In science, the suffix **-dynamic** refers to a "force producing motion" (1827). [1] The term *dynamic* was used as a term in philosophy in 1817. Its etymology stems from the French *dynamique* (1762), from German *dynamisch*, introduced by Gottfried Leibniz 1691 from Greek *dynamikos* meaning "powerful," from *dynamis* "power," from *dynasthai* "be able to have power," of unknown origin. The figurative sense of "active, potent, energetic" is from 1856. *Dynamics* as a branch of physics was in use from 1788.

The term was first used in a thermodynamical-sense in 1849 by Scottish physicist William Thomson who referred to a "perfect *thermo-dynamic* engine", in reference to the ideal Carnot engine, having no irreversibility, described by French physicist Sadi Carnot in 1824.

In 1895, Scottish mathematical physicist Peter Tait, an early historian of thermodynamics and associate of Thomson, defined *dynamics* as "a science that treats of the action of force upon matter, but which is, correctly, the science of matter and motion, or of matter and energy." [2]

See also

â— thermo-

References

1. Dynamic (1827) - *Online Etymology Dictionary*.
2. Tait, Peter Guthrie. (1895). *Dynamics*, (pg. 1). London: Adam and Charles Black.

θΔics

In science, **ism**, or the suffix *–ism*, signifies a doctrine, theory, or set of principles, describing a subject, state, condition, property, or attribute related to a particular subject, view, or philosophy; generally a topic in the "gray area" and or "neo-" realm of knowledge solidification [1]

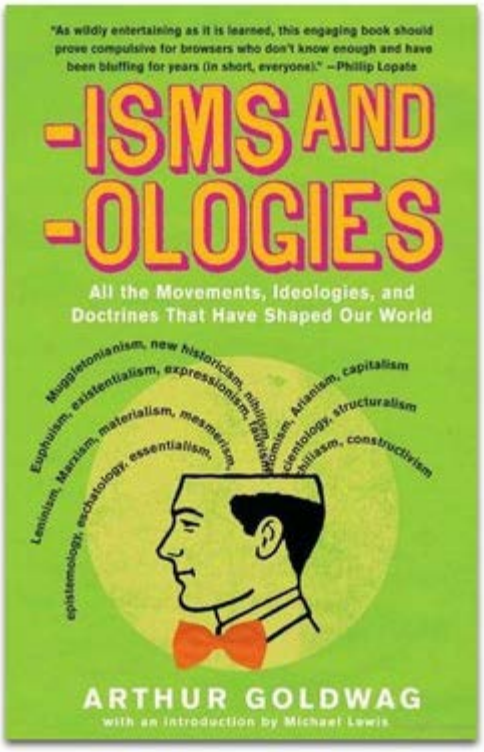

Writer Arthur Goldwag's 2007 *–Isms and –Ologies: all the Movements*, wherein he outlines over 450 of the most prominent 'isms' and 'ologies' of humankind, on things such as materialism, nihilism, and existentialism. [2]

List

The following are some *Hmolpedia* "isms":

- Abioism
- Chemicalism
- Darwinism
- Epicureanism
- Existentialism
- Goetheanism
- Holism
- Individualism
- Materialism

  → Dialectical materialism
  → Eliminative materialism
  → Extreme materialism

- Naturalism
- Nihilism
- Panbioism
- Panexperientialism
- Panpsychism
- Physicalism
- Positivism
- Racism
- Realism
- Reductionism

  → Anti-reductionism

- Thimsianism
- Vitalism

  → Neo-vitalism

Quotes

The following are related quotes:

> "**Isms** in my opinion are not good. A person should not believe in an ism."
>
> – John Hughes (1986), *Ferris Bueller's Day Off*

References

1. *–ism* – Merriam-Webster Collegiate Dictionary (2000).
2. Goldwag, Arthur. (2007). *–Isms and –Ologies: all the Movements, Ideologies, and Doctrines That Have Shaped Our World*. Vintage.

External links

- –ism – Wiktionary.

θΔics

In culture, **10 percent myth** is the postulate that the average person typically uses only ten percent of their brain, while the remaining 90 percent remains dormant. The myth originated in the 1890s reserve mental energy theories of Harvard psychologists William James and Boris Sidis, who applied the theory to the development of child prodigy William Sidis to affect an adult IQ of 250-300.

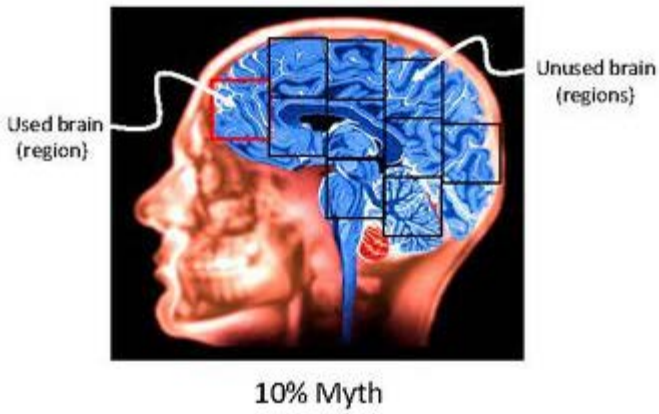

Left: a general depiction of the **10 percent myth**; showing only 10 percent brain activity. Right: a video still from the scene (Ñº) from the 2005 film *The Wedding Crashers*, wherein Owen Wilson (John Beckwith) cites the 10 percent figure, but uses it as a pick up line to say that he thinks we only use 10 percent of our hearts.

The figure of ten percent came about as the James-Sidis theory was retold over and over from “small part” (William James, 1906), to “one-quarter” (Addington Bruce, 1914), “10 percent” (*World Almanac*, 1929 – attributed to “scientists and psychologists), to “10 percent” (Lowell Thomas, 1936 – attributed to William James). The Lowell Thomas figure was included in the 1936 biographical preface section about Dale Carnegie, in the 15-million copy best-seller *How to Win Friends and Influence People*, which thus acted to solidify the semi-factual myth; semi-factual being that the so-called "myth" is based on an actual scientific theory, that was tested out in an actual case, and proved correct to a significant extent.

Origin

The seed of the ten percent myth originated in the 1890s reserve energy theories of Harvard psychologists William James and Boris Sidis which postulated that just as the body has dormant energy that can be called on when the circumstance presents itself, then so to must the mind have dormant intellectual ability that can be called on when the circumstance presents itself. The theory itself was based on the second wind descriptions of an Adirondack hiking guide and the extrapolation of this to prolonged mental work, in the sense that one will always begin a project cold, but that given time or after successive attempts or efforts one will eventually begin to warm up to the task, with new mental energy.

In 1891, William James founded America's first psychology department at Harvard University comprised of an eleven room psychology laboratory. During this period, a newly immigrated Russian by the name of Boris Sidis was completing his BA (1890), and MA (1891) at Harvard and began studying under James' tutelage, eventually receiving his PhD (1896) and later his MD there. During this period, in about 1892, Boris and his wife Sarah Sidis, a Harvard physician herself, began hosting a weekly philosophy-psychology discussion group, every Sunday, at their house, attended by scores of students, revered teachers, and no other than professor William James, considered the most renowned of them all, who was said to have "frequently climbed the many stairs to their attic". [5] It was some time in this period that the reserve energy psychology theory originated. The first published statement of this theory, know better known as the ten percent myth, it seems, was in James’ 1906 speech “The Energies of Men” wherein he commented that:

> “We make use of only **a small part** of our possible mental and physical resources.”

In the 1914 article “New Theories of Education”, American journalist

Addington Bruce, called the James-Sidis principle the “law of reserve energy”, and was explaining it to the effect that in the days of the savage people only used three-quarters of their brains, but that modern people were tapping into their mind with more use having discovered their reserve mental energy: [4]

Image from 2014 TED-Ed talk (Ñº) by Richard Cytowic on the **ten percent myth**.

> “Psychologists are more and more inclined to the opinion, first voiced only a short time ago by William James and Boris Sidis, that there is in every human being a store of disposable ‘reserve energy’, commonly utilized at infrequent intervals, but capable of being utilized habitually to great advantage. Reaction to stimulus results in tapping a new level of energy. Without being in the slightest degree conscious of it, they have adjusted themselves to the leading of a fuller, a more intense, a more effective life than they led in the days when, like the savage, they lived with **three-quarters** of their brain unused.”

In 1929, on the heels of William James' view that “we are making use of only a small part of our possible mental and physical resources”, the *World Almanac* ran an advertisement from a self-improvement company that stated: [8]

> “Scientists and psychologists tell us we only use about **10 percent** of our brain power.”

The myth became legend when in 1936 American writer Lowell Thomas commented in the conclusion of his introductory biography, “A Shortcut Distinction”, on Dale Carnegie, found in the introduction to multi-decade long best-seller *How to Win Friends and Influence People*, that:

> “Professor William James of Harvard used to say that the average person develops only **10 percent** of his latent mental ability.”

The over millions of people (at least 15-million) who have read this book, over the last century, have since gone on to popularize this ten percent brain function factoid to the point that it is now part of the common cultural zeitgeist.

William Sidis

In 1898, Boris and Sarah bore a son William James Sidis, named in honor of "William James", in which Sarah and particularly Boris began to test and prove the reserve mental energy theory. Their test, in fact, was so successful in developing of their son's intellectual abilities using this principle, that William was on the the first page of the *New York Times* nineteen times for his various mental feats and was in fact the model for the 1997 film *Good Will Hunting*. [61] Boris commented on his application of reserve energy in the raising of his son in a circa 1910 issue of New York *American*: [7]

William Sidis (IQ=250-300) - truth behind the **10% myth**: spoke first word 'door' at six months; learned to read and spell correctly before age two; at age 4, was typing in French and English; age 5, invented a base twelve logarithm table; age 6, could pass a medical school anatomy exam; age 8, passed the entrance exam for MIT and had written at least four books on anatomy, astronomy, grammar, linguistics, and mathematics; age 9, graduated high school, passed Harvard entrance exam, and gave an anatomy lecture; age 10, had learned differential and integral calculus was checking Einstein's work for errors; age 11, gave a lecture on four-dimensional space; age 16, Harvard graduate (BS mathematics), age 17, mathematics professor at Rice University, while pursing PhD; age 18-20, completed Harvard law school (then quit his last semester, while in good academic standing, for no apparent reason); at 21, he defended himself in court; age 22, wrote treatise on second law of thermodynamics applied to life, the evolution of the universe, and black holes; age 29, invented (and patented) a perpetual calender, with movable parts; spoke 25 languages.

> "I do not believe in the prevailing system of education for children. I have raised my son upon a system of my own, based to some extent upon the principles laid down by professor William James."

He continues:

> "You must begin a child's education as soon as he displays any power to think. Everybody knows how hard it is to learn a new language late in life. The same holds good of all our acquisitions. The earlier they are acquired the more truly they become part of us. At the same time keep alive within the child the quickening power of curiosity. Do not repress him. Answer his questions; give him the information he craves, seeing to it always that he understands your explanations.
>
> You need not be afraid of overstraining his mind. On the contrary, you will be developing it as it should be developedâ€•will he habituating the child to avail himself of the great fund of latent energy which most of us, to our detriment, so seldom use.
>
> The law of 'reserve mental energy,' as set forth by professor William James, has much to do with the progress of my son. Professor James explained that the power of getting what is popularly known as 'second wind' might be controlled at will and enable us to accomplish daily and regularly what we can all do under stress of circumstances. If you do prolonged mental work you will find yourself grow tired, but if you keep on working the feeling of fatigue will pass away. You are drawing on your reserve mental energy."

In 1910, American journalist Addington Bruce began to popularize the combination of the reserve energy theory, its application in William Sidis' childhood abilities, in conjunction with the logic that a large fraction of the average brain is unused. [3] It is primarily through the writings of Bruce that the figure of "unused percent" began to be associated with child prodigy William Sidis. In 1951 retrospect, Sarah commented back on their application of the "reserve mind theory" their son:

> "Genius was the term used for Billy. My son had merely learned the ability to use his brain to its capacity. In this regard, the science of psychopathology has set forth this fundamental principle which is not only of

the utmost importance in medicine but also in the field of education. It is the idea of stored up, dormant, potential, subconscious power—reserve energy. Billy was able to achieve an understanding easier than most people because he was aware of how to release and harness this reserve energy."

(add)

Fact or fiction?

As to the question of whether the ten percent theory is fact or fiction, as many articles have been published on this issue, arguing from both sides, the fact that the myth is based on the true story of the use of the theory in the intellectual development William Sidis leaves the question open for debate, in the sense that one, in theory, could take any random child and by means of accelerated home schooling result to utilize or employ a far greater portion of the mind than is used in the development of the average student.

The famous "Edith Experiment" is another example of this. Specifically, in 1952 New Yorker Aaron Stern resolved to make his newborn daughter a genius, simply by stimulating the mind in the proper manner. In fact, In 1952, when his daughter was born, Stern called a hospital press conference, inviting all his friends to see the infant, and in his own words, "I told them bluntly that she was destined become a genius." With her father's help, she was reading before age two, entered collage at age twelve, was teaching mathematics at Michigan State University by age 15, completing her PhD at age 18, supposedly has an an adulthood IQ of 203, and now works as a secret computer programmer at IBM.

In the 1971 book *The Making of a Genius*, Stern commented that "he could foster the same meteoric IQ in the children of the Tasaday tribe, a Stone Age people living in the Phillippines." On these examples, it may be that the mind is capable of far greater ability that is currently used, thus lending credibility to the 10 percent myth.

Acquired savants

Of related note, there are about 70 known cases of so-called "acquired savant" syndrome, as documented (Ñº) by Darold Treffert, in his *Islands of Genius* (2010), wherein everyday normal people have a concussion to the head or stroke, after which they developed profound skills in certain areas, e.g. Jason Padgett who after being beaten in head (2002), outside of a bar, became a math savant, Orlando Serrell, who after being hit in the head by a baseball at age ten, was able to do "calendar calculating", which is the ability to tell you what day of the week a particular date will fall on, or Jon Sarkin, who after having a stroke became a famous artist with his own art gallery.

See also

â— Good Will Hunting (William Sidis)

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1. Thomas, Lowell. (1936). "A Shortcut to Distinction", In: *How to Win Friends and Influence People* (pg. 283), by Dale Carnegie, Simon and Schuster.
2. (a) James, William. (1907). *The Energies of Men* (pg. 14). Kessinger Publishing.
(b) Speech: "The Energies of Men" delivered as the Presidential Address before the American Philosophical Association at Columbia University, Dec. 28, 1906.
3. Bruce, H. Addington. (1910). "Bending the Twig" (discusses Boris's reserve energy theory), *American Magazine*, Vol. 69: 690-95, Mar.
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5. Wallace, Amy. (1986). *The Prodigy: a Biography of William James Sidis: America's Greatest Child Prodigy* (pg. 14). Dutton Adult.
6. Sarah, Sidis. (1951). "Genius", unpublished manuscript, 5-pgs, Sidis.net.
7. Author. (1910). "Boy Prodigy of Harvard", *Current Literature*, 48: 291-93.
8. Pickover, Clifford A. (1998). *Strange Brains and Genius: the Secret Lives of Eccentric Scientists and Madmen* (ch. 13: Do We Really Use Only 10 Percent of Our Brain?, pgs. 209-213). Quill.

External links

â— 10% of brain myth – Wikipedia.

θΔics

In HT pioneers, **1952-1994 HTPs**, or human thermodynamic pioneers, are those individuals (listed to the left) to have developed or theorized on general human thermodynamic theories, during the years 1952 to 1994, the year that C.G. Darwin defined “human thermodynamics” as the statistical mechanical study of “human molecules” up to the next divide, 1994/1995, the year prior to that when American chemical engineer Libb Thims clearly visualized the basics of human chemical thermodynamics.

θΔics

In religio-

2 Kings 2:24

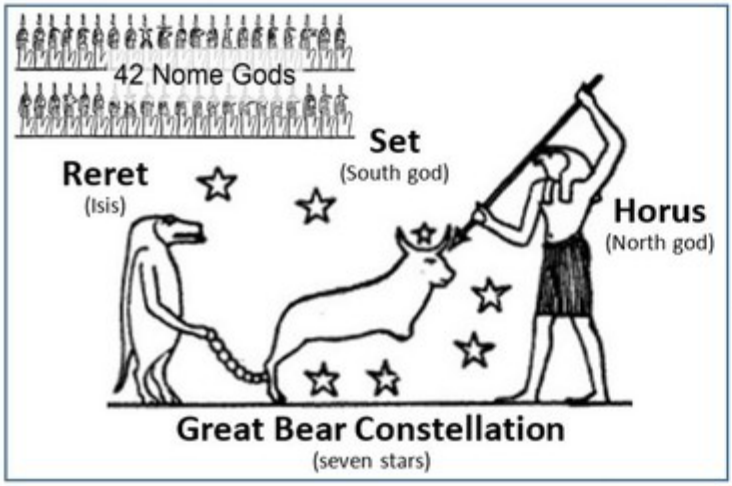

Set vs Horus Star Battle
(**Poly**-theistic version | 3500BC)

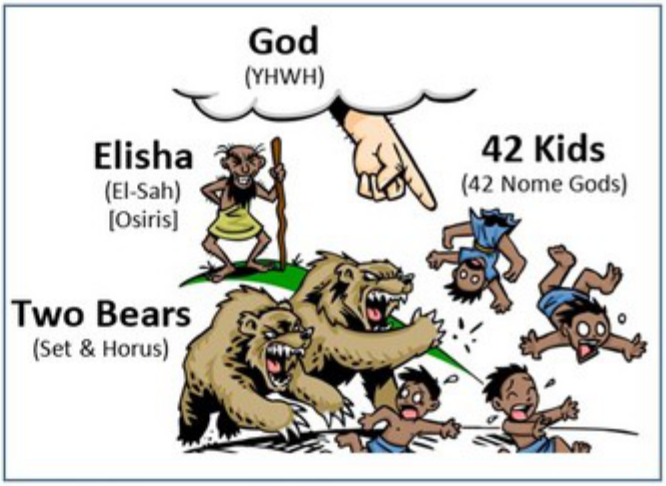

Elisha and the Two Bears
(**Mono**-theistic version | 500BC)

A before and after take on **2 Kings 2:24**, the story of how Elisha issues a "curse" on 42 boys, for calling him bald, that draws two female "bears" out of the woods, who tear the boys to pieces. This strange-sounding Biblical story, accordingly, i.e. according to recension theory, is a monotheistic rewrite of the **Set and Horus battle**, in the form of two bears (Budge, 1904). The 42 boys are rewrites of the 42 gods of the judgment hall, i.e. 42 nome gods of Egypt, who judge the result of the fight. The character Elisah, or El-sah, is Hebrew for "god Sah", i.e. the Orion constellation version of the god Osiris.

mythology, **2 Kings 2:24**, aka "Elisha and the Two Bears", is section 2, line 24, of the second book of Kings, of the Old Testament, of the Bible, wherein it is strangely told that two "bears", come out of the woods, via a spell, and tear up 42 boys, as punishment for calling a man, named Elisha (the understudy of Elijah), "bald"; the story is a reformulated retelling of the famous c.3500BC tale of the Set vs Horus battle, in the form of two bears (or Set in the form of the Great Bear constellation), done to avenge the killing of Osiris, i.e. El-Sah (or Elisha), the outcome of the skirmish decided on by 42 nome gods.

Overview

In the Bible, 2 Kings 2:24, and surrounding text, reads as follows: [1]

> 23 And he went up from thence unto Bethel: and as [**Elisha**] was going up by the way, there came forth little children out of the city, and mocked him, and said unto him, Go up, thou bald head; go up, thou bald head.
>
> 24 And he turned back, and looked on them, and cursed them in the name of the Lord. And there came forth **two she bears** out of the wood, and **tare forty and two children** of them.
>
> 25 And he went from thence to mount Carmel, and from thence he returned to Samaria.

This peculiar-sounding tale, historically, has had frequent illustrations; a few examples (Ñº)(Ñº)(Ñº) of which are shown below:

This strange-sounding Biblical story, accordingly, i.e. according to recension theory, is a rewrite of the famous Set and Horus battle, dating to pre-Dynastic time (c.3500BC), who were said to have battled in the form of two bears; Set and Horus shown below in the standard form of jackal-like camel animal and hawk, respectively.

The typical representations of Set and Horus, the origin behind the "two bears" of **2 Kings 2:24**.

The fight was done to rectify the previous killing of Osiris (El-Sah, i.e. "god Sah" or "Elisha"), the father of Horus, and brother of Set; Osiris having been previously "tore up" into 14 pieces by Set, because he had accidentally slept with Set's wife Nephthys, whom Osiris had mistake for his wife Isis, Nephthys' twin sister.

The 42 boys are rewrites of the 42 gods of the judgment hall, i.e. 42 nome gods of Egypt, who presided the judgment of the dead, and presumably over the battle between Set and Horus. The Hebrew mythology translated character Elisha, or El-sah, is Hebrew for "god Sah", i.e. the Orion constellation (made of 14 stars) version of the god Osiris (or Sah-Osiris). The tearing up of the 42 boys is a rewritten retelling of the metaphor of the tearing up of the 14 stars of the Osiris, in the form of the Orion constellation, prior to his Nov-Dec "rising" or resurrection, i.e. the Orion constellation viewed as a man (or pharaoh) rising from the horizontal position to the vertical position between 9PM and 12mid in Nov and Dec.

In 1874, *Chambers Encyclopedia*, summarized the Set vs Horus battle, using what seems to be the Plutarch (100CE) version of the story, as follows: [4]

> "The goddess [Isis], intending to visit Horus her son at Buto (Ñº), deposited the chest [containing the body of Osiris] in an unfrequented spot; but Typhon [Set] discovered it by the light of the moon, **tore it into** 14 **pieces**, and distributed each to a nome or district. Isis recovered all by passing the marshes in a boat of papyrus; all except the phallus, which had been eaten by the Lepidotus, the Phagrus, and Oxyrhynchus fish. Subsequently, a battle took place between Horus and Typhon or Set, which lasted three days, and ended by Typhon having **fetters** [pictured adjacent] placed upon him. Isis, however, liberated Typhon, which so enraged Horus that he tore off her diadem, but Teti or Thoth placed on her the head of a cow instead. Typhon finally accused Horus of illegitimacy; but the question was decided between them by Teti or Thoth and the [42] gods. From Osiris, after his death, and Isis sprung Harpocrates [Horus]. Osiris seems to have been finally revived, and to have become the judge of the Karneter or Hades [afterlife], presiding at the

final judgment of souls in the Hall of the two Truths [Judgment Hall], with the **42 demons** [42 nome gods] who presided over the capital sins, and awarding to the soul its final destiny. Thoth or Hermes recorded the judgment, and justified the deceased against his accusers, as he had formerly done for Osiris."

The first time Horus and Set fought, according to Wallis Budge (1904), it was in the form of men; the second time the fought, however, it was in the form of "bears". [3] The transition of the fight into the story guise of "two men" fighting into "two bears" fighting seems to have come about via the circa 800-300BC Greek retelling of the Egyptian story, e.g. Herodotus (450BC) or Plutarch (100CE), in the Hebrew-Egyptian format. Budge summarizes this as follows: [3]

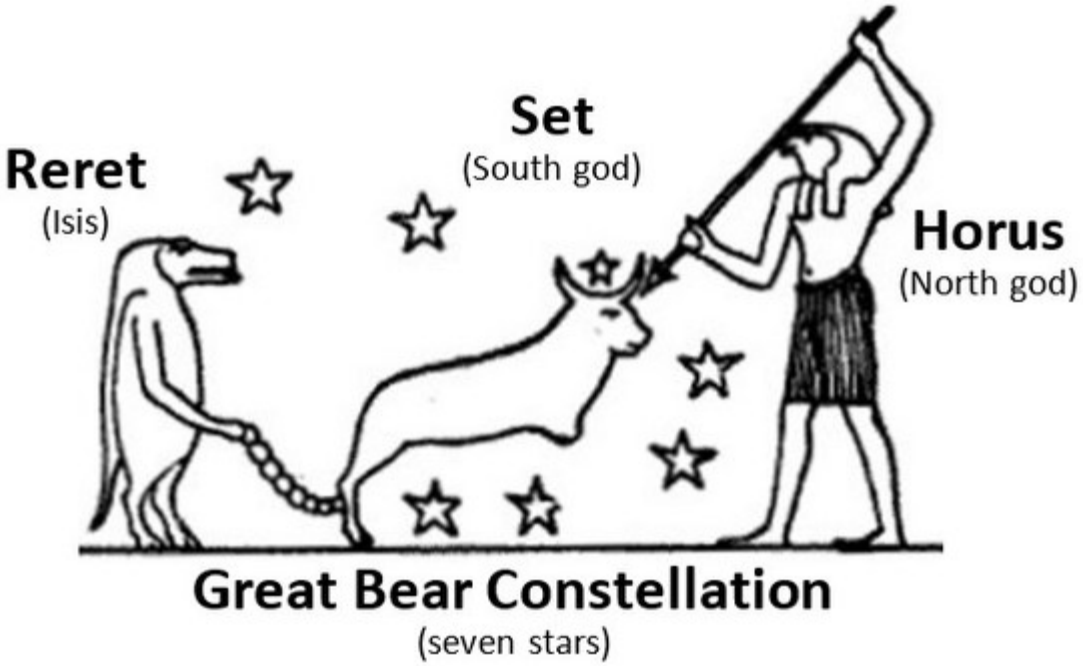

The Greco-Egyptian astro-theology interpretation of Horus killing Set, or the constellation Khepesh, i.e. "Thigh" (Egyptian) or "Bear" (Greek) shaped, constellation; Set being held in chains by the hippopotamus goddess Reret, a form of Isis, who later, feeling sorry for Set, releases his chains. The second version of the fight, between Set and Horus, was said to have taken place in the form of "two bears" according to Wallis Budge (1904). [3]

> "The kingdom of Set was supposed to be placed in the northern sky, and his abode was one of the stars which formed the constellation of Khepesh 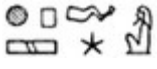 or the 'Thigh', which has been identified with the **Great Bear**, and it was from this region that he made use of his baleful influence to thwart the beneficent designs of Osiris, whose abode was Sah or Orion, and of Isis [Reret], whose home was Sept, or Sothis."

This would seem to be an astro-theology reference, to a bear-shaped constellation. The constellation of the "Great Bear" (Ñº) is the sign (Ñº) of Set; similar to how the Orion constellation is the sign of Osiris.

Decoding | History

In 1881, Gerald Massey, in his A Book of the Beginnings, while not decoding the Elisha and the Two Bears" story, was making connections between Elijah, Elisha, and Egyptian mythology. [5]

In 1936, H.S. Darlington, in his "Elisha and the Two She-Bears", was making semi-approximate, slightly error-filled, connections between Elisha, Osiris, and the 42 nomes of Egypt. On Elisha and Elijah, Darlington says the following:

> "Now, Elisha was the understudy of Elijah who is said to have been a 'hairy man' and to have worn a garment of hair, or possibly the pelt of some shaggy haired animal such as that of the bear or the lion. Elijah probably belonged to some order of shamans who vowed never to cut the hair off their heads and faces, lest the power they received from the spirit they served should forsake them."

The correction of this, i.e. the descriptions of Elisha and Elijah, is that the hairy man or "garment of hair" description is

reference to the over-typical description of Set who is said to have worn a hairy red coat of fur (the model behind the red color of the devil). Darlington then connects Elisha to Baal:

> "Elijah is represented as a rain-maker who won a contest in opposition to the priests of Baal."

The god Set, as Wallis Budge (1904) has pointed out, was previously ascribed, by the Egyptians in the Delta region, with all the attributes of the Semitic god Baal; who, in later Christian times, became on of the names of the devil. [3] Darlington then attempts to connect 42 and Osiris with the Elisha version of the story as follows:

> "There crops up the question why the number **forty-two** [42] is specifically given as the number of students in the college at Bethel, all of whom are supposed to have been struck by lightning? Could it be that the acceptable and maximum number of students or brothers in a shamanistic training school, under the tutelage of a fatherly priest, was set at forty-two? If so, perhaps the idea arose in Egypt, where Osiris as the father of men, and the slain god, is said to have been **cut up into a number of fragments**. Commonly he was divided into fourteen but others say sixteen, and still another account says forty-two."

Here, to correct things, fourteen is the number of stars of the Orion constellation, dubbed the the early Egyptians as the god Sah, hence the namesake "El-Sah" or Elisha or Elijah, which are but Hebrew namesake translations of "god Sah". The god Sah, as is well established, was in the early Dynastic period, syncretized with the god Osiris. Hence, in transliteration, we have the following: "god Sah" [equals] "god Osiris" [equals] "Elisha (or Elijah)". Also, to correct things, Osiris, in the famous "Passion of Osiris", was never cut into 42 pieces. Darlington continues:

> "One of these fragments was supposed to have been preserved in each of the principal temples. These forty-two temples were located in the forty-two names or districts of the land. Although Osiris was dismembered it was believed that he would be resurrected when all forty-two parts came to a coalescence or integration whereby his spiritual body, rather than his material body, would be reconstituted, and a new unity achieved. No doubt there was a priest for each of the forty-two temples and the forty-two fragments. If these men met in secret conclave at times, in a secret hall of initiation, they would figuratively at least have restored Osiris to cosmic functioning again."

Here, to correct things again, only 14 parts of Osiris had to be reconstituted (as a mummy) prior to resurrection. Darlington continues:

> "In Christian terms where one or two are gathered together there the Christ will be: so it seems the Egyptians believed that in the assembly of forty-two priests as parts of the total spirit of the slain deity, the godhead in perfection would be reestablished. Every soul seeking union with Osiris had to be tried before forty-two judges who assisted Osiris, and these it seems are the brothers of a fraternity who pass on the character of the candidate for initiation into the ultimate mysteries of the god and of the doctrine of unity with him. Hence from Egypt, probably came the notion of having forty-two students or brothers in a fully constituted lodge of rain-makers."

This part is about correct. The 42 judges, mentioned by Darlington, are the 42 gods (nome gods) of the Judgment Hall, where Osiris judges the soul of the deceased, the weight of the soul, determined by the 42 negative confessions.

Darlington, on this platform, then summarizes the 2 Kings 2:24 passage as follows:

A Horus Gilgamesh *Awkward Moments: Children's Bible* (2013) rendition (Ñº) 2 Kings 2:24, the two female bears shown as two male "bears", via the metaphor for large harry homosexual men. [2]

> "In summary: The forty-two children torn by the two she-bears, were priestly brothers in an initiation school for doctors who sought for adoption by Thunder, but who knew him as Baal instead of by his "true" name Yahveh [Yahweh]. Elisha as a partly bald man called up a thunderstorm, and the lightning struck the false "sons of the prophet." This in itself was a wonder, for a bald man should not normally have any power at all to provoke a thunderstorm. Thus, Elisha was an exceptional priest and Yahveh an exceptional Thunderer."

The conclusion here, while way off, at least is in the neighborhood, i.e. in the sense of connecting Elisha to Baal, who was a latter form of Set, and connects the story, in a round-about sense, previously, to Osiris and the 42 nomes.

In 2017, Libb Thims decoded the 2 Kings 2:24 parable, independently, while reading the Set chapter of Wallis Budge's *The Gods of the Egyptians, Volume Two* (1904), and its mention of Set and Horus fighting in the form of "two bears", the illustrated Horus Gilgamesh (2013) rendition, shown adjacent, which he had previously read, coming to mind at this point.

Quotes

The following are related quotes:

> "The Egyptians say that the souls of their gods shine as the stars in the firmament, and the soul of Isis is called by the Greeks the Dog Star, but the Egyptians Sothis, and the soul of Horus is called Orion, and the soul of Typhon [Set] is called the Bear."
>
> — Plutarch (100AD), *On Isis and Osiris* (pg. 53)

> "Osiris wrestles for 3 days and 3 nights with Set over the throne, and are turned into bears (Ursa Major and Ursa Minor)."
>
> — Eddie Austerlitz (2010), *If It's Backwards It Must Be Right* (pg. 47)

See also

â— Genesis

â— Joshua 10:13

References

1. 2 Kings 2:24 (KJV) – BibleGateway.com.
2. Gilgamesh, Horus and Tickheathen, Agnes. (2013). *Awkward Moments Children's Bible, Volume One* (Foreword: David McAfee) (eB) (Ñº) (Tear Those Boys to Pieces, pgs. 23-24). CreateSpace.
3. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (two bears, pg. 245; Great Bear, pg. 249, Baal, pg. 250). Dover, 1969.
4. Chambers, Robert. (1874). *Chambers's Encyclopedia: a Dictionary of Universal Knowledge for the People, Volume VII* (§:Osiris, pgs. 133-34). W. and R. Chambers.
5. Massey, Gerald. (1881). A Book of the Beginnings, Volume Two (pg. 211). Cosimo, 2007.
6. Darlington, H.S. (1936). "Elisha and the Two She-Bears" (pdf), Open Court, 2(6):107-114.

θΔics

In meet-ups, **4th of July holiday** is an annual meet-up between founding members of the Institute of Human Thermodynamics (IoHT): Libb Thims, Lynn Liss, and Ira Liss, and others, e.g. Hudson and Spenser, meet annually on the 4th of July weekend at a different waterpark each year and discuss progress of the development of human chemistry and human thermodynamics.

Perfect Day

In 2019, Royal Caribbean opened a new island waterpark called Perfect Day at CocoCay (Ñº), in the Bahamas, which boasts a 135-foot water slide called Devil's Peak, which goes 50 mph, and is the tallest waterslide in North America.

Bring list

The following is the bring list for the dihumanide molecule Lynn≡Ira, to bring from LA, for the 2019 canoe trip:

1. Tubes & electric pump (with attachments)
2. Grill or pan (for cooking hamburgers for lunch on fire)
3. Netting like bag with tie down rope (to hold pan and things for when canoe tips)
4. Cooler with rope tied to handle (to tie to canoe) with some kind of lid latch (to retain contents of cooler for when canoe tips)

Other things to have ready include: adult IDs (3), waver forms (5), poop bags (3), firewood, life jackets for kids (rent?), water-shoes (for hot spring hiking), waterproof case with tie down rope (for phone/electronics), water speaker, and (add)

Meetings

The meetings are listed below, shown with abbreviations lazy river (L.R.) and super-slide (S.S.):

Year	Park	Location	L.R.	Rides	Acres	Bar	S.S.	Fittest	Runners Up
2001	Deep Rivers	Hobart, In		10	10				
2002	Mountain Creek Waterpark	Vernon, NJ		10					
2003	Six Flags Hurricane Harbor	Valencia, Ca							
2004	Wet 'n Wild	Las Vegas, Nv		22	22		65ft	Lynn	
2005	White Water	Atlanta, Ga		40	40		45ft		
2006	Noah's Ark	Dells, Wi	2	60	70		55ft		
2007	Schlitterbahn	New Braunfels, Tx		60	65	Y	55ft		
2008	Waterworld Safari								
	The Oasis | Arizona Grand Resort							Ira	
2009	Island Water Park	Fresno, Ca	Y	25				Ira	Hudson (product #1), Lynn, Libb
	Wild Water Adventure Park	Clovis, Ca	N	37	52				" "
2010	Keylime Cove WP Resort	Gurnee, Il							

	Hurricane Harbor 6 Flags	Gurnee, Il				
2011	Welk Waterpark Resort	Escondido/Hidden Meadows, Ca			Ira	Hudson, Spencer (product #2), Libb, Lynn
	Wave Waterpark	Vista, Ca	Y			" "
	Knotts Soak City	Chula Vista, Ca	Y			
2012						
2013						
2014						
2015						
2016	Great Wolf Lodge	Williamsburg, Va	Y	Y		
	Water Country USA	Williamsburg, Va	Y	Y		
2017						
2018						
2019	Black Canyon River, Nevada Las Vegas Water Sports Cowabunga Bay [?]	Boulder City, Nevada Las Vegas, Nevada Henderson, Nevada				
2020						

(add)

Quotes

The following are noted quotes:

> "I wrote *Common Sense* the latter end of the year 1775, and published it the first of January, **1776**. Independence was declared the **fourth of July** following."
>
> — Thomas Paine (1794), *The Age of Reason* [1]

> "If I were to ask my wife: darling do you really love me? And she says: I'm trying my best to do so, it's not the answer I want. I want her to say: I can't help loving you, I love you so much I could eat you. And that's what the plant feels in growing, it doesn't feel that it must grow, it's not under orders, it's not a military chain of command. It does this spontaneously, so that when you try to command this spontaneous process, you stop it. What you are basically, deep deep down, far far in, is simply the fabric and structure of existence itself. Reality itself is gorgeous, it is the plenum, the fullness of total joy. Wowee! And all those stars, if you look out in the skies, is a firework display, like you see on the **4th of July**, which is a great occasion for celebration. The universe is a celebration it is a firework show to celebrate that existence is. This is the real secret of life: to be completely engaged with what you are doing in the here and now, and instead of calling it 'work', realize that this is play."

— Alan Watts (c.1970), “Work as Play” (Ñº)

References

1. Paine, Thomas. (1795). *The Age of Reason* (editor: Moncure Conway) (txt) (pg. 63). Merchant Books, 1896.

Further reading

â— Butcher, Dan. (2009). “Top U.S. Water Parks”, CNN.com, July 15.

External links

â— List of waterparks – Wikipedia.

θΔics

In symbols, the = symbol or “equals sign” represents an equivalence of the quantities or values on each side, left and right, of its position in a mathematical expression.

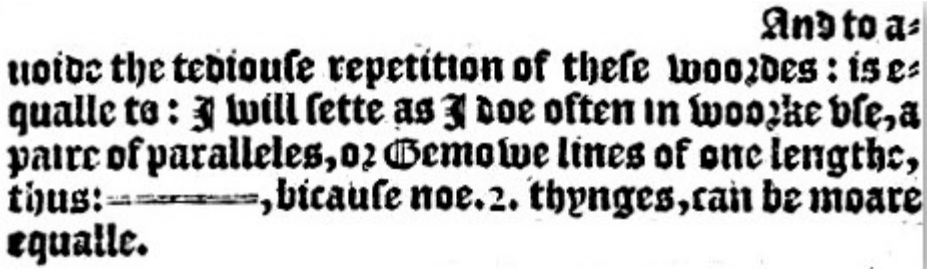
And to a-
uoide the tediouſe repetition of theſe wooꝛdes : is e-
qualle to : I will ſette as I doe often in wooꝛke vſe, a
paire of paralleles, oꝛ Gemolwe lines of one lengthe,
thus: =====, bicauſe noe. 2. thynges, can be moare
equalle.

Passage from Robert Recorde's 1557 book *The Whetstone of Witte* in which the equals sign "=" was introduced for the first time.

Etymology

In 1557, English mathematician Robert Recorde, in his textbook *The Whetstone of Witte*, introduced the equals symbol “=” as a means of truncation of the words “is equal to”. [1] Specifically, Recorde states: [2]

> “To avoid the tedious repetition of the words: is equal to, I will set a pair of parallels, or lines of one length, thus: =, because no two things can be more equal.”

References

1. Bodanis, David. (2000). *E = mc² - a Biography of the World's Most Famous Equation* (pg. 25). Berkley Books.
2. Recorde, Robert. (1557). *The Whetstone of Witte: whiche is the seconde parte of Arithmeteke: containing the extraction of rootes; the cossike practise, with the rule of equation; and the workes of Surde Nombers.* Publisher.

External links

â— Equals sign – Wikipedia.
â— The Whetsone of Witte – Wikipedia.

θΔics

In symbols, **A** is the symbol for affinity, chemical affinity, or elective affinity. The symbol "A", in thermodynamic formulations, can also refer to mechanical work from the German “Arbeit”, meaning work, and to Helmholtz free energy, a thermodynamic formulation of affinity.

Affinity

It is difficult to say when exactly A can into use as “affinity”, being that this subject, according to English chemistry historian James Partington,

The start of the science of modern affinity chemistry, however, traces to descriptions of chemical "attractions" by English physicist Isaac Newton in "Query 31" to his 1718 *Optics*. [1] In the century to follow the terms affinity and attraction were often used synonymously.

In 1936, Belgian physicist Theophile de Donder had clearly used the symbol "A" for affinity as the negative partial of the partial of the Gibbs free energy per unit partial of extent of reaction for a change in a isothermal isobaric system: [2]

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

In modern simplified notation:

$$A = -\Delta G$$

In addition, the standard affinity, symbol A°, is the affinity of a chemical reaction when each constituent of the reaction is take in its standard state. [3]

Arbeit

In 1864, French chemist Marcellin Berthelot put forward his theory that the heat of reaction was the true measure of affinity; and later, in circa 1775, proposed his maximum work principle, which argued that that the "maximum work" that a chemically reactive system can produce was a measure of the heat released from the chemical reactants on going to products. This view, however, soon came into conflict with the new 1865 "entropy" state formulation of heat by German physicist Rudolf Clausius.

In 1882, to reconcile the inconsistencies between Berthelot's view and Clausius' view, Hermann Helmholtz, in his "On the Thermodynamics of Chemical Processes", proved that the true measure of affinity is free energy (not heat), thus showing Berthelot's theory to be fallacious (at all temperatures above absolute zero). In the period to follow this date would be a probable time for symbol introduction, as various free energy formulas began to be used. Since the German word for work is “Arbeit”, likely used by Helmholtz, the symbol “A” soon began to be used for work, maximal work, free energy or Helmholtz free energy, and also affinity.

In 1917, Walther Nernst was using A for “work”.
In 1924, James Partington was using A for “work”.

Reaction energy

In 1905, Fritz Haber was using A for “reaction energy”.

Helmholtz free energy

In 1923, Gilbert Lewis, building in some sense on Haber, was using A for “Helmholtz free energy”, as follows:

$$A = U - TS$$

In *circa* 1950s, IUPAC began to assign A to Helmholtz energy (Helmholtz free energy), a function which measures affinity for isothermal isochoric systems.

At some point along the line, however, this A for Helmholtz free energy symbol notation, as shown in the characteristic function notation table, began to be supplanted by the symbol F for Helmholtz free energy (or "free energy", for short, with an V,P constant system assumed).

References

1. Muir, Matthew M.P. (1907). *A History of Chemical Theories and Laws* (ch. XIV: Chemical Affinity, pgs. 379-430, esp. keyword: "Bergmann", pgs. 384-94). Wiley.
2. De Donder, Theophile. (1936). *Thermodynamic Theory of Affinity: A Book of Principles* (pg. 2). Oxford University Press.
3. Perrot, Pierre. (1998). *A to Z of Thermodynamics* (Standard affinity, pg. 284). Oxford University Press.
4. Partington, James. (1937). *A Short History of Chemistry*. Dover.

External links

â— A – Wikipedia.

θΔics

In equations, the function:

$$A = T\Delta S - \Delta H$$

is called “[name]” and is the relation between chemical affinity A of reactants in an isothermal isobaric system and the bound energy TΔS and enthalpic energy ΔH of the system. With substitution of the enthalpy function:

$$H = U + PV$$

into the affinity equation, we have:

$$A = T\Delta S - \Delta U - P\Delta V$$

which means that affinity (bonding/reaction force), specifically affinity between reactants (or people), i.e. the force of reaction between people, is a function of temperature, entropy, internal energy, pressure, and volume. This means that affinity will be favored, between two people, when there is an increase in entropy, a decrease in internal energy, and a decrease of volume, of the interactive system, over time. One can expand on this equation in more detail, by noting that German physicist Rudolf Clausius defined internal energy of the system, which in this case concerns a system of interacting people or human molecules, as the sum of the vis viva T_v and the ergal J_e or

$$U = T_v + J_e$$

which when referring to a change Δ over time is:

$$\Delta U = \Delta T_v + \Delta J_e$$

Subsequently, the measure of the affinity between two people, wherein A > 0 for spontaneously favored relationships (or ΔG < 0, thermodynamic sense, i.e. according to the spontaneity criterion), is expressed by the equation:

$$A = T\Delta S - P\Delta V - \Delta T_v - \Delta J_e$$

meaning that in addition to an entropy increase, ΔS > 0, or transformational content increase (meaning that heat was transformed into system internal evolution work), which signifies that the body or boundaried system of the relationship has transformed or evolved over time, and a volume decrease, ΔV < 0, associated with favorable relationships, meaning that spatial movements of the pair come together over time rather than diverging (simplified by saying that two homes become one), a vis viva decrease, ΔT < 0, and an ergal decrease, ΔJ < 0, will also be associated with favored relationships.

A decrease in vis viva seems to make intuitive sense, in that a couple nearing their golden wedding anniversary will invariably tend to have less kinetic energy then a newly minted couple, in the sense that the former's daily movements will often be slow and tending to be confined to the kitchen, bathroom, and television room. The subject of an ergal decrease over time as associated with stable relationships requires more thought. In formulaic terms, ergal change over time is defined as:

$$\Delta J_e = J_{e_f} - J_{e_i}$$

Thus, a negative ergal change, which be the above reasoning is associated with favored relationships, implies that the ergal at the start of the relationship, *Ji*, must be greater than the ergal at the end of the relationship, *Jf*.

In the terminology of William Hamilton, an "ergal decrease" is expressed by saying that their was a decrease in the force function of the relationship (system) over time; or in the terminology of William Rankine, this is expressed by saying that there was a decrease in the potential energy of the relationship (system) over time.

θΔics

In equations, the following formula:

$$A = -\Delta G$$

is called the "affinity-free energy equation" or "Goethe-Helmholtz equation" and is the relation between the chemical affinity A and Gibbs free energy change ΔG a closed isothermal-isobaric reacting system. The free energy affinity equation is the main governing equation of human existence, to the affect that the sum of affinities of all humans in a system will be equal to the negative Gibbs free energy change of that system on going between two states of existence. In terms of enthalpy and entropy, this equation reduced to:

$$A = T\Delta S - \Delta H$$

which states that affinity equals the change in the entropic energy (or bound energy) "TΔS", i.e. the quantity of the product of the absolute temperature of the system *T* times the entropy change ΔS, less the change in the enthalpic energy "ΔH" (enthalpy change) of the system. If the enthalpy function is expanded:

$$A = T\Delta S - \Delta U - P\Delta V$$

we see that not only is affinity a function of bound energy, but also internal energy and pressure-volume work energy.

Etymology

The name Goethe-Helmholtz equation is an "Hmolpedia assigned name"; premised on the fact that a prior established name for this equation, in the literature, is generally lacking or nonexistent. In this direction, the name "Goethe-Helmholtz equation" has been assigned to this relation, on the premise that German polymath Johann Goethe was the first to explain how chemical affinity A applies to human affairs (1809), in standard physical chemistry format, and German physicist Hermann Helmholtz was the first to prove that free energy change (isochoric-isobaric: Helmholtz free energy (ΔF) or isothermal-isobaric: Gibbs free energy (ΔG)) is the true measure of chemical affinity (in his disproof of the Thomsen-Berthelot principle). This should not be confused with either the Helmholtz equation (acoustics) or Gibbs-Helmholtz equation (electrochemical thermodynamics).

Humans

Greek philosopher Empedocles was the first to state that chemical affinity applies to humans, in love and war, with his various circa 450BC chemistry aphorisms.

The first to formulate a "standard model of human existence", structured on standard physical chemistry, in particular the logic of affinity reactions, was German polymath Johann Goethe as found in his 1809 novella *Elective Affinities*.

The first to state the relation between affinity and Gibbs free energy is the governing equation of human relationships, in both intimate and social terms, was American electrochemical engineering Libb Thims in his 2007 *Human Chemistry*. [1]

In lay terms, assuming all human interactions to be chemical reactions, pure in simple, and assuming that the sum of human attractions (desires) and repulsions (aversions) to the forces of chemical affinities, in the words of Ilya Prigogine:

> “All chemical reactions drive the system to a state of equilibrium in which the affinities of the reactions vanish.”

Progogine summarizes this by the following three inequality rules: [4]

Measure	Description
$A > 0$	reaction proceeds to the right
$A < 0$	reaction proceeds to the left
$A = 0$	reaction is in a state of equilibrium

Some of this logic has been quantified in terms of "Gottman stability ratio" of attractions and repulsions for successful marriage reactions, in the 1990s studies of American mathematical psychologist John Gottman.

Thomsen-Berthelot principle

Independently, in 1854 and 1864, chemists Julius Thomsen and Marcellin Berthelot posited that heat is the driving force of chemical reactions and thus the measure of chemical affinity. This came to be know as the Thomsen-Berthelot principle.

Chemical thermodynamics

The proof that free energy, and not heat, is the "true" measure of chemical affinity, was first given by German physicist Hermann Helmholtz in his 1882 "On the Thermodynamics of Chemical Processes", in which he worked out the derivation specifically for the isochoric-isobaric free energy or Helmholtz free energy, as it has come to be called. [2] In modern notation, Helmholtz showed that:

$$A = -\Delta F$$

or in expanded form:

$$A = T\Delta S - \Delta U$$

which states that affinity A equals the change in the entropic energy (or bound energy) "TΔS" (entropy change) less the change in the internal energy "ΔU" (internal energy change) of the system.

Absolute zero

In his 1906, German physical chemist Walther Nernst, in his heat theorem (or third law of thermodynamics as it has came to be called), showed that the Thomsen-Berthelot principle is only true at absolute zero, in the sense that as the temperature approaches zero, entropy change becomes zero:

$$\lim_{T \to 0} \Delta S = 0$$

and when substituted into the Helmholtz formula for affinity (above):

$$A = -\Delta U$$

at which point heat, or rather the heat released form the internal energy (bond energy) chances "ΔU" of the chemical

reactions, becomes the true measure of chemical affinity A.

Gibbs free energy

The first to work out the proof that free energy is the measure of chemical affinity specifically for isobaric-isothermal reacting systems, in which case the free energy is Gibbs free energy, the type of reactions that freely occur on the surface of the earth, such as do human chemical reactions, seems to have been Belgian mathematical physicist Theophile de Donder, sometime beginning in 1920, culminating in his 1936 *Thermodynamic Theory of Affinity*. De Donder stated the relation in terms of variation in the extent of reaction: [3]

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

which states that the affinity A of a closed isothermal-isobaric reacting system is equal to the negative of the variation of the Gibbs free energy ∂G per variation in the extent of reaction $\partial \xi$.

De Donder's formulation of chemical affinity is said to be based on American engineer Willard Gibbs' 1876 concept of chemical potential. [4] The definition of what is called "standard affinity", according to French thermodynamicist Pierre Perrot, is:

$$A^\circ = -\Delta_r G^\circ$$

which according to Perrot, equates to:

$$A^\circ = \sum_{i=1}^{k} -\nu_i \mu_i^\circ$$

such that the affinity of the chemical reaction is calls "standard" when each constituent is taken in its standard state. [5]

Thermodynamic coupling

Add: affinity coupling (De Donder, pg. 113);
Add: free energy coupling

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. xvi). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (pg. 443). Morrisville, NC: LuLu.
2. Helmholtz, Hermann. (1882). "On the Thermodynamics of Chemical Processes", in: *Physical Memoirs Selected and Translated from Foreign Sources*, 1: 43-97. Physical Society of London, Taylor and Francis, 1888.
3. (a) De Donder, Théophile. (1920). *Lecons de Thermodynamique et de Chemie Physique* (Lessons of Thermodynamics and Physical Chemistry), (pg. 117, formula 318). Paris: Gauthier-Villars.
(b) De Donder, T. (1922). "Article". *Bull. Ac. Roy. Belg.* (Cl. Sc.) (5) 7: 197-205.
(c) De Donder, T. (1927). "L' Affinite", Paris: Gauthier-Villars.
(e) De Donder, Theophile and Van Rysselberghe Pierre. (1936). *Thermodynamic Theory of Affinity: A Book of Principles*, (pg. 2).Oxford University Press.
4. Kondepudi, Dilip and Prigogine, Ilya. (1998). *Modern Thermodynamics – from Heat Engines to Dissipative Structures* (4.1: Chemical potential and Affinity: the Driving Force of Chemical Reactions, pgs. 103-13). New York: John Wiley & Sons.

5. Perrot, Pierre. (1998). *A to Z of Thermodynamics* (Standard affinity, pg. 284). Oxford University Press.

θΔics

In famous publications, ***A Dissertation on Elective Attractions*** is a 1775 chemistry textbook, 382-pages in length, by Swedish chemist Torbern Bergman, styled as a “manual of theoretical chemistry”, which took the science of affinity chemistry, initiated in 1718 with the affinity table logic of French chemist Étienne Geoffroy, to a premiere status of the 18th century. [1]

The *Dissertation* contains a 59-row 50-column affinity table, the biggest one ever made, as well as reaction schematic diagram (depicting 64 reactions), explaining single and double elective affinity reactions in pictorial form, styled on the 1754 chemical ‘equation’ diagrams, i.e. bonding “brackets”, { and }, reaction “darts” (→), “heated” (Δ) reaction, reaction in “water” ( ), etc., pioneered in the lecture notes of Scottish chemist William Cullen and his student English chemist Joseph Black. [2] The *Dissertation* was the first to introduce letter symbols for both single and attached chemical species, as in *a*, *b*, *ac*, *abd*, *abcd*, etc., in a sense the forerunner notations to modern chemical equations.

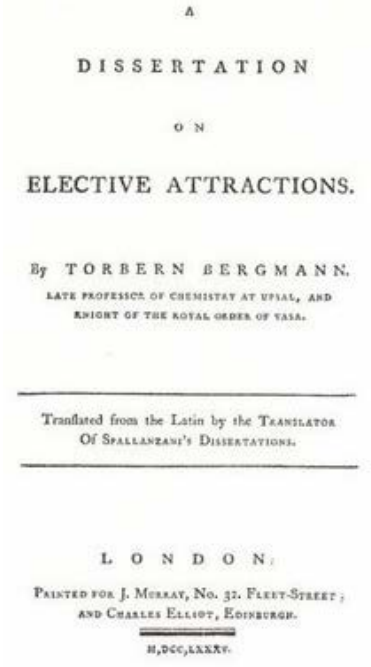
A

DISSERTATION

ON

ELECTIVE ATTRACTIONS.

By TORBERN BERGMANN.

LATE PROFESSOR OF CHEMISTRY AT UPSAL, AND KNIGHT OF THE ROYAL ORDER OF VASA.

Translated from the Latin by the TRANSLATOR OF SPALLANZANI'S DISSERTATIONS.

LONDON:

PRINTED FOR J. MURRAY, No. 32. FLEET-STREET; AND CHARLES ELLIOT, EDINBURGH.

M,DCC,LXXXV.

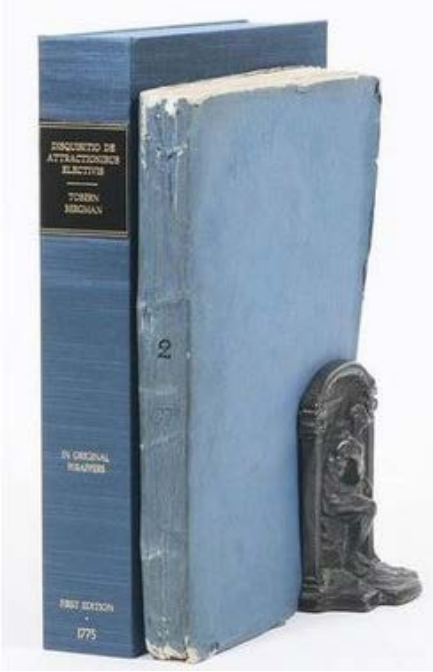

A 1775 first edition (Q) of Swedish chemist Torbern Bergman’s ***Dissertation on Elective Attractions***, shown with large fold-out affinity table, the 1885 German edition of which was used by Goethe to script *Elective Affinities*, the founding book of human chemistry and forerunner to the science of human chemical thermodynamics.

Editions

The textbook was first published as a 1775 Latin edition entitled *Disquisitio de Attractionibus Electivis*, in the issue of the *Acta* of the Royal Society of Uppsala for 1775 (vol. 2 of "Nova acta Regiae societatis scientiarum upsaliensis").

French extracts from the original version appear in the 1778 edition Rozier's *Observations sur la Physique* 13 (Supplement), pages 298-333.

In 1783, Bergman published a revised version.

The first English edition, based on the revised second edition was published in 1785 by English physician-chemist Thomas Beddoes. [3]

The first German translation, done by Heinrich Tabor, appeared in 1785, according to scholars including Alistair Duncan (1970) and Reginald Hollingdale (1971).

Alternatively, Australian philosopher Sandra Lynch (2005) states that the German edition appeared in 1782. [10]

The first French edition was published in 1788.

The first Italian translation was done in 1801.

The second English edition, a reprinting of the 1785 Beddoes translation, was published in 1970, with a preface by Alistair Duncan.

Jeremy Adler states that Goethe would have most likely read the Tabor German edition; although it is possible that he read the original Latin version; Goethe, in his *Truth and Poetry* autobiography: [9]

> “I had thus learned Latin, German, French, and English, merely by practice, without rules, and without conception. Whoever knows the condition of school instruction then, will not think it strange that I skipped grammar as well as rhetoric; all seemed to me to come together naturally; I retained the words, their forms and inflexions, in my ear and mind, and used the language with ease in writing and in chattering.”

Chemical equations

The following is #20 of Bergman's reaction diagrams (chemical equation), of sixty-four in total, showing the "decomposition of *calcareous hepar* by *vitriolic acid*":

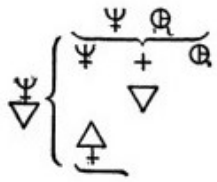

$$CaS + H_2SO_4 \rightarrow CaSO_4 + S$$

1775 version modern version

which in words, the *calcareous hepar*,

(CaS)

described such that it has its "proximate principles [are] united", which are *calcareous earth* (calcium oxide, CaO) and sulphur (S):

(CaO) and (S)

is decomposed [reacts with] *vitriolic acid* (sulfuric acid, H_2SO_4):

(H_2SO_4)

in water, (H_20), indicating that “the three surrounding bodies freely exercise their attractive powers in it”, to form gypsum and elemental sulphur:

($CaSO_4$) and (S)

The separation of the signs of calcareous earth and hepar inside the vertical bracket { represents breaking of the combination of these two “proximate principles” by the action of the vitriolic acid, which “attracts calcareous earth more strongly than sulphur does.” The signs of the calcareous earth and vitriolic acid are placed side by side above a complete horizontal bracket—the indication that a new combination—the point of which is turned downwards to imitate that the new compound (vitriolated calcareous earth or gypsum) is precipitated. The fact that sulphur, which is the other product of the reaction, also precipitates, is indicated by turning downwards the point of the lower horizontal half bracket. [5] In modern terms, calcium sulfide *CaS* is decomposed by sulfuric acid H_2SO_4 in water calcium sulfate $CaSO_4$, which precipitates (down full-bracket) and to produce elemental sulfur *S* which precipitates (downward half-bracket); which, neglecting intermediates, would be written as:

$$CaS(s) + H_2SO_4(aq) \rightarrow CaSO_4(s) + S(s)$$

This reaction, of course, is an example of a single elective affinity (reaction), and in Bergman chemical species letter notation would be categorized as the following "type" of reaction:

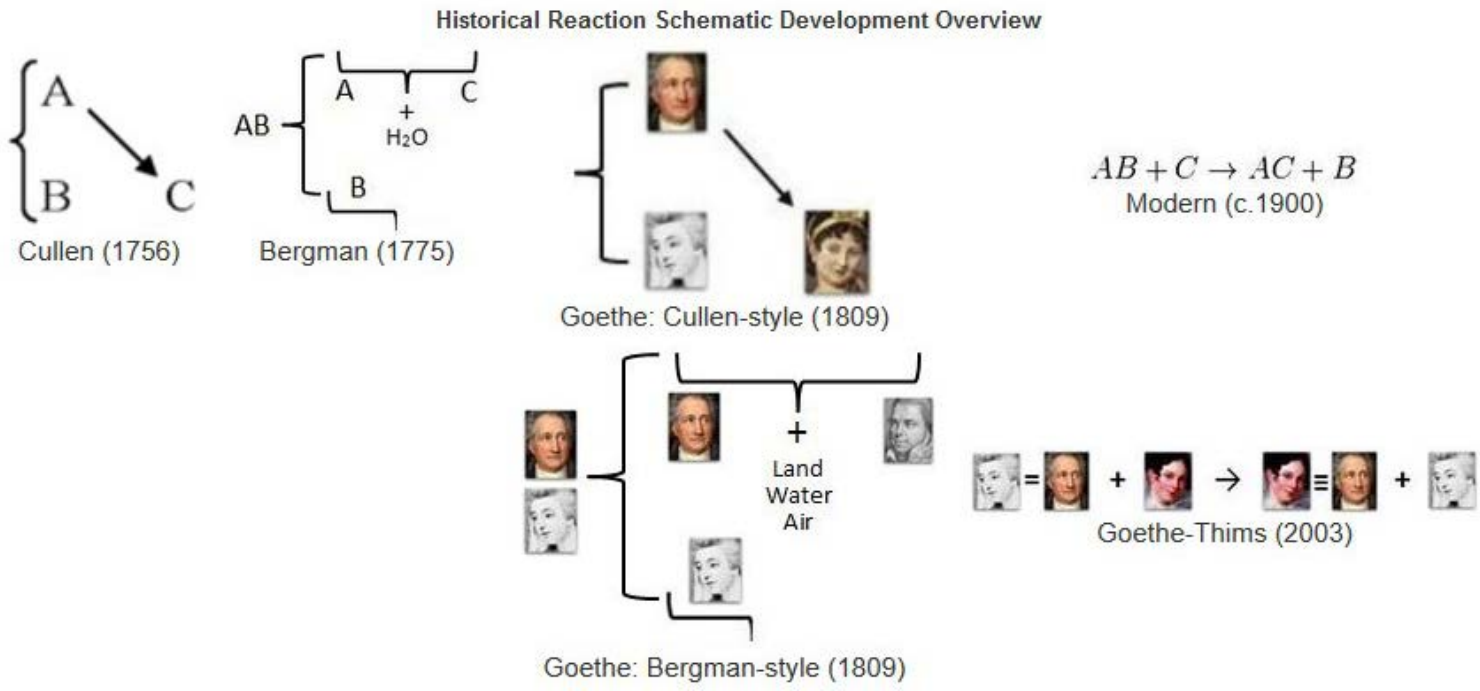

This thus explains the "symbols" Goethe had in mind in the writing of his greatest work.

Elective Affinities

See main: Elective Affinities (book), elective affinity

Torbern's *Dissertation* functioned as the reference textbook for the scripting of the first human elective affinity reactions, found as "layers of Gestalt", in German polymath Johann Goethe's 1809 novella *Elective Affinities*, the founding book of the science of human chemistry. [4] To exemplify this, in 1808, a year prior to the publication of his novella, Goethe commented to his friend Riemer: [6]

> "The moral symbols used in the natural sciences were the elective affinities discovered and employed by the great Bergman."

In a conversation with Riemer on 24 July 1809, Goethe specifically names Bergman as a source for his for the idea of "elective affinity", using the early German translation of that term, namely "*Wahlverwandtschaft*", which became an inspiration for his novel. [7]

In his novella, Goethe built on this premise by laying out this logic of "moral symbols", in literary form, where each chapter, in underlying theoretical basis, was considered as a different type of affinity reaction or chemical reaction in the modern sense. In chapter three, for instance, in the mind of Goethe, the Captain *C* arrives to stay with the married couple Eduard *A* and Charlotte *B*, after which time Edward and the Captain rekindle their old friendship, thus displacing Charlotte from their activities. This is depicted below in the Bergman reaction diagram style of what was called a single elective affinity:

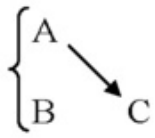

Or in a modern reaction sense, chemical species *A* and *B* are attached in a weakly bonded chemical union, signified by the bonding bracket "{", ordered such that if species *C* were introduced into the system, the greater affinity preference of *A* for *C* would cause *A* to displace *B* and to thus form a new union with *C*, which equates to the following in modern terms:

$$AB + C \rightarrow AC + B$$

Goethe scripted each chapter in his novella based on variations of these types of affinity reactions. [4] The first to examine, in detail, the exact affinity reactions used by Goethe, was German science historian Jeremy Adler who in 1969, on the suggestion of his advising professor Claus Bock did his PhD dissertation on the theoretical chemistry, chemists, and specific elective affinity reactions underling the chapters to Goethe's novella. [7]

19th century affinity chemistry

At the turn of the 19th century, affinity chemistry split into valence chemistry (1850s) (or quantum chemistry (1920s)) and chemical thermodynamics (1880s), wherein the measure of affinity *A* between reactants was determined to be a quantity called free energy *G*, according to formulations such as:

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

Likewise, with the determination of the set of known elements, in the arrangement of the periodic table (1860s), structural bonding changes and were soon determined to be connected to dynamics related to electron-photon interactions and geometries, and the symbolized nature of alchemical species were replaced by exact molecular formulas characterized as reactants and products of chemical reactions progressing through mechanisms. In turn, the carryover of Goethe's theory of human elective affinity reactions, into modern formulation became more complicated.

Human chemistry

In the 1914 book *Human Chemistry*, American engineer William Fairburn declares that "today there are eighty-one known elements" and openly discusses his views that people, as combinations of these elements, are "human chemical elements" and that the job of the "human chemist", i.e. the manager or foreman, is to achieve successful "reactions resulting from combinations of individuals". Fairburn states that human reactions can be quantified by energy and entropy changes and on the topic of affinity chemistry, he states:

> "Just as there are many affinities among the chemical elements, so there are many possible harmonious combinations of human workers; some of these harmonious combinations, however, of both chemical and human elements, may become violently explosive when subjected to an outside influence."

Fairburn's general view, however, is rather elementary, being half metaphorical and half suppositional in theme. In commentary on the relationship of entropy S to human reactions (relationships), for instance, he states: [8]

> "The classified division of entropy, referring to temperature changes which can be likened to coolness, passion, explosiveness and frigidity, are all interesting but of themselves prove little."

In the modern sense, the nature of entropy in human chemical reactions is a in depth topic. In a reaction in which a group of human molecules (people) are thrown into a closed reaction vessel, such as the grounds of the estate in Goethe's novella or a isolated island, the following affinity formula will dictate the progression of the overall process:

$$A = T\Delta S - \Delta H$$

When more factors are added in, such as movements of chemical species into or out of the system or external influences (forces), the nature of the study and prediction of human chemical reactions becomes immensely more complicated. [4] In 1995, American chemical engineer Libb Thims, for instance, after learning about the spontaneity criterion in chemical thermodynamics, studied the following Gibbs free energy equation:

$$\Delta G = \Delta H - T\Delta S$$

for a period of seven years (1995-2001), before it began to make any sort of sense as to how to apply the terms ΔS and ΔH apply in the

understanding of the phenomenon of human existence and behavior. Moreover, Thims did not know who Goethe was or learn of his elective affinity work until *circa* 2006 after reading a reference to his theory of human affinities in the back footnotes section of Belgian chemist Ilya Prigogine's 1982 book *Order Out of Chaos*; thus soon finding corroboration on his views with that of Goethe via the following affinity-free energy equation:

$$A = -\Delta G$$

originally formulated by Belgian thermodynamicist Theophile de Donder in the 1920s.

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θΔics

In famous publications, ***A Letter to American Teachers of History*** is a 1910 treatise by American historian Henry Adams, written at the age of 72, following nearly five decades of rumination on the physical sciences applied to historical explanation, setting forth the argument that the teaching of the second law of thermodynamics in the curriculum of the history departments of universities instruction should be mandatory, based on the argument that the second law undermines all of human history.

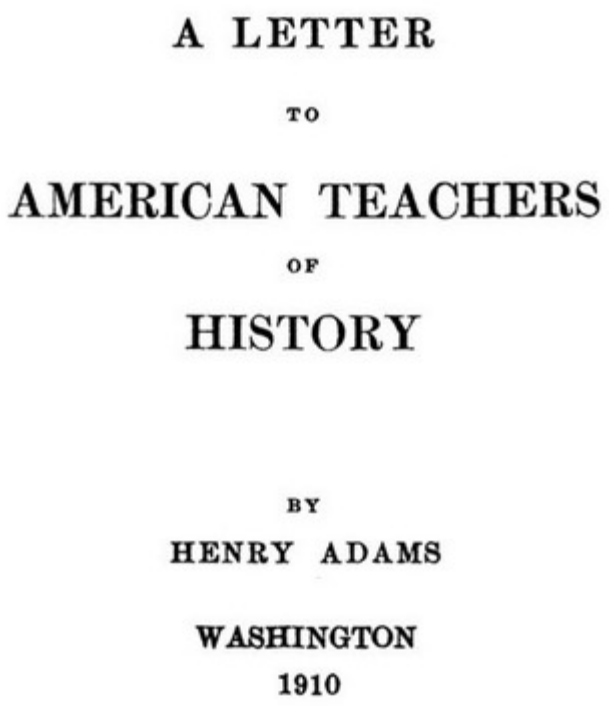
A LETTER

TO

AMERICAN TEACHERS

OF

HISTORY

BY

HENRY ADAMS

WASHINGTON

1910

Adams' 1910 ***A Letter to American Teachers of History***, employs human molecular theory logic, nebular hypothesis social contraction models, and thermodynamics, and implores history teachers to begin teaching students about historical events, e.g. the rise and fall of civilizations, via the "physico-chemical social dynamics" model, has he refers to it.

Overview

The following is a noted quote: [5]

> "If thought is capable of being classified with electricity, or will with chemical affinity, as a mode of motion, it seems necessary to fall at once under the second law of thermodynamics. Of all possible theories, this is likely to prove the most fatal to professors of history."

Adams suggestion outlines, generally, the field of human thermodynamics called history thermodynamics. [1]

Of note, Adams' *Letter* was the first American publications to use the term "human molecule" as the definition of a person.

The central conclusion reached by Adams, in his *Letter*, according to American historian William Thayer, is where Adams states that:

> "The department of history needs to concert with the departments of biology, sociology, and psychology some common formula or figure to serve their students as a working model for the study of vital energies; and this figure must be brought into accord with the figures or formulas used by the departments of physicists and mechanics to serve their students as models for the working of physico-chemical and mechanical energies."

Adams concludes:

> "Without the adhesion of the physicists, the model would cause greater scandal than though the contradictions were silently ignored as now; but the biologists—or, at least, the branches of science concerned with humanity—will find great difficulty in agreeing on any formula which does not require from physics the abandonment, in part, of the second law of thermodynamics."

In reconciliation of this issue, Adams declares that "either the law must be abandoned in respect to vital energy altogether or vital energy must abandon reason altogether as one of its forms and return to the old dilemma of Descartes."

William James' response

Adams' friend American psychologist William James, author of the 1906 *Energies of Men*, famously argued against Adams' *Letter* on his death bed, sending a response letter and two follow-up postcards, the latter dated exactly two months prior to his death. [2] In commentary on this, James' biographer Robert Richardson concludes: [3]

> "What can one say about the philosophical bravado, the cosmic effrontery, the sheer panache of this ailing philosopher with one foot in the grave talking down the second law of thermodynamics? It is a scene fit to set alongside the death of Socrates."

In short, Adams' *Letter* essentially laid question to James' *magnum opus* theory of innate reserve energies and this may have quickened his end.

William Thayer's review

In 1918, in commentary on Adams' *A Letter to American Teachers of History*, wherein Adam notably "calls for the aid of another Newton", American historian William Thayer comments, in his 1918 presidential address to the American Historical Association, that:

> "In reading Henry Adams' astonishing tract, I can not help suspecting at times that he is making fun of us historians; for he proposes, as I think you would agree with me, something which is not only impossible for anyone to carry out but which he himself never even attempted to carry out. In all the nine volumes of his *American History*, is there a hint of the second law of thermodynamics? Can you discover the slightest trace of a common formula for history and physical chemistry?"

In his address, Thayer seems to be ambivalent in his review, but at one point concedes:

> "The time may come when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry … then it may be possible, as Adams suggests, to invent a common formula for thermodynamics and history."

In end comment to Adams premise, to note, Thayer goes into a discussion on other past conflicts between the use of science in the humanities, such as the use of Darwin's "survival of the fittest" by the Germans in WWII and distinction of races, morality, as well as overlaps with religion.

Asimov

There is some suggestion (Ñº) that Isaac Asimov's 1942 to 1993 theory of "psychohistory", a "science of human behavior reduced to mathematical equations", as Asimov describes, as described by the fictional character Hari Seldon (Ñº), in his seven-volume *Foundation* series, is similar to Adams 1908 "physico-chemical social dynamics", as Adams calls it.

In 1944, Asimov, it seems, was passingly referring to Henry Adams (Ñº), as the name of one of his characters, in his science fiction stories; so possibly, Asimov may have had some type Henry Adams model behind his character of Hari Sheldon.

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θΔics

In famous publications, ***A Manual of the Steam Engine and Other Prime Movers*** is a 1859 book by Scottish engineer William Rankine, often referred to as the world's first thermodynamics textbook. [1]

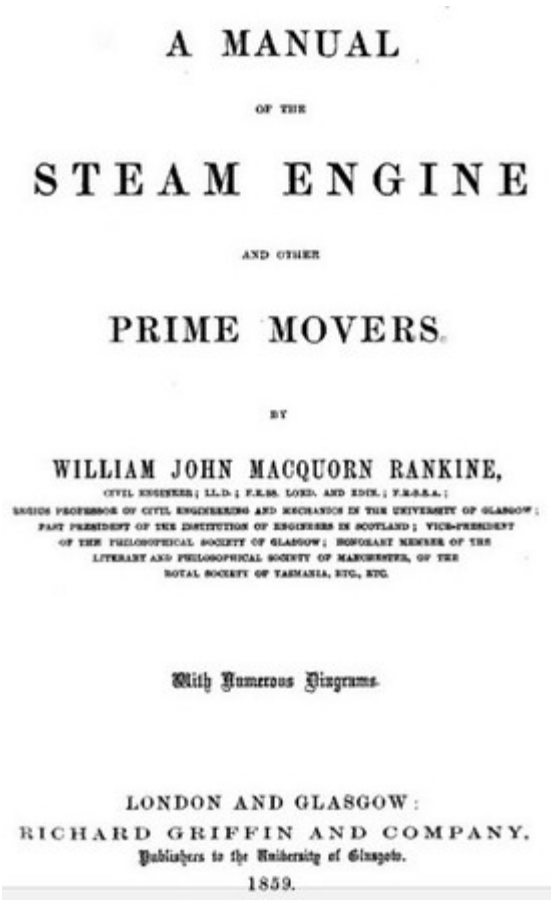
A MANUAL

OF THE

STEAM ENGINE

AND OTHER

PRIME MOVERS.

BY

WILLIAM JOHN MACQUORN RANKINE,

CIVIL ENGINEER; LL.D.; F.R.SS. LOND. AND EDIN.; F.R.S.S.A.;
REGIUS PROFESSOR OF CIVIL ENGINEERING AND MECHANICS IN THE UNIVERSITY OF GLASGOW;
PAST PRESIDENT OF THE INSTITUTION OF ENGINEERS IN SCOTLAND; VICE-PRESIDENT
OF THE PHILOSOPHICAL SOCIETY OF GLASGOW; HONORARY MEMBER OF THE
LITERARY AND PHILOSOPHICAL SOCIETY OF MANCHESTER, OF THE
ROYAL SOCIETY OF TASMANIA, ETC., ETC.

With Numerous Diagrams.

LONDON AND GLASGOW:
RICHARD GRIFFIN AND COMPANY,
Publishers to the University of Glasgow.
1859.

Title page to the 1859 ***A Manual of the Steam Engine and Other Prime Movers*** by Irish engineer William Rankine.

Overview

In this work, Ranking introduces terms such as adiabatic and isothermal and stated one of the first definitions, after William Thomson (1854), of thermodynamics: [2]

> "It is a matter of ordinary observation, that heat, by expanding bodies, is a source of mechanical energy; and conversely, that mechanical energy, being expended either in compressing bodies, or in friction, is a source of heat. The reduction of the laws according to which such phenomena take place, to a physical theory, or connected system of principles, constitutes what is called the science of **thermodynamics**."

Rankine also gave the following definition of the second law: [3]

> "If the absolute temperature of any uniformly hot substance be divided into any number of equal parts, the effects of those parts in causing work to be performed are equal."

The first chapter on the subject of "thermodynamics", according to Scottish physicist James Maxwell, is found in Rankine's *Manual*, titled "Principles of Thermodynamics". [4]

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External links

â— Manual of the Steam Engine and Other Prime Movers – Encyclopedia Britannica.

θΔics

In famous publications, "**A New Method to Obtain Very Great Motive Powers at Small Cost**" is a short 1690 memoir by French physicist Denis Papin, in which, building on the vacuum pump weight-lifting ideas initiated in 1647 by German inventor and physicist Otto Guericke, the first-ever design of a steam engine was outlined and diagrammed and in which the term "energy" was used in a modern sense. [1] This publication was one of the first to use the term motive power in a functional sense and to contain a crude description of what is now known as the Carnot cycle.

This design was later used by English engineers Thomas Savery, in 1697, and Thomas Newcomen, in 1710, to make the first working steam engines. Soon more steam engines were built, generally being improved modifications of the Newcomen design. The study of the physics of these various heat engines was outlined in the 1823 memoir *Reflections on the Motive Power of Fire* by French physicist Sadi Carnot. This initiated the science of thermodynamics.

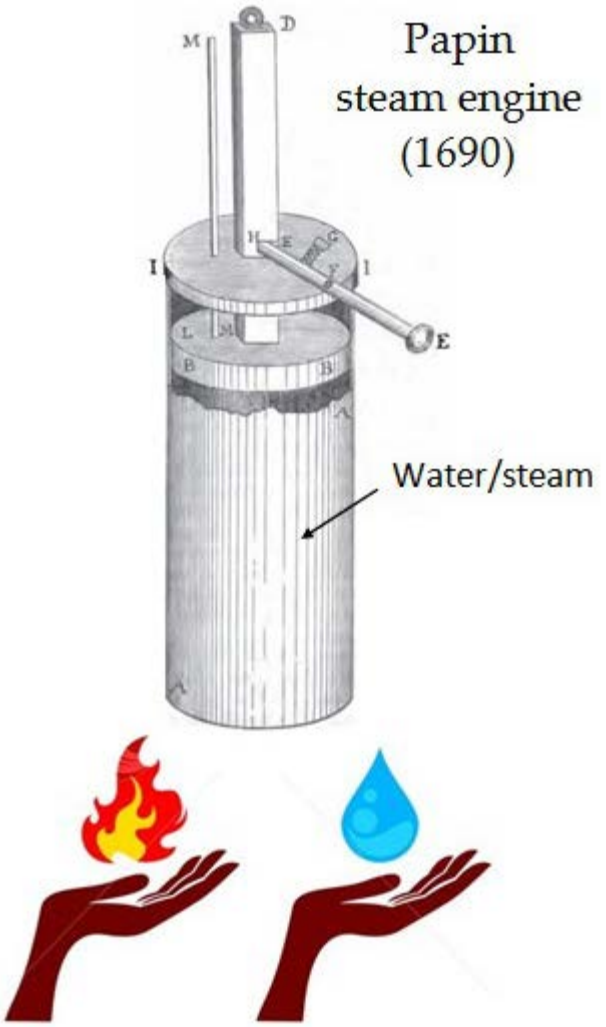

The basics of the Papin steam engine: a piston and cylinder containing water that is made to expand in contract in cycles, by alternate contact with fire and water, cyclically, so as to produce useful work, outlined in prototype theory in 1690 by French physicist Denis Papin. [1]

Overview

In his *New Method*, Papin begins with a discussion of the difficulties and failures involved in trying to create a vacuum in a piston and cylinder by means of gunpowder. In this mindset, he states that he had recently begun to endeavor to find a more functional way to create the vacuum. In particular, Papin reasons, "since it is a property of water, that a small quantity of it turned into vapor by heat has an elastic force like air, but upon cold supervening is resolved again into water, so that no trace of the said elastic force remains", he thus arrived at the view where:

> "I at once saw that machines could be constructed, in which water, by the help of a moderate heat, and a little cost, might produce that perfect vacuum which could by no means be obtained by the aid of gunpowder."

On this proposition, Papin states his design as such: "**A** is a tube of uniform diameter, closed shut at the bottom, **B** is a piston fitted to the tube; **D** a handle fixed to the piston; **E** an iron rod movable round an axis **F**; **G** a spring pressing the cross-rod **E**, so that the said rod must be forced into the groove **H** as soon as the piston with the handle has arrived at such a height as that the said groove **H** appears above the lid **I**; **L** is a little hole in the piston, through which the air can escape from the bottom of the tube **A**, when first the piston is forced into it."

The use of this instrument, according to Papin, is as follows: "a small quantity of water is poured into the tube **A**, to the depth of three or four lines; then the piston is inserted and forced down to the bottom, till a portion of the water previously poured in comes through the hole **L**; then the said hole is closed by the rod **M**. Next the lid **I**, pierced with the apertures requisite for that purpose, is put on, and a moderate fire being applied, the tube **A** soon grows warm (being made of thin metal), and the water within it, being turned to steam, exerts a pressure so powerful as to overcome the weight of the atmosphere and force up the piston **B**, till the grove **H** of the handle **D** appears above the lid **I**, and the rod **E** is forced, with some noise, into the said groove by the spring **G**. Then forthwith the fire is to be removed, and the stream in the thin metal tube is soon resolved into water, and leaves the tube entirely void of air."

Next, continues Papin, "the rod **E** being turned round so far as to come out of the groove **H**, and allow the handle **D** to descend, the piston **B** is forthwith pressed down by the whole weight of the atmosphere, and causes the intended

movement; which is of an energy great in proportion to the size of the tube."

Interestingly, this is one of the first modern utilizations of the term "energy" in a physics sense; predating 1807 kinetic energy definition of English physicist and physician Thomas Young, being rather a precursor of sorts to German physicist Rudolf Clausius' 1850 formulation of the "internal energy" U of the working body.

In terms of experimental results, Papin states that his tube was 2.5-inches in diameter, it raised 60-pounds, and that 1-minute was sufficient for a moderate fire to drive the piston to the top.

Proposed uses

He proposed to apply this power to draw water or ore from mines; to discharge iron bullets to a great distance; to propel ships against the wind (using an arrangement of paddle-wheels); and to other practical applications. An account of his steam engine design was included in a small treatise published by Papin, both in Latin and French, at Marburg and Cassel respectively, in 1695. [3] In 1698, Papin published a work titled *Treatise of Several New Machines and Extraordinary Inventions on Different Topics*. [4] Papin, however, never made a working model.

Influence in England

Soon enough, Papin's design for a steam engine found their way to England. Specifically, a brief notice of Papin's steam engine designs were included in the *Philosophical Transactions* for the year 1697, in a review of the little 1695 book published on the Continent by Papin. [5] The first to have come in contact with the work of Papin, it seems, was English engineer Thomas Newcomen. [2] In a communication on the subject from a Dr. Robinson, in reference to Robert Hooke (Dr. Hook), the noted polymath assistant of Robert Boyle who had previously designed a modified air vacuum-pump in 1657 and who later became the curator of experiments of the Royal Society from 1662 to 1703, we find: [6]

> "There are to be found among Hook's papers, in the possession of the Royal Society, some notes of observations, for the use of Newcomen, his countryman, on Papin's boasted method of transmitting to a great distance the action of a mill by means of pipes … it would appear from these notes that Dr. Hook had dissuaded Mr. Newcomen from erecting a machine on this principle, of which he had exposed the fallacy in several discourse before the Royal Society. One passage is remarkable: 'Could he (meaning Papin) make a speedy vacuum under your second piston, your work is done.' "

Although the exact date of this note is not known, it can be assigned to the period between 1687, the year when Papin proposed a plan of working an atmospheric engine at a distance by exhausting air through pipes, and March 1703 the time of Hooke's death. [2] This period in which Newcomen first began to devote his attention to the subject can be further refined. Author Stephen Switzer, in 1729, surmised "I am well informed that Mr. Newcomen was as early in his invention as Mr. Savery was in his, only the latter being nearer the Court had obtained his patent before the other knew it; on which account Mr. Newcomen was glad to come in as a partner to it. [7] As Savery obtained his first patent for his "Miner's Friend" (first working steam engine) on July 25, 1698, it follows that Newcomen would have already been contemplating an atmospheric steam engine prior to this time. It would thus seem likely that Newcomen became engaged in steam engine designs after reading the account of Papin's proposal in the 1697 *Philosophical Transactions*, if not before in 1695 or 1690, through his association with his countryman Robert Hooke, associate of Robert Boyle, an associate of Papin. [2]

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θΔics

In famous publications, **“A Paradoxical Ode / After Shelley”** was an 1878 encrypted poem, consisting of three stanzas, addressed to a fiction character Hermann Stoffkraft, but sent to Peter Tait, written by Scottish physicist James Maxwell, the only time he ever expressed his private thoughts about the relationship of science and religion, choice and chance, death and eternity. In loose terms, the poem is Maxwell's final thoughts on (a) whether or not there is a god and he has a soul, (b) whether, conversely to first possibility, all that exists is atoms and voids or matter and force, or (c) whether there is some scientific connection between (a) and (b) or not.

The poem was a reaction to the views expressed in the 1878 novel *Paradoxical Philosopher*, by Balfour Stewart and Tait, in which the hardened scientific German materialist Stoffkraft (a character modeled Hermann Helmholtz and Ludwig Buchner; his last name meaning "matter-force" in German) is converted to the religious-sided views of the several Christian scientists in the novel, primarily to adopt the so-called "principle of continuity" of afterlife, as presented in the 1875 *The Unseen Universe*, by Tait and Stewart; which itself had been a reaction to the religion vs science debate that had erupted at the 1874 British Association for the Advancement of Science (BAAS) meeting, stemming from the abrupt comment of Irish physicist John Tyndall that:

> “All religious theories, schemes and systems, which embrace notions of cosmogony, or which otherwise reach into the domain of science, must, in so far as they do this, submit to the control of science, and relinquish all thought of controlling it.”

First page of Maxwell’s poem, sent to Tait

To Hermann Stoffkraft, Ph.D.
A Paradoxical Ode.
[After Shelley]

First page of James Maxwell's last poem, "A Paradoxical Ode", sent to Peter Tait, but addressed to the fictional materialist hero Dr. **Hermann Stoffkraft** of Tait and Balfour Stewart’s 1878 novel *Paradoxical Philosopher*. [1]

The poem is Maxwell’s rare inner thoughts on this tenuous matter and his last and dying poem, written in his final year as he was in the final stages of stomach cancer, as he went into his 48th year, the same age his mother died previously from the same disease.

The mention of "After Shelley" is a pastiche of English romantic poet Percy Shelley's 1820 *Prometheus Unbound*, a play concerned with the torments of Prometheus and his suffering at the hands of Zeus. [3]

Poem

See also: Maxwell on the soul

In followup to his review, in 1878 Maxwell penned a satirical three-part poem entitled “A Paradoxical Ode”, addressed to Hermann Stoffkraft (the so-called materialistic hero of *Paradoxical Philosophy*), which he sent to Tait poking fun at their work, themed on the alluded to premise that his soul was an amphicheiral knot, a knot that can be deformed into its mirror image, in a scientific sense, which curiously was Maxwell’s last poem, as he knew he was dying as he wrote it. The original version is reproduced below: [1]

I

My soul’s an amphicheiral knot (1)

Upon a liquid vortex wrought (14)
By Intellect in the Unseen residing (17)
While thou dost like a convict sit
With marlinspike untwisting it (2)
Only to find my knottiness abiding,
Since all the tools for my untying
In four-dimensioned space are lying (3),
Where playful fancy intersperces,
Whole avenues of universes;
Where Klein and Clifford fill the void
With one unbounded, finite homaloid (4),
Whereby the Infinite (5) is hopelessly destroyed.

II

But when thy Science lifts her pinions
In Speculation's wild dominions,
I treasure every dictum thou emittest;
While down the stream of Evolution
We drift (6), and look for no solution
But that of survival of the fittest (7),
Till in that twilight of the gods
When earth and sun are frozen clods (13),
When, all its matter degraded (8),
Matter in aether shall have faded,
We, that is, all the work we've done (9),
As waves in aether, shall for ever run (16)
In swift expanding spheres, through heavens beyond the sun.

The "**amphicheiral knot**" (a trefoil knot), i.e. a knot that can be deformed into its mirror image, as found on the cover of Balfour Stewart and Peter Tait's 1875 *The Unseen Universe*, wherein they argue for the immortality of the soul using thermodynamics. [3]

III

Great Principle of all we see,
Thou endless Continuity! (15)
By thee are all our angles gently rounded,
Our misfits are by thee adjusted,
And as I still (10) in thee have trusted,
So let my methods never be confounded!
O never may direct Creation
Breach in upon my contemplation,
Still may the causal chain ascending,
Appear unbroken and unending,
And where the chain is best to sight
Let viewless fancies guide my darkling (11) flight
Through aeon-haunted worlds, in order infinite (12).

Notes

The following are speculative notes to the various riddled lines of the poem:

(1a) An amphicheiral knot is one that can be deformed into its mirror image. In Shelley's poem, Asia refers to herself as

an “enchanted boat” drifting without course or star, driven only “by the instinct of sweet music.”
(1b) In 1867 Tait had demonstrated the mutual interaction of smoke-rings in his laboratory for the benefit of William Thomson. Thomson rashly proposed a “vortex atom theory” (atomic theory), asserting that knotted vortices in the ether comprise all chemical elements. Tait was now laboring hard to classify knots; supposedly to build an knot element periodic table, of some sort.
(2) Convicts might be given the task of recovering hemp from rope by using a marlinspike.
(3) Maxwell was doubted that we live in a world of more than 3 spatial dimensions. In a letter to C.J. Monroe, dated 1871, he asked: “If you have four dimensions this becomes a puzzle, - for first, if three of them are in our space, then which three?”

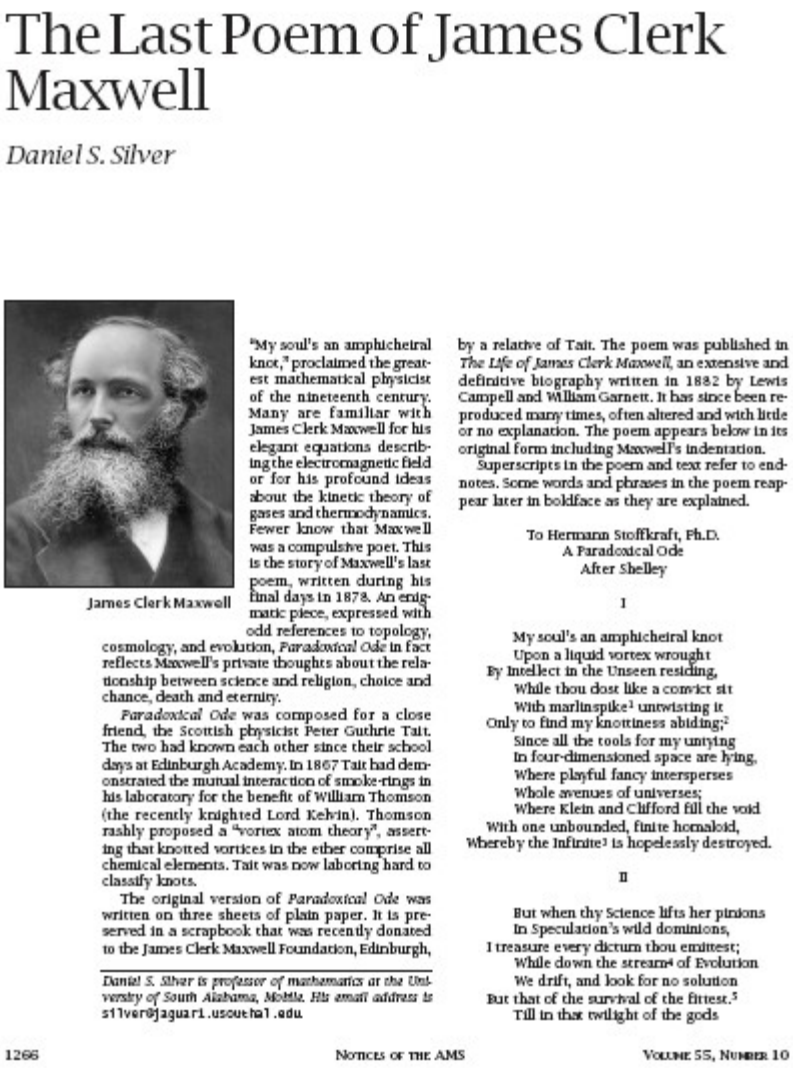

The Last Poem of James Clerk Maxwell

Daniel S. Silver

James Clerk Maxwell

"My soul's an amphicheiral knot," proclaimed the greatest mathematical physicist of the nineteenth century. Many are familiar with James Clerk Maxwell for his elegant equations describing the electromagnetic field or for his profound ideas about the kinetic theory of gases and thermodynamics. Fewer know that Maxwell was a compulsive poet. This is the story of Maxwell's last poem, written during his final days in 1878. An enigmatic piece, expressed with odd references to topology, cosmology, and evolution, *Paradoxical Ode* in fact reflects Maxwell's private thoughts about the relationship between science and religion, choice and chance, death and eternity.

Paradoxical Ode was composed for a close friend, the Scottish physicist Peter Guthrie Tait. The two had known each other since their school days at Edinburgh Academy. In 1867 Tait had demonstrated the mutual interaction of smoke-rings in his laboratory for the benefit of William Thomson (the recently knighted Lord Kelvin). Thomson rashly proposed a "vortex atom theory", asserting that knotted vortices in the ether comprise all chemical elements. Tait was now laboring hard to classify knots.

The original version of *Paradoxical Ode* was written on three sheets of plain paper. It is preserved in a scrapbook that was recently donated to the James Clerk Maxwell Foundation, Edinburgh, by a relative of Tait. The poem was published in *The Life of James Clerk Maxwell*, an extensive and definitive biography written in 1882 by Lewis Campell and William Garnett. It has since been reproduced many times, often altered and with little or no explanation. The poem appears below in its original form including Maxwell's indentation.

Superscripts in the poem and text refer to endnotes. Some words and phrases in the poem reappear later in boldface as they are explained.

To Hermann Stoffkraft, Ph.D.
A Paradoxical Ode
After Shelley

I

My soul's an amphicheiral knot
Upon a liquid vortex wrought
By Intellect in the Unseen residing,
While thou dost like a convict sit
With marlinspike[1] untwisting it
Only to find my knottiness abiding;[2]
Since all the tools for my untying
In four-dimensioned space are lying,
Where playful fancy intersperses
Whole avenues of universes;
Where Klein and Clifford fill the void
With one unbounded, finite homaloid,
Whereby the Infinite[3] is hopelessly destroyed.

II

But when thy Science lifts her pinions
In Speculation's wild dominions,
I treasure every dictum thou emittest;
While down the stream[4] of Evolution
We drift, and look for no solution
But that of the survival of the fittest.[5]
Till in that twilight of the gods

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2008 article "The Last Poem of James Clerk Maxwell" by American mathematician Daniel Silver, which helped to unearth some of the background to Maxwell's final thoughts. [4]

(4) Three-dimensional space in which the axioms and postulates of Euclid hold.
(5) The Infinite was often identified with God.
(6) In Shelley’s poem, Asia also drifted down a stream.
(7) “Survival of the fittest” was a term invented by philosopher Herbert Spencer.
(8) Dr Stoffkraft asserts that all energy degrades. With the end of humanity, collective consciousness will disappear; degradation of energy is William Thomson's version of the second law.
(9) Perhaps a very personal note.
(10) always.
(11) In the dark.
(12) Likely intended as a bad rhyme.
(13) heat death (Rudolf Clausius' theory of universal end).
(14) Liquid vortex is William Thomson's theory, said to be set in motion by "some supernatural power", as Maxwell comments ("Paradoxical Philosophy", *Nature*, 19 Dec 1878).
(15) the "principle of continuity", discussed by Maxwell ("Paradoxical Philosophy", *Nature*, 19 Dec 1878) refers to the conservation of energy used to explain the supposed continuity of the mind or soul in the movement of the universe, in thermodynamic terms, as attempted by Tait and Balfour.
(16) The waves in aether theory refers to Christiaan Huygens' 1678 undulatory theory of light and to Thomas Young's 1803 double-slit experiment, the latter of which, whose theory on color Maxwell cited in his electromagnetic theory of light.
(17) The "unseen intellect" is Tait and Stewart's version of God.

In sum, as noted by the ending lines of the poem, Maxwell considers the thoughts of the paradoxical philosopher to be mere "viewless fancies", but nevertheless all that one has to guide the person at their parting moments. Again, as mentioned, at the time of writing this, his last poem, as well as his *Nature* review of Stewart and Tait’s energetic immortality theory of the soul, it was known that Maxwell already knew he was dying. This fact is summarized well by American statistical mathematician Daniel Silver, in his well-researched 2007 article “My Soul’s an Amphicheircal

Knot: the Last Poem of James Clerk Maxwell", he comments :

> "Questions about the soul's immortality were no longer merely academic for Maxwell. He was dying, and very likely knew it by now. For months he had been suffering from stomach pains, but he had consulted no doctors. We know from Campbell that when he wrote his review, he was having difficulty swallowing. He would learn soon that he had the same cancer that took his mother at the very same age that he was now. He would die within a year."

Addendum

Taped to the bottom of the page of Tait's scrapbook is an addendum, sent by Maxwell some days afterwards.

> Last three lines of Ode to Stoffkraft should be as follows.
>
> > While Residents in the Unseen–
> > Aeons or Emanations – intervene,
> > And from my shrinking soul the Unconditioned screen.

The mention of soul, or rather his "shrinking soul", or the "ba" as originally formulated in Ra theology, and carried over into Christianity, and thus into Maxwell's poem, is referred to by Maxwell in his "Review: *Paradoxical Philosophy*", wherein he asks which part of the double mind is responsible for doing right and wrong and in the same vein discusses binding problem, as to whether or not atoms have consciousness. The "unseen", as mentioned, is Tait and Stewart's version of god, and the "unconditioned screen", according to Daniel Silver, is Immanuel Kant and William Hamilton's theory that god is hidden from human thought because humans are "conditioned", and Hamilton was one of Maxwell's instructors at the University of Edinburgh. In any event, we see that Maxwell was a soul theorist in the end.

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θΔics

In famous publications, **"A Project for Scientific Psychology"** is an 1895 manuscript of Austrian psychologist Sigmund Freud in which he outlined a bold plan to formulate a hard science of the study of the mind or psyche in terms of pure chemistry and energy, or chemical thermodynamics in the modern sense. [1] In the opening declaration of his *Project*, Freud stated: [6]

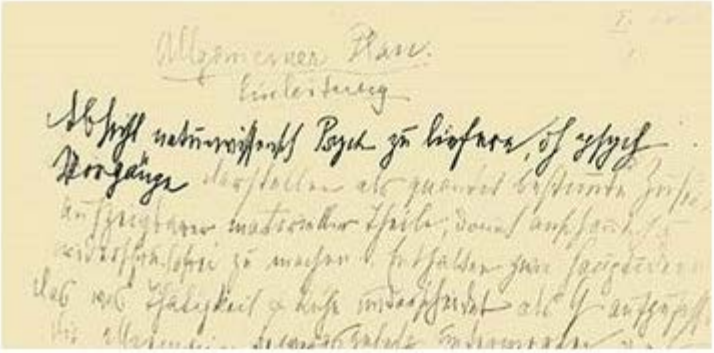

Excerpt from the manuscript of Freud's 1895 **"Project for Scientific Psychology"**, the highlighted section reads: 'the intention [of this project] is to furnish a psychology that shall be a natural science', the natural science referred here said to mean one that studies matter using experimentation, measurement, and formulation. [1]

> "The intention is to furnish a psychology that shall be a natural science; that is, to represent psychical processes as quantitatively determinate state of specifiable material particles."

The mention of states of atoms or molecules seems to be a direct usage of "state" as defined in thermodynamics, as being quantified by a specific intensive and extensive variables. Freud then goes on to project that the psychology of the future will be one based on chemistry and energetics or rather thermodynamics, in the modern sense: [2]

> "In the future psychologists will exercise a direct influence, by means of particular chemical substances, on the amounts of energy and their distribution in the mental apparatus."

It is said that Austrian philosopher Wilhelm Jerusalem's 1895 *The Function of Judgment* greatly inspired Freud's "Project". [3]

The initiation of Freud's ambitions plans to develop a hard science version of psychology based on thermodynamics and mechanical theory, was first laid out in his "Project for Scientific Psychology", began in the spring of 1895, but never finished and published post humorously in 1950, in volume one of his twenty-four volume collected works. [4]

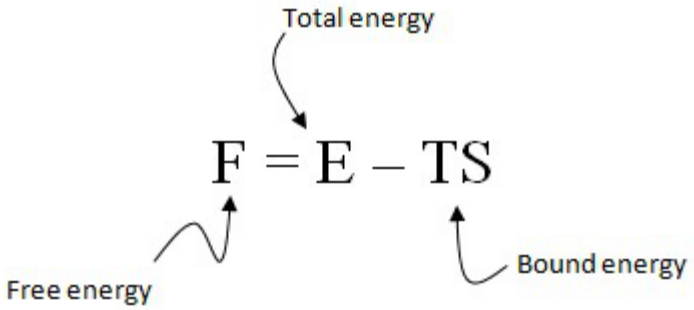

Free energy | Bound energy

It is said that in this is paper Freud gave his first outline of his views on 'bound energy' and 'unbound energy' (or free energy) in the states of consciousness; terms which had only recently been introduced in Hermann Helmholtz' 1882 paper "The Thermodynamics of Chemical Processes", one the founding papers of chemical thermodynamics.

In Freud's theory of 'bound' and 'unbound' psychical energy, which itself is an extrapolation of Helmholtz's interpretation of "bound energy" (TS) and "free energy" (F), according to the views of French psychoanalyst Jean Laplanche, a student of Jacques Lacan, it is said that Freud carried this through into his death instinct theory, viewing unbound energy as death. [5] In a modern sense, this may be seen as being correct in the sense of the Gibbs free energy minimum of a reaction being seen as the dead state of a reaction, where forward reaction ceases to progress, such as typified by a 'dead relationship'.

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θΔics

In human chemistry, **A. Weber** (c.1824-c.1889) was an English love and happiness theological philosopher, self-described as an “obscure scribe”, noted for his 1874 five part article “Speculations Concerning Love and Courtship”, in part two of which he devotes a section to his objectionable views on German polymath Johann Goethe’s 1796 human elective affinity theory. [1]

Religion

Weber, judging from his article “Speculations on Happiness”, seems to be a theological philosopher, considering Genesis of the Bible to be factual and to be a firm believer in the existence of God. [2]

Elective Affinities review

Weber, in his two-page review of Goethe's 1809 *Elective Affinities*, begins by opening to the following, in which he attempts to argue that whether one is a God-fearing spiritualist, as Weber seems to be, or whether one is a materialist, which Weber seems to consider Goethe to be, the "senses" are an important topic in regards to the study of love:

> “Whether we belong to that school of thought which proclaims the supremacy of matter and defines the feelings, thoughts, and aspirations of mankind as being only the natural, and, indeed, necessary outcome of so many ounces of flabby brain substance, the true measure of which is by some measured quantitatively, by others gauged qualitatively; or whether we be disciples of that other school, which considers the brain and its servants, the senses, as instruments merely to be played upon by a spiritual faculty altogether different from and independent of them;—we cannot but admit that the senses play a very important *role* in our daily life.”

Here we are reminded of Scottish physicist James Maxwell's famous 1847 (age 16) insight: "the only thing which can be directly perceived by the senses is force, to which may be reduced light, heat, electricity, sound and all the other things which can be perceived by the senses." [4] Skipping a few pages, Weber then gives his summary of Goethe’s variety of love, according to the elective affinities theory (human chemical theory), as follows:

> “There is one theory of love which we must yet consider, whatever other theories may escape an obscure scribe like him who traces these poor chapters on love. It is the theory of what Goethe calls the "elective affinities," and writes a book to illustrate. I am too humble to criticize a book written by such a venerable master. That book is all but forgotten as a philosophical speculation, and the Masters Boswell have had little to say in its favor, redeemed though its desolating theory be by chapters a mastermind alone could plan and a mastermind alone render in style of surpassing beauty and profound pathos. But we have nothing to do with the book any further, and we will glance merely at the groundwork of it; that is a simple chemical formula, which I cannot bring home more clearly to the reader than by the following extract from *Chambers's Encyclopaedia:* [3]

> > "Chemical affinity, or chemical attraction, is the force which produces all chemical phenomena. It differs from the attraction of gravitation in acting, not between masses, but between atoms, and only when the atoms are at insensible distances. It differs also from cohesion, which unites the particles of the same substance, while affinity unites atoms of different substances. The compounds thus formed are new bodies, often bearing no resemblance in appearance or other properties to the elements which combine to produce them. Thus water results from the combination of two gases. The strength of chemical affinity is different between different substances. *Sulphuric acid combines with lime, and forms gypsum; but if potash is added the sulphuric acid leaves the lime and combines with the potash.* As a sort of choice is here manifested, it is called a case of elective affinity. *These elective affinities, however, are often altered by a change of temperature or other accompanying circumstance."*

Following this, Weber seems to let his true feelings out of the bag, which well exemplifies the collision between the age-old (Anunian theology) religious belief of choice-based moral judgment (after death), i.e. karma or soul, and the newly-emerging Goethean philosophy of choice determined largely by external forces (in partial exchange interaction with internal force) and morality determined by those forces, via what is considered thermodynamically natural and unnatural:

> Now, any observer of human life may undoubtedly trace a similar process now and then in the world of love; but then that love is neither worth giving nor worth accepting; and **I deny as earnestly as I can that human affections are swayed in the fashion of chemical atoms**, when even among those elective affinity is not a rule but an exception. If we apply the formula to the love vagaries of an individual here and there, ruled exclusively by his senses, we do no great harm; but every human being that glories in the possession of what makes us true men and true women will **shrink in disgust from a theory which deprives us of volition**, and leaves us an easy prey to physical laws which we *must* follow; which determines our choice independently of ourselves, and as easily destroys one effect by an additional but equally fortuitous fresh cause. Let us, however, for clearness sake, adapt the formula to the case in hand:
>
> > "One individual, A, combines his love with that of B, and they become a pair; but if C be added (he or she may be a friend, a neighbor, a visitor, etc.) A must leave B and combine with C. But these elective affinities are often altered by a change of temperature, across the Channel or anywhere else, or other accompanying circumstance."

This human affinity take presented here by Weber, of course, is Geoffroy's law of affinity (1718) scaled up to the human-human reaction level, albeit upgraded to a certain extent by the circa 1800-1820 experimental finding or theory (Berthelot?) that temperature affects or changes the force of affinity. Weber continues by giving his take on how he conceives of Goethe's affinity theory would be scaled up socially to a society at large:

> Now apply this formula, softened as much as you like without disturbing the law, to society at large, and what is to become of it? What shall henceforth hold it together? We shall see a world of husbandless wives, of wifeless husbands, and generations orphaned at birth; a world in which no love, no individuality can be sacred; a world, in fact, such as could not exist long, and which ought to be exterminated as soon as possible.

This, of course, is a very-corrupted view. Nevertheless, Weber concludes with his view that France, being largely atheist, and as Weber seems to think, sexually promisuous and free loving, has adopted or transformed into elective affinity type society, as contrasted with the Christian-based society:

> That, however, tendencies exist which bear some slight resemblance to elective affinity, if you deprive the latter of the iron "must" and leave some will to the impersonators of the theory, it would be needless to deny, they exist even on a pretty large scale. Look at France, for example, see how for many, many years, sense love of the elective affinity kind has flourished and has undermined society at large to a woeful extent; look how the sacredness of the family has vanished, and has been replaced by other familiar institutions which have none but degrading influences? How much of the pitiable fall of the French nation is due to the utter immorality that pervades life amongst them, and is pictured forth with rueful truth in French literature, I cannot pretend to say, but I believe that sowing the wind we shall reap the whirlwind, and that seeds of physical corruption cannot bring forth soul-fruit.

> He who allows his meaner parts to overgrow and choke the nobler will surely not be the father of a race of pure-minded men and women! It is refreshing to withdraw the eye from such scenes and to direct them to countries and nations among which the family exists still as one of the holiest and purest institutions, as the truest nursery for future generations, as the real training ground for men and women who in their turn shall instill respect for it in their descendants, and thus sow the seeds of peace, concord, and loving kindness, which shall bear fruits of heroism and wisdom! But the family is generally not the result of the tropical phase of love. It is rather the result of the next phase in which our choice is governed more by the mind; when we are looking less for the perishing charm of outward looks and more for the enduring qualities of a sound heart, a sound mind, and a clear intellect in a sound, though not necessarily beautiful outward form. These are the qualities which help us through the struggles of life and adversity, or to use honorably and manfully the gift of prosperity. By these alone shall we build up the immortality we yearn for in the hearts and remembrance of our fellow creatures, and more particularly of our immediate descendants; by these alone can we render ourselves worthy of another existence beyond the exit gates of mortal life."

These last passages are a large cesspool in great need of cleaning.

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External links

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θΔics

In hmolscience, **A.I. Yablonsky** (1936-1986) was a Russian engineer and physicist noted for his 1971 to 1986 work on a science of scientific activity, culminating, among other publications, in his *Mathematical Models in Science Studies*, wherein he applies non-linear thermodynamics to the modelling of social phenomena and trends, e.g., as discussed by Yelena Istileulova (2011), to theorize about the temperature of scientific organizations as the accumulated characteristics of external impact on scientists. [1]

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(d) Istileulova, Yelena. (2011). "Organization as a Human Being: Information (mind) + Matter (body) + Energy" (capacity to work)" (Ñº), Assignment, PhD student, Ljubljana University, Faculty of Economics, Dec 2.

θΔics

In existographies, **Aaron Freeman** (1956-) (CR:6) is an American physicist, writer, broadcast journalist, and standup comedian, noted for his Jun 2005 NPR talk "Eulogy from a Physicist" and followup May 2005 essay "My Inner Particle" both of which are ruminations of a "physicist mindset" in respect to what happens to a person when they cease to exist, from the point of view of thermodynamics, particle physics, and quantum mechanics, both reflectively prompted into existence following the recent passing of his father and sister.

Physicist's Eulogy

See main: Atheist eulogy

In Jun 2005, Freeman, on NPR's "All Things Considered", stated the following, in what has come to be known as a "Eulogy from a Physicist": [1]

> "You want a physicist to speak at your funeral. You want the physicist to talk to your grieving family about the conservation of energy, so they will understand that your energy has not died. You want the physicist to remind your sobbing mother about the first law of thermodynamics; that no energy gets created in the universe, and none is destroyed. You want your mother to know that all your energy, every vibration, every Btu of heat, every wave of every particle that was her beloved child remains with her in this world. You want the physicist to tell your weeping father that amid energies of the cosmos, you gave as good as you got.
>
> And at one point you'd hope that the physicist would step down from the pulpit and walk to your brokenhearted spouse there in the pew and tell him that all the photons that ever bounced off your face, all the particles whose paths were interrupted by your smile, by the touch of your hair, hundreds of trillions of particles, have raced off like children, their ways forever changed by you. And as your widow rocks in the arms of a loving family, may the physicist let her know that all the photons that bounced from you were gathered in the particle detectors that are her eyes, that those photons created within her constellations of electromagnetically charged neurons whose energy will go on forever.
>
> And the physicist will remind the congregation of how much of all our energy is given off as heat. There may be a few fanning themselves with their programs as he says it. And he will tell them that the warmth that flowed through you in life is still here, still part of all that we are, even as we who mourn continue the heat of our own lives.
>
> And you'll want the physicist to explain to those who loved you that they need not have faith; indeed, they should not have faith. Let them know that they can measure, that scientists have measured precisely the conservation of energy and found it accurate, verifiable and consistent across space and time. You can hope your family will examine the evidence and satisfy themselves that the science is sound and that they'll be comforted to know your energy's still around. According to the law of the conservation of energy, not a bit of you is gone; you're just less orderly. Amen."

(add)

My Inner Particle

In May 2005, Freeman published "My Inner Particle", a reflection of his thoughts on the recent passing of his father and sister, from the point of

view of knowledge of the universe, as he sees things as a physicist, using a mixture of the human particle and human wave view of things and the standard model: [2]

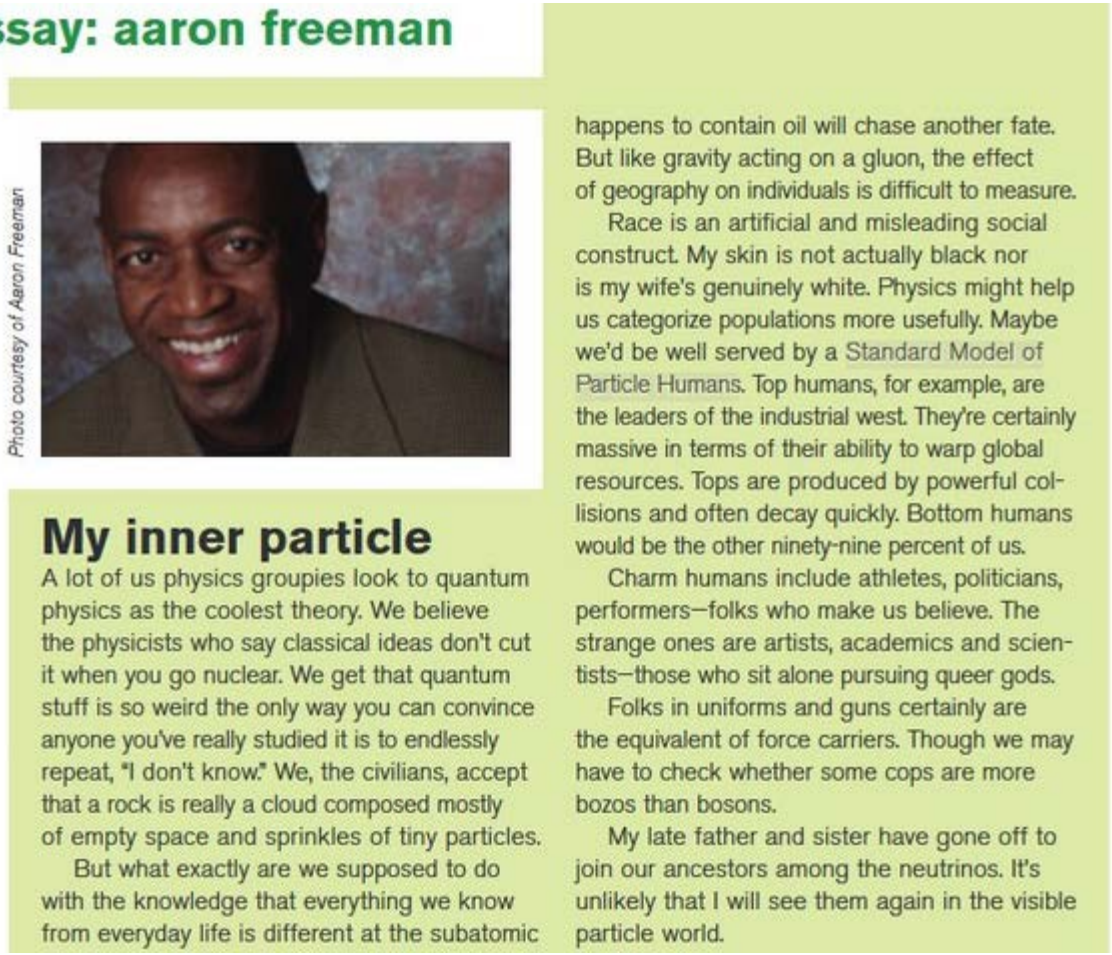

essay: aaron freeman

Photo courtesy of Aaron Freeman

My inner particle

A lot of us physics groupies look to quantum physics as the coolest theory. We believe the physicists who say classical ideas don't cut it when you go nuclear. We get that quantum stuff is so weird the only way you can convince anyone you've really studied it is to endlessly repeat, "I don't know." We, the civilians, accept that a rock is really a cloud composed mostly of empty space and sprinkles of tiny particles.

But what exactly are we supposed to do with the knowledge that everything we know from everyday life is different at the subatomic

happens to contain oil will chase another fate. But like gravity acting on a gluon, the effect of geography on individuals is difficult to measure.

Race is an artificial and misleading social construct. My skin is not actually black nor is my wife's genuinely white. Physics might help us categorize populations more usefully. Maybe we'd be well served by a Standard Model of Particle Humans. Top humans, for example, are the leaders of the industrial west. They're certainly massive in terms of their ability to warp global resources. Tops are produced by powerful collisions and often decay quickly. Bottom humans would be the other ninety-nine percent of us.

Charm humans include athletes, politicians, performers—folks who make us believe. The strange ones are artists, academics and scientists—those who sit alone pursuing queer gods.

Folks in uniforms and guns certainly are the equivalent of force carriers. Though we may have to check whether some cops are more bozos than bosons.

My late father and sister have gone off to join our ancestors among the neutrinos. It's unlikely that I will see them again in the visible particle world.

A segment of **Freeman**'s "My Inner Particle" essay, published in *Symmetry Magazine*, wherein he elaborates on his so-called "Standard Model of Particle Humans", in the context of death, in the wake of the recent passing of his father and sister. [2]

> "A lot of us physics groupies look to quantum physics as the coolest theory. We believe the physicists who say classical ideas don t cut it when you go nuclear. We get that quantum stuff is so weird the only way you can convince anyone you 've really studied it is to endlessly repeat, "I don t know." We, the civilians, accept that a rock is really a cloud composed mostly of empty space and sprinkles of tiny particles.

But what exactly are we supposed to do with the knowledge that everything we know from everyday life is different at the subatomic level? How should evidence of extra six or seven dimensions inform our days? Where in my head and worldview am I supposed to put antimatter?

I want to get in touch with my inner particle and let it point the way.

Particle logic--mysterious, counterintuitive, seemingly insane--pretty much describes life as I live it. And since we are so mind-numbingly small compared to the rest of the universe it makes sense to me to think of individuals as particles [see: human particle].

I want to reason like an electron, to be all over any task from every direction at once. I want to philosophize like a meson, yin and yang, opposites contained in a unified whole. I want to dream like a neutrino, limitless, unstoppable.

As individuals we display a kind of wave-particle duality [see: double slit experiment] While the positions of our bodies are measurable with a high degree of accuracy at any given time our images--audio, video and photographic--spread out around the world via the Internet, existing everywhere at once. For millions of people appearing on TV, broadcast television images spread out, wave-like, across the galaxy in all directions at the speed of light.

Like quarks we are attracted to one another by a strong force: love. We are kept within our social shells [see: human molecular orbital theory] by weaker but still potent bonds of commerce and culture. Geography [see: social gravitation] attracts us, like gravity, in ways that are destiny-producing across the vastness of time. Civilizations reared amid bountiful and fertile soil are destined for one kind of history. Peoples arising on land that happens to contain oil will chase another fate. But like gravity acting on a gluon, the effect of geography on individuals is difficult to measure [see: social physics school].

Race [see: racial thermodynamics] is an artificial and misleading social construct. My skin is not actually black nor is my wife' s genuinely white. Physics might help us categorize populations more usefully. Maybe we d be well served by a Standard Model of Particle Humans. Top humans, for example, are the leaders of the industrial west. They re certainly massive in terms of their ability to warp global resources. Tops are produced by powerful collisions and often decay quickly. Bottom humans would be the other ninety-nine percent of us.

Charm humans include athletes, politicians, performers--folks who make us believe. The strange ones are artists, academics and scientists--those who sit alone pursuing queer gods.

Folks in uniforms and guns certainly are the equivalent of force carriers. Though we may have to check whether some cops are more bozos than bosons.

My late father and sister have gone off to join our ancestors among the neutrinos. It s unlikely that I will see them again in the visible particle world.

We humans are perhaps most particle-like in our slavish submission to the principle of uncertainty. Everyone who s ever sat down to write a letter knows you can form in your mind precisely what you want to say, yet still be surprised by what you ultimately write. Uncertainty is what makes every day an adventure.

I believe accessing my inner particle will help me deal with the uncertainty of my life. My inner particle does not know how the world should be and is thus untroubled by how it is. It desires neither certainty nor comprehension. Thus my inner particle is far wiser than I.

Perhaps my inner particle will grant insights into all manner of human phenomena. Maybe I ll be a faster cyclist by embracing my photon self. Maybe I 'll start to see the womb as a human Higgs field wherein eggs, like particles, acquire mass.

Then again, if the string theorists are right, maybe all I ll get from my inner particle are some good vibrations."

Some of this discussion, to note, is similar to that presented in Vladimir Cruz's 2010 film *Afinidades*, e.g. both refer to love in terms of gluons and the strong force.

Beliefs

The following are statements on Freeman's beliefs:

"Fifteen years ago, I was a Catholic atheist. I didn't believe in god but was afraid of her anyway. There were no Jews in my family, and my significant other was a Scotch-Irish agnostic. Had she cared enough, she would have evangelized atheism. As a comedian always looking for jokes, I started reading the Bible. I was struck by how many Jews were in that book, and so I got curious about Judaism. I really became a Jew to confuse radical black Muslims: "He's my brother--my enemy--my brother--my enemy--Arrrgh!" I have friends who say if you cannot prove you are descended from freed African slaves then there's no need for further discussion of your Jewishness. To them there are no white Jews. I don't go that far. But Moses,

Aaron, Miriam and company were Africans. They were born in Africa--as were their parents and their parents before them and theirs. I make jokes about my conversion because, well, I'm a comedian. But aside from that, the truth about my conversion is pretty boring. I am a Jew for the same reason that I am a Negro: I have no choice; I just am."

— Aaron Freeman (2006), "No Joke: Converting to Judaism wasn't a tough decision" [3]

"I believe in Nike, goddess of victory; Anapurna, goddess of food; Sophia, of wisdom, Shango, of the sky; and absolutely in Dionysus, of wine making and theater!"

— Aaron Freeman (2013), response to query 'do you believe in god', asked by Deborah Mitchell, who devoted a chapter of her book *Growing Up Godless* (2014) to his eulogy; he deflected the query by giving comedic like agnostic or polite atheist's creed

(add)

See also

- What happens when you die?

References

1. (a) Freeman, Aaron. (2005). "Planning Ahead Can Make a Difference in the End" (Q), NPR, All Things Considered, Jun 1.
(b) Mitchell, Deborah. (2014). *Growing Up Godless: a Parent's Guide to Raising Kids Without Religion* (foreword: Dale McGowan) (§: Eulogy from a Physicist, pgs. 146-48). Sterling Publishing.
2. Freeman, Aaron. (2005). "Aaron Freeman: My Inner Particle" (Q)(pdf), *Symmetry: Dimensions of Particle Physics*, May 1.
3. Freeman, Aaron. (2006), "No Joke: Converting to Judaism wasn't a tough decision" (Q), Chicago Tribune, Dec 17.

Videos

- Lopez, Pedro. (2016). "Aaron Freeman: Physicist at Your Funeral" (Q), Mar 4.

External links

- Aaron Freeman – Wikipedia.
- Aaron Freeman – FamousBirthdays.com.

θΔics

In existographies, **Aaron Haspel** (c.1985-) is an American writer, philosopher, and aphorist, stylized a "Twitter generation Rochefoucauld" (Teachout, 2015) (Q), noted for []

Overview

In 2015, Haspel, in his blog "Alpha Theory", in an attempt to derive an ethics, devoid of vitalism, anthropocentrism, which goes beyond "moral intuition", Plato, Kant, and Nietzsche's will to power, utilitarianism, G.E. Moore's naturalistic fallacy, i.e. that the way we *do behave* has nothing to do with *should behave*, and the ideas of Peter Singer, by postulating a system of ethics that applies to a hypothetical cube of space, which he calls "Eustace", floating around the universe, loosely depicted as follows: [1]

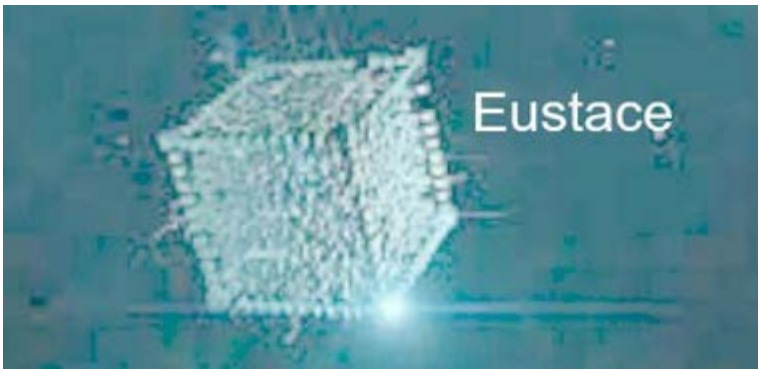

Haspel defines this hypothetical Eustace "system" as follows: "will assume that at least something in the way of atomic state change is going on; particles will dart in and out of our little cube of space", in other words, thermodynamically speaking, his system is open. He then correctly states that the first and second law will apply to the governance of this system.

Haspel then cites Patrick Woodward's Ohio State University's chemistry page (Q) on the first law, which is generally correct. Haspel then cites, however, Frank Lambert's infamous 2ndLaw.com page, with its incorrect "energy dispersion" of the second law.

Skipping forward, Haspel then jumps to the conclusion that "useful for describing Eustace is the Gibbs-Boltzmann equation for free energy", or:

$$\Delta G = \Delta H - T\Delta S$$

Technically, here to clarify, this version of the Gibbs function, is the isothermal isobaric thermodynamic potential, i.e. the potential for constant temperature, constant pressure systems, which account for most earth-surface type reactions. Haspel seems, correctly, to be describing an isochoric system, i.e. constant volume system, with an open boundary. Pressure and temperature of a volumetric system floating about space, would likely change greatly, e.g. floating near stars and black holes, etc. In any event, his derivation, is meant, supposedly, as a laymanized exercised, as would seem to be the case.

Whatever the case, in a few incoherent and confused steps, Haspel produces the following equation:

$$\alpha = (\Delta H - T\Delta S) / T\Delta S$$

and that alpha is "the rate at which the free energy in a system is directed toward coherence, rather than dissipation and

is the measure of the stability of a system". He concludes with the idea that "over time, via Bernoulli trials, complexity emerges from the ooze".

After this, the derivation mostly goes more off the rails, e.g. he cites information theory, chance models (compare: anti-chance), far-from-equilibrium, Maxwell's demon, and other erroneous models, but he does interestingly suggest the idea that his alpha is a "universal maximization function" and that "all living things maximize alpha". Here, of course, we broach the abioism discussion.

To say the least, sidelining all his derivation and citation problems, at least we see Haspel, broaching the problem in the general correct direction, such as has been done in better form by those including: Harold Blum, Bruce Lindsay, Norman Dolloff, Mark Janes, and Jacob Leachman, i.e. a big picture view of things, e.g. ethics, in the great chain of being stylized view of things.

References

1. Haspel, Aaron. (2015). "Alpha Theory" (O)(O), Blogspot.

Further reading

● Haspel, Aaron. (2015). *Everything: a Book of Aphorisms* (Amz). Publisher.

External links

● Aaron Haspel – Twitter.
● Home – AaronHaspel.com.

θΔics

In existographies, **Aaron Sloman** (1936-) is Zimbabwe-born English mathematician, physicist, and artificial intelligence researcher, noted for []

Overview

In 2011, Sloman, after read Alan Turing's "The Chemical Basis of Morphogenesis" (1952) – an investigative read that had resulted from a miscommunication with Barry Cooper (1943-2015), who had asked Sloman to contribute to a book on Turing's life and work (published by Elsevier in 2013) (Q) – decided to elaborate on what Turing might have done "had he lived longer", in respect to how thinking humans could have arisen from a cloud of dust (see: nebular hypothesis).

Sloman's ongoing, mostly online, project is entitled: "The Meta-Morphogenesis Project: the Self-Informing Universe", some of which is found in his 2013 talk "From Molecules to Mathematicians: How Could Evolution Produced Mathematicians" (compare: molecules-to-man evolution), subtitled "How could evolution produce mathematicians from a cloud of cosmic dust?" (compare: Paul Davies take on Fred Hoyle's *The Black Cloud* (1959)) and his 2014 discussions on how "life, mind, ecosystems, and cultures" could have arisen from a "cloud of dust" in the face of entropy and the second law (compare: chemistry professor paradox). [1]

Sloman, in his model, has touched on Tibor Ganti's ideas about the "requirements for life", Lionel Penrose and son Roger Penrose's 1959 about "droguli" (Q) or activated complexes; Henry Morris (1985) on entropy and evolution (Q); among others.

Religion | Atheism

Sloman, in his "Varieties of Atheism" (2008), discusses how, being born into a Jewish family (see: Jewish atheism), he had become an "adamant atheist" at age 10 or 11, later discovered how Epicurus had similar views to him, and discussed how he was an "analytical atheist", i.e. one who "doesn't claim that god does not exist, but that the usual concept when analyzed closely is incoherent, so that existence of an instance makes no sense" (see: atheism terminology). [3]

Education

In 1956, Sloman completed his BS in mathematics and physics at Cape Town University, then, via a Rhodes Scholarship, studied mathematics at Balliol College, Oxford, completing his PhD in 1962 in the philosophy of mathematics, after which he became a lecturer in the philosophy of science at the University of Sussex from 1964 to 1991, during which time he helped to start courses in artificial intelligence (compare: physical intelligence) and later the School of Cognitive and Computer Science. In 1991 to 1994, Sloman was head of the school of computer science at Birmingham University; he retired in 2002, thereafter doing research as honorary professor of AD and cognitive science. [2]

References

1. (a) Turing, Alan. (1952). "The Chemical Basis of Morphogenesis" (pdf), *Philosophical Transactions of the Royal Society*, 237B, 5-72.
(b) Sloman, Aaron. (2017). "The Meta-Morphogenesis Project: the Self-Informing Universe" (Q), University of Birmingham.
(c) Sloman, Aaron. (2013). "Molecules to Mathematicians" (abs), Talk, University of Birmingham.
(d) Sloman, Aaron. (2014). "Entropy and Evolution", University of Birmingham.
2. Aaron Sloman (cv) – University of Birmingham.
3. Solman, Aaron. (2008). "Varieties of Atheism: What is Analytical Atheism?" (Q), Birmingham University, Apr.

Videos

- Sloman, Aaron. (2016). "What's Information? An Answer from Physics, Biology, and Philosophy" (Q), The Van Leer Jerusalem Institute, Jul 24.

Threads

- The partly related Meta-Morphology project (2017) – Hmolpedia threads.

External links

- Aaron Sloman – Wikipedia.
- Aaron Sloman (faculty) – University of Birmingham.
- Aaron Sloman – Twitter.

θΔics

In terminology, **Ab-** is an ancient language prefix denoting: “father” (Akkadian, Turkish, Hebrew, etc.) and or “water” (Turkish, Aryan, etc.), a derivative of the Egyptian Heliopolis creation myth of sun (fire) born out of land (earth), land or "keme" arisen (pyramid) out of flood (water) three element theory (see also: four element theory), which, through religious translation-syncretism, became the basis of the current world-dominating Anunian theologies: the Ab-ra-ham-ic theologies (51% world belief), i.e. Abraham-based, and the B-ra-hma-ic theologies (21% world belief), i.e. Brahma-based, or “father Ra born of Nun” belief systems.

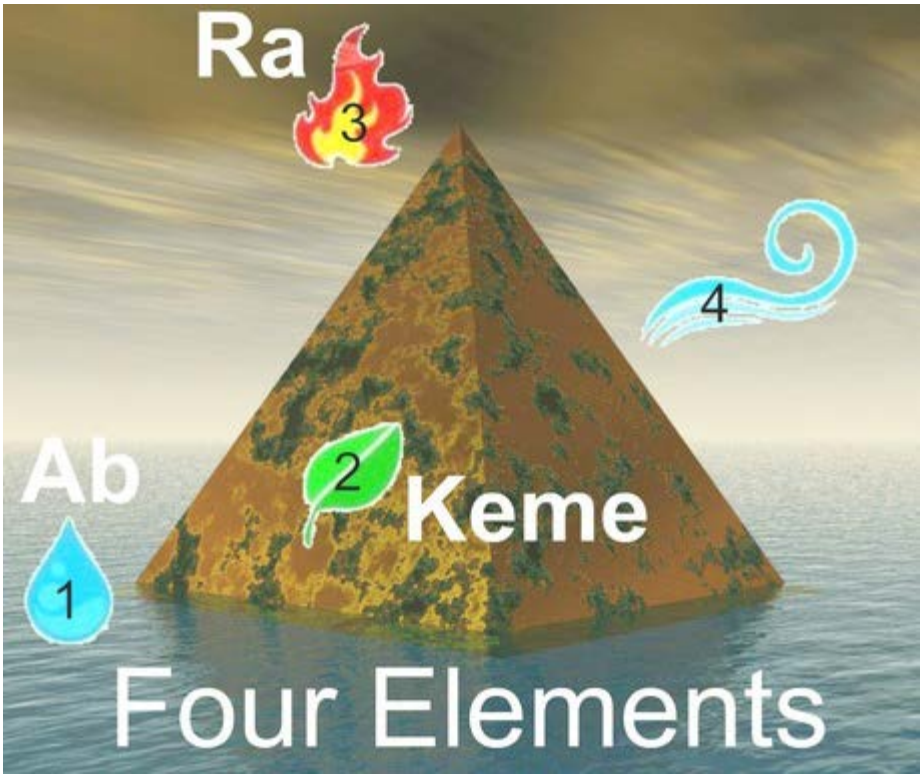

In 3100BC, in Heliopolis, Egyptian scholars derived a creation myth, based on the movements of the stars, the sun, and the annual Nile River flood, according to which water was first, symbolized by the god Nun, out of which land or the god Atum arose, out of which the sun or the sun god Ra burst forth and flew into the sky carried by the benu bird (aka phoenix). In 600BC, Thales traveled to Egypt and from them acquired the water as first principle theory, from which fire and earth were derived. In 500BC, Heraclitus expanded on Thales water model into the form of the three element theory, namely that things are comprised of water, earth, and fire. This eventually became the four element theory, namely that all things are comprised of water, earth, fire, and air, a theory which held sway up until the time of Percy Shelley.

Overview

The Egyptian hieroglyph (Ñº) for Ab is the following:

which is shown by the vulture, which is usually a symbol of divine power, and used in the “ah” sound in words like: around, about, Adam, or Atum; the b hieroglyph is represented by the foot and lower leg, and used in words like: boy, bubble, Bobby, and Bernadette. (Ñº)

In 1904, Scottish road engineer turned religio-mythology scholar James Forlong gave the following well-honed etymology: [1]

> **Ab**. This word, in many languages, denotes "father" (as in Akkadian, Turkish, Hebrew, etc.) like the Latin *avus*. With Akkadians also *ab* was "moving water " (compare A) like the Turkish *ab* "wave," and the Aryan *ap* "water." The Babylonian month Ab was called in Akkadian Nene-gar ("fire making"), sacred to "the queen of the spear" (see Quirinus). This was August, but the Akkadian January was called Abba-uddu ("rising flood "). *Ab* "father," and *Ma* "mother," are reversed in many dialects; and *Ab* becomes the Aryan *Pa* and *Pa-pa*, while *Ma* becomes *Am*, and *Urn*, and *Ma-ma*, "the great nurse." Ab, as the father, is the type of "fertility" and of "fruit" (Hebrew *Eb:* see Job viii, 1 2; Dan iv, 12, etc); but the root *abah* signifies "desire."

In Persian, likewise, ab means water: Ä€B “water.” (Ø¢Ø¨). [2]

References

1. Forlong, James G.R. (1906). *Faiths of Man: A Cyclopædia of Religions, Volume 1: A-D* (Ab, pg. 2). London: Bernard Quaritch.
2. Ab – Encyclopedia Iranica.

θΔics

In religions, **Ab-ra-ham-ic theologies**, a subset of Ra theology, refers to the set of religions centered around the theory that all humans are descendant from a man name Abraham, the Torah version (500BC) of the family structure of Egyptian sun god Ra, whose name reads etymologically as 'Father (B) – Ra (ra) – son of Nun (hma)', which includes the following modern-day religions: [1]

Abrahamic religions			World beliefs
Ab-***ra***-ham-ic faiths:	Abraham	Christianity 33%, Islam 20%, Judaism 0.2%, Baha'ism 0.1%, and Mandaeism 0.001%.	53%

Morality

The morality system practiced in these religions is a heaven hell rebirth version of the Egyptian negative confessions morality system.

References

1. Thims, Libb. (2003). *Human Thermodynamics, Volume 3.* Unpublished manuscript. IoHT publications.

External links

â— Abraham - Wikipedia
â— Abrahamic religions - Wikipedia

θΔics

In hmolscience, **ABC model** (TR:10) is simplified three step description of the light-mediated mechanism through which the 3-element molecule retinal straightens, when in the presence of light of wavelength about 550 nm, employed to explain how a like, albeit more complex, mechanism of movement operates in the hydrocarbon mental processing the 26-element human molecule (person), to thus give a conceptual understanding of the external force / internal force nature of the will and 'choice', as this is a crucial concept hinging commonly in religion vs. science debates—in fact, it is commonly cited as the crux of the issue, in respect to morality and meaning. [1]

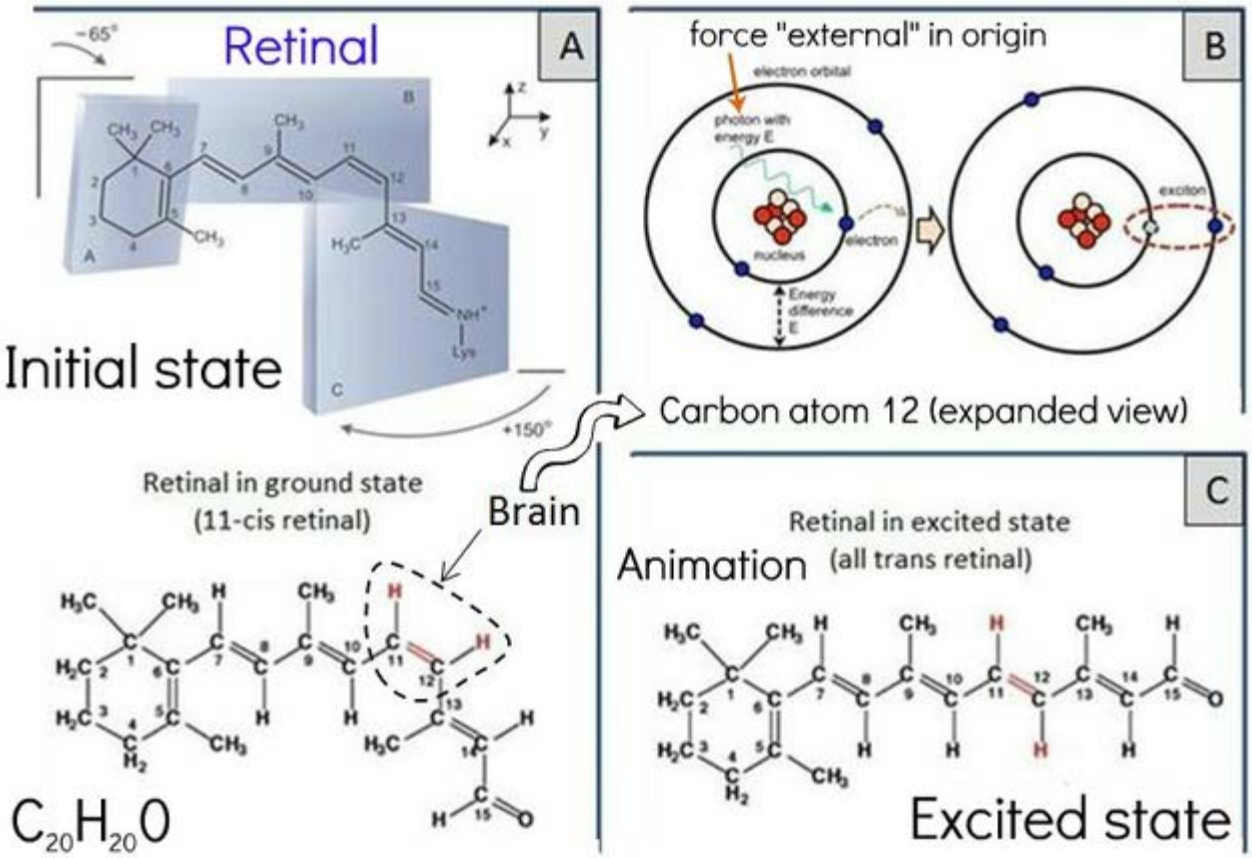

The "**ABC model**" of the so-called free operation of the will or free will: (A) retinal molecule in ground state (normal state); (B) light (or one or more photons) with a frequency of 400 to 700 nm absorbs into the the carbon atom (note: atom shown is actually beryllium) at the 11 position, thus causing (exchange force) an electron to jump up in orbital position (excited state); (C) the retinal molecule reacts to this by "moving" to the straightened position, a short-lived heightened energy configuration (see also: will to power).

Mind-body problem

The ABC model solves the famous mind-body problem, i.e. the $C_{20}H_{20}O$ molecule has a conceptual "body" (41 atom atomic structure) and "mind" (C11-C12 region of the molecule), according to which 550 nm photons activate a so-called state of forced "awareness" (i.e. conscious mind, as Descartes might have reasoned), according to which the molecule "chooses", not to imply free will, to straighten in the excited state; as shown below:

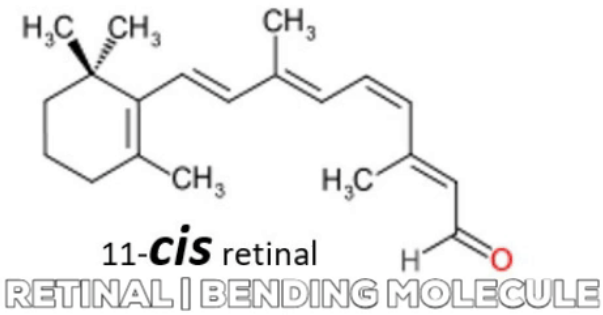

when the stimulus is removed (light taken away) the "mind" chooses to retract back to the bend configuration, i.e. the normal or unconscious state, speaking anthropomorphically.

Human choice is but a more elaborated version of this, where in stored memories delay the choice, for seconds, minutes, or hours, or days, for simple choices, or for months, years, or decades, for more complex choices. The Libet experiment gives insight into this mechanism.

Internal force

The internal force here is the set of electromagnetic exchange forces existing and operating in the bonding dynamics of the C11-C12 carbon atom junction.

External force

The external force here is the light transmitted from some external source (e.g. sun light) directed at and entering the volumetric region of the retinal molecule.

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (retinal molecule, pg. 198). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
(c) Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc) (retinal molecule, pgs. 60-61). LuLu.

θΔics

In existographies, **Abdus Salam** (1926-1996) (IQ:#|#) was an Indian-born Pakistani theoretical physicist noted for []

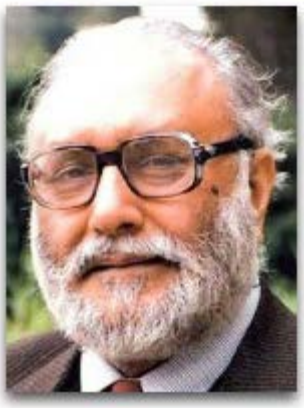

Overview

In 1956, Salam, in his draft article "On Parity Conservation and Neutrino Mass" (Q), questioned "parity conservation"; he then sent the draft article to Wolfgang Pauli, who dismissed it; after which, in 1957, Tsung-Dao Lee and Chen-Ning Yang suggested experiments that showed that the weak interaction of radioactive decay could indeed violate parity conservation. [1]

In 1979, Salam shared the Nobel Prize in Physics with Sheldon Glashow and Steven Weinberg for his contribution to electroweak unification theory.

Quotes | On

The following are quotes on Salam:

> "Dirac was regarded by **Salam** as the 'supreme physicist'."
>
> — Umar Salam (2018), "Salam: the First M*slim Nobel Laureate", Netflix [1]

Quotes | By

The following are quotes by Salam:

> "I am a theoretical physicist, and we are engaged on the following problem: we would like to understand the entire complexity of inanimate matter in terms of as few fundamental concepts as possible.The task which we are engaged on is to try to reduce this seeming complexity to something simple and elementary. But to do this, what we will most certainly need is a complete break from the past and a sort of new and audacious idea of the type which Einstein has had in the beginning of the century."
>
> — Abdus Salam (c.1960), "Video Lecture"; supposedly a commentary on parity [2]

> "Once Dirac asked me whether I thought geometrically or algebraically. I said I did not know what he meant, and could he tell me himself how he thought. He said his thinking was geometrical. I was taken aback by his because Dirac, with his transformation theory, represented for my generation the algebraic movement in physics par excellence. So, I said: "I still don't understand." He said, "I will ask you a question. How do you picture the de Sitter space?" I said, "I write down the metric and then think about the structure of the terms in the expression." He said, "Precisely as I thought. You think algebraically.....I picture, without effort, the de Sitter space as a four-dimensional surface in a five-dimensional space."
>
> — Abdus Salam (c.1970), "Dirac and finite field theories in Reminiscences about a great physicist Paul Adrian Maurice Dirac" (Q)

References

1. Vandal, Omar; Thaver, Zakir. (2018). "Salam: the First M*slim Nobel Laureate" (quote, 22:22-; parity conservation, 23:30-) (Q), Netflix.
2. Beall, Abigail. (2019). "Abdus Salam: the Muslim Science Genius Forgotten by History" (Q), BBC.com, Oct 15.

External links

- Abdus Salam – Wikipedia.

θΔics

In existographies, **Abhijit Pandit** (c.1975-) is an Indian hmolscientist, philanthropist, research, and academician; noted for []

Overview

In 2017, Pandit, in his *Human and Social Thermodynamics*, a 56-page booklet, attempted to discuss the following:

> "This book is based on interdisciplinary subjects of thermodynamics, social sciences and management. Human and social thermodynamics is a very recent and interesting subject which is becoming popular worldwide. Needless to mention, the concepts of this subject, if properly implemented, can provide solutions to several problems of management, personal life of people and society. This book is written, keeping in mind that it can do some value-addition and enrichment in the lives of any type of reader like students, teachers, casual-readers, researchers and others."

The key words of this are: enthalpy, entropy, Gibbs free energy, love, society, thermodynamics, and human molecule. Pandit's book, in sum, has an opening chapter on what he calls "phase space", which is code for thermodynamic system, followed by three JHT article copy-pastes, firstly: Gerard Nahum's 2010 "A Proposal for Testing the Energetics of Consciousness and its Physical Foundation"; secondly: Vamshi Regalla and Ravi Vedula's 2012 "A Strange Thing Called Love: in View of Thermodynamics"; and thirdly: Jeff Tuhtan's "On the Differences Between a Person and a Particle". [2]

In 2019, Pandit, in his *Human Thermodynamics and its Emerging Research Opportunities and Anthropological Applications: Application of Human Thermodynamics in Real Life*, a 108-page booklet, attempted to further summarize ideas on human thermodynamics; the abstract is as follows: [3]

> "Human thermodynamics is the study of the energy and entropy aspects of the work cycles involved in human life, namely those existent between heat, spontaneity, irreversibility and the laws defining therein. In short, human thermodynamics is the study of heat and its relation to the motion and changes in the equilibriums of human bodies. The essential process of thermodynamics is that whereby heat cycles through a system of chemical species, e.g. water molecules in a steam engine or human molecules in a social system (sociological thermodynamics) and thereby mediates the production of work In simple terms, heat, in the form of gamma-ray photons, cycles from the sun, the systems are coupled economies, the chemical species are people, and the work is the work of life. The four laws of thermodynamics define the boundaries of this action."

(add)

Education

Pandit completed his BS, MS, and PhD at the University of Calcutta; thereby, accordingly, he is likely associated with the Indian school of econophysics. [1]

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1. Pandit, Abhijit. (2017). *Human and Social Thermodynamics* (Amz) (abs) (cvr). LAP Publishing.
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(b) Nahum, Gerard. (2010). "A Proposal for Testing the Energetics of Consciousness and its Physical Foundation", *Journal of Human Thermodynamics*, 6: 1-25, March.
(c) Regalla, Vamsi and Vedula, Ravi. (2012). "A Strange Thing Called Love", YouTube, Feb 04.

(d) Regalla, Vamsi and Vedula, Ravi. (2012). “A Strange Thing Called Love: in View of Thermodynamics” (url) (pdf), *Journal of Human Thermodynamics*, 8(2): 121-32, Dec 31.
(e) Tuhtan, Jeff. (2012). “On the Differences Between a Person and a Particle” (pdf) (rev), *Journal of Human Thermodynamics*, 9(5):55-64.
3. Pandit, Abhijit. (2019). *Human Thermodynamics and its Emerging Research Opportunities and Anthropological Applications: Application of Human Thermodynamics in Real Life* (abs) (GB). Lambert.

θΔics

In science, **abiogenesis**, as compared to biogenesis, refers to hypothesis, introduced by Thomas Huxley (1870), that so-called "living matter", or what is classified as "life", i.e. animal life or vegetable life, in Linnaean classification (1758), can be generated from non-life, i.e. from the mineral kingdom; that organic can be synthesized from inorganic, in Berzelius classification (1826); that a living being can be created from non-living starting material; that a so-called "alive" human can evolve or metamorphosize, over time, via natural physicochemical processes, from so-called "dead", inert, or categorizationally neither alive nor non-alive atoms (dead atom / living atom), elements (dead element / living element), chemicals (dead chemical / living chemical), or molecules (dead molecule / living molecule).

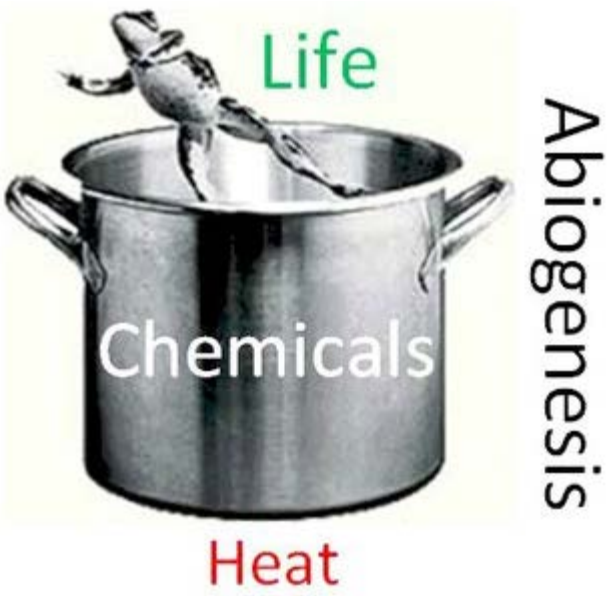

A depiction of **abiogenesis**, namely the hypothesis (Thomas Huxley, 1870) that by heating and or adding energy to non-living matter, life can be generated, i.e. a frog will eventually hop out of the primordial soup; the logic of which many, in modern times, adhere to via a combination of the Miller-Urey experiment (1952), the RNA world hypothesis (Walter Gilbert, 1986) (Q), the hydrothermal vent theory (Gunter Wachtershauser, 1990) (Q), among other arguments.

Overview

In 1870, Thomas Huxley introduced the term "abiogenesis" as follows:

> "But though I cannot express this conviction of mine too strongly, I must carefully guard myself against the supposition that I intend to suggest that no such thing as **abiogenesis** has ever taken place in the past, or ever will take place in the future. With organic chemistry, molecular physics and physiology yet in their infancy, and every day making prodigious strides, I think it would be the height of presumption for any man to say that the conditions under which matter assumes the properties we call 'vital' may not, someday, be artificially brought together. All I fear justified in affirming is that I see no reason for affirming that the feat has been performed yet. And looking back through the prodigious vista of the past, I find no record of the commencement of life, and, therefore, I am devoid of any means of forming a definite conclusion as to the conditions of its appearance. Belief, in the scientific sense of the word, is a serious matter, and needs strong foundations. To say, therefore, in the admitted absence of evidence, that I have any belief as to the mode in which the existing forms of life have originated, would be using words in a wrong sense. But expectation is permissible where belief is not; and if it were given me to look beyond the abyss of geologically recorded time to the still more remote period when the earth was passing through physical and dynamical conditions, which it can no more see again than a man can recall his infancy, I should expect to be a witness of the evolution of living protoplasm from non-living matter. That is the expectation to which analogical reasoning leads me; but I beg you once more to recollect that I have no right to call my opinion anything but an act of philosophical faith."
>
> — Thomas Huxley (1870), BAAS president's address, Sep 14 [2]

> "Of the causes which have led to the origination of living matter, it may be said that we know absolutely nothing, . . . Science has no means to form an opinion on the commencement of life; we can only make conjectures without any scientific value."
>
> — Thomas Huxley (c.1877); in: "Biology", *Encyclopedia Britannia* (1780) [3]

(add discussion)

Quotes

The following are related quotes:

> "A deep abyss deep abyss separates the inorganic from the organic, the inanimate from the animate. The rock-crystal on the one side, vegetable and animal on the other, how infinitely different the image."
>
> — Heinrich Frey (c.1877) (O)

> "To say that even the very lowest form of life, not to speak of the higher forms, still less of volition and consciousness, can be fully *explained* on physical principles alone, . . . is simply unscientific. There is absolutely nothing known in physical science which can lend the slightest support to such an idea. To suppose that life, even in its lowest form, is wholly material, involves either a denial of the truth of Newton's laws of motion, or an erroneous use of the term 'matter.' Both are alike unscientific."
>
> — Peter Tait (1878) [4]

> "A mass of living protoplasm is simply a molecular machine of great complexity, a total results of the working of which, or its vital phenomena, depend, on the one hand upon its construction, and, on the other, upon the energy supplied to it; and to speak of vitality as anything but the name of a series of operations, is as if one should talk of the 'horologtity' of a clock."
>
> — Thomas Huxley (1880), "Biology", *Encyclopedia Britannica* (O)

> "Believing, as I do, in the continuity of nature, I cannot stop abruptly where our microscopes cease to be of use. Here the vision of the mind authoritatively supplements the vision of the eye. By a necessity engendered and justified by science I cross the boundary of the experimental evidence. If you ask me whether there exists the least evidence to prove that any form of life can be developed out of matter, without demonstrable antecedent life, . . . [men of science] will frankly admit their inability to point to any satisfactory experimental proof that life can be developed, save from demonstrable antecedent life."
>
> — John Tyndall (c.1880), Belfast Address [5]

> "No evidence worth anything has as yet, in my opinion, been advanced in favor of a living being being developed from inorganic matter."
>
> — Charles Darwin (1882), "Letter to D. Mackintosh" [5]

> "It is mere rubbish thinking at present of the origin of life; one might as well think of the origin of matter."
>
> — Charles Darwin (1883), "Letter to Joseph Hooker", Feb 28 [5]

See also

- Defunct theory of life
- Life does not exist
- Life terminology upgrades

References

1. (a) Huxley, Thomas. (1870). "Address", President's Address, BAAS, Liverpool, Sep 14.

(b) Breen, Andrew E. (1922). “Evolution: Abiogenesis”, in: *Sociological Essays, Volume 1* (§5:123-69; §§: Abiogenesis, pgs. 158-). John P. Smith Printing Co.
2. (a) Huxley, Thomas. (1870). “Address”, President’s Address, BAAS, Liverpool, Sep 14.
(b) Gerard, John. (1904). *The Old and the Newest Answer* (pg. 51). Longmans, Green and Co.
(c) Breen, Andrew E. (1922). “Evolution: Abiogenesis”, in: *Sociological Essays, Volume 1* (§5:123-69; §§: Abiogenesis, pgs. 158-). John P. Smith Printing Co.
3. (a) Huxley, Thomas. (c.1877). “Article” (Q), Publication.
(b) Huxley, Thomas. (1878). *A Manuel of the Anatomy of Invertebrated Animals* (pg. 41). Publisher.
(c) Huxley, Thomas. (1880). “Biology”, *Encyclopedia Britinica*.
(d) Breen, Andrew E. (1922). “Evolution: Abiogenesis”, in: *Sociological Essays, Volume 1* (§5:123-69; §§: Abiogenesis, pgs. 158-). John P. Smith Printing Co.
4. (a) Tait, Peter. (1878). “Article”, *Contemporary Review*, Jan.
(b) Breen, Andrew E. (1922). “Evolution: Abiogenesis”, in: *Sociological Essays, Volume 1* (§5:123-69; §§: Abiogenesis, pgs. 158-). John P. Smith Printing Co.
5. Breen, Andrew E. (1922). “Evolution: Abiogenesis”, in: *Sociological Essays, Volume 1* (§5:123-69; §§: Abiogenesis, pgs. 158-). John P. Smith Printing Co.

External links

- Abiogenesis – Wikipedia.

θΔics

In philosophy, **abioism**, from *a*- "not" + *bio*- "life" + -*ism* "doctrine" is the belief or conclusion that "life", similar to "ether", does not exist (see: life does not exist) and has never existed.

Abioism is the view that life is not just a metaphysical theory, as Gilbert Lewis (1925) classified the term, but correctly is a defunct theory, i.e. see: defunct theory of life (for historical overview), i.e. a fictional divide handed down to us from religio-mythology past, incongruent with modern view of things; a point of proposed chemical synthesis, in space-time, that cannot be found in the great chain of being, on going from hydrogen to human.

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Why Life Does Not Really Exist

I have been fascinated with living things since childhood. Growing up in northern California, I spent a lot of time playing outdoors among plants and animals.

STAFF | By Ferris Jabr on December 2, 2013

The title section to Ferris Jabr's 2013 "Why Life Does Not Really Exist" *Scientific American* article, wherein he explains how he independently arrived at the view that "life" is something that does NOT exist; a view retrospectively defined, categorically speaking, as "**abioism**" in 2015 by Libb Thims, one of six main things one has to deny in mentally switching from theism to atheism. [1]

Correctly, things, specifically CH-based things, such as AQ, DTA, retinal, ants, or humans, etc., can "move" (see: animate things), but the movement occurs, up and down the scale of things, hydrogen to human, according to the principles of chemistry, physics, and thermodynamics; life terminology upgrades, accordingly, is the solution to the seemingly confused paradox.

Precurcors | Alternatives

Stepping stone alternatives and or precursors to abioism are: **panbioism** (everything is alive view), the belief one toys with in the mind before arriving at abioism, **emergent-bioism** (life "emerged" at a certain point in the past), aka abiogenesis or "emergentism", which is the current *status quo* scientific dogma based view, and **creationism** (a divine entity "created" life at some point in time), e.g. clay creation myth, creation by breath, etc., which is the ancient astro-theology and or religio-mythology view, taught to children, and passed along through generations.

Etymology

The term “abioism” is a rather newer term, coined by Libb Thims (2015), first being significantly added as a header category on the atheism types by denial and belief page (see: 4 Jul 2015 edit version 25), as anyone who “denies life”:

One of the six main disbeliefs, along with: atheism, achristism, mortalism, asoulism, and aspiritism. The term "abioism" was introduced above, in some context, similar to the way the term "atheism" refers to disbelief in the existence of god.

Abioists

The following are the four known independent abioists,

i.e. the four people known in total, as of 2016, who each arrived at the life does not exist view independently, ordered according to publication date:

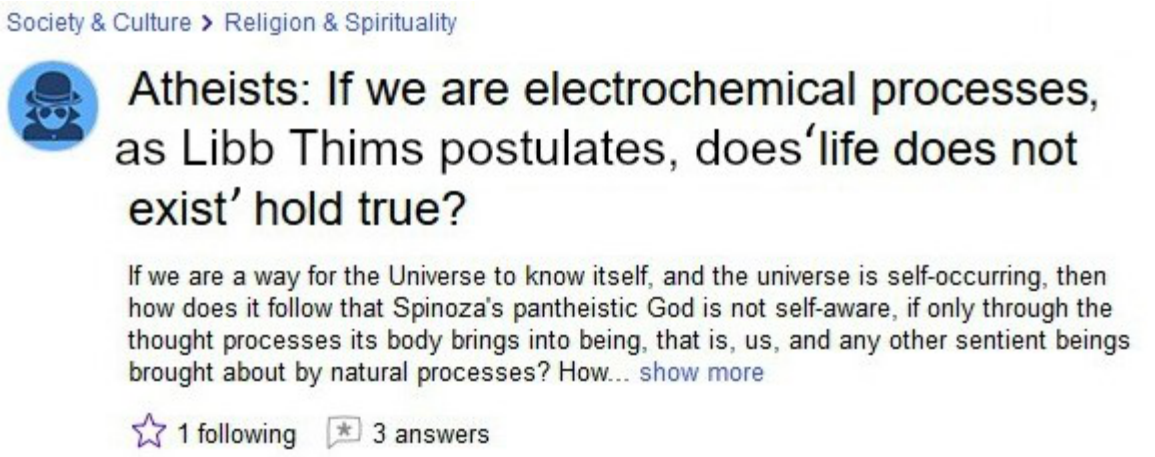

A 2015 Yahoo Answers query (Q) about Libb Thims' version of the "**life does not exist**" view, intermixed with discussion of Spinoza's god; see: defunct theory of life (2009) + life terminology upgrades (2012); see also: Thims' "Lotka's Jabberwock" (2016) talk given at BPE 2016.

- **Alfred Rogers** | Idea: 1990s; Published: 2010
- **Jonathan Dowling** | Idea: 1998-2004; Published: 2013
- **Libb Thims** | Idea 2007; **Published 2009**
- **Ferris Jabr** | Published: 2013

Rogers, to note, states that he came up with the idea that life is something that does not exist, when he "reasoned that there was no difference between life and non-life and that the perceived difference was due to a difference in complexity." [1] He did not, however, publish on this view until the 2010 launch of his website: LifeDoesNotExist.com.

The following are dependent-abioists, i.e. individuals who learned about the abioism from someone one of the previous independent abioists:

- Jeff Tuhtan (dependent | Thims, 2011) (Q)
- Patrick Fergus (dependent | Thims, 2014) | Atheist
- Inderjit Singh (dependent | Thims, 2015)

(add)

Near-Abioists

A noted early near-abioist is Alfred Lotka (1925), who, in his "Regarding Definitions" chapter, after nearly demolishing the concept of life as defunct and something that will go the way of superfluous terms of inexact science, comments:

> "If we continue to use the **word life**, this is merely a matter of convenience and does not imply any departure from the point of view set forth in [Regarding Definitions]."

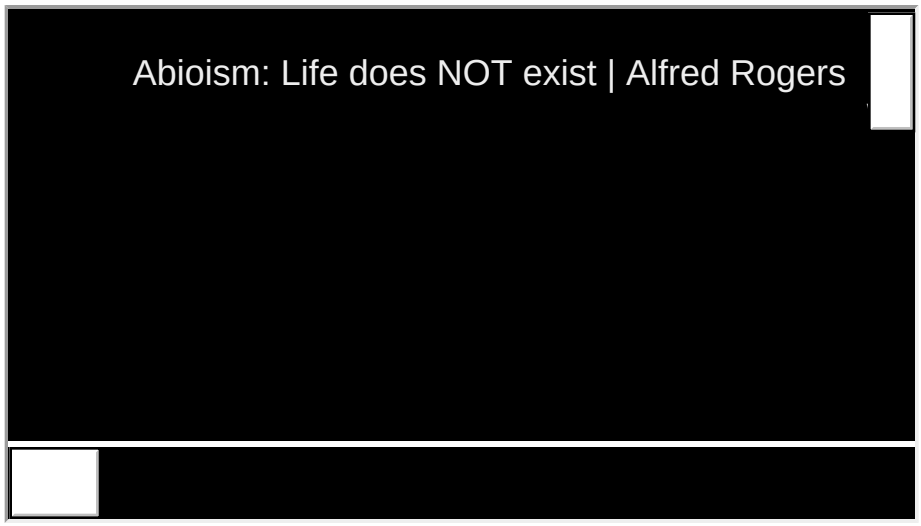

A 2016 video by American philosopher Alfred Rogers speaking on his 1990s discerned view that "life does not exist", aka **abioism**.

Other near-abioists include: Charles Sherrington (1938), Albert Szent-Gyorgyi

(1948), Francis Crick (1966), Norman Dolloff (1975), and, via Szent-Gyorgyi, Henri Atlan (1999).

Of note, Nikola Tesla is one example of an near-abioist, i.e. he was close to concluding that life does not exist, but instead sided with panbioism; as is evidenced the following statement, from his *New York American* article "How Cosmic Forces Shape Our Destines":

> "There is **no thing endowed with life** — from man, who is enslaving the elements, to the humblest creature — in all this world that does not sway it in turn. Whenever action is born from force, though it be infinitesimal, the cosmic balance is upset and universal motion result."

Here, he double sits both arguments by saying that no particular thing in the universe is "alive" but that any action resulting from force, which amounts to saying that anything that moves is alive, constitutes life. This is close to abioism.

Reactions

In 2009, when Libb Thims published his views openly that "life is a defunct scientific theory" — which was in direct opposition to Russian physical chemist Georgi Gladyshev's 1997 book *Thermodynamic Theory of the Evolution of Living Beings*, and then-current argumentative views, the implicit assertion of which being that from a thermodynamic point of view, a "specific point in time", in the evolution or form change of hydrogen into human, over the last 13.7-billion years, some hypothetical atomic aggregate can be said to be, at that given second, a "living being", which amounts to nonsense — a number of publications by Gladyshev, Indian chemical engineer DMR Sekhar, among others, followed in the wake.

In 2013, David Bossens, a noted abioism-curious thinker, after spending about a year in Hmolpedia threads, published his *Debates of the Hmolpedians*, wherein he devoted his chapter three "The long life debate" to the details of the issue at hand. [3]

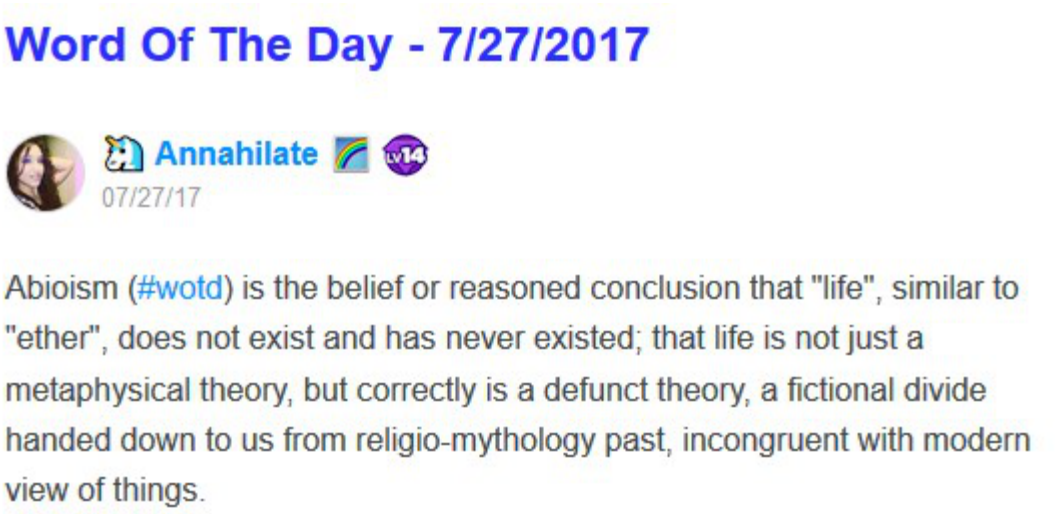

A 2017 "word of the day" definition of **abioism**, by atheist blogger Annahilate. [7]

In 2016, Adrian Bejan, a seeming implicit atheist, in his *The Physics of Life: the Evolution of Everything*, on his first page, as cited in this dialogue (Q), says he "naturally disagrees" with Ferris Jabr's 2014 statement that "nothing is truly alive". [4] This avowal puts Bejan into the panbioism, as opposed to the abioism, belief category, per his implicit assertion that both water molecules moving in rivers and human molecules moving on roadways are "truly alive" in some sense. [5]

In 2016, Robert Arvay, a seeming spiritual materialism theist, in his section: "Who Is It Who Can Say: 'I Am Not'?", of his *The God Paradigm*, devotes several pages to Ferris Jabr's life does not exist assertion; the opening section of which is as follows: [6]

> "An online article by Ferris Jabr is titled, 'Why Life Does Not Really Exist.' While at first, the premise (life's non-existence) may seem absurd, it raises an important question, one without which we cannot understand what life really is, why it exists, and why it is one of the basic foundations of reality. In our previous discussion of life", we noted that one biologist lamented that the more in depth he studied living things, the less life he found. We also mentioned that the mistake being made by materialist biology is that

it confuses the chemical processes of life with life itself."

(add)

Quotes

The following are related quotes:

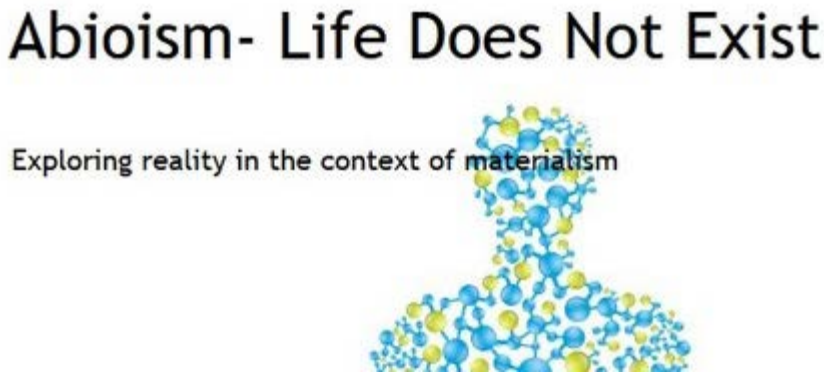

On 27 Jun 2018, Twitter user Jim Crawford (Poetry Polly) started a blog (Q) on abioism, aiming to be a layman's take (Q) on abioism to be specific, the second blog of which was on "thingness".

"I have always considered thermodynamics to be the most beautiful subject that I have come across. I independently thought of an idea linking life and thermodynamics when I was going through a difficult time during my early twenties. I later discovered that Schrodinger had the same idea 60 years earlier, essentially the idea was that life evades the decay to thermodynamic equilibrium by maintaining negative entropy in an open system. Thanks to you I now understand my previous line of thinking to be flawed, and I appreciate the content you are producing on **abioism**."

— Dan Pohl (2017), site message (Q) to Libb Thims, Sep 11

"Kudos to Libb Thims, who I understand is the coiner of the term '**abioism**'. I haven't read any of his work yet and so cannot comment on it, but the term rocks! :)"

— Jim Crawford (2018), "Introduction" (Q) to new Abioism Blog, Jun 27

"Oderberg's idea of immanent causation is a good description of what I mean by 'self-movement' [see: self-motion]. If we could not privilege the imminent causes of self-movement above non-imminent ones, then we could not even say that living canines are any more alive than robotic dogs, an assumption that is taken to its logical end in the writings of those who espouse **abioism** (e.g. Jabr 2013) — the idea that life does not really exist. Moreover, we see how the difference between causes internal to a thing and causes external to a thing can matter apart from their necessity in a functional process. For example, we recognize that a car battery, which cannot hold a charge and is in need of a jump, is "dead" in contrast to one that can turn the starter when prompted by the ignition. While the faulty battery might be able to still complete an electrical circuit and permit the circulation of current so the driver can make a pit stop at the auto parts store, he dare not turn the engine off before he gets there, unless he wants to jump the battery again. By saying this, I do not mean to draw an analogy between human death and the death of car batteries, but to highlight an important feature of the causal story about a thing, which can in turn provide us with knowledge about the condition of a thing."

— Adam Omelianchuk (2019), "The End of a Human Organism as a Self-Moving Whole" [8]

"I must have watched that Alfred Rogers [**abioism**] video (Q) at least five times."

— Ram Poudel (2019), comment to Libb Thims over lunch, Chicago, summer

References

1. Jabr, Ferris. (2013). "Why Life Does Not Really Exist", *Scientific American*, Brainwaves Blog, Dec 2.
2. Rogers, Alfred. (2014). "Email to Libb Thims", Nov 17.
3. Bossens, David. (2013). *Debates of the Hmolpedians* (Amz) (Q). Lulu.
4. Bejan, Adrian. (2016). *The Physics of Life: the Evolution of Everything* (Jabr, pg. 1; god, pg. 166). St. Martin's Press.
5. Bejan, Adrian and Zane, J. Peder. (2012). *Design in Nature: How the Constructal Law Governs Evolution in Biology, Physics, Technology, and Social Organization* (theory origin, pgs. 1-3; thermodynamics, 34+ pgs). Doubleday.
6. Arvay, Robert. (2016). *The God Paradigm* (Jabr, pg. 289). Lulu.
7. Abioism | Word of the Day (7/27/2017) – Atheist Amino Blog.
8. (a) Oderberg, David S. (2013). "Synthetic Life and the Bruteness of Causation"; in: *Aristotle on Method and Metaphysics* (editor: Edward Feser) (pgs. 206-35; quote, pg. 213). Palgrave Macmillan.
(b) Omelianchuk, Adam. (2019). "The End of a Human Organism as a Self-Moving Whole" (pdf) (pgs. 29-30), *Journal of Medicine & Philosophy*.

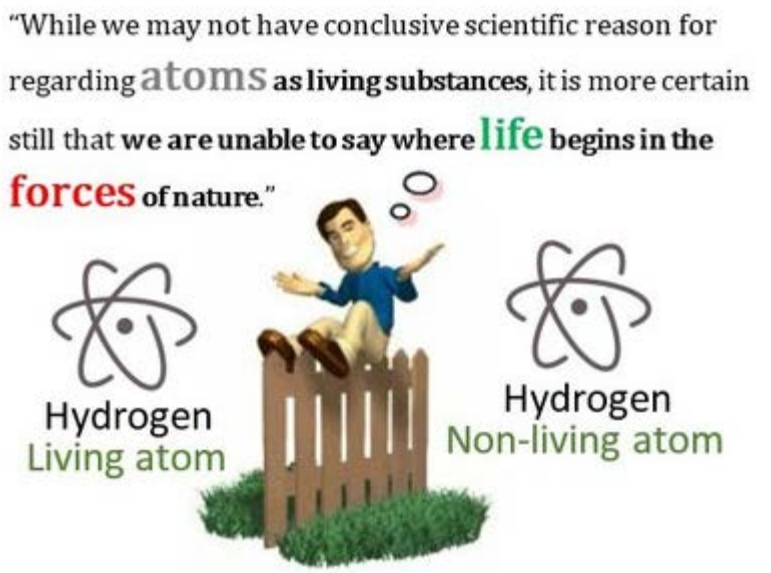

The **abioism** position resolves the above perplexing conundrum, as stated by Henry Bray (1910), i.e. it is the solution to the great problem of natural philosophy (Saint-Hilaire, 1836).

Further reading

- Kurtz, Mark. (2019). "I recently came across a belief called 'abioism' (life doesn't really exist)". What are the best arguments against it? (Q), Quora, Jan 31.
- Thims, Libb. (2019). "What is the Origin and Evolution of Life?" (Q), Quora, Nov 24.

Videos

- Abioism (playlist) – HumanChemistry101.

External links

- Does life really exist? (2013) – Quora.com.
- Abioism: Life Does Not Exist (2018) – Blogspot.
- Life does not exist (2018) – AntiNatalism Forum.

θΔics

In existographies, **Abner Kneeland** (1774-1844) was an American evangelist and theologian turned free thinker and pantheist, noted as the last person jailed (1838) in the US for blasphemy against, specifically for "willfully blaspheming the holy name of god" (Q) and for his public disavowal of Christ, a crime for which he was jailed for 60-days.

Quotes | On

The following are quotes on Kneeland:

> "It is evident that the notion of *spirits*, imagined by savages and **adopted by the ignorant**, is calculated to retard the progress of knowledge, since it precludes our researches into the true cause of the effects which we see, by keeping the human mind in apathy and sloth. This state of ignorance may be very useful to crafty theologians, but very injurious to society. This is the reason, however, why in all ages priests have persecuted those who have been the first to give natural explanations of the phenomena of nature— as witness: Anaxagoras, Aristotle, Galileo, Descartes—and, more recently, Richard Carlile, William Lawrence, Robert Taylor, and **Abnet Kneeland**; to which we may add the name of the learned and venerable Thomas Cooper, lately president of Columbia College, South Carolina."
>
> — H.D. Robinson (1835), notes to Baron d'Holbach's *The System of Nature* [1]

References

1. d'Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (pg. 53). J.P. Mendum, 1889.

External links

- Abner Kneeland – Wikipedia.

θΔics

In religio-mythology, **Abraham**, aka Ab-**Ra**-**Ham**, the fictional eleventh descendant from Noah (or Nun), is the Judeo-Christian-Islam creation myth anthropomorphism of the "Father Ra born of Nun", or Ra (fire), born out of land or keme (earth) that arose following the flood (water).

Overview

The name "Abraham", in Greek three element theory language, translates as follows:

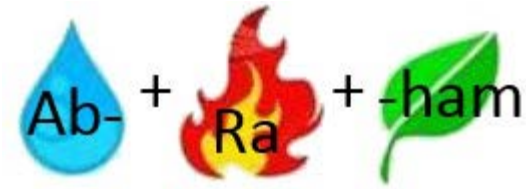

In short, Abraham, not a real person, means the sun god (sun) born out of the pyramid, i.e. land mound that arose after annual 150-day Nile flood, entity of the Heliopolis creation myth of Egyptology (2800BC), technically a syncretism of the supreme god-entity of the Heliopolis, Hermopolis, Memphis, and Thebes creation myths; who was also reconceptualized, in Hinduism, as the creator god Brahma; the gist of which is shown below.

Abraham | Brahma | Ra

See main: Abraham and Brahma

One of the more significant unifying decipherments is the connection between the similarities of Jewish-Christian-Islam patriarch Abraham and the Hindu creator god Brahma, which overlap in at least six ways:

(a) Both Abraham and Brahma are the said-to-be creators all humans (Ra is the main creator god of the Egyptian pantheon).
(b) Both Abraham and Brahma have the same etymology: "Father Ra son of Nun" (water-fire-earth theory).
(c) Both Abraham and Brahma derived from the Nun (Noah and Ma-Nu, respectively).
(d) Both Abraham and Brahma have the same sister-wife, in namesake, Sarai and Saraswati, respectively.
(e) Both Abraham and Brahma have the same thrice sister-wife parable (creation by incest rewrite).
(f) The slaying of son reoccurs in both cases (release of the soul rewrite / Osiris-Horus splitting rewrite).

The decipherment of the etymological origin of the supposed humankind patriarch person "Abraham" to the Ra the sun god model, to note, is a puzzle very difficult to track down; particularly in the pre-Internet (c.2003), pre-Wikipedia (c.2005), pre-Google Books (c.2007) era, though there have been no shortage of detectives in this endeavor, namely: Voltaire (c.1750), Johann Goethe (1770), Constantin Volney (1791), Gerald Massey (1883), Wallis Budge (1895), Gary Greenberg (1996), among others. The following, to exemplify modern searchability, are a few 2013 Google Books (30 million plus books scanned) search returns (Ñº) for keys: Ra, Brahman, Abraham, shown to exemplify the modern-day easy of tracing the Abraham etymology.

In these works, see a generally accurate picture, except for the lack of clarification that the name Ham, suffix "-ham", or phrase "father of Ham", correctly has the

meaning of land mound (primordial land mound following the flood), deriving from Coptic word for "Egypt", *kÄ“me* (pronounced: chem), the name of the fertile black soil left behind following the annual flooding of the Nile—hence, just as the sun (or sun god Ra) is born daily and annual out of the land mound (flood-mound god Nun or pyramid), following the great flood, so to in transliteration is Abraham born of Noah, following the great flood, after which the sun shows forth following the darkness.

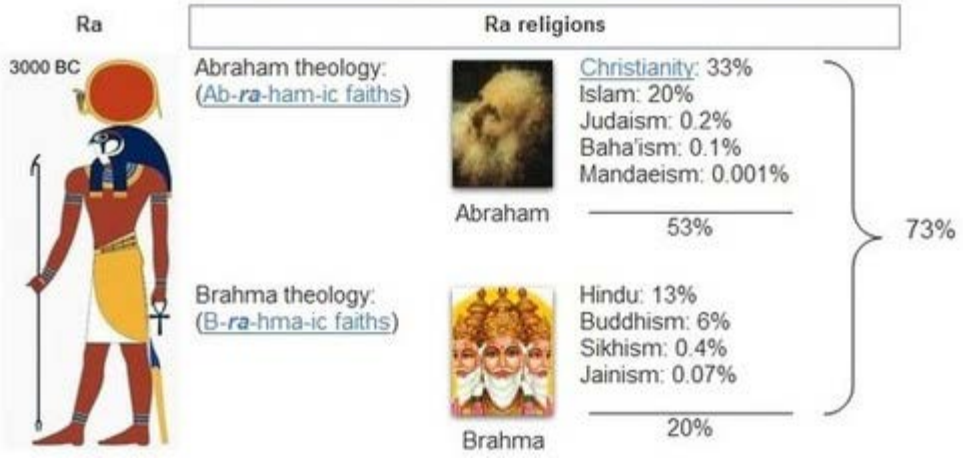

A snapshot religious syncretism-adoption character transformation Ra (2800BC) into Brahman (1600BC) and Abraham (500BC).

In regards to decipherment difficulty, to exemplify, it took American electrochemical engineer Libb Thims, about two years (c.2003), and a read-through of about 75+ books in comparative mythology and religion, including the works of Budge and Greenberg, among others, to figure out exactly who this mysterious "Abraham" character was, him being so precariously dominate in the world religions. [1]

Chemistry | Atheism

In opposition to belief in the existence of a person named “Abraham”, who some 75 percent of the modern world have some belief in, inclusive of the conception that all existing humans are descendants of Abraham, the dominate world belief system, typically taught to children (see: belief system children), the alternative of which, according to English natural philosopher Francis Bacon, is belief in atomic theory, and in turn atheism, inclusive of the conception that all existing humans or human molecules are descendants of the hydrogen atom: [3]

> “Nay, even that school which is most accused of atheism doth most demonstrate religion; that is, the school of Leucippus [450BC] and Democritus and Epicurus. For it is a thousand times more credible, that four mutable elements, and one immutable fifth essence, duly and eternally placed, need no God, than that an army of infinite small portions, or seeds unplaced, should have produced this order and beauty, without a divine marshal.”

It is thus by no coincidence that both Abraham (or Brahma) and chemistry have the same root etymology (see: chemistry etymology), being that they are each different belief systems that explain the origins of humans from the elements of the earth cyclically heated by the sun:

Name	Etymology
Abraham | Brahma	Father "Ra" born of the "Nun" (pyramid) – or *kÄ“me*, pronounced: **‘chem’** (Greenberg, 1996), the name of the black fertile soil left behind following the receding of the annual 150-day Nile flood.
Chemistry	From Coptic word for "Egypt", *kÄ“me* (pronounced: **chem**) or *chÄ“mia*, according Plutarch (*On Isis and Osiris*, 100AD), named as such owing to the black color of its soil; hence the synonym “black art” (Partington, 1936).

Said another way:

> " 'Ham', the name of Noah's second son, is pronounced 'Chem' in Hebrew, and he is depicted as the father of the Egyptian and African peoples. The name derives from the Egyptian word 'Keme', an ancient name for Egypt. It means 'the black land' and refers to the fertile black soil left behind when the annual Nile flood withdraws to its banks."
>
> — Gary Greenberg (1996), *101 Myths of the Bible* (pg. 74) [4]

In short, both Abraham and chemistry explain the origins of humans from a connection between the sun (or heat) and 'Chem', or "arisen land" (fertile soil), combination sun birth, following the flood, in the former, or 92 naturally occurring "elements" of the periodic table, cyclically heated by the sun, a process described by via synthesis/analysis and chemical thermodynamics, in the latter.

Human chemical thermodynamics

The modern upgrade replacement belief system for the world-dominating "humans descendent from Noah (Nu), a land mound born out of the flood via the power of the rising sun/god" model, i.e. Abrahamic theology and Brahmaic theology, is human chemical thermodynamics, i.e. the physio-chemical model of "humans as powered animate chemical geometries synthesized via the cyclical action of heat according to the laws and mechanisms of physical chemistry. The 3,000+ articles of Hmolpedia are a prolegomenon to this transition in belief system. [5]

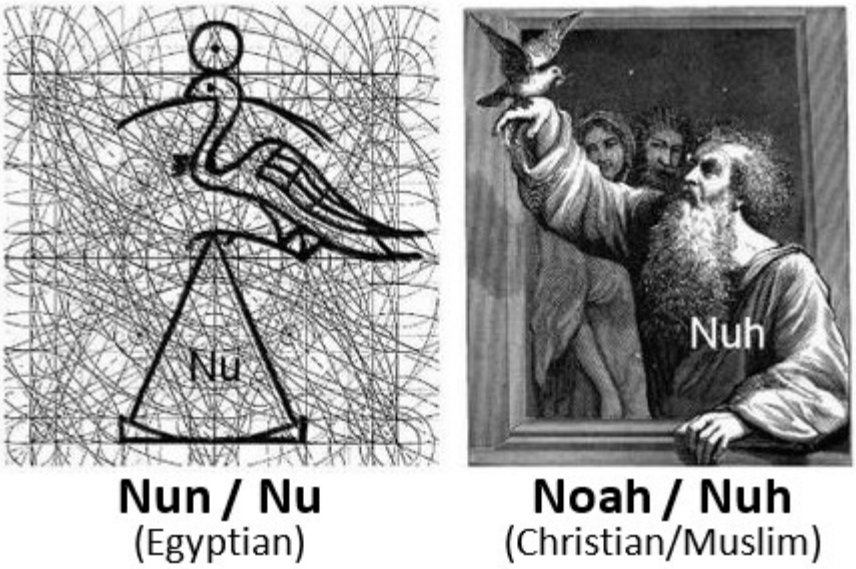

Left: Egyptian version (3100 BC): Benu bird bursting forth from the primordial land mound (Nun) carrying the sun (Ra) on its head into the sky following the great flood—a concept modeled on the annual 150-day Nile flood. **Right:** Torah version (1000BC): Noah (or Nuh) lost in the darkness of a great 150-day flood, nearing the end of which he sends out a bird that does not return, signifying that land had arose, after which the sun begins to shine, who becomes the patriarch of **Abraham**, by eleven generations, who in turn fathers all of humanity, according to the Judeo-Christian-Islam faiths, the dominate belief system of half the modern world. [1]

Quotes

The following are related quotes:

> "Therefore, it would be found to be composed of the first two letters of the alphabet. This is precisely what is found in the Hebrew word for father: AB. Linking it with the Egyptian RA, the radiant solar deity, we have AB-RA-M, receiving later in its evolution the developed powers of godhood represented by the fifth Hebrew letter, he, and so becoming **AB-RA-H-AM**. And as Abram came out of the primordial empyreal fire, UR, it is hardly coincidental that even UR begins with that letter, U, which (with V) represents the downward line of descent, the turning upward and the return to the heights."
>
> — Alvin Kuhn (1900), *Esoteric Structure of the Alphabet* (Ñº) (pg. 23)

> "Not only is there no evidence that any such figure as **Abraham** ever lived but archaeologists believe that there is no way such a figure could have lived given what we now know about ancient Israelite origins."
>
> — Daniel Lazare (2002), "False Testament" [6]

See also

â— Abraham and Isaac
â— Religion
â— Existence of God
â— Anunian theology
â— Ra theology

References

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(b) Harpur, Tom. (2004). *The Pagan Christ* (pg. 115-16). Thomas Allan Publishers.

External links

â— Abraham – Wikipedia.
â— Ancient Egyptian creation myths – Wikipedia.

θΔics

In religio-mythology, **Abraham and Brahma**, aka the "Abraham/Brahma motif" (Goodman, 1994), Brahma and Abraham, or Abraham = Brahma (Q), refers to multiply overlapping parallels between the Hebrew patriarch figure Abraham (500BC) and the Hindu creator god Brahma (900BC), and their respective wife-sisters Sarah and Saraswati (see: Sarah and Saraswati); both sets of which derive from the older Egyptian astro-theology coupling of Ra/Sirius (c.3500BC), i.e. Sun-Star based theology.

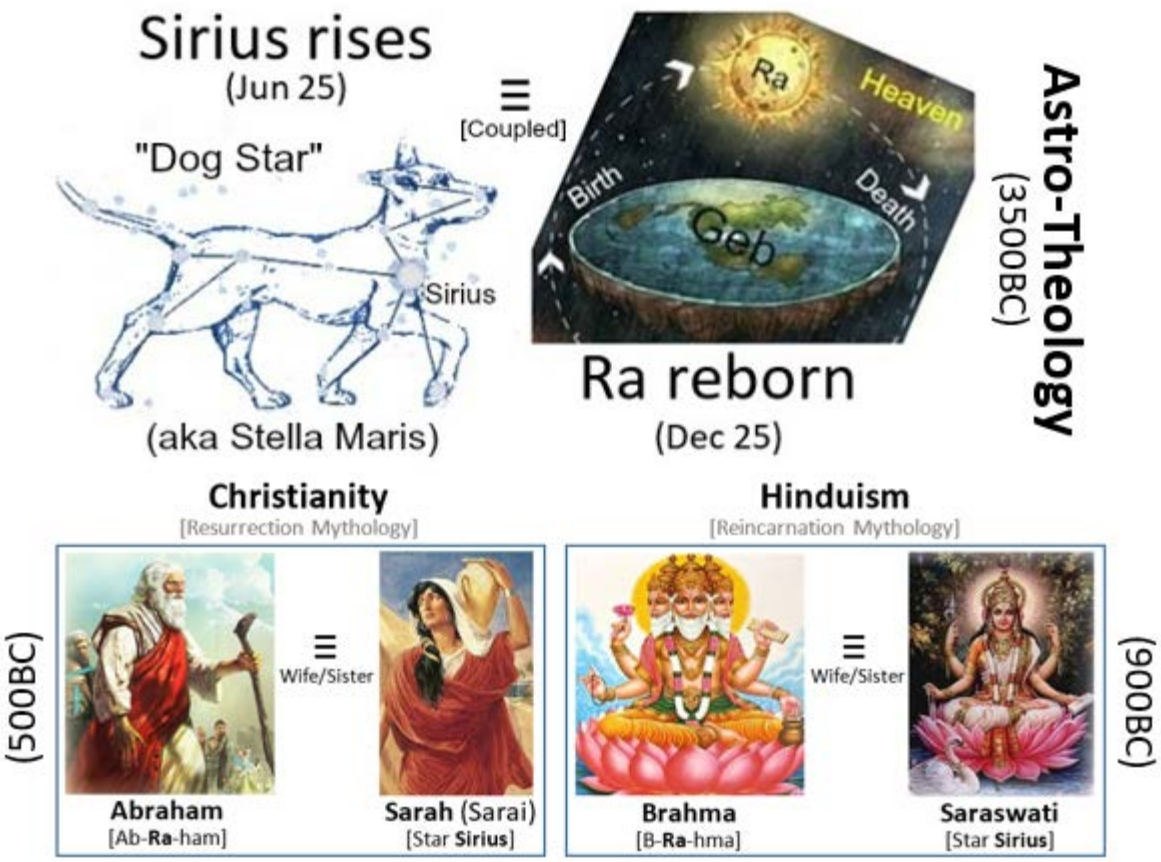

A diagram of the **Abraham and Brahma** connection from a chapter of Libb Thims' *Zerotheism for Kids* (2016), explaining how Abraham and Brahma, and Sarah and Saraswati, are not real people (nor gods), but anthropomorphism of an ancient astro-theological belief of the connection of the sighting of helical rising of Sirius, the start of the annual Nile River flood, and the re-powering of the sun. [13]

Overview

In c.3,500BC to 500AD, in Egypt, prior to the completion of the Aswan High Dam (1970) of the Nile River, it was universal belief, in an astro-theological sense, held by Egyptians, Greeks, and Romans, and that the Jan 25 heliacal rising (Q) of the the star Sirius, which had previously not been seen for 70-days, signaled or initiated the annual 150-day Nile River flood and worked to "re-kindle" the power or heat of the sun; the following is one take on this:

> "Who is there that does not know **that the vapor of the sun is kindled by the** [Jun 25] **rising** of the **dog-star** [Sirius]? The most powerful effects are felt on the earth from this star. When it rises, the seas are troubled, the wines in our cellars ferment, and **stagnant waters** [Nile River] **are set in motion** [150-day flood]."
>
> — Pliny the elder (77AD), "On the Rising of the Dog Star" [14]

This ancient star-sun-flood observed phenomena, first was worked into an astro-theology model, in pre-dynastic Egypt (3500BC), which then became Egyptian religio-mythology in dynastic Egypt (3100BC-200AD), wherein the sun became the god Ra, the Sirius became the goddess Isis, and the flood waters became the god Nun. This four-thousand year established and practiced model became the backbone of the Hindu religio-mythology (900BC) and Jewish religio-mythology (500BC), via the characters Brahma and Abraham, respectively, and independently, via migration and cultural transmission of ideas.

Abraham & Brahma | *pre*-Rosetta Stone era

In c.1000 to 500BC, it was known that Jewish priests were of Egyptian origin; for example:

> "The 'Choens' [Cohens] (O) are most senior Egyptian priest-teachers."
>
> — Herodotus (c.450BC) [15]

Hence, it would have been known that the fictional prophet "Abraham" would be of Egyptian origin, in derivation. In the years to follow, however, with the decline of the Egyptian Empire (see: histomap), the Egyptian language and religion became less well known; accordingly scholars began to attribute Abraham to an Indian origin; for example:

> " 'This man', answered Aristotle, 'was by birth a Jew, and came from Celesyria; these Jews are descended from the Indian philosophers; they are named by the Indians Calani'."
>
> — Josephus (c.90AD), *Selected Works* (pg. 65) (O)

Accordingly, in the years c.500BC to 1820s, prior to the making (189BC), later discovery (1799), and translation (1820) of the famed tri-lingual Rosetta stone, the key to understanding Egyptian hieroglyphics, and theological system, of the Egyptians, this language conveys, decoded in preliminary form dissection (1840s-1870s), then later in more refined form (1910s-1920s), there was no way for an intelligent person, e.g. Voltaire or Kant, to be able to discern that Hinduism (900BC) and Judaism (500BC) are both derived from ancient Egyptian religio-mythology (3100BC), itself based an ancient astro-theology. Accordingly, thinkers in this general era, if they noticed Abraham = Brahma connection, generally had no choice, per reason of lack of better data, but to conclude that Abraham derived from the Brahma model of the Hindus. This is what we call the "pre-Rosetta Stone era". In the "post-Rosetta Stone era", in the late 19th century (c.1870s-present), it became clear that both Abraham and Brahma were *independently* copied from the older Sun-Sirius + Nile River flood theological cyclical model, which turned Ra-Isis + Nun god model, which morphed into the reincarnation-based Hindu version and the resurrection based Jewish-Christian-Islam version, respectively.

In c.1552, French linguist, astronomer, and cabalist Guillaume Postel (1510-1581) (O) made a connection between Abraham and the Brahmans, which he drew directly from his studies of Zohar. [10]

In 1760, Voltaire, with the appearance of *Ezourvedam*, argued that India was he cradle of civilization, he questions the historical and theological priority of biblical chronology, and claimed that Abraham and Brahma were identical. Alternatively, Tomas Doreste (1998), stated that Voltaire believed that Abraham, was a real person, who descended from some of the numerous Brahman priests who left India to spread their teachings throughout the world; and in support of his thesis he presented the following elements: the similarity of names and the fact that the city of Ur, land of the patriarchs, was near the border of Persia, the road to India, where that Brahman had been born. [8]

In c.1769, Immanuel Kant, similar to what Voltaire had done before him, compared Adam and Abraham with Adimo and Brahma, and argued that Joseph was equivalent to Ganesha. [12]

In 1799, Joseph Priestley, in his *A Comparison of the Institutions of Moses with those of the Hindoos and other Ancient Nations*, attempted to counter Voltaire, using some type of comparative approach to assert or raise Christianity above all others. [11]

The following are *pre*-Rosetta Stone era, i.e. before 1870s, related Abraham and Brahma connecting quotes, made in the period when Egyptian hieroglyphics were either not yet understood (pre 1820s), or there meaning was just beginning to be disseminated (1840s-1870s):

> "'**Abraham**' and his wife 'Sarah' are derived from **'Brahma'** and his wife 'Saraswati'."
>
> — Constantin Volney (1791), *The Ruins* (pg. #); Nigel Leask (2004) truncated (pg. 105) version

"In regard to Brama [Brahma], I shall only observe, that according to the researches of the learned Thomas Hyde [1700], the Persians, those neighbors of the Indians, called their most ancient religion the religion of Abraham, and that Zoroaster [c.1000-600BC] (Q), their legislator, himself is never called otherwise but Ib**ra**him, or Abraham Zerdusht. The same may be said of the A**ra**bians, the neighbors of the more southern India, amongst whom Abraham was believed to have founded the famous temple of Mecca, to say nothing of the Egyptians, whom he instructed, as Josephus (37-100) (Q) attests, in the Chaldaic astronomy. Whilst we find then such a number of Persian words in the ancient language of India, which prove the great communication which must have existed between both countries, there is no wonder if the name of Abraham, the prophet of Persia, had been likewise adopted in India, and the testimony of those authors confirmed who pretend the Bramins to have been disciples of the Persians; and the Chaldaic name of the sacred fire, the worship of which is one of the principal points of the religion of Zoroaster, shows the primeval origin of the ancient religion of Persia. As the Indian alphabets are all syllabic, and every consonant without a vowel annexed, is understood to have an a joined to it, there is no wonder if from ***Abraham*** was made ***Brahma***; and thus we see other Persian words in the Sanskrit having an *a* annexed as *deva* from *div*, *appa* from *ab*, *deuda* from *deud*, etc. (See: Father Paolino's *Amarasinha* [1798] (pgs. 12) (Q); Michael Symes' *Embassy to Ava* [1795] (§14) (arc))."

— Joseph Hager (1801), *Dissertation on the Newly Discovered Babylonian Inscriptions*

"Let me not be called a wicked atheist for seeing the likeness between **Brahma and Abraham**; for what says the learned Joseph Hager [1801]: 'As the Indian alphabets are all syllabic, and every consonant without a vowel annexed is understood to have an A joined to it, there is no wonder if from *Abraham* was made Brahma; and thus we see other Persian words in the Sanskrit having an *a* annexed as *deva* from *div*, *appa* from *ab*, *deuda* from *deud*, etc.'"

— Godfrey Higgins (1833), *Anacalypsis, Volume One*

"The names **Abram** and **Brahma** are equivalent in numerical value."

— Charles King (1864), *The Gnostics and Their Remains, Ancient and Mediaeval* (pg. 13)

People from this camp, in short, will tend to argue that Judaism was copied from Hinduism and the Jewish priests originally Indian priests, which is an incorrect view.

Abraham, Brahma & Ra | *post*-Rosetta Stone era

The following are *post*-Rosetta Stone era, i.e. after 1870s, related Abraham and Brahma connecting quotes, during which time it began to become apparent that Ra (sun) and Isis (Sirius), sun-star based Egyptian mythology (3100BC), rooted ancient astro-theology (3500BC), predates both Babylonian mythology (2300BC), Persian mythology (1100BC), Hindu mythology (c.900BC), and Hebrew mythology, therein being

Here Adam and Eve (Earth and Sky, Sibu and Nuit) mourned their first born Abel (summer), who had been killed by his brother Cain (lance), with the lance-like frosts of winter. Here Abraham (Ab-RA-Ham, father Ra at his Fire-City) mourned his father Terah (Earth). Here is where the God Saturnus mourned his mother Terra (Earth). Here is the dark abyss of Tartarus where Cronus receives his scythe. Here is the Ur of Chaldees, where Old Father Time cuts off the year with his sickle.

A 1912 etymology of **Abraham**, as "father Ra, born of earth, at is fire city", by American comparative mythologist Wakeman Ryno, who is explicitly defined as a solar-astrological based fictional character. [2]

the determinate original source of the Brahma/Saraswati, Abraham/Sarah commonalities:

> "The fire-god of Ur was Ab-Ram. The Hebrew world 'Ab' means 'father', and Ram (head sign of the Zodiac) means 'most high'. Ab-Ram and Is-Ra-El were names of Saturn."
>
> — Samuel Dunlap (1858), *Vestiges of the Spirit History of Man*; cited by Hilton Hotema (1956) [6]

> "So Ab, the original, Ram, or due east point, the orient, or origin of all light, or **Braam** of Sanscrit, by disguising its true meaning and mystifying the multitude by inserting at the proper place this H converted Abraam into **Ab-ra-ham**, or Ab, the first, original, **Ra, the father or sun god**, and Ham the Egyptian founder; or *God the father of Ham*."
>
> — Karl Anderson (1892), *The Astrology of the Old Testament* [1]

> "Here Adam and Eve (Earth and Sky, Sibu and Nuit) mourned their first born Abel (summer), who had been killed by his brother Cain (lance). with the lance-like frosts of win-ter. Here **Abraham** (Ab-RA-Ham, **father Ra** at his Fire-City) mourned his father Terah (Earth). Here is where the God Saturnus mourned his mother Terra (Earth). Here is the dark abyss of Tartarus where Cronus receives his scythe. Here is the Ur of Chaldees, where Old Father Time cuts off the year with his sickle."
>
> — Wakeman Ryno (1912), "Comparative Mythology" [2]

In 1956, Hilton Hotema, in his *Ancient Sun God*, building on Samuel Dunlap (1858), devoted an entire chapter to "Ab-Ram the Sun-God"; a synopsis his views from one of his later books is as follows:

> "The story of **Abraham** is a myth. Abraham himself is a myth. It was usual with the Old Arabians to regard Satum and Abram as their progenitor, and while looking upon Saturn as their father **...** He was a child named Ab-ram, and this name is later changed to Ab-ra-ham. Charles King in his work, *The Gnostics*, states that the words "brahma" and "abrahrn" have the same numerical value. When we run this 'allegory' down, we discover that Abram (Abraham) is just another myth of the sun."
>
> — Hilton Hotema (1963), *The Secret of Regeneration* [3]

(add discussion)

Other

The following are *post*-Rosetta Stone era etymologies, making the Brahma = Abraham connection, but remaining ignorant as to the older "father Ra born of Keme" following the annual 150-day Nile River flood marked by the helical rising of Sirius (Sarah/Saraswati) etymology:

> "**Abram** is but the Hindu Brama, with *a* as prefix instead of suffix; and Brama was the original name of the Hindu creator. Later the letter *h* was added, thus making it Brahma. The letter *h* signifies life, and thus did Brama, Abram, and Sarai in due time receive life, or being, which implies that in the beginning they did not have it."
>
> — Lloyd Graham (1975), *Deceptions and Myths of the Bible* [4]

“There are certain striking similarities between the Hindu god **Brahma** and his consort Saraisvati, and the Jewish **Abraham** and Sarai, that are more than mere coincidences.”

— Gene Matlock (c.2002), “Who Was Abraham?” [9]

“The similarities between Abraham and Brahma have not gone unnoticed. Abraham is said to be the father of the Jews, and Brahma, as the first created being, is often seen as the father of mankind. Abraham’s name is derived from the two Semitic words *ab* meaning ‘father’ and *raam/raham* meaning ‘of the exalted….’ We might also note that the name of Brahma’s consort Sarasvati seems to resonate with that of Abraham’s wife, Sarah [… each one’s identity as a wife and/or sister]. Also, in India, the Sarasvati River includes a tributary known as the Ghaggar…. According to Jewish tradition, Hagar was Sarah’s maidservant…. Both Brahmins … and Jews see themselves as the ‘chosen people of God.’ The Hebrews began their sojourn through history as a ‘kingdom of priests’ (Exodus 19:6). Likewise, Brahmins are also a community of priests. ”

— Steven Rosen (2006), *Essential Hinduism* [5]

“**Brahma**, the Hindu God of Creation, is **Abraham**. Sarasvati, the Hindu Goddess of knowledge and wisdom and consort to Brahma, is Sarah, Abraham's wife. I first came across the idea that Abraham and Brahma might be connected around 1999 but can't remember exactly where I saw it other than remembering doing an internet search on something and coming up with a site with this information. The site I think also connected Hammarabi to Abraham to Brahma as all variants of the same person. In Hebrew, the names for Brahma and Abraham would be written the same way: BRHM, with the vowels excluded. But Krishna sounds and looks like Christ, so what of the similarity? And I put this information on my mental back burner until debating with Muslims on internet talkboards several years later and again ran across another Abraham-Brahma connection checking out some Hindu Vedic sites countering Islamic doctrines. Abraham is the Brahma of the South. The Brahma of Egypt, the Black Brahma. The Saturn Brahma. Osiris is the Sun Brahma. Hindu Vedic merchants were trading spices heavily with Egypt and Canaan through the Yemen-Sabeans who are linguistically and culturally connected to Canaanite Hebrews. At some point ancient Hebrews picked up both Egyptian royalty racism and Vedic Brahmin ideas such as the whole "Priests of God" racial prejudice against Gentiles seen as inferior human beings just as Brahmins considered other castes less than themselves. The End of Abraham chapter tells more about how Jewish authors plagiarized Hindu Vedic religious personages, Brahma and Sarasvati, to create Abraham and Sarah.”

— Stephen Lewis (2007), *Biomystical Christianity* [7]

Discussion

The Jewish-Christian-Islam patriarch Abraham and the Hindu creator god Brahma overlap in many ways; the following are the top six ways:

(a) Both Abraham and Brahma are the said-to-be creators all humans (Ra is the main creator god of the Egyptian pantheon).
(b) Both Abraham and Brahma have the same etymology: “Father Ra son of Nun” (water-fire-earth theory).
(c) Both Abraham and Brahma derived from the Nun (Noah and Ma-Nu, respectively).
(d) Both Abraham and Brahma have the same sister-wife, in namesake, Sarai and Saraswati, respectively.
(e) Both Abraham and Brahma have the same thrice sister-wife parable (creation by incest rewrite).

(f) The slaying of son reoccurs in both cases (release of the soul rewrite / Osiris-Horus splitting rewrite).

(add)

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Further reading

● Rainbow Warrior. (2014). "Brahma and Abraham: Divine Covenants of a Common Origin" (Q), Academia.edu.

External links

● Is there a relationship between Brahma in Hinduism and Abraham in the Abrahamic religion? (Q) (2012) – Quora.com.

θΔics

In religio-mythology, **Abraham and Isaac** refers to the paradoxical Biblical story, as told in Genesis 22, wherein god asks Abraham to sacrifice his only son Isaac, after which he proceeds to do so, by slitting his throat and roasting him on a pile of wood, until being interrupted by an angel from god who tells him to stop, after which a "ram" appears, caught by his horns in the thicket, which Abraham then uses instead of his son for the sacrifice.

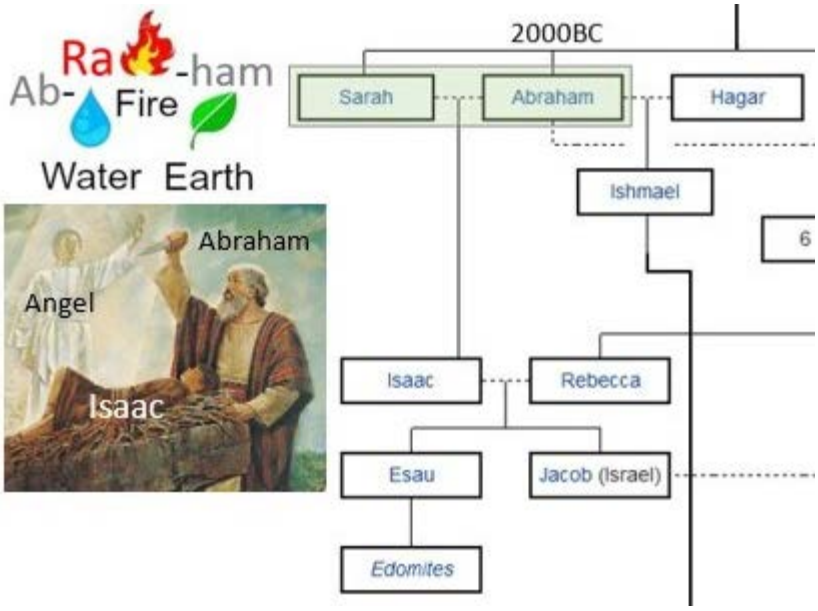

A segment, from the religio-mythology genealogy page, showing Abraham about to **slay his son Isaac** on a pile of wood, right when an angel of god appears to him, and tells him to stop.

Overview

The character Abraham, in god character rescripts, originally was the sun god Ra; the original Egyptian equivalent of Isaac, however, is wanting.

In 1996, Gary Greenberg, in his *The Bible Myth: the African Origins of the Jewish People*, conjectured that the sacrifice of Isaac by Abraham is a rescript of the sacrifice Osiris by Set or something to this affect; a rewrite of the ritualistic act of the release of the ba (soul) of Osiris. [2] This argument, however, is lacking in logic.

In 2005, Robert Clark, in his *An Order Outside Time: a Jungian View of the Higher Self from Egypt to Christ* (Ñº), attempted to connect Isaac to either Horus or Shu, loosely, but the argument is lacking.

Empedocles

In c.455BC, Empedocles, in his Fragment 137, describes a strange father slaughtering a son, who has "changed his form", motif as follows: [1]

> "A father lifts up his dear son, who has changed his form, and prays and slaughters him, in great folly, and they are at a loss as they sacrifice the suppliant. But he, on the other hand, deaf to the rebukes, sacrificed him in his halls, and prepared himself an evil meal. In the same way, a son seized his father and the children their mother, and tearing out their life-breath devour their own dear flesh."

Connected commentary on this is as follows:

> "In reference to Fragment 137, in historical times, such sacrifices were no longer practiced; the passage probably reflects ancient customs as does the biblical story of **Abraham and Isaac**."
>
> — Plinio Prioreschi (1996), *A History of Medicine: Greek Medicine* (pg. 86)

These two independent rescripts, i.e. Empedocles and Genesis, of the same motif, shows that there must be one original astro-theological model that both are based on; the specifics of this, however, are wanting.

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Mystery) (section: "The Osirian Iconography in Isaac's Sacrifice", pgs. 245-46). Citadel Press.

External links

â— Binding of Isaac – Wikipedia.

θΔics

In existographies, **Abraham Lincoln** (1809-1865) (IQ:175|#205) (CR:25) was an American president, voted the second smartest president, behind Thomas Jefferson, by colloquial vote (2013), noted for using Euclidean logic based reasoning and arguments in his legal cases, when a lawyer, and as president, supposedly, in pushing and arguing for the passing of the 13th amendment, i.e. the legal end of slavery (see also: energy slave) in America. [1]

Religion

Lincoln, as a child, who grew up in the home of devout Separate Baptist parents, but never embraced his father's religion. In 1831 to 1837, Lincoln, aged 22 to 28, on his own in New Salem (Ñº), became a voracious reader, and was imbibed deeply of the anti-Christian writings of Thomas Paine and Constantin Volney. He became a full-blown skeptic and even wrote a treatise denying essential Christian tenets like the inspiration of Scripture and the divinity of Christ. [7]

> "The Bible is not my book nor Christianity my profession. I could never give assent to the long, complicated statements of Christian dogma."
>
> — Abraham Lincoln (c.1865), in FSM app

> "My earlier views of the unsoundness of the Christian scheme of salvation and the human origin of the scriptures have become clearer and stronger with advancing years, and I see no reason for thinking I shall ever change them."
>
> — Abraham Lincoln (c.1865), in FSM app

(add)

Euclid

In 1850 to 1859, Lincoln, while working as a travelling lawyer, of the Illinois 8th Judicial Circuit (Ñº), was said to have spent most of his spare time reading to remedy his "want of education" that he regretted, supposedly, all his days:

> "Lincoln read hard works—was philosophical—logical—mathematical—never read generally."
>
> — John Stuart (c.1870), "Comment on Lincoln" by his first law partner

During his nights and weekends on the circuit, according to existographer Doris Goodwin (2005), Lincoln taught himself geomemtry, carefully working out propositions and theorems until he could proudly claim: "I nearly mastered the six-books of Euclid." The following are other noted Lincoln-Euclid quotes:

> "If A can prove, however conclusively, that he may, of right, enslave B — why may not B snatch the same argument, and prove equally, that he may enslave A?– You say A is white, and B is black. It is color, then; the lighter, having the right to enslave the darker? Take care. By this rule, you are to be slave to the first man you meet, with a fairer skin than your own. You do not mean color exactly?–You mean the whites are intellectually the superiors of the blacks, and, therefore have the right to enslave them? Take care again. By this rule, you are to be slave to the first man you meet, with an intellect superior to your own. But, say you, it is a question of interest; and, if you can make it your interest, you have the right to enslave another. Very well. And if he can make it his interest, he has the right to enslave you."

— Abraham Lincoln (1854), “Personal Notes”, Unpublished [4]

“If you have ever studied geometry, you remember that by a course of reasoning, Euclid proves that all the angles in a triangle are equal to two right angles. Euclid has shown you how to work it out. Now, if you undertake to disprove that proposition, and to show that it is erroneous, would you prove it to be false by calling Euclid a liar?”

— Abraham Lincoln (1858), “Fourth Lincoln-Douglas Debate”, Sep 18 [5]

“There are two ways of establishing a proposition. One is by trying to demonstrate it upon reason, and the other is, to show that great men in former times have thought so and so, and thus to pass it by the weight of pure authority. Now, if Judge Douglas will demonstrate somehow that this is popular sovereignty,—the right of one man to make a slave of another, without any right in that other, or anyone else to object,—demonstrate it as Euclid demonstrated propositions,—there is no objection. But when he comes forward, seeking to carry a principle by bringing it to the authority of men who themselves utterly repudiate that principle, I ask that he shall not be permitted to do it.”

— Abraham Lincoln (1860), “Speech”, Columbus, Ohio [4]

“In the course of my law reading I constantly came upon the word “demonstrate”. I thought at first that I understood its meaning, but soon became satisfied that I did not. I said to myself, What do I do when I demonstrate more than when I reason or prove? How does demonstration differ from any other proof? I consulted *Webster’s Dictionary*. They told of ‘certain proof,’ ‘proof beyond the possibility of doubt’; but I could form no idea of what sort of proof that was. I thought a great many things were proved beyond the possibility of doubt, without recourse to any such extraordinary process of reasoning as I understood demonstration to be. I consulted all the dictionaries and books of reference I could find, but with no better results. You might as well have defined blue to a blind man. At last I said,- Lincoln, you never can make a lawyer if you do not understand what demonstrate means; and I left my situation in Springfield, went home to my father’s house, and stayed there till I could give any proposition in the six books of Euclid at sight. I then found out what demonstrate means, and went back to my law studies.”

— Abraham Lincoln (c.1863) [4]

“Lincoln studied and nearly mastered the six-books of Euclid (geometry) since he was a member of Congress. He began a course of rigid mental discipline with the intent to improve his faculties, especially his powers of logic and language. Hence his fondness for Euclid, which he carried with him on the circuit till he could demonstrate with ease all the propositions in the six books; often studying far into the night, with a candle near his pillow, while his fellow-lawyers, half a dozen in a room, filled the air with interminable snoring.”

— William Herndon (c.1870) [4]

(add)

Euclid | Slavery

In Jan 1865, as portrayed in the 2012 film *Lincoln*, a famous "Euclid scene" occurs, shown adjacent, a

reenactment of the decisive peace negotiators (Ñº) response telegraphy, Lincoln enters into a discussion with a telegraph operator (right) and an engineer, during which he digresses on his reading of Euclid, specifically common notion (axiom) #1 of book 1 of *Elements*: (Ñº)

The "Euclid scene" from the 2012 film *Lincoln*, wherein Lincoln ruminates on Eulid's first common axiom: "things which are equal to the same thing are equal to each other" as the basis of his "decision" that he is going all for none in respect to passing a law (Amendment #13) that ends slavery, once and for all, whatever the cost.

1. Things which equal the same thing also equal one another.
2. If equals are added to equals, then the wholes are equal.
3. If equals are subtracted from equals, then the remainders are equal.
4. Things which coincide with one another equal one another.
5. The whole is greater than the part.

which, supposedly, as the scene depicts, Lincoln employed, in the turnings of his mind, in the decisive moment of deciding on whether or not to allow the confederate peace negotiators into the capital of Washington (to negotiate for a peace settlement), the result of which, based supposedly on Euclid's first axiom, he "chooses" to alter the telegraph message, so to keep the peace negotiators at bay, thereby prolonging the war, until he can get the thirteenth amendment passed. In his mind, as the film portrays, Lincoln uses Euclid as a logic proof that slavery is wrong; the film dialogue of which is as follows: [3]

> Lincoln: Euclid's first common notion is this: "Things which are equal to the same thing are equal to each other."
>
> Scene: Homer doesn't get it; neither does Sam.
>
> Lincoln: That's a rule of mathematical reasoning. It's true because it works; has done and always will do. In his book, Euclid says this is "self-evident."
>
> Lincoln: D'you see? There it is, even in that two-thousand year old book of mechanical law: it is a self-evident truth that things which are equal to the same thing are equal to each other. We begin with equality. That's the origin, isn't it? That balance, that's fairness, that's justice.

On this film depicted logic, Lincoln finagled the passage of the 13th amendment, to the US Constitution, which reads as follows:

> **Section 1.** Neither slavery nor involuntary servitude, except as a punishment for crime whereof the party shall have been duly convicted, shall exist within the United States, or any place subject to their jurisdiction. **Section 2.** Congress shall have power to enforce this article by appropriate legislation.

(add discussion

Anecdote | Squaring the circle

In one incident, as reported by William Herndon (Ñº), one of Lincoln's law partners and later existographer, Herndon walked in on Lincoln at the tail end of a two-day attempt to square the circle:

> Herndon (reflection): "I say Lincoln so deeply absorbed in study he scarcely looked up when I entered. He was surrounded by a quantity of blank paper, large heavy sheets, a compass, a ruler, numerous pencils, several bottles of ink of various colors, and a profusion of stationery. He was apparently struggling with a calculation of some magnitude, for scattered about were sheet after sheet of paper covered with an unusual array of figures."
>
> Herndon: (speaking): "What are you doing?"
>
> Lincoln: "I am trying to solve the difficult problem of squaring the circle. I have devoted the better part of two days, almost to the point of exhaustion."

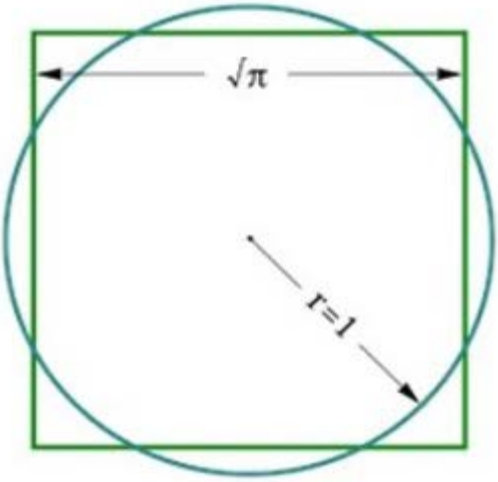

A depiction of "sparing the circle", a problem proposed by ancient geometers, the goal of which is to constructing a square with the same area as a given circle by using only a finite number of steps with compass and straightedge. It was proven impossible to do, in a finite number of steps, in 1882.

(add discussion)

Education

Lincoln, as a young man, read Thomas Paine's *The Age of Reason* and Constantin Volney's *The Ruins*, supposedly the American edition, the first 25 chapters of which translated by Thomas Jefferson. [8]

Lincoln, while on the travelling circuit, studied geometry, astronomy, political economy, and philosophy. [2]

Quotes | On

The following are quotes on Lincoln:

> "Much of **Lincoln**'s unhappiness, the melancholy that 'dripped from him as he walked', was due to his want of religious faith. When the black fit was on him, he suffered as much mental misery as Bunyan or Cowper in the deepest anguish of their conflicts with the evil one."
>
> — Ward Lamon (1872), *Life of Lincoln* [9]

Quotes | By

The following are noted quotes:

> "Towering **genius** disdains a beaten path. It seeks regions hitherto unexplored."
>
> — Abraham Lincoln (1838), "Lyceum Address", Jan 27 (Ñº)

> "Stand with anybody that stands RIGHT. Stand with him while he is right and PART with him when he

goes wrong."

— Abraham Lincoln (1854), "Speech at Peoria, Illinois", in reply to Senator Douglass, Oct 6 (Ñº)

"I walk slowly, but never walk backwards."

— Abraham Lincoln (c.1860) (Ñº)

"Nearly all men can stand adversity, but if you want to test a man's character, give him power."

— Abraham Lincoln (c.1860) (Ñº)

"In great contests each party claims to act in accordance with the will of god. Both may be, and one must be, wrong. God cannot be for and against the same thing at the same time."

— Abraham Lincoln (1862), "Mediation on the Will of God", Sep (Ñº)

"It is best not to swap horses while crossing the river."

— Abraham Lincoln (1864), "Reply to Nation Union League", Jun 9 (Ñº)

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(c) Thirteenth Amendment to the United States Constitution – Wikipedia.
(d) Thims, Libb. (2013). "Poll: 3 Smartest American Presidents?" (Ñº) (N=25-35/18), Nov 11.
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3. (a) Emerson, Jim. (2012). "Lincoln: It's True Because it Works" (Ñº), Scanners, Dec 17.
(b) Anon. (2012) "Lincoln on Euclid" (Ñº), LincolnMovieUK, Nov 19.
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9. (a) Lamon, Ward. (1872). *Life of Lincoln* (pg. 486). Publisher.
(b) Jacoby, Susan. (2004). *Freethinkers: a History of American Secularism* (pg. 115). Henry Holt and Co.

Further reading

â— Goodwin, Doris. (2009). *Team of Rivals: the Political Genius of Abraham Lincoln*. Publisher.

External links

â— Abraham Lincoln – Wikipedia.

θΔics

In non-existents, **Abraham never existed** refers to the deduced conclusion that the religious character Abraham, the presumed patriarch of Judaism, Christianity, and Islam, never existed as a real person, but rather was god-to-prophet invention, specifically "sun god" Ra to "man" Abraham rescript (see: recension theory), effected to realized a new monotheism out of decaying extant polytheism (or henotheism).

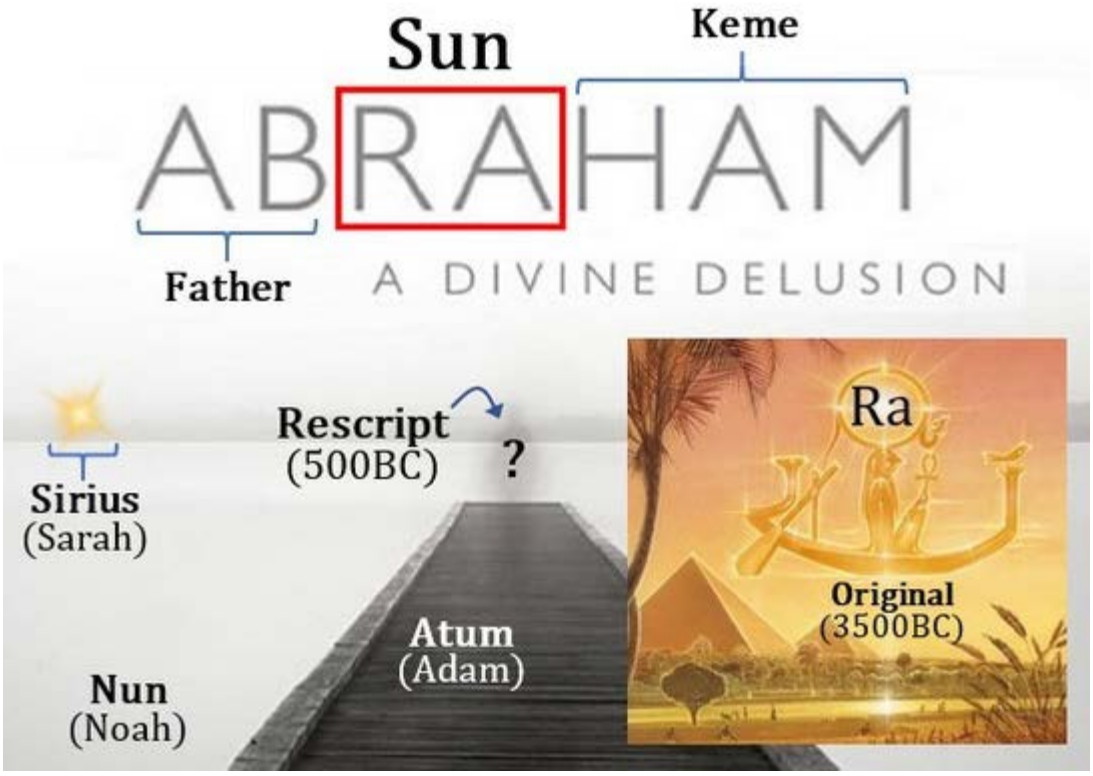

A re-annotated version of George Graham's 2015 *The Abraham Dilemma: a Divine Delusion*, showning the gist reason why **Abraham never existed**, namely that the early Is-Ra-El-ites (Jews), in aims to effect a god reduction, so to make a successful monotheism out of an extant polytheism (or henotheism), employed the "god into prophet" method, and turned the sun god "**Ra**" into the invented patriarch "**Abraham**", whose name means "father Ra of keme" or "Ra born out of Atum", rescripted to the punchline that Adam (Atum) was said to the first man (see: religio-mythology genealogy), whose descendent is Noah (Nun), whose descendent is Abraham (Ra), who had the wife Sarah (Sirius), with whom he procreated: Isaac (father of Jacob), who also, in later invented history (c.600AD), had the wife Hagar, with whom he procreated Ismael (patriarch to Muhammad). [3]

Overview

The following natural phenomena, in Ancient Egypt, prior to the damning of the Nile river, was a annual observation that was real:

> "Who is there that does not know **that the vapor of the sun is kindled by the** [Jun 25] **rising** of the **dog-star** [Sirius]? The most powerful effects are felt on the earth from this star. When it rises, the seas are troubled, the wines in our cellars ferment, and **stagnant waters** [Nile River] **are set in motion** [150-day flood]."
>
> — Pliny the elder (77AD), "On the Rising of the Dog Star" [9]

The Egyptians made the sun a god called Ra, the star Sirius a goddess, Isis predominately, and the Nile River the god Nun. These gods and goddess, over time, and cross-culturally, were rescripted (see: god character rescripts).

In c.1550 to 1830, prior to the translation of the Rosetta Stone, which released the key to the ancient Egyptian language and religion, scholars made numerous connections between Brahma and Abraham (see: Abraham and Brahma), and their respective wives, Saraswati and Sarah; for example:

> "'**Abraham**' and his wife 'Sarah' are derived from **'Brahma'** and his wife 'Saraswati'."
>
> — Constantin Volney (1791), *The Ruins* (pg. #); Nigel Leask (2004) truncated (pg. 105) version

In c.1850, scholars, now with knowledge of all three religions: Egyptian religion (previously missing), Hinduism, and Judaism, began to "see", via overlapping similarities, that both Abraham and Sarah motif, along with the Brahma and Saraswati motif, were both rescripts of the Ra and Sirius, star rising, sun rebirth, annual Nile River flood periodicity (see: Ra, Brahma, and Abraham): the following is one example:

> "So Ab, the original, Ram, or due east point, the orient, or origin of all light, or **Braam** of Sanscrit, by disguising its true meaning and mystifying the multitude by inserting at the proper place this H converted Abraam into **Ab-ra-ham**, or Ab, the first, original, **Ra, the father or sun god**, and Ham the Egyptian founder; or *God the father of Ham*."
>
> — Karl Anderson (1892), *The Astrology of the Old Testament*

In 1849, Henry Ouvry (1813-1899), an English military officer, age 36, in a letter to his brother, stated the following:

> "What language do you suppose that Abraham spoke? [see: Frederick II] I have been learning Hebrew and Arabic and I say he did not speak Hebrew, for when he lived there was no Hebrew to speak; and, again, what language was spoken before the flood?"
>
> — Henry Ouvry (1849), "Letter to Brother", Jul 14 [4]

In 1892, Ouvry, aged 79, in his *Cavalry Experiences and Leaves from My Journal*, added the following footnote correction to this paragraph:

> "It is now forty years since I wrote the **above absurdity**. I was then unacquainted with German Biblical criticism: I now know that such a person as **Abraham never existed**, and that there was never any general Deluge, and that, the whole so-called Mosaic account is a mere legend, and has no claim to be considered historical."
>
> — Henry Ouvry (1892), *Cavalry Experiences and Leaves from My Journal* [4]

Ouvry, in short, stated in effect that it took him some 40-years, following study in German Biblical criticism, although he does not specify which German (Ñº) he learned this from, to unlearn the ingrained-form-childhood belief that Abraham was a real person.

In 1974, Thomas Thompson (1939-) (Ñº), in his *The Historicity of the Patriarchal Narratives: The Quest for the Historical Abraham*, used archeological data and biblical criticism to argue that the biblical characters: Abraham, Isaac, and Jacob are not historical, that there presumed existences have NOT been "substantiated by the archaeological and historical research", contrary to the then-prevalent view; the following is an oft-cited quote:

> "Not only has archaeology not proven a single event of the patriarchal traditions to be historical, it has not shown any of the traditions to be likely."
>
> — Thomas Thompson (1974), *The Historicity of the Patriarchal Narratives* (pg. 328)

In 1995, Ibn Warraq, in his *Why I Am Not a Muslim*, citing Thompson (1974), stated the following:

> "The Torah was not written by, nor "given" to, Moses, and there is no good reason to believe any of the exploits of Abraham and others to be true. Certainly no historian would dream of going to the Muslim sources for the historical verification of any biblical material; the Muslim accounts of Abraham, Moses, and others are, as we saw earlier, taken from rabbinical Jewish scriptures or are nothing more than legends (the building of the Kaaba, etc.) invented several thousand years after the events they purport to describe.

Historians have gone even farther. There seems to be a distinct possibility that **Abraham never existed**: 'The J tradition about the wandering of Abraham is largely unhistorical in character. By means of the theological leitmotif of the wandering obedient servant of Yahweh, it gives a structure to the many independent stories at J's disposal. It is an editorial device used to unite the many disparate Abraham and Lot traditions' (Thompson, 1974). Thompson goes on to say (p. 328): 'Not only has "archaeology" not proven a single event of the patriarchal traditions to be historical, it has not shown any of the traditions to be likely. On the basis of what we know of Palestinian history of the second millennium BC, and of what we understand about the formation of the literary traditions of Genesis, it must be concluded that any such historicity as is commonly spoken of in both scholarly and popular works about the patriarchs of Genesis is hardly possible and totally improbable. The quest for the historical Abraham is a basically fruitless occupation both for the historian and the student of the Bible."

In 2001, Libb Thims, while drafting the "Thermodynamics of Religion" chapter, to his *Human Thermodynamics* manuscripts, began to research the various religions of the world, then being under the impression that Abraham, the patriarch of Judaism, Christianity, and Islam, so he was told, was a real person, and therein began to do historical research into Abraham, along the way amassing some 170+ books in religio-mythology, astro-theology, and comparative religion and mythology (see: Thims religio-mythology book collection); it would not be until 2003 to 2004 period, particularly after reading Gary Greenberg's *101 Myths of the Bible* (2000), that he began to discern that Abraham was fictional, and based on the motif of helical rising of Sirius (Sarah) coupled, i.e. married, so to say, to the re-birth of the sun (Ra or Abraham), following the annual 150-day Nile River (Noah) flood phenomena.

In 2016, Thims, in his drafting *Smart Atheism: For Kids*, digressed into the astro-theological origins of Abraham stories; some content of which was summarized, in reduced form, in his drafting *Human Chemical Thermodynamics* (2019). [8]

Quotes

The following are related quotes:

"Whether Abraham is a myth or a real personage [see: Abraham never existed] can probably never be known. Without Abraham, no Jews, no Jesus, no Christianity, and no salvation for the world. But some have asserted that Brahma and Abraham are alike corruptions [see: Abraham and Brahma] of Abba Rama, or Abrama, and that Sarah is identical with Saravasti, thus showing a Hindoo origin for the man and woman standing at the head of all the Jews. If Abraham is a myth—and the chances that he is are at least equal to the belief that there was such a man—then the story about Isaac, Jacob, his twelve sons, Moses, Aaron, Joshua, Samson, Job, Samuel, Saul, David, Solomon, etc., is also mythical."

— DeRobigne Bennett (1881), *The Gods and Religions of Ancient and Modern Times* (pg. 481)

"The story of Abraham is a myth. Abraham himself is a myth. It was usual with the Old Arabians to regard Saturn and Abram as their progenitor, and while looking upon Saturn as their father ... He was a child named Ab-ram, and this name is later changed to Ab-ra-ham. Charles King in his work, The Gnostics, states that the words "brahma" and "abrahrn" have the same numerical value. When we run this 'allegory' down, we discover that Abram (Abraham) is just another myth of the sun."

— Hilton Hotema (1963), The Secret of Regeneration (pgs. 136-37)

"**Abraham**, Jacob, Moses, King David, and King Solomon in all his splendor, **never existed**, a 15-year study of archaeological evidence, by Thomas Thompson, has concluded."

— David Keys (1993), "Leading Archaeologist Says Old Testament Stories are Fiction" [1]

"**Abraham**, the Jewish patriarch, **probably never existed**. Nor did Moses. The entire Exodus story as recounted in the Bible probably never occurred. The same is true of the tumbling of the walls of Jericho. And David, far from being the fearless king who built Jerusalem into a mighty capital, was more likely a provincial leader whose reputation was later magnified to provide a rallying point for a fledgling nation. Such startling propositions — the product of findings by archaeologists digging in Israel and its environs over the last 25 years — have gained wide acceptance among non-Orthodox rabbis. But there has been no attempt to disseminate these ideas or to discuss them with the laity."

— Michael Massing (2002), "New Torah for the Modern Minds" [7]

"If Jesus, and Muhammad, and **Abraham**, and Moses, had never been born, which in any case **I tend to doubt**, or if all the stories told about them were untruth, as was suddenly found, and everyone had to admit it, some people, I know, would go into a panic, [thinking]: 'now what will we do, we have no morals suddenly?' What could be more nonsensical than that?"

— Christopher Hitchens (c.2009), Video debate (2:34-)

"Some scholars say **Abraham never existed**. Others say he really wasn't willing to sacrifice Isaac. Others say that Abraham's willingness to follow a commandment to kill his son in its historical and cultural context was not immoral. Still others claim that he expected Isaac not to perish but to be resurrected."

— George Graham (2015), *The Abraham Dilemma: a Divine Delusion* [3]

"For historians, historical 'truth' is based on: 1) an accurate chronology (Herodotus' principle) anchored on absolute dates and 2) reliable documents (Thucydides' principle) coming from critical editions. Depending on the method chosen, the result will be different: according to archaeology, **Abraham never existed** because there is no definite archaeological evidence, but according to chronology, Abraham existed."

— Gerard Gertoux (2017), *Sarah Wife of Abraham: Fairy Tale or Real History?* [2]

See also

â— Jesus never existed
â— Muhammad never existed
â— Moses never existed
â— Soul does not exist
â— Spirit does not exist
â— God does not exist
â— Afterlife does not exist
â— Life does not exist

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θΔics

In existographies, **Abraham P. Sperling** (1912-c.2000) was an American mathematician and psychologist generally noted as an early commentator of the IQ of William Sidis.

Overview

In the 1940s, Sperling was the director of New York city's Aptitude Testing Institute.

Quotes | By

The following are quotes by Sperling:

> "I have tested more than five thousand people. Of all the mentally superior individuals that I have seen, nobody begins to approach the intellect and perspicacity of William Sidis. According to my computations, he easily had an IQ between 250 and 300."
>
> — Abraham Sperling (c.1941) [1]

> "Sidis easily had an IQ between 250 and 300. I have never heard of the existence of anybody with such an I.Q. I would honestly say that he was the most prodigious intellect of our entire generation."
>
> — Abraham Sperling (c.1941) (Ñº)

> "Young Sidis was truly an intellectual phenomenon. His childhood achievements ranked with those of John Mill, Thomas Macaulay, and Johann Goethe. By the time William Sidis was two he could read English and, at four he was typing original work in French. At the age of five he had devised a formula whereby he could name the day of the week for any given historical date. At eight he projected a new logarithms table based on the number twelve. He entered Harvard at the age of twelve and graduated *** laude before he was sixteen."
>
> — Abraham Sperling (1946), "A Story of Genius" [2]

> "Helena Sidis told me that a few years before his death [c.1941], her brother Bill took an intelligence test with a psychologist. His score was the very highest that had ever been obtained. In terms of I.Q., the psychologist related that the figure would be between 250 and 300."
>
> — Abraham Sperling (1946), "A Story of Genius" [2]

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1. Wallace, Amy. (1986). *The Prodigy: a Biography of William James Sidis, America's Greatest Child Prodigy* (pg. 283). Dutton Adult.
2. Sperling, Abraham. (1946). "A Story of Genius" (pgs. 322-339), in *Psychology for the Millions*, F. Fell.

External links

â— Abraham Paul Sperling (1912-) – WorldCat Identities.

θΔics

In thermodynamics, **absolute temperature** is a temperature scale, such as one in degrees kelvin or rankine, not related to the physical properties of any particular substance and measured with reference to absolute zero. [1]

History

The the early Reaumur, Fahrenheit, and centigrade scales were an “arbitrary series of numbered points on a scale”, according to Irish-born Scottish physicist William Thomson, who reasoned instead that each interval of degrees on a “absolute” scale would need to measure or represent the same exact amount of work, using Carnot’s notion that a given amount of heat passing between two temperatures can produce only a particular amount of work. Thomson adopted the absolute zero number of Victor Regnault who had determined -272.75 ËšC, by four different methods. [3]

Thomson published his “absolute” temperature scale in 1848. [2] Irish physicist William Rankine also proposed a similar scale in the following years.

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1. Perrot, Pierre. (1998). *A to Z of Thermodynamics* (absolute temperature, pg. 2). Oxford University Press.
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3. Shachtman, Tom. (1999). *Absolute Zero and the Quest for Absolute Cold* (pg. 98). Mariner Books.

External links

â— Absolute temperature – Eric Weisstein’s World of Physics.
â— Absolute temperature scale – Encyclopedia Britannica.

θΔics

In physics, **absolute zero** refers to a zero indicator reading on an absolute temperature scale.

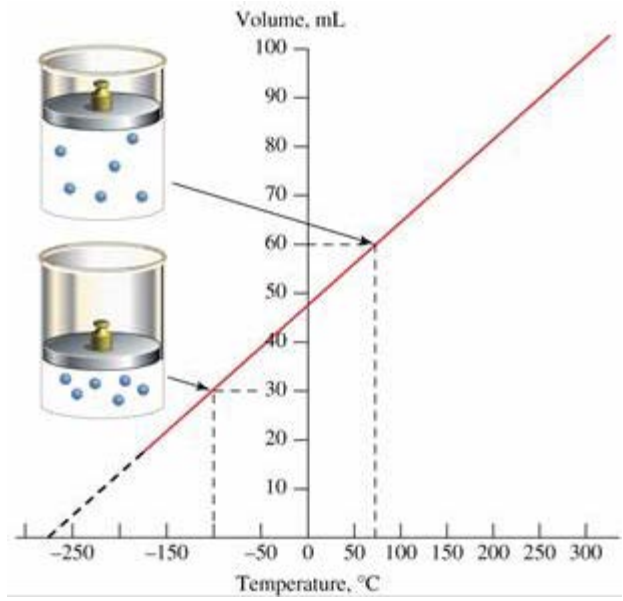

At **absolute zero** (0 K or -273 ˚C), according to the kinetic theory of heat, particle movement should stop.

History

In 1703, Guillaume Amontons, a French physicist, mathematically derived the idea of an “absolute zero”. [1]

> “It appears that the ‘**extreme cold**’ [absolute zero] of this thermometer is that which would reduce the air by its ‘spring’, to sustain no load at all.”
>
> — Guillaume Amontons (1703), *Publication* [4]

In c.1780, William Irvine, based on the theories of Joseph Black, supposedly, calculated absolute zero; the following is a synopsis:

> “Irvine’s particular theory was basically very simple in that the took the concept of ‘quantity of heat’ to its logical conclusion. Each and every body, according to Irving, contains a certain ‘absolute quantity of heat’, which is fixed by its heat capacity and its absolute temperature. If, for any reason, the heat capacity of a body should change then it must either emit or absorb heat; thus, the heats of combustion, of chemical reactions in general and the latent heats of fusion and vaporization are merely the consequences of abrupt changes in the heat capacities of the substances concerned. In fact, all productions or absorptions of heat indicate changes in heat capacity. Now this theorem enabled Irvine and his followers to calculate the **absolute zero** of temperature.”
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 55)

In 1848, Scottish physicist William Thomson publishes his “On an Absolute Thermometric Scale founded on Carnot’s Theory of the Motive Power of Heat, and Calculated from Regnault’s Observations”, in which he bases the concept of thermodynamics-based “absolute thermometric scale” on the 1824 formula for heat engine efficiency of French physicist Sadi Carnot. [2]

In 1925, Albert Einstein and Satyenda Bose predicted a new state of matter at ultra-low temperatures.

In 1995, Einstein and Bose's "new state of matter", called Bose-Einstein condensate, is created at 1.7E-7 K by Americans Eric Cornell and Carl Wieman at Colorado University, Boulder.

Entropy at absolute zero

In 1905, German physicist Walther Nernst introduced his heat theorem, later coming to be known as the third law of thermodynamics, which showed that absolute zero is unattainable. The essential problem Nernst tackled is that the state function formulation of heat Q called ‘equivalence-value’ (renamed 'entropy' in 1865), introduced formulaically by German physicist Rudolf Clausius in 1854 as:

$$\frac{Q}{T}$$

verbally defined as the "generation of the quantity of heat Q of the temperature T from work" becomes an infinite or undefined

when the temperature becomes zero:

$$\frac{Q}{0}$$

which thus leads to an unexplained inconsistency in the second law of thermodynamics at absolute zero. In other words, the possibility that there exists an actual state in nature of zero degrees temperature introduces the "division by zero" issue of mathematical functions. [3] In an alternative sense, both heat flow and temperature could simultaneously reach zero at absolute zero, giving the function S = 0/0, another non-computable result.

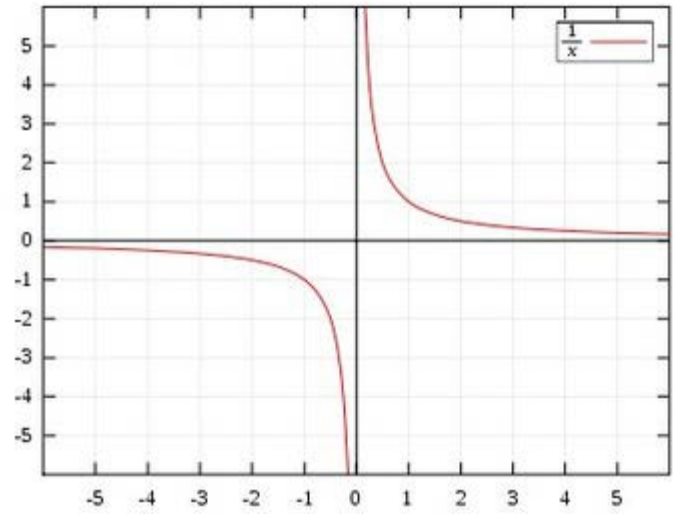

The **division by zero problem**: as *x* approaches 0 from the right, in the function *y = 1/x*, the value of *y* approaches infinity. As *x* approaches 0 from the left, *y* approaches minus infinity. On this logic, in the function *S = Q/T*, s approaches infinity as *T* approaches 0, for both positive or negative values of heat flow.

References

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2. Thomson, William. (1848). "On an Absolute Thermometric Scale Founded on Carnot's Theory of the Motive Power of Heat" (pgs. 100-06), *Cambridge Philosophical Society Proceedings* for June 5; and *Phil. Mag*., Oct. 1848.
3. Division by zero – Wikipedia.
4. James, W.S. (1929). "The Discovery of the Gas Laws. II. Gay-Lussac's Law" (abs), *Science Progress in the Twentieth Century (1919-1933)*, 24(93):57-71.

External links

- Absolute zero – Wikipedia.
- Timeline of low temperature technology – Wikipedia.

θΔics

In hmolscience, **abstract molecule** is a term, found in fields such as physical economics or ecological stoichiometry, used to describe a human abstracted as a type of molecule.

Quotes

The following are related quotes:

> "Pareto's *homo economicus* is 'an **abstract molecule** that responds only to economic forces'."
>
> — Michael McLure (2002), *Pareto, Economics and Society* [1]

> "This formula combines all compounds in a human into single **abstract** 'molecule'. The stoichiometric approach considers whole organisms as if they were single abstract molecules. Organisms can be thought of as complex evolved chemical substances that interact with each other and the abiotic world in a way that resembles a complex, composite, chemical reaction. This formula for the 'human molecule' [allows one] to think about how every human represents the coming together of atoms in proportions that are, if not constant, at least bounded and obeying some rules."
>
> — Robert Sterner and James Elser (2002), *Ecological Stoichiometry* [2]

References

1. (a) McLure, Michael. (2002). *Pareto, Economics and Society: the Mechanical Analogy* (molecules, pg. 124; molecule, 4+ pgs; comparison table, pg. 65-66). Routledge.
(b) Kirman, Alan P. (1987). "Pareto as an Economist", in: *The New Palgrave: A Dictionary of Economics, Volume Three* (editors: J. Eatwell, M. Milgate, and P. Newman) (pgs. 804-09). MacMillan Press.
2. Sterner, Robert W. and Elser, James J. (2002). *Ecological Stoichiometry: the Biology of Elements from Molecules to the Biosphere* (chapter one) (human molecule, empirical formula pg. 3; discussion, pgs. 47, 135). Princeton University Press.

θΔics

In terminology, **absurd** refers to theories, ideas, or premises, e.g. "earth moves", "person = molecule", "heat death", "human ≠ alive", etc., that are ridiculously unreasonable, unsound, or incongruous; generally because they seem severely at odds to common sense, ingrained beliefs, and or immediate logic. [1]

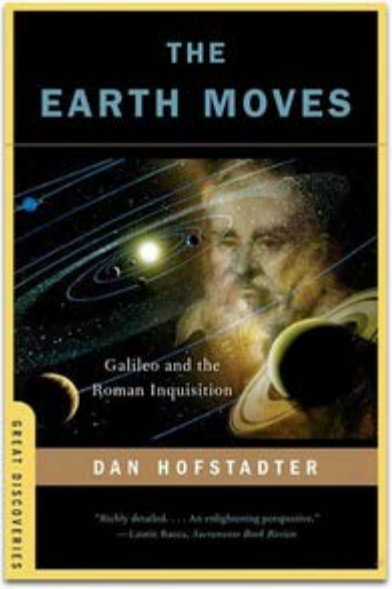

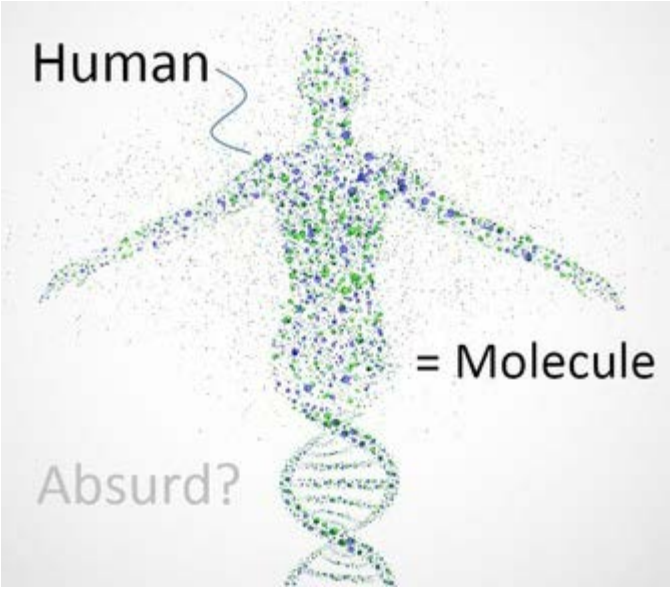

Left: Dan Hofstader's *The Earth Moves: Galileo and the Roman Inquisition* (2009) on how in the years 1500 to 1700 the premise of a "moving earth" was considered "**absurd**" to all by the inquisitive thinkers, such as Nicolaus Copernicus (1540) or Galileo Galilei (1633). [11] Right: a depiction of a human as a DNA-centric CHNOPS+20 type of "abstract molecule" (Robert Sterner), a view deemed as "absurd" by many in the 21st century.

Earth moves

In circa 1540, Nicolaus Copernicus stated the following about his heliocentric cosmology: [6]

> "The scorn which I had to fear on account of the newness and **absurdity** of my opinion [that the earth moves] almost drove me to abandon a work already undertaken."

The mention of others before him, supposedly, to the earlier work of al-Zarqali and al-Battani. [7]

In 1633, the congregation of prelates and cardinals convened on the matter of Italian physicist Galileo Galilei's experimental finding that the "earth moves" concluding that: [2]

> "The doctrine that the earth is neither the center of the universe nor immovable, but moves even with daily rotation, is **absurd**, and both philosophically and theologically false, and at the least an error of faith."

(add discussion)

Perpetual motion

In 1849, James Thomson, in his publication "Theoretical Considerations on the Effect of Pressure in Lowering the Freezing Point of Water", made the following prediction, arrived at after grappling with an apparent "absurdity" of the possibility of perpetual motion pointed out by his brother: [9]

> "Some time ago my brother, professor William Thomson, pointed out to me a curious conclusion to which he had been led, by reasoning on principles similar to those developed by Carnot, with reference to the motive power of heat. It was, that water at the freezing point may be converted into ice by a process solely mechanical, and yet without the final expenditure of any mechanical work. This at first appeared to me to involve an impossibility, because water expands while freezing; and, therefore, it seemed to follow, that if a quantity of it were merely enclosed in a vessel with a moveable piston, and frozen, the motion of the piston, consequent on the expansion, being resisted by pressure, mechanical work would be given out without any corresponding expenditure; or, in other words, a perpetual source of mechanical work, commonly called a perpetual motion, would be possible. After farther consideration, however, the former conclusion appeared to be incontrovertible; but then, to avoid the **absurdity** of supposing that mechanical work could be got out

> of nothing, it occurred to me that it is necessary farther to conclude, that the *freezing point becomes lower as the pressure to which the water is subjected is increased*."

Later that year, James' brother William Thomson verified this deduction to its numerical details by direct experiment. [10]

Heat death

In 1869, in a March 21st letter to Karl Marx, German social scientist Friedrich Engels gave his opinion on German physicist Rudolf Clausius' heat death extrapolations of the second law as follows: [3]

> "In Germany the conversion of the natural forces, for instance, heat into mechanical energy, etc., has given rise to a **very absurd** theory—that the world is becoming steadily colder … and that, in the end, a moment will come when all life will be impossible. I am simply waiting for the moment when the clerics seize upon this theory."

(add discussion)

Human = molecule | Thermodynamics

The premise of a person defined non-metaphorically as a molecule is an absurd premise for many.

In 1903, William Thomson, in his speech on religion and science (see: Thomson on religion), stated that it was not absurd to believe that a crystal could arise from the fortuitous concourse of atoms, but that it was absurd to think that a human could arise from such a mechanism, the latter of which requiring "creative power" as he would go on to assert:

> "Sir,—In your report of a few words which I said in proposing a vote of thanks to Professor Henslow for his lecture 'On Present Day Rationalism' yesterday evening, in University College, I find the following: —'Was there anything so **absurd** as to believe that a number of atoms by falling together of their own accord could make a crystal, a sprig of moss, a microbe, a living animal?' I wish to delete 'a crystal,' though no doubt your report of what I said is correct."

In 1925, Gilbert Lewis, in his *Anatomy of Science* lecture, when venturing to guess if either "crystals think" or if a person writing a textbook was but a chemical reaction, commented that both alternatives were absurd: [8]

> "Suppose that this hypothetical experiment could be realized, which seems not unlikely, and suppose we could discover a whole chain of phenomena [evolution timeline], leading by imperceptible gradations form the simplest chemical molecule to the most highly developed organism [person or human molecule]. Would we then say that my preparation of this volume [*Anatomy of Science*] is only a chemical reaction [extrapolate up], or, conversely that a crystal is thinking [extrapolate down] about the concepts of science? Nothing could be **more absurd**, and I once more express the hope that in attacking the infallibility of categories I have not seemed to intimate that they are the less to be respected because they are not absolute. The interaction between two bodies is treated by methods of mechanics; the interaction of a billion such bodies must be treated by the statistical methods of thermodynamics."

In 2010, Czech-American theoretical physicist Lubos Motl stated his view, regarding a Human Chemistry 101 educational video, made by American electrochemical engineer Libb Thims, which correlated female sexual heat, specifically music set video clips of scantily clad hot women in photo shoots, of that enthalpy, otherwise known as "heat content", that: [4]

> "It is **blatant absurdity** to model laws governing human relationships using rules of thermodynamics, a set of rules that only apply at the molecular level. Human beings are NOT molecules."

On 31 May 2015, Dooker Bewitt, in discussion with Libb Thims on attempts at non-supernatural solution to the Robertson sin problem, stated the following, in commentary about whether or not H_2 reacting with O_2 to form H_2O is good or evil, commented that a human is not a molecule per the following reasoning: (Ñº)

> "Humans are a set of molecules in a very specific configuration. In the same way that a table is a very specific set of molecules and atoms as well. The idea that we are a molecule is **completely absurd**, given that even a single cell in our body is made up of millions of molecules! How can a cell be made up of millions of molecules, but a human then be 'a molecule'? That's just silly."

(add discussion)

Human ≠ Alive

In the context of the defunct theory of life, the term "absurdities" finds frequent usage, especially in the questionable borderland of the hypothesized non-life to life transition in the so-called origin of life period. [5]

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1. Merriam-Webster Collegiate Dictionary, 2000.
2. (a) Congregation of the Prelates and Cardinals, June 22, 1633.
(b) Pearson, Karl. (1900). *The Grammar of Science* (pg. 20). Publisher.
3. Byrne, John, Toly, Noah, and Glover, Leigh. (2006). *Transforming Power: Energy, Environment, and Society in Conflict* (pg. 39). Transaction Publishers.
4. Motl, Lubos. (2010). "Comment: Sexual heat | pop quiz", Human Chemistry 101 YouTube, Nov. 20.
5. Absurd (search) – Hmolpedia.
6. Copernicus, Nicolaus. (1543). *On the Revolution of the Heavenly Spheres* (edited with commentary by Stephen Hawking) (pg. 2). Running Press, 2002.
7. Saleh, Abeer. (2015). *One Giant Step for Mankind: One Verse at a Time* (pg. 57). Cedar Graphics.
8. Lewis, Gilbert N. (1925). *The Anatomy of Science*. Silliman Lectures; Yale University Press, 1926.
9. Thomson, James. (1849). "Theoretical Considerations on the Effect of Pressure in Lowering the Freezing Point of Water" (Ñº), Read to the Royal Society of Edinburgh, Jan 2; in: *Transactions of the Royal Society of Edinburgh*, 16:575-80.
Stewart, Balfour and Tait, Peter G. (1875). *The Unseen Universe: or Physical Speculations on a Future State* (§108). Macmillan.
10. (a) Garrison, Fielding H. (1909). "Josiah Willard Gibbs and his Relation to Modern Science, Parts I-IV" (pdf) (predict, §1: 475), *Popular Science Monthly*, Part I: 74(27):470-84, May; Part II: 74:551-61, Jun; Part III: 75:41-48, Jul; Part IV: 75:191-203, Aug.
(b) Josiah Willard Gibbs and his Relation to Modern Science: I, II, III, IV – Wikisource.
11. Hofstadter, Dan. (2009). *The Earth Moves: Galileo and the Roman Inquisition*. W.W. Norton & Co.

θΔics

In existographies, **Abu Al-Biruni** (973-1048) (IQ:160|#587) (GME:43) (CR:11), aka Albiruni (Sachau, 1879), was an Iranian-born Afghanistan astronomer, mathematician, physicist, comparative religions scholar, a universal genius claimant, noted for []. [4]

Physics

The following statement Al-Biruni, supposedly, is a forerunner to Newton's first law of motion: [4]

> "All elements converge on the center of the earth, but the heavier precedes the lighter."

Al-Biruni also, supposedly, was one of the first to give a statement of specific gravity. [4]

Earth

Al-Biruni used the measurements of angles of mountains, trigonometry, and algebra methods to calculate the size of the earth as a sphere; somewhat as illustrated below (adjacent): [1]

(add)

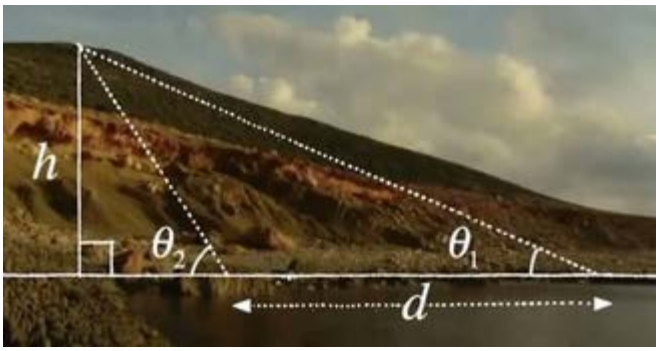

Al-Biruni's method for calculating the size of the earth.

Golden age | Islamic scientists

The four big scientific figures in Islam's golden age, according to Algerian-born astrophysicist Nidhal Guessoum (2010), are: al-Khwarizmi, inventor of algebra and coiner of "algorithm", Alhazen (Ibn al-Haytham), Avicenna (Ibn Sina), and al-Biruni, who exchanged many letters with the former. [3]

Quotes | On

The following are quotes on Biruni:

> "**Biruni**, a Persian by birth, a rationalist in disposition, this contemporary of Avicenna and Alhazen not only studied history, philosophy, and geography in depth, but wrote one of the most comprehensive of Muslim astronomical treatises, the Qanun Al-Masu'di."
>
> — David Lindberg (1978), *Science in the Middle Ages* [2]

Quotes | By

The following are noted quotes:

> "The difference between you and me is that you're a philosopher and I'm a [mathematical] scientist."
>
> — Abu Al-Biruni (c.1020), "Letter to Avicenna" [3]

References

1. BBC. (2015). "Abu Rayhan Biruni (al Biruni) the Great Persian Scientist" (Ñº), At Tar Foundation.
2. Lindberg, David C. (1978). *Science in the Middle Ages* (Biruni, 8+ pgs). University of Chicago Press, 1980.

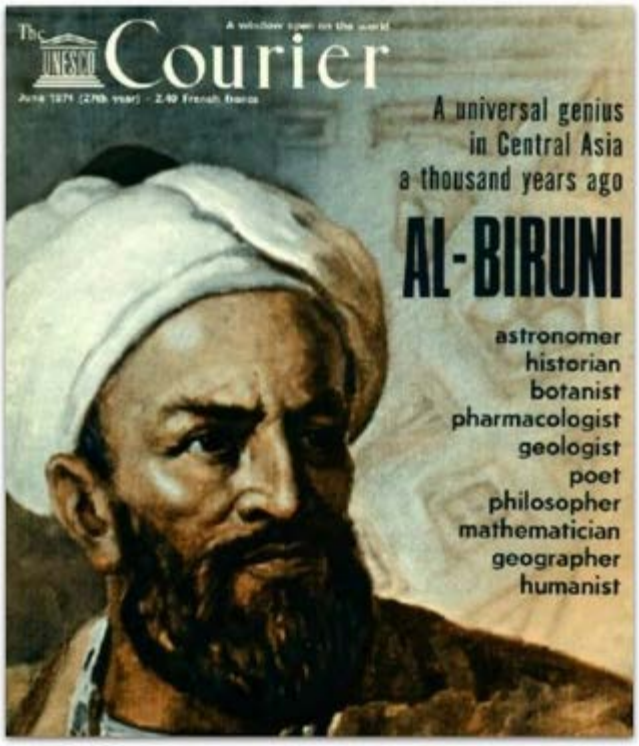

A 1974 cover story article on Al-Biruni, who is described as a **universal genius**, for his his multifarious work in astronomy, history, botany, pharmacology, geology, poetry, philosophy, mathematics, geography, and comparative religion, and the humanities. [5]

3. Guessoum, Nidhal. (2010). "Interview: Islamic Golden Age", in: *Atoms and Eden* (§16:215-28; Al-Biruni, pg. 217). Oxford University Press.
4. Salah, Abeer. (2015). *One Giant Step for Mankind: One Verse at a Time* (pg. 61). Cedar Graphics.
5. Gafurov, Bobojan. (1974). "Al-Biruni: A Universal Genius in Central Asia a Thousand Years Ago", *Courier* (pgs. 4-9), Jun.

Further reading

â— Biruni. (c.1000). *The Chronology of Ancient Nations* (translator: Edward Sachau) (Ñº). William Allen, 1879.

External links

â— Abu Rayhan al-Biruni – Wikipedia.

θΔics

In existographies, **Abu Isa al-Warraq** (c.815-870), aka “Muhamad al-Warraq” (Hecht, 2004), was an Arabian god skeptic, noted for []

Al-Rawandi

Al-Warraq was the friend and mentor of mentor of Ibn al-Rawandi, the first so-labeled “radical atheist” of Islam, author of books such as *Against the Koran* and *The Futility of Divine Wisdom*.Al-Rawandi, in his *The Book of Emerald* (c.900), described a dialogue between himself and al-Warraq, at the beginning of which al-Warraq is portrayed as the most radical in his god doubt, but by the end of the book, al-Rawandi goes further than al-Warraq in his god doubt radicalness.

Other

The surname of “Al-Warraq” was used as the pen name of Pakistani-born English ex-Muslim secular humanist (1995) turned atheist (2009) Ibn Warraq, for his 1995 book *Why I Am Not a Muslim*.

Quotes | By

The following are related quotes:

> “God is an idiot, because he who orders his slave to do things that he knows him be incapable of doing, then punishes him, is a fool.”
>
> — Abu al-Warraq (c.860) [1]

> “That Muhammad could predict certain events does not prove that he was a prophet: he may have been able to guess successfully, but this does not mean that he had real knowledge of the future. And certainly the fact that he was able to recount events from the past does not prove that he was a prophet, because he could have read about those events in the Bible and, if he was illiterate, he could still have had the Old Testament read to him.”
>
> — Abu al-Warraq (c.860) [1]

References

1. (a) Stroumsa, Sarah. (1999). *Freethinkers of Medieval Islam* (pgs. 43, 63). Brill.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 224-26). HarperOne.

External links

â— Abu Isa al Warraq – Wikipedia.

θΔics

In terminology, **accident**, from Latin *ad-* 'to' + *cadere* 'fall', refers to an occurrence, incident, or event conceived as happening by chance; was unplanned, unforeseen, or unexpected; lacking intention or seeming design. [1]

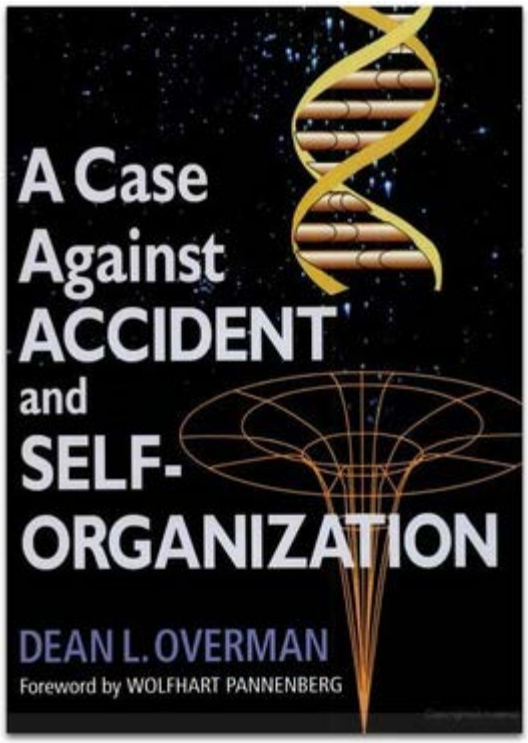

Dean Overman's 1997 *A Case Against Accident and Self-Organization*, wherein he argues that "accident" and self-organization can not be behind the formation of the first "living matter", presumably the true principle behind it being "god" or something along these lines.

Overview

In 1653, it was considered an old philosophical problem whether light was an "accident" or a "substance". [11]

In 1997, American lawyer and Christian apologeticist Dean Overman (Q), in his *A Case Against Accident and Self-Organization*, attempts to argue the following position: [9]

> "Is it mathematically possible that **accidental** processes caused the formation of the first form of living matter from non-living matter? Could accidental processes have caused the formation of a universe compatible with life? Are current self-organization scenarios for the formation of the first living matter plausible? Overman proceeds to demonstrate that it is mathematically impossible that accidental processes produced the first living matter."

Overman grapples with Michael Polanyi among other topics.

Evolution | I'm not an accident!

Darwinian-conceptualized evolution, as opposed to creationism or intelligent design varieties, particularly as seen by objectors, of the religion-siding bent, often tend to characterize Darwin's theory as "accidental, blind, random, chance based evolution", hence object per the assertion that "I'm not an accident" motto; the following being on overtypical example:

> "I'm not an accident, gentleman. You may be. I am not. I am not an **accident**. I am an event. And you are events. And what does this mean. An event is something that comes in its—into existence under its own name. And that's what the Bible says. It's as true as it has ever been. And you can say that Darwin is an event in the history of the human mind a catastrophe. The infamous pride of a natural scientist to explain his own existence, by accident. Why should I listen to a man who says he' accident? He's an accident, I'm another accident, so we never agree. But the fact is we want to agree. Charles Darwin is very important, because he spoke. And we have to make something on him. We have to refute him. So how is he an accident? You see, he's a duty. I have to get rid of him, or I have to reconcile myself to him."
>
> — Eugen Rosenstock-Huessy (1953), "Cross of Reality" [7]

(add)

Professor Utonium

The following shows an overzealous chemistry professor—specifically Professor Utonium (Q), the chemistry who created the Power Puff Girls (Q), by "accident" one day in his lab (Q), in the 1995-launched Cartoon Network series—angrily telling his kids they are all **accidents**, which is endemic of the underling nature inherent amid the ongoing evolution religion

debates.

Professor Utonium (O), the chemist who created the Power Puff Girls (O), by "accident", one day in his lab (O), as he tell them.

Meaning | Existence

The term "accident" has a rather deep connotative meaning to many, particularly when it comes to questions of purpose or meaning in respect to individual human existence and significance.

> "Whether or not historical events are causality connected or are the result of chance, **accident** or mathematical probability are much more than abstract speculations. Their answer goes to the very root of the historian's method of procedure. Of what would it avail us, if after all our labor, the reader were to agree that while strict causality has been proved in all past history, the future must be shrouded in darkness, or is controlled by chance? One may be convinced that historical laws are controlled by laws, but conclude that these laws are not causal, but indeterminate in nature."
>
> — Morris Zucker (1945), *Field Theory of History* [3]

(add)

Darwin's dice

English naturalist Charles Darwin, in his personal correspondence, seems to have not believed in accidental adaptation:

> "I cannot believe that a Rotifer or Tardigrade is adapted to its humble conditions of life by a happy **accident**."
>
> — Charles Darwin (1872), review of Henry Bastian's *The Beginnings of Life*; sent to Thomas Wallace [10]

His evolution theory, however, seems to have become attached to the word as the arbiter of the mechanism. American political theory philosopher Curtis Johnson's *Darwin's Dice* (2014), e.g., goes into a detailed terminological analysis of Darwin and his evolution theory in respect to basing his theory on terms such as: "blind", "random", "chance" (or chance variation), and "**accident**". [6]

Dawkins | Genes

(add)

Religion | Science

On of the

The Blind Watchmaker | Richard Dawkins

"The best general account of evolution I have read in recent years." –Edward O. Wilson

The watchmaker belongs to the eighteenth-century theologian William Paley, who made one of the most famous creationist arguments: Just as a watch is too complicated and too functional to have sprung into existence by accident, so too must all living things, with their far greater complexity, be purposefully designed. It was Charles Darwin's brilliant discovery that put the lie to these arguments. But only Richard Dawkins could have written this eloquent riposte to the creationists. Natural selection–the unconscious, automatic, blind, yet essentially nonrandom process that Darwin discovered–has no purpose in mind. If it can be said to play the role of watchmaker in nature, it is the *blind* watchmaker.

Left: Youtube atheist Aron Nelson (2008), aka AronRa, on the fallacy of the popular notion that evolution is based on "**accident**", with snippets of Richard Dawkins denying that evolutionists employ the notion of accident in their argument. Right: back cover section of Dawkins' 1986 *The Blind Watchmaker*, wherein he cites the "accident" based evolution model, contrary to his interview statements, as the antonym to William Paley's model of creation via god, along with 6+ usages of the term inside. (Q)

key hinges in the religion vs. science debate is the assumed premise in the latter that humans are but the result of "accident", or semi-synonymously "random chance" or "blind random chance"; the following being two examples:

> "Today's children are taught by our culture that we are a cosmic **accident**. Something slithered out of the primal slime and over billions of years evolved into a human being. We are cousins, ten times removed, to the ape at the zoo eating his own excrement."
>
> — Gary Bauer (1992/2013), Evangelical Christian centric politician; former domestic advisor to Ronald Reagan (Q) (Q) (Q)

The following, similarly, is an anthropomorphized-slant on the so-called molecules-to-man evolution model, wherein the term "accident" is accentually repeated four times, as a means to suggest objection:

> "Once upon a time, one molecule, scudding in a primordial ocean, suddenly and **absolutely accidentally** met another cute molecule. They decided to bind to each other and scud together, and found that they acquired a new property, which gave them a better chance to survive in that rough and unfriendly primordial ocean. During the next billions of years, these molecules met many other attractive molecules (of course, *absolutely accidentally*) and combined with many of them, creating a big conglomerate of molecules. This conglomerate again *absolutely accidentally* discovered that it can create similar little baby conglomerates by simple division and that is how a primordial organic complex or protein or nucleic acid was created. They then *absolutely accidentally* found each other in the primordial ocean, combined and created a small syndicate that acquired many new and very useful properties for survival and we now call it a 'cell'. Accidental and random combinations of molecules can neither create a car nor a human being or even a simple one-celled organism with a certain 'directing power' that can transform originally inanimate matter into numerous forms of life."
>
> — Nickolas Dorfman (2008), *Was Mona Lisa Created by Physicochemical Reactions Alone?* [5]

(add discussion)

Empedocles | Aristotle

Greek standard model philosopher Empedocles, supposedly, according to American teleology theorist Terrence Deacon, was the first to outline an accident-based mechanical evolution or formation of animate form model: [4]

> "Empedocles claimed that event the orderliness of living bodies might be able to arise spontaneously, simply by preserved **accident**. From these sparse beginnings all the more complex features of the world, like living bodies, could arise by combinations of more basic parts which themselves arose and combined by accident."

A depiction (Q) of various types of so-called "**accidents**": a book case falling, a person cutting off their hand, a nuclear leak (or explosion), an explosion, an electrocution, a fire, a broken leg, being hit by a car.

Greek science-philosopher Aristotle, according to Deacon, supposedly, devoted considerable effort to refuting Empedocles' model of accident-based mechanical evolution or formation of animate form. [4] The term index of the Oxford edition of Aristotle's collected works, however, does show that he does devote some a number of pages (15-rows) to discussion of "accident" and "accident, fallacy of"; the following is one example:

> "That a science of the **accidental** is not even possible will be evident if we try to see what the accidental really is. We say every thing is either is always and of necessity … or is for the most part, or is *neither* for the most part, *nor* always and of necessity, but merely as it chances … The accidental, then, is what occurs, but not always, nor for the most part. Now we have said what the accidental is, and it is obvious why there is no science of such a thing; for all science is of that which is always or for the most part, but the accidental is in neither of these two classes."
>
> — Aristotle (c.320BC), *Metaphysics* (11:8) [8]

Quotes

The following are other related quotes:

> "I never did anything worth doing by **accident**, nor did any of my inventions come by accident; they came by work."
>
> — Plato (c.360BC) (Q)

> "There is no such thing as **accident**; it is fate misnamed."
>
> — Napoleon Bonaparte (c.1810)

> "That man is the product of causes which had no prevision of the end they were achieving; that his origin,

his growth, his hopes and fears, his loves and beliefs, are but the outcome of **accidental** collections of atoms."

— Bertrand Russell (1903), "A Free Man's Worship" [2]

"**Accident** is the negation of law, while chance, when numbers are large, possess and element of certainly, though not necessity."

— Morris Zucker (1945), *Field Theory of History* [3]

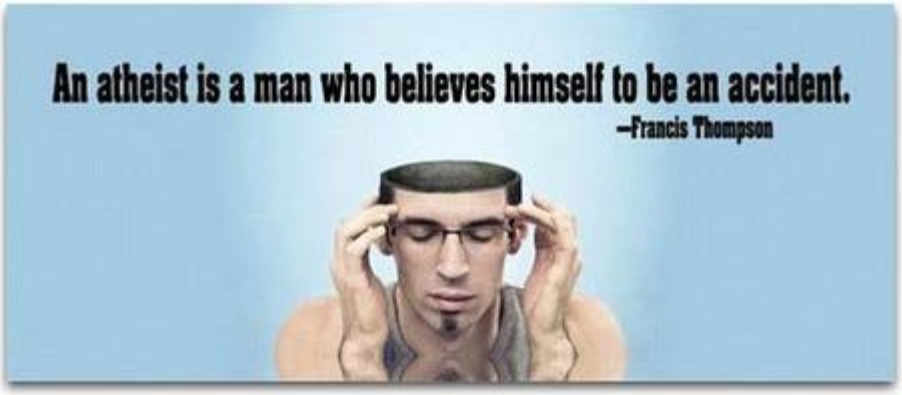

A controversial 2012 billboard (Q), erected outside of Rivers Church (Q), Johannesburg, South Africa, showing a circa 1990 quote by English poet Francis Thompson (1859-1907), namely: "an atheist is a man who believes himself to be an accident", with a half-headed man, visually suggesting that typical atheists are "empty headed" (or brainless), because they, supposedly, believe their existence to be "**accidental**", was pulled down, being that some found it offensive.

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(b) Curtis Johnson (faculty) – Lewis & Clark College.
7. (a) Rosenstock-Huessy, Eugen. (1953). "Cross of Reality" (pg. 21), Vol 5, Lecture 14, Dec 4.
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8. Brown, Richard H. (1977). *A Poetic for Sociology: Toward a Logic of Discovery for the Human Sciences* (pg. 255). University of Chicago Press, 1989.
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10. Darwin, Charles. (1872). "Letter to Alfred Wallace" (Q), Aug 28.
11. Middleton, William E. (1964). *The History of the Barometer* (pg. 13) (Amz). Publisher.

External links

- Accident – Wikipedia.
- Accident – BranyQuote.com.

θΔics

In hmolscience, **accidental evolution**, as contrasted with "designed evolution" (Mayr, 1959) or "thermodynamical evolution" (Dolloff, 1975), is the supposition, believed by many, that evolution, in particular the origin of "life" or the first living thing, occurred or is occurring via an "accident" or accidental processes of some sort.

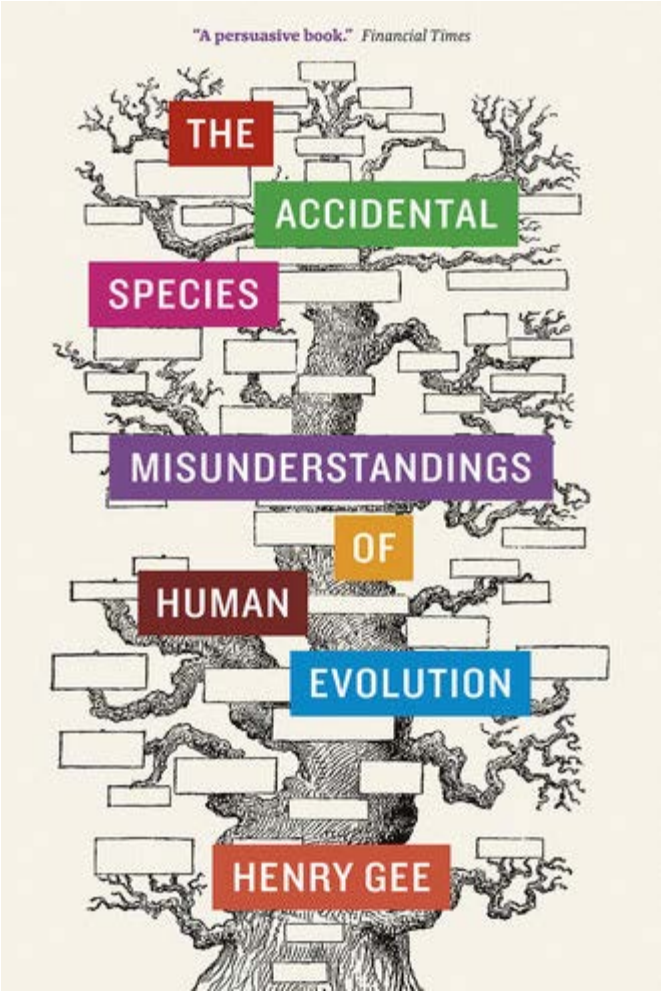

Cover to American paleontologist Henry Gee's 2013 *The Accidental Species: Misunderstandings of Human Evolution*, where he attempts to see the idea that **evolution** is a result of chance and accident; specifically that "our evolutionary outcome is one possibility among many, one that owes more to '**chance**' than to an organized progression to supremacy. He starts with bipedality, which he shows could have arisen entirely by '**accident**', as a by-product of sexual selection, moves on to technology, large brain size, intelligence, language, and, finally, sentience." [5]

Overview

In 1872, Henry Bastian, in his *The Beginnings of Life*, stated the following:

> "The nature of the living matter, whether animal or vegetal, was regarded, even by many ancient philosophers, as an **accident** dependent upon the influence of particular sets of conditions. As we have seen, Aristotle thought that plants might be engendered by the tissues of animals, and, on the other hand, that certain lower kinds of animals might take their origin from and within the substance of plants. Ovid, therefore, was but reproducing an actual belief of his time when, in his exposition of the Pythagorean philosophy."
>
> — Henry Bastian (1872), *The Beginnings of Life, Volume Two* (pgs. 172-73)

> "How long or when the particular ' tree of life', from one of the branches of which man was developed, appeared upon the earth, it is utterly impossible to say. The 'vertebrate' grade of organization *may* have been many times attained by ultimate branches of different 'trees of life'. But physical, chemical, and biological phenomena all compel us to believe that law and order universally prevail, even amidst occurrences which, on account of the complexity of their relations, may seem to have been the result of **chance or accident**. And equally good reasons also exist for the conviction that the same Forces which are now in action within and around us, have been and are constantly operative throughout the whole universe—everywhere producing the most beautiful and complex results, whose mutual alliance and inter-relations seem to combine in testifying to the existence of one supreme and all-pervading Power of which these results are the phenomenal manifestations."
>
> — Henry Bastian (1872), *The Beginnings of Life, Volume Two* (pg. 640)

In 1872, Charles Darwin, after reading Bastian's book, stated the following:

> "I cannot believe that a Rotifer or Tardigrade is adapted to its humble conditions of life by a happy **accident**."
>
> — Charles Darwin (1872), review of Henry Bastian's *The Beginnings of Life*; sent to Thomas Wallace [2]

In the century to follow, as Darwin never explicitly stated what was "behind" natural selection, the a colloquial view was propagated, particular to religious-minded people that "accident" or chance was the operative principle behind natural selection; the following is one take one this:

> "As the **accidental evolutionist theory** has been expanding over the last 100 years, it has been merged with 'big bang' and 'primordial soup' theories. Combined these ancillary theories, the accidental evolution theory now states that following the big bang, life spontaneously arose from chemicals. What is curious is that these chemicals somehow supposedly developed the desire to survive. Have we ever observed any lifeless chemicals develop a desire to survive? Have we ever seen chemicals doing anything but predictably reacting to each other? In other words, the accidental evolution theory says that out of lifeless chemicals single-celled living creatures have arisen, miraculously displaying a desire to survive. A desire to survive means having a need to improve survival factors and eliminate threats to survival. The need to improve survival means there is an intention to survive, and a value is put onto survival. Eliminating the threats to survival means survival is valued enough to put an effort into changing, adapting to, or destroying potential encroachments and dangers that could shorten life. These factors compound the problem presented: how could lifeless chemicals develop the ability to even *recognize* life, let alone value life enough to take persistent action to sustain it."
>
> — C.W. Adams (2006), "How could Chemicals have a Desire to Survive" [3]

(add)

Quotes

The following are related quotes:

> "Today's children are taught by our culture that we are a cosmic **accident**. Something slithered out of the primal slime and over billions of years evolved into a human being. We are cousins, ten times removed, to the ape at the zoo eating his own excrement."
>
> — Gary Bauer (1992/2013), Evangelical Christian centric politician; former domestic advisor to Ronald Reagan (Ñº)(Ñº)(Ñº)

> "Once upon a time, one molecule, scudding in a primordial ocean, suddenly and **absolutely accidentally** met another cute molecule. They decided to bind to each other and scud together, and found that they acquired a new property, which gave them a better chance to survive in that rough and unfriendly primordial ocean. During the next billions of years, these molecules met many other attractive molecules (of course, *absolutely accidentally*) and combined with many of them, creating a big conglomerate of molecules. This conglomerate again *absolutely accidentally* discovered that it can create similar little baby conglomerates by simple division and that is how a primordial organic complex or protein or nucleic acid was created. They then *absolutely accidentally* found each other in the primordial ocean, combined and created a small syndicate that acquired many new and very useful properties for survival and we now call it a 'cell'. Accidental and random combinations of molecules can neither create a car nor a human being or even a simple one-celled organism with a certain 'directing power' that can transform originally inanimate matter into numerous forms of life."
>
> — Nickolas Dorfman (2008), *Was Mona Lisa Created by Physicochemical Reactions Alone?* [4]

References

1. Bastian, Henry C. (1872). *The Beginnings of Life: Volume 2*. Appleton.
2. Darwin, Charles. (1872). "Letter to Alfred Wallace" (Ñº), Aug 28.

3. Adams, C.W. (2006). *Actuality: Life in the Real World* (§:How could Chemicals have a Desire to Survive, pgs. 84-85; §:Chemicals Cannot Decide to Extend Their Successor's Lives", pgs. 86-87). Publisher.
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Further reading

â— Mayer, Ernst. (1959). "Accident or Design: the Paradox of Evolution"; in: *The Evolution of Living Organisms* (1960); a Symposium of the Royal Society of Victoria in Melbourne, Dec; in: *Evolution and the Diversity of Life: Selected Essays* (§4:30-). Harvard University Press, 1997.

θΔics

In religio-mythology, **Achristism**, “a-Jesus-ism” (Q), or “Jesus atheism” (Price, 2000), is the denial of the existence of Jesus Christ, Christ, or Jesus of Nazareth, among other synonymous names, whether as a god or a historical real person; belief that Jesus is a mythical (see: Christ myth theory) or allegorical figure or character; belief that **Jesus never existed**.

A term "**achristism**" (Henry, 1694), or *a-Christ-ism*, or *a-Jesus-ism*, refers to denial of the existence of Jesus Christ as a real person; belief that Jesus never existed.

Overview

In 1694, English nonconformist clergyman Philip Henry (1631-1696), in a letter to Thomas Hunt, coined the term "achristism" as follows: [1]

> “What you write of the paralyzing atheism of the town, I am afraid is too true; but what do you think of such a thing as ***achristism***? I am sure Ephesians 2:12 (Q) mentions both. How many are there that own a god, and worship him, that have no regard to Jesus Christ in doing so; as if we could come to him, and have to do with him, and receive from him, without a mediator! How is he then 'the way?' Hath he not said, 'No man cometh unto the father but by me?' Is he the way to those that do not walk in him, or an advocate to those that do not employ him?”

In 1817, Napoleon Bonaparte, in dialogue with Gaspard Gourgaud, stated things thusly: [2]

> “I have dictated thirty pages on the world’s three religions; and I have read the Bible. My own mind is made up. **I do not think Jesus Christ ever existed**.”

In 1828, Robert Taylor, in his *Syntagma of the Evidences of the Christian Religion*, argued the following: [4]

> “Thou hast in this pamphlet all the sufficient evidence, that can be adduced for any piece of history a thousand years old, or to prove an error of a thousand years standing, that such a *person* as **Jesus Christ never existed**; but that the earliest Christians meant the words to be nothing more than a personification of the principle of reason, of goodness, or that principle, be it what it may, which may most benefit mankind in the passage through life.”

In 2000, Robert Price, in his *Deconstructing Jesus*, summarized things as follows: [3]

> “Generations of Rationalists and freethinkers have held that Jesus Christ corresponds to no historical character: There never was a Jesus of Nazareth. We might call this categorical denial ‘**Jesus atheism**’. What I am describing is something different, a ‘Jesus agnosticism’. There may have been a Jesus on earth in the past, but the state of the evidence is so ambiguous that we can never be sure what this figure was like or, indeed, whether there was such a person.”

In 2001, Kenneth Humphreys, being inspired (Q) by: Earl Doherty (*The Jesus Puzzle*, 1999); Dorothy Murdock (*The Christ Conspiracy*, 1999); Timothy Freke and Peter Gandy (*The Jesus Mysteries*, 1999); George Wells (*The Jesus Myth / The Jesus Legend*, 1999); Arthur Drews (*The Christ Myth*, 1910); Robert M. Price (*Deconstructing Jesus*, 2000); Hyam Maccoby (*The Mythmaker: Paul & the Invention of Christianity*, 1987); Burton Mack (*Who Wrote the New Testament?*, 1995); and Elaine Pagels (*The Gnostic Gospels*, 1979), launched: JesusNeverExisted.com, which turned

(Q) 2014 book. [5]

In 2013, some (Q) were distinguishing between hard “a-Jesus-ism” (akin to hard a-theism) and soft “a-Jesus-ism” (akin to soft a-theism).

In 2015, Libb Thims was listing "achristism", in atheism types by denial and belief, as one of the main categories of denial in respect to "strong atheism".

Noted achristists include: Count Volney (1791) (Q)(Q), Napoleon Bonaparte (1817), Thomas Jefferson (1823), Libb Thims (2003), among others. One can become an achristist, via study of religio-mythology, especially religio-mythology transcription and syncretism, and or possibly by logic deduction, e.g. that miracles are impossible, etc.

Anti-christ

An achristist, to note, is not to be confused with “antichrist” (Q); conceptualized, in the Bible, as a false messiah, a figure of concentrated evil, who will face Jesus Christ in his prophesized second coming; one example being Friedrich Nietzsche’s 1888 interpretation of the “antichrist” (Q) term, which has its own unique meaning.

Other

The term “achristism”, meaning to deny the existence of Jesus Christ, to note, seems to have been used by some to mean that a person named "Jesus", as a real person, that walked the earth from 0-33AD, existed, but was not divine (e.g. Einstein), or that he was not part of a trinity (e.g. Newton).

Quotes

The following are related quotes:

> “Jesus Christ in the New Testament, has no reference whatever to any event that ever did in reality take place upon this globe; or to any personages that ever in truth existed: and that the whole is an astronomical allegory, or parable, having invariably a primary and sacred allusion to the sun, and his passage through the signs of the zodiac; or a verbal representation of the phenomena of the solar year and seasons.”
>
> — Logan Mitchell (1842), *Christian Mythology Unveiled*

References

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(b) Williams, J.B. (1853). *Memoir of Rev. Philip Henry* (achristism, pgs. 187-88). American Tract Society.
2. (a) Bonaparte, Napoleon. (1817). “Comment to Gaspard Gourgaud”, Apr.
(b) Gougaud, Gaspard. (1898). *Talks of Napoleon at St. Helena with General Baron Gourgaud: Together with the Journal Kept by Gourgaud on Their Journey from Waterloo to St. Helena* (pg. 276). Nabu Press, 2012.
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5. (a) Main – JesusNeverExisted.com.
(b) Humphrey, Kenneth. (2005). *Jesus Never Existed: an Introduction to Ultimate Heresy*. Publisher, 2014.

θΔics

In dating systems, **ACM**, as compared to BCM, refers to years “After Christ Myth”, according to the Paine dating system (1802); which is a secular alternative to the Roman recension myth-based AD (*Anno Domini*) or CE (Common Era) Exiguus dating system (525AD) notations.

Further reading

● Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

θΔics

In science, **acronyms** are shortened capital letter abbreviations formed from the initial letter or letters of the successive parts or major parts of a compound terms; and are commonly employed to facilitate ease of discussion.

List

The following are some noted Hmolpedia acronyms:

- AG | Anno Goethe
- ATP – Adenosine triphosphate
- BG | Before Goethe
- DNA – Deoxyribonucleic acid
- EoHT – Encyclopedia of Human Thermodynamics
- HCR | Human chemical reaction (HCR theory)
- Hmol (or hmol) - one "human mole" or "human molar" as in human molar science (hmol science)
- HMS – human molecular science
- HT – human thermodynamics
- IoHT – Institute of Human Thermodynamics
- JHT – Journal of Human Thermodynamics
- STP – standard temperature and pressure
- θΔcs (or θΔics) – thermodynamics

Some of which are listed in the adjacent dropmenu.

θΔics

In terminology, **act** is the process of doing, as in an "action"; a state of real existence rather than possibility; something being done; a formal decision, law, or decree or edict. [1]

Natural act
$dG < 0$

Unnatural act
$dG > 0$

A 2011 draft, by Libb Thims (O), of what constitutes, differentially, a "natural act", as contrasted with an "unnatural act", stemming from discussions with the interactive play site app "Acts of Kindness" (at AOK.tv).

Quotes

The following are related quotes:

> "**Act** only according to that maxim whereby you can at the same time will that it should become a universal law."
>
> — Immanuel Kant (1785), the categorical imperative (compare: thermodynamic imperative) [2]

> "As my familiarity with the work [of Pareto] has increased, I have become convinced that my acquaintance with Pareto's analysis of facts, with his synthesis of results, with his methods, and with some of his theorems is at present indispensable for the interpretation of a wide range of phenomena, whenever and whatever men **act** and react upon one another."
>
> — Lawrence Henderson (c.1928), in lieu of mental absorption of Vilfredo Pareto [3]

> "The Iranian engineer and post-revolutionary Prime Minister, Mehdi Bazargan proposes the theory of thermodynamics. This is to find out the relationship between faith and knowledge and the role of morality in everyday life, which is an attempt to combine Western techno-science with local culture. Bazargan's usage of the theory of thermodynamics is not metaphorical. His arguments are followed by direct application of concepts and formula. What he achieves is quite creative: faith and knowledge become intertwined but disjointed ....The effect of this disjointedness is that the individual becomes responsible for acting morally, as if he or she is performing the **act** of god. Second, as argued by Bazargan using the theory of thermodynamics, faith is self-reflecting: it changes through time and adjust to renew changes in life. Faith also dies if there is no effort by the subject to revive it."
>
> — Nurdeng Deuraseh (2011), "Muslim Scholars on Dialogue of Modern Science", co-authored with: Termizi Abu Talib, and Husni M. Harun, generally based on the 2004 work of Mazyar Lotfalian [4]

See also

- Action
- Action thermodynamics
- Activated complex
- Activation energy
- Active Brownian agent
- Actual energy

References

1. (a) Merriam-Webster Collegiate Dictionary, 2000.
(b) Act – Dictionary.com.
2. Kant, Immanuel. (1933). *Grounding for the Metaphysics of Morals* (pg. 30); translated by James W. Ellington [1785]. *3rd ed.* Hackett.
3. (a) Henderson, Lawrence J. (1935). *Pareto's General Sociology: a Physiologists Interpretation* (pg. vi). Harvard University Press.

(b) Russett, Cynthia. (1966). *The Concept of Equilibrium in American Social Thought* (pg. 114). Yale College.
4. Deuraseh, Nurdeng, Talib, Termizi A. and Harun, Husni M. (2011). "Muslim Scholars on Dialog of Modern Sciences: Issues and Responses", *International Journal of Asian Social Science*, 1(3):36-38.

θΔics

In science, **action** is the product of work and time: [1]

$$A = Wt$$

where *A* here stands for "action", *W* for work, and *t* for time.

Philosophy

In philosophy, generally tracing to the human movement theories of Greek philosopher Aristotle, what is called "action theory" or theories of "action" attempt to debate or theorize about "will" in the context of materialism, physicalism, and or other types of non-reductive chemical physical materialism, often alluding to the notion that "free will" and or consciousness or conscious "choice" to make an action are aspects of an emergent property. [2] Cuban-born American philosopher Alicia Juarrero puts it like this: [3]

> "The philosophical literature of action has remained trapped in [a] peculiar combination of Aristotelian and Newtonian views of causality."

(add discussion)

See also

- Action chains
- Action thermodynamics
- Mechanical action

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics* (pg. 4). Oxford University Press.
2. Deacon, Terrence W. (2011). *Incomplete Nature: How Mind Emerged from Matter* (action, 35+ pgs). W.W. Norton & Co.
3. Juarrero, Alicia. (1999). *Dynamics in Action: Intentional Behavior as a Complex System* (action, 95+ pgs). MIT Press.

Further reading

- Osborn, Henry F. (1916). *The Origin of Life: on the Theory of Action, Reaction and Interaction of Energy* (pg. xi). The Science Press.
- Kennedy, Ivan R. (2001). *Action in Ecosystems: Biothermodynamics for Sustainability* (ch. 4: Action Thermodynamics, pgs. 65-98). Research Studies Press.

External links

- Action (physics) – Wikipedia.
- Action theory (philosophy) – Wikipedia.
- Social actions – Wikipedia.

θΔics

In hmolscience, **action chains**, "event sequences" (Bohannan, 1957), "strips of culture" (Schechner, 1985), and or "chain reaction" (Hall, 1966), are cause and effect connecting domino-like actions and or reactions traceable in history, leading from acts to events.

Overview

In 1957, Paul Bohannan, in his *Justice and Judgment Among the Tiv*, and later in his *Social Anthropology* (1963), was using the term “event sequences”, to describe action reaction deterministic sequences of events.

In 1966, Edward Hall, in his *The Hidden Dimension*, introduced the term “action chain”.

In 1985, Richard Schechner, in his *Between Theater and Anthropology*, was using, according to Bohannan, the term “strips of culture” for action chains.

In 1995, Bohannan, in historical retrospect of Hall and Schechner, stated that his earlier event sequences term and Hall’s action chain were synonymous; and thereby defined action chains as follows: [1]

> “**Action chains** are the essential basis of cultural dynamics. Actions and events follow on another in predictable chains, sometimes founded on cause and effect, sometimes only on cultural tradition. Unless it is disturbed a known sequence of acts, once begun, is usually followed through.”

(add discussion)

Historical | Examples

The 28 Jun 1914 shooting of Austro-Hungarian Archduke Franz Ferdinand, by the Bosnian Serb student Gavrilo Princip, a member of the Serbian terrorist organization Black Hand, is said to have been the tipping point that, within thirty days, led to a global chain reaction that led to WWI, claiming ten million lives, and followup WWII, claiming another thirty million. [2] In this sense, the tipping point can be looked on as either the heat of the spark reaction working to catalyze the bigger reaction, thus acting to get the bigger reaction over the activation energy barrier, or as an aspect of collision theory.

The Russians invading Afghanistan in 1979, and the efforts therein of Osama bin Laden, was a link in the action chain, using Hall’s terminology, which led to the later 11 Sep 2001 bombings of the twin towers. [3]

See also

â— Great chain of being

References

1. (a) Hall, Edward T. (1966). *The Hidden Dimension: an Anthropologist Examines Man’s Use of Space in Public in Private* (chain, 3+ pgs). Doubleday Anchor Book.
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(c) Bohannan, Paul. (1995). *How Culture Works* (pgs. 49, 202). Simon and Schuster.
2. Buchanan, Mark. (2000). *Ubiquity: Why Catastrophes Happen* (pg. 3). Three Rivers Press.
3. Miller, John. (1999). “Greetings, America. My Name is Osama bin Laden: a Conversation with the Most Dangerous Man in the World” (Ñº), *Esquire*, Feb.

θΔics

In thermodynamics, **action thermodynamics** is type of chemical thermodynamics based on the logic that energy quantums are the integral cause of action or movement in all systems, molecular, biospheric, to human systems, and that the sets of movements towards equilibriums will accord with the laws of thermodynamics. [1]

History

The theory of action thermodynamics was developed beginning in the 1980s by Australian environmental chemist Ivan Kennedy, originally designed to solve specific biological problems, such as ATP synthesis, but soon began to be seen in a more generalized light, universally applicable to many systems, such as neuro systems, genetic systems, and ecosystems, among others.

Action resonance theory

A part of Kennedy's logic is what is called "action resonance theory", arguing that action is a thermodynamic property related to entropy, resulting from impulses of energy on matter producing force, based on Max Planck's quantum of action, *h*, or energy element.

Human activity

Kennedy postulates that one can understand certain aesthetic aspects of human activity, such as the appreciation of art, or act of listening to music, etc., by using a logic of action resonance, according to which the outcomes of the actions are resultant from the transmissions of intermolecular forces by quanta. Moreover, the resonant impulses form these quanta on the nearby material surfaces of molecules (electrons and nuclei) provide a variable dispersive thermodynamic force, generated particularly strongly during collisions, able to sustain the action and kinetic energy of the system of molecules. Thus, according to Kennedy, molecules are put in motion or halted by impulsive exchanges of quanta and as also deriving their current inertia form such dynamic exchange forces. [1]

References

1. Kennedy, Ivan R. (2001). *Action in Ecosystems: Biothermodynamics for Sustainability* (ch. 4: Action Thermodynamics, pgs. 65-98; also pg. 38). Research Studies Press.

θΔics

In chemistry, **activated complex** is the high energy structure formed during the transition stage (see: transition state) of a chemical reaction, between the reactants going to products, characteristic of the configuration species at or near the saddle point of the potential energy surface. [1]

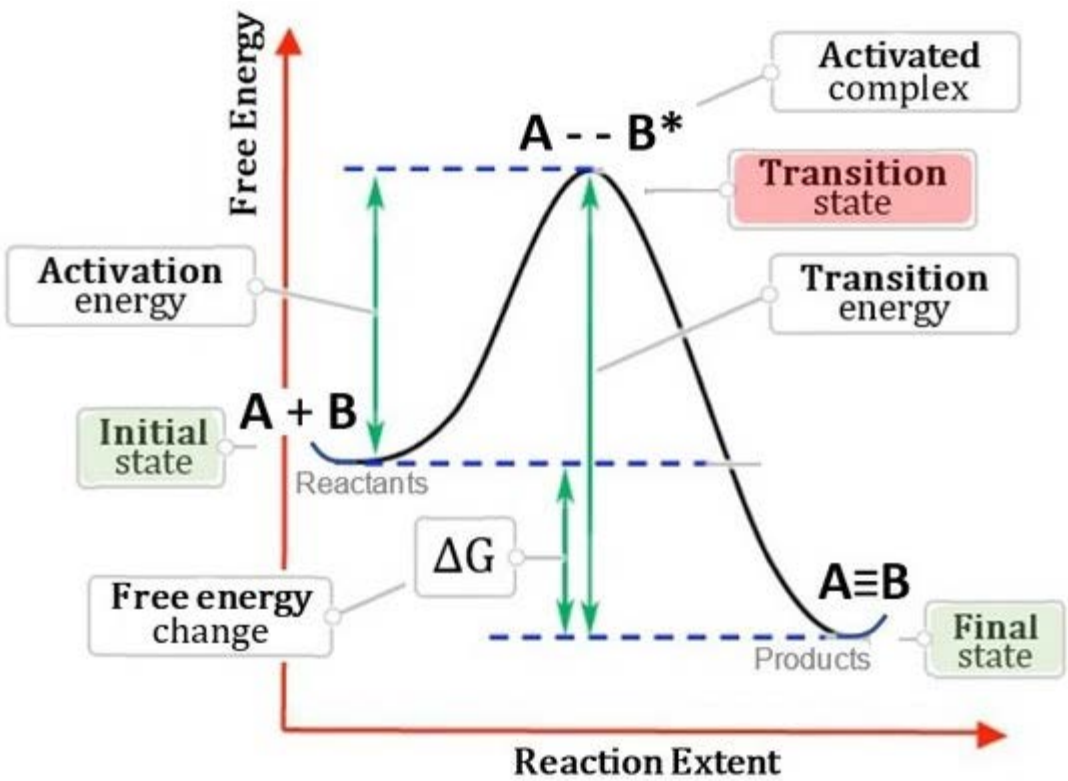

A basic reaction coordinate diagram showing the **activated complex** at the height of the transition state location on the free energy vs extent of reaction plot.

Overview

In 1929, German-born American physicist Fritz London, seems to seems to have originated the concept with the the publication of his formula for the energy of interaction of three or four electrons, such as in the approach interaction between two noble gas atoms that attract each other at large distance, but at short distance are repellent. [4]

In the 1930s, American chemistry Henry Eyring and colleagues developed an activated complex theory, which enables the rate constants in chemical reactions to be calculated using statistical thermodynamics,

The following is a simplified activated complex diagram for a combination reaction, showing reactants (A + B) equilibriating between the "activated complex" (A - - - B), and the products (AB):

$$A + B \leftrightarrow A - - - B \leftrightarrow AB$$

Each activated complex is associated with a specific activation energy, unique to each activated complex species in the mechanism.

The activated complex, according to Linus Pauling (1969) is said to have “a larger energy (enthalpy) value than the reactants”. [2]

History

The was developed by in the 1930s. [3]

References

1. Activation complex – IUPAC Goldbook
2. Pauling, Linus. (1969). *General Chemistry* (pg. 565). Dover.
3. (a) Daintith, John. (2004). *Oxford Dictionary of Chemistry.* Oxford University Press.
(b) Eyring, Henry. (1935). “The Activated Complex in Chemical Reactions” (abstract), *J. Chem. Phys.* Vol. 3, Issue 2, 107.
4. Snow, Richard and Eyring, Henry. (1957). “Activated Complex Energies” (abstract), *J. Phys. Chem.*, 61 (1): 1-6.

External links

â— Activated complex – Wikipedia.

θΔics

In chemistry, **activation energy** or "energy barrier" is the minimum impact energy required for a chemical reaction to take place. [1] In a reaction, the reactant molecules come together and chemical bonds are stretched, broken, and formed in producing the products:

Reactants → Products

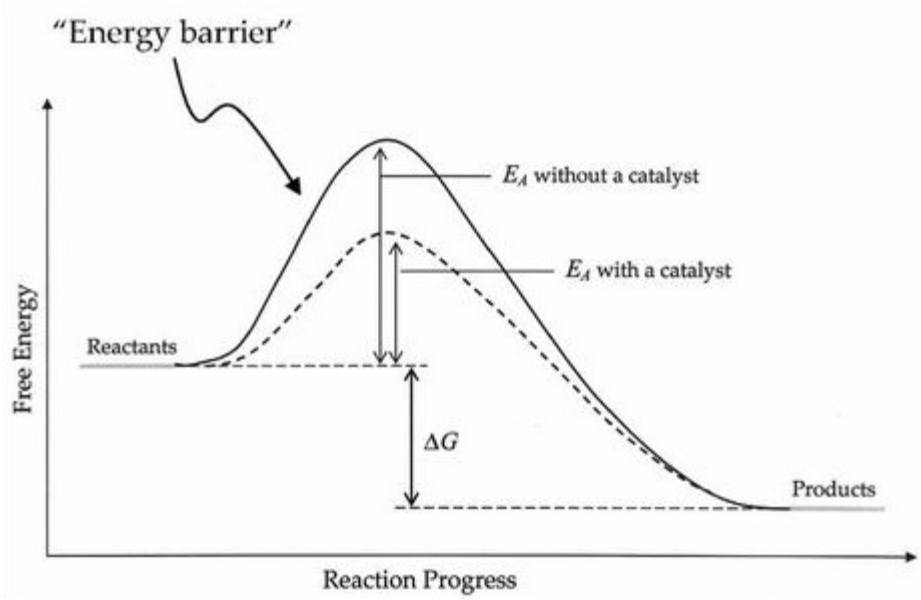

An **activation energy** diagram, showing the energy barrier, separating reactants from products.

During this process the energy of the system increases to a maximum, then decreases to the energy of the products. The "activation energy" is the difference between the maximum energy and the energy of the reactants; i.e. it is the energy barrier that has to be overcome for the reaction to proceed. [1] The activation energy is said to be the heightened measure of energy during the transition state of the chemical reaction.

History

In 1889, building on the previous 1884 work of Dutch physical chemist Jacobus van't Hoff, Swedish physical chemist Svante Arrhenius introduced term "activation energy", by suggesting that a catalyst forms an intermediate complex with the reactants, which acts to lower the activation energy or barrier to reaction or product formation, the logic of which is embodied in the Arrhenius equation. [4] In particular, Arrhenius found that the plot of the logarithm of the rate constant (ln k) against the inverse of the absolute temperature (1/T) is a straight line: [5]

$$\ln k = \text{intercept} + \text{slope} \times \frac{1}{T}$$

where the intercept is denoted ln *A* and the slope is denoted $-E_A/R$, where *R* is the ideal gas constant, *A* is the pre-exponential factor, and E_A is the activation energy:

$$\ln k = \ln A - \frac{E_A}{RT}$$

whence

$$E_A = RT(\ln A - \ln k)$$

German physical chemist Wilhelm Ostwald, according to Keith Laidler (1993), the first to realize that a catalyst acts without altering the energy relations of the reaction, and that it usually speeds up a reaction by lowering the activation energy. [2]

Biology

In 1912, Austrian-born American physical chemist and mathematician Alfred Lotka was using the term "trigger action" to explain the way in which the sight of a predator by the eyes of a prey acts to start the flee reaction, which is a crude way of explaining activation energy in biological terms. [6]

Russian bio-geologist Vladimir Vernadsky was one of the first to state that radiation from the sun operates as a factor of activation energy: [7]

> "The radiations that pour upon the earth cause the biosphere to take on properties unknown to lifeless planetary surfaces, and thus transform the face of the earth. **Activated** by radiation, the matter of the biosphere collects and redistributes solar energy, and converts it ultimately into free energy capable of doing work on earth."

It is difficult to know exactly what Vernadsky means by 'activated' here as this is a somewhat modern term for 1926 as the theory of activation energy (1884) was a relatively new concept and the electron-photon model of activation energy (Bohr, 1913) in terms of thermodynamics (Lewis, 1916) was even more modern.

Human chemistry

See main: Social activation energy

The study of activation energy in human chemistry is a complex subject, being that a number of potential theories can be used to explain the activation energy aspects of human chemical reactions, such as molecular orbital orientation, entropy of activation, heat (e.g. summer vs winter), trajectory collisions, catalysts, human catalysts, substrate factors (e.g. renting vs owning), among other aspects. [3]

A simple example, Lotka's model that light "triggers" flee reaction, it is know that, via the process of love at first sight, "light" triggers the male female reaction, and it is statistically known that about 2/3 of people believe in love at first sight and 20% fall in love at first sight and marry that person. [8]

In simple terms, a useful generalization supported by the Arrhenius equation is that, for many common chemical reactions at room temperature, the reaction rate doubles for every 10 degree Celsius increase in temperature. Thus, two human molecules in proximity during the winter months may not have sufficient activation energy to react, say, into a bonded relationship, but the same two molecules, in the summer months, may successfully collide and react, owing to a warmer reaction system or in other words owing to a lower activation energy.

References

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2. Laidler, Keith J. (1993). *The World of Physical Chemistry* (pg. 212). Oxford University Press.
3. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (activation energy, pgs. 94-98, 100, 279-84). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (activation energy, pgs. 448, 458, 498, 549, 695). Morrisville, NC: LuLu.
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(b) Anon. (1980). *Academic American Encyclopedia* (pg. 213). Aret Pub. Co.
5. Atkins, Peter and Jones, Loretta. (2007). *Chemical Principles: the Quest for Insight* (pg. 556). MacMillan.
6. (a) Lotka, Alfred. (1912). "Evolution in Discontinuous Systems" (pg. 71), *Journal of the Washington Academy of Sciences*, Vol. 2.
(b) Guilleminot, Hyacinthe. (1919). *Matter and Life* (*La Matiere et la Vie*) (pg. 115). Flammarion.
(c) Johnstone, John. (1921). *The Mechanism of Life* (pg. 49). Liverpool.
7. Vernadsky, Vladimir I. (1926). *The Biosphere* (pg. 44). Copernicus.
8. Fisher, Helen. (1992). *Anatomy of Love - a Natural History of Mating, Marriage, and Why we Stray*, (section: "Love at First Sight", pgs.49-50). New York: Fawcett Columbine.

External links

â— Activation energy – Wikipedia.
â— Activation energy – IoHT Glossary.

θΔics

In hmolscience, **active Brownian agent**, or Brownian agent, is agent conceived as a point-like particle that has active Brownian motion, the term "active" meaning the ability of an individual unit to move actively by gaining kinetic energy from the environment, active particles or agents assumed to have an internal propulsion mechanism (motor) and may use energy from an external source and transform it under non-equilibrium conditions into directed accelerated motion. [1]

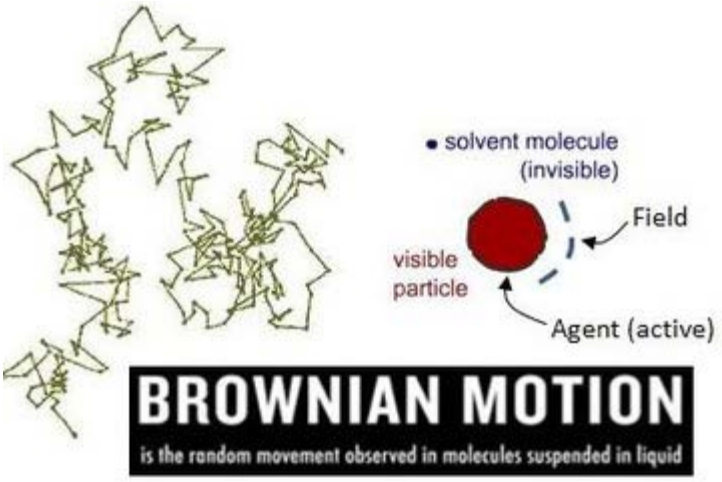

In 1905, Albert Einstein explained Brownian motion in terms of molecular collisions between the visible particles with the invisible solvent molecules, whereby owing to constant and random bombardment, sometimes a particle is pushed one way, sometimes another, smaller particles move more than larger ones, and motions increase with increasing temperature.

Etymology

The term "active Brownian motion" was introduced in 1995 by German theoretical physicists Lutz Schimansky-Geier, Michaela Mieth, Helge Rose, and Horst Malchow as follows: [2]

> "We call Brownian particles with the ability to generate a field **active Brownian particles** if the produced field self-consistently determines the motion of the particles or defines their rates of chemical reactions."

Since this introduction, the term seems to have taken on an expanded or alternative meaning, depending. Werner Ebeling, Lutz Schimansky-Geier, et al, in 2012 gave the following history: [1]

> "The concept of '**active Brownian particles**' introduced more than a decade ago. The term was first introduced by [Schimansky-Geier, et al] [2], referring to Brownian particles with the ability to generate a field, which in turn can influence their motion. In the following Ebeling, Schweitzer and others used this term in the context of self-propelled particles far from equilibrium. In general we will refer to "active Brownian particles" in the latter context as Brownian particles performing active motion, which may be accounted for by an internal energy depot and or a (nonlinear) velocity-dependent friction function."

(add discussion)

References

1. Romanczuk, Pawel Bar, M., Ebeling, Werner, Lindner, B., and Schimansky-Geier, Lutz. (2012). *Active Brownian Particles: From Individual to Collective Stochastic Dynamics; Dedicated to the Late Frank Edward Moss (1934 - 2011) Volume 202 of The European physical journal special topics* (abs) (pdf). EDP sciences.
2. Schimansky-Geier, Lutz, Mieth, Michaela, Rose Helge, and Malchow, Horst. (1995). "Structure Formation by Active Brownian Particles" (abs), *Physics Letters A*, 2-07:140-46.

Further reading

● Schweitzer, Frank. (1997). "Active Brownian Particles: Artificial Agents in Physics", in *Stochastic Dynamics, Lecture Notes in Physics* (editors: Lutz Schimansky-Geier and T. Poschel) (pgs. 358-71), *Volume 484*. Springer.
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● Ebeling, Werner, Schweitzer, Frank, and Tilch, Benno. (1999). "Active Brownian Particles with Energy Depots Modeling Animal Mobility", *Biosystems*, 4(1):17-29.
● Schweitzer, Frank. (2003). *Brownian Agents and Active Particles: Collective Dynamics in the Natural Sciences*. Springer, 2007.

θΔics

In thermodynamics, **actual energy** is []

Overview

In 1853, Scottish physicist William Rankine, in his “On the General Law of Transformation of Energy”, defined actual energy as follows: [1]

> “Actual [energy], or sensible energy, is a measure, transmissible, and transformable condition, whose presence causes a substance to tend to change its state in one or more respects. By the occurrence of such changes **actual energy** disappears, and is replaced by potential [energy] or latent energy; which is measured by the product of a change of state into the resistance against which that change is made. The *vis viva* of matter in motion, thermometric heat, radiant heat, light, chemical action, and electric currents, are forms of actual energy; amongst those of potential energy are the mechanical powers of gravitation, elasticity, chemical affinity, statical electricity, and magnetism.”

Rankine's term "actual energy", supposedly, is a near-synonym to the 1862 coined term kinetic energy.

References

1. Rankine, William. (1853). “On the General Law of Transformation of Energy”, Read before the *Physical Society of Glasgow*, Jan 05; in; *Proceedings of the Physical Society of Glasgow*, 3(5); in: *Miscellaneous Scientific Papers* (pgs. 203-). C. Griffin and Co., 1881.

θΔics

In existographies, **Adair Crawford** (1748-1795) (CR:2) was an English chemist, physician, and surgeon, noted for []

Overview

In 1776, Crawford travelled to Scotland where he attended, as has been conjectured (Cardwell, 1971), the chemistry lectures of William Irvine, having an interest in solving the problem of the nature of animal heat via comparing the specific heats of inhaled air (oxygen and nitrogen) vs exhaled air or "fixed air" (carbon dioxide) as it was then called. [1]

Quotes | On

The following are quotes on Crawford:

> "About the year 1780, it was distinctly proved that the same weights of different bodies require unequal quantities of heat to raise them through the same temperature, or give out unequal quantities of heat on cooling through the same number of thermometric degrees. It was recognized that for different bodies the unequal quantities of heat, by which the same weights of different bodies are heated through the same range, must be determined as special constants, and considered as characteristic of the individual bodies. This newly discovered property of bodies, Wilcke designated as their 'specific heat', while **Crawford** described it as the 'comparative heat', or as the *capacity* of bodies *for heat.*"
>
> — Hermann Kopp (1865), "Investigations of the Specific Heat of Solid Bodies" [2]

> "In 1779, **Crawford** published an account of his experiments and observations in the form of a book on animal heat. Crawford measured the specific heats of a large number of inorganic and organic substances and, something quite new, the specific heats of common air and 'fixed air' (carbon dioxide). This he did by filling a bladder with the two airs and comparing the heating and cooling effects they had on a given amount of water at a known temperature. He concluded that the 'specific heat' of fixed air was much smaller than that of ordinary air, only 1/67 in fact. Hence, as in respiration one breaths in ordinary air an exhales fixed air with a much reduced heat capacity there must, on Irving's principles, be a substantial emission of heat as a result of the change. Perhaps this was the real cause of animal heat? In his second and much expanded edition of the work (1788) Crawford described experiments using brass containers in place of bladders for the measurement of the specific heat of gases. The results, of course, could had have been accurate, and he had no appreciation of the fact that in the first experiments, in principle at any rate, he had been measuring the specific heats of gases at constant pressure (Cp) and in the second at constant volume (Cv)."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 57)

References

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2. Kopp, Hermann. (1865). "Investigations of the Specific Heat of Solid Bodies", *Journal of the Chemical Society*, 4(19): 154-234.

Further reading

â— Crawford, Adair. (1779). *Experiments and Observations on Animal Heat*. London.
â— Crawford, Adair. (1788). *Experiments and Observations on Animal Heat*. London.

External links

â— Adair Crawford – Wikipedia.

θΔics

In religio-mythology, **Adam** (TR:175), from the Semitic *adamah*, meaning “ground” (or clay), + “Atum”, the Egyptian primordial land mound god, as contrasted with Eve, is the name of the first human, created by god, according to the Abrahamic religions.

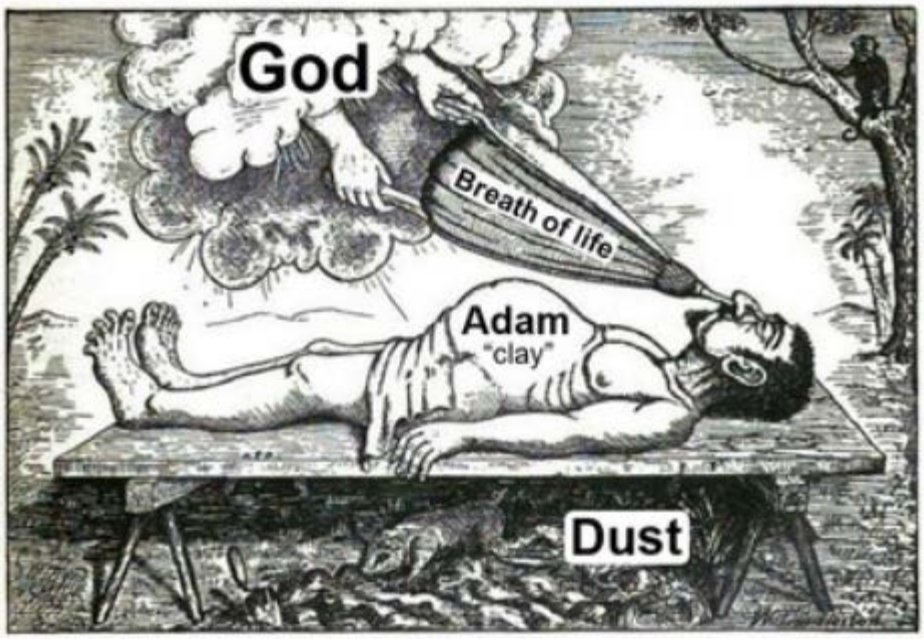

A depiction of god making **Adam**, according to Genesis 2:7, as comically illustrated by Watson Heston (1890). [2]

Overview

In 500BC, in the Bible, in Genesis 2:7, the following statement, concerning the origin of man, is found:

> “And the lord god formed man of the dust of the ground, and breathed into his nostrils the breath of life, and man became a living soul.”

The name "Adam", is first seen in Genesis 2:19, as follows (KJV):

> “Denn als Gott der HERR gemacht hatte von der Erde allerlei Tiere auf dem Felde und allerlei Vögel unter dem Himmel, brachte er sie zu dem Menschen, daß er sähe, wie er sie nennte; denn der **wie Mensch** allerlei lebendige Tiere nennen würde, so sollten sie heißen.” (Luther Bibel, 1545) (Q)
>
> “And out of the ground the Lord God formed every beast of the field, and every fowl of the air; and brought them unto **Adam** [*ha-adam* or **‘the man’**] to see what he would call them: and whatsoever Adam called every living creature, that was the name thereof.” (KJV, 1611) (Q)

(add)

Atum

See main: Atum and Adam

In 1907, Gerald Massey, in his decoding of the story of Cain and Abel, connects Atum and Adam as follows: [3]

Story / Myth	Version
Atum (father)	
Set & Osiris | → Horus (legitimate heir)	Egyptian mythology (c.2800BC)
Adam (father)	
Cain & Abel | →	Jewish mythology

Seth (legitimate heir) (c.500BC)

In 2000, Gary Greenberg, similar to Massey, argued that the name the first man, as Adam, according to Jewish mythology, made from clay or earth, is a rescript of Coffin Text 80, wherein Atum, the primordial god, conceptualized as the land mound of "earth" (e.g. pyramids), which emerged from the Nun (or was created by Nun), or primordial flood (i.e. Nile River), "breaths" out the god Shu (or air), through his nostrils, the life force god. Greenberg also asserts that the myth of Khnum creating the first two humans from clay, on his potter's wheel, which are brought to life by the power of the Ankh, put to the mouth of the clay, by the god Hathor, plus the older Mesopotamian myth of creation of the first humans from a mixture of blood and clay, were influential, via syncretism, in the story or rather two parallel creation of Adam stories. [1]

Quotes | Adam's rib

The following are Adam's rib related quotes:

> "How could god create **Eve** from Adam's rib?"
>
> — Ricky (2015), one of three written down questions, brought by an aged 11 boy to Libb Thims' Zerotheism for Kids: Smart Atheism for Children "Monday School" class, Aug 10

> "Why was there a first man, instead of a woman?"
>
> — Temple (2015), one of six written down questions, brought by an aged 10 girl to Libb Thims' Zerotheism for Kids: Smart Atheism for Children "Monday School" class, Aug 10

> "The drafting book *Smart Atheism: for Kids* is a follow up to an actual 'smart atheism' stylized 'Sunday School' for kids class I taught in Aug 2015 to five kids, who came with Noah's ark and Adam's rib questions and left (Q) with Big Bang and molecular evolution answers."
>
> — Libb Thims (2017), "Email to Gary Greenberg", Jun 10

Quotes

The following are related quotes:

> "The first creation story focuses on heaven and earth; the second focuses on human beings. The first story ends with man; the second begins with him. In the first, man is to be the master of life on earth (1:28); in the second, he is to be the servant of the earth (2:5, 2:15). In the first male and female are created together; in the second they are created sequentially. In the first story, man is made directly in the image of god (1:27); in the second he is made of earthly dust and divine breath (2:7) and becomes godlike only at the end — 'now man is become like one of us' (3:22) — and only in transgressing'."
>
> — Leon Kass (2003), *Beginning of Wisdom* (Q)

See also

- Adam and Eve
- Adam's rib
- Clay creation myth

References

1. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (§Myth #19: God formed Adam from the dust of the earth, pgs. 46-47). Source Books.
2. Heston, Watson. (1890). *The Old Testament Comically Illustrated*. The Truth Seeker Co, 1892.
3. Massey, Gerald. (1907). *Ancient Egypt: The Light of the World: a Work of Reclamation and Restitution in Twelve Books, Volume One* (pgs. 457-58). T. Fisher Unwin.

External links

- Adam – Wikipedia.
- Adam – Online Etymology Dictionary.

θΔics

In religio-mythology, **Adam and Eve**, Hebrew for "clay" and "breath", respectively, is a monotheistic transcription and syncretism rewrite of a combination of the Egyptian clay creation myth and the Greek original sin based "soul mate" theory, according to which, instead of the god-goddess pair Khnum-Hathor creating the original two humans by splitting a ball of clay in two, on a divine potter's wheel, thereby splitting their original soul, god creates the first human "Adam" out of clay or the dust of the ground, then forms the first female "Eve" out of one of Adam's ribs, then puts them in the "Garden of Eden" where the commit the "original sin" by eating from the forbidden "tree of knowledge".

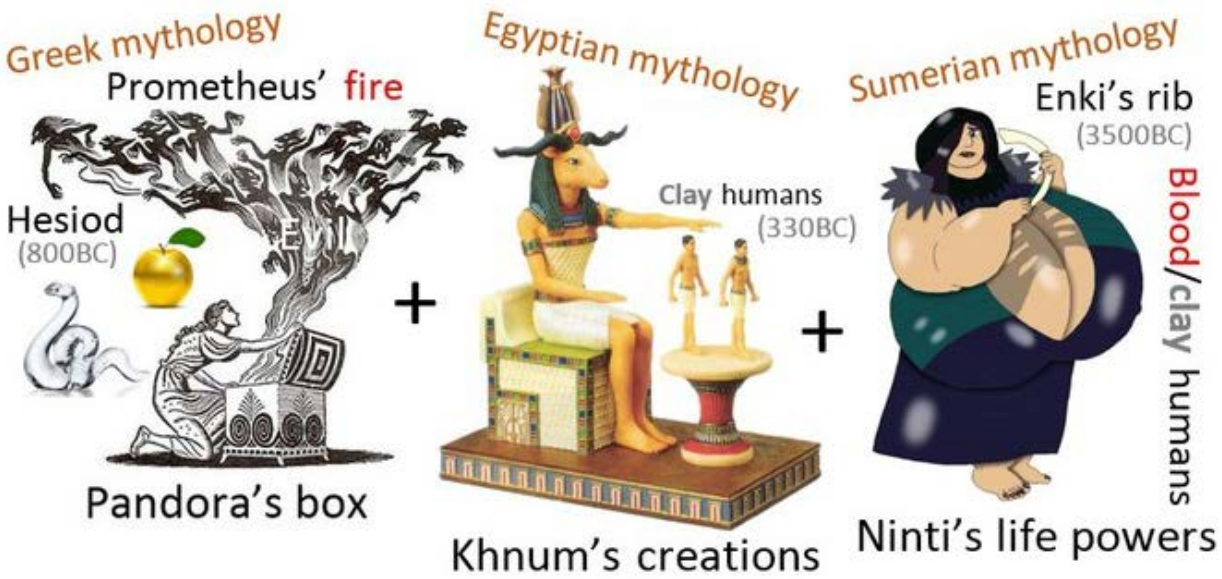

The basic nuts and bolts (O) of where the Biblical story of **Adam and Eve** derive, as taught during the "Zerotheism for Kids" (2015) class, namely: Adam eating the forbidden fruit in the Garden of Eden and thereby letting evil into the world, stemming from Hesiod's story of Pandora' box; Eve coming from Adams' rib, deriving from the myth of Enki's magical rib pain healing power and ability to make humans out of a mixture of blood and clay; and the Hebrew rendition of Adam as "clay" and Eve as "breath/spirit" deriving from Khnum's ability to make humans on his potter's wheel who were then brought to "life" by the powers of the ankh used by the goddess Hathor. Polls (2014) show that 56% of Americans believe that Adam and Eve were real people.

Overview

In 2650BC, Egyptian polymath Imhotep, was mentioning the god Khnum, associating him with the Nile food, as described in a third dynasty (2686-2613BC) inscription by King Zoser, on the rocks at Sehel Island, near Elephantine (Khnum's main cult center), wherein a seven-year famine occurred, wherein it was advised that Khnum would let the Nile flood once again if his temple was renovated. Sometime thereafter, in the millennium to follow, Khnum became the god who created humans, out of clay, on his divine potter's wheel, who were animated by the goddess Isis who put spirit, soul, and or breath into the clay figurines, with the power of the ankh, shown below, to bring them into life.

In 600BC, Greek philosophers, including: Thales, Democritus, Pythagoras, Plato, and others, each began to immerse themselves in a study abroad period in Egypt, to learn their philosophy, science, and religio-mythology based theology; wherein, Plato, in particular, learned the Egyptian clay creation myth origin of humans, thereafter incorporating this human origins model into the split human soul mate, as described in his c.380BC *Symposium*.

In circa 200BC, this general Plato-Imhotep origins of humans model, was reformulated, by the Hebrew scholars, i.e. "Is-Ra-El-ites", into the monotheistic conceptualized story of Adam and Eve, and the the Garden of Eden, shown below, which presently is taught to child throughout the modern world, in Christianity and Islamic faiths, as the origins of humans:

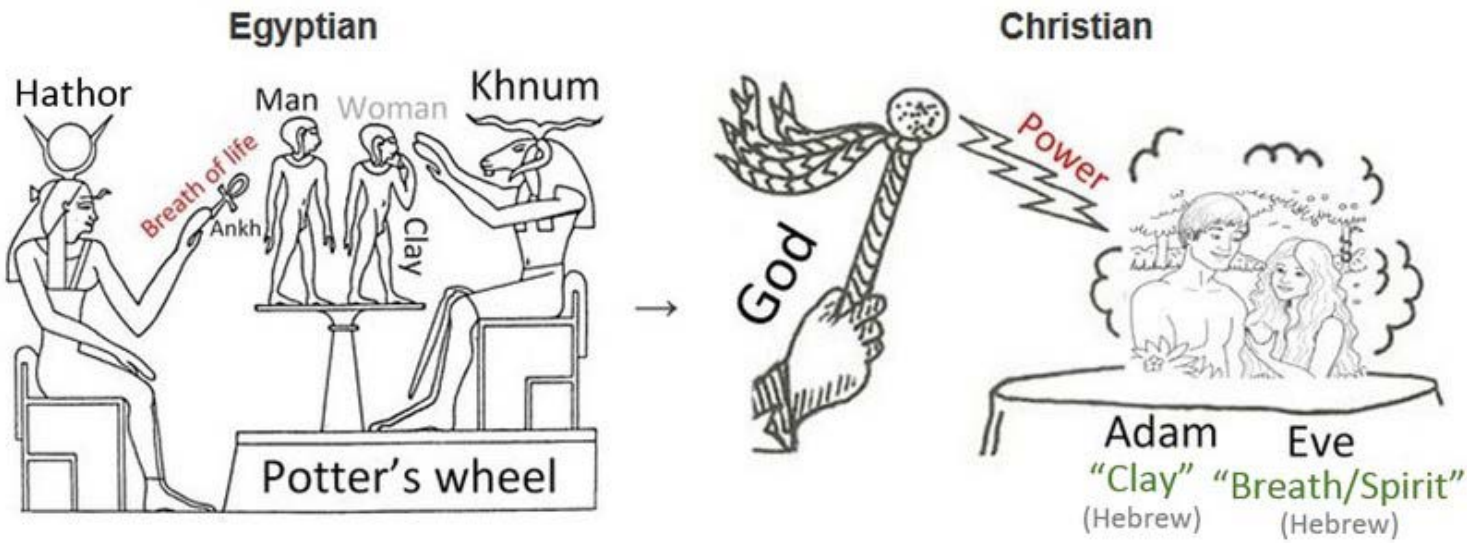

In circa 1700, German polymath Gottfried Leibniz (1646-1716), in his monad theory, argued that the soul and body are eternal, inseparable in companionship, a consequence of which being the following, as summarized by Ernst Haeckel (1899): [3]

> "The souls of men have existed in organized bodies in their ancestors from **Adam** downward, i.e. from the very beginning of things."

In circa 1770, German physiologist Albrecht Haller (1708-1777), based on the "scatulation theory", which assumed that the outline of the entire organism, with all its parts, was present in the egg, according to which the ovary of the embryo had to supposed to contain the ova of the following generation (and, these, again, the ova of the next generation; and so on), calculated that god, 6,000-years ago, on the sixth day of creation, packed the germs of 200-billion men into the ovary of Eve (see: Adam and Eve). [3]

Curiously, according to 2014 polls, 56% of Americans, including many atheists, believe that Adam and Eve were real people. [1]

Physicochemical | Origins

The following is the modern physicochemical understanding of human origins, via thermodynamically quantifiable chemical synthesis:

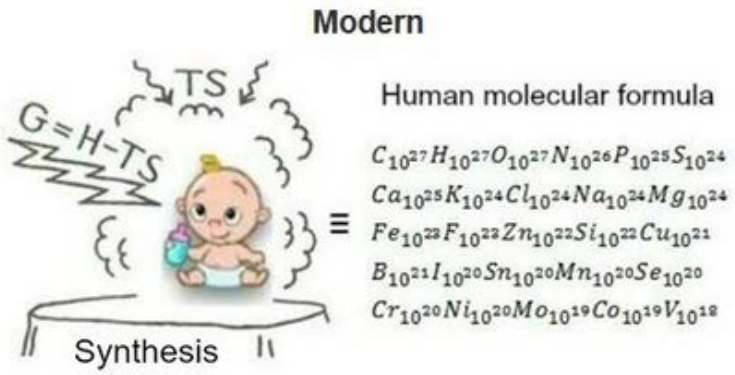

In short, we no longer believe in the origins of humans from Adam and Eve, but rather from atoms and energy, created not by the power of god, but by the power of Gibbs energy; a process that, in some way, is coupled to the waves, tides, and rhythms of the universe.

Quotes

The following are related quotes:

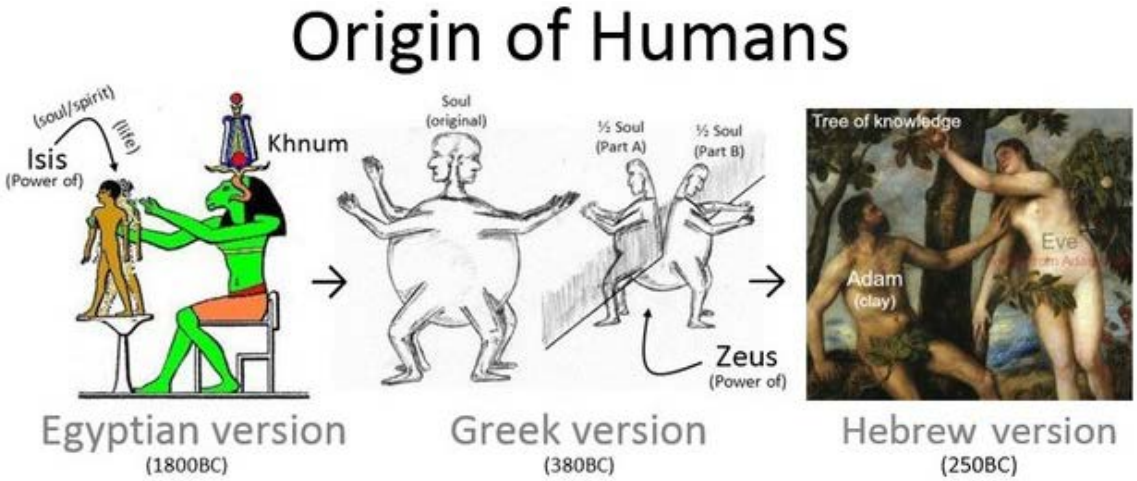

The Egyptian-Greek mythology derived monotheistic transcription and syncretism origin and basis of the story of **Adam and Eve** and original sin, version of the origin of humans, derived from a combination of the clay creation myth and the split soul or soul mate theory.

"The story of **Eve** and the serpent, and of Noah and his ark, drops to a level with the Arabian Tales, without the merit of being entertaining, and the account of men living to eight and nine hundred years becomes as fabulous as the immortality of the giants of the mythology."

— Thomas Paine (1794), *The Age of Reason* (Q)

"It has always been a mystery to me how **Adam**, **Eve**, and the serpent were taught the same language. Where did they get it? We know now, that it requires a great number of years to form a language; that it is of exceedingly slow growth. We also know that by language, man conveys to his fellows the impressions made upon him by what he sees, hears, smells and touches. We know that the language of the savage consists of a few sounds, capable of expressing only a few ideas or states of the mind, such as love, desire, fear, hatred, aversion and contempt. Many centuries are required to produce a language capable of expressing complex ideas. It does not seem to me that ideas can be manufactured by a deity and put in the brain of man. These ideas must be the result of observation and experience."

— Robert Ingersoll (1879), *Some Mistakes of Moses* (Q)

"Do you, good people, believe that **Adam and Eve** were created in the Garden of Eden and that they were forbidden to eat from the tree of knowledge? I do. The church has always been afraid of that tree. It still is afraid of knowledge. Some of you say religion makes people happy. So does laughing gas. So does whiskey. I believe in the brain of man."

— Clarence Darrow (c.1925), Scopes Monkey trial commentary

"God made **Adam and Eve**. Not Adam and Steve."

— Anon (2005), letter sent to Tammy Kitzmiller, following 14 Dec 2004 filing of Kitzmiller vs Dover lawsuit on teaching creationism to biology students to explain the origin of life, as an alternative to evolution theory, *circa* Jan [2]

"In the Bible, a woman was made from a man. In real life, a man is made from a woman."

— Mokokoma Mokhonoana (c.2010)

"**Adam and Eve** are historical persons created by god in a special formative act, and not from previously existing life-forms."

— Staff (2014), the new Bryan College belief statement, a reaction to declining Christian values; which professors now have to sign as part of their employment contract (Q)

> “[I’m an atheist because] I believe in atoms and energy, not **Adam** and **Eve**.”
>
> — Libb Thims (2015), response answer (Q) to question: “So, why are you an atheist?”, from Brian, an age 18 atheist (who was at the 8 Jun 2015 Atheism Reviews filming session), *circa* Jun 12

References

1. (a) Saletan, William. (2014). “God’s Work? A New Poll suggest American’s aren’t so Confident in their Creationism” (Q), Slate.com, Dec 4.
(b) Thims, Libb. (2015). “Were Adam and Eve Real People? 56% of Americans say Yes!” (Q), HumanChemistry101, Jan 6.
2. Lebo, Lauri. (2008). *The Devil in Dover: an Insider’s Story of Dogma v. Darwin in Small-Town America* (“Adam and Steve”, pg. 90). The New Press.
3. Haeckel, Ernst. (1899). *The Riddle of the Universe: at the Close of the Nineteenth Century* (translator: Joseph McCabe) (pg. 55). Harper & Brother, 1900.

Videos

- Thims, Libb. (2015). “Were Adam and Eve Real People? 56% of Americans say Yes!” (Q), HumanChemistry101, Jan 6.

External links

- Adam and Eve – Wikipedia.

θΔics

In existographies, **Adam Smith** (1723-1790) (IQ:170|#324) (Cattell 1000:318) [RGM:80|1,500+] (GEE:#) (CR:56) was a Scottish social philosopher and political economist noted, in human physics, for his 1759 *Theory of Moral Sentiments*—the first chapter of which described as "striking" by Charles Darwin (*Descent of Man*, 1871)—a book conceived as a prelude to his *Inquiry into the Nature and Causes of the Wealth of Nations* (1776), in which he describes his "invisible hand" notion, conceives of people as atoms or particles in a system held together by enforced natural justice.

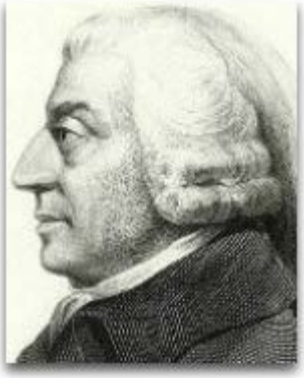

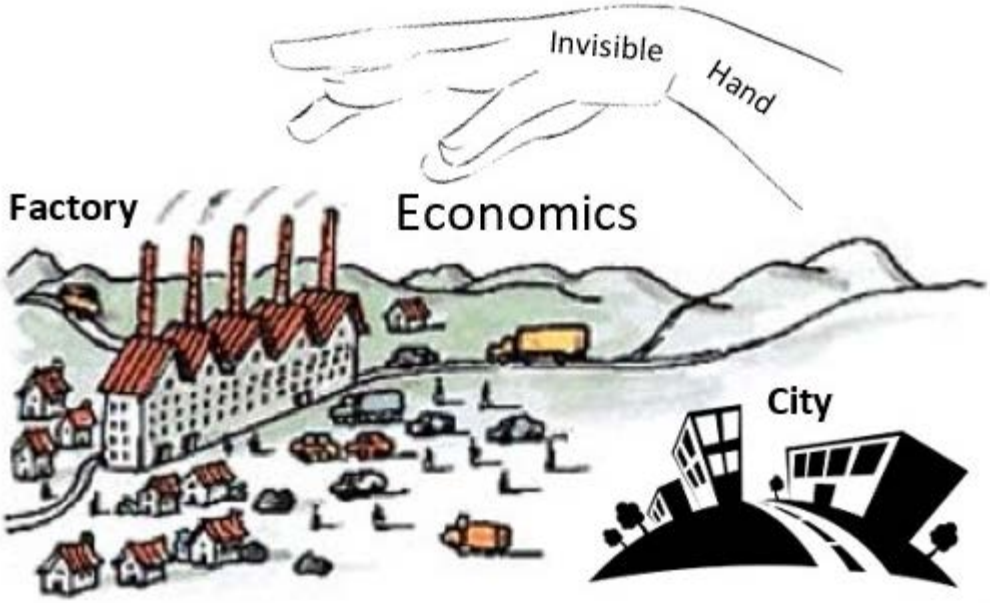

Smith's formulation of justice, supposedly, is seen as a negative formulation of Vilfredo Pareto's optimality. (Ñº)

Education

Smith, whose father died (dereacted) before he was born, was supposedly a sickly child, who at the age of 3 was kidnapped from his uncle's porch by gypsylike vagrants known as "tinkers", albeit later rescued by his uncle. Thereafter, Smith was known as a bookworm with a spectacular memory, who entered the University of Glasgow at age 14, then Oxford University at age 17, then became appointed professor of "moral philosophy" at the University of Glasgow.

In 1764, Smith left Glasgow for London and then to France as he tutored the young Duke of Buccleuch, during the course of which he began to familiarize himself with the new economic ideas of the physiocrats, especially with the work of French physician turned economic theorist Francois Quesnay. Smith, supposedly, agreed with Quesnay in all respects except that whereas Quesnay argued that the source of economic strength or wealth was "land", Smith reasoned that the source was "labor". [7]

Newton

Smith's an attempt at formulation of the general laws of economics, is said to have been directly inspired and shaped by English physicist Isaac Newton's 1687 formulation of the laws of motion. [1] Smith is said to have found particular inspiration in Newton's notion of causative forces. [2]

Humans | Atoms or particles

In his 1759 *The Theory of Moral Sentiments*, Adams declares that man is an atom or particle of the system and that justice is the main pillar that keeps humans as atoms bound together into a fabric: [6]

> "A wise man never complains of the destiny of providence, nor thinks the universe in confusion when he is out of order. He does not look upon himself as a whole, separated and detached from every other part of nature, to be taken care of by itself and for itself: he regards himself in the light in which he imagines the

> great genius of human nature, and of the world, regards him: he enters, if I may say so, into the sentiments of that divine being, and considers himself as an **atom**, a particle, of an immense and infinite system, which must and ought to be disposed of according to the conveniency of the whole."
>
> "Justice, on the contrary, is the main pillar that upholds the whole edifice. If it is removed, the great, the immense fabric of human society, that fabric which to raise and support seems in this world, if I may say so, to have been the peculiar and darling care of nature, must in a moment crumble into **atoms**. In order to enforce the observation of justice, therefore, nature has implanted in the human breast that consciousness of ill-desert, those terrors of merited punishment which attend upon its violation, as the great safe-guards of the association of mankind, to protect the weak, to curb the violent, and to chastise the guilty."

This work is said to have formed the basis of Smith's later 1776 *Inquiry into the Nature and Causes of the Wealth of Nations.*

Invisible hand | human molecules

Smith, in his *The Theory of Moral Sentiments*, also famously introduced the theory of the invisible hand: [3]

> "Led by an invisible hand to promote an end which was no part of his intention, by pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it. I have never known much good done by those who affected to trade for the public good. It is an affectation, indeed, not very common among merchants, and very few words need be employed in dissuading them from it."

Herein, Smith describes a selfish landlord as being led by an invisible hand to distribute his harvest to those who work for him.

The "invisible hand" model was later said to have been carried over into the social mechanics models of Leon Walras and Vilfredo Pareto, both of which employed human molecule models. This human molecule based invisible hand social mechanics logic thus slowly was carried over into economics. An example of this is the following 1967 usage by Spanish economist Jose Sampedro: [4]

> "Initiated by the physiocrats and was finally popularized in **Adam Smith**'s formula of the invisible hand … making it easy for each man to satisfy his own egoism. Once this idea had become generally accepted capitalism had defeated the attitudes that hindered its early advance. This implies the theoretical negation of the social structure in a radical way since the doctrine of capitalism conceived the economy as a cluster of human molecules related to each other on a purely economic basis."

Another version of this is found in a 1999 summary of neoclassical economics, by Robert Costanza and Thomas Prugh, who give the following position:

> "The welfare of human society is best served by the view of people as 'human molecules' who, by pursuing their own interests through the market, inevitably promote the general good. There is little need to consider things from the ecological point of view and embrace the notions of interaction, interdependence, community, and the noneconomic relations people enjoy with each other and with the natural world."

albeit only to argue that this so-called neoclassical economist position is a questionable viewpoint to adhere, in their view. [5]

Quotes | On

The following are noted quotes on Smith:

> "In 1776, **Adam Smith** published his *Wealth of Nations;* which, looking at its ultimate results, is probably the **most important book that has ever been written**, and is certainly the most valuable contribution ever made by a single man towards establishing the principles on which government should be based. In this great work, the old theory of protection as applied to commerce, was destroyed in nearly all its parts; the doctrine of the balance of trade was not only attacked, but its falsehood was demonstrated; and innumerable absurdities, which had been accumulating for ages, were suddenly swept away."
>
> — Henry Buckle (1857), *History of Civilizations, Volume One* (pg. 154)

> "**Adam Smith** inspired belief in the merit of melding the Newtonian physics of the material world with the science of human behavior."
>
> — Tom Siegfried (2006), *A Beautiful Math: John Nash, Game Theory, and the Quest for a Code of Nature* [7]

Quotes | By

The following are quotes by Smith:

> "Wealth, as Hobbes says, is power."
>
> — Adam Smith (1776), *Wealth of Nations* (pg. 13)

References

1. Hetherington, Noriss. (1983). "Isaac Newton's Influence on Adam Smith's Natural Laws in Economics" (abs), *Journal of the History of Ideas*, 44: 497-505.
2. Daniel, Gilles and Sornette, Didier. (2008). "Econophysics: Historical Perspectives", in: *Encyclopedia of Quantitative Finance* (abs), Rama Cont (eds). Wiley, 2010.
3. Invisible hand – Wikipedia.
4. (a) Sampedro, Jose L. (1967). *Decisive Forces in World Economics* (Adam Smith, human molecules, pg. 134). HcGraw-Hill.
(b) Jose Luis Sampedro (Spanish → English) – Wikipedia.
5. Prugh, Thomas and Costanza, Robert. (1999). *Nature Capital and Human Economic Survival* ("human molecules", pgs. 16-17; Section: "Economics and Entropy", pgs. 40-42). CRC Press.
6. (a) Smith, Adams. (1759). *The Theory of Moral Sentiments* (§3: Of the Utility of This Constitution of Nature, "crumble into atoms", pg. 125; "considers himself as an atom", pg. 405). Publisher.
(b) Oakley, Allen. (1994). *Classical Economic Man: Human Agency and Methodology in the Political Economy of Adam Smith and J.S. Mill* (pg. 59). Edward Elgar Publishing.
(c) The Theory of Moral Sentiments – Wikipedia.
7. Siegfried, Tom. (2006). *A Beautiful Math: John Nash, Game Theory, and the Modern Quest for a Code of Nature* (Newtonian, pg. 12; education, pg. 15-16). National Academies Press.

Further reading

â— Foley, Vernard. (1976). *The Social Physics of Adam Smith* (thermodynamics, pgs. 191-94; entropy, pg. 199). Purdue University Press.

External links

â— Adam Smith – Wikipedia.

θΔics

In existographies, **Adam Walker** (1731-1832) was an English inventor, astronomer, and itinerant science lecturer noted for his 1799 *System of Familiar Philosophy: in Twelve Lectures*, taught at Syon House Academy, which were attended by an aged eleven Percy Shelley, who would be inspired to outline an atheism-based elective affinities philosophy, which he applied in his relationships (see: Church of Elective Affinities). [1]

Overview

In 1802, Walker, in his revised two-volume *System of Familiar Philosophy: in Twelve Lectures*, gave the following nutshell abstract:

> "The work having been written at various times, and in various places, tautology has crept into many parts of it; and I fear some are more condensed than they should be in a system of familiar philosophy. Originality, or the pride of discovery, has not led me beyond the bounds of what I believe to be truth. The identity of fire, light, heat, caloric, phlogiston, and electricity, or rather their being but modifications of one and the same principle as well as their being the grand agents in the order of nature; these are the leading problems of the work; and the parts which have, in a great measure, any pretensions to novelty. They do not militate against the Newtonian system; and are presented to the reader more in the form of queries, than as doctrines fully established: they do not interfere with the elementary part of the work; or influence those conclusions that have been sanctified by time and experience. Whether I am right or wrong in my ideas of them, I doubt not but they will have a fair and candid reading. The theory was not sought, but has obtruded itself through an experience of near forty years: and though it differs in many points from the late received and adopted system of chemistry, my admiration of that simple and elegant system is not at all diminished; I rather lament that its worthy and ingenious founder [Lavoisier] did not live to have perfected so excellent and promising a beginning."

(add discussion)

Chemical affinity

The core section of his book is his lecture four "On Chemistry", section "Affinitive Attraction", as cited by Teddi Bonca (1999), in respect to Percy Shelley. Firstly, he opens to the following cautionary statement about the uncertainty of the nature of heat:

> "I feel a diffidence in the following explanations, conscious how much I am obliged to deviate from the received, or rather the new, documents of chemistry. For being able to find little difference between the phlogiston of the old chemists, and the caloric of the new, I have made the word fire to answer both.
>
> Phlogiston was considered as fire united to some unknown substance. Lavoisier says, caloric is that exquisitely elastic fluid which produces heat. Am I excused in calling these plain fire, as it is generally produced on the earth, is known to be impure, and

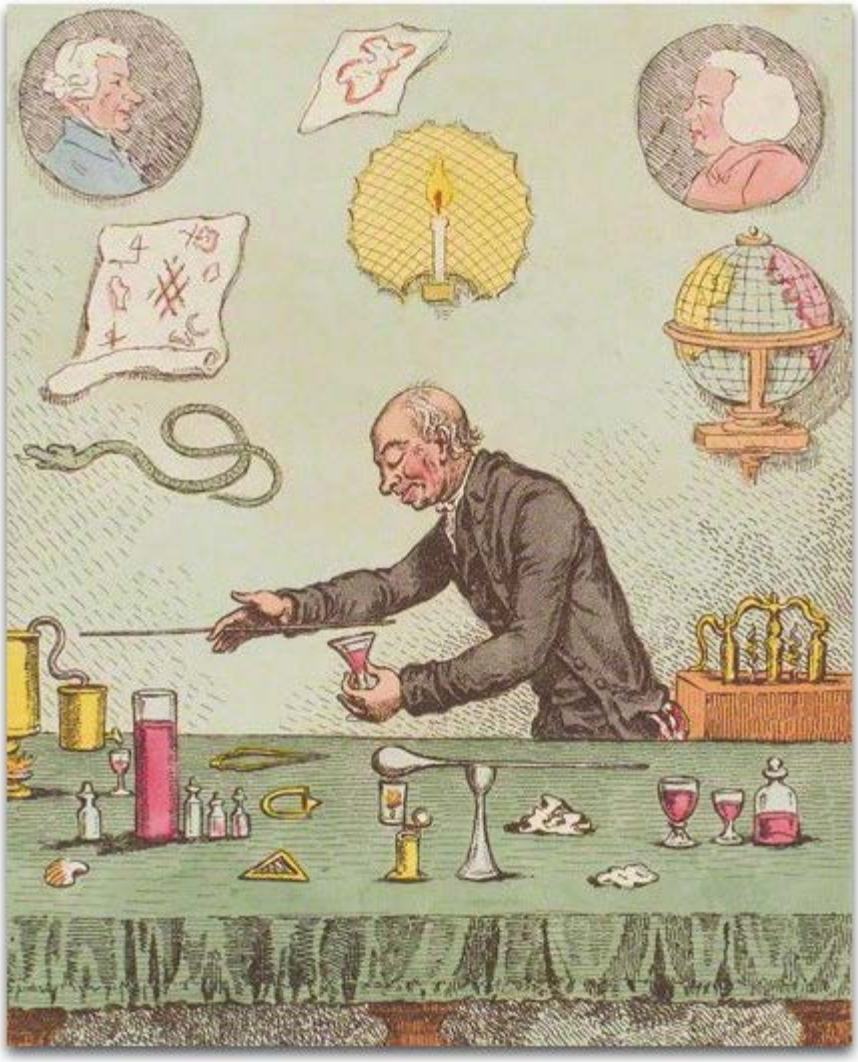

A 1796 portrait (Ñº) of what seems to be **Walker** (or possibly Joseph Priestley) giving one of his chemistry lectures.

united with much terrestrial matter; and, therefore, may have given rise to the idea of an unknown substance being united to the simple element. This element of fire having its chemical affinities in common with grosser bodies, enters more abundantly into some than into others; hence some bodies are more combustible than others, from containing more quiescent or latent fire; and therefore when that fire is extricated from such bodies, it brings much of their gross matter along with it. But when fire is united with the volatile and finer parts of terrestrial matter, it transforms it into that thin fluid we call our atmosphere. Fire therefore assumes various appearances, and produces various effects; but still I conceive the element to be identical, simple, unchangeable, deriving its various character from the substances with which it is combined. In short, in its elementary state I conceive it to be electricity, and I hope to prove that electricity is derived from the sun."

Then, after devoting several pages to definitions of basic chemistry terms: acids, alkalis, solution, distillation, crystallization, sublimation, etc., he engages in his "affinitive attraction" subsection, as follows:

"AFFINITIVE ATTRACTION. Purposing to carry forward the mechanical and chemical philosophy hand in hand, this lecture is devoted to the first principles of the most extensive and useful branch of natural philosophy: for all arts and manufactures are little more than the composition, or decomposition, of the natural bodies of the earth. We are indebted for many of the important facts in chemical analysis to a race of visionaries, who, in the pursuit of the philosopher's stone, and the elixir vitae, happily stumbled upon a variety of discoveries, that have been of more importance to mankind, than the grand secrets they were in pursuit of would, had they been found out. These facts, though now systemized into a tolerably regular and consistent theory, simple in its principles, and, seemingly, accordant in its various ramifications; yet, I am sorry to say, it does not quite agree with the experiments and observations that have fallen in my way to

make.

I think the grand basis of chemistry is attraction and repulsion. By attraction, I mean not only that of cohesion and gravitation (formerly explained), but the affinities of matter; the elective attractions, or local affections of it, that is, the tendency which the constituent parts of bodies have to unite readily with some substances, in preference, as it were, to all other parts of matter. Water and spirits are said to have an affinity, because they unite with the utmost readiness and affection. Water and oil have no affinity, because they will not unite (except by the intervention of an alkali, by which they become soap); for if oil and water are shaken together, it will be found the parts of each attract those of the same kind more strongly than the other, and the two presently separate. Acids and alkalis have so strong an affinity, that they rush into union with effervescence and ebullition so strong, indeed, is the attachment between acids and alkalis, that one will detach the other from most compounds with which that other is united.

The sea is a compound of fresh water and salt; yet so perfectly clear and homogeneous (as solutions generally are), that water and salt may be said to have affinity. That this selection, this choice, as it were, is but a modification of the attraction of cohesion, I entertain no doubt; for as various effects in chemical experiments prove the particles of matter to be of various shapes or forms, such particles as by their figure can lie conveniently by the fides of each other, or admit their centers coming nearer together, will adhere more strongly than those combinations where the corners and edges of particles do not fit, but enclose great spaces or interstices among them. This last may be called the attraction of cohesion; the other the attraction of affinity; but it is a distinction with little difference. See Plate V. in Magnetism, where the conforming fides of differently shaped particles so adjust themselves to one another as to become regular figures: something like the irregular flat stones in the Flaminian pavement that make a regular highway."

Then, after listing a set of ten laws of affinities, he states:

"Because the laws of this, and the other species of cohesive attraction, do not seem to follow the laws of gravity (by diminishing as the squares of the distances increase), some imagine them of a distinct and different nature from the attraction that holds, the earth and the planets together. But can such small masses as we can make our experiments upon, betray the fame strong phenomena as a world, a planet, or a sun? Could we measure the ratio of the attraction, exhibited between two corks running to meet each other, when swimming on the surface of water, I entertain little doubt but it would be found to be in the same ratio as the laws of gravitation. Magnetic and electric attraction probably are the fame also. Similar phenomena must arise from the same law, if we are not to multiply causes; which certainly is a most excellent rule in philosophizing, or examining nature."

Then he states:

"Objections are also made to fire and light being the same, because heated iron exhibits no light till it becomes violently heated. Fire lying in a latent state in metals, must be strongly excited by external heat, before it will betray signs of activity, or sensible light; for metals have so strong an affinity to fire, and retain it with so strong an attraction, that they must be attacked with great violence by external fire, or force, before they will part with their own."

After which he lists an 11th affinity law, on the color of flames, light, and affinity, weak to strong. He then says the following on how to construct affinity tables:

"Affinities are not confined to the grosser bodies of the chemists; they exist through all nature. Electricity,

light, fire, air, water, &c. have all a tendency to unite with some bodies in preference to others. We fee, then, that one substance will dislodge another, where greater affinity takes place; and that we can make tables of the relationship which one kind of matter has to another, and thereby know the results of most kinds of mixtures beforehand. For if a fixed alkaline salt be united with vegetable acid, as vinegar, and formed into a neutral salt; on adding to this compound some marine acid, the acetous acid (vinegar) will be disengaged, so as to fly off in a moderate heat, leaving the marine acid in possession of the alkali: if then the nitrous acid be added, it will, in like manner, dispossess the marine, which will rife in white fumes ; though, without such an addition, it could not be detached from the alkali by any degree of heat: but on the addition of the vitriolic acid, the nitrous-gives way in its turn, exhaling in red fumes, leaving the last acid in full possession of the original alkali."

He then gives the following generic affinity description (below), a statement of Geoffroy's first law of affinity (1718) and the split affinity theory (1799) of Claude Berthollet, and affinity table (adjacent):

tables of affinities by Geofroy, Bergman, Black, &c. A ſpecimen of which can only be given in this work. The ſubſtance to which other ſubſtances are related is generally placed in capitals at the top of the table; and the next ſubſtance under it, is that to which it has the greateſt affinity; the next under that a leſs, and ſo on; thus:

Vitriolic Acid.	Nitrous Acid.	Lime.	Fossil Alkali.
Terra ponderoſa	Vegetable alkali	Acid of ſugar	Vitriolic acid
Vegetable alkali	Foſſil alkali	Acid of ſorrel	Nitrous acid
Foſſil alkali	Terra ponderoſa	Vitriolic acid	Marine acid
Lime	Lime	Acid of tartar	Phoſphoric acid
Magneſia	Magneſia	Phoſphoric acid	Acid of ſugar
Volatile alkali	Volatile alkali	Nitrous acid	Acid of tartar
Clay	Clay	Marine acid	Acid of ſorrel
Zinc	Zinc	Acid of lemons	Acid of lemons
Iron	Iron	Acid of benzoin	Acid of benzoin
Lead	Lead	Acetous acid	Acetous acid
Tin	Tin	Acid of borax	Acid of borax
Copper	Copper	Aërial acid	Aërial acid
Antimony	Antimony	Water, &c.	Water
Arſenic	Arſenic		Unctuous oils, &c.
Mercury	Mercury		
Silver, Gold, &c.			

Walker's 1802 affinity table, from his lecture four "On Chemistry", which would have been the affinity table that young Percy Shelley learned.

That is, ſuppoſe *A* the principal ſubſtance to which the other ſubſtances are related; and the other ſubſtances are *B*, *C*, *D*, &c. Now if *A* be applied to two or more of theſe ſubſtances, *B*, *C*, &c. at the ſame time, and in quantity ſufficient to unite with each of them ſingly, it will generally unite to only one of them, as *A* to *B*, and diſregard the reſt. Sometimes *A* will attack both *B* and *C*, and divide itſelf between them; and ſometimes the compound *A B* being preſented to *C*, *A* will forſake *B*, and form an union with *C*, &c.

This, no doubt, would have been the key section on human elective affinity philosophy that supplanted into Shelley's mind (as it did Goethe's a generation earlier; compare: Goethe's affinity table), which he would use in the development of his "elective-affinity scheme" of human relationships, as Mary Shelley referred to it. In 1839, she famously stated the

following, about her late husband's ideas:

> "The misery of the **elective-affinity scheme** is that men are not chemical substances [compare: people are not molecules], and that in nine cases in ten the force of the attraction works more constantly and lastingly upon the woman than the man. There is no stronger argument against it than the *Memoirs of Mary Wollstonecraft* (1798) (Ñº). The Mormon polygamy is nothing more than a plant from the same evil seed sown in a baser soil, and is an attempt to compromise between the higher instincts of mankind, organized in their institutions, and the bestial propensities of sensualized individuals."

(add discussion)

Education | Background

The following is an abstract of Walker: (Ñº)

> "**Adam Walker** [1731-1821] British author and inventor. Taken from school "almost before he could read," Walker was largely self-educated. His dedication to learning earned him a reputation as a diligent student and as a result he was made an Usher at the Ledsham School and later was appointed writing master at Macclesfield. Encouraged by the success of his lectures, Walker began to tour, lecturing on natural philosophy in all the major cities. In 1778 he met Joseph Priestley who induced him to lecture at the Haymarket. As a result he was engaged as a lecturer at Eton College and several of the other public schools. He occupied his leisure time by perfecting various mechanical inventions including; an engine for raising water; steam carriages, rotary lights for the Scilly Isles (which were installed in 1790); a method of thermos-ventilation lines to heat homes without means of a kitchen fire, etc. Walker published several works the above was first published in 1799. *System of Familiar Philosophy* covers a wide range of topics; he illustrates Watts new patent steam engine along with a steam engine of his own invention; an early fire extinguisher. He also discusses electricity and magnetism in several of his lectures."

(add discussion)

References

1. (a) Walker, Adam. (1799). *System of Familiar Philosophy: in Twelve Lectures, Volumes: One, Two*. Publisher.
(b) Bonca, Teddi C. (1999). *Shelley's Mirrors of Love: Narcissism, Sacrifice, and Sorority* (Walker, pg. 128; pg. 270). SUNY Press.
2. (a) Walker, Adam. (1799). *System of Familiar Philosophy: in Twelve Lectures, Volumes: One* (§4:140-60), *Two*. Publisher.
(b) Bonca, Teddi C. (1999). *Shelley's Mirrors of Love: Narcissism, Sacrifice, and Sorority* (Walker, pg. 128; pg. 269 [note 12]; pg. 270). SUNY Press.

Further reading

â— Walker, Adam. (1766). *Analysis for a Course of Lectures on Natural and Experimental Philosophy*. Publisher, 1777.

External links

â— Adam Walker (inventor) – Wikipedia.
â— Walker, A. (Adam) (1730 or 1731-1821) – WorldCat Identities.

In mononyms, **Adams** [CR:11] (CR:503) is the surname, predominately, of American physicochemical social dynamics historian Henry Adams (1838-1918), and or in some discussions his brother Brooks Adams (1848-1927).

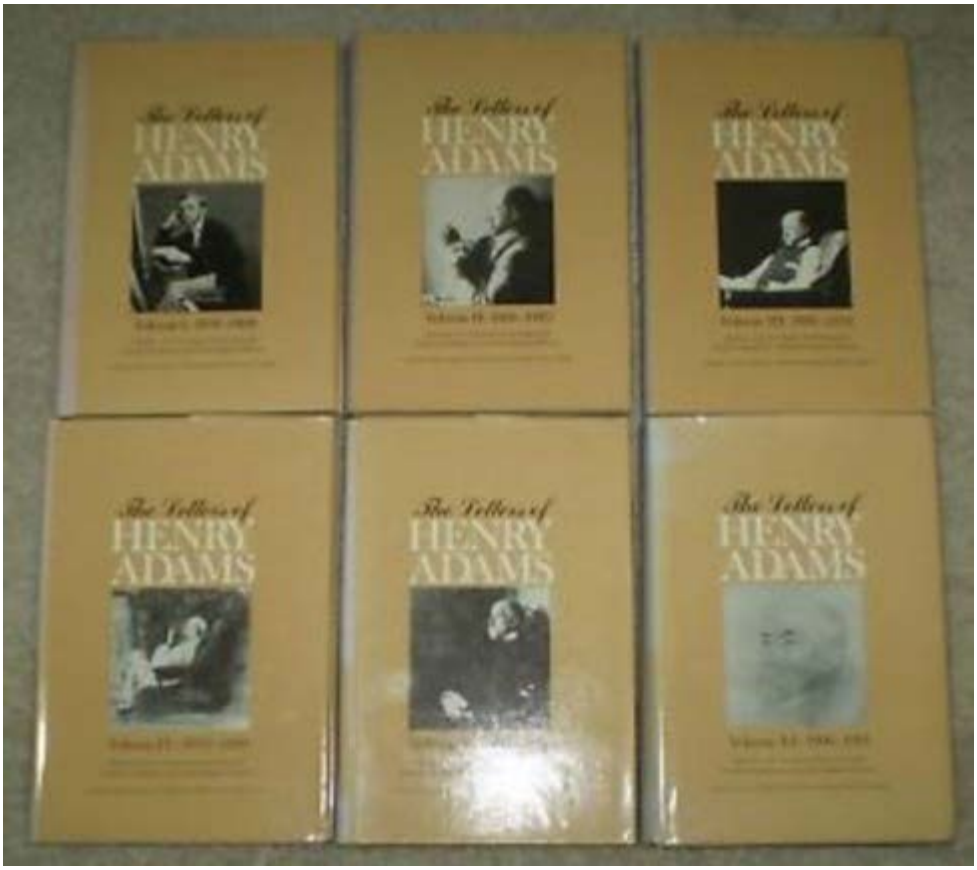

The six-volume set of the *Letters of Henry Adams*, on the correspondence of Henry Adams, Volumes 1-3:1858-1892 (Q) and Volumes 4-6:1892-1918 (Q), are filled with some of the deepest and richest two cultures intellectual statements and dialogues ever produced, possibly second only to Goethe and his volumes of correspondence.

Henry Adams | Related

The following is the listing of Henry Adams related names or articles:

- Adams Creed
- Adams on god
- Adams family tree
- Adams memorial
- Adamsian
- Henry Adams
- Brooks Adams
- Clover Adams

Presidents

Henry Adams was grandson and great grandson of the 6th and 2nd American presidents, respectively:

- John Adams (1735-1826) | 2nd president
- John Quincy Adams (1767–1848) | 6th president

He was born fourth of seven siblings to American historical editor, politician and diplomat Charles Francis Adams, Sr. (1807-1886) (Q) — himself son of 6th American President John Quincy Adams and grandson of 2nd President John Adams (1735-1826) — and Abigail Brown Brooks (1808-1889) (Q) — herself daughter of Boston insurance company millionaire Peter Chardon Brooks (1767-1849) (Q); the seven offspring produced therefrom listed as follows:

1. Louisa Catherine Adams (1831-1870)
2. John Quincy Adams II (1833-1894)
3. **Charles** Francis **Adams, Jr.** (1835-1915)
4. **Henry** Brooks **Adams** (1838-1918)
5. Arthur Adams (1841–1846)
6. Mary Gardiner Adams (1845-1928)
7. Peter Chardon **Brooks Adams** (1848-1927)

Other

The following are other hmolscience Adams names:

- Adam and Eve
- Richard Adams
- Adam Smith
- John Adams
- C.W. Adams
- Adam Walker

Quotes

See main: Adams quotes

The following are representative and or related Adams' quotes:

> "My rule in making up examination questions is to ask questions which I can't myself answer. It astounds me to see how some of my students answer questions which would play the deuce with me."
>
> — Henry Adams (c.1890) (Q)

> "Man is an imperceptible atom always trying to become one with god."
>
> — Henry Adams (c.1890) (Q)

> "Force and war must be moralized somehow, perhaps as in a physical or chemical process that reaches equilibrium."
>
> — Harold Kaplan (1981), *Power and Order: Henry Adams and the American Naturalist Tradition*; synopsis of **Adams**' formulaic view of natural history [1]

References

1. Kaplan, Harold. (2010). *Henry Adams and the American Naturalist Tradition* (chemistry, pg. 79). Transaction Publishers.

θΔics

In beliefs, **Adams creed**, or Adams' conjecture, refers to Henry Adams' 1863 (age 25) statement, amounting to his, in effect, atheist's creed, of how he believed there to exist a secret principle, comprised of regular waves (rhythm) and tides (rhyme), amid the ongoing operation of the the universe, similar to how Newton (1679 | age 37) and Goethe (SN:1) (1774 | age 25), before him, expressed similar views; and "one nature" ideology underlying all phenomena and activity, subatomic to atomic to social to galactic and beyond.

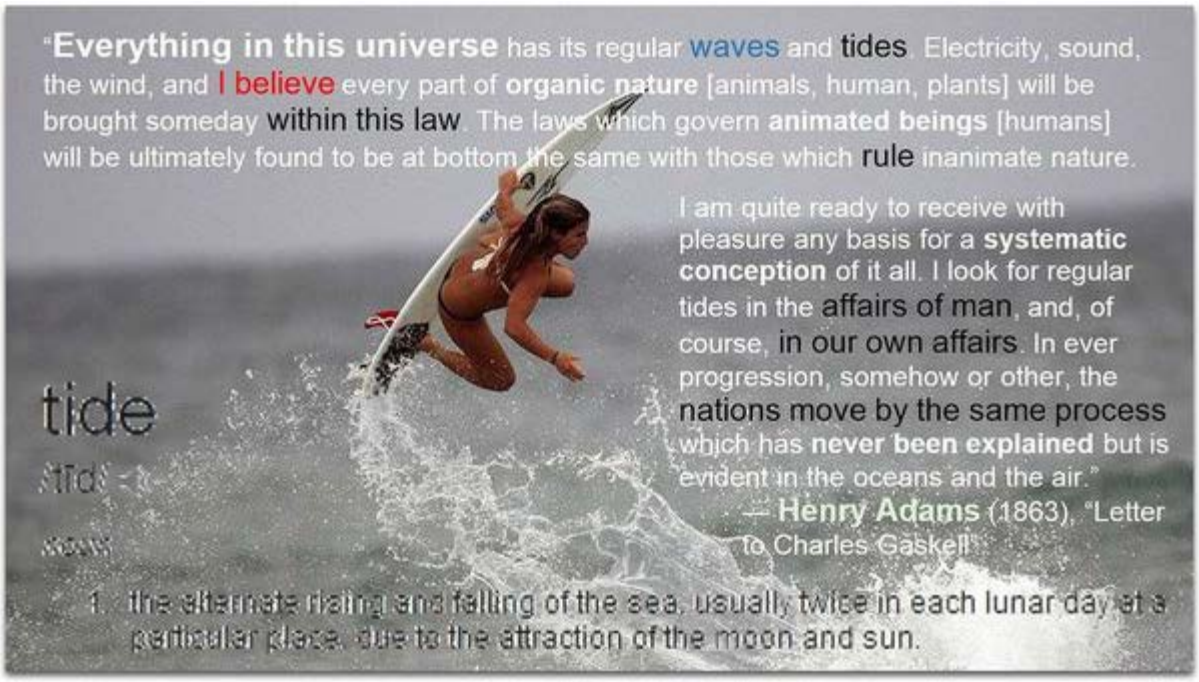

Slide #1 of Libb Thims 2015 "Zerotheism for Kids" class, showing Henry Adams' core belief discerned by him at the age of 25, therein forming belief #2 of zerotheism. [3]

Overview

In 1863, American thinker Henry Adams (SN:2), writing to his intellectual friend Charles Gaskell, outlined his views on he intuited a universal theory of existence, applicable, in a one nature manner, atoms to humans: [1]

> "Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and **I believe** every part of organic nature will be brought someday **within this law**. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."

Adams would spend the next 50-years on this subject, becoming one of the first dual pioneers, following Goethe, of human chemistry (see: HC pioneers) and human thermodynamics (see: HT pioneers).

In 2008, American comparative literature scholar Matthew Taylor, in his PhD dissertation, digressed on this belief quote of Adams and his physics-based theory of human existence. [2]

In 2015, American electrochemical engineer Libb Thims used the Adams belief statement as zerotheism "belief #2" taught to six kids during his "Zerotheism for Kids" lecture. [3]

References

1. (a) Adams, Henry. (1863). "Letter to Charles Gaskell", Oct.
(b) Adams, Henry. (1982). *The Letters of Henry Adams, Volume 1: 1858-1868* (editor: Jacob Levenson) (pgs. 395-96). Harvard University Press.
(c) Stevenson, Elizabeth. (1997). *Henry Adams: a Biography* (pg. 69). Transaction Publishers.

(d) Taylor, Matthew A. (2008). *Universes Without Selves: Cosmologies of the Non-Human in American Literature* (pg. 108), PhD dissertation, Johns Hopkins University. ProQuest, 2009.
2. Taylor, Matthew A. (2008). *Universes Without Selves: Cosmologies of the Non-Human in American Literature* (pg. 108), PhD dissertation, Johns Hopkins University. ProQuest, 2009.
3. Thims, Libb. (2015). “Zerotheism for Kids” (co-host: Thor) (main), 14-part [4:41-hr] lecture playlist (Ñº), 5-intro sides (Ñº), 56-main sides (Ñº), 11AM-3PM, Chicago, recorded: Aug 10; published: Sep 7.

θΔics

In quotes, **Adams quotes** refers to a listing of noted and or famous statements by Henry Adams.

List

The following is a work-in-progress listing of Adams quotes:

> "Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday within this law. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."
>
> — Henry Adams (1863), "Letter to Charles Gaskell" (Oct) [1]

> "Altogether, we go on with placidity unequalled, and the only question is what we live for. Nothing seems to come of it?"
>
> — Henry Adams (1878), "Letter to Charles Gaskell" (Aug 21) [2]

> "Social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life."
>
> — Henry Adams (1885), "Letter to Clover Adams" (Apr 12) [3]

> "A period of about twelve years measured the beat of the pendulum. After the *Declaration of Independence* [4 Jul 1776], twelve years had been needed to create an efficient *Constitution* [17 Sep 1787]; another twelve years of energy brought a reaction against the government then created; a third period of twelve years was ending in a sweep toward still greater energy; and already a child could calculate the result of a few more such returns."
>
> — Henry Adams (1890), *A History of the United States of America* (Q)

> "An atom is a man and Maxwell's demon, who runs the second law, ought to be made president."
>
> — Henry Adams (1903), "Letter to Brooks Adams", May 2 [4]

> "Gentle mathematicians and physicists still cling to their laws of thermodynamics, and are almost epileptic in their convulsive assurances that they have reached a generalization which will hold good. Perhaps it will. Who cares?"
>
> — Henry Adams (1903), "Letter to Charles Gaskell" (Jun 14) [5]

> "Intimates are predestined."
>
> — Henry Adams (1907), *The Education of Henry Adams* (§13: The Perfection of Human Society) (Q)

“A dynamic law requires that two masses – nature and man – must go on, reacting upon each other, without stop, as the sun and comet react upon each other, and that any appearance of stoppage is illusive.”

— Henry Adams (1907), *The Education of Henry Adams*; cited by Paul Staiti (2001) in “Winslow Homer and the Drama of Thermodynamics” (Q)

“On the physico-chemical law of development and dynamics, our society has reached what is called the critical point where it is near a new phase or equilibrium.”

— Henry Adams (1908), “Letter to Charles Gaskell” (Sep 27) [6]

“The solution of mind is certainly in the magnet.”

— Henry Adams (1908), “Letter to Charles Gaskell” (Sep 27) [6]

“I have run my head hard up against a form of mathematics that grinds my brains out. I flounder like a sculpin in the mud. It is called the ‘law of phases’, and was invented at Yale [by Gibbs]. No one shall persuade me that I am not a phase.”

— Henry Adams (1908), “Letter to Elizabeth Cameron” (Sep 29) [7]

“I’m looking for a ‘young and innocent physico-chemist who wants to earn a few dollars by teaching an idiot what is the first element of theory and expression in physics.’”

— Henry Adams (1908), “Note to John Jameson” (Dec) [8]

“Kelvin was a great man, and I am sorry I did not know enough mathematics to follow him instead of Darwin who led us all wrong.”

— Henry Adams (1909), “Letter to Charles Gaskell” (Q)(Q)

“My essay ‘The Rule of Phase [Applied to History]’ is a ‘mere intellectual plaything, like a puzzle’ [to Brooks]. I am interested in getting it into the hands of a ‘scientific, physico-chemical proofreader’ and I am willing to pay ‘liberally for the job’ [to Jameson].”

— Henry Adams (1909), Notes to Brooks Adams and John Jameson [8]

“I have been studying science for ten years past, with keen interest, noting down my phrases of mind each year; and every new scientific method I try, shortens my view of the future. The last—thermodynamics—fetches me out on sea-level within ten years. I’m sorry Lord Kelvin is dead. I would travel a few thousand-million miles to discuss with him the thermodynamics of socialistic society. His law is awful in its rigidity and intensity of result.”

— Henry Adams (1909), “Letter to Charles Gaskell” (May 2) [9]

"If thought is capable of being classified with electricity, or will with chemical affinity, as a mode of motion, it seems necessary to fall at once under the second law of thermodynamics. Of all possible theories, this is likely to prove the most fatal to professors of history."

— Henry Adams (1910), *A Letter to American Teachers of History*

"Thanks for yours of the 5th. I am sorry to have missed you, for I would have much liked to hear what you have to say, not merely on the general subject of **physico-human sociology** [see: physico-chemical sociology; physico-chemical social dynamics], but also on the point of its possible bearings on education. The strongest evidence that I can see in favor of the extension of the second law of thermodynamics to social and intellectual phenomena, is what seems to me the rapid atrophy of the social mind. Since two, society seems to me to be torpid except in rehashing its oldest commonplaces. In the world I live in, thought seems to me to be quite dead. Of course, this impression is probably caused by age, and is a result of mental fatigue; but I observe that it is shared by other people, and even by a considerable class of people; so that I am led to wish that I might hear the subject discussed by someone who had larger information than I. I will send you a little volume, touching incidentally on the subject, which has just come out under my name, dealing with the purely literary side of the matter. **Of course, it is on the physicists that the first duty lies of frankly disclosing their scheme**. I have an idea that Ostwald, while asserting the law to its full limits, expresses the opinion that the human race does not yet show proof of degradation. I am curious to know whether this is an accepted idea in his school. If so, it shifts the issue to a simple one of fact."

— Henry Adams (1912), "Letter to Edward H. Davis" (Q), Jan 12

See also

- Goethe quotes

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θΔics

In existographies, **Addy Pross** (1945-) (DN:7) (CR:10) is an Israeli reaction theory chemist noted for his 2003-present articles on attempts to discern the driving force for life, thermodynamically, arguing in short that a cell (see: cell-as-molecule) is akin to a refrigerator, increasing order at the expense of external energy, culminating in his 2012 book *What is Life?: How Chemistry becomes Biology*, wherein he attempts to grapple with Austrian physicist Erwin Schrodinger's famous 1943 what is life in terms of chemistry and physics query, albeit in such a way that he uses the extrapolate down method, wherein he employs Rube Goldberg type arguments, e.g. that the stability that governs animate replicating systems is a "dynamic kinetic stability" whereas that which governs the inanimate world is a "thermodynamic stability", and that the former "emerges" from the latter, etc., to argue that concepts such as purpose and Darwinian selection exist in the lower sub warm pond chemical system level. [1]

Human thermodynamics | Prediction

Pross seems to relatively uneducated about modern human thermodynamics and the "predictive" ability of the second law in the human sphere. He states, for example, that gravity and the second law, in the "living world" and in the human activity sphere of things, have "little predictive value". [2] Iranian mechanical engineer Mehdi Bazargan, conversely, in a circa 1980 note on his *Thermodynamics of Humans*, was one of the first to cogently state that thermodynamics has significant predictive power in the sphere of human activity: [3]

> "In general, an object in a given force field will, of necessity, behave in a calculable and **predictable** way. For any object, whether a stone, a plant, or a human society, force means movement."

The so-called "force field", in the human sphere of movement, is the electromagnetic force (see, e.g., Jaegwon Kim's 1992 library walk problem), and the so-called force function for human chemical reactions (see: HCR theory) is the Gibbs free energy, the characteristic function for isothermal-isobaric freely-running chemical reactions, whereby, according to the 1969 views of American science historian Henry Guerlac: [4]

> "By means of chemical thermodynamics the physical chemist can indeed, without leaving the 'cabinet', **predict** the course of many chemical reactions."

according to which, when this logic is scaled up to the human-human reaction level (reactions between people), this logic implies that "by means of human chemical thermodynamics the human physical chemist can indeed, without leaving the 'cabinet', **predict** the course of many human chemical reactions."

Life → Animate matter

Into the 2000s, with the 2002 publication of the Sterner-Elser human molecular formula (see: human molecular formula), and with the rise of modern human chemical thermodynamics, the question of when exactly is one to stop calling a "molecule", cell (cell-as-molecule), and or virus (virus molecule) as alive began to come into view, particularly in the context of the 2005 molecular evolution table and the 2009 evolution timeline, and doubly in particular in the context of human free energy theory, according to which there is no recognizable difference between the free energy that forms the water molecule and the free energy that forms the human molecule (human free energy of formation, following which one is forced to look under the scanning tunneling microscope at what exactly one means by the term "life", following which the term quickly becomes defunct beyond repair.

The following switching of terms, from "life" to "animate matter", by Pross, in the opening abstract sentence as compared to the opening article sentence, of his 2003 article "The Driving Force for Life's Emergence: Kinetic and Thermodynamic Considerations", gives a view of how, in the early 2000s, researchers began to vacillate ambivalently between the terms "life" and "animate matter", using the former in more pressurized summaries, the latter in more loosened dialogs: [5]

Abstract: "The principles that govern the emergence of **life** from non-life remain a subject of intense debate."

Article: "The nature of the driving force that led to the emergence of **animate matter** remains a subject of continuing debate and uncertainty."

Stepping into the 21st century, the discussion has indeed turned to free energy, specifically Gibbs free energy (see: human free energy timeline). In the free energy view, the search for the origin of life, in the context, of the human molecule perspective, , i.e. humans viewed as animate molecules, which have evolved or synthesized over time, through chemical mechanism, starting from hydrogen atom reactant precursors, the theory of life begins to fall apart to the point that it is no longer tenable (Thims, 2009). [6]

Not seeing the forest

The following is a related quote by Israeli chemist Addy Pross, in commentary about statements from Stuart Kauffman's 2000 *Investigations*, about not being able to see the forest: [2]

> "We see so many trees, yet we have **no real view of the forest**."
>
> — Addy Pross (2012), *What is Life?: How Chemistry Becomes Biology*; restatement of Kauffman's 2000 "life remains shrouded from view" perspective

A parody rendition of Pross' perspective that he and American complexity theorist Stuart Kauffman "see so many **trees**", such as catalysis, synthetic biology, RNA, metabolic pathways, DNA, molecular machinery, ATP, biosynthesis, etc., but he and Kauffman "have no real view of the **forest**" (see: ships not seen), the view they are missing being solution to the question "what makes a cell alive?" [2]

The issue here is that Kauffman and Pross have many "trees" (molecular machinery, metabolic pathways, membrane biosynthesis, molecular biology, etc.), to look at and study, but they cannot see the "forest" (or as Kauffman states: "what makes a cell alive is still not clear to us"). The forest that they cannot see in this case is the defunct theory of life and subsequent life terminology upgrades—a very difficult forest to see, to say the least.

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Videos

â— Pross, Addy. (2012). “What’s the Difference Between Living and Non-Living Thing?” (Ñº), Oxford Academic, Sep 28.

External links

â— Addy Pross (faculty) – Ben-Gurion University of Negev.

θΔics

In existographies, **Adi Shankara** (788-820), or “Sankara” (Hecht, 2004), was an Indian philosopher noted for []

Overview

In c.1810, in commentary on the materialist philosophy of Samkhya, asserted the following logic:

> “Nature made itself in the same way that ‘non-sentient milk’ flows forth from its own nature, as ‘non-sentient water’ flows from its own nature (to our benefit), so the non-sentient matter of the world, although non-intelligent, may be supposed to move from its own nature.”

Here, this brings to mind Vladimir Vernadsky and his division of the periodic table into two types of matter.

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External links

â— Adi Shankara – Wikipedia.

θΔics

In thermodynamics, **adiabatic**, from *a-*, meaning "not", + *-dia-*, meaning "through", + *-bainein*, meaning "to go" (Waser, 1966), refers to a system undergoing a process in which NO heat is allowed to go through the boundary (e.g. using heat-insulating material); only work is exchanged with the surroundings. [1] The basic model of the term is that in which a substance expands, pushing on the piston, in such a way that no heat transfers across its boundary, whereby all of the energy of the expanding body is transferred to the piston as work (via pressure volume work).

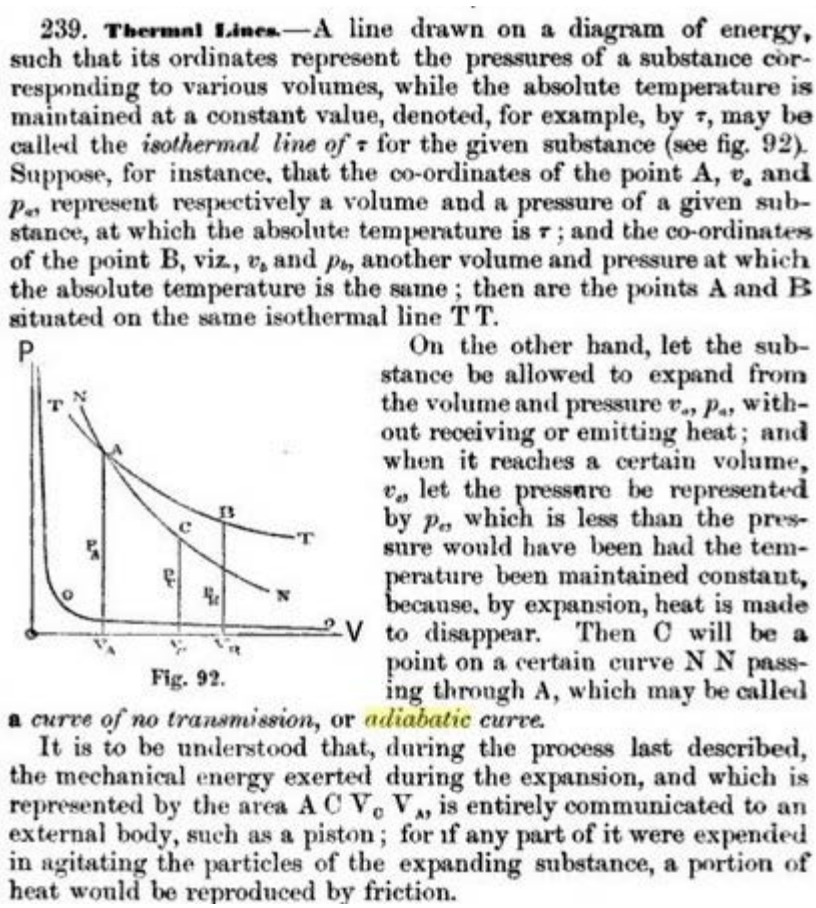

239. **Thermal Lines.**—A line drawn on a diagram of energy, such that its ordinates represent the pressures of a substance corresponding to various volumes, while the absolute temperature is maintained at a constant value, denoted, for example, by τ, may be called the *isothermal line of* τ for the given substance (see fig. 92). Suppose, for instance, that the co-ordinates of the point A, v_a and p_a, represent respectively a volume and a pressure of a given substance, at which the absolute temperature is τ; and the co-ordinates of the point B, viz., v_b and p_b, another volume and pressure at which the absolute temperature is the same; then are the points A and B situated on the same isothermal line T T.

Fig. 92.

On the other hand, let the substance be allowed to expand from the volume and pressure v_a, p_a, without receiving or emitting heat; and when it reaches a certain volume, v_c, let the pressure be represented by p_c, which is less than the pressure would have been had the temperature been maintained constant, because, by expansion, heat is made to disappear. Then C will be a point on a certain curve N N passing through A, which may be called a *curve of no transmission*, or *adiabatic curve*.

It is to be understood that, during the process last described, the mechanical energy exerted during the expansion, and which is represented by the area A C V_c V_A, is entirely communicated to an external body, such as a piston; for if any part of it were expended in agitating the particles of the expanding substance, a portion of heat would be reproduced by friction.

Scottish engineer William Rankine's 1859 explanation of how curve AC is an **adiabatic** curve, representing an expansion of a substance made without receiving or emitting heat. [3]

Etymology

The premise of a vessel changing temperature, without the addition of removal of heat, via the contact of a hot or cold body, was first noticed in respect to experiments with the vacuum pump; the following is a synopsis:

> "Higgins' theory [1776] accounted for the phenomenon of the heating (or cooling) of a gas when it is suddenly compressed (or expanded): **'adiabatic'** heating or cooling as it was later called. This had first been noticed in connection with experiments on the air pump. Cullen mentioned it but had no insight into its significance. Higgins also referred to it, and Johann Lambert pointed out that when air enters an evacuated vessel the temperature rises. His explanation was that even 'empty' space contains the 'matter of heat', so that the entry of air carrying more heat must cause a rise in temperature; and he went on to suggest that suddenly reducing the volume of a void should have a heating effect."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 58)

In 1859, William Rankine, in his *A Manual of the Steam Engine and Other Prime Movers*, introduced the term "adiabatic", consisting of the double Greek prefixes: *a-* (not) and *dia-* (through or across), thus referring to boundaries in which no heat can pass, referring to a special class of pressure-curves corresponding to the case of expansion within an envelope impermeable to heat. [2]

Physical description

In 1936, Italian-born American physicist Enrico Fermi stated that an adiabatic transformation is one that is thermally-insulated and reversible. The "reversible" addendum, however, may not be the the way in which the original sense of the term is used. In any event, Fermi says that in a piston and cylinder, the adiabatic process is done such that the cylinder is made of non-heat-conducting walls and the piston is shifted inward or outward very slowly. [4] The condition of "thermally-insulation" implies that:

$$dQ = 0$$

Substitution into the first law equation for this process:

$$dU = dQ - dW$$

gives:

$$dU = -dW$$

which means that "adiabatic expansion" correlates to an internal energy decrease; whereas, conversely, "adiabatic contraction" correlates to an internal energy increase.

Quotes

The following are related quotes:

> "Suppose a piston moves inward, so that the atoms are slowly compressed into a smaller space. What happens when an atom hits the moving piston? Evidently it picks up speed from the collision. You can try it by bouncing a ping-pong ball from a forward-moving paddle, for example, and you will find that it comes off with more speed than that with which it struck (Special example: V an atom happens to be standing still and the piston his it, it will certainly move.) So the atoms are 'hotter' when they come away from the piston than they were before they struck it. Therefore, all the atoms which are in the vessel will have picked up speed. This means that when we compress a gas slowly, the temperature of the gas increases. So, under slow compression, a gas will *increase* in temperature, and under slow expansion it will *decrease* in temperature."
>
> — Richard Feynman (1963), *Lectures on Physics, Volume One* (pgs. 1-4); supposedly an explanation of adiabatic compression on a fundamental level [5]

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External links

â— Adiabatic – Wikipedia.

θΔics

In hmolscience, **Adolf Fick** (1829-1901) was German physicist-physiologist noted, in religious thermodynamics, for 1869 lecture “The Forces of Nature in their Relationship”, wherein, via citation to Rudolf Clausius, he becomes the first to outline the so-called entropic proof for the existence of god, i.e. of an initial state universe.

Overview

In 1869, Fick, in his lecture “The Forces of Nature in their Relationship”, extrapolated German physicist Rudolf Clausius’ heat death theory of universal end to give what is said to be the first contour of the ‘entropy proof of God’s existence’, to argue that God must exist, because of the second law of thermodynamics, something to the effect that if heat death posits a final state of the universe, that this presupposes an "initial state", which "presupposes a creator", or something along these lines. [1]

Fick was a student of Carl Ludwig and Emil du Bois-Reymond, following which he became proficient in using the “thermodynamic method” in physiology, primarily by using the law of energy conservation to understand physiological processes.

Fink worked in Zurich, Switzerland, from 1852 to 1868, after which he moved to Wurzburg, Germany, where he held the chair of physiology until 1899. (Ñº) During this period, in 1868, Rudolf Clausius moved from Zurich to Wurzburg, and for a brief period, before Clausius moved to Bonn in 1869, Fink and Clausius were colleagues as professors. Thermodynamics historian Helge Kragh surmises that, although no documented connection exists, that Fink benefitted from discussions with Clausius.

In 1869, Fink, whatever the case, gave a series of six popular lectures on “The Forces of Nature in their Relationship”, which he dedicated to Clausius. Fink stated Clausius’ heat death as follows:

> “In the end all forces in the universe must take the form of heat and all temperature differences in the world must be equalized.”

This, following Clausius, precluded any idea of an eternally cyclic universe. A final state also led to the deduction of an initial state; about which Fink stated as follows:

> “This final state must be reached after a finite time has elapsed, counted from any arbitrarily chosen initial state which does not include infinite speeds or an infinite scattering of matter in space, i.e. counted from any initial state that can be conceived at all. To put it the other way around, if the world had existed in any eternity the final state would already have been reached.”

This, according to Helge Kragh, is the first clear statement of the entropic creation argument in its limited version, i.e. without speaking of a divinely created world. [3]

Kragh also explains how Franz Brentano, another professor at the University of Wurzburg, also, independent of Fick, supposedly, arrived at the entropic creation argument in 1868 to 1869.

In 1874, German physicist August Kronig, in his 1874 *The Existence of God and the Happiness of People*, quotes extensively from Fick’s lecture; a rough translation example of which is as follows: [2]

> ". . . . **Fick** does this by him showed that the occurrence of so-called final state of entropy as it is clear that something had to give it one that stand outside or above the world. Because - as he thought - since the Entwiöelung the world tends towards a final state of rest, so the world can not have always been a part, as is

expected elapsed from that infinitely long past to the present moment an eternity, and therefore that the final state already long ago, would have to be actually already occurred infinitely long. The presence, however, shows that state does not, so the world must have had a beginning, that it may be the cause of their origin does not lie in itself. I consider this the end for new. As an act of creation, of course, presupposes a Creator, and as I Auck about the existence of a creator of a peculiar, differing from that of other researchers of exact view I had appropriated, so I had to interest Fick's very end. First, I wish, however, to obtain certainty as to whether that conclusion really stemmed from Fick, whether or not the anonymous author of the paper had misunderstood abroad **** around. Very, I was pleased when researching this issue, the excellent Fick's popular lectures, entitled "the forces of nature in their relationship" (Würzburg, 1869) meet you."

(add discussion)

Religion

Fick was raised in the Protestant faith and known as a pious person, but he had no formal church affiliation. [3]

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External links

â— Adolf Eugen Fick – Wikipedia.

θΔics

In hmolscience, **Adolf Grunbaum** (1923-) is German-born American philosopher noted for []

Overview

In 1955, Grunbaum, in his "Time and Entropy", as cited by Judson Herrick (1956), gave a technical discussion, via mention of Clausius, intermixed with information theory, of the relation between vital processes, including mental acts, and the second law. [1]

Education

In 1935, Grunbaum, aged 12, read a book by philosophers who speculated about the origins of the universe, which piqued his interest; after which, in 1943, aged 20, he completed his BA in mathematics and philosophy at Wesleyan University, followed by his MS in physics in 1948 and his PhD in philosophy in 1951 both at Yale University.

Religion | Atheism

Grunbaum was born, in German, into a Jewish family, and by the time he was 12, during his bar mitzvah, he decided he was atheist. [2]

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Further reading

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External links

● Adolf Grunbaum – Wikipedia.

θΔics

In existographies, **Adolf Hitler** (1889-1945) (IQ:155|#365) (CR:38) was a Austrian-born German politician who became leader of the German national socialism party, advocates of Nazism, from the German *Nationalsozialismus* (national socialism), an ideological practice characterized as a form of fascism that incorporates biological racism and antisemitism, a reactionary alternative to internationalist Marxist socialism and capitalism, and who his 1925 *Mein Kampf* (*My Struggle*), an autobiographical manifesto, in which he employs a number of emotionally evoking thermal word based analogies and comparisons when discussing the stirrings of human passions.

The 1996 *Reenchanted Science: Holism in German Culture from Wilhelm II to Hitler*, by Anne Harrington, supposedly, traces theories of gestalt and holism in the work of Goethe to the rise and fall of Nazi holism and mechanism. [4]

Force | Energy | Power

In 1926, Hitler stated the following: [13]

> "The fundamental motif through all the centuries has been the principle that force and power are the determining factors. All development is struggle. Only force rules. Force is the first law. A struggle has already taken place between original man and his primeval world. Only through struggle, have states and the world become great. If one should ask whether this struggle is gruesome, then the only answer could be: For the weak, yes, for humanity as a whole, no."

This is sometimes truncated as follows: (Ñº)

> "Through all the centuries force and power are the determining factors. Only force rules. Force is the first law."

This is fairly cogent. That "force is the first law", however, is close but a bit off: the "first law", technically, is the conservation of energy and or its transformations (in equation form); subsequently, to become energy, force has to be multiplied by a conjugate variable pair, such as distance.

Hitler, prior to this, in his *My* Struggle, employed the terms: energy (22+), force (69+), and power (81+), the number of times indicated, respectively. The following is one example: [12]

> "All cases [of impressions made on people] have to do with an encroachment upon man's freedom of will. This applies most, of course, to meetings attended by people with a contrary attitude of will, whom must now be won over to a new will. In the morning and even during the day people's will power seems to struggle with the greatest energy against and attempt to force upon them a strange will and a strange opinion. At night, however, they succumb more easily to the dominating force of a stronger will. For, in truth, every such meeting represents a wrestling bout between two opposing forces."

(add discussion)

Thermal words | Social combustion

See main: Spark of the tongue

The following is a popular thermal word based quote from Hitler's 1925 *Mein Kampf*: [1]

> "All great movements are popular movements. They are the volcanic eruptions of human passions and emotions, stirred into activity by the ruthless goddess of distress or by the **torch** of the spoken word cast into the midst of the people."

Here we see Hitler conceptualizing the "spoken word" as something that can act like an activation energy lowering factor to the triggering of a large scale social chemical reaction, the way a match can ignite wood or gasoline in a combustion reaction. Indian-born Pakistani organometallic chemist Mirza Beg outlined a similar speech heat theory, in respect to the period shortly before the riots and manslaughter of Direct Action Day (16 Aug 1946), as follows: [11]

> "The speeches made by Hindu extremists generated high heat in their society. Their emotions were set so high as to interact with violent force with the Muslims and this led to widespread riots, killings, arson and looting."

This, supposedly, was one of the reaction mechanism steps that led to India and Pakistan to becoming independent and self-governing, in the so-called timeline of British India. (Ñº)

In 1925, Hitler alluded to the idea that the "torch of the spoken word", when thrown into the crowd, can act as something that starts a social fire, akin to a spark igniting gasoline combustion or a torch thrown into a large pile mound of dry wood, an action depicted in a scene from the 1987 film *Predator*, above left, wherein Dutch (Arnold Schwarzenegger) throws a lit torch onto the a large pile of dry wood on the forest floor; which would give seem to suggest that the people of Germany going into the mid to late 1930s were becoming akin to a type of dry wood or combustible substance at or near its flash point (spark required) or autoignition temperature (no spark required), depending. [5]

Such thermal word talk here should not be taken lightly nor dismissed as amusing metaphor knowing that, in Hitler's case, by 1934, true to his national socialism philosophy, he had seized complete control of Germany and by 1938 had begun to occupy Austria and parts of Czechoslovakia, by 1939 Poland, by 1940 Denmark, Norway, Holland, Belgium, France, Romania, and Yugoslavia, and by 1941 had begun to invade Russia, with supposed aims to conquer all of Europe. [7]

The combustion process typically can be started in two ways, namely by bring a substance to its flash point, the temperature at which a substance will ignite when a spark or flame is applied, or by bringing a substance to its kindling point or autoignition temperature, the temperature at which a substance will ignite, without the need of an applied spark or flame.

The autoignition temperature of a substance is the lowest temperature at which it will spontaneously ignite (spontaneous combustion) in a normal atmosphere without an external source of ignition, such as a flame or spark. This temperature is required to supply the activation energy needed for combustion.

Social pressure

The temperature at which a chemical will ignite, to note, decreases as the pressure or oxygen concentration increases. [6] Here, we may see, by extrapolation, via human chemical reaction theory, that the increase in the social pressure in Germany in the early 1930s may have worked to lower the autoignition temperature of the German people, and thus may have ignited on its own without the need of an external spark or flame to cross the activation energy barrier. Hitler, however, seems to have argued that his "spoken words" acted as the activation energy spark or flame, which would imply that the Germans were at or near their flash point, *not* their autoignition temperature, in July 1934, after the death of President Hindenburg, Hitler declares himself "Fuehrer and Reich Chancellor" over German and abolishes the title of President.

> "At the risk of appearing to talk nonsense I tell you that the national socialist movement will go on for 1,000 years!... Don't forget how people laughed at me 15 years ago when I declared that one day I would govern Germany. They laugh now, just as foolishly, when I declare that I shall remain in power!"
>
> — Adolf Hitler (1934), to a British correspondent in Berlin, June [8]

Technically, it would seem to be possible that spoken words (sound) could be employed as a means to start a fire they way rubbing of sticks together can create fire in leaves or kindling via friction. Although, it is difficult to find a citation, it has been suggested that as sound transmitted through powerful speakers can create vibration in objects, that such vibrations in materials rubbing against each other could work to start a fire via heated-generated friction, hence validating Hitler's spoken word argument.

Another remote explanation to Hitler's theory that the "torch of the spoken word", when cast into the crowd, can bring about revolution and or war, knowing that sound is but air vibrations pulsed in waves of certain frequency, impacting on the eardrum, is the comparison of certain crystallization and or freezing processes that will trigger when the test tube is tapped on or supercooled water bottle banged on (above video); see also Mpemba effect and war. [1]

Oxidant concentration

In respect to autoignition temperature being lowering when the oxygen concentration increases, in respect to the German people, this extrapolation is more blurry. Combustion, technically, is a sequence of exothermic chemical reactions between a fuel and an oxidant accompanied by the production of heat and conversion of chemical species. The following is a typical combustion reaction between methane (fuel) and oxygen (oxidant):

$$CH_{4(g)} + 2O_{2(g)} \rightarrow CO_{2(g)} + 2H_2O_{(g)}$$

In comparison to Hitler's spoken words social ignition model, it would seem that the fuel is the German people and the oxidant are the people of the surrounding countries, that when put into contact or mixed can ignite, given the right temperature and possibly the right spark or spoken words.

Passions

In, respect to the volcanic "eruption of the human passions", the steam engine conceptualized passion-based

social theories of American Albert Brisbane comes to mind.

Eugenics

Hitler is often conceptualized, according to colloquial opinion, as one of the most or the most evil persons in history, for his progressive eugenics-based implementations in WWII (1939-1945) during the course of which some 11 million people, of specific race, predominately Jews and other minorities, were systematically killed (dereacted), supposedly based on some type of scientific pretext.

The progressive eugenics-based implementations of Hitler are cited by American chemist Todd Silverstein, in the 2007 Rossini debate, as being one example of the possible future dangers potentially inherent in the future implementation of chemical thermodynamics based socialism: [2]

> "The rise of social Darwinism in the late 19th century and eugenics in the early 20th century are just two examples of scientific theories that were mistakenly extended into misguided social policies."

(add)

Related

In thermodynamics trivia, one of Max Planck's sons was executed in World War II for his part in the assassination attempt on Hitler in 1944. [9]

Quotes | On

The following are related quotes on or about Hitler:

> "**Hitler**'s ideals come mainly from Nietzsche, in whom there is every evidence of complete sincerity."
>
> — Bertrand Russell (1935), "Cosmic Purpose" [14]

> "The facts of history are evolved from definite relations at a definite time and place. Everybody admits that **Hitler** and the corner grocer in a general way are part of the same order of things as is the remotest inhabitant of the most insignificant south seas island."
>
> — Morris Zucker (1945), commentary on Alfred Kroeber's history theories [3]

Quotes | By

The following are noted quotes by Hitler:

> "All propaganda has to be popular, and has to accommodate itself to the comprehension of the least intelligent of those whom it seeks to reach."
>
> — Adolf Hitler (c.1925), cited by Bo Jinn (loc. 703)

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External links

â— Adolf Hitler – Wikipedia.

θΔics

In existographies, **Adolphe Quetelet** (1796-1874) (IQ:175|#225) (Siegfried 10:4) (SN:25) (CR:62) was a Belgian statistical mathematician, astronomer, and polymath (O), noted, in hmolscience, for his 1835 *Essay on Social Physics*, on "social physics", which introduced the subject of the physics of humans or human physics, the attempt to reduce human existence down to physics. [1] The gist of Quetelet's social physics the application of the system of numbers to the study of human patterns and phenomenon.

Scottish physicist James Maxwell was said (O) to have been introduced to Quetelet, in 1850, via his reading of John Hershel's review article "Quetelet on Probabilities"; though, to note, there is some debate (O) (O) as to how much Maxwell was influenced by Quetelet's interpretation of the normal distribution. [7]

Nightingale

Italian-born English social theorist Florence Nightingale, a student of Quetelet in some sense, began to employ Quetelet's social physics work, recasting it into what she called "social or moral economy", and proposed, particularly in the years after his passing, that Quetelet's social mechanics be taught at Oxford (see: Oxford Chair of Social Physics), a cause for which she championed, unsuccessfully, for several decades. [6]

Marriage | Statistics

In c.1846, Quetelet published the following table of marriage statistics from the register of marriages at Brussels: [1]

MARRIAGES IN BELGIUM IN THE YEARS

		1841	1842	1843	1844	1845
Men of 30 years of age and under, to	Women of 30 years of age and under	12,788	12,422	12,368	13,024	13,157
	Women from 30 to 45	2,630	2,626	2,406	2,375	2,438
	Women from 45 to 60	93	121	125	129	102
	Women from 60 upwards	7	6	8	5	5
Men from 30 to 45 inclusive, to	Women of 30 and under	6,122	5,803	5,617	4,948	5,810
	Women from 30 to 45	5,531	5,396	5,100	5,205	4,981
	Women from 45 to 60	529	542	479	493	532
	Women from 60 upwards	18	12	18	21	21
Men from 55 to 60 inclusive, to	Women of 30 and under	376	346	380	355	346
	Women from 30 to 45	896	879	896	951	993
	Women from 45 to 60	461	447	433	462	460
	Women from 60 upwards	23	19	29	36	28
Men from 60 and above, to	Women of 30 and under	48	35	45	41	36
	Women from 30 to 45	139	147	183	119	125
	Women from 45 to 60	153	170	137	112	145
	Women from 60 upwards	62	52	48	50	31
Annual Number of Marriages		29,876	29,023	28,220	29,326	29,210

In 1851, Mary Somerville, in her *Physical Geography*, presented the same table, and in respect to regular occurrence that 5 to 8 men, aged 30 or under, each year, marry women, aged 60 or order, she says the following on free will: [9]

> "Certainly **no event in a man's life depends more upon his free will than his marriage**; yet it appears from the records in Brussels, that nearly the same number of marriages take place every year, in the towns as well as in the country; and, moreover, that the same constancy prevails in each province, though the numbers of the people are so small, that accidental causes might be more likely to affect the general result than when the numbers are larger. In fact, the whole affair passes as if the inhabitants of Belgium had agreed to contract nearly the same number of marriages annually, at each stage of life. Young people may possibly be in some degree under the control of parents, **but there can be no restraint on the free will of men of 30 and women of 60 years of age; yet the same number** [5-8] **of such incongruous marriages do annually take place between men and women at those unsuitable ages**—a fact which almost exceeds belief. The day fixed for a wedding is of all things most entirely dependent on the will of the parties, yet even here there is a regularity in the annual recurrence."
>
> — Mary Somerville (1851), *Physical Geography, Volume Two* (free will, pgs. 409-11)

Moreover:

> "Forgetfulness as well as free will are under constant laws."
>
> — Mary Somerville (1851), *Physical Geography, Volume Two* (free will, pgs. 409-11)

In 1861, Henry Buckle, in *History of Civilization, Volume One* (pg. 24), cites Somerville and Quetelet, to argue for determinism in history.

Essay on Social Physics

Quetelet argued for a new science of "social physics", where, in picking up where the social mathematics of Marquis Condorcet left off, he hoped would be a quantitative science that would allow researchers to count, measure, and predict human actions, and that the "average man", a kind of perfect physical and moral being, would be the "center of gravity" against which such predictions could be made. [4]

Quetelet's *Essay on Social Physics* was originally published in French. The first English translation, supervised by English anatomist and ethnologist Robert Knox, was published in 1842. In the prefaced abstract to this translation, Knox summarizes: [1]

> "Quetelet's 1835 *Essay on Social Physics* was the first attempt made to apply the art of calculation to the social movements of the human being, and to examine by it his moral anatomy, with the view of detecting the real sources and amount of the evils under which he labors, and, ulteriorly, of remedying them when known."

The interest in applying the concept of the "normal curve", derived originally from astronomical measurements associated with observational errors, to questions of social applications, supposedly, first arose in the circle of the French scientists Pierre Laplace and Simeon Poisson. Quetelet being in or associated with this circle, soon thereafter began to carry this passing interest into published application; at first considering individual phenomena such as variation in body measurements, an interest going back to his period as a painter, and social phenomena such as the incidence of crime. In 1831, he issued pamphlets on both these subjects, in the latter of which he enunciated two central principles for the study of mankind at large: [4]

> First principle: Causes are proportional to the effects they produce. If a man can lift twice as much as another man, he is twice as strong as that man. Study of man's moral qualities is possible only if this principle can be applied to them also.
>
> Second principle: Exact conclusions are possible only with large numbers. "The greater the number of individuals, the more the influence of the individual will is effaced, being replaced by the series of general facts that depend on the general causes according to which society exists and maintains itself."

The moral regularities, the aggregates of individual choice, which Quetelet himself investigated included age-specific crime rates for men and (separately) for women and are sometimes referred to as the "moral statistics" of Quetelet.

These preliminary principles formed the basis of his famed 1835 treatise *Treatise on Man and the Development of his Faculties* with the controversial subtitle 'Essay on Social Physics'. The subtitle was so controversial that it was removed from the first 1842 English translation edition. In the 1869 second edition views were reversed and the controversial subtitle became the main title.

the term 'average human' (l'homme moyen), or average man, referring to the demographically average man, the human being with his individual wishes and peculiarities canceled out, in which questions of determinism arose, also supposedly resulted in a reaction of lively debate.

Goethe | Gauss

Quetelet was an associate of thinkers such as Germans mathematician Carl Gauss and polymath Johann Goethe; the latter showing Quetelet special hospitality when he visited Germany in 1829. [4]

Dostoevsky

In 1865, the year of the publication of the first Russian edition of Quetelet, Fyodor Dostoyevsky read Quetelet's social physics theory and the following year incorporated the logic of social physics into his *Crime and Punishment*. [2]

Quetelet showed, based on statistical methods, that one could predict the percentage of the population that would murder, turn to prostitution, marry, divorce, commit suicide, etc., and thus in Quetelet's 'social physics', crime is regarded as an unavoidable fact of life. [3] In modern terms, to note, these unavoidable facts are quantified by the Lewis inequality for unnatural processes viewed in the context of thermodynamic coupling.

In *Crime and Punishment*, the character Raskolnikov is said to apply Quetelet's social theory to the young women he meets on the street, reasoning that there is no point in helping her, since her fate had already been determined statistically by the laws of social physics. In this example, according to a review by Harold Bloom, Dostoevsky is said to be exemplifying "how the laws of social physics conflict with Christ's commandment to love one's neighbor." [3]

Quotes | By

The following are notable quotes by Quetelet:

> "In giving to my work the title of social physics, I have had no other aim than to collect, in uniform order, the phenomena affecting men, nearly as physical science brings together the phenomena to the material world."
>
> — Adolphe Quetelet (1835), *Essay on Social Physics* [5]

> "In a given state of society, resting under the influence of certain causes, regular effects are produced, which oscillate, as it were, around a fixed mean, without undergoing any sensible alterations."
>
> — Adolphe Quetelet (1835), *Essay on Social Physics* [5]

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Further reading

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External links

● Adolphe Quetelet – Wikipedia.

θΔics

In religio-mythology, **Adonis** was a god, in Greek mythology (see: Greek pantheon), of beauty and desire, generally categorized, via god character equivalents, as a Horus rescript or as a Horus motif god.

Quotes

The following are related quotes:

> "An analysis of our Easter rituals, which seemingly purport purely Christian significance, will reveal that similar miraculous events occurred in faiths of civilizations which preceded the Christian era by thousands of years. For example, Dupuis writes' that Krishna, the crucified Hindu Savior, rose from the dead. Similar stories circulated about Buddha' the Chinese Lao-Kium, and Zoroaster. Ovid's poem, written at the time of the Roman Emperor Augustus, describes Aesculapius, the 'son of god', as being put to death and being **resurrected**. Likewise, the savior Adonis or Tammuz, after being put to death, arose from the dead. Julius Firmicius, an eminent early Christian priest and scholar who lived during the reign of Constantine and therefore at the time of the Council of Nicaea (325 AD) gives an account of the rites of **Adonis**. He is struck by the similarity of the heathen mysteries with the Christian sacrament honoring the death and resurrection of Christ Jesus. Alexander Murray quotes the exclamation which the ancient Greeks used during their Easter festival: 'Adonis lives and is risen again'. In our Christian Easter services, the name of Christ replaces Adonis. Bonwick, Prichard, and other authoritative writers agree that Adonis was to the ancient Greeks, Osiris, the Egyptian savior. Osiris, too, was put do death, whence he rose from the dad. The worship of Osiris was universal in Egypt prior to any similar worship in the Mediterranean region."
>
> — Karel Hujer (1946), "The Astronomical Significance of Easter" [1]

References

1. Hujer, Karel. (1946). "The Astronomical Significance of Easter" (Ñº), *Popular Astronomy*, 154:131-34.

External links

â— Adonis – Wikipedia.

θΔics

In existographies, **Adragon de Mello** (1976-), aka “James Gunn” (name change) or "AD", is an American extreme forced prodigy, noted for graduating from college at age 11, in 1988, with a degree in computational mathematics, which set a Guinness Book record, for youngest college graduate.

Overview

In c.1970, Agustin Eastwood De Mello (1929–2003), a karate master, flamenco guitarist, and former weightlifting champion, wrote a science fiction story about “brilliant child who becomes a revered scientist and world leader who leads an intergalactic movement to the great benefit of mankind”, and sent the story to Isaac Asimov to review. [1]

In 1975, Agustin’s second wife Cathy Gunn, became pregnant, at point which Agustin began making her drink a baby genius formula of some sort.

In 1976, Adragon de Mello was born, at which point Agustin began to undertake one of the most extreme forced prodigy attempts on record, so in to realize his goal that Adragon would become a Nobel laurate by age 16. [2] Agustin envisioned that Adragon would become another da Vinci or Einstein. (Ñº)

At six weeks, according to his father, Adragon could say “hello”, at age 3, supposedly, he could read and write.

In 1981, Adragon, age 5, was accepted into Mensa.

IQ | 400

In 1981, Agustin gave some type of test designed for 20-year-olds to his son, then aged four; from these test results, Agustin calculated that son's IQ was 400 as follows:

$$IQ_{Mello_{age5}} \cong 100\frac{20}{5} = 400$$

Agustin then began telling media that his son has an IQ of 400. This is the highest inflated IQ on record.

Quotes | On

The following are quotes on de Mello:

> “The course load crippled AD. Yes, he was extremely gifted, and professors even noted the boy’s photographic memory, but he was coming apart. In astronomy, he scored poorest in the class. On three occasions, he did not complete the course work but the end of the term. As the quarter progressed and blackboard equations gained more parentheses, AD told his father that he couldn't handle the pressure anymore, that he might go crazy.”
>
> — Author (2002), “Article”, *Esquire Magazine* [1]

> “Agustin tested **AD**'s intelligence when the boy turned five. He calculated an **IQ of 400**, meaning AD might rank as the greatest intellect in history.”
>
> — Kurson Robert (2002), “Just Another Father-Son Story” [3]

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External links

â— Adragon de Mello – Wikipedia.

θΔics

In existographies, **Adriaan Michiel de Lange** (1945-) (SNE:6) (DN:1/10) (CR:58), aka "At de Lange", is a South African chemical physicist, who is a very well-read physical-sciences based thinker (above the 500+ book level in studying how thermodynamics applies to the humanities) who in 1982 began to view the idea that entropy production must apply to the spiritual world; then, in 1986, while teaching physical chemistry class, grasped the idea that "the intricate calculations concerning free energy in chemical reactions" must apply to the process of knowing and learning, on the extrapolation that student's learning behaviors must follow or map to the behaviors of molecules moving through the chromatograph column; in 1987, completed a yet unpublished manuscript *Entropy, Creativity, and Learning;* in the late 1990s, began posting and discussing his theories at the Learning-org.com forums; and in 2009 published an online book *Irreversible Self-Organization* (in Afrikaans).

Overview

In 1982, de Lange began to glimpse a view of how entropy (and later Gibbs free energy) apply to the evolution, human "being and becoming", as well as to the spiritual world. In 2010, he self-described himself as having a Dawkins number of 1. The following selection of quotes gives an idea of de Lange's theoretical development: [5]

> "Since as a kid I was aware of the abyss (super rift) between the material and mental worlds. I tried to bridge this abyss, but could not. Yet I kept on with my own "Steigerung" as Goethe did. Then during 1982-83 I discovered empirically that the law of entropy production applies to the spiritual [*humanistic*] world as it applies to the physical world. My joy knew no bounds. I have found the bridge between these two worlds with which to cross the abyss between them. Others thought I was crazy and would not dare to publish my account.

He continues,

> Then, in 1986, if I remember correctly, I was teaching university students the intricate calculations concerning free energy in chemical reactions. During that lecture I suddenly became aware how my mind was rushing along two levels. The lower level was concerned with chemical processes as a physical phenomenon. I executed this level almost automatically. But the higher level of my mind was exploring free energy in the process of knowing-learning as a spiritual [*thermodynamics*] phenomenon. I followed this level with great curiosity. I think the students became aware that I was rather absent minded that day, not perceiving my higher most thoughts. That day marks the beginning of my continual exploring of the role of free energy in the spiritulization [*actualization*] of humankind."

In the above quotes the italicized words (humanistic, thermodynamics, and actualization) were inserted in place of the words 'spirituality' or spiritual, so to make the presentation cogent in a modern scientific sense, as many parts of de Lange's theory are filled with religious thermodynamics

conjectures; albeit these seem to be only minor detractors to the overall theory which is quite an interesting read as compared to most other human thermodynamicists.

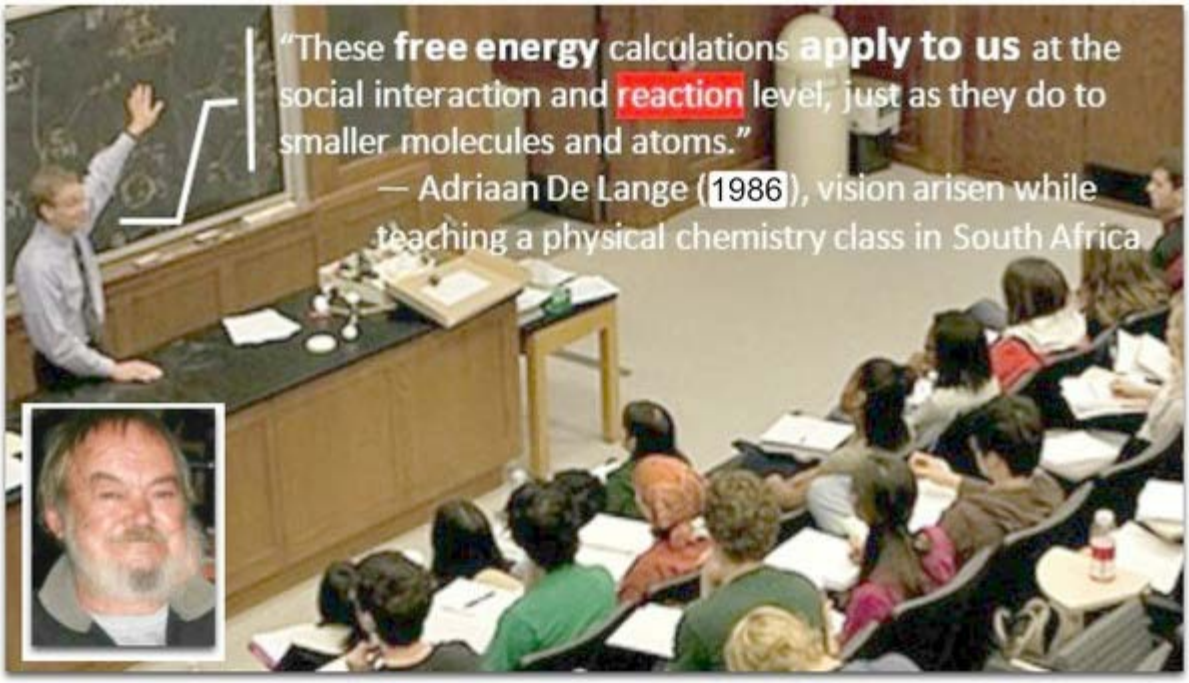

A mock rendition of South African physical chemistry Adriaan de Lange (1986) teaching Lewis-based physical chemistry to his students, amid which he came to the realization that these principles ALSO apply to people at the social interaction and reaction level; it would take him another 23-years to go from the "**idea stage**" to be able to pen out a full book on this view.

The last account, to note, is similar to American chemical engineer Libb Thims experience if circa 1995 while being taught about free energy calculations in chemical reactions and beginning to wonder how the same logic would apply at the human mental level, albeit purely hard science sense (no spiritual aspects).

Much of de Lange's theories seems to hinge around Belgian chemist Ilya Prigogine's 1980 book *From Being to Becoming*. De Lange's 2009 online multi-part *Irreversible Self-Organization* (written in Afrikaans) outlines a thermodynamics theory of human evolution and existence, and is an attempt to summarize his views on this subject. The following is a quote form this work: [1]

> "Life is like a puzzle. Without the concept of entropy, it is impossible to complete the puzzle."

De Lange, to note, as compared to other writers who mix religion and thermodynamics, has a fairly good comprehension of chemical thermodynamics, citing Gilbert Lewis, for instance, as one of his heroes. His knowledge of chemical thermodynamics is exemplified by his 1998 commentary on entropy, where he comments on how Max Planck was a better thermodynamicist than Erwin Schrodinger (which is true), and states that "the last great mathematician+physicist+chemist was J Willard Gibbs"; and comments that if he had to list the three greatest scientists of all time, that Gibbs would be one of them. [6] A down point in his presentation is that he intertwines his theories with diatribe on god, Christianity, and spirituality; but, then again, as compared to other religiosity writers on human thermodynamics he has a very strong understanding of Gibbs free energy in application to human activity.

As early as 1997, De Lange began posting up discussion pieces on the second law of thermodynamics, communication, and human organization. [4] De Lange's work has been cited and used in the 2009 theories of New Zealand business engineer Gavin Ritz, who has been discussing theory with de Lange since at least 2001. [2] De Lange goes by various names on the internet and in citations, including: AM de Lange, At de Lange (where At is somehow short for "Adriaan Michiel"), Mnr AM de Lange, or "Ontluiker", his online nickname.

Elective Affinities

In 2010 discussions with Libb Thims, in commentary on whether he had read German polymath Johann Goethe's

version of human chemical affinities, de Lange commented: [8]

> “Yes, you are correct - I have never read before Goethe’s *Elective Affinities*. When I was doing research on Goethe’s way of thinking (late 80's - early 90's) I remembered the novel *Elective Affinities* being mentioned somewhere, but I could not get hold of a copy here in the libraries of South African universities. I dismissed it. Had I known that in it he made use of chemical affinities, I would have made more effort to get a copy of it.
>
> I obtained my BS during 63-65, a curious transition period in the science faculty existed. Much of the science subjects’ first year course made use of late 1800-early 1900 scientific insights. But in the second year courses much insight from the 1940's were included.
>
> Thus our textbook and lectures in 1963 (first year) made use of chemical affinities as the guiding principle. But in 1964 (second year) the courses shifted to Gibbs free energy. Our textbook in physical chemistry was the famous one by Lewis and Randall. I feel in love with that book because it explained difficult concepts so clearly and used many examples as aid. In 1965 (third year) much more emphasis was put on quantum theory in both physics and chemistry. A book like that P.W. Atkins was still a twinkle in the eye.
>
> I felt that chemical dynamics based on affinities since Bergman was a rather woolly way to understand it. I took great pleasure in chemical dynamics based on Gibbs’ free energy and felt in 1975(?) that I have mastered it completely. It never occurred to me study chemical affinities again from this masterly position.
>
> Yesterday i got hold, by using Google of a scanned version of an English translation of his *Elective Affinities* (link). I read each page attentively up to page 100. Thereafter, I began to scan through it by reading parts of every second page up 385. The reason is that the book tired me because of so slowly developing to the climax. On page 60/61 he specifically explains through Edward to Charlotte that he is going to use chemical affinities to set up an ANALOGY with interpersonal dynamics of the form AB + CD → AD + CB (double substitution). I found it annoying that Goethe spoke through Edward what he intended to do in the rest of the novel. He should have done it in a foreword.
>
> I could not ascertain whether the analogy was used as a metaphor, a model or an isomorphism. I think the reason was simple. Little was known of chemical affinities in the early 1800's. Much of it was merely an arrangement of observations in a tabular (matrix) form.
>
> It is said that Weber used chemical affinities to set up a foundation for sociology, in other words, modelled sociology on chemical affinities (or Gibbs’ free energy in more recent terms. I myself will certainly not repeat such a venture. The reason is as follows:
>
> “Chemical reactions are per definition irreversible” Prigogine once exclaimed. He never tried to explain this claim and i think few will be able to do it. J.W. Gibbs mentioned that spontaneous reactions are characterized by $\Delta G < 0$. But it took a G.N. Lewis to use it to great advantage in chemical thermodynamics. He once mentioned that non-spontaneous reactions are characterized by $\Delta G - W < 0$, but I cannot remember where. It was only when I deepened myself in the thermodynamics that I discovered the importance of $\Delta G - W < 0$ in electro-synthesis and electro-analysis.
>
> Together with that, somewhere in 1984-85 came the incredible paradigm shift that in nature the condition $\Delta G < 0$ (spontaneous-irreversible) applies almost always, but when humans came into play, the condition $\Delta G - W < 0$ (non-spontaneous- irreversible) applies in the majority of interactions of humans with nature as well as humans among each other. This makes the idea that human thermodynamics can be modelled on chemical thermodynamics untenable. The condition $\Delta G - W < 0$ applies only when human interaction comes into play.
>
> Few evolutionists are even aware that homo sapiens emerged from other hominoids by making deliberate

use of the condition $\Delta G - W < 0$ to avoid extinction. This condition is stressed in Genesis 1 with the God's remark that humans will have to exist by working with sweat (implying that it is not a condition for the rest of nature-creation).

Up to now i have managed to give account in terms of "human entropics" of such vastly different phenomena such as slavery, money and technology. In all of them the condition $\Delta G - W < 0$ plays a central, essential role."

As we see, de Lange is well-schooled.

Gibbs free energy theory of evolution

The following 2001 thread discussions give an idea of the depth of understanding of human thermodynamics in De Lange's mind, which is quite deep, albeit detracted to a certain extent with digression on spirituality, noting in partiular that he seems to have a Goethean like approach to knowledge and that he uses both free energy and entropy theory in the understanding of the movement of his own life as well as in explaining evolution: [5]

> "In my own mind I have made, like Goethe, many interconnections between the subjects (branches) of knowledge with many spillovers from one subject to all others. How many times since 1970 had I not become trapped on a local optimum, not knowing who to reach the next one. Whereas Kaufmann discovered the 'patching algorithm', I learned a pattern which with difficulty I could much later articulate as the monadic categorical pattern. I later found that Goethe already as far back as two centuries ago called it 'steigerung' (staggering). In Afrikaans it would be called 'opstapeling' so that '(up)stapling in English will also do. As the years passed, I became aware how this staggering enabled me to wander from local optimum to local optimum in an endless manner. Among other things, I learned how 'entropy production' driven by 'free energy' changes drives this staggering."

He continues, in what is an excellent quote, aside the spiritual addendum:

> "In 1982-83, I discovered empirically that the law of entropy production also has a spiritual dimension. In 1986, if I remember correctly, I was teaching university students the intricate calculations concerning free energy in chemical reactions. During that lecture I suddenly became aware how my mind was rushing along two levels. The lower level was concerned with chemical processes as a physical phenomenon. I executed this level almost automatically. But the higher level of my mind was exploring free energy in the process of knowing/learning as a spiritual phenomenon. I followed this level with great curiosity. I think the students became aware that I was rather absent minded that day, not perceiving my higher most thoughts. That day marks the beginning of my continual exploring of the role of free energy in the spirituality of humankind."

This quote is similar to American chemical engineer Libb Thims' 1995 awakening to the implications concerning the human implications of description human chemical reactions in terms of free energy changes. De Lange continues, giving what seems to the Prigogine-interpretation of the difference between the applicability of classical thermodynamics versus nonequilibrium thermodynamics:

> "To manage both material and mental systems I had to reform my understanding of the "Gibbs free energy" G and entropy S considerably compared to that of 1967 (after five years of training in chemistry, mathematics and physics). I learned since 1968, as a result of doing research on soils which are surprisingly complex, that classical thermodynamics (CT) cannot handle complex systems whereas irreversible thermodynamics (IT), initiated by Prigogine, can do so. The first major difference between the two is that in CT the focus is on "entropy S" as a picture whereas in IT the focus is on "entropy production ΔS" as a

movie. The second major difference is that in CT entropy is interpreted as chaos whereas in IT the causes and consequences of entropy production ΔS get attention rather than trying to interpret it."

He then connections free energy to evolution as followings:

"Let me then give a quick summary of "free energy" F as I understand it presently. Every system, material or mental, has patterns in it. When these patterns are considered together, I think that they can be called the system's organisation. The entropy S of the system is a measure of the system's organisation, irrespective of the kinds of patterns (order or chaos, structure or process, microscopic or macroscopic). The system's organisation cannot change without its entropy S changing too.

The change (symbolised by Δ) in the entropy S gets the name "entropy production" (symbolised by ΔS). The reason is that entropy is increased (created) by what I prefer to call "entropic" (rather than thermodynamic) "force-flux pairs". These entropic force-flux pairs emerge when some forms of energy are converted into different forms of energy. Every form of energy may have its own entropic force-flux pair. Every form of energy may be expressed by the product XY of an extensive quantity X and an intensive quantity Y. When any system is scaled in size, all its extensive quantities X get scaled while all its intensive quantities Y remain the same. Differences in the values of an extensive quantity X is an entropic flux while differences in the values of an intensive quantity Y is an entropic force.

All the forms of energy of a system together is called its "total energy E". Some of this total energy E is bound into maintaining the systems present organisation, among others even those forms of energy! The rest of the total energy E is called the system's free energy F. Since it is not bound to keep up the system's organisation, it is readily available to drive the transformation in energy forms of the system and hence the associated entropy production ΔS.

When the system does not have sufficient free energy F to drive its entropy production and thus organisational changes, there are two options to obtain further free energy. One option is that it can be imported from an external source like animals eating food or plants absorbing sunlight. The other option is that it can be liberated from within by giving up some of its organisation through a process which I call the "creative collapse" (the complexity version of Heidegger's and Derrida's "deconstruction"). Taking animals or plants as example, they will then use their own tissues as source of free energy rather than eating food.

The change of the system's free energy F during its course through successive higher levels of complexity is itself very complex. That course may be called evolution when it involves innumerous generations or metamorphosis (development) when it involves one generation. Evolution and metamorphosis can be observed in both material and mental systems. Assume one level of complexity has been reached by the emergence of "kernels" or the "infants" of that level. They now have to mature into "adults" by a process called digestion. Their intensive (scaling independent) properties Y do not change much whereas their extensive (scaling dependant) properties X do change considerably. These extensive properties grow during the digestion so that the total energy E, entropy S and thus free energy F of the system increases. At first the increase in total energy E is fast, but it slows down gradually as maturity is reached. Thereafter it may even decrease gradually."

He continues:

"Processes happen spontaneously when the free energy F of a system decreases. But during digestion the free energy of the system increases. Is this not a contradiction? No, for digestion the system has to be open. Thus we have to consider the system and all the surrounding systems upon which it feeds as a whole. For this whole ecosystem (the system SY and the surroundings SU) the free energy does decrease so that the

digestion happens spontaneously. However, the system's gain in free energy is made possible by the extended loss in free energy of the sourcing systems. One system gets rich while many systems get poor.

When maturity is reached, the system begins to use that free energy to drive itself to the ridge of chaos where other kernels of the same order or even kernels of a higher order can emerge. At first the entropy production is low, but as the system approaches the ridge of chaos, enough entropy has to be produced fast enough to actually reach that ridge. In other words, the pattern of entropy production in the swing towards chaos to acquire new qualities which are opposite to the pattern in the swing towards order in the same qualities.

It is frequently claimed that systems have to be open during the swing towards chaos. However, this is often detrimental to the system. What will happen is that the system SY will lose to the environment SU the extra entropy it produced rather than using it to change its internal organisation. When this happens, the system begins to feed like a parasite upon the free energy sources in its environment to supplement its own free energy which ought to be liberated by means of a creative collapse. This supplement becomes detrimental to the environment. The latter loses free energy which it then cannot use self. Later on the environment gets deluged by entropy which it has not produced self. This free energy poverty and entropy pollution which degrade the environment will finally cause the demise of even that too an open system.

The digestive swing together with the bifurcative swing form a cycle (Many biochemical and ecological cycles are essential to life.) This peculiar cycle stays in form essentially the same. But in content it increases the free energy F, entropy S and total energy E after each cycle. In nature such a peculiar system would let to catastrophes (few becoming rich at the expense of many becoming poor) were it not for mutualistic symbiosis. Furthermore, somewhere something must act as a source of free energy at such a vast time scale so that whatever uses it without giving back, can indeed complexify through all levels in this time scale. This source of pure free energy in the case of our world is nothing else than an yellow star which we call sun."

Free energy landscapes

On this model, de Lange presents a free energy landscape diagram, pictured adjacent, which he says is "a simplified version of the image in my mind", wherein the vertical axis represents free energy, the 'Urphaenomen' or prototype of all functions having limits. De Lange's diagram seems to be similar to the free energy maps developed recently in drug-receptor thermodynamics. He continues:

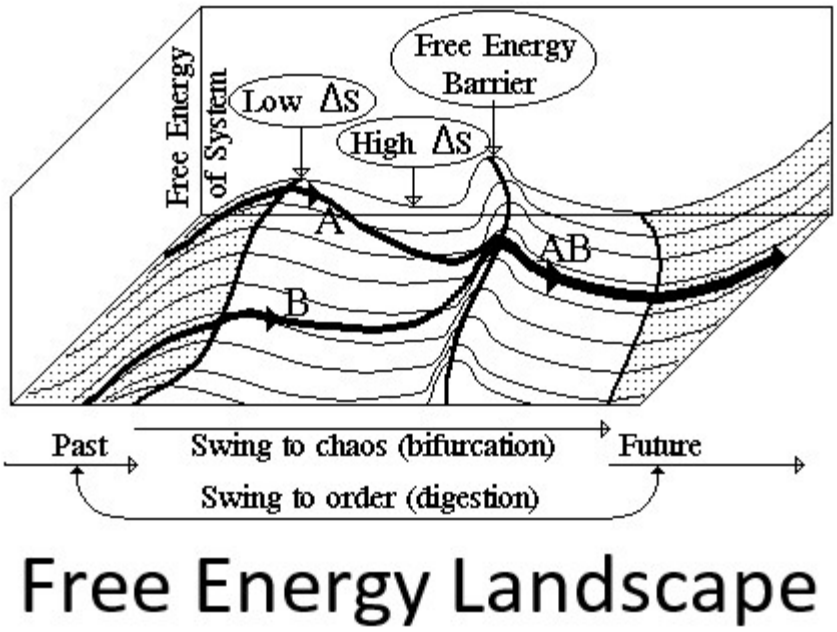

Adriaan de Lange's 2001 free energy landscape of evolution, employing a mixture of chaos theory, Prigoginean bifurcation theory, order-disorder logic, time (past vs future), free energy barrier, path functions, and discussions of high and low values of entropy change.

"All fitness functions, how imaginative we may create them, depend on free energy as the mother of them all. No change is possible without free energy changing somewhere in the universe, whether in the system SY or in the surroundings SU. The free energy F is not merely a theoretical concept of the imagination. It is a quantity based on innumerous measurements and calculations in the realm of physical chemistry. It is a quantity of bewildering consequences, the nemesis of many a student in physical chemistry."

In describing his graph further he explains:

> “Please notice the two shaded regions, designated past and future digestions. (Forget for a moment the thickest lines called A, B and AB as well as the strange barrier in the unshaded region where the two lines join.) The free energy in both shaded regions increases (the landscape bulges upwards to a summit). The difference is that the "hill of the past" is often lower than the "hill of the future". (I have actually drawn the future hill much higher than the past hill so that you can easily observe it.) Looking towards all the free energy hills of the future, there is a gradual elevation along the future hills. It is as if the system is gradually climbing the rugged landscape called free energy F from sea level towards a high mountain "Everest" beyond the horizon. "Steigerung" (staggering) is necessary to do so. Specialization, on the other hand, will cause the system to stay meandering within in a "patch" (region) containing only some hills this side of the horizon.”

(add) [5]

Education

De Lange is a seventh generation descendent of the the Boer people (South African of Dutch, German, or Huguenot descent). De Lange completed five years in training in chemistry, mathematics, and physics; resulting in a BS in chemistry, physics, and mathematics (1965), and a MS in physics (1967). Three times he has attempted to obtain a doctorate, but each time had to give up because he was unwilling to conform to the promoter’s way of thinking rather than doing original research.

In 1986, he was teaching university students the intricate calculations concerning free energy in chemical reactions. [5] In 1997, he was teaching Lewis dot structure to chemistry students.

He is well-read on people such as Erwin Schrodinger, Stuart Kauffman, and Ilya Prigogine. He states that was taught thermodynamics in his second year, via Italian physicist Enrico Fermi's 1936 book. [4] In 1998, it seems, de Lange was associated with the Gold Fields Computer Centre for Education at the University of Pretoria, South Africa. [3] At the University of Pretoria library, de Lange states that “I have read at least 500 books and thousands of papers to explore what manner of entropy thinking would accommodate most religions without scaring the daylights out of people, religious or not.” [7]

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θΔics

In existographies, **Adrian Bejan** (1948-) (CR:31) is a Romanian-born American mechanical engineer, of the MIT school of thermodynamics, anti-chance philosopher, noted for his 2007 application of his 1996 thermodynamics-based "constructal theory" in the explanation of social dynamics. [1] His latest publication on this topic is the 2009 collaborative book *Constructive Human Dynamics*. [2] Bejan's 1988 textbook *Advanced Engineering Thermodynamics*, was in its third edition in 2006. [3]

Panbioism

In 2016, Bejan, in his *The Physics of Life: the Evolution of Everything*, on his first page, as cited in this dialogue (Q), says he "naturally disagrees" with Ferris Jabr's 2014 statement that "nothing is truly alive". [7] This avowal puts Bejan into the panbioism, as opposed to the abioism, belief category, per his implicit assertion that both water molecules moving in rivers and human molecules moving on roadways are "truly alive" in some sense. [6]

Constructal theory | Overview

See also: Lazy ant study

In Sep 1995, Bejan, while attending an international conference on thermodynamics in Nancy, France, whereat he had brought flyers for his seventh book *Entropy Generation Minimization*, listened to a pre-banquet speech by Ilya Prigogine, who asserted that the various tree-shaped structures in nature, e.g. river basins, river deltas, air passages, or lightning bolts, such as shown below (adjacent(, were aleatoires, i.e. "random" (Q), the results of throwing dice, cosmic coincidences. [5] Bejan commented on this:

> "When [Prigogine] made that statement, something clicked, the penny dropped. I knew that Prigogine, and everyone else, was wrong. They weren't blind; the similarities among these treelike structures are clear to the naked eye. What they couldn't see was the scientific principle that governs the design of these diverse phenomena. In a flash, I realized that the world was not formed by random accidents, chance, and fate but that behind the dizzying diversity is a seamless stream of predictable patterns."

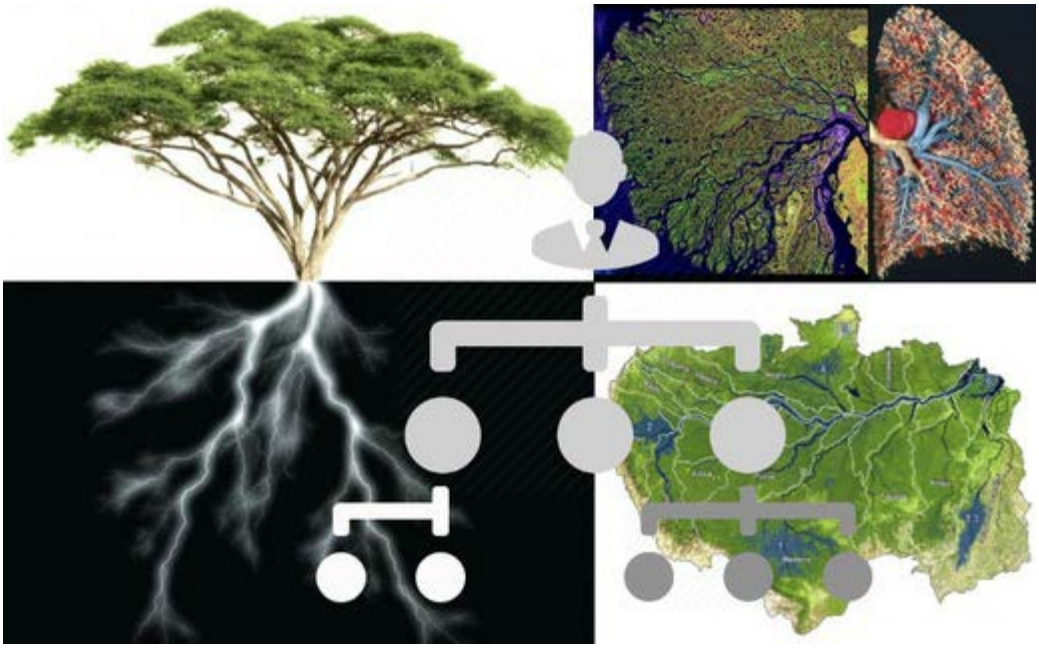

A diagram of **Bejan**'s concept of "constructal flow" patterns.

Moreover:

> "In the sixteen years since, I have shown how a single law of physics shapes the design of all around us. This insight would lead me to challenge many articles of faith held by my scientific colleagues, including the bedrock beliefs that biological creatures like you and me are governed by different principles from the inanimate world of winds and rivers and the engineered world of airplanes, ships, and automobiles. Over time, I would develop a new understanding of evolutionary phenomena and the oneness of nature that would reveal how design emerges WITHOUT an intelligent designer."

(add)

Religion | Physics

In 2012, Bejan, as outlined above, openly had rejecting both the Prigogine god and the god of the ID group.

In 2013, Bejan was featured (Q) in a "Through the Worm Hole" segment, hosted by Morgan Freeman, using his theory to usurp god via sports evolution (Q), which would seem to put him into the implicit atheism category.

In 2016, Bejan, in his *The Physics of Life*, while not using the term atheism, uses the term god once (pg. 166) to state that "in physical terms, the evolution of urban design and city traffic" are not "god-given". [6] This seems to be "intelligent design" rejection, but not avowed atheism; possibly closet theism of some sorts, e.g. of the Harold Morowitz or Stuart Kauffman variety? [6]

Social dynamics

In application of his constructal theory, Bejan reasons that society is a live "flow system" (e.g. a river basin, vascularized tissue, city traffic) where each person is like a alveolus in the lung, an eddy in a turbulent river, or a leaf on a branch, and that time's arrow is pointed in the direction of various sequences of flow configurations that constitute its existence or survival. The evolution of such systems, according to Bejan, actuates according to a new "thermodynamics principle", conceived by him in 1996, which argues that those configurations that continue to evolve are those that provide easier access to the currents that flow through them. [1]

Education

Bejan completed his BS (1971), MS (1972), and PhD (1975) all in mechanical engineering at the Massachusetts Institute of Technology. He is currently a professor of mechanical engineering, with focus on engineering thermodynamics and heat transfer, at Duke University.

Quotes | By

The following are quotes by Bejan:

> "I think of every thing that 'moves', from the atmosphere, to oceanic currents, to these other things that move, these 'buckets of water' we call animals, I think of them in the same way. So animal 'life', the biosphere, is, with regard to movement, and evolving flow architecture, on the planet, no different that other evolving flow architectures, all flowing more easily to churn over the earth's crust more effectively."
>
> — Adrian Bejan (2017), "Thermodynamics of Emotion" (8:35-9:11) (Q), Oct 28

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Videos

● Frontiers of the Second Law (01:28:28, 04 Apr 2010) – Clicker.com.
● Bejan, Adrian. (2010). "Constructal Theory of Generation in Nature" (vid), TEDxBucharest, Nov 29.

External links

● Adrian Bejan – Wikipedia.
● Adrian Bejan (faculty) – Duke University.
● Citations rankings (Adrian Bejan) – Google Scholar.

θΔics

In hmolscience, **Adrian Dragulescu** (c.1974-) is a Romanian-born American physicist noted for his 1997 to 2002 econophysics work with Russian-born American physicist Victor Yakovenko, at the University of Maryland, on the development of a statistical mechanical model of money, with money defined as energy, economic agents as gas molecules with a certain average money/energy, and an economic systems as one following a Maxwell-Boltzmann distribution like model of economic temperature.

Education

In 1996, Dragulescu completed his BS in physics in Timisoara, Romania.

In 1997, Dragulescu began working as a graduate student under Russian-born American physicist Victor Yakovenko, at the University of Maryland, on problems arising in economics and finance analyzed using concepts and quantitative methods from physics. In 2000, Dragulescu and Yakovenko published their "Statistical Mechanics of Money" (GS=400, 16 Jun 2013), there most widely-cited article, wherein the argue that:

(a) in a closed economic system money is conserved;
(b) money is a type of energy;
(c) each economic agent has a certain amount of average money (or energy);
(d) an "effective temperature" of the economic system can be obtained from this model that will follow the exponential Boltzmann-Gibbs law.

The following is their Boltzmann distribution money model:

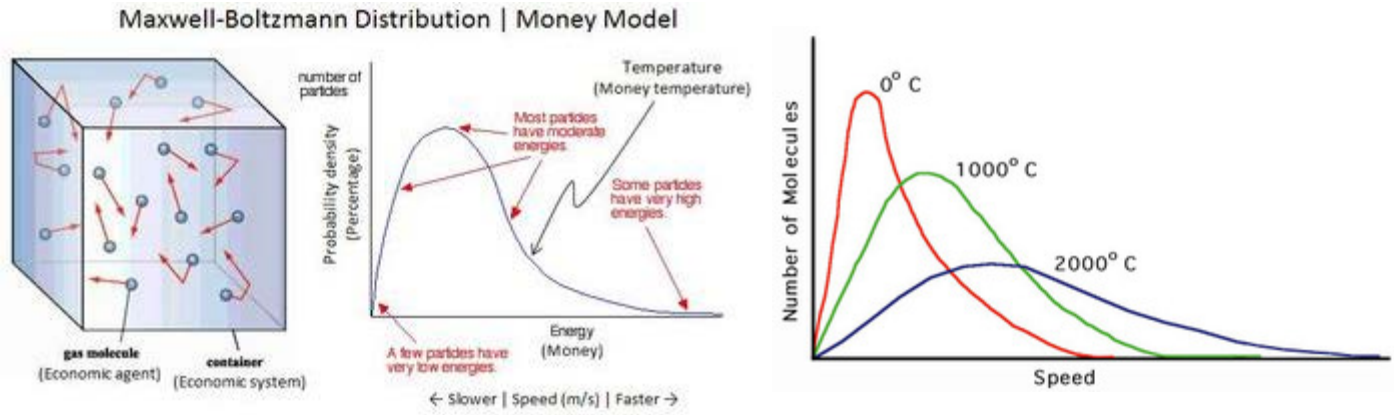

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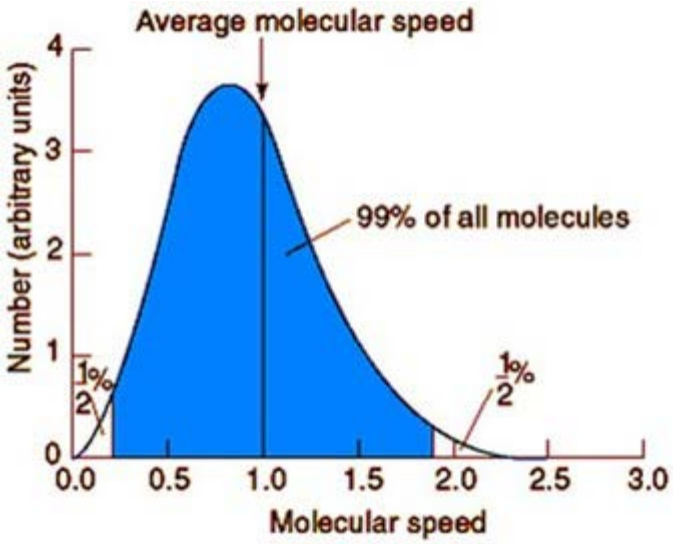

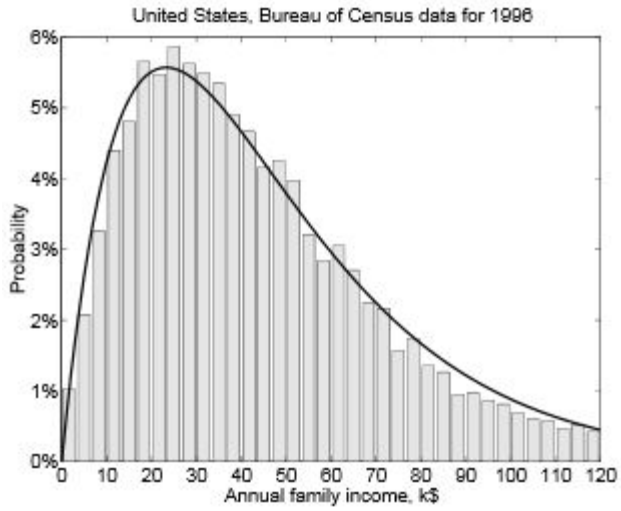

[4]

(add discussion)

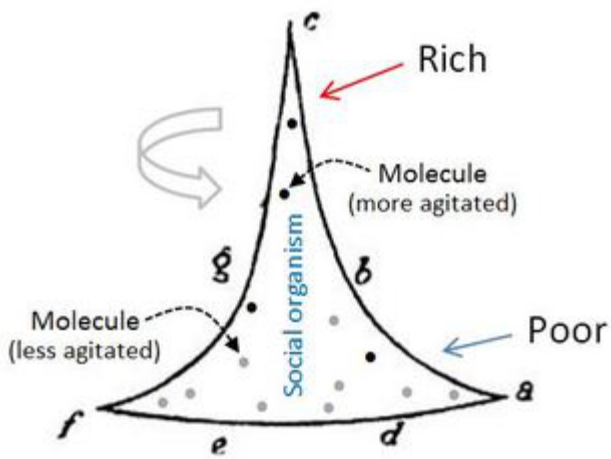

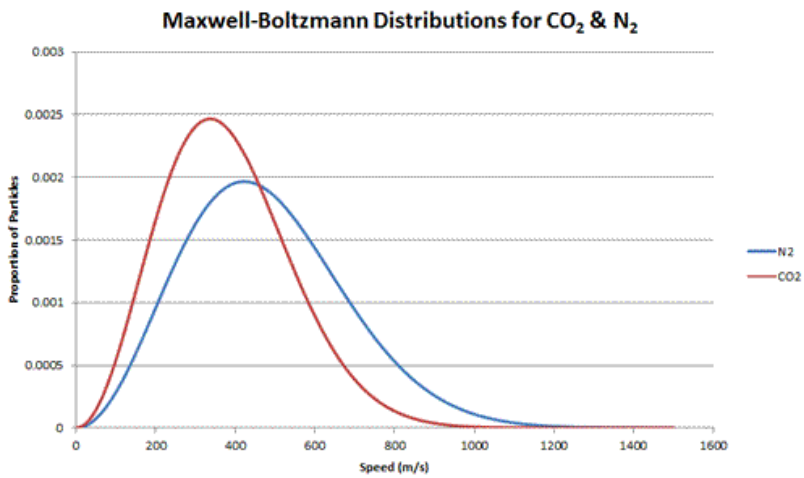

French-born Italian mathematical engineer Vilfredo Pareto's 1902 spinning top molecular social pyramid model of wealth distribution (Pareto principle). [5]

In 2002, Dragulescu finalized his studies by completing his PhD on "Applications of Physics to Economics and Finance: Money, Income, Wealth, and the Stock Market", under Yakovenko. In 2008 retrospect, Dragulescu stated the following about this educational experience: [3]

> "I made complete use of six years to get a PhD from the physics department of University of Maryland, College Park. My advisor was Victor Yakovenko. This was a very happy period of my life. I had the freedom and time to study any subject that interested me. Before that, I studied physics in Timisoara, Romania for five years. It was right after the Communist regime fell so the curriculum became boldly experimental, with a bunch of enthusiastic young lecturers."

Dragulescu, since 2002, has been a risk analyst, among other positions, at Constellation Energy Group, Baltimore.

See also

â— American school of econophysics

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External links

â— Dragulescu-Yakovenko (papers) – Fzu.cz.

θΔics

In religious thermodynamics, **Adrian Hough** (1959-) is an English physical chemist turned priest noted for his 2010 book *The Flaw in the Universe*, in which he attempts to explain both sin and natural disaster in terms of the second law of thermodynamics. [1]

Education

Hough completed his BS in chemistry and PhD on intermolecular forces with a thesis on "Spectroscopic Aspects of the Study of Weakly Bound Molecules" (1984), both at Oxford University. In 1989 Hough began studying theology at the Church of England and became a priest in 1993. In c.2010, he was employed as a Chaplain to the Bishop of Exeter where he trains newly ordained ministers; he is, supposedly, employed elsewhere now. (Ñº)

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External links

â— Hough, Adrian M. – WorldCat Identities.
â— Hough, Adrian Michael – WorldCat Identities.

θΔics

In existographies, **Adrien-Marie Legendre** (1752-1833) (IQ:175|#274) (Murray 4000:16|M) (GME:21) (Eells 100:11) (CR:3) was a French mathematician noted for his mathematical state function "transformation" procedure, known as the Legendre transform (or Legendre transformation), in which one specific variable of a state function equation can be converted into a more convenient form.

Partial differentials

In his 1786 "Memoir on how to Distinguish the Maxima and Minima in Calculus of Variations", Legendre is said to have established the modern notation and use for the partial differential of the form: [1]

$$\frac{\partial u}{\partial x}$$

This partial differential logic was then adopted by German mathematician Carl Jacobi in 1841 after which it became the norm.

References

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External links

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θΔics

In hmolsciences, **advanced perspective**, or advanced intelligence perspective, or third party, or double-blind placebo controlled perspective, refers to the "objective", as contrasted with "subjective", observational conceptualization mindset utilized when theorizing chemically, physically, or thermodynamically about human behavior.

Overview

In the advanced perspective one views people abstractly as "particles" or "molecules" moving about and reacting on a surface (of the earth), in the same way a chemist studies, observes, and tests atoms and molecules in the laboratory. [1] In this mindset the chemist uses a neutral point of view, approaching his or her problems with no preconceived notions about how things should or shouldn't be, but rather is focused with how things are and attempts to formulate theory to explain observational phenomena.

In the stoichiometric mode of thinking about humans as molecules, American limnologists Robert Sterner and James Elser explain: [2]

> "Organisms are considered as if they were 'single abstract molecules' that interact with each other and the abiotic world in a way that resembles a complex, composite, chemical reaction."
>
> — Robert Sterner and James Elser (2002), *Ecological Stoichiometry*

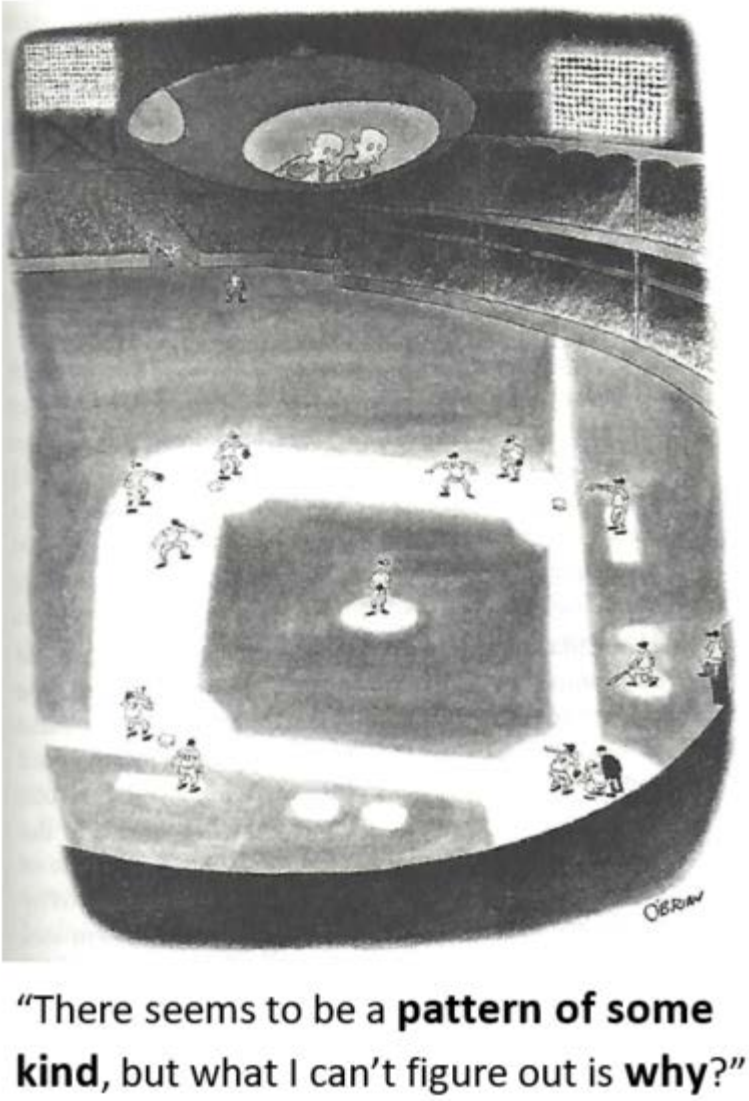

A cartoon depiction, from *The New Yorker Magazine* (1967), of alien scientists, aka "super observers", watching a baseball game, from above, but not able discern the why of the pattern. [7]

In other words, in the advanced viewing mode, humans are studied, from a far distance zoomed-out perspective, as though they were abstract dynamic 'particles' (human particles) or reactive 'entities' (human molecules), similar to how scientists view microbes through telescopes, atoms through scanning tunneling microscopes, or sub-atomic particles through bubble chambers and particle colliders. This is an important distinction being that for a number of reasons:

(a) Biases: anthropocentric biases often come to the fore when theorizing on topics that have immediate implications to one's understanding of his or her own existence; for instance, often one will incorrectly use the extrapolate down approach verses (e.g. assume atoms have consciousness), whereas the extrapolate up approach (e.g. assume humans chemically react with each other), tends to be the more-correct method of logic.

(b) Times: equations and concepts developed in classical science are typically structured around time-accelerated phenomena, relative to human existence time scales; particles in gas phase reactions move at speeds in excess of 1,200 miles per hour and extents of reactions will come to equilibrium with a matter of seconds or minutes, whereas humans move at speeds, on average, of 1 mile per hour, and extents of reactions for humans will often take years or decades to come to equilibrium, e.g. a golden wedding anniversary (50+ year reaction).

(c) Count: units in science tend to be based in molar units, involving a septillion (10^{24}) number of particles, per gram of substance (i.e. an Avogadro number of particles); whereas human phenomena, conversely, will often involve only one or two particles (single particle thermodynamics) or particles in the 10s to beyond several 1,000s or perhaps millions 10^6 of particles (such as during world wars) up to the billion 10^9 particle per system count (e.g. the population of India, viewed as a thermodynamic system); attempts at numerical formulation in this area include: Dunbar number (120), social Avogadro number, Lazlo number, and hmol.

(add)

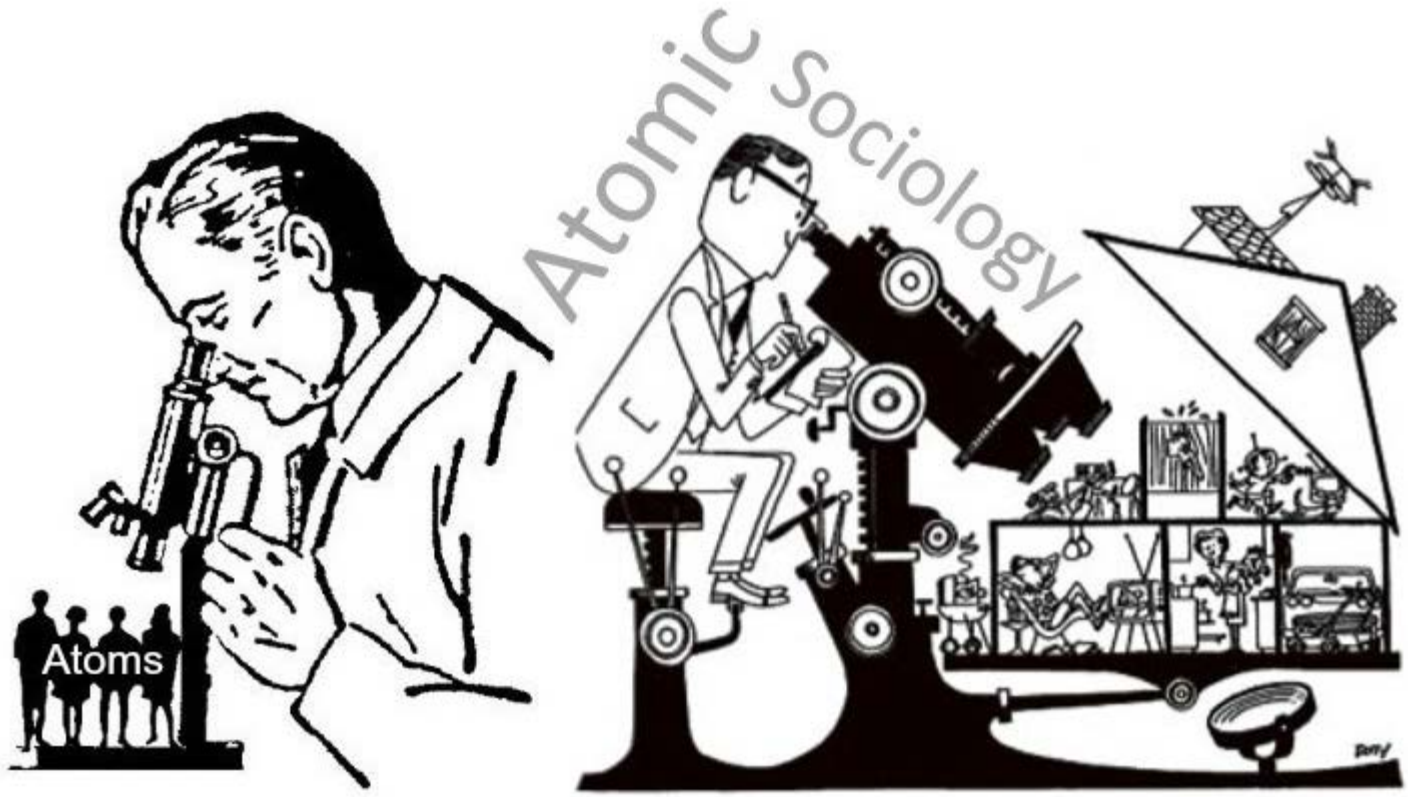

Depictions of "atomic sociology", namely of scientists, e.g. Albion Small (1899), Arthur Iberall (1970s), Serge Galam (1990s), or Mark Buchanan (2000s), thinking of people as "atoms" (human atoms or social atoms), using the **super-observer perspective**, and attempting to study their behavior as such (as conceptual particles).

Synonyms

Alternative synonyms of the scientific view of humans including:

- Super-observer (Oliver Reiser, 1935)
- Observer at a sufficient height (Pierre Teilhard, 1951)
- Molecular goggles (Albert Szent-Gyorgyi, c.1960s)
- Macroscope view (Joel de Rosnay, 1975)
- Cosmic perspective (Carl Sagan, *Cosmos*, 1980)
- Unsuspected visitor perspective (Alfredo Infante, 2001)
- Bird's-eye view (William McNeill, 2003),
- Martian or zoomed-back view (Andrew Morrow, 2006)
- Advanced intelligence perspective (Libb Thims, 2007) [3]
- Thermodynamic lens (Bruce Avolio, 2014).

In 2005, English evolutionary biologist Richard Dawkins introduced the term "middle world" to describe the realm of human discernment, that which one routinely encounters, as contrasted with the "lower world", of quarks and atoms, and "upper world" of the bigger expanse of the universe. [5]

In 2006, American chemical engineer Andrew Morrow began to contemplate on the phenomenon of the mid-life crisis, albeit using a modern chemistry atomic-system based, laws of thermodynamics guided philosophy of how to exist, based on the knowledge that humans are made of atoms. Morrow defines this view as such: [4]

> "Start with atoms and thermodynamics and to slowly zoom back out to the millimeters-to-miles distance regime [as a Martian might see us on Earth] and examine the world in which [you] live with a fresh perspective based strictly on well-established, non-controversial scientific knowledge [and] use this information as a foundation upon which [to] decide how to spend the remainder of [your] lifetime."

In this logic, Morrow states that his intention in publishing his views is for the reader to see the world through eyes unclouded by hate, fear, or other human emotion, so to observe our world, to evaluated our nature, our nurture, and our behavior, in such a manner that a chemical reality based thermodynamic-perspective world-view will empower the reader and further probe the mystery of existence.

Quotes

The following are related quotes:

> "My attitude has always been cosmic, and I looked on man as if from another planet. He was merely an interesting species presented for study and classification."
>
> — Howard Lovecraft (1922), "A Confession of Unfaith" [6]

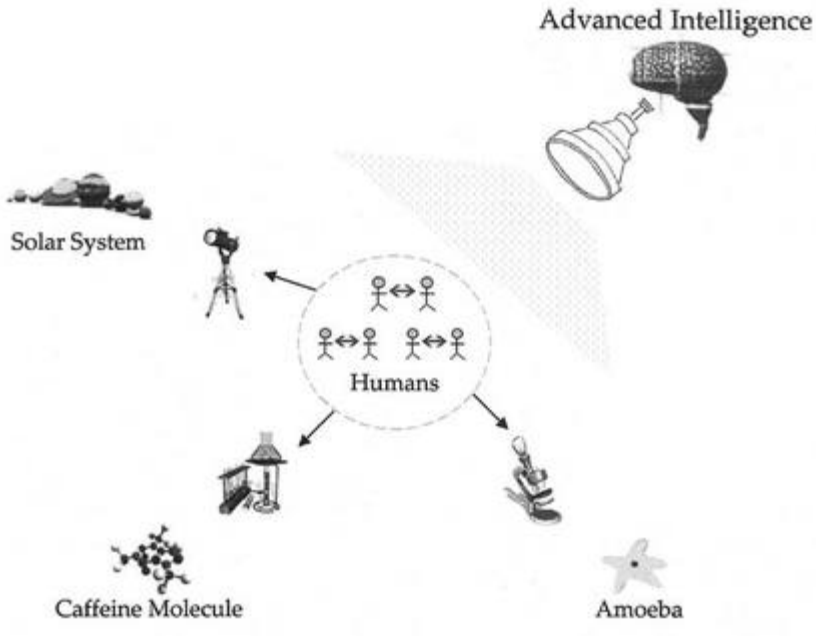

Diagram of the "**advanced intelligence perspetive**" from American chemical engineer Libb Thims' 2008 book *The Human Molecule*. [1]

> "The argument herein is that the activities of the universe, including human activities, belong to a single universe of processes. The problem lies in the fact that **we are the observers** and, in monism, observers are part of the observed. There are serious theoretical obstacles in self-observation and in self-description."
>
> — Richard Adams (1988), *The Eighth Day* (pg. 9)

> "Let's postulate the following ideal scenario for our analysis. There is an **extraterrestrial observer** whose spacecraft is outside of our atmosphere and by the way, he is never visible to us. However, in spite of the distance, he is still able to distinguish the movement of individual human beings. Certainly, it would not take too long for him, to realize that the movements of human beings obey chaotic rules. This ideal scenario would not matter too much to him, unless he ignores the second law of thermodynamics, but indeed he does not ignore this law. Thus, such observer would conclude quickly that human beings express many forms of unusual, seemingly irrational, behavior. For example, he will be surprised looking at riots, political meetings, religious behavior, wars, etc. As a result of these observations, he would ask himself, what in hell motivates such uncommon behavior of the human beings? Suppose now that this alien visitor gets closer to the earth (remember, he is invisible to human beings) and manages to learn the reason why the human beings behave that way. Soon he would be able to understand that such apparently unusual behavior is consistently motivated by a lack of some degree of freedom; which may be summed up as a state of

satisfaction or dissatisfaction. Viewed in this way, our social system may be approached through the second law of thermodynamics."

— Alfredo Infante (2001), "Social Entropy"

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θΔics

In famous publications, **Advice of the Guardian of the Ragusa Capuchins to Brother Pediculoso, on his Departure for the Holy Land** is a circa 1765 satirical walk though the Bible according to the ridiculing humor of Voltaire.

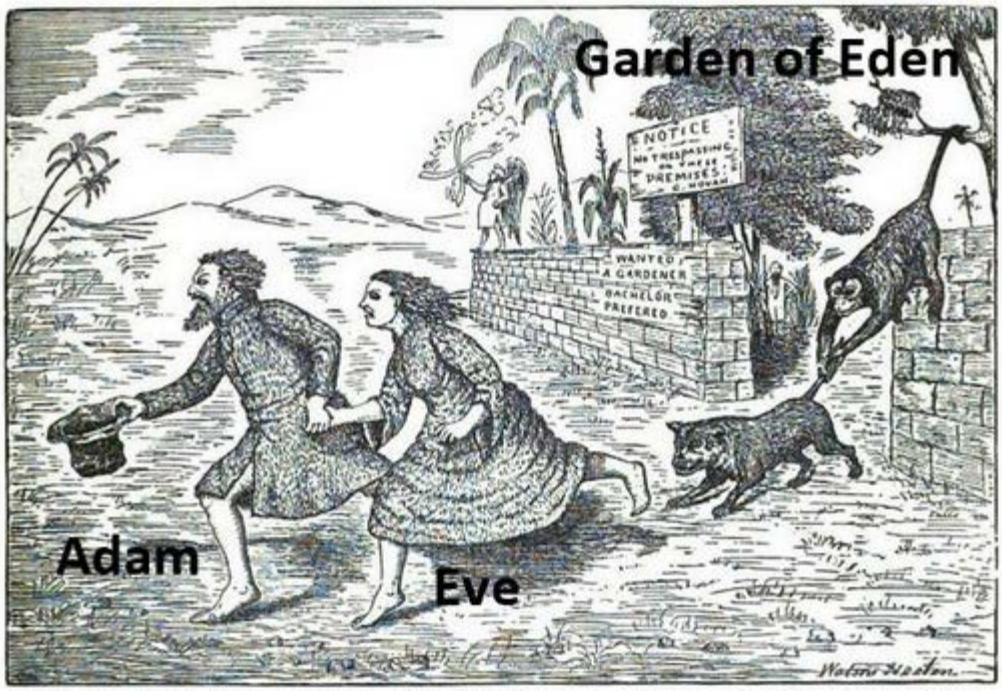

So he drove out the man; and he placed at the east of the garden of Eden Cherubims, and a flaming sword which turned every way, to keep the way of the tree of life.
— Anon (500BC), *Bible* (***Genesis* 3:24**)

A Watson Heston (1890) parody depiction of Adam and Eve fleeing from the Garden of Eden, as described in Genesis (3:24), which visually is similar to Voltaire's c.1765 verbal descriptions of the Biblical paradise and "Holy Land" in his **Advice of the Guardian of the Ragusa Capuchins** (shown below). [2]

Overview

In c.1765, Voltaire, during his time at Ferney, 1759 to 1778, penned a satirical pamphlet entitled "Advice of the Guardian of the Ragusa Capuchins to Brother Pediculoso, on his Departure for the Holy Land", wherein he presents a walk through the Bible as akin to, in modern retrospect, a walk though Candy Land or Alice in Wonderland; the 1828 English translation of which, as re-published by George Holyoake (1848), is as follows: [1]

"The first thing you will do, brother Pediculoso, will be to visit Paradise, where God created Adam and Eve, so well-known among the ancient Greeks and Romans, the Persians, the Medes, the Egyptians, and the Syrians, that not a single writer of all those people has ever mentioned it. It will not be difficult to find; for it is situated at the sources of the Euphrates, the Tigris, the Araxes, and the Nile; and though the sources of the Nile and the Euphrates are 1000 leagues from each other [see: §:Four Rivers) (Ñº)], that is nothing: you have only to ask the way of the capuchins at Jerusalem, and you cannot possibly miss it.

Do not forget to eat some of the fruit of the tree of knowledge of good and evil; for it must be confessed that you are a little stupid and somewhat ill natured: when you shall have eaten of that fruit, you will become a very good and a very wise man. Perhaps you may be uneasy respecting the consequences; for in the book of Genesis it is said expressly, "In the day that thou eatest thereof thou shalt surely die." Never fear, my dear brother, but eat away—Adam ate, and lived 930 years afterwards.

As to the serpent, which was "the most subtle of all the beasts of the field," he is chained, you know, somewhere in Upper Egypt: several of our missionaries have seen him. Bochart will tell you what language he spoke in, and the song with which he seduced Eve; but take care that you are not seduced too. Then you will find out the ox that guarded the gate of the garden, for you are of course aware, that cherub in Hebrew signifies an ox; and that is the reason why Ezekiel calls the king of Tyre a cherub. Vide St. Ambrose, the abbe Rupert, and, above all, the cherub Calmet.

Examine carefully the mark which the Lord put upon Cain. See whether it is upon the cheek or the shoulder. He deserved to be branded for killing his brother; but, inasmuch as Romulus, Richard III., Louis XL, and hundreds of others have done the same, it is a matter of no great consequence whether the murderer is pardoned or not, especially as the whole race is damned for an apple.

As you intend to push on as far as the city of Enoch, which Cain founded in the land of Nod, you will be

particular in ascertaining the exact number of masons, carpenters, blacksmiths, weavers, hat makers, painters, wool carders, laborers, herdsmen and shepherds, handicraftsmen, judges, and gaolers he had in his employ, when there were but four or five persons on the face of the earth.

Enoch was buried in that city which his grandfather Cain built; but he is still alive. Find him out; ask him how he does, and give him our compliments.

From thence you will pass between the legs of the giants who were begotten by the angels upon the daughters of men, and you will present to them the works of the reverend father don Calmet; but be careful to speak civilly to them, for they don't understand raillery.

You will go the top of Mount Ararat to see the remains of the Ark. Ascertain the correctness of its dimensions, as given by the illustrious Le Pelletier. Measure the mountain carefully, and then measure St. Gothard and the Pichincha in Peru. Calculate, with Woodward and Winston, how many oceans it would take to cover them, and to rise 15 cubits above. You will also have the goodness to bring us, in the original Hebrew, the text which places the deluge in the year of the creation of the world 1656; in the Samaritan, that which says the year 2309, and that of the Septuagint which makes it 2262; and to reconcile these three texts.

Present our respects to our father Noah, who planted the vine. The Greeks and the Asiatics were so unfortunate as to know nothing of him, but the Jews could boast of their descent from him in a right line. Ask him to let you see the covenant which God made with him and the beasts. We are grieved that he should get drunk, and warn you not to follow his example. Above all, get a memorandum of the precise time when Gomer, the grandson of Japhet, began to reign in Europe, which he found thickly peopled. This is a historical fact to verify.

Find out, if you can, what has become of Cainam, the son of Arphaxad, so celebrated by the Septuagint, and of whom the Vulgate says nothing. Beg of him to conduct you to the Tower of Babel, and see if the remains of that tower correspond with the dimensions given by the reverend father Kircher.

From the Tower of Babel you will go to Ur in Chaldea, and you will inquire of the descendants of Abraham the potter, why he left that fertile country, to go in search of a tomb at Hebron, and to buy corn at Memphis; why he made his wife [Sarah] pass for his sister [see: Gary Greenberg], and what he got by that contrivance; but, above all, learn, if you can, what cosmetics she used to make her look handsome at the age of ninety. Ascertain whether she made use of rose or lavender water as a perfume, when she arrived at the courts of the king of Egypt and of the king of Gerar; for these things are essential to our salvation.

You know that the Lord made a contract with Abraham, to give to him and his descendants all the countries from the Nile to the Euphrates. Ascertain the exact reasons why that contract has not been fulfilled.

While you are in Egypt, find out where the horses came from, which Pharaoh sent into the Red Sea in pursuit of the Hebrews; for, all those animals having perished in the sixth and seventh plagues, certain infidels have pretended that Pharaoh had no cavalry. See the book of Exodus, of' which Herodotus, Thucydides, Xenophon, Polybius, Livy, and all the Egyptian writers make such particular mention.

We will say nothing of the exploits of Joshua, the successor of Moses, nor of the moon which he made to stop at midday in the valley of Ajalon, and the sun which stood still upon Gibeon. These are trifles which happen every day, and not worth taking any trouble about.

But there is a matter of infinitely more consequence to morals, and which would contribute essentially to our improvement in honesty, humanity, and justice—I mean the history of the Jewish kings. Ascertain exactly how many assassinations they committed. Some fathers of the church compute them at 580; others, at 970: it is important to know the true amount. You will understand me to allude only to those cases where the murdered were near relatives of the murderers, for, as to the others, they are innumerable. Nothing can

be more edifying than a true account of all the murders committed in the name of the Lord: it would serve as an excellent commentary upon the sermons on brotherly love.

When, from the history of the kings, you enter upon that of the prophets, you will enjoy, and cause us to enjoy ineffable pleasures. You will have many inquiries to make, and many explanations to receive; but, when you come to Ezekiel, then will your very soul dilate with joy. First of all, you will see the four animals with the faces of a lion, an ox, an eagle, and a man; then the wheel with four faces, like unto the waters of the sea, (each face having more eyes than Argus,) going upon its four sides and not turning as it went. You know that God commanded the prophet to swallow a whole book of parchment: inquire carefully of all the prophets you meet, what were the contents of that book.

Get Ezekiel to show you the tile upon which he drew a plan of Jerusalem, while he was bound with the bands which the Lord gave him; and to tell you why he was commanded to lie upon his left side 380 days, and then 40 days upon the right.

In reporting your conversations with Ezekiel, be careful, my dear brother, not to alter his words, as you have done: that is a sin against the Holy Ghost. You have said that God commanded the prophet to bake his bread with cow dung; but the Vulgate says, (Ezekiel, chap. iv. v. 12,) "Comedes Mud, etstercone qnod egreditiu de homine operus ilhul in oculis eorwra." "Thou shalt eat it, thou shalt cover it with the ordure which comes out of the body of man." The prophet ate, and cried out "Pouah! Pouah! Pouah! Domine Deus Mens, ene anima mea non est polluta." "Pouah! Pouah! Pouah! Oh, Lord God, I never made such a breakfast in my life." Always be careful to preserve the purity of the text, my dear brother, and do not change it the least tittle.

If the breakfast of Ezekiel was rather filthy, the dinner of the Jews of which he speaks is somewhat cannibalish: "The fathers shall eat their sons, and the sons shall eat their fathers." It is well enough, perhaps, for the fathers to eat their children who are plump and tender; but, for the children to eat their tough, old, stringy fathers, that is a new fashioned cookery."

(add discussion)

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θΔics

In engines, **aeolipile**, aka "ball of Aeolis", is a device in which steam contained in a boiler is release through oppositely facing orifices of a hinged bulb causing rotation of the bulb.

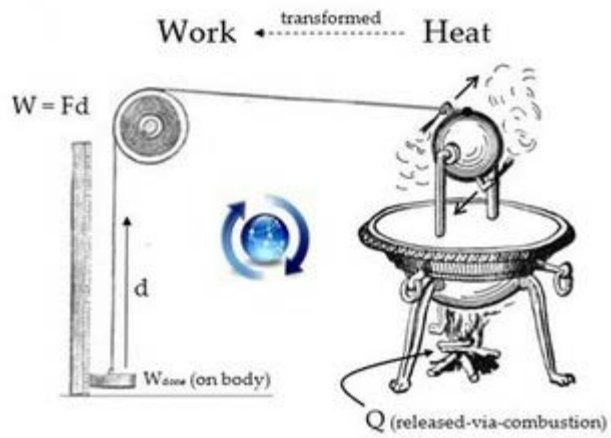

Left: an **aeolipile** (right) shown connected or coupled to a weight (left) in the form of a heat engine, to demonstrate the heat conversion into work aspect of the mechanical equivalent of heat. Right: a modern laboratory scale aeolipile.

Overview

In 250BC, Greek compressed air engineer Ctesibius is attributed to have invented the steam spinning device; which is often assigned as being the world's first prototype steam engine:

These came to be known as the ‘aeolipile’ as described by both Roman architect Vitruvius (15BC) and Greek physicist Hero (50AD). [1] Owing to the fact that Hero was the first to give a detailed account on how to make an aeolipile, the device has since come to be known as Hero's engine or the aeolipile of Hero.

See also

â— Dipping bird

References

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(c) Ctesibius – Wikipedia.

External links

â— Aeolipile – Wikipedia.

θΔics

In hmolscience, **aesthetic energy** is the energy associated with, produced, or derived from beauty and or physical attraction.

Overview

In the 1890s, Polish economist Leon Winiarski began to theorize about aesthetics in a thermodynamic sense, loosely as a type of biological energy associated with the processes of movement owing to attraction; having connection, in some way, to maximum pleasure and following periods of equilibrium,

In 1899, F. M. Winger, in summary of Winiarski's theories, characterized aesthetic energy as follows: [2]

> "Esthetics may be postulated of individuals or of races, and the aim of aesthetics is attraction. In both ancient and modern times, figure and dress were made as beautiful as possible for purposes of attraction. This is referred to a process of movement; nervous movement on the part of those who feel the effects of the beautiful object, nervous and muscular movement on the part of those who act either in order to produce beauty or from its effects. **Esthetic energy** is dependent upon biological energies, and changes as they change. It expresses itself in movement in the making of arms, dwellings, ornaments, and, in more modern times, in sculpture, painting, music, and architecture—the types varying according to the race. In the days of chivalry, strength attracted, now skill in arts or sciences does so. Social influence depends upon these acquirements, and the class which has acquired most will rule, although often a mediocre class in other respects. It is all utilitarian, the individual or the race desiring to attain a high position and attaining it according as intensity or duration of pleasure is given. These periods of maximum pleasure are followed and preceded by a period of equilibrium, and just so much pleasure results as there has been energy expended."

(add discussion)

See also

â— Beauty is power (Ñº)

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θΔics

In science, **affair** is a matter of occasioning public anxiety, controversy, or scandal. [1]

See also

- Juarrero-Deacon affair
- Proxmire affair
- Sokal Affair

References

1. Affair – Merriam-Webster Collegiate Dictionary, 2000.

Further reading

- Strogatz, Steven H. (1988). "Love Affairs and Differential Equations", *Mathematics Magazine*, 61(1): 35.

θΔics

In chemistry, **affinity** is the force of reaction, measured by free energy (see: driving force), or the degree to which two or more species are attracted. [1]

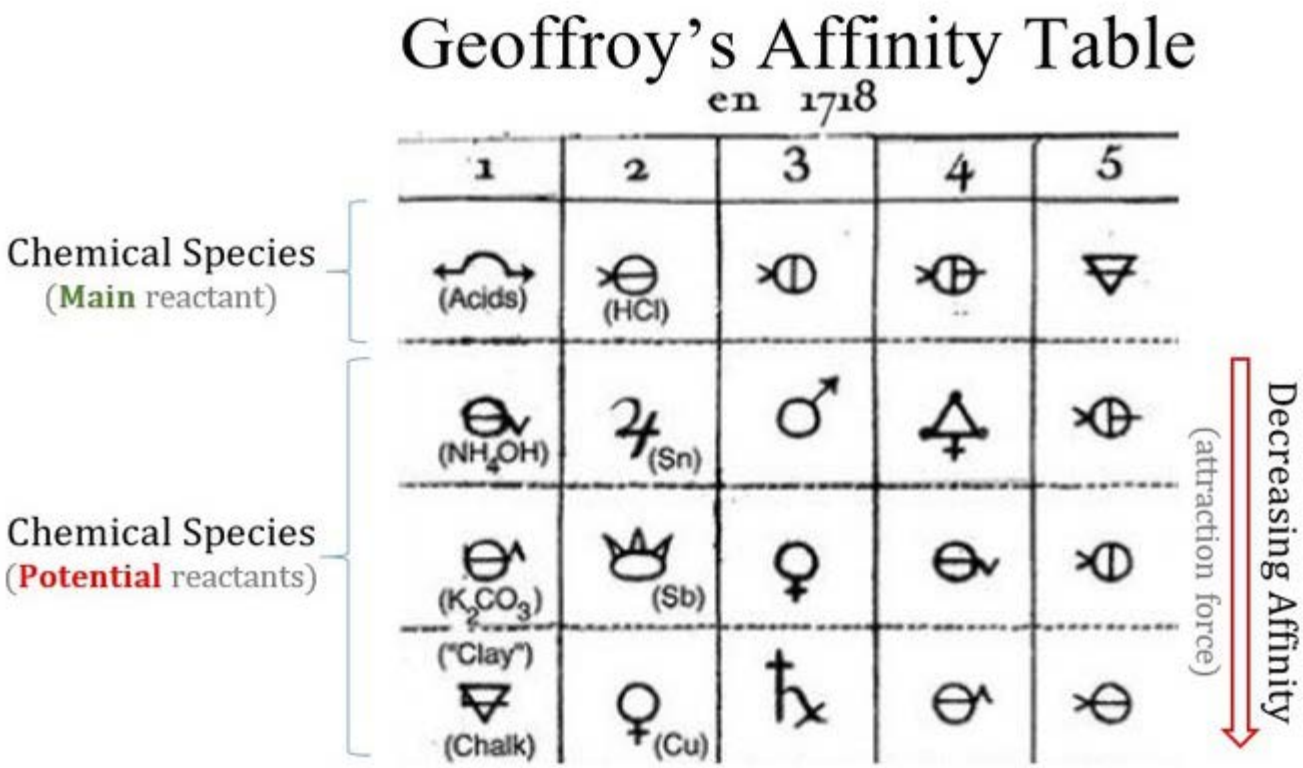

Section of French chemist Etienne Geoffroy's 1718 affinity table, the very first affinity table, constructed form affinity reaction descriptions as found in Isaac Newton's 1718 Query 31, each "header species" (top row) shown with potential "reactants" (chemicals below header species), listed in descending order of "affinity" preference, the weakest reactant listed in the lowest row.

Synonyms

In 1906 to 1910, "chemical affinity" began to be synonymously referred to, as summarized reported by Fielding Garrison, as: "chemical potentiality" and or the potential of the solution. (Q)

In 1922, English chemist Joseph Mellor commented: "some try to evade the difficulty by using other terms: 'elective attraction', 'chemical activity', 'chemical avidity', 'chemical energy', etc., but the original term 'chemical affinity', is convenient, provided it is kept in place." [7] Other synonyms include: elective affinity and human elective affinity. The term elective affinity was a common usage in the 18th century (supposedly originating in Francis Bacon's definition of affinity as an "election to embrace"); whereas *chemical affinity* is the common modern scientific usage.

Empedocles | Plato

The concept of affinities traces to the circa 450BC theories of attracting and repelling forces developed by Greek philosopher Empedocles (490-430BC), in the form of chemistry aphorisms, as in people who like each other mix like water and wine, whereas enemies separate like oil and water. Empedocles argued for existence of two forces: love (*philia*) and strife (*neikos*), which were used to account for the causes of motion in the universe. These two forces, philia and neikos, were said to intermingle with the four elements (earth, water, air, and fire) in such a manner that philia, so to say, served as the binding power linking the various parts of existence harmoniously together, whereas neikos acted to cause separation. [11]

These views were later adopted by others. First, it seems, by Greek physician Hippocrates (460-370BC), who in circa 410BC promoted the theory that "like assorts with like". [12] Greek philosopher Plato (428-348BC) also adopted this view, arguing that "like tends towards like." This generalized statement is often referred to as the the first law of affinity, or sometimes Plato's first law of affinity. Plato in particular interpreted Empedocles' two agents as *attraction* and *repulsion*, stating that their operation is conceived in an alternate sequence. From these arguments, Plato originated the concept of 'likes attract', e.g. earth is thus attracted towards earth, water toward water, and fire toward fire. [12]

In the following centuries there have been at least a dozen or more laws of attraction or "laws of affinity", depending on which chemist is sourced.

Affinitas

The name *affinitas*, according to English chemistry historian James Partington, was first used in the sense of chemical relation by German philosopher Albertus Magnus near the year 1250. [3]

Force

The introduction of the term affinity, according to Saul Dushman (1914), is usually ascribed to Dutch physician-chemist Herman Boerhaave (1668-1738), who is said to have gave this term a meaning that it has retained ever sense, vis: the "force holds together chemically dissimilar substances." [18]

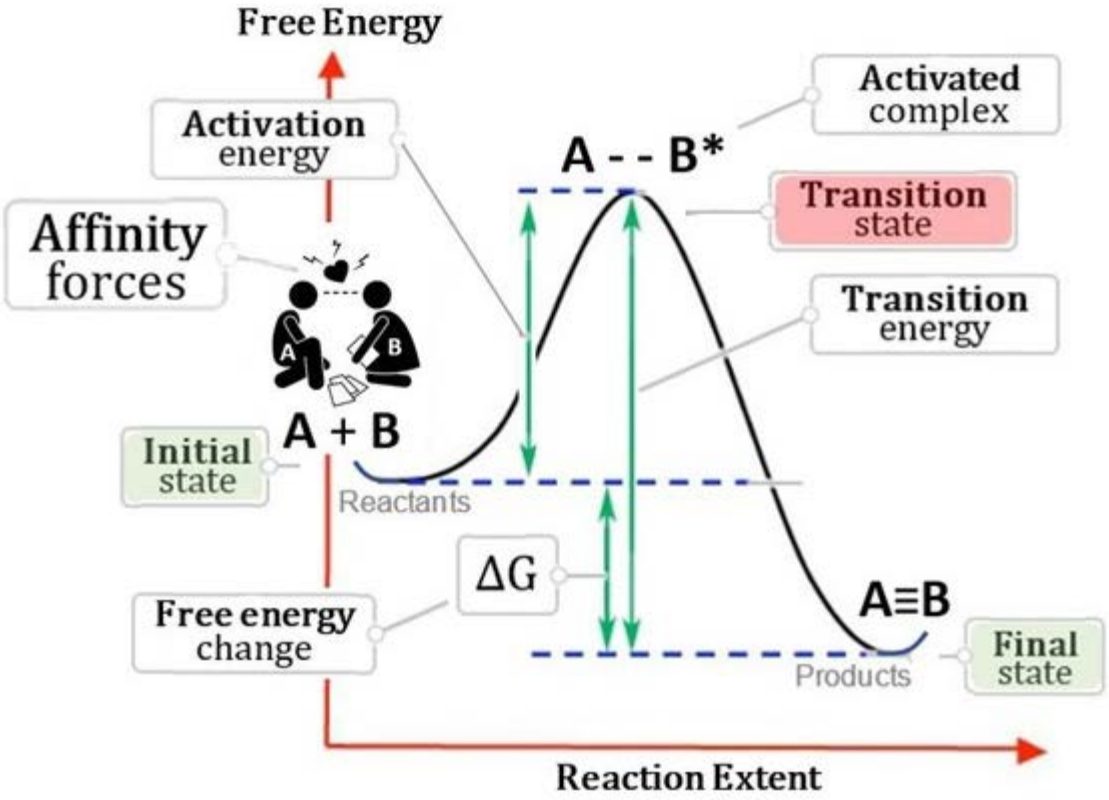

A modern diagram of "**affinities**", in the physico-chemical sociological context, from the 2019 Beg-Thims interview.

Affinity tables

The first affinity table was made by French chemist Etienne Geoffroy in 1718, now known as Geoffroy's affinity table. [6] Geoffroy's table was a result of his reading (actually a translation into French) of Newton's Query 31, in which various affinity relations were written out in verbal form. This launched the science of affinity chemistry, which dominated 18th century chemistry, only to later be subsumed into the beginnings of the late 19th century chemical thermodynamics and physical chemistry.

Dozens of affinity tables were produced in the decades throughout the 18th century. The largest affinity table ever created was Bergman's affinity table in 1775.

Goethe's affinities

In 1799 German polymath Johann Goethe began to express the outlines of a human chemical reaction view of human relationships using affinity chemistry logic, particularly in discussion to his associate German author Friedrich Schiller, wherein Goethe commented to the effect that:

> "Delicate [chemical] relationships [exist between people] through which they attract and repel, neutralize each other, separate again and re-establish themselves."

In 1808 using Bergman's 1775 affinity table as a basis of logic, Goethe made the world's first human elective affinity table, now known as Geothe's affinity table.

Faraday's view

In 1861, English chemist and physicist Michael Faraday, in what can be considered a representative transition view, defined the term "chemical affinity" as the force of chemical action between different bodies; that depends entirely upon the energy which particles of different kinds attract each other. [2]

Berthollet, Guldberg, Waage (1867)

Thermal theory of affinity

II. IDEAS CONCERNING AFFINITY.

1. Berthollet, Guldberg, Waage (1867).	
2. Berzelius, Helmholtz (1887).	Berzelius, Helmholtz (1887)
3. Mitscherlich, Spring (1904).	Mitscherlich, Spring (1904)
4. Deville, Debray, Berthelot.	Deville, Debray, Berthelot
5. Thomsen, Berthelot (1865).	Thomson, Berthelot (1865)
6. Horstmann, Gibbs, Helmholtz.	Horstman, Gibbs, Helmholtz

The main pioneers of late 18th century **affinity chemistry**, in physical chemistry in particular, according to the 1905 opinion of Dutch chemist Jacobus van't Hoff. [9]

Into the 1850s and 60s, what was called the "thermal theory of affinity" was introduced to explain chemical affinity on the logic that heat released during chemical reaction was the true measure of affinity. [8] This was called the Berthelot-Thomsen principle, proposed independently by Danish chemist Julius Thomsen in 1854 and by French chemist Marcellin Berthelot in 1864.

Followers of the Thomsen-Berthelot point of view included: German physical chemist Alexander Naumann (1837-1922), who notably received a copy of the first part of Gibbs' 1876 work, German chemist Karl Mohr, and Austrian physical chemist Hans Jahn (1853-1906). [15]

This logic however, was soon (early 1880s) shown to be an incomplete theory and thus defunct, due to the development of entropy (1850-65) and the discovery that not all reactions followed this model in practice. The fall of the thermal theory, however, was not immediate.

Criticism of the "thermal theory of affinity" came from Dutch theoretical chemist Schroder van der Kolk (1864) and later by Norwegian scientists, who formulated the law of mass action, Cato Guldberg and Peter Waage (1867). Others also began to point out that the inadequacy of the thermal theory of affinity in regards to explaining endothermic reactions. [14]

The 1904 theories, in Van't Hoff's ideas concerning affinity table (above), of Eilhard Mitscherlich and W. Spring on chemical affinity still need to be tracked down.

Work of chemical affinity

In the physical chemistry of Jacobus van't Hoff, starting with his 1884 *Studies in Chemical Dynamics* and followup expanded 3-volume *Lectures on Theoretical and Physical Chemistry* (1898-1900), without recourse to either free energy or entropy, he introduced what he called the "work of chemical affinity", which for a process occurring at constant pressure (isobaric) and and temperature (isothermal), according to chemistry historians Helge Kragh and Stephen Weininger, is the negative of the change in Gibbs free energy. [14]

Thermodynamic theory of affinity

When the logic of thermodynamics as developed by Rudolf Clausius, began to be applied to chemical problems, by scientists such as August Horstmann, Francois Massieu, Willard Gibbs, and Hermann Helmholtz, a new thermodynamic definition of affinity arose. The turning point was the 1882 publication "The Thermodynamics of Chemical Processes", by Helmholtz which proved that owing to the aspects of entropyit is the free energynot heat which is the true measure of affinities. [10] In this sense, free energy is sometimes defined as the "maximum work" (Helmholtz) that a system can produce or the "available energy" (Gibbs) of the system. [3] In this new interpretation, as defined in 1905 by Dutch physical chemist Jacobus van't Hoff: [9]

> "**Affinity** is defined as the maximum quantity of work that a chemical change can produce. Equilibrium ensues when this quantity is zero."

The influential 1923 textbook *Thermodynamics and the Free Energy of Chemical Substances* by American physical chemists Gilbert Lewis and Merle Randall is said to have led to the replacement of the term "affinity" by the term "free energy" in much of the English-speaking world. [4]

In 1936 Belgian chemist Theophile de Donder published his *Thermodynamic Theory of Affinity*, in which he clearly used the symbol "A" for affinity as the negative partial of the Gibbs free energy per unit partial of extent of reaction for a change in a isothermal isobaric system: [2]

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

Gibbs free energy

The thermodynamic measurement of affinity for isothermal-isobaric reactions, typical on the surface of the earth, is the negative of the change in the Gibbs free energy (such as alluded to in the work of Jacobus van't Hoff, above):

$$A = -\Delta G$$

or

$$A|_{T,P} = -\Delta G$$

in expanded form:

$$A = T\Delta S - \Delta H$$

This can also be restated in terms of the for driving force, symbol "D", of the reaction, such as done by Chinese thermodynamicist Jitao Wang, citing Theophile de Donder, as follows: [16]

$$A = D = -\Delta G_m = \sum_{i=1} \nu_i \mu_i$$

where μ is the chemical potential of ith component or chemical species and ν is the stoichiometric coefficient of the ith component or chemical species in the reacting system. This can also be redefined in terms such as: extent of reaction, progress of reaction, and or relaxation of reaction. [17]

Helmholtz free energy

For isothermal isochoric processes:

$$A|_{T,V} = -\Delta F$$

in expanded form:

$$A = T\Delta S - \Delta U$$

where the affinity is equal to the negative of the change in the Helmholtz free energy.

Human chemistry

In 2006, American electrochemical engineer Libb Thims came across the affinity-based "human chemical theory" of Goethe, at that time "affinity" being a new concept to Thims, being that in 1923, following the work of Gilbert Lewis (*Thermodynamics and the Free Energy of Chemical Substances*), the teaching of affinity based physical chemistry was supplanted the teaching of free energy based physical chemistry; meaning that the subject of affinity or affinity chemistry is not taught to chemical engineers and physical chemists, in modern times, a few fields aside (e.g. drug-receptor thermodynamics). Thims, thereafter, spent a large amount of time doing historical research to see how the concept of affinity transformed into the concept of free energy.

In 2007, Thims published first textbook on human chemistry, *Human Chemistry* (*Volume One, Volume Two*), outlining the basics of free energy interpretations of human affinities involved in human chemical reactions. [6][11]

See also

- Affinity of reaction

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External links

● Affinity – Wikipedia.

θΔics

In chemistry, an **affinity bond** is an attachment between two atoms or two molecules.

Overview

In 1657, William Cullen introduced the crotchet notation "{" of the to represent a bond between to chemical species; as follows:

> "The **dart** → between them expresses the *elective attraction*; when I put a dart with the tail to one substance and the point to another, I mean that the substance to which the tail is directed unites with the one to which the point is directed more strongly than it does with the one united to it in the **crotchet** {."

THE SIGNIFICANCE OF "BONDS" IN STRUCTURAL FORMULAS. By Dr. SPENCER B. NEWBERRY, Cornell University, Ithaca, N. Y.

[ABSTRACT.]

THE author reviews briefly the criticisms of Lossen (Ann. der Chem. und Pharm. Vol. 204) on the prevailing use of the terms "Unit of Affinity," "Bond," and "Valence," and showed that the confusion and indefiniteness of which Lossen complains may be avoided by the adoption of the following definitions.

"Unit of Affinity," the power of one atom to combine with one other atom.

"Bond," the graphic representation of a unit of affinity.

"Valency," the maximum number of atoms, of any kind whatever, with which a given atom can combine.

The author urges the retention, for the sake of simplicity in our graphic notation, of the hypothesis of the invariable quadrivalence of carbon, and of the so-called "multiple linking" of carbon atoms, and cites examples to prove that if the latter method of writing be abandoned a number of additional isomers are theoretically possible, the existence of which is not indicated by experiment.

1888 summary of the usage of the **affinity bond** concept or "unit of affinity". [1]

which equates to the following diagrammatic logic, in respect to an AB affinity bonded chemical union put into contact with a new chemical species C, whereby B detaches from A, owing to stronger affinity forces, to form a new BC union:

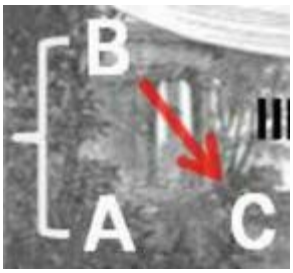

In the 1880s, chemists would speak of "units of affinity", "bond", and "valence", somewhat interchangeably, to the effect that, for example, carbon atoms have four valencies or four units of affinity. [1]

English chemist Matthew Muir summarized the situation in 1889 by saying that the symbol notation of H – C ≡ C – H would be used to represent the distribution of affinity, or the valencies, of the atoms of carbon and hydrogen in the molecule C_2H_2, which were becoming replaced, so to speak, by phrases to the effect that the carbons are linked by a triple bond to each other and by single bonds to the hydrogen atoms. Muir also explains how the translation of the concept of a "force of affinity", does not necessarily mean that force of affinity is divided into units or among the bonds, so to speak. [2]

The development of quantum chemistry in the early 20th century, in which bonding two atoms was defined, specifically by German physicist Walter Heitler in 1927, as the joining together of electron wavefunctions, with plus, minus, and exchange terms. [3]

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θΔics

In chemistry, **affinity chemistry** was subject of study, dominant between 1718 and into the 1830s, that sought to explain chemical reaction via various theories of chemical attraction or "affinity", such as chemical affinity or elective affinity, preexisting, in various levels, between all chemical species or elements. [1]

History

The initiator of affinity chemistry, in its primordial form, was Greek philosopher Empedocles (495-435 BC), the first human chemist, famous for his noted chemistry aphorisms of how people mix or sort:

> "People who love each other mix like water and wine; people who hate each other segregate like water and oil."

This logic later came to be codified into about ten laws of affinity, as extolled upon in the works of Plato and others.

The name *affinitas* was first used in the sense of chemical relation by Albertus magnus in circa 1250.

In 1675, French chemist Nicolas Lemery, in his *Course of Chemistry*, supposedly, used "elective affinities" as terminology that describes the replacement of one metal by others in the chemistry of salts. [10]

The modern theory of affinity chemistry, the transition from alchemy to chemistry, arose in the works and theories of English physicist Isaac Newton. His 1678/79 letter to Robert Boyle was preoccupied with the phenomenon of elective affinity among chemicals. In his letter to Boyle, he states, for example: [9]

> "There is a certain secret principle in nature by which liquors are sociable to some things and unsociable to others. Thus water will not mix with oil but readily with spirit of wine or with salts."

American science historian William Newman, in his summarized rewrite of Newton's letter, elaborates on this further: [9]

> "Just as water **'elects'** to mix with ethyl alcohol or with salts, so it **'chooses'** not to mix with oil, Similarly, water will sink into wood while quicksilver will not, but quicksilver will penetrate and amalgamate with metals, which water will not. Likewise aqua fortis (nitric acid) will dissolve silver and not gold, while aqua regis (mixed nitric and hydrochloric acid) will dissolve gold and not silver. Nonetheless these rules are not written in stone: 'but a liquor which is of itself unsociable to a body may by a mixture of a convenient mediator be made sociable. So molten lead which alone will not mix with copper or with Regulus of Mars, by the addition of tin is made to mix with either."

Newton goes on, in his writing of this period, to speak about how "particles of spirits floating in the water, will strike on metal, and will by their sociableness enter into its pores, and gather around the outside of its particles." The finalized version of Netwon's search, research, and experiments for this "secret principle" was presented some three decades later, following his successes in gravitational theory, in his famous Query 31 of the 1718 edition of his *Opticks*. That very same year (1718), French chemist Étienne Geoffroy, while doing a translation into French of Newton's *Opticks*, famously took the "verbal descriptions" of affinity reaction preferences and powers of combination and decombination, as found in Query 31, and made the world's first "affinity table" (see: Geoffroy's affinity table), the first of many to follow over the next century. The biggest was Swedish chemist Torbern Bergman 1775 which took up a large eight-page fold out map-like sheet showing the results of some 160 different reactions.

What is called the "old theory" of elective affinity, to note, according to some, is said to refer to the works of English chemist John Mayow (1674), French chemist Étienne Geoffroy (1718), and Swedish chemist Torbern Bergman (1775).

[2]

It was Geoffroy, however, who made the first affinity table ; thus establishing affinity chemistry as a branch of science and invariably giving seed and momentum to the chemical revolution. [3]

Incorporation into modern theory

In 1852, though the "theory of chemical valencies" of English chemist Edward Frankland, the degree of affinity attachment of each species was beginning to be incorporated into the soon-to-be science of quantum chemistry (1910s), solidifying eventually with American chemical engineer Linus Pauling's 1928 article "On the Nature of the Chemical Bond"; and in the 1870s, the measure of affinity was determined to be that of free energy, thus incorporating this aspect of affinity chemistry into the new science of chemical thermodynamics, and beginning [4]

Affinity chemistry is still to be found in modern science, albeit it is buried deep inside of connective theories of logic, such as affinity chromatography. [5] Likewise, in the modern drug-receptor thermodynamic theory of "drug-receptor affinity", affinity is defined as the "tendency of a drug molecule to bind to a receptor", a movement process quantified by intricate Gibbs free energy models. [6]

Human chemistry

German polymath Johann Goethe based his 1809 romance novella *Elective Affinities* on the work of Bergmann, arguing a theory that human relationships, specifically in reference to the passions of love, are determined by elective affinity preferences. [7] This publication thus founded the science of human chemistry; albeit the modern version uses the logic of chemical thermodynamics and quantum chemistry to argue the same view. [8]

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θΔics

In famous publications, **Affinity Lecture**, or Affinität (Affinity) as it was entitled in the original German, was the sixth lecture given by German physical chemist Wilhelm Ostwald, on the subject of affinity (chemical affinity or elective affinity), in the autumn of 1905 at MIT in his seven public lectures on the history of chemistry.

Contents

The following are the contents of the sixth lecture, wherein he see Ostwald making a rarely seen connection between Gibbs and Goethe:

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Bergmann, Verwandtschaftstabellen 209.	Bergmann, Relationship Tables 209
Berthollet und die unvollständigen Reaktionen 210.	Berthollet and incomplete responses 210
Das Konzentrationsgesetz von Wenzel 211.	The concentration of Wenceslas Law 211
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Wiederaufleben der Bergmannschen Lehre 219.	Resurgence of Bergmann's theory 219
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Das Gesetz der Massenwirkung 243.	Resolution of old problems 245
Auflösung alter Probleme 245.	The strength of the acids 247
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Die Entwicklungskämpfe der modernen physikalischen Chemie 249.	Your next future 251
Ihre nächste Zukunft 251.	

Sixth Lecture

The following is the original German and English translate of Ostwald's Affinity lecture:

German (205 - 209)	**English** (205 - 209)
Sechste Vorlesung.	
Affinität.	
Nachdem sich die Auffassung der chemischen Vorgänge als der Ergebnisse einer Wechselwirkung der verschiedenen Stoffe durchgesetzt hatte, entstand naturgemäss die Frage, durch welche Umstände diese	Sixth lecture.

Wechselwirkung bestimmt wird. Die grosse Mannigfaltigkeit und anscheinende Willkür in dem gegenseitigen Verhalten der Stoffe legte den Vergleich mit menschlichen Willenshandlungen nahe und in Goethes Meisternovelle: *die Wahlverwandtschaften* ist nicht nur der damals übliche Name für die Ursache der chemischen Verbindungen und Trennungen als Titel benutzt, sondern eine Schilderung ihrer Wirkungsweise als Vorbild für die gegenseitige Beeinflussung der beteiligten Menschen in den Text verwoben.

> „In diesem Fahrenlassen und Ergreifen, in diesem Fliehen und Suchen glaubt man wirklich eine höhere Bestimmung zu sehen; man traut solchen Wesen eine Art Wollen und Wählen zu und hält das Kunstwort Wahlverwandtschaften für vollkommen gerechtfertigt. . . . Man muss diese tot scheinenden und doch zur Tätigkeit innerlich immer bereiten Wesen wirkend vor seinen Augen sehen, mit Teilnahme schauen, wie sie einander suchen, sich anziehen, ergreifen, zerstören, verschlingen, aufzehren und sodann aus der innigsten Verbindung wieder in erneuter, neuer, unerwarteter Gestalt hervortreten: dann traut man ihnen erst ein ewiges Leben, ja wohl Sinn und Verstand zu, weil wir unsere Sinne kaum genügend fühlen, sie recht zu beobachten, und unsere Vernunft kaum hinlänglich, sie zu fassen."

Aus dieser Darstellung ist zunächst ersichtlich, wie weit man sich damals von der Erfassung der einfachen Gesetzmässigkeit entfernt fühlte, die in anderen Gebieten, z. B. dem der Astronomie, erreicht war und die als wissenschaftliches Ideal für alle Naturforschung gilt. Ferner tritt die spezifische Natur dieser Vorgänge, ihre Mannigfaltigkeit je nach der Art der beteiligten Stoffe in sehr anschaulicher Weise in den Vordergrund.

In der Tat nahmen die ersten Versuche, die Bildungs- und Zersetzungsvorgänge der Stoffe gesetzlich zu erfassen, ausschliesslich auf diesen Umstand Rücksicht. Schon E. Stahl, der Schöpfer der Phlogistontheorie, hatte auf die gegenseitigen Verdrängungen der Metalle aus ihren Salzen als eine typische Erscheinung hingewiesen und wir erkennen in der Phlogistontheorie unschwer die Widerspiegelung dieser Erfahrungen auf dem hypothetischen Gebiete der Verbindungen der Stoffe mit dem Phlogiston. Durch französische Forscher sind diese Reaktionsreihen später ausgedehnt und systematisiert

Affinity.

After the conception of the chemical processes had become established as the outcome of an interaction of various substances naturally arose the question of which circumstances this interaction is determined. The great variety and apparent arbitrariness in the mutual behavior of the materials presented comparing with human volitional actions near and in Goethe's masterpiece novella *Elective Affinities* is not only the then common name for the cause of chemical connections and disconnections as the title used, but a description of their mode of action interwoven as a model for the mutual influence of the people involved in the text: [B#:C#]

> "In this letting go and taking in fleeing and finding this one really believes a higher purpose to see, you dare such a kind nature and want to select and keeps the art word affinities for fully justified. . . . You have this dead translucent and yet inwardly always ready beings acting in front of his eyes to the activity, look to participate as they seek each other, dressed, take, destroy, devour, eat up, and then from the most intimate connection back in again, new, unexpected form emerge: then trust them to only an eternal life, probably rhyme or reason to, because we hardly feel our senses enough to watch them right, and our reason hardly sufficiently to take them."

From this representation is first evident how far you felt then removed from the detection of simple regularity, which was achieved in other areas, such as the astronomy, and is ideal for all nature as a scientific research. Further, the specific nature of these processes occurs, their diversity depending on the nature of the substances involved in a very clear way to the front.

In fact took the first attempts to understand the educational processes and decomposition of substances by law, solely on that fact into consideration. Even E. Stahl, creator of the phlogiston theory had pointed out the mutual displacements of the metals from their salts than a typical phenomenon and we recognize in the phlogiston theory easily the reflection of this experience in the areas of hypothetical compounds of the substances with the phlogiston. By French researchers, this series of reactions were later expanded and systematized, but in a way that provoked the opposition of his contemporaries and their

worden, allerdings in einer Weise, die den Widerspruch der Zeitgenossen und ihren Spott über die „Tabellendrechsler" hervorrief. Durch Torbern Bergmann (1735 bis 1784) endlich wurden die Auffassungen und Kenntnisse der Zeit gegen Ende des achtzehnten Jahrhunderts zusammengefasst.

Der grundsätzliche Gedanke aller dieser Versuche war, dass durch die Natur der Bestandteile ihre Fähigkeit zu gegenseitiger Bindung bestimmt ist, derart, dass wo die stärkere „Verwandtschaft" besteht, auch die entsprechende Verbindung gebildet wird, unter Aufgabe der frühren Verhältnisse. Andere Faktoren waren bis dahin nicht als wirksam in Betracht gezogen worden; erst Bergmann fand bei der systematischen Zusammenstellung der vorhandenen experimentellen Tatsachen und bei der Ermittelung neuer, dass es oft einen erheblichen Unterschied ausmacht, ob man die Stoffe in wässeriger Lösung oder in der Schmelzhitze aufeinander wirken lässt. Er unterschied daher die Verwandtschaft auf nassem von der auf trockenem Wege.

Dies war die erste Spur der Erkenntnis, dass ausser der Natur der Stoffe noch andere Faktoren für die Ergebnisse der chemischen Wechselwirkung massgebend sind. Das grosse Verdienst, derartige Faktoren ausfindig gemacht und ihre Wirkung durch anschauliche Versuche nachgewiesen zu haben, gebührt Claude Louis Berthollet (1748 bis 1822), dessen Namen uns in anderem Zusammenhange bereits entgegengetreten ist. Der neue Gedanke, welchen Berthollet in das Problem einführte, war der

der teilweisen Reaktion. Für die älteren Chemiker gab es nur ein Entweder — Oder; alle Vorgänge sollten in einem oder dem anderen Sinne vollständig zu Ende gehen. Dies war eine natürliche Folge des vorwiegend technischen Interesses an den chemischen Vorgängen, denn in dessen Sinne lag es überall, dass solche Vorgänge ausfindig gemacht wurden, welche die gewünschten Präparate in möglichst reiner und einheitlicher Form ergaben. Die fast ausschliessliche Bekanntschaft mit solchen praktisch vollständigen Vorgängen hat die natürliche Wirkung gehabt, dass man auf dass gesetzmässige Vorhandensein unvollständiger Vorgänge überhaupt nicht aufmerksam geworden war.

Berthollet wies dem gegenüber darauf hin, dass umgekehrt die unvollständigen Vorgänge, bei denen eine Reaktion durch die entgegengesetzte begrenzt wird, welche aus den Produkten wieder die Ausgangsstoffen entstehen lässt, als

mockery of the "table turner." By Torbern Bergmann (1735-1784) finally were the views and knowledge of the time towards the end of the eighteenth century combined.

The basic idea of â€‹â€‹all these experiments was that by the nature of the components of their ability is determined to mutual bond, such that where the stronger "relationship" exists, the corresponding compound is formed by the object of the previous posting conditions. Other factors were to have not previously taken into account as effective, only Bergmann found in the systematic compilation of the available experimental facts and the determination of new that it often represents a significant difference if you can interact with the substances in aqueous solution or in the melt heat it. Therefore, the relationship differed on wet from the dry way.

This was the first track of the realization that unless the nature of the substances, other factors for the results of the chemical interactions are decisive. The great merit of having made such factors identified and their effect demonstrated by illustrative experiments, Claude Louis Berthollet Due (1748-1822), whose name is already challenged us in another connection. The new idea, which Berthollet introduced into the problem was the

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the partial reaction. For the older chemists there was only one either - or, all transactions should be one or the other senses go completely to the end. This was a natural consequence of mainly technical interest in the chemical processes, because it was everywhere in the sense that such processes have been identified, which gave the desired products in as pure and uniform shape. The almost

die allgemeineren aufgefasst werden müssen, und dass die ausschliesslichen Vorgänge diese Beschaffenheit erst durch die Mitwirkung sekundärer Umstände annehmen. Hierbei sprach er das Prinzip der Massenwirkung aus, die zu einem chemischen Gleichgewicht führt, ebenso wie die gleichzeitige Wirkung mehrerer Kräfte auf einen Punkt eine Resultierende ergibt, an deren Grösse und Richtung jede beteiligte Kraft ihren Anteil nach Massgabe ihrer Beschaffenheit hat.

Berthollet stützte sich bei der Entwicklung dieser allgemeinen Ansichten einerseits auf Experimente, die er in solchem Sinne angestellt hatte, anderseits auf grundsätzliche Anschauungen, denen er zweifellos die höhere Bedeutung beimass. Er fasste die chemischen Vorgänge als Ergebnisse einer Gravitationswirkung zwischen den Atomen auf und fühlte sich sehr sicher in seiner Hoffnung, dass bald eine chemische Mechanik sich entwickeln würde, die der himmlischen Mechanik vergleichbar wäre. Es ist lehrreich zu wissen, dass T. Bergmann, zu dessen Anschauungen sich Berthollet in scharfem Gegensatze befand, seine eigenen Ansichten gleichfalls auf die Annahme einer Gravitationswirkung zwischen den Atomen begründet hatte. Es ergibt sich hieraus, welche geringe Bedeutung derartige allgemeine Hypothesen für die Beschaffenheit der von ihnen abhängigen Schlüsse haben; in beiden Fällen waren für die Gedankenbildung wirksam die tatsächlichen Kenntnisse der beiden Forscher auf dem Boden der Chemie allein.

In bezug auf den Begriff der Massenwirkung hat Berthollet allerdings einen Vorgänger, der ihm nicht nur zeitlich erheblich voranging, sondern auch das quantitative Gesetz der Massenwirkung mit aller wünschenswerten Klarheit aussprach. Es war dies K. F. Wenzel (1740 bis 1793), dessen Namen wir aus Anlass der ihm fälschlich zugeschriebenen Entdeckungen Richters kennen lernten. Wenzel hat 1777 ein Buch über die Verwandtschaft erscheinen lassen, in welchem er nichts weniger versucht, als eine zahlenmässige Messung der chemischen Kräfte, und zwar, was noch mehr sagen will, auf einem

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grundsätzlich ziemlich einwandfreien Wege. Auch ihn führte eine mechanische Analogie: wie ein Körper sich um so schneller bewegt, je grösser die treibende Kraft ist, so wollte er dem Stoffe eine grössere Verwandtschaft zuschreiben, der eine chemische Reaktion schneller durchführt. Als Beispiel hatte er die Wirkung der Säuren auf Metalle ins Auge gefasst. Er ist ganz klar darüber, dass diese Wirkung der Oberfläche proportional ist und gibt daher den zu vergleichenden Metallen die Gestalt von

exclusive acquaintance with such a virtually complete operations has had the natural effect that it had become on that lawful presence of incomplete transactions not attentive at all.

Berthollet pointed against which indicates that, conversely, the incomplete operations where a response is limited by the opposite, which again can be formed from the products, the starting materials, as the need to be wider understood, and in that the exclusive processes this condition only by the accept participation of secondary circumstances. Here he spoke of the principle of mass action, which leads to a chemical balance, as well as the simultaneous action of several forces at a point yields a resultant force on the magnitude and direction of each Party to power their share in accordance with their texture.

Berthollet was based on the development of these general views on the one hand, experiments that he had done in this sense, on the other hand, fundamental beliefs, which he undoubtedly attributed to the higher meaning. He summarized the chemical processes on the results of a gravitational effect between the atoms and felt very secure in his hope that soon a chemical mechanism would develop that would be comparable to the celestial mechanics. It is instructive to know that T. Bergmann, whose views Berthollet was in sharp contrast, had also founded his own views on the adoption of a gravitational effect between the atoms. It follows from this that such general hypotheses have little importance for the quality of their dependents conclusions in both cases were the thoughts the actual formation of effective knowledge of the researchers on the floor of the chemistry alone.

In relation to the concept of mass action but Berthollet has a predecessor, not only greatly preceded it in time, but also expressed the quantitative law of mass action with all desirable clarity. It was the KF Wenzel (1740-1793), whose name we met on the occasion of him falsely attributed discoveries judge. Wenzel 1777 have a book about the relationship appear, in which he attempted nothing less than a numerical measurement of the chemical forces, namely, what to say more, on a

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generally quite satisfactory way. Also led him to a mechanical analogy: as the body moves faster so the larger the driving force, so he wanted the substances attributed a greater affinity for conducting a chemical reaction faster. As an example, he had taken the action of acids on metals in the eye. He is very clear about the fact that this effect of the surface is proportional and are therefore to be compared metals, the shape of the same

gleich grossen Zylindern, die er auf allen Seiten ausser an einer Grundfläche mit einem unangreifbaren Überzuge versieht; ja er beschreibt sogar, wie man das flüssige Quecksilber nur in einen gleich weiten Hohlzylinder zu giessen braucht, um damit vergleichbare Messungen anstellen zu können. Dann aber entgeht ihm nicht, dass konzentrierte Säuren viel stärker wirken, als verdünnte, und er spricht ausdrücklich aus, dass die Geschwindigkeit ihrer Wirkung der Konzentration proportional zu setzen sei.

Berthollet hat zweifellos diesen Versuch einer messenden Inangriffnahme des Verwandtschaftsproblems nicht gekannt, denn es finden sich bei ihm keinerlei Hindeutungen auf diesen Gedanken oder Anwendungen desselben. Seine Aufmerksamkeit war nicht auf den Verlauf der Vorgänge, sondern auf ihr endliches Ergebnis gerichtet; diese statische Anschauungsweise tritt auch in dem Titel seines Hauptwerkes „Statique chimique" hervor. Doch wusste er aus dem einfachen Grundgedanken, dem des chemischen Gleichgewichts, eine ganze Anzahl bemerkenswerter Folgerungen zu ziehen.

Vor allen Dingen die, dass für ein jedes chemische Gleichgewicht die dauernde Anwesenheit aller beteiligten Stoffe notwendig ist. Wo sich einer oder der andere aus dem Gebiete des Wettkampfes entfernt, hat er die Folgen alsbald zu tragen, indem sich nunmehr ein neues Gleichgewicht ohne ihn herstellt. Zwei Arten solcher Entfernung kennt Berthollet: falls der Stoff gasförmig, oder falls er fest wird. Insofern wirken Flüchtigkeit und Kohäsion, wie er die Ursachen dieser Zustände bezeichnet, wie chemische Kräfte für das endliche Ergebnis mit.

Alle diese Gedanken sind richtig; sie haben aber erst sehr spät nach sachgemässer Entwicklung ihre Bestätigung gefunden. Berthollet nahm persönlich eine überaus geachtete Stellung ein; sein Hauptwerk wurde mehrfach übersetzt und alle waren einig darüber, dass darin die massgebenden Gedanken der höheren Chemie vorgetragen waren. Und dennoch sehen wir, dass auf diesen vielversprechenden Anfang keine Entwicklung erfolgt ist, ja dass das Interesse an den Problemen der chemischen Verwandtschaft für beinahe ein Jahrhundert so gut wie völlig verschwindet. Wie ist diese merkwürdige Erscheinung zu erklären?

Ein naheliegender Gedanke ist der folgende. Wir haben bei früherer Gelegenheit gesehen, dass Berthollet durch seine Auffassung des chemischen Gleichgewichts dazu geführt worden war, die Existenz von Verbindungen konstanter Zusammensetzung zu leugnen. Wenn wir das Problem in seiner ganzen Strenge nehmen, so werden wir

size cylinders which he provides on all sides except on a base with an unassailable Over the course; yes, he even describes how the liquid mercury only need to pour into a wide hollow cylinder is equal to that employ comparable measurements. But then do not miss him that much more concentrated acids act as dilute, and he speaks expressly, that the speed of their effect was proportional to the concentration set.

Berthollet has certainly never heard of the attempt of measuring addressing the relationship problem, because it can be found in him no allusions to these thoughts or applications thereof. His attention was not focused on the course of events, but on a finite result, this static way of looking occurs in the title of his main work "Statique Chimique" out, but he knew the simple main idea of â€‹â€‹chemical equilibrium, a number of remarkable. to draw conclusions.

Above all, that for each chemical balance of the permanent presence of all substances involved is necessary. Where one or the other is removed from the field of competition, he has to bear the consequences immediately by producing a new equilibrium is now without him. Two types of such removal Berthollet knows: if the substance is gaseous, or if it is fixed. Insofar as chemical forces acting on the finite result volatility and cohesion, as he describes the causes of these conditions, with.

All these ideas are correct, they have but to proper industrial development found very late in their confirmation. Berthollet personally took a very respectable position, his main work has been translated several times, and all were agreed that in the decisive idea of â€‹â€‹higher chemistry were presented. And yet we see that no development has taken place on this promising start, so that the interest in the problems of chemical affinity for almost a century disappears almost completely. What is this strange phenomenon to be explained?

An obvious idea is the following. We have seen on a previous occasion, that Berthollet was guided by his concept of chemical equilibrium to deny the existence of compounds of constant composition. If we take the problem in all its rigor, we shall also say today that he was right in fact and in principle, the production of an absolutely pure substance is as impracticable as the achievement of any other absolute target, such as the production of an absolutely empty space. But the answer is that we talked experimentally, can produce a very large number of substances in which we can no longer detect the presence of foreign substances, which are practically

auch heute sagen, dass er im Grunde recht gehabt hat und dass grundsätzlich die Herstellung eines absolut reinen Stoffes ebenso unausführbar ist, wie die Erreichung irgendeines anderen absoluten Zieles, etwa die Herstellung eines absolut leeren Raumes. Aber dem steht entgegen, dass wir, experimentell gesprochen, eine sehr grosse Anzahl von Stoffen herstellen können, in denen wir die Anwesenheit fremder Stoffe nicht mehr nachweisen können, die also praktisch rein sind. Bert ho 11et hat sich nur über die Grenze getäuscht, bis zu welcher die Trennungen praktisch ausführbar sind, und ist deshalb von Proust widerlegt worden. Dass trotz der experimentellen Widerlegung noch ein Kern Wahrheit in diesen Ansichten sein könnte, konnte aus den übrigen Kenntnissen jener Zeit keineswegs entnommen werden.

Dies war sicher ein nicht unwichtiger Grund für die Unwirksamkeit von Berthollets Werk; dass er aber nicht durchschlagend gewesen ist, ergibt sich daraus, dass Berthollets Ansehen auch nach Beendigung seines Streites mit Proust nicht merklich vermindert erscheint. Sein Werk gehörte aber dauernd zu denen, die jeder lobt und niemand liest. Auch wenn man sich heute in dem Lichte der inzwischen entwickelten Wissenschaft in Berthollets Werk zu vertiefen sucht, wird man es bald enttäuscht auf die Seite legen. Es enthält zu wenig

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Bestimmtes, experimentell Fassbares, als dass es in einer Wissenschaft, in welcher tagtäglich neue Tatsachen Staunen erregten und Aufmerksamkeit erforderten, von tiefgehendem Einflusse hätte werden können.

Entscheidend aber für den Gang der Entwicklung in der Chemie waren die anderen Entdeckungen, die um jene Zeit, am Anfange des neunzehnten Jahrhunderts gemacht wurden. Wir haben die wichtigsten von ihnen bereits kennen gelernt. Zunächst die stöchiometrischen Gesetze in dem anschaulichen Gewande der Atomtheorie, die sich überall bestätigten, wo man sie anzuwenden versuchte; dann die erstaunlichen Entdeckungen der Elektrochemie und zuletzt die alles bald an sich reissende Entwicklung der organischen Chemie, welche nicht nur der Wissenschaft ganz neue Arbeitsgebiete öffnete, sondern auch bald die Grundlage einer riesigen technischen Anwendung werden sollte. Alle diese Dinge gaben und verlangten unmittelbare Arbeit und, was das entscheidende war, sie konnten, wenigstens für das erste Bedürfnis erledigt werden, ohne dass man jene alten Probleme löste.

Denn es war nach wie vor präparative Chemie, die hier in den neuen Gebieten getrieben wurde. Immer noch war die

pure. Bert ho has 11et deceived only about the limit to which the separations are practically feasible, and has therefore been refuted by Proust. That despite the experimental refutation nor a kernel of truth in these views might be, could not be taken from the other knowledge of that time.

This was certainly not an insignificant reason for the ineffectiveness of Berthollet's work, but he's not been a resounding, arises from the fact that Berthollet's reputation will not appear noticeably reduced even after his quarrel with Proust. But his work was constantly to those who praises everybody and nobody reads. Also, if you're looking to delve into the light of the now-developed science in Berthollet's work today, you will drop it soon disappointed on the page. It contains too little

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Particular, experimentally more comprehensible than it. In a science in which new facts every day excited astonishment and attention required of influence could be coupled with deep

But the decisive factor for the course of development in the chemicals were the other discoveries that were made at that time, at the beginning of the nineteenth century. We have learned the most important of them already know. First, the stoichiometric laws in the ideological guise of the atomic theory, which were confirmed wherever they tried to apply it, and then the amazing discoveries in electrochemistry and finally the all soon be traveling on to development of organic chemistry, which opened not only

Frage nach den Reaktionsbedingungen ausreichend erledigt, wenn es gelungen war, ein vorteilhaftes Darstellungsverfahren ausfindig zu machen und niemand hatte ein Interesse daran, sich in die schlechten Methoden zu vertiefen, bei denen verschiedene Produkte nebeneinander entstehen. Kostete es doch ohnedies oft genug den ganzen Scharfsinn des Forschers, aus dem unmittelbar erhaltenen Reaktionsgemenge das erhoffte Produkt herauszupräparieren. So sehen wir, dass die Entwicklung des Verwandtschaftsproblems spät erfolgt und einen ganz anderen Ausgangspunkt hat: der Faden spinnt sich nicht bei der „reinen" Chemie an, sondern an einer ganz anderen Stelle, derselben Stelle, von welcher aus auch der Physik ein neues Leben zuwuchs.

Es ist die Entdeckung der Energiegesetze, welche dies neue Leben in die Chemie brachte. Allerdings geschah es viel langsamer als in der Physik, denn es waren zu Anfang wesentlich Physiker, welche den neuen Gedanken entwickelten und förderten, wenn er auch jedesmal aus chemischen Problemen erwachsen war. Denn in der Tat, sowohl Mayer und Helmholtz, deren Gedanken durch die Frage nach der Wärmeentwicklung im Tierkörper angeregt waren, wie Joule, der seine Entdeckung im Verfolge seiner Bemühungen gemacht hatte, die chemische Energie Voltascher Ketten zu Arbeitszwecken zu verwenden, waren von den Umwandlungen chemischer Energie in andere Formen ausgegangen. Ja, es besteht sogar der merkwürdige Umstand, dass im Gebiete der Chemie das besondere Gesetz, das sich aus der Anwendung des allgemeinen Energiegesetzes auf die Umwandlung chemischer Energie in Wärme ergibt, früher entdeckt worden ist, als jenes allgemeine Gesetz selbst.

Tatsächlich sprach bereits im Jahre 1840 J. G. Hess (1802 bis 1856) in Petersburg das Gesetz der konstanten Wärmesummen aus, demzufolge die gesamte Wärmeentwicklung für einen jeden bestimmten chemischen Vorgang eindeutig durch den Anfangs- und Endpunkt des Vorganges bestimmt ist, und nicht von den etwaigen Zwischenstufen abhängt. Hess war zu seinem Gesetze auf experimentellem Wege gelangt, doch hatte er es alsbald in seiner ganzen theoretischen Wichtigkeit begriffen und insbesondere gezeigt, wie man es benutzen kann, um indirekt Reaktionswärmen zu berechnen, die dem unmittelbaren Versuch unzulänglich sind. Die bewusste Anwendung des inzwischen entdeckten und in seiner allgemeinen Bedeutung klargestellten Gesetzes von der Erhaltung der Energie auf chemische Vorgänge ist dann in den fünfziger Jahren durch Julius Thomsen (geb. 1826) in Kopenhagen durchgeführt worden.

Da die Wärmeentwicklung bei einem chemischen Vorgange diesem Gesetz gemäss den Energieunterschied

the science of new work areas but was soon to be the basis of a huge technical application. All these things gave and demanded immediate work and what was the decisive, they could be done at least for the first need, without dissolving those old issues.

Because it was still preparative chemistry that was driven here in the new territories. Still the question of the reaction conditions was sufficiently done, if it had managed to make a favorable representation method and find no one was interested to delve into the bad ways in which different products are formed side by side. It cost but this is often enough without the ingenuity of the researcher hoped to dissect the product from the reaction mixture obtained immediately. Thus we see that the development of the relationship problem is late and a very different starting point is: the thread does not spin in to the "pure" chemistry, but in an entirely different place, same place, from which also the physics a new life increment.

It is the discovery of the laws of energy, which brought this new life into chemistry. However, it was much slower than in physics, because there were too much early physicist who developed the new ideas and promoted, when he was an adult and each time from chemical problems. After all, both Mayer and Helmholtz, whose thoughts were in fact inspired by the question of the evolution of heat in the animal body, such as Joule, who had made his discovery in Chase's efforts to use the chemical energy volts Ash chains for work purposes, were of the transformations chemical energy into other forms considered. Yes, there's even the odd fact that the special law that results from the application of the general law on the conversion of chemical energy into heat energy, has been discovered earlier in the areas of chemistry, than that general law itself

In fact, in Petersburg already spoke in 1840 JG Hess (1802-1856), the law of constant heat sums from, which found that the heat generation for each particular chemical process is uniquely determined by the start and end point of the process, and not by any intermediate stages depends. Hess had come to his law experimentally, but he soon realized it in all its theoretical importance, and in particular shows how you can use it to indirectly calculate heats of reaction that are the direct experimental inadequate. The deliberate use of the now discovered and clarified in its general meaning of the law of conservation of energy in chemical processes is then carried out in the fifties by Julius Thomsen (b. 1826) in Copenhagen.

As the heat in a chemical processes in accordance with this Law expresses the energy difference which exists

ausdrückt, welcher zwischen den Ausgangsstoffen und den Produkten der Reaktionen besteht, so schien das alte Problem der chemischen Verwandtschaft auf diesem Wege thermochemischer Messungen unmittelbar lösbar zu sein. Denn der Vorgang, bei dem mehr Energie frei wird, wird offenbar den Vorzug vor jedem anderen, möglichen Vorgange haben, der zu einer geringeren Energieentwicklung führt. Und da die Energieunterschiede unmittelbar durch die entwickelten Wärmemengen gemessen werden, so hiess die Folgerung einfach: von den möglichen Vorgängen wird der stattfinden, der die meiste Wärme entwickelt.

So wurde denn auch das Prinzip von J. T ho ra sen aufgestellt, und nachdem dieser sich bereits davon überzeugt hatte, dass es sicher nicht ohne Ausnahme gültig ist, wurde es von neuem von M. Berthelot proklamiert und mit einem grossen Aufwande von Scharfsinn und, wo dieser nicht ausreichte, von Beredsamkeit gegen die Einwendungen verteidigt, welche nicht ausblieben. Denn man muss sich darüber alsbald klar sein, dass dieses Prinzip nichts weniger bedeutet, als eine Wiederbelebung der alten Stahl-Bergmannschen Affinitätslehre von dem unbedingten Übergewicht des stärksten Stoffes. Der durch Berthollet bedingte Fortschritt, die Erkenntnis, dass ausser der Natur der Stoffe auch seine relative Menge oder genauer seine Konzentration einen entscheidenden Einfluss auf das Ergebnis der chemischen Wechselwirkung hat, wurde vergessen. Dies geschah um so widerstandloser, als auch die chemischen Tatsachen, welche im Sinne der Auffassung Berthollets sprachen, wenig bekannt und noch weniger beachtet waren. Allerdings hatte bereits der erste Versuch Thomsens, thermochemische Methoden auf das Problem der Salzbildung und der Konkurrenz mehrerer Säuren um eine Base anzuwenden, eine Bestätigung von Berthollets Auffassung des chemischen Gleichgewichts gegeben, doch lag diese Anschauung dem gesamten Denken der Zeit zu fern, als dass sie damals Aufmerksamkeit erregt und einen allgemeineren Einfluss geübt hätte.

So begann ein langer und hartnäckiger Kampf der schon anscheinend längst gestorbenen Bergmannschen Lehre in ihrer neuen Gestalt gegen die Tatsachen einerseits und gegen die gereiftere Erkenntnis der massgebenden Gesetze anderseits. Es handelt sich nämlich um einen ganz ähnlichen Missgriff, wie er bei der Berechnung der elektromotorischen Kraft einer Kette aus der gesamten Wärmetönung begangen worden war (S. 202), und hier wie dort wurde der Irrtum durch die Erkenntnis beseitigt, dass nicht der Unterschied der Gesamtenergie, sondern der der verfügbaren oder freien Energie die Erscheinungen

between the reactants and the products of the reactions, it seemed the old problem of the chemical relationship to be directly solved in this way thermochemical measurements. For the process in which more energy is released, apparently in preference to have each other, possible processes, which leads to a lower energy development. And since the energy differences are measured directly by the amount of heat developed, the inference was called simply: of the possible processes is the place that develops the most heat.

As well as the principle of J. T ho was placed ra sen, and after he had already convinced that it is not without exception is valid sure it was proclaimed anew by M. Berthelot and with a large expenditure of ingenuity where this was not enough of eloquence defended against the objections which did not fail. Because you have to be over soon clear that this principle means nothing less than a revival of the old steel Bergmann's affinity doctrine of the absolute predominance of the strongest substance. The conditional by Berthollet progress, the realization that unless the nature of the materials and its relative amount, or more precisely its concentration has a significant influence on the result of the chemical interaction, has been forgotten. This was done so without resistance, as well as the chemical facts which spoke in terms of Berthollet's view, were little known and even less attention. However, already had the first attempt Thomsen, a base to apply thermochemical methods to the problem of salt formation and competition of several acids, if confirmation of Berthollet's conception of chemical equilibrium, but was this view to remote the entire thinking of the time when they would then attract attention and practiced a more general influence.

Thus began a long and persistent struggle of the already seemingly long-dead miner's doctrine in its new shape to the facts on the one hand and against the more mature knowledge of the authoritative laws on the other. It is, in fact a very similar blunder, as he had been committed in the calculation of the electromotive force of a chain from the entire heat of reaction (p. 202), and here and there the error was eliminated by the realization that not the difference in the total energy, but the available or free energy governs the phenomena. In some cases, the free energy of the whole is not very different, then are the immediate consideration of the heat development results that do not stray far from the truth. Such cases also had just awakened faith in the correctness of the general set and maintained in spite of the more contradictions. But for more and more prominent influence of the mass effect that theory had no expression and no explanation, and these cases also caused because eventually leaving the same.

regelt. In manchen Fällen ist die freie Energie von der gesamten nicht sehr verschieden; dann gibt die unmittelbare Betrachtung der Wärmeentwicklung Resultate, die sich von der Wahrheit nicht weit entfernen. Solche Fälle hatten eben auch den Glauben an die Richtigkeit des allgemeinen Satzes erweckt und trotz der sich mehrenden Widersprüche aufrecht erhalten. Aber für den mehr und mehr hervortretenden Einfluss der Massenwirkung hatte jene Theorie keinen Ausdruck und keine Erklärung, und diese Fälle bewirkten denn auch schliesslich das Verlassen derselben.

Dieser Vorgang vollzog sich von zwei Seiten. Einerseits erwies sich das früher für unlösbar gehaltene Problem, in einem homogenen Gebilde den chemischen Zustand messend zu bestimmen, ohne

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den vorhandenen Gleichgewichtszustand zu stören, als zugänglich, nachdem man gelernt hatte, die Hilfsmittel der Physik statt der der Gewichtsanalyse darauf anzuwenden. In dem Masse, wie die Anwendung solcher physikalisch-chemischer Methoden sich mehrte und vermannigfaltigte, trat auch immer deutlicher zutage, dass eben in homogenen Gebilden der von Berthollet angenommene Gleichgewichtszustand, bei welchem jeder vorhandene Stoff seine Verwandtschaften befriedigt, nur entsprechend seiner Menge in verschiedenem Masse, durchaus die Regel ist, und dass die anscheinend ausschliesslichen Reaktionen in der Mehrzahl der Fälle ihre Ursache darin hatten, dass sich die betreffenden Stoffe als Gase oder Niederschläge aus dem Reaktionsgebiete entfernen. So kamen Berthollets tiefe Gedanken wieder langsam zuEhren, insbesondere alsGuldberg und Waage in Christiania sie 1867 zum ersten Male in eine so zulängliche mathematische Form gebracht hatten, so dass eine messende Bestätigung der theoretischen Voraussicht der Chemikerwelt vorgelegt werden konnte. Kants berühmter Vorwurf, dass die Chemie deshalb keine Wissenschaft sei, weil sie nicht der mathematischen Behandlung zugänglich war, wurde hierdurch zum ersten Male im eigentlichen Sinne erledigt.
Die fundamentale Arbeit von Cato M. Guldberg (1836 bis 1902) und Peter Waage (1833 bis 1900) erregte nur geringe Aufmerksamkeit. Im Jahresberichte der Chemie ist sie nicht referiert und als zwölf Jahre später die Entdecker auf die gleiche Angelegenheit in einer neuen Veröffentlichung zurück' kamen, konnten sie nur weniger als ein Dutzend inzwischen erschienener Arbeiten namhaft machen, aus denen sich Beobachtungsmaterial für die weitere Prüfung ihres Ansatzes entnehmen liess. Erst durch eine 1869 veröffentlichte Arbeit von Julius Thomsen wurde der Fortschritt etwas bekannter. Thom. sen hatte entsprechend den Ansätzen seiner Jugendarbeit

This process took place between the two sides. On one hand, this proved earlier thought to be unsolvable problem of determining measuring the chemical state in a homogeneous structure, without

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isturbing the existing equilibrium, as available after it was learned, instead of the weight analysis to apply the tools of physics it. In proportion as the use of such physicochemical methods multiplied and vermannigfaltigte, also came to light increasingly clear that precisely in homogeneous structures of equilibrium adopted by Berthollet in which each existing substance satisfies his affinities, only according to its amount, to varying degrees , certainly is the rule, and that the apparently exclusive reactions in the majority of cases were caused by the fact that remove the substances in question as gases or precipitation from the reaction areas. So Berthollet deep thoughts came back slowly zuEhren, especially alsGuldberg and balance in Christiania in 1867 they had brought for the first time in such a zulängliche mathematical form so that a measuring confirmation of theoretical foresight of the chemist world could be presented. Kant's famous complaint that the chemistry therefore is not a science, because it was not accessible to the mathematical treatment, was done in this way for the first time in the strict sense.

The fundamental work of Cato M. Guldberg (1836-1902) and Peter Waage (1833-1900) attracted little attention. In annual reports of chemistry it is not referenced, and twelve years later the discoverers' came back to the same matter in a new publication, they could only less than a dozen now make published works designated from which observational data for further testing of its approach Remove left. Only through a 1869 published work by

die Wärmeerscheinungen bei der Salzbildung dazu verwendet, um über den Zustand in homogener Lösung Aufschluss zu erhalten, und hattte dabei gefunden, dass seine Resultate durch Guldberg und Waages Theorie sich völlig ausreichend darstellen Hessen. Es muss betont werden, dass hierbei die Wärmetönungen nur als Kennzeichen für den jeweiligen Zustand verwertet wurden, und dass von dem oben kritisierten Satze, dass die mit grösster Wärmetönung verbundene Reaktion notwendig stattfinden müsse, gar kein Gebrauch gemacht worden war. Somit sind die Ergebnisse von der Richtigkeit oder Unrichtigkeit jenes Satzes ganz unabhängig und haben sich auch in der Folge bei unabhängiger Kontrolle als ganz zutreffend bewährt. Umgekehrt enthalten diese Arbeiten experimentelle Widerlegungen jenes falschen Prinzipes, denn sie beweisen, dass die Schwefelsäure eine schwächere Säure ist als Salz- und Salpetersäure, obgleich sie bei der Salzbildung bedeutend mehr Wärme entwickelt als diese. An die Arbeiten Thomsens schlossen sich später ähnliche, die mit anderen Hilfsmitteln zu dem gleichen Ergebnisse führten und die Richtigkeit des Grldberg-Waagescben Massenwirkungsgesetzes Tob »urf-iMMi Säten bestätigten.

Julius Thomsen of progress was slightly better known. Thom. sen had the phenomena of heat used in accordance with the approaches of his youth working in the salt formation to obtain information regarding the status in homogeneous solution, and hattte case found that his results by Guldberg and Waage theory perfectly adequate representing Hessen. It must be emphasized that in this case the heat effects were used only as an indicator for the current state, and that no use had been made of the above-criticized proposition that the reaction associated with the greatest heat of reaction must take place necessary. Thus, the results of the truth or falsity of that proposition are completely independent and have also proven themselves in the episode with an independent assessment as entirely correct. Conversely, this work included experimental refutation of that false principle, because they prove that the sulfuric acid is weaker than hydrochloric and nitric acids, although they largely developed more heat in the salt formation as this. Joined the work Thomsens later related, which led to the same results by other means and the accuracy of Grldberg-Waagescben mass action law Tob "confirmed URF IMMI sowed.

Neben dieser experimentellen Entwicklung des Freuen» iässt sicb eine theoretische verfolgen, deren Beginn ganz ausserhalb der Chemie liegt. Es ist bereas berichtet worden, dass der erste Versuch, die »es essdeckten Gesetre der Energie auf die Lösung des Affinitätsproblems anzuwenden, gescheitert war, weil er auf der falschen Voraussetzung beruhte, dass ausser chemischer Energie und Wärme gar keine andere Energieart bei den chemischen Vorgängen beteiligt sei. Wie die verwickelteren Probleme der Energieumwandlung zu behandeln seien, hatten Clausius und William Thomsen am Beginn der zweiten Hälfte des neunzehnten Jahrhunderts gezeigt, indem sie sich auf einen Gedankengang stützten, der schon lange vor Mayers Entdeckung, nämlich 1824 durch einen jung gestorbenen Artillerieoffizier, Sadi Carnot (1796 bis 1832) veröffentlicht worden war. Carnot hatte sich die Frage gestellt, von welchen Gesetzen die Gewinnung mechanischer Arbeit aus Wärme durch die damals gerade aufblühende Dampfmaschine abhängig ist, und war zu der folgenden Überlegung gekommen. Eine Wärmemaschine kann nur dann in Betrieb gesetzt werden, wenn ein Temperaturunterschied vorliegt. Alle Wärme von gleicher Temperatur ist völlig wertlos für den Zweck, denn mit dem Mangel des Temperaturunterschiedes fehlt jede Ursache für die Wärme, sich von einem Orte zum anderen zu begeben. Wenn somit eine Wärmemaschine arbeitet, so wird dabei eine gewisse Wärmemenge von einer höheren Temperatur auf eine niedere fallen, ähnlich wie eine

In addition to these experimental development offers »iässt SICB a theoretical track whose beginning is entirely outside of chemistry. It has been towne reported that the first attempt to "apply it essdeckten Gesetre energy on solving the affinity problem, had failed because it was based on the false premise that besides chemical energy and heat any other type of energy in the chemical processes was involved. As the more complicated problems of energy conversion should be treated, Clausius and William Thomsen had shown at the beginning of the second half of the nineteenth century, by they were based on a train of thought which existed long before Mayer's discovery, namely in 1824 by a deceased young artillery officer, Sadi Carnot was published (1796-1832). Carnot had asked the question of what laws the obtaining mechanical work of the heat by the then flourishing just steam engine depends, and had come to the following consideration. A heat engine can only be started when a temperature difference exists. All heat at the same temperature is completely worthless for the purpose, because with the lack of temperature difference lacks any source of heat, to move from one place to another. Thus, when a heat engine is operating, so there is a certain amount of heat from a higher temperature will drop to a lower, similar to a body of water to afford z. B. in a mill work, from a higher point must fall to a low. On the other hand makes heat, which simply passes through line at low temperature, no work; So a heat engine must be such that

Wassermasse, um z. B. in einer Mühle Arbeit zu leisten, von einer höheren Stelle auf eine niedere fallen muss. Anderseits leistet Wärme, welche einfach durch Leitung auf niedere Temperatur geht, keine Arbeit; eine Wärmemaschine muss also derart beschaffen sein, dass in ihr die Temperaturerniedrigung nur durch Arbeit erfolgt und wenn sie vollkommen sein soll, so darf gar keine Wärme durch Leitung auf niedrigere Temperatur gelangen, d. h. alle Temperaturänderungen müssen ohne Wärmeleitung und alle Wärmeübergänge müssen bei gleicher Temperatur erfolgen. Hierdurch gewinnt eine vollkommene Wärmemaschine das weitere Kennzeichen, dass sich ihr Betrieb umkehren lässt, da Wärmeübergänge zwischen gleichtemperierten Stellen in beiderlei Sinn unter gleichen Bedingungen erfolgen. Betreibt man eine Wärmemaschine im umgekehrten Sinne, so wird in ihr Arbeit verbraucht, um Wärme von niederer Temperatur auf höhere zu bringen und eine vollkommene Wärmemaschine würde gerade die Arbeit, die durch einen bestimmten Wärmefall von ihr geleistet ist, wieder verbrauchen, um die gleiche Wärmemenge auf die frühere höhere Temperatur zurückzubringen.

the temperature reduction is only by working in it and if it is to be perfect, no heat must pass through line to a lower temperature, that is, all changes in temperature have no heat conduction and all heat transfers must at the same temperature carried out , As a result, gaining a perfect heat engine further indicator that their operation can be reversed as heat transfers between equal temperament points made in both senses Alike. If you operate a heat engine in reverse, so consumed in her work to bring heat from a low temperature to a higher and a perfect heat engine would just consume the work that is done by a certain warmth case from her, again, about the same amount of heat return to the earlier higher temperature.

Wird dies zugegeben, so kann man beweisen, dass die Leistung einer vollkommenen Wärmemaschine nur vom Temperaturunterschiede, über den sie arbeitet, abhängt, und in keiner Weise von ihrer sonstigen Beschaffenheit. Denn gäbe es zwei vollkommene Maschinen A und B, von denen etwa A zwischen den gleichen Temperaturen aus derselben Wärmemenge mehr Arbeit entstehen lässt als B, so brauchte man nur B vorwärts, A aber mittelst der aus B erhaltenen Arbeit rückwärts gehen zu lassen, damit A beständig mehr Wärme auf die höhere Temperatur bringt, als B für die erforderliche Arbeit verbraucht. Man könnte mit anderen Worten beliebig grosse Wärmemengen von niederer auf höhere Temperatur bringen und mit diesen beliebig viel Arbeit erzeugen, d. h. man hätte ein Perpetuum mobile konstruiert. Da ein solches sich aber nicht konstruieren lässt, so ist die Annahme falsch. Auf gleiche Weise beweist man, dass auch B nicht vorteilhafter als A arbeiten kann. So bleibt nur übrig, dass beide Maschinen ein gleiches Verhältnis zwischen Wärmefall und Arbeit aufweisen, was zu beweisen war.

If this is added, so you can prove that the performance of a perfect heat engine only by the temperature differences over which it operates, dependent, and in no way other of their nature. Because there were two perfect machines A and B, of which about A can arise between the same temperatures in the same amount of heat more work than B, so we only needed B forward, A but means to let go of work obtained from B backwards so that A more heat resistant to the higher temperature brings, consumed as B for the required work. You could bring any large amounts of heat from lower to higher temperature and produce with this arbitrary amount of work, which means you would have a perpetuum mobile constructed with other words. Since such but can not be constructed, so the assumption is incorrect. In the same way one proves that B can not work more advantageous than A. So it only remains that both machines have an equal relationship between heat and work the case, which was to be proved.

Wie man sieht, ist bei dieser Überlegung überhaupt kein Gebrauch von dem Gesetze von der Erhaltung der Energie gemacht, denn es ist ganz unbestimmt gelassen worden, auf welche Weise die Arbeit aus der Wärme entsteht. Carnot dachte anfangs, dass der blosse Temperaturfall der Wärme hierzu ausreichend sei, ebenso wie der Fall des Wassers, ohne dass eine Verminderung der Wärme- bezw. Wassermenge eintritt. Später scheint er, wie sich aus hinterlassenen Aufzeichnungen entnehmen lässt, sich der richtigen Auffassung, dass hierbei ein Teil der Wärme verbraucht wird, genähert zu haben, doch sind jene Aufzeichnungen

As you can see, is in this consideration made absolutely no use of the law of conservation of energy, because it has been left very vague way in which the work arises from the heat. Carnot initially thought that mere temperature case, the heat should be sufficient for this purpose, as is the case of the water, without requiring a reduction in the heat respectively. Amount of water enters. Later, he seems as can be seen from posthumous recordings to be, have approached the right believes that this part of the heat is consumed, but are those records

erst ans Tageslicht gekommen, als die ganze Angelegenheit bereits durch die späteren Forscher aufgeklärt war. Wesentlich aber ist, dass die Schlussweise Carnots in der Tat ohne die Kenntnis deä Gesetzes von der Erhaltung der Energie oder des ersten Hauptsatzes ausführbar ist. Das Perpetuum mobile, welches durch Carnots Überlegung ausgeschlossen wird, ist daher ein anderes als das, welches durch Erschaffung von Energie betrieben werden könnte, denn es ist ja von der Geltung des ersten Hauptsatzes ganz unabhängig. Ein Carnotsches Perpetuum mobile würde sich z. B. ergeben, wenn man die Wärme einer gleichtemperierten Wassermasse veranlassen könnte, sich teilweise in andere Energie, z. B. in elektrische zu verwandeln. Dies ist erfahrungsmässig ebensowenig möglich, wie die Erschaffung von Energie. Es liegt hier also ein anderes, vom ersten Hauptsatze unabhängiges Gesetz vor, welches der zweite Hauptsatz heisst, und welches im Anschluss an die eben durchgeführten Betrachtungen in verallgemeinerter Gestalt so ausgesprochen werden kann: ruhende Energie setzt sich nicht freiwillig in Bewegung. Oder wenn man das eben beschriebene Carnotsche Perpetuum mobile ein solches zweiter Art nennt: ein Perpetuum mobile zweiter Art ist unmöglich. Carnots grosser Gedanke blieb zunächst ebenso ohne Wirkung, wie viele andere Gedanken, die ihrer Zeit zu weit voraus waren. Das kleine Büchlein, in dem er veröffentlicht worden war, geriet ganz in Vergessenheit. Dies änderte sich auch nicht, als

zehn Jahre später ein Ingenieur namens Clapeyron den Gedanken aufnahm und ihm eine elegante analytische Darstellung gab, und ebensowenig, als wieder etwa zehn Jahre später Poggendorff jene Abhandlung von Clapeyron, die französisch erschienen war, in seinen weitverbreiteten Annalen mit einem besonderen Hinweis auf ihre Bedeutung nochmals deutsch abdruckte. Erst R. Clausius und W. Thomson waren (1850) fähig, die Tragweite des Gedankens zu beurteilen, und insbesondere der erste wies nach, dass er wie oben dargestellt, unabhängig vom ersten Hauptsatze ist und daher trotz der unrichtigen Annahme von Carnot, dass keine Wärme in den Wärmemaschinen verbraucht wird, zu richtigen Resultaten führt, wenn man ihn in angemessener Weise mit dem ersten Hauptsatze verbindet. Ebenso war W. Thomson imstande, ihn zu wichtigen Schlüssen zu benutzen, ohne sich damals über die Frage zu entscheiden, ob der erste Hauptsatz gültig ist oder nicht.

Hierdurch kam es, dass während der erste Hauptsatz leichtverständlich ist und gegenwärtig einen Bestandteil

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only come to light when the whole affair had been cleared by later researchers. Much, however, is that the inference Carnot executable by the conservation of energy or the first law in fact without the knowledge DEAE Act. The perpetual motion, which is ruled by Carnot's idea is therefore another than that which could be operated by the creation of energy, for it is by the application of the first law quite independently. A Carnot cal perpetual motion would be z. B. arise if you could arrange for the warmth of a body of water equal temperament to transform partially into other energy, z. B. in electrical. This is experientially just as impossible as the creation of energy. It is here therefore another, independent of the first law against law, which is called the second law, and which can be pronounced after the plane carried out observations in a generalized form as: potential energy consists not voluntarily move. Or if you just described the mobile Carnot Perpetuum such a second type is called: a perpetual motion machine of the second kind is impossible. Carnot's big idea was initially also without effect, like many other ideas which had their time too far ahead. The little book in which he had been released, fell entirely into oblivion. This also did not change, as

Ottwald, guidelines chemistry. 15

ten years later an engineer called Clapeyron took up the idea and gave him an elegant analytical representation, nor, as again some ten years later Poggendorff those treatise of Clapeyron, who had appeared french, again in its widespread annals with a specific indication as to their meaning German reprinted. Only R. Clausius and W. Thomson had (1850) able to assess the scope of the idea, and in particular the first proved that he as shown above, is independent of the first law, and therefore, despite the incorrect assumption of Carnot, that no Heat is consumed in the heat engine, leads to correct results when you combine it in an appropriate manner with the first law. Likewise, W. Thomson was able to use him to important conclusions, without that time to rule on the question whether the first law is valid or not.

des elementaren Unterrichts bildet, der zweite Haupttsatz einen Charakter von Schwerverständlichkeit, ja fast eine geheimnisvolle Beschaffenheit erhielt. Seine Anwendungen waren durch die beiden genannten grossen mathematischen Physiker an gewisse mathematische Operationen geknüpft, deren Richtigkeit man einsehen und deren Erfolge man bewunder n konnte, ohne dass man aber begriff, warum gerade diese zweimaligen Differentiationen erforderlich sein sollten, um unter Verschwinden der zweiten Differentiale die endlichen einfachen Beziehungen zu ergeben. Anderseits beweist gerade die Entdeckung des zweiten Hauptsatzes zwanzig Jahre vor dem ersten, dass in ihm eine ähnliche, allgemeine Beziehung steckt, wie in dem Erhaltungsgesetze. Erst in neuerer Zeit hat sich herausgestellt, dass erstens der zweite Hauptsatz nicht nur, wie ihn Clausius und Thomson noch allein verwendet hatten, auf die Wärmelehre beschränkt ist, sondern sich bei allen Arten Energie betätigt, und zweitens, dass er die allgemeine Bedingung oder Definition dafür darstellt, dass überhaupt etwas geschieht. Der erste Hauptsatz besagt ja nur: wenn etwas geschieht, so stehen die verschwindenden und die erscheinenden Energiemengen im Äquivalenzverhältnisse, er gibt aber keine Auskunft darüber, ob und wann etwas geschieht, sondern setzt das Stattfinden eines Geschehens voraus. Hier tritt nun der zweite Hauptsatz ein und stellt die Voraussetzung fest, unter welcher etwas geschieht, und zwar auf Grund ganz ähnlicher Überlegungen, wie sie Carnot für die Wärme angestellt hat. Ebenso wie ein Temperaturunterschied bestimmt, ob seitens der Wärme etwas geschieht, so bestimmt ein elektrischer Spannungsunterschied, ob seitens der elektrischen Energie etwas geschieht, und ein Druckunterschied bestimmt einen entsprechenden mechanischen Vorgang. Für jede Energie lässt sich, wie die eingehende Untersuchung lehrt, solch ein Wert bestimmen, welcher für sie die gleiche Bedeutung hat, wie die Temperatur für die Wärme und für jede Energieart gelten demgemäss die Betrachtungen Carnots. So gibt es insbesondere auch für die chemische Energie ein solches „chemisches Potential1', und dieses ist der exakte Ausdruck für das, was man unter dem Namen der chemischen Verwandtschaft mehr gesucht als gekannt hat. Dieses chemische Potential steht unter Vermittlung der Verbindungsgewichte mit der Grösse, die vorher als freie Energie bezeichnet worden ist, in nächster Beziehung und damit chemisch etwas geschieht, muss ein Unterschied des chemischen Potentials vorhanden sein.

In this way it came about that while the first law can be easily understood and currently forms part of elementary education, the second Haupttsatz a character of gravity for granted, yes received nearly a mysterious nature. His applications were linked by the two called great mathematical physicist at certain mathematical operations, their accuracy, see you and whose successes are decora n could, without being however understood why this twice differentiations should be required under disappearance of the second differentials to give finite simple relationships. On the other hand just proves the discovery of the second law twenty years before the first that a similar, general relationship is in it, as in the conservation laws. Only in recent times has been found, firstly, that the second law, as it Clausius and Thomson had not only used alone, is limited to the theory of heat, but is operated in all types of energy, and secondly, that he, the general condition or definition why is that anything done. The first law says yes only: if something happens, so are the disappearing and appearing amounts of energy equivalence ratios, but gives no information about whether and when something happens, but continues to take place ahead of an event. Here enters the second law and is a prerequisite established, under which something is happening, and that due to a very similar considerations as it has done for the heat Carnot. Just as a temperature difference, determines whether the part of the heat for something to happen, so determined an electrical voltage difference, whether on the part of the electrical energy for something to happen, and a pressure difference determines a corresponding mechanical process. For each energy can be, as the in-depth investigation teaches determine such a value, which for them is the same as the temperature for the heat and for each type of energy are accordingly the considerations of Carnot. So there are particular for the chemical energy of such a "chemical potential', and this is the exact expression of what you have under the name of chemical affinity wanted more than known. This chemical potential is under mediation of combining weights the size of which has been previously referred to as free energy, in close relationship and thus chemically something happens, a difference of the chemical potential must be present.

Zunächst war die Chemie allerdings sehr weit davon entfernt, an den Fortschritten teilzunehmen, welche die Physik durch die Entdeckung und Anwendung der Energiegesetze erfuhr. Es war, entsprechend der Entstehungsgeschichte dieser Probleme, in erster Linie die

First, the chemistry was, however, very far from it, to participate in the advances, which learned physics through the discovery and application of energy laws. It was, according to the legislative history of these problems, primarily the theory of the steam engine and other heat

Theorie der Dampfmaschine und der anderen Wärmemaschinen, welche ausgebildet wurde. Clausius wies zwar gelegentlich darauf hin, dass die von ihm ausgebildeten Begriffe und die mit ihrer Hilfe gefundenen Gesetze auch in der Chemie Anwendung finden könnten, doch hat er selbst den Weg hierzu nicht gewiesen. Dies geschah zuerst durch August Horstmann (geb. 1842) im Jahre 1870, und zwar in einer grundsätzlich vollkommen ausreichenden Weise. Horstmann wendete die Formeln von Clausius, insbesondere sein Prinzip der maximalen Entropie auf den Fall chemischer Vorgänge in Gasen an, wo die von diesem eingeführten allgemeinen Funktionen eine rechneirische Auswertung ermöglichen und fand auf diesem Wege unter anderem dasselbe Massenwirkungsgesetz, welches Guldberg und Waage auf experimentellem Wege entdeckt hatten. Allerdings galt Horstmanns Ableitung zunächst nur für Gase; er hat aber ausdrücklich ausgesprochen, dass nach den vorhandenen Tatsachen gelöste Stoffe eine übereinstimmende Gestalt der massgebenden Funktion aufweisen, so dass die für Gase gefundenen Gesetze auf sie übertragen werden können. Es ist dies eine Bemerkung, die bei weiterer Verfolgung auf die durch van 't Hoff eingeführten Gedanken leitet.

Unabhängig von Horstmann wurden ähnliche Gedanken etwas später von französischen Forschern entwickelt, wenn auch in engerem Umfange. Bei weitem die umfassendste und tiefgehendste Arbeit wurde aber durch einen amerikanischen Forscher geleistet, Willard Gibbs (1889 bis 1904), welcher gleichfalls auf Clausius fussend der ganzen weiteren Entwicklung der chemischen Energetik eine dauernde Form gegeben hat.

Willard Gibbs hatte seine ausgedehnten Forschungen in einer fast unbekannten und sehr wenig verbreiteten Zeitschrift, den Transactions der Connecticut Academy, veröffentlicht. Da er ausserdem ganz und gar dem klassischen Typus des Gelehrten angehört, dem die Genauigkeit und Strenge seiner Darlegungen über alles geht, und dem meist das Mitteilungsbedürfnis und damit die Fähigkeit und Neigung zu anregender Darstellung abgeht, so hat er auch keine unmittelbare Schule gegründet,

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wodurch seinen Forschungen eine weitere Möglichkeit der Verbreitung entzogen wurde. So kann es nicht wundernehmen, dass auch diese genialen Arbeiten zunächst ganz unbekannt blieben, und dass erst durch einzelne andere Forscher, welche mehr oder weniger zufällig der hier verborgenen Schätze gewahr wurden und sie den Mitarbeitern zugänglich zu machen suchten,

engines, which have been formed. Although Clausius had occasionally pointed out that the terms trained by him and the matches with their assistance laws also in chemistry could be applied, but he has not even shown the way on this. This was done first by August Horstmann (born 1842) in 1870, and in a manner basically completely sufficient. Horstmann applied the formulas of Clausius, in particular its principle of maximum entropy to the case of chemical processes in gases, where introduced by this general functions enable counting Irish evaluation and found in this way, inter alia, the same law of mass action, which Guldberg and Waage experimentally had discovered. However Horstmann's derivative was initially only for gases; but he has expressly stated that according to the existing facts solutes have a matching shape of the decisive function, so that the laws found for gases can be transferred to them. This is a remark that passes in further persecution by the van't Hoff introduced thoughts.

Regardless of Horstmann similar ideas were later developed by French researchers, though in a narrower scope. By far the most comprehensive and most profound work has been done but by an American researcher, Willard Gibbs (1889 to 1904), which has also given on Clausius basing around the further development of chemical energetics a permanent form.

Willard Gibbs had his extensive research in an almost unknown and very little popular magazine, the *Transactions of the Connecticut Academy* published. He also totally belongs to the classical type of the scholar, the accuracy and rigor of his statements about everything goes, and usually lacks the desire to communicate and thus the ability and inclination to stimulating presentation, he has also established no direct school,

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which his research has been withdrawn is another way of spreading. So it is not surprising that even this ingenious work initially remained quite unknown, and that only

verhältnismässig spät Kunde und Anwendung von ihnen ans Licht kam.

Der gesamte Inhalt von Gibbs' Entdeckungen lässt sich in allgemeinverständlicher Gestalt noch nicht darstellen, weil er noch nicht Gemeingut des wissenschaftlichen Denkens geworden ist. Er ist ausserdem so reich und mannigfaltig, dass auch die Fachmänner ihn noch bei weitem nicht erschöpft haben, so reiche und mannigfaltige Anwendung bereits von ihnen gemacht worden ist. Es muss daher genügen, in ganz allgemeiner Weise den Charakter des von Gibbs bewirkten wissenschaftlichen Fortschrittes zu kennzeichnen.

Von allen Gebieten der theoretischen Physik ist das der Thermodynamik, oder, da dieser Name zu eng ist, der Energetik, bei weitem das sicherste und geordnetste. Auf Grund der beiden Hauptsätze der Energetik, die wir vorher kennen gelernt haben, und unter Benutzung anderer allgemeiner Gesetze, wie des Gasgesetzes, des Faraday schen Gesetzes usw. kann man zwischen den verschiedenartigsten Eigenschaften physikalischer Gebilde bestimmte, zahlenmässige Beziehungen aufstellen. Von diesen waren viele experimentell noch unbekannt, als sie auf theoretischem Wege gefunden wurden; die auf Grund der Theorie angestellten Versuche haben dann jedesmal nicht nur eine allgemeine, sondern auch eine zahlenmässige Bestätigung dieser Gesetze gegeben. Um nur ein Beispiel anzuführen, sei der Einfluss des Druckes auf den Schmelzpunkt erwähnt. Bunsen hatte gefunden, dass gewisse Stoffe, wie Wachs, Wallrat usw., die er untersucht hatte, ihren Schmelzpunkt durch starken Druck erhöhen. Kurze Zeit darauf wurde die Theorie auf die Frage angewendet; sie ergab eine Beziehung zwischen dem Einflusse des Druckes auf den Schmelzpunkt, der Schmelzwärme und der Volumenänderung beim Schmelzen, die zu dem unerwarteten Ergebnis führte, dass beim Wasser sich die Sache umgekehrt verhalten müsse, als Bunsen sie bei seinen Stoffen gefunden hatte: die Schmelztemperatur des Wassers sollte durch Druck fallen statt zu steigen. Der Versuch ergab nicht nur eine Bestätigung der Theorie dem Sinne nach, sondern auch die vorausberechnete (sehr geringe) Schmelzpunktserniedrigung wurde so genau gefunden, als die Versuchsfehler dies erwarten liessen.

Somit gestattet die Anwendung der beiden Hauptsätze, die experimentelle Naturgeschichte solcher Gebilde, deren Energieverhältnisse man kennt, zu einem Anwendungsgebiete der Kombinatorik zu machen. Die von Clausius, Thomson und Gibbs angeführten Methoden brauchen nur erschöpfend auf alle denkbaren Kombinationen der beteiligten Energien angewendet zu werden, um alle zwischen ihnen möglichen gesetzlichen

through individual other researchers, which happens to be the hidden here treasures were more or less aware of and sought to make them available to employees, comparatively late customer and application of they came to light.

The entire contents of Gibbs' findings can be accessible in understandable form not represent, because he has not yet become common property of the scientific thinking. He is also so rich and varied that even the professionals have him not yet exhausted by far, so rich and varied application has already been made of them. It must therefore suffice to characterize the nature of the induced by Gibbs scientific progress in the most general way.

Of all areas of theoretical physics is thermodynamics, or because the name is too tight, the power industry, by far the safest and most orderly. Due to the two main sets of power that we have met before, and using other general laws, such as the Gas Act, the Faraday's law and so you can choose between the most diverse properties of physical structures certain, establish numerical relations. Of these, many were experimentally still unknown, as they were found in a theoretical way; The staff on the basis of theory tests have then always given not only a general, but also a numerical confirmation of these laws. To cite just one example, the influence of the pressure may be mentioned on the melting point. Bunsen had found that certain substances such as wax, Wallrat etc., which he had studied, increase its melting point by strong pressure. Shortly afterwards, the theory has been applied to the question; they showed a relationship between the influence of pressure on the melting point, the melting heat and the volume change on melting, which led to the unexpected result that the water is the matter must behave inversely when Bunsen she had found in its materials: the melting temperature of water should fall by pressure instead of rising. The experiment showed not only a confirmation of the theory in spirit, but also the predicted (very low) melting point depression was found as accurate as the experimental error could expect this.

Thus, the application of the two laws, the experimental natural history of such structures, the energy ratios are known to turn into an Applications of combinatorics allowed. The reasons given by Clausius, Thomson and Gibbs methods need to be applied only to exhaustively all

Beziehungen zu ergeben. Das höchste Ideal, welches sich ein Leibniz für die Wissenschaft ersinnen konnte, findet sich auf dem von der Energetik beherrschten Gebiete verwirklicht.

conceivable combinations of the energies involved to give all possible legal relations between them. The highest ideal, which could devise a Leibniz for science, can be found on the dominated by the energetics areas realized.

Die Bedeutung von Gibbs' Arbeiten liegt nun gerade darin, dass er für die Lehre vom chemischen Gleichgewicht diesen Zustand geschaffen hat. In der Physik ist es seit langem anerkannt, dass die Thermodynamik nicht nur eines der fruchtbarsten Gebiete ist, sondern auch das exakteste. Es steht in dieser Beziehung der theoretischen Mechanik nicht nach, der es anderseits vermöge seines viel engeren Anschlusses an die Erfahrung weit überlegen ist. Gibbs hat den Zugang zu dem entsprechenden Gebiete der Chemie durch seine Arbeiten eröffnet und seitdem die Chemiker gelernt haben, sich seiner Methoden und Entdeckungen zu bedienen, ist eine reiche Ernte von wissenschaftlichen Ergebnissen gewonnen worden. Das Feld ist dabei, entsprechend der viel grösseren Mannigfaltigkeit der chemischen Erscheinungen den thermodynamischen gegenüber, so wenig erschöpft, dass vielmehr fast täglich neue Früchte eingebracht werden und es überall an Händen fehlt, um die in erreichbarer Nähe hängenden zu pflücken.

The importance of Gibbs' work is now in the fact that he has created this state of the theory of chemical equilibrium. In physics it has long been recognized that the thermodynamics is not only one of the most fertile areas, but also the most accurate. It is not according to this relationship of theoretical mechanics, it on the other hand by virtue of its much closer connection to the experience is far superior. Gibbs has opened access to the appropriate areas of chemistry for his work and since then, chemists have learned to his methods and discoveries to use, a rich harvest of scientific results has been obtained. The field is, according to the much greater diversity of chemical phenomena thermodynamic opposite, so little exhausted that rather almost daily new fruits are introduced and it all lacks hands to the pick hanging within reach.

Um die Beschaffenheit des durch Gibbs bewirkten Fortschrittes zu kennzeichnen, will ich eines der vielen von ihm entdeckten Gesetze, das Phasenge setr, etwas eingehender darstellen. Es ist dasjenige, dessen Bedeutung am frühesten erkannt worden ist, und das deshalb, insbesondere durch die Bemühungen von Bakhuis Roozeboom (geb. 1854) die mannigfaltigste Anwendung gefunden hat. An diesem Beispiele wird gleichzeitig der umfassende Charakter der Beziehungen ersichtlich, welche Gibbs aufzudecken wusste.

To characterize the nature of the caused by Gibbs progress, I want one of the many he discovered laws which Phasenge setr, representing a little more closely. It is one whose importance has been recognized at the earliest, and therefore, has found particular through the efforts of Bakhuis Roozeboom (born 1854), the most varied applications. At this same time examples of the comprehensive nature of the relationship can be seen which did uncover Gibbs.

Betrachtet man einen homogenen Körper, gleichgültig ob fest, flüssig oder gasförmig, in bezug auf seine möglichen Änderungen durch Wärme und mechanische Beeinflussung (wobei wir uns auf einen gleichförmigen Druck beschränken wollen), so finden wir, dass sein Zustand eindeutig und unveränderlich bestimmt ist, wenn man seine Temperatur und seinen Druck kennt. Dies wird unmittelbar deutlich bei einem Gase, für welches die Gleichung pv = RT gilt; hier können von den drei Veränderlichen zwei beliebig angenommen werden; die dritte ist dann zahlenmässig festgelegt. Gleichzeitig erkennt man, dass es nicht gerade Temperatur und Druck sein müssen, die man wählt; es können vielmehr beliebige zwei von den drei Veränderlichen sein, es müssen aber zwei, nicht mehr und nicht weniger sein. Ganz ebenso verhalten sich Flüssigkeiten und feste Körper: ihr Volumen ist bestimmt, wenn Druck und Temperatur

Considering a homogeneous body, whether solid, liquid or gaseous form, with respect to its possible changes due to heat and mechanical control (where we want to limit ourselves to a uniform pressure), we find that his condition is clearly and invariably determined, when its temperature and pressure are known. This is immediately evident in a gas, for which the equation PV = RT applies; here may be adopted any of the three variables, two; the third is then determined numerically. At the same time you realize that it does not just have to be temperature and pressure that one chooses; it can rather be any two of the three variables, but there must be two, no more, no less. Very well behaved liquids and solid bodies: their volume is determined when pressure and temperature are given, and two variables are free in general for them, the third no longer.

gegeben sind, und zwei Veränderliche sind im allgemeinen für sie frei, die dritte nicht mehr.

Man sagt daher, dass ein jeder homogene Körper zwei Freiheitsgrade oder kurz zwei Freiheiten hat.

Nun kann man über diese Freiheiten noch anders verfügen, als durch die Bestimmung von Druck, Temperatur oder Volumen, u. a. dadurch, dass man eine Flüssigkeit neben ihrem Dampf, einen festen Körper neben seiner Schmelze usw. zu haben verlangt. Man nennt nach Gibbs diese verschiedenen Teile des Systems, wo dieses andere Eigenschaften, insbesondere eine andere Dichte aufweist, Phasen. Ein Gebilde aus Wasser und Dampf besteht daher aus zwei Phasen, der flüssigen und der gasförmigen. Man kann also allgemein die Forderung aufstellen, dass zwei Phasen nebeneinander bestehen sollen.

Nun ist es offenbar nicht möglich, zwei Phasen nebeneinander im Gleichgewicht zu haben (und auf Gleichgewichte bezieht sich ausdrücklich unsere ganze Untersuchung), wenn nicht ihre Temperaturen und ihre Drucke gleich sind.

Solch eine Forderung ist, wie Gibbs beweist, immer gleichwertig mit der Verfügung über eine Freiheit. Mit der Anzahl der Phasen, die nebeneinander bestehen sollen, nimmt somit die Anzahl der Freiheiten ab, die für das Gebilde übrigbleiben. Bei einem einheitlichen Stoffe, bei dem sich eine jede Phase vollständig in die andere verwandeln lässt, wird somit nur eine Freiheit bestehen, wenn zwei Phasen nebeneinander vorhanden sind, und gar keine, bei drei Phasen.

Anderseits liegt eine weitere Reihe von Freiheiten vor, wenn die Stoffe zusammengesetzt sind. Jeder neue unabhängige Bestandteil bedingt eine Freiheit mehr. Fasst man alle diese Umstände zusammen, und nennt F die Anzahl der Freiheiten,

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P die der Phasen und B die der Bestandteile, so gilt die Gleichung

$$P + F = B + 2;$$

die Summe der Phasen und Freiheiten ist gleich der Anzahl der Bestandteile plus zwei.

Man sieht es dieser schlichten Gleichung nicht an, welchen unabsehbaren Inhalt sie besitzt. Wir prüfen zunächst, ob sie dem einfachen Fall genügt, von dem wir ausgingen. Haben wir einen Bestandteil in einer Phase, so

They say therefore that every homogeneous body has two degrees of freedom or short two freedoms.

Now you can have these freedoms nor otherwise than by the determination of pressure, temperature or volume, including the fact that a liquid is required in addition to its vapor to have a solid body in addition to its melt so. It is called by Gibbs these different parts of the system, where this other properties, in particular having a different density, phases. Therefore, a structure of water and steam consists of two phases, the liquid and gaseous. So you can generally set up the requirement that two phases are to exist side by side.

Now it is obviously not possible, two phases next to each other in balance to have (and on equilibria refers explicitly our whole investigation) unless their temperatures and their prints are the same.

Such a claim is, as Gibbs proves always equivalent to the disposal of a freedom. With the number of phases that are to coexist, thus decreases the number of freedoms, which remain for the structure. With a standardized materials, in which each phase can completely transform into the other, thus only a freedom shall stand when two phases coexist, and none in three phases.

On the other hand there is another set of freedoms, when the materials are put together. Every new part requires an independent freedom more. Summing up all these circumstances together, and calls F the number of freedoms,

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The P and B of the phases of the components, so the equation is valid

$$P + F = B + 2;$$

the sum of the phases and freedom is equal to the number of the components plus two.

ist P = 1 und B = l; somit ist F = 2: die Anzahl der Freiheiten ist zwei, ganz wie wir gesehen haben. Liegt ein Bestandteil in zwei Phasen vor, so folgt F = 1, es besteht nur eine Freiheit. Haben wir beispielsweise Flüssigkeit neben Dampf, so kann man nur eine Grösse frei bestimmen, z. B. die Temperatur; dann ist der Druck nicht mehr wahlfrei. In der Tat hat eine reine Flüssigkeit bei einer bestimmten Temperatur einen bestimmten Dampfdruck und bei keinem anderen Druck kann Dampf neben ihr bestehen. Denn wenn der Druck grösser gemacht wird, so verschwindet der Dampf und wird zu Flüssigkeit komprimiert; macht man ihn kleiner, so verschwindet die Flüssigkeit und geht in Dampf über.

Um weiter die Anwendung des Phasengesetzes zu zeigen, können wir nach dem Verhalten einer Lösung neben einem festen Körper, z. B. einem Salze fragen. Wir haben zwei Bestandteile und zwei Phasen, nämlich Lösung und festes Salz; ist F = 2, es gibt zwei Freiheiten. Wir können beispielsweise eine bestimmte Temperatur wählen, alsdann wissen wir aber, dass sich die Lösung mit dem festen Körper sättigt, d. h. dass sich ein ganz bestimmtes Verhältnis zwischen beiden in der Flüssigkeit herstellt und es sieht so aus, als wäre keine zweite Freiheit mehr vorhanden, welche das Phasengesetz gewährt. Indessen hat die Forschung gezeigt, dass noch die Konzentration der gesättigten Lösung verändert werden kann, wenn man den Druck verändert. Dann verschiebt sich auch die Sättigung. Allerdings ist diese Veränderlichkeit nur sehr gering, aber sie ist vorhanden, und das Phasengesetz hat in derartigen Fällen bereits mehrfach die experimentelle Forschung auf die Existenz solcher Veränderlichkeiten geführt, die wegen ihrer Kleinheit der bisherigen Beobachtung entgangen waren.

In solcher Weise, die um so mannigfaltiger wird, je zahlreicher die Bestandteile sind, kennzeichnet das Phasengesetz die formalen Eigenschaften aller möglichen chemischen Gebilde, insofern diese im Gleichgewicht sind. Es dient daher als Einteilungsprinzip für die wissenschaftliche Behandlung der ganzen Frage und eine Zusammenstellung unserer gegenwärtigen Kenntnisse, die sich auf das Phasengesetz beziehen, würde eine ganze Anzahl starker Bände umfassen.

Endlich darf nicht unterlassen werden zu betonen, dass sich der Begriff der Phase als ein grundlegender bei theoretischen Untersuchungen über die Grundbegriffe der Chemie überhaupt erwiesen hat. Er ist allgemeiner, als der des Stoffes, da er sowohl reine Stoffe wie Lösungen umfasst und mit seiner Hilfe lassen sich die Grundgesetze der Stöchiometrie allgemeiner und hypothesenfreier entwickeln, als auf irgendeinem anderen Wege. Hier hat

You do not see it in this simple equation, which incalculable content it has. We first check whether it complies with the simple case, from which we started. Do we have a part in one phase, so is P = 1 and B = l; Thus, F = 2: the number of freedoms is two, just as we have seen. If a component in two phases, as follows F = 1, there is only one freedom. Do we, for example, liquid addition to steam, so one can determine only one size-free, for example, the temperature. then the pressure is no longer optional. In fact, a pure liquid at a certain temperature a certain vapor pressure and no other pressure steam can coexist with her. Because if the pressure is made larger, so the steam disappears and is compressed to liquid; one makes it smaller, so the liquid disappears, and passes over into steam.

To further illustrate the application of the phase rule, we can look for the behavior of a solution in addition to a solid body, eg. As a wonder salts. We have two components and two phases, namely solution and solid salt; is F = 2, there are two degrees of freedom. We can choose, for example, a certain temperature, then, we know that the solution is saturated with the solid body, ie that establishes a precise relationship between the two in the liquid, and it looks as if no other freedom longer exists, which grants the phase law. However, has shown that even the concentration of the saturated solution may be varied, if one changes the pressure research. Then also the saturation shifts. However, this variability is very low, but it exists, and the phase rule has repeatedly done in such cases, the experimental research on the existence of such variability that had escaped because of their smallness of the previous observation.

In a manner that is so varied, the more numerous the ingredients are, the phase law marks the formal properties of all possible chemical structures, where these are in equilibrium. It therefore serves as a principle of classification for the scientific treatment of the whole question, and an assortment of our present knowledge relating to the phase rule, would include a number of strong volumes.

Finally must not omit to emphasize that the concept of phase has ever proven to be a fundamental in theoretical studies on the basic concepts of chemistry. It is more general than that of the substance, as it includes both pure substances such solutions and with his help, can the fundamental laws of stoichiometry develop general and hypothesis-free, as in any other way. Here in particular

insbesondere Franz Wald (geb. 1861) grundlegende Arbeit geleistet, auf welcher soeben eifrig weiter gebaut wird.

Franz Forest has done (born 1861) fundamental work on which will be built just on eagerly.

Dieser kurze Überblick über die Tragweite eines einzigen von den vielen Ergebnissen der Arbeit von Willard Gibbs mag ein Bild davon geben, welche Bedeutung ihr zukommt. Durch sie ist die mathematische Chemie auf die gleiche Stufe der Exaktheit und der Mannigfaltigkeit gehoben worden, wie sie die mathematische Physik seit mehr als einem Jahrhundert eingenommen hat. Es ist charakteristisch, dass während früher die Lehrbücher der Thermodynamik mit der Theorie der Dampfmaschine zu schliessen pflegten, in der sich die einzelnen Ergebnisse der Theorie zu rechnerischer Anwendung vereinigten, es gegenwärtig üblich geworden ist, die Hauptergebnisse der mathematischen Chemie als Paradepferd der Thermodynamik vorzureiten.

This brief overview of the scope of a single of the many results of the work of Willard Gibbs may give an idea of â €‹â€‹the importance it deserves. Through the mathematical chemistry has been raised to the same level of accuracy and variety, as it occupied the mathematical physics for more than a century. It is characteristic that while earlier the textbooks of thermodynamics used to connect with the theory of the steam engine, in which the individual results of the theory of computational applications combined, it is currently become customary vorzureiten the main results of mathematical chemistry as showpiece of thermodynamics.

Die Bedeutung des Phasengesetzes liegt, wie bereits bemerkt, ausschliesslich auf der formalen Seite. Es gibt uns ein Schema, dem alle möglichen Gleichgewichte unterworfen sind, sagt uns aber nichts Bestimmteres über die Beschaffenheit dieser Gleichgewichte. Hier tritt ein anderes Gesetz ein, welches sich aus der allgemeinen Auffassung des Gleichgewichts ergibt. Es reicht zwar gleichfalls nicht aus, um ein Gleichgewicht an sich vollständig zu definieren. Wohl aber gibt es an, wie ein einmal vorhandenes Gleichgewicht sich ändert, wenn man die Bedingungen verschiebt, unter denen es besteht. Es gibt mit anderen Worten Auskunft über den gegenseitigen Zusammenhang der an demselben Gebilde möglichen Gleichgewichte. Seine Geschichte ist eine recht verwickelte; man kann sie, wenn man will, bis in die mechanischen Prinzipien des kleinsten Zwanges und der kleinsten Wirkung zurückverfolgen. Seine Anwendung im chemisch-physikalischen Gebiete ist von verschiedenen Seiten mehr oder weniger klar versucht und ausgeführt worden; am klarsten wieder von van 't Hoff.

The importance of the phase rule is, as already noted, exclusively on the formal side. It gives us a framework to which all possible equilibria are subject to, but tells us nothing more definite about the nature of these equilibria. Here enters another law, which arises from the general conception of equilibrium. Although it is not enough also to define a balance to be complete. There is, however, how a once existing balance changes when you move the conditions under which it is made. There are, in other words information about the mutual relation of the possible on the same structure equilibria. His story is quite complicated; they can be, if you will, traced back to the mechanical principles of least constraint and of least action. Its use in the chemical-physical areas has been attempted clear from various more or less and run; most clearly back of van 't Hoff.

Man versteht den Satz am besten, wenn man ihn als eine erweiterte Definition des Gleichgewichtszustandes auffasst. In der Mechanik unterscheidet man bekanntlich das stabile, labile und indifferente Gleichgewicht. Das Gleichgewicht im engeren und eigentlichen Sinne ist durchaus das stabile; es hat die Eigenschaft, dass es sich jeder Störung widersetzt, indem jede Störung die Beschaffenheit hat, solche Änderungen des Gebildes hervorzurufen, die alsbald den Erfolg der Störung wieder zu vernichten oder ihre Wirkung auszugleichen suchen. Betrachten wir beispielsweise eine schwere Masse, die an einem Seil aufgehängt ist und zur Ruhe gekommen ist. Jede mögliche Bewegung, die man der Masse erteilen kann, ist mit ihrer Hebung verbunden, denn die Ruhelage senkrecht unter dem Aufhängepunkte ist ja die denkbar

One understands the phrase best if one conceives of it as an expanded definition of the equilibrium state. In mechanics it is well known that different stable, unstable and indifferent equilibrium. The balance in the strict and proper sense is quite stable; it has the property that it is any disturbance resists by any disruption has the texture, evoke such changes in the structure, which soon destroy the success of the system fault or compensate their effect looking. For example, consider a heavy mass, which is suspended on a rope and has come to rest. Any movement that can be obtained from the ground, is connected to their elevation, because the rest position under the suspension points is perpendicular indeed the lowest conceivable that may occur. Therefore, the mass of any other position other

niedrigste, die vorkommen kann. Daher wird die Masse aus jeder anderen Lage ausser der Ruhelage noch sich senken können und müssen. Man erkennt, dass die Ruhe- oder Gleichgewichtslage eben dadurch gekennzeichnet ist, dass jede andere, benachbarte Lage aus ihr nur durch Aufnahme von Arbeit erreicht werden kann, und dass daher jede andere Lage die Eigenschaft hat, dass sich die Masse aus ihr in die Ruhelage zu bewegen strebt, und wenn sie beweglich ist, auch sich tatsächlich bewegt.

Der vorliegende Fortschritt liegt nun in der Erkenntnis, dass derartige stabile Gleichgewichtszustände auch für alle anderen Gebilde, nicht nur die mechanischen bestehen. Hieraus etwa denSchluss zu ziehen, dass daher alle Gebilde mechanischer Natur seien, ist offenbar logisch nicht gerechtfertigt, weil erst bewiesen sein müsste, dass keine anderen Gebilde ausser den mechanischen, diese Eigenschaft haben. So fassen wir den Tatbestand allgemeiner und besser in solchem Sinne auf, dass wir sagen: es handelt sich um eine sehr allgemeine Eigenschaft aller energetischen Gebilde, und es ist dafür gleichgültig, welche Formen der Energie vorliegen.

Was nun das labile und das indifferente Gleichgewicht anlangt, so ist das erstere nur eine theoretische Abstraktion, die in einem wirklichen Gebilde niemals realisiert ist und die daher hier nicht betrachtet zu werden braucht. Bekanntlich definiert man ein labiles Gebilde als ein solches, das zwar nach keiner Seite einen Antrieb hat, sich zu ändern, das einen solchen aber bei der allerkleinsten Änderung seines Zustandes erlangt, und zwar in solcher Weise, dass dieser Antrieb immer stärker wird, je

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weiter das Gebilde sich aus der Ruhelage entfernt Da wir physisch nie ein Gebilde herstellen können, das von jeder Störung absolut frei wäre — mechanische, thermische, elektrische Schwankungen der Umgebung sind nie vollkommen auszuschliessen —, so haben wir es tatsächlich nie mit labilen Gebilden im strengen Sinne zu tun.

Indifferente Gleichgewichte gibt es dagegen in grosser Zahl, und die Eigenschaften des stabilen und des indifferenten Gleichgewichts schliessen sich gegenseitig nicht aus. Indifferent ist nämlich jedes stabile Gleichgewicht gegen solche Änderungen, welche keine Arbeiten der in Betracht kommenden Art bewirken. So ist unsere am Seile hängende Masse indifferent gegen Änderung der Temperatur und des elektrischen Zustandes usw. Man bezeichnet indessen mit dem Namen indifferent vorwiegend solche Gleichgewichte, bei denen

than the rest position still can descend and need. It is evident that the rest or equilibrium position is precisely characterized in that any other, adjacent layer can be obtained from it only by taking up employment, and that, therefore, any other location has the property that the mass of her in the rest position move aims, and if it is mobile, also is actually moving.

This progress is now in the knowledge that such stable equilibrium states exist for all other formations, not only the mechanical. From this about denSchluss to pull that therefore all formations mechanical nature are, clearly is not logically justified, because only would have to be proven that no other entity apart from the mechanical, have this property. So we take the facts and generally better in this sense in that we say: it is a very common feature of all energetic structures, and it is for this matter be which forms of energy.

Now what the unstable and indifferent equilibrium is concerned, as the former is only a theoretical abstraction that is never realized in a real structure and the need to be therefore not considered here. As is known, does one define an unstable structure as one that indeed after neither side has an incentive to change that obtains such but in the tiniest change in his condition, in such a way that this drive is getting stronger, ever

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Next, the structure moves away Since we never physically able to produce an assembly of the rest position, that would be of any interference absolutely free - mechanical, thermal, electrical fluctuations around are never completely ruled out - so we actually never with unstable structures in the strict do sense.

Indifferent equilibria there is contrast in large numbers, and the properties of the stable and the indifferent equilibrium are not mutually exclusive mutually exclusive. Indifferent is namely any stable balance against such changes, which do not cause any work of the type in

Änderungen, die bei ähnlich aussehenden Gebilden Arbeiten bedingen, keine solchen verursachen. Man nennt beispielsweise eine auf einer Ebene ruhende Kugel im indifferenten Gleichgewicht befindlich, weil Ortsbewegungen, die bei anderen schweren Gebilden im allgemeinen Arbeiten bedingen, dies hier nicht tun.

Bei chemischen Gebilden sind derartige indifferente Gleichgewichte nicht selten. Zwei Phasen eines einheitlichen Stoffes, die nebeneinander bestehen können, sind beispielsweise alsdann in einem indifferenten Gleichgewichte in bezug auf ihre relative und absolute Menge. Wenn ich Eis und Wasser bei 0* nebeneinander habe, so kann ich beliebig einen Teil des Eises in Wasser oder einen Teil des Wassers in Eis verwandeln, ohne dass hierdurch das Gleichgewicht gestört wird. Ebenso ist Wasser und Wasserdampf bei 100° und Atmosphärendruck im indifferenten Gleichgewichte. Ich kann das Volumen des Gefässes, in dem beide sich befinden, beliebig vergrössern und verkleinern; sorge ich durch passende Zu- oder Abfuhr von Wärme dafür, dass Temperatur und Druck des Gebildes sich nicht ändern, so bleibt dieses in jedem derartigen Zustande stehen, ohne das Bestreben zu haben, ihn zu verlassen und den früheren wieder zu erreichen.

Schliesse ich dagegen das Gebilde gegen Wärmezu- und -abfuhr ab, so wird es stabil. Denn beim Verkleinern des Volumens erhitzt es sich, und es tritt eine Druckzunahme ein, die sich der weiteren Verkleinerung des Volumen widersetzt. Umgekehrt kühlt es sich bei Volumenvergrösserung ab, und die eintretende Druckverminderung widersetzt sich ebenso einer Fortsetzung dieser Störung. Halte ich umgekehrt das Volumen konstant und führe Wärme zu, so verdampft Flüssigkeit; hierzu wird Wärme verbraucht und auch diese Änderung widersetzt sich dem ausgeübten Zwange der Temperaturerhöhung. Entziehe ich Wärme, so verflüssigt sich Dampf und die freiwerdende Verdainpfungswärme widersetzt sich gleichfalls der drohenden Temperaturerniedrigung.

Durch diese Betrachtungen sind wir nun bereits inmitten unseres Satzes und seiner Anwendungen. Wir sehen wieder: stabiles Gleichgewicht ist

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dadurch gekennzeichnet, dass bei versuchten Störungen solche Reaktionen eintreten, welche die Folgen dieser Störungen abschwächen und das Gebilde wieder in den früheren Zustand zurückzutreiben bestrebt sind. Und wir sehen gleichfalls, dass es sich nicht um eine geheimnisvolle und mit anderen Tatsachen nicht

question. So our hanging on ropes mass is indifferent to change of temperature and electrical condition, etc. This is known, however, with the name indifferent predominantly such equilibria in which no cause changes that require work at similar looking structures such. It's called, for example, located a resting on one level ball in neutral equilibrium because local movements that cause other heavy structures generally work, do not do this here.

When chemical structures such indifferent equilibria are not uncommon. Two phases of a single substance that can exist side by side, for example, then in an indifferent equilibrium with respect to their relative and absolute amount. When I at 0 * next to each other have ice and water, so I can arbitrarily change a part of the ice in the water or a portion of the water into ice, without this balance is disturbed. Likewise, water and steam at 100 ° and atmospheric pressure in indifferent equilibrium. I can arbitrarily zoom in and out the volume of the vessel, in which both are located; I care by matching supply or removal of heat that the temperature and pressure of the structure do not change, so this will be in each such state, without having the desire to leave him and to reach the previous again.

I conclude, however, the structure against heat supply and removal from, so it is stable. Because while reducing the volume it heats up, and it enters a pressure increase, which opposes the further reduction of the volume. Conversely, it cools at increasing the volume decreases and the entering pressure reduction opposes as a continuation of this disorder. I hold conversely the volume constant and lead to heat so liquid evaporates; this heat is consumed and this change opposes the applied constraints of temperature increase. I Defraud heat so liquefies steam and the released Verdainpfungswärme opposes also the threat of lowering the temperature.

Through these considerations, we are now already in the midst of our theorem and its applications. We see again: stable equilibrium is

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characterized in that in trying disorders such reactions occur, which are attenuate the consequences of these disturbances and repel the structure back to the former

zusammenhängende Besonderheit handelt, sondern um die physische Definition des Gleichgewichtes, auf welches sich unser Satz bezieht. Eine der hübschesten Anwendungen des Satzes ist die zur Bestimmung der Löslichkeitslinie. Bekanntlich lösen sich die Stoffe in ihren Lösungsmitteln mit steigender Temperatur bald reichlicher, bald spärlicher auf; der letztere Fall tritt verhältnismässig seltener ein. Es besteht mit anderen Worten zwischen dem Lösungsmittel und dem anderen Stoffe ein Gleichgewicht, das mit der Temperatur veränderlich ist. Betrachten wir es bei einer bestimmten Temperatur und fragen wir uns: was wird geschehen, wenn wir durch Wärmezufuhr die Temperatur erhöhen wollen? Die Antwort ist gemäss unserem Satze: das, was sich der Temperaturerhöhung widersetzt. Erfolgt also die weitere Auflösung des Stoffes in der Flüssigkeit unter Temperaturerniedrigung, so wird eine Mehrauflösung stattfinden. Ist umgekehrt der Umstand vorhanden, dass durch die Auflösung von weiteren Mengen des Stoffes eine Erwärmung stattfinden würde, so wird dieser sich bei Temperaturerhöhung ausscheiden. Bei der experimentellen Prüfung des Satzes trat noch der besonders interessante Fall ein, dass ein Beispiel gefunden wurde, das sich gerade umgekehrt zu verhalten schien, nämlich Kupferchlorid in Wasser. Aus den Untersuchungen von Thomsen ging nämlich hervor, dass sich dieser Stoff unter schwacher Wärmeentwicklung in Wasser löst, und dennoch vermindert er nicht seine Löslichkeit mit steigender Temperatur, sondern vermehrt sie. Dieser anscheinende Widerspruch klärte sich dahin auf, dass die Wärmeentwicklung allerdings stattfindet, wenn man das Salz in vielem reinen Wasser löst. Darum handelt es sich aber nicht, sondern, wie das Prinzip auch ausgesprochen wurde, darum, ob eine weitere Lösung von Salz unter den vorhandenen Bedingungen, nämlich in der bei niederer Temperatur gesättigten Lösung, Wärme verbraucht oder entwickelt. Der Versuch zeigte, dass ersteres der Fall ist, und so verwandelte sich die scheinbare Widerlegung des Prinzipes in eine besonders eindringliche Bestätigung.

Gibt uns somit das Verschiebungsprinzip Auskunft über alle Vorgänge, die mit einer Verschiebung der Gleichgewichtsbedingungen verbunden sind, so gewinnen wir endlich die Gleichgewichtsbedingungen selbst bis auf eine Konstante aus dem Massenwirkungsgesetz. In der Geschichte dieser Frage wurde vorher dargelegt, wie dies Gesetz, dass die Wirkung eines jeden Stoffes seiner Konzentration proportional ist, zunächst von Wenzel für Reaktionsgeschwindigkeiten und von Berthollet für Gleichgewichte vermutungsweise aufgestellt und dann sehr viel später von Guldberg und Waage sowie Julius Thomsen und seinen Nachfolgern expe rimentell bestätigt

state endeavor. And we see also that it is not a mysterious and non-contiguous with other facts peculiarity, but the physical definition of the balance, on which applies to our proposition. One of the prettiest is the set of applications to determine the solubility line. It is known that substances dissolve in their solvents with increasing temperature soon abundant, sometimes sparse on; the latter case occurs relatively less often. There is in other words between the solvent and the other substances a balance that is variable with temperature. Consider it at a certain temperature and we ask ourselves: what will happen if we are to increase by heating the temperature? The answer is based on our proposition: what opposes the increase in temperature. So If the further dissolution of the substance in the liquid under temperature decrease, so a multi-resolution will take place. Conversely, the fact exists that heating would take place by the release of further quantities of the substance, so this will be eliminated when the temperature increases. In experimental testing of the sentence yet entered the most interesting event that an example was found that seemed just the opposite behavior, namely copper chloride in water. From the investigations of Thomsen showed namely that this substance dissolves under low heat in water, and yet it does not diminish its solubility with increasing temperature, but increased it. This apparent contradiction comes to the effect that the development of heat, however, occurs when dissolving the salt in many pure water. That's not involved, but, as the principle has been pronounced, a question of whether a further solution of salt under the existing conditions, namely in the saturated solution at a low temperature, consumes or generates heat. The experiment showed that the former is the case, and so the apparent refutation of the principle transformed into a particularly poignant confirmation.

Thus gives us the displacement principle information about all the processes that are associated with a shift in the equilibrium conditions, we finally win the equilibrium conditions even up to a constant from the law of mass action. In the history of this question was set out in advance how this law that the effect of each substance its concentration is proportional, initially presumed to be established by Wenzel for reaction rates and by Berthollet for equilibria and then much later by Guldberg and Waage and Julius Thomsen and his has followers expe tally confirmed. The application of thermodynamics to chemical equilibria of gases yielded the same law, as first Horstmann and then in more detail and incoming Willard Gibbs proved. By van 't Hoff's discovery that the gas laws

worden ist. Die Anwendung der Thermodynamik auf die chemischen Gleichgewichte an Gasen ergab das gleiche Gesetz, wie zuerst Horstmann und dann ausführlicher und eingehender Willard Gibbs nachwies. Durch van 't Hoffs Entdeckung, dass die Gasgesetze unverändert für gelöste Stoffe und ihren osmotischen Druck gelten, ergab sich eine ausserordentliche Erweiterung des Geltungsbereiches dieses theoretischen Nachweises, denn statt nur für die wenigen Gase war nun das Massenwirkungsgesetz für die zahllosen gelösten Stoffe anwendbar geworden.

Allerdings ergab sich gleichzeitig die Grenze für die Anwendung des Gesetzes. Da die Ableitung auf der Anwendung der Gasgleichung pv = RT beruht, so gilt sie nicht mehr für solche Zustände der Gase oder Lösungen, für welche jene Formel nicht mehr der Ausdruck der messbaren Eigenschaften ist, d. h. das Massenwirkungsgesetz gilt nur für verdünnte Gase und Lösungen, und zwar um so genauer, je verdünnter sie sind; es ist mit anderen Worten ebenso ein Grenzgesetz, wie die Gasformel selbst.

Es liegt nahe, hier an die Theorie von van der Waals und ihre Anwendung auch auf diesen Fall zu denken; jedoch kommen hier grössere Mannigfaltigkeiten in Frage, als bei einfachen Gasen, da mindestens zwei von ihnen nebeneinander vorhanden zu sein pflegen. Die Theorie dieser Zustände ist noch nicht hinreichend entwickelt, um eine sichere und einfache Grundlage für derartige Fragen zu geben.

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Liegt nach dieser Richtung eine Beschränkung vor, so winde nach anderer Seite eine sehr erhebliche Erweiterung des Anwendungsgebietes der eben besprochenen Gesetze erzielt, als es sich herausstellte, dass auch die Ionen sich in bezug auf die Gesetze des osmotischen Druckes und der Massenwirkung genau wie andere Stoffe behandeln lassen. Hierdurch konnte das gesamte Verhalten der Salzlösungen den Gesetzen der chemischen Mechanik unterstellt werden, und es ergaben sich Aufklärungen für zahlreiche Tatsachen, die bis dahin zwar bekannt gewesen waren, die man aber nur als unzusammenhängende Einzelheiten beobachtet und den Annalen der Wissenschaft einverleibt hatte. Neben allgemeinen oder theoretischen Fortschritten wurden bei dieser Gelegenheit auch praktische Ergebnisse erzielt; insbesondere gelang es, eine ausreichende und umfassende Theorie der Reaktionen zu geben, deren man sich nur qualitativen und quantitativen Bestimmung der Stoffe in der analytischen Chemie bedient.

Auch von diesen Fortschritten kann nur eine ungefähre Anschauung an dem einen oder anderen Beispiel gegeben

apply unchanged for solutes and their osmotic pressure, an extraordinary expansion of the scope of this theoretical evidence showed, because instead of just for the few gases the law of mass action for the countless solutes had become applicable.

However, at the same time gave the limit for the application of the law. Since the derivative on the application of the gas equation PV = RT is based, so it no longer applies to such states of gases or solutions for which those formula is no longer the expression of measurable characteristics, ie the law of mass action applies only to dilute gases and solutions, namely the more accurate the more dilute they are; It is, in other words as a limiting law, such as the gas formula itself.

It is tempting here to think about the theory of van der Waals and its application to this case; But here come larger manifolds in question, as in simple gases, since at least two of them next to each other tend to be available. The theory of these states is not yet sufficiently developed to provide a safe and simple basis for such issues.

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Is this direction a restriction against, so winds by the other side, a very substantial extension of the indication of the just mentioned laws achieved, as it turned out that the ion exactly with respect to the laws of osmotic pressure and the mass effect as other substances Seek medical. In this way, could be subordinated to the laws of chemical mechanics the overall behavior of the salt solutions, and there were explanations for numerous facts which were until then indeed been aware that they had only observed as incoherent details and incorporated in the annals of science. In addition to general or theoretical progress and practical results have been achieved on this occasion; in particular to give a sufficient and comprehensive theory of reactions, the use is made only qualitative and quantitative determination of the substances in the analytical chemistry succeeded.

werden, da tatsächlich gegenwärtig fast die ganze anorganische Chemie sich als ein frisches Anwendungsgebiet dieses Teils der chemischen Mechanik, der Ionengleichgewichte oder der elektrochemischen Gleichgewichte darstellt.

Als erstes Beispiel betrachten wir das Problem von der Stärke der Säuren und Basen, welches, wie sich aus der geschichtlichen Darstellung ergab, von Anfang an im Mittelpunkte der hier auftretenden Fragen gestanden hat. Es ist schon erzählt worden, dass Thomsen zuerst den Zustand einer homogenen Lösung ohne Störung des Gleichgewichts mittelst thermochemischer Methoden zu bestimmen lehrte. Er hatte auf solche Weise festgestellt, dass in der Tat verschiedene Stärken der Säuren vorhanden sind, und dass beispielsweise Salzsäure ungefähr doppelt so stark ist wie Schwefelsäure. Dabei entstand natürlich die Frage, ob dies von der Base abhängig ist, um welche die Säuren konkurrieren, und Thomsen hatte eine solche Abhängigkeit aus seinen Versuchen erschlossen. Als indessen ähnliche Versuche nach anderen, schnelleren und teilweise auch genaueren Methoden angestellt wurden, ergab sich, dass diese Abhängigkeit von der Base nur scheinbar und infolge besonderer Komplikationen aufgetreten war, dass aber im übrigen sich die Stärke der Säuren, wie sie sich durch die verschieden starke Beanspruchung einer Base bei gleichzeitiger Einwirkung zweier Säuren herausstellt, eine spezifische Eigenschaft der Säuren und von der Base unabhängig ist.

Weiterhin stellte sich heraus, dass noch eine grosse Anzahl anderer Arten, wie die Säuren ihre sauren Eigenschaften betätigen, durch die gleichen Zahlen gekennzeichnet werden. Es war mit einem Worte möglich, für die Stärke der Säuren ähnliche Konstanten aufzustellen, wie für ihr Äquivalentgewicht, und die gegenseitige Verwandtschaft zwischen Säure und Base konnte durch das Produkt ihrer beiderseitigen Stärken ähnlich ausgedrückt werden, wie das Äquivalentgewicht der Salze durch die Summe der Äquivalentgewichte von Säure und Base.

Dies war der Stand der Sache, als Arrhenius seine ersten Veröffentlichungen begann, die ihn später zur Aufstellung der Ionentheorie führen sollten. In diesen früheren Arbeiten hatte er wesentliche Bestandteile jener Theorie bereits vorausgenommen und so unter anderen geschlossen, dass die Stärke der Säuren und Basen ihrer elektrischen Leitfähigkeit proportional sein müsse.

So gering war damals (um 1885) die Kenntnis dieser letzteren Eigenschaft, dass Arrhenius kaum ein halbes Dutzend Säuren aus der Literatur sammeln konnte, für

Also of these advances may be approximate intuition on the one or other example given, because in fact present nearly the whole inorganic chemistry presents itself as a fresh application of this part of the chemical mechanism, the ion equilibrium or of electrochemical equilibria.

As a first example we consider the problem of the strength of acids and bases, which as resulted from the historical view has been from the very beginning at the center of the questions raised here. It has already been told that Thomsen first taught the state of a homogeneous solution without disturbing the equilibrium to determine by means of thermochemical methods. He had found in such a way that different strengths of acids exist in fact, and that, for example, hydrochloric acid is about twice as strong as sulfuric acid. Of course, the question arose whether this is dependent on the base to which compete the acids, and Thomsen had developed such a dependence from his experiments. When, however, similar attempts by other, faster and sometimes more accurate methods were employed, it was found that this dependence had occurred from the base only apparent and due to special complications, but that otherwise the strength of the acids, as they differ by the heavy use of a base at the simultaneous action of two acids turns out, a specific characteristic of acids and is independent of the base.

Furthermore, it turned out that there is still a large number of other species, such as the acids activate their acidic properties, are characterized by the same numbers. It was possible in a word, to set up similar constants for the strength of the acids such as for their equivalent weight, and the mutual relationship between acid and base could be similarly expressed by the product of their mutual strengths, such as the equivalent weight of the salts by the sum of the equivalent weights of acid and base.

This was the state of affairs, as Arrhenius his first publications began that would lead him later to set up the ionic theory. In these earlier works he had essential components of the theory already anticipated and so closed, among others, that the strength of acids and bases must be their electrical conductivity proportionally.

So low was at that time (around 1885), the knowledge of this latter property that Arrhenius could hardly collect half a dozen acids from the literature, for which both sizes, the

welche beide Grössen, die Stärke und die Leitfähigkeit festgestellt waren. Bei diesen stimmte jene Voraussage wenigstens der Reihenfolge und Grössenordnung nach. Indessen blieb es nicht lange so. Von anderer Seite war man gleichfalls auf den Parallelismus zwischen beiden Grössen aufmerksam geworden, und bald konnten über dreissig Fälle vorgelegt werden, aus denen hervorging, dass jene allgemeine Eigenschaft der Säuren, die ihre „Stärke" genannt wurde, in der Tat der elektrischen Leitfähigkeit so genau proportional ist, als man nur erwarten konnte.

Hier aber entstand eine neue Schwierigkeit. Die Leitfähigkeit der Säuren in der früher (S. 181) gegebenen Definition ist keine bestimmte Grösse, sondern ändert sich mit der Verdünnung. Diese Änderung ist nicht die gleiche für alle Säuren; die starken (oder gutleitenden, was im Sinne des eben dargelegten Parallelismus das gleiche ist) behalten ihre Stärke und Leitfähigkeit fast unabhängig von der Verdünnung bei; die schwachen aber vermehren sie bedeutend. Hierbei stellte sich heraus, dass diese Vermehrung in allen Fällen nach dem gleichen Gesetz erfolgt, indem der Verdünnungseinfluss für alle Säuren durch eine einzige Kurve in den Koordinaten Leitfähigkeit und Verdünnung darstellbar ist; nur muss die Einheit der Verdünnung für jede Säure besonders gewählt werden. Stellt man mit anderen Worten zwei Säuren so ein, dass sie gleiche Leitfähigkeit zeigen (wofür ihre Verdünnungen entsprechend verschieden zu wählen sind), so bleibt diese Gleichheit bestehen, wenn man beide Säuren in gleichem Verhältnis weiter verdünnt oder konzentriert. Eine besondere Versuchsreihe zeigte dann weiter, dass diese Gesetze nicht nur für die Leitfähigkeit der Säuren bestehen, sondern allgemein für ihre „Stärke" in dem oben angegebenen Sinne. Dies musste auch erwartet werden, aus den gleichen Gründen, wie aus dem Volumengesetz von GayLussac die Geltung der allgemeinen Gasgleichung vorausgenommen werden konnte (S. 75).

Für alle diese Gesetzmässigkeiten fand sich nun auf einmal eine Erklärung, als Arrhenius 1887 seine Theorie der elektrolytischen Dissoziation (S. 185) veröffentlichte. Betrachtet man die Ionen als selbständige Stoffe, so kann man nach den Gesetzen der chemischen Massenwirkung das chemische Gleichgewicht zwischen den Ionen und dem nichtzerfallenen Teil einer Säure in eine Formel fassen. Diese Formel zeigt nun alle die Eigenschaften, welche erfahrungsmässig über den Einfluss der Verdünnung auf die Leitfähigkeit und Stärke einer einzelnen Säure, sowie über die gegenseitigen Beziehungen verschiedener Säuren gefunden worden waren. Dass alle Säuren in bestimmter Beziehung gemeinsame Eigenschaften haben, z. B. sauer schmecken und Lackmus röten, ergab sich als die Eigenschaft ihres

strength and conductivity were determined. These those predicting voted at least according to the order and magnitude. However, it did not stay for long. From other side, you had also become aware of the parallelism between two sizes, and soon were more than thirty cases are presented, which showed that those general property of acids, called their "strength", in fact, the electrical conductivity so is exactly proportional, as you could possibly expect.

But here was a new difficulty. The conductivity of the acids in the earlier (p.181) definition given is not a specific size, but varies according to the dilution. This change is not the same for all acids; the strong (or highly conductive, which is the same in the sense of parallelism just given) retain their strength and conductivity at almost independent of the dilution; the weak but they increase significantly. Here it turned out that this increase takes place in all cases, according to the same law, by the dilution effect can be displayed for all acids by a single curve in the coordinates conductivity and dilution; only needs to be especially chosen the unity of dilution for each acid. If, in other words two acids so that they show the same conductivity (how their dilutions are correspondingly different to choose), so this equality remains when it is diluted further both acids in the same proportion or concentrated. A special series of experiments showed then that these laws are made not only for the conductivity of acids, but in general for their "strength" in the sense indicated above. This had to be expected, for the same reasons as the from the volume Act GayLussac could be anticipated validity of the ideal gas law (S. 75).

For all of these laws are now found at once an explanation, as Arrhenius in 1887 published his theory of electrolytic dissociation (p 185). Considering the ion as separate substances, so you can according to the laws of chemical mass action grasp the chemical equilibrium between the ions and the nichtzerfallenen part of an acid in a formula. This formula now displays all the properties, which had been experientially found on the impact of dilution on the conductivity and strength of a single acid, as well as the mutual relations of different acids. . The fact that all acids in certain relationships have common characteristics, such as taste sour and redden litmus, resulted as the their common component, the hydrogen ion property; the different degree to which different and various dilute acids actuate these common characteristics, or their strength was easy to define to reflect their content

gemeinsamen Bestandteils, des Wasserstoffions; der verschiedene Grad, in welchem verschiedene und verschieden verdünnte Säuren diese gemeinsamen Eigenschaften betätigen, oder ihre Stärke liess sich einfach als ihrem Gehalt an freiem Wasserstoffion entsprechend definieren. Kurz, es hat selten in der Geschichte der Wissenschaft einen Fall gegeben, in welchem Erfahrung und Theorie, nachdem sie unabhängig voneinander entstanden waren, so gut und genau zusammenstimmten, wie es sich hier zeigte.

Solche Ergebnisse waren denn auch geeignet, den Ungläubigsten zu überzeugen und die Anzahl der Chemiker, die sich entschlossen, in diesen Forschungen nicht blosse „theoretische" Gedankenspiele, sondern wirkliche, und dazu recht erhebliche erfahrungsmässige Beiträge zur Wissenschaft zu sehen, vermehrte sich schnell. Allerdings waren es zunächst ganz ausschliesslich junge Männer, die sich der seit 1887, dem gemeinsamen Geburtsjahre der Theorien von van 't Hoff und Arrhenius, der neuen Bewegung anschlossen. Wenn es ihnen auch

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nicht so schlimm ging, wie seinerzeit Harvey, dem Entdecker des Blutkreislaufes, der infolge seiner Entdeckung und des gegen ihn betätigten aktiven Widerspruches seiner Kollegen seine blühende Praxis als Arzt verlor und keinen Fachgenossen, der älter war als vierzig Jahre, zu seinen Anschauungen zu bekehren vermochte, so waren es doch einige Jahre hindurch ziemlich heftige Kämpfe, welche geführt werden mussten, um für die neuen Arbeiten überhaupt nur ernsthafte Beachtung zu gewinnen. Aber unsere schnellere Zeit zeigt hierin neben ihren Fehler n auch neue Vorzüge: es ist nicht mehr nötig, dass ein grosser Entdecker verkannt stirbt, damit hernach die Bedeutung seiner Forschungen ans Licht kommt. Zwar ist auch noch heute für wesentliche Fortschritte, namentlich wenn es sich nicht um die Entdeckung neuer und auffallender Tatsachen, sondern um grundsätzliche Aufklärung alter und scheinbar wohlbekannter handelt, eine gewisse Latenz- und Karenzzeit üblich, und ich habe beinahe zu jedem derartigen Geschenk an die Menschheit in meiner Geschichtserzählung bemerken müssen, dass es zunächst bei den unmittelbar Beteiligten ganz unbeachtet blieb, aber diese Zeit ist doch im allgemeinen sehr viel kürzer geworden als früher und wir sind meist in der glücklichen Lage, unseren geistigen Führern, wenn wir ihres hohen Amtes endlich inne geworden sind, noch bei Lebzeiten unseren Dank für die erwiesene Förderung aussprechen zu können.

Es war keineswegs ausschliesslich nur das Problem von der Affinität der Säuren, das auf solche Weise gelöst, d. h.

of free hydrogen. In short, there has rarely been a case in the history of science, in which experience and theory, after they had emerged independently, as good and precise voted together, as it was here.

Such results were as well suited to convince the most skeptical and the number of chemists who decided to look into these researches not merely "theoretical" mind games, but real, and to legally relevant experiential contributions to science, increased rapidly. However, were there initially quite exclusively young men who joined the since 1887, the common birth years of the theories of van't Hoff and Arrhenius, the new movement. If they also

(249 - 251)

not so bad went, as his time Harvey, discoverer of blood circulation, who lost as a result of his discovery and the actuated against him active contradiction of his colleagues his thriving practice as a doctor and no colleagues, who was older than forty years, was able to convert them to his views , so there were still quite a few years through fierce fighting, which had to be performed in order to win at all, only serious consideration for new work. But our rapid time shows herein beside her errors n new advantages: it is no longer necessary that a great discoverer dies misunderstood, so afterwards the importance of his research comes to light. Although a certain latency and waiting period is even today for significant progress, especially when it is not old and apparently well-known to the discovery of new and striking facts, but rather fundamental enlightenment, common, and I have almost to any such gift to the mankind have noticed in my narrative, that it initially remained quite unnoticed among those directly involved, but that time is but generally very become much shorter than before and we are mostly in the fortunate position of our spiritual leaders, when we their high office finally have become inherent to can still express our gratitude for the proven promotion in his lifetime.

der Berechnung auf Grundlage einiger Konstanten zugänglich gemacht wurde, sondern das ganze Problem der Gleichgewichte bei Salzen. Ebenso wie sich für die Stärke der Säuren als allgemeine Definition die Konzentration an freiem Wasserstoffion ergab, so gilt die entsprechende, auf Hydroxylion bezogene Definition für Basen. Bei Salzen endlich, wo der Dissoziationsgrad ziemlich übereinstimmend ist, tritt die Löslichkeit, deren Bedeutung bereits Berthollet eingesehen hatte, als massgebender Faktor in den Vordergrund.

It was not exclusively the problem of the affinity of the acids, the resolved in such a way that the calculation based on some constants was made available, but the whole problem of equilibria in salts. Just as a general definition resulted in the concentration of free hydrogen for the strength of the acids, the corresponding, related to hydroxyl Definition of bases considered. When salts finally, where the degree of dissociation is quite consistent, takes the solubility, their meaning had already seen Berthollet, as a leading factor in the foreground.

Man muss natürlich fragen, ob es nicht ebenso einen Übergang von den Salzen zu allen chemischen Verbindungen im allgemeinen gibt, wie ein solcher bezüglich der Verbindungsgewichte (S. 53) sich herausgestellt hatte. In der Tat ist es möglich, die Gleichgewichtsbedingungen formal für alle beliebigen chemischen Gebilde aufzustellen. Aber während für den verdünnten Zustand der Stoffe die Massenwirkungsfunktion, von welcher das Gleichgewicht abhängt, einfach der Konzentration proportional gesetzt werden kann, so fehlt eine Kenntnis dieser Funktion bei dichten Gebilden, wie konzentrierten Lösungen oder Gemischen reiner Stoffe ohne alles Lösungsmittel. Hier sind wir vorläufig noch auf empirische Beziehungen angewiesen, die uns nur eine verhältnismässig rohe Skizze der Verhältnisse zu entwerfen gestatten. Hier ist Raum vorhanden, zunächst für geduldige Forschung, die uns mit dem erforderlichen Material versieht, sodann aber wohl auch künftig für grosse Entdeckungen, die uns gestattet, zahlreiche Einzelheiten zusammenzufassen und sie als Sonderfälle allgemeiner Gesetze erscheinen zu lassen. Überlegen wir, dass die systematische Untersuchung der chemischen Gleichgewichte nur von wenigen Händen und seit kurzer Zeit ausgeführt wird und die wissenschaftliche Massenarbeit, wie sie z. B. in der organischen Chemie besteht, hier noch gar nicht einmal organisiert ist, so erkennen wir, dass die nahe Zukunft uns noch sehr erhebliche Überraschungen bringen mag.

Of course you have to ask if it is not well is a transition from the salts to all chemical compounds in general as such with respect to the connection weights (53) had been found. In fact, it is possible to establish the equilibrium conditions for all formally any chemical entity. But while the state of diluted substances which mass action function of which depends on the balance, just the concentration can be put in proportion, so lacking a knowledge of this function in dense structures, such as concentrated solutions or mixtures of pure substances without any solvent. Here we are for the time being dependent on empirical relationships that allow us to design only a relatively rough sketch of the situation. Here space is available, initially for patient research that provides us with the necessary material, but then to leave well in the future for big discoveries that allowed us to summarize many details and they appear as special cases of general laws. Let us consider that the systematic study of chemical equilibria is performed by only a few hands, and for a short time and the scientific ground work, as it exists z. B. in organic chemistry, is still not even organized here, so we realize that the near future may bring very significant surprises us.

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θΔics

In chemistry, **affinity of reaction** *A* is the negative partial derivative of Gibbs free energy with respect to extent of reaction ξ at constant pressure and temperature. [1] This is shown below:

$$A = -\left|\frac{\partial G}{\partial \xi}\right|_{P,T}$$

The *affinity of reaction* is positive for spontaneous reactions and negative for non-spontaneous reactions: [2]

- A > 0 the reaction proceeds to the right
- A < 0 the reaction proceeds to the left

The above derivation stems from the 1922 work of Belgian mathematical physicist Théophile de Donder and is built on the "chemical potential" theories of American engineering thermodynamicist Willard Gibbs and the "free energy" logic of German physician and physicist Hermann von Helmholtz and others, formulating a relation between chemical affinity *A* and Gibbs free energy *G*. De Donder showed that if we consider a mixture of chemical species, e.g. a system of reactive humans, with the possibility of chemical reaction, the measure of affinity felt between the reacting species is equal to the negative of the Gibbs free energy of formation Δ*G* for the reaction: [3]

$$A = -\Delta G$$

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θΔics

In chemistry, **affinity reactions** were verbal or diagrammatic representations of attachment rearrangements between chemical species based on affinity preferences. Affinity reactions were prototypes for the modern "chemical reactions". The stimulation or origin of verbal descriptions of affinity reactions and their diagrams stems from Query 31 of English physicist Isaac Newton's 1718 edition of his *Opticks*, in which he verbally describes various gradients of "affinity" relationships between alchemical species. This statement later served the basis for the design of "affinity tables" and later the first affinity reactions diagrams made in the 1757 lectures of Scottish physician and chemist William Cullen. [1] Affinity reactions went by various names such as single elective affinity or double elective affinity, etc.

Newton

The origin of affinity reactions, and hence the transition from alchemy to chemistry, arose in the works and theories of English physicist Isaac Newton. This is evidenced in his 1678/79 letter to Irish chemist Robert Boyle, which was preoccupied with the phenomenon of elective affinity among chemicals; he states, for example: [4]

> "There is a certain secret principle in nature by which liquors are sociable to some things and unsociable to others. Thus water will not mix with oil but readily with spirit of wine or with salts."

Newton elaborates on this further:

> "Just as water **'elects'** to mix with ethyl alcohol or with salts, so it **'chooses'** not to mix with oil, Similarly, water will sink into wood while quicksilver will not, but quicksilver will penetrate and amalgamate with metals, which water will not. Likewise aqua fortis (nitric acid) will dissolve silver and not gold, while aqua regis (mixed nitric and hydrochloric acid) will dissolve gold and not silver. Nonetheless these rules are not written in stone: 'but a liquor which is of itself unsociable to a body may by a mixture of a convenient mediator be made sociable. So molten lead which alone will not mix with copper or with Regulus of Mars, by the addition of tin is made to mix with either."

Newton goes on, in his writing of this period, to speak about how "particles of spirits floating in the water, will strike on metal, and will by their sociableness enter into its pores, and gather around the outside of its particles." The finalized version of Netwon's search, research, and experiments for this "secret principle", however, was presented some three decades later, following his successes in gravitational theory and optics and light, specifically in his famous appended Query 31 of the 1718 edition of his *Opticks*.

> "Is it not for want of an attractive virtue between the parts of water ( ) and oil, of quick-silver ( )(Hg) and antimony ( )(Sb), of lead ( )(Pb) and iron (♂)(Fe), that these substances do not mix; and by a weak attraction, that quick-silver ( )(Hg) and copper (♀)(Cu) mix difficultly; and from a strong one, that quicksilver ( )(Hg) and tin ( )(Sn), antimony ( )(Sb) and iron (♂)(Fe), water ( ) and salts, mix readily?"
>
> — Isaac Newton (1718), "**Query 31**" of *Optics*

That year, French chemist Étienne Geoffroy, while doing a translation into French of Newton's *Opticks*, famously took these "verbal descriptions" of affinity reaction preferences and powers of combination and decombination, as found in Query 31, and made the world's first "affinity table" (see: Geoffroy's affinity table), a tabulated listing of reaction bonding powers, so to speak, the first of many to follow over the next century.

Single elective affinity reaction

The basic example is the "single elective affinity" reaction. In 1718, during a translation into French of Newton's *Opticks*, French physician and chemist Étienne Geoffroy made the world's first "affinity table" a sixteen-column, eight-

row table, containing twenty-four reacting species, showing specifically what affinity reactions would occur between various combinations of reactants. Geoffroy's law of affinity was that:

> "Whenever two substances are united that have a disposition to combine and a third is added that has a greater affinity with one of them, these two will unite, and drive out the other."

To expound on this law, using data from the 1718 edition of Newton's *Opticks* (query 31), Geoffroy made a sixteen-column, eight-row, affinity containing twenty-four reacting species, showing specifically what affinity reactions would occur between various combinations of reactants.

Cullen diagrams

In 1757, using Geoffroy's table, Scottish physician and chemist William Cullen utilized bonding *brackets* "{" and affinity preference *darts* "→" to pictorially discuss affinity preferences. Shown below, for instance, using Geoffroy's first law, if chemical species *A* and *B* are attached in a weakly bonded chemical union, signified by the bonding bracket "{", ordered such that if species *C* were introduced into the system, the greater affinity preference of *A* for *C* would cause *A* to displace *B* and to thus form a new union with *C*:

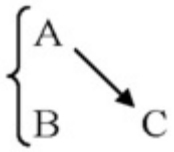

This equates to the following in modern terms:

$$AB + C \rightarrow AC + B$$

Soon other chemist began to use Cullen's diagrams in publication. In 1775, Swedish chemist Torbern Bergman, in his textbook *A Dissertation on Elective Attractions*, made sixty-four affinity reaction diagrams. [2] In 1809, using Bergman's textbook and diagrams, of single and double elective affinity reactions, as a basis of universal chemical logic, German polymath Johann Goethe published his famed book *Elective Affinities*, the founding book of the science of human chemistry, in which he presented the view that people react according to the laws of affinity, just as do smaller chemical species. [3]

See also

- Affinity of reaction
- Elective affinity
- Chemical affinity
- Human elective affinity

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θΔics

In chemistry, an **affinity table**, or "table of affinities", is an arrangement of chemical species ordered such that the species at the head of each column (header species) has a chemical attraction, and ability to combine via chemical reaction, with each species listed directly below (reactant species), with each potential reactant listed in order of decreasing force of affinity to the header species, enabling the chemist to predict the course of react.

A framed copy of French physician and chemist Étienne Geoffroy's 1718 **affinity table**, entitled: Table of Affinities Between Different Substances (Inter Differentes Substantias); captioned: Not invented, or thought involved, but to be seen what the nature of the issue, or does (Non Fingendum Aut Exogit Andum, Sed Videndum Quid Natura Ferat; Aut Faciat), at Museo Galieo, Florence, Italy. [7]

Pre-history

The affinity table was the spark of the chemical revolution. The beginnings of the chemical revolution centered around the revival of Leucippus' atomic theory through the works Rene Descartes (1637), French mathematician Pierre Gassendi (1649), English chemist Robert Boyle (1661), and English physicist Isaac Newton (1686). In this revival, the concept of the 'molecule', from French word *molécule*, originating from the Modern Latin *molecula*, a diminutive of Latin word moles or 'mass', was born, generally defined as a small unit of mass or structure comprised of two or more atoms. [3]

Unique among this group was Newton, who conceived of molecules as being structures of atoms attached together by a chemical force of affinity. He outlined his atomic chemical force affinity bonding theory in the 'Queries' section to his *Opticks* (the last and final "Query 31", to be precise). To cite the core example of Newton's description of a gradient of affinity reactions, he states: [4]

> "Is it not for want of an attractive virtue between the parts of water ( ) and oil, of quick-silver ( )(Hg) and antimony ( ) (Sb), of lead ( )(Pb) and iron (♂)(Fe), that these substances do not mix; and by a weak attraction, that quick-silver ( ) (Hg) and copper (♀)(Cu) mix difficultly; and from a strong one, that quicksilver ( )(Hg) and tin ( )(Sn), antimony ( ) (Sb) and iron (♂)(Fe), water ( ) and salts, mix readily?"

In 1718, during a translation into French of Newton's *Opticks*, French physician and chemist Étienne Geoffroy used Newton's descriptions of affinity tendencies or reactions, such as above, to construct the world's first affinity table, as shown below (and adjacent), titled "Table of Affinities: Between Different Substances", with the caption:

> "Not invented, or thought involved, but to be seen as what the nature of the issue is, or does."

The table containing twenty-four reacting species, detailing specifically what affinity reactions would occur between various combinations of reactants. This table might be readily defined as the pinnacle example of chemical determinism (see also: determinism), an issue at the center of discussion in German polymath Johann Goethe's extrapolation of this logic to human affairs (below). In any event, Geoffroy's table would go on to seed or rather, as some have argued, "launch", what would become the chemical revolution. [5]

Geoffroy's affinity table | 1718

See main: Geoffroy's affinity table

The original "affinity table" was the 1718 *Table Concerning the Different Affinities Observed in Chemistry between Different Substances* (*Tableau des différentes Rapports Observées entre Différentes Substances*), sometimes translated as "Table of the Different Relations Observed between Different Substances", a 16-column (9-row) affinity table made by French physician-chemist Étienne Geoffroy, which ordered chemical species according to the following rule, often categorized as Geoffroy's first law of affinity:

> "Whenever two substances are united that have a disposition to combine and a third is added that has a greater affinity with

one of them, these two will unite, and drive out the other.”

This is the prime example of the "laws of affinity", a methodology that traces back to Plato's notion of "likes attract; opposites repel", and before that to Empedocles' chemical aphorisms. Based on his so-called first law, as derived from Newton's Query 31, Geoffroy made the following affinity table:

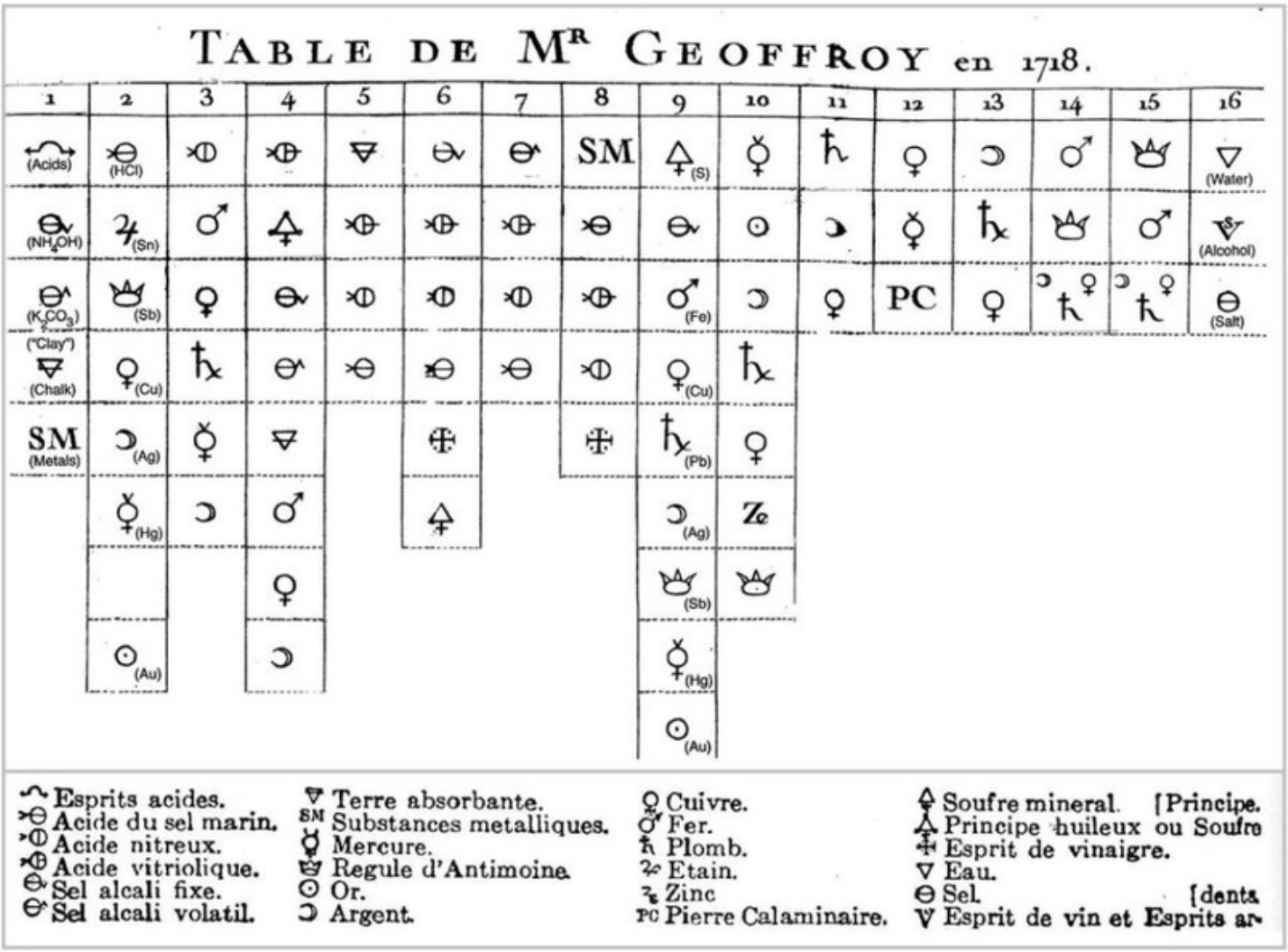

In Geoffroy’s table, to elaborate, at the head of each column is a header species with which all species below can combine or have a rapport with. The latter are so placed such that any higher species replaces all others lower in the column from their compounds with that at the head of the table. In other words, the species at the head of the table can potentially react with any species below it. All the species below the header species are ranked by chemical affinity preferences relative to the top species, with a higher rank corresponding to a higher affinity tendency. The species at the bottom of each column, for instance, have the least amount of affinity for the header species. If the bottom species is in a weakly bonded relationship with the header species, any species above it can potentially displace it from its attached partner. [2]

This table led to the development of the science of affinity chemistry and to the various laws of affinity; numbering up to ten, depending on which chemist was sourced. The best known is Plato’s ‘like attracts to like’ affinity law, e.g. water-to-water or fire-to-fire, etc.

Grosse's affinity table | 1730

In 1730, German chemist Jean Grosse (someone whom Geoffroy had inducted into the Academy in 1731), made a revised table of 19-columns (16-rows) for the use of his students: [5]

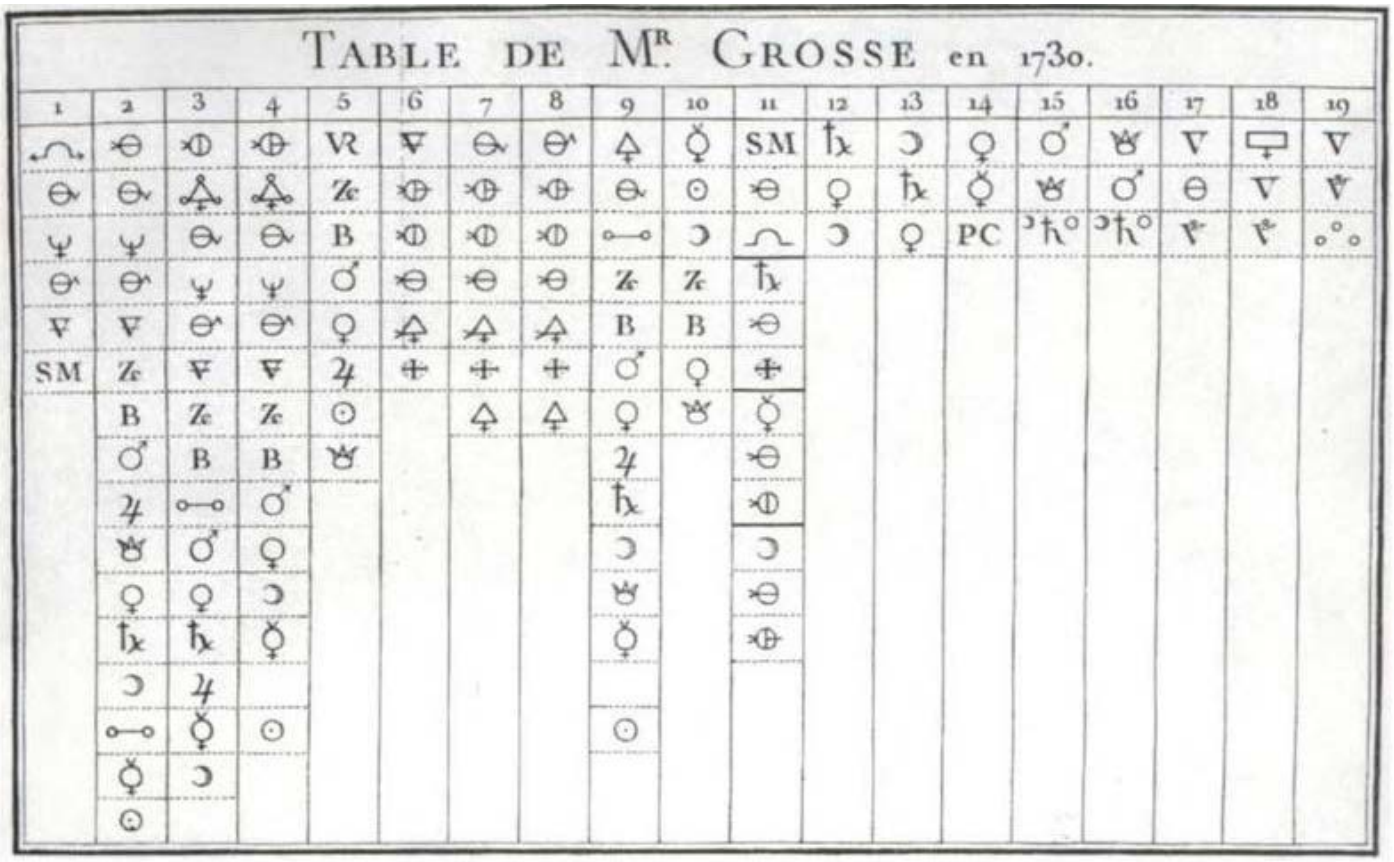

Macquer's *Elements of Chemistry* | 1749

In 1749, French chemist Pierre Macquer, published his *Elements of the Theory of Chemistry* (*Elemens de Chymie Theorique*), in which he began to incorporate affinity table logic into his outlines of general chemistry. The following diagram, from the 1753 second edition, is the famous illustration of three putti, in a chemistry laboratory, studying Geoffroy's affinity table: [5]

Gellert's affinity table | 1750

In 1750, German metallurgical chemist Christlieb Ehregott Gellert (1713-1795), who had begun to associate with the German chemists in 1744, produced a 28-column (17-row) affinity table: [5]

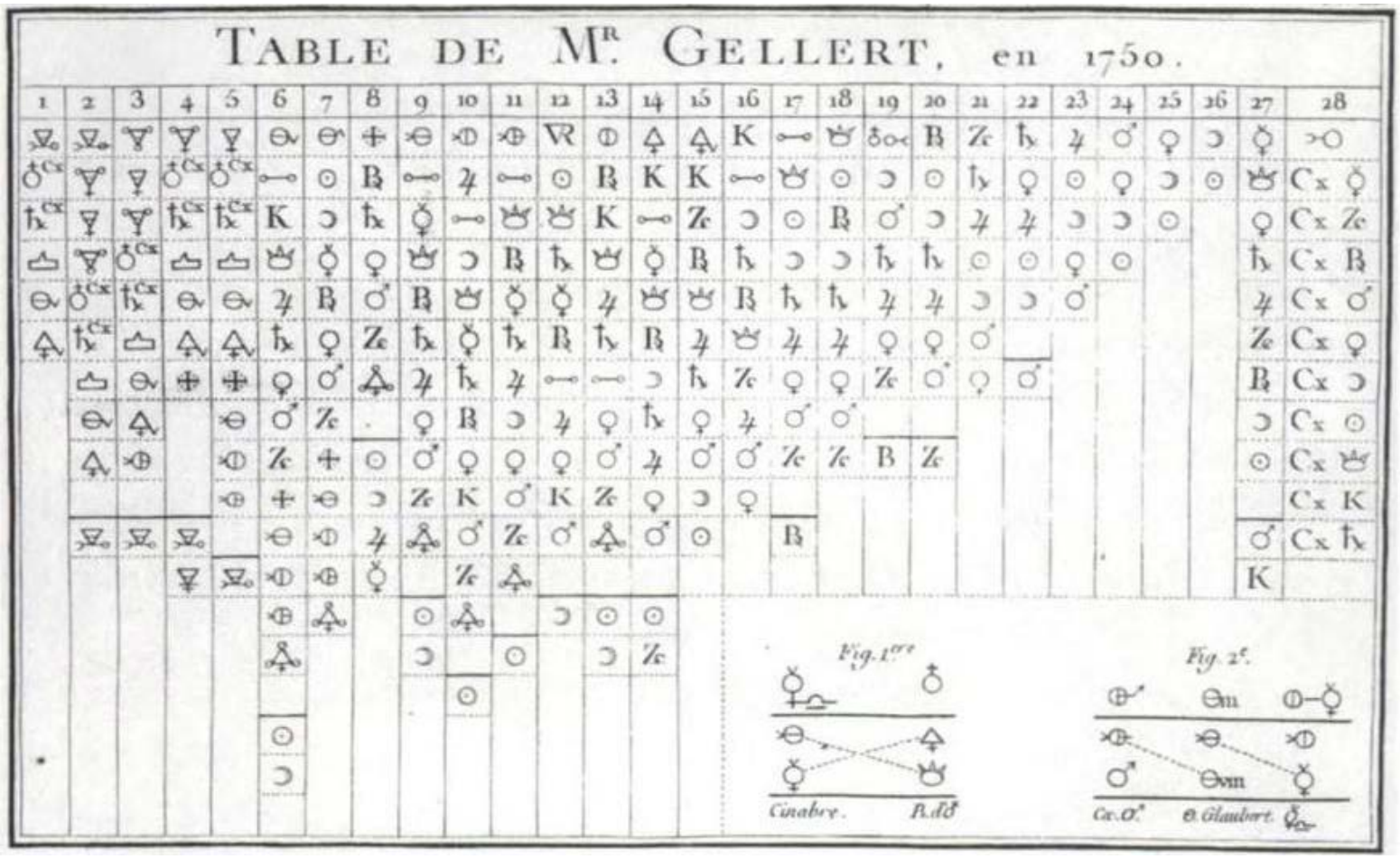

In figures one and two, in the lower right hand corner of Gellert's table, we begin to see the preliminary notion of the chemical reaction diagram, the dotted line indicative of the force of chemical affinity.

Rudiger's affinity table | 1756

In 1756, Mr. Rudiger produced a 15-column (9-row) affinity table: [5]

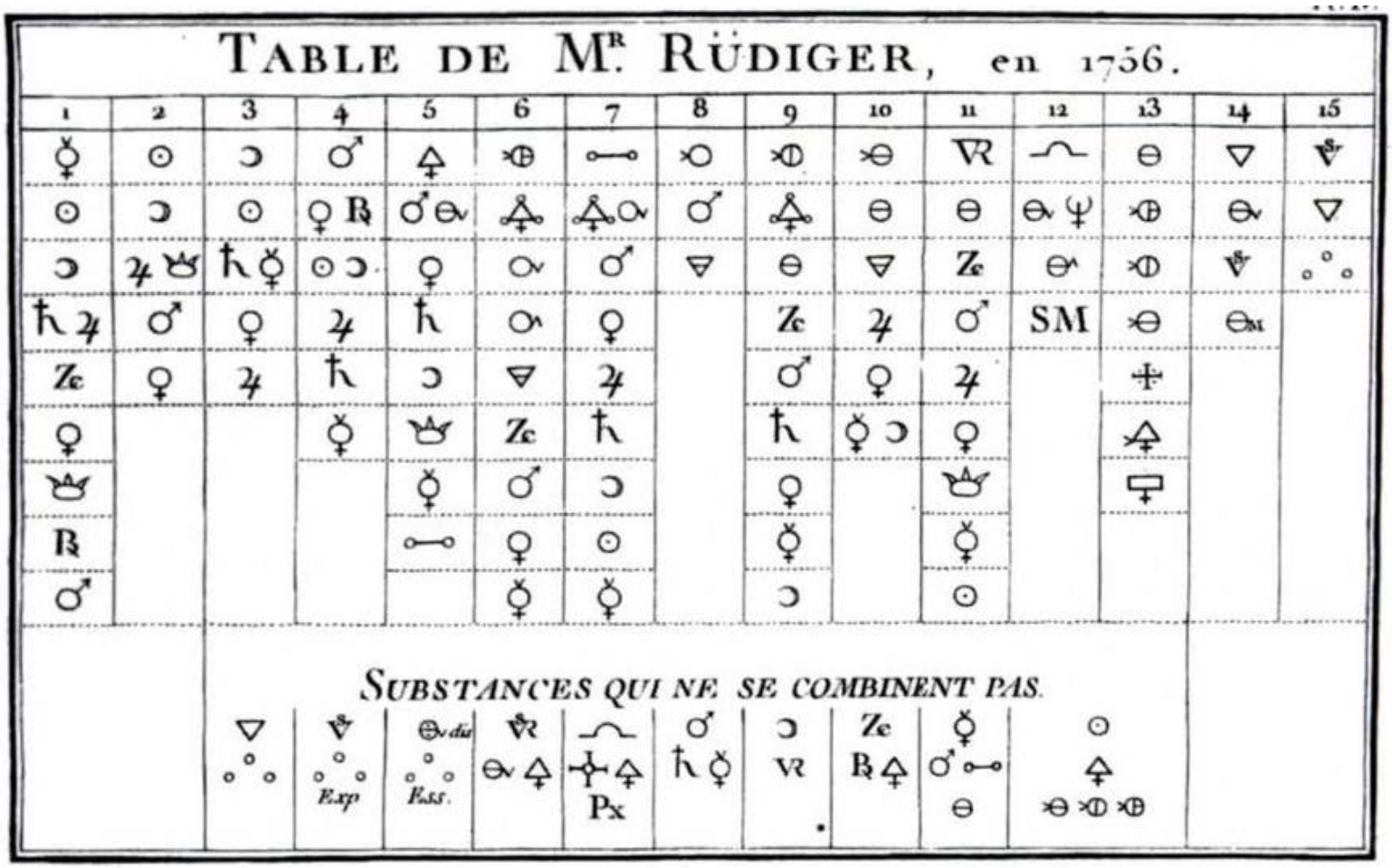

Cullen's reactions diagrams | 1756

See main: Cullen reaction diagrams

In the midst of the the science of "affinity chemistry", anchored in the construct of chemical reactions governed by "affinity tables", the origin of the concept of the 'chemical reaction' was born, in specific regards to chemical notation and diagram, in the sense of "reactants" (initial state) transforming to "products" (final state). This idea stems from these affinity tables through the work of Scottish physician and chemist William Cullen. [2] Specifically, in 1756, in lecture, Cullen utilized Geoffroy's affinity table wherein he pioneered the use of chemical reaction diagrams by using reaction arrows '→', to represent the affinity preference or force, and bonding brackets '{', to represent the chemical bond, to show the mechanistic steps in each elective affinity reaction. [6] In modern notation, although Cullen didn't use letters to represent chemical species (something latter done by Torbern Bergman), Cullen introduced the following notational representation for chemical reactions:

18th century

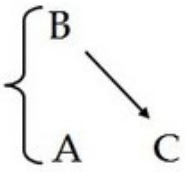

Bergman-Cullen reaction

Modern

$$AB + C \rightarrow BC + A$$

In this diagram (left), a system originally containing the chemical "AB" is put into contact with reactant "C", whereby virtue of the fact that B has a stronger force of "affinity" for that of C over that of it's bonded partner "A", it will, owing to these new chemical arrangements, displace or rather detach from A and form a new bonded union with C, in the form of "BC", leaving A to go off on its own (typically as a gas). This lecture method was passed along to Cullen's famous student Joseph Black, who expanded on this notation

use.

Limbourg's affinity table

In 1758, the Academy of Rouen offered a prize competition on the following topic: "Determine the affinities that are found between the principals and mixts as M. Geoffroy did, and find a physico-mechanical system of these affinities. The idea of the prize was for someone to unite the physical and the chemical sides of the affinity issue (hence the birth of the science of physical chemistry, as James Partington categorizes things). [5] Not finding an essay that addressed both aspects, the prize was awarded (divided between) to physician Jean Philippe de Limbourg (a former doctor of medicne from Liege and former student of Herman Boerhaave, Musschenbroek, and Rouelle), and Swiss mathematical physicist Georges Le Sage. Le Sage supplied a mathematical exposition of affinity in line with the concept of gravity; Limbourg produced the following extended 33-column affinity table: [5]

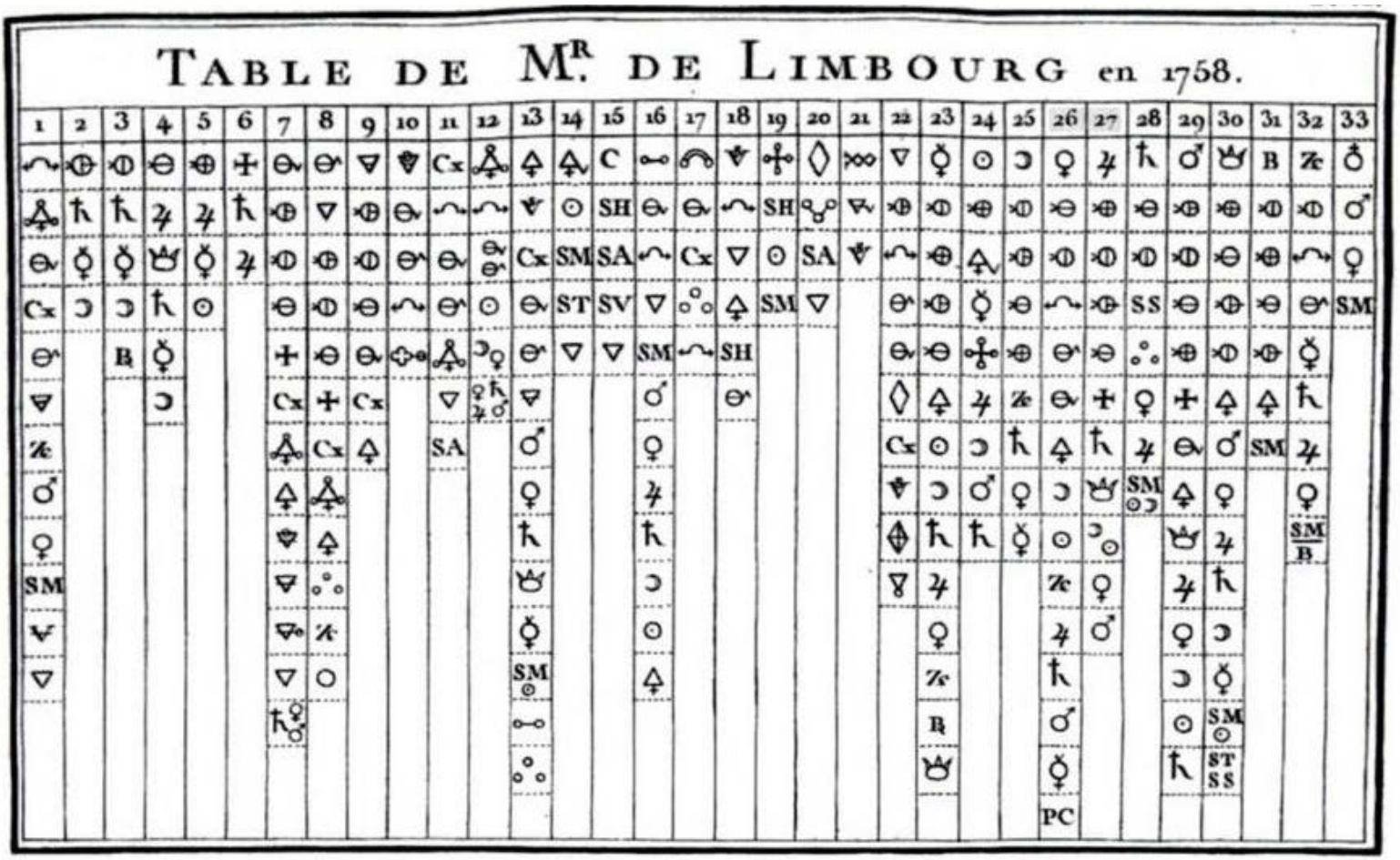

Marherr's affinity table

In 1762, a Mr. Marherr produced a 120-column (3-row) affinity table. [5]

Rouelle's affinity table | 1763

In 1763, French chemist Guillaume-Francois Rouelle (1703-1770), former teacher of Denis Diderot during the years 1754-1757, produced the following affinity table as found predominately in Diderot's *Encyclopedia*:

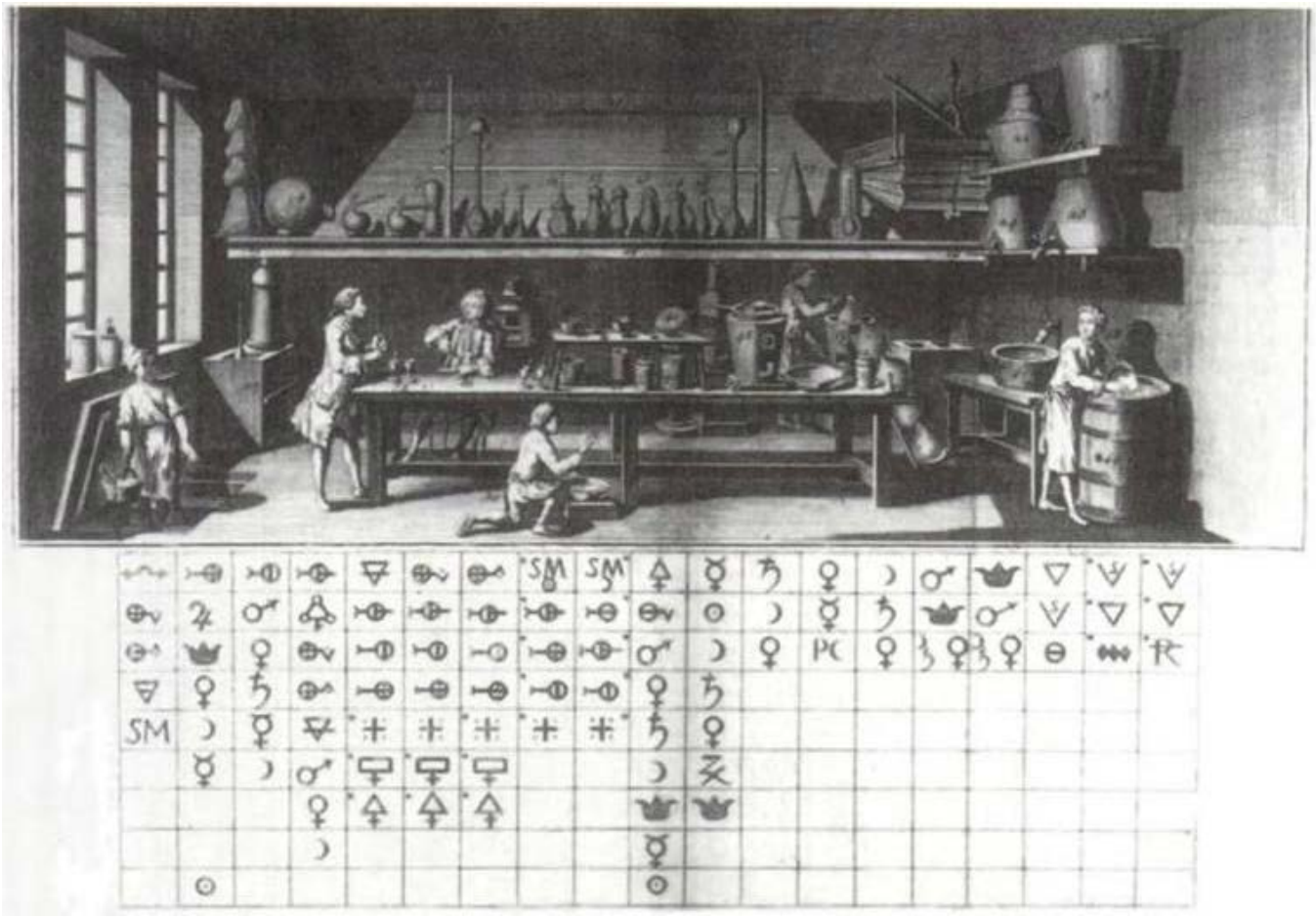

Spielmann's affinity table | 1763

In 1763, Jacob Reinbold Spielmann (1722-1783), who had learned chemistry at Berlin's Medical Surgical College from Pott and Margraf and spent some time in Paris with Jean Grosse and C.J. Geoffroy in the early 1740s, proposed a 28-column table. [5]

Demachy's affinity table

In 1769, a Mr. Demachy produced a 20-column affinity table. [5]

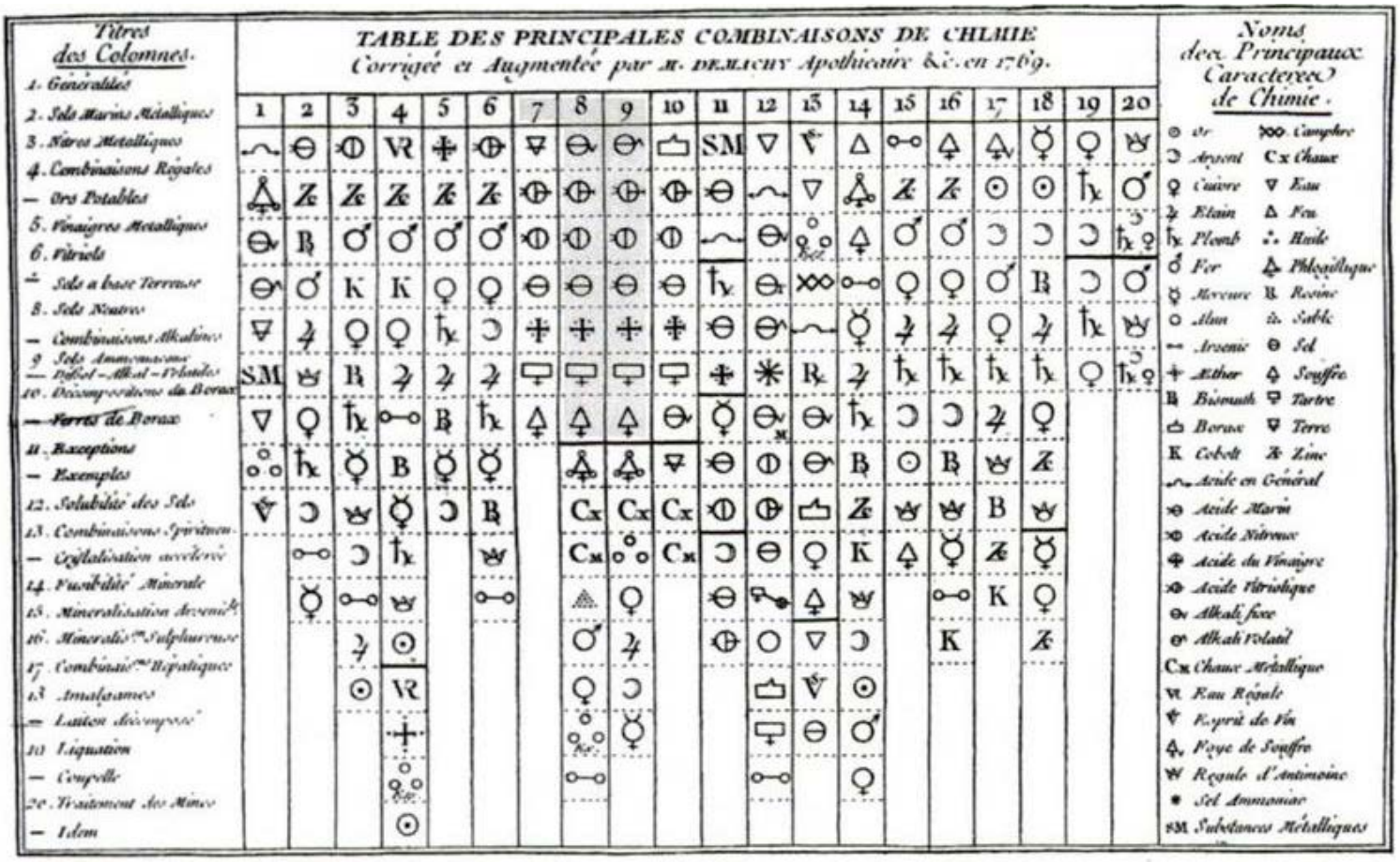

De Fourcy's affinity table

In 1773, a Mr. De Fourcy produced a 36-column affinity table. [5]

Bergman's affinity table | 1775

See main: Bergman's affinity table; See also: Bergman's reaction diagrams

The peak of the science of affinity chemistry culminated in the publication of the popular 1775 textbook *A Dissertation on Elective Attractions* by Swedish chemist Torbern Bergman (and expanded 1785 edition). The center piece of Bergman's book, was a 59-column (50-row chemical affinity table, the largest ever assembled, showing thousands of possible chemical reactions, in both the "wet way" (aqueous) and "dry way" in schematic form between various chemical species, a portion of which (upper right and corner) is shown below:

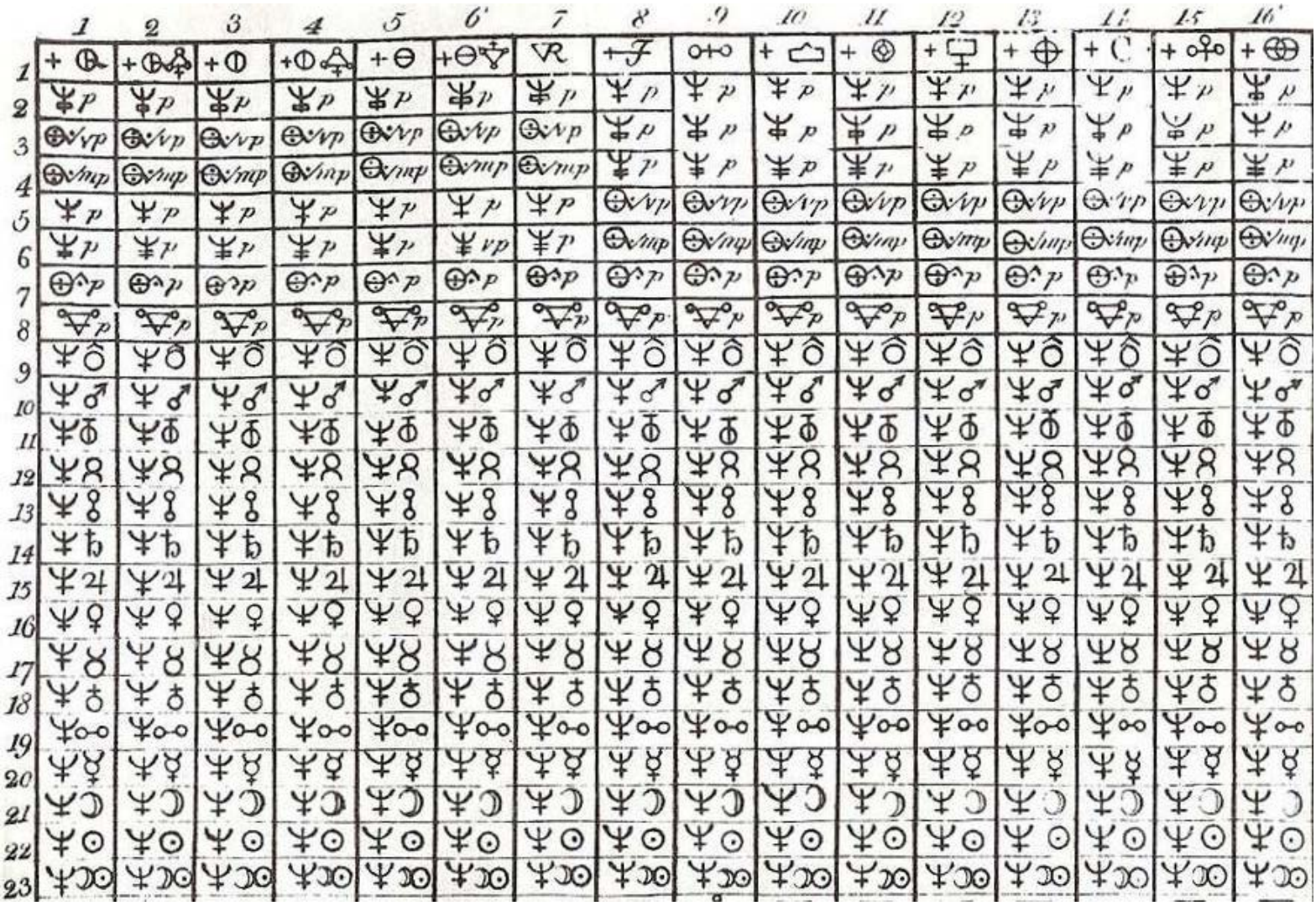

The full table was attached as a "map size" fold out to the appendix of his 1775 textbook. Bergman's table listed 25 acids, 15 earths, and 16 metallic calces; in comparison in the four acids, two alkalis, and nine metals in Geoffroy's original table. With this table, and accompanying reaction diagram schematic sheet (Cullen style), Bergman showed how chemical reactions, such as, for example, the famous ‘double elective affinity’ (double displacement reaction), where two chemical units, *AB* and *CD*, exchange or displace partners to form two new evolved species *AC* and *BD*. [2]

$$AB + CD \rightarrow AC + BD$$

could be quantified, diagrammed, and studied.

Diderot's affinity table | 1778

The following is French encyclopedist Denis Diderot's 1778 affinity table: [14]

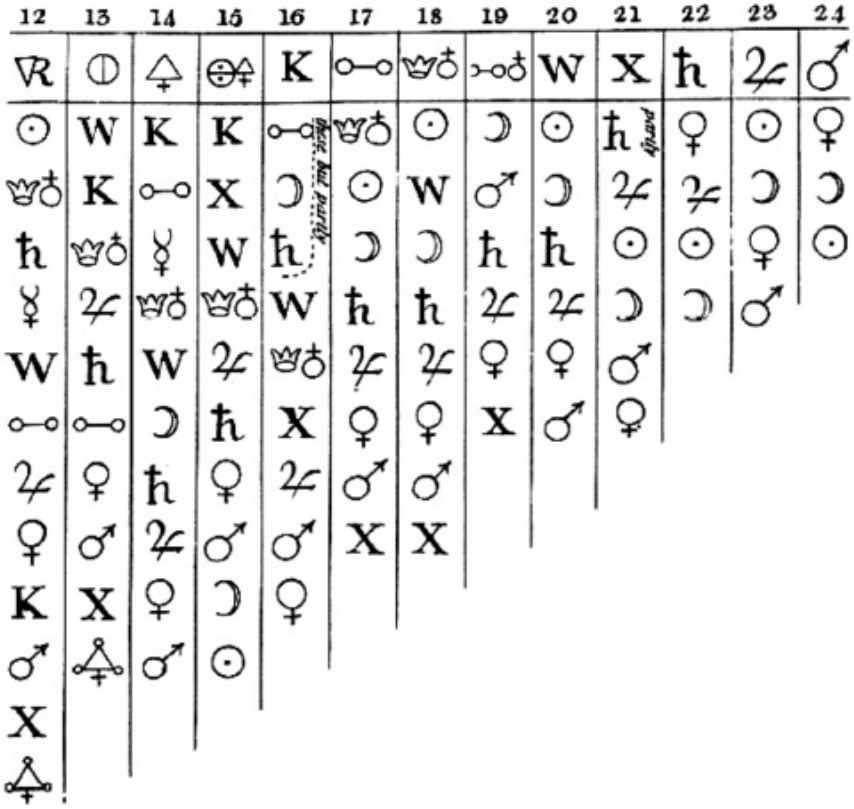

Walker | 1802

In 1802, English science lecturer Adam Walker, in his lecture four "On Chemistry", produced the following affinity table:

tables of affinities by Geofroy, Bergman, Black, &c. A ſpecimen of which can only be given in this work. The ſubſtance to which other ſubſtances are related is generally placed in capitals at the top of the table; and the next ſubſtance under it, is that to which it has the greateſt affinity; the next under that a leſs, and ſo on; thus:

Vitriolic Acid.	Nitrous Acid.	Lime.	Fossil Alkali.
Terra ponderoſa	Vegetable alkali	Acid of ſugar	Vitriolic acid
Vegetable alkali	Foſſil alkali	Acid of ſorrel	Nitrous acid
Foſſil alkali	Terra ponderoſa	Vitriolic acid	Marine acid
Lime	Lime	Acid of tartar	Phoſphoric acid
Magneſia	Magneſia	Phoſphoric acid	Acid of ſugar
Volatile alkali	Volatile alkali	Nitrous acid	Acid of tartar
Clay	Clay	Marine acid	Acid of ſorrel
Zinc	Zinc	Acid of lemons	Acid of lemons
Iron	Iron	Acid of benzoin	Acid of benzoin
Lead	Lead	Acetous acid	Acetous acid
Tin	Tin	Acid of borax	Acid of borax
Copper	Copper	Aërial acid	Aërial acid
Antimony	Antimony	Water, &c.	Water
Arſenic	Arſenic		Unctuous oils, &c.
Mercury	Mercury		
Silver, Gold, &c.			

This logic was taught to a young Percy Shelley, then aged 11, who would later use this model to develop his own unique atheism-based “elective-affinity scheme” of human relationships, as his second wife Mary Shelley would later refer to it.

Goethe's affinity table | 1809

See main: Goethe's affinity table; See also: Goethe's human chemistry

In the years 1796 to 1809, German polymath Johann Goethe used Torbern Bergman's 1785 physical chemistry textbook (and affinity table and reaction diagrams) to make a "human elective affinity table" (of human elective affinities), at least conceptually in his mind, if not most likely on paper. Verifiable evidence that Goethe did actually make an "affinity table" with people listed as reactants and products will never be known, being that, contrary to his usual practice (being the most prolific author behind Shakespeare), he destroyed all of his notes to his human elective affinity theory, leaving only the finished product, his famous 1809 novella *Elective Affinities*, wherein each chapter is said to be based on a different type of affinity reaction and each person is viewed as an interchangeable type of chemical species (see: Otto). The following re-construction outline is what Goethe did, in short:

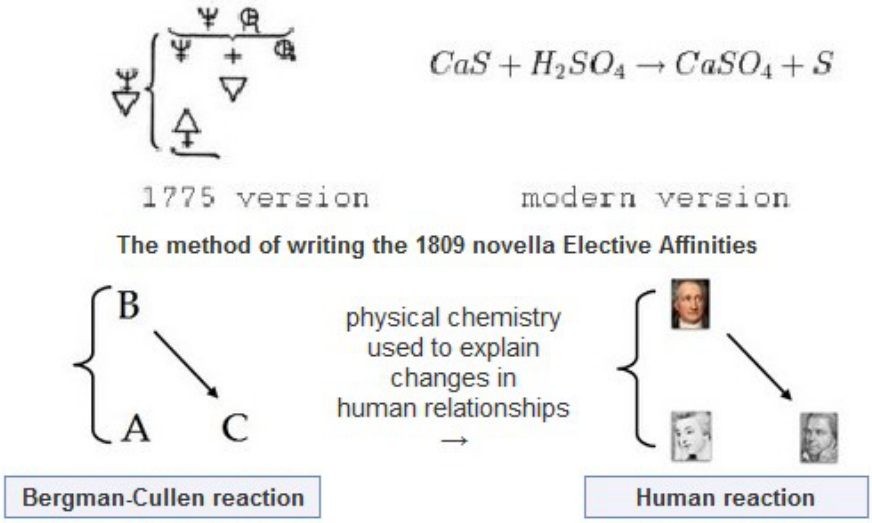

The following is a re-construction, first printed in American electrochemical engineer Libb Thims' 2007 *Human Chemistry* (pg. 398), of what Goethe's affinity table would have most likely looked like:

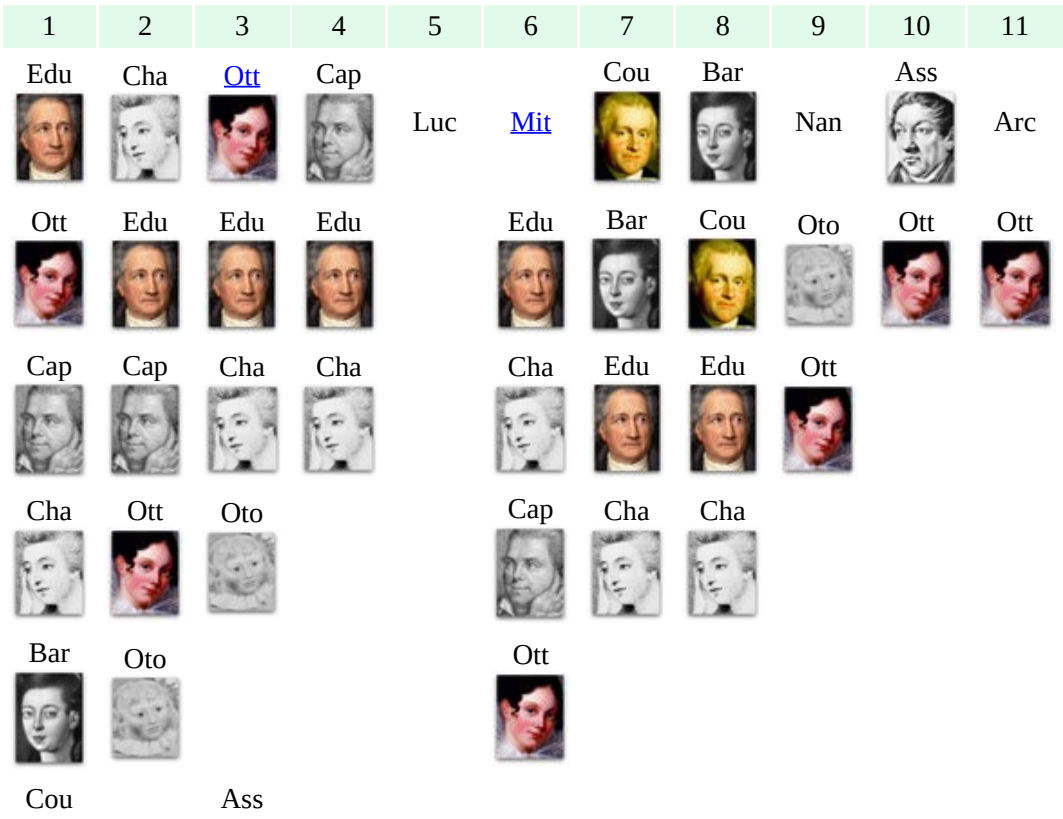

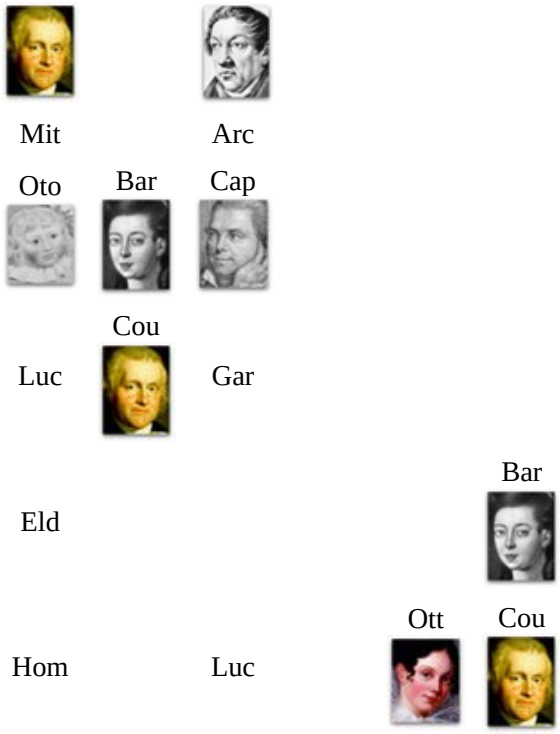

(add discussion)

Free energy tables

See main: Free energy table

In the decades 1775-1840s, it was increasingly becoming apparent that the "affinity table" approach to the quantification of chemical reactions had its limitation. One, Bergmann's multi-page map size affinity table was approaching the limit in functionability. Two, and most importantly, it was becoming apparent that that reactions seemed to depend on temperature, meaning that one would have to construct a different affinity table for each temperature, and hence make hundreds of affinity tables. Third, and most importantly, was the puzzling nature of heat, which between 1780s to 1830s, had its roots in the now defunct so-called "caloric theory of heat" which held that heat was a type of fluid-like indestructible particle (caloric).

In the late 1850s and into the 1870s, the so-called "thermal theory of affinity" was proposed, which held that heat release was the measure of affinity and hence the true measure of the driving force of chemical reactions. This theory, however, soon showed limitations: for instance, it could not explain endothermic reactions.

In 1882, German physicist Hermann Helmholtz, in his seminal paper "On the Thermodynamics of Chemical Processes", showed that the true measure of affinity is not "heat" but rather "free energy", which depended on reaction conditions, as shown below:

	Thermal theory of affinity (1854-1864)	**Thermodynamic theory of affinity (1882-1936)**
Driving force / Measure of affinity (isochoric-isobaric reactions)	Q	U – TS
Driving force / Measure of affinity (isothermal-isobaric reactions)	Q	U + PV – TS

Helmholtz's proof that overthrew the thermal theory of affinity of thermochemistry, updating things with the newly-forming science of chemical thermodynamics. In the decades to follow affinity tables were soon replaced by free energy tables. The first outlines of which were made by German physical chemist Fritz Haber in regards to gas phase reactions. [1] In more detail, according to Gilbert Lewis (1923), "the first systematic study of all the thermodynamic data necessary for the calculation of the free energy of chemical substances in a group of important reactions was done by Haber", as presented in his 1905 work *Thermodynamics of Technical Gas Reactions*. [8]

Haber, however, did not make actual free energy tables, but rather made tables of equilibrium constants, discussing reaction energies, which is nearly synonymous with free energy, loosely speaking.

The work of Haber gave way to the construction of the first so-called “table of free energies” made in 1914 by American physical chemists Gilbert Lewis and Merle Randall, giving free energies of formation values for oxygen, hydrogen, and a few oxides of hydrogen. [9] This formed the basis for their expanded-followup 1923 “Table of Standard Free Energies of Formation at 25 °C”, giving free energies of formation for 28 cations and a few metallic compounds and 111 non-metallic compounds and anions. [8]

Human free energy tables

The above logic, as outlined by Goldstein, that one can calculate the energies and entropies of the reaction mechanism steps involved in the formation or synthesis of an animated entity such as a mouse, gives way to the view that each person can be viewed, likewise, as a "molecule" (human molecule) or chemical species (human chemical species) with a measurable human molecular formula, as has been recently calculated (Sterner and Elser, 2000; Thims, 2002, *New Scientist*, 2005). The basic idea that each person was formed during a great process, involving a large number of mechanistic steps, was first outlined in 1789 by French philosopher Jean Sales, with his statement:

> “We conclude that there exists a principle of the human body which comes from the ‘great process’ in which so many millions of atoms of the earth become many millions of human molecules.”

This premise constitutes what is called the "human molecular hypothesis" (akin to the atomic hypothesis).

The basics of the idea of the "human free energy tables" was first outlined in American chemical engineer Libb Thims' 2007 *Human Chemistry* textbook, as a subject to be worked out in the future; the first stepping stone of which is to study the approaches (and pitfalls) of the 500+ thinkers on the HT pioneers timeline-table, so to get basic framework as to how people historically have attempted to calculate the energies, entropies, internal energies, enthalpies, temperatures, pressures, volumes, and free energies of humans.

Free energy selection method

See main: Thims thought experiment

In *circa* 1995, after taking courses in chemical thermodynamics and physical chemistry, and learning how reactions between different chemical species are predicted energetically, Thims began to muse about how this would be done chemical thermodynamically in regards to humans, even nearing the point of asking the question openly by raising his hand in his chemical engineering thermodynamics class. The following is the reformulated free energy based selection method table Thims hand in mind at this point (which, to note, is equivalent to Goethe's affinity table, affinity and free energy connected via the Goethe-Helmholtz equation):

Reaction #	A	+	B	→	C	ΔG (MJ/hmol)
1	Thims	+	Lisa | 5.0	→		-80
2	Thims	+	Sarah | 6.2	→		+25
3	Thims	+	Jessica | 6.1	→		0
4	Thims	+	Fay | 5.6	→		+10

5	Thims	+	Tina | 7.2	→		-20
6	Thims	+	Ashley | 5.8	→		-30
7	Thims	+	Mary | 5.9	→		-50
8	Thims	+	Sophia | 6.7	→		+125
9	Thims	+	Ava | 6.4	→		-75
10	Thims	+	Chloe | 4.3	→		+50
11	Thims	+	Samantha | 5.3	→		-125
12	Thims	+	Allison | 5.2	→		+200
13	Thims	+	Addison | 4.6	→		+10
14	Thims	+	Julia | 6.0	→		-200
15	Thims	+	Brooke | 6.0	→		-40
16	Thims	+	Lauren | 6.2	→		+10
17	Thims	+	Claire | 6.6	→		-25

18	Thims	+	Ella | 7.7	→		+10
19	Thims	+	Aubrey | 5.3	→		-15

The units listed above, to note, are retrospect units, in the sense that in circa 1995 Thims only had +/- conception of free energy change in his mind, i.e. that a negative free energy change is needed for a spontaneous, favorable, of feasible reaction, and that the more negative the value in magnitude the greater the spontaneity or favorableness of the reaction, as defined by the spontaneity criterion:

Condition	Description
$\Delta G < 0$	Reaction is spontaneous in the forward direction.
$\Delta G > 0$	Reaction is nonspontaneous (reaction is favored in the opposite direction).
$dG = 0$	System is at equilibrium (there is no net change).

Hence, if the above values of Gibbs free energy change, per each human chemical reaction, were accurate, as based on measurement, then reaction #14 would be the most thermodynamically favored (Thims marrying Julia and making a family); reactions: #11 (-125 MJ/hmol), #1 (-80 MJ/hmol), #9 (-75 MJ/hmol), #7 (-50 MJ/hmol), #6 (-30 MJ/hmol), #15 (-40 MJ/hmol), #17 (-25 MJ/hmol), #5 (-20 MJ/hmol), and #19 (-15 MJ/hmol) would each also be favored energetically, albeit each to a lesser degree, respectively; reaction #3 (0 MJ/hmol) would be at equilibrium or characterized by no free energy change and hence one that was equally favored in the forward and backwards direction; and reactions: #4 (+10 MJ/hmol), #13 (+10 MJ/hmol), #16 (+10 MJ/hmol), #18 (+10 MJ/hmol), #2 (+25 MJ/hmol), #10 (+50 MJ/hmol), #8 (+125 MJ/hmol), and #12 (+200 MJ/hmol) would each be non-favored reactions, with increasing amounts, respectively, i.e. reactions that are thermodynamically impossible, unless energy were added to the reaction to make each go.

The "hmol" in the above table, to note, is assumed to be three human molecules and wherein a normal reproduction reaction is approximated as involving an average of 1,500 cal per day at 365 days per 18 years times 3 people involved in the reproduction and one child rearing process, which amounts to about 125 megajoules of energy.

See also

- Affinity of reaction
- Human free energy table

References

1. (a) Cahan, David (1993). *Hermann von Helmholtz and the Foundations of Nineteenth-Century Science* (Ch. 10: "Between Physics and Chemistry - Helmholtz's Route to a Theory of Chemical Thermodynamics" by Helge Kragh). University of California Press.
(b) Quote: "Given the unlimited validity of Clausius' law, it would then be the value of the free energy, not that of the total energy resulting from heat production, which determineds in which sense the chemical affinity can be active." (Source: Helmholtz, H. v. "Die Thermodynamic chemischer Vorgange," *SB*, pg. 23, pg. 22-29, in *Wissenschaftlich Abhandlundgen von Hermann von Helmholtz*. 3 vols. Leipzig: J.A. Barth, 1882-95.)
(c) Leicester, Henry M. (1956). *The Historical Background of Chemistry*, (pg. 206). New York: Dover (reprint).
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(b) Thims, Libb. (2008). *The Human Molecule*, (preview), (pgs. 3-5). Morrisville, NC: LuLu.
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4. Newton, Isaac. (1704). *Opticks* (Query 31: On the small particles of bodies); London: Printers to Royal Society. Note: several editions published between 1704 and 1730.
5. Kim, Mi Gyung. (2003). *Affinity, That Elusive Dream – A Genealogy of the Chemical Revolution*. Cambridge, Mass: The MIT Press.
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7. Tabula Affinitatum: Inter Differentes Substantias (Table of Affinities between different substances) – Florence, Italy.
8. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pgs. 5-6; Table of

Free Energies, pgs. 607-08). McGraw-Hill Book Co., Inc.
9. Lewis, Gilbert and Randall, Merle. (1914). “The Free Energy of Oxygen, Hydrogen, and the Oxides of Hydrogen”, *Journal of American Chemical Society*, 35:1964.
14. Diderot’s Affinity Table (1778) – Meta-Synthesis.com.

θΔics

In equations, **affinity-free energy equation** (TR:25) refers to any relation that equates the chemical affinities or a reaction or process with the change in the free energy, Gibbs or Helmholtz, of the reaction or process, which depends on the reaction conditions, namely isothermal-isobaric or isothermal-isochoric, respectively.

History

The first to formally state the affinity-free energy relationship in equation form was German physicist Hermann Helmholtz, who in his famous 1882 "On the Thermodynamics of Chemical Processes", combined the earlier chemical thermodynamics work of American engineer Willard Gibbs with his own electrochemical thermodynamics work and, with the following statement, effectively overthrew the thermal theory of affinity:

> "Given the unlimited validity of Clausius' law, it would then be the value of the free energy, not that of the total energy resulting from heat production, which determines in which sense the chemical affinity can be active."

and gave the following equation formulation for affinity in relation to the direction of reaction changes spontaneously occurring:

$$\frac{dF}{dt} \leq 0$$

where, in modern terms, *F* is the Helmholtz free energy, and *t* is time, which states that the affinities will only be active when the system of the chemical process shows a decrease in free energy with time.

In 1936, Belgian physicist Theophile de Donder, in his *Thermodynamic Theory of Affinity*, head of the so-called "Brussels school of thermodynamics", using a parallel albeit slightly different approach, presented a formulation where the symbol "A" for affinity as the negative partial of the partial of the Gibbs free energy per unit partial of extent of reaction for a change in a isothermal isobaric system: [2]

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

and would go on to discuss this, using coupling theory, in terms of how reactants and chemicals can be made to go, move, or react in a direction contrary to their own affinity, or in an anthropomorphic sense, as Goethe would have seen things, in a direction contrary to their own will. De Donder's approach, according to Indian-born American physical chemist Dilip Kondepudi, of his school, is said to be based on American engineer Willard Gibbs' 1876 concept of chemical potential. [5]

In 2012, the term "Goethe-Helmholtz equation" began to be used, as an Hmolpedia coinage, in reference to the following isothermal-isobaric version of the equation relating affinity to Gibbs free energy change:

$$A = -\Delta G$$

(add)

Quotes

The following are related quotes:

> "Chemical affinity in the chemical battery and in electrolysis, then, is to be identified with free energy or with work, not with heat. As historian Helge Kragh has noted, it was only with Helmholtz's version of the energy/entropy/heat function that its implications for the problem of chemical affinity were clearly understood. It was Helmholtz's version that van't Hoff and Nernst further explored. The importance for chemistry of Helmholtz's work was publicly acknowledged in 1892 when the German Chemical Society elected Helmholtz to honorary membership. In the language of chemistry, the term affinity gave way to the term energy, just as, in the language of physics or natural philosophy, the term force also ceded rhetorical and intellectual space to energy. Physical chemistry became a kind of chemistry focused on energy relations in chemical reactions, thus shelving the problem of the causes of elective affinities of individual atoms for study by a later generation."
>
> — Mary Jo Nye (1999), *Before Big Science: the Pursuit of Modern Chemistry and Physics, 1800-1940* (pg. 99)

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1. De Donder, Theophile. (1936). *Thermodynamic Theory of Affinity: A Book of Principles* (pg. 2). Oxford University Press.
2. Kondepudi, Dilip and Prigogine, Ilya. (1998). *Modern Thermodynamics – from Heat Engines to Dissipative Structures* (4.1: Chemical potential and Affinity: the Driving Force of Chemical Reactions, pgs. 103-13). New York: John Wiley & Sons.

θΔics

In films, **Afinidades** is a 2010 Spanish-language modern-remake of Goethe's *Elective Affinities*, which takes place at Hotel Guama (O), in Zapata Swamp (Cienaga de Zapata) (O), Cuba, an isolated lagoon resort, assessable by boat, wherein []

The 2010 film ***Afinidades***, by Cuban writer, director Vladimir Cruz (top photo), is a modern-day remake of Goethe's *Elective Affinities* (1809), wherein the characters are conceptualized as quark-comprised chemicals that react together, discussing things such as freedom, morality, and meaning of existence.

Synopsis

The short synopsis of the film is that Cuba is economically down-trodden and losing its sense of values. In this state, a chemical company, run by Nestor (Jorge Perugorria), the "boss", is about to be sold to a foreign interest, during which 40 percent of the company staff will be sacked. Bruno (Vladimir Cruz), an overqualified theoretical physicist, working as a chemistry lab technician, at Bruno's company, doesn't want to lose his job during the company buyout; Nestor being the one person who has connections to the "big cheese" outside of Cuba. Nestor alludes to the deal that if Bruno consents to a swingers-like couple swap at the resort, his job will be secure. Nestor's wife Christina, a lawyer, is open to the idea, i.e she "likes everything" as she says. Bruno's wife Magda, a young art school graduate, however, is ambivalent to the whole thing, but eventually gives in. Things "heat" up as various sexual reactions ensue, at the end of which things, things get "cold" and Bruno looses his wife Magda, who says she dies of "disgust".

Overview

The script, written by Puerto Rican writer and director Vladimir Cruz arose during a 10-day screenwriter's conference in Switzerland; and the screenplay was selected for the 2009 edition of Plume & Pellicule. (O)

The movie was filmed in late 2009 in Cuba; some behind the scenes photos of which are available on VladimirCruz.net. (O)

The film is based on the novel *Chamber Music* (Musical de Camara) by Reinaldo Montero, and "inspired" by Goethe's *Elective Affinities*, or *The Selective Affinities* ("Las afinidades selectivas", as they call it in Cuba), elements of which are seen in the film, such as:

(a) physico-chemical framework to human relationships and passions;
(b) the island lagoon resort, accessible only by boat, modeled on the estate;
(c) the broken glass, and talk of how the Russians break their glasses after toasting;
(d) the metaphor of the structure of the huts having a solid foundation as metaphor for human relations (or something);
(e) the graveyard;
(f) the church and foot path;
(g) the sexual flexibility of all of the characters for each other (the two men for each other aside)
(h) citation to the forbiddenness of the sixth commandment, to "covet your neighbor's wife" (see: ten commandments)
(i) the slowing down of time;
(j) Magda dying from "disgust" at the end, similar to how Ottilie "died" from self-deprivation owing to the unattainability of love;

Cruz is Bruno, a theoretical physicist employee of the chemical company Nestor (Perugorría) who fears for the continuity of his job, married to Magda, a young and romantic woman, without much life experience, who plays the newcomer Gabriela Griffith. (O)

Nuffer | Review

In 2011, Corey Nuffer gave the following review synopsis of the film: [1]

> "All films arise from scripts but not all scripts come from novels. After reading Chamber Music (Música de Cámara) by Cuban author Reinaldo Montero, Cuban actor Vladimir Cruz wrote the script for the feature film, Affinities

(Afinidades). Along with fellow actor Jorge Perugorría, Cruz co-directed and starred in the film. Their efforts culminated in a film seething with the interstitial complexity that's easily encountered in a novel but less so on screen. Consequently, Affinities tells one story but emotes something as complicated as the human condition. It's a strange sensation to be intuiting such complexity from a film. Perhaps that's why it will keep you thinking long after the closing credits roll. Immediately, the film conveys the sort of tension leading you to believe this story will end in someone dying. Affinities is not a thriller, however, it is drama.

The writing allows for even less breathing space as characters interact with each other with grandiose ideas and brutally short replies. Sometimes these exchanges seem truncated, as if Cruz purposefully withheld anything that would feel like resolution. The absence, then, makes for silence, something that is given fierce presence in the role of Magda (exquisitely portrayed by actress Gabriela Griffith). It is in these exchanges that your mind wanders in a gentle panic. Much like music, it is these spaces of silence or what goes unsaid that are more important than the music itself. And so you continue watching with baited breath and hope for some release. Cruz even gives to one of the characters, the wonderful Spanish actress Cuca Escribano, the habit of speaking in questions. Indeed, while much of what she has to say provides us with the levity so scarce in this film, she is literally discussed in the movie as speaking in questions. The effect is both cute and frustrating, for many of her questions go unanswered.

With all that is happening under the surface, the plot of the film is somewhat simple: Two couples spend a weekend together on a getaway. Arriving on a Friday and leaving on a Sunday, they dine together, go boating together, sun themselves at the pool together, watch a show together and in more ways that you can anticipate and imagine, have sex. And there it is: There is a lot of sex in this movie. Affinities can certainly be considered a part of this genre of picture, but it is also much more. In a press conference for Affinity, Cruz explains that while this is a movie much ado about infidelity, it is also just as much about the individual. He states: "We are only trying to meditate about the human being and their complexities, facing emptiness and the lack of rational explanation for many of the problems of the contemporary world, sometimes appearing that the only way out is to take refuge in instincts." He goes on to say that the instinctual impulse ends up being sex.

No wonder why the movie carries with it such an overwhelming feeling; this is a lot to convey in 90-minutes of film, no matter how well made. Adding to everything is the political dimension: Cuba is still under US embargo. Whether intended or not, the feeling of claustrophobia in Affinities seems to carry with it room to at least ponder just how deep the complexity goes. And if things weren't complicated enough, Goethe is brought up. For those interested in seeing how deep the rabbit hole goes, there is a nod to Goethe's *Elective Affinities*. While it will provide more place for traction, it will certainly be without solace for the questions brought up in Affinity, with or without Goethe, bear the mark of great art: They keep the conversation going."

As per "Goethe is brought up", the name "Goethe" does not seem to have been mentioned directly in the film.

Universal | Review

The following is a 2011 ElUniversal.com (Q) review:

Spanish	English
Madrid.- Los actores cubanos Jorge Perugorría y Vladimir Cruz se estrenan en la dirección de largometrajes con "Afinidades", una película sobre la crisis de valores, la infelicidad y las lealtades que se presenta como una metáfora de lo que pasa hoy en Cuba, aunque, eso sí, con un formato muy caliente.	MADRID Cuban actors Vladimir Cruz and Jorge Perugorría are released in the direction of feature films with "Affinities", a film about the crisis of values and loyalties unhappiness that comes as a metaphor for what is happening today in Cuba, but, yes, with a very hot format.
Porque la película, con guión de Cruz sobre la novela "Música de cámara", de Reinaldo Montero, a su vez inspirada en "Las afinidades selectivas", de Goethe, va desvelando profundas lagunas interiores a través de los distintos encuentros sexuales de los personajes, dos parejas dispuestas a todo, si bien, por distintos motivos.	Because the film from a screenplay by Cruz on the novel "Chamber Music" by Reinaldo Montero, in turn inspired by "Selective affinities" of Goethe, deep lagoons unfolds through various sexual encounters characters two couples willing to all, although for different reasons.
"El punto de partida fue colocar personas infelices en un lugar paradisíaco, como una metáfora de Cuba donde la naturaleza es fantástica, el paisaje maravilloso y sin embargo la gente tiene	

problemas de todo tipo", explicó Cruz a un grupo reducido de periodistas, entre ellos, EFE.

"Afinidades", rodada en el idílico y poco conocido paraje de la Laguna del Tesoro de Guamá, en Matanzas, ha contado con un equipo integrado por "toda la gente con la que aprendimos a hacer cine en Cuba", ha detallado Cruz: desde el director de arte, Derubín Jacome, que fue profesor suyo, al veterano productor Camilo Vives.

En la cinta, Cruz es Bruno, un físico teórico empleado de Néstor (Perugorría) que teme por la continuidad de su puesto de trabajo, casado con Magda, una mujer joven y romántica, sin mucha experiencia de la vida, que interpreta la debutante Gabriela Griffith.

Néstor, un alto cargo de una empresa con capital extranjero, está casado con una abogada española, Cristina, personaje que encarna Cuca Escribano ("El camino de los ingleses", "Los aires difíciles"), a la que "no le da miedo nada y le gusta todo", según ella misma explica en la película.

"Cristina es positiva las 24 horas del día: da, da y da -explicó Cruz-, pero cuando deja de dar no recibe. Es infeliz, y en eso coincide con Bruno, a quien tampoco le funciona la fórmula de la vida".

"El caso de Néstor es distinto; es un manipulador real que utiliza su poder para jugar con los que tiene debajo", de hecho, añadió Cruz, simboliza la quiebra profunda de los valores de la revolución, algo que "es la primera vez que se dice en el cine cubano abiertamente".

Y Magda "es la peor, porque encarna la falta de escrúpulos de las nuevas generaciones; ella aprende de Cristina y al final es la que va más allá en los límites".

"A nosotros, más que dar respuestas, lo que nos interesaba era tocar ciertos temas que están muy presentes en la sociedad cubana: para qué sirve la libertad; hacia dónde vamos, o qué importancia tiene el individuo con todas sus miserias", reflexiona el director.

Y en el mismo sentido, añade: "si podemos seguir diciendo que todos somos iguales, todos nobles y buenos, o lo que es lo mismo, mantener la teoría del socialismo, de esa igualdad inexistente. O vamos a la profundidad oscura de nosotros mismos y la aceptamos, o no podremos ir a ningún sitio", concluyó Cruz.

El actor, que disculpa la ausencia de su compañero Perugorría, de rodaje en Cuba, reconoció que la experiencia de codirigir y coprotagonizar una película ha sido "agotadora", pero muy satisfactoria, y que para ello ha sido clave "la gran amistad, respeto y admiración" que se tienen.

Los actores, que coincidieron ya hace más de una década en "Fresa y chocolate", el primer largometraje de ficción de Tomás

"The starting point was to place people unhappy in paradise, as a metaphor for Cuba where nature is fantastic, wonderful scenery and yet people have all sorts of problems," said Cruz to a small group of journalists, among them, EFE.

"Affinities", shot in the idyllic setting of the little-known Treasury Laguna Guamá, in Matanzas, has had a team of "all the people I learned to make films in Cuba" team has detailed Cruz: from art director, Derubín Jacome, who was his teacher, veteran producer Camilo Vives.

In the film, Cruz is Bruno, a theoretical physicist employee Nestor (Perugorría) who fears for the continuity of his job, married to Magda, a young and romantic woman, without much life experience, who plays the newcomer Gabriela Griffith.

Nestor, a senior official of a company with foreign capital, is married to a Spanish lawyer, Cristina, a character who embodies Cuca Escribano ("The Summer Rain", "Rough Winds"), which "is not afraid nothing and likes everything, "as she explains in the film.

"Cristina is positive 24 hours a day, da, da and da Cruz explained, but when you stop to not receive is unhappy, and that coincides with Bruno, who also did not work the formula of life.".

"Nestor's case is different; it is a real manipulator who uses his power to play with beneath it" in fact, Cruz added, symbolizes the fundamental breakdown of the values of the revolution, which "is the first time it is said openly in Cuban cinema. "

And Magda "is the worst, because it embodies the ruthlessness of the new generations, she learns of Cristina and the end is beyond the limits."

"To us, rather than giving answers, what we wanted was to play certain issues that are very present in Cuban society: what good is freedom; where we are going, or how important is the individual with all its misery," reflects the principal.

And in the same sense, he adds: "If we can continue to say that all are equal, all noble and good, or what is the same, keep the theory of socialism, that nonexistent equality Or will the dark depths of ourselves. and accept it, or we can not go anywhere, "he said Cruz.

The actor, who excuse the absence of his partner Perugorría, filming in Cuba, acknowledged that the experience of co-directing and co-star in a film has been "exhausting", but very successful, and that this has been key, "the great friendship, respect and admiration "you have.

The actors, who agreed more than a decade in "Strawberry and Chocolate" ago, the first feature film by Tomas Gutierrez Alea and Juan Carlos Tabio, as directors are convinced that "the future of Cuba, and many other places , through the individual, hope and happiness amid the uncertainty about the future, "says Cruz.

Gutiérrez Alea y Juan Carlos Tabío, están convencidos como directores de que "el futuro de Cuba, y el de muchos otros lugares, pasa por el individuo, por la esperanza y la felicidad en medio de esa incertidumbre por el futuro", afirma Cruz.

(add discussion)

Quarks | Humans

See main: Social fermions

The following is the quark pairs are like human pairs scene:

> "Quarks are smallest particles in the universe and they only come in pairs."
>
> — Bruno (2010), four people at pool scene (32:27)

> "Like us?"
>
> — Christina (2010), comment to Bruno

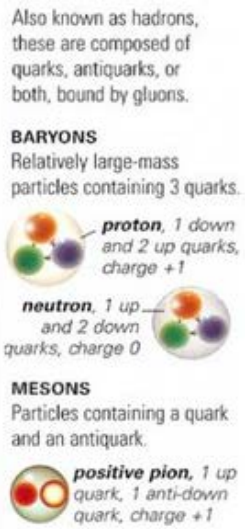

The famous "quark scene" from *Afinidades*, wherein Bruno, third inward (above), explains how quark pairs [mesons], and the character of the forces (gluons) that hold them together, are similar to human pairs [dihumanides], and that this helps us to understand the nature of things, such as sexual interactions; the scene is a modern-day attempt at the famous four-character dialogue of chapter four of Goethe's *Elective Affinities*, wherein the Captain explain how the operation of the affinities (chemical forces) hold and separate people (as chemicals) in various unions and bond changes.

> "Pairs can't be separated, because the farther apart they are, the stronger the attraction is, and the closer they get the more they ignore each other."
>
> — Bruno (2010), continuation

> "Just like I said. Just like us."
>
> — Christina (2010), general comment

> "Yes, honey, just like you and me."
>
> — Nestor (2010), interjection comment to Christina

> "Then it is through these particles behavior …."
>
> — Bruno (2010), discussion continued (32:43)

> "Well, I've already heard it one hundred times."
>
> — Magda (2010), interjection

> "They calculate that it would require the energy equivalent to the third second after the big bang to separate them."
>
> — Bruno (2010), discussion continued (32:57)

“Would it really? How impressive!.”

— Christina (2010), interjection comment

“Is there a point to all this?”

— Magda (2010), interjection

“It helps us to understand the nature of things.”

— Bruno (2010), discussion continued

“What things?”

— Magda (2010), interjection; before leaving to dive into pool (33:06)

Scene is followed, without dialogue, by Bruno and Christian, later, "having sex" (answer to Magda's question), in the grass, off to the side of he pool.

Freedom | Security

The following is the freedom vs security scene:

The freedom vs security scene (48:28) discussion, at the restaurant while watching the show.

“Do you know what I really want from life?”

— Bruno (2010), four people at restaurant show scene

“What I want is freedom.”

— Bruno (2010), answer

“Freedom …. Freedom doesn’t exist, and besides … is overrated.”

— Nestor (2010), response to Bruno

“Who is truly free?”

— Nestor (2010), continuation

“I can’t believe it’s you who tells me that.”

— Bruno (2010), comment

“Listen Bruno, in today’s world, what people really long for is security. We all want it, including you. What you want is a contract. One that ties you down, but give you money. That’s as close as one can get to the illusion of freedom.”

— Nestor (2010), continuation

> “And I want to be happy. Does happiness not exist either?”
>
> — Magda (2010), interjection

> “And I want a cubalibre! I hope that, at least, exists.”
>
> — Nestor (2010), conversation detaching comment (49:05)

> “Freedom is the ability to use your free will to get something, in this case four cubalibres!”
>
> — Nestor (2010), returning from the bar with drinks comment (51:04)

The following is the correlative quote from the original version:

> “None are more hopelessly enslaved than those who falsely believe they are free.”
> ("Niemand ist mehr Sklave, als der sich für frei hält, ohne es zu sein.")
>
> — Goethe (1809) *Elective Affinities* (P2:C5) [3]

The seeming paradox between freedom and security, also, to note, is the main subject of Frederick Rossini's 1971 "Chemical Thermodynamics in the Real World", wherein he asserts that the compromise between entropy and enthalpy in social system reactions explains the paradox.

Foundations

The following is the “foundations” are important scene dialogue:

> “I like our cottage. It’s strong, although it’s built on mud. It must have good foundations. Foundations are important. Even if you can’t see them.”
>
> — Nestor (2010), general comment, with the other three, while rowing the boat (25:56) past their bungalow on stilts

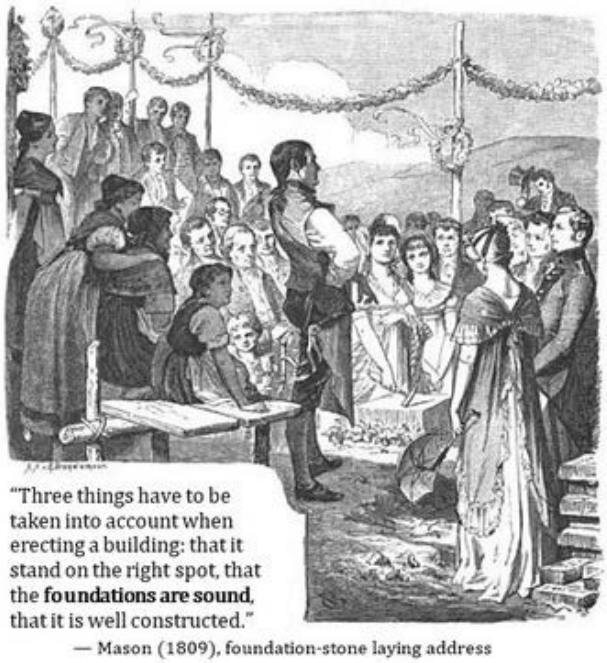

A comparison of the "sound foundations" scene from Goethe's *Elective Affinities* (P1:**C9**) as compared to the "good foundations" scene from Cruz's *Afinidades* (chapter four: 25:56-min), which is either a metaphor for the foundations of marriage or the foundations for one's theory of existence.

> “I like it too, just because it’s asymmetrical. I hate symmetry, it’s awfully boring.”
>
> — Bruno (2010), reply to Nestor’s comment

The following, from Goethe’s version (P1:**C9**), is the famous “foundations” quote:

> “Three things are to be looked to in a building: that it stand on the right spot; that it be **securely founded**; that it be successfully executed.”
>
> — Mason (1809), foundation stone laying address spoke in verse; James Froude (1854) translation

> “Three things have to be taken into account when erecting a building: that it stand on the right spot, that the **foundations are sound**, that it is well constructed.”
>
> — Mason (1809), foundation stone laying address spoke in verse; R.J. Hollingdale (1971) translation

> "Three things are necessary for a building: that it be rightly situated, that it have a **good foundation**, and that it be properly constructed.”
>
> — Mason (1809), foundation stone laying address spoke in verse; Judith Ryan (1988) translation

The key search “good foundations” + “Elective Affinities”, to note, turns up the following 1871 religion-siding statement by John Phelps Fruit, an Edgar Poe poetry (Q) scholar of sorts: [3]

> “The destiny of marriage may be profitably discussed in the light of this introduction. Manhood and womanhood is the most significant instance of the inevitable dualism that bisects nature. If the man and the woman were destined for each other, why not the individual man for the individual woman? Suppose we have given a certain individual man: there is only one individual woman who could be most congenial to him, whose life joined to his would make the most harmonious life. The theory of elective affinity has a **good foundation**, but cannot be carried out in practice to the extent that Goethe advocates in his story of *Elective Affinities*. For if a man fail to find his "affinity," he must endure his choice, though he see afterwards his destined beloved another man's. Free-will entails this. Society, of which he is a member, which is wiser than himself, and stands somehow for the will of god, demands that he abide the consequences of his own injudicious choosing. There are many marriages in which god's destiny is consummated, but there are too many which man has fixed.”

(add discussion)

Church | Footpath

The following is the dialogue that follows the "good foundations" dialogue:

> “Have you lost something dear?”
>
> — Christina (2010), query to Bruno, while on the boat, who is look around

> “Ever since yesterday I’ve been looking for a village … a **church** … and a **footpath**.”
>
> — Bruno (2010), reply to Christian (26:12)

The seeming-equivalent statement of Goethe’s version might be the following:

> “The birthday was come, and everything was ready. The wall was all complete which protected the raised village road against the water, and so was the walk; passing the **church**, for short time it followed the **path** which had been laid out by Charlotte, and then winding upwards among the rocks, inclined first under the summer-house to the right, and then, after a wide sweep, passed back above it to the right again, and so by degrees out on to the summit.”
>
> — Narrator (1809), opening paragraph to P1:C9 of *Elective Affinities*, prior to the foundation stone speech

(add disucssion)

Socialism | Goetheanism

A significant portion of the film focuses on loss of values in the 1990 to 2000s Cuban socialism, following the 1959 revolution, which tipped into the period following the 1991 Soviet collapse, which led into the “special period” of Cuba, wherein Soviet subsidies ceased. The Cuba Constitution of 1976, which defined Cuba as a socialist republic, was replaced by the Constitution of 1992 which is guided by ideas of Jose Marti and the political and social ideas of Karl Marx, Friedrich Engels, and Vladimir Lenin, i.e. Marxism-Leninism. (Q) Some film dialogue on this is as follows:

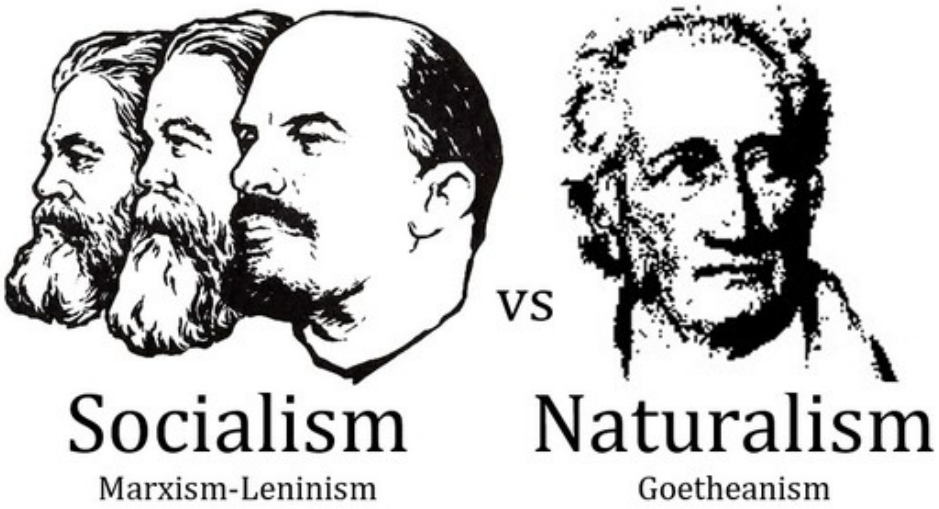

A depiction of the turn away from "socialism" of the Marx-Engels (Marxism) + Lenin (Leninism) variety, which has dominated the Cubin society in the last half-century, and an instinctive turn towards the physico-chemical naturalism espoused by Goethe, i.e. Goetheanism, in his human chemical theory, a realism-based, philosophically-grounded. modern Epicureanism, in some sense.

> “Thankfully, we still have socialist as ethics ….”
>
> — Nestor (2010), Nestor, Magda, and Bruno laying at pool

> “Ethics or erotica? Because some of us still get f*cked the hard way.”
>
> — Bruno (2010), reply to Nestor

It may be likely that Vladimir Cruz, the author of *Afinidades*, was named by his parents after "Vladimir" Lenin the main curator of socialism; similar to how many of Christian-faith nationality are named either Christopher or Mary; or how many of Islamic-faith nationality are named Muhammad; and that he is revolting against his culturally-passed beliefs.

The film also, at one point, discusses the incorrectness of the everybody’s equal theory, i.e. "equal workers in a workers state" Marx-Lenin ideology. The generally alluded to, but not stated explicitly, moral of the story is that Goetheanism is light out of the darkness of socialism, but one wherein the rules of engagement have not yet fully been worked out.

Characters

The following shows each character: Bruno/Captain (Vladimir Cruz), Magda/Ottilie (Gabriela Griffith), Christian/Charlotte (Cuca Escribano), and Nestor/Edward (Jorge Perugorria), each labeled (A,B,C,D), as a different chemical species, according to the Goethe lettering scheme (itself based on the Bergman lettering scheme):

Bruno	Magda	Christina	Nestor
[Vladimir Cruz]	[Gabriela Griffith]	[Cuca Escribano]	[Jorge Perugorria]
Theoretical physicist	Wife of Bruno	Wife of Nestor	Bruno's employer
(Chemical company employee)	(Art school graduate)	(Spanish lawyer)	(Boss of chemical company)

(add discussion)

Location | Hotel Guama

The film takes place at Hotel Guama, Cuba, as shown below, which is comprised of 44 independent cabins or bungalows made of wood and ceiling of guano, is accessible solely by sea, via a passage of 20 minutes on the boat of old Captain Jesus. (Q) This interesting factoid enacts, as would seem to be the case, the membrane transport mechanism of the semi-permeable "boundary" of the system. The other "guests" (chemical species) in the film are Russian, a language spoken by one of the characters, hence enacting a barrier to reaction with the four main characters (reactants); the guests, in a sense, becoming inert noble gas like molecules roaming about the system, but incapable of the more powerful sexual interactions potentials.

This isolation aspect enacts the roll of the isolated boundaried "estate" of Goethe's *Elective Affinities*; very-impressive choice.

Quotes | About

The following are related quotes:

> "The film [***Afinidades***] takes place inland on fresh water and its time is quite different from what we are used to in our contemporary cinematography. We are only trying to meditate about the human being and their complexities, facing emptiness and the lack of rational explanation for many of the problems of the contemporary world, sometimes appearing that the only way out is to take refuge in instincts. Those instincts lead to sex. At least this is the way out that the protagonists of this story

find: sex as a way of electric discharge so as to keep themselves alive, the manipulation of others as a way to cast out impotence and reaffirm personalities lacerated by loneliness. But the result is ephemeral and the attempt has unforeseeable consequences."

— Vladimir Cruz (2010), "Interview" (Q), Jun 18

Top: the pool scene where the characters discuss the forces operating between quarks, and how the strength increases when they are pulled apart, similar to humans in relationships. Bottom: the view of graveyard (37:19), symbolic of death, seen by female A (Christian) as she embraces (hugs) male C (Bruno) C, who in turn looks out at female D (Magda) embracing male B (Nestor) on a boat off in the distance.

"***Afinidades*** explores sex as a means of manipulation and escape from an existential void."

— Victoria Alcala (2012), "20 of the best Cuban films, 2006-2011" (Q), Jan

Quotes | Film

The following are other noted quotes from the film:

"There are more molecules in [a drop of] water than there are stars in the universe."

— Bruno (2010), opening credits

"Nothing is forbidden here, not even to covet your neighbor's wife."

— Nestor (2010), scene where guy is talking to other guy, after rain storm, shoveling water out of escape boat; as discussed by Goethe on 29 Jan 1830 (see: Goethe timeline)

"There's a graveyard behind the cottage, isn't that strange?"

— Christina (2010), woman speaking, while about to lie in the green grass, like an angel; graveyard and tombstone rearrangement take place in *Elective Affinities* (chapters: add)

“Only in unhappiness, do the questions get asked.”

— Magda (2010), scene with Nestor in boat (35:22); response to his midlife crisis dialogue

“The energy of collision has been absorbed.”

— Bruno (2010), in response to query “did you hear me”, while the four are talking (Q) on boat; reminiscent of the way William Thomson talked to his wife and Alfred Lotka's trigger action

“Nothing belongs to us my friend, and admitting this is the only way to avoid the pain of loss.”

— Nestor (2010), comment to Bruno (40:00), after Bruno says “let me speak to my wife”

“To jump orbits, you need a lot of energy. And you need balls.”

— Nestor (2010), comment to Bruno (see: social orbital theory; human molecular orbital theory), during dinner show (58:30), while women are in bathroom making out, about his statement that he would leave the company (or country) if he was left out of the buyout

See also

- Elective affinities scale
- Tom Stoppard | Arcadia

References

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2. Goethe, Johann. (1853). *Goethe's Opinions on the World, Mankind, Literature, Science and Art*, (translated by Otto Wenckstern) (pg. 3). John W. Parker and Son.
3. Fruit, John P. (1891), “The Destiny of Marriage: Portia and the Caskets”, in: *Poet Lore, Volume 3* (pgs. 69-74; quote, pg. 69). AMS Preprint.

Threads

- Covet your neighbor’s wife (2015)

External links

- Afinidades (film) – Wikipedia.
- Vladimir Cruz – Wikipedia.

θΔics

In

Left: a typical Ra theology era (3000-1000BC) depiction of the **afterlife**: (a) right: the ba or soul leaves the body, (b) left: the body is taken through the afterlife door, where the person's morality, based on his or her soul weight, a mass determined by the negative confessions, is weighed against the feather of truth, in the judgment hall, after which, depending on the scale measurement, the person either enters heaven or hell. [2] Right: a typical modern day Ab-ra-ham-ic depiction of the **afterlife**: (a) left: the spirit or soul leaves the body, (b) right: the person enters the afterlife through some type of door, tunnel, or white light. [5] This view of death, or some variation of this, is common to over 53 percent of the world's belief system.

science, **afterlife** is a theory which posits that there exists some state of life (reaction existence), or state of mental existence, after death (dereaction) or next life in the so-called hereafter.

Polls

A 2007 Pew poll of Americans found that 74% of Americans believe in the existence of the afterlife, and that 50% believe with "absolute certainty." (Q) A 2014 CBS poll found that 75% of Americans believe in the existence of heaven or hell, including 66% who think both exist. (Q) Other polls, on the high end, indicate that upwards of 95% of Americans believe in life after death. [1]

Overview

The following is the modern-day experimental psychology view of the afterlife theory: [1]

> “Afterlife is a cognitive illusion churned up by a psychological system designed to think about unobservable minds. The soul is distinctly human all right, a product of reasoned evolutionary thinking.”

The following is the typical American view of the afterlife: [5]

> “Where did we come from? Why are we here? Is there any meaning or purpose to life? Is there life after death? The question of our origin is very important, and continues to be a topic of great difference of viewpoint and intense controversy.”

Afterlife, in detail, is a theory that which holds that following the point of inception synthesis or birth, i.e. the transition state period when a person is brought into the universe into the form of a bound state animate molecular entity, that during the reaction span of time when a person thinks and therefore is, that he or she is ‘alive’, and that following the point or demarcation of cessation of existence, according to the doctrine of continuity, that one transits into a new state of existence, in whatever form that may be, termed the afterlife or ‘next life’, or something to this effect, wherein one, supposedly, has some form of ‘life’ after the point of death or cessation.

Recent 2005 polls indicate that the following three queries, in ranked descending prominence of respondents, are the three greatest philosophical conundrums of modern times: [6]

What happens when you die?
What is love?
What is the meaning of life?

Hence, searches for the so-called "afterlife theory" is the biggest weakspot in things lacking explanation in modern science.

Egyptian theology

The two dominate historical versions of the 'afterlife theory' are Ab-ra-ham-ic version (53% of the world's belief system), which utilizes a resurrection afterlife model which holds that one is reborn, in the same body, into either a hypothetical land of pleasantries, if one has been morally good, or into a hypothetical land of unpleasantries, if one has been morally bad, determined by ones moral essence (soul weight), and the B-ra-hma-ic version (20% of the world's belief system), which utilizes a reincarnation resurrection afterlife model which holds that one is reborn, in multiple cycles, in different bodies (human and animal), into upgraded states or degraded states of existence, based on one's morality or karma (karma weight). These to afterlife theories are both derivatives of the Ra theology life-death cycle, which in total accounts for 72% of the modern world's belief system.

A 90,000 year-old version of the **afterlife**, a prehistoric tomb: showing two women, in the twenties or early thirties, both featuring traumatic injuries to the skull, surrounded with antlers (food or hunting prowess), wearing necklaces (beauty or status), and surrounded by sea shells (water or rebirth). [4]

Materialist-version

The alternative to the standard "doorway version" of afterlife is what is called the "materialist version of death", as American experimental psychologist Jesse Bering puts in 2006 chapter section on this topic, which holds that one becomes becomes fertilizer, worm food, cosmic dust, or something along these lines, a view which she calls the "ultimate killjoy null hypothesis". [1]

Ancient history

Theories of human afterlife, according to burial findings, indicate that variations of belief in life after life, or life after death, or that some form of state of existence follows the termination of a person, dates back to 50,000 to 100,000 years ago, with people burying things with the dead such as red ochre, stone tools, necklaces, sea shells, and animal bones, such as deer antlers or wild boar mandibles, placed in the hands of the bodies, the latter of which are reasoned to signify hunting prowess ability or to insure it in the next life. [3]

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1. Bering, Jesse. (2006). "I Believe There's a Solution to Unamuno's paradox", in: *What We Believe But Cannot Prove: Today's Leading Thinkers on Science in the Age of Certainty* (pgs. 32-35), ed. John Brockman. Harper Perennial.
2. (a) Afterlife door: Press release [Mar. 29, 2010]: Cairo: Archaeologists have unearthed a 3,500-year-old door to the afterlife from the tomb of a high-ranking Egyptian official near Karnak temple in Luxor, the Egyptian antiquities authority said. These recessed niches found in nearly all ancient Egyptian tombs were meant to take the spirits of the dead to and from the afterworld. The nearly six-foot-tall (1.75 meters) slab of pink granite was covered with religious texts.
(b) Egyptian Body and Soul (2010) – ShadowOfTheNile.BlogSpot.com.
3. Lieberman, Philip. (1993). *Uniquely Human: the Evolution of Speech, Thought, and Selfless Behavior* (pg. 163). Harvard University Press.
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5. Ken. (2011). "Human Beings are Souls with Spirits and Bodies Too: We are Not Merely a Collection of Atoms", CreationOutReach.com.
6. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pgs. 301-02). Morrisville, NC: LuLu.

Further reading

● Roach, Mary. (2005). *Spook: Science Tackles the Afterlife* (Gerry Nahum, pgs. 97-106, 290, 297). W.W. Norton & Co.

Forums

● Thermodynamics and the afterlife? (2006) – Forums.Randi.org.
● An Afterlife is Impossible (2009) – Debate.org.
● First law of thermodynamics and life after death (2008) – AboveTopSecret.com.
● Thermodynamics Disproves Afterlife (2008) – Forums.AstralDynamics.com.

External links

● Afterlife – Wikipedia.

θΔics

In dating systems, **AG**, short for “Anno Goethe” (or “After Goethe”, depending), Latin for “Year of Goethe”, or year or period of reaction synthesis of German polyintellect Johann Goethe—conceived on 21 Dec 1748, born or emerged from birth canal at noon on 28 Aug 1749, reaching an age or reaction extent of one on 28 Aug 1750, in Gregorian calendar (Christian calendar) years—as contrasted with years BG, short for “Before Goethe”, is the notation employed in the Goethean calendar system to denote current years, i.e. it is a modern era non-mythological based dating system that assigns 1 Jan 1750 to start of the year 0 AG, 1 Jan 1751 to the start of the year 1 AG, 1 Jan 1752 to the start of the year 2 AG, etc., 1 Jan 1749 to the start of the year 1 BG (technically 7-months and 28.5 days before the birth of Goethe), 1 Jan 1748 to the start of the year 2 BG, etc.

Goethean Calender

... 2050BG	... 4BG	3BG	2BG	1BG	←|→	0AG	1AG	2AG	3AG	... 260	...
... 300BC	... 1746	1747	1748	1749	Dec 31 / Jan 1	1750	1751	1752	1753	... 2010	...

A snapshot of the **Goethean calendar**, which dates years before (**BG**) or after (**AG**) the reaction synthesis, i.e. birth (28 Aug 1749), of human chemistry founder Johann Goethe. The science of chemistry, originating in the works of the Greek atomic theorists, is by definition, an explicit godless belief system, i.e. all that is exists is atoms and voids (Democritus, 410BC or 2160BG), which, when applied to humans socially, is in turn a god-free atheist belief system.

$$BG_Y = BC_Y + 1750$$
$$BG_Y = 1750 - AC_Y$$
$$AG_Y = AC_Y - 1750$$

(Conversion formulas)

Halley dating

The Goethean calendar is dated to start on the measureable day of 9-years 3-months and 13-days before the 27th documented passing of Halley’s comment, predicted by English astronomer Edmund Halley to occur on 13 Mar 1759. (Ñº)

Etymology

The BG/AG dating system is based on the following statement of American philosopher and essayist Ralph Emerson, who reasons that those "after Goethe" (AG) are modern or existing in the modern era, whereas those "before Goethe" (BG), are ancient or existed in the ancient era:

Smart Atheism: for Kids

All Rights Reserved © 266 Anno Goethe [2016AD] by Libb Thims

Draft version: 18 Oct 2016 | 309-pages

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The title page to Libb Thims draft stage *Smart Atheism: for Kids*, showing the book copyrighted according to Anno Goethe (**AG**) years. [3]

> “All before Goethe [28 Aug 1749] are ancients, and all who have read him are **modern**.”
>
> — Ralph Emerson (1852), commentary on Margaret Fuller [1]

Goethe, in turn, reasoning, similarly, that the birth of Isaac Newton, rather than the birth the fictional religio-mythology figure of Jesus Christ (aka Horus-Osiris anointed), is the start of the modern era:

> “1642 [the year of Newton’s birth] is the Christmas of the **modern age**.”
>
> — Johann Goethe (c.1810), Publication

The Newtonian calendar (BN/AN) dating system, tested in Hmolpedia, while tentatively functionable, has at least two issues, one being that Newton’s year of birth varies according to whether the Julian calendar system (older calendar) or the Gregorian calendar system (modern calendar) is employed, both versions active during his reaction existence. Second, Newton, as was the cultural milieu in his day, was not yet completely free from Christianity, though he was grappling with them, e.g. he would objectionably not label years as AD, or Anno Domini ("Year of our Lord"), but instead used AC ("Anno Christum"), signifying is objection to the argument of the existence of the trinity, namely his view that while a person named Jesus Christ, in his mind, may have existed, may have been the son of God, and may have been "christened" (anointed with oil), or arisen, such a tentative person was definitely was not the ‘Lord’ or God. [1]

Goethe, alternatively, via the intellectually-grown cultural milieu of his day, had both discarded Christianity, as a system of morality—stating that: “Christianity is subject composed by a number of wise men; it’s religion is merely a rational, political institution” (1770), also that he was “non-Christian and loathed the cross symbol †” (1782), and a year before his reaction end that “I have found no confession of faith to which I could ally myself without reservation” (1831) —in its place situating the symbols of physical chemistry (see: moral symbols) as the future's basis of the new morality or system of right and wrong (or natural and unnatural), and seemingly being the first, Empedocles aside, to embrace the fact that he was a type of chemical and to address the ramifications of this insight.

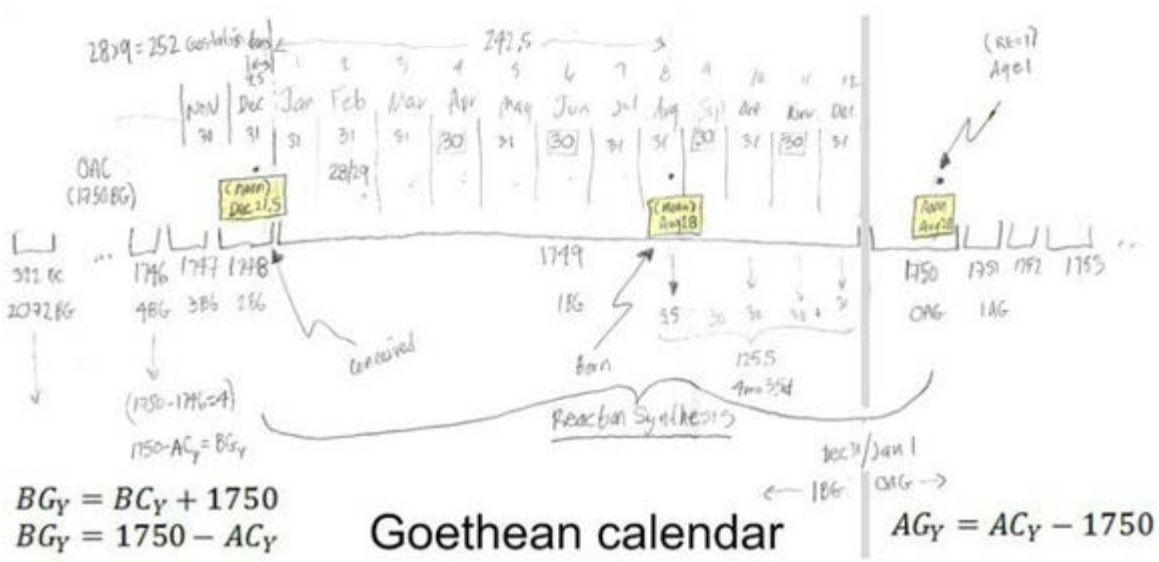

A 28 Jul 2014 (264 AG) draft sketch, showing BC/AC to BG/**AG** date conversion formulas, of the so-called Goethean calendar, initiated on 21 Jul 2014 (264 AG), in Hmolpedia, by Libb Thims, amid discussion with Mirza Beg, et al, based on the verbal 1852 (102 AG) outline by American philosopher Ralph Emerson, who referred to people, e.g. Margaret Fuller, whose minds have been raised in the era of Goethe as “modern”, Goethe, who claims to have been born at the stroke of noon on 28 Aug 1749 (1 BG) (see: Goethe timeline), in turn, likewise, conceiving the “modern age” to be the years following the birth or reaction synthesis of Newton or 1642 (108 BG)—technically 25 Dec 1642 (Julian calendar) or 4 Jan 1643 (Gregorian calendar).

The BG/AG dating system was first tested out on 21 Jul 2014 (21 Jul 264) in the Libb Thims article. This AG Hmolpedia article was initiated on 28 Jul 2014 (28 Jul 264).

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3. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

θΔics

In genius studies, **age of first spoken word** refers to the age at which a human first pronounced a recognizable word.

Overview

The following, originally from the IQ:200+ page (2009), is the list of first spoken words of a selection of child prodigies, with highest known "IQ estimates" (see: IQ key), and real IQ, aka meta-analysis IQ (meta IQ), i.e. that found if listed in the top 1000 geniuses rankings:

	Age	Person	Word	Meta IQ	IQ estimates / claims
1.	2 weeks	Ainan Cawley (1999-)	Said “Ayer” (water in Malay), whenever he was thirsty; also said “poo”, at five weeks, whenever he needed his diaper changed. (Q)		IQ_R=263-349 (age 7)
2.	6 weeks	Adragon De Mello (1976-)	Said “hello” at six weeks. (Q)		IQ_R=400 (age 5)
3.	8 weeks	Christian Heineken (1721-1725)	Spoke German at 8 weeks. (Q)		IQ_O=230 (Q)
4.	3 months	Marnen Laibow-Koser (1975-)	Speaking first words and grammatically correct sentences (IQ:R).		IQ_R=268
5.	4 months	Matthew Laine (c.1989-)	When he was about four months old, while sitting in a shopping cart, yelled to his mother, who had walked around the corner: “mommy come here”, to the amazement of onlookers. (Q)		IQ_O=200+ (Q) IQ_O=160+ (Q)
6.	4 months	Michael Kearney (1982-)	Said “daddy and “mama” at four months (Q); at age of six months, supposedly, told his pediatrician "I have a left ear infection". (Q)		IQ_R=325 (age 4) IQ_O=200 (age 14)
7.	4 months	Kim Ung-Yong (1963-)	Spoke first word at for months; talking at five months; writing at seven months.		IQ_G=210 IQ_O=200
8.	4 months	Nathan Leopold (1904-1971)	Spoke first words at four months.		IQ_O=206-210 IQ_O=200
9.	6 months	William Sidis (1898-1944)	Said “door”; also pointed to and said “moon” at seven months (Q); at about nine months said "he liked	175	IQ_P=250-300 (age 42)

				things, doors and people, that move."	303 IQ_O=200
10.	6 months		Christopher Langan (1952-)	Began talking at six months; reading at three years (Q).	IQ_M=174, 190 IQ_O=195, 190-210
11.	8 months		Alia Sabur (1989-)	Began talking at eight months (Q).	IQ_O="off the IQ scale" (Q)
12.	12 months		Edith Stern (1952-)	Was able to speak simple sentences (Q).	IQ_O=200, 201-203
13.	12 months		Ian Baker (1980-)	Spoke first word (IQ:C).	IQ_O=200
14.	13 months		Terence Tao (1975-)	Spoke first word (IQ:C).	IQ_O=233 (as Adrian Seng) IQ_R=220-230 (age 11) IQ_O=211

Of note, the mean age of first spoken word of 241 children, scoring an IQ between 160 and 237+ on the Stanford-Binet Intelligence Scale (Form L-M), aged 2.5 to 12.5, analyzed by Karen Rogers (1995), was 9 months. [1]

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National Association for Gifted Children 44th Annual Convention in
Little Rock, Arkansas, Nov 7.

External links

- Who is the world's earliest talking baby? (2015) – Quora.com.

θΔics

In science, **agent**, from the Latin *agere* 'to drive', lead, act, or do, is the abstraction of a human as an entity that acts or exerts power, produces or is capable of producing an effect, or the means or instrument by which a guiding intelligence achieves a result, modeled according to any number of theories: homo economicus—an 'an abstract molecule that responds only to economic forces' (Vilfredo Pareto, 1896); economic agent—an entity whose aim it to maximize utility or 'expected utility' via "choice" conceptualized as rational choice (Paul Samuelson, 1940); an active Browning agent—a human conceived as a Brownian motion like particle able to 'generate a field that self-consistently determines its motion' (Lutz Schimansky-Geier, 1995); an "autonomous agent"—a type of auto-catalytic perpetual motion self-reproducing molecule (Stuart Kauffman, 1999); etc. [5]

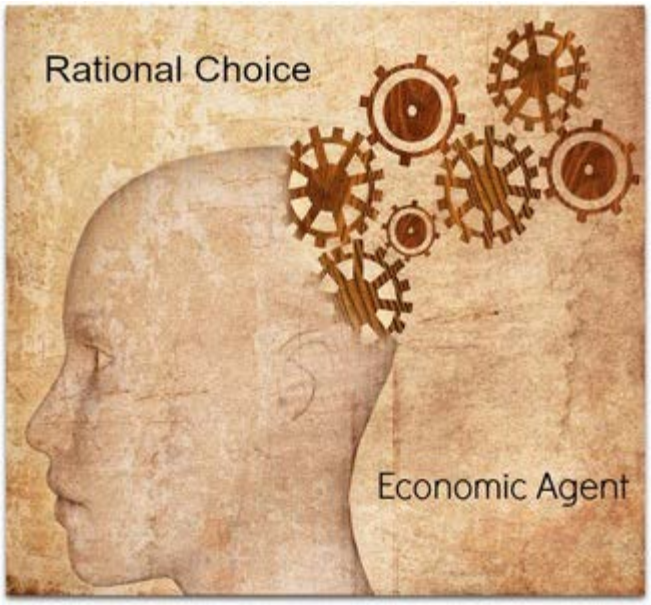

An artistic rendition of the generic "rational choice" Adam Smith type of "**economic agent**" acting so as to maximizing utility, or some variation along these lines. [4]

Economic agents

In 1941, American economist Paul Samuelson, second generation student of Willard Gibbs, published his PhD thesis, in which, according to American financial engineer Andrew Lo, he modeled each person as an "economic agent", and assumed that each individual acted so as to maximize a quantity called 'expected utility', a model with which he assumed should be able to predict their behavior in much the same way that physicists predict the behavior of physical objects.

In 1992, American philosopher Alan Nelson published his "Human Molecules" chapter wherein he posited that "economic agents" should be considered as "human molecules", an analogy comparison according to which just as thermodynamics can be reduced in approximation to statistical mechanics, by making certain assumptions about molecular agents (gas molecules), so to ideally should macroeconomics (general equilibrium theory) be reducible to microeconomics (individual choice), by making certain assumptions about economic agents (human molecules). [1]

Other

In 1999, in promotion of his upcoming book *Investigations* (2000), American bio-chemist Stuart Kauffman began to outline what seems to be his unified theory, that of what he calls the "adjacent possible" (or chemically adjacent possible), a rather ill-defined term, which he describes as those regions of the biosphere in which "autonomous agents"—Kauffman's term for a minimal living thing, which meets the criterion: (a) is auto-catalytic, (b) completes one thermodynamic work cycle, (c) has a membrane—push their way into novelty, molecular, morphological, behavioral, and organizational novelty. [2]

Quotes

The following are related quotes:

> "There seem to be 'laws' [of] social systems that have at least something of the character of natural physical laws, in that they do not yield easily to planned and arbitrary interventions. Over the past several decades, social, economic and political scientists have begun a dialogue with physical and biological scientists to try to discover whether there is truly a 'physics of society', and if so, what its laws and principles are. In particular, they have begun to regard complex modes of human activity as collections of many interacting **'agents'**—somewhat analogous to a fluid of interacting atoms or molecules, but within which there is scope for decision-making, learning and adaptation."
>
> — Philip Ball (2003), "The Physics of Society" [3]

See also

- Active Brownian agent | Browning motion
- Homo economicus
- Vilfredo Pareto

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(b) Hmolscience elaboration.

Further reading

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- Floridi, Luciano and Sanders, J.W. (2004). "On the Morality of Artificial Agents" (Abstract), *Minds and Machines*. Springer.
- Ksenzhek, Octavian S. (2007). *Money: Virtual Energy: Economy Through the Prism of Thermodynamics* (agent, 3+ pgs; agents, 3+ pgs). Universal Publishers.

External links

- Agent – Wikipedia.

θΔics

In processes, **aging** is any change, e.g. physical, psychological, and social, in an organism over time.

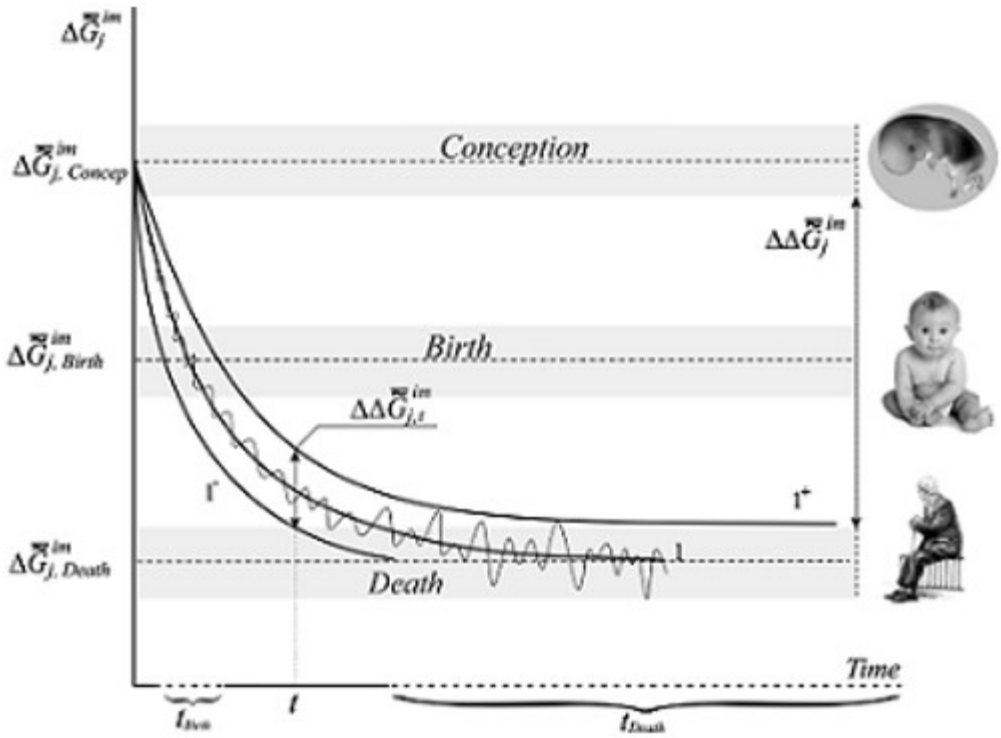

One of Georgi Gladyshev's **aging** diagrams (Q) showing hypothetical Gibbs energy change per existence stage.

Temperature

In 1975, experiments showed that the longevity *L* of fruit flies has been shown to vary inversely with ambient temperature *T*, which in formulaic terms would be stated in a form similar to the following equation: [6]

$$L = \frac{k}{T}$$

where *k* is a proportionality constant, determined by experiment.

Entropy

In the 1962 book *Time, Cells, and Aging*, American biologist Bernard Strehler devotes a section to how entropy relates to aging. [4]

In 2002, American physicist Jack Hokikian argued that aging and increase in entropy are synonymous, in that living organisms age with the passage of time because their entropy increases. In terms of aging and irreversibility, Hokikian states: [3]

> "The question of whether biological **aging** is a reversible process boils down to asking, can we transform ourselves, 'body and mind', in totality, to an earlier state?"

In answer to this, citing the 1980 work of Belgian chemist Ilya Prigogine, Hokikian concludes that "as Prigogine points out, this is impossible."

Gladyshev's model

In 1976, Russian physical chemist Georgi Gladyshev, began to develop a model of the human body as non-steady state chromatographic column such that nutritive particles migrate, up or down, along thermodynamic gradients and hierarchies in the body mediating the rate of aging. [1]

In the 1990s, Gladyshev began to conceive of the human organism as complex non-steady state chromatograph column, such that upon digestion of food-stuffs, in which some part of sustenance first reacts with hydrochloric acid and enzymes to break-down in the stomach, the nutritive particle molecules will then each migrate to different parts of the human molecular structure based on their relative thermodynamic stability and their relative chemical affinities for different intra-molecular attachment sites within the body. In 2005, through exchanges with American chemical engineer Libb Thims, Gladyshev began to conceive of his model via the logic of the human molecule – the body.

Gladyshev identifies "nutritive particle molecules" or nutritive molecules are identified as the molecules or their fragments which do not undergo change in a digestive path (or in the penetration into skin and membranes) and get (penetrate) in blood and physiological liquids of organisms. The role of such molecules is carried out with the fragments

of molecules of foodstuff, some medicines and the molecules containing in food additives (supplements). The interaction of nutritive particle molecules with supramolecular structures of an organism, including hereditary molecules of DNA and RNA, according to Gladyshev, can proceed without direct contact of these molecules to the mentioned structures.

Gladyshev argues that, according to supramolecular thermodynamics, one can investigate the supramolecular structures represent nanostructural and macro-structural formations. Thermodynamic quasi-equilibriums in these structures can be reached without direct contact between molecules and their fragments. These interactions, for example, extend through structured water which easily changes the conformation of structures. Unlike the chemistry, which considers thermodynamics of interaction between separate molecules, the supramolecular thermodynamics studies intermolecular interactions in macro-volumes rather greater sizes. The conformational variations of supramolecular structures of these volumes are reflected in variation of average specific Gibbs function of the formation of these structures, G im (im – intermolecular interactions).

The nutritive molecules influence on conformation of DNA and RNA and their supramolecular fragments. As a result of the action of such substances, dormant ancient genes, accumulated during the evolution of living beings, may be activated. It can lead to display (expression) fragments of DNA (RNA), responsible for hereditary diseases (atherosclerosis, diabetes, cancer and so on) as well as to lead to occurrence concerning the positive effects assisting a survival in a changing environment (inhabitancy). Concepts about (concerning) nutritive molecules apply to all living world including plants and so on. The action of nutritive molecules in many respects defines processes of ageing of organisms and biological evolution. These conclusions of supramolecular thermodynamics, according to Gladyshev, prove to be true according to both earlier and newer experimental data. [2]

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(f) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview). Morrisville, NC: LuLu.
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(i) Thims, Libb. (2005). "Thermodynamic Evolution", Chicago: Institute of Human Thermodynamics.
(j) Gladyshev G. P. The thermodynamic theory of aging in action: medical nutrition recommendations for patients of any age. Anti-Aging Therapeutics. Ed. Dr.R. Klats and Dr.R. Goldman, Volume IX, American Academy of Anti-Aging Medicine (A4M), 2007, Chicago, IL, USA Chapter 20, p. 135-152.
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5(5): 347–370.
(b) Ragland SS, Sohal RS (1975). "Ambient temperature, physical activity and aging in the housefly, Musca domestica". *Experimental Gerontology* 10 (5): 279–289.

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● Gladyshev, Georgi P. (2010). "Thermodynamic Theory Answer the Question: What is the Driving Force Behind Biological Evolution?", CreatAcad.org.

External links

● Aging – Wikipedia.

θΔics

In terminology, **agnostic** (TR:63), or agnosticism, coined by Thomas Huxley (1869), refers to someone amid belief and disbelief in the existence of god; someone in the 3-5 range on the Dawkins scale (2006).

ag·nos·tic
/ag'nästik/

noun

1. a person who believes that nothing is known or can be known of the existence or nature of God or of anything beyond material phenomena; a person who claims neither faith nor disbelief in God.

A Google-generated definition of agnostic: a person who is in between being a theist and an atheist.

Etymology

In 1869, Thomas Huxley coined the "agnostic"; the following is a retrospect statement about how this term came about:

> "When I reached intellectual maturity, and began to ask myself whether I was an atheist, a theist, or a pantheist; a materialist or an idealist; a Christian or a freethinker, I found that the more I learned and reflected, the less ready was the answer; until at last I came to the conclusion that I had neither art nor part with any of these denominations, except the last. The one thing in which most of these good people were agreed was the one thing in which I differed from them. They were quite sure that they had attained a certain "gnosis"—had more or less successfully solved the problem of existence; while I was quite sure I had not, and had a pretty strong conviction that the problem was insoluble. And, with Hume and Kant on my side, I could not think myself presumptuous in holding fast by that opinion ... So I took thought, and invented what I conceived to be the appropriate title of "**agnostic**". It came into my head as suggestively antithetic to the "gnostic" of Church history, who professed to know so much about the very things of which I was ignorant; and I took the earliest opportunity of parading it at our Society, to show that I, too, had a tail, like the other foxes."
>
> — Thomas Huxley (c.1885), in: Encyclopedia of Religion and Ethics (Ñº), 1908

(add discussion)

Quotes

The following are related quotes:

> "Well, I tell you, if I have been wrong in my **agnosticism**, when I die I'll walk up to god in a manly way and say, sir, I made an honest mistake."
>
> — Henry Mencken (c.1930)

> "I have repeatedly said that in my opinion the idea of a personal god is a childlike one. You may call me an **agnostic**, but I do not share the crusading spirit of the professional atheist whose fervor is mostly due to a painful act of liberation from the fetters of religious indoctrination received in youth. I prefer an attitude of humility corresponding to the weakness of our intellectual understanding of nature and of our own being."
>
> — Albert Einstein (c.1955)

> "At exactly which point I lost my early religious faith I am not clear, but I suspect I was then about twelve years old. It was almost certainly before the actual onset of puberty. I remember telling my mother that I no longer wished to go to church, and she was visibly upset by this. I imagine that my growing interest in science and the rather lowly intellectual level of the preacher and his congregation motivated me, though I

doubt if it would have made much difference if I had known of other more sophisticated Christian beliefs. Whatever the reason, from then on I was a skeptic, an **agnostic** with a strong inclination toward atheism."

— Francis Crick (1990), reflection on circa age 12 years [1]

References

1. Crick, Francis. (1966). "Why am I a Humanist" (Ñº), *Varsity Magazine*.

External links

â— Agnosticism – Wikipedia.

θΔics

In existographies, **Aharon Katchalsky** (1914-1972), aka "Aharon Katzir" was an Israeli chemist and biophysical thermodynamicist noted for his 1965 *Nonequilibrium Thermodynamics in Biophysics*, a fairly cogent application of thermodynamics to physiological problems.

Overview

In 1958, Katchalsky began to bring the formalism of linear nonequilibrium thermodynamics into physiology (biology), particularly in the study of membrane transport. [1]

In 1965, Katchalsky published his *Nonequilibrium Thermodynamics in Biophysics*, co-written with American epithelial physiologist Peter Curran, which is one of the most fluent and cogent textbooks on thermodynamics ever written. [3]

Katchalsky was fascinated by the concept of time, in the context of the irreversible directionality of thermodynamics, epitomized as a movement towards disorder, and directional physiology of living organisms, as captured in the general ordering process of evolution. On this topic, in 1965 Katchalsky gave a series of lectures on “The Physics and Biology of Time”, recorded by on film, at the University of California at Berkeley. [1] In 1968, Katchalsky founded the field of network thermodynamics through his associations at Harvard University and the Lewis School of thermodynamics. [4]

On 29 Dec 1970, Katchalsky, via his “Thermodynamics of Flow and Biological Organization”, was the opening speaker at the AAAS Symposium on Science and Human Values, a conference largely devoted to the application of thermodynamics to social phenomena. [5]

Reaction end

Katchalsky's thermodynamics work was cut short, irregularly, when he died during the May 30th, 1972 Lod Airport massacre at Tel Aviv.

Quotes | On

The following are related quotes:

> “Thermodynamics was one of **Katchalsky**’s great loves.”
>
> — Alan Perelson (1975), “Network Thermodynamics” [2]

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2. Perelson, Alan S. (1975). “Network Thermodynamics”, *Biophysical Journal*, Vol. 15 (7): 667-85.
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4. Peter F. Curran (1931-1974) – Biography, The-APS.org.
5. Katchalsky, Aharon. (1971). “Thermodynamics of Flow and Biological Organization” (abs)(Ñº), *Zygon*, 6(2):99-125.

External links

â— Aharon Katzir – Wikipedia.

θΔics

In existographies, **Ahmad Mumtaz** (1940-) is a Pakistani management scientist, noted for []

Overview

In c.1974, Mumtaz was a lecturer in management science at National Institute of Public Administration, Karachi Pakistan.

Quotes | On

The following are quotes on Mumtaz:

> "In 1974, I was nominated to attend an advanced training course at the National Institute of Public Administration, Karachi. As a chemist working on the fundamental aspects of coordination and organometallic chemistry, it seemed odd and totally unrelated to me. However, the first lecture by [management scientist] **Ahmed Mumtaz** was quite polarizing when he said that if the lectures during the following weeks could create a disturbance, even though slight, in the thinking of the participants, the objectives of the course would be attained and this led me to take the course with an open mind. I devoted quite a bit of my time to the course material picking up points related to chemistry and interpreting them in physico-chemical terms, wherever possible."
>
> — Mirza Beg (1987), *New Dimensions in Sociology* (Author's Preface, pg. vi) [1]

See also

● Ahsan Siddiqui

References

1. Beg, Mirza Arshad Ali. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (intro) (pdf, annotations by Libb Thims, 2014). Karachi: The Hamdard Foundation.

Further reading

● Mumtaz, Ahmad. (1974). *Bureaucracy and Political Development in Pakistan* (Q). Karachi: National Institute of Public Administration.

External links

● Ahmad Mumtaz (books) – WorldCat.

θΔics

In existographies, **Ahsan H. Siddiqui** (c.1930-) is a Pakistani public administrations advisor, noted for []

Overview

In 1974, Siddiqui, then director of the National Institute of Public Administration, Karachi, encouraged Mirza Beg to write his notes "relating physico-chemical terminologies to those of human behavior" and thought that it would be a "a valuable contribution to the field of sociology." [1]

Education

Siddiqui completed his PhD in the humanities, presumably in business administration and or economics; Siddiqui was a student of Mirza Amjed Beg, the brother of Mirza Beg. [2] In 2019, Siddiqui was residing in Islamabad, Pakistan.

Quotes | On

The following are quotes on Siddiqui:

> "**Siddiqui** was a great man. He encouraged me to write about what I meant about the potential energy, activation, activation complex, and activation complex formation. He wanted me to say that in writing. Tell us what you mean?"
>
> — Mirza Beg (2019), "Beg Interview, Day One (Part One) on Physico-Chemical Sociology", Sep 16 [2]

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(b) Beg, Mirza. (2019). "Beg Interview, Day One (Part One) on Physico-Chemical Sociology" (Interviewer: Libb Thims) (46:37-) (Ñº), Human Chemistry 101, Mon, Sep 16.

θΔics

By [genius quotient](), **All IQ ratings of 282 Young Geniuses** refers to the [282]() ratings of the top 282 geniuses, in of the [Cox Sample]() (301 geniuses), a subset of the [Terman Sample](), specifically the IQs of such genius, in the age range of "childhood and early youth" [Ch IQ] based on "[aptitude](), [achievement](), [character](), [leadership]() and performance", spanning from Sector Minimum [Ai IQ (min)] to [Sector Max]() [Ai IQ (max)].

Overview

The following is the 16-inch wide fold out "Individual and Average All IQ Ratings of 282 Young Geniuses" as found in [Volume Four]() "*Early Mental Traits of Three Hundred Geniuses*" [1] by [Lewis Terman]() and [Catharine Cox]() (1926). Terman and Cox used the [Stanford-Binet]() IQ test, which was used by Jerry and subject **All IQ** [scores]() for "individuals noted for [achievement]() or their [aptitude](), [leadership]() and performance in childhood and early youth" [pg. 87], as opposed to **All IQ** (Ai)(not table not available), referring to individuals "in the first permitted young manhood" [31]

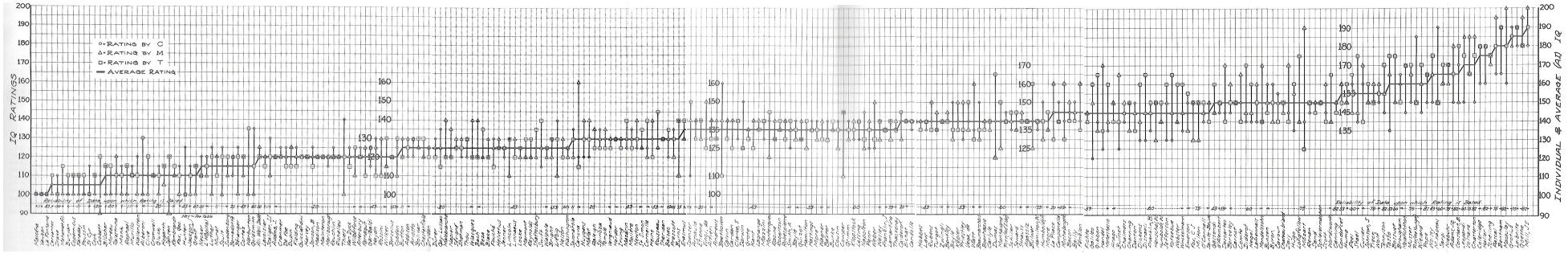

(cont)

References:

1. Cox, Catharine. (1926). Genetic Studies of Genius, Volume II. *The Early Mental Traits of Three Hundred Geniuses* [CH] [Ch] [ch] [All IQ] ratings [Hollow chart], pp. 545-55. Stanford University Press.

In bodies, **air** is gaseous substance comprised of approximately ten, dry weight, chemical species: nitrogen (N_2) 78%, oxygen (O_2) 21%, as well as argon (Ar), neon (Ne), helium (He), methane (CH_4), krypton (Kr), hydrogen (H_2), nitrous oxide (N_2O), and xenon (Xe), in smaller percentages, embedded in a system of about forty percent water vapor (H_20).

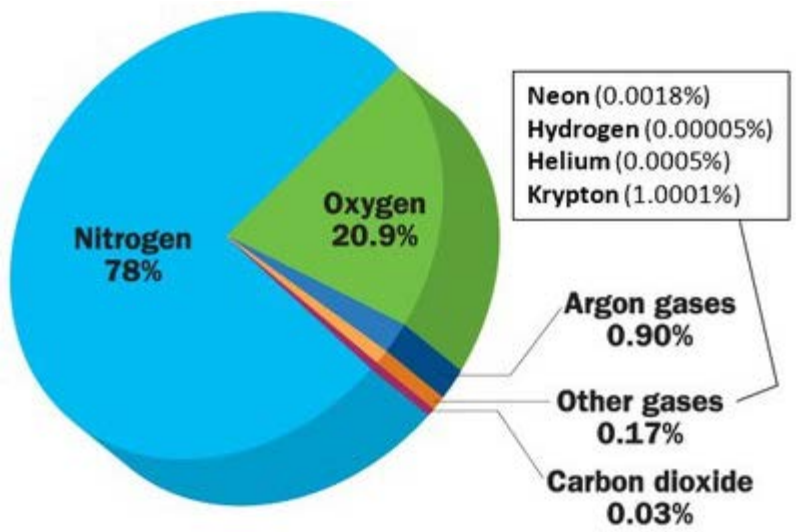

A composition pie chart of **air**:nitrogen (N_2) 78%, oxygen (O_2) 21%, as well as argon (Ar), neon (Ne), helium (He), methane (CH_4), krypton (Kr), hydrogen (H_2), nitrous oxide (N_2O), and xenon (Xe), in smaller percentages, embedded in a system of about forty percent water vapor (H_20)

Quotes

The following are related quotes:

> "The '**air**' is nothing other than a fume or evaporation coming from the earth, which it surrounds with a 'fixed and definite weight'. It penetrates everything that is not already filled with some other substance, is carried with the earth is it executes both its daily and annual motions, and, along with the earth, constitutes, as it were, a single body. We can 'weight the air' confined to a glass vessel. The weight is given by how much lighter the glass is once it has been evacuated. A receiver, e.g., of the sort that medical people use to distill water, is about three or four lobt [small coin] lighter after the extraction of the air."
>
> — Otto Guericke (1656), "Letter to Gaspar Schott", Jun 18 [1]

See also

- Air engine
- New Experiments on the Spring of the air
- Pump problem

References

1. Conlon, Thomas. (2011). *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum* (pgs. 68-69). Saint Austin Press/LuLu.

External links

- Air – Wikipedia.

θΔics

In science, **air pump** (TR:5) is combination vacuum pump, i.e. able to suck air out of a vacuum bulb or "receiver", and able pump air into the vacuum bulb or receiver.

Overview

The original 1647 pump designs of Otto Guericke were "vacuum pumps", a product of him trying to suck the air out of beer keg (see: beer keg experiment). The 1659 re-design of the former by Robert Boyle was a combination vacuum pump and air pump, which Boyle referred to as a "pneumatical engine", but which latter came to be called or classified, particularly by historians, as a "air pump". The following is a timeline map of the spread of the construction of air pumps, starting with Guericke's vacuum pump, which was followed by Boyle's air pump, then Christiaan Huygens pump, possibly Henry Power's pump, and Denis Papin's pump, being the main versions: [2]

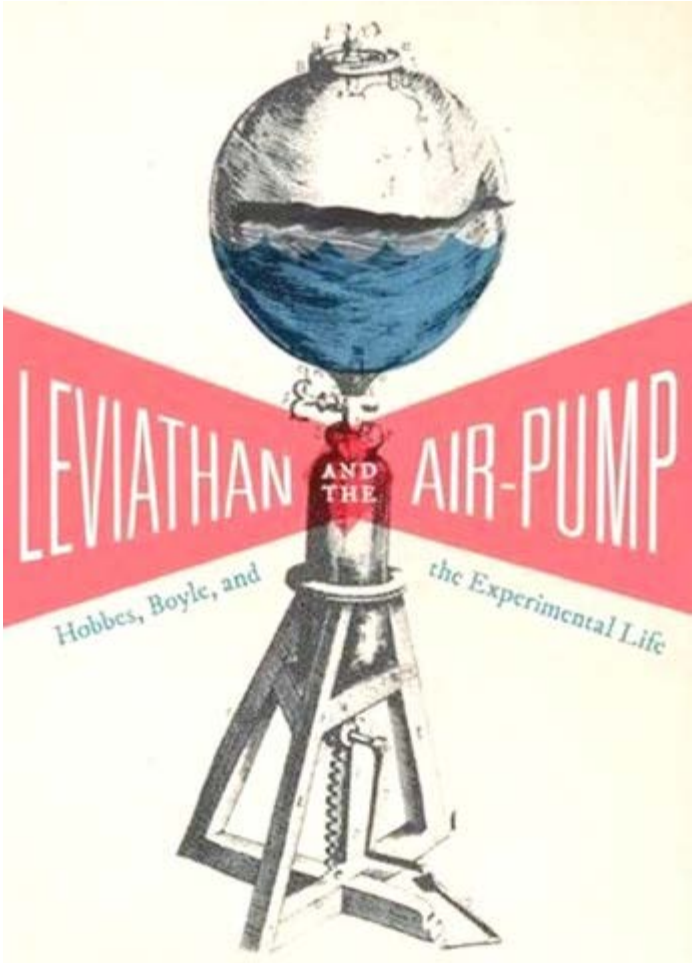

One of the various cover designs of Steven Shapin and Simon Schaffer's 1985 *Leviathan and the Air Pump*, showing a fish inside of the receiver "vacuum bulb" (top part), the part below the turn valve, at the bottom of the bulb, being the "**air pump**". [2]

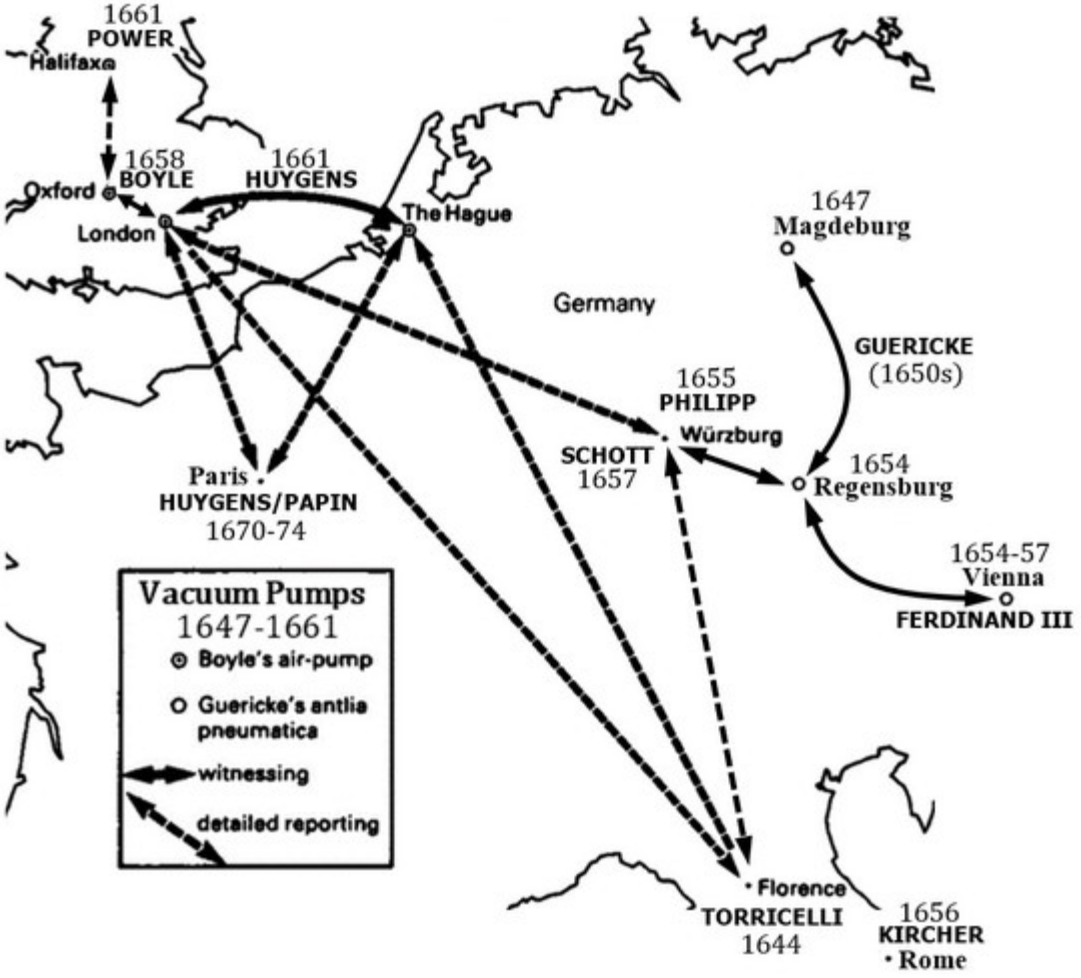

Note

The term “air pump”, as used in engineer and science discussion, is not to be confused with a typical air pump, such as used to fill a bicycle tire, as these types of devices simply push air into deflated tire tubes, but aren't able to make vacuums.

Quotes

The following are related quotes:

> “Papin's project of 1687, for using gunpowder, is of no real utility: indeed, he was sensible that he had not succeeded, and said he published it only to excite the learned of other countries to perfect it. (See the *Acta Eruditorem* for 1688, p. 497.) He proposed to employ a cylinder with a piston fitted into it, and to the rod of this piston the weights which were to be raised were applied by a rope conducted over pulleys, and they were to be lifted by the pressure of the atmospheric air upon the piston, when the air was exhausted from the cylinder. Thus far, he followed Otto Guericke; but instead of exhausting the cylinder by an **air pump**, Papin proposed to drive out the air by firing off a small quantity of gunpowder in the inside of the cylinder. The piston had a large aperture in it, covered by a valve opening upwards; and he thought that the sudden blast of flame produced by the explosion of the gunpowder would lift up the valve, and drive out the air at the aperture; but when the flame ceased, the valve would fall, and prevent the return of the air into the cylinder, so as to leave it exhausted, and then the pressure of the atmosphere on the upper surface of the piston not being balanced by any air beneath, would press the piston down with great force. Papin speaks of two models of this machine which he tried; one of them five inches diameter and 16, inches high; but he says he could never succeed in expelling the whole of the air from the inside of the cylinder: about one-fifth always remained, and that fifth, as he says, reduced the force to one-half of what it would have been if he could have expelled the whole of the air.”

— John Farey (1827), *A Treatise on the Steam Engine* [1]

"Boyle's original [pneumatic] machine [1658/1659] was presented to the Royal Society of London; he had one or two redesigned machines built for him by 1662, operating mainly in Oxford; Christiaan Huygens had one made in *The Hague* in 1661; thee was one at the Montmor Academy (Ñº) in Paris; there was one at Christ's College, Cambridge, by the mid-1660s; and Henry Power may have possessed on in Halifax from 1661. So far as can be found out, these were all the pumps that existed in the decade after their invention."

— Steven Shapin (1985), *Leviathan and the Air Pump* (co-author: Simon Schaffer) (pg. 38-39) [2]

References

1. Farey, John. (1827). *A Treatise on the Steam Engine: Historical, Practical, and Descriptive* (pgs. 94-98). Longman.
2. Shapin, Steven; Schaffer, Simon. (1985). *Leviathan and the Air Pump: Hobbes, Boyle, and the Experimental Life* (quote, pgs. 38-39; map, pg. 228). Princeton, 2011.

θΔics

In existographies, **Akhenaten** (c.1380-1335BC) (IQ:170|#331) (Time 100:2) (FA:1) (CR:39), son of Amen-hetep III, was an Egyptian pharaoh credited with the first attempted formulation of monotheism, via the god Aten. [1]

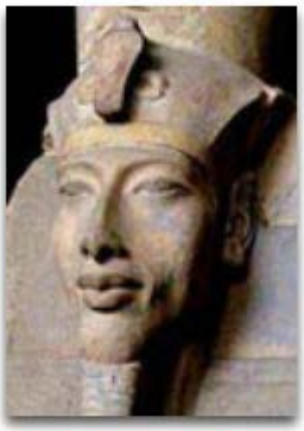

Name change

Akhenaten, the son of Amen-hetep III, was born Amen-hotep IV (or Amen-hetep IV), meaning "Amun is satisfied" (Ñº), but in adulthood, to embody his switch from Amen-Ra henotheism to Aten monotheism, changed his name to Akhenaten, written in hieroglyphics as: [5]

meaning "effective for Aten (or sun disc)", which has been rendered variously as: Khu-en-aten (Cooper, 1877), Khut-en-Aten (Budge, 1904), Akhnaton (Weigall, 1923), Ikhnaton (Freud, 1939), among other variants.

Judaism

In the 19th century, a number of scholars began to conjecture that the monotheistic religious reform initiated by Akhenaten was the seed of what would eventually transform into Judaism; the following is a noted opinion:

> "If Moses was an Egyptian and if he transmitted to the Jews his own religion then it was that of **Ikhnaton**, the Aton religion."
>
> — Sigmund Freud (1939), *Moses and Monotheism* (pg. 27) [3]

(add)

Ten Commandments

A number of passages in the Bible, such as the penning of the Ten Commandments, are said to have been written with "god's finger", which is the visual depiction of Akhenaten's god Aten, a sun disc with many arms, representative of sun rays, each with one finger.

Psalms

The "Hymn to Aten", as Ahmed Osman (1990), among others, have noticed, bears striking resemblance to Psalm 104. [2]

Ethics

Akhenaten regularly described himself as "living in Maat", meaning living in truth and justice, or something to this effect. [2]

Quotes | On

The following are related quotes:

> "**Ikhnaton**, who sought to reform religious conceptions in the light of reason is the 'first individual' in history."
>
> — J.H. Breasted (c.1910), *Publication*; cited by Roderick Seidenberg (1950) in *Post-Historic Man* (pg. 86)

"**Akhnaton** flung all these formulas into the fire. Djins, bogies, spirits, monsters, demigods and Osiris himself with all his court, were swept into the blaze and reduced to ashes."

— Arthur Weigall (1923), *The Life and Times of Akhenaton* (pg. 121) [4]

"**Akhenaten**'s fascination for the sun disc Aten is akin to constituting atheism."

— Donald Redford (1984), *Akhenaten: the Heretic King*; cited by Karl Luckert (1991) in *Egyptian Light and Hebrew Fire* (pg. 109)

References

1. Asante, Molefi K. (2004). *From Imhotep to Akhenaten: An Introduction to Egyptian* (§:Celestial Elements, pgs. 53-). *Philosophers*.
2. Osman, Ahmed. (1990). *Moses and Akhenaten*: *the Secret History of the Egypt at the Time of the Exodus* (pg. 5). Bear & Co.
3. Freud, Sigmund. (1937). *The Man Moses and the Monotheistic Religion: Three Essays* (*Der Mann Moses und die monotheistische Religion. Drei Abhandlungen*). Imago*; Moses and Monotheism* (translator: Katherine Jones) (txt) (pgs. 27; 61-62). Knopf, 1939.
4. Freud, Sigmund. (1937). *The Man Moses and the Monotheistic Religion: Three Essays* (*Der Mann Moses und die monotheistische Religion. Drei Abhandlungen*). Imago*; Moses and Monotheism* (translator: Katherine Jones) (txt) (pg. 26). Knopf, 1939.
5. Budge, Wallis. (1904). *The Gods of the Egyptians*, *Volume Two* (pg. 72). Dover, 1969.

External links

â— Akhenaten – Wikipedia.

θΔics

In existographies, **Al-Battani** (c.858-929) (IQ:165|#445) (GMG:22), aka “Albattani” (Guericke, 1672), was an Arab astronomer and mathematician; referred to as the "Ptolemy of the Arabs"; considered the greatest and best known astronomer of the medieval Islamic world; noted for his work in trigonometry; quoted by Copernicus; cited by Guericke (1672) who he refers to as the "follower [or successor] of Ptolemy".

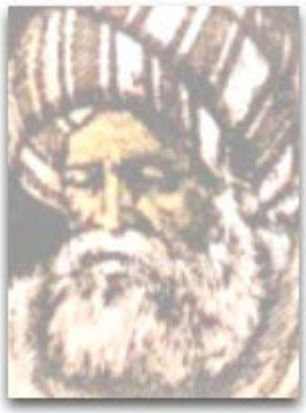

Quotes | On

The following are quotes on al-Battani:

> “When I attribute certain motions to the terrestrial globe, they will immediately shout to have me and my opinion hooted off the stage. Therefore, when I weighted these things in my mind, the scorn which I had to fear on account of the newness and absurdity of my opinion [that the earth moves] almost drove me to abandon a work already undertaken. In fact, I kept [the manuscript] hidden among my things.”
>
> — Nicolaus Copernicus (c.1540), a reference, supposedly, to the earlier work of al-Zarqali and **al-Battani** [2]

> “**Al-Battani** and al-Fargani are astronomers of the first rank among Arabs.”
>
> — Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* (pg. 57) [1]

> “That one cannot prove the existence of the moon's apogee and perigee by eclipses is clearly shown by the investigations of Ptolemy and **Albattani** who followed him, both of whom assigned different sizes to the angle subtending the moon in the apogee of its epicycle and the angle subtending ft in perigee which was 4' according to
> Ptolemy and 5'50" according to Albattani.”
>
> — Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* (pg. 285) [1]

References

1. Guericke, Otto. (1663). *New Magdeburg Experiments: on the Vacuum of Space* (*Ottonis de Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (translator and preface: Margaret Ames) (Albattani, 5+ pgs). Publisher, 1672; Kluwer, 1994; Springer, 2012.
2. (a) Copernicus, Nicolaus. (1543). *On the Revolution of the Heavenly Spheres* (editing and commentary: Stephen Hawking) (pg. 2). Running Press, 2002.
(b) Repcheck, Jack. (2007). *Copernicus’ Secret: How the Scientific Revolution Began* (pg. 10). Simon & Schuster.
(c) Saleh, Abeer. (2015). *One Giant Step for Mankind: One Verse at a Time* (pg. 57). Cedar Graphics.

External links

â— Al-Battani – Wikipedia.

θΔics

In existographies, **Al-Kindi** (c.801-873AD) (IQ:160|#556) [RGM:745|1,500+] (CR:1) was Muslim Arab philosopher, polymath, mathematician, physician, musician cryptographer (Q), and oft-cited middle ages genius, noted for []

Overview

Al-Kindi was one of the first to initiate the import of Greek philosophy into Arabic thinking; he was deeply involved in the translation and reception of such thinkers as Socrates, Aristotle, Plotinus, and Euclid. (Q)

Al-Kindi was one of the first blue sky problem theorists; a noted cryptographer; an alchemy debunker, e.g. asserting that base metals cannot be transformed into gold or silver; characterized as the "first great Muslim Aristotelians" (Hecht, 2004)

Quotes | On

The following are quotes on al-Kindi:

> "Ibn al-Haytham [Alhazen] was certainly the world's greatest physicist in the almost two millennia gap between Archimedes and Galileo. There were others, like Biruni, **Al-Kindi**, Khwarizmi (it's a long list) but none of the others did physics (theory and experiment) in way we understand the subject today."
>
> — Jim Al-Khalili (2019), Tweet (Q), Jan 10

Quotes | By

The following are noted quotes:

> "Muslims should not be ashamed to acknowledge truth and to assimilate it from whatever source it comes, even if it is brought via former generations and foreign peoples."
>
> — Al Kindi (c.850) [1]

References

1. (a) Armstrong, Karen. (1993). *A History of God* (pg. 173). Knopf.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 221). HarperOne.

External links

- Al-Kindi – Wikipedia.

θΔics

In existographies, **Abdallah al-Marri** (973-1057) (IQ:175|#233) (Murray 4000:3|AL) (FA:32) (CR:10), oft-cited as "al-Marri", aka the "Arab Lucretius" (Issa, 2016), was a Syrian-born blind philosopher, poet, skeptic, and irreligionist (Q), historically “Arab atheist” (Q), noted for his attacks on the dogmas of religion, his rejection of Islam, his sarcasm towards the religions of Jews, Christians and Zoroastrians, and his general view that religion consisted of ancient fables used to exploit the masses. (Q)

Atheism

Al-Marri is ranked, by Luke Meuhlauser (2009) (Q), alongside: Epicurus, Jean Meslier, Robert Ingersoll, and Noam Chomsky, as a top classical nonbeliever; categorized (Q) as an Arab atheist.

Epistle of Forgiveness

Al-Marri’s *Epistle of Forgiveness* (*Resalat Al-Ghufran*), which in 2007, was banned by the Algerian Ministry of Religious Affairs, is so similar to John Milton’s *Paradise Lost*, that most of today’s educated Arabs either associate the two works; and in 1886 some were erroneously claiming that Milton borrowed from *Epistle*; moreover, in 1919, Spanish orientalists suggested that Danti’s *Divine Comedy*, used ideas from Al-Marri’s *Epistle*. [5]

Heretic | Ranking

In 14th century, al-Marri was classified as a top three heretic:

> “The heretics in Islam are three: Ibn al Rawandi, Abu Hayyan al Tawhidi, and **Abu Alaa al-Ma’arri**–of them, mostly Abu Hayyan, because they (attempt to) edify grandiloquence but in fact they babble.”
>
> — Ibn al-Jawziyyah (c.1325) [3]

In 2004, Jennifer Hecht, likewise, groups al-Rawandi, al-Tauhidi, and al-Ma’arri as the "three worst zindiqs" [anti-religionists] of Islam, according to the Islamic tradition. [1]

Genius | Rankings

See also: Middle ages genius

Al-Marri is oft-compared to the following:

- Lucretius (99-55 BC) (IQ:180|#92) [RGM:N/A|1,260+] (Cattell 1000:209)
- Lucian (c.120-190AD) (IQ:#|#) [RGM:N/A|1,250+] (Cattell 1000:387)
- John Milton (1608-1674) (IQ:180|#111) [RGM:330|1,250+] (Cattell 1000:16)
- Dante Alighieri (1265-1321) (IQ:175|#218) [RGM:51|1,260+] (Cattell 1000:42)

Would seem to yield him (Jun 2017) an four-person genius comparison synthesis intelligence of (IQ:178|#164) [RGM:191|1,260+] (Cattell 1000:164); which, rounding down on the safe side of genius ranking guesstimation, yields an first draft IQ of 175 mean position #173 (which falls in the 180 IQ ranges); therefore #209 intuited.

Influenced

Influenced Al-Marri influenced Omar Khayyam and Saadi Shirazi (1210-1291). [5]

Quotes | On

The following are quotes on Al-Marri:

"It takes a keen mind [something Alfred von Kremer (c.1875) (Q) lacked] to examine the language and style [of the poetry of Al-Marri] with sufficient closeness to detect the subtle manner in which the poet at once disguises and proclaims his unbelief in the Mohammedan or any other revealed religion. Al-Marri contemplates life with the profound feelings of Lucretius and is like Lucian."

— Reynold Nicholson (1920), *Studies in Islamic Poetry* [4]

"Al-Marri is one of the great doubters of all time."

— Jennifer Hecht (2004), *Doubt: a History* [4]

Quotes | Intelligence

The following are al-Marri quotes on intelligence:

Left: the 1944 bust of **al-Marri**, by sculptor Fathi Muhammad. Right: a photo of the beheaded (and shot) Al-Marri, in his Syrian hometown of Maarrat al Nu'man (Q), aka "al-Ma'arra" (from which his nisba or Arabic toponymic nickname is derived), done by the al-Qaeda jihadists from the Al-Nusra Front. [3]

"If a man of sound judgment appeals to his intelligence, he will hold cheap the various creeds and despise them."

— Al Marri (c.1020) [2]

"Humanity follows two world-wide sects: one, men intelligent but without religion, second, men religious but without intellect."

— Al Marri (c.1020), "The Epistle of Forgiveness" (Q); this statement, of note, is misattributed, by Madalyn O'Hair (Q), in her *The Atheist World* (1991) (pg. 46), to Averroes; variant later said (Q) by Goethe [1]

Quotes | By

The following are quotes by al-Marri:

"Young men grow up in the belief to which his father has accustomed him. It is not reason that makes him religious, but he is taught religion his next of kin."

— Al Marri (c.1020) [2]

"They recite their sacred books, although the fact informs me that these are fiction from first to last. Reason

alone speaks the truth."

— Al Marri (c.1020) [2]

"The sacred stones in Mecca, visited and touched with hands and lips, are stones that were once kicked."

— Al Marri (c.1020) [2]

"The Christians have lied concerning the son of Mary. The Jews also lied concerning the son of Amran."

— Al Marri (c.1020) [2]

"Had they been left alone with reason, they would not have accepted a spoken lie; but the whips were raised to strike them down. Traditions were brought to them, and they were bidden to say, 'we have been told the truth', and if they refused, the sword was drenched in their blood."

— Al Marri (c.1020) [2]

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 231-33). HarperOne.
2. (a) Nicholson, Reynold A. (1920). *Studies in Islamic Poetry* (fiction, pg. 110; Mary, pg. 174; creeds, pg. 174; kin, pg. 176; blood, pg. 177; stones, pg. 191). Cambridge University Press.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 231-33). HarperOne.
3. Kamel, Marwan. (2015). "The 11th Century Poet Who Pissed of al-Qaeda" (Q), HistoryAnswers.co.uk, Feb 2.
4. (a) Nicholson, Reynold A. (1920). *Studies in Islamic Poetry* (Kremer, pg. viii; Lucretius, pg. 44). Cambridge University Press.
(b) Nicholson, Reynold A. (1930). *Literary History of the Arabs* (Lucian, pg. 318-19). Cambridge University Press.
(c) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 474, 519). HarperOne.
5. Issa, Islam. (2016). *Milton in the Arab-Muslim World* (Arab Lucretius, pg. 38). Taylor & Francis.

Further reading

- Al-Marri (c.1030). "The Tinder Spark", Publisher.
- Al-Marri (c.1030). "Unnecessary Necessity", Publisher.
- Al-Marri (c.1030). "The Epistle of Forgiveness", Publisher.

External links

- Al-Ma 'arri – Wikipedia.

θΔics

In existographies, **Zakariya al-Razi** (865-925) (IQ:170|#375) (RGM:719|1,500+) (FA:17) (CR:7), aka “Razi” (in Iran), “Rhazes” (in West), or "Abu Bakr al-Razi" (Hecht, 2004) was Persian physician, chemist, and polymath, generally known for his discovery of alcohol; noted, in atheism, for being one of the first outspoken religion-questioners in the Islamic world.

Atheism

Razi was one of the first skeptics of Islam, the newly-formed Muhammad [c. 575-632] centric Abrahamic faith. Razi is characterized as an "outspoken deist" and a "full-time freethinker" (Q).

Education

Razi was influenced by Hippocrates and classical Greek medicine. (Q)

Quotes | On

The following are quotes on Al-Razi:

> “Many scientists and doctors have been doubters of religious dogma, including physicist Galileo, the Jewish theorist and doctor Maimonides, the Muslim philosopher and doctor **Abu Bakr al-Razi**, and the physicist Marie Curie.”
>
> — Jennifer Hecht (2004), *Doubt: a History* [1]

> “**Al-Razi** is the greatest non-conformist in the whole history of Islam; the most free-thinking of the major philosophers of Islam; the lest orthodox and the most iconoclast; perhaps the single figure most frequently denounced and disapproved as a heretic in the subsequent history of Islamic thought. His doctrine emerges as irreconcilable with any kind of Islam, however open-minded.”
>
> — Jennifer Hecht (2004), aggregate quote of views, via citation of Sarah Stroumsa (1999), on Al-Razi [2]

Quotes | By

The following are quotes by Razi:

> “As a result of being long accustomed to their religious denomination, as days passed and it became a habit. Because they were deluded by the beards of the goats, who sit in ranks in their councils, straining their throats in recounting lies, senseless myths, and ‘so-and-so told us in the name of so-and-so …”
>
> — Zakariya Razi (c.910) *Source*; cited by *The Encyclopedia of Islam* (1938) as the “most violent polemic against religion in the course of the middle ages.” [3]

> “If the people of this religion are asked about the proof of the soundness of their religion, they flare up, get angry and spill blood of whoever confronts them with this question. They forbid rational speculation, and strive to kill their adversaries. This is why the truth became thoroughly silenced and concealed.”
>
> — Zakariya Razi (c.910) [2]

> “You claim that the evidentiary miracle is present and available, namely, the Quran. You say: ‘whoever denies it, let them produce a similar one’. Indeed, we shall produce a thousand similar, form the works of the rhetoricians, eloquent speakers and valiant poets, which are more appropriately phrased and stated the issues more succinctly. They convey the meaning better and their rhymed prose is in better meter. By god what you say astonishes us! You are talking about a work which recounts ancient myths, and which at the same time if full of contradictions and does not contain any useful information or explanation. Then you say: ‘produce something like it’?!”
>
> — Zakariya Razi (c.910) [2]

> “Jesus claimed that he was the son of god, while Moses claimed that god had no son, and Muhammad claimed that Jesus was created like the rest of humanity. Moreover, Mani and Zoroaster contradicted Moses, Jesus, and Muhammad regarding the ‘eternal one’, the coming into being of the world, and the reasons for the existence of good and evil.”
>
> — Zakariya Razi (c.910) [2]

> “No soul can be purged from the turbidity of this world and escape to the next, except by contemplating philosophy. If a person contemplates philosophy and comprehends anything, be it ever so small, his soul is purged from this turbidity and is saved.”
>
> — Zakariya Razi (c.910) [2]

References

1. Hecht, Jennifer M. (2004). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (xxi). HarperOne.
2. (a) Stroumsa, Sarah. (1999). *Freethinkers of Medieval Islam* (pg. 90; flare up, pg. 96; beards of goats, pg. 98; Jesus, pgs. 99-100; miracle, pg. 103; soul, pg. 113). Brill.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 227; flare up, pg. 228; beards of goats, pg. 228; Jesus, pgs. 228-29; miracle, pg. 229; soul, pg. 229-30). HarperOne.
3. (a) Kraus, P. and Pines S. (1938). *The Encyclopedia of Islam* (pg. 1136). Publisher.
(b) Stroumsa, Sarah. (1999). *Freethinkers of Medieval Islam* (beards of goats, pg. 98). Brill.
(c) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (beards of goats, pg. 228). HarperOne.

Further reading

- Razi, Zakariya. (c.900). *The Prophet’s Fraudulent Tricks*. Publisher.
- Razi, Zakariya. (c.900). *The Stratagems of Those Who Claim to Be Prophets*. Publisher.
- Razi, Zakariya. (c.900). *On the Refutation of Revealed Religion*. Publisher.

External links

- Muhammad ibn Zakariya al-Razi – Wikipedia.

θΔics

In existographies, **Alan Gardiner** (1879-1963) was an English Egyptologist, linguist, and philologist, noted for []

Overview

In c.1916, Gardiner, supposedly, conjectured, in rather weak terms, that the "N" derives from a Proto-Sinaitic text snake like symbol.

Some cite Gardiner as being the source for the conjecture that the animal head on the was scepter is the "Set animal", i.e. the animal-human form of the god Set.

External links

- Alan Gardiner – Wikipedia.

θΔics

In human thermodynamics, **Alan P. Lightman** (1948-) is an American astrophysicist and humanities educator noted for his 1992 book *Great Ideas in Physics* in which he intertwines a teaching of the first and second law, in with historical theories on how they apply to human society, to be used in a one semester humanities science type crossover class. The following backcover quote seems to capture Lightman's general philosophical outlook:

> "I am spellbound by the plays of Shakespeare. And I am spellbound by the second law of thermodynamics. The great ideas in science, like the cro-magnon paintings and the plays of Shakespeare, are part of our cultural heritage … Discoveries in science are not just about nature. They are about people as well."

Lightman's *Great Ideas in Physics*, interestingly, devotes the first two chapters to the first law and second law, respectively, including sections on "Conservation Laws and Human Freedom" (on energy and freedom) and "The Second Law Applied to Human Society" (on social thermodynamics), giving overviews of two cultures thinkers such as Henry Adams and Thomas Pynchon, the chapters themselves each connected to a appended human thermodynamics education style set of homework problems (similar in style to Swedish physical chemist Sture Nordholm's 1997 animate thermodynamics homework problems) with accompanying solutions manual. [1]

Two cultures thinker

Lightman seems to be a prime representative of not only a "two cultures" scholar, mixing together physics and the humanities together in his writing, outlook, and teaching. His 2005 book *A Sense of the Mysterious: Science and the Human Spirit* is abstracted as follows: [3]

> "Unusually gifted as both a physicist and a novelist, Alan Lightman has lived in the dual worlds of science and art for much of his life. In these brilliant essays, the two worlds meet. In *A Sense of the Mysterious*, Lightman records his personal struggles to reconcile certainty with uncertainty, logic with intuition, questions with answers and questions without. Lightman explores the emotional life of science, the power of metaphor and imagination in science, the creative moment, the different uses of language in science and literature, and the alternate ways in which scientists and humanists think about the world. Included are in-depth portraits of some of the great scientists of our time: Albert Einstein, Richard Feynman, Edward Teller, and astronomer Vera Rubin. Rather than finding a forbidding gulf between the two cultures, as did the physicist and novelist C. P. Snow fifty years ago, Lightman discovers complementary ways of looking at the world, both part of being human. Original, thoughtful, and beautifully written, *A Sense of the Mysterious* confirms Alan Lightman's unique position at the crossroads of science and art."

From an early age, Lightman was interested in both science and the arts and, while in high school, began independent science projects and writing poetry; similar to possibly individuals such as Roald Hoffmann and Mala Radhakrishnan (in chemistry) or James Maxwell (in physics) who mix poetry and science to an affective result (e.g. "A Paradoxical Ode", 1878). In 1981, Lightman began publishing essays about science, the human side of science.

Discussion questions

The following are examples of some of Lightman's discussion questions (see: homework problems) which he says should be either solved by students as part of their coursework in a one semester course or done as part of an open classroom discussion: [1]

Discussion Questions II-8

Consider the excerpt from Henry Adams on pages 109–112. Is Adams's application of the second law to human society metaphorical or literal? If literal, what in human society corresponds to "states of the system"? What corresponds to "configurations of the system"? Is it meaningful to speak of configurations of low and high probability? Is there a sense in which "order" can be defined in human society?

Adams implies that Darwin's "Law of Evolution" involves progress and upward advancement. Do you agree with this interpretation of survival of the fittest?

Adams associates the human Will with the ability for variation and adaptability and argues that the decrease in genetic variation in man, and his weakened Will, are a natural consequence of the second law of thermodynamics. In what sense do you think that decreased genetic variation can be called a decreased Will? Do you think the second law governs either, and if so, how? What is the time period over which the second law would govern human society, according to Adams? Does this time period correspond to the time scale of physical processes associated with the second law? Is Adams optimistic or pessimistic about the future of human society? Do you think that historians today are familiar with the second law of thermodynamics? Should they be?

Here we are queried on the work of the great Henry Adams, the first dual

Discussion Questions II-9

One statement of the second law is that a physical system naturally evolves toward redistributing its energy equally among all of its parts. Zachary Hatch, of the class of 1991 of Princeton University, has proposed that the historical dissolution of empires—in which political power is first consolidated into large, centralized regimes and then ultimately dispersed into many smaller nation-states—can be understood on the basis of the second law of thermodynamics. For example, the end of World War II brought the end to Hirohito's Japan, the modern version of the feudal empire that had existed for hundreds of years. China, too, saw its several-thousand-year-old dynasty fall and be replaced with a socialist state. Recently, we have witnessed the disintegration of the Union of Soviet Socialist Republics. Do you think this application of the second law is justified? If so, what corresponds to the energy of the system? What is the political or social process that corresponds to molecules' bumping into each other and thereby redistributing and sharing the total energy? Does such a process have the needed element of randomness? What corresponds to a state and a configuration of the system? Would the second law, if applicable, preferentially lead to a capitalist or to a socialist society? If true, how would this theory reconcile itself with the *formation* of empires?

Here, interestingly, we are queried about the relatively unknown ideas on the

thinker in both human chemistry and human thermodynamics, and his general aim to reformulate the study of human history in the form of history thermodynamics, based on the second law.

Discussion Questions II-10

Consider the excerpt from Thomas Pynchon on pages 112–113. How has Pynchon used the second law of thermodynamics? According to the second law, would the entropy of Maxwell's Demon increase or decrease as the Demon sorted the molecules? You can assume that the Demon plus the molecules constitute an isolated system. How would you compare Oedipa's feelings about the loss of information to the scientists' attitudes about the second law of thermodynamics?

Here we are queried on the subject of literature thermodynamics, via questions about the ideas of American writer Thomas Pynchon, the second law in society, entropy, Maxwell's demon, and information theory.

thermodynamics of the the rise and fall of civilizations by Zachary Hatch; ideas of which have been produced prior to him by Henry Adams and after him by Thomas Wallace.

Discussion Questions II-11

Consider the excerpt from Henry Morris on pages 114–115. Why do you think Morris used a law from science to refute the theory of evolution? Do you agree with Morris that evolution represents an increase in order? If so, under what circumstances, if any, would this be allowed by the second law of thermodynamics? Is a living creature an isolated system? Is a refrigerator? Do you agree with Morris's arguments? If you disagree, why?

Here we are queried about the subject of religious thermodynamics by citing American engineer Henry Morris and his views on God, evolution, and the second law.

Education

Lightman completed his AB in physics from Princeton in 1970 and his PhD in theoretical physics from the California Institute of Technology in 1974. From 1974 to 1996, he did postdoctoral work in astrophysics at Cornell University (during which time he began publishing poetry in small literary magazines). From 1976 to 1979, he was an assistant professor of astronomy at Harvard University, after which he worked for a decade as a research scientist at the a research scientist at the Harvard-Smithsonian Center for Astrophysics.

In 1989, Lightman was appointed professor of science and writing (humanities) and senior lecturer in physics (science) at the Massachusetts Institute of Technology (MIT), and in doing so became the first professor at MIT to receive a joint appointment in science and the humanities. In 1995, he was appointed John Burchard professor of humanities at MIT, a position that he resigned in 2002 to allow himself more time for writing. He currently teaches at MIT as adjunct professor of humanities.

Other

In his 2004 book *Living with the Genie: Essays on Technology and the Quest for Human Mastery*, co-authored with Daniel Sarewitz and Christina Desser, he discusses the idea of "entropy waste", which seems to have originated in the misaligned 1971 material entropy conception of Romanian mathematician Nicholas Georgescu-Roegen. [2] Lightman's 2005 book *The Discoveries* discusses the famous Jolly-Planck anecdote about not going into physics. [4]

References

1. (a) Lightman, Alan. (2000). *Great Ideas in Physics: the Conservation of Energy, the Second Law of Thermodynamics, the Theory of Relativity, and Quantum Mechanics* (§: Conservation Laws and Human Freedom, pgs. 35-36; §: The Second Law Applied to Human Society, pgs. 110-114; Appendix B: Problems and Discussion Questions, pgs. 253-). McGraw-Hill.
(b) Lightman, Alan. (1996). *Great Ideas in Physics: Solutions to Additional Problems* (20 pages). Publisher.
2. Lightman, Alan, Sarewitz, Daniel R., and Desser, Christina. (2004). *Living with the Genie: Essays on Technology and the Quest for Human Mastery* (keyword: entropy waste, pgs. 32, 60-61, 72, etc.). Island Press.
3. Lightman, Alan. (2005). *A Sense of the Mysterious: Science and the Human Spirit.* Publisher.
4. Lightman, Alan P. (2005). *The discoveries: great breakthroughs in twentieth-century science, including the original papers*. Toronto: Alfred A. Knopf Canada.

External links

â— Lightman, Alan P. – WorldCat Identities.
â— Alan Lightman – Wikipedia.
â— Alan Lightman (faculty) – MIT.edu.

θΔics

In hmolscience, **Alan Nelson** (c.1956-) is an American philosopher noted for his 1989 theory that economic agents can be view or modeled, in physical chemistry terms, as "human molecules", a person defined economically as a molecule, cited by the 2009 *Oxford Handbook of Philosophy of Economics* as being the co-originator, along with Dutch-born American economist Tjalling Koopmans, the winner of the Nobel Memorial Prize in Economic Sciences, of the "economic agents" viewed as individual "molecules" or human molecules theory. [1] Nelson's theory was first published in the 1992 chapter "Human Molecules" in the the multi-author book *Post-Popperian Tradition in Economic Methodology*. [4]

Overview

In the late 1980s, Nelson, while a philosophy professor at the University of California, Irvine, began developing a theory in which economic agents are viewed, in a physical chemistry and thermodynamic sense, as "human molecules".

In 1989 and 1990, Nelson began sending out various versions of his expanding theory in a paper entitled "Human Molecules", manuscripts which have since been cited and discussed in talks by the likes of those as economists Keven Hoover (Duke University) and Wade Hands (University of Puget Sound), among others. [2] Hoover comments 1990 version of Nelson's 1990 "Human Molecule" manuscript: [3]

> "Macroeconomics deals in aggregates. These aggregates are composed of the behaviors of individuals. Consumption as reported in the national income accounts is just the summation of the purchases of a nation's citizens. It is tempting then to see economic agents as **human molecules** (cf. Nelson [1990]) and the relations postulated in macroeconomic theory or measured in macroeconometrics as the analogues of the ideal gas laws or other macrophysical relations. But there is a crucial and obvious difference: molecules do not make choices, people do; and they do so with reference not just to the immediate past and their immediate surroundings, but also with reference to future goals and to global or macro relations."

In 1992, following further theory development and feedback, Nelson's manuscript was expanded into into the first chapter of part two ("Molecules and Games") of the multi-author book *Post-Popperian Methodology of Economics*; the part two section of the book consisting of the following three chapters: [4]

- "Human Molecules", by Nelson
- "Commentary on Alan Nelson's 'Human Molecules'", by American economist Bruce Caldwell
- "Reply to Bruce Caldwell's Commentary on 'Human Molecules'", by Nelson

Nelson's 1992 chapter on human molecules, wherein he conceives economic agents as "human molecules", has since gained a level of following, having been cited more than a half-dozen times as a forerunner to the economic-version of the human molecule construct. [5] The 2009 *Oxford Handbook of Philosophy of Economics* specifically cites Nelson has having originated this term in economics, each *human molecule* defined specifically as an 'ontologically distinct individual'; the term "human molecules" is also referred to, by the *Oxford Handbook*, as Danish-born American economist "Tjalling Koopmans's evocative coinage", the noted joint winner of the 1975 Nobel Memorial Prize in Economic Sciences. [1] The actual publication where Koopmans' uses the term "human molecule", in coinage, however, is difficult to track down.

In regards to Nelson's version, Australian philosopher Brian Ellis explains, in his 2001 *Scientific Essentialism*, that the comparison between molecules and humans is "explicitly drawn and discussed at length", particularly in regards to modeling neoclassical economics in the view of classical thermodynamics. [6]

Education

Nelson completed his SB (1978) at MIT, his MS (1982) at the University of Wisconsin, Madison, and both his MA (1980) and PhD (1984) at the University of Chicago Circle. Nelson's primary area of specialization in these four degrees was history of modern philosophy and his secondary are is the philosophy of science. From was an assistant professor of philosophy at UCLA from 1984 to 1988. He was assistant professor of philosophy at UC, Irvine, from 1988 to 1990; full professor thereafter and department chair from 1998 to 2001. In 2006, Nelson transferred to the University of North Carolina, Chapel Hill, where he currently is a professor of philosophy.

References

1. Kincaid, Harold and Ross, Don. (2009). *Oxford Handbook of Philosophy of Economics* (pg. 394). Oxford University Press.
2. (a) Nelson, Alan. (1989). "Human Molecules", Unpublished Manuscript, Department of Philosophy, University of California, Irving.
(b) Nelson, Alan. (1990). "Human Molecules", *Unpublished Typescript*. Department of Philosophy, University of California, Irving.
(c) Hands, D. Wade. (1993). *Testing, Rationality, and Progress: Essays on the Popperian Tradition in Economic Methodology* ("Human Molecules", Nelson (1989), pg. 224). Rowman & Little.
3. Hoover, Kevin D. (1993). "Causality and Temporal Order in Macroeconomics or Why Even Economists Don't Know How to Get Causes from Probabilities" ("Human Molecules" (1990), Nelson, pg. 710), *The British Journal for the Philosophy of Science*, 44: 693-710.
4. (a) Nelson, Alan. (1992). "Human Molecules", in: *Post-Popperian Methodology of Economics*, ch. 3, pgs. 113-33) by Neil De Marchi. Kluwer Academic Press.
(b) Caldwell, Bruce J. (1992). "Commentary on Alan Nelson's 'Human Molecules'", in N. De Marchi (ed.) *Post-Popperian Methodology of Economics*. Recovering Practice. Boston: Kluwer Academic Publishers, pgs. 135-49.
(c) Nelson, Alan. (1992). "Reply to Bruce Caldwell's Commentary on 'Human Molecules'", in N. De Marchi (ed.) *Post-Popperian Methodology of Economics*. Recovering Practice. Boston: Kluwer Academic Publishers, pgs. 135-49.
5. (a) Janssen, Maarten C.W. (1993). Microfoundations: a Critical Inquiry (behavior of in 'individual' humans and molecules, pg. 14; "Human Molecules" (1992), Nelson, pg. 125. Routledge.
(b) Mayer, T. and Heathfield. (1993). *Truth Versus Precision in Economics* ("Human Molecules" (1992), Nelson, pg. #). Langue: Anglais.
(c) Hoover, Kevin. (2006). "Microfoundations and the Ontology of Macroeconomics" (pg. 16: "Human Molecules", Nelson, 1992), Presented at the conference on Issues in Philosophy of Economics, University of Alabama, Birmingham, 19-21 May.
6. Ellis, Brian D. (2001). *Scientific Essentialism* ("Human Molecules" (1992), Nelson, pg. 170-87, 300). Cambridge University Press.
7. Alan J. Nelson (biography) – Lib.UCI.edu.

External links

- Alan Nelson (faculty page) – philosophy department, University of North Carolina at Chapel Hill.

θΔics

In existographies, **Alan Meyer Sica** (1949-) (CR:3) is an American sociologist noted, in sociological thermodynamics, for his 2012 article “Classical Sociological Theory”, wherein he discusses Russian-born American sociologist Pitirim Sorokin's famous 1928 "mechanistic school" chapter, to his *Contemporary Sociological Theories*, in its own context, and in relation to modern 21st century human thermodynamics. [1] Sica also has written and edited a number of books on German sociologist Max Weber.

Overview

Sica, in his article, comments on the 17th century social mechanics views of: Rene Descartes, Benedict Spinoza, Gottfried Leibniz, Hugo Grotius, and Nicolas Malebranche, and the 18th century social mechanics views of: George Berkeley, and the 19th century views of Henry Carey and Herbert Spencer. On Carey, in whom social mechanics, as Sica puts, "blossomed", we are given the following aggregate quote of Carey's discerning views:

> “The laws which govern matter in all its forms, whether that of coal, clay, ion, pebble stones, trees, oxen, horses, or men, are the same; man is the molecule of society; and social interaction operates under the great law of molecular gravitation.”

(add)

Social mechanics | Childish?

Sica, of note, points out how, in the end, Sorokin calls these "childish mechanical analogies"—as contrasted with Vilfredo Pareto, who also used human molecular theory, but whom Sorokin classifies as more “serious” a thinker—a point of view that, to note, is near verbatim to when in 1810 German poet and writer Christoph Wieland commented on German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*, in a letter to German philologist and archeologist Karl Böttiger, which he suggested should be "burned" after it is read, that: “to all rational readers, the use of the chemical theory is nonsense and childish fooling around”; supposedly, objected owing to the "radicalness of its Christianity" (Jul 16); in another letter, whose addressee, a woman, is unknown, he stated: "I confess to you, my friend, that I have read this truly terrifying work not with out feeling or concern" (see: *Elective Affinities* (enemies)).

While Sorokin, to his credit, does not seem to specifically classify Carey's social mechanics views, and the other so-called "primitive social mechanics" thinkers, as "terrifying" we do note that Sorokin's "The Mechanistic School" chapter has been cogently described as an "attack" on the mechanistic school of sociology, and similar in theme Austrian sociologist Werner Stark's 1962 chapters on the mechanistic school have likewise been described, by American sociologist Leon Warshay (1993), as an "angry" one: [2]

> “The work of Henry Carey (which is discussed in Chapters 10 and 11) and that of S.C. Haret is characterized as extreme mechanicism. Both apply physical principles to society (e.g. force, attraction, motion, constrains, space, equilibrium, energy, and electricity) and both see individuals in mechanistic-atomistic terms (e.g. as particles and or molecules) as inert elements caused from without. Stark criticizes extreme mechanicism for its inability to deal with social fact (pg. 163) and as inclined to be a- or anti-historical (pg. 159). Some ‘empiricism’ is evident here in Stark’s criticisms of the various types of mechanicism he posits. His argument is an angry one: that Carey, Pareto, and Lundberg have all ‘imported’ models from elsewhere (e.g. from physics and astronomy), and have ‘imposed’ them on social phenomena (which Stark knows to have an idealistic character) under a ‘unity of nature’ positivist ideal, which is really a sociology unified under physics (pg. 155).”

Here, then, in sum, see the intense emotional words "anger" and "terror" being associated with a theory (chemistry and

physics used to explain human behavior) that is supposedly "childish", which reverberates right up to the present time with the term "danger" being thrown about in the 2006 human chemical thermodynamics themed Rossini debate on basically the exact same topic? To continue, Sica comments on "childish" labeling as follows:

> "There were other, competing approaches dealing with the problem of human action in somewhat less 'childish' ways, less tied to the belief that *Homo sapiens* could be understood by means of mechanical or molecular imagery."

Sica gives the examples of the social physics theories of Marquis de Condorcet, Henri Saint-Simon, and Adolphe Quetelet as examples of supposedly less childish attempts.

Molecular view

One of the inherent problems here, in regards to classifying the study of humans from the molecular point of view as "childish", is that, as of 2002, with the publication of American limnologists James Elser and Robert Sterner's *Ecological Stoichiometry*, and, independently, American electrochemical engineer Libb Thims' 2007 *Human Chemistry*, humans are now scientifically defined as 26-element surface-attached molecules or "human molecules" with a measurable human molecular formula. While this new "molecular" view of humans, which Sica criticizes as "naive", citing C.G. Darwin (1952) as one example, is slowly beginning to find its way in the hard science engineering community, e.g. *Advanced Thermodynamics Engineering* (2011), the adoption of this view in modern sociology is slow in coming, despite the fact that its own founders, such as Henry Carey (1852), Albion Small (1899), founder of the University of Chicago Sociology Department, and Robert Nisbet (1970), founder of the University of California, Berkeley Sociology Department, have been proclaiming these views for over a century. It is a puzzling situation, to say the least? One points of unspoken tension is that the debated is invariably ingrained with deep-seated religious-biased belief system tensions, which, as Wieland states is one of the reasons for use of the term "childish", because as he so frankly put it 200-years ago the molecular view is not in alignment with many of the fundamental tenets of Christianity, such as free will, choice to do right or wrong, Bible-based morality vs. moral symbol based morality, and religiously-defined ideas on good and evil as opposed to thermodynamically-defined measurable models of natural and unnatural, and so on.

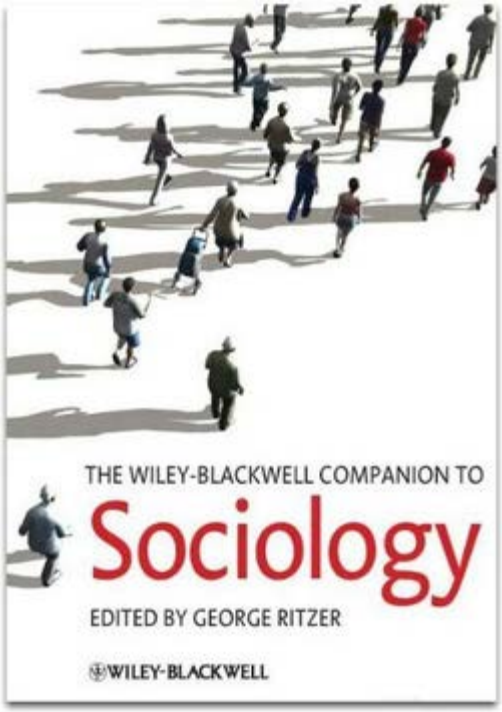

Cover to the 2012 collaborative *The Wiley-Blackwell Companion to Sociology*, wherein **Sica**'s chapter five "Classical Sociological Theory", discusses Pitirim Sorokin's famous 1928 "mechanistic school" and modern 21st century human thermodynamics. [1]

Education

Sica completed his BA in 1971 at the University of Richmond, his MA in 1974 with a thesis on "A Theory of Future Social Change" at the College of William and Mary, and his PhD in 1978 at the University of Massachusetts, Amherst. Currently, Sica is a sociology professor at Penn State University.

References

1. (a) Sica, Alan. (2012). "Classical Sociological Theory", in: *The Wiley-Blackwell Companion to Sociology* (editor: George Ritzer) (§5, pgs. 82-97; Sorokin + "mechanistic school", pgs. 85-86; humanothermodynamics, pgs. 87-88). John Wiley & Sons.
(b) Sorokin, Pitirim. (1928). "The Mechanistic School" (pdf), in: *Contemporary Sociological Theories* (§1, pgs. 1-62). Harper & Brothers.
(c) Sorokin, Pitirim. (1928). *Contemporary Sociological Theories* (§1: The Mechanistic School, pgs, 4-62; thermodynamics, pgs. 25-27; human molecules, pg. 46-47). Harper & Brothers.
2. Warshay, Leon H. (1993). "The Social Theory of a Humane Organicist: On Werner Stark as Intellectual Detective and Moralist", in: *In Search of Community: Essays in Memory of Werner Stark (1909-1985)* (pgs. 45-55). Fordham.

External links

â— Alan Sica (faculty) – Department of Sociology & Crime, Law and Justice, Penn State.
â— Sica, Alan (1949-) – WorldCat Identities.

θΔics

In existographies, **Alan Turing** (1912-1954) (IQ:185|#68] [RGM:32|#1,500+] (Stokes 100:96) (Glenn 20:18) (GEE:#) (RE:41) (CR:23) was British polymath, mathematician, engineer, computer scientist, code breaker, and chemist, labeled as a "great thinker" (Teuscher, 2006), someone who knew "too much" (Leavitt, 2007), etc., noted for his circa 1940s code breaking work, for his 1950 digression on the query “can machines think?” (see: Turing machine), wherein he addressed the so-called "theological objection", and for his 1952 chemical morphology theory.

Thinking machines | Theological objection

In 1950, Turing, in his “Computing Machinery and Intelligences”, wherein the so-called “Turing test” originated (similar to the Cartesian automaton problem), sought out consider the question: “can machines think?”, centered around the notion of a modern digital computer, of the Charles Babbage “analytical engine” type, following which Turing lists seven points of objection this proposal, or “opinions opposed to my own”, the first, ironically enough, being the religious objection, stated in full below: [4]

> “Thinking is a function of man's immortal soul. God has given an immortal soul to every man and woman, but not to any other animal or to machines. Hence no animal or machine can think.
>
> I am unable to accept any part of this, but will attempt to reply in theological terms. I should find the argument more convincing if animals were classed with men, for there is a greater difference, to my mind, between the typical animate and the inanimate than there is between man and the other animals. The arbitrary character of the orthodox view becomes clearer if we consider how it might appear to a member of some other religious community. How do Christians regard the Muslim view that women have no souls?
>
> But let us leave this point aside and return to the main argument. It appears to me that the argument quoted above implies a serious restriction of the omnipotence of the Almighty. It is admitted that there are certain things that He cannot do such as making one equal to two, but should we not believe that He has freedom to confer a soul on an elephant if He sees fit? We might expect that He would only exercise this power in conjunction with a mutation which provided the elephant with an appropriately improved brain to minister to the needs of this sort.
>
> An argument of exactly similar form may be made for the case of machines. It may seem different because it is more difficult to "swallow." But this really only means that we think it would be less likely that He would consider the circumstances suitable for conferring a soul. The circumstances in question are discussed in the rest of this paper. In attempting to construct such machines we should not be irreverently usurping His power of creating souls, any more than we are in the procreation of children: rather we are, in either case, instruments of His will providing mansions for the souls that He creates.
>
> However, this is mere speculation. I am not very impressed with theological arguments whatever they may be used to support. Such arguments have often been found unsatisfactory in the past. In the time of Galileo it was argued that the texts, "And the sun stood still . . . and hasted not to go down about a whole day" (Joshua x. 13) and "He laid the foundations of the earth, that it should not move at any time" (Psalm cv. 5) were an adequate refutation of the Copernican theory. With our present knowledge such an argument appears futile. When that knowledge was not available it made a quite different impression.”

(add discussion)

Chemical morphology

In 1952, Turing, in his “The Chemical Basis of Morphogenesis”, considered a "ring" of identical cells containing various chemical substances, called morphogens, and the patterns result from interactions between these morphogens that diffuse in the medium and enter into chemical reactions with each other. [1] This model is said to be akin or related

in some way to a cellular automaton theory, the Neumann automaton theory in particular. [2] English-born Canadian physical chemist Lionel Harrison employed Turing's chemical morphology theory in his 1980s kinetic theory of living pattern theories. [3]

Other

In during WWII, Turing cracked the German ‘Enigma’ cipher; he is known for Turing test of computer intelligence; and the so-called "Turing award" is considered by some to the be the Nobel Prize of computer science.

Education

In 1928 to 1930, Turing, aged 16 to 18, while attended Sherborne School, checked out the following books (Q) from the library:

- *Isotopes* (O) by Frederick Aston
- *Mathematical Recreations and Essays* (O) by W. W. Rouse Ball
- *Alice's Adventures in Wonderland* (O), *Game of Logic* (O) and *Through The Looking Glass* (O) by Lewis Carroll.
- *The Common Sense of the Exact Sciences* (Q) by William Clifford
- *Space, Time and Gravitation* (O) and *The Nature of the Physical World* (O) by Arthur Eddington.
- *Sidelights on Relativity* (O) by Albert Einstein
- *The Escaping Club* (O) by A. J. Evans
- *Contributions to Mental Philosophy* (translated and edited by J.D. Morell) (O) by Immanuel Fichte,
- *The New Physics* (Q) by Arthur Haas
- *Supply and Demand* (O) by Hubert Henderson
- *The Stars in their Courses* by (O) James Jeans
- *Atoms and Rays* (Q) and *Phases of Modern Science* (Q) by Oliver Lodge.
- *Matter and Motion* (O) by James Maxwell
- *The Theory of Heat* (Q) by Thomas Preston
- *A Selection of Photographs of Stars, Star-Clusters & Nebulae* (O) by Isaac Roberts
- *Modern Chromatics, with applications to art and industry* (O) by Ogden Rood
- *Celestial Objects for Common Telescopes* (O) by Thomas Webb
- *The Recent Development of Physical Science* by William Whetham
- *Science and The Modern World* by (O) Alfred Whitehead
- *Sound Waves and their Uses* (O) by Alexander Wood

(add)

Quotes | On

The following are statements of tribute and or praise of Turing:

> “**Turing** was a deep thinker rather than a fast thinker. His IQ was therefore not especially high.”
>
> — Jack Good (c.1970)

Quotes | By

The following are noted Turing quotes:

> “Sometimes it is the people no one imagines anything of who do the things that no one can imagine.”
>
> — Alan Turning (c.1950) (Q)

> "Science is a differential equation. Religion is a boundary condition."
>
> — Alan Turing (1954), "Epigram to Robin Gandy" (Q) (Q)

See also

- Founders of thermodynamics and suicide

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θΔics

In existographies, **Alan Watts** (1915-1973) (IQ:160|#340) [RGM:352|1,500+] (Perry 80:71) (CR:23), was an English-born American philosopher noted for a number of book and audio publications in which he advocates a semi-scientific semi-newage one nature mixture of Zen Buddhism, aspects of Christianity, and new physics theories, e.g. cybernetics, process philosophy, etc., much of which amounts to a good deal of circular philosophical talk, albeit semi-interesting nevertheless.

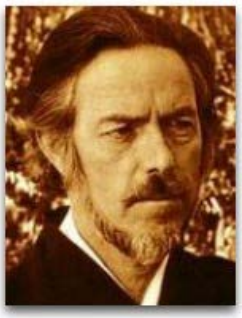

Wiggly forms | Science vs Buddhism

In 1960, Watt, in his "Science and Buddhism", gave the following diagram to give a two-point of view model of science (quantification) and ancient wisdom (description) of something such as the form of a flame dancing above a fire: (V)

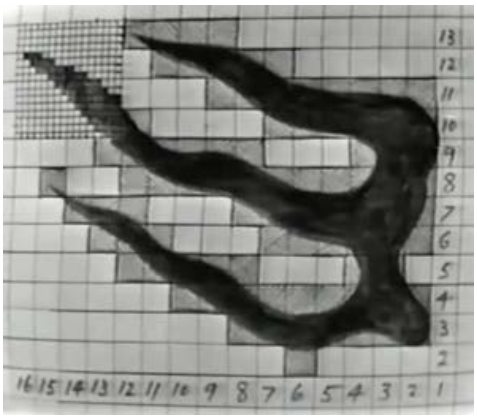

The following (V|13:51) shows Watts explaining how one can see a certain figure as either a bear climbing a tree or a tree with lopped off branches (left), depending on what you were told it was, in the same what that one can conceptualize an eclipse of the sun as either a dragon swallowing the sun, as in primitive cultures (e.g. ancient Egypt), or as the moon obfuscating view of the sun, as modern science explains things:

Before
(No exposure to alternative explanations)

→

After
(expose to alternative explanations)

This is akin to a modern version of Plato's allegory of the cave, in respect to religious beliefs.

Spontaneity

In circa 1969 to 1972, Watt, in his “Work as Play” video talk (Q), a key four minutes of which is shown, in text and in video, discussed spontaneity, work, and love in a pleasing manner:

> “And what is it all about? Well we say, one must live. It’s necessary to survive. You know, you really must go on. It’s your duty. We think, in other words, part of our western philosophy, that we think we have a drive to survive, that we must go on living, because some big daddy said to us: you gotta go on living … see! And you better make it or else … There really is no necessity to go on living.
>
> The fear of death is completely absurd. Because if you’re dead you’ve got nothing to worry about, so you’ll be alright.
>
> So in the same way, this thing here, this plant. I’m quite sure it doesn’t say to itself: You ought to go on living. You’ve got an instinct to survive which is something other than yourself in which you have to obey.

> Now you see, living, like this plant, is something spontaneous. In Chinese, the word for nature is ziran, which means that which happens of itself, not under any control of any outside boss. And so you stop this spontaneous flowering of nature cold if you tell it: you must do it! It's like saying to someone: you must love me! Well it's ridiculous.
>
> If I were to ask my wife: darling do you really love me? And she says: I'm trying my best to do so, it's not the answer I want. I want her to say: I can't help loving you, I love you so much I could eat you. And that's what the plant feels in growing, it doesn't feel that it must grow, it's not under orders, it's not a military chain of command. It does this spontaneously, so that when you try to command this spontaneous process, you stop it.
>
> What you are basically, deep deep down, far far in, is simply the fabric and structure of existence itself. Reality itself is gorgeous, it is the plenum, the fullness of total joy. Wowee! And all those stars, if you look out in the skies, is a firework display, like you see on the 4th of July, which is a great occasion for celebration. The universe is a celebration it is a firework show to celebrate that existence is.
>
> This is the real secret of life: to be completely engaged with what you are doing in the here and now, and instead of calling it 'work', realize that this is play."

Watts's comments about spontaneity and the "secret of life" in some ways, is akin to Robert Pirsig's views.

Thermodynamics

In 1970, Watt published *Does it Matter? Essays on Man's Relation to Materiality*, his third-most widely held book; the following being an example quote: [5]

> "A living body is not a fixed *thing* but a flowing *event*, like a flame or a whirlpool: the shape alone is stable, for the substance is a stream of energy going in at one end and out at the other. We are particular and temporarily identifiable wiggles in a stream that enters us in the form of light, heat, air, water, milk, bread, fruit, beer, beef Stroganoff, caviar, and *pate de foie gras*. It goes out as gas and excrement—and also as semen, babies, talk, politics, commerce, war, poetry, and music. And philosophy."

The following is oft-cited variation and or aggregation quote of the above: [1]

> "A living body can be likened to a flame or a whirlpool. The shape alone is stable. The substance is a stream of energy going in at one end and out at the other. Life's purpose to maintain and perpetuate itself is understandable as a physico-chemical phenomenon studied by the science of thermodynamics. We are temporarily identifiable wiggles in a stream that enters us in the form of light, heat, air, water, milk …. It goes out as gas and excrement—also as semen, babies, talk, politics, war, poetry, and music."

Watts interests seemed to be focused on mixing Eastern philosophy with science with focus on explaining and understanding the "ultimate things" and the whys and wherefores of existence.

Chopra

Watts can be compared, in some sense, to new age writer Deepak Chopra, albeit with more a sober grounding. Chopra, in fact, stated that he was "spellbound" after reading Watts' 1951 *The Wisdom of Insecurity*, along with Carl Jung, who me met at one point. [2]

Quotes | By

The following are notable and or interesting quotes:

> "Anybody who tells you that he has some way of leading you to spiritual enlightenment is like somebody who picks your pocket and sells you your own watch."
>
> — Alan Watts (c.1955) [3]

> "You are a function of what the whole universe is doing in the same way that a wave is a function of what the whole ocean is doing."
>
> — Alan Watts (c.1955) [3]

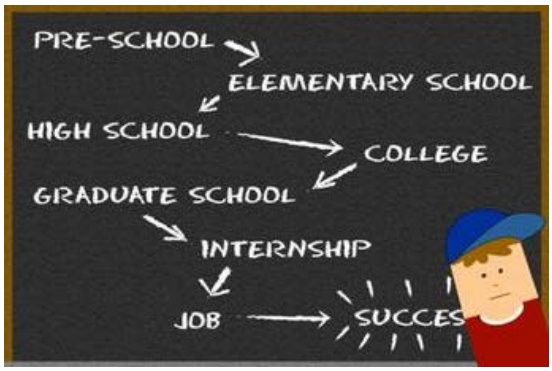

Left: **Watts** on what seems to be the question of purpose, or the use or value of existence and feelings, in the context of the large dynamic universe. Right: A video (Q) still (5:54) of what Watts calls the "here kitty kitty" social indoctrination ideology, set up

"Life is not a problem to be solved, but an experience to be had."

— Alan Watts (c.1955) [3]

for people as they enter the various "corridors" of society (similar to what Libb Thims conceptualizes as societal "hoop jumping"), from age 0 to 40, after which one supposedly wakes up to an empty bag or vision of reality.

"You yourself are the eternal energy which appears as this universe. You didn't come into this world; you came out of it. Like a wave from the ocean."

— Alan Watts (c.1960) [3]

"The meaning of life is just be alive. It is so plain and obvious and so simple. And yet, everybody rushes around in a great panic as if it were necessary to reach something beyond themselves."

— Alan Watts (c.1960) [3]

"But I'll tell you what the hermits realize. If you go off into a far, far forest and get very quiet, you'll come to understand that you're connected with everything."

— Alan Watts (c.1955) [3]

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Further reading | Videos

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External links

● Alan Watts – Wikipedia.
● Alan Watts (works) – UMD Library.
● Alan Watts (collections in text) – Genius.com.
● Watts, Alan (1915-1973) – WorldCat Identities.

θΔics

In hmolscience, **Alan Wilson** (1939-) is an English physicist turned social scientist and urban architect noted for his 1966 theory just as the so-called Newtonian "gravity model" (e.g. social gravity) has been fruitful in developing statistical socio-economic "gravity models", so to could the statistical version of entropy be used to build statistical socio-economic models; a synopsis which is is follows: [1]

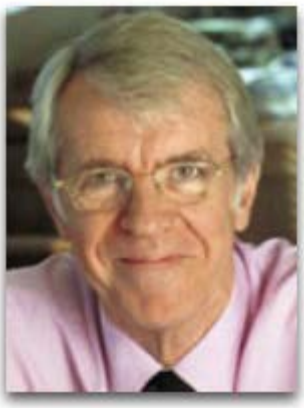

> "The concept of entropy has, until recently, been used primarily in the nonsocial sciences. This book is an attempt to show that it has a useful and valuable role in one branch of the social sciences—the study of urban and regional systems. It is hoped that 'entropy' enables the social scientist to tackle some basic problems in a fruitful way, and thus to make progress which might not be possible so easily with more orthodox tools."

Specifically, Wilson envisioned that the statistical version of the entropy maximization method could be applied to urban and regional models, a type architectural thermodynamics theory, which he describes fully in his 1970 book *Entropy in Urban and Regional Modelling*, in which the logic of general systems theory and entropy is used to facilitate city planning. [1] His first citation, however, is to the 1957 work of Edwin Jaynes.

Overview

Wilson gives the following as to theory starting origin: [1]

> "[My theory] has its origins in some work I was doing in 1966 when I realized that the well-known gravity model could be derived on the basis of an analogy with statistical mechanics rather than Newtonian mechanics."

In 1969, in social physics, Wilson published "Notes on Some Concepts in Social Physics", in which he discussed two applications of physics to the social sciences, namely what he referred to as the "population potentials" and the "gravity model", in which he outlines his plan to apply statistical mechanics and information theory (see: Shannon bandwagon) urban and regional modelling. On the use of analogies, in this paper, Wilson states: [3]

> "When concepts are transferred from physics to social sciences, the underlying analogy is often unsound, but by systematic analysis, the analogy can be made sound, and the increased understanding thus achieved can create powerful tools (see: toolism) and concepts which are adequate for their new employment. Though part of the study may proceed through analogy, in the end the analogy must be thrown away."

In 1980, Wilson published *Catastrophe Theory and Bifurcation: Applications to Urban and Regional Systems*, on what seems to be an application of the 1960 catastrophe theory of French mathematician Rene Thom and the 1972 bifurcation theory of Belgian chemist Ilya Prigogine to urban systems, the abstract of which is as follows: [4]

> "Mathematical models have long been used by geographers and regional scientists to explore the working of urban and regional systems, via a system where the equilibrium point changes slowly and smoothly as the parameters change slowly and smoothly. However, this all changed with the advent of catastrophe theory and bifurcation, which enabled the development of models where a quite sudden change in the position of the equilibrium point results from a slow, small, smooth change in one or more parameters."

Wilson's entropy theory work was cited in 1990 by Kenneth Bailey. [5]

Education

Wilson completed his BA in 1966 in mathematics and MA in theoretical physics in 1966, at the Rutherford Laboratory, both at University of Cambridge. In 1965, he began converting to the social sciences through research on the mathematical modelling of cities, and from 1964 to 1966, he was a research officer at the Institute of Economics and Statistics at Oxford University. He had research posts in Oxford and London before being appointed as Professor of Urban & Regional Geography at the University of Leeds in 1970. In 2007, he joined University College London's center for Advanced Spatial Analysis as professor of urban and regional systems.

Quotes | On

The following are quotes on Wilson:

> "**Alan Wilson** has written extensively on the use of entropy in social modeling. The specific case which he has emphasized is that of trip frequencies in travel between various points. His general philosophy relies heavily on Jaynes."
>
> — Elliott Montroll (1974), *Quantitative Aspects of Social Phenomena* (pg. 160)

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External links

● Alan Wilson (academic) – Wikipedia.
● Wilson, A.G. (Alan Geoffrey) (1939-) – WorldCat Identities.
● Alan Wilson (faculty) – UCL.ac.uk.

θΔics

In thermodynamics, **Alastair Jenkins** (c.1952-) is a Danish atmospheric physicist noted for his 2005 article "Thermodynamics and Economics" in which he gives a general historical derivation overview of the various methods of thermodynamics and concludes that economic activity can be modeled on the tendency for systems to maximize entropy.

Difficulties on theory

Jenkins culls his approach on the incorrect Edwin Jaynes method of information-based derivation or MaxEnt school of thought. [1] What is interesting about Jenkins paper is that his opening derivation is fairly clean; the red flags in the paper are his use of the acronym MEP (maximum entropy principle), placing his work in the realm of information theory based thermodynamics.

Migration | Immigration

Jenkins, in one interesting passage he compares people as being analogous to the molecules of the atmosphere and using English historian Peter Laslett's 1979 description of the 17th century gentry of England as "the families of the ruling segment pressed, like atmosphere, evenly, over the whole face of England", he expands this by saying that "as in a body of gas evenly distributed throughout a container, their spatial distribution was in a state of maximal entropy. Conflicts with other societies provide an additional source of energy dissipation and or entropy production and absorption of 'excess population'."

Education

Jenkins completed his BA in natural sciences and physics at the University of Cambridge, MS in 1975 with a thesis on "A critical survey of the aeronomical effects, up to 120 km altitude, of the temperature structure of the atmosphere", and PhD in 1977 with his dissertation on "Noctilucent clouds: structure and dynamics", at the University of Aberdeen, Scotland. Since 2002, he is a research scientist at UniResearch at the Geophysical Institute, University of Bergen. It is likely at some point along the way, that Jenkins studied atmospheric thermodynamics.

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External links

â— Alastair D. Jenkins (overview) – Folk.UIB.no.

θΔics

In hmolscience, **Albert Brisbane** (1809-1890) (SN:41) was an American social theorist who became the leading expositor and propagandist of the cosmological four movements theory French philosopher Charles Fourier, advocating for the implementation of his passional philosophy, called Fourierism, as the structural basis in the development of new utopian societies, called phalanxes throughout America.

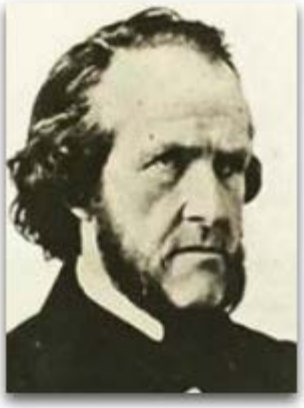

Social Destiny of Man

Brisbane, in his 1840 *Social Destiny of Man: Association and Reorganization of Industry*, employs the following aim or objective: [3]

> "Our evils are social, not political—political evils are the results of the false organization of society."

He then follows this with two opening quotes by Fourier:

> "Attractions are proportional to destines."
>
> "The serie distributes the harmonies of the universe."

The first of which is cogent; the latter of which seems to be a reference to the French term "série passionelle", which seems to translate as "passional series" or series of passions. The following is an example of term usage: "By its very definition, the série passionelle was a melting pot: it was a gathering of diverse individuals whose common passion would enable them to forget distinctions of age, wealth, character, and intelligence." [4] A precise rendering of this term is not immediate, for as some have discussed, Fourier seemed to believe that education, like the mingling of the 'série passionelle', would replace class rivalry with intrigue and group competition, and thus be the system that would be the solution to the conflict of the individual versus society problem. [5]

Functions of the Human Passions

In 1857, Brisbane published his "Theory of the Functions of the Human Passions" chapter, wherein he seems to give a cogent synopsis of Fourier's theory, as concerns

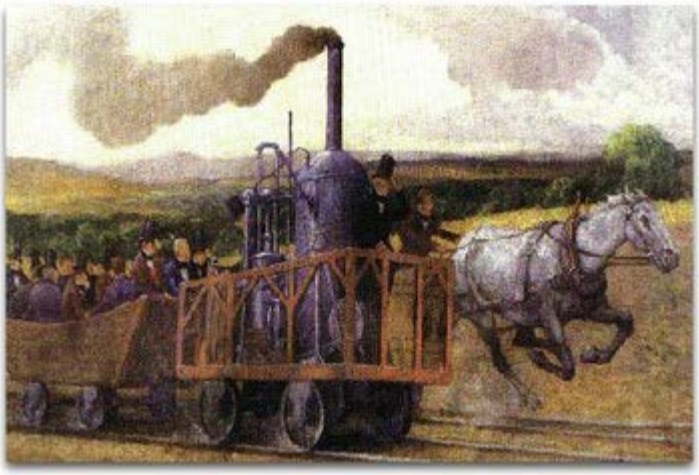

A depictions of the famous late August 1830 race between the Tom Thumb, the first American-built steam locomotive, built by Peter Cooper, and a horse—the horse eventually winning the race, owing to a belt that broke in the engine (Ñº); a model on which **Brisbane**, in 1857, conceptualized as a model on which the human passions could be fitted to ideally to a specific type of society conceptualized, in like manner, as an engine: [4]

> "It may be laid down as a law, that forces can operate naturally and rightly only in mechanisms which are suited to them. This is as true of the passions as it is of all other forces in nature—of steam, for example, which can not produce its legitimate effects in mechanics, except on condition that it operates in an engine perfectly fitted to it."

the
passions, as follows: [2]

> “Metaphysicians, seeing the passional forces misdirected or perverted under the influence of false social systems, and mistaking the effects which they produce under these systems for their true and legitimate action, have become imbued with prejudices against human hature, have assumed the passions to be imperfect and vicious motors, so that instead of making a careful and impartial study of them, they have fallen into the error of reviling and denouncing them. The passions can be harmoniously developed, and act legitimately only on condition that they operate in a social order adapted to their nature and requirements.
>
> It may be laid down as a law, that forces can operate naturally and rightly only in mechanisms which are suited to them. This is as true of the passions as it is of all other forces in nature—of steam, for example, which can not produce its legitimate effects in mechanics, except on condition that it operates in an engine perfectly fitted to it. Metaphysicians have not understood this simple law in its application to the forces of the soul. They have not understood that the social organization—the external mechanism of the passions—should be conformed to them; on the contrary, they have supposed that the passions should be conformed to the social organization—to its laws and institutions. But the passions rebel against all attempts to adapt them to a mechanism not in unity with them; in such a mechanism, their action is misdirected or perverted, and they engender as a consequence, social discord and evil. Instead of condemning the false social systems which pervert and denaturalize the passions, the world condemns the passions themselves; hence the doctrine of the depravity of human nature and its corollary, the permanent reign of evil on earth, have become the general belief of mankind. It has misled the metaphysicians, who have fallen into the common prejudice against human nature and have consequently failed entirely in the study of man.

Here, in this discussion of the "denaturalization of the passions", in respect to misdirected social mechanism theories, passions and the forces of the steam engines, etc., we see sharp insight, baring further digression on the so-called "forces of the soul".

> A new school of mental philosophy has sprung up in our day, founded by Gall, the doctrines of which are much more satisfactory than the old metaphysical theories. It does something more than treat of the origin of ideas, the phenomena of conscience, and the operations of reason. It treats of the real living springs of action in the soul, and of their functions in the individual sphere, of their modes of operation and their uses in that sphere, and explains their nature as they manifest themselves in present society. It does not, however, furnish an integral and systematic analysis of human nature; it does not explain the nature and essence of the passions, nor the developments of which they are susceptible; it does not explain their relation to the terrestrial destiny of man, to the globe of which he is the overseer, nor to the universe, in the scheme of which he has an important work to perform.
>
> In the brief treatise which follows, we shall endeavor to explain the functions of the passions, both in the individual and the universal sphere, the destiny to which they impel and guide man, and their relation to nature, to humanity, and to the universe. We shall present a synthetical view of their individual and collective action, of the objects or foci to which they tend, the ends for which they were created, so that the reader may have a general idea of the nature and destiny of the passions of the soul. We shall not enter into a detailed analysis of the divisions and subdivisions of the passions, nor of the special functions which their minor ramifications fulfil, neither shall we explain the scale and gamut of each passion, the degrees of development of which it is susceptible, nor the accords and dissonances it furnishes in social harmony. These and many other details we omit, because we are not writing a full treatise. Our object is simply to present a general analysis of the twelve radical passions, and to give an idea of their functions in directing man in the fulfillment of his social destiny on earth.

On man as a "compound being", according to Fourier, Brisbane states the following:

> Man is a compound being, composed of two principles—one active, the other passive. The active principle is what is called the mind, the soul; the passive principle is the body. The latter is the material instrument of the former, the means by which it inhabits the planet, acts upon matter, and arrives at a state of positive and practical existence.
>
> The soul, or active principle in man, is a whole, composed of a certain number of forces or motors, which we shall call the passions; by the metaphysicians, these forces are variously termed—sentiments, affections, feelings, faculties, impulses, instincts.
>
> The passions are spontaneously active and self-determining forces; they are the thinking, feeling, creating principle in man — the source of his acts and works in all spheres, material and spiritual. They are the agents of supreme wisdom, the motors implanted in him by that wisdom to impel him to fulfill his destiny on earth.
> The human passions were not created at random, were not called into existence without functions and employments having been assigned to them; on the contrary, their functions and uses have been calculated with mathematical precision."

(add discussion)

Education

Brisbane the son of a western New York merchant and landowner, the young Brisbane studied French and Philosophy in New York City, then left in 1828 for six years of study and travel in Europe. Toward the end of his sojourn Brisbane encountered French thinker Charles Fourier and decided to devote his reaction existence (life) to understanding and publicizing the Fourier's "social science."

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External links

â— Albert Brisbane – Wikipedia.

θΔics

In existographies, **Albert Camus** (1913-1960) (IQ:165|#447) [RGM:305|1,500+] (Stokes 100:74) (RE:47) (CR:49), pronounced "al-bear cam-oo" (Q) was a French-Algerian philosopher, who, via his 1942 essay *The Myth of Sisyphus* (see: Camus model), initiated a godlessness brand of existentialism, which rejected nihilism, termed "absurdism", themed on the conflict or apparent absurdity between (a) the human tendency to seek inherent value and meaning in existence and (b) the human inability to find any.

Camus' work was similar to Jean-Paul Sartre, the latter both praising and being critical of the former. [2]

Nihilism

Camus, supposedly, despised nihilism—which he defined as the impossibility of putting one's trust in a religion or in a belief or belief system of some kind—and viewed Fyodor Dostoyevsky's novel *The Possessed* as a prophecy about nihilism's devastating effects. [3]

Quotes | On

The following are quotes on Camus:

> "**Camus** is a very fine writer, but France has many other fine writers. Camus is not a great writer, not a genius. There is only one genius in France today: Jean Genet."
>
> — Jean Sartre (1947), luncheon conversation (Q) with Lionel Abel, New York

Quotes | By

The following are quotes by Camus:

> "The only way to deal with an unfree world is to become so absolutely free that your very existence is an act of rebellion."
>
> — Albert Camus (1942), *The Outsider*

> "Nietzsche was the most famous of god's assassins."
>
> — Albert Camus (1942), *The Myth of Sisyphus*

> "An intellectual is someone whose mind watches itself."
>
> — Albert Camus (c.1946), *Notebooks (1942-1951)*

> "Nobody realizes that some people expend tremendous amounts of energy merely to be normal."
>
> — Albert Camus (c.1949), *Notebooks (1942-1951)* [4]

> "Contrary to the opinion of certain of his Christian critics, Nietzsche did not form a project to kill god. He found him dead in the soul of his contemporaries. He was the first to understand the immense importance of the event and to decide that this rebellion on the part of men could not lead to any renaissance unless it was controlled and directed."

— Albert Camus (1951), *The Rebel: An Essay on Man in Revolt* (pg. 68).

References

1. (a) Absurdism – Wikipedia.
(b) The Myth of Sisyphus – Wikipedia.
2. Sartre, Jean-Paul. (1945). "Existentialism is a Humanism", Lecture at Club Maintenant, Oct 29; in: *Existentialism is a Humanism* (including A Commentary on *The Stranger*; translator: Carol Macomber; Introduction: Annie Cohen-Solal; Notes and Preface: Arlette Elkaim-Sartre; editor: John Kulka) (Camus, 33+ pgs.). Yale University Press, 2007.
3. (a) Camus, Albert. (1959). "Interview: Stage adaption of Dostoyevsky's 'The Possessed'", Pierre Dumayet. Translation: hvolsvellir.
(b) The Possessed (play) – Wikipedia.
4. Camus, Albert. (c.1949). *Notebooks: 1942-1951* (Notebook IV) (Q) (Q). Publisher.

Videos

● Spinoza, Dan. (2019). "The Stranger – Existentialism Rap" (Q), YouTube, Apr 5.

External links

● Albert Camus – Wikipedia.
● Albert Camus – Wikiquote.

θΔics

In hmolscience, **Albert Claude** (1899-1983) was a Belgian physician and cellular researcher, generally known for his 1930 cell fractionation technique, with which he discovered the cell organelles, namely: mitochondrion (which, in his Harvey Lecture, he famously first characterized as the "power plants of the cell"), chloroplast, endoplasmic reticulum, Golgi apparatus, ribosome, and lysosome; was the first to apply electron microscope in biology, thereby in 1945 publishing the first detailed structure of the cell; particularly noted for his 1973 response, during a dinner party, to a query, by a governor, likely of New York, about the existence of god, him being the then leading expert on the origin of life at the cellular level.

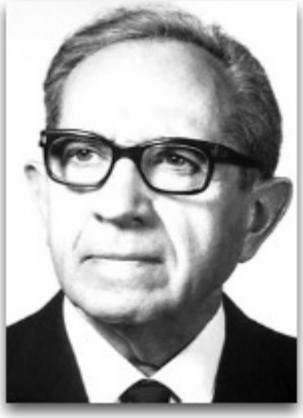

Governor anecdote

See also: Napoleon Laplace anecdote

In *circa* 1973, Claude, in respect to noted anecdotes, was invited to the party of a "Governor of a State", as he reflected in his Nobel Lecture—which likely would be the New York Governor, either Nelson Rockefeller (1 Jan 1959 to 18 Dec 1973) or Malcolm Wilson (18 Dec 1973 to 31 Dec 1974) (Ñº), being that in the Rockefeller Institute, New York, in the 1930s and 1940s, is where he did most of his pioneering work, during which time the governor and his wife approached Claude with questions about the "existence of god", him being the so-close to the unknown virus/cell then-conceptualized life/non-life boundary, about which he recalls as follows:

> "I am afraid that in this description of the cell, based on experimental facts, I may be accused of reintroducing a vitalistic and teleological concept which the rationalism and the scientific materialism of the 19th and early 20th centuries had banished from our literature and from our scientific thinking.
>
> Of course, we know the laws of trial and error, of large numbers and probabilities. We know that these laws are part of the mathematical and mechanical fabric of the universe, and that they are also at play in biological processes. But, in the name of the experimental method and out of our poor knowledge, are we really entitled to claim that everything happens by chance, to the exclusion of all other possibilities?
>
> About a year ago, I was invited to an official party by the Governor of a State. As the guests were beginning to leave, the Governor took me aside in a room nearby. He looked concerned and somewhat embarrassed. 'Dr. Claude,' he asked, 'you seem to know much about life. Please tell me: what do you think about the existence of God.' The question was unexpected, but I was not unprepared. I told him that for a modern scientist, practicing experimental research, the least that could be said, is that we do not know. But I felt that such a negative answer was only part of the truth. I told him that in this universe in which we live, unbounded in space, infinite in stored energy and, who knows, unlimited in time, the adequate and positive answer, according to my belief, is that this universe may, also, possess infinite potentialities. The wife of the Governor had joined us in the meantime. Hearing this, she seized her husband by the arm and said, 'You see, I always told you so.'
>
> Life, this anti-entropy, ceaselessly reloaded with energy, is a climbing force, toward order amidst chaos, toward light, among the darkness of the indefinite, toward the mystic dream of love, between the fire which devours itself and the silence of the cold. Such a nature does not accept abdication, nor skepticism.
>
> No doubt, man will continue to weigh and to measure, watch himself grow, and his universe around him and with him, according to the ever growing powers of his tools. For the resolving powers of our scientific instruments decide, at a given moment, of the size and the vision of our universe, and of the image we then make of ourselves. Once Ptolemy and Plato, yesterday Newton, today Einstein, and tomorrow new faiths, new beliefs, and new dimensions."

The "life = anti-entropy" section of this lecture has since gone on to become a semi-popular quote. [2]

Quotes

The following are noted quotes:

> "The same causes, always produce the same effects."
>
> — Albert Claude (1974), "Nobel Lecture", attributed to the Greeks [1]

> "Is it absurd to imagine that our social behavior, from amoeba to man, is also planned and dictated, from stored information, by the cells—these autonomous and all-contained units of living matter?"
>
> — Albert Claude (1974), "Nobel Lecture" [1]

References

1. Claude, Albert. (1974). "The Coming Age of the Cell: Inventory of Living Mechanisms, Biochemistry and Electron Microscope, and the View of the Impact of the Findings on our Status and Thinking" (Ñº), Nobel Lecture, Dec 12.
2. Gaither, Carl C. and Cavazos-Gaither, Alma E. (2012). *Gaither's Dictionary of Scientific Quotations* (pg. 1165) (Ñº). Springer.

External links

â— Albert Claude – Wikipedia.

θΔics

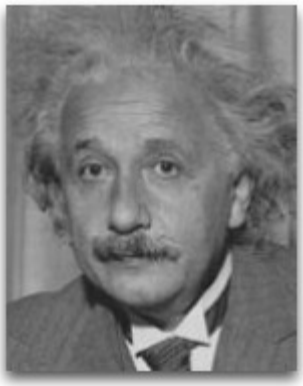

In existographies, **Albert Einstein** (1879-1955) (IQ:205|#3) (Gottlieb 1000:17) [RGM:2|1,500+] (Murray 4000:9|CS / 2|P) (LGS:1) [Kanowitz 50:2] [Cropper 30:1|R] (GPE:1) (HD:52) (RE:76) [CR:737] was a German-born American greatest physicist ever physicist noted for his 1905 discovery of the equivalence of mass and energy (mass-energy equivalence), for his hypothesis of "light quanta" (based on Max Planck's 1901 energy element), a pioneer of radiation thermodynamics, initiator of the science of relativistic thermodynamics, and for his 1915 masterpiece the general theory of relativity, which provided a new general theory of gravity that predicted the gravitational bending of light rays, a phenomenon that was confirmed by Arthur Eddington during the eclipse of 1919, after which Einstein became world-famous. [1] The follow is Einstein's 1933 statement on human behavior: [26]

> "Our behavior should be motivated by the ever-present realization that human beings in their thoughts, feelings and actions are not free agents, but are subject to the inexorable laws of cause and effect as are the stars in their courses."

The following is a truncated version of one of Einstein's famous quotes on physical theories:

> "Thermodynamics is the only physical theory of universal content that will never be overthrown."

Einstein also developed a model for the heat capacity in solids and gases, and, together with Indian physicist Satyendra Bose, developed a variation of statistics allowing for the description of the behavior of bosons. [2]

Purpose? | Why's of existence

See main: Einstein on purpose; See also: Einstein-Pascal dialogue

In December 1950, Einstein received a long handwritten letter from a nineteen-year-old engineering student at Rutgers University who said "My problem is this, sir, 'What is the purpose of man on earth?'" Dismissing such possible answers as to make money, to achieve fame, and to help others, the student said "Frankly, sir, I don't even know why I'm going to college and studying engineering." The student went on to express his opinion that man is here "for no purpose at all" and went on to quote from French mathematical physicist Blaise Pascal's (IQ=190) *Pensees* (*Thoughts*) the following words, which he said aptly summed up his own feelings on the matter: [20]

> "I know not who put me into the world, nor what the world is, nor what I myself am. I am in terrible ignorance of everything. I know not what my body is, nor my senses, nor my soul, not ever that part of me which thinks what I say, which reflects on all and on itself, and knows itself no more than the rest. I see those frightful spaces of the universe which surround me, and I find myself tied to one corner of this vast expanse, without knowing why I am put in this place rather than another, nor why this short time which is given me to live is assigned to me at this point rather than at another of the whole eternity which was before me or which shall come after me. I see nothing but infinities on all sides, which surround me as an atom, and as a shadow which endures only for an instant and returns no more. All I know is that I must die, but what I know least is this very death which I cannot escape."

The student remarked that Pascal saw the answers to be in religion but that he himself did not. After elaborating on the cosmic insignificance of man, he nevertheless asked Einstein to tell him where the right course lay, and why, saying "Pull no punches. If you think I've gone off the track let me have it straight." On 3 Dec 1950, a few days after receiving the letter, Einstein replied (see: main). [15]

Significance of **key terms** from Einstein's collected papers **(1879-1902)** indicating that "temperature" was the most dominate scientific term of this period.

Significance of **key terms** from Einstein's collected papers **(1900-1909)** indicating that "entropy" was the most dominate scientific term of this period.

Education

At age 5, Einstein received his first compass, and began to investigate the natural phenomenon. At age 9, Einstein built a 14-story card house. (Ñº)

At age 10, he set into a program of self-education and began reading as much about science as he could. At age 12, he had decided to devote himself to solving the riddle of the 'Huge World.'

In 1895, at age 16, Einstein attempts to skip high school, by taking an entrance exam to the Swiss Polytechnic, a top technical university, but fails the arts portion. The following year, age 17, he finishes high school and enrolls at ETH Zurich in the mathematics and physics program. In 1900, age 21, he graduated from college, with a degree in mathematical physics.

For the next two years, Einstein searched unsuccessfully for a teaching post, settling, in *circa* 1902, for a job at the patent office in Bern, evaluating patent applications for electromagnetic devices. He published his first scientific paper in 1901 on intermolecular forces, followed by two papers in 1902 on thermodynamics of potential differences in metals and of the second law in the context of kinetic theory. Over the next two years, he published two papers: "A Theory of the Foundations of Thermodynamics" (1903) and "On a General Molecular Theory of Heat" (1904)". The following year he published 25 papers, mostly on thermodynamics, five of which functioned to catapult him into scientific stardom. The following key term mapping gives an indication to the weight of different terms in the mind of Einstein during his first thirty years of life.

Einstein gained worldwide prominence in 1919, when British astronomers verified predictions of Einstein's general theory of relativity through measurements taken during a total eclipse. Einstein's theories expanded upon, and in some cases refuted, universal laws formulated by Newton in the late seventeenth century.

On the shoulders of giants

Born the year of Scottish physicist James Maxwell's dereaction (death), Einstein was so inspired by Maxwell's mathematics - which he'd had to teach himself because his teachers didn't include it in their curriculums - that he put a photograph of Maxwell on his study wall, alongside pictures of Michael Faraday and Isaac Newton. These three men were Einstein's great intellectual influences. [6]

Maxwell, who had built on the work English chemist and physicist Michael Faraday and his conception of "lines of force" (or field lines), through the publication of his 1873 *Treatise on Electricity and Magnetism*, had established

that light or all forms of electromagnetic radiation consisted of electromagnetic waves. Subsequently, by 1905 the wave nature of light was an established, incontrovertible fact. Einstein, however, proposed that light was not continuous but consists of localized particles. As Einstein wrote in the introduction to his March 1905 paper: [9]

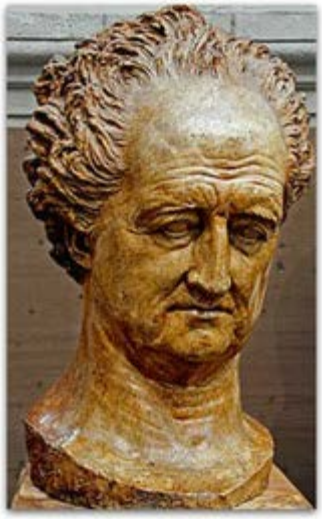

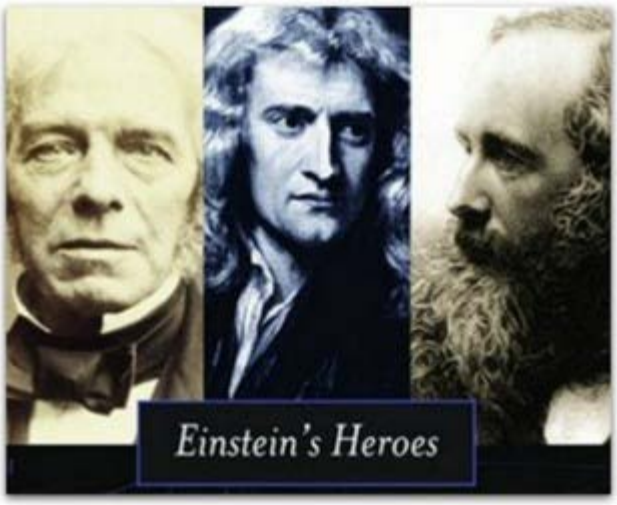

Einstein kept a **bust** of Goethe in his study, along with pictures of Faraday, Newton, and Maxwell, and in his personal library the most-represented author was the work of Goethe in a thirty-six volume edition and another of twelve volumes, plus two volumes on his *Optics*, the exchange of letters between Goethe and Schiller, and a separate volume of *Faust*. [16]

> "According to the assumption to be contemplated here, when a light ray is spread from a point, the energy is not distributed continuously over ever-increasing spaces, but consists of a finite number of **energy quanta** that are localized in points in space, move without dividing, and can be absorbed or generated only as a whole."

These "energy quanta" were later terms labeled as "photons" a 1926 coinage of American physical chemist Gilbert Lewis to describe a "particle" of light. [10]

Collected works

See also: Einstein's personal library

The complete scholarly edition of *The Writings of Albert Einstein*, according to Princeton University Press, constitutes about twenty volumes. On 17 Mar 1932, on the hundredth anniversary of Goethe's dereaction (death), Einstein wrote, in his auto-biographical answers to a questionnaire about his achievements and publications, in the process of becoming a member of the Kaiser Leopold German Academy of Scientists, the following: [15]

> "My publications consist almost entirely of short papers in physics, most of which have appeared in *Annalen der Physik* and the *Proceedings of the Prussian Academy of Sciences*. The most important of which have to do with the following topics: Brownian motion (1905), theory of Planck's formula and light quanta (1905, 1917), special relativity and the mass of energy (1906), general relativity (1916)."

According to Google Books analysis of key term usage as found in the collected papers of Einstein, the mindset of his twenties, from 1900 to 1909, was most dominated by the word "entropy". [14] The first 25 of Einstein's first 30 published papers, of over 300 in total, were in thermodynamics. [12] Thermodynamics played a special role in Einstein's early search for a unified theory of physics. [13]

Determinism

See main: *Determinism*

On whether or not the laws of science applied to humans, Einstein stated: [15]

Some of the books in Einstein's personal library.

"Scientific research is based on the idea that everything that takes place is determined by laws of nature, and therefore this holds for the actions of people."

Seed of drive

In his last *Autobiographical Note*, Einstein recalled the first crucial insight (thought experiment) that led to his special theory of relativity. It came to him unexpectedly, while he was daydreaming, at the age of sixteen: [4]

"What would it be like … to run beside a light beam, at the speed of light?"

Through this conjecture, a number of scientific insights, e.g. that no object with mass can be moved at the speed of light because it would take an infinite about of energy, that time is relativistic, that matter and energy are equivalent, that radiation consists of light quanta, etc., emerged or naturally fell out into plain view. [5]

Mass-energy equivalence

In 1905, with respect to the development of "relativistic thermodynamics", German-born American physicist Albert Einstein showed that energy is proportional, according to the speed of light squared, to matter. [7] Specifically, in his September 27 paper "*Does the inertia of a body depend upon its energy-content?*", Einstein proposed that the equivalence of mass and energy is a general principle, which is a consequence of the symmetries of space and time. [8]

Three-meter-tall sculpture of Einstein's $E = mc^2$ formula at the 2006 Walk of Ideas, Germany.

On love

See main: Einstein on love

The following are Einstein's thoughts on the subject of love: [11]

> "Gravitation cannot be responsible for people falling in love."

> "How on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?"

In respect to gravitation and love, Einstein seems to have been off in logic a bit. To cite a simple disproof example,

female sexual heat, for instance, is mediated by the lunar cycle which is a gravitational phenomenon.

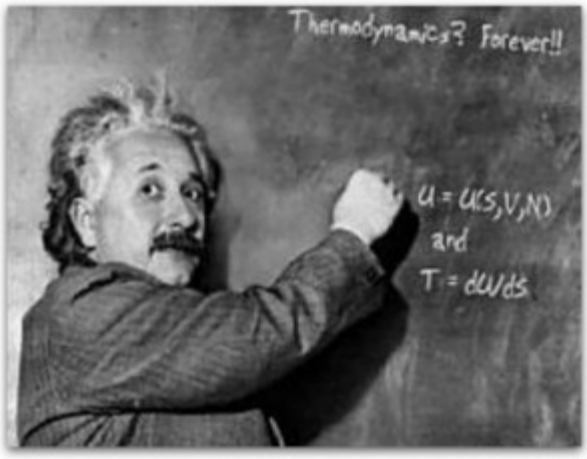

A retouched photo showing Einstein's famous "thermodynamics forever" or "thermodynamics will never be overthrown" quote. [17]

Atomic energy | Uranium bomb

In 1904, New Zealand-born British physical chemist Ernst Rutherford wrote: [21]

"There is reason to believe that an enormous store of latent energy is resident in the atoms of the radio elements. Its existence at once explains the failure of chemistry to transform the atoms and also accounts for the independence of the rate of change of all external agencies. If it were ever found possible to control at will the rate of disintegration of the radio elements an enormous amount of energy could be obtained from a small amount of matter."

In his famous Aug 2nd, 1939 letter to President Roosevelt, Einstein warned of the atomic bomb:

> "In the course of the last four months it had been made probable—through the work of Joliot in France as well as Fermi and Szilard in America—that it may become possible to set up a nuclear chain reaction in a large mass of uranium, by which vast amounts of power and large quantities of new radium-like elements would be generated. Now it appears almost certain that this could be achieved in the immediate future.This new phenomenon would also lead to the construction of bombs, and it is conceivable—though much less certain—that extremely powerful bombs of a new type may thus be constructed. A single bomb of this type, carried by boat and exploded in a port, might very well destroy the whole port together with some of the surrounding territory. However, such bombs might very well prove to be too heavy for transportation by air."

The theory that a the nuclear chain reaction could release several million times more energy than ordinary chemical reactions, was originally conceived by Leo Szilard, and there after communicated to Einstein.

Religion | God

See main: Einstein on religion; Einstein on god

The following are a few quotes by Einstein on god and or religion:

> "Thus, I came to a deep religiosity, which, however, reached an abrupt end at the age of 12. Through the reading of popular scientific books, I soon reached a conviction that much in the stories of the Bible could not be true. Suspicion against every kind of authority grew out of this experience, an attitude that has never left me."
>
> — Albert Einstein (c.1950), in FSM app

> "I do not believe in a personal god and I have never denied this but have expressed it clearly. If something is in me which can be called religious then it is the unbounded admiration for the structure of the world so far as our science can reveal it."

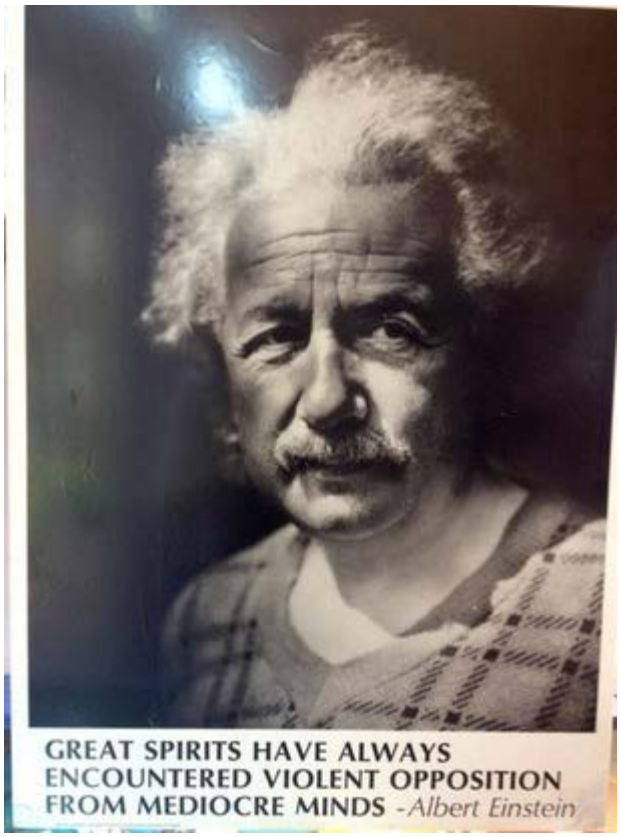

An Einstein photo (Ñº) from an article on the "Lieserl love letter hoax". (Ñº)

— Albert Einstein (1954), reply letter to an Italian-born American atheist on clarification of his religious views, Mar 24

> "I have repeatedly said that in my opinion the idea of a personal god is a childlike one. You may call me an agnostic, but I do not share the crusading spirit of the professional atheist whose fervor is mostly due to a painful act of liberation from the fetters of religious indoctrination received in youth. I prefer an attitude of humility corresponding to the weakness of our intellectual understanding of nature and of our own being."
>
> — Albert Einstein (c.1950), *Source*

Curiously, Einstein, in communication with Sigmund Freud, commented his view that he believed that Jesus Christ was an actual real person:

> "Dear professor Freud, it is admirable the way the longing to perceive the truth has overcome every other desire in you. You have shown with irresistible clearness who inseparably the combative and destructive instincts are bound up with the amative and vital ones in the human psyche. At the same time a deep yearning for that great consummation, the internal and external liberation of mankind from war, shines out from the ruthless logic of your expositions. This has been the declared aim of all those who have been honored as moral and spiritual leaders beyond the limits of their own time and country without exception, from Jesus Christ to Goethe and Kant."
>
> — Albert Einstein (1932), "Letter to Sigmund Freud" [25]

Whereas, in fact, the person of "Jesus Christ", as described in the Christian Bible, is but an half-divine half-anthropomorphized rewrite of the "Osiris anointed" mummification resurrection story of the Egyptian *Book of the Dead*. We might have to give Einstein an IQ downgrade (↓) for his comment, in respect to Newton and Goethe. "No way Einstein goes above Isaac Newton." (source: Electro-Cute (2013), IQ 200+ | Smartest person ever (4 of 4), Aug comment, 5+ thumbs up). Newton, for example, denied the divinity of Jesus Christ and the Holy Spirit; and Goethe, likewise, at age 21, contended

that "Jesus Christ is not the author of Christianity, but rather a subject composed by a number of wise men and that Christian religion is merely a rational, political institution", at age 33 described himself as "non-Christian", and at age 46 stated that one of the four things he hated most was the cross †, along with bugs, tobacco smoke, and garlic. On the flip side, mass public polling at TopTens.com's "10 Smartest People in History" (Ñº), still ranks Einstein (#2) above Newton (#5). Yet then again, Newton (#7) has a higher HCT ranking as compared to Einstein (#12).

> "The word god is for me nothing more than the expression and product of human weaknesses, the Bible a collection of honourable, but still primitive legends."
>
> — Albert Einstein (1954), Letter to Gutkind (Jan 3) (Ñº)

(add discussion)

Soul?

> *See main: Einstein on the soul*

In 1921, Einstein received a letter from a woman in Vienna imploring him to tell her if he had formed an opinion as to whether the soul exists and with it personal, individual development after death; on 5 Feb 1921, Einstein answered the following: [15]

> "The mystical trend of our time, which shows itself particularly in the rampant growth of the so-called theosophy and spiritualism, is for me no more than a symptom of weakness and confusion. Since our inner experiences consist of reproductions and combinations of sensory impressions, the concept of soul without a body seems to me empty and devoid of meaning."

In 1929, Einstein stated the following about his views on the question of god and soul:

> "We followers of Spinoza see our God in the wonderful order and lawfulness of all that exists and in its soul ('Beseeltheit') as it reveals itself in man and animal. It is a different question whether belief in a personal God should be contested. Freud endorsed this view in his latest publication. I myself would never engage in such a task. For such a belief seems to me preferable to the lack of any transcendental outlook of life, and I wonder whether one can ever successfully render to the majority of mankind a more sublime means in order to satisfy its metaphysical needs."
>
> — Albert Einstein (1929), "Letter to Eduard Busching" (Oct 29); after Büsching sent Einstein a copy of his book *Es gibt keinen Gott* [*There Is no God*] [28]

On 17 Jul 1953, in a response letter to a female Baptist pastor who queried him in regards to his views on soul, God, and everlasting life, Einstein replied: [15]

> "I do not believe in immortality of the individual, and I consider ethics to be an exclusively human concern with no superhuman authority behind it."

Dereaction | Reaction end

In 1948, an exploratory surgery found a grapefruit-sized aneurism (swelling and weakening) of the abdominal aorta.

The aneurism was partially wrapped with cellophane bands in 1949. On 11 Apr 1955, just two days after he signed Bertrand Russell's appeal for an end to the nuclear arms race, Einstein's aneurysm perforated. To the suggestion that he undergo the recently introduced aneurysmectomy and graft replacement, Einstein famously replied: [18]

> "I want to go when I want. It is tasteless to prolong life artificially; I have done my share, it is time to go. I will do it elegantly."

On April 18th, at the Princeton University Hospital, he dereacted, met his reaction end (died) or existence end in his sleep.

Brain

See main: Einstein's brain

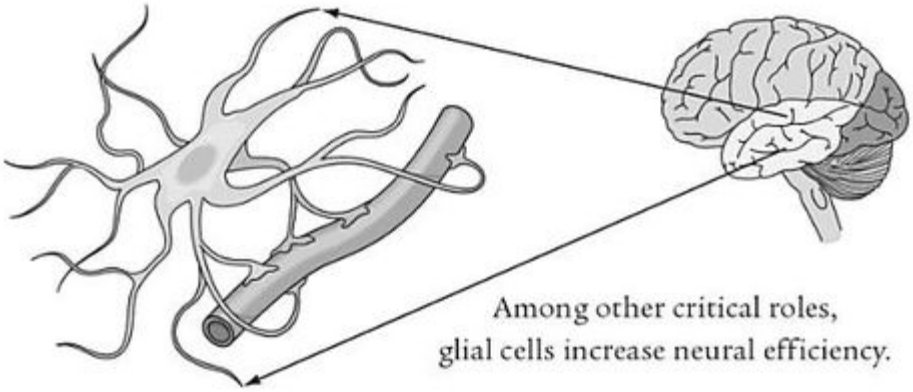

Einstein's brain is reported to have had more glial cells, in the left parietal lobe (above), a larger and more myelinated corpus callosum, and possibly a higher right frontal cortex neuronal density. [27]

Within seven hours of his reaction end, his brain was removed by American pathologist Thomas Harvey and had it cut into 240 blocks for study; sending tissue slides to several neuropathologists, who reported nothing exotic. The remaining brain sections floated in two mason jars of formaldehyde, inside of a cardboard box marked Costa Cider, under a beer cooler in Harvey's office.

In the mid-1980s, Marian Diamond studied Einstein's brain, finding that, in the left inferior parietal lobe, there were more glia per neuron (73 percent) as compared to average brains. [27]

In 1999, his brain was examined by Sandra Witelson and colleagues at McMaster University, who found that it weighted 1,230 grams; had parietal lobes, essential for mathematical and spatial reasoning, that appeared 15 percent wider than normal (a phenomenon also, supposedly, found in Gauss and Siljestrom); and his Sylvian fissure, the fold running through the parietal lobes, was missing. [19]

Einstein's corpus callosum was also found to be highly myelinated and much thicker than average. (Ñº) In 2001, American investigative journalist Michael Paterniti published *Driving Mr. Albert: a Trip Across America with Einstein's Brain*, wherein he details the so-called what had become "urban myth" of the Einstein's brain. (Ñº)

Praise | Tributes

The following are related tributes and or praise:

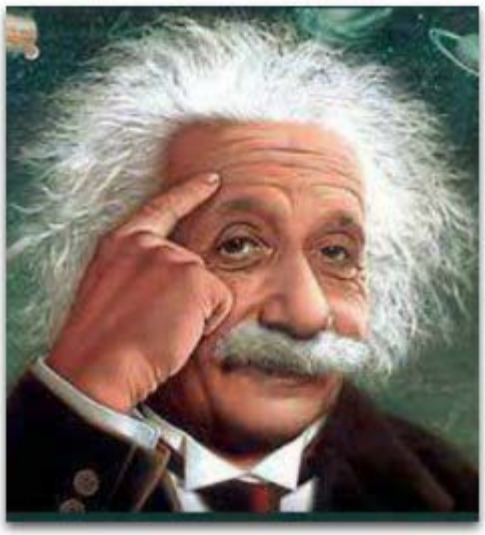

> "Centuries from now the man in the street will know of our time as the period of the [First] World War, but the educated man will associate the first quarter of our century with your name [**Einstein**], just as today some people think of the end of the seventeenth-century as the time of the wars of Louis XIV and others as the time of Newton."
>
> — Fritz Haber (1929), letter to Einstein on the occasion of his 50th birthday [15]

Quotes | Dated

The following are noted quotes and comments by Einstein:

An artistic depiction of the classic Einstein quote: “Education is the progressive realization of our ignorance.”

“Really, it would have been better if I had never been born. Sometimes the only thought that sustains me and is my only refuge from despair is that I have always done everything I could within my small power, and that year in, year out, I have never permitted myself any amusements or diversions except those afforded by my studies.”

— Albert Einstein (1898), "Letter to sister" [15]

“Nernst and Planck acted like people who wanted to get hold of a rare postage stamp.”

— Albert Einstein (1913), commentary on Walther Nernst and Max Planck’s summer travel to Zurich in attempts to recruit him to the University of Berlin, with offers of his own Kaiser Wilhelm Institute, full professorship, without any teaching duties, and lucrative salary [29]

“I, too, was originally supposed to become an engineer. But I found the idea intolerable of having to apply the inventive faculty to matters that make everyday life more elaborate—and all, just for dreary money-making. Thinking for its own sake, as in music! … When I have no special problem to occupy my mind, I love to reconstruct proofs of mathematical and physical theorems that have long been known to me. There is no *goal* in this, merely an opportunity to indulge in the pleasant occupation of thinking.”

— Albert Einstein (1918), "Letter to Heinrich Zangger" [15]

“With fame I become more and more stupid, which, of course, is a very common phenomenon.”

— Albert Einstein (1919), "Letter to Heinrich Zangger, Dec [15]

“I admire Goethe as one of the smartest and wisest men of all time.”

— Albert Einstein (1932), "Comment to Leopold Casper", Apr 9 [24]

“Read no newspapers, try to find a few good friends who think as you do, read the wonderful writers of earlier times, Kant, Goethe, Lessing, and the classics of other lands, and enjoy the natural beauties of [the] surroundings.”

— Albert Einstein (1933), "Advice to troubled despondent jobless Munich musician", Apr 5

“Everything is determined … by forces over which we have no control. It is determined for the insect as well as the star. Human beings, vegetables, or cosmic dust—we all dance to a mysterious tune, intoned in the distance by an invisible piper.”

— Albert Einstein (1936), "Response letter to sixth grade Sunday School student as to whether or not scientists pray", Jan 24 [15]

“Life and death flow into one, and there is neither evolution nor destiny, only being.”

— Albert Einstein (1939), "Letter to Queen Elisabeth of Belgium" [22]

“Great [individuals] have always encountered violent opposition from mediocre minds. The mediocre mind is incapable of understanding the man who refuses to bow blindly to conventional prejudices and chooses instead to express his opinions courageously and honestly.”

— Albert Einstein (1940), "Letter to Morris Cohen, Mar 19 [23]

“Objectively, there is, after all, no free will.”

— Albert Einstein (1946), "Letter to Otto Juliusburger", Apr 11

“My scientific work is motivated by an irresistible longing to understand the secrets of nature and by no other feeling.”

— Albert Einstein (1949), "Reply letter on a query about his scientific motivation", Aug 20 [15]

“Science is a wonderful thing if one does not have to earn one’s living at it. One should earn one’s living by work of which one is sure one is capable. Only when we do not have to be accountable to anyone can we find joy in scientific endeavor.”

— Albert Einstein (1951), "Reply letter to female student thinking about becoming a professional astronomer", Mar 24

Quotes | Un-Dated

The following are noted quotes and comments by Einstein:

“Don’t bother me, I want to study.”

— Albert Einstein (c1925), comment to second wife Elsa Einstein [m.1919-1936]; as reported by Angela Jabari (2017) as seen somewhere

“It’s not that I’m so smart, it’s just that I stay with problems longer.”

— Albert Einstein (c.1930)

“Life is like riding a bicycle. To keep your balance you must keep moving.”

— Albert Einstein (c.1930)

“Education is the progressive realization of our ignorance.”

— Albert Einstein (c.1930)

“When I examine myself and my methods of thought, I come to the conclusion that the gift of fantasy has meant more to me than my talent for absorbing positive knowledge.”

— Albert Einstein (c.1930)

"The formulation of the problem is often more essential then its solution which may be merely a matter of mathematical or experimental skill."

— Albert Einstein (c.1930) (Ñº)

"Now he has departed from this strange world a little ahead of me. That signifies nothing. For those of us who **believe in physics**, the distinction between past, present and future is only a stubbornly persistent illusion."

— Albert Einstein (1955), letter of condolence to the family of his lifelong friend Michele Besso, who had just passed away (Ñº); Einstein, himself, dereacted a month later

See also

â— Einstein on love
â— Einstein on purpose
â— Einstein's personal library
â— Einstein-Murphy dialogue
â— Einstein-Pascal dialogue

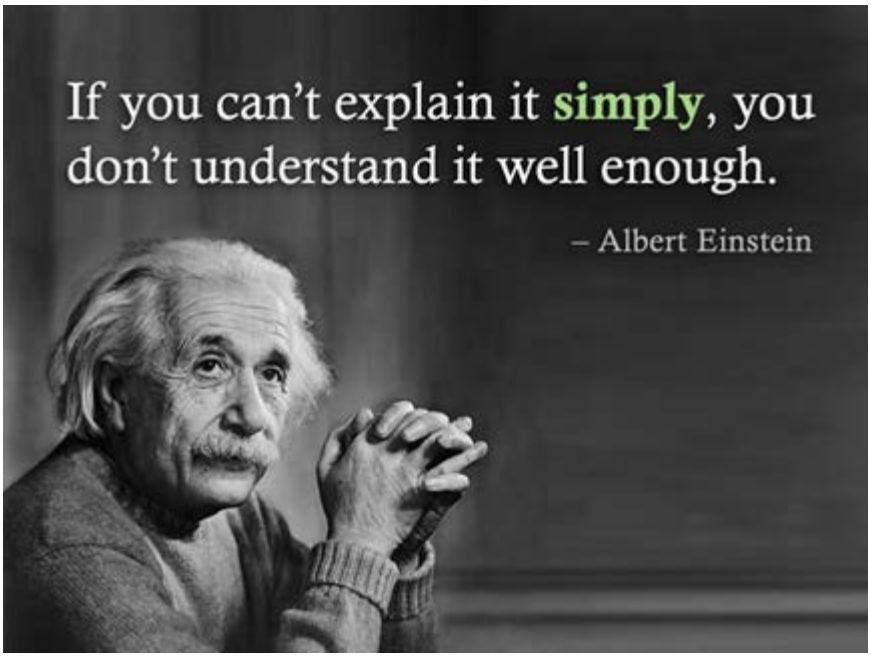

An Einstein original quote, or a paraphrase of Ernest Rutherford (see: barmaid explanations).

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(b) Source: Isaacson, Walter. (2007). *Einstein*, (pg. 423). Simon and Schuster.
(c) In the late 1920s at the California Institute of Technology, as recorded by Henry Borsook (1956), physical chemist Edwin Cohn asked geneticist Thomas Morgan what is research plans were? Morgan answer was: “I am not doing any genetics. I am bored with genetics. But I am going out to Cal Tech where I hope it will be possible to bring physics and chemistry to bear on biology.” Shortly after Morgan arrived at Cal Tech, Einstein visited the laboratory and posed almost the same question. Morgan answered similarly as before. In response, Einstein shook his head and said: “No, this trick won’t work. The same trick does not work twice. How on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?”
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θΔics

In science, **Albert L. Lehninger** (1917-1986) was an American biochemist noted for his 1971 book *Bioenergetics*, on the subject of bioenergetics, wherein he supposedly reasons that the entropy of living systems cannot be defined in classical thermodynamic terms because such systems are said to not exist at equilibrium, but rather in open metastable states (see: metastable equilibrium). [1] The following quote exemplifies Lehninger's perspective:

> "Today, all scientists agree that the laws of physics and chemistry, including the principles of thermodynamics, also hold in the biological world: there can be no vitalism or black magic by which living organisms sustain and perpetuate themselves."

Lehninger, in general, is noted for his 1982 textbook *Principles of Biochemistry*, having gone through five editions, and published in seven languages, which since has become something of a classic in college biochemistry courses.

Education

Lehninger completed his BA at Wesleyan University (1939), his MS (1940) and PhD (1942), in biochemistry, at the University of Wisconsin-Madison.

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θΔics

In hmolscience, **Albert Prescott Mathews** (1871-1957) was an American biochemist, physical chemist, and physiologist noted for his 1924 general cytology chapter "Chemistry and Psychism" in which he gives a discussion on the life, death, and the 'souls' of atoms (see: dead atoms) in terms of energy, light, and ether.

Dead atoms | Atomic souls

See main: Do atoms have souls?

In 1924, Mathews, in his *General Cytology*, chapter "Chemistry and Psychism", cited by Edwin Slosson (1925), gives a discussion on the life, death, and the 'souls' of atoms (see: dead atoms) in terms of energy, light, and ether, as follows: [1]

> "It is perfectly correct, therefore, from this point of view to speak of living and dead hydrogen atoms. We can even go farther with the simile if we wish and say that when the living high reactive form of the atom passes to the dead, unreactive form, the soul of the atom escapes at the moment of death, for a ray of light leaves the dying atom an travels onward in space, until perhaps it encounters and is absorbed by some other dead hydrogen atom, which it again raises to life by thus giving it a soul. What is this soul? It is a minute portion of the luminiferous ether; of time and space; of eternity and infinity.
>
> For us it is oxygen which thus summons the dead from the tomb; which vitalizes the dead molecules and atoms. The energy is stored in certain of the atoms of the molecules of the protoplasm in the form of widened orbits of rotation of the electrons. It is this which gives them the power of reacting and of passing back to the dead. When such electrons fall back to more stable configuration, the atom and molecule reverts to the dead and inert form such as we keep in bottles. It is the oxygen, then, which vitalizes all animals; but it is from the sun that the vital, radiant energy has come. It is in fact the luminiferous ether which has made they thing alive, for the ether is the great storehouse of energy; it is itself nothing else than space and time; energy and time. Energy is but ether divided by time. Quantity of energy is quantity of ether per second. So all goes back to the either; infinity and eternity. From it is derived our energy and life."

(add discussion)

Mathews, in this regard, might be classified as an early materialist/physicalist-based soul theorist.

Entropy

On the subject of entropy, Mathews states: [2]

> "Entropy is an extremely baffling conception. It is sometimes erroneously treated as if it were simply a statistical, a probable, or thermodynamic factor, without any material basis. Its material basis is almost never defined and is seldom even alluded to in books on thermodynamics."

His books include *Physiological Chemistry* (1915), *Principles of Biochemistry* (1936), *Vitamins, Minerals, and Hormones* (1937), *The Nature of Matter, Gravitation, and Light* (1927), and *Space-time and Matter* (date).

Education

Mathews graduated from high school at age 15, originally intending to study electrical engineering, but became captivated by William Sedgwick and E.B. Wilson's textbook *General Biology* completed his BS at MIT in 1892 (in biochemistry or physical chemistry?); was an assistant in biology at MIT, 1892 to 1893; fellow in biology at Columbia University in 1893 to 1895; a student at Cambridge University, England, and Marburg University, Germany, from 1895

to 1897; completed PhD, with a dissertation on the “Physiology of Secretion” at Columbia University (1898); became an assistant in physiology at Harvard Medical School, the following year. In 1901, Mathews went to the University of Chicago, becoming head of the department of physiological chemistry. Mathew’s 1915 *Physiological Chemistry* was the principle American text for nearly three decades, going through six editions (1939). [3]

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θΔics

In science, **Albert Nock** (1870-1945) was an American libertarian author, educational theorist, and social critic noted for his 1931 to 1932 commentary on the intellectual stature of Willard Gibbs in respect to the comparatively lessened respect for scientific knowledge by Americans in general, say as compared to the Germans in its peak intellectual leadership years.

Overview

In 1931, Nock, in his *The Theory of Education in the United States*, the Page-Barbour Lectures at the University of Virginia, recounted the following telling anecdote about American engineer Willard Gibbs: [1]

> "In the last generation, this country produced one of the most eminent men of science in the whole world. His name was quite unknown among us while he lived, and it is still unknown. Yet I may say without too great exaggeration that when I heard it mentioned in a professional assembly in the Netherlands two years ago, everybody got down under the table and touched their foreheads to the floor. His name was Josiah Willard Gibbs."

The "professional assembly", Nock refers to here, may likely have been some convention or meeting of sorts associated with the Dutch school of thermodynamics, although this is only a reasoned guess. Nock elaborates on why he brings this anecdote up as follows:

> "Now, the object of this observation is not to intimate that spurious or inflated reputations are easily made among us; whether this be true to any great extent or not is no concern of ours at the moment. We may raise the question, however, the general interest in science which as a people we are supposed to have, actually exists. It is taken for granted, especially by unfriendly critics of the 'great traditions' discipline, that as a people we are of a scientific turn, and have great interest in science. I see no reason to believe this.
>
> We are greatly interested in the practical outcome of invention and discover' that is clear, and we need not go too far out of our way to attribute a mercenary motive to this interest. We are also, I think, greatly possessed of an indolent, passive and fitful curiously about certain superficial and speculative concerns about sciences, which causes us to skim their large popular literature with some frail and tenuous semblance of attention. We are also susceptible to sensation-mongering, such as that which poor Einstein found so ready to be visited on him when he came here; a most discreditable and repulsive performance on the part of our journalists who, as you no doubt remember, drew on the very last resources of their loathsome profession in the effort to exploit his super achievements. But that we have, as for instance the Germans so notably have, an ingrained regard for science, an instinctive respect for whatever is *wissenschaftlich* [know-nomically or scientific-scholarly], a sense that the right way is the one to be followed—this is in my judgment rather than doubtful, for I nowhere see evidence of the working of any such spirit. Therefore when it is assumed that this turn for science has anything to do with a disparagement of the 'great traditions' discipline, I would suggest that we examine carefully the premises of this assumption before were accept it."

(add discussion)

Nock reports, in his Jun 1932 to Dec 1933 *Journal of These Days*, the following rather remarkable possibly the most ironic accounts in history: [2]

> "At one time they were going to dismiss Willard Gibbs from the faculty, but somebody made an impassioned speech for him, saying it would never do to let out such a good Yale man who was so well

> connected. So they kept him, not because he was almost beyond doubt the greatest mind in theoretical chemistry that ever lived, but because he was a loyal son of Yale and of a good Connecticut family. Gibbs could not get his work published for a long, except by getting it into the journal of a society over there that recorded the doings of the first families."

The irony of this situation is parodied well by *circa* 1902 visit of William Thomson to Yale, recounted by Irving Fisher, wherein Thompson made the following rather accurate forecast: [3]

> "By the year 2000 Yale would be best known to the world for having produced J. Willard Gibbs."

The only thing that might remotely compare to this would be German physicist Albert Einstein getting rejected from ETH Zurich for teaching assistant position (1900) or having his doctorate rejected from the University of Bern (1907) "after" he had already deduced the so-called most famous equation of all time: [4]

$$\mathcal{E} = mc^2$$

(add discussion)

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θΔics

In existographies, **Albert Szent-Gyorgyi** (1893-1986) (CR:25) was a Hungarian physiologist and bioenergetics pioneer noted, in animate thermodynamics, for his startling 1948 statement that “life, as such, does not exist”, for his 1961 electron theory of “living matter”, and for his 1974 proposal to replace the term “negative entropy” (or *negentropy*) with “syntropy”, which he pictured as a force which causes living things to reach “higher and higher levels of organization, order and dynamic harmony.” [1]

Gyorgyi’s views on life and energy were and inspiration to Chinese-born English biophysicist Mae-Wan Ho. [2]

At some point along the way, he also expressed his motto that "we need to fight against entropy."

Influenced

A noted student of Szent-Gyorgyi was John Avery who worked under him during the summers of 1960 and 1961.

Life, as such, does not exist

See main: Life does not exist

Szent-Gyorgyi, has become semi-famous for his oft-repeated, startling to some, statement that “life, itself, does not exist”, a view that has been cited up to the present in what is life debates. In 1948, Szent-Gyorgyi, in his *Nature of Life: a Study of the Muscle*, stated the following—which seems to be the first mention of this view—in his chapter section on colloidal chemical considerations: [9]

> “The biologist wants to understand life, but **life, as such, does not exist**: nobody has ever seen it. What we call ‘life’ is a certain quality, the sum of certain reactions of systems of matter, as the smile is the quality or reaction of the lips.”

In 1972, Szent-Gyorgyi, in his *The Living State*, opens to the following paragraph: [11]

> “Every biologist has at some time asked ‘what is life?’ and none has ever given a satisfactory answer. Science is built on the premise that nature answers intelligent questions intelligently; so if no answer exists, there must be something wrong with the question. **Life, as such, does not exist.** What we can see and measure are material systems which have the wonderful quality of ‘being alive’. What we can ask more hopefully is ‘what are the properties which bring matter to life? Though I do not know what life is, I have no doubt as to whether my dog is alive or dead. Life is a paradox. It is easy to understand why man always divided his world into ‘animate’ and ‘inanimate’, *anima* meaning soul, the presence of which had to explain queer behavior. The most basic rule of inanimate nature is that it tends toward equilibrium which is at the maximum of entropy and the minimum of free energy. As shown so delightfully by Schrodinger in his little book *What is Life?* (1945), the main characteristic of life is that it tends to decrease its entropy. It also tends to increase its free energy.”

In 1972, Szent-Gyorgyi, in his chapter contribution “What is Life?”, stated the following: [14]

> “In my search for the secret of life, I ended up with atoms and electrons, which have no life at all. Somewhere along the lines, life has run out through my fingers. So, in my old age, I am now retracing my steps [back to the cell].”

Szent-Gyorgyi, goes on, at this point, to state that “life is not a thing to be studied: rather, ‘being alive’ is a quality of some physical systems.” [14] This last fingers quote, to note, has been taking up recently by the “spirituality” and metaphysical theorists, as a basis to argue, e.g., for Vedic-based spirit theory (Ñº), astral spirit-based active principles (Ñº), and or paranormal ideas. (Ñº)

In 1978, Szent-Gyorgyi, in his symposium article “The Living State and Cancer”, was opening to the same “life, as such, does not exist” idiom, in regards to the question of what is life?, but quickly parlays the issue off to the assertion that the conceptual dualistic divide of the world between animate and inanimate or alive and not-alive is solved by reference to what he calls a “living state” which he describes as a “special physicochemical state, a state which can be described in terms of exact sciences, and has to fit into the great order of the universe, having been created by the same forces as the universe itself.” Here, after continuing with the statement that “we must search for an understanding and an answer to our question with a wide natural philosophical outlook and fit life into the great scheme of creation”, it would seem, possibly, that Szent-Gyorgyi is venturing into religious-framed talk (check). [13]

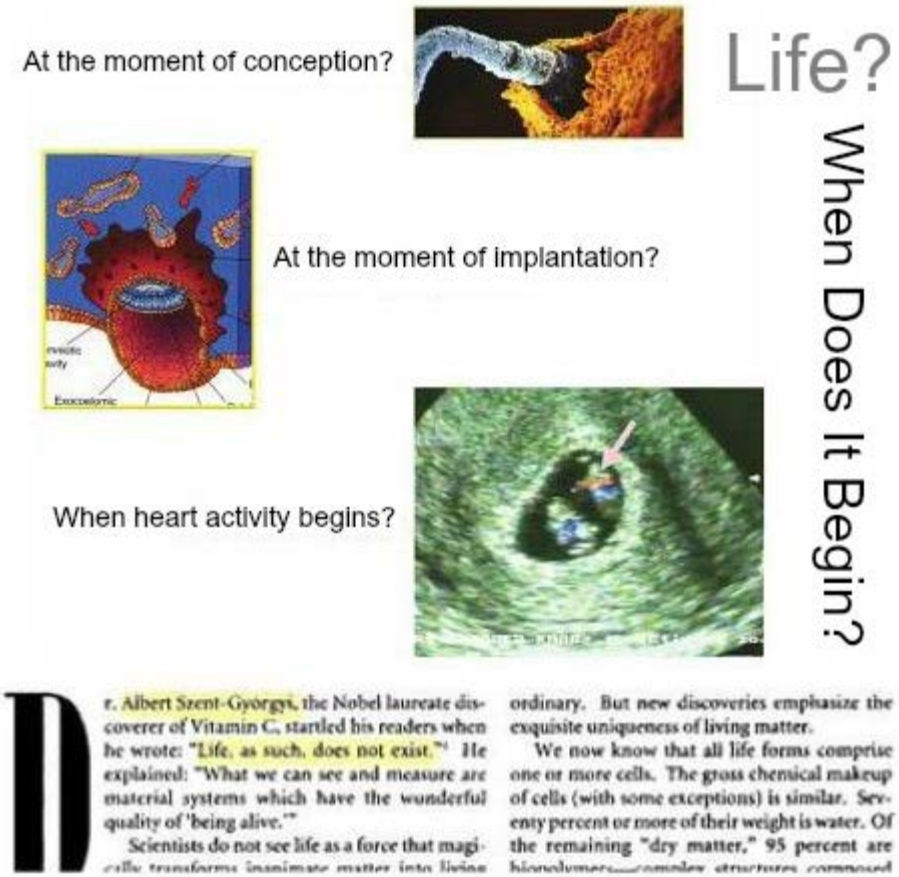

Top: an image from Asim Kurjak and J.M. Carrera’s 2006 chapter “The Beginning of Human Life”, wherein Albert Szent-Gyorgyi’s 1940s “life, as such, does not exist” statement is cited, as a platform to digress on possible legal and religious implications of the fetus. [10] Bottom:a 1993 article snippet, in *Liberty: a Magazine of Religious Freedom*, citing Szent-Gyorgyi’s startling statement: “life, as such, does not exist”. [8]

A citation from 1993 article, from a religious magazine article—the implication of the possibility that life does not exist has great implications for religious belief—is as follows: [8]

> “Albert Szent-Gyorgyi, the Nobel laureate discoverer of Vitamin C, *startled* his readers when he wrote: ‘Life, as such, does not exist.’ He explained: ‘What we can see and measure are material systems which have the wonderful quality of...”

In 2006, authors Asim Kurjak and J.M. Carrera, in their chapter “The Beginning of Human Life: Scientific and Religious Controversies”, section: “The Definition of Life”, in their *Textbook of Perinatal Medicine*, state the following: [10]

> “Some authors say that **life as such does not exist**—no one has ever seen it. Szent-Gyorgyi says that the noun ‘life’ has no significance because there is no such thing as ‘life’. Le Dantez holds that the expression ‘to live’ is too general, and that it is better to say that a dog ‘dogs’ or a fish ‘fishes’ than a ‘dog or a fish lives’.”

Kurjak argues that Szent-Gyorgyi's position may have possible implications on the so-called "legal" rights of an

embryo, such as depicted adjacent.

Atlan

French biophysicist and philosopher Henri Atlan—who notably studied, for a time, under Aharon Katchalsky—in his work on bioethics, namely on the problems involved in speaking about "life" in an essential fashion, e.g. claiming that the genome contains the "essence of life", repeatedly quoted Szent-Gyorgyi's claim that "life as such does not exist", which he interprets to mean that: [12]

> "Life does not exist as an explicative notion of organic properties … life does not exist as an object of biological research."

Atlan also states:

> "When Szent-Gyorgyi made the somewhat abrupt declaration: "life as such does not exist", in all likelihood he was not doubting his daily experience. I do not think I betray him in thus clarifying his words: **life does not exist** as an explicative notion of organic properties. I other words, life does not exist as an object of biological research."

Meaning that, in the context of bioethics, that "any thinking of the living cannot maintain its rigor if it postulates life as an essentialist notion" as his collected works editors Stefanos Geroulanos and Todd Meyers summarize (2011).

Religion

Szent-Gyorgyi's views on relation between religion and science seem to be of the covert ontic opening type. In his 1977 "Drive in Living Matter to Perfect Itself", to explain, he says that the coordinated behavioral adaptation such as the woodpecker's drilling and probing, as "random mutation, has the probability of zero", and goes onto state that "I am unable to approach this problem [compound traits] without supposing an innate 'drive' in living matter to perfect itself", which he goes onto label as "syntropy", the opposite of entropy—presumably culled from Schrodinger's 1944 what is life discussions—an idea that religious-science reconciler Gary Parker refers to as an "impersonal creative force". (Ñº) This is consistent in Szent-Gyorgyi's 1978 discussions, above, about how his dualist life theory needs to fit in the "great scheme of creation". [13] We also note, in 1928, when Szent-Gyorgyi discovered vitamin C, originally he did not know what the compound was, thinking it was some type of sugar compound; hence, he was going to name it ig-nose, a combination of the suffix *–ose* the sugar designating ending (as in *glucose* or *fructose*) and the prefix *ig-*, signifying that he was ignorant as to what it was, and thereby sent in the name suggestion "God-nose" to the editor of the *Biochemical Journal*, meaning that "God knows what this compound is?". (Ñº)(Ñº) Explicit atheists do not, in short, make comments like this.

Living matter | Electron theory of life

Szent-Gyorgyi is noted for his 1961 take on the concept of the photon mill and its role in the study of animate, earth-bound chemical processes: [4]

> "It is common knowledge that the ultimate source of all our energy and negative entropy is the radiation of the sun. When a photon interacts with a material particle on our globe it lifts one electron from an electron pair to a higher level. This excited state, as a rule has but a very short lifetime and the electron drops back within 10-7 to 10-8 seconds to the ground state giving off its excess energy in one way or another. Life has learned to catch the electron in the excited state, uncouple it from its partner and let it drop back to the ground state through its biological machinery, utilizing its excess energy for life processes."

In 1983, Szent-Gyorgyi, in his "On the Nature and Origin of Life", opens to the following: [7]

> "Biology, hitherto, did not contribute considerably to the foundations of physics. On the other hand it expects its basic problems to be solved by physics. Biology, being essentially the study of life, *bios*, its main problem is: what is life? The question must have been asked innumerable times without finding a satisfactory answer. This is an unusual situation, experimental science being based on experience that nature answers intelligent questions intelligently. If she is silent, something may be wrong with about the question."

He continues:

> "We can formulate our question about the nature of life in a different way, which is more in the language of science. We can ask, for instance, what is the difference between 'animate' (living) and 'inanimate' (non-living). We can try to compare the two bit by bit noting the difference in terms of exact science."

This is all fairly cogent, with nitpick point that animate things such as robots, automatons, steam engines, watermills, or windmills, etc., are, in colloquial speak, considered non-living, but still animate, hence deriding his classification scheme. In any event, the end of his argument concludes with something to the effect that the difference between the two, living and non-living, in his mind, has something to do with a peculiarity with electrons or electron orbitals in so-called living things, or in his own words:

> "It was almost forty years ago that I suggested that electron orbitals in living matter may form band patterns which promote electron mobility."

(add discussion)

Molecular goggles |

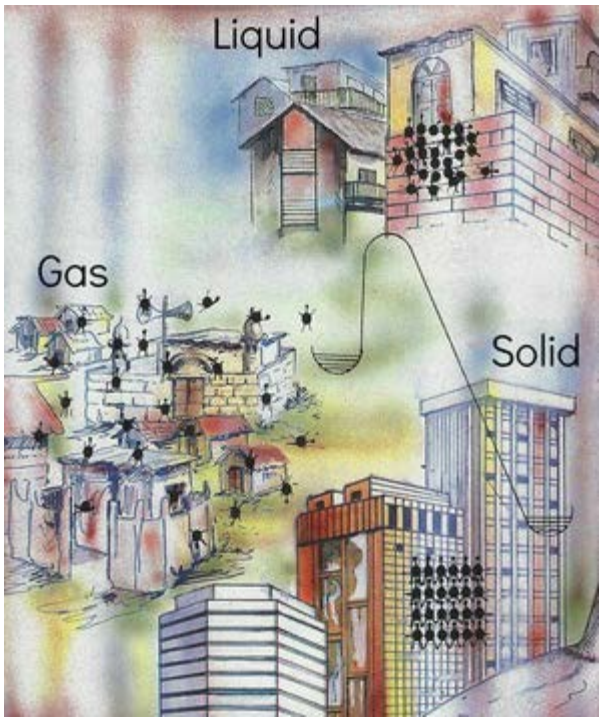

Top: a code-vision purview from *The Matrix* film, where like the ability to see individual atoms, the character Neo has the ability to see individual code characters. Right: cover section of Mirza Beg's 1987 *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, which seems to capture, in some sense, Szent-Gyorgyi's description of animals (or humans in Beg's case) in a jungle as "particularly concentrated loci of molecules holding a certain form". [6]

Perspective

Szent-Gyorgyi stated the following molecular goggles view (advanced intelligence view) (Matrix view) in the sense that he sees a monkey, or what one might call a monkey molecule, in a jungle as a particularly concentrated locus of molecules with an inflow and outflow of material: [5]

> "If one had the kind of vision [e.g. electron microscope/quantum microscope] that allowed one [see: advanced perspective] to see molecules and were in a jungle, one would see molecules wandering about everywhere, at random. In this ceaseless wandering, one might recognize a locus in which molecules of various types were particularly concentrated, which held its form [bound state] approximately while myriads of molecules streamed in and out [turnover rate]; and that locus would be a monkey in the jungle. That continuous inflow and outflow of material [metabolism], and whatever of its structure endured, would not only make that a unique monkey from among monkeys but would ensure that it changed [see: Heraclitus] from moment to moment throughout its entire existence."

Here we see Szent-Gyorgyi touching on a number of key issues in human molecular philosophy, namely the turnover rate problem (metabolism), the individuality problem, the blind random chance movement view (Democritus) versus free energy gradient movement view (modern), and the issue of change (irreversibility) (Heraclitus).

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External links

â— Albert Szent-Gyorgyi – Wikipedia.

θΔics

In existographies, **Albert Weiss** (1879-1931) (SN:60) (CR:13) was a German-born American physicist and behavioral psychologist, a characterized "radical reductionist" (Wolfman, 2013), noted for his 1925 forward-thinking view that man is a "geometrical electron-proton pattern" (see: proton-electron configuration) and all forms of social activity are reducible to "electron-proton interactions."

Overview

In 1925, Weiss, in his *A Theoretical Basis for Human Behavior*, attempted to “bridge over the gaps”, in outlining behaviorism, which he defined (pg. 7) as follows:

> “Behaviorism, for the writer, in psychology, is merely the name for that type of investigation and theory which assumes that man’s educational, vocational, and social activities can be completely described or explained as the result of the same (and no other) forces used in the natural sciences.”

Weiss’ views, as classified (Ñº) by Benjamin Wolfman (2013), as an early form of behaviorism, is classified as “radical reductionism” (see also: ultra-reductionism), per the underlying view that psychology could not deal with anything but the same elements of matter as did physics.

Electron-proton configurations

See main: Proton-electron configuration

In 1925, Weiss, in his section "Physical Units", citing John McLennan (1922) (Ñº) and Harvey Lemon (1923), opened to the following statement: [5]

> “Physicists are fairly well agreed that negative and positive electrical particles, described as electrons and protons, are the hypothetical ultimate elements out of which every thing is built up.”

Weiss then jumps to the conclusion that man is a "geometrical electron-proton pattern or system" as follows:

> “For purposes of description, each separate **geometrical electron-proton pattern**, no matter how simple or complex it may be, is to be regarded as a system. Such systems may be classified into the degrees of the similarity or dissimilarity postulated of atoms, molecules, compounds, tissues, plants, animals, men, races, nations, planets, etc. The systems of especial interest to the behaviorist are classified under animal tissues and social organizations.”
>
> — Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 19)

> “In the final analysis, human behavior is **reduced to** movements between electron-proton systems, but this reduction is the final aim of all scientific investigation.”
>
> — Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 36) (Ñº)

> “All forms of social activity or achievement are **ultimately reducible** to electron-proton interactions [that are mechanistic as any physical or chemical process].”
>
> — Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 142); cited by Judson Herrick (1956) [1]

In 1939, George Lundberg, in his *Foundations of Sociology*, citing Weiss, would going onto famous describe man as an "electron-proton configuration". [2]

Purpose | Rain-drop analogy

Weiss, in his section on "an analogy of purposive activity" (pgs. 346-47), steps through what he calls the rain-drop analogy, as follows:

Weiss argues that because it is silly to believe that the purpose of a raindrop is to get to the ocean, so to is it silly to believe that humans have purpose.

> "We may best visualize the relationship between the responses that make up the so-called purposive behavior category by the 'rain-drop analogy'. We may start with the assumption that every drop of rain in some way or another gets to the ocean. It may fall directly from the cloud into the ocean, or by sinking into the ground at some inland point, may be delayed for centuries before finding its way into the spring, brook, or river, that finally carries it to the ocean. **Anthropomorphizing this condition, we may say that is the 'purpose' of every drop of rain to get to the ocean**. Of course, this only means that virtually every *drop* does get there eventually. How it gets there depends upon where it falls. Falling from the cloud it may strike the leaf of a tree, and drop from one leaf to another until it reaches the ground … **Human behavior is merely a complication of the same factors**. Instead of only a few physical forces such as gravity, temperature, humidly, surface tension, friction, that act on every drop of rain, the stimuli which act on the sensor-motor system of man are much more numerous."

Here, although humorous, we see a false equivalence used, similar to the classic rock vs human comparison, in that a raindrop is an H_20 type thing, one that lacks the property of physico-chemical animation, and a human is a CHNOPS+ type thing, one that has the property of physico-chemical animation. The confusion evident here is that this a concept reform issue (see: purpose terminology reform).

Education

In 1906, Weiss, aged 27, entered the University of Missouri, where he studied physics, mathematics, and philosophy, completing his AB in 1910, MA in 1912, and PhD in 1916, with a dissertation entitled "Apparatus and Experiments on Sound Intensity", the latter under Max Meyer, who in turn had completed his own PhD under Max Planck. E.A. Esper (1966) summarized the Meyer-Weiss educational interaction as follows: [4]

> "There were strong bonds between Meyer and Weiss: Weiss had been born in Germany and ... spoke German in the home of his parents; his personality was most engaging: honorable, unassuming ... eager in interest in all matters of scientific and humane import, humorous; well trained in physics, chemistry, biology, mathematics, and philosophy-subjects in which Meyer found most of his American students deficient; ingenious in devising and constructing apparatus. In his early publications Weiss followed Meyer in research on tonal intensity and 'vocality', and in applying Meyer's hydraulic theories of the ear and of the nervous system to sensory discrimination and learning. In his later publications he enlarged upon Meyer's two main philosophical-or rather, methodological doctrines: that psychology should deal only with objective data and only with behavior having social import. Meyer has said, 'I have had very little-almost no-influence on American psychology *directly*, but perhaps a good deal through mediation by students of Weiss.' Meyer produced one doctor of philosophy: Weiss; Weiss produced twenty-five."

(add)

Religion

Weiss, who was brought to America as an infant, was son to German Lutherans; his father worked as an architect in St. Louis. [3] His 1925 book gives indication that by this time he was an implicit atheist, as he attacks every concept of religion, e.g. soul, spirit, free will, etc., with reductionist materialism and physics.

Quotes | Employed

The following are quotes employed by Weiss:

> "All we know about the problem of consciousness is the fact that as yet science has not discovered an adequate method of investigation whereby ideas can be studied directly, after the fashion of studying chemical processes in a test-tube. Hence there is no positive evidence that mental processes are 'subjective' as contrasted with 'objective'."
>
> — Wheeler, R.H. (1923), "Introspection and Behavior" (pg. 110) (Ñº); in: *A Theoretical Basis of Human Behavior* (pg. 231)

Quotes | By

The following are related quotes:

> "Whether behaviorism is regarded as a phase in the development of psychology or biology, there can be no doubt that the methods and principles of the natural sciences as represented by mathematics, chemistry, physics and biology, are displacing the anthropomorphism, intuitionism, which in the past have molded social organization and defined our individual responsibility."
>
> — Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. v)

> "Because of the universal presence of the conditions called energy every change of motion in any system may be regarded as a 'function', in the mathematical sense, of all the other changes that occur, and that they bear a definite quantitative relation to each other even though the exact relationship or the number system which best describes the relationship, is unknown."
>
> — Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 25)

> "To use the argument that 'there are many facts in physics still to be discovered' in favor of the existence of mon-material (spiritual or physic) forces, or to imply that inability to reduce even the simplest protoplasmic systems into their electron-proton components demonstrates the existence of non-mechanical forces, does not seem justified when we consider the trend of scientific development. Before the microscope was invented, the human 'soul' was described as a vaporous sort of material, too tenuous to be seen by the naked eye and which percolated through the bodily tissues. The microscope increased the range of vision, but instead of revealing the expected soul substance, the organic cell as the element of biological function was discovered. The soul substance theory almost vanished, but we still have shades of it with psychic or 'vital' forces."
>
> — Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 28)

> "In order to approach the mechanical equivalence postulate in the conception of the conservation of energy, a much greater temporal and spatial range must be considered in the explanation of human behavior than it

is customary to consider in the various heat and mechanical cycles by which the physicist demonstrates the conservation of energy."

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 30)

"Much of the opposition against the mechanical conception of human achievement centers in the fact that in the measurement and analysis of human behavior it is not yet possible to apply concretely the parallelogram of forces technique."

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 32)

"From the behavior standpoint, the organism at any moment may be represented as a diagram of the potential and kinetic forces, in the sense that all the movements within it and around it, both molar and molecular, represent changes in the equilibria among the systems of which the organism and its environment are mad up. This, of course, exactly what is occurring through the whole universe; and the behaviorist maintains that no further assumption is required to account for even such a complex system of symmetries as that represented by the League of Nations."

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 32)

"I regard the universe, which of course includes man and his work, as a physical continuum composed of nothing but electron-proton aggregates and the movements that take place among them."

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 46)

"The behavior of the physicist is just as 'physical' as the physics he teaches."
— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 47)

"When human behavior is studied as a form of 'motion', one that is directly opposed to the purposive and teleological character of behavior as presented by McDougall (1916), differing only in complexity from the motions and dynamics of physics and mechanics, behaviorism assumed the systematic status of 'physical monism', of which electrons and protons are the ultimate elements."

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 47)

"On the assumption of the validity of the law of the conservation of energy, every electron-proton change that occurs results in the redistribution of the stresses or strains that are present in every other electron-proton aggregate, including, of course, the particular aggregate known as the physicist or the behaviorist."

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pgs. 46-47)

"In adopting the <u>physical monism</u>, any conscious or psychical entity as distinct from the physical electron-proton entity is, of course, excluded. The formulation of the behavioristic position is then expressed in the statement that all human conduct and achievement reduces to *nothing but*: (a) different kinds of electron-proton groupings characterized according to the symmetry or geometrical structure and (b) the motions that occur when one structure or dynamic form changes into another. In other words, I assume that the scientific

study of what is generally known as personality and social organization can be conducted under the assumption that the physico-chemical continuum is the sole existential datum and that the totality of the electron-proton aggregates *is* the universe in which we live. Of course, I do not imply that human achievement can *now* be reduced to an electron-proton formulation. Neither is this possible in physics itself. **My statement merely implies that** I am opposed to the general attitude that until the last event or occurrence, especially those known as human achievement, has been reduced to a mechanical resultant, we must assume the existence of a non-physical (psychical) entity. It seems to me scientifically more expedient to follow the physicists who have, as physicists, inverted the principle and refuse to accept a non-physical until all mechanical conceptions have proved futile."

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pgs. 49-50)

"I regard an infant as an electron-proton aggregate."

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 51)

"The 'individual' on the basis of physical monism, is to be regarded as a locus in the movement continuum [of the universe], and a function, in the mathematical sense, of the changes that are occurring in all other electron-proton aggregates. A human movement as a cross-section of this locus at a given time, is the 'effect' of antecedent changes, and the 'cause' of subsequent changes."

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 52)

"Behavioristic psychology is the contribution to science that I regard as 'bridging the gap' between the physical and social sciences and explaining social organization and individual achievement in terms of physical and mathematical methodology."

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 55)

"Man is one out of many types of electron-proton organizations that exist."

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 59)

"Poetry, religion, morality, affection, love, intellect, for the poet, will seem to be a matter of sensations, images, feelings, and spirit, rather than electron-proton configurations."

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 62)

"Human behavior is in the last analysis of the same order as the physical and chemical processes which make up the totality of cosmic change and interaction."

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 96)

"The supernatural conception of man's destiny will be replaced by an experimental and scientific system of morality and rules of conduct."

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 128)

“I believe that human achievement is of the same order as the inorganic and organic processes which prevail in the physico-chemical universe.”

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pgs. 137-38)

“The individual is a specific system of anatomical and physiological elements regarded as a ‘locus in the electron-proton movement continuum’, interacting with other loci and with the rest of the continuum [of the universe].”

— Albert Weiss (1925), *A Theoretical Basis for Human Behavior* (pg. 142)

“In a cosmical sense, human behavior is an effector correlate or function of stimulating conditions.”

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 255)

“The ‘freedom of will’ is an illusion that is based upon the inability to discriminate the origin of implicit relations.”

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 361)

“The individual is a locus in the movement continuum, and the movements within this locus are correlational functions, in a mathematical sense, of all the movements that are occurring in the electron-proton organizations *not* within the locus. More specifically, the human individual is defined as a locus in the movement continuum, constituting a relatively permanent electron-proton aggregate, namely the atoms, molecules, and tissues of the body, interacting with the electron-proton systems not within the body, to form the series of energy interchanges.”

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 392)

“The behaviorist regards man as a link in the chain of physical processes which make up the universe and with this assumption goes the corollary that the measurements of human behavior and of human achievement are of the same order as physical measurements although the specific equations for individual and social measurements are **not yet found in the physics textbooks**.”

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 395)

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External links

â— Albert Paul Weiss – Wikipedia.

θΔics

In hmolscience, **Albert-Laszlo Barabasi** (1967-) (CR=8) is a Romanian-born American physicist noted for 2002 *Linked: the New Science of Networks*, wherein he collates the work of thinkers such as Stanley Milgram, on six degrees of separation, Mark Granovetter, on weak ties, Duncan Watts, on synchronized cricket chirping, his co-author Steven Strogatz, Malcolm Gladwell, on hubs and connectors, and Vilfredo Pareto, and his 80/20 wealth distribution principle, to outline a semblance of a network theory. [1]

Education

Barabasi completed his BS in physics and engineering in 1989 at the University of Bucharest, during which time he began publishing papers on chaos theory, his MS degree, under Hungarian statistical physicist Tamas Vicsek (Q), at Eotvos Lorand University, Budapest, and his PhD in 1994 in physics, supposedly on the subject of fractal concepts in surface growth (Q), under Eugene Stanley at Boston University. Presently, he is a professor at Northeaster University, Boston.

Quotes | About

The following are praise, tribute, and or quotes about Barabasi:

> "This book relies only occasionally on the analysis of chaos—a science initiated by Benoit Mandelbrot (1975) and Robert May (1976); in contrast, it relies heavily on the ideas of network science. Although it can be traced back to system theory which flourished in the 1960s and 1970s, network science really emerged in the late 1990s through the works of people such as **Albert-Laszlo Barabasi** (2002), Sergei Maslov (2002), Steven Strogatz (2003) or Duncan Watts (2003)."
>
> — Bertrand Roehner (2007), *Driving Forces in Physical, Biological, and Socio-Economic Phenomena* [2]

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Further reading

- Barabasi, Albert-Laszlo. (2010). *Bursts: the Hidden Pattern Behind Everything We Do*. Dutton.

External links

- Albert-Laszlo Barabasi – Wikipedia.
- Albert-Laszlo Barabasi (faculty) – Northeastern University.

θΔics

In hmolscience, **Alberto Patino Douce** (c.1951-) is an American geologist noted for 2011 thermodynamics discussions on the thermodynamics of extraterrestrial life.

Overview

In 2011, Douce, in his *Thermodynamics of Earth and Planets*, employed a "chemistry and physics first" model of teaching and understanding to explain everything else, concluding with a final chapter on thermodynamics and life, inclusive of a section on speculations on extraterrestrial life from the point of view of free energy gradients and chemical potentials.

In human physics, Douce states that his research interests include the application of statistical physics to human societies. [1]

Education

Douce complete his undergraduate work at the University of Buenos Aires in 1975 and PhD in geological sciences at the University of Origin in 1990. Douce currently is a professor of geology at the University of Georgia. [2]

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1. Douce, Alberto P. (2011). *Thermodynamics of Earth and Planets* (abs). Cambridge University Press.
2. Albeto E. Patino Douce (faculty) – University of Georgia.

θΔics

In hmolscience, **Alberto Hernando** (1981-) is a Spanish physicist noted, in human thermodynamics, for his 2009 to present publications in thermodynamics applied socially, with which they use as the basis for SThAR, an physics-based business consulting firm, claiming to be able to make social predictions.

Overview

In 2000, Hernando, in his "Fisher-information and the Thermodynamics of Scale-invariant Systems", asserts, with his associates, supposedly, that they "confirm analogy between properties of social systems (such as electoral results, city populations, citations in physics journals) and the thermodynamics of gases and liquids", which thus forms the basis of his theory of social thermodynamics. [1]

Hernando is called, by his business partner Gregory Botanes at the recently formed business consulting company SocialThermodynamics.org, the "father of the theory of social thermodynamics". [2]

Education

Hernando completed his PhD in applied and computational physics at the University of Barcelona, Spain in circa 2009. He currently is a researcher at the University of Barcelona working on the topics of quantum fluids, nanoscopic fluids, information theory, and complex networks.

References

1. Hernando, Alberto, Vesperinas, C., and Plastino, A. (2009). "Fisher-information and the Thermodynamics of Scale-invariant Systems", ArXiv. Aug 04.
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Further reading

â— Hernando, Alberto and Plastino, A. (2012). "Thermodynamics of Urban Population Flows" (abs) (pdf), *Physical Review E, Covering Statistical, Nonlinear, Biological, and Soft Matter Physics*, 86, 066105, Dec 5.

Further reading

â— Hernando, Alberto, Villuendas D., Vesperinas, C., Abad, M., and Plastino A. (2009). "Unravelling the Size Distribution of Social Groups with Information Theory on Complex Networks." arXiv.org. May 22.

External links

â— Alberto Hernando – es.LinkedIn.com.

θΔics

In existographies, **Albertus Magnus** (1205-1280) (IQ:180|#122) (Cattell 1000:601) (Gottlieb 1000:726) (Partington 50:40) (GCE:32) (MAG:2) (CR:26), aka "Albert the Great" (Holbach, 1770), was a German-born chemical philosopher, oft-classified "universal genius" (Waite, 1815), noted for his circa 1250 utilization of the name *affinitas* (affinity) used in the sense of chemical relation (affinity chemistry), examples of which are found in his *Book of Secrets*, which, according to English chemistry historian James Partington, marks the start of the physics-centric science of physical chemistry. [1]

Overview

Magnus was was born in Suabia, at Larvigen, on the Danube, in 1205. He is accredited with excessive stupidity in his youth, but his devotion to the Virgin was rewarded by a vision, which was accompanied by an intellectual illumination, and he became one of the greatest doctors of his time. He was made provincial of the Dominicans, and was appointed to the bishopric of Ratisbon, which subsequently {60} resigned to pursue his scientific and philosophic studies in a delightful conventual retreat at Cologne. In his old age he relapsed into the mediocrity of his earlier years, which gave rise to the saying that from an ass he was transformed into a philosopher, and from a philosopher he returned to an ass. [2]

Quotes | On

The following are quotes on or about Magnus:

> “When I returned home my [Victor Frankenstein] first care was to procure the whole works of this author [Cornelius Agrippa], and afterwards of Paracelsus and **Albertus Magnus**. I read and studied the wild fancies of these writers with delight; they appeared to me treasures known to few besides myself. I have described myself as always having been imbued with a fervent longing to penetrate the secrets of nature. In spite of the intense labor and wonderful discoveries of modern philosophers, I always came from my studies discontented and unsatisfied. Sir Isaac Newton is said to have avowed that he felt like a child picking up shells beside the great and unexplored ocean of truth. Those of his successors in each branch of natural philosophy with whom I was acquainted appeared even to my boy's apprehensions as tyros engaged in the same pursuit.”
>
> — Mary Shelley (1818), *Frankenstein: the Modern Prometheus* (§2)

> “**Albertus Magnus**, a celebrated philosopher of the thirteenth century, is said to have constructed an automaton which not only performed all the apparent motions of life, but absolutely answered questions. It is recorded of Thomas Aquinas, that, having accidentally seen the head, he was so terrified that he broke it in pieces, upon which Albert exclaimed: 'the meal of thirty-years work!' (*Periit opus triginta annorum!*) Though this appears one of the earliest instances of a speaking automaton constructed by one of the laity, there is no doubt but that the method of conveying answers to various interrogatories, by the agency of concealed pipes or a speaking trumpet, was practiced at a very early period. That the impostor Alexander (c.105-170) (Q), however, caused his Aesculapius to speak in this manner is expressly related by Lucian. He took, says this author, instead of a pipe, the gullet of a crane, and transmitted the voice through it to the mouth of the statue. But the invention of the *invisible girl*, which may be considered as an improvement on the oracular responses of the darker ages, infinitely surpassed any of those hitherto recorded.”
>
> — Charles F. Partington (1825), note on Edward Somerset’s 1663 purported language translating speaking head (device #88) [see: brazen head] (Q) [4]

Quotes | By

The following are noted quotes:

"The aim of natural science is not simply to accept the statements of others, but to investigate the causes that are at work in nature."

— Albertus Magnus (c.1270), "On Minerals" (*De Mineralibus*) (Q)(Q)

"That matter and power are the principles of each body is clear, for having taken away all the accidental forms, we arrive at length at substantial form which, being abstracted *per intellectum*, there remains a something very occult which is *prima material*."

— Albertus Magnus (c.1270), *The Generation of the Elements* (*De Generatione Elementorum*); cited by Mellor in section on matter and energy (1922) [3]

"Nature does not make animal kinds separate without making something intermediate between them; for nature does not pass from extreme to extreme *nisi per medium*."

— Albertus Magnus (c.1270), *De Animalibus*; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 79)

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External links

- Albertus Magnus – Wikipedia.

θΔics

In social chemistry, **Albion Small** (1854-1926) (Scott 50:36) was an American sociologist noted for his 1899 “A ‘Unit’ in Sociology”, wherein he posited that "general sociology" might well be modeled akin to "general chemistry".

Overview

In 1899, Small, in his “A ‘Unit’ in Sociology”, asserted that ‘general sociology’ might be defined as ‘the science of human atoms and their behavior’, on the model of ‘general chemistry’, defined as the science of atoms and their behavior. In his own words: [1]

> “General chemistry is sometimes defined as ‘the science of atoms and their behavior.’ The same chemists who use this definition acknowledge that they have never discovered the hypothetical ‘free atom.’ The only close likeness in this respect that I can discover between general sociology and general chemistry or biology is in the fact that we must use the conception of human individuals, although we can find no such object in reality as the free individual. If we should describe sociology as ‘the science of human individuals and their behavior’ we should be in verbal uniformity with one way of defining chemistry; but I do not see any profit from that fact in the shape of more knowledge about society. Unless we are willing however, to take as our ultimate concept ‘the human atom,’ ‘the individual,’ ‘the social man,’ or whatever we may choose to name the irreducible element in societary combinations, I see nothing but arbitrariness in the plan of adopting a ‘unit of inquiry.’ Is it not a purely gratuitous assumption that at present sociology needs or can use a unit of inquiry in the sense to which Professor Lindsay seems most to incline?”

This concept was conceived in critique of American sociologist Samuel Lindsay’s earlier 1898 discussion of units of consideration in sociology. [2]

Education

Small studied theology from 1876 to 1879 at the Andover Newton Theology School, in Newton, Massachusetts; then German history, social economics, and politics at the University of Leipzig and the University of Berlin, from 1879 to 1881; then taught at Colby College, Waterville, Maine, in the 1880s; in 1889, he completed his PhD, with a thesis “The Beginnings of American Nationality”, at Johns Hopkins University. In 1892, Small founded the Department of Sociology at the University of Chicago and in 1895 founded the *American Journal of Sociology*, the oldest scholarly journal of sociology in the United States. [3] During this period, in the early years of forming the University of Chicago sociology department, Small studied with American engineer and physicist turned sociologist and economist Frank Carlton, who thought along similar lines and mindset, in regards to modeling sociology and economics on physics and chemistry. [4]

References

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External links

â— Albion Woodbury Small – Wikipedia.

θΔics

In existographies, **Albrecht Haller** (1708-1777) (IQ:175|#226) (Cattell 1000:283) (Simmons 100:42) (CR:9) was Swiss anatomist, physiologist, and naturalist, noted for []

Vitalism

Haller, as disparaged by Ernst Haeckel (1899), gave support to the erroneous idea of *vis vitalis* or "vital force". [1]

Adam and Eve

Haller, on the "scatulation theory", which assumed that the outline of the entire organism, with all its parts, was present in the egg, according to which the ovary of the embryo had to supposed to contain the ova of the following generation (and, these, again, the ova of the next generation; and so on), calculated that god, 6,000-years ago, on the sixth day of creation, packed the germs of 200-billion men into the ovary of Eve (see: Adam and Eve). [1]

Education

Haller was a student of Herman Boerhaave.

References

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External links

â— Albrecht von Haller – Wikipedia.

θΔics

In literature thermodynamics, **Aldous Huxley** (1894-1963) was an English writer noted for his use of the concept of entropy in his literary theme. Aldous is the grandson of the famous English biologist Thomas Huxley, commonly known as "Darwin's bulldog", coiner of the term social chemistry, and his older brother was the evolutionary biologist Julian Huxley, promoter of the view that evolution is anti-entropic. This may explain from where Aldous became acquainted with entropy.

Meaninglessness philosophy

Huxley is frequently quoted for his 1937 so-called meaninglessness philosophy:

> "I had motive for not wanting the world to have a meaning; consequently assumed that it had none, and was able without any difficulty to find satisfying reasons for this assumption. The philosopher who finds no meaning in the world is not concerned exclusively with a problem in pure metaphysics, he is also concerned to prove that there is no valid reason why he personally should not do as he wants to do, or why his friends should not seize political power and govern in the way that they find most advantageous to themselves. … For myself, the philosophy of meaninglessness was essentially an instrument of liberation, sexual and political."
>
> — Aldous Huxley (1937), *Ends and Means: an Inquiry into the Nature of Ideals* [7]

This quote frequently is cited by theists in religions vs. science debates (Ñº) (vid | 3:41). In his first mention of the term "meaninglessness", Huxley cites the following closing passage of David Hume's 1748 *Enquiry*: [8]

> "If we take in our hand any volume; of divinity or school metaphysics, for instance; let us ask: does it contain any abstract reasoning concerning quantity or number" No. Does it contain any experimental reasoning concerning matter of fact or evidence? No. Commit it then to the flames; for it can contain nothing but sophistry and illusion."

(add discussion)

Entropy | Energy

In 1937, Huxley, in his *Ends and Means*, citing the early work of Joseph Unwin (1935), began to make use of the term "human entropy". [5] A glimpse of this view is discussed in the following passage, from *Ends and Means*, in which he discusses how the energy created by sexual restraint is "expansive": [1]

> "When the rigorous tradition (of sexual restraint) is inherited by a number of generations, the energy becomes productive. Productive energy does not spend itself exclusively in expansion; it also goes into science, speculation, art, social reform. Where productive energy persists for some time, a factor which Dr. Unwin calls 'human entropy' comes into play."

This passage is very interesting, in that it is very aligned with modern human chemistry and human thermodynamics, as compared to most other writers on entropy, who fumble around with disorder, degradation, and chaos, etc. In this same period, he also discussed entropy and time's arrow. [4]

In 1962, Huxley, in his book *Island*, comments in several places on entropy and the second law. In his aunt's loss of her breasts, via cancer, as being a product of the second law, as follows: [2]

> "A few months later the other breast had to be cut off. After that there were the X rays, the radiation sickness and then, little by little, the degradation … If it weren't so unspeakably hideous, it would be really funny. What a masterpiece of irony! Here was a soul that radiated goodness and love and heroic charity. Then, for no known reason, something went wrong. Instead of flouting it, a little piece of her body started to obey the second law of thermodynamics. And as the body broke down, the soul began to lose its virtue, its very identity. The heroism went out of here, the love and the goodness evaporated. For the last months of her life she was no more the Aunt Mary I had loved and admired; she was somebody else, somebody almost indistinguishable from the worst and weakest of the old people she had once befriended and been a tower of strength to. She had to be humiliated and degraded; and when the degradation was complete, she was slowly, and with a great deal of pain, put to death in solitude."

The degradation view of the second law, here, would seem to come from American Historian Henry Adams' view of the second law in his 1920 *Degradation of the Democratic Dogma*. [3] In another section he comments on entropy, Buddhism, and the soul:

> "One thinks one's self something unique and wonderful at the center of the universe. But in fact one's merely a slight delay in the ongoing march of entropy. And that precisely is the first half of Buddha's message. Transience, no permanent soul, inevitable sorrow. But he didn't stop there, the message had a second half. This temporary slow-down of entropy is also pure undiluted Suchness. This absence of a permanent soul is also the Buddha Nature."

This seems to be entering on religious thermodynamics topics.

Quotes | On

The following are Huxley related quotes:

> "Swept up by the seeming unstoppable force of Vilfredo Pareto's juggernaut in the 1930s, **Huxley** wrote a prominent review of *Mind and Society* in 1935, and declared Pareto his mentor. What attracted Huxley to Pareto was his cynicism toward human stupidity, the cavalier attitudes societies adopt towards issues of power."
>
> — Howard Schneiderman (2012), "Pacifism and Non-Attachment: Aldous Huxley and Utopian Thought" [1]

Quotes | By

The following are noted quotes:

> "Real orgies are never so exciting as pornographic books. In a volume by Pierre Louys all the girls are young and their figures perfect; there's no hiccoughing or bad breath, no fatigue or boredom, no sudden recollections of unpaid bills or business letters unanswered, to interrupt the raptures. Art gives you the sensation, the thought, the feeling quite pure — chemically pure, I mean, [with a laugh] not morally."
>
> — Aldous Huxley (1928), *Point Counter Point* [9]

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External links

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θΔics

In existographies, **Alec Groysman** (1948-) (CR:28) is a Russian-born Israeli chemical engineer noted, in hmolscience, for a number of presentations and articles on the use of the overlap of physical chemistry, art (art thermodynamics), and literature (literature thermodynamics), in engineering curriculum, and in particular for his 2011 Italian university rectors Generative Art Conference presentation “Use of Art Media in Engineering and Scientific Education”, wherein he describes Goethean-Thims based human chemistry as a "new scientific field" which he advocates for use in engineering and scientific education.

Human chemistry | Engineering and scientific education

In his 2011 conference presentation “Use of Art Media in Engineering and Scientific Education”, Groysman cites the human chemistry work of Johann Goethe and Libb Thims, among others; and discusses how not only is their "two cultures" (as professed by Charles Snow) but more likely "three cultures". [2] The following are photos and paper presentation excerpts from the conference:

“Dobereiner helped in refining Russian platinum, discovered catalysis, and reported his work to Goethe. We can only suspect that they both discussed this and that Dobereiner read the tragedy *Faust* and the novella *Elective Affinities*. The latter work of art gave impulse to a new scientific field named 'human chemistry'.

In the exact sciences there are quantitative measures of estimation of each value: mass, length, force, energy. In the humanistic disciplines (history, philosophy, psychology) as well as art there are no quantitative criteria. This is similar to the question of how to measure beauty, love, friendship, democracy? The function named Gibbs energy defines ‘love’ between substances [and] people [?] ... and is similar to Hamlet’s ‘to be or not to be?’ of William Shakespeare.”

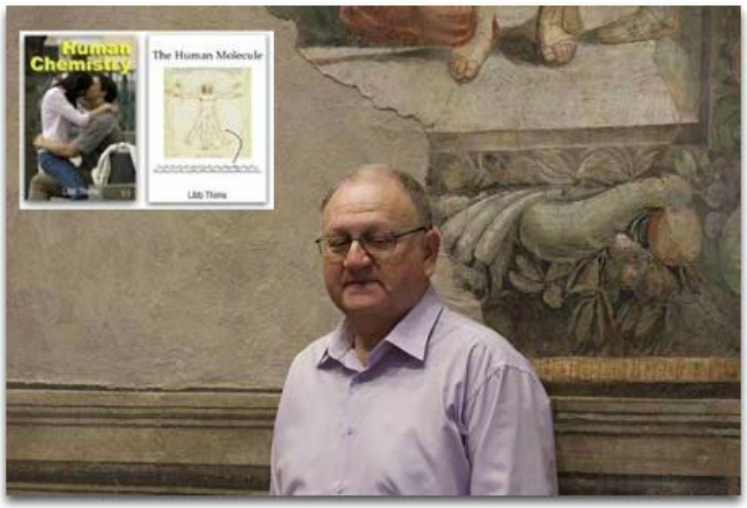

The latter "to be or not to be" sentence fragment, to note, is a paste addition from his earlier 2004 article “Aesthetic, Philosophical and Historical aspects in the Physical Chemistry education”, shown below right. The full 2011 conference excerpt on human chemistry is shown below left.

Other

In 2004, Groysman, in his article “Aesthetic, Philosophical and Historical aspects in the Physical Chemistry education”, commented the following telling statement: [1]

“The relationship of probability and entropy (more precisely, the decision about spontaneous occurrence of process) or calculation of Gibbs energy for some chemical reactions, is similar to Hamlet’s ‘to be or not to be?’ of William

Döbereiner helped in refining of Russian platinum, discovered catalysis and reported about his work to Goethe. We can only suspect that both (chemist Döbereiner and poet Goethe) discussed this, that Döbereiner read the tragedy "Faust" and the novella "Elective Affinities" written by his elder friend Goethe. The latter work of art gave impulse to new scientific field named *human chemistry*.

3.4. Human Chemistry

In *exact sciences* there are quantitative measures of estimation of each value: mass, length, force, energy. In *humanistic disciplines* (history, philosophy, psychology) as well as in *art* there are no quantitative criteria. This is similar to question *how to measure beauty, love, friendship, democracy*? If there is no quantitative estimation of some category or phenomenon, any definition becomes undefined, ambiguous and abstract. We know that in chemistry there is the function named *Gibbs energy* which defines the "*love*" between substances. Why there is no such function for estimation of love between people? Thus people tried to estimate this and *human chemistry* appeared [16, 17]. *Human chemistry* is the study of bond-forming and bond-breaking reactions between people and the structures they form. Historically, *human chemistry* appeared in 1809 with the publication of the novella "*Elective Affinities*" by Goethe, a chemical treatise on the origin of love [18]. In this stage today *human chemistry* is similar to alchemy in the middle ages, it borders with art, but further investigation on the molecular level in human brains will help to discover what happens in our organisms, and intimacy will end. Probably, such discovery will cause us to be unhappy, because mystery and wonder of love and relationships between people will be finished.

Groysman's 2011 Generative Art Conference symposium section on "human chemistry", which he describes, citing the 2007 work of American electrochemical engineer Libb Thims, as a new scientific field impulsed into inception by German polymath Johann Goethe's 1809 *Elective Affinities*, which he advocates for use in chemical engineering teaching. [2]

Shakespeare."

Groysman notes English-American poet Wystan Auden (1907-1973) composed the 1948 verse "The Entropy Song" (see: music thermodynamics), in a convenient, understanding, acceptable, and sympathetic poetic form for students. [1]

Groysman states that English author Charles Howard Hinton, in his scientific romance "The Persian King", supposedly, approached the theory of the fourth dimension through an allegory of thermodynamics. [1] Groysman also comments on the thermodynamics usage in the humanities by: Bruce Clarke, Rudolf Arnheim, Judigh K. Townsend, among others.

Education

Groysman completed his MS in chemical engineering in 1973 on isotopes and pure substances and PhD in physical chemistry on corrosion materials, both at the Mendeleev Chemical Technological University, Moscow; he presently is a professor of mechanical and biotechnology engineering at the ORT Braude College of Engineering, Israel.

See also

- Human thermodynamics education

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External links

- Alec Groysman – WCJS.org.

θΔics

In existographies, **Alessandro Volta** (1745-1827) (IQ:175|#245) (Cattell 1000:684) [RGM:140|1,500+] (SIG:13) (CR:18) was an Italian physicist noted for his famous 1776 "animal electricity" debated with his friend Luigi Galvani on the topic of the mechanism of the twitching of dead frog legs in an electric circuit the result of which was the invention of the battery in 1800. This debate can loosely be said to mark the start of the vitalism debate, the issue as to what separates a "living thing" from a "dead thing" or an animated thing (such as dead frog legs) moved by purely electro-physico-chemical means.

Eponyms

The term "voltage" and the unit "volt" are named in honor of Volta.

Battery

In 1800, Volta stacked small sheets of silver and zinc on top of each other with intermediate layers of salty water and showed that electrical current passed through if the circuit was closed—an electric "pile" or Voltaic pile that eventually came to be called a battery. [1]

Volta claimed that his electric pile was a perpetual motion machine, which only stopped because it had become "clogged" in the process of operation. [2]

Chemistry

The invention of the battery was soon employed by chemists.

In 1805, Luigi Brugnatelli (1859-1928) reasoned that just as Volta had used chemicals to make electricity, the opposite process—using electricity to cause chemical reactions—might work in the same manner, and performed electrodeposition of gold using the Voltaic pile. He wrote the following about electroplating technique in the Belgian *Journal of Physics and Chemistry*: "I have lately gilt in a complete manner two large silver medals, by bringing them into communication by means of a steel wire, with a negative pole of a voltaic pile, and keeping them one after the other immersed in ammoniuret of gold newly made and well saturated".

One of the first "voltaic piles" on display at the Tempio Voltiano museum, Como, Italy. [4]

In 1807, English chemist Humphry Davy discovered that electricity transforms chemicals during an experiment where he used Volta's electric pile to separate salts via electrolysis. He showed that the electromotive force, which drives the electric current through a circuit containing a single voltaic cell, was caused by a chemical reaction, not by the voltage difference between the two metals. He also used the voltaic pile to decompose chemicals and to produce new chemicals.

In 1831, after studying various electrolysis experiments, Swedish chemist Jacob Berzelius proposed that salt has an internal structure comprised of an acid, with a negative charge, and a base, with a positive charge. [3]

In 1833, English chemist physicist Michael Faraday discovered that each depositing mineral, such as copper, needs a different electric charge to make it release its atoms.

In 1852, English chemist Edward Frankland developed the theory of chemical valence or degree of combining power in an element.

Quotes | By

The following are quotes by Volta:

“You must be ready to give up even the most attractive ideas when experiment shows them to be wrong.”

— Alessandro Volta (c.1800) (Ñº)

“The language of experiment is more authoritative than any reasoning: facts can destroy our ratiocination—not vice versa.”

— Alessandro Volta (c.1800) (Ñº)

“What is possible to do well, in physics in particular, are those things that can be reduced to degrees and measures.”

— Alessandro Volta (c.1800) (Ñº)

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External links

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θΔics

In existographies, **Alex Paul Pentland** (1952-) (CR:5), commonly known as "Sandy", is an American computational social scientist, organizational engineer, and mobile information systems pioneer, as he defines himself, noted for his 2000s to present work in the field of what seems to be "computational evolutionary psychology", pure and applied, or the use of computer and digital technology to study unconscious social behavior behind conscious action and decisions, in a Mark Buchanan-conceived social physics like style; similar to the way an entomologist studies the behavior and social meaning of wiggle dance of the honey bee, some of which resulting in his 2008 *Honest Signals: How They Shape Our World* and his 2014 *Social Physics: How Good Ideas Spread—the Lessons from a New Science*. [1]

Social Physics | Misnomer

See main: Social Physics (misnomers)

Pentland's use of the term "social physics" to describe his work is an example of a scientific misnomer, in the sense that there is no actual "physics" in his social physics, similar to the way there is no actual physics in the sociophysics of Serge Galam, similar to the way there is no actual "thermodynamics" in Claude Shannon's so-called entropy-based "information theory". This is evidenced in the following 2014 Q&A: [4]

> Berinato: "You use a lot terminology in the book from physics and fluid dynamics. You talk a lot about flows and transfers. Is social science going to move toward a much more deterministic, data based approach like those hard sciences? Sometimes in the book, you get the sense that people are just atoms in a molecule. And there's sort of a determinism to it."
>
> **Pentland**: "A lot of the terms are drawn from things like fluid dynamics and other statistical types of physics. And so you get to the question of determinism and free will. Can't we make up our own minds? **Of course we can make up our own minds**. But this stuff we call culture is shared between us. When we use an approach that's based on social physics, rather than something that's based on straightforward economics, we find that we can get four, eight times the efficiency at incenting correct and cooperative behavior."

Here we see Pentland defending free will, or at least deflecting the question. When you read a real social physicist, e.g. Baron d'Holbach (1770), John Q. Stewart (1948), etc., discuss will and determinism as physics sees things you get a real social physics answer, not some some business consulting dogged language.

Overview

In the 1990s, Pentland was working on wearable computer technology.

In the 2000s, building on the work of thinkers such as John Gottman (marital micro-interaction video recordings), Robin Dunbar, and Steven Pinker, Pentland was running a "Human Dynamics" group (see: human dynamics) at MIT Media Labs, about which in 2006 he commented: [2]

> "Together with my research group, I have built a computer system that measures a set of nonlinguistic social signals, such as engagement, mirroring, activity, and stress, by analyzing 'tone of voice' over one-minute periods. We are examining some of the most important interactions a human being can have: finding a mate, getting a job, negotiating a salary, finding one's place in one's social network. These are activities for which we prepare intellectually and strategically, sometimes for decades, and yet the largely unconscious social signaling that occurs at the start of the interaction appears to be more predictive of its outcome than either the contextual facts. I suspect but cannot prove [that] a very large part of our behavior is determined by mainly unconscious social signaling, which sets the context, risk, and reward structure within which traditional cognitive processes proceed."

Pentland presently runs what he refers to as a “Social Physics” group, associated with the Human Dynamics Lab at MIT Media Lab, the focus statement of which is as follows: [3]

> “How can we create organizations and governments that are cooperative, productive, and creative? These are the questions of social physics, and they are especially important right now, because of global competition, environmental challenges, and government failure. The engine that drives social physics is big data: the newly ubiquitous digital data that is becoming available about all aspects of human life. By using these data to build a predictive, computational theory of human behavior we can hope to engineer better social systems.”

The 2014 logo for **Pentland's** Social Physics group at MIT Media Labs. [3]

Pentland here seems to be after some type of future computational data collection based system of applied social engineering.

Pentland's group here, also, to note, seems to have cursory similarity, thematically, in respect to data collection, to the 1950s “Social Physics” group run by physicist John Q. Stewart at Princeton (see: social physics school and Princeton Department of Social Physics); though, to clarify, Stewart's group was more "pure", whereas Pentland's group seems to be but a study of the new data of mobile information age, at present.

Education

Pentland completed his BGE at the University of Michigan in 1976 and his PhD in 1982 with a dissertation on “The Visual Inference of Shape: Computation from Local Features” at MIT.

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1. (a) Pentland, Alex. (2008). *Honest Signals: How They Shape Our World* (Gottman, 6+ pgs). MIT Press.
(b) Pentland, Alex. (2014). *Social Physics: How Good Ideas Spread—the Lessons from a New Science*. Penguin.
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3. Social Physics – MIT.edu.
4. Berinato, Scott and Pentland, Sandy. (2014), “Social Physics Can Change Your Company (and the World)” (interview by: Scott Berinato) (Q), Harvard Business Review, Apr.

External links

- Alex Pentland – Wikipedia.
- Alex (Sandy) Pentland – MIT Intelligence Initiative.
- Alex Pentland (faculty) – MIT Sloan.
- Pentland, Alex (1952-) – WorldCat Identities.

θΔics

In existographies, **Alex Pentland** (1952-), aka “Sandy”, is an American computational social scientist [see: Alex Pentland (mobile)]

θΔics

In science, **Alexander Bain** (1818-1903) was a Scottish philosopher noted for his 1870 *Logic: Deductive and Inductive*, wherein he gives the following material-physical-chemical stylized outline definition of a human: [1]

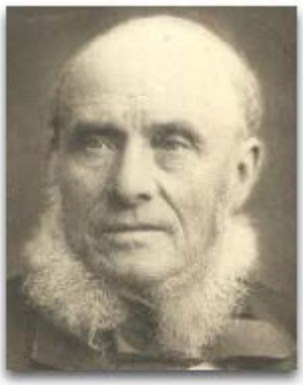

> "The enumeration of the attributes of oxygen, of gold, of man, should be an enumeration of the final (so far as can be made out), the underivable, powers or functions of each"

Bain's *Logic: Deductive and Inductive* was based on English philosopher John Mill's earlier 1843 *A System of Logic*, but differed from him in many particulars, and was distinctive for its treatment of the doctrine of the conservation of energy in connection with causation and the detailed application of the principles of logic to the various sciences with a section on the classification of the all sciences. Mill, in turn, in his latter editions, would cite Bain's gold/man comparison definition. [2]

In 1874, Bain wrote an appendix entitled "Correlation of Nervous and Mental Forces" for Scottish physicist Balfour Stewart's *The Conservation of Energy*. [3]

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1. Bain, Alexander. (1870). *Logic: Deductive and Inductive* (pg. 75). D. Appleton and Co., 1889.
2. (a) Mill, John S. (1843). *A System of Logic, Ratiocination and Inductive: Being a Connected View of the Principles of Evidence and the Methods of Scientific Investigation* (pg. 110). Harper & Brothers, 1904.
(b) A System of Logic – Wikipedia.
3. Stewart, Balfour. (1874). *The Conservation of Energy: with an Appendix, treating of the Vital and Mental Applications of the Doctrine* (ch. VI: The Position of Life, pgs. 154-70; Appendix I: Correlation of Vital with Chemical and Physical Forces, by Joseph le Conte, pgs. 171-; Appendix II: Correlation of Nervous and Mental Forces, by Alexander Bain, pgs. 205). Appleton.

External links

â— Alexander Bain – Wikipedia.

θΔics

In science, **Alexander Freeman** (1838-1897) was English mathematician, a correspondent of James Maxwell and Willard Gibbs, and translator of the 1878 English edition of Joseph Fourier's 1822 *Analytical Theory of Heat*, to which he added in various original notes on the life and work of Fourier. [1] Freeman was also one of the editors of one of the first English translations of French chemist Antoine Lavoisier's *Elements of Chemistry*. [2]

Maxwell's thermodynamic surface

Freeman, it seems, was the first to tell American engineer Willard Gibbs about the clay model water statute that Irish physicist James Maxwell had made, after spending an entire winter on it, based on Gibbs 1873 graphical thermodynamics papers. In February 18th, 1875 letter to Gibbs, Freeman states: [3]

> "You will be gratified to hear that Prof. Maxwell has made a clay model of your thermodynamic surface wherein entropy, energy, and volume are the three coordinates, and is able to explain a great deal by it."

Education

Freeman graduated Fifth Wrangler in 1861 from St. John's College, Cambridge in 1861 and completed an M.A. there in 1864. He was a member of the London Mathematical Society from 1866 to 1891. [4] At St. John's College, he was examiner for the mathematical Tripos in 1874 and 1875 and acted as deputy for the Plumian professor of astronomy from 1880 to 1882. [5] In 1883, Freeman was editor of the third edition of Charles Cheyne's *Planetary theory*, in which listed himself as M.A., F.R.A.S. rector of Murston, Kent and late fellow of St. John's College, Cambridge." [6]

References

1. Fourier, Joseph and Freeman, Alexander (translator) (1878). *The Analytical Theory of Heat*, English translation with Notes. Cambridge University Press.
2. Alexander Freeman (1838-1897) – WorldCat Identities.
3. Freeman, Alexander. (1875). "Letter to J. W. Gibbs", Feb 18; in J.W. Gibbs, Scientific Correspondence, 86. Beinecke Rare book and manuscript Library, Yale University Library.
4. Alexander Freeman (members) – London Mathematical Society.
5. Anon. (1897). "Obituary: Rev. Alexander Freeman", *Proceedings of the London Mathematical Society* (pg. 586). London Mathematical Society.
6. Cheyne, Charles and Freeman, Alexander. (1883). *An Elementary Treatise on Planetary Theory*. Cambridge University Press.

External links

â— Alexander Freeman (mathematician) – Wikipedia.

θΔics

In existographies, **Alexander Hislop** (1807-1865) (RMS:48) was a Scottish minister noted for []

Odin | Thor

In 1853, Hislop, in Note L: "The Identity of the Scandinavian Odin and Adon of Babylon", says the following about the origin of Odin: [1]

> "1. Nimrod, or Adon, or Adonis, of Babylon, was the great wargod. Odin, as is well known, was the same.
>
> 2. Nimrod, in the character of Bacchus, was regarded as the god of wine; Odin is represented as taking no food but wine. For thus we read in the *Edda:* "As to himself, he [Odin] stands in no o of food; wine is to him instead of every other aliment, according to what is said in these verses: The illustrious father of armies, with his own hand, fattens his two wolves; but the victorious Odin takes no other nourishment to himself than what arises from the unintermitted quaffing of wine," (MALLET, *20th Fable,* vol. ii., p. 106).
>
> 3. The name of one of Odin's sons indicates the meaning of Odin's own name. Balder, for whose death such lamentations were made, seems evidently just the Chaldee form of Baal-zer, "The seed of Baal;" for the Hebrew z, as is well known, frequently, in the later Chaldee, becomes *d.* Now, Baal and Adon both alike signify "Lord;" and, therefore, if Balder be admitted to be the seed or son of Baal, that is as much as to say that he is the son of Adon; and, consequently, Adon and Odin must be the same. This, of course, puts Odin a step back; makes his son to be the object of lamentation and not himself; but the same was the case also in Egypt; for there, Horus the *child* was sometimes represented as torn in pieces, as Osiris had been. Clemens Alexandrinus says *(Cohortatio,* vol. i., p. 30), "they lament an infant torn in pieces by the Titans." The lamentations for Balder are very plainly the counterpart of the lamentations for Adonis; and, of course, if Balder was, as the lamentations prove him to have been, the favourite form of the Scandinavian Messiah, he was Adon, or "Lord," as well as his father.
>
> 4. Then, lastly, the name of the other son of Odin, the mighty and warlike Thor, strengthens all the foregoing conclusions. Ninyas, the son of Ninus or Nimrod, on his father's death, when idolatry rose again, was, of course, from the nature of the mystic system, set up as Adon, "the Lord." Now, as Odin had a son called Thor, so the second Assyrian Adon had a son called Thouros *(Cedrenus,* vol. i., p. 29) (Ñº) . The name Thouros seems just to be another form of Zoro, or Doro, "the seed;" for Photius tells us that among the Greeks Thoros signified "Seed" *(Lexicon,* pars i., p. 93). The D is often pronounced as Th. Adon, in the pointed Hebrew, being pronounced Athon."

(add)

Tammuz | Osiris

Hislop, in his Note N: "Zoroaster, the Head of the Fire-Worshippers", says the following on the purported equivalence of Zoroaster, Tammuz, Nimrod, Adonis, and Osiris:

> "That Zoroaster was head of the fire-worshippers, the following, among other evidence, may prove. Not to mention that the name Zoroaster is almost a synonyme for a fire-worshipper, the testimony of Plutarch is of weight: "Plutarchus agnoscit Zoroastrem apud Chaldaeos Magos instituisse, *ad quorum imitationem,* Persae etiam suos habuerunt.* Arabica quoque Historia, (ab Erpenio edita) tradit Zaradussit non *primum*

An image (Ñº) of "Nimrod's stump" from Hislop's book (pg. 98).

instituisse, sed reformasse religionem Persarum et Magorum, qui divisierant in plures sectas," (CLERICUs, lib. i., *De Chaldaeis*, sect. i., cap. 2, vol. ii., p. 195); "Plutarch acknowledges that Zoroaster among the Chaldeans, instituted the Magi, *in imitation of whom* the Persians also had their (Magi). The Arabian history also (edited by Erpenius) relates that Zaradussit, or Zerdusht, did not for the first time institute, but (only) reform the religion of the Persians and Magi, who had been divided into many sects." The testimony of Agathias is to the same effect. He gives it as his opinion that the worship of fire came from the Chaleans to the Persians, lib. ii., cap. 25, pp. 118, 119. That the Magi among the Persians were the guardians of "the sacred and eternal fire" may be assumed from Curtius, (lib. iii., cap. 3, pp. 41, 42), who says that that fire was carried before them "on silver altars;" from the statement of Strabo, *(Geograph*, lib. xv., p. 696), that "the Magi kept upon the altar a quantity of ashes and an immortal fire," and of Herodotus, (lib. i., p. 63), that "without them, no sacrifice could be offered." The fire-worship was an essential part of the system of the Persian Magi, (WILsoN, *Parsee Religion*, pp. 228–235). This fire-worship the Persian Magi did not pretend to have invented; but their popular story carried the origin of it up to the days of Hoshang, the father of Tahmurs, who founded Babylon, (WILson, pp. 202203, and 579), *i.e.*, the time of Nimrod. In confirmation of this, we have seen that a fragment of Apollodorus, (Müller 68), makes Ninus the head of the fire-worshippers. Layard, quoting this fragment, supposes Ninus to be different from Zoroaster, *(Nineveh and its Remains*, vol. ii., p. 443, Note); but it can be proved, that though many others bore the name of Zoroaster, the lines of evidence all converge, so as to demonstrate that **Ninus and Nimrod and Zoroaster were one**. The legends of Zoroaster show that he was known not only as a Magus, but as a Warrior, (ARNOBIUs, lib. i., p. 327). Plato says that Eros Armenius (whom CLERICUs, *De Chaldaeis*, states, vol. ii., p. 195, to have been the same as the fourth Zoroaster) died and rose again after ten days, having been killed in battle; and that what he pretended to have learned in Hades, he communicated to men in his new life, (PLATO, *De Republica*, lib. x., vol. ii., p. 614). We have seen that the death of Nimrod, the original Zoroaster, was not that of a warrior slain in battle; but yet this legend of the warrior Zoroaster is entirely in favor of the supposition that the original Zoroaster, the original Head of the Magi, was not a priest merely, but a warrior-king. Everywhere are the Zoroastrians, or fire-worshippers, called Guebres or Gabrs. Now, Genesis x. 8 proves that Nimrod was the *first* of the "Gabrs."

As Zoroaster was head of the fire-worshippers, so Tammuz was evidently the same. We have seen evidence already that sufficiently proves the **identity of Tammuz and Nimrod**; but a few words may still more decisively prove it, and cast further light on the primitive fire-worship.

1. In the first place, Tammuz and Adonis are proved to be the same divinity. Jerome, who lived in Palestine when the rites of Tammuz were observed, up to the very time when he wrote, expressly identifies Tammuz and Adonis (vol. ii., p. 353), in his *Commentary on Ezekiel*, viii. 14, where the Jewish women are represented as weeping for Tammuz; and the testimony of Jerome on this subject is universally admitted. Then the mode in which the rites of Tammuz or Adonis were celebrated in Syria was essentially the same as the rites of Osiris. The statement of Lucian *(De Dea Syria*, vol. iii., p. 454) strikingly shows this, and Bunsen (vol. i., p. 443) distinctly admits it. The **identity of Osiris and Nimrod** has been largely proved in the body of this work. When, therefore, **Tammuz or Adonis is identified with Osiris**, the identification of

Tammuz with Nimrod follows of course. And then this entirely agrees with the language of Bion, in his *Lament for Adonis,* where he represents Venus as going in a frenzy of grief, like a Bacchant after the death of Adonis, through the woods and valleys, and "calling upon her Assyrian husband" (BION, *Idyll,* Id. i., v.24, in *Poetae Minores Graeci,* p. 304). It equally agrees with the statement of Maimonides, that when Tammuz was put to death, the grand scene of weeping for that death was in the temple of Babylon (see *ante,* p. 101).

2. Now, if Tammuz was Nimrod, the examination of the meaning of the name confirms the connection of Nimrod with the first fire-worship. After what has already been advanced, there needs no argument to show that, as the Chaldeans were the *first* who introduced the name and power of kings (SYNCELLUs, vol. i., p. 169), and as Nimrod was unquestionably the first of these kings, and the first, consequently, that bore the title of Moloch, or king, so it was in honor of him that the "children were made to pass through the fire to Moloch." Now, the intention of that passing through the fire was undoubtedly to purify. The name Tammuz has evidently reference to this, for it signifies "to perfect," that is, "to purify"* "by fire;" and if Nimrod was, as the *Paschal Chronicle* (vol. i., pp. 50, 51), and the general voice of antiquity, represent him to have been the originator of fire-worship, this name very exactly expresses his character in that respect. It is evident, however, from the Zoroastrian verse, elsewhere quoted (p. 400), that fire itself was worshiped as Tammuz, for *it* is called the "Father that perfected all things." In one aspect this represented fire as the creative god; but in another, there can be no doubt that it had reference to the "perfecting" of men by "purifying " them. And especially it perfected those whom it consumed. This was the very idea that, from time immemorial till very recently, led so many widows in India to immolate themselves on the funeral piles of their husbands, the woman who thus burned herself being counted blessed, because she became *Suttee,"* i.e., "Pure by burning." And this also, no doubt, reconciled the parents who actually sacrificed their children to Moloch, to the cruel sacrifice, the belief being cherished that the fire that consumed them also *"perfected"* them, and made them meet for eternal happiness. As both the passing *through* the fire, and the burning *in* the fire, were essential rites in the worship of Moloch or Nimrod, this is an argument that Nimrod was Tammuz. As the priest and representative of the perfecting or purifying fire, it was he that carried on the work of perfecting or purifying by fire, and so he was called by its name.

When we turn to the legends of India, we find evidence to the very same effect as that which we have seen with regard to Zoroaster and Tammuz, as head of the fire-worshippers. The fifth head of Brahma, that was cut off for inflicting distress on the three worlds, by the "effulgence of its dazzling beams," referred to in the text of this work, identifies itself with Nimrod. The fact that that fifth head was represented as having read the Vedas, or sacred books produced by the other four heads, shows, I think, a succession.* Now, coming down from Noah, what would that succession be? We have evidence from Berosus, that, in the days of Belus—that is, Nimrod-–the custom of making representations like that of two-headed Janus, had begun. Assume, then, that Noah, as having lived in two worlds, has his two heads. Ham is the third, Cush the fourth, and Nimrod is, of course, the fifth. And this fifth head was cut off for doing the very thing for which Nimrod actually was cut off. Now, I suspect, this Indian myth is the key to open up the meaning of a statement of Plutarch, which, according to the terms of it, as it stands, is visibly absurd. It is as follows: Plutarch (in the 4th Book of his *Symposiaca,* Quaest. 5, vol. ii., p. 670, B), says that "the Egyptians were of opinion that darkness was prior to light, and that the latter [viz., light] was produced from *mice,* in the fifth generation, at the time of the *new moon."* Now, in India, we find that "a *new* moon" was produced in a different sense from the ordinary meaning of that term, and that the production of that new moon was not only important in Indian mythology, but evidently agreed in time with the period when the fifth head of Brahma scorched the world with its insufferable splendor. The account of its production runs thus: that the gods and mankind were entirely discontented with the moon which they had got, *"because it gave no light,"* and besides the plants were poor and the fruits of no use, and that therefore they churned the White sea [or, as it is commonly expressed, "they churned the ocean'], when all things were mingled, *i.e.,* were thrown into confusion, and that then a new moon, with a new regent, was appointed, which brought in an entirely new system of things *(Asiatic Researches,* vol. ix., p. 98). From MAURICE's *Indian Antiquities* (vol. ii., sect. 6, pp. 264–266), we learn that at this very time of the churning of the ocean, the earth was set on fire, and a great conflagration was the result. Now, the name of the moon in India is Soma, or Som (for the final *a* is only a breathing, and the word is found in the name of the famous temple of Somnaut, which

name signifies “Lord of the *Moon,”)* and the moon in India is male. As this transaction is symbolical, the question naturally arises, who could be meant by the moon, or regent of the moon, who was cast off in the fifth generation of the world ! The name Som shows at once who he must have been. Som is just the name of Shem; for Shen's name comes from Shom, “to appoint,” and is legitimately represented either by the name Som, or Sem, as it is in Greek; and it was precisely to get rid of Shem, (either after his father's death, or when the infirmities of old age were coming upon him) as the great instructor of the world, that is, as the great diffuser of spiritual light that in the fifth generation, the world was thrown into confusion, and the earth set on fire. The propriety of Shem's being compared to the *moon* will appear, if we consider the way in which his father Noah was evidently symbolized. The head of a family is divinely compared to the *sun*, as in the dream of Joseph (Genesis xxxvii. 9), and it may easily be conceived how Noah would, by his posterity in general, be looked up to as occupying the paramount place as the sun of the world; and accordingly Bryant, Davies, Faber, and others, have agreed in recognizing Noah as so symbolized by Paganism. When, however, his younger son—for Shem was younger than Japhet—(Genesis x. 21) was *substituted* for his father, to whom the world had looked up, in comparison of the “greater light,” Shem would naturally, especially by those who disliked him and rebelled against him, be compared to “the lesser light,” or the moon.* Now, the production of **light by *mice***, at this period, comes in exactly to confirm this deduction. A mouse in Chaldee is “Aakbar;” and Gheber, or Kheber, in Arabic, Turkish, and some of the other eastern dialects, becomes “Akbar,” as in the well-known Moslem saying, “Allah Akbar,” “God is Great.” So that the whole statement of Plutarch, when stripped of its nonsensical garb, just amounts to this, that light was produced by the Guebres or fire-worshippers, when Nimrod was set up in opposition to Shem, as the representative of Noah, and the great enlightener of the world.”

(add)

Keys

Alexander was found via the keys: Nimrod, Tammuz

References

1. Hislop, Alexander. (1853). *The Two Babylons: the Papal Worship Proved to be the Worship of Nimrod and his Wife* (Note L: Odin and Adon, pg. 503-504; Tammuz, Nimrod, Osiris, pg. 506). S.W. Partridge and Co, 1871.

External links

â— Alexander Hislop – Wikipedia.
â— The Two Babylons – Wikipedia.

θΔics

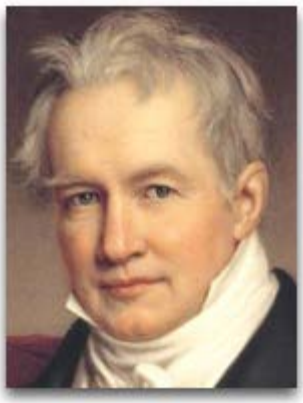

In existographies, **Alexander Humboldt** (1769-1859) (IQ:185|#82) (Cattell 1000:94) [RGM:83|1,310+] was Prussian geographer, naturalist, explorer, romantic philosopher, oft-characterized polymath and fabled "last persons to know everything"; younger brother to Wilhelm Humboldt (1767-1835); noted for being one of the first to propose that South America and Africa were both joined; in Jena (1797), with his brother Wilhelm, Friedrich Schiller, and Johann Goethe, the four discussed, in Goethe's own words, “all of nature from the perspectives of philosophy and science”.

Overview

In 1844, Humboldt, in his multi-volume *Cosmos: a Sketch of a Physical Description of the Universe*¸ attempted to sketch out his view of things, generally stitched around his ideas on terrestrial magnetism and geology, with focus on minerals, or “inorganic terrestrial life”, in Linnaean speak, wherein he tries to “elevate nature” with “lofty language”; a few salient examples of which are as follows:

> “The physical description of the world, considering the universe as an object of the external senses, does undoubtedly require the aid of general physics and of descriptive natural history, but the contemplation of all **created things**, which are linked together, and form one whole, animated by **internal forces**, gives to the science we are considering a peculiar character.”
>
> — Alexander Humboldt (1844), *Cosmos: a Sketch of a Physical Description of the Universe, Volume One* (pg. 59)

> “As we have now passed in review the whole sphere of **inorganic terrestrial life**, and have briefly considered our planet with reference to its form, its internal heat, its electromagnetic tension, its phenomena of polar light, the volcanic reaction of its interior on its variously composed solid crust, and, lastly, the phenomena of its two-fold envelopes—the aerial and liquid ocean—we might, in accordance with the older method of treating physical geography, consider that we had completed our descriptive history of the globe. But the nobler aim I have proposed to myself, of raising the contemplation of nature to a more elevated point of view, would be defeated, and this delineation of nature would appear to lose its most attractive charm, if it did not also include the sphere of **organic life** in the many stages of its typical development. The idea of vitality is so intimately associated with the idea of the existence of the active, ever-blending natural forces which animate the terrestrial sphere, that the creation of plants and animals is ascribed in the most ancient mythical representations of many nations to these forces, while the condition of the surface of our planet, before it was animated by vital forms, is regarded as coeval with the epoch of a chaotic conflict of the struggling elements.”
>
> — Alexander Humboldt (1844), *Cosmos: a Sketch of a Physical Description of the Universe, Volume One* (pg. 339)

Here, as we see, all of this is closet coded theism, e.g. “created things”, and anthropomorphism, e.g. “animated by internal forces” (compare: Holbach), bloated with unnecessary words, e.g. “But the nobler aim I have proposed to myself, of raising the contemplation of nature to a more elevated point of view”. Here we see the specifics of a purported-to-have-been-genius, who nobody cites anymore.

Quotes | By

The following are quotes by Humboldt:

> “There are three stages of scientific discovery: first people deny it is true; then they deny it is important; finally they credit the wrong person.”
>
> — Alexander Humboldt (c.1840), *Publication*; compare: Arthur Schopenhauer (1818) on three stages of scientific

truth

> “In considering the study of physical phenomena, not merely in its bearings on the material wants of life, but in its general influence on the intellectual advancement of mankind, we find its noblest and most important result to be a knowledge of the chain of connection, by which all natural forces are linked together, and made mutually dependent upon each other; and it is the perception of these relations that exalts our views and ennobles our enjoyments.”
>
> — Alexander Humboldt (1844), *Cosmos: a Sketch of a Physical Description of the Universe* (Ñº)

External links

â— Alexander von Humboldt – Wikipedia.

θΔics

In science, **Alexander Oparin** (1894-1980) (CR:13) was Russian plant physiologist and biochemist noted for []

Overview

In 1922, Oparin, during a meeting of the Russian Botanical Society, introduced his concept of a primordial organism arising in a brew of already formed organic compounds. [8]

In 1924, Oparin, in his *The Origin of Life*, argued that compounds of nitrogen, carbon, hydrocarbons, and other oxygen-containing organic molecules fell from the cooling clouds, filling the oceans, and from these a complex aggregate called colloids formed, and eventually transformed into an organic body. [1]

In 1936, Oparin, argued, based on the 1931 'coazervate' theory of H. Budenberg de Jong, that inorganic molecules, in an oxygenless atmosphere, could react via the action of sunlight, to produce a 'primeval soup' of organic molecules; which in turn could combine to create a 'coacervate droplet' (compare: cell-as-molecule), such as shown below:

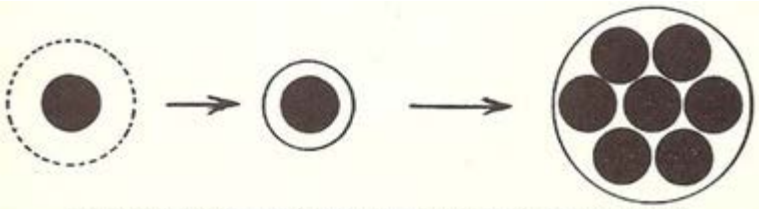

Transformation of a colloidal solution particle into a coazervate particle.

which, in turn, would grow by fusion with other droplets, and reproduce through fission into daughter droplets, gaining a primitive metabolism in which those factors that promoted cell integrity survived, whereas those that didn't became extinct. [2]

Vernadsky

Oparin, of note, attacked Vladimir Vernadsky's 1926 'theories on perpetual life' (Ñº), who stated that they were not in accord with the "objective data of modern science." [5]

Education

In 1917, Oparin completed a degree in plant physiology at Moscow State University and became a biochemistry professor there in 1927, focusing on plant enzymes and metabolism.

Difficulties

Oparin's coacervate droplet origin of life theory, to note, falls apart as baseless, when analyzed via physical chemistry; such as found in Lionel Harrison 1993 "cell-as-molecule" approach, in upgrade to cell as first living thing, according to which the notion of "life" found in the mechanism of a "first reaction" becomes untenable, and therefore defunct. [4]

Quotes | On

The following are Oparin-related quotes:

> "Oparin's great contribution to the theory of the origin of life is that he postulated a long chemical evolution as a necessary preamble to the emergence of life, thinking of the evolutionary process as passing through three distinct chemical phases, from: inorganic chemistry, to organic chemistry, to biological chemistry."
>
> — Sergius Morgulis (1952). "Introduction", in: *The Origin of Life* [7]

> "While rejecting vitalism, teleology, and mysticism, Haeckel taught a view of nature that advocated a cosmic perspective and an evolutionary framework, and thereby surpassed the crudely mechanistic and materialistic [see: crude materialism] explanations of the world. Going beyond Darwin, Haeckel proposed that life had emerged spontaneously from matter; an hypothesis anticipated by over fifty years: the abiogenetic theory of **Alexander Oparin**."
>
> — James Birx (1992), "Introduction to *The Riddle of the Universe*" [3]

Quotes

The following are noted quotes:

> "Neither the theory of spontaneous generation nor the theory of the continuity of life solves rationally the problem of the origin of life, since these theories are based on the tacit assumption of an absolutely impassable hiatus between animate and inanimate nature."
>
> — Alexander Oparin (1936), *The Origin of Life* (pg. 45)

> "At the dawn of the European civilization, with the Greek philosophers (Ñº), there were two clear tendencies in this problem. Those are the Platonic and Democritian trends, either the view that dead matter was made alive by some spiritual principle or the assumption of a spontaneous generation from that matter, from dead or inert matter."
>
> — Alexander Oparin (c.1940) [6]

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External links

â— Alexander Oparin – Wikipedia.

θΔics

In existographies, **Alexander Pope** (1688-1744) (IQ:180|#109) (Cattell 1000:82) (CR:43) was an English poetry philosopher, noted, in hmolscience, for his 1734 moral poetry work *An Essay on Man*, an attempt to grapple with the issue of growing scientific knowledge in the face of stagnant religious logic, conceived as the centerpiece of a proposed system of ethics, aimed to be made into a larger work (project never completed), a set of four moral epistles, in short, commented on by a number of thinkers: Voltaire, Jean-Jacques Rousseau, Gottfried Leibniz, Immanuel Kant, John Mill, among others.

The three most commented on passages from Pope's *Essay* are "shall gravitation cease when you go by?" (4.128), "Whatever IS, is RIGHT" (1.292), and his ideas about man's position in the great chain of being (2.33-34).

Religion

Pope has been characterized a "deist" (Joshi, 2014).

Influences

Pope, according to Arthur Lovejoy (1933), derived most of his ideas in the first epistle of his *Essay on Man*, from William King (1650-1729) (Q) and views such as the following: [6]

> "It is absurd to imagine that the earth was made for the sake of mankind, and not of the universe. No one who is not blinded by pride and ignorance, could ever suppose it."
>
> — William King (c.1710), *Publication*; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 188)

(add)

Shall gravitation cease when you go by?

Pope, in section 4.128, famously asks: "shall gravitation cease when you go by" (compare: George Scott), which has since become a standalone quote cited and commented on by many. The specific stanza in full reads: [1]

> Shall burning Aetna, if a sage requires,
> Forget to thunder, and recall her fires?
> On air or sea new motions be imprest,
> Oh blameless Bethel! to relieve thy breast?
> When the loose mountain trembles from on high
> **Shall gravitation cease, if you go by?**
> Or some old temple, nodding to its fall,
> For Chartres' head reserve the hanging wall?

In 1852, John Mill, in his "Nature" essay, said the following on Pope's arguments: [2]

> "For how stands the fact? That, next to the greatness of these cosmic forces, the quality which most forcibly strikes everyone who does not avert his eyes from it is their perfect and absolute recklessness. They go straight to their end without regarding what or whom they crush on the road. Optimists, in their attempts to prove that **'whatever is, is right,'** are obliged to maintain, not that nature ever turns one step from her path to avoid trampling us into destruction, but that it would be very unreasonable in us to expect that she should. Pope's **'Shall gravitation cease when you go by?'** may be a just rebuke to anyone who should be so silly as to expect common human morality from nature. But if the question were between two men,

> instead of between a man and a natural phenomenon, that triumphant apostrophe would be thought a rare piece of impudence. A man who should persist in hurling stones or firing cannon when another man 'goes by,' and, having killed him, should urge a similar plea in exculpation, would very deservedly be found guilty of murder. In sober truth, nearly all the things which men are hanged or imprisoned for doing to one another are nature's every-day performances."

In 1875, Balfour Stewart and Peter Tait, in their *The Unseen Universe*, citing Pope, via Mill, also digressed on this. [3]

In 1896, English science-religion reconciler George Millin, in his *Evil and Evolution*, citing Pope, via Mill, states the following on Pope's 4.128: [4]

> "In your perfect world, if a rock should fall when a man happened to be under it, what would save that man from being crushed? I cannot tell. I could not have suggested the law of latent heat to save the man from being drowned if he happened to be under a snow-covered hill when the temperature suddenly rose one degree above freezing point. That gravitation should cease is perhaps not so inconceivable as Pope would evidently have supposed."

(add discussion)

Whatever IS, is RIGHT

Pope, in his essay section 1.287-92, stated the following:

> "All nature is but art, unknown to thee;
> All chance, direction, which thou canst not see;
> All discord, harmony not understood;
> All partial evil, universal good.
> And, spite of pride, in erring reason's spite,
> One truth is clear, 'Whatever is, is right'."

The last comment "Whatever IS, is RIGHT", written seemingly in relation to or on the heels of Gottfried Leibniz (1646-1716) and his 1734 "this is the best of all possible worlds" logic (Q), drew a lot of heat. Voltaire, e.g., initially referred to Pope's *Essay on Man* as "the most beautiful, the most useful, the most sublime didactic poem ever written in any language", but in his *Candice* (1759), made Pope's 1.292 "Whatever IS, is RIGHT" assertion a theme that he satirized. Leibniz' assertion, that this is the "best of all possible worlds", subsequently, provided the basis for the satirical work *Candide*.

Great chain of being

Pope, after mentioning the "great chain" (1.33), in section 2.33-34, shown below bolded, in his discussion of Newton, apes, and the rules that bind the comet, supposed outlines a great chain of being argument: [1]

> Superior beings, when of late they saw
> A mortal man unfold all nature's law,
> Admir'd such wisdom in an earthly shape,
> And shew'd a Newton as we shew an ape.
>
> Could he, whose rules the rapid comet bind,
> Describe or fix one movement of his mind?
> Who saw its fires here rise, and there descend,

Explain his own beginning, or his end;
Alas what wonder! man's superior part
Uncheck'd may rise, and climb from art to art;
But when his own great work is but begun,
What reason weaves, by passion is undone.

(add)

Quote | On

The following are quotes on Pope:

> "In the same year [age 8] in which I began Latin, I made my first commencement in the Greek poet with the Iliad. After I had made some progress in this, my father put **Pope's** translation into my hands. It was the first English verse I had cared to read, and it became one of the books in which for many years I most delighted: I think I must have read it from twenty to thirty times through. I should not have thought it worthwhile to mention a taste apparently so natural to boyhood, if I had not, as I think, observed that the keen enjoyment of this brilliant specimen of narrative and versification is not so universal with boys, as I should have expected both a priori and from my individual experience. Soon after this time I commenced Euclid, and somewhat later, algebra, still under my father's tuition."
>
> — John Mill (1873), *Autobiography* (Q)

Quotes | By

The following are other noted quotes by Pope:

> "Nature and nature's laws lay hid in the night. God said 'let Newton be!' and all was light."
>
> — Alexander Pope (1727) "Intended for Isaac Newton", Westminster Abbey [5]

> "Nor public flame, nor private, dares to shine;
> Nor human spark is left, nor glimpse divine!
> Lo! thy dread empire, Chaos! is restored;
> Light dies before thy uncreating word:
> Thy hand, great Anarch! lets the curtain fall;
> And universal darkness buries all."
>
> — Alexander Pope (1728), *The Dunciad* (Q)

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External links

- Alexander Pope – Wikipedia.
- An Essay on Man – Wikipedia.

θΔics

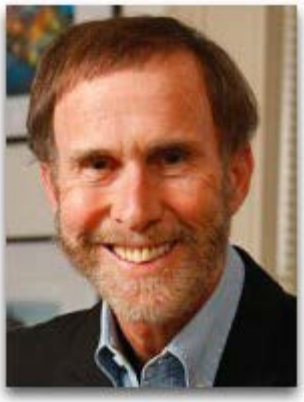

In existographies, **Alexander Rosenberg** (1949-) (CR:15), or “Alex Rosenberg”, is an American economics and biology philosopher, a self-defined atheist "naturalist", noted for his 1980 two cultures namesakes usages of the joint terms: sociophysics and sociochemistry (see: socio-physical chemistry), for his 1985 reductionism discussions, and for his 2011 reaction-provoking book *The Atheist’s Guide to Reality: Enjoying Life without Illusions*, wherein he promotes what he refers to as "nice atheism", a "blind variation", "dumb luck", "random chance", "accident" themed, "mindless" process, "entropy = disorder" thermodynamics-conceptualized model of evolution, based on game theory and terms such as "thermodynamic noise", according to which everything is an nihilistic allusion, there is no morality, meaning, or purpose to existence, but that the closest thing to what he calls "core morality" is to promote the fitness of our ancestors, based on some type of Hamilton rule logic of being nice, the end concluding motto of which is stay happy, keep going, and when in doubt "take Prozac or equivalent serotonin reuptake inhibitor". [1]
[1]

Blind | Prediction

Rosenberg spends a good amount of time referring to the "blindness" of history and "blind variation" (term used 33 times), according to which while we rightly predict macro-human phenomenon, such as the weather or planetary motion, as well micro-human phenomenon, such as chemical reactions, we are completely "blind" in our ability to about human motions:

> “Scientism realizes that Asimov’s aspirations—to make human history and human affairs subject to prediction and control [*Foundation Series*, 1942-1993]—were overly optimistic. Scientism recognizes that history is blind, and the empirical sciences of human behavior are myopic at best.” (pg. 243)

Certainly a read through of Morris Zucker’s 1945 *Field Theory of History* (volume one) would cure Rosenberg of some of this tendency towards mis-logic in respect to what physics, chemistry, and thermodynamics can say about human history of human future. The issues with Rosenberg’s mis-logic about thermodynamics based historical prediction, was long ago elaborated by C.G. Darwin, and his 1952 *The Next Million Years*, who asserted that thermodynamics has the ability to predict the next million years of human evolution. The issue here seem to be that whereas Darwin was trained in thermodynamics, Rosenberg was not; hence the mislogic. Molecules, in short, are not blind and do not move around blindly as Rosenberg incorrectly asserts. Put a hydrogen molecule H_2 and oxygen molecule O_2 in proximal vicinity and they will move not "blindly", but towards each other, water H_20 will the the product, and free energy will be the driving force. The famous floating magnets experiment is a visual clarifier of this logic. This logic naturally enough scales up to explain human movement.

The only thing that humans or molecules seem to be "blind" about, to clarify, is seemingly captured in the Heisenberg uncertainty principle.

Drive

While a majority of Rosenberg’s assertions and extrapolations go off the rails of sound physics and chemistry, some of his statements, with respect to “drive” seem to be in the remote neighborhood of correctness:

> “Whatever is in our brain driving our lives from the cradle to grave, it is not purposes. But it does produce the powerful illusions of purposes, just like all other purposeless adaptations.” (pg. 205)

> “In a world where physics fixes all the facts, where the second law drives all adaption, there are no future or past designs.” (pg. 162)

> “The second law must be the driving force in adaptive evolution.” (pg. 79)

Other statements on the nature of drive, however, become rather incongruous:

> "Take any biological process that looks like it's an intelligent and flexible response to changes in the environment that it must be driven by a purpose, plan, or goal. Behind that appearance will be found some engine of blind variation and a filter passively screening for fitness, whether it's the building of the brain, navigating an interchange, or keeping up your end of the conversation … Darwinian natural selection is simply physics at work among organic macromolecules." (pg. 92)

This last assertion, about Darwinian selection occurring among molecules, was ridiculed frankly by Robert Pirsig (*Lila: Inquiry into Morals*, 1991).

The first part, about the engine of blind variation being behind drive, smacks in the face about what thermodynamics, the science behind the operation of "engines", has to say about drive at the chemical level, which is that free energy is the driving force, a logic that traces back to Johann Blumenbach's 1871 formative drive theory (see: bildungstrieb), a logic carried through the power center works of: Kant (1790), Schiller (1795), Goethe (1809), Schopenhauer (1818), Nietzsche (1865), Freud (1910), to name a few (see: Freud-Schiller drive theory). Rosenberg, in his nihilism belief system, seems to be ignorant of all of this?

Thermodynamics | Difficulties

A noticeable issue with Rosenberg's attempt to parlay physics as the say all of everything, is his lack of clear understanding thermodynamics, particularly in respect to his overly-employed the "second law requires" this, or the "second law says" that, etc., claims. One example is the following: [1]

> "The evolution and maintenance of adaptions by natural selection wins the prize for greatest efficiency in carrying out the second law's mandate to create disorder."

This is an example of science lost in transition. The original Clausius 1865 statements of the first and second law are that "energy of the universe is conserved" and that the "transformation content of the universe tends to a maximum", respectively.

Molecule theory | Difficulties

Rosenberg's polemic, in his effort to dismiss purpose from the humanities, is to scaffold on the blind random chance model of natural selection based evolution, running on what he calls the "mindless process" of Darwinian theory, conjoined with the purposeless universe hypothesis of physics, to argue the following in congruent statments: [1]

> "The most complex and impressive adaptions are the result of a chain of events that starts with no adaptations at all, just molecules in random motion. That leaves nothing for purposes, ends, goals, to do anywhere in nature." (pg. 57)
>
> "As molecules bounce around, any amount of order, structure, pattern almost always gives way to disorder, to entropy." (pg. 65)

The issue here, in respect to the first statement, is that molecules do not move in random motion, but along free energy gradients. This gets into the terminological subtleties of chemical teleology, not that there is teleology in chemistry or chemical processes, but where are thermodynamically quantifiable reaction starts or initial states and reaction ends or final states, whereby, according to thermodynamics, there are indeed "ends" in nature, contrary Rosenberg's assertion. Accordingly, as humans, as molecules (see: human molecule), do not move around randomly, but along free energy

gradients, quantified by initial states and final states, or starts and ends.

Rosenberg, beyond this, cited the 1880 “without god, everything is permissible” motto of Fyodor Dostoyevsky. One thing that is not permissible, if god does not exist, however, is perpetual motion—one of which is perpetual motion of the living kind, which Rosenberg seem to defend. Subsequently, it is chemical thermodynamics, not god, that "governs" what is permissible and not permissible in the varieties of human movements and actions—contrary to Rosenberg’s all movements and actions are possible “there is no basis for morality” nice nihilism supposition.

Nice atheism | Reality

In 2011, Rosenberg published his *The Atheist’s Guide to Reality*, in which, in his own words, he tried to do the following:

> “In *The Atheist’s Guide to Reality* I tried to coopt the word ‘scientism’ and to argue that science can answer the persistent philosophical questions that trouble people, including the nature of reality, the purpose of life, the existence of a soul, the grounds of morality, whether we have free will, and the meaning of human history. Most of the answers science gives to these questions are unpopular and people neither understand them nor want to hear them.”

The abstracted "big questions" and solutions or short answers given by Rosenberg in his book are as follows: [1]

> “Is there a god? No. What is the nature of reality? What physics says it is. What is the purpose of the universe? There is none.What is the meaning of life? Ditto. Why am I here? Just dumb luck. Is there a soul? Is it immortal? Are you kidding? Is there free will? Not a chance! What is the difference between right and wrong, good and bad? There is no moral difference between them. Why should I be moral? Because it makes you feel better than being immoral. Is abortion, euthanasia, suicide, paying taxes, foreign aid, or anything else you don’t like forbidden, permissible, or sometimes obligatory? Anything goes. What is love, and how can I find it? Love is the solution to a strategic interaction problem. Don’t look for it; it will find you when you need it. Does history have any meaning or purpose? It’s full of sound and fury, but signifies nothing.”

The contents Rosenberg's book, interestingly, provoked American writer Leon Wieseltier to attack it on the front cover of *The New Republic* as "The worst book of the year", about which he summarized as follows: [5]

> “I take this cutting-edge wisdom [above Q&A abstract] from the worst book of the year, a shallow and supercilious thing called *The Atheist’s Guide to Reality: Enjoying Life Without Illusions*, by **Alex Rosenberg**, a philosopher of science at Duke University. The book is a catechism for people who believe they have emancipated themselves from catechisms. The faith that it dogmatically expounds is scientism. It is a fine example of how the religion of science can turn an intelligent man into a fool.”

Wieseltier, to note, is anti-science in the humanities and liberal arts to the bone. In his 2013 response to Steven Pinker on scientism, entitled “Crimes Against Humanities”, to exemplify, Wieseltier states: [6]

> “The question of the place of science in knowledge, and in society, and in life, is not a scientific question. Science confers no special authority, it confers no authority at all, for the attempt to answer a nonscientific question. It is not for science to say whether science belongs in morality and politics and art.”

In any event, the above criticism is well-representative of the bubbling science vs religion issue in America, a subject about which very few American professors are willing to breach, in respect to the tenuous subject of physical humanities.

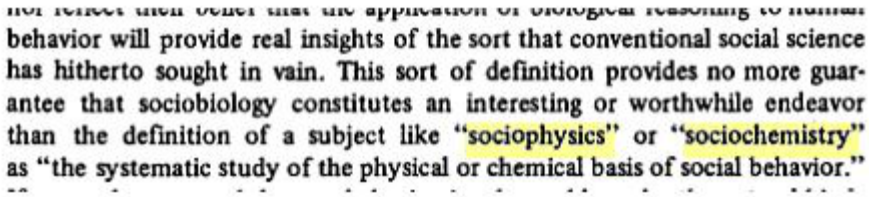
behavior will provide real insights of the sort that conventional social science has hitherto sought in vain. This sort of definition provides no more guarantee that sociobiology constitutes an interesting or worthwhile endeavor than the definition of a subject like "sociophysics" or "sociochemistry" as "the systematic study of the physical or chemical basis of social behavior."

Rosenberg's 1980 definition of sociophysics and or sociochemistry—or "socio-physical chemistry" in truncated modern Hmolpedia neologism terms—as the systematic study of the physical and chemical basis of social behavior. [3]

Reductionism

In 1985, Rosenberg, in the context of the reductionist anti-reductionist debate, classified the two debating parties as either "autonomists", who believe that the biological sciences are sufficiently different form the physics sciences that biological theory and practice must remain permanently insulated (see: unbridgeable gap) from distinctive methods and theories of the physical sciences, and the "provincialists", who hold that biological science is a subset of the physical sciences and that biological findings and theories must be not merely compatible with those of physics but must actively cohere with its theoretical achievements. [2]

Education

Rosenberg originally started as a physics student but switched to philosophy after reading David Hume's *Treatise on Human Nature*. [4] Rosenberg completed his BA in 1967 in philosophy at City College of New York and his PhD in 1971 with a dissertation on the nature of microeconomic laws at Johns Hopkins University. Rosenberg, since 200, has been a professor of philosophy at Duke University (see also: Adrian Bejan and Roy Weintraub), where he tends to work in three areas: metaphysics, especially the nature of causality, the philosophy of economics, and the philosophy of biology.

Quotes | On

The following are quotes on Rosenberg:

> "Here's a Philosophy TV dialogue (Ñº) between John Dupre (left) and **Alex Rosenberg** (right). They are both physicalists — the believe that the world is described by material things (or fermions and bosons, if you want to be more specific) and nothing else. But Dupre is an anti-reductionist, which is apparently the majority view among philosophers these days. Rosenberg holds out for reductionism, and seems to me to do a pretty good job at it."
>
> — Sean Carroll (2010), "Physicalist Anti-Reductionism" (Ñº), Nov 3

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(b) Leon Wieseltier – Wikipedia.
6. Wieseltier, Leon. (2013). "Crimes Against Humanities: Now Science Wants to Invade the Liberal Arts. Don't Let it Happen", *The New Republic*, Sep 3.

External links

â— Alexander Rosenberg – Wikipedia.
â— Alex Rosenberg (faculty) – Duke University.
â— Alexander Rosenberg (profile) – Duke University, Philosophy.
â— Rosenberg, Alexander (1946-) – WorldCat Identities.

θΔics

In existographies, **Alexander the Great** (356-323) (IQ:180|#147) (Cattell 1000:17) [RGM:N83|1,320+] (Murray 4000:N/A) , aka “Alexander III of Macedon”, was a Greek king-warrior noted for []

Overview

In 336BC, Alexander, at age 20, succeeded his father, Philip II (382-336BC), following his assassination, to the throne and inherited a strong kingdom and an experienced army, and over the next ten years, by age 30, created one of the largest empires in ancient history, therein becoming not only King of Macedonia (336BC), but also Pharaoh of Egypt (332BC), King of Asia (331BC), and King of Persia (330BC).

Religion

See also: Supreme god timeline

Alexander, supposedly, initiated the process of fusion of the Egyptian religion with Greek religion via syncretism.

Alexander, supposedly, claimed to the divine right to rule Egypt from the god Amun, whom he identified with the Greek god Zeus, aka Amen-Zeus. [1]

Alexander, in sum, initiated the process of unification of Greek science with Egyptian theology to form the proto-roots of what, over the next 600 years, would eventually become Christianity under the so-called Greco-Roman empire.

Osiris-Horus | Jesus

In 2016, Charles Pope, in his *Alexander the Great: Beyond the Divide*, argued that Alexander, as conqueror of the world, during the Greek recension, attempted to invert the long-standing traditional model of pharaoh (or emperor) as “Horus in life” and “Osiris in the afterlife”, via the new god Serapis, and therein become himself an Osiris-Horus in life, and therein become the main prototype to the later Roman-Hebrew man-god character of Jesus (150AD), as formulated during the Roman recension; the gist of which is as follows: [2]

> “**Alexander** was the primary inspiration for Christ.Alexander was such a towering figure that at least some influence on emerging Christianity would be expected. However, upon closer inspection the parallels between Alexander and Jesus turn out to be both extensive and profound. Alexander the Great's birth had been "immaculately conceived" (see: virgin birth) and then "celestially announced." He was a precocious youth that confounded his elders. He railed against conventional thinking (orthodoxy) and was revered everywhere, except by his own family and home town. His campaign began with a wedding. He cast out demons and was accused of having a demon. He fed the multitudes and spoke in parables. He was particularly fond of the mustard seed. He traveled incessantly. He prayed for those that spitefully used him. He walked on water and calmed the tempest. He was warned against entering his capital, but approached his prophesized demise with eager resolve. He was lifted up into the "heavens" and also descended to the "underworld." His higher calling was to attain a faraway kingdom, and one that could only be gained through a symbolic death and ascension. He comforted and later appeared to his followers. He moved mountains and enveloped those who believed in him from the onslaught of the godless.”
>
> — Charles Pope (2016), *Alexander the Great: Beyond the Divide* (abs)

> “The wolf was a symbol of Benjamin (the Hebrew Horus), which along with Osiris were major inspirations (role models) for **Alexander**. Alexander strove to invert the traditional metamorphosis of a Horus that (through death) became an Osiris. He was instead an Osiris that shed this role (also through a symbolic death) in order to become a Horus. Consistent with this, the new god Serapis could be depicted with the club of Hercules (Horus).”

— Charles Pope (2016), *Alexander the Great: Beyond the Divide* (pg. #)

The following, also, is a related factoid:

> "When Caligula [12AD-41AD] was a boy, a seer told him that he would never be emperor until he walked on water. So he built a pontoon bridge across the Bay of Naples, put on the breastplate of **Alexander the Great**, and paraded night and day across the bay, throwing lavish sex orgies in the light of bonfires. He had a very good memory. He exiled his own wife and proclaimed himself a god, dressing up as Apollo, Venus (a goddess), Mercury, and Hercules. He demanded that everyone, from senators to guards to guests and public crowds, refer to him as divine in his presence."
>
> — James Frater (2010), *ListVerse.com's Ultimate Book of Bizarre Lists* (pg. 214)

(add)

Ptolemy I

In 323BC, Ptolemy I (see also: Ptolemy), a former Macedonian general under Alexander, after Alexander's death (de-reaction), was appointed 'satrap' (governor) of Egypt. In 305BC, Ptolemy I declared himself king of Egypt, and later "soter" (savior) of Egypt.

Ptolemy I employed an Egyptian priest and a member of an Athenian priestly family and gave them the charge to work together to combine the religions. [1]

Ptolemy I, supposedly, linked the Greek god Hades to the Egyptian gods Osiris and Apis, combining them into the go Serapis, and established the divine right to rule through Serapis.

Horus, likewise, got identified with Apollo, Hathor with Aphrodite and Thoth with Hermes.

Peculiarities

Alexander carried the works of Homer and Aristotle into battle (Ñº).

Library of Alexandria

Alexander established the Library of Alexandria

Education

Alexander was tutored by Aristotle until the age of 16.

Quotes | By

The following are noted quotes:

> "There is nothing impossible to him who will try."
>
> — Alexander (c.335BC), on taking charge of an attack on a fortress (Ñº)

> "I cry, because, having just found out [add philosopher] that there are many worlds, I have not yet been able to conquer one."
>
> — Alexander the Great (c.335BC), famous response to being asked why he cried [3]

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External links

â— Alexander the Great – Wikipedia.

θΔics

In existographies, **Alexander Wissner-Gross** (1982-) (CR:17) is an American mathematician, electrical engineer, and physicist, a former child prodigy of sorts, described by Czech-American theoretical physicist Lubos Motl in 2007 as an "interdisciplinary genius", noted for []

Overview

In 2013, Wissner-Gross, in his “Causal Entropic Forces”, co-written with American mathematician Cameron Freer, attempted to argue that "intelligence" and intelligent behavior stems from the impulse (see: impulse theory) to seize control of future events in the environment, which they consider as a fundamentally thermodynamic process, and argue that important landmarks in human evolution, like the use of tools, upright walking and social organization, are defining behaviors of a human cognitive niche that spontaneously emerge through what they refer to as "entropic forces", which they equate to or characterize by entropy maximization. [1] Their article, of note, cites Thomas Wallace (*Wealth, Energy, and Human Values*, 2009), Dietrich Stauffer (*The Beginning of Infinity*, 2011) as econophysics representatives, along with other thinkers such as: Eric Chaisson, Alex Kleidon, and Eric Verlinde. Their article, of curiosity, has stirred a bit of a media frenzy, as far as thermodynamic theories go, with discussions and news postings on the theory found in over a dozen press outlets ranging from *Forbes* to *BBC News* to *Physics Today*. [2]

The following is Wissner-Gross' cart-and-rod diagram, from his computer simulation program *Entropica*, that operates based on what they call "causal entropic forces", which they define as forces of the motivation for intelligent behavior, which encourage a system to preserve as many future histories as possible. In the cart-and-rod exercise simulation, these entropic forces, supposedly, control the cart to keep the rod upright. Allowing the rod to fall would drastically reduce the number of remaining future histories, or, in other words, lower the entropy of the cart-and-rod system. Keeping the rod upright, according to Wissner-Gross and Freer, maximizes the entropy. It maintains all future histories that can begin from that state, including those that require the cart to let the rod fall. Wissner-Gross and Freer, in their abstract, state:

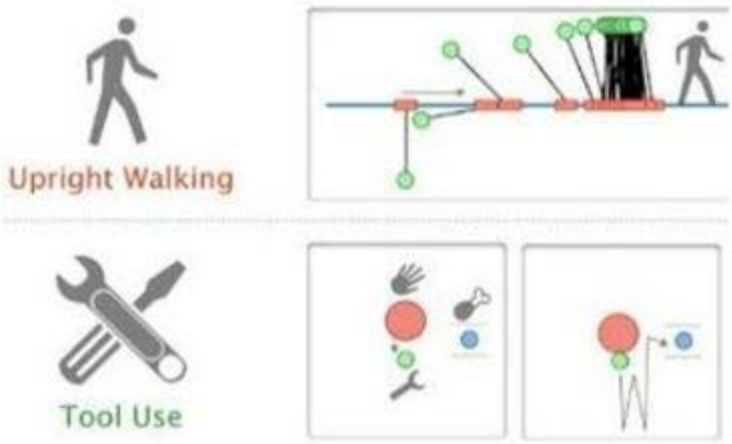

A diagram of the Gross-Freer model, something to the effect that walking upright lowers entropy, or something along these lines. [3]

> “Recent advances in fields ranging from cosmology to computer science have hinted at a possible deep connection between intelligence and entropy maximization, but no formal physical relationship between them has yet been established.”

Ideas and theories on intelligence and entropy, however, are not new, as Wissner-Gross and Freer seem to think—theorists include: Hungarian-born American prodigy turned mathematician and chemical engineer John Neumann, and his NASA-funded 1948-1953 thermodynamics-based automaton theories (see: Neumann automaton theory); Canadian materials science engineer Jack Kirkaldy, and his 1965 His “Thermodynamics of the Human Brain” outlines a free energy minimization principle of brain operation, consciousness, and development and his followup “Thermodynamics of Terrestrial Evolution”, which argues that the “causal element of biological evolution and development can be understood in terms of a potential function which is generalized from the variational principles of irreversible thermodynamics”; Chinese-born Canadian mathematician and economist Jing Chen, and his 2005 "entropy theory of the human mind" theory; American neuroscience researcher Todd Hylton, and his 2009-2012 Darpa-funded "physical intelligence" project; to name a few.

Education

Wissner-Gross seems to have been a bit of an accelerated prodigy in youth, performing with the New York City Opera Children's Chorus in 1992 and winning a number of state and national awards in mathematics, language, and computer science, and gifted talent searches before 1996. In 1997, Wissner-Gross was ranked 4th in the USA Computer Olympiad for student programmers. In 1998, age 16, Wissner-Gross spent summer doing "sand box physics", supposedly of the Per Bak variety. [4] In summer 1998, Gross had just finished his junior year at Great Neck South High School on Long Island, and was known as a "legendary whiz kid". In 1998, he came in first in the USA Computer Olympiad, and also won the USA Math Talent Search competition, which he won again in 1999. A skilled fencer and singer, he performed with the New York City Opera for its 1992 and 1993 seasons. [4] In 1999, Gross graduated first out of 225 students at Great Neck South High School, New York, and in 2003 graduated first out of about 550 students of the MIT school of engineering, simultaneously completing three undergraduate degrees: SB in physics, SB in electrical science and engineering, and SB in mathematics, on of which involved a thesis on "Surface Intruder Dynamics in Granular Fluids". He then completed an AM in physics and a PhD in physics, with a dissertation on "Physical Programmable Surfaces", in 2008, both at Harvard University. Since 2010, Wissner-Gross has been a research affiliate at the Media Laboratory at MIT and an researcher at the Institute for Applied Computational Science and the Harvard Innovation Lab, Harvard University.

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θΔics

In existographies, **Alexander Zotin** (1926-2000) (CR:9), or Aleksandr Il'ich Zotin, was a Russian biophysicist noted, in hmolscience, for a number of books on the thermodynamics of biological processes, i.e. chnopsological thermodynamics.

Overview

In 1972, Zotin published *Thermodynamic Aspects of Developmental Biology*, his most popular book. [1] In 1997, Zotin stated the following finalized views on his his thermodynamic theory of development: [8]

> "All phenomena occurring in nature may be subdivided into two classes: occurring on their own (that is spontaneous processes) and occurring as a result of some forces (action-compelling processes). It is evident that the development of an organism is a "spontaneous process", and we can hardly imagine this process to be the result of some forces outside an organism. We cannot accept the vitalism views of special forces or laws inside organisms, which are not physical but may determine. The phenomenological theory of ontogenesis regards the processes of organism development, growth and aging as a spontaneous process of living system transition from a less probable state to a more probable one, which may be described in terms of thermodynamics. In this respect, it takes over after other thermodynamic theories of development (Bauer, 1935; Salzer, 1957) and especially the theory of Prigogine-Wiame (Prigogine and Wiame, 1946; Prigogine, 1967; **Zotin**, 1972)."

In 1978, Zotin supposedly asserted that German physicist Hermann Helmholtz, was one of the first to argue that life somehow circumvents the second law; this assertion, however, may be misattribution (fact check)? [2]

Zoton, according to Paris Arnopoulos, had some type of structural size stability law correlating boundary stability with dissipation rate. [9]

Human thermodynamics

In 1996, Zotin, in his "Aspects of Bioenergetics and Civilization", co-written with Ingolf Lamprecht, argued that the appearance of civilization is regarded as a mechanism to hasten the heat death of our universe. [3]

Thermodynamics

Beginning in 1966, until his death (de-reaction), Zotin focused on studying the energetics and thermodynamics of developmental processes; initially his goal was to confirm the thermodynamic theories of Ilya Prigogine and Viam (?) based on principles of nonlinear thermodynamics. In ichthyology, in or prior to 1969 to 1980, what has been called the Prigozhin-Viam theory, supposedly cited by Zotin (1969), argues that a live organism belong to the open system category, because they exchange substances—hence, in the process of aging an ontogenesis the value of the production of entropy of the organism as a whole decreases constantly. [6] The person named "Viam" cited here, to note, may be a fictional person issue; possibly a Russian to English translation issue?

In any event, Zotin soon, however, began to formulate his own conception of the thermodynamics of biological processes, with specific focus on the developmental processes. This effort resulted in the publication of more than 100 papers and several monographs, including the editing of four collected monographs on the problems of thermodynamics of biological processes in Russian and English. [4] A focus of his was to find a correlation between the level of energy metabolism, the evolutionary status, in relation to the origin of various animals. [5]

Zotina

From 1967 until at least 1993, Zotin co-authored a number of articles, chapters, and books with his wife Rimma Sergeevna Zotina (), often cited as R.S. Zotina; in their 1982 chapter "Kinetics of Constitutive Processes During Development and Growth of Organisms", supposedly, labeled the two parts of the Prigogine entropy function (deS and diS) as external dissipation function and bound dissipation function.

Education

In 1950, Zotin completed his undergraduate work in developmental biology at the Moscow State University, in the department of Darwinism; after which he entered the postgraduate school at the Severtsov Institute of Animal Morphology, USSR Academy of Sciences, and defended his candidate thesis "Structure in Sturgeon and Salmonid Fishes" in 1954. In the years to follow he focused on biological physics, summarizing his work on water metabolism in embryogenesis in a 1961 monograph, which was defended as a doctoral dissertation (1963). [4] In 1990, Zotin was listed as "professor Dr. A.I. Zotin" associated with the Institute of Developmental Biology and with the Academy of Science of the U.S.S.R. in Moscow.

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External links

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- Aleksandr Illich Zotin – KLI Theory Lab (authors).

θΔics

In human thermodynamics, **Alexis Carrel** (1873-1944) was a French surgeon-biologist and social philosopher noted for his 1935 *Man: the Unknown*, cited by Mehdi Bazargan (1956), wherein he argued that the second law was useless at the psychological level and also commented, controversially, in support of eugenics (in only the German edition), to the effect that Germany has begun to take "energetic measures" to weed out defective humans.

Thermodynamics

On thermodynamics, in regards to humans, Carrel, in his *Man: the Unknown*, stated: [1]

> "The second law of thermodynamics, the law of dissipation of free energy, indispensable at the molecular level, is useless at the psychological level, where the principles of least effort …"

also:

> "It was generally admitted, not only that miracles did not exist, but that they could not exist. As the laws of thermodynamics make perpetual motion impossible, physiological laws oppose …"

Lastly, as has been cited, regarding feelings and thermodynamics: [2]

> "…cultivated only for itself, for the elegance of its methods, for its light and beauty. Its goal is the material and spiritual benefit of man. As much importance should be given to feelings as to thermodynamics. It is indispensable that our …"

Eugenics

Carrel advocated the use of gas chambers to rid humanity of "inferior stock". His endorsement of this idea began in the mid-1930s, prior to the Nazi implementation of such practices in Germany. In the 1936 German introduction of his book, at the publisher's request, he added the following praise of the Nazi regime which did not appear in the editions in other languages:

> "The German government has taken 'energetic measures' against the propagation of the defective, the mentally diseased, and the criminal. The ideal solution would be the suppression of each of these individuals as soon as he has proven himself to be dangerous."

As to what exactly these 'energetic measures' were, that may never be known; in particular, as human thermodynamic instruments are still yet to be developed (even in modern times).

Influence

Interestingly, Iranian thermodynamicist Mehdi Bazargan cited Carrel in his 1956 book *Thermodynamics of Humans*, in what seems to be a discussion of the relationship between internal energy and entropy of a person in relation to physiological age and cell and tissue growth, or something along these lines. [3]

French sociologist Roger Caillois commented critically on Carrel's book, on its eugenic implications, and possible thermodynamic content. [4]

Quotes

The following are notable quotes:

> "The atmosphere of libraries, lecture rooms and laboratories is dangerous to those who shut themselves up in them too long. It separates us from reality like a fog."
>
> — Alex Carrel (c.1930) (Q)

> "To what extent is any given man morally responsible for any given act? We do not know."
>
> — Alex Carrel (c.1930) (Q)

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External links

- Alexis Carrel – Wikipedia.

θΔics

In science, **Alexis Thérèse Petit** (1791-1820) was a French physicist noted for his 1818 publication on the efficiencies of air-engines and steam-engines and for his 1817 work with French physicial chemist Pierre Dulong in the correction of Newton's law of cooling. [1] More notably, in 1819 they discovered that the specific heat of any solid element multiplied by its atomic weight is approximately equal to a constant. [2] This has come to be known as the Dulong-Petit law for the specific heat capacity of metals.

Education

Petit studied at the École Polytechnique, graduating in 1811, later becoming professor of physics from 1815 to 1819.

Carnot

In thermodynamics, Petit is known to have had a discussion with French physicist Sadi Carnot on the subject of efficiency in engines, which may have influenced or stimulated the latter in his 1824 *Reflections on the Motive Power of Fire*, with its famous derivation of the efficiency of heat engines in general. One of Petit's noted students in physics, during the years 1815-16, was Auguste Comte, the French sociologist and philosopher who is generally credited with having coined the term sociology and who first outlined the subject of "social physics". Physics, for Comte, was his most difficult class, because, in his own words, Petit "went too fast". [3]

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External links

â— Alexis Petit – Wikipedia.
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θΔics

In human thermodynamics, **Alf Hornborg** (1954-) is a Swedish anthropologist and human ecologist noted for his 2001 book *The Power of the Machine*, written over a period of ten-years, wherein he discusses concepts such as the "thermodynamics of imperialism", "thermodynamics and the economy of order", the "exergy of hunter-gatherer societies", among others. The following is a truncated opening quote from the book:

> "The last quarter of the second millennium saw the rise of power of the machine. Power is here understood as a social relation built on an asymmetrical distribution of resources and risks. Power relations are culturally constructed but masquerade—to the powerful and powerless alike—as inevitable and natural. To reveal their arbitrary foundation, [i.e.] to unmask the power of the machine, we need to be open to thermodynamics."

In his treatise, Hornborg cites the thermodynamic views of a number of founding individuals, such as Erwin Schrodinger (1944), Leslie White (1959), Howard Odum (1971), Nicholas Georgescu-Roegen (1971), Richard Adams (1975), Eugene Ruyle (1977), and Ilya Prigogine (1984), among others.

Free energy

In his 2006 article "Footprints in the Cotton Fields", Hornborg outlines some interesting views on free energy. In introducing his theory, he states: [3]

> "The second law of thermodynamics [stipulates that] the buildup and maintenance of industrial infrastructure necessarily requires a continuous net input of free or available energy."

In a note, he comments that free energy or available energy is technically referred to as exergy and closely related to negative entropy, citing Erwin Schrodinger's *What is Life?* (1944) and Nicholas Georgescu-Roegen's *The Entropy Law* (1971) as references. [4] He then states:

> "Industrial infrastructure—whether a factory, an industrial city, or the global 'technomass'—must maintain an unequal exchange of free energy with its hinterland in order to survive."

On the surface, this statement seems cogent, in that internal biochemical systems and reactions are said to be driven by free energy coupling between systems or reactions, e.g. ATP energy currency. In digging into the foundations of what is said here, however, we note that neither Schrodinger nor Georgescu-Roegen had a correct understanding of chemical free energy in respect to human-human interactions. Schrodinger related free energy as something released during digestion from food-stuff and Georgescu-Roegen related it to something released during combustion from natural fuels. Correctly, as defined by Rudolf Clausius (1865), Willard Gibbs (1876), Hermann Helmholtz (1882), Gilbert Lewis (1923), and others, free energy for a system of particles (atoms, molecules, or humans) is defined as state variable, symbol *G*, defined as:

$$G = U + PV - TS$$

where *G* is the Gibbs free energy, *U* the internal energy, *P* the pressure, *V* the volume, *T* the temperature, and *S* the entropy of the system of human molecules (human particles), an expression which meaning that free energy quantifies the "state" of the system at an given moment in time. In human-human interaction terms, the quantities of food-stuff and natural fuel-stuff become assigned as substrate interactions, having an effect on the activation energy (barrier to reaction) of human chemical reactions, not on the free energy of human-human interpersonal interactions. [5]

Techno-economics

Hornborg's central theory is what he calls techno-economics, a view that treats technology and economics using a holistic framework, inclusive of the ecological environment. The worldview of industrial society, according to Hornborg, is to be viewed in terms of three levels of reality:

(a) Thermodynamics: and other properties of matter and energy, or nature, for short.
(b) Technical knowledge: or ideas about how to assemble various components and substances so as to exploit such material properties.
(c) Economics: defined as sociocultural institutions for exchange between individuals and groups.

On this basis, Hornborg presents a machine view of nature and economy.

Education

Hornborg completed his PhD in cultural anthropology in 1986 at Uppsala University. [2] Hornborg is currently professor and chair of human ecology at Lund University, Sweden.

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External links

â— Alf Hornborg (faculty) – Lund University.

θΔics

In existographies, **Alfred Ayer** (1910-1989) (CR:2), aka A.J. Ayer, was a British logical positivism philosopher and atheist, noted for []

Quotes | On

The following are quotes on Ayer:

> "**Ayer** was catapulted to fame byLanguage, Truth and Logic [1936],a book published at the philosophically precocious age of 26. Inspired by a year in Austria in the company of the Vienna Circle, he had returned to proselytise his version of the group's creed. The members of the Vienna Circle—which included Otto Neurath, Rudolf Carnap and Kurt Godel—did not all agree in detail but they shared a conviction that all philosophical metaphysics and most ethics to date was not so much wrong as meaningless nonsense. Scientific claims made sense because there was some way of testing their truth. **But how can we test, say, whether everything that exists is essentially immaterial or whether an action is morally right or wrong?** These claims appear to be meaningful because they come in the form of grammatically correct sentences with proper words. But since nothing could ever show them to be true or false they were, the Circle believed, meaningless."
>
> — Julian Baggini (2019), "The Influential Wrongness of AJ Ayer" [1]

Quotes | By

The following are quotes by Ayer:

> "William James was being teased by a theological colleague who said to him: 'A philosopher is like a blind man in a dark cellar, looking for a **black cat** that isn't there.' 'Yes', said James, 'and the difference between philosophy and theology is that theology finds the cat'."
>
> — Alfred Ayer (c.1970), on William James and the "black cat analogy" [2]

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External links

● A.J. Ayer – Wikipedia.

θΔics

In existographies, **Alfred Binet** (1859-1911) (CR:5) was a French psychologist, noted for []

Micro-organisms

In 1888, Binet, in his *The Psychic Life of Micro-Organisms: a Study in Experimental Psychology*, sought to show that psychological phenomena begin among the very lowest classes of beings, e.g. the simple cellule or protoplasm.

IQ testing

See main: IQ history

In 1899, Binet was appointed to the Commission for the Retarded, a repercussion of a new French law that mandated school for children ages six to fourteen, whose aim was to develop a "test" to differentiate between normal and abnormal children, so to be able assign each to different classrooms.

In c.1902, French psychologist Theodore Simon (1872-1961), while an intern at the asylum in Perray-Vaucluse studying abnormal children, began to work with Binet to develop a test that could measure intellectual development of children ages 3-12.

In 1905, Binet, together with his student Theodore Simon, published their so-called "Binet-Simon intelligence scale", the forerunner to the modern Stanford-Binet test and Stanford-Binet intelligence scale (Ñº),

Influenced

In 1912, William Stern, a German psychologist, added to Binet's intelligence testing work by inventing the concept of "mental quotient", defined as the ratio of the age the test was designed for divided by the age of the person who takes the test:

$$MQ = \frac{Age_{mental}}{Age_{actual}}$$

Thus, for instance, if a eight-year-old took a test designed for a ten-year-old, and passed, the child's MQ would be 1.25 or ten divided by eight.

In 1916, Lewis Terman, a professor at Stanford University, modified Stern's formula by multiplying it by 100, creating a new formula, 100(MQ), or:

$$IQ = \frac{Age_{mental}}{Age_{actual}}(100)$$

which he called an "intelligence quotient" or IQ for short, a term which stuck with great tenacity, thus setting the person's intelligence at a value of 100, values below being indicative of reduced average intelligence, values above being indicative of above average intelligence.

Quotes | By

The following are quotes by Binet:

> "If a drop of acetic acid be introduced beneath the glass-slide, in a preparation containing quantities of

Infusoria (Ñº), the latter will be at once seen to flee from all directions like a flock of frightened sheep."

— Alfred Binet (1888), *The Psychic Life of Micro-Organisms* (pg. vi)

"Though the fact of an exercise of 'choice' in taking food is settled beyond question, yet the interpretation of this phenomenon is a matter of much uncertainty. Some writers, as Charlton Bastian for instance, explain this choice of food as an affinity of chemical composition existing between the organism and the nutriment. This idea does not lead to anything. Others compare the discrimination made by the Proto-organism between objects presented to it, to the action of a magnet which in some way selects particles of iron that have been mixed with particles of other substances."

— Alfred Binet (1888), *The Psychic Life of Micro-Organisms* (pg. 40)

"When the Amoeba, in its rampant course, happens to meet a foreign body. In the first place, if the foreign particle is not a nutritive substance, if it be gravel for instance, the amoeba does not ingest it; it thrusts it back with its pseudopodia. This little performance is very significant; for it proves, as we have already said, that this microscopic cellule in some manner or other knows how to choose and distinguish alimentary substances from inert particles of sand."

— Alfred Binet (1888), *The Psychic Life of Micro-Organisms* (pg. 41)

"This exercise of 'choice', in micro-organisms, is one of the most incomprehensible of phenomena; it is exceedingly difficult to explain it without resort to anthropomorphism."

— Alfred Binet (1888), *The Psychic Life of Micro-Organisms* (pg. 62)

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External links

â— Alfred Binet – Wikipedia.

θΔics

In human physics, **Alfred Fouillee** (1838-1912) was a French philosopher and sociologist noted for []

Overview

In circa 1880, Fouillee, supposedly, outlined some type of theory of "idea-forces", an idea that does not reflect a reality independent of itself but rather becomes one of the factors of reality, the concept of which he summarizes as follows (1890): [1]

> "One has not enumerated all the causes and forces in nature when one has enumerated all movements. There may be and there are other activities than those that are purely mechanical: these are the psychic activities. The ideas are at once the expression of their activities and the movements through which they reveal themselves externally. They are the intermediaries between the world of motion and the moral world. For true evolutionism, ideas are far from being inert but are conscious forms of action. Thinking is a manifestation of mental energy, not of mental inertias."

As summarized by Spanish philosopher Miguel de Unamuno (1912): [2]

> "Once more I must repeat that our ethical and philosophical doctrines in general are usually merely the justification *a posteriori* of our conduct, of our actions. The very same reason which one man may regard as a motive for taking care to prolong his life may be regarded by another man as a motive for shooting himself. Nevertheless it cannot be denied that reasons, ideas, have an influence upon human actions, and sometimes ever determine them, by a process analogous to that of suggestion upon a hypnotized person, and this is so because of the tendency in every idea to resolve itself into action—an idea being simply an inchoate or abortive act. It was this notion that suggested to Fouillee his theory of idea-forces. But ordinarily ideas are forces which we accommodate to other forces, deeper and much less conscious."

(add discussion)

Other

Fouillee's 1880 *Contemporary Social Science* was cited French social-philosopher Maurice Hauriou's 1899 *Lessons on Social Movement*.

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1. Goodstein, Elizabeth S. (2005). *Experience Without Qualities: Boredom and Modernity* (pg. 48). Stanford University Press.
2. Unamuno, Miguel de. (1912). *The Tragic Sense of Life* (pg. 261). Dover, 1954.

External links

â— Alfred Jules Emile Fouillee – Wikipedia.

θΔics

In existographies, **Alfred Kroeber** (1876-1960) (CR:6) was an American cultural anthropologist noted for []

Overview

In 1915, Kroeber, in his “Eighteen Professions”, listed eighteen propositions that in his view embody history as a field of study; numbers fifteen and seventeen, shown below, respectively, being the most contentious: [1]

> “There are no laws in history similar to the laws of physico-chemical science.”
>
> “The causality of history is teleological.”

American physical historian Morris Zucker comments on the last of these: [2]

> “This mumbo-jumbo of medieval phraseology connecting causality with purpose in history is another evidence of that professorial phenomenon, while the body moves and breaths in the twentieth century, while the mind is five hundred years behind its time.”

(add)

Cultural death

In 2009, Kroeber's 1944 theories of a society or cultural “dying”, described in what seem to be physical chemistry terms, shown below, were cited by American physical chemist Thomas Wallace in his socioeconomic thermodynamic theory of the rise and fall of civilizations [5]

> “Cultural dying is a replacement of most of the material and patterns with new material and patterns developed within the culture, until after a sufficient length of time, the transformation is so great that it is descriptively more useful to speak of the end product as a new culture, or one different from the original one.”

This is an intuitive view being that what are perceptually conceived as "biological entities", such as birds and bees, are actually carbon-centric reactive molecules, formed through chemical reaction synthesis, and transformed likewise in a reverse type of reaction, but do not actually "live" or "die", in a physical chemistry sense.

Boas | Physical anthropology

Kroeber was a student of physical anthropology pioneer Franz Boas. Kroeber, according to Robert Pirsig, turned against his mentor in respect to "values". [4]

Influenced

In 1936, George Devereux completed his PhD under Kroeber.

Quotes | By

The following quotes by Kroeber:

> “The entity civilization has intrinsically nothing to do with individual men nor with the aggregates of men on whom it rests. It springs from the organic, but is independent of it. The mental processes of groups of

men are, after all, only the collected processes of individuals reacting under certain special stimuli. Collective psychology is therefore ultimately resolvable into individual human psychology, just as this in turn is resolvable into organic psychology and physiology."

— Alfred Kroeber (1915), "Eighteen Professions" (pg. 283)

"Civilization reacts to civilization, not to geography."

— Alfred Kroeber (1915), "Eighteen Professions" (pg. 285)

"There are only individual minds. When these react on each other cumulatively, the process is merely physiological."

— Alfred Kroeber (1915), "Eighteen Professions" (pg. 287)

Reference

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2. Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 254). Arnold-Howard Publishing Co.
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(b) Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (pg. 231). AuthorHouse.
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External links

- Alfred L. Kroeber – Wikipedia.

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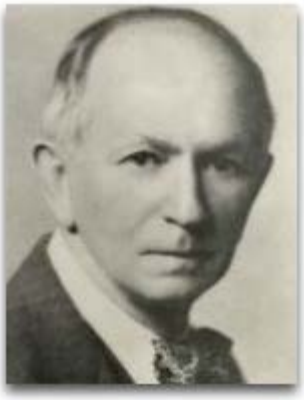

In existographies, **Alfred Lotka** (1880-1949) (IQ:185|#74) (RGM:371|1,500+) (SN:20) [CR:174] was an Austrian-born American physical chemist, mathematician, actuary, and "part-time genius" (Ruth, 2014) (Q), noted for his 1922 articles "Contribution to the Energetics of Evolution" and "Natural Selection as a Physical Principle", which introduced the term trigger action, and his 1925 book *Elements of Physical Biology*, in which he used thermodynamics and energetics to explain evolution; his overall approach has been classified as "extreme reductionism" (Adam, 1988). [22] Lotka was one of the first to explain collision theory in biology. [2] Lotka coined the term "biophysical economics" in his *Elements.* Lotka is the eponym of the of the Darwin-Lotka energy law, Lotkean (Dobler, 1997) (Q), e.g. Lotkean Jabberwocky, or Lotkian (Adams, 1988) (Q).

Evolution | Entropy maximization | Potential minimization

In 1945, Lotka, in his "The Law of Evolution as a Maximal Principle", opened to the following sharp statements: [21]

> "What we seek is not an 'empirical rule', but a law of nature that brooks no exceptions."
>
> — Alfred Lotka (1945), "The Law of Evolution as a Maximal Principle" (pg. 167)

> "An irreversible process, as the physicist uses the words, is associated with a decrease in thermodynamic potential, with capacity for yielding a balance of work, as when one gas diffuses into another gas."
>
> — Alfred Lotka (1945), "The Law of Evolution as a Maximal Principle" (pg. 169-70)

Then, following a dismissal of the views of "potential" and "demographic potential" of Vito Volterra (1937), which he refers to as un-commendable, and after citation to the commendable views, in his opinion, of Bertrand Russell (1927), on evolution, stated the following, very forward-thinking logic:

> "Short of this [Russellian] eventuality, or at any rate until it [species mass maximization] is attained, the problem [of evolution] is one of 'distribution'. What determines the 'distribution' of the total matter of the system among the several species and individual organisms, and the successive changes in this distribution? Is there some significant physical quantity which these competing organisms maximize by their collective activities? Problems of distribution are not new to the physical sciences. The whole topic of 'change of state' deals with precisely such problems. As applied to these cases, the law of evolution is well known and clearly defined. It states, that for an isolated system, for example, the entropy of the system increases to a maximum as the system approaches equilibrium; or, more generally, that certain clearly defined functions of the parameters specifying the state of the system—its thermodynamic potentials—approach a minimum."
>
> — Alfred Lotka (1945), "The Law of Evolution as a Maximal Principle" (pg. 174--75)

Next, following this statement, Lotka, citing, indirectly, the 1902 lectures of Wilhelm Ostwald, on "bacteria growth" and "crystal growth", as explained by the same physical chemistry energetics based principle (see: section below), such as:

> "This observation, casually introduced by Ostwald in one of his lectures in 1902, was the 'trigger' that set off the train of thought developed in my subsequent publications, and summarized, in part, in my *Elements of Physical Biology* (1925) and *Analytical Theory of Biological Associations* (*Theorie Analytique des Associations Biologiques*) (1934, 1939)."
>
> — Alfred Lotka (1945), "The Law of Evolution as a Maximal Principle" (pg. 176)

states the following:

> "A special example which has often been cited, because of a certain superficial analogy to the growth of a colony of bacteria in a suitable nutrient medium, is that of the crystallization from a supersaturated solution, upon the introduction of a crystal 'germ' of the dissolved substance. So long as the supersaturated solution is left undisturbed it may remain as such for long, perhaps indefinite periods, though seemingly spontaneous crystallization may also take place. This restricted type of stability has sometimes been spoken of as the metastable state [see: Beg-Thims interview]. **Its thermodynamic potential is not at the minimum possible for the system**, and hence, as soon as an **available 'path'** is presented (by the introduction of the crystal germ), the transformation to the crystal form is initiated. It continues until that particular amount of the solid has formed which is required to bring about stable equilibrium, that is, to make the thermodynamic potential a minimum."

Very intelligent, indeed. Such a statement, has not been improved upon, give or take some recent work, e.g. Harold Blum (1850), Georgi Gladyshev (1987), Adriaan Lange (1997), among a few others.

Lotka, following this statement, footnotes things, to the effect that he 1902 lecture ideas of Ostwald, in respect to metastable states, or something in this area, imbibed into him the crude premise that this, given some correction, would allow him to solve the 'origin of life' problem; the following being the exact quote:

> "If this were merely outward appearance of analogy, the oft repeated example would hardly be worth quoting again here. But it is literally true that the nutrient solution is 'metastable' in the absence of a germ of an organism capable of growth in it. Whether in primordial nature somewhere locally such a state presented itself, and whether the metastable state could pass over into some kind of **elementary 'living' matter** without the presence of a preexisting germ, just as crystallization of a supersaturated solution can take place even in the absence of a crystal germ, that is today still one of the unsolved problems of science. But if such was the origin of life, we know that it was followed by a long chain of evolutionary development."
>
> — Alfred Lotka (1945), "The Law of Evolution as a Maximal Principle" (pg. 175-76)

Here, we see Lotka struggling with the seeming 'origin of life' problem, which has since been solved (see: abioism), with the patch conjecture that life originated when some type of organic-like crystal jumped from a metastable state, via thermodynamic potential decrease, into "some kind of elementary 'living' matter"? Lotka, however, to point out, in his "Regarding Definitions" (1925) chapter had pretty nearly arrived at a near abioism like solution. In any event, he gives the following generally correct solution to the problem of defining evolution thermodynamically:

> "We may expect that the law of organic evolution takes the form that it is accompanied in the long run with diminution of some function, analogous to thermodynamic potential, of the parameters defining the physical state of the system as a whole."
>
> — Alfred Lotka (1945), "The Law of Evolution as a Maximal Principle" (pg. 176)

Correctly, while this statement is indeed prescient, the evolution function is not 'analogous' to thermodynamic potential, it is a thermodynamic potential function, the Gibbs function, specifically. Nevertheless, Lotka goes on to outline a general model:

> "In organic evolution, trigger action, such as a 'stimulus', in the form of a very small dose of external energy, e.g. to the eye or sensor organ, which acts merely as a 'trigger' or 'key' to release energy supplied by a separate source, such as in the pulling of the trigger of a gun, plays an important role, for trigger action presupposes a fund of free energy ready to be released."
>
> — Alfred Lotka (1945), "The Law of Evolution as a Maximal Principle" (pgs. 170+179)

> "What we have before us in organic nature is a system composed of aggregates of energy transformers [e.g. bacterial, animals, humans] adapted by their composition and structure to guide available energy into such channels as lead to their maintenance and growth. A special branch of physics needs to be developed, the 'statistical dynamics of systems of energy transformers'."
>
> — Alfred Lotka (1945), "The Law of Evolution as a Maximal Principle" (pg. 179)

Lotka then, in respect to this future science of statistical dynamics of systems of energy transformers, posits, using what seems to be collision theory, that four things or elements are to be distinguished, in respect to energy transformers and their collisions in the field of evolving nature: receptors, free energy, effectors, and adjustors. As to the second, he elaborates:

> "Free energy. Associated with the transformer is a fund of free energy" ready to be released by trigger action, that is, by an expenditure of an amount of energy bearing in general no quantitative relation to the energy released, which can thus be far in excess of the energy applied at the 'trigger'. It can be noted here, only in passing, that the possession of such a fund of free energy is what gives the opportunity for 'purposive' action and the exhibition of the phenomenon of 'will', that is, action teleologically aimed at future effects."
>
> — Alfred Lotka (1945), "The Law of Evolution as a Maximal Principle" (pg. 181)

Lotka directs readers interested in an elaboration of ideas in this last quote to chapter 28 of his *Elements of Physical Biology* (1925) and to his "Evolution and Thermodynamics" (1944) article in *Science and Society*. [11]

Preconceived premises | Difficulties

Lotka, in his §§:Fundamental Premises and Implicit Assumptions (pg. 376) and §§:Difficulties of Shaking off Preconceived Premises (pg. 377), uses the example of how Euclid's parallel axiom, once believed to be a "necessary truth", was found by Carl Gauss (1792) to be but an "arbitrary assumption", one of many alternatives that can claim equal legitimacy, to interject into the note that preconceived premises are not always correct, and often difficult to shake off:

> "The examination, and, where need be, revision of our fundamental premises is a task of a wholly different order from that of rearing upon these premises a structure of logical argumentation. It is a task that often demands the efforts of **giant intellects**, of men of altogether unusual independence of thought. Most of us are held back by our preconceived, intuitive judgments, which, blindly entertained, blind us also against the recognition of possible alternatives."

He then cites former Harvard president Charles Elliott (1901): [20]

> “In reasoning, the selection of the premises is the all-important part of the process. The main reason for the painfully slow progress of the human race is to be found in the inability of the great mass of people to establish correctly the premises of an argument. Every school ought to give direct instruction in fact-determining and truth-seeking; and the difficulties of these processes ought to be plainly and incessantly pointed out.”

Lotka continues:

> “As a matter of fact our innate perversity in this matter, our inveterate conservatism in all that concerns some of those ‘implicit and unrecognized assumptions out of which sophistry is bred’, is not due to negative influences, to sloth of mind, alone. There is a strong positive misguiding influence at work also: The wish is father to the thought.”

Then Lotka gives the remedy:

> “There is, fortunately, a natural corrective for our inclination to allow likes and dislikes to influence our reason. This corrective is found in the instinct of curiosity, the faculty that impels men to seek the truth, even if it be unpalatable. In fact, a certain type of mind seems to take a particular satisfaction in digging up such otherwise displeasing revelations; the cynic and even the muckraker thus has his useful function. It is probably safe to say, too, that curiosity a desire to know life in all its phases, to ‘experience reality; is fundamentally the motive that impels some individuals to taste of the less savory phases of life.”

Then he quotes (Q) a Simpson (1922), an American professor of mathematics:

> “The stabilization of our institutions rests ultimately upon our ability to know and to test assumptions, and upon a willingness to revise them without partisanship, or bitterness, or distress.”

(add)

Mechanical equivalents | Economic value

Lotka, in his §§: Relation of Economic Value to Physical Energy” and §§: Economic Conversion Factors of Energy, gives a fairly decent overview of the mechanical equivalent of heat (and or equivalence values) in respect to economic theories of value, energy, and work, and both of these in respect to what he calls “trigger action”, aka activation energy:

> > “The life contest, then is primarily a competition for available energy, as has been pointed out by Boltzmann. [18] Energy in this sense and for this reason has value for the organism which is a very different thing from saying (as some have said or implied) that economic value is a form of energy. It is true that different kinds of energy are in a certain sense interconvertible into each other at fairly definite rates by exchange upon the market, in a human population. But the conversion factors here involved are of a totally different character from those that enter into the analytical expression of the law of conservation of energy.
>
> This must be immediately apparent from the fact alone that the 'mechanical equivalents' of the several forms of energy are absolute constants, whereas the economic conversion factors are somewhat variable, though they have often a species of approximate constancy, a fact which calls for explanation.

A simple example may help to clarify the view; the case of the automatic vending machine, the penny-in-the-slot chocolate dispenser, for instance. The salient facts here are:

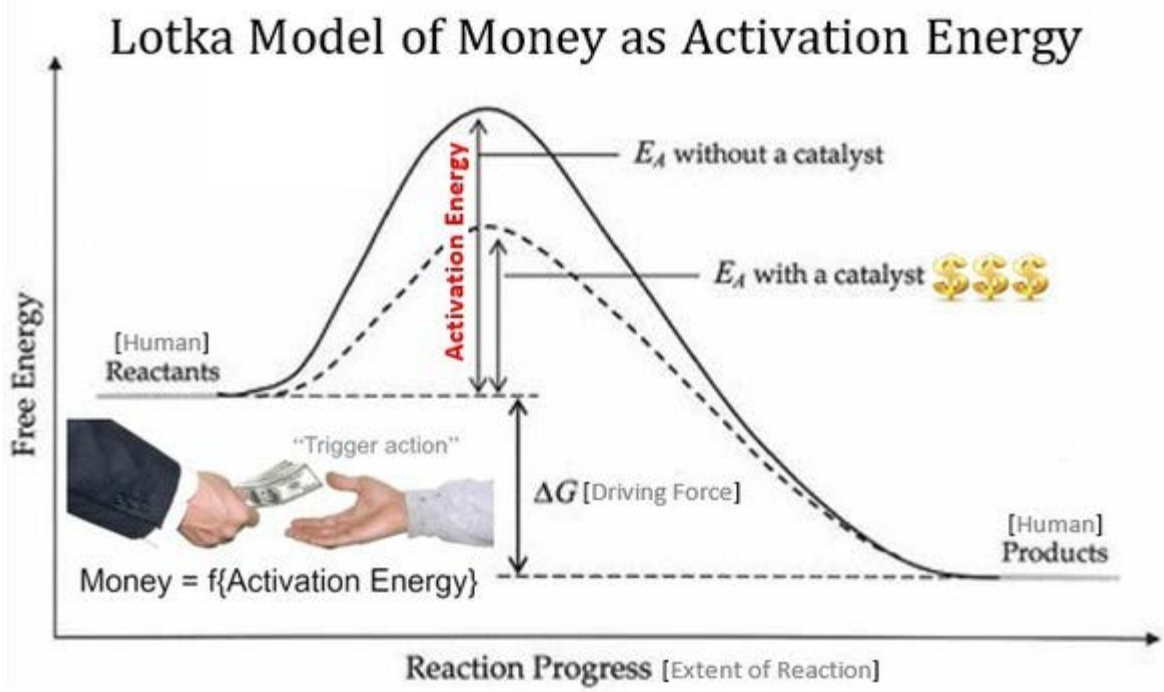

Lotka's 1925 model of money as a function of activation energy, from his *Elements* (pgs. 355-56), a form of "trigger action", similar to a small spark triggering a dynamite explosion, which he derived from his mentor German physical chemist Wilhelm Ostwald, who was the first to realize, in the 1890s, that a catalyst acts without altering the energy relations of the reaction, i.e. the free energy changes, and that it usually speeds up a reaction by lowering the activation energy of the reaction, the logic of which Lotka compared to the input of a coin into a candy machine which sets in motion an economic mechanism yielding desired economic product.

1. A definite amount of money brings in exchange a definite amount of commodity (and of energy).
2. The physical process is a typical case of "trigger action," in which the ratio of energy set free to energy applied is subject to no restricting general law whatever (e.g., a touch of the finger upon a switch may set off tons of dynamite).
3. In contrast with the case of thermodynamic conversion factors, the proportionality factor is here determined by the particular mechanism employed.

Reflection shows that all transformation of money or of economic assets of any kind into energy by exchange upon the market is of this character. It is always a case of trigger action. Somewhere there is a store of available energy, which can be tapped with an expenditure of greater or less effort. The payment of the price sets in motion the requisite machinery for the release of that energy (or for its transfer of ownership, the release being delayed at the discretion of the buyer)."

Here, in modern terms, we see the energy of money being classified as an "activation energy" lowering factor; which, to note, is in opposition to the Maxwell-Boltzmann distribution so-called kinetic theories of money, e.g. as advocated recently by Victor Yakovenko (2016), among others, based on the Pareto distribution models. Lotka continues:

"In view of the entire absence of any general law regulating the ratio of energy released to energy applied in such cases of trigger action, we may ask the question, how does it come about that economic conversion factors, economic ratios in-exchange of different forms of energy, display any regularity whatever? The answer is not far to seek. The approximate constancy of the economic conversion factors is traceable to the approximate constancy in type of the mechanism involved, namely the human organism and its social aggregations.

Just as one particular slot

machine will always deliver a certain package of chocolate, so a certain social organization under similar conditions will render (approximately) the same amount of selected form of energy in return for a stated sum of money. As to the circumstances that quantitatively determine these economic conversion factors, for a discussion of these the reader must be referred to the literature."

The Lotka chocolate machine model of activation energy based social mechanism triggered by money exchanges.

The literature Lotka refers to here is: Georg Helm (1877), Leon Winiarski (1900), Wilhelm Ostwald (1909, 1913), Emil Budde (1902) (Q), and Julius Davidson (1919). He ends this economic energy section with the following:

> "Only this may be remarked here, that the conception advanced by Ostwald [*Die Energie* (1908) (pg. 164)], for example, that the determining feature is the (physical) availability of the particular form of energy, is inadequate."

(add)

Consciousness

Lotka, in his §24:Consciousness, states a few discerning points of view; which are as follows:

> "The inference that consciousness is absent in non-living matter reminds one somewhat of the assumption commonly made by ignorant persons that insects or similar voiceless creatures feel no pain."
>
> — Alfred Lotka (1925), *Elements of Physical Biology* (pg. 390)

Lotka, in this hilarious statement, to note, does not seem to be asserting, e.g., something along the lines to the affect that the hydrogen atom is "conscious", but rather, as elaborated on further below, each "rung" on the "scale of evolution" has a certain mechanism and or nature to it. He then goes into a discussion (pg. 391) of what he calls "open" molecule, i.e. transition state complexes, as seems to the case:

> "Since metabolism is essentially a state of chemical flux, or chemical reaction in progress, one is led to suspect that the conscious state may be in some way correlated to that, transitional state through which matter must pass on its way from one stable molecular combination to another a state regarding which our knowledge today is extremely fragmentary. Almost the only direct evidence we have of matter actually in that state is the observation by Sir J.J. Thomson and by F.W. Aston of such molecular debris as CH_3 and the like, by a method capable of detecting these fugaceous aggregations of atoms even though their life period be only a few millionths of a second."

Then, skipping a paragraph:

> “This may give us at least some distant idea of the meaning of consciousness as applied to so-called non-living inorganic matter. Such consciousness as may here occur would be, it seems, of the nature of flashes of almost infinitesimally short duration.”

Skipping some, he says:

> “The separation of "chemical" processes from other physical processes is almost certainly merely a matter of convenience. If, then we tentatively associate consciousness with certain states of chemical strain in molecules, we are forced to contemplate the possible extension of our conception to matter under physical strain generally.”

Then, to conclude the chapter, he gives the following ripe discernment:

Lotka's "strain analogy", at the end of his "consciousness" chapter, wherein he compares the surface tension bubble formation tendency of a soap bubble, to the strain an amoeba makes to engulf a food particle, to the stain of a Newton in working on a difficult problem.

> “When we say that a soap bubble, for example, tends to contract under surface tension, or perhaps when we use even less guarded language and say that it is trying to contract, our terms are commonly thought reprehensible as being more picturesque than scientific. Yet we ought to be prepared for the conception that the straining of the bubble to contract may not be so fundamentally different a thing from the straining of an amoeba to engulf a food particle, or the straining of a Newton to assimilate a new conception or to solve a problem in philosophy. The two phenomena may be far separated, indeed, upon the scale of evolution, yet they may be two rungs upon the same scale.”

(add)

Le Chatelier’s principle

Lotka, in his §22:Displacement of Equilibrium (pgs. 282-84), owing partly to the that he is fluent in French and German, gives one of the best introduction to Le Chatelier principle, in English, to date, along with introduction and critiques of extended applications, outside of physical chemistry proper; the opening of which is as follows:

> “The principle of Le Chatelier is best illustrated by a simple example. Consider the simple chemical reaction:

$$2H_2 + O_2 \leftrightarrows 2H_2O + 58.3\text{cal}$$

At high temperatures this reaction is reversible; that is to say, it takes place to some extent in the direction of the upper arrow, but also to some extent in the direction of the lower arrow, and an equilibrium is finally established between these two opposing reactions. Now this is what the Le Chatelier principle tells us: If we add either H alone or alone to the system, the equilibrium is shifted in the direction of the upper arrow, that is to say, in such direction as to absorb some of the added constituent. Similarly, if we heat the system, the equilibrium is shifted in the direction of the lower arrow, that is to say, in the direction of the reaction which absorbs heat. The principle, as enunciated by Le Chatelier himself, is: [12]

> ‘Every system in chemical equilibrium, under the influence of a change of any single one of the factors of equilibrium, 3 undergoes a transformation in such direction that, if this transformation took place alone, it would produce a change in the opposite direction of the factor in question. The factors of equilibrium are temperature, pressure, and electromotive force, corresponding to three forms of energy heat, electricity and mechanical energy.’

The second paragraph of the principle as quoted above, requires special emphasis. It is often omitted, even by authors of the highest repute with the result that a vagueness is introduced for which Le Chatelier himself cannot justly be made responsible. This vagueness is then often rendered still worse by departures from, the original wording, aimed at an extension of the scope of the law to all conceivable systems and "factors," an extension which is gained with a total sacrifice of all validity of the principle.”

Skipping a few paragraphs, Lotka surmises:

“As has been shown by Ehrenfest (1911) the error arises through failure to discriminate, in the application of the principle, between the intensity factor (e.g., pressure) and the capacity factor (e.g. volume) of an energy. Ehrenfest points out that the explanation lies in the very vagueness of the principles, which permits it to be construed in each case to suit circumstances. The principle is commonly applied fix post facto, and its competence to predict thus escapes any serious test.”

Lotka then cites (pg. 283) the following "sweepingly vague settings", as he says, statements of Lotka’s principle:

“The broadest definition of the principle of Le Chatelier is that a system tends to change so as to minimize an external disturbance.”

— Wilder Bancroft (1911), [13]

“Every external action produces in, a body or system changes in such direction, that in consequence of this change the resistance of the body or system against the external action is increased. If we regard the faculty of adaptation of animals and plants from the point of view that the organisms undergo, under the influence of external actions, changes which render them more resistant to those actions, then the property of non-living matter which is expressed by the principle of Le Chatelier-Braun may be regarded as a sort of adaptation of such non-living matter.”

— Orest Khovolson (1909), *Trait de Physique* [14]

“If the equilibrium of a natural complex (system of masses, organism, system of ideas) is disturbed, it adapts itself to the stimulus (Reiz) which causes the disturbance, in such manner that the said stimulus continually diminishes until finally the original or a new equilibrium is again established.”

— J. Lowy (1911), *Cosmos* [15]

(add)

PV

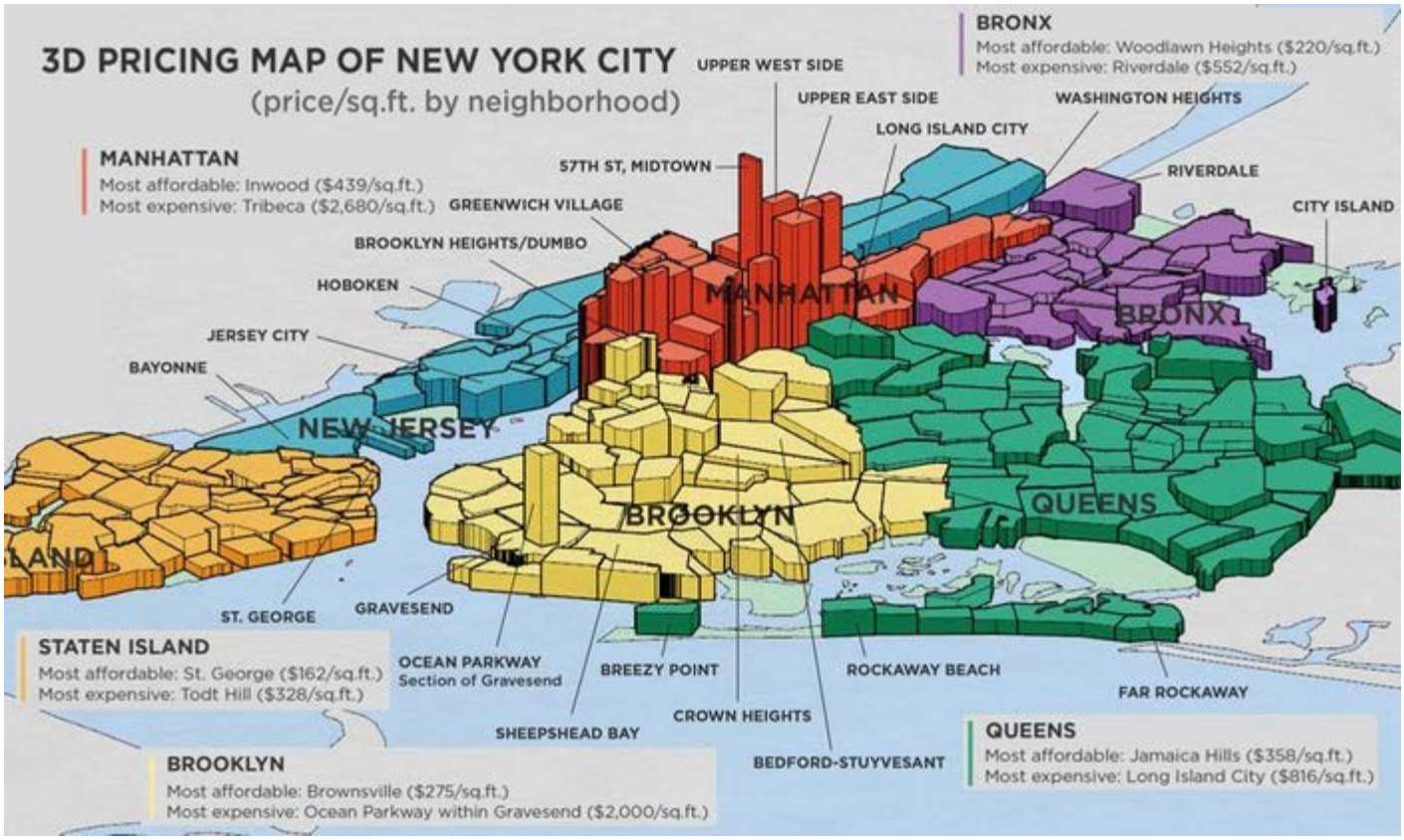

A rent ($/mo) vs area (ft²) diagram (Q) of New York City, the general model of which Lotka attempts (pg. 288) to map into a conjugate variables formulation of energy model, similar to the PV diagram calculation of work.

diagrams | RV diagrams

Lotka, in his §§: Extension of the Scope of Rigorous Application (pgs. 286-89), extends the conjugate variable model of energy, in respect to specifically pressure (intensity factor) and volume (capacity or extensivity factor), as commonly found in PV diagrams to calculate work of a heat engine, to the work associated with the rent per unit area a person is willing to pay in a given metropolis, the discussion of which highly original, and worth rumination; the main points of which are as follows:

> "The second direction in which the analysis, on general grounds, of the principle, enlarges its field of warrant, is in the matter of the kinds of "factors" to which it is properly applicable. It has already been pointed out that, in its physico-chemical application, it must be used with proper discrimination as to the distinction between the capacity and the intensity factor of an energy, as, for example, volume and pressure. It is found, upon analysis, that the applicability of the principle to the effect of a change in pressure, for example rests upon the following fundamental property of the pressure and volume of a system in stable equilibrium.
>
> 1. For every value of v, the volume of the system, there is a definite value of pi the pressure which it exerts, the internal pressure, as we may term it.
>
> 2. The volume v increases or decreases according as the internal pressure pi is greater or less than the external pressure p upon the enclosure, that is to say:

$$\frac{dv}{dt} \gtreqless 0 \text{ according as } p_i \gtreqless p_e$$

3. It can be shown that, given (1) and (2), stability demands that the curves representing the relative between p (ordinates) and v (abscissae) must slope from left to right downwards. For if such a curve slopes in the opposite direction, then the slightest displacement from equilibrium will immediately cause the system to travel with cumulative effect, avalanche-like, along the pv curve further and further away from the starting point.

Now these fundamental properties (1), (2) and (3), of a capacity and an intensity factor of an energy are shared by certain parameters that have no direct or simple relation to energy whatsoever [Lotka footnotes the following]:

> Owing to the custom of counting heat absorbed by a system as positive, but work done upon it as negative, the relation analogous to that of (2) takes the form, in the case of heat energy:
>
> $$\frac{dQ}{dt} \gtreqless 0 \text{ according as } T_i \gtreqless T_e$$
>
> where Q is the quantity of heat absorbed by the system at a temperature from a source at the temperature T. Here the Q_T curves slope upward from left to right. [Cf. A. J. Lotka, loc. cit., p. 36].

and since the applicability of the principle depends upon these properties, it will extend to such other parameters possessing them. As an example may be mentioned the relation between area *a* occupied by a population, and the rent per unit area Ri that an (average) individual is willing to pay. If Ri is greater than Re, the rent at market rate, the individual will move into a more spacious apartment, and *a* will increase, and vice versa; so that:

$$\frac{da}{dt} \gtreqless 0 \text{ according as } R_i \gtreqless R_e$$

On the other hand the curves representing, in rectangular coordinates, the relation between rent and area available per head, necessarily slope from left to right downward. If it were true, as sometimes stated, that the more a man has, the more he wants, economic equilibrium would be an unstable condition.”

Lotka, in his §23: The Parameters of State (pgs. 300-301), elaborates more on this model later, specifically, via citation to Hermann Helmholtz, and his "On the Thermodynamics of Chemical Processes" (1882), and Paul Ehrenfest (1911), he asserts that "there is much latitude" in the choice of selection of conjugate variable parameters; after which he makes the jump to systems in which "organic evolution is proceeding". He elaborates, on the equation from point two above, as follows:

> "In physico-chemical systems the topographic parameter v (volume) is the capacity factor of an energy, as had already been noted; and associated with v is what may be termed a conjugate parameter Pi (pressure), which is the intensity factor of the energy in question, i.e., that factor which determines the direction of any change in
> the capacity factor v, according to the scheme:
>
> $$\frac{dv}{dt} \gtreqless 0 \text{ according as } p_i \gtreqless p_e$$
>
> where pe is the external pressure. This relation is essentially the Helm-Ostwald Intensity Law. Although this law is not as universal as its sponsors would make it appear, yet it has a certain field of utility. For a critique of this law see Max Planck, *Eight Lectures on Theoretical Physics*, Columbia University Press, 1915, p. 11. The
> form of this relation may be taken as the definition of a pair of conjugate parameters."

He then states (pg. 304):

> "We may speak of the rent per unit area that the representative individual is willing to pay as a measure or at least an index of the 'population pressure'."

Then he goes into a coining of the term "biophysical economics" and his social ideal gas derivation.

Walking turning beetle

See also: Cartesian automaton; Neumann automaton

Lotka, in his section on "correlating apparatus" (pgs. 340-41), i.e. inputs and outputs of animal reactions, modeled as: receptors, adjustors, and effectors, employs mechanical walking beetle as an example model; about which he says the following:

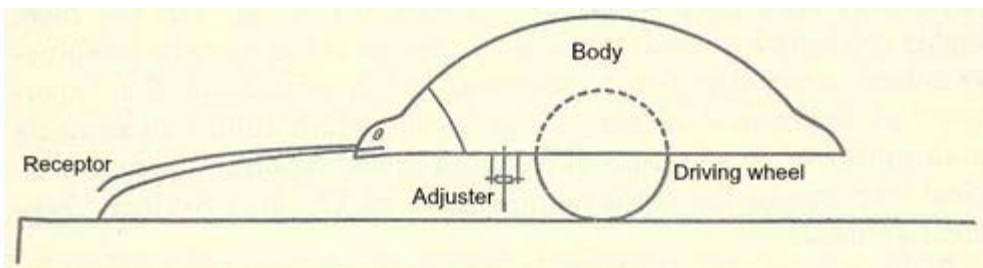

FIG. 69. MECHANICAL WALKING BEETLE, EXHIBITING THE SEVERAL CHARACTERISTIC ELEMENTS OF THE CORRELATING APPARATUS

Lotka's mechanical walking sensor-induced table edge turning beetle (pg. 341), which he cites in the latter sections of this book in discussions of models of human and animal movement and reactions, along with issues such as the falsities of teleology models.

> "Some time ago there appeared on the market an ingenious toy, primarily designed, no doubt, merely to amuse; but, in point of fact, highly instructive. Its general appearance and simple mechanism are illustrated in figure 69. The beetle "walks" on two toothed wheels, of which one is an idler, while the other is rotated by a spring whose gradual release is ensured by a simple escapement device. At its forward end reckoning in the direction of motion (at the "head") the toy is provided with a pair of antennae, of which one is a dummy, and rises clear of the table upon which the beetle is placed to exhibit its talents. The other antenna is operative and is so bent downward as to glide along the table top, in contact with it.
>
> A little in advance of the propelling wheel is another smaller toothed wheel, running idle, and disposed transversely to the direction of the driving wheel. This transverse wheel clears the table without contact in the normal working position of the beetle. The animal, if placed somewhere near the center of the table, makes a straight track, apparently intent [purpose] upon reaching the edge and seeking destruction in a species of mechanical suicide. But the moment the operative antenna clears the edge of the table, the body

of the toy, till then held up by the contact of the antenna with the table surface, sinks down a fraction of an inch, and the transverse wheel now contacts with the table. In consequence the toy rotates until the running wheel is parallel with the table edge, and the insect continues its peregrinations with the operative antenna hugging the side of the table top.

Clearly here the antenna is a receptor, which "apprises" the insect of certain features in its environment, which depicts, in a crude but sufficient manner the environment in the toy. The law of depiction is here extremely simple; a depression in the external world (table top) is translated into a downward tilt in the angle of repose of the toy.

The adjuster, in this case, is the transverse wheel, about as simple an example of an adjuster as can well be imagined. It "construes" the information furnished by the receptor antenna, and modifies in accordance with this information the law of motion of the toy, in such manner as to preserve the beetle from a fall which might destroy that stability of form on which the continued operation, according to schedule, of the mechanism depends."

Lotka, later, in his 27§§: "Mechanistic and Teleological Interpretation of Adjustors" (pgs. 281-85), elaborates on the nature of the adjustor or sensor input as follows:

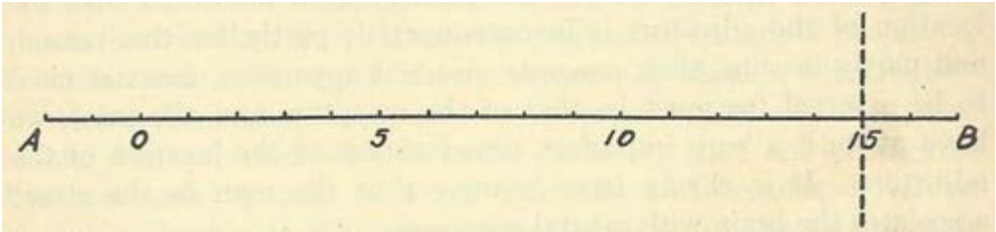

FIG. 72. HOW THE FUTURE ENTERS INTO THE DETERMINATION OF THE MOTION OF THE WALKING MECHANICAL BEETLE, THUS IMITATING PURPOSIVE ACTION (TELEOLOGY).

Lotka's mechanical model of a scaled measurement (pg. 382) of sensory induced mechanical "teleology", so to say, which for the mechanical beetle (above) is exact and for humans involves a lag or delay, or something along these lines.

"We have seen, from the example of a simple toy, that typical and fully competent adjusters can very well be provided in and by purely mechanical structures. In the toy beetle anticipatory correlation between the reaction of the beetle and untoward variations of the environment is established as follows: The beetle is progressing along the straight line AB (see fig. 72) . Its law of motion is that of uniform progression along this straight line. Suppose a scale of centimeters is laid along AB. Successively higher scale divisions along AB are reached at successively later intervals. In fact, this scale, with the beetle moving along it (at constant velocity, we may suppose, to simplify the argument) constitutes a clock. If at the time t the driving wheel of the beetle is at the zero mark, scale divisions to the left correspond to and represent past instants, and those to the right represent future instants. Suppose the antenna is 5 divisions long, and that the table edge is at division mark 15. If for any reason the adjuster apparatus failed to function, at time t = 15 the driving wheel of the beetle would pass the table edge and fall over. When the adjuster apparatus is functioning, five time units in anticipation of the threatened catastrophe the antenna "senses" the danger, and the creature turns aside into the path of safety.

Note that this anticipatory reaction depends upon the correspondence between points forward upon the line of advance, and future instants of time. A supposititious future, & future that may be, is depicted, instant by instant, by successive points in the line of advance of the beetle on the supposition that its law of motion continues unchanged. The behavior of the beetle is determined in terms of this depiction of a supposititious future."

Lotka, at this point, footnotes a cited discussion of Alfred Whitehead and Ernst Mach on "futures that may be". He then continues:

"The depiction in this case is plainly mechanical or geometric. We, as living, conscious organisms, in

certain circumstances exhibit a precisely analogous behavior; our action is determined by a picture (psychic in this case) of the future that we seek to avoid or to attain. We are directly conscious of our own volition (whatever its precise physical significance may be.) **We hesitate not at all in describing our action as purposive**, as directed to and determined by an end, by a final cause. As to the tin beetle, we have dissected him and fully understand his mechanism. We would think it foolish, with our peep behind the scenes, to impute to him volition or purpose; we describe his action as mechanical, as fully determined by an efficient cause."

Then he picks a middle range example, an amoeba:

Old Faithful Paramecium

Lotka's mechanical beetle vs human vs amoeba example brings to mind Alfred Roger's 2014 human vs geyser vs paramecium example, in respect to classifying one as "alive" and the others as "non-life", about which, in respect to whether he believes the hydrogen atom is alive, he comments: "There is no essential difference between 'life' and 'non-life.' The perceived difference is complexity. Old Faithful (Q) has 'life-like' movement but is easier to understand than a paramecium (Q). The hydrogen atom is NOT alive." [16]

"But what shall we do when confronted with a case that falls into neither of these categories? An amoeba, for example? We cannot enter the amoeba in spirit and become parties to its conscious experience; we do not even know whether it has any such experience. On the other hand its mechanism is not completely known to us. To class it among purposive, teleological beings so long as we are ignorant of its working, and to be prepared to reclassify it among 'purely mechanical' structures us soon as we come to understand its physical operation, seen is hardly a very commendable way to marshal our mental stock-in-trade."

Lotka continues:

"The mystery may be in part of our own making. The difficulty in answering a question sometimes arises from the fact that the question has been badly put. Certainly no harm can come from an effort to make a survey of some of the relevant facts and their relations. To such a survey we shall proceed forthwith. Here it may be well to summarize briefly three cardinal points in our observations so far:

1. Mechanisms teleological in their operation can be constructed, which we would not in any ordinary sense of the word describe as conscious.
2. The active types of teleological mechanisms in nature (animals) impress us as being in some sense conscious, though in the case of the lower rungs on the scale we feel very doubtful as to just what meaning to assign to this statement.
3. In our own selves we feel that consciousness (volition) plays a dominant role in the teleological operation of our bodies, and, in particular, in the operation of the adjusters.

In all that has been said so far the individualistic character of tastes has been emphasized. A man's likes and dislikes are essentially his own personal affair. This does not mean, as might perhaps at first sight appear,

that tastes of different individuals are wholly random collections of likes and dislikes, dealt out purely haphazard, like the cards from a well shuffled pack. However erratic human desires may appear in detail, in the gross they display a species of uniformity, of law, of constancy."

A modern variant of Lotka's windup mechanical beetle, is the battery-powered Tamiya Mechanical Beetle (O) is shown adjacent, which is similarly designed to the effect that if it encounters a wall it will turn, according to which if put on a surface enclosed by four walls it will move about, turning at each wall for several hours. Lotka then cites Bell Telephone's recent "automated" switching apparatus, eliminating the 'operator', and Leonardo Quevedo's 1910 chess automaton (O), as further examples he could elaborate on. In other places, on the mechanical beetle model, Lotka states:

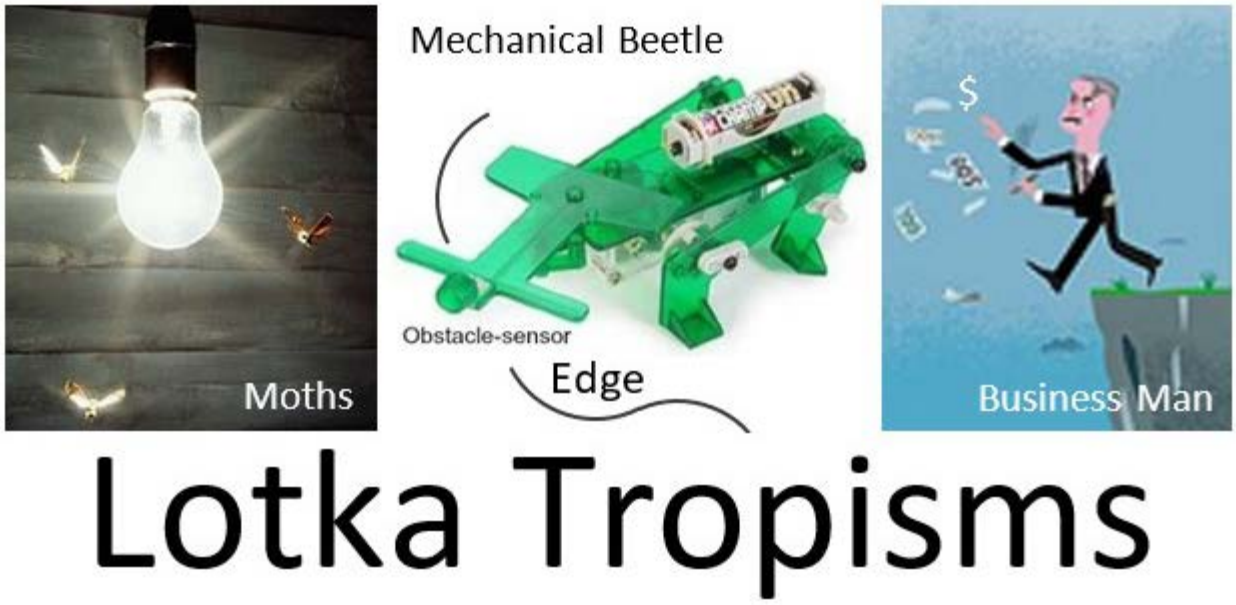

Left: Lotka says that the tropisms of the moth to light work or operate with the same mechanical inevitableness of the mechanical beetle towards the table edge. Right: an toy Tamiya Mechanical Beetle (O), that one can by, and study, similar to Lotka's mechanical beetle.

> "The tropisms of a moth apparently draw it toward a light with the same mechanical inevitableness as the gears of the toy beetle constrain it to follow the table edge."
>
> — Alfred Lotka (1925), *Elements of Physical Biology* (pg. 395)

(add discussions)

Ethics

Lotka digresses in a few places on ethics as follows:

> "Just as a man has learned, in the progress of ages, to think logically, to think in accord with reality, so he must yet learn to will rightly, that is, in harmony with Nature's scheme. We have here a thought that seems fundamental for a natural system of ethics."
>
> — Alfred Lotka (1925), *Elements of Physical Biology* (pgs. 386-87)

> "The choice may not be made simply in response to instinctive impulse. It may be more or less consciously guided by "principles," such as may be given either empirically, on the word of an accepted authority, the Church for example; or as worked out systematically by the agent himself (philosophy of conduct, ethics). These two types of choice may be respectively termed instinctive and reflective, or, in analogy with the terms employed with regard to thought, the instinctive may also be classed as autistic, the reflective as

realistic, since the former seeks no basis outside the individual himself, the latter tends to seek an objective basis."

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 412)

(add)

Mill wheel | Solar

Lotka seems to have been the first to diagrammatically conceptualize "life" as a function of the "photon mill" or "overshot mill wheel" as he calls it; about which he says (pg. 334) the following:

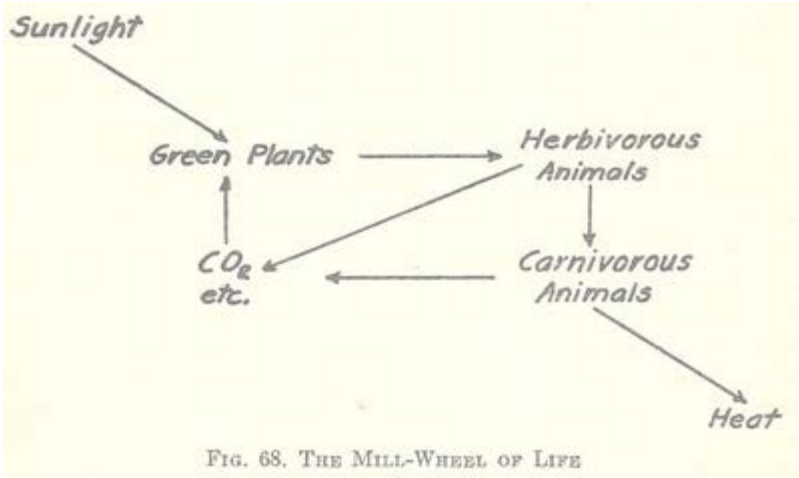

Lotka's version of the photon mill model of life.

> "The circulation of substance in the organic world and its inorganic background, which was considered in an earlier chapter in its purely material relations, now acquires a new significance. We recognize in it now a typical characteristic of the great world engine which, for continued operation, must of necessity work thus in cycles. The picture presented to our minds is that of a **gigantic overshot mill wheel**, receiving from above the **stream of sunlight** with its two hundred twenty-seven million gross horsepower though much of this is split without effect and discharging below its dissipated energy in the form of heat at the general temperature level. The main outstanding features of the wheel are represented diagrammatically in figure 68. But in detail the engine is infinitely complex, and the main cycle contains within itself a maze of subsidiary cycles. And, since the parts of the engine are all interrelated, it may happen that the output of the great wheel is limited, or at least hampered, by the performance of one or more of the wheels within the wheel. For it must be remembered that the output of each transformer is determined both by its mass and by its rate of revolution. Hence if the working substance, or any ingredient of the working substance of any of the subsidiary transformers, reaches its limits, a limit may at the same time be set for the performance of the great transformer as a whole"

Lotka later (pg. 357) states the following about evolution, his solar mill model, and thermodynamics:

> "The law of evolution adumbrated as a law of maximum energy flux seems probable, that so long as there is an abundant surplus of available energy running "to waste" over the sides of the mill wheel, so to speak, so long will a marked advantage be gained by any species that may develop talents to utilize this "lost portion of the stream." Such a species will therefore, other things equal, tend to grow in extent (numbers) and this growth will further increase the flux of energy through the system."

He then goes on to mention that this beyond the

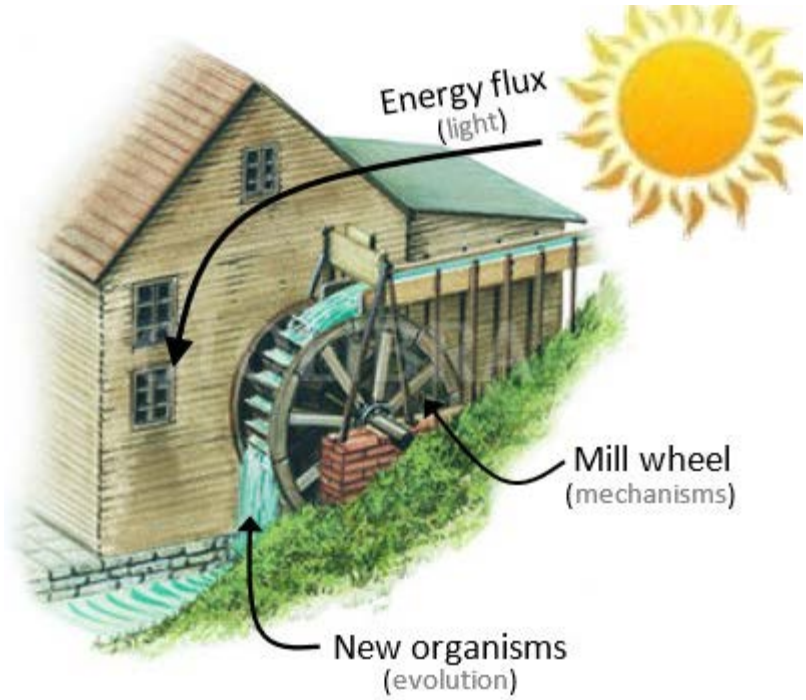

A rendition of Lotka's conception of an energy flux driven evolution mill wheel, i.e. what has come to be called the "photon mill" model in recent years.

"reasoning of thermodynamics" and also that Hyacinthe Guilleminot has independently arrived at similar views. He continues (pg. 358) with the following wisdom, regarding pronouncements of so-called maximal laws:

> "The general effect will be to increase the rate of energy flux through the system of organic nature, with a parallel increase in the total mass of the great world transformer, of its rate of circulation, or both. One is tempted to see in this one of those maximum laws which are so commonly found to be apt expressions of the course of nature. But historical recollections here bid us to exercise caution; a prematurely enunciated maximum principle is liable to share the fate of Thomsen and Berthelot's chemical 'principle of maximum work'."

In other works, Lotka cautions his statement that evolution tends to go in the direction of those species who facilitate maximal energy flux, with the historical reflection on how the asserted "thermal theory of affinity", i.e. the assertion that chemical reactions proceed in the direction of maximal heat release (and or that heat release is a measure of the affinity), was quickly overthrown by the discerning mind of Helmholtz and the thermodynamic theory of affinity.

Chemical evolution | Natural selection

Lotka, in his ripe §12: "Chemical Equilibrium as an Example of Evolution Under a Known Law", opens to the following chapter quote:

> "I wanted to remind the biologists that in the early stages of life what they are accustomed to speak of as natural selection passes over into what might be described as a mere physical selection of stabler compounds."
>
> — Karl Pearson (c.1900), cited by Lotka in *Elements of Physical Biology* (pg. 152)

On this platform, Lotka equates stability to fitness, and ventures the assertion that evolution operates according to thermodynamic potential minimum transformational states; the main quotes of which are as follows:

> "In the population of molecules here under consideration the relation between birth rate and death rate is of

the simplest possible form. Each molecule of S1 that ‘dies’ becomes a molecule of S2, and vice versa.”

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 153)

“In equilibrium, the molecules are present in amounts proportional to their respective mean lengths of life, although, they are ‘born’ in equal numbers, since k2n2 = k1n1.”

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 153)

Here we see Lotka mentally vacillating on and or water-testing the view that anthropisms such as ‘born’ and ‘die’ are funny (non-cogent) terms when scaled down into the conceptual physicochemical reaction range of evolution.

“Thus, in the struggle for existence the stabler (fitter) molecules of S1 have the advantage, being, on an average, longer-lived. There is thus an obvious analogy between the course of events in such a population of different species of molecules, on the one hand, and a mixed population of different species of organism on the other, an analogy which extends into details for the exposition of which space is lacking here.”

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 153)

On this “space lacking” point, Lotka cited his 1907 article “Studies on the Growth of Material Aggregates.” [9] Lotka then cites the following quote by Edward Baly to explain the three phases of transition states: [10]

“Every complete reaction consists of three separate stages, with each of which is associated its characteristic energy change. In general, molecules in the free state exist in a phase which is non-reactive, and in order to carry out any reaction it is first of all necessary to bring them into a reactive phase. This, which is the first stage of the reaction, requires that a definite amount of energy should be supplied to each molecule, the amount necessary being the difference in energy contents of the initial phase and the particular phase necessary for the reaction in question.

The second stage of the reaction is the atomic rearrangement whereby new molecules are produced, and it is this stage, and this stage alone, which is represented by the equation of the reaction.

The third and final stage is the change in phase of the newly synthesized molecules, whereby they pass into their normal and non-reactive phases. These last two stages are both accompanied by an escape of energy. If the sum of the amounts of energy evolved in the second and third stages is greater than that absorbed in the first stage, the reaction is exothermic; whilst an endothermic reaction is one in which the energy necessary for the first stage is greater than the total amount evolved in the second and third stages.”

(add)

Thermodynamic potentials

Lotka, following the above, then goes into (pgs. 156-58) the following very-good discussion of evolution described via thermodynamic potential minimas:

“It should be remarked that the second stage is, apparently, passed through in an exceedingly brief space of time, so that at any instant only an imperceptibly small amount of substance exists in the transitional state. We are, in fact, almost wholly devoid of any information regarding matter in this state, and the words of

Schonbein hold true in almost their full force today: "Presumably, between the state in which two portions of matter exist after completion of chemical combination, and the state in which they previously existed separately, there is a series of transition states of which the chemistry of today knows nothing."

Probably the only positive and direct experimental evidence we have of matter in this intermediate state between two compounds is furnished by the superlatively refined methods of Sir J. J. Thomson and Dr. F. W. Aston, which not only reveal but actually weigh such decapitated molecules as CH3, whose length of life is measured in ten-millionths of a second.

As to the agencies, the "fluctuations" that provide, every now and again, the requisite energy to carry a transforming molecule "over the crest of the hill," there is first the thermal agitation of the molecules, second the influence of incident light in photochemical reactions, and third the influence of catalysts, whose action probably depends on a flattening of the path over the hill crest, the point of departure and the final state remaining unchanged. For discussions of these technical details the reader must be referred to the literature, a few of the more recent publications being noted in a footnote below.

While the details of the manner of the "birth" and "death" of the molecules in chemical transformation are, as yet beyond the range of the observation of the physicist, the fundamental laws of energetics, which hold true generally, and independently of particular features of mechanism, are competent to give substantial information as to the end product, at any rate, of the evolution of such a system as considered in the simple example above. The final equilibrium must accord, as regards its dependence on temperature, pressure and other factors, with the second law of thermodynamics, which may thus be said to function as a law of evolution for a system of this kind.

This is a point worth dwelling on a little at length, inasmuch as our knowledge of the form and character of the law of evolution for this special type of system may be expected to serve as a guide in the search for the laws of evolution in the more complicated systems, belonging to an essentially different type, which confront us in the study of organic evolution. The second law of thermodynamics can be expressed in various ways, but the form in which it serves our present purpose best is that which states that the system evolves toward a state in which certain functions (thermodynamic potentials) of the variables defining its condition are at a minimum, somewhat as a ball placed in a hemispherical bowl ultimately comes to rest in the position in which its (gravitational) potential is a minimum, namely, at the lowest point of the bowl.

Mary laws of nature are conveniently expressed in this form, as minimum (or maximum) laws, and it is to be expected that the law of evolution in life-bearing systems also, (where, as we shall see later, mechanism cannot be lightly waved aside into the convenient catch-all of the laws of thermodynamics), will be found to receive its most convenient expression in this form. In another respect the case of chemical evolution may confidently be expected to be found a good model in the treatment of the broader problem of evolution. It is to be noted that the law of chemical evolution is expressed in terms of the system as a whole. It is the thermodynamic potential of the entire system that approaches a minimum. Biologists have rather been in the habit of reflecting upon the evolution of individual species. This point of view does not bear the promise of success, if our aim is to find expression for the fundamental law of evolution."

On maxima and minima, Lotka cites: J. Petzold (1891), Pierre Duhem (1911), and F. Michaud (1921). Later, Lotka states the following ripe comment:

"Generally it can be said that in equilibrium the thermodynamic potential is a minimum, but the expression for this potential will vary according as pressure and temperature, or volume and temperature, for example, are held constant. Only this shall be noted in passing: Whereas, in the thermodynamical treatment of physico-chemical phenomena a function Φ is given (essentially as the expression of the laws of thermodynamics), and whereas certain consequences are derived from this known function, the type of problems with which we are here concerned is of inverse nature. We are given certain data regarding the

behavior of these systems, for example, the fact that their evolution follows more or less closely a system of equations of the type of the general equations (1) (Chapter VI) of the Kinetics of Material Transformation; and the problem may be raised, as to whether there exist functions Φ analogous to the functions known as thermodynamic potentials, in terms of which the behavior of the system can be concisely epitomized, after the manner of thermodynamics. If such a plan could be successfully carried out, the result would be a species of quasi-dynamics of evolving systems, in which certain parameters P played a role analogous to forces, without being in any sense identical with forces (or even with generalized forces); certain other conjugate parameters p would play a role analogous to displacements, and certain functions Φ would resemble in their relations to certain events in the system, the energy functions Φ (free energy, thermodynamic potentials) of thermodynamics."

— Alfred Lotka (1925), *Elements of Physical Biology* (pgs. 319-21)

(add)

Life | Definitions

Lotka, in his opening chapter, "Regarding Definitions", opens to the following quote:

"Truth comes out of error more readily than out of confusion."

— Francis Bacon (1620), *New Instrument of Science* (§2:Aphorism 20) (O); cited by Lotka in *Elements of Physical Biology* (§1:Regarding Definitions, pg. 3)

(add)

Ostwald | Bacterial growth | Crystal growth

In 1901, Lotka attended the physical chemistry lectures of Wilhelm Ostwald, wherein he gleaned the connection between biological phenomena (e.g. bacterial growth) and physical phenomena (crystal growth) both informally described physico-chemical methods; which Sharon Kingsland (1995) describes as follows: [8]

In 1901, **Lotka**, aged 21, as a student in the physical chemistry lectures of Wilhelm Ostwald, listened to a lecture of the growth of bacteria (O) as compared to crystal (O) growth, both described by one and the same physicochemical principles, which, as he later (1945) recalled, acted as the "trigger" for the train of thought that led to his *Elements of Physical Biology* (1925).

"In any case, the similarity between physical-chemical and biological systems had first struck **Lotka** much earlier, while he was attending Friedrich Wilhelm Ostwald's lectures in Leipzig in 1901. In one of these lectures, Ostwald compared the growth of a bacterial colony to the formation of crystals in a supersaturated liquid. Such a liquid existed in what he called a "meta-stable" state, that is, it was in equilibrium until disturbed by the addition of a crystal which would act as a "seed" for the formation of more crystals until a second equilibrium of concentration was attained. The whole process was accompanied by energy changes within the system. In a similar manner, the bacterium "seed" in a nutrient broth grew by extracting solid matter from the surrounding liquid, a process accompanied by energy changes in the living colony. Ostwald's analogy introduced in passing at the end of a lecture was only a heuristic device used to illustrate how biological processes might be understood by reference to inorganic processes. As Lotka later recalled, it was this comparison which had acted as the "trigger" for the

train of thought that led eventually to the *Elements*. The important difference was that Lotka's argument rested not on superficial resemblance, but on the demonstration of a true identity between physical-chemical and biological systems. This demonstration required an elaboration of Ostwald's sketch."

In 1902, Lotka, during his student days at Leipzig, began to outline the "first plan" for his theory of the physics of biology. In 1907, he began to publish some of his ideas, the first appearing in *American Journal of Science*.

In 1921, Lotka was feeling the pressure to collect his ideas into book form so to beat other imagined contenders to the punchline. Kingsland cited the following Jan 1922 letter to Raymond Pearl wherein Lotka vents on David Burns 1921 *An Introduction to Biophysics*, as a semi-contender, albeit a physiology book, thereby differing from Lotka's "nature as one gigantic whole" model: [19]

> "The time is ripe. I see many signs of the fact. Have you seen a recently published book by Burns and Paton, *An Introduction to Biophysics*? It also dug a spur into my side—not that there is anything to get excited over, the book would hardly be described as either inspired or inspiring. But it shows the undercurrent, which one of the days must break through to the surface."

Kingsland suggests that "these currents" carried Lotka into a decision in 1922 to accept a fellowship at Johns Hopkins, wherein he would spend the next two years writing *Elements of Physical Biology*, completed in 1924 and published in 1925.

Elements | Organisms / Humans

Lotka, in his §15: "The Stages of the Life Drama", lists 13 elements that comprise the human. He also gives the following diagram:

Average composition of human body	POUNDS	PER CENT
Oxygen	97.20	63.03
Carbon	31.10	20.20
Hydrogen	15.20	9.90
Nitrogen	3.80	2.50
Calcium	3.80	2.50
Phosphorous	1.75	1.14
Chlorine	0.25	0.16
Fluorine	0.22?	0.14?
Sulphur	0.22	0.14
Potassium	0.18	0.11
Sodium	0.16	0.10
Magnesium	0.11	0.07
Iron	0.01	0.01
Total	154.00	100.00

Lotka's table 17 (pg. 197) showing a 13 elemental composition of a human (see: periodic table; human molecular formula; hmolscience periodic table).

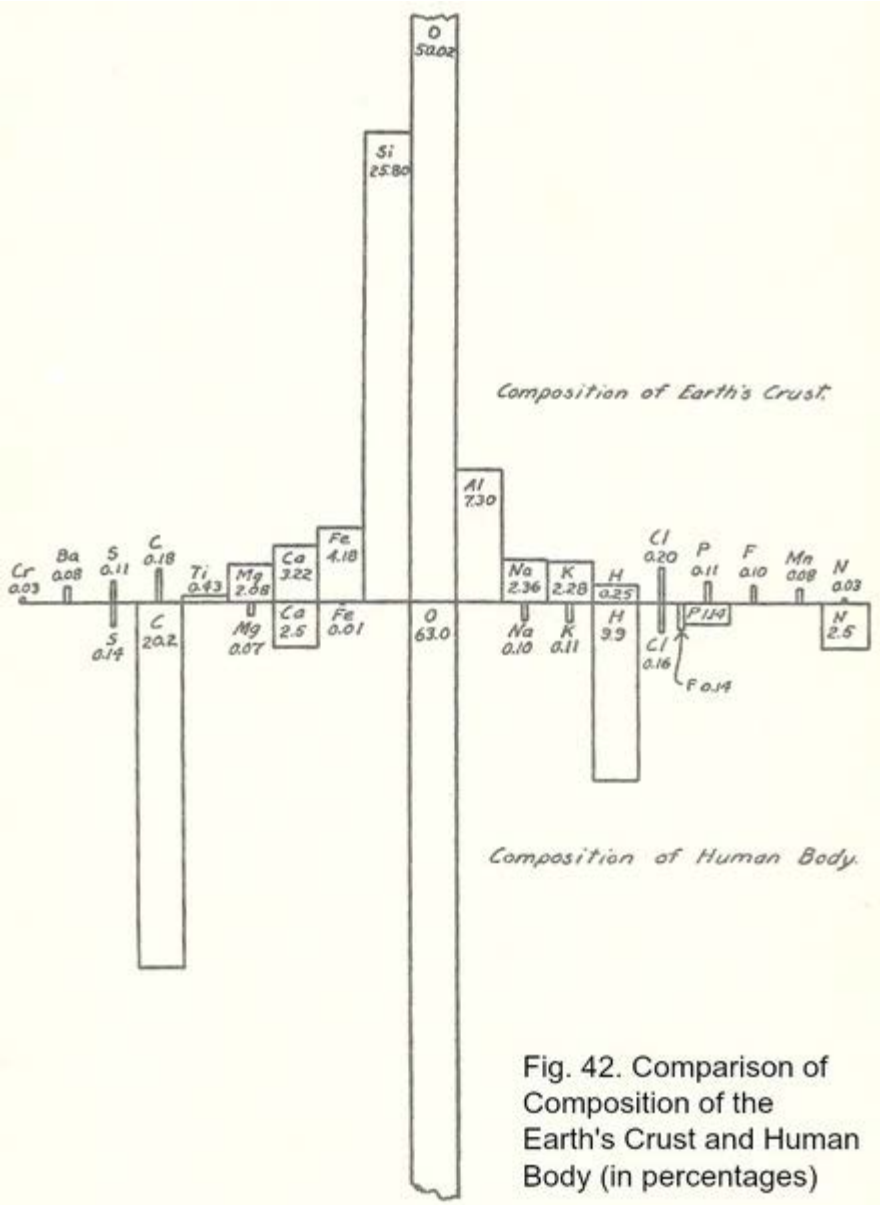

Fig. 42. Comparison of Composition of the Earth's Crust and Human Body (in percentages)

Lotka, of note, in commentary on these two elemental listings (in humans), seems to be the first to address the so-called "aluminum disproof", of the various disproofs of the existence of god, i.e. in indirect reference to the clay creation myth of humans, he states:

> "On the whole it may be said the living organisms are composed of comparatively rare elements. We are, indeed, earth-born, but yet not altogether common clay. Indeed, taken literally the expression "common clay," as

TABLE 18

*Composition of living organisms**

Atomic weight	Heat combustion per gram	Element	Symbol	Plants	Animals
		Elements invariably present in living organisms			
	calories				
1.008	34.702 (H_2)	Hydrogen	H	Hydrogen, carbon, oxygen, and nitrogen—"H, C, O, N"—are *essential and of chief rank* in all life processes; forming, with sulphur, practically all plant- and animal proteins and, with phosphorus, forming the nucleoproteins	
12.005	8.08	Carbon	C		
16.00		Oxygen	O		
14.01	0.143	Nitrogen	N		
31.04	5.747	Phosphorus	P	In nucleoproteins and phospholipins	In nucleoproteins and phospholipins; in some brachiopods; in blood; and in vertebrate bone and teeth
32.06	2.22	Sulphur	S	In most proteins, 0.1 to 5 per cent	In most proteins, 0.1 to 5 per cent
39.10	1.745	Potassium	K	Abundant in marine plants, especially "kelps" (larger *Phæophyceæ*); activity of chlorophyll depends on it	In blood, muscle, etc.
24.32	6.077	Magnesium	Mg	Present in large quantities in *Corallinaceæ* (a family of calcified red algæ	Present in echinoderms and alcyonarians; present in all parts of vertebrates, especially in bones
40.07	3.284	Calcium	Ca	Present in large quantities in certain algæ (chiefly marine)	In all parts of vertebrates; abundant in bones and teeth
55.84	1.353	Iron	Fe	Essential in the formation of protoplasm; present in chlorophyll	Essential in the formation of protoplasm, and in the higher animals; essential in hemoglobin as an oxygen-carrier

applied to man, is an extreme case of poetic license; for aluminum and silicon the chief constituents of clay, and taking second and third place in rank of abundance among the components of the earth's crust, are both present only in traces in the human body."

This, in short, is indirect implicit Bible debunking, wherein he relegates the creation of humans according to Genesis (or Heliopolis creation myth) as being but a form of poetry.

Lotka, also lists, in life drama chapter, citing Henry Osborn's "the Origin and Evolution of Life" (1917), a table of 17 element composition of living organisms (plants and animals), shown adjacent.

23.00	3.293	Sodium?	Na	Believed essential to all plants, but not demonstrated; found in marine plants, especially *Phæophyceæ*	Present in all animals; abundant in blood and lymph
35.46	0.254	Chlorine?	Cl	Present in many plants; believed by some to be essential; abundant in marine algæ, especially in the *Phæophyceæ*	Present in all animals; abundant in blood and lymph; present in the gastric juice.
28.3		Silicon?	Si	Found in all plants; present in large quantities in the *Diatomaceæ*, both fresh-water and marine; in form of "silica" constitutes 0.5 to 7 per cent of the ash of ordinary marine algæ	Present in radiolarians and siliceous sponges; also in all the higher animals
Elements frequently present in living organisms					
126.92	0.1766	Iodine	I	In marine plants, especially the "brown algæ," *Phæophyceæ*; in *Laminaria* and *Fucus*; also in some Gorgonias	Essential in the higher animals (thyroid)
54.93		Manganese	Mn	In some plants	In most animals in very slight proportions
79.92		Bromine	Br	In marine plants, especially the "brown algæ," *Phæophyceæ*; in some Gorgonias	In some animals in very slight proportions
19.0		Fluorine	F	In a few plants	In some animals—constituent of bones and teeth; in shells of molluscs and in vertebrate bones

*Reproduced from "The Origin and Evolution of Life by Henry Fairfield Osborne; copyright, 1917, by Charles Scribner's Sons. By permission of the publishers.

Elements rarely present in living organisms					
	calories				
27.1		Aluminum†	Al	In a few plants	In a few animals
74.96	1.463	Arsenic†	As		In some animals
137.37	0.952	Barium†	Ba	In a few plants	
11.0		Boron	B	In some plants	
58.97		Cobalt†	Co	In a few plants	
63.57	0.585	Copper†	Cu	In a few plants	Traces in some corals; essential in some lower animals as oxygen-carrier
207.20	0.243	Lead†	Pb		Traces in some corals
6.94		Lithium	Li	In some plants	
58.68		Nickel†	Ni	In a few plants	
226.0		Radium†	Ra	In some plants	In some animals
87.63	1.497	Strontium†	Sr	In a few plants	
65.37	1.291	Zinc†	Zn	In a few plants	In a few animals; traces in some corals

The exceedingly rare occurrence of cerium, chromium, didymium, lanthanum, molybdenum, and vanadium is in all probability merely adventitious.

†Commonly regarded as poisons when present in *mineral* (ionic) forms, even in small proportions.

Lotka's table of 17 elements comprising organisms (plants and animals), via citation to Henry Osborn (1917).

Davidson

Lotka seems to have been one of the first to take note of the relatively unknown 1919 work of American economist Julius Davidson, one of the first to attempt to explain facets of economics in terms of Gibbsian thermodynamics and equilibrium chemical reactions models. [7]

Free energy | Available energy

Lotka seems to use both the terms "free energy" and "available energy", though possibly not in the absolute correct sense, e.g. speaking about the conservation of free energy (below). This is evidenced by the fact that in his section on the "world engine" he seems to equates the boiler to the working substance. Working outside of academic mainstream, Lotka began his studies of the energetics of evolution in the early 1900s; in this isolation he soon came to the view that there was no distinction between biology and physical systems, but that life existed in terms of the exchange of energy. [4] Lotka proposed that natural selection was, at its root, a struggle among organisms for "available energy"; organisms that survive and prosper are those that capture and use energy at a rate and efficiency more effective than that of its competitors. Lotka extended his energetic framework to human society. In particular, he suggested that the shift in reliance from solar energy to nonrenewable energy would pose unique and fundamental challenges to society. [5] In commentary on James Johnstone's 1921 entropy retardation logic, in particular that "in living processes, the increase in entropy is retarded," Lotka tells us, in his 1922 "Contributions to the Energetics of Evolution" article, "he points out that this is true, primarily, of plants; but that among animals also natural selection must work toward the weeding out of unnecessary and wasteful activities, and thus toward the conservation of free energy, or, what amounts to the same thing, toward retarding energy dissipation." [4]

Physical biology | Biophysics

Lotka, in his “Preface” (pg. viii), defined the term “physical biology” to mean physical principles applied to systems of biological entities, and “biophysics” as the study of certain physical aspects of the life process of the individual; according to which the latter is a subset of the former. Lotka, citing Alexander Forbes (1920) and Walter Porstmann (1925), in his §5:Program of Physical Biology”, gave the following bold type definition:

> “Physical biology, as here conceived and discussed, is essentially a branch of the greater discipline of the ‘general mechanics of evolution, the mechanics of systems undergoing irreversible changes in the distribution of matter among the several components of such system. In introducing the term ‘physical biology’ the writer would suggest that the term ‘biophysics’ be employed (as hitherto) to denote that branch of science which treats of the physics of individual life processes, as exhibited IN THE INDIVIDUAL organism (e.g., conduction of an impulse along nerve or muscle); and that the term ‘physical biology’ be reserved to denote the broader field of the application of physical principles in the study of life-bearing systems AS A WHOLE. Physical biology would, in this terminology, include biophysics as a subordinate province.”

This definition, of significant note, was preceded by his ripe §1:Regarding Definitions, wherein he goes into persuasive argument about how there are issues with the attempts to define “life”, i.e. the “bio-”, according to physicochemical principles, but that he does not know presently how to resolve the issue, and thereby retains the term “life”, and related, for practical purposes.

Needham | Terminology

> *See also: Darwin on higher and lower*

In 1942, Joseph Needham published a critique of Lotka’s mention that:

> “The passage 'from lower to higher forms', which are often used to describe the direction of evolution, are vague, and undoubtedly contain an anthropomorphic element [and his suggestion that] these be replaced by proceeds 'from simpler to more complex forms'.”

In 1944, Lotka published are communication rebuttal of Needham’s objections. [11]

Influence

Influential to Lotka was the 1921 work of English oceanographer James Johnstone. [3] Lotka's work later came to be influential to those as American mathematician Norbert Wiener, Russian-born American mathematical biologist Nicolas Rashevsky, founder of mathematical biophysics, American biophysicist Jeffrey Wicken, and possibly to Belgian thermodynamicist Ilya Prigogine in his dissipative structures theory in relation to equilibriums in biology.

Education

Lotka began his study at Birmingham University, England in 1898 and earned his BS degree in 1901. He then spent a year studying chemistry at Leipzig University from 1901 to 1902. During this period, he developed his interest in the mathematical theory of evolution, which would be the foundation for his life's work. [6] Lotka came to the United States in 1902, where he

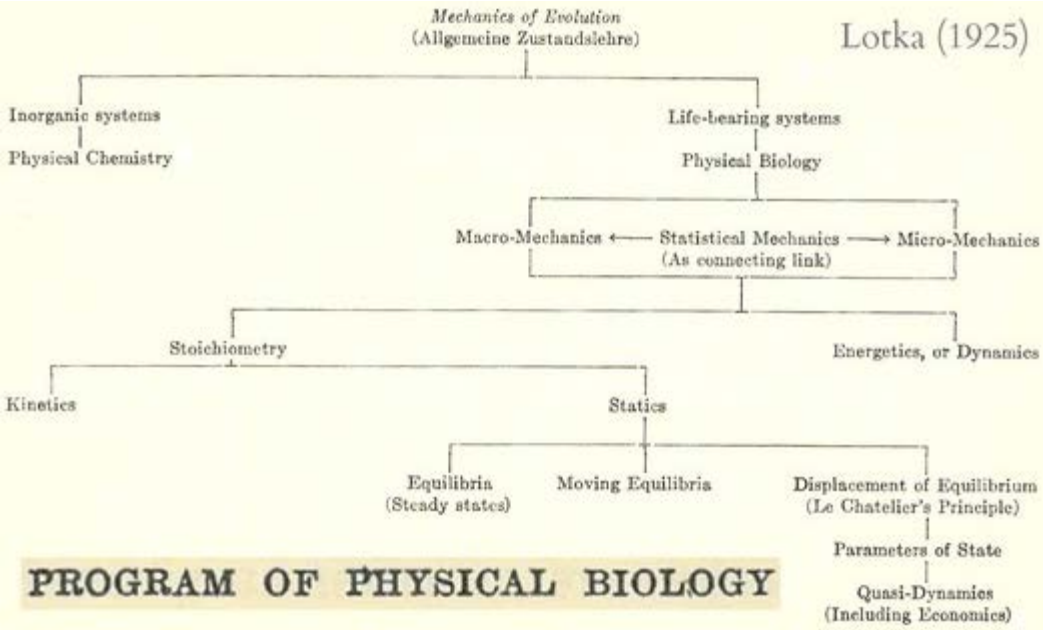

Lotka's diagram of his program of physical biology (pg. 53), a subset of which he defines as "biophysics", aka physiology.

worked as an assistant chemist at the General Chemical Company in New York until 1908. While there, he published his first papers on the mathematical theory of evolution and on population analysis. He entered Cornell University as a graduate student and assistant in physics in 1908 and received his MA degree in 1909. Following his education at Cornell University, Lotka worked as an examiner at the United States Patent Office (1909), assistant physicist at the United States Bureau of Standards (1909-1911), and as an editor of the *Scientific American Supplement* (1911-1914). He received his Doctor of Science degree from Birmingham University in 1912. Lotka then returned to General Chemical Company, where he worked as a chemist from 1914 to 1919. While he held these various positions, Lotka continued his investigations into the mathematical theory of evolution. From 1922 to 1924, he accepted a temporary research appointment in Raymond Pearl's Human Biology group at Johns Hopkins University to focus on his studies. The result of his work was the publication *Elements of Physical Biology* (1924). [6]

Quotes | On

The following are noted tributes:

> "In the era BC (before cybernetics) it [*Elements of Physical Biology*] was an important source of education and encouragement for few souls who had gleam in their eyes about the prospective mathematization of the social sciences. It had a substantial influence on Henry Schultz and Paul Samuelson, and, I am sure, many others besides myself. As a matter of fact, most of the ideas of Wiener emphasizes—for example, the relation of entropy to organizational behavior—can be found in **Lotka**, and I have felt some annoyance at the lack of recognition of the latter's contributions."
>
> — Herbert Simon (c.1990) (O)

Quotes | Employed

The following is the title page quote:

TABLE III.—*Periodic classification of the elements.* = elements in humans

	Group 0.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.
1		H 1							
2	He 4	Li 7	Gl 9.1	B 11	C 12	N 14	O 16	F 19	
3	Ne 20	Na 23	Mg 24.4	Al 27.0	Si 28.3	P 31	S 32	Cl 35.5	Fe 55.9 Co 59 Ni 58.7
4	A 39.9	K 39.1	Ca 40.1	Sc 45	Ti 48.1	V 51	Cr 52.1	Mn 55	
5		Cu 63.6	Zn 65.4	Ga 70	Ge 72.5	As 75	Se 79.2	Br 79.9	
6	Kr 82.9	Rb 85.5	Sr 87.6	Yt 88.7	Zr 90.6	Cb 93.5	Mo 96		Ru 101.7 Rh 103 Pd 106.5
7		Ag 107.9	Cd 112.4	In 115	Sn 118.7	Sb 120.2	Te 127.5	I 126.9	
8	Xe 130.2	Cs 132.9	Ba 137.4	La 138.9	Ce 140.3				
9				Rare earth metals.					Os 191 Ir 193.1 Pt 195.2
10						Ta 181	W 184		
11		Au 197.2	Hg 200.6	Tl 204	Pb 207.1	Bi 209			
12	Nt 222		Ra. 226		Th 232.5		U 238.2		

FIG. 45. PERIODIC CLASSIFICATION OF THE ELEMENTS, SHOWING DIVISION INTO PETROGENIC ELEMENTS, ABOVE THE ZIGZAG LINE, AND METALLOGENIC ELEMENTS, BELOW THE LINE

Lotka's periodic table (pg. 207), at a point in time when "90 elements" were known, with elements highlighted being the elements of a human, according to his table 17 (pg. 197), thus defining a person, in modern parlance, as a "CHNOPS+7 phase", according to Lotka's cited measurements.

"When the elements have been 'mingled' in the fashion of a man, and come to the light of day, or in the fashion of the race of wild beasts or plants or birds, then men say that these 'come into being', and when they are 'separated', they call that in common parlance, death .... let not the error prevail over the mind that there is any other source of all the perishable creatures that appear in countless numbers."

— Empedocles (c.450BC), cited by Alfred Lotka (1925) in *Elements of Physical Biology* (pg.185)

"There is no coming into being of aught that perishes, nor any end for it, but only mingling, and separation of what has been mingled."

— Empedocles (c.450BC), cited by Alfred Lotka (1925) in *Elements of Physical Biology* (pg. 246)

"It is to be hoped that these men, finding that they cannot longer write impertinently and absurdly will be reduced either to write nothing, or books that may teach us something; and so, ceasing to trouble the world with riddles or impertinencies, we shall either by their books receive an advantage, or by their silence escape an inconvenience."

— Robert Boyle (1661), *The Skeptical*; cited by Lotka (pg. x)

"In all such cases there is one common circumstance, the system has a quantity of potential energy, which is being transformed into motion, but which cannot begin to be so transformed until the system has reached a certain configuration, to attain which requires an expenditure of work which in certain cases may be

infinitesimally small, and in general bears no definite proportion to the energy developed in consequence thereof. Every existence above a certain rank has its singular points, the higher the rank, the more of them. At these points influences too small to be taken into account by a finite being may produce results of the greatest importance. All great results produced by human endeavor depend on taking advantage of these singular states when they occur. In the course of this our mortal life we more or less frequently find ourselves on a physical or moral watershed, where an imperceptible deviation is sufficient to determine into which of two valleys we shall descend."

— James Maxwell (c.1870), "Article", in: *Life of Clerk Maxwell* (editors: Lewis Campbell and William Garnett (1882) (pgs. 441-43); cited by Lotka in *Elements of Physical Biology* (pg. 408)

"An abandonment of willfulness without extinction of will, but rather by means of a great development of will, whereby, instead of being consciously free and really in subjection to unknown laws, it becomes consciously acting by law, and really free from the interference of unknown laws

— James Maxwell (c.1870), *Ethics*; cited by Lotka in *Elements of Physical Biology* (pg. 414)

"Not only do the body fluids of the lower forms of marine life correspond with sea water in their composition, but there are at least strong indications that the fluids of the highest animals are really descended from sea water."

— Lawrence Henderson (1913), *The Fitness of the Environment* (pg. 187); cited by Lotka in *Elements of Physical Biology* (pg. 203)

"Mind is merely the 'integration' of the organism's motor responses to stimuli."

— A.G. Tansley (1916), summary of the views of Edwin Holt in *The Freudian Wish* (pg.76-94); cited by Lotka in: *Elements of Physical Biology* (pg. 405)

Quotes | By

The following are quotes by Lotka:

"The preface is that part of a book which is written last, placed first, and read least."

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. vii)

"In the struggle for existence, the advantage must go to those organisms whose energy-capturing devices are most efficient in directing available energies into channels favorable to the preservation of the species."

— Alfred Lotka (1922) (Q)

"Evolution is the history of a system undergoing irreversible changes."

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 24)

“Problems of evolution are in large measure problems of probabilities, statistical problems. Incidentally, this reflection disposes of the rather foolish objection sometimes raised against the theory of evolution, that it ascribes the course of events in an evolving system to chance. When we describe a phenomenon as being governed by chance, we do not, of course, mean that there are no definite causes (determining factors) at work; we merely state in these terms that the causes are complex and not known to us in detail.”

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 25)

“The law of evolution is the law of irreversible transformations; that the direction of evolution (which, we saw, had baffled description or definition in ordinary biological terms), is the direction of irreversible transformations. And this direction the physicist can define or describe in exact terms. For an isolated system, it is the direction of increasing entropy. More generally, it is the direction of decreasing thermodynamic potential, this potential being variously defined, according to the conditions of transformation. The law of evolution is, in this sense, the second law of thermodynamics.”

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 26)

“What is needed is an altogether new instrument—a microscope for elephants; one that shall envisage the units of a biological population as the established statistical mechanics envisage molecules, atoms and electrons; that shall deal with such average effects as population density, population pressure, and the like, after the manner in which thermodynamics deal with the average effects of gas concentration, gas pressures, etc.; that shall accept its problems in terms of common biological data, as thermodynamics accepts problems stated in terms of physical data; and that shall give the answer to the problem in the terms in which it was presented.”

— Alfred Lotka (1925), *Elements of Physical Biology* (pgs. 39-40); cited by Roderick Seidenberg (1950) in *Post-Historic Man* (pgs. 153-54)

“Physical chemistry views the progressive changes in a system comprising several chemical species, that is to say elements, compounds, phases, etc. It describes the system by enumerating these components, by stating their character and extent (mass); and by further indicating the values of certain quantities or parameters, such as volume or pressure, temperature, etc., which, together with the masses of the components, are found experimentally to be both necessary and sufficient, for the purposes in view, to define the state of the system. With the instantaneous state of the system thus defined, physical chemistry investigates by observation and by deductive reasoning (theory) the history, the evolution of the system, and gives analytical expression to that history, by establishing relations, or equations, between the variables defining these states (after the manner set forth above), and the time.”

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 41)

“We envisage the life-bearing system, in the progress of evolution, as an assembly of a number of components: Biological species; collections or aggregations of certain inorganic materials such as water, oxygen, carbon dioxide, nitrogen, free and in various combinations, phosphorus, sulfur, etc. rate of growth dX/dt of any one of these components will depend upon, will be a function of, the abundance in which it and each of the others is presented; this rate of growth will also be a function of the topography, climate, etc. Terrestrial species have an essentially two-dimensional distribution, so that area functions here in a manner somewhat analogous to that in which volume enters into physicochemical relations. Aquatic life, with its three-dimensional sphere of activity, is enacted in systems whose extension is described in terms of

volume. More detailed topographic parameters may be required to define in sufficient completeness the configuration, the structure of these systems."

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 43)

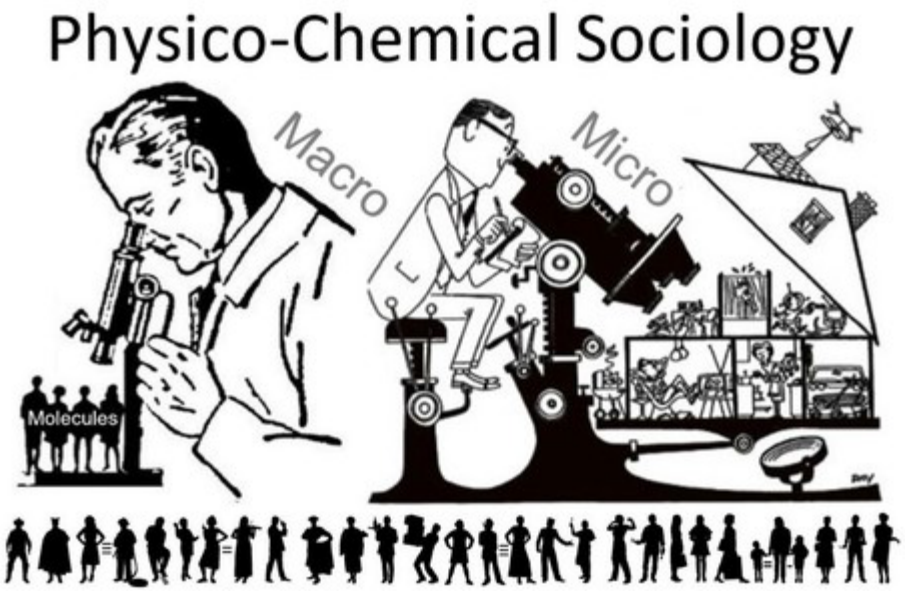

A physicochemical sociology depiction of micro-mechanics (individualism and interaction view) and macro-mechanics (system-view), as **Lotka** refers to them, generally, for chnopsological systems.

"It so happens that many of the components that play an important role In nature, both organic and inorganic, are built large numbers of individuals, themselves very small as compared with the with the aggregations which they form. Accordingly the study of systems of this this kind can be taken up in two separate aspects, namely, first with the attention centered upon the phenomena displaced by the component aggregates in bulk; we may speak of this as the 'bulk mechanics' or 'macro-mechanics' of the evolving system. And, secondly, the study of such systems may be conducted with the attention centered primarily upon the phenomena displayed by individuals of which the aggregates are composed. This branch of the subject may suitably be termed the 'micro-mechanics' of the evolving system. It is evident that between these two branches or aspects of the general discipline there is an inherent relation arising from the fact that the bulk effects observed are of the nature of a statistical manifestation or resultant of the detail working of the micro-individuals."

— Alfred Lotka (1925), *Elements of Physical Biology* (pgs. 50)

"If the population of the United States continues to follow this [Pearl-Reed equation] growth curve in future years, it will reach a maximum of some 197 million souls, about double its present population, by the year 2060 or so. Such a forecast as this, based on a rather heroic extrapolation, and made in ignorance of the physical factors that impose the limit, must, of course, be accepted with reserve."

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 67)

"The evidence points clearly that the elements, such as we know them, are the product of 'the general brewing of material which occurs under the intense heat in the interior of the stars.' Out of such foundry came our own abode, if we accept the well-considered views of Eddington (1923): 'I do not say that the earth was a gaseous body when it first became recognizable as an independent planet, but I am convinced that its material was at one time merged in a completely gaseous sun.' And since we are of earth, ours also is the same origin. The hand that writes these words and the eye that reads them alike are composed of the selfsame atoms that came into being, ages and ages ago, in the young sun. Far, far more wonderful than any dream of old mythology is the story of our creation."

— Alfred Lotka (1925), *Elements of Physical Biology* (pgs. 272-273); an early "star stuff" type quote

“The last things to receive critical scrutiny are always the fundamental premises of our arguments.”

— Alfred Lotka (1925), a general statement made in context of misuse of Le Chatelier’s principle; in: *Elements of Physical Biology* (pg. 282)

“Facts are stubborn things; it seems a pity to demolish the idol of a pretty generalization, but in such things we cannot permit the wish to be father to the thought.”

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 289)

“As Pareto remarks, if a man dislikes spinach, it is useless trying to prove to him, as one would demonstrate a proposition in geometry, that spinach tastes good.”

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 385) [17]

“Let us call to mind once more the picture of the life conflict viewed as the interplay of organisms moving over a topographic chart and suffering a succession of collisions with each other and with features of their environment. We might seek to develop, for such a system, a discipline of statistical mechanics similar to that which the physicist has developed to deal with the kinetic theory of gases and allied problems.”

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 358)

“Gilbert and Pogue in their memoir on Power 9 estimate that the use of power derived from coal and other extraneous sources (i.e., not from the human body) gives to each man, woman and child the service equivalent of 30 servants.”

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 366); an early energy slave type of statement

“In a most real way, the artificial extension of our natural body, e.g. artificial ears (telephones, artificial eyes (microscope), etc., have bound men together into one body: so very real and material is the bond that modern society might aptly be described as one huge multiple Siamese twin. That a species of ‘slavery’, that is to say of ownership of one person's body [artificial or not] by another or by others, should prevail, is in the last analysis an absolutely unavoidable situation, once we recognize that no sharp lines are drawn to separate the individual from his fellow; willy-nilly we must accept the fact..”

— Alfred Lotka (1925), *Elements of Physical Biology* (pgs. 369-70)

“It is a singular fact possessing a certain psychological interest, that as soon as we understand the modus operandi of a teleological mechanism we are disposed to reject its interpretation in terms of ‘final causes’.”

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 384)

“To say that a necessary condition for the wilting of these words is the willing of the author to write them, and to say that a necessary condition for the writing of them is a certain state and configuration of the

material of his brain, these two statements are probably merely two ways of saying the same thing."

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 403)

"Aimed collisions imply a correlation between a present state or event and a future occurrence or eventuality (a future that will be or a future that may be). Psychologically this correlation is apprehended as purposive forethought. Physically it implies the disposal of a fund of free energy], since the energy for bringing about (or for avoiding) a future encounter cannot itself be derived from that encounter. There is thus of necessity a fundamental connection between purposive action and the disposal of a fund of free energy."

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 409)

"An agent is not always conscious of the relation of his actions to the beneficiary. Thus, for example, the scientific investigator, working under the stress of the instincts of curiosity, workmanship, and self-expression, may have little or no thought of conferring a benefit on society. Such benefit nevertheless follows. The choice may not be made simply in response to instinctive impulse. It may be more or less consciously guided by 'principles', such as may be given either empirically, on the word of an accepted authority, the Church for example; or as worked out systematically by the agent himself (philosophy of conduct, ethics)."

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 412)

"The role of the hands in the evolution of man's intelligence seems to have been clearly recognized by the Greek philosopher Anaxagoras (500-428 BC). He explained, as cited by Will Durant, that 'man's intelligence by the power of manipulation that came when the forelimbs were freed from the tasks of locomotion'."

— Alfred Lotka (1925), *Elements of Physical Chemistry* (pg. 440)

"To say with the great stoic '0 universe, whatsoever is in harmony with thee, is in harmony with me.' The being whose will is so adjusted is fortune's favorite; all things must bend to his will as they bend to nature's law. For his will is nature's law."

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 434); concluding sentence of book; possibly his philosophical creed or belief statement motto

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Further reading

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● Lotka, Alfred. (1921). "Note on the Economic Conversion Factors of Energy" (Q), *Proceedings of the National Academy of Sciences*, 7:192-97.
● Lotka, Alfred. (1924). "Biased Evolution", *Harpers Magazine*, May.
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External links

● Alfred Lotka – Wikipedia.

θΔics

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In existographies, **Alfred Marshall** (1842-1924) (CR:10) was an English economist—generally known for his supply and demand curves—sometimes cited, in the econophysics literature, as having employed remote thermodynamic stylized thinking in his economics theories, e.g. the notion that economies achieves an equilibrium state like that described for gases by James Maxwell and Ludwig Boltzmann; or to have used the conservation of energy or the first law in his utility theories. [1] Most of these physics plus economics connections and assertions, however, seem rather tenuous and a stretch, as compared to other economic thermodynamicists.

Quotes | By

The following are quotes by Marshall:

> "Just as the motion of every body in the solar system affects and is affected by the motion of every other, **so it is with the elements or the problem of political economy**."
>
> — Alfred Marshall (1872), review of Stanley Jevons' 1871 *Theory of Political Economy*

See also

â— Three moral bodies problem | Stanley Jevons

References

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External links

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θΔics

In existographies, **Alfred Mayer** (1836-1897) (IQ:150|#567) was an American physicist noted for his 1878 "floating magnets" experiment, in he placed various numbers of positively-charged needles in corks floating on water, at a height above which he held a larger negatively charged side of a powerful magnet, and recorded the geometric distributions of the corks, per number of corks. [1]

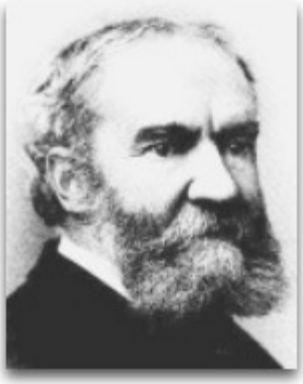

Education

In 1865, Mayer was a professor of physics and chemistry at Pennsylvania College of Gettysburg, and in the following year he was awarded his PhD from the same college.

Floating magnets experiment

See main: Floating magnets experiment

Mayer's diagrams, where corks were representative of electrons and the magnet representative of the nucleus, later served the basis for British physicist Joseph Thomson's 1904 plum pudding model of the atom. [2] Thomson's model, in turn, later inspired the 1913 quantum mechanical, electron orbital changing, Bohr model of the atom.

Thermodynamics

In a visit to Trenton and Niagara Falls, Mayer found that on misty days the water was heated by the arrest of motion after the descent, as one would expect in accordance with the first law of thermodynamics. If the atmosphere were dry, however, the evaporation more than offset the heating effect. [3]

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(d) Mayer, Alfred M. (1878). "On the Morphological Laws of the Configurations Formed by Magnets Floating Vertically and Subjected to the Attraction of a Superposed Magnet; with Notes on Some of the Phenomena in Molecular Structure Which These Experiments May Serve to Explain and Illustrate." *American Journal of Science*, 16: 247-256.
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External links

- Alfred M. Mayer – Wikipedia.
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θΔics

In existographies, **Alfred Radcliffe-Brown** (1881-1955) (Scott 50:30) (GSE:#) was an English social anthropologist, noted for []

Quotes | On

The following are quotes on Radcliffe-Brown:

> "I see most efforts at theoretical, and/or theory-method, integration as ignoring "natural," qualitative differences, whether Parsons, Merton, **Radcliffe-Brown**, or anyone else (See my MacIver, below, points 7 and 8)."
>
> — Leon Warshay (2013), "Dialogue with Libb Thims on Two cultures department", Mar 5

Quotes | By

The following are quotes by Radcliffe-Brown:

> "Like other young men with blood in their veins, I wanted to do something to reform the world – to get rid of poverty and war, and so on. So I read Godwin, Proudhon, Marx and innumerable others. Kropotkin, revolutionary, but still a scientist, pointed out how important **for any attempt to improve society was a scientific understanding of it**."
>
> — Alfred Radcliff-Brown (c.1940), commentary on his early education [1]

> "Social structure is not to be thought of as static, but as condition of equilibrium that only persists by being continually renewed, like the chemical-physiological homeostasis of a living organism. Events occur which disturb the equilibrium in some way, and a social reaction follows which tends to restore it."
>
> — Alfred Radcliff-Brown (1952), *Structure and Function in Primitive Society* (pg. xxii); cited by Richard Adams (1988) in *The Eighth Day* (pg. 43-44)

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External links

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θΔics

In existographies, **Alfred Rogers** (1933-) (CR:33), who goes by "Al Rogers", is an American philosopher noted for his 2010-launched cite LifeDoesNotExist.com, where he expounds on his view that life does not exist, that the hydrogen atom is not alive, and therefore what we perceive or conceive as "life" is but a difference in complexity as compared to less complex single atom; a view independently arrived at by American electrochemical engineer Libb Thims (2009) and American science journalist Ferris Jabr (2013), all explicitly stated views of the historical defunct theory of life positions and variations, apex of which is English geneticist Francis Crick's 1966 decisive statement that "we must abandon the word 'alive'", but that he did not know what the alternative was? (see: life terminology upgrades). . [1]

Overview

In 1988, Rogers began scouting for publisher for a draft book entitled *Our Tool, Our Master*, wherein certain economic ideas were expounded, such as outlined on his Life Does Not Exist website. In the 1990s, Rogers came up with the idea that life is something that does not exist, when he "reasoned that there was no difference between life and non-life and that the perceived difference was due to a difference in complexity." [5] The following is his 2010 online description gist of his reasoning behind his conclusion that life does not exist: [1]

> "**Life does not exist** in the sense that life is not absolutely different from non-life. The difference between life and non-life is like the difference between plants and animals. A recent article in the proceedings of the National Academy of Sciences reported that bacteria locked in Antarctic ice for 100,000 to 8-million years resumed growing when given warmth and nutrients. Could they have been alive for all that time? Could any life processes been going on for that period? If not, can a living thing spend an intermittent part of its life as a non-living thing? I think this is incongruous with life and non-life being absolutely different. During the frozen period all the conditions for life, including the DNA existed, but life did not exist. More commonly many seeds remain viable for many years under certain conditions. They go through a life cycle in part of which they are not alive. Can a living thing be not alive during part of its life?"

As to the specific year he came up with this premise, Rogers states the following: [3]

> "I don't know in what year I came up with the idea. It came about by realizing that what we call life can go through periods of being non-life-a seed being dormant for hundreds of years. Life, such as tobacco molds can be produced from non-life. It then appears that the difference is complexity rather than something intrinsic. I do not believe a hydrogen atom is alive."

Both Types of "Movement" neither of which are "alive".

Old Faithful

vs.

Paramecium

"There is no essential difference between 'life' and 'non-life.' The perceived difference is complexity. Old Faithful (Ñº) has 'life-like' movement but is easier to understand than a paramecium (Ñº). The hydrogen atom is NOT alive."

— Alfred Rogers (2014), curator of LifeDoesNotExist.com, "Email communication to Libb Thims", Nov 21

(add discussion)

Elaboration

In 2014, Rogers, in communication with Libb Thims, gave the following more detailed inside-the-mind look description his religious confrontations and life puzzlings: [6]

> "Let's see if I can do a little better than 'scattered thoughts.' I was raised as a Presbyterian and had prolonged discussions with an agnostic in army basic training. I read books advocating each viewpoint including works of Thomas of Kempis (c.1380-1471) (Ñº) and Saint Augustine and concluded by age 24 that I could not believe anything supernatural. This left me with a value system without foundation so I inquired into what was most important in one earthly existence.
>
> I believe the primary value is happiness. This is a very difficult value to conceptualize. Negatives such as sickness, hunger, poverty, poor living conditions are easier to clarify than positives such as beauty, creativity, and recognition of individual worth.
>
> The question of life emerged in the obtuse reasons for the beginning of life in biological and evolutionary studies. My studies in biology exposed me to arbitrary descriptions of life and I concluded that 'life' and 'non-life' were essentially the same. I concluded then that there were no essential differences between 'life' and 'non-life.' It also appeared that the perceived difference was complexity. Old Faithful has life-like movement but is easier to understand than a paramecium.
>
> I have more recently espoused support of the Christian church because the morality it teaches is close to my values and is able to teach these values better than any other organization. I realize the supernatural teachings of the church conflict with my own but this may be necessary to establish moral values in most people.
>
> Their supernatural beliefs, to reiterate, are not mine but agnostics and atheists do nothing to promote a moral system that is very important to social happiness."

(add discussion)

Religion

In 1956 (age 23), Rogers made a deconversion from Christianity to a new non-supernatural belief system based philosophy. [1] In 2014, the following is what Rogers had to say about his religious beliefs, after queried about Dawkins number: [4]

> "I would be a 6 on the Dawkins scale, although 10 appeals to me. Some belief in god is based on the belief that he cannot be known but can only experienced (Martin Buber, 1778-1965) (Ñº). This cannot be fully rejected or proved because only some people would experience god. It seems most logical to me that life is only a more complex form of non-life and there for does not exist. I have built my own value system based on the belief that we have only one existence and that the greatest good is to be happy and to extend happiness to those we love. Many of the resulting values are similar to those of Jesus of Nazareth so I am an attendee and supporter of a Christian church although I can never be a member or take communion or pray.I believe the church promotes moral behavior better than any other organization and thereby contributes to general happiness. Some of the ideas on the discussion you sent are repellant to me because of the zeal to be first to formulate an idea. My ideas are freely shared with anyone who agrees with them."

The first salient issue in the above statement, is that Rogers seems to be unaware that "Jesus of Nazareth", aka Jesus

Christ, never existed as well, but rather was one of a long string of son of of the sun god rewrites lineages, revolving around the Passion of Osiris, aka Osiris anointed, i.e. "christened with oil", prior to dual-deity sexual process resurrection, as described in the so-called story of Osiris and Isis (Stella Maris, aka Virgin Mary) (see: religio-mythology transcription and syncretism).

The second salient issue with the above, while certainly a workable model for Rogers and his being, is the so-called utilitarian calculus happiness model system value model, such as expounded on, in various hues, by those including: Jeremy Bentham, John Mill, Francis Edgeworth, and more recently Sam Harris, among others, is that it does not take into account the factors, such as the so-called real world "Rossini model", as outlined by Frederick Rossini (1971), according to which freedom and security in social systems are governed by entropy and enthalpy determinates; the Henry Adams' waves and tides theory of universal connection (aka the Goethean daemonic); nor the "seeming to divine senses of purpose" Einstein model of motive as free energy peaks and wells differentials determine the course of time for humans; note to mention universal coupling theory; to name a few.

Education

Rogers graduated from Temple University in 1955 with a degree in pharmacy and thereafter worked as a pharmacist and is currently retired.

Exercise

> *See: Genius and exercise*

Rogers is avid exercise enthusiast; to quote: [2]

> "At 81, I still do a sprint triathlon every year and am the current national champion in the 100 butterfly in the 80 to 84 age group."

(add)

Quotes | By

The following are relevant quotes:

> "I am interested in how people will react to the idea that the difference between life and non-life is only a matter of complexity. I also believe that when we are able to transmit human intelligence to a machine, machines will then produce entities far superior to humans and we will be irrelevant."
>
> — Alfred Rogers (2014), email communicate to Libb Thims, Nov 4

> "Life I think is still think is a useful term, in the same way that we have plants and animals. We've used it so often, it's probably a good thing to keep using that as a term? What are some of the consequences of thinking this way? Is 'life' worthless, because we don't think it's any different from 'non-life'? I don't think so. If you were building a fireplace, and you were building a fire, and somebody gave you a Stradivarius (Ñº) violin, **I don't think you would throw it on the fire**?"
>
> — Alfred Rogers (2016), "Abioism: Life Does NOT Exist" (7:01-37)

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6. Rogers, Alfred. (2014). “Email to Libb Thims”, Nov 21.

θΔics

In human chemistry, **Alfred Gilbert Steer** (1913-2003), cited as “A.G. Steer, Jr.”, was an American Goethean scholar noted for []

Overview

In 1935, Steer published *Goethe’s Social Philosophy: as Revealed in Campagne in Frankreich and Belagerung von Mainz*, his most-widely-held book. [2]

In 1979, Steer, in his *Goethe’s Science in the Structure of the Wanderjahre*, the term wanderjahre meaning “years of travel”, begins to mention "elective affinities" in passing. [3]

In 1990, Steer, in his *Goethe’s Elective Affinities*: *the Robe of Nessus*, attempts to dissect Goethe's masterpiece *Elective Affinities*, with the aim of making the book more accessible and impactive to the English-speaking reader; the subtitle of which taking its name from Goethe’s famous comment on how people viewed his dangerous novella as the “Robe of Nessus”. [1] Steer here does some of the first work on human chemical reaction theory, as he conceived Goethe would have done his reactions. Steer also seems to be one of the first to point out that Ottilie as "D" derives from the German word for "little lady" as follows:

> “The Captain then reduced the chemical process to an equation with letters: if compound AB comes into contact with compound CD, they may switch partners and end up in the new combination AC and BD. Here Eduard supplies the last and most ironic stage of anthropomorphizing by relating the letters to the people present: if A is Charlotte, then B is Eduard, C stands for the Captain, and D is the ‘Dämchen’ (little lady) Ottilie.”

(add discussion)

Education

In 1990, Steer was associated with the University of Georgia.

References

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2. Steer, Alfred G. (1935). *Goethe’s Social Philosophy*: *as Revealed in Campagne in Frankreich and Belagerung von Mainz*. Chapel Hill, University of Carolina Press.
3. Steer, Alfred G. (1979). *Goethe’s Science in the Structure of the Wanderjahre* (elective affinities, pgs. 1, 7, 66). University of Georgia Press.

External links

â— Steer, A.G. (Alfred Gilbert) (1913-) – WorldCat Identities.
â— Alfred Gilbert Steer Jr. (death notice) – OnlineAthens.com.

θΔics

In existographies, **Alfred Tennyson** (1809-1892) (IQ:170|#215) (CR:12) was an English poet, a Cattell 1000 (#133), noted for []

Overview

In 1835, Tennyson, in his poem "Locksley Hall", a dramatic monologue written as a set of 97 rhyming couplets, stated (lines 151-52) the following, semi-Empedocles' chemical aphorism laced couplet: [1]

> "Woman is the lesser man, and her passions unto mine
> Are as moonlight unto sunlight and as water unto wine."

Irish mathematical economist Francis Edgeworth cites this couplet as a launching point for the so-called aristocracy of sex in respect to his utilitarianism argument. [2]

In 2002, American physicist turned literary scholar Barri Gold, in her "The Consolation of Physics: Tennyson's Thermodynamics Solution", argues that Tennyson's 1849 poem "In Memoriam" not only anticipates evolution theory, but also, anachronistically, and incorrectly, argues or states that he was theorizing about bound energy, some thirty plus years before the term "bound energy" was even coined and formulated (Hermann Helmholtz, 1882). [3]

References

1. (a) Tennyson, Alfred. (1835). "Locksley Hall", in: *Poems*. Publisher, 1842.
(b) Locksley Hall – Wikipedia.
2. Edgeworth, Francis Y. (1881). *Mathematical Psychics: an Essay on the Application of Mathematics to the Moral Sciences* (end and means, pg. vii; social mechanics, pgs. 12-13). C. Kegan Paul & Co.
3. (a) Gold, Barri J. (2002). "The Consolation of Physics: Tennyson's Thermodynamics Solution", *Publications of the Modern Language Association*, 117(3): 449-64.
(b) Gold, Barri J. (2010). *ThermoPoetics: Energy in Victorian Literature and Science* (source/sink, pg. 223). MIT Press.

Further reading

â— Jordan, Elaine. (1996). "Tennyson, 1857-67: Divorce, Democracy, and Thermodynamics", in: *Tennyson*, ed. Rebecca Scott, Longman.

External links

â— Alfred, Lord Tennyson – Wikipedia.

θΔics

In thermodynamics, **Alfred René Jean Paul Ubbelohde** (1907-1988) was a Belgian-born English thermodynamicist noted for his suggestion that the term "animate matter" be used in place of the outdated term "life", which thus introduced the subject outline of "animate thermodynamics" and for his related postulate of local entropy decrease, arguing that living organisms, in the context of the second law, represent local decreases in entropy at the expense of increases in entropy elsewhere in the universe. Ubbelohde was one of the first to outline the subject of life thermodynamics and is noted to have coined the term disentropic. To quote Ubbelohde's view of the laws of thermodynamics in relation to life: [1]

> "So far as concerns the laws of thermodynamics there is reasonable expectation that more information about their bearing on life will be obtainable as the results of further experiments, particularly as the result of measurements on the energy and entropy changes accompanying the activities of living organisms."

(add discussion)

Butler | Time and Thermodynamics

In a review of Ubbelohde's 1947 *Time and Thermodynamics*, titled "Thermodynamics and Humanism", British physical chemist John Butler surmises that Ubbelohde overall aim is to delve into the "wider human aspects of thermodynamics", but concludes that this effort, confined mainly to short chapters at the beginning and end, "is disappointing". Butler, in a possible reference to religious thermodynamics, comments in the end of his review that "I find it rather curious that he never mentions, though he may imply, the one inevitable teleological conclusion from the second law, that if the world as we know is steadily running down, there must have been a winding up." [4]

In his opening chapter on Contributions to Thermodynamics to Scientific Humanism, the following is his condensed statement of what this refers to, a noted human thermodynamics quote:

> "Contributions to the thermodynamics of scientific humanism [concerns] insights on the nature of time, [as in] personal or psychological time, and refers to the unification of the specialized sciences effected by the contributions they make to the proper study of mankind, man's nature and destiny."

In the concluding chapters of this book, he comments that "no final judgment can yet be given in the problem [of] how far living things obey the laws of thermodynamics ... but various aspects of disentropic behavior of living things are examined."

Man and Energy

Ubbelohde's 1954 book *Man and Energy* seems to be a follow-up expanded treatise to his 1947 book, with sections and chapters on "The Heat Birth?" (of the universe), Thermodynamics and Life, and Thermodynamic Laws and Cognition, in the latter of which it is discussed whether or not animate organisms can reverse the the overall trend of entropy in the world.

Education

Ubbelohde was born in Antwerp, Belgium, in 1907. He was educated at St Paul's School, 1920-1926, Christ Church, Oxford, 1926-1930, and was senior scholar of Christ Church, 1931-1933. He then became a senior researcher, in the Department of Thermodynamics at Oxford, 1933-1935. This was followed by excursions as a Dewar Fellow of the Royal Institution, London, 1936-1940; a Principal Experimental Officer, Ministry of Supply, 1940-1945; a Professor of

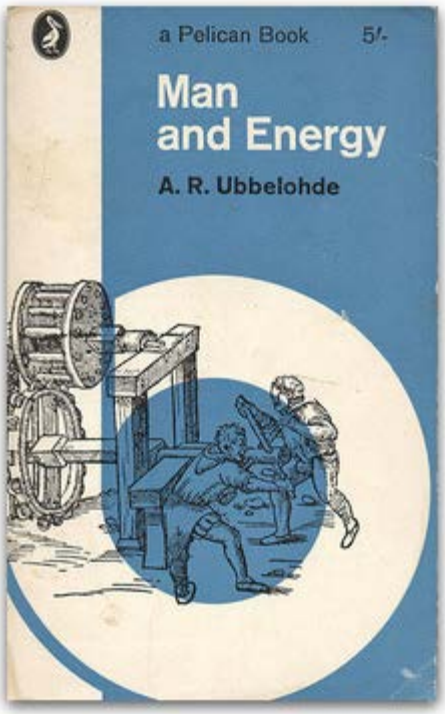

Cover of 1954 book ***Man and Energy*** by Ubbelohde.

Chemistry at Queen's University, Belfast, 1945-1954; an election as a Fellow of the Royal Society, 1951.

In 1954, Ubbelohde became a professor of thermodynamics at Imperial College London, a position he held until 1975. In 1961 he was awarded CBE; from 1961 to 1975 he was the head of the Chemical Engineering Department at Imperial College; following this he became a senior research fellow, Imperial College, 1975-1988; research interests included chemical thermodynamics, combustion, explosions and detonations, ionic melts, graphite and intercalation compounds. [2] Over the course of his career, Ubbelohde wrote six books and some 400 publications. [3] Ubbelohde was the chair of the Solvay Conferences on Chemistry (London), from 1959 to 1980. [5]

References

1. Ubbelohde, Alfred René. (1947). *Time and Thermodynamics* (ch. 9: Life and Thermodynamics, pg. 92-105). Oxford University Press.
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4. Butler, J.A.V. (1947). "Thermodynamics and Humanism (Review: Time and Thermodynamics). *Nature* (pg. 72), Vol. 19, July 19.
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External links

â— The Ubbelohde Memorial Lectures – BritishCarbon.org.

θΔics

In existographies, **Alfred Wallace** (1823-1913) (IQ:175|#245) [RGM:505|1,500+] (EvT:17|21+) (CR:8) was an English naturalist and evolutionist noted for []

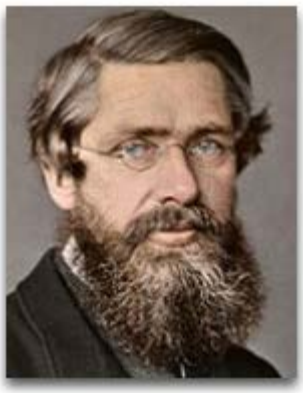

Overview

In 1855, Wallace, in his "On the Law which has Regulated the Introduction of New Species", outlined a theory of evolution according to which organisms have resulted from long and uninterrupted series of changes. [1]

In circa 1856, Charles Lyell and Edward Blyth, independently, told Charles Darwin about Wallace's paper, this goaded Darwin into writing up a "species sketch" of his theory, resulting in his now-famous 1859 *On the Origin of Species*.

Quotes | By

The following are quotes by Wallace:

> "Compared with our astounding progress in physical science and its practical application, our system of government, of administrative justice, and of national education, and our entire social and moral organization, remain in a state of barbarism."
>
> — Alfred Wallace (c.1875) [2]

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2. Haeckel, Ernst. (1899). *The Riddle of the Universe: at the Close of the Nineteenth Century* (translator: Joseph McCabe) (pg. 6). Harper & Brother, 1900.

External links

â— Alfred Russel Wallace – Wikipedia.

θΔics

In existographies, **Alfred Wegener** (1880-1930) (IQ:160|#536) (Simmons 100:53) was German geophysicist noted for his 1910 Pangaea theory of continental drift, and supercontinent formation.

Overview

In 1910, Wegener conceived supercontinent (Pangea) theory and continental drift theory; in 1912 went on expedition to find evidence of fossil plant overlap between fitting continents.

Quotes | On

The following are quotes on

> "I don't choose my masters and friends according to limelight. Galileo, Semmelweis (Ñº), **Wegener**, Darwin, Belousov (Ñº), McClintock, and Lynn Margulis were not always in the limelight."
>
> — Erland Lagerroth (2011), "My Way of Discover" (Ñº)

External links

â— Alfred Wegener – Wikipedia.

θΔics

In existographies, **Alfred Whitehead** (1861-1947) [RGM:1,228|1,500+] (Stokes 100:58) (CR:31) was an English mathematician and philosopher, noted for []

Overview

In 1925, Whitehead put forward efforts to solve the "moral responsibility problem" via recourse to a organism-centric materialistic mechanism theory, and for his followup 1928 process theory wherein he outlines a god-based quantum based micro-panpsychist approach to mind and a micro-panvitalist approach to life, and in which he employ 'extended' usage of the term "organism", to embrace the atomic and molecular aggregate of physics as well as chnopsology (biology) organisms. [1]

Organic mechanism | Organism + Materialism

In 1925, Whitehead, in his *Science and the Modern World*, a Harvard lecture series turned book, in rejection to the reduction of biology to physics, per reasoning that it seemingly negates individual moral responsibility, devised his "organic mechanism" theory, or organism + materialism, a type of materialistic vitalism dualism augmentative compromise, the gist of which, in key sections, he outlines, in his "The Romantic Reaction" lecture, as follows: [7]

> "It is the defect of the eighteenth century [materialistic] scientific scheme that it provides none of the elements which compose the immediate psychological experiences of mankind. Nor does it provide any elementary trace of the organic unity of a whole, from which the organic unities of electrons, protons, molecules, and living bodies can emerge. According to that scheme, there is no reason in the nature of things why portions of material should have any physical relations to each other. Let us grant that we cannot hope to be able to discern the laws of nature to be necessary."
>
> — Alfred Whitehead (1925), *Science and the Modern World* (pg. 75)

> "A scientific realism, based on mechanism, is conjoined with an unwavering belief in the world of men and of the higher animals as being composed of self-determining organisms."
>
> — Alfred Whitehead (1925), *Science and the Modern World* (pg. 76)

> "Tennyson goes to the heart of the difficulty. It is the problem of mechanism which appalls him: 'The star, she whispers, blindly run.' This line states starkly the whole philosophic problem implicit in the poem. Each molecule blindly runs. The human body is a collection of molecules. Therefore, the human body blindly runs, and therefore there can be no individual responsibility for the actions of the body. If you once accept that the molecule is definitely determined to be what it is, independently of any determination by reason of the total organism of the body, and if you further admit that the blind run is settled by the general mechanical laws, there can be no escape from this conclusion. But mental experiences are derivative from the actions of the body, including of course its internal behavior. Accordingly, the sole function of the mind is to have at least some of its experiences settled for it, and to add such others as may be open to it independently of the body's motions, internal and external."
>
> — Alfred Whitehead (1925), *Science and the Modern World* (pgs. 78-79)

This certainly is a mess of hatchet job at solution of the individuality problem of moral responsibility, in particular the assumption that "molecules run blindly", which certainly does not corroborate with modern physicochemical science, but nevertheless a starting point or launching pad for further discourse. Whitehead continues:

> "There are then two possible theories as to the mind. You can either deny that it can supply for itself any experiences other than those provided for it by the body, or you can admit them. If you refuse to admit the additional experiences, then all individual moral responsibility is swept away. If you do admit them, then a human being may be responsible for the state of his mind though he has no responsibility for the actions of his body. The enfeeblement of thought in the modern world is illustrated by the way in which this plain issue is avoided in Tennyson's poem. There is something kept in the background, a skeleton in the cupboard. He touches on almost every religious and scientific problem, but carefully avoids more than a passing allusion to this one."
>
> — Alfred Whitehead (1925), *Science and the Modern World* (pg. #)

> "Either the bodily molecules blindly run, or they do not. If they do blindly run, the mental states are irrelevant in discussing the bodily actions."
>
> — Alfred Whitehead (1925), *Science and the Modern World* (pg. #)

Then he interjects with John Mill's "materialistic mechanism" view, as he refers to it, and then continues:

> "I feel that this theory is an unsatisfactory compromise. The gap between living and dead matter is too vague and problematical to bear the weight of such an arbitrary assumption, which involves an essential dualism somewhere."
>
> — Alfred Whitehead (1925), *Science and the Modern World* (pg. 80)

Here, Whitehead is addressing the life/non-life false dichotomy, which has been recently resolved by defunct theory of life (2009) and life does not exist (2010) solutions. Whitehead, to continue, then he jumps to the following mess of logic, according to which the electrons of the brain are somehow different than the electrons of a piece of paper:

> "Thus an electron within a living body is different from an electron outside it, by reason of the plan of the body. The electron blindly rums either within or without the body; but it runs within the body in accordance with its character within the body; that is to say, in accordance with the general plan of the body, and this plan includes the mental state."
>
> — Alfred Whitehead (1925), *Science and the Modern World* (pg. 80)

He then states his theory as follows:

> "I shalI not discuss Mill's determinism, as it lies outside the scheme of these lectures. The foregoing discussion has been directed to secure that either determinism or free will shall have some relevance, unhampered by the difficulties introduced by materialistic mechanism, or by the compromise of vitalism. I would term the doctrine of these lectures, the theory of *organic mechanism*. In this theory, the molecules may blindly run in accordance with the general laws, but the molecules differ in their intrinsic characters according to the general organic plans of the situations in which they find themselves."
>
> — Alfred Whitehead (1925), *Science and the Modern World* (pg. 81)

(add)

Process theory

In 1927-28, Whitehead, in his University of Edinburgh Gifford Lectures turned book *Process and Reality*, platforms on Henri Bergson's creationism coded ideas, with ubiquitous references to Descartes and Hume, to produce some three-hundred plus pages of god babble soaked page fluff, to put things plainly.

His ideas, however, have attracted some modern thinkers who would like to sell encoded god theory in a semi-scientific sounding guise. To cite one example, Terrence Deacon (2011), claims that Whitehead, in his *Process and Reality*, makes the "most sophisticated effort to make twentieth-century physics compatible with teleological principles." [4] This assertion, however, is a stretch, based on a few paragraphs, wherein Whitehead attempts to give a new age / ontic opening stylized description of quantum ideas and electromagnetic theory.
Whitehead's organism theory extends, in his mind, down to the particle level and has been characterized as taking a micro-panpsychist approach to mind and a micro-panvitalist approach to life. [4]

Atomic organisms

The following is a 1929 reference, by British animal psychologist Lloyd Morgan, to Whitehead's atomic scale extended usage of the term "organism": [2]

> "Common alike to water and to carbon dioxide is the component oxygen. And the oxygen disengaged by the analysis of water has the same properties as the oxygen disengaged by the analysis of carbon dioxide. It does not follow, however, that prior to this disengagement by analysis, the atom of oxygen engaged in the transactions of a molecule of water is in all respects the same as an atom of oxygen engaged in the transactions of a molecule of carbon dioxide. The organization of the one molecule differs from that of the other. They are different 'organisms' in Professor **Whitehead's** extended usage of this word. There has been much discussion as to the acceptance or rejection of this extended usage, under which a molecule or atom as well as an oak tree, a rabbit, or an ameba, may be spoken of and discussed as an organism, though of course not a *living* organism. I am one of those who accept this extended usage. Of these terms the molecule, as an organism, is a community of atoms, as members in molecular fellowship."

The term 'panexperientialism' was coined in 1977 by American theologian-philosopher David Griffin, a combination of 'pan' meaning all of, the whole, or universal, and 'experience', meaning loosely to take place in an event, in commentary on Whitehead's theories.

Whitehead, supposedly, argued that the distinction between biology and physics is that biology studies the more complicated organisms, physics the less complicated. American physiologist Charles Sherrington (1928) devotes a certain amount of text to a discussion of Whitehead's organism point of view in respect to inconsistencies with the term life and the so-called first living thing, concluding that perhaps to call the first "living" system as not alive. [1]

Influence

In the mid-1930s, Whitehead was a mentor to American psychologist James Miller who suggested that Miller make a serious attempt to develop a theoretical integration of the biological and social sciences dealing with mankind and other living beings comparable to the physical universe theories of English physicists Arthur Eddington and James Jeans. [3] It is likely from Eddington's 1928 book *The Nature of the Physical World* that Miller learned his definition of entropy. The result of this influence was Miller's 1978 living systems theory.

Quotes | By

The following are noted quotes:

> "If I answered letters, I would have no time for original work."
>
> — Alfred Whitehead (1915), reply to Bertrand Russell about Russell's complaint that "Whitehead had not answered one of Russell's letters" [10]

"A science which hesitates to forget its founders is lost."

— Alfred Whitehead (1916), *BAAA address* (Ñº) [6]

"Mankind is driven forward by dim apprehensions of things to obscure for his existing language."

— Alfred Whitehead (c.1920), quoted by Robert Pirsig (1991) [8]

"The misconception which has haunted philosophic literature throughout centuries is the notion of independent existence. There is no such mode of existence. Every entity is only to be understood in terms of the way in which it is interwoven with the rest of the universe."

— Alfred Whitehead (c.1925) [9]

"Intelligence is quickness to apprehend as distinct from ability, which is capacity to act wisely on the thing apprehended."

— Alfred Whitehead (c.1930) (Ñº)

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3. James Grier Miller – International Society for the Systems Sciences.
4. Deacon, Terrence W. (2011). *Incomplete Nature: How Mind Emerged from Matter* (pgs. 77-78). W.W. Norton & Co.
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(b) Foley, Michael. (1990). *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian Mechanics* (pg. 84). Routledge, 2014.
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(b) Whitehead, Alfred. (1928). *Process and Reality* (pg. v). Free Press, 1979.

External links

â— Alfred Whitehead – Wikipedia.

θΔics

In hmolscience, **Ruben Alfredo Palomino Infante** (c.1960-) is a Peruvian chemical engineer noted, in sociological thermodynamics, for []

Overview

In 2001, Infante, in his “Social Entropy”, argued that social entropy is the quantity that measures the effects of the second law of thermodynamics in human social behavior and that the "state" of a human society as a “system” is described by the degree of dissatisfaction or satisfaction with the social, political, and economic rules. [1]

Infante, to begin with, after introducing some basic isothermal-isobaric chemical thermodynamics functions and definitions, namely: closed system, energy, heat, work, internal energy, enthalpy, entropy, Gibbs free energy, chemical potential (see: social chemical potential), first law, second law, Clausius entropy, Boltzmann entropy, and third law to begin with, employs the advanced perspective or “unsuspected visitor” model, as he calls it, wherein an invisible alien scientist visitor comes to earth to study humans: [2]

> “Let’s postulate the following ideal scenario for our analysis. There is an **extraterrestrial observer** (see: advanced perspective) whose spacecraft is outside of our atmosphere and by the way, he is never visible to us. However, in spite of the distance, he is still able to distinguish the movement of individual human beings. Certainly, it would not take too long for him, to realize that the movements of human beings obey chaotic rules. This ideal scenario would not matter too much to him, unless he ignores the second law of thermodynamics, but indeed he does not ignore this law. Thus, such observer would conclude quickly that human beings express many forms of unusual, seemingly irrational, behavior. For example, he will be surprised looking at riots, political meetings, religious behavior, wars, etc. As a result of these observations, he would ask himself, what in hell motivates such uncommon behavior of the human beings? Suppose now that this alien visitor gets closer to the earth (remember, he is invisible to human beings) and manages to learn the reason why the human beings behave that way. Soon he would be able to understand that such apparently unusual behavior is consistently motivated by a lack of some degree of freedom; which may be summed up as a state of satisfaction or dissatisfaction. Viewed in this way, our social system may be approached through the second law of thermodynamics.”

(add)

Infante defines "social entropy" as a "function of social state, an expression of the degree of satisfaction or dissatisfaction of human beings; this state has to deal with the social, political, cultural and economic situation." He then partitions entropy of the social system into two parts, as follows:

$$dS_s = dS_b + dS_g$$

where Sb is the entropy of the individual human "being", Sg is the entropy of the group, and Ss is the entropy of the system.

Infante, in this scenario, stated that in social systems, the Gibbs free energy is the total energy in the system less the energy that is unavailable and that this difference represents the ‘state’ of the social system.

Education

In 2001, Infante was a professor at the School of Chemistry and Chemical Engineering, National University of San Marcos. In 2012, Infante gave a talk on “Modelling the Dynamics of Pulsed Isolation of Essential Oil” at the 9th Americas Conference on Differential Equations, Trujillo, Peru. (Ñº)

References

1. Infante, Alfredo I. (2001). "Social Entropy: A Paradigmatic Approach of the Second Law of Thermodynamics to an Unusual Domain", *Nexial Institute*.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 17-18). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (pg. 634). Morrisville, NC: LuLu.

External links

â— Ruben Alfredo Palomino Infante (Spanish → English) - directorio.concytec.gob.pe.

θΔics

In existographies, **Alhazen** (c.965-1040) (IQ:172|#270) [RGM:616|1,500+] (MAG:11) (GME:58) (CR:11), aka "Ibn Al Haytham" (Arabic), pronounced "Eb-In All High them" or "Eb-In Hay-them" (Q), was an Arabic polymath who did work in astronomy and optics, who is noted for his semi "scientific method" like experimental work on light. [1]

Overview

Alhazen's prolific output has been attributed to the genius hiatus effect, namely, according to legend, owing to the caliph's anger over his supposed inability to regulate the flow of the Nile, as he had supposedly boasted that he could build a dam that would stop the Nile River flooding, he feigned madness and was put under house arrest from 1011 to 1021, during which time he is said to have invented the camera obscura, theorizing that the light which when passing though a small hole, producing an inverted image on the wall of his prison cell, is the manner in which the human eye sees:

During this period of confinement, he also wrote his influential seven-volume *Book of Optics*, along with treatises on astronomy, geometry, number theory, and natural philosophy.

Optics | Light

Alhazen, in his *Optics*, pitted Euclid's emission theory of vision against Aristotle's intromission theory of light, corroborating with the latter. [2]

> "How does light travel through transparent bodies? Light travels through transparent bodies in straight lines only.... We have explained this exhaustively in our *Book of Optics*. But let us now mention something to prove this convincingly: the fact that light travels in straight lines is clearly observed in the lights which enter into dark rooms through holes. The entering light will be clearly observable in the dust which fills the air."
>
> — Alhazen (c.1020), "Treatise on Light"

(add)

Quotes | On

The following are quotes on Alhazen:

> "**Ibn al-Haytham** [Alhazen] was certainly the world's greatest physicist in the almost two millennia gap between Archimedes and Galileo. There were others, like Biruni, Al-Kindi, Khwarizmi (it's a long list) but none of the others did physics (theory and experiment) in way we understand the subject today."
>
> — Jim Al-Khalili (2019), Tweet (Q), Jan 10

Quotes | By

The following are related quotes:

> "The seeker after the truth is not one who studies the writings of the ancients and, following his natural disposition, puts his trust in them, but rather the one who suspects his faith in them and questions what he gathers from them, the one who submits to argument and demonstration, and not to the sayings of a human being whose nature is fraught with all kinds of imperfection and deficiency. Thus the duty of the man who investigates the writings of scientists, if learning the truth is his goal, is to make himself an enemy of all that he reads, and, applying his mind to the core and margins of its content, attack it from every side. He should also suspect himself as he performs his critical examination of it, so that he may avoid falling into either prejudice or leniency."
>
> — Alhazen (c.1020) (Q)

> "Truth is sought for its own sake. And those who are engaged upon the quest for anything for its own sake are not interested in other things. Finding the truth is difficult, and the road to it is rough."
>
> — Alhazen (c.1030), *Critique of Ptolemy*

> "If learning the truth is the scientist's goal, then he must make himself the enemy of all that he reads."
>
> — Alhazen (c.1010) [3]

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External links

- Alhazen – Wikipedia.

θΔics

In thermodynamics, **G. Ali Mansoori** (c.1943-) is an Iranian-born American engineering scientist noted for being the co-editor of the 1990 book *Advances in Thermodynamics, Vol. IV: Finite-Time Thermodynamics and Thermoeconomics*, with noted economic thermodynamics chapters such as German theoretical ecologist Bengt Mansson's "Thermodynamics and Economics". [3]

Mansoori has also made contributions to molecular based study of thermodynamics and statistical mechanics of condensed matter, phase transitions and his 2005 book *Principles of Nanotechnology*, in which some of the first chapters on nanothermodynamics are presented [1].

Education

Mansoori completed his PhD at the University of Oklahoma in 1969 with a dissertation on "A Variational Approach to the Equilibrium Thermodynamic Properties of Simple Liquids and Phase Transitions". [2] Mansoori did post-doctoral work at Rice University. Mansoori currently is a professor of bioengineering and chemical engineering at the University of Illinois at Chicago.

References

1. Mansoori, G. Ali. (2005). *Principles of Nanotechnology: Molecular-based Study of Condensed Matter in Small Systems*, (chapter 3: "Thermodynamics and Statistical Mechanics of Small Systems", pgs. 84-114). World Scientific.
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Further reading

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External links

(1988-1992)

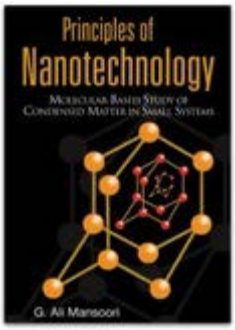

(2005)

- Ali Mansoori (faculty) – University of Illinois at Chicago.
- Thermodynamics Research Laboratory – University of Illinois at Chicago.
- Mansoori, G. A. (G. Ali) – WorldCat Identities.

In existographies, **Ali Rizvi** (c.1980-) (FA:169) is a Pakistani-born Saudi-raised Canadian-American physician turned "atheist Muslim" (see: atheism terminology), noted for []

Overview

In 2016, Rizvi, in his *The Atheist Muslim: a Journey from Religion to Reason*, outlined his deconversion from Islam to reason-based secularism leaning towards atheism process; the opening pages of which discuss what it's like being educated in Saudi Arabia, e.g. that kids aren't allowed to make paper snowflakes because they look like the "star of David", that tenth-graders were required to learn the following passages verbatim:

> "The hour will not come until Muslims will fight the Jews, and Muslims will kill all the Jews."
>
> — Author (2000), *Monotheism*

The 2005 and 2006 so-called "reformed" textbooks, per US pressure, for first-grade students contained the following:

> A fill-in-the-blank question in a first-grade textbook read, "Every religion other than Islam is _____. Whoever dies outside of Islam enters _____."
>
> The correct answers: "false" and "hellfire," respectively.
>
> — Anon (2006), *Saudi Textbook for 1st Graders*

Rizva asserts that these types of youthful indoctrinations is one of the reasons why 15 of nineteen 9/11 hijackers were Saudis.

Muhammad

Rizvi, in interview (2016), compared Muhammad, and his child bride Aisha (married: age 6; consummated: age 9), to Thomas Jefferson, his alleged relations to his mixed slave Sally Hemings (impregnated: age 22) (Ñº), seemingly indicating that he believed Muhammad to have been are real person, rather than a mythical figure (see: Egyptian mythology).

Education

Rizvi complete his is MS in biochemistry at McMaster University, Ontario, his MD in Pakistan, after which he trained in oncologic pathology at SUNY Buffalo and Roswell Park Cancer Institute, and in 2011 switched careers to the field of medical communications, to focus on writing. [3]

References

1. Rizvi, Ali A. (2016). *The Atheist Muslim: a Journey from Religion to Reason* (Amz). St. Martin's Press.
2. Anon. (2016). "LoRD 161: the Atheist Muslim, Ali A. Rizvi" (Ñº), The Legion of Reason, Mar 22.
2. Ali A. Rizvi (about) – RichardDawkins.net.

External links

â— Ali A. Rizvi – Twitter.

θΔics

In existographies, **Alice Grenfell** (1842-1917) (RMS:73) was an English religio-mythology scholar noted for []

Quotes | By

The following are quotes by Grenfell:

> "The points of contact between Judaism and the religion of Babylonia have frequently been mentioned by numerous writers, but the traces of Egyptian mythology in both Jewish and Christian scriptures have not been so much noticed, nor could they be till quite lately. It is only within the last few decades that students have been sufficiently well provided with mythological texts and commentaries to be in possession of the necessary material, thanks to the labors of Birch [Samuel Birch], von Bergmann, von Bissing, Breasted, Brugsch, **Budge**, Chabas, Deveria, Grebaut, Guieysse, de Horrack, Jequier, Lanzone, Ledrain, Lefebure, Legrain, Lieblein, Mariette [Auguste Mariette], Maspero, Moret, Piehl, Pierret, Pleyte, Renouf, Sharpe, Spiegelberg, Wiedemann and others. The relationship of Egyptian mythology to Jewish religion is too large a subject to discuss fully; *haec peritioribus relinguo* [these religious experts]; so I only mention a few traces of Egyptian influence in the Old Testament, but there are many others. I will then point out the more numerous Egyptian touches in the New Testament."
>
> — Alice Grenfell (1906), "Egyptian Mythology and the Bible"; cited by Thomas Cheyne (1907)

References

1. Grenfell, Alice. (1906). "Egyptian Mythology and the Bible" (Ñº) (Arc), *The Monist*, *16:*169-200.

θΔics

In human thermodynamics, **Alice Sheldon** (1915-1987) (IQ:165|#19), penname James Tiptree, Jr., was and American Air Force major, CIA agent, experimental psychologist, and science fiction writer noted for []

Overview

In circa 1955, Sheldon outlined moral views on the relationship between entropy, negative entropy, and life (reaction existence).

In the 1980s, Sheldon, in a series of interviews with Charles Platt, she gave the following view of her thermodynamic philosophy: [1]

> "Life is a denial of entropy; it's a striking manifestation of *negative* entropy. So I believe it can be shown that things with a high degree of organization, meaning a low degree of entropy, seem good to us. For example, Nazism is a highly entropic form, and democracy is far more complex. An altruistic act is more complex than a selfish one; you can carry these concepts quite a ways, to show that most things we feel to be 'good' in the New Testament sense, and sensible, involve a more organized structure to action. To me, Lucifer is positive entropy, runaway breakdown of the system, the war of all against all, which I think will, unfortunately, recur."

In another interview, she refers to her view of the inverse relation of entropy and information or rather information theory in regards to complexity:

> "[Negative entropy, that is] complexity, organization, high-bit information characterizes all I felt to be good, and it is at least in theory capable of objective proof that altruism is more complex, technically, than selfish greed; that the forward seat is more organized than bouncing on a horse's kidneys; that Yeats represents more information per bit than Edgar Guest; that consensus and democracy are more highly organized forms than tyranny and Nazism."

It's very rare to find a woman elaborating on thermodynamic philosophy; two notable exceptions being: Elizabeth Porteus and Teresa Brennan. It would seem likely that Sheldon included some of her thermodynamic philosophy in her science fiction writing (see: literature thermodynamics), but this remains to be tracked down.

Education

Sheldon completed her BA at American University in 1959 and her PhD in 1967 with a dissertation on the responses of animals to novel stimuli in differing environments at George Washington University.

References

1. Spek, Inez. (2000). *Alien Plots: Female Subjectivity and the Divine in the Light of James Tiptree's* A Momentary Taste of Being (pg. 64). Liverpool University Press.

External links

â— James Tiptree, Jr. – Wikipedia.

θΔics

In hmolscience, **Alicia Juarrero** (1947-), or Alicia Juarrero Roque, is a Cuban-born American ontic opening philosopher noted for her 1999 book *Dynamics in Action*, wherein she espouses a philosophical blend of Aristotle, “nothing moves itself”, and Ilya Prigogine, “uncertainty reins at the bifurcation”, to position the argument that we must embrace uncertainty and novelty within the complex system. [1]

Juarrero draws on a number of conceptions, namely information theory, systems theory, and nonequilibrium thermodynamics, to outline a new way to reconceptualize the causes of action or what she calls action theory, in such a way that seems to favor emergence theory over reductionism. [2]

Noted reviewers for Juarrero's *Dynamics in Action*, include: Americans science philosopher David Depew, chemical engineer and ecologist Robert Ulanowicz, and zoologist Stanley Salthe.

Juarrero-Deacon affair

See main: Juarrero-Deacon affair

In 2011, Juarrero, supposedly under the advise of MIT Press, initiated legal action with the University of California, Berkeley, alleging that American anthropological neurologist Terrence Deacon stole the bulk content of her theory, promulgating it into his 2011 book *Incomplete Nature: How Mind Emerged from Matter*, albeit without any reference to her work. The 2012-launched sites AliciaJuarrero.com and TheTerryDeaconAffair.com are host to the ongoing legal investigation. [4]

Education

Juarrero completed her BA and MA in philosophy, and in 1977 completed her PhD with a dissertation on “Explanation of Moral Justification of Behavior”, all at the University of Miami. Juarrero then became philosophy professor at Prince George’s Community College, Maryland, retiring from that position in 2002; teaching only part time thereafter.

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External links

â— Alicia Juarrero (profile) – Miami Magazine Online.

θΔics

In chemistry, **Alistair Matheson Duncan** (c.1941-), otherwise known as A.M. Duncan, is an English chemistry historian, whose specific focus is 18th century chemistry, in particular affinity chemistry and the use of affinity tables. Of note, Duncan wrote the 30-page introduction section to the 1970 edition of Swedish chemist Torbern Bergman's 1775 *A Dissertation on Elective Attractions*. [1]

Education

Duncan completed his 1971 PhD on "Eighteenth-Century Theories of Chemical Affinity and Attraction" at the University of London. [2] In circa 1980, Duncan was in contact with German science historian Jeremy Adler and gave him direction and guidance with his research on the affinity chemistry behind Goethe's *Elective Affinities*.

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θΔics

In terminology, **alive** (TR:350), a defunct scientific term, refers, in its historically and recursively, to something having life—a circular definition; something not dead or inanimate. [1]

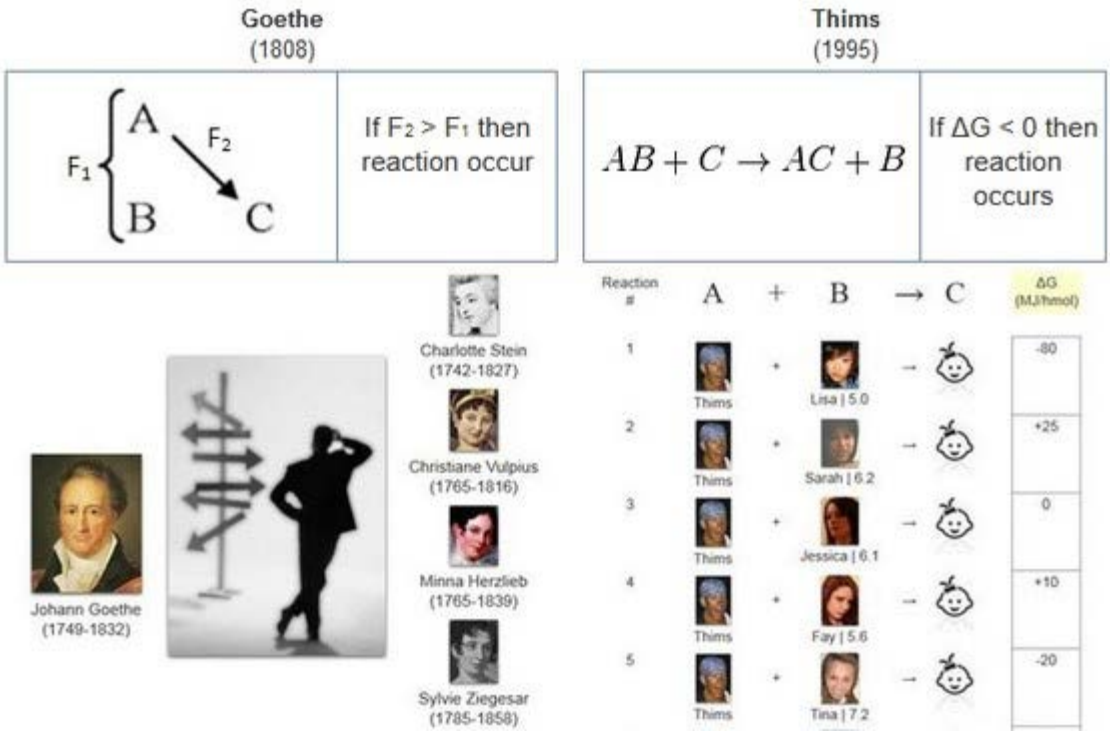

A comparison of the independent and equivalent Goethe (1808) and Thims (1995) social reaction (human chemical reaction) models, according to which if human bondings and debondings are but chemicals reacting, then when, if it all, is one able or not to assert that any other given reaction, such as hydrogen reacting with oxygen to form water:

$$2H_2 + O_2 \rightarrow 2H_20$$

can be said to be "**alive**"?

Goethe | Thims

German polyintellect Johann Goethe (1808) and American electrochemical engineer Libb Thims (1995), independently, developed equivalent versions of human chemical reaction theory, via their respective love thought experiments, amid which people are re-conceptualized as reactive chemicals whose interactions and reactions are governed by the laws and principles of physical chemistry. In this purview, one deep question that eventually arises to the fore, is when, technically, can one say that a chemical reaction, whether two humans reacting to form a couple or two hydrogen atoms reacting to form a molecule, is "alive"? Goethe left the problem open, via his famous three person (Edward, Captain, Charlotte) dialogue of chapter four:

> "You ought yourself to see these creatures, **which seem so dead**, and which are yet so full of inward energy and force, at work before your eyes. You should observe them with a real personal interest. Now they seek each other out, attract each other, seize, crush, devour, destroy each other, and then suddenly reappear again out of their combinations, and come forward in fresh, renovated, unexpected form; thus you will comprehend how we attribute to them a **sort of immortality**—how we speak of them as having sense and understanding; because we feel our own senses to be insufficient to observe them adequately, and our reason too weak to follow them."

Thims, in 2009, after study of Goethe, discovered in 2006, solved the problem, via the conclusion that "alive", and its terminological ken, is an anthropomorphic religio-mythology conception, and that just as hydrogen molecules reacting with oxygen molecules to form water molecules are defined as defined as being "alive", neither are human molecules reacting to form, e.g., dihumanide molecules, defined as being alive. [9]

Existence | Philosophy

See main: Reaction existence

American astrophysicist Max Tegmark, one of the spokespersons and or interviewees in the Templeton Foundation

promo video for their “Science and the Big Questions” funding area, who lists on his MIT faculty homepage the following quote by American inner voice philosopher and theologian Howard Thurman (1899-1981) as one of his guiding philosophies: [5]

> “Don't ask yourself what the world needs; ask yourself what makes you come **alive**. And then go and do that. Because what the world needs is people who have come alive.”

This difficult do decipher—in modern physical science terms—philosophy, does contain the word "go" which seems to have immediate connection to Scottish physicist James Maxwell's famous age three query "what's the go o' that?", and thus seems in some sense to shed light on the problem in that we can ask the same query about chemical reactions, namely: why do chemical reactions go? The first succinct answer, to this question, was given by German physical chemist Walther Nernst, in short, as follows: [8]

> “Since every chemical process, like every process of nature, can only advance without the introduction of external energy only in the sense in which it can perform work; and since also for a measure of the chemical affinity, we must presuppose the absolute condition, that every process must complete itself in the sense of the affinity—on this basis we me may without suspicion regard the maximal external work of a chemical process (i.e. the change of free energy), as the measure of affinity. Therefore the clearly defined problem of thermo-chemistry is to measure the amounts of the changes of free energy associated with chemical processes, with the greatest accuracy possible … when this problem shall be solved, then it will be possible to predict whether or not a reaction can complete itself under the respective conditions. All reactions advance only in the sense of a diminution of free energy, i.e. only in the sense of the affinity.”

Chemical reactions, certainly, do not "come alive", and certainly human interactions, relationships, and dynamics are chemical reactions (see: human chemical reaction theory); hence, a solution to the crux seems to be redefinition via the above "moral symbols", as Goethe called them, and logic utilized by Nernst and is modern explanation of reality as physical chemistry sees things.

A related quote, to the Thurman quote, shown below, by Melissa, a Rhodes Scholar, on her way to start postgraduate work at the University of Oxford, one of the women in American electrochemical engineer Libb Thims’ circa 1993 mate selection Excel-type spreadsheet of his top 19 marriage-potential girlfriends (see: Thims thought experiment), comment directed to Thims, in respect to their at the time relationship, is as follows:

> “I’ve never felt so **full of life** [alive].”
>
> — Melissa (c.1982), conversation with Libb Thims

This latter phrase “full of life”, in short, can be seen as a synonym for “alive”, the term alive, in this usage, thus being equated with a "measure of life", so to speak. This statement ever since has always been carried along in Thims' mind as a sort of unsolved puzzle. In other words what does to be "so full of life" mean? Variations of this statement had recurrently been expressed to Thims by a large percentage of the women in his relationships, and some of this puzzle found their way into Thims' circa 1995 usage of free energy differentials (dG) as a dissection tool to look at the problem in a new way, namely through chemical thermodynamics, similar to how Goethe, in his love thought experiment (see: Goethe thought experiment), analyzed his so-called *Renouncers* problem (see: Goethe timeline) of a hero being simultaneously in love with four woman in terms of affinity measures (or affinity force measures), namely through affinity chemistry, the precursor science to chemical thermodynamics.

If, however, we are advised to abandon this term (alive), in the post 2009 defunct theory of life "molecular-reaction" perspective of mental states of human existence, experience, and movement, or as English geneticist Francis Crick

cogently put it:

> "Let us **abandon** the word 'alive'."
>
> — Francis Crick, *Of Molecules and Men* (1966) [6]

what term are we to then use in its place to capture the above Thurman-Melissa usage? This is a difficult to "reinterpret" as German physicist Karl Pearson says:

> "[If] these terms ['unit-mass of living matter', 'resultant of organic forces', 'continuity of organic substance', etc.], biologists have adopted from physics, are used figuratively, we ought to find them **re-defined**."
>
> — Karl Pearson (1892), *Grammar of Science* [7]

term and as such the meaning behind the namesake "alive" is one of the hardest to reconcile in modern physical science terms.

Terminology reform

See main: Life terminology upgrades

The following, to exemplify the difficulty involved in finding a suitable redefinition for the term "alive" that captures the visceral sense of the above Thurman-Melissa examples, shows the 10 May 2013 progress of the life terminology upgrade page:

- Birth → Reaction start
- Life → Reaction existence
- Death → Reaction end
- Living → Animate
- Alive → Reactive
- Biology → Chnopsology
- Living system → Chnopsological system
- Living matter → CHNOPS-based matter
- Died → Dereacted; Deboundstated
- Dead → Debounded; No reaction existence
- Lives → Goes (Thomas Huxley, 1880)
- Protoplasm → CHNOPS comprised entity (Edwin Hill, 1900; Anon, c.1915)
- Living substance → "CHNOPS plus systems" (Frank Thone, 1936)
- Life → Animate matter (Alfred Ubbelohde, 1954)
- Earth-based life forms → CHNOPS organisms (Harold Morowitz, 1968)
- Biochemistry → The study of 'powered CHNOPS systems' (Henry Swan, 1974)
- Life thermodynamics → Animate thermodynamics (Sture Nordholm, 1997)
- Biogenic elements → CHNOPS (National Academy of Science, 1998)
- The living perspective → The CHNOPS perspective (Paul Keddy, 2007)
- Life → Animate bound state reactive existence (Libb Thims, 2007)

The above table, indicating that a replacement link for alive has not yet been written, indicates clearly that the term "alive" is a difficult shoe to fill, as compared to other terms, more easily filled terms, such as birth, life, death—in other

words, use of the term “reactive” does not exactly embody the above Thurman-Melissa usages, and is thus a difficult terminology issue in need of reconciliation.

Hirn | Positive and negative work

German physicist Gustave Hirn's 1868 *Philosophical Implications of Thermodynamics* , the subject headings of chapter two shown below:

> "Chapter two:
> §2.1: Application of the mechanical theory of animate heat engines.
> §2.2: Sources of vital heat.
> §2.3: Similarity of the organization Areas live with our engines.
> §2.4: Positive and negative work to be **alive**.
> §2.5: The first proposal of thermodynamics applied to these beings as our engines.
> §2.6: Details on the physiological functions of animated motors.
> §2.7: In what parts of the body consumes heat as much as to work."

was the first to address the question of applying thermodynamics to animals and people who he defined as "animate heat engines". Hirn's section on "positive and negative work to be alive" seems to the most fruitful in that he seems to be utilizing German physicist Rudolf Clausius' definition of positive work and negative work to explain human motion, whereby in the end the notion of "alive" becomes displaced as an unnecessary term.

Virus | Alive?

In 1969, American chemical engineer Linus Pauling, stated his ambivalent view that the virus was generally thought to be the simplest kind of matter thought to be alive. [2]

American debater Kate Shuster’s discussion of what constitutes the term **alive**, using the example of the virus, which according to American chemical engineer Linus Pauling is the “the simplest kind of matter thought to be alive”, but which, according to Pauling, can also be viewed as a large molecule (virus molecule) or type of reactive animate molecule capable of genetic reproduction in certain environments. [3]

> “To illustrate the difficulty of defining a living organism, let us consider the the simplest kinds of matter thought to be **alive**. These are the *viruses*, such as the tomato busy stunt virus, which have the power of reproducing themselves in the appropriate environment.”

The following is a more recent example:

> “Are viruses life forms? What counts as **‘alive’** is more complicated than you might think. An entity like a virus can survive without food or water while still reproducing its DNA by using hosts that it infects. But does this count as life? What are the characteristics that define something as alive?”
>
> — Kate Schuster (2008), *Is There Other Life in the Universe?*

Pauling goes on to conclude that if we require that living organisms also have the property of carrying out some metabolic reactions, then the plant viruses would be described simply as molecules (with molecular weight of the order of magnitude of 10,000,000) that have such a molecular structure as to permit them to catalyze a chemical reaction, in a proper medium, leading the synthesis of molecules identical with themselves.

See also

● Defunct theory of life

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2. Pauling, Linus. (1969). *General Chemistry* (ch.24: Biochemistry, §24.1: The Nature of Life, pgs. 767-69; §:24.2 The Structure of Living Organisms, pgs. 769-70). Dover.
3. Shuster, Kate. (2008). *Is There Other Life in the Universe?* (§: What is Life?, pgs. 29-30). Heinemann-Raintree Library.
4. (a) Max Tegmark (faculty) – Space.MIT.edu.
(b) Science and the Big Questions – Templeton.org.
5. (a) Bailie, Gil. (1996). *Violence Unveiled: Humanity at the Crossroads* (pg. xv). Crossroad Pub. Co.
(b) Howard Thurman – Wikipedia.
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θΔics

In religio-mythology, **Allah** (TR:5) is the supreme god of Islam, the belief system of Muslims, the story of which goes that this god told his ideas, as contained in the Quran, to a prophet named Muhammad, via an angel called Gabriel, who transmitted the ideas to Muhammad.

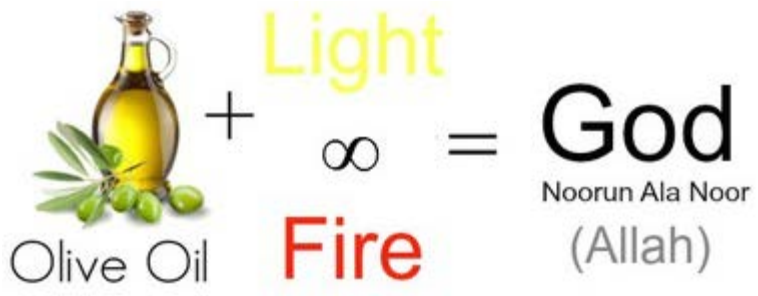

The general way Muslims conceptualize "**Allah**", namely as glowing olive oil in a dark cave.

Overview

Muslim's equate Allah (god) to ever-glowing olive oil, in a dark cave, i.e. energy infinite (Noorun Ala Noor), which amounts to a perpetual motion theory; see: Beg-Thims dialogue (threads: #130-35).

Moon god

In 1901, Hugo Winckler (Ñº) conjectures, supposedly, that Allah was a lunar deity, or moon god worshipped in pre-Islamic Arabia. [1]

References

1. Allah as a lunar deity – Wikipedia.

External links

â— Allah – Wikipedia.

θΔics

In hmolscience, **Allan Sandage** (1926-2010) was an American astronomer noted for his 1958 determination of the Hubble constant, the constant that gauges the rate of the expansion of the universe, thereby obtaining the first semi-accurate evidence-based age of the universe measurement in the 14-billion-year range, in contrast to the then presumed 25-million-year age estimates.

Religion

Sandage, of Jewish ethnicity, stated that he was "almost a practicing atheist as a boy". [1]

In circa 1980, Sandage told physicist-minister Hugh Ross, chief of Reasons.org, then serving as minister of Sierra Madre Congregational Church, that he had recently converted to Christianity, after studying the Bible for 35-years, and that to find a suitable church to attend went around and asked the pastors of 66 different churches two questions, namely:

> 1) Did I believe the Bible to be the error-free word of god, cover to cover, in all respects, including science and history?
> 2) How old did I believe the universe to be?

and that Ross was the only one who gave him answers "he felt he could endorse", which is why he joined their church.

In 1985, at age 50, during a conference on science and religion, as a Christian, telling the audience that the big bang was a supernatural event, that science had taking us to the "first event", but it could not take us further to the "first cause", i.e. the sudden emergence of matter, space, time, and energy, which pointed the need for some kind of transcendence; in 1998, he told a reporter: "It is only through the supernatural that I can understand the mystery of existence." [1] Thinks science and religion are not in conflict. (Ñº)

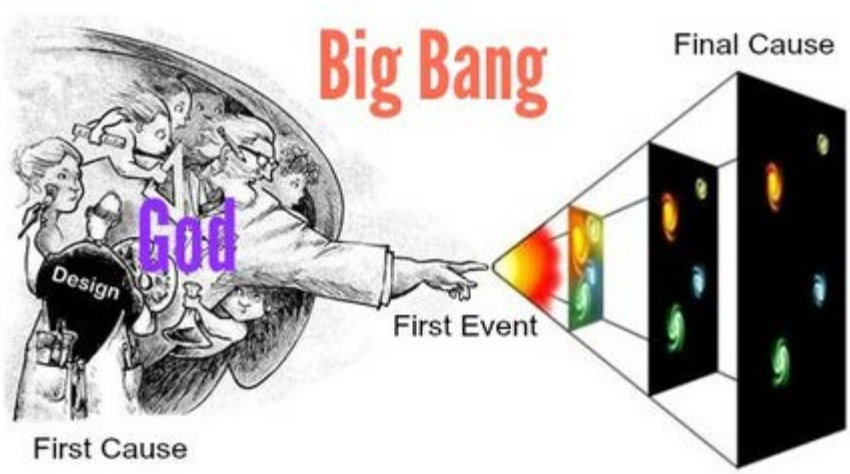

The 1985 view of the big bang according to **Sandage**.

Education

Sandage, supposedly, was the star student of Edwin Hubble, and thereafter carried on the work of his mentor. [2]

Quotes

The following are related quotes:

> "There is reluctance to reveal yourself as a believer, the opprobrium is so severe."
>
> — Allan Sandage (1998), interview [2]

References

1. (a) Begley, Sharon. (1998). "Science Finds God", *Newsweek*, Jul 20.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 103). Zondervan, 2009.
2. (a) Ross, Hugh. (2013). "Sandage Test Affirms Biblical Creation Model and Constant Laws of Physics" (Ñº),

Reasons.org, Mar 4.
(b) Hugh Ross (creationist) – Wikipedia.

External links

â— Allan Sandage – Wikipedia.

θΔics

In literature thermodynamics, **Allen MacDuffie** (c.1975-) is an American literature scholar noted for his 2006 to present work on the overlap and interconnections of thermodynamics concepts in novels.

Overview

In 2006, MacDuffie, in his "Irreversible Thermodynamics: Robert Louis Stevenson's *Dr. Jekyll and Mr. Hyde* and Scottish Energy Science", attempted to argue that Scottish writer Robert Stevenson (1850-1894), a top 30 greatest literary author ever, employed thermodynamics, energy theory, Maxwell's demon, and or irreversibility in his 1886 *Dr. Jekyll and Mr. Hyde*. [1]

MacDuffie's current project is *The City and the Sun: The Rise of Energy Culture in Victorian Britain*, an interdisciplinary book examining the evolution of the discourse of energy in Victorian literature, with central chapters on John Ruskin, Charles Dickens, Robert Louis Stevenson, H.G. Wells, and Joseph Conrad.

Education

MacDuffie completed his BA in English literature at Georgetown University in 1997, and an AM (2001) and PhD (2006) in English literature at Harvard University, the latter with a dissertation on "Entropy and Flowers: the Direction of Energy in Ruskin's Economy". [2]

References

1. (a) MacDuffie, Allen. (2006). "Irreversible Thermodynamics: Robert Louis Stevenson's *Dr. Jekyll and Mr. Hyde* and Scottish Energy Science" (abs), *Representations*, 96: 1-20, Fall.
(b) Robert Louis Stevenson – Wikipedia.
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Further reading

â— MacDuffie, Allen. (2011). "Victorian Thermodynamics and the Novel: Problems and Prospects", *Literature Compass*, 8(4): 206-13, April.

External links

â— Allen MacDuffie (faculty) – University of Texas at Austin.

θΔics

In equations, the **Alley equation**, or NO JOB = NO PU$$Y (dollar signs used here to circumnavigate the vulgar slang software filter), or mathematically:

$$\text{no job} = \text{no pussy}$$

In verbal terms, as found in the title of the popular 1970 song by Italian singer Adriano Celentano:

> "Whoever does not work, does not make love."

or, as found in lyrics, "He who does not work, does not make love, my wife told me yesterday" ... as the song goes. [13] In less-offensive, albeit inspecific mate selection prerogative terms:

$$\text{no job} = \text{no sex}$$

The first equation version, shown above, classified as a type of colloquial street physics logic, is referred to here as the "Alley equation", for lack of a neutral term, being that the equation is found on shirts made by the popular Chicago biker clothing and tattoo store The Alley, which equates to the shorthand logic that a woman is not going to have sex with a man without a job or money yielding work output.

A screenshot of a 17 May 2013 of a WGN News Chicago sports anchor Pat Tomasulo interviewing a woman named Lisa who wearing a shirt from the famous Chicago biker clothing and tattoo store "The Alley" with the logo: [4]

$$\text{no job} = \text{no pussy}$$

which is what we might call "street physics" or "real" econophysics and or financial physics, depending—namely that "job" correlates to "work" output, the value of which is gauged by money paid for services, which, according to the colloquial equation shown, has a sexual equivalence value.

In 2013, American electrochemical engineer Libb Thims showed the adjacent photo, of the woman with the Alley equation shirt, to 30 people (20 men and 10 women) and asked if the equation was "true" or "false", the results of which found that 80 percent believed the equation to be true and that slightly fewer women (10 percent) than men (25 percent) believed the equation to be false. [14]

In more "academically-neutral" terminology, American evolutionary psychologist David Buss, in his 1994 *Evolution of Desire: Strategies of Human Mating*, puts it like this: [12]

> "The seriousness of the male's lack of economic providing is illustrated by the report of a woman in her late twenties who participated in a study of marital separation: 'My husband lost a series of **jobs** and was very depressed. He just couldn't keep a job. He had a job for a couple of years, and that ended, and then he had another for a year, and that ended, and then he had another. And then he was really depressed, and he saw a social worker, but it didn't seem to be helping. And he was sleeping a lot. And I think one day I just came to the end of the line with his sleeping. I think I went out one night and came back and he hadn't even been able to get out of bed to put the children to bed. I left them watching television and there they were when I came back. The next day I asked him to leave. Very forcefully.'"

The Alley equation, shown on the woman's shirt adjacent, went semi-viral, when on 17 May 2013 WGN News Chicago aired a short video clip entitled "Morning News Giving Away Free Crap on Clark and Randolph" in which sports anchor Pat Tomasulo talks with a woman named Lisa, who is in line to get free stuff, after which the video and photos of Lisa and her "NO JOB = NO PU$$Y" shirt, shown adjacent, began to fan out around the Internet, found and

discussed over the course of the next month on sites such as Break.com and BarstoolSports.com, with thermal word themed thread comments such as: [4]

> “This girl is 100% a coal burner. You can tell by the sweatshirt.”

among other equation provoking dialog. The term ‘coal burner’, mentioned here, a 1970s originated term for a white woman who has sexual relations exclusively with black men. The reference to the woman as a "coal burner", racial differences aside, gives feel into the notion of sex as a type of human combustion reaction (see: combustion), such as theorized about in the works of German polyintellect Johann Goethe's 1796 human chemical theory, Russian geochemical mineralogist Vladimir Vernadsky's 1926 "pressure of life" green fire theory, or Chinese ecological economist Wenyuan Niu's 2001 social combustion theory.

Etymology

The no job = no sex equation (Alley equation), seems to be a variant of the older 19th century or earlier proverb: [1]

> “No bees, no honey ; no work, no money.”

A semi-recent variant of this seems to be the "no job, no money, no girlfriend" saying, such as found on the following 2009 photo of wall graffiti poetry, below left, found written on the wall of an abandoned building in Bagamoyo, Tanzania, Africa, or as found on the SomeEcards.com image, below right: [2]

No retreat
No surrender
No true love
No job
No house
No money
No girlfriend
No car

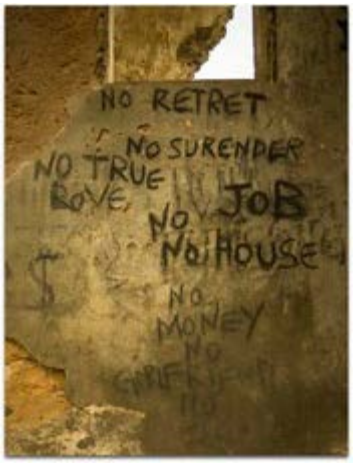

In the 2000s, the phrase "no job, no pu$$y", began to show up on popular woman's tanks and T-shirts, such as the 2007 SikWorld.com clothing advertisement, below left, or the *circa* 2012 mugshot of a woman, below right: [3]

One film that seems to well capture the nature of the Alley equation is the 2011 film *Limitless*, wherein the opening scenes a non-producing writer is dumped by his girlfriend for not having a job, after which he takes a fictional psychoactive pill called NZT which increases his mental ability allowing him within the course of one week to climb to the top of the occupational ladder, after which he begins having lots of sex with many women after which his girlfriend comes back to him. The opening breakup scene from the film is shown below:

Limitless (2011)

Guess Who's Coming to Dinner? (1967)

The 2011 film *Limitless*, gives both ends of the spectrum of the "No Job = No Sex" Alley equation, in a rather time-accelerated perspective. The "breakup scene" from the 2011 film *Limitless*, shown above left, where she says shes sick of being the bank for him (top) and gives him back his apartment keys (bottom) which seems to well-capture the "no job = no sex" equation.

Inverse Alley equation

What might be called the inverse Alley equation would be something along the lines of the following logic:

$$\text{job} \propto \text{sex}$$

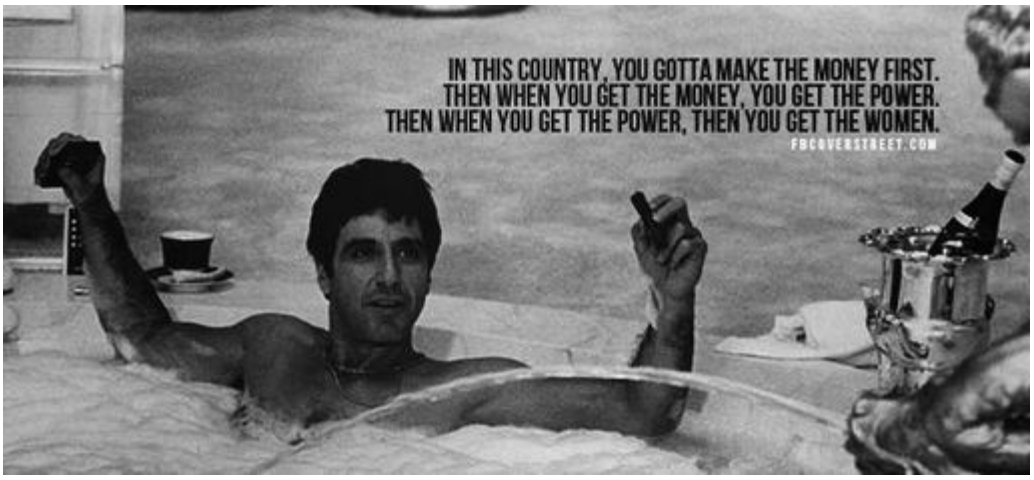

Noted street philosophy (street physics) quote from the 1983 film *Scarface*, about money, power, and woman.

namely that a man with a job will have more access to sex, the magnitude of sex, whether in quantity or quality, increases proportionately in respect to the magnitude of the job. Alternatively, as explained in the 1983 *Scarface*, quote shown adjacent, the formula looks more along the lines of a flow chart:

Money → Power → Woman

In terms of quantity, the apex example would be American professional basketball and reaction existence long bachelor player Wilt Chamberlain (1936-1999) who in his 1991 autobiography *A View From Above*, devoted an entire chapter to sex, in which famously claims that over the course of his 40-years worth of sexual activity, from 1951, age 15, to 1991, that he was closing in on 20,000 woman, which at a conservative estimate (15,000) would imply that he had sex with 375 woman a year on average, or about 1.2 woman per day. [11]

In terms of quality, 1967 film *Guess Who's Coming to Dinner*, the lead male of which is specifically scripted to be an ideally perfect male, done so specifically to make the focus on racial difference acute or the sole factor to objecting to marriage, whose background check by the parents of the female he is planning to marry yields the following results: [6]

> "He's an important guy. Just the main points: Born Los Angeles, 1930... graduated maxima *** laude John Hopkins, '54... assistant professor, Yale Medical School, '55... three years professor, London School of Tropical Medicine... three years assistant director, World Health Organization... two textbooks and a list of monographs and medical society honors... as long as your arm."

The opposite end of the spectrum, is the 1967 film *Guess Who's Coming to Dinner*, wherein the lead male is specifically scripted to be an occupationally perfect male in ever way possible, racial difference aside, and wherein the daughter, of a leading American family, tells her mother: [6]

"I fell in love with him in 20 minutes."

and when queried about their possible premarital sexual activity replies: "We haven't. He wouldn't", which seems to well-capture

The following is the dialog where the mother probes the daughter about there sexual level of their relationship:

> "Joey, I want to ask you something. How deeply are you and John in... No, I have no right to ask. How deeply involved? Do you mean, have we been to bed together? I don't mind you asking me that. We haven't. He wouldn't. I don't think he was in doubt about my

feelings, but he wouldn't."

what might be called the inverse Alley equation: Got JOB = Got Sex.

Discussion

The Alley equation (no job = no sex) seems to well-capture some type of yet-unspecified scientific law.

In 1974, American chemist, mathematician, and statistical mechanicist Elliott Montroll, in his *Introduction to Quantitative Aspects of Social Phenomena*, coauthored with Wade Badger, employ a certain number of humans to molecules comparisons, which as of 2011 is the "correct" textbook thermodynamic way humans are supposed to be viewed (*Advanced Engineering Thermodynamics*, 2011) (see: human molecular formula), and in one section of this book give the following formula for the total kinetic energy of the ith molecule in a system, being supposedly a socioeconomic system: [10]

$$\epsilon_i(x) = \frac{1}{2} m u_i^2$$

where m is mass and u_i the velocity of the molecule, respectively, then comments:

> "The [acts of a human] individual [occurs] in a manner to that in which energy is transferred from gas molecule to gas molecule by collisions. Through transfer of goods or services (or welfare), every family has someone with an annual income. One might argue that through many transactions money tends to get randomly distributed but, through some unclear constraints which are due to training, motivation, risk-taking, inheritance, intimidation etc., some people obtain [more money]."

This is pretty decent logic. Here, Montroll seems to be making a reference to the Pareto principle of wealth distribution. Likewise, the statement that every family has someone with an annual income (money paid for services), is but a academic restatement of the Alley equation street logic rule of thumb:

$$\text{no job} = \text{no sex}$$

In other words, a person, typically male, being that human socioeconomic systems are non-aqueous (in the aquatic world roles tend to be reversed, since eggs can be laid on the sea floor, and watched by males), with a job, occupation, or trade will have strong tendency to have sexual intercourse, which can be defined as a combination reaction:

$$\mathrm{A} + \mathrm{B} \rightarrow \mathrm{AB}$$

in the first step of the mechanism, which will be quantified and governed by a free energy change (see: human free energy; human free energy of formation), composed of enthalpy and transformation content energy changes. Of these sexual combination reactions, 85 percent will result in reproduction, which in human chemical reaction formulation, in overall mechanism, double displacement reaction, will accrue, and attached family will be a product of the reaction, and accumulated money, according to Pareto's principle will result.

Flow theory

The *Guess Who's Coming to Dinner* example, seems to be well quantified by American evolutionary psychologist David Buss' circa 1993 noted sexual proposition study, conducted with graduate student Jennifer Semmelroth, wherein 213 college women were polled, half of which (N=109) were asked how flattered the would feel by being persistently asked

out on a date by various men, differing by occupation, shown below, the other half (N=104), were asked how upset they would feel by outright sexual proposition by various men, similarly differing by occupation, on a Likert scale of 7 being 'most upset' to 1 being 'least upset', the results of which are shown below, with the guesstimated inclusion of the occupationally-perfect idealized male Dr. John Wayde Prentice Jr., from the 1967 film *Guess Who's Coming to Dinner* and and an occupationless homeless man: [7]

Reaction of College Women to Outright Sexual Proposition
by Various Men, Differing by Occupation

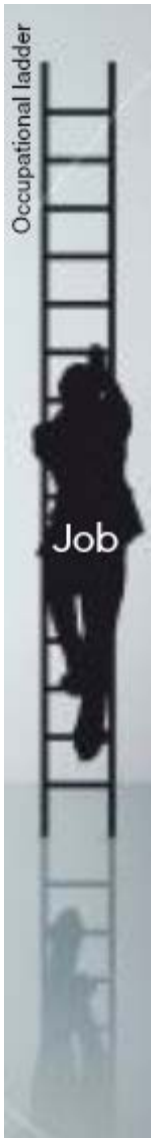

Occupation	Least upset (0)
	0.25
	0.50
	0.75
	1.00
	1.25
Dr. John Wayde Prentice Jr. [±]	1.50
	1.75
	2.00
	2.25
	2.50
Premedical students (2.65) Rock stars (2.71) Graduate students (2.80)	2.75
	3.00
	3.25
	3.50
	3.75
Construction workers (4.04)	4.00
Cleaning men (4.19) Garbage collectors (4.32)	4.25
	4.50
	4.75
	5.00
Jobless man [±]	5.25
	5.50

↑
Less upset

More upset

	Homeless man [±]	5.75 6.00 6.25 6.50 6.75 **Most upset (7.00)**	↓

In terms of energy flow, coupling theory, and branching family reproduction reaction paths or networks, there might be something here found related to Romanian-born American mechanical engineer Adrian Bejan's 1997 so-called "constructal law" of branching flow systems, which he describes as follows: [8]

> "For a finite sized flow system to persist in time (live or survive), its configuration must evolve (change in time) in such a way that it provides easier and easier access to the currents that flow through it."

or as the tag line from his 2012 book puts it: [9]

> "Everything—from biological life to inanimate systems—generates shape and structure and *evolves* in a sequence of ever-improving designs in order to facilitate."

Namely, there might exist some type of connection to the Bejan flow theory and the structural nature of how connective family trees of human sexual reactions, governed by the Alley equation, yield fruitful human reproduction reactions (see HCR theory), that grow or branch outward on the surface of the earth, in some type of mechanistic way, from the flow source (man with big job), such as depicted adjacent, for trees and lightening bolts. In other words, someone such as a "Rockefeller" or a "Gates" is going to have a lot of Alley equation energy flow, and this energy flow will need to find venting outlets, which may tend to actuate in the form of lightening bolt like family branching social mechanism lineages, possibly quantified by the Bejan flow theory, of geometrically decreasing branching size with distance from the flow source.

See also

â— Beckhap's law
â— Metamorphology

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θΔics

In human chemistry, an **alpha molecule**, or α molecule, is the molecule at the center of a grouping of molecules, which have combined into a complex, such that for the surrounding molecules, the attraction is directed toward the alpha, creating a combinations of forces that act to maintain the structure of the complex. [1] The concept of a central pressure regulating molecule was introduced in 1910 by Dutch physical chemist Johannes van der Waals, who stated: [2]

> "If we let the number of molecules that have combined into a complex be so large that it is possible to speak of a **molecule at the center** surrounded by a single layer containing almost as many other molecules as it is possible simultaneously, then for the surrounding molecules the attractionis directed towards the interior and acts to maintain the complex; and this part of its attraction is lost for the surface pressure."

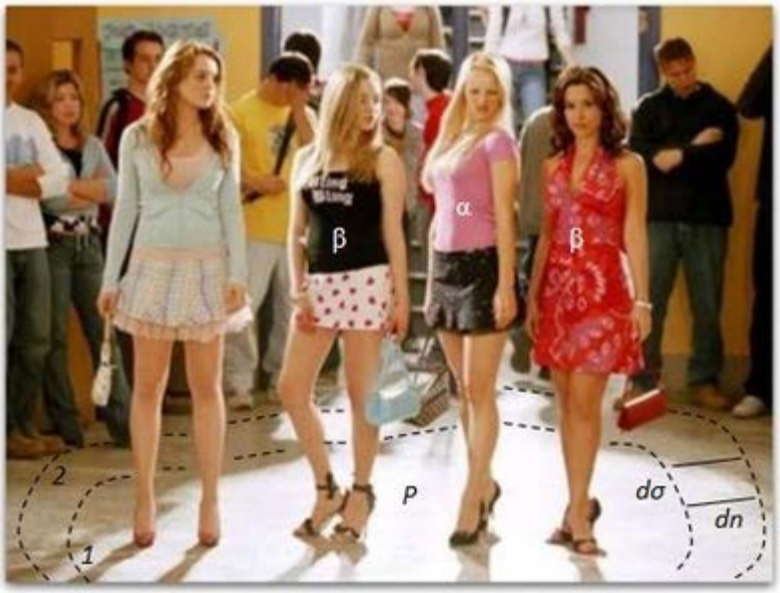

A depiction of the **α molecule** or "queen bee" Regina George (Rachel McAdams), in pink, a scene from the 2004 film *Mean Girls*, flanked by two β molecules, Karen Smith (Amanda Seyfried), left, Gretchen Wieners (Lacey Chabert), right, and an newly introduced (transfer student) α competing molecule Cady Heron (Linday Lohan), a new chemical species introduction that acts to change the chemical potential of the system. [4]

In the decades prior to this, in 1873, van der Waals published a revolutionary paper in which he proposed the view that in a body of gas there exist variations in intermolecular attractions, repulsions, and interactions, which he quantified by what he called "degree of association", which result to create density, pressure, and temperature variations.

Van der Waals overall idea was that when atoms combine, such as the the dioxide molecule, or molecules combine, such as the dihumanide molecule, that "new chemical forces" arise, which he labeled as either true association, for combined molecular associations, as contrasted with pseudo association, for interactions of non-combined molecules.

The alpha molecule phenomenon has been studied and diagrammed for lek mating arenas, rat societies, and human cafeteria distributions.

See also

â— Personal space

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Videos

â— Thims, Libb. (2011). "Pressure Volume Work and Mean Girls" (V), HumanChemistry101, Apr 25.

External links

â— What high school was *Mean Girls* based on? (2009) – Yahoo Answers.

θΔics

In symbols, **alphabet** refers to []

Greek alphabet

The following is a work-in-progress ordering of the "alphabet", as it transformed over 5,000 years, from a basis of religio-mythology significant key Egyptian hieroglyphic symbols, to the 24-letter Greek alphabet, to the modern 26-letter English alphabet: [1]

		Egyptian hieroglyphs (many symbols) (2500BC)				**Phoenician alphabet** (22 letters) [1050BC]	#	**Greek alphabet** (24 letters) [800BC]		**Etruscan** (# letters) [300BC]	**Roman** (26 letters) [800AD]	**Derived Terms**
1.	**Phoenix** (bennu)					aleph	**1**	A Alpha	α alpha		**A**	Atum, Adam
2.						beth	**2**	B Beta	β beta		B	Ab; Ab-raham; B-rahma
3.								X Chi	χ chi		C	
						way	**3**	Ïœ Diagamma	Ï diagamma			
4.	**Pyramid** (Atum)					daleth	**4**	Δ Delta	δ delta		**D**	Δ, ΘΔ-ics, derivative, derivation
5.						he	**5**	E Epsilon	ε epsilon		E	En-ergon (energon), energeia, energy
							6	Ïœ Diagamma	Ï , Ï› diagamma			
6.								Φ Phi	φ phi		F	Frieie energie (see: free energy)
7.						gimel	**3**	Γ Gamma	γ gamma		G	Gibbs
8.						heth	**8**	H Eta	η eta		H	Helios, heat; heat content; enthalpy
9.						yodh		I Iota	ι iota		I	
10.											J	Joule
11.						kaph		K Kappa	κ kappa		K	Kelvin
12.						lamedh		Λ Lambda	λ lambda		L	Love
13.						mem		M Mu	μ		M	Mass, Matter

									mu			
14.	**Water** (Nun)					nun		N Nu	ν nu		**N**	Noah, Nuh, number, new, neo, nil, negative, noosphere
15.						ayin		O Omicron	ο omicron		O	
16.						pe		Π Pi	π pi		P	Pressure
						sade		M san				
17.						qoph		Ϙ qoppa		ϙ	**Q**	Quantity
	Sun (Ra)			Ouroboros	Ê~	, ⊗ teth / tet	**9**	, Θ Theta	θ theta	,⊙	Th	Theos, theology, Theodorus, Theophrastus, Thanatos (see Mor). therm, thermal, temperature, thermo-, ΘΔ, think, thought,
18.						res		P Rho	ρ rho		R	Gas constant
19.						sin		Σ Sigma	σ, ς sigma		S	Entropy
20.						taw		T Tau	τ tau		T	Temperature
21.								Y Upsilon	υ upsilon		U	Internal energy
22.											V	
23.								Ω Omega	ω omega		W	Wahrscheinlichkeit (see: Multiplicity)
24.						samekh		Ξ Xi	ξ xi		X	
25.								Ψ Psi	ψ psi		Y	
26						zayin	**7**	Z Zeta	ζ zeta		Z	

(add)

Egyptian | Phoenician

While the jump from Phoenician alphabet to Greek alphabet has been worked out as being closely related, the jump from Egyptian to Phoenician is lacking in many areas. The following, however, shows how the Phoenician gods derived from Egyptian gods: [5]

EGYPTIAN	PHŒNICIAN
Set	Set
Bal	Ba'al
Pth Hephaistos	(Ptah) the opener, with seven forces, the Semitic week
Esmun Eighth Hermes	Esmun
Tet. Hermes	Tet, the Serpent
Amun, the concealed	Amon, the Sculptor
A-nebu	Nebo
Khonsa Heracles	Kon Heracles
Her God of Day	Ur, God of Light
Hes-Iri-Hesar	Asar, The Mighty
Anuke	Hanokhe
N.T. Athena-Tenait	Teneth, Tenait
HS. Throne	HaS. (toreth) Throne

(add)

Theta | #9 | Ennead

The Greek symbol theta 'θ' (lower case), or Theta 'Θ' (upper case), represented the number 9 in the Greek numbering system, which, prior to the Greeks, was written by the Egyptians as a circle with X inside " ", generally known as the symbol for the city of Heliopolis, aka "city of the sun", or also a circle with dot in side " Ê˜ ", the latter generally, however, being the symbol for Ra, the sun god, such as shown in Gardiner's sign list (1929).

In c.280, Porphyry, in some publication, stated that the Greek theta corresponds firstly to the 'soul' of the world (see: world soul), and also, more importantly, that the significance of number "nine", in respect to its use in as "theta", was symbolic or representative of the famous "**Ennead**" [9 gods], or paut (group) of nine deities, of Heliopolis, as told in their Heliopolis creation myth, which is behind the constructions of the pyramids. [2]

In c.555, John Lydus, supposedly, noted that the Egyptians also used a symbol in the form of a *theta* for the cosmos, with an airy fiery circle representing the world, and a snake, spanning the middle, representing the *agathos daimon* or 'good spirit'; which would seem to correspond to what we now call the "ouroboros". [4]

Quotes

The following are related quotes:

> "In the Greek He is called Theos: placer, arranger, He who brings cosmos out of chaos, if it be not one of the primitive forms for divinity, of which the literal meaning is unknown. Theos gives Thetis (mother of Achilles), Theta (mother of the sun): divine = Goda and Dione, besides many other names generally beginning with Theo, Thea, Thei, or their cognate forms. Theos, in combination with Doron: a gift, supplies us with Theodorus, Theodore, Tudor, which are often confounded with those from the Gothic word Theod: people, whence Theoderic, Derrick, Dirk, and these, again, frequently suffer confusion with those connected with the Celtic word Darach: an oak, as Derringer (often taken as an ally of above given) : oaken spear. Derringer being made famous by his pistols, suggests Shakespeare's well-known Pistol: either a man of Pistoa, a pistolier (like carbineer), or a maker of *pistoles*, and so = Pringle, probably the maker of an obsolete coin so called. Theos of the Greeks, gave Deus to the Romans, Dieu to the French, Dios to the Spaniards, Dio Italians, and deity to us."
>
> — Henry Long (1870), *The Names We Bear* (pg. 216)

> "The letter ***theta*** (Θ) was, in its archaic form, written as a cross within a circle (,) and later as a line or point within a circle (Θ, Ê˜). According to **Porphyry** (c.280), the Egyptians used an X within a circle as a symbol of the soul. Having a value of nine '9', it was used as a symbol for the **Ennead** [nine gods], the nine major deities of the ancient Egyptians. The earliest of these, the great Ennead of Heliopolis, was comprised of the original creator god, Atum, often identified with Ra

[Atum-Ra]; his children, Shu and Tefnut; their children, Geb and Nut; and the fourth generation, the brothers, Osiris and Set, and their sisters, Isis and Nephthys. Johannis Lydus (c.540) noted that the Egyptians also used a symbol in the form of a *theta* for the cosmos, with an airy fiery circle representing the world, and a snake, spanning the middle, representing the *agathos daimon* or 'good spirit'. The Egyptians also used the sign of a point within a circle (Ê˜) to represent the sun god **Ra**, the probable origin of its use as the astrological symbol for the sun. Coincidentally, *theta* had the same value in isopsephy as Helios, namely: ΘΗΤΑ = 318 = ΗΛΙΟΣ [Helios]. In classical Athens, *theta* was also known as the 'letter of death' because it was the initial letter of *Thanatos* [see: Mor] (death). It survives on potsherds used by Athenians when voting for the death penalty."

— Kieren Barry (1999), *The Greek Qabalah: Alphabetical and Mysticism and Numerology in the Ancient World* (pg. 73) [4]

"In Old Hebrew and Phoenician as the letter *tet* ' ', also known as the 'compass', is part of all early alphabets, including Mayan, Chinese, Linear A & B, Etruscan, and the Indus Valley scripts. It also appears on early rock paintings all over the world. The *tet* became the Greek **theta**, originally written (now θ). Theta is the first letter of god: *theos* [see: theology], and his throne or *thronos*."

— Esther Stein (2018), *The Visible Kingdom of God: the Song of Noah* [3]

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θΔics

In human chemistry, **Alphonse Esquiros** (1812-1876) was a French religious writer noted his 1940 discussion of human molecules, law of attraction, and unity, as having some direction toward god.

Overview

In 1840, Esquiros, in his *The Gospel of People*, gave one of the earliest uses of the term molécules humaines (the English translation being 'human molecules'), referring to people a person as a molecule: [1]

> "For verily I say unto you, the heart that prays, as one who loves the world advances in unity, that is to say towards God. This unit can be held in effect by the assent of **human molecules** to carry all toward each other; the law of attraction is a law of love."

The book in which this is found, to note, is a exposition on the life and times of Jesus Christ.

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External links

â— Henri-Francois-Alphonse Esquiros – Wikipedia.

θΔics

In god disproofs, **aluminum disproof**, or "aluminum proof that that god does not exist", refers conflicting "fact" that god, supernaturally speaking, said, as told to the prophets Moses, in the *Bible*, and Muhammad, in the *Quran*, that he made humans out of clay (see: clay creation myth), which is a substance comprised predominately of the element aluminum Al, but that humans, according to modern mass composition analyses, are NOT made of aluminum. The discrepancy proves that god does not exist.

A rendition of discernment, first pointed out by Alfred Lotka (1925), that chemically speaking, according to elemental composition, humans, as CHNOPS+20 entities, are not made of "clay", which is a AlSiO+6 type of matter, and that the **clay creation myth** of humans is but ancient mythological "poetry", i.e. religio-mythology.

Lotka

In 1925, Alfred Lotka, in his *Elements of Physical Biology*, was to first to point out that, chemically-speaking, humans do not have the same elemental composition of clay, and that the clay creation origin of humans is but a poetical fancy; specifically:

> "On the whole it may be said the living organisms are composed of comparatively rare elements. We are, indeed, earth-born, but yet not altogether common clay. Indeed, taken literally the expression "common clay," as applied to man, is an extreme case of **poetic license**; for aluminum and silicon the chief constituents of clay, and taking second and third place in rank of abundance among the components of the earth's crust, are both present only in traces in the human body."

Lotka, in short, gave the first so-called "aluminum disproof", of the various disproofs of the existence of god, i.e. in indirect reference to the clay creation myth of humans. This, in short, is indirect implicit Bible debunking, wherein he relegates the creation of humans according to Genesis (or Heliopolis creation myth) as being but a form of poetry.

Overview

That god said, as recorded in the *Bible* (Gen 2:7) and the *Quran* (Surah 15:26), among other places, that he created man from clay or a mixture of clay ("Adam" is Hebrew for clay) and divine breath or spirit (Eve is Hebrew for breath or spirit), and that he created "plant life" on the third day of creation, "animal life" on the fifth day of creation, and "human life" on the sixth day of creation. God also gave this clay + spirit made human soul. The substance clay (Ñº) is a naturally occurring aluminum silicate ($Al_2(SiO_3)_3$,) composed primarily of fine-grained minerals, including: Andalusite (Al_2SiO_5), Sillimanite (Al_2SiO_5), and Kyanite (Al_2SiO_5).

The models of human according to god, as compared to a human according to science, are compared below:

	God's view	Science's view
Human	f{Al, Si, O} + life + spirit + soul	powered f{CHNOPS+20} elements

The clay creation myth (god's view) as compared to the human free energy of formation model (science's view). This

proves that god does not exist.

Thims

In 2014, Libb Thims, independent of Lotka, began employing the aluminum disproof in dialogue with theists, as a tool to falter their "god complex" belief system, e.g. see: 7 Jul 2014 Beg-Thims dialogue (comment #10); then on 6 Jan 2015, by Libb Thims (V:5:40-6:05), as an effective disproof of the existence of god.

References

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θΔics

In existographies, **Alvin Kuhn** (1880-1963) was an American religio-mythology scholar noted for []

Overview

In 1940, Kuhn published *Lost Light: an Interpretation of Ancient Scriptures*, which is like-ranked, according to Amazon reviewers (Q), as between Gerald Massey's *The Historical Jesus and the Mythical Christ* (c.1900) and Tom Harpur's *The Pagan Christ* (2004). [1]

Chemistry | Physics

Kuhn, as summarized by Tom Harpur (2004), supposedly, was trying to sell, in place of standard Christianity, an a seeming monism, Egyptian-based model, such that the "glow of Christliness is at once both chemically radioactive and intellectual". [4] The following are representative chemistry and physics term usage (see: Beg analysis) quotes:

> "The intelligent ancient Egyptians called the human body (see: Egyptian human) 'the crucible of the great house of flame.' The mingled fires of the four grades of consciousness, sense, feeling, mind and spirit flare up in a constant 'burning' in the body of man, and the product is as certainly determined by the nature and properties of the mixture as is any chemical compound in a test-tube. The true science of the psyche would be that which gives a knowledge by which one would mingle the proper elements in proper proportions (compare: William Fairburn, 1914). It is therefore as idle for a mortal to pray for results other than the one which the law of divine chemistry inexorably prescribes from the mixture, as it would be for a chemist to pray that certain combinations should give a result different from the known one."
>
> — Alvin Kuhn (1954), *Prayer and Healing: a Rational Exegesis* [7]

> "Religion has ever tended to persuade that the forces of faith and prayer will override the laws of chemistry and physics and work miracles. Phenomena without end have been claimed and reported to substantiate the claim. Some of this appears formidable and carries conviction to many. It is bluntly contended here that it would be tragedy if special forces of faith and pietism, of thaumaturgy or sorcery, or any sort of psychological mummery could alter, negate or modify the laws of nature."
>
> — Alvin Kuhn (1954), *Prayer and Healing: a Rational Exegesis* [7]

These are good, indeed. In the following, however, Kuhn seems to grasp at some type of twisted idea of Kantian chemical deism, or something to this effect:

> "If this mental chicanery is accepted and ecclesiastical history evidences that it is nearly universal, then it distinctly places divinity in the role of flouting its own expressly announced principle of morality, the assurance of an inviolable moral order in the world. Said Kant: "Two things fill the mind with ever new and increasing admiration and awe, the oftener and the longer we reflect upon them: the starry heavens above and the moral law within." If the moral law is thus found conclusively sanctioned in the consciousness of the human, such authority must spring from its being the counterpart in man of the same universal law of the cosmic mind. If the moral law is sacred to man, it must be infinitely more sacred to god, and therefore inviolable. Logically, it cannot be assumed that god can break, ignore or set aside his own invincible principle of cosmic justice. He cannot vouchsafe benison indiscriminately. He cannot permit any to reap where they have not sown. He cannot out of the compassion of his heart, flout the laws of chemistry. He cannot lavish blessings upon some and leave others unnoticed. We simply cannot think of deity as being so passionately compassionate that it showers blessings without good judgment based on some principle of right."

— Alvin Kuhn (1954), *Prayer and Healing: a Rational Exegesis* [7]

Here, this seems to be a grasp at something akin to what Pierre Teilhard was after in the 1930s.

Lectures

Kuhn, supposedly, gave over 2,000 public lectures: "I have given nearly 2,000 lectures all over the U.S. and Canada, and always have been asked to return." [5] These lectures were always lengthy, detailed, and delivered to packed houses, with a "huge outpouring of vitality and strength", as told by people who attended these, as Tom Harpur (2004) reports. [4]

Influence

Kuhn has been influential to those including John Jackson and Tom Harpur, the latter of whom cited Kuhn as one of his top three citation staples, along with Gerald Massey and Godfrey Higgins. [2]

Quotes | On

The following are Kuhn related quotes:

> "**Kuhn** is a man of immense learning and even greater courage. He is one of the single greatest geniuses of the twentieth century, who towers above all others of recent memory in intellect and his understanding of the world's religions."
>
> — Tom Harpur (2004), *The Pagan Christ*

> "Harpur's book is merely a reiteration of 'pagan copycat' theories. The bibliography contains many unreliable sources: Freke and Gandy, Acharya S [Dorothy Murdock], Tim Leedom, T. W. Doane, Earl Doherty, Helen Ellerbe, Kersey Graves, John Spong, Godfrey Higgins, Gerald Massey, **Alvin Kuhn**. These last three (in reverse order) are Harpur's most favored sources; throughout Harpur expresses bewilderment that these three "scholars" (the word he applies liberally to just about anyone, regardless of credentials), especially Kuhn, have been so vastly ignored. The idea that they have been ignored because they are not competent scholars does not occur to Harpur."
>
> — John Holding (2005), critique of Harpur's *The Pagan Christ* [3]

> "I personally find Gerald Massey to be a joke within academia. His criticism by known scholars was very positive. Here a paste on his reception in the scrutiny of academia. Christian theologian W. Ward Gasque, a PhD from Harvard and Manchester University, sent emails to twenty Egyptologists that he considered leaders of the field – including Kenneth Kitchen of the University of Liverpool and Ron Leprohan of the University of Toronto – in Canada, the United States, Britain, Australia, Germany and Austria to verify academic support for some of these assertions. His primary targets were Tom Harpur, **Alvin Boyd Kuhn** and the Christ myth theory, and only indirectly Massey. Ten out of twenty responded, but most were not named. According to Gasque, Massey's work, which draws comparisons between the Judeo-Christian religion and the Egyptian religion, is not considered significant in the field of modern Egyptology and is not mentioned in the Oxford Encyclopedia of Ancient Egypt or similar reference works of modern Egyptology. Gasque reports that those who responded were unanimous in dismissing the proposed etymologies for Jesus and Christ, and one unspecified Egyptologist referred to Alvin Boyd Kuhn's comparison as 'fringe nonsense'."
>
> — Mr. O. (2015), "Message to Libb Thims" (Q), Feb 19

Quotes | By

The following are representative Kuhn quotes:

> "Therefore, it would be found to be composed of the first two letters of the alphabet. This is precisely what is found in the Hebrew word for father: AB. Linking it with the Egyptian RA, the radiant solar deity, we have AB-RA-M, receiving later in its evolution the developed powers of godhood represented by the fifth Hebrew letter, he, and so becoming **AB-RA-H-AM**. And as Abram came out of the primordial empyreal fire, UR, it is hardly coincidental that even UR begins with that letter, U, which (with V) represents the downward line of descent, the turning upward and the return to the heights."
>
> — Alvin Kuhn (1900), *Esoteric Structure of the Alphabet* (Q) (pg. 23)

> "The next element is water, and this is a more pertinent symbol of the lower self in man even than earth. It stands in two senses, first, for the primordial essence of all substance, the water of the abyss, the mother principle of all things: secondly for the higher water of life. The first is called in Egypt the water of the Nun, or of Nu (Nnu, equated with Noah by Massey). The Greek Nux (Nyx), Latin Nox, perhaps matches this goddess of the infinite void, in whom there is nothing but the sheer potentiality of life. As this is the primal darkness and the void. Nu, Nun, Nyx, is apparently the linguistic original of all things negative in speech, as 'no', 'none', 'not, 'nought', 'never', 'negative', German 'nichts' [see: hieroglyphics]. But out of it flashed the first ray of light. It was the water of source, and life is born out of water."
>
> — Alvin Kuhn (1940), *Lost Light* (pg. 357)

> "There is not one iota of history as we know it in the entire Bible!"
>
> — Alvin Kuhn (c.1940), "Our Birth is But a Sleep" (Q); cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 115)

> "It is quite exciting, incidentally, to know that the Genesis account of the creation of mankind through its first parentage in Adam and Eve bears the marks of derivation from the primary Egyptian symbolic depiction."
>
> — Alvin Kuhn (c.1940) (Q)

> "Thinking which does not start from and continue in close relation to its foundations in the physical universe must lead to falsity."
>
> — Alvin Kuhn (c.1940) (Q)

> "No one can make the search and discover these numberless resemblances without forming the conviction that the Bible writings are **'rescripts'**, often … corrupted, of ancient wisdom literature."
>
> — Alvin Kuhn (1944), *Who is the King of Glory?* (pg. 191); cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 30) [6]

> "The Rosetta Stone 'struck a mighty blow at historical Christianity' by showing how Christianity stole all

of its ideas from Egyptian religion."

— Alvin Kuhn (1944), *Who Is This King of Glory?* (Q)

See also

- Thomas Kuhn

References

1. Kuhn, Alvin. (1940). *Lost Light: an Interpretation of Ancient Scriptures*. Filiquarian Publishing, 2007.
2. (a) Harpur, Tom. (2004). *The Pagan Christ*. Thomas Allan Publishers.
(b) Holding, John P. (c.2005). "Tom Harpur's *The Pagan Christ:* a Critique" (Q), Tektonics.org.
3. Holding, John P. (c.2005). "Tom Harpur's *The Pagan Christ:* a Critique" (Q), Tektonics.org.
4. Harpur, Tom. (2004). *The Pagan Christ* (chemically radioactive, pg. 41; also, pg. 204). Thomas Allan Publishers.
5. Alvin Kuhn (about) – pc93.tribod.com.
6. (a) Kuhn, Alvin. (1944). *Who is the King of Glory?: A Critical Study of the Christos-Messiah Tradition* (pg. 191). Publisher.
(b) Harpur, Tom. (2004). *The Pagan Christ* (pg. 30). Thomas Allan Publishers.
7. Kuhn, Alvin. (1954). *Prayer and Healing: a Rational Exegesis* (Arc) (Q) (Q). Theosophical Press, 1966.

Further reading

- Kuhn, Alvin. (1930). *Theosophy: A Modern Revival of the Ancient Wisdom*. Publisher.
- Kuhn, Alvin. (c.1950). *Rudolf Steiner's Mystery of Golgotha*. Unpublished.

External links

- Alvin Boyd Kuhn – Wikipedia.

θΔics

In hmolscience, **Alvin Plantinga** (1932-) is an American philosopher, whose general aim is to meld Christian apologeticism with naturalism, to show that science and religion are compatible, generally known for his 1974 *Good, Freedom, and Evil*, wherein he attempts to solve the problem of evil, via arguments about natural evil and moral evil, for his 1993 so-called evolutionary argument against naturalism, wherein he attempts to pit evolution theory against naturalism, to show that the former disproves the latter, in respect to the origin of truth, and for his 2011 *Where the Conflict Really Lies*, the cover of which shows compatibility between reactions (chemistry), plants (biology), and the cross (Christianity). [1]

Evolution | Naturalism argument

In 1993, Plantinga introduced his so-called "evolutionary argument against naturalism" (or Darwin's doubt), cited by Maltesean agnostic anti-atheism Bo Jinn (2013), the gist of which is as follows: [2]

> "Atheism gives us very good reasons to doubt the truth of any of our beliefs, bearing in mind that those beliefs are purely the result of matter and energy, unguided by any higher intelligence or scope (God), which is what naturalism (atheism) presupposes. There is no reason why a mindless evolutionary process centered only on survival is meant to produce beings capable of discovering truth, for the simple reason that evolution is not concerned in the very slightest with truth."

The first incorrect point of this assertion, in respect to "survival" was pointed out by Robert Pirsig (1991) and his Chemistry professor paradox. The rest of the statement is incorrect, in that it misattributes presuppositions about "naturalism", i.e. what is natural and unnatural, in respect to matter and energy, to Darwin, whereas correctly the attribution is Clausius (or rather Gibbs, as per evolutionary systems are concerned, i.e. the replacement or rather usurpment of God's energy with Gibbs energy).

Related

Plantinga's work, according to Mr. O, is thematically similar, in the debate arena, to a mixture of Thomas Nagel, John Lennox, Sam Harris, William Craig, Stephen Evans (Q), Michio Kaku (Q), Richard Dawkins, Bart Ehrman (Q), Neil Tyson, Gary Habermas (Q), John Locke, William Paley, C.S. Lewis, and Einstein, respectively.

Quotes

The following are related quotes:

> "Natural atheology, the attempt to prove that God does not exist or that at any rate it is unreasonable or irrational to believe that he does—in which the most widely accepted and impressive piece or representative has to do with the so-called problem of evil—is the opposite of natural theology, attempts to give successful arguments or proofs for the existence of God [in nature]."
>
> — Alvin Plantinga (1974), *God, Freedom, and Evil* [3]

References

1. Plantinga, Alvin. (2011). *Where the Conflict Really Lies: Science, Religion, and Naturalism*. Oxford University Press.
2. (a) Evolutionary argument against naturalism – Wikipedia.
(b) Jinn, Bo. (2013). *Illogical Atheism: a Comprehensive Response to the Contemporary Freethinker from a Lapsed Agnostic* (eB) (loc. 1979). Sattwa Publishing, 2014.
3. Plantinga, Alvin. (1974). *God, Freedom, and Evil* (natural atheology, pgs. 2-7). William B. Eerdmans Publishing Co.

Videos

● Plantinga, Alvin. (2010). “Science and Religion: Where the Conflict Really Lies” (O), Lecture at Biola University, c. Nov 12.

External links

● Alvin Plantinga – Wikipedia.

θΔics

In hmolscience, **Alvin M. Saperstein** (c.1930-) is an American physicist noted for his 1982 suggestion that moral implications of thermodynamics be taught to college physics students and for his 1980s to 1990s work on the physics of war; and for his 1999 *Dynamic Modeling of the Onset of War*, wherein he attempts to model war using some type of linear equations.

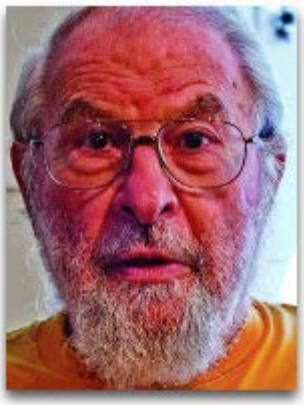

Morality

See main: Morality and thermodynamics

In 1982, Saperstein, in his "Point of View: Ethics in the Classroom: Morality and the Laws of Thermodynamics", suggested that moral implications of thermodynamics be taught to college students, the abstract of which is as follows: [1]

> "The first and second laws of thermodynamics are usually presented as straight physics. Local problems (such as heat engines) may be assigned but seldom is any effort made to examine **universal human problems**. Considering moral implications of these laws makes them relevant to students, gaining their attention and easing instruction."

(add discussion)

War

In 1984, Saperstein published "Chaos: a Model for the Outbreak of War", the abstract of which is as follows: [2]

> "The chaos as formulated for physical dynamic systems is applied to a very simple nonlinear model of the arms race. The transition, from stability to instability, from arms race to war, could be analogous to the transition from a laminar to a turbulent (or chaotic) flow."

In 1999, Saperstein published *Dynamic Modeling of the Onset of War*. [3]

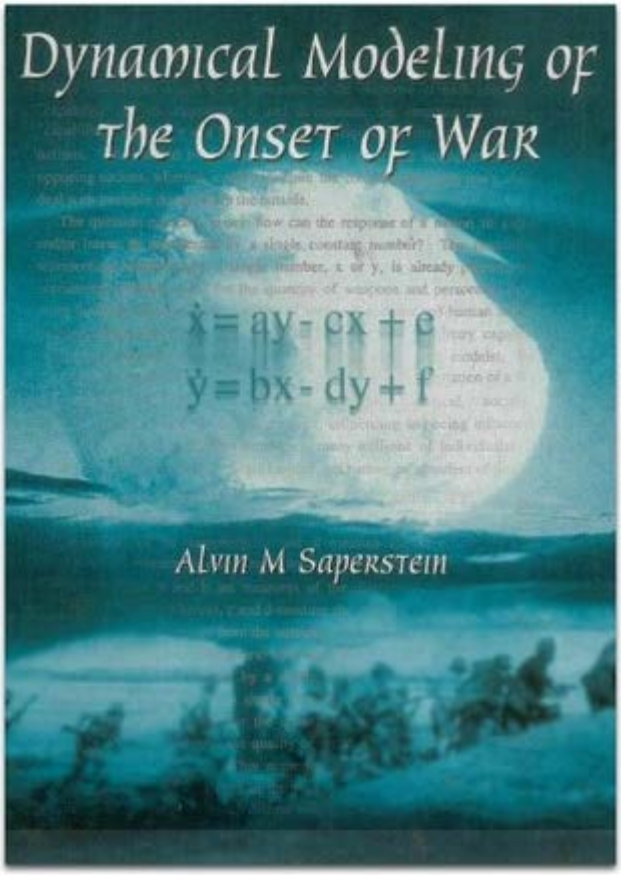

Saperstein's 1999 *Dynamic Modeling of the Onset of War*, wherein he employs equation overlay method on the cover. [3]

Reductionism | Holism

Saperstein gives the following statement, in regards to his position in respect to the debate between the holistics (holism) and the reductionists (reductionism), himself siding more on the latter side:

> "At first glance, it appears that the paradigm of 'reduction', the idea that the whole is just the sum of its parts (presuming, as it does, that the parts exist independent of the whole), is untenable when applied to a study of international relations. The opposite of reductionism might be characterized as 'holistics', that you cannot understand the whole in terms of its parts but must create an entirely different science starting from the whole (e.g., developing a science of the physical behavior of gases without presuming the existence of molecules—a science which actually has been done, i.e. thermodynamics, with limited successes). The practitioners of reductionism would counter that if you really know the properties of the individual, including knowledge of how that individual is governed by the environment in which it finds itself, that you

> could deduce the properties of the collective. Such an attitude towards a science, such a working hypothesis for the acquisition of further knowledge, is non-testable, as is Occam's razor. You can't say reductionism is wrong; its supports will say you haven't pushed it far enough. The same can be said for holistics. However, when progress towards knowledge in a reductionism sense is made (as was the case with the physics of gases), it is usually felt that more understanding has been gained: you know more about something when you can link its behavior to that of its elements. I choose to try to make progress in this sense."

(add discussion)

Education

Saperstein completed his BS in physics at New York University, his PhD in 1956 with a dissertation on "Analysis of Proton-Proton Scattering Using Energy Dependent Boundary Conditions" at Yale University, and in 2011 retired from a career as a physics professor at Wayne State University, Michigan. (Q)

References

1. Saperstein, Alvin M. (1982). "Point of View: Ethics in the Classroom: Morality and the Laws of Thermodynamics" (abs), *Journal of College Science Teaching*, 12(1):10-11, Sep-Oct.
2. Saperstein, Alvin M. (1984). "Chaos: a Model for the Outbreak of War" (abs), *Nature*, 390:303-05.
3. Saperstein, Alvin M. (1999). *Dynamic Modeling of the Onset of War*. World Scientific.

Further reading

- Saperstein, Alvin M. (1984). "Chaos: a Model for the Outbreak of War" (abs), *Nature*, 390:303-05.

External links

- Saperstein, Alvin M. – WorldCat Identities.
- Alvin Saperstein (faculty) – Wayne State University.

θΔics

In hmolscience, **Alvin Weinberg** (1915-2006) (CR:6) was an American nuclear physicist noted for a number of publications on physics loosely applied to society topics, as cited by scholars such as: Glen Gordon, Marlan Blissett, and Gerard Nahum.

Overview

In 1967, Weinberg published *Reflections on Big Science*, wherein he makes a one-paragraph digression on classical thermodynamics. [1]

In 1972, Marlan Blissett, cited Weinberg's *Reflections on Big Science*, albeit in such a way to extrapolate views on "social thermodynamics", asserting that Weinberg theorizes that the underlying process by intellectual "thermodynamic revolutions", or paradigm changes in science, similar to the theme of Thomas Kuhn's scientific revolution structure, are the result of two factors: available "energy levels", a variation he culled from Leo Szilard who defining energy and entropy as having a meaning or measure as information) and the "second law" (entropy or disorder always tends to increase) both intertwined with Wienberg's idea of the "semantic complexity" inherent in the various branches of science as they become more and more specialized, where at the same time science as a whole becomes more and more tensioned. [2]

In 1982, Weinberg published a few articles on information, Maxwell's demon, and energy; which sometimes tend to get cited. [3]

Quotes | About

The following are noted quotes about Weinberg:

> "Thermodynamics, and the second law in particular, can be used quite effectively in dealing with many problems of our society and has been by several authors, notably **Alvin Weinberg**, Stephen Berry, and Barry Commoner."
>
> — Glen Gordon (1981), "Thermodynamics and Society" [4]

References

1. Weinberg, Alvin M. (1967). *Reflections on Big Science*. MIT Press.
2. Blissett, Marlan. (1972). *Politics in Science* (section: Big Science and the Laws of Social Thermodynamics, pg. 25-35; term: entropy, pgs. 26, 53, 66, etc.). Little, Brown and Co.
3. (a) Weinberg, Alvin M. (1982). "Avoiding the Entropy Trap" (Ñº), *Bulletin of the Atomic Scientists* (pgs. 32-35), Oct.
(b) Weinberg, Alvin M. (1982). "On the Relation between Information and Energy Systems" (abs), *Interdisciplinary Science Review*, 72(1): 47-52.
4. Gordon, Glen E. (1981). "Thermodynamics and Society: Review: *Entropy: A New World View*" (abs), *Science*, 20 (4488): 1340-41.

Further reading

â— Weinberg, Alvin M. (1959). "Energy as the Ultimate Raw Material" (Ñº), presented at meeting of Southeastern Section of the American Physical Society, New Orleans, Apr 10.

External links

â— Alvin M. Weinberg – Wikipedia.

θΔics

In existographies, **Alvise Capuano** (c.1525-1580) (FA:41) was an Italian free thinker noted for []

Overview

In 1577, Capuano was denounced to the Inquisition for his heterodox beliefs; which are the following: [1]

> "I am an atheist. I do not believe god exists, or indeed, any supernatural being. I believe that the world was created by chance. I believe that when the body dies the soul dies also. I believe that Christ was the adopted son of the Madonna, born as other men are. I believe that angels and demons do not exist. I believe that there are no true witches; that witchcraft arises from melancholic humors. I believe that the world has neither beginning nor end. I believe that Christ's miracles were not true miracles but natural acts. I believe that the only law that must be obeyed is the law of nature."
>
> — Alvise Capuano (1577), Inquisition trial testimony

On 7 May 1580, Capuano was condemned to perpetual imprisonment. Shortly thereafter, however, he was released; supposedly, per reason that he recanted (Ñº) his atheism and atheist creed. [2]

References

1. (a) Nelson, Alan H. (2003). *Monstrous Adversary: the Life of Edward de Vere, 17th Earl of Oxford* (pg. 212). Oxford University Press.
(b) Hecht, Jennifer M. (2004). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 288). HarperOne.

θΔics

In neurothermodynamics, **Alzheimer's thermodynamics** is the study of the energetic and entropic aspects of the structures, dynamics, and processes connected to mechanisms, particularly the buildup of amyloid plaques on neurons, of the degenerative Alzheimer's disease. The subject seems to have arisen in *circa* 2000, possibly being a subset of protein thermodynamics.

Further reading

● Chebaro, Yassmine, Mousseau, Normand, and Derreumaux, Philippe. (2009). "Structures and Thermodynamics of Alzheimer's Amyloid-β AB (16-35) Monomer and Dimer by Replica Exchange Molecular Dynamics Simulations: Implications for Full-Length AB Fibrilation" (abstract). *Journal of Physical Chemistry B*, May 09.

● Janke, Wolfhard. (2008). *Rugged Free Energy Landscapes* (term: Alzheimer's, pgs. 5, 203, 240, 261, 269-71, 304-306). Springer.

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● Hortschansky, Peter, Christopeit, Tony, Schroeckh, Volker, and Fandrich, Marcus. (2005). "Thermodynamics Analysis of the Aggregation of Propensity of Oxidized Alzheimer's β-amyloid Variants" (abstract). *Protein Science,* Vol. 14 (11), pgs. 2915-18.

θΔics

In matter, **amber** (TR=8) is a hard yellowish to brownish translucent tree resin; often used as polish and for ornaments; noted for its electric like properties and for its preserving ability of ancient organisms, such as bacteria.

A depiction of a piece of **amber**, named from Greek term for sun "ηλεχτορ" or ilechtor, pronounced "elector", which, owing to its electrostatic properties, i.e. it attract straw and small pieces of paper when rubbed, is the root behind the terms electron and electricity.

Etymology

Amber is named after an early Greek word for the sun, *ηλεχτορ*, pronounced "elector", which was often used to describe amber, because of its sunshiny color; amber, subsequently, came to be called "electron" by the Greek classic writers. [1]

Electric properties

Greek thinker Thales, in circa 580BC, is credited with having been the first to noted that when amber was rubbed, straw attracted to it. [2] Thales theorized that "spirit" is what gave amber its properties: [3]

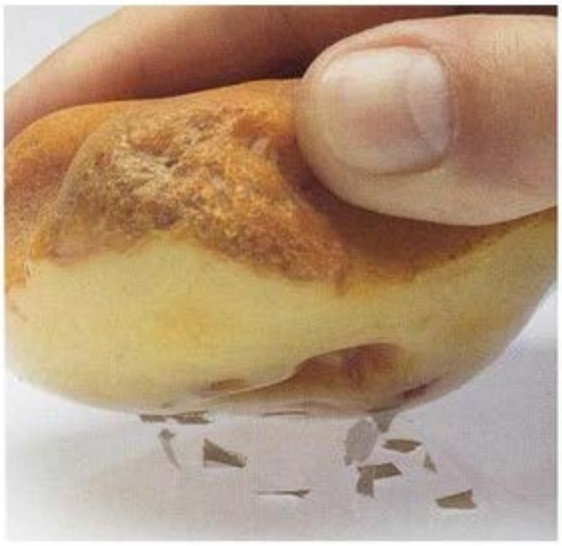

In circa 300BC, Theophrastus, the successor to Aristotle in the Peripatetic school, is said to be the first author to make a distinct mark on the subject of the electrical properties of amber. [4]

Quotes

The following are related quotes:

> "As **amber** attracts a straw, so does beauty admiration, which only lasts while the warmth continues."
>
> — Robert Burton (1621), *The Anatomy of Melancholy*

See also

â— Loadstone

References

1. Fowler, Michael. (1997). "Historical Beginnings of Theories of Electricity and Magnetism" (Ñº), University of Virginia, Physics.
2. Voldman, Steven H. (2004). *ESD Physics and Devices* (pg. 1). John Wiley & Sons.
3. Buchner, Ludwig. (1855). *Force and Matter: Principles of the Natural Order of the Universe, with a System of*

Morality Based Thereon (15th German edition; 4th English edition) (pg. 12). London: Asher and Co, 1884.
4. (a) Barlow, Peter. (1814). *A New Mathematical and Philosophical Dictionary* (§:Electricity, pg. #). Publisher.
(b) Theophrastus – Wikipedia.

External links

â— Amber – Wikipedia.

θΔics

In existographies, **Ambrose Bierce** (1842-1914) [RGM:401|1,500+] [HD:43] (FA:143) was an American writer, noted for []

Horror

Bierce, in the horror writing genre, is often grouped with Edgar Poe and Howard Lovecraft.

Atheism

In 1906, Bierce published *The Devil's Dictionary*, a satirical reformulation of religious terms.

In 2006, free-thought historian Bill Cooke published his *Dictionary of Atheism, Skepticism, and Humanism*, aims to be a modern upgrade to: Voltaire's *Philosophical Dictionary* (1764), Joseph McCabe's *Rationalist Encyclopedia* (1948), Beirce's *Devil's Dictionary* (1911), and John Saul's *Doubter's Companion: a Dictionary of Aggressive Common Sense* (1994). [3]

Quotes | By

The following are quotes by Bierce:

> "Camels and Christians receive their burdens kneeling."
>
> — Ambrose Bierce (c.1900), *Publication* [1]

> "Eucharist, n. A sacred feast of the religious sect of Theophagi.A dispute once unhappily arose among the members of this sect as to what it was that they ate. In this controversy some five hundred thousand have already been slain, and the question is still unsettled."
>
> — Ambrose Bierce (1906), *The Devil's Dictionary* [2]

> "Faith, n. Belief without evidence in what is told by one who speaks without knowledge, of things without parallel."
>
> — Ambrose Bierce (1906), *The Devil's Dictionary* [2]

> "Infidel, n. In New York, one who does not believe in the Christian religion; in Constantinople, one who does."
>
> — Ambrose Bierce (1906), *The Devil's Dictionary* [2]

> "Pray. v. To ask that the laws of the universe be annulled in behalf of a single petitioner, confessedly unworthy."
>
> — Ambrose Bierce (1906), *The Devil's Dictionary* [2]

> "Religion, n. A daughter of Hope and Fear, explaining to Ignorance the nature of the Unknowable."
>
> — Ambrose Bierce (1906), *The Devil's Dictionary* [2]

> "Saint, n. A dead sinner revised and edited."

— Ambrose Bierce (1906), *The Devil's Dictionary* [2]

"Reverence, n. The spiritual attitude of a man to a god and a dog to a man."

— Ambrose Bierce (1906), *The Devil's Dictionary* [2]

References

1. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§:Bierce, 173-76). Prometheus.
2. Ambrose Bierce – FFRF.com.
3. Cooke, Bill. (2006). *Dictionary of Atheism, Skepticism, and Humanism*. Prometheus Books.

External links

â— Ambrose Bierce – Wikipedia.

θΔics

In existographies, **Amedeo Avogadro** (1776-1856) (IQ:175|#285) (GCE:21) (CR:11) was an Italian chemist noted for []

Overview

See main: Avogadro constant

In 1811, Avogadro, in his "Essay on Determining the Relative Masses of the Elementary Molecules of Bodies", advanced the hypothesis that all gases under the same conditions of temperature and pressure, in unit volume, have the same number of molecules.
The formulation of Avogadro's law, supposedly was one of the first to coin the term "molecule", as differing from an atom.
The following is the Avogadro constant N_A:

$$N_{\mathrm{A}} = 6.022 \times 10^{23} \left(\frac{entities}{mol} \right)$$

(add)

Thermodynamics

In thermodynamics, the ideal gas constant R divided by the Avogadro constant is the Boltzmann constant k_B:

$$k_B = \frac{R}{N_{\mathrm{A}}}$$

which is used a good deal in statistical thermodynamics.

In 1895, German chemist Walther Nernst wrote an early book on chemical thermodynamics based on Avogadro's law. [1]

References

1. Nernst, Walther. (1895). *Theoretical Chemistry: from the Standpoint of Avogadro's Rule & Thermodynamics* (section: The Measure of Affinity, pgs. 586-88). MacMillan and Co.

Further reading

â— Morselli, Mario. (1984). *Amedeo Avogadro: a Scientific Biography*. Springer.

External links

â— Amedeo Avogadro – Wikipedia.

θΔics

In religio-mythology, **Amen**, aka "Amun", Amoun or Ammon (Plutarch, 100AD), is an Egyptian aggregate god, conceived during the 12th dynasty (1991-1803BC), in Thebes,

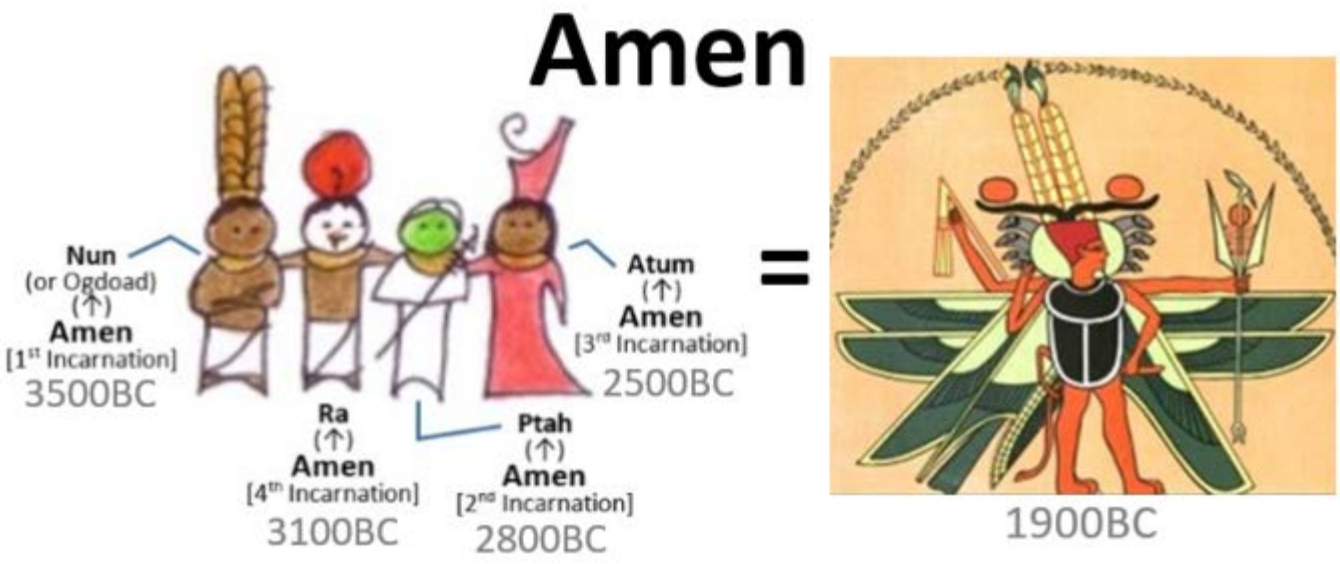

A general synopsis of how **Amen** is a synretism of four gods: Nun, Ptah, Atum, and Ra, a god theory developed in Thebes (see: supreme god timeline), in the 12th dynasty Egypt, a general result of god reduction pressures. [2]

conceptualized as a four part god syncretism, namely: Amen as Nun (or Ogdoad) (1st incarnation), Amen as Ptah (second incarnation), Amen as Atum (3rd incarnation), and Amen as Ra (4th incarnation), all synced as the new supreme god and state god of Egypt. [1]

New Kingdom

In the 18th dynasty (1549-1292BC), Amen was transformed into Amen-Ra and or Amen-Ra = Atum (see: supreme god timeline), as depicted below, depending; a "super-god" so to say, comprised of the powers of about ten or so of the main Egyptian gods of history, as shown adjacent (right), as representative of the various symbols: staffs (Set, Horus, Osiris), plums (Nun), sun disc (Ra), etc. This was the last point, in the evolution of gods, that it became near to silly to depict gods that were conceived or synretized after this point in time, per reason that it produced a visually characterize nonsense; Aten, e.g., one of the main post Amen-Ra gods, was simply depicted as the sun disc with hands. This is why most religions produced after this period tended to forbid the depiction of "god", as the result was childish or silly.

In c.1000BC, some of the superpower attributes of Amen, e.g. wings, was recast into the character of Zoroaster.

In 100AD, Plutarch, in his *On Isis and Osiris*, summarized Amen as follows: [3]

> "Most people believe that **Amoun** is the name given to Zeus in the land of the Egyptians, a name which we, with slight alteration, pronounce Ammon. But Manetho of Sebennytus thinks that the meaning 'concealed' or 'concealment' likes in this world. Hectaecus of Abdera, however, says that the Egyptians use this expression one to another whenever they call to anyone, for the world is a form of address. When they, therefore, address the supreme god, whom they believe to be the same as the 'universe', as if he were invisible and concealed, and implore him to make himself visible and manifest to them, they use the word 'Amoun'."

(add)

Christianity | Prayer

In Christianity, the word "Amen" is said at the end of prayers, such as is touched on by Plutarch (100AD) above, a reverse of the name originally said to the beginning of prayers (e.g. Lord's prayer); most, however, are ignorant of the fact that this is an atrophied reference to the god Amen.

See also

â— Aron Nelson

References

1. (a) Budge, Wallis. (1904). *The Gods of the Egyptians*, *Volume One* (Amen-Ra, pg. 493). Dover, 1969.
(b) Budge, Wallis. (1904). *The Gods of the Egyptians*, *Volume Two* (Amen-Ra, pg. 7). Dover, 1969.
(c) Greenberg, Gary. (2000). *101 Myths of the Bible*: *How Ancient Scribes Invented Biblical History* (roots, pgs. 3-4; pgs. 4-5). Source Books.
2. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs) (Amen, pg. 115). Publisher.
3. Plutarch. (c.100AD). *Isis and Osiris*; in: *Plutarch's Moralia, Volume Five* (pg. 25) (Introduction: Victor Hanson). Harvard University Press.

Further reading

â— Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (Amun, pg. 15). Facts on File, Inc.

External links

â— Amun – Wikipedia.

θΔics

In religio-mythology, **Amen-Ra** is an 18th dynasty (1549-1292BC) conceived supreme god syncretism of the of the Egyptian gods Amen, the chief god of Thebes powerful during the 12th dynasty (1991-1803BC), and Ra, the chief sun god of Heliopolis, who was powerful during the 5th dynasty (2498-2345BC). [1]

Judaic recension

Of note, during the Judaic recension (c.500BC) (see: supreme god timeline), the supreme god Amen-Ra was reformulated, monotheistically, into the story where Ra became Abraham and Amen became the name said at the end of prayers.

Ptolemaic period

In the Ptolemaic period, Alexander the great tried to mold Persian, Egyptian, and Greek religions into one new religion by blending Zeus with Amen-Ra to make the god Zeus-Amen, but this did take well, and was a short-lived (short-existed) religious reform, lasting only a few centuries.

References

1. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (pgs. 219-20). Facts on File, Inc.

See also

â— Supreme god timeline

External links

â— Amen-Ra – Dictionary.com.

θΔics

In genius studies, **American genius** is a human who is born, i.e. chemically synthesized, in the country of the United States, who becomes a genius.

Overview

The term "American genius", based on books penned with this subtitle, according to Google Books, include: Louis Armstrong, Benjamin Franklin, Steve Jobs, Frank Wright, Henry Longfellow, Ernest Lawrence (1901-1958) (Ñº), Winslow Homer, Orson Welles, and Abraham Lincoln, to name the predominate listings.

A 2005 printing of US postage stamps in honor of American scientific genius: showing Americans: Barbara McClintock, Willard Gibbs, Richard Feynman, and Hungarian-born American John Neumann (who came to America at age 26).

Rankings

See main: Genius epochs

The following is a work-in-progress ranking of American geniuses, as subset of the top 1000 geniuses, in short:

Person	IQ Estimates	Description
		(Cattell 1000:N/A) [RGM:**N/A**|1,310+] [GTE] [GCE] [GPE] [GEE] (CR:759|#2); first American PhD engineer; his genius is unmistakable: "Gibbs is the **greatest mind** in American history." — Albert Einstein (c.1925) "In the last generation, this country produced one of the most eminent men of science in the whole world. His name was quite unknown among us while he

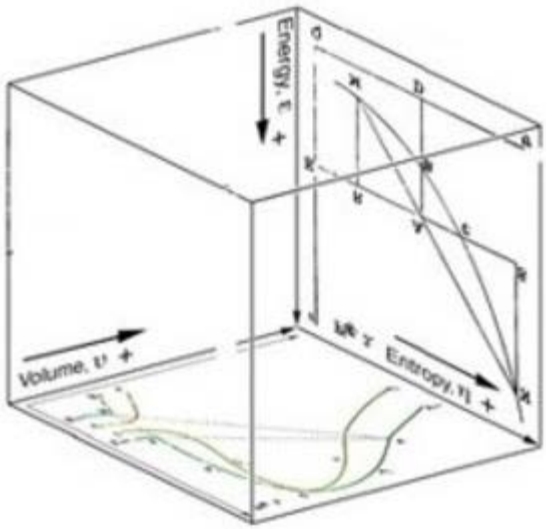

1 | 210 | [5]

Willard Gibbs (1839-1903)

lived, and it is still unknown. Yet I may say without too great exaggeration that when I heard it mentioned in a professional assembly in the Netherlands two years ago, **everybody got down under the table and touched their foreheads to the floor**. His name was Josiah Willard Gibbs".

— Albert Nock (1931)

Central founder of chemical thermodynamics, statistical mechanics, vector analysis; quote: "[untold number of] Nobel Prizing-winning careers [have been] launched from a passing remark or footnote in Gibbs' monumental masterpiece [*Equilibrium*, 1876]" (Frank Weinhold, 2009); his 700-equation *Equilibrium* is the most-complex, dense, and treasure-filled scientific treatise ever published—the **key** to the elective affinities problem (see: affinity-free energy equation)—the greatest of all genius puzzles—that was described by John Strutt (IQ:190|#42), official solver of the two-century long blue sky problem, as being "too difficult and too condensed for most, I might say all, readers"—James Maxwell (IQ:210|#4), in fact, was the only one, of the 300 scientists Gibbs mailed it to, that immediately understood it (see: thermodynamic surface and Maxwell's thermodynamic surface); first-slating: 195-220 (c.2013).

2 | 195 | [13]

Gilbert Lewis (1875-1946)

[RGM:N/A|1,310+] (CR:483|#5) [:35] American physical chemist and chemical thermodynamicist; eponym of the Lewis school of thermodynamics, first to translated and distill Willard Gibbs' *On the Equilibrium of Heterogeneous Substances*—the densest scientific treatise of all time—into a practical and workable language chemists could readily understand; invented the dot structure pair model of chemical bonding; did some of the first work on relativity; coined the term photon; Linus Pauling's *On the Nature of the Chemical Bond* (1939) was dedicated to him; quote: "Lewis was the direct mentor of more Nobel Prize winners in chemistry than any Nobel Prize winner in any category" (Adriaan de Lange, 1998); his 1925 *Anatomy of Science*, speculated on hmolscience, i.e. on whether or not him writing this book was nothing but a large "chemical reaction" (extrapolate up) or conversely whether crystals "think" (extrapolate down); his protégé Frederick Rossini, author of the 1950 *Chemical Thermodynamics*, followed up on the former approach with his 1971 Priestley Medal address 'Chemical Thermodynamics in the Real World', which sparked the later 21st century Rossini debate; first-draft slating: IQ:190-200 (c.2015)

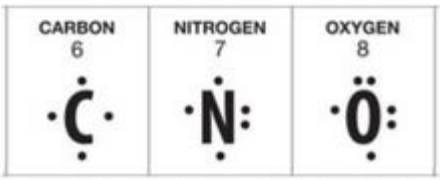

Lewis Dot Structure (1902)

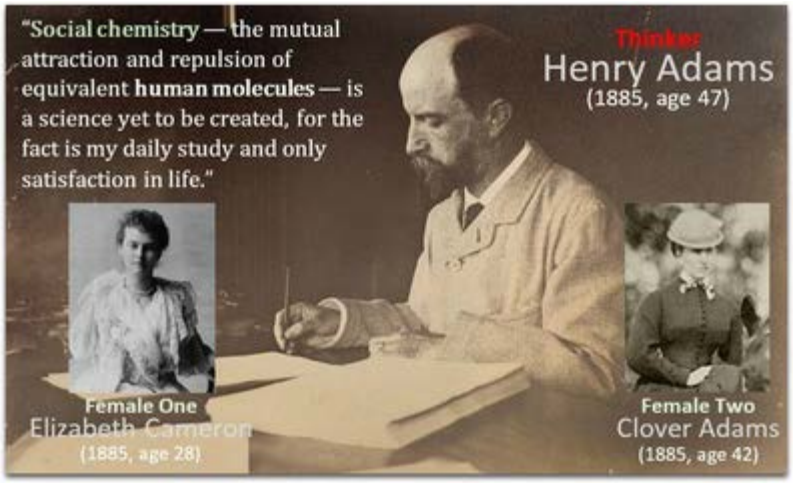

3 — 195 [21]

Henry Adams (1838-1918)

Collected works: 12+

[RGM:811|1,310+] (SN:2) (CR:241) American historian;

"No one shall convince me that I am not a phase."

penned nine-volume American history set solely to prove cause and effect; his *The Education of Henry Adams* (1907), which is ranked as the greatest American nonfiction book of the twentieth century (American Library), grapples with: Goethe, Gibbs, Clausius, Thomson, Pearson, Darwin, among others, in search of a unified theory of the humanities and physical sciences; prophet of the "another Newton"; biggest hmolscience thinker since Goethe; spent five decades on the social-history aspects of the elective affinities problem; quote: "social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life" (1885); quote: "I would travel a few thousand-million miles to discuss with [Thomson] the thermodynamics of socialistic society" (1909); probably the first true hmolscientist (human chemist + human thermodynamicist + human physicist); known to many as an enigmatic genius of political thought; first-slating: 185-195 (c.2016).

4 — 190 [37]

Thomas Jefferson (1743-1826)
Library: 6,700+ (Ñº)

IQ_B=195
IQ_{CB}=**178**
IQ_C=160
IQ_W=160
IQ_S=160

(Cattell 1000:79) [RGM:29|1,245+] (Murray 4000:N/A) (HD:17) (CR:21) American founding father; third American President; author of declaration of independence (based on Newtonian mechanics); thinker behind the separation of church and state; fabled "last persons to know everything"; thing philosopher; an unlearn expositor; auto-characterized Epicurean materialist.

[RGM:173|1,310+] [GCE] [DNP] (EPD genius) (CR:55) American chemical engineer; startup chemical company (before age 15); studied under Arnold Sommerfeld in Munich,

5 | 190 [38]

Linus Pauling (1901-1994)

IQ_{JP}=180
IQ_{SS}=160, 170, 180
IQ_{O}=160

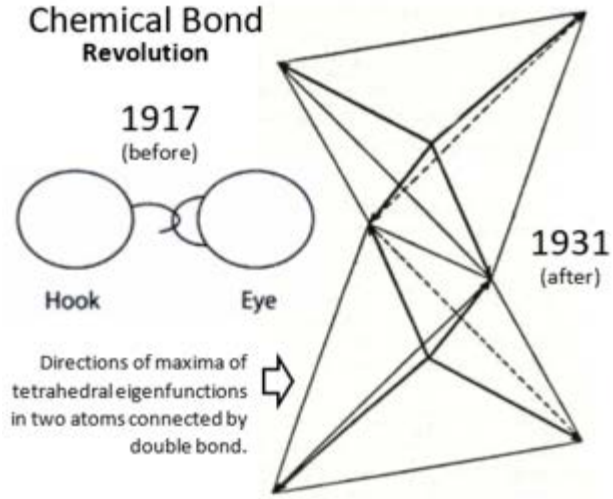

Niels Bohr in Copenhagen, and Erwin Schrödinger in Zürich, during which time he became interested in how quantum mechanics might be applied in his chosen field of interest, the electronic structure of atoms and molecules; also, in Zürich, Pauling was also exposed to one of the first quantum mechanical analyses of bonding in the hydrogen molecule, done by Walter Heitler and Fritz London; his 1938 *The Nature of the Chemical Bond* has been referred to as the "bible" of modern chemistry; gets upgrade for, in 1989, ripping apart Schrodinger's thermodynamic views on life (see: Note to Chapter 6).

6 | 185 [49]

Richard Feynman (1918-1988)

IQ_{SS}=225
IQ_{O}=190
IQ_{O}=125

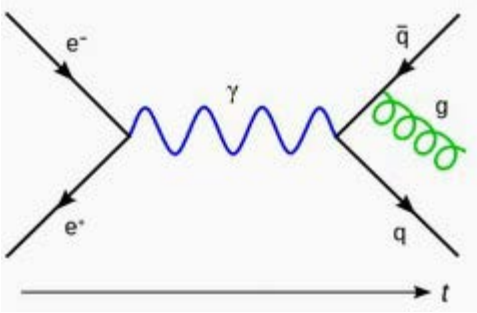

[RGM:146|1,330+] (CR:79|#57) American physicist;iIn grade school, infamously scored 125 on an IQ test; as an MIT senior, in 1939, had the highest score in the nation on the Putnam; he supposedly had a standing bet that he could solve any problem to within 10% within 60 seconds; and some have suggested his non-verbal IQ was greater than 190 (Ñº); motto: "believe in the atomic hypothesis" (Feynman time capsule wisdom); known for: quantum electrodynamics; see also: Feynman problem solving algorithm. Dirac is generally ranked, e.g. by Freeman Dyson (Ñº), among others (Ñº), as smarter than Feynman.

7 | 185 [54]

Percy Bridgman (1882-1961) ↑

IQ_{JP}=180
IQ_{EM}=170

(CR:65|#75) American physicist and social physicist; known for Bridgman equations; Bridgman paradox (key modern topic); thermodynamics founders and suicide; played key role in John Q. Stewart's 1939-1954 Princeton Department of Social Physics.

8 | 185 [58]

Thomas Edison (1847-1931)

IQ_{SS}=240
IQ_{B}=195

[RGM:31|1,260+] (FA:110) (CR:40|#93) Invented: practical light bulb (1878) based on the electric arc lamp (1802) invention by Humphry Davy (IQ:185|#71) (Ñº), phonograph, and motion picture camera; and originated the concept and implementation of electric-power generation and distribution to homes, businesses, and factories; gave pretty decent stance (see: Edison on the soul) on religious theories (e.g. soul, life, immortality, spirit) query during

1909 *New York Times* interview; upgrade (↑) for his comments on Thomas Paine (IQ:180|#139).

9 — 185 [62]

Norman Dolloff (1907-1984)

IQ_{SN}= 186±

(SN:5|55+) American metallurgical engineering geologist; in his *Heat Death and the Phoenix* (1975), he gives a so-called "organism synthesis equation" (adjacent). Classified as the transition point mindset of someone grappling to switch from the entropy "order/disorder" model of everything to the "free energy" model of everything; all done in the framework of explicit atheism.

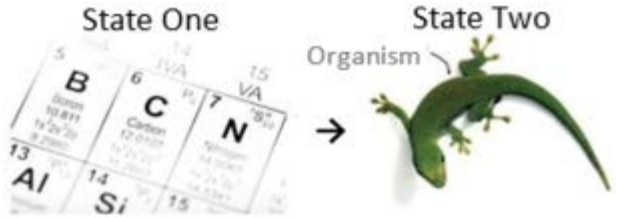

$$\sum n_i \rightarrow \text{organism}; \Delta G_R^\circ = +; \Delta S_R^\circ = -$$

Organism Synthesis Equation
(Dolloff, 1975)

10 — 180 [105]

Lawrence Henderson (1878-1942)

(SN:8) American physiologist; ran the Harvard Pareto circle; used a synthesis of Gibbs and Vilfredo Pareto for his pioneering "Sociology 23" course; the last great theory of all things theorists (following Henry Adams).

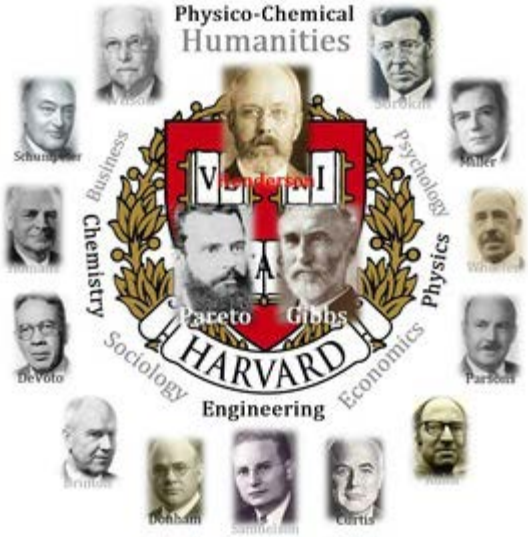

11 — 180 [130]

John Bardeen (1908-1991)

[RGM:N/A|1,330+] (EPD genius) (CR:7) American physicist and electrical engineer; noted as dual Nobel laureate (): Nobel Prize physics (1956) for the invention of the transistor; Nobel Prize physics (1972) for the theory of superconductivity; see *True Genius: the Life and Science of John Bardeen: the Only Winner of Two Nobel Prizes in Physics* (2002); first-slated: 180|#130 (c.2016).

12 — 180 [138]

Frederick Rossini

(SN:7|55+) American physical chemist and chemical thermodynamicist; in his "Chemical Thermodynamics in the Real World" (1971), stated very directly that via the following equation (adjacent): we can come to understand the paradox between freedom and

$$\ln K = -\frac{\Delta H^\circ}{R}\left(\frac{1}{T}\right) + \frac{\Delta S^\circ}{R}$$

Social Freedom & Security Equation
(Rossini, 1970)

	(1899-1990)		security in society; huge downgrade ↓ for ending this beautiful speech with "the point of all of this is that our creator has fashioned laws [of thermodynamics] that are deep seated and broadly applicable [to our social interactions]"; down-graded from 185|#83 (original guesstimate) to 180|#140 (Feb 2018) per creationism comments.
13 — 180 — [148]	James Madison (1751-1836)	IQ_C=160 IQ_{Si}=160	(Cattell 1000:476) [RGM:177|1,305+] American political leader; one of the chiefs of Princeton School of Social Physics; used Newtonian government in the construction of the US Constitution, such as the principle of separation of powers, as found in celestial mechanics.
13 — 180 — [158]	John Tukey (1915-2000)	IQ_{CP}=200± IQ_O=180	(SN:13) American chemist, mathematician, and statistician; noted for his 1966 free energy theory of attitude state changes, based on the theory of absolute reaction rates in chemistry; first-slating: 180|#158 (see: IQ:200+ HCT prodigies) (c.2016).
14 — 180 — [178]	John Nash (1928-2015)	IQ_{CP}=200± IQ_O=180	[RGM:325|1,245+] (CR:23) American economist; described, at age 20, as "a genius" in his letter of recommendation by Carnegie Tech professor R.L. Duffin; Based his 1949 "Nash equilibrium", and supposedly game theory, supposedly, on the statistical interactions of reacting molecules from his studies of chemical engineering and chemistry at Carnegie Tech; some rank Nash at the IQ=200+ level and compare his genius to that of Nikola Tesla or John Neumann (Ñº); famously known for his mixture of genius and madness (e.g. *A Beautiful Mind*, 2001); a Discovery.com top 5 mad genius (Ñº); (V) Quote: "It is believed that mathematician John Forbes Nash had an IQ around 180" (Jennifer Evans, 2010). (Ñº)
15 — 180 — [197]	Claude Shannon (1916-2001)		[RGM:N/A|1,330+] (Murray 4000:N/A) American electrical engineer; noted for his age 21 penned 1937 MS thesis "A Symbolic Analysis of Relay and Switching Circuits" (Ñº) mapped Boolean algebra into circuit language; he later went on to invent information theory; guestimated IQ (2012) of 180± (Ñº); forum (2017) cited IQ (Ñº) at 180.
16 — 175 — [208]	Abraham Lincoln (1809-1865)	IQ_{CB}=**160** IQ_C=150 IQ_B=170 IQ_W=147 IQ_{Si}=150	(Cattell 1000:40) [RGM:49|1,320+] (Murray 4000:N/A) American president [See: American Presidents by IQ]; "Towering **genius** disdains a beaten path. It seeks regions hitherto unexplored." — Abraham Lincoln (1838), Speech, Jan 27 (Ñº)

noted for his Emancipation Proclamation (1863) which ended slavery and brought a close to the civil war; made decisions using Euclidian logic.

17 — 175 [210]

Benjamin Franklin (1706-1790)

IQ_{CB}=**173**
IQ_{C}=160
IQ_{B}=185
IQ_{W}=160

(Cattell 1000:45) [RGM:22|1,300+] (Murray 4000:14|T) American author, printer, political theorist, politician, freemason, postmaster, scientist, inventor, humorist, civic activist, statesman, and diplomat; a so-called "last universal genius"; a founding father (see: founding fathers fallacy); pioneer in the science of electricity; famously noted for his key on kite lightening experiment.

18 — 175 [220]

Edgar Poe (1809-1849)

IQ_{O}=145

[RGM:55|1,330+] [GLA:14] American writer, editor, and literary critic; best-known for his poem “The Raven” (1845) noted for its musicality, stylized language, and supernatural atmosphere, which tells of a talking raven's mysterious visit to a distraught lover, tracing the man's slow fall into madness, as he is lamenting the loss of his love; sitting on a bust of Pallas, the raven seems to further instigate his distress with its constant repetition of the word "Nevermore"; The poem makes use of folk, mythological, religious, and classical references; Yahoo Answers IQ estimated (Ñº) at 145; his interpolated IQ per GLA position is 170 to 180; his comments on Margaret Fuller (IQ:#|#), madness and intelligence (similar to Aristotle), and true genius, would seem to align him higher ↑ in rankings; position 175|#190 guestimate (Jun 2017).

19 — 175 [246]

John Adams (1735-1826)

IQ_{C}=155
IQ_{Si}=155

[RGM:188|1,250+] (HD:14) (Cattell 1000:182) (founding father:3) (American President:2) was an American politician and thinker; patriarch of the so-called Adams family (or Adams political family): his son, John Quincy Adams, was 6th president, and his great grandson was Henry Adams, the leading social Newton, behind Goethe.

(add)

Quotes

The following are related quotes:

> “We think ourselves possessed, or, at least, we boast that we are so, of liberty of conscience on all subjects. Yet, how far are we from these exalted privileges in fact! **There exists**, I believe, throughout the whole Christian world, **a law which makes it blasphemy to deny our doubt the divine inspiration** of all the books of the Old and New Testaments, from Genesis to Revelation. **Who would run the risk of translating Dupuis**?”
>
> — John Adams (1825), “Letter to Thomas Jefferson”, Jan 23

> “I now know all the people worth knowing in **America**, and I find no **intellect** comparable to my own.”
>
> — Margaret Fuller (c.1840), publication (Ñº)

“There is one spot in America, which I would like to visit, viz the long-neglected spot in Baltimore where the **greatest American genius** lies buried. In my opinion your Bryant, Whittier, etc., are pygmies compared with Poe. He is the literary glory of America. More than thirty-five years have elapsed since his death, and his fame is constantly increasing. That is a true test of genius.”

— Alfred Tennyson (1885) (Ñº)

“The **greatest American genius** of that day was the oldest man in the convention [Philadelphia, May, 1787], Benjamin Franklin, aged eighty-one. Of him and of George Washington nothing need be said, as every schoolboy knows their history.”

— Henry Elson (1900), *Side Lights on American History* (pg. 33)

“Gibbs is the **greatest mind** in **American** history.”

— Albert Einstein (c.1925), *Source*; cited by William Phelps (1939), in *Autobiography* (pg. 425)

“Who is the most original and the most versatile **intellect that the Americas have so far produced?** The answer ‘Charles Peirce’ is uncontested, because any second would be so far behind as not to be worth nominating. Mathematician, astronomer, chemist, geodesist, surveyor, cartographer, metrologist, spectroscopist, engineer, inventor; psychologist, philologist, lexicographer, historian of science, mathematical economist, lifelong student of medicine; book reviewer, dramatist, actor, short-story writer; phenomenologist, semiotician, logician, rhetorician [and] metaphysician.”

— Max Fisch (1981), *Publication* [1]

References

1. Everett, Daniel. (2019). “The American Aristotle: Charles Sanders Peirce was a brilliant philosopher, mathematician, and scientist. His polymathic work should be better known” (Ñº), Aeon.co, Aug 15.

Further reading

â— Rukeyser, Muriel. (1942). *Willard Gibbs: American Genius* (Academy member quote, pg. 251; Gibbs' theses advised, pgs. 327-28; diagram anecdote, pgs. 328-29). Garden City, New York: Doubleday, Doran & Co., Inc.

External links

â— American Genius – Wikipedia.

θΔics

In government, **American Presidents** are the forty-plus leaders of the United States, since its founding, in the years to follow its 1776 declaration of independence from England, among which, in respect to hmolscience, a significant number stem from the Princeton school of social physics. Notable and or relevant factoids are shown below:

#	President	IQ	Notables
1.	George Washington (1732-1799) Term: 1789-1797	IQ:140|#491	(Cattell 1000:19) [RGM:50|1400+] (EPD:F11) [2]
2.	John Adams (1735-1826) Term: 1797-1801	IQ:170|#272	[HD:14] The patriarch of the so-called Adams family (or Adams political family): his son, John Quincy Adams, was 6th president, and his great grandson was Henry Adams, the leading social Newton, behind Goethe.
3.	Thomas Jefferson (1743-1826) Term: 1801-1809	IQ:190|#44	[HD:17] One of fabled "last persons to know everything"; a Cattell 1000 (top 90); library=6,487 books; known for: American government founding; atheism advocation (situated the separation of church and state clause in the Constitution in 1802); was a polymath who spoke five languages and was deeply interested in science and political philosophy; he once stated "I cannot live without books"; Quote: "He who knows nothing is closer to the truth than he whose mind is filled with falsehoods and errors." (Ñº) The 1608 English translation of Simon Stevin's work *Disme, The Arts of Tenths or Decimal Arithmetike*, by Robert Norton, is said to have inspired him to propose a decimal monetary unit for the US. The tenth of a dollar is still referred to as a "dime"; often met with other encyclopedists at Café Procope (see: epicenter genius); noted for the "all men are created equal" motto used in the Declaration of Independence; a theory that, in hmolscience logic, would translate as "all molecules are synthesized equal" (see: contented molecule).
4.	James Madison (1751-1836) Term: 1809-1817	IQ:170|#270	[HD:18] The patriarch of the so-called Princeton school of social physics; in 1769, was studying a primitive form of social physics a Princeton; was a student of John Witherspoon (1723-1794), a signatory of the Declaration of Independence, and noted interpreter of the political philosophy of Charles Montesquieu, notable for his "hot climates" / "cold climates" theory of human behavior, who in turn had been deeply influenced by the celestial mechanics work of Isaac Newton; a set of teachings, that went into the so-called Newtonian-based framing of the US Constitution, e.g. separation of powers, as Woodrow Wilson (#28) argued; or as John Q. Stewart stated: "in early Princeton, physics cooperated with politics in a sort of analogical double play, Newton to Witherspoon to Madison."
5.	James Monroe (1758–1831) Term: 1817-1825		After replacing Morris as minister to France, he obtained Thomas Paine's release from prison, after which Paine stayed in Monroe's home, where he penned part 2 of *The Age of Reason* (Jacoby, 2004; pg. 41.
6.	John Quincy Adams (1767–1848) Term: 1825-1829	IQ:175|#222	Son of John Adams (2nd president); his grandson was Henry Adams, the leading social Newton, behind Goethe; When he sworn into office, he chose (Ñº) to swear on a book of law instead of the Bible, because he wanted to make it clear that he was protecting the US constitution and the laws of the US above all else.

7.	Andrew Jackson (1767–1845) Term: 1829-1837		
8.	Martin van Buren (1782–1862) Term: 1837-1841		
9.	William Harrison (1773–1841) Term: 1841		
10.	John Tyler (1790–1862) Term: 1841-1845		
11.	James Polk (1795–1849) Term: 1845-1849		
12.	Zachary Taylor (1784–1850) Term: 1849-1850		
13.	Millard Fillmore (1800–1874) Term: 1850-1853		
14.	Franklin Pierce (1804–1869) Term: 1853-1857		Took oath by swearing, not on Bible, but on a law book, per reason that the believed that the death of his son, killed in a train accident, two months before he took office, was punishment for his sins. (Ñº)
15.	James Buchanan (1791–1868) Term: 1857-1861		
16.	Abraham Lincoln (1809–1865) Term: 1861-1865	IQ:170|#271	A Cattell 1000 (top 40); led the union to victory in the Civil War (1861-1865); his 1863 Emancipation Proclamation freed all slaves in America, paving the way for slavery's eventual abolition.
17.	Andrew Johnson (1808–1875) Term: 1865-1869		
18.	Ulysses Grant (1822–1885) Term: 1869-1877		
19.	Rutherford Hayes (1822–1893) Term: 1877-1881		
20.	James Garfield (1831–1881) Term: 1881		
21.	Chester Arthur (1829–1886) Term: 1881-1885		

22.	Grover Cleveland (1837–1908) Term: 1885-1889		
23.	Benjamin Harrison (1833–1901) Term: 1889-1893		
24.	Grover Cleveland (1837–1908) Term: 1893-1897		
25.	William McKinley (1843–1901) Term: 1897-1901		
26.	Theodore Roosevelt (1858–1919) Term: 1901-1909	IQ:150|#455	[RGM:307|1,305+]
27.	William Taft (1857–1930) Term: 1909-1913		
28.	Woodrow Wilson (1856–1924) Term: 1913-1921		During his 1912 presidential candidacy speeches, argued that Constitution, written by James Madison based on Newtonian physics logic, was in need of reform and upgrade; namely that government, according to modern science, was answerable not to Newton, but to Darwin.
29.	Warren Harding (1865–1923) Term: 1921-1923		
30.	Calvin Coolidge (1872–1933) Term: 1923-1929		Noted, in evolutionary psychology, for "Coolidge effect", the phenomenon, supposedly, observed by Coolidge at a chicken farm with his wife, that males (and to a lesser extent females) exhibit renewed sexual ability, continuously, albeit only if new receptive sexual partners are presented. [3]
31.	Herbert Hoover (1874–1964) Term: 1929-1933		
32.	Franklin D. Roosevelt (1882–1945) Term: 1933-1945	IQ:145|#474	[RGM:362|1,305+]
33.	Harry Truman (1884–1972) Term: 1945-1953		
34.	Dwight Eisenhower (1890–1969) Term: 1953-1961		
35.	John Kennedy (1917–1963) Term: 1961-	IQ:165|#345	[RGM:114|1,305+]

	1963		
36.	Lyndon Johnson (1908–1973) Term: 1963-1969		
37.	Richard Nixon (1913–1994) Term: 1969-1974		
38.	Gerald Ford (1913–2006) Term: 1974-1977		
39.	Jimmy Carter (1924-) Term: 1977-1981		
40.	Ronald Reagan (1911–2004) Term: 1981-1989		
41.	George H. W. Bush (1924-) Term: 1989-1993		
42.	Bill Clinton (1946-) Term: 1993-2001		
43.	George W. Bush (1946-) Term: 2001-2009		His administration, in 2001, began to limit federal funding to stem cell research in which "the life-and-death decision has already been made", which launched the stem cell controversy about ethics of stem cell research (a separation of church and state issue); the logical objection of which, being underlying Christianity-based, as 1993 NIH researcher turned 2009 NIH head Francis Collins argues, being that certain types of stem cells have a soul; hence it is immoral to use them for research purposes. [4]
44.	Barack Obama (1961-) Term: 2009-2015	IQ_E:135	A a quick estimate for IQ was made based on the mean of a number of spurious Internet sources: 110-160 (Ñº), 120-130 (Ñº), 130 (Ñº), 145 (Ñº); averaged up for secular views employed in politics in respect to religion. In 2013, Trump Tweeted: “Sorry losers and haters, but my I.Q. is one of the highest -and you all know it!” (Ñº) > “I know some of you may think I’m tough and harsh but actually I’m a very compassionate person (with a very high IQ) and with strong common sense.” — Donald Trump (2013), Tweet, Apr 21 In 2013, Trump tweeted that his IQ was “much higher” than Barack Obama and George W. Bush. (Ñº) In 2015, Trump’s IQ was reported, in an article (Ñº) by BeforeItsNews.com, as being 156 based on the fact that he graduated from Wharton School, that
	Donald		

45	Trump (1946-) Term: 2017-	the average student needs an SAT score of 1500 to get in, and that this translates to an IQ of 145 to 149 or 156 as reported. This was reported (Ñº) by Snopes.com to be a hoax article. In 2016, based on the previous "hoax IQ", a presidential IQ chart began making the rounds, in social media, stating something to the affect that Dean Simonton was the one who calculated Trump's IQ at 156 (Ñº)(Ñº) and that his IQ was second highest presidential IQ, below John Q. Adams and above Thomas Jefferson. In Mar 2017, a poll conducted of 3,000 UK residents ranked Trump second lowest in intelligence, above George W. Bush, and ranked Obama first in intelligence, among 30 most talked about public figures on YouGov.com. (Ñº) In 2017, Jordan Peterson, who thinks his own IQ is in "excess of 150", stated, in interview (Ñº), that the "a 160 IQ estimate" for Donald Trump is "too high", but crouched his statement by noting that being a business mogul, a successful reality show producer, and president does take some level of multifaceted intelligence.

(add)

Religious affiliation

Nearly all US presidents, in belief system, have been characterized as being adherents to Christianity in religious belief, with the exceptions of four who have been said to have had some type of atheism association or were nonreligious or with no religious affiliation: Thomas Jefferson, and as others have argued or alleged: Abraham Lincoln, William Taft, and Barack Obama. [5]

Unique among the group is Jefferson, who with his "last persons to know everything", polymath-polyglot, walking encyclopedia status, possessor of a 6,487 book personal library, suffered from the so-called "Henry Adams effect", described in 1907 by Henry Adams, in his *The Education of Henry Adams* (see: genius), about how the active mind will always be several generations or millennia ahead of his or her peers, who will be caught in a slower type of mental inertia.

Intelligence

See main: American Presidents by IQ

The following are the results of about 25-35 people with the query "Who are the Three Smartest American Presidents", of which 18 were able to give answers, the results of which are shown below, along with known IQ estimates from genius IQ table (IQ_G) from American psychologist Dean Simonton's 2006 historical extrapolation estimates (IQ_S)—who, to note, seems to consider John Adams to have the highest IQ, ahead of Thomas Jefferson (who he ranks second in intelligence): [6]

Rank	**Smartest Presidents** (2013 colloquial opinion)	**Votes**	**IQ_G/IQ_C**	**Smartest Presidents** (2006 Simonton ranking)	**IQ_S**	**Smartest Presidents** (2016 Thims ranking)	**IQ_S** (top 500)

1.	Thomas Jefferson (1743-1826)	11	180	John Adams (1735-1826)	173	Thomas Jefferson (1743-1826)	IQ:180|#91
2.	Abraham Lincoln (1809–1865)	8	160	Thomas Jefferson (1743-1826)	160	James Madison (1751-1836)	IQ:170|#254
3.	John F. Kennedy (1917–1963)	6		John F. Kennedy (1917–1963)	158	Abraham Lincoln (1809–1865)	IQ:170|#255
4.	Franklin D. Roosevelt (1882–1945)	6		Bill Clinton (1946-)	156	John Adams (1735-1826)	IQ:170|#256
5.	Bill Clinton (1946-)	5		James Madison (1751-1836)	155	John F. Kennedy (1917–1963)	
6.	Theodore Roosevelt (1858–1919)	5		Jimmy Carter (1924-)	153	Woodrow Wilson (1856–1924)	
7.	John Adams (1735-1826)	2		Woodrow Wilson (1856–1924)	152	Barack Obama (1961-)	
8.	Woodrow Wilson (1856–1924)	2		Theodore Roosevelt (1858–1919)	149	Theodore Roosevelt (1858–1919)	
9.	George Washington (1732-1799)	2		James Garfield (1831–1881)	148		
10.	James Madison (1751-1836)	1	160	Chester Arthur (1829–1886)	148		
11	Jimmy Carter (1924-)	1		Abraham Lincoln (1809–1865)	148		
12.	Ronald Reagan (1911–2004)	1		Franklin D. Roosevelt (1882–1945)	146		

13.	Barack Obama (1961-)	1	134	Millard Fillmore (1800–1874)	143
14.	Lyndon Johnson (1908–1973)	1		John Tyler (1790–1862)	142
15.	Harry Truman (1884–1972)	1		Franklin Pierce (1804–1869)	141
16.	James Monroe (1758–1831)	1			

(add)

Leaders | Scientific paradigm based

The following are noted leaders of countries who each based their governance models on one or another distinct scientific paradigms:

â— Adolf Hitler |
â— Benito Mussolini | Vilfredo Pareto, Friedrich Nietzsche
â— James Madison | Isaac Newton
â— Joseph Stalin | Karl Marx
â— Mehdi Bazargan |
â— Napoleon Bonaparte | Johann Goethe
â— Thomas Jefferson | Epicurus
â— Woodrow Wilson | Isaac Newton, Charles Darwin

See also

â— Founding fathers fallacy

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4. (a) Bush, George W. (2001). "President Discusses Stem Cell Research", Aug 09.
(b) Stem cell controversy – Wikipedia.
5. Religious affiliations of Presidents of the United States – Wikipedia.
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(b) Simonton, Dean K. (2006). "Presidential IQ, Openness, Intellectual Brilliance, and Leadership: Estimates and Correlations for 42 U.S. Chief Executives" (pdf), *Political Psychology*, 27(4):511-26.
(c) IQ estimates [of US Presidents] by academics (section) – Wikipedia.

External links

â— List of Presidents of the United States – Wikipedia.

â— List of Presidents of the United States by time in office – Wikipedia.
â— The Presidents – WhiteHouse.gov.

θΔics

In genius studies, **American Presidents by IQ** is a ranking of the presidents of the United States by intellectual brilliance, political genius, executive genius, legislative genius (Q), leadership prominence, and honed decision making ability. [N1]

The Mount Rushmore depiction of **American presidents**: George Washington, Thomas Jefferson, Theodore Roosevelt, and Abraham Lincoln, labeled with 2017 **IQ** estimates, as tabulated below.

> "There has never been a **greater concentration of intellectual power** here at the White House since Thomas Jefferson dined alone."
>
> — John F. Kennedy (c.1962), speaking at a White House dinner that was attended by every Nobel Laureate in US [17]

> "I understand that Thomas Jefferson was our **smartest president**. Who was **our stupidest**? Second stupidest?"
>
> — Chris Lamb (2001), "Dear Cecil Query" [6]

In 1950, the US government commissioned a team of scholars from the University of Pennsylvania and the Columbia Historical Society to select 23 great lawgivers (see: Washington 23) to display as on the walls of the US House of Representatives, among whom only two Americans were selected: Thomas Jefferson and George Mason.

Political genius

One of the earliest mentioned "political geniuses" was Greek politician and general Themistocles (c.524-459BC) (Q), characterized by those including Thucydides, as perhaps the "greatest political genius to emerge in democratic Greece", noted for his ability to "put an end to the civil wars of Greece, compose their differences, and persuading them to lay aside all enmity during the war with the Persians", as Plutarch put things. (Q) A "political genius", according to Nietzsche (1862), is one who is "governed by other and higher laws than the ordinary person" and has a "nobility of style", his examples come to mind being: Caesar, the Machiavellian "prince", and Napoleon. (Q)(Q) The term "political genius", according to modern Google Book search, is most-associated with names such as: Abraham Lincoln (Q), George Washington (Q), Henry IV (Q), John Adams, James Madison (Q), Franklin D. Roosevelt (Q), Woodrow Wilson (Q), Winston Churchill (Q), Barack Obama (Q)(Q), Julius Caesar (Q), and Lyndon Johnson (Q), respectively, to name a few.

Rankings

The following is a work-in-progress rankings of American Presidents by IQ, generally being an extrapolation and interpolation of those presidents previously having established IQ scores as found in the top 1000 geniuses rankings (ranking position shown in [#] brackets), each IQ citation is indicated by subscript (see: IQ key), when available: [N1]

US Presidents			
IQ	**President**	**IQ Estimates**	**Description**
190 **1** [44]	Thomas Jefferson (1743-1826)	IQ_B=195 IQ_{CB} =**178** IQ_C=160 IQ_W=160 IQ_{Si}=160 IQ_{SiM} =154	[RGM:**29**|1,305+] (Cattell 1000:79) [HD:17] Fabled "last persons to know everything" and "walking encyclopedia; library: 6,487 books; thing philosopher; an unlearn expositor; founding father (author of *Declaration of Independence*); auto-characterized "Epicurean materialist". A 2015 ranked top 10 Smartest President (**#1**). [11]
			↑ 190+
180 **2** [150]	James Madison (1751-1836) Term: 1809-1817	IQ_C=160 IQ_{Si}=160 IQ_{SiM} =142	[RGM:**177**|1,305+] (Cattell 1000:476) [HD:18] The patriarch of the so-called Princeton school of social physics; in 1769, was studying a primitive form of social physics a Princeton; was a student of John Witherspoon (1723-1794), a signatory of the Declaration of Independence, and noted interpreter of the political philosophy of Charles Montesquieu, notable for his "hot climates" / "cold climates" theory of human behavior, who in turn had been deeply influenced by the celestial mechanics work of Isaac Newton; a set of teachings, that went into the so-called Newtonian-based framing of the US Constitution, e.g. separation of powers (see: Newtonian government), as Woodrow Wilson (#28) argued; as John Q. Stewart stated: "in early Princeton, physics cooperated with politics in a sort of analogical double play, Newton to Witherspoon to Madison." A 2015 top 10 Smartest President (**#2**). [11]
			↑ 180+
175 **3** [205]	Abraham Lincoln (1809-1865)	IQ_{CB} =**160** IQ_C=150 IQ_B=170 IQ_W=147 IQ_{Si}=150 IQ_{SiM} =140	[RGM:**50**|1,305+] (Cattell 1000:40) Used Euclidian geometry as a basis to determine right from wrong in making crucial policy decisions, e.g. about slavery.
175 **4** [215]	John Adams (1735-1826) Term: 1797-1801	IQ_C=155 IQ_{Si}=155 IQ_{SiM} =143	[RGM:**187**|1,305+] (Cattell 1000:182) [HD:14] The patriarch of the so-called Adams family (or Adams political family): his son, John Quincy Adams, was 6th president, and his great grandson was Henry Adams, the leading social Newton, behind Goethe; his age 23 "diary notes" on the five types of genius, the 5th of which is "political genius", and his latter correspondence with Jefferson exemplifies his above superior mind. A 2015 top 10 Smartest President (**#3**). [11]

			↑ 175+
— 170 **5** [275]	John Quincy Adams (1767–1848)	IQ_{C}=175 IQ_{Si}=175 IQ_{SiM} =169	[RGM:**N/A**|1,305+] (Cattell 1000:483) Son of John Adams (2nd president); grandfather of Henry Adams; quote: "John Quincy Adams, the **only child prodigy among the presidents**, was estimated to have the highest IQ at 170, which is above the 99.99th percentile" (Cox, 1926). [12] Fluent in French, Dutch, German, English, and Latin. He also could read and write Italian, and Ancient Greek. He he chose (O) to swear in to office on a book of law instead of the Bible, because he wanted to make it clear that he was protecting the US constitution and the laws of the US above all else.
			↑ 170+
— 160 **6** [380]	Woodrow Wilson (1856–1924) Term: 1913-1921	IQ_{Si}=155 IQ_{SiM} =145	[RGM:**640**|1,305+] Used Darwinian evolution logic as a logic platform in his presidency. Ranked 8rd smartest president according to public opinion (Thims, 2013). [2] A 2015 top 10 Smartest President (**#4**). [11] Quora (2013) ranked smartest US president nominee. [17]
			↑ 160+
— 155 **7** [418]	John Kennedy (1917–1963) Term: 1961-1963	IQ_{Si}=160 IQ_{SiM} =151 IQ_{O}=119	[RGM:**114**|1,305+] Ranked 3rd smartest president according to public opinion (Thims, 2013). [2] As a kid scored 119 on the Otis Intelligence Test. [6]
— 155 **8** [420]	Theodore Roosevelt (1858–1919)	IQ_{Si}=153 IQ_{SiM} =142	[RGM:**307**|1,305+] A 2015 ranked top 10 Smartest President (**#5**). [11] Downgrade ↓ for referring to founding father Thomas Paine as a “filthy little atheist that apparently esteems a bladder of dirty water as the proper weapon with which to assail Christianity.” (Jacoby, 2004)
			↑ 155+
— 150 **9** [N/A]	Bill Clinton (1946-) Term: 1993-2001	IQ_{Si}=159 IQ_{SiM} =149	[RGM:**568**|1,305+] Highest IQ poll (2014): #1 Clinton, #2 Carter, #3 Obama, #4 G.H.W. Bush, #5 G.W. Bush (4,590 votes). [9] Rhodes scholar and Yale graduate.
— 150	Jimmy Carter (1924-) Term: 1977-1981	IQ_{Si}=157 IQ_{SiM}	[RGM:**N/A**|1,305+] Ranked in top 15 smartest president according to public opinion (Thims, 2013). [2] Highest IQ poll (2014): #1 Clinton, #2 Carter, #3 Obama, #4 G.H.W. Bush, #5 G.W. Bush (4,590 votes).

10 [N/A]			=145	[9] Quora (2013) ranked smartest US president nominee. [17]
150 | **11**		James Garfield (1831–1881) Term: 1881	IQ_{Si}=152 IQ_{SiM} =142	A 2015 ranked top 10 Smartest President (**#6**). [11] Quora (2013) ranked smartest US president nominee. [17] Could write Latin and Ancient Greek simultaneously (he was ambidextrous). Came up with a proof (of more than 300 in existence now) of the Pythagorean theorem.
150 | **12** [483]		Franklin D. Roosevelt (1882–1945) Term: 1933-1945	IQ_{Si}=151 IQ_{SiM} =140	[RGM:**359**|1,305+] Ranked 6th smartest president according to public opinion (Thims, 2013). [2] Married to Eleanor Roosevelt, ranked 5th smartest female of all time according to public opinion (Thims, 2011). [8] A four-term president who pulled America out of the great depression and aligned the US with the Allied Powers during WWII.
			↑ 150+	
145 | **13**		Chester Arthur (1829–1886) Term: 1881-1885	IQ_{Si}=152 IQ_{SiM} =142	
145 | **14**		John Tyler (1790–1862) Term: 1841-1845	IQ_{Si}=148 IQ_{SiM} =136	
145 | **15**		Rutherford Hayes (1822–1893) Term: 1877-1881	IQ_{Si}=146 IQ_{SiM} =134	
145 | **16**		Barack Obama (1961-) Term: 2009-2015	IQ_{O}=110-160	[RGM:**496**|1,305+] Ranked 1st in YouGov.com poll (2016), of 3,000 British people, of the "perceived intelligence" of the 30 most talked about public figures. [7] Internet IQ estimates: 110-160 (O), 120-130 (O), 130 (O), 145 (O). High intelligence in respect to the relation of government policy and the Bible. Highest IQ poll (2014): #1 Clinton, #2 Carter, #3 Obama, #4 G.H.W. Bush, #5 G.W. Bush (4,590 votes). [9]
145 | **17**		Dwight Eisenhower (1890–1969) Term: 1953-1961	IQ_{Si}=145 IQ_{SiM} =132	
145 | **18**		Martin van Buren (1782–1862) Term: 1837-1841	IQ_{Si}=146 IQ_{SiM} =133	
		Andrew		

145 | **19**	Jackson (1767–1845) Term: 1829-1837	IQ_C=145 IQ_{Si}=145 IQ_{SiM} =126	
145 | **20**	Benjamin Harrison (1833–1901) Term: 1889-1893	IQ_{Si}=145 IQ_{SiM} =132	
145 | **21**	Grover Cleveland (1837–1908) Term: 1885-1889	IQ_{Si}=144 IQ_{SiM} =131	
145 | **22**	George H. W. Bush (1924-) Term: 1989-1993	IQ_{Si}=143 IQ_{SiM} =130	
145 | **23**	William McKinley (1843–1901) Term: 1897-1901	IQ_{Si}=143 IQ_{SiM} =130	
145 | **24**	James Polk (1795–1849) Term: 1845-1849	IQ_{Si}=143 IQ_{SiM} =130	
			↑ 145+
140 | **25**	Lyndon Johnson (1908–1973) Term: 1963-1969	IQ_{Si}=141 IQ_{SiM} =128	A 2013 voted top 15 smartest US President. [2]
140 | **26**	Harry Truman (1884–1972) Term: 1945-1953	IQ_{Si}=141 IQ_{SiM} =128	A 2013 voted top 15 smartest US President. [2]
140 | **27** [491]	George Washington (1789-1797)	IQ_{CB} =**140** IQ_C=140 IQ_B=140 IQ_{Si}=140 IQ_{SiM} =133 IQ_W=135	[RGM:54|1,305+] (Cattell 1000:19)

140 | 140		William Taft (1857–1930) Term: 1909-1913	IQ_{Si}=140 IQ_{SiM} =127	
140 | 140		James Monroe (1758–1831) Term: 1817-1825	IQ_{Si}=139 IQ_{SiM} =124	
140 | 140		Franklin Pierce (1804–1869) Term: 1853-1857	IQ_{Si}=147 IQ_{SiM} =135	A top 10 worst presidents (#4), according to US News and Report (2014). [14] Existence-long friends with writer Nathaniel Hawthorn (IQ:155|#439).
			↑ 140+	
135 | 135		Herbert Hoover (1874–1964) Term: 1929-1933	IQ_{Si}=142 IQ_{SiM} =130	A top 10 worst president (#9), according to US News and Report (2014), characterized: "poor communicator who fueled trade wars and exacerbated the depression. " [14] He, supposedly, was a “brilliant man”, but his administration was a disaster. [5] Quora (2013) ranked smartest US president nominee. [17] Graduated from Stanford. In his spare time at college, he translated a Middle Ages book about mining from Latin into English. The translation contains extensive footnotes and is known for being very clearly translated. He also spoke Mandarin Chinese.
135 | 135		Richard Nixon (1913–1994) Term: 1969-1974	IQ_{Si}=143 IQ_{O}=143 IQ_{O}=132 IQ_{SiM} =131	A top 10 worst presidents (#10), according to US News and Report (2014); summary: known for Watergate scandal (resigned). [14] Scored 143 on an IQ test taken at school. [9] "Nixon was widely reported to have an IQ of 132" [12]
135 | 135		Millard Fillmore (1800–1874) Term: 1850-1853	IQ_{Si}=149 IQ_{SiM} =136	A top 10 worst presidents (#5), according to US News and Report (2014). [14] Characterized: a “blundering, pompous, ultimately shallow failure”. (Q)
135 | 135		Zachary Taylor (1784–1850) Term: 1849-1850	IQ_{Si}=140 IQ_{SiM} =126	A top 10 worst presidents (#6), according to US News and Report (2014); characterized: a “stalwart defender of slavery”. [14]
135 | 135		James Buchanan (1791–1868) Term: 1857-1861	IQ_{Si}=140 IQ_{SiM} =126	A top 10 worst presidents (#1), according to US News and Report (2014). [14]
			↑ 135+	
130 | 130		Gerald Ford (1913–2006) Term: 1974-1977	IQ_{Si}=140 IQ_{SiM} =127	A 2015 top 10 Dumbest President (**#4**). [11] Graduated graduated in the top third of his law school. [12]

37	130		Donald Trump (1946-) ↑↓↓ Term: 2017-	IQ_{O}=146 IQ_{O}=145 IQ_{self} =132 IQ_{O}=125	A Quora (2017) ranked dumbest American president. [15] Categorized: as “possibly the dimmest president ever” by Jennifer Rubin (May 2017) (Q) High "business IQ" and "entertainment IQ", but low "political IQ", according to consensus. Many believe he is autistic, smart in some areas, abysmal in others. [16] Quora discussion (Q) on “What is Trump’s IQ” endlessly variate between 90s to 150s; ConservativePush.com ranked at 145 (Q)
38	130		William Harrison (1773–1841) Term: 1841	IQ_{Si}=146 IQ_{SiM} =134	A top 10 worst presidents (#8), according to US News and Report (2014); summary: a former war hero (recaptured Detroit), only in office for 30 days (before dying from cold), in bed the entire time. [14] A Quora ranked (2012) dumbest American president. [15]
					↑ 130+
39	125		Ronald Reagan (1911–2004) Term: 1981-1989	IQ_{Si}=142 IQ_{SiM} =130	A 2015 top 10 Dumbest President (**#5**). [11] Gerald Ford: “Regan is probably the least well-informed on the details of running the government of any president I knew.” [15]
40	125		Calvin Coolidge (1872–1933) Term: 1923-1929	IQ_{Si}=142 IQ_{SiM} =127	A Quora (2012) ranked “dumbest American president”; noted for: Teapot Dome Scandal, and supposedly, for bringing on the Wall Street Crash and Great Depression. [15] Noted, in evolutionary psychology, for "Coolidge effect". [12]
41	125		George W. Bush (1946-) Term: 2001-2009	IQ_{Si}=139 IQ_{SiM} =125 IQ_{O}=125	A 2015 top 10 Dumbest President (**#2**). [11] A Quora (2012) ranked “dumbest American president”. [15] A top 10 worst presidents (#10), according to US News and Report (2014). [14] His SAT score (1206) was converted, by Linda Gottfredson (Q), into an IQ of 125. He banned stem cells research, per reason that stem cells have a soul; hence it is immoral to use them for research purposes. [10]
42	125		Ulysses Grant (1822–1885) Term: 1869-1877	IQ_{C}=130 IQ_{Si}=130 IQ_{SiM} =120 IQ_{O}=115	A top 10 worst presidents (#7), according to US News and Report (2014). [14] Quote: "Grant was lowest, with an IQ estimate of 115, about the 84th percentile" (Cox, 1926). [12]
43	125		Andrew Johnson (1808–1875) Term: 1865-1869	IQ_{Si}=140 IQ_{SiM} =126	A 2015 top 10 Dumbest President (**#3**). [11] A top 10 worst presidents (#3), according to US News and Report (2014). [14] A Quora ranked (2012) dumbest American president. [15]
44	125		Warren Harding (1865–1923) Term: 1921-1923	IQ_{Si}=140 IQ_{SiM} =124	A 2015 top 10 Dumbest President (**#1**). [11] A top 10 worst presidents (#2), according to US News and Report (2014), characterized: "an ineffectual and indecisive leader who played poker while his friends plunder the US treasury" [14]
					↑ 125+

(add)

Trump | IQ?

In 2013, Trump began to attract media attention by tweeting about his purported high IQ:

> "Someone asked me if I thought I was a genius. I decided to say yes. Why not? Try it out. Tell yourself that you are a genius. Right away you will probably wonder why and in what way you are a genius. And right away, you will have opened your mind up to wonder—and to asking questions. That's a big first step to thinking like a genius."
> — Donald Trump (2010), *Think Like a Champion* (pg. 132) (Q)

In summer 2017, Rex Tillerson reportedly called Trump a "moron". Trump responded by saying that his IQ test scores are higher than Tillerson.

> "Sorry losers and haters, **my IQ is one of the highest**, and you all know it!"
>
> — Donald Trump (2013), Tweet, May 8 (Q)

> "I know some of you may think I'm tough and harsh but actually I'm a very compassionate person (with **a very high IQ**) and with strong common sense."
>
> — Donald Trump (2013), Tweet, Apr 21

> "As far as that low-info voter base goes, **I have an IQ of 132**. So much for that theory."
>
> — Donald Trump (2015), Twitter (Q), Dec 13

In Oct 2017, Chris Cillizza, of CNN Politics, collected 22 Tweets related to Trump's so-called IQ obsession. [13]

In 2015, Trump's IQ was reported, in an article (Q) by BeforeItsNews.com, as being 156 based on the fact that he graduated from Wharton School, that the average student needs an SAT score of 1500 to get in, and that this translates to an IQ of 145 to 149 or 156 as reported. This was reported (Q) by Snopes.com to be a hoax article. In 2016, based on the previous "hoax IQ", a presidential IQ chart began making the rounds, in social media, stating something to the affect that Dean Simonton was the one who calculated Trump's IQ at 156 (Q)(Q) and that his IQ was second highest presidential IQ, below John Q. Adams and above Thomas Jefferson.

In Mar 2017, a poll conducted of 3,000 UK residents ranked Trump second lowest in intelligence, above George W. Bush, and ranked Obama first in intelligence, among 30 most talked about public figures on YouGov.com. (Q)

In 2017, Jordan Peterson (who thinks his own IQ is in "excess of 150"), stated, in interview (Q), that "a 160 IQ estimate" for Donald Trump is "too high", but crouched his statement by noting that being a business mogul, a successful reality show producer, and president does take some level of multifaceted intelligence.

Trump's guestimated IQ, according to opinion, is low. 50 percent of people, according to public polls, think that Trump's IQ, is below 100 (mean: IQ=31), whereas 50 percent think his IQ is above 100 (mean: IQ: 105), with numbers ranging from zero to 160. [16] The dumbest things he's done in Oct (alone), according to public opinion, is to (a) state that he "met with the president of Virgin Islands", not knowing that he is the president of the Virgin Islands, (b) throw paper towels (Q) at hurricane ravaged Puerto Ricans, and (c) give "skittles" (one of his favorite cereals) (Q) as food supplies to hurricane victims. [16]

Trump's claim to fame, in short, was his going from a 1990 negative $1 billion net worth, in the form of a bankrupt Atlantic City casino, to a 2001 $1.7 billion net worth (Q), thereby which he name-branded himself, to being a 2004 TV celebrity, via *The Apprentice* (Q), to successfully winning the US presidency on an anti-PC platform ticket.

Historical background

In 1926, Catherine Cox, in coordination with Lewis Terman and Maud Merrill, in her Cox 300 (see: Cox IQs), ranked the IQs of eight US presidents, including:

62. Adams, J. Q. (IQ=175)
194. Madison (IQ=160)
206. Adams, J. (IQ=155)
#. Lincoln (IQ=150)

#. Washington (IQ=140)

In 1983, Herbert Walberg, et al., estimated the IQs of a number of presidents, e.g. Jefferson (IQ=160), as are shown above by the W-subscript IQs. [4]

In 1996, Tony Buzan, in coordination with Raymond Keene, in his Buzan 100 (see: Buzan IQs) ranked the IQs of the following three US presidents:

7. Jefferson (IQ=195)
61. Lincoln (IQ=170)
95. Washington (IQ=140)

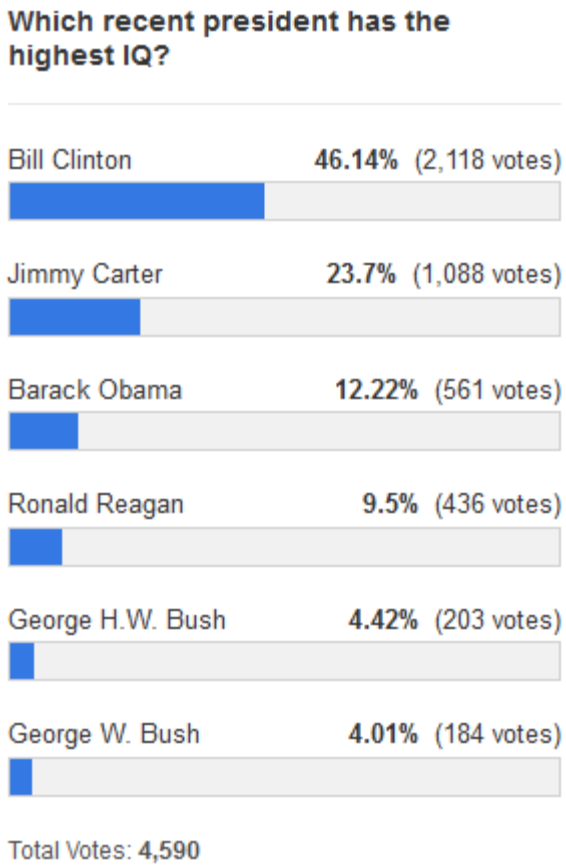

Poll results from IQ blogger Pumpkin Person's 2014 article: "IQs of U.S. Presidents", showing Clinton having the highest IQ, compared to Carter, Obama, Reagan, G.H.W. Bush, and G.W. Bush. [9]

In 2004, Steven Rubenzer and Thomas Faschingbauer, in their *Personality, Character, and Leadership in the White House: Psychologists Assess the Presidents*, had the following to say about the IQs and intelligence of the various presidents: [12]

> "Every president to date has been a white male of Western European ancestry. Most were successful, professional politicians. Many of the rest were military men or lawyers. How well do they reflect the range of people whom they represent? Are they made of special stuff not found in the rest of us? Presidents do differ among themselves. Some came from wealthy families; others were very poor. The most startling contrast is level of education. Some (e.g., Jackson and Lincoln) had virtually no formal schooling. Others,

such as Jefferson and J. Q. Adams, were among the most learned men of their time; Wilson held a PhD.

Despite their range of education, it is almost certain that, as a group, presidents were brighter than the average Americans of their time. Leaders, almost by definition, must be able to comprehend problems and articulate or resolve them better than their followers. Research confirms that they typically score at the 9oth percentile of the group they lead in intelligence? Most modern presidents, such as Richard Nixon, Jimmy Carter, and Clinton, have been very smart men. Even those with more modest intellectual reputations (e.g., Reagan and Ford), were college graduates, and Ford graduated in the top third of his law school. A president doesn't have to be the smartest person in the land, but he ought to be above average. When there is a question about this, as with Harding, the results are unhappy.

There were no IQ tests in Washington's time, but there were other ways that intelligence could be estimated. Nearly a hundred years ago [1926], a team of researchers [Catherine Cox, Maud Merrill, Lewis Terman, et al] attempted to gauge the intelligence of 301 eminent people by systematic analysis of their writings, both as children and adults? They studied a variety of professions, including scientists, artists, and political figures. Included in their group were a number of early presidents. John Quincy Adams, the **only child prodigy among the presidents**, was estimated to have the highest IQ at 170, which is above the 99.99th percentile. Grant was lowest, with an IQ estimate of 115—about the 84th percentile. It should be noted that these estimates, based on written works, might underestimate ability in areas such as spatial relations. This would put generals, such as Washington and Grant, at a disadvantage relative to scholars. Incidentally, Washington's estimated IQ was 130; John Adams' 140; Jefferson's 145.

Since intelligence tests are now widely used in schools, businesses, and medical settings, it's increasingly possible to get actual IQ scores on presidents and candidates. Nixon was widely reported to have an IQ of 132, which is approximately at the 98th percentile of Americans. As part of his evaluation for Alzheimer's disease, Reagan almost certainly took an IQ test, though his score could be significantly lower than it would have been before the disease. As we will see in the next chapter, intelligence is one of the best predictors of performance for all jobs, particularly complex ones."

In 2006, Dean Simonton ranked the IQs of 42 US presidents. [1]

In 2013, Libb Thims had polled about 25-35 Chicagoans with the in-person queried with: "Who are the Three Smartest American Presidents", of which 18 were able to give answers, the results of which are shown below (Q), as compared to the top 16 Simonton 2006 rankings. [2]

Rank	**Smartest Presidents** (2013 colloquial opinion)	**Votes**	**IQG**	**Smartest Presidents** (2006 Simonton ranking)	**IQs**
1.	Thomas Jefferson (1743-1826)	11	180	John Adams (1735-1826)	173
2.	Abraham Lincoln (1809–1865)	8	160	Thomas Jefferson (1743-1826)	160
3.	John F. Kennedy (1917–1963)	6		John F. Kennedy (1917–1963)	158
4.	Franklin D. Roosevelt (1882–1945)	6		Bill Clinton (1946-)	156

5.	Bill Clinton (1946-)	5		James Madison (1751-1836)	155
6.	Theodore Roosevelt (1858–1919)	5		Jimmy Carter (1924-)	153
7.	John Adams (1735-1826)	2			
8.	Woodrow Wilson (1856–1924)	2		Woodrow Wilson (1856–1924)	152
9.	George Washington (1732-1799)	2		Theodore Roosevelt (1858–1919)	149
10.	James Madison (1751-1836)	1		James Garfield (1831–1881)	148
11	Jimmy Carter (1924-)	1		Chester Arthur (1829–1886)	148
12.	Ronald Reagan (1911–2004)	1		Abraham Lincoln (1809–1865)	148
13.	Barack Obama (1961-)	1	134	Franklin D. Roosevelt (1882–1945)	146
14.	Lyndon Johnson (1908–1973)	1		Millard Fillmore (1800–1874)	143
15.	Harry Truman (1884–1972)	1		John Tyler (1790–1862)	142
16.	James Monroe (1758–1831)	1		Franklin Pierce (1804–1869)	141

In 2014, Andrew Soergel and Jah Tolson, of US News and World Reports, averaged the results of five major presidential polls, to rank the 10 worst presidents, as follows: [14]

1. James Buchanan
2. Warren Harding | An ineffectual and indecisive leader who played poker while his friends plunder the US treasury.
3. Andrew Johnson
4. Franklin Pierce
5. Millard Fillmore
6. John Tylor | Stalwart defender of slavery.
7. Ulysses Grant
8. William Harrison | Only 30 days in office.
9. Herbert Hoover | Poor communicator who fueled trade wars and exacerbated the depression.
10. Richard Nixon | Watergate scandal
10. George. W. Bush

In May 2015, Simonton-based, Thims compiled results became a feature Business Insider article penned by Natasha Bertrand. [3]

In May 2015, Lindsey Cook, a data editor at US News and World Report, took the "mean" of the four IQ estimates (IQ at age 1-17, and 18-26; corrected and uncorrected), for each president, from the Simonton (2006) study, as are shown by the IQ_{SiM}= #s, as shown above. [5]

In 2017, a reprint of the above began to circulate, in the Internet, showing Donald Trump, with an IQ of 156, second from the top.

Quotes

The following are related quotes:

> "He who has a faculty of combining these laws of human nature into rules, for the government of society, to procure peace, plenty, liberty, has a great **political genius**."
>
> — John Adams (1758), "On the Characteristics of Genius" [1]

> "Now we are in a position to admire the political genius of Barack Obama. Actually 'genius' is probably too strong a word. I don't think that Obama is a genius. He is, however, a highly intelligent man, and he is possessed of a certain kind of low cunning that makes him politically formidable."
>
> — Dinesh D'Souza (2014), *Obama's America: Unmaking the American Dream* (pg. 109)

Notes

N1. This page resulted as a 10 Oct 2017 request of Matthew Rocheleau of the Boston Globe.

References

1. Simonton, Dean K. (2006). "Presidential IQ, Openness, Intellectual Brilliance, and Leadership: Estimates and Correlations for 42 U.S. Chief Executives" (pdf), *Political Psychology*, 27(4):511-26.
2. Thims, Libb. (2013). "Poll: 3 Smartest American Presidents?" (N=25-35/18), Nov 11.
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4. Walberg, Herbert J. Tsai, Shiow-Ling, Weinstein, Thomas, Gabriel, Cynthia L., Rasher, Sue, P. Roesecrans, Teresa, Rovai, Evangelina, Ide, Judith, Trujillo, Miguel, and Vukosavich, Peter. (1981). "Childhood Traits and Environmental Conditions of Highly Eminent Adults", *Gifted Child Quarterly*, 25(3):103-07.
5. Cook, Lindsey. (2015). "Presidential IQs and Success in the Oval Office" (Q), US News and World Report, May 27.
6. Cecil. (2001). "Who Was the Stupidest U.S. President?" (Q), StraightDope.com, Jun 22.
7. Dahlgreen, Will. (2016). "Perceived Intelligence of top 30 Public Figures" (Q), YouGov UK, May 23.
8. Thims, Libb. (2011). "Poll: Who are the Three Smartest Women of All Time?", Street Poll (N=30), Chicago: IoHT Publications.
9. Pumpkin Person. (2014). "IQs of U.S. Presidents" (Q), Brain Size, WordPress, May 03.
10. (a) Bush, George W. (2001). "President Discusses Stem Cell Research", Aug 09.
(b) Stem cell controversy – Wikipedia.
11. Schwartz, Larry. (2015). "The 10 Smartest (and the Dumbest) Presidents in America's History: Some Presidents Weren't Firing on All Cylinders" (Q), AlterNet.org, Feb 28.
12. Coolidge effect – Wikipedia.
13. Cillizza, Chris. (2017). "Donald Trump's IQ obsession, in 22 quotes" (Q), CNN Politics, Oct 10.
14. Soergel, Andrew and Tolson, Jay. (2014). "The 10 Worst Presidents: Not all U.S. Presidents are missed once they leave the White House" (Q), US News and World Reports, Dec 31. 15. Who was the dumbest American president? (2012) (Q) – Quora.
16. Thims, Libb. (2017). "Poll of Random Chicagoans" [N=20], Oct 15.
17. Who was the smartest US President (2013) (Q) – Quora.

Further reading

Goodwin, Doris. (2009). *Team of Rivals: the Political Genius of Abraham Lincoln*. Publisher.

External links

- IQ estimates [of US Presidents] by academics (section) – Wikipedia.
- U.S. Presidential IQ hoax – Wikipedia.

θΔics

In schools, **American school of econophysics** refers to the collective econophysics work and departments seen semi-sprouting in the United States, towards the turn of the 20th century, such as those headed by American physicist Eugene Stanley (1995-present), at Boston University, Russian-born American physicist Victor Yakovenko (2003-present), at the University of Maryland, and American physicist Joseph McCauley (2008-present), at the University of Houston. [1]

Etymology

The term "American school of econophysics" was first used in the 2008 article “Some Relevant Econophysics’ Moments of History, Definitions, Methods, Models and New Trends” by Romanian economist Gheorghe Savoiu and Ion Siman. [4] Savoiu also used the term again in his 2012 chapter "The Potential of Econophysics for the Study of Economic Processes" coauthored with American physicist Constantin Andronache, of Boston University. [1]

Boston University econophysics

In 1995, American physicist Eugene Stanley, noted for his use of the Ising model of human behavior, at Boston University, began attending the Kolkata econophysics conferences, of Bikas Chakrabarti, where he coined the word econophysics. The following is 2013 university profile of the Boston University econophysics group: [2]

BU Physics | Econophysics

American physicist Eugene Stanley, who completed his BS in physics at Wesleyan University in 1962, followed by work in biological physics under Max Delbruck in 1963, followed by a 1963 PhD on critical phenomena in magnetic systems at Harvard, investigates, since 1995, has been investigating, at Boston University, the notion that economic agents, in their herd effect like behavior preferences, can be modeled as electron spins, and also that Vilfredo Pareto power laws like Pareto principles can be studied in economics via physics.

Eugene Stanley
(1941-)

> Econophysics: Using Statistical Physics Concepts to Better Understand Economic Questions
>
> A physicist views the economy as a collection of interacting units. This collection is complex; everything depends on everything else. The interesting problem is: how does everything depend on everything else? Physicists are looking for laws that will help us understand this complex interaction. To a physicist, the most interesting thing about economics is that it is dominated by fluctuations in quantities of economic interest. Because big economic shocks affect the economy around the world, the possibility of an economic “meltdown” is one that we must take seriously. Big changes in big money affect not only people with large amounts of it, but also those who have very little of it—those on the margins of society. Finding ideas that serve to solve economic problems can potentially help in making progress on unsolved physics problems. A good example is turbulence. If we take a bucket of water and disturb the surface, energy is added to the system on a big scale. This energy then dissipates over progressively smaller scales. This is an unsolved physics problem; many empirical facts can be stated, but little can be said about understanding it. The economy is analogous to this example of turbulence. One can add information on a big scale to an economic system—e.g., the news of who wins a presidential election—and that information is dissipated on smaller and smaller scales. The way that you handle the “turbulence” associated with this dissipation of information in a financial market may help us understand how to approach turbulence in our physics research."

Stanley, to note, is an editor of *Physica* A, which is one of the few journals that publishes econophysics papers, e.g. Bertrand Roehner (2005). [6]

University of Maryland econophysics

In circa 2003, Russian-born American physicist Victor Yakovenko's began to form his "econophysics group" at the University of Maryland, which as of 2013 has the following listing: [13]

Victor Yakovenko's Econophysics Research Group | Collaborators

Research
Econophysics: Applications of statistical physics to economics and finance.

Victor Yakovenko (1961-)

● Victor Yakovenko, Econophysics group head.
● J. Barkley Rosser, Jr., Professor of Economics and holder of the Kirby L. Kramer Jr. Chair of Business Administration (James Madison University, Harrisonburg, Virginia), Honorary Editor of the *Journal of Economic Behavior and Organization* (2008-2009)
● Anand Banerjee, graduate student (2005-2008) Ph.D.
now a postdoctoral fellow at NIH
● Justin Chen, undergraduate student from Caltech (2007 summer),
developed computer animation of money exchange models
Richard Prange, Professor Emeritus of Physics (2002-2008), deceased
● A. Christian Silva, graduate student (2002-2005) Ph.D.
now with the Evnine-Vaughan Associates, San Francisco
● Adrian Dragulescu, graduate student (1997-2002) Ph.D.
now a risk analyst at the Constellation Energy Group in Baltimore

(add discussion)

University of Houston econophysics

In circa 2008, American physicist Joseph McCauley founded an econophysics branch of the physics department, the 2013 university page abstract of which is as follows:

In 2004, American physicist Joseph McCauley published his *Dynamics of Markets: Econophysics and Finance*, wherein he outlined his ideas on how physics, but NOT thermodynamics, applies to to the study of financial markets, and in 2008 launched an econophysics department at the University of Houston, which supposedly produces graduate students in econophysics.

Joseph McCauley (1943-)

Econophysics - Introduction

Econophysics, also known as the physics of finance, is the study of the dynamical behavior of financial and economic markets. Recently, a vast amount of market data has become available allowing empirical studies of market behavior to be performed. In the econophysics group at the University of Houston, we begin with these empirical studies to measure what the statistical properties of actual dynamics of markets are and then model that behavior mathematically. The models we create and study vary from discrete agent-based ones appropriate for short-time scale behavior to continuous stochastic ones appropriate for longer time scale behavior.There are many interesting and important open questions about market dynamics that interest us. These include questions about how to properly measure and explain the important properties of market dynamics, about the stability of markets, and about what the differences are in the behavior of different types of markets. We are also interested in how the dynamics of markets impacts society. The faculty member in the

econophyiscs group include Professors Joseph L. McCauley, Kevin E. Bassler, Gemunu H. Gunaratne, George F. Reiter and David R. Criswell, as well as Dr. Valery A. Kholodni, an adjunct professor.

(add discussion)

Other

In 2015, in query Emory University physics department head Eric Weeks, about whether Emory has either an econophysics or sociophysics program, such as outlined by conceptually by Emory physics professor emeritus Peter Fong (1988), in terms of Newtonian sociology, commented that Georgia Tech might have a program in econophysics. [5]

Non-US schools

Globally, econophysics schools are also found or are beginning to emerge at the University of Leiden, Japan University, and Lund University.

See also

- Princeton department of social physics
- Romanian school of physical socioeconomics
- Two cultures synergy

References

1. Savoiu, Gheorghe and Andronache, Constantin. (2012). "The Potential of Econophysics for the Study of Economic Processes", in: *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (§7, pg. 99). Academic Press.
2. H. Eugene Stanley (faculty) – Boston University.
3. (a) Victor M. Yakovenko (faculty) – University of Maryland.
(b) Econophysics (research group) – University of Maryland.
4. Savoiu, Gheorghe and Iorga-Siman, Ion. (2008). "Some Relevant Econophysics' Moments of History, Definitions, Methods, Models and New Trends" (pdf), Romanian Economic and Business Review 3 (3), 29-41.
5. (a) Fong, Peter. (1988). "Ethics, Politics and Sociology as Newtonian Sciences" (abs), in: *Newton's Scientific and Philosophical Legacy* (editors: P.B. Scheurer and G. Debrock) (§4:pgs. 343-54). Kluwer Academic Publishers.
(b) Weeks, Eric. (2015). "Email to Libb Thims", Feb 9.
6. Dash, Kishore C. (2015). "Judging the Impact of 'Econophysics' Through Response Questionnaire" (Q), in: *Econophysics and Data Driven Modelling of Market Dynamics* (editors: Frédéric Abergel, Hideaki Aoyama, Bikas K. Chakrabarti, Anirban Chakraborti, Asim Ghosh) (§4:327-48). Springer.

External links

- Graduate school for econophysics (2011) – PhysicsForums.com.
- Is there any PhD or Master in Econophysics all over the world? (2011) – Quora.com.

θΔics

In existographies, **Amir Shirzadi** (c.1960-) is an English materials engineer, with expertise in diffusion bonding, noted for []

Overview

In 2017, Shirzadi, in his “Thermodynamics and Unconditional Love” talk, at Open University, first digressed on general thermodynamics, how negative Gibbs energy is the criterion for spontaneous reactions:

> Spontaneous reactions occur if:
>
> $\Delta G = \Delta H - T\Delta S < 0$

talked a little about money and entropy, or something to this affect, then interjected into his views on the thermodynamics of human chemical bonds (22:08-29:16), using the model of a newly married couple, as shown below, each of whom have 6 groomsmen and 6 bridesmaids: [1]

after which, as shown above, Shirzadi conjectures that the new marriage bond the bride has to her husband as well as the 6 friendship bonds she has to her bridesmaids, and the 6 new weak ties / social bonds she has to her husband’s best men are each quantified as enthalpy changes:

> 13 social bonds = enthalpy ΔH factors (see: human enthalpy)
> 13 social conflicts = entropy $T\Delta S$ factors (see: human entropy)

Here, of note, we can compare this reduction to Frederick Rossini's 1971 "Chemical Thermodynamics in the Real World" lecture, wherein he described freedom and security in society as follows:

Society	$\frac{\Delta S^\circ}{R}$	$-\frac{\Delta H^\circ}{RT}$
	↑	↑
	Freedom	Security

Shirzadi then jumps to the following:

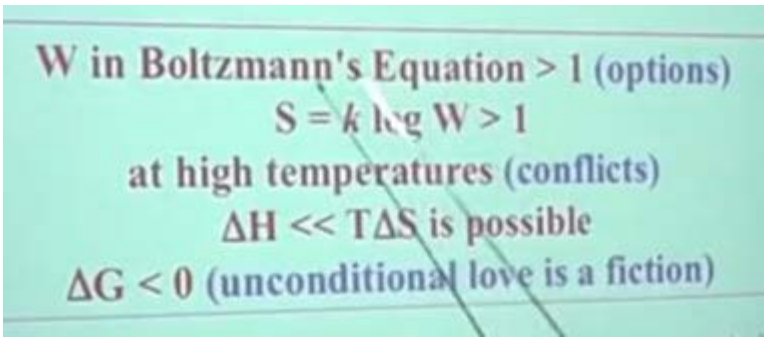

On the Boltzmann equation, which, to note, only applies to systems where the Boltzmann chaos assumption prevails (social systems are not gas phase systems):

$$S = k \log W$$

he says that the W or multiplicity, when greater than one, refers to social bonding “options” or one can have “ten wives, ten husbands, or a thousand friends”, as he says (see: polyhumanide molecule). He then conjectures that potential social "conflicts", which may erupt between any one or all of the various combinations of social bonds and interactions equates to temperature increase (see: social temperature), which he says will produced the following conditions:

$$\Delta H << T\Delta S$$

which will thus produce the spontaneity criterion ($\Delta G < 0$), and thusly, in his concluding opinion "unconditional love" is thermodynamically impossible, i.e. unless the temperature gets too high, wherein even a strong marriage bond will not hold. Of note, on enthalpy change, he says the following:

“This ΔH in some cultures they call it ‘love at first sight’.”

Shirzadi also says that if the temperature is getting too high, thereby threatening the stability of the marriage bond, i.e. ΔH, one can "buy some flowers" (for your wife) and thereby bring down the temperature, i.e. lower the TΔS.

Education

In 2017, Shirzadi was a lecturer at The Open University and a visiting scientist at Cambridge University.

See also

- Thermodynamics of love
- Jacob Leachman
- Erich Muller

References

1. Shirzadi, Amir. (2017). “Thermodynamics and Unconditional Love” (Q), Open University, Feb 24.

External links

- Amir A. Shirzadi – Google Scholar.
- Amir Shirzadi (faculty) – Cambridge University.

θΔics

In existographies, **Amitai Etzioni** (1929-), born "Werner Falk", is a German-born American sociologist noted for []

Education

In 1958, Etzioni received his PhD in sociology at the University of California, Berkeley, after which he worked as professor of sociology at Columbia University for 20 years, chairing the department at one point.

Quotes

The following are example quotes:

> "Conflict-ridden and conflict-free societies are well-known examples. For general theoretical purposes, however, it seems useful to take as an analytic starting point the state of 'social entropy', in which no social bonds are assumed and no social order is positioned. Any social order is considered a counter-entropic arrangement that requires explanation."
>
> — Amitai Etzioni (1968), *The Active Society* (pg. 95)

> "Some, subject to coercion, while highly alienated and inclined to rebel, will often suppress or repress their attitudes until an opportunity for rebellion arises and means are available. Physical scientists have wondered how order is possible if the world is moving toward entropy. According to one position, anti-entropy is possible …"
>
> — Amitai Etzioni (1968), *The Active Society* (pg. 97)

> "These preparations are modern analogies to the primitives' war dances. Again, as in thermodynamics or electronics, while societal assets or power potentials may be accumulated and stored or activated in anticipation of future use, there are some costs or 'losses' involved since some of the potential energy is 'dissipated' and increasingly so as time …"
>
> — Amitai Etzioni (1968), *The Active Society* (pg. 323)

References

1. Etzioni, Amitai. (1968). *The Active Society - a Theory of Societal and Political Processes* (thermodynamics, 3+ pgs; entropy, 10+ pgs; social entropy, pg. 95). Free Press.

External links

â— Amitai Etzioni – Wikipedia.

θΔics

In religio-mythology, **Ammit**, aka “Ammut” or “the devourer”, is the Egyptian soul-eating monster, of female gender, supposedly, that is part alligator (head), part lion (front end) and part hippopotamus (rear end), which resides in the Judgment Hall, generally seen seated on or near the lake of fire (aka Hell), whose job is to eat the souls of sinners, i.e. those whose heart, weighted according to the negative confessions, weighs more than the feather of truth. [1]

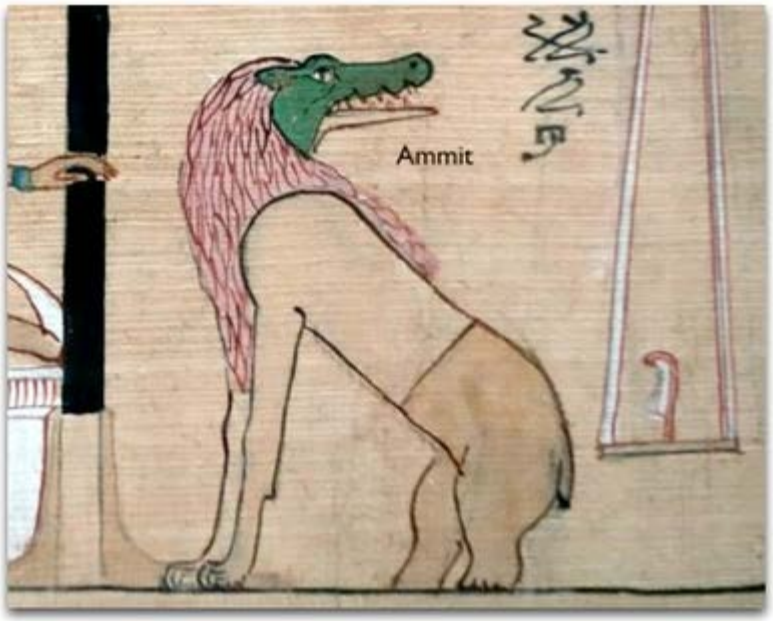

A depiction of **Ammit**, from the Papyrus of Hunefer (c.1300BC) (O), showing him awaiting the verdict of the weighing of the soul, in respect to how far down the feather of truth descends.

References

1. Faulkner, Raymond. (1972). *The Egyptian Book of the Dead: the Book of Coming Forth by Day: Complete Papyrus of Ani, Featuring Integrated Text and Full-Color Images* (translator: Ogden Goelet; Preface: Carol Andrews; Introduction: Daniel Gunther; Foreword: James Wasserman) (Amz) (pgs. 41, 165). Chronicle Books, 2015.

External links

- Ammit – Wikipedia.

θΔics

In famous publications, "**An Account of Carnot's Theory of the Motive Power of Heat**; with Numerical Results Deduced from Regnault's Experiments on Steam" is an 1849 paper, about 40-pages in length, read to the Royal Society of Edinburgh on January 2nd, by Irish physicist William Thomson, notable for the coining of the term "thermo-dynamic" and for having introduced German physicist Rudolf Clausius to both Carnot's principle and to the difficulties inherent in it due to its reliance on the caloric theory. [1]

Clausius

Of great effect, Thomson's "An Account of Carnot's Theory" was referenced heavily in the introduction to Clausius' founding 1850 paper "On the Moving Force of Heat and the Laws of Heat which may be Deduced Therefrom", the paper which acted to lay out the initial foundations of the mechanical theory of heat. [2] In particular, Clausius quotes a section of a footnote from Thomson's paper (paragraph 12), a digression on the term "thermal agency" in regards the discovery by English physicist James Joule of the generation of heat by internal friction in a fluid body, as this might related to the criterion of a perfect thermo-dynamic engine. The specific quote of Thomson that Clausius repeats is: [3]

> "If we abandon this principle, we meet with innumerable other difficulties—insuperable without further experimental investigation—and an entire reconstruction of the theory of heat from its foundation."

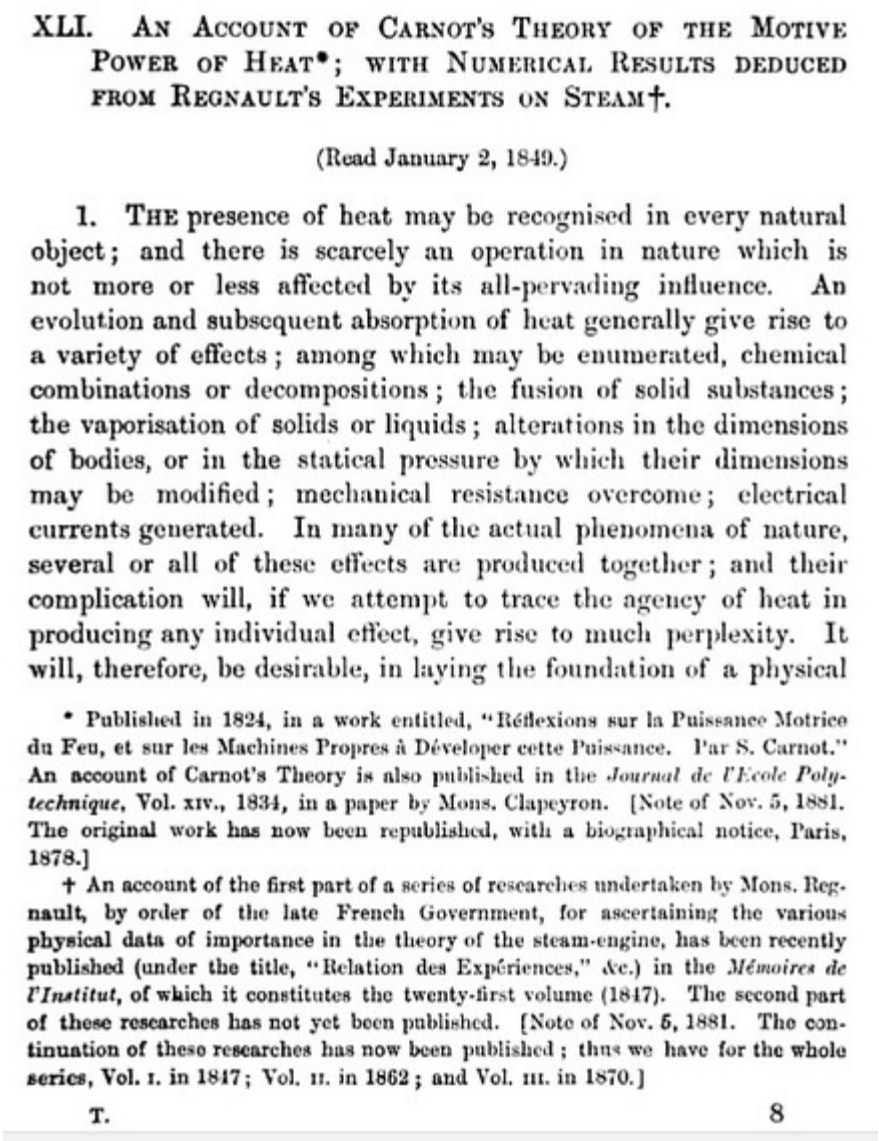

XLI. An Account of Carnot's Theory of the Motive Power of Heat*; with Numerical Results deduced from Regnault's Experiments on Steam†.

(Read January 2, 1849.)

1. The presence of heat may be recognised in every natural object; and there is scarcely an operation in nature which is not more or less affected by its all-pervading influence. An evolution and subsequent absorption of heat generally give rise to a variety of effects; among which may be enumerated, chemical combinations or decompositions; the fusion of solid substances; the vaporisation of solids or liquids; alterations in the dimensions of bodies, or in the statical pressure by which their dimensions may be modified; mechanical resistance overcome; electrical currents generated. In many of the actual phenomena of nature, several or all of these effects are produced together; and their complication will, if we attempt to trace the agency of heat in producing any individual effect, give rise to much perplexity. It will, therefore, be desirable, in laying the foundation of a physical

* Published in 1824, in a work entitled, "Réflexions sur la Puissance Motrice du Feu, et sur les Machines Propres à Développer cette Puissance. Par S. Carnot." An account of Carnot's Theory is also published in the *Journal de l'Ecole Polytechnique*, Vol. xiv., 1834, in a paper by Mons. Clapeyron. [Note of Nov. 5, 1881. The original work has now been republished, with a biographical notice, Paris, 1878.]

† An account of the first part of a series of researches undertaken by Mons. Regnault, by order of the late French Government, for ascertaining the various physical data of importance in the theory of the steam-engine, has been recently published (under the title, "Relation des Expériences," &c.) in the *Mémoires de l'Institut*, of which it constitutes the twenty-first volume (1847). The second part of these researches has not yet been published. [Note of Nov. 5, 1881. The continuation of these researches has now been published; thus we have for the whole series, Vol. i. in 1847; Vol. ii. in 1862; and Vol. iii. in 1870.]

T. 8

Opening page of William Thomson's 1849 "**An Account of Carnot's Theory of the Motive Power of Heat**", wherein he spearheads the introduction of thermodynamics in outline or aims.

Clausius concludes, on this excerpt, "I believe that we should not be daunted by these difficulties"; and proceeds over the next fifteen years to lay out the mechanical theory of heat in a set of nine memoirs, culminating with the binding of these memoirs into the 1865 textbook *The Mechanical Theory of Heat*, the bedrock of thermodynamics.

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θΔics

In famous publications, "**An Inquiry Concerning the Source of Heat which is Excited by Friction**" is a 1798 article by American-born English physicist Benjamin Thompson in which the results of cannon boring experiments were published and discussed which showed that heat produced, via friction, in the boring of a cannon, could be used to make water boil in 2.5 hours time, thus laying question to French physicist Antoine Lavoisier's 1787 caloric theory. [1] This experiment gave one of the first calculations of what would be later called the mechanical equivalent of heat.

What is heat?

These boring experiments, according to Thomson, gave "farther insight into the *hidden nature of heat*; and to enable us to form some reasonable conjectures respecting the existence, or non-existence, of an igneous fluid." The following summary quote by Thomson highlights the central conclusion of the article:

> "What is heat? Is there anything as igneous fluid? Is there anything that can with propriety be called caloric? That heat generated by friction [in the boring experiments] appeared, evidently, to be *inexhaustible*, [it] cannot possibly be *a material substance*; … it appears to me to me to be extremely difficult, if not quite impossible, to form any distinct idea of anything capable of being excited and communicated in the manner heat was excited and communicated in these experiments, except it be MOTION."

In short, heat was experimentally determined to be or be related to the motion of particles of bodies.

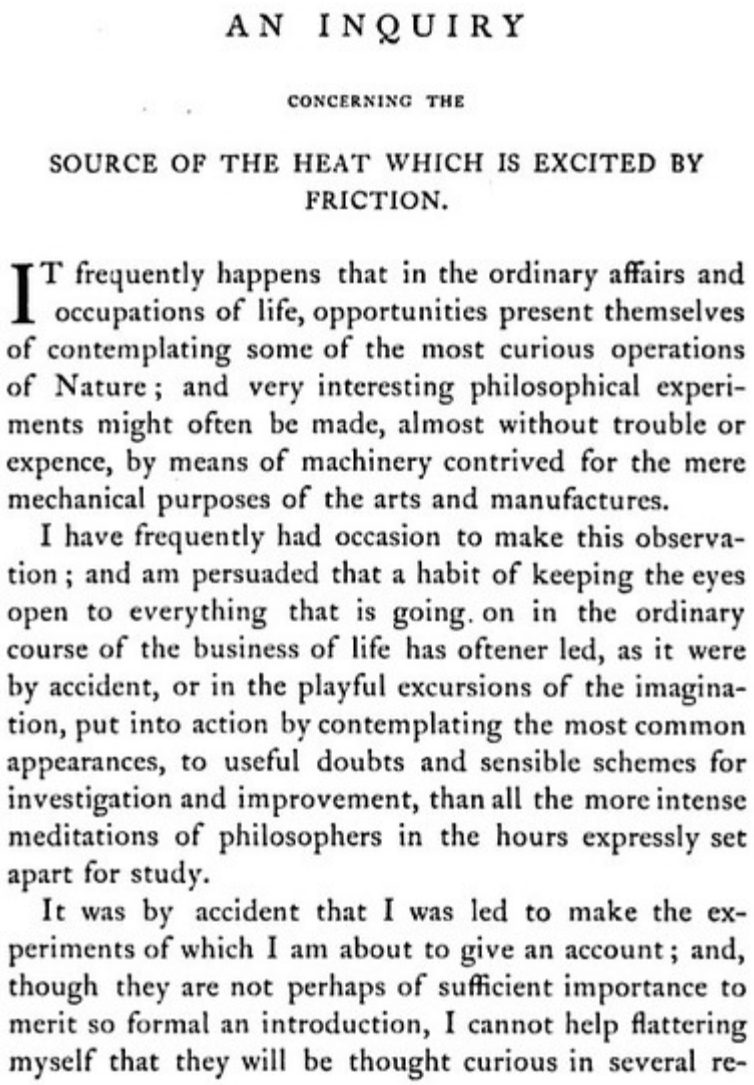

AN INQUIRY

CONCERNING THE

SOURCE OF THE HEAT WHICH IS EXCITED BY FRICTION.

IT frequently happens that in the ordinary affairs and occupations of life, opportunities present themselves of contemplating some of the most curious operations of Nature; and very interesting philosophical experiments might often be made, almost without trouble or expence, by means of machinery contrived for the mere mechanical purposes of the arts and manufactures.

I have frequently had occasion to make this observation; and am persuaded that a habit of keeping the eyes open to everything that is going on in the ordinary course of the business of life has oftener led, as it were by accident, or in the playful excursions of the imagination, put into action by contemplating the most common appearances, to useful doubts and sensible schemes for investigation and improvement, than all the more intense meditations of philosophers in the hours expressly set apart for study.

It was by accident that I was led to make the experiments of which I am about to give an account; and, though they are not perhaps of sufficient importance to merit so formal an introduction, I cannot help flattering myself that they will be thought curious in several re-

Opening page to Benjamin Thompson's 1798 "**An Inquiry Concerning the Source of Heat which is Excited by Friction**", wherein he describes how the results of his cannon boring experiment laws question to the prevailing caloric theory of heat.

References

1. (a) Thomson, Benjamin. (1798). "An Inquiry Concerning the Source of Heat which is Excited by Friction". *Philosophical Transactions.* Vol. XVIII, pg. 286.
(b) Read: before the Royal Society of London on January 25, 1798.
(c) Thomson, Benjamin. (1798). "An Inquiry Concerning the Source of Heat which is Excited by Friction" in *The Complete Works of Count Rumford*, (pgs. 469-93). Oxford University Press, 1870.

External links

â— An Experimental Inquiry Concerning the Source of Heat which is Excited by Friction – Wikipedia.

θΔics

In language, an **anagram** is a derived word, word play, or new name made out of the letters of another more common name or word. In hmolscience, a term which itself is a portmanteau of hmol (shorthand for "human mole") and science, curiously, there are a number of anagrammatists who have employed anagrams in their name or work, some of which are summarized below.

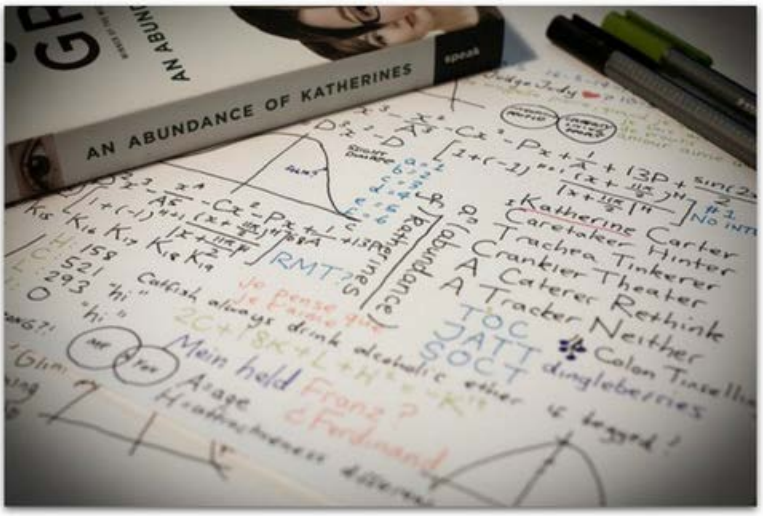

An artistic rendition or recreation of the likely (or actual) notes used by American writer John Green in the development of his 2006 **anagram** filled and equation of love themed book *An Abundance of Katherines*, in which names such Katherine Carter are anagrammatized to a significant effect. [9]

Akhenaten | Amen-hotep IV

In c.1350BC, Egyptian pharao Akhenaten, the son of Amen-hetep III, who was born Amen-hotep IV (or Amen-hetep IV), meaning “u is satisfied” (Ñº), but in adulthood, to embody his switch from Amen-Ra henotheism to Aten monotheism, changed his name to Akhenaten, written in hieroglyphics as:

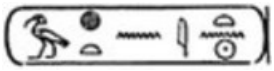

meaning “effective for Aten (or sun disc)”, which has been rendered variously as: Khu-en-aten (Cooper, 1877), Khut-en-Aten (Budge, 1904), Akhnaton (Weigall, 1923), Ikhnaton (Freud, 1939), among other variants.

While not necessarily an "anagram", *per se*, the switch in names evidenced here is a common theme to many who attempt to tamper with deeply rooted powers of belief, whether on going from henotheism to monotheism (Akhenaten, c.1350BC), trinity-based monotheism to monotheism (Newton, c.1665), monotheism to deism (Voltaire, 1718), deism to atheism (anons, 19th), or atheism to zerotheism (e.g. Thims, 2005), among others.

Hamlet | Amleth

English author William Shakespeare used anagrams among other forms of word play. His 1599 tragedy Hamlet, e.g., is considered an anagrammatic name of the Danish prince Amleth. [1]

Newton | Jeova Sanctus Unus

English physicist Isaac Newton (1643-1727) used the perfect anagram “Jeova Sanctus Unus”, derived from this Latin name Isaacus Neuutonus, which means or is code for “religion science”, where “Jeova” is a version of YHWH, one of older the biblical names of God, “Sanctus” means “holy” or great, and “Unus”, means “one”, hence:

> Isaac Newton = Isaacus Neuutonus (Latin) = Jeova Sanctus Unus (anagram) = one holy god or god, the holy one (coded translation)

The Hebrew version of YHWH or Jeova, to note, has its etymological roots in the Egyptian god Aten (although it is doubtful Newton knew of this, as hieroglyphics were still a mystery in Newton’s time), and Sanctus, beyond its Latin meaning of holy, may have more a hidden meaning in Newton’s mind, being that it relates to a number a Biblical tales and hymns. Some speculate that Newton used the anagram to represent his Unitarian (as opposed to the Trinitarian belief) belief system; others that he intended the term to signify something to do with gravity; others, such as biographer James Gleick, that he was searching for a way to explain the “spirit” in the context of a natural mechanical universe. [5]

Boyle | BR

Irish chemist Robert Boyle published his 1676 article "Of the Incalescence of Quicksilver with Gold", read by Newton at the Royal Society, using the inverted initials B.R., which Newton, of course, recognized. [5]

Voltaire | Arovet Li

The name of French thinker "Voltaire" (originally François Marie Arouet), which the author adopted in 1718, is an anagram of "*AROVET LI*," the Latinized spelling of his surname, Arouet, and the initial letters of "*le jeune*" ("the younger"). The name also echoes in reverse order the syllables of the name of a family château in the Poitou region: "Airvault". The adoption of the name "Voltaire" following his incarceration at the Bastille is seen by many to mark Voltaire's formal separation from his family and his past.

Volnay | Voltaire + Ferney

The surname of French religio-mythology philosopher Constantin Volney, was born first with surname “Boisgirais”, after his father’s estate, but afterwards assumed the name of Volney, a portmanteau of Voltaire, the philosopher, and Ferney (Ñº), a town in eastern France were Voltaire resided.

Otto | Cipher

> *See main: Otto (cryptography)*

German polymath Johann Goethe frequently used anagrams and word play in his writings, the most hidden nature of which was his use of the German name Otto, used anagrammatically for the root of the four main characters of his 1809 *Elective Affinities*, the mysterious use of which has been subject

to much speculation and theory explication. Germanic studies professor Astrida Tantillo notes that it has frequently been pointed out that the four main characters as well as the child that is born share the same root name "Otto". Both Eduard and the Captain were called OTTO in youth; the two women CharlOTTE and OTTilie, have related names; and the misfortune child born out of the "mental" double adultery (or double elective affinity) of the four main characters (reactants) is called Otto. Opinions differ as to why Goethe used this naming riddle, but the modern chemical view would argue that Goethe intended the reader to grasp the logic that each person is a different type of "human chemical" (or human molecule) in essence.

Thomson | PQR

Irish-born Scottish mathematical physicist William Thomson, at the age of seventeen, published his first three mathematical papers in the *Cambridge Mathematical Journal*, using the cryptic initials P.Q.R., which, according to his biographer David Lindley, have no particular meaning except that they are often used as a triplet of variables in three dimensional mathematical problems. [6]

Maxwell | θΔcs

Scottish physicist James Maxwell used a style of coded phonetic anagramming in his postcard correspondences with Peter Tait and William Thomson, specifically using coded Greek letters to represent the term 'thermo-dynamics' (θΔcs or θΔ). During his early school years, at the Edinburg Academy at the age of 10 (1841), Maxwell frequently wrote to his father in zany letters filled with puns and misspellings, embellished with elaborate doodles, and containing secret messages in different colored inks. [2]

Maxwell | JCM

Maxwell, amid his secret code letter writing circle, with Peter Tait and William Thomson (see: θâˆ†ics), would sometimes sign his letters, articles, and post cards as follows:

$$\frac{dp}{dt}$$

which, is the analytical equivalent of the thermodynamical quantity JCM (and to James Clerk Maxwell's initials); such as reported by his existographer Lewis Campbell (1882); meaning: [11]

$$\frac{dp}{dt} = \mathrm{JCM}$$

The equation first appears in Peter Tait's 1868 *Sketch of Thermodynamics* (§162, eq. 4; pg. 91), in the following form, which Tait defines, specifically, as the second law of thermodynamics:

$$\frac{\frac{dp}{dt}}{M} = JC$$

Maxwell, shortly thereafter, took notice of the equation, and began using the dp/dt signature, first used in an Apr 1870 letter to William Thomson, and thereafter to Tait and various witty publications in *Nature*.

In 1964, physicist David MacDonald, in his *Faraday, Maxwell, and Kelvin*, stated that the derivative dp/dt would now be written more correctly written as: (∂p/∂t)v, and that it is one of Maxwell's four thermodynamic relations derived by him in *Theory of Heat* (pgs. 165-69) from the geometry of isothermal and adiabatic curves; now commonly derived from the equality of the mixed second derivatives of the various thermodynamic potentials. [11]

In 1970, American science historian Martin Klein, in an appendix section "On Maxwell's Signature", citing Macdonald, devotes two pages to a discussion of Maxwell and his derivative signature, which he surmises that Maxwell meant as not only his own initials, but also "the second law of thermodynamics itself", as Klein puts it, where J is the mechanical equivalent of heat, C is Carnot's universal function, depending on temperature, and M is the "coefficient of proportionality, the heat absorbed per unit volume change in an isothermal expansion". [12]

Sidis

American super high IQ child prodigy William James Sidis (person behind the film *Good Will Hunting*), who himself is named after American reserve energy psychologist William James, used pseudonyms in all of his publications (all except his *The Animate and the Inanimate*, which he felt confident about), such as Barry Mulligan, Parker Greene, Jacob Marmor, Barry Mulligan, John W. Shattuck, and Frank Folupa, five of which are recognized by the Library of Congress. The majority of them, all except, supposedly, Frank Folupa, the name he used as the author of his *Notes on the Collection of Transfers*, which has been argued to be some type of coded anagram, are names of actual people who had contributed to society, but were mostly unknown. Sidis biographer Dan Mahony guesses that Frank Folupa equates to "French fallu pas", meaning not practical or necessary. [7] Ted Frankel suggest that Folupa is an exact anagram for "foul pa", meaning "frankly a flop" or "fouled up", which may have been the way he (or his 10 percent myth father experimenter, Boris Sidis) viewed things, in the end. [8]

Roegen | NicolaE GEORescum

The attached surname, namely "Roegen", of Romanian-born American mathematician Nicholas Georgescu-Roegen is said to be a reverse anagram (similar to Thims, below). He was born Nicolae Georgescu and also formerly known as Nicholas St. Georgescu. The name Nicholas seems to be an English (or Americanized) version of Nicholae. In post-humorous publications and discussion of him, by his associates, e.g. Kozo Mayumi and John Gowdy, he is simply referred to as 'Georgescu'. According to one explanation, when Nicolae was very young, he attended military school to help support his widowed mother and his younger brother. He was clearly a superior mathematician, but there was another Georgescu (very common Romanian name) so he added "Roegen" to his Georgescu to make himself "unique". He was in academic competitions and won many scholarships for academics. He kept his new name after leaving Romania after the WWII and is know by that whole name. The surname "Roegen", according to this source, is a play on the name "George" (of his original last name George-scu). [9] According to a second reference, surname attachment name came from an anagram of his Romanian name NicolaE GEORescum, such that if the capital letters are read backward it becomes ROEGEN. [10]

Libb Thims | Bill Smith

See main: Libb Thims (etymology)

The pen name turned legal name of American electrochemical engineer Libb Thims is a derived anagram of the overly-common American name Bill Smith (a type of John Doe); the surname Smith being the most-common last name in American, which is on account of the fact that many of the original pilgrims to American were "black smiths" by occupation, the descendant families of which tended to adopt the dominate patriarch occupation as their surname.

The original use of the pen name "Bill Smith", beginning in *circa* 2001-2002, was to maintain anonymity, the main reason rooted in Thims' overarching philosophy that to truly get some one to fall in love with you, one needs to be make the process happen solely on personality and a fit shape, in the sense that the more a person achieves, in terms of respected accomplishments, occupation ladder climbing, fame, etc., the more a person becomes simply a "label" after which the person is falling in love with the label rather than the person; a sort of "reverse Cinderella philosophy", if you will.

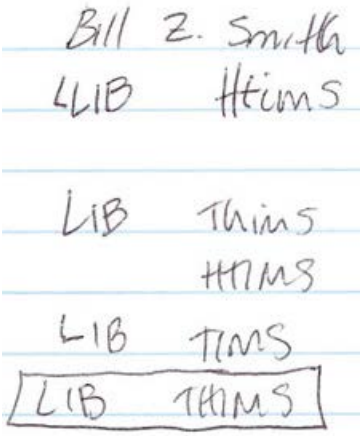

A *circa* 2003 scratch paper attempt to **anagrammatize** the pen name Bill Smith by American electrochemical engineer Libb Thims.

The need to switch to a new pen name arose in *circa* 2002-2003 following the rise of the Internet search capabilities, particularly Amazon.com books, it became apparent that there were dozens if not hundreds of published Bill Smith authors; hence, name brand recognition for the work Thims was in the process of developing would be difficult.

Moreover, in the modern "Internet age", if one is a promoter of some novel or grand work or theory, one needs a unique name that generates a top search return rank. In this end, to exemplify, the following Google Analytics graph shows the growth of the monthly visits to the Hmolpedia "Libb Thims" article, since its page creation on Dec 31, 2007 up to Oct 24, 2011, which shows the anagrammed name drawing about 250 page views per month:

The name "Libb Thims", itself, is an anagram modeled on the Latin phrase *ad lib* meaning "say what you want", albeit with an extra letter B added to make uniqueness, and the surname Thims, being phonetically similar to the "thimble", a sewing device used by Thims as a child to sew things.

The adoption of "Libb Thims", both as a pen name and eventually legal name (2009), to note, is also similar to that of Voltaire in the sense of "the adoption of the name "Voltaire" following his incarceration at the Bastille is seen by many to mark Voltaire's formal separation from his family and his past." [3]

Katherines

See main: Equation of love (section: An Abundance of Katherines)

American writer John Green's 2006 graphical mathematics of love themed book *An Abundance of Katherines* utilizes a number of anagrams derived from the name "Katherine", e.g. it contains the emotional words "heart" and "tear", according to Green. [4]

See also

â— Hmolpedia (etymology): a portmanteau "hmol" and "encyclopedia".

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External links

â— Anagram – Wikipedia.

θΔics

In science, **analogy** or metaphor, being a comparison based on similarity or resemblance, is often used to explain terms, to make arguments, or give suppositions, etc., just as allegory, associated with symbolism, is often employed to the same effect.

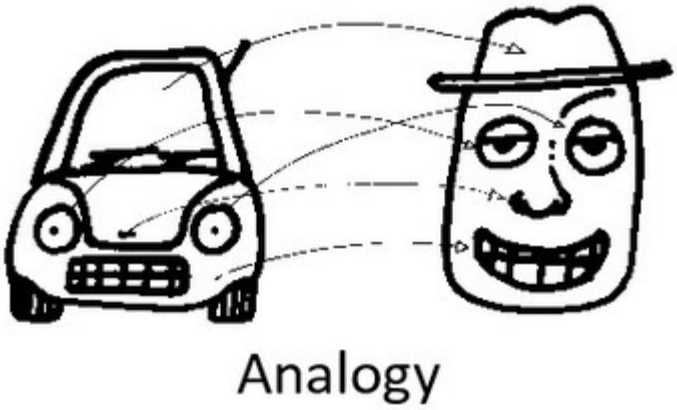

An example of a basic **analogy** (O) or comparison between two things in similarity, namely the front of a car and human face, according to which head lights are likened to eyes, the grill is likened to the mouth, the hood to the nose, etc.

Overview

Analogies, in science, come in a number of varieties.

In 1802, William Paley proposed his famous "watch analogy", wherein he compared a watch to a human, arguing that they each have a "purpose" designated by their maker, the gist of which is as follows:

"When we come to inspect the **watch**, we perceive — what we could not discover in the **stone** — that its several parts are framed and put together for a 'purpose', *e.g.* that they are so formed and adjusted as to produce 'motion', and that motion so regulated as to point out the hour of the day."

In 1996, Michael Behe introduced his so-called mouse trap analogy, wherein he argued, via analogy, that bacteria flagella are complex machine like entities that couldn't have been created by blind random chance accident, therefore they, like humans, were designed by a creator, i.e. god:

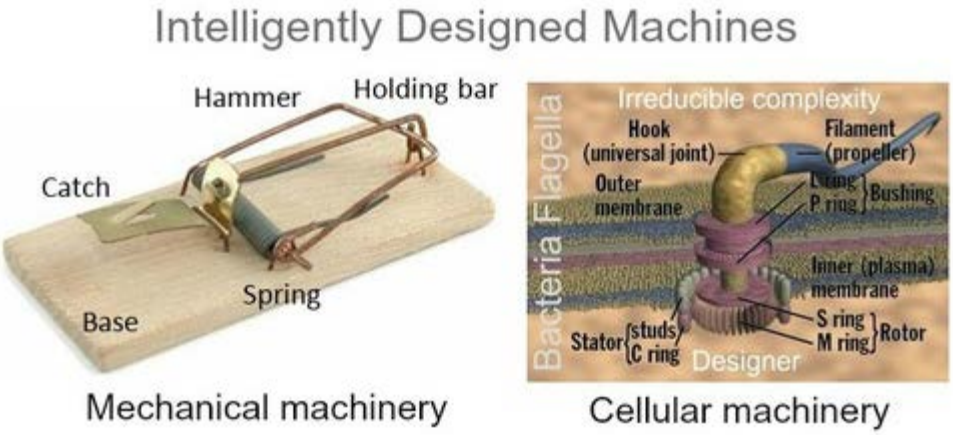

(add discussion)

Human thermodynamics

See main: Thermodynamic analogy

In 1952, English physicist C.G. Darwin defined 'human thermodynamics' as the "thermodynamic study of systems of human molecules", in his book in his *The Next Million Years*, wherein he used the word 'analogy' 19 times, comparing humans, by analogy, to the molecules of a body of gas governed by Boyle's law, to the behavior of a wild animal, and to the behavior of ants. The following are few representative quotes:

> "The **analogy** I have cited of the gas laws is the simplest example that is furnished by statistical mechanics, and it is only fair to mention that, when the subject is pursued further, it does get a good deal more complicated. Thus much greater difficulties arise in considering how the gas can condense into a liquid or solid, but it would not be profitable to follow the **analogy** into these intricacies.
>
> We may, so to speak, reasonably hope to find the Boyle's Law which controls the behavior of those very complicated molecules, the members of the human race, and from this we should be able to predict something of man's future.
>
> The possibility depends on finding out whether there are for humanity any similar internal conditions, which would be analogous to the condition of being a conservative dynamical system, and external conditions analogous to the containing vessel.
>
> In the gas, the external conditions were given by the containing vessel, and the analogy here is obviously the earth itself. The internal principle, which is to be analogous to the property of being conservative dynamical systems, of course lies deeper. It must depend on the laws governing the nature and behaviour of the human molecules. When I compare human beings to molecules, the reader may feel that this is a bad **analogy**, because unlike a molecule, a man has free will, which makes his actions unpredictable.
>
> Though the individual collisions of the human molecules may be a little less predictable than those of gas molecules—which, as I have said, do not have to be considered in detail either—the census returns show that for a large population the results average out with great accuracy. The internal principle then of the human molecules is human nature itself. On the **analogy** between human history and the molecules of a gas, the different civilizations are to be ranked as fluctuations from the average."

In objection to this definition, many argue, on what seem to be emotional, religious, or philosophical grounds, that this statement is pure analogy.

In 2006, Polish science-philosopher theologian Jozef Zycinski stated that in his 2000 article "God, Freedom, and Evil: Perspectives from Religion and Science" he "offers an interpretation of human behavior with consideration of analogies from thermodynamics". [9]

In 2008, American physical chemist Thomas Wallace argued that the rise and fall of civilizations can be explained thermodynamically on the analogy of the five-year operational life of a car battery. [8]

Human chemistry

See main: Chemical analogy; Chemical aphorism

In 1800, German poet Friedrich Schlegel, supposedly, used a vast range of chemistry metaphors and allegory in his literary work; a subject on which he was said to have more than a passing knowledge of, but not a systematic understanding of. [10]

In his 1948 book *We Human Chemicals*, American writer Thomas Dreier gives the following view: [7]

> "I am aware that when I talk about human beings as combinations of chemicals it is like using an extremely crude, but nonetheless practical, graduated laboratory beaker as a measuring device. We can, I believe, employ the **analogies** and examples of chemical reaction and other reactions which each of us will develop out of experience with the confidence we feel when we take measurements with a yardstick."

The classic example of a scientific analogy is Greek philosopher Empedocles' fifth century BC explanation of the mixing of social groups to the chemical solubility of liquids in stating that:

> "People who love each other mix like water and wine; people who hate each other segregate like water and oil."

Empedocles, the first to formulate a standard model of physics, insisted that the two ruling passions of human life, love and hate, are the two ruling principles which pervade and rule the whole universe. In one sense, the debate continues to this day, with people split as to whether or not the above statement is pure analogy, or whether some people do separate like un-emulsified chemicals, owing to chemical properties.

Often, in analogy comparisons, wherein terms are borrowed from either the physical-sciences-to-explain-humanity, e.g. Johann Goethe's 1809 culling from chemistry to compare people to chemical species to explain love as affinity reactions, or from the humanities-to-explain-the-physical-sciences, e.g. James Maxwell's 1861 borrowing from Henry Buckle's census statistics on history of civilizations to formulate the kinetic theory of gases, the line become what is factually true and what is pure metaphor becomes blurry.

When, for example, one argues that the moon is blue like cheese, therefore the moon must be made of cheese, the analogy becomes obviously nonsensical in a modern view. When, conversely, American chemical engineer Scott Fogler states, in his 1992 *Chemical Reaction Engineering* textbook, that: [1]

> "A catalyst is a substance that affects the rate of a reaction but emerges from the process unchanged. A man inciting a mob to riot and then ducking out before the tanks roll in can be regarded as a catalyst."

One may wonder is Fogler using analogy, or can in actuality a person be a catalyst, no analogy? Fogler would likely state that he used analogy, given the context of the book, but from a modern post-2000 point of view, wherein people have begun to calculate actual molecular formulas for human beings, on can clearly say that the people can in actuality be defined as 'human catalysts'. The issue here comes down to a scalability factor: with some arguing that the laws, principles, and terminologies of small scale atomic and molecular reactions, such as oxygen and hydrogen reacting to form water, do not and cannot be scaled up, whereas others argue that humans are molecules no different than any other molecule, and that such matters can be scaled up.

Grey analogies

To give an example of this, where an author ambiguously leaves the subject in a gray area, is American physiologist Lawrence Henderson's 1935 explanation of Vilfredo Pareto's 1916 sociology treatise using what he called Gibbsian thermodynamics "analogies", wherein where a social system is said to contains individuals roughly analogous to "Gibbs' components". [2] In a modern sense, however, we know that a human being has a molecular formula, as determined independently by American scientists Robert Sterner, James Elser, and Libb Thims, whereby the supposition of people being analog components, becomes incorrect. [3]

The updated 2002-view, according to Sterner and Elser, wherein the analogy perspective dissolves, is:

> "Animals are abstracted as local thermodynamic perturbations—repositories of chemical energy—whose feeding, metabolism, growth, and reproduction and analyzed by application of energy concepts of thermodynamics: calories, free energy, work, entropy, heat, efficiency, and productivity [modeled on] the basic assumption that flows of energy organize thermodynamic systems, including biological ones. Animals [are viewed] as repositories of multiple chemical elements; in the stoichiometric view, they are mixtures of multiple substances, as for example in the 'human molecule'."

Even in this quote, from two people who actually calculated the human empirical molecular, defining it as the formula for a 'human molecule', it may still be the case that they believe that they are still using abstracted analogy. Others, such as American chemical engineers Libb Thims or Andrew Morrow, conversely, have no reservations or ambiguity with the reality that they are made of atoms and that a bound state structure of atoms is a molecule, no analogy. When polled, similarly, about 57% of people believe that they are a 'giant molecule', no analogy. [5]

Quantum theory

It is said that German physicst Max Planck discovered his new radiation formula, approaching the problem through thermodynamics, in which he drew an "analogy" between radiation trapped inside a cavity and the properties of a gas confined within the walls of a container. [6]

Quotes

The following are related quotes:

> "And I cherish more than anything else the 'analogies', my most trustworthy masters. They know all the secrets of nature, and they ought to be least neglected in geometry."
>
> — Johannes Kepler (c.1620), *Publication* (Q)

See also

- Black cat analogy
- Chemical analogy
- Exact analogy
- Mathematical analogy
- Physical analogy

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External links

● Analogy – Wikipedia.

θΔics

In chemistry, **analysis**, from the Greek *ana* “thoroughly” and *lusis* “a loosening”, refers to the decomposition or *taking to pieces* a compound body, into its constituent elements. [1]

The antonym of analysis is "synthesis".

34. The decomposition or *taking to pieces* of a compound body, in order to discover its constituent elements, is called *Analysis*, from two Greek words, *ana*, thoroughly, and *lusis*, a loosening.

An 1858 definition of **analysis**, by English chemist John Bidlake, with etymology, as the "taking to pieces a compound body [into] its constitute elements". [1]

Hmolscience

In hmolscience, in regards to a human molecule's (person's) reaction existence (life), the term "analysis" is the modern term for what in ancient times was called "death", which is now a defunct theory (see: defunct theory of life). In plain speak, a person, technically, cannot "die" anymore so that can any other atom or molecule die, but rather can only be synthesized (born) or analyzed (die). The outdated terms, e.g. "born", "die", "life", etc., are mythological-religious carryover terms, that do not hold up in the modern physical science view of the universe; hence the regress to pure chemical descriptions.

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θΔics

In existographies, **Anatol Rapoport** (1911-2007) (CR:8) was a Russian-born American mathematical biologist noted for []

Overview

Rapoport, at some point, did general systems theory research, with individuals including Ludwig Bertalanffy and Kenneth Boulding.

Weak ties

In 1954, Rapoport stated the following view:

> "It is a well-known fact that the likely contacts of two individuals who are closely acquainted tend to be more overlapping than those of two arbitrarily selected individuals."

This would go on to form the basis of logic behind stimulating the idea behind American sociologists Mark Granovetter's highly-cited 1973 theory of weak ties.

Information theory

In 1956, Rapoport, in his "The Promise and Pitfalls of Information Theory", rebutted the use of information theory to make crack pot theories; the following is a noted quote:

> "It is misleading in a crucial way to view 'information' as something that can be poured into an empty vessel, like a fluid or even energy."
>
> — Anatol Rapoport (1956), "The Promise and Pitfalls of Information Theory" [2]

(add)

Other

Rapoport, in coordination with Mechthilde Knoller, of note, did the first English translation of Hungarian-born American physicist Leo Szilard's 1929 article "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings". [1]

References

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(b) English translation of "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings" by Anatol Rapoport and Mechthilde Knoller in *Maxwell's Demon 2* (pgs. 110-19) by Harvey Leff and Andrew Rex.
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External links

â— Anatol Rapoport – Wikipedia.

θΔics

In existographies, **Anaxagoras** (500-428 BCM) (IQ:180|#132) (Cattell 1000:703) (ACR:4) (FA:7) (EvT:4|21+) (CR:50) was a Greek philosopher, teacher of Socrates, who held the view that the sun was a hot or fiery stone, supposedly, based on the examination of fallen meteors, that moon light was reflected sunlight, and was said to have postulated the existence of the element "aether", which he conceived of as being in constant rotation and carried with it the celestial bodies. [1]

Sun as stone | Moon light

In 77AD, Pliny the elder, in his *Natural History* encyclopedia, summarized Anaxagoras' famous stone falling prediction as follows: [8]

> "The Greeks boast that **Anaxagoras**, the Clazomenian, in the second year of the 78th Olympiad, from his knowledge of what relates to the heavens, had predicted, that at a certain time, a stone would fall from the sun. And the thing accordingly happened, in the daytime, in a part of Thrace, at the river Aegos. The stone is now to be seen, a waggonload in size and of a burnt appearance; there was also a comet shining in the night at that time. But to believe that this had been predicted would be to admit that the divining powers of Anaxagoras were still more wonderful, and that our knowledge of the nature of things, and indeed every thing else, would be thrown into confusion, were we to suppose either that the sun is itself composed of stone, or that there was even a stone in it; yet there can be no doubt that stones have frequently fallen from the atmosphere. There is a stone, a small one indeed, at this time, in the Gymnasium of Abydos, which on this account is held in veneration, and which the same Anaxagoras predicted would fall in the middle of the earth. There is another at Cassandria, formerly called Potidaea, which from this circumstance was built in that place. I have myself seen one in the country of the Vocontii, which had been brought from the fields only a short time before."

Anaxagoras, based on this evidence, posited that the sun was a hot or fiery stone.

Atheism

When Anaxagoras, according to Voltaire (1764), claimed that the sun was not driven by Apollo mounted on a chariot he was called an atheist, and had to flee. [5]

> "Everything has a natural explanation. The moon is not a god, but a great rock, and the sun a hot rock."
>
> — Anaxagoras (c.450BC) (Ñº)

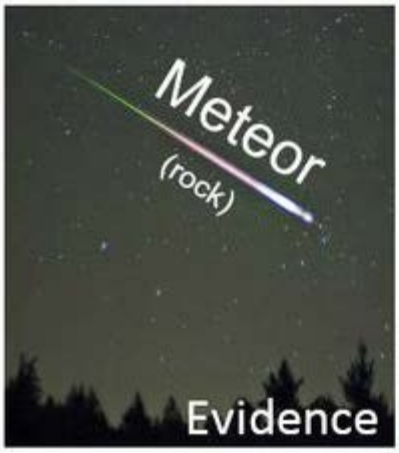

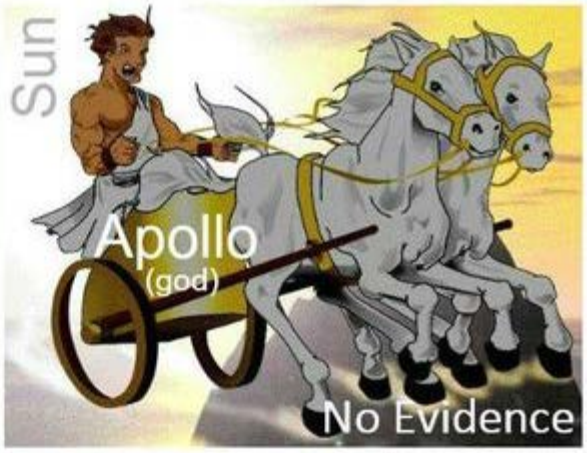

Left: the 2009 Leonid meteor, a type of measureable evidence, i.e. something that can be seen, studied, and quantified. Right: a depiction of the god Apollo pulling the sun on his flying chariot; an un-evidenced assertion about which **Anaxagoras** in 450BC said did not occur, being that he employed the evidence of observed fiery meteors to assert that the sun was a fiery rock moving in a rotating aether.

> "The citizens of Athens ... passed a law permitting impeachment of those who did not practice religion and taught theories about 'the things on high'. Under this law they persecuted Anaxagoras, who was accused of teaching that the sun was a red-hot stone and the moon was earth."
>
> — Bertrand Russell (1961), *History of Western Philosophy* (pgs. 79-81) [9]

In c.450 BC, Anaxagoras was imprisoned, supposedly for a time, for claiming that the sun was not a god and that the

moon reflected the sun's light.

Moon light

Anaxagoras proposed that the moon shines by reflected light from the "red-hot stone" which was the sun, the first such recorded claim. [9]

Evolution

Anaxagoras, supposedly, was the second person, behind Anaximander (c.610-c.564 BC), to state views on the general idea of the evolution of humans from earlier forms over time:

> "The role of the hands in the evolution of man's intelligence seems to have been clearly recognized by the Greek philosopher **Anaxagoras**. He explained, according to Will Durant, that 'man's intelligence by the power of manipulation that came when the forelimbs were freed from the tasks of locomotion'."
>
> — Alfred Lotka (1925), *Elements of Physical Chemistry* (pg. 440)

> "Neither creation nor destruction of life, according to **Anaxagoras** (510-428BC), was possible, and although, in his opinion, plants, animals, and man all come from the earth slime, nevertheless it was essential that this should be fructified by unchanging and infinitely small seeds (spermata), the ethereal embryos, which were carried into the earth from the air with rain water."
>
> — Alexander Oparin (1936), *The Origin of Life* [7]

This latter statement may have been an early panbioism view type philosophy.

Homoeomeria | Anti-atomic theory

The following is a summary of Anaxagoras' homoeomeria theory, or all things are made up of like parts theory, of form composition:

> "Now view **Anaxagoras**, his *homoeomeria* ["made up of like parts"] so the Greeks called it. To begin with, take bones: you see, they are made of little bones, wee, tiny ones; and from wee, tiny guts, guts are crated and blood comes into being and lots of little drops of blood foregather. And gold, he things, can be made out of grains of gold, and earth coalesce from baby earths, and fire from fire, and water come from waters, and all else likewise: so he theorizes. But nowhere in all his world dies he allow for void, or for an end to cutting things. Therefore, in both these matters, he's wrong."
>
> — Lucretius (55BC), *On the Nature of Things* (translator: Frank Copley) (pg. 20) (1:830-845)

His theory, accordingly, was against atomic theory:

> "To another very eminent philosopher, **Anaxagoras**, best known to the world as the teacher of Socrates, we are indebted for the most important service to the atomic theory, which, after its statement by Democritus, remained to be done. Anaxagoras, in fact, stated a theory which so exactly contradicts the atomic theory of Democritus that the truth or falsehood of the one theory implies the falsehood or truth of the other. The question of the existence or non-existence of atoms cannot be presented to us this evening with greater clearness than in the alternative theories of these two philosophers."
>
> — James Maxwell (1873), "Molecules" [4]

Whatever the case, the following view is often mis-attributed to Anaxagoras as well as to Empedocles: [2]

> "Birth is the aggregation of atoms, death is their disaggregation or destruction of atomic composite, without anything being derived from nothing and nothing going into anything in the process."
>
> — Leucippus (c.460BC), often mis-attributed to semi-analogous views of Empedocles and **Anaxagoras** [6]

Anaxagoras, philosophy historian Giovanni Reale, like Empedocles, held the atomic theory view that "birth is the aggregation of atoms, and death is their disaggregation" or the destruction of the atomic composite, without anything being derived from nothing and nothing going into anything in the process. [2]

Nous | Noosphere

Anaxagoras was the originator of the concept of "nous", or mind of the cosmos, conceptualized as an ordering force.

In 45BC, Cicero, in his *On the Nature of the Gods*, rips on Anaxagoras' concept of god as "the disposition and due order of things delineated and brought to completion by the power and reason of an infinite mind". [10]

In the early 20th century, Vladimir Vernadsky and Pierre Teilhard both later theorized about the concept of the "noosphere" or "sphere of human thought", the latter arguing that the universe was evolving towards this point (omega point), a godhead matter-energy like point in the future.

Quotes | On

The following are quotes on Anaxagoras:

> "What still concerns the history of anthropomorphism, then, as I from Schopenhauer (*The World as Will*, third edition, part 2 page 369 gather), **Anaxagoras** gewefen the first to which "the well-known to us only from the animal nature and their purpose calculated only aids an intelligence herbeizog, which are added from outside, which used a time available and given the forces of nature and its laws smart to her to enforce this really strange purposes"."
>
> — August Kronig (1874), *The Existence of God and the Happiness of People* [3]

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External links

â— Anaxagoras – Wikipedia.
â— Anaxagoras – Wikiquote.

θΔics

In existographies, **Anaxarchus** (c.380-320BC) was a Greek philosopher (see: Greek philosophy), a student of Metrodorus, an advisor to Alexander the Great, whose philosophy (Q) was a mixture of the atomism of Democritus and the skepticism of Pyrrho, noted for []. [1]

Anecdote

A noted anecdote, as reported by Plutarch (Q), is that after Anaxarchus told Alexander the Great that there was an infinite number of worlds, he wept, per reason that he was sad that in the new big scope of things, with such a vast multitude of worlds, he was not able to even conquer one of them.

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External links

- Anaxarchus – Wikipedia.

θΔics

In existographies, **Anaximander** (c.610-564BC) (IQ:180|#117) (FA:2) (EvT:2|21+) (ACR:24) (GPhE:#) (CR:45) was a Greek philosopher noted for producing some of the first views on evolution, heliocentrism, and for a refined expansion Thales, something to the effect that the the "infinite" (or immortal and indestructible) is principle and element of the things (e.g. earth, air, fire, water) that exist.

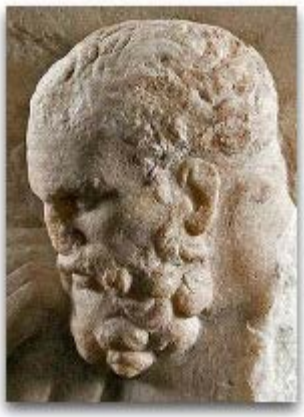

Atheism | Theism

The philosophy expounded by Anaximander is attributed by some to have been an atheism-siding type of logic; some views of which are as follows:

> "**Anaximander** was the chief of the old atheistic philosophers."
>
> — Ralph Cudworth (1678), *The True Intellectual System of the Universe* (pg. #)

In 2003, Jennifer Hecht, in her *Doubt: a History*, states that Anaximander is "the first philosopher for whom we have any detail, and he explained the world without reference to gods."

Evolution

Anaximander, as cited by Philip Ball (2011) and Bill Nye (2014), after studying fossils, argued that fish grew from warm mud, and that humans evolved from fish. [1]

Astronomy

The following, according to Henry Bray (1910), is a synopsis of Anaximander's views on the universe quotes: [2]

> "**Anaximander**, the immediate successor of Thales, taught that the earth was not really connected with the planets, and that the latter were inhabited just as is the earth; that the fixed stars were the centers of other planetary systems; that the sun was a glowing mass; and that the earth moved around the center of the system."

(add)

Education

Anaximander was the main pupil and successor of Thales; he is also cited as a student of Pythagoras, who was also a student of Thales.

Quotes | On

The following are about quotes:

> "**Anaximander**, a pupil of Thales, said that a certain infinite nature is first principle of the things that exist. From it come the heavens and the worlds in them. It is eternal and ageless, and it contains all the worlds. He speaks of time, since generation and existence and destruction are determinate. Anaximander said that the infinite is principle and element of the things that exist, being the first to call it by the name of principle. In addition, there is an eternal motion in which the heavens come into being. The earth is aloft, not supported by anything but resting where it is because of its equal distance from everything. Its shape is rounded, circular, like a stone pillar. Of its surfaces, we stand on one while the other is opposite. The heavenly bodies come into being as a circle of fire, separated off from the fire in the world and enclosed by air. There are certain tubular channels or breathing-holes through which the heavenly bodies appear; hence eclipses occur

when the breathing-holes are blocked, and the moon appears sometimes waxing and sometimes waning according to whether the channels are blocked or open. The circle of the sun is twenty-seven times greater than the earth and the circle of the moon is eighteen times greater. The sun is highest, the circles of the fixed stars lowest. Animals come into being from moisture evaporated by the sun. Humans originally resembled another type of animal, namely fish. Winds come into being when the finest vapors of air are separated off, collect together and move. Rain comes from vapor sent up by the things beneath the sun. Lightning occurs when wind breaks out and parts the clouds."

— Hippolytus (c.220), *Refutation of All Heresies* (Ñº)

"**Anaximander**, the son of Praxiades, was a native of Miletus. He laid down as his principle and element that which is unlimited without defining it as air or water or anything else. He held that the parts undergo change, but the whole is unchangeable; that the earth, which is of spherical shape, lies in the midst, occupying the place of a center; that the moon, shining with borrowed light, derives its illumination from the sun; further, that the sun is as large as the earth and consists of the purest fire. He was the first inventor of the gnomon (Ñº) and set it up for a sundial in Lacedaemon, as is stated by Favorinus in his *Miscellaneous History*, in order to mark the solstices and the equinoxes; he also constructed clocks to tell the time. He was the first to draw on a map the outline of land and sea, and he constructed a globe as well."

— Diogenes Laertius (c.230), *Lives and Opinions of Eminent Philosophers* [4]

"**Anaximander** the Milesian, a disciple of Thales, first dared to draw the inhabited world on a tablet; after him Hecataeus the Milesian, a much-travelled man, made the map more accurate, so that it became a source of wonder."

— Agathemerus (c.250) [3]

"**Anaximander** separated himself from Thales by regarding the abstract as of higher significance than the concrete: and in this tendency we see the origin of the Pythagorean or mathematical school. The speculations of Thales aimed at discovering the material constitution of the universe; they were founded, in some degree, upon an induction from observed facts, however imperfect that induction might be. The speculations of Anaximander were wholly deductive; and, as such, tended towards mathematics, the science of pure deduction."

— George Lewes (1867), *The History of Philosophy: from Thales to Comte, Volume 1* (pg. 17)

"Since the time of Schleiermacher the philosophy of **Anaximander** has received marked attention from historians of philosophy, and the literature on the subject has grown to large proportions. By many Anaximander is regarded as a metaphysician—as the first metaphysician. In this essay the attempt will be made to study the records, so far as they may conceivably be regarded as containing a metaphysical scheme, without express reference to other interpretations, although they have been conscientiously read and considered. The treatise of Anaximander was known to Aristotle and Theophrastus; there is no reason to think that it was studied by later writers for the purpose of ascertaining his opinions,' although Apollodorus may have inspected it with a view to determine his chronology. Theophrastus remarks upon its high-flown style,' which suggests that it was not discursive but, like that of Heraclitus, somewhat curt and aphoristic. We must therefore look to Aristotle and Theophrastus for a knowledge of the facts; but we shall be under the necessity of somehow checking their conclusions, the more since it is no longer a secret that

Theophrastus was absolutely under the spell of his master, and that Aristotle himself, with all his speculative genius, or just because of it, was not always able to distinguish between that which his predecessors said and that which their words suggested to him."

— W.A. Heidel (1912), "On Anaximander" [5]

Quotes | By

The following are representative quotes:

"Immortal and indestructible, surrounds all and directs all."

— Anaximander (c.600BC) (Ñº)

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External links

â— Anaximander – Wikipedia.

θΔics

In existographies, **Anaximenes** (585-528BC) (IQ:165|#440) (ACR:25) (GPhE:#) (CR:3) was a Greek philosopher, student of Anaximander, mentor to Hippo, noted for []

Overview

In c.545BC, Anaximenes theorized that the "arche" or source and cause of everything, out of which out of which all things are made, was *aer*, variously translated as "mist, vapor or air"; air, according to Anaximenes, when rarefied, became fire, and when condensed became water and earth, as follows:

He theorized this, supposedly, per reasoning that because animals need air to breath, that this must be the original source of life. [1] This can be compared to Anaximander, who theorized that what he called the "apeiron", which differentiated into water, earth, and fire, was the arche, and Thales, who said that water was the arche. Anaximenes model has since been truncated to an air is the first principle of everything philosophy.

Quotes | On

The following are quotes on Anaximenes:

> "Several scholars have declared that there are many, perhaps even innumerable worlds, including: Aristarchus, **Anaximenes**, Xenophanes, Democritus, Epicurus, Metrodorus, Leucippus, and Diogenes."
>
> — Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* [2]

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External links

â— Anaximenes – Wikipedia.

θΔics

In existographies, **Anders Celsius** (1701-1744) (RGM:195|1,500+) (Gottlieb 1000:265) (CR:3) was a Swedish astronomer and physicist, noted for [[

Overview

In 1741, Celsius obtained a thermometer from St. Petersburg and etched on the side opposite its scale a formulation: a boiling point of 0˚ and a freezing point of 100˚. Celsius had proposed the downward counting scale in attempts to avoid negative numbers, of boiling water (0) and melting ice (100).

In 1742, Celsius, in his “Observations of Two Persistent Degrees on a Thermometer”, published the findings of his scale.

External links

- Anders Celsius – Wikipedia.

θΔics

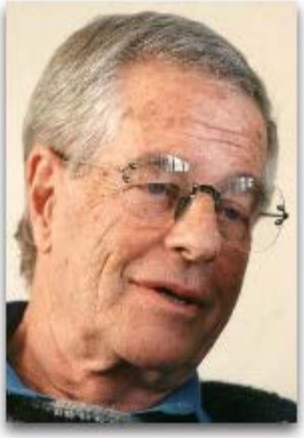

In hmolscience, **Andras Brody** (1924/27-2010) or "Andrew Brody" was a Hungarian economist noted for his 1985 article "An Essay in Macroeconomics", coauthored with Katalin Martinas and Konstantin Sajo, wherein, building on the work of John Neumann (1934), Paul Samuelson (1955), and Nicholas Georgescu-Roegen (1971), they outline an economic thermodynamics model, in which, among other things, they attempt to argue for a social chemical potential model, to the affect that "market prices are the chemical potentials μ_i derived from the economic entropy, which is now U", according to Hungarian theoretical physicist Bela Lukacs who frequently cites their work as the "Bródy-Martinás-Sajó model". [2]

Education

Brody completed his BA in mathematics in 1945 at the Eotvos University, Budapest, his MA in industrial economics and PhD in 1960, both at Karl Marx University, Budapest.

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External links

● Brody, Andras – WorldCat Identities.
● Andras Brody (1924-2010) – Hungarian Academy of Sciences.

θΔics

In existographies, **Andre-Marie Ampere** (1775-1836) (IQ:180|#143) (Cattell 1000:557) [RGM:558|1,500+] [Kanowitz 50:32] (Eells 100:93) (GPE:54) (SIG:6) (CR:22), oft-cited as "Andre Ampere" (Q), was a French physicist and mathematician, dubbed the "Newton of electricity" (Maxwell, 1873) and "father of electrodynamics" (Heaviside, 1888), eponym of the amp, or SI unit ampere (A), noted for, among other things, his work on extending the results of Hans Oersted—who in 1819 discovered that a compass needle deflects near current—by showing that the deflection of a compass relative to an electrical current obeys the right hand rule; that coils of current-carrying wires act as magnets that attract and repel each other (1820); defined "electric potential"; and also established the science of electrodynamics (1822). [4]

Overview

Ampere, as a youth, was manifestly brilliant: as a young boy he mastered advanced mathematics and taught himself science by memorizing the contents of learned encyclopedias, long passages of which he could recite years later. [5] As a child, he spent a great deal of time reading in the library of his family home, and he voraciously consumed books of history, geography, literature, philosophy and the natural sciences. His father taught him Latin and encouraged Ampere to pursue his passion for mathematics. Some historians write that the young Ampere was a math prodigy at a very early age and that he used to work out long mathematical formulas, just for his own personal entertainment, using small pebbles or breadcrumbs to represent groups of numbers. (Q)

In 1793, Ampere, age 18, saw the execution of his father during the French Revolution, after which he was literally speechless for a year and in a prolonged state of deep depression; Ampere gave up his studies for 18-months following trauma (Q); this was only compounded by the death of his young wife, five years into their marriage troubles with his two children, and unhappy second marriage, in what has been referred to as a "tortured life". [5]

The 1795, Ampere, age 20, penned a series of letters to a man named "Couppier", a supposed wealthy silk maker, reasoned to have resided in a chateau near the Ampere family, who asked many questions about mechanical contrivances; Ampere explained why perpetual motion was impossible, citing Joseph Lagrange's work on analytical mechanics, Gottfried Leibniz on conservation of vis viva; he discussed Denis Diderot, Johannes Kepler; he show he was self-educated whose interests ranged from mathematics and astronomy; from botany to plans for a universal language and his translations of Horace. In one letter, Ampere wrote in a childish scrawl: "You can see that the way in which I leap around is the way to get absolutely nothing done successfully. But as these ideas come to me I just simply have to pursue them." [5]

Electrodynamics

In 1820, Ampere, two weeks after Hans Orsted's discovery that a current-carrying deflects a compass needle, observed that a coil of wire acts as a magnet when a current flows through it and that two such coils attract and repel each other, just as to magnets; that year he also published a paper wherein he precisely defined electric potential or electric pressure, as distinct from electric current. [7]

In 1822, Ampere had firmly established by experiment and quantitative analysis, the science of electrodynamics or the "electricity in motion". [7]

Telegraph

In 1820, Ampere, in respect to the history of the invention of the telegraph (compare: Georges Le Sage, 1774), suggested that by using a circuit for each letter and a magnetic needle at the terminal end it would be possible to transmit messages.

In 1830, William Ritchie demonstrated Ampere's proposal on a small scale.

In 1832, Paul Schilling (1786-1837) worked out a small system based on Ampere's telegraphy theory.

In 1836, William Cooke (1806-1879) and Charles Wheatstone used these principles to make an working telegraphy that

ran one-mile along a railway in London.

Atomic theory

In 1814, Ampere developed a ‘geometric model’ in which he pictured atoms of chemical elements as being composed of subatomic particles. [1]

Electrodynamics

In circa 1820, Ampere dubbed the study of currents as “electrodynamics”. [4] In 1861, James Maxwell built on the work of Ampere to pen the fourth of his four Maxwell equations:

Maxwell's equation	Formulator	Name
$\nabla \cdot \mathbf{D} = \rho$	Gauss-Maxwell	(add)
$\nabla \cdot \mathbf{B} = 0$	Gauss-Maxwell	
$\nabla \times E = -\frac{\partial B}{\partial t}$	Faraday-Maxwell	
$\nabla \times \mathbf{H} = \frac{\partial \mathbf{D}}{\partial t} + \mathbf{J}$	Ampere-Maxwell	

(add)

Cybernetics

In 1834, Ampere, in his *Essay on the Philosophy of Science*, coined the term “cynbernetique” (cybernetics). [2]

> “The future science of government should be called ‘cybernetics’ (‘la cybernetique’).”
>
> — Andre Ampere (1834), *Essay on the philosophy of science*; coined from (O) the French word meaning “the art of governing”, from the Greek *kybernetes* “navigator or steersman” ; adopted by Norbert Wiener for the field of control and communication theory

(add)

Reaction end | Epitaph

Ampere choose for his gravestone epitaph “Tandem felix” meaning “Happy, at last.” [5]

Quotes | On

The following are quotes on Ampere:

> “The experimental investigations by which **Ampere** established the laws of mechanical action between electric currents is one of the most brilliant achievements in science. The whole, theory and experiment, seems as if it had leaped, full grown and full armed, from the brain of the **‘Newton of electricity’**. It is perfect in form, and unassailable in accuracy, and it is summed up in a formula from which all the phenomena may be deduced, and which must always remain the cardinal formula of electro-dynamics.”
>
> — James Maxwell (1873), *Treatise on Electricity and Magnetism, Volume 2* [6]; note: in the 1780s, some regarded Alessandro Volta as the “Newton of electricity” (Q)(Q)(Q)

> “It has been stated, on no less authority than that of the great Maxwell, that **Ampère**'s law of force between a pair of current elements is the cardinal formula of electrodynamics. If so, should we not be always using it? Do we *ever* use it? Did Maxwell, in his treatise? Surely there is some mistake. I do not in the least mean to rob Ampère of the credit of being the **father of electrodynamics**; I would only transfer the name of cardinal formula to another due to him, expressing the mechanical force on an element of a conductor supporting current in any magnetic field; the vector product of current and induction. There is something real about it; it is not like his force between a pair of unclosed elements; it is fundamental; and, as everybody knows, it is in continual use, " actually or virtually (through electromotive force) both by theoretical and practical men
>
> — Oliver Heaviside (1888), “The Mutual Action of a Pair of Rational Current Elements” [3]

Quotes | By

The following are noted Ampere quotes:

> “My father never required me to study anything, but he knew how to inspire in me a great desire for knowledge. Before learning to read, my greatest pleasure was to listen to passages from Buffon’s natural history. I constantly requested him to read me the history of animals and birds.”
>
> — Andre Ampere (c.1820)

> “Doubt is the greatest torment that a man suffers on earth.”
>
> — Andre Ampere (c.1820), on religious beliefs; “Letter to Friend” (Q)

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External links

- Andre-Marie Ampere – Wikipedia.

θΔics

In hmolscience, **Andre Lalande** (1867-1963) was a French philosopher noted, in human thermodynamics, for his 1899 to 1931 "involution" theory aimed at correcting evolution theory as entropy and the dissipation of energy would see things, in his view.

Overview

In 1899, Lalande, in his *Dissolution Opposed to Evolution in the Physical and Moral Sciences*, his PhD thesis, presents an argument, as summarized by Leon Winiarski (1900), who finds the work in support of his own and similar to French lawyer Maurce Haurion's *Lessons Social Movement* (1899), "directed towards an application of mechanics and thermodynamics to social science." [1] According to one recent summary of Lalande: [2]

> "Lalande's philosophy is [to some considered] disputable. He revolts against favorite ideas, especially against monistic evolutionism. According to Lalande, two laws rule over the world. The one, evolution, is dominant in biology, the other, involution, a term nearly identical with entropy, in the physico-chemical world. Life, as it can be observed, results from a compromise between two antagonistic tendencies of which the one is directed toward increasing individual differences, and the other toward elimination them. Man's will must choose between these two tendencies. He is bound to decide because Lalande denies that the vital impetus is a reliable guide for the organization of human life. Opposed to Spencer and critical of Bergson, Lalande adheres to a moral rationalism."

In 1930, Lalande published a revised version of his doctoral thesis as *The Evolutionist Illusions*, wherein he made a further attempt to explain how the law of the dissipation of energy fits into the logic of evolution. [3]

French philosopher Henri Bergson (1911) cites Lalande's *Dissolution*, in his discussion of the second law, mentioning that Lalande argues that life is a willed tendency towards death. [4]

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External links

â— Andre Lalande (philosopher) (French → English) – Wikipedia.

θΔics

In economic thermodynamics, **Andrei Khrennikov** (1958-) is a Russian-born Swedish applied mathematician noted for his 2005 article "Financial Heat Machine", in which he models financial markets from the point of view of phenomenological thermodynamics, describe a financial Carnot cycle, and argue that an economic perpetual mobile is possible "under some conditions", along the way discussing things such as the "boiling of the financial market" or the "heating of expectations", among other terms. [1]

Khrennikov cites John Neumann, Marc Lichnerowicz, Borisas Cimbleris, and Joseph McCauley as the founders of financial thermodynamics.

Education

In 1980, Khrennikov competed his undergraduate work in mechanics and mathematics at Moscow State University and in 1989 his PhD, with a dissertation on "Pseudo-differential equations on Superspace" at The Steklov Mathematical Institute of Academy of Sciences." Since 1997, he has been a professor at the Department of Mathematics, Statistics and Computer Sciences, University of Växjö, Sweden. [2]

References

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2. Andrei Khrennikov (curriculum vitae) – w3.msi.vxu.se.

Further reading

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â— Khrennikov, Andrei. (2012). "Financial Heat Machine: Coupling with the Present Financial Crises" (abs), *Wilmott*, 57:32-45.

External links

â— Andrei Khrennikov (about) – w3.msi.vxu.se.

θΔics

In hmolscience, **Andres Florez Amaya** (c.1984-) is Colombian microbiologist and cancer researcher noted for his 2013 blog "Thermodynamics of Love" which attempts a thermodynamics of love conceptualized approach to explain love and relationships via a mixture of John Gottman's *The Mathematics of Love* (2005) and protein thermodynamics. [1]

Thermodynamics of love

The following are the main sections from Florez' 2013 blog "Thermodynamics of Love", divided by interjection and commentary: [1]

> "This was one of my first notes and I would like to share it with you. The basic idea is to show how love can be interpreted in terms of energy consumption and how these can affect relationships. One of the main arguments against studying love and relationships more quantitatively is that emotions and human feelings are always assumed to be very complex and impossible to describe by current sophisticated scientific methods.Phrases like 'love is so incomprehensible, that is better to silence the mind and let everything flow and don't make any questions at all', are very frequent among people. It could be that this is true, but aren't you dear reader, a little curious, of what are the reasons for breaking up or being together in the first place?. In my opinion, there is a lot of help that science can give to elucidate the mechanisms of love dynamics, especially why people break up. A lot of work has been done in the past, especially by the famous psychologist John Gottman (who has an institute about relationships), and published a very interesting book called *The Mathematics of Marriage*. The book is interesting in the sense that he was able to collect data and predict if a couple was going to divorce or not with very high accuracy. The mathematical models are actually not very complicated, but this tells you that something can be done to make our lives more pleasant by involving the reason in how we choose our partners."

Next, Florez discusses the energy minimization principle, derived from the second law, and protein stability—ideas which he may have gleaned from his 2010 "Protein Network Prediction" (Q) article—as a basis to explain stability in human relationships:

> "Without doing too much math, one could easily thing about a fundamental principle every relationship should have, the 'minimum energy'. This comes from the second law of thermodynamics. As a simple example, in the case of proteins in the cell, they need to be folded correctly in order to perform the correct function. This folding could be spontaneous or sometimes helped by other proteins. However, "in order to be stable, the conformation has to have the lowest energy possible". This is a very critical point to discuss about relationships. The stability in a relationships, meaning, the possibility to stay together for long periods of time, depends mostly on the energy expended in the relationship."

Florez then tries to illustrate in terms of energy expended in courting and fighting:

> "I will give real life example to illustrate my point: Normally when a man is dating a girl, it is clear that he has to expend a lot of energy,and by energy I mean the time, gifts, attention and so on, that the guy expends on the girl to capture her attention (some girls need a lot of energy J), this is reasonable and it is what should be done; however, this only happens at the beginning of the relationship most of the times (I guess most of the girls get disappointed about this). However, this initial energy has to be reduced, in the sense that the attraction becomes more rational and less emotional. Evolutionary speaking, this has to be done in this way, otherwise we would be sick by the dopamine effects or in thermodynamic words, we become unstable because of the excess of energy."

Next, he talks about interaction energy and couple energy:

> “Once the relationship is started, the individual energy becomes [transforms] into the energy of the couple. This does not change the principle at all—coming back to the example of the proteins—when two or more proteins interact, they should keep the interaction energy low to have a stable interaction (stable relationship in the case of the couple). So the question is now, what is this couple energy?. When we think about it, most of the couple energy is normally expended in fights, and those fights whatever the reason is, it always comes from the fact that the couple has a lot of interaction energy that is not favorable, and here it comes the secret, the energy is high in fights because one thing is missing … the affinity!!!”

Here, with is mention of ‘affinity’, things begin to teeter off into statements of illogic, which no doubt has to do with the fact that the subject of the thermodynamic theory of affinity is something that but a few historians of chemistry are knowledgeable about:

> “The affinity basically indicates, what people normally call ‘chemistry’ or the ‘spark’. This chemistry pretty much depends on the compatibility, like having similar likes, similar hobbies, similar ways of thinking, the more affinity the lowest energy and therefore more stability. It sounds tricky, but it is a fundamental principle. Sometimes we think love can manage everything, which for some exceptional cases it can, but there must be affinity in order to be stable.”

Next, he goes into a discussion of debonding:

> “According to recent studies, one of the most common cases of divorce is actually no because of cheating, it is because the couple got bored. And getting bored is just a consequence that the couple is not enjoying or not trying exciting things together, like for example go for tango dancing, jump from an helicopter, learn Chinese, things like that. And maybe this boring behavior was a consequence of not having high affinity from the beginning. Love chemistry is not a mystery; it works in the same way as real chemistry. If you have a strong chemistry with someone, you will have a high chance to maintain low energy and in this way you will have a stable and exciting relationship ... sound easy!!!. This low energy status, however, is not easy to get and depends also in some other little things besides affinity. You could love with passion, which is good and desirable, but when your brain is investing high levels of energy trying to solve problems that don't depend on you, then it becomes a problem.”

Florez then concludes with what seems to be the example that mental time and energy wasted on hypothetical cheating scenarios, is akin to or an aspect of the endothermic or endergonic aspects of bond breakage:

> “For instance, if your girlfriend/boyfriend didn't call you when you said, you could start imaging several things and generate a ‘movie’ in your head, and those imaginations need a lot of glucose from your brain, and suppose you're wasting 400 kilojoules thinking about something that is not true, you could win a Nobel Prize investing that energy in research (some people will argue that you also need luck). But it is not people’s fault, the idea as it is concluded from the previous arguments, is to look for the right person that makes you feel good, as everybody want, with the condition to keep low energy status in order to have a successful relationship, this can only be achieved if you have a strong affinity with that person.”

(add discussion)

Education

In 2006, Florez completed his BS in microbiology, at the University of Pamplona, Columbia. From 2007 to 2010, Florez joined the “Program of Study and Control of Tropical Diseases” at University of Antioquia as a research associate since 2007 until 2010, and undertook a project to search for new drug targets by detecting essential proteins in the Leishmania major, Leishmania infantum and Leishmania braziliensis protein networks which were predicted by using protein sequence and structural information; a fruitful result of which was the proposal of new drug target candidates to be analyzed by virtual screening with future plans to evaluate the selected compounds by in vitro assays. [2] This may have been where Florez learned about drug-receptor thermodynamics and or protein thermodynamics, which he seems to employ in his 2013 "Thermodynamics of Love" blog. In 2010, Florez began working towards his PhD with a dissertation “Understanding the Role of MYCN in Neuroblastoma Tumors Using Systems Biology” at the Division of Theoretical Systems Biology, at the German Cancer Research Center, Heidelberg, Germany; a project seeming complete in 2013. (Q)

See also

- David Hwang

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Further reading

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External links

- Andrés Flórez (profile) – Blogger.com.
- Andres Florez (profile) – University of Heidelberg, Germany.

θΔics

In existographies, **Andrew McIntosh** (c.1950-) (CR:6) is an English thermodynamics professor, noted in religious thermodynamics, as one who promotes young earth creationism, i.e. a creationist thermodynamicist, is an opponent of Darwinian evolution, and is noted for his 2000 book *Genesis for Today*, in which he argues that the Bible describes events literally as they occurred. [1]

In a debate with Richard Dawkins on BBC Radio Ulster, McIntosh stated his belief that the world was six-thousand-years old, that marine trilobites were made extinct by Noah's flood, and that the second law of thermodynamics contradicts the Darwinian theory of evolution. [2]

In a circa 2009 movie *Creation*, McIntosh and theistic evolutionist Denis Alexander debated Lewis Wolpert. (Ñº)

McIntosh was a reviewer for English materials scientist and pastor Edgar Andrews book *Who Made God? Searching for a Theory of Everything*, which devotes 15+ pages to thermodynamics discussion. [4]

Education

McIntosh completed his BS in applied mathematics at the University of Wales in 1973 and his PhD in 1981, with a thesis on “Unsteady Premixed Laminar Flames”, at the aerodynamics department of Cranfield Institute of Technology. [3]

Quotes | By

The following are representative quotes:

> “There is a fundamental law in the universe to which there is no known exception. That is, that when there is any work done due to energy conversion, there is always some dissipation of useful energy. In purely thermodynamic terms, this means that, for a closed system, the measure of energy no longer available for useful work is increasing. This is called entropy. Thus, in a closed system, the overall entropy is increasing. However, the law applies not only to the area of mechanics and engines. It applies to any system, since entropy is effectively a measure of the disorder in that system. In overall terms, disorder increases, cars rust and machines wear out. No spontaneous reversal of this process has ever been observed for a closed system. For living systems, this law still applies. That which is dead (such as a stick or leaf from a tree) has no information or teleonomy within it to convert the sun’s energy to useful work. Indeed, it will simply heat up and entropy will increase.”
>
> — Andrew McIntosh (1999), “Mathematics” [5]

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External links

â— Andrew McIntosh (professor) – Wikipedia.

â— Andy McIntosh – CreationWiki.org.

θΔics

In human chemistry, **Andrew M. McKinnon** (c.1969-) is a Scottish sociologist note for []

Overview

In 2010, McKinnon published two articles on German sociologist Max Weber's usage of German polymath Johann Goethe's 1809 human chemical theory, specifically the term "elective affinity", in his 1905 *The Protestant Ethic and the Spirit of Capitalism*. [1]

McKinnon, also in 2010, published work on English natural philosopher Herbert Spencer's energetics theory of sociology. [2]

Note

Of note, McKinnon, citing the 2002 reductionism vs. emergentism ideas of Italian chemist Pier Luisi, uses an "emergent property", e.g. the classic "water is an emergent property of hydrogen and oxygen" statement, reinterpretation of Weber's conceptual notion of Goethe's human elective affinity theory as applied to religion and sociology, which does not exactly seem to align with the way Weber and Goethe saw things. [3]

Education

McKinnon completed his BA (somewhere) in something, his MA (in something) at the British Columbia, and his PhD (with a dissertation on something) at Toronto. Currently, McKinnon is a professor of sociology at the University of Aberdeen.

See also

â— Weberian elective affinity

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(b) Pier Luigi Luisi – Wikipedia.

External links

â— Andrew McKinnon (faculty) – University of Aberdeen.

θΔics

In hmolscience, **Andrew William Morrow** (1961-) is an American chemical engineer noted for his self-originated 2006 philosophy that people are 'mosaics of atoms with a mind' and that being aware of this atomic reality, one should attempt to see the reactions of one's fellow human beings to oneself, so to see if further insight can be found. [1] Morrow's philosophy is centered around the connection between atoms, life, and mind; such as is captured in his 2009 video "We are Made of Atoms":

> "You are made of atoms and there is no escape from this knowledge. Peace and happiness but first you must be wiser."

In which he speculates on how the internet is making the world more open and privacy less concealed.

Thermodynamic philosophy

In 2006, Morrow outlined an advanced intelligence perspective philosophy, using a mixture of atomic-logic and thermodynamics, on how to conduct one's self: [2]

> "Start with atoms and thermodynamics and to slowly zoom back out to the millimeters-to-miles distance regime [as a Martian might see us on Earth] and examine the world in which [you] live with a fresh perspective based strictly on well-established, non-controversial scientific knowledge [and] use this information as a foundation upon which [to] decide how to spend the remainder of [your] lifetime."

In this logic, Morrow states that his intention in publishing his views is for the reader to see the world through eyes unclouded by hate, fear, or other human emotion, so to observe our world, to evaluated our nature, our nurture, and our behavior, in such a manner that chemical reality based thermodynamic-perspective world-view will empower the reader and further probe the mystery of existence.

In this end, to to dig out a framework philosophy, Morrow states that he "will ignore the vast mathematical complexity of thermodynamics and focus on the philosophical implications of its 'laws'."

Sustainability

In 2010, Morrow began working on a sustainability population model, which he calls "perinatal lottery sterilization", as a way to use modern science to avoid Unsustainable World Population. He argues that some humans should be sterilized at infancy or even someday soon *in utero* as determined by lottery for the purposes of adult education and promotion of otherwise voluntary population stabilization.. He is in the process writing a book on a larger theme he calls Thermostat for Thermonuclear War, which he hosts at Thermo4Thermo.org. The work takes the approach of scientific materialism with an emphasis the triad of Atom, Life and Mind (ALM) and with some aspects of human thermodynamics. [3]

Education

Morrow completed his BS in chemical engineering in 1983 at the Rensselaer Polytechnic Institute, New York. [3] His occupation since has been as a computer engineer / computer programmer. One of his teachers was Hendrick Van Ness.

References

1. Morrow, Andrew M. (2009). "A Proper Dichotomy", EoHT discussion post, Sep 08.
2. Morrow's 'worldview' (thermodynamics and atomic systems) – Amorrow2.Wikidot.com.
3. Morrow, Andrew W. (2010). *A Periodic Table of Civics* , later renamed to "Einstein's Headche", (Thermo4Thermo.org). Ishi Press. (yet to be released)

External links

â— Andrew Morrow – AWM's wordpress.com collection - see Privacy Singularity and Zoom Tunnels

θΔics

In economic thermodynamics, **Andrew George Pikler** (c.1910-c.1980) American electrical engineer (?) noted for his 1954-55 article "Utility, Theories in Field Physics and Mathematical Economics" in which he gave an overview of the use of mechanics and thermodynamics in economics in the early years and highlighting connections, such as between temperature and velocity of circulation of money. [1]

In 1947, American polymath John Neumann, in a letter to Jacob Marschak, in attempts to interest the Cowles Commission in the work of Pikler, wrote the following about Pikler and his discussion with him: [2]

> "I want to tell you that I have talked to him about his ideas in considerable detail and that I have come to the conclusion that the model constructions which he likes to illustrate them are not very essential but that there is probably a very healthy nucleus in his way of using statistical ensembles and transition probabilities; i.e., in applying to the fluctuations of money those concepts which have turned out to be appropriate to gas and chemical kinetics. I think that his work deserves interest and encouragement."

The gist of this aspect of Pikler's theory seems to have come to fruition in his 1951-54 article "The Quanta-Kinetic Model of the Monetary Theory", in which he describes the displacements of monetary units in the economic system on the kinetic theory of gases, similar to the way in which we are unable to describe the movements of individual molecules, case by case, but only globally via the ensemble. [3]

American physical economics historian Philip Mirowski classifies Pikler (1951) as a "further out neosimulator", in the history of non-neoclassical or anti-neoclassical economics programs of the appropriation of physics metaphors, that he has stumbled upon in his research, along with: Johannes Lisman (1949), John Bryant (1982), Edwin Jaynes (1983), Giuseppe Palomba (1968), and Marc Lichnerowicz (1970). [3]

References

1. (a) Pikler, George. (1954). "Utility, Theories in Field Physics and Mathematical Economics (I)", *J. Philos Sci*, 17: 47-58.
(b) Pikler, George. (1955). "Utility, Theories in Field Physics and Mathematical Economics (II)", *J. Philos Sci*, 20: 303-18-58.
(c) Bryant, John (2009). *Thermoeconomics: A Thermodynamic Approach to Economics* (ch. 1: Introduction; ch. 3: Thermodynamic Principles; ch. 5: Money). VOCAT International Ltd.
2. Mirowski, Philip. (2002). *Machine Dreams: Economics Becomes a Cyborg Science* (pg. 150). Cambridge University Press.
3. (a) Pikler, Andrew G. (1951). "The Quanta-Kinetic Model of the Monetary Theory" (abs), *Metroeconomica*, 3(2): 70-95.
(b) Pikler, Andrew G. (1954). "The Quanta-Kinetic Model of the Monetary Theory: three additional appendices" (abs), *Metroeconomica*, 6(2): 72-75.
4. Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (pg. #). Cambridge University Press.

Further reading

â— Pikler, Andrew. (1951). "Optimum Allocation in Econometrics and Physics" (abs), *Weltwirtschaftliches Archiv. Bd.* 66; 97-132.

θΔics

In affinity chemistry, **Andrew Plummer** (1697-1756) was a Scottish physician-chemist noted for his interpretation of chemical reactions as the result of competition between attractive and repulsive forces. [1]

Living library | Poor lecturer

Plummer was a poor lecturer; John Fothergill (M.D. Edinburgh 1736) in a paper read in 1769 said of Plummer: [2]

> "He knew chemistry well. Laborious, attentive and exact had not a native diffidence veil'd his talents as a praelector he would have been among the foremost in the pupils esteem: such was the gentleness of his nature, such his universal knowledge, that in any disputed point of science, the great Maclaurin always appealed to him, as to a **living library**; and yet so great his modesty that he spoke to young audiences upon a subject he was perfectly master of, not without hesitation."

Oliver Goldsmith who attended some medical classes in Edinburgh wrote that:

> "Plumer (sic) Professor of chymistry understands his busines (sic) well but delivers himself so ill that he is but little regarded."

Education

Plummer attended the arts curriculum of the University of Edinburgh from 1712 to 1717 but did not graduate, graduation in arts having almost ceased early in the eighteenth century. Plummer matriculated in the University of Leyden on 5 Sep 1720, and the register of the University of Leyden for 1721 includes the names of Andrew Plummer, Andrew St. Clair and John Innes all of whom were elected professors of medicine at Edinburgh in 1726. Plummer graduated M.D. at Leyden on 23 July 1722. His graduation thesis, entitled '*de phthisi pulmonali a catarrho orto*', was dedicated to John, Duke of Roxburgh. [2]

Plummer was a student of Dutch physician-chemist Herman Boerhaave.

Plummer was a professor of chemistry at the University of Edinburgh from 1726 to 1755.

Plummer came to be a close associate of William Cullen, the inventor of the affinity reaction diagram method, the precursor to the modern chemical reaction "reactants" going to "products" method of reaction notation, who eventually became his successor at Edinburgh. Cullen's most-famous student was Joseph Black, who further carried forth the lecture ideas of the former two in his chemistry lectures at Edinburg in the 1770s and 1780s.

In some way or another, Cullen's diagrams of an algebra of forces of affinity are said to have had their partial origin in the earlier ideas of Plummer. [3]

Cullen

William Cullen who had attended medical classes in Edinburgh in the mid-1730s but appears not to have attended Plummer's lectures was in 1747 appointed Lecturer in Chemistry in Glasgow and in 1751 Professor of Medicine. He soon began planning his next move that was to succeed Plummer in Edinburgh. For three years various friends of Cullen tried to persuade Plummer to resign but Plummer remained uncooperative. In 1755 he was stricken with an illness which it appeared would force him to abandon lecturing and now other candidates as well as Cullen pressed their claims. During the struggle Cullen was described by one of his supporters as *"the fittest person in Europe to fill the Chemical Chair, and as the candidate who would be most acceptable to the Duke of Argyll"*. The matter was resolved after several months of in-fighting when the Duke of Argyll visited Edinburgh and brought to bear the influence which

resulted in Cullen being appointed joint Professor of Chemistry during the life of Plummer, with the succession on his death. Plummer died on 16 April 1756 having, among other achievements firmly established the teaching of chemistry in the University of Edinburgh. [2]

Black

A number of Plummer's students made significant contributions to Chemistry. The most outstanding academically was Joseph Black part of whose classic research on alkaline substances was carried out while a student at Edinburgh; however while Black probably attended Plummer's lectures his interest in chemistry unquestionably arose from his earlier association with William Cullen in the University of Glasgow.

References

1. Plummer, Andrew. (1771). *Essays ad Observations Physical and Literary*, vol ii. Edinburg, 2nd edition, pgs. 381-83.
2. Andrew Plummer – University of Edinburgh, School of Chemistry.
3. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (Plummer, pg. 387). Morrisville, NC: LuLu.

External links

â— Andrew Plummer – Wikipedia.

θΔics

In existographies, **Andrew Robinson** (1957-) is a British genius studies scholar noted for []

Overview

In 2010, Robinson, in his *Sudden Genius? The Gradual Path to Creative Breakthroughs*, commented the following missing candidates qualms on Cox IQs: [1][N1]

> "Cox, following a methodology basically similar to Terman's, and under his supervision, faced more constraints. Few of her chosen individuals had lives as completely documented as Gallon's. (Strangely, Galton was not included in the study, presumably on the grounds that he was not a bona fide genius.) So little could Cox discover about Shakespeare's life that he had to be excluded. Living individuals were deliberately excluded, so there is no Curie or Einstein, no George Bernard Shaw or William Butler Yeats in the study, for instance. In addition, Cox chose to eliminate those born before 1450, along with all aristocrats, and anyone else whose achievements could not be attributed to them without dispute. All this was understandable. But some of the other omissions were hard to defend: among the scientists, no Jean-Francois Champollion, Carl Gauss, Robert Hooke, August Kekule, Charles Lyell, James Clerk Maxwell, Dimitri Mendeleev, Louis Pasteur, or Christopher Wren; among the artists no Gian Lorenzo Bernini, Johannes Brahms, Paul Cezanne, Anton Chekhov, Francisco de Goya, Franz Schubert, Percy Bysshe Shelley, Leo Tolstoy, or Oscar Wilde. The Cox/Terman list is an idiosyncratic choice of geniuses, to put it politely, even when we allow for the fluctuation of reputation between the 1920s and now. (The genius of all these omitted individuals was accepted in the mid-1920s.)"

The following are the names from Robinson's "missing geniuses" smattering, shown in conjunction with top 500 geniuses IQ rankings (if included) or not top five-hundred (NTF) material, if known:

Francis Galton (IQ:165|#266)
William Shakespeare (IQ:190|#48)
Marie Curie (IQ:185|#65)
Albert Einstein (IQ:215|#3)
George Shaw (IQ:165|#261)
William Yeats (IQ:170|#252)
Jean Champollion (IQ:175|#180)
Carl Gauss (IQ:190|#25)
Robert Hooke (IQ:195|#22)
August Kekule
Charles Lyell
James Maxwell (IQ:210|#4)
Dmitri Mendeleyev (IQ:175|#182)
Louis Pasteur (IQ:175|#92)
Christopher Wren
Gian Lorenzo Bernini
Johannes Brahms
Paul Cezanne (IQ:150|#422)
Anton Chekhov
Francisco de Goya
Franz Schubert
Percy Shelley (IQ:185|#80)

Leo Tolstoy (IQ:180|#96)
Oscar Wild

(add)

Note

N1. Note (a) the salient use of "creative" in Robinson's work, i.e. a term short for god talk, and that (b) Robinson was Templeton Foundation funded [2007-2010] for his *Creative Breakthroughs* book.

References

1. Robinson, Andrew. (2010). *Sudden Genius? The Gradual Path to Creative Breakthroughs* (pg. 20). Oxford University Press.

Further reading

â— Robinson, Andrew. (2006). *The Last Man Who Knew Everything: Thomas Young, The Anonymous Polymath Who Proved Newton Wrong, Explained How We See, Cured the Sick, and Deciphered the Rosetta Stone, Among Other Feats of Genius*. Pi Press.
â— Robinson, Andrew. (2011). *Genius: a Very Short Introduction*. Oxford University Press.

External links

â— W. Andrew Robinson – Wikipedia.

θΔics

In human thermodynamics, **Andruin Mui** (c.1986-) is a Dutch economist noted for his 2010 to present work-in-progress semi-thermodynamics based theory of entrepreneurship (see: business thermodynamics) and reality enhancement. [1]

Difficulties

A salient difficulties on Mui's theory is that, although he cites Rudolf Clausius, the majority of his energy and entropy statements are quotes from American organic chemist Frank Lambert, who notably did so poorly in his senior level thermodynamics courses, at Harvard, that he was forced to switch majors from physical chemistry to organic chemistry, and his energy dispersal theory of entropy, which has numerous issues of its own.

Education

In 2010, Mui was associated with the Erasmus School of Economics, Erasmus University Rotterdam, Netherlands.

References

1. (a) Mui, Andruin. (2010). "Entrepreneurship: the Act of Enhancing One's Realty", European Regional Science Association, 50th congress (abs), Jönköping, Sweden, 19-23 August.
(b) Mui, Andruin. (2012). "Linking Micro-Level Entrepreneurial Action and Macro-Level Economic Progress: the Interdisciplinary and Multidimensional Domain of Entrepreneurship" (abs), Feb 23, Papers.SSRN.com.

θΔics

In hmolscience, **anecdotes** are famous, telling, and often entertaining or noteworthy stories or incidences, tending to capture a humorous or sometimes discerning tale or wit. [1]

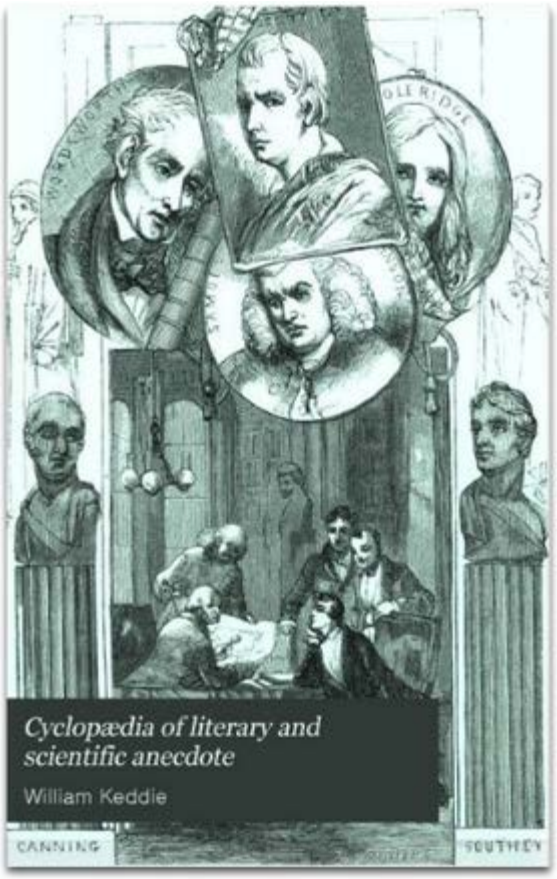

William Keddie's 1854 *Encyclopedia of Literary and Scientific Anecdotes*, showning: William Wordsworth, Samuel Coleridge, Samuel Johnson, and Scott Bar, in circular portraits, and Canning and Southey on pillars; along with interesting memoranda of Humphry Davy on chemistry. [3]

Napoleon Laplace anecdote

See main: Napoleon Laplace anecdote

In 1802, Napoleon Bonaparte queried Pierre Laplace about why he did not mention a "creator" or god in his new multi-volume celestial mechanics treatise, to which Laplace famously retorted: "I had no need of that hypothesis".

Neumann-Shannon anecdote

See main: Neumann-Shannon anecdote

In 1939, Claude Shannon approached John Neumann about what he should call his new logarithmic function of information transmission, to which Neumann irkingly, as it has come to pass, suggested the name "entropy", as an inside joke of sorts; which has added a derisive, detrimental, and clogging effect to many areas of science; the original Sokal affair, as the phenomena is classified as, in modern terms.

Governor anecdote

In 1973, a "Governor of a State", likely of New York, nearly the end of a dinner party, approached noted cellular components pioneer Albert Claude about what he thought about the existence of god, to which he deferred the query to talk of anti-entropy and future faiths and changes of beliefs. [2]

See also

- Thermodynamics anecdotes

References

1. Fadiman, Clifton, and Bernard, Andre. (2000). *Bartlett's Book of Anecdotes*. Little, Brown and Company.
2. Claude, Albert. (1974). "The Coming Age of the Cell: Inventory of Living Mechanisms, Biochemistry and Electron Microscope, and the View of the Impact of the Findings on our Status and Thinking" (O), Nobel Lecture, Dec 12.
3. Keddie, William. (1854). *Cyclopædia of Literary and Scientific Anecdote: Illustrations of The Characters, Habits and Conversation of Men of Letters and Science*. R. Griffin and Co.

θΔics

In science, **anergy**, or *anergie* (German), in short, is "interconvertible component of energy" (Ñº); or, in more detail, is a near incongruous, claimed to be thermodynamics concept, introduced by Zoran Rant (1964), a counterpart to his earlier 1956 concept of exergy, conceptualized or defined as the amount of the energy value of a fossil fuel, e.g. coal or oil, which cannot be converted into alternative forms of energy.

Overview

In 1964, Slovene mechanical engineer Zoran Rant, in his "Exergy and Anergy", published originally in German, supposedly, as summarized (Ñº) by Hans Baehr (1965), defined anergy as follows: [1]

5.2 Anergy

The proportion of a form of energy that is not converted into exergy is referred to as *anergy*, symbolised by B. From Eq. (1) we obtain anergy B_U of an internal energy:

$$B_U = U_u + T_u (S_1 - S_u) - p_u (V_1 - V_u),$$

and the following applies:

$$U_1 = (-E_{ex}) + B_U. \quad (2)$$

All energy is made up of exergy and anergy.

The definition of "**anergy**" from the 1994 *Dubbel Handbook of Mechanical Engineering*. [4]

> "Exergy is that part of energy which can be converted into every other form of energy; the remainder is **anergy**."

which defines, recursively or nonsensically, as the amount of energy that cannot be converted into other forms of energy. Formulaically, anergy is defined as follows: [2]

> Anergy = Energy – Exergy

(add discussion)

Note | Confusions

The issues with "anergy" as a concept are numerous; Jan Szargut (2005), e.g., points out that the reference level of anergy is optional, hence anergy could be negative, hence "it would be very difficult to explain the physical meaning of a negative value of anergy". [5]

Similarly, many confuse anergy as being the synonym of the second law; one example comes from Charles Hall (2011), who states the following:

> "In effect, the first two laws of thermodynamics say: 'nothing happens in the world without energy conversion and entropy production'. The consequences are: (1) every process of industrial and biotic production requires the input of energy; (2) because of the unavoidable entropy production the valuable part of energy (called exergy) is transformed into useless heat at the temperature of the environment (called **anergy**), and usually matter is dispersed too."

Moreover, such as Reiner Kummel (2011), confuse the Rant-based term "anergy" with the same term used, in a different sense, in immune physiology. [3]

References

1. Rant, Zoran. (1964): "Exergie and Anergie" ("Exergy and Anergy"). *Wissenschaftliche Zeitschrift der* TU Dresden (3)/4, 1145–1149. Wissenschaftliche Zeitschrift der TU Dresden (3) 1964 / 4, 1145-1149.
2. Sato, Norio. (2004). *Chemical Energy and Exergy: An Introduction to Chemical Thermodynamics for Engineers* (pg. 99). Elsevier.
3. Kummel, Reiner. (2011). *The Second Law of Economics: Energy, Entropy, and the Origins of Wealth* (abs) (pg. 37).

Springer.
4. Beitz, Wolfgang and Kuttner, Karl-Heinz. (1994). *Kubbel Handbook of Mechanical Engineeering* (pg. 8). Springer.
5. Szargut, Jan. (2005). *Exergy Method: Technical and Ecological Applications* (pg. 9). WIT Press.

Threads

â— Exergy vs Gibbs Available Energy (2012) – Hmolpedia.

External links

â— Anergy (German → English) – Wikipedia.

θΔics

In religio-mythology, **angel**, as contrasted with "demon" (see: Satan; devil), in modern day terms, refers to a fictional, myth-based, semi-divine female spirit-like entity, with wings and a halo, and embodying the power of "good", originating, in cross-cultural god reduction view of belief systems, from the ancient Egyptian belief in the "benu bird" (see: phoenix), a magical bird thought to carry the sun on its head, following its daily birth, and carry it though the sky during its daily journal.

A timeline of artistic depictions of Egyptian sun birds (#s 1-11), turned Egyptian gods holding suns (#8), turned Roman saints with sun disc on head (#s 14-15), turned angelic figures with "halos" behind (#s 22-30) and then above (#s 33-46) their head, as we now think of what "**angels**" are. [3] Modern "angels", according to Massey (1907), are Egyptian sun god birds, turned human soul birds (see: Egyptian human), that were "compounded" and "carried" into the reformed belief systems of Babylonia, Judea, Greece, Rome, and into the modern-days. [2]

Overview

In c.3,100BC, Egyptians thought a sun god model, according to which the sun or sun as supreme god was carried in the sky by a bird called the benu bird or benben bird, labeled the "phoenix" by Herodotus (c.450BC).

In c.500BC, Jews, who were a reformed sect of Egyptians, i.e. Is-Ra-El-ites, effected a massive god reduction, similar to that previously attempted by Akhenaten (1300BC), wherein extant supreme gods were turned into a handful of synonymous themed gods, such as El, Amen, Yahweh, YHWH, etc., who were mixed together, in texts, into an confused amalgamation, conceptualize as one god; former classic secondary gods, in the former henotheism scheme, e.g. Atum, Nun, Osiris, etc., were made or rescripted into prophets, such as Adam, Noah, Moses, respectively, via the "god-to-prophet" rescript method (Dunlap, 1858), and the ancient motif of the children of god, e.g. Horus and Set, battling nightly in the forms of the powers of lightness and darkness or good and evil, were re-cast into the story guise of angels and demons. [1]

In c.1820, with the translation of the Rosetta Stone, the detective work of the 150+ religio-mythology scholars ferreted the basics of how Egyptian birds were turned into Christian angels; one example is as follows:

> "The human soul never was 'conceived as a bird', but might be imaged as a bird, according to the primitive system of representation. The golden hawk, for instance, was a bird which typified the sun that soared aloft as Horus in the heavens, and the same bird in the eschatology was then applied to the human soul in its resurrection from the body. Hence the hawk with a human head is a compound image, not the portrait of a human soul. The **celestial poultry** that **pass for angels** in the imagination of Christendom have no direct relation to spiritual reality. A **'feathered angel'** was never yet seen by clairvoyant vision, and is not a result of revelation. We know how they originated, why they were so represented, and where they came from into the Christian eschatology. They are the human-headed birds that were compounded and portrayed for souls in Egypt [see: Egyptian human], and carried out thence into Babylonia, Judea, Greece, Rome, and other lands."
>
> — Gerald Massey (1907), *Ancient Egypt: The Light of the World: a Work of Reclamation and Restitution in Twelve Books, Volume One* (pg. 136) [2]

In the 20th century, after 1920 to 1945, following WWI and WWII, much of this former religio-mythology research, so-intelligently perused by thinkers like Massey and Dunlap, in the 19th century, was pushed underground, classified as "not-acceptable references", generally as religious faith began to blossom.

In the 21st century, per repercussion of this intellectual atrophy, very few modern people understand the mythological origin of angels, and therefore continue to believe in them; the following, from a 2006 Barack Obama campaign speech, is one humorous take on this: [1]

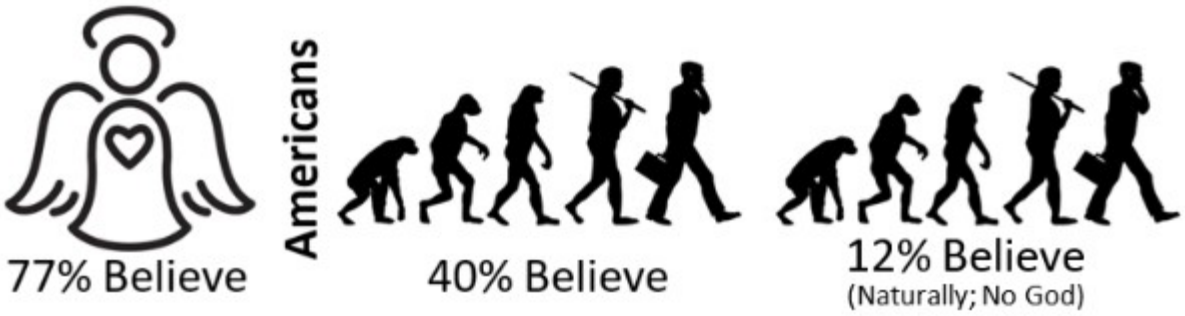

"Substantially, more people, in America, believe in **angels**, then they do in **evolution**."

— Barack Obama (2006), 'Faith and Politics', Jun 28

(add)

Quotes

The following are related quotes:

> "When you die, you turn into an **'angel'** with very pretty wings, and god is a boy with a nice white shirt."
>
> — Girl #5 (2016), "Video of Kids aged 4 and 5 who were asked: What Happens When You Die? For Dying Matters Awareness Week" (1:21-1:40), Keech Hospice Care, Luton, England [1]

> "What do you think of this 'great awakening', and **angels** coming down to save us? Like religious stuff people talk about?"
>
> — Armando (2020), "Text to Libb Thims", Query asked in the context of the third week of the US Coronavirus Quarantine, Apr 2

References

1. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs) (angels, pgs. 99, 113, 191, 273, 284, 287; Girl #5, pg. 5; Obama, pgs. 87). Publisher.
2. Massey, Gerald. (1907). *Ancient Egypt: The Light of the World: a Work of Reclamation and Restitution in Twelve Books, Volume One* (pg. 136). T. Fisher Unwin.
3. (a) Thims, Libb. (2004). *Human Thermodynamics (Volume Three)* (§22: Religion and Thermodynamics II, pgs. 611-62) (see: halo article). 330-pgs. (un-finished manuscript) Chicago: IoHT Publishing.
(b) See: "Halo" article for more images, dates, and details.

External links

â— Angel – Wikipedia.

θΔics

In hmolscience, **Angelo Letizia** (c.1975-) is a writer noted for his *The Battle for Existence*, which attempts to explain why the universe exists via entropy arguments.

Overview

In 2007, Letizia, in his *The Battle for Existence*, outlined an entropy-based theory of existence, generally viewing entropy as the tendency towards death; the abstract of which is as follows: [1]

> "Gottfried Leibniz once asked "why does the universe exist? This book intends to the answer that question."

The book is an an entropological explanation of the Darwinian "struggle for existence" postulate. In short, building on the 1944 work of Erwin Schrödinger, Letizia's aim is to illustrate how:

> "The second law of thermodynamics may operate on a social, as well as atomic level."

In his book, Letizia also outlines his views on entropy ethics, where he reasons that ethics are used by humankind as a "bulwark against entropy". [2]

References

1. (a) Letizia, Angelo. (2007). *The Battle for Existence* (quote, pg. 68; thermodynamics, pgs 9, 91-93; entropy: 20+ pgs). LuLu.com.
(b) Angelo Letizia's Storefront – LuLu.com

θΔics

In existographies, **Ani** (c.1200-1250BC) was an Egyptian scribe, noted for his funding of his afterlife funeral spell rites document, aka the *Papyrus of Ani* (c.1250BC), discovered by Wallis Budge (1888), which is the most-complete version of the *Egyptian Book of the Dead*.

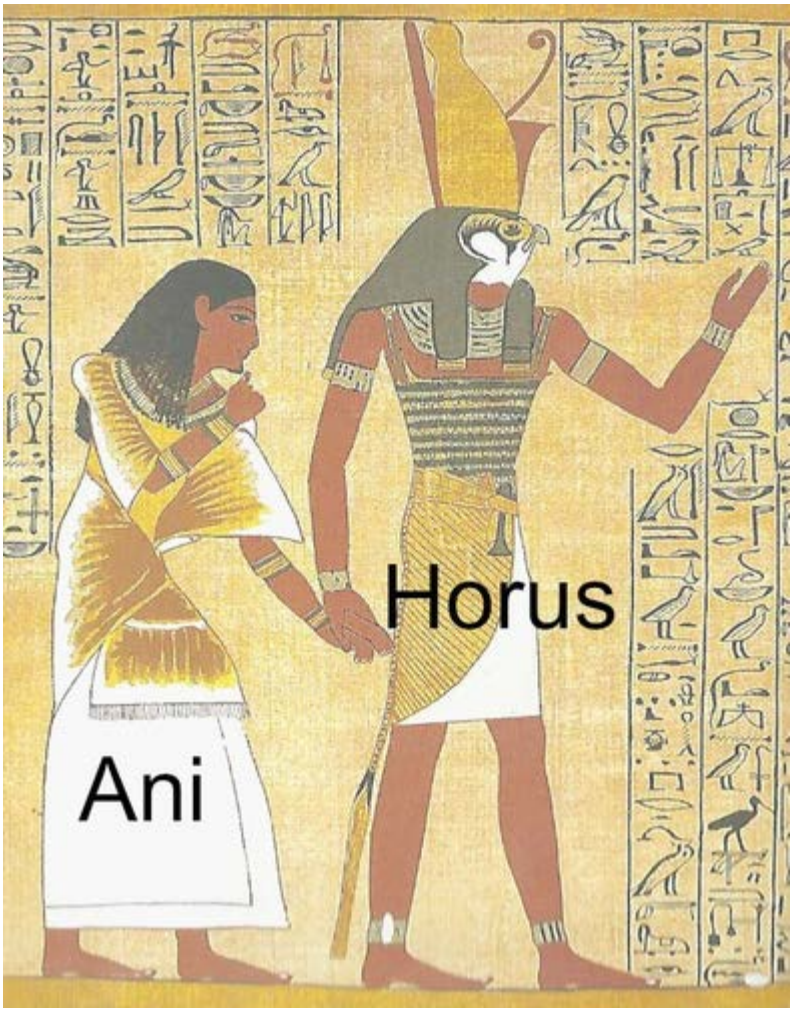

A depiction of **Ani**, from the *Papyrus of Ani*, showing Horus (aka god the son) leading Ani, after he has passed the weighing of the soul (see: soul weight) test in the judgment hall, to the presence or throne of Osiris (aka god the father). [1]

Other

Ani's wife, named "Tutu", is seen accompanying him in many of the vignettes of the Book of the Dead.

Osiris Ani

The goal of the deceased, like pharaohs before, is to be come "an Osiris" in the afterlife; the following, from plate 33 of the Papyrus of Ani, is a depiction of the "Osiris Ani", in this respect, i.e. Ani mummified like Osiris:

(add)

References

1. Faulkner, Raymond. (1972). *The Egyptian Book of the Dead: the Book of Coming Forth by Day: Complete Papyrus of Ani, Featuring Integrated Text and Full-Color Images* (translator: Ogden Goelet; Preface: Carol Andrews; Introduction: Daniel Gunther; Foreword: James Wasserman) (Amz) (Ani, pg. 42). Chronicle Books, 2015.

External links

â— Papyrus of Ani – Wikipedia.

θΔics

In terminology, **animal** (TR:835) refers to a certain class of powered CHNOPS+ organisms in possession of animation; in obsolete Linnaean classification, is one of the three forms of "life", i.e. "animal life", along with plant life (or vegetable life) and mineral life.

Quotes

The following are related quotes:

> "Anaximander, a pupil of Thales, said that a certain infinite nature is first principle of the things that exist. From it come the heavens and the worlds in them. It is eternal and ageless, and it contains all the worlds. He speaks of time, since generation and existence and destruction are determinate. Anaximander said that the infinite is principle and element of the things that exist, being the first to call it by the name of principle. In addition, there is an eternal motion in which the heavens come into being. The earth is aloft, not supported by anything but resting where it is because of its equal distance from everything. Its shape is rounded, circular, like a stone pillar. Of its surfaces, we stand on one while the other is opposite. The heavenly bodies come into being as a circle of fire, separated off from the fire in the world and enclosed by air. There are certain tubular channels or breathing-holes through which the heavenly bodies appear; hence eclipses occur when the breathing-holes are blocked, and the moon appears sometimes waxing and sometimes waning according to whether the channels are blocked or open. The circle of the sun is twenty-seven times greater than the earth and the circle of the moon is eighteen times greater. The sun is highest, the circles of the fixed stars lowest. **Animals** come into being from moisture evaporated by the sun. Humans originally resembled another type of animal, namely fish. Winds come into being when the finest vapors of air are separated off, collect together and move. Rain comes from vapor sent up by the things beneath the sun. Lightning occurs when wind breaks out and parts the clouds."
>
> — Hippolytus (c.220), *Refutation of All Heresies* (Q)

See also

- Animal heat
- Animal life
- Animal thermodynamics

External links

- Animal – Wikipedia.

θΔics

In science, **animal heat**, a term conceived in 1779, is the heat produced in the body of a living animal by functional chemical and physical activities. [1] Animal heat can also be defined as the heat generated in the body of a warm-blooded vertebrate as the result of its physiological and metabolic processes. [2] An animal "in heat" refers to a state of sexual receptiveness in animals, especially in females. [8]

A caricature (O) of French physiologist Jules Beclard holding a thermometer, conducting what seems to be one of his *circa* 1860 **animal heat** and muscular work and temperature experiments, shown with a physiology book in the background, standing above a dead (deceased) animal, and in front of a live (existive) animal (cat or dog).

History

One of the earliest postulates of *animal heat* was made by Greek physician Hippocrates who in c.490BC stated that: "heat, a quantity which functions to animate, derives from an internal fire located in the left ventricle". [3]

In the late 18th century, French chemist Antoine Lavoisier introduced the "combustion theory of animal heat", the dominate theory of animal heat or how heat is produced in animals. In Lavoisier's animal heat model, body is warmed by combustion of carbon from food, with the incidental consequence of changing red arterial blood coming from the heart into the darker venous blood that carries the ashes back to the lungs in the form of carbon dioxide. [9]

Mechanical equivalent of heat

One of the early stimulators to the development of the science of thermodynamics was the synthesis of the mechanical equivalent of heat in relation to the need to understand animal heat. In particular, two German physicians and physicists, Robert Mayer and Hermann Helmholtz, in particular, wanted to understand the reason and operation behind the production of animal heat and how this related to other physical heats, such as solar heat, electrochemical heat, chemical heat, combustion heat, frictional heat, etc. [4]

In the late 1840s, debates on the sources and character of animal heat renewed impetus to use the metaphor of the animal machine. A key player in these debates was German chemist Justus Liebig who used a language of vital forces and in his 1842 *Animal Chemistry* drew on the metaphor of the furnace to describe the "metamorphosis" of nutrition and oxygen. [6] His student German physician Robert Mayer, influenced by these views, used the metaphor of combustion in his early publications on the mechanical equivalent of heat. [7]

In particular, during a series of blood-letting procedures, while working as a ship's physician in 1840 aboard a Dutch merchantman ship destined for a round-trip to Java, Mayer noted that since less body heat is required in the tropics, he reasoned, based on the Lavoisier combustion theory of animal heat, that less combustion will take place, less ash will be produced, and the venous blood will retain the bright red color of fresh arterial blood. [9]

See also

- Animal mechanism

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● Lewes, G.H. (1858). “Animal Heat”, *Blackwood’s Edinburgh Magazine*, 84: 414-30.

External links

● Animal heat – *Encyclopedia Britannica*, 11th ed. (1911), LoveToKnow.

θΔics

In terminology, **animal life**, along with vegetable life, was one of the two distinctions of forms of "life" in the 19th century.

Overview

In 1735, Carl Linnaeus, in his *System of Nature* (*Systema Naturae*), introduced binomial nomenclature classification (Linnaean classification) of species scheme, dividing the world into: mineral, plant, and animal; implicitly a non-living matter (minerals or mineral life) and living matter (plant life and animal life) divide, as it has been passed down to us. Linnaeus, however, seems to have had, in his mind, a bit of a "gradual panbioism" conception; in his own words, Linnaeus divided nature into the following three kingdom conceptualizations: [1]

> "Stones grow; plants grow and live; animals grow, live, and feel."

This quote seems to have been passed on over the next century, verbatim, with little reflection, until about the mid-19th century, when people started questioning the "stones grow" assertion (see also: rock vs human):

> "How do stones, or mineral substances, grow? Not as plants, shrubs, or trees. Whenever they grow at all, it is by accretion. It is as if a new layer or coating were added to, or plastered on, to them. They grow, in general, very slowly."
>
> — William Alcott (1859) (Ñº)

> "Objections: Stones do not grow, but increase in size by accretion. Feeling may be said to exist in the lower classes of both plants and animals, provided that contractility be accepted as a property of sensitive tissue. If it be surmised that pain is a result of feeling (i.e. sensation), it may be attributed to Oethalium with equal propriety as to Ameba. Were every act of fissuration, evisceration or amputation accompanied with pain, it becomes difficult to understand why self-mutilation should be so frequently imposed for the preservation of both individual life and that of the species. It is probable that at such times an organism feels no more pain than is experienced by the contractile contents of an ovum undergoing segmentation."
>
> — Harrison Allen (1869) (Ñº)

Hereafter, talk began to shift into what chemists can do with minerals and the types of minerals chemists can make.

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θΔics

In theories, **animal magnetism** asserts that a type of "magnetism" exists between animals akin to that which exists between iron and lodestone.

An 1863 illustration (O) of "**animal magnetism**", from Baron Du Potet's work on mesmerism, which he practiced in London (O), showing the mesmeric practitioners directing some type of hypothetical magnetic effluvial lines into the patient, thereby curing him of his mental issues.

Overview

The theory was developed in the 1770s by German physician Franz Mesmer, starting in 1774 when he had his patient, Francisca Osterlin, suffering from hysteria, swallow a preparation containing iron, then attached magnets to various parts of her body, during which she reported a mysterious fluid running through her body. [1]

References

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External links

- Animal magnetism – Wikipedia.

θΔics

In science, **animal mechanism** refers to the mechanism by which animals move.

Overview

Shown adjacent is a photo of one Etienne Marey's animal mechanism experiments, a neurologically-deactivated frog, depicted on what's labeled as "Marey's myograph", wherein the muscles are stimulated and their contractions recorded; a primitive experiment aiming to quantify the physics of the operation of the frog muscular work. [1]

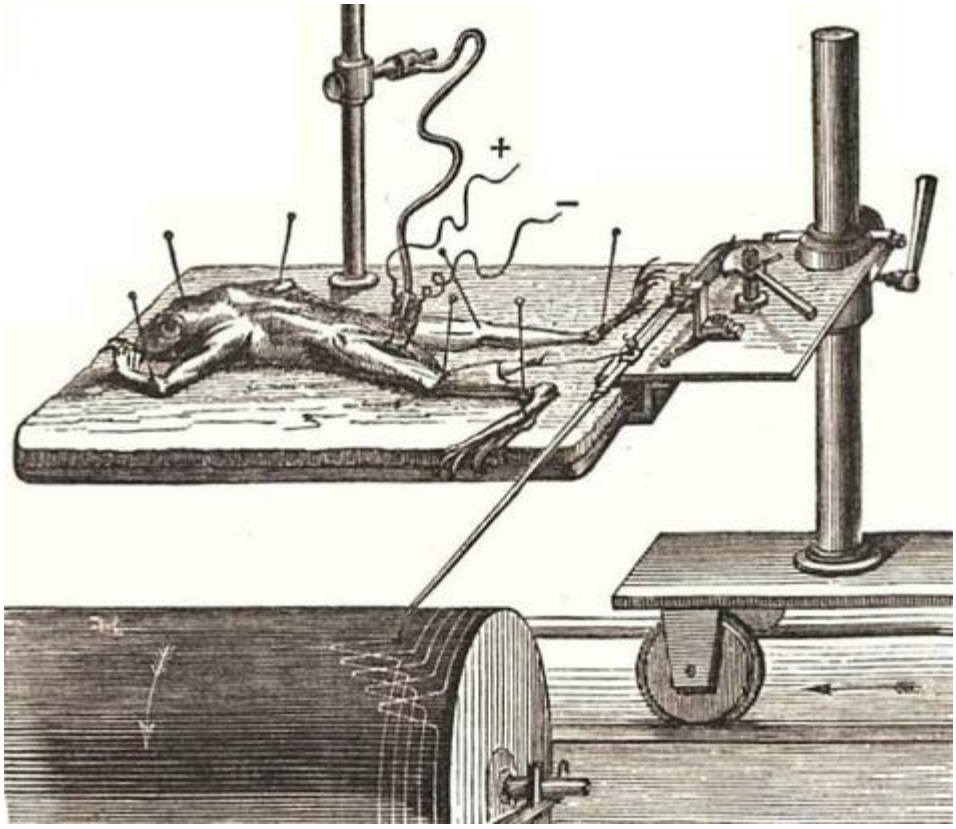

One of Etienne Marey's **animal mechanism** experiments on frogs.

Shown below is an 1882 photo of a bird flight, taken with Marey's chronophotographic gun, which he made that year, an instrument was capable of taking 12 consecutive frames a second, in order to study animal mechanism:

Marey, in his *Animal Mechanism* (1873), also touched on what he called "animal thermodynamics", most of which, however, referring to physiology or heat and work measurements "in" animals, rather than "between" or amid social systems of animals, which is the more complex and robust topic of discussion.

References

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θΔics

In animate thermodynamics, **animal thermodynamics** is the study of the application of the laws and principles of thermodynamics to systems of interactive animals.

History

In 1894, American mechanical engineer Robert Thurston published his *The Animal as Machine and Prime Mover*, containing various sections on thermodynamics. [7]

The first to coin the term animal thermodynamics seems to have been Irish-Scottish physicist William Thomson who in 1903 stated:

> "It seems indeed, with our present want of experimental knowledge of **animal thermodynamics** and with such knowledge as we have of physical thermodynamics, that the breath of an animal kept for considerable time in a hot-water bath above the natural temperature of its body may be found to contain no carbonic acid at all."

The first to apply thermodynamics to animals, in a system sense, i.e. in terms of the energies of interactions between animals, e.g. trigger action, was American physical chemist Alfred Lotka and his 1926 *Elements of Physical Biology*. [2]

A noted piece of work is the 1975 article "Fever and Survival", summarizing the experimental work of American zoologist Matthew Kluger, wherein it was found that lizards (desert Iguanas), first injected with infectious bacteria, who normally develop a fever of about 2°C, placed in one of three ambient temperature environments: (a) neutral (38°C), (b) low (34°C), or (c) high (40°C), showed increased host survival with an elevation in temperature. [8]

Recent

In 2002 American psychologist Mark Blumberg, in his book *Body Heat*: *Temperature and Life on Earth*, summarized much of the historical work done on the relationship between temperature, thermodynamics, and animal behaviors, such as the surface law in relation to elephants, the 1970s fever-temperature studies of Matthew Kluger, and the loss of thermoregulation behaviors, e.g. shivering, during REM sleep, such as been studied in cats. [3]

One relatively popular recent study is a 1993 study of system temperature and the reproduction behaviors of the Leopard Gecko, who were discovered to have temperature-dependent sex determination (TSD). Research shows that more females can be produced in predominantly cool temperatures (about 26–30 °C (79–86°F)) and very warm temperatures (about 34–35 °C (93–95°F)). It was recorded that males can be produced at the intermediate temperatures (about 31–33 °C (88–91°F)). Females born in the higher temperatures differed from those who were born in the lower temperatures hormonally and behaviorally. Those born in the warmer temperatures expressed more aggressive behavior. These are known as "hot females" and are often determined to be infertile, that is unable to reproduce. [5]

An example of recent work is the study of heat dependent proteins in relation to high and low temperature system environments of animals, such as fish in cold environments or snails in hot environments; much of which seems to be driven by a need to understand potential future implications of global warming on animals. [4]

See also

- Limnological thermodynamics
- Plant thermodynamics
- Bacteria thermodynamics

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θΔics

In science, **animate**, from PIE root *ane-* 'to blow, breath', from Greek *anemos* 'wind' or Snskrit *aniti* 'he breaths', as contrasted with inanimate, as it refers to matter that moves, or in defunct colloquial phraseology, defines matter or molecular structure that is alive, i.e. powered CHNOPS+ matter. [1]

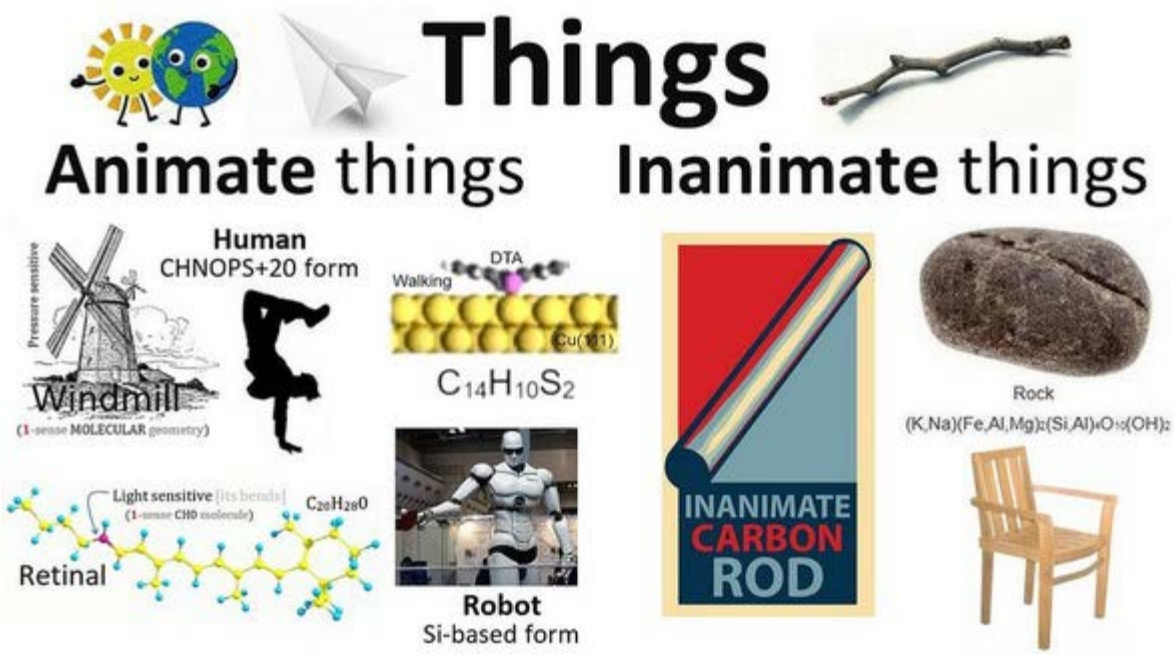

A division of "things", from Libb Thims' BPE 2016 talk (Q), into two categories: **animate**, or things whose atomic geometry changes per unit time, and inanimate, or things whose atomic geometry does not change per unit time.

Overview

In 1954, Belgian-born English thermodynamicist Alfred Ubbelohde defined animate as follows: [2]

> "**Animate** matter [is] termed 'life' for short."

To understand when a piece of matter or molecular unit, such as a DNA molecule, bacteria molecule, or human molecule, etc., becomes animated, logic such as the "induced movement", driving force, exchange force, thermodynamic force, energy source perspectives, etc., are needed. The 1920 thermodynamics book *The Animate and the Inanimate*, by American prodigy William Sidis, is an example of a publication that makes significant use of the term animate. [3]

Thermodynamically-speaking, the *only* difference between animate and inanimate systems is that the animate system receives external forcing. When this forcing is removed, the system will degrade in accordance with the second law to a state of equilibrium. An example of a large, animate system is the earth, which can be idealized as a type of large photon mill, where the external forcing comes from, to a large extent, the sun.

As the animate system is driven to the equilibrium state, it will undergo a free energy change, and will have ever-decreasing amounts of free energy available to the system for it to carry out internal work, or work on its surroundings, and thus the animate system will ultimately become inanimate. The time duration of an animate system in which it changes from animate to inanimate is often referred to as its "persistence".

Fundamentally, an animate system is a system on which work must be done by the surroundings, and which via interaction with its surroundings must be subject to periodical increases of its free energy such that it may perform work in changing its internal configuration, possibly in response to changes in its surroundings.

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External links

● Animate (disambiguation) – Wikipedia.

θΔics

In hmolscience, **animate and inanimate** is a conceptual "movement" division dualism, similar to "life and nonlife" (an "alive" division dualism) or "organic and inorganic" (a "carbon" division dualism) conceptual divides.

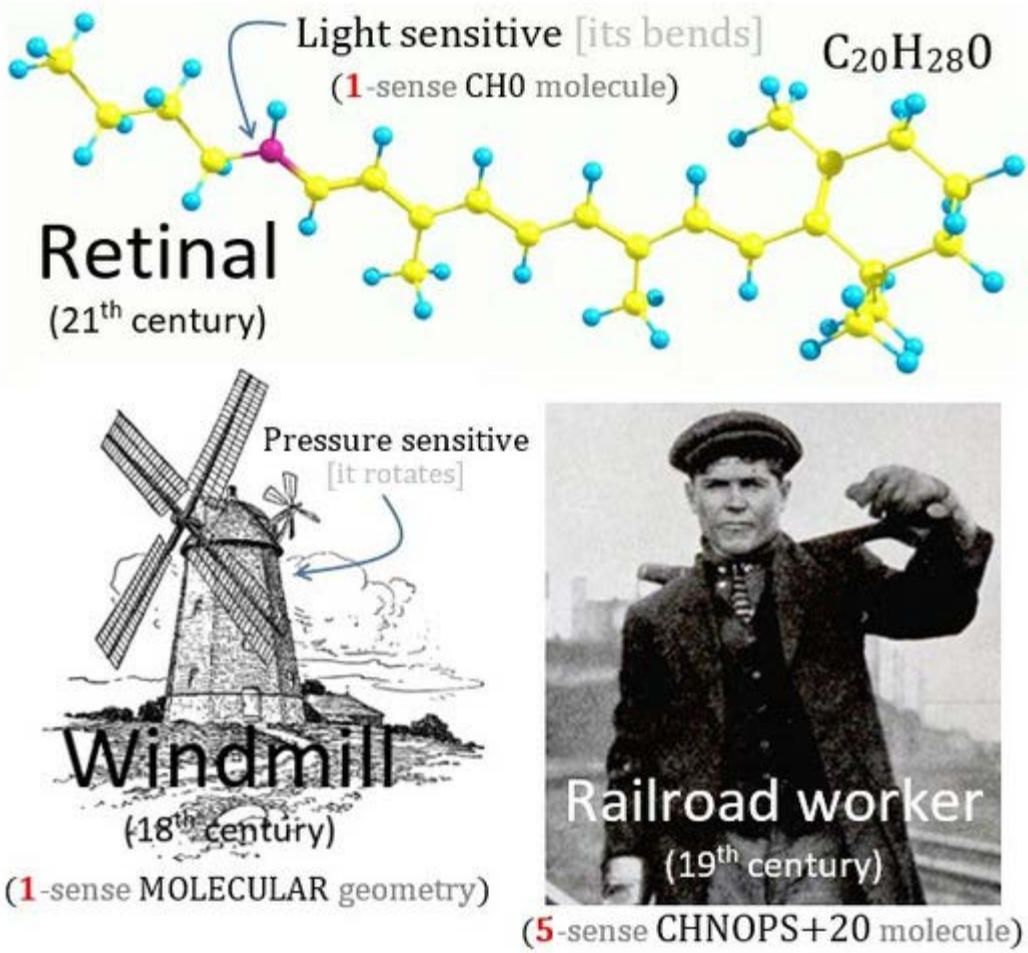

Three examples of "animate" things: a windmill, a railroad worker (man), and a retinal molecule (a type of animate molecule), the "principles of animation" of which, in the former and latter case, being completely known.

Bacon

In circa 1610, Francis Bacon, in his §601: "Experiments in Consort Touching on the Affinities and Differences between Plants and Inanimate Bodies", had the following to say about the supposed animate and inanimate distinction: [1]

> "The differences between **animate and inanimate** bodies, we shall handle fully under the title of life, and living spirits, and powers. We shall therefore make but a brief mention of them in this place. The main differences are two. All bodies have spirits, and pneumatical parts within them; but the main differences between animate and inanimate, are two: the first is, that the spirits of things animate are all continued within themselves, and are branched in veins, and secret canals, as blood is: and in living creatures, the spirits have not only branches, but certain cells or seats, where the principal spirits do reside, and whereunto the rest do resort: but the spirits in things inanimate are shut in, and cut off by the tangible parts, and are not pervious one to another, as air is in snow.
>
> The second main difference is, that the spirits of animate bodies are all in some degree, more or less, kindled and inflamed and have a fine commixture of flame, and an aerial substance. But inanimate bodies have their spirits no whit inflamed or kindled. And this difference consisteth not in the heat or coolness of spirits; for cloves and other spices, naptha and petroleum, have exceeding hot spirits, hotter a great deal than oil, wax, or tallow, &c. but not inflamed. And when any of those weak and temperate bodies come to be inflamed, then they gather a much greater heat than others have uninflamed, besides their light and motion, &c."

(add discussion)

Haeckel

In 1868, Ernst Haeckel, in his §: Physics and Biology", of *The History of Creation*, pointedly said that the animate and inanimate distinction is a supernatural fiction: [1]

“The mechanical view of nature has for many years been so firmly established in certain domains of natural science, that it is here unnecessary to say much about it. It no longer occurs to physicists, chemists, mineralogists, or astronomers, to seek to find in the phenomena which continually appear before them in their scientific domain the action of a creator acting for a definite purpose. They universally, and without hesitation, look upon the phenomena which appear in their different departments of study as the necessary and invariable effects of physical and chemical forces which are inherent in matter. Thus far their view is purely materialistic, in a certain sense of that "word of many meanings."

When a physicist traces the phenomena of motion in electricity or magnetism, the fall of a heavy body, or the undulations in the waves of light, he never, in the whole course of his research, thinks of looking for the interference of a supernatural creative power. In this respect, biology, as the **science of so-called ‘animated’ natural bodies**, was formerly placed in sharp opposition to the above-mentioned inorganic natural sciences (anorganology). It is true modern physiology, the science of the phenomena of motion in animals and plants, has completely adopted the mechanical view; but morphology, the science of the forms of animals and plants, has not been affected at all by it. Morphologists, in spite of the position of physiology, have continued, as before, in opposition to the mechanical view of functions, to look upon the forms of animals and plants as something which cannot be at all explained mechanically, but which must owe its origin necessarily to a higher, supernatural creative power, acting for a definite purpose.

In this general view it is quite indifferent whether the creative power be worshipped as a personal god, or whether it be termed the power of life (*vis vitalis*), or final cause (*causa finalis*). In every case, to express it in one word, its supporters have recourse to a miracle for an explanation. They throw themselves into the arms of a poetic faith, which as such can have no value in the domain of scientific knowledge.

All that was done before Darwin, to establish a natural mechanical conception of the origin of animals and plants, has been in vain, and until his time no theory gained a general recognition. Darwin's theory first succeeded in doing this, and thus has rendered an immense service. For the idea of the unity of organic and inorganic [see: organic and inorganic] nature is now firmly established; and that branch of natural science which had longest and most obstinately opposed mechanical conception and explanation, viz. the science of the structure of animate forms, their significance and origin, is launched on to precisely the same road towards perfection as that along which all the rest of the natural sciences are travelling. The unity of all natural phenomena is by Darwin's theory finally established.

This unity of all nature, the animating of all matter, the inseparability of mental power and corporeal substance, Goethe has asserted in the words, ‘Matter can never exist and be active without mind, nor can mind without matter.’ These first principles of the mechanical conception of the universe have been taught by the great monistic philosophers of all ages. Even Democritus of Abdera, the immortal founder of the atomic theory, clearly expressed them about 500 years before Christ; but grand Spinoza, and the great ALL NATURE IS ANIMATE. Dominican friar, Giordano Bruno, did so even more explicitly. The latter was burnt at the stake for this, by the Christian inquisition in Rome, on the 17th of Feb., 1600, on the same day on which, 36 years before, Galileo, his great fellow-countryman and fellow-worker, was born. On the Campo di Fiori in Rome, where that funeral pile once stood, free Italy a short time ago (in July, 1889) unveiled a monument erected to the memory of the great martyr of the monistic theory; an eloquent sign of the immense change which time has wrought. By the theory of descent we are for the first time enabled to conceive of the *unity of nature* [see: one nature] in such a manner that a mechanico-causal explanation of even the most intricate organic phenomena, for example, the origin and structure of the organs of sense, is no more difficult (in a general way) than is the mechanical explanation of any physical process; as, for example, earthquakes, the courses of the wind, or the currents of the ocean.

We thus arrive at the extremely important conviction that all natural bodies which are known to us are equally animated, that the distinction which has been made between **animate and inanimate** bodies does not exist. When a stone is thrown into the air, and falls to earth according to definite laws, or when in a

solution of salt a crystal is formed, or when sulphur and quicksilver unite in forming cinnabar, the phenomenon is neither more nor less a mechanical manifestation of life than the growth and flowering of plants, than the propagation of animals or the activity of their senses, than the perception or the formation of thought in man. The forces of nature present themselves here merely in different combinations and forms, sometimes simpler, sometimes more complex. Bound elasticities become free and pass over into living forces, or vice versa. This restoration of the monistic conception of nature constitutes the chief and most comprehensive merit of our new theory of development, and is the crown of modern natural science."

(add discussion)

Sidis

In 1920, William Sidis, in his *The Animate and the Inanimate*, sought to reconcile the issue, in his mind, by recourse to ideas of William Thomson, and the assertion that "life is a reversal of the second law of thermodynamics", in short.

Quotes

The following are noted oft-cited quotes:

> "We thus arrive at the extremely important conviction that all natural bodies which are known to us, are equally animated, that the distinction which has been made between **animate and inanimate** bodies does not exist."
>
> — Ernst Haeckel (1868), *The History of Creation*; cited by: Henry Bray (1910), Benjamin Wiker (2009) [3]

> "Neither the theory of spontaneous generation nor the theory of the continuity of life solves rationally the problem of the origin of life, since these theories are based on the tacit assumption of an absolutely impassable hiatus between **inanimate and inanimate** nature."
>
> — Alexander Oparin (1936), *The Origin of Life* (pg. 45)

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θΔics

In animate thermodynamics, **animate engine** (or organic engine), as compared to an inanimate engine (or inorganic engine), i.e. steam engine, is a name use by English biologist James Johnstone in 1921 to define an animal in thermodynamic terms, in such a way as to differentiate a perceptual divide between life and non-life or animate from inanimate. [1]

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θΔics

How ? In the **inanimate engine** there is a working substance, the steam, and we regard this as something different from the engine, which may exist even if there is no steam in it. But in the **animate engine** the mechanism (muscle and nerve) are the same as the working substance (the proteids, fats, and carbohydrates, which *are* the muscle and nerve). It *may* be the case that a " living " muscle contains " non-living " substances which are oxidised and yield energy, but since we only define the " life " of the muscle by its irritability (that is, its ability to contract when it is stimulated), we cannot be sure that there are parts of it which are not alive. It is probable that the substances carried to the muscle by the blood-stream are actually built up into the living tissue—they become alive—and are then oxidised, or die.

The **animate engine** (vs inanimate engine) model used to answer the typical difficulties encountered when attempting to explain animal existence using thermodynamic (steam engine) theory, e.g. how to label the working substance of animal existence, or the perceptual "life" vs "non-life" divide, death, etc. [1]

In hmol science, **animate matter** is matter (fermions) that moves or is animated, generally by the action of force (bosons). The term 'animate matter' frequently arises in origin of life, life vs. non-life, and what is life debates or discussions, in the sense of what separates animate matter from inanimate matter.

The term "animate matter" frequently is evoked in discussions whether or not a human has a psyche, consciousness, free will (or self-motion), a soul, spirit, among others, particularly in the 17th century up until the early 20th century, but even in modern time. [1]

Animate matter is almost exclusively built from six elements:

- hydrogen H (60.5%),
- oxygen O (25.7%),
- carbon C (10.7%),
- nitrogen N (2.4%),
- phosphorous P (0.17%),
- sulfur S (0.13%).

The percentages of atomic abundance in the soft tissues of the mature human body are given in brackets (Bergethon and Simons, 1990). The remaining 0.4% are ions that control the electrolytic equilibrium:

- calcium Ca^{2+} (0.23%),
- sodium Na^{+} (0.07%),
- potassium K^{+} (0.04%),
- magnesium Mg^{2+} (0.01%),
- chloride Cl^{-} (0.03%).

Two transition metal ions that are electron carriers, i.e.,

- iron $Fe^{3+} \longleftrightarrow Fe^{2+}$,
- copper $Cu^{2+} \longleftrightarrow Cu^{+}$,

and trace elements

- Mn, Zn, Co, Mo, Se, J, F, . . . ,

are much less abundant.

Polish solid state physicist Michal Kurzynski's 2006 appendix C.1 Elementary Building Blocks, from his *The Thermodynamic Theory Machinery of Life*, wherein he outlines the 20 main elements common to **animate matter** (or life) as he vacillates on these two terms, i.e. he defines humans as CHNOPS+14 state of matter. [7]

Descartes' mind-matter dualism

In 1664, English philosopher Margaret Cavendish critiqued of some of French philosopher Rene Descartes' 1637 discourses, particularly his metaphysical system of dualism describes two kinds of substance: matter and mind. According to this system, everything that is "matter" is deterministic and natural—and so belongs to natural philosophy—and everything that is "mind" is volitional and non-natural, and falls outside the domain of philosophy of nature. Cavendish concludes, in her review, in a very long-winded explanation, that animate matter has self-motion, animate matter does not, but that all matter of the universe is a commixture of the two, part animate and part inanimate, such that the animate is moving and the inanimate moved. [5] Cavendish, in general, rejected the work of Aristotle and mechanical philosophy and tended to engage in criticism, not only with Descartes, but with Thomas Hobbes and Robert Boyle.

Moral motion

In his 1789 *Travels to Discover the Source of Moral Motion* (volume one) and *Apocalypse of Nature, wherein the Source of Moral Motion is Discovered* (volume two), British philosopher John Stewart outlines the very-interesting results of his researchers of having travelled the world to study the various systems of morality, out of which he derives a religion-free eight tenet "Religion of Nature", based firstly on abandonment of every notion of a deity, with the replacement of the postulate that all that exists is matter and motion, then secondly outlines a new replacement religion of how combinations of the particles of matter coalesce to form "intellectualized bodies" that can have both moral motion and immoral motion in the course of the "revolutions and operations" of the universe, which is said to have neither beginning or end. [6]

Living matter

A near synonym to animate matter, often used, is "living matter", albeit one that is invested heavily in the anthropomorphic conceptions, such as that there exists something called "life", which as of 2009 has been shown be a defunct view, often connected with morality and the Ra-theology based theory of death and the soul. In 1926, Russian biogeochemist Vladimir Vernadsky took this route and in his *The Biosphere*, delineation of the matter of the biosphere into two types: (a) living matter and (b) *kosnoe* matter or inert matter, arguing to the effect that the living matter has never been made from inert matter, on the logic that each type of matter comes from different elements of the period table. [3] Prior to this publication, Vernadsky penned three articles on the topic of living matter: "Living Matter", "The

Structure of Living Matter", and "Living Matter in Geochemical History of the Element's System"; only one of which has since been published. [4] Vernadsky's "living matter" as distinct from "inert matter", however, has since been show to be fallacious, one reason being that animate molecules such as human molecules, are composed of 26 elements, and these elements are not compartmentalized to certain groups.

Non-rational vs. rational animate matter

In 1955, Belgian-born English thermodynamicist Alfred Ubbelohde, in his chapter on "Thermodynamics and Life", stated abruptly that the term 'life' is shorthand for 'animate matter', and alluded to the direction that in the thermodynamical study of "living things" that one must utilize the latter term over the former. [2] Ubbelohde thus introduced the subject of "animate thermodynamics" in place of the outdated anthropomorphic-based defunct subject of "life thermodynamics". Ubbelohde, however, footnoted his definition of life as animate matter by subdividing animate matter into two classes: (a) non-rational animate matter, in which selection processes are unconscious, and (b) rational animate matter, in which selection processes are conscious. This latter addendum, however, is still soaked with anthropomorphism, with the implicit assumption that certain types of moving matter have consciousness and that consciousness is something that exists in the definitions of the modern physical sciences. This dichotomy can easily be shown to be fallacious by asking whether or not the animate light-induced 'straightening' 3-element molecule retinal is conscious or rather if it 'selects to choose to straighten consciously or unconsciously', which invariably leads to the conclusion that the premise of consciousness is an outdated model that is defunct in a modern physical science or hmol science perspective.

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Further reading

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θΔics

In chemistry, **animate molecule**, as compared to an inanimate molecule, is a molecule that moves in, a non-linear manner, when subjected to a force and can thus be said to be "animated".

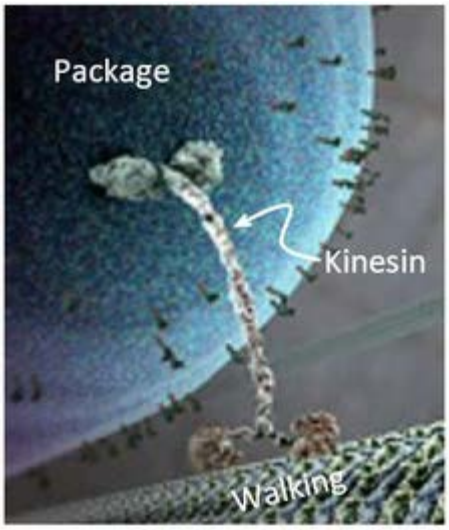

Video of an **animated molecule**: kinesin, a motor protein, carrying a load along a microtubule. [2]

Overview

In 2006, American planetary scientist Carolyn Porco stated, to cite an example, albeit incorrect, usage of this term, in her summary argument, that she believes humans are not alone in the universe, that: [4]

> "Sometime in the interval of 3.8 to 3.5 billion years ago, self-replicating organisms [originated] from inanimate materials in a very narrow window of time in a complicated chain of chemical events that must have occurred to evolve **animated molecular structures** from inanimate atoms."

The subject of animate verses inanimate often comes to the fore in the study of the physics and chemistry of social systems. This is exemplified in English chemical physicist Philip Ball's 2004 article "The Physical Modelling of Human Social Systems", wherein he asks: [1]

> "Can there really be any similarities between, say, a collection of *inanimate particles* in a fluid interacting via simple, mathematically defined forces of attraction and repulsion, and communities of people each of whom is governed by an unfathomable wealth of psychological complexity?"

Here, Ball defines gas particles and fluid molecules as being inanimate, and asks whether or not the laws that govern these systems can be scaled up to humans.

Inanimate molecules

An example of non-moving inanimate molecule would be a molecule affixed or bonded to a surface, and thus immobilized.

An example of a simple moving in straight trajectory inanimate molecules include: gas molecules, which are said to obey the Boltzmann chaos assumption, and travel around chaotically in straight trajectories, banging into each other, at speeds of 1,200 miles per hour, or the single water molecule, which can only move in essentially straight line trajectories, and is not able to bend its atomic geometry.

Bending animate molecules

An example of simple animate "bending" molecule include the 3-element retinal molecule, which straightens in response to a single photon.

Surface-moving animate molecules

Examples of molecules animated in the form of walking or moving on a surface include: Steve Bartel's 2005 walking molecule, i.e. DTA (9,10-dithioanthracene) and 2007 molecular carriers, i.e. nano-walkers, as well as the two-legged motile protein "kinesin" that walks along microtubules carrying loads to destinations, being powered by ATP. [2] Kinesin is a small 6-element molecule, with molecular formula of about $C_{400}H_{620}N_{100}O_{120}P_{50}S_{20}$, that walks, carries

things, and has a metabolism, so to speak.

Folding animated molecules

An example of an intermediate in complexity animated molecule is a protein molecule, a chain of polypeptides that folds inward on itself into its native state.

Boundaried animated molecules

A specific demarcation of in classifications of animate molecules are those that have a boundary or semipermeable boundary, within which an atomic turnover rate occurs. This is a complex subject. Examples in this classification include: the 15-element bacterial molecule, a 22-element fish molecule, or the 26-element human molecule (a person). [3]

Planetary-sized molecules

To note, it is difficult to, as of yet, classify large planetary-sized molecules such as the earth molecule or sun molecule, being that they move, in certain trajectories, but the term "animate" does not seem applicable, so to speak. More work needs to be done of dynamics of the universe before better classifications can be made in this area.

See also

- Animate matter
- Animate engine
- The Animate and Inanimate
- Animate thermodynamics
- Inanimate
- Living molecule

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θΔics

In science, **animate organism** or "animate being", as contrasted with an inanimate organism (or inanimate being), is an organized body with property of chemical animation—and more fully is animate atomic geometry (animate molecule), type of animate matter, or animate chemical species, such as a walking molecule, above that in movement complexity than the simple mechanical automaton, such as windmill, generally tending to be moved by chemical processes, e.g. exchange force based induced movement or free energy driving force methods of system transformation, rather than simple mechanical or gravitation animation processes, such as is the case in the hydrostatic pressure induced movement of the Hero automaton.

36. The elements are not all of equal importance, for some are found only in very minute quantities in a few scarce minerals, while others are continually occurring in various combinations, to form the atmosphere, and the ocean, together with the great rocky masses of the earth's crust, and the organized bodies which live upon its surface.

37. By *Organized* bodies, we mean animals and plants, which live and grow by the help of what are called *Organs*, or leaves, roots, lungs, heart, stomach, &c.

38. The products formed by these Organs, such as sap, sugar, starch, gum, blood, &c., are termed *organic* substances; and hence the chemistry of plants and animals is called *Organic Chemistry*.

39. Air, water, and minerals, on the other hand, are neither produced, nor continued in being, by means of organs; they are therefore called *inorganic* bodies, and the branch of chemistry relating to them is termed *Inorganic Chemistry*.

An 1858 description of an "organized body", in context of the main 39 points of general chemistry, from English chemist John Bidlake's *Textbook of Elementary Chemistry*, which differentiates all element-based "bodies" into two types: organic (bodies which live) and inorganic (bodies which don't live); which is a defunct precursor model, to say, to the modern 21st century ecological stoichiometry view of the differentiation of all element-based "bodies" into two main types: animate (bodies which possess the property of animation) and inanimate (bodies which do not possess the property of animation); hence, the name distinctions of animate matter vs inanimate matter, **animate organism** vs. inanimate organism, animate chemical vs inanimate chemical, etc.

Animate organism

(human molecule)

Overview

The following 1860s letter by Henry Adams, with its mention of "animated being", might well capture the meaning of the term animate organism: [6]

> "Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday within this law. The laws which govern **animated beings** will be ultimately found to be at bottom the same with those which rule inanimatenature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."

The 1620s reaction automaton theory discussions of French philosopher Rene Descartes (IQ=195), the 1900 "I am an automaton endowed with power of movement, which merely responds to external stimuli beating upon my sense organs" theory of Nikola Tesla (IQ=195), along with the 1950s free energy electochemical automaton theory of John Neumann (IQ=185) may well facilitate the differentiation of the various types of "animation", e.g. Greek automaton animation, AI-based animation, etc., as compared to the animation found in a moving reactive human.

Etymology

Greek philosopher Aristotle (IQ=195) freely used the term "organon", spelled "organ" in English, to denote a part of a living being or of man in particular. [4]

The term "animate organism", in the modern hmolscience perspective, is an upgrade from the defunct term "living organism", in that a body can possess animation or reactivity, but not life—in the sense that "life" is something that does not exist, in the famous 1925 words of Nikola Tesla.

To explain another way, in the hmolscience periodic table perspective, a zirconium-based organism, e.g., will not have the property of "animation"; such chemical species may exist, and may have the property of trajectory or unidirectional movement, possibly even spin, but not complex animation. Conversely, carbon-based organisms, as embodied in the out-dated term "carbon-based life", will tend to possess the property of animation; but not all carbon-based entities, graphite being one of many examples. Those carbon based animate organisms in possession of the so-called CHNOPS-based or "CHNOPS system" set of core elements, while in the bound state of animate existence, may well then be classified as types of "animate organisms" and as such function to proactively take the place of the now-defunct terms of olden: living organism or living system, which have no hard physical science basis, but only mythological basis; hence resulting to do away with the "unbridgeable gap" model of the last century.

Examples

The simple 3-element retinal molecule is a simple example of a animate organism, one moved by the exchange force of the photon; the 15-element bacteria molecule is an intermediate in complexity example of an animate organism, one that generally requires some type of agar medium to function, DTA, driven in surface-attached motion by a heat, is another example; the 26-element human molecule (person) is a more complex example of an animate organism. Other examples include: fish molecule, cell-as-molecule, the two-legged kinesin protein molecule, that walks along microtubules while carrying cargo.

Unbridgeable gap models

The above defunct theory of life-based "animate organism model" is the modern and correct view. Some, however, even in modern times, may wish to retain some semblance of autonomy, free will in the form of self-organization, or ontic opening stylized model of purpose, and will attempt to take recourse in the "unbridgeable gap" model and will attempt to explain the "start of life" using some type of chemical perpetual motion conception, often using feedback loop models (e.g. autocatalytic closure). These models, however, tend to yield absurdities, one after another, paragraph after paragraph, in a spiral down a path towards inanity. One example of this, is the 2007 book *The Self-Creating Universe*, by American chemistry-trained dermatologist David Alkek, who attempts to employ the term "animate organism" in the context of chemistry, in his incorrigibly-entitled chapter "self-reproducing matter", as follows:

> "Biology can never be reduced to chemistry and physics. There is a definite step between animate and inanimate. What is an even greater mystery is the progression from inanimate mass of chemical to an **animate organism**, capable of independent existence and replication. We don't have to involve a transcendental power to do this. The emergence of living from nonliving matter is another example of the self-organizing power of matter and energy."

What Alkek has done, in short, is transferred "god theory", i.e. transcendental power", into the terms "emergence" and "self-organization", nothing but waterbasket terms.

The reader is more than welcome to tread through the inanity of the pages preceding this wondrous passage, inclusive of citing Robert Hazen's 2005 book *Genesis* as citing American RNA-based life theorist Gerald Joyce's famous 1991 working-definition of life as: "a self-sustained chemical system capable of undergoing Darwinian evolution"; mention of the Urey-Miller experiment (1952); mention of the meteorite theory of life; mentioning that "viruses blur the border between living and nonliving matter", and so on down the yellow brick road.

Other

German mathematical philosopher Edmund Husserl (1859-1938), according to Google Books search results, seems to have been a dominate advocate of the term "animate organism". [1] Danish natural science philosopher Claus Emmeche uses the term "animate organisms" within the loose context of thermodynamics discussions in his 2004 article "A-life, Organism and Body: the Semiotics of Emergent Levels"; inclusive of all the other "life terms". [2]

See also

- Animate engine

- Animate system
- Animate thermodynamics
- Chnopsology | the study of CHNOPS-based animated structures.

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θΔics

In thermodynamics, **animate thermodynamics** is the thermodynamical study of animate nature, i.e. animated systems, animate engines, animate matter, animate molecules, or animate bodies. The following is American protein thermodynamicist Donald Haynie's 2001 take on the thermodynamics of animate nature:

> "The universality of the relationships of **thermodynamics** eliminates an "artificial" distinction between the **animate** and the inanimate, and thereby enables one to see the world as a single thing."

This cogent statement, to clarify, is a view, according to Haynie, that only "some people" hold. [8]

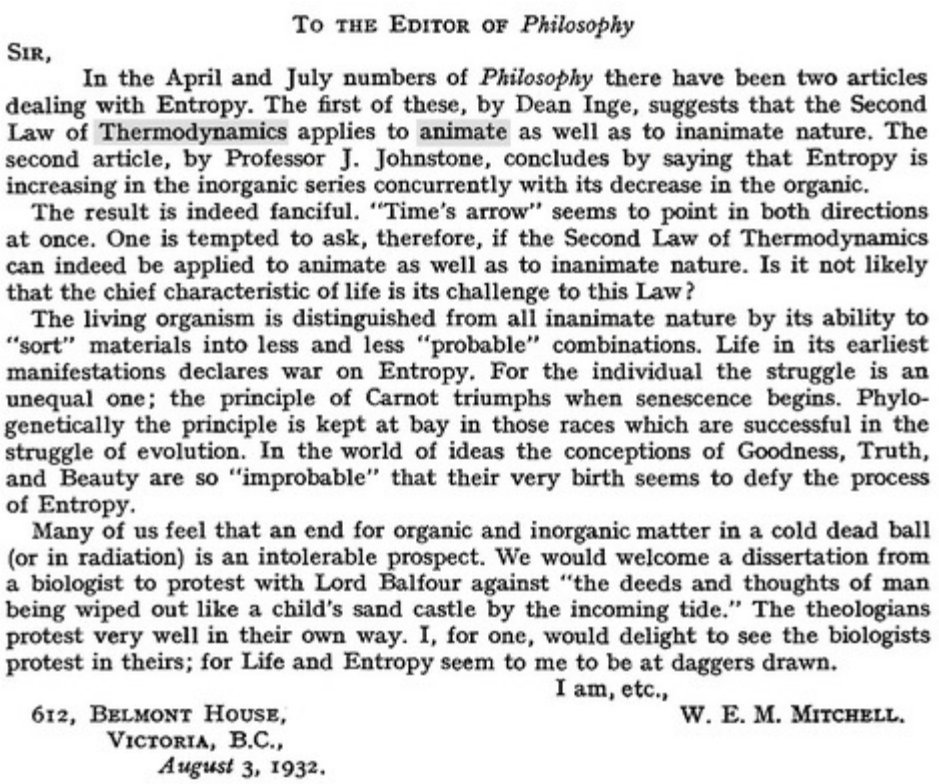

To the Editor of *Philosophy*

Sir,

In the April and July numbers of *Philosophy* there have been two articles dealing with Entropy. The first of these, by Dean Inge, suggests that the Second Law of Thermodynamics applies to animate as well as to inanimate nature. The second article, by Professor J. Johnstone, concludes by saying that Entropy is increasing in the inorganic series concurrently with its decrease in the organic.

The result is indeed fanciful. "Time's arrow" seems to point in both directions at once. One is tempted to ask, therefore, if the Second Law of Thermodynamics can indeed be applied to animate as well as to inanimate nature. Is it not likely that the chief characteristic of life is its challenge to this Law?

The living organism is distinguished from all inanimate nature by its ability to "sort" materials into less and less "probable" combinations. Life in its earliest manifestations declares war on Entropy. For the individual the struggle is an unequal one; the principle of Carnot triumphs when senescence begins. Phylogenetically the principle is kept at bay in those races which are successful in the struggle of evolution. In the world of ideas the conceptions of Goodness, Truth, and Beauty are so "improbable" that their very birth seems to defy the process of Entropy.

Many of us feel that an end for organic and inorganic matter in a cold dead ball (or in radiation) is an intolerable prospect. We would welcome a dissertation from a biologist to protest with Lord Balfour against "the deeds and thoughts of man being wiped out like a child's sand castle by the incoming tide." The theologians protest very well in their own way. I, for one, would delight to see the biologists protest in theirs; for Life and Entropy seem to me to be at daggers drawn.

I am, etc.,

W. E. M. Mitchell.

612, Belmont House,
Victoria, B.C.,
August 3, 1932.

A 1932 correspondence letter of Canadian philosopher W.E.M. Mitchell in which he points out seeming inconstancy between English theologian-philosopher William Inge's recent article, which argued that **thermodynamics** applies to **animate** nature as well as inanimate nature, and English biologist James Johnstone's recent article, which concludes (incorrectly) that entropy is the inorganic world (non-carbon based) and decreasing in the organic world (carbon-based); which leaves the reader with the incorrigible view that time's arrow (1928) points in both directions (↔). [4]

Overview

The term "animate" is the physical sciences based replacement for the soft sciences based term "biological", which has no physical meaning, but only mythological meaning. The etymology of the two is outlined below: [5]

> Animate (Greek *anemos* wind; Sanskrit *aniti* he breaths (1500BC))
> Biological (Greek *bios* life (1400BC))

A related term is psyche, which derives also from a word meaning 'breath', and means something along the lines the 'source of animation'. [6]

In human chemistry, when the molecular formulas for animate structures, from bacteria to man, are calculated and studied, it becomes apparent that the core source of animation is found in animate bonding geometry of the carbon atom and in particular the hydrocarbon central nervous systems found in all so-called animated entities, which in turn become or are made animate owing to photon-electron interactions, a subject which has its roots in the 1913 Bohr model of the atom and the 1958 light-induced bending retinal molecule work of American biochemist George Wald.

The term 'life' and its corpus of associations, according to the 2009 defunct theory of life, has no physical basis. [1] The term animate, in the sense of a "structure that either moves and or has activity", should be used in place of the incorrigible term life and its derivatives (alive, living, etc.).

Thomson

Irish-born Scottish physicist William Thomson's famous 1852 article "On a Universal Tendency in Nature to the Dissipation of Mechanical Energy", historically, has been the launching point on debates as to whether or not the second law applies to life or "animated creatures", as put it, a query to which Thomson answered, in a somewhat ambivalent

way, that it "probably" applies: [9]

> “Known facts with reference to the mechanics of animal and vegetable bodies, [there is] at present in the material world a universal tendency to the dissipation of mechanical energy [and] any restoration of mechanical energy, without more than an equivalent of dissipation, is impossible in inanimate material processes, and is *probably* never effected by means of organized matter, either endowed with vegetable life or subject to the will of an **animated creature**.”

This famous verbal statement of the second law, thus launched the debate on whether or not entropy (in Clausius terms), or dissipation (as Thomson viewed things), might relate to "vegetable life" or to the "will" of animated things; this thus seems to be the first usage of the term animate used in the context of thermodynamic formalism. [10]

Thomson’s 1902 article “Animal Thermostat”, on the apparent power of certain animals of producing cold under certain circumstances, in relation to the specific heat experiments of Adair Crawford (1748-1795), was referred to in 1907 (by someone) as the subject of “animate thermodynamics”, and thus seems to be the first coining of the term "animate thermodynamics". [7]

Animated heat engines

German physicist Gustave Hirn's 1868 *Philosophical Implications of Thermodynamics* was the first to address the question of applying thermodynamics to animals and people who he defined as "animate heat engines". An overview synopsis of his chapter two (French to English translation):

> "Chapter two: Application of the mechanical theory of animate heat engines. - Sources of vital heat. - Similarity of the organization Areas live with our engines. - Positive and negative work to be alive. - The first proposal of thermodynamics apply to these beings as our engines. - Details on the physiological functions of animated motors. - In what parts of the body is consumes heat as much as to work."

Hirn's section on "positive and negative work to be alive" seems to the most fruitful in that he seems to be utilizing Rudolf Clausius' definition of positive work and negative work to explain human motion, whereby in the end the notion of "alive" becomes displaced as an unnecessary term.

20th century views

In his 1920 *The Animate and Inanimate*, American polymath-prodigy William Sidis outlined a crude entropy reversal theory of human animate existence.

In his 1946 article "Life and the Second Law of Thermodynamics" English physical chemist and noted chemical thermodynamicist John Butler outlined Thomson's view of the second law, a view which he summarized by stating that Thomson "expressly excluded the operations of animate agencies" from the second law, which is not exactly correct; but also discussed the recent views on thermodynamics and life expressed by Gilbert Lewis (1926) and Erwin Schrodinger (1944). [10]

In 1954, Belgian-born English thermodynamicist Alfred Ubbelohde, in his section 'Thermodynamics and Life', stated that the word ‘life’ should be re-termed ‘animate matter’. Specifically, he states: [2]

> “Animate matter [is] termed ‘life’ for short.”

Therefore, what Ubbelohde is implying is that what was formerly called life thermodynamics (1920s-50s), then

biological thermodynamics (1960s-70s), then biothermodynamics (1980s-90s), should in modern times be referred to as "animate matter thermodynamics" or animate thermodynamics in short.

In 1997, Swedish physical chemist Sture Nordholm, in his "In Defense of Thermodynamics: an Animate Analogy", was the first to use the specific term 'animate thermodynamics', used in the context of thermodynamics applied to human behavior, wherein he used the Planck entropy relation and the Helmholtz free energy equations to argue that thermodynamics, in its generality, once thought only applicable to inanimate matter, is also applicable to the animate world and animate matter, specifically being applicable to human behavior. Nordholm coins the term in an end exercises, questions, and discussion section, specifically question three on political thermodynamics:

> "Discuss the political systems dictatorship and democracy from the point of view of the proposed rules of human behavior. Which system of government is most in tune with **animate thermodynamics**? How might the level of education in a society influence the choice of system of government?"

Nordholm correctly defines, albeit implicitly, the human to be a type of animate matter.

Branches

Animate thermodynamics, itself, is a branch of thermodynamics, whereas and some of the branches of animate thermodynamics include:

- Action thermodynamics
- Biochemical thermodynamics
- Biological thermodynamics
- Drug-receptor thermodynamics
- Ecological thermodynamics
- Hierarchical thermodynamics
- Human thermodynamics
- Life thermodynamics (defunct)
- Limnological thermodynamics
- Neurothermodynamics
- Pharmaceutical thermodynamics
- Protein thermodynamics

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(b) Haynie, Donald. (2001). *Biological Thermodynamics* (animate, pgs. 297, 316). Cambridge University Press.
9. Thomson, William. (1852). "On a Universal Tendency in Nature to the Dissipation of Mechanical Energy" (Google Books) (URL), Proceedings of the Royal Society of Edinburgh for April 19, 1852, also Philosophical Magazine, Oct. 1852, also Mathematical and Physical Papers, vol. i, art. 59, pp. 511.
10. Butler, John A.V. (1946). "Life and the Second Law of Thermodynamics" (abs), *Nature*, 158: 153-154.

θΔics

In things, **animate thing**, as compared to an inanimate thing, is a thing that has the property of movement to action, that abides by the laws of motion, the first law of motion in particular; historically, from the Greek *animus* "to breath", a moving thing that has the property of breath or movement via wind power.

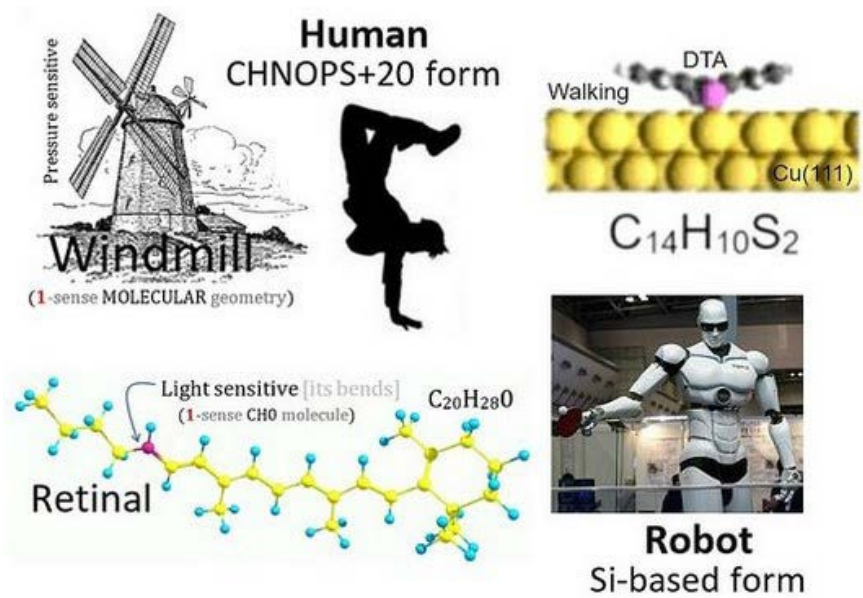

A few examples of **animate things**: windmill, human, DTA, retinal, and a robot, which can be divided further into CH-based animate things, e.g. human, DTA, retinal, and non CH-based animate things, e.g. windmill, robot.

Thermodynamics | Categories

In science, the study of things, both animate and inanimate, from the thermodynamic perspective, opens a number of important clarification issues; as exemplified by the following three views:

> "**Animate** matter [is] termed 'life' for short."
>
> — Alfred Ubbelohde (1954), *Time and Thermodynamics* [1]

Here, we note that DTA and AQ, animated below, are definitively NOT alive, but fall within Ubbelohde's definition; hence the need for the abioism viewpoint.

> "Discuss the political systems dictatorship and democracy from the point of view of the proposed rules of human behavior. Which system of government is most in tune with **animate thermodynamics**? How might the level of education in a society influence the choice of system of government?"
>
> — Sture Nordholm (1997), "In Defense of Thermodynamics: an Animate Analogy" [2]

Here, we note that a windmill is an animate thing, but not necessarily a thing involved with politics, which points to the need to distinguish that Nordholm is referring to "CHNOPS+20 thing animate thermodynamics", as opposed to chnopsological thermodynamics, aka "biological thermodynamics" (in defunct layspeak), or CH-based animate thermodynamics, e.g. the thermodynamics of animate molecules such as DTA or AQ.

> "The universality of the relationships of **thermodynamics** eliminates an "artificial" distinction between the **animate** and the inanimate, and thereby enables one to see the world as a single thing."
>
> — Donald Haynie (2001), *Biological Thermodynamics* [3]

This last quote, is about correct (aside from the fact that Haynie misses the abioism solution to the problem that thermodynamics does not recognized life, as Alfred Lotka (1925) and Charles Sherrington (1938) have pointed out), i.e. it points to the monistic nature of thermodynamics.

Animation | Overview

See main: CH-based animation

Among animate things of a decisively "intelligent" nature, e.g. robots, humans, or monkeys, etc., it is found that the nature of this intelligence derives from the geometric arraignment of the protons, neutrons, and electrons of the elements of column 14 of the periodic table (see: hmolscience periodic table), the elements carbon C, for humans and monkeys, and silicon Si, for robots or computers, in particular, which have the property of light-induced electron-rearrangement or flexibility.

The following are examples of four related intelligent carbon-based animate things, namely: retinal, DTA, AQ, and human, the first three with the ability to bend, walk, and carry, respectively, and the human, with the ability to bend, walk, carry, as well as to plan and think about other types of movements: [1]

Animate CH-Based Things

Thing	Movement
Retinal | $C_{20}H_{28}O$ | **Light**-powered	

Bending

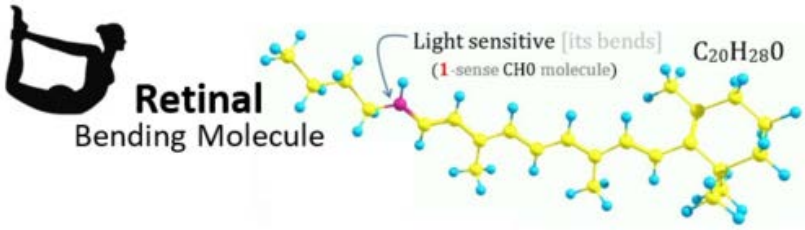

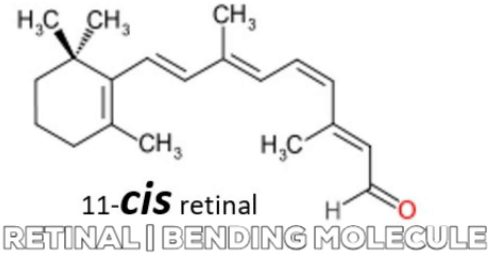

Walking

DTA | $C_{14}H_{10}S_2$ | **Heat**-powered

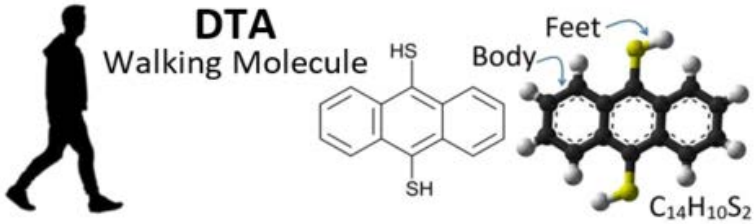

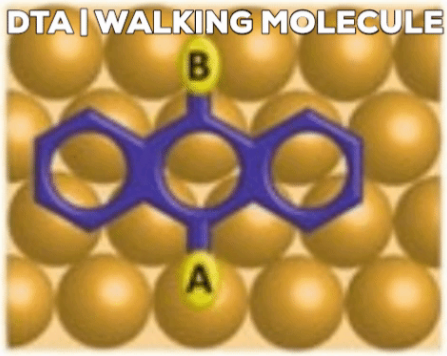

Carrying

AQ | $C_{14}H_8O_2$ | **Heat**-powered

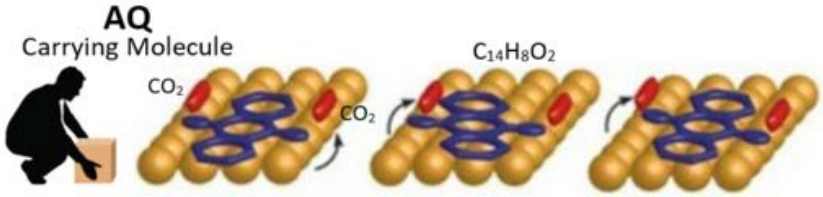

Bending
Walking
Talking
Carrying
Dancing
Thinking

Human | CHNOPS+20 | **Heat**+**Light**-powered

Here, to pause, we see that a human (a powered CHNOPS+20 thing), as a walking, talking, bending, thinking, dancing animated atomic geometry, is but a more developed atomic form than things such as AQ ($C_{14}H_8O_2$), a carrying carbon-based thing, DTA ($C_{14}H_{10}S_2$), a walking carbon-based thing, or retinal ($C_{20}H_{28}O$), a bending carbon-based thing, by virtue of the fact that as more atoms, e.g. sulfur S (DTA) or oxygen O (retinal), are added to the carbon-based animate thing, over the course of evolution (see: molecular evolution table; evolution timeline; great chain of being), from hydrogen to human, more advanced movement properties are acquired.

Asoulism

Here, firstly, in respect to soul beliefs (compare: asoulism), according to the polls of Julien Musolino (2013), some 84% of American college students, specifically psychology students, believe they have a soul, and that 73% believe that god gave it to them. Secondly, just as Rene Descartes, in the 1610s, was impressed with the Francini brothers' hydraulic automatons, e.g. animated Neptune, Diana, Orpheus, and a sword-wielding Perseus that swooped down and slayed a dragon rising out of the water, all hydraulically-powered (Ñº) by the flow of water from the river (Ñº) Seine, so much so that reasoned, dualistically, that he was an automaton with a soul in the pineal gland; here to, impressed by the above types of small 3-element animated molecules, do we reason, monistically, that the human does not have a soul, and that human motion is but a more elaborate variety of powered-motion as compared to AQ, DTA, or retinal.

Abioism

A key semantic point to note here, when attempting to distinguish between, e.g. a human and a windmill, in respect to anthropomorphized terms such as "life" (see: life does not exist; **abioism**), is that while both are "powered" animate forms, and that while both may be carbon-based, e.g. if the windmill is wooden (hydrocarbon-based), the distinguishing feature, separating the two, is that a human is a powered CHNOPS+20 element based animate form (Swan, 1974).

See also

- â— Animate
- â— Animate and Inanimate
- â— Animate engine
- â— Animate matter
- â— Animate molecule
- â— Animate organism
- â— Animate thermodynamics
- â— Animated being

References

1. (a) Ubbelohde, Alfred René. (1947). *Time and Thermodynamics*, (ch. IX: “Thermodynamics and Life”). Oxford University Press.
(b) Ubbelohde, Alfred René. (1954). *Man and Energy ... Illustrated*, (Section: XIII: Thermodynamics and Life, pg. 183-200, Section: XIV: Thermodynamic Laws and Cognition, pg. 201-09). London: Hutchinson's Scientific & Technical Publications.
2. Nordholm, Sture. (1997). “In Defense of Thermodynamics: an Animate Analogy” (abs), *Journal of Chemical Education*, 74(3): 273.
3. (a) Haynie, Donald. (2001). *Biological Thermodynamics* (animate, pgs. 297, 316). Cambridge University Press.
(b) Haynie, Donald. (2008). *Biological Thermodynamics* (pg. 330). Cambridge University Press.
4. (a) Musolino, Julien. (2015). *The Soul Fallacy*: *What Science Shows We Gain from Letting Go of Our Soul Beliefs* (foreword: Victor Stenger) (soul questionnaire, pgs. 52-54, 57). Prometheus.
(b) Thims, Libb. (2018). “LOL: 84% of US College Students Believe They Have a Soul and 73% Believe That God Gave it to Them” (Ñº), Atheism Reviews, Mar 7.

θΔics

In hmolscience, **animated being** is []

Overview

In 1845, American physician John Gorman, in his *Philosophy of Animated Existences: Sketches of Living Physics*, wherein he attempted to outline a hylozoism model of "animated beings", being governed by the three forces of physics, albeit done such that life and mind were "special creations", aka god-siding discussions in the background. Gorman, of interesting note, uses the alternative "being or force" (see: being terminology upgrade). Gorman, of anathema, refers to Lucretius' *On the Nature of Things*, as a "gloomy, wretched philosophy". [1]

Quotes

The following are related quotes:

> "**Every thing** in this universe has its regular waves and tides. Electricity, sound, the wind, and **I believe** every part of organic nature will be brought someday **within this law**. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."
>
> — Henry Adams (1863), "Letter to Charles Gaskell" (see: Adams creed) [2]

References

1. Gorman, John. (1845). *Philosophy of Animated Existences: Sketches of Living Physics* (animated beings, 21+ pgs; forces or beings, pg. vi; Lucretius, pg. 86). Sorin & Ball.
2. (a) Adams, Henry. (1863). "Letter to Charles Gaskell", Oct.
(b) Adams, Henry. (1982). *The Letters of Henry Adams, Volume 1: 1858-1868* (editor: Jacob Levenson) (pgs. 395-96). Harvard University Press.
(c) Stevenson, Elizabeth. (1997). *Henry Adams: a Biography* (pg. 69). Transaction Publishers.
(d) Taylor, Matthew A. (2008). *Universes Without Selves: Cosmologies of the Non-Human in American Literature* (pg. 108), PhD dissertation, Johns Hopkins University. ProQuest, 2009.

θΔics

In hmolscience, **Anirban Chakraborti** (c.1972-) is an Indian physicist noted for []

Overview

In 2000, Chakraborti began to do work on the statistical mechanics of economics, Gibbs distribution money theories, and agent-based econophysics models. Chakraborti has the following description of himself posted on his Ecole Centrale Paris faculty page: [2]

> "Econophysics studies consisting of various conceptual approaches of economic problems using the tools and methods of statistical physics. This has been a rapidly growing interdisciplinary field. I have been fortunate to become the first PhD in econophysics from India."

Chakraborti is an associate of Indian physicist and the Indian school of econophysics, who seems to have been a student of Indian physicist Bikas Chakrabarti. [1]

Education

Chakraborti completed his MS in 1998 at the University of Kolkata, India, and his PhD in 2003 at the Saha Institute of Nuclear Physics, Jadavpur University, Kolkata, India. Since 2005, he has been a physics lecturer at Banaras Hindu University, India, and also is a chair of quantitative finance at the Laboratory of Applied Mathematics and Systems, Ecole Centrale Paris, where he does research on econophysics and financial physics problems such as kinetic theory of gases based agent models, attempts at formulating a "microscopic" Pareto principle equation, Cont-Bouchard econophysics herding behavior models, and self-organized criticality, where among other things he claims to be applying statistical physics based thermodynamics to the social sciences.

References

1. (a) Chakrabarti, Bikas K. Chakraborti, Anirban, and Chatterjee, Arnab. (2006). *Econophysics and Sociophysics: Trends and Perspectives*. Wiley-VCH.
(b) Sinha, Sitabra, Chatterjee, Arnab, Chakraborti, Anirban, and Chakrabarti, Bikas K. (2010). *Econophysics: An Introduction* (§Appendix A: Thermodynamics and Free Particles Statistics, pgs. 251-). Springer.
2. Anirban Chakraborti (faculty) – Ecole Centrale Paris.

External links

â— Anirban Chakraborti (faculty) – Banaras Hindu University.
â— Anirban Chakraborti (profile) – Google Scholar.
â— Chakraborti, Anirban – WorldCat Identities.

θΔics

In symbols, **Ankh**, the forerunner to the Coptic ankh (Coptic cross), which became the Christian cross, is a symbol of inexact origin, the circle or looped part, generally viewed as being the sun (or sun disc), the other undefined, give or take specific theories, e.g. southern crux theory, legs and arms of Khepri (scarab) rolling (or flying) the sun disc through the sky, among others.

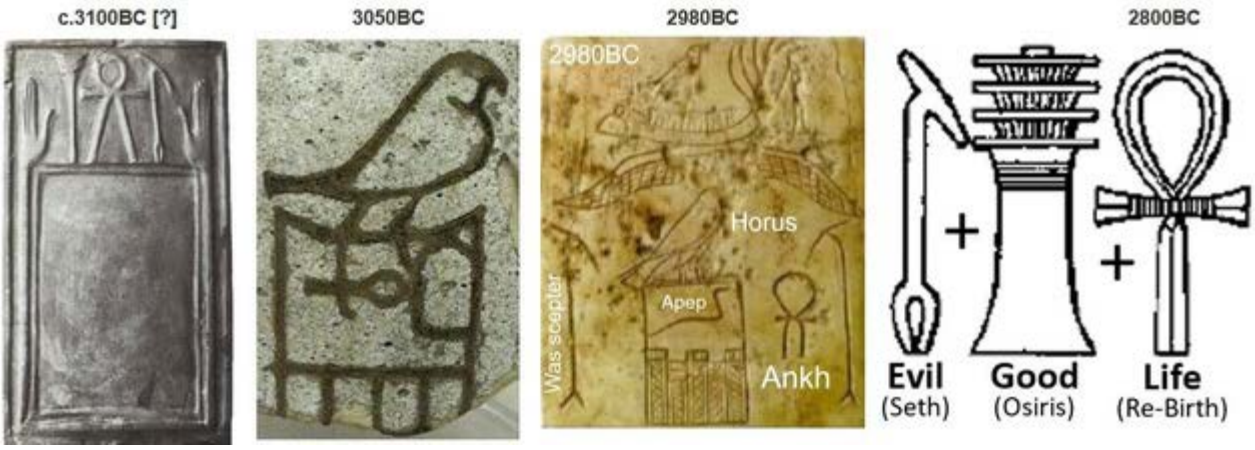

A few examples of early dynasty period **Ankh** symbols (see: cross), the earliest of which, e.g. ankh of king Hor-Aha (c.3050), middle left, or Hor-Djet (c.2980BC), middle right, seem to have two legs, which in 2800BC were bent together into a one combined shape, far right.

Budge

In 1904, Wallis Budge stated that the circle amulet "Ω", oft-seen been held by various Egyptian gods, asserted by some to be "related" to the ankh, was the "emblem of the sun's path in the heavens and of eternity". [1]

Petrie | Loin girdle

In 1905, Flinders Petrie suppositioned that the ankh was a male loin girdle worn around the waste. (Ñº)

Southern Crux | Ankh

In 2006, Peter Joseph, in his viral Zeitgeist, asserted the view, based on Dorothy Murdock (1999), and others, that the Ankh, in the context of astro-theology, is symbolic of the re-birth of the sun on the or at the position of the star constellation of the southern crux. This southern crux sun ankh model, however, does not seem to align with the older ankh with two legs depictions.

Khepri | Ankh

In 2016, Libb Thims was loosely conjecturing following is an image of the conjecture that the two-legged ankh (c.2980BC) is representative of the Khepri-Ra god (dung beetle rolling scarab) flying or rolling the new-born sun into the sky, the arms and legs of the beetle being the two arms and two legs of the Ankh of 1st dynasty Egypt:

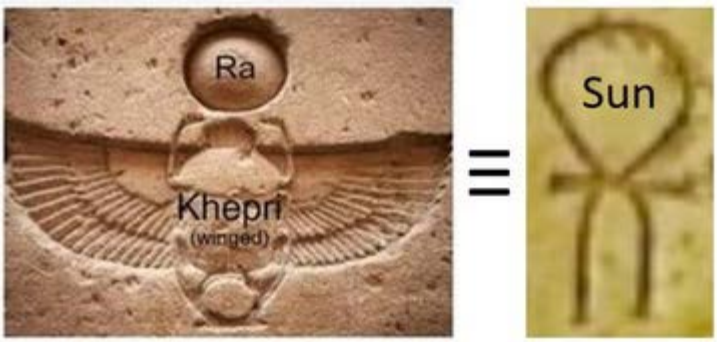

(add discussion)

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians*, *Volume Two* (pg. 244). Dover, 1969.

Videos

â— Mabry, Reggie. (2010). “Secret of the Ankh” (Ñº), AfricaOnlineTV, Aug 15.

External links

â— Ankh – Wikipedia.

θΔics

In existographies, **Anne C. van Helden** (c.1945-) is a Danish science historian, who in 1991 was associated with the Boerhaave Museum (see: Herman Boerhaave), in Leiden, noted for []

Overview

In 1991, Helden, in her "The Age of the Air-Pump", building on Steven Shapin and Simon Schaffer's 1985 *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*, attempted to fill in missing historical details about the history of the invention of the air pump and its ramifications. [1] The following, from this article, is Helden's table of air pumps (vacuum pumps) dated to year of invention, design, and improvement:

Air Pump Designs up to 1740

(Helden, 1991)

	designer	date of design	number of cylinders	valve system	piston movement	remarks
1	Otto von Guericke	c. 1647	1	valves	simple pull	partly immersed in water
2	Otto von Guericke	c. 1656	1	valves	lever	waterseals on all possible leaks
2a	Otto von Guericke	1663	1	valves	lever	travel-version of number 2
3	Robert Hooke	1659	1	cock & stopper	rack-and-pinion	no waterseals; glass receiver
3a	Christiaan Huygens	1661	1	cock and valve	rack-and-pinion	no waterseals; glass jar on table
4	Robert Hooke	1662	1	cock & stopper	rack-and-pinion	cylinder immersed in water
5	Christiaan Huygens	1662	1	cock & valve	rack-and-pinion	water on the piston
6	Denis Papin	< 1674	1	three way cock	stirrup	piston with built-in waterseal
6a	J.A. Nollet	c. 1740	1	three way cock	stirrup	no waterseals
7	Wolferd Senguerd	1679	1	three way cock	rack-and-pinion	inclined cylinder
7a	Musschenbroek workshop	c. 1680	1	three way cock	rack-and-pinion	small horizontal; no waterseals
8	Denis Papin	1676	2	valves	rope over pulley	
9	Francis Hauksbee	< 1703	2	valves	rack-and-pinion	built-in pressure gauge
9a	Jacob Leupold	c. 1710	2	valves	lever	
9b	William Vream	1717	2	valves	rack-and-pinion	driven with continuous circular movement
10	W.J. 's Gravesande	1722	2	three way cocks	rack-and-pinion	automatic cock operation
11	W.J. 's Gravesande	< 1736	1	three way cock	rack-and-pinion	automatic cock operation

The following is Helden's table of extant seventeenth century air pumps, the oldest of which being the pump made by Otto Guericke in 1663 for Johann Schonborn, now kept at the Deutsches Museum, Munich:

Extant Seventeenth Century Air Pumps

(Helden, 1991)

type	maker	date	first owner	present keeper
2a		1663	Otto von Guericke	Deutsches Museum, Munich
2a		< 1674	C. Heraeus	Kunstkapstivoli, Malmö
2a		1675-1725	Otto von Guericke (?)	Technische Hochschule, Braunschweig
3		1660-1700		Museum Boerhaave, Leiden
4	Samuel van Musschenbroek	1675	Leiden University	Museum Boerhaave, Leiden
6a		c. 1740	J.A. Nollet	C.N.A.M., Paris
6a		c. 1740		C.N.A.M., Paris
7	Johan van Musschenbroek	1686	Count of Hesse-Kassel	H.L.M., Kassel
7	Johan van Musschenbroek	1697		Domus Galilaeana, Pisa
7	Johan van Musschenbroek	1698	Groningen University	Museum Boerhaave, Leiden
7	Jan van Musschenbroek	1706	Utrecht University	University Museum, Utrecht
7	Jan van Musschenbroek	1708		Deutsches Museum, Munich
7	Jacob Leupold	1709	Elector of Saxony	Zwinger, Dresden
7a	Johan van Musschenbroek	1675-1700		Museum Boerhaave, Leiden
9	Francis Hauksbee	c. 1708	Royal Society	Science Museum London
9		c. 1710		private collector
9		c. 1730		M.H.S., Oxford
9		1700-1750		Deutsches Museum, Munich
9		1700-1750	Cristino Martinelli	University of Padua
9		1743		M.S.S., Florence
9a		c. 1720		N.M.S., Edinburgh
9a		1725-1750		C.N.A.M., Paris
10	Jan van Musschenbroek	1722	W.J. 's Gravesande	Museum Boerhaave, Leiden
10	Jan van Musschenbroek	c. 1735	Franeker University	Museum Boerhaave, Leiden
	Jacob Leupold	1700-1725		Deutsches Museum, Munich

In 2003, Helden, expanding her 1991 article, contributed a short article "Air Pump" to the Wilbur Applebaum's *Encyclopedia of the Scientific Revolution: from Copernicus to Newton*. [2]

Huygens | Onnes

Helden has published historical work on Christiaan Huygens and also on Heike Kamerlingh Onnes and his low temperature thermodynamics research, from 1882 to 1923. [3]

Quotes | By

The following are quotes by Helden:

> "Guericke had designed his first air pump on the basis of a fire syringe: a piston moving back and forth in a brass cylinder. During the outward motion, it took in air from a spherical recipient. The pump was emptied during the inward stroke, while a leather valve prevented the air from flowing back to the recipient. The outlet was supplied with a valve as well, to prevent the atmospheric air from being taken in during the suction stroke. Hooke and Huygens improved on this design, but the overall idea remained the same. Leakage was the largest problem with the earliest vacuum pumps. To reduce it, the pump cylinder had to be perfectly straight with a smooth inner surface. Requirements like this made the construction of a vacuum pump extremely expensive and difficult. No more than fifteen scholars and institutions succeeded in obtaining a vacuum pump before 1670, and most of these depended on Guericke, Hooke, or Huygens for the construction and maintenance of their instruments."

— Anne Helden (2003), “Air Pump”, in: *Encyclopedia of the Scientific Revolution* [1]

References

1. (a) Shapin, Steven and Schaffer, Simon. (1985). *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Guericke, 5+ pgs; map, pg. 228; antlia pneumatica, pg. 278). Princeton University Press, 2011.
(b) Helden, Anne. (1991). “The Age of the Air-Pump” (pdf), *Tractrix: Yearbook for the History of Science, Medicine, Technology, and Mathematics*, 3:149-72.
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(b) Helden, Anne. (1991). “The Age of the Air-Pump” (pdf), *Tractrix: Yearbook for the History of Science, Medicine, Technology, and Mathematics*, 3:149-72.
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3. Helden, Anne C. van – WorldCat Identities.

θΔics

In existographies, **Annie Besant** (1847-1933) [RGA:42|375+] (FA:139) was a British atheism activist, women's rights activist, socialist, and theosophist, noted for []

Bradlaugh

In c.1870s, Besant met Charles Bradlaugh, and in 1883, the pair co-authored *The Freethinker's Textbook*, which seems to be aimed at attacking Christianity as a barrier to social progress. [1]

Quotes | By

The following are quotes by Besant:

> "An atheist is one of the grandest titles. It is the order of merit of the world heroes: Copernicus, Spinoza, Voltaire, Paine."
>
> — Annie Besant (1876), "The Gospel of Atheism"

References

1. (a) Bradlaugh, Charles and Besant, Annie. (1883). *The Freethinker's Textbook*. Freethought Publishing Co.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 414). HarperOne.

External links

â— Annie Besant – Wikipedia.

θΔics

In terminology, **anoint,** anointing, or the “anointed one”, refers to rub with oil, a puberty ritual, originating in Inner Africa, wherein when a boy reached puberty, tribal elders would slit the urethra of the boy and lubricate the member with palm oil, thereby initiating the way of the way of a man and a woman; or cutting the prepuce cover for the same purpose. [1]

In Dynastic Egypt times, all of the pharaohs were bathed each morning in water, symbolic of the sun god Ra bathing each morning in the primordial ocean Nun, and thereafter ‘anointed’ [with oil], robed, and invested with the royal insignia by priests wearing the masks of Horus and Thoth. [2]

References

1. Massey, Gerald. (1907). *Egyptian Book of the Dead and the Mysteries of Amenta (pg. 172-73); Book IV of Ancient Egypt the Light of the World* (pg. 217-18). Cosmo, 2008.
2. White, Joh Manchip. (1963). *Everyday Life in Ancient Egypt* (pg. 113-14). Dover, 2002.

External links

â— Anointing – Wikipedia.

θΔics

In science, **anomalous suspension** refers to []

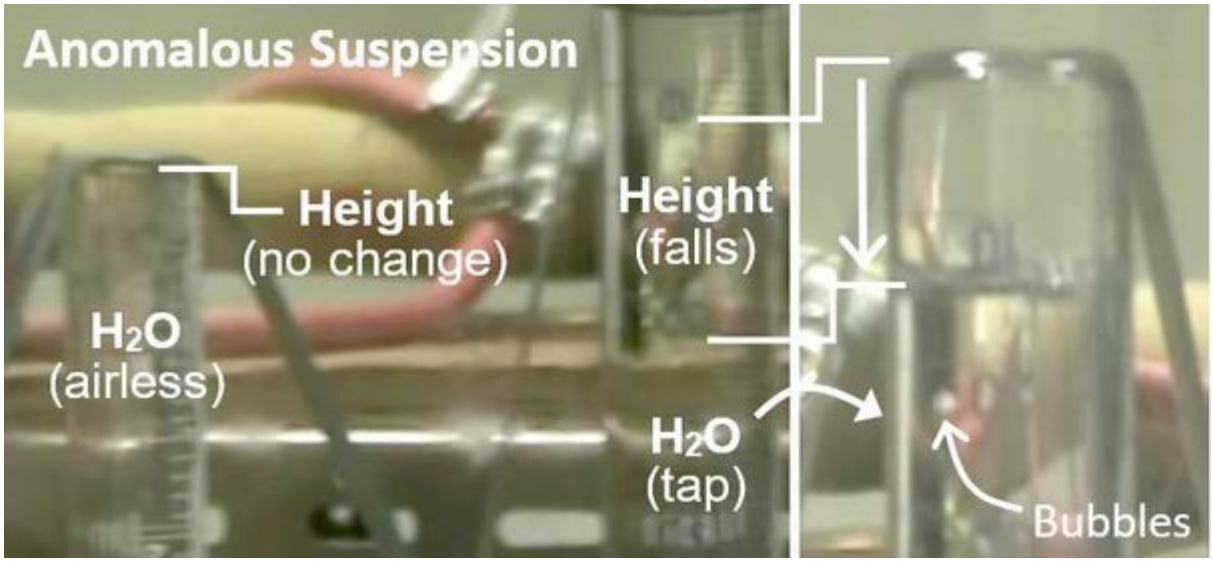

Video screen shots of Michael Nauenberg's 2008 demonstration of **anomalous suspension**, at the UC Santa Cruz physics labs, showing two water column barometers, both inverted into tub of water, the left one filled with airless water, the right one filled with tap water, both inside of vacuum receiver, and as the vacuum is increased, the level of the water column in the right barometer begins to fall, as air bubbles ascend upward, as though the water were "boiling" at room temperature, and eventually the column falls to the level of the water in the dish, whereas the left column barometer remains the same height. [8]

Overview

In 1661, Christiaan Huygens observed that if he took a Torricelli-style water barometer, the water previously having the air bubble boiled out of it, and put it into a Boyle-style vacuum receiver, and then pumped the air out the receiver, that the column of water, in the Torricelli-tube, did NOT fall, as the vacuum increased; whereas the column did fall when normal water was used, such as Boyle had found in the previous two years.

Huygens reported his findings back to Robert Boyle, which Boyle initially denied, per reason that he could not reproduce it with his own air pump. Boyle also suggested that Huygens pump could not evacuate sufficiently. Huygens, in turn, believed that Boyle's pump was defective.

In 1663, the anomalous suspension experiment was successfully carried out in London and subsequently repeated before members of the Royal Society. [5]

During this period, Boyle suggested that mercury be substituted for water and that the mercury be purged for four days.

Huygens eventually published a letter in the *Journal des Scavans*, later published in the *Philosophical Transactions* (1672), wherein he recapitulated the history of the air pump and the anomalous phenomena. [5]

In 2008, Michael Nauenberg, a German-born American physicist, repeated Huygens "anomalous suspension" on video, at one of the University of California, Santa Cruz, physics labs, available on YouTube, wherein you can see that when one does the vacuum-in-vacuum experiment with normal water, that when the void begins to increase in the receiver, that bubbles in the water begin to form and rise to the top or Torricelli space, as thought the water were "boiling at room temperature" as Boyle had previous described this phenomena. In Nauenberg's video, you can see that the Torricelli water column, on the left, containing the previously air purified water, i.e. water with the air boiled out beforehand, does not fall as the void in the receiver increases.

In 2015, Nauenberg, in his "Solution to the Long-Standing Puzzle of Huygens' 'Anomalous Suspension'", states that the phenomena of anomalous behavior has remained an unsolved phenomena to this day, but attributes it to molecular adhesion, in the airless water, between the water molecules and the glass; possibly something related to the capillary action phenomena. Nauenberg says that in the normal water, the bubbles bread up the water, or something along these lines, thus letting the column fall. [4]

Quotes

The following are related quotes:

“Hearing nothing from you by the two last posts concerning what I sent you about the **high-suspended mercury**; I thought fit to send you this addition thereunto, to be inserted toward the close of it next before the last paragraph As to that ‘subtitle matter’ therefore of Huygens (as likewise that of Descartes) supposed to penetrate the glass, quicksilver, and other bodies: I do neither affirm, nor deny it, but only suspend my assent till it be proved; and if it be proved, I admit it. But admitting (without affirming) such to be; and admitting it also to be heavy or pressing downwards (for else it makes nothing to the present busyness:) I am not satisfied that this matter having free admission (though perhaps not equally free) as well above as below, should make this difference; since, whatever power it have, should equally operate (for ought I can see) whether the quicksilver be or be not cleansed of common air. And therefore the chief (if not the only) thing which doth determine whether it can or cannot be suspended at such a height, being this, whether it be or be not cleansed of common air: It seems to me most likely, that the cause of difference should be in that air, on whose absence or presence it doth depend, whether the quicksilver do stand or fall and what therein should make the difference I see nothing more likely than the spring of it. As to that of Brouncker (Ñº), the case is somewhat different. For though he doth also attribute the effect to somewhat in the external air, which may give a further pressure than what is commonly observed in the Torricellian experiment: yet I do not remember that he doth expressly say whether it do or do not penetrate the glass. And I think we may more easily give an account of it (and perhaps more suitable to his sense) if we say, it do not. Which I should thus do.”

— John Wallis (1672), “Letter to Henry Oldenburg”, Oct 5/[15]

“Huygens’ most important contribution to pneumatics was his discovery of ‘**anomalous suspension**’ in 1661. He had purged water of air, and filled a barometer with this water. Next, he put the barometer under his recipient [vacuum bulb] and evacuated it. To his astonishment, the water in the barometer did not descend. Today, the phenomenon is attributed to adhesion between the water and the glass tube, but in Huygens time it was rather puzzling. Boyle initially denied the effect, because he could not produce it with his own pump. He suggested that Huygens’ pump could not evacuate sufficiently. Huygens on the other hand (correctly) believed it was Boyle's pump that was detective.”

— Anne Helden (1991), “The Age of the Air Pump” (pg. 153) [1]

“In the early 1660s, Christiaan Huygens claimed to have observed the so-called ‘**anomalous suspension**’ of water, the failure of a column of water, when purged of air, to descend in the Torricellian apparatus when moved into the receiver of an air-pump. This was a finding that, if genuine, appeared to threaten the conceptual basis of Boyle's pneumatics.”

— Steven Shapin (2010), *Never Pure* [2]

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θΔics

In existographies, **Anon Theophrastus** (c.1609-1665) (FA:50), aka "second Theophrastus", "Redivivus" (Ñº) of Theophrastus, or Theophrastus reborn (Ñº), is the assigned name to the anonymous French materialistic atheism freethinking author of *Theophrastus Redivivus* (c.1659). [1]

Quotes

The following are noted quotes by Anon Theophrastus:

> "I use the teachings of the philosophers and thinkers of antiquity to show that god does not exist, that the world is eternal, that the soul is mortal, that hell is nothing but a fairy tale, and that religion is a political artifice. A cunning deception is that death is detestable, because nothing stifles him [it?]. Thus, I have divided the work, as Theophrastus of Eresus did it, into six books: the first on the gods, the second on the world, the third on religion, the fourth on the soul and on hell, the fifth on the contempt of death, the sixth on the natural life. All this belongs to the argument with the gods. If it has been proved that the gods do not exist, the rest understands itself."
>
> — Anon Theophrastus (c.1659), *Theophrastus Redivivus* (pg. 8) [1]

> "It is useful that everybody, except the enlightened elite, is convinced that god exists, although this conviction is not true."
>
> — Anon Theophrastus (c.1659), *Theophrastus Redivivus* (pg. 56) (Ñº)

> "Only human reason, the cunning of sly people who want to come to power, has invented everything that was said about gods: without this invention, it would be difficult for man to secure the obedience of the people."
>
> — Anon Theophrastus (c.1659), *Theophrastus Redivivus* (pg. 341); a Critias view [3]

> "There are only three deceivers who go after man: Moses, Jesus, and Muhammad."
>
> — Anon Theophrastus (c.1659), *Theophrastus Redivivus* (pg. 528); a Frederick II view [3]

> "I agree with those legislators and philosophers who think that some religion is necessary in a society."
>
> — Anon Theophrastus (c.1659), *Theophrastus Redivivus* (pg. 541) (Ñº); compare: no religion

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(b) Theophrastus Redivivus (German → English) – Wikipedia.

θΔics

In hmolscience, **anorganic**, from *an-* meaning “not’, “without”, “lacking” (O), + -*organic*, meaning “related to organs”, as compared to inorganic, refers to []

Overview

In 1799, Friedrich Schelling, in his *First Outline of a System of the Philosophy of Nature*, employed the terms “anorganic” and “organic”, in a way that seems synonymous with “inorganic” and “organic”, but discussed in his own peculiar theory. [2]

Quotes

The following are related quotes:

> “The mind is nothing but the result of an organic combination of physical powers. The universe is, as it were, a chemical, magnetical, electrical, etc., laboratory, in which, the material powers (also called vital powers) consummate their unceasing changes and transformations. Where one formation ceases [final state], another begins [initial state]. Even the corpse of man lives; but this is no longer human life, it is only the **life of ‘anorganic’ nature** [see: inorganic life], to which the human form, after its dissolution, returns, and out of which ‘organic’ nature reproduces itself. **There is nothing dead in the world**, and dying implies only a retransformation to the material of common life.”
>
> — Karl Heinzen (1846), *Six Letters to a Pious Man* (pg. 14)

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θΔics

In hmolscience, **Another Newton**, "New Aristotle" or "Next Einstein" (or few super-Einsteins), refers to some future great intellect who will make comprehensible the production of a blade of grass without a designer (Immanuel Kant, 1710), explain human history in terms of physics and chemistry (Henry Adams, 1910), and or someone who will explain the "moral equivalent of war" (Raymond Fosdick, 1924).

> "Such a complete solution seems to call for the aid of **another Newton**."
>
> — Henry Adams (1910), *A Letter to American Teachers of History*

Two cultures genius Henry Adams giving his opinion that the solution to the problem of the physicochemical thermodynamics of history, i.e. a Gibbs-based explanation of social change, one he spent some five decades on, will require **another Newton**.

> "It is absurd to hope that **another Newton** will arise in the future who shall make comprehensible by us the production of a blade of grass according to natural laws which no design has ordered."
>
> — Immanuel Kant (1790), *Critique of Judgment* [6]

> "Another option is to admit the inadequacy of all current approaches and to wait for the appearance of the 'Galileo' or the **'Newton' of sociology** to come along with a new approach that will solve all the problems."
>
> — Jane Azevedo (1997), *Mapping Reality* [8]

American physical historian Henry Adams employed the term for a future two cultures genius that would explain human movement, via chemistry, physics, and thermodynamics, the way Newton explained celestial movement via physics and Euclidean geometry.

Social Newtons

See main: Social Newton

The term "Newton of sociology", Czechoslovakian-born English sociologist Werner Stark's 1962 term for American physical sociologist Henry Carey, or "Newton[s] of social theory", English philosopher Stephen Toulmin's 1992-2002 terminology for the French social physicists, e.g. Auguste Comte, often tends to refer to someone who in the past has attempted to formulate the humanities mechanistically, e.g. via social mechanism theory, done with great precision, in the same way that English physicist Isaac Newton famously formulated the movements of planets mechanistically.

Future Newton | 1910

In 1910, American historian Henry Adams used the term "another Newton" in reference to a future genius who comes forth to give the "complete solution", as Adams put it, to the elective affinities problem: explaining morality, sociology, economics, and history according to chemistry, physics, and mechanics, via pure mathematics, symbols, figures, and one "common formula"—in a sense, the "new Goethe" (IQ=230). The term is used in the final paragraph of Adams' famous two chapter *A Letter to American Teachers of History*, chapter one: "The Problem", chapter two: "The Solutions", wherein he ends with the summary: [1]

> "Such a complete solution seems to call for the aid of **another Newton**."

This is pretty deep insight, coming from one who 45-years earlier, in *circa* 1865, stated the following in his own

personal query notes:

> "Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday within this law. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."

Adams worked on this problem almost daily, as he told his wife in 1885:

> "Social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life."

In short, having spent nearly five-decades on this problem, seeking unified solution through the big geniuses of physical science: Clausius (IQ=205), Gibbs, and Thomson (IQ=185), not to mention Darwin (IQ=175), among others, Adams concluded or rather prophesied in the end that the solution would require a new Newton. The idea of another Newton seems to embody, in some extent, the need to supplant Charles Darwin's 1859 evolution theory with Rudolf Clausius' 1865 thermodynamics, and to fully explain the result, via formula and equation, and repercussions throughout the broad spectrum of the sciences of the humanities. The following is a truncated aggregate synopsis of the main points or sections of Adams' 1910 chapter "The Solutions", wherein, at the end of which, the another Newton term is used:

> "Suppose that the physicist takes the lead, and seeks for a means of compromise—some middle term, on which the elevationist can stand while discussing the details of the treaty! The degradationist can produce from his stores of energy an number of figures for choice; such as that of water, which expands or contracts, according to the temperature, or falls according to its position; or electricity, which dissipates itself into work; or of dynamite, which does work by explosion; or of gases, which work restlessly without accomplishing anything; or of table salt, which dissolves mysteriously in water, to help digestion or stimulate appetite; but possibly he may begin with his favorite figure of a gaseous nebula, and may offer to treat primitive humanity as a volume of human molecules of unequal intensities, tending to dissipate energy, and to correct he loss by concentrating mankind into a single, dense mass like sun.
>
> History would then become a record of successive phases of contraction, divided by periods of explosion, tending always towards an ultimate equilibrium in the form of human molecules of equal intensity, without coordination. Science should prove twenty times over, by every method of demonstration known to it, that man is a thermodynamical mechanism
>
> If the teacher of history cares to contest the ground with the teacher of physics, he must become a physicist himself, and learn to use laboratory methods. He needs technical tools [see: human thermodynamics instruments] quite as much as the electrician does large formulas, like Willard Gibbs' rule of phase; generalizations, no matter how temporary of hypothetical, such as all mathematicians use for the convenience of their scholars.
>
> Man, as a form of energy, is in most need of getting a firm footing on the law of thermodynamics. One cannot doubt that William Thomson could have suggested half-a-dozen figures which would answer the purpose, although he might very well have refused to waste his own stock of [potential] energy in the effort to prove his thermodynamical ascent from a hypothetical Eocene lemur, or even from a duck-billed

platypus; neither of which would have promised energetic means of saving him from the pitfalls which his keen mathematical instinct would have shown him as the work of his fellow physicists, planted directly in his path.

The Darwinian readily admits that Thomson's sun accounts for evolution better than Darwin's did; and he only too ready to drop all the school-phrases—to call the process "transformation", and so, quietly surrender the issue. He is equally ready to admit that Darwin never supplied the motive power that should vary in force with the phenomena; he might even go so far as to concede that the want of such an energy had embarrassed biology nearly to the point of paralysis.

The department of history needs to concert with the departments of biology, sociology, and psychology some common formula or figure to serve their students as a working model for their study of the [animate] energies; and this figure must be brought into accord with the figures or formulas used by the departments of physics and mechanics to serve their students as models for the working of physico-chemical and mechanical energies.

Without the adhesion of physicists, the model would cause greater scandal than though the contradictions were silently ignored as now; but the biologists—or, at least, the branches of science concerned with the humanity—will find great difficulty in agreeing on any formula which does not require from physics the abandonment, in part, of the second law of thermodynamics.

"If the physicists and the physico-chemists can at last find their way to an arrangement that would satisfy the sociologists and the historians, the problem would be wholly solved. Such a complete solution seems not impossible; but at present—for the moment—as far as the stream runs—it also seems, to an impartial bystander, to call for the aid of **another Newton**."

To note, in the above version, the term "vital energy" is removed and replaced with the proper modern term usage, as indicated by brackets, respectively. The way in which Adams was using the term shows that he was grappling with the "defunct theory of life" (2009) a great problem that only began to find partial solution in the mind of Nikola Tesla and his 1925 decisive comment "there is no thing endowed with life", which is an upgrade from the earlier Helmholtz school pact (Reymond-Brucke oath) that their is not vital energy, but there is life, but one explained purely by physico-chemical methods.

In 1921, American historian William Thayer comments on Adams' another Newton synopsis: [2]

"In reading Henry Adams' astonishing tract, I can not help suspecting at times that he is making fun of us historians; for he proposes, as I think you would agree with me, something which is not only impossible for anyone to carry out but which he himself never even attempted to carry out. In all the nine volumes of his *American History*, is there a hint of the second law of thermodynamics? Can you discover the slightest trace of a common formula for history and physical chemistry?"

Thayer, in other words, gives his opinion that it would be an "impossible" task for someone to find a common formula for history and physical chemistry. Interesting comment indeed. Thayer is way off, however, in his assertion that Adams "never even attempted to carry out" his proposal; whereas correctly Adams spent 50-years on this problem (c.1965-1918). Thayer does, however, to his credit, give the following cogent statement:

"The time may come when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry … then it may be possible, as Adams suggests, to invent a common formula for thermodynamics and history."

This, as we see, is great vision indeed.

New Aristotle | 1924

Similar to the premise of "Another Newton" is American lawyer and political writer Raymond Fosdick's 1924 "Wanted: an Aristotle" address delivered at the commencement exercises of the University of Iowa, during which he states that what we need is to find or discern a 'moral equivalent of war', American physical historian Morris Zucker summarizes, the success of which he situates on the need of a new Aristotle. [3] Zucker summarizes the gist of Fosdick's address as follows: [4]

> "This **new Aristotle**, who will set our askew world to rights, will be in the form of a collective intelligence, Fosdick asserts."

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WANTED: AN ARISTOTLE

"Dear! Dear! Does it sound like

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spiritual unity of which Aristotle never conceived. I am not now speaking of the cohesiveness among nations which modern industry has introduced, or the solidarity of human interests which our new

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goes can be maintained against ideas. The fundamental unity of civilization is the unity of its intellectual life. The Scotsman Adam Smith and the German Karl Marx, the Englishman Darwin

A few snippets of American lawyer and political writer Raymond Fosdick's 1924 "Wanted: an Aristotle" address, wherein he asserts that to find the moral equivalent of war we will need a new Aristotle. [3]

In full, as cited in Andres Reggiani's 2007 book on the social engineering philosopher Alexis Carrel, Fosdick stated: [5]

> "The great overshadowing need that faces our time and our generation is the need of an organizing intelligence dedicated to the advancement of the common good. We need brains of synthetic capacity. We need a planetary consciousness. We need the ability think on a terrestrial scale and plan in world terms. We need an Aristotle. … This task is obviously too great for a single brain. The world is now too vast and too complex to be grasped by a single philosopher. **When Aristotle comes again**, it will be in the form a collective intelligence, the sustained thinking of many minds, driving toward the common goal."

Reggiani, in citing Fosdick above, to note, seems conceptualize this "coming Aristotle", in some way, in the visions outlined by Carrel in the 1930s, which he summarizes as follows:

> "Carrel considered medicine to be the discipline best suited for leading the way to universal knowledge. The role of physicians would be to 'guide' the process of human regeneration by supplying society with 'engineers of the body and soul'."

(add discussion).

Next Einstein | Super-Einsteins

> *See main: Few super-Einsteins*

The term phrase "super-Einstein" and or "next Einstein" began to arise in 20th century:

"… emergence, the physicochemical, the organismal, the mental and the social. Hence, it till the advent of a **few super-Einsteins**, theoretical biology must stand as a combination of oppositions—a *compositio oppositorum*."

— William Wheeler (c.1935), "Essay"

"Where will the **next Einstein** lead scientific thinking?"

— Chris Quigg (2004), "Physics of the Large Hadron Collider Workshop" (Ñº)

"The physics of the point that existed 13.7 billion years ago is mostly beyond our imaginations, not to mention our conceptual tools. Gravity, electromagnetism—all the forces at work around us did not have an independent existence. Matter as we know it didn't exist. With everything that would become the universe packed so tightly in one spot, there was an enormous amount of energy. In such a universe, the physics of small particles, quantum mechanics, and that of large bodies, general relativity, were somehow part of a single, overarching, and still unknown theory. Just what that theory is awaits the **next Einstein**."

— Neil Shubin (2013), *The Universe Within* [7]

(add)

Quotes

The following are related quotes:

"Science has not yet produced the Vignola of its ensemble architecture—the 'Newton' called for by Adams."

— Roderick Seidenberg (1950), *Post-Historic Man* (pg. 163)

See also

The following are other similar epitaphs:

â— John Stewart | "Modern Pythagoras" (Ñº)
â— Georg Hegel | "Modern Aristotle" (Adriaan Peperzak, 2012) (Ñº) (Ted Ladlier, 2000) (Ñº); specifically in "young Marx's eyes" (William McBride, 1977) (Ñº)
â— Karl Marx | "Modern Aristotle" (Ñº)

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θΔics

In existographies, **Anson Gilbert Rabinbach** (c.1945-) (CR:6) is an American historian noted for his 1990 book *The Human Motor*, in which he traces the historical use of thermodynamic theory and heat engine metaphor (or human motor), concepts such as work, energy, and entropy, to the modeling and understanding of the human being. [1] The work contains a detailed account of how the newly developed principles of energy and entropy were carried over into the humanities, e.g. economics, psychology, and sociology, etc., by those such as Carl Neumann, Sigmund Freud, and Leon Walras, among numerous others.

Education

Rabinbach completed his BA (1967) at Hofstra University and his MA (1970) and PhD (1973) both at the University of Wisconsin-Madison. In 1992, Rabinbach was a professor of history at Cooper Union. Currently, he is a history professor at Princeton University.

Quotes | By

The following are quotes by Rabinbach:

> "With the discovery of a fatigue as the dystopia of universal labor power, the search for a 'thermodynamics of society' began in earnest."
>
> — Anson Rabinbach (1990), *The Human Motor* (pg. 68)

References

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External links

â— Anson Rabinbach (faculty) – History Department, Princeton University.
â— Rabinbach, Anson – WorldCat Identities.

θΔics

In science, **Anthonie W. J. Muller** (1951-) is a Dutch biophysicist noted for his 1983 thermosynthesis theory, which argues that early life originated and operated through heat engines before it acquired today's photosynthesis and respiration machineries. [1]

Education

Anthonie Muller completed his BS in physical chemistry in 1972 and his MS in experimental biophysics in 1979, both at the Free University of Amsterdam. His thesis work was on protection of phage nucleic acid against gamma radiation and determining the intrinsic viscosity of a bacterial protein. His first paper on thermosynthesis was published in 1983. In 1990, Muller completed his PhD in material science, dissertation on the corrosion of dental NiCr alloys, at the school of dentistry of the University of Amsterdam. [2] He has since worked at the geology department at the University of Glasgow (1995-96), the biochemistry department at the University of Edinburg (1995-97), the geology department at the Washington State University (2004-06), and is currently at the Swammerdam Institute for Life Sciences, University of Amsterdam. [3]

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Further reading

See also: PDF attachment (to this page)

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θΔics

In existographies, **Anthony Collins** (1676-1729) (FA:64) was English philosopher, deism promoter, an anti-atheist and or so-classified "covert implied atheist" (Berman, 2007), depending, supposedly, referred to as "our Diagoras" by George Berkeley, noted for []

Overview

Collins, supposedly, rejected Epicurean atheism in favor of some type of stoicism-themed Spinozan atheism, that was being referred to as "fatalism". [1]

Quotes | On

The following are quotes on Collins:

> "Jacob Reimann, in his *Universal History of Atheism* (1725), included as atheists: Thomas Hobbes, John Toland, Charles Blount, and **Anthony Collins**."
>
> — Jennifer Hecht (2003), *Doubt: a History* [1]

Quotes | By

The following are quotes by Collins:

> "The immortality of the soul was nowhere plain in the Old Testament, was denied by the Sadducees, the most philosophical part of the Jewish nation, was thought doubtful by most sects of the Greek philosophers, and denied by the stoics, the most religious sect of them all; had never, according to Cicero, been asserted in writing by any Greek extant in his time, and was first taught by the Egyptians."
>
> — Anthony Collins (c.1710) [3]

> "Ignorance is the foundation of atheism, and freethinking the cure of it."
>
> — Anthony Collins (1713), *Discourse of Freethinking* [2]

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Flynn; foreword: Richard Dawkins) (§:276-80, esp. pg. 277). Prometheus Books.

External links

- Anthony Collins – Wikipedia.

θΔics

In existographies, **Anthony Shaftesbury, 3rd Earl** (1671-1713) (IQ:170|#340) (CR:4), aka "Anthony Cooper, 3rd Earl of Shaftesbury", oft-cited as "Shaftesbury", not to be confused with his grandfather noted politician Anthony Shaftesbury, 1st Earl (1621-1683) (IQ:165|#440) (Cattell 1000:365), was an English deism themed, albeit "anti-religious" perceived, moral philosopher and politician, noted for []

Virtue | Merit

In 1699, Shaftesbury had finished an early version of his *Inquiry Concerning Virtue or Merit*, then published by John Toland, and later translated (1745) by Denis Diderot, which, supposedly, has some thematic relation to Pierre Bayle's 1681 *Thoughts on the Comet*, and its conjecture that a "society of atheists" is perfectly viable. [1]

Morality | Universal

In 1711, Shaftesbury, in his *Characteristics of Men, Manners, Opinions and Times*, outlined some type of deism themed universal moral goodness model (see: universal morality); the gist of which is as follows: [2]

> "**Shaftesbury**'s view of virtue is part of his larger view of goodness. Something is good, according to Shaftesbury, if it contributes to the "Existence or Well-being" of the system of which it is a part (C 2.18). Every animal is a part of its species. So a particular animal, say a tiger, is a good member of its species—it's a good tiger—if it contributes to the well-being of the tiger species as a whole. There is also "a system of all animals", which consists of the "order" or "economy" of all the different animal species (C 2.19). So a good animal is one that contributes to the well-being of "animal Affairs" in general (C 2.19). The system of all animals, moreover, works with the system "of Vegetables, and all other things in this inferior World" to constitute "one system of a Globe or Earth" (C 2.19). So something is a good earthly thing if it contributes to the existence of earthly things in general. And the system of this earth is itself part of a "Universal System" or "a System of all Things" (C 2.20). So to be "wholly and really" good a thing must contribute to the **good of the universe as a whole** (C 2.20). This progression of ever-larger systems is a bit dazzling, and we might wonder how we can know (or even make sense of) whether something is contributing to the well-being of the universe as a whole. But Shaftesbury avoids this problem by discussing in detail only that which makes "a sensible creature" a good member of its species—by focusing on whether an individual creature is promoting the well-being of its species (C 2.21). Perhaps Shaftesbury believes that a creature that contributes to the well-being of its species will also always contribute to the well-being of the universe as a whole, in which case being a good member of one's species would be coextensive with being "wholly and really" good. The goodness or evilness of a sensible creature, according to Shaftesbury, is based on the creature's motives, and not simply on the results of the creature's actions (C 2.21–22). This leads to a crucial claim: every motive to action involves affection or passion (C 2.40–44). Reason alone cannot motivate (C 2.28–52, 77–81).

Those influenced, to some degree, by this publication include: Alexander Pope, Joseph Butler, Francis Hutcheson, Mark Akenside, Samuel Coleridge, and Immanuel Kant. (Q) Pope, in his *Essay on Man*, e.g., restated simple ideas from Shaftesbury's *Moralists* done into verse. [5] Shaftesbury's work was read (Q) by Benjamin Franklin as young man.

Education

Shaftesbury was educated directly by John Locke according to the principles of Locke's *Thoughts Concerning Education*; by age 11, he could read in both Latin and Greek. Shaftesbury studied with avidity the works of Marcus Aurelius; some have compared Shaftesbury to Aurelius. [5]

Quotes | On

The following are quotes on Shaftesbury:

"**Shaftesbury** was a man possessing right reason in a more eminent degree than the rest of mankind and his character is the highest that the perfection of human nature is capable of."

— Robert Molesworth (c.1714), *Publication* [5]

"Not only Leibnitz, Voltaire, and Diderot, but Lessing, Mendelssohn, Wieland and Herder, drew the most stimulating nutriment from Shaftesbury."

— Hermann Hettner (c.1860), *Publication* [5]

"Toland is best known for his call for common-sense thinking in the deist manifesto *Christianity Not Mysterious*, he gained notoriety as editor and biographer of Milton, Harrington, and Ludlow; translator and publicist of Giordano Bruno; pamphleteer and spy for Robert Harley, and purveyor of Hermetic and clandestine manuscripts for Prince Eugène of Savoy. A self-proclaimed atheist, he amused, annoyed, and embarrassed such personal acquaintances as Locke, Swift, Bayle, Leibniz, **Shaftesbury**, and Sophie Charlotte of Prussia. His works on biblical criticism, philosophical materialism, and the Druids became sources for Diderot and Holbach; and historians of Freemasonry and of English political and diplomatic affairs continue to search for keys to the intrigue that surrounded him."

— Stephen Daniel (1984), abstract of *John Toland: His Methods, Manners, and Mind* [4]

Quotes | By

The following are quotes by Shaftesbury:

"Truth is the most powerful thing in the world, since even fiction itself must be governed by it, and can only please by its resemblance."

— Anthony Shaftesbury (1711), *Characteristics of Men, Manners, Opinions and Times, Volume One* (pg. 8) (Q)

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External links

- Anthony Ashley-Cooper, 3rd Earl of Shaftesbury – Wikipedia.

θΔics

In hmolscience, **anthropic physics** or “physik anthropik”, a near synonym of human physics (Adolphe Quetelet, 1835) or humanized physics (Edwin Slosson, 1910), is a term used by German physical chemist Wilhelm Ostwald in his 1912 *The Energetic Imperative* on the energetics of morality and culture, supposedly used in the sense of meaning the science of the physical chemistry of humans; a term which would be derived from the combining form of Ancient Greek ἄνθρωπος (anthrōpos), meaning“man, human”. [1]

Overview

In 1912, Wilhelm Ostwald, in his *The Energetic Imperative*, defined anthropic physics as follows:

> “We recognize the logic of general science, because they are dealing with the most general terms. In mathematics these are already specialized, because the size, which constitutes the central concept of mathematics is by no means all things. She defines as an already great variety of relationships, which are given by the much richer content of the concept of size. Even more specifically, the science which takes the concepts of time and space to do so; it is called geometry, kinematics and kinetics in a somewhat arbitrary division.
>
> These sciences can all be summed up in a large group for which the fundamental concept of order shall prevail. They probably called formal sciences and sets them against the other as the real one. This is not right if it is to represent a fundamental difference: they're just the sciences of the most general properties of things.
>
> There now follows a group of physical sciences, which are referred to as mechanics, physics and chemistry. They also correspond to an increasing diversity of the considered properties or relations and have also its summary term. This is the concept of energy, such as the physical sciences can be summarized as the study of the various activities of the energy.
>
> A third group of science connect to physiology, psychology and cultural studies. The last one has been referred to sociology, however, proves to be too narrow in the name of the general position that we adopt here, because the association is only one of the tools of culture. All of these studies can be used as the biological, combine the sciences of life, the physiology of the most general and therefore also the lowest areas of the phenomena of life are assigned, while psychology has with the mental phenomena in animals, how to do in humans. The last and highest science is at last, which is about the people and their special properties. It would mean the best anthropology, had not taken this name for a small part of this overall research already being implemented. Maybe you can call them on the analogy of the name of **anthropic physics**.
>
> One may claim that can be accommodated in this simple scheme, all sciences, there is currently and place in the foreseeable future.
>
> I make myself prepared to find that you will consider this claim in doubt and, for example, mention that great science, like medicine, astronomy, philology, history, etc., are not taken into account. It is noted that the scheme applies only to the pure sciences, i.e. to the sciences as they are to remember the image used earlier, driven because of the completeness and order of the camp. The so-called applied sciences should better have a different name, as they were earlier called for adequate arts. So the medicine is an art for which their proper exercise requires knowledge of almost all pure science, from logic to anthrop. Similarly, the story is not a science in itself, but a general scientific method, because we use them as well in mathematics, as in politics. We have seen that all the knowledge of the past serves as our basis for the foresight of the future, so they can never do without and it is unacceptable to want to make it a special area. And in a similar way one can get along in all such questions of methodology.
>
> I made this last, somewhat scrawny considerations in order to give everyone the feeling of assurance that in fact the scientific knowledge are at present so far, not the propagation of science everything that mankind

> can do with success at the task as far as an incomprehensible gift of higher powers to accept, but as a crop for which the *garden of humanity* must be regularly appointed and can, and the richer fails, the rational order is executed. Our ancestors believed that the yield of the fields depended on the favorable attitude of the gods, and means to increase yields were victims in this field to gods. We no longer believe in god's field, but we believe in potash, nitrogen and phosphate, with the result that our fields are now wearing the multiple of the preceding years. This faith has taught us a man of science, namely, Justus Liebig, whose effectiveness is still great and a long period, one of the most brilliant title to fame of the good city of Munich and will be. And wherever we look, everywhere we connect similar feats against the science. If it is more urgent today than ever a question to put all our people an enjoyable and worth living in fate: what body we can turn to good effect to achieve this great goal? There is no other than science, the science that we bow to the raw energy of nature with ever-increasing quality conditions at our will and teaches us to subdue the earth."

To repeat, one of the best excerpts from this passage is:

> "Our ancestors believed that the yield of the fields depended on the favorable attitude of the gods, and means to increase yields were victims in this field to gods. We no longer believe in god's field, but we believe in potash, nitrogen and phosphate, with the result that our fields are now wearing the multiple of the preceding years."

This, he says, whereas our ancestors used to believe in the existence of gods or god, we now believe in the existence of elements governed by the physical sciences. A very cogent statement indeed.

Anthropic thermodynamics

The technical-correct modern English version of this term, knowing that Ostwald's version of energetics evolved into what has come to be known as chemical thermodynamics, would be anthro-thermodynamics or anthrothermodynamics a Greek-based version of "human thermodynamics", in the sense of anthropology being the science of humans.

Anthropology, in the modern sense, however, has become a rather watered-down soft science, that studies humans in relation to distribution, origin, classification, and relationships of races, physical character, environmental and social relations, and culture. [2] This is evidenced by the watered down nature of the so-called subject of "anthropological thermodynamics".

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θΔics

In science, **anthropic principle**, aka the "fine tuning argument", is an idea which posits that the universe possesses many of its extraordinary properties because they are necessary for the existence of life, according to which, based on this theory, humans are conceived to occupy a central place in the universe. [8]

An artistic rendition of the **anthropic principle**, i.e. the supposition that humans occupy a privileged central position in the universe, because god made the constants that way, as opposed to Copernican principle, i.e. the supposition that humans do not occupy a privileged position in the universe. (Ñº)

Carter

In 1970, Australian theoretical physicist Brandon Carter, at the Clifford Memorial meeting in Princeton, introduced ideas, unpublished at that point, about what he called an "anthropic principle", a general "reaction against exaggerated subservience to the Copernican principle", namely the premise that "we must not assume gratuitously that we occupy a privileged *central* position in the universe, according to which, in the strong position extension of this logic, that "our position cannot be privileged in any sense." Carter in opposition to this "dogma" as he calls it then, citing American physicist Robert Dicke (1961), then concludes that this is untenable because:

> (a) Special favorable conditions (temperature, chemical environment, etc.) are prerequisite for our existence.
> (b) The universe evolves and is by no means spatially homogeneous on a local scale.

Carter then defines his so-called anthropic principle as follows:

> "What may be termed the ***anthropic principle*** [states] that what we can expect to observe must be restricted by the conditions necessary for our presence as observers. Although our situation is not necessarily *central*, it is inevitably privileged to some extent."

He then goes on to cite examples of what he calls "large number coincidences", e.g. the supposed "coincidence" that all stars, whether red giants, white dwarfs, or neutron stars, etc., always have a mass equal in order of magnitude to the inverse of the gravitational coupling constant, etc. The long and the short of his argument, as people have taken it, being that these supposed or rather conceived-to-be formulaic "coincidences" are evidence that the universe, or rather the fundamental constants of the universe, were fine-tuned by God for humans. The so-called strong version of this anthropic principle, summarized by Paul Davies (1982), is the supposition: "The universe must be such as to admit the creation of observers within it at some stage." [1]

Davies

English physicist Paul Davies is one who has spent a considerable amount of time ruminating on the pros and cons of variants of the so-called anthropic principle. In the mid-1960s, as an undergraduate physics student, he read English astronomer Fred Hoyle's 1957 science fiction novel *The Black Cloud*, in which a large cloud of gas from interstellar space arrived in the solar system, which was said to be 'alive'. Davies was intrigued by this idea, in his own retrospect words: [3]

> "How can a cloud be alive? I puzzled over this at length. Surely gas clouds just obey the laws of physics? How could they exhibit autonomous behavior, have thoughts, make choices? But, then, it occurred to me,

> all living things supposedly obey the laws of physics."

Hoyle's living cloud left Davies 'baffled and vaguely disturbed', leaving him questioning the 'what exactly is life question' and 'when did it start?' issue. Next, Davies' PhD advisor (Michael Seaton or Sigurd Zienau) then gave him a copy of Hungarian-American physicist Eugene Wigner's 1961 essay "The Probability of the Existence of a Self-Reproducing Unit" which purported to prove that a physical system cannot make a transition from a nonliving state to a living state without contravening the laws of quantum physics, arguing to the effect, according to Davies, that 'something funny must have gone on when life started.' [4]

Davies supervisor then passed him Australian astrophysicist Brandon Carter's circa 1970 paper on the 'anthropic principle' (a term he coined), which argues to affect that the laws of nuclear physics are fine-tuned to make carbon in stars, and hence predisposed to the development of life, and hence anthropocentric laws are made to favor the development of human life, in short. Davies then worked under Hoyle and with Carter for two years at Cambridge, from 1970 to 1972. During this period he chanced across a copy of Erwin Schrodinger's famous 1944 booklet *What is Life?*, as we all have, which gave Davies the view that biological organisms can be explained by physics. This seems to have been Davies first indoctrination into the basics of the thermodynamics of life and his later circa 1980s gravitational entropy theory of life. In 1999, Davies, in fact, declared the second law to the "ultimate problem of biogenesis". In his 2003 *The Origin of Life*, Davies attempts to answer the question: [5]

> "Is life written into the laws of nature, or just a bizarre accident, unique in the universe? How can a mix of non-living chemicals be transformed into something as complex as the living cell?

In 2006, Davies, in his *The Goldilocks Enigma: Why Is the Universe Just Right for Life?*, pictured adjacent, in which he argues that the earth, with its so-called "bio-friendly" conditions habitable zone, was fine-tuned by accident, and found in one of many universes. [6]

Religion | Science

Religion and science reconcilers frequently invoke Carter's anthropic principle, in a number of various guises, to argue, vicariously, that "God fine-tuned the universe or the constants of the universe for man!", or some variant along these lines. (Ñº)

In 1993, German chemist, philosopher, and geneticist Friedrich Cramer, in his "The Entropic Versus the Anthropic Principle: on the Self-Organization of Life", pits up Clausius' second law against Carter's anthropic principle, concluding frankly that the notion of "self-organization" is nothing but something that lets the metaphysical into physics (see: ontic openings) and hence justifies the notion of creation by God. [2] The following is one recent example:

American astronomer Neil Tyson ridiculing the "fine tuning argument" and "intelligent design", by showing how many ways the universe is not suited for "life" (powered-CHNOPS+ geometries).

> "The 2013 article 'Does Our Solar System Exist in Region of the Universe that's Just Right for Life?" (Ñº), asks: 'why does the universe appear to be fine-tuned for life? The logic behind this question, sometimes known as the **anthropic principle**, says that's why we are here today, able to study the universe and learn about its laws. But if any of these constants were slightly different, we could never have come in to exist in the first place.' You will see that your own scientists are supporting me in saying that constants are environment dependent. And now I leave it your judgment if I am 200 years backdated."

— Mirza Beg (2014), “Beg-Thims dialogue” (post #17), Sep 3

The gist of this argument, in short, is something along the lines of the assertion that the constants of the universe are designed, by God, to bring into existence intelligent observers, e.g. if “*α*” (alpha), the fine-structure constant:

$$\alpha = \frac{k_e e^2}{\hbar c}$$

which encompasses a ratio of four fundamental physical constants, namely: e, the electric charge, *Ä§* (*h*/2π), the reduced Planck constant, k_e, the Coulomb constant, and *c* the speed of light, to change by 4%, stellar fusion would not produce carbon, according to which, as English cosmologist John Barrow points out, carbon-based life would be impossible, i.e. if *α* were > 0.1, stellar fusion would be impossible and no place in the universe would be warm enough for life as we know it. [9]

Difficulties on theory

The central difficulty on theory with any and all types of anthropic principles, is that all variants of “anthropisms”, according to Ernst Haeckel (1895), are erroneous opinions: [10]

> “What we may call 'anthropism' is that powerful and world-wide group of erroneous opinions which opposes the human organism to the whole of the rest of nature, and represents it to be the preordained end of the organic creation, an entity essentially distinct from it, a godlike being.”

In other words, to think that the universe is fine-tuned to make "carbon" (the intelligent element behind human brains) is no more tenable than the alternative assertion that the universe is fine tuned to make "silicon" (the intelligent element behind computer CPU brains), the latter being what might be referred to as "siliconism" or in this case an "silicon-ic principle", if one were to argue that the constants of the universe are fine tuned to make silicon-based life or correctly silicon-based animation (e.g. a robot), as life is something that does not exist (see: defunct theory of life). Both modes of reasoning are excursions into inanity.

The long and the short of the correct representation of the crux of the issue is that any when CHNOPS+ system of elements is in the so-called "habitable zone" around a medium sized star, powered animate intelligent behavior will tend to result, given enough rotation cycles of heat input, owing to a combination of the quantum electrodynamic animate properties of the carbon atom. In other words, using the silicon-based / carbon-based animation comparison, to call one type of animation, e.g. carbon-based, by the term "life" and another, e.g. silicon-based, as non-life, is but pure anthropism, plain and simple, and hence "erroneous" logic as Haeckel puts it, not to mention the secondary erroneous assertion that carbon-animation or humans are privileged types of atomic geometries.

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10. Haeckel, Ernst. (1895). *The Riddle of the Universe: at the Close of the Nineteenth Century* (translator: Joseph McCabe) (anthropism, pg. 11). Harper & Brothers, 1905.

Further reading

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External links

â— Anthropic principle – Wikipedia.

θΔics

In terminology, **anthropism** is a human-centric (anthropomorphic) conceptualize ideology, tending to be of historical and or religio-mythology origin, that, often times, tend to be illusionary and or constructed on false pretext, and thereby, subsequently, "disappear from the scene" (Charles Sherrington, 1938) when physics and chemistry have entered on the description.

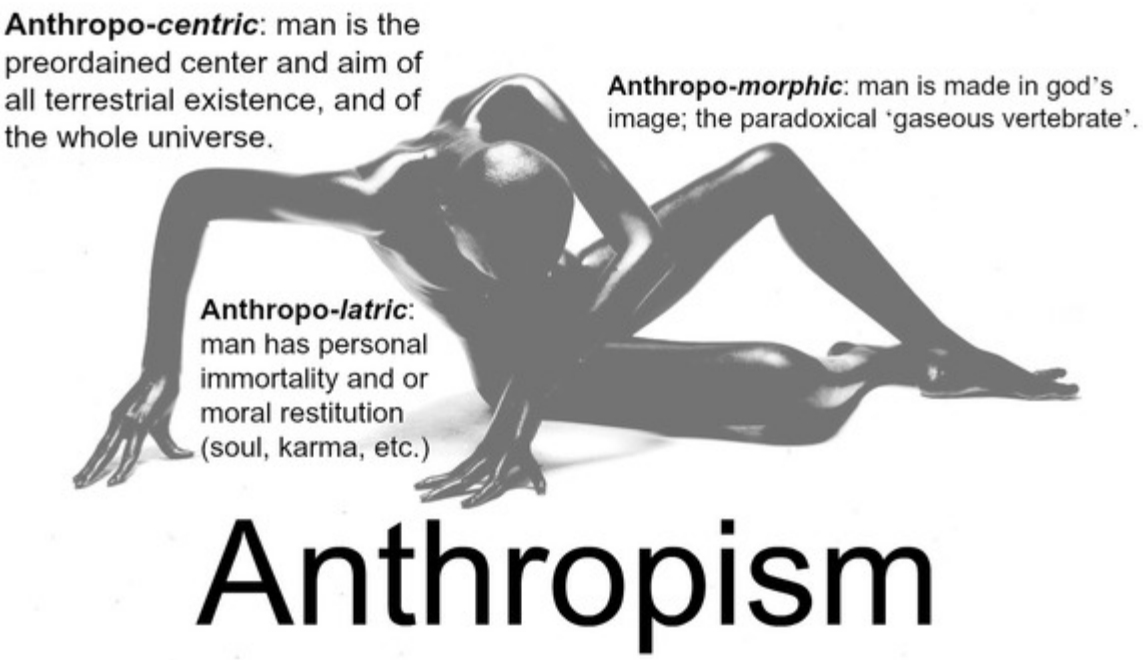

The three ingrained beliefs of **anthropism**, according to Ernst Haeckel (1899), one: anthropocentrism, belief that man is the preordained center of the universe; two: anthropomorphism, belief that man's shape is the ideal perfect form and or fashioned in the image of god; three: anthropolatrism, belief that main has personal immortality, and or that the universe operates on man's acts via some type of moral restitution principle, as conceptualized by soul or equivalent, e.g. karma (or spirit).

Haeckel

In 1899, Ernst Haeckel, in his *The Riddle of the Universe*, defined anthropism as follows:

> "**Anthropism** is that powerful and world-wide group of erroneous opinions which opposes the human organism to the whole of the rest of nature, and represents it to be the preordained end of the organic creation, an entity essentially distinct from it, a godlike being."

He then states that anthropism has three components of implicit belief, which are:

> I. The *anthropocentric* dogma culminates in the idea that man is the preordained center and aim of all terrestrial life—or, in a wider sense, of the whole universe. As this error is extremely conducive to man's interest, and as it is intimately connected with the creation-myth of the three great Mediterranean religions, and with the dogmas of the Mosaic, Christian, and Mohammedan theologies, it still dominates the greater part of the civilized world.
>
> II. The *anthropomorphic* dogma is likewise connected with the creation-myth of the three aforesaid religions, and of many others. It likens the creation and control of the world by God to the artificial creation of a talented engineer or mechanic, and to the administration of a wise ruler. God, as creator, sustainer, and ruler of the world, is thus represented after a purely human fashion in his thought and work. Hence it follows, in turn, that man is godlike. "God made man to His own image and likeness." The older, naive mythology is pure "homotheism," attributing human shape, flesh, and blood to the gods. It is more intelligible than the modern mystic theosophy that adores a personal god as an invisible—properly speaking, gaseous—being, yet makes him think, speak, and act in human fashion; it gives us the paradoxical picture of a "gaseous vertebrate."
>
> III. The *anthropolatric* dogma naturally results from this comparison of the activity of god and man; it ends in the apotheosis of the human organism. A further result is the belief in the

> personal immortality of the soul, and the dualistic dogma of the twofold nature of man, whose "immortal soul" is conceived as but the temporary inhabitant of the mortal frame. Thus these three anthropistic dogmas, variously adapted to the respective professions of the different religions, came at length to be vested with a i extraordinary importance, and proved the source of the most dangerous errors. The anthropistic view of the world which springs from them is in irreconcilable opposition to our monistic system; indeed, it is at once disproved by our new cosmological perspective.

The first two are fairly standard; the third, however, is more complex, being that Haeckel does not rightly deny the existence of the soul, but later supposedly develops some type of monism-based soul crystal theory.

Sherrington

In 1938, Charles Sherrington, in his *Man on His Nature* (1938), employed the term anthropism, as follows: [2]

> "When physics and chemistry have entered on the description, sociology disappears from the scene, it is an **'anthropism'**."
>
> "When physics and chemistry have entered on their description of the perceptible, life disappears from the scene, and consequently death. Both are **anthropisms**."

> "Our sixteenth-century Fernel viewed the body as a tenement for faculties. One faculty was that which actuated the various bodily movements. Then came Descartes with is robot [see: Cartesian automata], a mechanism actuating itself. Such too had been Descartes' thought with respect to the motions of the macrocosm. For Kepler still, a century later than Fernel, each planet was ridden by an angel. Then later with the 'reign of law' that guidance became a 'force', e.g. gravitational. Today that 'force' has in turn disappeared. There remains a curvature of space. The human mind looking at nature has had to dehumanize its point of view—it has, using Samuel Alexander's word, to 'deanthropize' itself. It has to dispense with 'causation', which is regarded as an **anthropism**, but is yet a final cause. It is more faithful to William of Occam."

(add discussion)

See also

- Anthropomorphize
- Anthropic physics
- Anthropological thermodynamics
- Chemical party
- Deanthropomorphize

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θΔics

In hmolscience, **anthropological thermodynamics**, a branch of human thermodynamics, is the cross-cultural study of human societies according to the laws of thermodynamics.

Overview

The subject of "anthropological thermodynamics", comparatively, is very marginal in its development, likely attributed to the fact that anthropologists, in generally, are not a mathematically inclined group. Most attempts in this area have been exercises to invoke the thermodynamics laws metaphorically. [1] Anthropologists, as some have noted, are attracted particularly to the second law, with its "arrow of time" as a directional progress of change, as well as the Prigoginean thermodynamics conceptions of "dissipative structures".

It was well known that, prior to the 1940s, the subject of anthropology, as a science, lacked well-developed laws with predictive powers.

In 1943, American anthropologist Leslie White published his "Energy and the Evolution of Culture", wherein he asserted the following: [4]

> "Everything in the universe may be described in terms of energy, meaning 'the capacity for doing work'. Galaxies, stars, molecules, and atoms may be regarded as organizations of energy. Living organisms may be looked upon as engines which operate by means of energy derived directly or indirectly from the sun. The civilizations, or cultures of mankind, also, may be regarded as a form or organization of energy."

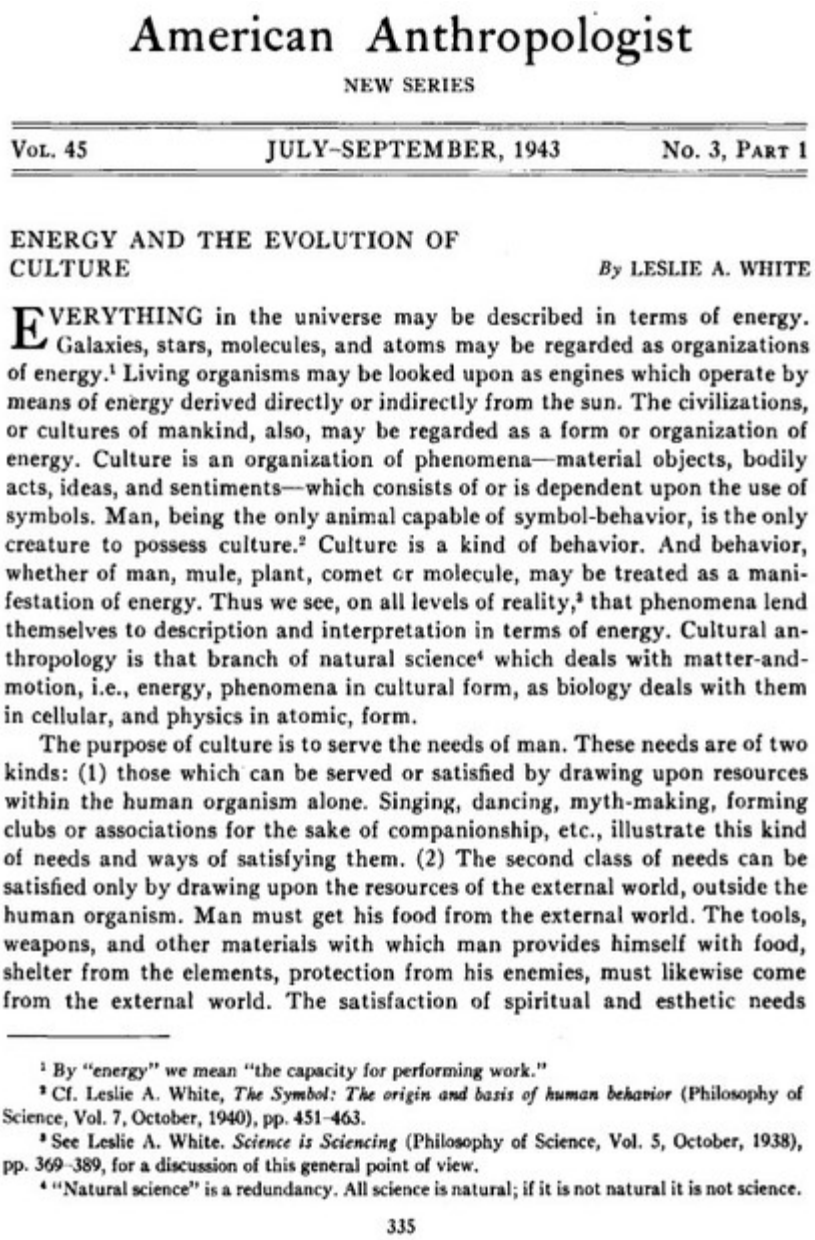

American Anthropologist

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ENERGY AND THE EVOLUTION OF CULTURE

By LESLIE A. WHITE

EVERYTHING in the universe may be described in terms of energy. Galaxies, stars, molecules, and atoms may be regarded as organizations of energy.[1] Living organisms may be looked upon as engines which operate by means of energy derived directly or indirectly from the sun. The civilizations, or cultures of mankind, also, may be regarded as a form or organization of energy. Culture is an organization of phenomena—material objects, bodily acts, ideas, and sentiments—which consists of or is dependent upon the use of symbols. Man, being the only animal capable of symbol-behavior, is the only creature to possess culture.[2] Culture is a kind of behavior. And behavior, whether of man, mule, plant, comet or molecule, may be treated as a manifestation of energy. Thus we see, on all levels of reality,[3] that phenomena lend themselves to description and interpretation in terms of energy. Cultural anthropology is that branch of natural science[4] which deals with matter-and-motion, i.e., energy, phenomena in cultural form, as biology deals with them in cellular, and physics in atomic, form.

The purpose of culture is to serve the needs of man. These needs are of two kinds: (1) those which can be served or satisfied by drawing upon resources within the human organism alone. Singing, dancing, myth-making, forming clubs or associations for the sake of companionship, etc., illustrate this kind of needs and ways of satisfying them. (2) The second class of needs can be satisfied only by drawing upon the resources of the external world, outside the human organism. Man must get his food from the external world. The tools, weapons, and other materials with which man provides himself with food, shelter from the elements, protection from his enemies, must likewise come from the external world. The satisfaction of spiritual and esthetic needs

[1] By "energy" we mean "the capacity for performing work."

[2] Cf. Leslie A. White, *The Symbol: The origin and basis of human behavior* (Philosophy of Science, Vol. 7, October, 1940), pp. 451–463.

[3] See Leslie A. White. *Science is Sciencing* (Philosophy of Science, Vol. 5, October, 1938), pp. 369–389, for a discussion of this general point of view.

[4] "Natural science" is a redundancy. All science is natural; if it is not natural it is not science.

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American anthropologist Leslie White's 1943 "Energy and the Evolution of Culture" generally marks the start of the field of **anthropological thermodynamics**, i.e. the use of energy, entropy, and or thermodynamics in general in the field of anthropology. [4]

White soon thereafter, following further publications, in 1949 and 1959, came to be known as "anthropology's most significant prophet of the second law", known for his "energy theory of cultural evolution". [2]

In the 1950s, Claude Levi-Strauss was using energy, entropy, and work ideas in anthropology.

In 1960, Hungarian-born American anthropologist Steven Polgar delivered a talk entitled "Evolution and the Thermodynamic Imperative", at a meeting of the American Association for the Advancement of Science, New York, wherein he attempted to argue that there are four processes common to organic evolution and social evolution which retard the increase of entropy on earth, which have ethical consequences, in his view; during the course of which he sites: Alfred Lotka (1945), Leslie White (1949), Walther Nernst, Arthur Eddington (1929), Erwin Schrodinger, Harold Blum (1955), and cites Joseph Needham as having resolved the dilemma in 1943 by differentiating thermodynamic order from biological organization. [1]

In 1973 to 1977, American anthropological Eugene Ruyle pioneered the science of what he termed ethnoenergetics, a precursory themed subject to human thermodynamics, arguing that labor, value, money, and capital are all forms of "ethnoenergy", defined as "somatic energy expended by the members of a population", that property is an "ethnoenergetic field", and that money is "a symbol for energy, a claim on the energy of other people." [5]

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θΔics

In science, **anthropomorphize**, or "anthropomorphism" or "anthropism", in contrast to deanthropomorphize, refers to the tendency to force human-centric conceptions, notions, and or ideals into, other non-human based sciences, one or more of the physical sciences, being a common example.

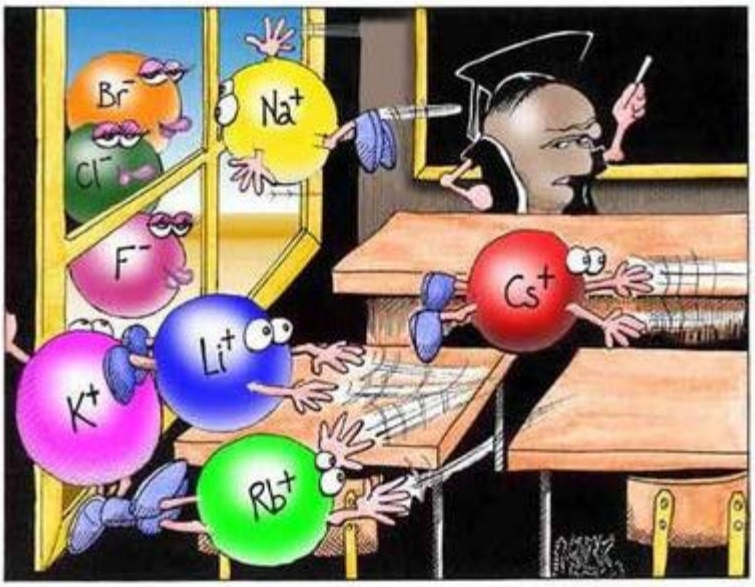

"Perhaps one of you gentlemen would mind telling me just what it is outside the window that you find so attractive...?"

A cartoon of atoms (elements) **anthropomorphized** into male and female humans, with corresponding, albeit selective sexual desires and attractions, by artist Nick Kim. [1]

Discussion

The anthropomorphize process often tends to employ the extrapolate down approach; whereas, conversely, the deanthropomorphize method tends to use the extrapolate up approach.

The anthropomorphizing approach, as compared to the deanthropomorphizing approach, is often quick to attract ridicule, from the hard scientists, such as when, for instance, a hypothetical statement such as "sodium Na+ falling in love with chlorine Cl" are made.

Conversely, many will conceded, particularly when racial separations are compared to the separation of oil and water, such as in racial thermodynamics, that there is some truth to Empedocles' ancient chemical aphorisms.

The keen insight of Goethe, from his famous anonymous attack-buffering "advertisement" to his *Elective Affinities* (see: timeline), in regards to these matters, would seem apt at this point:

> “There is, after all, only one nature.”

Prudence, it would seem, should be one's guidance in both directions, in these matters.

Chemical anthropomorphism

See main: Chemical anthropomorphism

In 1910, American science historian Fielding Garrison, noted Gibbsian biographer, commented how he believes Goethe’s chemical "anthropomorphisms", as he calls them, “seem so plausible and fascinating”, and are in some way related to American engineer Willard Gibbs’ 1876 chemical thermodynamics:

> “Suppose
> chemical

CHEMICAL ANTHROPOMORPHISM

Anthropomorphism is the attribution of human-like behavior to creatures and things that are not human. In a pet store, a clerk told a customer that the turtle he was watching with his head pulled into its shell was "shy." Sure, the turtle's head was retracted, but how did the clerk know it was shy? Maybe pulling its head in was simply a turtle-like thing to do and had no significance at all. Who knows? Turtles can't talk. But you don't have to work in a pet store to anthropomorphize. Science writers do it, too.

Consider an example close at hand. The following sentence is in this chapter. ". . . fluorine wants to grab an electron to fill its outermost orbital, and cesium is barely holding on to one in its outermost orbital." Wait a minute. Does fluorine really "want" to grab an electron? Can a fluorine atom really "want" things?

Clearly, the answer is no. Atoms and molecules are not sentient beings. They don't want anything. Well, then, why do fluorine and cesium react? The answer lies in this simple statement: All systems seek to achieve a minimum of free energy.

Cesium and fluorine react because the free energy contained in a molecule of cesium fluoride is less than the free energy of the two separate atoms. When the two elements combine, most of the energy difference is given off as heat, creating the "vigorous reaction" mentioned earlier. Most scientists and science writers know this and use anthropomorphic language sparingly. The reason they use it at all is because it is a more colorful way of making a point. "Wants to grab" is more concrete and memorable than the sleeper: Cesium and fluorine react because the reaction product has lower free energy than the reactants. But both student and writer must remember that the latter is what really drives chemical reactions.

American physical chemist Philip Manning's age 12 and up geared chapter insert section on "chemical anthropomorphism", wherein he gives in to the view that it is incorrect to speculate about the "wants" of atoms, as it is to the wants of turtles, but that all one can say in regards to such a question as "why do fluorine and cesium react?", is that because "all systems seek to achieve a minimum of free energy." [3]

substances to be represented by a number of men and women of varying degrees of strength of character and "attractiveness," and suppose the marital combinations or what Goethe called the "elective affinities" between these men and women to be determined by certain mysterious "laws." If a man strong in character should mate with a woman, weaker but otherwise "attractive," or *vice versa*, one set of observers might affirm that the union was due to the man's superior potentiality or masculinity, others might maintain that the real strength in the combination or "affinity" lay in the woman's "attractiveness"; or *vice versa.* Curiously enough, these **anthropomorphisms**, which seem so plausible and fascinating in Goethe's novel, are daily and hourly employed to explain the facts of chemical combination."

(add)

See also

â— Anthropic physics
â— Anthropological thermodynamics
â— Chemical party

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θΔics

In hmolscience, **anti-chance**, or “non-chance” based, as opposed to chance-based models, refers to the operation of the nature of things in a manner that is independent of chance.

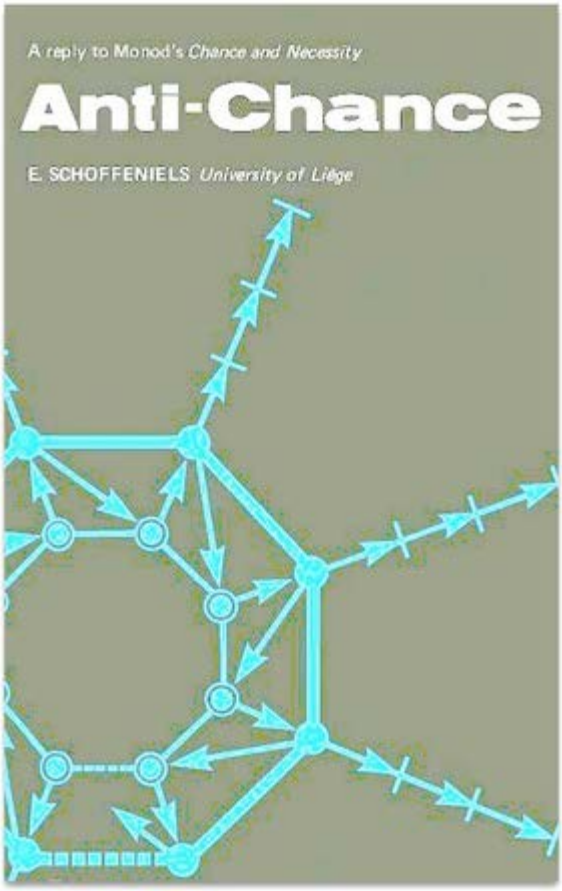

Cover to **anti-chance** philosopher Ernest Schoffeniels’s 1973 *Anti-Chance: a Reply to Monod’s Chance and Necessity*, where he refutes the chance-based views of Jacques Monod and his *Chance and Necessity* (1970). [6]

Overview

In c.455BC, Empedocles introduced his four element and two force model of things according to which the regular laws of nature govern the behavior of all the components of the world. His model, retrospectively, is deemed to not invoke what chance events. [8] There are, however, usages of the term "τύχης", variously translated as luck, fortune, or chance in some fragments:

> “Thus, by the will of “**τύχης**” (luck, fortune, chance), all things have thought.”
>
> — Empedocles (c.455BC), Fragment I95 / DK103

Latter commentary by Aristotle (*Physics* 2.8), on Empedocles' theory of the formation of animals, also, supposedly, paint on a chance varnish to Empedocles' theories.

In c.1675, Benedict Spinoza objected to the deeply ingrained Greek atomic theory chance-based models of existence, wherein, previously, ever thing was deemed a result of a "fortuitous concourse of atoms", as follows:

> “**Nothing in nature is by chance**. Something appears to be chance only because of our lack of knowledge.”
>
> — Benedict Spinoza (c.1675); *Publication* (Q); cited (Q) by Heinz-Otto Pietgen in *Baustein des Chaos* (1992)

In c.1705, Isaac Newton, in his “A Short Schematic of the True Religion” (see: Newton on god), stated his reasons for objecting to atheism as follows: [7]

> “Opposite to the first is atheism in profession and idolatry in practice. Atheism is so senseless and odious to mankind that it never had many professors. Can it be by ‘accident’ that all birds beasts and men have their right side and left side alike shaped (except in their bowels) and just two eyes and no more on either side the face and just two ears on either side the head and a nose with two holes and no more between the eyes and one mouth under the nose and either two fore legs or two wings or two arms on the shoulders and two legs on the hips one on either side and no more? Whence arises this uniformity in all their outward shapes but from the counsel and contrivance of an author? Whence is it that the eyes of all sorts of living creatures are transparent to the very bottom and the only transparent members in the body, having on the outside a hard-transparent skin, and within transparent juices with a crystalline lens in the middle and a pupil before the Lens all of them so truly shaped and fitted for vision, that no artist can mend them? Did ‘blind chance’ know that there was light and what was its refraction and fit the eyes of all creatures after the most curious manner to make use of it? These and such like considerations always have and ever will prevail with mankind to believe that there is a being who made all things and has all things in his power and who is therefore to be feared.”

In c.1745, Denis Diderot, in his *Philosophical Thoughts*, juxtaposed chance, god, and nature as the three choices of operation of the universe, as follows:

> "We do not know nature at all; causes hidden deep within her may have produced everything. Look in your turn at Trembley's polyp! Does it not contain inside it the causes of its own regeneration? Why then would it be absurd to believe that there exist physical causes for which everything was made and to which the whole chain of this vast universe is so necessarily linked and subordinated that nothing that happens could not have happened; that it is our absolutely invincible ignorance of these causes that has made us look to a god, who is not even a being of reason, according to some? Thus, destroying chance does not mean proving the existence of a supreme being, for **there may be something else which is neither *chance* nor *god***; I mean 'nature', the study of which can as a result only produce unbelievers, as is proved by the manner of thinking of all its most successful observers."
>
> — Denis Diderot (c.1745), *Philosophical Thoughts*; cited by Julien la Mettrie (1747) in *Man: a Machine* (pg. 24)

In 1770, Baron d'Holbach, in his §4: "Of the Laws of Motion common to all the Beings of Nature—of Attraction and Repulsion—of Inert Force—of Necessity", stated the following very-ripe anti-chance (or non-chance) view of a dust storm and a political revolution: [1]

> "Two examples will serve to throw the principle here laid down, into light—one shall be taken from **physics**, the other from **morals**. In a whirlwind of dust, raised by elemental force, confused as it appears to our eyes, in the most frightful tempest excited by contrary winds, when the waves roll high as mountains, **there is NOT a single particle of dust, or drop of water, that has been placed by 'chance'**, that has not a cause for occupying the place where it is found; that does not, in the most rigorous sense of the word, act after the manner in which it ought to act; that is, according to its own peculiar essence, and that of the beings from whom it receives this communicated force. A **geometrician exactly knew the different energies acting in each case**, with the properties of the particles moved, could demonstrate that after the causes given, each particle acted precisely as it ought to act, and that it could not have acted otherwise than it did.
>
> In those terrible convulsions that sometimes agitate political societies, shake their foundations, and frequently produce the overthrow of an empire; there is not a single action, a single word, a single thought, a single will, a single passion in the agents, whether they act as destroyers, or as victims, that is not the necessary result of the causes operating; that does not act, as, of necessity, it must act, from the peculiar essence of the beings who give the impulse, and that of the agents who receive it, according to the situation these agents fill in the moral whirlwind. This could be evidently proved by an understanding capacitated to rate all the action and re-action, of the minds and bodies of those who contributed to the revolution."

Here, to clarify, firstly we see Holbach explicitly jettisoning the Greek chance-based version of atomic theory.

In 1771, Goethe, and his college friends (see: Goethe's circle), which eventually included Friedrich Schiller, read Holbach's *System of Nature*. The view of "non-chance", in Goethe's writings, according to Bernhard Kuhn (2013), is captured, in part, throughout his *Poetry and Truth*, in what he refers to as the "daemonic" (see: Goethe's daimonic), a type of force like chance, but not chance: (O)

> "I perceived something in nature (whether living or lifeless, animate or inanimate) that manifested itself only in contradictions and therefore could not be expressed in any concept, much less any word. It was not divine, for it seemed irrational; not human, for it had no intelligence; not diabolical, for it was beneficent; and not angelic, for it often betrayed malice. It was like **chance**, for it laced continuity, and like providence,

for it suggested context. Everything that limits us seemed penetrable by it, and it appeared to dispose at will over the elements necessary to our existence, to contract time and expand space. It seemed only to accept the impossible and scornfully to reject the possible."

In c.1795, Friedrich Schiller, like Goethe, stated his non-chance view of things as follows:

"**There is no such thing as chance**; and what seem to us merest accident springs from the deepest source of destiny."

— Friedrich Schiller (c.1795), Ranker.com (Q)

In 1855, Ludwig Buchner, in his *Force and Matter*, stated the following:

"What we still designate as 'chance', merely depends on a concatenation of circumstances, the internal connection and final causes of which we have as yet been unable to unravel."

— Ludwig Buchner (1855), *Force and Matter* (15th ed) (pg. 226) (Q) (see: anti-chance)

In 1926, Albert Einstein, who had read Buchner's *Force and Matter* at age 13, also a Goethe-Spinoza proselyte, in a letter to German physicist Max Born, about quantum mechanics, commented the following: [4]

"Quantum mechanics is certainly imposing. But an inner voice tells me that it is not yet the real thing. The theory says a lot, but does not really bring us any closer to the secret of the "old one." I, at any rate, am convinced that ***he* does not throw dice**."

In 1943, Einstein, in conversation with biographer William Hermann, concerning what is real and exists versus what is but mental constructs, stated the following: [5]

"**Nature doesn't know chance**, it operates on mathematical principles. As I have said so many times, **god doesn't play dice with the world**."

In 1973, Ernest Schoffeniels (1927-1992), a French physician and "comparative biochemist" (Q), in his *Anti-Chance: a Reply to Monod's Chance and Necessity*, refuted the chance-based views of Jacques Monod, as presented in his *Chance and Necessity* (1970); the following is a representative excerpt: [6]

"When Schrodinger wrote that biological systems feed on negative entropy he meant to say therefore that their existence depends upon a continual increase in the entropy of the environment. This concept has been proposed at a time when bioenergetics being still in its infancy, the reconciliation of the second principle and the biological fact was reached with difficulty. An organism feeds not on negative entropy, but on energy which permits it to maintain its entropy constant and eventually even to decrease. Since the whole process represents an apparent violation of the fundamental rule of the increase in entropy, the overall appearance is of a consumption of a hypothetical negative entropy supplied by the environment. This is **toying with words** (always this fascination with words!) representing the **state of ignorance** within which

the biologist and the physicist debated at the end of the Second World War. It is thanks to the work of Meyerhof and especially of Lipmann that the notion of coupling has been defined and that finally a little light has been thrown on the subject of transducers characteristic of the biological systems. If we do not know in their finest detail all the phenomena of coupling, we have nevertheless a very satisfactory view of the mechanism leading to the transformation of chemical energy into mechanical work (muscular contraction), light (bioluminescence) and into osmotic work (active transport of ions), etc. Also the transformation of radiant energy of the sun into sugars (photosynthesis) is generally speaking well understood."

In 1995, Adrian Bejan, while attending an international conference on thermodynamics in Nancy, France, listened to a pre-banquet speech by Ilya Prigogine, who asserted that the various tree-shaped structures in nature, e.g. river basins, river deltas, air passages, or lightning bolts, such as shown below, were aleatoires, i.e. "random" (Q), the results of throwing dice, cosmic coincidences.

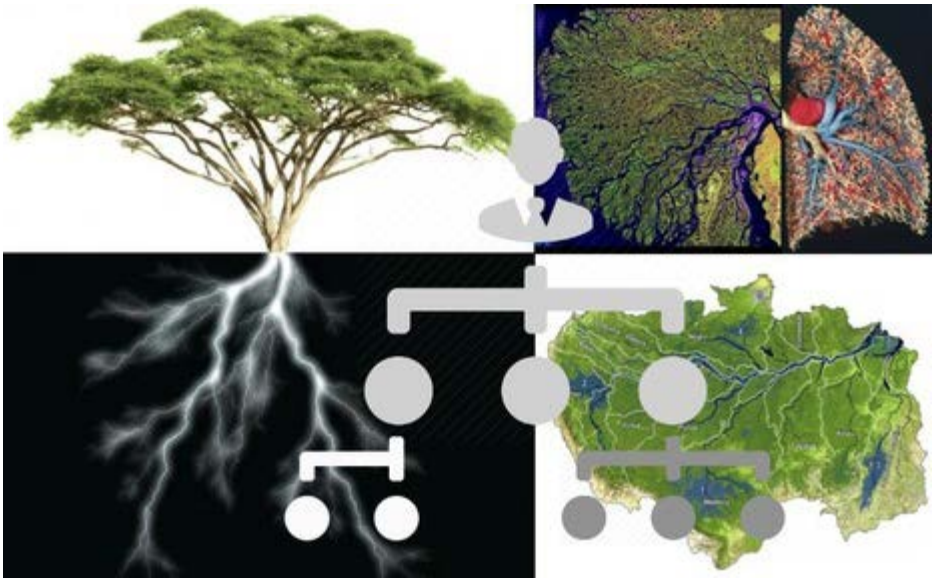

In 2012, Adrian Bejan, in opposition to the views of Ilya Prigogine (1995), stated his belief that the world and its formation, e.g. trees, lungs, etc., is **non-chance** based process. [3]

In 2012, Bejan, in his atheism-implicit *Design in Nature*, commented retrospectively on this: [3]

> "When [Prigogine] made that statement, something clicked, the penny dropped. I knew that Prigogine, and everyone else, was wrong. **They weren't blind**; the similarities among these treelike structures are clear to the naked eye. What they couldn't see was the scientific principle that governs the design of these diverse phenomena. In a flash, I realized that **the world was not formed by random accidents, chance**, and fate but that behind the dizzying diversity is a seamless stream of predictable patterns."

(add)

Mean IQ

The mean IQ of anti-chance based philosophers, based on the following 9 thinkers, with established IQ citations, namely: Spinoza (185|#53), Newton (220|#2), Holbach (190|#31), Goethe (225|#1), Schiller (185|#68), Buchner (190|#35), Einstein (215|#3), Lotka (185|#78), and Henderson (180|#104), as of Mar 2018, is: **197|#41**.

Quotes

The following are related quotes:

> "Who could be so sottish as to think all those things [e.g. flying mechanism of insects] the productions of 'chance'?"
>
> — Robert Hooke (1665), *Micrographia* (pgs. 171-72); cited by Stephen Inwood (2002) in *The Man Who Knew Too Much* (pg. 73)

"The word 'chance' expresses only our ignorance of the causes of the phenomena we see happen and succeed each other without any apparent order."

— Pierre Laplace (1782), *Publication*; cited by Ernest Schoffeniels in *Anti-Chance* (pg. v)

"We do not know, moreover, that the word 'chance' expresses only our ignorance of causes."

— Jean Lamarck (c.1800), *Publication*; cited by Ernest Schoffeniels in *Anti-Chance* (pg. v)

"My theology is a simple muddle. **I cannot look at the universe as the result of 'blind chance'**, yet I can see NO evidence of a beneficent design, or indeed or design of any kind."

— Charles Darwin (1870), "Letter to Joseph Hooker" (Q), Jul 12

"Matter and energy have an original property, assuredly **not by chance**, which organizes the universe in space and time."

— Lawrence Henderson (1913), *The Fitness of the Environment* [7]

"Problems of evolution are in large measure problems of probabilities, statistical problems. Incidentally, this reflection disposes of the rather foolish objection sometimes raised against the theory of evolution, that it ascribes the course of events in an evolving system to **chance**. When we describe a phenomenon as being governed by chance, we do not, of course, mean that there are no definite causes (determining factors) at work; we merely state in these terms that the causes are complex and not known to us in detail."

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 25)

"I do not feel that I am the product of chance, a speck of dust in the universe."

— Jean-Paul Sartre (1980), deathbed conversation with Pierre Victor

See also

- Atheism types by denial and belief

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θΔics

In hmolscience, **anti-entropy** is a loose term associated with effects or processes opposite that of entropy, namely order, organization, and improbability as opposed to that of disorder, disorganization and probability; expressing the ascending primacy of life (powered CHNOPS+ matter) over entropy, where life is defined as a kind of anti-entropic or negative entropy process. [1]

Overview

In 1951, French religion-reconciling physical chemist Pierre Teilhard, in his "The Transformation, starting with Man, of the Process of Evolution", dedicated to Julian Huxley, stated the following: [2]

> "**Anti-entropy** is an effect of changes that are seized, draws a portion of matter in the direction of continually higher forms of structurization and centration."

In 1967, or thereafter, this particular terminology, often considered a post-Teilhardian expression, in that it was used significantly employe in the peculiar venacular of Teilhard, had become common. [1]

In 1974, Belgian physician and cellular biologist Albert Claude, in his Nobel Lecture, stated the following, now popularly requoted statement: [3]

> "Life, this **anti-entropy**, ceaselessly reloaded with energy, is a climbing force, toward order amidst chaos, toward light, among the darkness of the indefinite, toward the mystic dream of love, between the fire which devours itself and the silence of the cold. Such a nature does not accept abdication, nor skepticism."

(add discussion)

Difficulties

> *See main: Anti-entropy difficulties*

The difficulties with "anti-entropy", as with all entropy antonyms, is that the tendency towards entropy increase in systems, does not translate into the tendency towards chaos or disorder increase in evolution and social terms, but rather into the quantifiable measure of "transformation content" increase or increase in the "equivalence value of all uncompensated transformations", in the original words of Clausius; which has to do with the concluding supposition that entropy can't be reversed—or in now-defunct Lavoisier-speak that caloric is not conserved when a body returns to its original state following a cyclical process of heat expansion and cooling contraction. The translation of entropy increase tendency to evolutionary social concerns is that when entropy reaches a maximum, free energy will reach a minimum, equilibrium will be reached, and the process will therein cease to go in the forward direction; which, in respect to the molecular structures involved, e.g. a given human or social structure, in a given state, translates to the quantifiable meaning that each bound state atomic geometry, e.g. Jack or Jill, America or Russia, etc., at the bottom or top of the hill, will have a different free energy of formation in each specific state of existence, as are, by standard methodology, tabulated on free energy tables.

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Lecture, Dec 12.
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Further reading

â— Bailly, Francis and Longo, Guiseppe. (2009). "Biological Organization and Anti-Entropy." *Journal of Biological Systems*, Vol. 17, No. 1.

θΔics

In hmolscience, **anti-entropy difficulties** refers to the confusions associated with the conceptual understanding of entropy in respect to order, disorder, complexity, evolution, and social phenomena—the gist of which being that people tend to associate “entropy” with disorder and “entropy increase” with increase in disorder or chaos, and therein posit numerous types of theoretical entropy antonyms, in attempts at quick fix of the apparent confusion; which generally traces to Hermann Helmholtz’s 1882 statement (Ñº) that the magnitude of entropy |S| can be equated with disorder.

Overview

The difficulties with all entropy antonyms, e.g. "anti-entropy", is that the tendency towards entropy increase in systems, does not translate into the tendency towards chaos or disorder increase in evolution and social terms, but rather into the quantifiable measure of “transformation content” increase or increase in the “equivalence value of all uncompensated transformations”, in the original words of Clausius; which has to do with the concluding supposition that entropy can’t be reversed—or in now-defunct Lavoisier-speak that caloric is not conserved when a body returns to its original state following a cyclical process of heat expansion and cooling contraction. The translation of entropy increase tendency to evolutionary social concerns is that when entropy reaches a maximum, free energy will reach a minimum, equilibrium will be reached, and the process will therein cease to go in the forward direction; which, in respect to the molecular structures involved, e.g. a given human or social structure, in a given state, translates to the quantifiable meaning that each bound state atomic geometry, e.g. Jack or Jill, America or Russia, etc., at the bottom or top of the hill, will have a different free energy of formation in each specific state of existence, as are, by standard methodology, tabulated on free energy tables.

θΔics

In terminology, **anti-interdisciplinarity**, or the "disciplinarity fragmentation issue", as opposed to interdisciplinarity, refers to a philosophy, held by anti-interdisciplinaritists (some of whom may also be anti-reductionists), aka "splitters", e.g. Francis Collins or Philip Anderson, as opposed to interdisciplinaritists (some of whom may also be reductionists), aka "lumpers", e.g. Josip Stepanic or Gheorghe Savoiu, as Harold Morowitz (1979) classified things, who believe that different disciplines, such as sociology and thermodynamics, i.e. socio-thermodynamics, or sociology and biology, i.e. sociobiology, should be kept apart in their special "disciplines"; Richard Lewontin's *Not in Our Genes* (1984), wherein the sociobiology of Edward Wilson and Richard Dawkins is criticized (Q), supposedly, being one example of a pro anti-interdisciplinarity position. [1]

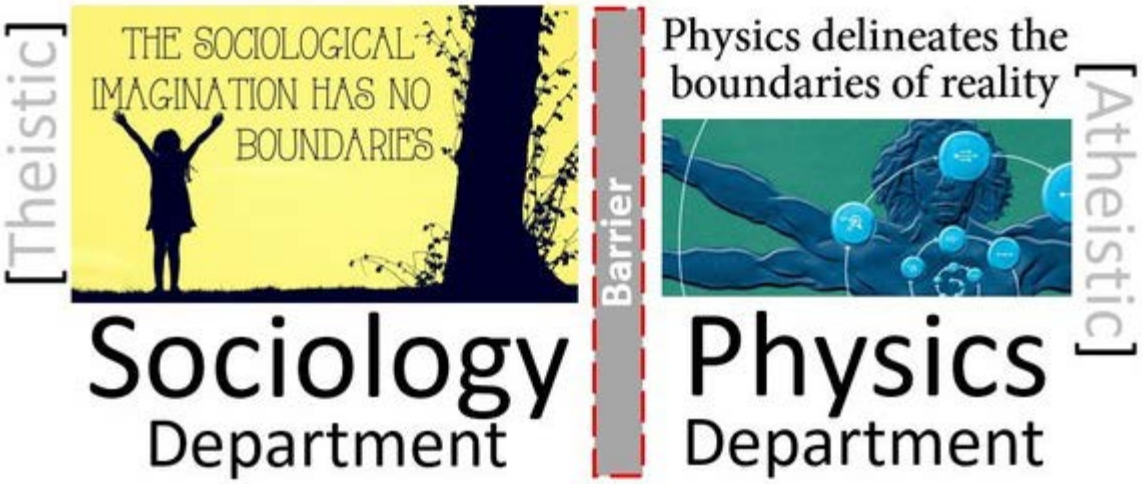

Left: a banner (Q) for the William Paterson Sociology Department. Right: a generic Physics Department banner. The former tends to be overtly secular, albeit theistically implicit, whereas the latter is secularly-neutral and implicitly atheistic. This is the underlying reason for **anti-interdisciplinarity**, in large part

Overview

In 1979, Harold Morowitz, in his "Splitters and Lumpers" essay, famously stated things as follows: [2]

> "The terms 'splitters' and 'lumpers' come from taxonomy, where the classifiers were separated into those who liked to create new taxa because of small differences and those who preferred to coalesce categories because of similarities. The concept has found wider applicability as knowledge in all fields expands. Specialists are confined to ever-narrowing domains while generalists survey the immensity of information in an effort, one hopes, to find higher orders of structure. It is clear that in the university and intellectual community ... the splitters are in command and the lumpers are in serious disarray, unable to keep up with the output of printouts that are generated in such a variety of ways. It is saddening to witness the loss of status of those engaged in integrative thought, for one sees in it the fragmentation of scientific and humanistic disciplines."

(add discussion)

Quotes

The following are example quotes:

> "When Francis Collins, splitter extraordinaire, was put in charge of the whole NIH, the entire gene story became a recital of reductionism gone berserk. Long live us lumpers. Beware of splitters."
>
> — Walter Bortz (2013), "Dare to be 100: Splitters and Lumpers

References

1. Bortz, Walter M. (2013). "Dare to be 100: Splitters and Lumpers" (Q), Blog, Huffington Post, Feb 11.
2. Morowitz, Harold. (1979). "Splitters and Lumpers" (Q), in: *The Wine of Life and Other Essays on Society, Energy &*

Living Things. St. Martins.

θΔics

In isms, **anti-reductionism**, aka “holists” or “emergentists”, as compared to reductionism, is the view that various subjects, concepts, and phenomena, generally biological (chnopsological) and or humanities centric phenomena, cannot be "reduced" down to pure physics and chemistry.

Anti-reductionists will often tend to hold to the unbridgeable gap model. Anti-reductionists will often tend to posit the existence of higher laws, e.g. "biotic laws", unique to humans or living systems (chnopsological systems).

Anti-reductionists

One of the first noted anti-reductionists was Italian philosopher Giambattista Vico who in the early 18th century was anti-Cartesian in the sense that he conceived that to reduce human affairs to geometrical methods was madness (or would make one go mad), or something along these lines.

The following are recent noted anti-reductionists: Walter Elsasser (1955), Eugene Wigner (1967), Arthur Koestler (1964), Michael Polanyi (1967), Lila Gatlin (1972), Philip Mirowski (1988), Robert Rosen (1991), David Chalmers (1995), Alicia Juarrero (1999), and John Eccles, among others.

Hungarian-born English physical chemist Michael Polanyi’s 1967 **anti-reductionism** cover story article “Life Transcending Physics and Chemistry”, wherein he uses information theory to argue that quantum mechanics is inadequate to explain life; cover shows an “artist's statement that form and function of a biological system (a flower) *cannot* be explained by the laws governing its parts.” [1]

Overview

In 1964, Floyd W. Matson, in his *The Broken Image: Man, Science and Society*, platforms around Niels Bohr’s complementarity principle, as a type of ontic opening polemic, to argue that a whole frog is a whole frog, about which physical and chemical reduction can tell us nothing. [9]

Spokespersons for anti-reductionism view, according to Lila Gatlin (which seems to be her inclination), are physicists Walter Elsasser (*The Physical Foundation of Biology*, 1955; “The Atom and the Organism”, 1966) and Eugene Wigner (*Symmetries and Reflections*, 1967) who supposedly find difficulty with the view that living systems obey the fundamental laws of chemistry and physics (in particular quantum mechanical laws) and go on to postulate the existence of higher “biotoic laws” said to govern living systems. [2]

Hungarian-born English physical chemist Michael Polanyi, in his 1967 *Chemical & Engineering News* cover story article “Life Transcending Physics and Chemistry”, shown adjacent, uses information theory (see: Shannon bandwagon) in an attempt to argue that quantum mechanics is inadequate to explain life (see: defunct theory of life)—stating that: [2]

> “All objects conveying information are **irreducible** to the terms of physics and chemistry.”

Polanyi’s article is abstracted as follows: [1]

> “When I say that life transcends physics and chemistry, I mean that biology **cannot** explain life in our age by the current workings of physical and chemical laws.”

(add)

Chaos theory

In 1990, James Gleick stated the following: [7]

> "Chaos is **anti-reductionist**. This new science makes a strong claim about the world: namely, that when it comes to the most interesting questions, questions about the order and disorder, decay and creativity, pattern formation and life itself, the whole cannot be explained in terms of the parts."

Reductionist Steven Weinberg, naturally enough, has taken objection to this assertion. [8]

Nonreductive consciousness

Australian philosopher David Chalmers is a noted anti-reductionist in regards to consciousness. [3] In his 1995 article "Facing Up to the Problem of Consciousness", argues that there is no way to reduce experiential qualities to physical processes, the truncated synopsis of his views being as follows: [4]

> "No mere account of the physical process will tell us why experience arises. The emergence of experience goes beyond what can be derived from physical theory. I argue that if we move to a new kind of **nonreductive** explanation, a naturalistic account of consciousness can be given. I put forward my own candidate for such an account: a nonreductive theory based on principles of structural coherence and organizational invariance and a double-aspect view of information"

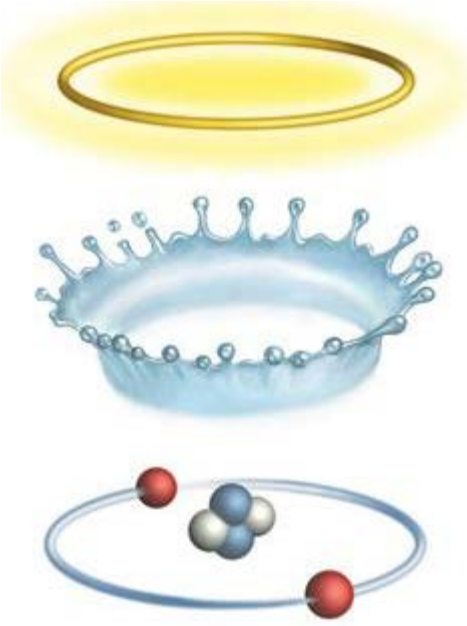

An image of emergence—i.e. that emergent properties, wetness, "emerge" at the holism or system level, that cannot be explained by looking at reductive atomic methods—often used as a tool, along with self-organization, by **anti-reductionists** to bring, using evasive and subtle methods, spirituality and religion back into science or nature. [6]

In both the Chalmers and Polanyi examples we see recourse to the use of the Shannon bandwagon/Sokal affair models of information to argue for anti-reductionism.

Australian neurophysiologist John Eccles, according to Chalmers, supposedly, held the view that consciousness is not reducible to physics. [5]

Quotes

The following are related quotes:

> "At its nuttiest extreme are those with holistics in their heads, those whose reaction to reductionism takes the form of a belief in psychic energies, life forces that cannot be described in terms of the ordinary laws of inanimate nature."
>
> — Steven Weinberg (1992), *Dreams of a Final Theory* [8]

> "Here's a Philosophy TV dialogue (Ñº) between John Dupre (left) and Alex Rosenberg (right). They are both physicalists — the believe that the world is described by material things (or fermions and bosons, if you want to be more specific) and nothing else. But Dupre is an **anti-reductionist**, which is apparently the majority view among philosophers these days. Rosenberg holds out for reductionism, and seems to me to do a pretty good job at it."
>
> — Sean Carroll (2010), "Physicalist Anti-Reductionism" (Ñº), Nov 3

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(b) Weinberg, Steven. (1992). Weinberg, Steven. (1992). *Dreams of a Final Theory: the Scientist’s Search for the Ultimate Laws of Nature* (pg. 60). Random House.
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(b) Anderson, Robert. (1965). “Review: *The Broken Image*” (pdf), *American Anthropologist*, 67(1):195-97.

External links

â— Antireductionism – Wikipedia.

θΔics

In atheism terminology, **anti-theism**, or an ‘anti-theist’, refers to []

Quotes

The following are related quotes:

> “I'm not even an atheist so much as I am an **antitheist**; I not only maintain that all religions are versions of the same untruth, but I hold that the influence of churches, and the effect of religious belief, is positively harmful.”
>
> — Christopher Hitchens (2001), *Letters to a Young Contrarian* (Ñº)

> “I am more of an ‘**anti-theist**’, than an ‘atheist’. In other words, my view is not just that there is no reason to believe that there is a deity, and all the arguments that there is one, have all long since been ‘exploded’ by philosophers, astronomers, scientists, physicists, biologists, and so forth, mainly by philosophers though, but that **it’s a ‘good’ thing that it’s not the case** [that there is a god]. In other words, I do know some non-believers that ‘wish it was true’, who think it would be nice if there was a celestial dictatorship. I cannot want to make myself want there to be a celestial dictatorship. I think it would be the absolute definition of unfreedom, if there was an unchanging, undying, all-knowing father, who kept you under surveillance, before you were born, all your life, and after you were dead.”
>
> — Christopher Hitchens (2009), “Interview Response” (to statement, by host Jian Ghomeshi, that Hitchens is a ‘renowned atheist’) (Ñº), Q on CBC, YouTube, Sep 21

External links

â— Antitheism – Wikipedia.

θΔics

In philosophical thermodynamics, **antientropism**, the opposite of entropism is associated with the study of good. [1] In this sense, as found in several of the publications of Keith Ferreira, antientropism is considered as the philosophical study of what is good or acts of goodness. [2]

References

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2. Ferreira, Keith N. (2003). *Intellectual Jazz II*, (pg. 83). iUniverse.

θΔics

In science, **antireductionism** (newer term) or "anti-reductionism" (older term), as compared to reductionism (or ultra-reductionism), refers to []

Overview

In 1972, In 1972, American biophysicist Lila Gatlin referred to the spokespersons for anti-reductionism view as physicists Walter Elsasser (*The Physical Foundation of Biology*, 1955; "The Atom and the Organism", 1966) and Eugene Wigner (*Symmetries and Reflections*, 1967) who supposedly find difficulty with the view that living systems obey the fundamental laws of chemistry and physics (in particular quantum mechanical laws) and go on to postulate the existence of higher "biotoic laws" said to govern living systems. [1]

Quotes

The following are related quotes:

> "I don't think you can relegate something as complex as human behavior to physics."
>
> — Kent Klitgaard (2016), opening BPE 2016 talk (O) statement (0:21)

See also

- Unbridgeable gap
- Reductionist anti-reductionist debate

References

1. Gatlin, Lila L. (1972). *Information Theory and the Living System* (pgs. 14-). Columbia University Press.

External links

- Antireductionism – Wikipedia.

θΔics

In war thermodynamics, **Antoine Bousquet** (c.1974-) is an English complexity theory economist noted for his 2008 book *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity*, in which he devotes chapter three to what he calls "thermodynamic warfare", writing on art of war thinkers such as Carl Clausewitz. [1]

References

1. Bousquet, Antoine. (2008). *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity* (ch. 3: Thermodynamic Warfare and the Science of Energy, pgs. 63-92). Columbia University Press.

External links

â— Antoine Bousquet (faculty) – Department of Politics, University of London.
â— Antoine Bousquet – BBK.Academia.edu.
â— Bousquet, Antoine J. – WorldCat Identities.

θΔics

In existographies, **Antoine Lavoisier** (1743-1794) (IQ:180|#94) (Cattell 1000:393) [RGM:285|1,500+] (Murray 4000:5|CS / 1|C) (Gottlieb 1000:67) (Partington 50:5) (GCE:2) (CR:157) was French chemist, botanist, and economist noted for for his caloric theory, in which heat was hypothesized to be a fluid-like indestructible mass-less particle, called caloric, capable of causing expansion in bodies. This theory was developed in refutation of the older "phlogiston theory", outlined in 1718 by German chemist Georg Stahl, in which heat was was hypothesized to be a fire-like element, having mass, called "phlogiston" that was contained within combustible bodies and released during combustion. [1]

Overview

Between 1768 and 1787, Lavoisier published over sixty papers leading to his theory of combustion. [3] His caloric theory of combustion found its way to the physicists of the world principally through the famous publication of this 1789 textbook *Elements of Chemistry.* [4] The heat-expansion work and theories of Dutch physician and chemist Herman Boerhaave, who previously in 1732 had written an influential chemist textbook titled *Elements of Chemistry,* were influential to Lavoisier.

Heat

Lavoisier was also key player in the early development of the science of thermochemistry, particularly for the 1782 construction and use of an ice-calorimeter, which together with French mathematician Pierre Laplace was used to determine the heat released in combustion reactions. He is also considered as one of the founders of modern chemistry, known for his experimental work on compounds, explanation of combustion, and help in devising a system of chemical nomenclature.

In 1783, Lavoisier, together with Pierre Laplace, in their *Memoir on Heat*, asserted the following propositions:

> "The conservation of 'free heat', in the simple mixture of bodies, is thus independent of all hypotheses no the nature of heat."
>
> — Antoine Lavoisier (1783), *Memoir on Heat* (co-author: Pierre Laplace) [9]

> "If in a combination or in any change of state whatsoever there is a decrease of free heat, this heat reappears entirely when the substances return to their original state."
>
> — Antoine Lavoisier (1783), *Memoir on Heat* (co-author: Pierre Laplace) [9]

> "All variations in heat, real or apparent, which a system of bodies undergoes in changing state are reproduced in inverse order when the system returns to its first state."
>
> — Antoine Lavoisier (1783), *Memoir on Heat* (co-author: Pierre Laplace) [9]

One of the first chemists to adopt Lavoisier's theories was Scottish chemist Joseph Black who taught them as early as 1784. [2]

Elective affinity | Reactions

The force or energies or attractions and repulsions of "elective affinities" were for Lavoisier , as American historian Peter Reill summarizes, the "governing" factor for all reactions: [7]

> "Elective affinities, in Lavoisier's eyes, governed all chemical reactions, from the simplest to the most complex. For him, the physical universe was teeming with continuous combinations and reductions."

The permutations for all such reactions, according to Lavoisier were based upon a minimum of three participants:

> oxygen base + caloric
> other base + caloric + inciting caloric

of varying intensities and proclivities. Lavoisier described his reaction model as follows: [7]

> "[In any chemical equation] we must take into consideration the nature of the elements which enter into composition, the different affinities which the particles of these elements exert upon each other, and the affinity which the caloric possesses with them."

Rather than undermining the logic of elective affinity, as Reill summarizes, Lavoisier placed elective affinities on an even sounder footing than before.

Combustion theory

In 1780, Lavoisier introduced the combustion theory of animal heat.

Reaction energies

In 1782, Lavoisier discussed his views on the nature of the energies and forces involved in the dissolution of metals in acids, such as in the process of dissolving a metal in nitric acid. In commentary on the subject of "energies" of reaction, he states: [5]

> "To know the energies of all these forces, to succeed in giving them numerical values, to calculate them, that is the goal which chemistry ought to propose to itself. Chemistry advances slowly, but it is not impossible that it may reach the goal. Meanwhile we are obliged to content ourselves with general considerations … I only hope that the reader of this memoir will apprehend the possibility of some day applying exact calculations to chemistry. But, before all, certain data must be obtained which will serve as a foundation, and it is to that subject I mean to devote myself."

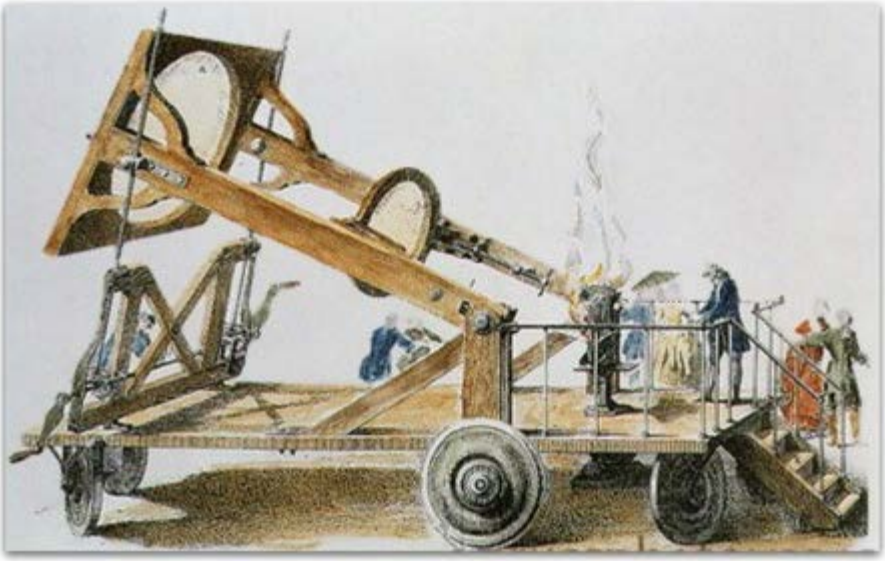

Lavoisier shown conducting experiments in the 1770s with his solar furnace, an instrument that focused the heat of the sun using lenses which had a diameter of up to 1.32 meters. The lenses were made from curved sheets of glass with the internal space filled by vinegar. This furnace was intended to replace the need for fuel in experiments that needed heat, because of concerns about contamination from the fuel's combustion products. In one experiment, Lavoisier used the furnace to burn diamond in air in a glass jar. By analyzing the combustion products he was able to show that diamond was comprised solely of carbon. [1]

It was at least hundred-years before this goal began to be realized; specifically, with the development of the science of chemical thermodynamics, beginning in the 1870s, various physicists and chemists soon began to give insight into some of the numerical values of the types of energies involved in chemical reaction; such as: internal energy, entropy,

enthalpy, free energy, activation energy, bond energy, etc.

Thermodynamics

In 1823, French physicist Sadi Carnot used Lavoisier's conception of caloric to outline a generalized theory of heat-engines, or of the production of motion by heat. In Carnot's theory, the production of motion by heat was due to the need of bodies in contact to "re-establish equilibrium in the caloric", such that the fall of the caloric from a hot body, through an intermediate substance, e.g. steam, to a colder body, thus causing expansion (and later contraction) in the "working substance", was the drive or impelling power of the heat engine.

The subtle erroneous assumption implied in this theory is that in the cycle of the heat engine, in which (a) caloric particles are added to the working substance, (b) the working substance expands, (c) caloric particles are removed from the working substance, and (d) the body contracts to its original state, that "no permanent change occurs in the condition of the working body".

In the late 1840s, German physicist Rudolf Clausius became aware of Carnot's theory, through the work of French physicist Émile Clapeyron and English physicist William Thomson, and set out to amend Carnot's assumption that the condition of the body never changes with the newer logic of the theory of heat in which heat is considered as the energy related to the vibratory motion or kinetic movement of particles, along with the mechanical equivalent of heat, in which the production of work by heat and heat by work are proportional, and thus, subsequently, a portion of heat is consumed by the particles of the working body as they act on each other in a cycle in an irreversible manner. As such, according to Clausius, the condition of the working body does change, and this change shows itself as a consumption of heat in the constituency of the working body as particles act or work on each other in an irreversible manner.

A photo (Ñº) of Lavoisier's laboratory.

To quantify this internal work, in an approximate manner, Clausius developed the model of "entropy", in which the intensive quantity of heat *dQ*, passing into or out of the system, is divided by the extensive measure of absolute temperature *T* at the surface of the working body, and this quantity, dQ/T, is then said to model the energy workings of the system particles as they act on each other, and was called by Clausius the "transformation-content" of the working body. This was the start of the science of thermodynamics.

Quotes | On

The following are noted quotes on Lavoisier:

> "It took them only an instant to cut off that head, but it is unlikely that a hundred years will suffice to reproduce a similar one."

— Joseph Lagrange (1794), comment made day after Lavoisier's execution, May 9

"Although he lived only to the age of 51, **Lavoisier** revolutionized the field of chemistry. He created the first modern table of chemical elements [see: periodic table], recognized the role oxygen plays in the rusting of metals, demonstrated that water—previously considered one of the four fundamental elements—is a compound of hydrogen and oxygen, and asserted that the total weights of the products of a chemical reaction must equal the total weights of the reactants. Yet despite his remarkable importance to modern chemistry, Lavoisier's **scientific work was more a hobby than a profession**. In fact, because he made his living as a tax collector, his scientific work was relegated to early morning and after-dinner hours."

— Rebecca Balinski (1996), abstract of English translation of Jean-Pierre Poirier's 1993 *Antoine Laurent de Lavoisier, 1743-1794* [8]

Quotes | By

The following are noted quotes by Lavoisier:

"We must trust to nothing but fact: these are presented to us by nature, and cannot deceive. We ought, in every instance, to submit our reasoning to the test of experiment, and never to search for truth but by the natural road of experiment and observation."

— Antoine Lavoisier (1789), *Elements of Chemistry* (pg. xiii-xxxvii) (Ñº)

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3. Partington, J.R. (1957). *A Short History of Chemistry*, 3rd ed. New York: Dover (reprint).
4. Lavoisier, Antoine. (1789). *Elements of Chemistry* (pg. 5). London: G.G. and J.J. Robinsons.
5. (a) Lavoisier, Antoine. (1872). "Considerations Generales sur la Dissolution des Metaux dans les Acides", *Mem. De l'Acad. Des Sciences*, pg. 492.
(b) Muir, Matthew M.P. (1907). *A History of Chemical Theories and Laws* (pg. 388). Wiley.
6. Antoine Lavoisier's solar furnace – SciencePhotos.com.
7. Reill, Peter Hanns. (2005). *Vitalizing Nature in the Enlightenment* (elective affinities, 16+ pgs; quotes, pgs. 108-110). University of California Press.
8. Poirier, Jean-Pierre. (1993). *Lavoisier: Chemist, Botanist, Economist* (*Antoine Laurent de Lavoisier, 1743-1794*) (translator: Rebecca Balinski) (pg. 311). University of Pennsylvania Press, 1998.
9. (a) Lavoisier, Antoine; Laplace, Pierre. (1783). *Memoire on Heat* (*Memoire sur la Chaleur*) (translator: Henri Guerlac). Academic Press, 1982.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 62-63). Cornell University Press.

Further reading

â— Emerson, Ralph W. (1885). *The Hundred Greatest Men: Portraits Reproduced from Fine and Rare Steel Engravings* (Lavoisier, pgs. 356-59). London: Sampson Low, Marston, Searle, & Rivington.
â— Holmes, Frederic L. (1987). *Lavoisier and the Chemistry of Life*. University of Wisconsin Press.

External links

â— Antoine Lavoisier – Wikipedia.

θΔics

In existographies, **Antonie van Leeuwenhoek** (1632-1723) (IQ:175|#280) (Simmons 100:55) (Hart 100:30) was Dutch scientist, noted for []

Overview

In c.1672, Leeuwenhoek, while working at a draper's shop, and being interested in seeing threads closer, and stimulated by a reading of the microscope used (Q) by Robert Hooke (*Micrographia*, 1665), built a new improved single-lens 200x microscope, as shown below:

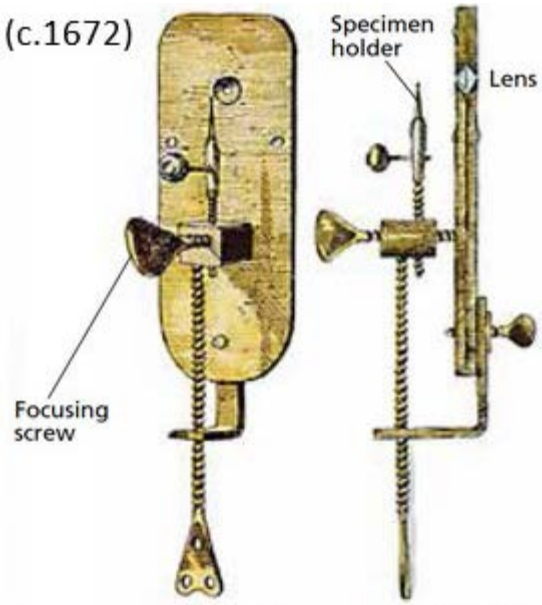

Leeuwenhoek Microscope (200x)

and with this he was the first to view single-celled organisms or "animalcules" as he referred to them

Students

A student of Leeuwenhoek's was Dutch mathematician and physicist Nicolaas Hartsoeker (1656-1715), noted for his 1678 description of sperm, in a letter to Christiaan Huygens, which he postulated was a little human, therein originating the homunculus theory, and for his c.1694 invention of a screw-barrel simple microscope.

Quotes | By

The following are noted quotes:

> "If you dare, you will overcome every difficulty."
>
> — Antoni van Leeuwenhoek (1719), title page motto to his *Letters to the English Royal Society* [1]

> "A man has always to be busy with his thoughts if anything is to be accomplished."
>
> — Antonie Leeuwenhoek (c.1670) (Q)

> "My work, which I've done for a long time, was not pursued in order to gain the praise I now enjoy, but chiefly from a craving after knowledge, which I notice resides in me more than in most other men."

— Antonie Leeuwenhoek (c.1670) (Q)

"In the year of 1657 I discovered very small living creatures in rain water."

— Antonie Leeuwenhoek (c.1670) (Q)

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1. Finkin, Matthew W. (2009). *For the Common Good: Principles of American Academic Freedom* (pg. 16). Yale University Press.

External links

- Antoine van Leeuwenhoek – Wikipedia.

θΔics

In existographies, **Antonio Barcelo** (1845-1927) (SN:26) (CR:16), aka "Antonio Portuondo y Barcelo", "A.-P. y Barcelo" (Trisca, 1922) or "A.P. Barcelo" (Sorokin, 1928), was a Spanish civil engineer and mathematician noted, in social thermodynamics, for his his 1912 *Notes on Social Mechanics* on social mechanics

Overview

In 1912, Portuondo, in his *Notes on Social Mechanics*, outlined a mechanical theory of sociology based largely on the mechanical-dynamical views of Austrian physicist Ernst Mach. [1]

Portuondo's work was attacked in Romanian scholar Petre Trisca's 1922 *Introduction to Social Mechanics*. [2] German-Spanish science historian Jose Pacheco has recently produced some summary work on Portuondo's version of social mechanics. [3]

Notes on Social Mechanics

The following is the index of Portuondo's *Notes*:

1. Introduction
2. Preliminary ideas. Definitions. Hypotheses
3. Kinematics
4. Statics and Dynamics
    - a. First Part: Equilibrium and movement for individuals
        - i. Theorems on the movement of individuals
    - b. Second Part: Equilibrium and movement of social groups
        - i. Social Statics
        - ii. Social Dynamics
        - iii. Theorems on the movement of social groups.
5. The Universal Energy

The last chapter on the universal energy includes the concept of entropy in its final considerations, where the author recalls that in any physical process a fraction of the input energy is dissipated, i.e. it is transformed in such a way that it is impossible to retrieve or store it for any future use, and he adds "… and this 'bend towards dissipation of mechanical energy in nature' is quite contrary to human interest, as Lord Kelvin has stated."

Quotes | By

The following are quotes by Barcelo:

> "In spite of man's desire to escape from the law of gravitation and from all the other laws of mechanics, he cannot do it."
>
> — Antonio Barcelo (1925), *Essay on Social Mechanics*; cited by Pitirim Sorokin (1928) in *Contemporary Sociological Theory* (pg. 17); cited by Joseph Mayer (1941) in *Social Science Principles in Light of Scientific Method* (pg. 233) [4]

Education

Portuondo was a civil engineering professor at *Escuela de Ingenieros de Caminos, Canales y Puertos*, from 1883 until his retirement in 1813, whereafter he served as director for many years. For several years, during this period, Portuondo was in charge of teaching political economics. This task led him to the field of 'social mechanics' and he also finally became a respectable member of the *Institut International de Sociologie* in his later days.

References

1. Barcelo, Antonio. (1912). *Apuntes de Mecanica Social* (*Notes on Social Mechanics*). Publisher.
2. Trisca, Petre. (1922). *Prolégomènes à Mécanique Sociale: Étude sur la Mécanique Sociale: Analyse des Ouvrages Ayant le meme Titre* (*Introduction to Social Mechanics: Study of Social Mechanics: Analysis of Works of the Same Title*). Libraire Felix Alcan.
3. Pacheco, Jose M. (2008). "Does More Abstraction Imply Better Understanding: *Ampuntes de Mecanica Social* by Antonio Porunondo). Max Planck Institute for the History of Science, *Preprint 351*.
4. (a) Barcelo, Antonio. (1925). *Essay on Social Mechanics* (*Essais de mecanique sociale*) (partially published previously in: *Revue International de Sociology*, 1915). Publisher.
(b) Mayer, Joseph. (1941). *Social Science Principles in Light of Scientific Method: with Particular Application to Modern Economic Thought* (pg. 233). Duke University Press.

External links

â— Barcelo, Antonio Portuondo y. – WorldCat Identities.

θΔics

In hmolscience, **Antony Gormley** (1950-) is British sculptor noted for his circa 1999 quantum human sculptures.

Overview

In the late 1990s, Gormley built a quantum orbital conceptualized human; one of which is shown below, showing the hazy form of a human body as a density of molecular movement inside the diffuse sphere of its quantum cloud of molecular influence: (O)

(add discussion)

See also

- Chris Gash
- Jonathan Borofsky
- Norval Morrisseau
- Shawn LaPaix

External links

- Quantum Cloud – Wikipedia.

θΔics

In religio-mythology, **Anubis**, Anpu (Budge, 1906) or Anup (Murdock, 2008), the former being the Greek name of the mortuary god defined originally by the hieroglyph: 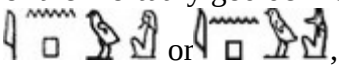 or , i.e. the feather + water + square symbol (followed by a "jackal"), meaning "wind, water, mountain" (Hornung, 1982), rendered as the sound ***Ä±Í—npw***, vocalized in Egyptian, according to the Akkadian transcription in the Amarna letters, as "Anapa" (Conder, 1894) (Ñº), is the son of either "Set + Nephthys" or "Osiris + Nephthys" (Plutarch, 100AD), depending on version of myth (from another older point of view, he was the sun of Ra), noted for being the general anointer of the mummified Osiris prior to his resurrection (see: death and resurrection of Osiris); some versions assert he was the baptizer of Horus. [1]

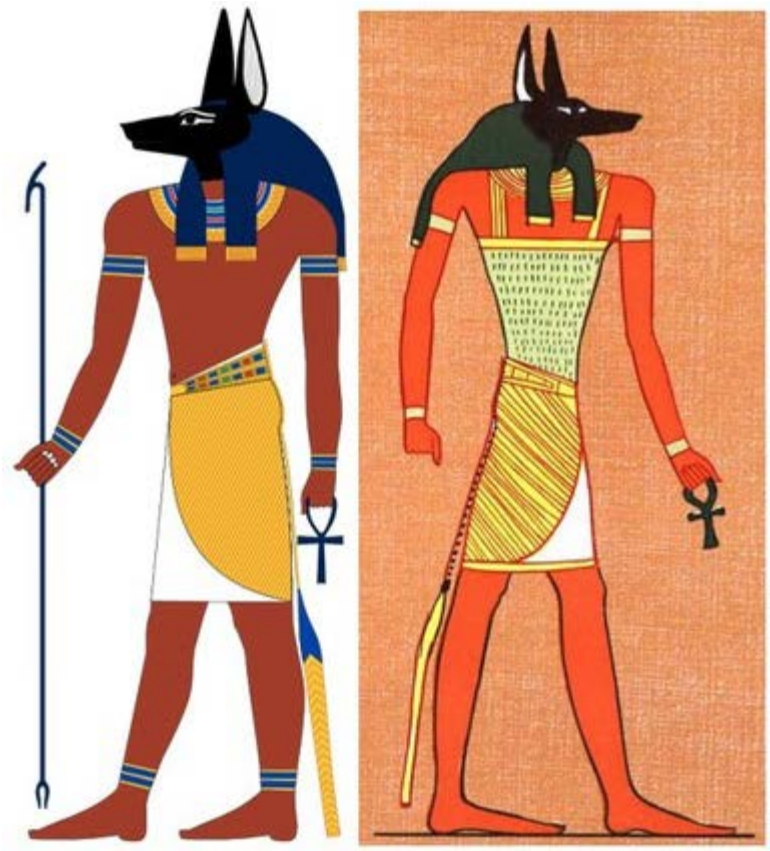

Two renditions of **Anubis**, the guide of the dead in the underworld and general mortuary god of Egypt.

Anubis | Canis Major & Minor

The Egyptians, according to Chartrand (1982), considered the Canis Minor constellation to be Anubis; which he summarizes as follows: [4]

> "The small dog, placed in the sky for faithfulness, drinks from the Milky Way, once thought to be a river. In Egypt, he was **Anubis**, the jackal god. The Greeks called the whole group Prochon."

Other sources, however, connect Anubis to Canis Major; as Normandi Ellis (2012) puts things: [5]

> "At most underworld entrances and in many sarcophagus rooms, the black dogs Anubis and Upuaut appear. While Anubis prepares the human vessel for its entrance into the underworld, Upuaut guards the gateway and opens the way into altered states of being. These jackals appear as openers of the way as early as the First Dynasty of Egypt. The Dogon tribe of Sudan, who probably are linked to Egypt's early ancestors, have a strong connection to the star Sirius, the bright Dog Star, which appears in the constellation Canis Major. They know, for example, that there are actually two stars: Sirius A and Sirius B, which appear to circle each other. The Canis Major and Canis Minor constellations may represent Anubis and Upuaut, but the Dog Star itself, called Sothis by the Egyptians, is linked to Isis, and the hidden twin star may be linked to Nephthys."

(add)

Anubis / Embalming Osiris | John / Baptizing Jesus

In Egypt, when Thebes became the new religious capital, Anubis became the chief embalming god of the dead, Osiris first and foremost, then in the form of priests dressed as Anubis for dead pharaohs who wanted to be like Osiris in the afterlife:

> "In the Theban Recension [2040-720BC] of the *Book of the Dead*, **Anubis** plays some very prominent parts, the most important of all being those which are connected with the judgment and the embalming of the deceased. Tradition declared that Anubis embalmed the body of Osiris, and that he swathed it in the linen swathings which were woven by Isis and Nephthys for their brother; and it was believed that his work

was so thoroughly well performed under the direction of Horus and Isis and Nephthys, that it resisted the influences of time and decay."

— Wallis Budge (1904), *The Gods of the Egyptians, Volume Two* (pg. 262)

In the Roman Recension (100-800AD), in the context of recension theory, Anubis became John, according to which the wrapping of the body of the dead Jesus is described in John 19:38-40 (see: Jesus Christ).

In 1864, English writer Charles King, in his *Gnostics and their Remains*, is cited by Wallis Budge (1904), has having done some interesting work on some of the "alleged connections of Anubis with Christ in the Gnostic system". [3]

Overview

The worship of Anubis, as a god, according to Budge (1904) is older than that of Osiris cult worship, but younger than Horus worship, whose role in the Old Kingdom period was to guide the dead in the underworld, or something to this affect: [1]

> "His worship is very ancient, and there is no doubt that even in the earliest times his cult was general in Egypt; it is probable that it is older than that of Osiris. In the text of Unas (line 70) [2500BC] he is associated with the Eye of Horus, and his duty as the guide of the dead in the Underworld on their way to Osiris was well defined, even at the remote period when this composition was written, for we read, 'Unas standeth with the Spirits, get thee onwards, Anubis, into Amenti (the Underworld), onwards, onwards to Osiris'."

Anubis was perceived to superintend the embalming of the kings and courtiers in the mortuary and the subsequent binding with linen bandages. His coat color, according to Michael Jordan (1993), is black in relation to the black tar that embalmers coated the mummies with. [2] It is Anubis who performs the "opening of the mouth" ceremony; hence, he seems to have an astro-theology origin.

Quotes

The following are related quotes:

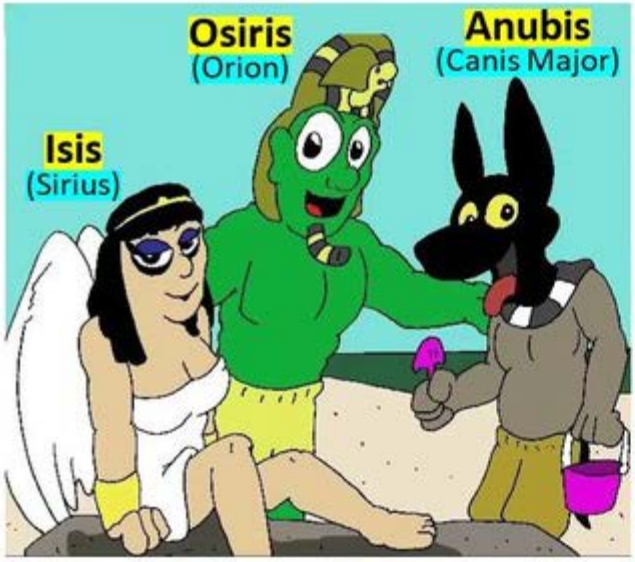

> "They relate that Isis, learning that Osiris in his love had consorted with her sister [Nephthys] through ignorance, in the belief that she was Isis, and seeing the proof of this in the garland of melilote (Ñº) which he had left with Nephthys, sought to find the child; for the mother, immediately after its birth, had exposed it because of her fear of Typhon [Set]. And when the child had been found, after a great toil and trouble, with the help of dogs which led Isis to it, it was brought up and became her guardian and attendant, receiving the name of **Anubis**, and it is said to protect the gods just as dogs protect men."

— Plutarch (100AD), *On Isis and Osiris* (pg. 39)

> "Of the stars, the Egyptians think that the Dog Star [aka Sirius] [its name reflecting its prominence in Canis Major (Greater Dog)] is the star of Isis, because it is the bringer of water [the heliacal rising of Sirius marks the start of the annual 150-day Nile River flood]."
>
> — Plutarch (100AD), *On Isis and Osiris* (§38) (pg. 91)

References

1. (a) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (§16:Anpu or Anubis, pgs. 261-66). Dover, 1969.
(b) Hornung, Eric. (1982). *Conceptions of God in Ancient Egypt: the One and Many* (translator: John Baines) (Anubis, pg. 67). Cornell University Press, 1996.
2. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (pg. 19). Facts on File, Inc.
3. (a) King, Charles W. (1864). *Gnostic and their Remains* (Anubis, 25+ pgs; esp. pgs. 230, 279). D. Nutt, 1887.
(b) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pg. 266). Dover, 1969.
4. Chartrand, Mark R. (1982). *Skyguide: a Field Guide for Amateur Astronomers* (pg. 126). Publisher, 1990.
5. Ellis, Normandi. (2012). *Imagining the World into Existence: an Ancient Egyptian Manual of Consciousness* (pg. #). Publisher.

External links

â— Anubis – Wikipedia.

θΔics

In religions, **Anunian theology**, or Ra theology, refers to those religions centered around belief in the "Nun (or Nu)", the primordial land mound that arose from the waters of chaos at the beginning of creation, which include the Abrahamic religions (the Nun personified by Noah) and Brahmaic religions (the Nun personified by the man-god Ma-Nu), which accounts for 72 percent of the world's current belief systems. [1]

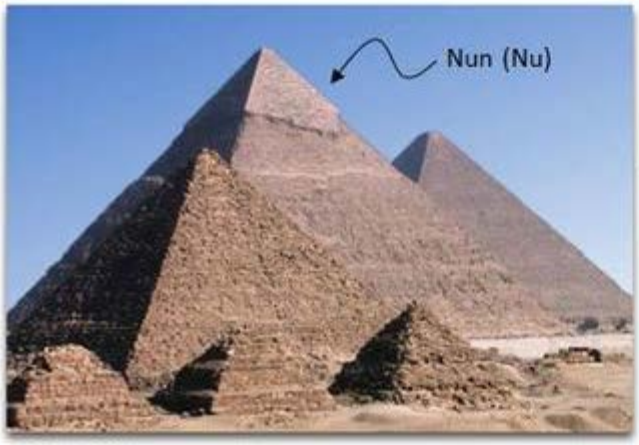

Left: the Pyramids of Giza, the original Egyptian representation of the Nun (Nu). **Right:** a so-called "nunergetic pyramid", sold by Nun Technologies, a newage company, trying to capitalize on a mixture of ancient Egyptian religion and modern crystal power and positive energy theories; each of which trace back to the ancient Egyptian myth of the sun (Ra) "born" (given life) out of the tip (benben stone) the land mound Nun (Nu) that arose from the primordial waters of chaos, otherwise known as **Anunian theology** or Ra theology—today known to us as the story of Abraham (Abrahamic religions) or Brahma (Brahmaic religions), which account for some 72 percent of the world's belief systems, Christianity, Islam, and Hinduism being the big three, a tension of which has resulted to be the cause of much of our modern warfare. [2]

In short, ¾-ths of the minds of the modern world, although most are completely oblivious to this fact, being that that the myth has been retold and retold so many times, through so may thousands of years, that it is barely recognizable to the original, are thickly ingrained with the Anunian belief system of life, death, morality, purpose, and afterlife (resurrection, reincarnation, or spirituality)—so much so that even the most atheist of nihilistic hardened purposeless universe theory physical science based scientists will hold to the belief, likely to their grave, that he or she is "alive" and at some point will "die"—in the face of fact that such a model is completely at odds with modern physics and chemistry, according to which molecules, atoms, and subatomic particles are not "alive" and do not "die" and the second fact that a human is a molecule (see: human molecular formula; human molecule; human molecular theory). The whole situation is quite humorous, to say the least.

The guidebook out of this quagmire is called *The Mechanical Theory of Heat*, but the path out of the thicket is a long way off, and bared by numerous and varied obstacles.

References

1. Ashby, Muata. (2006). *African Religion Volume 1: Anunian Theology and the Mysteries of Ra.* Cruzian Mystic Books.
2. Nunergetic pyramids – NunTech.com.

θΔics

In religio-mythology, **Apep**, aka Apap or Apophis, was the evil snake, in Egyptian mythology, that was said to do battle with sun, or sun god, typically Ra, each night.

Quotes

The following are related quotes:

> "The mythological and religious texts of all periods contain many allusions to the fight which Set waged against Horus, and more than one version of the narrative is known. In the **first and simplest form** the story merely records the natural opposition of Day to Night, or Night to Day, and the two combatant gods were Heru-ur, or Horus the Elder, and Set. In its **second form** the two combatant gods are Ra and Set, and the chief object of the latter is to prevent Ra from appearing in the East daily. The form which Set assumed on these occasions was that of a monster serpent, and he took with him as helpers a large number of small serpents and noxious creatures of various kinds. The name of the serpent was **Apep** [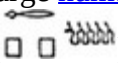] or Aaapef [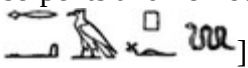], which is preserved in Coptic under the form [ⲁⲡⲱⲫ], but he was also called Rerek [ ], and since he was identified with a long series of serpent monsters he had as many names as Ra. In the **third form** of the story the combatant gods are Osiris and Set, and we have already seen how Set slew his brother and persecuted his widow and child, and how he escaped punishment because Osiris had, at the time of his death, none to avenge his cause. In the **fourth form** of the story the combatant gods are Horus, the son of Osiris and Isis, and Set, and the avowed intention of Horus is to slay him that slew his father Osiris."
>
> — Wallis Budge (1904), *The Gods of Egypt, Volume Two* [1]

> "The Hebrew **Satan** was the Egyptian **Sut** [Set], who became the evil one of the later theology as an anthropomorphic rendering of Apap [**Apep**] the serpent of evil. Sut was one of the seven sons of the old 'first mother', the goddess of the Great Bear in the astronomical mythology [astro-theology]. He was not one of 'the sons of god', as there was no god extant when he was born. Sut was brought forth twin with Horus, and first born as the adversary of his brother Osiris. In a truer version of the mythos the conflict was in phenomena that were physical, not moral."
>
> — Gerald Massey (1907), *Ancient Egypt: The Light of the World* [2]

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pgs. 244-45; Typho as #56, pgs. 252-53; four forms, pg. 254). Dover, 1969.
2. Massey, Gerald. (1907). *Ancient Egypt: The Light of the World: a Work of Reclamation and Restitution in Twelve Books, Volume Two* (pg. 493). T. Fisher Unwin.

External links

â— Apep – Wikipedia.

θΔics

In religio-mythology, **Apollo**, aka Apollo-Helios (300BC) or Apollo-Helios/Sol (300AD), is []

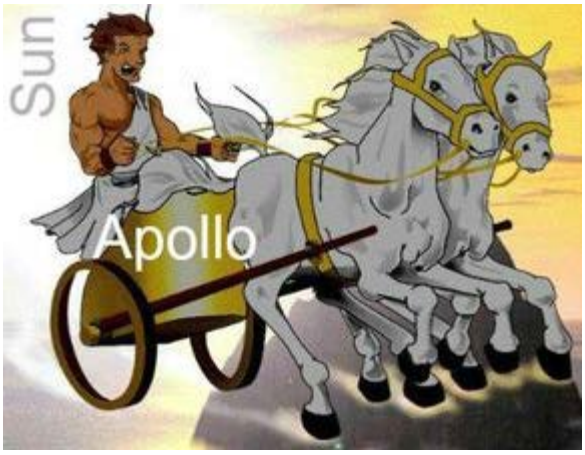

The Greco-Roman view of **Apollo** (or Helios) as a god-like man who drove the sun through the sky on his golden chariot.

Overview
(add)

Anaxagoras
In 476BC, Anaxagoras, asserted, as summarized by Voltaire (1764), that the sun was not driven by Apollo, mounted on a chariot, but rather, based on the "evidence" of examined fallen meteors, and the reasoned postulate that moon light was reflected sunlight, that it was a hot or fiery stone, moving in a fifth element, in addition to the standard four elements, he called "aether", which he conceived of as being in constant rotation and carried with it the celestial bodies, he was called an atheist, and had to flee.

Egyptian | Greek | Roman | Christian

See main: God character equivalences

The Egyptian mythology to Greek mythology to Roman mythology to Christianity transliteration of the gods and god sons, as summarized more fully in Mangnall's Abstract of Heathen Mythology (1789), is as follows:

	Father	Son	Grandson
Egyptian	Amen-Ra	Osiris	Horus
Greek	Zeus		Apollo / Dionysus
Roman	Jupiter		Bacchus / Sol [?] (Ñº)
Christian	God the father		Jesus | God the son

(add)

Quotes
The following are related quotes:

> "The initiatory rites of Demeter in Eleusis were transferred from Egypt (1.29.2). The rite of Osiris is the same as that of Dionysus and that of Isis very similar to that of Demeter; the names alone having been interchanged, and the punishments in Hades of the unrighteous, the Fields of the Righteous and the fantastic conceptions, current among the many - all these were introduced by Orpheus in imitation of the Egyptian funeral customs. (1.96.4-5). Isis, after having invented the practice of medicine, taught this art to her son Orus [Horus], named also Apollo, who was the last of the gods that reigned in Egypt."
>
> — Diodorus Siculus (40AD) *Historical Library*

> "On the second of these days, Arueris was born whom they call **Apollo**, and some call him the elder Horus."

— Plutarch (100AD), *On the Isis and Osiris* (pg. 33)

"To have been goddess-born, heaven-descended; to have 'lived and died as none could live and die', to have been believed to have done and suffered great things for the service of mankind, but above all, to have propitiated the wrath of the 'superior deity', and to have conquered the invisible authors of mischief; in their behalf; was such an overwhelming draft on the tender feelings, the excitement of which is one of the strongest sources of pleasure in our nature, that the best hearts and the weakest heads never gave place to the coolness and apathy of skepticism. Not a doubt was entertained that a similar series of adventures was proof of one and the same hero, and that the Grecian **Apollo**, the Phoenician Adonis, the AEsculapius of Athens, the Osiris of Egypt, the Christ of India, were but various names of the self-same deity; so that nothing was so easy at any time, as the business of conversion. Not incredulity, but credulity, is the characteristic propensity of mankind."

— Robert Taylor (1829), *The Diegesis* (pg. 18)

References

1. Taylor, Robert. (1829). *The Diegesis: a Discovery of the Origin, Evidences, and Early History of Christianity, Never Yet Before or Elsewhere so Fully and Faithfully Set Forth* (Arc) (Osiris, 5+ pgs) . London: Richard Carlile.

External links

â— Apollo – Wikipedia.

In debates, **appeal to authority**, or "argument from authority", related to credentialism, refers to the discredited practice of attempting to decide whether or not a proposition is true, solely based on what an authority as said, or the weighted consensus of authorities have said, e.g. it took only one Copernicus, who used reason, logic, and measurements, to overthrow the weighted consensus of every authority around him and antecedent him.

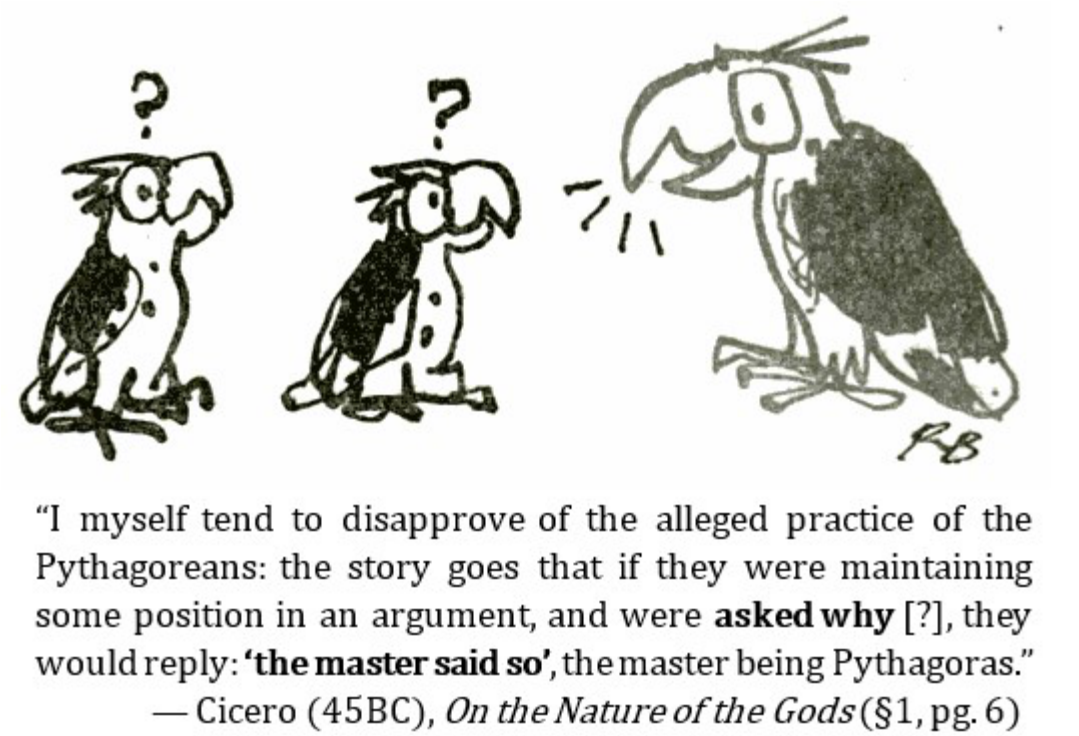

An general image of the **"appeal to authority"** argument, from Glass Bentley's 1958 article "Liberal Education in a Scientific Age, meant to illustrate the state of education system in America. [2]

Quotes

The following are related quotes:

> "I myself tend to disapprove of the alleged practice of the Pythagoreans: the story goes that if hey were maintaining some position in an argument, and were asked why, they would reply: **'the master said so'**, the master being Pythagoras."
>
> — Cicero (45BC), *On the Nature of the Gods* (§1, pg. 6) [1]

> "When we engage in argument we must look to the weight of reason rather than **authority**. Indeed, students who are keen to learn often find the authority of those who claim to be teachers to be an obstacle, for they cease to apply their own judgment and regard as definitive the solution offered by the mentor of whom they approve."
>
> — Cicero (45BC), *On the Nature of the Gods* (§1, pg. 6) [1]

> "Anyone who conducts an argument by **appealing to authority** is not using his intelligence; he is just using his memory."
>
> — Leonardo da Vinci (c.1500), *Publication*

> "Those who rely simply on the **weight of authority** to prove any assertion, without searching out the arguments to support it, act absurdly. I wish to question freely and to answer freely without any sort of adulation. That well becomes any who are sincere in the search for truth."
>
> — Vincenzo Galilei (c.1560), advise taught to his son Galileo

References

1. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (pg. xxvi). Oxford University Press, 1998.
2. Glass, Bentley. (1958). "Liberal Education in a Scientific Age" (§: "The Present Divorce Between Science and the

Humanities", pg. 348), *Bulletin of the Atomic Scientists*, pgs. 346-53, Nov.

See also

â— Appeal to nature

External links

â— Appeal to authority – Wikipedia.

In philosophy, **appeal to nature**, or “ethical appeal to nature”, generally refers to a system of ethics or moral reasoning based on nature; via the shorthand logic that "right = natural", "wrong = unnatural", and the two of these are coupled together in system-based natural processes seen *in* (e.g. ATP, energy currency, etc.) and *between* (e.g. global wars, forced marriage, etc.) organisms.

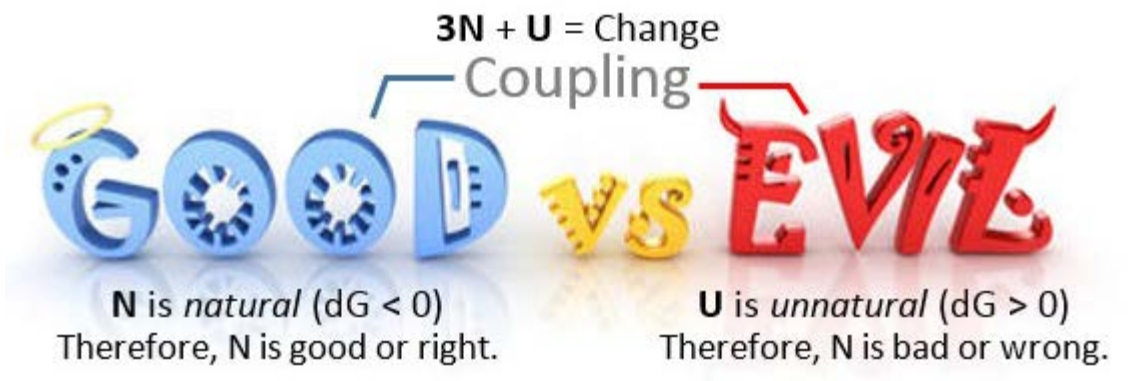

A diagram of modernnatural ethics, aka "**appeal to nature**" as it was called formerly, showing how coupling rectifies the ancient problem of evil, via the logic of free energy driving force rules of endergonic-exergonic coupling operations in systems.

Overview

In 322BC, Aristotle, in his *Physics*, introduced the appeal to nature argument, in respect to areas such as slavery and money making. [1]

In 1670, Benedict Spinoza (1632-1677), in his *Tractatus Theologico-Politicus* (§3), building on Thomas Hobbes (1588-1679) and Maimonides (1135-1204), digressed on what he referred to as the "natural right", as apposed to "natural wrong", of things, as follows: (Q)

> “By the right and order of nature, I merely mean the rules determining the nature of each individual **thing** by which we conceive it is determined naturally to exist and to behave in a certain way. For example fish are determined by nature to swim and big fish to eat little ones, and therefore it is by sovereign natural right that fish have possession of the water and that big fish eat small fish. For it is certain that nature, considered wholly in itself, has a sovereign right to do everything that it can do, i.e., the right of nature extends as far as its power extends … since the universal power of the whole of nature is nothing but the power of all individual things together, it follows that each individual thing has the sovereign right to do everything that it can do, or the right of each thing extends so far as its determined power extends.”

In 1770s, Goethe subsumed Spinoza, as a tonic for the battle between his passions and moral sense, and by 1809 had penned his moral symbols theory meaning.

In 1874, John Mill, in his “On Nature” essay, delved into the pros and cons of using the appeal to nature argument for ethical reasoning. [2]

Quotes

The following are related quotes:

> “The only way that an endergonic reaction ($dG_1 > 0$) can occur spontaneously is if it is linked to an exergonic reaction ($dG_2 < 0$) such that the sum of the two dG reactions ($dG_1 + dG_2 < 0$) is negative. A good analogy would be when an introvert breaks out his ‘party hat’ whenever his extroverted buddy stops by. This process [change] of hooking together is called coupling, and your cells [and people] use coupling all the time to perform many of the energetically unfavorable [unnatural] reactions in a cell [or society].”
>
> — Anon (2015), Shmoop.com on “Free Energy” (Q)

References

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2. Mill, John. (1874). “On Nature” (O), in: *Nature, The Utility of Religion and Theism*, Rationalist Press, 1904.

External links

- Appeal to nature – Wikipedia.

θΔics

In education, **Appignani Chair of Atheism, Humanism, and Secular Ethics** is a 2016-initated chair, established at the University of Miami, for the study of atheism, humanism, and secularism, stimulated into inception per $2.2 million endowment of American philanthropist Louis Appignani, an ex-Catholic Bertrand Russell inspired atheist, whose vision is to make atheism a legitimate academic subject in America.

American philanthropist Louis Appignani (right), with wife Laurie Appignani, and Richard Dawkins (center), at the May 2016 press announcement of the establishment of America's first "**chair of atheism, humanism, and secular ethics**" at the University of Miami. [3]

Early models

See also: Atheism professor

In 450BC, Greek philosopher Empedocles, using his two element and four force model of everything, applied at the social level, e.g. friends mix like water and wine, whereas enemies separate like oil and water, is the first person, historically attributed, according to Theophilus (c.120-184) (Q), as summarized below, to "teach" atheism:

> "What good did it do Epicurus to maintain that there is no providence; or Empedocles to **teach atheism**; or Socrates to swear by the dog, and the goose, and the plane-tree, and AEsculapius struck by lightning, and the demons whom he invoked? And why did he willingly die? What reward, or of what kind, did he expect to receive after death? What did Plato's system of culture profit him? Or what benefit did the rest of the philosophers derive from their doctrines, not to enumerate the whole of them, since they are numerous? But these things we say, for the purpose of exhibiting their useless and godless opinions."

In 1806, Goethe using his newly in-development elective affinities based human chemical theory, built in part on Empedocles' atheism implicit oil, water, and wine model of social interactions, began teaching a young Arthur Schopenhauer, at first by intellectual mentorship and later by consultation (1819), implicit physicochemical atheism (Q), a process Schopenhauer later described as being learned ideas as "fruit from the tree". Schopenhauer would go onto become "the first admitted and inexorable atheist among us Germans", as Nietzsche (1882) later summarized things. In 1868, Schopenhauer became Friedrich Nietzsche's intellectual "educator". In 1910, German physical chemist and so so-labeled "radical atheist" Wilhelm Ostwald, building in part on Goethe's atheism implicit human chemical theory, via his Monistic Sunday Sermons, taught energy-based atheism. Into the early 20th century, the rise of Marxism-based atheism turned communism shut down efforts to "teach" intelligent versions of natural science based atheism. The only known example being the implicit atheism based Harvard Pareto circle, ranked by Pitirim Sorokin as on par with the "mechanistic schools" of history, which pitted Pareto-Gibbs based social science against Marxism-based social science. The passing of Lawrence Henderson and WWII, however, was said to have shut the program down.

In 2011, American sociologist Phil Zuckerman, author of *Society Without God* (2008), at Pitzer College, Ca, initiated a secular studies program and major, its most-popular class being "Secularism and Skepticism". [10]

Appignani Chair | Overview

In 2001, American

business magnate Louis Appignani, a former Catholic who turned Bertrand Russell inspired college atheist, donated $1 million towards the establishment of a "Louis Appignani Foundation" the gist philanthropic aim of which is the following: [2]

Louis Appignani at 2011 American Atheists meeting discussing his 2001 to present philanthropic efforts to promote and support reason and science based decision making over spirituality, myth, and faith based decision making. [2]

> "About ten years ago, when I decided to get involved in philanthropy, I thought where can I, in my small way, make a difference? I thought, by concentrating on critical thinking, organizations that are secular, that emphasize science and reason, as opposed to spirituality and mythology, as a basis for making decisions, I thought that would be an area where very few people are passionate about those issues, and I thought that maybe I could make a small dent, by contributing to my country, by emphasizing that."

In circa 2004, Appignani engaged into discussion with American philosopher Harvey Siegel, then chair of the philosophy department at the University of Miami, about starting some type of atheism professorship.

In 2015, Julio Frenk (O) became the new president of the University of Miami, and therein stated his vision (O) to establish 100 new academic chairs in time for the school's centennial celebration in 2025. This opened up wiggle room for the possibility to establish a chair of atheism.

In 2016, the University of Miami, stimulated by a $2.2 million Appignani, established the nation's first chair for the study of atheism, humanism and secular ethics". The university, of note, resisted the chair proposal per reason that they didn't want the name "atheism" in the title of the chair, preferring to call it instead: "philosophical naturalism".

> "There was great reluctance on the part of the university to have an endowed chair with the word 'atheism' in the name, and that was a deal-breaker for Lou. He wasn't going to do it unless it had the word atheism in it."
>
> — Harvey Siegel (2016), on University of Miami atheism chair, May 20 [1]

The overt reason for resisting the name atheism

in the chair title, was: “We didn’t want anyone to misunderstand and think that this was to be an advocacy position for someone who is an atheist”, said Thomas J. LeBlanc, executive vice president and provost, said in an interview.

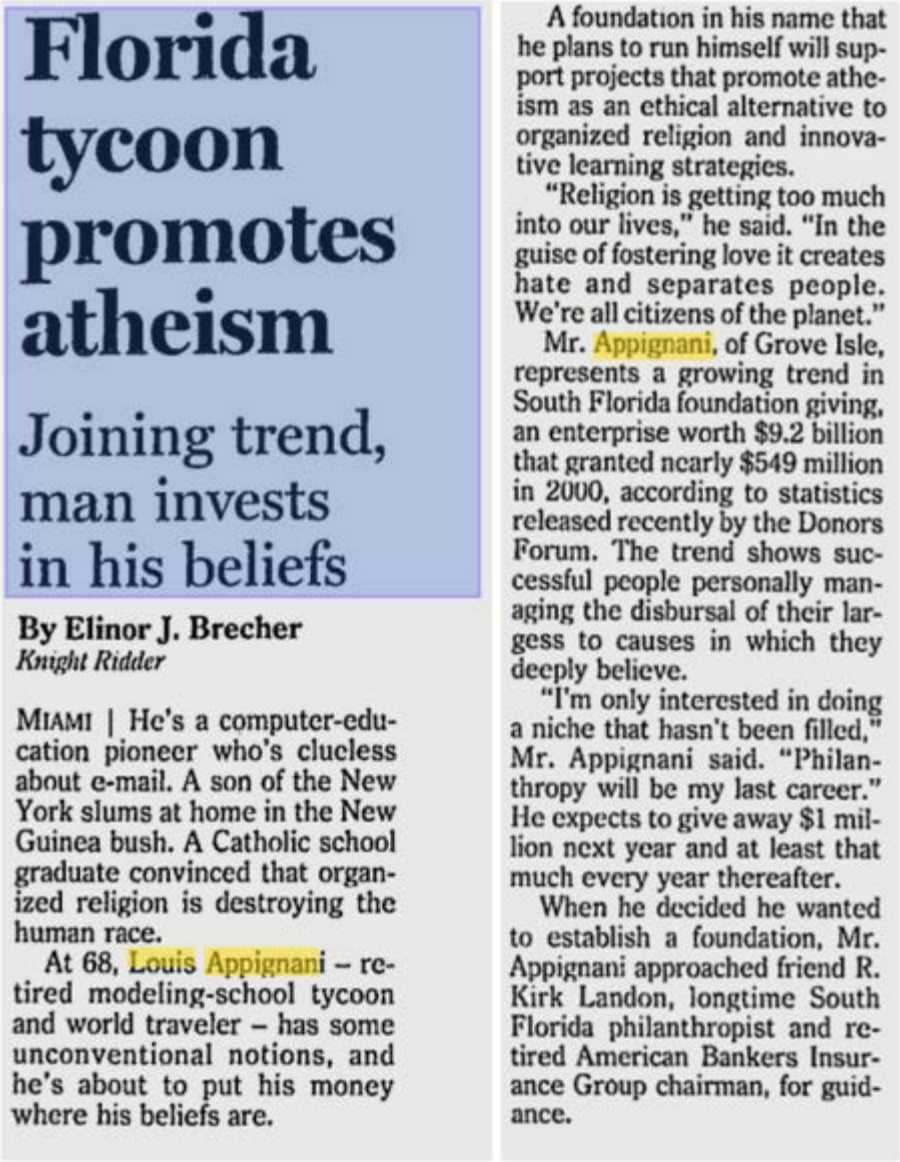

Florida tycoon promotes atheism

Joining trend, man invests in his beliefs

By Elinor J. Brecher
Knight Ridder

MIAMI | He's a computer-education pioneer who's clueless about e-mail. A son of the New York slums at home in the New Guinea bush. A Catholic school graduate convinced that organized religion is destroying the human race.

At 68, Louis Appignani – retired modeling-school tycoon and world traveler – has some unconventional notions, and he's about to put his money where his beliefs are.

A foundation in his name that he plans to run himself will support projects that promote atheism as an ethical alternative to organized religion and innovative learning strategies.

"Religion is getting too much into our lives," he said. "In the guise of fostering love it creates hate and separates people. We're all citizens of the planet."

Mr. Appignani, of Grove Isle, represents a growing trend in South Florida foundation giving, an enterprise worth $9.2 billion that granted nearly $549 million in 2000, according to statistics released recently by the Donors Forum. The trend shows successful people personally managing the disbursal of their largess to causes in which they deeply believe.

"I'm only interested in doing a niche that hasn't been filled," Mr. Appignani said. "Philanthropy will be my last career." He expects to give away $1 million next year and at least that much every year thereafter.

When he decided he wanted to establish a foundation, Mr. Appignani approached friend R. Kirk Landon, longtime South Florida philanthropist and retired American Bankers Insurance Group chairman, for guidance.

A 2002 *Star News* article (Q) about Appignani giving away $1 million to promote atheism as an ethical alternative to organized religion and innovative learning strategies, pre belief that “religion is getting too much into our lives; in the guise of fostering love, it creates hate and separates people—we’re all citizens of the planet.”

Chair | Objective

The holder of the chair, according to David Kling, professor and chair of the department of religious studies at the University of Miami, is to (a) offer one course annually on the history, philosophy, and influence of atheism; (b) engage with the community (university and public); for example, through public lectures, forums, or conferences.” Moreover, that the academic objective of the new position “would be to examine questions of science, knowledge, ethics, and social policy from a strictly atheistic perspective.” (Q) The May 2016 chair description, specifically, is as follows: [4]

> “The new chair will be an interdisciplinary appointment held by a distinguished scholar whose research and interests include the study of atheism—understood, for purposes of this gift, as a philosophical approach that emphasizes the methods and techniques of science, logic, and reason in dealing with questions of knowledge, ethics, politics, and social policy. The new chair also will offer annually a minimum of one course on the history, philosophy, or influence of atheism.”

The Oct 2016 chair description is as follows: [5]

> “The ideal candidate is a distinguished scholar whose research and teaching interests include the study of atheism, humanism, and or secular ethics, and intellectual and academic methods that emphasize a

naturalistic approach in dealing with problems affecting humanity. The holder of this chair will be expected to engage the broader community and offer at least one class a year on atheism and or its role in human affairs as part of his or her regular faculty duties. She or he will have a recognized body of scholarship and evidence of effective teaching. The holder's appointment will be in one or more of the College's departments."

(add discussion)

Discussion

In May 2016, YouTube atheism activist Aron Nelson, in his "Professor of Atheism?", blogged his confusion about an atheism professorship; the gist of which is as follows: (Q)

> "There's no belief system, no body of dogma to rehearse: none of that. Just the things that everyone should already be studying anyway, minus all the volumes of imaginary nonsense that you get with religion. So it occurs to me that a **professor of atheism** wouldn't actually have a field of study."

(add discussion)

Quotes

The following are related quotes:

> "The cancer that exists in our society has to do with religion. The way this country is going, we're not interested in science anymore. The cancer is with people's thinking. I think it's vitally important that all of us in our respective organizations somehow encourage secular free thought groups or free thought people who can think for themselves and not pray to an almighty for solutions to complex problems."
>
> — Louis Appignani (2011), "Speech at Southeast Regional Atheist Meeting" [2]

Louis Appignani (c.2010), funder behind the 2016 established "**chair of atheism**" at the University of Miami, sitting (Q) with Albert Einstein and Richard Dawkins, leader of the new atheism movement, in Jackson Hole, Wyoming, two of whose lectures, at the University of Miami, Appignani sponsored.

> "I'm trying to eliminate discrimination against atheists. This is a step in that direction, to make atheism legitimate."
>
> — Louis Appignani (2016), commentary on new University of Miami "Chair of Atheism" [1]

> "I think it's a very bold step of the University of Miami, and I hope there will be others. It's enormously important to shake off the shackles of religion from the study of morality."
>
> — Richard Dawkins (2016), on University of Miami atheism chair, May 20 [1]

See also

- Nightingale Chair of Social Physics

References

1. Goodstein, Laurie. (2016). “University of Miami Establishes Chair for Study of Atheism” (Q), *The New York Times*, May 20.
2. (a) Appignani, Louis. (2011). “Talk at Southeast Regional Atheist Meeting” (Q|23min), r3ggi3000, Dec 29.
(b) Nardi, William. (2016). “Donor behind UMiami’s new atheism chair: Reagan ‘downfall’ of country, religion ‘cancer’” (Q), The College Fix, Jun 15.
3. Staff. (2016). “Gift Establishes Chair in Atheism, Humanism, and Secular Ethics” (Q), University of Miami News & Events, May 23.
4. Anon. (2016). “Gift Establishes Chair in Atheism” (Q), Veritas, May 2.
5. Siegel, Harvey. (2016). “Finalized Advert for Appignani Chair”, Email attachment, Oct 11.

Videos

- Appignani, Louis. (2015). “Openly Secular” (Q), Openly Secular, Jun 5.

θΔics

In hmolscience, **applicability**, as opposed to non-applicability, tends to refer to the applicability of various scientific laws and principles, e.g. second law, uncertainty principle, conservation of energy, information theory, Pauli exclusion principle, Boltzmann entropy, wave-particle duality, wave function collapse, etc., to human individual and or human social phenomena; a subject that tends to involve the extrapolate up method.

Overview

There is exists some ongoing and prevalent confusions concerning the applicability of thermodynamics to human affairs; some believing thermodynamics to be not applicable to human affairs; some believing it applicable, but not applying the correct version of thermodynamics to human social processes and affairs.

In 1910, Joseph Klein, in his *The Physical Significance of Entropy*, stated his view that is conceivable that the second law is applicable to animate events: [1]

> "The second law in its objective-physical form (freed from all anthropomorphism) refers to certain mean values which are found from a great number of like and 'chaotic' elements. This law has no *independent* significance, for its roots go down deep into the theory of probabilities. It is therefore conceivable that it is **applicable** to some purely human and animate events as well as to inanimate, natural events, provided the variable elements present constitute adequate haphazard for the calculus of probabilities."

In 1975, American chemical mineralogist Norman Dolloff, in his *Heat Death and the Phoenix: Entropy, Order, and the Future of Man*, discussed how he had pondered for a number of years, whether or not thermodynamics were applicable to the whole range of human activity; the book's dust-jacket summarizes this as follows: [3]

> "Is the universe running down? Will the highly organized structures of matter and life be transformed at last into a state of inert uniformity? Or will matter and life develop ever more efficient structures capable of making use of the energy of the universe? The author pondering the significance of the laws of thermodynamics, realized that they were **applicable** not only to physics and chemistry but to all the natural sciences, and indeed to the whole range of human activity: psychology, history, music, philosophy and religion. Now, in this incisive and wide-ranging study, he shows how an understanding of the laws of thermodynamics in all their ramifications may enable man to organize his future and control the destiny of life in accordance with the fundamental principles that govern the universe."

In 1995, Jay Labinger commented the following on Joseph Klein's applicability assertion: [2]

> "Klein's [human **applicability** assertion] suggests that a minimum requirement for applicability of the second law is a sufficiently large number of elements—an Avogadro's number of people, perhaps? [see: social Avogadro number]—as well as hinting at issues such as free will versus random actions."

(add)

Quotes

The following are related quotes:

> "The law of conservation **applies** to some things and not to others, and the things which it does not apply are unreal."
>
> — James Johnstone (1914), *The Philosophy of Biology* (see: Johnstone-Pavlovich rule)

"It's by no means clear, by the way, that the second law of thermodynamics applies to the universe as a whole, because it is an experimental law, and we don't have experience with the universe as a whole."

— Carl Sagan (1985), "The God Hypothesis" (Q) in *The Varieties of Scientific Experience*

"I admit, open systems do exist and can be described with thermodynamics; nonetheless, their application to group dynamics is a major stretch, and modeling human relationships on them involves all sorts of unstated assumptions, for instance that a state function (like Gibbs free energy) even **applies**. Or that they're spontaneous."

— The Literature Engineer (2005), opinion on human thermodynamics (Q), Jun

"Where did Gibbs state that 'a society is one such material system'? He didn't — that is your particular (incorrect) reading of the **application** of thermodynamics."

— Philip Moriarty (2009), response to the following video "Entropy: Sixty Symbols" (Q) thread post by Thims: "As for your *worries* (regarding state functions of humans), quoting from Gibbs (1876): the comprehension of the laws which govern any material system is greatly facilitated by considering the energy and entropy of the system in the various states of which it is capable. A society is one such material system. If you think that you are exempt from these laws, that is your prerogative", Aug 30

"Even Leonard, in his closing [Rossini debate] response, appreciates the difference between drawing an *analogy* between thermodynamic functions of state and features of society, and the claim that one can **equate** [**apply**] a thermodynamic entropy/enthalpy/free energy with properties of human relationships/society. It is this distinction between analogy and mathematical/physical equivalence that is so important and which you seem unable to grasp."

— Philip Moriarty (2009), Moriarty-Thims debate (part two) (post #128), Sep 12 8:50 PM EDT

"I am not the originator of the premise of the non-metaphor **application** of thermodynamic entropy/enthalpy/free energy functions to human society, although I arrived at this view independently. People to have pioneered this view include: Johann Goethe (1809) – affinity (free energy), human chemical reactions; Georg Helm (1887): energy, entropy; Leon Winiarski (1897): energy, entropy; Wilhelm Ostwald (1906): social energy; Mehdi Bazargan (1950): free energy, internal energy, entropy, temperature, and so on (dozens more). So to Phil: are all of us crackpots for thinking that state functions apply to systems of humans, or am I the only crackpot?"

— Libb Thims (2009), Moriarty-Thims debate (part two) (post #160), Sep 12 10:34 AM EDT; similar digression is found in: Ilya Prigogine's 1977 Nobel Lecture "obviously" comment; and Mala Radhakrishnan's 23 Sep 2013 tweet

See also

- Applied human thermodynamics
- Worthless application

References

1. (a) Klein, Joseph F. (1910). *Physical Significance of Entropy: or of the Second Law* (humans, pg. 89-90). D. van Nostrand.

(b) Labinger, Jay A. (1995). "Metaphoric Usage of the Second Law: Entropy as Time's (double-headed) Arrow in Tom Stoppard's *Arcadia*", Presented at Nov meeting of the Society for Literature and Science, Los Angeles; in: *The Chemical Intelligencer* (pg. 32), Oct. 31-36, 1996.
2. Labinger, Jay A. (1995). "Metaphoric Usage of the Second Law: Entropy as Time's (double-headed) Arrow in Tom Stoppard's *Arcadia*", Presented at Nov meeting of the Society for Literature and Science, Los Angeles; in: *The Chemical Intelligencer* (pg. 31), Oct. 31-36, 1996.
3. (a) Dolloff, Norman H. (1975). *Heat Death and the Phoenix: Entropy, Order, and the Future of Man* (free energy, 27+ pgs). Exposition Press.
(b) Shrock, Robert R. (1982). *Geology at MIT 1865-1965: a History of the First Hundred Years of Geology at Massachusetts Institute of Technology: Department Operations and Projects* (§:Norman H. Dolloff (S.B. 1930), pgs. H-19-20). MIT Press.

Further reading

● Wayne, James J. (2014). "Generalized Second Law of Thermodynamics and its Applications in Social Science" (abs), SSRN, Oct 29.

θΔics

In human thermodynamics, **applied human thermodynamics** is the use of human thermodynamics theory or principles in practical application. Some of these are listed below, distinguished between those applications proposed in theory and those to have become working models.

The study of the practical application of human chemical thermodynamics or human statistical thermodynamics for use in the bioengineering of human systems would be termed "human engineering thermodynamics", similar to how chemical engineering thermodynamics is used in chemical engineering by chemical engineers in the practical application and development of chemical plants, oil refineries, etc.

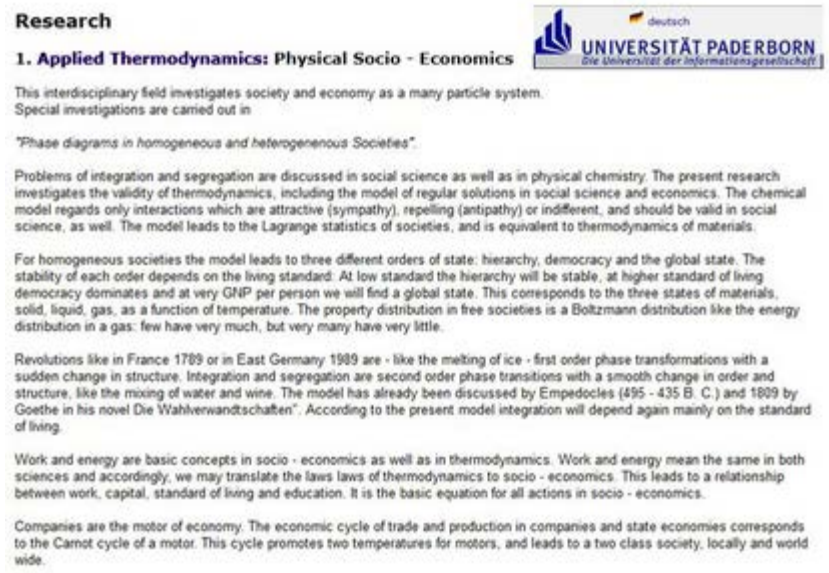

Research

deutsch
UNIVERSITÄT PADERBORN
Die Universität der Informationsgesellschaft

1. Applied Thermodynamics: Physical Socio - Economics

This interdisciplinary field investigates society and economy as a many particle system.
Special investigations are carried out in

"Phase diagrams in homogeneous and heterogenenous Societies".

Problems of integration and segregation are discussed in social science as well as in physical chemistry. The present research investigates the validity of thermodynamics, including the model of regular solutions in social science and economics. The chemical model regards only interactions which are attractive (sympathy), repelling (antipathy) or indifferent, and should be valid in social science, as well. The model leads to the Lagrange statistics of societies, and is equivalent to thermodynamics of materials.

For homogeneous societies the model leads to three different orders of state: hierarchy, democracy and the global state. The stability of each order depends on the living standard: At low standard the hierarchy will be stable, at higher standard of living democracy dominates and at very GNP per person we will find a global state. This corresponds to the three states of materials, solid, liquid, gas, as a function of temperature. The property distribution in free societies is a Boltzmann distribution like the energy distribution in a gas: few have very much, but very many have very little.

Revolutions like in France 1789 or in East Germany 1989 are - like the melting of ice - first order phase transformations with a sudden change in structure. Integration and segregation are second order phase transitions with a smooth change in order and structure, like the mixing of water and wine. The model has already been discussed by Empedocles (495 - 435 B. C.) and 1809 by Goethe in his novel Die Wahlverwandtschaften". According to the present model integration will depend again mainly on the standard of living.

Work and energy are basic concepts in socio - economics as well as in thermodynamics. Work and energy mean the same in both sciences and accordingly, we may translate the laws laws of thermodynamics to socio - economics. This leads to a relationship between work, capital, standard of living and education. It is the basic equation for all actions in socio - economics.

Companies are the motor of economy. The economic cycle of trade and production in companies and state economies corresponds to the Carnot cycle of a motor. This cycle promotes two temperatures for motors, and leads to a two class society, locally and world wide.

German solid state physicist Jurgen Mimkes' circa 2005 online **applied human thermodynamics** description section of his University of Paderborn physical socio-economics research group (see: human thermodynamics education). [1]

Overview

A few notable hmolscience applied thinkers include:

- Vladimir Lenin | Atomic theory based communism theory implementation
- John Neumann | NASA-funded space colonization automaton theory
- Johan Galtung | UNESCO-funded thermodynamic theory of peace project
- Satish Boregowda | NASA-funded thermodynamic stress theory

Theoretical models

See also: Libb Thims (prospectus)

The following are applications developed up to the theoretical or beta-stage of development:

Application	Description
• Combat thermodynamics (1953-1991)	In 1960, American combat pilot John Boyd, having flown 22 combat sorties in an F-86 Sabre during the Korean war (1953), enrolled at Georgia Tech to complete a degree in industrial engineering in order to better understand, in a physical science sense, certain anomalies of combat behavior, namely why the Korean pilots in quicker, faster, more-maneuverable Mig-15 planes had a worse kill ratio than the Americans in their bigger, slower, less-maneuverable planes. During his engineering education, Boyd sought not to worry about mathematical details, but to understand the underlying principles and concepts of physics and thermodynamics, in regards to human dog fight behaviors. Over the next 20 years, Boyd would go on to develop his thermodynamics-based combat theory, about which he consulted the pentagon on over in over 1,500 briefings, and with which he used in the successful formulation of the successful invasion of Iraq during the first Gulf War (1990-1991). In the retrospect opinion of Marine Corps general Charles Krulak:

"The Iraqi army collapsed morally and intellectually

under the onslaught of American and Coalition forces. John Boyd was an architect of that victory as surely as if he'd commanded a fighter wing or a maneuver division in the desert."

- Alien life-detection probes (1964-2005)

In 1964, Jet Propulsion Laboratory at CalTech was being funded by NASA to construct and design two probes (Voyager 1 and Voyager 2) to be sent to Mars in the upcoming 1977 Voyager mission to Mars and one of the main functions of one probe was to look for life. During this engineering phase, a debate erupted between English biophysicist James Lovelock and his colleagues as to how one would theoretically be able to recognize life, specifically Martian life? Lovelock proposed that any universally-designed life-recognition type of detection equipment or machine would need to be able to "look for an entropy reduction, since this must be a general characteristic of all forms of life." The probes were eventually built and sent to Mars, and although they did not have "entropy reduction detectors", Lovelock's theory was eventually outlined in his 1975 article "Thermodynamics and the Recognition of Alien Biospheres." Lovelock commented in retrospect (1979), that most likely, his reply was "taken to be at the best unpractical and at worst plain obfuscation, for few physical concepts can have caused as much confusion and misunderstanding as has that of entropy." As of 2005, the probes were still operational, at a yearly cost of $4.2 million.

- Consciousness quantification (1995-)

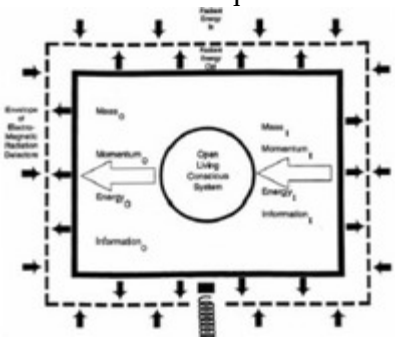

In circa 1995, American chemical engineer and physician Gerry Nahum, with a background in thermodynamics and information theory, worked out a 25-page proposal, entitled "Proposal for Testing the Energetics of Consciousness and its Physical Foundation", to conduct a consciousness-weighing project to quantify the energy of consciousness at the point of death, estimated to cost $100,000, using a negative entropy theory. Nahum has been actively seeking funding, at various university physics departments and private sectors, and presenting his theory at conferences to find partners.

- Foodstuffs thermodynamics (2005-)

In the 1990s and 2000s, Russian physical chemist Georgi Gladyshev developed an anti-aging model of foodstuffs in which he hypothesized to be able to thermodynamically quantify the anti-aging value of any food or nutritional substance via using a formula similar to the Gibbs-Helmholtz equation. He obtained a $2 billion patient for this model. He has given various lectures on this topic at the American Academy of Anti-Aging medicine conferences. In 2007, Gladyshev met with American chemical engineer Libb Thims in Chicago to discuss a joint venture to take his patented theory to the market place.

A human chemical thermodynamics matching theory based dating site, outlined in principle in the 2007 textbook *Human Chemistry*

- ReactionMatch.com (2008-)

and taken to the preliminary beta-stage of development in 2008, situated to be a hard science replacement for the hap shod sites claiming to be based on science, such as eChemistry.com (2006), run by a chemical engineer, Chemistry.com, run by an anthropologist, ScientificMatch.com (2007), run by an electrical engineer, among other sites run primarily by psychologists and computer programmers. In 2009, the online dating industry topped $1 billion and was growing at a rate of 10%.

Funded models

The following are applications that have developed up to the funding stage:

Application	Description
● Technocracy (1918-1933)	Technocracy was a type of thermodynamics-based "bureaucracy" project, funded by Columbia University, in operation from 1918 to 1933, headed by American engineer Howard Scott, in association with a group of prominent architects, engineers, and doctors, who under the mandate of the 1918 energy survey of North America, set out to become a sort of economic advisory board to the United States. Its premise was to determine an optimal organizational structure devised to manage societal activity based on physical science or, more specifically, on Gibbsian thermodynamics. The general methodology of the group was to examine social phenomena, such as unemployment or energy use, in the light of physical science. The result of the project were detailed in the 1932 book *Technocracy: A Thermodynamic Interpretation of Social Phenomena*. Some of their conceived economic theories include: the use of "energy certificates" instead of money as units of value, the use of Carnot efficiency to model economic efficiency, as well as the term "Technate" used to describe the region over which a technocratic society would operate using thermodynamic energy accounting instead of a price system (money) method.
● Physical intelligence (2009-2011)	A two-year research and development project, initiated by US defense advanced research projects agency (DARPA) program manager Todd Hylton in 2009, conceived to replace artificial intelligence with "physical intelligence", one that spontaneously evolves as a consequence of thermodynamics in open systems, hypothesized to be able to be built from chemical and electrical components. The mission statement of DARPA, to note, is to "bridge the gap from fundamental science to application". The program, currently being undertaken by a number of different government and non-government teams, is working on the following goals: (a) Creating a theory (a mathematical formalism) and validating it in natural and engineered systems; (b) Building the first human-engineered systems that display physical intelligence in the form of abiotic, self-organizing electronic and chemical systems; (c) Developing analytical tools to support the design and understanding of physically intelligent systems. The end goal for military application and use of physical intelligence.

Working applications

The following are applications developed up the revenue stage:

Application	Description
● Psychodynamics (1873-) 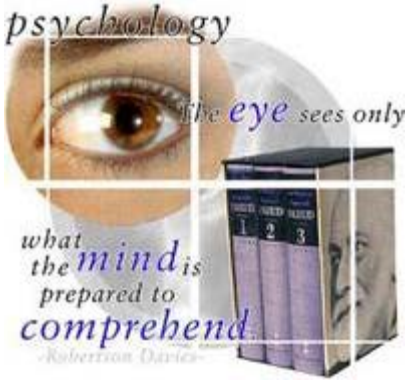	Freud started medical school in 1873, at the University of Vienna, under adviser German physiologist Ernst Brücke, director of the director of the Physiology Laboratory at the University, close friend and previous medical school lab partner to German physicist Hermann von Helmholtz one of the three-main formulators of the first law of thermodynamics (conservation of energy) (conservation of force). Over the next six years, initially concentrating on biology, Freud did research under Brücke, and under this collective influence, conceived the idea that external influences must be "conserved" in the mind in various "states of consciousness" (or subconscious), later to develop his id, ego, superego model of the mind. In circa 1920s, Swiss psychologist Carl Jung incorporated aspects of the second law of thermodynamics into a variation of this model. In the 1970s, on the models of Jung, Croatian-born American psychologist Mihály Csíkszentmihályi developed "positive psychology" with his Csíkszentmihályi flow, or "states of optimal experience", theory, using of the Freudian-Jungian terms psychic energy and psychic entropy in his analysis of states of mental life, and ideas on negentropism, e.g. psychic negentropy.
● Human entropy imaging (2007-)	Conceived by Russian biometrist Viktor Minkin, head of the Russian vibraimage company, to use pixel vibration technology to measure human emotional states, quantitatively to be explained via psychological entropy or human entropy methodologies, the theory of which to be developed by American chemical engineer Libb Thims, to be used in application for home use and government used, e.g. terrorist screening technologies. Following R&D, equipment is slated to be marketed and sold in the US under the direction of Thims; although, Thims is stalled out on parts of theory development, as he is currently mastering the works of Clausius, Gibbs, and Lewis, which underlie theory. In 2008, Thims outlined a few basic principles of "human thermodynamic imaging", after which Minkin incorporated parts of preliminary theory into Vibraimage version 7.0. In 2009, Minkin, possibly using some of the Gibbs free energy matching theory, took the project to the working model stage in the site PsyMaker.com, which claims to facilitate (a) recognition of emotions of visitors, (b) emotion recognition in Skype, (c) measure pixel-dependent aura, (d) lie detection, (e) couple compatibility matching, (f) remote and contactless public security.
	A consulting firm application in business thermodynamics, founded by Spanish telecommunications engineer Gregory Botanes, claiming be applying the laws of social thermodynamics to model social network behaviors and make predictions of business paths, needs, and issues.
	"**Sthar** is the first company in the word to apply the

- SThAR (2009-)

revolutionary and recently discovered social thermodynamics universal laws to model social networks behavior and predict social changes, based on a mathematical model instead of existing statistics-based models."

Company claims to be using "social thermodynamics research" and Montecarlo techniques, to the commercial applications of marketing, e.g. advanced behavioral marketing, competitive analysis, media investment optimization; threats detection, e.g. viruses issues, web 2.0 enterprises, etc.; security, intelligence, and defense, e.g. counterterrorism, electronic crime, knowledge management, among others.

References

1. Research (Jurgen Mimkes) – Physics Department, University of Paderborn.

In Hmolpedia, **apply to be a writer** refers to []

Overview

In 2007 to 2017, Hmolpedia (see: progress report) was, in the idealistic style of Wikipedia, an encyclopedia that “anyone can edit”. In these years, nearly all of the articles were written by Libb Thims, with goading and guidance from thread posts, and most user edits amounted to spelling typos made anonymously, with a few attempting to start new articles, such as to blog draft book chapters, such as "My Brother is at 113!", on an historical aspect of econophysics, or pet theories, e.g. "Dynamics of Elective Affinities"; most of these idiosyncratic articles would be removed by Thims and the authors directed to the “editing rules” page and the “beta wiki” to make draft articles for proposals.

On 2 Feb 2018, a hacking vandalism incident (Ñº) occurred, resulting in 100s of pages moved, via some type of coding trick, to the not available or missing state (in online version); this took several months of effort, between Libb Thims (site creator) and Travis Derouin (wiki coder) to correct. As a repercussion of this deleterious incident, the Hmolpedia permission settings were changed to **“anyone can edit”** pages to only those approved to be **“writers”** (see: Hmolpedia writers) can edit pages, so to stop potential rogue hackers from joining the site and destroying it, in a similar sense.

This change, along with the “Captcha problem” (a coding error as arose, such that now members have to request to be “friends” with Libb Thims before they can even edit their own profile pages, have worked to slow new user contributions (in threads) to a standstill.

Presently, owing to the vandal potential circumstance, if someone wants to contribute to the site, they have to (a) join, i.e. sign up with an account, (b) begin contributing in the threads (only a few people per year now contribute here), and (c) draft page change proposals (in the thread below respective article, or new page candidates in the “beta wiki”, and THEN apply to be a writer; examples of which are shown below:

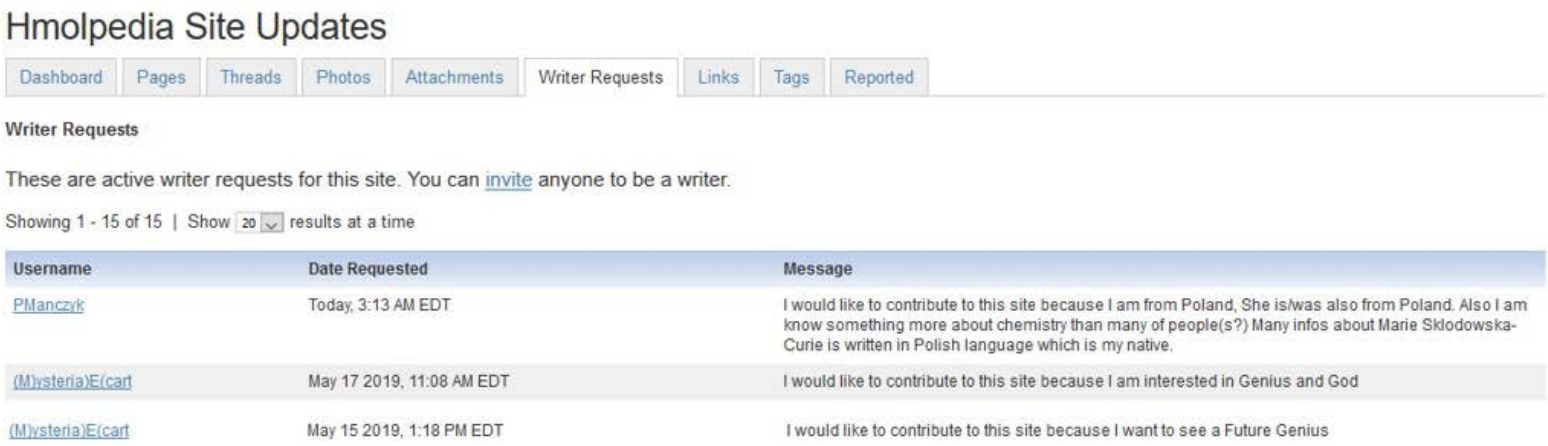

Thims will then vet potential authors, i.e. observe them via a “vetting process”, to see if they qualify to be an Hmolpedia author. Generally speaking, qualified authors have to be seasoned scholars in the **“two cultures namesakes”** topics, which is the focus of Hmolpedia. While Hmolpedia could use a few general clean up editors, e.g. fixing spelling errors or grammar, if one seeks to join to sell one's pet “god theory” or “increase your IQ”, or whatever, then seeking to join as writer would NOT be advised. Generally speaking, Hmolpedia is only interested in sincere "writers" thematic to the genuine nature of Faustian quest like searching, and education promotion therefrom, such as found letter exchanges of Adams quotes.

Approved writers

If one does become an “approved writer”, Thims has to then (a) see their writer request message (in the writer requests tab), which he checks semi-often, then, if they have been vetted, (b) change their permission settings to “writer”, which is one step below “moderator” (which is one step below “administrator”).

θΔics

In existographies, **Apuleius** (c.124-170AD) (Cattell 1000:927) (SHP:20) (CR:5) was a Roman-ruled Numidian Latin author, noted for []

Overview

In c.165AD, Apuleius, in his *Metamorphosis*, aka *The Golden Ass* (Augustine, c.400AD), described how the Egyptian parade ceremonies, with Osiris, Isis, and Anubis, were performed in Rome publicly.

Silent historians problem

See main: Silent historians problem

Apuleius is cited, along with Homer, Aesop, and Apollonius, as authors upon which later Jesus stories were possibly based (Ñº); cited (pg. 266) by Budge, *Volume Two* (1904).

Other

It was Friedrich Jodl (1849-1914), to note, who convinced Otto Weininger to change the title of his 1903 book from *Eros and Psyche* (original title), seemingly on Apuleius' "Cupid and Psyche", in his *Metamorphosis*, to *Sex and Character* (*Geschlecht und Charakter*), the latter considered more "scholarly", in Jodl's view. [2]

Quotes | By

The following are noted quotes by Apuleius:

> "The Egyptians hold the festival of Isis at the time when they say she is mourning for Osiris. At that time the Nile River begins to rise, and it is a common saying among the natives that it is the tears of Isis that cause the river to rise and water the fields."
>
> — Apuleius (c.165AD), *Eleventh Book*; cited by Wallis Budge (1904) [1]

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pgs. 216-17; Isis weeping, pg. 219). Dover, 1969.
2. (a) Janik, Allan and Veigly, Hans. (1998). *Wittgenstein in Vienna: a Biographical Excursion through the City and its History* (§9: Schwarzspanierstrasse 15, pgs. 204-05; Jodl, 2+ pgs). Springer Science.
(c) Cupid and Psyche – Wikipedia.

Further reading

â— Evola, Julius. (1996). *The Mystery of the Holy Grail: Initiation and Magic in the Quest for the Spirit* (Isis, 4+ pgs; Osiris, 4+ pgs; Horus, 3+ pgs). Simon & Schuster.

External links

â— Apuleius – Wikipedia.

θΔics

In molecules, **AQ** (TR:4), or “AnthraQuinone”, molecular formula: $C_{14}H_8O_2$, is DTA-like animate molecule, with two oxygen feet, which has the ability, when powered, to carry “loads” of CO_2 molecules.

Overview

In 2007, Ludwig Bartels, expanding on his earlier DTA experiments (2005), began investigating so-called "molecular carriers", specifically by doing STM studies on AnthraQuinone (AQ) (Q), a DTA-like molecule, formula $C_{14}H_8O_2$, with two oxygen feet. The following shows an "AQ molecule" attaching to or carrying a CO_2 molecule (or two CO_2 molecules) during diffusion along the Cu(111) high-symmetry direction by means of individual steps: [1]

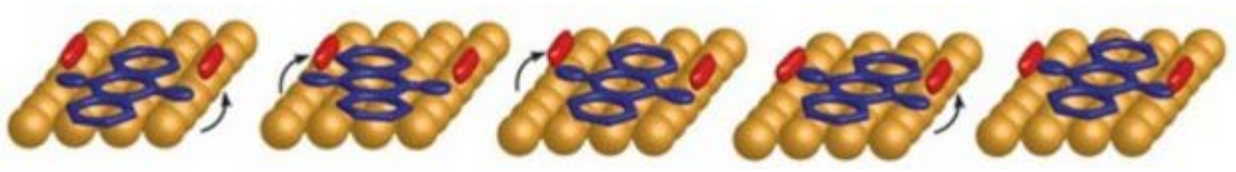

Bartels found that carrying more load, e.g. 2 or three CO_2 molecule, slows the carrier down, just as a human is slowed down when carrying more bundles.

The following is a gif animation of DQ carrying its CO_2 bundles:

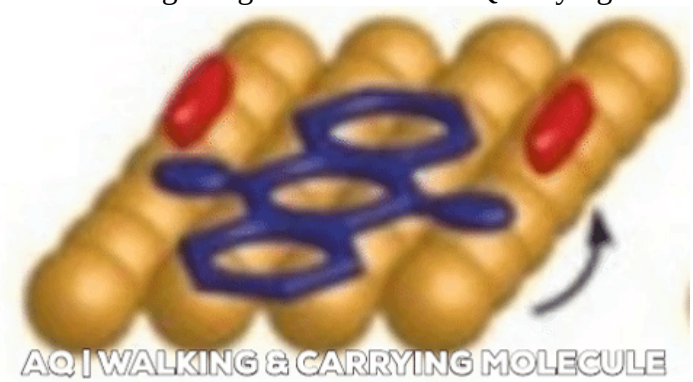

(add)

See also

- ATP
- DNA
- Kinesin
- Myosin
- Retinal | Retinal molecule | ABC model
- RNA
- Virus | Virus molecule

References

1. Leigh, David A., Lewandowska, Urszula, Lewandowski, Bartosz, and Wilson Miriam R. (2014). “Synthetic Molecular Walkers”, in: *Molecular Machines and Motors: Recent Advances and Perspectives* (editors: Alberto Credi, Serena Silvi, Margherita Venturi) (§4:111-38; pgs. 126-27). Springer.

θΔics

● Dear Santa: All I Want for Christmas is to Skip Church! (Q)
● Why Atheists are Smarter than Theists? (Q)

28 Jan 2015

● Son of Hamas (Q) | Quran 9:5 (Q)

● Is There an Afterlife? | Atheists Christopher Hitchens and Sam Harris vs Theists David Wolpe and Bradley Shavit (2011) | Reviewed (Q)

● Bill Nye: Creationism is Not Appropriate for Children | Review (Q)

● Brigitte Gabriel Slams Muslim American | Ideology Solution? (Q)

● Why I Am Not a Christian (1927) | Russell | Thims' Commentary (Q)

● Secret of Life | Alan Watts | Upgraded (Q)

● Richard Dawkins Teaching Evolution to Religious Students | Reviewed (Q)

● Atheism Documentary | CBC News | Review (Q)

● Muslims Go Bat-sh*t Crazy During Gay Film (Q)
● Behead those who Insult the Prophet Rally | Australia (2012) (Q)
● This is Islam | Documentary (Q)

● A Muslim Rips on Muslims (Q)

● Muslim's are Brainwashed | A Woman Tells it Like it Is! (Q)

● 11-Year-Old Child Bride Speaks Out (Q)

● Second Law Disproves Evolution? | Responses 1. TomWalksThrough (Q), 2. Steve Shives (Q), 3. ZombeePIctureShow (Q), #4. (add), … 10. Atheism Reviews (Q)

Cartoons Kill | Charlie Hebdo

● Hannity vs Imam Choudary | Hebdo Shooting Justified! (Q)
● Charlie Hebdo Shooting | JaclynGlenn (Q)
● Is it OK to mock religion? | Charlie Hebdo & Muhammad Cartoons (Q)

● The ONE QUESTION atheists have been UNABLE to answer! (Q)

● How to Deconvert a Religious Person (Q) (Q)

● Throw your Quran into the Trash Day! (Q)

● Victor Stenger vs Zack Manis (2009) | Evidentialism (Q)

● What Good Comes from Being an Atheist? (Q)

● MrRepzion (aka Daniel Sulzbach) Religious Deconversion Documentary (Q)

● The Force Awakens | Official Teaser Analysis: Science vs Religion (Q)

Art | Themes

The following are good God-believer cohost videos:

● Prayer as Self-Talk | Atheism (Q)

New | 25 Dec 2014

● Dane Cook on Atheists (Q)
● Extreme atheism (Q) | Inter-stitched with adjacent explanation.
● Dawkins vs Brian Green | God question? (2013) (Q)
● Religious Government vs Godless Government | Which is Better? (Q) | IJ1:2:09
● Dawkins vs Wendy Wright | Show me the Evidence! (Q) (Q) (Q)

● Hitchens rips Fox News anchor | God is Not Great (2007) (Q)
● An Atheist Physicist converts to Islam | Review (Q) | 6 IJs before 6:26

New | Pre 24 Dec

● Deepak Chopra is full of [quantum] s**t! | Julia Sweeney (A) (Q) (Q)

● Death as an Atheist | Julia Sweeny (Q)

● If Evolution is Fact, we are Deluded and Without Hope | Dawkins (Q) | 6:30

● 6th Grader schools Pastor about Noah's Ark (Q)

● Christian call-in | 3-times no proof (Q) (Q)

Requested | Debate reviews

The following are debates that have been requested to be reviewed:

● Sam Harris vs Reza Aslan | Debate Reviewed (2007) (Q) | Requested by: 503Workshop (Q)

New

● Richard Dawkins vs John Lennox | God delusion debate (Q) (Q)
● God is NOT a magician with a magic wand | Pope Francis (2014) (V) (Q)
● Smart Religious People | Oxymoron | Sam Harris and Kyle Kulinski (Q)
● Top 10 Creationist Scientists Ranked by Idiocy (Q) (Q)

Other

● Baby I Love Your Way | Nietzsche | Will to Power | Freebird song and book discussion
● Benjamin Carson on Political Correctness | Religion (2013) (Q)
● If God Doesn't Exist, Then Who Wrote the Bible? (Q) | 2012
● Stop Calling Theists Stupid!!! | Atheist Experience vs Theists | 2014 (Q)

King reviews

The following are good co-host with King videos:

● Spiritual Atheism! Ahh … What? (2011) (Q)
● It's POINTLESS to talk to an atheist!!! | MrRepzion (Q) | Original: 26 Jan 2014 | IJ1(0:56)

Short | Seemingly

The following are potentials that seemingly will be short and quick reviews:

● Best Richard Dawkins Moment Ever!!! | Review (Q) | 2009 | IJ(0:20): the problem here is that he debates with tools and lightweights; in short: (a) he doesn't debate with heavy hitters, (b) he, being but a zoologist, and thereby ignorant to the physical sciences, rides on a bandwagon platform of baseless albeit popular "self-genes" theory, has never done any real battle, and (c) [add]

● Dawkins on the Banana Man and Kirk Cameron (Q) | Review (2009) | IJ1(0:50): compare the Bill Nye did debate with Ken Ham and the effect it had, the soberness of his passion, and followup book, and "Richard Dawkins debates" 6.8M+ view count (Q) in seven, as compared to 6.7M+ "Bill Nye debates" view count (Q) in two years.

Newer

● How to remain Christian! (Q) | Citing sources (Q) | 2014
● Shelly Kagan vs William Craig | Atheistic morality (2014) (Q) IJ1(2:18)

● Sam Harris vs Fareed Zakaria | Islam is crap? (2014) (Q): IJ1(7:00-7:22)
● Stephan Baldwin vs Dawkins | Why are the apes still here? (Q) | Note: Thor pick (Q) | Insert: (Q)
● Kate Smurthwaite vs Christian | Abortion, Heaven & Idiots | Original 2011 (Q)
● OG Furious (Dean Leysen) vs Big Bang theory | Atheism debunked | Original 2013 (Q)

● Meaning in atheism if we're just chemicals (Q) | Insert: soulless bag of chemicals
● Eric Hovind, Daniel Johnson, and Shawn Karon vs atheist monument (2013) (Q)

Draft | Board | New finds

The following are new potential reviews and or new finds:

● Ravi Zacharias vs Nietzsche, Hitler, and morality | Original: 2013 (Q) | IJ1(8:30-15:28); IJ2(16:23): "morality" | Insert: the "Hitler card" (Q) | Insert: (Q)

● Atheists do exist vs Atheists don't exist? | Jaclyn Glenn (2014) (Q) | IJ1(0:50): "studies show that even people who claim 'atheism' tacitly hold religious beliefs, such as soul, karma, cosmic justice, etc."
● Muslim vs Lawrence Krauss | Morality (2013) (Q) | IJ1(0:15): "atheist's moral judgments are relative and subjective"; IJ2(1:01): "evolution has no true meaning, it's just survival and reproduction" + Michael Ruse (Q)

● Burka-covered vs Open-faced woman | French law (2011) (Q) | Insert: new atheism bit about the school girls who burned because the had burkas on | Insert: The Burka ban law "exposes unveiled Muslim women to being raped by Muslim men" as punishment (1:30-ish) (Q); "who are you trying to seduce" (14:41)

Slated

● Sam Harris and Michael Shermer vs Deepak Chopra (2010) (Q)

> IJ1:1:24 (ontic opening); IJ2: 2:29 (new age, quantum consciousness, thermodynamics); IJ3:2:56 (woo woo physics, Ryan Grannell) (Q); IJ4:4:14 (non-locality, connected universe); IJ5:5:07 (ad homonym); IJ6:5:55 (credentiality, Buffett number, Moriarty-Thims debate, 8-degrees problem [George Scott]; IJ7:7:19 (Einstein: "Science without religion is lame, religion without science is blind"); IJ8:7:32 (Hawking: "It would be very difficult to explain how the universe should ["would" Chopra] have begun in just this way except as the act of a God who intended to create beings like us", anthropic principle); IJ9:7:51 (misattribution, anachronism [Robert Doyle]); IJ10:8:08 (God-given: insight, inspiration, creativity, free

will, conscious choice, imagination … “are your neurons doing that or are you doing that?”); IJ11:8:36 (personal god), IJ12:9:23 (closeted atheists issue: 95 percent of AAS members are atheists, but “they do not like to say so” as Napoleon found); IJ13:10:27 (public embarrassment). [3]

Location: Caltech. Date: 23 Mar 2010. Topic: the question: "Does God Have a Future?", presented by ABC's Nightline. Participants: Sam Harris and Michael Shermer vs Deepak Chopra and Jean Houston. Moderator: Dan Harris; See also: Karl Pearson on consciousness per segment (Q)

● Tennessee Christian students vs biology teacher | Evolution (1996) (Q) (Q) (Q)

Debates
● Hitchens vs Hitchens | Iraq and God (Q)

Newer
The following are very new:

● Atheist Jessica Alquist vs Cranston West High School | Prayer banner (2012) (Q)
● Richard Dawkins vs Virgin birth lady | Bishops in parliament (2012) (Q)
● Christopher Hitchens vs Theist | Why battle god-belief if God doesn’t exist? (Q)
● Black atheist vs. black catholic | Suicide Jesus (2014) (Q) | IJ1(3:04):
● Miss USA contestants vs Evolution | Ignorance (2011) (Q)
● Bill Nye vs News Anchor | Biblical harm (2012) (Q)

Semi-Newly added
The following are newly added AR debate possibilities:

● Lawrence Krauss vs Ian Hutchinson | Miracles (2012) (Q) | IJ1(2:10): ontic opening argument; etc.
● Bill Maher vs. Bill O’Reilly | Noah's ark (2010) (Q) | IJ1(1:00): Noah’s ark, IJ2:
● Neil deGrasse Tyson vs Sam Harris (2006) (Q) | IJ1(1:24):
● John Stossel vs. theist Fox News anchor (Q) | IJ1(1:25)
● Amazing Atheist vs William Craig (2013) (Q) | IJ1 (5:21)
● Atheist Matt Dillahunty vs theist | Existence of Jesus (2014) (Q) | IJ1 (0:29)
● Jaclyn Glenn vs Muslim man | Sperm drinking morality (2014) (Q) (Q)
● Atheist Dan Barker vs Muslim apologist Adam Deen | Atheism is not ... (2012) (Q) | IJ1(0:48): “atheism is not …”
● Atheist Annie Gaylor vs. Oprah | Religion as addition (1984) (Q) | IJ1(1:40): opium of the masses
● Ben Affleck vs Sam Harris and Bill Maher | Islam (2014) (Q) (Q)

Older | Potentials | Slated
The following are tenable debates to review and or in the slated stage:

● Atheist evolutionist vs Muslim (2014) (Q) | IJ1:7:30-ish (evolution)
● Atheist-Agnostic Ralliers vs Christian Crusaders (2012) | IJ1: 1:41 (Q)
● Sam Harris vs Oxford grad student | IJ1:1:15 (Q)
● Atheist Peach vs Numb Nut Theist (2010) | IJ1: 1:01 (Q)
● Egyptian Atheist vs. Islamic Talk Show Hostess (2014) | IJ1: 1:00; IJ2: 2:14, etc. (Q)
● Peter Atkins vs William Craig (1998)
● Bill Nye vs Ken Ham (2014)
● Jaclyn Glenn vs Muslim (2014)
● Lawrence Krauss vs Deepak Chopra (2013)
● Oprah vs Atheist Annie Gaylor (1984) | IJ1: 1:17 (Q); IJ2: 3:09

● Christian chemist Gunnar Dieckman vs Atheist protester (2012) (O)

IJ1:time (going to hell); IJ2:4:13 (who wrote the old testament and new testament); IJ3:4:39 ("Always be ready to give answers …", see: ABR (Q));

● Creationist Student vs Tim White (2011) (Q)

IJ1:0:32 (quote: "Why should be base the validity of all of our life's beliefs on a theory?"); IJ2:1:17 (quote: "Evolution is a fact, it's not a theory"); IJ3: (add)

● Atheist Michael Sizer vs theist Mariano Grinbank (2010) | Morality: Natural or Supernatural? (Q) IJ1:time (Hamilton's rule)
● University of North Texas Atheist student vs Street Preacher (2011) (Q)

Pat picks

The following are debate picks by king atheist Pat:

● Bill Maher vs Christian Ross Douthat (2012) (Q); author of *Bad Religion: How We Became a Nation of Heretics* (17 Apr 2012) (Q) | IJ1(6:56-7:08): "Where is the idea of universal human rights, if not metaphysical principle? Can you find universal human rights under a microscope? Is it in the laws of physics? No."

In hmolscience, **Aram Boyajian** (1888-1964) was an Armenian-born American electrical engineer and philosopher noted for []

Overview

In 1944, Boyajian, in his "A.A. Michelson Visits Immanuel Kant", described by Bernard Bell (1945) as a "remarkable paper", wherein he opens to the following: [1]

> "In the ages when people believed in ghosts inhabiting everything, there was no conflict between intelligence and matter, none between purposeful action and physical necessity. But ever since ghosts have been driven out of things by a reign of law in nature, intelligence and purposeful action have been steadily crowded out of the physical world by matter and physical necessity; and the human soul, as the lest of the ghosts, has been reduced to an insecure, furtive existence. What does science say about the matter? What does philosophy?"

He then jumps to the following humorous statement:

> "Physics teaches us that the universe is made up of electrons, protons, neutrons and quanta obeying certain laws, some pretty well known, others to be clarified further, but, whatever the exact formula may be, the picture is one of blind (unconscious) matter tossed around by blind (unconscious) forces in obedience to blind (meaningless) physical laws."

This is hilarious to the last; he then states frankly:

> "The physicist carefully avoids the embarrassing philosophical implications of these theories with respect to man, god and immortality, and other philosophical questions, but these have to be faced sometime or other."

Boyajian, on this platform, then injects into the following dialogue between a fictional A.A. Michelson, stylized on Albert Michelson (1852-1931), noted for the 1887 Michelson-Morley experiment (Ñº), and Immanuel Kant, as summarized by Judson Herrick (1956): [1]

> "Boyajian reports an imaginary conversation between the philosopher Kant and the physicist Michelson. With the author's Kantian metaphysics, we are not here concerned, but some reflections, which introduce the dialogue, upon the growth of ideas about the chemical equation are pertinent here.
>
> In the early days of chemistry, attention was directed mainly to the matter involved in chemical reactions. The equation for the formation of water from its elements was written as:
>
> $$2H_2 + O_2 = 2H_2O$$
>
> in which no account is taken of the energy involved in the reaction. In the familiar laboratory experiment an electric spark is introduced into the mixture of hydrogen and oxygen to start the reaction; in other words, there is an energy factor on both sides of the equation. The correct equation as now written is:

$2H_2 + O_2 = 2H_20 + 293{,}000$ Joules

> ‘This equation’, Boyajian says, ‘satisfies the law of conservation of mass plus energy, whereas the old one would not, because 2H20 is a little lighter than (2H2 + O2) at the same temperature.’ Now he asks, ‘But is the new equation really complete?’ It is suggested that it is not, ‘and that someday we shall add to the right-hand member of the equation a third term representing a mental factor:
>
> $2H_2 + O_2 \rightarrow 2H_2O + 293{,}000\ J + X$
>
> the X in this equation being the mind-stuff that is necessary to balance the equation.’ I noticed that in the last formula the equality sign was replaced by another symbol and in response to my inquiry for the reason Boyajian wrote:
>
> ‘You allude to the fact that in my third equation the equality sign has been changed to an arrow. That had a double significance. First, as the equation became more up to date, its typographical form also was made to conform. Chemistry books nowadays use mostly arrows instead of equality signs. Second, the reason for the change in the convention is that chemical equations represent a reaction moving in a certain *direction* .... And I would call particular attention to the fact that later in my article I have pointed out that X is another aspect of the physicochemical system and not an additional factor. To use Coghill's language, in my opinion, ‘mentation’ would be a simple shorthand psychological statement of a complex biochemical process, rather than an addition to it’.”

Judson, to note, seems to asserts that some form of this hydrogen plus oxygen to form water argument was done by Claude Bernard in 1865. Judson then attempts to sell Boyajian's argument as potential panpsychism, if one wishes:

> “What is important for us here is that no chemical "equation" represents a static balance. It symbolizes a process, and this process is directive. The process is set in motion by a disturbance of an equilibrated system of energy, and it continues until a new and different equilibrated system is established. The essential feature of this reaction and of every other mechanical action, is a change in pattern of organization and performance; or, otherwise expressed, there emerges a new product with different properties. In Boyajian's formula the ‘X’ admittedly stands for an unknown. It may simplify the problem if at this level of organization, we call this unknown ‘pattern’ instead of ‘mind-stuff’. At the higher levels of the organic realm this pattern takes the form that Schrodinger (1944) calls ‘code script’ and Coghill (1938) calls ‘mentation.’ The concept of pattern carries no implication of panpsychism here, though it does not exclude that hypothesis if one wishes to adopt it.”

(add discussion)

Education

In 1915, Boyajian completed his AB in electrical engineering at Swarthmore College (Ñº), and in 1945, was electrical engineer with General Electric Company, working in the area of transformers. [2] In 1952, Boyajian was a visiting lecturer at MIT. (Ñº)

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(b) Bell, Bernard I. (1945). *God is Not Dead* (pg. xiv). Harper & Brothers.
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â— Boyajian, Aram. (1946). “The Strange Trinity Called Man” (abs), *Scientific Monthly*, Apr.

θΔics

In literature thermodynamics, ***Arcadia*** is a 1993 play by British playwright Tom Stoppard in which the characters, juxtaposed between the years 1809 (date of publication of Goethe's *Elective Affinities*) and 1989, attempt to interpret German scientist Johann Goethe's 1809 affinity theory of sex, love, relationships, and death, a theory which itself is based on Swedish chemist Torbern Bergman's 1775 textbook *A Dissertation on Elective Attractions* (viewed using a human chemical perspective), in the modern-day second law of thermodynamics perspective, with a mixture of chaos theory, mathematics, among other mixed topics. [1] The play alludes to a dialog on relationships and sexual energy.

An opening scene from act II of a November 1998 performance of *Arcadia* done at Willamette University Theater. [3]

American English professor Raymond J. Wilson III, in his 2003 "Gardens in Stoppard, Austen, and Goethe", seems to have been one of the first to make a connection between *Arcadia* and *Elective Affinities*. [4]

Etymology

The enigmatic phrase *En in Arcadia ego* ("even in Arcadia I exist"), used in the play, made its first debut before in a painting by Itailian artist Guercino (or Giovanni Barbieri) in c.1618, featuring a skull with a bee perched on it, below which is found the riddled phrase, which loosely means that even in paradise or utopia by death and sex coexists in the balance of natural harmony.

In Guercino painting, the phrase 'Et in Arcadia ego' - meaning 'And in Arcadia I' - is found directly below the skull which in turn is facing directly toward the viewer. This clarifies to some extent the meaning of the mysterious motto. The 'ego' part (i.e. 'I' as in 'me') can be understood to refer to the skull, that is, death. So we would have: 'Even in Arcadia death'. To put it another way, 'death is also to be found in Paradise; or, in the midst of earthly delights, the transience of life cannot be disregarded'.

Dialogues

The following are noted dialogues, selected by Jay Labinger (1995): [5]

> "THOMASINA: When you stir your rice pudding, Septimus, the spoonful of spreads itself round making red trails like the picture of a meteor in my astronomical atlas. But if you stir backward, the jam will not come together again. Indeed, the pudding does not notice and continues to turn pink just as before. Do you think this is odd?
> SEPTIMUS: No.
> THOMASINA: Well, I do. You cannot stir things apart.
> SEPTIMUS: No more you can, time must needs run backward, and since it will not, we must stir our way onward mixing as we go, disorder out of disorder into disorder until pink is complete, unchanging and unchangeable, and we are done with it forever. This is known as free will or self-determination."
>
> — Tom Stoppard (1993), *Arcadia* (pgs. 4-5; first 10 minutes)

> "THOMASINA: If you could stop every atom in its position and direction, and your mind could comprehend all the actions thus suspended, then if you were really, *really* good at algebra you could write the formula for all the future; and although nobody can be so clever as to do it, the formula must exist just as if one could."
>
> — Tom Stoppard (1993), *Arcadia* (pg. 5; first 10 minutes)

> "THOMASINA: ... Newton's equations go forwards and backwards, they do not care which way. But the heat equation cares very much, it goes only one way ...
> SEPTIMUS: So, we are all doomed!
> THOMASINA: (Cheerfully) Yes.
> SEPTIMUS: So the improved Newtonian universe must cease and grow cold. Dear me."
>
> — Tom Stoppard (1993), *Arcadia* (pgs. 87, 93)

Labinger also notes that the ending scene where Tomasina dies in a fire just before the final (1812) scene—that is she suffers her own "heat death" as Labinger puts it, he comments that a member of the audience, during his "Metaphoric Usage of the Second Law: Entropy as Time's (double-headed) Arrow in Tom Stoppard's *Arcadia*", presented at Nov meeting of the Society for Literature and Science, Los Angeles, explained that he had heard that Stoppard in an interview had said that he added this touch after his son, a physics student, told him that his take on thermodynamics was rather too optimistic.

Notes

One aspect of this play that is difficult to track down is how Tom Stoppard came to be aware, if at all, about the fact that Goethe's 1809 version of science and sex, explained via chemical affinities A, and the post 1865 versions of science and sex, explained via equations that incorporate entropy S, are related via the following equations, derived in overview in 1882 by Hermann Helmholtz:

$$A = -\Delta G$$

or in terms of entropy and entropy:

$$A = T\Delta S - TH$$

The existence of this connection is a deeply buried fact in science, especially so in 1993, at the time of penning *Arcadia*. It is possible, however, that this was just a fortuitous connection or guess?

References

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(c) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (section: Arcadia and Elective Affinities, pgs. 445-49) (preview), (Google books). Morrisville, NC: LuLu.
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(b) Et in Arcadia ego – Wikipedia.
(c) Arcadia (utopia) – Wikipedia.
3. Arcadia (photos) by Chris L. Harris – Flickr.com.
4. Raymond, Wilson J. (2003). "Gardens in Stoppard, Austen, and Goethe", in: *Gardens and the Passion for the Infinite, Volume 78* (pgs. 59-). Springer.
5. Labinger, Jay A. (1995). "Metaphoric Usage of the Second Law: Entropy as Time's (double-headed) Arrow in

The phrase "***Et in Arcadia ego***" is quoted, in the play, by Lady Croom, the archly witty resident aristocrat of Sidley Parkin 1809, a quote from the c. 1618 paintine (above, below the skull) by Italian artist Guercino. [2]

Tom Stoppard's *Arcadia*", Presented at Nov meeting of the Society for Literature and Science, Los Angeles; in: *The Chemical Intelligencer* (pg. 34), Oct. 31-36, 1996.

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● Rich, Frank. (1993). "Critic's Notebook; on Thermodynamics, Byron and Oh, Yes, Sex", *The New York Times*, July 08.
● Essay: Arcadia Notes (thermodynamics) by Carol Ann Duffy – CourseWork.info.
● Arcadia (main themes) – Physics.Weber.edu.
● Arcadia: Themes, Motifs, and Symbols – SparkNotes.com.

θΔics

In existographies, **Archelaus** (c.470-410BC) was a Greek philosopher, student of Anaxagoras (500-428BC), teacher (or influence) to Socrates (469-399BC), according to Aristoxenus (360-300BC) (Q), noted for []

Motion

Archelaus asserted that the principle of motion was the separation of hot from cold, from which he endeavored to explain the formation of the earth and the origin of animals and humans.

Quotes | On

The following are quotes on Archelaus:

> "The belief that animal, including human, life was originally generated from primeval slime (154a-c) is common to many early cosmologies, including those of Anaximander (DK 12 A11, A30), **Archelaus** (DK 60 AI), and the source of the cosmogony in Diodorus (I.7 as printed by DK with 68 B5)."
>
> — Christopher Taylor (1999), *The Atomists: Leucippus and Democritus* [2]

Quotes | By

The following are noted quotes by Archelaus:

> "Both men and animals are made from a milky slime squeezed out by the heat of the earth."
>
> — Archelaus (c.440BC) *Publication*; cited by Michel Montaigne (c.1580) [1]

References

1. (a) Montaigne, Michel. (c.1580). *The Complete Works* (translator: Donald Frame) (pg. 507). Everyman's Library, 2003.
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2. Taylor, Christopher C.W. (1999). *The Atomists: Leucippus and Democritus: Fragments: a Text and Translation with a Commentary by C.C.W. Taylor* (Archelaus, pgs. 197-98). University of Toronto Press.

External links

- Archelaus (philosopher) – Wikipedia.

θΔics

In existographies, **Archibald Sayce** (1845-1933) was a British Assyriologist and religio-mythology scholar, noted for

Overview

In 1913, Sayce, in his *The Religion of Ancient Egypt*, argued for a parallelism of the "stellar theology" (see: astro-theology) of Babylon and Egypt, both countries absorbing popular star-worship into the official pantheon of their respective state religions by identification of gods with stars or planets. [1]

Quotes | On

The following are quotes on Sayce:

> "The cosmogony of the Jews, as recorded in Genesis, was mainly borrowed from the Babylonians. According to **A. H. Sayce**, the creation myth that it embodies arose at Eridu, a town on the Persian Gulf. Here, he says in the Hastings' *Encyclopedia of Religion and Ethics*, 'the land was constantly growing through disposition of silt, and the belief consequently arose that the earth had originated in the same way. The water of the great deep accordingly came to be regarded as the primordial element out of which the universe was generated. The deep was identified with the Persian Gulf, which was conceived as encircling the earth'."
>
> — Henry Mencken (1930), *Treatise on the Gods* (Ñº)

References

1. Sayce, Archibald H. (1913). *The Religion of Ancient Egypt* (pg. 237f). Adamant Media Corporation.

External links

â— Archibald Sayce – Wikipedia.
â— Archibald Henry Sayce – WikiSource.

θΔics

In existographies, **Archimedes** (287-212BC) (IQ:190|#39) (Cattell 1000:414) [RGM:9|1,500+] (Murray 4000:20|M / 5|T) (GME:4) (CR:75) was a Greek mathematician, physicist, and engineer, noted for his principle of the lever, buoyancy principle or theory of specific gravity, a mechanical method of the calculation of areas, among others; sometimes known as one of fabled "last persons to know everything".

Architronito | Steam-powered cannon

In 330BC, Archimedes, according to Leonardo da Vinci (c.1500), invented a architronito, or steam-powered cannon that throws 70lb iron balls, via the action of “great noise and fury”, at the enemy, by the action of heat derived from burning coals; diagrams of which are found in da Vinci’s notebooks; the gist of which is diagrammed as follows: [5]

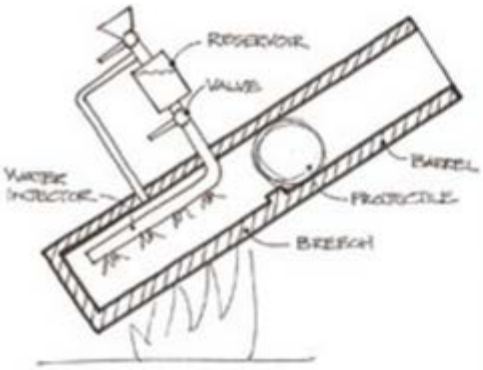

(add)

Mathematics

Archimedes discovered the value of Pi, worked on the concept of infinity, and made steps towards the development of calculus. [1]

Mechanics | thermodynamics

In his *The Method of Mechanical Theorems*, Archimedes gives an account of his “mechanical method”, in which, utilizing his center of gravity method, he shows how to use infinitesimals and the law of the lever to determine the areas of figures from the known center of mass of other figures, in what seems to be a precursor to integral calculus. [1]
French physicist Gustave Hirn, in his 1868 *Philosophical Implications of Thermodynamics*, mentions Archimedes, and his lever principle, as follows: [2]

> “We see how many people incorrectly thought are what we call the power of an engine. When they hear about a steam engine, a water wheel of twenty horses for example, it contained only twenty horses harnessed together and acting both are driven by the engine. They thus confuse the effort exerted at a given time, and assumes no minimum time, with the mechanical work, which involves the idea of time. **Archimedes** said that with a lever and a fulcrum long enough, that it would raise the earth, he probably thought to have multiplied almost indefinitely the power of man, in reality, unconsciously perhaps He has made us very small. Lift the land means, in effect, use the engine working at our disposal, to raise to a height equal weight to that of Earth. But really, how long would it take a very vigorous man, working day and night, without rest, to lift such a weight to one millimeter in height? He would need two million of millions of centuries! Archimedes indeed, although we were humiliated.”

No doubt this "moving earth" postulate would have been considered heresy, being in direct opposition to the

stationary earth theory found at the heart of Ra theology, and hence Christianity; just as was Galileo Galilei put under house arrest some 2,000-years latter for advocating the same view.

A depiction of **Archimedes**, who famously said "give me a lever long enough, and I will move the earth", moving the earth; thus Illustrating his "principle of the lever", supposedly one of the per-cursors to infinitesimals and hence to integral calculus.

Archimedes palimpsest

In 1998, the auction house of Christie's sold the famous Archimedes Palimpsest, a 1000AD collected works set of Archimedes theories, which was made into a palimpsest in 1200AD, for more than $2 million. Since then, Stanford University working in coordination with the Walters Art Museum has been using a variety of imaging techniques to retrieve the hidden texts and images, which turned out to be heretofore undiscovered works, *Balancing Planes*, *On Floating Bodies*, *The Method of Mechanical Theorems* and the *Stomachion*, in which Archimedes wrote about topics ranging from gravity to infinity. [1] The ongoing project is currently hosted at the Walters Art Museum, Baltimore, Maryland. [4]

Other

In 1789, at the age of 13, French mathematician, physicist, and philosopher Sophie Germain (see: smartest woman ever), in her father's library, intrigued by the famous death of Archimedes, she self-taught herself mathematics; learning Latin and Greek so to read Isaac Newton and Leonhard Euler.

Quotes | By

The following are quotes by Archimedes:

> "Eudoxus first discovered the proof that the cone is one-third of the cylinder of equal height on the same base, and the pyramid one-third of the prism. No small share [of the discovery] should be assigned to Democritus, who first made the assertion about the above-mentioned figure without proof."
>
> — Archimedes (c.220BC), *Mathematical Theorems Addressed to Eratosthenes* (see: Eratosthenes) [6]

References

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Further reading

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External links

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θΔics

In *Elective Affinities*, the **architect**, see: Goethe's affinity table, was an old pupil of the Captain who, beginning in chapter fourteen, became a main character in the novella, supervising and guiding a number of architectural projects on and about the estate, and to a certain extent became enamored with Ottilie, and in this sense a combatant to Eduard and his interest in Ottilie. [1]

Person Behind Character

Zacharias Werner (1768-1823) German romantic poet

Minna Herzlieb (1765-1839)

Does a dual with Goethe of a cycle of seventeen sonnets in competition for Minna's charms.

In 1807, she came to Weimar, where she met Goethe, who presented her with some sonnets; it has been argued that she may have been one of the models for Ottilie.

Person behind character

To a certain extent, as Goethe said "lived every word of my *Elective Affinities*", and noting that Goethe was an architect, at times, in the course of his own existence, it can be argued that some of the character of architect embodied aspects of Goethe himself, although not in the sense as did the Eduard character.

In the winter of 1807 to 1808, Goethe fell in love with 18-year-old Minna Herzlieb (1765-1839), the "foster daughter" of the printer and publisher Karl Frommann (1765-1837); the product of this was the cycle of seventeen sonnets written as a dual with Minna's other admirer, the fomantic poet Zacharias Werner (1768-1823); who seems to have been the character behind the architect character of the novella, who attempts to win the affections of Ottilie in competition with Eduard. [2]

Alternatively, in his 1811 autobiographical notes, Goethe wrote: [3]

> "As to persons who this year called on me in Weimar, I find the following mentioned: Engelhard, architect from Cassel, on his way to Italy. It was asserted that he had been the prototype of my artist in the *Elective Affinities*."

See also

â— Architecture
â— Architectural thermodynamics

References

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2. (a) Hollingdale, R.J., Goethe, Johann. (1971). *Elective Affinities* ("Introduction", pgs. 1-16). Penguin.
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3. Goethe, Johann. (1901). *Annals or Day and Year Papers* (translator's introduction by Charles Nisbet; Contents: Annals by Years, pg. xiii; 1807-1811, pgs. 144-183; elective affinities, pgs. 156-57, 168, 177-78, 181). In: *Classic Memoirs, Volume 32*. Colonial Press.

Further reading

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θΔics

In hmolscience, **architectural thermodynamics**, a branch of human thermodynamics, is the use of concepts, such as energy and entropy, and the laws of thermodynamics in architectural design or theory, in individual unit, buildings, or city planning.

Overview

In the late 1970s, one of the first courses on “architectural thermodynamics”, as the class was called, was taught at Georgia Institute of Technology. The course name, however, was eventually changed to “thermal principles in architecture”, because the former name apparently intimidated students. [3]

Architectural pioneers in this field include English urban architect Alan Wilson (1970), Italian architect Luis Fernández-Galiano (1991). [1] Since 1995, Australian-born American mathematician and architect Nikos Salingaros has done a significant amount of theorizing in this field, albeit using a mixture of verbalized analogies, unitless thermodynamic variables, e.g. architectural entropy and architectural temperature, chaos theory, and complexity, geared to match building design with emotional comfort and beauty. [2]

In 1884 to 1992, Sanford Kwinter proposed with a more abstract formulation the need to introduce far from equilibrium thermodynamics and the arrow of time in architecture. These ideas were introduced through a various articles (see “Landscapes of Change: Boccioni's "Stati d'animo" as a General Theory of Models” in Assemblage, No. 19, Dec., 1992, pp. 50-65) and the book Architectures of Time which was written between the years 1984 and 1989 (Architectures of Time. Toward a Modernist Theory of the Event in Modernist Culture. 2002. MIT Press: Cambridge, Massachusetts; London, England). [10]

Architectural Thermodynamics and Human Comfort in Hot Climates

The properties of matter and energy must be considered in order to fully understand climatic phenomena. Heat, radiation, pressure, humidity, and wind, among other factors, interact mutually to establish climate conditions near the Earth's surface.

In this environment of continuously changing pressure, wind movement, temperature, humidity, and cloud cover, an architect places a fixed building. Such a rigid structure is intended to provide a comfortable internal environment over a wide range of these external variables. Two factors facilitate this task: first, in temperate and subtropical zones, ordinary buildings offer fair protection from climatic extremes, and, second, the human body has a considerable margin of tolerance for these variables. However, special treatment is required, particularly in tropical zones.

When considering the architectural design of a building, as well as in town and regional planning, other elements should be considered. The continuous daily motion of the population, which has properties analogous to the humidity concepts of saturation, evaporation, and condensation, must be accommodated in houses, towns, and regions.

Any living organism continuously adapts itself to the flux of its environment. Once constructed, however, a man-made object can no longer adjust itself. This inflexibility of human creation is at once its weakness and its strength. A design can succeed in uniting the particular and permanent with the universal and continuously changing. Yet another design, by failing to sense the forces at work or to create a harmonious union, can isolate and alienate human life.

Before considering the application of scientific concepts to architectural design and town planning, it is useful to briefly examine some basic concepts of architectural thermodynamics and human comfort.

Egyptian architect Hassan Fathy's 1986 chapter on **architectural thermodynamics**. [4]

In 2007, Javier Garcia-German, building on Fernández-Galiano, edited *From the mechanical to the thermodynamics. For a Definition Power Architecture and Planning* (De lo Mecánico a lo Termodinámico. Por una Definición Energética de la Arquitectura y del Territorio), which seems to have been published in English in 2014 as Thermodynamic Interactions: an Exploration into Material, Physiologcial, and Territorial Atmospheres (Ñº), the cover of which is as follows: [10]

In 2008, Turkish urban planning engineer Seda Bostanci did her PhD dissertation “Evaluation of Urban Skylines by the Entropy Approach”, wherein he uses a mixture of Shannon entropy and thermodynamic entropy to outline an aesthetical theory (see: aesthetic energy) of urban skyline design, the truncated synopsis of which is as follows: [1]

> “Urban design has formed a field in which visual-spatial, cultural, social, functional and natural factors are taken into account for the purpose of providing the best habitat, and that gathers multidimensional concepts together within time while being developed in the intersection of architecture and city planning. Urban design has a wide range of content developed in communication with various disciplines. Within its content, computer and mathematical based model suggestions, especially on researches where urban environment qualities are examined, contribute to the discipline as innovative approaches.
>
> Entropy approach has been put forward as an applicable innovation approach in the matter of aesthetic evaluation (see: beauty) in urban design. Entropy, aesthetic and urban design concepts have some relations. Entropy, in its preliminary meaning, is the mathematical representation of thermodynamic results.In applications, distribution relations of formal aesthetic evaluation criteria are measured over aesthetics-related evaluation concepts. The aesthetical qualities of the city are considered at different scales such as urban pattern, urban skylines, cityscapes, city squares and urban furniture. From among these scales, urban skylines are preferred for the applications. Aesthetical evaluation of the cities, measurability can be achieved through the entropy method. This method also makes possible an interrogation into the relationship that urban skylines formal esthetic evaluation criteria have established between each other.”

Aspects of Bostanci's theory, however, are marred by her use of the information theory interpretation of entropy, which has been shown to be baseless argument. [8]

Thermodynamic materialism

In 2013, Harvard University Graduate School of Design offered a four credit seminar course entitled “Air in Motion / Thermodynamic Materialism”, taught by Inaki Abalos and Matthias Schuler, in which air and or space (see: nature abhors a vacuum) is treated and studied “thermodynamically”, rather than metaphorically, poetically, or phenomenologically, as has been done traditionally. An excerpt from the course description is: [6]

GSD Course Bulletin - Spring 2013 - DES-03438

COURSE DETAILS

03438: Air in Motion / Thermodynamic Materialism (DES 0343800)

Architecture
Seminar - 4 credits - Limited enrollment
Thursday 10:00 - 1:00 7 Sumner 104

INSTRUCTOR(S)

Inaki Abalos, Matthias Schuler, TBA

A human thermodynamics education course in **architectural thermodynamics**, a graduate school seminar course entitled "Air in Motion / Thermodynamic Materialism" taught at the Harvard University Graduate School of Design, wherein air and or space (see: nature abhors a vacuum) is treated "thermodynamically". [6]

> “The revision carried out by the thermodynamics from the mid XIXth is critical when reconsidering the architectural and landscape conception of this element, thus happened to be a real building material. This is enabled by parametric digital media, which allows not only deciphering its changing nature over time but also conceiving artificial environments, opening new territories at the scale of buildings, public spaces [see also: personal space] and the landscape. Now, the air in movement demands to be studied in its different manifestations, to reveal its power through meticulous analysis, to map them and to conceptualize what we are calling a new idea of thermodynamic beauty [see: beauty] which completes the tectonic tradition and points new directions to architect´s work.”

The second part of the course deals with "thermodynamic materialism", in some way, in coordination with a research project at ETH Zurich titled "Thermodynamic Materialism".

Architectural elective

affinities

Left: Edward and Charlotte discussing changes to the land and buildings of their estate, scale models shown in front and behind them, from the 1996 film version of Goethe's *Elective Affinities*. Right: Edward and the Captain surveying the land (P1:C3), in preparation for landscape changes to the estate, illustration from the 1885 Hjalmar Boyesen illustrated edition (see also: architect).

A precursor to architectural thermodynamics, are the human physical chemistry based architectural and landscape work and theories of German polymath Johann Goethe as presented in his 1809 *Elective Affinities*, wherein he studied and theorized about people as "chemical species" and land and building as structural aspects or conditions, possibly in some sense "catalysts", of human chemical reactions (see: theory) occurring in the "wet way" (aqueous) or "dry way" (heated), modeled on Swedish chemist Torbern Bergman's 1775 *A Dissertation on Elective Attractions*.

In short, Goethe modeled land and building design from the point of view of affinity chemistry, the precursor science to chemical thermodynamics. The characters of the Architect, the Captain, and Edward all embody aspects of architectural affinity chemistry theory.

A vicarious student of the Goethe's affinity theory work is German sociologist Max Weber, who at the age of 14 was reading *Elective Affinities* in the classroom as a young student, hiding it behind his textbook. [3] In Weber's application of Goethe's human elective affinities concept metamorphosized into its own peculiar variant, sometimes referred to as Weberian elective affinities, in contrast to Goethean elective affinities.

An extension of this Weberian elective affinities theory in architecture is the University of Sao Paulo, Brazil, 5-day "Architectural Elective Affinities Conference" (Mar 20-24), themed on the subject of "architectural elective affinities", which they defined as a "complex borrowing of the Weberian concept of elective affinities, namely the: attractions, interactions and similarities between individuals or disciplines and fields of research—used as a tool for grasping the development of architectural forms in the perspective of specific spatio-temporal structures." The synopsis of the conference seems to be the following: [7]

> "The elective affinities operative between architectural history and other disciplines—such as literature, history, sociology, anthropology, arts, including the photography and the cinema—have been lengthily debated in the past years. The conference intends particularly to identify these affinities, looking from inside the discipline of architecture."

(add discussion)

Shown adjacent, is a poster for a 2013 conversation series by Philip Ursprung,Iñaki ÁbalosandRenata Sentkiewiczin an open talk where they will share their approach to the topics of the reconstruction of the subject and the architectural experience, the relations between space and matter, the use of thermodynamic criteria in design protocols, and how each approach can reveal the idea of â€‹â€‹beauty. (Ñº)

A 2013 poster for reconstruction of the subject and the architectural experience, the relations between space and matter, the use of thermodynamic criteria in design protocols, and how each approach can reveal the idea of â€‹â€‹beauty. (Ñº)

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9. Dusek, Val. (1999). *The Holistic Inspirations of Physics: the Underground History of Electromagnetic Theory* (*Elective Affinities*, pgs. 221-23). Rutgers University Press.
10. Garcia-German, Javier. (2017). "Thermodynamic Interactions" (Ñº), UrbanNext.net.

Further reading

â— Berkowitz, Alan R., Nilon, Charles H., Hollweg, Karen S. (2003). *Understanding Urban Ecosystems: a New Frontier for Science and Education* (ch. 8: Understanding Ecosystems: an Ecological Economics Perspective, section: "Ecological Economics and the Second Law", by William R. Rees, pgs. 120-22). Springer.
â— Kibert, Charles J., Sendzimir, Jan, Guy, G. Bradley. (2002). *Construction Ecology: Nature as the Basis for Green Buildings* (section: "Thermodynamics in biology and human organization", pgs. 109-114, section: "Applying biological thermodynamics to buildings", pgs. 118-19, by Timothy F.H. Allen). Taylor & Francis.

θΔics

In science, **architecture** is study of the design and implementation of the functional ordering of material for the purpose of structured human activity.

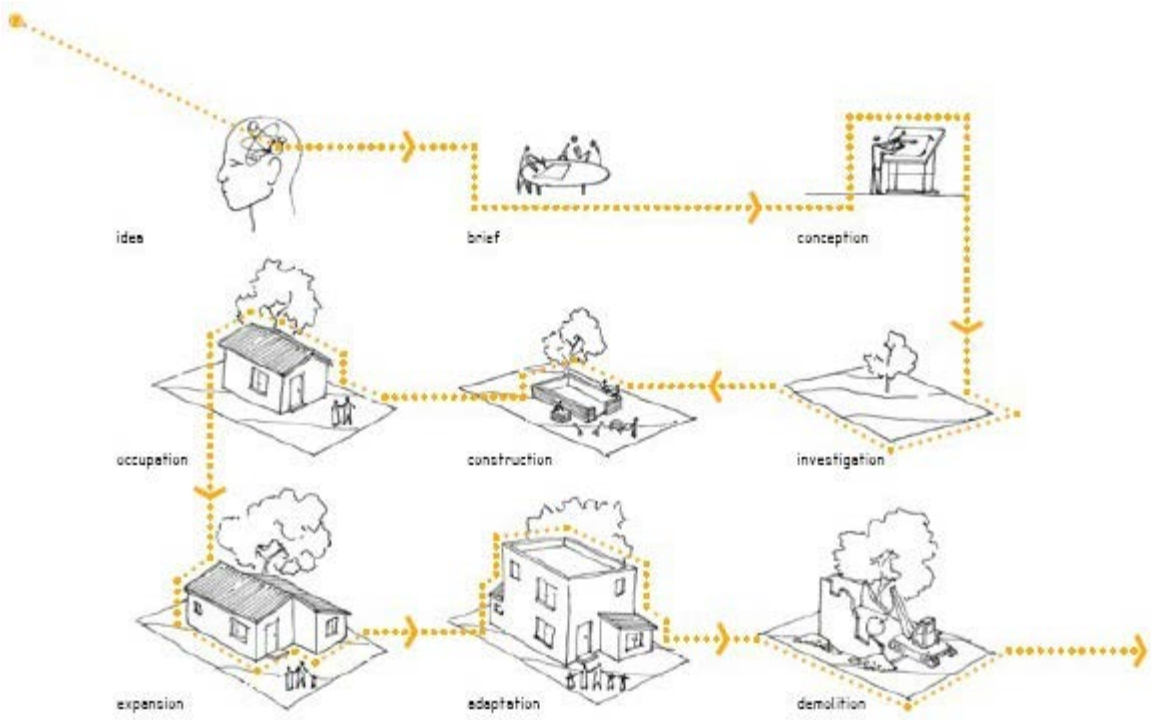

Schematic of the **architecture cycle**, i.e. of the parts or stages of one cycle of the architectural process. [1] This, to note, seems to be an integral aspect of exodermal cycles in general: economic cycles, rise and fall of civilizations, exodermal regeneration cycles (sloughing hypothesis), etc.

Thermodynamics

The general methodology of applying the laws of thermodynamics to the study of architecture is called "architectural thermodynamics".

Chemistry

In the perspective of human chemistry, the surface of the earth and the materials of the surface of the earth are defined as types of "catalysts" and quantified in terms of there affect in lowering or raising the activation energy barrier to reaction between humans. In this sense, architecture can be studied, from a physical science point of view, in terms of their effect as a catalystic design aspects.

In this direction in 1928, in a landmark contribution to catalytic theory, English chemist Hugh Taylor suggested that a catalyzed chemical reaction is not catalyzed over the entire solid surface of the catalyst but only at certain 'active sites' or centers. [3] Taylor visualized active sites as unsaturated atoms or available binding regions in the solid that resulted from topological features such as surface irregularities, dislocations, edges of crystals, or cracks along grain boundaries, etc. Thus, an *active site* or binding site is a point on a catalytic reactive surface that can form strong chemical bonds with an absorbent molecule. [4]

In this sense, the study of the design of the land can be viewed as a study of active sites to human chemical reaction.

See also

â— Geology

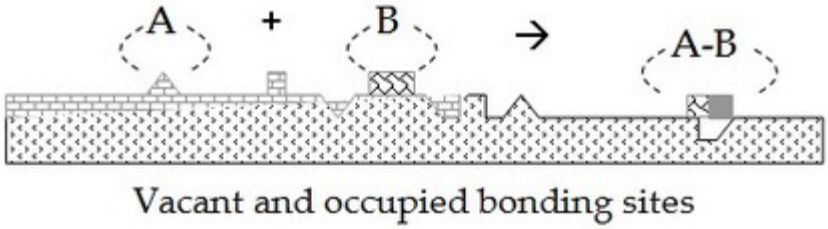

The conceptual model of two species *A* and *B*, on two different sites or "active sites", reacting to form an *A-B* complex on a new attachment site. [2]

References

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4. (a) Fogler, S. (1992). *Elements of Chemical Reaction Engineering*, 2nd Ed. New Jersey: Prentice Hall, P.T.R.
(b) Active site – Wikipedia.
(c) Binding site – Wikipedia.

External links

â— Architecture – Wikipedia.

θΔics

In queries, **are viruses alive?** is a near century-long ongoing overly-common question as to whether or not a virus, by definition, is "alive", i.e. a living thing; the question itself is a loaded one, being that in order to answer the question properly, one also has to be able to simultaneously answer the residual question "are humans alive?", a repercussion of the original question, only seen following prolonged introspection; wherein the standard "recourse to authority" will only tend to impede.

A basic modern quiz style example of the "**are viruses alive?**" query; the quick and short answer to which is option (e) none of the above, being that (a) alive, (b) dead, (c) half-alive, and (d) dead and alive, are "anthropisms", as Charles Sherrington (1938) explained, NOT recognized by chemistry and physics, according to which something akin to the cell-as-molecule (see: virus molecule) is the correct answer, wherein in the terms "life" and "death" are foreign concepts, i.e. defunct scientific (see: defunct theory of life; life does not exist) terminologies (see: life terminology upgrades).

Overview

In 1969, American chemical engineer Linus Pauling, in his *General Chemistry*, devoted the opening sections of his biochemistry chapter to debate the question of whether or not to consider the virus, which he characterized as "the simplest kind of matter thought to be alive", as correctly: (a) living organism, (b) giant particle, or (c) giant molecule (with a molecular weight of 10,000,000), a query to which, in the end, he remained indecisive about. [3]

Quotes

The following are related quotes:

> "Life is an example of the way in which an energy-system in its give and take with the energy-system around it can continue to maintain itself for a period as a self-centered, so to say, self-balanced unity. Perhaps the most striking feature of it is that it acts as though it 'desired' to maintain itself. But we do not say of the spinning of a heavy top which resists being upset that it 'desires' to go on spinning. The very constitution of the living system may compel it to increase; thus a self-fermenting protein system, granted its conditions, *must* increase. The behavior of a living body is an example of this, and we call it 'living'. The behavior of the atom is an example of this and **we *do not* call it 'living'.** The behavior of those newly discovered so-called 'viruses' is an example of this and there is hesitation whether or not to call it 'living'. The difference is one not of ultimate nature but of scheme and degree of complexity. The atoms and sub-atoms are among earth's commonest. 'Living' becomes a name for certain complexes of them, arrangements of which it may be said that they are organized integratively, i.e. to form a solidarity, and individual. These 'faculties', as Fernel has described, of moving, of ingesting, of excreting and secreting, are processes which examination resolves wholly into chemistry and physics. Chemistry and physics finds them not separable from the rest of chemistry and physics. What we call by convention 'life' is then chemical-physical. There is indeed **no good ground** for speaking of these as living, those as not-living."
>
> — Charles Sherrington (1938), *Man on His Nature*

> "One day the present controversy over the living and non-living status of viruses will be seen as picayune as the medieval debate over the number of angels on the point of a needle."
>
> — Author (1940), "Article", *Veterinary Medicine* (Q)

> "Under the electron microscope, it is possible to see the actual arrangement of the virus particles in the

crystal lattice. Thus, for the first time in history, we can see a molecule. **Are viruses alive?** It may be that they are not. Scientists are undecided, although the modern trend is to regard them as living entities. This clearly is the province of the biochemist … a curious kind of no man's land where one minute an aggregation of molecules is 'alive' and another is inanimate."

— Author (1947), "Article", *The Chemical Age* (Q)

"**Are viruses alive?** The answer depends on the definition of life. Rather than be engulfed in the quicksands of semantics, the writer will evade a direct answer; the reader is as qualified to ponder the question as he is."

— Ernest Borek (1952), *Man: the Chemical Machine* (Q)

"**Are viruses alive**? This question is still widely debated among virologists. In view of the ever increasing data we have on the superb complexities of the life cycle of a virus, it would seem to be prejudice on our part to exclude them from the living?"

— Author. (1955). "Article", *InterChemical Review* (Q)

"The question '**are viruses alive?**' cannot be answered."

— Clyde Goodheart (1969), *An Introduction to Virology* (Q)

"**Are viruses alive?** Viruses lie in a semantic twilight zone between living and nonliving organisms. They are essentially short segments of genetic material, DNA or RNA, protected by overcoats of protein. They can be crystallized and they will not grow or propagate in isolation which supports that they are nonliving."

— Edward Wilson (1977), *Life: Cells, Organisms, Populations* [1]

"Re: '**Are viruses Alive?**' The answer is no. Charles Sherrington gave the answer in his 1938 Gifford Lectures *Man on His Nature*. On the question of 'those newly discovered so-called 'viruses' [1935]', as he says, "there is hesitation whether or not to call it 'living'", about which he concludes, following prolonged derisively-sharp argument, correctly: 'when physics and chemistry have entered on the description of the perceptible, life disappears from the scene, and consequently death. Both are anthropisms.' Virus, correctly, is an animate form of powered CHNOPS+ based atomic structure. So are you. You have to convince yourself, however, that you are not alive to see the truth of this answer. Tesla saw it in 1915 when he concluded: 'there is no thing endowed with life.' Life and death are religio-mythology concepts, handed down to us from the ages, not scientific ones."

— Libb Thims (2014), post (6+ likes) to DNews "Are Viruses Alive?" video [2]

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2. Anon. (2013). "Are Viruses Alive?" (Q), DNews, Mar 6.
3. Pauling, Linus. (1969). *General Chemistry* (ch.24: Biochemistry, §24.1: The Nature of Life, pgs. 767-69; §:24.2 The Structure of Living Organisms, pgs. 769-70). Dover.

Videos

- Anon. (2014). "What is life? Are viruses alive?" (Q), This Place, Mar 12.

External links

- Are Viruses Alive? (51% yes | 49% no) – Debate.org.

θΔics

In existographies, **Arieh Ben-Naim** (1934-) (CR:15) is a Israeli physical chemist noted, in information thermodynamics, for his writings, beginning in 2007, on an attempt to replace the disorder view of entropy, of physical chemistry, by the information view of entropy in Shannon information theory, in a manner similar to what Edwin Jaynes attempted to do in 1957, whom Ben-Naim cites as his main source.

Overview

In his 2007 book *Entropy Demystified*, he states that he discovered the understanding to the mystery to entropy, one day when he was writing an article on the entropy of mixing and the entropy of assimilation. [1] Most of Ben-Naim's effort, to note, is similar in vein to the effort of American organic chemist Frank Lambert's 2000s attempt to replace the disorder view of entropy with a dispersal view. Both have stated that they never understood entropy, as they taught the subject for many years to students, but saw the light one particular day while reading or writing a particular article (William Thomson's energy dissipation, in Lambert's case, and Willard Gibbs' entropy of mixing, in Ben-Naim's case).

This is followed up by his 2008 book *A Farewell to Entropy*, in which he argues that "thermodynamics and statistical mechanics will benefit from replacing the unfortunate, misleading and mysterious term entropy with a more familiar, meaningful and appropriate term such as information, missing information or uncertainty." [2]

Difficulties on theory

As to the so-called difficulties on theory, in Ben-Naim's work, as it is with all attempts to reformulate thermodynamics in terms of information or information theory, the quantity "information", measured in units of "bits", is not one of the fundamental SI units for measuring quantities of the physical universe, but is simply a variable useful in Boolean logic. In short, the majority of Ben-Naim's argument is baseless. [5] So enthusiastic is Ben-Naim's quest to rescript thermodynamics in terms of information theory that he suggest that to remedy the unit inconsistency issues that he have all SI units of science reformulated such that we redefine the absolute temperature scale, throw out Planck's constant, and makes thermodynamic entropy unitless.

Human thermodynamics

In his 2012 book *Entropy and the Second Law*, Ben-Naim, begins to mention human thermodynamics theories, in his citation if Swedish physical chemist Sture Nordholm who in 1997 equated energy with wealth and entropy with freedom. [4]

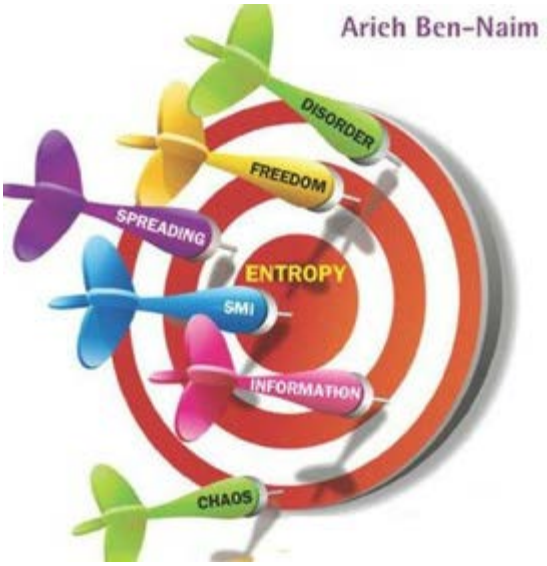

Ben-Naim's 2012 interpretation of "entropy", the bull's-eye view of which he equates to what he calls "Shannon's measure of information" (SMI) or Shannon entropy, surrounding by other historical interpretations of entropy (see also: misinterpretations), namely: disorder, freedom (or degrees of freedom), spreading (or energy spreading/energy dispersal), information, and chaos. [3]

Education

Ben-Naim completed his BS in chemistry in 1957, his MS in physical chemistry in 1961, and his PhD on the "Thermodynamics of Aqueous Solutions of Noble Gases", specifically on the entropy of solvation of argon, in 1964, all at the at the Hebrew University of Jerusalem. He taught thermodynamics and statistical mechanics for many years, retiring in circa 1990. He currently is a retired professor of physical chemistry at The Hebrew University of Jerusalem.

Quotes | On

The following are quotes on Ben-Naim:

> "Your proposal about Shannon information … S — is nothing but another word that begins with S and refers to human excrement. You should be abjectly ashamed of yourself. Not only are your methods and your **behavior nauseating** but your ability in uniting information

theory and statistical mechanics is erased by your ignorance in dismissing the needs of ordinary students, specifically beginning chemistry students to whom entropy and thermodynamics are enormous conceptual obstacles. Abandonment of the terribly flawed manuscript that you sent to … and collaboration with him on melding your expertise in complex probability with our proved success in conceptual perceptions could result in a synthesis that would change education in entropy for this and succeeding generations. If this does not occur, **I will literally fight to my death** to show the world the fallacy of believing that your views are anything but those of a deceptive, half-truth promoting, dishonest person as you have shown yourself to me."

— Frank Lambert (2009), review of Ben-Naim's *Entropy Demystified*

References

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2. Ben-Naim, Arieh. (2008). *A Farewell to Entropy.* World Scientific Publishing Co.
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5. Thims, Libb. (2012). "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair" (url), *Journal of Human Thermodynamics*, 8(1): 1-120, Dec 19.

Further reading

● Ben-Naim, Arieh. (2010). *Discover Entropy and the Second Law of Thermodynamics: a Playful Way of Discovering a Law of Nature.* World Scientific Books.
● Frank L. Lambert (2009) review of Arieh Ben-Naim's 2007 *Entropy Demystified* – Amazon.com.
● Ben-Naim, Arieh. (2017). *The Four Laws That Do Not Drive the Universe: Elements of Thermodynamics for the Curious and Intelligent*. World Scientific Press.

External links

● Arieh Ben-Naim – Wikipedia.
● Arieh Ben-Naim (home) – AriehBenNaim.com.

θΔics

In existographies, **Aristarchus** (c.310-230BC) (IQ:175|#263) (RGM:186|1,500+) (CR:9) was a Greek astronomer noted for being the first person to popularize heliocentrism, a view which he adopted from Pythagoras or Heraclides Ponticus (Ñº); arguing that the earth rotates on its axis, that the earth orbits the sun, and devised methods for estimating relative distances of sun and moon from earth. [1]

Aristarchus' works, along with those of Hero, Hypatia, Sappho, Berossus and his *Babylonaica*, are said to be the five most "tantalizing losses from the Library of Alexandria". [2]

Quotes | On

The following are quotes on Aristarchus:

> "You (King Gelon) are aware the 'universe' is the name given by most astronomers to the sphere the center of which is the center of the earth, while its radius is equal to the straight line between the center of the sun and the center of the earth. This is the common account as you have heard from astronomers. But **Aristarchus** has brought out a book consisting of certain hypotheses, wherein it appears, as a consequence of the assumptions made, that the universe is many times greater than the 'universe' just mentioned. His hypotheses are that the fixed stars and the sun remain unmoved, that the earth revolves about the sun on the circumference of a circle, the sun lying in the middle of the floor, and that the sphere of the fixed stars, situated about the same center as the sun, is so great that the circle in which he supposes the earth to revolve bears such a proportion to the distance of the fixed stars as the center of the sphere bears to its surface."
>
> — Archimedes (c.230BC), *The Sand Reckoner* (Ñº)

> "At the school of Alexandria, **Aristarchus**, of Samos, flourished between 280 and 264BC. This astronomer adopted the views of Pythagoras in regard to the earth's motion around the sun; and he held that since the stars appeared to keep the same fixed position in space, when viewed from the opposite points of the earth's orbit around the sun, their distances must be vastly greater than that of the sun."
>
> — Henry Bray (1910), *The Living Universe* [3]

References

1. Rowan-Robinson, Michael. (1999). *The Nine Numbers of the Cosmos* (pg. 24). Oxford University Press.
2. Five Most Tantalizing Losses from the Library of Alexandria (2012) – SparkNotes.com.
3. Bray, Henry T. (1910). *The Living Universe* (pg. 140). Truro Publishing Co., 1920.

Further reading

â— Heath, Thomas. (2013). *Aristarchus of Samos: the Ancient Copernicus – a History of Greek Astronomy to Aristarchus, Together with Aristarchus's Treatise on the Sizes and Distances of the Sun and Moon* (Heraclides, 38+ pgs). Cambridge University Press.

References

â— Aristarchus of Samos – Wikipedia.

θΔics

In existographies, **Aristippus** (c.435-356BC) (CR:2), aka Aristippos (Lange, 1875), was a Greek sensual pleasure philosopher, a student of Socrates, noted for []

Quotes | On

The following are quotes on Aristippus:

> "Epicurus, according to various hostile writers, passed off as his own views of Democritus on atoms and **Aristippus** on pleasure."
>
> — Diogenes Laertius (c.230), *Lives and Opinions of Eminent Philosophers* (X.4)

> "Every pleasure is a good, every pain is an evil; but we are not on that account to pursue after every pleasure and to flee from every pain. Peace of soul and freedom from pain are the only lasting pleasures, and these are therefore the true **aim of existence**. On this point Epicurus diverges sharply from **Aristippus**, who placed pleasure in motion, and declared the individual pleasure to be the true object. Epicurus was opposed to Aristippus, from whom he had learnt so much, in teaching that intellectual pleasure was higher, and to be preferred to physical pleasure; for the mind is stimulated not only by the present, but also by the past and the future."
>
> — Friedrich Lange (1875), *The History of Materialism, Volume One* [1]

See also

● Aristippus the Younger (c.380-310BC) (O) | Grandson | Teacher of Theodorus

References

1. Lange, Friedrich A. (1875). *The History of Materialism: and Criticism of its Present Importance*, *Volume 1*: *Materialism in Antiquity*. *The Period of Transition* (translator: Ernst Thomas). *The Seventeenth Century* (translator: Ernest Thomas) (pgs 102-03). Houghton, Osgood, and Co, 1879.

Further reading

● Laertius, Diogenes. (c.225BC). *Life of Aristippus* ("known as the atheist", pgs. 86; *On the Gods*, pg. 97), in: *Lives and Opinions of Eminent Philosophers* (O), *Book 2* (pg. 97) (translator: Robert Hicks). Publisher, 1925.

External links

● Aristippus – Wikipedia.

θΔics

In hmolscience, **Aristophanes** (c.446-386BC) (IQ:165|#350) (FA:18) (CR:10) was a Greek philosopher cited by Plato, in his *Symposium*, as having given speech in which he describes the human "natural" state as double creatures, cleft in two by Zeus, for our hubris, thereafter struggling to reunite through love, which is the basis of the modern concept of the "soul mate".

Atheism

In his satirical play *The Clouds* (Ñº), tells a dialogue about the nature of rain (natural or Zeus caused), between a fictional atheist character Socrates and a lay character Strepsaides, who thinks rain is caused by "Zeus pissing into a sieve" (Hecht, 2013; pg. 12).

Soul desire

The following is an example soul mate matching statement:

> "The intense yearning which each has towards the other does not appear to be the desire of intercourse, but of something else which the soul desires and cannot tell, and of which she has only a dark and doubtful presentiment."
>
> — Aristophanes (c.390BC), in Plato's *Symposium*, 370BC [1]

(add discussion)

Goethe

> *See also: Goethe on the soul*

German polyintellect Johann Goethe incorporated the cleft human theory into his *Elective Affinities*, via the subtle mention (P1:C5) of how Eduard (rightside headache) and Ottilie (leftside headache) had headaches on opposite sides of each other's heads, implying that they were at birth attached, back to back, as one entity, but then split in two, and thereafter finding each other as true loves.

Quotes | By

The following are related quotes:

> "By words the mind is winged."
>
> — Aristophanes (c.400BC) (Ñº)

References

1. Solomon, Robert C. (1981). *Love: Emotion, Myth, & Metaphor* (pgs. 24, 111). Prometheus Books, 1990.

External links

â— Aristophanes – Wikipedia.
â— Aristophanes – WikiQuote.

θΔics

In mononyms, **Aristotelian** refers to one who is a disciple or follower of the doctrines, ideologies, or teachings of Aristotle.

Quotes

The following are related quotes:

> "Since I had deliberated on these questions for a long time and had likewise been engaged in active study of the structure of the world [universe], not only did the great mass of these world bodies and their enormous distances lead me to doubt that the human intelligence could comprehend them, but also, and most particularly of all, did vast, intermediate, and endless space fill me with curiosity and infuse me with a desire to investigate it. For indeed, what is it? Inasmuch as it contains all things, it serves as a place for 'being' and 'existing'. Is it by chance some fiery heavenly matter? Is it solid, as **Aristotelians** assert? Is it fluid, ad Copernicus and Tycho Brahe believe? Is it some sort of tenuous fifth essence? Or, is space completely devoid of all matter, a 'vacuum', as it were?"
>
> — Otto Guericke (1672), "Why the Author Was Led to Investigate the Vacuum" in: *New Magdeburg Experiments on the Vacuum of Space* (§§: Book 2, §: Chapter 1, pg. 84) [1]

References

1. (a) Aristotle. (320BC). *Physics, Book Four*. Publisher.
(b) Guericke, Otto. (1663). *New Magdeburg Experiments: on the Vacuum of Space* (*Ottonis de Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (translator and preface: Margaret Ames) (pg. 84-85). Publisher, 1672; Kluwer, 1994; Springer, 2012.

External links

â— Aristotelianism – Wikipedia.

θΔics

In existographies, **Aristotle** (384-322 BC) (2134-2072 BG) (IQ:195|#8) (Cattell 1000:6) [RGM:5|1,500+] (Murray 4000:3|CS / 1|WP) (Glenn 20:1) (Perry 80:3|Li) (**EPD**:M&F) [LPKE] (RE:62) [CR:537] was a Greek philosopher, an epicenter genius, a fourth-ranked genius in meta-analysis rankings, a top ranked greatest philosopher ever, oft-cited last person to know everything, general thinker, and scientist noted for coining the term energy, for his views on the existence of a vacuum or void, for his theory of the four elements and their interrelationship, and on heat in relation to reproduction, and first dominate thinker on the blue sky problem.

Natural | Unnatural

Aristotle, in his *Physics* and *On the Heavens*, described the motions of projectiles as being partly natural and partly unnatural: natural motion, as for all heavy bodies, is downward, toward the center of things, and its unnatural motion is imparted by air whose motion can be traced to whatever started the motion. [17] He seems to have taken this as a fundamental principle to which he applied to all phenomena, such as fire rising, money making, and so on.

Aristotle, in his *Physics* (2:8), states the following on natural things: [18]

> "Natural things are exactly those things which do move continuously, in virtue of the principle inherent in themselves, towards a determined goal; and the final development which results from any one such principle is not identical for any two species, nor yet is it any random result but in each there is always a tendency towards an identical result if nothing interferes."

(add)

Fire

The following is Aristotle's views on fire: [6]

> "For any two portions of fire, small or great, will exhibit the same ratio of solid to void; but the upward movement of the greater is quicker than that of the less, just as the downward movement of a mass of gold or lead, or any other body endowed with weight, is quicker in proportion to its size."

Aristotle was the first to document the Mpemba effect, which he attempted to explain using a theory called 'antiperstasis'. [7]

Life

Aristotle's conception of the origin of life, according to Alexander Oparin (1936), is presented principally in his: *On the Parts of Animals*, *On the Movements of Animals*, *On the Origin of Animals*, and *On Plants*, employing a mixture of four element theory, entelechy, animal heat, and spontaneous generation.

A depiction of the Aristotelian universe, the general model of four elements and a teleology-based movement scheme.

Existence

Aristotle stated the following about existence of place: [15]

> "A natural scientist must have the same kind of understanding of place as he does of infinity—that is, he should know whether or not it exists, in what sense it exists, and what it is—because the idea that existing things exist somewhere is universally accepted. I mean, that which does not exist is nowhere. Where, for example is a goat-stag or sphinx? Also, the most common and most fundamental kind of change is change of place, which is known as movement."

(add)

Universe

Aristotle, in his *The World* (*De Mundo*), described the world to his pupil Alexander the Great as follows: [16]

> "It is a joining together of the sky [Nut] and earth [Geb] and of the elements [four elements] contained there in."

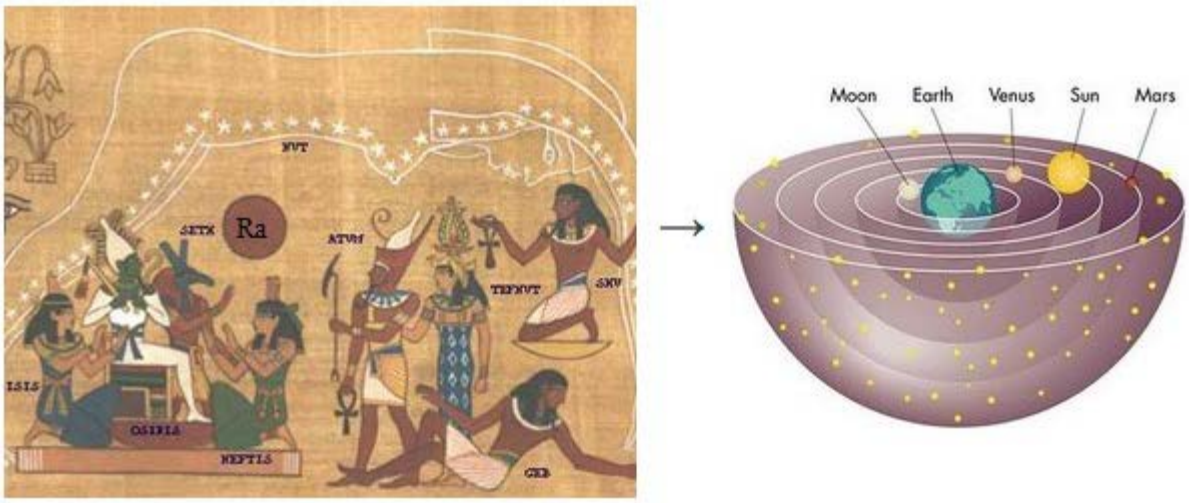

Left: The Egyptian anthropomorhic Ennead cosmology model (2400BC). Right: Aristotle's 55-sphere Geocentric (Geb-centric) model (322BC).

(add)

Money making

In his *Politics*, Aristotle comments on the relative naturalness or unnaturalness of money-making: [13]

> "Of the two sorts of money-making, one is a part of household management, the other retail trade, the former necessary and honorable, the latter a kind of exchange which is justly censured, for it is unnatural, and a mode by which men gain from one another. The most hated sort, and with the greatest reason, is usury, which makes a gain out of money itself, and not from the natural use of it. For money was intended to be used in exchange, but not to increase at interest. And this term usury, which means the birth of money from money, is applied to the breeding of money because the offspring resembles the parent. Wherefore of all modes of making money, that is the most unnatural."

(add)

Collected works

The collected works of Aristotle, originally published as a series of scrolls, where each scrolls is considered a book, was published as 12-volume set by Oxford University Press between 1912 and 1954, which comprises 2,512 total pages according to the 1984 Revised Oxford Translation two-volume set, which have further been divided categorically via Bekker numbers. [11]

Animate organisms

Aristotle, supposedly, was of the view that chemical processes could not explain the generation of living things and animate homogeneous materials, whereas chemical processes could explain the generation of inanimate compounds. [10]

Motion

Aristotle's thesis, in regards to motion, is that "nothing moves itself". [8]

Vacuums

In the nature abhors a vacuum debate, Aristotle firstly believed that atmosphere had weight, according to which as air became less dense it would be possible to move faster through the atmosphere. Based on this first belief, in an complete vacuum, a moving object would encounter no resistance, and infinite speed would be possible, but “infinite speed” he deemed impossible, hence a vacuum would be impossible, which he declared in his the famous dictum *horror vacui*. His usage of the term "void", such as in describing two differing portions of heat, as above, of note indicates that he employed a moderate notion of the void or partial vacuum, or something along these lines.

Energy

In his 350BC book *Metaphysics*, Aristotle used the term *enérgeia* to mean act or ‘activity’, ‘actuality’, or in a literal sense ‘(a state of) functioning’, deriving from *energos* "active, working," from *en-* "at" + *ergon* "work". [1] Aristotle used the term *enérgeia* to clarify, in one sense, the definition of “being” as potency (*dýnamis*) and act (*enérgeia*).

Animal heat

In his c.350BC *De Generatione Animalium*, Aristotle postulated that the mode of animal reproduction is determined by a “vital heat” of the animal. The warmer an animal is, Aristotle reasoned, the more perfect will be the state in which its young are generated. [2] Live young are produced by the hotter animals; colder ones produce eggs; the coldest of all, such as insects, produce a larva which in turn produces an egg. [3]

Elements

Aristotle argued that there are four elements out of which all is made: earth, air, water, fire. Each of the four earthly elements has its natural place; the earth at the center of the universe, then water, then air, then fire. When they are out of their natural place they have natural motion, requiring no external cause, which is towards that place; so bodies sink in water, air bubbles rise up, rain falls, flame rises in air. [4]

Soul

See main: Aristotle on the soul

On the soul, Aristotle, supposedly, had the following to say: (Ñº)

> “Happiness is the settling of the soul in its most appropriate spot.”

(add)

Education

Aristotle, who was the son of Nicomachus, the physician to Amyntas, father of Philip, king of Macedon, was orphaned at a “tender age” and then brought up by a tutor named Proxenus. [21] Aristotle later became a student of Plato.

Students

Aristotle tutored Alexander the Great, who by age of thirty, he had created one of the largest empires in ancient history; established the Library of Alexandria, unified Greek philosophical science with Egyptian theology to form Christianity.

Quotes | On

The following are quotes on Aristotle:

"**Aristotle** is regarded as the most eminent of philosophers."

— Otto Guericke (1672), *The System of the World: According to the More Common Philosophical Theories* [16]

"**Aristotle**, the greatest philosopher of his time, who was named the 'genius of nature' because of his great mind, when he was accused of having bad opinions of the gods, was forced to retire to the Chalcis where he died at the age of sixty-six."

— Jean Meslier (1729), *The Testament* (pg. 343)

"**Aristotle** was the great thinker who was the first to analyze so many forms, whether of thought, society or nature."

— Karl Marx (1867), *Capital: a Critique of Political Economy* [14]

Quotes | By

The following are quotes by Aristotle: [9]

"Nothing natural occurs by chance."

— Aristotle (c.350BC), *De Caelo* (300b8-301a11) [22]

"Plato is my friend, but truth my greater friend."

— Aristotle (c.322 BC), *Publication*; quote was inscribed into Isaac Newton's age 19 written notebook *Philosophical Questions* a set of forty-five queries into a foundation for a new philosophy.

"The worst form of inequality is to try to make unequal things equal."

— Aristotle (c.322 BC), *Publication*; compare Pareto: "The assertion that men are objectively equal is so absurd that it does not even merit being refuted." [19]

"All men by desire to know. An indication of this is the delight we take in our senses; for even apart from their usefulness they are loved for themselves; and above all others the sense of sight. For not only with a view to action, but even when we are not going to do anything, we prefer seeing, one might say, to everything else. The reason is that this, most of all the senses, makes us know and brings to light many differences between things."

— Aristotle (c.320), *Metaphysics*; cited by Lawrence Henderson (1932) [20]

“The aim of art is to represent not the outward appearance of things, but their inward significance.”

— Aristotle (c.330BC) (Ñº)

“There is only one way to avoid criticism: do nothing, say nothing, and be nothing.”

— Aristotle (c.330BC) (Ñº)

“At first, he who invented any ‘art’ that went beyond the common perceptions of man, was naturally admired by men, not only because there was something useful in the inventions, but because he was thought wise and superior to the rest. But as more arts were invented, and some were directed to the necessities of life, others to its recreation, the inventors of the latter were always regarded as wiser than the inventors of the former, because there branches of knowledge did not aim at utility. Hence, when all such inventions were already established, the sciences which do not aim at giving pleasure or at the necessities of life, were discovered, and first in the places where men first began to have leisure. **This is why the ‘mathematical’ arts were founded in Egypt**; for there the priestly caste was allowed to be at leisure.”

— Aristotle (c.350BC), *Metaphysics*; in *Collected Works* (pg. 1553)

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External links

â— Aristotle – Wikipedia.

θΔics

In genius rankings, **Aristotle's citation rankings** (TR:69) (ACR:#) refers to the rankings of the top 30+ philosophers, scientists, and thinkers employed by Greek philosopher Aristotle (384-322 BC) in his collected works, specifically those names employed in the 1994 two-volume Princeton edition of *The Complete Works of Aristotle*, according to the number of rows a given individual is allotted in the "name index".

Rankings

The following is a work-in-progress ranking of the the top 30+ names employed by Aristotle, judged by the amount of space each person is allotted in the "name index" section, of is two-volume *The Complete Works of Aristotle* (Princeton, 1994), specifically the number of "rows", as shown in the 7th column (below), each person has. The third column shows each person's IQ, if it has been determined, as found in the top 1000 geniuses tables; the 8th column shows each individuals Hmolpedia citation ranking (CR), which is the number of times each person has their name hyperlinked with the 5,000+ online articles of Hmolpedia; the comparison of the two, HCR and CR giving a time-weighted perspective of influence, then and now: [1]

Rank	Thinker	IQ	Dates	Classification	Students	Rows	CR
1.	Plato	(IQ:180|#98)	427-348 BC	Philosophy	Aristotle Coriscus	27	294
2.	Homer	(IQ:175|#277)	800-700 BC	Epic poetry		21	51
3.	**Empedocles**	(IQ:190|#24)	495-435 BC	Four elements + two forces model	Gorgias	20	276
4.	Anaxagoras	(IQ:180|#132)	500-428 BC	Natural philosophy		14	50
5.	**Democritus**	(IQ:190|#36)	460-370 BC	Atomic theory | Atheism		12	285
6.	Pythagoras	(IQ:180|#86)	570-490 BC	Mathematics		11	115
7.	Euripides	(IQ:180|#175)	480-406 BC	Tragedy and drama		11	19
8.	Socrates	(IQ:180|#168)	469-399 BC	Anti-reductionist	Plato Aristippus	9	122
9.	**Heraclitus**	(IQ:185|#81)	535-450 BC	Flux and fire philosophy		7	121
10.	Sophocles		496-406 BC	Tragedy and drama		6	

11.	**Parmenides**	(IQ:180|#127)	510-450 BC	Denial of the void philosophy	Zeno of Elea Melissus Empedocles	5	118
12.	Zeno of Elea	(IQ:155|#475)	490-430 BC	Paradox philosophy		5	19
13.	Coriscus		385-325 BC	Student of Plato; friend of Aristotle		5	
14.	Melissus		c.470-400BC			4	9
15.	Hesiod	(IQ:150|#525)	c.750-650BC			4	41
16.	Isocrates					4	
17.	Gorgias		c.485-380BC			4	4
18.	**Leucippus**	(IQ:180|#124)	c.500-450BC		Democritus	3	212
19.	**Xenophanes**	(IQ:175|#230)	c.560-475BC		Parmenides	3	28
20.	Solon	(IQ:170|#403)	c.638-558BC			3	16
21.	Protagoras		c.490-420BC			3	
22.	Theodectes					3	
23.	**Thales**	(IQ:180|#92)	c.624-546		Anaximander Euclid Pythagoras Eudemus	2	92
24.	**Anaximander**	(IQ:180|#117)	c.610-564BC		Anaximander	2	45
25.	**Anaximenes**	(IQ:165|#440)	585-528BC		Hippo	2	3
26.	Diogenes	(IQ:170|#350)	c.408-323BC		Zeno of Citium	2	12
27.	Exodus					2	
28.	Herodotus	(IQ:175|#249)	484-425 BCM			2	81
30.	Xenocrates		396-314BC			2	5
31.	Polybus					1	
32.	Aesop					1	
33.	Theodorus of		c.500-			1	

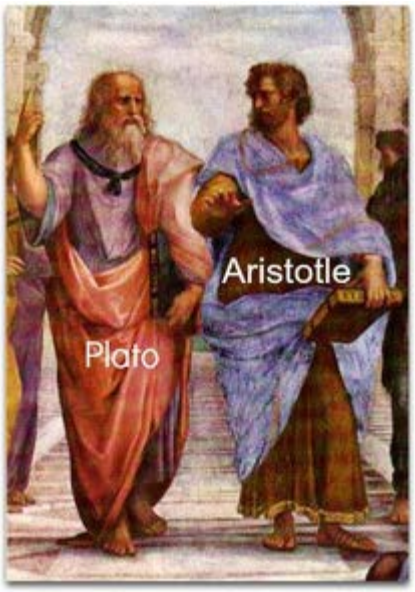

Byzantium		450BC			
Aristotle	195	384-322 BC	Friend / Student of Plato	Alexander	148

(add)

See also

â— Greatest philosopher ever
â— Greatest mathematician ever
â— Hmolscience citation rankings

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(c) Note: the Pythagoras ranking includes both Pythagoras and the Pythagoreans.

θΔics

In geniuses on, **Aristotle on the soul** refers to the collected ideas, theories, and beliefs of Aristotle on the concept of the soul.

Overview

In c.322BC, Aristotle, after penning his *On the Soul*, a 52-page treatise on historical views about the nature of the soul, surmised his view that "happiness is the settling of the soul in its most appropriate spot." (Q)

Quotes | On

The following are quotes on Aristotle's soul theories:

> "Aristotle, Plato's brilliant student, wrote about the soul in *De Anima*, his treatise on the nature of living things. Like Plato, Aristotle believed that the soul gives life to the body. All living things, Aristotle proposed, must have a soul. At the bottom of the hierarchy, we find the soul of trees and plants, the 'nutritive soul'. This soul was responsible for the functions of nourishment, growth, and decay. One step up was the 'sensitive soul', which gave nonhuman animals the sense of sight, smell, touch, taste, and hearing. And at the top of the hierarchy was the soul that distinguishes human beings from all other living creatures, the 'rational soul'. So far, we can see the influence of Plato's ideas on Aristotle's thinking.
>
> — Julien Musolino (2015), *The Soul Fallacy* [1]

See also

- Geniuses on the soul

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External links

- Aristotle's Theory of the Soul – Stanford Encyclopedia of Philosophy.

θΔics

In science, **Aristotle-Mpemba effect**, or "Mpemba effect", pronounced “Mem-pem-ba” (Q), sometimes called the ‘hot-begets-cold-quicker phenomenon’, is the observation that, within a certain range of temperatures, heated water cools more quickly than cold water. [1] The Mpemba effect is counter intuitive and is often categorized as one of the top seven paradoxes of thermodynamics. [4] The paradox, however, has its resolution in the view that boiled (or heated water) removes the impurities of molecules, particularly carbon dioxide, which allows the pure, albeit hot, water to freeze faster. [1] The phenomenon launched into scientific fame when in 1963 a circa thirteen-year-old African student Erasto Mpemba noted the phenomenon while making ice cream and over the next six years began to experiment, research, and find a scientific explanation for the phenomenon.

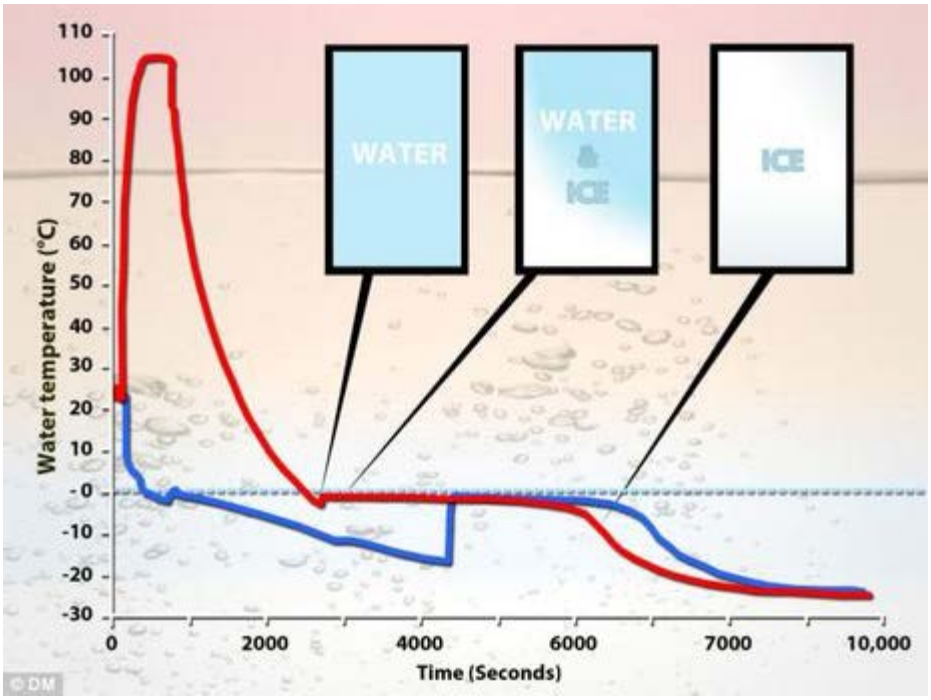

A 2010 image (Q) of **Aristotle-Mpemba effect**, by James Brownridge, who has conducted 100s of Mpemba effect experiments, who believes the effect has to do with impurities in the water.

Explanations

Since the 1960s, scientists have proffered dozens of theories to explain the effect, such as: evaporation, convection, frost, supercooling, latent heat of condensation, solutes, thermoconductivity, and supercooling.

In 2010, James Brownridge published a theory, which argued that the effect had something to do with impurities in the water.

In 2013, scientists at Nanyang Technical University, Singapore, argue that the covalent bonds in hot water are contracted (shortened) and the hydrogen bonds are stretched (longer), and that this structure allows the water to release energy faster, thereby reaching the freezing state quicker. (Q) [9]

Early history

The hot-begets-cold-quicker phenomenon was first recorded by Greek philosopher Aristotle in circa 350BC: [2]

> “The fact that water has previously been warmed contributes to its freezing quickly; for so it cools sooner. Hence many people, when they want to cool hot water quickly, begin by putting it in the sun.”

In c.1265, English philosopher Roger Bacon is said to have experimentally tested the phenomenon. [7]

In c.1461, Giovanni Marliani, an Italian physician-physicist, in a debate over how objects cooled, confirmed that hot water froze faster than cold, in an experiment where he had taken four ounces of boiling water, and four ounces of non-heated water, placed them outside in similar containers on a cold winter day, and observed that the boiled water froze first; Marliani was, however, unable to explain this occurrence. [3]

Thinkers such as Rene Descartes and Francis Bacon had also noticed this phenomenon. Bacon, commented, for example, in his 1620 *Novum Organum*, that “slightly tepid water freezes more easily than that which is utterly cold”.

Mpemba anecdote

In 1963, a circa thirteen-year-old African student named

Erasto Mpemba, in the United Republic of Tanzania, was making ice cream at school, which he did by mixing boiling milk with sugar. He was supposed to wait for the milk to cool before placing it the refrigerator, but in a rush to get scarce refrigerator space, put his milk in without cooling it. To his surprise, he found that his hot milk froze into ice cream before that of other students. He asked his physics teacher for an explanation, but was told that he must have been confused, since his observation was impossible.

Mpemba believed his teacher at the time. But later that year he met a friend of his who made and sold ice cream in Tanga town. His friend told Mpemba that when making ice cream, he put the hot liquids in the refrigerator to make them freeze faster. Mpemba found that other ice cream sellers in Tanga had the same practice.

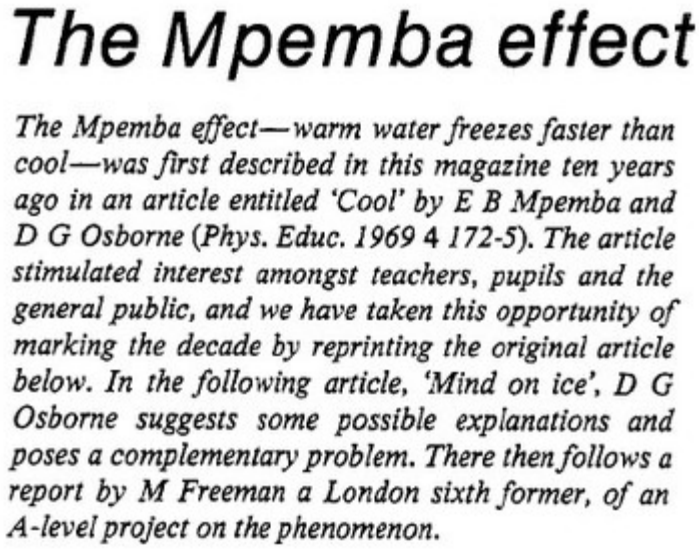

The Mpemba effect

The Mpemba effect—warm water freezes faster than cool—was first described in this magazine ten years ago in an article entitled 'Cool' by E B Mpemba and D G Osborne (Phys. Educ. 1969 4 172-5). The article stimulated interest amongst teachers, pupils and the general public, and we have taken this opportunity of marking the decade by reprinting the original article below. In the following article, 'Mind on ice', D G Osborne suggests some possible explanations and poses a complementary problem. There then follows a report by M Freeman a London sixth former, of an A-level project on the phenomenon.

A 1979 clipping summary of the **Mpemba effect** by the journal of *Physics Education* of Great Britain. [6]

Later, when in high school, Mpemba learned Newton's law of cooling, which describes how hot bodies cool, but does not explain the effect he observed. Mpemba asked his teacher why hot milk froze before cold milk when he put them in the freezer. The teacher answered that Mpemba must have been confused. When Mpemba kept arguing, the teacher said "All I can say is that is *Mpemba's physics* and not the *universal physics*" and from then on, the teacher and the class would criticize Mpemba's mistakes in mathematics and physics by saying "That is Mpemba's mathematics" or "That is Mpemba's physics." But when Mpemba later tried the experiment with hot and cold water in the biology laboratory of his school, he again found that the hot water froze sooner. This was done while he was elementary (or junior high school) student in in Form 3 of Magamba Secondary School, Tanzania. After passing his O-level examinations, he became a student at Mkwawa Secondary (formerly High) School, Iringa, Tanzania.

In high school, the school headmaster invited physicist Denis Osborne, from the University College in Dar Es Salaam, to their conference on "Physics and development of Tanzania," in which he gave a lecture on physics. After the lecture, Mpemba asked him the question:

> “If you take two similar containers with equal volumes of water, one at 35°C (95°F) and the other at 100°C (212°F), and put them into a freezer, the one that started at 100°C (212°F) freezes first. Why?”

The question resulted in the eruption of laughter from the student audience, along with ridiculed by his classmates and teacher. Osborne said that he could not think of any explanation, but would try the experiment later. When back in his laboratory, he asked a young technician to test Mpemba's claim. The technician later reported that the hot water froze first, and said "But we'll keep on repeating the experiment until we get the right result." However, repeated tests gave the same result, and in 1969 Mpemba and Osborne wrote up their results. [5]

The 1969 article stimulated such debate among teachers, pupils, and the general public, particular on the issue that an unknown teenage African school boy can, in a sense, overthrow or rather throw an experimental wrench in Newton’s law of cooling, in such a way as to affront the world science community.

In 1979, the phenomenon had been christened the ‘Mpemba effect’ by the journal of *Physics Education* of Great Britain. [6]

Social
Mpemba

effect

See main: Social Mpemba effect

As applied to social affairs, the Mpemba effect, in regards to orderings of human molecules (people) in societies, should predict that a "hot society" should cool faster, i.e. solidify into order faster, than a "cool society".

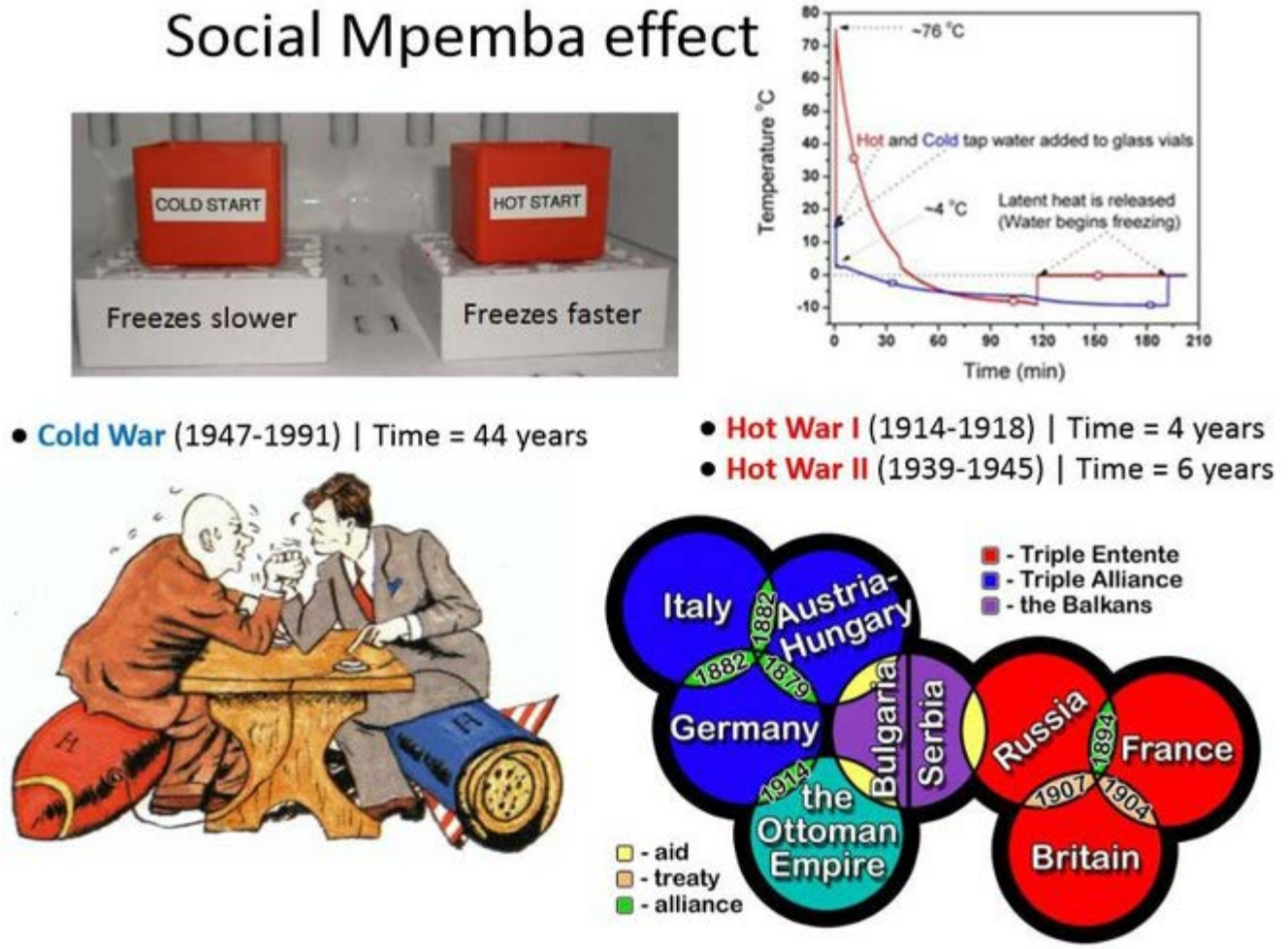

A 2013 power point depiction of a "Social Mpemba effect" in respect to the rate of "social cooling", i.e. solidification into the new social order, in respect to "hot wars" vs "cold wars" by American electrochemical engineer Libb Thims, presented at UPESW 2013 [8]

This is evidenced by the fact that the "Cold War", between Russia and America, lasted 44 years, from 1947 to 1991, whereas traditional "Hot Wars", such as WWI (1914-1918) or WWII (1939-1945), tend to last on average about 5.5 years, in other words the "cooling process" to the new social order (frozen water) from the old social order, occurs much faster if the collective societies are heated (liquid water) first.

The repercussions of this would be that a hot war may, theoretically, would, in the long term, result in solidified order or a state of stable peace faster than would a cold war. Historically, French anthropologist Claude Levi-Strauss was the first to distinction between "cold" and "hot" societies; though it is doubtful that he ever considered the Mpemba effect in this respect.

In 2013, Libb Thims, at UPESW 2013, presented an outline of the social implications of the Mpemba effect. [8]

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Further reading

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External links

● Mpemba effect – Wikipedia.

θΔics

In existographies, **Arius** (256-336) (Cattell 1000:237) was a Roman theologian or "Egyptian priest" (Pherson, 1896), who held shocking opinions about the “trinity”, being that there was a time when “god the father” existed before “god the son”, or something to this effect, and as a warning to sinners, his bowels were gushed out. [1]

Quotes | On

The following are quotes on Arius:

> “Several of the ancient religions believed in a trinity. India’s was composed of three gods, the Creator [Brahma], the Preserver [Vishnu], the Destroyer [Shiva]. Egypt's trinity was composed of Osiris, Isis and Horus. Isis **without the touch of man** [see: virgin birth] brought forth Horus, and then married Osiris. The three were one god, and in connection with eight others composed an ennead or assemblage of nine, into many of which assemblages the Egyptians had to distribute their too numerous deities. Alexandria, the capital of Egypt, was a city founded by Alexander the Great in the year BC 322; it became at one time a vast school of religion and philosophy, but its population was addicted to piracy in the century before Christ, and their ships dominated the Mediterranean till the Romans destroyed them and captured their city. **The idea of making Jesus and the Holy Ghost gods seems to have originated in Egypt**. Says Milman (1840): "The Arians and Athanasians first divided the world on a pure question of faith." These parties took their names from **Arius** and Athanasius (Ñº), two Egyptian priests. Athanasius was an Alexandrian and the leader of the trinitarians; Arius would not accept the views of Athanasius, and the controversy reached a stage which seemed to threaten bloodshed.”
>
> — John Pherson (1896), “A Chapter in the History of Christian History” [2]

References

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2. (a) Milman, Henry H. (1840). *The History of Christianity*. Publisher.
(b) Pherson, John D. (1896). “A Chapter in the History of Christian History” (pg. 745), *The Free Thought Magazine*, 14:737-.

Further reading

â— Rubenstein, Richard E. (2013). *When Jesus Became God* (Arius, 5+ pgs). HMH.

External links

â— Arius – Wikipedia.

θΔics

In existographies, **Armand Seguin** (1767-1835) (CR:4) was a French chemist and physiologist, noted for []

Overview

In 1789 to 1794, Seguin was Antoine Lavoisier's assistant from 1789 until 1794, during which time they conducted a number of experiments on the combustion theory of animal heat; Seguin often being the one the experiments were conducted on (one example pictured adjacent). [1]

In the late 1880s, Seguin expanded on Lavoisier's combustion theory to postulate that a chemical combination of hydrogen with carbon (hydrogene carbone) was released by the blood into the lungs. [2]

Quotes | On

The following are quotes on Seguin:

> "It is worth noting that Rumford nowhere in his 1797 paper suggests that heat is the measure of the vis viva of the constituent atoms. This hypothesis had bee mentioned by Lavoisier and Laplace, and, more recently, by **Armand Seguin** in his long critical essay (1789)."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 101) [1]

See also

â— Marc Seguin

References

1. (a) Levere, Trevor H. (2001). *Transforming Matter: a History of Chemistry from Alchemy to the Buckyball* (pg. 98). JHU Press.
(b) Mendelsohn, Everett I. (1964). *Heat and Life: the Development of the Theory of Animal Heat* (pg. 146). Harvard University Press.
2. Seguin, Armand. (c.1886). "Observations Generales", Publisher, pgs. 469-70.
3. Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 101). Cornell University Press.

External links

â— Armand Seguin – Wikipedia.

θΔics

In existographies, **Armin Navabi** (1984-) (FA:157) is an Iranian-born Canadian ex-Muslim atheist noted for []

Overview

Navabi was born into an upper-class non-practicing Muslim family.

In 1996, Navabi, aged 12, attempted suicide by jumping off the top floor of his middle school. The attempt was unsuccessful. He fractured his back, broke both legs, one hand, was in a wheel chair for seven months, missing an entire year of school.

Navabi did this because he reasoned, with sheer logic, that he could escape, according to Islamic doctrine, the possibility of burning in hell for eternity, according to which if a boy dies before age 15, he goes straight to heaven, because before that age, as Muslim boys are taught there's no way one could be responsible for anything they do, in this age range. Navabi, retrospectively, explains this as follows: [1]

> "You're pure until you're 15, because there's no way you could be responsible for anything you do [before then]. So that means that if you die before age 15, you die pure and you go to heaven. For me, this was a loophole in the system. Why would anybody stick around and gamble potentially burning for eternity? The most logical decision is to quit this game that I never chose to play, early, and just go directly to heaven."

In the years to follow, Navabi tried to become more religious, but within a few years, began to lose faith. He then went hunting for evidence, reading voraciously in his own religion, other religions, and history, eventually coming to the conclusion that all religious are manmade.

In 2002, at age 18, he became an atheist.

In 2011, Navabi launched Iranian Atheists on a social networking site called Orkut, out of loneliness he says; shortly thereafter, he transferred the site to Facebook, under the moniker Atheist Republic, which has 1M+ likes, sometime therein launching WhyThereIsNoGod.com.

A photo of **Navabi** and his brother going to their first day of school, shown being given a Quran, kissed by his mother, a ritualistic way of blessing the school year. [1]

In 2014, Navabi published *Why There Is No God: Simple Responses to 20 Common Arguments for the Existence of God*. In the first chapter, he puts William Paley, and his watch analogy, against John Conway, and his game of life program. The second chapter points our Biblical errors, e.g. that god told Moses that created plants *before* the sun (Genesis 1:1-19), which is physically impossible, being that plants cannot form from seeds unless sunlight is present first, and Quranic errors, god told Muhammad, via an angel, that the earth is flat with the sun rising and setting in particular parts of the earth (Surah 18:86). [2]

References

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2. Navabi, Armin. (2014). *Why There Is No God: Simple Responses to 20 Common Arguments for the Existence of God* (eB). Atheist Republic.

External links

â— Home – WhyThereIsNoGod.com.

θΔics

In hmolscience, **Arnab Chatterjee** (1976-) (CR:14) is an Indian complex systems and physics of society, via statistical physics, researcher, part of the Indian school of econophysics (aka "Kolkata school" according to Victor Yakovenko), noted for []

Overview

In 2003, Indian physicist Bikas Chakrabarti co-authored "Money in Gas-Like Markets: Gibbs and Pareto Laws" with Arnab Chatterjee and S.S. Manna, wherein they considered ideal-gas models of trading markets, where each agent is identified with a gas molecule and each trading as an elastic or money-conserving (two-body) collision. Unlike in the ideal gas, they introduce a quantity the "saving propensity" $λ of agents, such that each agent saves a fraction $λ of its money and trades with the rest. They show that steady-state money or wealth distribution in a market is Gibbs-like for relation $λ = 0, has a non-vanishing most-probable value for $λ ≠ 0, and Pareto-like when $λ is widely distributed among the agents. They compare these results with observations on wealth distributions of various countries. [1]

In 2006, Chatterjee was one of the editors of *Econophysics and Sociophysics: Trends and Perspectives*, along with Bikas Chakrabarti and Anirban Chakraborti, where Jurgen Mimkes' noted thermodynamics chapters are found. [2]

In 2016, Chatterjee is an editor (Ñº) of the, supposedly, upcoming Cambridge University Press book series *Physics of Society: Econophysics and Sociophysics* (Ñº), along with Bikas Chakrabarti, Mauro Gallegati, Alan Kirman, and Eugene Stanley.

Religion

Chatterjee, when queries by Thims (2016) about his views on religion in respect to social physics, stated that he has written very little on this topic, his §VII B of his "Socio-Economic Inequalities: a Statistical Physics Perspective" (2014) aside. [4]

Education

Chatterjee completed his MS in science in 2000 and PhD in 2008. [2]

References

1. Chatterjee , Arnab, Chakrabarti, Bikas K., Manna, S. S. (2003). **"**Money in Gas-Like Markets: Gibbs and Pareto Laws", *Physica Scripta* T106 (2003) 36-38.
2. (a) Chakrabarti, Bikas K. Chakraborti, Anirban, and Chatterjee, Arnab. (2006). *Econophysics and Sociophysics: Trends and Perspectives*, ("A Thermodynamic Formulation of Economics" (PDF) [ch. 1] and "A Thermodynamic Formulation of Social Science" [ch. 10]). Wiley-VCH.
(b) Mimkes, Jurgen. (2006). "A Thermodynamic Formulation of Social Science", In: *Econophysics & Sociophysics: Trends & Perspectives* (pgs. 277 – 308). Bikas K. Chakrabarti, Anirban Chakraborti, Arnab Chatterjee (Eds.). WILEY-VCH Verlag, Weinheim, Germany.
3. Chatterjee, Arnab. (2016). "Email communication with Libb Thims", Feb 8.
4. Chatterjee, Arnab. (2016). "Socio-Economic Inequalities: a Statistical Physics Perspective" (pdf), ArXiv, Oct 8.

External links

â— Arnab Chatterjee – Twitter.
â— Arnab Chatterjee – Google Sites.

θΔics

In hmolscience, **Arne Stahl** (1931-) is a German physicist noted for his 1996 article "Entropy Balances and Raw Material Consumption" wherein he does some type of Shannon entropy and or Shannon bandwagon fueled derivation resulting in a table, a rendition of which is shown below, from German physicist Reiner Kummel's 2011 economic thermodynamics book, showing physiologic entropy production of an adult human (0.5) and the entropy production per capita by economic activity for the world on average (10), the USA (35), Germany (20), and India (2) in units, supposedly, of "macrobits per second" which is argued to equate to watts per kelvin: [1]

Process	Macrobit/s (≐ W/K)
Influx of solar radiation entropy per square meter of Earth's surface	< 0.1
Infrared entropy export into cold space per square meter of Earth's surface	1.2
Transport entropy in Earth's greenhouse per square meter of Earth's surface	0.2
Entropy reduction by photosynthesis per square meter of Earth's surface (daily average in moderate climate)	-1.3×10^{-3}
Physiological entropy production of an adult human being	0.5
Entropy production per capita by economic activities	
World average	10
USA	35
Germany	20
India	2
Entropy production by water pollution per capita in Germany	1–2

Education

Stahl's background seems to be in semiconductor theory. In 1996, he was associated with the Institut für Theoretische Physik der RWTH, Aachen, Germany

References

1. (a) Stahl, Arne. (1996). "Entropy Balances and Raw Material Consumption" ("Entropiebilanzen und Rohstoffverbrauch") (abs), *Naturwissenschaften*, 83(10):459-66.
(b) Kummel, Reiner. (2011). *The Second Law of Economics: Energy, Entropy, and the Origins of Wealth* (pgs. 127-28). Springer.

External links

â— Stahl, A. (Arne) (1931-) – WorldCat Identities.

θΔics

In science, **Arno Penzias** (1933-) (RGM:578|1,350+) is a German-born American physicist, noted for his 1964 co-discovery, working with Robert Wilson at Bell Labs, of cosmic microwave background radiation, the first evidence of a big bang universe.

Religion

Penzias is a conservative Jew, who believes in the existence of god, but says he constantly wrestles with this existence; believes that the Jews were the chosen people; that Moses was real; the following are few example quotes:

> "The best data we have are exactly what I would have predicted had I nothing to go on but the first five books of Moses, the Psalms and the Bible as a whole."
>
> — Arno Penzias (c.1978), commentary on big bang theory [1]

> "Religion is that which we know beyond what we can prove."
>
> — Arno Penzias (1994), Interview [3]

> "The thing I wrestle with at all times is the reality of god."
>
> — Arno Penzias (1994), Interview [3]

> " I think the word 'god' is meaningful in that I would like to believe in a purposeful world. Purpose implies an 'owner' of that purpose and I think that god is the owner of the purpose of the world. By looking at the creation one can infer purpose. Nature, blind nature, is driven by chance, by the laws of probability which revolve around what one would call the second law of thermodynamics. For example, if you were to put a pinch of salt in one part of a boiling kettle of soup, sooner or later that salt would end up dispersed throughout. In other words, it would reach the most disordered possible state. Nature, through random chance, seeks disorder. Life, on the other hand, somehow works against that; it organizes, makes things orderly. If we go out and we see a forest of trees and all of a sudden the trees are plated in a row of equal spaces, we would see purpose. Order implies purpose. Once we look at the purpose, we can, then, go one step further, and say something about the engine of that purpose and the owner of that purpose. If there are a bunch of fruit trees, one can say that whoever created these fruit trees wanted some apples. In other words, by looking at the order in the world, we can infer purpose and from purpose we begin to get some knowledge of the creator, the planner of all this. This is, then, how I look at god. I look at god through the works of god's hands and from those works imply intentions. From these intentions, I receive an impression of the almighty."
>
> — Arno Penzias (1994), response to question about the meaning of the world 'god', to him, as a concept or mathematical formula [3]

Penzias believes, in short, that the evidence of order in the universe implies purpose, which in turn points to someone who creates it, therefore god, in Penzias' view, is the "owner" of the world's purpose.

References

1. (a) Browne, Malcolm W. (1978). "Clues to Universe Origin Expected", *New York Times*, Mar 12.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pgs. 21-24). Zondervan, 2009.

2. (a) Haberman, Joshua O. (1994). *The God I Believe In* (§:Arno Penzias, pgs. 175-; apples, pg. 184). Maxwell Macmillan.
(b) Dimitrov, Tihomir. (2011). “Nobel Laureate Arno Penzias and God and Big Bang” (Ñº), 2012Daily.com.
3. Haberman, Joshua O. (1994). *The God I Believe In* (§:Arno Penzias, pgs. 175-; apples, pg. 184). Maxwell Macmillan.

Further reading

â— Oakes, John. (2005). “Interview with Arno Penzias and Robert Wilson” (Ñº), EvidenceForChristianity.org, May 5.

External links

â— Arno Penzias – Wikipedia.

θΔics

In existographies, **Arnold Sommerfeld** (1868-1951) (IQ:175|#279) was a German theoretical physicist note for several famous quotations loosely connected to the manuscript *Thermodynamics and Statistical Mechanics* he was working on at the time of his death. [1]

Overview

As the story goes, in the late 1940s, Sommerfeld had previously written a series of books in physics: mechanics (1943), electrodynamics (1948), optics (1950), etc., and was asked why he had never written a book on thermodynamics? The following is his humorous and frequently quoted answer: [2]

> "Thermodynamics is a **funny** subject. The first time you go through it, you don't understand it at all. The second time you go through it, you think you understand it, except for one or two small points. The third time you go through it, you know you don't understand it, but by that time you are so used to it, it doesn't bother you anymore."

In an odd twist of fate to this quote, in April of 1951, while in the midst of writing a book on thermodynamics (*Thermodynamics and Statistical Mechanics*), and having been nominated 81 times for the Nobel Prize (more than any other physicist), but not yet having won, Sommerfeld was killed from injuries after a traffic accident while walking his grandchildren. The book was published posthumously the following year. [3] The following is another noted quote from his thermodynamics book: [4]

> "Reversible processes are not, in fact, processes at all, they are sequences of states of equilibrium. The processes which we encounter in real life are always irreversible."

(add)

References

1. Sommerfeld, Arnold. (1956). *Thermodynamics and Statistical Mechanics: Lectures on Theoretical Physics* (pg. 19). Vol. V., trans. by Joseph Kestin. Academic Press.
2. Angrist, Stanley W. and Hepler, Loren G. (1967). *Order and Chaos – Laws of Energy and Entropy* (pg. 215). New York: Basic Books.
3. (a) Sommerfeld, Arnold. (1952). *Thermodynamik und Statistik - Vorlesungen über theoretische Physik Band 5* Herausgegeben von Fritz Bopp und Josef Meixner. Diederich sche Verlagsbuchhandlung.
(b) Sommerfeld, Arnold. (1964). *Thermodynamics and Statistical Mechanics - Lectures on Theoretical Physics Volume V* (edited by F. Bopp and J. Meixner, and translated by J. Kestin). Academic Press.
(c) Crawford, Elisabeth. (2001). "Nobel Population 1901-50: Anatomy of a Scientific Elite", November 15, 2007, PhysicsWorld.com.
4. Hokikian, Jack. (2002). *The Science of Disorder: Understanding the Complexity, Uncertainty, and Pollution in Our World* (pg. 25). Los Feliz Publishing.

External links

â— Arnold Sommerfeld – Wikipedia.
â— Arnold Sommerfeld – NNDB.

θΔics

In existographies, **L. Aron Nelson** (1962-) (FA:179), aka “AronRa” or Aron-Ra, pronounced RN (not “Aron-Ra”), is an American atheism activist noted for []

Aron-Ra | Namesake

In 2016, Nelson, in his *Foundational Falsehoods of Creationism*, stated the following about his Internet name: [1]

> “My surname is no terrible secret, but it isn't my preference either. When I signed up for the Usenet group TalkOrigins.com [e.g. “You Are an Ape” (2003) (Q)] I needed a handle and quickly decided on **Aron-Ra**. Why? I wanted to give a nod to Amen-Ra (see: Amen-Ra) a composite of the Egyptian air god [Amen] and sun god [Ra], also known as Amun-Re, whom I see as a template for the god of Western monotheism.”

Here, to correct things, Amen was hardly the Egyptian air god (see: supreme god timeline), but rather the god representative of "hidden powers, unseen but everywhere" (Jordan, 1993). [3]

YouTube

In 2006, Aron Ra launched his AronRa YouTube channel, which soon thereafter became a top ten atheism channel.

Quotes

The following are quotes by Nelson:

> “I don’t like being lied to. And I especially didn’t like being lied to as a child.”
>
> — Aron Nelson (2011), response (Q) as to what drives him to make his top 10 YouTube atheism channel [1]

References

1. Ra, Aron (Aron Nelson) (2016). *Foundational Falsehoods of Creationism* (pg. #). Pitchstone Publishing.
2. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs) (Nelson, pg. vi). Publisher.
3. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (Amun, pg. 15). Facts on File, Inc.

External links

- Aron Ra – Wikipedia.
- Aron Ra – Wikiquote.
- AronRa – Rational Wiki.

θΔics

In thermodynamics, an **arrow of time** refers to the direction time flows in respect to irreversibility and entropy increase.

An alternative synonym for arrow of time is English astronomer Arthur Eddington's 1928 term "time's arrow", refers to the temporal effect or measure of irreversibility in nature. The phrase was popularized in the 1950s and into the 70s by those as Austrian-born English philosopher Karl Popper and Belgian thermodynamicist Ilya Prigogine. [1]

A newer synonym is "thermodynamic arrow", popularized in the 1980s by English theoretical physicist Stephen Hawking, who introduced this term in comparison to the psychological arrow. [2]

A 1639 allegory by F. Quarles, showing Father Time, holding an hourglass, who tells Death (see: death), holding an arrow, when to extinguish the light of life of a human, shown in front of the sun and a sundial; the inscription reading: "tempus erit" or the time will come; the overall depiction said to well-capture the conception of the **arrow of time**, in respect to thermodynamics, heat, and the second law. [3]

References

1. (a) Popper, K. (1956). "The Arrow of Time", *Nature*, Vol. 177. Pg. 538.
(b) Prigogine, Ilya. (1984). *Order Out of Chaos – Man's New Dialogue with Nature*, (section: "Boltzmann and the Arrow of Time", pgs 253-56, "Entropy and the Arrow of Time", pgs. 257-59). New York: Bantam Books.
2. Hawking, Stephen. (1996). *The Illustrated - A Brief History of Time*, (ch. 9: "The Arrow of Time", pgs. 182-95). New York: Bantam Books.
3. Mainzer, Klaus. (1996). *Symmetries of Nature* (§3.4. Symmetry and Thermodynamics, pgs. 317-18). Walter De Gruyter.

Further reading

● Hawking, Stephen W. (1985). "Arrow of Time in Cosmology", *Physical Review D*, Nov. 15; in: *Quantum Cosmology* (pgs. 308-15) by Lizhi Fang and Remo Ruffini, World Scientific, 1987.
● Carroll, Sean. (2010). *From Eternity to Here: the Quest for the Ultimate Theory of Time.* Penguin Group USA.

External links

● Arrow of time – Wikipedia.
● Arrow of Time (comic) by Fenerit , Wed Nov 19, 2008.

θΔics

In subjects, **art** refers to []

Quotes

The following are related quotes:

> "At first, he who invented any '**art**' that went beyond the common perceptions of man, was naturally admired by men, not only because there was something useful in the inventions, but because he was thought wise and superior to the rest. But as more arts were invented, and some were directed to the necessities of life, others to its recreation, the inventors of the latter were always regarded as wiser than the inventors of the former, because there branches of knowledge did not aim at utility. Hence, when all such inventions were already established, the sciences which do not aim at giving pleasure or at the necessities of life, were discovered, and first in the places where men first began to have leisure. This is why the 'mathematical' arts were founded in Egypt; for there the priestly caste was allowed to be at leisure."
>
> — Aristotle (c.350), *Metaphysics* (pg. 1553) [1]

See also

â— Art science
â— Art thermodynamics

References

1. Aristotle. (322BC). *The Complete Works of Aristotle, Volume Two* (editor: Jonathan Barnes) (§: Metaphysics, pgs. 1552-; quote, pg. 1553). Princeton, 1995.

External links

â— Art – Wikipedia.

θΔics

In science, **art science**, which can be subdivided into art chemistry (e.g. René Magritte's 1933 "Elective Affinities"; Wolfe von Lenkiewicz's 2011 "Elective Affinities", etc.), art thermodynamics, and art physics, is the subject of the representation of scientific principles in artistic or thematic depiction.

See also

- Art thermodynamics
- Equation overlay method

θΔics

In human thermodynamics, **art thermodynamics** or *thermodynamic art* is the use of thermodynamic metaphor, logic, and or theory in art, in either interpretation or inspiration. A common example is the use of various interpretations of entropy, e.g. order and disorder, in the construction or study of art. An example of thermodynamic art, of sorts, is the "drinking bird", invented in the 1940s by American chemist Miles Sullivan. Other examples are found as thermodynamics tattoos, in which people tattoo equations of energy or entropy (or another equation) of on their body.

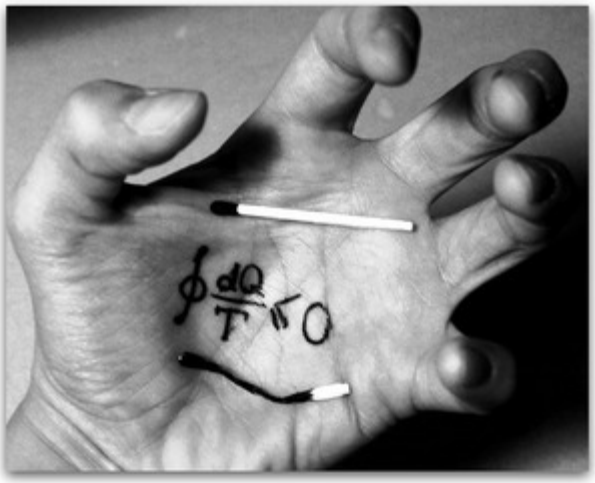

Tattoo (or inking) of the Clausius inequality; photo by Marco Fantoni (March, 2008). In the photo, showing a hand holding both a new and burnt match, according to Fantoni "the hand represents the capacity of the human mind to analyze and understand natural phenomena [such as] the power and imperative of irreversibility." [5]

Artists

Belgian surrealist artist René Magritte's 1933 oil on canvas painting *Elective Affinities*, of an unhatched egg in a bird cage, on the model of German polymath Johann Goethe's 1809, pre human chemical thermodynamics, novella *Elective Affinities* (book), visualizing the logic that each person is born in to a world caged by the reactionary forces of chemical affinities, is an excellent example of the use of the combined law of thermodynamics in art.

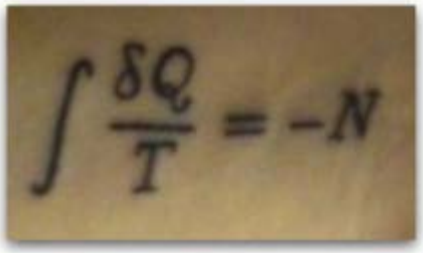

Clausius' 1854 principle of the equivalence of transformations (formulation of the second law) tattoo on forearm, May 2010, another example of a thermodynamics tattoo. [6]

A notable artist in this field was American Robert Smithson, who, between 1959 and 1973, wrote several articles about his interpretation of entropy and its connection to art and landscape design. [1] Smithson describes his use of entropy in art and landscape in his 1966 essay "Entropy and the New Monuments" and his 1973 interview "Entropy made Visible". [2]

American psychologist Rudolf Arnheim is noted in this field for his 1970s theories on the interpretation of entropy in the psychology of art. [3]

References

1. (a) Schmitz, John E.J. (2007). *The Second Law of Life: Energy, Technology, and the Future of Earth as We Know It*, (section: "The Concept of Entropy and Art", pgs. 158-60). William Andrew Publishing.
(b) Boettger, Suzaan. (2002). *Earthwords: Art and the Landscapes of the Sixties*, (pgs. 50-51). University of California Press.
2. (a) Smithson, Robert. (1966). "Entropy and the New Monuments", *Robert Smithson Collections.*
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(b) Arnheim, Rudolf. (1973). "On Entropy and Art", *Leonardo*, Vol. 6, No. 2. Spring. pgs. 188-89.
(c) Land, Richard I. (1973). "Comments on Discussions of Entropy and Art in Leonardo in 1973." *Leonardo*, Vol. 6, pgs. 331-33. Pergamon Press.
5. (a) Irreversibility (photo) - Flickr.
(b) Irreversibility – Flickr (Italian → English).
6. Zimmer, Carl. (2010). "Graduating into Entropy", Discover Magazine Blog, May 02.

Further reading

â— Staiti, Paul. (2001). "Winslow Homer and the Drama of Thermodynamics" (Abs), *American Art*, Vol. 15, No. 1, Spring, pgs. 11-13.
â— Author. (2005). "Art Turns to Thermodynamics", *PhysicsWorld.com*, May 13.

External links

â— Schrodinger equation and Heisenberg uncertainty tattoos – Atom.Physics.CalPoly.edu.

θΔics

In human physics, **Arthur Bentley** (1870-1927) was and American political scientist and philosopher noted for []

Overview

In 1906, Bentley, in his *The Process of Government*: *a Study of Social Pressures*, as cited by Cynthia Russett (1966), outlined the following force/pressure view of government: [1]

> "The phenomena of government are from start to finish phenomena of force. But force is an objectionable word. In the first place, it is apt here, as in the natural sciences, to lead its users into metaphysical quagmires. In the second place, it is too closely identified with so-called 'physical force' and too apt to be understood as in opposition to non-force factors of a sympathetic or moral or ideal nature; and this even while these latter factors are actually being treated as themselves very powerful agents in social process.
>
> I prefer to use the word pressure instead of force, since it keeps the attention closely directed upon the groups themselves, instead of upon any mystical 'realities' assumed to be underneath and supporting them; and since its connotation is not limited to the narrowly 'physical'. We frequently talk of 'bring pressure to bear' upon someone, and we can use the word here with but slight extension beyond this common meaning.
>
> Pressure, as we shall use it, is always a group phenomenon. It indicates the push and resistance between groups. The balance of the group pressures *is* the existing state of a society. Pressure is broad enough to include all forms of group influence upon group, from battle and riot to abstract reasoning and sensitive morality. It takes upon itself 'moral energy' and the finest discriminations of conscience as easily as bloodthirsty lust for power. It allows for humanitarian movements as easily as for political corruption. Groups exert their pressure, whether they find expression thought representative opinion groups or whether they are silent, not indeed with the same technique, not with the same palpable results, but in just as real a way. The tendencies to activity are pressures as well as the more visible activities."

Bentley goes onto summarize, somewhere, that "all phenomena of government are phenomena of groups pressing one another." [2]

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External links

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θΔics

In hmolscience, **Arthur Clough** (1819-1861) was an English poet, Goethe-disciple, assistant to Florence Nightingale, friend of James Froude at Oxford, noted for his 1849 elective affinities influenced long poem *Amours de Voyage* (*Loves to Travel*), which gives a materialistic natural forces take on love.

Amours de Voyage

The following section seems to capture Clough's Goethean-influenced take on the affinities of love issue:

> "Juxtaposition is great,—but, you tell me, affinity greater.
> Ah, my friend, there are many affinities, greater and lesser,
> Stronger and weaker; and each, by the favour of juxtaposition,
> Potent, efficient, in force,—for a time; but none, let me tell you,

The first four lines, to note, seem to be a direct restatement of Goethe's 1796 *Third Lecture on Anatomy*. (Ñº)

> Save by the law of the land and the ruinous **force of the will**, ah,
> None, I fear me, at last quite sure to be final and perfect.
> Lo, as I pace in the street, from the peasant-girl to the princess,
> *Homo sum, nihil humani a me alienum puto*,—
> *Vir sum, nihil faeminei*,—and e'en to the uttermost circle,
> All that is Nature's is I, and I all things that are Nature's.
> Yes, as I walk, I behold, in a luminous, large intuition,
> That I can be and become anything that I meet with or look at:
> I am the ox in the dray, the ass with the garden-stuff panniers;
> I am the dog in the doorway, the kitten that plays in the window,
> On sunny slab of the ruin the furtive and fugitive lizard,
> Swallow above me that twitters, and fly that is buzzing about me;
> Yea, and detect, as I go, by a faint but a faithful assurance,
> E'en from the stones of the street, as from rocks or trees of the forest,
> Something of kindred, a common, though latent vitality, greets me;
> And to escape from our strivings, mistakings, misgrowths, and perversions,
> Fain could demand to return to that perfect and primitive silence,
> Fain be enfolded and fixed, as of old, in their rigid embraces."
>
> — Arthur Clough (1849), Amours de Voyage, Canto III (VII Claude to Eustace) (Ñº)

In 2006, American literature professor Stefanie Markovits abstracted Clough's *Loves to Travel* as follows: [1]

> "Why, Claude wonders, should he fall for Mary rather than some other girl who would be equally suitable and equally attractive? Is love just the chance collision of two people who are, as the saying goes, in the right place at the right time—a kind of lucky hit in the dark? 'Juxtaposition', within the frame of *Amours*, fits into two sets of metaphors. The first of these is chemical and has to do with the concept of elective affinities: the idea that elements having inherent tendencies to form combinations and that they will combine and recombine according to these tendencies when placed in solution with each other. Goethe had explored the social and sexual implications of the concept in his novel *Die Wahlverwandtschaften* (1809), a work that obviously influenced **Clough**'s reflections on the subject of *Amours*. Goethe's novel is really more of a thought experiment [see: Goethe love thought experiment] about enlightenment than anything else. In it, a hyperrational couple invite into their home a pair of outsiders, only to discover that the foreign

elements bring with them dangerous forces of elective affinity. The four main characters find themselves reshuffling their relations according to these affinities, and the results are devastating."

(add discussion)

Poetry historian Benard Richards (2001) summarizes things as follows: [2]

> "In this poem sexual attraction seems not so much a matter of minds as of blind natural forces - a materialist version, perhaps, of Goethe's mystical 'elective affinities'. We are not very far from the spirit of Huxley's notorious pamphlet 'On the Physical Basis of Life' (1862)"

(add discussion)

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External links

â— Arthur Hugh Clough – Wikipedia.

θΔics

In existographies, **Arthur Compton** (1892-1962) (GPE:#) (CR:12) was an American physicist noted for []

Overview

In 1923, Compton, in his "A Quantum Theory of the Scattering of X-Rays by Light Elements", gave experimental evidence for the particle view of light, in which he employed the terms: "light element", "quanta of radiation", "radiation quantum", but not, it seems, the term photon. [1] Many, such as American science historian Isaac Asimov, claim that Compton coined the term photon in 1923. [2]

In the 1930s, Robert Millikan entered into a debate with Compton over whether cosmic rays were composed of high-energy photons (Millikan's view) or charged particles (Compton's view). Millikan thought, in the above quote, his cosmic ray photons were the "birth cries" of new atoms continually being created by god to counteract entropy and prevent the heat death of the universe. Compton would eventually be proven right by the observation that cosmic rays are deflected by the earth's magnetic field (and so must be charged particles).

In 1935, Arthur Compton, in his *The Freedom of Man*, cited the following statement by Werner Heisenberg, from his *The Physical Principles of Quantum Theory* (1930): [3]

> "The resolution of the paradoxes of the atomic physics can be accomplished only by renunciation of the old and cherished ideas. Most important of these is the idea that natural phenomena obey exact laws—the principle of causality."

then alluding to the notion that it makes the model of Laplacian determinism, as captured in Laplace's demon model of the universe, seem "less and less probable" to some physicists. [4]

Religion

Compton seems to have been an implicit Christian; the dedication page to his *The Freedom of Man* (1935) reads as such:

> "To my father philosopher and friend who for many years has taught his students, myself among them, the way toward a rational and satisfying Christian philosophy, which he has found for himself by careful study, constructive imagination, and keen appreciation of the values of life."

(add discussion)

Quotes | Employed

The following are quotes employed by Compton:

> "Nothing happens without a cause, but with a cause and by necessity."
>
> — Leucippus (c.460BC)

References

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External links

â— Arthur Compton – Wikipedia.

θΔics

In existographies, **Arthur Eddington** (1882-1944) (GPE:#) (EPD:F2) (CR:90) was an English mathematician, astronomer, and physicist notable for his laymanized discussions of thermodynamics and time, beauty, order and disorder, purpose, chance, anti-chance, etc.

Relativity test

On 29 May 1919, Eddington took a take a trip to the island of Principe (off the west coast of Africa) to measure the solar eclipse, to test the validity of Einstein's mass bends light conjecture:

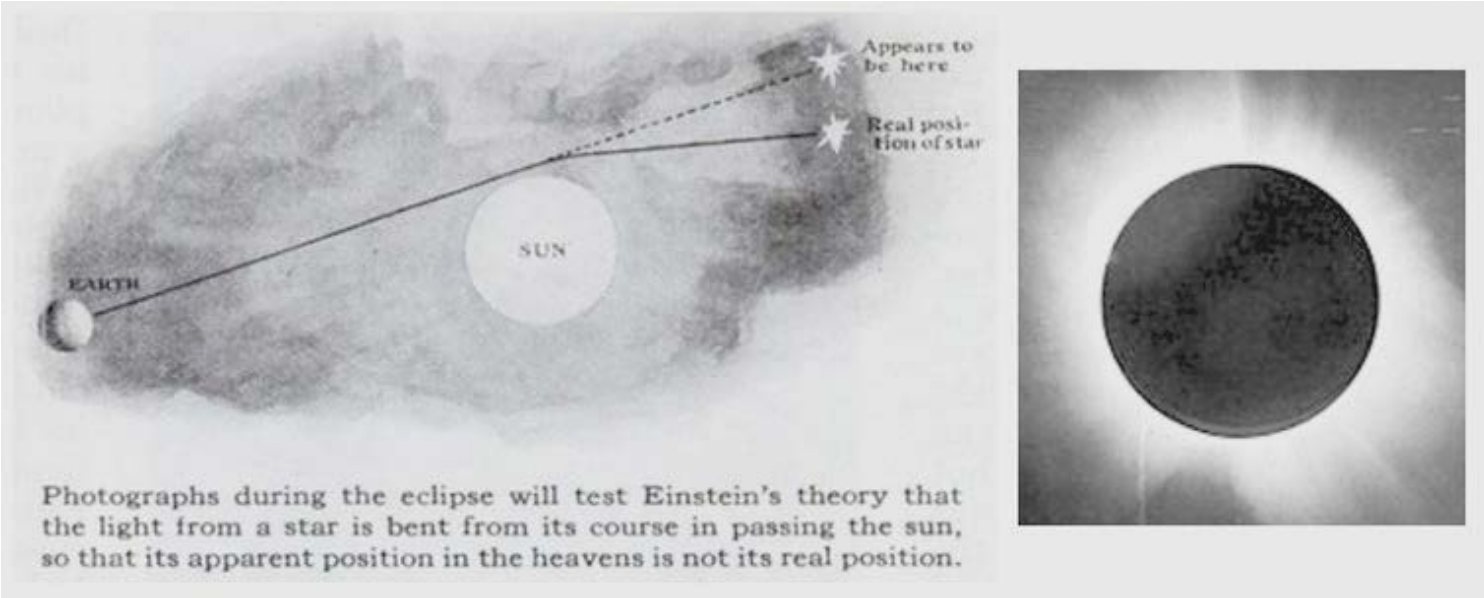

Eddington's report of his findings to the Royal Society of London, and later London *Times*' headline: "Revolution in Science: New Theory of the Universe", made Einstein an overnight genius celebrity. [5]

This test was later influential to Karl Popper and his falsifiability criterion.

Nature of the Physical World

In 1928, Eddington published his Gifford Lectures turned book *The Nature of the Physical World*, in which, in his famous chapter four "The Running-Down of the Universe", he introduced a number of terms such as the time's arrow (or arrow of time), entropy-clock, the "shuffling cards model of entropy", the association between entropy and beauty, among various famous thermodynamics quotes. [1]

The focus of the lectures was to introduce philosophical outcomes of the recent developments in the theory of relativity, quantum theory, and progress in the principles of thermodynamics. Being that both the course and the book were intended for general audiences, the popularity of many of its conceptions has had a great following. The coining and use of the neo-modern term "Entropy Law" by Romanian mathematical economist Nicholas Georgescu-Roegen beginning in 1970 is one of many examples. [2]

New Pathways in Science

In 1935, Eddington published his Cornell University Messenger Lectures turned book *New Pathways in Science*, wherein he seemed to imbibe Maxwell's demon with conscious purpose, describing him as a sorting agent:

> “The way in which conscious purpose might intervene was pointed out by Clerk Maxwell who invented a famous sorting demon.”

Eddington, later also ruminates on whether Maxwell’s demon would be ‘baffled’ by Werner Heisenberg’s uncertainty principle (see also: Filon-Pearson demon)

Education

Eddington was the first person ever to win first wrangler as a second-year student at Cambridge.

Quotes | By

The following are noted quotes from his *Gifford Lectures*:

> “The law that entropy always increases — the second law of thermodynamics — holds, I think, the supreme position among the laws of nature. If someone points out to you that your pet theory of the universe is in disagreement with Maxwell’s equations — then so much the worse for Maxwell's equations. If it is found to be contradicted by observation — well, these experimentalists do bungle things sometimes. But if your theory is found to be against the second law of thermodynamics I can give you no hope; there is nothing for it but to collapse in deepest humiliation.”
>
> — Arthur Eddington (1928), *The Nature of the Physical World*; Gifford Lectures turned book

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5. Castles, Elaine E. (2012). *Inventing Intelligence: How America Came to Worship IQ* (pg. 2). ABC Clio.

External links

â— Arthur Eddington – Wikipedia.

θΔics

In science, **Arthur Haas** (1884-1941) was an Austrian physicist noted for his 1910 electron orbital quantization paper, predating the Bohr model (1913), and for his two-volume 1936 *Commentary on the Scientific Writings of J. Willard Gibbs*, co-authored with Frederick Donnan. [1]

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External links

â— Arthur Erich Haas – Wikipedia.

θΔics

In existographies, **Arthur Iberall** (1918-2002) (CR:37), aka “Ibby” (Q), was an American physicist-engineer noted, in human thermodynamics, for a number of publications on defining social systems and the origins of civilizations from the point of view of physics, thermodynamics, and chemical engineering, a subject which he called "homeokinetics". [1]

Overview

In 1971, Iberall published*Towards a General Science of Viable Systems*, which is one of his most-popular works. Others include the 1974 *Bridges in Science: from Physics to Social Science*, the 1976 *Nature, Life, Mind, and Society*, the 1977 *Physical Foundations for Socio-Economic Modeling for Transport Planning*, and the 1993 *Foundations for Social and Biological Evolution: Progress toward a Physical Theory of Civilization and of Speciation.* Iberall’s work has been cited by American social thermodynamicist Douglas White.
In 1981, Iberall was invited to the Crump Institute for Medical Engineering of UCLA, where he further refined the key concepts of homeokinesis, developing a physical scientific foundation for complex systems' systems of nature, life, man, mind, and society. As an invited visiting scholar at UCLA, Dr. Iberall became involved in defining the physics and nonlinear mathematics of complex physical systems such as living and social systems, in showing how information flow occurs in complex systems.

Free energy

In 1971, Iberall, in his *Toward a General Science of Viable Systems*, and also his 1974 *Bridges in Science: from Physics to Social Science*, discussed Gibbs’ ensemble theory and thermodynamics functions of free energy, in the social science framework. [8]

Field thermodynamics | CHNOPS+ systems

In his three-part 1977-78 article series on “A Field and Circuit Thermodynamics for Integrative Physiology”, Iberall uses concepts from statistical mechanics to develop what he calls the subject of “field thermodynamics”, arguing that the Hamiltonian field concept unites the way change is viewed in both biology and physics. [4] In the second paper to this series he attempts to show how biological phenomena can be reduced to physical theory at any level of organization; the physical theory in question being comprised of thermostatics, thermodynamics of irreversible processes, statistical mechanics, and nonlinear mechanics. [5] In third part, he applies the model of the thermodynamics of Brownian motion to interactions in biological systems. [6]

Human thermodynamics education

In human thermodynamics education, Iberall taught courses on the thermodynamics of living systems for chemical engineering students in their thermodynamic study, including a two year seminar on the general physical science underlying all complex systems in nature for graduate students, faculty, and non academic well educated professionals, a physical foundation for comparative political systems, and physical foundations for social systems. [2] He sponsored by the Marshak colloquium which commonly gives its honors course as mathematics adaptable to the social sciences.

Iberall lectures

In 2003, the “Arthur Iberall Lecture Series”, was launched, hosted at Trinity College, Hartford Connecticut, with a fund of 50k USD, which has produced lectures by those including: Eugene Yates (2003), Douglas White (2008), Dilip Kondepudi (2010), Judith Rosen (2014) on the work of Robert Rosen, and a 2015 recognition talk on the work of Howard Pattee. [10]

Education

Iberall completed his BS in physics in 1940 and completed some mechanical engineering work in 1941, both at the City College of New York; from 1942 to 1945, he completed some graduate studies in physics, under George Gamow (his advisor) and Edward Teller, at George Washington University. In 1976, Iberall received an honorary Doctor of Science from Ohio State University for his achievements in interdisciplinary scientific research. [7]

In 1978, Iberall was a professor of physics at the City College of the City University of New York. He was a researcher

at the University of California, Irvine, a fellow of the American Society of Mechanical Engineers, a distinguished annual lecturer at the Biomedical Engineering Society, and for ten years he was chief physicist at the Rand Development Corporation, focused on applied physical sciences for government and industry. He did biophysical research for the NASA exobiology program on the dynamic of mammalian physiological processes. His applied research has ranged broadly in measurement, mechanical instrumentation, high altitude research, hydrodynamic studies of flow fields, nonlinear fluid dynamics, arterial blood flow, the physics of turbulence, high speed electric power switching, and low loss cryogenics. [2]

Quotes | By

The following are quotes by Iberall:

> "The potentials that drive the fluxes of the human social system, the most evident being the external and internal physical-chemical potentials, include a sheaf of potential-like components that represent the command-control system emergent as politics. On the whole, culture represents the social equivalent with the main processes of economics and politics being driven by a social pressure."
>
> — Arthur Iberall (1985), "Outlining Social Physics for Modern Societies" [9]

> "Operationally extending the scope of a Navier-Stokes description of material flow fields, e.g. stars, atmospheres, plasmas, galaxies, vascular systems, etc., has become routine in physics. Its further extension, e.g. to societies, is now timely."
>
> — Arthur Iberall (1985), "Outlining Social Physics for Modern Societies" (compare: Ram Poudel) [9]

References

ARTHUR S. IBERALL DISTINGUISHED LECTURE SERIES

Dedicated to the exploration of connections between physical processes and their manifestations in nature, life, humankind, mind, and society. The series honors the physicist, Arthur S. Iberall (1918-2002), whose intellectual legacy includes homeokinetics, a method of applying the laws of thermodynamics to all self-organizing systems. His applied research contributed significantly to the development of the first space suit, the high-speed dental drill, stove surface burners, the fancy-stitch sewing machine, and the electric knife.

Description of Iberall from the 2007 Arthur S. Iberall Distinguished Lecture Series: on Life and the Sciences of Complexity. [3]

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External links

● Arthur Iberall – Wikipedia.
● Iberall, Arthur S. – WorldCat Identities.

θΔics

In hmolscience, **Arthur David Jonath** (1931-) is an American materials scientist and aeronautics engineer noted, in economic thermodynamics, for his 2008 to present publications of a theory that thermodynamics applies to economics, entropy applies to populations of people, and that the principle of entropy increase is a replacement for god.

Overview

In circa 2008, Jonath launched the site ProfitandEntropy.com (Q) (WB), wherein he outlines what he calls "profit economics", a thermoeconomic model that compares currency flow to heat flow, and the production of profit to the production of increasing entropy.

In 2009, Jonath, together with American psychologist Richard Goldwater, in their "Saving Capitalism from Finance: the Power of Thermoeconomics", argued the following: [2]

> "Entropy is an idea that applies to populations of humans as well as of molecules."

(add discussion)

God | Entropy

In 2009, Jonath, in his video interview "Isomorphism, Entropy and God", reflects on how his interest in entropy and life dates back to his childhood and how his atheist Jewish grandmother and how, when he was aged 12 to 16, she would explain to him why she did not believe in god, the gist of which being that the Ukraine pogroms she had witnessed, in 1903 to 1905, convinced her that there was no god.

When Jonath did eventually asked his grandmother what she did, as an atheist, believe in, i.e. her atheist's creed, him still at that time vacillating on the dismissal of belief in god, she replied: "I believe in oxygen, without it you die." At another time, she replied, similarly, to one of his brothers, "I believe in the sun, without it you die", which acted as a trigger that sent him on a search for the "prime mover", as he says, e.g. studying comparative religions, via Huston Smith, comparing eastern vs western religions, and thereafter coming to grasp, at the basic level, the idea of entropy and the inevitability of its increase, and therein "replaced the concept of a god with the concept of entropy" as he surmised in retrospect.

Economic temperature

One of the more interesting aspects their ideas is the use of economic temperature, on the model that just as heat excites molecules, increasing pressure in a container, so to will desire heat up people, and put pressure on behavior.

Difficulties on theory

The bulk of their theories, to note, are very elementary and described by them as "analogies" suitable for a teaching in a physics-for-poets course. Many of their basic thermodynamic facts are also incorrect, e.g. claiming that Rudolf Clausius described entropy as a 'measure of the tilt toward equilibrium.' To cite one example of basis extrapolation, they reference supposed 'entropy expert' Rod Swenson, who states that maximum entropy means maximum uncertainty of knowing where any individual particle is at any particular time, and then, on this basis, conjecture that in human terms this means that at maximum entropy in a human system, one will not be able to predict what any individual earns or buys at any given time?

Education

Jonath completed his BS and MS (1961), thesis "The Effect of the Moon on an Infinitesimal Hyperbolic Escape from Earth", at MIT in engineering. [3] While at MIT, Jonath took two economics courses taught by American economist Paul Samuelson. Shortly thereafter, Jonath completed a PhD in Materials Sciences at Stanford University.

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Further reading

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θΔics

In existographies, **Arthur Koestler** (1805-1983) (CR:3) was a Hungarian-born English anti-reductionist (Q) philosopher, an Aldous Huxley admirer, noted, in hmolscience, for []

Overview

In 1956, Koestler, in his *The Ghost in the Machine*, interjected, in some notable way, according to Paris Arnopoulos (1993), on the mind-matter distinction; he also discusses some type of holon theory. [1]

In 1968, Koestler penned some type of presentation, at the "Beyond Reductionism" symposium held in Alpbach Austria, whose participants included: Jerome Bruner, Jean Piaget, Ludwig Bertalanffy, the following up book of which, edited by Koestler and John Symthies, according to Michael Foley, is said to be representative of the debate on whether organisms are reducible or not to mechanical properties. [2]

In 1972, Koestler, in his *Janus: a Summing Up*, according to Jeremy Griffith (2003), extolls upon Erwin Schrodinger's celebrated 1944 dictum: "what an organism feeds on is negative entropy", in such a way that the latter is able to argue that the term 'god' is the historical term used to describe the integrative meaning of existence. [3]

Quotes | Thermodynamics

The following are quotes by Koestler on thermodynamics:

> "… of it may in fact be equated with the second law of thermodynamics — the gradual dispersion of matter and energy into a state of chaos. But, on the other hand, Freud's death-instinct, which works so quietly within the organism, appears, when projected outward, as active destructiveness or sadism."
>
> — Arthur Koestler (1978), *Janus: a Summing Up* (pg. 64)

> "Turning once more to the other aspect of Freud's Thanatos, the outstanding characteristic of living substance is, as already mentioned, that it seems to ignore the second law of thermodynamics. Instead of dissipating its energy into the environment, the living animal extracts energy from it, eats environment, …"
>
> — Arthur Koestler (1978), *Janus: a Summing Up* (pg. 66)

> "The most general manifestation of the integrative tendencies is the reversal of the second law of thermodynamics in open systems feeding on negative entropy (Schrodinger), and the evolutionary trend towards 'spontaneously developing states of greater heterogeneity and complexity' (Herrick)."
>
> — Arthur Koestler (1978), *Janus: a Summing Up* (pg. 306)

Quotes | On

The following are quotes on Koestler:

> "**Koestler**'s latest book, *Janus: a Summing Up*, as the subtitle implies, restates themes from many of his other works and tries to show that they all derive from a single, unifying viewpoint, which is perhaps best described as 'anti-reductionism'. His *betes noires* are scientists who insist that man is "nothing but" a killer ape, or a stimulus-response machine, or a bundle of neuroses, or the product of purely random mutations. To the contrary, Mr. Koestler argues, a human being is a "holon"- an entity that is more than the sum of its parts and, at the same time, a part of some larger whole. To symbolize man's dual nature (see: dualism), Mr. Koestler borrows the image of the two-faced Roman god, Janus. Each of us has strong "self-assertive"

tendencies that help define us as unique individuals; we also have strong "integrative" tendencies that help tie us to one social group or another, each with its own rules and constraints. Only when these opposing tendencies are kept in equilibrium can we function successfully."

— Gerald Jonas (1978), "Seeing the Universe Whole" [5]

Quotes | By

The following are representative quotes:

"Man cannot be treated as units in operations of political arithmetic because they behave like the symbols for zero and the infinite, which dislocate all mathematical operations."

— Arthur Koestler (1949), *Crossman* (Q)

"God seems to have left the receiver off the hook, and time is running out."

— Arthur Koestler (1956), *The Ghost in the Machine* (Q)

"The true mark of genius is not perfection, but originality, the opening of new frontiers; once this is done, the conquered territory becomes common property."

— Arthur Koestler (c.1960) [4]

"Somebody once asked Niels Bohr why he had a horseshoe hanging above the front door of his house. Surely you, a world-famous physicist, can't really believe that hanging a horseshoe above your door brings you luck? Of course not, Bohr replied, but I have been reliably informed that it will bring me luck whether I believe in it or not."

— Arthur Koester (c.1960), *Publication* (Q)

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External links

- Arthur Koestler – Wikipedia.
- Koestler, Arthur – WorldCat Identities.

θΔics

In existographies, **Arthur Lovejoy** (1873-1962) (CR:27) was German-born American philosopher noted for his 1932-1933 William James lecture series at Harvard turned 1936 book *The Great Chain of Being: a Study of the History of an Idea*, wherein he gives the first historical account of the "great chain of being" theory, and how, though once the apex of the renaissance, supposedly, it fell off following Rene Descartes' dualism supposition, i.e. the division of a person into soul-mind and mechanistic material body, which thus separated intellectuals into two cultures, and thereby broke up the great chain of being, by the combined influence, according to Peter Stanlis, of romantic idealism, Darwin's evolution theory, and Einstein's relativity. [1]

Quotes | By

The following are quotes by Lovejoy:

> "The history of 'ideas', particularly in respect to the great chain of being, is no subject for highly **departmentalized** minds; and it is pursued with some difficulty in an age of departmentalized minds."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pg. 22)

> "No doubt man's quest of intelligibility in nature and in himself, and of the kinds of emotional satisfaction which are conditioned by a sense of intelligibility, often, like the caged rat's quest of food, has found no end, in wandering mazes lost."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pg. 23)

> "It was in the eighteenth century that the conception of the universe as a 'chain of being', the principles which underlay this conception – plenitude, continuity, gradation – attained their widest diffusion and acceptance. The faith in speculative *a priori* metaphysics was waning, and the Baconian temper (if not precisely the Baconian procedure), the spirit of patient empirical inquiry, continued its triumphant march in science, and was an object of fervent enthusiasm among a large part of the general educated public. There has been no period in which writers of all sorts — men of science and philosophers, poets and popular essayists, deists and orthodox divines — talked so much about the 'chain of being', or accepted more implicitly the general scheme of ideas connected with it, or more boldly drew from these their latent implications, or apparent implications. Addison, King, Bolingbroke, Pope, Haller, Thomson, Akenside, Buffon, Bonnet, Goldsmith, Diderot, Kant, Lambert, Herder, Schiller — all these and a host of lesser writers not only expatiated upon the theme but drew from it new, or previously evaded, consequences; while Voltaire and Samuel Johnson, a strange pair of companions in arms, led an attack upon the whole conception. Next to the word 'nature', the 'great chain of being' was the sacred phrase of the eighteenth century, playing a part somewhat analogous to that of the blessed word 'evolution' in the late nineteenth."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pgs. 183-84)

> "I proposed the term 'retrotensive method', which seems to be a needed addition to the philosophical vocabulary, at the Sixth International Congress of Philosophy (1927)."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pg. 275) [2]

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(b) Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea* (pgs. 275; proposed, pg. 366). Harvard University Press, 1936.

Further reading

â— Lovejoy, Arthur. (1930). *The Revolt Against Dualism*. Transaction Publishers, 1996.

External links

â— Arthur Oncken Lovejoy – Wikipedia.

θΔics

In hmolscience, **Arthur Peacocke** (1924-2006) was an English biochemist-turned-theologian noted, in religious thermodynamics, for his 1983 to 1995 publications on an effort to do a Teilhardian-like reformulation of theology using dissipative structures theory as an ontic opening.

Overview

In 1983, Peacocke, in in the context of biological thermodynamics, wrote a textbook on the thermodynamics of biological complexity. [1]

In 1984, Peacocke, in his *Zygon* article "Thermodynamics and Life", attempted to used Ilya Prigogine, and his order through fluctuations theory, as an ontic opening to sneak god into the picture; the abstract of which is as follows: [2]

> "The basic features of thermodynamics as the 'science of the possible' are outlined with a special emphasis on the role of the concept of entropy as a measure of irreversibility in natural processes and its relation to 'order', precisely defined. Natural processes may lead to an increase in complexity, and this concept has a subtle relationship to those of order, organization, and information. These concepts are analyzed with respect to their relation to biological evolution, together with other ways of attempting to quantify it. Thermodynamic interpretations of evolution are described and critically compared, and the significance of dissipative structures, of 'order through fluctuations', is emphasized in relation both to the evolutionary succession of temporarily stable forms and to kinetic mechanisms producing new patterns."

In 1995, Peacocke, in his "Chance and Law in Irreversible Thermodynamics, Theoretical Biology, and Theology", used Prigoginean thermodynamics to reconcile evolution and Christianity, intertwined with arguments about chance. [3]

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● Peacocke, Arthur R. (1986). *God and the New Biology* (Appendix: Thermodynamics and Life, pgs. 133-). Harper & Row.

● Peacocke, Arthur R. (1993). *Theology for a Scientific Age: Being and Becoming – Natural, Divine, and Human Theology and the Sciences* (thermodynamics, pgs. 32, 52, 55, 64, 281, 362, 417, 438). Fortress Press.

External links

● Arthur Peacocke – Wikipedia.

● Chance and Law in Irreversible Thermodynamics (synopsis) – CouterBalance.org.

θΔics

In existographies, **Arthur Schopenhauer** (1788-1860) (IQ:185|#60) [RGM:89|1,500+] (Murray 4000:13|WP) (**SN**:15) (FA:93) (GA:10) (GPhE:#) [CR:250] was a German natural philosopher, an "avowed atheist" (Hecht, 2003), noted for his two-volume, 1818/1844 treatise: *Die Welt als Wille und Vorstellung*, variously translated as: *The World as Will and Idea*, *The World as Will and Presentation* (Ñº), or *The World as Will and Representation*, in which, building on German polymath Johann Goethe's 1809 inorganic/organic elective affinities unified theory of will, among numerous other thinkers, e.g. Empedocles, Leucippus, Kant, etc., he posited that there was an inherent force inside humans (as well as inside all entities in general), which he named the 'will to live' (later re-branded by Nietzsche as "will to power"), that drove such entities into a will to live and to reproduce; although, through subtle in language, to note, he attempts to differentiate the so called will of inorganic masses, such as planets; and most interesting of all: he employs extended Goethean human chemistry style logic to explain types of reserved wills in humans, chemically. [1]

Overview

Schopenhauer, in short, as summarized by Jennifer Hecht (2003), believed that there is no god, that no thing made the world, and, supposedly, that humans are "accidental" animals (check). [16]

Dialogue on Religion

In c.1830, Schopenhauer, in his *Dialogue on Religion*, borrowing from, in admixture, David Hume's *Dialogue Concerning Natural Religion* (1779) and Cicero's dialogue *The Nature of the Gods* (45BC), employs two characters: Philalethes, the voice of philosophy, and Demopheles, the voice of the people, and thereby compares the philosophical view with the "metaphysics of the masses"; a few representative quotes: [18]

> "They found it easier to burn Vanini that to confute him."
>
> — Arthur Schopenhauer (c.1830), *Dialogue on Religion* (pg. 5 + clause, pg. #)

> "You've no notion of how stupid most people are."
>
> — Arthur Schopenhauer (c.1830), *Dialogue on Religion* (pg. 21); voice of Demopheles

(add)

Zollner | Helmholtz & Boltzmann

Both Hermann Helmholtz, partly via the writings of Karl Zollner, and Ludwig Boltzmann objected to Schopenhauer's one nature version of philosophy. [11]

Will

In 1839, Schopenhauer won the Royal Norwegian Society of Sciences essay competition, on the question: "Is it possible to demonstrate human free will from self-consciousness?", with his submission "On the Freedom of the Will", the synopsis of which, as

Translations of **Vorstellung**

noun

imagination	Phantasie, Imagination, Fantasie, Vorstellungskraft, Einbildungskraft, Vorstellung
vision	Vision, Sehen, Vorstellung, Sehvermögen, Gesicht, Weitblick
idea	Idee, Vorstellung, Ahnung, Gedanke, Begriff, Einfall
perception	Wahrnehmung, Vorstellung, Auffassung, Einsicht, Beobachtung
presentation	Präsentation, Darstellung, Vorstellung, Vorlage, Darbietung, Vorführung
introduction	Einführung, Einleitung, Vorstellung, Einbringen, Bekanntschaft, Ankündigung
notion	Begriff, Vorstellung, Idee, Ahnung, Ansicht, Meinung
performance	Performance, Leistung, Aufführung, Erfüllung, Ausführung, Vorstellung
concept	Konzept, Begriff, Idee, Vorstellung, Gedanke
conception	Konzeption, Empfängnis, Auffassung, Vorstellung, Anlage
image	Image, Bild, Abbild, Vorstellung, Ebenbild, Bildnis
picture	Bild, Foto, Aufnahme, Gemälde, Photo, Vorstellung
showing	Vorführung, Ausstellung, Vorstellung, Aufführung, Leistung
play	Spiel, Stück, Vergnügen, Spielraum, Theaterstück, Vorstellung
interview	Interview, Gespräch, Vorstellungsgespräch, Unterredung, Einstellungsgespräch, Vorste

The following are the various translations of **Schopenhauer**'s notion of the world as "will" and "vorstellung", variously translated as: representation (most common), presentation, or idea.

summarized by Albert Einstein (c.1930), is as follows: [8]

> "Man can do what he wills but he cannot will what he wills."

While Schopenhauer does repeatedly say, throughout his essay, "man can do what he wills", the latter part "but he cannot will what he wills" does not seem to be found, at least in the English translation; though this is the gist of what he argues, albeit via prolonged inorganic, plant, and animal division of argument as to how this comes about.

Whatever the case, in German, as recalled by Einstein in conversation with James Murphy: "Der Mensch kann was er will; er kann aber nicht wollen was er will", which was first printed Max Planck's 1932 *Where is Science Going?* and later reprinted by James Jeans (*Physics and Philosophy*, 1942) and Morris Zucker (*The Philosophy of American History*, 1945). [10]

In the essay, Schopenhauer claimed that as phenomenal objects appearing to a viewer (see: advanced perspective), humans have absolutely no free will. They are completely determined by the way that their bodies react to stimuli and causes, and their characters react to motives. As things that exist apart from being appearances to observers, however, humans have free will. [9]

In the 1844 second volume of his *The World as Will and Representation*, Schopenhauer cites German chemist Justus Liebig's description of the reaction of damp copper Cu in air containing carbonic acid H_2CO_3, to argue rather cogently that the:

> "The will of the copper, claimed and preoccupied by the electrical opposition to the iron, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive."

This is some real genius material for the year 1844, rarely seen in modern times; by virtue, of course, of the great two-culture divide that followed in the years after 1850 and the invention of thermodynamics, and in particular 1876, with the invention of chemical thermodynamics, after which philosophers were generally barred entry into chemical speculation of human affairs, by virtue of the advanced level of education one needed (degree in physical chemistry, chemical physics, or chemical engineering, at a minimum) in order to understand even the basics of affinity or rather free energy, as it has come to be known, of chemical processes (not to mention electrical engineering, which, following

James Maxwell's 1873 *Treatise on Electricity and Magnetism*, is an involved subject in itself: thus baring the lay philosopher from making electromagnetic speculations on the human condition). Another quotes is:

> "Will power is to the mind like a strong man who carries on his shoulders a lame man who can see."
>
> — Arthur Schopenhauer (c.1840) (Ñº)

(add discussion)

Mentor | Goethe

Schopenhauer's main intellectual mentor was German polymath Johann Goethe, who first came to his home in 1806; whom he consulted with 1816 about his work-in-progress *The World as Will and Representation* (1818); and who in 1819 again met with Schopenhauer and who that year read his new book.

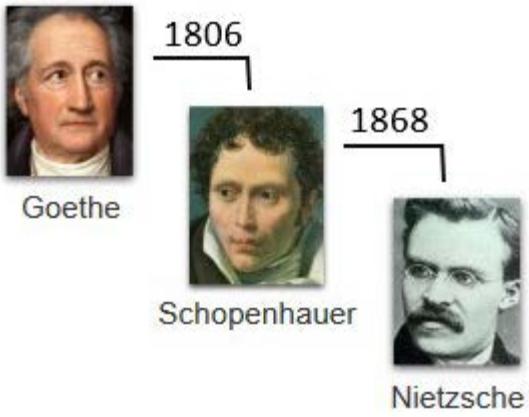

The German physical realism school: German polyintellect Johann Goethe, who directly mentored **Schopenhauer** (1806-1819), via his 1809 human chemical theory and the idea of electrochemical "will", whose work in turn was seized on by Friedrich Nietzsche in 1868 as the basis of his philosophy.

Students | Influenced

Notable students of Schopenhauer include: Gustav Fechner (1801-1887) and Friedrich Nietzsche (1844-1900). The way Nietzsche was led into Schopenhauer is as summarized by German philosopher Thomas Nawrath as follows: [6]

> "1868 was one of the most important years in Nietzsche's development as a thinker. It marks the moment when he abandoned the struggle of the Hegel scholars and seized on the writings of **Arthur Schopenhauer**. Schopenhauer, widely recognized as Nietzsche's "educator", maintained a critique of Immanuel Kant, the genius of the leading philosophical schools in Germany at their times."

Schopenhauer's work has been influential to Austrian psychologist Sigmund Freud, in particular his death drive counterpoint theory to Schopenhauer's will to live drive theory (life drive), and to Albert Einstein, in respect to his definitional understanding of will (see: Einstein-Murphy dialogue).

In 1853, Richard Wagner, while writing the music for *The Valkyrie*, the second part of the *Ring* cycle, he discovered Schopenhauer and was so mesmerized by *The World as Will and Representation* that he read if from cover to cover in spite of his work on *The Valkyrie* and then read it three more times within a year. Goethe-Nietzsche scholar T.K. Seung comments on this: [13]

> "Schopenhauer's philosophy drastically changed his view of life and music by destroying his Feuerbachian optimism and his revolutionary fire. He came to believe that social injustice and human suffering could never be eliminated by any political movement. He accepted Schopenhauer's view that the whole world was a tragic play of the blind will. The injustice in Wonton's world in *The Ring* is not an unfortunate mistake to be rectified, but reveals the inevitable tragic dimension of human existence. He changed from a Feuerbachian optimist and idealist to a Schopenhauerian pessimist or realist."

(add discussion)

Johanna Schopenhauer | Goethe

On 19 October 1806, German polymath Johann Goethe made Christiane Vulpius (1765-1816), the mother to his sixteen-year-old son August Goethe (1789-1830), albeit a women of lowly origins, his wife, following the invasion into their home earlier that month of the French troops, wherein she saved the house by boldly confronted them and declared that "a friend of Napoleon" lives here. In the weeks to follow, Goethe's attempt to introduce Vulpius into high society, according to Goethean scholar Astrida Tantillo, was a bigger scandal that was the original affair in the first place. [4]

Johanna Schopenhauer (1766-1838)

Christiane Vulpius (1765-1816)

The first time the couple appeared publicly together as husband and wife was at a tea party at the house of Johanna Schopenhauer (1766-1838), mother of Arthur Schopenhauer, who at the time would have been about age eighteen. Johanna had only recently moved to Weimar and believed that Goethe had chosen her house for the occasion because of her urbanity and outsider status. As Johanna latter quipped: [5]

> "If Goethe could give that women his name, I certainly could give her a cup of tea."

No doubt the young Arthur Schopenhauer was much impressed by this incident. In any event, following the publication of Goethe's 1809 *Elective Affinities*, Arthur eventually read it, no doubt the year of its publication—and by the time of the first edition of his *The World as Will and Representation*, had begun to assimilate Goethe's theory of will into his own theory of the "will to power".

Goethe | elective affinities

(1815)

(1845)

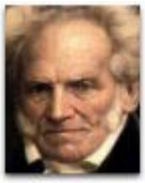

(1855)

Schopenhauer, as summarized above, knew Goethe personally in the decade 1810-20 through his mother's literary set in Weimar. In his *The World as Will and Representation*, Goethe's views, influence, and verse is quoted liberally, in particular his 1809 novella *Elective Affinities*, wherein Goethe's central theory of chemical will is explained. In regards to his own doctrine of will in relation to Goethe's central doctrine of will, the following offhand remark by Schopenhauer, on Goethe's novella, is said to acknowledge the continuity between the two: [2]

> "As the title indicates [*Elective Affinities*], though Goethe was unaware of this, [it] has as its foundation the idea that the will, which constitutes the basis of our inner being, is the same will that manifests itself in the lowest, inorganic phenomena."

That Goethe was unaware of this notion is hardly the truth as this subject was central topic of Goethe's four chapter four. In any event, Schopenhauer's first mention of elective affinity (or rather chemical affinity) occurs on page 110 of his treatise, where he explains:

> "Knowledge which everyone possesses directly in the concrete, namely as feeling, is the knowledge that the inner nature of his own phenomenon, which manifests itself to him as representation both through his actions and though the permanent substratum of these his body, is his *will*. This constitutes what is most immediate in his consciousness, but as such it has not wholly entered into the form of the representation, in which object and subject stand over against each other; on the contrary, it makes itself known in an immediate way in which subject and object are not quite clearly distinguished, yet it becomes known to the individual himself not as a whole, but only in its particular acts. Of itself it will become the key to the knowledge of the innermost being of the whole of nature, since he now transfers it to all those phenomena that are given to him, not like his own phenomenon both in direct and in indirect knowledge, but in the latter solely, and hence merely in a one-sided way, as *representation* alone. He will recognize that same

> will not only in those phenomena that are quite similar to his own, in men and animals, as their innermost nature, but continued reflection will lead him to recognize the force that shoots and vegetates in the plant, indeed the force by which the crystal is formed, and the force that turns the magnetic to the North Pole, the force whose shock he encounters from the contact of metals of different kinds, the force that appears in the elective affinities of matter as repulsion and attraction, separation and union, and finally even gravitation, which acts so powerfully in all matter, pulling the stone to the earth and the earth to the sun; all these he will recognize as different only in the phenomena, but the same according to their inner nature."

Again, very genius in viewpoint, for such a year.

Schopenhauer cites Goethe over forty-one times in volume two alone and his theory of human elective affinity in general, as chemical attraction and repulsion, which he argues is inherent in man, plant, and chemical, several times in both of his volumes, which one might very well argue is the seed for the germination for his entire treatise. [3]

Other

Schopenhauer, supposedly, liked Bruno and Spinoza, and curses all other philosophers, from Augustine to Kant, who upholds national religion over philosophy. [14]

In 1805, when he was 17, his father, Heinrich Schopenhauer, died (deboundstated), apparently from suicide. [20]

Quotes | Employed

The following are quotes employed by Schopenhauer:

> "If anyone who wanders all day arrives toward evening, it is enough."
>
> — Petrarch (c.1374), *Publication*; quoted fondly by Arthur Schopenhauer (c.1860) near his reaction end (death) [20]

Quotes | On

The following are quotes on Schopenhauer:

> "**Schopenhauer** was the first admitted and inexorable atheist among us Germans."
>
> — Friedrich Nietzsche (1882), *The Gay Science* (Ñº)

> "My first and only teacher, the *great* **Arthur Schopenhauer**."
>
> — Friedrich Nietzsche (1886) (Ñº)

> "**Schopenhauer** takes us as far as philosophy can."
>
> — Leo Tolstoy (c.1890) [12]

> "The most terrible chapter in the most comfortless of all the great books that have been written, the chapter on 'Death and its Relation to the Indestructibility of our Nature', in **Schopenhauer**'s *The World as Will and Idea*, is where the permanence of the will to maintain the species is set down as the only real permanence."

— Otto Weininger (1903), *Sex and Character* (pg. 223)

"**Schopenhauer's** saying, that 'a man can do as he will, but not will as he will', has been an inspiration to me since my youth, and a continual consolation and unfailing well-spring of patience in the face of the hardships of life, my own and others."

— Albert Einstein (c.1940) [12]

"**Schopenhauer** is the person who, coming upon Kant's philosophy, noticing that god therein was not attached to anything, shook the text until god fell out."

— Jennifer Hecht (2003), *Doubt: a History* (pg. 393)

Quotes | Morality

The following are Schopenhauer quotes on morality:

"Believers convince themselves that their religion's myths are somehow connected to its ethical code, and thus 'regard every attack on the myth as an attack on right and virtue. This reaches such lengths that, in monotheistic nations, atheism or godlessness has become the synonym for absence of all morality'."

— Arthur Schopenhauer (1818), *The World as Will and Representation, Volume One* (pg. #); summarized by Jennifer Hecht (2003) in *Doubt: a History* (pg. 396)

"It is easy to preach morality, difficulty to find a basis for it."

— Arthur Schopenhauer (c.1830), "Essay on the Foundations of Morality" [19]

Quotes | Truth

The following are noted quotes by Schopenhauer on the nature of truth:

"All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident."

— Arthur Schopenhauer (1818), *The World as Will and Representation* (preface) (see: truth)

"Truth that has been merely learned is like an artificial limb, a false tooth, a waxen nose; at best, like a nose made out of another's flesh; it adheres to us only because it is put on. But truth acquired by thinking of our own is like a natural limb; it alone really belongs to us. This is the fundamental difference between the thinker (compare: free thinker) and the mere man of learning."

— Arthur Schopenhauer (c.1840) (Ñº)

Quotes | General

The following are noted general Schopenhauer quotes; the latter of these quotes, particularly in respect to steps one and

two, seem to quantify the current nature of the state of the sciences of human chemistry, in large part, and human thermodynamics, to a lesser extent:

> “We should be surprised that a matter that generally plays such an important part in the life of man [love] has hitherto been almost entirely disregarded by philosophers, and lies before us as raw and untreated material.”

Noted Schopenhauer quote on the nature of the "untreated subject" of love, found on the back cover to the 2007 *Human Chemistry* textbook by American chemical-electrical engineer Libb Thims. [1]

> “Religion is the masterpiece of the art of animal training, for it trains people how they shall think.”
>
> — Arthur Schopenhauer (c.1830) [12]

> “We should be surprised that a matter that generally plays such an important part in the life of man has hitherto been almost entirely disregarded by philosophers, and lies before us as a raw and untreated material.”
>
> — Arthur Schopenhauer (1844), *The World as Will and Representation (§44: The Metaphysics of Sexual Love)* [7]

> “At the same point of view we find, indeed, Englishmen even at the present. The *Bridgewater-Treatise*-men, Lord Brougham, and company. To all these, teleology is at once also theology and at every instance of purpose recognized in nature, instead of thinking and learning to understand nature, they break at once into the childish cry, ‘Design! Design’. The ignorance of the Kantian philosophy is principally responsible for this whole outcast position of the English.”
>
> — Arthur Schopenhauer (1844), *The World as Will and Idea*; cited by John Cornell (1986) [14]

> “For if we could guarantee them their dogma of immortality in some other way, the lively ardor for their gods would at once be cool; and if continued existence after death could be proved to be incompatible with the existence of gods, they would soon sacrifice these gods to their own immortality, and be hot for atheism.”
>
> — Arthur Schopenhauer (1844), *The World as Will and Representation, Volume Two* (pgs. 160-61) [15]

> “Many millions, united into nations, strive for the common good. Now senseless delusion, now intriguing politics, incite them to wars with one another; then the sweat and blood the great multitudes must flow. In peace, inventions work miracles, seas are navigated, delicacies are collected from all the ends of the earth, the waves engulf thousands. All push and drive, some plotting and planning, others acting; the tumult is indescribable. But **what is the ultimate aim of it all?** To sustain the ephemeral and harassed individuals through a short span of time, in the most fortunate case with endurable want and comparative painlessness (thought boredom is on the lookout for this). Then the propagation of the race. With this evident want of proportion between effort and the reward, the will-to-live appears as a folly, or as a delusion. Seized by this, every little thing works with the utmost exertion of its strength for something that has no value.”
>
> — Arthur Schopenhauer (1844), *The World as Will and Representation, Volume Two* (pg. 357) [17]

> “The relation of the genius to the ordinary mind may also be described as that of an idio-electrical body to one which merely is a conductor of electricity.”
>
> — Arthur Schopenhauer (1851), “On Genius” (Ñº)(Ñº) in *Parerga and Paralipomena* (§3) (Ñº); not to be confused

with “On Genius” (1844) from *The World as Will and Representation, Volume Two* (§31)

“Talent hits a target no one else can hit; genius hits a target no one else can see.”

— Arthur Schopenhauer (c.1850)

“A genius is someone in whom intellect predominates over ‘will’ much more than within the average person.”

— Arthur Schopenhauer (c.1850)

“After your death, you will be what you were before your birth.”

— Arthur Schopenhauer (c.1850) (Ñº)

“Religion has and always will be in conflict with the noble endeavor after pure truth.”

— Arthur Schopenhauer (c.1850), “Religion: a Dialogue”; in: *The Works of Schopenhauer* (editor: Will Durant) (pg. 474) [20]

“Religions are like glowworms; they shine only when it is dark. A certain amount of general ignorance is the condition of all religions, the element in which alone they can exist. And as soon as astronomy, natural science, geology, history, and knowledge of countries and peoples have spread their light broadcast, and philosophy finally is permitted to say a word, every faith founded on miracles and rev-elation must disappear.”

— Arthur Schopenhauer (c.1850), “Religion: a Dialogue”; in: *The Works of Schopenhauer* (editor: Will Durant) (pg. 485) [20]

“The chief objection I have to pantheism is that it says nothing. To call the world ‘god’ is not to explain it; it is only to enrich our language with a superfluous synonym for the word world.”

— Arthur Schopenhauer (1851), *A Few Words on Pantheism* [20]

“Any dogma, no matter how extravagantly absurd, inculcated in childhood, is sure to retain its hold for life.”

— Arthur Schopenhauer (c.1850), *Publication* [20]

See also

â— Einstein's personal library

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θΔics

In existographies, **Arthur Young** (1905-1995) (CR:14) was and American aviation engineer and philosopher noted, in human thermodynamics, for his 1976 book *The Reflexive Universe*, in which he outlines ideas on the immortality of the soul as guaranteed by the first law of thermodynamics (cessation thermodynamics). [1] Young is also noted for his lecture ideas on the entropy and negentropy in relation to people and molecules.

Process theory

The four central tenets of Young's 'theory of process' or process theory are that reality is structured dynamically on four levels: [2]

(a) The dimensionless level of photons, or light of spirit.
(b) The one-dimensional level of time and nuclear particles.
(c) The two-dimensional level of planar space (breadth and width) and atoms.
(d) the tree-dimensional level of time-plus-space, of molar matter, of molecules and familiar space-time objects.

(add)

Influences

The work of Young was influential to American philosopher Christian de Quincey, whose combined views exemplify the extrapolate downward approach. [2]

Education

Education Young completed a degree in mathematics from Princeton University in 1927. Over the next dozen years, Young worked to develop the world's first helicopter, and by 1947 got the Bell helicopter into production. In the years to follow, he turned to the next phase of his career as a philosopher of the mind (or soul), the resulting theory being his 1976 book *The Reflexive Universe*, a synthesis of general Darwin-based evolution theory, added with speculations on psychology and parapsychology, all intertwined with semi-scientific ideas on how consciousness evolved.

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θΔics

In existographies, **Arto Annila** (1962-) (CR:2) is a Finnish civil engineer, biophysicist (powered CHNOPS+ physicist), and general complex systems theorist, noted for []

Overview

In 2009, Annila, in his "Economies Evolve by Energy Dispersal", co-authored with Stanley Salthe, therein supposedly aligning with his incoherent "infodynamics" ideas. [1]

In 2010, Annila and Salthe, in their "Cultural Naturalism: Culture is Described as a Society's Means to Consume Free Energy", published in *Entropy*, and "Physical Foundations of Evolutionary Theory: the theory of Evolution by Natural Selection Subsumed by the 2nd Law of Thermodynamics", published in *Journal of Non-Equilibrium Thermodynamics*, citing the Theophile De Donder-based affinity ideas of Dilip Kondepudi and Ilya Prigogine (1998), attempted to outline some type of affinity of reaction and free energy based model of cultural evolution; the gist of which, as summarized by Ladislav Kovac (2015), is as follows: [2]

> "**Arto Annila** and collaborators in a series of papers (summarized in his review with Stanley Salthe (Annila and Salthe 2010)) describe entropy with a formula superficially similar to Boltzmann's: S = k In P. But here, Annila et al. have redefined the concept of probability, used by Boltzmann. Annila introduced the concept of 'physical probability', which encompasses isoenergetic configurations of a system but also its dynamic change due to internal transformation of energy within the system, along with influx and efflux of energy into and out of the system, respectively. Annila based his reasoning on the analysis of a chemical system, which tends to achieve a state of maximum probability by maximizing its entropy (or, in other words, minimizing its free energy). The energy difference, a gradient of energy, is the motive force that drives a chemical reaction. In standard chemical thermodynamics, a difference between chemical potentials (free energy) of products and substrates [typo: reactants] has been named the affinity of the reaction (Kondepudi and Prigogine 1998), but Annila's notion of affinity also includes a portion of energy that influxes into the system from its surroundings. He applied the term 'stationary state' specifically to the state of a system in which there is an energy balance between the system and its surroundings, and claimed that an influx of energy turns an improbable equilibrium state to a probable nonequilibrium state. Similarly, an efflux of energy from an improbable nonequilibrium state turns it to a probable equilibrium state."

In 2013, Annila published "Thoughts About Thinking", which was later read by Umberto Lucia, who in turn decided to study the subject "from an engineering thermodynamic point of view", some insights of which went into Lucia's JHT publicly peer-reviewed (Q) article "Entropy Generation, Brain Dynamics, and Thomas Aquinas", which was commented on by Annila, both of which were commented on by Thims. [3]

Education

In 1988, Annila completed his BS in civil engineering, in the faculty of information sciences, department of technical physics, in 1991 he completed his PhD in information sciences, in 1996 he completed his MS in biochemistry, in the faculty of biosciences, and in 1999 became a docent of physical chemistry, all at the University of Helsinki. In 2008, he became a tenured professor of biophysics.

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External links

- Arto Annila (faculty) – University of Helsinki.

θΔics

In existographies, **Aryabhata** (476-550) (IQ:170|#375) [RGM:345|1,500+] (Odueny 100:61) (GMG:18) (GME:#) (GAE:#) (CR:5) was an Indian mathematician, astronomer, and physicist, noted for []

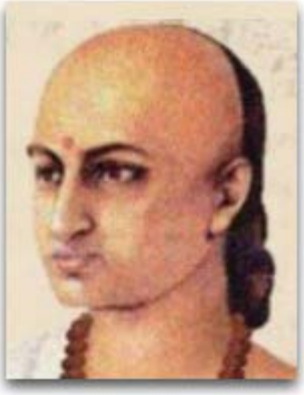

Overview

Aryabhata employed 62,832/20,000 (= 3.1416) for π; speculated, supposedly, that π (pi) is irrational, as later conjectured by Leonhard Euler, and proved by Johann Lambert (Ñº); stated that the earth rotates on its axis; classified as a physicist for his explicit mention of the relativity of motion; is said to have been the first to employ a zero symbol concept, and that his later countryman Brahmagupta was to use a zero symbol and the first to show that subtracting a number from itself results in zero (Ñº).

Quotes | By

The following are noted quotes by Aryabhata:

> "Just as a person travelling on a boat fees that the trees on the bank are moving, people on the earth feel the sun is moving.
>
> — Aryabhata (c.520), *Publication* (Ñº); cited by Kishore Dash (2019) in *The Story of Econophysics* (pg. 2)

External links

â— Aryabhata – Wikipedia.

θΔics

In ecological thermodynamics, **ascendency**, as distinguished from the standard-spelling dictionary term *ascendancy*, meaning “governing or controlling influence: domination”, is a pseudo-thermodynamical construct blend of average mutual information (Atlan, 1974), a concept from information theory, and Gibbs free energy (in the form of a modeled analogy), specifically the product of the former by the "total activity" (sum of all flows) inherent in an ecosystem. [1] In lay terms, ascendency is an information theory based version of Gibbs free energy, posited to represent the organization driving growth (see: driving force) of ecosystems. [2]

To create a rabbit out of nothing and place it on the table, the magician need not summon up the entire enthalpy, $H = U + PV$. Some energy, equal to TS, can flow in spontaneously as heat; the magician must provide only the difference, $G = H - TS$, as work.

American thermal physicist Daniel Schroeder’s 2000 depiction of Gibbs free energy in relation to the creation of a rabbit; the citation-source definition of free energy upon which American ecosystem engineer Robert Ulanowicz models his ecological principle of **ascendency**: something that self-organizing, dissipative systems are hypothesized to optimize in their development over time. [4]

Etymology

The concept of ascendency was conceived in 1979 by American ecosystem engineer Robert Ulanowicz who sought to quantitatively extend the biological information theories of French biophysicist Henry Atlan (student of Aharon Katchalsky), particularly his concept of “average mutual information”, as explained in his 1974 article “On a Formal Definition of Organization”, wherein Atlan attempts to argue that the time derivative of Claude Shannon's telegraph line information H-function (an apocryphal claimed version of Ludwig Boltzmann's gas theory average particle velocity H-theorem):

$$\frac{dH}{dt}$$

defines the organization of an ecosystem on the basis of a kinetics of change of information content of a system under the effects of environmental noise-producing factors accumulated in time. [3] In his own retrospect words, as explained in a chapter footnote to his 2009 book *A Third Window*: *Natural Life Beyond Darwin and Newton*, Ulanowicz states: [4]

> “My method of scaling was not motivated by Bateson’s considerations, about which I was unaware at the time. I had simply drawn upon my background in thermodynamics to define in analogy to Gibbs or Helmholtz free energies (measures of the capacity of a system to do effective work [Schroder, 2000]). Both of these quantities take the form of a scalar measure of the system’s energy multiplied by a logarithmic term (as with AMI) indicative of its constituents.”

What is rather ironic or possibly telling is that in spite of the fact that Ulanowicz supposedly has spent four decades on this free energy based or analogized “ascendency” concept and that his 2009 *A Third Window* is supposed to be a verbalized summary of this argument, he completely avoids any discussion of free energy in his book, aside from the above footnote and a prefaced mention of the origin of the term, which amounts to a comment that "the mathematical form of mutual information resembled a familiar quantity from thermodynamics called Gibbs-Helmholtz free energy" (a statement that amounts to the conclusion that ascendency is a thermodynamic isomorphism).

Beyond this, Ulanowicz fails to differentiate, in his work, between Helmholtz free energy (applicable to volume-confined [isochoric] systems, e.g. explosive research), which he uses in his 1986 *Growth and Development*, and

between Gibbs free energy (applicable to volume-changing system, e.g. ecosystems), which he convolutes together in his 2009 book as "Gibbs-Helmholtz free energy" (which is not even a thermodynamic variable: it's either Gibbs free energy or Helmholtz free energy) is rather telling that his grasp of thermodynamics or at least ability to present thermodynamics correctly is very limited—not to mention of the fact that his citation of American thermal physicist Daniel Schroeder as the go-to source for the definition of free energy (Schroeder's summary of Gibbs free energy, depicted above), a relative anon in the thermodynamics community.

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External links

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θΔics

In -isms, **asoulism** refers to a denial in a belief in the existence of the soul (see: soul does not exist); this, to clarify, is a grade above the precursor belief that the soul exists, but is not immortal; an "asoulist" is one who does not believe in the existence of souls.

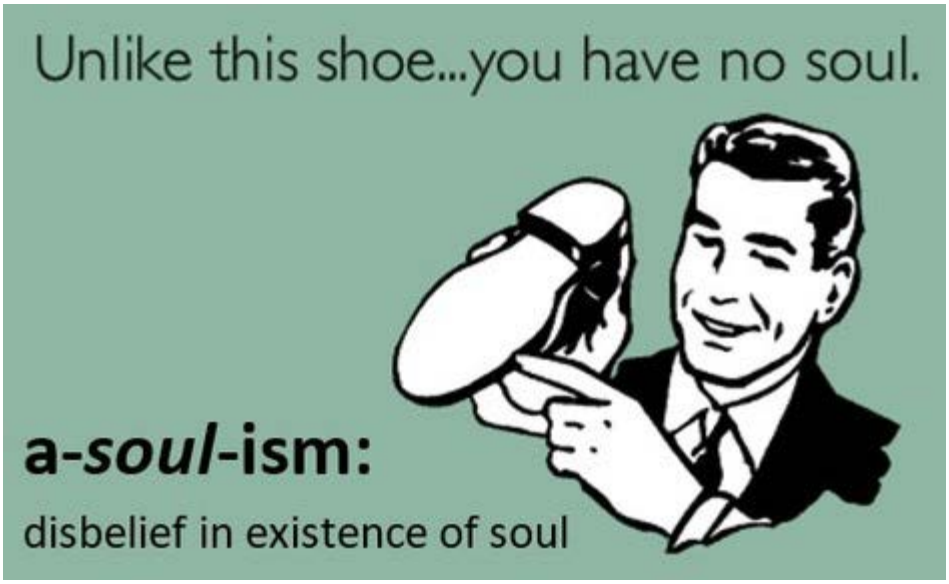

A image of **asoulism** or disbelief in the existence of souls, with a play on the similarly sounding words "soul" (of humans) and "sole" (of shoes).

Overview

The term "asoulism" is a relatively new term, seemingly coined by David Weisman (2010) as follows: [1]

> "I wish there were a term in the English language that honestly captures the idea that all we experience is due to brain function. 'Materialism' comes close, but is laden with excess metaphysical baggage. The philosopher John Searle coined 'biological naturalism' as a mind-body theory within philosophy, and that comes very close. '**Asoulism**' is more modest: a simple disbelief in the existence of souls based on evidence."
>
> — David Weisman (2010), "The Experience of a Unified Mind and the Possibility of an Everlasting Soul are Connected and there is Scant Evidence to Support the Existence of Either" [2]

Examples of avowed asoulists include: Jean Meslier (1729), Julien la Mettrie (1745), Francois Broussais (c.1820), Thomas Edison (1824), Kurt Bell (2011), Patrick Fergus (2014), and Libb Thims (2015).

Soulless | Bag of chemicals

See main: Soulless bag of chemicals

In 2008, in *Breaking Bad*, third episode, "… And the **Bag's** in the River", season one, the show opens to Professor White cleaning up the human that had been dissolved in hydrofluoric acid (shown adjacent; lower left), amid which his mind reflects back to, it seems, his college days, and dialogue with a woman, possibly his lover at the time, as shown adjacent right (main image), wherein she reads off the percentage of elements of a human, in moles, to him and he writes them down on a chalkboard, as follows:

> Hydrogen (H) 63%
>
> Oxygen (O) 26%
> Carbon (C) 9%
> Nitrogen (N) 1.25%
> Calcium (Ca) 0.25%
> Phosphorus (P) 0.19%
> Sodium (Na) 0.04%
> Iron (Fe) 0.00004%

at the end of which he comments how he thinks that something is missing, to

which the woman replies “the soul”?

In 2011, secular thinker Kurt Bell, an article/blog titled “Soulless Bag of Chemicals”, opened to the following: [2]

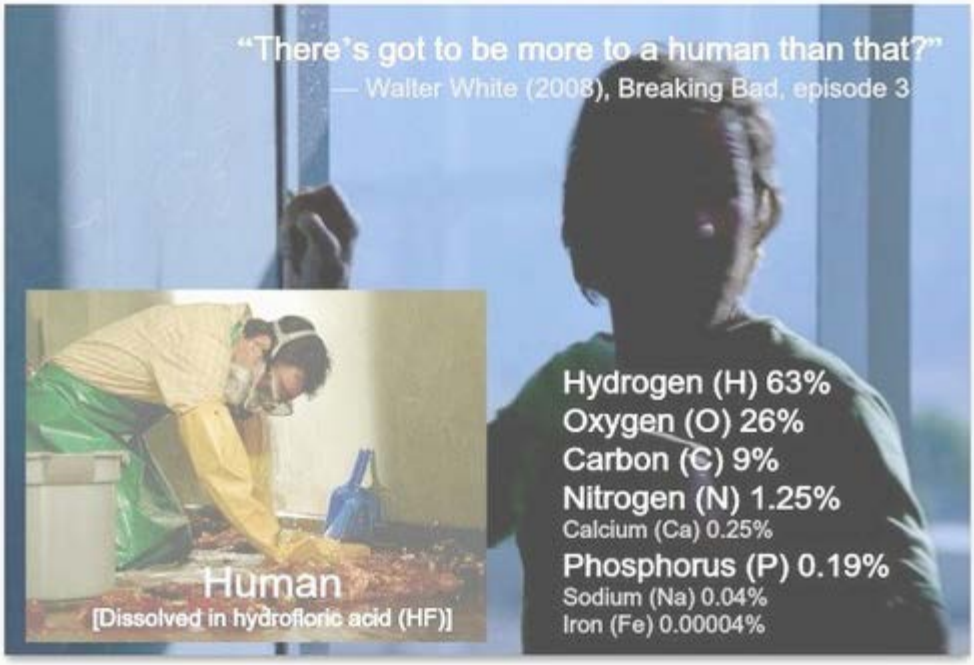

An illustrated diagram, with the CHNOPS elements enlarged, of the "soul" scene from the third episode, season one, of *Breaking Bad*, wherein Walter White and a woman list the elements of a human and speculate on the "soul" as the thing missing from the list.

> “On my better days I regard my wife and daughter as ‘**soulless bags of chemicals**.’ To be fair though, I think the same of myself and all other forms of life. Souls are supernatural things beyond perception or measure, worthy only of suspended belief pending some real evidence or the giving up of the tenets of science. Chemicals we are…despite the clever animation of flesh and musings of mind brought about by the electricity of life. So why do we think more of ourselves? How are we so offended by these facts?”

Bell then followed this up with a YouTube vlog about how his use of the controversial phrase about how he thought of his wife and his daughter as “soulless bags of chemicals”, which he said he heard somewhere, borrowed it, and liked it, but that it sparked a heated reaction and “got under the skin” of many people, no pun intended.

Thereafter, into the 2010s, the phrase began to take root, whether arisen independently or via the "heard somewhere" method, or by possibly by Bell (or others). The following are a few example usages of the phrase:

> “Think about atheism for a second. As an atheist, you must believe that you are the result of the purely mindless, random chance interaction of particles over an immensely long period of time—the classic monkey typing Shakespeare scenario. (I know that the origin of species involves natural selection—however what created our universe with natural laws, which make life possible? Blind chance.) Being a **soulless bag of chemicals** created by unguided, meaningless random chance you of course have no free will. You are merely a zombie acting automatically according to the chemicals swishing around in your brain. I don't find this too plausible for many reasons.”
>
> — Jacob Stein (2012), “Does Egyptian History Contradict the Torah”, Jan 10 [4]

> “If Darwin was right, man is nothing more than a **soulless bag of chemicals** or equally soulless hominid and there is no ultimate fixed meaning or higher purpose to life except what we choose.”
>
> — Linda Kimball (2013), “Our Only Defense Against the Destructive ‘Me’ Generation & Antichrist Utopianists”, Aug 20 [5]

The term "soulless bag of chemicals", as of 2014, has yet to make it into GoogleBooks, and seems to presently reside in the spontaneous colloquial vernacular of the blogosphere, videos, and forums.

Moralism

One tricky issue that compounds the jump to asoulism, is that of "moralism" connected to the theory of the soul, namely that if one denies the soul, one also, assumedly, must therefore, be an amoralist, i.e. deny the existence of "morals" (or justice).

Mortalism

A second, less tricky, issue that compounds the jump to asoulism, is that of "mortalism" connected to the theory of the soul, namely that if one denies the soul, one also, assumedly, must therefore be an mortalist, i.e. deny the existence of "immortality" (or afterlife), or variants thereof.

Partial | Asoulism

There exists a middle range of atheists who deny the existence of god but retain a semblance of soul theory; the following is one notable example:

> "There was no wit, no shadow, no nuance, no multi-sidedness, no art, no pleasure or erotic play to be found in its pages. It denied god, argued that all religions were created out of fear, ignorance, and anthropism; that **souls did not outlive the body**; that the world was determined by strict laws."
>
> — Denis Diderot (c.1769), private complaints on reading Baron d'Holbach's *The System of Nature* [3]

Another example is the 1899 evolution-based neuro-soulplasm theory of atheist-pantheist Ernst Haeckel. A few "skeptical agnostic asoulists" include: Napoleon Bonaparte (c.1815), Sigmund Freud (sort of: Yes/No; metaphor), and possibly David Weisman (2010).

Quotes

The following are related quotes:

> "What is the soul, but an empty word to which no idea corresponds?"
>
> — Julien la Mettrie (c.1747/48) [5]

> "A soul? Give my watch to a savage, and he will think it has a soul. If I have a soul, then pigs and dogs also have souls"
>
> — Napoleon Bonaparte (1817), "To Gaspard Gourgaud", St. Helana, Jan 28

> "The church believes in **things that do not exist, in 'souls'**; it believes in effects that do not exist, in 'divine' effects; it believes in states that do not exist, in 'sin', in 'redemption', in the salvation of the soul: it stays everywhere on the surface, at signs, gestures, word to which it gives an arbitrary meaning. It possesses a thoroughly thought-out method of psychological counterfeiting."
>
> — Friedrich Nietzsche (1888), WP:394, Mar-Jun

“One of the proofs of the immortality of the soul is that myriads have believed it. They also believed the world was flat.”

— Mark Twain (c.1902), *Notebook* (Ñº)

“The naturalist now readily admits that plants have souls — or will-power — but he appropriates the soul as an energy of thermodynamics.”

— Henry Adams (1910), per citation of Wilhelm Wundt [8]

“My mind is incapable of conceiving such a thing as a soul. I may be in error, and man may have a soul; but I simply **do not believe it**. What a soul may be is beyond my understanding.”

— Thomas Edison (1924), “Do We Live Again?” [2]

“We need to demythologize persons by rooting out certain unfounded ideas from the perennial philosophy. Letting go of the belief in souls is a minimal requirement. In fact, desouling is the primary operation of the scientific image.”

— Owen Flanagan (2002), *The Problem of the Soul*; cited by Julien Musolino (2015) in *The Soul Fallacy* (pg. 21)

“The luckiest thing that ever happened to me was that my father didn’t believe in god, and so he had **no hang-ups about souls**. I see ourselves as products of evolution, which itself is a great mystery.”

— James Watson (2003), “Discover Dialogue: Reversing Bad Truths” [7]

“In making such a claim (‘soul does not exist’; ‘ether does not exist’) I am circumscribing legitimate concepts and claims from illegitimate concepts and claims. We do not then say that ‘souls are examples of nothingness’; to do so would be to understand …”

— Brett Bourbron (2004), *Finding a Replacement for the Soul* [6]

“As a physicist who had never seen the hand of god in any observable phenomena, I view the scientific **rejection of the soul** as the ultimate validation of reductionist material monism.”

— Victor Stenger (2005), “Forward” to *The Soul Fallacy* (pg. 9) by Julien Musolino

“Where do we come from? Do souls really exist? I can’t answer these questions, especially not at 6am.”

— Miranda July (c.2011) (Ñº)

“**There's no soul**; that’s garbage.”

— Patrick Fergus (2014), response statement when Libb Thims told Pat that he was conducting a “What is the Soul Comprised of?” polling of 36 people; also picked as most-liked answer by vote, Sep 28 [4]

See also

â— Abioism
â— Achristism
â— Amoralism | Moralism
â— Aspiritism
â— Atheism
â— Geniuses on the soul
â— Mortalism

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θΔics

In human chemistry, **Astrida Orle Tantillo** (c.1963-) is an American Germanic studies professor, science philosopher, and eighteenth-century literature theorist noted for her articles, books, invited talks, and conference participation on the analysis of the science and philosophy of the works of German polymath Johann Goethe, particularly his 1809 novella *Elective Affinities*. [1]

Overview

In 2000, Tantillo, in her "Polarity and Productivity in Goethe's *Wahlverwandtschaften*" , examines Goethe's human chemical theory in terms of the family structure, according to each character's perspective: Eduard being interested in the separation or of 'divorcing' the elements; Charlotte in their marriage; and the Captain in their freedom of movement. She concludes that each viewpoint of the chemical theory, in what she calls a "formulaic reduction that applies the laws of chemistry to human beings", is completely true for the characters that express it. [5]

In 2001, Tantillo published *Goethe's Elective Affinities and the Critics*, wherein she elaborates on the following:

> "From the time of its publication to today, Goethe's novel *Elective Affinities* has aroused a storm of interpretive confusion. Readers have fiercely debated the role of the chemical theory of elective affinities presented in the novel. Some argue that it suggests a philosophy rooted in fate. Other maintain it is about free choice. Others still believe that that the chemical theory is merely a structural device that allows the author to foreshadow events in the novel and bears no relevance to the greater issues in the novel."

Tantillo gives an exhaustive account of nearly every opinion, critique, fan, or detractor of Goethe's *Affinities* over the last two-hundred years, including the chemical theory views of those such as German science historian Jeremy Adler, Hans Reiss, Kevin Yee, among others. [2]

In 2002, Tantillo, in her *The Will to Create: Goethe's Philosophy of Nature*, centers again on the philosophical implications of Goethe's *Affinities*, but with specific focus on four aspects of Goethe's philosophy: (a) polarity, (b) intensification, (c) compensation and finality, and (d) competition, reproduction, and gender. [3]

Education

Tantillo completed her BA in European History and German in 1985 at the University of Oregon, and MA (1990) and PhD (1994), both on social thought, at the University of Chicago. [4] In circa 1995, Tantillo became a professor of Germanic studies at the University of Illinois, Chicago, and is currently head of department.

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External links

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θΔics

In religion, **astro-theology**, "astronomical mythology" (Massey, 1907) or “stellar theology” (Sayce, 1913), is religion based on the identification of gods with stars, star constellations, or planets.

A rendition of the Orion star constellation, named "Orion the Hunter" by the Greeks, as the Egyptian **astro-theologians** would have interpreted things, first as the god Sah, riding in his star boat, latter as the god Osiris "rising from the dead", during the Nov "raising of Orion" perceptual constellation orientation change; which, in Roman era times, was molded into the story of the "raising of Jesus" from the dead (e.g. raising of Lazarus).

Orion | Sah | Osiris | Jesus

In 2287BC, in the Pyramid Texts of Pepi I, Osiris was being associated with the Orion star constellation, the dying and rising pharaoh (or hunter):

> “Lo, he has come as Orion; Lo, Osiris has come as Orion; Lord of wine at the wag-feast.”
>
> — Anon (2287BC), Pepi I (O) Pyramid Texts, Utterance 442 (O)

> “Behold, he has come as Orion, Osiris has come as Orion, Lord of the Wine in the Wag-festival.”
>
> — Anon (2287BC), *Pyramid Text* (§818-20) (O)

> “Hail, O King! Thou art this great star, the bearer of Orion, who ferries the ship of heaven with Orion, who rows the ship of Dewat with Osiris. The king goes forth from the eastern part of heaven, reinvigorated in his season and fresh in his time. Nut gave birth to this King together with Orion. The Year (?) has adorned thee together with Osiris.”
>
> — Anon (c.2300), *Pyramid Text*, 882a-883d.PM [7]

Osiris, at some point, before or after this, was synced with the god Sah.

The following shows an astro-theological detail from the tomb of Seti I (c.1275BC), the vault above the sarcophagus, the bull said to correspond to what is now called the "Great Bear" constellation, the others, supposedly being a mystery: [8]

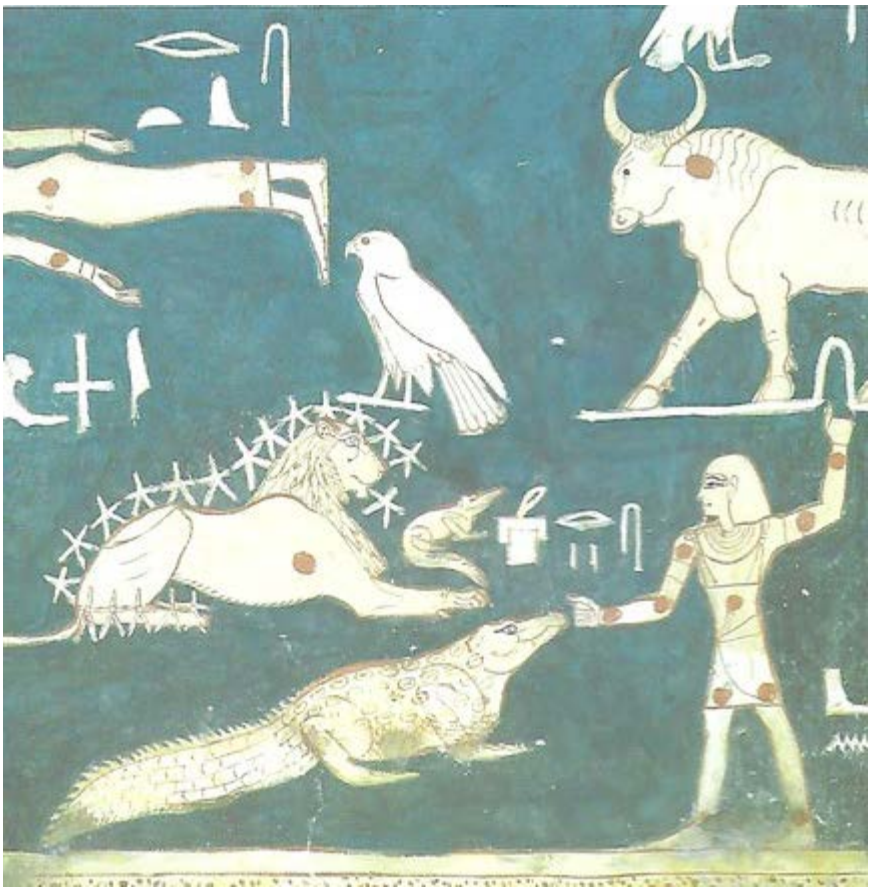

(add)

Plutarch

In 100AD, Plutarch summarized the main astrological ideas of the Egyptian gods as follows:

> "The Egyptians say that the souls of their gods shine as the stars in the firmament, and the soul of Isis is called by the Greeks the Dog Star, but the Egyptians Sothis, and the soul of Horus is called Orion, and the soul of Typhon [Set] is called the Bear."
>
> — Plutarch (100AD), *On Isis and Osiris* (pg. 53)

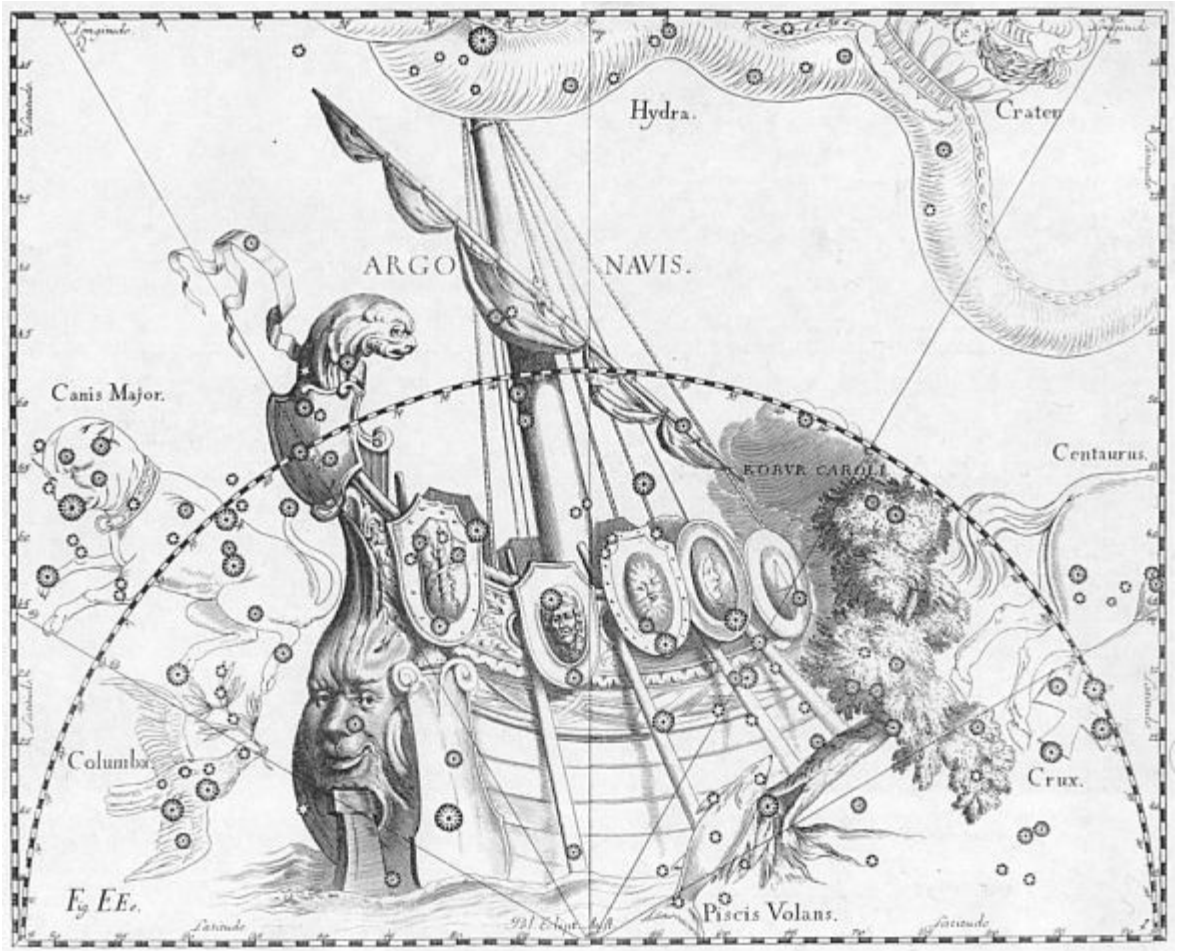

A sketch of the constellation “Argo Navis” (O), by German astronomer Johannes Hevelius (c.1670), the ship-like constellation, believed by Egyptians, according to Plutarch (100AD), to have been set in the sky in honor of Osiris. We also see the Southern Crux or "cross", said to be related to the idea that Osiris (turned Jesus) died on the cross.

> “The Egyptians give to Osiris the title of general, and the title of pilot to Canopus, from whom they say that the star derives its name; also that the vessel which the Greeks call Argo, in form like the ship of Osiris, has been set among the constellations in his honor, and its course lies not far from that of Orion and the Dog-star; of these the Egyptians believe that one is sacred to Horus and the other to Isis.”
>
> — Plutarch (100AD), *On Isis and Osiris* (pg. 55)

In 2004, Philip Coppens, in his *The Canopus Revelation: Stargate of the Gods and the Ark of Osiris*, devoted considerable time to discussion of the relation between Osiris and Canopus (O), the second brightest star in the sky. [7]

Derham | Usage

In 1713, English physicist and theologian William Derham gave a series of Boyle lectures, an anti-atheism anti-deism annual lecture series established by the will of Robert Boyle, on what he called “Physico-Theology” on the subject of a watchmaker like astronomy analogy as proof of the Christian religion against atheists and other notorious infidels, in the context of newly emerging natural philosophy. [1] In 1714, Derham, in follow up to the latter, published *Astro-theology: a Demonstration of the Being and Attributes of God: From a Survey of the Heavens*, a simplified summary of new telescope observations, e.g. the movement of the spots on Mars and Venus, the gist of which being to outline a teleological argument, similar to the watchmaker analogy, for god’s existence. [2] This Derham usage, according to *Oxford English Dictionary*, is the earliest use of the term “astro-theology”. The Derham usage, however, is but not defined in the modern proper pro-atheism sense of the term, as theology based on star or planet movement and or star cluster geometry.

Sun | Atum | Ra | Brahma | Abraham

In pre-dynastic Egypt, the sun was personified by a number of supreme gods, including: Ra, Atum, Aten, and Horus. During the Heliopolis recension (see: recension theory), Ra and Atum were syncretized as the god Atum-Ra. In Hinduism (900BC), Ra became Brahma. In Judaism (500BC), Ra became Abraham. In Christianity (300AD), Horus, the sun of Ra (or the sun of Osiris, depending on text), conceptualized as the early-day sun, became Jesus the son of god. [3]

Massey

In 1881, Gerald Massey began publishing his works on religio-mythology; some of which, supposedly, containing star or sun based discussion. In 1900, Massey published "The Historical Jesus and the Mythical Christ". In 1970, Jordan Maxwell read this, becoming inspired by it, and in 2000 re-published it under the title "Astro-Theology". [6]

Budge

In 1904, Wallis Budge, in his *Gods of the Egyptians, Volume One* (pg. 83), in discussion of the Pyramid Texts of the 4th and 5th dynasties, namely: Unas (2348BC), Teta [Teti] (2333BC) (Q), Pepi I (2287BC), Mer-en-Ra-Mehti-em-sa-f, and Pepi II (Q) , aka Pyramid Texts at Sakkara, as he calls them, states that among the gods of this period, "allusions are made to the following important stars", as he puts it: [3]

#	Post-sync god	Pre-sync god	Star / Constellation	Budge listing
1.	Osiris	Sah	Orion	Saḥ (Tetȧ 349), , i.e., Orion.
2.	Isis	Septet	Dog Star [Sirius]	Sepṭet (Tetȧ 349), , i.e., the Dog Star.
3.	Set [?]	Sehut	Great Bear	Seḥuṭ (Pepi II. 857), .
4	Nephthys [?]	Nekhekh	[?]	Nekhekh (Tetȧ 218), .

Sah and Sopdet were later syncretized with the gods Osiris and Isis, respectively, as follows:

> **Orion** (constellation) → Sah (god) → Osiris (god)
> **Sirius** (star) → Sopdet (goddess) → Isis (goddess)

The star named “Sothis”, e.g. as mentioned in Pepi I Pyramid Texts (Q), of note, seems also to be name variant of the star Sirius. (Q)

Budge, in his *The Gods of the Egyptians, Volume One* (pgs. 487-88), in commentary of Heru-Sa-Ast-Sa-Asar, i.e. “Horus, son of Isis, son of Osiris”, the 14th form of Horus, according to Budge order, reformulated as Apollo by the Greeks (500BC) and Jesus by the Romans (300AD), stated the following about the Passion of Osiris: [3]

> “Soon after the birth of her child she was persecuted by Set, who kept herself and Horus prisoners in a house, but by the help of Thoth she escaped with her child one evening, and set out on her way under the protection of seven scorpions called Tefen, Befen, Mestet, Mestetef, Petet, Thetet, and Matet. These scorpions probably represent the seven stars of the constellation Canis Major, in which the stars of Isis

[Sirius] and Sothis were situated. The last three scorpions showed Isis the way and led her to the town of Crocodilopolis, and then on to the city of Thebti, the city of the Two Sandals-Goddesses, where the swamp country begins."

(add)

Recent

In 1913, Archibald Sayce, in his *The Religion of Ancient Egypt*, argued for a parallelism of the "stellar theology" of Babylon and Egypt, both countries absorbing popular star-worship into the official pantheon of their respective state religions by identification of gods with stars or planets. [4]

In 1959, Jordan Maxwell began to engage in free-thinking religious decoding. In 1970, Maxwell read Gerald Massey's "The Historical Jesus and the Mythical Christ", therein gleaning the idea of "astro-theology". [6] In c.2000, Maxwell published a DVD entitled *Astrotheology: the Root of all Religion*. (Q) In 2010, segments of Maxwell's talk on "astrotheology" at the Republic Forum began to appear on YouTube (Q), wherein he commented his astrology-like view that the "stars effect people" and digressed on Biblical astrotheology decodings, such as that in Job 38:32 (Q), which says: "Canst thou bring forth Mazzaroth [Zodiac] in their time? canst thou also guide [The North Star with those that are about him] Arcturus with his sons?"

In 1997, J.S. Gordon (1946-2013), in his *Land of the Fallen Star Gods*, building on the work of Helena Blavatsky, digresses on stars, gods, and mythology. [9]

In 1999, Dorothy Murdock was publishing ideas on the zodiac in relation to modern religion. In 2004, Murdock published *Suns of Gods*, which she considered as a PhD thesis on comparative religion and astrotheology. [5]

In 2009, bloggers were referring to the "main astrotheologists" as: Jordan Maxwell, Michael Tsarion, and Dorothy Murdock along with Zeitgeist references to it. (Q)

In 2014, Wayne Herschel, author of *The Hidden Records: the Star of the Gods*, in his video "Senmut Tomb Tablet Reveal: Christmas Tree Egyptian Origin" (O), showed how the "leg of the bull" Egyptian symbol is the Pleiades constellation:

(add)

Other

The is some conjecture (Q) that the Big Dipper, according to the Egyptians, supposedly, was thought to be the torn off "leg of Set" following is battle with Horus:

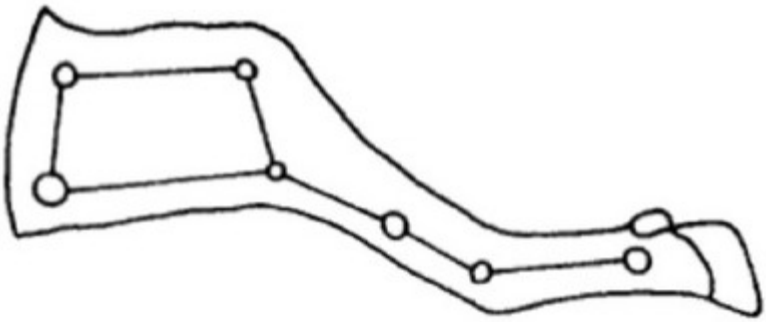

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Quotes

The following are related quotes:

> "The constellation of Isis is called, by the Greeks, Canis Major; that of Horus, Orion; and that of Typhon, Ursa."
>
> — Plutarch (c.110AD), *De Iside et Osiride* (pg. #); cited by John Narrien (1833) in *Origin and Progress of Astronomy* (pg. 44); cited by Bal Tilak (1893) in *The Orion: Researches into the Antiquity of the Vedas* (pg. 103) who also states: Narrien further observes that this assertion of Plutarch seems to be confirmed by the discovery of a sculptured planisphere on the ceiling of the *Temple of Denderah* where "in the place of Canis Major is traced a cow, the animal consecrated to Isis and instead of Orion is the figure of man which is supposed to be intended for the son of Osiris"

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(b) William Derham (about) – The Galileo Project.
3. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (important stars, pg. 83; Apollo, pg. 486; Horus son of Ra or son of Osiris, depending on text, pg. 487; seven scorpions, pgs. 487-88). Dover, 1969.
4. Sayce, Archibald H. (1913). *The Religion of Ancient Egypt* (pg. 237f). Adamant Media Corporation.
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Further reading

● Lull, Jose and Belmonte, Juan. (c.2015). "The Constellations of Ancient Egypt" (pdf), in: *Publications* (§6:157-) (38-pgs). Publisher.

External links

● Astro-theology – Wikipedia.
● Astrolatry – Wikipedia.

θΔics

In science, **astronomy** is the study of the nature of the movements and behaviors of things in the universe, such as: planets, stars, galaxies, asteroids, comets, blackholes, galactic clusters, galactic filaments, the dark matter problem, the accelerating satellites problem, among other anomalies.

Quotes

The following are related quotes:

> "The first to turn his attention to the problem of investigating the distance and sizes of the stars was Aristarchus, the Samian, who lived four hundred years before Ptolemy and recorded for posterity the theories of Pythagoras. Hipparchus of Rhodes followed him: the Ptolemy, with his magnum opus of five books, Al-Battani and Al-Fargani (c.790-861) (Ñº)(Ñº), the Arabs, and more recently Muller (of Konigsberger), Copernicus, Tycho Brahe, Kepler, Wendelin, Lansberg, Riccioli and a number of others."
>
> — Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* (pg. 43) [1]

See also

â— Greatest astronomer ever

References

1. Guericke, Otto. (1663). *New Magdeburg Experiments: on the Vacuum of Space* (*Ottonis de Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (translator and preface: Margaret Ames) (pg. 43). Publisher, 1672; Kluwer, 1994; Springer, 2012.

External links

â— Astronomy – Wikipedia.

θΔics

In religio-mythology, **Aten**, or “jtn” (Egyptian), aka “Aton”, was the sole god (see: supreme god timeline) of the Egyptian pharaoh Akhenaten, in the Egyptian state capital of Amarna, from 1352 to 1336 BC, conceived as a monotheistic sun god version of the 18th dynasty syncretism or aggregate god “Amen-Ra = Atum”, being thereby the embodiment of the energy, as some have retrospectively characterized things, or heat of sun, whose rays of were thought of as the long out-stretched hands (or fingers) of god.

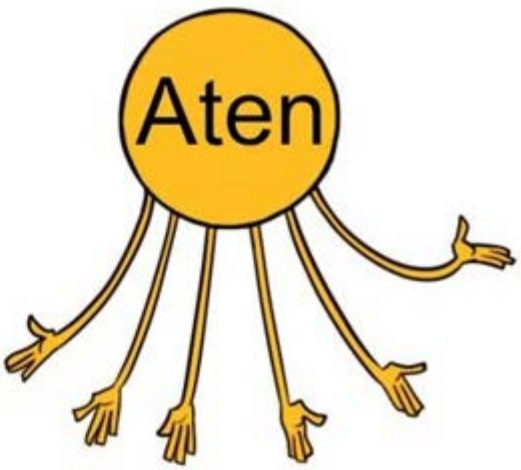

A general depiction of the Egyptian god "**Aten**" the world's first monotheistic god, promoted by the Egyptian pharaoh Akhenaten from 1352 to 1336 BC.

Old Testament

In the 19th century, many began to conjecture that Aten was the model forerunner to the god of the Old Testament of the Bible; many descriptions of the god of the Bible, e.g. that the Ten Commandments were written with the long outstretched “finger” of god (see: Aten’s fingers), concur to this conclusion.

External links

â— Aten – Wikipedia.

θΔics

In religio-mythology, **Aten's fingers** (TR:15) are the fingers of the god that writes laws on granite tablets with "his own finger", based on the description of the Egyptian monotheistic pharaoh Akhenaten's and his son god Aten, typically depicted in carvings as a sun disc with many long outstretched fingers; generally considered the prototype to Moses' monotheism.

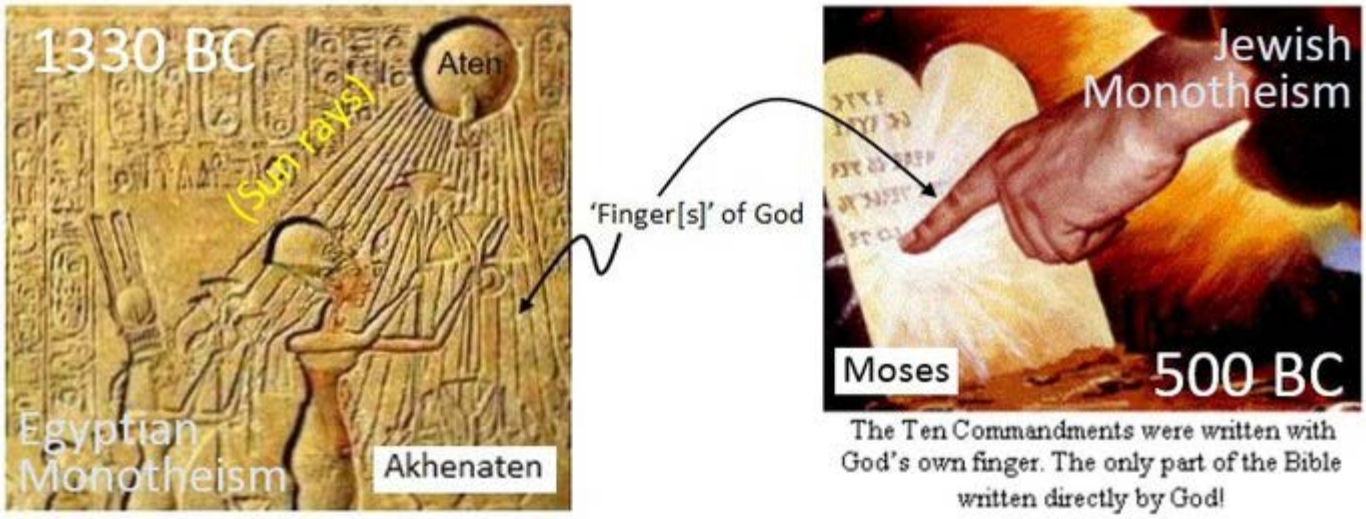

Left: a depiction **Aten's fingers**, namely of long outstretched "fingers" (sunrays anthropomorphized), of the sun-god Aten, being worshiped in 1330BC by the Egyptian monotheism-believing pharaoh Akhenaten; which became the "finger of god" which wrote the Ten Commandments, in the Bible, as cited by Goethe (1830), in humor, and American politician William Reed (1838) as a theory or hypothesis that we need to keep in order to explain political union formation.

Overview

The so-called "finger of fod" (see: Aten's fingers) passages found in the Bible is reference to Egyptian pharaoh Akhenaten's 1330BC monotheistic Aten (Ñº) theory of god, whose long stretched out "fingers", shown above, were conceptualized as the rays of the sun, a model that was incorporated into passages of the Christian Bible, in particular the method cited by which the 10 commandments (i.e. 42 negative confessions) were written onto stone tablets, e.g. Exodus 31:18, Deuteronomy 9:10, among about ten or so other locations. [1]

Goethe

In 1830, German polyintellect Johann Goethe, in a letter to Carl Zelter, mentioned the term "finger" in joking realism reference to Christian model that the Ten Commandments were carved out on granite tablets with the power of his own finger: [2]

> "Following on what went before, let me tell you in fun, that in my *Elective Affinities*, I took care to round off the inward, true catharsis, with as much purity and finish as possible, but I do not therefore imagine that any handsome fellow could thereby be purged from the lust of looking after the wife of another. The sixth commandment, which seemed to the Elohim-Jehovab to be so necessary, even in the wilderness, that he engraved it on granite tables with **his own finger**,—this it will still be necessary to uphold in our blotting-paper catechisms."

(add)

Reed

In 1839, American politician William Reed, in his "The Infancy of the Union" address, delivered before the New York Historical Society, had the following rather religion-siding message to say about the Napoleon Laplace anecdote: [3]

> "And how was the Union made? Has it a date, a day or a year, like the declaration of independence or the constitution? Was it done in convention? Did men come together by some appointment, and deliberate in solemn council, and ordain a Union? Never. It was the work of time—the natural result of things—the

growth of circumstances, or whatever other plausible, but really unmeaning phrases, may be used as a substitute for an acknowledgment of God's providence in the destinies of mankind. It is related — we do not vouch for the accuracy of the story, though we can well believe it: when Napoleon inquired of Laplace, why he had not mentioned God in his *System of the World*, the *savant* replied, because he could dispense with that hypothesis.

In contemplating the political system of our country, there are minds which doubtless would dispense with the same hypothesis in many particulars, not looking beyond the secondary cause of human agency. But in the formation of the Union, the hypothesis not only cannot be dispensed with, but it is the only adequate cause that can be offered, to explain the effects. Let anyone, taking for his point of mental vision the present day, look back to the years, when the separate companies of the primitive colonists, the hapless followers of the hapless Raleigh at the south, and the iron-nerved pilgrim band at the north; and though the observer should be Bunyan's Little-Faith, or Mr. Worldly-Wiseman, he could scarce fail to trace the controlling power of divine agency. The way was preparing, slowly, cautiously, laboriously, for an era, in which there was to be a mighty development of the capacity of man for self political government. The course of events was led on so tranquilly, that there was given no note of preparation to intimate to human intelligence, what was in reserve at no very distant futurity. The Union was coming on, the chief great means of achieving a system of popular government on a widely extended territory. The ground was made ready and the foundations laid, and it only remained for human sagacity to carry out a plan, which, in humble confidence we may say, was traced by the **finger of god**."

This so-called "finger of god" reasoning behind the formation of the union is cited here by Reed as the "cause" behind the formation of the American union.

References

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(b) Finger of god – Bible.Knowing-Jesus.com.
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(b) Die Wahlverwandtschaften – GoetheZeitPortal.de.
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(b) William Bradford Reed – Wikipedia.

θΔics

In thermodynamics, **Athanase Dupre** (1808-1869) was a French mathematician and physicist noted for having re-introduced, so to speak, the German-version of 'thermodynamics' into France via his circa 1860s series of papers on the mechanical theory of heat, published in the *Annals of Chemistry and Physics*, and his follow-up 1869 advanced textbook *Theorie Mechanique de la Chaleur* (*Mechanical Theory of Heat*). [1]

Education

Dupre graduated first in his class at the Ecole Normale Superieure in 1829 after which he began teaching mathematics and physics at the College Royal in Rennes and later chair (1847) and dean (1866) of mathematics in the faculty of science at Rennes.

Massieu

Dupre's work in thermodynamics was said to have influenced his colleague engineer Francois Massieu who in turn began to publish papers on the thermodynamics of fluids, particularly on 'characteristic functions', which in turn were cited by American engineer Willard Gibbs as precursors to his 'fundamental equations'. [2]

Universe

In the context of the implications of the first and second law on the past and future order, Dupre commented in 1866:

> "In the future, the present order cannot, except for certain modifications, continue forever. In the past, it is certain that there has been a beginning."

Dupre's views on this topic were used as a basis of support in the religious thermodynamics arguments of French philosopher Elme Marie Caro, in the years 1864 to 1887. [3]

References

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2. Nivoit, Edmond. (1897). "Notice of the Life and Work of Mr. Massieu, Inspector General of Mines" (French → English), Annales des Mines, 9th Series, Volume. 11.
3. Kragh, Helge S. (2008). *Entropic Creation: Religious Contexts of Thermodynamics and Cosmology* (Athanase Dupre, pg. 52). Ashgate Publishing, Ltd.

External links

â— Athanase Dupre – Wikipedia.
â— Athanase Dupre (German → English) – Wikipedia.

θΔics

In existographies, **Athanasius Kircher** (1602-1680) (IQ:180|#186) [RGM:366|1,500+] (CR:30), aka "Incredible German" (Germanus Incredibilis), was German theologian, Egyptologist, physicist, philosopher, and general polymath, a fabled last persons to know everything, noted for his 1667 *The Nature of the Magnetic Universe: with Psychological Discussions*, wherein he outlined a magnetic cosmology, according to which magnetism governed the movements of everything, animate to inanimate, plants, animals, and planets. [1]

Overview

German polyintellect Johann Goethe commented, during his researches of optics and other subjects, “thus, entirely unexpected, Father Kircher is here again”; coined the term electromagnetism; the first Egyptologist.

In British historian Robert Irwin's 2006 *For Lust of Knowing*, Kircher is called "one of the last scholars aspiring to know everything", who, along with his contemporary countryman Gottfried Leibniz, is cited as the probable "last" such scholar. At least two books have been written on Kircher’s universal genius status. [2]

Guericke

In 1651 to 1652, Kircher was in touch with Otto Guericke, e.g. in this period Guericke’s son, supposedly, conveyed his greetings to Kircher in person during his travels. [3]

In 1656, Gaspar Schott, in his *Mechanica Hydraulico-Pneumatica* (pgs. 356-60), appended letters he had written to Kircher about Guericke’s vacuum experiments. (Q)

Vacuum | Experiments

In 1641, Kircher, supposedly, was present at the Gasparo Berti test (see: Berti vacuum experiment) of the "nature abhors a vacuum" experiment.

In c.1656, Kircher was sent summaries of Otto Guericke's vacuum experiments and asked for comment:

> “These and many other considerations are adduced on both sides of this question. Melchior Cornaeus (Q), professor of theology at our own university of Wurzburg, has learned and at some length argued these matters in a discussion of his own dedicated to this topic. On several occasions he and I observed and carefully scrutinized the experiments in question. When I first saw them, I sent an account to **Kircher** at Rome and to some other friends and scholars, asking their opinion of them. All of them sided with the Aristotelians against the ‘vacuists’. Among the replies I received was this from Kircher.”
>
> — Gaspar Schott (c.1656), summary of communications on Otto Guericke’s vacuum experiments [3]

Kircher replied as follows:

> “I hate seen the account of the experiments sent to my assistant priest and hate read through it carefully. I am astonished by what it going on in the minds of such people that emboldens them to assert that a vacuum has been produced when the very experiments themselves demonstrate abundantly that there isn't a vacuum. The experiments, while they certainly exhibit the presence of great forces, are very far from showing that a vacuum exists and, on the contrary, then can be no better demonstration that a vacuum doesn't exist.
>
> For if a vacuum is produced by this experiment, what, I ask, is the source of the need for such great exertion? It is certainly not the air, for that has all been extracted. Therefore, it must be the ‘nothingness’ that is left behind after the extraction of the air. Can anyone conceive that nothingness can offer a resistance? Has anyone ever heard of such a thing in philosophy?

The philosophical explanation would be that the small amount of air left behind in the opening, creates the resistance because of the supreme impulse it has to fill the vacuum. But as everybody knows, were the continuity of substance to be once ruptured (which, in my opinion, cannot be achieved by any human undertaking) so little air would have neither the potency to fill the space, nor indeed the impulse. The resistance seen and nature's impulse to oppose are better attributed to the rarefaction of air than to anything else. I have seen this kind of thing a hundred times in similar machines. I am in accord with the considerations you bring up and they clearly demonstrate the truth about the non-existence of a vacuum.

I regret that I do not have enough time for a thoroughgoing refutation from first principles of the claims made on behalf of this whole contraption. Therefore, I shall leave the discussion of this issue to your reverence and to Father Cornaeus. Your reverence might be able to do this most opportunely in the *Hydraulica* when it treats of the vacuum. By the way, my associate, Fr. Valentine Stanfel, sends you his regards. He is also particularly expert in hydrostatics and had decided to publish similar material to that which you are now in the process of doing. As you have anticipated him, he has abandoned his plan. In the meantime, he will not be short of other topics to engage him among the great range of disputed issues. Your reverence should not neglect to correspond with hint; for that would be beneficial to you both."

— Athanasius Kircher (1656), "Letter to Gaspar Schott", Feb 26 [3]

Here, as we see, Kircher incorrectly denies the existence of the vacuum, per what seem to be Aristotelian convoluted verbal arguments about nothingness.

Magnetic cosmology

Kircher, supposedly, was led into his studies on magnetism, upon being impressed by William Gilbert's 1600 *On Magnetism*. [1]

Kircher's magnetic cosmology was a precursory stepping stone, so to speak, to the later 1687-1718 gravitation/chemical affinity forces divide cosmology of Isaac Newton.

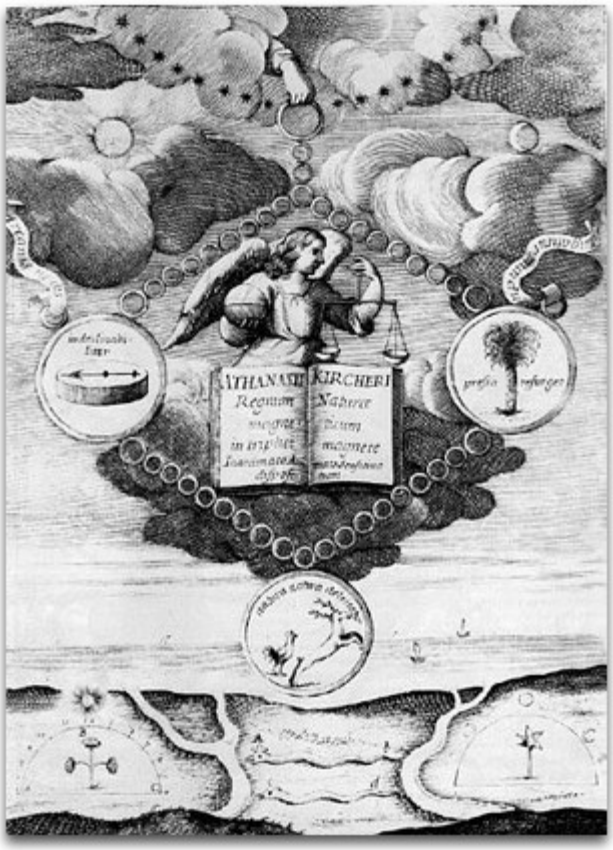

Frontispiece from Kircher's *Magneticum Naturae Regnum* (1667), showing both animate (animals and plants) and inanimate (lodestones) being governed by magnetism (or possibly electromagnetism). [1]

Quotes | On

The following are quotes on Kircher:

"In contrast to the Cartesian caution, in Germany — where orthodox Cartesianism never gained a foothold — several prominent thinkers embraced the belief that the fixed stars were surrounded by planets and spread throughout an infinite universe. The *Ecstatic Celestial Journey* (*Iter exstaticum coeleste*), 1656, by the Jesuit **Athanasius Kircher** explicitly characterized the fixed stars as suns with encircling planets, although it denied inhabitants even to the planets of our solar system and to the moon. And Otto Guericke, famous for the 'Magdeburg experiments' proving the existence of a vacuum, devoted a section of his *Experimenta Nova* (1672) to an examination and endorsement of Kircher's view of other planetary systems. Von Guericke also noted the possibility of an inhabited moon and planets, and emphasized (following Galileo) that any inhabitants would not be men, but rather diverse creatures beyond all our imaginings. But von Guericke denied Descartes's equation of extension and matter, and instead traced his ideas to Galileo, Kepler, Antonius de Rheita (O), Mersenne, Bruno, and Nicholas of

Cusa."

— Steven Dick (1984), *Plurality of Worlds* (pg. 116)

Quotes | By

The following are related quotes:

"Nothing is indeed nothing. Nothing is not something; [it is] not this or that or another being, but it is no being. Nothing is nowhere, neither in the mind, nor in the nature of things, nor in the intelligible or sensible world; [it is] not in god, nor beyond god in any creatures. Any whatever being exists; any whatever something exists; all full things have being. Nothing [however] is superfluous; a vacuum is nothing; nothing is empty; nothing is banished from the universe."

— Athanasius Kircher (1656), *Ecstatic Celestial Journey* (pg. 434); cited by Edward Grant (1981) in *Much Ado About Nothing* (pg. 396)

"Nothing is more beautiful than **to know all**."

— Athanasius Kircher (c.1670), *Publication* (Q)

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(b) Godwin, Joscelyn. (2009). *Athanasius Kircher's Theatre of the World: the Life and Work of the Last Man to Search for Universal Knowledge.* Inner Traditions.
3. Conlon, Thomas. (2011). *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum* (Kircher greetings, pg. 10; pgs. 67-68). Saint Austin Press/LuLu.

Further reading

● Stolzenberg, Daniel. (2013). *Egyptian Oedipus: Athanasius Kircher and the Secrets of Antiquity*. University of Chicago Press.

External links

● Athanasius Kircher – Wikipedia.

θΔics

In terminology, **atheism** is disbelief in the existence of god (see: existence of god) or gods. About two dozen historical types or brands of atheism, e.g. Freudian atheism, Epicurean atheism, Nietzschean atheism, etc., exist, as are listed in: atheism types by denial and belief.

Polls

A 2014 Pew Research Center survey (Ñº) asked Americans to rate groups on a "feeling thermometer" from zero (as cold and negative as possible) to 100 (the warmest, most positive possible rating). U.S. adults gave atheists an average rating of 41, comparable to the rating they gave Muslims (40) and far colder than the average given to Jews (63), Catholics (62) and evangelical Christians (61).ï»¿

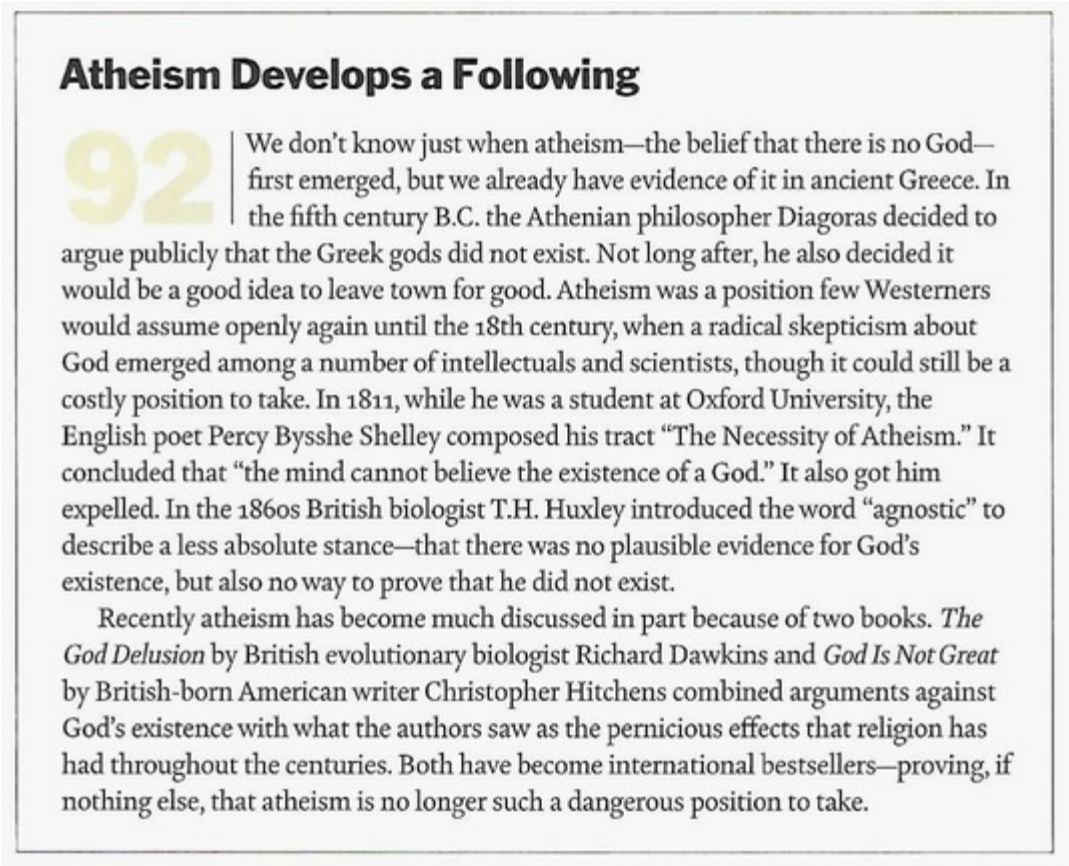

Atheism Develops a Following

92

We don't know just when atheism—the belief that there is no God—first emerged, but we already have evidence of it in ancient Greece. In the fifth century B.C. the Athenian philosopher Diagoras decided to argue publicly that the Greek gods did not exist. Not long after, he also decided it would be a good idea to leave town for good. Atheism was a position few Westerners would assume openly again until the 18th century, when a radical skepticism about God emerged among a number of intellectuals and scientists, though it could still be a costly position to take. In 1811, while he was a student at Oxford University, the English poet Percy Bysshe Shelley composed his tract "The Necessity of Atheism." It concluded that "the mind cannot believe the existence of a God." It also got him expelled. In the 1860s British biologist T.H. Huxley introduced the word "agnostic" to describe a less absolute stance—that there was no plausible evidence for God's existence, but also no way to prove that he did not exist.

Recently atheism has become much discussed in part because of two books. *The God Delusion* by British evolutionary biologist Richard Dawkins and *God Is Not Great* by British-born American writer Christopher Hitchens combined arguments against God's existence with what the authors saw as the pernicious effects that religion has had throughout the centuries. Both have become international bestsellers—proving, if nothing else, that atheism is no longer such a dangerous position to take.

A synopsis of **atheism** from the 2011 *Time* magazine special issue "100 Ideas that Changes the World", attributing the world changing "idea" to: Diagoras, Percy Shelley, Thomas Huxley, Richard Dawkins, and Christopher Hitchens . [15]

Physics & Chemistry | Closet atheism

See main: Closet atheism

A peculiar feature of atheism, per category of occupation, is the factoid, first pointed out by Napoleon Bonaparte, in his circa 1810 pollings of the French university physical scientists, is that while most physical scientists are atheists, few are willing to admit as such; the following are representative quotes:

> "How comes it, then, that Laplace was an atheist? At the Institute neither he nor Monge, nor Berthollet, nor Lagrange believed in god. But they **do not like to say so**."
>
> — Napoleon Bonaparte (c.1814), dialogue with Gaspard Gourgaud

> "If we need an atheist for a debate, I go to the philosophy department. The physics department isn't much use."
>
> — Robert Griffiths (1987) [12]

> "At the University of California, Berkeley, where I was a professor for 18 years, we had 50 chemistry professors. But for many years there was only who was willing to publicly identify himself as an atheist, my good friend Robert Harris. A more recent addition to the Berkeley chemistry faculty is a second open atheist, Richard Saykally."
>
> — Henry Schaefer (2003), *Science and Christianity: Conflict or Coherence?* [13]

(add)

Overview

Atheism, according to Dale McGowan (2013), is a secular approach to reaction existence (life) based on the understanding that reality is an arrangement of physical matter, with no consideration of unverifiable spiritual forces. [7] In 2006, free-thought historian Bill Cooke published his *Dictionary of Atheism, Skepticism, and Humanism*, aims to be a modern upgrade to: Voltaire's *Philosophical Dictionary* (1764), Joseph McCabe's *Rationalist Encyclopedia* (1948), Ambrose Bierce's *Devil's Dictionary* (1911), and John Saul's *Doubter's Companion: a Dictionary of Aggressive Common Sense* (1994). [9]

Chair of atheism

See main: Appignani chair of atheism

In circa 2004, American business magnate Louis Appignani, a former Catholic who turned atheist in his first week of college after reading Bertrand Russell, engaged into discussion with American philosopher Harvey Siegel, then chair of the philosophy department at the University of Miami, about starting some type of atheism professorship. In 2011, American sociologist Phil Zuckerman, author of *Society Without God* (2008), at Pitzer College, Ca, initiated a secular studies program and major, its most-popular class being "Secularism and Skepticism". [10] In 2016, the University of Miami, stimulated by a $2.2 million donation by Louis Appignani, a former Catholic who turned atheist after reading Bertrand Russell, established the nation's first chair for the study of atheism, humanism and secular ethics".

> "I'm trying to eliminate discrimination against atheists. This is a step in that direction, to make atheism legitimate."
>
> — Louis Appignani (2016), commentary on new University of Miami "Chair of Atheism" [10]

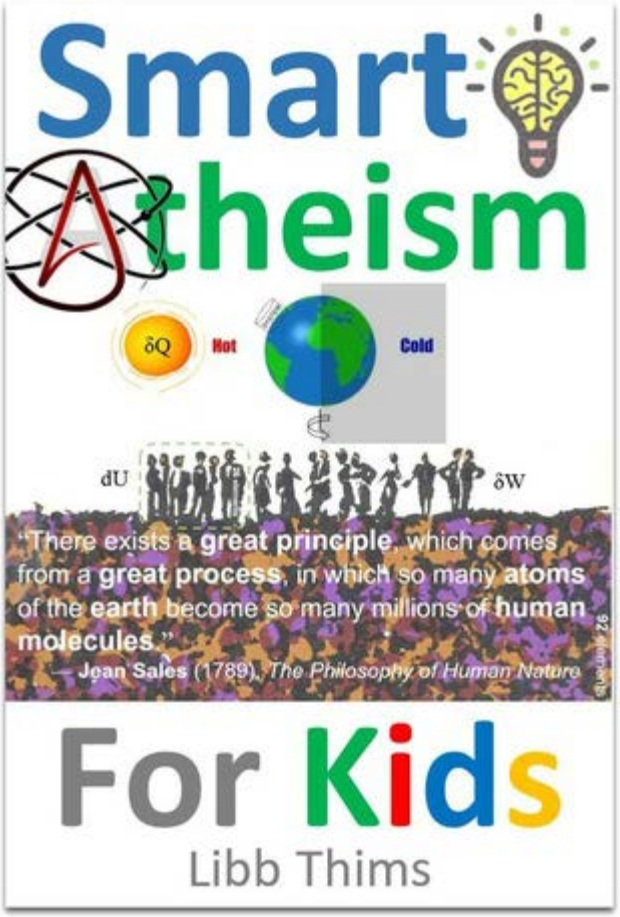

The 9 Sep draft cover for Libb Thims' 2016 *Smart Atheism: For Kids*, a book version follow-up to Thims' 10 Aug 2015 *Zerotheism for Kids* class, on how to "teach **atheism**", as Empedocles did in 450BC, to a 3 to 5 year old and or for kids aged 6 to 14 to read about. [11]

> "I think it's a very bold step of the University of Miami, and I hope there will be others. It's enormously important to shake off the shackles of religion from the study of morality."
>
> — Richard Dawkins (2016), on University of Miami atheism chair, May 20 [10]

The university, of note, resisted the chair proposal per reason that they didn't want the name "atheism" in the title of the chair, preferring to call it instead: "philosophical naturalism".

> "There was great reluctance on the part of the university to have an endowed chair with the word 'atheism' in the name, and that was a deal-breaker for Lou. He wasn't going to do it unless it had the word atheism in it."
>
> — Harvey Siegel (2016), on University of Miami atheism chair, May 20 [10]

The overt reason for resisting the name atheism in the chair title, was: “We didn’t want anyone to misunderstand and think that this was to be an advocacy position for someone who is an atheist”, said Thomas J. LeBlanc, executive vice president and provost, said in an interview. The holder of the chair, according to David Kling, professor and chair of the department of religious studies at the University of Miami, is to (a) offer one course annually on the history, philosophy, and influence of atheism; (b) engage with the community (university and public); for example, through public lectures, forums, or conferences.” Moreover, that the academic objective of the new position “would be to examine questions of science, knowledge, ethics, and social policy from a strictly atheistic perspective.” (Ñº) In May 2016, YouTube atheism activist Aron Nelson, in his “Professor of Atheism?”, blogged his confusion about an atheism professorship; the gist of which is as follows: “There’s no belief system, no body of dogma to rehearse: none of that. Just the things that everyone should already be studying anyway, minus all the volumes of imaginary nonsense that you get with religion. So it occurs to me that a **professor of atheism** wouldn’t actually have a field of study.” (Ñº)

Greek atheism | History

See main: Four horsemen of atheism

In overview, the origin of atheism, in the dominate sense, seems to have originated with the rise of Greek atomic theory.

American theologian and preacher Jonathan Edwards (1703-1758), the third president of Princeton, in one of his circa 1750 works, refers to Greek atomic theorist Epicurus as the “chief father of atheism.” (Ñº)

Sudanese-born American philosopher Monydit Malieth, likewise, credits Epicurus as being the "father of atheism". [8]

As stated by English scientific philosopher Francis Bacon in his 1597 essay “Of Atheism”: [1]

> “Nay, even that school which is most accused of **atheism** doth most demonstrate religion; that is, the school of Leucippus and Democritus and Epicurus. For it is a thousand times more credible, that four mutable elements, and one immutable fifth essence, duly and eternally placed, need no God, than that an army of infinite small portions, or seeds unplaced, should have produced this order and beauty, without a divine marshal.”

A cartoon on anti-free thinking effect of religious indoctrination (see: religious IQ); possible rendition of:

“Is there an intellectually honest Christian evolutionist position? Or do we simply have to check our brains at the church house door?”

> — Anon (c.1997), query to The Scientist from a San Antonio attorney; cited by Lee Strobel (2004) in *The Case for a Creator* (pg. #)

Of the atomic school, Greek philosopher Epicurus is often seen as the champion of atheism owing to his queried view, often classified as the "problem of evil", that:

> “Is God willing to prevent evil, but not able?
> Then he is not omnipotent.
> Is he able, but not willing?
> Then he is malevolent.
> Is he both able and willing?
> Then whence cometh evil?

> Is he neither able nor willing?
> Then why call him God?”

which is one of the better known logic disproofs of the existence of God.

French atheism

In the 1620s, in France, in the wake of Michel Montaigne’s *Essays* and follower Pierre Charron’s *Of Wisdom* (*De la sagesse*), the latter characterized as a “seminary of atheism”, French theologian-philosopher Marin Mersenne (1588-1648) (Ñº) asserted that Paris, with a population of 400,000, contained some 50,000 atheists (Ñº), i.e. a 12.5% atheism population (Hecht, 2004; pg. 309).

When the intellectual salons of France began to open in the late 18th century, amid the rise of the encyclopedists, such as Denis Diderot, explicit, open, and extreme atheism points of view began to emerge.

In 1773, Pierre Chaumette, Josephe Fouche, and Jacques Hebert, three self-proclaimed atheists, introduced the "cult of reason", in Paris, France’s first state-sponsored (Ñº) atheistic religion (compare: Russian atheism), which culminated in a grand "festival of reason" thrown in Notre Dame in Paris. [14]

In 1802, Napoleon Bonaparte, the new leader of France, the rising global superpower, both intellectually and militarily, went around to all the leading scientists of France and queried them about their religious beliefs and in particular belief in the existence of God, according to which he found that they all were atheists. The most direct of these scientists was Pierre Laplace who when queried in circa 1802 as to why there was no mention of a deity in his new *Celestial Mechanics*, replied famously "I had no need of that hypothesis." (see: Napoleon Laplace anecdote)

Napoleon, in the decades to follow, during his various debates with others on religion, would frequently refer back to these early conversations with Laplace, Lagrange, and the other faculty members of the *École Polytechnique*, about their convictions that there is no God, as sorts of anchor points to get his own bearings, right up until his last years. In one debate with his personal assistant General Baron Gaspard Gourgaud, during the years 1812-1816, on the subject of Gourgaud’s opinion that staring up at the starry heavens leads one to an amazement and wonder in the greatness of God, Napoleon replied: [4]

> “How comes it, then, that Laplace was an **atheist**? At the Institute neither he nor Monge, nor Berthollet, nor Lagrange believed in God. But they do not like to say so.”

This statement, made about the great leading scientists of Napoleon’s day is more or less a verbatim description of the views held by the leading scientists of our day—nearly all do not believe in God, but do not like to say so. This issue will be a central focal point of this book. In other words, although scientists no longer believe in God, considering divine intervention as being an *unneeded hypothesis*, what exactly scientists do believe remains a bit of an obscure picture.

Gourgaud went on to comment in rebuttal or rather defense of his Christian beliefs that ‘I own that I believe firmly in God, and cannot conceive how men can be atheists. To proclaim themselves such seems to me mere mental braggadocio’. To this abrasive comment, Napoleon retorted:

> “Bah! Laplace was an **atheist**, and Berthollet too. At the Institute they all were atheists, and yet Newton and Leibnitz were believers. Atheists compare man to a clock; but the clock-maker is a being of superior intelligence. They grant that creation is the result of matter, as warmth is the effect of fire.”

To pause and reflect on this frank statement, we notice, firstly, a definite century shift in the thinking mindset of the

modern intellectual, specifically from that of a science framed in the workings of a creator God, the Newtonian universe (1727), to that of a science framed in the workings of a Godless universe, the Laplacian universe (1827).

Russian atheism

In 1925 to 1947, the League of Militant Atheists (Ñº) arose in Russian co-aligned with the communist ideals; it had 3.5M members at its height.

American atheism | Separation of church and state

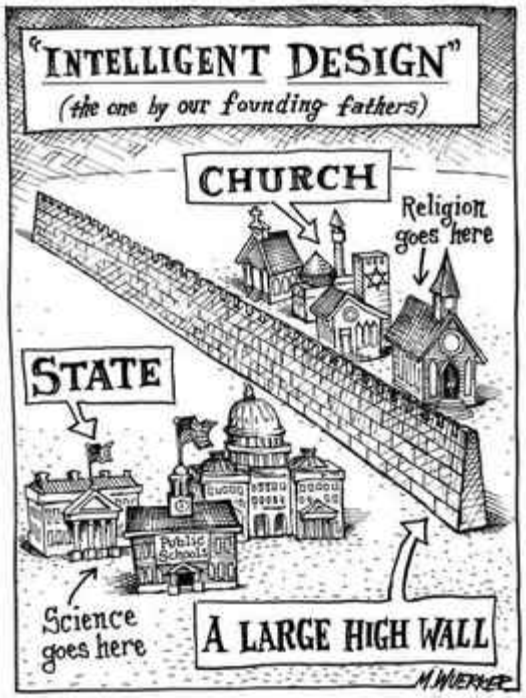

In 1802, Thomas Jefferson famously announced the governmental need for the separation of church and state. The following are example quotes:

> "Question with boldness even the existence of God"
>
> — Thomas Jefferson (date)

> "I believe in an America where the separation of church and state is absolute."
>
> — John F. Kennedy (date)

(add discussion)

Nietzsche | 12-step program

In the late 18th century, Friedrich Nietzsche stated that "God is dead" and that prophesied that some great intellect in the future, home he referred to as an uberman, would arise to fill the god void. The following are 12 humorous steps designed to help one escape the constraints of Judeo-Christianity, i.e. to become an "uberman": [6]

1. Reject societal ideals and moral codes
2. Create a new set of values and moral ideals.
3. In establishing new ideals, to not rank them according to transcendental categories.
4. Transcend nihilism as presented in the forms of christianity and Platonism.
5. Overcome yourself.

A semi-humorous semi-serious Friedrich Nietzsche—the 1882 popularizer of the "God is dead" motto—conceptualized twelve step will to power program, by PhilosophersGuild.com. [6]

6. Live in a constant state of rebirth and growth, not looking toward religion or society to determine the value of things, but looking inward for meaning and beliefs.
7. While aware of life's terrors, affirm life without resentment.
8. Learn to see beyond good and evil.
9. Lift up your heart, high, higher! And do not forget your legs! Lift up also your legs, and better still if you stand upon your head!
10. Learn, pray you to laugh!
11. Know that there are no eternal facts, nor are there any absolute truths.

12. Eat one *Will to Power Bar*; the abdomen is the reason why man does not easily take himself for a god.

(add discussion)

Dawkins scale

In 2006, Richard Dawkins, in his *The God Delusion*, introduced the so-called Dawkins scale of belief in the existence of god, a 1-7 scale in its original form or 1-12+, in alternative forms, according to which the typical "atheist" tends to fall in the 5 to 8 Dawkins number range, as depicted adjacent.

5	Lower than 50 percent but not very low. Technically agnostic but leaning towards **atheism**. "I don't know whether God exists but I'm inclined to be skeptical.'	←	**Weak Atheist:** I do not know whether God exists but I'm inclined to be skeptical.
6	Very low probability, but short of zero. *De facto* atheist. 'I cannot know for certain but I think God is very improbable, and I live my life on the assumption that he is not there.'	←	**De-facto Atheist:** I cannot know for certain but I think God is very improbable and I live my life under the assumption that he is not there.
7	Strong atheist. 'I know there is no God, with the same conviction as Jung 'knows' there is one.'	←	**Strong Atheist:** I am 100% sure that there is no God,
8	Beyond atheism (fill in the blank): "Do not prefer to be associated with term 'a-theist' to the same extent that I do not prefer to be associated with the term 'a-fairyist' in the sense that I am an adherent to a disbelief in tooth fairies"; Pierre Laplace (IQ=190), who in 1802 commented to Napoleon that he has "no need of that hypothesis", might well fall in this range.	←	**Beyond Atheism:** I have no need of that hypothesis. Beyond 110% sure there is no God (well read in comparative religion and mythology)

The Dawkins number classification scheme range of typical **atheism** viewpoints (between agnosticism and beyond atheism).

Church of Atheism

See main: Atheist church

In 2006, the so-called First Church of Atheism was launched online allowing people, via local ordinance laws, supposedly, to be come ordained ministers of the atheist, for the purposes of weddings, baptisms, etc.

The site was found per key word search: “how to become an atheist”. [4] The site contains a four-board draft wiki, entitled *Good Book Project*, started by T. Patrick Snyder, a type of morality text aiming to replace the Bible, with the following rather humorous outline: [5]

> “The *Good Book*, should give a general outline of major sciences starting with physics (and the big bang), and including chemistry, mathematics/logic, astronomy, earth science, biology, human evolution, early cultures, a brief history of the world, then a history of science including major figures. Then the second section would include morality/philosophical aspects. This would include the golden rule, encouragement against hatred, and for love and forgiveness.”

There doesn't, however, seem to be much progress beyond this humble start. In response to a query: “is it possible to become [an] ordained [atheist], but still have different spiritualities?”, Dorian Wallace, of the NYC chapter, gave the following response: (Ñº)

> “I don’t see a problem with that. First Church of Atheism – NYC is not a set belief system. You must think for yourself and decide your own spiritual path. The whole point of our group is to:
>
> A. Have a place for important and special ceremonies without the worry of a superstitious deity being brought into it.
> B. A place to meet like-minded people and build a support group.
> C. A quiet forum for people in religious families or communities in need of a community to talk to about their own beliefs.

Here we see a number of issues: belief in one type of metaphysics (god) is supplanted by but another variety of metaphysics (spirituality). Secondly, a so-called "church" without a belief system, does not work as a system that binds,

the Latin *ligare* "to bind" being the root etymology of the term religion.

New atheism / aggressive atheism

With the inception of the Internet (and the increase in open distribution of information) and in particular following the 9/11 events, what has been termed “new atheism” or in some respect "aggressive atheism" has come to grip the teen community as well as the adult community, a movement launched by the publication of American neuroscientist Sam Harris’ 2004 best-selling book *The End of Faith*, followed by a courtier of others, including: Richard Dawkins (*The God Delusion*, 2006), Victor Stenger (*God: the Failed Hypothesis*, 2007), Peter Atkins (*On Being*, 2011), among others. [2]

Quotes

See main: Atheism quotes

The following are noted quotes:

> “Men think epilepsy divine, merely because they do not understand it. We will one day understand what causes it, and then cease to call it divine. And so it is with everything in the universe.”
>
> — Hippocrates (c.400BC), *Publication*

> “We have a right to look upon an atheist as a monster amongst rational beings, as one of those extraordinary productions which we hardly ever meet with in the whole human species, and who opposing himself to all other men, revolts not only against reason and human nature, but against the divinity himself.”
>
> — William Derham (c.1714), *Publication* (Ñº)(Ñº); cited by Baron d’Holbach (1770) in *The System of Nature* (pg. 303)

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11. Thims, Libb. (2016). *Smart Atheism: For Kids*. Publisher.
12. (a) Griffiths, Robert. (1987). “Article”, *Christianity Today*, Apr 3.
(b) Schaefer, Henry F. (2003). *Science and Christianity: Conflict or Coherence?* (debate, pg. 26; Harris, pg. 77). The Apollos Trust.
13. (a) Schaefer, Henry F. (2003). *Science and Christianity: Conflict or Coherence?* (debate, pg. 26; Harris, pg. 77). The Apollos Trust.

(b) Roberg A. Harris (faculty) – UC Berkeley.
(c) Richard Saykally (faculty) – UC Berkeley.
14. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 368-69). HarperOne.
15. Anon. (2011). "100 Ideas that Changed the World", *Time*, May 6.

Further reading

â— Cardiff, Ira. (1945). *What Great Men Think of Religion* (atheist, 24+ pgs). Christopher Publishing House.
â— Hunter, Michael and Wootton, David. (1992). *Atheism: from the Reformation to the Enlightenment* (abs). Oxford University Press.

External links

â— Atheism – Wikipedia.
â— New Atheism – Wikipedia.
â— Book store – ThinkAtheist.com.
â— Historical atheist quotes – TheMysteryWorld.com.
â— Free Thought Bibliography – WordPress.

θΔics

In hmolscience, **atheism 2** is []

→ Atheism (mobile; readable)
→ Atheism (online; readable) – WayBack (2017)
→ **Atheism** (hacked)

θΔics

In hmolscience, **atheism atrocities fallacy**, or "Stalin/Hitler debating point" (Dawkins, 2006), the theist's "trump card" (Q), *Reduction ad Hitlerum* (Strauss, 1951) (Q), among other names, is the assertion, typically employed in argument, that all large scale mass atrocities of history have been committed by atheists; something akin to the following assertion:

A 2016 Twitter (Q) theist propaganda "atheism leads to Hitler" image, depicting some of the leading atheists of recent years, namely: T.J. Kincaid, Bill Maher, Richard Dawkins, Lawrence Krauss, Bill Nye, and Sam Harris.

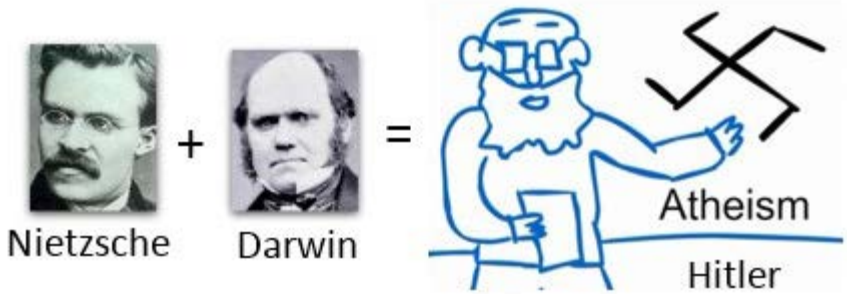

This is a screenshot from a 2010 video (Q) on how to beat an atheist in debate, point number six being to say "Hitler was an atheist" therefore godlessness leads to evil.

The fallacy, is the general statement that: Adolf Hitler (theist), Joseph Stalin (Marxist atheist), Vladimir Lenin, Mao Zeodong (secular Confucianist), and Pol Pot (secular Buddhist-Catholic) were all atheists and accordingly without morals engaged in mass acts of justified atrocity.

Hitler + Nietzsche | Stalin / Mussolini

Of note, Ravi Zacharias (2013) (Q|13:40) asserts that Adolf Hitler presented copies of Friedrich Nietzsche to Joseph Stalin and Benito Mussolini personally. [3] Likewise, in his *The Real Face of Atheism* (2004) (Q), Zacharias states that Hitler posed next to busts of Nietzsche in photos and that during Auschwitz Hitler, supposedly, said something along the lines of the following; which is said to be hanging on the wall of one of the Polish prison camps:

> "I freed Germany from the stupid and degrading fallacies of conscience and morality. We will train young people before whom the world will tremble. I want young people capable of violence—imperious, relentless and cruel."

In other places, however, Hitler seemed evoke morality:

> "Secular schools can never be tolerated because such schools have no religious instruction, and a general moral instruction without a religious foundation is built on air; consequently, all character training and

religion must be derived from faith ...we need believing people."

— Adolf Hitler (1933), speech made during negotiations leading to the Nazi-Vatican concordant, Apr 26 (Q)

He also comments how Hitler, in his *My Struggles*, intermixed Nietzschean atheism with Darwinian atheism, and to assert the wrongfulness of interbreeding of weaker and stronger races; or something along these lines.

Philip Eveland (2000) corroborates (Q) on this and moreover asserts that Hitler visited the Weimar Nietzsche archives several times and consumed Nietzsche's philosophy as a baby consumes its mother's milk; he also points out that Elizabeth, Nietzsche's sister, congratulated Mussolini, on the occasion of his fiftieth birthday for being the 'noblest disciple of Zarathustra.'

Bernice Rosenthal (2002) also, supposedly, discusses the "common Nietzschean elements" in the cults of personality of Stalin, Hitler, and Mussolini. (Q)

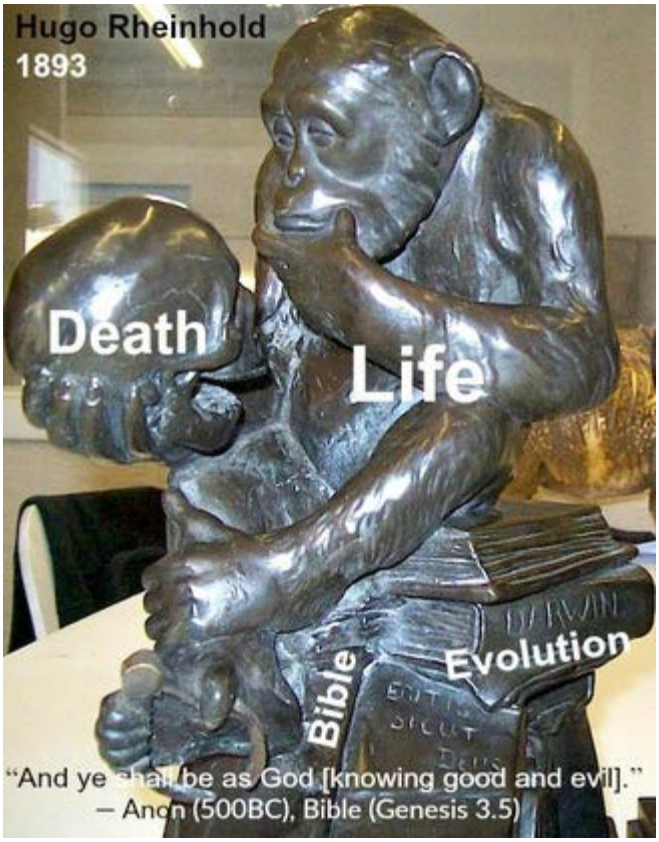

Vladimir Lenin, supposedly, kept a Hugo Rheinhold thinking Darwin monkey statue displayed on his desk in the Kremlin. (Q)(Q)

Quotes

The following are related quotes:

"As an agent of our creator, by fighting off the Jews, I am doing the lord's work."

— Adolf Hitler (1925), *Mein Kampf* (Q)

"I do not believe that a decay of dogmatic belief can do anything but good. I admit at once that the new systems of dogma, such as those of the Nazis and the Communists, are even worse than the old systems, but they could never have acquired a hold over men's minds if orthodox dogmatic habits had not been instilled in youth. Stalin's language, e.g., is full of reminiscences of the theological seminary. What the world needs is not dogma, but an attitude of scientific inquiry, combined with a belief that the torture of millions is not desirable, whether inflicted by Stalin or by a deity imagined in the likeness of the believer."

— Bertrand Russell (1954), *Human Society in Ethics and Politics* [4]

"I admit that the generation which produced Stalin, Auschwitz and Hiroshima will take some beating, but the radical and universal consciousness of the death of god is still ahead of us. Perhaps we shall have to colonize the stars before it is finally borne in upon us that god is not out there."

— Reginald Hollingdale (1971), *Thomas Mann: A Critical Study*

"The grandfather of Marxian atheism and Freudian atheism is **Ludwig Feuerbach**, who was first a theologian, then a Hegelian, and finally an atheistic philosopher."

— Hans Kung (1990), *Freud and the Problem of God* [2]

> "Stalin was an atheist and Hitler probably wasn't; but even if he was, the bottom line of the Stalin/Hitler debating point is very simple. Individual atheists may do evil things but they don't do evil things in the name of atheism."
>
> — Richard Dawkins (2006), *The God Delusion* [1]

> "I known you feel that religion has been a bane to civilization, but I feel that atheism has, and I will point to the worst mass-murders in modern times: Hitler, Stalin, Mao, and Pol Pot – all confirmed atheists."
>
> — Bill O'Reilly (2007), interview with Richard Dawkins (Q)

See also

- Atheism genealogy
- Killing spree paradox

References

1. Dawkins, Richard. (2006). *The God Delusion* (pg. 378). Publisher.
2. Kung, Hans. (1990). *Freud and the Problem of God* (translator: Edward Quinn) (pg. 3). Yale University Press.
3. Zacharias, Ravi. (2013). "The Incoherence of Atheism" (Q), City Life Church.
4. (a) Russell, Bertrand. (1954). *Human Society in Ethics and Politics* (pg. 208). Simon & Schuster.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 453). HarperOne.

Further reading

- Murdock, Dorothy. (2010). "Were Stalin, Hitler and Pol Pot Atheists?" (Q), Freethought Nation, Apr 17.
- Pearce, Jonathan. (2014). "A Great Myth About Atheism: Hitler/Stalin/Pol Pot = Atheism = Atrocity" (Q), SkepticInk.com, Mar 3.
- Sherlock, Michael. (2014). "The Atheist Atrocities Fallacy" (Q), RichardDawkins.net, Oct 23.

External links

- Pol Pot and Mao Zedong were Not Atheists (2012) – Exposing Religion Blog.
- Hitler, Stalin, and Atheism (2004) – RejectionOfPascalsWager.net.

θΔics

In Hmolpedia, **top YouTube atheism channels** are video channels that publish or focus on atheism and or atheism-related topics.

Shortly after YouTube launched (14 Feb 2005) **atheism channels** and communities began to emerge and form, one of the earliest being The Amazing Atheist, launched in 2006.

Overview

On 14 Feb 2005, YouTube was launched.

In 2006, T.J. Kincaid launched The Amazing Atheist channel, and as of 2015 is the most-subscribed atheism channel on YouTube.

In 2008, the Texas-based atheism call in talk show The Atheist Experience, hosted by Matt Dillahunty, began to publish atheism shows on YouTube.

In 2014, American electrochemical engineer Libb Thims did a top 20 countdown video, shown adjacent, of YouTube atheism channels, with over a million views, ranked by views per sup.

List | Sub Rankings | Top 10

In 2015, the following listing shows the top selection of the top ten YouTube atheism channels, at the million+ views level, that upload some debate-like videos, and or atheism discussions or topics, ranked by subs:

#	Channel	Host	About
1.	The Amazing Atheist Launch: 20 Nov 2006 201M views | **637K** subs (315 v/s)	TJ Kincaid (c.1979-)	
2.	DarkMatter2525 Launch: 17 Nov 2008 56M views | **387K** subs (145 v/s)	Jon Matter (c.1979-)	
3.	Thunderf00t Launch: 20 Oct 2006 75M views | **327K** subs (231 v/s)	Phil Mason (c.1971-)	
4.	JaclynGlenn Launch: 22 Mar 2011 21M views | **279K** subs (75 v/s)	Jaclyn Glenn (1990-)	
5.	Pat Condell Launch: 7 Feb 2007 54M views | **224K** subs (240 v/s)	Pat Condell (c.1949-)	
6.	CultOfDusty Launch: 9 Dec 2008 21M views | **192K** subs (110 v/s)	Dusty Smith (c.1978-)	
7.	The Thinking Atheist Launch: 27 May 2009 25M views | **191K** subs (129 v/s)	Seth Andrews (1968-)	

8.	The Atheist Experience Launch: 30 Sep 2008 18M views | **120K** subs (148 v/s)	Matt Dillahunty (1969-)
9.	AronRa Launch: 24 Aug 2006 14M views | **117K** subs (119v/s)	Aron Nelson (1962-)
10.	The Atheist Voice Launch: 6 Jun 2013 9M views | **110K** subs (80 v/s)	Hemant Mehta (1983-)

List | Views per Sub Rankings | 1M+ views | Top 25+

The following are a selection of the top ten of top YouTube atheism channels, at the million+ views level, that upload some debate-like videos, and or atheism discussions or topics, ranked by views per sub (v/s):

#	Channel	Host	About
1.	Theoretical Bullsh*t Launched: 14 Jan 2007 3M views | 45K subs (**67 v/s**)	Scott Clifton (1984-)	Has a rather peculiar and interesting atheism-identifying mental experiment upbringing, e.g. winning debates, at age 13, online, with Christian pastors. [1]
2.	The Bible Reloaded Launched: 3 Jan 2012 4M views | 60K subs (**74 v/s**)		An atheist podcast in which two guys, Hugo and Jake, dissect, discuss, and dismantle the Christian Bible, highlighters in hand, via reading the entire NIV Bible, cover to cover; along the way reviewing Christian movies, such as "God's Not Dead", etc.
3.	JaclynGlenn Launch: 22 Mar 2011 21M views | 279K subs (**75 v/s**) ↑ (#8)	Jaclyn Glenn (1990-)	A a Catholic turned Protestant turned agnostic who came out as an atheist (Q) in 2012; she is LA based vlogger, who has some type of degree in biomedical science; and who, via her JaclynGlenn channel, within two years been climbing into the top ranks of YouTube atheist channels (Q)(Q); in May 2014, she, supposedly, resurrected the notorious Jew turned atheist turned Christian turned rabble-rousing (Q) troll-like religion-twisting vlogger Shawn Karon (aka VenomFangX) turned Jews for Jesus missionary (Q) back into video-making status, who made a video (now banned) ripping on her (which seemed to work), after which she comments how she "didn't know who he was or his rep?" (Q) ;
4.	The Atheist Voice Launch: 6 Jun 2013 9M views | 110K subs (**80 v/s**) ↓ (#1)	Hemant Mehta (1983-)	In 2004, completed a double degree in mathematics and biology; began teaching in 2007; acquired master's degree from DePaul in 2010, began teaching math at a high school in Naperville, Illinois, and resigned in 2014, to peruse "opportunities online" that "are just a lot greater right now"; a Jain turned atheist; gained notoriety for his 2007 *I Sold My Soul on eBay* (Q), followed by *The Young Atheist's Survival Guide* (2012). (Q)

Godless Top Ten

5.	Launch: 18 Jun 2008 1.2M views | 14K subs (85 v/s) | old **Note:** channel switch issue ↑↓ 659K views | 15K subs (44 v/s) | new		Andre Oliver (c.1989-)	Noted for his 2013 autobiographical documentary *Stray from the Flock: the Story of a Black Atheist* (Q); in 2014, owing to some type of Network vs Google Adsense switch/copyright issue, switched to doing some type of "godless top ten videos" focus.
6.	Evid3nc3 Launch: 8 Nov 2007 4M views | 42K subs (**97 v/s**) ↓		Christopher Redford (c.1982-)	A Bible-thumping Christian who lost his faith as he began to study science in college; famous for his very inside-the-mind deconversion process video series; and his nodal belief structure mapping of the belief structure (see: Redford deconversion model); note: hasn't published anything in 3 years.
7.	Cristina Rad Launch: 20 Sep 2008 10M views | 102K subs (**97 v/s**) ↑		Cristina Rad (c.1985-)	A Romanian atheist vlogger and blogger. (Q)
8.	CultOfDusty Launch: 9 Dec 2008 21M views | 192K subs (**110 v/s**)		Dusty Smith (c.1978-)	An American Southerner, presently in Denver, Colorado, who likes to talk fast and rant about stupid Christian idiocy. (Q) (Q)
9.	AronRa Launch: 24 Aug 2006 14M views | 117K subs (**119 v/s**)		Aron Nelson (c.1969-)	Quote (2011): "I don't like being lied to. And I especially didn't like being lied to as a child", when queried with what drives him, in his YouTube page, or what is the catalyst. (Q) (Q)
10.	TheVeganAtheist Launch: 22 Jan 2009 5M views | 46K subs (**119 v/s**)		Anon (c.1986-)	Motto: "Go vegan and let go of your supernatural beliefs"; a vegan-atheist who is passionate about animal rights, human rights and being rational.
11.	FactVsReligion Launch: 13 May 2008 3M views | 26K subs (**126 v/s**)		Laura Neilson (c.1983-)	Noted for her 2008 "4 Questions for an Atheist" (Q), along with draw Muhammad videos, among a few other atheism videos.
12.	The Thinking Atheist Launch: 27 May 2009 25M views | 191K subs		Seth Andrews (1968-)	A straight-up bible belter Christian, raised by theologians, who moved him and his five siblings out of public school and into a church-owned Temple Christian School, because the public school was teaching him information contrary to his family religious teachings, turned radio host (1990), who began to lose his faith when in 1997 Christian radio singer Rich Mullins died in a random gruesome car accident on his way to a benefit concert; during 9/11, he came to the view that prayer was

	(**129 v/s**)		ridiculous; in 2004, he discovered a number of Christopher Hitchens's debates on YouTube, and that became a catalyst that helped him to leave faith behind, finally coming out as an atheist to his family and friends in 2008 (Q); later published the 2012 *Deconverted: a Journey from Religion to Reason* about his deconversion. (Q)
13.	The Atheist Experience Launch: 30 Sep 2008 18M views | 120K subs (**148 v/s**) ↓	Matt Dillahunty (1969-)	A Christian of 25-years who after losing his tech job, and with enough money saved up, decided to become a priest to help non-believers, and in this path, first attempted to save his atheist roommate from hell, and began to read up on apologetics, atheism, philosophy of science, etc., works, and thereby lost his own faith (Q); in 1997, became the main host of the Austin, Texas based call-in cable access television show *The Atheist Experience*, a Q&A between mostly believers and the hosts focused on the topics are religious dogma, morality, ethics and application of the scientific method. (Q)
14.	DarkMatter2525 Launch: 17 Nov 2008 56M views | 387K subs (**145 v/s**)	Jon Matter (c.1979-)	A seeming American who does cartoon comedy roasting religion videos with the motto “nothing is sacred, question everything.” (Q)
15.	Steve Shives Launch: 20 Dec 2010 8M views | 49K subs (**167 v/s**)	Steve Shives (c.1980-)	Topics: Atheism, commentary, smartassery of a generally respectable quality; joined YouTube to post in response to questions for atheists (Q)
16.	Netwriter Launch: 19 Aug 2006 1M views | 7K subs (**181 v/s**)		
17.	Atheism-is-Unstoppable Launch: Oct 2013 2M views | 13K subs | (**185 v/s**) ↓		Motto: “I am just a guy who saw *The Life of Brian* [1979] as a child, and figured it out. This isn't rocket science, people”; his MO is to upload atheism or religious subject matter and ridicule it with a kangaroo moving around the screen as his avatar; channel and channel name is a reaction to Kurt Cameron video "Christianity is Unstoppable". (Q)
18.	We Fu*cking LoveAtheism Launch: 13 Oct 2012 3M views | 12K subs (**208 v/s**)		An extension of the popular Facebook pages: We ******* Love Atheism (Q) (258K likes) and We Love Atheism (Q) (29K likes) made by a community of atheists.
		Phil	A British debater who has a BS (1993) and PhD (1996) in

19.	Thunderf00t Launch: 20 Oct 2006 75M views | 327K subs (**231 v/s**)	Mason (c.1971-)	chemistry; presently a researcher in food science chemistry, who gained notoriety for a 42+ part video series entitled "Why do People Laugh at Creationists?" (2007-2014), inclusive of debates and critiques with the likes of idiocy level creationists, such as: Kent Hovind, Ray Comfort, and Casey Luskin. (Q)
20.	Pat Condell Launch: 7 Feb 2007 54M views | 224K subs (**240 v/s**) ↓	Pat Condell (c.1949-)	Makes short monologue videos denouncing religion, where he seems to talk endlessly and quickly about politics and religions overlaps, in a venting manner. (Q)
21.	Edward Current Launch: 4 Dec 2006 21M views | 83K subs (**256 v/s**)	Edward Current (c.1974-)	A "not agnostic" (2007) turned "agnostic atheist" (2009) (Q); who has since been using YouTube to use give subtle comedy to highlight the inconsistencies and stupidities of Christianity giving the impression, to his viewers, that he is "certainly an atheist" (Q); noted for his 2008 "An Atheist Meets God" (Q) cartoon. (Q)
22.	Atheist Digest Launch: 19 Jul 2012 3M views | 11K subs (**266 v/s**)		Motto: "we invented religion to explain why we are here; but the archaic reasoning of religion needs to be eroded"; channel supplemental channel to the limited atheist presence on the Internet; mostly re-uploads of *The Atheist Experience* shows and some Richard Dawkins interviews.
23.	The Amazing Atheist Launch: 20 Nov 2006 201M views | 637K subs (**315 v/s**)	TJ Kincaid (c.1979-)	The first major YouTube atheist, he vents on lot of religious idiocy, but supposedly has some type of downgrade or bad rep for misogyny postings and views. (Q)
24.	Tony Sobrado Launched: 15 Feb 2012 1M views | 3K subs (**343 v/s**)	Tony Sobrado (c.1984-)	A writer for *The Huffington Post*, essayist, and podcaster; channel is dedicated to skepticism, conspiracy theories, atheism and natural science from the perspective of the social sciences and philosophy of science; uploads original material, e.g. in person audio interview of the late Victor Stenger (2013) (Q)
25.	Fighting Atheist Launch: 31 Mar 2007 9M views | 22K subs (**427 v/s**)		An American consultant noted for his 2007 "Confessions of a former Christian" (Q), wherein he tells the story of how first he, and then his wife, made the transition from church-going Christians to book smart atheists, among other related videos and blogs. Not active since.
26.	Cruciefiction Launch: 2 Oct 2010 12M views | 13K subs (**867 v/s**)		

(add discussion)

● Armoured Skeptic | Gregory (c.1985-) (Q)
Joined: 26 Feb 2014
2M subs | 69K subs (29 v/s)

● The Real Black Atheist

Joined: 18 Jul 2012
2M views | 16K subs (155 v/s)

● SundriedAtheist
Launched: 24 Jul 2008
8M views | 5K subs (1636 v/s)

List | 100K+ views

The following are sub million view channels:

● UNCT Atheists (7 Feb 2010) 446K views | 2K subs (223 v/s)
● AtheistByNature (30 Aug 2013) 258K views | 1K subs (258 v/s)
● Dave Muscato | Dave Muscato (Q) (17 Jun 2006) 200K views | 439 subs (455 v/s)

List | 10K+ views

The following are other recently-found resources:

● AtheistMinority (16 Mar 2014) 91K views | 6K subs (15 v/s)
● Kristi Winters (12 Jul 2011) 10K views | 450 subs (22 v/s)
● Atheist Analysis (10 Mar 2014) 53K views | 2K subs (23 v/s)
● Prototype Atheist (4 Dec 2013) 19k views | 795 subs (24 v/s)

● ZombeePictureShow | Joined: 28 Dec 2009 | 15K views | 529 subs (26 v/s)
About: a self-educated person who spent his first 10-years in Mexico being educated by “retarted teachers”, as he says, and books by Einstein, Godel, Wittgenstein, Cantor, and Aristotle, thereafter getting his first degree in engineering. (Q)

● TGIAtheist (1 Dec 2011) 8,600 view | 265 subs (32 v/s)
● American Atheists (6 Dec 2013) | David Silverman | 19K views | 512 subs (37 v/s)
● That Atheist Guy (20 Jun 2014) 66K views | 2K subs (40 v/s)

References

1. (a) Scott Clifton – Wikipedia.
(b) CliftonNotes – Twitter.

External links

● Atheism | Theism debates (600+) – WorldviewNaturalism.com.
● Atheist videos (new) – Reddit.com.
● Videos – AtheismResource.com.
● List of atheistic YouTube channels – CreationWiki.

θΔics

In hmolscience, **atheism genealogy** refers to the intellectual parentage of the various branches, lines, and methodologies of atheism.

Genealogy | Tree

The following shows basic roots, branches, and off-shoots of atheism trains of though, i.e. atheism genealogy, in terms of intellectual parentage in influence:

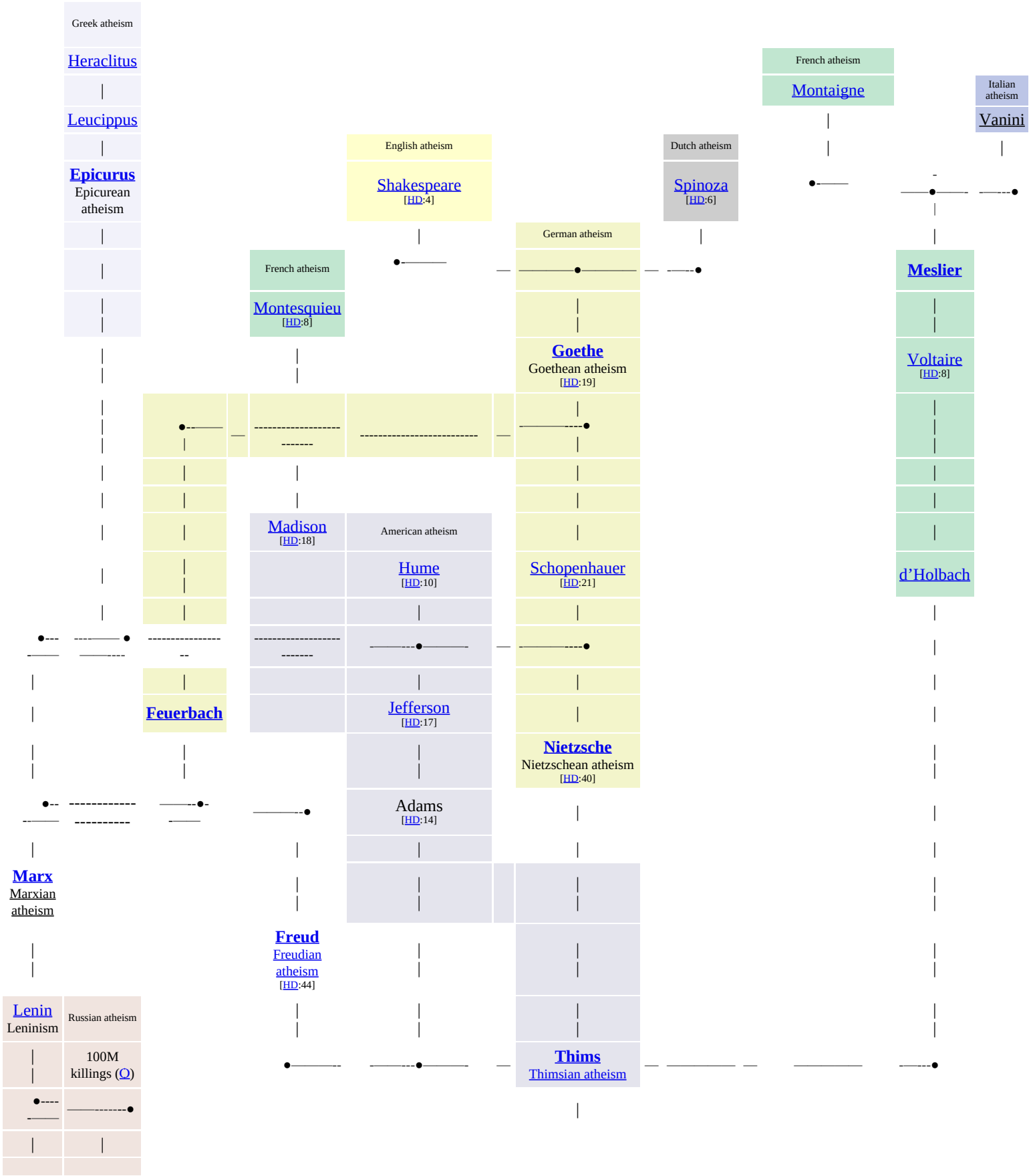

Stalin	Mao
Stalinism	Maoism

Quotes

The following are related quotes:

> "Freud's originality—the originality of Freudian atheism—is that his atheism is not just another instance of philosophical empiricism or scientific positivism, but of an interpretation of personal experience. In this fashion, Freudian thought comes to be classed along with the thought of Feuerbach, Marx, and Nietzsche."
>
> — Bernard Lonergan (1973), "Sacralization and Secularization" [1]

> "The grandfather of Marxian atheism and Freudian atheism is Ludwig Feuerbach, who was first a theologian, then a Hegelian, and finally an atheistic philosopher."
>
> — Hans Kung (1990), *Freud and the Problem of God* [2]

> "Soviet orthodoxy [1917-1986] was shaped as a quasi-religion with Marx as God and the Spirit, Lenin as God the Father, and the party as collective God the Son."
>
> — Yuri Tarnopolsky (1993), reflection, as a scientist, i.e. self-defined "human chemist" (or pattern chemist), on his time as a Russian citizen (1936-86) and Siberian concentration camp days (1983-85), prior to his 1987 immigration to America, amid the eventual "fall of communism" in 1989 (O) [3]

> "Nietzsche launched a new building project that represents an advance for atheism. Meslier denied all divinity, Holbach dismantled Christianity, Feuerbach deconstructed god. Then Nietzsche introduced transvaluation: atheism is not an end in itself. Do away with god, yes, but then what? Another morality, a new ethic, values never before thought of because unthinkable, this innovation is what makes it possible to arrive at atheism and to surpass it. A formidable task, and one still to be brought to fruition."
>
> — Michel Onfray (2005), *Atheist Manifesto* (O)

References

1. Lonergan, Bernard J.F. (1973). "Sacralization and Secularization", in: *Philosophical and Theological Papers, 1965-1980, Volume 17* (editors: Robert C. Croken, Robert M. Doran) (pg. 261). University of Toronto Press.
2. Kung, Hans. (1990). *Freud and the Problem of God* (translator: Edward Quinn) (pg. 3). Yale University Press.
3. Tarnopolsky, Yuri. (1993). *Memoirs of 1984* (Amz) (pg. 135). University Press of America.

θΔics

In hmolscience, **atheism professor**, "professor of atheism" or "teacher of atheism", refers to a person who teaches atheism, namely: morals, purpose, meaning, philosophy, sense of being, becoming, and reality defined by the laws of nature, from an explicit atheism perspective, with religio-mythology deconstruction taught therein.

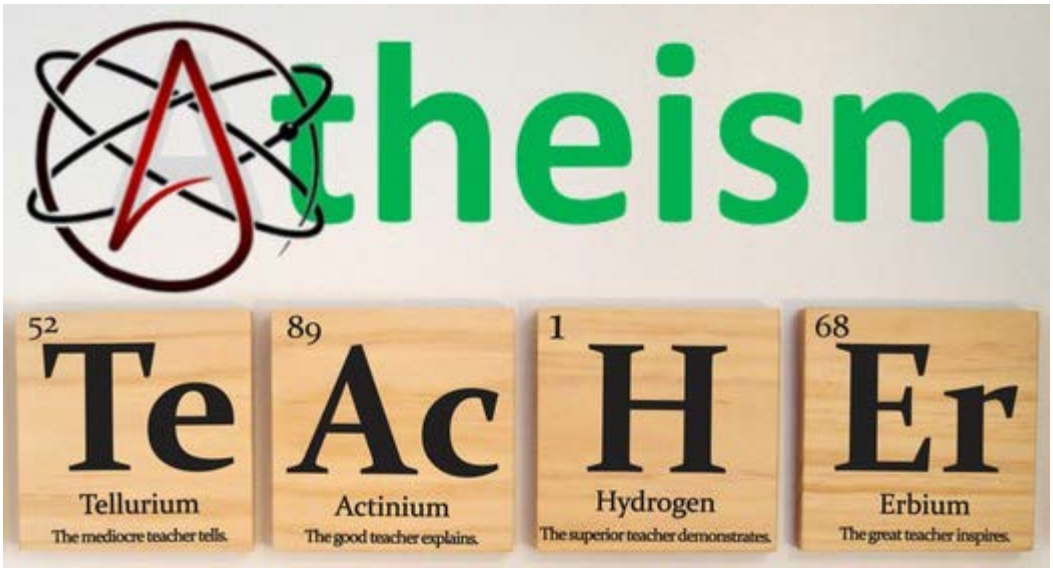

Image from a 2015 article (Q) about a former Indiana public school teacher who was fired for admitting he was an atheist and refusing to pray during faculty meetings and other occasions, e.g. when the principle asked teachers to "pray so it wouldn't snow, so that student testing wouldn't be disrupted" and the teacher said, in reply to all recipients of the email, that he choose to "rely on the predictions of the meteorologists"; image brings to mind Johannes Wislicenus (1885).

Overview

In 450BC, Empedocles taught atheism; the following is a retrospect citation to this:

> "For it was fit that they who wrote should themselves have been eye-witnesses of those things concerning which they made assertions, or should accurately have ascertained them from those who had seen them; for they who write of things unascertained beat the air. For what did it profit Homer to have compose the Trojan war, and to have deceived many; or Hesiod, the register of the theogony of those whom he calls gods; or Orpheus, the three hundred and sixty-five gods, whom in the end of his life he rejects, maintaining in his precepts that there is one god? What profit did the sphaerography of the world's circle confer on Aratus, or those who held the same doctrine as he, except glory among men? And not even that did they reap as they deserved. And what truth did they utter? Or what good did their tragedies do to Euripides and Sophocles, or the other tragedians? Or their comedies to Menander and Aristophanes, and the other comedians? Or their histories to Herodotus and Thucydides? Or the shrines and the pillars of Hercules to Pythagoras, or the Cynic philosophy to Diogenes? What good did it do Epicurus to maintain that there is no providence; or **Empedocles to teach atheism**; or Socrates to swear by the dog, and the goose, and the plane-tree, and AEsculapius struck by lightning, and the demons whom he invoked? And why did he willingly die? What reward, or of what kind, did he expect to receive after death? What did Plato's system of culture profit him? Or what benefit did the rest of the philosophers derive from their doctrines, not to enumerate the whole of them, since they are numerous? But these things we say, for the purpose of exhibiting their useless and godless opinions."
>
> — Theophilus (c.170AD) "Letter to Autolycus" [1]

In 1965, at the University of Jena, Germany, a chair of "scientific atheism" was established, its first occupant being German sociologist Olaf Klohr (Q)(Q), its inception, supposedly, having something to do with the "rather amused reaction of the western world" to Soviet astronaut Yuri Gagarin's remarks that he found no trace of god "up there" or "out there". [2]

In 2015, Libb Thims, together with co-host Thor, in their "Zerotheism for Kids" class, taught atheism, generally Thimsian atheism, to a group of six kids.

In 2016, the University of Miami began to establish its "Appignani Chair of Atheism, Humanism, and Secular Ethics"; as of 2018, the chair seems to be still unnamed.

Quotes

The following are related quotes:

> "You find me a state or society that threw off theocracy and threw off religion and said we adopt the teachings of Lucretius and Democritus and Galileo and Spinoza and Darwin and Russell and Jefferson and Thomas Paine, and we make those **what we teach our children**. We make that scientific and rational humanism our teaching. You find me that state, that did that, and fell into tyranny, and slavery, and famine, and torture, and then we'll be on a level playing field."
>
> — Christopher Hitchens (2008), "Debate with Peter Hitchens on Iraq War and Religion" (Q), Grand Valley State University, Apr 3

References

1. (a) Theophilus. (c.170). "Letter to Autolycus" (Q) (*Adversus Autol* III.2), Book 3, Ch. 2: "Profane Authors had No Means of Knowing the Truth". Publisher.
(b) Kors, Alan C. (2014). *Atheism in France, 1650-1729, Volume I: the Orthodox Sources of Disbelief* (pg. 191). Princeton University Press.
2. Homrighausen, E.G. (1965). "Professor of Atheism" (abs), Theology Today, Jan 1.

θΔics

In quotes, **atheism quotes** are noted statements on or about atheism, atheists, famous atheists, non-believers, irreligious, and or atheism vs theism, etc., related topics.

Recent

The following are recently found quotes:

> "I believe in the separation of church and state. We all have our own religious beliefs. There are people out there who are atheists, who don't believe at all. They are all citizens of Minnesota and I have to respect that."
>
> — Jesse Ventura (1999), Explaining his refusal to sign a 'National Day of Prayer' proclamation, May 6 (Q)

> "Organized religion is a sham and crutch for weak-minded people who need strength in numbers. It tells people to go out and stick their noses in other people's business."
>
> — Jesse Ventura (1999), "Interview in *Playboy*" (Q), Nov; in FSM app

> "Atheism is the shadow of the sacerdotalism."
>
> — Thomas Kirkman (c.1870) [6]

> "When you're inside the religious bubble everything makes sense."
>
> — Michael Shermer (2013), "Foreword" to Peter Boghossian's *A Manuel for Creating Atheists* (pg. i2)

> "Nature's operations, as far as we have yet observed them, proceed by inexorable atheistical laws, and every new discovery of natural laws is a new blow to the tottering dogma of a 'moral governor' and mechanical contriver, the offspring of dark and ignorant ages."
>
> — E.B. (1851), commentary on John Mackintosh's "The Logic of Atheism"

> "Doubt is the greatest torment that a man suffers on earth."
>
> — Andre Ampere (c.1820), on religious beliefs; "Letter to Friend" (Q)

> "It is now quite lawful for a Catholic woman to avoid pregnancy by a resort to mathematics, though she is still forbidden to resort to physics and chemistry."
>
> — Henry Mencken (c.1930)

> "Waking up in the 'real world' — by proving to oneself that god is imaginary [does not exist] — impacts our ethics, meaning, and significance."

— Marshall Brain (2015), *How God Works* (Q)

"Cosmology is a kind of religion for intelligent atheists."

— Stephen Hawking (c.1962), description (Q) to his wife, when they first met, about himself

"I'm an atheist because at age 15 was told that my rapist gets heaven if he repents and chooses god, but I get hell even if I'm good but don't believe."

— aTashoo (2012), Storify.com tweet (Q), Nov 24

Anti-Atheism | List

The following are agnostic and or theism-siding quotes against atheism:

"A wonder it must be that there should be any man found so stupid as to persuade himself that this most beautiful world could be produced by the fortuitous concourse of atoms."

— John Ray (c.1700) (Q)

"People who do not believe in the immortality of the soul are abnormal, if not pathological."

— William H. Thomson (1910), on Thomas Edison's *New York Times* atheism-themed interview

Atheism | List

The following are newly added atheism quotes:

"The universe, that is the all, is made neither of gods nor men, but ever has been and ever will be an eternal living fire, kindling and extinguishing in destined measure."

— Heraclitus (c.500BC), quote in Ludwig Buchner's 1855 *Force and Matter* [2]

"Religion is regarded by the common people as true, by the wise as false, and by the rulers as useful."

— Seneca (c.50AD), found via mAtheist app (Q)

"If, then, you listen to the stories about the gods in this way, accepting them from those who interpret the story reverently and philosophically, and if you always perform and observe the established rites of worship, and believe that no sacrifice that you can offer, no deed that you may do will be more likely to find favor with the gods than your belief in their true nature, you may avoid superstition which is no less evil than **atheism**."

— Plutarch (c.100AD), *On Isis and Osiris* (pg. 31)

“Live a good life. If there are gods and they are just, then they will not care how devout you have been, but will welcome you based on the virtues you have lived by. If there are gods, but unjust, then you should not want to worship them. If there are no gods, then you will be gone, but will have lived a noble life that will live on in the memories of your loved ones.”

— Marcus Aurelius (c.160AD) (Q)

“The Bible. That is what fools have written, what imbeciles command, what rogues teach, and the young children are made to learn by heart.”

— Voltaire (c.1750) [5]

“All children are born atheists; they have no idea of god.”

— Baron d’Holbach (1772), *Freethoughts Opposed to Supernatural Ideas* [5]

“Those who will not reason are bigots, those who cannot are fools, and those who dare not are slaves.”

— Lord Byron (c.1810)

“Every time we say that God is the author of some phenomenon, that signifies that we are ignorant of how such a phenomenon was able to operate by the aid of forces or causes that we know in nature.”

— Percy Shelley (1811), *The Necessity of Atheism* (Q)

“Gods only excuse is that he does not exist.”

— Stendhal (c.1820), cited by Nietzsche, in *Ecce Homo*, as “best atheist joke”, saying he was jealous of for not having said it first [3]

“Religion is the masterpiece of the art of animal training, for it trains people how they shall think.”

— Arthur Schopenhauer (c.1830) [4]

“Nature’s operations, as far as we have yet observed them, proceed by inexorable atheistical laws, and every new discovery of natural laws is a new blow to the tottering dogma of a ‘moral governor’ and mechanical contriver, the offspring of dark and ignorant ages.”

— E.B. (1851), commentary on John Mackintosh’s “The Logic of Atheism” [1]

“And if the inscription on the ancient pyramid of Sais says, ‘I am all that is, that was, and that will be, no mortal man has yet removed the veil’, it might be replied thereto, that modern science has removed the veil

and has discovered that force and matter were, are, and will be."

— Franz Pisko (c.1875), front matter quotes to Ludwig Buchner's *Force and Matter* [2]

"Where there are three students of nature, there are two atheists."

— Ludwig Buchner (1884), *Force and Matter* (pg. 1)

"In Christianity neither morality nor religion come into contact with reality at any point."

— Friedrich Nietzsche (c.1885), found via mAtheist app (Q)

"The more the fruits of knowledge become accessible to men, the more widespread is the decline of religious belief."

— Sigmund Freud (1927), *The Future of an Illusion* (Q)

"Religion is comparable to a childhood neurosis."

— Sigmund Freud (1927), *The Future of an Illusion* (Q); cited by Bo Jinn (loc. 1936)

"I don't believe in God because I don't' believe in Mother Goose."

— Clarence Darrow (1930), "Speech in Toronto" (Q), found via mAtheist app (Q)

"New motor roads dustless,
The latest steel is rustless,
Our tennis courts are sodless,
Our new religions, godless."

— Arthur Guiterman (1936), *Gaily the Troubadour* (Q)

"God is a name that is a cover for nothing more than a mirage."

— Simone de Beauvoir (c.1950)

"Prayer has no place in the public schools, just like facts have no place in organized religion."

— Superintendent Chalmers (c.2005), *The Simpsons* (Q)

"Since the Bible and the church are obviously mistaken in telling us where we came from, how can we trust

them to tell us where we are going?”

— Anon (c.2008), AtheistBlogger.com list of 101 atheist quotes (Q); found via mAtheist app (Q)

“Be religious …. or be smart.”

— Bo Jinn (2013), on new atheism

References

1. E.B. (1851). Pamphlets of the Opponents (III): Commentary on “The Logic of Atheism” by John Mackintosh (pgs. 410-12; quote, pg. 414), in: *The Reasoner: and Theological Examiner*, 10.
2. Buchner, Ludwig. (1855). *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon* (15th German edition; 4th English edition) (pg. 1). London: Asher and Co, 1884.
3. (a) Nietzsche, Friedrich. (1888). *Ecce Home* (pg. 39). Dover, 2012.
(b) Ecce Homo (book) – Wikipedia.
(c) Malieth, Monydit (aka Tonnerre). (2013). *The Future Affects the Past: What Destination is Time Rushing To?* (pg. 26). Red Lead Books.
4. Malieth, Monydit (aka Tonnerre). (2013). *The Future Affects the Past* (religion, pg. 13). Red Lead Books.
5. Konner, Joan. (2007). *The Atheist’s Bible: an Illustrious Collection of Irreverent Thoughts* (Voltaire, pg. 66). Harper Collins.
6. Christie, Richard C. (1899). *Etienne Dolet: the Martyr of the Renaissance, 1508-1546* (atheism, pg. 478). Publisher.

External links

- Atheism quotes (1,097+) – GoodReads.com.

θΔics

In video channels, **Atheism Reviews** is a 2014-launched YouTube channel, by American electrochemical engineer Libb Thims (DN=10), an "extreme atheist and materialist" (Sekhar, 2011) (Q) or "strong atheist who adheres to a physics-based morality" (Bossens, 2013) (Q), and possible co-hosts Pat (DN=9.5), aka "King Atheist", and Art (DN=2), aka "God Believer", aimed at addressing atheist, atheism, anti-theism, etc., versus religion topics and discussions, and critiquing, clarifying, and most-importantly "correcting" public science vs religion debates in general. [1]

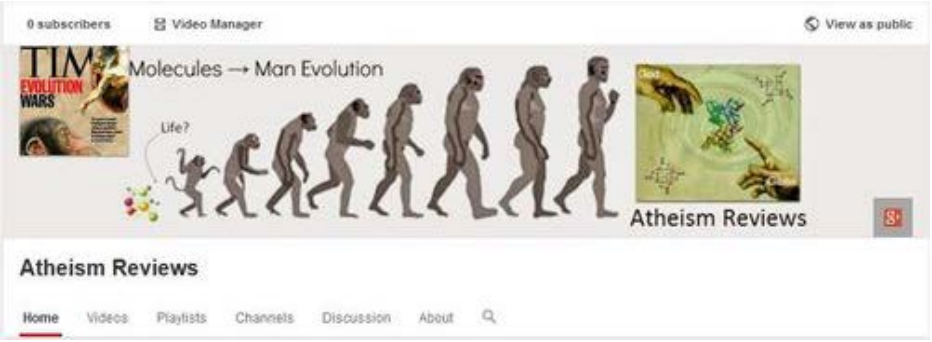

Top: the 11 Sep 2014 debut page look to the new Libb Thims launched "**Atheism Reviews**" channel (see **atheism timeline**) aimed at bringing some order to the growing physical science vs. religious science debates sprouting up in recent years. The Michelangelo "God vs Gibbs" icon, shown above, indicative of the new frontline in the religion vs science debates, the old front line being "Darwin vs God". Right: the show logo used as table display during show filming of reviews, indicative of the gist view that all that exists is atoms and energy (and god is NOT energy).

Reviews

The following are channel reviews:

> "These fellas on the video are hilarious! Now that's some good drinking!!"
>
> — Christine Torrez (2016), "Thread Comment" (Q) on 13 Nov 2014 "Christian William Craig vs Osiris-Horus Jesus Connection" video

Mottoes | Thematic

The following are seeming mottoes for review styles of AR interjections:

> "We are living in a totally ridiculous world. We have all kinds of things from horoscopes to Zen Buddhism to faith healers to religions to what have you. The whole world around us is full of nonsense, baloney, big speak and what have you. The fact that I'm busy in science has little or nothing to do with religion. In fact, I protect myself, I don't want to have to do with religion. Because once I start with that, I don't know where it will end. But probably I will be **burned** or **shot** or something in the end. I don't want anything to do with it. I talk about things I can observe and other things I can predict and for the rest you can have it."
>
> — Martinus Veltman (2004) interview (Q) with Harold Kroto (quote, 10:05-) (Q)

> "One person with a belief is a social power equal to ninety-nine who have only interests."
>
> — John Mill (c.1855), Publication

> "One horse-**laugh** is worth ten thousand syllogisms."
>
> — Henry Mencken (c.1930) [6]

> "Every great action is **extreme**."
>
> — Francois la Rochefoucauld (c.1865) (Q)

"One of the reasons we atheists have to be **loud and assertive** is that we are floating alone in a vast sea of ignorance."

— Paul Myers (2008), on the so-called atheist misconception [4]

"Pull no punches. If you think I've gone off the track **let me have it straight**."

— Anon (1950), engineering student (Q) querying Einstein on religious-free "purpose"

"It takes the **latter half** of all of one's lifetime to **unlearn** the falsehood that was instilled into us during the earlier half. Generation after generation we learn, unlearn, and re-learn the same lying legendary lore. Henceforth, our studies must begin from the evolutionist standpoint in order that they may not have to be gone over again."

— Gerald Massey (1883), *The Natural Genesis*

"The clash between atheism and religion has become the **defining battle** of the 21st century."

— Nick Spencer (2014), *Atheists: the Origin of Species* (Q)

"There is no God! There is no God! I came to America so I could say that. In my country [Iran], they will kill me if I say it."

— Sadegh Simorgh (2014), response following query by Libb Thims of "Are you a Muslim?", to which he first responded "On my ID card", to which Thims responded "What do you mean?", Oct 31

In other words, in AR interjections, the aim will be to tell it like it is, speaking straight from the shoulder, pulling no punches.

God's energy vs Gibbs energy

See also: God vs Gibbs

A central focus of Atheism Reviews channel, central host Libb Thims being an "assassin of God" (Albert Camus, 1942) "in training", in the great lineage of trained assassins, from Schopenhauer to Nietzsche, and possibly Weininger, is to usurp God's energy with Gibbs energy (see: Gibbs landscape).

"What do you call the person who trains the assassins of God? Goethe."

— Libb Thims (2014), mental reflection note, from posts #42-44, in thread "You can be smart and believe in God?" (Nov 9) on the focus of the Atheism Reviews channel, 10:29AM CST Dec 18

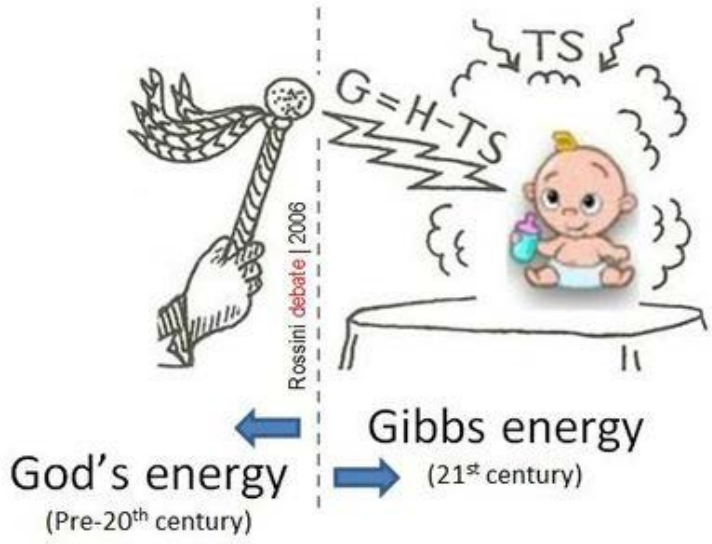

A Gibbs energy vs God's energy diagram, modified from the human free energy of formation page, outlining the gist of the overarching aim of the **Atheism Reviews** channel.

"God is not a magician with a magic wand."

— Pope Francis (2014), speech, Oct 27 (Q) (Q) (V)

The adjacent diagram is a Gibbs energy vs God's energy diagram, modified from the human free energy of formation page.

Mental disjunct

A focus of the channel will be to help amend the following 5,000-year-old and ongoing mental disjunct, which, as the old saying goes, has us "walking backwards into the 21st century":

3100BC

Mental
⟷
Disjunct

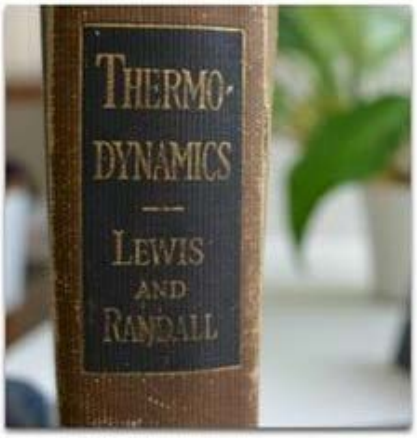

1923

Namely, the disjunct between our 3100 BC religio-mythology transcription and syncretism belief system roots, and the 1923 modern chemical thermodynamics belief system upgrade, as Gilbert Lewis famously clarified.

Molecule formation | Godless

The following shows, top right, shows the formation of a molecule of dicarbonide C_2, from two carbon C atoms, demonstrated via the a floating magnets (O) model, which amounts to but a change, towards stability, in geometrical arrangements of protons and electrons, i.e. "matter", namely fermions (quarks and leptons), held together "forces", namely: bosons (photons):

$C + C \rightarrow C_2$

Godless

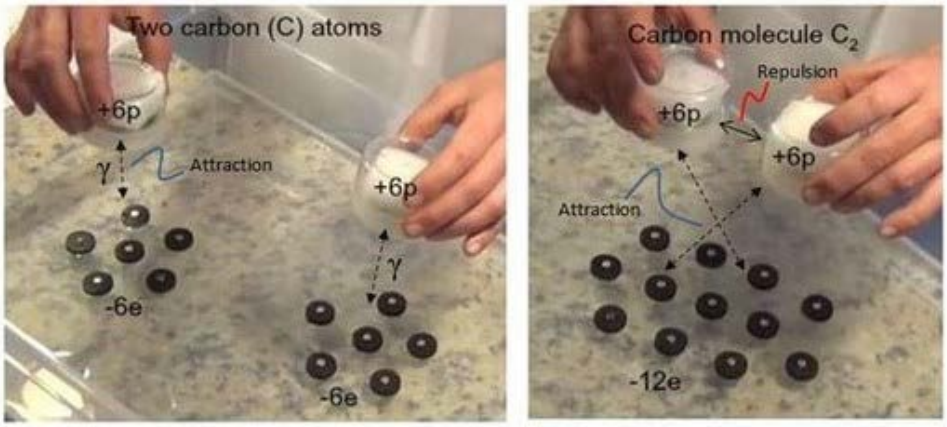

$Hu + Hu \rightarrow Hu_2$

Godless

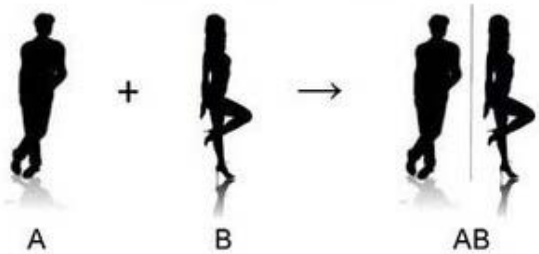

A comparison between a carbon-carbon and a human-human bond forming reaction, both of which are godless, involving but changes in proton-electron photon interaction dynamics.

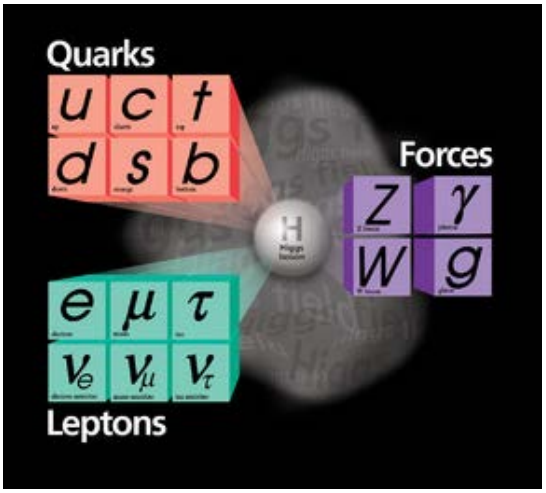

which, scaled up, is no different than when people, as "proton-electron configurations" (George Lundberg, 1939), form dihumanide molecules in marriage, mergers during times of economic deflation, or coalitions during times of war. In both cases, atomic-level and human-level, there is no so-called "god", god principle, or god theories involved. Beliefs converse to this are but reverse-thinking ingrained teachings accrued past the eclipse of Greek philosophy, following the burning of the Library of Alexandria, from whence humanity fell into the dark ages in thinking for some 1,500-years. Those who would seek to invoke god theory or god talk into this picture are but straight "retarted", not in the sense of belonging in the special education class, but retarted in the sense of being impeded in thinking by some near two millennia.

Time length | Aim

An aim, in regards to video length, knowing that debates tend to go into the 1 to 2-hour range, will be to break up debate discussions into digestible viewer consumption bites, aiming for finished reviews to be in the 4 to 7-minute range, symbolic of the four horseman of atheism and the seven visible planets, behind the numbering of the seven god-themed days of the week: Moon's day (Mon), Mars' day (Tue), Mercury's day (Wed), Thor's day [day of Jupiter] (Thu), Frige's day [day of Venus] (Fri), Saturn's day (Sat), Sun's day (Sun); or on a high end to go up to 13-minutes, the number of months in years having a blue moon; of if need be, to go up to 42-minutes, the number of negative confessions involved in the weighting of the soul, which in Christianity rewrite terms became the number of generations between God (Ra) and Jesus (Osiris-Horus).

Another aim, is to stylized AR uploads into an "equals three" (Q) viral debates critique and commentary format, i.e. pick three hot debate interjections, per upload, and analyze them per Ray William Johnson attention grabbing format.

Atheism channels

See main: Top YouTube atheism channels

The following are a selection of the top ten of top "atheism channels" in YouTube that upload some debate-like videos, and or atheism discussions or topics, ranked by views per sub (v/s):

1. The Atheist Voice (6 Jun 2013) 7.2M views | 100K subs (72 v/s)
2. GenerationXeroFilms (18 Jun 2008) 1.2M views | 14K subs (85 v/s)

Left: YouTube was launched on 14 Feb 2005 after which atheism channels and communities began to emerge and form, one of the earliest being The Amazing Atheist, launched in 2006.

Right: a 1 Oct 2014 photo of the new **Atheism Reviews** broadcast table, showing molecules-to-man evolution, on the left, and God vs Gibbs conflict, on the right.

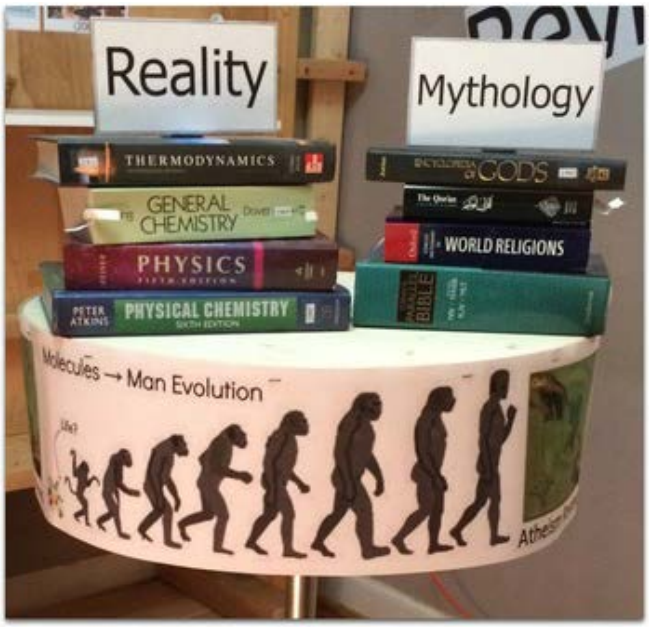

3. Evid3nc3 (8 Nov 2007) 4M views | 42K subs (95 v/s)
4. Christina Rad (20 Sep 2008) 10M views | 99K subs (101 v/s)
5. CultOfDusty (9 Dec 2008) 19M views | 179K subs (106 v/s)
6. AronRa (24 Aug 2006) | 13M views | 110k subs (118v/s) (Q) (Q)
7. FactVsReligion (13 May 2008) 3M views | 25K subs (120 v/s)
8. JaclynGlenn (22 Mar 2011) 16M views | 237K subs (126 v/s)
9. The Thinking Atheist (27 May 2009) 23M views | 181K subs (127 v/s)
10. The Atheist Experience (30 Sep 2008) 16M views | 122K subs (131 v/s)

(add discussion)

IQ | Studies

See main: Religion and intelligence

In respect to IQ and religiousity, firstly, 2013 meta-analysis studies, find that religious people tend to be less intelligent, i.e. have a lower general intelligence, that atheists: specifically, team led by Miron Zuckerman of the University of Rochester found "a reliable negative relation between intelligence and religiosity" in 53 out of 63 studies. (Q) Secondly, 2010 Pew research polls, found, via polls multiple answer testing on basic religious questions, find that atheists have a higher "religious IQ" than religious people. (Q)

Morality | Studies

In respect to morality and religiosity, 2014 studies find that religion doesn't make people more moral. (Q) Likewise, a 2002 study of religion and public life found that "irreligious tend to be more ethical than their religious peers, particularly compared with those who describe themselves as very religious." (Q)

Playlist

See main: Atheism Reviews playlist

The following are the slated first videos for Atheist Review productions, the "IJ" short for interjection points:

1. Atheism timeline | Video
2. Review: Sam Harris and Michael Shermer vs Deepak Chopra (2010) (Q)

Left: a depiction of Baron d'Holbach's famous "all children are born atheists" quote, about how religion is ingrained into the mind at birth, and how, as Gerald Massey (1883) points out, "it takes the latter half of all of one's lifetime to unlearn the falsehood." Right: the first introduction video to **Atheism Reviews** made on 15 Sep 2014.

IJ1:1:24 (ontic opening); IJ2: 2:29 (new age, quantum consciousness, thermodynamics); IJ3:2:56 (woo woo physics, Ryan Grannell) (Q); IJ4:4:14 (non-locality, connected universe); IJ5:5:07 (ad homonym); IJ6:5:55 (credentiality, Buffett number, Moriarty-Thims debate, 8-degrees problem [George Scott]; IJ7:7:19 (Einstein: "Science without religion is lame, religion without science is blind"); IJ8:7:32 (Hawking: "It would be very difficult to explain how the universe should ["would" Chopra] have begun in just this way except as the act of a God who intended to create beings like us", anthropic principle); IJ9:7:51 (misattribution, anachronism [Robert Doyle]); IJ10:8:08 (God-given: insight, inspiration, creativity, free will, conscious choice, imagination … "are your neurons doing that or are you doing that?"); IJ11:8:36 (personal god), IJ12:9:23 (closeted atheists issue: 95 percent of AAS members are atheists, but "they do not like to say so" as Napoleon found); IJ13:10:27 (public embarrassment). [3]

Location: Caltech. Date: 23 Mar 2010. Topic: the question: "Does God Have a Future?", presented by ABC's Nightline. Participants: Sam Harris and Michael Shermer vs Deepak Chopra and Jean Houston. Moderator: Dan Harris.

(add discussion)

Thims | Extreme atheist

Three of **Atheism Reviews** channel founder Libb Thims unfinished draft manuscripts, each touching on either implicit and or explicit atheism concerns and issues. [2]

The long and the short of American electrochemical engineer Libb Thims' belief system is that he believes in chemical thermodynamics over that of the Bible, and has since been characterized by his religious debater antagonists as an "extreme atheist" and materialist or strong atheist, among labels. In terms of implicit and or explicit atheism-touching precursor book publications, three draft-level publications, shown adjacent, include: *Purpose? (in a Godless universe)* (2011), *Elective Affinities: Illustrated, Annotated, and Decoded* (2012), and *Chemical Thermodynamics: with Applications in the Humanities* (2013), each presently unfinished, are each barred up, so to speak, with the Gordian knot issue of God's embeddedness in the minds of people, i.e. it is not so easy in social mechanics, as Laplace did with his 1802 celestial mechanics, to dismiss the god issue, with the passing off-hand statement "I had no need of that hypothesis" (see: Napoleon Laplace anecdote). [2]

Nye-Beg goad | Origin | Etymology

See also: Atheism timeline

The Atheism Reviews YouTube channel was launched or rather initiated, by American electrochemical engineer Libb Thims, on 11 Sep 2014, ironically, by coincidence, on the 13th anniversary of the 2001 9/11 attack, an act which ushered in the so-called "new atheism" era, a significant stopping point on the atheism timeline, the slated-to-be first video for the new channel.

At some point prior to this, Thims began discussing, with his outspoken atheist friend Pat—who to note, when queried on 20 Apr 2014, about what, on the Easter's day, as an atheist, he believes in, responded with: "Energy. You have sex, there's friction … that's heat. Then a baby shoots out. It's all energy. The sun's a giant orgasm. Like if you see a hot girl ... and she's soo hot, you can't even touch that s**t. You're like daaammn! "—the possibility of doing a YouTube channel entitled "Atheist Dialogues", with "Traveling Atheist" segments, etc.

On circa July 7th, Pat suggested to Thims that he and his younger brother, aka "Junior Atheist", a recent law school graduate, come over on Monday July 14th to discuss atheism. This prompted Thims into the idea that the three of them go the Wisconsin Dells waterparks, drink some beers, ride the lazy river, sit in the hot tub, and discuss atheism in the form of a first annual "atheism convention". This plan actualized, albeit with the exception that Art, aka "God Believer" (DN:2) came, along with two other girls and one guy, who were typical Americans, i.e. religious, in some form or another, in place of Junior Atheist, and owing to the new dynamics—e.g. one girl was deeply religious (her eyes began to water when godlessness was mentioned)—partying ensued and not much atheism was discussed.

The possible tipping point for the visualized need for such a channel seems to have been the circa May/Jun 2014 comment by Dave (DN:6), pictured adjacent, to Libb Thims, "hey have you seen the new Bill Nye

vs Creation museum guy debate?", after which, Thims saw how utterly failing Nye, an electrical engineer like Thims, was in addressing Ken Ham's concerns and objections, e.g. citing nearly childlike evidence of counting California tree rings as being evidence that the earth is more than 5,000-years old. The first rebuttal in the Bill Nye vs Ken Ham was also one of the goads into the launch of Atheism Reviews; as one reviewer put it fairly aptly: (O)

Atheism Reviews host Libb Thims, known as an extreme atheist (2011), at 2:41 AM Aug 25th 2014, trying to get Pat, aka King Atheist, Atheism reviews co-host, to "pray to God", on one of the ten knee-pad extending Korean church chairs the good Lord gracious gave us [i.e. the one's Libb swiped from the alley a few hours before the party] the night of the 4th Annual Summer Party. In the back: party goers Dave throwing up his Christian "C" gang signs, and, in the middle: Lawrence keepin' it real! Numbers shown being each person's self-estimated number on the Dawkins scale of belief in the existence of God. Top right: the **Atheism Reviews** recording studio, the molecular evolution table shown at right; photos of Johann Goethe (1784), Erasmus Darwin (1794), Etienne Saint-Hilaire (1833), the three core "pre-Darwianian" evolutionists, and Charles Darwin (1859). Bottom right: the Atheism Reviews Adidas Polo T-shirt (O) with molecules-to-man evolution AR logo, worn by host Libb Thims and co-host Pat. A "Keep Calm and Trust God" shirt (O) was ordered for God-believers.

> "Nye seemed to embody the typically naive scientist-type about to debate the religious for the first time: 'Science is obviously right', 'this guy's beliefs are obviously cuckoo', so 'what, me worry?' Nye strikes me as totally unprepared for the type of tactics he is about to encounter, and he speaks at a pace 3-times slower than the average creationist debater, so you can just see the creationist audience ticking off all of Ham's arguments he won't get to."

The 9 Sep 2014 Mirza Beg dialogue, post #22, about whether or not recanting his Islamic beliefs, in part, in order to side with an atheist physical chemistry description of the humanities would "drive him insane", trigged Thims into writing the articles: insanity and genius, God is dead, Gibbs energy, God vs Gibbs, and in turn the atheism timeline, the viewing which seemed to trigger into inception the Atheism Reviews channel.

Atheism Reviews, in some sense, is a spinoff of the 2007-launched Google Partnered channel Human Chemistry 101 (1K+ subscribers, 2M+ views), which tended to draw subscribers from three areas of interest, namely:

a. Hmolscience
b. Genius rankings
c. Atheism / Religio-mythology

Some of the historical atheism-centric / religio-mythology videos from the 61+ videos made so far via this channel, view counts as of 12 Sep 2014, include:

- What's your Dawkins number? (1 Nov 2011) | 2,061+ views
- Egyptology of Jesus Christ (8 Dec 2010) | 1,785+ views
- Life-death cycle (21 Mar 2011) | 548+ views
- Feynman on existence and purpose (11 Nov 2010) | 35,646+ views
- We can't just come from nothin' (5 Nov 2010) | 492+ views
- God = mythology (4 Nov 2010) | 1,248+ views

Atheism Reviews is aimed to be a channel focused on the latter subject, the atheistic view being implicit, in the former channel, made explicit in the new channel, aimed centrally at giving peer review to the growing physical scientists vs religious philosopher debates, seen emerging in recent years, including: English physical chemist Peter Atkins vs William Craig (1998), American physicist Lawrence Krauss vs Deepak Chopra (2013), and American electrical engineer Bill Nye vs Ken Ham (2014), American biomedical scientist Jaclyn Glenn vs Muslim (2014), and English biologist Richard Dawkins vs everybody, particularly after the publication of his *The God Delusion* (2006), to name a few; not to mention digressions on general "hot topic" atheism issues and dialogues seen in recent years.

New atheism

A depiction of some of the so-called "new atheists" making headlines into the 21st century.

The following is an image of some of the so-called "new atheists" of recent years, showing, from left to right: American comedian Penn Jillette, astrophysicist Neil Tyson (technically an agnostic, per self-declaration), American comedian Bill Maher, an self-labeled agnostic noted for his film *Religulous* (2008), American physicist Lawrence Krauss, an atheism advocate, debater, and writer (*A Universe from Nothing*, 2012) since at least 2009, British-born American Christopher Hitchens, a writer (*God is Not Great*, 2007) and debater, American Sam Harris, an author (*The End of Faith*, 2004), who wants to jettison Christianity and Islam for Eastern spirituality, American Darwinism writer Daniel Dennett, noted for his *Darwin's Dangerous Idea* (1996) and *Breaking the Spell* (2007), English biologist Richard Dawkins, the leading 21st century atheism debater, known for his *The Selfish Gene* (1976), *The Blind Watchmaker* (1986), and *The God Delusion* (2006), English comedian Ricky Gervais, a popular atheism quote poster boy, so-to-say, and Somalian-born Dutch screen writer and atheist activist Ayaan Hirsi Magan Ali, known for her views critical of Islam, practices of circumcision and female genital cutting also known for her screenplay for Theo van Gogh's movie *Submission* which led to death threats, resulting in the director's murder. While the above group is commendable for paving the way, one of the inherent issues with this group is none are trained the physicochemical sciences, hence their punches lack power.

Progress report

The following shows the developmental timeline of the Atheism Reviews channel:

- 11 Sep 2014 – Initiated channel at YouTube.
- 14 Nov 2014 – Intro + 5 videos: 416 views | 10 subs (42 v/s) | 40± views/day.

Descent into idiocy

See main: Creationism scientists ranked by idiocy

The following is a general rule of thumb motto in regards to AR mindset:

> "We do not have to visit a madhouse to find disordered minds; our planet is the mental institution of the universe."
>
> — Johann Goethe (1830), variant (Q) of conversations (Q)

In other words, ventures into "religion vs science" debates tend, more often than not, to be a "decent into idiocy":

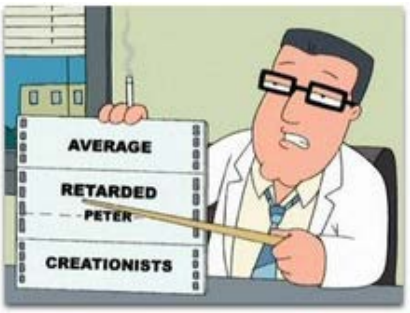

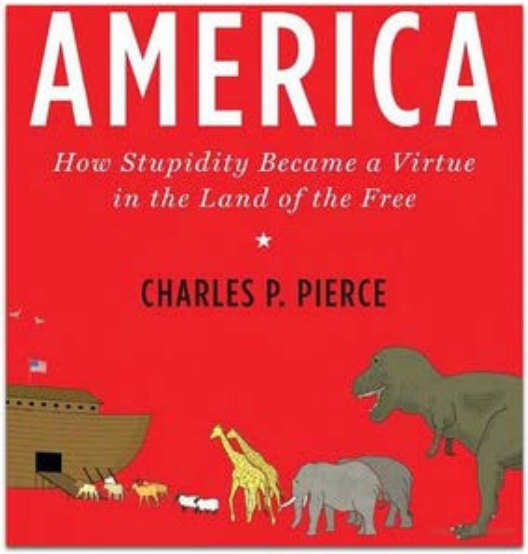

One of the inherent problems of engaging—for scientists in particular—into religion vs science, filled with "god talk" laced debates, is that it invariably becomes a straight drop into idiocy land, discussions beyond inanity (see: creationist scientists ranked by idiocy), and nonplus. [5]

> “I lost 5 IQ points reading Strobel's book, which was nothing more than mindless propaganda.”
>
> — Anon (2003), commentary on Strobel’s *The Case For Christ* (Q)

tending towards discussions soaked with inanity, filled with talk of "flying horses", e.g. Muslim Mirza Beg (2014) (Q), battling with physicochemical materialist Libb Thims, and "walking on water", e.g. Christian William Gladstone (1894) (Q), battling with materialist Thomas Huxley, and also objection raised by Iranian-born American Christian (Isho) to Thims (2014), among other possible examples in the so-called "impossibilities debate", as Gladstone seemed to name the topic.

The Christian kid in first slated video, e.g. cited American atheist turned pastor and journalist Lee Strobel's 2004 *The Case for a Creator*, cover shown below (left), with title overlaid on images of molecules, which in turn, per Google "people also searched for" recommendations, shown below (right), leads to more idiocy, namely 20 more books advocating for god theory in the face of modern science:

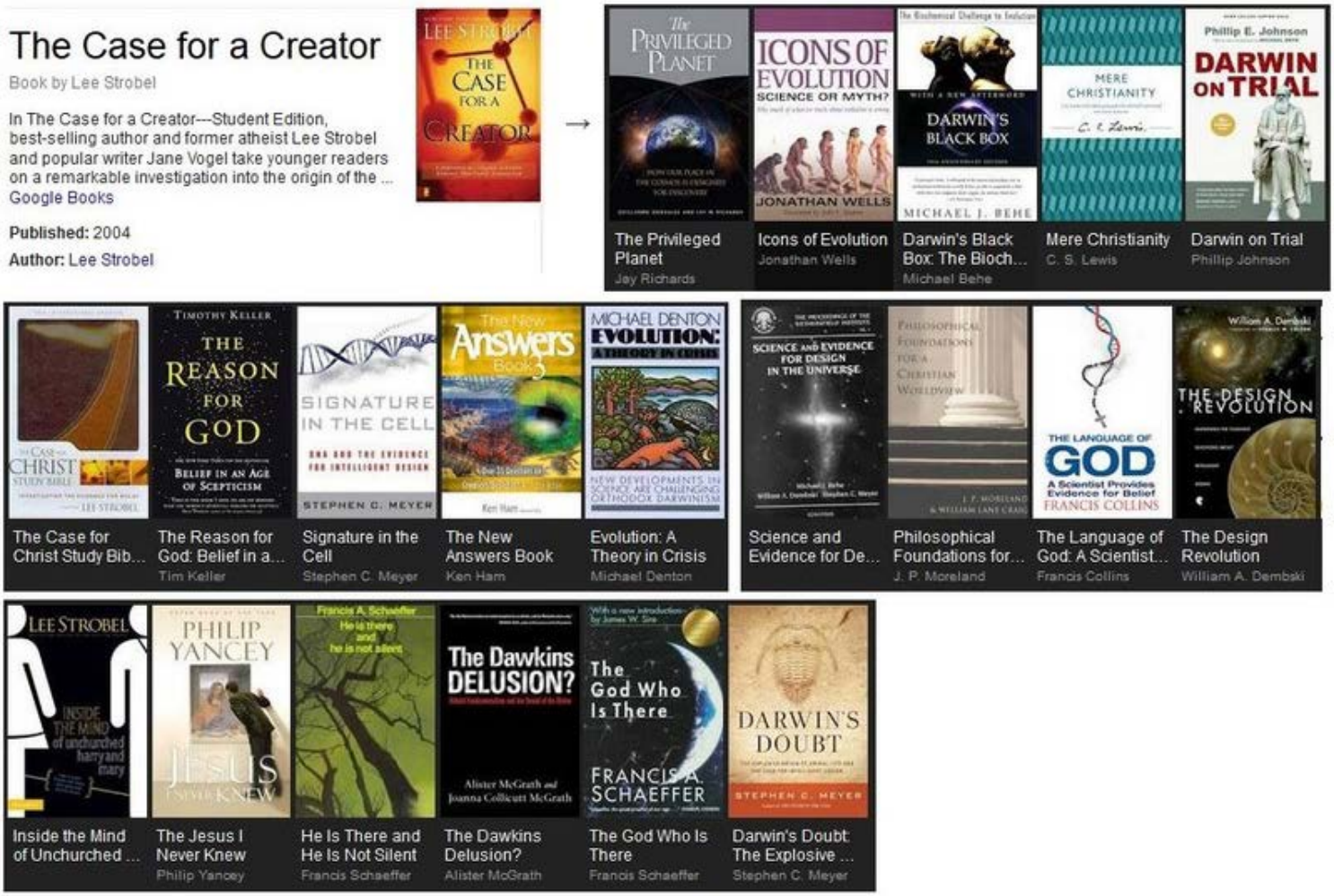

(add discussion)

References

1. Atheism Reviews – YouTube.
2. (a) Thims, Libb. (2011). *Purpose? (in a Godless universe)*. (94-pg manuscript) (unfinished); Online as 105-page unfinished manuscript (14 Apr 2013). IoHT publications.

(b) Thims, Libb. (2011). *Elective Affinities: Illustrated, Annotated, and Decoded*. Publisher.
(c) Thims, Libb. (2013-15/16). *Chemical Thermodynamics: with Applications in the Humanities* (42-intro + 55-draft pages: pdf) (§:Religion | Belief conflicts, pgs. 26-28) . Publisher.
3. Hawking, Stephen. (1996). *The Illustrated: A Brief History of Time* (pg. 163). New York: Bantam Books.

Left: a God-believer shirt for guest appearance theists. Right: an Atheism Reviews logo.

4. Myers, Paul Z. (2008). "Actually, it's theists who believe in nothing, quite fervently" (Q), Pharyngula, *ScienceBlogs.com*, Mar 7.
5. Pierce, Charles P. (2009). *Idiot America: How Stupidity Became a Virtue in the Land of the Free*. Random House.
6. Murdock, Dorothy M. (aka Acharya S.). (1999). *The Christ Conspiracy: the Greatest Story Ever Sold* (pg. vi). Adventures Unlimited.

External links

- Atheism | Libb Thims – Pinterest.
- History of atheism (2012) – FrankLLudwig.com.
- The Big List O' Debates (600+) – Blod.AlwaysData.net.

θΔics

In debates, **Atheism Reviews debates chronology** is []

Debates

The following is a work-in-progress chronological listing of atheism-centric relevant debates slated to be reviewed by Atheism Reviews or already reviewed:

#	Year	Mo	Atheist | Agnostic	Theist	Topic	Vid	Aud	AR: Date/link
	2009	Mar,18	Richard Carrier	William Craig	Did Jesus rise of the Dead?	(Ñº)	(Ñº,Ñº)	

External links

â— The Big List O' Debates (600+) – Blod.AlwaysData.net.

θΔics

In video channels, **Atheism Reviews playlist** is the video playlist for the Atheism Reviews channel.

● What's wrong with star dust oppressing star dust? (2012) | Riptime @ 2:21 (Q)

Recent

● Jesus vs Cesar or Alexander? | Idiot America (2013) | IJ1:2:46 (Q)

● Lawrence Krauss on Science Based Morality (2014) (Q)

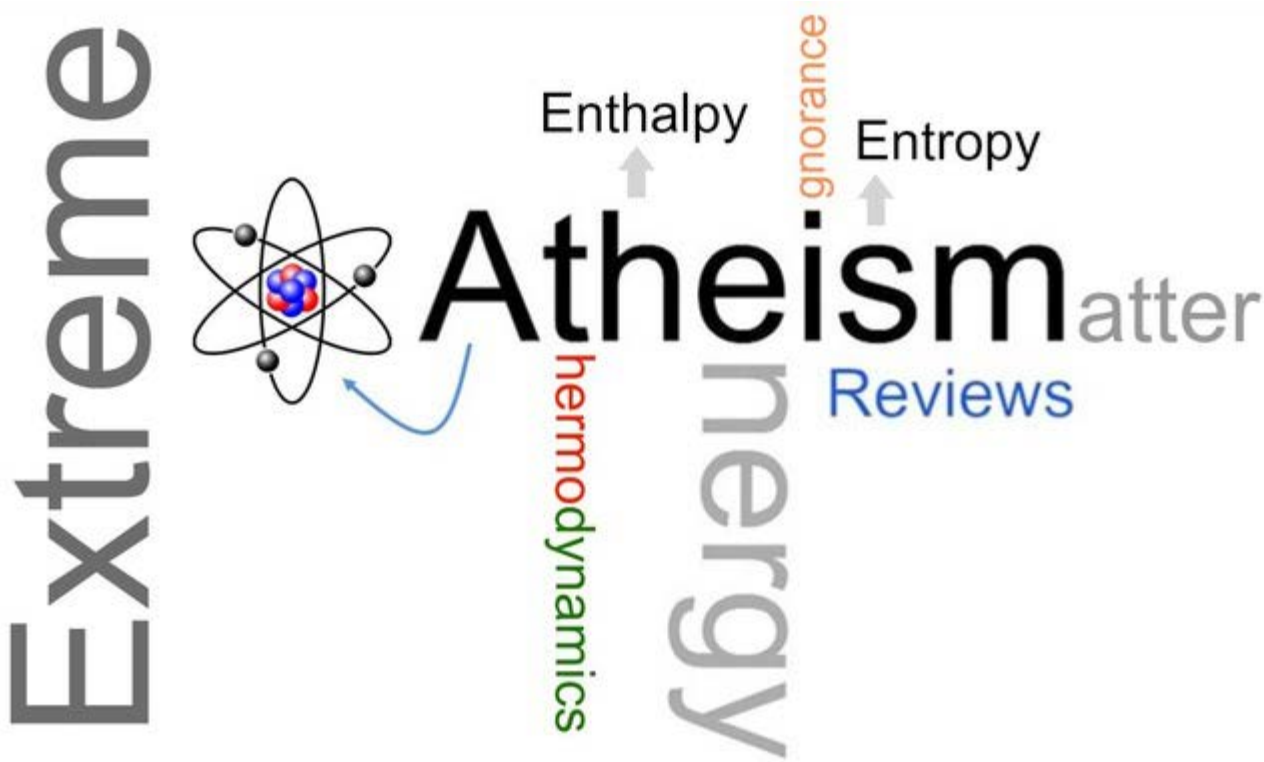

A screen image for the word scramble mnemonic for the belief system of modern "extreme atheism" (aka extreme realism), which is the driving force behind the Atheism Reviews show, namely:

A | **A**tomic theory: all atheists believe in the existence of atoms.
T | **T**hermodynamics: belief that the universe operates according to the laws of thermodynamics.
H | Enthalpy (**H**), aka "heat content": belief it is the measure of security in society, per the Rossini hypothesis.
E | **E**nergy: belief that everything can be boiled down it, per mass-energy equivalency $E = mc^2$.
I | **I**gnorance: an understanding that 99% of people are ignorant to either thermodynamics or religio-mythology.
S | Entropy (**S**): belief that it is the measure of freedom in society, per the Rossini hypothesis.
M | **M**atter: all atheists are materialists, i.e. believe in the existence of matter (or transformations per $E = mc^2$).

● Lawrence Krauss vs Michael Behe (2005) | Reviewed (Q)
● Michael Shermer vs Stephen Meyer (2005) | Reviewed (Q)

● David Silverman (2015), being queried about atheistic morality, conservatism, founding fathers, the atheist leader murder supposition (e.g. Stalin, Pol Pot, Hitler, etc.) etc., at the CPAC 2015 convention (Q)

Mar-Apr | 2015

● Examining the stigma of atheism | CNN (Q)

● Bill O'Reilly vs Richard Dawkins (Q)

● Hannity (Christian) vs. David Silverman (atheist) (Q)
● Hannity (Christian) vs. Hitchens (atheist) (Q)

● Dawkins vs Lennox (Q)
● A Muslim Who Hates Atheists | Richard Dawkins (Q)
● Muslim vs Confused Theist | First Cause (Q) (Q)

● Christopher Hitchens (Atheist) vs Frank Turek (Christian) | Debate One (2008) (Q)

Thor picks

The following are Thor picks:

● Frank Turek (Christian) vs Dennis Normark (Nontheist) | 2014 (Q) (Q)

Drafts | Storage

The following are older draft video possibilities:

● AR playlist 1
● AR playlist 2
● AR playlist 3 | 97+ shows (drafts | archives)

See also

● Atheism Reviews playlist | Published

θΔics

In videos, **Atheism Reviews playlist (published)** is the list of published videos by the YouTube Atheism Reviews channel hosted by American extreme atheist and electrochemical engineer Libb Thims.

List

The following listing are completed and uploaded Atheism Reviews videos—those wherein either co-host Pat aka King Atheist, or other special guests, are in the studio, are shown as indicated. Filming dates are in Goethean calendar years.

#	Title	YouTube	Original	Filmed	Published	Co-Host[s]/Guest[s]	Draft Notes / Page anchors
	Atheism Reviews | Intro	[Q]			15 Sep 2014		
1.	History of atheism | Timeline	[Q]			5 Nov 2014	King	Atheism timeline, famous atheists
2.	Why belief in Atomic Theory leads to Atheism	[Q]			6 Nov 2014	King	Atomic theory
3.	Christian comedian Brad Stine vs atheists | In God We Trust	[Q]	2005	11 Nov 264 AG	12 Nov 2014	King, Lawyer	Material: (Q) | IJ1(1:18) | Followed by: (Q); MP3 (Q)
4.	Allah-based Islam vs Chance-based atheism	[Q]	13 Feb 2014	11 Nov 264 AG	12 Nov 2014	King, Baby Darwin	Material: (Q) (Q) (Q)
5.	Christian William Craig vs Osiris-Horus Jesus connection	[Q]	2012	11 Nov 264 AG	13 Nov 2014	King, Baby Darwin, Persian Princess	Material: (Q) | IJ1(0:46) "that's just based on misinformation"; IJ2(1:04): "they never quote the primary sources"
6.	Top 20 YouTube Atheism Channels | 2014	[Q]		18-19 Nov 264	19 Nov 2014		YouTube atheism channels
7.	Gingers DON'T have souls | Neither do YOU!	[Q]	14 Jan 2010		21 Nov 2014		Soulless bag of chemicals
8.	An Atheist Interviews a Free Spirit	[Q]		27 Nov 2014	12 Dec 2014	Bam	
9.	Why Atheism Doesn't Make Sense!!! What?	[Q]	29 Feb 2013			King, Big Pun, Bam, Lawyer, King Jew	(Q)
10.	10 Biggest Lies	[Q]			16 Dec		
11.	Atheists Are Under Attack! | Sam Harris vs Reza Aslan (2014)	[Q]			17 Dec		Semi done: (Q)
12.	Napoleon Laplace Anecdote	[Q]					
13.	God or god? | Capitalization psychology	[Q]					

14.	God and the fine tuning constant argument | Robert Rosenkranz	[Q]	2013	24 Dec	Intro done: (Q)
15.		[O]			
16.		[O]			
17.		[O]			
18.					
19.					
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21.					
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23.					
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25.					

(add discussion)

See also

- Atheism Reviews playlist

θΔics

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Libb Thims (2009), "Email to Georgi Gladyshev", Jan 2

"I am under the view, that the term **'life' is a defunct scientific theory**.

You agree with me that the single atom is not alive. What about two atoms? What about three?

Does a bound state of atoms have to have a certain movement to be considered alive?

What if **we heat** a system of four atoms, do they suddenly become alive? What **if we subject a system of atoms to both gravitational and electromagnetic forces, does that suddenly make them alive?** What if the two forces act to move smaller atoms through the cavities of larger atoms on a cyclical basis, thus activating reactions [metabolism] in the process, does that make them alive?

What if the two forces begin to arrange the atoms into hierarchies, and that smaller atoms and bundles of atoms begin to move between the hierarchies, does that make them alive? What if a structure of atoms, begin to **turnover their internal atoms** [turnover rate], with those of the surrounding space, on a cyclical basis, does that make it alive?

It is very obvious that one atom is not alive. It is very obvious that two atoms are not alive. It is very obvious that three atoms are not alive. **It is very obvious that four atoms are not alive.** If we continue this logic onward, it should be very obvious that no matter how many atoms one adds to the argument that an atom or a structure made of two or more atoms cannot be alive.

It is my view that one cannot define an atom or two or more atoms structured as a bound state to be alive. **The word itself and baggage of theory surrounding the word is meaningless.** It is akin to the words: vitalism, élan

vital, hylozoism, panpsychism, etc."

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"For any particular **thing**, ask: What is it in itself? What is its nature?"

— Marcus Aurelius (167), *Meditations*

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"There is present in all **things** a natural desire to exist in the best manner in which the condition of each thing's nature permits this. And [we see that all things] act toward this end and have instruments adapted thereto. They have an innate sense of judgment which serves the purpose of knowing.

[They have this] in order that their desire not be in vain but be able to attain rest in that [respective] object which is desired by the propensity of each thing's own nature."

— Nicholas of Cusa (1660), *Learned Ignorance*

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"Science is written in the **language of mathematics** and its characters are triangles, circles, and other geometric figures, without which it is humanly impossible to understand a single word of it; without these, one is wandering about in a dark labyrinth."

— Galileo Galilei (1623)

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"It seems from what we hear on all sides that the Christian religion is a huge blunder; that the Mosaic account of the creation is an absurdity large enough to throw all nations into rollicking guffaw; that Adam and Eve never existed; that **the ancient flood and Noah's ark were impossibilities**; that there never was a miracle; that the Bible is the friend of cruelty, of murder, of polygamy, of all forms of base crime; that the Christian religion is woman's tyrant and man's stultification; that the Bible from lid to lid is a fable, a cruelty, a humbug, a sham, a lie."

— Robert Ingersoll (c.1882), "The Plague of Infidelity" (Ñº)

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"An individual in a society is like a drop in a glass of water or a molecule [H_2O] in a drop. One molecule cannot be identified from the other, yet there are scores of interacting forces on each molecule, in this case the smallest particle of water which is incapable of independent existence without these forces. The interacting forces are both attractive and repulsive. The smallest unit of a society, an individual, is incapable of independent existence by virtue of his being a social animal and there [being] a large number of interacting constraints on him."

— Mirza Beg (1987), *New Dimensions in Society: a Physico-Chemical Approach to Human Behavior*

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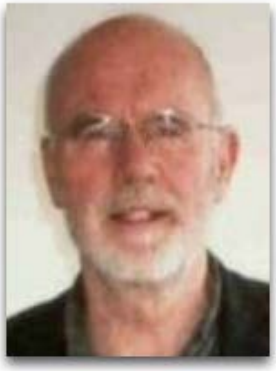

"The state of large stochastic systems of N objects may be calculated by the Lagrange principle L(N) = T log P(N) + E(N) → maximum ! P is the probability, that is to be maximized under a system condition E, and T is the Lagrange ordering parameter. L is the Lagrange function of the system, that may be far away or close to stability. At equilibrium the Lagrange function is at maximum. In natural sciences E is given by the **chemical bonds** and the (negative) Lagrange function corresponds to the **free energy** [G], from which all thermodynamic states may be calculated. In **social systems**, the Lagrange principle corresponds to the common benefit. The function E represents the **social bonds** of the system."

— Jurgen Mimkes (2002), "The Structure of Complex Systems: Thermodynamics, Socio-Economics", ZiF SocioPhysics Conference, Germany

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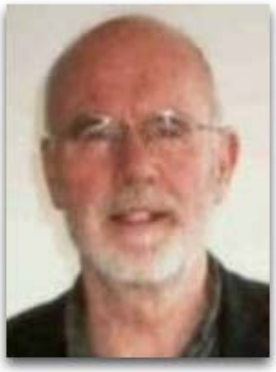

"The thermodynamic formulation of social laws is based on the law of statistics under constraints, the Lagrange principle. This law is called 'free energy principle' in physics and has been applied successfully to all fields to all fields of natural science. In social sciences it may be called the 'principle of maximal happiness' of societies. The principle **may be applied** to collective and individual behavior of social, political or religious groups."

— Jurgen Mimkes (2006), "A Thermodynamic Formulation of Social Science"

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"Why is defining life so frustratingly difficult? Because life is a concept that we invented. On the most fundamental level, all matter that exists is an arrangement of atoms and their constituent particles. There is **NO** threshold at which a collection of atoms **suddenly becomes alive**, no categorical distinction between the living and inanimate, no Frankensteinian spark. We have failed to define life because there was never anything to define in the first place."

— Ferris Jabr (2013), "Why Life Does Not Really Exist"

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"I read works by Thomas of Kempis (c.1380-1471) and Saint Augustine and concluded by age 24 [1957] that I could not believe anything supernatural."

— Alfred Rogers (2014), Email to Libb Thims, Nov 21

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"**Life does not exist** . I arrived at this idea, in the 1990s [circa age 62], by realizing that what we call life can go through periods of being non-life, a seed, e.g., being dormant for hundreds of years. Life, such as tobacco molds can be produced from non-life. It then appears that the difference is complexity rather than something intrinsic. I do not believe a hydrogen atom is alive."

— Alfred Rogers (2010), LifeDoesNotExist.com

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"The question of life emerged in the obtuse reasons for the beginning of life in biological and evolutionary studies. My studies in biology exposed me to arbitrary descriptions of life and I concluded that 'life' and 'non-life' were essentially the same. I concluded then that there were no essential differences between 'life' and 'non-life.' It also appeared that the perceived difference was complexity. Old Faithful has life-like movement but is easier to understand than a paramecium."

— Alfred Rogers (2014), Email to Libb Thims, Nov 4

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"I am interested in how people 'will react' to the idea that

the difference between life and non-life is only a matter of complexity."

— Alfred Rogers (2014), email to Libb Thims, Nov 4

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"Each of us from a purely physical standpoint is a large batch atoms."

— Paul Aebersold (1949), "Atomic Energy Benefits: Radioisotopes"

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[Henry Adams]

"The time may come when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry … then it may be possible, as Adams suggests, to invent a common formula for thermodynamics and history."

— William Thayer (1918), American historian

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"In a world of physics and chemistry, how could things like **moral** obligations or values really exist?"

— Sam Harris (2010), *The Moral Landscape*

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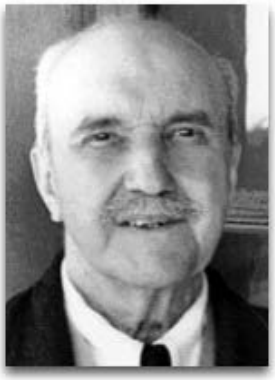

"Faith in the supernatural is a desperate wager made by man at the lowest ebb of his fortunes."

— George Santayana (c.1920), "Supernaturalism"

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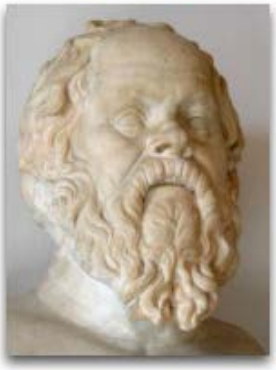

"When the debate is lost, slander becomes the tool of the loser."

— Socrates (c.410BC)

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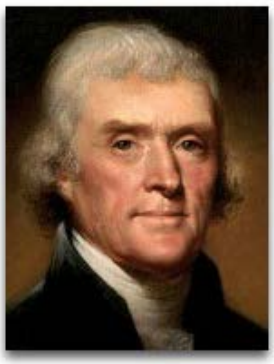

"As you say of yourself, I too am an Epicurian. I consider the genuine (not the imputed) doctrines of Epicurus as containing everything rational in moral philosophy which Greece and Rome have left us."

— Thomas Jefferson (1819), "Letter to William Short", Oct 31

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"Actually, it's theists who believe in nothing, quite fervently."

— Paul Myers (2008)

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"Whatever we once were, we are no longer just a Christian nation; we are also a Jewish nation, a Muslim nation, a Buddhist nation, a Hindu nation, and a **nation of nonbelievers** [ATHEISTS]. And even if we did have only Christians in our midst, if we expelled every non-Christian from the United States of America, whose Christianity would we teach in the schools? Would we go with James Dobson's, or Al Sharpton's? Which passages of Scripture should guide our public policy? Should we go with **Leviticus**, which suggests slavery is OK and that eating shellfish is abomination?"

— Barack Obama (2006), "Faith and Politics", Jun 28

d

"Some Christian lawyers—some eminent and stupid judges—have said and still say, that the Ten Commandments are the foundation of all law. Nothing could be more absurd."

— Robert Ingersoll (1894), *About the Holy Bible*

d

"In a world where there is no god, where you and are just molecules in motion, why am I obligated to be rational?"

— Dustin Segers (2012), Reason Rally debate, Mar 24

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"I'm an atheist. I regard religion with fear and suspicion. It's not enough to say that I don't believe in God. I actually regard the system as distressing: I am offended by some of the things said in the Bible and the Qur'an, and I refute them."

— Emma Thompson (2008), "Acting on Outspoken Beliefs", Oct 15

"One day the natural sciences, chemistry in particular, will dissolved the Christian world view in a vat of nitric acid."

— Ludwig Feuerbach (1850), *The Natural Sciences and the Revolution*

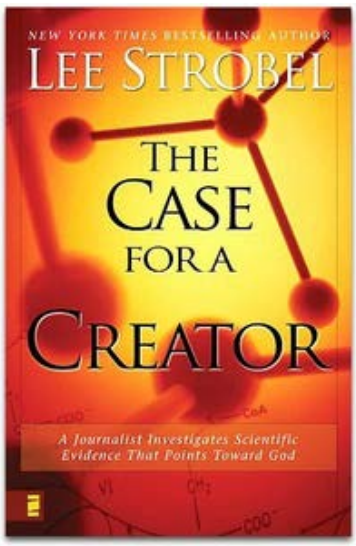

"If **Darwinism** is true, then there are five inescapable

conclusions: 1) there's no evidence for god, 2) there's no life after death, 3) there's no absolute foundation for right or wrong, 4) there's no ultimate meaning for life, and 5) people don't really have free will."

— William Provine (1988), as summarized by Lee Strobel (*The Case for a Creator*, 2004)

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"I believe in energy. You have sex, there's friction … that's heat. Then a baby shoots out. It's all energy. The sun's a giant orgasm. Like if you see a hot girl ... and she's soo hot, you can't even touch that sh*t. You're like daaammn! "

— Pat Fergus (2014), when queried on Easter about what, as an atheist, he believes in, Apr 20

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"There's no soul; that's garbage."

— Pat Fergus (2014), response to query: 'what is the soul comprised of?', Sep 28

"God's only excuse is that he does not exist."

— Stendhal (c.1820)

"Stendhal's 'god's only excuse' statement is the best atheism joke ever! I'm only jealous of not having thought of it first."

— Friedrich Nietzsche (1888), *Ecce Homo*,

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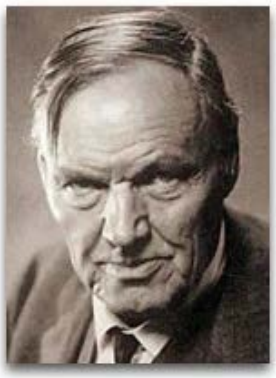

"Do you, good people, believe that Adam and Eve were created in the Garden of Eden and that they were forbidden to eat from the tree of knowledge? I do. The church has always been afraid of that tree. It still is afraid of knowledge. Some of you say religion makes people happy. So does laughing gas. So does whiskey. I believe in the brain of man."

— Clarence Darrow (c.1925)

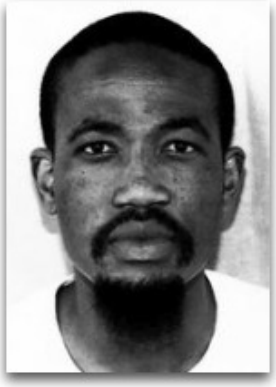

"In the Bible, a woman was made from a man. In real life, a man is made from a woman."

— Mokokoma Mokhonoana (c.2010)

"**Beauty** is a manifestation of secret natural laws, which otherwise would have been hidden from us forever, and **morality** is found in the symbols of physical chemistry."

— Goethe (c.1809)

d

d

"The Bible. That is what fools have written, what imbeciles command, what rogues teach, and the young children are made to learn by heart."

— Voltaire (c.1750)

"Pascal and Voltaire both probably had IQs in the neighborhood of 200."

— Paul Popenoe (1927), "The Childhood of Genius: A Review"

d

"Thus humans [are] **molecules** [that] gravitate toward one another through association, which generates **heat**, which produces **motion**, which in turn constitutes progress. This [social] gravitation is measurable through physical laws of direct ratio to mass and inverse ratio to distance. [Social] centralization and decentralization come about through the operation of centripetal and centrifugal **forces**."

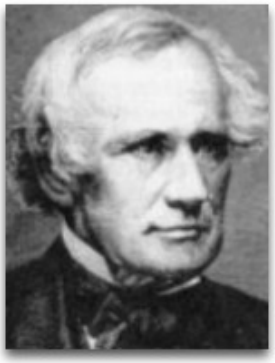

— Henry Carey (1858), views summarized by Howard W. Odum, 1929

d

The atheist sin problem:

"The '**sin problem**' is something you can't solve. [Namely] This 'conscience' thing, we just dreamed it up. There's no right, there's no wrong, there's no good, there's no evil."

— Phil Robertson (2015), Duck Dynasty star, "11th Annual Vero Beach Prayer Breakfast Speech", Mar 20

"I'll make a bet with you: Two guys break into an **atheist's home**. He has a little atheist wife and two little atheist daughters. Two guys break into his home and tie him up in a chair and gag him.

And then they take his two daughters in front of him and rape both of them and then shoot them and they take his wife and then decapitate her head off in front of him.

And then they can look at him and say, 'Isn't it great that I don't have to worry about being judged? Isn't it great that there's nothing wrong with this? There's no **right** or **wrong**, now is it dude?'"

"Then you take a sharp knife and take his manhood and hold it in front of him and say, 'Wouldn't it be something if this [sic] was something wrong with this?

But you're the one who says there is no God, there's no right, there's no wrong, so we're just having fun. We're sick in the head, have a nice day.'

If it happened to them, they probably would say, 'something about this just ain't right.'"

Problem: Try to solve Robertson's sin problem.

Criteria one: Use ONLY universal principles, i.e. universal laws: astronomy, physics, chemistry, and thermodynamics.

Criteria two: Do NOT use supernatural principles.

Clue: the "moral symbols", of nature, are found in physical chemistry (Goethe, 1809).

In religio-mythology, **atheism symbols** are []

Overview

In 450BC, Leucippus posited that all that exists is atoms and void:

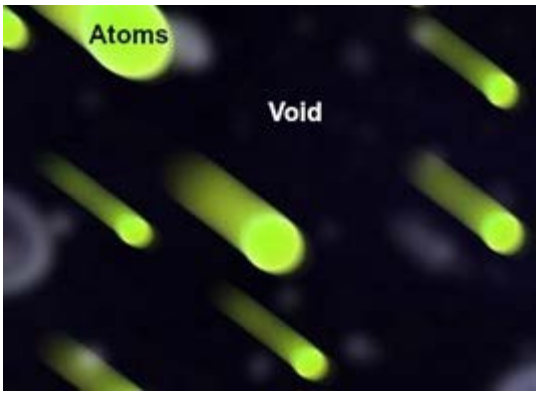

An "I have a personal relationship with reality" image with the 2007 Reed atheism symbol.

This logic became the foundation of Epicurean atheism (see: Atheism genealogy) and the "atom" eventually became the symbol or icon of the atheist; as famously said by atheist physicist Richard Feynman: "believe in atoms" (see: Feynman time capsule wisdom)

List

The following is the work-in-progress list of common atheism symbols; chronologically ordered:

Symbol	Origin	Meaning
		In 1790, German polyintellect Johann Goethe [HD:19], the intellectual mentor to Arthur Schopenhauer, Germany's first open atheist, who in turn intellectually trained Friedrich Nietzsche, the top ranked atheist of all time, declared (see: Goethe on religion), in his *Venetian Epigram* 66, that the four things that he loathed the most were: "tobacco smoke, bugs, garlic, and †." On 24 Jul 1809, Goethe declared that the "moral symbols" of nature are the physical chemistry reaction symbols of the "elective affinities" invented and used by the Torbern Bergman. The elective affinities, which he outlined in his novella *Elective Affinities*, which "overturned everything holy", according to Heinrich Heine, to Goethe, embodied the following sort of summation:

1. 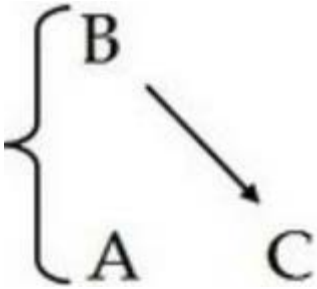

Date: 1809

By: Johann Goethe

Passions = f{Elective Affinities} = Spinoza's god + Shakespearean atheism + Linnaean science

In 1816, Percy Shelley, independent of Goethe, after being kicked out of Oxford in 1811 for his *The Necessity of Atheism*, and after previous to that in 1804 having developed his own elective affinities sort of natural belief system, married Mary Shelley in the "Church of Elective Affinities" as Mary retrospectively referred to it.

The actual "symbols" of elective affinities, historically, derive from Newton's Query 31 (1718), which were verbal statements of reaction displacement powers between chemicals; which morphed into various "affinity tables"; which in 1757 became actual bonding bracket and affinity dart symbols developed by William Cullen, who began to use Étienne Geoffroy's affinity table in lectures at the University of Aberdeen; these eventually morphed in complexity into the symbols used by Torbern Bergman (1775), in his: "Bergman's affinity table", "Bergman's affinity reaction diagrams", and Bergman's chemical signs explained; in 1882, via Helmholtz's "On The Thermodynamics of Chemical Processes", the Bergman symbols morphed into the various "symbols" of chemical thermodynamics. All of this symbols became "atheism implicit" in 1885, when Johannes Wislicenus, at the University of Leipzig, kicked god out of the chemistry classroom (see: year god was disabused from science). The basic Cullen reaction symbol is shown (as employed in the opening three chapters of Goethe's *Elective Affinities*; see: EA:IAD)

2. θΔcs

Date: 1876

By: James Maxwell

The symbol "θΔics" was used by James Maxwell, as shorthand for "thermodynamics", in communication with William Thomson and Peter Tait, in the mid 1870s; Maxwell, however, was not an atheist, but rather a very intelligent free thinking skeptic (see: Maxwell on the soul).

In circa 2008, Libb Thims was using θΔics as the icon for the *Institute of Human Thermodynamics* and began putting it at the bottom of each pate of the newly-launched Encyclopedia of Human Thermodynamics (turned Hmolpedia). In c.2013, Thims was water-testing the phrase "In ΘΔics we trust" on the main page of Hmolpedia, in place of the religious "In god we trust" symbol.

In

1952, Bertrand Russell, in an article “Is There a God?”, stated the following: [4]

3.

Date: 1952

By: Bertrand Russell

> “Many orthodox people speak as though it were the business of sceptics to disprove received dogmas rather than of dogmatists to prove them. This is, of course, a mistake. If I were to suggest that between the Earth and Mars there is a **china teapot** revolving about the sun in an elliptical orbit, nobody would be able to disprove my assertion provided I were careful to add that the teapot is too small to be revealed even by our most powerful telescopes. But if I were to go on to say that, since my assertion cannot be disproved, it is intolerable presumption on the part of human reason to doubt it, I should rightly be thought to be talking nonsense. If, however, the existence of such a teapot were affirmed in ancient books, taught as the sacred truth every Sunday, and instilled into the minds of children at school, hesitation to believe in its existence would become a mark of eccentricity and entitle the doubter to the attentions of the psychiatrist in an enlightened age or of the Inquisitor in an earlier time.”

In 1958, Russell elaborated on this teapot god disproof analogy, as follows: “I ought to call myself an agnostic; but, for all practical purposes, I am an atheist. I do not think the existence of the Christian God any more probable than the existence of the Gods of Olympus of Valhalla. To take another illustration: nobody can prove that there is not between the Earth and Mars a china teapot revolving in an elliptical orbit, but nobody thinks this sufficiently likely to be taken into account in practice. I think the Christian God just as unlikely.”

It is difficult to say when exactly the teapot logo started to appear; to give one example, in 2015, Reddit user ArguingFromIgnorance made (Q) the “in teapots we trust” logo on a $20 bill (shown above).

Chosen as the symbol for the American Atheists, founded by Madalyn O'Hair [FA:108]. They chose the atomic symbol as seen in the center of the above graphic as their logo. The use of

4.

Date: 1963

By: Madalyn O'Hair

the atomic symbol flowed from their belief that human progress can best be achieved through the scientific method and rational, open inquiry. The lower part of the symbol is broken or open ended. This refers to the incompleteness that is inherent in the science. As AA's web site says: "*Not all of the answers are in*. [1]

The atheist atomic symbol is the only atheist symbol (#16) approved by the US Department of Veteran Affairs to be put on cemetery stones. [3]

5.

Date: 1965

By: Dennis Barrington

The winning design, by Dennis Barrington, called the "happy human" (Q), out of a hundred designs, of a competition arranged by the British Humanism Association, thereafter representative of "humanism", whose motto is "good without god".

The walking fish symbol is a play on fish “miracle” of Jesus and the story of how he tells a group of fisherman to throw their net into the water, after which they catch 153 fish; which is a story that traces (Q) back to the mathematics of Pythagoras (510BC); called by Archimedes in 250BC the “measure of the fish”. The legs added on represent the view that fish "evolved" over time, rather than being "created" on a the "fifth day" of creation.

6.

Date: 1983

By: Al Seckel and John Edwards

In 1983, two friends Al Seckel and John Edwards, who were involved in the southern California atheist and freethought movements; the symbol (left-faced design; like the Christian fish) was first used on a freethought leaflet for Atheists United in 1984. It was then sold by Atheists United and other freethought groups, which got free permission from Seckel and Edwards throughout the 80s, to be used on bumper stickers and t-shirts. [2]

In 1990, Chris Gilman, a Hollywood prop maker, claims to have independently thought up the design (a right-faced design) manufactured the first plastic car ornaments in and licensed the design to Evolution Design of Austin, Texas, although he claims to have come up with it independently. [2]

7.

Date: 2003

Person: Tim Ahrentlv

The Invisible Pink Unicorn (IPU) symbol was made from the mathematical void symbol and was reshaped to represent a unicorn; void symbol (empty set Ø) is an allusion to nothingness and in this case meaning "no faith" or "no god"; while this unicorn is a story atheists use to tell to make their point. (Q)

8.

Date: 2005

By: Bobby Henderson

In

Jan 2005, Bobby Henderson [FA:141], then a 24-year-old Oregon State University physics graduate, in reaction to the Kansas evolution hearings (Q), and how the Board of Education was considering teaching intelligent design alongside evolution in science classes, sent an open letter to the Kansas State Board of Education, wherein he satirized creationism by professing HIS satirical belief that whenever a scientist carbon-dates an object, a supernatural creator that closely resembles spaghetti and meatballs is there ‘changing the results with his noodly appendage’. Henderson argued that his Flying Spaghetti Monster (FSM) belief was just as valid as intelligent design, and called for equal time in science classrooms alongside intelligent design and evolution. By Nov, the letter had gone viral, and readers of the Boing Boing website made the FSM symbol, with noodle legs and meatball eyes, as a parody of the Jesus fish, i.e. an Ichthys symbol, the symbol of the satirical god of the Darwin fish.

In Aug 2005, BoingBoing user bpowah made the first FSM symbol (Q); about which he commented the following: (Q)

> “This morning over coffee, I meme-sprouted a simple graphic intended for chrome plating and adhesive sticking to the back of a car. I hope some (if not all by now) Boing Boing readers are Pastifarian graphics artists and would like to refine it and perhaps submit it to a manufacturer of those footed Darwin Fish (who's population is on the decline as they are gobbled up by jesus fish) I submit it to the public domain via BoingBoing and Wikipedia.”

9.

Date: 2007

By: Wayne Otero

The empty set is the unique set that contains no elements; meaning the atheist has no elements to their creed (Q); it asserts the idea that “there is no god and shows the obvious spiritual emptiness” (Q) of atheists; or “represents the idea that there is no god.” (Q)

This particular symbol was designed and released to public domain by Michigan graphic artist and retired schoolteacher Diane Reed. (Q) It’s simple, positive, unique, and attractive. The circle represents the natural universe, the point is the

10.

Date: 2007

By: Diane Reed

inquiring mind, and the resemblance to the Latin “A” is both a nod to the language of science, and to the necessity of having some easily graspable connection to “atheism.” It doesn’t imply that atheists believe in nothing; it doesn’t confuse the issue with evolution; and it doesn’t stick a gratuitous finger in any religion’s eye. The icon was presented at the Atheist Alliance International convention in Washington DC, the attendees (which included Richard Dawkins and Daniel Dennett) cast their votes between 6 candidates. This was the winner. (Q)

11.

Date: c.2009

By: (add)

A blend of the Reed atheism symbol (2007) a the O'Hair atheism symbol (1963).

11.

Date: (add)

By: Seth Andrews [?]

A thinking atheist logo tattoo (Q); a blend of the Reed atheism logo inside of a lightbulb; which is the icon of the 2009 launched YouTube atheism channel: The Thinking Atheist, by Seth Andrews.

In 2015, Libb Thims made an atheism word scramble for one of the shows of the Atheism Reviews video channel, each letter defined as follows:

13. 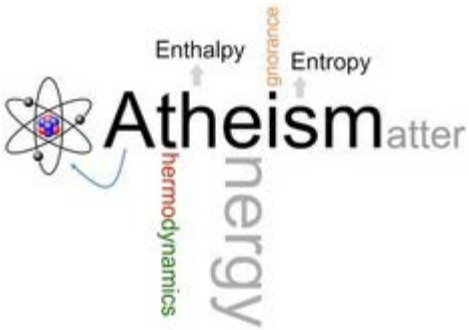

Date: 2015

By: Libb Thims

A | **A**tomic theory: all atheists believe in the existence of atoms.
T | **T**hermodynamics: belief that the universe operates according to the laws of thermodynamics.
H | Enthalpy (**H**), aka "heat content": belief it is the measure of security in society, per the Rossini hypothesis.
E | **E**nergy: belief that everything can be boiled down it, per mass-energy equivalency $E = mc^2$.
I | **I**gnorance: an understanding that 99% of people are ignorant to either thermodynamics or religio-mythology.
S | Entropy (**S**): belief that it is the measure of freedom in society, per the Rossini hypothesis.
M | **M**atter: all atheists are materialists, i.e. believe in the existence of matter (or transformations per $E = mc^2$).

(add disucssion)

In 2008, someone posted up a list (Q) of 120 so-called “atheism symbols”; most of which, however, are but a random collection of symbols, e.g. pi.

References

1. Atheist Symbols – ReligiousTolerlance.org.
2. What do the Darwin Fish Mean? (2006) – YahooAnswers.
3. Emblems – Cem.VA.gov.
4. Russell’s teapot – Wikipedia.

External links

- Sims Atheism Tattoos – Modthesims.info.
- Atheism symbols – Conservapedia.com.

θΔics

In atheism terminology, **atheism synonyms**, as contrasted to theism synonyms (e.g. believer), are terms that generally mean disbelief and or denial in the existence in god, which, barring detailed clarification, include: free thinker (Molyneux, 1697), heathen, radical, doubter, unbeliever (Mammon, 1782) or non-believer, materialist, nihilist, secularist (Holyoake, 1851), humanist, bright (Paul Geisert, 2003) (O), godlesss, and zerotheistm (Thims, 2015), or combinations thereof, e.g. "secular humanist" (Warraq, 1995), "secular naturalism" (Edd Doerr, 2014), "materialistic atheist", etc. [1]

See also

- Atheism clarifiers | Radical atheist, militant atheist, extreme atheist, etc.
- Atheism types | Spinozist, Hobbesian, Nietzschean, etc.

References

1. (a) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (Bright, pg. 483). HarperOne.
(b) Joshi, S.T. (2014). *The Original Atheists: First Thoughts on Nonbelief*. Prometheus Books.

θΔics

In terminology, **atheism terminology** refers to terms, types (see: atheism types), definitions, phrases, labels, etc., related to non-belief in the existence of god, gods, god theory, god hypotheses, and or god talk.

List

The following is a work-in-progress A-to-Z listing of relevant terms related to atheism:

#	Term	Definition
A		
1.	Abioism	The denial or disbelief of the existence of life (e.g. life does not exist; defunct theory of life); see: atheism types by denial and belief.
2.	Accommodationist atheist	e.g. Brian Greene (Q)
3.	Achristism	The denial or disbelief of the existence of Jesus Christ; see: atheism types by denial and belief.
4.	Aggressive atheist	One who ridicules religious beliefs publicly via humor, e.g. Francois Rabelais; someone who is very “aggressive” with their atheism, e.g. Pat Condell (Q)(Q).
5.	Agno-atheist	
6.	Agnostic	
7.	Agnostic atheist	(Q) (Q); Jeff Tuhtan (2015) (Q)
8.	Agnostic labeled atheist	Someone who self-identifies as "agnostic" but is labeled by the public as atheist, e.g. Neil Tyson or Carl Sagan.
9.	Agnostic soft atheist	One who is not 100% sure about a lot of things, in the universe, but is highly skeptical. (Q)
10.	Agnosticism	
11.	Analytical atheist	One who “doesn't claim that god does not exist, but that the usual concept when analyzed closely is incoherent, so that existence of an instance makes no sense” (Aaron Sloman, 2008)
12.	Anti-evolution atheist	One who believes (a) god does not exist (or "there is no god"), but also that (b) "humans did not come from monkeys" (e.g. it happens naturalistically, similar to a chicken coming from an egg), e.g. ex-Muslim atheist Angela (guest on Atheism Reviews); a term derivative for a seeming lack of educational basics (someone raised to adulthood in Iran who came to America).
13.	Anti-theist	Someone, e.g. Christopher Hitchens [DN:7] [5], who believes that religion poisons everything and should therefore not just be declined but actively opposed (Q). [3]
14.	Apatheist	Someone of the mindset “who cares whether there’s a god or not?”, e.g. Bob Seidensticker, prior to getting into debate, years after college, with a young-earth creationist (Q); some classify Denis Diderot as one classify an apatheist, i.e. one who is apathetic about theism/atheism distinction, based on his reply when being accused of being an atheist that he simply did not care whether god existed or not. (Q)
15.	Applied atheist	(Q)
16.	Apophatic atheist	[11]
17.	Asoulism	The denial or disbelief in the existence of the soul; see: atheism types by denial and belief.
18.	Asoulist	Someone who denies the existence of the soul, e.g. Jean Meslier (1729), Julien la Mettrie (1745), Francois Broussais (c.1820), David Weisman (2010) (possibly), Kurt Bell (2011),

		Patrick Fergus (2014), and Libb Thims (2015); along with "skeptical agnostic asoulists", e.g. Napoleon Bonaparte (c.1815).
19.	Athe-agnostic	Some who is a 20/80 blend of atheism and agnosticism, e.g. Brad Pitt, quote: "I'm probably 20 percent atheist and 80 percent agnostic." (Q)
20.	Atheism	The denial or disbelief in the existence of god.
21.	Atheism atrocities fallacy	The assertion that all major atrocities of the world, from mass killings to genocides, are the result of communities loosing belief in the existence of god.
22.	Atheism genealogy	A genealogy showing the roots of all main brands of atheism.
23.	Atheism-label avoider	
24.	Atheism Reviews	A 2014-launched YouTube channel launched by Libb Thims aimed at reviewing atheism vs theism debates and dialogues, and other atheism-related topics.
2#.	Atheism synonyms	Terms that synonymous with "atheist", give or take.
21.	Atheism timeline	
22.	Atheism types	
23.	Atheism types by denial and belief	
24.	Atheist	
25.	Atheist apologist	(Q)
26.	Atheist ex-christian	
27.	Atheist ex-hindu	
	Atheist-label hesitant nonbeliever	A nonbeliever who is hesitant to call themselves an atheist; e.g. Michael Ruse.
29.	Atheist misconception	
	Atheist Muslim	Similar to 'Jewish atheists', which expressly reject Judaism while retaining its cultural elements (Ali Rizvi, 2013). (Q)
30.	Atheist rabbit hole	
31.	Atheist's Bible	
32.	Atheist's creed	
33.	Atheistic morality	A morality system that does not involved the premise of existence of god or related god terms or god talk.
	Atheistic religion	
34.	Atheism genealogy	A genealogy of the various intellectual roots and branches of the main types or brands of atheism; see: atheism types by denial and belief.
	Atheology	Atheology study of atheism (Bo Jinn, 2013); nearly synonymous "natural atheology", the attempt to prove that God does not exist or that at any rate it is unreasonable or irrational to believe that he does (Alvin Plantinga, 1974).
		One who as "vowed" that they are an atheist, Jean d'Alembert (Q); someone who has

35.	Avowed atheist [DN:7]	admitted and stated in public that they are an absolute atheist, e.g. Baron d'Holbach (1770) (see: atheism timeline) [9]; the densest avowed atheists are those who do so publicly, privately, verbally and in print and have it carved on their tombstone; and or submitted, or who submit that their work so atheistic that it be "translated into Latin and then buried in the ground, so to avoid censorship, corruption, and or destruction", by the religiously ignorant, so to correctly await discovery of super enlightened minds of the future (e.g. John Stewart).
36.	Axiological atheist	[10]
B		
37.	Belief	
38.	Believer	A person who believes in god (compare: unbeliever).
39.	Bible vs physical science (conflicts)	
	Born-atheist	Simson Najovits (2009)
40.	Buchnerian atheism	The brand of atheism of German physician-physicist Ludwig Buchner (1824-1899); see: atheism types by denial and belief.
C		
41.	Christianity	
42.	Christian captain parable	
43.	Closet atheist	One who keeps their godless beliefs a secret, e.g. hidden in one's closet.
44.	Constructive atheist	[10]
45.	Creationism scientists ranked by idiocy	
46.	Crypto-atheist	Someone whose work, e.g. Thomas Hobbes and *Leviathan* (1651) (see: atheism timeline) is presents a type of coded atheism. [6]
D		
47.	Dawkins number	
48.	Dawkins scale	
49	Deconversion	
50.	De-facto atheist [DN:6]	See: Dawkins scale [2]
	Disproofs of the existence of god	
51.	Dogmatic atheist	[11] e.g. British biochemist eobiont-coiner Norman Pirie (1907-1997). [12]
E		
	Epicurean atheism	
	Epicureanism	
52.	Epistemological atheist	[10]

53.	Evangelical atheist	e.g. Ludwig Buchner (label: "father of German atheistic evangelism")
54.	Evolution vs creationism in education	
55.	Existential atheism	
56.	Explicit atheism	Someone, e.g. Democritus, who “explicitly” states in their work, philosophy, or argument that they “reject” and deny the existence of god; or assumed and stated explicitly that such an entity does not exist. [7]
57.	Explicit negative atheist	[3]
58.	Extreme atheism	One who has a belief system or belief state “extremely” nullified, devoid, and on the far right hand side of the Dawkins scale, i.e. devoid of belief in the existence of god (and god concepts, e.g. soul, spirit, life, death, free will, etc.)—often someone who employs extreme materialism (e.g. Ludwig Buchner or Julien la Mettrie) and or extreme mechanist (e.g. Henry Carey) in Stark classification—which, in the 19th century terms, would refer to someone who only believes in the existence matter and energy in various states of vacuum, or in 20th century terms, would refer to someone who only believes in the existence of fermions and bosons and the interactions and bound states they produce; and or someone who writes with an extreme “frenzied anger” (e.g. Jean Meslier).
F		
59.	Faithist	An atheist, sometimes referred to as an “accommodationist”, who seeks common ground with religious believers despite differences. [3]
60.	Famous atheists	
61.	Feuerbachian atheism	The brand of atheism of German anthropologist philosopher Ludwig Feuerbach (1804-1872); see: atheism types by denial and belief.
62.	Firebrand atheist	The type of atheism which advocates people openly and proudly saying “I’m an atheist” rather than the weaker “I’m not religious” sideskirting response of the 20th century (Q); and or a type of aggressive no-holds-barred atheism, according to which point one is: “tell the truth about religion, with the emphasis on the ‘telling’; done, albeit, supposedly, in such a way that it’s the person under attack knows that it’s the ‘religious beliefs’ that are being attacked NOT the person; it’s a straight forward no daisies pronouncement that “religion is a lie—all of it—that’s the truth. Respect is earned, and religion hasn’t earned any”; and point two is “don’t’ feign respect for the respectful, i.e. you don’t respect religion that don’t give it respect.” (David Silverman, c.2011) (Q) (Q)
63.	First true atheist	
64.	Founding fathers fallacy	
65.	Four horsemen of atheism	
66.	Freudian atheism	The brand of atheism of Austrian psychiatrist Sigmund Freud (1856-1939); see: atheism types by denial and belief.
	Functional atheist	Lucretius, according to Colin Sanders (2013), was a "functional atheist", i.e. he admitted that gods, made of atoms, may exist, but morality is in the hand of humans and gods are not involve in human affairs. [13]
G		
67.	God	

	Gods	
68.	God is dead	
	God talk	
69.	God void issue	
70.	Godless	A work, theory, or philosophy free from suppositions of the existence of god, god theory, or god talk.
71.	Goetheanism	A type of Spinoza "god is nature" or "god = nature" model, i.e. Spinoza's god view, intermixed with Shakespearean atheism, and a belief that human morality can is the same as that which exists at the chemical level (i.e. chemical morality).
	Goethean morality	
72.	Gibbsianism	
H		
73.	Hard-core atheist	(Q)
74.	Haught disbeliever	
	Henotheism	Adherence to one particular god out of several, especially by a family, tribe, or other group; coined by Friedrich Schelling (Q); used by Max Muller, as a counterpoint to polytheism, and Wallis Budge (1904), in respect to aspects of Egyptian religion.
75.	History of atheism	
76.	Holbachian atheism	The brand of atheism of French materialism philosopher Baron d'Holbach (1664-1729); see: atheism types by denial and belief.
77.	Humanist atheist	(Q)
I		
78.	Implicit atheism	
79.	Implicit atheist	One who doesn't believe in any gods but hasn't consciously rejected such belief; though not in all cases (see: implicit atheism). [7]
80.	Implicit negative atheist	[3]
81.	Intellectually fulfilled atheist	The type of atheism made logically tenable after Darwin; according to Richard Dawkins (1986). (Q)
82.	Intentionally abrasive atheist	An atheist who specifically likes to create friction and abrasion when interacting with theists, e.g. charlidog2 (Q)
J		
83.	Journey atheist	[11]
	Judgment-believing agnostic	Someone who holds to the agnostic position, because they believe that wrong acts are accounted for after death, something like karma (poll by Thims of 18-year-old Christian raised guy, whose mother makes him pray and go to church go help his drug use issues).
K		
84.	King Atheist	The powerful atheism type of Patrick Fergus (DN=9.5); someone who rebels against their parent's religion starting in youth (his family religion was Irish Catholic); someone who is against all religions and dogma as absurd, even to the point of being no-holds-bared sacrilegious, e.g. burning a pile of wooden crosses, religious god figurines (e.g. Diagoras chopping up a wooden statue of Hercules to boil his turnips, or burning a pile of your Jewish

		friend' kippahs (skull caps) in a fire (Fergus), etc.; and who is constantly talking about atheism and daily working to convert all of his friends to atheism, e.g. often times staying up all night talking till the break of dawn trying to convince their friends of the illogicalness of religion.
L		
85.	Legendary atheist	Someone who is a "legend" in atheist community and in the theistic community, e.g. Ludwig Feuerbach, Sigmund Freud, and Karl Marx (Q) (Q); see: top 100 atheists for more.
	Liberal Christian	Go to church, believed in god, but don't believe the Bible is the inspired word of god; stage below agnostic (Bart Ehrman, 2014).
M		
	Materialist	One who believes that all that exists is "matter and motion", "force and matter" (Buchner, 1855), or "stuff and force" (Mach on the materialists) (Q); an atheism implicit belief system; the apex thought of which encapsulated in Friedrich Lange's 1865 *The History of Materialism*, a treatise which, together with Kant and Schopenhauer, worked to mold Nietzsche into a top 100 atheist; after 1860s, superseded and or intermixed with: "evolutionist" (Darwin, 1859), "energeticist" (Ostwald, c.1910); among other variants: "thermodynamicist", chemical thermodynamicist, physicochemical materialist, etc.
86.	Marginal atheist	
87	Marxian atheism	The brand of atheism of German dialectical materialism philosopher Karl Marx (1818-1883); see: atheism types by denial and belief.
88.	Meslierian atheism	The brand of atheism of French priest-philosopher Jean Meslier (1664-1729); see: atheism types by denial and belief.
89.	Militant atheist	An atheist hostile to religion, e.g. Friedrich Nietzsche. (Q)
90.	Mortalism	The denial of the existence of the afterlife; and denial of the soul-without-body after death; see: atheism types by denial and belief.
91.	Movement atheism	Those atheists who are "on board" with the atheism movement and ignore the various kinds of atheists who are uninterested in it or hostile to it; there are four kinds: secularist atheists, identity atheists, evangelical atheists, and constructive atheists. (Q)
N		
92.	Negative atheist	aka weak atheist or implicit atheist. [10]
	New atheism	An "atheist who is finally speaking up" (Dave Rubin, 2015), as defined amid erudite discussion (V:38:00-39:00) with Sarah Haider; Generally, originating from Sam Harris' *The End of Faith* (2004), which he began writing the day "after" 9/11; predominantly referring to Harris-Dawkins-Hitchens stylized type of media frenzy, intermixed with hues of: Neil Tyson, Daniel Dennett, Lawrence Krauss, Victor Stenger, among others.
94.	New atheist	
95.	Newtonianism	
96.	Nihilistic atheist	[10]
97.	Nietzschean atheism	The brand of atheism of German philosopher Friedrich Nietzsche (1844-1900); see: atheism types by denial and belief.
	NOMA	Acronym for: Non-Overlapping Magisteria (Q); Stephen Gould's 1997 ideas about how religion (subjects: of human purposes, meanings, and values) and science (natural, physical, zoological, etc.) are two different domains of inquiry that do not overlap, and the latter "might illuminate, but can never resolve" the former.
	Noma creationist	Someone who believes in a NOMA-conceptualized model of creationism, e.g. David Roemer. (Q)

98.	Nonbeliever	
O		
99.	Objective morality	
100.	Open atheist	Someone who is "open" and out about their atheism beliefs; e.g. Ryan Grannell.
101	Ostwaldian atheism	The brand of atheism of German physical chemist Wilhelm Ostwald (1853-1932); see: atheism types by denial and belief.
P		
102.	Philosophical unbeliever	e.g. Matthew Turner (1782) (see: atheism timeline) [6]
103.	Physicochemical atheism	Atheism derived directly from physical chemistry; e.g. Goetheanism, Ostwaldian atheism, Thimsian atheism.
	Political atheism	
104.	Positive atheist	aka strong atheist or explicit atheist [10]
105.	Practical atheist	Someone, e.g. Marcus Aurelius, who speaks from an agnostic position, but is atheist in practice. [10] One who "behaves as if there were no god" (Hecht, 2004); John Calvin (1509-1564) (Q), e.g., supposedly, had a man named Monet beheaded for being a “practical atheist”, for doing things such as having a book of pornographic pictures he called his “New Testament”. [15]
	Practicing atheist	Simson Najovits (2009)
	Problem of evil	
106.	Pure agnostic [DN:4]	Impartial agnostic. [2]
107.		
Q		
108.		
R		
109.	Redford deconversion model	
110.	Reductionary atheist	[10]
111.	Reluctant atheist	An atheist who is looking for good reasons to reject atheism and return to religious (e.g. Christian) heritage. (Q)
112.	Rumored atheist	Someone rumored to be "atheist", e.g. Barack Obama, whose father was an admitted atheist before he was born, or Adolf Hitler (Q) who is frequently misattributed as the as the chief atheist of the atheism atrocities fallacy.
S		
113.	Schopenhauerian atheism	The brand of atheism of German philosopher Arthur Schopenhauer (1788-1860); see: atheism types by denial and belief.
114.	Scientific atheist	The type of atheist who bases their beliefs and non-beliefs squarely on scientific fact; someone not so concerned with a specific doctrine, but is quicker to point out that the myths that most religions provide as a foundation have no logical, scientific proof to back them up,

		e.g. Ludwig Buchner, Karl Marx, and Vladimir Lenin (Q). [8]
115.	Scientific evangelical atheist	e.g. Lawrence Krauss (Q)
116.	Semi-atheist	Someone, according to Geoffrey Blainey, like Benedict Spinoza, who believes that natural laws explain the workings of the universe. [4]
117.	Secular atheist	e.g. Thucydides (Q)
118.	Secularism	An upgrade from “freethought”, but less derisive or more preferable to some than “atheism”; meaning indifference to or rejection or exclusion of religious considerations; coined by George Holyoake in 1851. [1]
119.	Soft atheist	
	Speculative atheist	One who "intellectually rejects faith"; John Calvin (1509-1564) (Q), e.g., had Jacques Gruet (c.1500-1547) (Q) beheaded and his “anti-Christian writings” burned per charge he was a "speculative atheist" [14]
120.	Spiritual atheist	One who sees themselves as spiritual, though, have no connection to a particular belief in god or, in some cases, even in the transcendent. (Elaine Ecklund, 2010) (Q)
121.	Staunch atheist	A semi-recent British term,; seemingly synonymous with “strong atheist”.
122.	Stewartian atheism	The brand of atheism of Scottish/English moral philosopher John Stewart (1749-1822); see: atheism types by denial and belief.
123.	Strong atheism	Someone who is “strong” in their atheism beliefs, and is cited or described as such, e.g. Libb Thims (Bossens, 2013) (Q); sometimes synonymous with: positive atheism or explicit atheism. (Q)
124.	Subjective morality	
T		
125.	Thimsian atheism	The brand of atheism of American electrochemical engineer Libb Thims; see: atheism types by denial and belief.
126.	Top 100 atheists	
U		
127.	Unapologetic atheist	e.g. Stephen Fry (Q)
	Unbeliever	A person who does not believe in god (compare: believer).
128.	Under-the-radar atheist	The type of atheist that Sam Harris (Q) self-identifies as (note: closet "spiritual atheist" would seem more apt).
129.	Utilitarianism	A type of calculus of greatest happiness secular morality system; largely advanced by English moral philosopher John Mill (1806-1873).
V		
130.		
W		
131.	Weak atheist [DN:5]	Agnostic but leaning towards atheism. [2]
132.	Weak theist [DN:3]	Agnostic but leaning towards theism. [2] Someone very uncertain, but inclined to believe in god; e.g. Blaise Pascal, noted for Pascal's wager, DN:3.4 (estimate), is said to be between

		weak atheist and pure agnostic. [5]
X		
133.		
Y		
134.		
Z		
135.	Zeitgeist	A 2006 viral film documentary by Peter Joseph, which asserts, via citation to Dorothy Murdock and Gerald Massey, in a round-about-way, without coming exactly to a concluding point, that Jesus Christ is a rewrite of the Horus myth (correctly: Jesus is rewrite of the Osiris myth, i.e. the father of Horus; whereas Horus, the "lawgiver", became "Moses" the lawgiver").
	Zerotheism	
136.	Zerotheist	Someone, e.g. Paul Dirac (1927), who believes in the existence of fermions, bosons, and zero gods (no gods). (Q)

(add discussion)

Quotes

The following are related quotes:

> "Different unbelievers have generated creeds that a sufficiently different enough to be seen as a cluster of positions—a 'family' of atheisms—which can be glimpsed in the huge range of words that have been used interchangeably with atheist over the last four centuries: bright, Cartesian, communist, determinist, Epicurean, existentialist, fatalist, freethinker, Hobbist, humanist, infidel, irreligious, libertine, monist, naturalist, Nietzschean, rationalist, sceptic, secularist, Spinozist and unbeliever, to name only the less abusive term."
>
> — Nick Spencer (2014), *Atheists: the Origin of the Species* (pg. xviii)

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(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 277). HarperOne.

θΔics

In terminology, **atheism types** refers label-clarifiers of types of atheists and or atheism adherents.

A depiction of some common **types** of atheism, the most common stereotype being that atheists are nihilists and don't believe in anything.

Discussion

The number of ways people label themselves or label others in respect to types or shades of disbelief in God or gods is extensive and elaborate.

Some atheist labels or statements of disbelief can be affixed with beliefs; a famous example being Thomas Jefferson, and oft-cited atheist, self-describing himself in 1819 and 1820 as an “Epicurean materialist” and moral philosopher.

List

See also: Atheism terminology; Atheism types by denial and belief

The following is a work-in-progress listing of atheism “types”, types of atheism, i.e. variants of namesake disbeliefs in the existence of god, ranked generally from weak or marginal to strong or extreme, fitted loosely to the Dawkins scale, i.e. showing equivalent Dawkins number (DN) in column three:

#	Type	DN	Examples | Description
	Weak theist	**3**	Agnostic but leaning towards theism
			e.g. Blaise Pascal, noted for Pascal's wager; DN:3.4 (estimate) [7]
	Pure agnostic |	**4**	Impartial agnostic
	20/80 athe-agnostic		e.g. Brad Pitt, quote: "I'm probably 20 percent atheist and 80 percent agnostic." (Q)
	Agnostic soft atheist		One who is not 100% sure about a lot of things, in the universe, but is highly skeptical. (Q)

Soft atheist		
Semi-atheist		e.g. Benedict Spinoza
Agnostic labeled atheist		e.g. Neil Tyson 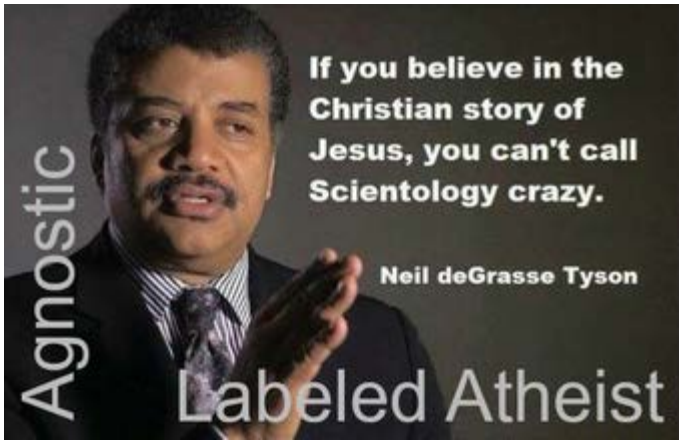
Weak atheist	**5**	Agnostic but leaning towards atheism
Rumored atheist		e.g. Adolf Hitler (Q) and Barack Obama
Crypto-atheist		e.g. Thomas Hobbes (1651) (see: atheism timeline) [1]
Reluctant atheist		An atheist who is looking for good reasons to reject atheism and return to religious (e.g. Christian) heritage. (Q)
De-facto atheist	**6**	
New atheist		One who has kinship with the new four horsemen of atheism.
Aggressive atheist		e.g. Pat Condell (Q) (Q) 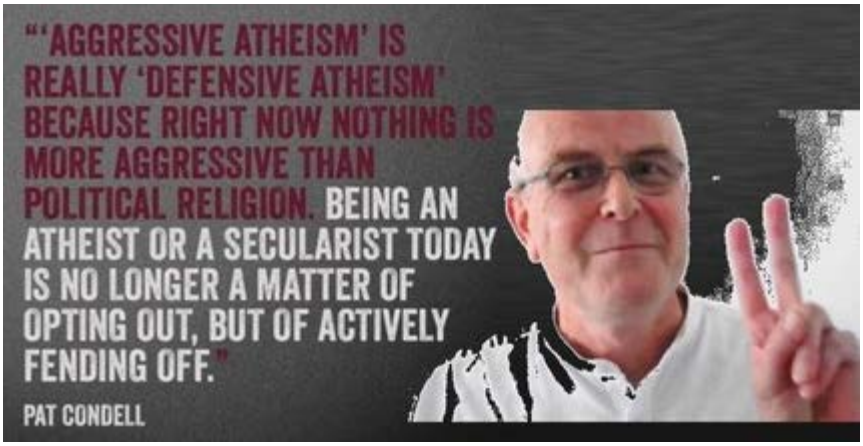
Explicit atheist		e.g. Democritus and the other Greek atomic theorists [3]
Anti-theist		e.g. Christopher Hitchens (Q), a DN=7 estimate [7]; one who believes that religion poisons everything and should therefore not just be declined but actively opposed. [5]
Avowed atheist	**7**	e.g. Baron d'Holbach (1770) (see: atheism timeline) [2]
Militant atheist		e.g. Friedrich Nietzsche (Q)
Strong atheist		e.g. Libb Thims (Bossens, 2013) (Q)
Staunch atheist		e.g. Ludwig Feuerbach [8] (Q)
	8	
		e.g. Julien la

Extreme atheist | Historical		Mettrie, Ludwig Buchner, Baron d'Holach, Ludwig Feuerbach, Ludwig Buchner, Ayn Rand, and Libb Thims
King atheist	**9**	e.g. Patrick Fergus
Intentionally abrasive atheist		e.g. charlidog2 (Q)
Extreme atheist | Modern	**10**	e.g. Libb Thims (Sekhar, 2011) (Q); self-assigned in 2009 as "10" on the 7-point Dawkins scale amid Moriarty-Thims debate

Quotes

The following are related quotes:

> "The grandfather of Marxian atheism and Freudian atheism is Ludwig Feuerbach, who was first a theologian, then a Hegelian, and finally an atheistic philosopher."
>
> — Hans Kung (1990), *Freud and the Problem of God* [12]

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θΔics

In atheism, **atheism types by denial and belief** refers to weighted ranking of the various 20+ classical and neo-modern "brands" of atheism, near-atheism, and proto-atheism, ordered by density of number of *denials* (god, afterlife, soul, spirit, life, etc.) and concordant *beliefs* (morals, free will, chance, determinism, dualism, monism, etc.) if known. Adjacent is the famous Goethe-Schopenhauer-Nietzche intellectual triad; the main knowledge conduit of modern morality and meaning based atheism.

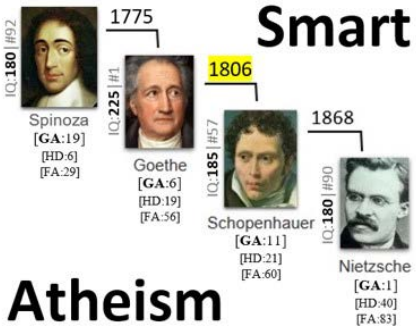

> "I am really amazed, really delighted! I have a precursor, and what a precursor! I hardly knew **Spinoza**: what brought me to him now was the guidance of instinct. Not only is his whole tendency like my own, to make knowledge the most powerful passion, but also in five main points of his doctrine I find myself; the most abnormal and lonely think is closest to me in these points precisely: **he denies** free will, purposes, the moral world order, the nonegoistical, evil; of course the differences are enormous. I summa: my solitariness which, as on the very high mountains, has often, often made me grasp for breath and lose blood, is now at least a solitude for two."
>
> — Friedrich Nietzsche (c.1885), comment to close friend in his later yeas [16]

(add)

Overview

The following table shows a work-in-progress ranking of the various "types" of atheism (see: atheism types), and proto-atheism (or near-atheism) varieties, ranked by "level of denial", i.e. the more foundationless (religio-mythology rooted) dogma a thinker denies the more of an extreme atheist they are; shown also are respective and concordant beliefs (if promulgated):

			Disbeliefs | Denials							Beliefs | Creeds								
#	Type		Atheism (deny: god)	Achristism (deny: Christ)	Mortalism (deny: afterlife)	Abioism (deny: life)	Asoulism (deny: soul)	Aspiritism (deny: spirit)	Dating system (godless)	Moralism (morals: exist)	Purpose (meaning)	Chance (anti-determinism)	Determinism (Fate/Destiny)	Free will (choice)	Dualism (two nature)	Monism (one nature)	Composition (genealogy)	Refs
1.	**Thimsian atheism** (Libb Thims) ↦ Extreme atheism	2016	Yes [FA:128] [science disabused] [religio-mythology] [disproved]	Yes (Osiris myth)	Yes (continuity theory) [concept upgrade] [term upgrade]	**Yes** (term upgrade) [anthropism]	Yes [concept issue] (coupling)	Yes	Yes (BG/AG) (Goethean calendar) [2015=265AG]	Yes [Bergmanian/Gibbsian] (Moral symbols) [concept upgrade]	Yes/No "potentials" [concept upgrade] [term upgrade] (Lindsay/Blum)		Yes (Holbach's demon)	No	No	Yes (one nature)	Darwinism Physicochemical atheism Goetheanism Holbachian atheism Schopenhauerian atheism Buchnerian atheism Ostwaldian atheism Nietzschean atheism	
2.	**Holbachian atheism** (Baron d'Holbach) ↦ Extreme atheism	1770	Yes [FA:37]			No	Yes					No (anti-chance)	Yes	No			Meslierian atheism	
3.	**Nietzschean atheism** (Friedrich Nietzsche)	1888	Yes [HD:40] [FA:71]	No (Ñº)						Yes? (complex naturalism)							Schopenhauerian atheism Kantianism Buchnerian atheism Feuerbachian atheism Helmholtzianism	
4.	**Epicurean atheism** [Epicureanism] (Epicurus)	300BC	Yes/No [FA:9] (inactive)	N/A (Dionysus)			No (atomic) (immortal) (Ñº)			Yes (Ñº)		Yes	No (Ñº)	Yes (Clinamen)				
5.	Shelleyan atheism (Percy Shelley)	1811														Yes (one nature)		
6.	Schopenhauerian atheism (Arthur Schopenhauer)	1844	Yes [HD:21] [FA:55]							Yes (Compassion)							Goetheanism	
7.	Ostwaldian atheism (Wilhelm Ostwald)	1909	Yes [FA:73]					No		Yes (Energetic imperative)							Energetics Kantianism	
8.	Buchnerian atheism (Ludwig Buchner) ↦ Extreme	1855	Yes [FA:63]							Yes (system relative)					No	Yes (Ñº)	Goetheanism Physicochemical atheism	

	atheism																
9.	Rogers' atheism (Alfred Rogers)	2016	Yes [DN:6/10]	Yes [N1]	Yes (one existence)	**Yes**		Yes [N1]	N/A (pragmatic) [N1]	Yes	No [N1]	Yes [N1]	No [N1]				
10.	Russellian atheism (Bertrand Russell)	1927	Yes [age 18]	No	Yes [age 15]		Yes [loosely]			Yes (Utilitarianism) [Age 14]		Yes		No [age 15]		Yes (Ñº)	Darwinism [age 13] Utilitarianism [age 14] Cartesian dynamics Shelleyan Hegelian	[20]
11.	Meslierian atheism (Jean Meslier) |→ Extreme atheism	1729	Yes [FA:28]				Yes							No			Montaigne (evidence) Vanini (evolution)	
12.	Mettriean atheism (Julien la Mettrie) |→ Extreme atheism	1747	Yes [FA:31]				Yes	Yes										
13.	Jeffersonian atheism [Jeffersonianism] (Thomas Jefferson)	1830	Yes [HD:17] [FA:52]														Epicureanism Materialism	[15]
14.	Freudian atheism (Sigmund Freud)	1895	Yes [HD:51] [FA:76]			No	Yes/No (metaphor)			Yes (ego ideal) (Ñº)							Helmholtzianism Epicurean atheism Feuerbachian atheism	[5]
15.	Marxian atheism (Karl Marx)		Yes [FA:55]	No (Ñº)			No (Ñº)			Yes/No (non-rational)	Yes (labor-based)						Epicurean atheism Feuerbachian atheism Anti-Buchnerian Hegelianism Anti-Kantianism	[12]
16.	Feuerbachian atheism (Ludwig Feuerbach)	1841	Yes [FA:58]	Near (fantasy figure) (Ñº)						Meager (Ñº)							Anthropology Hegelianism Theology	[15]
17.	Utilitarianism (John Mill)		Yes [HD:24] [FA:68]							Yes (Utilitarian)								
18.	Stewertian atheism (John Stewart)	1789	Yes [FA:42]	?	Yes				Yes (BK/AK) (Knowledge calendar) [2015=5265AK]	Yes (Moral movement)			Yes	No-ish (Ñº)		Yes (integer)	Newtonianism	
19.	Dawkinsian atheism [Dawkinsianism] (Richard Dawkins)	2006	Yes [FA:121]	No (Ñº)		No				Yes/No Haldane's rule (Ñº) (Hamiltonianism)	Yes (DNA-drive)	Yes (Blind forces)					Darwinism Genetic atheism	
20.	Randianism (aka Objectivism) (Ayn Rand)		Yes [FA:87]	No (Ñº)			No (Ñº)			Yes (Individualism)								(Ñº)
21.	Harrisian atheism [Harrisianism] (Sam Harris)	2004	Yes [FA:117]	No (Ñº)		No		No		Neo-Buddhism (Utilitarianism)				No				[4]
1.	**Goetheanism** (Johann Goethe)	1832	Near [HD:19] [FA:48] (god ≈ sulfur) (god = being)	? (Ñº)		Near (Ñº)	No (Ñº)		Nearly (BM/ME) (Modern era) [2015=372ME]	Yes "Bergmanian" (Moral symbols)				No	No	Yes (one nature)	Spinozism Bergmanism Shakespearean atheism Physicochemical atheism	
2.	Humeanism (David Hume)		Near [HD:10] [FA:28] (skeptic)							Yes (Moral rationalism) (Ñº)								[13]
3.	Hegelianism (Georg Hegel)		Yes/No (increasing reality)														Anti-Kantianism	[12]
4.	Kantianism (Immanuel Kant)		No (Agnostic)				No (time exempt)			Yes (Categorical imperative) (Ñº)				Yes/No (compatibilism)			Anti-Humean	[11]
5.	Voltairism (Voltaire)		No [HD:9] [FA:33] (Deism)	No (last words)													Meslierian atheism	(Ñº)

6.	Darwinism (Charles Darwin)	Near (Agnostic)	Agnostic (Ñº)	Agnostic (Ñº)	Proto (warm pond)	Agnostic (Ñº)	No (Ñº)		No		Yes/No	Yes (Ñº)	No (Ñº)	No (Ñº)		Evolution	
7.	Einsteinism (Albert Einstein)	No [HD:52] [EA:81] (Spinoza's god) (No: personal god)	No (Ñº)	Yes/No (Ñº)	No							Yes	No			Spinozism Goetheanism Schopenhauerian atheism	
8.	Spinozism (Benedict Spinoza)	Nearly [HD:6] [EA:25] (god = nature)	No (Ñº)								No	Yes	No	No	Yes	Anti-Cartesianism	[3]
9.	Newtonianism (Isaac Newton)	No (denied trinity)	No					Sort of (BC/AC) (Christ ≠ Lord)					No (self-motion)			Cartesianism Physics Occult/Alchemy/Chemistry	(Ñº)
10.	Cartesianism (Rene Descartes)	No	Agnostic (Ñº)			No								Yes			
11.	Aristotelianism (Aristotle)	No (prime movers)	N/A			No (Ñº)				Yes (final cause)							(Ñº)
12.	Parmenideanism (Parmenides)		N/A												Yes (one being)		[6]

Revelation

Charles Darwin, of note, denied belief in revelation; was agnostic about belief in afterlife; and seems to have believed in the existence of Jesus, at least as a real person:

> "Science has nothing to do with Christ, except insofar as the habit of scientific research makes a man cautious in admitting evidence. For myself, **I do not believe** that there ever has been any revelation. As for a future life, every man must judge for himself between conflicting vague probabilities."
>
> — Charles Darwin (1879), "Letter to German student" [18]

(add summary)

Atheism | God does not exist

The term "atheism", whether implicit atheism or explicit atheism, is a very-loaded word; which is a result of the fact that the term "god" itself is concept-heavy term, hence, when one denies god, what exactly the person is "denying" can have different meanings, depending on the denier. Two different people, e.g., may self-identify as "atheist", and assume they are on the same page, but may later come to find that whereas one denies "god, soul, spirit, and afterlife", the other denies "god and afterlife" but not spirit or soul, which often becomes syncretize into some blurry new age personal concept; hence the former may not see the latter as true atheist (say of the Jean Meslier variety).

Achristism

The term "achristism", meaning to deny the existence of Jesus Christ; or in some cases to assume he existed, as a real person, that walked the earth from 0-33AD, but to deny his divinity (e.g. Einstein) or trinity (e.g. Newton)—seems to have been coined by English nonconformist clergyman Philip Henry (1631-1696) in his last years:

> "What you write of the paralyzing atheism of the town, I am afraid is too true; but what do you think of such a thing as ***achristism***? I am sure Ephesians 2:12 (Ñº) mentions both. How many are there that own a god, and worship him, that have no regard to Jesus Christ in doing so; as if we could come to him, and have to do with him, and receive from him, without a mediator! How is he then 'the way?' Hath he not said, 'No man cometh unto the father but by me?' Is he the way to those that do not walk in him, or an advocate to those that do not employ him?"
>
> — Philip Henry (1694), "Letter to reverend Francis Tallents", Aug 13 [19]

In 2013, some were distinguishing between hard "a-Jesus-ism" (akin to hard a-theism) and soft "a-Jesus-ism" (akin to soft a-theism). (Ñº)

The following is a straightforward example of an "achristist" denial that he existed:

> "I have dictated thirty pages on the world's three religions; and I have read the Bible. My own mind is made up. I do not think Jesus Christ ever existed."
>
> — Napoleon Bonaparte (1817)

Other examples, Napoleon aside, of achristists include: Count Volney (1791) (Ñº)(Ñº), Thomas Jefferson (1823), Libb Thims (2003), among others. One can become an achristist via study of religio-mythology, especially religio-mythology transcription and syncretism, and or possibly by logic deduction, e.g. that miracles are impossible, etc.

An achristist, to note, is not to be confused with “antichrist” (Ñº); conceptualized, in the Bible, as a false messiah, a figure of concentrated evil, who will face Jesus Christ in his prophesized second coming; one example being Friedrich Nietzsche’s 1888 interpretation of the “antichrist” (Ñº) term, which has its own unique meaning.

Abioism | Life does not exist

Abioism is a rather newer term, coined by Libb Thims (2015); examples of abioists include: Thims, Alfred Rogers, Ferris Jabr, Jeff Tuhtan, Patrick Fergus, Inderjit Singh; near-abioists include: Charles Sherrington, Francis Crick, Albert Szent-Gyorgyi, and Henri Atlan.

Asoulism | Soul does not exist

Asoulism is a relatively new term, coined by David Weisman (2010); as follows:

> “I wish there were a term in the English language that honestly captures the idea that all we experience is due to brain function. ‘Materialism’ comes close, but is laden with excess metaphysical baggage. The philosopher John Searle coined ‘biological naturalism’ as a mind-body theory within philosophy, and that comes very close. ‘Asoulism’ is more modest: a simple disbelief in the existence of souls based on evidence.”
>
> — David Weisman (2010), “The Experience of a Unified Mind and the Possibility of an Everlasting Soul are Connected and there is Scant Evidence to Support the Existence of Either” [2]

Examples of avowed asoulists include: Jean Meslier (1729), Julien la Mettrie (1745), Francois Broussais (c.1820), David Weisman (2010), possibly, Kurt Bell (2011), Patrick Fergus (2014), and Libb Thims (2015); along with "skeptical agnostic asoulists", e.g. Napoleon Bonaparte (c.1815).

Mortalism | Afterlife does not exist

Mortalism seems to have two distinct meanings associated with it. Firstly, one associated with an outright denial of the existence of an afterlife; such as summarized below:

> “Not all those who denied the existence of an afterlife—the mortalists—were atheist, the history of atheism and that of mortalism are closely connected.”
>
> — David Berman (2007), “Unbelief during the Enlightenment” [1]

Secondly, is one that is "soulism" inherent, i.e. a belief in the existence of the soul, but such that the soul ceases to exist when the body ceases to exist; or other variants along these lines. Einstein, e.g., denied afterlife, denied the soul without a body, but didn't directly deny the soul *with* a body (see: Einstein on the soul).

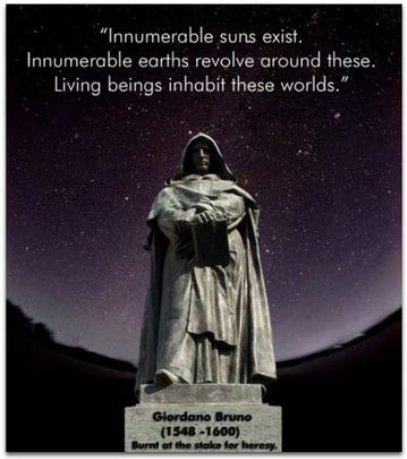

Belief | Quotes

The following are relevant belief-related quotes;

> “One’s theological holdings [can be divided] into two classes: those for which a man would go to the stake, and those for which a man would not go to the stake.”
>
> — Edwards A. Park (c.1870)

> “For the second law [of thermodynamics], I will burn at the stake.”
>
> — Heinz London (c.1933), comment made to H. Montgomery during his time at Harwell [10]

> “The belief state of an obscure lump of molecules wandering around a remote corner of England is of no importance whatsoever epistemologically speaking.”
>
> — Barry Barnes (1998), response to David Mermin whether he “might perhaps be into astrology” [9]

Quotes

The following are related quotes:

> “There are many questions in philosophy to which no satisfactory answer has yet been given. But the question of the ‘nature of the gods’ is the **darkest and most difficult of all**. So various and so contradictory are the opinions of the most learned men on this matter as to persuade one of the truth of the saying that philosophy is the child of ignorance.”
>
> — Cicero (45BC), *On the Nature of the Gods* (Ñº)

> “Spinoza’s equation ‘god = nature’ is self-contradictory, and must be seen as a subterfuge. After all, Spinoza’s motto was ‘be prudent’. Consequently, the vulgar characterization of Spinoza as a pantheist is incorrect: he was a secret atheist because he was a naturalist. The same holds for Einstein, who once declared that his religion was Spinoza’s, i.e. none.”
>
> — Mario Bunge (2010), *Matter and Mind: a Philosophical Inquiry* [7]

See also

â— Top 100 atheists

Notes

N1. Quote: “In your types of atheism under achristianism I would be a Yes. I support Christianity because their moral teachings are close to mine but I do not share any Christian beliefs. I would also be a yes under aspiritism. Under dating system I would stick to the present system for pragmatic reasons. I am a no under purpose, a yes under chance and a no under determinism.” (Alfred Rogers, 2016) [17]

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θΔics

In atheism terminology, **atheism-label avoider**, or an "atheism-avoiding label mindset", e.g. Jennifer Hecht in 2003, refers to someone, generally in the deconversion state, in going from theism to atheism, that does not believe in god, but "does not like to say so", as Napoleon Bonaparte put things (see: Napoleon Laplace anecdote) in his interviews of the leading scientists of France in the 1800s, per general social unrest that public atheism avowal brings to the fore, first and foremost being family and friend social bonding change dynamics, secondly public social dynamic changes, and thirdly, in some cases, public danger worries (e.g. Martinus Veltman, 2004).

Atheism label avoiders will tend to used "implicit atheism" in communications and writings, and publicly used neutral, socially non-offensive, alternative terms, such as: secular, naturalist, humanist, none (or non-believer), among others evasive labels.

Quotes

The following are related quotes:

> "How comes it, then, that Laplace was an atheist? At the Institute neither he nor Monge, nor Berthollet, nor Lagrange believed in god. But **they do not like to say so**."
>
> — Napoleon Bonaparte (c.1814), dialogue with Gaspard Gourgaud [1]

> "We are living in a totally ridiculous world. We have all kinds of things from horoscopes to Zen Buddhism to faith healers to religions to what have you. The whole world around us is full of nonsense, baloney, big speak and what have you. The fact that I'm busy in science has little or nothing to do with religion. In fact, I protect myself, I don't want to have to do with religion. Because once I start with that, I don't know where it will end. But probably I will be **burned** or **shot** or something in the end. I don't want anything to do with it. I talk about things I can observe and other things I can predict and for the rest you can have it."
>
> — Martinus Veltman (2004) interview (Ñº) with Harold Kroto (quote, 10:05-) (Ñº)

> "Initially after writing my book *Doubt*, I **avoided the atheist label**, saying only that I did not believe in god. After some reflection, I realized I needed to defend what I truly believe. I now call myself an 'atheist', and proudly."
>
> — Jennifer Hecht (2013), "The Last Taboo" (Ñº)

See also

â— Embarrassed to be an atheist

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In terminology, **atheist** is a person who does not believe in the existence of god or gods; and does not believe in the existence of one God viewed as the creative source of man and the world who transcends yet is immanent in the world. [1]

Atheist types

See main: Atheism types

(add discussion)

Non-metaphysical belief systems

A non-metaphysical belief system, is a belief system or belief state rooted in principles or creeds (see: atheist's creed) that are non-metaphysical.

(add discussion)

Atheistic belief systems | Types

See main: Godless belief systems

The typical "atheist" tends to fall in the 5 to 8 Dawkins scale number range. Once a person admits to being an atheist or thereabouts, the question that immediately comes to the fore, is what that person does believe in, i.e. what that person's non-deity based belief system is — being that "atheism", by definition, is not a belief system, though some would like to conceive that it is. Some, such as as atheist Thomas Jefferson, who characterized himself in letter as an "Epicurean materialist" (1820), historically, have opened up publicly about their godless belief system. The following is a list of known belief systems or philosophies adhered to by atheists:

Belief system | Godless	Date	Description	Example Believer[s]	Basis
Spiritualism	2700BC	"spirit" based belief system	Imhotep	
Heraclitean (Q)	475BC	"flux and fire" belief system	Heraclitus	
Materialism	460BC		Leucippus	
Empedoclean	420BC	4 elements + 2 forces belief system	Empedocles (Q)	Standard model
Epicureanism	270BC	"pleasure principle" belief system	Epicurus, Amafinius, Horace—whose famous statement *Carpe Diem* ("Seize the Day"), supposedly, illustrates the philosophy —Lucretius, Virgil, Julius Caesar, Pierre Gassendi, Denis Diderot, Jeremy Bentham, Christopher Hitchens, and Michel Onfray. (Q)	Atomic theory
Cartesian atheist	1660	"god or [=]	Franciscus van den Enden (Q)	

Spinozan	1676	nature" belief system	Benedict Spinoza, Albert Einstein	
Newtonian atheist	1686		Pierre Laplace	
Epicurean materialist	1820		Thomas Jefferson	
Existentialism	1841		Soren Kierkegaard [technically, he was a Christian]	
Darwinian	1859			
Nihilism	1882		Friedrich Nietzsche	
Carnotian	1906		H.G. Wells | Quote: “He was a practical electrician fond of whiskey, a heavy, red-haired brute with irregular teeth. He doubted the existence of a Deity but accepted Carnot’s cycle, and he had read Shakespeare and found him weak in chemistry.” [3]	Second law
Partetian (Q)	1914		Lawrence Henderson, Bernard DeVoto	
Gibbsian	1935		Lawrence Henderson	
Marxist-Leninist atheism (Q)	1917	A "materialist" advocating understanding of nature	Vladimir Lenin	
Meaninglessness	1937		Aldous Huxley	Second law
Existential nihilism (Q)	1943		Jean-Paul Sartre (Q), Martin Heidegger, Jacques Derrida	
Objectivism	1957		Ayn Rand (Q)	
Purposelessness	1986		Peter Atkins (Q)	Second law
Pointlessness	1988		Steven Weinberg (Q)	
Pastafarianism (Q)	2005	A [physics] creationism-parody belief system	Bobby Henderson Ofer Po (Q)	
Goetheanism	2011	A one nature [physicochemical] humanism mixed with physicalism mixed with materialism belief system	Libb Thims (Q)	Atomic theory + Combined law

Other terms include: physicalism and (add) which need placement above, somewhere.

Many will vacillate on the question of atheism for "fear of death", as some have commented, hence maintaining some type of residual theistic belief system (e.g. spiritualism).

Some, as of late, in rejection of traditional religion, will self-describe themselves as "spiritual but not religious" (Q) and or "spiritual atheist", the latter of which seems to be but a bend over backwards neoplasmic code variant for some type of spirit or soul based theism.

Notes

Some, will float in the gray area on the existence of god question: Albert Einstein, in response to this query, would always reply I do not believe in a "personal god", meaning that he held some type of Benedict Spinoza based "god = nature" conceptualization in his mind.

Quotes

The following are related quotes:

> "Atheism is so senseless and odious to mankind that it never had many professors."
>
> — Isaac Newton (c.1700), A Short Scheme of the True Religion (Q) (Q)

> "The **atheists** are for the most part impudent and misguided scholars who reason badly, who, not being able to understand the origin of evil, and other difficulties, have recourse to the hypothesis of the eternity of things and of inevitability."
>
> — Voltaire (c.1780) [6]

> "**Atheists** express their rage against god although in their view he does not exist."
>
> — C.S. Lewis (1950) (Q)

See also

- Atheism timeline
- Creationism scientists ranked by idiocy
- Famous atheists

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External links

- 50 Top Atheists in the World (2011) – TheBestSchools.com.
- Category: American atheists – Wikipedia.

θΔics

In hmolscience, **atheist church**, *a-theos* “without god” + *kyrios* “master”, refers to an assembly of people, with a general disbelief in the existence of god, who gather for purposes such as: moral guidance (see: atheistic morality), discussions of right and wrong, community togetherness, community outreach, ritual, song, dance, children's education, e.g. Zerotheism for Kids (Thims, 2015), atheist kids songs (Hawkins, 2014) (Q), listening to sermons, e.g. Monistic Sunday Sermons (Ostwald, 1910), ceremonies, such as weddings, e.g. Church of Elective Affinities (Shelley, 1816) or funerals, well-being, discussion, children's camp, e.g. Camp Quest (Kagin, 1996), festivals, holidays, among other traditional monotheism "church" like functions, albeit without a creed (see: atheist creeds) based on god (see: zerotheism) or a god-based bible (see: atheist bible).

A Las Vegas billboard (Q) for the 2012 launched “United Church of Bacon”, a parody “**atheist church**”, akin to the parody god “flying spaghetti monster”, lunched by John Whiteside, in association with Penn Jillette. [5]

Overview

In 1809, Goethe penned his *Elective Affinities*, which attacked the sixth commandment, of the ten commandments of Christianity, with the chemical theory of “elective affinities” applied to human relationships and morals; this formed the gospel of two of the greatest of god's assassins, namely: Arthur Schopenhauer, who trained under Goethe, and Friedrich Nietzsche, who trained himself by reading the work of Schopenhauer.

In 1816, Percy Shelley married Mary Shelley, in the “Church of Elective Affinities”, who congregation included George Byron, among others, the doctrine of their religion being the chemical theory of “elective affinities”, a variant of what Goethe previously, independently, outlined.

In circa 1850, Auguste Comte, a so-labeled “atheist philosopher”, in France, launched, supposedly, a movement of unbelieving congregations, which lasted for one generation. [1]

In 1910, Wilhelm Ostwald, in Germany, in coordination with Ernst Haeckel, gave his series of “Monastic Sunday Sermons”, which would have been an atheist church congregation of sorts.

In 2006, the so-called First Church of Atheism was launched online allowing people, via local ordinance laws, supposedly, to be come ordained ministers of the atheist, for the purposes of weddings, baptisms, etc. [3]

First Church of Atheism
A community for atheists and
Network of our local chapters

A logo for the 2006-launched online "First Church of Atheism", which has semi-active MeetUp stylized events in a few US cities. [3]

In 2013, English atheists Sanderson Jones and Pippa Evans, in England, launched the “Sunday Assembly”, dubbed a church-like gathering for atheists, aimed at capturing the theme of traditional fun singing and gathering, but without "god" in the mix. [2]

In 2015, Libb Thims, together with Atheism Reviews co-host Thor, taught a big bang cosmology + coupled morality based atheism Sunday school class, entitled "Zerotheism for Kids", to a group of six Chicago children, aged 6 to 11, as a reaction to the fact that the six year old had been given a traditional "children's bible", teaching Nile river cosmology + snake-n-apple morality, after which he asked, in confusion about the six-day creation model, "how did god create the world so fast?"

Quotes

The following are related quotes:

> “After Harris came high pope Dawkins, then cardinal Hitchens, the bishop Dennett, and then the lower and more moderate figures in this new atheist priesthood: Krauss, Stenger, Atkins, Shermer [and all the rest] *e bella compagnia*.”
>
> — Bo Jinn (2013), *Illogical Atheism* (loc. 286) [4]

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Videos

● Glenn, Jaclyn. (2014). “First Church of Atheism” (Q), May 30.

Threads

● Anon. (2016). “Atheism: Deeper than Myths”, Hmolpedia threads, May 22.

θΔics

In anecdotes, **atheist deathbed conversions** refers famous atheists or assumed atheists that converted "out of atheism" and into theism in their last days, or during their last words; or, conversely, took peculiar precautions to make sure they would not utter theistic nonsense while delusional in their last moments.

Spinoza

In 1677, Benedict Spinoza (1632-1677), who was ranked by Pierre Bayle in 1682 as the "greatest atheist there ever was", took some very peculiar steps in his last days to prevent himself from saying anything in his last moments that might conflict with his new geometrical theory of natural ethics; this was summarized by Bayle as follows: [1]

> "Spinoza, sensing that he was near his end, had his landlady come and begged her to prevent any minister from coming to see him in that condition. His reason was, as is known from one of his friends [Adriaan Paets, according to Verniere], that he wished to die without a dispute and that he feared falling into some weakness of the understanding which would make him say something that could be used against his principles. This is to say that he feared that it would be spread about in the world that, when facing death, his conscience having awoken, it made him give the lie to his bravery and renounce his sentiments. Can a more ridiculous and more extreme vanity be seen than this one, and a crazier passion for the false idea one forms of constancy?"

(add)

Voltaire

In 1778, Voltaire (1694-1778) [HD:9] [FA:38] ended, supposedly, with the following quizzical last words:

> "I am abandoned by god and man; I shall go to hell! I will give you half of what I am worth, if you give me six months life."
>
> — Voltaire (1778), supposed last words [2]

> "I am abandoned by god and man. I will give you half of what I am worth if you will give me six months of life. Then I shall go to hell and you will go with me, oh, Christ, oh, Jesus Christ!"
>
> — Voltaire (1788), variant of what he reportedly said to his attending physician (Q)

(add)

Paine

In 1809, Thomas Paine (1737-1809) [HD:15][FA:49], as some American believers claimed, died "howling and terrified", recanting his assaults on organized religion and the reliability of the Bible. [3]

> "I would give worlds, if I had them, that the *Age of Reason* had never been published. Oh, god, save me; for I am at the edge of hell alone."
>
> — Thomas Paine (1809), supposed last words [2]

(add)

Napoleon

In 1821, Napoleon Bonaparte, being an agnostic irreligionist most of his existence, in his last three weeks, professed belief in god:

> "I am neither atheist nor a rationalist; I believe in god and am of the religion of my father. I was born Catholic, and will fulfill all the duties of the church."
>
> — Napoleon Bonaparte (1821), statement three weeks before reaction end, Apr 18

Curiously, here we see some sort of Pascal's wager like fear creeping into his mind, at the last moment?

Neumann

See main: Neumann on god

In 1957, Hungarian-born American polymath John Neumann (1903-1957), the last of the last universal geniuses, who was raised in an ecumenical non-serious Jewish family, who defined themselves as Jewish, for reasons of "tradition", who, in his first marriage, nominally converted to Catholicism, albeit presenting himself as agnostic throughout his days to his friends and associates, but who in his last months on his death bed, Apr/May 1956 to his last day of existence on 8 Feb 1957, had Roman Catholic priest Anselm Strittmatter stay by his side, wherein he expressed great fear of death, and asked to have Pascal's wager administered to hims so that he wouldn't have to endure the possibility of eternal damnation.

Sartre

In 1980, French famously atheist existentialist philosopher Jean-Paul Sartre (1905-1980), lover of famous atheist Simone de Beauvoir (1908-1986), supposedly, stated a belief in god, contrary to his entire philosophical corpus. Sartre, in his latter year, began to waver on his atheistic beliefs, leaning, in the end, towards Judaism. In 1974, in an interview with Simone de Beauvoir, his lover, he stated: (Q)

> "I see myself as a being that could, it seems, only come from a creator. This, however, is not a clear, exact idea."

In 1980, while on his deathbed, in conversation with Pierre Victor, he supposedly said the following: [4]

> "I do not feel that I am the product of chance, a speck of dust in the universe, but someone who was expected, prepared, prefigured. In short, a being whom only a creator could put here; and this idea of a creating hand refers to god."

The 1996 book *Hope Now: the 1980 Interviews* (Q) goes into this deconversion episode.

Hitchens

In circa 2008, famous new atheism leader Christopher Hitchens (1949-2011) stated in video interview somewhere that if, per chance, on his deathbed, while heavily sedated and or hallucinating, that he speaks about belief in god, it will not be a statement of sanity, or something to this affect. He held to his word to his end and remained an atheist. His son Alexander Hitchens described his last days as follows: [3]

> "On the deathbed conversion – I spent my father's final weeks and days at his bedside and watched him draw his final breath and die, and can assure you that there was no hint of any sort of conversion (as I'm

sure you have already guessed). In fact, we barely spoke about religion at all except for joint expressions of frustration at the god botherers who made the rounds in the ICU and other units where dying people could be preyed upon by vulturous Christians."

In 2016, writer Larry Taunton published *The Faith of Christopher Hitchens: The Restless Soul of the World's Most Notorious Atheist* (Q), based on two road trips he took with Hitchens in his last year, wherein he stated that Hitchens privately "not certain" about his atheism despite what he led the public to believe. This was ballooned by the media to the effect the effect that Taunton's book spoke of a deathbed deconversion and that Hitchens "accepted god" before death. (Q) Hitchens' son described this as a "bloody book".

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θΔics

In hmolscience, **atheist eulogy** refers to a speech, given at the ceremony of someone who's existence, as a reactive bound state, defined individual, has ceased to exist, presented in an atheistic mode of transmission, style, and theory; a eulogy that does not invoke god, god theory, or god talk.

Ingersoll

In 1882, Robert Ingersoll, during a burial service for his friend's child, famously gave the following retrospectively classified secular or agnostic eulogy of sorts, wherein he softly leans towards a denial of the afterlife, and of heaven and hell: [4]

> "I know how vain it is to gild a grief with words, and yet I wish to take from every grave its fear. Here in this world, where life and death are equal kings, all should be brave enough to meet what all have met. The future has been filled with fear, stained and polluted by the heartless past. From the wondrous tree of life the buds and blossoms fall with ripened fruit, and in the common bed of earth patriarchs and babes sleep side by side. Why should we fear that which will come to all that is? We cannot tell. We do not know which is the greatest blessing, life or death. We cannot say that death is not good. We do not know whether the grave is the end of this life or the door of another, or whether the night here is not somewhere else a dawn. Neither can we tell which is the more fortunate, the child dying in its mother's arms before its lips have learned to form a word, or he who journeys all the length of life's uneven road, painfully taking the last slow steps with staff and crutch. Every cradle asks us "Whence?" and every coffin "Whither?" The poor barbarian weeping above his dead can answer the question as intelligently and satisfactorily as the robed priest of the most authentic creed. The tearful ignorance of the one is just as consoling as the learned and unmeaning words of the other.
>
> No man standing where the horizon of a life has touched a grave has any right to prophesy a future filled with pain and tears. It may be that death gives all there is of worth to life. If those who press and strain against our hearts could never die, perhaps that love would wither from the earth. Maybe a common faith treads from out the paths between our hearts the weeds of selfishness, and I should rather live and love where death is king than have eternal life where love is not. Another life is naught, unless we know and love again the ones who love us here. They who stand with breaking hearts around this little grave need have no fear. The largest and the noblest faith in all that is, and is to be, tells us that death, even at its worst, is only perfect rest. We know that through the common wants of life, the needs and duties of each hour, their grief will lessen day by day until at last these graves will be to them a place of rest and peace, almost of joy. There is for them this consolation: The dead do not suffer. If they live again their lives will surely be as good as ours. We have no fear; we are all children of the same mother and the same fate awaits us all. We, too, have our religion, and it is this: "Help for the living, hope for the dead"."

On 30 Mar 1892, Ingersoll gave another eulogy for his good friend Walt Whitman; a funny section of which is: [5]

> "Today we give back to mother nature, to her clasp and kiss, one of the bravest, sweetest souls that ever lived in human clay."

(add)

Lindsay | Burbank

On 11 Apr 1926, Luther Burbank dereacted (died), four months after "going public", in newspaper interview, with his atheism, in reaction to the Scopes Monkey Trial (1925) after which he began receiving death threats and much heated public outcry; his eulogy was given, in Santa Rosa,

California, by fellow freethinker Ben Lindsey (Ñº), a Denver judge, whom Burbank had previously asked to perform this duty, which was said to a throng of ten-thousand mourners: [2]

A video still of Ben Lindsey giving his "**infidel eulogy**" for his friend and fellow freethinker Luther Burbank in 1926.

> "It is impossible to estimate the wealth he has created. It has been generously given to the world. Unlike inventors, in other fields, no patent rights were given him, nor did he seek a monopoly in what he created. Had that been the case, Luther Burbank would have been perhaps the world's richest man. But the world is richer because of him. In this he found joy that no amount of money could give.
>
> And so we meet him here today, not in death, **but in the only immortal** life we positively know--his good deeds, his kindly, simple, life of **constructive work** and loving service to the whole wide world.
>
> **These things cannot die**. They are cumulative, and the work he has done shall be as nothing to its continuation in the only immortality this brave, unselfish man ever sought, or asked to know.
>
> As great as were his contributions to the material wealth of this planet, the ages yet to come, that shall better understand him, will give first place in judging the importance of his work to what he has done for the betterment of human plants and the strength they shall gain, through his courage, to conquer the tares, the thistles and the weeds. Then no more shall we have a mythical god that smells of brimstone and fire; that confuses hate with love; a god that binds up the minds of little children, as other heathens bind up their feet—little children equally helpless to defend their precious right to think and choose and not be chained from the dawn of childhood to the dogmas of the dead.
>
> Luther Burbank will rank with the great leaders who have driven heathenish gods back into darkness, forever from this earth.
>
> In the orthodox threat of eternal punishment for sin--which he knew was often synonymous with yielding up all liberty and freedom--and in its promise of an immortality, often held out for the sacrifice of all that was dear to life, the right to think, the right to one's mind, the right to choose, he saw nothing but cowardice. He shrank from such ways of thought as a flower from the icy blasts of death. As shown by his work in life, contributing billions of wealth to humanity, with no more return than the maintenance of his own breadline, he was too humble, too unselfish, to be cajoled with dogmatic promises of rewards as a sort of heavenly bribe for righteous conduct here. He knew that the man who fearlessly stands for the right, regardless of the threat of punishment or the promise of reward, was the real man.
>
> Rather was he willing to accept eternal sleep, in returning to the elements from whence he came, for in his lexicon change was life. Here he was content to mingle as a part of the whole, as the raindrop from the sea performs its sacred service in watering the land to which it is assigned, that two blades may grow instead of one, and then, its mission ended, goes back to the ocean from whence it came. With such service, with such a life as gardener to the lilies of the field, in his return to the bosoms of infinity, he has not lost himself. There he has found himself, is a part of the cosmic sea of eternal force, eternal energy. And thus, he lived and always will live.

Thomas Edison, who believes very much as Burbank, once discussed with me immortality. He pointed to the electric light, his invention, saying: 'There lives Tom Edison.' So Luther Burbank lives. He lives forever in the myriad fields of strengthened grain, in the new forms of fruits and flowers, plants, vines, and trees, and above all, the newly watered gardens of the human mind, from whence shall spring human freedom that shall drive out false and brutal gods. The gods are toppling from their thrones. They go before the laughter and the joy of the new childhood of the race, unshackled and unafraid"

(add)

Freeman

In Jun 2005, physicist Aaron Freeman, penned his "Eulogy from a Physicist", in reference to a reflection of his thoughts on the recent passing of his father and sister, which aired on NPR's "All Things Considered", which reads as follows:

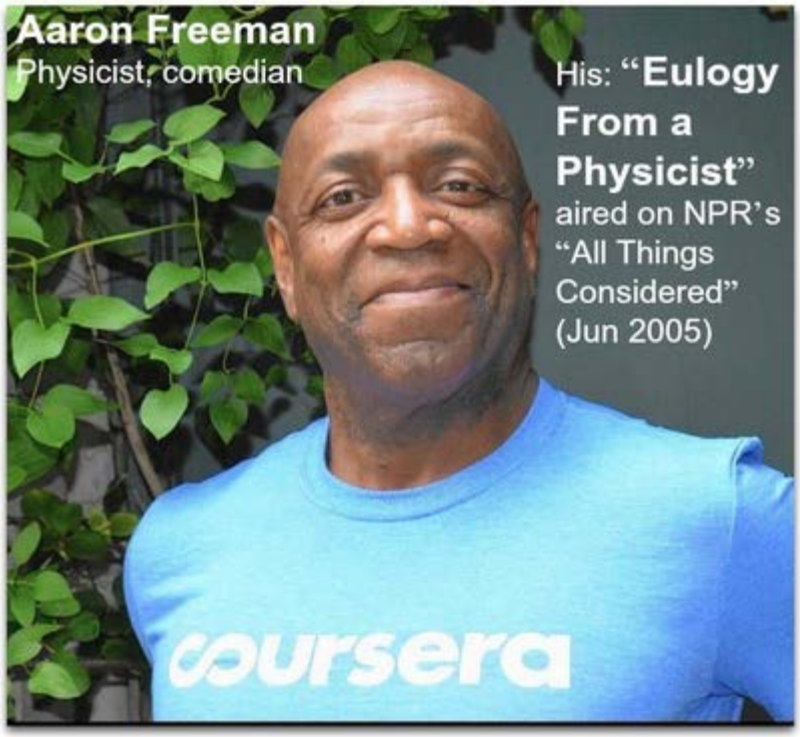

In 2005, physicist Aaron Freeman gave a spoken physics style eulogy on NPR radio, in reference to a reflection of his thoughts on the recent passing of his father and sister.

"You want a physicist to speak at your funeral. You want the physicist to talk to your grieving family about the conservation of energy, so they will understand that your energy has not died. You want the physicist to remind your sobbing mother about the first law of thermodynamics; that no energy gets created in the universe, and none is destroyed. You want your mother to know that all your energy, every vibration, every Btu of heat, every wave of every particle that was her beloved child remains with her in this world. You want the physicist to tell your weeping father that amid energies of the cosmos, you gave as good as you got.

And at one point you'd hope that the physicist would step down from the pulpit and walk to your brokenhearted spouse there in the pew and tell him that all the photons that ever bounced off your face, all the particles whose paths were interrupted by your smile, by the touch of your hair, hundreds of trillions of particles, have raced off like children, their ways forever changed by you. And as your widow rocks in the arms of a loving family, may the physicist let her know that all the photons that bounced from you were gathered in the particle detectors that are her eyes, that those photons created within her constellations of electromagnetically charged neurons whose energy will go on forever.

And the physicist will remind the congregation of how much of all our energy is given off as heat. There may be a few fanning themselves with their programs as he says it. And he will tell them that the warmth that flowed through you in life is still here, still part of all that we are, even as we who mourn continue the heat of our own lives.

And you'll want the physicist to explain to those who loved you that they need not have faith; indeed, they should not have faith. Let them know that they can measure, that scientists have measured precisely the conservation of energy and found it accurate, verifiable and consistent across space and time. You can hope your family will examine the evidence and satisfy themselves that the science is sound and that they'll be comforted to know your energy's still around. According to the law of the conservation of energy, not a bit of you is gone; you're just less orderly. Amen [see: supreme god timeline]."

In May 2005, Freeman, prior to the above, to note, published “My Inner Particle”, a reflection of his thoughts on the recent passing of his father and sister, from the point of view of knowledge of the universe, as he sees things as a physicist, using a mixture of the human particle and human wave view of things and the standard model. [2]

Thims | Fergus

On 25 Jan 2015, Libb Thims, during the fire pit toast done in the wake of the Jan 21st passing of Atheism Reviews co-host Patrick Fergus, gave an impromptu physicist-like eulogy of sorts, to the man whose atheist creed was “I believe in energy”, as follows: [3]

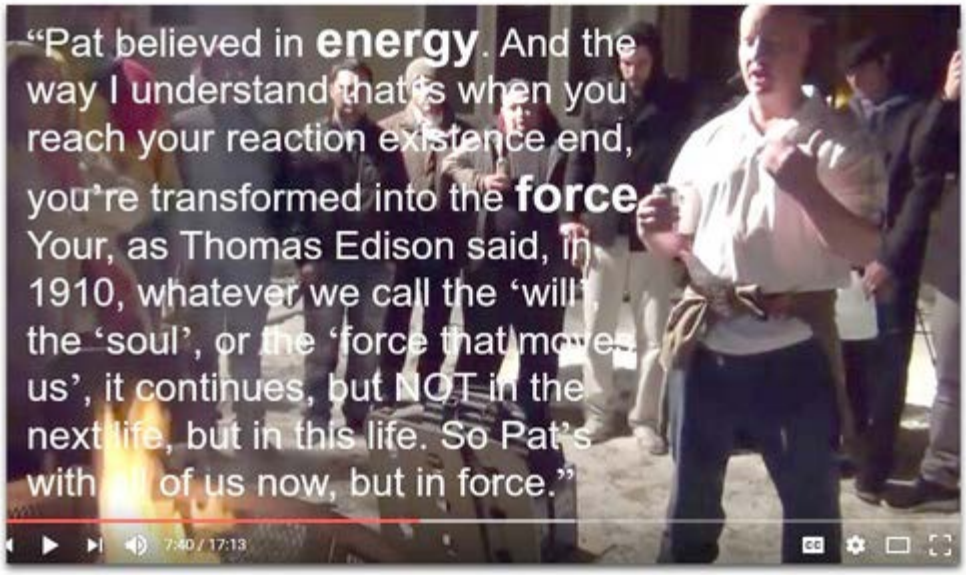

Libb Thims on 25 Jan 2015 doing an **atheist's eulogy**-like toast to Patrick Fergus, aka "King Atheist", co-host of the YouTube channel Atheism Reviews, who ceased to exist on Jan 21st; a real-time rendition of Aaron Freeman's 2005 “Eulogy from a Physicist”, in many respects. [3]

> “Passion #3 is atheism. He probably tried to convert everybody here into atheism or at least half of you here? If you sat with Pat, he would start talking about atheism. That’s what I liked about Pat. He had real passion about that. [Monica: ‘He was real!] He was real. He kept it real. [Monica: ‘Always]. And about that passion, I know a lot of people posted in: ‘Pat’s in heaven right now’. Pat, however, didn’t believe in heaven. He believed in energy. And the way I understand that is when you reach your reaction existence end, you’re transformed into the force. You’re, as Thomas Edison said, in 1910, whatever we call the ‘will’, the ‘soul’, or the ‘force that moves us’, it continues, but NOT in the next life, but in this life. So Pat’s with all of us now, but in force.”

In this impromptu creed, in retrospect, to note: (a) Thims had in mind at this time the Star Wars secular eulogy talk of Yoda who speaks about people being "transformed into the force", as envisioned by George Lucas, and (b) technically, there is no such thing as conservation of force, but only conservation of energy; the former is a scientifically approximately correct forerunner to the latter, the details of which being sorted out in the late 19th century; nevertheless, when a force moves a body through a unit of distance, it becomes "work", according to the principle of the transmission of work, which is conserved in the universe.

Quotes

The following are related quotes:

> “When my husband died, because he was so famous and known for not being a believer, many people would come up to me — it still sometimes happens — and ask me if Carl changed at the end and converted to a belief in an afterlife. They also frequently ask me if I think I will see him again. Carl faced his death with unflagging courage and never sought refuge in illusions. The tragedy was that we knew we would never see each other again. I don’t ever expect to be reunited with Carl. But, the great thing is that when we were together, for nearly twenty years, we lived with a vivid appreciation of how brief and precious life is. We never trivialized the meaning of death by pretending it was anything other than a final parting. Every single moment that we were alive and we were together was miraculous-not miraculous in the sense of inexplicable or supernatural. We knew we were beneficiaries of chance. . . . That pure chance could be so generous and so kind. . . . That we could find each other, as Carl wrote so beautifully in Cosmos, you know, in the vastness of space and the immensity of time. . . . That we could be together for twenty years. That is

> something which sustains me and it's much more meaningful. . . . The way he treated me and the way I treated him, the way we took care of each other and our family, while he lived. That is so much more important than the idea I will see him someday. I don't think I'll ever see Carl again. But I saw him. We saw each other. We found each other in the cosmos, and that was wonderful."
>
> — Ann Druyan (c.1996), letter (Ñº) written after the passing of Carl Sagan

See also

â— Rest in power

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θΔics

In festivals, **atheist holiday** refers to any day, considered, from a secular point of view, “holy”, metaphorically speaking, or sacred, celebrated by a non-believer, atheist, free thinker, humanist or agnostic.

A 2011 **atheist holiday** stylized Christmas tree, namely a Flying Spaghetti Monster (FSM) topped pine tree (Ñº), the FSM god, i.e. the 2005 parody god of Bobby Henderson, replacing the traditional Christian “angel”, which in the Roman recension (50BC-400AD) replaced the “ba” (pharaoh-headed bird) of Osiris, representative of his soul about to ascend into the afterlife.

Newtonian Christmas | Dec 25 / Jan 4

Isaac Newton was born on Christmas Day, Dec 25, 1642, according to the Julian calendar (or Jan 4, 1643 in Gregorian calendar years), then in use in England. Non-believers such as Goethe, have spoken about Newton's birth as the "new Christmas"; for example:

> “1642 [Newton ’s birth] is the **Christmas** of the modern age.”
>
> — Johann Goethe (c.1810)

Recently, Richard Dawkins (2008) has spoken, similar to Goethe, of revamping Dec 25 to be celebrated NOT as the birth of Jesus Christ, who never existed (see: Jesus never existed), but as a celebration of the birth of Isaac Newton, who did exist. [4]

Thomas Paine Day | Jan 29

In the 1990s, the *Truthseeker*, an atheist periodical, began to call for the celebrations of Thomas Paine’s birthday, Jan 19, at “Freethinkers Day”. [1]

Darwin Day | Feb 12

Some secularists and atheists celebrate “Darwin Day” (Ñº) on Feb 12 the birthday of Charles Darwin; the following are related quotes:

> “When Darwin’s book hit the crowd, it was like Christmas for ex-Christians.”
>
> — Jennifer Hecht (2003), *Doubt: a History* (pg. 405)

Ingersoll Day | Aug 11

Some atheists celebrate the Aug 11 birthday of Robert Ingersoll (1833-1899) as a holiday of sorts. [2]

Freethought Day | Oct 12

Some secularists and freethinkers observe Oct 12 as “Freethought Day”, an occasion that marks the anniversary of the effective end of the Salem Witch Trials. (Ñº)

Christmas | Khoiak festival

The time of Christmas (Dec 25 to Jan 6), aka Khoiak festival (Dec 10 to Jan 8), as it was originally called in Egypt, prior to the Greek recension and Roman recension of Egyptian religion, with the traditional use of the Christmas tree, aka tamarisk tree (djed pillar or backbone of Osiris) as it was originally called in Egypt, and gifts, is a peculiar time for atheists; per general reason that that this is symbolic of the time that many great atheists have, traditionally been burned at the stake (with their books), for questioning the meaning of Christmas, according to its underlying religio-mythology components (see: religio-mythology scholars).

In the Old Testament (c.250BC), aka the Jewish recension of Egyptian religion, the Osiris cult, the religious belief system that gave rise to the origin of the Christmas tree, was forbidden; this is stated in Jeremiah 10:2-4 as follows:

The anti-Christmas minded women, at right, holding the sign "pagan idol", means that the Christmas tree is symbolic of Osiris and the ascent of his ba or soul, aka "angel" at top of tree, into the afterlife. In the Jewish recension, the Ra worship aspect of Egyptian religion was kept, while the Osiris worship was rejected. In the Roman recension, Ra worship was kept, aka belief in Ab-Ra-ham (Abraham) as patriarch, AND Osiris worship was re-added back into the belief mixture, in the form of Jesus Christ, aka an "Osiris anointed" belief system, Osiris being descendant from Ra (or Jesus being descendant from Abraham). All of this, of course, is lost to the modern ear, give or take a few in the know.

Christmas, for atheists, in short, is symbolic of what they have been "working their mind" (see: unlearn) to reject as untruth; the following are related quotes:

Quotes

The following are related quotes:

> "I wanted to become an **atheist**, but I gave up. They have **no holidays**."
>
> — Henny Youngman (c.1990) [3]

> "There is an assumption that atheists don't 'do **Christmas**'."
>
> — Elisabeth Cromwell (2011), "A Very Atheist Christmas" [1]

> "All I want for Christmas is a rational view of a universe by physical laws."
>
> — Author (c.2014) (Ñº)(Ñº)

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θΔics

In terminology, **atheist misconception** refers to commonly conceptualized ideas or pictures, often held in the mind of theists, about atheists, regarding how they visualize atheists seeing or thinking the universe, in respect to human affairs and or meanings, e.g. viewing atheists as "lonely nihilists who believe in nothing" (Myers, 2008), or "not able to believe in love" (anon artist, image shown), or amoral or without morals, etc.

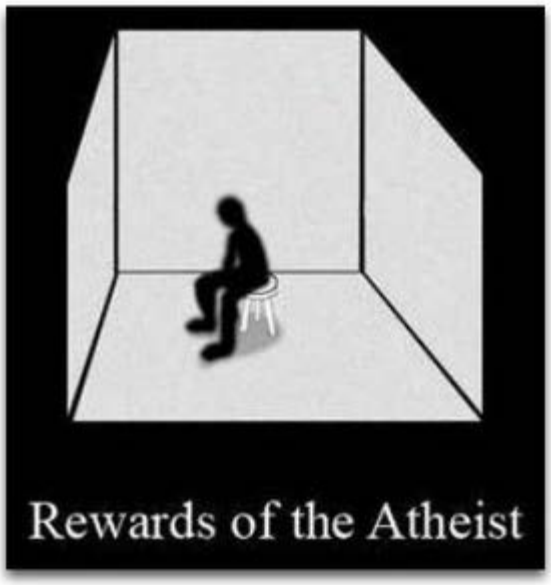

A 2008 DevianArt depiction by a theist (Q) of their conception, or rather **misconception**, of an atheist, as someone who believes in nothing, not even love, morals, purpose (or sense of purpose), or meaning. [1]

Fallacy

The following, summarized by atheism historian Michael Palmer (2013), is example of the so-called "atheist fallacy", the assumed conclusion that without god in mind existence thereby becomes meaningless, purposeless and without point: [2]

> "It is a common assumption of religious faith that, without God, life is essentially meaningless and purposeless, with human beings condemned to the depressing and uninviting prospect of the compost heap."

This is the co-called "god void issue". Palmer goes on to state:

> "With God's death [Nietzsche, 1882], meaning has been relocated."

Palmer goes on to quote from Albert Camus and his atheist rendition of the myth of Sisyphus as seeming reconciliation of the issue.

Creeds

A reaction, so to say, to some of these atheist misconceptions, have been published statements by atheists, called "atheist's creeds", about what, exactly, he or she does believe in, if not god.

> "The very pith of the Atheist's Creed is contained in once sentence, which concists of only two words. Or, like every other creed, it is a negative throughout. 'No God!'"
>
> — W.T. Marris (1883), "Sermon", at Grosvenor Street Wesleyan Chapel (Q)

(add discussion)

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θΔics

In education, **Atheist Sunday School**, or "Sunday School for Atheists", refers to a weekend (or weekday) class taught to children of atheist, agnostic, humanist, or free-thinking parents, as replacement to the typical Christian class that religious parents send their children to each Sunday morning.

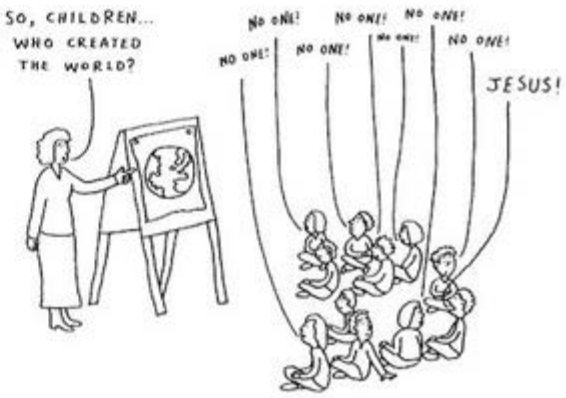

Left: the 2007 *Time* article on the rise of **Atheist Sunday Schools** being taught in humanist community centers in California. Right: a joke atheist Sunday school cartoon (Q) subtitled "a possible infiltrator is detected at the atheist Sunday school".

Overview

In the 1830s, in Great Britain, and later America, so-called "secular Sunday schools" and or "socialist Sunday Schools, as alternatives to orthodox Christian Sunday schools began to appear, centered around the ideas of those such as Robert Owen; resistance for some of these secular or socialist schools began to appear per reasons that they were subverting the minds of young people with political and anti-religious doctrines and teachings. [5] These, however, do not seem to have been atheism-explicit Sunday schools.

In 1910, German physical chemist and radical atheist Wilhelm Ostwald gave a series of sixty "Monistic Sunday Sermons" in Germany, generally based on his monism view of energy, supported by Ernst Haeckel and his evolution views, in Germany. This wasn't necessary a Sunday School for kids, as summarized by Caspar Hakfoort (1992) and Stephen Contakes (2013), but rather a pioneering effort directed towards free thinking adults. [1]

In 2004, the Humanist Community Center in Palo alto, Ca, began to offer a weekly 'Sunday School for Atheists' class for the children of atheists, secularists, and humanists, where parents would take turns teaching kids about morals and meaning with god. [2]

In 2015, American electrochemical engineer Libb Thims, in Chicago, together with *Atheism Reviews* co-host Thor, taught a 'Monday School for Atheists' kids class, dubbed 'Zerotheism for Kids', to five kids, ages: 6, 7, 9, 10, and 11, two girls and three boys, over the course of 3.5-hours, with one recess and lunch break. [3]

In 2015, YouTube existential philosopher Nick Bohl, was hired by Greg Epstein (Q), Harvard's humanist chaplain, author of *Good Without God* (2009), organizer of the YouTube Humanist Hub, launched in 2013, a public version spinoff of the 1970s initiated Humanist Community at Harvard (HCH), to begin teaching a so-dubbed "secular Sunday school" class, superficially entitled the "Big Questions Lab" (BGL), for kids of parents that are humanists, atheist, agnostic, and allies, in and around Cambridge, Massachusetts.

In Jul 2016, initial segments of the BGL class were recorded and put on YouTube. Those who helped make the program include: Dale McGowan, author of *Parenting Beyond Belief* (2007), Karenna Gore, E.O. Wilson, Alfie Kohn, Tracy Elizabeth, and Katherine Ozment. A review of this BQL class, however, seems to be more of a basic kindergarten class, focused on answering "big questions" such as "why is the sky blue?", "why are days shorter in the winter?", with no atheism-explicit talk mentioned in respect to the bigger deep questions that kids as.

See also

- Camp Quest
- Church of Elective Affinities

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(b) Note 1: the first attempt at this lecture was initiated in circa Feb 2015 when Thims’ sister came to visit with her two kids (ages 4 and 6) to Chicago during which Thims said he wanted to do an atheism for kids video with them; she explained that, as they were already in Hebrew school, that “they already believe in god, that will only confuse them!”; after which Thims got into an argument and the project was scuttled.
(c) Note 2: the modern working version of the show was conceived, in mid Jul 2015, when Sarah, a friend of Thims, explained who she gave her 3 kids, two boys, ages 6 and 9, and one girl age 10, a children’s bible to read, after which the youngest (aged six) asked “how did god create the world so fast?” (i.e. 6-days, standard Genesis account); to which Sarah really didn’t have an answer; Thims then sent his "Are Adam and Eve Real People?" (Q) video to her to watch; which in turn found its way into Alex, another friend of Thims, who texted him to send her more like this to show her two kids.
4. (a) Bohl, Nick. (2016). “Atheist Sunday School?! Philosophy & Community for Nonreligious/Interfaith Families” (7-min) (Q), The Humanist Hub, Jul 12.
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θΔics

In atheism terminology, **atheistic evangelism**, or an "evangelical atheist", someone who is evangelical about atheism, refers to those of an atheistic or agnostic-leaning-toward-atheism mindset, actively promoting atheism views and publically countering theological views, in a vociferous manner; someone who preaches atheism as gospel.

Overview

Modern Christian apologists consider Ludwig Buchner, and his 1855 *Force and Matter*, the father of atheistic evangelism (Q), or antitheism, in Germany; a counterpart, supposedly, to Thomas Huxley, who some consider to be the first atheistic evangelist—though Huxley himself denied, supposedly, that he was an atheist, preferring the term agnostic, which he coined in 1868—the 'atheistic evangelism' standard, as some have categorized, since then has been carried by Bertrand Russell, Henry Mencken, Richard Dawkins, and Sam Harris. [1]

In 1948, the term "atheistic evangelism" (Q) was used in reference to Junius Brown (1902-1970) (Q), and his *Psychology and the Social Order*, with its "penetrating" analysis of religion; who was generally noted for his attempt to integrate Lewin, Freud, and Marx. (Q)

Dan Barker, a former "evangelical preacher", considers himself and or tends to be cited as an "evangelical atheist". (Q)

Etymology | Note

The term "evangelist", from Greek *euangelistes* "preacher of the gospel" or "bringer of good news", derives from *eu-* "good" + *angellein* "announce", from *angelos* "messenger", means, in the 12th century sense, someone, e.g. "Matthew, Mark, Luke or John" who divines messages from god via the communication of an angel. [2] It is difficult to say, therefore, that a real atheist would cling to such a metaphysically-based term.

See also

- Atheistic morality

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2. Evangelist – EtymOnline.com.

External links

- Evangelical atheism – Wikipedia.

θΔics

In hmolscience, **atheistic morality**, or "scientific morality", refers to a system of ethics, of discernment between the right or wrong of a choice or action, not in any way based on supposition of the existence of god, or god theory (or god hypothesis) residual baggage, e.g. supernatural suppositions, but rather one based on nature as the modern measurable physical and physicochemical sciences understand the operation of the universe.

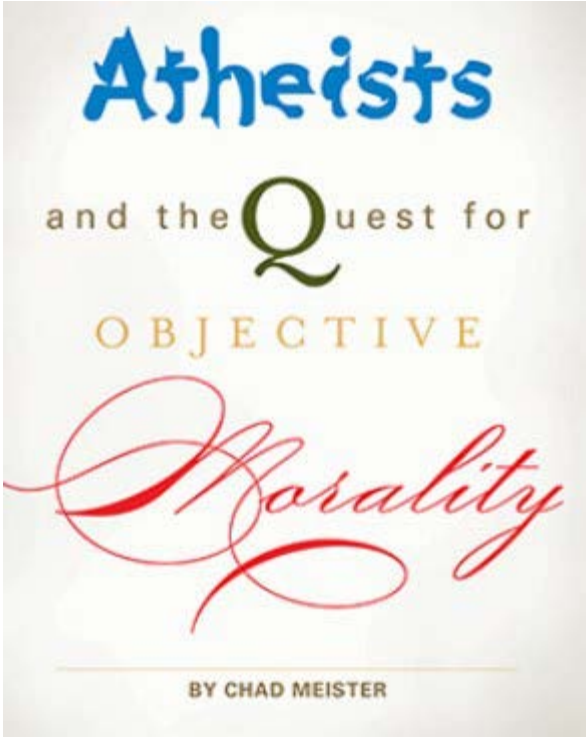

Image from American religious philosopher Chad Meister's 2010 article "Atheists and the Quest for Objective Morality", wherein he asserts that a pure science based **atheistic morality** will never, likely, be possible. [3]

Overview

In c.280BC, Epicurus, via atomic theory, penned some type of atheistic moral theory.

In 45BC, Roman scholar Cicero, an Epicurean materialism based commenter on religion vs science dialogues, and the first to transliterate the Greek word ἄθεος, from the privative ἀ- + θεός "god", meaning "godless", into the Latin *átheos* (Q), in his "On Fate", introduced the term "moral science" as follows: [1]

> "That branch of philosophy which, because it relates to manners, the Greeks usually term ethics [from: ήθος or 'ethos'], the Latins have hitherto called the philosophy of manners. But it may be well for one who designs to enrich the Latin language, to call it **moral science**. And here we have to explain the nature and force of certain propositions which the Greeks term 'axioms'. When these propositions relate to the future, and speak of possibilities and impossibilities, it is difficult to determine their precise force. Such propositions necessarily refer to the amount of possibility, and are only resolvable by logic, which I call the art of reasoning."

This would seem to define moral science, according to Cicero, as the study of actions of behaviors that lead to death (or the arrival of goddess Mor), and or the avoidance of such actions or behaviors, leading to the prolongation of life (accentuation of the stay of the goddess Vita). Here, to clarify, knowing in a modern sense, that "life" and "death" do not exist (see: defunct theory of life; life does not exist; life terminology upgrades), just as neither do the Greco-Roman goddess Mor and Vita exist, but rather are religio-mythology conceptions, we define, or rather translate, Cicero's moral science logic, to signify the study of the nature and direction of the beginning and ending of human chemical reactions, whether individual, interpersonal, social, or global.

In 1616, Lucilio Vanini, in his *Of the Marvelous Secrets of the Queen and Goddess of the Mortal Ones, Nature*, became the second main thinker, behind Epicurus, according to Jennifer Hecht (2003), explicitly known that doubters could be more moral than believers, per argument that doubters are motivated by "reason" whereas believers are not. [8]

In 1682, Pierre Bayle, in his *Various Thoughts on the Occasion of the Comet*, in commentary on the famous comet of 1680, argued that comets were a natural phenomenon, that comets did not presage disaster, and therein presented the "first-ever all-out defense of the morals of an atheist", as Jennifer Hecht (2003) summarizes things. [8]

In 1777, French thinker Jean Sales—a confirmed a "Voltairian" in general belief system, albeit characterized as a materialistic theist, who believed in the immortality of the soul, but who approves of the extreme atheism of Baron d'Holbach, but not that of Julien La Mettrie— penned the social Newton (or moral Newton) questioning tale known as "Newton in Senegal", a short Socratic dialogue style satirical play, found in volume four of his seven-volume human molecular theory based *The Philosophy of Nature: Treatise on Human Moral Nature*, which tells the allegorical tale of Newton perched by the coast in Senegal, Africa, representative of a civilizing force of the enlightenment, taking time off from checking his calculations of the tides to contemplate the grandeur of nature, during which time Newton, presented

as vegetarian, enters into a dialogue with a merman, an oyster, and a native African about whether or not they should eat each other, and the "morality" of each dietary pattern.

In 1777, French materialist philosopher Baron d'Holbach, in his *The System of Nature: the Laws of Moral and Physical World*, itself known as the "Atheist's Bible", himself widely known as the "Newton of the atheists" (O) even cited so in history of atheism documentaries. (V|1:45); argued for a god-free morality system, the gist of which is summarized by European historian Nathan Barber (2006) as follows: [6]

> "D'Holbach took Newton's ideas about the universe operating as a clock or machine to the **extreme**, arguing that humans have no free will, and that forces and laws of nature governed the lives of humans, not humans themselves and certainly not god. He aggressively argued against the existence of god and even against the existence of human souls. After all, why would human machines have need for souls?"

In 1789, British philosopher John Stewart, in his *Travels to Discover the Source of Moral Motion*, outlined a first to outline a non-deity physical-chemistry based so-called "moral motion" theory, in which he did away with all of the mythological terms 'life', 'death', 'god', etc., and replaced these with modern physical sciences (astronomy, physics, and chemistry) based theory of 'moral motion' (or moral movement), wherein man is viewed as an intelligent type of animate matter, made of particles (atoms), and that all that exists in the universe is matter and motion; a belief system he referred to as "natural religion". [2]

In 1809, German polyintellect Johann Goethe famously stated that the symbols of Swedish chemist Torbern Bergman's *A Dissertation on Elective Attractions*, namely reaction arrows, bonding brackets, heat, water, and chemical affinity preferences are the new godless system that explains natural science based morality in human affairs; the short version of which he stated as follows:

> "The **moral symbols** in the natural sciences—for example that of the elective affinities invented and used by the great Bergman—are more intelligent and permit themselves to be connected better with poetry, even connected with society better than any others, which are, after all, even the mathematical ones, anthropomorphic. The thing is that the former (the chemicals) belong with the emotions, the latter (mathematics) belong with the understanding."

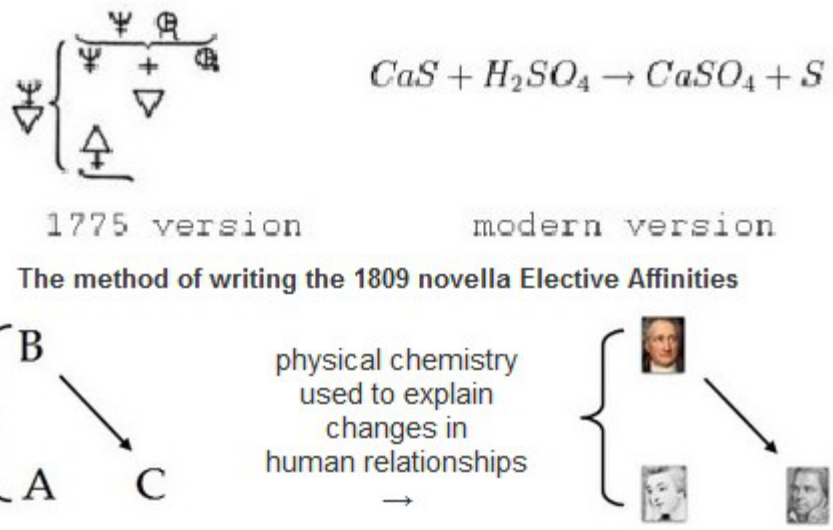

A overview of the **moral symbols**, i.e. reactions diagrams (AB + C → BC + A), bonding crotchets (' { '), affinity darts (' → '), and characters (A, AB, etc.), etc., pioneered in the combined works of chemists Etienne Geoffroy (1718), William Cullen (1757), and Torbern Bergman (1775), used by German polymath Johann Goethe to formulate his 1799 theory of physical chemistry based morality quantified in terms of human chemical affinities (table), as explained in his 1809 novella *Elective Affinities*, wherein he outlined a unified approach to the explanation of chemical, physical, and social nature, on the premise that there is after all only one nature.

In 1855, German physicist Ludwig Buchner, in his *Force and Matter: Principles of the Natural Order, with a System of Morality Based Thereon*, wherein he outlined a semi-cogent Goethean-like morality system; example quotes from this work are as follows:

> "The universe, that is the all, is made neither of gods nor of men, but ever has been and ever will be an eternal living fire, kindling and extinguishing in destined measure."

— Heraclitus (500BC), opening quote to Buchner's 1884 *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon*

"Where there are three students of nature, there are two atheists."

— Anon (c.1850), opening quote to Buchner's 1884 *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon*

"Just as man and woman attract one another, so oxygen attracts hydrogen, and, in loving union with it, forms water, that mighty omnipresent element, without which no life nor thought would be possible."

— Ludwig Buchner (c.1870), cited by Henry Finck (1887) as representative of "gross materialism"

"Potassium and phosphorous entertain such a violent passion for oxygen that even under water they burn—i.e. unite themselves with the beloved object."
— Ludwig Buchner (c.1870), cited by Henry Finck (1887) as representative of "gross materialism"

Beyond this, little headway has been made, in respect to "atheistic morality", Wilhelm Ostwald's 1906 energetic imperative ideas aside, by virtue of the fact that (a) one has to "overturn everything holy", as Heinrich Heine (1810) said, (b) a "great revolution" and overhaul in 5,000+ year old belief doctrines is requisite, as Victoria Woodhull (1871) saw things, in order for a new physicochemical-based morality system to be implemented, and (c) one has to go through the extremely dense 1876 chemical thermodynamics work of Willard Gibbs, which, supposedly, only one person in the world, namely James Maxwell, has been able to do successfully.

Thims

In 2006, American electrochemical engineer Libb Thims, who independently had been working on the same underlying problem since 1995 (see: Thims though experiment), discovered the work of Goethe, and began to work out some of details of Goethe's so-called moral symbols hypothesis.

In early 2011, Thims, in Q&A responses, on his Human Chemistry 101 channel, gave the following physical chemistry stylized atheistic morality example: (Q)

"To understand good (natural) and evil (unnatural), you first have to view all individual human movements as chemical reactions. Some reactions we call "good", such as love at first sight: Man + Woman → Man≡Woman. These are quantified by negative Gibbs free energy changes. Some reactions we call "bad", such as an unwanted arraigned marriage, or "evil", such as reproduction from farther-daughter incest: Father + Daughter → Baby. These are quantified by positive Gibbs free energy changes. Both reactions, good and evil, occur in society because of what's called thermodynamic coupling.

A simple example of what we might call an "evil" process or reaction would a hydrogen molecule H_2 naturally or spontaneously splitting apart in the atmosphere to form two hydrogen atoms: $H_2 \rightarrow H + H$ This reaction, which never occurs on its own, has a free energy change measure of +157 kilojoules per mol. This is called an unnatural reaction, from the earth-surface system point of view. This reaction can be made to occur, however, if it is coupled energetically to another stronger reacting system (such as a strong battery) or if the system is heated (such as the early universe is hypothesized to have been). In the case of thermodynamics coupling, we say that unnatural reactions can be made to go if they are coupled to natural reactions, as long as the later are more powerful than the former. Hence the motto: "good always triumphs over evil."

In Mar 2011, Thims, in his “Thermodynamic Proof that Good Always Triumphs over Evil”, used free energy coupling theory, to outline, theoretically, how natural (aka good/right) an unnatural (aka evil/wrong) are coupled to each other, socially, just as how ATP bond energy is coupled to various endergonic (unnatural) reactions in the body, ones that wouldn’t normally go on their own; the abstract of which is as follows: [7]

> “A proof is given that good [natural] always triumphs [drives] over evil [unnatural] in the framework of thermodynamics, the science that governs the operation of the known universe.”

(add discussion)

Studies

In 2015, Jean Decety, and her team of development psychologists, published the results of their six-country so-called sticker study of kids 5 to 12 years old, the results of which found that children of non-believers gave away an average of 4.1 stickers, as compared to children of religious background who gave away 3.3 stickers. (Q)

Duck Dynasty | Sin problem

In 2015, Phil Robertson, one of the stars of the show Duck Dynasty, as the key note speaker of the 11th Annual Vero Beach Prayer Breakfast, described what he referred to as the "sin problem", via the telling of a hypothetical scenario of an atheist family who is raped, dismembered, and murdered (see: audio), at the end of which the perpetrators claim there is nothing "wrong" with what they did because atheists have no morals, i.e. sense or foundational basis of right or wrong: [5]

Duck Dynasty star Phil Robertson giving his 2015 Vero Beach Prayer Breakfast "Atheist Family Rape Murder Scenario" speech, wherein he outlines his view on what he calls the "sin problem", i.e. how do you atheists explain right and wrong.

> “The ‘**sin problem**’ is something you can’t solve. [Namely] This ‘conscience’ thing, we just dreamed it up. There’s no right, there’s no wrong, there’s no good, there’s no evil.
>
> I’ll make a bet with you: Two guys break into an atheist’s home. He has a little atheist wife and two little atheist daughters. Two guys break into his home and tie him up in a chair and gag him. And then they take his two daughters in front of him and rape both of them and then shoot them and they take his wife and then decapitate her head off in front of him. And then they can look at him and say, ‘Isn’t it great that I don’t have to worry about being judged? Isn’t it great that there’s nothing wrong with this? There’s no right or wrong, now is it dude?’
>
> Then you take a sharp knife and take his manhood and hold it in front of him and say, ‘Wouldn’t it be something if this [sic] was something wrong with this? But you’re the one who says there is no God, there’s no right, there’s no wrong, so we’re just having fun. We’re sick in the head, have a nice day.’ If it happened to them, they probably would say, ‘something about this just ain’t right.’”

(add discussion)

Quotes

The following are related quotes:

> “Hobbes attempted before Spinoza to construct a ‘geometry

of morals', Helvetius constructed a 'physics of morals', d'Holbach a 'physiology of morals'; but, under these diverse names, Epicurean morality is, in short, never anything more than the quest of personal advantage: it rests upon the audacious confusion of actuality and duty."

— John Masson (1909), *Lucretius, Epicurean and Poet, Volume Two* (pg. 163)

A cartoon rendition of the so-called "killing spree paradox" (Q), often put to atheists, by believers, who raise the question about the basis of **atheistic morality**.

"Heaven help us if an **atheistic morality**, rooted in evolutionary theory or otherwise, should ever become the guiding moral force on a global scale."

— Chad Meister (2010), "Atheists and the Quest for Objective Morality" [3]

See also

- Moral chemistry
- Subjective morality | Objective morality

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● Atheism and morality – Conservapedia.

θΔics

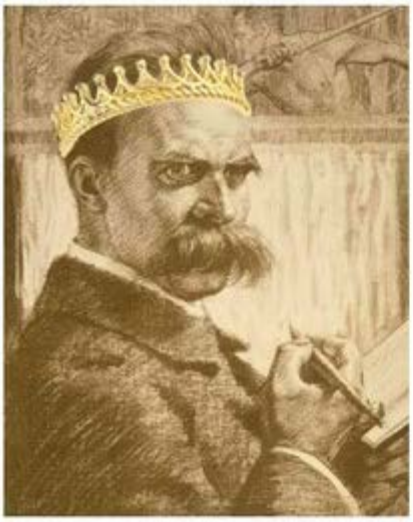

The religious prophets of **atheistic religion**: Friedrich Nietzsche, the greatest atheist ever, Gilbert Lewis, a prophet of modern chemical thermodynamics, the science behind physicochemical atheism, and Christopher Hitchens, the best atheistic orator ever.

In belief systems, **atheistic religion**, aka “nontheistic religion”, “secular religion”, or “humanistic religion”, refers to any type of godless "working" glue that binds a group in identity and operational function; the following, generally speaking, are staple components: an **atheist’s creed** (e.g. Adams creed, 1863), **atheistic morality** (e.g. moral symbols, 1809), **atheist’s bible** (e.g. *On the Nature of Things*, 55BC; *The System of Nature*, 1770), an **atheism genealogy** (e.g. Heraclitus to Epicurus to Nietzsche) **atheist church** (e.g. Church of Elective Affinities, 1816; Sunday Assembly, 2013), **atheist prophets** (e.g. Goethe, Lewis), atheist popes (e.g. Hitchens, Dawkins), atheist preachers (e.g. Wilhelm Ostwald), atheist sermons (e.g. "Monistic Sunday Sermons", 1910), **atheist Sunday school** (e.g. Zerotheism for Kids, 2015), **children's atheism bible** (e.g. *Smart Atheism: for Kids*, 2016), atheist summer camps (e.g. Camp Quest, 1996), atheist commandments (categorical imperative, gold rule, etc.), evangelical atheists (e.g. Ludwig Buchner, aka the "father of German atheistic evangelism"), schools or centers of training for atheist students (e.g. Appignani Chair of Atheism) with atheist teachers (e.g. Empedocles), atheism communities (e.g. Reddit atheism (Q), 2M+ members), **atheist apologists** (Q), atheistic holidays (e.g. Darwin Day, Feb 12; Bruno Day, Feb 17, Thomas Paine Day (Jan 29) or birth day (Feb 9) (Q), etc.) and or secular holidays (e.g. 4th of July, Halloween, Thanksgiving, Memorial Day, Labor Day, etc.) and **god replaced** with something, e.g. power defined by modern science, but NOT by god-coded conceptions such as "higher powers" or "invisible powers" (Hobbes, 1651), and wherein god theory based principles, such as "soul" or "karma", are replaced with a *non*-god-based equivalent (see: geniuses on soul), an atheist and or secular dating system (e.g. BG/AG), and last but not least an **atheist eulogy** (e.g. Aaron Freeman's "Eulogy from a Physicist") to be spoken at the time of the dereaction of a person. [1]

Atheism | Not a religion?

It is frequently asserted, particularly by religious apologists, that "atheism is a religion". This assertion then tends to be countered by the argument that "atheism, by definition, cannot possibly be a religion because atheists do not have to believe in anything to be an atheist" (i.e. "atheism is not a religion"). (Q) When, however, one looks at the specifics of historical atheism types by denial and belief, this latter argument or position falls apart, i.e. unless one is a nihilistic atheist (see: nihilism).

Overview

Historically, beginning in the 19th century, and into the 20th century, many have discussed and referred to Buddhism as an "atheistic religion" (Q); likewise, many have categorize various Abrahamic, e.g. Unitarian Universalists, or Brahmaic religions, e.g. Jainism, or certain “schools” of Hinduism, e.g. Charvaka, as being “atheist” or secular religions, in practice and belief outlook. These classifications, however, is an incorrect play on ideas and mis-labeling on things, as all of these sects are god-based in their respective roots (Q)(Q), as religio-mythology scholarship evidences.

In 1720, John Toland, in his *Pantheisticon*, proposed a pantheism-based civic religion, with meetings, community rituals, and secular liturgy, generally modeled on the Masonic lodges, i.e. cultish-like nonreligious citizens’ clubs. [2] This, baring digression, would have been a Spinoza’s god (god = nature) stylized religion, which many retrospectively classify as coded atheism, i.e. a worship of nature.

In 1809, Goethe published his *Elective Affinities*, where god is replaced by the power of nature, as defined by natural science, and where morality is replaced by the moral symbols of physical chemistry. This so-called religion, based in the theory of chemical affinity, is loosely characterized as Goetheanism, albeit this is more of a philosophy; Goethe himself said in his last year of existence: “I have found no confession of faith to which I could ally myself without reservation” (see: Goethe on religion).

In 1816, Percy Shelley, the most-famous of all British atheists, and Mary Shelley were “married”, as the latter retrospectively describes things, in the Church of Elective Affinities, a religion based on the chemical principles of elective affinities or chemical affinities, generally the same as what Goethe, independently, arrived at, previously.

In 1910, German radical atheist Wilhelm Ostwald, building on Goethe, and others, was giving his "Monistic Sunday Sermons", on how energy-based monism replaces theism, and the repercussions and details of this view; a type of natural science based atheism Sunday school, so to say, devoid of any supernatural suppositions.

In 1817, Vladimir Lenin launched Marxism, an admixture of Friedrich Engels’ term “scientific materialism” and Karl Marx’s conception of “historical materialism”, itself a mixture of Adam Smith’s theories and Epicurean philosophy, as a form of utopian-idealized forced godless religion in Russia and related communist countries; Yuri Tarnopolsky (1993), in reflection, as a scientist, i.e. self-defined “human chemist” (or pattern chemist), on his time as a Russian citizen (1936-86) and Siberian concentration camp days (1983-85), prior to his 1987 immigration to America, amid the eventual “fall of communism” in 1989 (Q), summarizes this “religion” as follows: [3]

> “Soviet orthodoxy [1917-1986] was shaped as a **quasi-religion** with Marx as God and the Spirit, Lenin as God the Father, and the party as collective God the Son.”

This religion, however, “fell” off, in 1986, after some 100-million died (dereacted), from starvation (bread lines), and other atrocities, per reason of its structural tenets, in particular its "equal works and a workers state" ideology, which goes against the general Pareto principle distribution of wealth rule of nature, as evidenced by the lazy ant study.

In the 21st century, of note, the effects of hydraism, have barred the formation of any sort of cogent "atheistic religion", in short. The only thing remotely like an "atheistic religion", seen of recent, is the Internet-based following of so-called "new atheism", the popes comically defined as follows:

> “After Harris came **high pope** Dawkins, then **cardinal** Hitchens, the **bishop** Dennett, and then the lower and more moderate figures in this **new atheist priesthood**: Krauss, Stenger, Atkins, Shermer [and all the rest] *e bella compagnia*.”
>
> — Bo Jinn (2013), *Illogical Atheism* (loc. 286)

This new so-called sect of atheistic religion, while commendable for its public openness, with its derisive mud-slinging techniques, lack of religio-mythology fundamentalism, and theory vacuity, however, has left many "embarrassed to be an atheist".

In 2016, AnswersInGenesis.com (Ken Ham) produced *Atheistic and Humanistic Religions*, volume three of their *World Religions and Cults* series, edited by Bodie Hodge and Roger Patterson, wherein they attempt to step through the various **atheistic religions** and humanistic religions of history, e.g. Epicureanism, materialism, naturalism, dualism, communism, to scientology; a book aimed at teaching the theist how to be “able to spot their tenets and oppose them instead of allowing them to subtly infiltrate Christianity and undermine us from within”. [4]

Jediism | Jedi religion

In 1977, George Lucas released *Star*

Wars, with its force-based philosophy of the universe; this, soon thereafter, spawned a practiced religion called "Jediism" (Q). While this "force" is fictional, e.g. based on the idea of "midichlorians", it is a step above monotheism, in mental appeasement.

Examples of "**atheist religions**". e.g. Jediism and Pastafarianism, shown on dog tags.

Pastafarianism | FSM religion

In 2005, Bobby Henderson posited the parody god "flying spaghetti monster", and was thereafter considered the founder of parody Pastafarian faith: Pastafarianism, which he outlined in his *The Gospel of the Flying Spaghetti Monster* (2006).

Quotes

The following are related quotes:

> "I agree with those legislators and philosophers who think that some religion is necessary in a society."
>
> — Anon Theophrastus (c.1659), *Theophrastus Redivivus* (pg. 541) (Q); compare: no religion

> "My father's religion was of the same kind with that of Lucretius: he regarded it with the feelings due not to mere mental delusion, but to a great moral evil. His standard of morals were Epicurean, inasmuch as it was utilitarian, taking as exclusive text of right and wrong, the tendency of actions to produce pleasure or pain."
>
> — John Mill (1873), *Autobiography*

> "Cosmology is a **kind of religion** for intelligent atheists."
>
> — Stephen Hawking (c.1962), description (Q) to his wife, when they first met, about himself

See also

- No religion

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1. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.
2. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 335). HarperOne.
3. Tarnopolsky, Yuri. (1993). *Memoirs of 1984* (Amz) (pg. 135). University Press of America.
4. Hodge, Bodie and Patterson, Roger. (2016). *World Religions and Cults, Volume Three: Atheistic and Humanistic Religions*. New Leaf Publishing.

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● De Botton, Alain. (2012). *Religion for Atheists: a Non-Believer's Guide to the Uses of Religion*. McClelland.
● Buczkowski, Tom. (2016). "What Are Some Examples of Godless Religions?" (Q), Quora, Jan 25.

External links

● Nontheistic religion – Wikipedia.
● Secular religions – Rational Wiki.
● Whoever said "atheism" isn't a religion? (2017) – Reddit.

θΔics

In models, **atheistic universe** refers to []

Overview

In c.450BC, Empedocles, in his *On Nature*, outlined a four element, two force view of all things, according to which the elements, as Cicero (45BC) described things, were considered "divine"; this is coded atheism, coated with a light veneer of theism, so to say. [1] On this basis, Empedocles, according to Theophilus (c.170AD) (Q) "taught an atheistic" view of the universe. [2]

In 300BC, Epicurus, building on the atomic theory work of Democritus, who described gods as "phantoms", outlined an overtly atheistic model of the universe, wherein everything in the universe is made of atoms and voids governed by chance; to not incur odium or indictment of the mass, however, according to Cicero, does not outright deny the existence of the gods, but rather refers to them as "appearances" and says that they are powerless things that are made of atoms that reside in the outskirts of the universe, having no concern for humans, or "deprived of any stewardship or activity" (Cicero, 45BC). Posidonius (c.60BC), e.g. was the first to argue that Epicurean religion was "virtually atheistic". [1]

In 1770, Baron d'Holbach, in his *The System of Nature: Laws of the Moral and Physical World*, penned a famous atheistic universe model. [4]

In 1802, Pierre Laplace, in his five-volume *Celestial Mechanics*, outlined a mechanical universe view of things, wherein he implicitly dismissed with the hypothesis of god, as he told Napoleon Bonaparte (see: Napoleon Laplace anecdote).

In 1855, Ludwig Buchner, in his *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon*, outlined a famous atheistic universe model, based on the premise that the universe is made of matter and that force is the governing principle. [5]

In 2004, David Mills, in his *Atheist Universe: the Thinking Person's Answer to Christian Fundamentalism*, outlined a soft atheism / new atheism stylized take on semi-modern religion vs atheism conflicts, such as intelligent design, "open atheism" (vs closet atheism), mythological disproof of god, etc. [3]

Quotes

The following are related quotes:

> "The idea of an **atheistic universe** is an absurdity."
>
> — J.M.G. (1873), "Modern Difficulties in Reference to Prayer" (Q)

See also

- Dead universe
- Living universe
- Mechanical universe
- Pantheistic universe
- Physical universe
- Spiritual universe
- Theistic universe
- Thermodynamical universe

References

1. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (Empedocles, pgs. 13-14; Epicurus, pgs. 108, 178, 183). Oxford University Press, 1998.
2. (a) Theophilus. (c.170). "Letter to Autolycus" (Q) (*Adversus Autol* III.2), Book 3, Ch. 2: "Profane Authors had No

Means of Knowing the Truth". Publisher.
(b) Kors, Alan C. (2014). *Atheism in France, 1650-1729, Volume I: the Orthodox Sources of Disbelief* (pg. 191). Princeton University Press.
3. Mills, David. (2006). *Atheist Universe: the Thinking Person's Answer to Christian Fundamentalism*. Ulysses Press.
4. d'Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson). J.P. Mendum, 1889.
5. Buchner, Ludwig. (1855). *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon* (15th German edition; 4th English edition). London: Asher and Co, 1891.

θΔics

In terminology, **Atheist's Bible** is a term, arisen in the 18th century, and thereafter, referring to a book that supplants religious belief for naturalism, materialism, physicalism, chemicalism, physicochemicalism, physicochemical-materialism reductionist based view of nature, via an explicit godless mode of logic; physicochemical atheism propounded, in short.

Rankings

The following is a work-in-progress ranking of the known "historical" so-called atheist's bibles, each as summarized further below, chronologically:

#		Book	Date	Notes
1.	Baron d'Holbach (1723-1789)	***The System of Nature**: Laws of Moral and Physical World*	1770	Presents an anti-chance based, matter-and-motion basis of all things; credited with making both Goethe and Percy Shelley, the two main human elective affinity theorists, who each read this work in college, atheists.
2.	Ludwig Buchner (1824-1899)	*Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon*	1855	
3.	Lucretius (99-55BC)	*On the Nature of Things*	55BC	Presents the gist synopsis of Epicureanism.
4.	Johann Goethe (1749-1832)	*Elective Affinities*	1809	
5.	Thomas Paine (1737-1809)	*The Age of Reason*	1794	
6.	John Stewart (1749-1822)	*Moral State of Nature*	1789	Note: the "Advertisement" (Q), to his *Moral State of Nations*, which he indirectly refers to as the "Bible of Nature", states that he presents a scheme of "pantheism", a golden mean between "deluded superstition [theism], dogmatic deism, and chaotic atheism".

(add)

Lucretius

In 55BC, Greek atomic theorist Lucretius's penned his *On the Nature of Things*, which thereafter became mentioned as an "atheist's bible". [2]

> "In 1453, Gutenberg's press turned out the first printed book, a Bible. By 1473, presses had published *On the Nature of Things*. Only twenty years had elapsed between the first mechanically printed bible and the first mechanically printed Lucretius!"
>
> — Jennifer Hecht (2004), *Doubt: a History* (pg. 271)

Some atheists, e.g. Thomas Jefferson, owned up to half-dozen copies of Lucretius.

Monet

In c.1550, a man named Monet was labeled a "practical atheist" and had a book of pornographic pictures in his possession that he called his "New Testament"; he was beheaded that year by John Calvin (1509-1564) (Q). [6]

Hobbes

In 1651, Thomas Hobbes published his *Leviathan*, which has been associated with the term atheist's bible:

> "The modern myth that scientists will save mankind can be traced back to Bacon's scientific Utopia, *New Atlantis*. In his critique of Hobbes, Professor Mazzeo concentrates on the psychological aspects of Hobbesian thought rather than the political. Hobbes anticipated Freud in several insights, for example his view of the atemporality of unconscious processes and his conviction that religion was based on fear. Leviathan, however, is not so much an **atheist's bible**, as has sometimes been charged."
>
> — Author (1967), "Article" (Q), *The Month*

(add)

Bayle

In 1697, Pierre Bayle published his *Historical and Critical Dictionary*, wherein he classifies Benedict Spinoza at the "greatest atheist", a multi-volume work which has been characterized as a "bible for doubters" (Hecht, 2003).

Holbach

In 1770, Baron d'Holbach published his *The System of Nature*, which was banned and even publicly burned, which is generally cited as the first main mention of a book referred to as an "Atheist's Bible". [1]

> "Dr. Beard, in his lecture (sermon), quoted at some length d'Holbach's *System of Nature*, which he called the **Atheist's**

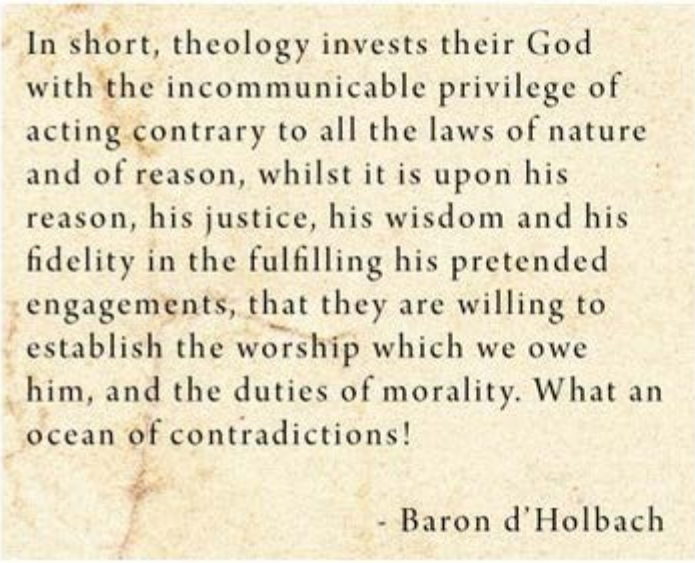

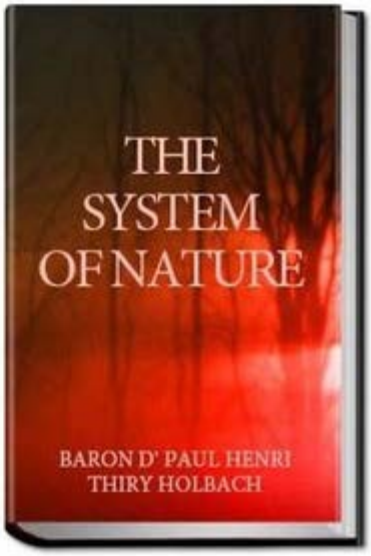

Bible. D'Holbach's conclusion was that there was no god."

French materialism philosopher Baron d'Holbach's 1770 *The System of Nature*, the most-cited representation of an "**Atheist's Bible**"; other so-labeled "Atheist Bibles include: Thomas Paine's *The Age of Reason* (1794), Thomas Hobbes' *Leviathan* (1651), Winwood Reade's *The Martyrdom of Man* (1872), and Bertrand Russell's *Why I'm Not a Christian* (1927).

— George Holyoake (1861), "Manchester Lectures on Secularism, by the Reverend Dr. Beard", *The Reasoner* (pg. 169), Mar 17

"Many of his manuscripts were published anonymously after being smuggled to Holland for publication. More officially, he wrote hundreds of articles for the *Encycloptdie*, principally on earth sciences such as geology, chemistry, and mineralogy; and, in 1770, he published his *Systeme de la nature* (*System of Nature*), his comprehensive defense of atheistic materialism **sometimes called the "atheist's bible".** This work pulled no punches. It depicted humanity as entirely a product of nonintelligent natural forces acting under necessary laws. The "soul" is an illusion. "Mind" is purely organic. Matter is inherently endowed with energy enough to account for all observed events. The **book was immediately suppressed**, of course, but nonetheless attracted a wide readership."

— Frederick Ferre (1996), *Being and Value: Constructive Postmodern Medaphysics* (pg. 186)

The following quote, per citation of the 2004 BBC atheism documentary special, hosted by Jonathan Miller, of note was added to the Baron d'Holbach page, on 13 Apr by user [Dionyseus], and then removed (Q), following talk page (Q) contention debates (suppression tactics), by user [Devraj5000], on 14 Jun 2007:

"Holbach's book *Le Système de la nature* became known as the **Atheist's Bible**."

— Jonathan Miller (2004), "Atheism: a Rough History of Disbelief" (Q), BBC special

Here we see an example of Wikipedia suppression of knowledge at its finest.

Paine

In 1794, Thomas Paine published his *The Age of Reason*, was as a vicious attack on religion (Q)(Q), thereafter becoming one of the most-widely cited "atheist's bible", historically; to cite a few examples:

"During a circumstantial discussion of this spread through political associations such as the London Corresponding Society and other groups whose shifting addresses in both the East and West Ends are

closely tracked, Paine's *Age of Reason* is given pride of place as the **'New Holy Bible' of the infidels** (p. 5). It was, however, accompanied or preceded by such other works as the 'heavy artillery of Voltaire, Godwin, &c.', Meslier's *Le Bon Sens*, the works of Peter Annet (until stopped by prosecution) (pp. 7-8), and above all, Mirabaud's [i.e. d'Holbach's] *System of Nature*, and Volney's *Ruins of Empires*: the latter, in point of style, is looked upon as the **Hervey of the Deists**; the former, as the **Newton of the Atheists**: and, as the *System of Nature* was translated by a person confined in Newgate as a patriot, and published in weekly numbers, its sale was pushed' (p. 6)."

— Martin Priestman (2000), on quotes from William Reid's *The Rise and Dissolution of the Infidel Societies* (1800), in: *Romantic Atheism: Poetry and Freethought, 1780-1830* (pg. 39)

"Although denounced as the '**Atheist's Bible**', Paine's work is actually an exposition of a radical kind of deism and makes an attempt at critical biblical scholarship that anticipates modern efforts. How many American leaders of today would have the courage to enlighten the public as to their true feelings regarding religion, but instead follow timidly along like sheep in fear of being ostracized?."

— Christopher Reyes (2010), *In His Name* (pg. 230)

(add)

Goethe

In 1809, Johann Goethe published his *Elective Affinities*. While not specifically cited as an "Atheist's Bible", Heinrich Heine said that it "overturns everything holy", that it is an "attack against religion, morality, and the social forms", and that Goethe was a "corrupter of religion". [3] Goethe's *Elective Affinities* became an intellectual platform for other atheist bible like works, e.g. Buchner (1855), in the years to follow.

Jefferson

In c.1820, Thomas Jefferson finished making his supernatural-events expunged so-called *Jefferson's Bible*, which as been referred to as an atheist's bible. [2]

"After rejecting the public school system Oskar undertakes his own education by close reading of two books whose pages, for simplicity's sake, he has torn out and shuffled to make a single new volume, Goethe's *Elective Affinities* [**free energy based god replacement**] and a volume promisingly entitled Rasputin and Women."
— Gunter Grass (1959), *The Tin Drum*

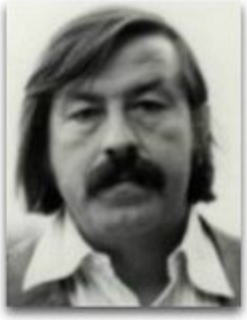

Grass Bible

Sabato Bible

"On the shelves there was also to be found, naturally, Ostwald's *Energetics*, that sort of thermodynamic bible in which **god is replaced by** a lay entity called **energy**."
— Ernesto Sabato (1961), *On Heroes and Tombs*; compare: Mirza Beg (1987) and Frederick Rossini (1971) who replace god with free energy

The following are two citations, in literature, to working **atheist bibles**, firstly Gunter Grass' 1959 **Goethe-Rasputin Bible**, where god is replaced with free energy, second Ernesto Sabato's 1971 **Ostwald Bible**, where god is replaced with energy (Wilhelm Ostwald, to note, was also the first atheist preacher of sorts, via is Monistic Sunday Sermons).

Buchner

In 1855, German physician Ludwig Buchner published his *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon*, which was not only cited as the "Bible of materialism" but also the Bible of a new movement:

"Buchner's *Force and Matter* also became the **Bible of** a new movement, 'free thinking', otherwise known as **atheism**."

— Howard Bloom (2012), *The God Problem* (pg. #)

(add)

Other

In 1872, Fyodor Dostoyevsky, in his *Demons* (aka *The Possessed*) (Q), a book originally intended to be called *The Atheist*, attacks the nihilists; in one passage of the book, an army officer goes mad and attacks his commanding officer, then smashes up his landlady's little shrine of Christian icons, and puts in their place the works of Karl Vogt, Jacob Moleschott, and Ludwig Buchner, like a trio of Bibles on stands, in front of each he burns a church wax candle. [7]

In 1872, Winwood Reade, published his *The Martyrdom of Man*, summarized via the phrase "From Nebula to Nation", dubbed an "atheist's bible" (Q) and "substitute bible for secularists" (Smith, 1967), wherein, using what seems to be a Darwin-based comparative religions stylized approach, he argues, in his last chapter, for what he calls a "religion of reason and love". [4]

In 1895, Elizabeth Stanton, noted atheist feminist, penned *The Women's Bible*; which may be a sort of atheist's bible, in some sense.

In 1927, Bertrand Russell published his essay book *Why I'm Not a Christian*, which has been referred to as an "atheist's bible". (Q)

In 2011, A.C. Grayling published *The Good Book: a Secular Bible* (Q), where he attempts to give a secular version of ten commandments, as he sees things.

In 2016, Libb Thims, building on his "Zerotheism for Kids" (2015) lecture, a Sunday School class for atheist kids, began drafting *Smart Atheism: for Kids*, themed as an atheist bible for kids (see: Children's Atheism Bible). [5]

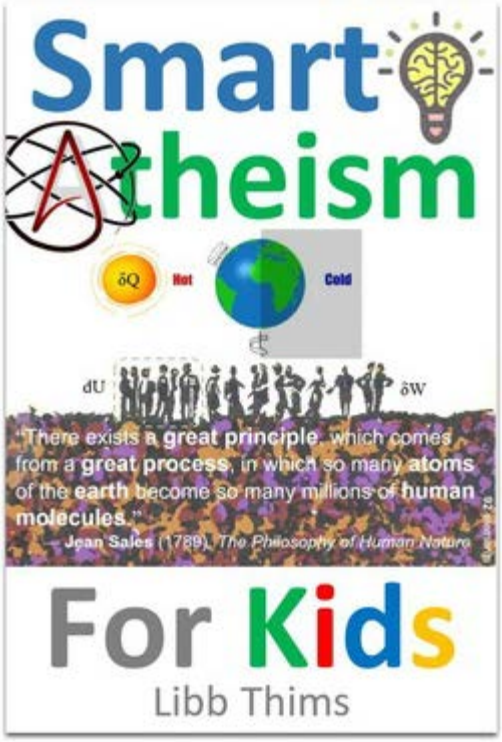

Libb Thims 2016 draft-stage *Smart Atheism: for Kids*, originally entitled as "Atheist's Children's Bible".

Quotes

The following are related quotes:

-

> "He was a practical electrician fond of whiskey, a heavy, red-haired brute with irregular teeth. He doubted the existence of a deity but accepted **Carnot's cycle**, and he had read Shakespeare and found him weak in chemistry."
>
> — Herbert Wells (1906), "Lord of the Dynamos" (Q); in: *The Door in the Wall, and Other Stories* [1]

> "Thus Spake Zarathustra has been called the **'atheist's bible'**, for so Nietzsche intended it."
>
> — Wiley Richard (1990), The Bible and Christian Traditions: Keys to Understanding the Allegorical Subplot of Nietzsche's Zarathustra (pg. 35)

See also

- Atheism timeline

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2. Looking for an Atheist's Bible (2015) – Reddit.com/r/AskPhilosophy.
3. Tantillo, Astrida O. (2001). Goethe's *Elective Affinities* and the Critics (§Unpublished Comments, pgs. 7-12; §Negative Reviews and Responses, pgs. 12-26). Camden House.
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Further reading

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● Linsley, Geoff. (2008). *The Atheist's Bible: How Science Eliminates Theism* (thermodynamics, 8+ pgs) (Ω). iUniverse.
● Minois, Georges. (2009). *The Atheist's Bible: the Most Dangerous Book That Never Existed* (*Le Traite des trois imposteurs: Histoire d'un livre blasphematoire qui n'existait pas*) (translator: Lys Eiss). University of Chicago Press, 2102.

External links

● The Skeptic's Annotated Bible – SkepticsAnnotatedBible.com.
● The Woman's Bible – Wikipedia.

θΔics

In terminology, **atheist's creed** refers to a set of fundamental beliefs, or guiding principles, held by an atheist, at least one of which must be a belief that god does not exist. Some examples of atheist creeds are listed below. Atheist creeds, said another way, are published statements by atheists, about what, exactly, he or she does believe in, if not god.

Apostles' creed | God-version

In circa 390, the so-called "Apostles' creed" originated, supposedly, in a letter by Ambrose to Pope Siricius, which stated: "Let them give credit to the Creed of the Apostles, which the Roman Church has always kept and preserved undefiled." (Q) The modern version of which, oft-recited in modern Church, is the following: (Q)

> "**I believe** in God, the father almighty, creator of heaven and earth.
> I believe in Jesus Christ, his only Son, our Lord.
> He was conceived by the power of the Holy Spirit and born of the Virgin Mary.
> He suffered under Pontius Pilate, was crucified, died, and was buried.
> He descended to the dead.
> On the third day he rose again.
> He ascended into heaven and is seated at the right hand of the Father.
> He will come again to judge the living and the dead.
>
> I believe in the Holy Spirit,
> the Holy Catholic Church,
> the communion of saints,
> the forgiveness of sins,
> the resurrection of the body,
> and the life everlasting. Amen."

(add discussion)

Hypatia

The following is the film rendition of what Hypatia, the only known female universal genius, would seemingly have said during the period when all royals and officials had to publicly state belief in Christianity or be stoned:

> "**I believe** in philosophy."
>
> — Hypatia (415), reply during inquisition as to whether she believed in Christianity; as portrayed in the 2010 film *Agora*

(add discussion)

Capuano

In 1577, Alvise Capuano was convicted of atheism; the following is his creed expressed to the inquisition during the trial:

> "I am an atheist. I do not believe god exists, or indeed, any supernatural being. I believe that the world was created by chance. I believe that when the body dies the soul dies also. I believe that Christ was the adopted son of the Madonna, born as other men are. I believe that angels and demons do not exist. I believe that there are no true witches; that witchcraft arises from melancholic humors. I believe that the world has neither beginning nor end. I believe that Christ's miracles were not true miracles but natural acts. I believe

that the only law that must be obeyed is the law of nature."

(add)

Paine

In 1795, English-born American Thomas Paine, spurred by the religious revolution in France (1793), penned his *The Age of Reason*, one of the first so-called Atheist's Bibles, in which he opened to three statements of belief, namely: belief in one god, belief in the equality of man, and belief that religious duties consist in doing justice, loving mercy, and endeavoring to make our fellow creatures happy. He then went onto point out the things he did not believe; firstly: [8]

> "I do not believe in the creed professed by the Jewish church, by the Roman church, by the Greek church, by the Turkish church, by the Protestant church, nor by any church that I know of. My own mind is my own church."

This might well mark a transition to atheism types by denial and belief in so-called brands of proto-atheism and atheism.

Adams' creed

See main: Adams creed

In 1863, American thinker Henry Adams (SN:2), writing to his intellectual friend Charles Gaskell, outlined his views on he intuited a universal theory of existence, applicable, in a one nature manner, atoms to humans: [1]

> "Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and **I believe** every part of organic nature will be brought someday **within this law**. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."

Adams's wasn't to note, it seems, and out and out atheist, but rather his work was "atheism implicit".

Russell | Godless-version

In 1925, British mathematician and philosopher Bertrand Russell gave his semi-creed like noted "I believe" statement by:

> "**I believe** that when I die I shall rot, and nothing of my ego will survive."
>
> — Bertrand Russell (1925), "What I Believe" (Q); quoted in Richard Dawkins' 2006 *The God Delusion* (pg. 354)

(add discussion)

Jonath's grandmother | Jewish atheist's creed

In *circa* 1947, the atheist Jewish grandmother of American materials scientist engineer Arthur Jonath, as told to him when at aged 12-16 he queried his grandmother about what, as an atheist, she believed in, stated the following creed: [5]

> "**I believe** in oxygen, without it you die; I believe in the sun; without it you die."

This response acted as a trigger that sent Jonath on a search in the decades to follow for the "prime mover", as he says, e.g. by studying comparative religions, via Huston Smith, comparing eastern vs western religions, and thereafter coming to grasp, at the basic level, the idea of entropy and the inevitability of its increase, and therein "replaced the concept of a god with the concept of entropy" as he reflected in 2009 retrospect.

Asimov

The following is Isaac Asimov's creed, stated the year after (Q) he came out as an atheist:

> "**I believe** in evidence. I believe in observation, measurement, and reasoning, confirmed by independent observers. I'll believe in any 'thing', no matter how wild and ridiculous, if there is evidence for it. The wilder and more ridiculous some thing is, however, the firmer and more solid the evidence will have to be."
>
> — Isaac Asimov (1983), *The Roving Mind* (Q)(Q)

Turner's creed

In 1993, English poet and music journalist Steve Turner (Q) penned a seeming moral relativism creed, oft-cited by a number of people, including Ravi Zacharias (2013) (Q) who uses it as an example of what the generic Marx-Freud-Darwin atheist believes: (Q)

> **We believe** in Marx, Freud and Darwin.
> We believe everything is OK
> as long as you don't hurt anyone,
> to the best of your definition of hurt,
> and to the best of your knowledge.
>
> We believe in sex before during
> and after marriage.
> We believe in the therapy of sin.
> We believe that adultery is fun.
> We believe that sodomy's OK
> We believe that taboos are taboo.
>
> We believe that everything's getting better
> despite evidence to the contrary.
> The evidence must be investigated.
> You can prove anything with evidence.
>
> We believe there's something in horoscopes,

UFO's and bent spoons;
Jesus was a good man just like Buddha
Mohammed and ourselves.
He was a good moral teacher although we think
his good morals were bad.

We believe that all religions are basically the same,
at least the one that we read was.
They all believe in love and goodness.
They only differ on matters of
creation sin heaven hell God and salvation.

We believe that after death comes The Nothing
because when you ask the dead what happens
they say Nothing.
If death is not the end, if the dead have lied,
then it's compulsory heaven for all
excepting perhaps Hitler, Stalin and Genghis Khan.

We believe in Masters and Johnson.
What's selected is average.
What's average is normal.
What's normal is good.

We believe in total disarmament.
We believe there are direct links between
warfare and bloodshed.
Americans should beat their guns into tractors
and the Russians would be sure to follow.

We believe that man is essentially good.
It's only his behavior that lets him down.
This is the fault of society.
Society is the fault of conditions.
Conditions are the fault of society.

We believe that each man must find the truth
that is right for him.
Reality will adapt accordingly.
The universe will readjust. History will alter.
We believe that there is no absolute truth
excepting the truth that there is no absolute truth.

We believe in the rejection of creeds.

Later he added the following "chance" post-script: (Q)(Q)

If chance be the father of all flesh,
disaster is his rainbow in the sky,
and when you hear

State of emergency!
Sniper kills ten!
Troops on rampage!
Whites go looting!
Bomb blasts school!

It is but the sound of man worshiping his maker.

(add discussion)

Myers | Atheist's creed

In 2008, American biologist and science blogger Paul Myers (1957-) posted the following two-point "I believe" stylized atheist creed, posted in reaction to a nihilism artistic conceptualization of an atheist believing in nothing:

> "**I believe** in time, matter, and energy, which make up the whole of the world.
>
> I believe in reason, evidence and the human mind, the only tools we have; they are the product of natural forces in a majestic but impersonal universe, grander and richer than we can imagine, a source of endless opportunities for discovery.
>
> I believe in the power of doubt; I do not seek out reassurances, but embrace the question, and strive to challenge my own beliefs.
>
> I accept human mortality. We have but one life, brief and full of struggle, leavened with love and community, learning and exploration, beauty and the creation of new life, new art, and new ideas. I rejoice in this life that I have, and in the grandeur of a world that preceded me, and an earth that will abide without me."
>
> — Peter Myers (2008), "a short, simple creed for the godless" [1]

(add discussion)

Palmer | Atheist's creed

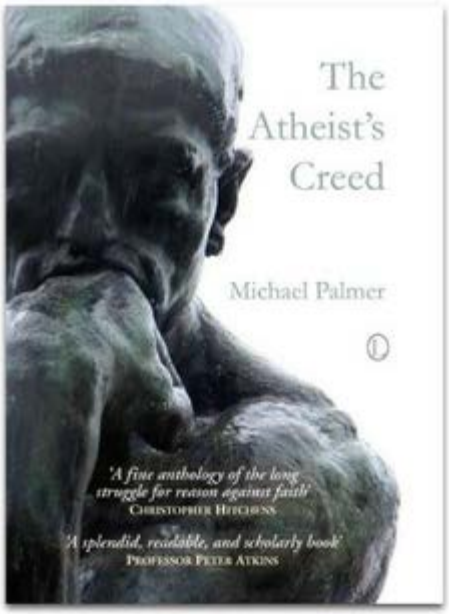

In 2010, English religion-atheism philosopher Michael Palmer (1945-), in the opening page of 2010 *The Atheist's Creed*, stated the following is a six-point "I believe" stylized atheist creed, which, supposedly, as attracted considerable publicity: [2]

> "**I believe** that the cosmos is all that is or ever was or ever will be.
>
> I believe that no other reality, divine or otherwise, exists. There is no life after death, no meaning to life apart from life, and no events or experiences, individuals or scriptures by which any supra-natural reality can be revealed. The cosmos forms the boundary of our experience.
>
> I believe that human life has no meaning apart from itself: that while there is purpose in life, there is no purpose to life. There is no ultimate justice, no

final act of grace and no salvation. This is not a providential universe.

I believe that not everything is permissible. For while that which increases happiness is not always a good, that which increases misery is always an evil.

English religion-atheism philosopher Michael Palmer's *The Atheist's Creed* (2010), which opens to his declaration of six "beliefs", which he declares (shown adjacent), which make up his godless creed. [2]

I believe that by the deployment of human reason and the acquisition of knowledge, by the development of moral law and the cultivation of compassion, the suffering of humanity can be alleviated and the condition of our lives improved.

I believe that the path to individual and collective happiness lies in being educated to reality, and in being thus released from the irresponsible and pernicious illusion of religion, for which there is neither evidence nor need."

— Michael Palmer (2010), *The Atheist's Creed* [2]

(add discussion)

Thims | Atheist creeds

In 2012, American electrochemical engineer Libb Thims, known as an "extreme atheist" (Sekhar, 2011) and or "strong atheist" (Bossens, 2013), founder of the 2014-launched Atheism Reviews YouTube channel, began penning, on his personal notes page, reflective attempts at "belief statements"; some of which in chronological working draft development are listed below:

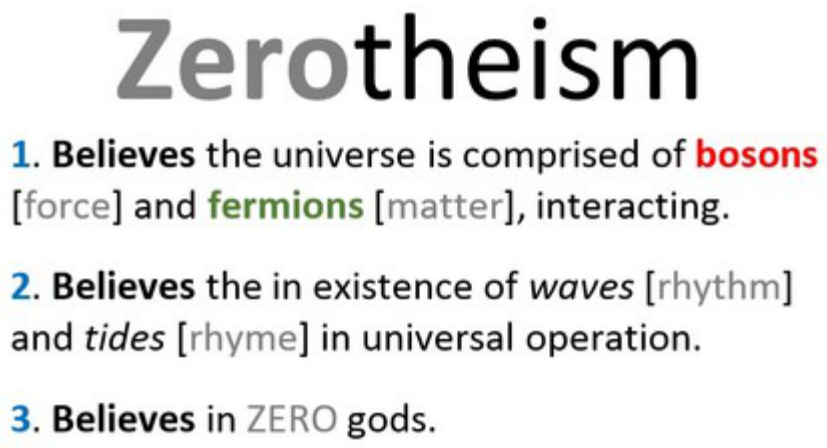

Thims' 2015 version of the basic creed every free-thinking kid should know, as taught during the "Zerotheism for Kids" lecture, introduced a basic bare-boned 3-point set of beliefs creed to the children, in the form of the three tenets of zerotheism. [7]

"Not only do I not believe in the principle of the afterlife, but also do not believe in the principle of life."

— Libb Thims (2012), personal note, written in black pen on printing paper (a synopsis statement of the defunct theory of life position), Sep 24

"I believe in thermodynamics and the periodic table; and not much else."

— Libb Thims (2013), personal note from practice statement on slide 8 of UPESW talk, Jun 24

"**I believe** in fermions, bosons, and vacuum. Much theory must be jettisoned, and great terminology reform is in order, if this view is to be successfully carried through into the expunging of the humanities. One must, however, remember not to throw out the baby with the bath water."

— Libb Thims (2014), mental note arisen while running on treadmill, documented @ 10:02 PM CST Jul 20

"I only believe in that which is measurable, everything else is but speculation."

— Libb Thims (2014), mental reflection note on the start of the new Atheism Reviews channel 10:24 CST Nov 15

(add discussion)

Jensen

In 2014, American chemistry historian William Jensen, and atheist [DN=7], stated the following creed: [4]

> 1.**I believe** that the evidence, whether physical, historical, or anecdotal, for the existence of a supernatural realm is either lacking or woefully flawed, where the label "supernatural realm" encompasses both supernatural entities (from gods to human souls) and supernatural powers (from telepathy to good luck charms). In the absence of any proper evidence, the only rational conclusion is that such entities and powers do not exist but are rather the products of wishful thinking and the human imagination.
>
> 2. I believe that the physical universe is indifferent to the existence of the human race and can just as easily extinguish it as sustain it, especially if we fail to heed the limitations set by the physical laws discovered by science.
>
> 3. All of this means that the human race is on its own and cannot hope for a supernatural bailout from its collective woes nor for redress of individual woes in an imaginary life after death. We have but one life to live and the quality of that life – be it our physical and mental wellbeing, our sense of purpose, our ethics, etc. – are all dependent on our interactions with our fellow human beings.
>
> 4. I believe that the most serious problem facing the human race is the problem of overpopulation. This is the elephant in the room that no one wants to talk about. Virtually all of our collective woes, from pollution, depletion of resources, and global warming to the increasing extinction of wildlife, crime, and the origins of many wars and ethnic conflicts are ultimately traceable to the ever present pressures of unchecked population growth. It is, in the words of Thomas Huxley, the real "Riddle of the Sphinx" and, unless we collectively solve it, human civilization, and possibly the very existence of the human race itself, is doomed to ultimate extinction.

(add discussion)

Atheist's creed | Christian views

In 2008, American theologian John Haught, *God and the New Atheism* (2008), gave seven summary statements as his conceptualization of the "vision of reality" held in the mind of the so-called "new atheists", such as Richard Dawkins, Sam Harris, Christopher Hitchens, which—according to theistic scientist Michael Bunner (2013)—are representative of the embodiment of the atheist's creed, or seven tenets of scientific naturalism, as Christian's see things: [3]

> 1. Apart from nature, which includes human beings and cultural creations, there is nothing. There is no God, no soul, and no life beyond death.
> 2. Nature is self-organizing, not the creation of God.
> 3. The universe has no overall purpose, although individual human lives can be lived purposely.
> 4. Since God does not exist, all explanations, all causes are purely neutral and can be understood only by science.
> 5. All the various features of living beings, including human intelligence and behavior, can be explained ultimately in purely natural terms, and today this usually means in evolutionary, specifically Darwinian terms.
> 6. Faith in God is the cause of innumerable evils and should be rejected on moral grounds.

7. Morality does not require belief in God, and people behave better without faith than with it.

(add discussion)

Other

The following are other creed-like statements by atheists:

> "I am an atheist. I do not believe in prayers. **I believe** in work. And my work is that of an author. My pen is my weapon."
>
> — Taslima Nasrin (2002), homepage quote (see: atheist's creed)

> "**I believe** that when I die will cease to be. I will no longer exist in any way. I will be as I was before I was born, which is to say, completely non-existent."
>
> — T.J. Kinclaid (2013). "Atheism and Death" (Q)

Quotes

The following are related quotes:

> "The very pith of the **Atheist's Creed** is contained in once sentence, which consists of only two words. Or, like every other creed, it is a negative throughout. 'No God!'"
>
> — W.T. Marris (1883), "Sermon", at Grosvenor Street Wesleyan Chapel (Q)

> "**I believe** [in] energy. You have sex, there's friction … that's heat. Then a baby shoots out. It's all energy. The sun's a giant orgasm. Like if you see a hot girl ... and she's soo hot, you can't even touch that sh*t. You're like daaammn! "
>
> — Patrick Fergus (2014), when queried on Easter (Apr 20) about what—as an atheist—he believes in?

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θΔics

In science, **atmospheric pressure** is "pressure", or force per unit surface area, directed force normal, of a column of air, at any given location given location, above the surface of the earth, up to the Karman line (100 km above the surface of the earth) boundary.

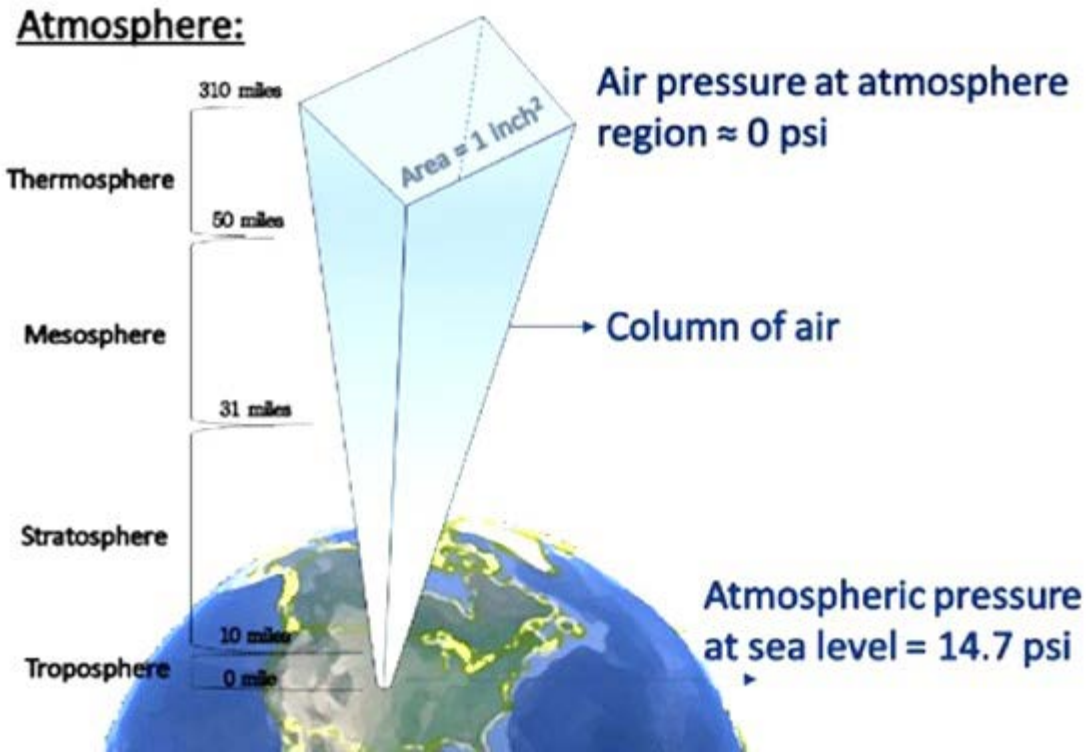

A diagram illustrating the **atmospheric pressure**, i.e. the weight, or force per unit area, of a column of air pressing down on the surface of the earth, per unit area.

Overview

In 1614, Isaac Beeckman, in his journal notes, according to William Middleton (1964), had correctly explained the action of a suction pump by an appeal to the pressure of air, and compared air to a sponge, which can be condensed, but because of its elasticity tries to return to its previous state; in 1618, Beeckman, supposedly, began to communicate some of these ideas to Rene Descartes.

On 24 Oct 1630, Giovanni Baliani, communicated to Galileo that, after shortly after he came to know that air had weight, that he began to believe in the existence of the vacuum; the following is an excerpt:

> "The higher we go in the air, the less heavy it is."
>
> — Giovanni Baliani (1630), "Letter to Galileo", Oct 24 [5]

In 1630, Jean Rey, in his *Essay on Tying to Find out why Tin and Lead Increase Weight when Calcined*, supposedly, was thinking about the weight and pressure of air. [4]

In 1631, Rene Descartes, in a letter, supposedly to his pupil Reneri, stated the following ideas, illustrated with a diagram (as shown adjacent): [1]

> "To resolve your difficulties, imagine the air to be like wool, and the aether which is in its pores to be like eddies of wind which move hither and thither in this wool; and consider that this wind, which acts from all sides between the little fibers of the wool, prevents them from pressing as hard against one-another as they might do without it. For they all have weight, and press upon one-another as much as the agitation of this wind can let them, so that the wool which is upon the earth is compressed by all that which is above, even to beyond the clouds; and this makes a great weight.
>
> So that if we had to raise a part of this wool which is, for example, at the point marked O (see adjacent figure), with all that above on the line OPQ, we should need a very considerable force. Now this weight is not commonly felt in the air when we push it upwards; because if we raise a part,

for example that which is at the point E towards F, that which is at F goes in a circle towards CHI and comes back to E; and so its weight is not felt at all, no more than that of a wheel is felt in turning it, when it is perfectly balanced on its axis. But **in the example that you bring forward of a tube DR closed at the end D, where it is attached to the plane AB, the quicksilver which you suppose to be in it cannot begin to descend all at once** unless the wool which is near R goes towards O, and that which is at) goes towards P and Q, and so on, till all the wool in the line OPQ is raised, and this, taken all together, is very heavy. For, the tube being closed at the top, no wool—I mean air—can come in to replace the quicksilver when it descends. You will say that wind—I mean aether—can very well enter through the pores of the tube. I admit this; but consider, that the aether which will come in can come only from the sky above; for although there is some everywhere in the pores of air, nevertheless there is no more than is necessary to fill them. Consequently, if there is a new space to fill the tube, aether which is in the sky above the air must come in, after the air has risen in its place.

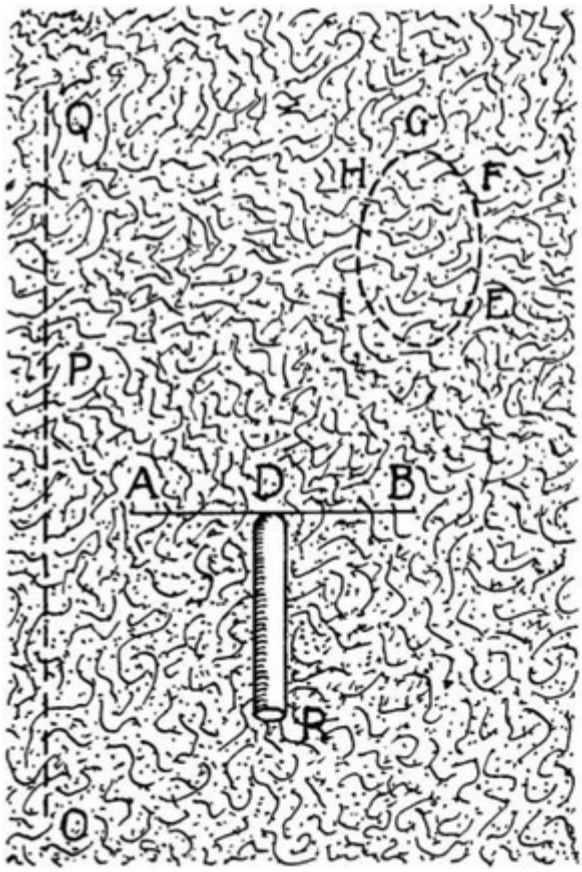

Descartes' 1631 illustration of a column of mercury in air.

And so that you will make no mistake, you must not think that this quicksilver cannot be separated from the top of the tube by any force, but only that it needs as much force as is required to raise all the air which there is from that point to the above clouds."

Of note, meteorology instrument historian Ernst Gerland (1893), stated that in this letter, Descartes had "given out the idea of the barometer, still without having been proven by trial". [2]

> "Surely it is unreasonable to see in this a prevision of the barometer. Apart from the fact that nothing is said about a cistern, there is no indication that Descartes realized that if the tube wee long enough only part of the quicksilver would come out."
>
> — William Middleton (1964), *The History of the Barometer* (pg. 8)

Gerland's classification of Descartes as being the originator of the idea of the barometer, in short, has since been classified as an over-reading of the above. [3]

In c.1660, Otto Guericke had correctly defined atmospheric pressure as the weight of the air above the surface of the earth, as stated below:

> "The weight of air on the earth's surface is as great as the weight of water about 20 Magdeburg cubits deep. In other words, if water should rise 20 cubits above the earth's surface, the pressure it would exert on all things beneath is the same as the pressure of air."

— Otto Guericke (1663), *Magdeburg Experiments on the Vacuum of Space* (pg. 113)

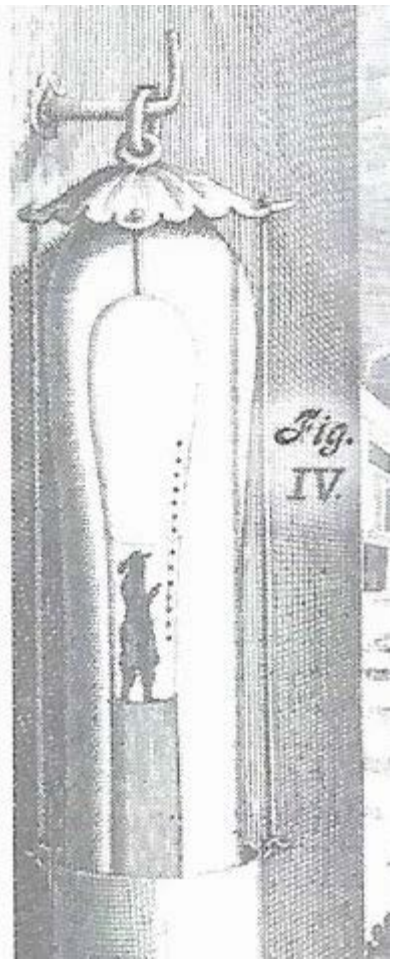

Otto Guericke's c.1662 column barometer, from Illustration X, Figure IV, of Schott diagrams, which varied up or down by sever hand lengths, according to atmospheric pressure, which he used to predict when storms were near.

and had built a column barometer, shown adjacent, attached to his house, for measuring changes in atmospheric pressure

See also

â— Atmospheric thermodynamics

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External links

â— Atmospheric pressure – Wikipedia.

θΔics

In thermodynamics, **atmospheric thermodynamics** is the study of the states of meteorological systems and the energy and entropy transformations they undergo. [1] A focus in atmospheric thermodynamics is on the application of thermodynamics towards weather prediction.

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External links

● Atmospheric thermodynamics – Wikipedia.

θΔics

In science, **atom**, from the Greek *atomos* meaning “uncuttable”, possibly related, etymologically to the Egyptian Atum, the primordial land god (see: Atoms and Atum), is a constituent of matter consisting of *z* negatively charged electrons bound predominantly by the Coulomb force to a tiny, positively charged nucleus consisting of *Z* protons and (*A* - *Z*) neutrons, where *Z* is the atomic number and *A* is the mass or nucleon number. [1] The negatively-charged electrons move about the positively-charged nucleus in regions called "orbitals", generally defined by the 90% probability region of movement, whose shape is determined by a combination of an attraction for the positive charge as this conflicts with like-like negative charge repulsion effects of the crowding of negatively-charged electrons around the nucleus.

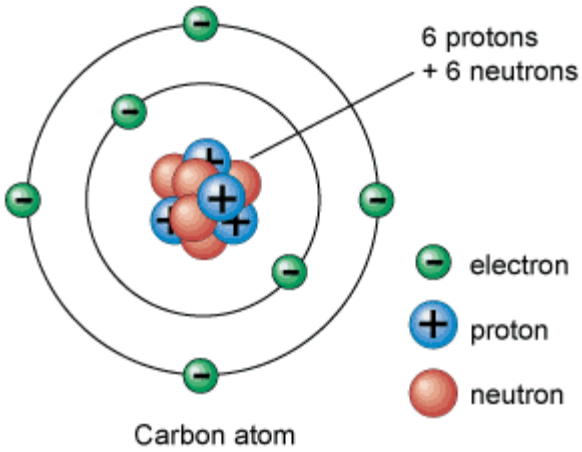

The human molecule, i.e. one average 70-kg (154-lb) person, is composed of 6.9 x 10E27 atoms, of 26 varieties, from hydrogen H, the smallest containing one proton and one electron, to iodine I, the largest containing 53 protons, 74 neutrons, and 53 electrons. [2]

Quotes

The following are related quotes:

> “It is called the ‘**atom**’ not because it is the smallest thing, but because it *cannot be cut*, since it cannot be affected and contains no void.”
>
> — Eusebius (c.313), *Praeparatio Evangelica* (XIV.14.5) [3]

See also

- Atomism
- Human atom
- Social atom

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External links

- Atom - Wikipedia.

θΔics

In schools, **atomic school** refers to []

Greek | Atomic school

The predominate usage of the term “atomic school”, prior to the 18th century, tends to refer to the Greek atomic theorists: namely: Leucippus, Democritus and Epicurus and their adherents, e.g. Lucretius.

Heat | Atomic school

In the 19th century, in reaction to the Lavoisier argument that heat was a type of fluid like atom termed caloric, the term “atomic school” began to be associated with Maxwell, Clausius, and Boltzmann, according to which atoms viewed as real and heat was conceptualized as matter in motion; as opposed to others, such as the “energetics school”, e.g. Ernst Mach, who denied the existence of atoms, believing instead that "all is energy" and or that an atom was a point center of force as Roger Boscovich believed, i.e. an "all is force" philosophy. (Q)

Quotes

The following are related quotes:

ATOMIC SCHOOL.

1. LEUCIPPUS and Democritus were the propounders of the Atomic theory of the universe. The Atomic philosophy is founded on the supposition that the ultimate elements of the universe are particles exceedingly minute and absolutely least. By absolutely least is meant small in the last degree—so small that the particle cannot be smaller. Such a degree of smallness is, of course, a fiction, for we cannot conceive anything arrested at a stage at which its quantity cannot be supposed to be diminished. The Atomic philosophers, however, supposed that such an arrestment did take place in nature. They supposed that all things were composed of particles, so little that they could not be less, particles which could not be severed by any force; and these particles they called atoms, using that word to denote their indivisible character.

Scottish metaphysician James Ferrier’s circa 1850 opening synopsis (Q) of the “**atomic school**”, from his *Lectures on Greek Philosophy*.

> “Nay, even that **school** which is most accused of atheism doth most demonstrate religion; that is, the school of Leucippus and Democritus and Epicurus. For it is a thousand times more credible, that four mutable elements, and one immutable fifth essence, duly and eternally placed, need no god, than that an army of infinite small portions, or seeds unplaced, should have produced this order and beauty, without a divine marshal.”
>
> — Francis Bacon (c.1601), “Of Atheism” [1]

> “Atomism ‘flourished’ in Greece for a period of about 150-years, from 430 BC to 280 BC. During the whole of this period there was something like an ‘**atomic school**’, working at the theory, handing down traditions and developing new points with greater or less activity, but three great names stand out as landmarks in the course of its evolution, those of Leucippus, Democritus and Epicurus.”
>
> — Cyril Bailey (1928), *The Greek Atomists and Epicurus* (pgs. 1-2) [2]

See also

- Atomic theory

References

1. Bacon, Francis. (c.1610). “Of Atheism”, Publisher.
2. Bailey, Cyril. (1928). *The Greek Atomists and Epicurus: a Study* (Q)(pdf). Russell & Russell, 1964.

In hmolscience, **atomic sociology**, a simpler variant of "molecular sociology", dubbed a bankrupt "pseudoscience" (Alex Simirenko, 1966) (Ñº), refers to a sociology based on the model of a human as an metaphorical atom, i.e. social atom, human atom, human atomism, i.e. a general "humans-as-atoms" model, that tends to use the billiard ball model.

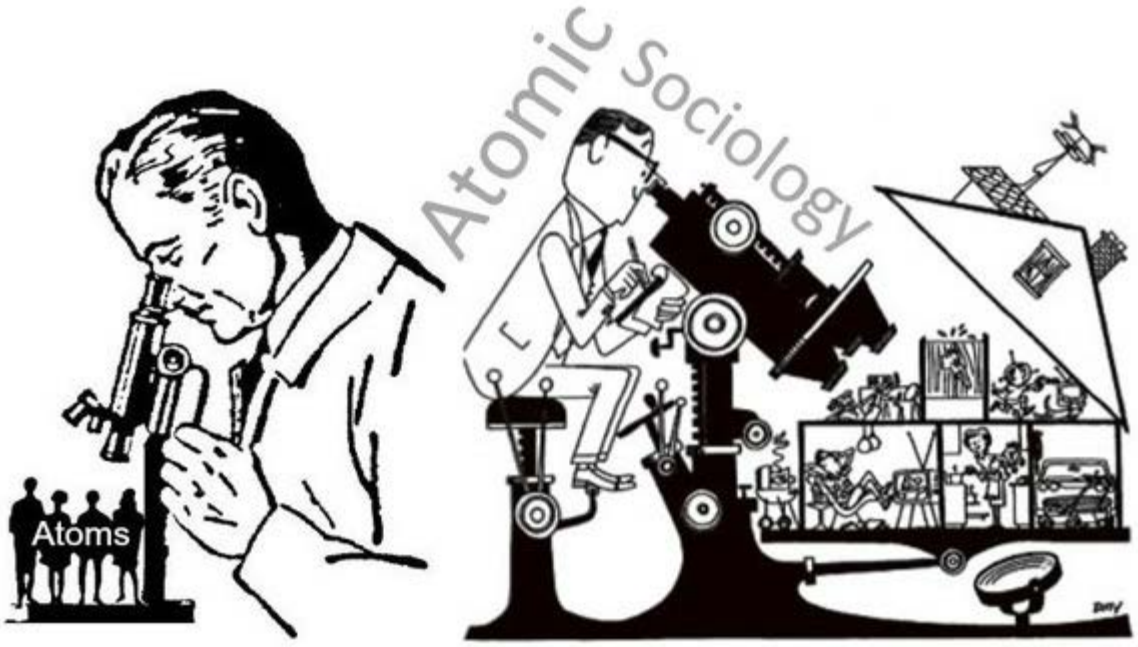

Depictions of "**atomic sociology**", namely of scientists, e.g. Albion Small (1899), Arthur Iberall (1970s), Serge Galam (1990s), or Mark Buchanan (2000s), thinking of people as "atoms" (human atoms or social atoms), using the super-observer perspective, and attempting to study their behavior as such (as conceptual particles).

Overview

In 450BC, with the advent of "atomic theory", by Leucippus and his followers (Democritus, Epicurus, Lucretius, Cicero, etc.), people began to think of society as made of types of atoms, and the soul of humans as made up of a special type of atoms that have "clinamen" (Ñº), i.e. a swerve property, hence allowing for a semblance of free will and choice.

In 1899, Albion Small, founder of the sociology department of the University of Chicago (1892) and *American Journal of Sociology* (1895), in his article "A 'Unit' in Sociology", argued that 'general sociology' might be able to be defined in the future as 'the science of human atoms and their behavior', on the model of 'general chemistry', which is defined as the science of atoms and their behavior.

In 1950, Feliks Gross, in his "Atomic Sociology" article, outlined some type of blurry sociology of basic energies, in short. [2]

Others to employ "humans-as-atoms", human atom, or human atomism models include: Arthur Iberall and Serge Galam two name two of numerous examples.

Quotes

The following are related quotes:

> "The unholy alliance of Newton and Locke produced an atomic psychology, which explained mind as a mosaic of 'sensations' and 'ideas' linked together by laws of association (attractions); we have had, too, **atomic sociology**, that reduced society to a cluster of human atoms, complete and self-contained each in itself and only mutually attracting and repelling each other."
>
> — Alexandre Koyre (1950), "The Significance of Newtonian Synthesis" [3]

References

1. Small, Albion W. (1899) "Briefer Communications: A 'Unit' in Sociology." *The Annals of the American Academy of Political and Social Science* (pgs. 81-229; esp. pg. 83: "human atom"), Vol. 13.
2. Gross, Feliks. (1950). "Atomic Sociology", *Calcutta Review* (pgs. 5-). University of Calcutta.

3. (a) Koyre, Alexandre. (1950), “The Significance of Newtonian Synthesis”, *Archives Internationales d’Historie des Sciences*, III:291-311; in: Koyre, *Newtonian Studies* (pg. 22-23). University Chicago Press, 1965.
(b) Brown, Robert. (1986). *The Nature of Social Laws: Machiavelli to Mill* (pg. 80). CUP Archive.
(b) Goldsmith, Edward. (1992). *The Way: An Ecological World-View* (pg. 22). University of Georgia Press.

Further reading

â— Ogburn, William F. (1946). “Sociology and the Atom” (abs), *Journal of Sociology*, LI(4):267-.

θΔics

In science, **atomic theory** is an argument that all matter in the universe consists of small particles called atoms or *atomos* (Greek meaning 'uncuttable' or 'indivisible') moving about in a void or vacuum.

Father of Atomic Theory

"All reality consists of hard indivisible particles, moving and colliding in empty space."

Leucippus (c.450BC)	Theory

The atomic theory was originated by Greek philosopher Leucippus in circa 450 BC as a point of argument to contradict the earlier *circa* 485 BC hypothesis by Greek philosopher Parmenides that vacuums are a natural impossibility or that "nature abhors a vacuum".

The following table lists the chronological development of atomic theory, from the early 'Greek school' of atomic theory (450-55BC), to fragmented commentary in the dark ages, to the revival of atomic theory (1600-1800), to subatomic theory (1902-1926), to subnuclear theory (1963-), to human molecular theory (2002-).

Date	Person	Atomic View

Classical Atomic Theory: Greek philosopher Leucippus originated "atomic theory" in circa 475BC, supposing the universe to consist of atoms and voids; students of Leucippean atomic theory include: Democritus, Epicurus, and Lucretius. [4]

Standard model

Next to and along side of the development of atomic theory was Greek philosopher Empedocles' 450BC "standard model" of physics, in which the universe consisting of four elements (earth, air, water, and fire) and two forces (attraction and repulsion).

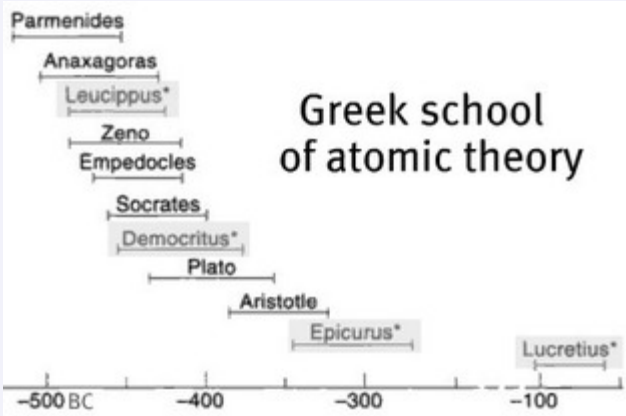

c.485 BC		Parmenides (c.510-450BC)	Argued that vacuums are a natural impossibility, specifically that "nature abhors a vacuum".
c.450 BC		Leucippus (c.500-430BC)	Often called the 'father of atomic theory', he was the first to conceive of the atomic theory, arguing that the universe consisted entirely of atoms and void, a theory purposely contrived so to contradict Greek philosopher Parmenides' earlier view that voids are impossible.
c. 420BC		Socrates (469-399BC)	Is said to have had a negative reaction to the atomic theory, which in his view was a theory which left no room for freedom of choice, and hence a basis of morality; this Socratic aversion (carried forward by his greatest student Plato), is said to been the reason for the two-millennium long interment of atomic theory. In short, the Platonic view rejected "mechanical manifestations of material atoms".
c.410BC		Democritus (c.460-370BC)	Student of Leucippus, who furthered the atomic view, whose famous motto is: "nothing exists but atoms and voids." [9] Another version reads: "no thing is real but atoms in a void, and all things happen by chance and necessity." [17] In more detail: [1]

"According to convention there is a sweet and a bitter, a hot and a cold, and according to convention there is color. In

truth there are atoms and a void."

360BC		Plato (427-348BC)	in his circa 360BC dialogue *Timaeus*, supposedly following Pythagoras, introduced the atomic theory proposition that ideal geometric forms serve as atoms, according to which atoms broke down mathematically into triangles, such that the form elements had the following shape: fire (tetrahedron), air (octahedron), water (icosahedron), earth (cube). This, however, was not atomic theory proper, but rather the four element theory.
c. 300BC		Epicurus (341-270BC)	Built on the theories of Leucippus and Democritus in the development his Epicurean philosophy ("eat, drink, and be merry, for tomorrow we may die"), that of aiming to find satiety in life's desires. He left his teachings in the form of some three hundred scrolls, which fell into the hands of his vicarious student Lucretius. In opposition to Democritus, he introduced the swerve of the atom theory, to allow for human free will.
c. 75 BC		Lucretius (99-55BC)	Student of the work of Epicurus, outlined the basics of atomic theory in his lengthy poem *De Rerum Natura* (*On the Nature of Things*), chapter two on 'movement and shapes of atoms'. [10] On heat in relation to atoms, Lucretius states: [2] "Clothes hung above a surf-swept shore grow damp; spread in the sun they dry again. Yet it is not apparent to us how the moisture clings to the cloth, or flees the heat. Water, then, is dispersed in particles, atoms too small to be observed." On atomic volition he comments: "For surely the atoms did not hold council, assigning order to each, flexing their keen minds with questions of place and motion and who goes where. But shuffled and jumbled in many ways, in the course of endless time they are buffeted, driven along, chancing upon all motions, combinations. At last they fall into such an arrangement as would create this universe." This talk of the absence of atomic volition, to note, is similar in context to the earlier circa 450 BC human chemistry views of Greek philosopher Empedocles, who famous stated that people related tend to mix like water and wine; whereas enemies mix or rather separate like oil and water.
c. 50AD		Hero (10-70AD)	Viewed matter as consisting of particles mixed with distributed vacua.
c.250		Plotinus (205-270)	An anti-atomicist philosopher; view: "What motion of atoms can one attribute to the actions and passions of the soul? . . . What movements of atoms stir the

thought of the geometer, the arithmetician, or the astronomer? What movements are the source of wisdom?”

Atomic Theory Suspension: in the early and middle ages, from the rise of Christianity up until the invention of the printing press, atomic theory lay in relative dormancy (100-1500), aside from a few scattered views. This was is generally owing to the fact that atomic theory, by implication, promotes atheism, and hence is diametrically opposed to religion. In the 1610 words of English scientific method philosopher Francis Bacon (see: "renaissance atomic theorists", below):

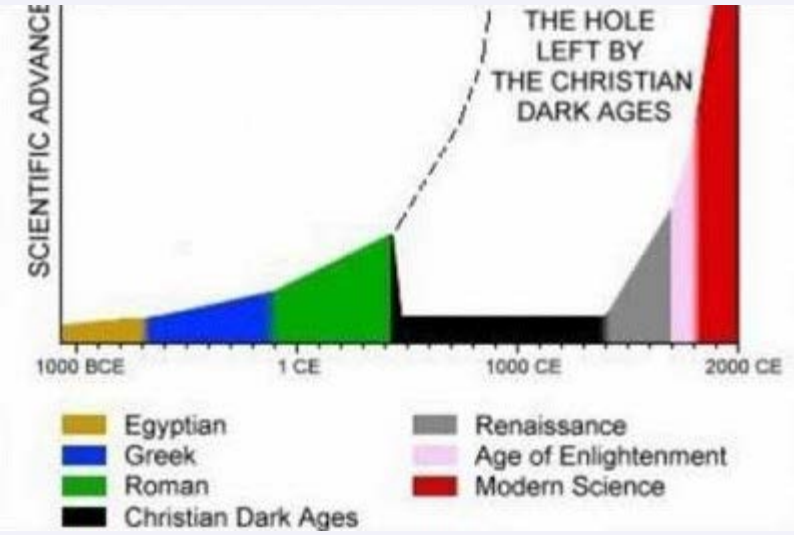

> “Nay, even that school which is most accused of **atheism** doth most demonstrate religion; that is, the school of Leucippus and Democritus and Epicurus. For it is a thousand times more credible, that four mutable elements, and one immutable fifth essence, duly and eternally placed, need no God, than that an army of infinite small portions, or seeds unplaced, should have produced this order and beauty, without a divine marshal.”

400		Augustine (354-430)	Argues: “let those philosophers disappear, who attribute natural corporeal principles to the intelligence attached to matter, such as Thales, who refers everything to water, Anaximenes to air, the Stoics to fire, Epicurus to atoms, that is to say, to infinitely small objects that can neither be divided nor perceived.”
		Adelard of Bath (1075-1150)	Thought that physics of atoms made sense. [24]
		William of Conches (c.1090-1154)	Thought that physics of atoms made sense. [24]
		Thierry of Chartres (c.1100-1150)	Thought that physics of atoms made sense. [24]
		Averroes (1126-1198) IQ_B=170	Had some type of Aristotelean-influenced atomic theory; later cited by Daniel Sennert. (Ñº)
1175		Maimonides (1135-1204)	Refers to the earlier atomic views of Epicurus and gives commentary on the doctrine of the Mutakallemim (scholars of kalam), the first principle of which is that “the universe, that is, everything contained in it, is composed of very small parts [atoms] which are indivisible on account of their smallness; such an atom has no magnitude; but when several atoms combine, the sum has a magnitude, and thus forms a body”; the second proposition of which is that the universe is a vacuum in which the atoms are found; the third proposition arguing that time is composed of 'time-atoms'. [8]

William of Ockham (c.1288-1348)

Was critical of Aristotle; claimed that matter could be reduced down to elementary particles. [24]

Nicholas of Autrecourt (c.1299-1369)

Defended atomism. [24]

Atomic Theory Revival: in the sixteenth century onward, scientists and philosophers, from Bruno to Kant, began to utilize atomic theory, in various forms, in what is known as the revival period (1550-1800), central among this group being Gassendi, Descartes, and Newton. [4]

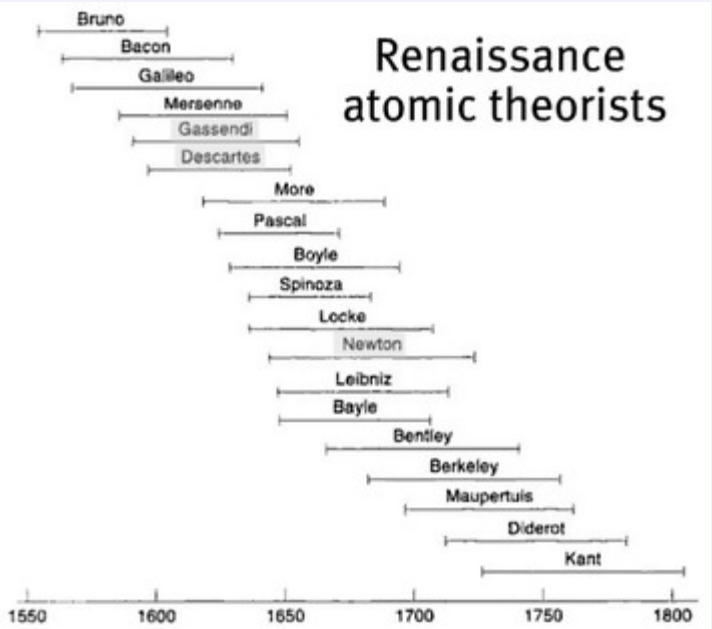

1417

Poggio Bracciolini (1380-1459)

In January, while scouting about German monasteries in search of rare "humanism" books of antiquity, discovered Lucretius' 55BC atomic theory based *On the Nature of Things*—all copies previous thought destroyed or non-existent—which he sent to his wealthy associate Niccolo Niccoli, inventor if *italic script*, a noted book collector whose aim was to will his final collection with funds into the form of Italy's first public library; Niccoli made more than fifty copies, in book form.

Desiderius Erasmus (1466-1536)

Attempted to reconcile Epicurus and Lucretius with Christian thinking. [24]

1516

Thomas More (1478-1535)

Attempted to reconcile Epicurus and Lucretius with Christian thinking; his *Utopia* was the result. [24]

Conceived of the atom as a three-dimensional physical particle capable of spontaneously moving itself. Using Lucretius as a basis, he extended the Copernican heliocentrism to argue that the universe is made up of an infinite number of suns with their own planetary systems; and viewed matter as following an active animistic principle, in that matter is 'intelligent', discontinuous in structure, and made up of discrete atoms or

1584		Giordano Bruno (1548-1600)	four elements (water, earth, fire, and air); proposed the view that everything that exists is made up of infinitesimal *monads*, of three varieties: God (the monad of monads), souls, and indivisible atoms. He was burned at the stake for his views; in the centuries to follow, his ideas were held up for ridicule, debate, or inspiration; Margaret Cavendish, for example, wrote an entire series of poems against "atoms" and "infinite worlds" in *Poems and Fancies* in 1664.
1601		Francis Bacon (1561-1626)	In his 1601 essay "Of Atheism", on the subject of atheism, outlined the view that one can either believe in God or believe in atoms (or rather the "school of Leucippus and Democritus and Epicurus"), but not both.
1618		Daniel Sennert (1572-1637)	In his 1618 *Epitome Naturalis Scientiae* he gave speculative support for atomic theory; in his 1636 *Hypomnemata Physicae* he outlined the view that each substance can be broken down into its *minima naturalia* a sort of atom, stable small corpuscle, or smallest possible component of a substance. [11]
1623	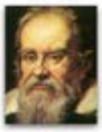	Galileo Galilei (1564-1642)	Openly endorsed the atomism of Democritus and Epicurus, statements to the effect of which appear in *Il Saggiatore* (1623) and in *Dialogue* (1632), form which he drew a number of consequences about the nature of 'sensible qualities.' Viewed the atom as an unextended geometrical point. Expressions recurrent in his writings include: *atomi ignei* (igneous atoms), *atomi del fuoco* (atoms of fire), *atomi calidi* (hot atoms), and *sottilissimi atomi* (very thin atoms). [16]
1637		Rene Descartes (1596-1650)	Significant reviver of atomic theory, and supposedly was one of the first to develop a prototype of 'molecular theory' in the form of hooked-together atoms, whereby when the hook of one atom got caught in the loop of another atom, a bond would form. 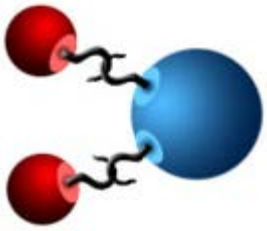
1649		Pierre Gassendi (1592-1655)	Wrote a book on the life of Epicurus, reasoned that to account for the size and shape of atoms moving in a void could account for the properties of matter. Heat was due to small, round atoms; cold, to pyramidal atoms with sharp points, which accounted for the pricking sensation of severe cold; and solids were held together by interlacing hooks.
1661		Robert Boyle (1627-1691)	In his *The Skeptical Chemist*, argued that matter is composed of *clusters of particles* and that chemical change results from the rearrangement of the clusters; matter's basic elements were said to consist of various sorts and sizes of particles, called 'corpuscles', which were capable of arranging themselves into groups. First to apply atomic theory to chemical change. Defined an element as 'a substance that cannot be decomposed into any simpler substance'.
1714		Gottfried Leibniz (1646-1716)	In his *Monadology*, he extended Bruno's concept of 'monads', in which universe consisted of an indefinite number of indivisible units, but defined such that each indivisible monad is primarily a center of force or action; he, supposedly, updated Bruno's concept of self-motivation of matter soul; with the term "force".

1718		Isaac Newton (1643-1727)	Newton, in Query 31 of his *Opticks*, acknowledged the various 'atom attachment theories' in vogue at the time, i.e. "hooked atoms", "glued atoms" (bodies at rest), and the "stick together by conspiring motions" theory, but believed particles attract one another by some force, which "in immediate contact is extremely strong, at small distances performs the chemical operations, and reaches not far from particles with any sensible effect."
1721		Emanuel Swedenborg (1688-1772)	Outlined a type of atomic geometry, in which geometric groupings of small, concrete atoms explain the properties of different substances. [14]
1748		Gowin Knight (1713-1772)	His *An Attempt to demonstrate that all the Phenomena in Nature may be explained by two simple active principles, Attraction and Repulsion, wherein the attractions of Cohesion, Gravity, and Magnetism are more particularly explained*, which consists of ninety-one propositions, marks of an epoch in which attempts were made to push the Newtonian doctrine into molecular speculations; preceding Boscovich's better-known work on a similar subject by ten years.
1758		Roger Boscovich (1711-1787)	Developed a 'theory of point atoms', a modified type of Newtonian atomic theory of inelastic collisions regarding atoms as centers of forces rather than as particles. His 1763 book *Theoria Philosophiae Naturalis*, outlined a 'stationary atom' theory, which reasoned that at short range, atoms attracted each other, but that at longer range, atoms pushed each other way, the latter aspect explaining gas pressure
1775		Bryan Higgins (1741-1818)	Outlined an atomic hypothesis that recognized seven elements—earth, water, alkali, acid, air, phlogiston, and light—each one consisting of 'atoms homogeneal', being impenetrable, immutable in figure, inconvertible, and globular, or nearly so, and in which a speculation was made on the attractions and repulsions between these bodies. [14]

Modern Atomic Theory: At the end of the eighteenth century, experimental evidence, e.g. the experimental chemistry of Lavoisier (1780s), the invention of battery (1800), etc., began to drive forward more robust ideas and conceptions on atomic theory, central among this group being John Dalton, often considered the father of modern atomic theory, for his assignment of hydrogen, the lightest element, with an atomic mass unit of one, using this as a basis to determine atomic ratios in molecules. [4]

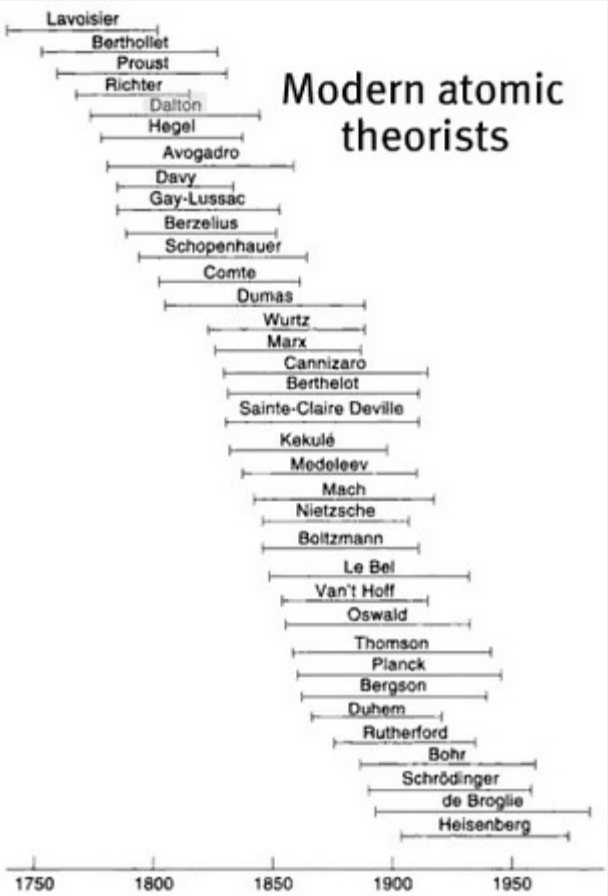

1787		Antoine Lavoisier (1740-1794)	Considered bodies to be composed of particles, which were kept separate by means of caloric or the matter of heat, such that the more caloric there was in a given body, the more it would be made to expand according to Boerhaave's law; he also introduced the modern definition: "with the word 'element' or 'principles of bodies', we associate the notion of the ultimate entity arrived at by analysis; all substances that we have not yet decomposed by any means, we consider elements."
1789		William Higgins (1763-1825)	His *A Comparative View of Phlogistic and Antiphlogistic Theories*, had developed a theory of 'ultimate particles' attached via divided force fractions, a type of atomic union to form molecules model; in 1814 he published *Experiments and Observations on Atomic Theory and Electrical Phenomena*. [14]
1803		John Dalton (1766-1844)	Using the hooked atom theory as a model for bonding, founded modern 'atomic theory' by initiating the basics of stoichiometry, assigning the hydrogen atom, the lightest element, as unity, and determined the atomic ratios in various molecules, such as nitrous anhydride N_2O_3. Dalton is often considered the 'father of modern atomic theory.'
1811		Amedeo Avogadro (1776-1856)	Calculated the number of atoms in a volume of gas, as defined by the Avogadro constant.

1814		Andre Ampere (1775-1836)	Developed a ‘geometric model’ in which he pictured atoms of chemical elements as being composed of subatomic particles. [7]
1816		Jean Biot (1774-1862)	Central person of the 'atomic theory' group at the Ecole Polytechnique, including Augustin Cauchy (1789-1857) and Simeon Poisson (1781-1840), who, in the 1810s to 1830s, employed models in which the atom consisted of a massive nucleus surrounded by an atmosphere of imponderable ether particles. [7] In his 1816 textbook on experimental and theoretical physics, he mentioned views on atomic structure similar to Andre Ampere’s ‘geometric model’ .
1826		Gustav Fechner (1801-1887)	After translating Biot’s 1816 textbook into German, in 1828 he went on to construct a dynamic atomic model in which the ‘atoms simulate in small dimensions the situations of the astronomical objects in larger dimensions, being animate in any case by the same forces; and each body may be regarded as a system of innumerably many small suns, floating at comparatively large distances from one another, such that each or several of them together are surrounded by orbiting planetary atoms.” [7]
1841		Karl Marx (1818-1883)	Completed his 1841 PhD dissertation on *Differences between the Natural Philosophies of Democritus and Epicurus*, in which he is very critical of Gassendi’s efforts to rehabilitate Epicureanism; also authored a post-humorous piece entitled “Epicurean Philosophy”.
1870		William Thomson (1824-1907) → Vortex atom theory	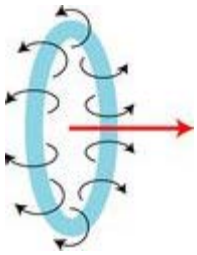 In 1867, inspired by Hermann Helmholtz’s 1858 paper on “vortices”, recently translated by his friend Peter Tait, the two came up with the idea, following smoke ring experiments done by Tiat, that atoms were types of vortex rings, like smoke rings, or knots of swirling vortices in the æther. [19] Chemical elements would thus correspond to knots and links and that an understanding and classification of all possible knots would explain why atoms absorb and emit light at only the discrete wavelengths that they do. [20] In his 1870 *Nature* article "Size of Atoms", he worked out a method for estimating the size of atoms, or rather to fix the limits between which their sizes lie; similar atomic sizing methods were worked out independently, in this period, by Josef Loschmidt and George Stoney. In 1902, he is said to have proposed the first modern 'structural theory of the atom' (see: subatomic theory section, below), in which an atom was hypothesized to have a uniformly distributed positive electrical cloud in which electrons were inserted so as to produce an equilibrium situation when the negative charges were at rest. [4]
1871		Wilhelm Weber (1804-1891)	Built on Fechner’s model of the atom, but assumed the heavy solar atoms and the almost massless planetary atoms to be electrically charged, replacing Fechner’s gravitational attraction with electrical forces. Weber gave the following picture of an atom: “Let *e* be the positively charged electrical particle, and let the negative particle, carrying an opposite charge of equal amount, be denoted by –*e* Let only the latter be associated with the massive atom, whose mass is so large that the mass

of the positive particle may be considered as negligible. The particle –*e* may then be considered as being at rest, while just the particle *e* moves around the particle –*e*."

This model, supposedly, became defunct with James Maxell's electromagnetic theory of transverse electric and magnetic waves.

1868		Ludwig Boltzmann (1844-1906)	Building on the kinetic theory work of Clausius and Maxwell, developed the statistical mechanics of atomic movement (velocities), thus bring conclusive validation to atomic theory, over detracting views, such as professed by those of the energetics school, particularly Ernst Mach, Wilhelm Ostwald, and Pierre Duhem, who considered atoms to be a metaphysical abstraction.
1878		Alfred Mayer (1836-1897) → Floating magnets experiment	To study how atomic points of charge might be arranged, he took equally magnetized needles and stuck them through corks so that they would float with their north poles all at the same height above the water, all repelling each other equally. He then held the south pole of a more powerful magnet some distance above the water, to attract the needles towards this central point. The idea was to see what equilibrium patterns the needles would form for different numbers of needles. He found that the needles liked to arrange themselves in shells: three needles formed a triangle, five a square with a needle at the center; ten a ring with a triangle at the center; fifteen a needle surrounded by two shells or rings; and so on. These experimental findings inspired the later 1904 "plum pudding model" of Joseph Thomson. 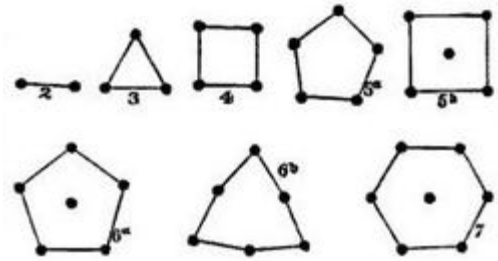
1883		Henri Bergson (1859-1941)	Published *Les Extraits de Lucrece* (*Excerpts from Lucretius*) giving commentary on the atom-void views of Lucretius, a view which he favored.
1897		Ernst Mach (1838-1916)	Famously declared: "I don't believe that atoms exist!", following an 1897 lecture by Ludwig Boltzmann at the Imperial Academy of Science in Vienna; often cited as the "last physicist to deny the existence of the atom"; Mach's opposition to Boltzmann, along with his teaming up with Wilhelm Ostwald with the energetics school, is said to be what drove Boltzmann to the grave; Max Planck's famous "a new scientific truth" quote is attributed to this debacle; Albert Einstein later met with Mach to see if he would be willing to recant, if he could predict a property of a gas in such a way that it required the assumption of the existence of atoms—Mach, supposedly, as Einstein recalled delightedly, "replied affirmatively". [23]
1897		Joseph Thomson (1856-1940)	After experimenting with cathode-ray tubes, published a paper, in which he postulated that the cathode rays are streams of "negatively electrified particles" [i.e. electrons] with mass.

Subatomic Theory

1891 George Stoney (1826-1911)

Coined the term "electron" (1891); also estimated the size of the atom (along with William Thomson and Josef Loschmidt) in *circa* 1870.

1903 Hantaro Nagaoka (1865-1950)

Building on the 1859 work of James Maxwell on the stability of Saturn's rings, Nagaoka mathematically considered the properties of a 'Saturnian' atom, which he supposed the atom to consist of a central attracting mass surrounded by rings of rotating electrons, showing that such a system was stable if the attractive force was large. [6]

1904 Joseph Thomson (1856-1940)

After experimentally discovering the electron (1897), conceived of the 'plum pudding model' in 1904 of an atom, in which small negatively charged electrons floated in a uniformly positively-charged sphere.

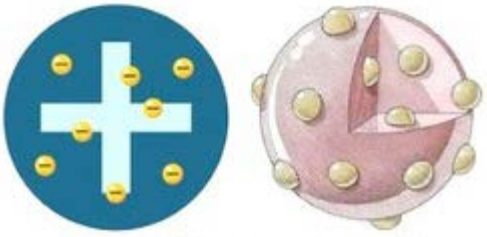

Plum Pudding Atomic Model
(Thomson, 1904)

In 1887, Heinrich Hertz

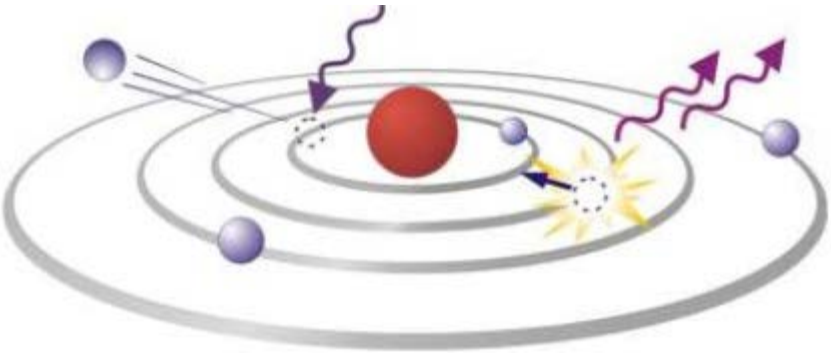

discovered that electrodes illuminated with ultraviolet light create electric sparks more easily. In 1900, while studying black-body radiation, the German physicist Max Planck suggested that the energy carried by electromagnetic waves could only be released in "packets" of energy. In 1905, Albert Einstein published a paper advancing the hypothesis that light energy is carried in discrete quantized packets to explain experimental data from the photoelectric effect. This model contributed to the development of quantum mechanics. In 1914, Robert Millikan's experiment supported Einstein's model of the photoelectric effect. Einstein was awarded the Nobel Prize in 1921 for "his discovery of the law of the photoelectric effect", and Millikan was awarded the Nobel Prize in 1923 for "his work on the elementary charge of electricity and on the photoelectric effect".

1909 Wilhelm Ostwal (1853-1932)

Quote: "I am now convinced that we have recently become possessed of experimental evidence of the discrete or grained nature of matter, which the **atomic hypothesis** sought in vain for hundreds and thousands of years. The isolation and counting of gaseous ions, on the one hand, which have crowned with success the long and brilliant researches of J.J. Thomson, and, on the other, agreement of the Brownian movement with the requirements of the kinetic hypothesis, established by many investigators and most conclusively by J. Perrin, justify the most cautious scientist in now speaking of the experimental proof of the atomic nature of matter, the atomic hypothesis is thus raised to the position of a scientifically well-founded theory, and can claim a place in a text-book intended for use as an introduction to the present state of our knowledge

			of general chemistry." (Ñº) [21]
1911		Ernest Rutherford (1871-1937)	After experimentally discovering the nucleus, in his 1909 gold foil experiment, conceived of the 'Rutherford model' of the atom in 1911, according to which the atom had most of its mass at the center characterized by a "positive central charge *N* e, and surrounded by a compensating charge of *N* electrons"; Rutherford failed to speculate further on electronic structure, but did mention the Saturn ring model of Nagaoka; Rutherford later coined the term 'proton' (1919) for structure of hydrogen nuclei. [5]
1913		Niels Bohr (1885-1962) → Bohr model	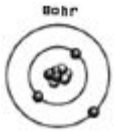 Established the basic modern model of the internal structure the atom, called the 'Bohr model', in which an atom consists of a central positively charged nucleus surrounded by a certain number of negatively charged electrons, moving about in specific orbits about the nucleus, at certain discrete distances from the nucleus, with specific energies, whereby the electrons can gain or lose energy by jumping from one allowed orbit to another, absorbing or emitting electromagnetic radiation, in the form of energy elements, with a frequency *v* determined by the energy difference between the two energy levels according to the Planck relation ($E_2 – E_1 = h\,v$), determined in 1900 by Max Planck.
1924		Louis de Broglie (1892-1987)	Introduced the 'wavelike atom' model, proposing that all matter, particularly electrons, must have a wave-like behavior in their motion.
1926		Jean Perrin (1870-1942)	Won the Nobel Prize in physics for proving, conclusively, the reality of the "atomistic description" of nature—a recognition often said to mark the final and formal acceptance of Leucippus' c.450BC atomic theory by science officially; he did this by calculating Avogadro's number using three different methods, all involving liquid phase systems. First, he used a gamboge soap-like emulsion, second by doing experimental work on Brownian motion, and third by confirming Einstein's theory of particle rotation in the liquid phase.
1926		Erwin Schrodinger (1887-1961)	Utilized de Broglie's wave hypothesis to develop a wave equation that describes the movement of the electrons about a nucleus (or rather the distribution of the charges electrons in space), thus initiating the 'orbital model' of the atom.
1932		James Chadwick (1891-1974)	Experimentally discovered the 'neutron' an uncharged nuclear particle slightly larger in mass than the proton.
			Using a field ion
1955		Erwin Muller (1911-1977)	

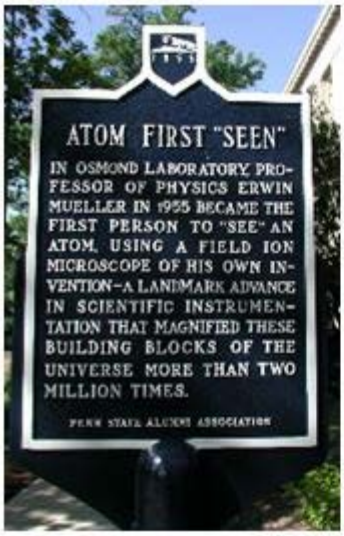

microscope, he became the first person to “see” an individual atom (Ñº); the dots in the image shown, a platinum micrograph (1973), similar to the view seen by Muller, are individual platinum atoms. (Ñº)

Subnuclear Theory

1963		Murray Gell-Mann (1929-)	Assigned the name "quark" to the fundamental constituents of the nucleon (protons and neutrons).

Human molecular theory

See main: Human molecular theory, Human molecular hypothesis, human molecule

A subset of atomic theory logic is 'human molecular theory', the premise that humans are made of atoms, ordered in specific arrangement, in the form of a dynamic molecule. The immensity of this simple doctrine cannot be overestimated in terms of it far-reaching implications. To illuminate, as commented, in aggregate form, famously by American physicist Richard Feynman, in his famous time capsule wisdom:

> “If all scientific knowledge were lost in a cataclysm, the single statement that I would propose to best pass on our understanding of the world, so to preserve the most information for the next generations of creatures, would be: **‘all things are made of atoms’**.”

The extrapolation of this, up to the human scale, namely that:

> “All humans are made of atoms”

is the more far-reaching statement with which to pass on to subsequent generations.

That humans are little particles (made of atoms), which go by various names: human molecules, human atoms, human

atomisms, human particles, human chemicals, or human elements, etc., that move around, attracting each other when in near vicinity, but repelling upon being squeezed together in too close a manner. In this one sentence, one sees that there is an enormous amount of information about the human world, if just a little imagination and thinking are applied. In this perspective, the following table gives a gist outline of human molecular theory:

Modern Human Molecular Theory		
1919	George Carey (1845-1924)	Definitively stated that: "man's body is a chemical formula in operation."
	Robert Sterner (c.1958-)	In their ecological stoichiometric studies of elemental composition variations in related species of small fresh water organisms, Sterner and Elser initiated modern 'human molecular theory' by calculating the following 22-element empirical molecular formula for one person:
2000	James Elser (c.1959-)	$H_{375,000,000}\ O_{132,000,000}\ C_{85,700,000}\ N_{6,430,000}\ Ca_{1,500,000}\ P_{1,020,000}\ S_{206,000}\ Na_{183,000}\ K_{177,000}\ Cl_{127,000}\ Mg_{40,000}\ Si_{38,600}\ Fe_{2,680}\ Zn_{2,110}\ Cu_{76}\ I_{14}\ Mn_{13}\ F_{13}\ Cr_{7}\ Se_{4}\ Mo_{3}\ Co_{1}$ which they specifically defined as the chemical formula for one 'human molecule', thus giving, for the first time, experimentally measured proof or derivation that a human being is a 'molecule' comprised of a specific number of operational atoms. In his human thermodynamic studies, particularly surrounding efforts to understand how the spontaneity criterion applies to human relationships, in 2002 calculated the following 26-element empirical molecular formula:
2002	Libb Thims (c.1975-)	$H_{2.5E9}\ O_{9.7E8}\ C_{4.9E8}\ N_{4.7E7}\ P_{9.0E6}\ Ca_{8.9E6}\ K_{2.0E6}\ Na_{1.9E6}\ S_{1.6E6}\ Cl_{1.3E6}\ Mg_{3.0E5}\ Fe_{5.5E4}\ F_{5.4E4}\ Zn_{1.2E4}\ Si_{9.1E3}\ Cu_{1.2E3}\ B_{7.1E2}\ Cr_{98}\ Mn_{93}\ Ni_{87}\ Se_{65}\ Sn_{64}\ I_{60}\ Mo_{19}\ Co_{17}\ V$ and in 2007 wrote the first textbook on the behavior and reactions of human molecules; and in 2008, after becoming aware of the earlier work of Sterner and Elser, wrote the first booklet on history of the concept of the human molecule. In 2005, in an anon author of a *New Scientist* article entitled “That’s Life”, gave the following 12-element empirical formula was: [15]
2005	New Scientist	$H_{15,750}N_{310}O_{6,500}C_{2,250}Ca_{63}P_{48}K_{15}S_{15}Na_{10}Cl_{6}Mg_{3}Fe_{1}$ This attempt at what the author calls "one's chemical formula", however, is lacking in 14 elements shown to have active role in the internal functioning of a person.

The three subjects concerning the study of human molecules include: human chemistry, human physics, and human thermodynamics.

Quotes

The following are related quotes:

> "When I taught physics in secondary school in 1891, the invisible and indestructible atom was the foundation upon which the scientific structure was built. Some of my naïve pupils were skeptical and asked if I were telling a fairy tale."
>
> — Judson Herrick (1956), *The Evolution of Human Nature* (pg. 33)

> "If, in some cataclysm, all scientific knowledge were to be destroyed, and only one sentence passed on to the next generation of creatures, what statement would contain the most information in the fewest words? I **believe** it is the atomic hypothesis (or atomic fact, or whatever you wish to call it) that all things are made of atoms — little particles that move around in perpetual motion, attracting each other when they are a little distance apart, but repelling upon being squeezed into one another. In that one sentence you will see an enormous amount of information about the world, if just a little imagination and thinking are applied."
>
> — Richard Feynman (1964), *Lectures on Physics*

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Further reading

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External links

â— Atomic theory – Wikipedia.
â— Atomism – Wikipedia.

θΔics

In homeokinetics, **atomism** is abstract name for any atom-like particle in the universe. [1] A group of interacting atomisms in a system are said to constitute an ensemble.

History

In 1977, American physicist Arthur Iberall introduced the term as a tool to theorize, in a generalized manner, on any type of system in the universe, from small gas molecule systems to human systems, which are said to be comprised of "human atomisms", to galactic systems, etc. [2]

In 1987, Iberall began the discussing the concept of people viewed as human atomisms: [3]

Arthur Iberall discussing "**atomisms**".

> "The factory day is characteristic not only of living systems but also of all complex atomistic systems that persist and that express much of their action internally. For an individual **human atomism** the factory day largely, but not completely, coincides with the earth's day."

In his three-part article on field thermodynamics applied to biology, Iberall gives three related definitions, introducing them by stating that "the concept of a system as an ensemble of atomistic entities is so fundamental to physics that I define here three terms that support the topic:

Term	Definition
Atomism	A generalized atom or a bounded, material object (of whatever size) that is active, and involved in processes that keep it active. The processes here referred to being thermodynamic engine processes.
Active atomism	Being active is to have the property of possessing, or drawing upon an energy supply to do work. Active entities can exchange energy over time, and the term *action* refers to the integrated product of energy and time.
Human atomism	A human being defined abstractly as a generalized atom.
Ensemble	A set of essentially similar atomism, continually engaged in interactions (e.g. collisions).

(add discussion)

See also

â— Human atom
â— Social atom

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Action”, *Ecological Psychology*, 791): 37-68.

θΔics

In hmolscience, **Atoms and Atum** refers to the conjecture that the Greek term "atom" or “atomos” (Q), introduced by Leucippus (470BC), which supposedly means “uncuttable”, is derived from or related to the name of the Egyptian god Atum.

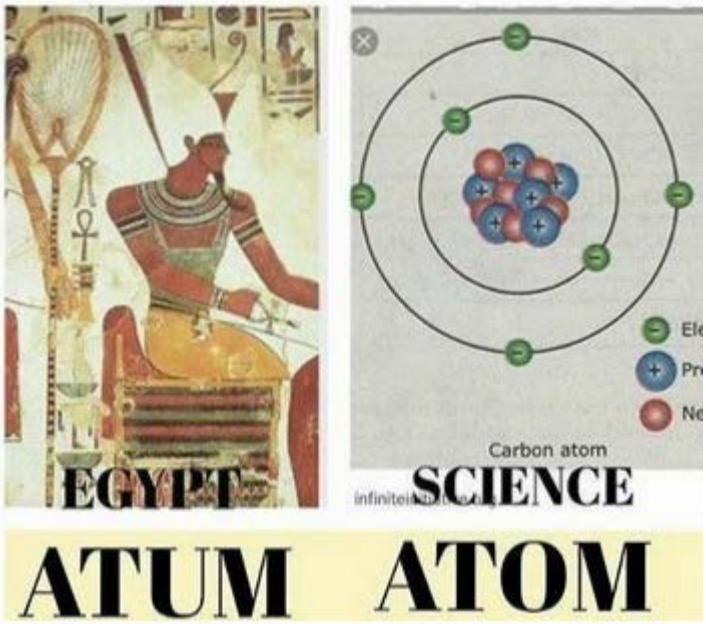

A diagram (Q) showing the **atoms and Atum** hypothesis, namely that Leucippus, after studying in Egypt, based the word "atom" on the Egyptian god Atum, the one who called for the first land mound from the watery void or vacuum.

Overview

In 580BC, Thales, among Greek philosophers, initiated the study abroad in Egypt method of education. Although little is known about Leucippus, the supposed coiner of the term “atomos”, we do know that his student Democritus did study in Egypt (Pliny, c.77AD) (Q), for up to seven years (Q), according to some accounts. [3] Accordingly, Democritus, speculatively speaking, would have learned at least the following basic religio-mythology cosmologies, and therein thematically have gotten the idea of first earth or "Atum" arising out of or existing in the void aspects of the Ogdoad, the gods Huh (space) and Hauhet (infinity) specifically:

0. Pre-Dynastic creation myth | 3500BC | Supreme god: Horus
1. Heliopolis creation myth | 3100BC | Supreme god: **Atum [Atom]** or Atum-Ra / Ennead
2. Memphis creation myth | 2800BC | Supreme god: Ptah
3. Hermopolis creation myth | 2400 BC | Supreme god: **Ogdoad [Void]**
4. Thebian creation myth | 2050 BC | Supreme god: Amen
5. Amarnan creation myth | 1300BC | Supreme god: Aten
6. Saite recension | 670BC | *Book of Dead* (canonized)

The following are the extant fragments of Democritus, wherein the term "atom" is used, according to which, in a very conjectural manner, it could be possible that while dismissing the concept of gods from his model, he may have kept the idea of matter (Atum) and void (Huh) as his basic model; or this was Leucippus’ basic model (but fragments from him are lacking), and he but expanded on it in secular/scientific themed terms:

> “It has often been demonstrated that we do not grasp how each thing is or is not. Sweet exists by convention, bitter by convention, color by convention. **Atoms and void** alone exist in reality. . . We know nothing accurately in reality, but only as it changes according to the bodily condition, and the constitution of those things that flow upon the body and impinge upon it. It will be obvious that it is impossible to understand how in reality each thing is.”
>
> — Democritus (c.420BC), Pay (Q) fragment #26

> “The universe is infinite because it has **not been produced by a creator**. The causes of what now exists had no beginning.”
>
> — Democritus (c.420BC), Pay (Q) fragment #45

> “The material cause of all things that exist is the coming together of atoms and void. Atoms are too small to be perceived by the senses. They are eternal and have many different shapes, and they can cluster together to create things that are perceivable. Differences in shape, arrangement, and position of atoms produce different things. By aggregation they provide bulky objects that we can perceive with our sight and other senses.”
>
> — Democritus (c.420BC), Pay (Q) fragment #47

> “We see changes in things because of the rearrangement of atoms, but atoms themselves are eternal. Words such as ‘nothing’, ‘the void’, and ‘the infinite’ describe space. Individual atoms are describable as ‘not nothing’, ‘being’, and ‘the compact’. There is no void in atoms, so they cannot be divided. I hold the same view as Leucippus regarding atoms and space: atoms are always in motion in space.”
>
> — Democritus (c.420BC), Pay (Q) fragment #48

> “Nothing exists except atoms and empty space; everything else is opinion.”
>
> — Democritus (c.420BC), Pay (Q) fragment #49

In 1954, George James, in his *Stolen Legacy*, a book which argues that Greek philosophy originated in ancient Egypt, Memphite theology (see: Memphis creation myth) specifically, suggested that the Greek term “atom” is based on the name of the Egyptian god Atum. [1] Others such as Martin Bernal (1987) and Anthony Preus (1993) and others have published views forwarding this argument. [2]

Atum | Atom | Adam

See main: Atum, Atom, Adam

In 1949, Rene Lubicz, in his *The Temple of Man*, connected the Egyptian Atum to the Greek biblical Adam, and on this connection.

In 2001, Edward Smith, in his *David’s Questions*, based on Lubicz, was speculating about the etymological relation between all three:

> “Surely there must be an archetypal relationship between Adam (hard) and atom (indivisible) from which these two Greek sources arose?”
>
> — Edward Smith (2001), *David’s Question* (pg. #)

(add)

Quote

The following are related quotes:

> “Small wonder Leucippus and Democritus jointly held the view that Atom (Atum) was the basic principle of the universe.”
>
> — Boniface Nwigwe (2004), *Emergent and Contentious Issues in African Philosophy* (pg. 138)

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θΔics

In physiology, **ATP** or adenosine triphosphate ($C_{10}H_{16}N_5O_{13}P_3$) is a five element molecule, classified as a nucleotide, which acts as an energy carrier in biology, often called molecular energy currency, the thermodynamics of which were described by German-born American Fritz Lipmann in 1941. [1] The energy is stored in the three high-energy phosphate bonds is on the magnitude of 20 kJ of free energy per bond per mol, amounting to about 55 kJ per mole of ATP. To release this energy, each phosphate group bond (P–O) can be cleaved, one-by-one, as exergonic reactions, providing enough energy to drive typical endergonic reactions in the cell. An average person at rest hydrolyzes and produces some 40 kg of ATP per day. [2]

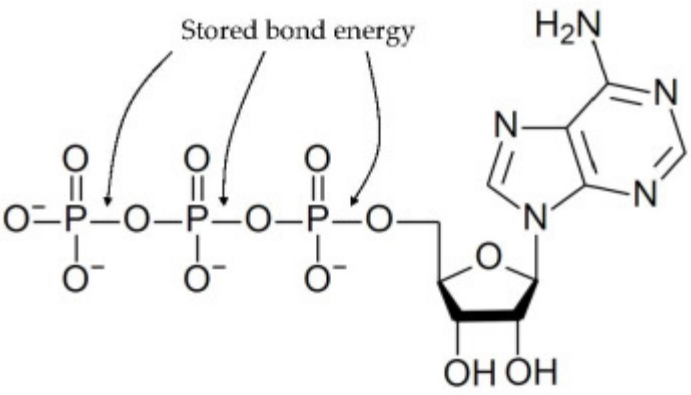

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See also

â— STP

External links

â— Adenosine triphosphate – Wikipedia.

θΔics

In science, **attack**, from the point of view of scientific endeavors being a type of intellectual warfare (Thomas Young, 1810), refers to an assault on theory, belief, position, argument or point of view, often times made publically, such as in journal article format, via letter or article; sometimes done personally, via communication, directly or indirectly; at other times delivered in group between different factions or schools of thought.

Physics

In physics, classic examples of attacks can be found in the 17th century battles between Isaac Newton and Robert Hooke on gravitation and light.

Human chemistry

The 1809 physical chemistry based novel *Elective Affinities* by German polymath Johann Goethe has been under attack nearly ever since its publication. As summarized in the 1859 *New American Cyclopedia*, edited by George Ripley and Charles Dana, describe Goethe's novella as follows: [1]

> "In 1809, Goethe printed the most exceptionable of his novels, the *Wahlverwandschaften* ("Elective Affinities"), in which the charms and graces of this style are employed in the description of the impulses which spring from the collision of passion and duty in the relations of marriage. By the title of the book, and in the whole spirit of it, he would represent that sexual affinities follow the same inevitable law as chemical affinities, and that humanity struggles impotently against the dictates of nature. Like all his productions, this was suggested by circumstances in his own experience. The work shocked the moral world, in spite of the beauty with which it was written, and to this day tasks the ingenuity of those of his admirers who seek to defend it from **attack**."

As Goethe himself commented in 1827 eighteen years after its publication:

> "I [would] have been much cheered to hear [a] kind word about the *Wahlverwandtschaften*; for at that time, and afterwards, not many pleasant remarks were vouchsafed be about that novel."

The long and the short of the central reason for the attack on Goethe's novella is that the view presented by therein (that morality is based on physical chemistry) in direct opposition to the view presented in the Bible (that morality is governed by the negative confessions) and the general morality doctrine found the in the Ra theologies in general.

Thermodynamics

The classic example of attack is that of the energetics school led by Ernst Mach attacking the work of Ludwig Boltzmann and his belief in atomic theory, the result of which was Boltzmann putting a noose around his neck while on family vacation (see: founders of thermodynamics and suicide).

Life

German physicist Justus Liebig's use of vitalism (*Animal Chemistry*, 1842) was quickly attacked by the Helmholtz school.

A classic example of prolonged multi-decade attack was the attack on Erwin Schrodinger's 1943 comment that "life feeds on negative entropy", by his fellow physicist colleagues, after which he was forced to append a "Note to Chapter 6" to defend himself and explain his actions, and in the decades to follow was given royal trashings by the likes of those as Linus Pauling.

Hmolsciences

The work of Spanish civil engineer Antonio Portuondo (*Notes on Social Mechanics*, 1912) was vigorously attacked by French sociologist Petre Trisca (*Introduction to Social Mechanics*, 1922). [2]

In his 1928 *Contemporary Sociological Theories*, Russian-born American sociologist Pitirim Sorokin devoted the first 62-pages, his entire first chapter, to what he classified as the "mechanistic school of social thermodynamics", to argue his viewpoint that subjects such as "human chemistry", "human physics", and "social mechanics" are, in his own words, "inadequate, and therefore defective." [3]

Since going public, in 2005, the human chemistry, human physics, and human thermodynamics work of American electrochemical engineer Libb Thims, has been under attack, almost at nearly monthly, if not weekly rate (see: Libb Thims (attack)).

Quotes

The following are related quotes:

> "Christoph Rothmann who did not withdraw from entering into the so-called **field of combat** with Scaliger on the subject of comets, declared, in a certain letter to Tycho, that: 'the lighter exhalations of the earth are carried on high with the help of good angels and are lifted above the moon, which the result that, being lighted by the penetrating rays of the sun there, they appear in the form of comets with tails or beards."
>
> — Otto Guericke (1665), "Reply Letter to Sanislaus Lubienietzki", Aug 5/15; in *New Experiments on the Vacuum of Space* (pg. 298)

> "I shall **attack** chemistry like a shark."
>
> — Samuel Coleridge (1800) (see also: Whewell-Coleridge debate) [4]

> "The biographical articles seldom amuse me much in writing; there is too little invention to occupy the mind sufficiently: I like to a deep and difficult investigation when I happen to have made it easy to myself if not to all others—and there is a spirit of gambling in this, whether as by the cast of a die, a calculation *a perte de vue* [i.e. a farfetched calculation] shall bring out a beautiful and simple result, or shall be wholly thrown away. Scientific investigations are a **sort of warfare**, carried on in the closet or on the couch against all one's contemporaries and predecessors; I have often gained a single victory when I have been half asleep, but more frequently found, on being thoroughly awake, that the enemy had still the advantage of me when I thought I had him fast in a corner—and all this, you see, keeps one alive."
>
> — Thomas Young (c.1820), "Letter to Hudson Gurney" [7]

> "The works of Willard Gibbs can only be **attacked** with profit by the expert mathematician."
>
> – William Bayliss, *Principles of General Physiology* (1915)

> "Indeed, not all **attacks**—especially the bitter and ridiculing kind leveled at Darwin—are offered in good faith, but for practical purposes it is good policy to assume that they are."
>
> – Hans Seye (1964) [6]

> "I prefer rationalism to atheism. The question of God and other objects-of-faith are outside reason and play no part in rationalism, thus you don't have to waste your time in either **attacking** or defending."

– Isaac Asimov (date) (link)

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θΔics

In hmolscience, **attack reaction** refers to []

Overview

In 1934, Heini Hediger, in his "On the Biology and Psychology of Flight in Animals", was speaking about "flight reactions" and "critical reactions" of big cats. [1]

In 1955, Hediger, in his *The Psychology of Animals in Zoos and Circuses*, described these as such: [2]

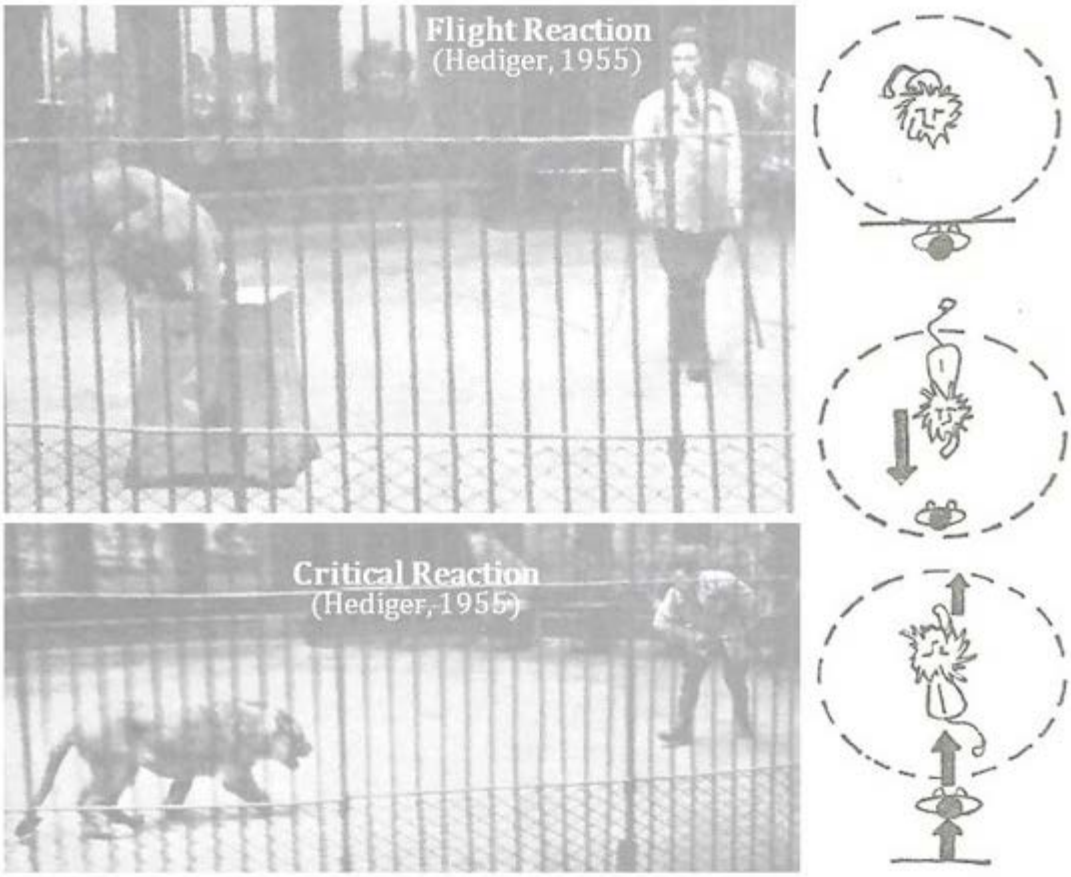

An illustration of the "flight reaction" and "**attack reaction**" by Heini Hediger (1955), left, and a sketch of the "attack reaction" by Edward Hall (1966), based on the work of Heidiger.

> "According to the definition, 'flight reaction' occurs in every wild animal, or in an animal adapted to captivity, whenever man approaches to within the characteristic flight distance of that animal. In addition to this fundamental possibility of driving the new wild animal away to any desired point by releasing its flight reaction, the tamer has another basic possibility, of drawing the animal towards him from any point by releasing its so-called 'critical reaction'. This occurs whenever the man approaches a wild animal (or one accustomed to captivity), which is prevented from escape, to a distance less than its characteristic 'critical distance'. In the case of the big cats, this distance plays an exceedingly important part, is fixed, and **may be determined to within centimeters**. The critical reaction consists of a change from flight to attack, never with the character of an active offensive, but always of a defensive, emergency nature."

This was photo diagramed by Hediger as shown adjacent, shown with a 1966 sketch of this so-called "attack reaction" by Edward Hall. [2]

In 2003, Raddai Raikhlin, in his *Civil War, Terrorism, and Gangs*, was employing a Hall model in his work. [3]

In 2007, Libb Thims, in his *Human Chemistry*, was employing the Hediger-Hall attack reaction model as such: [4]

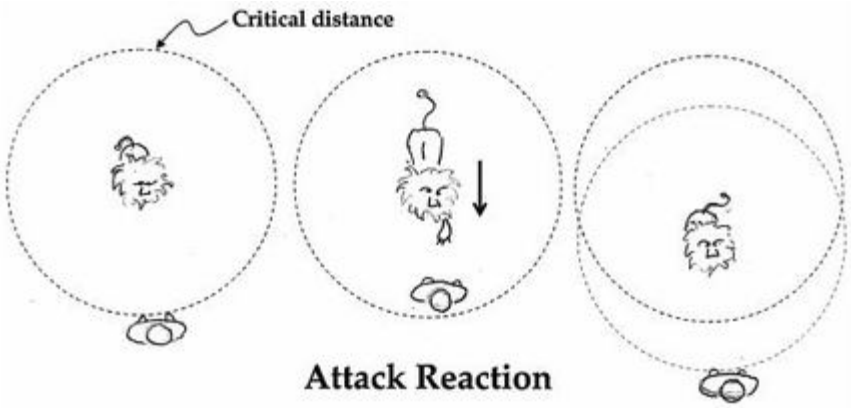

In 2019, Thims, in the "war" article, was employing the attack reaction as follows:

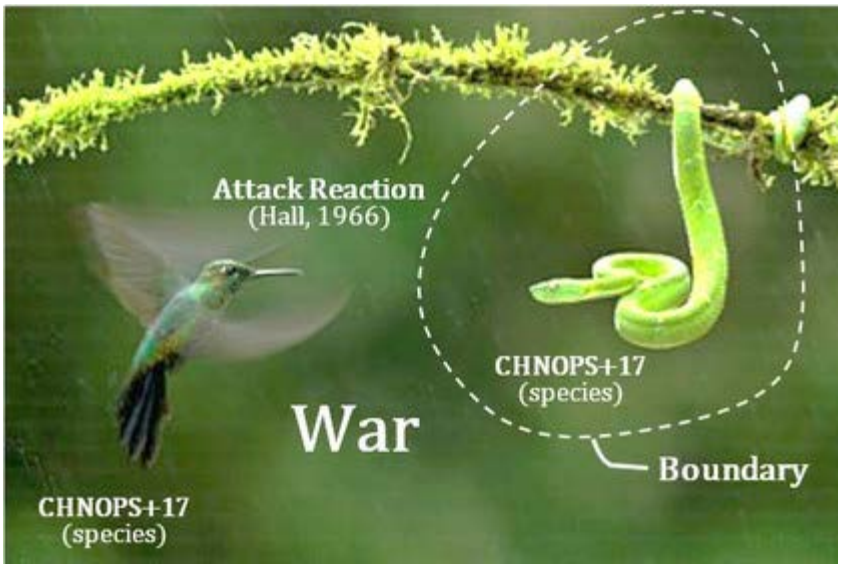

(add)

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θΔics

In existographies, **Attila Grandpierre** (c.1950-) (CR:3) is a Hungarian astrophysicist noted, in human thermodynamics, for his 2004 claim that he was the first person to calculate the entropy of a human, i.e. solve the Bridgman paradox.

Overview

In 2004, Grandpierre, in his "Entropy and Information of Human Organisms and the Nature of Life", claimed that he was the first to calculate the entropy content of a human being (human entropy); following is his humorous abstract: [1]

> "We determine for the first time the entropy content of human beings. The energy contained in the radiation within the human body is utilized to decrease its entropy. Therefore, not in itself but in its effect, the entropy of radiation in vivo may be regarded as negative. Calculating the negentropy of radiation in vivo and the entropy of materials, we found that the sum entropy of the human organism is effectively negative. This result does not contradict any law of thermodynamics since environment is not involved, and reflects the experience that human beings are able to control their behavior."

Grandpierre's general research program, judging by his publications, seems to be the determination of the place and action of the human being in the structure of the universe.

In 2007, Grandpierre, together with co-author Katalin Martinas, penned "Thermodynamic Measure for Nonequilibrium Processes", wherein they attempted to use the "extropy" concept to for formulate a new second law for non-equilibrium conditions, biological or otherwise.

On 2008, Grandpierre, in his "Biological Extension of the Action Principle: Endpoint Determination beyond the Quantum Level and the Ultimate Physical Roots of Consciousness", employed a mixture of photon arguments and the principle of least action to theorize about biology and consciousness in terms of some type of hued teleology logic. [2]

Education

Grandpierre completed his undergraduate degree in physics-astrophysics in 1974 at Eotvos Lorand University, his doctorate in 1977, and his candidate of physical sciences in 1984. He became a research scientist at the Konkoly Oberservatory of the Hungarian Academy of Sciences in 1990, where he currently works. He was a teacher in the King Nagy Lajos Private University, Miskolc from 1997 to 2002.

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External links

â— Attila Grandpierre (staff) – Konkoly Oberservatory of the Hungarian Academy of Sciences.
â— Grandpierre, A. (various articles) – Grandpierrre.hu.
â— Attila Grandpierre – Google Scholar.

θΔics

In terminology, **attitude** (TR:21) is []

Attitude | States

In 1966, John Tukey outlined, via in communicate to James Coleman, a free energy based model of "attitude states", the gist of which being that firstly, each human is a "chemical entity"; secondly, the "state" of a chemical entity is characterized by a 'free energy level'; thirdly, the "boundary" between states is separated by a free energy level that is higher than the levels of the states it separates; fourthly, the "transition rate" from each state to the other is an exponential function of the difference between the free energy level of the state and that of the boundary; fifthly, and most importantly, an "attitudinal state" may be characterized by a tension level, according to which the boundary between attitudinal states is characterized by a higher tension level, with the transition rates an exponential function of the difference between tension levels. [1]

Other

The 1999, Tom DeMarco and Timothy Lister, in their *Peopleware: Productive Projects and Teams*, attempted to define entropy, in a corporate or organization, as "uniformity or attitude, appearance, and thought processes." [2]

Quotes

The following are related quotes:

> "Patterns of culture do not operate in accordance with the laws of physics. How are you going to prove in terms of the laws of physics that a certain **'attitude'** exists within a culture? What is an attitude in terms of the laws of molecular interaction? What is a cultural value? How are you going to show *scientifically* that a certain culture has certain values? You can't. Science has no values. Not officially."
>
> — Robert Pirsig (1991), commentary on commentary on Boas' physical anthropology [3]

References

1. (a) Tukey, John. (1966). "Personal communication to James Coleman"; note #6 of Coleman (1971).
(b) Coleman, James S. (1971), "Theoretical Bases for Parameters of Stochastic Processes" (abs), *The Sociological Review*, 19(S1):17-28; in: *The Sociological Review Monograph: Stochastic Processes in Sociology* (free energy, pg. 25; Tukey, 26-27; state, 25-26), Issue 19. Routledge & Kegan Paul.
2. DeMarco, Tom and Lister, Timothy. (1999). *Peopleware – Productive Projects and Teams, 2nd ed.* (Section: "Corporate Entropy", pg. 98). New York: Dorset House Publishing.
3. Pirsig, Robert M. (1991). *Lila: An Inquiry into Morals* (physics of culture, pgs. 52-53). Random House, 2013.

External links

â— Attitude (psychology) – Wikipedia.

θΔics

In hmolscience, **attraction**, as contrasted with repulsion, refers to the movement of a body under the influence of a force towards a second body or towards an attractor. [1]

See also

- A Dissertation on Elective Attractions
- Gottman stability ratio
- Muller stability ratio
- Alfred Mayer
- Exchange force

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (ch. 6: Attraction and Repulsion, pgs. 147-82). Morrisville, NC: LuLu.

θΔics

In religio-mythology, **Atum**, hieroglyph: , , or ; "Atem" or "Tem" (Budge, 1904), is the name of the original supreme god of Heliopolis, of the Heliopolis creation myth, prior to his syncretism as Ra-Atum (or Atum-Ra) in the 6th dynasty (2500BC); the chief god of Ennead, born out of the Nun. [1]

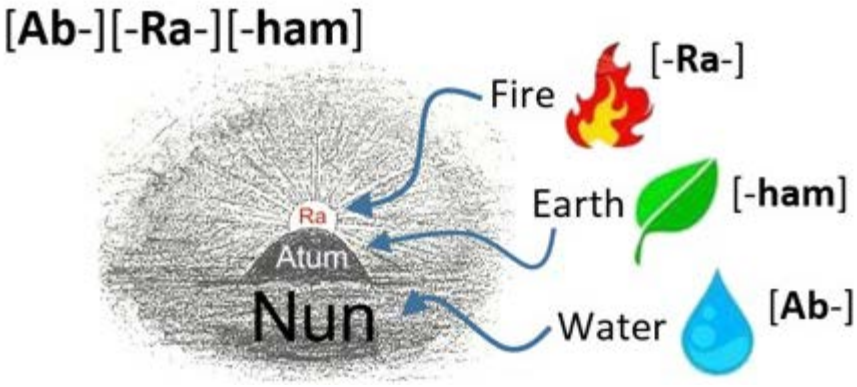

A depiction of **Atum** as the primordial land mound, symbolized by the pyramids of Egypt, that rises out of the Nun, or watery abyss, symbolic of the annual Nile River flood, out of the which the sun, or Ra, is born.

Overview

The following is an artistic rendition of Atum, in the form of a man or god man appearing standing on the top of the primordial land mound, aka keme, that rises out of the primordial waters, aka Nun, the tip of which is called the benben or benben stone:

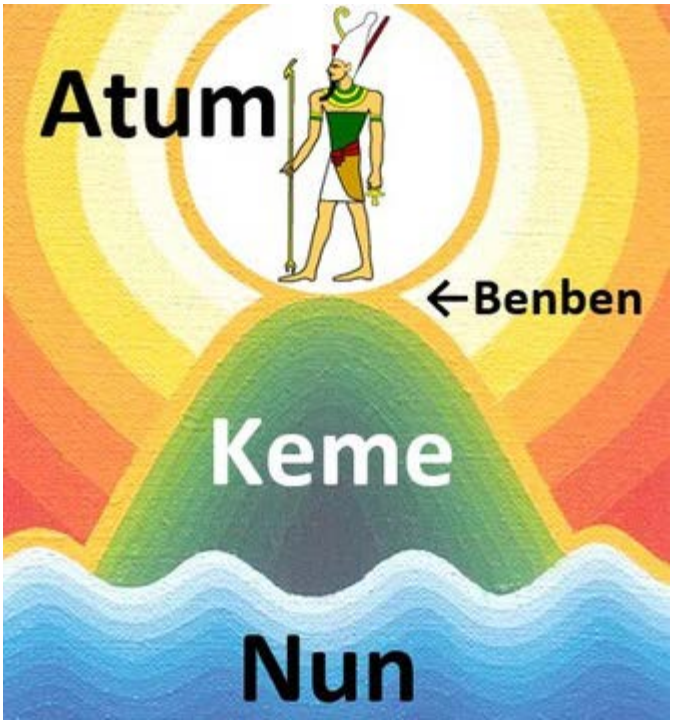

The following are various anthropomorphic images of Atum:

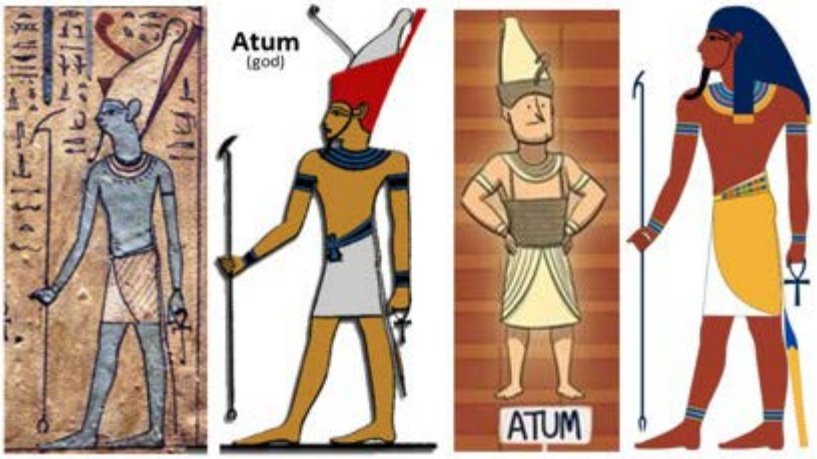

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Hinduism

In Hindu mythology, aka Hinduism, Atum became the character "Atman", a description of which is as follows:

> "In the beginning, the world was nothing but the Atman, in the form of a man. It looked around and saw nothing different to itself. Then it cried out once, It is I.' That is how the word 'I' came to be. That is why even at the present day, if any one is called, he answers, 'It is I,' and then recalls his other name, the one he bears."
>
> — Anon (c.750BC), *Brihadaranyaka Upanishad* [4]

(add)

Judaism | Atum / Adam

See main: Atum and Adam

In Hebrew mythology, aka Judaism, the god Atum, rendered as "Atem", who fathered the gods Set, Osiris, and Horus, became the man Adam, who fathered the brothers: Cain, Abel, and Seth. [3]

Atum | Atom

See main: Atoms and Atum

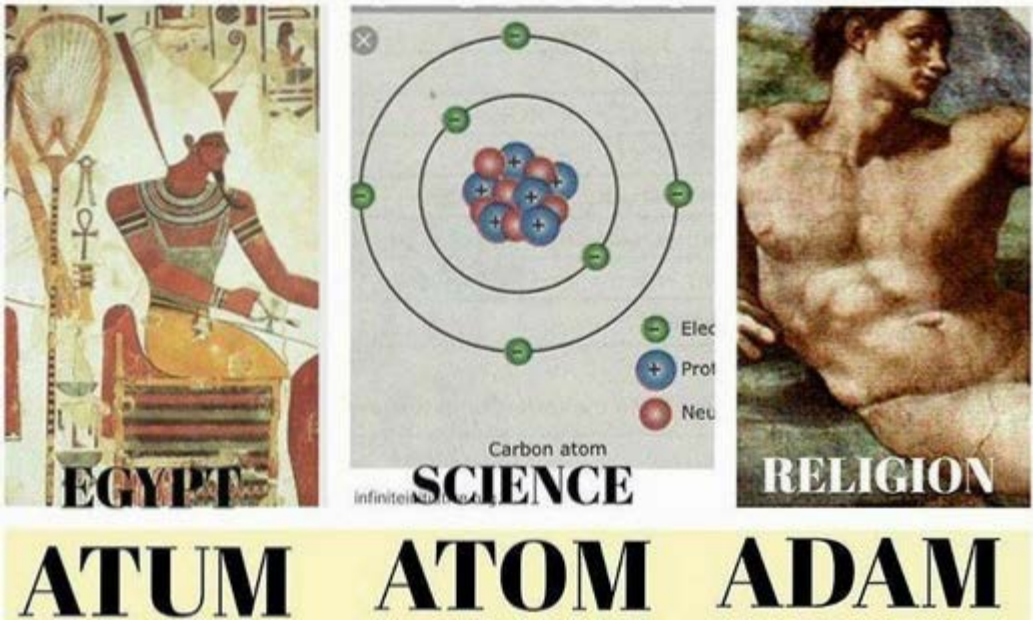

A generic image (Ñº) showing how the Egyptian god **Atum**, through what Massey calls "mythology evolution", became the man Adam, and also, possibly, the root of the word Atom or "Atomos", coined by Democritus, referring to the smallest things indivisible.

In 1954, George James, in his *Stolen Legacy*, a book which argues that Greek philosophy originated in ancient Egypt, Memphite theology (see: Memphis creation myth) specifically, suggested that the Greek term "atom" is based on the name of the Egyptian god Atum. [8] Others such as Martin Bernal (1987) and Anthony Preus (1993) and others have published views forwarding this argument. [9]

In c.1769, Immanuel Kant, according to Ernst Haeckel (1899), compared Adam and Abraham with Adimo and Brahma, and argued that Joseph was equivalent to Ganesha. [6]

In c.1770, Voltaire, in his *Philosophical Dictionary, Volume Three*, connected the Hebrew Adam to the Hindu Adimo as follows: [5]

> "It may be remarked, that this is the first time the name of Adam occurs in the book of Genesis. The first man, according to the ancient Brachmans, who were prodigiously anterior to the Jews, was called Adimo, a son of the earth, and his wife Procris, life. This, is recorded in the. Veidam, in the history of the second formation of the world. Adam and Eve expressed perfectly the same meanings in the Phoenician language."

In 1907, Gerald Massey, in his *Ancient Egypt: Light of the Modern World, Volume Two*, connects Atum to Adam as follows: [7]

> "In the Hebrew legend it is the woman Eve who offers the fruit of the tree of knowledge. In other versions, especially the Greek, the fruit is offered to the man by a serpent in the tree. Now the serpent was another type of the Great Mother, Kep, who was earlier than the serpent-woman, Rannut; and whether portrayed in the shape of a serpent or in the human form, she was the primordial giver of fruit from the tree. The serpent, the crocodile or dragon, the hippopotamus, the sow, the cow, the lioness and woman all meet as one in Kep, the earliest mother of life. The primal mother in the Kamite representation was the bringer-forth of Sut [Set] and Horus as her first two children, who were born twins. These, as the powers of darkness and light, or drought and fertility, were a pair of combatants who fought for the supremacy until one brother slew the other. This is one of those primary legends that became universal, but **NOT because it had a hundred different origins at different times**."

Here, of note, we see Massey correctly disabusing the multiple origins theory, e.g. the commonly held belief that reason multiple religions and cultures each have a flood myth, is because there was a universal flood over the entire earth, and they each, independently, derived their own unique mythology, therefrom. Correctly, universal myths are "dependent", i.e. dependent on Nile River cosmology, as Massey aptly puts things.

Massey, to continue, then discusses how, whereas in 3500BC, in the first dynasty Egypt, Horus and Set were the two chief gods, Horus being paramount, but that in:

> "Sut [Set] and Horus were **indefinitely earlier** than the solar **Atum**. But in the cult of Atum-Ra at On or Annu [Heliopolis] they were fathered *on* him and continued as his sons."

Here, to pause, Massey is touching on the pre-Dynastic (3500BC), Horus-centric creation myth, to Heliopolis (3100BC), Atum-centric creation myth, reformulation of Egyptian state religion:

> 0. Pre-Dynastic creation myth | 3500BC | Supreme god: **Horus**

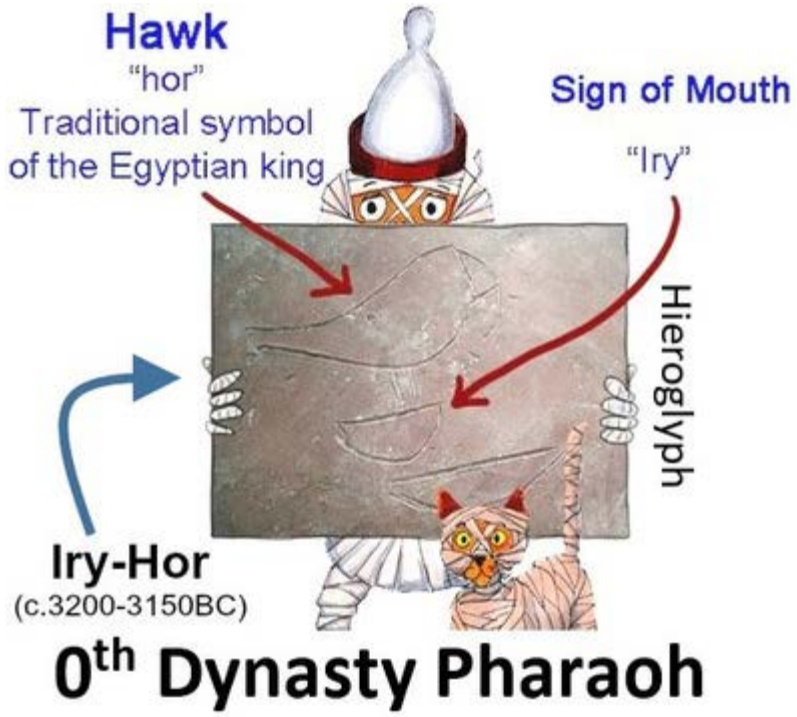

1. Heliopolis creation myth | 3100BC | Supreme god: **Atum**-Ra

A depiction (Ñº) of Iry-Hor (c.3200-3150BC) (Ñº), the first pharaoh of dynasty 0, and supposedly earliest historical person known by name, holding his hieroglyphic symbol name (Ñº), a hawk (or falcon) standing on a mo (or stand), the "Hor" suffix symbolic of the god Horus, who Wallis Budge refers to as the "oldest god of all", who, in the Heliopolis creation myth (c.3100BC), was reconceptualized as being born "on" our out of the new state god **Atum**.

↳ Horus vs Set

2. Memphis creation myth | 2800BC | Supreme god: Ptah
3. Hermopolis creation myth | 2400 BC | Supreme god: Ogdoad
4. Thebian creation myth | 2050 BC | Supreme god: Amen

5. Amarnan creation myth | 1300BC | Supreme god: Aten

6. Hebrew creation myth | 500BC | Supreme god: El-Yahweh-Amen
7. Roman creation myth | 200AD | Supreme god: **God**

↳ Jesus vs Devil

8. Nordic creation myth | 700AD | Supreme god: **Odin**

↳ Thor vs Loki

Massey continues:

"Sut and Horus offer an instructive instance of evolution in mythology. They were born sons of the first

> Great Mother as two of the primordial powers, the twin powers of darkness and light. But in the re-cast of their theology the priests of Annu brought them on as the warring sons of Atum-Ra, who fought each other 'up and down the garden' until, as here related, one of them was slain. In various inscriptions, Sut and Horus are called the sons of Atum (Renouf, *Hib. Lectures*, p. 84)."

Here, to pause, we see how this universal mythos was transliterated, in Nordic mythology, into the story of the battles between the brothers Loki [Set] and Thor [Horus], who were the sons of Odin [Atum]. Next, Massey touches on how, in the Memphis creation myth (2800BC), Horus and Set, as the constituent powers of Atum, were recast as the sons of Ptah, the new state god of Memphis:

> "Otherwise stated, they became two of the associate gods, the constituent parts and powers of Atum, as the sons of Ptah and members of the Put company of the Ali."

Next, Massey connects Atum to Adam as follows:

A Mar 2018 screen shot of the Google query search returns for "which eye did ...", showing the Thor and Horus connection, in respect to the release of the new film Thor: Ragnarok, wherein Thor, in the film (Ñº), looses his "right eye", whereas in the original Egyptian version, Horus looses his "left eye", i.e. the moon, in battle with Set.

> "The battle in Amenta was not only fought betwixt the Apap [Apep] of darkness and the sun-god Ra. When the two brothers Sut and Horus were repeated in the solar mythos, as the sons of Atum, the conflict was continued for possession of the garden [Garden of Eden]. This was now the motive of the warfare. Previously it was for the water of the inundation or light in the moon. Now it was for the water and the tree of life in the Aarru-garden. In one version of the mythos, Sut is the murderer of the good brother as Osiris. In the other, Sut [Set] **pierces and puts out the eye of Horus**. This is represented as the contest between Cain and Abel, the two sons of Adam, in the book of Genesis."

Here, of note, we see the origin of the Nordic mythology (Ñº) rescript of this "Set piercing the eye of Horus", i.e. a story meant to explain the astronomical phenomenon of the full moon turning to new moon, in the rescript of how both the father Odin and the son Thor loose their eye, respectively, in battle:

Originally, Horus, or Hor, Har, Her, or Heru, to clarify, in ancient Egyptian religion, was a god in the form of a falcon (or hawk) whose right eye was the sun or morning star, representing power and quintessence, and whose left eye was the moon or evening star, representing healing. (Ñº)

Massey continues:

> "Sut and Horus represented two contending nature-powers. They fought each other as the two rehus or lions in the light and dark halves of the moon, with Taht as the adjudicator of the landmarks. They also fought as two dragons, or as the crocodile of water and the dragon of drought, both of which were rightly represented in the astronomical mythology. "Hydra" remains for all time as the 'hellish Apap' who drank up the water. And 'Draconis' is a figure of the good dragon or Horus-crocodile. Lastly, the two opponent powers were portrayed as **twin-brothers**, fighting for the birth-right, or seeking to overcome each other. Thus, they contended for possession of the garden in Amenta, where they fought upon the mount of glory or were constellated as the Gemini contending in the zodiac."

Massey, then jumps to the Jewish recension of this as follows:

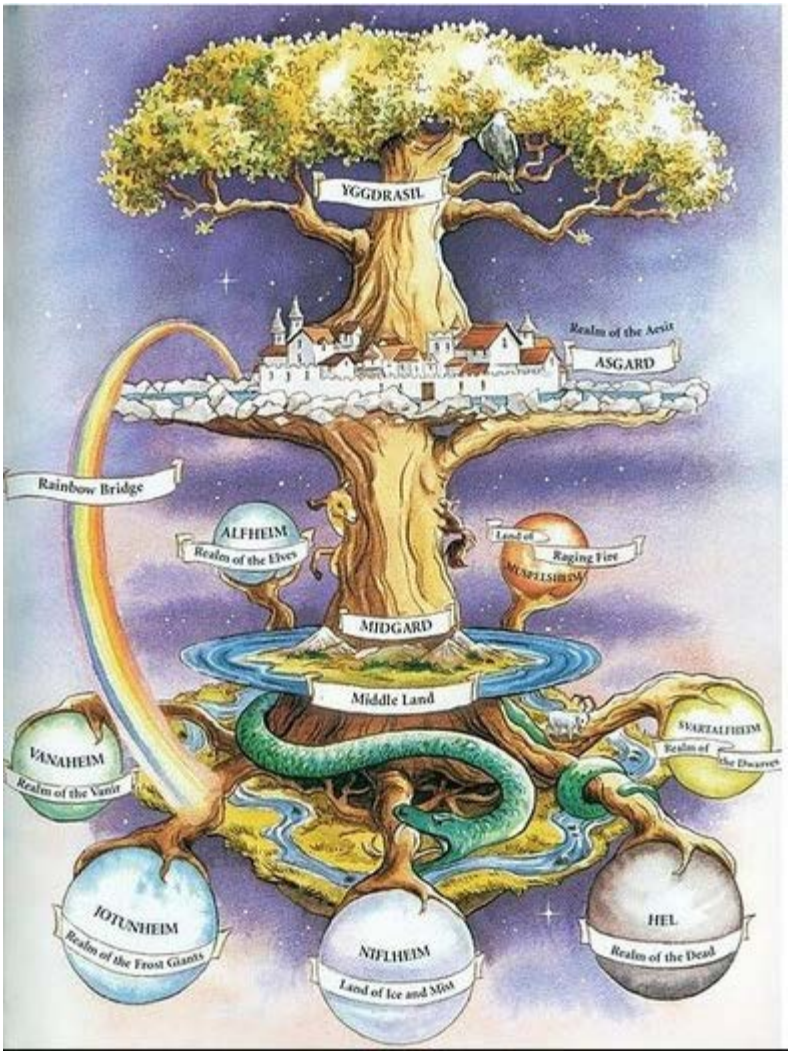

A depiction (Ñº) of three levels of "Asgard", the Nordic mythology rescript of the Egyptian Aarru-garden, which is the parallel to the Jewish recension variant Garden of Eden.

> "The conflict of the brothers was continued in the garden of Eden, and Cain fulfils the character of the murderer Sut [Set], the slayer of his brother. There is an attempt even to discriminate betwixt the two domains of Sut and Horus, when it is said that Abel was a 'keeper of sheep', but Cain was a 'tiller of the ground' (Gen. 4:2-3)."

Massey continues:

> "The Aarru-garden, or paradise, planted in Amenta by Ptah for **Atum** his son, was founded on food and liquid, that is on the water, and the tree, or plant, as food of life. These, in the Hebrew version, are called "the trees in the midst of the garden," and "the river that went out of Eden to water the garden." They represent the mythical tree and the water of life, which had their beginning in actual food and drink, and were afterwards repeated, on earth, in heaven, and in the making of Amenta. The well or water-spring that was the source of life to primitive man was here continued as a basis for the re-beginning of life in the earth of eternity."

In the Nordic recension, aka Nordic mythology version, as depicted in the recent film *Thor: Ragnarok*, we see reference to this water spring of life, under the garden of Asgard.

Quotes

The following are related quotes:

"**Atum**'s myth is well developed already in the Pyramid Texts. In the midst of the watery abyss of indeterminacy, personified as Nun, Atum creates for himself a point of determinacy, a mound that rises from the waters at the site of Heliopolis, a moment which is also functionally identical to that in which Atum grasps his phallus in his hand. The determinacy of place which comes with the emergence of solid ground in the Nun is one with the determinacy achieved by a part of the body (the phallus) which expresses Atum's self-awareness. The place of the primordial hillock, which embodies the beginning of everything and was represented at Heliopolis by the presence of a benben stone, or pyramidion, is also a place which is everywhere. This moment of the emergence of the primeval mound is also hardly to be distinguished from the first sunrise, which is in turn each day's sunrise. From here begins the close identification of Atum and Re. The compound name Re-Atum is very common, either with separate determiners indicating that the two are kept distinct even in fusion (e.g. in Coffin Text spell 673) or with Re subordinated to Atum, as in Coffin Text spell 266, where the operator says "I am Atum in his name of Re." Where one is to be subordinated to the other, it is Re who is subordinated to Atum, for the sun can be regarded as merely one element in the self-developing totality. Alternately, the sun itself, Re in the broadest sense, can be the focus, relativizing Re in the narrow sense and Atum alike, as in Book of Dead spell 15A: "Hail to thee, Re at his rising, Atum at thy setting."

— Edward Butler (2010), "Aten" (Ñº), Henadology, WordPress

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3. (a) Massey, Gerald. (1907). *Ancient Egypt: The Light of the World: a Work of Reclamation and Restitution in Twelve Books, Volume One* (pgs. 457-58). T. Fisher Unwin.
(b) Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (§Myth #19: God formed Adam from the dust of the earth, pgs. 46-47). Source Books.
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8. James, George. (1954). *Stolen Legacy* (Ñº). Publisher.
9. Lefkowitz, M. (1998). *Not Out of Africa* (§149: Atoms and Atum, pg. 253-). Publisher.

External links

â— Atum – Wikipedia.

θΔics

In religio-mythology, **Atum and Adam** refers to the conjecture that the Biblical man Adam (c.300BC) is a rescript of the story of the Egyptian god Atum, who, according to Heliopolis creation myth (2500BC), raised the first earth land mound (benben or pyramid) out of the water or was the first god to come into existence in the Nun, before the land-mound arose.

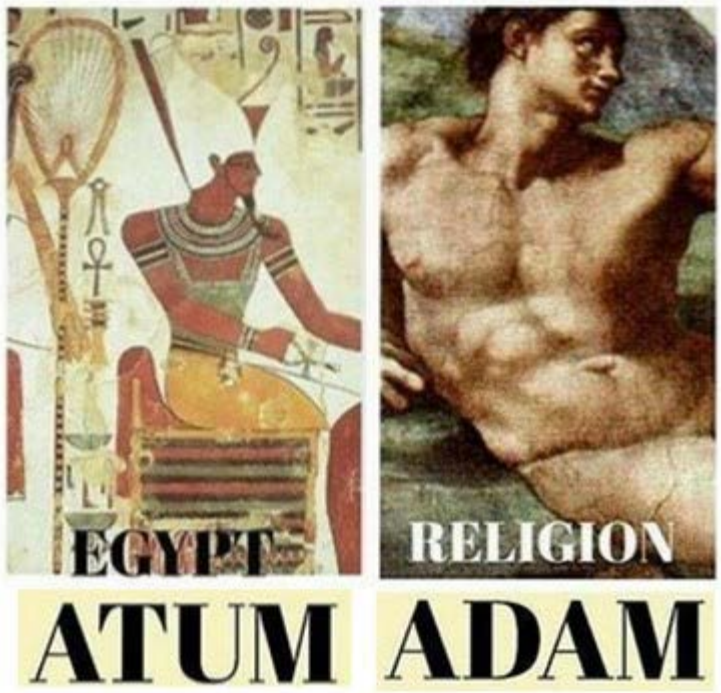

A diagram showing the **Atum = Adam** equivalence, i.e. the Egyptian god Atum and the Hebrew man Adam, the latter of which, according to consensus (Massey, 1907; Luckert, 1991; Greenberg, 2000), being a monotheistic rescript of the former.

Overview

In 1861, Daniel Haigh, in his *The Conquest of Britain by the Saxons*, via citation to the work of "Mr. Osburn", was making the Atum and Adam connection as follows: (Ñº)

> "The mythology of Egypt supplies most interesting confirmation of this theory that the gods of heathenism were deified patriarchs, and shows the system extended still farther, so as to embrace even their forefathers who lived before the flood. Thus **Atum**, 'King of the gods', 'Lord of the worlds', 'god of the setting sun', and 'of the lower world', the judge of souls departed, whom he calls children, whilst they call him father, is evidently **Adam**."

In 1883, Gerald Massey, in his *Natural Genesis, Volume Two*, was connecting Atum, some type of sixth generation of gods scheme, with Adam being created on the sixth day of creation. (Ñº)

In 1907, Gerald Massey, in his *Ancient Egypt*, makes the Atum to Adam connection as follows: [1]

> "The so-called 'legends of creation' would be more correctly termed the 'legend of human evolution', although in a different sense from that of Darwinian development. As Semite, they came to us in the latest and least genuine form, with no clue to any true interpretation. In a Maori myth, man was created by the god Tiki from red clay. This he kneaded with his own blood, or with red water from the swamps. Man is **Atum** in Egyptian, Admu in Assyrian, and **Adam** in Hebrew."

Later, in his decoding of the story of Cain and Abel, Massey connects Atum and Adam more explicitly as follows: [1]

Atum (father)

Set & Osiris | → Horus (legitimate heir)

Adam (father)

Cain & Abel | → Seth (legitimate heir)

In 1991, Karl Luckert, in his discussion of the Shabaka stone creation myth (c.710BC), in the context of the transition of religio-political power from the Heliopolis creation myth (Atum-centric) to the Memphis creation myth (Ptah-centric)

and Hermopolis creation myth (Ogdoad-centric) tenuously connected Atum to Adam as follows: [2]

> "Comparisons and evaluations of the kind Frankfort [1948] offered obviously are based on a double standard. After all, was the breath blown into **Adam's** nostrils by the Hebrew god any less material than the Egyptian wind of Shu? Were the creative commands of the Hebrew god, in Genesis 1, more spiritual than the commands of Ptah? Or, were the words that resounded from the heart and tongue of Ptah more 'spiritual' than **Atum-Shu**'s mostly silent breathing? Then, is a sovereign god any less real if his involvements extend into the human as well as material spheres?"

In 2000, Gary Greenberg, in his *101 Myths of the Bible*, similar to Massey, argued that the name the first man, as Adam, according to Hebrew mythology, made from clay or earth, is a rescript of Coffin Text 80, wherein Atum, the primordial god, conceptualized as the land mound of "earth" (e.g. pyramids), which emerged from the Nun (or was created by Nun), or primordial flood (i.e. Nile River), "breaths" out the god Shu (or air), through his nostrils, the life force god. Greenberg also asserts that the myth of Khnum creating the first two humans from clay, on his potter's wheel, which are brought to life by the power of the Ankh, put to the mouth of the clay, by the god Hathor, plus the older Mesopotamian myth of creation of the first humans from a mixture of blood and clay, were influential, via syncretism, in the story or rather two parallel creation of Adam stories. [3]

Quotes

The following are related quotes:

> "Ancient **Adam** was not a man or male of the human species, but, rather, a mythical being representing the ancient Egyptian god of **Atum** or Atoum."
>
> — F.G. Morgan (1907), "Biblical Myths of Eden, Adam, and Eve" (pg. 71)

> "This interesting theory may have a measure of truth in it in spite of the fact that Greek society, for instance, voiced protests, through literature, against what was considered the immorality of-the gods.'" Yet it is hard to believe that this is the primary explanation of the brother-sister marriages in the myth. The basic reason for their presence seems to have been a structural necessity arising from the myth itself. If **Atum** is regarded as the first divine being, who generated Shu and Tefnet from himself, and if the whole Heliopolitan Ennead is to be explained as related through the succession established, then Shu and Telnet as well as their children Geb and Nut must be paired in marriage and procreation although they are brother and sister; and when the Ennead is rounded off by the children of Geb and Nut — Osiris, Seth, Isis and Nephthys — it is natural that the same principle should be followed in grouping these. In all cases, therefore, the 'Geschwisterehe' [sibling marriage] is a compulsive element in a genealogical structure which has all the marks of being consciously and factitiously fashioned. **A parallel may be sought in the Biblical situation relating to Cain**. His wife's origin is admittedly glossed over carefully, e.g. Leviticus 18:9 forbids brother-sister incest, but the Book of Jubilees 4 states that **the sons of Adam married their sisters**, the suggestion being that incest was necessary to populate the earth, but the mythic detail shows that Cain's wife must be regarded as his sister. The same applies to Abel."
>
> — John Griffiths (1966), *The Origins of Osiris and His Cult* [4]

> "**Atum**, the spirit of life, existed within Nun. In creating himself, Atum became the evolving ancestor of the human race. So goes the Egyptian mythology of creation, in which the Judaic **Adam** has his roots."
>
> — Author (1982), "Article" (pg. 215), *Anthropology: Contemporary Perspectives*

See also

â— Atoms and Atum

References

1. Massey, Gerald. (1907). *Ancient Egypt: The Light of the World: a Work of Reclamation and Restitution in Twelve Books, Volume One* (Atum, Admu, Adam, pgs. 87-88; Cain and Abel, pgs. 457-58). T. Fisher Unwin.
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3. (a) Frankfort, Henry. (1948). *Ancient Egyptian Religion* (pg. 22). Publisher.
(b) Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (§Myth #19: God formed Adam from the dust of the earth, pgs. 46-47). Source Books.
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θΔics

In religio-mythology, **Atum-Ra**, or “Ra-Tem” (Budge, 1904), a syncretism of the gods Atum, the primordial land mound, aka benben, and Ra, the sun god, was the supreme god of Heliopolis, during the old kingdom (2700-2200BC), particularly in the 5th and 6th dynasty (2500-2200BC), when the great pyramids were built, generally depicted as the sun born out of the tip of a mound or pyramid.

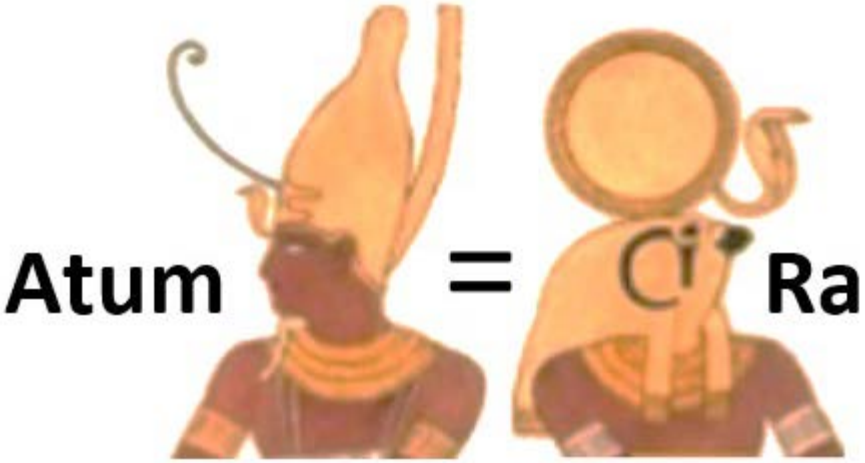

A depiction **Atum-Ra**, which was a synretism of the gods Atum and Ra, which occurred in the 5th dynasty (2500BC), into one new god.

Overview

The following is a depiction of Atum, either as the first land mound, or a man-like god standing on the first land mound, called benben, which he summoned up out of the watery abyss Nun, out of which Ra the sun god comes forth; jointly synretized as **Atum-Ra** in the 5th dynasty (2500BC):

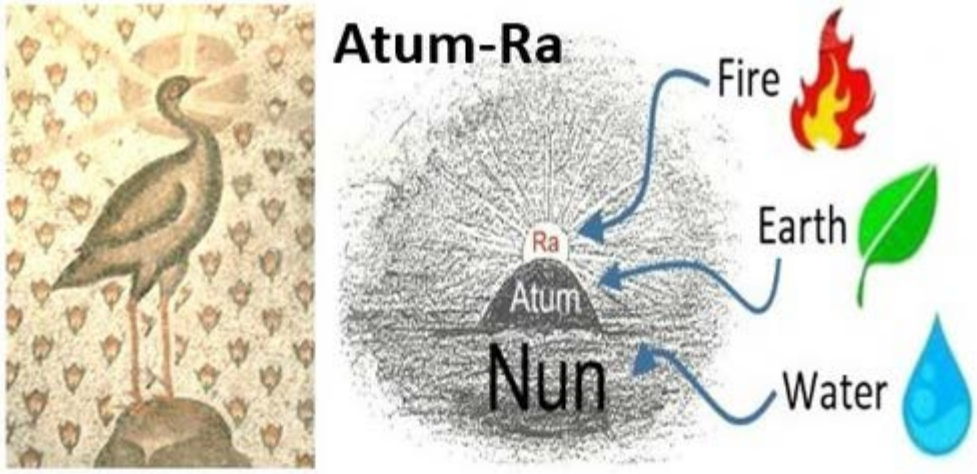

The following is an artistic depiction of the gods Ra and Atum, with their backs facing each other, therein symbolic of their new joint god fusion or syncretism:

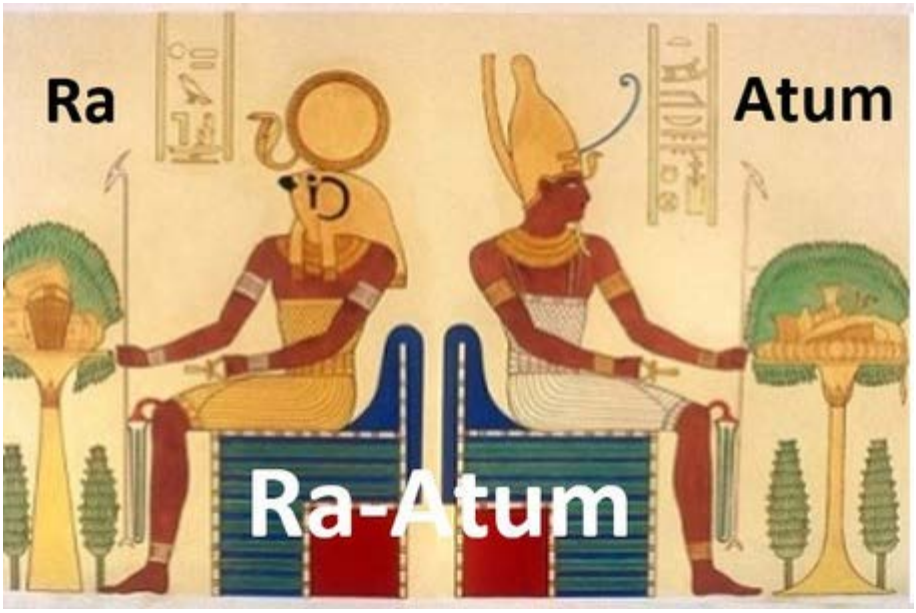

(add)

Quotes

The following are related quotes:

> "The phoenix of Ra was that whereby Atum came into being in chaos, in the abyss, in darkness and in gloom."
>
> — Anon (c.2000BC), Coffin Text (Spell 76) [2]

> "When the priests of Ra attained to the great power which they enjoyed at Heliopolis under the Vth and VIth Dynasties they did not suppress the local god Tem (Atum), but they associated their god with him, and produced the compound god **Ra-Tem** (Atum)."
>
> — Wallis Budge (1904), *The Gods of the Egyptians, Volume One* (pg. 105) [1]

> "So Atum created a little mound of dry earth to stand on, and this was the beginning of the world. This bit of dry earth, the primeval hillock [benben], is represented in old Egyptian writings by the hieroglyph which represents the sun [Ra] on the little mound at the moment of that first time."
>
> — Maria Leach (1956), *The Beginning: Creation Myths Around the World* (pg. 218)

> "Although the exact experiential moment when Atum became identified with the sun god Ra can no longer be determined, it already was standard practice in the old kingdom [2700-2200BC] to refer to these polar manifestations together as a single '**Atum-Ra**'."
>
> — Karl Luckert (1991), *Egyptian Light and the Hebrew Fire* (pg. 41) [2]

See also

â— Amen-Ra

References

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2. Luckhert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective* (Atum-Ra, pg. 41; Spell 76). SUNY Press.

θΔics

In thermodynamics, **August Horstmann** (1842-1929) was a German chemist, of the Berlin school, a residual student of Hermann Helmholtz, notable for his 1969 paper "Vapor Pressure and Heated Evaporation of Ammonium Chloride" the first publication in chemical thermodynamics, in which he applied the second law of thermodynamics to the study of equilibriums in chemical systems. [1] German chemist Fritz Haber, in 1908, gave an excellent summary of Horstmann's contribution to science: [2]

> "[While it was] Clausius [who first] called attention to the general applicability of the theory of heat to chemical reactions … we have **Horstmann** to thank for the fundamental advance from this incidental observation to a fruitful thermodynamic treatment of chemical problems."

Specifically, in 1869, he was the first to apply the newly formed concept of entropy (1865) to chemistry, that of a study of the sublimation of ammonium chloride, NH_4Cl, where he showed that the process followed the same laws as those involved in vaporization of a liquid; hence the Clausius-Clapeyron equation could be applied. [8]

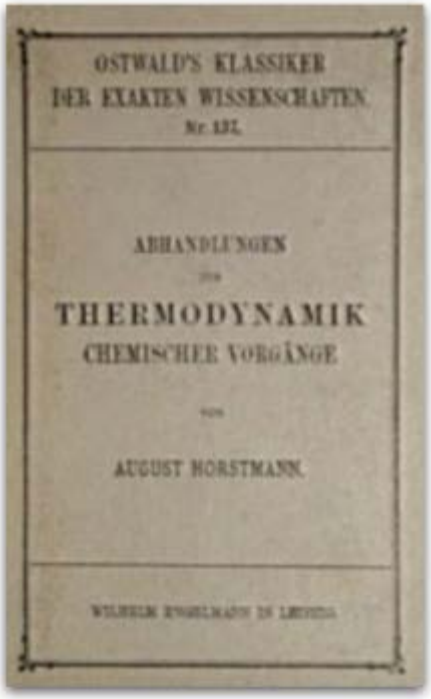

Horstmann's collected chemical thermodynamics work (1869-81) published as the 1903 (72-page) booklet *Treatises on the Thermodynamics of Chemical Processes*. [9]

American chemistry historian William Jensen has done a notable amount of commentary on the early chemical thermodynamics work of Horstmann.

Overview

In 1868, in order to ascertain molecular weights via a vapor density method, Horstmann began to investigate the effect of temperature on the equilibrium constant for a dissociation process, beginning with the Clausius-Clapeyron equation, but extending it to apply to a substance that is dissociating. In 1872-73, Horstmann applied the entropy principle to the problems of chemical dissociation. [5] In October 1873, Horstmann announced the condition for chemical equilibrium to be that of maximum entropy. [6] Horstmann's equilibrium statement, to note, is similar to American engineer Willard Gibbs who, independently, in December of the same year, in a footnote, stated that the condition for thermodynamic equilibrium in a chemical system at constant temperature and pressure is that a certain function, now universally known as the thermodynamic potential, should be a minimum. [7]

Horstmann continued to lecture well into 1899 on three specific topics: "Thermochemistry considerations for the Mechanical Theory of Heat", "Physical and Theoretical Chemistry", and on the latest developments in theoretical chemistry (in particular dissociation, physical theories of solutions, and reaction rate from the viewpoint of the conservation of energy). [4]

Education

Horstmann was educated at University of Heidelberg, completing his PhD in 1865, thereafter becoming a professor of theoretical chemistry. [3] After receiving his doctorate degree, Horstmann studied mathematics, reading current chemical and physical problems and visited the lectures of Hermann Helmholtz. He then moved on to the mechanical theory of heat, going to Zurich, where the new science of thermodynamics was being developed by German physicist Rudolf Clausius. [4]

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1. (a) Horstmann, August F. (1869). "Dampfspannung und Yerdampfungswärme des Salmiaks" (Vapor Pressure and Heated Evaporation of Ammonium Chloride), *Ber.*, 2: 137-40.
(b) Laidler, Keith. (1993). *The World of Physical Chemistry* (pgs. 108, 434). Oxford University Press.
2. Haber, Fritz. (1908). *Thermodynamics of Technical Gas Reactions* (pg. 68). Longmans, Green, and Co.

3. Drennan, O.J. (1972). *Dictionary of Scientific Biography*, 6, 519-20.
4. August Friedrich Horstmann – Horstmann Family (biography); from the 1997 article "August Friedrich Horstmann and Physical Chemistry" by Alexander Kipnis in the series *Berlin Contributions to the History of Science and Technology*, Berlin: ERS Verlag..
5. Horstmann, August F. (1872). "Article", *Ann. d. Chem. U. Pharm*., 8. Suppl.-Bd., 112-13.
6. Horstmann, August F. (1873). "Theorie der Dissociation", *Liebig's Annalen der Chemie und Pharm*acie, Bd. 170 (CLXX), 192-210.
7. (a) Gibbs, Willard. (1873). *Trans. Connect. Acad.*, Dec., II., footnote to pg. 393.
(b) Garrison, Fielding H. (1909). "Josiah Willard Gibbs and his Relation to Modern Science", *Popular Science*, pgs. 470-84.
8. (a) Horstmann, August F. (1869). "Dampfspannung und Yerdampfungswärme des Salmiaks" (Vapor Pressure and Heated Evaporation of Ammonium Chloride), *Ber.*, 2: 137-40.
(b) Leicester, Henry. (1956). *The Historical Background of Chemistry* (pg. 205). New York: Dover.
9. Horstmann, August. (1869-1881). *Treatises on the Thermodynamics of Chemical Processes* (*Abhandlungen fur Thermodynamik Chemischer Vorgange*). Edited by 10. (a) Jacobus Van't Hoff. Ostwald's Klassiker der Exakten Wiessenschaften, No. 137. Leipzig (W. Engelmann), 1903.
10. (a) Jensen, William B. (2009). "August Horstmann and the Origins of Chemical Thermodynamics" (pdf), *Bulletin for the History of Chemistry*, 34(2):83-91.
(b) Jensen, William B. (2009). "Introduction to the English Translation of 'The Theory of Dissociation' a Forgotten Classic of Chemical Thermodynamics" (pdf), *Bulletin for the History of Chemistry*, 34(2):73-.

Further reading

● Partington, James R. (1989). *A Short History of Chemistry* (pg. 328). Dover.
● Cahan, David. (1993). *Hermann von Helmholtz and the Foundations of Nineteenth-Century Science* (pg. 418). Berkeley: University of California Press.
● Servos, John W. (1996). *Physical Chemistry from Ostwald to Pauling* (pgs. 27-33). Princeton University Press.

External links

● August Friedrich Horstmann (German → English) – Wikipedia.
● August Friedrich Horstmann (1842-1929) – HistorieChemie.Free.Fr

θΔics

In existographies, **August Kekule** (1829-1896) (IQ:165|#444) (GCE:8) (Murray 4000:15|C) (Simmons 100:43) (Partington 50:6) (CR:6), aka “Friedrich Kekule” (Partington, 1937), was a German chemist, noted for []

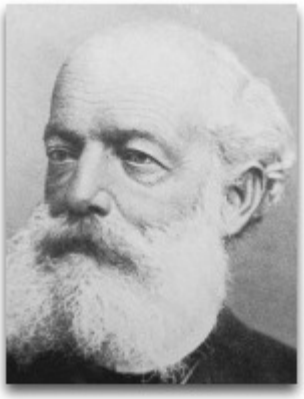

Chemical structure

In 1857, Kekule announced the tetravalence of carbon.

In May 1858, Kekule had built on the idea of tetravalence and the ability of carbon atoms to link to each other, therein becoming, supposedly, the principle formulator of theory of chemical structure.

In Jun 1858, Archibald Couper, independent of Kekule, arrived at the idea of auto-linking of carbon atoms, and provided, supposedly, the first molecular formulas where lines symbolized bonds connecting atoms (compared: bonding brackets).

Benzene

In 1859, Kekule, in his lectures, as has been presumed (Palmer, 2010), was drawing elements and molecules with elongated figures of which the lengths were made proportional to their “affinity units”, as he referred to them, i.e. valences or bonds, in a modern sense:

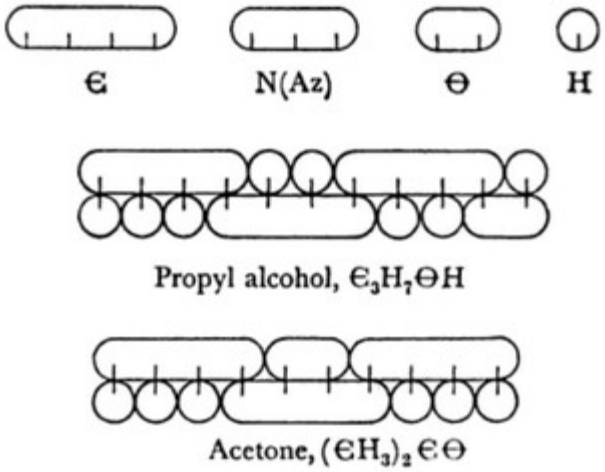

In 1865, Kekule, in his “On the Constitution of Aromatic Substances”, he summarized these views, and published the ring structure for benzene:

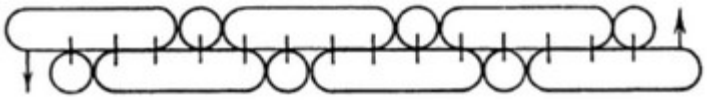

Benzene, C_6H_6

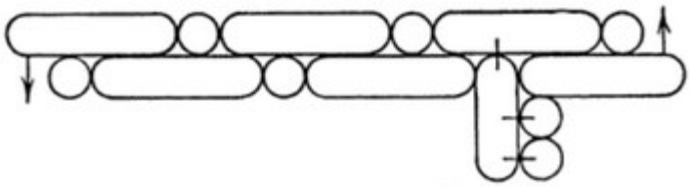

Aniline, $C_6H_5AzH_2$

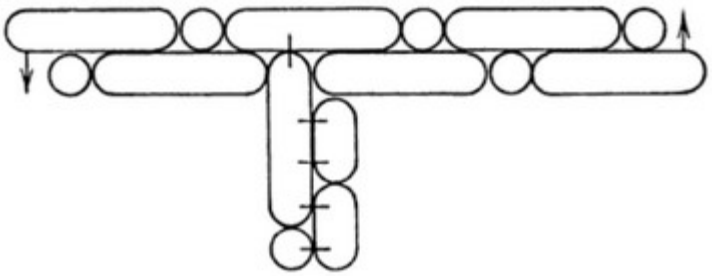

Benzoic acid, $C_6H_5CO_2H$

which he later said he dreamed by a snake (see: Ouroboros) circling around and biting its tail:

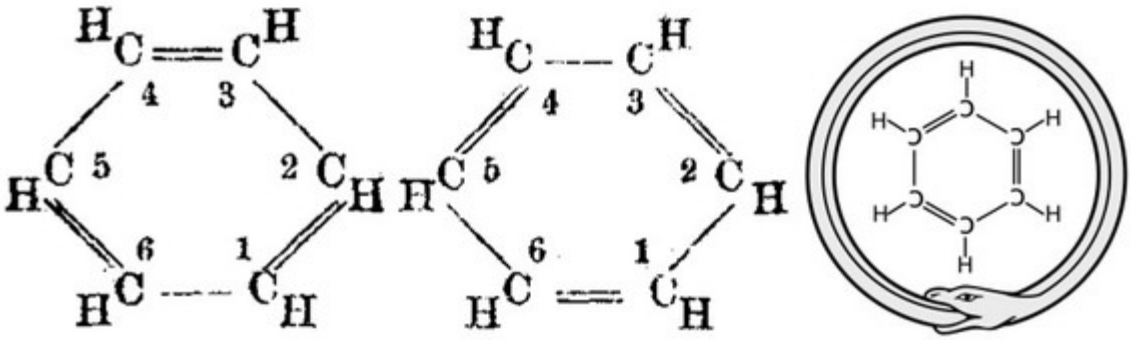

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Quotes | On

The following are quotes on Kekule:

> "Man's observations of natural phenomena have fascinated him throughout the recorded history and have provided him a base for development of theoretical ideas. He has sought similarities occurring in two different systems, the social and the natural, and has attempted to derive corollaries in support of his theories. The interpretation of the atomic structure in terms of the solar system by Bohr the structure of benzene as a ring on the basis of a model of a snake with its tail in the mouth postulated by **Kekule** and the determination of density by the loss of weight of a body on its immersion in water, attempted by Archimedes are some such examples where the latter set of observations were superimposed on the former system to arrive at an acceptable solution of complex phenomena. The book *New Dimensions in Sociology*, *A Physico-Chemical Approach to Human Behaviour* by Mirza Beg is a new approach in which he has tried

to establish an interface between physico-chemical and social sciences. It makes an interesting reading and provides a basis to quite a few socialization processes like assimilation, migration, mind-body split, etc."

— Mumtaz Kazi (1987) "Forward by a Scientist" to Mirza Beg's *New Dimensions in Sociology* [2]

"By the mid-1800s, the new science of chemistry was developing rapidly and chemists had begun to probe the forces holding compounds together. In 1858, **August Kekule** and Archibald Couper independently proposed that, in all organic compounds, carbon is tetravalent—it always forms four bonds when it joins other elements to form stable compounds. Furthermore, said Kekule, carbon atoms can bond to one another to form extended chains of linked atoms. In 1865, Kekule provided another major advance when he suggested that carbon chains can double back on themselves to form rings of atoms."

— John McMurry (2012), *Organic Chemistry* (§1:Structure and Bonding) (Ñº)

Quotes | By

The following are quotes by Kekule:

"It has not yet been attempted, as far as I know, to apply the same views (of atomicity in general and carbon tetratomicity in particular) to aromatic substances. When I published the theory of carbon tetratomicity seven years ago, I had a good idea that I had a very good idea about it, but I had not judged develop it in detail."

— August Kekule (1865), "On the Constitution of Aromatic Substances" [1]

References

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(b) Palmer, W.G. (2010). *A History of the Concept of Valency to 1930* (pgs. 58-59). Cambridge University Press.
2. Beg, Mirza Arshad Ali. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (intro) (pdf, annotations by Libb Thims, 2014) (Foreword by a Scientist, pgs. i-iii). Karachi: The Hamdard Foundation.

External links

â— August Kekule – Wikipedia.

θΔics

In existographies, **August Kronig** (1822-1879) (CR:10) was a German physicist noted for his 1856 paper "A General Theory of Gases", in which he theorized on the translational motions of molecules, and for his 1874 book *The Existence of God and the Happiness of People*, in which he discusses concepts such as gravity, kraft, Charles Darwin, Arthur Schopenhauer, Anaxagoras, entropy and particularly how the heat death theory of universal end mandates or not an initial universal creator, a topic centered around the existence of god.

Gas theory

Kronig, in his 1856 "A General Theory of Gases", explained that: [1]

> "The molecules of gas do not oscillate about definite positions of equilibrium, but that they move with constant velocity in right lines until they strike against other molecules, or against some surface which is to them impermeable."

This view of 'stationary oscillating atoms', to note, seems to have been first outlined by Croatian thinker Roger Boscovich who in his 1763 book *Theoria Philosophiae Naturalis*, outlined a 'stationary atom' theory, an atomic theory which reasoned that at short range, atoms attracted each other, but that at longer range, atoms pushed each other way, the latter aspect explaining gas pressure.

This type of view, in loose sense, may have been taken up by French chemist Antoine Lavoisier in which caloric particle moving into the interstices or spaces of the particles of bodies, caused the overall body to expand, according to Boerhaave's law, but when the caloric particles were removed, it was implied that the particles of the bodies returned to their original position, so to speak.

In any event, Kronig's paper spurred German physicist Rudolf Clausius into the writing of his 1857 famous paper "On the Kind of Motion which we call Heat", which launched the kinetic theory of gases and statistical mechanics.

The Existence of God and the Happiness of People

In his 1874 book *The Existence of God and the Happiness of People*, Kronig quotes extensively from the popular 1869 lecture "the forces of nature in their relationship" by German physicist-physiologist Adolf Fick who goes into detail about the possible theological ramifications of heat death. The following is start-translation of a few pages concerning thermodynamics discussion:

(386-390)

dem gegenüber eine eigenthümliche Verstandesaftection, die ich Intelligenzblindheit nenne. Wie die Farbenblindheit darin besteht, daß gewisse Individuen gewisse Farben nicht zu erkennen vermogen, so äußert sich die Intelligenzblindheit dadurch, daß die davon Befallenen gewisse Manifestationen der Intelligenz nicht zu erkennen im Stande find, und zwar merkwürdigerweise gerade die allerfrappantesten und imposantesten.

Einige Vorwürfe, welche Schopenhauer gegen den Anthropomorphismus erhebt, möchte ich hier zurückzuweisen versuchen. Derselbe soll (Parerga 2te Auflage, Theil I Seite 127) ein kindlicher Gedanke sein. Mit Rücksicht darauf, daß niit seltenen Ausnahmen allen Erwachsenen durch die Erziehung zahlreiche Vorurtheile eingeimpft werden, die dem kindlichen Alter noch fremd find, halte ich diesen Vorwurf für gewichtlos, indem ich

The peculiar to a Verstandesaftection, which I call intelligence blindness. Like the color-blindness is that certain individuals not to recognize certain colors vermogen, it expresses the intelligence of blindness in that the manifestations of which afflicted some of the intelligence to recognize not able find, and oddly enough, precisely the allerfrappantesten and impressive.

Some allegations against the anthropomorphism which Schopenhauer does, I would try here rejected. He is said (Parerga 2nd edition, I share his page 127) a child's thought. Considering the fact that NIIT rare exceptions, all

den Abscheu vor dem Anthropomorphismus zu jenen Vorurtheilen zähle.

Ferner ist (eben da Seite 125 und 126) „das Phaenomen einer Persönlichkeit, das heißt einer selbstdewußten Individualität, die erst erkennt und dann dem Erkannten gemäß will, uns ganz allein aus der auf unseren» kleinen Planeten vorhandenen, animalischen Natur bekannt." Diese Thatsache muß ich zugeben. Allein ich sehe darin keinen Mangel, sondern einen Vorzug des Anthropomorphismus. Alle beide einander diametral entgegenstehenden Lehren, daß ein vollkommener, und daß gar kein Gott eristirt, find Erzeugnisse speculativer Philosophie. Und eben weil ich diese zur Erforschung der Wahrheit für ungeeignet balte, weil ich ein confequenter Erfahrungsphilofoph sein und bleiben will, bringe ich zur Erklärung der' ganzen Welt überhaupt nur solche Phaenomene und Kräfte zur Anwendung, die ich auf unserem kleinen Planeten kennen gelernt habe. Wenn Schopenhauer also behauptet, daß wir Menschen „nicht nur nicht befugt, sondern nicht einmal fähig sind," uns außer Menschen und Thieren auf der Erde uoch eine andere Persönlichkeit zu denken, so kann ich darauf nur erwidern, daß ich jene Befugniß und jene Fähigkeit für mich dennoch in Anspruch nehme.

Endlich meint Schopenhauer, daß „der Drang des geängsteten Menschen sich niederzuwerfen und Hülfe anzuflehn in seiner häufigen und kläglichen Roth und auch hinsichtlich seiner ewigen Seligkeit" die wesentlichste Ursache des Gottesglaubens ist (Seite 128). Hierin wird er wohl Recht haben. Aber meine Intelligenzhypothese trifft diefer Vorwurf nicht (vergleiche Studie 5 über Beten). Es braucht ja auch nicht gerade alles, was im Katechismus steht, falsch zu sein.

Was noch die Geschichte des Anthropomorphismus betrifft, so ist, wie ich aus Schopenhauer (die Welt als Wille, dritte Auflage, Theil 2 Seite 369) entnehme, Anaragoras der Erste gewefen, welcher „das uns blos aus der animalischen Natur bekannte und auf ihre Zwecke allein berechnete Hülfsmittel einer Intelligenz herbeizog, welche von außen hinzukommend, die ein Mal vorhandenen und gegebenen Naturkräfte und deren Gesetze schlau benutzte, um ihre, diesen eigentlich fremden Zwecke durchzusetzen."

167. Gin unhaltbarer Beweis für die Entstehung der Welt durch einen Schöpfungsact. 1873.

Anter der Ueberschrift „die Entwickelung der Welt nach einem stabilen Endzustande" heißt es im Ausland 1872 Nummer 41 Seite 979:

adults are instilled by the education many prejudices to the child's age still find strange, I find this accusation for weightless, as I am counting the horror of anthropomorphism to those prejudices.

It is also (just as page 125 and 126) "the phenomenon of a personality, that is a selbstdewußten individuality that recognizes first and then referred to the known wishes us all alone from the post on our" small planet existing animal nature. "This fact I must admit. But I see no lack, but one advantage of anthropomorphism. Both of diametrically opposing doctrines that one perfect, and that no god exists, find the products of speculative philosophy. And just because I to this search for truth Bait will be unfit because I have a confequenter Erfahrungsphilofoph be and remain, I bring to the explanation of 'the whole world in general, only those phenomena and forces the application that I've met on our small planet. If so Schopenhauer claimed that we humans " not only not authorized, but not even capable of, "except us humans and animals on Earth uoch think a different personality, I can only reply that I and those powers that ability to me but to be eligible.

Finally, says Schopenhauer, that "the urge of the anguished people prostrate themselves and help anzuflehn in his frequent and lamentable Roth and also of his eternal salvation," the most important cause of belief in God is (page 128). In this he is probably right. But my intelligence hypothesis inapplicable Diefer allegation (see study 5 on prayer). It need not just everything in the Catechism to be wrong.

What still concerns the history of anthropomorphism, then, as I from Schopenhauer (The World as Will, third edition, part 2 page 369 gather), Anaxagoras gewefen the first to which "the well-known to us only from the animal nature and their purpose calculated only aids an intelligence herbeizog, which are added from outside, which used a time available and given the forces of nature and its laws smart to her to enforce this really strange purposes. "

167th Gin untenable evidence for the origin of the world by an act of creation. 1873rd

Anter the heading "the development of the world to a stable final state is" both abroad in 1872 number 41 page 979:

„ . . . . Fick schließt dabei, indem ihm das Eintreten jenes Endzustandes der sogenannten Entropie als bewiesen feststeht, daß es ein Etwas geben müsse, welches außer oder über der Welt stehe. Denn — so überlegt er — da die Entwiöelung der Welt einem Endzustand der Ruhe zustrebt, so kann die Welt nicht von Ewigkeit her gewesen sein, weil gerechnet von jenem unendlich lange vergangenen Augenblicke an bis zur Gegenwart eine Ewigkeit verflossen ist, und darum jener Endzustand schon längst, eigentlich schon unendlich lange eingetreten sein müßte. Die Gegenwart aber zeigt jenen Zustand nicht; also muß die Welt einen Anfang genommen haben, d. h. es kann die Ursache ihrer Entstehung nicht in ihr selbst liegen."

". . . . Fick does this by him showed that the occurrence of so-called final state of entropy as it is clear that something had to give it one that stand outside or above the world. Because - as he thought - since the Entwiöelung the world tends towards a final state of rest, so the world can not have always been a part, as is expected elapsed from that infinitely long past to the present moment an eternity, and therefore that the final state already long ago, would have to be actually already occurred infinitely long. The presence, however, shows that state does not, so the world must have had a beginning, that it may be the cause of their origin does not lie in itself. "

Ich halte diesen Schluß für neu. Da ein Schöpfungsact natürlich einen Schöpfer voraussetzt, und da auck ich über die Existenz eines Schöpfers eine eigenthümliche, von derjenigen anderer exacter Forscher abweichende Ansicht mir zueigen gemacht habe, so mußte mich Fick's Schluß sehr interessiren. Zunächst wünschte ich indessen Gewißheit darüber zu erlangen, ob jener Schluß wirklich von Fick herrührte, oder ob nicht der ungenannte Verfasser des Aufsatzes im Ausland Fick etwa mißverstanden hätte. Sehr freute es mich, bei der Erforschung dieser Frage die vortrefflichen populären Vorträge Fick's, betitelt: „die Naturkräfte in ihrer Wechselbeziehung" (Würzburg 1869) kennen zu lernen. Es heißt dort auf Seite 69 und 70:

I consider this the end for new. As an act of creation, of course, presupposes a Creator, and as I Auck about the existence of a creator of a peculiar, differing from that of other researchers of exact view I had appropriated, so I had to interest Fick's very end. First, I wish, however, to obtain certainty as to whether that conclusion really stemmed from Fick, whether or not the anonymous author of the paper had misunderstood abroad **** around. Very, I was pleased when researching this issue, the excellent Fick's popular lectures, entitled "the forces of nature in their relationship" (Würzburg, 1869) meet you. It says on page 69 and 70:

„Clausius hat unter der Bezeichnung des zweiten Hauptsatzes der mechanischen Wärmetheorie einen Satz aufgestellt und begründet, der die vorliegende Frage endgültig zu beantworten gestattet."

"Clausius's under the name of the second law established the mechanical theory of heat and justified a sentence that allows this question to be answered definitively."

„Leider kann ich diesen merkwürdigen Satz hier nicht entwickeln, da dies nicht wohl ohne Anwendung des mathematischen Calculs angeht. Ich kann daher nur ohne Beweis die Behauptung aufstellen: Wenn der in Rede stehende zweite Hauptsatz der mechanischen Wärmetheorie ganz allgemein gültig ist, und namentlich auch Anwendung erleidet auf Temperaturen, wie sie an der Sonne und an anderen vielleicht noch heißeren Himmelskörpern stattfinden, dann können wir ganz allgemein für das ganze Universum, nicht etwa bloß für das Sonnensystem, die Behauptung aufstellen, daß die einmal in Wärme verwandelte mechanische Spannkraft nie ganz in solche zurück verwandelt werden kann, und da die erstere Verwandlung fortwährend stattfindet, so müßte zuletzt alle Kraft im Universum die Form der Wärme.annehmen, und es müßten zugleich alle Temperaturdifferenzen in der Welt ausgeglichen werden. Die ganze Kette der physikalischen Vorgänge im Universum könnte alsdann unmöglich ein in sich

"Unfortunately I can not here develop this strange statement, since this does not concern probably without the application of the mathematical calculus. I can therefore only establish without proof of the assertion: If the discussed second law of thermodynamics is quite universal, and especially application suffers at temperatures as they take place in the sun and in other, perhaps even hotter celestial bodies, then we can up in general for the whole universe, not only for the solar system, the claim that the once transformed into heat, mechanical clamping force can never be entirely transformed into such returns, and since the former change constantly taking place, most recently, all power would have in the universe the shape of the Wärme.annehmen, and it must at the same time all temperature differences in the world can be compensated. The whole chain of physical processes in the universe could then possibly be returning in a cycle itself, persisted in the end always repeated the universe as a whole is in a constant state forever. Rather, the universe would come as such on the

zurückkehrender Cyklus sein, bei dessen immer wiederholtem Ablauf das Universum als Ganzes in einem ewig gleichbleibenden Zustande beharrte. Vielmehr käme dem Universum als solchem im Ganzen ein nach einem Ziele strebender Entwicklungsprozeß zu."

whole, one after an aspiring goals development process. "

„Das Ziel wäre aber, wie schon gesagt, die Ausgleichung aller Temperaturunterschiede, also — im Sinne eines organischen Wesens — der allgemeine Tod. Dieser finale Zustand, der dann freilich ewiger Fortdauer fähig ist, würde aber nach Verfluß einer endlichen Zeit nahezu erreicht werden, von jedem beliebigen Anfangszustande an gerechnet, der nicht unendliche Geschwindigkeiten oder unendliche Zerstreuung der Materie im Raume einschließt d. h. von jedem Anfangspunkte an gerechnet, der überhaupt gedacht werden kann. Es müßte also umgekehrt der finale Zustand schon erreicht sein, wenn die Welt von Ewigkeit her da wäre."

"The goal would be, as I said, the equalization of temperature differences, that is - in the sense of an organic being - the general's death. This final condition, then, of course eternal continuance of which is capable, would be but reached after the lapse of a finite time, almost, from any initial state counted as non-infinite speed and infinite distribution of matter in space, including means expected from any initial points in the can be thought at all. It would therefore reverse the final state to be reached with the world of eternity there would be."

„Wir sehen uns somit am Schlusse unserer Betrachtungen vor folgende bedeutsame Alternative gestellt: entweder sind bei den höchsten, allgemeinsten und fundamentalsten Abstraktionen der Naturwissenschaft wesentliche Punkte übersehen, oder — wenn diese Abstraktionen vollkommen streng und allgemein gültig sind — dann kann die Welt nicht von Ewigkeit her da sein, sondern sie muß in einem von heute nicht unendlich entfernten Zeitpunkt durch ein in der Kette des natürlichen Causalnexus nicht begriffenes Ereigniß d. h. durch einen Schöpfungsakt entstanden sein."

"We see, therefore, at the end of our discussion made the following important alternative: either at the highest, most general and most fundamental abstractions of science overlooked essential points, or - if these abstractions are quite strict and universal - it can not the world of eternity time ago there, but it must be in one of today is not infinitely remote date by a not in the chain of the natural causal nexus grasped event were to say, by an act of creation. "

Eigentlich sollte mir der Fick'sche Schluß, welcher die auch von mir in ähnlichem Sinne behauptete Nothwendigkeit eines Schöpfers darzuthun bestimmt ist, sehr gefallen. Dennoch muß ich gestehen, daß er mir unhaltbar zu sein scheint, und zwar aus dem sehr einfachen Grunde, weil sich ganz derselbe Schluß nicht allein in Beziehung auf den finalen Zustand der Welt, sondern ebenso gut hinsichtlich jedes beliebigen historischen Ereignisses der Zukunft oder der Vergangenheit machen läßt. Das folgende Beispiel mag dies zeigen.

Actually, I should end Fick, who also claimed to me in a similar sense of necessity of a Creator is intended to show, very much. However, I must confess that it seems to me to be untenable, and indeed for the very simple reason, that is exactly the same conclusion, not only in relation to the final state of the world, but equally well in terms of any historical event in the future or the past can be done. The following example may illustrate this.

Napoleon der Dritte ist im Jahre 1873 gestorben. Das bezeichnete Iahr ist von jedem beliebigen früheren Iahre um eine endliche Zeitstrecke entfernt, vom Iahre 1000 zum Beispiel 873 Iahre, vom Jahre 1000 vor Christi Geburt 2873 Iahre und so weiter. Nimmt man nun an, die Welt existirte schon seit Ewigkeit, so wäre von dem unendlich weit entfernten Anfaugsmomente der Welt an bis zum Tode Napoleons des Dritten eine unendlich lange Zeit verflossen, und das letztere Ereigniß müßte also nicht erst im Iahre 1873, sondern schon unendlich lange Zeit vorher eingetreten sein.

Napoleon the Third died in 1873. The year is designated by any previous year, at a finite stretch of time away from the year 1000 as 873 years, from 1000 BC 2873 years, and so on. Assuming now that the world existed since eternity, there would be passed by the infinitely distant Anfaugsmomente the world until the death of Napoleon III a long time, and the latter event should therefore not only in the year 1873, but has infinitely long before his time occurred.

If we knew the formula, from which the year calculated on the basis of what could be Clausius theory must die, the last organism, and if we are to that formula for the entry of

Wenn wir die Formel kennten, aus der sich das Iahr berechnen ließe, in welchem bei Zugrundelegung der Clausius'schen Theorie der letzte Organismus sterben muß, und wenn wir nach jener Formel für den Eintritt des

Education

Kronig was a founding member of the Berlin Physical Society.

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θΔics

In biographies, **August von Goethe** (1789-1830) was the son of German polymath Johann Goethe, the only one of the five children, of the paring of Christiane Vulpius (1765-1816) and Goethe, to reach adulthood, who was notably present at their 19 October 1806 wedding (see: Goethe timeline), and, as it has tentatively been argued, the embodiment of many of the regrettable aspects of the Otto child in Goethe's 1809 *Elective Affinities* (see: Goethe's affinity table).

Ottilie von Goethe | Offspring

In 1817, August Goethe married Ottilie Pogwisch (1796-1872), "Ottilie von Goethe" thereafter, the daughter of a countess who arrived in Weimar in 1806, soon becoming good friends with Adele Schopenhauer (1797-1849), sister of Arthur Schopenhauer (1788-1860), daughter of Johanna Schopenhauer (1766-1838), the women in whose home Goethe and his new scandalous bride Christiane made their first public appearance.

The marriage, said to have been a problematic one, produced three children: Walter Wolfgang von Goethe (1818-1885), Maximilian Wolfgang von Goethe (1820-1883), and Sedina Alma Henrietta Cornelia von Goethe (1827-1844), none of whom produced offspring. [1]

It may be that some aspects of Ottilie von Goethe may have fused into the character of "Ottilie" of Goethe's 1809 *Elective Affinities*, although this is only speculation, at the moment (fact check).

End

August, towards his end, was said to have turned to alcohol, which may have played a role in his early death on a trip to Rome, age 40, in 1830; an Italian trip which seems to echo that made by both his father and grandfather, at about the same age.

References

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External links

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θΔics

In science, **August Weismann** (1834-1914) was a German chemical zoologist noted for []

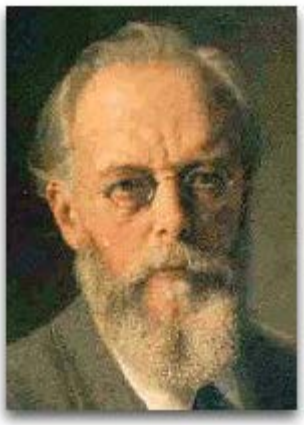

Morality

In 1889, Weismann, in his *Essay on Heredity*, stated the following thought-provoking quote: [2]

> "We can, indeed, kill all organic beings and thus render them inorganic at will. But these changes are not the same as those which we induce in a piece of chalk by pouring sulphuric acid upon it; in this case we only change the form, and the inorganic matter remains. But when we pour sulphuric acid upon a worm, or when we burn an oak-tree, these organisms are not changed into some other animal and tree, but they disappear entirely as organized beings and are resolved into inorganic elements."

This quoted attracted the attention of: Karl Pearson (1900) and C.W. Formby (1907). (Ñº)

Germ plasm

In 1892, Weismann published his germ plasm theory, according to which inheritance only takes place by means of the germ cells—the gametes such as egg cells and sperm cells. [3]

Internal force

Weismann, in regards to the concept of internal force, also theorized about "forces residing in the organism" influencing the germ-plasm, an imperceptible entity he halves and divides as if it were a physical quantity. [2]

Evolution | Life

In 1902, Weismann, in his *Lectures on the Theory of Evolution*, as summarized by Alexander Oparin (1936), rejected vitalism, and asserted his belief that life must have arisen sometime or other from inanimate matter. [4]

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θΔics

In existographies, **Auguste Comte** (1798-1857) (IQ:185|#71) (Cattell 1000:95) [RGM:397|1,500+] (Scott 50:5) (FA:64) (CR:102) was a French sociologist and philosopher notable for coining the term sociology, for having introduced the subject of "social physics", and for champion the idea of positivism. [1]

Social physics

Ironically, in spite of physics being his most difficult subject, Comte is now considered the father of social physics. Specifically, in his *Cours de philosophie positive* (*Positive Philosophy*), written between 1830 and 1842, Comte argued that social physics would complete the scientific description of the world that Galileo, Newton, and others had begun. In particular, Comte stated:

> "Now that the human mind has grasped celestial and terrestrial physics, mechanical and chemical, organic physics, both vegetable and animal, there remains one science, to fill up the series of sciences or observation—social physics. This is what men have now most need of; and this it is the principal aim of the present work to establish."

(add)

Hierarchy of science

In 1854, French philosopher Auguste Comte, in his *System of Positive Polity: or System of Sociology*, gave the following so called "hierarchy of the sciences", according to which they all are, at bottom, dependent on astronomy: [3]

> "The conception of the hierarchy of the sciences from this point of view implies, at the outset, the admission, that the systematic study of man is logically and scientifically subordinate to that of Humanity, the latter alone unveiling to us the real laws of the intelligence and activity. Paramount as the theory of our emotional nature, studied in itself, must ultimately be, without this preliminary step it would have no consistence. Morals thus objectively made dependent on Sociology, the next step is easy and similar; objectively Sociology becomes dependent on Biology, as our cerebral existence evidently rests on our purely bodily life. These two steps carry us on to the conception of Chemistry as the normal basis of Biology, since we allow that vitality depends on the general laws of the combination of matter. Chemistry again in its turn is objectively subordinate to Physics, by virtue of the influence which the universal properties of matter must always exercise on the specific qualities of the different substances. Similarly Physics become subordinate to Astronomy when we recognise the fact that the existence of our terrestrial environment is carried on in perpetual subjection to the conditions of our planet as one of the heavenly bodies. Lastly, Astronomy is subordinated to Mathematics by virtue of the evident dependence of the geometrical and mechanical phenomena of the heavens on the universal laws of number, extension, and motion."

In this framework, as summarized by German physicist Karl Pearson, in Comte's hierarchy of science, morals is the "supreme science", about which paramount is the "theory of our emotional nature", which must be tied into: sociology, biology, chemistry, physics, astronomy, and lastly mathematics as the "language", in Willard Gibbs famous phrasing, of it all, respectively, in one unified theory. [4] This position is fortified by the fact that Goethe—the highest ranking universal genius—considered his 1796 "moral symbols" theory, sociology and biology based on physical chemistry (physics + chemistry), or affinity chemistry as it was called in Goethe's time, to be his greatest work or "best book".

Education

Comte attended the famous French school of thermodynamics, the École Polytechnique in the mid 1810s. However, following the brief closure of the École in 1816, for reorganization, Comte was forced to leave and continue his studies at the medical school at Montpellier. When the École Polytechnique reopened, he did not request readmission. Physics was Comte's most difficult subject. His first year professor in physics, at the École Polytechnique, was French physicist Alexis Petit, who according to Comte, went too fast. [2]

Quotes | On

The following are quotes on Comte:

> "**Comte** is a living writer who has done more than any other to raise the standard of history. There is much in the method and in the conclusions of his great work *Positive Philosophy* with which I cannot agree; but it would be unjust to deny its extraordinary merits."
>
> — Henry Buckle (1857), *History of Civilization in England, Volume One* [2nd London Edition] (pg. 4)

Quotes | By

The following are noted quotes by Comte:

> "The 'order of nature' is doubtless very imperfect in every respect; but its production is far more compatible with the hypothesis of an intelligent will, than with that of a blind mechanism. Persistent atheists therefore would seem to be the most illogical of theologists: because they occupy themselves with theological problems, and yet reject the only appropriate method of handling them. But the fact is that pure atheism even in the present day is very rare. What is called 'atheism' is usually a phase of pantheism, which is really nothing but a relapse disguised under learned terms, into a vague and abstract form of Fetichism."
>
> — Auguste Comte (1848), *General View of Positivism* [5]

See also

â— HP pioneers

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θΔics

In hmolscience, **Auguste Walras** (1801-1866) was a French economist noted for his ideas on how to go about deriving a scientific economics, similar to celestial mechanics, namely: [1]

> "To create a scientific theory of economics one would need to use differential calculus to derive a 'science of economic forces, analogous to the science of astronomical forces'."

views which he expressed to his son Leon Walras, during a walk in 1858, who in turn would go on to defined people as "economic molecules", and whose philosophy became the dominate view of the Lausanne school of physical economics.

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θΔics

In existographies, **Augustin Cauchy** (1789-1857) (IQ:160|#510) [RGM:315|1,500+] (Murray 4000:18|M) (GME:19) (Eells 100:15) (CR:10) a French mathematician and physicist noted for []

Influence

In 1850, James Maxwell, aged 16, read Cauchy's book on *Differential Calculus*.

Other

In c.1913, G.H. Hardy ranked Srinivasa Ramanujan (1887-1920) in the same league as Gauss, Euler, Cauchy, Newton, and Archimedes. [1]

Quotes | On

The following are quotes on Cauchy:

> "Roger Boscovich (1711-1787), published a detailed exposition of the views attacked by Buffon and defended by Alexis Clairaut, and, inspired alike by the opinions of Newton and Leibniz, he conceived a cosmology in which the universe is composed solely of material points, these being attracted to each other in pairs. When these points are separated by a sensible distance, their attraction is reduced to mere universal attraction, whereas when they are in very close proximity it assumes a dominant importance. Boscovich's cosmology provided physical theory with a program which the geometricians of the eighteenth century, and of a great portion of the nineteenth, labored assiduously to carry out. The efforts of Johann Segner (1704-1777), and subsequently of Thomas Young, again drew attention to capillary phenomena, and with the assistance of the hypothesis of molecular attraction, as also of Clairaut's method, Laplace advanced in 1806 and 1807 an admirable theory, which Carl Gauss improved in 1829. Being a thoroughly-convinced partisan of Boscovich's monological doctrine, Laplace communicated his convictions to numerous geometricians, who surrendered to the **ascendency of his genius**; we shall only mention Claude Navier (1785-1836), Simeon Poisson, and **Augustin Cauchy**. In developing the consequences of the hypothesis of molecular attraction, Navier, Poisson, and Cauchy succeeded in building up the theory of the equilibrium and small motions of elastic bodies, one of the finest and most fruitful theories of modern physics. The discredit into which the progress of present-day thermodynamics has brought Boscovich's cosmology has, however, affected scarcely anything of what Laplace, Gauss, Navier, Poisson, Cauchy, and many others have deduced from the principles of this cosmology. The theories which they established have always been readily justified with the assistance of new methods, the way of bringing about this justification having been indicated by Cauchy himself and George Green. After Pierre Macquer, many chemists used the hypothesis of molecular attraction in an attempt to disentangle the laws of reaction which they studied, and among these scientists we may mention Torbern Bergman, and above all Claude Berthollet. When the latter published his "Statique chimique" in 1803, he believed that the science of chemical equilibria, subject at last to Newton's method, had found its true direction; however, it was not to enter upon this direction until much later on, when it would be guided by precepts altogether different and which were to be formulated by thermodynamics."
>
> — Anon (1911), *Catholic Encyclopedia, Volume 12* (pg. 65)

Quotes | By

The following are quotes by Cauchy:

> "I shall never flaunt the little learning that I have acquired through the care and help my father has given me. If I have learned anything, it is only because he took care to teach me. Had he not taken upon himself the trouble of instructing me, I would be as ignorant as many other children."

— Augustin Cauchy (c.1840), on his (Ñº) education

"Men pass away, but their deeds abide."

— Augustin Cauchy (1857), last words (Ñº)

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(b) A Mathematician's Apology (1940) – Wikipedia.

External links

â— Augustin-Louis Cauchy – Wikipedia.
â— Cauchy – MacTutor.

θΔics

In existographies, **Augustin Fresnel** (1788-1827) (IQ:180|#170) (GPE:50) was a French engineer-physicist, noted for []

Overview

In 1814, Fresnel, after finding the state of the science of optics in disarray, penned a letter to Andre Ampere, stating his interest in the wave theory of light, wherein he showed his awareness that it explained the constancy of the speed of light and was at least compatible with stellar aberration. In 1816, Fresnel wrote to Thomas Young, who had been working on the problem since at least 1807. The joint work of the two thinkers, eventually led to the acceptance of the wave theory of light over the older Newtonian 'corpuscular theory of light'.

Quotes | On

The following are related quotes:

> "Not Copernicus and Galilei [sic], when they abolished the Ptolemaic system; not Newton, when he annihilated the Cartesian vortices; not Young and **Fresnel**, when they exploded the 'corpuscular theory'; not Faraday and Clerk-Maxwell, in their splendid victory over *Actio in distans* – more thoroughly shattered a malignant and dangerous heresy, than did Joule when he overthrew the baleful giant force, and firmly established, by lawful means, the beneficent rule of the rightful monarch, energy! Then, and not till then, were the marvelous achievements of Sadi Carnot rendered fully available; and Science silently underwent a revolution [see: thermodynamic revolution] more swift and more tremendous than ever befell a nation. But this must be a theme for the Poet of the Future!"
>
> — Anon (1884), review of Joule's Scientific papers [1]

> "With the death of Lord Kelvin, on December 17 [1907], there passes away the grandest figure of contemporary science, and with it closes an epoch in the history of physics. When William Thomson was born, in 1824, Ohm's law of the flow of electric currents had not been discovered, Oersted's discovery of the magnetic action of the current was but four years old, while Faraday's capital discovery of the induction of currents was not to come for seven years. The wave theory of light had been but recently set on its feet by Young and **Fresnel**, and was not yet thoroughly believed, while the two laws of thermodynamics, perhaps the most important contribution of the nineteenth century, were unknown. All these things Lord Kelvin saw, and a great part of them he was. Probably no one, with the single exception of Helmholtz, born three years earlier, exercised greater influence on the science of the nineteenth century, while to compare the influence of these two great physicists with that of Darwin is as bootless as to question whether the grass is greener than the sky is blue."
>
> — Arthur G. Webster (1908), "Lord Kelvin", Dec 22 [2]

Quotes | By

The following are quotes by Fresnel:

> "In choosing a theory, one should pay attention to simplicity in hypotheses only. Simplicity in computation can be of no weight in the balance of probabilities. Nature is not embarrassed by difficulties of analysis. She avoids complication only in means. Nature seems to be proposed to do much with little: it is a principle that the development of physics constantly supports by new evidence."
>
> — Augustin Fresnel (c.1820) (Q)

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1. Author. (1884). “review of Joule’s Scientific papers”, *Phil. Mag. 18*: 154-4.
2. (a) Webster, Arthur G. (1908). “Lord Kelvin” (Q), Dec 22; in: *Science*, 27:1-8, Jan 3.
(b) Walsh, James J. (1908). “Lord Kelvin” (Q), *Catholic World*, 86:757-68.

Further reading

● Buchwald, Jed Z. (1989). *The Rise of the Wave Theory of Light: Optical Theory and Experiment* (§5: Fresnel’s Ray Theory of Diffraction, pgs. 111-). Publisher.

External links

● Augustine-Jean Fresnel – Wikipedia.

θΔics

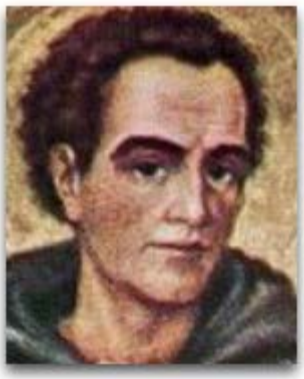

In existographies, **Augustine** (354-430) (IQ:180|#131) (Cattell 1000:82) (RGM:193|1,500+) (CR:37), i.e. Augustine of Hippo or "St. Augustine", was a Roman theological philosopher, aka "Grand Pooh-Bah" of the god cultists (Meslier, 1729), noted for his pitting up Biblical tenets with Epicurean-modeled of atomic theory.

Influences

Augustine, in his later years, supposedly, was influenced by Plotinus, particularly his Neoplatonism views. [2]

Confessions

In 400AD, Augustine, in his existographical work *Confessions*, discusses how he was made, via the actions of his mother, to detach from a women he had "slept with for many years", with whom he had a son, and put into a proper marriage, arranged by his mother, that would lead him to Christianity; he comments on this:

> "My heart which was deeply attached was cut and wounded, and left a trail of blood."

He also discusses his upbringing and how he grappled with choosing between Christianity (his mother's faith), Manicheanism (a community he resided in for nine years), and Epicureanism (he enjoyed worldly pleasures); the gist of which is as follows: [6]

> "Nothing kept me from an even deeper whirlpool of erotic indulgence except fear of death and of your coming judgment which, through the various opinions I had held, never left my breast. With my friends Alypius and Nebridius I discussed the ultimate nature of good and evil. To my mind, Epicurus would have been awarded the palm of victory, had I not believed that after death, **the life of the soul remains with the consequences of our acts**, a belief which Epicurus rejected; and I asked: if we were immortal and lived in unending bodily pleasure, with no fear of losing it, why should we not be happy? What else should we be seeking for?"

Very interesting indeed. Very similar to: "we all have to live and die with the consequences of the choices of our actions".

Genesis

Augustine, asserted, supposedly (Ñº), on theological grounds, that everything in the universe was created by god in the same instant, and not in six days as a plain reading of Genesis would require.

Free will | Sin

On the subject of free will, Augustine had the following to say: [4]

> "As a runaway horse is better than a stone which does not run away because it lacks self-movement and sense perception, so the creature is more excellent which sins by free will than that which does not sin only because it has no free will."

(add discussion)

Anti-Epicureanism

Augustine, in his 426 *City of God* (§14:1-3), argued that Epicurean and Stoic philosophies were aimed at living (reactively existing) according to the flesh, instead of according to the spirit or soul, and hence sin-ridden philosophies.

(Ñº) The gist of his oft-cited argument as follows:

> "Let those philosophers disappear, who attribute natural corporeal principles to the intelligence attached to matter, such as Thales, who refers everything to water, Anaximenes to air, the Stoics to fire, Epicurus to atoms, that is to say, to infinitely small objects that can neither be divided nor perceived. Let us reserve the same fate to all the other philosophers, who are too numerous to name and who claimed to have found in simple and combined substances, lifeless or living, indeed in what we call material bodies, the cause and principle of things."

(add discussion)

Life | Non-life issue

On the life from non-life paradox, Augustine puts it like this: [3]

> "Some of them believed that inanimate beings could produce living beings. Such was the case of the Epicureans; these philosophers, and others like them, were incapable of imagining anything but what their heart, corrupted by their senses, allowed them to see."

(add)

Education

Augustine, according to his own reports, did not procure a zeal for wisdom until age 19: [6]

> "Many years of my life had passed by—about twelve—since in my nineteenth year I had read Cicero's *Hortensius*, and had been stirred to a zeal for wisdom."

He goes on to state that "quest for wisdom" did not come at once, but resulted as a vexation between (a) despise for earthly success and (b) disease of lust.

Quotes | By

The following are related quotes:

> "I am quite certain that I am, that I know I am, and that I love this being and this knowing. Where these truths are concerned I need not quail before the academicians [skeptics] when they say: 'what if you should be mistaken?' Well, if I am mistaken, I exist. For a man who does not exist can surely not be mistaken either, and if I am mistaken, therefore I exist."
>
> — Augustine (426), *City of God* [7]

> "That which is called the Christian religion existed among the ancients, and never did not exist, from the beginning of the human race until Christ came in the flesh, at which time the true religion which already existed began to be called Christianity."
>
> — Augustine (c.400) (Ñº)

> “The good Christian should be beware of mathematicians, and all those who make empty prophecies. The danger already exists that the mathematicians have made a covenant with the devil to darken the spirit and to confine man in the bonds of hell.”
>
> — Augustine (c.400), *The Literal Meaning of Genesis* (source: mAtheist); compare: Hamid Al-Ghazali (c.1100) (Ñº) [5]

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2. Cross, Frank L. and Elizabeth, Livingstone. (2005). *The Oxford Dictionary of Christian Church* (§:Platonism). Oxford University Press.
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7. (a) Augustine. (426). *City of God* (translator: D.S. Wiesen). Harvard University Press, 1988.
(b) The City of God (book) – Wikipedia.
(c) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (§:Augustine, pgs. 193-204; quote, pg. 201). HarperOne.

External links

â— Augustine of Hippo – Wikipedia.

θΔics

In theories, **auto-catalytic closure**, or "autocatalytic set theory", is a physical science based origin of life explanation which argues that "dead" individual molecular species A, B, and C, become "alive" once catalytic closure among them is achieved and they are able to complete one thermodynamic cycle. [1]

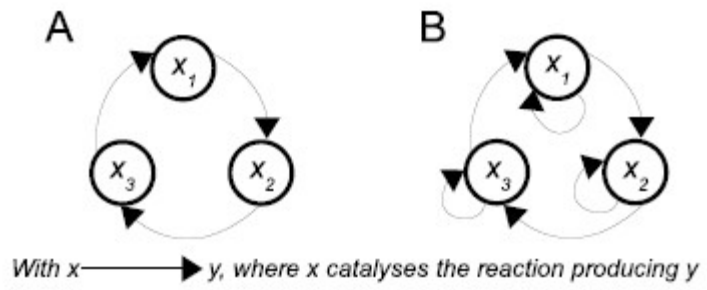

A depiction of **autocatalytic closure**, according to Irish artificial life researcher James Decreane, where in **A:** simple collectively autocatalytic reaction network, where the species x_1 catalyzes the production of x_2. Similarly the production of x_3 and x_1 can be catalyzed by x2 and x_3 respectively, forming/closing the autocatalytic loop; in **B:** A three element hypercycle, in contrast to collectively autocatalytic reaction networks, individual molecular species are capable of self-production in hypercycles. [3]

The model is a variant of the 1920s autocatalysis theory, and was first proposed by American Stuart Kauffman in his 1993 *The Origins of Order* and the expanded on in a number of books to follow as a pervading principle germane to life. [2]

See also

â— Perpetual motion of the living kind

References

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3. Decraene, James (2009) Autocatalytic Closure and the Evolution of Cellular Information Processing Networks (abs). PhD thesis, Dublin City University.

External links

â— Autocatalytic set – Wikipedia.

θΔics

In genius studies, **auto-estimated IQ**, or “self-estimated IQ”, in defunct layspeak (Q), per self-terminology reform, refers to the estimation, e.g. via either interpolation, extrapolation, intuition, guesstimation, and or test-based gauge, etc., of one's own existence state intelligence quotient (IQ).

Overview

In 1995, a study of 46 male and 80 female students, who were asked to estimate their own IQ prior to completing the digit symbol and vocabulary tests from the Wechsler Adult Intelligence Scale (WAIS), found that men tend to over-estimate their IQ, and that women tend to under-estimate their own IQ. [1]

Quotes

The following are related quotes:

> “My IQ is H_2SO_4.”
>
> — Dr. Seuss (1930), *College Humor* [2]

> “I have always been somewhat precocious, both physical and mentally. My IQ stands somewhat above the average. So, it seems that from a hereditary point of view, nature was very kind to me.”
>
> — Martin King (1950), essay on the religious development of personality (penned at age 21)

> “My IQ is at least 180.”
>
> — Bertrand Russell (c.1960), attributed (Q); possibly apocryphal, being a mixture of his uberman theory, his "common man" (Q) quote, and his 180 Platt IQ (1962) estimate

> “My physics genius level is between 1.5 and 2.5.”
>
> — Lev Landau (c.1962), personal notes (see: Landau genius scale)

> “My IQ is somewhere between Dr. Seuss, who in 1931 claimed an IQ of H_2SO_4, and Dr. Faustus, who in 1514 sold his soul to the devil for truth, knowledge, and power; the embodiment of the latter found in the mind of Goethe, who in 1809 professed that he and his wife were like $CaCO_3$ (limestone), who when put into contact with H_2SO_4 (Captain) have no “choice” but to debond, and who in 1926 became the first ever person ranked [Cox] with an IQ of 225.”
>
> — Libb Thims (2013) YouTube post reply to query by Paul Rael, Aug [3]

References

1. Reilly, Jacqueline, and Mulhern, Gerry. (1995). “Gender differences in self-estimated IQ: The need for care in interpreting group data” (abs), *Personality and Individual Differences*, 18(2):189-92, Feb.
2. Lindemann, Richard. (2015). *The Dr. Seuss Catalog* (pg. 96). McFarland.
3. (a) Thims, Libb. (2013). Query: “Who are you, a professor somewhere? And what is your IQ?”; asked (Q) by Paul Rael, Aug.
(b) Note: variations of this "what is your IQ query" have been asked reoccurring since circa 2009 (see: Libb Thims (genius ranking)); draft answers prior have been attempted, this is the first one that seems to hold in the mind.

θΔics

In chemistry, **autocatalysis** is a type of catalysis in which a reaction is accelerated by one of its own products, so that a long time may elapse before anything happen, but if that product begins to form, or is introduced from without, the reaction goes faster and faster. [1]

Overview

In 1920, Austrian-born American physical chemist Alfred Lotka, student of Wilhelm Ostwald — the first to realize that a catalyst acts without altering the energy relations of the reaction, and that it usually speeds up a reaction by lowering the activation energy — was discussing mechanisms of coupled autocatalytic reactions. [4]

In 1925, American physical chemist Gilbert Lewis stated that autocatalysis "has not long been known". [1]

In 1952, Sergius Morgulis, in summary of Harold Blum (1951) and Alexander Oparin (1936), outlined a catalytic + free energy + feedback reaction model of the origin of life.

In 1961, Hungarian-born American anthropologist Steven Polgar, in his article “Evolution and the Thermodynamic Imperative”, seems to have labeled replication as “chromosomal autocatalysis”. [2]

In 1968, Dean Wooldridge was using autocatalysis as one of the hypothetical steps in the formation of the “living cells”, a step preceded by a reducing atmosphere, after which, as he states: [5]

> “The droplets that started as inert bags of chemicals could slowly lead to structures with properties of growth, metabolism, and reproduction at least crudely similar to those exhibited by modern single-celled organism.”

In 1995, American complexity theorist Stuart Kauffman constructed an entire book series around the premise of “auto-catalytic closure” and closed thermodynamic cycles in order to argue for the emergence of life from the periodic table of elements; event going so far as to posit a new fourth law of thermodynamics, framed around the notion of auto-catalysis. [2]

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2. (a) Polgar, Steven. (1961). “Evolution and the Thermodynamic Imperative”, *Human Biology*, pgs. 99-109.
(b) Steven Polgar (1931-1978) – eMuseum at Minnesota State University, Mankato.
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4. Hargittai, Istvan. (1992). *Spiral Symmetry* (pg. 224). World Scientific.
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Videos

â— Bawendi, Moungi. (2008). “Autocatalysis and Oscillators” (Ñº), Lec 36 | MIT 5.60 Thermodynamics and Kinetics, Spring.

External links

â— Autocatalysis – Wikipedia.

θΔics

In science, **automaton** (TR:86) is an animated figurine, typically of human or animal replica, made of mechanical or man-made electrochemical parts.

Related terms and or synonyms include: android, human machine, human motor, and or robot.

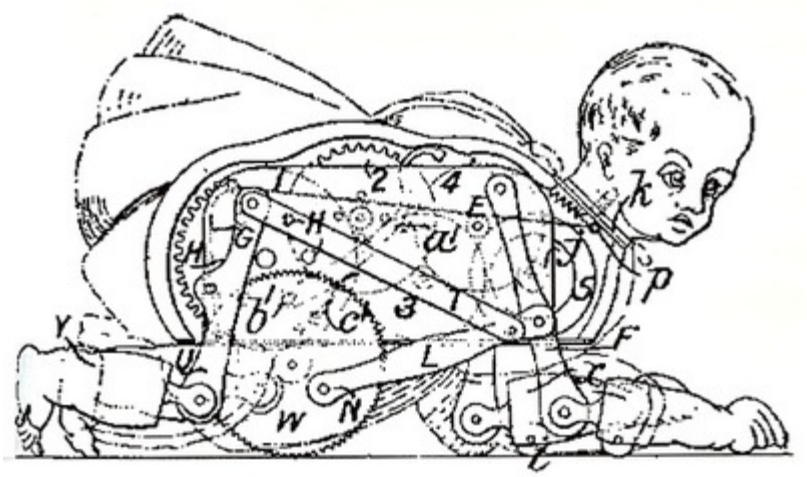

A nineteenth-century artistic rendition of an **automaton** baby doll. [3]

History

The origin of the first automaton is difficult to pin down, but they seem to have been first built by the Greeks.

In c.60AD, Hero, a Greek engineer, built a three-wheeled cart that could carry a group of automata to the front of a stage where they would perform for an audience. Power came from a falling weight that pulled on string wrapped round the cart's drive axle, a sort of string-based control mechanism; the following is one of his automata: [5]

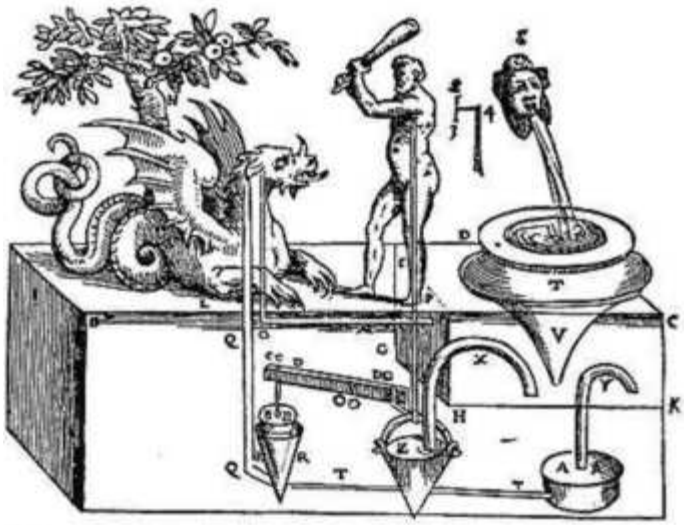

In c.1200, Al-Jazari (1136-1206) (Q), a middle eastern polymath, in his *Book of Knowledge of Engineering Tricks*, depicted a water clock with automated figurines: [7]

In 1540, Gianello Torriano, a Italian inventor, produced a number of automata, including a human-sized, lute-playing female.

In 1598, Tommaso Francini and Alessandro Francini, Florentine hydraulics engineering brothers, built a number of water-driven automata, in garden terraces at Saint-Germain-en-Laye, Paris, that turned around, played music, and even one where a hero slayed a rising dragon. (Q)

In 1644, Isaac de Caus, a French engineer, created a montage scene of a mechanical owl stalking a group of smaller birds.

In 1738, Jacques Vaucanson, a French inventor, famously made a flute player, a tambourine player, and digesting duck automaton; as shown below: [7]

In 1760, Friedrich von Knauss, an Austrian inventor, supposedly, created a mechanical doll that could write up to 107 different words via dictation. [6]

In 1774, Jaquet Droz (1721-1790) (Q), a French watchmaker, built three automata, including: “The Writer” (made of 6,000-pieces), “The Musician” (Q) (made of 2,500-pieces), and “The Draughtsman” (made of 2,000-pieces).

The Draughtsman (Q), shown above, is capable of drawing four different images: a portrait of Louis XV, a royal couple (believed to be Marie Antoinette and Louis XVI), a dog with "Mon toutou" ("my doggy") written beside it, and a scene of Cupid driving a chariot pulled by a butterfly.

Philosophy

In 1637, French philosopher René Descartes, in his *Discourse on Method*, set out to construct his own scientific system by studying himself and the world about him. One question Descartes posed to answer was if it was possible to construct a human replica, automaton (mechanical human) so that an external observer would not be able to tell the difference between the real emotional human and the purely mechanical version.

In this direction, Descartes reasoned that if one, schooled in the study of mechanics, constructed a human automaton which ‘walked, ate, breathed and, in a word imitated as much as possible all the other actions of (humans), including even the signs we use to express our passions, such as crying when struck, fleeing when a loud noise is made nearby, etc.’ that another person ‘would find it difficult to distinguish between real human beings and those who only had the same shape’.

As a rule of thumb, according to Descartes, there would be only two ways to distinguish the real human from the mechanical ones. Firstly, an automaton could never ‘arrange words in different ways to reply to the meaning of everything that is said in its presence’. Second, an automaton would never be able to ‘act on the basis of knowledge, but merely as a disposition of their organs.’ In short, an automaton could not react the way real humans could. [1]

'The Steam Concert', caricature of modern music from 'Un Autre Monde' (1844). [7]

Neumann's free energy automaton theory

See main: Neumann automaton theory

In 1948, American chemical engineer John Neumann famously put forward his thermodynamic-based electrical-chemical automaton theory, in which he envisaged a robot or automaton, made of wires, electrical motors, batteries, etc., constructed in such a way that when floating on a lake stoked with component parts, it will reproduce itself (self-replicate), albeit one that could be made to work only if a source of free energy is available. [2]

Other

In 1964, American physicist Jerome Rothstein set out to answer questions on free will and determinism, origin and fate of the universe, and causes and purposes in nature via thermodynamics, specifically modeling people as automatons or well-informed heat engines, where he concludes that some of these admit answers, whereas others admit violations answers that entail violations of the second law. [4]

Quotes

The following are related quotes:

> “I am an **automaton** endowed with power of movement, which merely responds to external stimuli beating upon my sense organs.”
>
> — Nikola Tesla (1900), “The Problem of Increasing Human Energy”

See also

- Animate engine
- Animate matter
- Animate molecule
- Animate thermodynamics

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External links

- Automaton – Wikipedia.

θΔics

In hmolscience, **autopoiesis** (TR:5), or what is “autopoietic”, from the Greek *poiesis* meaning "make or produce", as contrasted with *praxis* meaning "action", is a hypothetical attempt (Maturana, 1972) at a re-definition of a "living system" as a thing or system that automatically makes, creates, or produces, without any basis in external reference, environment, or external force, or something along these lines.

Overview

In 1972, Humberto Maturana, following a conversation with Francisco Varela, invented the word “autopoiesis”, from *auto*- “meaning” [add] + -*poiesis* “to make”, as follows:

> “The second essay included in this book [*Autopoiesis and Cognition*, 1973] was written in 1972, as an expansion of the section on 'Living Systems' in the 'Biology of Cognition'. The writing of this essay was in fact triggered by a conversation that Francisco Varela and I had in which he said: ‘If indeed the circular organization is sufficient to characterize living systems as unities, then one should be able to put it in more formal terms.’ I agreed, but said that a formalization could only come after a complete linguistic description, and we immediately began to work on the complete description. Yet we were unhappy with the expression 'circular organization', and we wanted a word that would by itself convey the central feature of the organization of the living, which is autonomy. It was in these circumstances that one day, while talking with a friend (Jose Bulnes) about an essay of his on Don Quixote de la Mancha, in which he analyzed Don Quixote's dilemma of whether to follow the path of arms (*praxis*, action) or the path of letters (*poiesis*, creation, production), and his eventual choice of the path of praxis deferring any attempt at poiesis, I understood for the first time the power of the word **‘poiesis’** and invented the word that we needed: **autopoiesis**. This was a word without a history, a word that could directly mean what takes place in the dynamics of the autonomy proper to living systems. Curiously, but not surprisingly, the invention of this word proved of great value. It simplified enormously the task of talking about the organization of the living without falling into the always gaping trap of not saying anything new because the language does not permit it. We could not escape being immersed in a tradition, but with an adequate language we could orient ourselves differently and, perhaps, from the new perspective generate a new tradition.”

In 1973, Maturana, and Varela, in their *Autopoiesis and Cognition: Realization of the Living*, attempt to re-define living systems NOT as objects of observation and description, nor even as interacting systems, but as “autopoietic” or self-contained unities whose only reference is to themselves, ones that are autonomous, self-referring and self-constructing closed systems, in short. [1]

The term "autopoiesis", in the 1970s and 1980s, seems to have had a certain popularity in melting pot theories, system theories, often being intermixed with dissipative structures theories, among others, before seemingly falling off, per reasons of solipsism, in the 1990s.

Quotes | On

The following are quotes on autopoiesis:

> “The autopoietic model is miraculously decoupled from the physical world by its progenitors... (and thus) grounded on a solipsistic foundation that flies in the face of both common sense and scientific knowledge.”
>
> — Rod Swenson (1992), “Galileo, Babel, and Autopoiesis (It's Turtles All The Way Down)” [2]

> “The term ***autopoiesis*** has been invented as a definition of life. Its origin is clearly biological. Its extension to other fields has been discussed, but rather unsuccessfully and on the basis of wrong premises.”
>
> — Niklas Luhmann (1980), “The Autopoiesis of Social Systems” (Ñº)

> “I am an atheist with no interest in reinserting classical teleology back onto the physical sciences. I don't think that current systems theory, complexity theory, dissipative systems theory, the **autopoiesis** metaphor, etc., adequately explain the special thermodynamic organization of living organisms. My attempt ‘teleodynamics’ IS consistent with the second law of thermodynamics (no magic). I argue that teleodynamics is just a special case of thermodynamics not some new physics.”
>
> — Terrence Deacon (2013), JDNM review, May 22

References

1. Maturana, Humberto and Varela, Francisco. (1973). *Autopoiesis and Cognition: the Realization of the Living* (autopoiesis, pg. xvii). D. Reidel.
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External links

â— Autopoiesis – Wikipedia.

θΔics

In thermodynamics, **available energy** is the greatest amount of mechanical work that can be obtained from a system or body, with a given quantity of substance, in a given initial state, without increasing its total volume or allowing heat to pass to or from external bodies, except such as at the close of the processes are left in their initial condition. In this definition, the initial state of the body is supposed to be such that the body can be made to pass from it to states of dissipated energy by reversible processes.

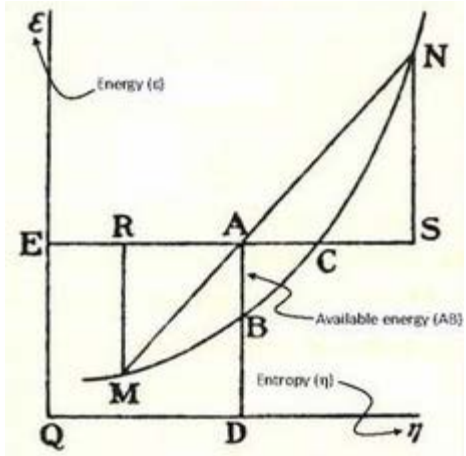

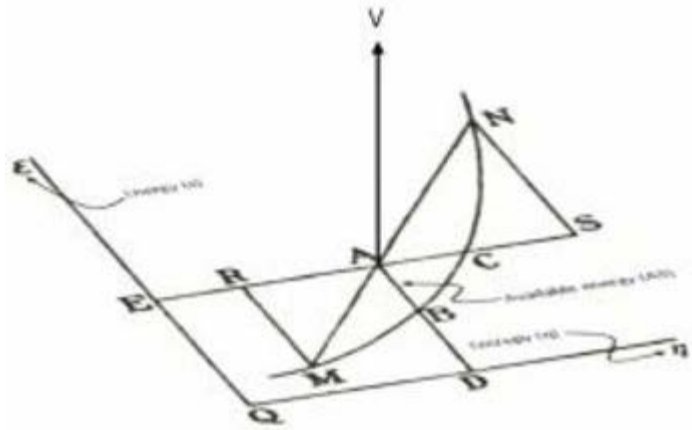

Left: American engineer Willard Gibbs' 1873 graph of the of the energy ε verses the entropy η of a body showing the **available energy** of a body, section AB, at an entropy of D, a type of energy that would famously be labeled as "free energy" by German physicist Hermann Helmholtz in 1882. [1] Right: Irish physicist James Maxwell's 1875 addition of the volume axis, shown perpendicular to the plane here, and used sunlight and shadows, to make a three-dimensional thermodynamic surface.

Overview

In 1873, American engineer Willard Gibbs, in his "A Method of Geometrical Representation of the Thermodynamic Properties of Substances by Means of Surfaces", introduced the definition of available energy; although, to note, it may have had an earlier etymology, as Gibbs seems to refer to an earlier use when he states “this [definition] has been called the *available energy* of the body”. [1] Gibbs' available energy came to be called “free energy” by German physicist Hermann Helmholtz in 1882. [2]

The graph made by Gibbs to illustrate his ideas, pictured adjacent and below, shows a plane perpendicular to the axis of *V* (volume) and passing through point A, which represents the "initial state" of the body. Qε and Qη are sections of the planes $\eta = 0$ and $\varepsilon = 0$, and therefore parallel to the axes of ε (internal energy) and η (entropy), respectively. Other sections, according to Gibbs, are:

MN = the section of the surface of dissipated energy.
AD = the energy of the body in its initial state.
AE = the entropy of the body in its initial state.
AB = its *available energy*.
AC = its *capacity for entropy*.

Here, Gibbs defines "capacity for entropy" as the amount by which the entropy of the body can be increased without changing the energy of the body or increasing its volume.

Mis-extrapolations | Humanities

As to the extrapolation of Gibbs’ conception of available energy in relation to human activity and in the thermodynamics of human social systems, the translation has often been lost in transit. To cite a classic example of mistranslation, in the 1971 book *The Entropy Law and the Economic Process*, Romanian mathematician Nicholas Georgescu-Roegen used references such as *Webster’s Collegiate Dictionary* to define entropy as the measure of unavailable energy in a closed thermodynamic system and the goes off the rails by stating that in the thermodynamical operation of a steam engine, where the heat from the burning coal flows into the boiler and out through the escaping steam:

> “At the beginning, the chemical energy of the coal is *free*, in the sense that it is *available* to us for producing some mechanical work. In the process, however, the free energy loses this quality, bit by bit. Ultimately, it always dissipates completely into the whole system where it becomes bound energy, that is, energy which we can no longer use for the same purpose.”

On this and other ill-contrived statements, Georgescu-Roegen, in his book, went on to build entropy-base theory of economics. This book soon thereafter seeded the careers of many burgeoning economists, such as American writer Jeremy Rifkin, who came to incorrectly view Georgescu-Roegen as a foremost thermodynamicist. This logic can now often be found in modern publications, by those arguing that we are depleting our free energies by the consumption of our oil-gas-coal natural fuels. This, however, is a huge mis-extrapolation of what constitutes “free energy” in a chemical system. [3]

References

1. Gibbs, J. Willard. (1873). "A Method of Geometrical Representation of the Thermodynamic Properties of Substances by Means of Surfaces" (pgs. 49-50), *Transactions of the Connecticut Academy*, II. pp.382-404, Dec.
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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (Google books). Morrisville, NC: LuLu.

Further reading

â— Burges, Edward A. (1959). *Available Energy and the Second Law Analysis* (available energy, 34+ pgs). Academic Press.

θΔics

In mate selection, **averageness** refers to the trend that average traits tend to be sexually selected for or more physically attractive on average, being that in theory they are indicative of long term stability in evolution. [1]

Beauty

Statistically, the average or blend of a given population for a given trait or look tends to be found the most visually appealing or attractive; the following, e.g., shows morphs of a selection of 30 HotOrNot.com photos, morphed into 1-10 scale physical attractiveness ranking tiers, along with a morph of the average of all 30 photos, which shows that the "average" morphology tends to be as attractive as the individually selected most attractive person (or morph photo):

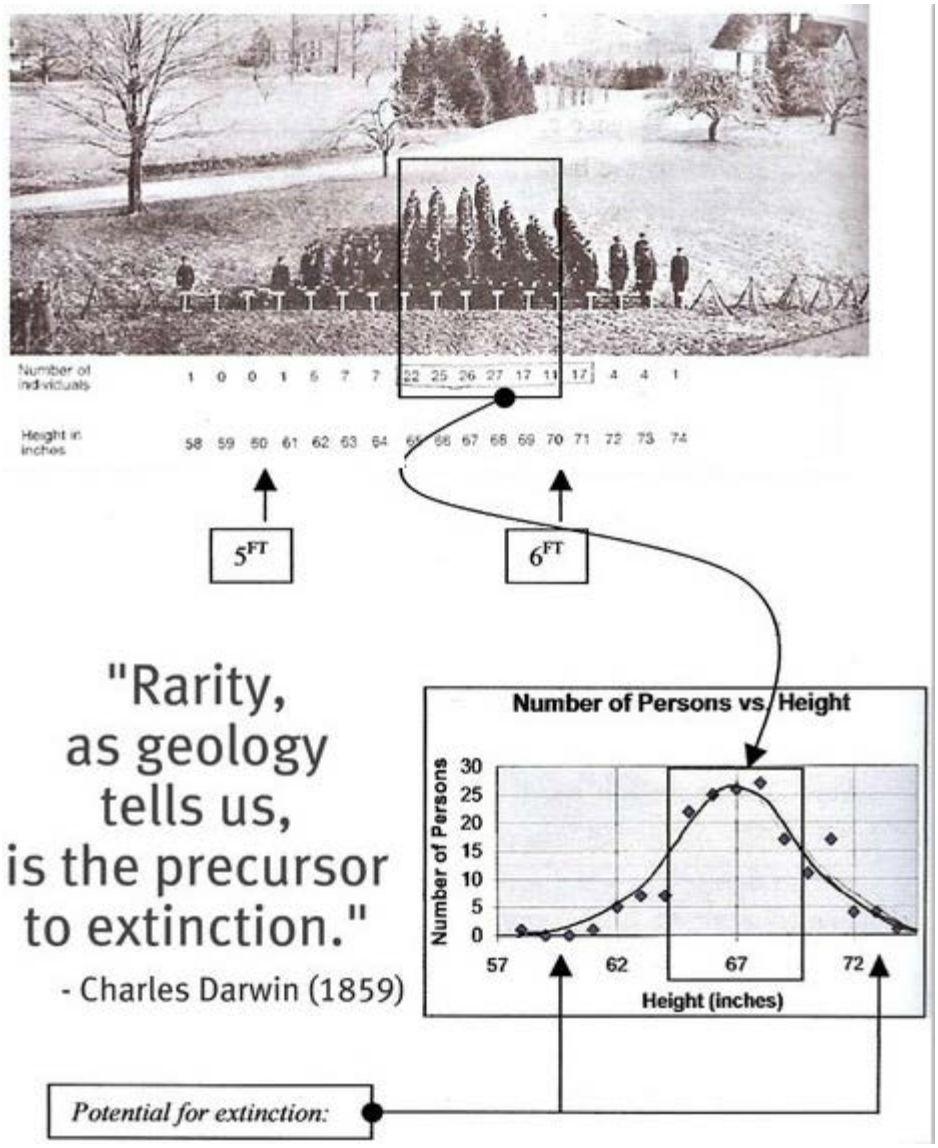

A distribution of heights of a company of American civil war solders, showing an **average** height of about 5'10".

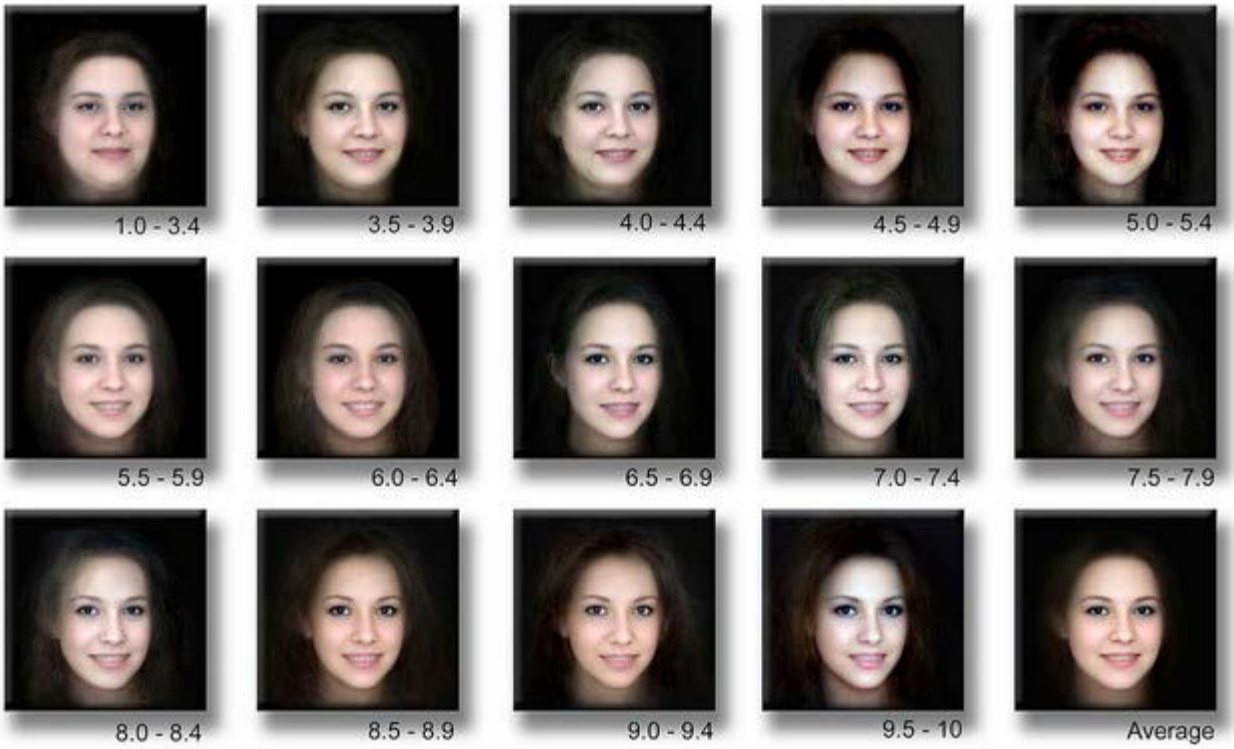

(add discussion)

Human chemistry

In human chemistry, averageness is theorized to be one of the measurable components of the enthalpy factors of the human chemical bond. [2]

Further reading

1. Rhodes, Gillian; Zebrowitz, Leslie, A. (2002). Facial Attractiveness - Evolutionary, Cognitive, and Social Perspectives (averageness as fundamental, pgs. 21, 28; average faces, attractiveness of, pgs. 61-62, etc.). Ablex.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (averageness, pgs. 97, 148-49, 271, 327; averageness factor, pg. 150) (preview), (Google books). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (averageness, pgs. 390, 500) (preview), (Google books). Morrisville, NC: LuLu.

External links

â— Averageness – Wikipedia.

θΔics

In existographies, **Averroes** (1126-1198) (IQ:175|#253) (Cattell 1000:347) [RGM:503|1,500+] (FA:38) (CR:16), aka “Ibn Rushd”, was an Andalusian polymath, a middle ages genius, noted for []

Aristotle

Averroes is generally known as the "commentator" of the work of Aristotle; he tried to reconcile the Quran with Aristotle.

Three impostors

Averroes is associated, by scholars including Pierre Bayle (1697) (Q) and Ernest Renan (1852), to have originated the “three impostors” hypothesis. [1]

Influenced

Averroes influenced: Dons Scotus (Q), Siger of Brabant, Lucilio Vanini, and Salman Rushdie, the latter of whom, of note, adopted the name “Rushdie” in honor of Averroes, aka Ibn Rushd.

Quotes | On

The following are quotes on Averroes:

> “**Averroes**, this great man, who had no religion, used to say that he preferred that his soul should be with the philosophers than with the Christians. Averroes called the Christian religion impossible because of the mystery of the Eucharist. He called that of the Jews a religion of children, because of the various precepts and legal obligations. He admitted that the religion of the Muslims, which looks only to the satisfaction of the senses, was a religion of swine?”
>
> — Author (c.1990), cited by A de. Libra (1996) [2]

Quotes | By

The following are quotes by Averroes:

> “The Christian religion is a false religion, by reason of the pretended mystery of the Eucharist; the Jewish religion is childish, for the many rites and ceremonies; lastly, the Mahometan religion is a hoggish religion, because of the carnal enjoyment which it permits and authorizes.”
>
> — Averroes (c.1180) [3]

> “Knowledge is the conformity of the object and the intellect.”
>
> — Averroes (c.1100), *Decisive Treatise and Epistle Dedicatory* (Q)

> “The world is divided into men who have wit and no religion and men who have religion and no wit.”
>
> — Averroes (c.1180), cited by Madalyn O’Hair (1991) in *The Atheist World* (pg. 46); variant said by Goethe and others

References

1. (a) Renan, Ernest. (1852). *Averroes et l'averroisme*. Publisher.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (Al-Ghazzali, pgs. 233-37; Averroes, pgs. 237-39; three impostors, pg. 332). HarperOne.
2. (a) Libera, A de. (1996). *Introduction to Averroes, Le Livre du didcours decisive* (quote, pg. 80-81). Garnier-Flammarion.
(b) Minois, Georges. (2009). *The Atheist's Bible: the Most Dangerous Book that Never Existed* (translator: Lys Weiss) (Averroes, 16+ pgs; quote, pg. 28). University of Chicago Press, 2012.
3. Translator. (1714). *The Life of Lucilio (alias Julius Caesar) Vanini: Burnt for Atheism at Toulouse with an abstract of his writings being the sum of the atheistical doctrine taken from Plato, Aristotle, Averroes, Cardano and Pomponazzius's philosophy with a confutation of the same; and Mr. Bayle's arguments in behalf of Vanini completely answered* (Amz) (pg. 24). Publisher, 1730.

Further reading

● Minois, Georges. (2009). *The Atheist's Bible: the Most Dangerous Book that Never Existed* (translator: Lys Weiss) (Averroes, 16+ pgs). University of Chicago Press, 2012.

External links

● Averroes – Wikipedia.
● Averroes – WikiQuote.

θΔics

In existographies, **Avicenna** (980-1037) (IQ:180|#129) (Cattell 1000:364) [RGM:307|1,500+] (GPhE:20±) (GCE:40±) (CR:23), aka "Ebn Sina" (Q), was a Persian physician, philosopher, chemist, and general polymath, cited by Leonardo Da Vinci who claimed to disprove his child birth soul origin theory, noted for []

Overview

Avicenna gained fame when, as a doctor, he cured the sultan of Bukhara, who rewarded Avicenna by giving him access to a considerable library, wherein he was attracted to a neo-Platonic reading of Aristotle, wherein, e.g., he learned to speak about an afterlife. [1]

Soul | Birth

In c.1500, Leonardo da Vinci, in his anatomical notes on child birth, specifically "Quaderni d' Anatomia III, 3 and 8 verso", stated the following: [2]

> "I reveal to me the origin of their second – first or perhaps second – cause of existence. Though these figures will be shown the cause of many dangers of ulcers and diseases. Division of the spiritual from the material parts. And how the child breathes and how it is nourished through the umbilical cord; and why **one soul governs two bodies**, as when one sees that the mother desires a certain food and the child bears the mark of it. And why the child [born] at eight months does not live. Here **Avicenna** contends that the soul gives birth to the body and every member, but **he is in error**.
>
> In the case of this child the heart does not bet and it does not breath because it lies continually in water. And it were to breathe it would be drowned, and breathing is not necessary to it because it receives life and is nourished from the life and food of the mother. And this food nourished such creature in just the same way as it does the other parts of the mother, namely the hands, feet and other members. And a single soul governs these two bodies, and the desires and fears and pains are common to this creature as to all the other animated members. And from this it proceeds tht a thing desired by the mother is often found engraved upon those parts of the child which the mother keeps in herself at the time of such desire; and a sudden fear kills both mother and child. We conclude therefore that a single soul governs the bodies and nourishes the two [bodies]."

(add)

Quotes | By

The following are quotes by Avicenna:

> "The knowledge of any thing, since all things have causes, is not acquired or complete unless it is known by its causes."
>
> — Avicenna (c.1020), *On Medicine* (Q)

> "It is not so easy and trifling to call me a heretic; no belief in religion is firmer than mine own. I am a unique person in the whole world, and if I am a heretic; there is no Muslim anywhere in the world."
>
> — Avicenna (c.1020), *Publication*; cited in "Salam: the First M*slim Nobel Laureate" (2018) as akin to Abdus Salam in situation and mindset [3]

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 230-31). HarperOne.
2. Da Vinci, Leonardo. (c.1518). *The Notebooks of Leonardo Da Vinci* (soul, pgs. 68-71). Arcturus, 2017.
3. Vandal, Omar; Thaver, Zakir. (2018). “Salam: the First M*slim Nobel Laureate” (quote @55:40-) (Q), Netflix.

External links

- Avicenna – Wikipedia.

θΔics

In science, **Avogadro's constant** or *number*, symbol *N* or N_A, is the number of atoms, molecules, or chemical entities in one mol of substance. [1] The modern definition of Avogadro's number is defined as the number of atoms in a twelve gram sample of carbon twelve, which is:

$$N_{\mathrm{A}} = 6.022 \times 10^{23} \left(\frac{entities}{mol} \right)$$

History

In 1811, Italian chemist Amedeo Avogadro, the eponym of the constant, advanced the hypothesis that all gases under the same conditions of temperature and pressure, in unit volume, have the same number of molecules.

In 1895, the term gram-molecule began to be truncated as 'mol' by Walther Nernst, a term introduced two years earlier by Wilhelm Ostwald. [2]

In 1909, French chemist Jean Perrin, in his "Brownian Motion and Molecular Reality", building on Albert Einstein's 1905 Brownian motion work, stated that Avogadro's hypothesis is equivalent to saying that 'any two gram-molecules contain the same number of molecules', and commented further by stated:

> "The invariable number N is a universal constant, which may appropriately be designated **Avogadro's constant**."

Perrin gave the following value: [3]

$$N = 70.5 \times 10^{22}$$

which, it seems, to the number of molecules in 32-grams of oxygen.

In 1911, Irish chemist Edmund d'Albe was defining the 'gram-molecule' as the number of hydrogen atoms in one gram of hydrogen to be: [6]

$$0.91 \times 10^{24}$$

In 1913, American chemist Robert Mulliken gave the following value: [4]

$$N = 60.62 \times 10^{22}$$

In 1914, American physicist Harvey Fletcher calculated the following value of Avogadro's constant for the number of molecules in a gram molecule of air: [5]

$$N = 60.3(\pm 1.2) \times 10^{22}$$

(add)

Sociological Avogadro's number

See main: Social Avogadro number

The first to make an attempt at representative particle unit number equivalent for sociological thermodynamics calculations was Hungarian sociologist Babics Laszlo who in 2003 calculated what he called a "sociological Avogadro's number" of A = 60. On the high end, Laszlo also notes that the mean population number (6.01E7 in 1992) for each of the top 87 of the world's countries could serve as a representative A, although he considers this value to be too high for meaningful calculations. [7]

American chemical engineer Libb Thims had discussed this same issue with Russian physical chemist Georgi Gladyshev during a meeting in Chicago in 2006, during which Thims alluded to the idea that the value should be around 1,000 and possibly be called the Gladyshev number (or Gladyshev constant), being that Gladyshev was the first to do some of the pioneering work in sociological thermodynamics calculations of Gibbs free energy, which has units of J/mol. In this sense, in order to make calculations of quantities such as Gibbs free energy, entropy, internal energy, or enthalpy, for social processes, one first has to redefine the idea of the 'gram-molecule' for systems, groups, or masses of humans.

The central issue here is that humans aren't typically measured in groups by mass. In short, the standard SI base unit for 'amount of substance' is not applicable to calculations of reactions involved in larger systems of interacting humans. One could say, for instance, that in a 1,000-kg sample of average humans (70-kg) that there are about 14 human molecules on average. Using an alternative methodology, for instance, one could use the figure of 477, being the average number of students in a typical US elementary school in the 2001-2001 school year, as a representative Avogadro number for humans. Noting there various alternatives, the issue seems to require more thought.

References

1. Daintith, John. (2005). *Oxford Dictionary of Science.* Oxford University Press.
2. (a) Nernst, Walther. (1895). *Theoretical Chemistry: from the Standpoint of Avogadro's Rule & Thermodynamics.* MacMillan and Co.
(b) Ostwald, Wilhelm. (1893). *Hand- und Hilfsbuch zur ausführung physiko-chemischer Messungen* (*Handbook and Support for Making Physico-Chemical Measurements*). Leipzig. p.119.
3. (a) Perrin, Jean. (1909). "Brownian Motion and Molecular Reality" *(*"Mouvement brownien et réalité moléculaire"), Annales de Chimie et de Physique, 18: 1–114.
(b) Engl. Trans. by Frederick Soddy (London: Taylor and Francis, 1910) [Excerpt: sections 1-6 complete (from: David M. Knight, ed., Classical Scientific Papers: Chemistry (New York: American Elsevier, 1968) and the abridgment reprinted in Henry A. Boorse & Lloyd Motz, The World of the Atom, Vol. 1 (New York: Basic Books, 1966)].
4. Mulliken, Robert. (1913). "Article", *Ann. d. Phys*. 41: 759-.
5. Fletcher, Harvey. (1914). "Determination of Avogadro's Constant *N* From Measurements of the Brownian Movements of Small Oil Drops Suspended in Air", *Physical Review*, 4: 440-53.
6. D'Albe, Edmund. (1911). *Contemporary Chemistry* (gram-molecule, pgs. 69-70). D. Van Nostrand Co.
7. (a) Laszlo, Babics. (2003). "A Tomegtarsadalmak Mechanikajaes Termodinamikaja", 92-page manuscript. Feb 10.
(b) Laszlo, Babics. (2010). "The Mechanics and Thermodynamics of Mass Societies", *Journal of Human Thermodynamics*, Vol. 6, pgs. 39-46, Aug.

External links

â— Avogadro constant – Wikipedia.

θΔics

In chnopsology, **Axel Kleidon** (c.1960-) is a German physical meteorologist noted for his view that: [1]

> "Biological activity increases the entropy production of the entire planetary system, both living and non-living."

Kleidon was one of the editors, along with Ralph Lorenz, of the 2004 collaborative book *Non-Equilibrium Thermodynamics and the Production of entropy: Life, Earth, and Beyond*. [2]

Education

Kleidon completed his BS in physics in 1992 at the University of Hamburg, Germany, his MS in physics in 1994 at Purdue University, Indiana, and his PhD in meteorology in 1998 at the University of Hamburg, Germany.

See also

- MaxEnt school
- Principle of maximum entropy production

References

1. (a) Kleidon, Axel. (2004). "Beyond Gaia: Thermodynamics of Life and Earth System Functioning", *Climatic Change*, 66:271-319.
(b) Deacon, Terrence W. (2011). *Incomplete Nature: How Mind Emerged from Matter* (pg. 268). W.W. Norton & Co.
2. Kleidon, Axel and Lorenz, Ralph. (2004). *Non-Equilibrium Thermodynamics and the Production of entropy: Life, Earth, and Beyond*. Springer.

External links

- Axel Kleidon (faculty) – Max Planck Institute for Biogeochemistry.
- Kleidon, A. (Axel) – WorldCat Identities.

θΔics

In existographies, **Ayaan Hirsi Ali** (1969- ACM) (RGM:521|1,500+) (FA:159) (CR:9) is a Somali-born Dutch-American Ex-Muslim turned democracy-pro, female rights and secularism-atheism activist, characterized a "little Voltaire" (Ellian, 2001), noted for []

Name

Ali was born, 13 Nov 1969, with the name “Ayaan, daughter of Hirsi, son of Magan”, her father’s Somali subclan named “Osman Mahamud”, and her paternal grandfather’s birth name being “Ali”, hence her birth name being “Ayaan Hirsi Magan”, in Western style.

On 24 Jul 1992, Ayaan, in efforts to avoid an arranged marriage, formulated by her father, made her way covertly into Holland, wherein, during the refugee registration process, she changed her name, using her paternal grandfather’s birth name as her new surname, to “Ayaan Hirsi Ali”, as she is now famously known, and her birth date to 13 Nov 1967, so that her family and her new arranged marriage family wouldn’t be able to track her down. [1]

Deconversion

In May 2002, Ali, following the shakeup of 9/11, read the first four pages of a little brown book called *The Atheist Manifesto* (1995), by Herman Philipse, given to her by her friend Marco, after an argument they were having, and therein decided she was an atheist. To confirm, a few days later, she looked at herself in the mirror and said "I don't believe in god" in Somali. She said it felt right. [1]

After this, she read Benedict Spinoza, John Locke, Immanuel Kant, John Mill, Voltaire, Bertrand Russell and Karl Popper.

On 29 Aug 2004, Ali's 10-minute film *Submission* (Ñº) was aired on the Dutch public broadcasting network — done while working with writer and director Theo van Gogh (1957-2004) (Ñº), wherein she wrote the script and provided the voiceover — which criticized the treatment of women in Islamic society, wherein scenes of actresses portraying Muslim women suffering abuse, dressed in a semi-transparent *burqa* were shown with texts from the Quran, written on the skin, interpreted as justifying the subjugation of Muslim women. After the film's release, both Ali and van Gogh received death threats.

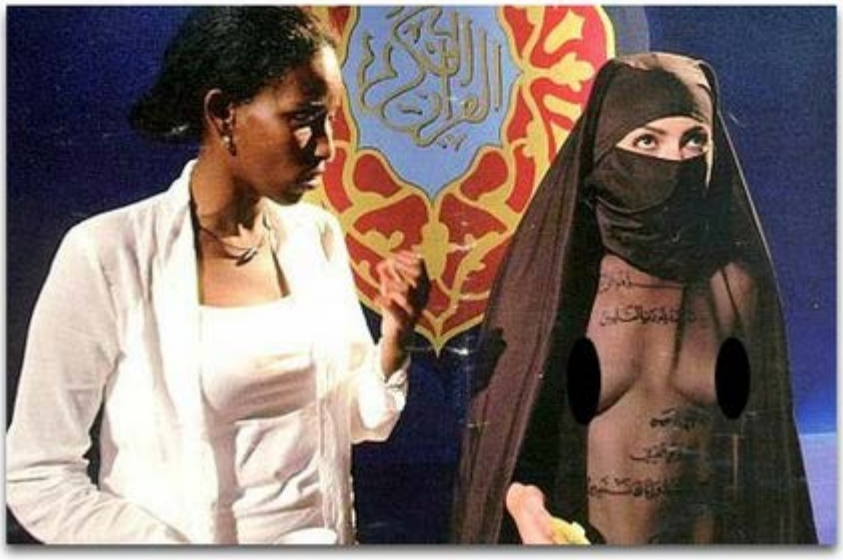

In Aug 2004, the film *Submission*, written by **Ali** and directed by Theo van Gogh (1957-2004), was released on Dutch television, wherein the sub-human treatment of woman in Islamic cultures, justified by the Quran, was criticized; three months later van Gogh was stabbed to death, and to his body was affixed a note stating that "Ali will be next".

On 2 Nov 2004, van Gogh, while biking to work at 9AM, was shot 8 times, semi-decapitated, stabbed in the chest, by a 26-year-old Mohammed Bouyeri, a radical Dutch Sunni, to which a note was affixed to his body stating that Ali would be next.

In 2007, Ali was forced to leave Holland and go to America, because the Danish government said the show was costing to much, a reference to the cost to protect her.

Muslim angels | Christian angels

In 2001, Ali amid her discussion of her 10-year deconversion from Muslim to openly secular to internally atheist, engaged in dialogue (pg. 274) with Abshir, a young Somalian imam, about to undergo heart surgery, on the difference between the two types of angels, Muslim angel vs Christian angel:

> Ali: “If I’m questioning the holiness of the Quran, that means I also question the existence of hell and heaven.”
> Abshir: “That’s impossible.”
>
> Ali: “It’s not just that. All these angles and djinns—I may be very underdeveloped in my understanding of the exact sciences, but I still see no proof of their existence.”
> Abshir: [no comment]
>
> Ali: “Abshir, looking at the paintings here in the west, are these the angels, beings in white dresses with chubby cheeks?”
> Abshir: “No, Muslim angels are totally different. **They don’t have wings**!”

Ali also gives the following background story (pg. 313) on the fall of Satan in respect to what this has to do with “submission” and why Muslims tend to never question the word of Allah:

> “The Quran tells a vivid story about how Satan was expelled from the realm of angels after Allah created Adam. Allah ordered all the angels to bow to Adam, but Satan refused to obey. He talked back to Allah: Why should he, an elevated angel, bout down to creature mad of mud? Allah threw Satan out of paradise, and from then on Satan has tried to lure Adam and his offspring from the ‘straight path’. For a human to doubt any of Allah’s rules is to fall into Satan’s clutches.”

Another point she brings up is that Muslims are taught that, throughout their days, one angel sits on their left shoulder recording their sins, while another angel sits on their right shoulder recording their good deeds, and who she carried this belief with her into her 30s, prior to her deconversion.

Quotes | On

The following are quotes on Ali:

> “I point out that **Ayaan Hirsi Ali** was given an IQ test in the Netherlands and did very poorly. Yet, it’s hard to imagine someone brighter.”
>
> — Jason Richwine (2008), panel, at the American Enterprise Group, discussing (Ñº) new book by Mark Krikorian, director of Center for Immigration Studies; see: mislabeled geniuses and IQ test

Quotes | Racism

The following are quotes by Ali on racism:

> “This obsession with racism, which I saw so often among Somalis, is really a comfort mechanism, to keep people from feeling personally inadequate and to externalize the causes of their unhappiness.”
>
> — Ayaan Ali (2007), *Infidel* (pg. 232); reflection on how her refugee friend Naima would complain about assumed “Dutch racism”, e.g. that Dutch train conductors supposedly looked longer at the student transport cards of “dark girls” as compared to “white girls”.

> “We are all racist. Racism is a universal trait.”

— Ayaan Ali (2017), “Interview with Islamic SJW Apologist” (time), response to are you are you Islamophobic? Are you anti-Semitic?, Apr 1

Quotes | By

The following are noted quotes:

“If I fall down dead right now, then at least I’ve seen the world.”

— Ayaan Ali (1991), *Infidel* (pg. 193); on her 6 Aug Dutch immigration Service interview, amid her escape to Holland, where she picked a new name, and cut ties with her old world

“Look at how many Voltaires the west has. Don’t deny us the right to have our Voltaire, too. Look at our women, and look at our countries. Look at how we are all fleeing and asking for refuge here, and how people are now flying planes into buildings in their madness. Allow us a Voltaire, because we are truly living in the Dark Ages.”

— Ayaan Ali (2001), opinion voiced at the debate “The West or Islam: Who Needs a Voltaire?”, The Balie debate house, Amsterdam, Nov [1]

“It’s my religion too, and if I want to call it backwards I will do so. Yes, Islam is backwards!”

— Ayaan Ali (2002), Dutch TV debate, Aug [1]

“Islam is like a mental cage. At first, when you open the door, the caged bird stays inside: it is frightened. It has internalized its imprisonment. It takes time for the bird to escape, even after someone has opened the doors to its cage.”

— Ayaan Ali (2002), Dutch TV program about women in Islam, Aug; in *Infidel* (pgs. 285-86)

“In Saudi Arabia, everything bad was the fault of the Jews. When the air conditioner broke or suddenly the tap stopped running, the Saudi women next door used to say the Jews did it. The children next door were taught to pray for the health of their parents and the destruction of the Jews. Later, when we went to school, our teachers lamented at length of all the evil things the Jews had done and planned to do against Muslims. When they were gossiping, the women next door used to say, ‘she’s ugly, she’s disobedient, she’s a ***** —she’s sleeping with a Jew.”

— Ayaan Ali (2007), *Infidel* (pg. 47)

“Some time after we moved to Riyadh we started school, real school, in the morning and Quran school in the afternoon. But real school in Saudi Arabia was just like madrassah. We studied only Arabic, math, and the Quran, and the Quran must have taken up four-fifths of our time.”

— Ayaan Ali (2007), *Infidel* (pg. 49)

“In Saudi Arabia, everything bad was the fault of the Jews. When the air conditioner broke or suddenly the tap stopped running, the Saudi women next door used to say the Jews did it. The children next door were taught to pray for the health of their parents and the destruction of the Jews. Later, when we went to school, our teachers lamented at length of all the evil things the Jews had done and planned to do against Muslims. When they were gossiping, the women next door used to say, ‘she’s ugly, she’s disobedient, she’s a ***** —she’s sleeping with a Jew.”

— Ayaan Ali (2007), *Infidel* (pg. 47)

“People had contested the whole basis of the idea of God's power on earth, and they had done it with reasoning that was beautiful and compelling. Darwin said creation stories were a fairy tale. Freud said we had power over ourselves. Spinoza said there were no miracles, no angels, no need to pray to anything outside ourselves: God was us, and nature. Emil Durkheim said humans fantasized religion to give themselves a sense of security. I read all this, and then had to try to stuff it all behind the little shutter in my brain.”

— Ayaan Ali (2007), *Infidel* (pg. 239); reflection on her 1995 deconversion readings

“Dutch society worked without reference to god, and it seemed to function perfectly. This man-made system of government was so much more stable, peaceful, prosperous, and happy than the supposedly god-devised systems I had been brought up to respect.”

— Ayaan Ali (2007), *Infidel* (pg. 240)

“I was enamored with the idea that you should think precisely and question everything and build your own theories.”

— Ayaan Ali (2007), *Infidel* (pg. 248); on reading western books

“Bin Laden's quotes from the Quran resonated in my brain: "When you meet the unbelievers, strike them in the neck." "If you do not go out and fight, God will punish you severely and put others in your place." "Wherever you find the polytheists, kill them, seize them, besiege them, ambush them." "You who believe, do not take the Jews and Christians as friends; they are allies only to each other. Anyone who takes them as an ally becomes one of them. " Bin Laden quoted the hadith: "the hour of judgment will not come until the Muslims fight the Jews and kill them".”

— Ayaan Ali (2007), *Infidel* (pg. 271); reflection on hearing Osama Bin Laden’s videos on CNN and Al-Jazeera, following 9/11

“It takes a long time to dissolve the bars of a mental cage.”

— Ayaan Ali (2007), *Infidel* (pg. #309)

“I read Alexis de Tocqueville [RGM:322|1,300+] (*Democracy in America*, 1840) (Ñº), and I read about democracy, and I lived in countries that had no democracies, that had no founding fathers, so I don’t find myself in the same luxury as you do. You grew up in freedom, and you can spit on freedom, because you do not know what it is not to have freedom.”

— Ayaan Ali (2017), “Interview with Islamic SJW Apologist” (6:57-7:16) (Ñº), Apr 1

“There’s no Islamophobia. It’s a myth.”

— Ayaan Ali (2017), “Interview with Islamic SJW Apologist” (3:56-58) (Ñº), Apr 1

References

1. Ali, Ayaan. (2007). *Infidel* (name, pgs. 3, 17, 193; debate, pg. 274; little Voltaire, pg. 275; atheism, pg. 281; backwards, pg. 289). Simon & Schuster.

Further reading

â— Ali, Ayaan. (2015). *Heretic: Why Islam Needs a Reformation Now*. Publisher.

External links

â— Ayaan Hirsi Ali – Wikipedia.

θΔics

In existographies, **Ayn Rand** (1905-1982) (IQ:160|#538) [RGM:456|1,500+] (GFG:18) (CR:34) was a Russian-born American "vulgar philosopher" (Solomon, 1981), extreme atheist and activist, and semi-ranked smartest woman ever, noted for her applied atheism philosophy of objectivism, which argues that because each of us is born into a godless world "alone", each of us therefore is "justified in pursuing our own self-interests", much of which is outlined in her 1957 magnum opus *Atlas Shrugged*. [1]

Difficulties on theory

While Rand is correct in her godlessness, a salient difficult in her progressiveness of this knowledge, is that we do not come into the world "alone", remain alone, and dereact (die) alone, but rather in infancy, in adulthood, and in old age, we "find ourselves essentially linked to other people", as Robert Solomon points out. [2] Rand's objectivism philosophy, in other words, lacks an understanding of "linking" (or bonding), i.e. human chemical bonding, the exchange force nature thereof, and the Goethean daimonic principle, aka the Adamsian waves and tides theory, among other issues associated with human coupling theory (see: free energy coupling).

Quotes | By

The following are related quotes:

> "If devotion to truth is the hallmark of morality, then there is no greater, nobler, more heroic form of devotion than the act of a man who assumes the responsibility of thinking. The alleged short-cut to knowledge, which is faith, is only a short-circuit destroying the mind."
>
> — Ayn Rand (1957), *Atlas Shrugged* (Ñº)

> "If any civilization is to survive, it is the morality of altruism that man have to reject."
>
> — Ayn Rand (c.1960) (Ñº)

> "You are never called upon to prove a negative; that is a law of logic."
>
> — Ayn Rand (1979), response to being asked (V) if the reason she does not believe in the existence of god was because that you can't prove that such an "entity, being, or energy" exists, by Phil Donahue; to which she responded that there is no proof and no one can give such a proof

> "The three As: Aristotle, Aquinas, and Ayn Rand, speaking in big terms, are the three main philosophers who have identified important philosophical truths."
>
> — Ayn Rand (c.1970), *Interview Q&A* (Ñº); cited by Chris Sciabarra (1995) in *Ayn Rand: the Russian Radical* (pg. 12)

References

1. Atlas Shrugged – Wikipedia.
2. Solomon, Robert C. (1981). *Love: Emotion, Myth, & Metaphor* (Goethe, 7+ pgs; quote, pg. 25; *Elective Affinities*, pg. 38). Prometheus Books, 1990.

External links

â— Ayn Rand – Wikipedia.

θΔics

In religions, **B-ra-hma-ic theologies**, a subset of Ra theology, refers to the set of religions centered around the theory that all humans are descendant from the creator god Brahma, the Vedic version (1000BC) of the family structure of Egyptian sun god Ra, whose name reads etymologically as 'Father (B) – Ra (ra) – son of Nun (hma)', which includes the following modern-day religions: [1]

Brahmaic religions			World beliefs
B-**ra**-hma-ic faiths:	Brahma	Hindu 13%, Buddism 6%, Sikhism 0.4%, and Jainism 0.07%.	20%

Morality

The morality system practiced in these religions is a cyclical reincarnation version of the negative confessions morality system.

References

1. Thims, Libb. (2003). *Human Thermodynamics, Volume 3*. Unpublished manuscript. IoHT publications.

External links

â— Brahma - Wikipedia

θΔics

In religio-mythology, **Ba**, one of the seven main parts (see: Egyptian model of human) of the human in Egyptian mythology (compare: ka), the precursor to the Christian concept of the soul, is a thing conceptualized as that part of a person that had existence after death; oft-depicted as a bird with a human head.

The basic visual depiction of the **Ba**, a bird with a human head. [1]

Overview

In 1978, Anthony Mercante, in his *Who's Who in Egyptian Mythology*, a basic dictionary of sorts, defined Ba as follows: [1]

> "**BA**: the soul, or that part of a person that had eternal existence after death. The Ba, closely associated with the Ka (each person's double) and the Ab, or heart, was one of the principal elements of the life in man. The Ba amulet was in the form of a man-headed hawk wearing a beard. After death, the Ba was believed to visit its body in the tomb. Many graves had narrow passages in the pits so that the Ba might find its way there. In the Pyramids of Me roe, openings were left in the stone coverings near the apex so that the Ba might enter them, and a ledge to stand on was placed beneath each opening. In the *Book of the Dead* the Ba is seen visiting its body, to which it presents the symbol shen, symbolic of eternal life. The final union of all souls with their bodies was believed to take place in the heavenly Anu Heliopolis. Small figures of the Ba made of gold and inlaid with semiprecious stones were placed on the breast of the mummy in the hope of preserving it from decay."

(add summary)

Quotes

The following are related quotes:

> "As their lives and loves survive in memory among their offspring, their ka souls will continue to shine from the shadow play among the **ba** structures of this book."
>
> — Karl Luckert (1991), "In Memory" of father Wilhelm G. Luckert, whose "restless mind harbored questions and doubts which the Karl imbibed in childhood", and mother Emilie Luckert-Hilt, who passed while book was going to press; note: he seems to have "ka" incorrectly associated with soul, whereas correctly the "ba" is typically translated as soul [2]

References

1. Mercante, Anthony S. (1978). *Who's Who in Egyptian Mythology* (editor and reviser: Robert Bianchi) (ka, pg. 81; ba, pg. 19). Metro Books, 1995.
2. (a) Luckhert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective* (pg. viii). SUNY Press.
(b) Mercante, Anthony S. (1978). *Who's Who in Egyptian Mythology* (editor and reviser: Robert Bianchi) (ka, pg. 81; ba, pg. 19). Metro Books, 1995.

External links

â— Ba (section) – Wikipedia.

θΔics

In hmolscience, **Babics Laszlo** (1944-) is a Hungarian sociologist noted, in human thermodynamics, for his 2003 effort to calculate an hmol, i.e. a mole of humans studied in mass, thermodynamically.

Overview

In 2003, Laszlo, in his "The Mechanics and Thermodynamics of Mass Societies", speculated on topics such as the volume of society (social volume), social acceleration due to gravity, and potential energy and entropy of society.

Of interest, Laszlo makes an attempt at a calculation of a sociological version of sociological Avogadro's number, i.e. a social Avogadro number or hmol, which he calculates to be A = 60 individuals, which is needed as a basis in sociological thermodynamics calculations, as well as a sociological version of the Boltzmann constant. [1]

In 2014, Marc Donohue and Richard Kilburg cited Laszlo in support of their human behavior = molecular behavior assertions. [2]

Education

Laszlo graduated from Eotvos Lorand University (Universitas Budapestiensis de Rolando Eotvos Nominata), Budapest, Hungary in 1974.

References

1. (a) Laszlo, Babics. (2003). "A Tomegtarsadalmak Mechanikajaes Termodinamikaja", Manuscript. Feb 10.
(b) Laszlo, Babics. (2003). "The Mechanics and Thermodynamics of Mass Societies" (84-pages) (Hungarian → English), SocialThermodynamics.hu.
(c) Laszlo, Babics. (2003). "The Mechanics and Thermodynamics of Mass Societies", English trans. by Vera Tanczos, 85-pages.
(d) Laszlo, Babics. (2010). "The Mechanics and Thermodynamics of Mass Societies", *Journal of Human Thermodynamics*, Vol. 6, pgs. 39-46, Aug.
2. Kilburg, Richard R and Donohue, Marc D. (2014). "Leadership and Organization Behavior: a Thermodynamic Inquiry" (analogy, pg. 266), *Consulting Psychological Journal: Practice and Research, Special Issue: the Physics of Leadership and Organizational Structure* (abs) (Ñº) (main), 66(4):261-87.

θΔics

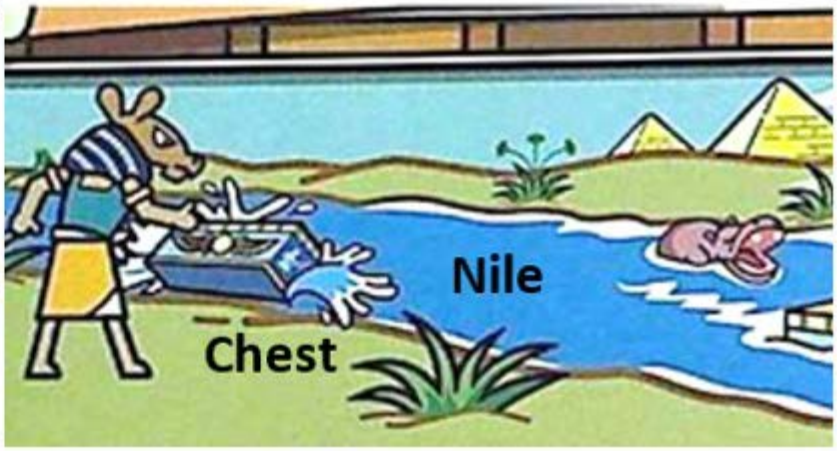

In religio-mythology, **baby in basket on river** is a reoccurring aspect of Osiris legend (see: Osiris rescripts), wherein a new god as baby is said to have been "exposed in his infancy upon the Nile", generally placed there in a "reed basket", "ark", or "chest", and set afloat, the most famous retelling of which being the birth of Moses.

Egypt | Osiris

In c.3000BC, in Osiris mythology, Osiris, while not being born in a reed basket and set afloat on the Nile River, is tricked, during his "last supper", by his brother Set into getting into a "chest", specifically designed for his body's dimensions, and thrown into the Nile, and eventually washing ashore in Byblos, where it regrew into a magnificent evergreen tree (see: Christmas tree), symbolic of the reborn Osiris as djed pillar. Osiris was the resurrected and therein, during the act of the black rite, gave birth (see: Virgin Birth) to the new divine king Horus. As Egyptian power and cultural influence spread over time, cross-culturally (see: histomap), this Egyptian river death, resurrection, god sun rebirth motif was transmitted, rescripted, and retold, presumably as a motif for god son like ruling power, or something to this effect.

Akkad | Sargon

In c.2300BC, the semi-legendary figure of Sargon of Akkad, the supposed first ruler of the Semitic-speaking Akkadian Empire; in 700BC, neo-Assyrian texts were penned associating him with the birth in basket legend:

> "My mother was a high priestess, my father I knew not. The brothers of my father loved the hills. My city is Azupiranu, which is situated on the banks of the Euphrates. My high priestess mother conceived me, in secret she bore me. **She set me in a basket of rushes**, **with bitumen she sealed my lid**. **She cast me into the river which rose over me**. The river bore me up and carried me to Akki, the drawer of water. Akki, the drawer of water, took me as his son and reared me. Akki, the drawer of water, appointed me as his gardener. While I was a gardener, Ishtar granted me her love, and for four and ... years I exercised kingship."

In 1909, Otto Rank noted the basket on water birth overlap between Sargon, Moses, and Oedipus. Joseph Campbell also made comparisons.

Greece and Roman | Dionysus and Bacchus

> *See main: Osiris, Dionysus-Bacchus, and Moses*

In c.1650, Samuel Bochart noted that both Bacchus, the Roman version of Dionysus, who is the Egyptian version of Osiris, had the baby put in ark on the waters motif in their story: (Ñº)

> “Both Bacchus and Moses were born in Egypt, **shut up in an "ark," and put on the waters**. Both fled from Egypt toward the Red Sea and had serpents (in Moses' case, a bronze serpent). For both, water flowed from a rock and milk and honey were provided. Both were called legislators, turned sticks into snakes, saw light in the darkness, and had unknown tombs.”

Others, such as Voltaire (c.1769), William Hort (1802), Edward Stillingfleet (1817), and many others, would document over trait overlaps between the three.

In 1949, N.M. Holley gave the following table of “floating chest” motifs in Greek mythology alone: [1]

	Child	Mother	Divine Father	Embarkation	Disembarkation
1.	Perseus	Danae	Zeus	Argos	Seriphus
2.	Telephus	Auge	Hercules	Tegea	Mysia
3.	Dionysus	Semele (dead on arrival)	Zeus	Thebes	Prasia in Laconia
4.	Anios (born after arrival)	Rhoio	Apollo	Uncertain	Delos
5.	Tennes (young man)	Hermithea (sister)	Apollo	Colonae in Troad	Tenedos

In 2014, Dorothy Murdock, in her *Did Moses Exist? The Myth of the Israelite Lawgiver* (pg. 201), which, to note, is the top Google Books search (Jul 2017) return for keys: “Osiris, Dionysus, Bacchus, Moses” (Ñº), elaborates on the Osiris-Moses connection in extended format (Ñº); herein, she gives (pgs. 331-33) 18+ Dionysus-Bacchus and Moses overlaps, the top five of which are as follows:

> 1. Like the Hebrew prophet, Dionysus was said to be born in or near Egypt, reflected in the epithet Nilus or "of the Nile."
> 2. **Dionysus was "saved from the waters" in a small box or chest.**
> 3. Bacchus's epithet was "Mises," similar to "Moses."
> 4. The Greek god was said to be "Bimater" or to have two mothers, like Moses with his birth and adoptive mothers.
> 5. Dionysus was "brought up near a mountain of Arabia called Nisa," comparable to Mt. Sinai, where Moses spent many years.

We also note that Moses had a brother and sister, Aaron and Miriam. In Hebrew 'aron' means chest, ark or box, and Miriam can be easily seen as connected to Maria, Mary and the notion of waters. (Ñº)

Quotes

The following are related quotes:

> “A similar exposure of a **baby in a reed basket** has been ascribed to the first Mesopotamian imperialist, Sargon of Akkad, the lither historical weight of this Moses story will have to be adjusted downward.”

— Karl Luckert (1991), *Egyptian Light and Hebrew Fire* (pg. 122) [2]

References

1. Holley, N.M. (1949). “The Floating Chest” (Ñº), *The Journal of Hellenic Studies*, 69:39-47.
2. Luckhert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective* (pg. 122). SUNY Press.

θΔics

In mythology, **Babylonian mythology**, a subset of Mesopotamian mythology (Q), which includes: Sumerian mythology, Akkadian mythology, and Assyrian mythology, refers to []

Overview

In 1908, Samuel Driver (Q), noted Old Testament scholar, stated that Babylonian mythology and Hebrew mythology, and their concordant flood stories, are derived from the same original:

> "The Babylonian narratives are both polytheistic, while the corresponding biblical narratives (Genesis 1 and 6-9) are made the vehicle of a pure and exalted monotheism; but in spite of this fundamental difference, and also variations in detail, the resemblances are such as to leave no doubt that **the Hebrew cosmogony and the Hebrew story of the Deluge are both derived ultimately from the same original as the Babylonian narratives**, only transformed by the magic touch of Israel's religion, and infused by it with a new spirit."
>
> — Samuel Driver (1908), *Modern Research as Illustrating the Bible*

In 1916, Leonard King (Q), the former Assistant Keeper of Egyptian and Assyrian Antiquities at the British Museum and professor of Assyrian and Babylonian archaeology at the University of London, King's College, in his *Legends of Babylon and Egypt in Relation to Hebrew Tradition*, building on Driver (1908), opened to the following accepted connection between the Hebrew flood story and the Babylonian flood story:

> "The Babylonian account of the Deluge, which was discovered by George Smith in 1872 on [700BC] tablets from the Royal Library at Nineveh, is, as you know, embedded in a long epic of twelve Books recounting the adventures of the Old Babylonian hero Gilgamesh. Towards the end of this composite tale, Gilgamesh, desiring immortality, crosses the Waters of Death in order to beg the secret from his ancestor Ut-napishtim, who in the past had escaped the Deluge and had been granted immortality by the gods. The Eleventh Tablet, or Book, of the epic contains the account of the Deluge which Ut-napishtim related to his kinsman Gilgamesh. **The close correspondence of this Babylonian story with that contained in Genesis is recognized by everyone and need not detain us**. You will remember that in some passages the accounts tally even in minute details, such, for example, as the device of sending out birds to test the abatement of the waters. It is true that in the Babylonian version a dove, a swallow, and a raven are sent forth in that order, instead of a raven and the dove three times. But such slight discrepancies only emphasize the general resemblance of the narratives. In any comparison it is usually admitted that two accounts have been combined in the Hebrew narrative."

King then compares the Babylonian account of the deluge, as described on the Nineveh tablets (700BC), with the Egyptian account of the deluge, as described on the walls of a chamber in the tomb of Seti I (1279BC), i.e. the "Destruction of Mankind".

Quotes

The following are related quotes:

> "The **Hebrew** redactors used Egyptian myths to make the biblical stories; which, from time to time, had **Babylonian myths** grafted onto earlier texts or replaced portions of the original stories."
>
> — Gary Greenberg (2000), *101 Myths of the Bible* (pg. 7)

See also

- God character equivalents

References

1. (a) Driver, Samuel. (1908). *Modern Research as Illustrating the Bible* (pg. 28). Schweich Lectures.
(b) King, Leonard. (1916). *Legends of Babylon and Egypt in Relation to Hebrew Tradition*: *Schweich Lecture* (Driver, pg. 20; §2: Deluge Stories and the New Sumerian Version, pgs. 41-101; Egyptian legend of the destruction of mankind, pg. 48) (O)(txt). Oxford University Press, 1918; Cosimo, 2005.

θΔics

In religio-mythology, **Bacchus** (worshiped: c.400BC-400AD) was the Roman god of wine, a rescript and or syncretism of the Greek god Dionysus, himself a rescript of the Egyptian god Osiris.

A youthful **Bacchus**, holding his thyrsus, or magical staff, covered in ivy vines, leaves, and topped with a pine cone, painted (Q) by John Weguelin (1882), riding what seems to be a wine barrel.

Moses

In 435BC, Herodotus, in his *The Histories* (pg. 100), was connecting Osiris with Bacchus as follows:

> "All the Egyptians sacrifice the pure male kine and calves, but they are not allowed to sacrifice the females, for they are sacred to Isis; for the image of Isis is made in the form of a woman with the horns of a cow, as the Grecians represent Io; and all Egyptians alike pay a far greater reverence to cows than to any other cattle. So that no Egyptian man or woman will kiss a Grecian on the mouth, or use the knife, spit, or caldron of a Greek, or taste of the flesh of a pure ox that has been divided by a Grecian knife. They bury the kine that die in the following manner: the females they throw into the river, and the males they severally inter in the suburbs, with one horn, or both, appearing above the ground for a mark. When it is putrefied and the appointed time arrives, a raft comes to each city from the island called Prosopitis; this island is in the Delta, and is nine schoeni in circumference: now in this island Prosopitis there are several cities; but that from which the rafts come to take away the bones of the oxen is called Atarbechis; in it a Temple of Venus has been erected. From this city, then, many persons go about to other towns; and having dug up the bones, all carry them away, and bury them in one place; and they bury all other cattle that die in the same way that they do the oxen; for they do not kill any of them. All those who have a temple erected to Theban Jupiter, or belong to the Theban district, abstain from sheep, and sacrifice goats only. For the Egyptians do not all worship the same gods in the same manner, except Isis and Osiris, who, they say, is **Bacchus**; but these deities they all worship in the same manner."

In c.1630, Gerardus Vossius, in his *On the Origin and Progress of Idolatry*, was making some kind of Moses and Bacchus parallelism connection. (Q)

In 1679, Pierre Huet, supposedly, had produced the following equation: (Q)

> Mnevis (Q) = Osiris = **Bacchus** = Moses

In c.1769, Voltaire, in his *Philosophical Dictionary* (Q), citing Vossius (c.1630) and Pierre Huet (1679), stated that Moses is a rewrite of the Bacchus; the opening section of which is as follows: [5]

> "Of all the true or fabulous personages of profane antiquity, **Bacchus** is to us the most important. I do not mean for the fine invention which is attributed to him by all the world except the Jews, but for the prodigious resemblance of his fabulous history to the true adventures of Moses.

> The ancient poets have placed the birth of Bacchus in Egypt; he is exposed on the Nile, and it is from that event that he is named "Mises" by the first Orpheus, which, in Egyptian, signifies "saved from the waters", according to those who pretend to understand the ancient Egyptian tongue, which is no longer known. He is brought up near a mountain of Arabia, called Nisa, which is believed to be Mount Sinai. It is pretended that a goddess ordered him to go and destroy a barbarous nation, and that he passed through the Red Sea on foot, with a multitude of men, women, and children. Another time, the river Orontes suspended its waters right and left to let him pass, and the Hydaspes did the same. He commanded the sun to stand still [compare: Joshua 10:13]; two luminous rays proceeded from his head. He made a fountain of wine spout up by striking the ground with his thyrsis, and engraved his laws on two tables of marble. He wanted only to have afflicted Egypt with ten plagues, to be the perfect copy of Moses.
>
> Vossius is, I think, the-first who has extended this parallel. The Bishop of Avranches, Huet, has pushed it quite as far; but he adds, in his *Evangelical Demonstrations*, that not only Moses is Bacchus, but that he is also Osiris and Typhon. He does not halt in this fine path. Moses, according to him, is Esculapius, Amphion, Apollo, Adonis, and even Priapus."

Voltaire, to note digresses for several pages beyond this. Here, however, we do not that connecting Moses with Bacchus and both back to Osiris is a cogent synopsis for 1630 (Vossius) as well as for 1769 (Voltaire).

In 1802, William Hort, in his *The New Pantheon: an Introduction to the Mythology of the Ancients* (Q), describes Bacchus as follows:

> "What appears to be the true history of **Bacchus**? The best historians, Herodotus, Plutarch, and Diodorus Siculus, assert that he was born in Egypt, and educated at Nysa, a city in Arabia Felix, whither he had been sent by his father, Jupiter Ammon. From them it appears, that the Bacchus of the Greeks was no other than the famous Osiris, conqueror of India. This Bacchus is supposed, by many learned men, to be Moses. Both are represented as born in Egypt, and exposed in their infancy upon the Nile. Bacchus was educated at Nissa or Nysa, in Arabia, and in the same country passed forty years. Bacchus, when persecuted, retired to the borders of the Red Sea; and Moses fled with the Israelites, from the Egyptian bondage, beyond the same sea. The numerous army of Bacchus, composed of men and women, passed through Arabia in their journey to India. The army of the Jewish legislator, composed of men, women, and children, was obliged to wander in the desert, long before they arrived in Palestine, which, as well as India, is part of the continent of Asia. The fable represents Bacchus with horns, which may be supposed to allude to the light that is said to have shone around the countenance of Moses, who, in old engravings, is frequently represented with horns. Moses received the Jewish law on Mount Sinai. Bacchus was brought up on Mount Nysa. Bacchus, armed with his thyrsus, defeated the giants. The miraculous rod of Moses was the means of destroying the descendants of the giants. Jupiter was said to have sent Bacchus into India to exterminate a sinful nation; and it is recorded, that Moses was commanded, by the true god, to do the same in Palestine. The god Pan gave Bacchus a dog to accompany him in his travels; Caleb, which, in Hebrew, signifies a dog, was the name of the faithful companion of Moses. Bacchus, by striking the earth with his thyrsus, produced rivers of wine. Moses, by striking the rock with his miraculous rod, caused water to gush out to satisfy the raging thirst of the Israelites."

In 1803, Charles Lebrun, in his *Doubts of the Infidels*, argued the following:

> "The history of Moses is copied from the history of **Bacchus**, who was called Mises by the Egyptians, instead of Moses. Bacchus was born in Egypt; so was Moses... Bacchus passed through the Red Sea on dry ground; so did Moses. Bacchus was a lawgiver; so was Moses. Bacchus was picked up in a box that floated on the water; so was Moses.... Bacchus by striking a rock made wine gush forth... Bacchus was worshipped...in Egypt, Phenicia, Syria, Arabia, Asia and Greece, before Abraham's day."

In 1815, translator Charles Elton, not to be confused with zoologist Charles Elton (1900-1991), citing Vossius, in a footnote, in his dissertation on the mythology of Hesiod (Q), attempts to summarize the Bacchus and Moses similarities as follows:

> "The working of metals was not among the ancient attributes of Vulcan: but a diversity of character or attributes is not always an objection. Each god had not only a twofold nature, celestial, and human or heroical, but his history and qualities changed with change of place. Thus, Hercules was the sun; he was also a vagabond hero; but he may have been one person in Greece, and another in Phoenicia. Gerardus Vossius, in his treatise *de Origine et Progressu Idolatriae*, may therefore be right in his conjecture, that among the Phoenicians both Joshua and Samson were commemorated in the Tyrian Hercules. **Bacchus** was the sun, and an Indian conqueror. His history also assimilates with that of Noah. He was likewise in all probability Caphtor, the grandson of Ham; the great Egyptian warrior who dispossessed the Avim of that part of the land of Canaan, afterwards called Philistia. (See: *Priestley's Lectures on History*, i.5.)."

Elton, next, gives the following telling historical synopsis:

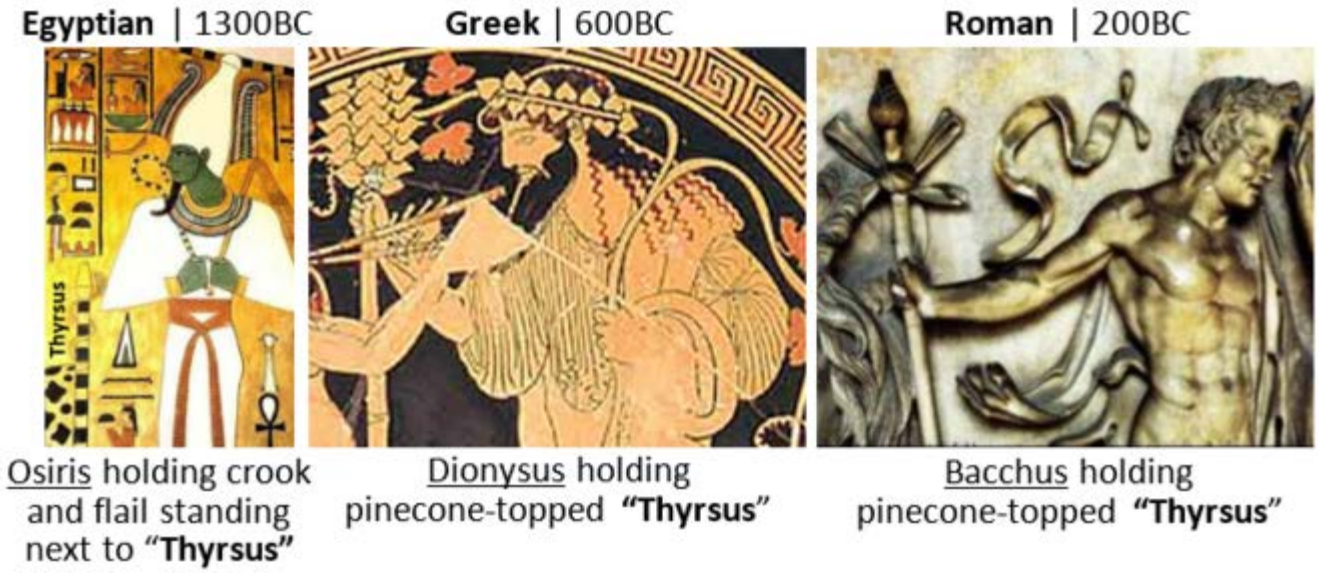

A depiction of Osiris holding his "crook and flail", symbolic of a shepherd's crook, meaning carer of the people, and flail, symbolic of punishment necessary to sustain society, when combined (Q) being symbolic of the ruler's dominion over Egypt, standing next to his thyrsus, Dionysus/Baccus holding his pinecone topped "thyrsus", and Moses holding his magic rod, which he uses to smite water from a rock dry up or part seas, just as does Bacchus.

> "Bacchus is called by Orpheus, [add]; and by Plutarch (*de Iside et Osiride*) Palaestinus. **Bacchus** was exposed in an ark upon a river: a double coincidence with Noah and Moses, which is exactly in the spirit of the old mythologists. Nonnus, in his *Dionysiacs*, mentions the flight of Bacchus to the red sea, and his battles with the Princes of Arabia; and relates that he touched the rivers Orontes and Hydaspes with his thyrsus, and that the rivers dried up, and he passed through dry-shod. The Indians are in darkness, while the Bacchic army are in light. The ivy-rod of Bacchus is thrown on the ground, and creeps to and fro like a live serpent. Snakes twist themselves about the hair and limbs of Bacchus; which may be a shadow of the fiery serpents in the wilderness. The host of Bacchus, like the multitude led by Moses, is accompanied by women. One of the Baccha; touches a rock, and water gushes out; at another time wine and honey."

Elton, of note, siding with the Bible, mentions the opinion of citing Edward Stillingfleet (1635-1699) (Q), to conclude, in the end, that "portions of Noah's memory were retained in many fables under Saturn, Janus, Prometheus, and Bacchus."

In 1900, John Robertson, a Christian mythology scholar and Jesus myth theory advocate, argued that the horns of Moses have some connection to the horns of Greco-Roman winemaking deity Dionysus, or "Bacchus" as the Romans called

him, who was worshiped as a young bull, and Dionysus as a bull; and or how in the Hebrew language the word *keren* can mean either "horn" or "ray", the latter having a solar ray connotation. [4]

Quotes

The following are related quotes:

> "**Bacchus** was murdered, and the remains of his lacerated body were collected by his weeping mother Ariadne."
>
> — James Bonwick (1878), *Egyptian Belief and Modern Thought* (Q)

See also

- Osiris, Dionysus, and Bacchus

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External links

- Bacchus (redirect to Dionysus) – Wikipedia
- Osiris-Dionysus – Wikipedia.
- Bacchus – CrystalLinks.com.

θΔics

In genius studies, **bachelorhood and genius** refers to the peculiarly noticeable phenomena that the higher one goes up in the genius rankings, towards the top of the top 500 geniuses of all time, many of the top geniuses never married; in fact three of the biggest mononym geniuses: Newton (#2), Gibbs (#4), Tesla (#19), Nietzsche (#90), among others, never married, and Goethe (#1), the number one genius, who had so many love affairs, that entire volumes of books have been written on this subject, e.g. *Goethe and His Woman Friends* (Crawford, 1911), only married "reluctantly" in 1806 at the age of 57 owing to the peculiar circumstances of war, see: Goethe timeline (19 Aug 1806), namely the observation that his Christiane Vulpius, the mother of his then sixteen year old son, was willing to put her "life" on the line to defend Goethe's house when Napoleon's troops invaded Jena.

Goethe, one of Germany's most famous bachelors, and the #1 top 500 genius, whose greatest work as a treatise on the physico-chemical nature of relationships in respect to social-religious ideas about what is right and wrong in respect to the the dynamics of the marriage bond, remained a bachelor for the first 56-years of his existence, marrying Christiane Vulpius, only when war came to Germany.

Overview

In general, there is a certain correlation, to some extent, to genius and bachelorhood; the following is an example quote by Tom Siegfried (2006): [2]

> "Adam Smith had a lot in common with Isaac Newton. Both were **lifelong bachelors**. Both became professors at the university they had attended. Both were born after their fathers had dies. And both became fathers themselves of a new scientific discipline. Newton built the foundation of physics; Smith authored the bible of economics."

In respect to genius attainment level, there seems to exist some yet unwritten law according to which genius rank is inversely proportional to time spent married. Sudanese-born American thinker Monydit Malieth summarizes this as follows: [1]

> "Geniuses are often misanthropist; they enjoy their lonesomeness because their minds are their best entertainment. Geniuses are also inclined to misogyny. If a background check is run on all of the world's geniuses, a substantial percentage of them had relationship problems with women and a **high percentage of** [**geniuses**] **never married**."

Said another way, genius level, in many cases, seems directly proportional, in increasing amount, to the amount of passion, devotion, and time one puts into his or her work, which is reciprocal, in decreasing amount, to the amount of passion, devotion, and time one puts into his or her relationships.

Goethe

Goethe, the #1 ranked top 500 genius, remained a bachelor for the first 56-years of his existence, per reasons that would seem to encompass an evolved explanation; one reason in particular being that his "greatest work", aka his self-described "best book", was an 1809 treatise on the chemical nature of the relationship bond, marriage bond, and social bonds, in respect to or opposed to traditional "moral" ideals, e.g. Christian, social, and or cultural convention rules, of marriage. "Human bonds", in short, through to be, by many in Goethe's time, the work of god, the union of two souls, i.e. Plato's view (see: soul mate), or something along these lines, according to which divorce, in most cases, was considered "immoral", whereas in the chemical world, an entirely different picture is seen, i.e. in Goethe's 1796 to 1832 mindset views, human relationship bonds are but are higher-level variants of smaller "chemical bonds", of the Bergman-

Cullen type, which he experimented with in his laboratory. There is, in short, an inconsistent logic expounded from each point of view (chemical or religious). Goethe specifically gives voice to one point of view, via the character Count in P1:**C10** of his 1809 *Elective Affinities*, namely:

> "There is nothing to say against that," said the Count. "In a new character a man may readily venture on a second trial; and when we know the world we see clearly that it is only this positive eternal duration of marriage in a world where everything is in motion, which has anything unbecoming about it. A certain friend of mine, whose humor displays itself principally in suggestions for **new laws**, maintained that **every marriage should be concluded only for five years**. Five, he said, was a sacred number—pretty and uneven. Such a period would be long enough for people to learn one another's character, bring a child or two into the world, quarrel, separate, and what was best, get reconciled again. He would often exclaim, 'How happily the first part of the time would pass away!' Two or three years, at least, would be perfect bliss. On one side or other there would not fail to be a wish to have the relation continue longer, and the amiability would increase the nearer they got to the parting time. The indifferent, even the dissatisfied party, would be softened and gained over by such behavior; they would forget, as in pleasant company the hours pass always unobserved, how the time went by, and they would be delightfully surprised when, after the term had run out, they first observed that they had unknowingly prolonged it."

This paragraph was penned three years after Goethe himself got married, after 56 years of bachelor hood. Specifically, on 6 Aug 1806, however, war came to Jena, Germany, namely: news reached Goethe of the formal dissolution of the Holy Roman Empire; by Oct war had come to Jena. During the chaos, on 14 Oct, drunken French troops, bent on looting, force their way into Goethe's house, whereupon Christiane Vulpius (1765-1816) boldly confronted them at the door and declared that "a friend of Napoleon" lived here (see: Goethe and Napoleon)—the house was spared, and five days later, on 19 October Goethe made Christiane his wife; their sixteen year old son August present as one of the witnesses.

In the weeks to follow, Goethe's attempt to introduce Vulpius, a women of lowly origins, into high society, which, according to Goethean scholar Astrida Tantillo, was a bigger scandal than was the original affair in the first place. [3] The first time the couple appeared publicly together as husband and wife was at a tea party at the house of Johanna Schopenhauer (1766-1838), mother of Arthur Schopenhauer, who at the time would have been about age eighteen. Johanna had only recently moved to Weimar and believed that Goethe had chosen her house for the occasion because of her urbanity and outsider status; Johanna latter quipped about the famed "bachelor" Goethe: [4]

> "If Goethe could give that women his name, I certainly could give her a cup of tea."

(add discussion)

Theory | Discussion

On the so-called Goethe chemical model of the marriage bond, marriage by chemical definition is a single combination reaction, of the following form:

$$A + B \rightarrow A{\equiv}B$$

The marriage bond itself, i.e. the "≡" of the "A≡B" union or dihumanide molecule, stores energy in the bond, i.e. bond energy, part of the Gibbs energy of the reaction. In this sense, it can be postulated that marriage itself, for the genius, results in a loss of creative energy, which otherwise would have been available without the "attachment". The following anecdotal report of a comment by Niels Bohr to George Gamow on Paul Dirac's post-honeymoon lackluster cosmology theory (Ñº) letter to *Nature*:

> “Look what happens to [geniuses] when they get married.”
>
> — Niels Bohr (1937), comment to George Gamow, in reference to Paul Dirac’s 1937

Here, we may posit that Dirac, in the wake of his 1927 very-succesfull work in developing a relativistic + quantum mechanics based description of the motion of the electron, which predicted the existence of antimatter or negative energy states of the electron and included electron spin, decided that marriage would be a good option for him, wherein he supposedly found happiness; a downside of this, however, was a loss of a portion of his intellectual acumen prowess, i.e. "power" of mental discernment for the deeper secret truths of nature.

Thompson | Anecdote

On related note, Scottish physicist William Thomson, while not a bachelor, famously referred to interactions and outings with his wife as a second law type of "dissipation of energy", something distracting or diverting heat energy him from his "work" spent on his studies. Specifically, in 1885, while musing upon the subject of thermodynamics one day, Thomson suddenly realized that his wife was discussing plans for an afternoon excursion: [5]

> “At what time,” he asked, glancing up, “does the dissipation of energy begin?”

In other words, in this quip Thomson is applying his version of the second law of thermodynamics, as captured in his 1852 paper "On a Universal Tendency to the Dissipation of Mechanical Energy", to the tentative understanding the work involved in the course of daily human-human interactions; a prime human thermodynamics example application of the law of dissipation of energy.

Thims

Thims, similar to Goethe, has never really quite understood marriage. Thims, e.g., when asked about marriage, has always classified himself as a "run-away groom". Girls and women, in Thims early years, would always seem to quickly fall in love with Thims and declare this openly to hims, via the classic "I love you" phrase. This general observation, from a general super-observer perspective, led Thims into his 19-girlfriend "love thought experiment", similar to Goethe's 4-girlfriend *The Renouncers* love thought experiment. The first "thoughts of marriage", when one of Thims' closer girlfriends, early on, circa age 20-21 mentioned the term "Mrs Thims", while paying for a hotel room with Thims' credit card, brought about a "cold" feeling in Thims mind as though "marriage", i.e. being locked into the same exact "thing" say for the next say 80-years, felt like something akin to a "death trap".

Moreover, in many cases, Thims would have to frequently "hide" from many of his girlfriends, so to get study done, some of whom would frequently go from library to library to search for him and try to track him down. Some actually have openly told Thims that they "feel" like they are in the way of whatever it is Thims is after; as the following personal note recollects:

> “It’s as though I have a bigger sense of ‘chemical potential’ to fulfill (or realize). Women always just always seem to be getting in the way. Some even tell me so, namely: that they feel that way.”
>
> — Libb Thims (2016), "personal note", practice answer rehearsal, to long-time overly common reoccurring query “so why aren’t you married?”, after showing the new landlord my new exercise station (Ñº), in anticipation of the question, who just had his second baby over the past weekend; jotted herein as note per realization that the term “chemical potential” seemed to arise naturally in the mind, as workable cogent synonym to the seemingly teleological and or atomic purview objectionable term “purpose” (e.g. it is difficult to sentence that it is hydrogen’s ‘purpose’ to bond with oxygen to form water), seemingly thereby to fill in as workable “purpose terminology upgrade” employable, in light of Vicente Talanquer's discernible chemical teleology terminology objections, in passing conversations; possibly even preferable than to “thermodynamic potential”, as suggested by Bruce Lindsay (1983), which has a less-recognizable immediate meaning, in everyday passing colloquial conversations, 11:45 AM

In some sense, the deeper one gets into a relationship a certain "power" loss can be felt in respect to ability to focus on theory.

Quotes

The following are related quotes:

> "Another form of sagacity and self-defense consists in 'reacting' as seldom as possible and withdrawing from situations and relationships in which one would be condemned as it were to suspend one's 'freedom', one's initiative, and become a mere reagent."
>
> — Friedrich Nietzsche (1888), *Ecce Homo* (pg. 27); note: in 1882, the year when *The Gay Science* was published, he proposed to Lou Salome (Ñº) and was rejected, which conflicts, in some respect, with the above rule

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θΔics

In science, **bacteria** is a powered CHNOPS+9E thing, noted for []

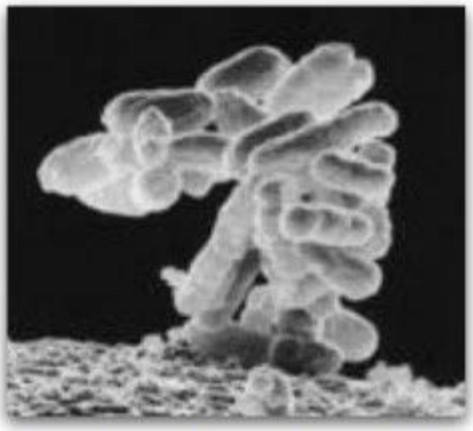

$C_{E11}H_{E11}O_{E11}N_{E10}P_{E9}S_{E9}Ca_{E9}K_{E7}$
$Cl_{E7}Na_{E7}Mg_{E7}Fe_{E6}Si_{E5}Mn_{E3}Co_{E3}$

A proton electron microscope image of about twenty *E. coli* **bacteria** attached and growing on a **surface**, show with its molecular formula. [1]

References

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See also

â— Bacteria molecule
â— Virus

External links

â— Bacteria – Wikipedia.

θΔics

In animate thermodynamics, **bacteria molecule** is the view of a bacteria unit, such as one *Escherichia coli* bacterium, as a single molecule, characterized by a 15-element molecular formula. [1] To exemplify the molecular perspective of a bacterial entity, the adjacent picture is the magnified image (10,000x) of a cluster about twenty *E. coli* bacteria, attached to a surface, along with the molecular formula of the cluster, as a unite defined as a 15-element molecule. [2]

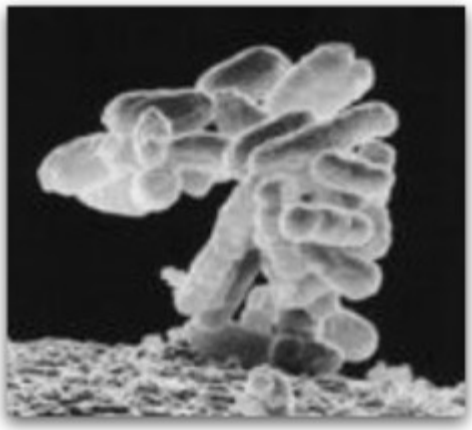

$C_{E11}H_{E11}O_{E11}N_{E10}P_{E9}S_{E9}Ca_{E9}K_{E7}$
$Cl_{E7}Na_{E7}Mg_{E7}Fe_{E6}Si_{E5}Mn_{E3}Co_{E3}$

Bacteria molecule (E. Coli, height=5μm)

In more detail, a single bacterium is in itself a very large animated molecule, such as the colony or cluster of 20-30 *Escherichia coli* bacterial units (bacteria molecules) attached to a substrate, as pictured adjacent, comprised of about 10-billion carbon, hydrogen, and oxygen atoms, among twelve other atom types in various quantities.

This view falls into place in the logic of molecular evolution tables, in which in between the formation of hydrogen ion molecule, the smallest molecule in the universe, and the human molecule, there must exist a connective reaction mechanism. The first calculation of the molecular formula for the *Escherichia coli* bacterium was done by American chemical engineer Libb Thims in 2005. [3]

In the surface thermodynamics approach to "large molecular entity" interaction with a surface, such as a bacteria molecule attaching to an aquatic surface, the attachment process is viewed as a spontaneous change, which is accompanied by a decrease in the free energy of the system. [4]

References

1. Molecular Evolution Table - Institute of Human Thermodynamics.
2. Note: the shorthand "E", as in E11, used in formula means to the power of 10 (as indicated by the number to the right of the symbol), e.g. 3E5 = 3 x10^5 or C_{E11} = 10^{11} carbon atoms.
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θΔics

In terminology, **bag of chemicals** or the "bag of chemical" argument is the argument that just as the cell with its membrane is like a bag or sac of chemicals so too are people with their skin membrane, like or are a giant bag of chemicals.

→

Left: the bombardier beetle spraying out a mixture of the chemicals: hydroquinone $6H_4(OH)_2$ and hydrogen peroxide H_2O_2, in defense. Right: the extrapolation of the beetle as sac of chemicals to human as a **bag of chemicals**, used in creation.com writer Dominic Statham's 2010 article "Are We More Than a Bag of Chemicals?" [4]

Etymology

The conception of an organism of a bag of chemicals seems to stem from Richard Dawkins' 1986 discussions (Ñº), in his *The Blind Watchmaker*, of the chemicals: hydroquinone $6H_4(OH)_2$ and hydrogen peroxide H_2O_2, inside the bombardier beetle, and how the beetle squirts these chemical out of its tail to make an explosion, outside of its body, when attacking, but how the chemicals are kept neutralized and or separated while inside the body of the beetle. Dawkins does not, however, at this point, use the phrase bag of chemicals.

In 1999, citing Dawkins' *The Blind Watchmaker*, English astronomer and astrophysicist Michael Rowan-Robinson, in his *The Nine Numbers of the Cosmos*, states the following: [1]

> "The aspect of existence I want to focus on in this chapter [We Exist] is the stuff we are made of. Well, what are we made of? Bones, flesh, blood, skin? The four humours of the alchemists? A **bag of chemicals**? The idea that turns out to be really powerful is that we are made of atoms. This was first suggested by a group of Ionian philosophers of the sixth century BC, especially Leucippus and Democritus, the greatest of the so-called pre-Socratics. Plato and Aristotle dismissed this idea, sending western thought in the wrong direction for 2,000-years. Interestingly, what Aristotle disliked about atomic theory was that it seemed to require an infinite number of different types of atom, one for every different substance in the universe. In *De caelo* ('On the Heavens') Aristotle argues that his theory of the four basic elements, earth, air, fire, and water, had much more predictive power."

In 2005, John Sanford, in his *Genetic Entropy and the Mystery of the Genome*, stated the following:

> "Are you are just a meaningless **bag of molecules**—the product of nothing more than random molecular mutations and reproductive filtering?"

In 2008, Dawkins, in his *River Out of Eden: a Darwinian View*, does begin to refer to a cell as a "bag of chemicals". [3]

In 2008, English quantum physicist Michael Brooks, in his popular *13 Things That Don't Make Sense*, titled chapter five "Life: Are You More Than Just a Bag of Chemicals", in his attack on the theory of life as something that does not make sense in light of modern physical science (see: defunct theory of life). [2] From here, the term seems to have increasingly made its way into the creationism vs. evolutionism debates circles.

In 2010, Creation.com writer Dominic Statham, e.g. penned an article entitled "Are We Nothing More Than a Bag of Chemicals?", outline his objections to American plant geneticist Anthony Cashmore's 2010 article "The Lucretian

Swerve", about how free will in biology and criminology is a type vitalism theory, specifically objecting to his statement that: [4]

> "The reality is, not only do we have no more free will than a fly or a bacterium, in actuality we have no more free will than a bowl of sugar."

In 2010, religious writer C.W. Adams, to cite and example, penned, what seems to be a Robert Pirsig (1991) stylized argument, the following: (Ñº)

> "Why would a lifeless or previously lifeless **bag of chemicals** decide it was important that future generations even exist, let alone improve their chances of survival? While we might quickly assume that living organisms would want to produce offspring with grater chances of survival, there is no rational reason for this desire. Why would a selfishly motivated newly living organism care about a future generation? First accidental evolutionists make a huge leap assuming that life somehow spontaneously generated from chemicals. Then they make a huge leap that these newly living chemicals somehow preferred survival and pain as opposed to a painless existence of nonlife. Then they make another huge leap by assuming that these newly living chemicals could and would want to dilute their strength to produce offspring that require only trouble and work to maintain. They against all odds, evolution theory proponents take the leap in assuming that these newly living chemicals somehow created an 'unselfish gene' that somehow passed on improvements for the future survival of future generations who do nothing for that newly living chemical itself. All of this was done by newly living chemicals that not much different in substance from their dead chemical cousins? The only answer accidental evolutionists seem to give us to these questions is that this all must have been a series of random accidents."

(add discussion)

Soulless bag of chemicals

See main: Soulless bag of chemicals

In 2011, secular thinker Kurt Bell blogged an article titled "Soulless Bag of Chemicals", in which he opens to the following: [5]

> "On my better days I regard my wife and daughter as 'soulless **bags of chemicals**.' To be fair though, I think the same of myself and all other forms of life. Souls are supernatural things beyond perception or measure, worthy only of suspended belief pending some real evidence or the giving up of the tenets of science. Chemicals we are… despite the clever animation of flesh and musings of mind brought about by the electricity of life. So why do we think more of ourselves? How are we so offended by these facts?"

Secular thinker Kurt Bell discussing (2011) reaction, in video to his controversial labeling of his wife and child, from a secular perspective, as "soulless **bags of chemicals**". One response video is found here: (Ñº)

He followed this up with a vlog about how his use of the controversial phrase about how he thought of his wife and his daughter as "soulless bags of chemicals", which he said he heard somewhere, borrowed it, and liked it, but that it sparked a heated reaction and "got under the skin" of many people, no pun intended.

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θΔics

In existographies, **Bahram Moshiri** (c.1940-) (FA:165), or "بهرام مشیری" (Persian), is an Iranian-born American materials scientist and chemical engineer, a Jabari 20 smartest atheist (#18) (Q), noted for his various videos (in Persian) on atheism and religion, especially Islam and Shia.

Overview

In 1970, Moshiri came to America. Sometime therein, or shortly thereafter, Moshiri completed a MS degree in materials science and chemical engineering at the Catholic University of America. [1]

Muhammad | Fatima story

In c.2015, Moshiri, in his one video (3:20-) (Q), ridicules the story of the "Death of Fatima", Fatima being the daughter of Muhammad, a Quranic story, about which Iranians cry for one week each year. The gist of the story being that Omar, the successor of Muhammad, in Suni beliefs, kicked an open wooden door at Fatima, who was standing pregnant in the doorway, and the wooden door cut her stomach, killing the unborn child. Moshiri ridicules this by pointing out that there was no wood in Saudi Arabia. Hence, the story if a fabrication.

Quotes | On

The following are quotes on Moshiri:

> "**Moshiri** is super smart."
>
> — Angela Jabari (2016), comment, Dec 28

Quotes

The following are noted quotes:

A video still (Q) of **Moshiri** (2014) on PARS TV, in his library.

> در شگفتم از ائمه اطهار که تا زنده بودند آدم می کشتند اما بعد از مرگشان شفا میدهند
>
> "I am surprised by the Imams, that when alive they were killing people, but after their death they are divinely healing people."
>
> — Bahram Moshiri (c.2010)

> من نه شوق رفتن به بهشت دارم و نه خوف از جهنم ریا، برای من بهشت آنجائیست که آزادی باشد
>
> "I am not interested in heaven, nor scared of hell, for me heaven is that place that freedom exists."
>
> — Bahram Moshiri (2016), Facebook banner

References

1. Biography (Persian → English) – BahramMoshiri.com.

External links

- Bahram Moshiri – Facebook.

θΔics

In thermodynamics, **Bakhuis Roozeboom** (1854-1907), or Bakhuius Roozboom (among other variants), was a Dutch chemist, one of the founders of physical chemistry, a product of the Dutch school of thermodynamics, noted for his circa 1901 "phase theory", as applied especially to the phenomena of solidification. [1]

Education

In 1872, Roozeboom graduate first in his class at the Hoogere Burgerscholen, a secondary school upper class citizens.

In 1878, he became a lecture assistant at Leiden University. In 1881, he took candidate degree at Leiden in mathematics, astronomy, physics, and chemistry and in 1884 completed with a dissertation *About the Hydrates of Sulfurous Acid, Chlorine, Bromine, and Hydrogen Chloride*, concerning the dissociation phenomena of these gases (solids which when heated split into a liquid and a gas). Roozeboom's dissertation contained the graphical results of a then unexplained anomalous behavior for the hydrate of hydrogen bromide, which made a strange form of P-T plot, with a minimum and maximum dissociation temperature. This graphical anomaly or 'startling phenomenon', as it was called, attracted the attention of Johannes Waals, who within the following two months reported to have found a solution, in the guise of a Clausius-Clapeyron style differential equation.

In 1886, Johannes van der Waals introduced Roozeboom to the 1876 phase theory of American engineer Willard Gibbs, which gave Roozeboom a sound theoretical basis on which to continue his investigations. [2]

In 1896, Roozeboom succeeded Jacobus van't Hoff as professor of chemistry at the University of Amsterdam, where he continued his work on heterogeneous equilibria, which he had begun at Leiden University. During these years, he stimulated his PhD students to work out the details of his phase theory, an effort which resulted to produce two or three graduate students per year. The results were summarized in *Die Heterogenen Gleichgewiche vom Standpunkte de Phasenlehre*, the first and second volume of which appeared in 1901 and 1904. After his death, some of his pupils and students, namely E.H. Buchner, A.H.W. Aten, and F.A.H. Schreinemakers, continued his publication. [3]

References

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External links

â— Hendrik Willem Bakhuis Roozeboom – Wikipedia.

θΔics

In animate thermodynamics, **Balfour Stewart** (1828-1887) was a Scottish physicist noted for a number of publications of his views on how heat, energy, and dissipation apply to the social world as well as the religious implications of thermodynamics in the context of large scale universal times.

Stewart, as a "religion + science = compatible" advocate, was involved in the Tyndall-Stewart-Tait debate (1874-1879).

Social energy

In 1868, the year he won the Rumford Prize for his work on radiant heat, Stewart penned two articles (or a two-part article) with English astronomer Norman Lockyer (the first editor of *Nature*), the first entitled "The Sun as a Type of the Material Universe", generally being a historical overview of sun spot theory, the second entitled "The Place of Life", in which they attempt to explain energy of position and energy of motion, as well a degradation of energy, in both the physical world and social world. [5]

Social cannon ball

See main: Social cannon ball model

In 1868, Stewart, in his "The Place of Life", attempts to extrapolate kinetic energy or energy of motion, to which they refer to as "actual energy", and potential energy or energy of position, to which they refer to as "energy of position", in to the social realm and in doing outline a model of how the energetic man (high character energy) is constantly at war with the man of position (high social position) and label the former as a type of social cannon-ball: [7]

> “When a man pursues his course undaunted by opposition, unappalled by obstacles, he is said to be a very energetic man. By his energy, we mean the power which he possesses of overcoming obstacles; and the amount of his energy is measured by the amount of obstacles which he can overcome, by the amount of work which he can do. Such a man may in truth be regarded as a **social cannon-ball**. By means of his energy of character he will scatter the ranks of his opponents and demolish their ramparts. Nevertheless such a man will sometimes be defeated by an opponent who does not possess a tithe of his personal energy. Now, why is this? The reason is that, although his opponent may be deficient in personal energy, yet he may possess more than an equivalent in the high position which he occupies, and it is simply this position that enables him to combat successfully with a man of much greater personal energy than himself. If two men throw stones at one another, one of whom stands on the top of a house and the other at the bottom, the man at the top of the house has evidently the advantage.
>
> So in like manner, if two men of equal personal energy contend together, the one who has the highest social position has the best chance of succeeding. But this high position means energy under another form. It means that at some remote period a vast amount of personal energy was expended in raising the family into this high position. The founder of the family had doubtless greater energy than his fellow-men, and spent it in raising himself and his family into a position of advantage. The personal element may have long since vanished from the family, but it has been transmuted into something else, and it enables the present representative to accomplish a great deal, owing solely to the high position which he has acquired through the efforts of another. We thus see that in the social world we have what may be justly called two kinds of energy, namely:
>
> 1. Actual or personal energy
> 2. Energy derived from position

> Let us now turn to the physical world. In this as in the social world, it is difficult to ascend. The force of gravity may be compared to the force which keeps a man down in the world."

(add discussion)

Other

In his 1874 *The Conservation of Energy*, Stewart penned a chapter the applications of the laws of energy to life. A central term used throughout the book is chemical affinity. The following is Stewart's central philosophy as stated in his preface: [1]

> "[We] regard [the] universe [as] composed of atoms with some sort of medium between them as the machine, and the laws of energy as the laws of [the] working of this machine."

In cessation thermodynamics, Stewart collaborated with Peter Tait in the writing of the 1875 book *The Unseen Universe* on immortality and conservation of energy. [2]

Stewart's followup book was his 1878 *Paradoxical Philosophy*, a sequel to his *The Unseen Universe*, in which he gives reflections on his own rhetoric. [3]

Curiously, James Maxwell comments on Stewarts 'paradoxical philosophy' to the effect that the central problem he saw was that an objective prophetic vision leads back to the subjective view and interests of the writer, which is the philosopher's paradox, commonly seen in human thermodynamics. [4]

References

1. Stewart, Balfour. (1874). *The Conservation of Energy: with an Appendix, treating of the Vital and Mental Applications of the Doctrine* (ch. VI: The Position of Life, pgs. 154-70; Appendix I: Correlation of Vital with Chemical and Physical Forces, by Joseph le Conte, pgs. 171-; Appendix II: Correlation of Nervous and Mental Forces, by Alexander Bain, pgs. 205). Appleton.
2. Stewart, Balfour and Tait, Peter G. (1875). *The Unseen Universe: or Physical Speculations on a Future State*. Macmillan.
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4. Maxwell, James. (1878). "Review: Paradoxical Philosophy", in: *Scientific Papers*, II, pg. 451; in *Nature*, 19 (19 Dec 1878): 141-43; in: *Scientific Papers*, 2, 756-62.
5. Myers, Greg. (1985). "Nineteenth-Century Popularizations of Thermodynamics and the Rhetoric of Social Prophecy." *Victorian Studies*, 29: 35-66.
7. (a) Lockyer, Norman and Stewart, Balfour. (1868). "The Sun as a Type of the Material Universe", *MacMillan's Magazine*, 18: 319-; in: *Contributions to Solar Physics* (pgs. 63-84).
(b) Lockyer, Norman and Stewart, Balfour. (1868). "The Place of Life in a Universe of Energy", *MacMillan's Magazine*, 18: 319-; in: *Contributions to Solar Physics* (pgs. 85-103).

Further reading

â— Stewart, Balfour. (1866). *Elementary Treatise on Heat*. MacMillan and Co.

External links

â— Balfour Stewart – Wikipedia.
â— Balfour Stewart – Astro.UMontreal.ca.

In experiments, **ball and clay experiment** was an experiment, performed in circa 1720 by Willem Gravesande, or possibly earlier by Giovanni Poleni (1683-1761), in which inelastic balls (brass), of various masses, but of the same size, were released from various heights, or rolled down a ramp from various heights, and allows to fall onto a clay surface; after which the indentation, mass, and height were recorded, and used to experimentally resolve the vis viva controversy, i.e. whether it was momentum mv or vis viva mv^2 that was conserved in the process; the latter was the conclusion.

Photo of what seems to be Dutch physicist-mathematician Willem Gravesande's **ball and clay surface kinetic energy experiments**, shown at the Boerhaave Museum, Leiden, Netherlands. [2]

Overview

In 1670, French physicist Edme Mariotte seems to have been the first to have conceived of the idea to employ clay to search, via experiment laws on inelastic collisions; his main experiment being the use of clay ball pendulums, i.e. pendulums made with clay bobs, sizes which he varied, with which he measured the impact of the collisions, by indentation of the clay.

Sometime thereafter, Italian physicist Giovanni Poleni (1683-1761) conducted similar experiments, possibly with metal balls and a clay surface.

In circa 1720, Dutch physicist Willem Gravesande, at Leiden University, to test Gottfried Leibniz's model of vis viva, performed a number of experiments wherein he dropped balls of different mass on soft clay, finding, surprisingly, that if the heights from which the balls fell were inversely proportional to their masses, the indentations made by the balls would be the same. The following, is a modern rendition of the experiment, with clay depths exaggerated:

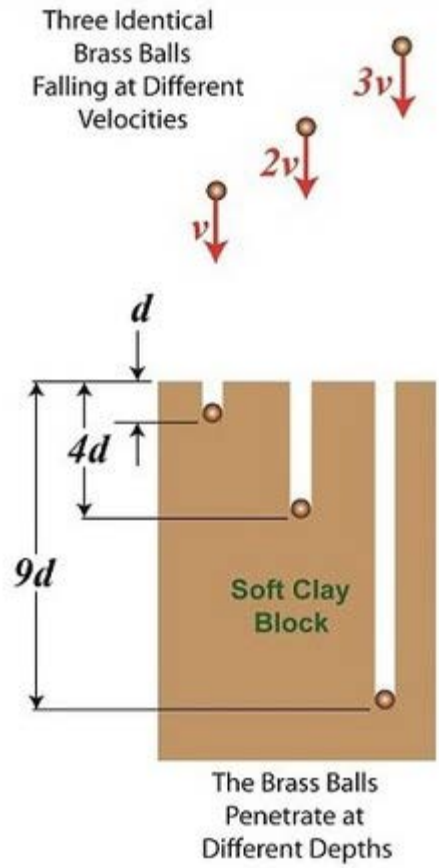

Gravesande, in more detail, allowed brass balls to be dropped (or rolled down a ramp) with varying velocity onto a soft clay surface and found that a ball with twice the velocity of another would leave an indentation four times as deep, that three times the velocity yielded nine times the depth, and so on; shared these results with Emilie Chatelet (IQ=190) and with Voltaire (IQ=195) who in turn, predominantly the former, subsequently corrected Newton's (IQ=215) formula $E = mv$ to $E = mv^2$, and thus synthesized the first version of the conservation of energy (vis viva into vis mortua); he also is the inventor of the ball and ring experiment, a significant experimental precursor to the eventual formulation of thermodynamics.

This result, knowing that height was proportional to the square of velocity v of impact, it followed that the depth of impact was proportional to mv^2, and hence to "force". [1]

References

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(b) Brown, Richard C. (2012). *The Tangled Origins of the Leibnizian Calculus: Case Study of a Mathematical Revolution* (pg. 265). World Scientific.
2. Museum Boerhaave – Wikipedia.
3. O'keefe, Philip J. (2015). "Willem Gravesande's Experiments on Kinetic Energy" (Ñº), Engineering Expert Witness Blog, Sep 11.

θΔics

In experiments, the **ball and ring experiment** is a volume expansion demonstration experiment in which: (a) a cold (room temperature) brass ball is shown to be able to pass through tightly-fitted brass ring, (b) the ball is then heated with a flame, and (c) the experimenter then shows that the hot steel ball is unable to fit through the ring, as it previous was able to before, in the cold state, thus providing experimental proof that bodies do measurably expand when heated.

A *circa* 1900 version of the ring and ball experiment, is shown adjacent, wherein, a brass ball with a diameter of 29 mm, at height 260 mm, when heated will not pass through the brass ring, but when cold or ambient temperature will. [1]

A 1900 version of Willem Gravesande's circa 1730 **ball and ring** experiment and modern version (video). [1]

History

In circa 1725, Dutch physicist Willem Gravesande, at Leiden University, supposedly, performed the first ball and ring experiment; shown approximately as follows, wherein a brass ball is first shown to go through a metal ring, then is heated, after which it is shown not to be able to go through the ring:

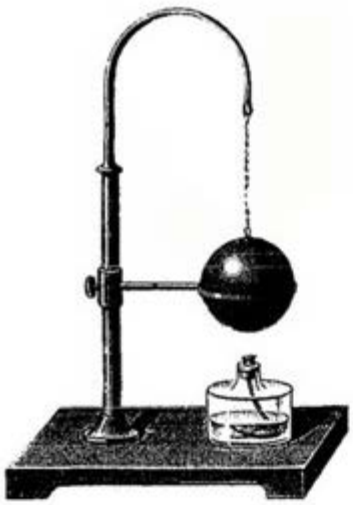

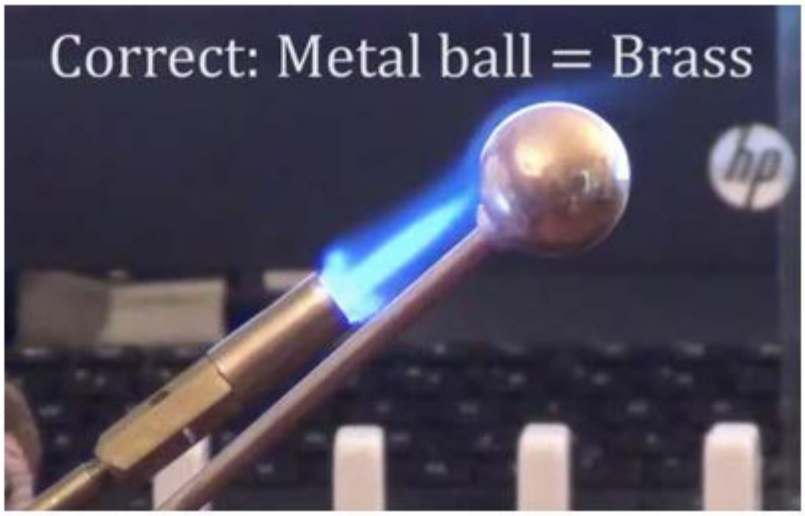

The general picture, however, can be gleamed by the intermediate interactions of French philosopher-physicist Voltaire and Dutch physician and chemist Herman Boerhaave.

In 1726, Voltaire, after being released from the Bastille (jail), on the condition that he go to England, went to London, where he occupied himself mainly with mathematics and made himself familiar with the philosophy of Isaac Newton, of which he made a more special study afterwards at Leyden University. He remained in London for three years, then returned to Paris, made several journeys, and then in 1736 settled in Leyden under the name of “Revol”, which he dropped when he found the pseudonym was useless. In a letter to the crown prince of Prussia (afterwards Frederick the Great), with whom he had entered into an active corresponds with, Voltaire says:

> “I am the town of two simple citizens, Boerhaave and Gravesande attract from four to five hundred strangers.”

During this period, Voltaire was very busy writing a work on the philosophy of Newton, and received great assistance from the learned Gravesande and also consulted with Boerhaave. [2]

The generality of this volume expansion experiment, as what seems to have been worked on by both Boerhaave and Gravesande, latter came to be termed, by French chemist Antoine Lavoisier, "Boerhaave's law", being that Boerhaave chemistry lectures, at the University of Leyden, introduced the idea of volume expansion by heat as a general law of nature; the finalized version of which included in his chemistry textbook *Elements of Chemistry*, and later forming the opening sentence of Lavoisier's 1787 *Elements of Chemistry*, and the basis of his quest to outline the caloric theory of volume expansion by heat.

References

1. Turner, Gerard L. (1983). *Nineteenth-century Scientific Instruments* (§Expansion, pgs. 112-). University of California Press.
2. Van Sypesteyn, J.H.R. C.A. (1877). “Voltaire in the Netherlands”, *The Living Age* (pg. 100), 134: 97-105.

θΔics

In knowledge, **banned** refers to ideas, subject, practices, publications, and or books that have been prohibited for use, performance, distribution, or practice.

Books

In Italy, Francesco Algarotti's 1738 *Newtonianism for the Ladies*, was placed on the Vatican's Index of banned books. [1]

French philosopher Jean Sales was imprisoned for the materialistic views expressed in his *The Philosophy of Nature: a Treatise on Moral Human Nature*. [1]

See also

- Human molecule (banned)

References

1. Fara, Patricia. (2011). *Newton: the Making of a Genius* (pg. 5). Pan Macmillan.

External links

- List of books banned by governments – Wikipedia.

θΔics

In religio-mythology, **baptism**, from the Greek βαπτίζω (baptízō), "I dip in liquid", refers to immersion of the body or of pouring of water of the head, typically in infant, while certain words are said, done to initiated one into a religion; a ceremonial practice of placing holy water on the head of someone, thereby being symbolic of the sun re-born out of the primordial abyss or Nile River; symbolic of Ra, the sun god, born out Nu (or Nun), the water god.

Anubis anointing Osiris

John baptizing Jesus

A depiction of Anubis anointing Osiris (Dendera Temple, c.30AD) compared to a portrait of John the baptist **baptizing** Jesus (600AD), the later being a re-write of the former; both of which deriving the the older model that Ra was reborn each morning, and yearly, out of the water of the Nu (or Nun), aka sun born out of the receding annual 150-day flood of the Nile River.

Overview

The concept of "baptism" is a symbolic ritual associated with or seen as the embodiment of the re-birth of the new sun out of the waters of the Nun or Nile River (Massey, 1906); which is conceptualized, in mirror form, astro-theologically, as a copy of the Aquarius constellation (Bede, 600BC).

Anubis | John the Baptist

The concept of baptism originated in Egypt with the god Anubis who baptized the god Horus (Ω)(Ω) using the water that ran under the temple, which was considered to be associated with either the god Nun or Osiris, and considered holy. In the Roman recension, Anubis became rescripted as "John the Baptist" and Horus became Jesus.

Quotes

The following are related quotes:

> "Hail, thou who dippest thyself [in Nu]."
>
> — Anon (c.1000BC), "Osiris Praise Song" [1]

> "In America, the pretext of **baptism** absolutely extinguished the feelings of humanity."
>
> — Voltaire (1764), *Philosophical Dictionary* (§:Fanaticism) [6]

> "I consider it a degradation and a stain on my honor to submit to **baptism** in order to qualify myself for state employment in Prussia."
>
> — Heinrich Heine (c.1830), *Publication* [7]

> "Plutarch's version of the myth of Isis and Osiris connects the various episodes, many of which can be documented from Egyptian sources, into a single, running narrative (*On Isis and Osiris*, 12-19). The story begins with Kronos (Geb, the Egyptian earth god) and Rhea (Nut, the Egyptian sky goddess) overcoming the curse of Helios (Re, the sun god) with the help of Hermes (Thoth, the Egyptian moon god) by producing five children on five intercalary days: Osiris, Horus, Typhon (Set), Isis, and Nephthys. As pharaoh of Egypt, Osiris brings civilization to that country and to the whole world. Typhon, however, gathers conspirators and plots to kill Osiris. First, he imprisons Osiris within a coffin and throws it into the Nile River, and later he dismembers the body of Osiris and scatters the pieces all around Egypt. One piece, the penis, is lost forever in the Nile River. In both episodes, the reproductive power of Osiris is **sub-merged in** the Nile."
>
> — Marvin Meyer (1999), *The Ancient Mysteries* [5]

See also

- Anoint

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pg. 260; summer solstice, pg. 264). Dover, 1969.
2. (a) Murdock, Dorothy M. (2008). *Christ in Egypt: the Horus-Jesus Connection* (§: Who is Anubis?, pgs. 236-). Stellar House Publishing.
(b) Smith, Alexander. (2012). *The Holiest Lie Ever* (§16: John the Baptist, pgs. 150-). Trafford Publishing.
3. Murdock, Dorothy. (2011). "Was John the Baptist and Egyptian Myth" (Q), Stellar House, Dec 30.
4. Massey, Gerald. (1907), *Ancient Egypt, Volume Two* (pg. 855). Publisher.
5. Meyer, Marvin. (1999). *The Ancient Mysteries: a Sourcebook of Sacred Texts* (pg. 160). University of Pennsylvania Press.
6. (a) Voltaire. (1764). *Philosophical Dictionary* (§:Fanaticism) (txt). Publisher.
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7. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pg. 185). Prometheus.

External links

- Baptism – Wikipedia.
- Baptism of Jesus – Wikipedia.

θΔics

In hmolscience, **Barack Obama** (1961-) is the 44th current American President noted for his 2006 campaign speech on the connection between faith and politics, the key exert being the following:

Faith | Politics

On 28 Jun 2006, Obama gave his famous "Faith and Politics" speech, toward the end of which he goes into his first point:

> "Given the increasing diversity of America's population, the dangers of sectarianism have never been greater. Whatever we once were, we are no longer just a Christian nation; we are also a Jewish nation, a Muslim nation, a Buddhist nation, a Hindu nation, and a nation of nonbelievers. And even if we did have only Christians in our midst, if we expelled every non-Christian from the United States of America, whose Christianity would we teach in the schools? Would we go with James Dobson's, or Al Sharpton's? Which passages of Scripture should guide our public policy? Should we go with Leviticus, which suggests slavery is OK and that eating shellfish is abomination? How about Deuteronomy, which suggests stoning your child if he strays from the faith? Or should we just stick to the Sermon on the Mount - a passage that is so radical that it's doubtful that our own Defense Department would survive its application? So before we get carried away, let's read our bibles. Folks haven't been reading their bibles."

Then he goes into what he calls his second point:

> "Democracy demands that the religiously motivated translate their concerns into universal, rather than religion-specific, values. It requires that their proposals be subject to argument, and amenable to reason. I may be opposed to abortion for religious reasons, but if I seek to pass a law banning the practice, I cannot simply point to the teachings of my church or evoke god's will. I have to explain why abortion violates some principle that is accessible to people of all faiths, including those with no faith at all.
>
> Now this is going to be difficult for some who believe in the inerrancy of the Bible, as many evangelicals do. But in a pluralistic democracy, we have no choice. Politics depends on our ability to persuade each other of common aims based on a common reality. It involves the compromise, the art of what's possible. At some fundamental level, religion does not allow for compromise. It's the art of the impossible. If God has spoken, then followers are expected to live up to God's edicts, regardless of the consequences. To base one's life on such uncompromising commitments may be sublime, but to base our policy making on such commitments would be a dangerous thing."

This quote was cited and discussed by American moral philosopher Joshua Greene as an example of the need to develop a universal moral currency system in the modern world, to deal with modern moral quagmires, such as gay rights, stem cell research, abortion, physician assisted death, etc.. [2]

Atheism | Beliefs

Obama was born to Barack Obama, Sr., an ex-Muslim atheist, and Ann Dunham, a free thinking Christian leaning towards atheist.

All American Presidents, four aside, namely: Thomas Jefferson (office: 1801-1809), a self-proclaimed "epicurean materialist" (1820), Abraham Lincoln, who said "the Bible is not my book nor Christianity my

profession", William Taft, and Barack Obama, have been Christians, generally speaking. [3]

On 16 Dec 2016, Obama signed legislation that amended the Frank Wolf International Religious Freedom Act, which extended protection of religious persecution to people with “non-theistic beliefs”; the bill was dubbed as America’s first bill protecting atheists. (Ñº)

Quotes

The following are related quotes:

> “Substantially, more people, in America, believe in angels, then they do in evolution.”
>
> — Barack Obama (2006), “Faith and Politics”, Jun 28 (Ñº|9:28)

References

1. Obama, Barack. (2006), “Call to Renewal: Obama on Church and State” (vid) (Ñº) (text), Jun 28.
2. Greene, Joshua. (2013). *Moral Tribes: Emotion, Reason, and the Gap Between Us and Them* (pgs. 175, 182). Penguin.
3. Religious affiliations of Presidents of the United States – Wikipedia.

External links

â— Barack Obama – Wikipedia.

θΔics

In hmolscience, **Barbara S. Heyl** (c.1935-) is an American sociologist noted for her 1968 investigative rather impressive article "The Harvard 'Pareto Circle'", wherein she discusses the warfare amid the Harvard sociology schools in the 1930s and early 1940s between the so-called Pareto approach and the Marxist approach to describe large-scale historical socio-political phenomena within a unified framework, both of which offering similar, i.e. "society as a system of mutually interacting particles", but alternative approaches. [1]

Harvard Pareto circle

The so-called Harvard Pareto circle, so-named by Heyl, included: George Homans, characterized by Leon Warshay as being "mechanistic", Charles Curtis, Lawrence Henderson, Joseph Schumpeter, Talcott Parsons, Bernard DeVoto, Chane Brinton, and Elton Mayo. The term Harvard "Pareto circle"—not to be confused with any of the original Pareto circles one might conceive amid or connected to the Lausanne school network—has since spawned a certain amount of citation, discussion, and followup articles. [2]

Education

Heyl was a professor of sociology at Illinois State University—alma mater of socioeconomic thermodynamics pioneer Thomas Wallace (ISU president from 1988 to 1995)—from 1975 to 2005, where she taught classes on sociology and deviance, sociology of law, and advanced qualitative research methods, and currently is professor emerita of sociology. [3]

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1. (a) Heyl, Barbara. (1968). "The Harvard 'Pareto Circle'." *Journal of the History of the Behavioral Sciences*, 4:316-34; in: *Talcott Parsons: Critical Assessments, Volume 1* (editor: Peter Hamilton) (§2, pgs. 29-49). Taylor & Francis.
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3. Barbara Heyl (faculty update) – Illinois State University.

θΔics

In hmolscience, **Barkley Rosser** (1948-) is an American mathematical economist note, in economic thermodynamics, for his discussion and critique of the use of physics concepts, such as entropy, thermodynamics, chaos theory, complexity theory, in economics.

Of note, Rosser's recent 2008 article "Debating the Role of Econophysics" is a critique of econophysics which contains a rather decent historical section on the use of entropy in economics, including mention of Georg Helm (1887), Leon Winiarski (1900), Alfred Lotka (1925), Harold Davis (1941), Paul Samuelson (1990), among others. Rosser notes, for instance, that French political economist Leon Walras (1874) was deeply influenced by the 1803 work of French physicist Louis Poinsot in the development of his general equilibrium theory. [1]

Interestingly, Rosser is one of the few people to have commented on the 1919 work of the relatively unknown American economist Julius Davidson. [2] Rosser has also commented on the sociophysics work of German physicist Wolfgang Weidlich. [3]

Education

Rosser received a BA in economics with a minor in mathematics in 1969, an MA in economics in 1972, and a Ph.D. in economics in 1976, studying with Eugene Smolensky, all from the University of Wisconsin–Madison. Rosser currently is an economics professor at James Madison University.

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External links

â— J. Barkley Rosser, Jr. – Wikipedia.

θΔics

In science, **barmaid physics**, aka "barmaid explanations", refers to the oft-cited premise that, in physics, one doesn't full understand a phenomena, theory, concept, principle, or law, etc., completely, until one can explain it to a barmaid or child, e.g. in simple words, or on a cocktail napkin.
Anecdotally, the origin of this simplification rule for difficult concepts is said to have occurred in a real situation in the working existence of either: James Maxwell, Charles Wilson, Ernest Rutherford, and or to Albert Einstein; albeit most oft-cited is Rutherford.

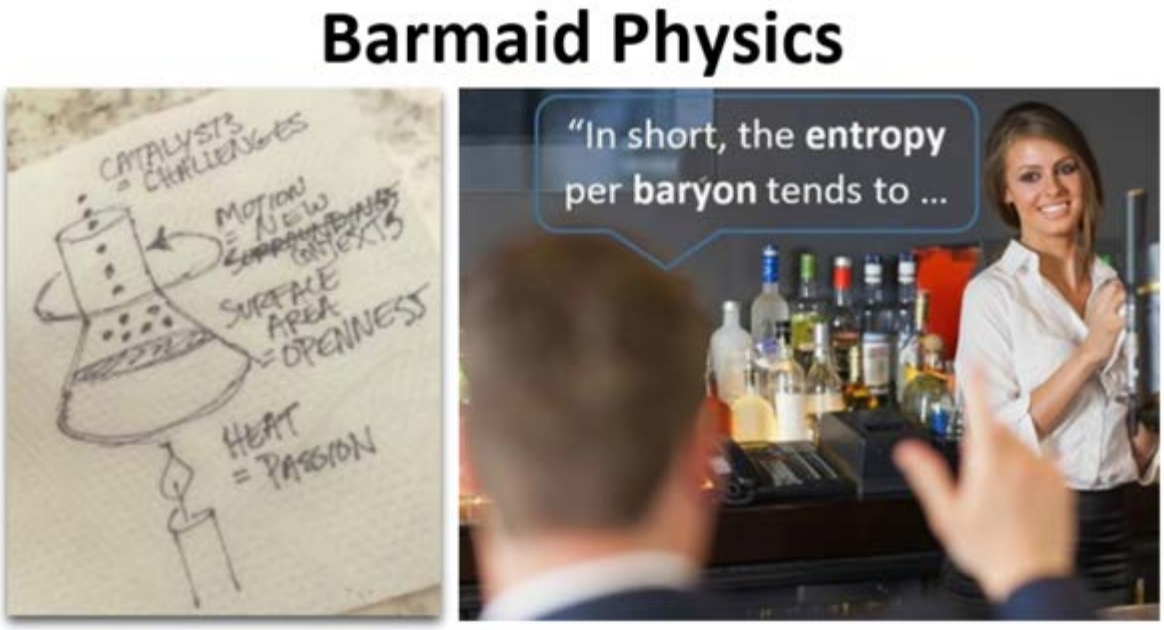

A rendition of **"barmaid physics"** type explanations, wherein the guy tries to explain, at left, Ben Biddle's 2013 "Innovation is like a Chemical Reaction" cocktail napkin idea, and at right, Roger Penrose's 2004 conjecture of the second law, under the stipulation of a positive cosmological constant, as: "Entropy per baryon tends so increase relentlessly and stupendously with time" to a beautiful, albeit simple minded (see: Beckhap's law) female bar tender. [4]

Maxwell

The following are quotes germane to the philosophy that if one cannot explain a phenomenon to a child than one does not understand the phenomena

> "If you can't make a physical model of it, you don't understand it well enough."
>
> — James Maxwell (or William Thomson) (c.1870), stated somewhere, in thereabout this form [?]

Wilson

The following are variants of the quote attributed to cloud chamber inventor Charles Wilson:

> "The laws of physics should be simple enough that a barmaid can grasp them."
>
> — Charles Wilson (c.1911) (O)

Rutherford

The following are variants of the quote attributed to alpha particle discoverer Rutherford:

> "It should be possible to explain the laws of physics **to a barmaid**."
>
> — Ernest Rutherford (c.1915) [5]

> “If a piece of physics cannot be explained to a barmaid, then it is not a good piece of physics.”
>
> — Ernest Rutherford (c.1915) (Q)

> “A good scientific theory should be explicable to a barmaid.”
>
> — Ernest Rutherford (c.1915) (Q)

> “No physical theory is worth much if it cannot be explained to a barmaid.”
>
> — Ernest Rutherford (c.1915) (Q)

> “A scientist who can’t explain his theories to a barmaid doesn’t really understand them.”
>
> — Ernest Rutherford (c.1915) (Q)

> “An alleged scientific discovery has no merit unless it can be explained to a barmaid.”
>
> — Ernest Rutherford (c.1915) (Q)

Einstein

The following are variants of the quote attributed to Einstein:

> “All physical theories, their mathematical expressions apart, ought to lend themselves to so simple a description that even a **child could understand** them.”
>
> — Albert Einstein (c.1930), comment to Louis de Brogile [5]

> “If you can't explain it simply, you don't understand it well enough.”
>
> — Albert Einstein (1947), supposedly derived (Q) from Rutherford “barmaid” comment [6]

Quotes

The following are related quotes:

> “One major difference between the ‘games’ played by theoretical physicists and those played by pure mathematicians is that, aside from meeting the demands of internal consistency and mathematical rigor, a physical model must also meet the inflexible boundary condition of agreeing with physical reality.”
>
> — James Cushing (date); compare Gibbs on mathematicians vs. physicists [7]

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θΔics

In science, a **barometer** (TR:31) is a device or instrument, no matter how is works, that measures the pressure of the atmosphere (see: atmospheric pressure), in a strict sense (Middleton, 1964), or "pressure" in a general sense. [4]

Overview

In 1643, Evangelista Torricelli, during his investigation of possible existence of vacuums in nature, in respect to Galileo's "pump problem" (c.1640), inverted a tube of mercury into a bowl of mercury, and therein found that a vacuum was created at the top of the tube, which was the first disproof of the nature abhors a vacuum postulate, tracing back to Parmenides (485 BC). A depiction of Torricelli's experimental device is shown adjacent, and it is now known as the barometer or "meter" for measuring pressure. [2]

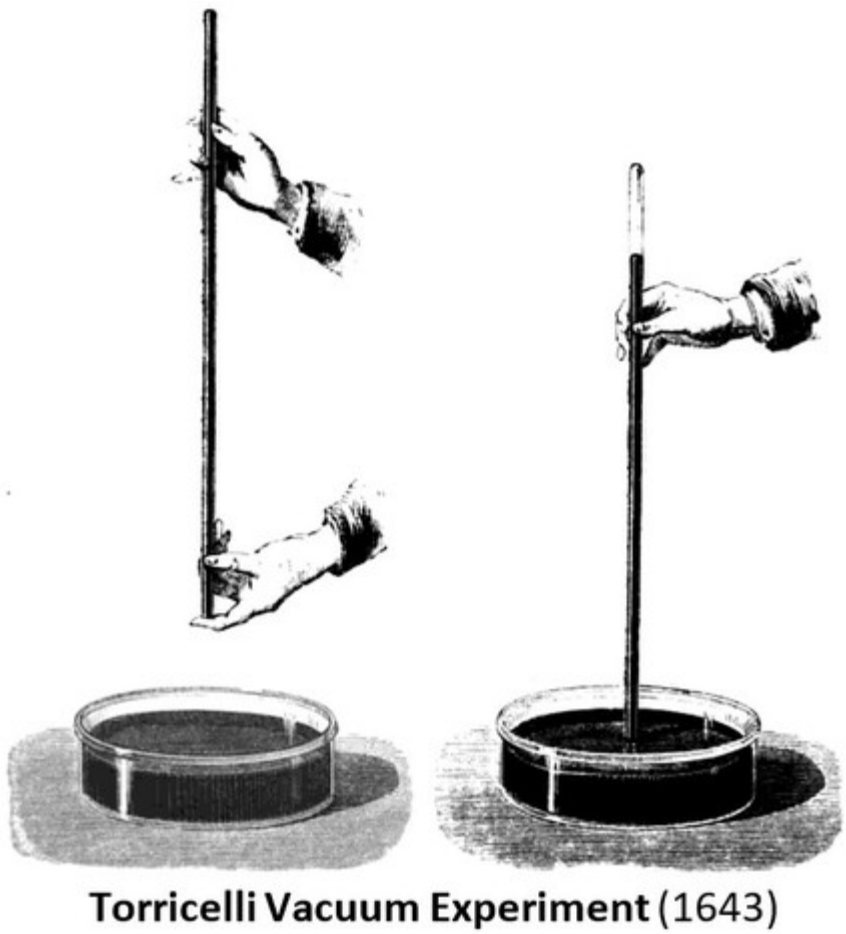

A rendition of Evangelista Torricelli's 1643 barometer. [2]

In 1648, Blaise Pascal conducted an experiment, in continuation of Torricelli's work, wherein he had someone carry a Torricelli vacuum up a mountain and recorded the changes in the height of the vacuum at the top:

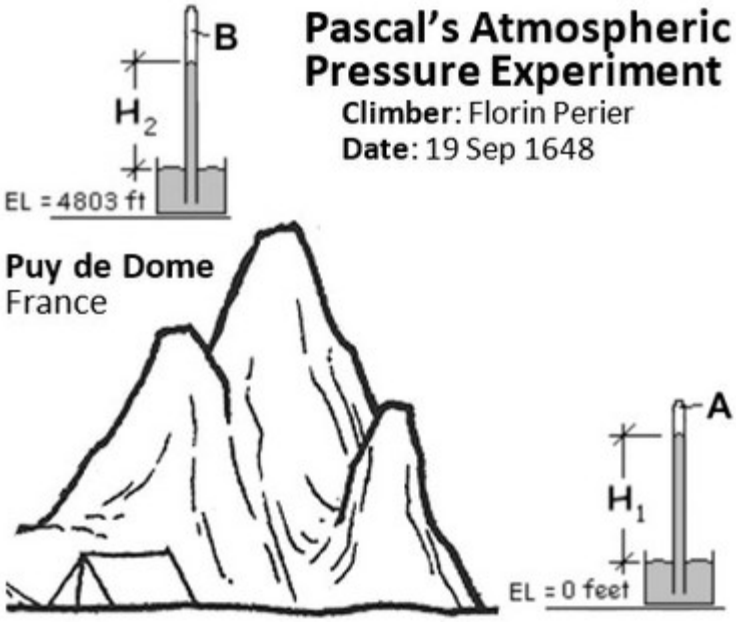

In c.1660, Otto Guericke, independent of Pascal and Torricelli, used a vacuum pump and a two copper globe like device (see: illustration IX) to make water rise in a glass tube, during the course of which one of his onlookers asked "how high will it make the water go?", in response to which Guericke tested this question by attaching a four story tube to the side of his home (see: illustration X), finding that it would only rise a little past the third story or "19 Magdeburg cubits". Moreover, when the experiment had been set up for several days, he recorded that it varied in height, on certain days, as follows: [3]

> "Afterwards, however, when this experiment had been set up for several days, I saw some variation from one day to the next. Sometimes, the water was the width of one hand or two or three higher than before, and sometimes that amount lower. I could not explain the reason for this."

Here, then, we have the first account of daily change in barometric pressure. Guericke, of note, had already deduced that it was the weight of the atmosphere that produced the perceived nature abhors a vacuum phenomenon, and also stated that at a certain height upwards, where the earth's atmosphere ends, that pure space would begin in the form of a complete vacuum. Here, however, we see him perplexed at the daily atmospheric variation.

Naming

In 1663, Robert Boyle, in his *New Experiments and Observations Touching the Cold*, was using the term "barometer" in reference to "mercurial cylinder" measured up to 29 or 30 inches. [4]

In 1664, Robert Hooke, in his letters to Mr. Beale, was using the term "baroscope".

In 1665, Henry Oldenburg, the publisher of the Royal Society transactions, printed the following note:

> "Modern philosophers, to avoid circumlocutions, call that instrument, wherein a cylinder of quicksilver, of between 28 to 32 inches in altitude, is kept suspended after the manner of the Torricellian experiment, a '**barometer**' or 'baroscope'."
>
> — Henry Oldenburg (1665), "Article", *Philosophical Transactions*, Feb 12 [4]

Signaling, to the effect, that barometer was slightly preferred over baroscope.

See also

- Human thermodynamic instrument
- Social barometer
- Thermometer

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External links

- Barometer – Wikipedia.

θΔics

In existographies, **Baron d'Holbach** (1723-1789) (IQ:190|#31) [RGM:414|1,500+] [**SN:12**] (FA:74) (GAE:1) (GPhE:5) [CR:251], born Paul Dietrich, aka Paul-Henri Thiry, "Jean-Baptiste de Mirabaud" (pseudonym), or the "materialist Mirabaud" (Owen, 1829), was a German-born French-raised atheism-explicit anti-chance based matter-and-motion philosopher, noted for his Holbach's school (Q), Holbach's geometrician (forerunner to Laplace's demon), etc., characterized as the "Newton of the atheists" (Q)(V|1:45) or "the supreme materialist" (Cooper, 1976), even cited so in history of atheism documentaries, and high ranked extreme atheist, who; in epicenter genius categorizations, was "one member of Voltaire's circle", if not the leader, and who; according to Caspar Hakfoort, was one of the stepping stone pioneers of scientism, being generally known for his 1770 ***The System of Nature****: the Laws of Moral and Physical World*, referred to by some as an "Atheist's Bible", wherein saw the universe as nothing more than matter in motion, bound by inexorable natural laws of cause and effect, in which there is "no necessity to have recourse to supernatural powers to account for the formation of things." [1]

Early period

Holbach was said to have been "abandoned by his parents and raised by his uncle, for whom he had no particular affection" (Q) or his "mother died leaving him an orphan at a young age" (Q) or "his father, a rich parvenu, according to Rousseau, died when Holbach was still a young man, after his father had brought him to Paris at age 12" (Q) or "was apparently an orphan by the age of 13 and lived with his uncle (from whom he took the new name Holbach)" (Q).

Wealth

In 1753, Holbach's father and uncle both died (deboundstated), leaving him an immense fortune, with which he used to fund his famous intellectual salons. [9]

Solon | Meetings

> *See also: Hume-Holbach dinner party*

Holbach, for thirty years, from 1750 to 1780, at his second mansion Le Château de Grand-Val, outside of Paris, ran a bi-weekly intellectual salon, with the entice of excellent food, expensive wine, and a library of over 3000 volumes, he attracted many notable visitors, including: Diderot, Grimm, Condillac, Condorcet, D'Alembert, Marmontel, Turgot, La Condamine, Helvetius, Jean-Jacques Rousseau, Adam Smith, David Hume, and Benjamin Franklin.

Influences

Holbach's was keen on Lucretius, e.g. his children's tutor had published a new translation of *On the Nature of Things*. Holbach read Jean Meslier, John Toland, Anthony Collins, Denis Diderot, when he edited Holbach's *System of Nature*, added footnotes of doubters from Cicero to Thomas Hobbes.

System of Nature

> *See main: The System of Nature*

In circa 1768, d'Holbach finished a draft of his *The System of Nature: the Laws of Moral and Physical World*. He showed the draft to Denis Diderot who complained privately, to someone, the following, as summarized by Scott:

> "There was no wit, no shadow, no nuance, no multi-sidedness, no art, no pleasure or erotic play to be found in its pages. It denied god, argued that all religions were created out of fear, ignorance, and anthropism; that souls did not outlive the body; that the world was determined by strict laws."

Diderot went on to admit to friends that d'Holbach made "atheism dull", and that his book was an act of war—to

destroy the power of religion, via reference to the new sciences.

In 1770, d'Holbach, after smuggling it across the border into Amsterdam to be published, under a pseudonym (Q), under the name "Jean-Baptiste de Mirabaud", e.g. see the 1795 English translation by William Hodgson (Q), then shipped it back to France, where it debuted anonymously as *The System of Nature*, soon-to-be-dubbed (Q)(Q) the "Atheist's Bible", to the public. The anonymous work, of note, was initially attributed to Helvetius and Honore Mirabeau. [10]

Critical History of Jesus Christ

In 1770, d'Holbach published *Critical History of Jesus Christ: a Rational Analysis of the Gospels*, oft-cited as one of the first Christ myth theory books, wherein he attempted to debunk the authenticity of Jesus Christ; the following are noted sections: [7]

> "The salvation of Christians thus depends neither on the reading nor on the understanding of the sacred books, but on the belief that these books are divine. If, unfortunately, the reading or examination of any one, does not coincide with the decisions, interpretations, and commentaries of the church, he is in danger of being ruined, and of incurring eternal damnation. To *read* the gospel, he must commence with being disposed blindly to believe all which that book contains; to *examine* the gospel, he must be previously resolved to find nothing there but the holy and the adorable; in fine, to *understand* the gospel, he must entertain a fixed persuasion, that the priests can never be themselves deceived, or wish to deceive others in the manner they explain it. "Believe, (say they,) believe on our words that this book is the work of God himself; if you dare to doubt it, you shall be damned. Are you unable to comprehend anything which God reveals to you there? Believe evermore: God has revealed himself that he may not be understood."
>
> — Baron d'Holbach (1770), *Critical History of Jesus Christ* (pg. 6)

> "Victor of Tunis informs us, that, in the sixth century, the Emperor Anastasius "caused the gospels to be corrected, as works composed by *fools*." The Elements of Euclid are intelligible to all who endeavor to understand them; they excite no dispute among geometricians. Is it so with the Bible? and do its *revealed* truths occasion no disputes among divines? By what fatality have writings revealed by God himself still need of commentaries? and why do they demand additional lights from on high, before they can be believed or understood? Is it not astonishing, that what was intended as a *guide* to mankind, should be wholly above their comprehension? Is it not cruel, that what is of most importance to them, should be least known?"
>
> — Baron d'Holbach (1770), *Critical History of Jesus Christ* (pg. 9)

> "It is also extremely difficult to ascertain whether those books belong to the authors whose names they bear. In the first ages of Christianity there was a great number of gospels, different from one another, and composed for the use of different churches and different sects of Christians. The truth of this has been confessed by ecclesiastical historians of the greatest credit. (Tillemont, tom. ii. 47, etc. Epiphan. Homil. 84. Dodwell's Disser. on Irenaeus, p. 66. Freret's Examin. Critique. Codex Apocryphus, &c.) There is, therefore, reason to suspect, that the persons who composed the acknowledged gospels might, with the view of giving them more weight, have attributed them to apostles, or disciples, who actually had no share in them. That idea, once adopted by ignorant and credulous christians, might be transmitted from age to age, and pass at last for certainty, in times when it was no longer possible to ascertain the authors or the facts related. Among some fifty gospels, with which Christianity in its commencement was inundated, the church, assembled in council at Nice [325AD], chose four of them, and rejected the rest as apocryphal, although the latter had nothing more ridiculous in them than those which were admitted. Thus, at the end of three centuries, (*i.e.* in the three hundred and twenty-fifth year of the Christian era,) some bishops decided, that these four gospels were the only ones which ought to be adopted, or which had been inspired by the Holy Spirit. A miracle enabled them to discover this important truth, so difficult to be discerned at a time even then not very remote from that of the apostles."

— Baron d'Holbach (1770), *Critical History of Jesus Christ* (pgs. 10-11)

> "Notwithstanding this decision, there still remain some difficulties on the authenticity of the gospels. In the *first* place, it may be asked whether the decision of the Council of Nice, composed of three hundred and eighteen bishops, ought to be regarded as that of the universal church? Were all who formed that assembly entirely of the same opinion? Were, there no disputes among these men inspired by the Holy Spirit? Was their decision unanimously accepted? Had not the authority of Constantine a chief share in the adoption of the decrees of that celebrated council? In this case, was it not the imperial power, rather than the spiritual authority, which decided the authenticity of the gospels?"

— Baron d'Holbach (1770), *Critical History of Jesus Christ* (pgs. 12)

The gist of this, up to this point, seems to be the conjecture that that Christianity was invented in 325AD, under the orders of Roman Emperor Constantine I, during which time 318 bishops, following debate and discussion, picked four (Matthew, Mark, Luke, John) of 50 total potential gospels, to the be the core of the new religion of the empire.

Common Sense

In 1772, d'Holbach published *Common Sense* (*Bon Sens*), under the pseudonym of "Cure Meslier", a work said to be deeply indebted to Meslier, which gave a popular expression to the former's atheism; by 1803, it was recognized that the work had been written by Holbach. [6]

Soul | Determinism

On the determinism and the soul, religiously conceptualized as an autonomous entity, d'Holbach, in his "A Defense of Determinism" (Q), had the following to say:

> "Those who have affirmed that the soul is distinguished from the body, is immaterial, draws its ideas from its own peculiar source, acts by its own energies, without the aid of any exterior object, have, by a consequence of their own system, enfranchised [liberated] it from those physical laws according to which all beings of which we have a knowledge are obliged to act. They have believed that the soul is mistress of its own conduct, is able to regulate its own peculiar operations, has the faculty to determine its will by its own natural energy; in a word, they have pretended that man is a free agent."

(add)

Education

Holbach attended Leiden University from 1744 to 1748. In c.1759, Holbach translated the best works published by the Germans on natural history and chemistry into French. [10]

Quotes | Employed

The following are quotes employed by Holbach:

> "Timaeus of Locris (Q), who was a Pythagorean, admits that the doctrine of future punishments was fabulous, solely destined for the imbecility of the uninformed, and but little calculated for those who cultivate their reason."

— Baron d'Holbach (editor) (1770), *The System of Nature* (pg. 129)

“We believe that that which is will always be, and that the same causes will have the same effect.”

— Thomas Hobbes (1655), a paraphrase, supposedly (Joshi, 2014), his chapter on causality in *De Corpore*; cited by Baron d’Holbach (1770) in *System of Nature* (pg. 124)

Quotes | On

The following are noted quotes on Holbach:

“I have never met with a man more learned—I may add, more ***universally*** **learned**, than the **Baron d'Holbach**; and I have never seen anyone who cared so little to pass for learned in the eyes of the world. Had it not been for the sincere interest he took in the progress of science, and a longing to impart to others what he thought might be useful to them, the world would always have remained ignorant of his vast erudition. His learning, like his fortune, he gave away, but never crouched to public opinion. The French nation is indebted to d'Holbach for its rapid progress in natural history and chemistry. It was he who, 30 years ago, translated (enriched with valuable notes) the best works published by the Germans on both these sciences, till then, scarcely known, or at least, very much neglected in France. Holbach possessed an extensive library, and the tenacity of his memory was such as to enable him to remember without effort every thing he had once read ”

— Friedrich Melchior (1789), “On Baron d’Holbach”, Aug 10; note that, in the context of this quote, Melchior (Q) was also closely associated with: Jean Rousseau (IQ:175|#243), Denis Diderot (IQ:175|#243), Jean d'Alembert (IQ:185|#73), Marmontel, Morellet, and Helvetius (IQ:175|#215) [10]

“There is no book of atheistical description which has made a greater impression than the famous *System of Nature*.”

— Henry Brougham (c.1856) (Q) [10]

“The failure of the reformation to capture France had left for the Frenchmen no half-way house between infallibility and infidelity; and while the intellect of Germany and England moved leisurely in the lines of religious evolution, the mind of France leaped from the hot faith which had massacred the Huguenots to cold hostility with which La Mettrie, Helvetius, **Holbach**, and Diderot turned upon the religion of the fathers.”

— Will Durant (1926), *the Story of Philosophy* [2]

“The notion that the brain itself feels and thinks is a ‘revolting opinion’ reminiscent of the ‘**insane** [see: crazy] author [**Holbach**] of the *Systéme de la Nature*’.”

— Mathieu Buisson (c.1802) (Q), as cited by L.S. Jacyna (1987) in summary of Buisson’s criticism (Q)(Q) of Xavier Bichat’s 1801 theory (Q) of physiological properties; note: quoted misattributed, by Jennifer Hecht (2003), to Louis de Bonald

“Nietzsche launched a new building project that represents an advance for atheism. Meslier denied all divinity, **Holbach** dismantled Christianity, Feuerbach deconstructed god. Then Nietzsche introduced transvaluation: atheism is not an end in itself. Do away with god, yes, but then what? Another morality, a new ethic, values never before thought of because unthinkable, this innovation is what makes it possible to arrive at atheism and to surpass it. A formidable task, and one still to be brought to fruition.”

— Michel Onfray (2005), *Atheist Manifesto* (O)

"As Casper showed in his article 'The Historiography of Scientism: A Critical Review' (1995), the notion of scientism in a variety of meanings has been around for a long time; still, Casper put it to new uses by applying it to persistent efforts over the centuries, from Hobbes and **d'Holbach** to Capra and Hawking in our own day, to make the latest science serve the construction of a world-view."

— Floris Cohen (2009), "Note about an Unfinished Book on Ostwald by the Late Casper Hakfoort" [3]

"As romantic genius will claim, geniuses help move history forward. Their voices speak to the future, as Stael explains in all her comments on genius. Or, as **Baron d'Holbach** said of his fellow philo-sophes: 'You are not men of your times; you are men of the future, the precursors of future reason. It is not wealth, nor honour, nor vulgar applause that you should aim for, it is immortality.' The genius advances progress by his discoveries, 'soaring like an eagle toward a luminous truth', as the essay on genius in the *Encyclopedie* explained."

— Kathleen Kete (2012), *Making Way for Genius: the Irish Aristocracy in the Seventeenth Century* [11]

"**D'Holbach's** book caused a great stir among the Paris savants, effectively dividing the deists from the atheists. Voltaire, committed to deism and long impatient with d'Holbach's declamatory ways, called it 'a chaos, a great moral sickness, a work of darkness, a sin against nature, a system of folly and ignorance.' He wrote to Delisle de Sales: "I think that nothing has debased our century more than this enormous stupidity."

— Rebecca Stott (2013), *Darwin's Ghosts: in Search of the First Evolutionists* [5]

"**Holbach's** treatise [*System of Nature*] remains one of the most exhaustive discussions of atheism — from a scientific, philosophical, moral, and political perspective — ever written."

— Sunand Joshi (2014), *The Original Atheists* [9]

"**Baron d'Holbach** is first modern atheist in Western Christian tradition; the first intellectual since antiquity to really make a case for atheism, that wasn't just an attack on Christianity."

— Chad Denton (2017), "A Century of Lights, Episode 8" (V|6:13-23), Jan 26

Quotes | By

The following are notable quotes by Holbach:

"An so, wise men, you are not men of your times; **you are men of the future**, the precursors of future reason. It is not wealth, nor honour, nor vulgar applause that you should aim for: it is immortality."

— Baron d'Holbach (1770), *Essay on the Prejudices* (see: posthumous genius) [11]

"To discover the true principles of morality, men have no need of theology, of revelation, or of god."

— Baron d'Holbach (c.1770) (Q)

"All children are born atheists; they have no idea of god."

— Baron d'Holbach (1772), *Freethoughts Opposed to Supernatural Ideas* [4]

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Further reading

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External links

- Baron d'Holbach – Wikipedia.
- The System of Nature – Wikipedia.

θΔics

In literature thermodynamics, **Barri J. Gold** (1966-) is American English professor noted for her 2010 book *ThermoPoetics: Energy in Victorian Literature and Science*, in which she outlines the subject she terms “thermopoetics” the interaction between Victorian physics and literature. [1] Precursors to the book seem to be Gold’s 2002 article “The Consolation of Physics: Tennyson’s Thermodynamics Solution”, as well as her 2009 talk “Bleak House: the Novel as Engine”. [2]

Misrepresentation and anachronism

Gold's mode of presentation is fairly poor as science writers go. Her work is filled with both misrepresentation and anachronisms galore.

To cite one of numerous examples, she summarizes Balfour Stewart and Norman Lockyer’s two-part 1868 article "The Sun as a Type of the Material Universe" and "The Place of Life in a Universe of Energy" as by stating that, in their article set, “they aim to develop a mechanism for intelligence and free will based on a hypothesis about the origin of sunspots”. Nowhere in either article, however, do they discuss nor use the term free will, let alone attempt to argue for a sunspot theory of free will?

She informs us incorrectly that Alfred Tennyson's 1849 "In Memoriam" poem was theorizing about bound energy, some thirty plus years before the term "bound energy" was even coined and formulated (Hermann Helmholtz, 1882).

Charles Dickens' 1859 book *A Tale of Two Cities*, according to Gold, has entropy theories in it. Is she not aware that the the term entropy would yet even be coined for a another six years (Rudolf Clausius, 1865)? She states, to exemplify the idiocy of her conjectures, that Dickens' passage of "it is a far, far better thing I do, that I have ever done; it is a far, far better rest I go to, than I have ever known", taps into an "emergent chemical thermodynamics". What? Charles Dickens was tapping into an emergent chemical thermodynamics in 1859? Does she not know that the first "chemical thermodynamics" entitled book was not written until 1924 by James Partington?

Gold's entire book is page after page of misrepresentation: "Dickens [*A Tale of Two Cities*, 1859] applies the same principles of entropic decay to the tumbrels themselves"; "Herbert Spencer [*First Principles*, 1862] was reading counterentropic transformations"; "the first law was born of religious conviction", "the second law was the discovery of frustrated engineers"; "Sydney Carton was Dickens' tool for producing novelist order within the constraints of thermodynamics", etc., etc., etc.

She states that Dickens' use of the term "wasting candles", in his 1852 *Bleak House*, exhibits "Dickens' thermodynamic sensibilities" and that in the same book mention of "shops lit two hours early", is Dickens theorizing about heat death, a concept that would not yet be articulated for another decade (William Thomson, 1862).

This really is horrible writing, beyond recompense. It would been much clearer writing if Gold would have stated I am going to argue that "this passage" means this, thermodynamically, etc., rather than trying to force-feed beyond digestible arguments that early 19th century authors were theorizing thermodynamically before the science of thermodynamics was even founded. This mode of misrepresentation of facts is similar to Robert Doyle who falsely claims, in his 2011 *Free Will: the Scandal in Philosophy*, that William Thomson was discussing information theory back in the 19th century. These types of mis-presentations are very energy absorbing detractments.

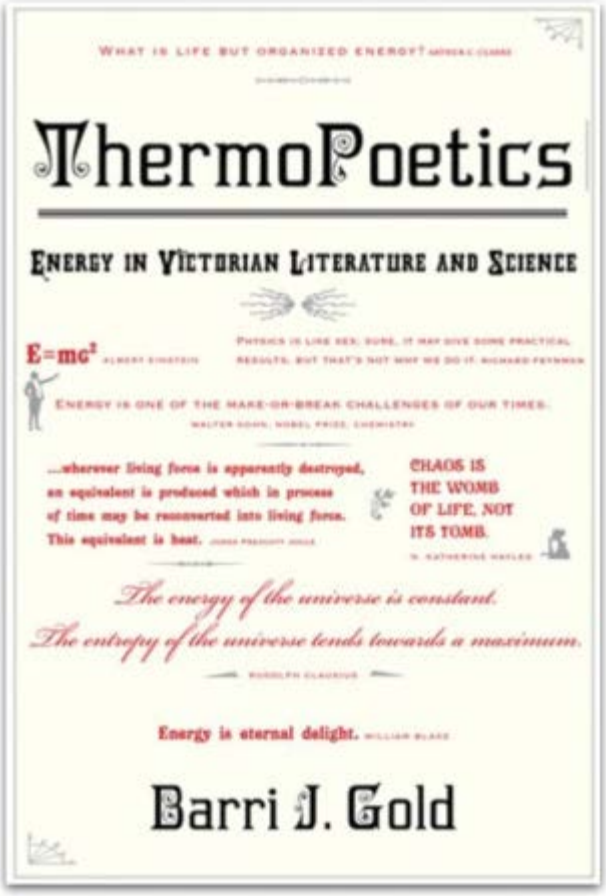

Cover of **Gold**'s 2010 *ThermoPoetics: Energy in Victorian*

Literature and Science, in which she outlines the subject she terms "thermopoetics" the interaction between Victorian physics and literature. [1]

Source and sink

The only interesting aspect of Gold's anachronistic conjectures, is that in her bent on re-framing Dickens' 1852 *Bleak House* into what she calls a "narrative engine", she attempts to assign certain characters or groups as "sinks", analogous to the condenser, and "sources", analogous to the boiler, of the steam engine, to which she attributes to people who are "too passionless" or conversely passionate, respectively, according to which model, in the novel as in the heat engine: [1]

> "A narrative engine must have both a source and a sink."

Quotes | Cited

The following are a few quotes employed by Gold:

> "Energy is eternal delight."
>
> — William Blake (1793), *The Marriage of Heaven and Hell*

> "What is life but organized energy?"
>
> — Arthur Clarke, "Out of the Sun" (1958)

Education

Gold completed her BS in physics at MIT; her MA and PhD, both in English language and literature, at the University of Chicago; and currently is a professor of English at Muhlenberg College. [3]

See also

- Bruce Clarke
- Thermolinguistics

References

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2. (a) Gold, Barri J. (2002). "The Consolation of Physics: Tennyson's Thermodynamics Solution", *Publications of the Modern Language Association*, 117(3): 449-64.
(b) Gold, Barri J. (2009). "Bleak House: the Novel as Engine", British Society for Literature and Science, Program, Panel E.
3. Anon. (2010). "Review: Energy, Victorian Style", *PhysicsWorld.com.*

Further reading

- Gold, Barri J. (2012). "Energy, Ecology, and Victorian Fiction" (abs), *Literature Compass*, 9(2): 213-24, Feb.

External links

- Berri Gold (faculty) – Muhlenberg College.

θΔics

In hmolscience, **S. Barry Barnes** (1943-) is a Scottish-born English sociologist noted for the following 1998 statement to American solid-state physicist David Mermin in regards to whether he might be into astrology, exchanged amid their so-called sociology of science debates or wars: [1]

> "The belief state of an obscure lump of molecules wandering around a remote corner of England is of no importance whatsoever epistemologically speaking."

(add discussion)

References

1. (a) Barnes, Barry. (1998). "Oversimplification and the Desire for Truth: Response to Mermin" (abs) (pg. 637), *Social Studies of Science*, 28:636-40.
(b) Barnes, Barry, Bloor, David and Henry, John. (1996). *Scientific Knowledge: A Sociological Analysis*. University of Chicago Press.
(c) Mermin, N. David. (2001). "Conversing Seriously with Sociologists" (pg. 94), in: *The One Culture? A Conversation about Science* (editors: Jay Labinger and Harry Collins) (§7:83-98). University of Chicago Press.
(d) David Mermin – Wikipedia.

External links

â— S. Barry Barnes – Wikipedia.

θΔics

In hmolscience, **Barry Commoner** (1917-2012) was an American biologist, ecologist, and politician noted for his 1976 *The Poverty of Power: Energy and the Economic Crisis*, in which, according to Michael Macrakis, he prepared a popular presentation of thermodynamics in support of his policy views on the then trendy energy conservation. [1] The gist of the book seems to comprise an opening laymanized history of thermodynamics chapter, followed by chapters on energy use sources, fossil fuels, nuclear fuel, solar power, etc. [2]

References

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2. Commoner, Barry. (1976). *The Poverty of Power: Energy and the Economic Crisis*. Alfred A. Knopf.

External links

- Barry Commoner – Wikipedia.

θΔics

In existographies, **Bart D. Ehrman** (1955-) is an American critical history New Testament scholar, author of some 30+ books in this field, noted for his 2005 focus on the fact that "no original copies of the Bible exist".

Religion | Beliefs

In c.1972, Ehrman, in high school, was a born-again Christian, he “accepted Christ as his lord and savior”, as he used to say, and in his late teens was committed evangelical Christian. He then went to seminary school, and was a pastor of a Baptist church for a year. Then, as he was getting his PhD in New Testament studies, at Princeton Theological Seminary, he began to lose his grip in his previously held belief that the New Testament was the “inerrant word of god”, as he starting finding “mistakes” in the Bible. [1] For years afterword, he was an open-minded “liberal Christian”, i.e. he still went to church, he still believed in god, but I didn’t believe that the Bible was the inspired word of god.

In 1998-1999, after reading multiple views, e.g. philosophical, theological, etc., on the "problem of suffering" in the world, supposedly controlled by a god, he became an agnostic. Ehrman. In 2014, was self-identifying as “both a humanist and an agnostic” and or, as he said during his 2014 FFRF "Emperor Has No Clothes" award speech, an “agnostic and atheist”, in the latter of which he digresses on terminology, as follows: [2]

> “What I used to think, before I was an ‘agnostic’ [1998/1999], was that agnostics and atheists were two degrees of the same thing. When I first declared myself agnostic, I was amazed at how militant both agnostics and atheists can be about their terms [laughter] Every agnostic I met thought that ‘atheists’ were simply *arrogant agnostics* [laughter] and every atheist thought that ‘agnostic’ was simply a wimpy atheist [laughter]. Two degrees of the same thing. Where someone will admit they do know, the other will admit they don’t. But, I have come to think that they are not two different degrees of things, but that they are two different kinds of things. That agnosticism has to do with epistemology. That atheism has to do with belief.”
>
> — Bart Ehrman (2014), FFRF “Emperor Has No Clothes” award speech, May 2-3 [2]

Correctly, evangelical Christian (1972-1970), liberal Christian (1978-1990s), agnostic (1998/1999), humanist-agnostic (2010), to agnostic-atheist (2014) are different "belief states" of the a deconversion process, wherein each is less epistemologically ignorant than the former, and the middle agnostic-themed terms are akin to mental transition state stage.

Quotes

The following are related quotes:

> “My thesis can be stated simply: scribes occasionally altered the words of their sacred texts to make them more patently orthodox and to prevent their misuse by Christians who espoused aberrant views.”
>
> — Bart Ehrman (1993), *The Orthodox Corruption of Scripture* (O)

> “It is one thing to say that the originals were inspired, but the reality is that we don't have the originals—so saying they were inspired doesn't help me much, unless I can reconstruct the originals. Moreover, the vast majority of Christians for the entire history of the church have not had access to the originals, making their inspiration something of a moot point. Not only do we not have the originals, we don't have the first copies of the originals. We don't even have copies of the copies of the originals, or copies of the copies of the copies of the originals. What we have are copies made later—much later. In most instances, they are copies

made many centuries later. And these copies all differ from one another, in many thousands of places. As we will see later in this book, these copies differ from one another in so many places that we don't even know how many differences there are. Possibly it is easiest to put it in comparative terms: there are more differences among our manuscripts than there are words in the New Testament."

— Bart Ehrman (2005), *Misquoting Jesus* (Q)

"The Bible's not some kind of inerrant revelation from god."

— Bart Ehrman (2014), reflection on his graduate school days change of views [2]

References

1. Anon. (2009). "Finally Top Bible Scholar "Professor D. Ehrman" Leaves Christianity" (Q), ImageOfLove, May 1.
2. Burdick, Scott. (2014). "Interview: Bart Ehrman's Personal Beliefs" (Q), Bart D. Ehrman, May 8.

Further reading

- Ehrman, Bart D. (2011). *Forged: Writing in the Name of God--Why the Bible's Authors Are Not Who We Think They Are*. Harper Collins.
- Ehrman, Bart D. (2014). *How Jesus Became God: The Exaltation of a Jewish Preacher from Galilee*. HarperOne.

External links

- Bart D. Ehrman – Wikipedia.
- How Jesus Became God – BartDEhrman.com.

θΔics

In existographies, **Basilides** (c.80-145AD) was an Alexandrian Gnostic theologian and religious teacher, not to be confused with Basilides the Epicurean (c.250-175BC) (O) successor of Polystratus (see: Greek philosophy), noted for []

Overview

In c.138AD, Basilides published a *Exegetica*, a two-dozen volume treatise on, supposedly, the Christian gospels.

In his "Acts of John" (5th century Armenian edition), produced by his followers, the Basilidians, Christ is described as encountering his followers in "many different guises, not especially a human one". (O)

The works of Basilides were all burned during the 400 to 800AD pagan purge.

Quotes | On

The following are quotes on Basilides:

> "**Basilides** is a philosopher devoted to the contemplation of divine things."
>
> — Clement of Alexandra (c.200AD) [1]

References

1. Harpur, Tom. (2004). *The Pagan Christ* (pg. 113). Thomas Allan Publishers.

External links

- Basilides – Wikipedia.

θΔics

In genius studies, **battle of the prodigies** is a phrase that refers to a study of the

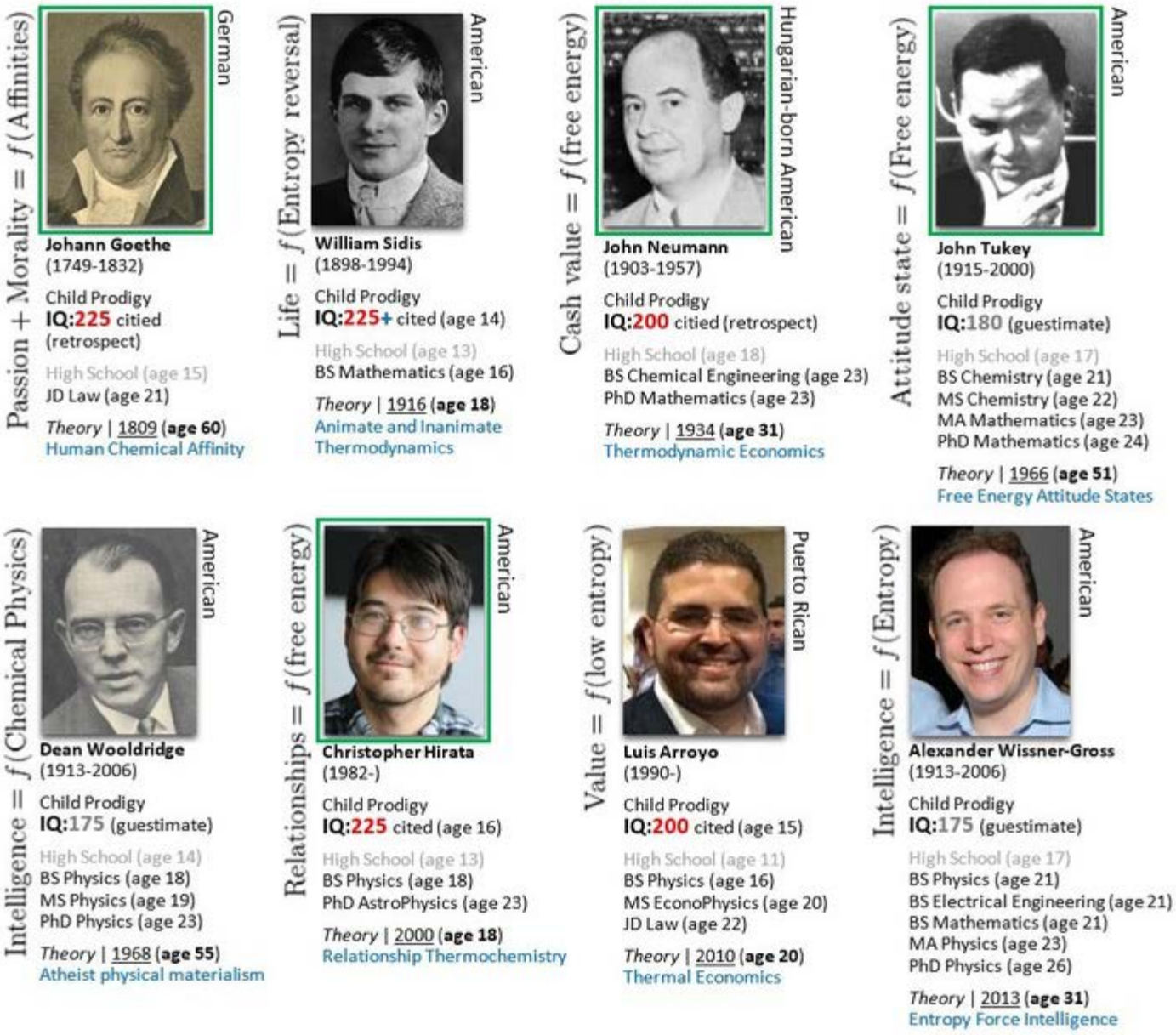

comparison of the similarly related thermodynamics-based theories of existence independently arrived at in the minds of near IQ:200 (±25-points) child prodigies turned adults.

Overview

The adjacent diagram gives a visual of the so-called "battle of the prodigies", i.e. eight noted theory related child prodigies, namely: Johann Goethe (1809|60), William Sidis (1916|18), John Neumann (1934|31), John Tukey (1966|51), Dean Wooldridge (1968|55), **Christopher Hirata** (2000|18), Luis arroyo (2010|20), and Alexander Wissner-Gross (2013|31), five cited with IQ:200+ range (Goethe, Sidis, Neumann, Hirata, and Arroyo), three of which cited in the IQ:225+ range (Goethe, Sidis, and Hirata), who into adulthood (age 18+) independently derived and or arrived at physiochemical, thermodynamic, and or chemical thermodynamics formulation one or more aspects of existence, date (age) of theory publication shown next to each name; Neumann's theory, to note, not quite independent (but nevertheless original), being that it resulted following a request, by Abraham Flexner, to read and comment on Georges Guillaume's 1932 economic thermodynamics PhD dissertation. The **GREEN** box indicates theorists whose model is about the same, i.e. free energy / affinity based; the two related by the Goethe-Helmholtz equation (i.e. thermodynamic theory of affinity).

Goethe

In 2006, Libb Thims discovered Goethe, and his "human chemical theory", via Prigogine (footnote 2.5), and shortly thereafter found that he was a famous early child prodigy who became the first adult person to be ranked with an IQ of 225 (Cox, 1925).

Sidis

In 2008, Thims had become aware of William Sidis, aka 20th century America's most famous child prodigy, had started an Hmolpedia article on him, and knew of his IQ citations in the 250-300 range, and his age 16 developed "life is a reversal of the second law theory" of animate and inanimate forms.

Neumann

John Neumann is a peculiar case; he is frequently name-dropped as a missing candidate in the IQ:200+ video series; between 2010 and 2015, e.g. his name was mentioned, as a missing IQ:200+ candidate, some 15+ times (Ñº). Other independent sources likewise have IQ guestimated his IQ at 200. (Ñº) His digressions on chemical thermodynamics in economics are near to target; his suggestions on entropy in telecommunications, however, has resulted in a weed theory.

Wooldridge

Dean Wooldridge is a comparable child prodigy turned atheism-explicit physical materialism philosopher. While not necessarily thermodynamics-centric, his work is in the neighborhood.

Hirata

On 15 Feb 2010, Thims discovered Hirata, via specifically searching for people cited with IQs of 225 or above, and shortly thereafter found his "human thermochemical theory", embedded as a subfile of one of his CalTech faculty pages.

Arroyo

In 2010, Puerto Rican childprodigy Luis Arroyo, then aged 20, completed MS physics thesis "A Thermal Model of Economy", after which, on 10 Feb 2016, via Ram Poudel, who is presently working on his PhD in economics and thermodynamics, was read by Thims (sent to him from Poudel), and after researching Arroyo's background, that he was a famous Puerto Rican child prodigy, who was cited with an IQ of 200 at age 15.

Wissner-Gross

On 19 Apr 2013, American child prodigy turned physicist Alexander Wissner-Gross, the 2003 MIT valedictorian (of 550 engineering students), who was the last person to simultaneously obtain an MIT triple major (SB in physics, SB in electrical science and engineering, and SB in mathematics), before they outlawed the practice, published his "Causal Entropic Forces", co-written with American mathematician Cameron Freer, wherein they attempt to argue that "intelligence" and intelligent behavior stem from what they call "entropic forces", which received a certain amount of press frenzy. [1]

On 30 Apr 2013, Libb Thims queried Wissner-Gross about his theory in respect to Christopher Hirata and also whether he thought he was smarter than Hirata: [2]

> "Your new article popped up on my RSS feed today, so I started an Hmolpedia article on you: Alexander Wissner-Gross. As you seem to be a bit of an accelerated learner, where do you see yourself fitting currently on the genius IQs table? Or have you had estimates made by others of your IQ? For example, do you think you are above or below **Christopher Hirata**, who similar to you was an age 13 national physics olympiad winner, who also developed his own thermodynamics theory of humans, in intelligence?"

To which Wissner-Gross replied: [12]

> "Hard to say where I would fit in your table, but I would say that my causal entropic force theory is intended to be treated more seriously than the **Hirata** work you mention. :-)."

In Nov 2013, interestingly, related or not, a few months after this dialogue, Wissner-Gross gave a local TED talk entitled “A New Equation for Intelligence”, the gist of which was discussion of his proposed intelligence equation; the main statement of which is as follows: (Ñº)

> “I asked, starting several years ago, is there an underlying mechanism for intelligence that we can factor out of all of these different threads? Is there a single equation for intelligence? The answer, I believe, is yes. [$F = T \quad S\tau$] What you're seeing is probably the closest equivalent to an $E = mc^2$ for intelligence that I've seen. So what you're seeing here is a statement of correspondence that intelligence is a force, F, that acts so as to maximize future freedom of action. It acts to maximize future freedom of action, or keep options open, with some strength T, with the diversity of possible accessible futures, S, up to some future time horizon, tau. In short, intelligence doesn't like to get trapped. Intelligence tries to maximize future freedom of action and keep options open.”

Whatever the case, Wissner-Gross seems to think his theory is better than Hirata's theory, which, however is not the case. To give some comparison, there is no denying the fact that the great German polyintellect Goethe, also a child prodigy cited with a 225+ IQ did the exact same derivation as Hirata 200 years ago (see: Goethe timeline), considering his finished product to be his greatest publication and something to be taken very seriously as its theoretical implications overthrow the foundations of modern thought (as can be gleaned from some of the commentary of his enemies). The deeper issue, however, which this type of derivation tends to bring to the fore (see, e.g. the 2006 Rossini debate and 2009 Moriarty-Thims debate), is that the chemical thermodynamic dissection of humanity strips away fundamental beliefs concerning morality, purpose, life/death, religion, etc., reducing them to pure physics and chemistry, leaving the unacquainted reader with a residual anger and irritation. This is exemplified is exemplified by German writer Christoph Wieland’s 1810 comment, found in a letter (which he suggested should be burned after it is read) to his close friend German philologist and archaeologist Karl Böttiger, on Goethe’s *Elective Affinities* (which gives the same type of derivation as Hirata) that "to all rational readers, the use of the chemical theory is nonsense and childish fooling around."

References

1. (a) Wissner-Gross, Alexander. (2013). “Causal Entropic Forces” (abs), *Physical Review Letters*, 110(168702):1-5.
(b) Gorski, Chris. (2013). “Physicist Proposes New Way to Think About Intelligence”, 3QuarksDaily.com.
(c) Kosner, Anthony Wing. (2013). “From Atoms to Bits, Physics Shows Entropy as the Root of Intelligence”, Forbes, Apr 21.
(d) Press – AlexWG.org.
2. Thims, Libb. (2013). "Email communication with Wissner-Gross", Apr 30.

θΔics

In animate thermodynamics, **Bauer principle**, "principle of the permanent inequilibrium of living matter" or "principle of stable nonequilibrium", is a principle which states that "living and only the living systems are never in equilibrium, and, on the debit of their free energy, they continuously invest work against the realization of the equilibrium which should occur within the given outer conditions on the basis of the physical and chemical laws."

Overview

The principle was formulated in 1920 by Hungarian-born Russian physical biologist Erwin Bauer, supposedly, based on an extrapolation of Gibbsian thermodynamics to chnopsological systems (biological systems). [1]

A shortened version of the Bauer principle, according to Russian biophysicist Mikhail Volkenstein, is: [2]

> "Living systems are never in equilibrium and at the expense of their free energy …"

(add discussion)

References

1. (a) Bauer, Erwin. (1920). *Die Grunprincipien der rein Naturwissenshtlichen Biologie* (*The Fundamental Principles of Biological Science*). Berlin.
(b) Bauer, Erwin. (date). *Vorträge Und Aufsätze Über Entwickelungsmechanik Der Organismen, Volumes 26-34* (*Lectures and Essays on the Evolutionary Mechanics of Organisms*) (Nabu Press). Publisher.
(c) Bauer, Erwin. (1935). *Theoretical Biology*. Publisher.
2. Volkenstein, Mikhail. (2009). *Entropy and Information*. BirkHauser Basel.

Further reading

● Zotin, Aleksandr I. (1990). *Thermodynamics Bases of Biological Processes: Physiological Reactions and Adaptations* (Bauer principle, pg. 237). Walter de Gruyter.
● Minai, Asghar T. (1993). *Aesthetics, Mind, and Nature: a Communication Approach to the Unity of Matter and Consciousness* (Bauer principle, pg. 59). Praeger.
● Grandpierre, Attila. (2010). "On the First Principle of Biology and the Foundation of the Universal Science" (Bauer principle, pgs. 18, 24-25); in: *Astronomy and civilization in the New Enlightenment: Passions of the Skies* (editors: Anna-Teresa Tymieniecka, Attila Grandpierre) (pgs. 19-36). Springer.
● Tuhtan, Jeff. (2012). "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality" (Bauer principle, pg. 87) (pdf), PhD dissertation, Stuttgart University, Germany.

θΔics

In dating systems, **BC** is the abbreviation for "Before Christ", or "Before Common", [era] as some re-label things in a superficially politically-correct sense, referring to the years prior to the fictionalized birth of the religio-mythology conceptualized person Jesus Christ, aka "Osiris-Horus Anointed".

Alternatives | Neutral

The following, using Greek philosopher Aristotle is an example, are Hmolpedia-introduced scientifically-neutral dating reference frame alternatives to the BC/AD religio-mythology based dating system:

	Before Christ (BC) / Anno Domini (AD)	Before Printing (BP) / Printing Era (PE)	Before Newton (BN) / After Newton (AN)	Before Goethe (BG) / After Goethe (AG)
Aristotle	(384-322 BC)	(1834-1722 **BP**)	(2026-1964 **BN**)	(2134-2072 **BG**)
Einstein	(1879-1955 AD)	(429-505 **BP**)		(129-205 **AG**)

Note, as of 2016, the issues connected to the Julian calendar system (older calendar) / Gregorian calendar system (modern calendar) Newton-birth dating system (modern era) issue (1642/1643) leads to more technical issues than the printing era (1450 invention) or Goethean calendar, the latter of which has been employed as a working model.

Other

Greek-born Roman historian Eusebius (c.263-339AD), e.g., in his *Chronicle* used an era beginning with the birth of religio-mythology character Abraham, aka "Father Ra born of Nun", i.e. Ab-ra-ham, the patriarch of the Anunian theologies (Ab-ra-ham-ic theology and B-ra-hma-ic theology), dated in 2016 BC (AD 1 = 2017 Anno Abrahami); hence, subsequently, counting the years before the fictional birth of Abraham, supposedly, as BA or "Before Abraham", thus dating the start of the world, 5500 BC or 4000 BC, depending on source (Ñº), in Biblical chronology, to the years 3484 BA (Before Abraham) or 1984 BA, the year when God created the world in seven days, as Eusebius would have conceptualized things. [2]

Quotes

The following are relevant quotes:

> "Since, we are looking at the history of God from the Jewish and Muslim as well as the Christian perspective, the terms '**BC**' and 'AD', which are conventionally used in the West, are *not* appropriate."
>
> — Karen Armstrong (1993) (542 PE), *A History of God* [1]

References

1. Armstrong, Karen. (1993). *A History of God* (Introduction, note pg. xxiii). Ballantine Books.
2. Gutschmid, Alfred. (1889). *Klein Schriften* (pg. 433). F. Ruehl.

External links

â— BC – Wikipedia.

θΔics

In dating systems, **BCM**, as compared to ACM, refers to years “Before Christ Myth”, according to the Paine dating system (1802); which is a secular alternative to the Roman recension myth-based BC (Before Christ) or BCE (Before Common Era) Exiguus dating system (525AD) notations.

Further reading

● Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

θΔics

In science, **beauty** (TR:168) is the quality or aggregate of qualities in a person or thing that gives pleasure to the senses—a sense, defined by James Maxwell, as the perception of a force—or in other words a force that activates the pleasure center; which according English proverb collections of John Ray, resultantly is a form of power or energy per unit time. [1]

A **beauty** is power image, alluding to the idea that beauty has a certain amount of weight or power to it, in the same what that dropping a weight through a height can produce a certain amount of of work or heat via the mechanical equivalent of heat effect (see: sidewalk study). [6]

Overview

Studies have shown that one's sense of beauty is not something culturally ingrained, but rather is some type of "turning tendency" sense that babies have right out of the womb, i.e. they will naturally tend to turn towards the more beautiful face, given two photo choices.

The 1975 *Sociometry* article "Beauty is Power: the Use of Personal Space on the Sidewalk", presenting the results of the time lapse filming of pedestrians observed from above walking along a sidewalk (see: sidewalk study), by American sociologists James Dabbs and Neil Stokes, seems to be the first quantified study of the relation between beauty and personal space volume increase. [3]

Thermodynamics

German polymath Johann Goethe, in 1809, theorized about beauty in chemical affinity terms (pre chemical thermodynamics theory terms):

> "**Beauty** is a manifestation of secret natural laws, which otherwise would have been hidden from us forever."
>
> — Goethe (c.1800)

Polish social economist Leon Winiarski, in 1894, may have been first, with his "aesthetic energy" theories, to discuss beauty in thermodynamic terms.

American electrochemical engineer Libb Thims, in 1995, was the first to begin study of the Beckhap's law phenomenon in chemical thermodynamic terms, namely quantification in terms of reaction spontaneity (feasibility), i.e. to quantify and correlate the beauty vs. brains inverse correlation in enthalpic and entropic terms (see: Libb Thims history).

Since the early 2000s, Chinese-born Canadian mathematical economist Jing Chen has been discussing beauty in thermodynamics and evolution terms; and example excerpt of which is shown below from his 2005 *The Physical Foundation of Economics: an Analytical Thermodynamic Theory*, wherein he cites Arthur Eddington as having been the first to discuss beauty in entropic terms. [4]

> "'The geometry of **beauty** is the visible signal of adaptively valuable objects: safe, food-rich, explorable, learnable habitats, and fertile, healthy dates, mates, and babies' (Pinker, 1997). More generally, the sense of beauty is an evolved intuition about resources. Long ago, Eddington noticed the relation between entropy and beauty."

In 2008, Turkish urban planning engineer Seda Bostanci did her PhD dissertation on thermodynamics and aesthetic theory of urban planning.

Evolutionary psychology

See main: Evolutionary psychology

American evolutionary psychologist David Buss, as presented in his 1994 book *Evolution of Desire*, did some of the first quantitative work in connecting measureable cross-cultural patterns of human "beauty" with evolutionary psychology theory. [3]

In 2006, American-born English socio-economic evolutionary psychologist Satoshi Kanazawa published an article in the *Journal of Theoretical Biology*, claiming that attractive people are 26% less likely to have male offspring, based on data from 3000 Americans taking part in an investigation called the National Longitudinal Study of Adolescent Health. [7]

These findings were summarized the 2006 *The Courier Mail* article "Beautiful People Have Girls", by staff writer John Radowitz, which when viral (16,858 Facebook recommendations, as of 2012), which, the following year, precipitated the 2007 book *Why Beautiful People Have More Daughters*, depicted adjacent, co-written, in part, with sections from the posthumous writings of American-born Japanese social psychologist Alan Miller (1959-2003). [2]

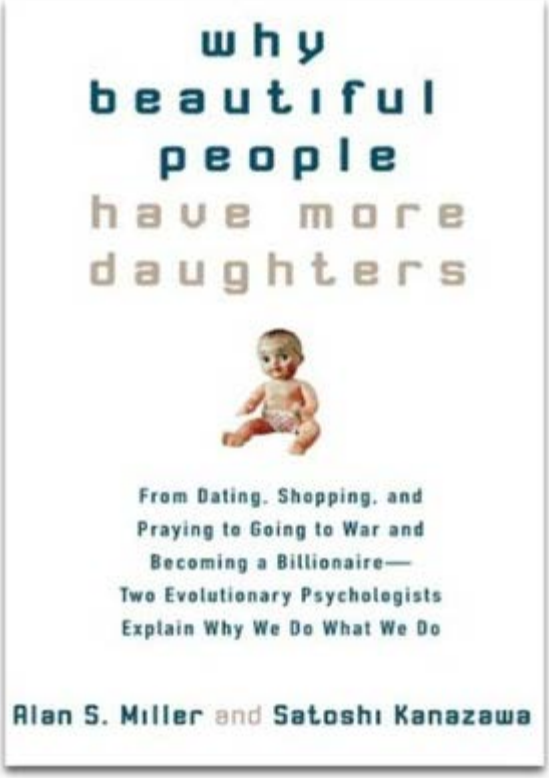

Evolutionary psychologists Alan Miller and Satoschi Kanazawa's 2007 book *Why Beautiful People Have More Daughters*, based on Kanazawa's 2006 *Journal of Theoretical Biology* article claiming that attractive people are 26% less likely to have male offspring; an example of quantifiable patters correlated to measures of **beauty**. [2]

Quotes

The following are related quotes:

> "Cleopatra's nose, had it been shorter, the whole face of the world would have been changed."
>
> — Blaise Pascal (c.1650), *Pensees* (pg. 180) (Q) [5]

> "Taught from infancy that beauty is woman's sceptre, the mind shapes itself to the body, and roaming round its gilt cage, only seeks to adorn its prison."
>
> — Mary Wollstonecraft (1792), *A Vindication of the Rights of Women* (pg. 50)

> "**Beauty** is everywhere a welcome guest."
>
> — Johann Goethe (1809), *Elective Affinities* (P1:C6)

See also

- Beckhap's law
- Sidewalk study

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(1788-1856), Edinburg University.
(c) Mahon, Basil. (2003). *The Man who Changed Everything: the Life and Times of James Maxwell* (pg. 25). Wiley.
(d) Ray, John. (c.1680). *Collection of English Proverbs*. Publisher.
2. (a) Radowitz, John. (2006). "Beautiful People Have Girls", *The Courier Mail*, Aug 02.
(b) Miller, Alan S. and Kanazawa, Satoshi. (2007). *Why Beautiful People Have More Daughters: From Dating, Shopping, and Praying to Going to War and Becoming a Billionaire: Two Evolutionary Psychologists Explain Why We Do What We Do.* New York: A Perigee Book.
3. Buss, David M. (1994). *The Evolution of Desire: Strategies of Human Mating* (beauty, 32+ pgs). Basic Books.
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5. (a) Nordau, Max. (1910). *The Interpretation of History* (pg. 4). Publisher.
(b) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 317). Arnold-Howard Publishing Co.
6. (a) Dabbs, James M. and Stokes, Neil A. (1975). "Beauty is Power: the Use of Space on the Sidewalk" (abs), *Sociometry*, 38: 551-57.
(b) Etcoff, Nancy. (1999). *Survival of the Prettiest – the Science of Beauty*. New York: Anchor Books.
7. Satoshi Kanazawa – Wikipedia.

Further reading

● Etcoff, Nancy. (1999). *Survival of the Prettiest: the Science of Beauty*. New York: Anchor Books.
● Bates, Brian and Cleese John. (2001). *The Human Face.* New York: DK Publishing.
● Rhodes, Gillian and Zebrowitz, Leslie A. (2002). *Facial Attractiveness: Evolutionary, Cognitive, and Social Perspectives.* London: Ablex.
● Patzer, Gordon. (2008). *Looks: Why They Matter More Than You Ever Imagined*. AMACOM.

External links

● Beauty – Wikipedia.

θΔics

In genius rankings, **Becker 139** (Becker 139:#) refers to a meta-analysis ranking, made by American lister John Becker (c.2019), by combining 20 lists of greatest "philosophers" (see: greatest philosopher ever), keen on the subject of philosophy, from books and online listing, albeit these are not disclosed, and combining into a ranked listing, ranked according to the number of times a given individual's name reoccurs on multiple lists, wherein those with same number list ranks are ordered chronologically.

Rankings

The following, according to the revision 10 Apr 2020, is the Becker 139: [1]

Nineteen lists	Eighteen lists	Seventeen lists	Sixteen lists	Fifteen lists
1. Plato 2. Aristotle	3. Rene Descartes 4. Immanuel Kant	5. Thomas Hobbes 6. John Locke 7. David Hume 8. Friedrich Nietzsche	9. Thomas Aquinas 10. Benedict Spinoza 11. Jean Rousseau	12. Karl Marx 13. Jean Sartre

Fourteen lists	Thirteen lists	Twelve lists	Eleven lists	Ten lists
14. Socrates 15. Augustine 16. John Mill 17. Ludwig Wittgenstein	18. Gottfried Leibniz 19. Georg Hegel	20. Confucius | Not real 21. Arthur Schopenhauer 22. Soren Kierkegaard 23. Bertrand Russell 24. Martin Heidegger 25. Simone Beauvoir	26. Francis Bacon 27. William James 28. Edmund Husserl	29. Niccolo Machiavelli 30. George Berkeley

Nine lists	Eight lists	Seven lists	Six lists	Five lists
31. Avicenna 32. Voltaire	37. Lao Tzu |	41. Heraclitus 42. Marcus	47. Mozi 48. Mencius 49. Anselm of Canterbury 50. Blaise Pascal 51. Charles Peirce 52. Gottlob Frege	61. Buddha | Not real 62. Zeno of Elea 63. Sun Tzu 64. Adi Shankara 65. Ramanuja 66. Al-Ghazali 67. Duns Scotus 68. William of Ockham

33. Jeremy Bentham
34. John Dewey
35. Hannah Arendt
36. Michel Foucault

Not real
38. Parmenides
39. Epicurus
40. Willard Quine

Aurelius
43. Plotinus
44. Averroes
45. Auguste Comte
46. Karl Popper

53. George Moore
54. Albert Camus
55. John Rawls
56. Jurgen Habermas
57. Noam Chomsky
58. Jacques Derrida
59. Richard Rorty
60. Saul Kripke

69. Charles Montesquieu
70. Denis Diderot
71. Mary Wollstonecraft
72. Henri Bergson
73. Alfred Whitehead
74. Rudolf Carnap
75. Theodor Adorno
76. Peter Singer
77. Judith Butler

Four lists	Three lists
	96. Zoroaster | Not real 97. Thales 98. Kanada 99. Mahavira 100. Diogenes the Cynic 101. Chanakya 102. Zeno of Citium 103. Xun Kuang 104. Han Fei 105. Cicero 106. Lucretius 107. Sextus Empiricus 108. Vasubandhu 109. Hypatia 110. Honen 111. Shinran 112. Dogen 113. Madhvacharya 114. Desiderius Erasmus 115. Thomas More 116. Johann Fichte 117. Friedrich
78. Pythagoras 79. Democritus 80. Zhuang Zhou 81. Patanjali 82. Seneca the Younger	

83. Nagarjuna
84. Boethius
85. Al-Fababi
86. Peter Abelard
87. Zhu Xi
88. Maimonides
89. Nichiren
90. Wang Yangming
91. Thomas Paine
92. Mao Zedong
93. Maurice Ponty
94. Gilles Deleuze
95. Slovoj Zizek

Schelling
118. Herbert Spencer
119. Sigmund Freud
120. George Santayana
121. Sun Yat-sen
122. Mohandas Gandhi
123. Nishida Kitaro
124. Ramana Maharshi
125. Hans Gadamer
126. Ayn Rand
127. Claude Strauss
128. Simone Weil
129. Donald Davidson
130. Elizabeth Anscombe
131. Thomas Kuhn
132. Judith Thomson
133. Luce Irigaray
134. Amartya Sen
135. Thomas Nagel
136. Robert Nozick
137. John McDowell
138. Martha Nussbaum
139. Cornel West

(add)

See also

â— Becker 160

References

1. Becker 139 (Ñº) (c.2019) – Greatest Philosophers of All Time | Ranked.

θΔics

In genius rankings, **Becker 160** (Becker 160:#) refers to a meta-analysis list of the "greatest" and or most-important “scientists”, of all time, compiled by American lister John Becker in 2018, based on a summation of “over 20 lists”, from online and book sources, although the specifics of these lists are not disclosed; name reoccurring on equal number of lists, are ranked chronologically.

Rankings

The following is the Becker 160, grouped by list re-occurrence: [1]

Nineteen lists	Seventeen lists	Fifteen lists	Fourteen lists	Eleven lists
1. Albert Einstein	2. Galileo Galilei 3. Isaac Newton 4. Marie Curie	5. James Maxwell	6. Michael Faraday 7. Charles Darwin 8. Louis Pasteur	9. Aristotle 10. Nikola Tesla 11. Niels Bohr 12. Stephen Hawking

Ten lists	Nine lists	Eight lists	Seven lists	Six lists
13. Archimedes	14. Leonardo da Vinci 15. John Dalton	16. Nicolaus Copernicus 17. Antoine Lavoisier 18. Gregor Mendel 19. Thomas Edison 20. Max Planck 21. Ernest Rutherford 22. Edwin Hubble 23. James Watson 24. Tim Berners-Lee	25. Johannes Kepler 26. Alessandro Volta 27. William Thomson 28. Alexander Fleming 29. Linus Pauling 30. Rosalind Franklin	31. Avicenna 32. Dmitri Mendeleyev 33. Robert Oppenheimer

Five lists	Four lists	Three lists	Two lists	
			103. Alhazen 104. Francis Bacon 105. Thomas Newcomen 106. Daniel Fahrenheit 107. Anders Celsius 108. Charles Messier	

34. Euclid
35. Ptolemy
36. Andreas Vesalius
37. Rene Descartes
38. Blaise Pascal
39. Robert Boyle
40. Robert Hooke
41. Carl Linnaeus
42. Alfred Nobel
43. Sigmund Freud
44. Erwin Schrodinger
45. Enrico Fermi
46. Werner Heisenberg
47. Rachel Carson

50. Pythagoras
51. Hippocrates
52. William Harvey
53. Antonie Leeuwenhoek
54. Benjamin Franklin
55. Christiaan Huygens
56. Henry Cavendish
57. Pierre Laplace
58. Andre Ampere
59. Amedeo Avogadro
60. Carl Gauss
61. Georg Ohm
62. James Joule
63. Joseph Lister
64. Wilhelm Rontgen
65. Alexander Bell
66. Joseph Thomson
67. Heinrich Hertz

74. Hipparchus
75. Galen
76. Al-Khwarizmi (Ñº)
77. William Gilbert
78. Tycho Brahe
79. Gottfried Leibniz
80. Edmond Halley
81. Joseph Priestley
82. Charles Coulomb
83. James Watt
84. William Herschel
85. Edward Jenner
86. Joseph Gay-Lussac
87. Charles Babbage
88. Robert Bunsen
89. Robert Koch
90. Paul Ehrlich
91. Wilber Wright
92. Fritz Haber
93. Alfred Wegener
94. Paul Dirac
95. Marie Mayer

109. Joseph Lagrange
110. Jean Lamarck
111. Caroline Herschel
112. Joseph Fourier
113. Alexander Humboldt
114. Humphry Davy
115. Charles Lyell
116. Christian Doppler
117. Justus Liebig
118. William Hamilton
119. Robert Mayer
120. Karl Weierstrass
121. Hermann Helmholtz
122. Elizabeth Blackwell
123. Francis Galton
124. Gustav Kirchhoff
125. Bernhard Riemann
126. Ernst Haeckel
127. Ivan Pavlov
128. Henri Becquerel
129. Hermann Emil Fischer
130. William Ramsay
131. Albert Michelson
132. Santiago Cajal
133. Rudolf Diesel
134. David Hilbert
135. Thomas Morgan
136. Guglielmo Marconi

48. Francis Crick
49. Jane Goodall
68. Karl Landsteiner
69. Otto Hahn
70. Barbara McClintock
71. Edward Teller
72. Jonas Salk
73. Edward Wilson
96. John Bardeen
97. Alan Turing
98. Richard Feynman
99. Gertrude Elion
100. Steven Weinberg
101. Donald Knuth
102. Craig Venter
137. Lise Meitner
138. Chandrasekhara Raman
139. James Chadwick
140. Louis Broglie
141. Leo Szilard
142. John Neumann
143. Konrad Lorenz
144. Hans Bethe
145. Rita Montalcini
146. Wernher Braun
147. Norman Borlaug
148. Charles Townes
149. Frederick Sanger
150. Noam Chomsky
151. Gordon Moore
152. Peter Higgs
153. Roger Penrose
154. Carl Sagan
155. Lynn Margulis
156. Stephen Gould
157. Christiane Volhard
158. Alan Guth
159. Edward Witten
160. Mae Jemison

(add)

See also

â— Becker 139

References

1. Becker 160 (Ñº) (2018) – Greatest Scientists of All Time | Ranked.

θΔics

In laws, **Beckhap's law** is a colloquial premise on the relation between beauty and intelligence, which states that: [1]

> "Beauty times brains equals a constant."

or in mathematical form:

$$\text{beauty} \times \text{brains} = k$$

or, stated another way, beauty is inversely proportional to brains:

$$\text{beauty} \propto \frac{1}{\text{brains}}$$

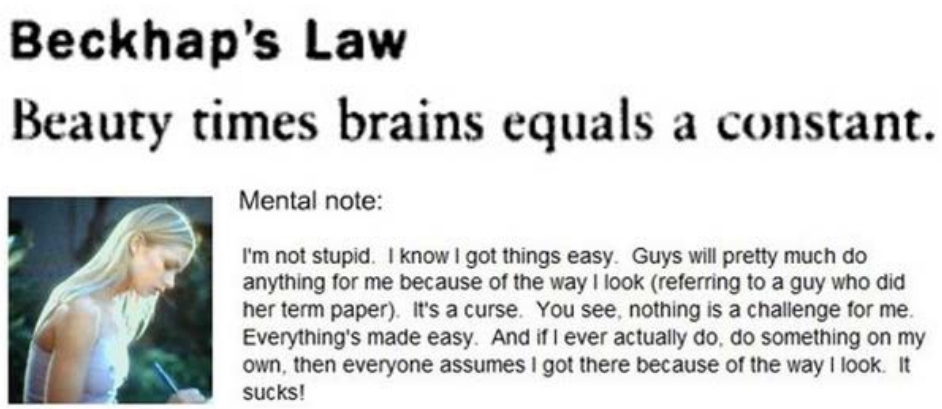

Top: Beckhap's law from the 2003, 25th anniversary edition of the book *Murphy's law* by Arthur Bloch. [4] Bottom: Visual and verbal depiction of **Beckhap's law**: screen shot (and thinking-to-herself words) of Cynthia, described as the "Superbowl of women", in the 2000 film *100 Girls*. [4]

Beckhap's law is sometimes referred to as the "beauty-brains paradox", the rule that intelligence is inversely proportional to beauty, that beauty varies inversely with intelligence, that it is very rare to find beauty and brains in the same package, or that people aren't typically endowed with both beauty and brains, etc.

In simple terms, Beckhap's law captures the general understanding that beauty and brains tend not to be found in the same package; that best-looking or hottest people won't typically be found in math class; that models tend to be dumb; that physicians tend not to be beauty queens; and so on, in the sense that if one is heightened in the looks department, he or she will likely be deficient in the brains department, and vice versa.

Politically correct | General statement

In more intuitive terms, using more politically correct language or rather "scientifically correct" terminology, this can be restated to the effect that Beckhap's law declares that, on average, one's level of physical attractiveness (beauty) *A* will be inversely proportional to one's intelligence (brains) *I*, a statement defined mathematically as :

$$A = \frac{k}{I}$$

In more general terms, as captured well in the 2001 film *Shallow Hal*, Bekhap's law can be restated to equivalent conclusion that, in general:

> "Inner beauty times outer beauty equals a constant."

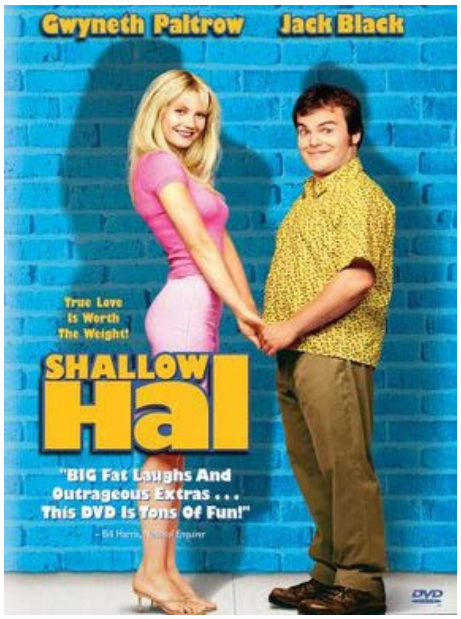

The 2001 film *Shallow Hall* is a classic parody of the "inner beauty" vs "outer beauty" paradox, aka **Bekhap's law**.

The term "beauty", however, in thermodynamic terms, is one of the more difficult conceptions to quantify (see below), in the sense that, knowing a person is powered molecule, it becomes difficult to distinguish the relative beauty of comparative smaller molecules, such as water H_2O as compared to hydronium H_3O+

The 1975 personal space studies of James Dabbs and Neil Stokes is one exception to the above, being that here average physical outer beauty was quantified in inches of personal space increase, in moving scenarios. [13]

Etymology | Peckham's or Beckhap's law

There is some inconsistency as to the eponym of this law, namely whether it is attributed to a person named *Peckham* (used commonly in the 1970s) or *Beckhap* (used commonly in recently decades). In a 1975 listing of eponym laws, the statement 'beauty times brains equals a constant' was listed as Peckham's law, not *Beckhap*'s law? [6] Likewise, in the 1979 book *1,001 Logical Laws*, the same saying was also listed as "Peckham's law". [8] If it is indeed Peckham, the saying could be attributed to American Supreme Court justice Rufas Peckham (1838-1909). [11] This, however, is only logical guess.

The name Beckhap's law (possibly a verbal to written typo) was cemented into fame, as seems to be the case, with its inclusion of the very-popular 1977 book *Murphy's Law and Other Reasons Why Things Go Wrong* by American writer Arthur Bloch, which reprinted into the 25th edition. [2] The origin of who is Beckhap (or Peckham), however, may remain as elusive as is the origin of Murphy of Murphy's law. [2]

Usage

In 1983, without specifically naming the saying, sociologist David Myer stated that:

> "On the idiom that it is 'a strange illusion to suppose that beauty is goodness', there might be a trace of truth to the stereotype. Children and young adults who are attractive tend to have higher self-esteem. They are more assertive, although they are also believed to be more egotistical. There are neither more nor less academically capable, contrary to the negative stereotype that **'beauty times brains equals a constant'**."

Myer cites the 1979 paper of Jack Sparacino and Stephen Hansell, who in their various studies of high school and college students, founding that for high school students "attractiveness was not associated with achievement for boys [N=84] but was negatively associated for girls [N=83]" and also "found no relationship between attractiveness and grades for male college students", as reference to back his assertion regarding the beauty-brains quote, being what he considers to be a negative stereotype. [7]

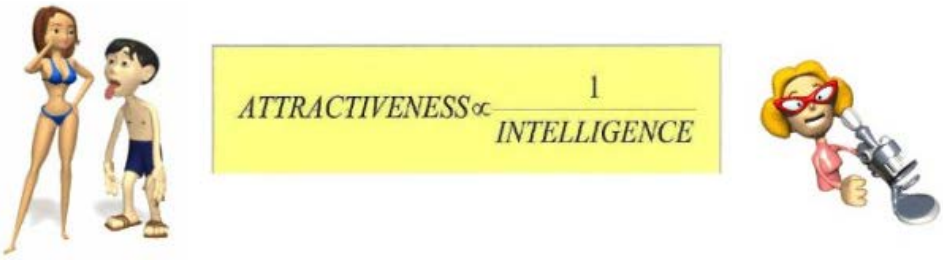

A 2005 depiction of **Beckhap's law** on the home page of HumanThermodynamics.com. Caption: "Why is attractiveness *A inversely* proportional to intelligence *I?* Why in any random high school, for instance, are the least physically attractive students typically found in math class, and the most physically attractive students typically found in English class?" (based on poll, conducted by Libb Thims, of twenty different Chicagoans, from twenty different high schools, concerning which classroom on average will the most attractive, and least attractive, students typically tend to be found in any given high school).

In 2005, and anon blogger posted a short blog entitled "What is Beckhap constant?", stating that: "there has been a constant debate (pardon the pun) on what exactly the Beckhap constant is. Did this crazy guy simply mean a fixed constant or an arbitrary one?" [9] He summarized Beckhap's law as such: [10]

> "Using **Beckhap's law**, we are able to prove that the world is made up of two sorts of people, assuming that most people tend towards extremes of the two characteristics: (a) that if you are a genius, you will never be so good-looking; (b) that if you are a beauty, the magnitude of your good looks will exceed the magnitude of your intelligence. (and conversely)."

The following is a 2019 statement (Ñº) from just-one-liners.com:

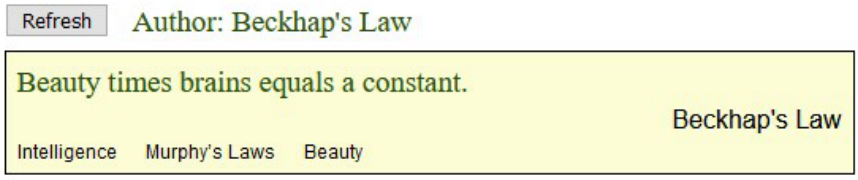

Other usages can be found beyond this.

Thermodynamics

See main: Beckhap's law (proof)

A very simplified explanation of Beckhap's law, in physical science terms, is beauty governed within the confines of Boerhaave's law, namely that heat added to a system tends to increase the volume (or social volume), and hence the molecular motion, or "disorder" as is often implied, of the given body or system; and conversely, heat removed from a system tends to decrease the volume and hence the "order" of the system or body, and that at absolute zero of temperature perfect crystalline order is said to exist.

Some aspects of this phenomenon have been quantified volumetrically, as discussed in the 1975 study "Beauty is Power: the Use of Space on the Sidewalk" by James Dabbs and Neil Stokes. [13]

Hence, in conceptual speak, it is difficult in nature to find a "hot ice cube", such as depicted adjacent (burning ice cube), or in turn a "beautiful smart person" (e.g. a genius supermodel).

In 2002, American electrochemical engineer Libb Thims, in human chemical thermodynamics terms, attempted to correlate the initial state G_i and final state G_f of the free energy change for a typical mating reaction to bulk values of attractiveness and intelligence involved in mate

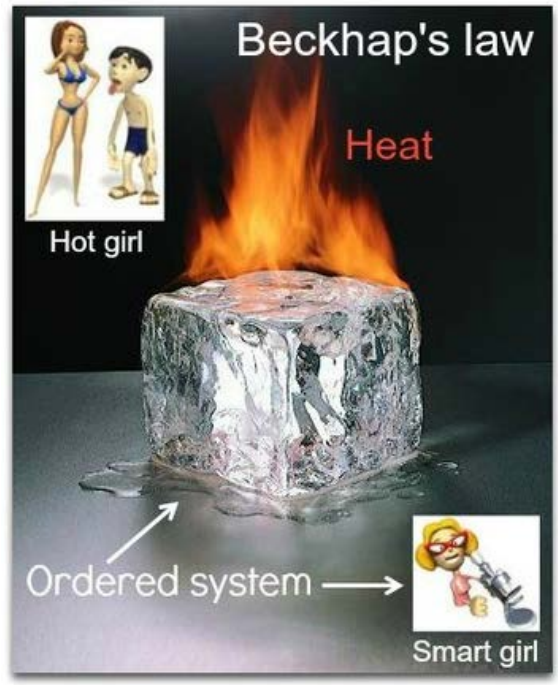

A general visual of **Beckhap's law**: namely the premise of finding burning (hot) ice (ordered), i.e. a hot and ordered thing, generally speaking.

selection. A solution was found using the following two assumptions, first that enthalpy is proportional to physical attractiveness:

$$H = kA$$

second that entropy is inversely proportional to intelligence:

$$S = \frac{k}{I}$$

values which can used to represent the instantaneous 'state' of the reactive system at any given second on going from reactants to products. These can then be substituted into the Gibbs equation:

$$\Delta G = H_f - H_i - T(S_f - S_i)$$

to yield for an inverse relationship plot. Skipping over much of the derivation and discussion, using the two above approximations, and assuming that initial state of the reaction, in which two individuals, one male molecule Mx and one female molecule Fy, of varying levels of intelligence and beauty, is the day the pair fall in love at first sight, that they pair conceives one child, Bc, three years later, and that the end state of the reaction, coincides with the point of the fifteenth year of the growth of the child, after which the precipitate child molecule begins to detach from the parental structure. This gives the following simplified overall reaction mechanism:

$$M_X + F_Y \rightarrow B_C$$

On this model, the following variables can be be defined at day one (-3 years before conception) and the final day (+15 after conception):

$G_f = G_C^{15}$	Gibbs free energy of the state of the child, Bc, detached at age 15.
$G_i = G_X^{-3} + G_Y^{-3}$	Gibbs free energy of the state of two reactants, the male Mx and female molecule Fy, at the point of love at first sight.
$H_f = H_C^{15}$	Enthalpy of the state of the child, Bc, detached at age 15.
$H_i = H_X^{-3} + H_Y^{-3}$	Enthalpy of the state of the two reactants, the male Mx and female molecule Fy, at the point of love at first sight.
$S_f = S_C^{15}$	Entropy of the state of the child, Bc, detached at age 15.
$S_i = S_X^{-3} + S_Y^{-3}$	Entropy of of the state of the two reactants, the male Mx and female molecule Fy, at the point of love at first sight.

Using these time-specific variables, through a bit of substitution, one can derive the following result: [5]

$$A_X^{-3} = \frac{C_1}{I_X^{-3}} + C_2$$

which says that, owing to the constraints of the Gibbs equation, otherwise known as the combined law of thermodynamics, the physical attractiveness of the individual, in this case the male, will vary inversely with the intellect of the individual, on average, at the initial start to a typical romantic male-female reaction.

There are many issues, to note, with this proof, one being that the second assumption, that of entropy, using the disorder model of entropy, in human reactions, being inversely proportional to intelligence (mental order), is derived from gas theory, particularly the Boltzmann chaos assumption, in which particles are assumed to have non-correlative velocities, which is not the case with human molecules.

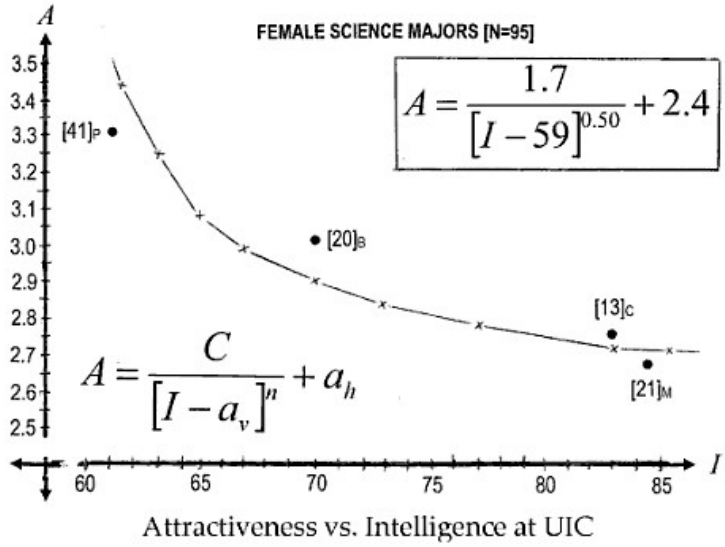

A plot of the ranked data results, of the group "female science majors", from the 2002 study of 2,018 University of Illinois at Chicago (UIC) college graduation photos, graduating classes of 1969 and 1972, showing that attractiveness is inversely proportion, on average, to intelligence, a finding which corroborates **Beckhap's law**.

P = psychology, B = biology, C = chemistry, and M = mathematics, each with 41, 20, 13, and 21 students, respectively. Similarly, *A* = physical attractiveness (of group); on a scale of 7.0 = most physically attractive to 1.0 = least physically attractive; and *I* = intellectual difficulty (of degree); on a scale of 100 = most intellectually difficult to 10 = least intellectually difficult.

Corroboration

In a 2002, in corroboration of Beckhap's law, American chemical engineer Libb Thims (being unaware of either Beckhap's law or the saying) undertook an "Attractiveness vs. Intelligence" study of photos and corresponding graduation degrees of the 2,018 students of the graduating classes at the University of Illinois at Chicago (UIC) in the years 1969 and 1972, finding that when like groups of students are grouped (e.g. male engineers, female science majors, education degrees students, etc.) that within those groups physical attractiveness does indeed have an inverse relationship to intelligence. [3]

In more detail, in the course of the study, to determine if the inverse pattern, called by Thims the "beauty-brains paradox", exists statistically, in 2002 Thims conducted an 'attractiveness *A* vs. intelligence *I*' study, i.e. to determine if attractiveness is, in actuality, inversely proportional to intelligence.

Thims had one group of people rate the physical attractiveness of 2,018 college graduation photos, graduating classes of 1969 and 1972 at the University of Illinois at Chicago, on a 7-point Likert type scale (7 being most physically attractive), and had a second group of people rate the intellectual difficulty, on a 100 point scale (100 being most intellectually difficult), of each degree obtained, for the people in those photos, albeit only being shown the name of the degree.

These two data sets were sorted by sex and grouped into similar categories. The results confirmed the theory. In the graduating classes of 1969 and 1972, for example, 670 female students obtained 67 different degrees. By comparing females who obtained science-related degrees, among other related groups, we obtain the plot shown above. [3]

Anomalies

Some will be quick to point out so-called "anomalies" to Beckhap's law, and cite individuals who are considered "brainy" and "beautiful", such as supermodel Cindy Crawford who was a high school valedictorian, who was a first year chemical engineering student before being "discovered" for her beauty potential, and thereafter entering into the supermodel hall of fame.

German mathematics student Julia Ruscher, adjacent, and the 2001 comedy film *Legally Blond* are two other anomaly examples.

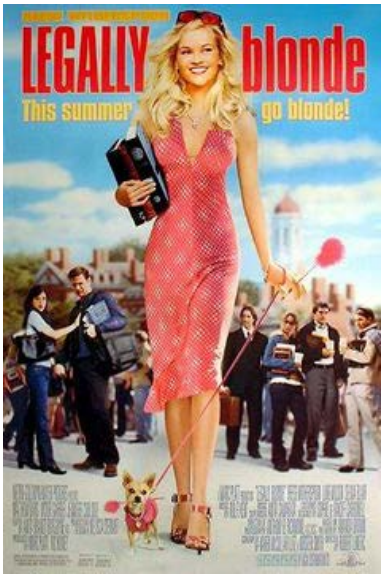

The 2001 film *Legally Blond* a parody of Beckhap's law, mixed in with a bit of the anomaly effect.

Note

A controversial, albeit well-discussed, 2004 paper "Why Beautify People are More Intelligent" by English economist Satoshi Kanazawa and American sociologist Jody Kovar attempts to present what seems to be a contrived "empirical evidence" based polemic to "prove" the stereotype that individuals *perceive* physically attractive others to be more intelligent than physically unattractive others. [12]

Trivia

The 1976 film *Rocky*, gives the following take on Beckhap's law:

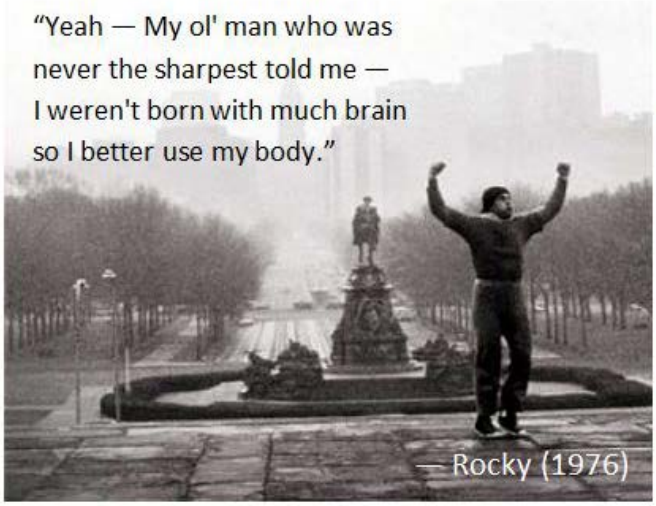

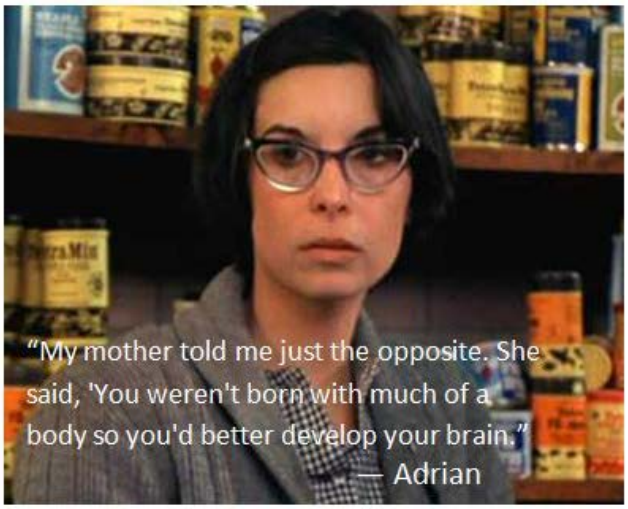

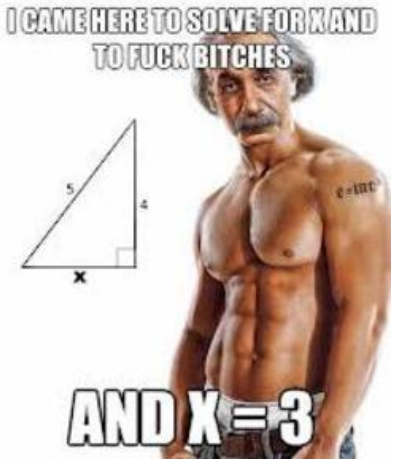

A photoshop image of hot guy with a genius brain (Albert Einstein), with a tattoo of the mass-energy equivalency on his arm E=mc², an example of **Beckhap's law**.

References

1. Beckhap's law (list of eponymous laws) – RationalWiki.org.
2. (a) Bloch, Arthur. (1991). *The Complete Murphy's Law: a Definitive Collection* (Quote: Beckhap's law: Beauty times brains equals a constant.). Price Stern Sloan.
(b) Bloch, Arthur. (1977). *Murphy's Law and Other Reasons Why Things Go Wrong.* Price.
3. (a) Thims, Libb. (2002). "UIC: Attractiveness vs. Intelligence Date: 2,000 graduation photos rated for attractiveness and undergraduate degrees per each photo rated for intellectual difficulty", IoHT Research Project.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (UIC: Attractiveness vs. Intelligence Study, pgs. 671-72). Morrisville, NC: LuLu.
4. (a) Bloch, Arthur. (2003). Murphy's Law: 25th Anniversary Edition (Beckhap's law, pg. 136). Perigee.
(b) Arthur Bloch - Wikipedia.
5. Thims, Libb. (2002). *Human Thermodynamics (Volume One)* (ch. 8, pg. 199). 330-pgs. (un-finished) Chicago: IoHT.
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7. (a) Myers, David. (1983). *Social Psychology* (pg. 479). McGraw-Hill.
(b) Sparacino, Jack. and Hansell, Stephen. (1979). "Physical Attractiveness and Academic Performance: Beauty is not always Talent" (abstract), *Journal of Personality*, 47: 449-69.
(c) Hansell, S., Sparacino, J., and Ronchi, D. (1982). "Physical attractiveness and Blood Pressure: Sex and Age Differences." *Personality and Social Psychology Bulletin*, 8(1): 113-21; study found that unattractive females have significantly higher blood pressure than attractive women, a relationship not found among unattractive and attractive men.
8. Peers, John, Bennett, Gordon. (1979). *1,001 Logical Laws, Accurate Axioms, and Profound Principles, Trusty Truisms, Homey Homilies, Colorful Corollaries, Quotable Quotes, and Rambunctious Ruminations for all Walks of Life* (Peckham's Law, pg. 131). Doubleday.
9. Decipher. (2005). "What is Beckhap constant?", Happenchance.Blogspot.com, Feb 11.
10. Decipher. (2005). "Special Report: Beckhap's Law", Happenchance.Blogspot.com, Feb 10.
11. Rufas Peckham – Wikipedia.
12. Kanazawa, Satoshi and Kovar, Jody. (2004). "Why Beautify People are More Intelligent" (abs), *Intelligence*, 32(3): 227-43.
13. Dabbs, M. and Stokes, N.A. (1975). "Beauty is Power: the Use of Space on the Sidewalk" (abs), *Sociometry*, 38: 551-57.

External links

â— Beckhap's law – WordNik.com.
â— Beauty times brains equals constant (discussion) – MineKey.com.
â— Murphy's Laws | Humanship: Beckhap's law – 50megs.com.

θΔics

In proofs, **Beckhap's law proof** was a quantitative study, conducted in 2002 by American electrochemical engineer Libb Thims, wherein the attractiveness of graduation photos were plotted against the difficulty of degrees obtained in the 1969 to 1972 students of the University of Illinois at Chicago, to determine if beauty and brains, on average, are inversely proportional, done to quantitatively prove Beckhap's law, which asserts that beauty is inversely proportional to brains.

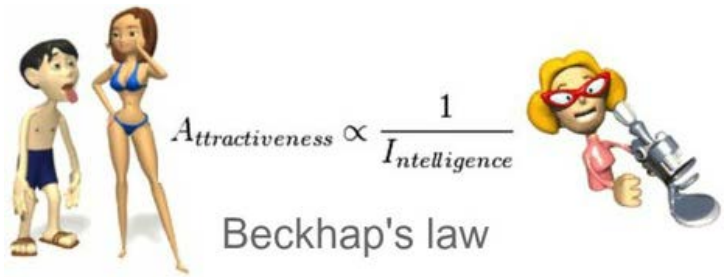

A visual depiction of Beckhap's law, which says that beauty (physical attractiveness) is inversely proportional, on average, to brains (intellect). In 2002, American electrochemical engineer Libb Thims collected data on actual "beauty" and "brains" estimates of the 1969 to 1972 graduating classes of the University of Illinois, Chicago, giving quantitative proof to the colloquial folklore legend.

Overview

In 2002, American electrochemical engineer Libb Thims had one group of people (N=14) estimated intellectual difficulty of college degrees, obtained by the University of Illinois, Chicago (UIC) graduating classes of 1969 and 1972, on a scale of 1 (easiest) to 100 (hardest), which he then plotted, on the ordinate, against the estimated, by another group of people (N=2) average physical attractiveness, on the abscissa, of the graduation photos of those who obtained those degrees, on a scale of 1 (least attractive) to 7 (most attractive).

Specifically, to determine if physical attractiveness, statistically, is inversely proportional to intelligence, on average, Thims had one group of people rate the physical attractiveness of 2,018 college graduation photos, graduating classes of 1969 and 1972 at the University of Illinois at Chicago, and had a second group of people rate the intellectual difficulty of each degree obtained, for the people in those photos, albeit only being shown the name of the degree.

The study found that attractiveness is inversely proportional to intelligence, on average, in accordance with Beckhap's law. The second part of the study attempted to explain the results chemical thermodynamically, via showing how Gibbs free energy function can be used to explain the findings.

Physical attractiveness | Beauty

Thims had two people, a married couple in their late 20s, who each scored in the 8.5-9.0 range, on the 10-point hot-or-not.com photo ranking website (when it was active), sort through and rank by attractiveness some 2,000+ photos of the UIC graduating classes of 1969, 1970, 1972, 1973, and 1980, the male ranking the females, the female ranking the males, without knowing what their degree obtained was; example rankings shown below: [1]

Female | Examples

7
(most attractive)
↑
—
↓
(least attractive)
1

Top: more physically attractive females, attractiveness scores of 7, who obtained easier degrees in: elementary education and English.

Bottom: lesser physically attractiveness females, attractiveness scores of 1, who obtained harder degrees in: German, anthropology, history, and sociology.

Male | Examples

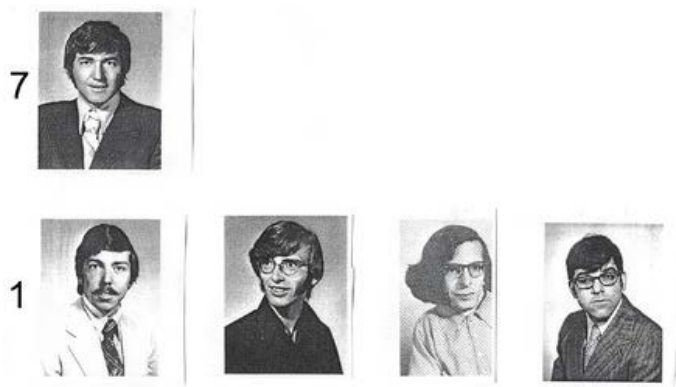

Top: a more physically attractive male, attractiveness score of 7, who obtained an intellectually easier degree of communications.

Bottom: lesser physically attractive males, attractiveness scores of 1, who obtained harder degrees in: psychology, history, computer science, and chemical engineering.

(add)

Intellectual difficulty | Brains

See main: College degrees by intellectual difficulty

The following shows the ranking of "intellectual difficulty" (I), on a scale of 1-100 (100=harder, 0=easier), of the 90 attained degrees for female graduating students of the University of Illinois, Chicago, for the graduating classes of 1969 and 1970 combined, according to the polled opinion of American college students (N=14). [2]

Hardest

Bio-Engineering	88.3
Electrical Engineering: Wave Propagation & Radiation	87.5
Science & Engineering	85.8
Mathematics	83.3
Chemistry	82.5
Energy Engineering	81.7
Thermal Science	81.7
Wave Propagation & Radiation	80
Aerospace Science	79.2
Physics	79.2
Aerospace Engineering	78.3
Computer Science & Communication	78.3
Engineering: Mechanical Analysis	78.3
Information Engineering	77.5
Mechanical Analysis & Design Engineering	77.5
Metallurgical Engineering	76.7
Systems Analysis Engineering	76.7
Engineering Systems Analysis	75.8
Engineering: Structural Design	75.8
Structural Design Engineering	75.8
Applied Physics Engineering	75
Finance	75
Applied Mechanics Engineering	74.2
System Analysis	74.2
Biology	73.3
Computer Science & Communication Engineering	73.3
Architectural Structures	72.5
Electrical Engineering	72.5
Operations Research Engineering	72.5
Physics: Education	72.5
Structural Mechanics	72.5
Chemistry & Geography	71.7
Mechanical Engineering	71.7
Structural Design	70.8
Psychology	70.8
Spanish & Political Science	70.8
Accounting	70
Computer Science	70
Electronics Engineering	70

Mechanical Analysis & Design	69.2
Systems Engineering	69.2
Civil Engineering	68.3
Manufacturing Engineering	67.5
Behavioral Science	65.8
Quantitative Methods	65.8
Engineering: Structural Mechanics	65
English Literature	64.2
Business Marketing	63.3
Education - Mathematics	63.3
Wave Radio & Property	63.3
Architecture & Art	62.5
Systems Management	62.5
Business Administration - Accounting	61.7
Business Administration - Finance	61.7
Secondary Education - History	61.7
Architectural Design	60.8
Philosophy	60.8
Criminal Justice	60
Painting Graphics Art	60
Political Science	60
Architecture	59.2
Education: English	58.5
English: American Literature	58.3
Materials Engineering	58.3
Art History	57.5
Biological Sciences	57.5
Education: History	57.5
Metallurgy	57.5
Administration of Criminal Justice	56.7
Communications Engineering	56.7
American Literature	55.8
Mass Communication	55.8
Operations Research	55.8
Sociology - Teacher Education	55
Industrial Design	54.5
Elementary Education	51.7
Mass Media	51.7
Geology	50
History - Teacher Education	50
Soil Mechanics	50

Marketing	49.2
Spanish Literature	49.2
Social Studies	48.3
Design	48.2
Economics	47.5
English	47.5
Business Administration - Marketing	46.7
German	46.6
Business Administration - Operations & Systems	45.8
Business Management	45
Geography	45
Spanish	44.2
Business Administration	43.3
History	41.7
Sociology	40
Music	39.2
Management	35
Speech (Radio & Television Directing)	34.2
Speech & Theater	33.3
Speech: Television & Radio	32.5
Physical Education	27.5

Easiest

(add discussion)

Data | Analysis

The data sets were sorted by sex and grouped into similar categories. The results confirmed the theory. In the graduating classes of 1969 and 1972, for example, 670 female students obtained 67 different degrees. By comparing females who obtained science-related degrees, among other related groups, the following plot is obtained: [3]

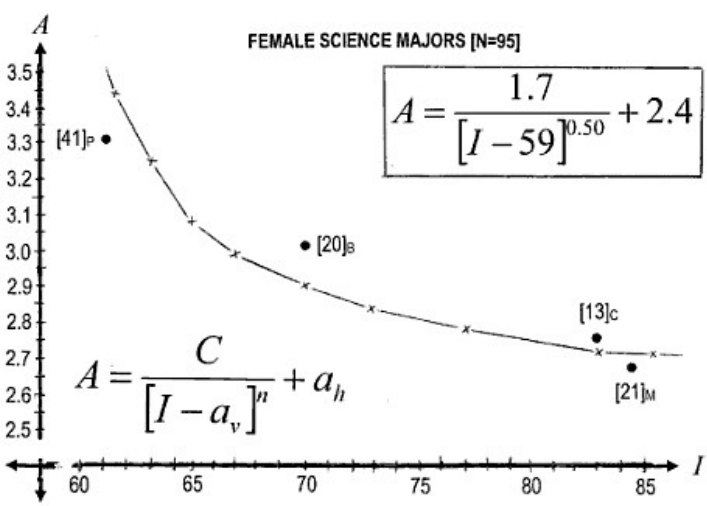

Attractiveness vs. Intelligence at UIC

Description: A plot of the ranked data results, of the group "female science majors", from the 2002 study of 2,018 University of Illinois at Chicago (UIC) college graduation photos, graduating classes of 1969 and 1972, showing that attractiveness is inversely proportion, on average, to intelligence, a finding which corroborates Beckhap's law.

Key: P = psychology, B = biology, C = chemistry, and M = mathematics, each with 41, 20, 13, and 21 students, respectively. Similarly, *A* = physical attractiveness (of group); on a scale of 7.0 = most physically attractive to 1.0 = least physically attractive; and *I* = intellectual difficulty (of degree); on a scale of 100 = most intellectually difficult to 10 = least intellectually difficult.

A similar inverse trend was found with male engineering students, namely that the physical attractiveness of students, on average, was found to be inversely proportional to intellectual difficulty of degree obtained. Other gradating classes were analyzed as well, including: 1973, 1980.

Thermodynamics | Human chemistry

See main: Human chemical thermodynamics

Thims then attempted to explain this finding by correlating the initial state G_i and final state G_f of the free energy change for a typical mating reaction to bulk values of attractiveness and intelligence involved in mate selection. A solution was found using the following two assumptions, first that enthalpy is proportional to physical attractiveness:

$$H = kA$$

This would concur, in some sense, with Frederick Rossini's 1971 "Chemical Thermodynamics in the Real World" argument that enthalpy is a measure of "security" in social reaction existence, meaning that people will tend to want to bond with physically attractive individuals in relationships, and hence be seemingly more "secure" in their social existence or in the social structure, whereas less physically attractive individuals will tend to remain single, e.g. homebodies, cat ladies, and or outcasts, e.g. hobos, bag ladies, etc., give or take, baring more detailed discussion.

The second assumption made was that entropy is inversely proportional to intelligence:

$$S = \frac{k}{I}$$

This would concur, in some sense, with Stephen Hawking's 1996 argument that reading decreases the neurological entropy of a person by so many units, meaning that intellectual mastery would be inversely proportional to entropy of a person, in a roundabout sense, using a combination of the 1862 entropy as a measure of disgregation model of Rudolf Clausius and the 1882 characterization by Hermann Helmholtz of the magnitude of entropy |S| as the measure of disorder of the particles of the system with respect to each other.

With these approximations in place, one can employ intelligence and physical beauty as correlative measure of entropy and enthalpy, respectively, which can thus be used to represent the instantaneous 'state' of the reactive system at any given second on going from reactants to products. These, in turn, can then be substituted into the Gibbs equation:

$$\Delta G = H_f - H_i - T(S_f - S_i)$$

to yield for an inverse relationship plot. Skipping over much of the derivation and discussion, using the two above approximations, and assuming that initial state of the reaction, in which two individuals, one male molecule Mx and one female molecule Fy, of varying levels of intelligence and beauty, is the day the pair fall in love at first sight, that they pair conceives one child, Bc, three years later, and that the end state of the reaction, coincides with the point of the fifteenth year of the growth of the child, after which the precipitate child molecule begins to detach from the parental structure. This gives the following simplified overall reaction mechanism:

$$M_X + F_Y \rightarrow B_C$$

On this model, the following variables can be be defined at day one (-3 years before conception) and the final day (+15 after conception):

$G_f = G_C^{15}$	Gibbs free energy of the state of the child, Bc, detached at age 15.
$G_i = G_X^{-3} + G_Y^{-3}$	Gibbs free energy of the state of two reactants, the male Mx and female molecule Fy, at the point of love at first sight.
$H_f = H_C^{15}$	Enthalpy of the state of the child, Bc, detached at age 15.
$H_i = H_X^{-3} + H_Y^{-3}$	Enthalpy of the state of the two reactants, the male Mx and female molecule Fy, at the point of love at first sight.
$S_f = S_C^{15}$	Entropy of the state of the child, Bc, detached at age 15.
$S_i = S_X^{-3} + S_Y^{-3}$	Entropy of of the state of the two reactants, the male Mx and female molecule Fy, at the point of love at first sight.

Using these time-specific variables, through a bit of substitution, one can derive the following result: [9]

$$A_X^{-3} = \frac{C_1}{I_X^{-3}} + C_2$$

which says that, owing to the constraints of the Gibbs equation, otherwise known as the combined law of thermodynamics, the physical attractiveness of the individual, in this case the male, will vary inversely with the intellect of the individual, on average, at the initial start to a typical romantic male-female reaction.

There are many issues, to note, with this proof, one being that the second assumption, that of entropy, using the disorder model of entropy, in human reactions, being inversely proportional to intelligence (mental order), is derived from gas theory, particularly the Boltzmann chaos assumption, in which particles are assumed to have non-correlative velocities, which is not the case with human molecules.

Discussion

(add)

References

1. Thims, Libb. (2002). "UIC: Attractiveness vs. Intelligence Date: 2,000 graduation photos rated for attractiveness and undergraduate degrees per each photo rated for intellectual difficulty", IoHT Research Project.
2. Thims, Libb. (2003). *Human Thermodynamics, Volumes 1-3* (Research project #, pg. 221). IoHT Publications.
3. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (UIC: Attractiveness vs. Intelligence Study, pgs. 671-72). Morrisville, NC: LuLu.

θΔics

REDIRECT

See: **Beckhap's law**

In hmolscience, **becoming,** as compared to “being”, refers to []

Overview

In 1809, Goethe, in his *Elective Affinities*, situated the subtle character transformation according to which Charlotte only became flexible, i.e. "willing" to break her marriage bond (divorce) with Edward, in respect to the approaches of the Captain, who desired to marry her, "after" he became a Major. [1] The truncated version of this becoming a major transformation is explained by Joseph O’Leary (2005): [2]

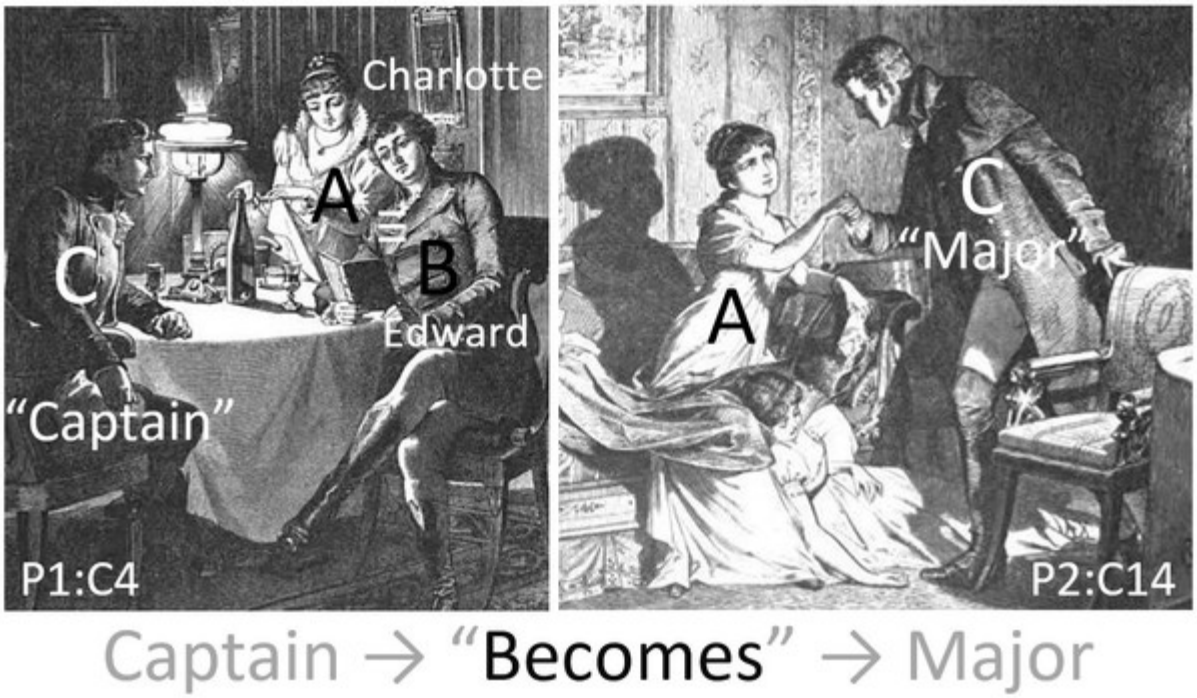

The scene (left) from *Elective Affinities* P1:**C4** where Captain explains "elective affinity” to Edward and Charlotte, who later, in P1:**C14**, receives a letter of offer to “**become**” a Major, after which, toward the end of the story, in P2:C14, Charlotte agrees to receive him for the prospect of marriage.

Section 2: The double adultery:

The two couples, thrown together as in a laboratory vessel, form new attachments. Eduard's passion for Ottilie grows like wildfire. At a foundation-laying ceremony on Charlotte's birthday he throws a glass in the air but it is not smashed; it is inscribed with the letters E and O which he takes as an omen. The visit of an adulterous couple, the Count and the Baroness, creates a sense of moral disorder. Eduard and Charlotte make love while thinking of Ottilie and the Captain respectively; the next day Edward embraces Ottilie, Charlotte the Captain.

Section 3: Departure of the two men:

Charlotte tries to restore things to normal. On Ottilie's birthday the Captain saves a boy from drowning. Eduard ignores the general commotion and puts on the fireworks display for Ottilie alone. The Captain leaves. Promising Charlotte that he will try to cure his passion, Eduard retires to a smaller residence, having ensured that Ottilie will stay on, and then joins the army. Charlotte reassures the ex-clergyman Mittler that her marriage is not doomed, for she is pregnant.

Section 5: The re-emergence of the fateful relationships:

After the visit of Ottilie's tutor, Charlotte gives birth to a boy who resembles Ottilie and the Captain. A visiting English Lord tells a story which may suggest that Charlotte and the Captain were lovers in the past. More Romantic fads: Ottilie reveals a capacity for water-divining; Charlotte refuses the Lord's offer to cure Ottilie's headache by magnetism. Eduard tells the Captain (now a Major) that his survival in battle means that Ottilie is his. He will divorce

Charlotte and the Captain can marry her. This will restore all-round harmony.

(add discussion)

See also

â— Drive-thru paradox

References

1. (a) Goethe, Johann. (1809). *Elective Affinities: Illustrated, Annotated, and Decoded* (editor: Libb Thims). Publisher, 2013.
(b) O'Leary, Joseph S. (2005). "Goethe in 'The Golden Bowl'", *Essays on Literary and Theological Themes*, Jun 22.

θΔics

In human chemistry, **Beda Allemann** (1926-1991) was a Swiss-born German literary critic and theorist noted for his 1973 article "On the Function of the Chemical Parable in Goethe's *Elective Affinities*", in which, similar to Jeremy Adler and Kevin Yee, he interrogates the implied parallel, in Goethe's 1809 *Elective Affinities*, between the chemical simile and the bondings of the characters, and, as summarized by Stefani Engelstein, argues against reductive determinism and that the chemical analogy drawn by Eduard in the fourth chapter fails to conform to the plot. [1]

References

1. (a) Allemann, Beda. (1973). "On the Function of the Chemical Parable in Goethe's *Elective Affinities*" ("Zur Funktion der chemischen Gleichnisrede in Goethe's *Wahlverwandtschaften*" *Untersuchungen zur Literature als Geschichte* (pgs. 199-218). Ed. Vincent J. Gunther"), Helmut Koopmann, Peter Putz, and Hans Joachim Schrimpf. Berlin: Erich Schmidt Verlag.
(b) Engelstein, Stefani. (2008). *Anxious Anatomy: the Conception of the Human Form in Literary and Naturalist Discourse* (pgs. 54, 252). SUNY Press.

External links

â— Beda Allemann (French → English) – Wikipedia.

θΔics

In existographies, **Bede** (672-735) (IQ:160|#431) (Cattell 1000:878) [RGM:615|1,500+] (GHE:6) (CR:15) was an English monk noted for his 731 *Ecclesiastical History of the English People*, wherein he tells the story of King Edwin's consultations on which new religion the kingdom should follow.

John the Baptist | Aquarius

In c.710, Bede, supposedly, associated John the Baptist with the Aquarius constellation, the man carrying the water jar, such as shown below (middle right):

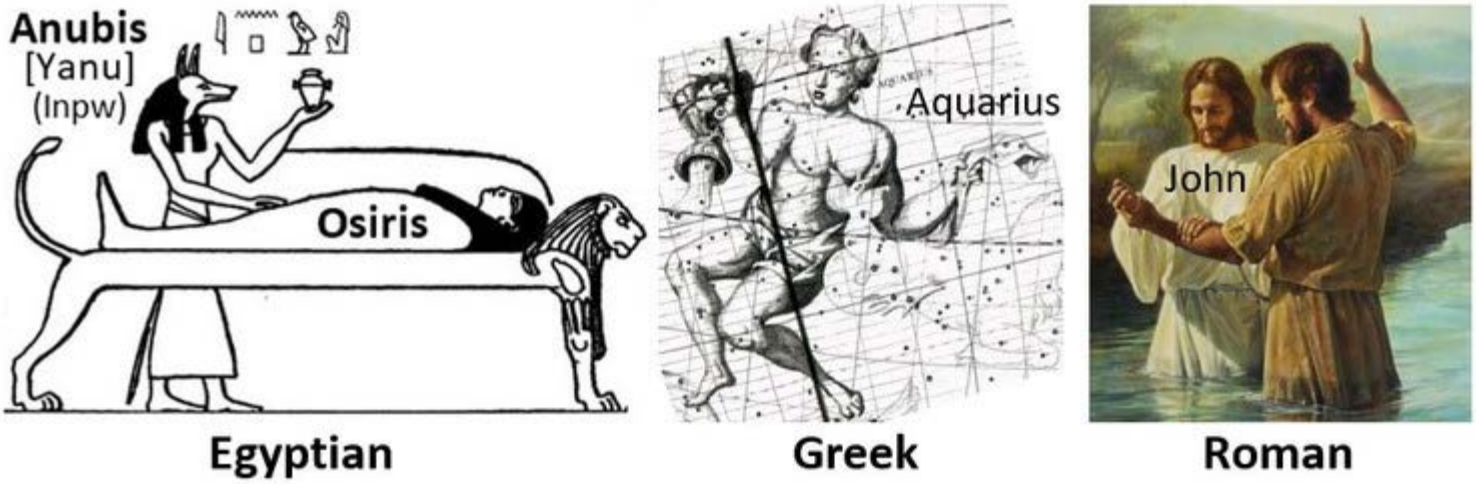

This connection, in turn, as deciphered by Alvin Kuhn (c.1933), Tom Harpur (2004), and Dorothy Murdock (2008), supposedly, connects back with Anubis, aka the "bringer of the waters" (in the celestial Nile River as Milky Way sense of things), above left, who like John the Baptist, was beheaded, in an astro-theological sense. [1]

Warmed sparrow | Religion

In 627, as recounted by Bede (731), the missionary bishop Paulinus approached King Edwin of Northumberland in aims to sell the Christian gospel to him as the new religion for the kingdom. Edwin was willing to listen, but also called together a meeting of his council elders, which included his pagan high priest, Coifi. After Paulinus presented the gospel to him, one of the chief advisors replied with the following: [2]

> "Your Majesty, when we compare the present life of man on earth with that time of which we have no knowledge, it seems to me like the swift flight of a single sparrow through the banqueting-hall where you are sitting at dinner on a winter's day with your thanes and counselors. In the midst there is a comforting fire to warm the hall; outside the storms of winter rain or snow are raging. This sparrow flies swiftly in through one door of the hall, and out through another. While he is inside, he is safe from the winter storms; but after a moment of comfort, he vanishes from sight into the wintry world from which he came. Even so, man appears on earth for a little while; but of what went before this life or of what follows, we know nothing. Therefore, if this new teaching has brought any more certain knowledge, it seems only right that we should follow it."

(add)

References

1. (a) Harpur, Tom. (2004). *The Pagan Christ* (pg. 93). Thomas Allan Publishers.

(b) Murdock, Dorothy M. (2008). *Christ in Egypt: the Horus-Jesus Connection* (pg. 254). Stellar House Publishing.
2. (a) Meynell, Makr. (2010). “King Edwin of Northumberland’s Converstion and the Sparrow in the Storm” (Ñº), WordPress, Sep 10.
(b) Weinberg, Steven. (1992). Weinberg, Steven. (1992). *Dreams of a Final Theory: the Scientist’s Search for the Ultimate Laws of Nature* (pg. 261). Random House.

External links

â— Bede – Wikipedia.

θΔics

In experiments, **beer keg vacuum experiment**, depicted adjacent, was a *circa* 1649 experiment in which water or wine was either drained or sucked out of a well-sealed beer keg to see if an vacuum (or Torricelli-type vacuum) could be made, conducted by German engineer Otto Guericke. [1]

A Schott diagram depiction of German engineer Otto Guericke's famous *circa* 1645 **beer keg vacuum experiment**, in which Guericke and another man (or Guericke's two assistants) try to completely evacuate the air form a well-caulked beer keg, so to see if a "vacuum" could be made, the existence of which that was deemed impossible by both Aristotle and Parmenides, among others

Overview

In c.1645, Otto Guericke, based on the dating of the invention of his vacuum pump (1647), as evidenced below, carried out his famous beer keg vacuum experiment, as illustrated adjacent.

> "The vacuum pump, for which Guericke is most celebrated, has been **dated to 1647**, but that too must have been the culmination of work going back to earlier years, e.g. Guericke's grandson, who died in c.1790, recorded in his *History of the Duchy of Magdeburg*, that he possessed an astrolabe and a spirit level on which were engraved: 'fait par Otto de Guericke, engineer at Magdeburg 1632."
>
> — Thomas E. Conlon (2011), *Thinking About Nothing* (pg. 43)

The Guericke beer keg vacuum experiment was an experiment to see if a vacuum could be made in a beer keg and performed by German engineer Otto Guericke.

It has been said or surmised that Guericke may have been stimulated or influenced in some way or another into his beer keg experiment by a mixture of hearing about Aristotle's denial of the void, Galileo's theoretical investigations on the pump problem, and in particular the rumored 1643 Torricelli mercury column experiment in which a Torricelli vacuum was made. [2]

In circa 1648, German engineer Otto Guericke, after ending a prolonged engagement with the 30 Year War, began to devote a considerable portion of his spare time to experimentation and was especially fascinated with the nature of cold, much of which was centered on the question of the void. Guericke pondered the question: [3]

> "Could **empty space** exist, and is heavenly space unbounded?"

In researching this query, Guericke was brought into contact with German mathematical physicist Gaspar Schott, an adherent to Aristotle's version of the denial of the void, albeit open to new experimental information, the person who would go on to diagram and document all of Guericke's numerous experiments.

The first part of the keg experiment seems to have been only to make a Torricelli vacuum in the keg by letting water or wine drain out the bottom of a previously completely full keg. Guericke explains the experiment as such: [4]

> "I had a wine or beer keg filled with water and well caulked throughout so that no external air could enter. I introduced a bronze tube, attached to the lower part of the keg by means of which water could be drawn out. Then through its own natural weight [natural vacuum], the water would of necessity go down and leave

behind in the keg a space of air (and accordingly empty of any natural body)."

The second version of the experiment seems to have involved a type of suction pump with two men working the pump to remove contents from the keg, as depicted above (a Schott diagram) and thus make an extra strong vacuum or rather an "artificial vacuum" as it might be deemed in modern terms.

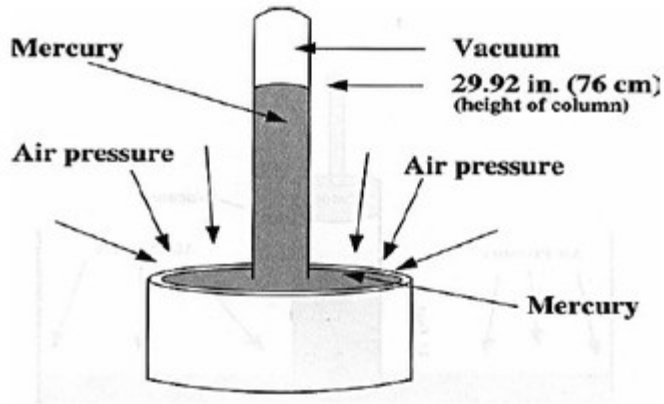

The 1643 Torricelli vacuum experiment, the prototype model, it is said, that German engineer Otto Guericke experimentally tested to see if vacuum's could be made in beer kegs.

Results

The result of Guericke's beer keg experiments were that (a) they seemed to have resulted in the bi-product invention of the vacuum pump (and hence to the pneumatical engine and later the gas laws) and (b) they introduced him to the "sealing problem", i.e. how to make a container air tight. The solution to this problem was the invention of the famous Magdeburg hemispheres, two copper hemispheres sealed by grease, such that when the vacuum was induced inside the volume of the globe of the two attached and fitted hemispheres, the pressure of the surrounding atmosphere worked to hold or rather seal the hemispheres very tightly.

When the two hemispheres are simply laid together and the air exhausted from the inner space and if the vacuum could be made perfect in a sphere whose cross section is one square foot, the force required to separate the hemispheres would be 2116.8 pounds, or something less than one ton.

Naturally the discovery of the immense force of the atmosphere caused many attempts to utilize it. Denis Papin, professor of mathematics at Marburg, found the true solution in 1696, but did not meet with practical success; his first large steam cylinder, the Papin engine, in an unfinished condition stands in the court of the museum of Cassel. It is an undoubted fact that he did make an atmospheric engine work by the condensation of steam in a cylinder fitted with a piston. [5]

In short, skipping over a bit of intermediate history, Guericke's beer keg experiments directly led to the invention of the steam engine by Denis Papin and hence to the formulation of the subject of thermodynamics.

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(b) Guericke, Otto and Schott, Kaspar. (1672). *Otto Guericke's New Experiments on (as they are called) on the Magdeburg vacuum space* (*Ottonis De Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (15+ diagrams, various pages). Janssonius a Waesberge.
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3. Partners and Rivals during the Scientific Revolution – Faculty.Fairfield.edu.
4. Guericke, Otto. Ames, Margaret G.F. (1994). *The New (so-called) Magdeburg Experiments of Otto von Guericke* (pg. 114). Kluwer Academic.
5. Marks, W.D. (1882). "Talks on the Steam Engine" (pg. 108), *The Engineer: with which is incorporated Steam engineering, Volumes 3-4.*

Further reading

â— Logan, William B. (2005). *Oak: the Frame of Civilization* (pg. 179). W.W. Norton & Co.

θΔics

In mononyms, **Beg** refers to the physicochemical sociology work of Pakistani organometallic chemist Mirza Beg, in particular his 1987 *New Dimensions in Sociology*.

See also

â— Beg analysis
â— Beg-Thims dialogue

References

1. Beg, Mirza Arshad Ali. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (intro) (pdf, annotations by Libb Thims, 2014) (individual, pg. 23). Karachi: The Hamdard Foundation.

θΔics

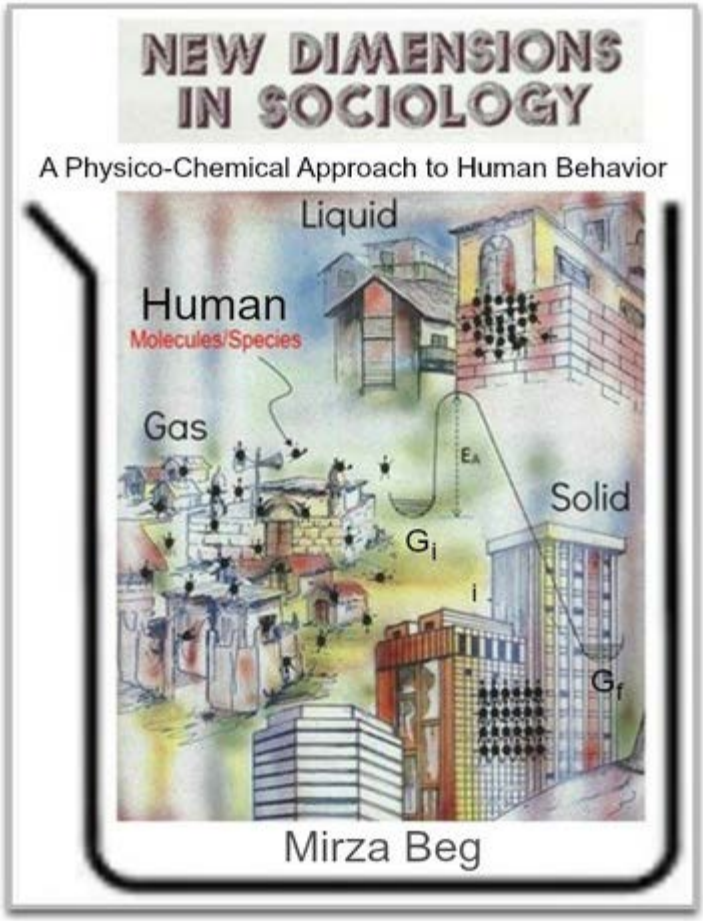

Cover to Mirza Beg's 1987 ***New Dimensions in Sociology***, wherein he shows societies existing in reaction beaker, shows a Gibbs energy surface diagram, depicts humans as little molecules, residing in various states: gas, liquid, solid, shows activation energy, lattice structure, etc. [1]

In hmolscience, **Beg analysis**, aka "social Newton term analysis" (when done on the works of social Newtons), is the analysis of a humanities scholar's work in respect to the "correctness", and or "type", i.e. focus, of usage of physical, chemical, and thermodynamical terms; with particular focus on overt incorrectness and or term dominance.

Three independent books resulting from the so-called "**Beg analysis**" method, where a focused and detailed look at humanities scholars using physical science and or physicochemical terminology is completed, with aims to ferret out the issue in regards to correctness or incorrectness and validity or invalidity.

If, to go through one hypothetical case scenario, albeit one based on an aggregate summation of actual publications, one professes on the political "power" of China, mentioning, along the way, the economic "bond" between American and Europe, in which digression is made on the "force" of Middle Eastern terrorism, as this connects to the stored "energy" of GDP of Brazil, which the theorist asserts is related to the "entropy" of Mexico and the "enthalpy" of Australia, both been influenced by the "pressure" and "temperature" of war-like "state" of North Korea, which in some way derives from the "force" of the implosion of Japan at the end of WWII, itself related to the "friction" arisen amid WWI, deriving from the increasing loss of "work" following the Bolshevik revolution, which the theorist believes is related to the "free energy" of late 18th century France, albeit hindered by the "bound energy" of pre-dark age Greece, which the professor inserts, via citation, is hypothetically related to the "transition state" of 1st Dynasty Egypt, which someone, long forgotten in the past, evidenced as being based on the "reaction" between sodium and water, with mention of the Mpemba effect, at the end of which the professor concludes with a physically incorrect assertion about the nature of the power of the energy of the bond, changing by force, of the work done by society in a given state, then an obvious and immediate correction to reality must be digressed upon.

Overview

Beg analysis, i.e. the explicit focus on the "correctness" or "incorrectness" of physico-chemical sciences terms used by humanities scholars, in a specific field, was done, independently, by Mirza Beg (1987), in sociology, Philip Mirowski (1989), in economics, Duncan Michael Foley (1991), in government, respectively, and as methodology, termed "Beg analysis", per synthesis of the previous three, by Libb Thims (2014) in a growing numbers of analysis.

Beg analysis, in more detail, is the analysis and dissection of the work of a humanities scholar—or an entire humanities field, e.g. sociology, economics, government or politics—in which scholars unawaringly employ and use physical science and or physicochemical terms and terminology, whether via implicit analogy, unconscious analogy, or metaphor (e.g. thermal words), or explicit realism modelling, e.g. what "force" moved you to go to "work" today (see: Library walk problem), in their presentation and or argument, by a trained physical science or physicochemical scientists or from the physical sciences purview.

Beg | Sociology

The so-called "Beg analysis" method was pioneered by Indian-born Pakistani organometallic chemist Mirza Beg, who in 1974, via happenstance, was invited to attend some type of business or government leadership course, wherein an unusually large number of physical chemistry like terms were being employed to explain business or government operation. Beg explains this as follows: [1]

> "In 1974, I was nominated to attend an advanced training course at the National Institute of Public Administration, Karachi. As a chemist working on the fundamental aspects of coordination and organometallic chemistry, it seemed odd and totally unrelated to me. However, the first lecture by Mr. Mumtaz was quite polarizing when he said that if the lectures during the following weeks could create a disturbance, even though slight, it the thinking of the participants, the objectives of the course would be attained and this led me to take the course with an open mind. I devoted quite a bit of my time to the course material picking up points related to chemistry and interpreting them in physico-chemical terms, wherever possible.
>
> A peculiar feature of the course was that the lecturers were using terms like polarization, activation, potential energy, complexes, compounds, perhaps metaphorically and in an unrelated context. This compelled me to ask some of them if they were aware of the real sense of the terminologies which have actually been borrowed from chemistry or material sciences. As expected, they had no clue to them and this prompted me to write a few notes, related physico-chemical terminologies to those of human behavior. I was encouraged in doing so by Dr. A.H. Siddiqui, the then deputy director of the Institute, who thought it would be a valuable contribution to the field of sociology."

Beg continues:

> "The above notes where mimeographed and they appeared as a booklet *Human Behaviour in Scientific Terminology* in 1976. Four papers were published out of this booklet in local journals. The response from the readers was very encouraging and in the light of the comments received it transpired that the pertinent data had to be put in urgently to provide a quantitative basis to the hypothesis."

These four articles, referred to above, are: "Human Behaviour in Scientific Terminology" (1979), "Human Behaviour in Scientific Terminology: Assimilation" (1980), "Human Behaviour in Scientific Terminology: Affinity, Free Energy Changes, Equilibria, and Human Behaviour" (1981), each published in *Pakistan Management Review*, along with a fourth 1982 article published in *Pakistan Marketing Review*. [2] All of this effort culminated in his magnum opus the 1987 *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*. [1]

Mirowski | Economics

In 1989, American economics historian Philip Mirowski published his densely-woven *More Heat Than Light: Economics as Social Physics, Physics as Nature's Economics*, a book written during a six-year gestation period, originated via a passing 1979 remark about how value, in economics, must be conserved, the term "conservation" here attempting to make a faint implicit connection to the conservation laws of physics, without explicitly stating so. Mirowski explains this as follows: [3]

> "The origins of this work can be traced to an innocent comment made in passing in an economics seminar at Stanford University sometime in 1979 or 1980. The speaker tossed off an observation to the effect that 'value had to be conserved' in his model if some mathematical assumption in the model were to hold; the tone of his voice suggested that no one in his or her right mind would find a problem.

> Like so many other assertions in economics, this one passed over without further comment, in the interests of getting on to the main topic of the seminar. For some reason, the comment haunted me afterward. I didn't care much about the model per se, but the very notion that such an assertion would go unchallenged seemed to me of profound import. Having had some background in physics, I knew how important conversation principles were in that arena; in physics great efforts were made to render them explicit. In economics, no one to my knowledge had systematically confronted the issue, at least in the textbooks."

(add discussion)

Foley | Government

In 1990, English political scholar Michael Foley, in the acknowledgement section to his *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian Mechanics*, stated how he was led into the writing of this book because in his earlier research he kept coming across repeated usage of mechanical analogy references in American politics: [4]

> "This [*Laws, Men and Machines*] work had a long period of gestation during which I was repeatedly led to ruminate upon the extraordinary wealth of mechanical references in American politics."

The American presidents originating from the so-called Princeton school of social physics would seem to be the bulk of the topic of discussion here.

Social Newton | Beg analysis

> *See main: Social Newton term analysis*

On 19 Aug 2014, American electrochemical engineer Libb Thims began using the term "Beg analysis", in the Hmolpedia article on American moral philosopher and neuroscientist Joshua Greene, as a classification label to the aforementioned terminology dissection methodology, and began a Beg analysis, in table form, of Greene's *Moral Tribes*, after coming across his discussion of whether or not physical "distance" should matter in regards to its action on personal "forces" and what this has to say about whether one is morally normal or morally abnormal, being that force times distance is explicitly defined by Gustave Coriolis' 1829 principle of the transmission of work, something that, like Morowski notes in regards to conservation laws, took many centuries to ferret out; the short version of this analysis is the following:

> Work (Ñº) | 51+
> Force (Ñº) | 21+
> Reaction (Ñº) |14+
> Movement (Ñº) | 13+
> Power (Ñº) | 13+
> Distance (Ñº) | 9+
> Bond (Ñº) | 1+

In 2015, Thims expanded on this so-named "Beg analysis" of Greene to do a Beg analysis or key term analysis of some top social Newtons to show their respective change in "term" focus, comparatively, over time (see: Social Newton term analysis); the following, e.g. is the Beg analysis or "social Newton term analysis" of the 1855 *Force and Matter* of German physicist Ludwig Buchner (SN:9):

Scientific terms	Religious terms	Elements	Metaphysical

Force (Ñº) | 100+
Matter (Ñº) | 100+
Work (Ñº) | 88+
Power (Ñº) | 84+
Motion (Ñº) | 61+
Chemical (Ñº) | 54+
Heat (Ñº) | 40+
Mechanical (Ñº) | 39+
Atom (Ñº) | 33+
Energy (Ñº) | 30+
Molecule (Ñº) | 20+
Electricity (Ñº) | 19+
Affinity (Ñº) | 9+
Affinities (Ñº) | 3+
Bond (Ñº) | 0+

Soul (Ñº) | 75+
God (Ñº) | 65+
Spirit (Ñº) | 45+

Hydrogen (Ñº) | 16+
Oxygen (Ñº) | 16+
Carbon (Ñº) | 15+
Iron (Ñº) | 12+
Phosphorus (Ñº) | 3+
Sulphur (Ñº) | 2+
Nitrogen (Ñº) | 7+
Calcium (Ñº) | 3+
etc.

Life (Ñº) | 100+
Death (Ñº) | 50+
Love (Ñº) | 21+
Evil (Ñº) | 18+
Ether (Ñº) | 13+
Hate (Ñº) | 0+

Buchner, of note, seems to be jettisoning "god" as a functionable concept, yet retaining "soul" as a possible force/matter/motion-based reformulation, possibly.

In 2016, Thims did a partial Beg analysis of 2014 political thermodynamics theory of Randall Schweller.

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(b) Beg, M. Arshad Ali. (1980). "Human Behaviour in Scientific Terminology: Assimilation" (Ñº), *Pakistan Management Review*, 21(3):5-##.
(c) Beg, M. Arshad Ali. (1981). "Human Behaviour in Scientific Terminology: Affinity, Free Energy Changes, Equilibria, and Human Behaviour" (Ñº), *Pakistan Management Review*, 22(4):17-##.
(d) Beg, M. Arshad Ali. (1982). "Article Title", *Pakistan Management Review*, 1, 32, Jan.
3. Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (pg. 2). Cambridge University Press.
4. Foley, Michael. (1990). *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian Mechanics* (entropy, pg. 199-200). Routledge, 2014.

θΔics

In dialogues, **Beg-Thims dialogue** refers to the discussion, initiated publicly, 23 Jun to 12 Sep 2014, in the threads of Hmolpedia, between Pakistani THEIST islamic organometallic chemist Mirza Beg—pioneer of physicochemical sociology—and American ATHEIST electrochemical engineer Libb Thims—curator of the field of physicochemical humanities, who early 2014 initiated the drafting of the first textbook on human chemical thermodynamics (*Chemical Thermodynamics: with Applications in the Humanities*), along with interjection by Hmolpedia Inderjit Singh.

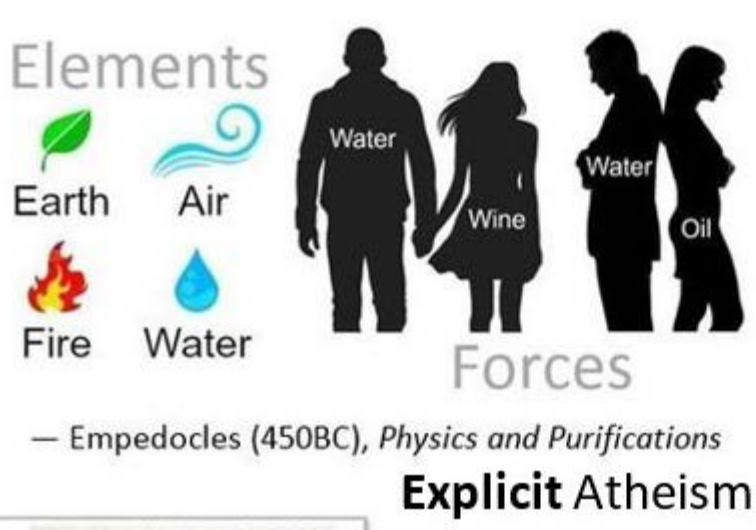

1809
Coded Atheism

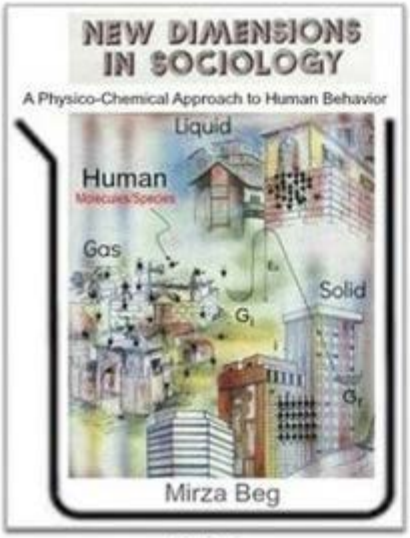

1987
Implicit **Theism**

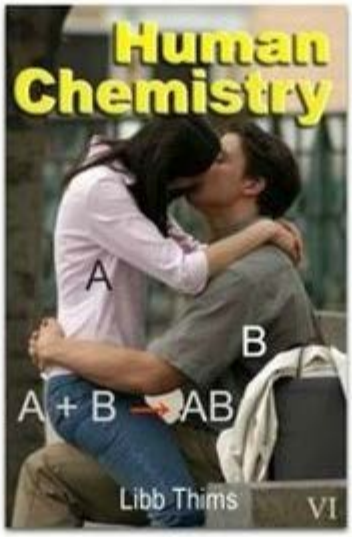

2007
Implicit Atheism

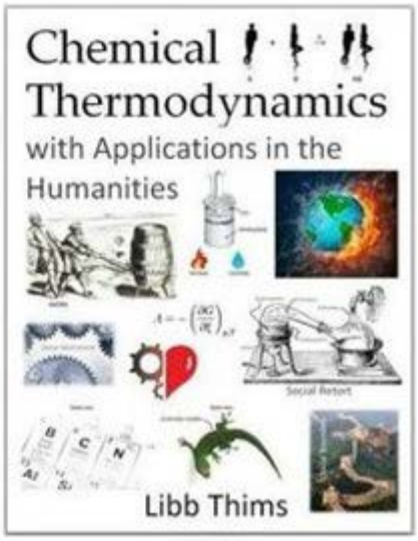

2013
Explicit Atheism

The three leading thinkers to expand on the premise, initiated by **Empedocles** (*On Nature*, 435BC) with his chemical aphorisms, that "friends mix like water and wine, whereas enemies separate like oil and water", have been: **Goethe** (*Elective Affinities*, 1809), Pakistani organometallic chemist Mirza **Beg** (*New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, 1987), and American electrochemical engineer Libb Thims (*Human Chemistry*, 2007; *Chemical Thermodynamics: with Applications in the Humanities*, 2014). A dialogue between Beg and Thims, i.e. a **Beg-Thims dialogue**, was initiated on 23 Jun 2014. A mental dialogue was initiated between Thims and Goethe in *circa* Feb 2006.

Beg

On 13 May 2014, Thims discovered the physiochemical sociology work of Mirza Beg; in late May, Thims obtained a copy of of Beg's 1987 *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*. [1] On 23 Jun 2014, Begs and Thims began communicating, via Hmolpedia messaging, and in some 189+ public thread dialogue interactions, over the course of two months, until 12 Sep 2014.

Goethe | Beg

The 2014 discovery of Beg by Thims, via keyword Google search on term "physico-chemical sociology", who only recently began to upload his work to Academia.edu, is comparable to the discover of Goethe by Thims, via footnote 2.5, in *circa* Feb 2006, the latter effects of which have been profound (see: progress report), one example of which being the penning of the two-volume textbook *Human Chemistry* (2007). [2]

Atheism Reviews

An immediately recognizable precipitate of the "Beg discovery" and followup "Beg-Thims dialogue" has been the initiation of the Atheism Reviews YouTube video channel, wherein per observation of Beg's salient main weakness being the underlying religious backbone of his entire corpus of work, e.g. his belief in flying donkeys (namely the buraq that Muhammad, supposedly, rode on his night journey), it was instilled into Thims mind that it was an an imperative or moral imperative, so to say, that he make 100 atheism vs religion videos on review, debate, discussion, and or education of this underlying global tensional issue, e.g. 2014 polls show that 56% of Americans believe that Adam and Eve were real people. (Ñº) By 8 Jan 2015, Thims had made 21 videos. [4]

Thims, prior to this, was aiming to bottle the "religious issue" into about the equivalent of an introductory footnote, and thereby sidestep the entire issue, via implicit atheism. [3] The new path taken has been that of explicit atheism, of the extreme atheism historical approach.

Dialogue

The following are the initial 163 Hmolpedia thread posts between Beg and Thims, following in-site messaging from Beg to Thims: [1]

— —

Comment **#0 | Re: Dr. Mirza Arshad Ali Beg (message repost)**

Sadi-Carnot (Libb Thims)
Jun 23 2014, 11:36 AM EDT | Post edited: Jun 23 2014, 11:39 AM EDT

The following is a reposted message, sent to me yesterday (4:23 pm EDT 23 Jun 2014), from Beg (user:MirzaArshadAliBeg) copied here for conversation preservation utility and for better discussion purposes:

> "Sadi, I have been introduced to hmol.pedia as Mirza Beg by Libb Thims. My full name is Mirza Arshad Ali Beg. My publications at the University of British Columbia with Professor HC Clark carried the name M.A.A. Beg. Subsequent publications from Pakistan carried the name M. Arshad A. Beg and that name went on until 1980. From this time onwards I started writing my full name on each publication. I wonder if my full name can replace the Mirza Beg in the hmol.pedia. I will send you my recent articles and also those that are listed with academia.edu, but you say that this is not the forum. What is the best thing to do? Dr. Mirza Arshad Ali Beg"

To reply, firstly, Sadi-Carnot is my (Libb Thims) site user name, hence you are communicating with Libb Thims.

Votes | 3 of 3 found valuable

— —

Comment **#1 | Re: Dr. Mirza Arshad Ali Beg (message repost)**

Sadi-Carnot (Libb Thims)
Jun 23 2014, 11:37 AM EDT | Post edited: Aug 4 2014, 7:23 PM EDT

I could be persuaded to retitle your article to "Arshad Beg", if that is how you are known to your fellow co-workers in Pakistan? But, to note, you are already cited as "Mirza Beg" 35+ times in Hmolpedia:

http://www.eoht.info/search/everything/Mirza%20Beg?contains=Mirza%20Beg

and in my working textbook [pdf]. Please communicated further here in this thread. Secondly, in regards to your article "name", the general rules and protocols for naming Hmolpedia articles is here, one that generally teeters on a balance between hyperlink facility, name usage commonality, and future name usage tendency or repetitiveness in working articles (see: naming articles). Hence, we will not be able to retitle your article as "Mirza Arshad Ali Beg", because the hyperlink tool will not recognize your hyperlink in other articles, when I discuss your work, e.g. "in 1987, Mirza Beg, in

his physicochemical sociology, theorized that fugacity applies to sociology, as a working concept", etc.

Votes | 2 of 2 found valuable

— —

Comment #**2**

MirzaArshadAliBeg (Mirza Beg)
Jun 25 2014, 4:25 PM EDT

I would be more comfortable if we could settle for ArshadAliBeg as one word name. The second choice would be Arshad Beg.

With regard to your humanthermodynamics, there is quite a lot of thermodynamics in my Book: Life Processes, Health Aging & Disease. I wonder if you have had time to visit the copy of its Chapter 1 that I sent you, or the six papers relating to Oxidative Dehydration Theory on Life Processes, Health Aging & Disease that are placed on the https://independent.academia.edu/MirzaArshadAliBeg, All of these papers and the Book were presented in the HEC-International Workshop on Contemporary Versus Sustainable Health Care System in Pakistan held in March 2013.

I am now adding 3 papers on Emergence of life forms in the light of Quran and Science. I do not know how to place attachments in the threads that you want us to follow.

Votes | 2 of 2 found valuable

— —

Comment #**3**

Sadi-Carnot (Libb Thims)
Jun 26 2014, 2:20 PM EDT

Beg, thank-you for your note. I'll ruminate on the second choice "Arshad Beg".

I have finished your 1987 book and have already published a short review of it, pdf below, to be published soon in the Romanian Econophysics, Sociophysics, and Other Multidisciplinary Sciences Journal:

http://www.humanthermodynamics.com/NBPS.pdf

Re: "there is quite a lot of thermodynamics in my Book: Life Processes, Health Aging & Disease", I've skimmed through some of these, but all the thermodynamics discussion in your recent work, seems to be but regurgitation of what you said in your 1987 book, with nothing new added (as far as I recall from memory of past skims)? Your 1987 book, I read in great detail, and will make a scanned pdf soon with my hand written commentary for you to read (and also Jeff Tuhtan (Germany) has requested a copy as well as Gheorghe Savoiu (Romania)).

The main problem you have presently in your work (and mindset) is the religious conflict. As Charles Sherrington put it (1938): "chemistry and physics do not recognize the word life". You can either side with the Quran or Physical Chemistry, but not both [see: defunct theory of life]. Also, to add attachments to your Hmolpedia page, (a) sign in, (b) click the "more tools" drop link, and (c) click on "add attachment" and then upload file and save.

Votes | 2 of 2 found valuable

— —

Comment #**4**

MirzaArshadAliBeg (Mirza Beg)
Jul 6 2014, 8:59 PM EDT

Re: "The main problem you have presently in your work (and mindset) is the religious conflict. As Charles Sherrington put it (1938): "chemistry and physics do not recognize the word life"."

I do not quite agree with the observation that main problem I have presently in the work (and mindset) is the religious

conflict; reason being chemistry and physics do not recognize the word life. This reasoning however raises another conflict. Chemistry deals with materials and material sciences while physics deals with energy and the energetics of materials. Wedding chemistry with physics opens the dimensions of physical chemistry. The physical sciences claim that they are exact sciences but they are at best correlation with observations. For the present, I do not contest the above observation since more important for me is the application of the principles of exact sciences to non-exact sciences, which includes the application of physico-chemical principles of exact sciences on a molecular system to a living molecule. This is where the main conflict lies. The living molecule is bound to act differently from the non-living molecule and hence the behaviour of the human molecule is bound to be different from a humanized molecule that has been energized with a certain quantum of free energy. In sum, the behaviour of the energized human molecule is not likely to be exactly in accordance with the physico-chemical principles. There can be empirical correlations and this is what the work so far done has its emphasis on; it does not make tall claims; it only aims at reducing the empiricism in the first instance.

We have followed up and laid the foundations for work on *Environmental Sociology and Social Pollution*.

Votes | 2 out of 2 found valuable

— —

Comment #**5**

MirzaArshadAliBeg (Mirza Beg)
Jul 6 2014, 10:51 PM EDT

Re: "You can either side with the Quran or Physical Chemistry, but not both.'

That would be myopic in approach since Quran, Islam and for that matter any religion is a way of life. All religions including Islam, Christianity, Hinduism, and Buddhism have laid down guiding principles on living a civilized life. All Messengers and Reformers have demonstrated through words and deeds that it is possible to live without polarizing forces. They laid the foundations for an Ideal Society, the one that has the minimum most polarizing forces. In the 1987 publication Prophet Mohammad was the main focus and was designated as the ideal Personality and the Society that He reformed as an Ideal Society. Polarizing forces (satanic in character) were only waiting for opportunity to induce deviations from ideality and introduce cracks into the Ideal Society.

Polarizing forces have been identified in Quran as well as scriptures of other religions and faith. The same have been stated quantitatively by physical sciences in terms of Eternal Laws and cited as case studies in the Scriptures. Physical sciences and the observations in Scriptures therefore do not appear to me as being in conflict. On the other hand, the two of them are supplementing one another while dealing with polarizing forces; one dealing with deviations from Ideality and the other stating the same with figures, equations and models. The present attempt at opening new dimensions in Sociology by a physico-chemical approach aims to understand human behavior by interpreting actions and interactions of the humanized (energized) human molecule under different circumstances, stress situations for example.

More on Polarizing Forces .....

Votes | 1 of 2 found valuable

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Comment #**6** | **Reply 1**

Sadi-Carnot (Libb Thims)
Jul 7 2014, 6:40 AM EDT

Re: “Post #4”, that is some funny stuff! Before replying, I would just like to say that at this point you have three options, either: (a) hold to your religious convictions (words of the Quran), and go down in history as Ernst Mach did (1897) as someone who would not recant and admit to the existence of atoms, (b) recant, as Wilhelm Ostwald did (1809), and side with physical science (words of Clausius and Gibbs, whom you cite), or (c) leave your final say in regards to your beliefs in riddled form, such as Maxwell did in his last poem "A Paradoxical Ode". See following timeline for Mach/Ostwald recant comparison: here. In your case, by comparison, you will have to recant your religious faith and teachings, if you want your theory to increase in value in the generations to come. Compare how William

Thomson held to religious teachings in the face of physico-chemical science and evolution theory, and how his sun age calculations fell into ill repute in his later years, in spite of his early genius years.

Votes | 1 of 1 found valuable

— —

Comment **#7** | **Reply 2**

Sadi-Carnot (Libb Thims)
Jul 7 2014, 6:41 AM EDT | Post edited: Jul 7 2014, 6:56 AM EDT

The follow Thomson quote, for example:

> "Mathematics and dynamics fail us when we contemplate the earth, fitted for life but lifeless, and try to imagine the commencement of life upon it. This certainly did not take place by any action of chemistry, or electricity, or crystalline grouping of molecules under the influence of force, or by any possible kind of fortuitous concourse of atoms. We must pause, face to face with the mystery and miracle of creation of living creatures."

is strikingly reminiscent of your statement above (post #4). To exemplify, your statement "wedding chemistry with physics opens the dimensions of physical chemistry", is parlay into what is called the ontic opening argument, which come in many forms.. A kind of verbal wizardry that attempts to sneak in metaphysical concepts into the physicochemical sciences, albeit without any foundational basis.

Votes | 1 of 1 found valuable

— —

Comment **#8** | **Reply 3**

Sadi-Carnot (Libb Thims)
Jul 7 2014, 6:41 AM EDT | Post edited: Jul 7 2014, 7:03 AM EDT

Re: "physical sciences claim that they are exact sciences but they are at best correlation with observations", this again is another ontic opening attempt. The speed of light is exactly 299,792,458 m/s. The mechanical equivalent of heat is exactly 778.26 ft-lbs. One can never get exactly to absolute zero temperature. These are cornerstones of exact science.

Re: "For the present I do not contest the above observation" [that "chemistry and physics do not recognize the word life"]. This is a good starting point. Here, however, is where you will find conflict. The reason that chemistry and physics do not recognize the word life, as Sherrington pointed out in 1938, the logic of which causing Francis Crick to proclaim that we must "abandon the word alive", in 1966, is that the word "life", for 75% of the belief systems of the world (see: religion), including yours (Islam) and mine (Christianity, before age 5), derive from the Egyptian theory that the sun us born each day and dies each night.

The Quran, in short, is a re-write of the Egyptian Book of the Dead; the so-called prophet Abraham and his descendent Mohammed, are mythological anthropomorphizations of the Heliopolis creation myth of father (Ab) – Ra (sun) – born out of earth (Nun) (see: Ab-ra-ham-ic theologies).

Hence, when you go looking to find "life" in the physicochemical sciences, you will run into apparent absurdities, e.g. living molecules (or dead molecules), and incongruous statements, e.g. that "a humanized molecule that has been energized with a certain quantum of free energy", which are classified as perpetual motion of the living kind theories, such as advocated by Islamic chemical engineer DMR Sekhar and his 2010 "self-drive" theory (see: perpetual motion of the living kind).

Votes | 1 of 1 found valuable

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Comment **#9 | Reply 4**

Sadi-Carnot (Libb Thims)
Jul 7 2014, 6:42 AM EDT | Post edited: Jul 7 2014, 7:00 AM EDT

To resolve this paradox, what you need to do is spend some time thinking to yourself exactly where, i.e. at what point, on the molecular evolution table, molecules "became alive", or energized by the quantum of free energy, as you put it.

Once you come to the conclusion that there is no such point, you are directed to the premise that the hydrogen atom is "sort of alive", and once you convince yourself that the hydrogen atom is not "sort of alive", then you will arrive at the conclusion that the notion of life and death must be jettisoned, as Francis Crick concluded, following rounds of vitalism/anti-vitalism debate in the 1960s.

Re: "That [you can either side with the Quran or Physical Chemistry, but not both] would be myopic in approach since Quran, Islam and for that matter any religion is a way of life. All religions including Islam, Christianity, Hinduism, and Buddhism have laid down guiding principles on living a civilized life", we concur on this point: each religion has indeed laid down "guiding principles" for each respective civilization. These guiding principles, however, were laid down not by the hand of god, but by wise men of past centuries.

As times (centuries) change, however, so to do the bases behind these guiding principles, e.g. slavery was once deemed moral now it is immoral. This led Goethe to conclude in 1809 that "conventional moral norms can turn into sheer immorality when applied to situations of [certain] character" and that we must turn to "moral symbols in the natural sciences", i.e. the affinities and or free energies of physical chemistry, to find our new "guiding principles" for the future religion, in order to foundationally answer puzzling legal issues, such as "should the woman who kills her newly born child suffer the death penalty?" (Goethe's thesis 55) (see: student reactions).

Votes | 1 of 1 found valuable

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Comment **#10 | Reply 5**

Sadi-Carnot (Libb Thims)
Jul 7 2014, 6:42 AM EDT

The true "prophet" now, is not the fictional character of someone named "Muhammad", descendent from the Egyptian aggregate god Abraham, but the prophets of the physicochemical sciences, who are able to use the "prediction" methods of physical chemistry, to better foresee and laydown new "guiding principles" for each respective future civilization. This subject will, in the future, be known as the physicochemical based humanities religion. While certainly this will not be seen solidified for many centuries to come, at the very least, if we can convince you to recant at least some of your hold on the teachings of the Quran, at least we can make some small bit of agreeable progress, for the moment.

Re: "Physical sciences and the observations in Scriptures therefore do not appear to me as being in conflict", one could write a whole multi-volume book on the conflicts between scriptures and the physical sciences. To cite one dominate example, in regards to the formation of humans, the Quran states (38:71-72) (37:11) (23:12-15) that humans were created as follows:

> "I [Allah] created a human being out of clay. I formed him, from sticky clay, and breathed my spirit into him."

Baring prolonged dissent into absurdities and digressions on mythology, a human is not formed from the elements of clay {Al, Si, O} but rather of the elements {C, H, N, O, P, S + P, Ca, K, Na, Cl, Mg, Fe, F, Zn, Si, Cu, B, Cr, Mn, Ni, Se, Sn, I, Mo, Co, V). Here we see a conflict: there is no aluminum Al in a human? (see: human molecular formula) [see: disproof #1 of the existence of god].

Votes | 1 of 1 found valuable

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Comment **#11 | Re: Reply 6**

Sadi-Carnot (Libb Thims)
Jul 7 2014, 6:43 AM EDT

The issue here is that the Quran employs the so-called clay creation theory [see: clay creation myth] to explain human formation and animation. The modern physicochemical sciences, however, now employ free energy of formation [see: human free energy of formation] logic to explain human synthesis, in which there is no such thing as "spirit" involved. We all notice, e.g., how in your 1983 article "Physico-Chemical Processes and Human Behaviour Part—IV: Muslim Society, its Formation & Decline", cited above, you attempt to grapple with the so-called "spirit issue", via equation 12(a), but that in your finalized book, you leave this "conflicting" issue on the drawing room floor, mentioning spirit only in regards to how Newton, and the chemists of his day used to refer to gases as the "spirits" of reaction. You may very well continue to retain, i.e. remain, in your apparent denial that there is not conflict, but you will lose face, i.e. lose my respect to a certain amount. Again, either we can be brothers in our belief in the exactness of the physicochemical methods as they apply to the test tube as well as to society [see: social test tube], or we can be at odds? I should hope you side with reality, i.e. the methods of the physicochemical sciences, as Goethe did some 200-years ago [see: Goethe timeline]?

1 out of 1found this valuable.

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Comment **#12 | RE: Reply 7**

Sadi-Carnot (Libb Thims)
Jul 7 2014, 6:52 AM EDT | Post edited: Jul 7 2014, 7:05 AM EDT

Re: "The present attempt at opening new dimensions in Sociology by a physico-chemical approach aims to understand human behaviour by interpreting actions and interactions of the humanized (energized) human molecule under different circumstances, stress situations for example", this is all good, but again you will need to come to grips with your underlying conflicts, which are numerous at this point. Goethe's moral symbols should help guide you. Either you can believe that physicochemical sciences, which teaches that life is something not recognized by physics and chemistry, that energy is conserved, and chemical reactions stop when the entropy reaches a maximum, or you can believe in the Quran, which teaches that life exists, that humans have free will, that each individual choice determines the weight of one's soul, and that the soul is immortal, but you cannot believe in both.

If its reconciliation you are after, you can believe that choices are determined by fermion-boson interaction, that energy is conserved, or the energy measure of a force-distance conjugate variable pair behind a determined choice is conserved, that there are natural and unnatural processes in the universe, as thermodynamics sees things, and that these natural and unnatural processes are coupled, and that this coupling would seem to have something to do with the spins and dynamics of the universe, but that is about as much reconciliation you will be able to salvage, as far as I see things presently: forces determine a choice, but atoms and molecules don't have souls nor spirits, and are neither alive nor dead.

I'm still ruminating on your name change?

Also, please try to remember to sign in before posting, so that we know who is posting, without you having to sign your name each time.

1 out of 1found this valuable

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Comment **#13 | RE:**
"**living molecule**"

Sadi-Carnot (Libb Thims)
Jul 7 2014, 7:32 AM EDT
I just found this Spanish article, citing my 2002 calculations of the human molecular formula, with an image of the hand of god reaching down and touching a molecules, i.e. giving life to it:

Fórmula química del ser humano

By Triplenlace on 4 - septiembre - 2013 · No Comment

La **fórmula empírica** de un compuesto químico es una expresión que contiene los símbolos de los elementos químicos que forman el compuesto y, al lado de cada uno de ellos, como subíndices, cantidades que indican la *proporción* molecular o molar en que se hallan estos elementos en el compuesto. Por ejemplo, la *formula empírica* del **butano** es C_2H_5, lo que quiere decir que cada molécula de butano contiene dos átomos de **carbono** *por cada* cinco de **oxígeno**.

Por su lado, la **fórmula molecular**, además de las proporciones, indica exactamente *el número de átomos contenidos en cada molécula*. Así, la *fórmula molecular* del butano es C_4H_{10}, lo que quiere decir que cada molécula de butano contiene exactamente cuatro átomos de carbono y diez de hidrógeno. La fórmula molecular es un múltiplo de la empírica.

The 2013 *Triple Bond Chemistry* article, entitled "The Chemical Formula of a Human" (Ñº), which cited the Sterner-Elser molecular formula (2000) and the Thims molecular formula (2002), shown with some type of protein-like molecule amid the Michelangelo's painting of god creating Adam.

http://triplenlace.com/2013/09/04/la-formula-quimica-del-ser-humano/

which may help shed light on the issues of conflict I'm getting at, i.e. either Allah reached down and gave life to a molecule, such as DNA or a human, or a molecule is animated in its daily reactions and movements, as the physicochemical sciences describe such movement, via the SI units and formulas of thermodynamics (no God involved).

1 out of 1found this valuable

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Comment **#14 | Reply 1: Three choices**

MirzaArshadAliBeg (Mirza Beg)
Jul 7 2014, 9:54 PM EDT

"Re: “Post #4”, that is some funny stuff! Before replying, I would just like to say that at this point you have three options, either: (a) hold to your religious convictions (words of the Quran), and go down in history as Ernst Mach did (1897) as someone who would not recant and admit to the existence of atoms, (b) recant, as Wilhelm Ostwald did (1809), and side with physical science (words of Clausius and Gibbs, whom you cite), or (c) leave your final say in regards to your beliefs in riddled form, such as Maxwell did in his last poem "A Paradoxical Ode". See following timeline for Mach/Ostwald recant comparison: here. In your case, by comparison, you will have to recant your religious faith and teachings, if you want your theory to increase in value in the generations to come. Compare how William Thomson held to religious teachings in the face of physico-chemical science and evolution theory, and how his sun age calculations fell into ill repute in his later years, in spite of his early genius years."

Before commenting on the three choices offered to me, I would like you all to have a quick glance of my paper: Emergence of Life Forms --- in the site:

https:academia.edu/7460187

Beg's 2014 "Emergence of Life Forms in Thermodynamic & Islam" (Ñº) article, wherein he attempts to explain life in terms of Allah-based thermodynamics.

There I have clearly stated, "Ecologists and ecological anthropologists may not agree with most of the above analyses in terms of Quranic interpretations of ecological anthropology and physical laws (including those of thermodynamics). This may, however, be considered as useful attempt at some basic understanding of the physical constraints on ecological processes and their governance by the Eternal Laws which have been rediscovered in the last three centuries. I am only trying to draw parallels between the principles of physics and chemistry and what has been stated in the Glorious Quran.

1 out of 1found this valuable

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Comment **#15 | Reply 1: Three choices**

MirzaArshadAliBeg (Mirza Beg)
Jul 7 2014, 10:43 PM EDT

Papers on "Creation of Universe was Designed", and "Interpretation of Nature & Environmental Degradation in Islam & Science, led me to suggest that the commonality of observable facts is observed at all hierarchies of the universe starting from the most minute in the cellular constituents of the smallest creatures to the widespread distribution of stellar bodies in the celestial environment or the ecosystem of the universe. This is upheld by the Quranic verse 6:59 states that everything seen and unseen, is ordered and regulated through the governance system of Allah by His Eternal laws. The simplest as well as the most difficult things in nature are subsisted to His laws that have been clearly stated in the Holy Quran and were rediscovered much later in 19th century. The fresh and the withered, living and lifeless are none of them outside the Plan of His Creation. The statement "Rediscovery" may hurt some scientists but that is plain truth. To my limited knowledge principles stated in the Glorius Quran are the most comprehensive. The approach can be restated as: Religio-Physico-Chemical Sociology or Religio-Physico-Chemical Dimension of Sociology. Remember: The whole world has not gone secular yet.

1 out of 1found this valuable

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Comment **#16 | Reply 1: Three choices**

MirzaArshadAliBeg (Mirza Beg)
Jul 7 2014, 11:24 PM EDT

> "Re: Either you can believe that physicochemical sciences, which teaches that life is something not recognized by physics and chemistry, that energy is conserved, and chemical reactions stop when the entropy reaches a maximum, or you can believe in the Quran, which teaches that life exists, that humans have free will, that each individual choice determines the weight of one's soul, and that the soul is immortal."

Personally I do not find anything wrong in believing both in physico-chemical sciences, which teach that life processes

are governed at the cellular/pico-environment level, that energy is conserved, and chemical reactions as well as social interactions stop when the entropy reaches a maximum, and (not or) still believing in the Quran or other scriptures, which teach that life processes operate according to available free energy, that humans have restraints on free will, and that the soul is immortal.

0 out of 1found this valuable

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Comment **#17 | RE: Response 1**

Sadi-Carnot (Libb Thims)
Jul 8 2014, 3:28 AM EDT | Post edited: Jul 8 2014, 3:31 AM EDT

Re: "Emergence of Life Forms in Thermodynamics and Islam", what year did you write this? Please date all of these Academia.edu uploads.

In any event, I began skimming this new article. All I can say at this point is that your 1987 book, repetitive digressions about Muhammad aside, was very impressive! With these newer 2014, publications, however, you seem to be going down a very slippery slope to metaphysical land, wherein you seem to have lost track of measureable objective reality? The only way I can categorize this is that when you started making your physicochemical terms "notes" turned finalized book, you were 42-55 age range, the so-called "skepticism" range, according to Goethe's stages of existence classification, whereas now at age 82 you are into the mysticism stage [see: stages of existence].

There is so much error in your new thermodynamic emergence paper, that it is difficult to see where to begin. The biggest error, naturally enough, is your belief in the existence of god. Presently, only 5% of leading US scientists believe in the existence of god.

A number which mirrors much of the scientific belief among leading world universities. Hence, when you write about how "Allah did this", and Allah created that", you are wasting your time. Laplace declared the "hypothesis of god" superfluous and unneeded over 200-years ago [see: Napoleon Laplace anecdote].

Hence, you in your 2014 writings, are basing your work on a defunct scientific hypothesis. While I understand that in Pakistan, 98% of the populous is Islamic, and there are "social pressures" against claiming no religious belief:

http://en.wikipedia.org/wiki/Religion_in_Pakistan

1 out of 1found this valuable

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Comment **#18 | RE: Response 2**

Sadi-Carnot (Libb Thims)
Jul 8 2014, 3:29 AM EDT

Here, however, we are speaking scientist-to-scientist, and the power I believe in is that defined by thermodynamics, in which there is no god involved. In any event, in reference to the following quote, from said paper:

> "The living body was energized [by Allah] with a soul consisting of free energy and entropy. The soul acts as the driving force for all forward reactions and interactions, while entropy retards the forward reactions."

Where, on the following timeline, i.e. at what point in time (years ago), did Allah give "life" to bodies [see: evolution timeline]. Also, did Allah energize the first body with "life" and insert it with a "soul" on the same day, or did this soul-insertion come later?

1 out of 1found this valuable

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Comment **#19** | **RE: Response 3**

Sadi-Carnot (Libb Thims)
Jul 8 2014, 3:49 AM EDT

Re: "interpreting Quranic passages in terms of thermodynamics", you should spend some time studying Mehdi Bazargan's 1956 work [see: *Thermodynamics of Humans*]. Or if you can read Farsi:

http://www.humanthermodynamics.com/Thermodynamics_of_Human_Beings__Persian_.pdf

You can see that he goes about the situation in a much better way, relegating Quranic passage discussion to footnotes.

1 out of 1found this valuable

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Comment **#20** | **Reply 2**

MirzaArshadAliBeg (Mirza Beg)
Jul 8 2014, 6:37 AM EDT

> "Re: "Mathematics and dynamics fail us when we contemplate the earth, fitted for life but lifeless, and try to imagine the commencement of life upon it. This certainly did not take place by any action of chemistry, or electricity, or crystalline grouping of molecules under the influence of force, or by any possible kind of fortuitous concourse of atoms. We must pause, face to face with the mystery and miracle of creation of living creatures."
>
> is strikingly reminiscent of your statement above (post #4). To exemplify, your statement "wedding chemistry with physics opens the dimensions of physical chemistry", is parlay into what is called the ontic opening argument, which come in many forms. A kind of verbal wizardry that attempts to sneak in metaphysical concepts into the physicochemical sciences, albeit without any foundational basis."

Life forms emerged on planet earth when the ideal environmental conditions to sustain life processes were achieved. The Glorious Quran has at verse 2:117, as well as at several other occasions stated that Creation of man follows a series of processes. It is stated that life form was created out of clay or earthy matter. This implies that clay was used as the medium for personifying the quantum of energy that was destined to form the body of a certain creature in the shape of a man.
The embodiment of the quantum of energy i.e. the earthly body and its energizing with the soul that constitutes the driving force or free energy (Delta) F is what constitutes the living being, while granting the soul a number of (not infinite) degrees of freedom makes a man, the unique creation of Allah.
It has been suggested that the basic logic of life, information storage, and replication began with crystals, long before nucleic acids and proteins ever came on the scene. Accordingly it would be something that could induce replication of information.

More...

0 out of 1found this valuable

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Comment **#21** | **Reply 4**

MirzaArshadAliBeg (Mirza Beg)
Jul 8 2014, 8:15 AM EDT

> "Re: To resolve this paradox, what you need to do is spend some time thinking to yourself exactly where, i.e. at what point, on the molecular evolution table, molecules "became alive", or energized by the quantum of free energy, as you put it"

Life forms emerged on planet earth when the ideal environmental conditions to sustain life processes were achieved. The Glorious Quran has at verse 2:117, as well as at several other occasions stated that Creation of man follows a series of processes. It is stated that life form was created out of clay or earthy matter. This implies that clay was used as the medium for personifying the quantum of energy that was destined to form the body of a certain creature in the shape of a man. The embodiment of the quantum of energy i.e. the earthly body and its energizing with the soul that constitutes the driving force or free energy is what constitutes the living being, while granting the soul a number of (not infinite) degrees of freedom makes a man, the unique creation of Allah. The soul has to undergo numerous stages of personification and embodiment of quantized energy.

More... Information Storage & Replication

0 out of 1found this valuable

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Comment **#22 | RE: Year?**

Sadi-Carnot (Libb Thims)
Jul 8 2014, 3:32 PM EDT | Post edited: Jul 8 2014, 3:46 PM EDT

I will ask again: “in what YEAR did this [first life] formation occur?”

To give you a comparable example, in 2011, I asked this same question to Russian physical chemist Georgi Gladyshev, who is about the same age as you (age 78), i.e. four years younger, and who since the 1970s has been working on a "thermodynamic theory of the evolution of living beings", explained like you in terms of free energy theory, albeit unlike you (as Russia is largely atheist), his theory is god-free, but alas after 91-thread posts:

http://www.eoht.info/thread/4456714/defunct+theory+of+life

he retreated in defeat never to return to Hmolpedia public debate threads again? Now he just gripes about this in external publications:

> “At this juncture, I would like to express my opinion about many new big publications of Libb. I do not want to have any relation to the manifestly absurd notions about ‘non-existent theory of life’ and the widespread use of the term ‘molecule’.”
>
> — Georgi Gladyshev (2013), “Life as a Phenomenon”

http://endeav.net/news/23-life.html

Hopefully, you will not retreat away from debate like Gladyshev? In any event, if you cannot, in your mind, pick a specific year in which Allah came down from his heavens and started the “first life” form, then you may be grappling with the so-called no origin of life theory [see: no origin theory of life]. If this is so, then say so?

1 out of 1found this valuable

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Comment **#23 | Reply 1**

MirzaArshadAliBeg (Mirza Beg)
Jul 8 2014, 3:57 PM EDT

"Re: “Post #4”, that is some funny stuff! If you want your theory to increase in value in the generations to

come!"

The theory will take firm roots if the ground reality i.e. religion is regarded as absurdity instead of a way of life, and life itself as a disregarded entity. The theory has already opened new dimensions in Sociology, Environmental Sociology, Environmental Psychology and Religio-Physico-Chemical Sociology, proposed during the present discussion.

0 out of 1found this valuable

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Comment **#24** | **Re: Reply 1**

Sadi-Carnot (Libb Thims)
Jul 8 2014, 5:10 PM EDT

Re: "The theory has already opened new dimensions in sociology", in whose work? As far as I am aware, no physical scientist or sociologist in the last three decades has picked up on your work, until I discovered it on 13 May 2014. You need to come down to reality here? Compare the way South African chemical physicist Adriaan de Lange, in his 1982 theories, mixes free energy and spirituality, applied socially. But how now nobody cites his work:

http://scholar.google.com/scholar?hl=en&q=Adriaan+de+Lange&btnG=&as_sdt=1%2C14&as_sdtp=

and he now has to hide off in South Africa, no longer publishing in English, but writing in Afrikaans, so that no actual modern scholar will be able to find, let alone critique or attack his work; with German metallurgist Jurgen Mimkes, who in 1992 began to mix in free energy without reference to god, soul, or spirituality, and how now he does get cited a lot, invited to conferences, and so on:

http://scholar.google.com/scholar?q=Jurgen+Mimkes&btnG=&hl=en&as_sdt=0%2C14

This is one of the reasons why you currently are ranked #4 in existive social Newton rankings, while de Lange is #6, and Mimkes is #1, and how Wallace (#2) and Hirata (#3) are now ranked above you.

1 out of 2found this valuable

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Comment **#25** | **Re: Reply 2**

Sadi-Carnot (Libb Thims)
Jul 8 2014, 5:11 PM EDT | Post edited: Jul 8 2014, 5:17 PM EDT

Re: "The theory will take firm roots if the ground reality i.e. religion is regarded as absurdity instead of a way of life, and life itself as a disregarded entity", I'll try to explain further, via example. The moral system of the Quran and the Bible, i.e. that of soul weight, derive their basis of justification on the grounds that certain actions are "wrong", whereas certain actions are "right". These wrongs and rights were first drawn up into a list, called the "negative confessions" (NC), see the 1500BC version below for examples:

http://www.eoht.info/page/Negative+confessions

To go through one example, NC#15: "I have not lain with men", this was considered a sin or wrong action, in 1500BC, that was said to weight the soul down, barring access to heaven, according to soul weight theory:

http://www.eoht.info/page/Soul+weight

This NC#15 was carried over into the 10 commandment, and then into the Quran in a number of places, as an act of sin (e.g. Quran 7:80):

http://wikiislam.net/wiki/Qur%27an,_Hadith_and_Scholars:Homosexuality

Where in chemical thermodynamics does it say that a man cannot sleep and or bond with another man? Certainly, it is thermodynamically feasible for two same sex hydrogen atoms to bind into the hydrogen molecule?

$H + H \rightarrow H_2$

Why should it be a sin, for humans?

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Comment **#26** | **Re: Reply 3**

Sadi-Carnot (Libb Thims)
Jul 8 2014, 5:12 PM EDT | Post edited: Jul 8 2014, 5:21 PM EDT

American child prodigy turned astrophysicist Christopher Hirata, by comparison, addressed this very same problem, albeit without recourse to the Bible or the Quran, instead siding with the morality of physicochemical sciences. For example, see his homework problem #4 (section one), namely: “work out the mathematics of homosexuality in a men-only society through the reaction $2\ Y \leftrightarrow Y_2$, considering limiting cases as was done in this chapter's treatment of heterosexual relations with both men and women present”.

http://www.humanthermodynamics.com/The_Physics_of_Relationships.pdf

You, conversely, side with the Quran, not physical chemistry, and declare homosexuality immoral and a sin, on the baseless logic that because "Allah says so". This is why Hirata is ranked above you in social Newton rankings.

We can go through example after example of this type of discourse, where I show how you are incorrect in your basis of logic. Again, you are going to have to recant your religious faith, if you desire for your theory to absorb into the future, more. I doubt, however, you will be able to do this as you seem to be enraptured by the “Glorious Quran”, as you deem it. Myself, alternatively, am enraptured by the glorious “On the Equilibrium of Heterogeneous Substances” written by Willard Gibbs in 1876. Gibbs is based in reality; the Quran is not.

2 out of 2found this valuable

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Comment **#27** | **Reply 5**

MirzaArshadAliBeg (Mirza Beg)
Jul 8 2014, 5:43 PM EDT

> "Re: Allah created a human being out of clay. I formed him, from sticky clay, and breathed my spirit into him."

Allah has revealed to the Prophet, bpuh, in verse 23:12-14: We did create life (Man) from clay. The verse then describes the process of creation when inorganic matter becomes living matter, and absorption of inorganic constituents of the earth into living matter by way of food and nutrients. Proceeding from here it is possible to suggest that life emerged from the nutrient rich clayey ferment that produced the enzyme. The enzymes are living molecules of proteins and trace elements. For life processes to proceed the enzyme needs to be charged with soul, the driving force that would carry the guidelines/commands of life processes. It had to be a clayey environment since that alone can store information and help orientation of the molecule in space and help chirality. Likewise it had to be some such mechanism that provides the driving force. Irradiation or interaction with a foreign particle as proposed by the geneticists/evolutionists, is not likely to activate life processes. This leaves us with only one alternative that is Allahâ€Ÿs will: kun-fayakun, and soon enough the clayey broth has a clay particle charged with a soul that bears the command for shaping the particle into a living organism. It may be reminded that „amrâ€Ÿ or command is unrelated to time which itself was created along with space by the decree: Be, and it was done. It has been suggested that the basic logic of life, information storage, and replication began with crystals, long before nucleic acids and proteins ever came on the scene. Accordingly it does not have to be DNA, nor anything like DNA, but something that could induce replication of information accurately, for example some

mechanism that energizes the crystallization process to replicate. The crystallization is a one-step process which needs a crystalline particle to nucleate on.

1 out of 1found this valuable

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Comment **#28 | Re: Year?**

MirzaArshadAliBeg (Mirza Beg)
Jul 8 2014, 6:40 PM EDT

> "Re: I will ask again: “in what YEAR did this [first life] formation occur?"

Life forms emerged on planet earth when the ideal environmental conditions to sustain life processes were achieved. The Glorious Quran has at verse 2:117, as well as at several other occasions stated that Creation of man follows a series of processes. Yes, it is stated that life form was created out of clay or earthy matter.

Emergence of life forms must have occurred when the earth had cooled to temperatures when water in liquid form could interact with clay and form some sort of broth. This must have started some time at the onset of first Ice Age. I have given a timeline in respect of the "Six Periods". Please read the paper, do not just skim it. Also go through the Book: Life Processes, Health Aging & Disease, Ecosystem Approach to Life Processes, where I maintain that Life processes are concerned with interaction of and governed by living molecules.

0 out of 1found this valuable

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Comment **#29 | RE: Year, for the third time?**

Sadi-Carnot (Libb Thims)
Jul 8 2014, 7:29 PM EDT | Post edited: Jul 8 2014, 10:04 PM EDT

> Post #27, that was hilarious!

I’m in the process of scanning your entire 1987 book into pdf form (with my hand written comments) so that you can see were your (a) errors are, but also (b) where your good, interesting, and or strong points are. I’m presently on scanned pg. 75, and should have a pdf Online shortly; possibly, I’ll be finished within an hour or three? I will then submit it to the following three or four individuals (Jeff Tuhtan, Gheorghe Savoiu, Jurgen Mimkes, and Ingo Muller) for review. Tuhtan and Savoiu have already requested it; Muller has done social phase diagram work like you, Mimkes is #1 social Newton, Savoiu (and his Romanian cohort physicist Ion Savoiu) is interested in physicochemical migration theories and population demographics, and Tuhtan is a sharp guy, interested in applying thermodynamics to populations of fish (and humans). I hope you will be able to hold under the “pressure”, no analogy intended?

Lastly, to repeat a third time: what year did life begin? Please do not play dumb, by trying to evade the question.

1 out of 1found this valuable

— —

Comment **#30 | RE: Let the games begin!!!**

Sadi-Carnot (Libb Thims)
Jul 8 2014, 10:24 PM EDT | Post edited: Jul 8 2014, 10:31 PM EDT

> At long (40-years) last, there we are Mirza (or Arshrad as you seem to prefer yourself), a pdf

scanned annotated critical review: of your 1987 *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, which I finished reading (and annotating) on 14 Jun 2014 (the scanning process, which I finished about a-half hour ago):

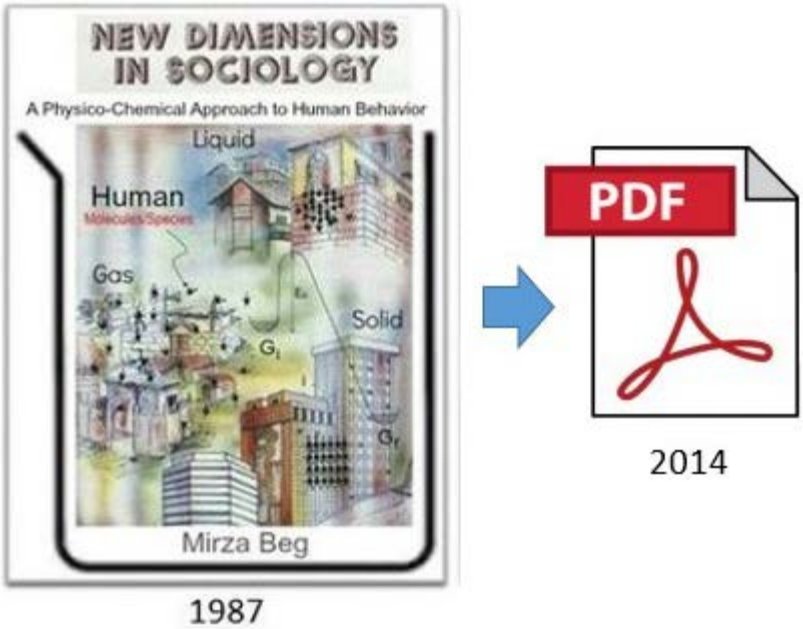

On 8 Jul 2014, during the **Beg-Thims dialogue**, Thims hand scanned Beg's entire *New Dimensions* (see: comments #29-30), into pdf form, complete with Thims' and-written notes and commentary, and uploaded to the Internet for public consumption.

http://www.humanthermodynamics.com/Beg_1987.pdf

All-in-all, religious issues, aside, I will state for the record, that you (in 1987) have penned the best stuff since Goethe. This is no small complement. But, for the record, Goethe penned his great work at the age of 60, and carrying forward his great mind till the end:

> "I have found no confession of faith to which I could ally myself without reservation."
>
> — Johann Goethe (1831), one year before his reaction end

Finished off at the age of 82 with my genuine respect, via completing *Faust* (1832) [see: Faustian], and carrying through his new "affinities philosophy" up until his last days, e.g. see: 20 Aug 1831 [see: Goethe timeline]

I'm telling you, brother-to-brother, you will have to recant, if you want to save face? State your indecision opening. Either except energy, work, and force, all combined as "power" (energy per unit time), defined via physical chemistry, as Goethe did, as I do, or crawl off as a weak minded (albeit once sharp) scientist who fell prey to the victims of old age. And I don't mean this in disrespect, but on the off chance, that you might recant, so that future scholars might look back on you and re-quote, e.g., the way Dirac butted heads with Einstein, about his "God does not play dice" comments:

> "If we are honest — and scientists have to be — we must admit that religion is a jumble of false assertions, with no basis in reality. The very idea of god is a product of the human imagination. It is quite understandable why primitive people, who were so much more exposed to the overpowering forces of nature than we are today, should have personified these forces in fear and trembling. But nowadays, when we understand so many natural processes, we have no need for such solutions. I can't for the life of me see how the postulate of an almighty god helps us in any way. What I do see is that this assumption leads to such unproductive questions as why God allows so much misery and injustice, the exploitation of the poor by the rich and all the other horrors He might have prevented. If religion is still being taught, it is by no means because its ideas still convince us, but simply because some of us want to keep the lower classes quiet. Quiet people are much easier to govern than clamorous and dissatisfied ones. They are also much

> easier to exploit. Religion is a kind of opium that allows a nation to lull itself into wishful dreams and so forget the injustices that are being perpetrated against the people. Hence the close alliance between those two great political forces, the State and the Church. Both need the illusion that a kindly god rewards — in heaven if not on earth — all those who have not risen up against injustice, who have done their duty quietly and uncomplainingly. That is precisely why the honest assertion that god is a mere product of the human imagination is branded as the worst of all mortal sins. Any further assumption implied by belief in a god which one may have in one's faith is inadmissible from the point of view of modern science, and should not be needed in a well-organized society."
>
> — Paul Dirac (1927/1933), commentary to Werner Heisenberg and Wolfgang Pauli on Einstein's "god's dice" comments

If you recant, you will strengthen me; if you hold-fast to Allah, you will but disappoint me, if not weaken me (although this is difficult to foresee).

— —

Comment **#31 | RE: Email update**
Sadi-Carnot (Libb Thims)
Jul 8 2014, 10:47 PM EDT | Post edited: Jul 8 2014, 10:52 PM EDT

Just to keep you in the loop, I just sent four emails out, with the following message:

> "Jeff & Gheorghe, you have both requested a scanned copy of Mirza Beg's 1987 New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior, so here you are, annotations by me (completed on 14 Jun 2014), scanned today:
>
> http://www.humanthermodynamics.com/Beg_1987.pdf

Ingo and Jurgen, Beg has now, at the age of 82, entered into debate and discussion with me, see thread #29 where your names enter the fray:

> http://www.eoht.info/page/Mirza+Beg

I would appreciate if Jeff and Gheorghe would speak their mind as well, either to me, via email, or post directly into the threads."

— —

Comment **#32 | Re: Reply 3**

MirzaArshadAliBeg (Mirza Beg)
Jul 9 2014, 8:35 AM EDT

> "You, conversely, side with the Quran, not physical chemistry. Again, you are going to have to recant your religious faith, if you desire for your theory to absorb into the future, more. I doubt, however, you will be able to do this."

Yes, I will keep siding the Glory of the Quran without fear for going into oblivion, so far as hmolpedia is concerned, but then hmolpedia will also lose faith in not being neutral and being myopic. Yes, I am committed to religion and that is because it has laid down guiding principles for sustainable living. The Principles were enunciated in each religion by a

Noble personality; in Islam it was Prophet Mohammad who demonstrated the validity of the principles in letter and spirit. The Quran states all the Guiding Principles for sustainable living and I do not find them at variance with the Eternal Laws. The Quran, for that matter warns against polarization, polarizability and polarizing forces. I have in my own way attempted to draw parallels among the Eternal Laws and those of Physics and Chemistry. The present discussion prompts me to call this a Religio-Physico-Chemical Sociology approach.

It was in this backdrop that I wrote the Chapter VI of the Book (1987): Polarizing Forces and Mind-Body Split or Munafaqat where I proposed a scale of Munafaquat. Dwelling on the theme of this Chapter, I wrote the Book: Democracy Displaced in Pakistan, A Case History of Disasters of Social Pollution (1998). This prompted me to write another Book, this time on Social Polllution and Global Poor Governance, Analysis of Psyche of the Governing Hierarchy (1999). The Corruption Perception Index developed for each country was adopted as Social Pollution Index.

I request you all to read these Books on Religio-Physico-Chemical Sociology with an open mind.

More: Hydrogen Molecule

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Comment **#33 | RE: Updates / Comments, etc. 1**

Sadi-Carnot (Libb Thims)
Jul 9 2014, 9:03 AM EDT

To update you, I just took a photo of my most-recently read 35-books, your book shown at #31, which you might like to see (adjacent photo; see also: Thims books read)

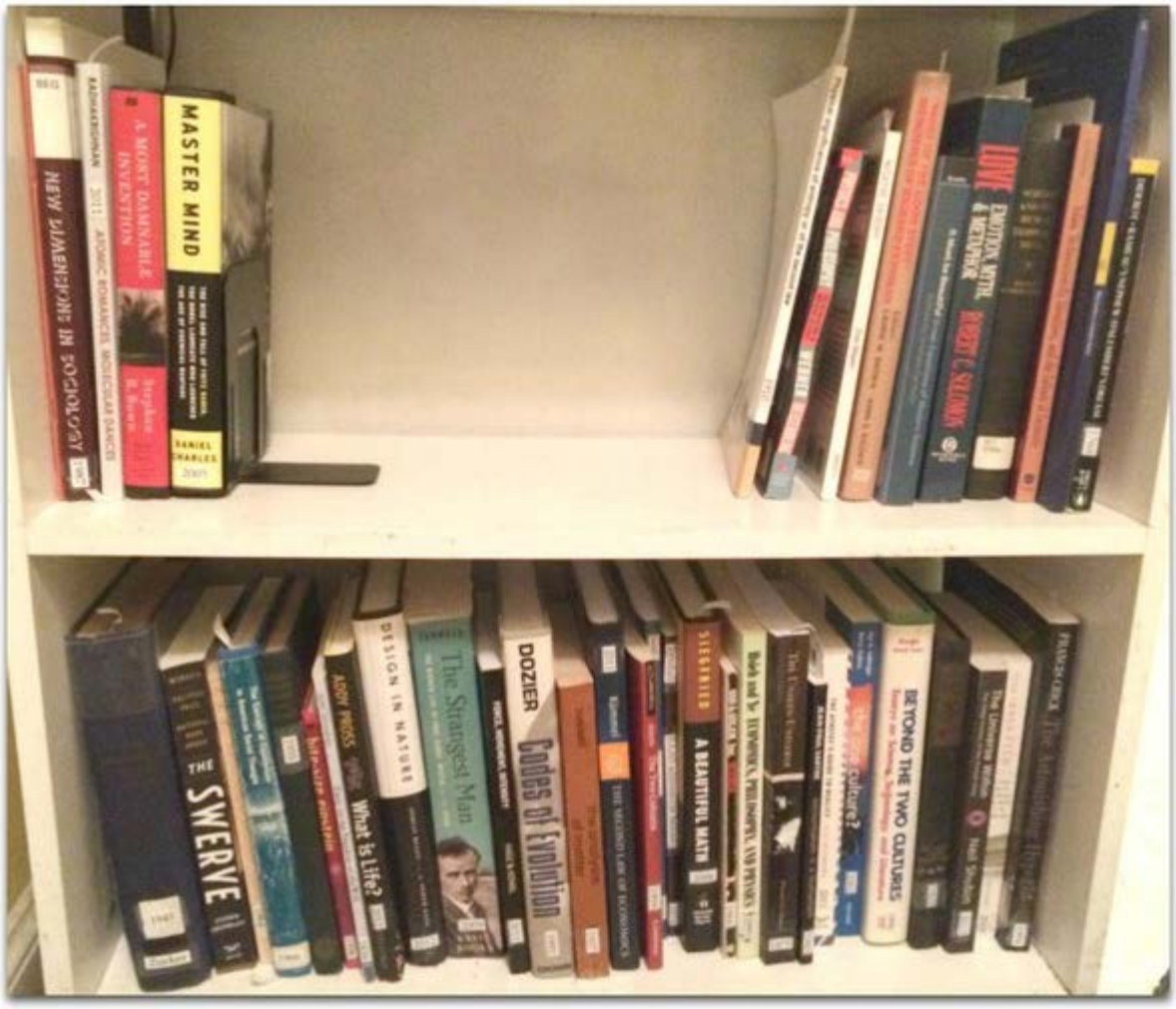

A 9 Jul 2014 photo (Ñº) of Thims books read, Beg's book seen on top shelf, far left.

Re: "All-in-all, religious issues, aside, I will state for the record, that you (in 1987) have penned the best stuff since Goethe", to clarify on this comment, what I mean is that you have penned the best hmolscience work since Goethe. To clarify, you, as far as I am currently aware, are the first (Goethe (1809) aside, and Henderson (1935), verbally, via analogy), to produce HCR theory (human chemical reaction theory). This is no small feat, I will tell you that. One salient feature missing in your theory is that of "human chemical bonding theory" (see: human chemical bond). In other words, in a given bond between two people, such as a man and women in a marriage reaction:

$M + F \rightarrow M{\equiv}F$

There is "free energy" stored inside of the bond (see: bond energy). This was worked out by Fritz Lipmann in 1941. I'll

let this slide, as the problem of trying to work out an actual physicochemical-based neuro-socio mechanism to explain the operation and holding functional aspect of the "M≡F" bond, in terms of the fundamental forces, is very difficult. It took me some years to solve this, i.e. to get a working model going.

1 out of 1found this valuable

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Comment **#34 | RE: Updates / Comments, etc. 2**

Sadi-Carnot (Libb Thims)
Jul 9 2014, 9:03 AM EDT

Secondly, all of your work on social energy / transition state diagrams, 8 in total (pages 166-199), in the history of using energy diagrams to explain social behavior, predates anyone that I am aware of; David Hwang (2000), Adriaan de Lange (2001), and Thomas Wallace (2009), being some that come to mind following you:

Thirdly, your use of fugacity is very impressive! It is one of the more difficult topics in chemical thermodynamics to understand, let alone to apply it socially. No one, among the some 3,300 Hmolpedia articles that I am aware of, nor that I can find via Google Books, i.e. all the world's libraries, has written about fugacity applied socially:

Fourthly, your connection and use of both "affinity" and "free energy" is also impressive. Not many people are able to do this. Categorically, this is called the Goethe-Gibbs connection; only six people, listed in the previous link, have been able to make this connection (one of whom is Jurgen Mimkes, whose email communication I will share with you shortly).

Fifth, all of your migration and immigration theory work is fairly impressive also; the only other person, of the 1,000+ biographies I've written and read about in Hmolpedia, that has done such work, that I am aware of, is John Q. Stewart, who headed the Princeton Department of Social Physics.

These five points, off the top of my head, are your main five strong points.

1 out of 1found this valuable

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Comment **#35 | RE: Updates / Comments, etc. 3**

Sadi-Carnot (Libb Thims)
Jul 9 2014, 9:04 AM EDT

To point out your main "difficulty on theory", referring to point four above, i.e. affinity & free energy, the main issue you have is that the logic of affinity tables conflicts with the theory of the soul, a point which Goethe was well aware of, but one that either you are ignorant of or in denial of? In other words, there is no "choice" involved in affinity tables. The species at the lower rows, in any affinity table, will always be displaced in their bond (with the top row species) by any of the species in rows above them. Newton was also well aware of this, which is why he left the puzzle to his last and final Query 31.

1 out of 1found this valuable

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Comment **#36 | RE: Updates / Comments, etc. 4**

Sadi-Carnot (Libb Thims)
Jul 9 2014, 9:05 AM EDT | Post edited: Jul 9 2014, 9:25 AM EDT

To quote Geoffroy's first law of affinity, derived from Newton's Query 31:

> "Whenever two substances are united that have a disposition to combine and a third is added that has a greater affinity with one of them, these two will unite, and drive out the other."

Hence, sodium will drive out hydrogen in its water molecule bond with oxygen, because sodium has a greater affinity for oxygen, than hydrogen. In your mind, you would like to situate the “free energy” as being inside each chemical species—in the human molecule case you conceptualize it as being “soul” placed there by Allah—but, correctly, free energy is a system property, not situated inside of say: hydrogen, sodium, or oxygen, measureable via system properties: temperature, pressure, volume, etc. We can, to note, as mentioned above (i.e. bond energy) situate free energy, quantitatively, inside of bonds, or assign a free energy measure to a species in a given state, such as Gilbert Lewis pioneered, via free energy tables.

In short, sodium will ALWAYS drive out hydrogen in its bond with oxygen. There is no choice involved. The same applies to human chemical reactions. Subsequently, if there is no choice involved in human chemical reactions, the soul theory is defunct. As this is the sub-structure of your entire philosophy, we see the issue at hand—in other words, your book, recent articles, and over all “affinity/free energy + Quran logic” theory is inherently in conflict. Affinity theory and soul theory do not corroborate. Goethe was well aware of this, whereas you do not seem to be?

1 out of 1found this valuable

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Comment **#37 | RE: Tuhtan, Savoiu, and Mimkes email responses**

Sadi-Carnot (Libb Thims)
Jul 9 2014, 9:06 AM EDT | Post edited: Jul 9 2014, 9:07 AM EDT

Peer review on Beg's *New Dimensions in Sociology*, from American ecohydrolic engineer Jeff Tuhtan, Romanian physical economist Gheorghe Savoiu, and German sociophysicist Jurgen Mumkes.

Re: Tuhtan response, 8 hours ago, Jeff Tuhtan sent me the following email:

> “Thanks for the scan, will have a look! My comment on the ongoing discussion: If your religion can explain Ostwald ripening, I'll be in church on Sunday.”

Re: Savoiu response, 7 hours ago, Gheorghe Savoiu sent me the following email:

> “Thank you ... It must be one of the most amazing and realistic books ... Just give me two weeks or three maybe, please!”

Re: Mimkes response, 1 hour ago Jurgen Mimkes sent me the following email:

> “This is a very interesting paper, which corresponds to the views of my papers:
>
> â— Society as a many-particle System, J. Thermal Anal. 60 (2000), 1055 - 1069
> â— Binary Alloys as a Model for the Multicultural Society, J. Thermal Anal. 43 (1995) 521-537
> â— A thermodynamic formulation of social science in Econophysics & Sociophysics: Trends & Perspectives Bikas K. Chakrabarti, Anirban Chakraborti, Arnab Chatterjee (Eds.) WILEY-

VCH Verlag, Weinheim, Germany (2006) 277 - 308
â— my talk : Chemistry of social bonds (College Park, 2006)

Comment: The article has very many interesting aspects, I see many analogies, but in his article I miss any experimental proof like in physical chemistry."

1 out of 1found this valuable

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Comment **#38 | RE: Ostwald & Sunday church**

Sadi-Carnot (Libb Thims)
Jul 9 2014, 9:12 AM EDT

Re: "If your religion can explain Ostwald ripening, I'll be in church on Sunday."

http://en.wikipedia.org/wiki/Ostwald_ripening

This seems to be a jab at Beg and his religious belief?

In regards to Ostwald and church on Sunday, on a side note, I recently have also found out about Ostwald's famous "Monistic Sunday sermons", which he began giving in circa 1906. Jeff, I'm sure both you and I would have gladly attended these, with zeal!

1 out of 1found this valuable

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Comment **#39 | RE: Hmolpedia and neutrality**

Sadi-Carnot (Libb Thims)
Jul 9 2014, 9:48 AM EDT | Post edited: Jul 9 2014, 10:00 AM EDT

Re: (post #32): "Yes, I will keep siding with the Glory of the Quran without fear for going into oblivion, so far as Hmolpedia is concerned, but then Hmolpedia will also lose faith in not being neutral and being myopic", it is not a matter of being neutral nor myopic, it is matter of experiment disproof.

When Benjamin Thompson did his famous 1798 cannon boring experiment, he disproved caloric theory. We have hence lost faith in caloric theory, and now believe in entropy theory.

When Albert Michelson and Edward Morley did their famous 1887 aether wind measuring experiment:

http://en.wikipedia.org/wiki/Michelson%E2%80%93Morley_experiment

getting negative results, leading Einstein, in 1905, via relativity theory, to disabuse the notion of 'ether', the medium in which electromagnetic waves were thought to be propagating, from physics, the combined result disproved ether theory, and we now believe in electromagnetic theory and relativity.

When Benjamin Libet did his famous 1982 readiness potential experiment (see: Libet experiment) he disproved the theory of free will, we now believe in exchange force theory.

In short, when experimental evidence and logic disproves a theory, one cannot remain "neutral", a scientist must accept measurable fact and experimental findings, and find new theory to corroborate and explain that new evidence, while jettisoning the old theory. One cannot hold hands with both Aristotle (ether) and Einstein (relativity) at the same time. This applies to all theories, even soul theory: One cannot hold hands with Imhotep (soul theory) and Clausius (energy/entropy theory) at the same time.

1 out of 1found this valuable

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Comment **#40 | RE: Redford deconversion model**

Sadi-Carnot (Libb Thims)
Jul 9 2014, 10:31 AM EDT | Post edited: Jul 9 2014, 10:40 AM EDT

Note: I am also aware that "logical argument" alone will not suffice to deconvert someone, such as yourself, from a religious belief system, namely that it requires a weakening of at least four of seven nodal points (Creation, Prayer, Other Muslims, Personal Relationship [with Allah], Morality, Logical Argument, Quran) of one's adherence system, according to the Redford deconversion process model, which takes on average 3-years:

So, while I may very well weaken your mental nodal points on: creation (vs. chemical synthesis), morality vs. (moral symbols of physical chemistry), and logical argument (such as above thread posts), the other nodal points (Prayer, Other Muslims, Personal Relationship, and Quran) will be something you will likely have to deal with on your own, which is something I'm sure you do not desire to do?

Hence, in short, I see we will only be able to get so far, presently, in regards to debate. Maybe in three years you will able to deconvert yourself?

Then again, I am also aware that apostasy in Islam, say as compared to Christianity deconversion, is a serious offense, publishable by death or imprisonment:

http://en.wikipedia.org/wiki/Apostasy_in_Islam

On the bright side, if you do deconvert yourself, and if you subsequently are imprisoned, at least you will find solace in the logical conclusion that you cannot "die", being that "life", according to the deconverted view, is something that does not exist, as Nikola Tesla so famously put it in 1915, or as stated by Charles Sherrington, in 1938, "death is an anthropism", a word "not understood" by physics and chemistry.

2 out of 2found this valuable

Work in progress

The remaining 140+ thread-to-article conversion sections is a work in progress. [1]

Quora | Follow-up

On 4 Aug 2015 into Sep 2015, Beg, via Quora.com, began probing on atheism vs Muslim related questions, asking and commenting on questions such as "Have any atheists actually read the Quran before debating with Muslims?", wherein he seems to refer to Thims as a "know-all" who makes "flimsy arguments". [5]

See also

â— Moriarty-Thims debate

References

1. (a) Dr. Mirza Arshad Ali Beg (message repost) (23 Jun 2014) – Hmolpedia threads | 163 posts | 12 Aug 2014.
(b) Beg-Thims dialogue (12 Aug 2014) – Hmolpedia threads | 26 posts | 12 Sep 2014.
2. (a) Goethe, Johann. (1809). *Elective Affinities: Illustrated, Annotated, and Decoded* (editor: Libb Thims). Publisher, 2013.
(b) Beg, Mirza Arshad Ali. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (intro) (pdf, annotations by Libb Thims, 2014) (individual, pg. 23). Karachi: The Hamdard Foundation.
(c) Thims, Libb. (2007). *Human Chemistry (Volume One).* Morrisville, NC: LuLu.
(d) Thims, Libb. (2007). *Human Chemistry (Volume Two).* Morrisville, NC: LuLu.
3. Thims, Libb. (2014). *Chemical Thermodynamics: with Applications in the Humanities* (85-page version: pdf

of 800-pages estimated total). Publisher, 2016.
4. Atheism Reviews – YouTube.
5. Mirza-Arshad-Ali-Beg – Quora.com.

θΔics

In interviews, **Beg-Thims interview** refers to the Sun 15 Sep to Thu 19 Sep interview of Mirza Beg, in Karachi, Pakistan, by Libb Thims, on his 1987 *New Dimensions in Sociology: a Physicochemical Approach to Human Behavior*, on the origin and subject matter of physicochemical sociology, as Beg developed it from the 1974 idea and notes stage to 1987 book level. [1]

An Apr 2019 poster advertisement for the **Beg-Thims interview**, showing Beg's 1987 *New Dimensions in Sociology* (right), Thims' draft-stage *Human Chemical Thermodynamics* (right), and a human chemical reaction mechanism for the monumental meeting (center) between human molecules Mirza Beg (B_M) and Libb Thims (T_L), where the question mark signifies the product formation, actuating during the 5-day meeting. [2]

Video editing | Note

Of note, all video parts, the total video being recorded on a Sony video camera that automatically broke up the total recording segment into 30-min (max) video clips, were combined and edited up to Day 2.3, during which point a new video editing software update was made (video editing being done on Adobe Premiere Elements 11) to Adobe Premier Elements 2020, after which the audio became out of sync with the video by a noticeably-irritating amount. Thims tried several new video editing software, but could not remedy the problem.

Hence, after several months delay, on 24 to 27 Mar 2020, Thims simply began doing a bulk upload of all remaining video clips, NO editing. The total video series, available on the Human Chemistry 101 YouTube channel, consists of 47 videos (see: Beg playlist), totaling 21-hours (1,267-min) of total viewing time.

Day initial | Sun | 15 Sep

Thims arrived in Karachi, Pakistan on Sun 15 Sep 2019 and met with Beg and his family for an afternoon meet-and-greet, equipment set up and check, and discussion of itinerary, lecture timeline, and topic focus. The 4-day interview, following Sun, Sep 15 (Day 0), was as follows: Mon, Sep 16 (Day 1), Tue, Sep 17 (Day 2), Wed, Sep 18 (Day 3), Thur, Sep 19 (Day 4).

Quotes | Day 0

The following are quotes from the meet-and-greet day (Sep 15):

> "Libb you are my amanuensis."
>
> — Mirza Beg (2019), "Beg interview 1.0" (meet-and-greet day); Sep 15

> "You see, de Lange believes what he wants to believe, namely that Gibbs energy as governor of social reactions is the 'spiritual component' of the energy of the father of Jesus, I believe what I believe, namely that Gibbs energy applied socially is the 'will of Allah', and you [Thims] believe whatever you want to believe, namely that you do not believe in god and that Gibbs energy applied socially is just a 'natural physico-chemical energy', yet all three of us have, in common, a belief in thermodynamics."
>
> — Mirza Beg (2019), "Beg interview" (meet and greet day); comment arisen following Thims explanation of the "beliefs" of Social Newtons existive (possibly a reflection of Beg, following a reading of "religion as a function of birthplace" article, Thims had sent Beg a few days earlier, in respect to the stance Thims would adhere to in respect

to religions dialogue digressions), Sep 15

Quotes | Day 1

The following are quotes from Day One (Sep 16)

> "This book was not accepted. Nobody accepted the book. One fellow, who is in Washington, at the Islamic Institute, he said, in his review, that sociology has been treated by zoologists, in terms of insects, animals, and animal behavior. Now here is a scientist. He says that he can interpret human behavior in terms of molecules? Thank you Dr. Beg, for introducing molecules into sociology. Thank you [joking]! I hope success to you. Nobody encouraged me, until you [Thims] did."
>
> — Mirza Beg (2019), "Interview Day 1.1" (53:40-54:59); comment made when looking at 1987 book launching photo; response likely a reference to E.O. Wilson's 1975 *Sociobiology: the New Synthesis* (compare: Marcin Borkowski 2010 comment), Sep 16

> "I irritated the social scientists, just like Stewart did at Princeton in the 1950s. They don't like me. But after that book [*New Dimensions*, 1987], and then after writing about social pollution, they started recognizing that there IS room for a 'scientist' in the 'social sciences' department."
>
> — Mirza Beg (2019), "Interview Day 1.3" (5:22-6:00), Sep 16

> "A terrorist is an 'impurity' in the social lattice that lowers the melting point of society."
>
> — Mirza Beg (2019), Interview Day 1.3 (31:11-)

Quotes | Day 2

The following are quotes from Day Two (Sep 17):

> "The DNA initiates 'life' and life is not possible unless there is chirality."
>
> — Mirza Beg (2019), "Interview Day 2.2" (Ñº) (2:44-), Sep 17

Photo during the first day meet and greet session, between Thims and Beg, Beg shown holding a copy of Hmolpedia, Volume One (A-B), with the Mirza Beg article, which Thims brought as a gift for Beg.

Quotes | Day 3

The following are quotes from Day Three (Sep 18):

> "Enthalpy is the 'resources' and entropy is the 'wastage'."
>
> — Mirza Beg (2019), "Beg-Thims Interview", Day 3.10 (2:44-), Sep 18

Quotes | Day 4

The following are quotes from Day Four (Sep 19):

"Free energy change is brought about by soul. Soul is the driving force. Soul is the free energy."

— Mirza Beg (2019), "Beg-Thims interview" (26:30-57), Day 4.1, Sep 19

"It appears that you have the whole world in your hand."

— Mirza Beg (2019), "Beg-Thims interview", Day 4.2 (2:47-), Sep 19

"Love is chemical affinity."

— Mirza Beg (2019), "Beg-Thims interview", Day 4.3 (13:46-), Sep 19

"Dead molecules equal entropy. Living molecules equal infinite energy plus entropy."

— Mirza Beg (2019), "Beg-Thims interview", Day 4.11 (7:20-), Sep 19

"Along with man, along with life, and along with every living creature, also was created Devil!"

— Mirza Beg (2019), "Beg-Thims interview", Day 4.11 (10:52-), Sep 19

"Oh, I don't believe in devil."

— Libb Thims (2019), "Beg-Thims interview", Day 4.11 (11:01-), Sep 19

"You may not believe it, but that's your problem! You may not believe in the devil, you may not believe in Allah, but that's your problem."

— Mirza Beg (2019), "Beg-Thims interview", Day 4.11 (11:07-), Sep 19

Quotes | On

The following are quotes on the Beg-Thims interview:

"Love it, great work! This will be remembered for generations."

— Josh Melnick (2020), "Comment on Day 1.3", Human Chemistry 101 (Ñº)

See also

â— Mimkes interview (playlist) (2016)

References

1. Beg, Mirza Arshad Ali. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (intro) (pdf, annotations by Libb Thims, 2014) (pg. vi). Karachi: The Hamdard Foundation.
2. Beg Interview Announcement (Apr 2019) – Hmolpedia Reddit.

External links

â— Beg playlist – Human Chemistry 101.

θΔics

In science, **behavior** refers to the way in which something functions or operates; or conducts itself in a manner involving action and response to stimuli. [1]

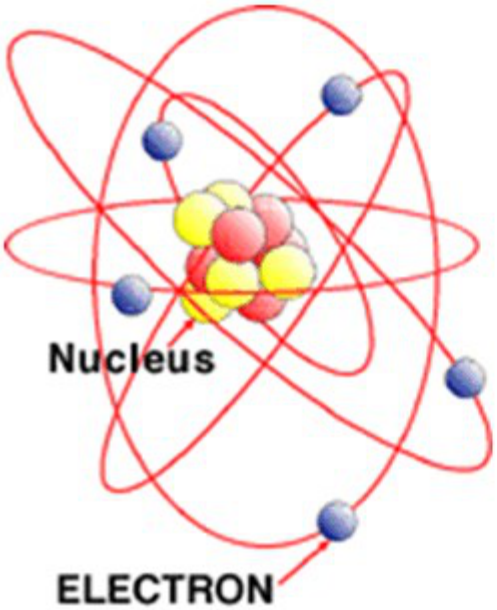

Hmolscience

In 1925, American physical chemist Gilbert Lewis, in his "Anatomy of Science" lecture, end chapter: “Life; Body and Mind”, speculated on a future science that in a unified manner would be able to describe the behavior of both an electron and a university faculty member, but doesn't know whether this would be more like mechanics or psychology, quote shown adjacent in full. Further on toward the end of his lecture, Lewis stated the following:

“Perhaps our genius for unity will some time produce a science so broad as to include the **behavior** of a group of electrons and the behavior of a university faculty, but such a possibility seems now so remote that I for one would hesitate to guess whether this wonderful science would be more like mechanics or like a psychology.”
— Gilbert Lewis (1925), *Anatomy of Science*

> “We cannot forget that there are two kinds of **behavior** with which we are already intimately acquainted: on one hand, the behavior of weights and electric charges and chemical reagents; on the other hand, the behavior of man. These require two distinct vocabularies, and most writers who describe animal behavior have adopted the one or the other. We have ‘nature fakers’, who make animals think and act just like men, and there are the others, who regard the swarming of bees as a sort of chemical reaction. I do not know which of these two extremes to regard as the more futile, for both extrapolations go far beyond what is now justifiable. Yet the attempt to bridge the vast gulf is a legitimate aim of science.”

Although Lewis doesn’t cite any one here, two historical examples of such comparison include French meteorologist Antoine Poincare who in his circa 1875 chapter “New Concepts of Matter”, to his book *On Science*, the behavior of a cluster of midges, which are tiny dipteran flies, to a system of gas molecules. [4]

Likewise, earlier German physicist Hermann Helmholtz, in his Carlsruhe winter lectures of 1862-1863, entitled “On the Conservation of Force”, he made the comparison of a system of gas particles to a system of gnats, the former of which were hypothesized to cross one another in rectilinear paths in all directions, until, striking one another or the sides of the vessel, and reflecting in another direction. [4]

In circa 2000, American nuclear-mechanical engineer Philip Ugorowski gave the following supposedly dumbed-down description of the nucleus, to his friend biologist-artist Linda Hensley: [7]

> “Forget the classic image of an atom as a solid ball with a smaller solid ball orbiting around it. Think about the nucleus as a jostling swarm of bees.”

In more detail, Ugorowski explains: [8]

> "I developed [the bee analogy] after reading *The Tao of Physics* [1975], which talks about something similar. Basically it's that the standard model of physics describes forces between particles like protons, neutrons and electrons as arising out of the exchange of virtual particles or photons. This exchange makes the particles "aware" of each other, and the exchange is what actually produces the force. For example, two protons, being both negatively charged, will repel, but how? What is the actual mechanism of the 'electric field'? If you think of them as not solid objects like balls but more as swarms of bees, then you can see how, by exchanging bees, the two swarms would be able to tell (by the rate of exchange of bees) how large the other swarm was, and how close. It is in this exchange that the particles "feel" the presence of the other, and are pulled or pushed toward or away from each other. So-called 'solid' objects are actually more process than substance. Even a single proton is considered to be mostly empty space, with 3 quarks flying around in a tightly defined volume of space."

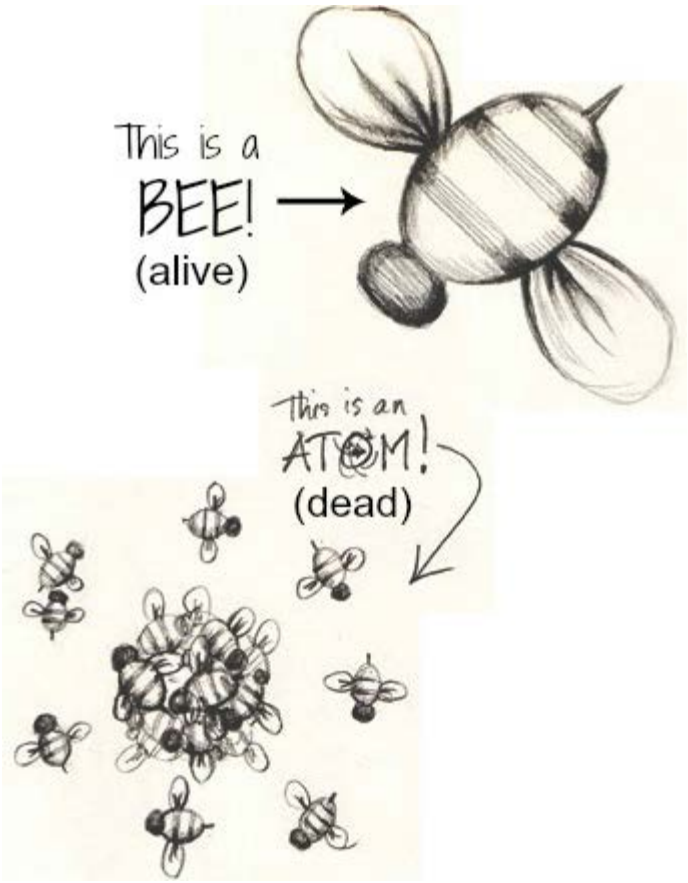

An modified version of American illustrator Linda Hensley's 2010 illustration of American nuclear physicist Philip Ugorowski's description of the "nucleus as a jostling swarm of bees, and I happily absorbed his explanation of the orbiting electrons as more bees, or maybe gnats" to illustrate the apparent (or non-apparent) "dead atom" / "living molecule" (bee) divide, dichotomy, or dualism. [7]

Hensely's artistic recollection of this description, with her addition of orbiting electrons as bees, is shown adjacent.

In 1947, Dutch-born American mathematician, theoretical physicist, economist Tjalling Koopmans stated the following:

> "While it was long possible and sometimes tempting for physicists to deny the usefulness of the molecular hypothesis, we economists have the good luck of being some of the 'molecules' of economic life ourselves, and of having the possibility through human contacts to study the **behavior** of other 'molecules'."

In 1970s, Koopmans began speculating on how entropy applies to the study of these molecules of economic life.

In 1953, American economist Robert Heilbroner stated the following:

> "There is an unbridgeable gap between the **'behavior'** of [subatomic particles] and those of human beings who constitute the objects of study of social science. Aside from pure physical reflexes, human behavior cannot be understood without the concept of volition—the unbridgeable capacity to change our minds up to the very last minute. By way of contrast, the elements of nature 'behave' as they do for reasons of which we know only one thing: the particles of physics do not 'choose' to behave as they do."

In 1989, American philosopher Alan Nelson began circulating a manuscript entitled "Human Molecules", later published in chapter form (1992), wherein "economic agents" are viewed as human molecules, and a followup response chapter, by Bruce Caldwell, criticizing this view; followed by a response chapter by Nelson to Caldwell's criticism.

In 2002, American econophysicist Meng-Hua Ye, in his course description to his St. Mary's College of Maryland Econ

101 “Introduction to Economics” course, described economics as follows: [3]

> “Economics: the study how consumers and producers as economic agents **behave**, how prices are determined, how the performances of an economy is measured by things like growth, unemployment and inflation, and how government policies may affect the performances of the economy.”

Here we see a mixture of the person defined in economics, as either an: "agent", "molecule", or "particle", depending on point of view, whereas correctly, the new standard 21st century textbook definition of a human is that of a "molecule" (see: human molecular formula).

See also

â— Human behavior

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4. (a) Poincare, Antoine. (c.1875). *On Science* (§:New Concepts of Matter, pg. #). Publisher.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (Helmholtz, Poincare, pg. 136). Morrisville, NC: LuLu.
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(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (Helmholtz, Poincare, pg. 136). Morrisville, NC: LuLu.
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7. Hensley, Linda. (2010). “Satellite”, Jun 25.
8. Email communication with Libb Thims (8 Apr 2013).

External links

â— Behavior – Wikipedia.

θΔics

In science, **behaviorism** (Time 100 Ideas:95) (TR:13) is []

Overview

In 1885 to 1897, Ivan Pavlov did work on digestive glands and conditioned response, wherein he showed that by ringing a bell he could get a dog to salivate.

In 1913, John Watson, in his "Psychology as the Behaviorist Views It", asserted that the mind is a blank slate or tabula rasa at birth; the following are example quotes:

> "Psychology as a **behaviorist** views it is a purely objective experimental branch of natural science. Its theoretical goal is … prediction and control."
>
> — John Watson (1913), "Psychology as the Behaviorist Views It" (Ñº)

In 1925, the two psychologists most frequently identified with behaviorist point of view, according to Albert Weiss, were Max Meyer, noted for his use of mechanical analogies, and John Watson, noted for his effort to reduce the soul, mind, and thinking to chemical processes; in a way that supposedly did away with Cartesian dualism.

In 1925, Albert Weiss, in the preface to his *Theoretical Basis of Human Behavior*, after stating that he was in complete agreement on essentials with Meyer and Watson, said the following about behaviorism: [1]

> "Meyer's explanation of human behavior by the aid of mechanical analogies and the theoretical conceptions which he has introduced have received such scant consideration that it is very evident that the modern conceptions of science as are found in mathematics, physics, and chemistry are still far from being second nature to most psychologists, and especially to that large group of writers who claim to be **behaviorists** of varying degree. The criticisms that have been directed against Watson's writings have taught me that the difficulty which confronts anyone who tries to demonstrate that the *complete* explanation of human behavior does not require a 'unique psychic' factor any more than does geology."

In the 1940s, Burrhus Skinner advanced ideas in behaviorism.

Quotes

The following are related quotes:

> "Whether **behaviorism** is regarded as a phase in the development of psychology or biology, there can be no doubt that the methods and principles of the natural sciences as represented by mathematics, chemistry, physics and biology, are displacing the anthropomorphism, intuitionism, which in the past have molded social organization and defined our individual responsibility."
>
> — Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. v)

References

1. Weiss, Albert P. (1925). *A Theoretical Basis of Human Behavior* (pgs. v-viii). R.G. Adams & Co, 1929.

External links

â— Behaviorism – Wikipedia.

θΔics

In religio-mythology, **Beheading of John the Baptist**, aka "Beheading of Yahya" (Islamic), refers the Biblical or Quranic story of the cutting off of the head of John the Baptist, while in prison; which is a re-write of the original Egyptian view of the head of the Anubis constellation (Aquarius constellation) being perceptually "cut-off", above the horizon, on Aug 29 at midnight.

Cut-off Head of Aquarius Constellation Above Horizon

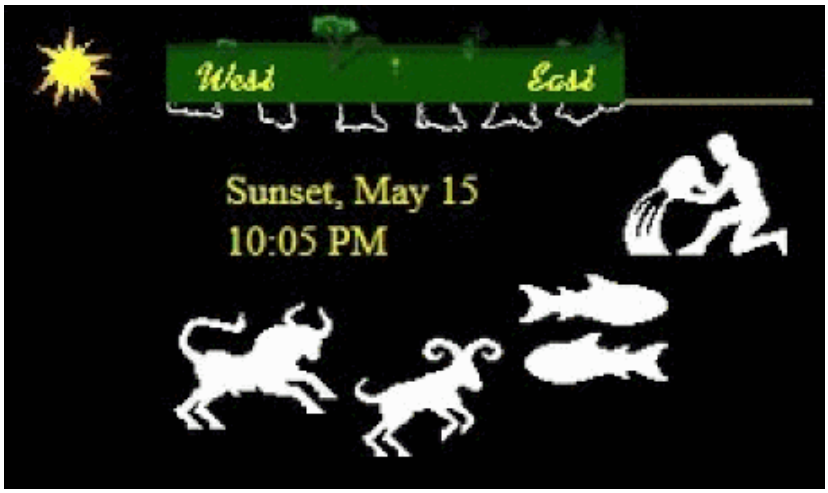

Beheading of John the Baptist

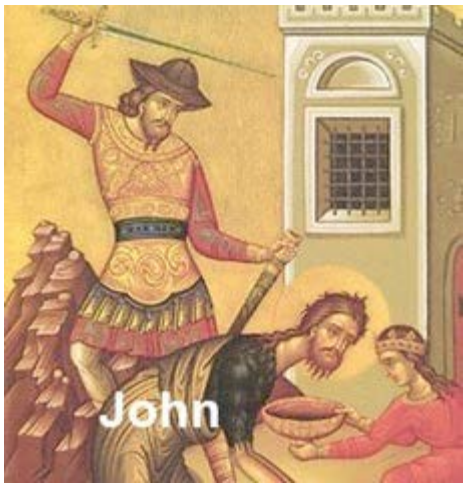

Above left (Q) an animation of the Aquarius constellation, aka the god Anubis as the Egyptians called him, rising above the horizon, which when viewed from Alexandria at midnight on Aug 28 to 29, looks as though he had been beheaded. Above right, in the Christian Bible, Anubis became the character John the Baptist who gets his **head cut off** in prison, after baptizing Jesus.

Egyptian | Astro-theology

On Jun 24, astro-theologically speaking, each year, the Aquarius constellation, aka the "water bringer", rises, for the first time, above the horizon.

In Egyptian mythology, the Aquarius constellation, as the Greeks called it, was associated with the god Anubis, and was thought to be symbolic of the "bringing of the water" of the annual Nile River flood, lasting 150-days (see: Noah's flood), from Jun 25 to Dec 25. [2]

At midnight on Aug 28 to 29, as seen from Alexandria, the head of Aquarius or Anubis appeared to be cut off (as shown in gif image above, left):

> "At midnight on Aug 28 and 29, Aquarius was seen at Alexandria above the southern horizon, travelling along the ecliptic with his head above the equator, **as though it had been cut off** (Matthew 14:10)."
>
> — Herbert Hardwicke (1884), *The Popular Faith Unveiled* (pg. 195) [2]

> “Further Thoughts on John the Baptist earlier article followed Massey [c.1890] in equating John with the Egyptian god Anubis, ... As Aquarius, John decreases from 24 June, getting gradually lower in the sky until 29 August, when **he gets his head cut off**.”
>
> — Anon (1984), “Article”, *The Freethinker* (pg. 15)

In other words, only the head of Anubis (Aquarius or John) was seen above the horizon. Hence, a myth was made to explain this.

Christian myth

In c.150AD, during the Roman recension, polytheistic Egyptian mythology was recast into monotheistic Christian mythology, during the course of which the god Anubis, aka the "water bringer" or "baptist", was recast into the character of the man John the Baptist and the following nonsense story of how he lost his head in prison over the whim request of the daughter of Herodias, because she was danced so good:

> “On Herod’s birthday the daughter of Herodias danced for the guests and pleased Herod so muchthat he promised with an oath to give her whatever she asked.Prompted by her mother, she said, “Give me here on a platter the **head of John the Baptist**.”The king was distressed, but because of his oaths and his dinner guests, he ordered that her request be granted and had John beheaded in the prison. His head was brought in on a platter and given to the girl, who carried it to her mother. John’s disciples came and took his body and buried it. Then they went and told Jesus.”
>
> — Anon (c.150AD), Mathew 14:6-20 (Q), *Bible*

(add)

Islamic myth

In c.700, Muslims believed that the head of John the Baptist, aka “head of Yahya”, existed and various Caliphs were purporting to have possession of it and have it preserved at various shrines; the following is an example synopsis:

> “Abd al-Malik’s (646-705) (Q) successor, Al-Walid (668-715) (Q), had given up his father’s apocalyptic ideas referring to Jerusalem and expanded the sanctuary of **John the Baptist** in Damascus, the Haram, where the head of John the Baptist was preserved, and site which had already been treasured by Mu’awiaya (639-661).”
>
> — Karl-Heinz Ohlig (c.2015), “From Muhammad Jesus to the Prophet of the Arabs” (pgs. 263) [1]

Presently, Muslims believe, according to legend, that the head of John the Baptist (Q) is stored in the Umayyad Mosque (Q) in Damascus, Syria, and is known to Muslims as the “Shrine of Yahya”.

References

1. Ohlig, Karl-Heinz. (c.2015). “From Muhammad Jesus to Prophet of the Arabs: the Personification of the Christological Epithet” (pdf), AlMushlig.com.
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θΔics

In hmolscience, **Behrouz Abedian** (c.1953-) is an Iranian-born American mechanical engineer noted for []

Overview

In 2015, Abedian, in his "Thermophysics of Sport Games", with co-author Rose Solow, worked on formulating a statistical thermodynamics analysis of sports games, players conceptualized as social Maxwellian particles, the abstract of which is as follows: [1]

> "We present a thermodynamic analysis of sport games by introducing intra-game parameters that are assumed to exist under quasi-equilibrium conditions. In this work, the resulting average scoring frequency in sport activities is taken synonymously as the thermodynamic pressure and dependent on an effective player area variable. This player area, in effect, is inverse of the mass density in thermodynamic systems. The analysis provides a basis to properly define other equilibrium parameters for sport games. Based on the presented analysis and retrieval of available data on sports' games, we'll propose an equation of state [see: social ideal gas law] for sport games with physical parameters that should characterize sport activities. The derived equation turns out to be different from other well-known thermodynamic equations of state, yet it is shown to be consistent with the second law of thermodynamics. This work is expected to contribute to the historical, classical discussions on whether people can be treated as social Maxwellian particles [see: human particle]."

(add discussion)

Education

Abedian completed his BS at Tehran Institute of Technology in 1975, his MS in 1977 and PhD in 1980 at MIT, all in mechanical engineering. Presently, Abedian is a professor of mechanical engineering at Tufts University.

References

1. (a) Solow, Rose and Abedian, Behrouz. (2015). "Thermophysics of Sport Games", 15-pg draft, Jun 2.
(b) Abedian, Behrouz. (2015). "Email communication to Libb Thims", Jun 9, 12.

External links

â— Behrouz Abedian (faculty) – Tufts University.

θΔics

In hmolscience, **Behrouz Sadeghi Amroabadi** (1987-), wherein "Sadeghi Amroabadi" is his family name, albeit he goes by "Behruz Sadeghi" on the Internet, but cites with his full name in publications, is an Iranian physico-economist noted for his graduate school work on measures of energy consumption as measures of economic growth and entropy as a new type of cost index measure, the latter being the subject of his 2014 PhD dissertation. [1]

Education

In 2014, Amroabadi was in the last year of his graduate school work in economics, having passed PhD comprehensive examinations in his faculty by Nov, and toward the end of the year was a visiting student in Towson University, USA, during which time he met some the heads of the American school of econophysics, e.g. Russian-born American physicist Victor Yakovenko of the University of Maryland. On Nov 10th, Amroabadi contacted Libb Thims about post-doctoral positions for research related to entropy; Thims suggesting that he might contact the Romanian school of physical socioeconomics, Yakovenko of the American school, as well as John Rutledge. [2]

Bazargan translation project

See main: Bazargan translation project

Sadeghi has stated, to Libb Thims, that he would be willing to do the Farsi-to-English translation of Iranian mechanical engineer Mehdi Bazargan's 1956 *Thermodynamics of Humans*. [3]

Note: Iranian-born American mechanical engineer Fardin Khalili, to note, had previously begun working on the translation, for Libb Thims, stated that he estimated to be done by end of summer 2014.

Note: Iranian-born American atheist Sadegh Simorgh, translator of title (above), associated of Libb Thims, has also suggested interest in translation as well as a third alternative translator.

References

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(b) Amroabadi, Behrouz S. (2014). "Economic Entropy as a New Index of Cost in Economics", University of Isfahan, Iran.
2. Amroabadi, Behrouz S. (2014). "Email communications with to Libb Thims." Nov 10, 18.
3. (a) Bazargan, Mahdi. (1956). *Love and Worship or Thermodynamics of Humans* (Farsi: *Eshq va Parastesh ya Thermodynamic-e Ensan*) (عشق و پرستش ي ا ترموديناميك انسان) (pdf). Tehran: Enteshar Publications.
(b) Amroabadi, Behrouz S. (2014). "Email communications to Libb Thims." Nov 18.

External links

- Behruz Sadeghi – Academia.edu.

θΔics

In terminology, **being** refers to the quality or state of having existence (e.g. human existence). [1] The term *being* is often associated with "conscious existence", life, or the qualities that constitute the essence of a living thing. [2] The term is often found in conjunction with the word human, as in "human being", implying both the anatomical, physiological, and psychological structure, but also whatever may constitute the essence of the individual.

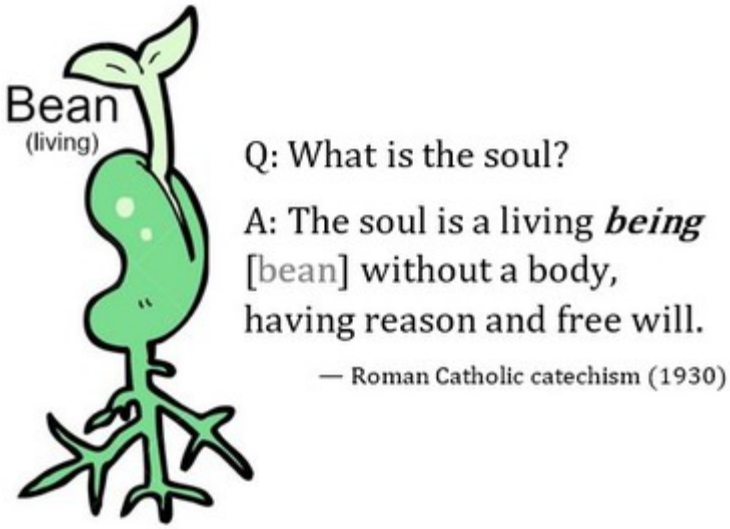

Definition of the soul taught to Odilie Watson (1920-2007), wife of DNA co-discoverer Francis Crick and 1953 illustrator (O) of DNA as it appears in *Nature*, who, as child, the heard term living "**being**" (see: living being) to her mind as "living bean", which she remained puzzled about, but remained silent on, until her later discussions with Crick, her husband of 55-years, who cites the above quote and anecdote in the opening chapter of his 1995 *The Astonishing Hypothesis*. [7]

Shakespeare

English author William Shakespeare's famous "to be or not to be" query seems to well-capture the gist of the modern person's notion of being, in the sense of a term captures or embodies one's theory of existence. The following is the first quarto's version of the speech of William Shakespeare's famous *Hamlet* quote:"To **be** or not to **be**, I there's the point, to die, to sleep, is that all?", which amounts to a frank and straightforward query about the point of existence, and seems to exemplify what most modern people associate with the term "**being**". [4]

Ham. To be, or not to be, I there's the point,
To Die, to sleepe, is that all? I all:
No, to sleepe, to dreame, I mary there it goes,
For in that dreame of death, when wee awake,
And borne before an euerlasting Iudge,
From whence no passenger euer retur'nd,
The vndiscouered country, at whose sight
The happy smile, and the accursed damn'd.
But for this, the ioyfull hope of this,
Whol'd beare the scornes and flattery of the world,
Scorned by the right rich, the rich cursed of the poore?

Russian-born Israeli chemical engineer Alec Groysman comments on this logic thermodynamically in his 2004 article "Aesthetic, Philosophical and Historical aspects in the Physical Chemistry education", where he states: [2]

> "The relationship of probability and entropy (more precisely, the decision about spontaneous occurrence of process) or calculation of Gibbs energy for some chemical reactions, is similar to Hamlet's **'to be or not to be?'** of William Shakespeare."

which seems cogent, being that Gibbs free energy, according to Erwin Schrodinger (*What is Life?*, 1944), is the subject one is supposed to turn to if one is to understand, supposedly, what life is in terms of chemistry and physics.

Teilhard

In a short essay titled 'Action and Activation', French philosopher Pierre Teilhard gives an excellent definition of *life* in relation to being. In particular, *being*, in metaphysics, Teilhard states "can be defined with a precision that is geometric in type"; energy, however, presents itself to the physicist as a magnitude that is still open to all sorts of possible corrections or improvements." In relation to the combined mechanism of activation, being, and energy, Teilhard reasons

that: [3]

> "One of the most distinctive characteristics of living substance in action is undoubtedly the predominate importance assumed in it by the fact of ***being*** (or of not *being*) appropriately *responsive to a stimulus* and *stimulated*."

Here we see Teilhard attempting to frame out the concept of "being" in a pure physical-chemical perspective.

Zerotheism

In 2015, Libb Thims, during the "Zerotheism for Kids" lecture, to note, similar to the Odilie Watson example, illustrated above, had difficulty explaining to the children, aged 6 to 11, what a "being" was, as the term was brought up towards the end of the lecture on the topic death, history of theories of the soul, in relation and the Parmenides vs Heraclitus debate on being continuity vs the existence of the void.

Quotes

The following are representative quotes:

> "**Being** is unbegotten, indestructible, whole, eternally one, immovable and infinite. With it there is no was nor shall be; the whole is forever now, one and continuous."
>
> — Parmenides (c.460BC), *Sources*; cited by: Henry Bray (1910) [6]

> "Belief is half of **being**."
>
> — Robert Getchell (1993), said by etiquette teacher Amanda (Anne Bancroft) to Maggie in *Point of No Return* (Q)

See also

- Animate being
- Becoming
- Being and becoming
- Chemical being
- Human molecule
- Human particle
- Inanimate being
- Living being
- Material being
- Physical being

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4. To be, or not to be – Wikipedia.
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7. Crick, Francis. (1994). *The Astonishing Hypothesis: the Scientific Search for the Soul*. Simon and Schuster.

Further reading

● Alexander of Aphrodisias. (c.175-225). *On Aristotle on Coming to Be and Perishing 2.2-5*. A&C Black, 2014.

θΔics

In existographies, **Bela Lukacs** (1947-) (CR:9) is a Hungarian theoretical physicist and cosmologist noted, in economic thermodynamics, for his 1989 to 1994 digressions on his view that economy in itself can never satisfy the Gibbs-Duhem relations, subsequently an economy in itself can never have a thermodynamic formalism.

Overview

In 1989, Lukacs, in his "Once More about Economic Entropy", build on the 1985 economic thermodynamic theories of Andras Brody, and associates, and in which, according to Australian chemist James Reiss, he equates economic variables to thermodynamic variables. [1]

In 1994, Lukacs, in his lecture "On Economics and Other Utilities", attempted to show that an economy in itself can never satisfy the Gibbs-Duhem relations, subsequently an economy in itself can never have a thermodynamic formalism, but rather only the set economy + ecology, may possibly have such a formalism. [2]

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2. Lukacs, Bela. (1994). "On Economic and Other Utilities", *Proceedings of the Second Autumn School on Reactor Physics*, ERÖFI II (ed. A. Rácz), Lillafred, 7-10 Nov.

External links

â— Bela Lukacs (physicist) (Hungarian → English) – Wikipedia.
â— Bela Lukacs – Articles.

θΔics

In terminology, **belief** is is a state or habit of mind in which trust or confidence is placed; a conviction of the truth of some statement or the reality of some thing or phenomenon, especially when based on examination of evidence. [1]

Quotes

The following are related quotes:

> "I'm willing to **believe** that we are flotsam and jetsam."
>
> — Jim Peebles (c.1991), response to query about the Steven Weinberg pointless universe model [2]

> "The belief state of an obscure lump of molecules wandering around a remote corner of England is of no importance whatsoever epistemologically speaking."
>
> — Barry Barnes (1998), response to David Mermin whether he "might perhaps be into astrology" [3]

> "A **belief** is a lever that, once pulled, moves almost everything else in a person's life. Are you a scientist? A liberal? A racist? These are merely species of belief in action. Your beliefs define your vision of the world; they dictate your behavior; they determine your emotional responses to other human beings."
>
> — Sam Harris (2004), *The End of Faith* (pg. 12)

See also

- Belief fixation (see: walking encyclopedia)
- Belief system
- Belief system (children)

References

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(c) Mermin, N. David. (2001). "Conversing Seriously with Sociologists" (pg. 94), in: *The One Culture? A Conversation about Science* (editors: Jay Labinger and Harry Collins) (§7:83-98). University of Chicago Press.
(d) David Mermin – Wikipedia.

Further reading

- Girotto, Vittorio, Pievani, Telmo, and Vallortigara, Giorgio. (2014). "Supernatural Beliefs: Adaptations for Social Life or By-Products of Cognitive Adaptations?", *Behavior*, 151:385-402.

θΔics

In belief systems, **belief in the existence of god by scientists**, or belief in the "hypothesis of god" (Pierre Laplace, 1802) or "theory of god" (James Martineau, 1837), depending, by scientists, as compared to belief in the existence of god by the general public, refers to the topic or subject of the belief state of natural or physical scientists in regards to religion in general and the question of god specifically.

> "You clearly can be a scientist and have religious beliefs. But I don't think you can be a real scientist in the deepest sense of the word because they are such alien categories of knowledge."
>
> — Peter Atkins (1997), commentary the results, shown adjacent, of the 1998 Larson-Witham study on belief, in the existence of god among leading US scientists [4]

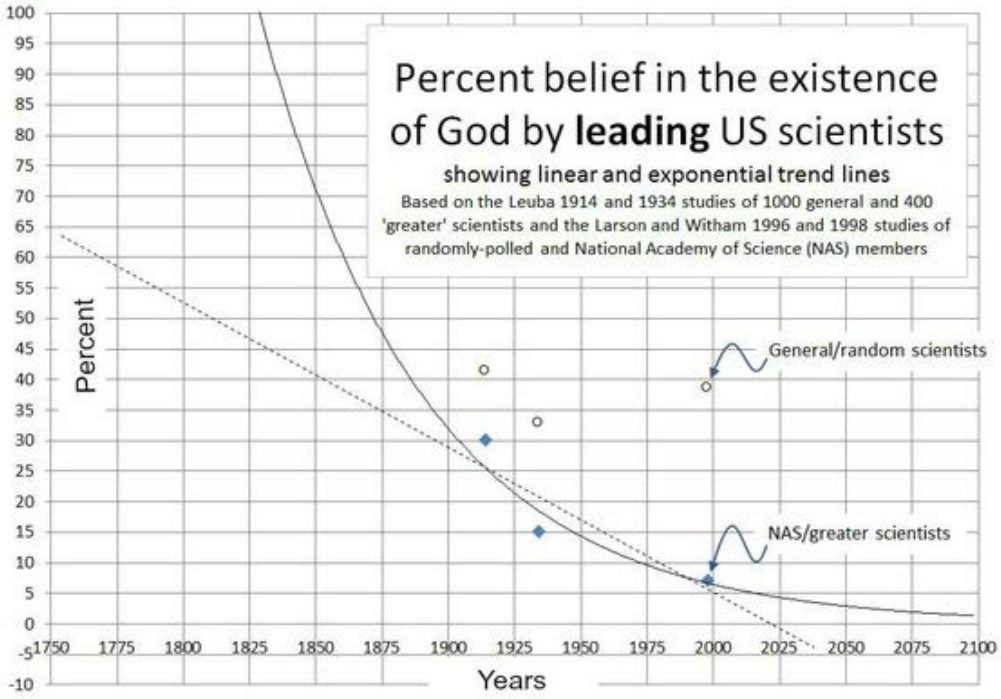

A graph showing the trend lines for **belief in the existence of god** by general or randomly polled US **scientists** (o) and for 'greater' or National Academy of Science (NAS) member scientists (♦), based on the James Leuba (1912,1924) studies and the Edward Larson and Larry Witham (1996,1998) studies, of over 3,000+ American scientists combined. [3]

Overview

Scientists, in general, tend to be very taciturn and reticent in regards to discussion of belief system or belief state, in respect to religion and religious belief. The following table (and adjacent graph) shows percent belief in the existence of god by leading US scientists and general or randomly selected US scientists, in the years shown, based on a combination of the 1914 and 1924 pollings of 1,000 randomly selected US scientists and 400 'greater' scientists, conducted by American psychologist James Leuba (1867-1946), and the similar 1996 and 1998 studies, conducted by Americans science historian Edward Larson and Larry Witham, of randomly polled US scientists and a portion of the over 2,000 members of the National Academy of Science (NAS): [3]

	Leading scientists	General scientists
1914	30	42
1934	15	33
1998	7	39

The data shows that while about 38 percent of general or randomly polled scientists, on average, in the 20th century, believed in the existence of god, levels remaining about constant, give or take, belief in the existence of god by 'leading' scientists is on the decrease, where currently fewer than 5% of NAS members believe in the existence of god, which is in marked contrast to the general public, of whom over 95% believe in either in god (83%) or a universal spirit or higher power (12%), according to 2009 PewResearch polls, elaborated on in more detail below, the "scientists" in question here being a selection of more than 2,500 scientists surveyed who are members of the American Association for the Advancement of Science (AAAS); other results from this poll are shown below—as well as a summary of the main results of the Larson-Witham study (1998) in table 1 (below left): [6]

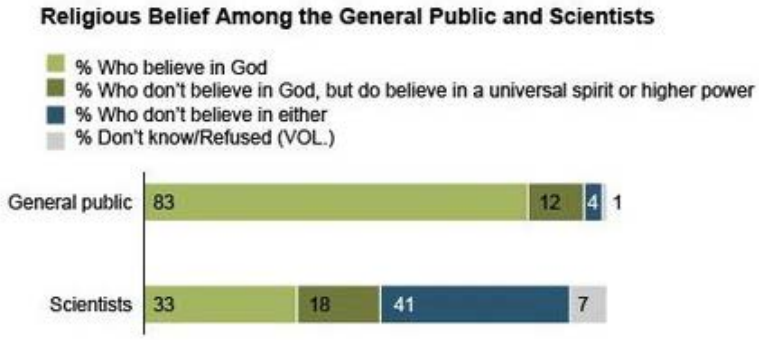

	Public %	Scientists %
Think that humans, other living things have evolved due to natural processes	32	87

Table 1 **Comparison of survey answers among "greater" scientists**

Belief in personal God	*1914*	*1933*	*1998*
Personal belief	27.7	15	7.0
Personal disbelief	52.7	68	72.2
Doubt or agnosticism	20.9	17	20.8
Belief in human immortality	*1914*	*1933*	*1998*
Personal belief	35.2	18	7.9
Personal disbelief	25.4	53	76.7
Doubt or agnosticism	43.7	29	23.3

Figures are percentages.

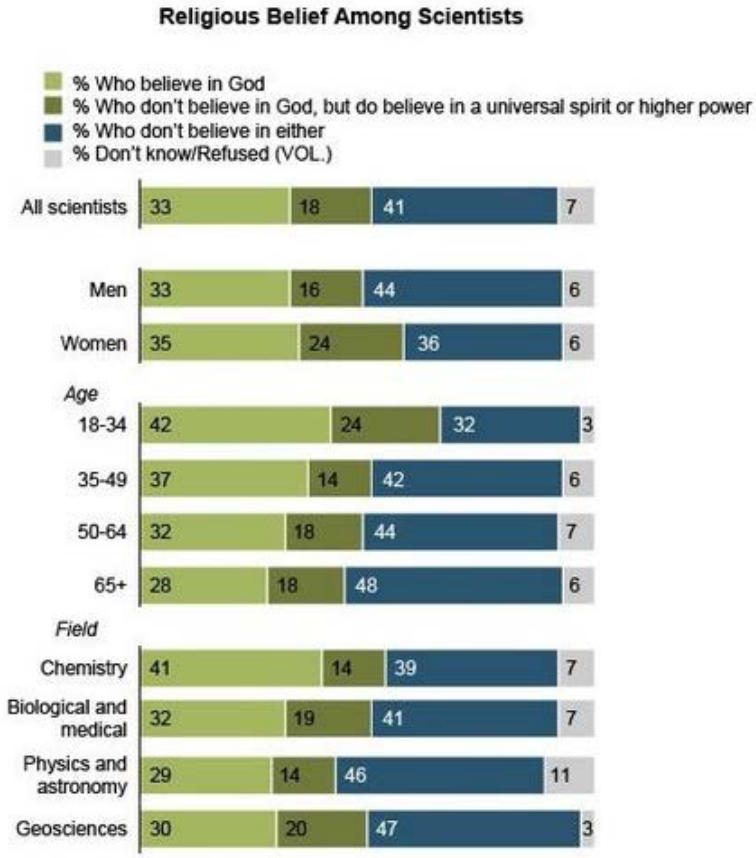

(add discussion)

Royal Society | Belief polls

In 2015, Michael Ruse, in his *Atheism: What Everyone Needs to Know*, Ruse, chapter "The Matter of Science", opens to the following 2005 poll results of a query of 1,074 members of the Royal Society, of which 253 responded (243 male, 10 female), with the following four questions (results shown): [7]

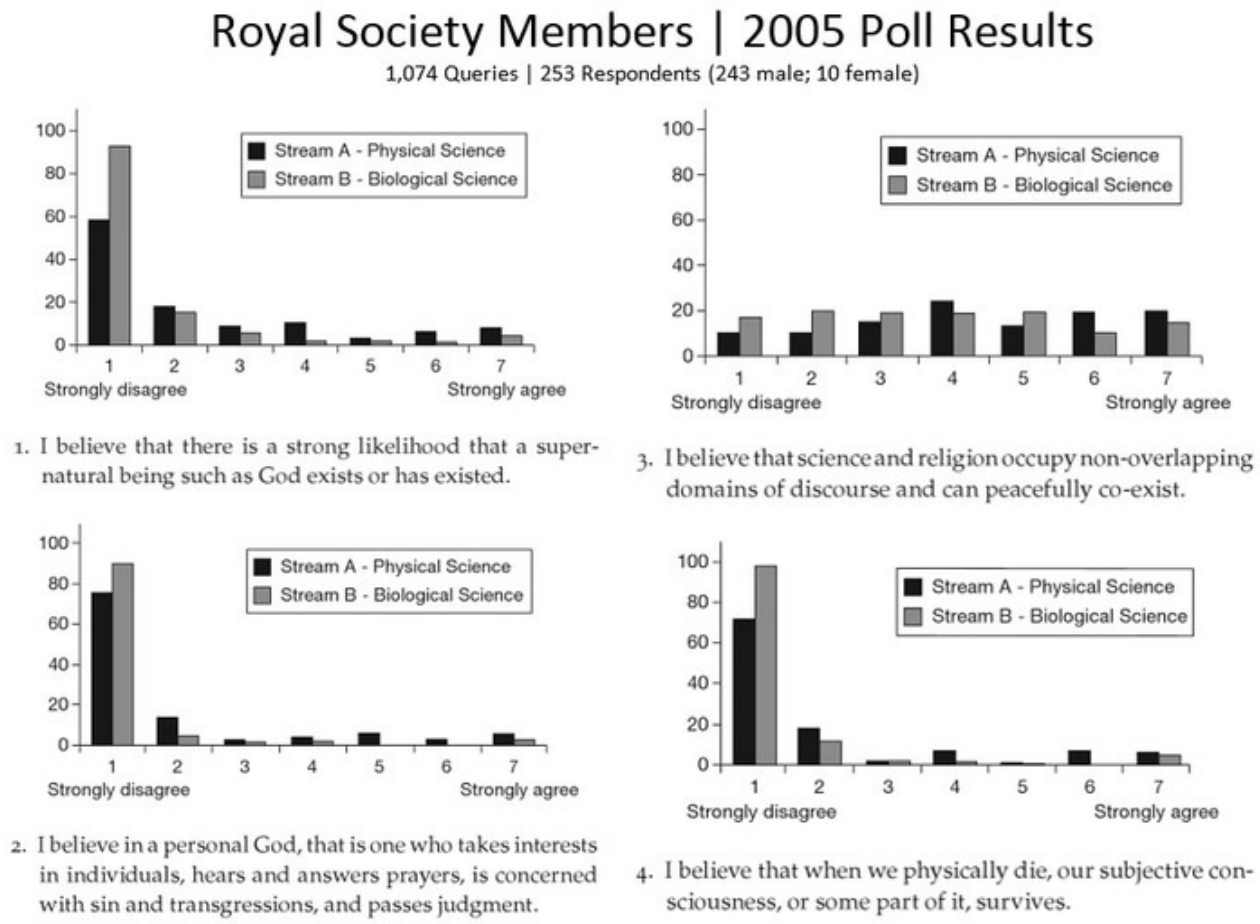

Ruse then compares these results to the 1996 and 1998 studies, conducted by American science historians Edward Larson and Larry Witham, of randomly polled US scientists and a portion of the over 2,000 members of the National Academy of Science (see: belief in the existence of god by scientists). He then mentions the Napoleon Laplace anecdote, wherein Pierre Laplace (1802) dismissed god with a wave of the hand; after which he the he attempts to elaborate on the point that the atheism controversy is not just a matter of the facts, but a matter of "burning moral concern", both about the stand one should take on the issues and the consequences of one's commitment.

Napoleon | Queries

See main: Napoleon on religion

In 1802, the first semi-systematic polling of scientists, in regards religious belief, was conducted beginning by French emperor Napoleon Bonaparte who seemingly went around and polled and queried all of the leading scientists of France—one of which resulted in the famous Napoleon Laplace anecdote, during which time Pierre Laplace told Napoleon that he had no need of the "hypothesis of god" in his formulation of celestial mechanics.

In 1812-1816, a famous dialog occurred between Napoleon and Gaspard Gourgaud (1783-1852) , a general baron and Napoleon's personal assistant, during which time Gourgaud gave his opinion that staring up at the starry heavens leads one to an amazement and wonder in the greatness of God, which provoked the following dialogue: [1]

> **Bonaparte:** "How comes it, then, that Laplace was an atheist? At the Institute neither he nor Monge, nor Berthollet, nor Lagrange believed in God. But they do not like to say so."
>
> Gourgaud: "I own that I believe firmly in God, and cannot conceive how men can be atheists. To proclaim themselves such seems to me mere mental braggadocio."
>
> **Bonaparte:** "Bah! Laplace was an atheist, and Berthollet too. At the Institute they all were atheists, and yet Newton and Leibnitz were believers. Atheists compare man to a clock; but the clock-maker is a being of superior intelligence. They

> grant that creation is the result of matter, as warmth is the effect of fire."

In 1817, similarly, Napoleon commented the following to Gourgaud: [1]

> "I often asked Laplace what he thought of God. He owned he was an atheist. Many crimes have been committed in the name of religion. The oldest religion is the worship of the sun [Ra theology]. Where is the soul of an infant? I cannot remember what I was before I was born; and what will become of my soul after my death? As to my body, it will become carrots or turnips. I have no dread of death. In the army I have seen many men suddenly perish who were talking with me."

Edison | Interview

> *See main: Edison on the soul*

In 1910, American inventor Thomas Edison, in an interview with Edward Marshall of *The New York Times*, famous gave his frank and open views on religion and his religious beliefs, which were pretty much in alignment with those of Bonaparte, albeit Edison elaborates greatly in giving his opinion on the hypothesis of the soul, in relation to force and energy, being a mere speculative theory, that is not completely understood, say the way savages used to consider fire divine: [2]

> **Edison:** "I cannot believe in the immortality of the soul. Heaven? Shall I, if I am good and earn reward, go to heaven when I die? No – no. I am not 'I' – I am not an individual – I am an aggregate of cells."
>
> **Edison:** "No, all this talk of an existence for us, as individuals, beyond the grave is wrong. It is born of our tenacity of life—our desire to go on living—our dread of coming to an end as individuals. I do not dread it, though. Personally I cannot see any use of a future life."
>
> Marshall: "But the soul!" [I protested] "The soul—."
>
> **Edison:** "Soul? Soul? What do you mean by soul? The brain?"

(add discussion)

Feynman | Lectures

In 1963, American physicist Richard Feynman gave a set of lectures entitled "A Scientist Looks at Society", latter published as *The Meaning of It All: Thoughts of a Citizen Scientist*, where he states his opinion that that more than half of the scientists do not believe in their father's god: [5]

> "I do believe that there is a conflict between science and religion, religion more or less defined that way. And in order to bring the question to a position that is easy to discuss,
> by making the thing very definite, instead of trying to make a very difficult theological study, I would present a problem which I see happens from time to time. A young man of a religious family goes to the university, say, and studies science. As a consequence of his study of science, he begins, naturally, to doubt as it is necessary in his studies. So first he begins to doubt, and then he begins to disbelieve, perhaps, in his father's god. By 'God' I mean the kind of personal god, to which one prays, who has something to do with creation, as one prays for moral values, perhaps. This phenomenon happens often. It is not an isolated or an imaginary case. In fact, I believe, although I have no direct statistics, that more than half of the scientists do not believe in their father's god, or in god in a conventional sense. Most scientists do not believe in it. Why? What happens? By answering this question I think that we will point up most clearly the problems of the relation of religion and science."

Feynman, unlike Edison, remained the epitome of the reticent and taciturn scientist, in regards to religious questions and his own beliefs, always dancing around the subject, but never being forthcoming.

Thims | Dawkins number

In 2009, American electrochemical engineer Libb Thims began using the Dawkins scale as a tool to probe scientists about his or her belief in the existence of god, by directly asking them what their Dawkins number (DN) is? This gets belief query methodology tends to dig a little deeper and get beyond the above yes/no or unsure dichotomy. Many Hmolpedia biographies, as of 2014, have been labeled per Dawkins number (DN=#), self-estimated and or gauged per published commentary.

See also

â— Dawkins number
â— God does not play dice

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1. (a) Gourgard, Gaspard. (1904). *The Talks of Napoleon at St. Helena with General Baron Gourgaud*: *together with the Journal Kept by Gourgard on Their Journey from Waterloo to St. Helena* (translated, and with notes, by Elizabeth Wormeley Latimer, author of *France in the Nineteenth Century*) (§17: Religion, pgs. 270-81; "at the institute", pgs. 274-75; "I often asked Laplace", pg. 276). A.C. McClurg & Co.
(b) Gaspard Gourgaud – Wikipedia.
2. Marshall, Edward. (1910). "No Immortality of the Soul Says Thomas A. Edison" (Ñº) (pdf), Interview, *The New York Times*, Oct 2.
3. (a) Leuba, James H. (1916). *The Belief in God and Immortality: A Psycholgical, Anthropolgical and Statistical Study*. Sherman, French & Co.
(b) Leuba, James H. (1933). "Religious Beliefs of American Scientists," *Harper's Magazine*, 169, 291-300.
(c) James H. Leuba – Wikipedia.
(d) Larson, Edward J. and Witham, Larry. (1998). "Leading Scientists Still Reject God", *Nature*, 394:313, Jul 23.
4. (a) Atkins, Peter. (1997). "Comment", in: "Article" (Highfield, R.), *The Daily Telegraph* (pg. 3), Apr 3.
(b) Larson, Edward J. and Witham, Larry. (1998). "Leading Scientists Still Reject God", *Nature*, 394:313, Jul 23.
5. (a) Feynman, Richard. (1963). "A Scientist Looks at Society", John Danz Lecture Series, University of Washington, Seattle, Apr; published as: *The Meaning of it All* (pdf) (pgs. 32, 43). Addison-Wesley, 1998.
(b) The Meaning of It All – Wikipedia.
6. Masci, David. (2009). "Scientists and Belief" (full: (Ñº)), Pew Research Religion & Public Life Project, PewForum.org, Nov 5.
7. (a) Stirrat, M. and Cornwell, R.E. (2013). "Eminent Scientists Reject the Supernatural: a Survey of the Fellows of the Royal Society", *Evolution: Education and Outreach*, 6(33).
(b) Ruse, Michael. (2015). *Atheism: What Everyone Needs to Know* (abs) (Royal Society polls, pgs. 100-106). Oxford University Press.

θΔics

In terminology, **belief state** refers to a state of mind or time period window of state of mind, wherein one's beliefs and or belief system if "fixated", to a certain a certain mode of thinking about the world, amid growing world knowledge, in between which, for some, the mind can be "made over" (Bernard DeVoto, 1928) per acquisition, mental digestion, successful absorption, and assimilation of new world knowledge.

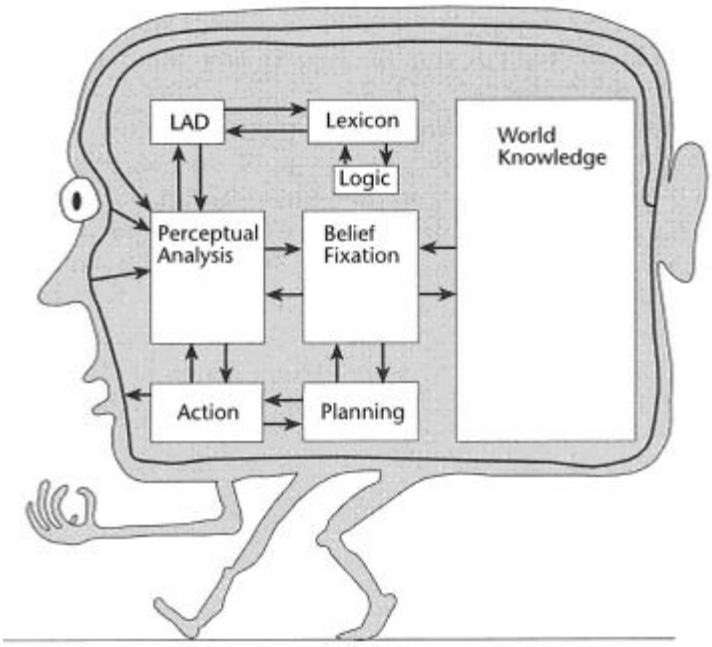

American philosopher Daniel Dennett's 2001 conception of the processing system of a "walking encyclopedia" type of person, in which the "**belief** fixation" area or **state** of the mind, anchored centrally, is connected in a two-way manner to the perception and analysis region, the smaller planning region, and the larger world knowledge sections of the mind. [2]

Quotes

The following are related quotes:

> "The **belief state** of an obscure lump of molecules [see: human] wandering around a remote corner of England is of no importance whatsoever epistemologically speaking."
>
> — Barry Barnes (1998), response to David Mermin whether he "might perhaps be into astrology" [1]

See also

â— Belief in the existence of god by scientists
â— Belief system
â— Belief system (children)

References

1. (a) Barnes, Barry. (1998). "Oversimplification and the Desire for Truth: Response to Mermin" (abs) (pg. 637), *Social Studies of Science*, 28:636-40.
(b) Barnes, Barry, Bloor, David and Henry, John. (1996). *Scientific Knowledge: A Sociological Analysis*. University of Chicago Press.
(c) S. Barry Barnes – Wikipedia.
(d) Mermin, N. David. (2001). "Conversing Seriously with Sociologists" (pg. 94), in: *The One Culture? A Conversation about Science* (editors: Jay Labinger and Harry Collins) (§7:83-98). University of Chicago Press.
2. Dennett, Daniel C. (2001). "Things about Things" (§:Walking Encyclopedia, pgs. 137-), in: *The Foundations of Cognitive Science* (editor: Joao Branquinho). Oxford University Press.

θΔics

In existence, a **belief system** refers to a system of belief concerning the operation and workings of the universe.

> "Fables should be taught as fables, myths as myths, and miracles as poetic fancies. To teach superstitions as truth is a most terrible thing. The child mind accepts and **believes** them, and only through great pain and perhaps tragedy can he or she be in after years relieved of them. The reason for this is that a superstition is so intangible a thing that you cannot get at it to refute it."
>
> – Hypatia (360-415), Greek philosopher (1040 BP)

One of these myths that currently grips the modern mind is that of belief in the theory of life, which has its roots in the ancient *circa* 4000BC fable of the birth and death of the sun myth, but which is a concept, namely "life" and in particular the origin of life that is in direct conflict with modern evolution theory and physical science, and was officially classified as defunct scientific theory in 2009 (see: defunct theory of life), but one that will likely remain in the underlying "child mind" of future adults for many years to come.

In 1748, David Hume gave an example of a person in India who refused to believe that that water can become solid during winter.

Belief system | Child

See main: Belief system (child)

(add)

Core scientific beliefs

The following is the belief system held by the modern thermodynamicist or modern physical scientist:

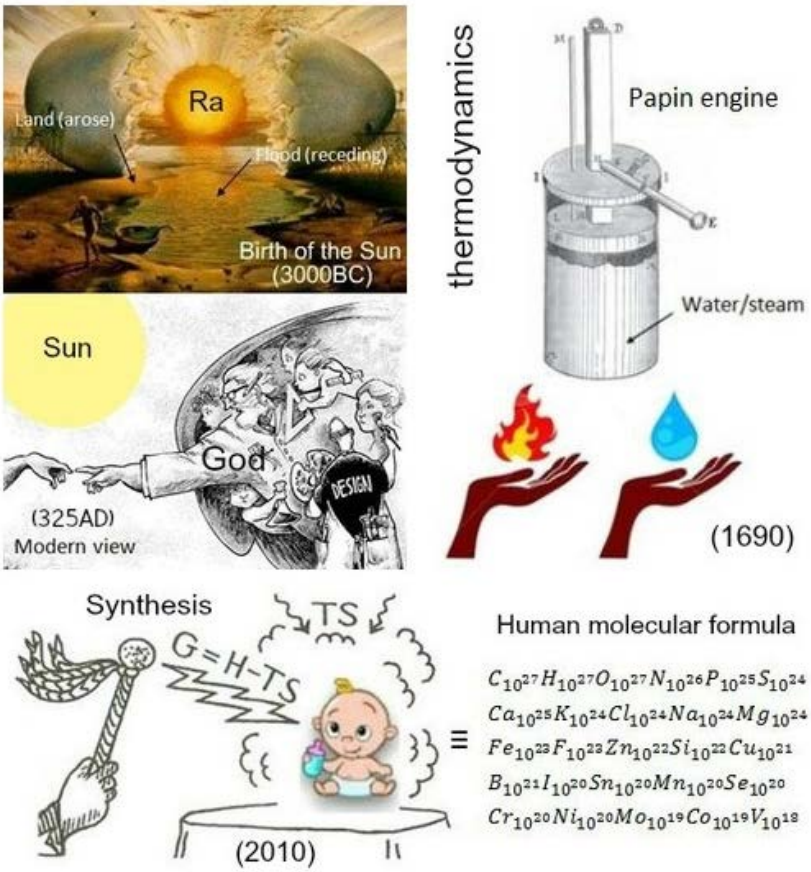

A depiction in the change in "belief system" over the last 5,000-years of human intellectual development, from that of Ra theology (3000BC), to Ab-Ra-hamic/B-Ra-hmaic theologies (325AD), to the inception of hard science, at the center of which is belief in thermodynamics (1690), to modern human chemical thermodynamics, and belief in humans as animate reactive molecules "synthesized" by the universe whose behavior is operated by the first law and second law of thermodynamics via free energy differentials.

> "If, in some cataclysm, all scientific knowledge were to be destroyed, and only one sentence passed on to the next generation of creatures, what statement would contain the most information in the fewest words? I **believe** it is the atomic hypothesis (450BC), or atomic fact, or whatever you wish to call it, that all things are made of atoms — little particles that move around in perpetual motion, attracting each other when they are a little distance apart, but repelling upon being squeezed into one another. In that one sentence you will see an enormous amount of information about the world, if just a little imagination and thinking are applied."
>
> — Richard Feynman (1964), *Lectures on Physics* (time capsule wisdom)

> "**Believe** that humans were created from the atoms of the earth through a great process."
>
> — Jean Sales (1789), *Philosophy of Nature: Treatise on Human Moral Nature* (Human molecular hypothesis)

> "A theory is the more impressive the greater the simplicity of its premises, the more different kinds of things it relates, and the more extended its area of applicability. Therefore the deep impression that classical thermodynamics made upon me. It is the only physical theory of universal content which **I am convinced** will never be overthrown, within the framework of applicability of its basic concepts."
>
> — Albert Einstein (c.1945), *Autobiographical Notes* (Einstein postulate)

> "**Believe** that the entire universe and everything in it is governed by the laws of energy and entropy."
>
> â— Clausius postulate (1865)
> â— Eddington rule (1928)

These core beliefs, the middle belief being a subset of the first belief, are rooted in the 450BC standard model of physics (elements of forces) of Greek philosopher Empedocles and the 485 atomic theory of Greek philsopher Leucippus, respectively, all entwined with two-and-a half-century long debate on the existence or non-existence of the vacuum. This belief system, adhered to particularly by the human thermodynamicist, gives way to what is called the "standard model of human existence", according to which all other presumptions are assumed false or given a secondary status. The modern belief system traces human origin to the hydrogen atom (see: evolution timeline).

Thermodynamic belief system

The following, being the opening statement to German physicist Rudolf Clausius' 1875 *The Mechanical Theory of Heat*, is what might be considered as the foundation of the thermodynamic belief system, started with the conception of the modern heat engine by French physicist Denis Papin in 1690:

> "Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, work is performed."
>
> — Rudolf Clausius (1875), "Mathematical Introduction"

Belief that humans are molecules

See main: Human molecule

About 57 percent of people believe that they are molecules or specifically "giant molecules". These statistics come from English physicist James Eadon's 2001-2008 online pollings, graph shown below from American electrochemical engineer Libb Thims' 2008 *The Human Molecule*: [1]

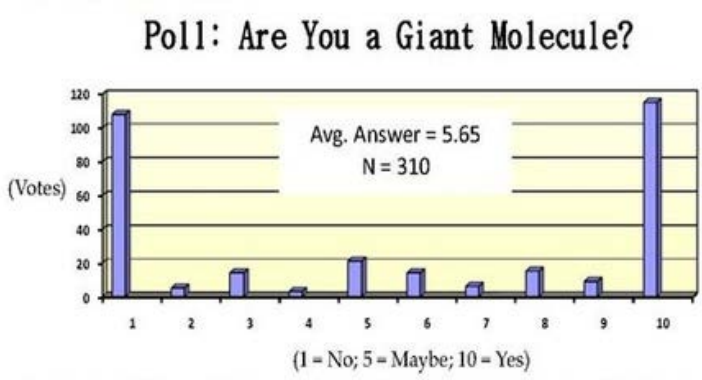

Belief that love is a chemical reaction

See main: Love the chemical reaction

About 66 percent of people believe that love is a chemical reaction. These statistics come from a 2005 poll results of 100 Americans done by American electrochemical engineer Libb Thims: [2]

Scientist's belief in god and immortality

The following are the 1998 polled views of America's so-called leading or "greater" scientists, the members of the National Academy of Sciences, on personal belief or disbelief on God and immortality: [3]

American National	Disbelief	Doubt (or agnosticism)	Doubt (or agnosticism)	Belief	Belief

Academy of Sciences (1998)	Disbelief in God	in immortality	of belief in God	of belief in Immortality	in God	in Immortality
Physical scientists (physicists and astronomers)	79%	76.3%	13.5%		7.5%	7.5%
Biological scientists	65.2%	69%	32.3%		5.5%	7.1%
Mathematicians					14.3%	15%
Overall:	72.2%	76.7%	20.8%	23.3%	7.0%	7.9%

This 1998 data set can be combined with American psychologist James Leuba's 1916 and 1933 data sets to yield the following plot, which show, according to extrapolative estimates, that currently about 5 percent of leading scientists believe in the existence of God: [4]

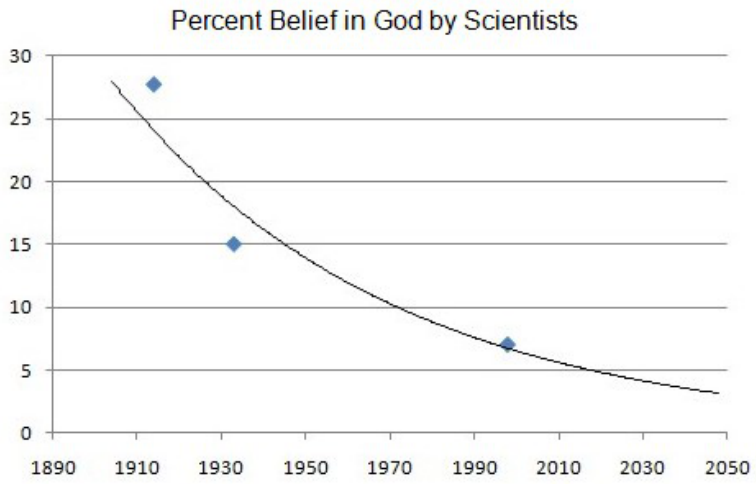

Belief in God, spirit, or life force

Only 2 percent of Americans don't believe in any sort of spirit, God, or life force. These results come from the millennium poll of the general public the world over:

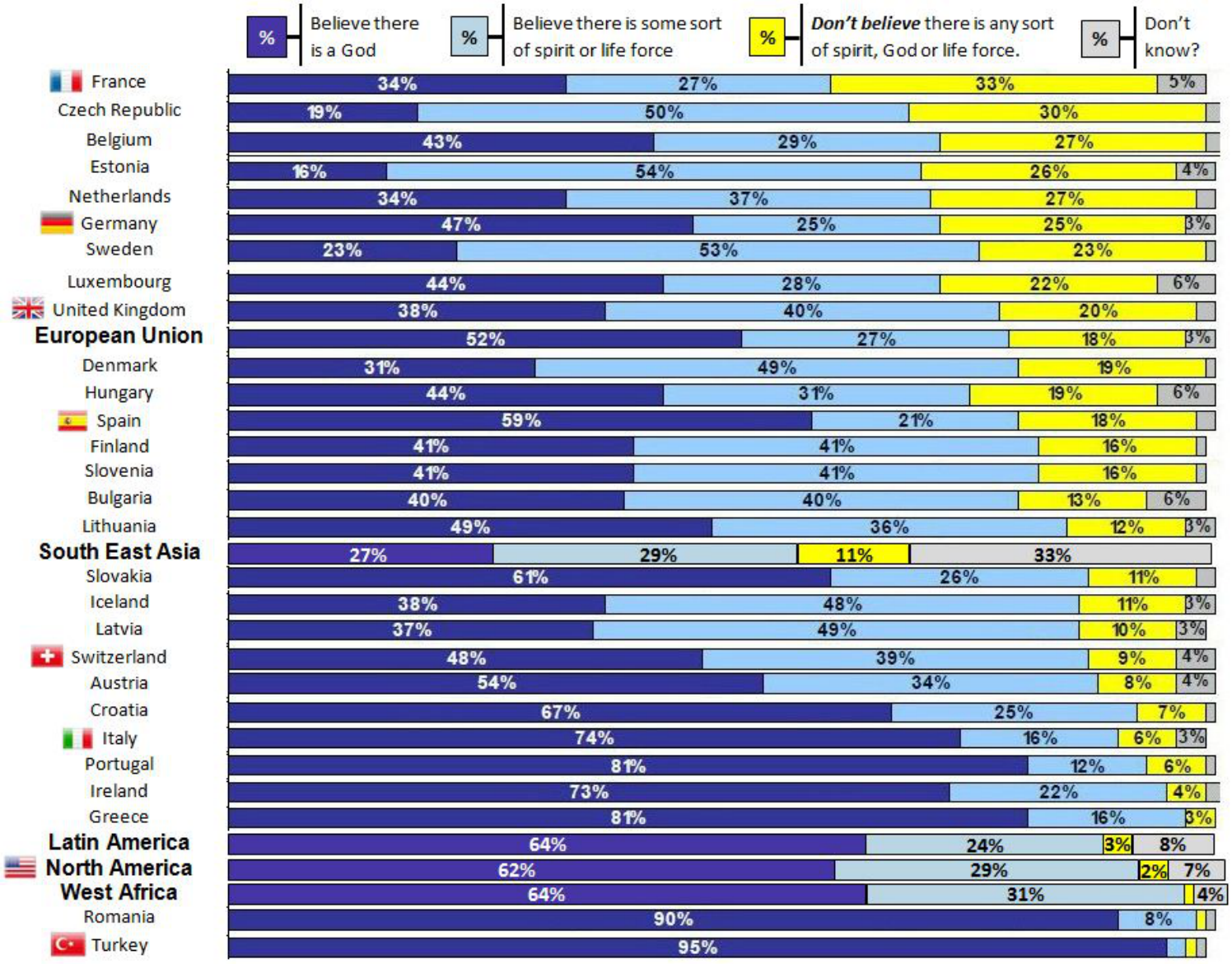

Ancient belief system

The ancient belief system, which predates that of the modern belief system, and is held as the dominate belief system of the world, is the belief system of Ra theology, which is rooted in the daily life-death cycle of the sun, of which the modern religions of the world are derivatives of, as shown below:

This religious system accounts for 72 percent of the morality system of the modern world.

The ancient belief system traces human origin to either Abraham (or Brahma) (or Ra in the original Egyptian version).

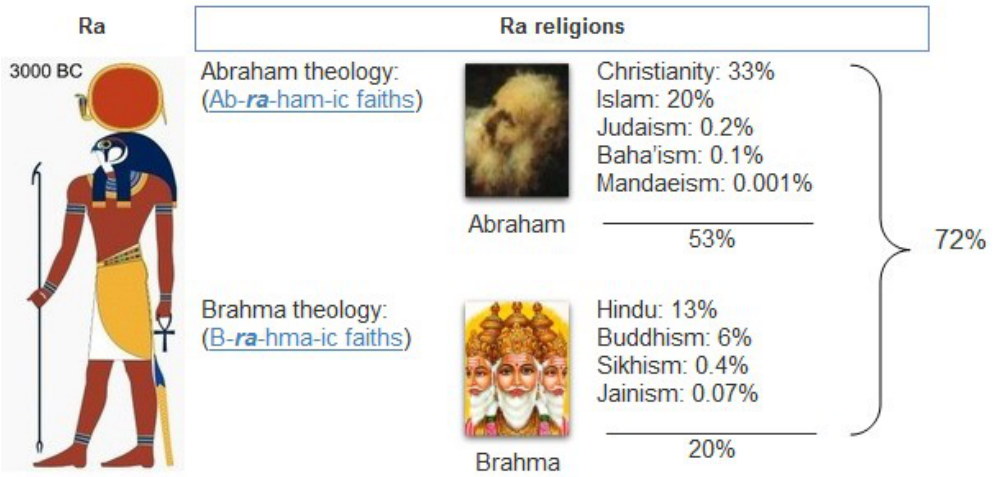

A depiction of the underlying structure of modern religions, of which 72 percent are Anunian theology based.

See also

â— Existence of God

â— Dawkins scale
â— Dawkins number

References

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(b) Thims, Libb. (2008). *The Human Molecule*

(issuu) (preview) (Google Books) (docstoc). LuLu.
2. Thims, Libb. (2005). "Poll: Is Love a Chemical Reaction?", *Research Project* number 4, Chicago: Institute of Human Thermodynamics.
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(b) Leuba, James H. (1933). "Religious Beliefs of American Scientists," *Harper's Magazine*, 169, 291-300.
(c) James H. Leuba – Wikipedia.
5. Labinger, Jay A. and Collins, H. (2001). *The One Culture? A Conversation about Science* (pdf) (pg. 35). University of Chicago Press.

External links

â— Belief system – Wikipedia.

θΔics

In belief systems, **belief systems of children** refers to beliefs ingrained in the mind the the child, whether taught, told, or learned in the earliest years of mental learning and development.

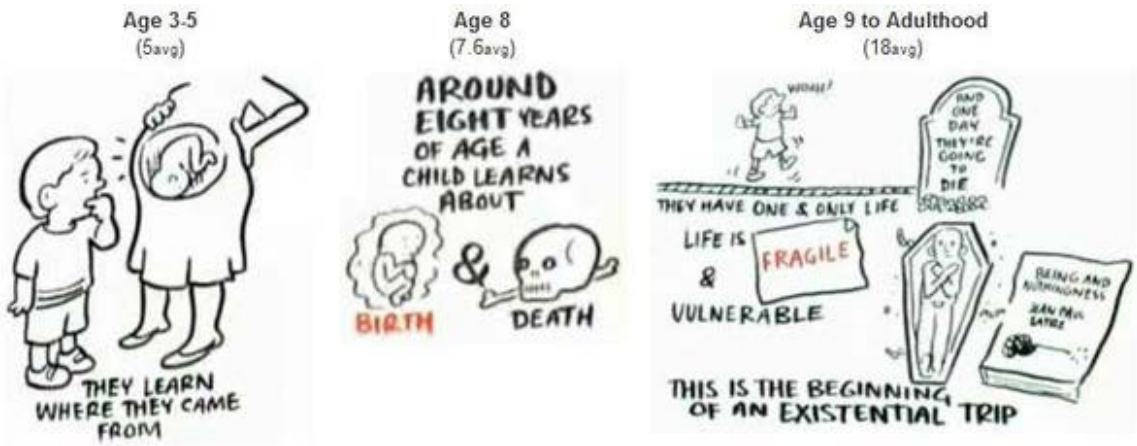

The typical "big question" belief system development Q&A timeline of **children**, according to American economist Jeremy Rifkin. [1]

Things we were taught as children

Shown adjacent is an overview of the "big question" coming into being stages of a typical child (child prodigy anomalies aside), up through adulthood, ending with French existentialism philosopher Jean-Paul Sartre's 1943 *Being and Nothingness*—itself was an extension of German philosopher Martin Heidegger's 1927 *Being and Time*, both revolving around the subject of existentialism—according to the 2010 views of American economist Jeremy Rifkin, mixed in with a few other references. [1]

The issue here is that before age 3-5 the average person, according to modern religio-mythology belief system classifications, is taught/told about where they come from according to the god/spirit/life force—91 percent of Americans, e.g., believe in one of these life theory models—based Abrahamic/Brahmaic, i.e. Anunian theology, rooted belief system (below left), about which over 72 percent of the modern world adheres to, which does NOT corroborate with the modern physical science belief system (below right), according to which humans are 26-element "molecules" (human molecules), that were "synthesized" (not born), "reactive" (not alive), and in the end "analyzed" (do not die), as is the case for any other animate atomic geometry in the universe that comes into and out of "bound state" existence:

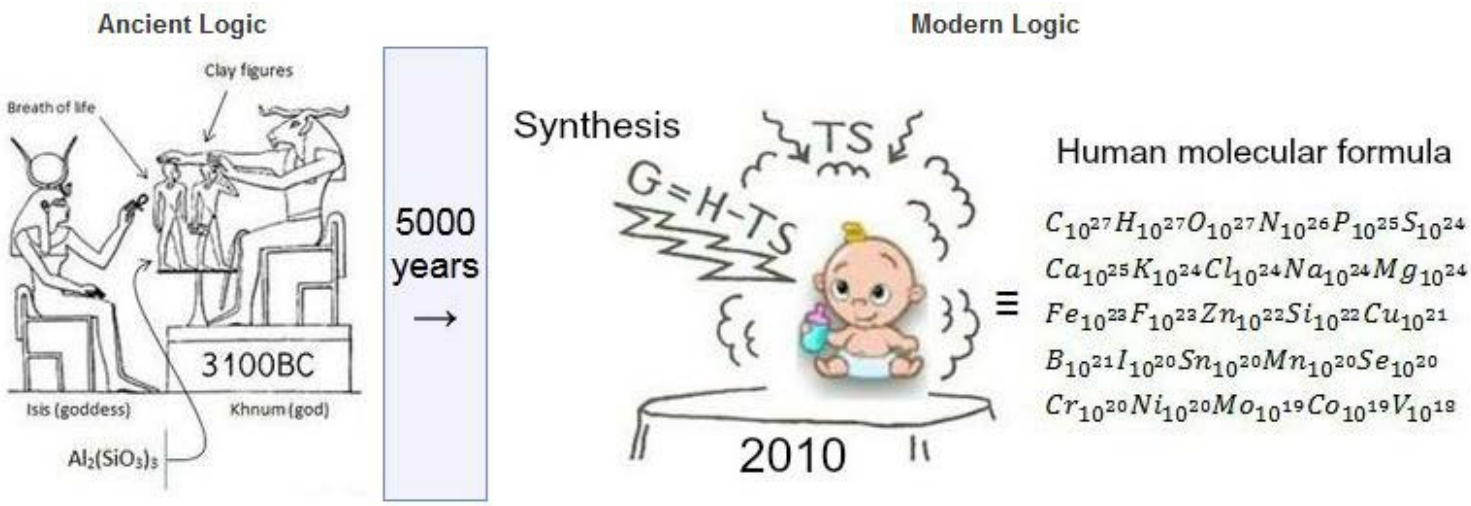

Quotes

The following are related quotes:

> "Fables should be taught as fables, myths as myths, and miracles as poetic fancies. To teach superstitions as truth is a most terrible thing. The **child mind** accepts and **believes** them, and only through great pain and perhaps tragedy can he or she be in after years relieved of them. The reason for this is that a superstition is so intangible a thing that you cannot get at it to refute it."

— Hypatia (360-415), Greek philosopher (1040 BP)

"It takes the latter half of all of one's lifetime to unlearn the falsehood that was instilled into us during the earlier half. Generation after generation we learn, unlearn, and re-learn the same lying legendary lore. Henceforth, our studies must begin from the evolutionist standpoint in order that they may not have to be gone over again."

— Gerald Massey (1883), *The Natural Genesis* [2]

"Since as a **kid** I was aware of the abyss (super rift) between the material and mental worlds. I tried to bridge this abyss, but could not. Yet I kept on with my own "Steigerung" as Goethe did. Then during 1982-83 I discovered empirically that the law of entropy production applies to the spiritual [*humanistic*] world as it applies to the physical world. My joy knew no bounds. I have found the bridge between these two worlds with which to cross the abyss between them. Others thought I was crazy and would not dare to publish my account.

Then, in 1986, if I remember correctly, I was teaching university students the intricate calculations concerning free energy in chemical reactions. During that lecture I suddenly became aware how my mind was rushing along two levels. The lower level was concerned with chemical processes as a physical phenomenon. I executed this level almost automatically. But the higher level of my mind was exploring free energy in the process of knowing-learning as a spiritual [*thermodynamics*] phenomenon. I followed this level with great curiosity. I think the students became aware that I was rather absent minded that day, not perceiving my higher most thoughts. That day marks the beginning of my continual exploring of the role of free energy in the spiritulization [*actualization*] of humankind."

— Adriaan de Lange (2010), retrospect reflection on arrival of human free energy theory

"Origins: probably 4-5 yrs old, I believed that I came from some sort of light source, probably the sun. My first word was also "light". Life and death: I grew up in the country, so we had dead animals around all the time. Probably 6 or so before I thought about my own death as inevitable. Existence: I neglected this question until coming across your *Human Molecule* book at around age 30. I don't believe in the common sense notion of life. There does not seem to be any evidence that I am alive."

— Jeff Tuhtan (2013), response to query on "big questions" recollections (see: belief system (children)) [3]

References

1. (b) The Empathic Civilization (RSA Animate) (2010) – YouTube.
(c) Rifkin, Jeremy. (2010). *The Empathic Civilization: the Race to Global Consciousness in a World of Crisis* (entropy, 33+ pgs; thermodynamics, 11+ pgs). Polity Press.
(d) Note: the (5_{avg}) and (7.6_{avg}) values come from a an inperson poll (N=8) conducted by Libb Thims (19 Apr 2013); the (7.6_{avg}) is the mean of Goethe, who at age 9 built his own alter to nature out of his father's natural history collection, surmounting it sulfur and with a candle, which he lit when making his devotions, Thims, who at age 15, with the obtainment of a work permit and drivers permit, at a point of subsequent legal entering of adulthood, began to ruminate on the bigger questions and whys of existence, and Tuhtan, who at age 30, above quote, began to interject into questions of existence.
(e) Anomalies include: Michael Kearney graduated high school by 8; William Sidis passed Harvard Medical School anatomy exam by age 8; Kim Ung-Yong was solving differential equations by age 4.
(f) What age do you talk to your child about where they came from? (2009) – SodaHead.com.
(g) Where do Babies Come From? – About.com.
(g) Being and Nothingness – Wikipedia.
(i) Existentialism – Wikipedia.
2. Massey, Gerald. (1883). *The Natural Genesis.* Publisher.

3. Hmolpedia messaging communication to Libb Thims (22 Apr 2013).

Further reading

â— Emmons, Natalie A. and Kelemen, Deborah. (2014). “The Development of Children’s Prelife Reasoning: Evidence from Two Cultures” (abs), *Child Development*, Jan 16.

θΔics

In atheism terminology, **believer**, as compared to an "unbeliever", is one who believes in god, aka a theist, and or believes in the existence of god. in one form or another; short for "god believer".

θΔics

In hmolscience, **Ben Carson** (1951-) is an American neurosurgeon, a 2014 ranked smartest person existive (#21), turned 2016 US republican presidential candidate noted for his public interview comments on his faith in god vs science in an age where some 60 percent (average scientists) to 95 percent (national academy scientists) of scientists don't believe in god.

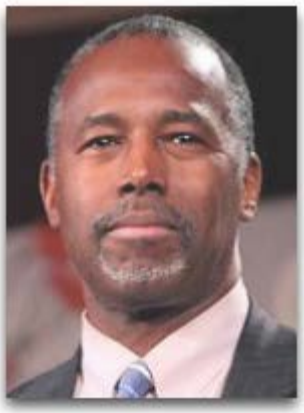

Quotes

The following are noted quotes:

> "And you know, I get a lot of grief out there. People say, 'How can you be a scientist and believe that god created the earth? Obviously, you know [they say] we developed from a puddle of promiscuous biochemicals. And if you believe in anything other than that, you're a moron.' I don't criticize them. I say, 'Can you tell me how something came from nothing?' And of course they can't. They say 'well, we don't understand everything.' I say 'ok, no problem'. 'I'm just going to give you that there's something'. And now you're going to tell me there's a big bang, and it comes into perfect order? So that we can predict seventy-years hence when a comet is coming, that kind of precision. And they say, 'Well, yeah.' And I say, 'But don't you also believe in entropy, that things move toward a state of disorganization?' [they say] 'Well yah'. [I say] 'So how does that work? "And they say, 'We don't understand everything.' And I said 'I'm not sure you understand anything! ' But, I said, 'I'm not going to be critical of you, not a problem. You're entitled to believe what you believe, even though it requires a lot more faith than what I believe. But everybody believe what you want to believe."
>
> — Ben Carson (2015), campaign speech (see: smart theism) (Q) (V:0:08-1:42), Liberty University, Nov 11; in 6 Oct 2015 Carson commented (Q), on *The View*, how some of the people he talked to about this evolution question included Nobel laureates; and in 2011, he was in a theist debate team (Q) with Francis Collins against atheists Richard Dawkins and Daniel Dennett

See also

- Barack Obama
- Thomas Jefferson
- Woodrow Wilson

External links

- Ben Carson – Wikipedia.

θΔics

In existographies, **Benard Belidor** (1698-1761) was a French engineer and mathematician, noted for []

Overview

In c.1739, Belidor, in his *Hydraulic Architecture, Volume Two*, presented an analysis of Thomas Savery's vacuum engine and Denis Papin's 1707 direct-pressure steam engine.

Quotes | On

The following are quotes on Belidor:

> "In the winter of 1763-64, having occasion to repair a model of Newcomen's engine belonging to the Natural Philosophy [Black's] class at the University of Glasgow, my mind was again directed to it. At that period, my knowledge was derived principally from Desaguliers [*Natural Philosophy*], and partly from **Belidor** [*Hydraulic Architecture*]."
>
> — James Watt (c.1800), *Publication* [2]

Quotes | By

The following are quotes by Belidor:

> "It must be avowed that this [steam engine] is the most marvelous of all machines, and that there is not a single other of which the mechanism has so much resemblance to that of animals. Heat is the cause of its motion, a circulation takes place in its different tubes like that of blood in the veins; it has valves that open and close at the proper moment; it feeds itself, it rejects what it has used at regular intervals, it draws from its own work everything that it required for its support."
>
> — Bernard Belidor (1739), *Hydraulic Architecture, Volume Two Architecture Hydraulique, Volume Two* (pgs. 324-25) [1]

References

1. (a) Belidor, Benard. (1739). *Hydraulic Architecture, Volume Two* (*Architecture Hydraulique)* (pgs. 324-25). Paris: C.A. Jombert.
(b) Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 165). Courier, 1990.
2. Johns, Cort. (2019). *The Lost Industrial Revolution* (pg. 186). LuLu.

External links

â— Bernard Forest de Belidor – Wikipedia.

θΔics

In science, **Bénard cells** (TR:56)**,** or "Benard rings" (Schoffeniels, 1973), are ordered hexagonal convection cells or atomic-molecular structures that spontaneously form in viscous mediums, such as silicon oil or whale oil, when placed on a hot plate and heated past a bifurcation point into the turbulent flow regime.

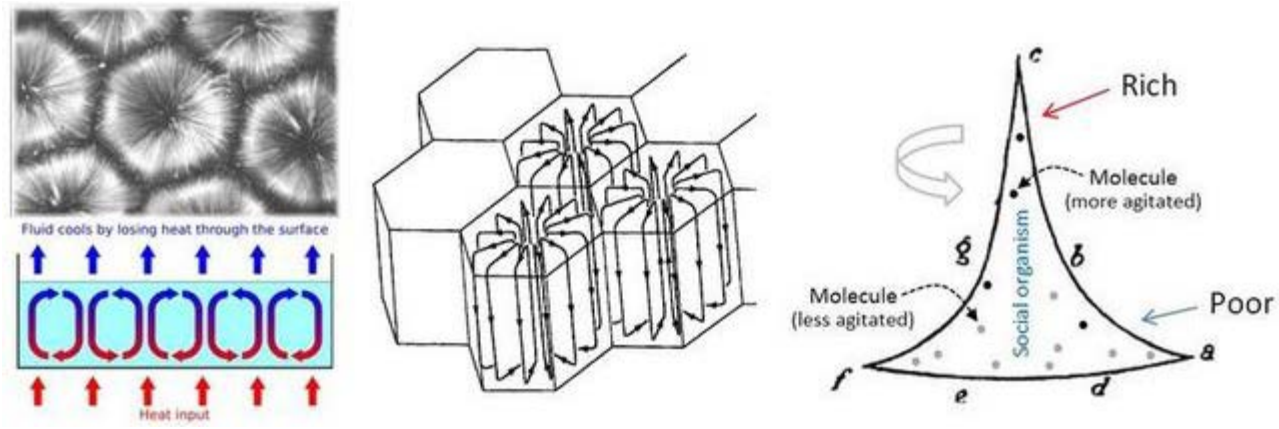

Top left: top view photo of **Benard cells**: showing their hexagonal shape. Bottom left: a diagram showing heat flow. Middle: a Benard cell internal atomic or molecular movement flow diagram, showing how the cooling mechanism. Right: a Pareto social pyramid, showing Vilfredo Pareto's 1902 conception of "circulation of elites", over time, in a given hierarchied social system, akin to a social Benard cell, as Fritjof Capra (1996) likes to theorize, wherein more agitated human molecules (e.g. first generation millionaires) tend to move up the spinning top social pyramid, and less agitated human molecules (e.g. silver spoon babies) tend to move down, through generations.

History

The cells are named after French physicist Henri Bénard, who, in completing his PhD dissertation "Cellular Eddies in a Horizontal Liquid Layer", conducted the first experiments on them in 1900. [1] The Bénard cell phenomenon is the model for the now-famous conception of "far-from-equilibrium" invented by Belgian chemist Ilya Prigogine in the 1970s, in "ordered structures" (models for organized life) are said to "spontaneously" form, at a point far away from equilibrium (high heat flow).

These types of structures are termed dissipative structures, and are supposedly representative of things such as evolution and the formation of human societies, and thus are said to give resolution to the tendency to disorder aspects (view) of the second law.

The following, as cited by Aharon Katchalsky (1971), shows the development of Benard cells over time: [7]

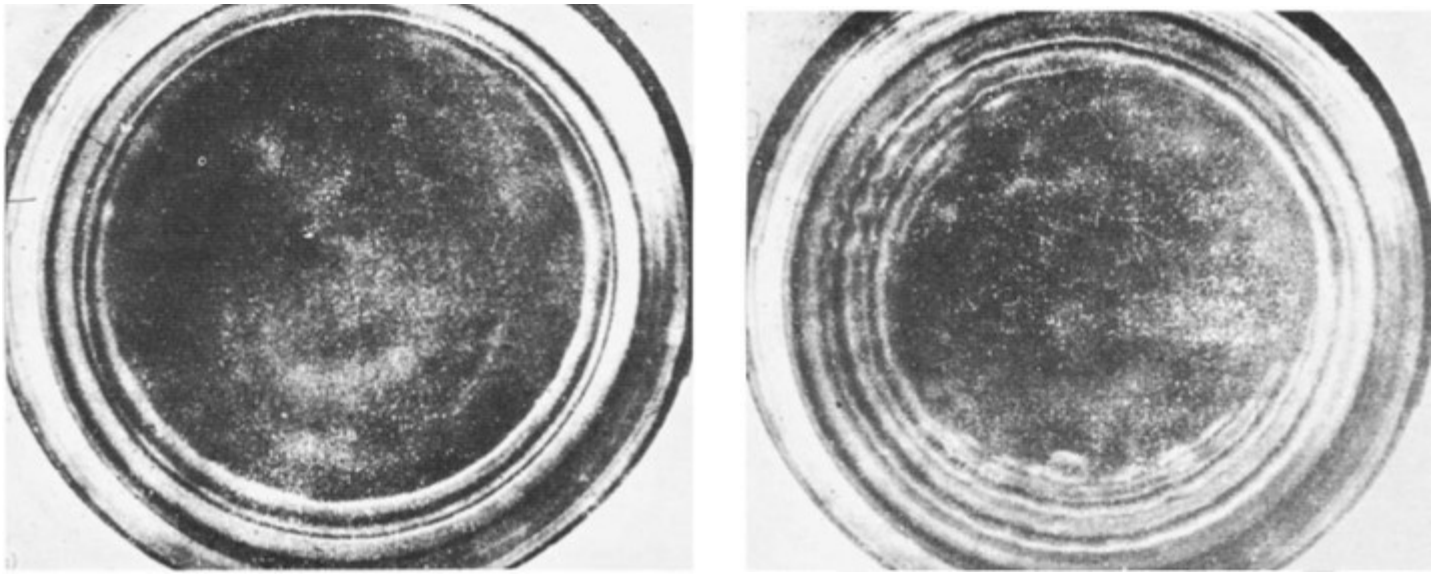

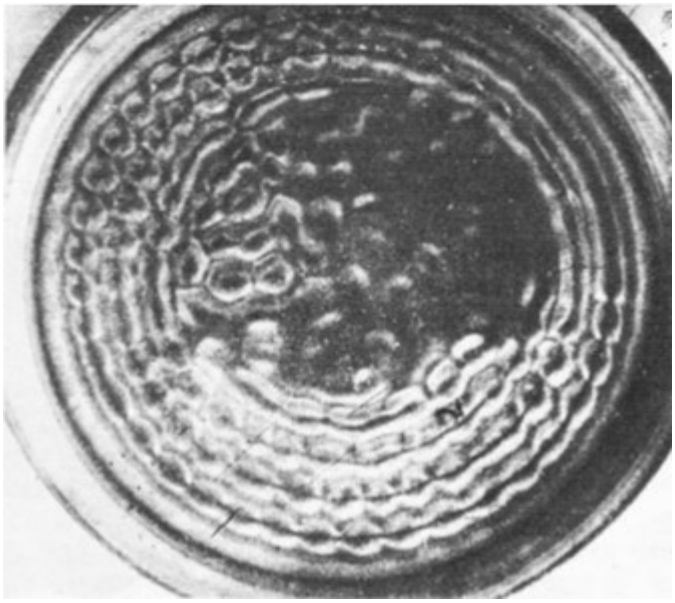

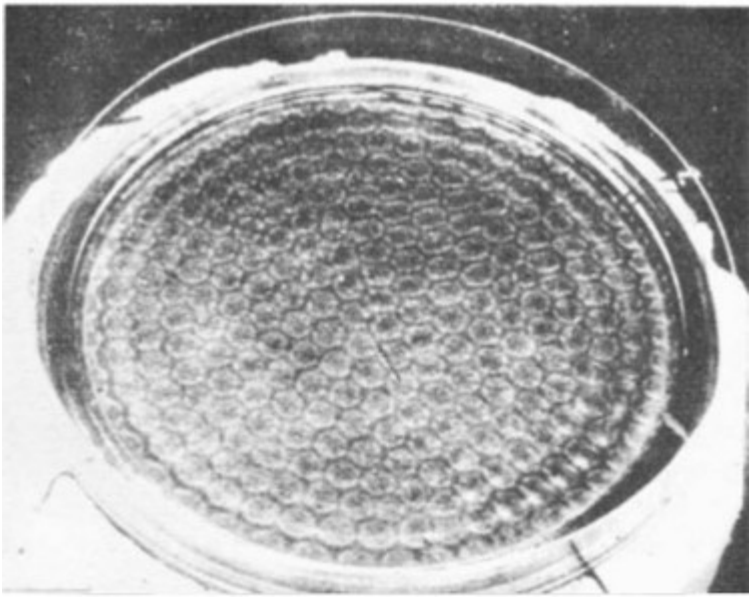

(add)

Anthropomorphic thermodynamics

In the 1970s, Bénard cells began to be popularized by Belgian chemist Ilya Prigogine, who used them as an example of "dissipative structures", being a type of ordered structure that forms according to his entropy generation version of the second law of thermodynamics. This was soon parlayed into a thermodynamic model of the evolution of life. [2] In the reading accounts of Bénard structure formation in reference to evolution, on the logic of Prigogine, one will often find anthropomorphic accounts or descriptions of molecular behavior in the region of heat flow. In the 1996 book *The Web of Life*, Austrian-born American theoretical physicist Fritjof Capra tells us that: [3]

> "Prigogine's detailed analysis of **Bénard cells** showed that as the system moves farther away from equilibrium, it reaches a critical point of instability, at which the ordered hexagonal pattern emerges" and that, during convection, "heat is transferred by the coherent motion of large numbers of molecules."

(add)

Gradient-dissipation theory

In the early 1990s, American ecologists Eric Schneider and James Kay built on early data from silicon oil Bénard cells experiments to postulate an entropy production, exergy

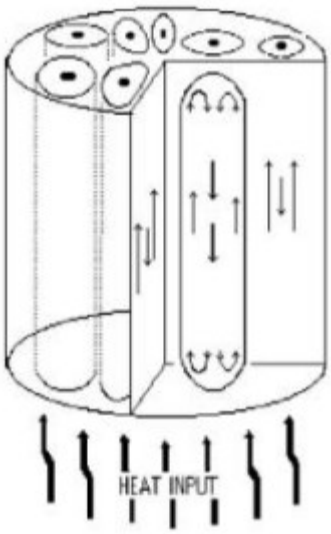

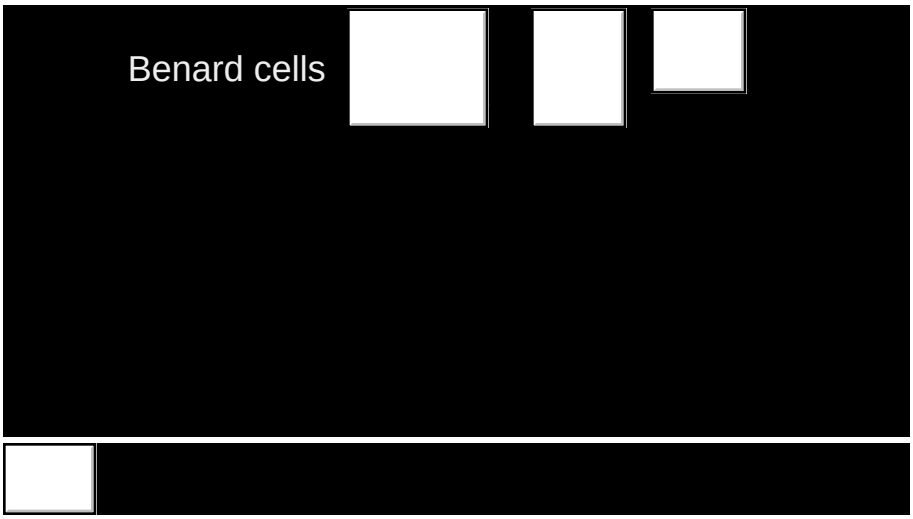

Diagram of the internal heat convection structure of **Benard cells** from Richard Coren's 2006 chapter "The Challenge to Evolution"; adjacent to 2010 video overview of Benard cells by Libb Thims. [6]

consumption
theory of biological order formation in the heat gradient from the sun. Specifically, using a nonequilibrium extension of the second law, of the William Thomson / Ilya Prigogine energy dissipation variety, to graphical calculations of theirs done on heat flow through silicon oil in turbulent flow regime, they argue that spontaneous organizations appear in the fluid, which act to degrade the heat flow gradient across a fluid layer. They then extend this postulate to be a pervading regulatory behavior in the whole of the biosphere.

In particular, using the 1957 experimental data from the PhD dissertation of German researcher P. L. Silveston, in 1994, Schneider and Kay start with the generalized Prigoginean thermodynamics perspective that when a system is removed far from equilibrium by subjecting it to a stress, it will often undergo a transition from a spatially uniform state to a patterned state of spatial variation, but add to it that both "entropy production and exergy destruction occur" during the heat transfer process across the fluid layer, and that the "emergence of the ordered structures (Bénard cells)", at a Rayleigh number (a dimensionless number for a fluid associated with the transition of heat transfer from the form of conduction to convection) of about 1760, results in such a manner to act to dissipate more energy. [5] In other words, the ordered structures emerge to act more effective energy dissipaters, consuming energy in the form of increased entropy production and decrease exergy (available work) consumption.

In the early 2000s, Schneider continued his writing on this subject, but in coordination with Dorian Sagan. In their 2005 book *Into the Cool - Energy Flow, Thermodynamics, and Life*, for instance, they state: [4]

> "In **Bénard systems** molecules come together, organize, and allow heat to flow more efficiently into the cool … [but] these *organisms of physics* do not have the capacity, as true organisms do, to seek out new gradients to support their nonequilibrium organization."

They argue further that "neither the first law of thermodynamics nor the second law is violated during the formation of these nonliving cells", but rather, "the quality of energy (engineers call it *exergy*) is degraded as self-like entities form."

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2. Solé, Ricard V. and Goodwin, Brian. (2002). *Signs of Life*, (pgs. 13-29). Basic Books.
3. Capra, Fritjof. (1996). *The Web of Life - A New Scientific Understanding of Living Systems*, (section: "Dissipative Structures", pgs. 86-89). New York: Anchor books.
4. Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Life* (pgs. 112-24, 328-29). Chicago: The University of Chicago Press.
5. (a) Silveston, P.L. (1957). "Warmedurchange in Horizontalen Flassigkeitschichtem." (Heat Changes in Horizontal Silicon Oil), PhD thesis, Techn. Hochsch. Muenchen, Germany.
(b) Schneider, E.D, Kay, J.J., 1994, "Life as a Manifestation of the Second Law of Thermodynamics", *Mathematical and Computer Modelling*, Vol 19, No. 6-8, pp.25-48.
6. (a) Coren, Richard L. (2006). *God and Science Among the Infinities* (previously titled: *The World is Too Complex for God*, 2001) (thermodynamics, pgs. 49, 62-68). BookSurge.
(b) Thims, Libb. (2010). "Benard Cells" (Ñº), HumanChemistry101, Oct 6.
7. (a) Gmitro, John I and Scriven, L.E. (1966). "A Physicochemical Basis for Pattern and Rhythm", in: *Intracellular Transport* (editor: Katherine Warren). Symposia of the International Society for Cell Biology, Volume 5 (pg. 223). Academic Press.
(b) Katchalsky, Aharon. (1971). "Thermodynamics of Flow and Biological Organization" (abs)(Ñº), *Zygon*, 6(2):99-125.

External links

â— Benard cells – Wikipedia.

θΔics

In existographies, **Benedict Spinoza** (1632-1677) (IQ:180|#53) (Cattell 1000:108) [RGM:157|1,500+] (Murray 4000:10|WP) [HD:6] [FA:50] [RMS:19] (EPD:M6) (GPhE:#) [CR:194] was a Dutch philosopher, and "celebrated atheist" (Holbach, 1770), noted for, in hmolscience, his 1676 posthumously-published *Ethics: Demonstrated in Geometrical Order*, a treatise on morality written, supposedly, in the style of Euclid's *Elements*, as a series of geometrical proofs of numerous philosophical points, accompanied by definitions, axioms, demonstrations, and corollaries, as well as intervening stretches of friendlier prose (*scholia*).

Moses

In 1670, Spinoza, in his *Theologico-Political Treatise*, building on Abraham Ezra (1089-1167), denied that Moses wrote the Pentateuch; example statement:

> "It is thus clearer than the sun at noonday that the Pentateuch was not written by Moses, but by someone who lived long after Moses."
>
> — Benedict Spinoza (1670), Theologico-Political Treatise (Ñº)

(add)

Ethics

The following is a representative quote from *Ethics* part three: [8]

> "I shall consider human actions and desires in exactly the same manner, as though I were concerned with lines, planes, and solids."

Much of this argument, to note, is oft-encapsulated in the term "Spinoza's god" (or god = nature), retrospectively classified as pantheism. [20]

Soul | Excommunication

In 1656, Descartes was excommunicated from Judaism for asserting that there was no "immortal soul", among other things such as that the Torah was not the literal world of god, and the Jews were not the chosen people. [20]

Descartes, after he was excommunicated, changed his name to its Latin equivalent "Benedict", thereafter working as a lens-grinder and tutor by day, and philosopher by night.

In 1676, Descartes, in his "Of the Soul", part five of his *Ethics*, presented his final views on the matter of the soul.

Religion | Atheism

In 1670, Spinoza anonymously published a treatise on theology. [5] In 1921, German-born American Albert Einstein, following his arrival in New York, a rabbi sent him a telegram asking: "Do you believe in god" to which he famously replied: [4]

> "I believe in Spinoza's god, who reveals himself in the orderly harmony of what exists."

The gist of Spinoza's views of god are that miracles were seen by only those who wanted to see them; that if God had laws, there were inherent in natural laws; that there was no afterlife; that knowledge of nature was knowledge of God; and that the only rational language which to describe the universe was the language of mathematics. [5]

Spinoza's belief system is notoriously difficult to label. Christianity historian Geoffrey Blainey (2011) refers to Spinoza as probably the first "semi-atheist" to announce himself in a Christian land in the modern era. [17]

> "Spinoza does not prove the existence of god. Being is god. If others denounce him as an atheist for this, I wish to exalt him."
>
> — Johann Goethe (c.1810), response to a book that labeled Spinoza as an atheist [18]

Spinoza's general religion has always tended to be labeled by the equation "God = Nature" or "Nature = God" or something along these lines.

In 1661, Spinoza published a *Short Treatise on God*.

Influences

Spinoza is known to have studied Francis Bacon, Rene Descartes, Euclid, and as many have supposed Giordano Bruno, though there is no evidence of the latter.

Bruno | Conatus

With regard to Spinoza's psychology and ethics, the idea of the "conatus", or the theory of striving to preserve in being, extended to all finite things, organic and inorganic, and even the term "conato de conservarsi" itself are said to be derived from or influenced by Giordano Bruno (1548-1600). [12] Translator W.H. White (1953), however, comments in footnote that despite striking parallel passage between the two "there is no direct evidence that he actually read Bruno". [14]

Descartes

Much of Spinoza's work is said to have been, in part, responses to difficulties in the work of French philosopher Rene Descartes (1596-1650), whose aim was to overthrow church-endorsed authority of Aristotle in favor of a new epistemology and metaphysics that would serve as the foundation for a new mechanistic and mathematized approach to the natural world. [10] Descartes was thirty-seven years old when Spinoza was born (synthesized), had he recently moved to Holland, and died (analyzed) the when Spinoza was seventeen. The topic of Spinoza's first published work was *The Principles of Descartes' Philosophy*.

Causality

In the third book of his *Tractatus Theologico-Politicus*, Spinoza states the following in respect to why things happen:

> "All things happen according to the laws of nature."

The following is one dismantling Aristotle's famed final cause:

> "Nature has not fixed aim in view and all final causes are merely fabrications of men."

(add)

Goethe

Spinoza's morality philosophy was said to have been very influential to German polyintellect Johann Goethe, in regards to his 1808 physical chemistry based morality system, as presented in his 1809 *Elective Affinities*. [1] According to German Goethean scholar Herman Grimm, Spinoza's manner of treating human relations, had opened the way to the latter views of Goethe and Friedrich Schiller who, in their *circa* 1796 correspondences, compared humans to elements that attract or repel one another without any exercise of "will" in the matter. [2] In regards to Spinoza's view of morality, and its possible influence on Goethe's physical chemistry morality theory, Goethe writes in his 1814 autobiography *Poetry and Truth*:

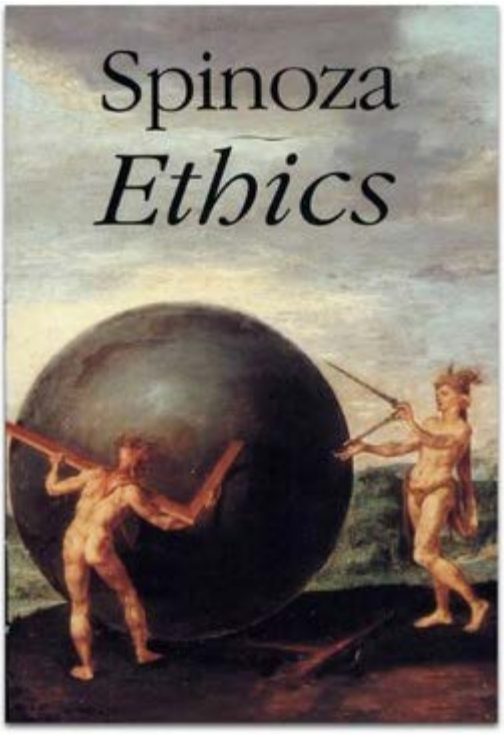

A 2001 edition of **Spinoza**'s *Ethics*, the cover showing Dutch painter Maarten Heemskerck's c.1550 "Geometry", illustrating Spinoza's aim of reformulating human ethics geometrically, or using proofs. [11]

> "After seeking through the world in vain, to find a means of cultivation for my unusual nature, I at last fell upon the *Ethics* of this philosopher. If would be impossible for me to render an account of how much I drew from my perusal of the work itself and how much I myself read into it. Enough that I found in it a sedative for my passions, and that it seemed to open out for me a free and boundless view of both the sensible and the moral world. But what especially riveted me to him, was the utter disinterestedness, which glowed in his every sentence."
>
> — Johann Goethe (1814), retrospect commentary on finding Spinoza's *Ethics* in 1774-75 [3]

In other words, Goethe, in Spinoza, may have intuited the some of the preliminaries of the physical chemistry morality system that he eventually comes to present in *Elective Affinities*.

Will

On the subject of "will", Spinoza is said to have criticized Rene Descartes' dualism position, and, in propositions 48-49 of his *Ethics*, summarized as follows: [6]

> "There is in the mind no absolute faculty of willing or not willing but only particular volitions like this or that affirmation or this or that negation. Will and understanding are one and the same thing. Ideas are not dumb figures traced on a canvas; the assumption that they are is what prevents our seeing that every idea inasmuch as it is an idea contains affirmation or negation. There is not in the mind a will absolute and free; but the mind is so conditioned as to be caused to will this or that, by some cause which is determined by other cause, and this by another and so to infinity. So then the relation of the understanding and the will to this or that idea, to this or that volition, is that of stoniness to this or that stone, or that or humanness to Peter or to Paul. Will cannot be called 'free cause', but only 'necessary cause'. The will is nothing else than a manner of thinking just as is the understanding. Men think themselves free, because they are conscious of their volitions and of their desires and are oblivious to the causes which dispose them do desire and to will."

This last part, i.e. "men think themselves free", seems to have been paraphrased into Goethe's famous P2:C5 quote on freedom:

> "None are more hopelessly enslaved than those who falsely believe they are free."

In another place:

> "**Spinoza** says that if a stone which has been catapulted though the air had consciousness, it would think that it was flying of its own will. I only add that the stone would be right. That catapulting is for the stone what the motive is for me."
>
> — Arthur Schopenhauer (1819), *The World as Will and Representation* (pg. #); cited by David Skrbina (2017), in *Panpsychism in the West* (pg. 142)

(add)

Education

At an early age, he was distinguished for his great capacities, and was said to have been strongly impressed by the following maxim of Rene Descartes:

> "Nothing ought to be received as truth until it has been proved by good and solid reasons."

A portion of **Spinoza**'s study room.

Spinoza, as a young man, ran with a crowd who were admirers of Descartes, but he personally admired Giordano Bruno.

He was an accomplished Latin and Greek scholar, well-versed in the classic and ancient systems of philosophy, and had studies mathematics, algebra, physics, chemistry, optics. Spinoza spoke Portuguese, German, Latin, and Hebrew.

At one point he started training for a rabbinical career, but being short on money took up a career as a lens grinder, wherein, during the course of his work, he met and advised both Christiaan Huygens and Gottfried Leibniz. [5]

Influence

Goethe and Einstein aside, Spinoza was said to have influence on Gotthold Lessing, Novalis, George Eliot, Mary Shelley, Somerset Maugham, and Jorge-Luis Borges. [10] Likewise, in 1854 French historian-philosopher Hippolyte Taine, in his "Essay on Livy" submitted to the French Academy, expressed his view that according to Spinoza, a human's place in relation to nature, is not that of an empire within an empire, but of a part in a whole; that a person's inner nature or being is subject to laws in the same way as the external world; moreover, that there is a dominate principle, a ruling faculty, which regulates thought and imparts an irresistible in inevitable impulse to the human machine. [11]

Quotes | On

The following are incidences of praise and or tribute:

> "**Spinoza's** *Treatise on Theologico-Politics*, has for its main objective the destruction of all religions, particularly the Jewish and Christian religions – which he thinks are altogether invented for public utility – and in their place to introduce atheism, libertarianism, and freedom, based on rational that people will keep themselves virtuous, not in the hope of compensation after death, but simply for the sake of excellency of virtue itself."
>
> — Jean-Baptiste Stouppe (c.1660), *La Religion des Hollandais* [21]

“All our modern philosophers, though often perhaps unconsciously, see through the glasses which **Spinoza** ground.”

— Heinrich Heine (c.1835), *Publication* [22]

“I am really amazed, really delighted! I have a precursor, and what a precursor! I hardly knew **Spinoza**: what brought me to him now was the guidance of instinct. Not only is his whole tendency like my own, to make knowledge the most powerful passion, but also in five main points of his doctrine I find myself; the most abnormal and lonely thinker is closest to me in these points precisely: he denies free will, purposes, the moral world order, the nonegoistical, evil; of course the differences are enormous. In summa: my solitariness which, as on the very high mountains, has often made me grasp for breath and lose blood, is now at least a solitude for two.”

— Friedrich Nietzsche (c.1885), comment to close friend in his later yeas [15]

“The principle of plenitude had latent in it a sort of absolute cosmical determinism which attains its final systematic formulation and practical application in the *Ethics* of **Spinoza**.”

— Arthur Lovejoy (1933), *The Great Chain of Being* (pg. 54)

Quotes | By

The following noted Spinoza quotes:

“We must bear in mind that the terms good and evil are only applied relatively, so that the same thing may be called both good and bad according to the relations in view, in the same way as it may be called perfect or imperfect. Nothing regarded in its own nature can be called perfect or imperfect; especially when we are aware that all things which come to pass, come to pass according to the eternal order and fixed laws of nature.”

— Benedict Spinoza (1662), “On the Improvement of the Understanding: Treatise on the Emendation of the Intellect” (Ñº) (Ñº)

“The man who endeavors to find out the true causes of miracles, and who desires as a wise man to understand nature, and not to gape at it like a fool is generally considered and proclaimed to be a heretic and impious by those whom the vulgar worship as the interpreters both of nature and of the gods. For these know that if ignorance be removed, amazed stupidity—the sole ground on which they rely in arguing or in defending their authority—is take away also.”

— Benedict Spinoza (c.1660) [19]

“I call him free who is led solely by reason.”

— Benedict Spinoza (c.1660) (Ñº)

“To take appeal to the will of god is to take refuge in the asylum of ignorance.”

— Benedict Spinoza (c.1660)

“All things are animate in varying degrees.”

— Benedict Spinoza (1674), “Letter to Schuller”; cited by David Skrbina (2017), in *Panpsychism in the West* (pg. 142)

“All noble things are as difficult as they are rare.”

— Benedict Spinoza (1676), *Ethics* [14]

“We must take care not to admit as true anything that is only probable. For when one falsity has been let in, infinite others follow.”

— Benedict Spinoza (c.1670) [16]

“Nothing in nature is by chance. Something appears to be chance only because of our lack of knowledge.”

— Benedict Spinoza (c.1660) (Ñº)

“I have striven not to laugh at human actions, not to weep at them, nor to hate them, but to understand them.”

— Benedict Spinoza (c.1660) (Ñº)

“Everyone should be free to choose for himself the foundations of his creed, and that faith should be judged only by its fruits.”

— Benedict Spinoza (c.1670) (Ñº)

“Nature abhors a vacuum.”

— Benedict Spinoza (c.1670) (Ñº)

“He who seeks equality between unequals, seeks an absurdity.”

— Benedict Spinoza (c.1670) (Ñº)

“The ordinary surroundings of life which are esteemed by men (as their actions testify) to be the highest good, may be classed under the three heads — ‘riches’, ‘fame’, and the ‘pleasures of sense’: with these three the mind is so absorbed that it has little power to reflect on any different good.”

— Benedict Spinoza (c.1670) (Ñº)

“That thing is called free, which exists solely by the necessity of its own nature, and of which the action is

determined by itself alone."

— Benedict Spinoza (c.1670) (Ñº)

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â— Baruch Spinoza – Wikipedia.
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â— Spinoza Quotes – Genius Quotes.

θΔics

In existographies, **Bengt Mansson** (c.1960-) (CR:5) is a Swedish-German theoretical ecologist noted for his 1990 economic thermodynamics chapter on "Thermodynamics and Economics" on the integration of thermodynamics into economics, wherein he seems to view human economic activity from the dissipative systems view and focuses in on the quantity exergy as his variable of study, and mentions the work of the pre-thermodynamics physiocrats along with the early 1970s economic-thermodynamic discussions of Nicholas Georgescu (1986) and Tjalling Koopmans (1977), among others. [1]

His 1993 ecological thermodynamics article "Ecology, Thermodynamics, and H.T. Odum's Conjectures" discusses the work of Howard Odum. [2]

Education

In 1990, Mansson was associated with the Theoretical Ecology (ATO) Research Center Julich, Federal Republic of German. In 2011, Mansson was on the faculty of Karlstad University, Sweden.

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External links

â— Benjt Mansson (faculty) (Swedish → English) – Karlstad University.

θΔics

In literature chemistry, **Benito Galdos** (1843-1920) was a Spanish realism novelist noted for []

Overview

In 1887, Galdos, published his *Fortunata and Jacinta*, which, supposedly, according to Hispanic literature scholar Vernon Chamberlin, is derived or based on the realism philosophy contained in German polymath Johann Goethe's 1809 physical chemistry based *Elective Affinities*. [1] Chamberlin describes Galdos' position as follows: [4]

> "Evidence suggest that Galdos remembered his reading of *Die Wahlverwandtschaften* when he set about to depict determinism in love as one part of his vast panorama of the human life cycle in *Fortunata y Jacinta*."

Although Galdos does not, supposedly, cite *Elective* Affinities directly in his *Fortunat and Jacinta*, he does refer explicitly to not only Goethe, but also to his novel *Werther* and the drama *Faust*, and it is known that he possessed the French translation by Camille Selden (Paris, 1872) of Goethe's *Elective Affinities*. [2]

Galdos' *Fortunata Y Jacinta* together with Spanish novelist Leopoldo Alas' 1885 *La Regenta* (The Judge's Wife) are said to be the most popular and representative novels of Spanish literary realism. [3] Alas, likewise, is said to have based his 1890 *His Only Son* on *Elective Affinities*; some claiming that it is a so-called successor of the former.

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External links

â— Benito Galdos – Wikipedia.

θΔics

In hmolscience, **Benito Mussolini** (1883-1945) was an Italian prime minister, leader of Italy from 1922 to his ousting in 1943, notable for his 1902 to 1904 studies of the works of Friedrich Nietzsche, Vilfredo Pareto, and French engineer-philosopher Georges Sorel, of which, his readings of Pareto in particular, he attributes to his abandonment of socialism. [1]

Mussolini was one of the key figures in the creation of fascism. The ideological basis for fascism came from a number of sources. Mussolini utilized works of Plato (*The Republic*, 380BC), Georges Sorel, Nietzsche, and the socialist and economic ideas of Vilfredo Pareto, to create fascism.

In 1900, Mussolini registered at the University of Lausanne, in their department of social science, to attend courses delivered by Pareto. [4] Intermittently, he attended Pareto's courses and or his lessons up into 1904. [2]

Mussolini regarded Pareto as such a formative influence on his own fascist ideology that he offered to make Pareto a senator in Italy's House of Lords; Pareto, however, owing to his failing health, turned down this offer. [3]

Majorana

In 1937 to 1938, Mussolini became entangled with the famous disappearance of Italian physicist Ettore Majorana, the so-called Italian Paul Dirac. Firstly, in 1937, Majorana applied for a professorship in Palermo; competition for the post, however, is Giovanni Gentile junior, senator Gentile's son; to remedy the situation, the senator Gentile gets Mussolini to appoint Majorana Professor of Theoretical Physics at the University of Naples, in November 1937, supposedly, to Majorana's irritation and or consternation.

Majorana takes up his [diverted] professorship on the 13th January, 1938, and carries out his duties punctually, leading a complete normal life, at least in appearance. But on the 25th March of this same year he sends, from Palermo, a letter to Antonio Carrelli, the director of the Naples Institute of Physics, where he works, in which he says "I have taken a decision which after everything is inevitable". The following day, in his last telegram, he comments how "the sea has rejected me", and is never heard from again. Enrico Fermi then enlists Mussolini's help in carrying out a search for Majorana, to no avail.

See also

â— Adolf Hitler

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External links

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θΔics

In existographies, **Benjamin Franklin** (1706-1790) (IQ:180|#152) (Cattell 1000:45) [RGM:27|1,500+] (Murray 4000:14|T) (Gottlieb 1000:54) [Kanowitz 50:25] (GPE:96) (HD:16) (FA:72) (CR:31) was an American politician, a founding father, scientist, and irreligion philosopher, an oft-ranked universal genius, noted for []

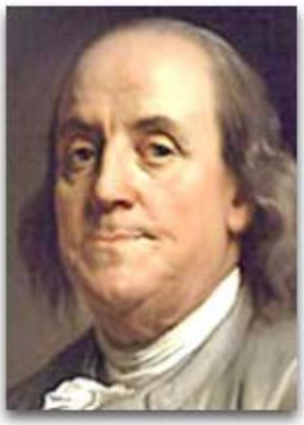

Electricity

In 1746, Franklin showed that a lightening is a discharge of electricity. [1]

In 1749, Franklin invented the "lightening rod" for buildings

In 1752, Franklin had one built (Q) on the steeple of Christ Church in Philadelphia. This provoked theological objection; some of which is recounted as follows:

> "When **Benjamin Franklin** invented the lightning rod, the clergy, both in England and America, with the enthusiastic support of George III, condemned it as an impious attempt to defeat the will of god. For, as all right-thinking people were aware, lightning is sent by god to punish impiety or some other grave sin—the virtuous are never struck by lightning. Therefore, if god wants to strike any one, Benjamin Franklin ought not to defeat his design; indeed, to do so is helping criminals to escape. But bod was equal to the occasion, if we are to believe the eminent Dr. Price, one of the leading divines of Boston. Lightning having been rendered ineffectual by the 'iron points invented by the sagacious Dr. Franklin', Massachusetts was shaken by earthquakes, which Dr. Price perceived to be due to god's wrath at the 'iron points'. In a sermon on the subject he said, 'In Boston are more erected than elsewhere in New England, and Boston seems to be more dreadfully shaken. Oh! there is no getting out of the mighty hand of god'."
>
> — Bertrand Russell (1943), "An Outline of Intellectual Rubbish" [4]

(add)

Library

Franklin's personal library, numbering above 2,000 books, contain things such as William Cowper's poetry and works by Baron d'Holbach, the latter of whom he visited in his Paris salon. (Q)

Theism | Deism | Atheism

Franklin recounts his transition from theism to deism to atheism as follows:

> "I was a scarce fifteen, when doubting by turns of several points, as I found them disputed in the different books that I had read, I began to doubt of revelation itself. Some books against deism fell into my hands. It happened that they wrought an effect in me quite contrary to what was intended by them; for the arguments of the deist, which were quoted to be refuted, appeared to me much stronger than the refutations. I soon became a deist."
>
> — Benjamin Franklin (c.1780) [3]

> "I left town, as a teenager, because, in part, my indiscrete disputations about religion began to make me pointed at with horror by good people as an infidel or atheist."
>
> — Benjamin Franklin (c.1780) [3]

Franklin [HD:16][FA:72], at one point, stayed at the house of agnostic closet atheist David Hume [FA:66]; encouraged

Thomas Paine [FA:81]; and proposed to Anne-Catherine de Ligniville, the widow of Helvetius [FA:42]. [3]

Quotes | On

The following are quotes on Franklin:

> "Those who knew **Benjamin Franklin** will recollect, that his mind was ever young; his temper ever serene; science, that never grows grey, was always his mistress. He was never without an object; for when we cease to have an object we become like an invalid in a hospital waiting for death."
>
> — Thomas Paine (1794), *The Age of Reason* (pg. 130)

Quotes | By

The following are noted quotes by Franklin:

> "If the way to see by faith is to shut the eye of reason, [then] the way to see by 'blind faith' is to cover both eyes."
>
> — Benjamin Franklin (1759); "then" part added by Thims (c.2014) (Q)

> "Lighthouses are more helpful than churches."
>
> — Benjamin Franklin (c.1780) [2]

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External links

● Benjamin Franklin – Wikipedia.

θΔics

In existographies , **Benjamin Gal-Or** (1933-) is an Israeli physicist noted for []

Overview

In 1974, Gal-Or, in his *Modern Developments in Thermodynamics: an Interdisciplinary Collective Treatise*, a multi-author book on topics such as the thermodynamics of animate systems (living systems) of Aharon Katchalsky, thermodynamics in particle physics and astrophysics, among other subjects, in the end chapter of which he presented seven-pages of noted and or historical thermodynamics quotations, selected by Gal-Or, of a number of thinkers, including: Clifford Truesdell, Arthur Eddington, John Wheeler, Henri Poincare, Olivier Beauregard, among others. [1]

Education

Gal-Or completed his BS (1959), MS (1961), and DSc (1964), in what seems to have been in jet propulsion physics, at the Israel Institute of Technology University; becoming a professor there from 1968 to 2001. [2]

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2. Benjamin Gal-Or (overview) – Technion.

Further reading

â— Gal-Or, Benjamin. (1987). *Cosmology, Physics, and Philosophy: Including a New Theory of Aesthetics*. Springer.

External links

â— Benjamin Gal-Or – Facebook.

θΔics

In existographies, **Benjamin Gayle Kyle** (1927-) (CR:14) is an American emeritus chemical engineering professor, noted for []

Overview

In 1988, Kyle, in his "The Mystique of Entropy", speculated on various aspects of the second law in regards to humanity and social science. [3]

In 1999, Kyle revised and reprinted his "The Mystique of Entropy" into the expanded 1999 multi-chaptered essay *Entropy: Reflections of a Classical Thermodynamicist*, which was made as an attached CD-ROM to the 3rd edition of his *Chemical and Process Thermodynamics* textbook, and later posted as an online webpage. In this work, Kyle discusses a number of diverse views, such as of those of English author William Inge (God and entropy), French philosopher Pierre Teilhard (evolution, thermodynamics, and spirituality), American historian Henry Adams (social energy and entropy), Claude Levi-Strauss (entropology), and Nicholas Georgescu (economics and the second law), among others, such as Herman Daly (ecological economics), Jeremy Rifkin (natural resources), Rudolf Arnheim (art), etc. [1]

Kyle's end section, to this chapter, entitled "commentary", makes an attempt to dig out a sort of philosophical insight on how to live by. His suggested equation is:

$$\Delta S \approx 0$$

meaning, in Kyle's view, that one should aim, thermodynamically speaking, to follow a negligible entropy change path ($\Delta S \approx 0$) in the course of one's existence.

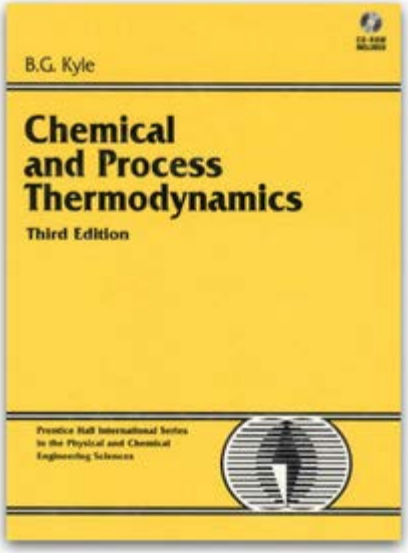

1999 textbook by Kyle containing an attached CD-ROM with the "The Mystique of Entropy" article.

Education

Kyle was a chemical engineering professor at Kansas State University.

Quotes | On

The following are quotes on Kyle:

> "For an extensive review of entropy involvement in a variety of subjects including: social sciences, literature, art, etc., see **Kyle** (1988)."
>
> — Dimitrios Tassios (2013), *Applied Chemical Engineering Thermodynamics* (pg. 212)

See also

â— List of thermodynamics textbooks that include human thermodynamics

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3. Müller, Erich. A. (1998). "Human Societies: a Curious Application of Thermodynamics" (scan) (abstract) *Chemical Engineering Education*, Vol. 1, No. 3, Summer.

External links

â— Kyle, B.G. (Benjamin Gayle) – WorldCat Identities.
â— Benjamin Gayle Kyle (about) – Prabook.com.

In science, **Benjamin Libet** (1916-2007) was an American neuroscientist noted for his 1983 study, and publications to follow, which showed that so-called act of conscious choice or the feeling of the "free will" to choose or intend to do something and actually carry out the intended movement is preceded by electrical activity in the motor cortex some 350 milliseconds before one reports awareness of intention to move or feels that he or she has decided to move. More recent fMRI research has shown that some "conscious" decisions can be predicted or measured up to 10 seconds before they enter awareness, long before the preparatory motor activity detected by Libet. [1] Libet's work is considered as the first scientific disproof of the doctrine or theory of free will.

Libet experiment

In his now-famous 1982 so-called "Libet experiment", six different test subjects as follows: "flex your finger to push the button when you feel like it, and tell us where the hand on the rapidly moving clock is when you decide to do that." The time at which an EEG signal indicating brain activation for movement occurs is set as zero time, the report of awareness of intention to push the button is about 350 milliseconds (0.35 seconds) later, and the actual EKG, the voltage in the finger muscle doing the push, happens about 200 milliseconds later than that. Libet's experimental findings show, in short, that the brain starts working earlier than one is consciousness of choice. The tendency to confuse the two is one of the sources of the illusion of conscious will.

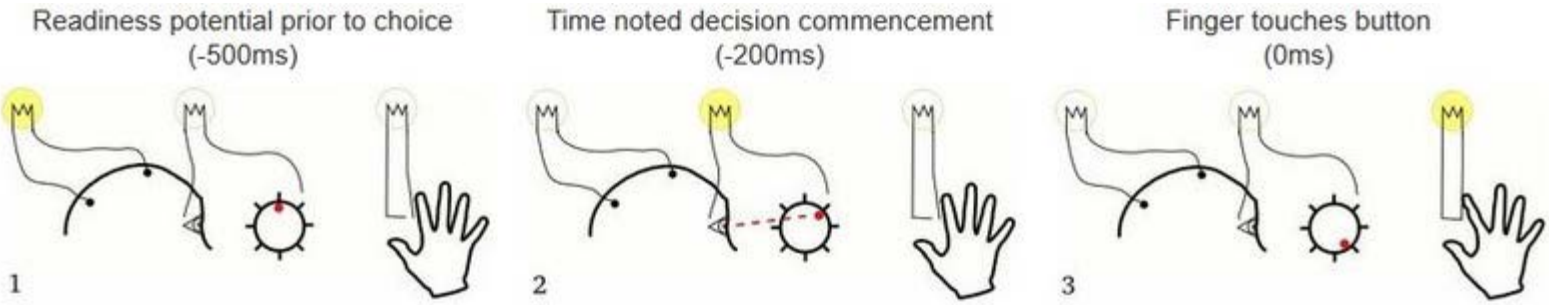

A three step summary of the **Libet's** 1983 study (see: Libet experiment), which finds a three step time demarcated (delayed) mechanism involved in the so-called conscious action of "choice" to perform an "action", both of which being preceded by an unconscious readiness potential change in the matter of the brain; the time of the readiness potential, in turn, preceded by electromagnetic sensory perception input (not part of the experiment).

Quotes

The following are noted quotes:

> "I did not embark on experiments on consciousness in alert people until after I had obtained the security of academic tenure."
>
> — Benjamin Libet (c.1990), comment to Francis Crick [2]

References

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2. Crick, Francis. (1994). *The Astonishing Hypothesis: the Scientific Search for the Soul* (pg. 228). Simon and Schuster.

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External links

- Benjamin Libet – Wikipedia.
- Neuroscience of free will – Wikipedia.

θΔics

In existographies, **Benjamin Thompson** (1753-1814) (IQ:#|#) (Cattell 1000:571) (EPD:F2) (GPE:#) (CR:41), aka Count Rumford, was an American-born English physicist noted for his 1798 cannon-boring experiments (compare: ice rubbing experiment, 1799), which provided data for the first calculation of the mechanical equivalent of heat, and which laid question to the then-established caloric theory, as discussed in his famous "An Inquiry Concerning the Source of Heat which is Excited by Friction". [1]

Overview

In 1787, Thomson reacted to reading about Scottish physician-chemist George Fordyce's *circa* 1785 experiments in which he measured a gain in the weight of water after it was frozen, by repeating Fordyce's experiment to see for himself if this was in fact the case. [4]

In 1799, Thompson, in his "Inquiries Concerning the Weight Ascribed to Heat", weighted a block of ice just before it began to melt, and then after it had entirely melting, finding no significant change of weight, even though a considerable amount of latent heat (aka caloric particles, in Lavoisier's view) had entered it; he therefore positioned this as evidence that heat is weightless. [5]

Name

Thompson was born in rural Woburn, Massachusetts. At the age of nineteen he married a wealthy widow, fourteen years his senior, from a section of the New Hampshire town of Concord that had formerly been called Rumford, hence his surname. [3]

Influences

Thompson promoted English physician-physicist Thomas Young to be lecturer at the Royal Institute, and it was in these lecturers that Young, using Thompson's cannon-boring data, gave the first modern definition of heat and also of energy.

Quotes | On

The following are quotes on Rumford:

> "**Rumford** has informed us himself that he should probably have remained in the modest condition of his ancestors if the little fortune which they had to leave him had not been lost during his infancy. Thus, **like many other men of genius**, a misfortune in early life was the cause of his subsequent reputation. His **father died young** [age 2]. A second husband removed him from the care of his mother, and his grandfather, from whom he had everything to expect, had given all he possessed to a younger son, leaving his grandson almost penniless. Nothing could be more likely than such a destitute condition to induce a premature display of talent."
>
> — Georges Cuvier (c.1815), *Publication* (pg. 9)

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(b) Thompson, Benjamin. (1798). "An Inquiry Concerning the Source of Heat which is Excited by Friction". *Philosophical Transactions.* Vol. XVIII, pg. 286.
(c) Thompson, Benjamin. (1798). "An Inquiry Concerning the Source of Heat which is Excited by Friction" in *The Complete Works of Count Rumford*, (pgs. 469+). Oxford University Press, 1870.
3. Baeyer, Hans C. von (1999). *Warmth Disperses and Time Passes - the History of Heat*, (pg. 6). New York: The Modern Library.
4. (a) Thompson, Benjamin. (1799). "An Inquiry Concerning the Weight Ascribed to Heat", Royal Society of London.
(b) Becker, Barbara J. (2000). *Thermodynamics: Count Rumford and Sally Thompson: Student Reader* (pg. 3). Kendall Hunt.

5. (a) Thompson, Benjamin. (1799). “Inquiries Concerning the Weight Ascribed to Heat” (pg. 381), *Philosophical Transactions of the Royal Society*.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 102). Cornell University Press.

Further reading

â— Greenfield, Susan and Brown, G.I. (2001). *Count Rumford: the Extraordinary Life of a Scientific Genius: Scientist, Soldier, Statesman, Spy*. Sutton.

External links

â— Benjamin Thompson – Wikipedia.

θΔics

In hmolscience, **Benjamin Ward** (c.1935-) is an American economist noted for []

Overview

In 2016, Ward, in his *Dionysian Economics: Making Economics a Scientific Social Science*, starting with Friedrich Nietzsche's model that in social things there are two opposing forces, an Apollonian force, representing order and reason, and a Dionysian force (see: WP:1067), representing chaos and energy, argues that economics needs to begin using the scientific method, specifically prediction and replication, e.g. touching on the success of Gibbs free energy in biology (see: equation 133), along the way citing: Lucretius, Leon Walrus, Francis Edgeworth, Paul Samuelson, George Glider, Philip Mirowski, among others, and therein seems to attempt to push for the revival of mathematical economics in mainstream economics, or something to this effect.

Quotes | By

The following are quotes by Ward:

> "Mirowski, in his *Machine Dreams: Economics Becomes a Cyborg Science* – a work well documented – writes as an angry man who at times overstates a plausible case by not considering alternative explanations of the trajectory of the discipline."
>
> — Benjamin Ward (2016), *Dionysian Economics* (pg. 4)

References

1. Ward, Benjamin. (2016). *Dionysian Economics: Making Economics a Scientific Social Science*. Springer.

External links

â— Benjamin N. Ward (faculty) – University of California, Berkeley.

θΔics

In Egyptian mythology, **bennu**, benu, or "benu bird", from root Bn, which means 'ascension' or 'to rise' (Ñº), was a confabulous mythical bird, dubbed by Herodotus (450BC) the "phoenix", thought to be the form of the morning new born sun and or the bird that carried the sun on its head each morning in its journey thought the sky.

FIG. 54.
THE BENNÛ (PHOENIX).
(LEPS., "TODT." CH. 83.)
Ptolemaic Papyrus.

Left: the **bennu** bird, aka phoenix, from a Ptolemaic papyrus (c.305-30 BC), the mythical bird thought to be the form of the new born sun, or that which carried the sun at its birth, each day. [1] Right: a depiction of the "**benu bird**" on the Papyrus of Ani version of the Egyptian Book of the Dead. [2]

Overview

The following shows the benu bird carrying the sun disc on its head on a solar bark:

In 1897, Alfred Wiedemann, in his *Religion of the Ancient Egyptians*, devoted a chapter section to the bennu, about which he said the following: [1]

> "The phoenix, Egyptian ***bennu***, which classic and Christian artists often represented as an eagle, was imagined by the Egyptians rather as a heron, and was depicted with two long feathers growing out at the back of its head, and sometimes also with a tuft hanging from its breast. The name *bennu* signifies 'that which revolves' or 'turns back'.
>
> Myths told how the bird was born from the midst of flames which arose from out of the summit of a tree in Heliopolis, and that it was known to men by the beauty of its song, to which even the sun himself love to listen. The phoenix symbolized the morning sun arising out of that fiery glow of dawn which dies away as the new born luminary ascends the sky, and hence was regarded as the bird of Ra. But since the dead sun

was held to become an Osiris and the new Sun to arise from the embalmed body of the old which had been duly brought to Heliopolis, in like manner also the phoenix was supposed to be a form of Osiris in which the god returned to his own country.

Further, as on the death of the sun it was from the Osiris sun that the phoenix sun arose, so it was taught in the case of humanity also that it was from his 'own Osiris' that there sprang the new man of the resurrection, and of this resurrection the phoenix became a symbol from a very early date. Hence, even in funerary texts of the Old Kingdom [c.2500BC] the deceased was likened to the phoenix: later it continued to serve as a symbol of the resurrection, and as such it is mentioned in patristic literature and figures in earliest Christian art."

(add)

Benben

The golden tip of the great pyramids, called the "benben stone", was thought to be the nest of the bennu, and or the location of its morning rising.

Quotes

The following are related quotes:

"The next representation [chapter 17; plate 7 (page 46)] [image segment #6] is of a heron standing before an offering-stand with a flower on top. The accompanying caption identifies this bird as ***benu*** 'the heron', a Heliopolitan deity associated with the beginnings of creation as a manifestation of Atum, or Re [Ra] as creator deity. The benu is often described as the 'Egyptian phoenix', an error which may derive from Herodotus, who has transmitted a faulty description of a legend he claimed to have heard from priests of Heliopolis. In the Egyptian legends, however, the benu is not reborn from his ashes after a fiery death; rather, the benu made his appearance on the primordial mound when the land emerged from the water, bringing the light with him, a concept fundamental to Heliopolitan religion. As an example of how puzzling the glosses in the accompanying text can be, the benu is said to be Osiris in one explanation and Osiris' corpse in the other, two associations the benu does not seem to have outside this chapter."

— Ogden Goelet (1994), "Commentary on the Corpus of Literature and Tradition Which Constitutes the Egyptian Book of the Dead, the Book of Going Forth by Day" (image, pg. 46; text, pg. 169) [2]

References

1. (a) Wiedemann, Alfred. (1878). "Article", *Aewg. Zeit* (pg. 93).
(b) Wiedemann, Alfred. (1897). *Religion of the Ancient Egyptians* (bennu, pg. 193). Publisher.
2. Faulkner, Raymond. (1972). *The Egyptian Book of the Dead: the Book of Coming Forth by Day: Complete Papyrus of Ani, Featuring Integrated Text and Full-Color Images* (translator: Ogden Goelet; Preface: Carol Andrews; Introduction: Daniel Gunther; Foreword: James Wasserman) (Amz) (benu bird, pg. 49, plate 7-B). Chronicle Books, 2015.

External links

â— Bennu – Wikipedia.

θΔics

In existographies, **Benoit de Maillet** (1656-1738) (IQ:150|#570) was a French natural philosopher, diplomat, and proto-evolution theorist, noted for []

Overview

In 1732, Maillet completed *Telliamed*, his surname "de Maillet" in reverse, based on manuscripts written in the previous ten years, albeit published posthumously in 1748, in impartial form, and full form in 1755, wherein he posited, based on the fact that iron rings of ancient moored ships now sat in the desert in the ruins of Memphis, that the earth could not have been created instantaneously, as the Bible decreed, but rather was 2 billion years old, based on the datum that the sea was receding at a rate of three inches per century, and that all land creatures originally derived from sea-based human-like creatures. [1]

These types of ideas, supposedly, are found represented, without citation, in Francesco Soldini's 1776 *De anima brutorum commentaria*, as shown below: (Ñº)

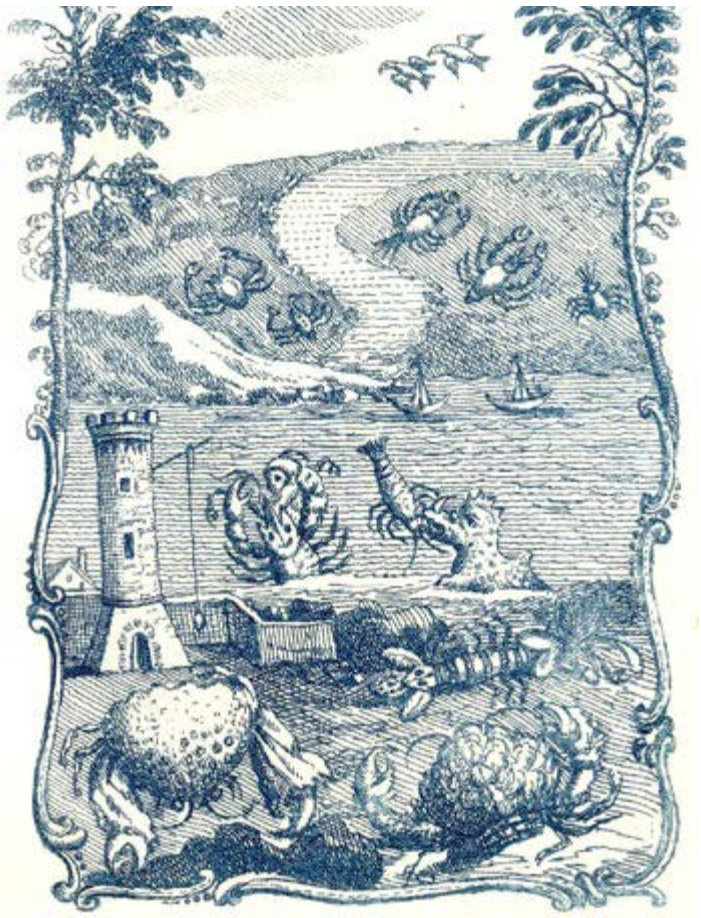

Maillet proposed that life began in the water in the form of minuscule seeds that joined together to create all aquatic forms, from which all terrestrial and winged creatures were then derived. In his opinion, all plants and animals would have analogous examples among the aquatic specimens.

Influence | On

Maillet's *Telliamed* was part of Voltaire's personal library. (Ñº) Some of Maillet's account of things are found in the first three volumes of Buffon's *Natural History*.

References

1. (a) de Mallet, Benoit. (1732). *Telliamed: Conversations between and an Indian Philosopher and a French Missionary*

on the Diminution of the Sea, the Formation of the Earth, the Origin of Man, etc. Publisher, 1755.
(b) La Mettrie, Julien. (1751). *Machine Man and Other Writings: Treatise on the Soul, Man as Plant, The System of Epicurus, Anti-Seneca or the Sovereign Good, Preliminary Discourse* (translator and editor: Ann Thomson) (pg. xx). Cambridge University Press, 1996.
(c) Scott, Michon. (2012). "Benoit de Maillet" (Ñº), StrangeScience.net.
2. La Mettrie, Julien. (1751). *Machine Man and Other Writings: Treatise on the Soul, Man as Plant, The System of Epicurus, Anti-Seneca or the Sovereign Good, Preliminary Discourse* (translator and editor: Ann Thomson) (pg. xx). Cambridge University Press, 1996.

External links

â— Benoit de Maillet – Wikipedia.

θΔics

In existographies, **Benoit Mandelbrot** (1924-2010) (CR:11) was a Polish-born French-American mathematician and polymath noted for []

Information

See main: Thermodynamic information fallacy

In 1961, Tribus was an audience participation in the April MIT "a new way to derive thermodynamics based on information theory" seminar by American engineer Myron Tribus, during which time Mandelbrot quickly attacked the MaxEnt interpretation, saying famously: [1]

> "Everyone knows that Shannon's derivation is in error."

American electrical engineer Claude Shannon was in residence at MIT that week, so naturally enough Tribus went to see him. Shannon, according to Tribus, "was immediately able to dispel Mandelbrot's criticism, but went on to lecture me on his misgivings about using his definition of entropy for applications beyond communication channels." [1]

Thermodynamics

Mandelbrot, at some point, possibly stirred by the Tribus lecture, produced a study entitled "Thermodynamics of Discourse". [2]

Mandelbrot, particularly in his 1962 thermodynamics work, on a generalized description of the temperature of an isolated system, seems to have been sufficiently influenced by Hungarian physicist Leo Szilard and American engineer Willard Gibbs. [3]

Quotes | By

The following are noted quotes:

> "Some existing models of income distribution considered as 'thermodynamic' theories. There is a great temptation to consider the exchanges of money which occur in economic interaction as analogous to the exchanges of energy which occur in physical shocks between gas molecules. In the loosest possible terms, both kinds of interactions 'should' lead to 'similar' states of equilibrium. That is, one 'should' be able to explain the law of income distribution by a model similar to that used in statistical thermodynamics: many authors have done so explicitly, and all others of whom we know have done so implicitly."
>
> — Benoit Mandelbrot (1960) "The Pareto-Levy Law and the Distribution of Income" [4]

See also

- Neumann-Shannon anecdote

References

1. Tribus, M. (1998). "A Tribute to Edwin T. Jaynes". In *Maximum Entropy and Bayesian Methods, Garching, Germany 1998: Proceedings of the 18th International Workshop on Maximum Entropy and Bayesian Methods of Statistical Analysis* (pgs. 11-20) by Wolfgang von der Linde, Volker Dose, Rainer Fischer, and Roland Preuss. 1999. Springer.
2. Malina, Frank J. (1979). *Visual Art, Mathematics, and Computers: Selections from the Journal Leonardo* (pg. 30). Pergamon Press.
3. McEvoy, Paul. (2002). *Classical Theory* (pg. 254). MicroAnalytix.

4. (a) Mandelbrot, Benoit. (1960). “The Pareto-Levy Law and the Distribution of Income” (abs), *International Economics Review*, 1:79.
(b) Chakraborti, Anirban. (2011). “Opinion formation in the Kinetic Exchange Models in France” (O), Galam SocioPhysics Conference, Paris.
(c) Goswami, Sanchari and Chakraborti, Anirban. (2015). “Kinetic Exchange Models in Economics and Sociology”, in: *Nonlinear Maps and Their Applications: Selected Contributions from NOMA* (editors: Ricardo Lopez-Ruiz, Danièle Fournier-Prunaret, Yoshifumi Nishio, Clara Gracio) (§4:69-; quote, pg. 71). Springer.

Videos

- Work on thermodynamics in Geneva – WebOfStories.com.

External links

- Benoit Mandelbrot – Wikipedia.

θΔics

In mononyms, **Bergman** (CR:188) is the surname of Swedish chemist Torbern Bergman (1735-1784); citation of his name tends to be in reference to his 1775 *A Dissertation on Elective Attractions*.

Related | Articles

The following are the Bergman-related articles:

- Bergman's affinity table
- Bergman's chemical signs explained
- Bergman's reaction diagrams

Quotes

The following are related quotes:

> "The moral symbols of the natural sciences are the elective affinities discovered and employed by the great **Bergman**."
>
> — Johann Goethe (1809), comment to Friedrich Riemer, Jul 24

> "Goethe's usage of the term 'elective affinity', culled from **Bergman**'s 1775 *De Attractionibus Electivis* (German translation, 1785), referred to the tendency of certain chemical species to form pairs. When extended to the sphere of interpersonal relationships, as is done in Goethe's novel, this has implications for the view on the human as such. If persons behave like chemical species, their behavior must to some extent be pre-determined, with no room for free will. Goethe's thinking on these matters must be viewed in relation to Schelling's philosophy of nature, in which the sphere of nature and the sphere of human consciousness are seen as continuous."
>
> — Frode Pedersen (2011), "Demonic Affinities: On Goethe's *Die Wahlverwandtschaften*" [1]

> "**Bergman** was to Goethe, as Gibbs is to Thims."
>
> — Libb Thims (2015), mental synopsis note arisen amid writing of posthumous genius page, 1:39PM CST Nov 9

References

1. Pedersen, Frode H. (2011). "Demonic Affinities: On Goethe's *Die Wahlverwandtschaften*" (abs), Literature and Chemistry: Elective Affinities Conference, Bergen University, Oct 27-28.

θΔics

In affinity chemistry, **Bergman's chemical signs explained** is an appendix table to Swedish chemist Torbern Bergman's 1775 physical chemistry textbook *A Dissertation on Elective Attractions*, explaining the various chemical symbols and species found in his affinity table (see: Bergman's affinity table) and affinity reaction diagrams (see: Bergman's reaction diagrams). [1]

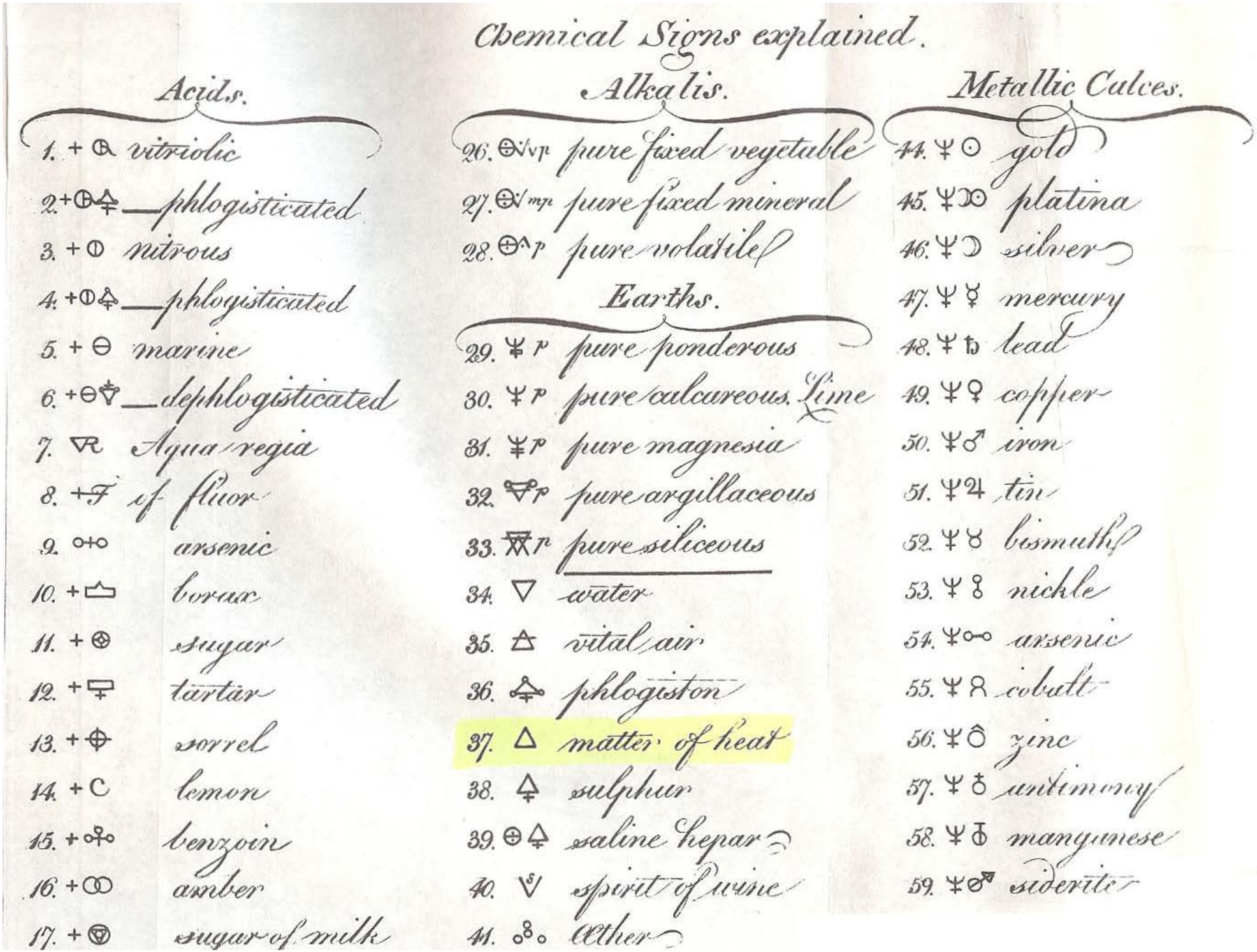

Chemical Signs explained.

Acids.		Alkalis.		Metallic Calces.	
1. +	vitriolic	26.	pure fixed vegetable	44.	gold
2. +	phlogisticated	27.	pure fixed mineral	45.	platina
3. +	nitrous	28.	pure volatile	46.	silver
4. +	phlogisticated	**Earths.**		47.	mercury
5. +	marine	29.	pure ponderous	48.	lead
6. +	dephlogisticated	30.	pure calcareous. Lime	49.	copper
7.	Aqua regia	31.	pure magnesia	50.	iron
8. +	of fluor	32.	pure argillaceous	51.	tin
9.	arsenic	33.	pure siliceous	52.	bismuth
10. +	borax	34.	water	53.	nickle
11. +	sugar	35.	vital air	54.	arsenic
12. +	tartar	36.	phlogiston	55.	cobalt
13. +	sorrel	37.	matter of heat	56.	zinc
14. +	lemon	38.	sulphur	57.	antimony
15. +	benzoin	39.	saline hepar	58.	manganese
16. +	amber	40.	spirit of wine	59.	siderite
17. +	sugar of milk	41.	æther		

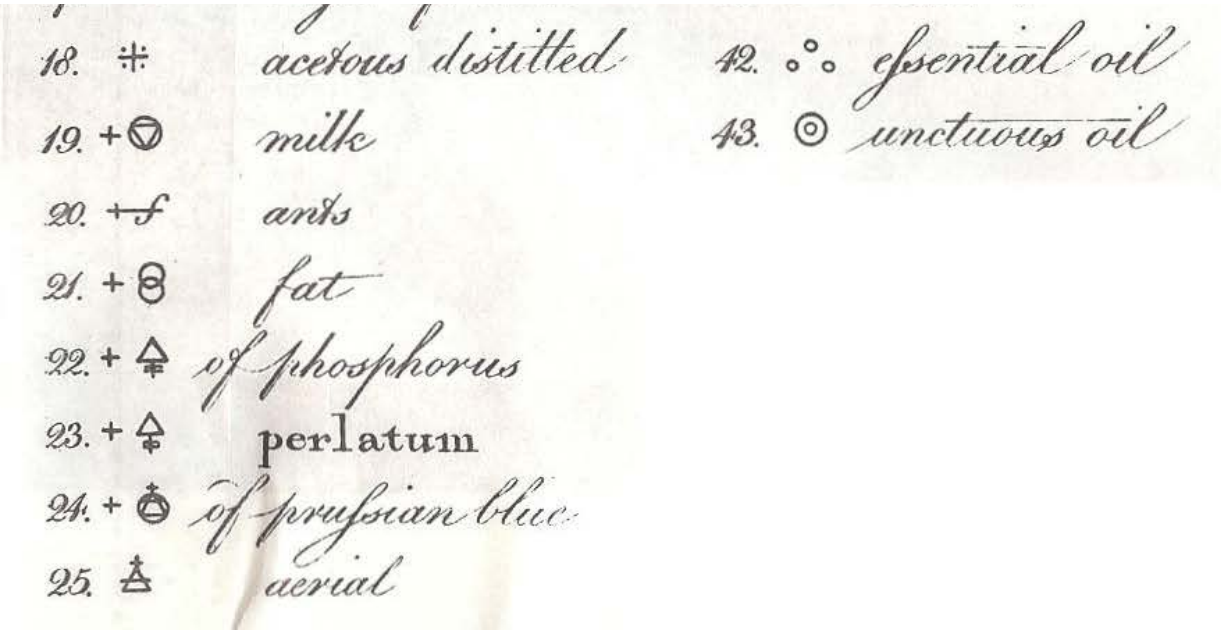

Discussion

Bergman's table was the largest affinity table ever made. The table formed the basis of logic to the German polymath Johann Goethe's 1809 human affinity table. In the decades to follow the publication of Bergman's table, it became apparent that reactions were temperature dependent and that one table would have to be made for each degree on the temperature scale. This impediment eventually gave way to the construction of free energy tables, after it was shown in German physicist Hermann Helmholtz's 1882 treatise *The Thermodynamics of Chemical Processes*, that the measure of affinity is equal to the negative of the free energy change for the given reaction or set of reactions in a system.

References

1. Bergman, Torbern. (1775). *A Dissertation on Elective Attractions*. London: Frank Cass & Co.

θΔics

In affinity chemistry, **Bergman's affinity table** is a 1775, 59-column 50-row, affinity table, found in appendixes (as attached foldout sheets) in the chemistry textbook *A Dissertation on Elective Attractions*, by Swedish chemist Torbern Bergman, showing the majority of the main chemical reactions, known at the time, in the "wet way" (aqueous reactions) and "dry way" (heated reactions), ordered according to affinity preference. The table is shown below and below the table is Bergman's "chemical signs explained" table: [1]

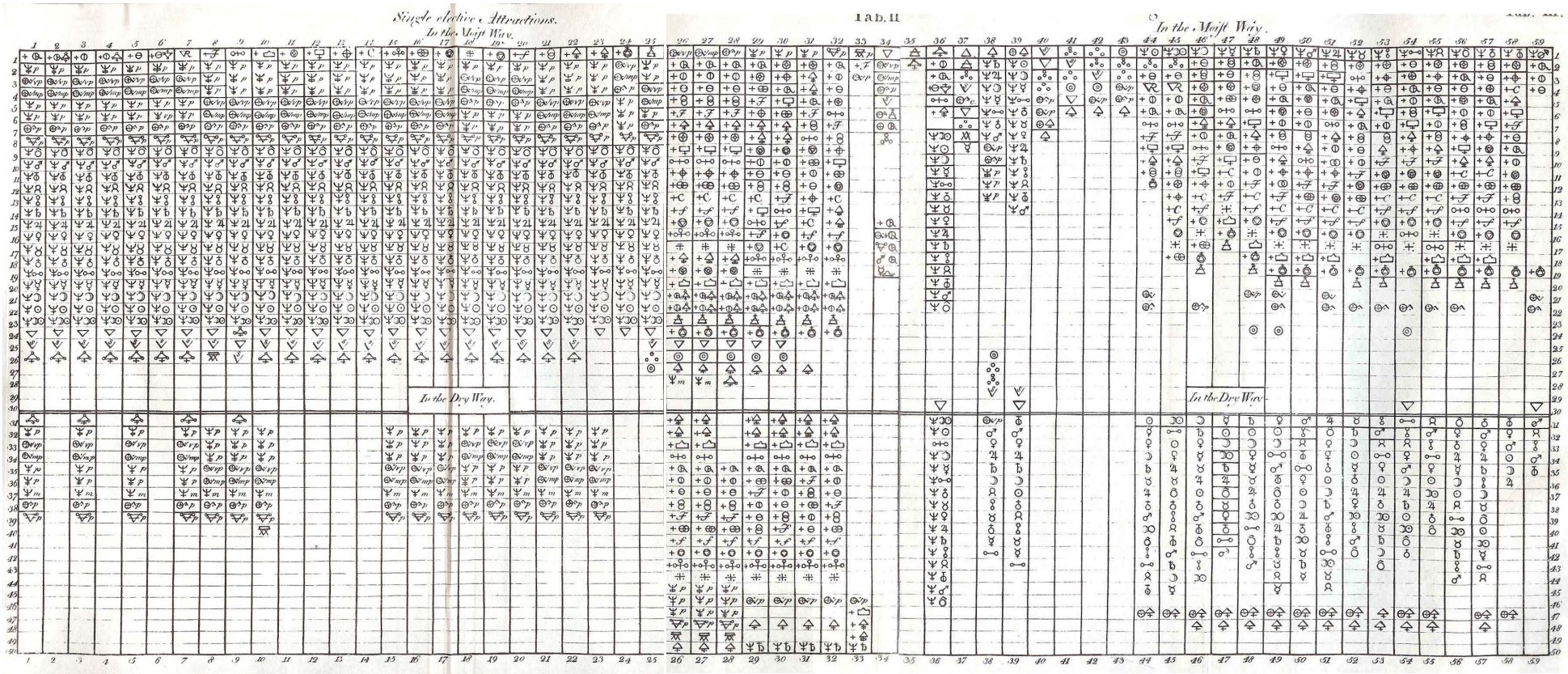

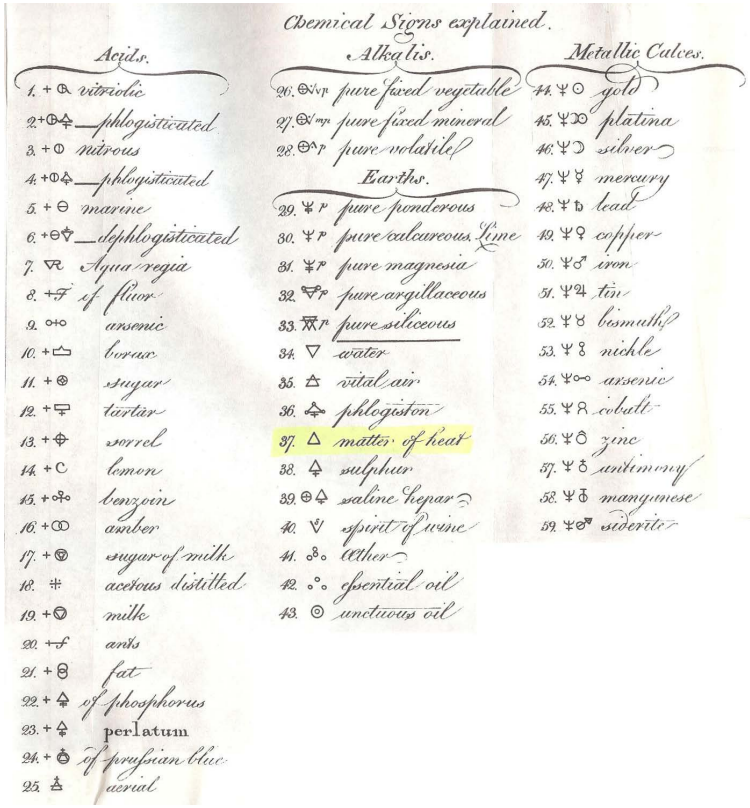

Chemical Signs explained.

Acids.	Alkalis.	Metallic Calces.
1. + vitriolic	26. pure fixed vegetable	44. gold
2. + phlogisticated	27. pure fixed mineral	45. platina
3. + nitrous	28. pure volatile	46. silver
4. + phlogisticated	**Earths.**	47. mercury
5. + marine	29. pure ponderous	48. lead
6. + dephlogisticated	30. pure calcareous Lime	49. copper
7. Aqua regia	31. pure magnesia	50. iron
8. + of fluor	32. pure argillaceous	51. tin
9. arsenic	33. pure siliceous	52. bismuth
10. + borax	34. water	53. nickle
11. + sugar	35. vital air	54. arsenic
12. + tartar	36. phlogiston	55. cobalt
13. + sorrel	37. matter of heat	56. zinc
14. + lemon	38. sulphur	57. antimony
15. + benzoin	39. saline hepar	58. manganese
16. + amber	40. spirit of wine	59. siderite
17. + sugar of milk	41. æther	
18. acetous distilled	42. essential oil	
19. + milk	43. unctuous oil	
20. + ants		
21. + fat		
22. + of phosphorus		
23. + perlatum		
24. + of prussian blue		
25. aerial		

See also

- Bergman's reaction diagrams

Discussion

Bergman's table was the largest affinity table ever made. The table formed the basis of logic to the German polymath Johann Goethe's 1809 human affinity table. In the decades to follow the publication of Bergman's table, it became apparent that reactions were temperature dependent and that one table would have to be made for each degree on the temperature scale. This impediment eventually gave way to the construction of free energy tables, after it was shown in German physicist Hermann Helmholtz's 1882 treatise *The Thermodynamics of Chemical Processes*, that the measure of affinity is equal to the negative of the free energy change for the given reaction or set of reactions in a system.

References

1. Bergman, Torbern. (1775). *A Dissertation on Elective Attractions*. London: Frank Cass & Co.

θΔics

In affinity chemistry, **Bergman's affinity reaction diagrams** are a set of 64 affinity reactions, diagrammed in the Cullen reaction diagram style, of various wet and dry reactions, as published in Swedish chemist Torbern Bergman's 1775 chemistry textbook *A Dissertation on Elective Attractions*, table I, as shown below (2625x1698px). Bergman's reaction diagrams are themselves derived from Cullen's reaction diagrams, both of which are precursors to modern chemical equations. Of note these 64 reactions served as the theoretical basis to the 36 human chemical reactions presented in German writer Johann Goethe's 1809 *Elective Affinities*. [2]

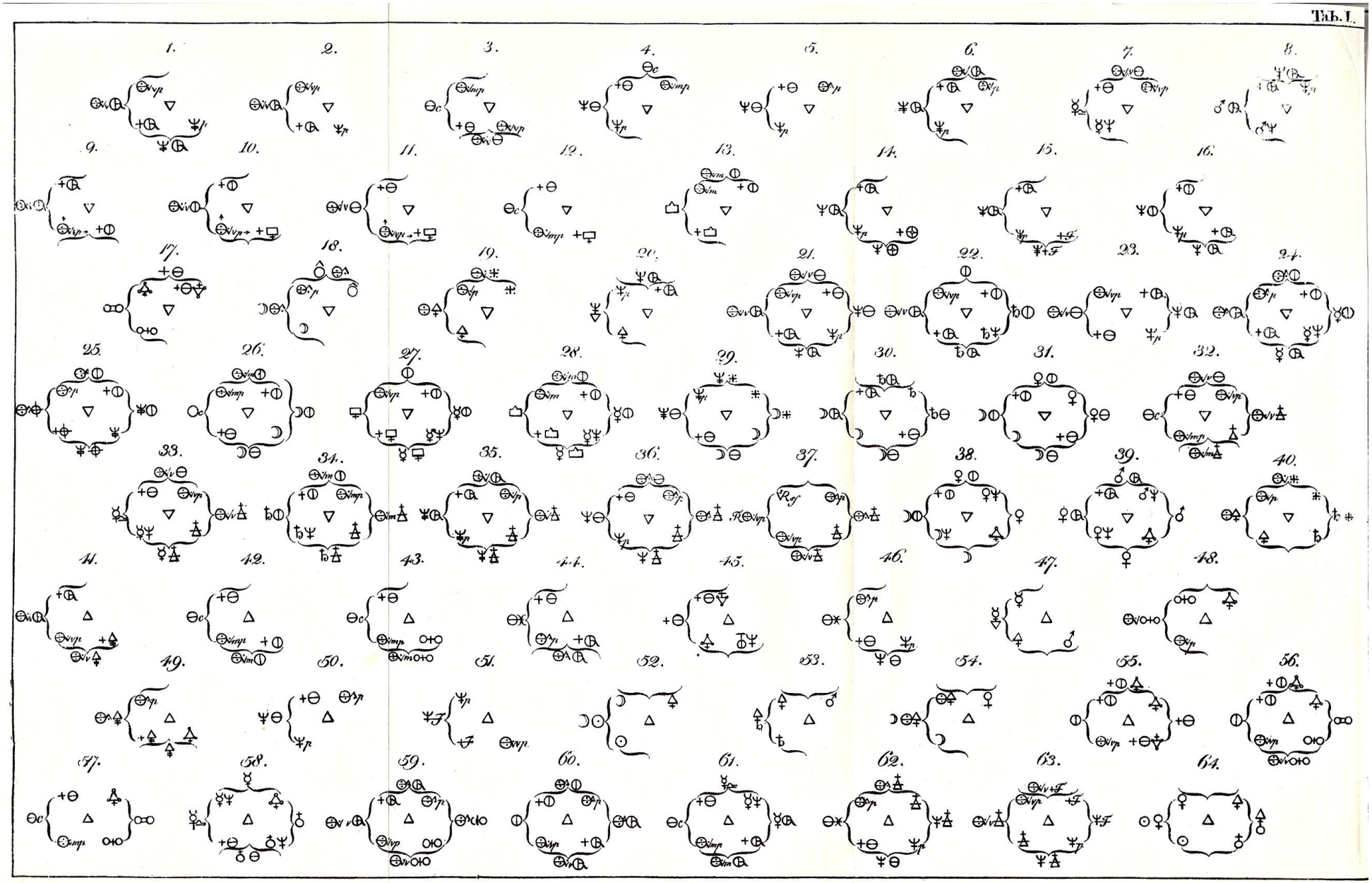

Table I from Torbern Bergman's *A Dissertation on Elective Attractions.*

References

1. Bergman, Torbern. (1775). *A Dissertation on Elective Attractions*. London: Frank Cass & Co.
2. (a) Adler, Jeremy. (1987). "Eine fast magische Anziehungskraft". Goethe's "Wahlverwandtschafte" und die Chemie seiner Zeit ("An almost Magical Attraction"). Goethe's Elective Affinity and the Chemistry of its Time), Munich.
(b) Adler, Jeremy. (1990). "Goethe's use of chemical theory in his *Elective Affinities*" (ch. 18, pgs. 263-79) in *Romanticism and the Sciences* - edited by Andrew Cunningham and Nicholas Jardine, New York: Cambridge University Press.
(c) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. (preview), (ch. 10: Goethe's Affinities, pgs. 371-421; ch. 16: Human Thermodynamics, section: History, pgs. 665-74). Morrisville, NC: LuLu.

External links

â— Bergman's 64-reaction diagrams (scan) - School of Chemical Sciences, University of Illinois at Urbana-Champaign.

θΔics

In thermodynamics schools, the **Berlin school of thermodynamics** is a set of teachings and students centered around the thermodynamics work of German physicist Hermann Helmholtz, beginning in 1847, and Rudolf Clausius, beginning in about 1850, at the University of Berlin.

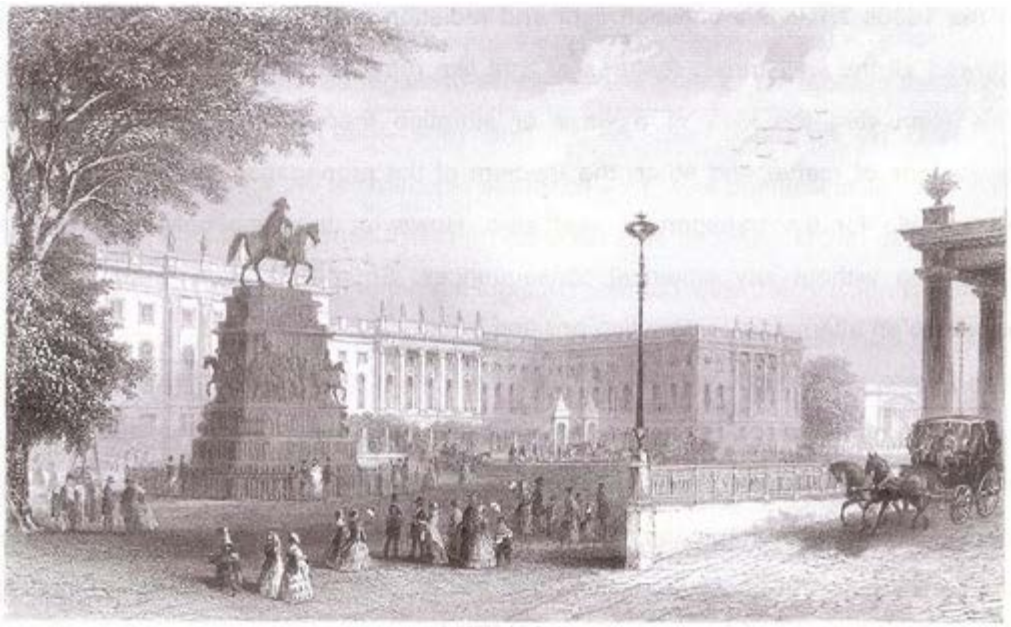

The University of Berlin, about 1850, the home to the **Berlin school of thermodynamics**. [3]

Overview

In 1831, German chemist and physicist Heinrich Magnus, who previously had studied at Berlin, but then ventured to to Stockholm to work under Swedish chemist Jacob Berzelius, and later to Paris, where he studied for a while under Frenchmen chemist and physicist Joseph Gay-Lussac and chemist Louis Thénard, returned to Berlin as lecturer on technology and physics at the university of Berlin. In 1834 he became assistant professor of physics and technology in the university there and in 1845 was appointed professor.

Among other subjects he studied include: the expansion of gases by heat (1841–1844), the vapor pressures of water and various solutions (1844–1854), thermoelectricity (1851), electrolysis (1856), induction of currents (1858-1861), conduction of heat in gases (1860), polarization of heat (1866–1868) and the deflection of projectiles from firearms. From 1861 onwards he devoted much attention to the question of diathermancy in gases and vapours, especially to the behavior in this respect of dry and moist air, and to the thermal effects produced by the condensation of moisture on solid surfaces.

In 1844, German Rudolf Clausius graduated from the University of Berlin where he studied mathematics and physics under Magnus, among others. In 1847, after receiving his doctorate from the University of Halle, Clausius became professor of physics at the Royal Artillery and Engineering School in Berlin and Privatdozent at the Berlin University.

Between the years 1871, at which time Helmholtz became professor of physics at the university, to 1931, where Walther Nernst formulated his theory on the zero entropy condition at at absolute zero temperature, the University of Berlin was the world's leading institute for thermodynamics and has science come to be known as the "Berlin school of thermodynamics". [1] All three fundamental principles, energy conservation by Hermann Helmholtz, the principle of entropy by Rudolf Clausius, and the zero entropy condition at absolute zero temperature by Nernst were established while their inventors were connected to this institute. [2]

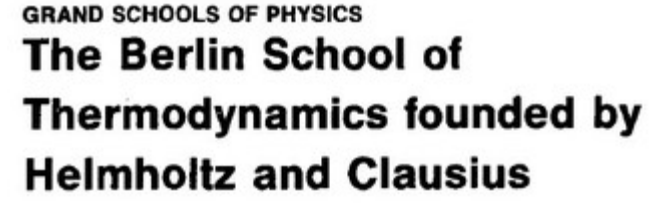

GRAND SCHOOLS OF PHYSICS

The Berlin School of Thermodynamics founded by Helmholtz and Clausius

Clipping from the 1991 *European Journal of Physics* article "Grand Schools of Physics: The Berlin School of Thermodynamics founded by Helmholtz and Clausius" by Werner Ebeling and Dieter Hoffman. [2]

Helmholtz, together with Clausius, founded the *Berlin School of Thermodynamics* where he succeeded Heinrich Magnus as the director of the Physical Institute. The influence of this school on the development of thermodynamics was crucial; to name a few other famous scientists connected to this school: August Horstmann, a former student of Helmholtz, who was the first to incorporate Clausius' thermodynamical theories into chemistry, Max Planck, who seeded the quantum revolution on Boltzmann's statistical thermodynamics, Albert Einstein, Erwin Schrödinger, and Leo Szilard, to name a few. Between 1866 and 1869, American mathematical engineer Willard Gibbs spent a year each at Paris, Berlin, and Heidelberg, where he came into contact with Helmholtz and Clausius.

Two others connected with the Berlin school include German mathematician Constantin Caratheodory, a student at the university in 1900 and later a lecturer, and Hungarian-born American mathematician and chemical engineer John Neumann, who taught there between 1926 and 1930.

References

1. Schmitz, John E.J. (2007). *The Second Law of Life – Energy, Technology, and the Future of Earth As We Know It*, (pg. 72). Norwich, NY: William Andrew Publishing.
2. Ebeling, W. and Hoffman, D. (1991). “Grand Schools of Physics: The Berlin School of Thermodynamics founded by Helmholtz and Clausius”, *European. J. Phys.*, 12, 1-9.
3. (a) Payne, Albert Henry. (1850). *Berlin und seine Kunstschatze*. Leipzig and Dresden.
(b) Wolf, Stefan L. (2012). "Rudolf Clausius: a Pioneer of the Modern Theory of Heat" (pg. 3), Publication.

θΔics

In hmolscience, **Bernard Barber** (1918-2006) was an American sociologist noted for his 1970 publication and commentary of the "Sociology 23" lecture notes of Lawrence Henderson.

Overview

In 1970, Barber published, for the first time, Lawrence Henderson's "Sociology 23" lecture notes, in which he gave a retrospect "Introduction to L.J. Henderson", discussing Henderson's idea of the social system and equilibrium in respect to Gibbs and Pareto. [1]

Education

In circa 1936, Barber engaged in his undergraduate work in sociology at Harvard, during which time he attended Lawrence Henderson's "Sociology 23", the first time it was offered in the spring of 1938; he also took undergraduate sociology courses from: Pitirim Sorokin, Talcott Parsons, and Robert Merton. [2] Barber then completed his master's and PhD degrees at Harvard; then was a sociology professor at Barnard College, Columbia University, for 35-years until his retirement, and in 1970 was chair of the sociology department. [3]

Quotes | Employed

The following are quoted cited, discussed, highlighted and or critiqued by Barber:

> "A very important fact, which should never be forgotten in studying social phenomena, that nearly all supposedly qualitative questions turn out on examination to be quantitative."
>
> — Lawrence Henderson (1938), "Sociology 23", in *L.J. Henderson on the Social System* (pgs. 21, 142)

> "Pareto's social system is in some respects analogous in its usefulness to Gibbs' physicochemical system. This system of Pareto's disregards physical, chemical, and physiological phenomena, but makes possible in some measure the consideration of all interactions between persons. Like Gibbs' system, it is clear and simple."
>
> — Lawrence Henderson (1938), "Sociology 23", in *L.J. Henderson on the Social System* (pgs. 30, 88)

> "Henderson's method in discussion is feebly imitated by the pile-driver. His passion was hottest when his logic was coldest."
>
> — George Homans (1948), *The Society of Fellows* [4]

Quotes

The following are noted quotes:

> "If Pareto had truly joined the social sciences to the natural sciences, an achievement Henderson very much wanted to see, it is only to be expected that he would put Pareto in the great company of Gibbs, Bernard, and even Newton."
>
> — Bernard Barber (1970), *L.J. Henderson on the Social System* (pg. 34)

References

1. Barber, Bernard. (1970). “Preface”, in: *L.J. Henderson on the Social System* (pgs. vii-ix). University of Chicago Press.
2. Cohen, I.B. (1992). “*Social Studies of Science* by Sociologist Bernard Barber” (pdf), *Current Comments*, Mar 2.
3. Barber, Bernard. (1970). “Introduction to L.J. Henderson”, in: *L.J. Henderson on the Social System* (pg. 27). University of Chicago Press.
4. (a) Homans, George, and Bailey, Orville T. (1948). *The Society of Fellows* (pg. 4). Harvard University Press.
(b) Barber, Bernard. (1970). “Introduction to L.J. Henderson”, in: *L.J. Henderson on the Social System* (pg. 6). University of Chicago Press.

Further reading

â— Bernard, Barber. (1952). *Science and the Social Order*. Publisher.

External links

â— Bernard Barber papers, 1938-1988 – Columbia University Library.

θΔics

In hmolscience, **Bernard Beaudreau** (1955-) is a Canadian economist noted, in economic thermodynamics, for his 1998 to 2006 efforts to outline an energy theory of economics.

Overview

In 1998, Beaudreau, in his *Energy and Organization*, attempted to integrate the subjects of classical mechanics, thermodynamics, mechanical engineering, production theory, and economics in general. In this work, Beaudreau defines an “entropic process” as one in which energy is transferred from one system to another in the form of work, and defines “anthropomorphic entropy processes” as ones conceived and overseen by man, such as involved in the production of food, tools, shelter, and culture. [2]

Beaudreau attempted to integrate French physicist Gustave Coriolis’ 1829 definition of work, as the product of force and distance over which the body is moved (i.e. W=f(f,d)) with the definition of work used in political economy, defined as a function of capital and labor (i.e. W=f(C,L)). In this same work, he spends a good deal of time differentiating between what he calls “animate energy” (human power, horse power, etc.) and “inanimate energy” (wind power, waterpower, steam power, nuclear power, etc.).

In 1999, Beaudreau, in his *Energy and the Rise and Fall of Political Economy*, used basic physics and thermodynamics, albeit only very superficially, as a guide to the first (steam power) and second (electrical power) industrial revolutions, and more importantly, to show how political economists from Adam Smith to Irving Fisher have attempted to understand these two energy-based industrial revolutions. [5]

In 2005, Beaudreau published *Energy Rents*: *a Scientific Theory of Income Distribution*, a slightly expanded version of *Energy and Organization*, in which he gives the following opinion: [1]

> “Nineteenth and twentieth century political economists failed to provide a theory or model of production that was consistent with classical mechanics and thermodynamics.”

In this book, interestingly, he also argues that:

> “Tools improve man's thermodynamic efficiency.”

Technically, to note, this statement is incorrect in that a tool is purely a catalyst which acts to lower the activation energy to various economic human chemical reactions. Thermodynamic "efficiency", however, depends solely on the difference between the hot body and cold body, which, in the human economic heat engine context, is a difficult topic to pin down. Certainly a tool, such as a hammer, makes work more efficient, but it is still a catalyst. The idea of a tool being a catalyst in a human thermodynamic sense, was first discussed by American chemist James Reiss in 1994. [4]

He also uses the term "entropy processes" significantly.

In 2006, in "Identity, Entropy, and Culture", Beaudreau toys with the notion of information entropy. [3]

Education

Beaudreau completed his PhD in economics at the University of Western Ontario.
From 1998 to 2008, Beaudreau has been an economics professor at Laval University, Quebec City, Canada.

References

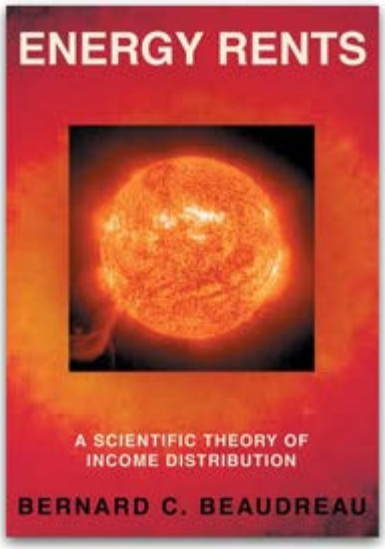

Beaudreau's 2005 book *Energy Rents*, which discusses economic theory from a thermodynamic point of view. [1]

1. Beaudreau, Bernard C. (2005). *Energy Rents: a Scientific Theory of Income Distribution* (pg. 9; thermodynamics, pgs. 7, 11-12, 16, 20, 40, 45, etc.). iUniverse.
2. Beaudreau, Bernard C. (2008). *Energy and Organization* (entropy and economics, pgs. 37-38; anthropomorphic entropy processes, pg. 46), 216-pgs. LuLu; Greenwood Publishing Group, 1998, 189-pgs.
3. Beaudreau, Bernard C. (2006). "Identity, Entropy, and Culture" (abstract), *Journal of Economic Psychology*, 2792): 205-23.
4. Reiss, James A. (1994). "Comparative Thermodynamics in Chemistry and Economics", in: *Economics and Thermodynamics: New Perspectives on Economic Analysis* (ch. 5, pgs. 47-72) edited by Peter Burley and John Foster. Boston: Kluwer Academic Publishers.

External links

â— Beaudreau, Bernard C. (1955-) – WorldCat Identities.
â— Bernard Beaudreau (faculty) – Laval University.

θΔics

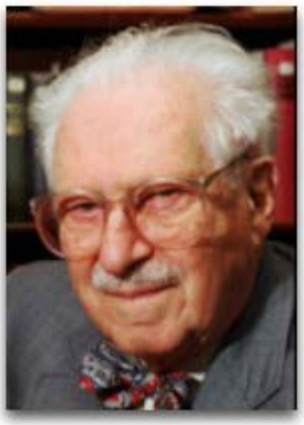

In existographies, **I. Bernard Cohen** (1914-2003) (CR:8) was an American history of science scholar—the first American PhD in the history of science—noted for a number of publications, beginning in the 1994, on the overlap of the natural sciences and the social sciences, and the history of some social Newtons in general, in what seems to have been a reaction followup to the publication of Philip Mirowski's famously provoking *More Heat Than Light* (1989).

Social Newtons

In 1994, Cohen outlined, somehow, how Irish-born English philosopher George Berkeley developed or had some type of "Newtonian sociology". [1]

In 2008, Cohen cited Crane Brinton's 1950 usage of the term "Newton of social science" in a discussion of Charles Montesquieu's 1748 *The Spirit of the Laws*, wherein he compares a well-working monarch with the systems of the universe, employing some type of social gravitation theory. (Q)

Einstein

Cohen's April 1955 interview with Albert Einstein was the last Einstein gave before his reaction end (death); published that July in *Scientific American.*

In 1985, Cohen, in his *Revolution in Science*, discussed Einstein's views on the so-called Maxwellian revolution. [3]

Quotes | By

The following are noted and or representative quotes:

> "The study of the interaction between the natural sciences and the social sciences has been a grossly neglected field of study."
>
> — Bernard Cohen (1993), "Analogy, Homology, and Metaphor in the Interaction between the Natural Sciences and Social Sciences, Especially Economics" [2]

References

1. (a) Cohen, I. Bernard. (1994). "Newton and the Social Sciences: with Special Reference to Economics, or, the Case of the Missing Paradigm", in: *Natural Images in Economic Thought: Markets Read in Tooth and Claw* (editor: Philip Mirowski) (§3). Cambridge University Press.
(b) Cohen, I. Bernard. (1994). "An Analysis of the Interaction Between the Natural Sciences and the Social Sciences" (abs), *The Natural and the Social Sciences, Boston Studies in the Philosophy of Science*, 150:1-99.
2. Cohen, I. Bernard. (1993). "Analogy, Homology, and Metaphor in the Interaction between the Natural Sciences and Social Sciences, Especially Economics" (Q), in: *Non-natural Social Science: Reflecting on the Enterprise of More Heat Than Light* (editor: Neil de Marchi) (pgs. 7-44). Duke University Press.
3. Cohen, I. Bernard (1985). *Revolution in Science* (pg. 443). Harvard University Press.

Further reading

● Cohen, I. Bernard. (1994). *Interactions: Some Contacts between the Natural Sciences and the Social Sciences*. Publisher.
● Cohen, I. Bernard. (1994). *The Natural Sciences and the Social Sciences: Some Critical and Historical Perspectives*. Kluwer Academic.
● Cohen, I. Bernard. (1995). *Science and the Founding Fathers: Science in the Political Thought of Jefferson, Franklin, Adams, and Madison*. Publisher.
● Cohen, I. Bernard and Smith, George E. (2002). *The Cambridge Companion to Newton*. Cambridge University Press.

External links

- I. Bernard Cohen – Wikipedia.

θΔics

In hmolscience, **Bernard DeVoto** (1897-1955) was an American historian noted for his participation in the 1930s to early 1940s Harvard Pareto circle. [1]

Education

DeVoto attended the University of Utah for one year, and then transferred to Harvard University, graduating from there with a degree in something in 1920, after which he worked as an English instructor at Northwestern University from 1922 to 1927, and then as a part-time instructor at Harvard, along with writing regular column "The Easy Chair" in *Harper's Magazine*, from 1935 to 1955.

At some point, DeVoto took a course in the history of science from Lawrence Henderson. [2] Sometime thereabouts, Henderson, as reported by George Homans (1984), told DeVoto to read the general sociology works of Italian engineer Vilfredo Pareto: [3]

> "It was Henderson, the philosopher of science, who told DeVoto to read Pareto, with fateful consequences for me."

As early as March 1928 DeVoto was expressing enthusiasm for Pareto's *Traité de Sociologie Générale* (*Treatise on General Sociology*), referring to Pareto as follows: [2]

> "Pareto's *Treatise on General Sociology* is the hardest boiled book I have ever read. Three times, since I passed my puberty, has my **mind been made over** [see: unlearn]. Once by a nexus of which Henry Adams was the center, once by a matrix of which Frazer burned brightest, and once by a long study of genetics and evolution. Pareto is doing the job a fourth time, and far more vitally than any others."

This, of course, is two cultures social Newton genius comparison at its near finest, Goethe aside.

One of the convictions he learned from Pareto, as DeVoto biographer Wallace Stegner reports, was that any society exhibited continuities, which Pareto termed 'residues', and that it was extremely easy to confuse a temporary modification or rationalization of one of these—a 'derivation' in the Pareto jargon—with true change. [2]

References

1. Heyl, Barbara. (1968). "The Harvard 'Pareto Circle'." *Journal of the History of the Behavioral Sciences*, 4:316-34; in: *Talcott Parsons: Critical Assessments, Volume 1* (editor: Peter Hamilton) (§2, pgs. 29-49). Taylor & Francis.
2. Stegner, Wallace E. (2001). *The Uneasy Chair: A Biography of Bernard DeVoto* (Pareto, 26+ pgs; course, pg. 82; derivation, pg. 110; §: Seminar on Pareto, pg. 138-43; three times, pg. 138). University of Nebraska Press.
3. Homans, George C. (1984). *Coming to My Senses: the Autobiography of a Sociologist* (Pareto, 45+ pgs; quote, pg. 90). Transactions Publishers.

External links

â— Bernard DeVoto – Wikipedia.

θΔics

In existographies, **Bernard Fontenelle** (1657-1757) (IQ:#|#) (Cattell 1000:539) (CR:6) was French lawyer, scientist, philosophy writer, one whose portrait is on display at the Royal Society, noted for []

Overview

Fontenelle is noted for his *A Conversation on the Plurality of the World* (1686), *The Origin of Fables* (1724), and *Of the Island of Borneo* (1686), wherein he defended Copernicanism, critiqued miracles, satirized religions, and presented some of the first discussion of the Bible as myth. [1]

Fontenelle has been cited thinkers including: Julien la Mettrie, Baron d'Holbach (Ñº), Voltaire (Ñº), Napoleon Bonaparte, and John Avery.

Quotes | On

The following are quotes on Fontenelle:

> "By the first or second decade of the eighteenth century not only the Copernican theory of the solar system but also the belief in other inhabited planets and in the plurality of worlds seems to have been commonly accepted even in highly orthodox circles. The *Conversation on the Plurality of the Worlds* (1686) of **Fontenelle** no doubt did more than any other single writing to diffuse these ideas among the educated classes generally."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pg. 130)

> "The modern origins of this understanding of myth (though he used the term 'fable') can be traced to **Bernard Fontenelle's** *De l'origine des fables*. He was the first enlightenment thinker to propose a comprehensive theory of myth that argued for its roots in the naiveté and 'childishness' of the ancients and contemporary 'savages'. Although Fontenelle's text was not published until 1724, there is good evidence to conclude that it was written by 1680, thus making it the earliest modern theory of myth."
>
> — Paul Eddy (2007), *The Jesus Legend* (pg. 159)

Quotes | By

The following are noted quotes by Fontenelle:

> "We must confess, dear Madam, that we scarce know where we are, in the midst of so many worlds; for my own part, I begin to see the earth so fearfully little, that I believe that from henceforth I shall never be concerned at all for anything. That we so eagerly desire to make ourselves great, that we are always designing, always troubling and harassing ourselves, is certainly because we are ignorant what these vortexes are; but now I hope my new lights will in part justify my laziness, and when anyone reproaches me with carelessness, I will answer, Ah, did you but know what the fixed stars are!"."
>
> — Bernard Fontenelle (1686), *Conversation on the Plurality of the World* (Preliminary Discourse, pgs. xxxviii-xlii); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 133)

> "The universe is but a watch on a larger scale; all its motions depend on determined laws and the mutual relations of its parts . . . It is now known with certainty . . . that Venus and Mercury turn round the sun, and

not round the earth; on this subject the ancient system is absolutely exploded . . . At the appearance of a certain German named Copernicus, astronomy became simplified; he destroyed all the unnecessary circles, and crushed to pieces the crystalline firmaments. Animated with philosophic enthusiasm, he dislodged the earth from the central situation which had been assigned it and in its room placed the sun, who is more worthy of such a mark of distinction. The planets were no longer supposed to perform their revolutions round the earth, and enclose it in the centre of their orbits . . . They all turn around the sun; the earth itself not excepted."

— Bernard Fontenelle (1686), *A Conversation on the Plurality of the World* [2]

"Behold a universe so immense that I am lost in it. I no longer know where I am. I am just nothing at all. Our world is terrifying in its insignificance."

— Bernard Fontenelle (1686), *Conversations with a Lady on the Plurality of Worlds* [3]

"Dreadful, Madam, said I; I think it very pleasant. When the heavens were a little blue arch, stuck with stars, methought the universe was too strait and close; I was almost stifled for want of air; but now it is enlarged in height and breadth and a thousand vortexes taken in. I begin to breathe with more freedom, and I think the universe to be incomparably more magnificent than it was before."

— Bernard Fontenelle (1686), *Conversation on the Plurality of the World* (§4); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 132-33)

"Calculus is to mathematics no more than what experiment is to physics, and all the truths produced solely by the calculus can be treated as truths of experiment. The sciences must proceed to first causes, above all mathematics where one cannot assume, as in physics, principles that are unknown to us. For there is in mathematics, so to speak, only what we have placed there... If, however, mathematics always has some essential obscurity that one cannot dissipate, it will lie, uniquely, I think, in the direction of the infinite; it is in that direction that mathematics touches on physics, on the innermost nature of bodies about which we know little."

— Bernard Fontenelle (1627), *Elements of the Geometry of Infinity* [3]

"Women react differently: a French woman who sees herself betrayed by her husband will kill his mistress; an Italian will kill her husband; a Spaniard will kill both; and a German will kill herself."

— Bernard Fontenelle (c.1730), *Publication* (Ñº)

"History is a set of agreed-upon lies."

— Bernard Fontanelle (c.1740), *Publication*; citing (Ñº) by Napoleon Bonaparte (c.1820) and John Avery (2017)

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 342). HarperOne.
2. (a) Fontenelle, Bernard. (1686). *A Conversation on the Plurality of the World*. Publisher.
(b) Grayling, A.C. (2016). *The Age of Genius: the Seventeenth Century and the Birth of the Modern Mind* (pg. #).

Bloomsbury.
3. Bernard Fontenelle – WikiQuote.

External links

â— Bernard Fontenelle – Wikipedia.

θΔics

In human chemistry, **Benard Joly** (1944-) is a French chemistry historian noted for []

Overview

In 2006, Joly, in his "Goethe's *Elective Affinities:* Between Science and Literature", gave a rather detailed hypothesis of what chemistry works and theories German polymath Johann Goethe might have read in the pre-1809 years, prior to the writing of his physical chemistry based *Elective Affinities*; the abstract of which is as follows: [1]

> "The title of Goethe's novel Elective Affinities refer to the chemical tenet of rapports between different bodies which, from Etienne-François Geoffroy's works in 1718, emerge as a prevailing theory [see: affinity theory] in the eighteenth-century chemistry. Goethe does not limit his views to the analogy between love attractions which made and break up couples and chemical processes which determine bonds and precipitations of chemical substances. His excellent knowledge of chemical and alchemical tradition leads him to consider affinity as a law of nature having effects in chemistry as well as in the living being and in the mind."

Joly, in the article, states:

> "Realize that the force that destroyed the couple Charlotte and Edward and binds the two new couples formed, Goethe invoked, as the title suggests, is the natural power of elective affinities, a concept borrowed from the chemistry of his time, and he did this, via Captain, in a brilliant exposition of popular science in chapter four of the first part, before Odile has appeared. The move is surprising, even daring in terms of the structure of the novel, as Goethe did not hesitate to leave his characters in the same storyline that gives them life, to let them hold a discourse which at this point the advance of the plot, cannot yet be an attempt to interpret their own history, and which is therefore, in a way, overhanging from the text of the novel, whose characters would have escaped a moment in order to expose the springs, not from their subjective existence as it unfolds in the body of the story, but the same processes as the author, or at least the narrator uses to structure his work and build the psychology of his characters."
>
> — Bernard Joly (2006), "Goethe's *Elective Affinities:* Between Science and Literature" (§2)

Then he discusses Walter Benjamin (1922) on Goethe's *Elective Affinities*; then Goethe's daemonic.

On the combined influence of Schelling, Kant, Bergman, Joly states the following:

> "Goethe himself had however indicated in a letter of June 1809 to another of his friends, he had borrowed its title from a treaty of Swedish chemist Torbern Bergman published in Latin in 1775, De attractionibus electivis, and translated into German from 1782 under the title Die Wahlverwandtschaften, which is the title of the novel. The French translation of the Treaty of Bergman (1788) is called Treaty chymical elective affinity or attraction. Regardless of whether we actually read Goethe's book Bergman, where he became acquainted as a result of its trade with Schelling, which he had read in 1798 Ideas for a Philosophy of Nature published the previous year and the Soul of the World published the same year, works in which the professor of Jena, following Kant gave to chemical science a very important role, elective affinities expressed by him at a higher level the two forces fundamental attraction and repulsion. It is not impossible that Goethe had heard of "some ingenious pages on the application of elective affinities of chemistry elective affinities feelings" had written the Duchess of Bouillon, whose adopted daughter had married in 1795 Baron de Vitrolles that relates all this in his autobiographical Memories of a migrated. Gibelin, who reports this passage in an article in the Journal of Comparative Literature in 1953, notes that the Bouillon Duchess lived in Erfurt, but one of his friends went two or three times a month in Weimar, sometimes

> taking with Vitrolles him who claims to have had with Goethe and "very good conversation", which raises the possibility that he had informed the poet of the work of his stepmother."
>
> — Bernard Joly (2006), "Goethe's *Elective Affinities:* Between Science and Literature" (§7)

(add discussion)

In 2011, Joly was one of the presenters at the UIB literature and chemistry conference.

Education

Joly presently is professor of the history and philosophy of science, Université de Lille 3, specializing in the history of chemistry. [2]

References

1. Joly, Bernard. (2006). "Les *Affinities elective* de Goethe: entre science et literature" (French); "Goethe's *Elective Affinities:* Between Science and Literature" (English), Methodos, 6.
2. Benard Joly (French → English) (reseach) – Université de Lille 3.

External links

â— Bernard Joly (French → English) (faculty) – Université de Lille 3.

θΔics

In existographies, **Bernard Mandeville** (1670-1733) was Dutch-born English physician, philosopher, political economist, and satirist, noted for []

Influenced

Mandeville influenced John Locke, Jonathan Swift, and Friedrich Hayek.

Quotes | On

The following are quotes on Mandeville:

> "Whether there exists a god. or whether he exists not, our duties will be the same; and our nature, if consulted, will prove, *that vice is an evil, and that virtue is a real and substantial good*. We are assured, that there have been found philosophers and atheists, who deny the distinction of *vice* and *virtue*, and who have preached up debauchery and licentiousness of manners: in this number, may be reckoned Aristippus and Theodorus, surnamed the *Atheist*, Bion (c.325-250BC) (Ñº), the Boristhenite, Pyrrho, etc., amongst the ancients (see: Diogenes Laertius), and amongst the moderns, the author [**Bernard Mandeville**] of the *Fable of the Bees* [1705](Ñº), which, however, could only be intended to show, that in the present constitution of things, vices have identified themselves with nations, and have become necessary to them, in the same manner as strong liquors to those who have habituated themselves to their use. The author who published the *Man Automaton* [Mettrie, 1748], has reasoned upon morality like a madman."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 310)

Quotes | By

The following are quotes by Mandeville:

> "How few men reflect, and even among those who pay attention to themselves, scarcely any have found the thread for the labyrinth of our **passions**."
>
> — Bernard Mandeville (c.1714) [1]

References

1. Zinsser, Judith. (2006). *Emilie Du Chatelet: Daring Genius of the Enlightenment* (pg. 59). Penguin.

External links

â— Bernard Mandeville – Wikipedia.

θΔics

In science, **Bernard Pullman** (1919-1996) (CR=4) was a French molecular biophysicist quantum biochemist, and historian noted for his 1995 *The Atom in the History of Human Thought*, wherein, in his digression on the history of atomic theory, he gives a long list of the disagreements between atomism and Christianity. [1]

References

1. (a) Pullman, Bernard. (1995). *The Atom in the History of Human Thought* (translator: Axel Reisinger) (pg. 89-94). Oxford University Press, 1998.
(b) Stenger, Victor J. (2013). *God and the Atom: from Democritus to the Higgs Boson: the Story of a Triumphant Idea* (pg. 48). Prometheus Books.

External links

â— Bernard Pullman – Wikipedia.
â— Pullman, Bernard (1919-) – WorldCat Identities.

θΔics

In existographies, **George Bernard Shaw** (1856-1950) (IQ:180|#162) [HD:45] [JSA:14], commonly referred to as "Bernard Shaw", was an Irish playwright, polemicist, and thinker noted for []

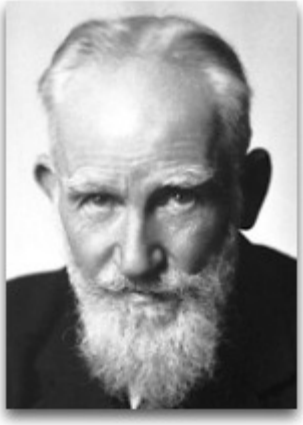

Atheism

The following are atheism related Shaw quotes:

> "Shakespeare had no conscious religion."
>
> — Bernard Shaw (c.1920) [1]

Quotes | On

The following are quotes on Shaw:

> "**Shaw**, the great playwright, was a whimsical maverick, who scoffed at religion, lampooned Christianity, and once called himself an atheist; yet had a tinge of mysticism and speculated that a 'life force' impels all creatures."
>
> — James Haught (1996), *2000 Years of Disbelief* [1]

Quotes | By

The following are noted quotes by Shaw:

> "All great truths begin as blasphemies."
>
> — Bernard Shaw (1917), *Annajanska, the Bolshevik Empress* (Q)

> "My way of joking is to tell the truth. It's the funniest joke in the world."
>
> — Bernard Shaw (c.1920) (Q)

> "Beware of false knowledge; it is more dangerous than ignorance."
>
> — Bernard Shaw (c.1920) (Q); compare: unlearn

> "2% of the people think; 3% of the people think they think; and 95% of the people would rather die than think."
>
> — Bernard Shaw (c.1920) (Q)

> "Emotional excitement reaches men through tea, tobacco, opium, whiskey and religion."
>
> — Bernard Shaw (c.1920) in: *The Atheist's Bible* (pg. 13); Angela Jabari tweet (Q)

References

1. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pgs. 35, 215-28). Prometheus.

External links

- George Bernard Shaw – Wikipedia.

θΔics

In hmolscience, **Bernard Louis Strehler** (1925-2001) was an American bio-chemist (chnops-chemist) and gerontologist noted for his 1956 to 1962 work on the thermodynamics of aging.

Overview

In 1944, Strehler, supposedly, began to formulate some type of theory on aging.

In 1956 Strehler met Hungarian-born American physicist Leo Szilard and the two attempted to establish a research institute to study the biology of aging; which may explain how Strehler became acquainted with entropy. The initiative, however, never petered out. [3]

In 1962, Strehler, in his *Time, Cells, and Aging*, devoted a section to how entropy relates to aging. [1] The following is a quoted section: [2]

> "Entropy will increase spontaneously in any macrosystem which is not already in its most stable condition and which possesses sufficient ambient thermal energy to permit reaction to occur. Aging and most other disorganizing changes, of course, would not take place at absolute zero because change involves the motion of molecules, their parts, and their aggregates."

(add discussion)

Education

Strehler completed his BS in cell biology in 1947 and PhD in 1950 both at Johns Hopkins University. This was followed by research work at the Oak Ridge National Laboratory, the University of Chicago, and the National Institute of Health. He taught at the University of Southern California from 1967 to 1990. His research led to the discovery of *luciferin*, the material that contributes to the light in fireflies. He also studied the bioluminescense of green plants and later concentrated on DNA and human aging.

References

1. Strehler, Bernard L. (1977). *Time, Cells, and Aging* (Entropy, pg. 10-27), 2nd ed. Academic Press.
2. Hokikian, Jack. (2002). *The Science of Disorder: Understanding the Complexity, Uncertainty, and Pollution in Our World* (pg. 68-69). Los Feliz Publishing.
3. (a) Anon. (2004). "Obituary for Bernard Strehler, USC Professor of Biology; Studied Aging", GRG.org.
(b) Coles, L. Stephen. (2002). "The Life and Contributions of Professor Bernard L. Strehler, Founding Editor-in-Chief of *Mechanisms of Aging and Development*, Professor of Biology at the University of Southern California [February 21, 1925 May 13, 2001]," *Mechanisms of Ageing and Development*, Vol. 123, pp. 821-5.

External links

â— Bernard L. Strehler (German → English) – Wikipedia.

θΔics

In existographies, **Bernhard Riemann** (1826-1866) (IQ:180|#115) [RGM:280|1,500+] (Murray 4000:10|M) (GME:11) (DN:1-2) (CR:14) was a German mathematician, noted for his so-called thermodynamic Riemannian geometry, which is unique, as compared to ordinary dynamical field type theories of matter, in the three dimensional Cartesian system or four dimensional Minkowski spaces, in that it has no 'tensorial' aspect, being that the theory has no dependence on spatial transformations. [1]

Education

At sixteen, he mastered Adrien-Marie Legendre's *Theory of Numbers*, a work that is said to have sparked his interest in prime numbers. He then is said to have mastered calculus and analytical techniques by reading the work of Leonhard Euler and to have schooled himself in the physics of Wilhelm Weber (1804-1891), the person, to note, who discovered, in 1856, through his studies of electrical charges and magnetics, that light moves at a constant speed of 300,000 kilometers per second.

Soon thereafter, Riemann attempted to establish the mathematical connections between all major physical forces; but had a breakdown doing so. Upon recovery, he read a paper by Joseph Fourier on Fourier series, which attracted the interest of Carl Gauss, who praise it.

In 1858, Riemann produced a paper on electrodynamics that he hoped would be the definitive say on the matter; but he was soon, however, superseded by electromagnetic theory work of Scottish physicist James Maxwell.

Religion

As a child, Riemann attempted a mathematical proof for Genesis chapter of the Bible. [2]

Quotes | On

The following are notes of praise and or tribute:

> "The three greatest German mathematicians to be: Carl Gauss, Riemann, and Karl Weierstrass."
>
> — Henri Poincare (c.1900)

> "I would ask whether anyone had proved the Riemann Hypothesis."
>
> — David Hilbert (c.1930), response (Ñº) to being asked what he would do if he were magically awakened after centuries

> "**Riemann** shattered the mathematical laws of Euclidian geometry and invented the Riemann geometry which involves the study of any number of dimensions in any kind of space. Riemann was able to blow the traditional Euclidean geometry asunder because his teacher Carl Gauss suspected that it could be done and proves with a mathematical theorem that it could be done."
>
> — Monydit Malieth (2013), *The Future Affects the Past* [3]

References

1. Weinhold, Frank. (2009). *Classical and Geometrical Theory of Chemical and Phase Thermodynamics* (Riemann, pgs. 421-28). Wiley.
2. Graves, Dan. (1996). *Scientists of Faith: Forty-Eight Biographies of Historic Scientists* (§42: Bernhard Riemann (1826-1866): the Non-Euclidean Geometer Behind Relativity Theory, pgs. 147-). Kregel Publications.

3. Malieth, Monydit (aka Tonnerre). (2013). *The Future Affects the Past: What Destination is Time Rushing To?* (pgs. 60-61). Red Lead Books.

Threads

â— Forces or curved spaces? (2010) – Hmolpedia threads.

External links

â— Bernhard Riemann – Wikipedia.

θΔics

In genealogies, **Bernoulli genealogy** or "Bernoulli family" consists of the "Bernoulli brothers, Swiss mathematicians, brothers Jacob Bernoulli (1654-1705) and Johann Bernoulli (1667-1748), earlier developers of German mathematician Gottfried Leibniz' version of differential calculus, and Dutch-born physicist Daniel Bernoulli, one of the first pioneers of in the kinetic theory of gases.

Bernoulli genealogy

Nicolaus Bernoulli
(1623–1708)

"Bernoulli brothers"
(differential equations)

Jacob Bernoulli
(1654–1705)

Nicolaus Bernoulli
(1662–1716)

"Bernoulli brothers"
(differential equations)

Johann Bernoulli
(1667–1748)
Student: Leonhard Euler

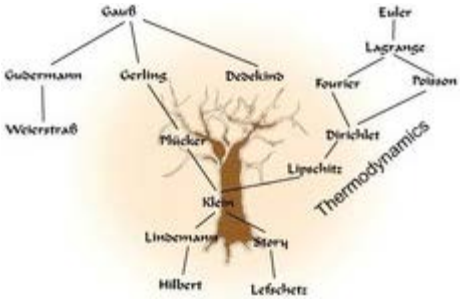

Mathematics Genealogy Tree
(According to which Johann Bernoulli, mentor to Leonhard Euler, is the mathematical father of thermodynamics [2])

"Hydrodynamica"

Nicolaus II Bernoulli
(1695–1726)

Daniel Bernoulli
(1700–1782)
Friend: Leonhard Euler

Johann II Bernoulli
(1710–1790)

Overview

In the history of differential equations, Swiss mathematicians, brothers Jacob Bernoulli (1654-1705) and Johann Bernoulli (1667-1748), the latter father of Daniel Bernoulli and mentor to Leonhard Euler (teacher of Joseph Lagrange), in Basel, Switzerland, were among the first interpreters of German mathematician Gottfried Leibniz' version of differential calculus.

They were both critical of English physicist Isaac Newton's theories and maintained that Newton's theory of fluxions was plagiarized from Leibniz' original theories, and went to great lengths, using differential calculus, to disprove Newton's *Principia*, on account that the brothers could not accept the theory, which Newton had proven, that the earth and the planets rotate around the sun in elliptical orbits. [1]
Noted students of Jacob Bernoulli include Jacob Hermann, noted for his 1716 ideas on heat, and Paul Euler, father of Leonhard Euler.

Other

Of note, German-born Swiss writer Hermann Hesse, noted for his 1943 novel *The Glass Bead Game*, which is said to be reminiscent of Johann Goethe's 1809 *Elective Affinities*, in the sense of its incorporation of modern science into the script as a sort of game employed by the players, is a forth generation by marriage descendant of Johann II Bernoulli. [3]

See also

- Euler genealogy
- Thomson genealogy

References

1. Tibell, Gunnar. (2008). “The Bernoulli Brothers”, Uppsala University.
2. Johann Bernoulli – Mathematics Genealogy Project.
3. Bernoulli family – Wikipedia.

External links

- Bernoulli family – Wichita State University.
- Bernoulli family – Library.ThinkQuest.org.

θΔics

In hmolscience, **Bert Thompson** (c.1960-) is an American microbiologist and creationist noted for being the co-author with Brad Harrub of their Oct 2002 65-page response article entitled "15 Answers to John Rennie and *Scientific American's* Nonsense", in response to John Rennie's 17 Jun 2002 *Scientific American* article "15 Answers to Creationist Nonsense", amid the Rennie creationism fiasco. [1]

Apologetics Press

In 2002, Thompson was a longtime director of *Apologetics Press*—an Alabama-based church organization, with a $1-million dollar annual budget, whose focus is to "wage war against atheism and evolution". Ironically, and somewhat humorously, Thompson, to note, who had spent some 26-years, as executive director of *Apologetics Press*, whose aim was to denounce the so-called immorality of atheism and evolution, three years later, in 2005, was fired owing to multiple reports of child molestation incidents dating back to at least 1982. (Ñº)

Education

Thompson completed his BS in biology from Abilene Christian University and his MS and PhD in microbiology from Texas A&M University. He is an adjunct professor of Bible and science at Southern Christian University, Montgomery, Alabama (aka Amridge University). [2]

References

1. Thompson, Bert and Harrub, Brad. (2002). "15 Answers to John Rennie and *Scientific American's* Nonsense" (Ñº) (pdf). ApologeticsPress.org, Oct 2.
2. Bert Thompson (about) – ChristianAnswers.net.

θΔics

In chemistry, the **Berthelot-Thomsen principle** (or Thomsen-Berthelot principle) argued that heat of a reaction was the true measure of affinity and that the more heat release the greater the affinity of the reactants. [1] This is sometimes called the "heat theory of affinity". The Berthelot-Thomsen principle, in short, states that of all chemical reactions possible, the one developing the greatest amount of heat will take place, with certain obvious exceptions such as changes of state. [2]

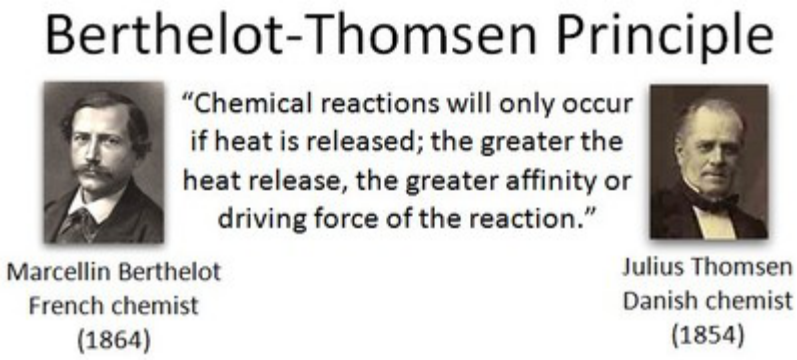

The principle was proposed independently by Danish chemist Julius Thomsen in 1854 and by French chemist Marcellin Berthelot in 1864. [3] The principle was disproved in 1882 by German physicist Hermann Helmholtz in his "The Thermodynamics of Chemical Processes", which proved that, owing to the aspects of entropy, it is the free energy, not heat that is the measure affinities. [4]

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1. Hall, Carl W. (2000). *Laws and Models: Science, Engineering, and Technology* (Berthelot-Thomsen principle, pg. 33). CRC Press.
2. Borisenko, Victor E. and Ossicini, Stefano. (2008). *What is What in the Nanoworld* (Berthelot-Thomsen principle, pg. 33). Wiley.
3. (a) Thomsen, Julius. (1854). “Die Grundzuge eines Thermochemischen Systems” (The Main Part of a Thermochemical Systems), *Ann. Phys*. 47, 34.
(b) Berthelot, Marcellin. (1873). “Sur la Statique de Dissolutions Salines” (On the Static Dissolutions of Salines), *Bull. Soc. Chim.* Pars 19, 160.
4. Helmholtz, Hermann. (1882). “On the Thermodynamics of Chemical Processes”, in: *Physical Memoirs Selected and Translated from Foreign Sources*, 1: 43-97. Physical Society of London, Taylor and Francis, 1888.

External links

â— Thomsen-Berthelot principle – Wikipedia.

θΔics

In affinity chemistry, **Berthollet's affinity theory**, as developed by French chemist Claude Berthollet during the years 1789 to 1803, an upgrade to Bergman's affinity theory (1785), argued that reactions could go in the reverse direction, that a reaction equilibrium state occurred when opposing affinity forces (chemical force) balanced, and that the mass of products and or reactants played a role, among other details. [1]

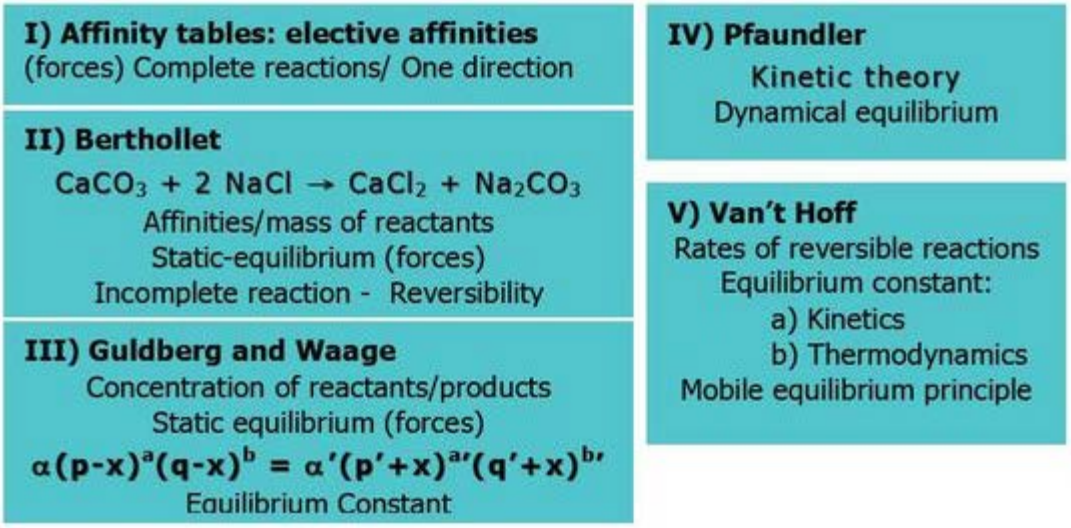

Spanish chemical equilibrium theory historian Juan Quilez's snapshot summary of **Berthellot's affinity theory**, in the context of the historical development of topic of chemical equilibrium, affinity tables up through the chemical thermodynamics work of Jacobus van't Hoff. [3]

Overview

In 1798, Claude Berthollet accompanied Napoleon's military expedition to Egypt, during which time his observations of the Natron Lakes, led to new insights about affinity theory. (Q) (Q)

In his 1799 paper "Research on the Laws of Affinity", Berthollet summarized his issues with the theory of elective affinity as follows: [4]

> "The very term *elective affinity* must lead into error, as it supposes the union of the whole of one substance with another, in preference to a third; whereas there is only a partition of action, which is itself subordinate to other chemical circumstances … care must be taken not to consider this affinity as a uniform force which produces compositions and decompositions … Such a conclusion would lead us to neglect all the modifications which it undergoes form the commencement of action to the term of equilibrium."

In short, Berthollet argued that the standard single elective affinity reaction, of the form:

$$AC + B \rightarrow AB + C$$

would actuate such that force of affinity of the leaving species A could possibly split into two parts: [5]

$$AC + B \rightarrow A_1B + A_2C$$

Berthollet elaborated on this further in 1801 as well as in his 1803 *Essai de Statique Chemique* (*Essay on Static Chemistry*).

In 1801, Berthollet, in his *Researches into the Laws of Chemical Affinity*, wherein, following historical overview of the work of Torbern Bergman, givens an chapter two, entitled "Experiments Which Show that the Doctrine of Elective Affinities is Ill Founded"; the following a

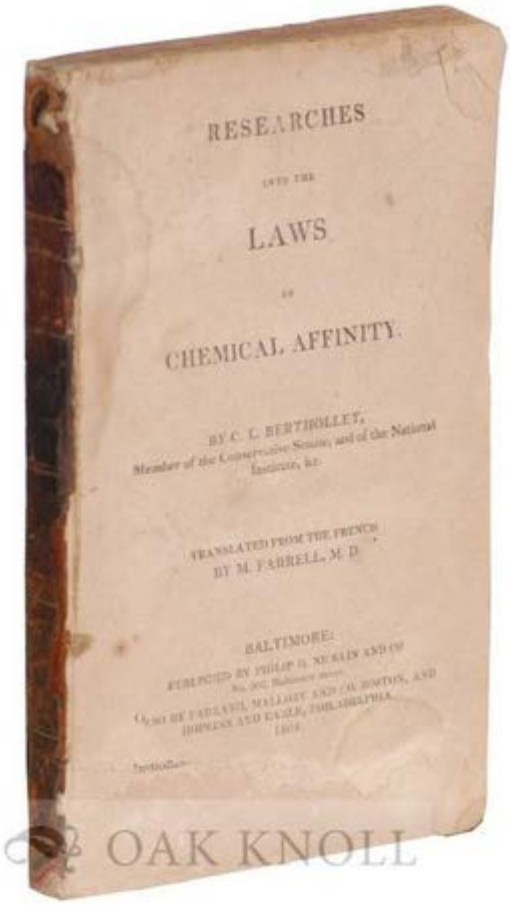

An American-edition English translation of Berthollet's 1801 *Researches into the Laws of Chemical Affinity*, wherein he shows, via experimental findings, how Torbern Bergman's elective affinity theory is in conceptual error, to some extent. [6]

representative excerpt: [6]

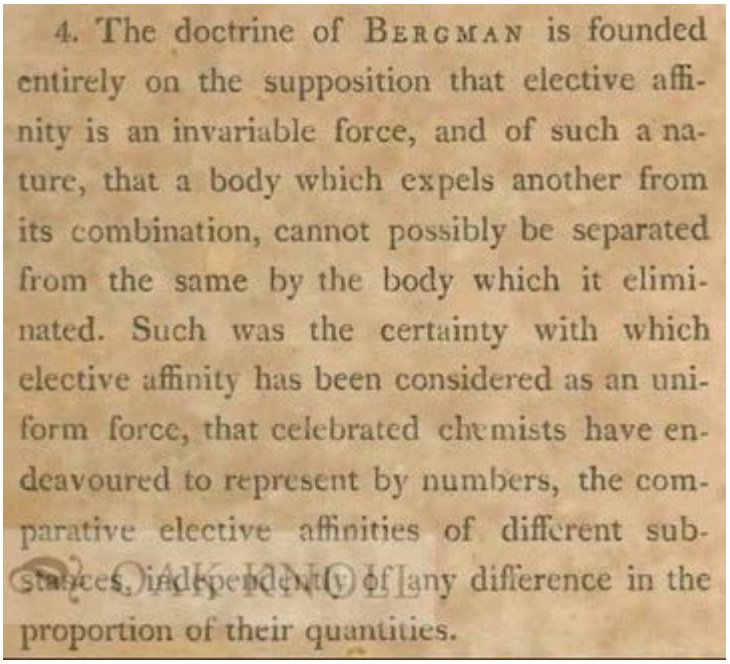

4. The doctrine of BERGMAN is founded entirely on the supposition that elective affinity is an invariable force, and of such a nature, that a body which expels another from its combination, cannot possibly be separated from the same by the body which it eliminated. Such was the certainty with which elective affinity has been considered as an uniform force, that celebrated chemists have endeavoured to represent by numbers, the comparative elective affinities of different substances, independently of any difference in the proportion of their quantities.

(add discussion)

Human chemistry

In human chemistry, in German polymath Johann Goethe's affinity chemistry based 1809 novella *Elective Affinities*, according to elective affinities scholar Jeremy Adler, Goethe refers to Berthollet's affinity theory via the Captain's comment "whether it still fits the newer doctrines, I am unable to say", about his present knowledge of affinity chemistry. Likewise in an 1826 letter Goethe famously commented: [2]

> "For decades [I have been struggling] with **Berthollet** in the matter of the affinities."

which is indeed quite a fascinating statement; the statement itself meaning that for some thirty years Goethe had been digging around in the experimentally-based revised affinity chemistry theories of Claude Berthollet so to better understand in the ins and outs of human existence.

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1. Holmes, Frederick L. (1962). "From Elective Affinities to Chemical Equilibria: Berthollet's Law of Mass Action" (Berthollet's affinity theory, pg. 115) (abs), *Chymia* 8: 105-46.
2. (a) Goethe, Johann. (1826). "Letter", Sep. 26.
(b) Adler, Jeremy. (1990). "Goethe's use of chemical theory in his *Elective Affinities*" (ch. 18, pgs. 263-79) in *Romanticism and the Sciences* - edited by Andrew Cunningham and Nicholas Jardine, New York: Cambridge University Press.
3. Quilez, Juan. (2007). "A Historical/Philosophical Foundation for Teaching Chemical Equilibrium", *Ninth International History Philosophy & Science Teaching Conference*, Calgary/Canada, Jun. 24-28.
4. (a) Berthollet, Claude. (1799). "Research on the Laws of Affinity" ("Recherches sur les Lois de l'Affinite"), 146, 154. Publisher.
(b) Berthollet, Claude-Louis. (1804). *Researches into the Laws of Chemical Affinity*. Da Capo Press, 1966.
5. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (Claude Berthollet, pgs. 375, 405, 425) (preview), (Google books). Morrisville, NC: LuLu.
6. (a) Berthollet, Claude. (1801). *Title*. Mémoires de l'Institut National des Sciences et Arts. Paris.
(b) Berthollet, Claude. (1801). *Researches into the Laws of Chemical Affinity* (translator: Mallory Farrell). London: John Murray.
(c) Berthollet, Claude. (1801). *Researches into the Laws of Chemical Affinity* (translator: Mallory Farrell) (abs). Boston; Philadelphia: Philip H. Nicklin and Co, 1809.

Further reading

● Guilez, Juan. (2004). "A Historical Approach to the Development of Chemical Equilibrium through the Evolution of the Affinity Concept: Some Educational Suggestions", *Chemistry and Education: Research and Practice*, 5(1): 69-87.
● Quilez, Juan. (2006). "The Role of Theories in Early Studies of Chemical Equilibria", *Bull. Hist. Chem.* 31(2):45-57.
● Guilez, Juan. (2009). "From Chemical Forces to Chemical Rates: A Historical/Philosophical Foundation for the Teaching of Chemical Equilibrium" (abs), *Science & Education*, 18(9): 1203-51.
● Harvey, David. (c.2010). *Analytical Chemistry 2.0* (§6A: Reversible Reactions and Chemical Equilibria, pgs. 210-13). McGraw-Hill, 1999.

θΔics

In experiments, **Berti vacuum experiment** refers to a Mar 1638 experiment done by Gasparo Berti and Rafael Magiotti, wherein they upended a large lead siphon about 22 braccia (# feet) long, filled with water, and sealed at both ends, into a large tub of water, after which the opened the bottom valve of the tube, so to see if a vacuum would be made in the top.

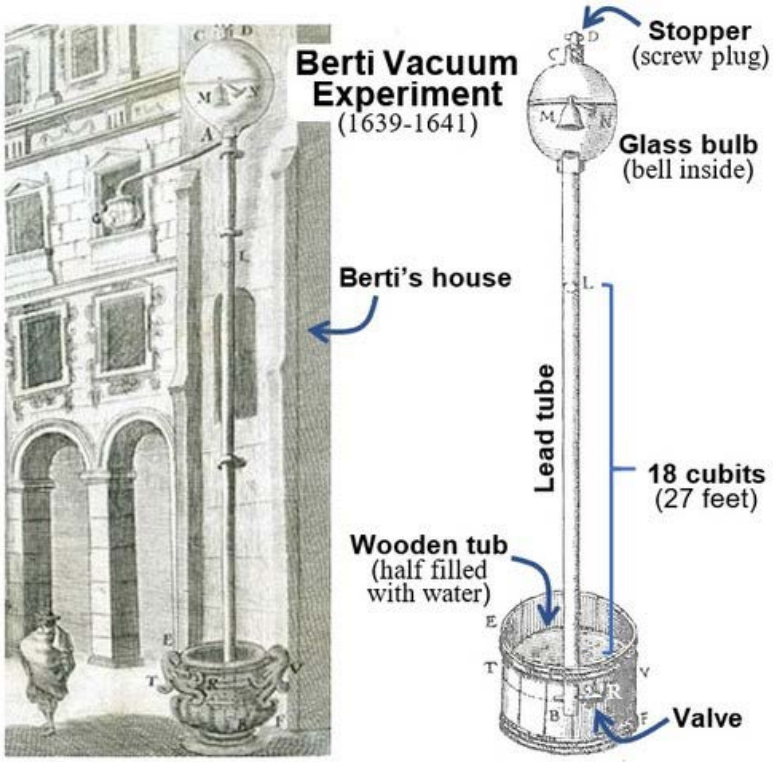

The top portion of the **Berti vacuum experiment** (c.1639), conducted by Gasparo Berti, using the house (shown) of Rafael Magiotti, to which they affixed working model, a 3-story version, of Galileo vacuum device (1632), filled it with water, the upended it into a tub of water, and opened the bottom valve, while keeping the top valve closed, to observe the water to fall to height L, shown above, in the tube, thereby making a vacuum in the region above level L, therein giving the first evidence that vacuums can exist in nature, contrary to the dogma of Aristotle.

Units

Galileo, either in his 1630 letter dialogue or in his 1632 *Dialogues*, stated that at 18 braccia (c.11 meters) or "18 cubits", which translates as "27 feet" or "34 feet" (Huff, 2010), depending on citation, that a siphon will stop working. There does not, to note, seem to be a consistent one-to-one conversion method to state in feet exactly what units Galileo employed and or stated as a max siphon height. Modern engineering hydraulics book, however, tend to cited 27 to 34 feet as being the maximal range for siphon operation, with 34 feet being the theoretical limit.

Dating

The Berti experiment is dated to the time when copies of Galileo's *Two New Sciences* reached Rome (Dec 1638), when the Galileo vacuum device became public, and prior to the cessation of Galileo (1642), per reason that Berti stated that he "hoped to convince Galileo" of the existence of the vacuum, meaning that Galileo was still around when the experiment was performed.

Middleton (1964) thinks the experiment was performed in the latter part of 1641. [6]

Herein, we will assume the experiment was performed in 1639, a year after the Dec 1638 reading of the Galileo's *Two New Sciences*, as the stimulus would have been strong in the wake of its arrival.

Overview

In 1630, Galileo engaged into a dialogue on the nature of the "pump problem", the question of why pumps or siphons would not work beyond 18 cubits, with Giovanni Baliani, the gist of which (Ñº) is shown below:

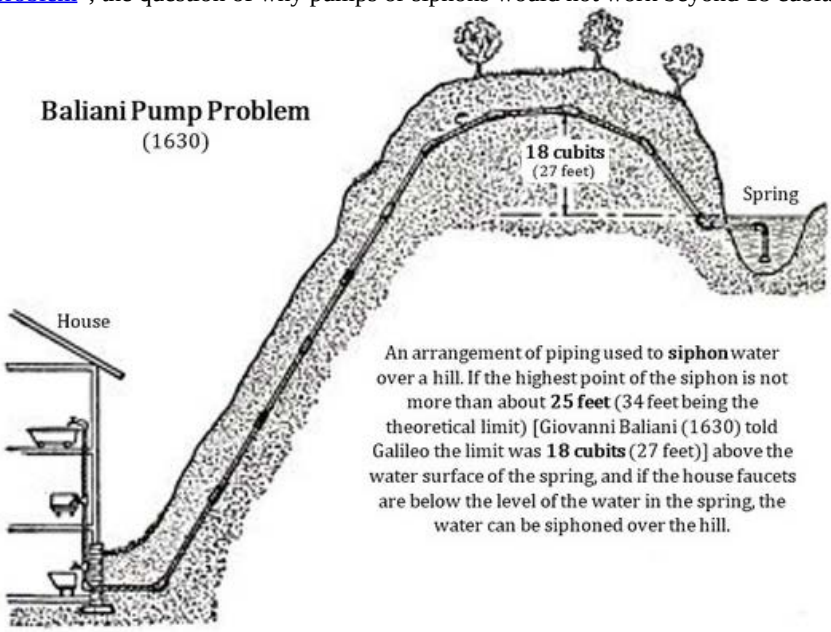

Galileo deciding that the reason the pump would not work beyond 18 cubits (27 feet), was because the water, in the pump (or siphon tubing), broke like a weak rope if it was longer than 18 cubits in length; Baliani using recourse to atmospheric pressure, as the reason.

In 1632, Galileo, penned his *Dialogues Concerning the Two New Sciences*, wherein, in the opening pages (pg. 14), he digresses, via a three-person dialogue, on the different points of view in respect to the Baliani pump problem, therein making his "thought experiment" pump (shown below) for measuring the "force required to break the water", as he envisioned things. [1]

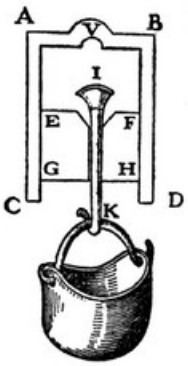

On 6 Mar 1638, Galileo, following censorship issues, formerly published his *Dialogues Concerning the Two New Sciences*.

In Dec 1638, fifty-copies of his *Dialogues*, reached Rome, and were quickly sold out, one copy of which reaching the hands of Gasparo Berti and Rafael Magiotti, who decided to make a working model of Galileo "pump thought experiment" design, which they attached to the side of Magiotti's house (as pictured), so to test Galileo's theories. [2]

In c.1639, Berti, using this device, conducted his so-called vacuum experiment, in front of vacuum existence theory supporter Magiotti and vacuum denialists Athanasius Kircher and Niccolo Zucchi; the gist of which (Nº) is illustrated below:

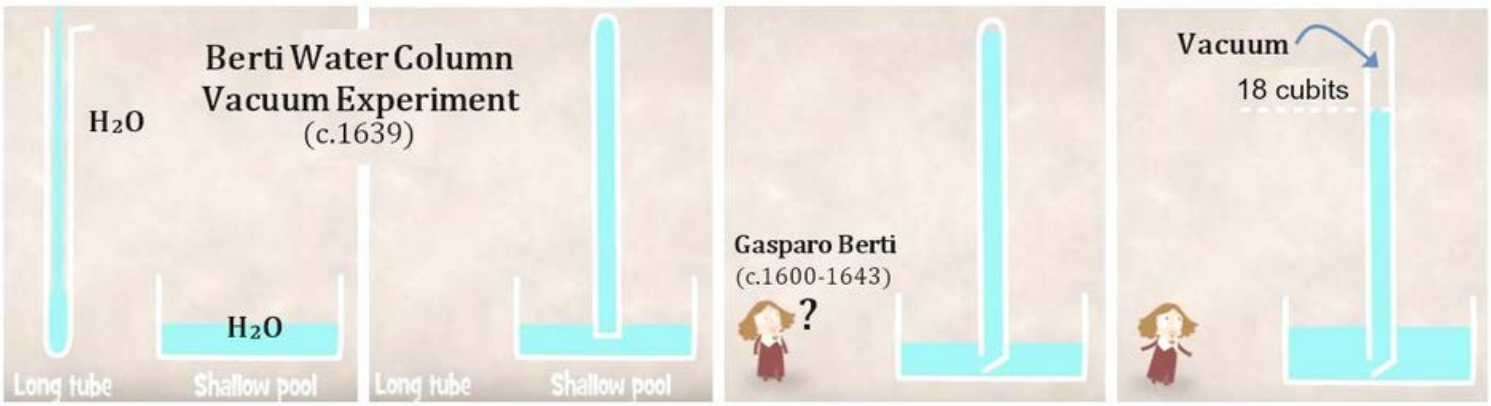

In c.1640, Magiotti communicated, via letter, the details of Berti's water column experiment to Evangelista Torricelli.

In 1643, Torricelli, in effort to make a reduced scale version of Berti's water column experiment, decided to use mercury instead of water, and therein made the now-famous "Torricelli vacuum", aka the world's first mercury barometer. [4]

In 1653, Emmanuel Maignan, in his four-volume *Course on Natural Philosophy*, gave the following retrospective account of Berti's experiment: [3]

> "I refer to the notable experiment performed in Rome several years ago, when I myself dwelt there, by that most clever and erudite man Gaspar Berti, who was indeed my greatest friend.
>
> This distinguished Gaspar, erected a rather long leaden tube AB (adjacent figure) out of doors on the wall of the tower of his house in which the stairs are, and made it secure by means of ropes fastened to iron clamps. I am obliged to say that I do not remember its length exactly, but I know that it must have been more (clearly very little more) than forty palms.
>
> The upper end A of the tube was opposite one of the windows of the tower, while the lower end B was not far from the ground, and was provided with a brass tap or cÏŒck R this being within the cask EF, filled with water for the purpose. To the upper end A was fitted, carefully joined, and cemented, a glass vessel in the form of a flask, rather large but very solid, and having two necks and mouths, the wider one below, into which the end of the tube was inserted at A, as into a box; the narrower above at C, of lead or else tin, as is the custom, and well made so that it would fit the stem of the threaded brass screw (cochlea) D very closely, this being the most solid kind of stopper and

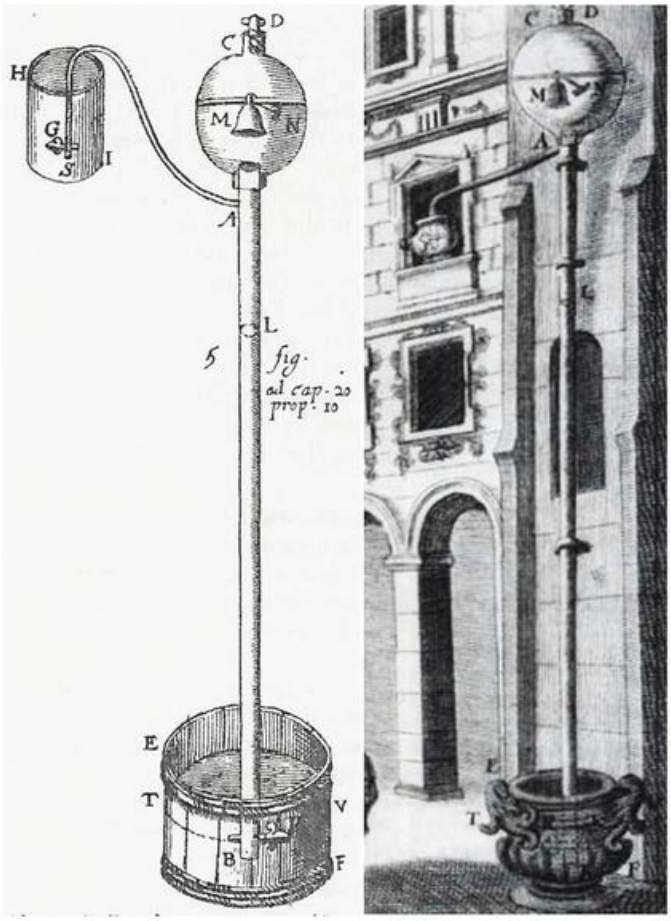

Two diagrams of Gasparo Berti's c.1639 **water column vacuum experiment**, designed to disprove Galileo (1632), and to show that a vacuum had been created in the top bulb; the right illustration from Gaspar Schott's *Technical Curiosities* (1664). [5]

the most suitable for the business in hand.

This being made ready, the tap R closed and the cask EF filled with water to about its middle, the entire tube, as well as the glass vessel, was filled from above through the opening C, right to the top. Then the opening C was closed with the screw D, in order to seal the entire apparatus.

When the tap R was opened the water flowed, contrary to the hope of many [e.g. Kircher and Zucchi], out of the pipe into the cask EF, to an easily observable height; but not all of it flowed out, and it soon stood quite still. This was clear, because a mark was made in the cask at the surface of the water, and next day it was found that the water in it had remained exactly at the mark, although the tap R had remained open all the time.

Then, when this tap had been carefully closed again, the screw D was taken out at the top. And as soon as it was taken out, **behold! the air rushed in with a loud noise and filled the space previously abandoned by the water**. Then by lowering a sounding-line it was determined how much water was inside, or rather to what height the water stood in the tube, and it was found to stand about 18 cubits [27 feet] [13.7 meters] above the level of the water in the cask, at the mark L."

The "bell" addition, figure MN, to the device, shown above, seems to have been the idea of Kircher:

"Athanasius Kircher had declared, that in order to get more evidence on which the vacuum in the said flask might be admitted or rejected, the experiment should be tried again, with a **bell** such as M in the flask, and a suitable iron hammer N. This could be attracted by a magnet outside, and then the magnet could be removed so that the hammer could fall and strike the bell. If, he said, the sound of this blow should be heard, it would be all over with the vacuum, since sound cannot be produced in one. But though he had reflected on this, it still remained untried [but according to Kircher and Zucchi, it must have been tried later]."

— Rafael Magiotti (c.1650), *Natural Philosophy*; quoted by William Middleton (1964) in *The History of the Barometer* (pg. 14)

Magiotti also stated, in this discourse, that he had communicated Berti's experimental findings to "his good friend" Gaspar Schott, who in turn was later in communication with Otto Guericke, who did the same experiments, independently, of Berti, its seems (but not independent of Galileo's vacuum device).

In 1664, Gaspar Schott, in his *Technical Curiosities*, published a diagram (shown adjacent) of Berti's vacuum experiment attached to Magiotti's house. [5]

Quotes

The following are related quotes:

"As to the history of the quicksilver experiment [Torricelli vacuum], your reverence may know that the many wells of Florence which are

cleaned out every year by means of siphons 'by attraction', gave signor Galileo occasion to observe the height of such attraction, which was always the same about 18 ells in that Tuscan measure; and so in every siphon or cylinder (as we like to say) however wide or narrow. From this had their origin his speculations about that matter, which were pout into his work on the resistance of solids. Afterwards, signor Gaspar Berti, here in Rome, made a led siphon which rose to about 22 ells from his courtyard to a room."

— Rafael Magiotti (1848), "Letter to Marin Mersenne", May 25 [6]

"In the 1640s, **Berti's [vacuum] experiment** appears to have remained entirely unknown except to the people actually involved, until Magiotti wrote to Mersenne in 1648 and Zucchi published his anonymous pamphlet in the same year. Who actually saw it, besides Berti? Certainly, Kircher, Magiotti, and Zucchi (Ñº); and as we have seen, Maignan knew all about it. De Waard (1936) thinks Michelangelo Ricci (Ñº) may have been there, but there is really no direct evidence for this assumption; nor is there any reason to believe that Torricelli witnessed the experiment. If Ricci was there, it would be strange if Torricelli did not hear of it from him, as Ricci was his mathematical executor. But Magiotti, near the end of the letter from which we have already quoted, specifically states that he wrote to Torricelli about the experiment, with the suggestion that if the water had been sea water, it would have stood lower in the tube. 'They', presumably Torricelli and Viviani (Ñº), he tells Mersenne, 'made experiments and finally came to the use of quicksilver'."

— William Middleton (1964), *The History of the Barometer* (pg. 19) [6]

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θΔics

In hmolscience, **Bertrand Roehner** (1946-) is a French physicist noted for his early-1980s to present work in econophysics and sociophysics, some of which is summarized in his 2007 *Driving Forces in Physical, Biological and Socio-Economic Phenomena*, wherein he theorizes on things such as metastability in post-revolution societies on a semi-thermodynamic basis, social bonding, among others. [1]

Overview

The following seems to be the gist of Roehner's book: [1]

> "This book relies only occasionally on the analysis of chaos—a science initiated by Benoit Mandelbrot (1975) and Robert May (1976); in contrast, it relies heavily on the ideas of network science. Although it can be traced back to system theory which flourished in the 1960s and 1970s, network science really emerged in the late 1990s through the works of people such as Albert-Laszlo Barabasi (2002), Sergei Maslov (2002), Steven Strogatz (2003) or Duncan Watts (2003)."

(add discussion)

Suicide | Dedonding theory

See main: Human chemical bond

In 2005, Roehner, in his "A Bridge Between Liquids and Socio-Economic Systems: the Key Role of Interaction Strengths", posited that suicide is a type of escape phenomenon similar to way molecules in liquids and selective evaporation due to bonding rearrangements and weak ties. [6]

In 2007, Roehner published *Driving Forces*, an expansion on his 2005 molecular suicide model; of which the following is thematic to his long-term aim: [1]

> "Emile Durkheim, at the end of the nineteenth century, was able to show that there is a clear relationship between the likelihood of suicide and the strength of the bonds which link and individual to the rest of society."

Roehner goes on to state that the his writing his book so to outline "experimental procedures aimed at estimated the strength of bonds" in society, similar to the manner in which Galileo Galilei famously rolled a ball down an inclined plane some 400 times to find that: [5]

> "We always found that the spaces traversed by the ball were to each other as the squares of the times and this was true for all inclinations and for all balls."

Roehner cites this as starting point of modern physics, and eludes to the notion that similar experiments (or sociophysics experiments) are needed to mark the starting point of modern sociophysics. Roehner, on this decent platform, however, seems to think what he calls "network science" is the key, seemingly unaware of classic

Field	Measurement	Key mechanism	Absolute (A) or relative (R) measurement of bond strength
Physics			
1	Boiling point	Rate at which molecules leave the liquid	R
2	Miscibility or immiscibility of two liquids *A* and *B*	Is interaction *A* compatible with interaction *B*?	R
3	Light scattering	Fourier transform of two-point correlation functions	R
4	Autocorrelation of the velocity	Exploration of transport phenomena	R
5	Small-angle neutron scattering	Exploration of alloy segregation	A
6	Infrared spectroscopy	Exploration of atomic interactions within molecules	A
Social sciences			
1	Mixing of two populations *A* and *B*	Is interaction *A* compatible with interaction *B*?	R
2	Correlation length	Exploration of the interactions between commodity markets	R
3	Normalized correlation length	Exploration of interactions between share prices	R
4	Autocorrelation of prices	How fast is equilibrium restored?	R
5	Severance of social ties	Increase in suicide rates	R

Roehner's measurement of social bonds table; one of the aims of his book being to outline methods to measure social bond strengths.

preexisting social experiments, such as the: sidewalk study (1975), hallway study (1994), the Dunbar number measurement of group stability work of Robin Dunbar (2000s), the Gottman stability ratio work of marriage bonds of John Gottman (1970s), and so on, a seeming "reinventing the sociophysics wheel" phenomenon, so to say; which common to anyone who cites Eugene Stanley's *An Introduction to Econophysics* (2000) as being the first book to appear in the field of econophysics or physics based economics, being thereby ignorant of how large and encompassing the so-called mechanistic school was at the start of the 20th century as categorized by Pitirim Sorokin (1928).

Roehner seems to have attempted to work out some of of social bonding theory modeled on chemical and or physical bonding ; the following, e.g., is his table 1.2 "Experimental means for the exploration of bonds", wherein he compares physical bonding models to social bonding models: [1]

Econophysics

Some of Roehner's first econophysics publications are based on George Zipf (1982), Vilfredo Pareto (1985). [2] In 1998, he gave an invited talk on "Empirical regularities in Separatism and Integration" at the Harvard sociology department per invited of S. Lieberson. [4] In 2000, he published "Thermometers of Speculative Frenzy", in collaboration with Didier Sornette. [3]

Education

Roehner presently is a professor at the Institute for Theoretical and High Energy Physics at the University of Paris.

Quotes | Cited

The following are quotes employed by Roehner:

> "Facts are stubborn things; and whatever may be our wishes, our inclinations, or the dictates of our passions, they cannot alter the state of facts and evidence."
>
> — John Adams (1770), cited by Bertrand Roehner in *Driving Forces* (pg. v)

Key

Roehner was found via the key: social metastability.

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θΔics

In existographies, **Bertrand Russell** (1872-1970) (IQ:180|#106) (RGM:145|1,500+) (Gottlieb 1000:593) (EPD:M2/F4) [HD:51] [FA:117] (GAE:21) (Stokes 100:77) (GPhE:#) [CR:165] was a British mathematician, and philosopher, noted for his second law of thermodynamics based dismal view of human future in the explanation of his rejection of religion. The source of his main opinion on the second law seems to stem from his 1927 book *Why I Am Not a Christian*; a book listed by the New York Public Library as one of the most influential 150 books of the 20th century. [1]

Evolution | Mass transformation

In 1927, Russell, in his *An Outline of Philosophy*, stated the following about what he considered, from the 'outside observer' perspective, to be the 'end game', so to say, of evolution:

> "Every living thing is a sort of imperialist, seeking to transform as much as possible of its environment into itself and its seed. We may regard the whole of evolution as flowing from this 'chemical imperialism' of living matter. Of this, man is the last example (so far). He transforms the surface of the globe by irrigation, mining, quarrying, making canals and railways, breeding certain animals and destroying others; and when we ask ourselves, from the **standpoint of an outside observer** [see: advanced perspective], what is the end achieved by all these activities [?], we find that it can be summed up into one very simple formula: to transform as much as possible of the earth's surface into human bodies [see: turnover rate]. And in pursuing the simple purpose of maximizing the amount of human life, we have at any rate the consolation of feeling at one with the whole movement of living things from their earliest origin on this planet."
>
> — Bertrand Russell (1927), *An Outline of Philosophy*; cited by Alfred Lotka (1945) in his "The Law of Evolution as a Maximal Principle" (pg. 174) as a better "signpost pointing us in a better direction" than as compared to Vito Volterra's 1926 predator-prey demographic 'potential' analogies; cited by Judson Herrick (1956) in *The Evolution of Human Nature* (pg. 123) [14]

(add)

Accidental | Atoms

In 1903, Russell, then aged 29, in his "A Free Man's Worship", his supposed best-known and most reprinted essay, engaged into a Faustian dialogue, wherein, after referring to the Nebular hypothesis, origin of life, formation of humans, followed by solar explosion stylized heat death, comments the following: [15]

> "Such, in outline, but even more purposeless, more void of meaning, is the world which science presents for our belief. Amid such a world, if anywhere, our ideals henceforward must find a home. That man is the product of causes which had no prevision of the end they were achieving; that his origin, his growth, his hopes and fears, his loves and beliefs, are but the outcome of accidental collections of atoms; that no fire, no heroism, no intensity of thought and feeling, can preserve an individual life beyond the grave; that all the labours of the ages, all the devotion, all the inspiration, all the noonday brightness of human genius, are destined to extinction in the vast death of the solar system, and that the **whole temple of man's achievement** must inevitably be buried beneath the debris of a universe in ruins—all these things, if not quite beyond dispute, are yet so nearly certain, that no philosophy which rejects them can hope to stand [compare: Eddington rule]. Only within the scaffolding of these truths, only on the firm foundation of unyielding despair, can the soul's habitation henceforth be safely built."

This is an example of "ignorant atheism", close to dumb atheism, but not exactly (compare: smart atheism).

Indian-born ex-atheist Christian Ravi Zacharias (1990) refers to this quote as the "unapologetic atheistic viewpoint on

death”. [16]

Collected works

The collected works of Russell, including his shorter writings, published and unpublished, and his unpublished book-length manuscripts, including over 2,500 papers, comprises 28-volumes. [22]

Wittgenstein

In 1910, Russell met Ludwig Wittgenstein, who became his pupil. [8]

In 1913, Russell encountered Ludwig Wittgenstein who told him that the ideas in his 350-page draft manuscript *Theory of* Knowledge, which had been written in 31-days, were wrong; the following are representative quotes of the situation before and after his “event” encounter, with Wittgenstein, as he calls it: [22]

> “There will be an introductory chapter, which I shall probably leave to the last—the first substantial chapter, which I have nearly finished, is called "Preliminary description of Experience". Then I shall set to work to refute James's theory that there is no such thing as consciousness, then the idealist theory that there is nothing else. Then I shall classify cognitive relations to objects—sense, imagination, memory. Then I shall come on to belief, error, etc.; then to inference; then finally to "construction of the physical world"—time, space, cause, matter. If I go on the scale on which I have begun, it will be quite a big book-500 pages of print I should think.”
>
> — Bertrand Russell (1913), “Letter to Ottoline Morrell”, May 8 [24]

> “We were both cross from the heat. I showed him a crucial part of what I had been writing. He said it was all wrong, not realizing the difficulties—that he had tried my view and knew it wouldn't work. I couldn't understand his objection—in fact he was very inarticulate—but I feel in my bones that he must be right, and that he has seen something that I have missed. If I could see it too I shouldn't mind, but as it is, it is worrying, and has rather destroyed the pleasure in my writing—I can only go on with what I see, and yet I feel it is probably all wrong, and that Wittgenstein will think me a dishonest scoundrel for going on with it. Well, well—it is the younger generation knocking at the door—I must make room for him when I can, or I shall become an incubus. But at the moment I was rather cross.”
>
> — Bertrand Russell (1913), “Letter to Ottoline Morrell”, May 28 [23]

> “I can now express my objection to your theory of judgment exactly: I believe it is obvious that, from the proposition: ‘A judges that (say) a is in the religion R to b’, if correctly analyzed, the proposition ‘aRb.v. ~ aRb’ must follow directly *without the use of any other premise*. This condition is not fulfilled by your theory.”
>
> — Ludwig Wittgenstein (1913), “Letter to Bertrand Russell”, Jun 18 [24]

> “The stuff I wrote about ‘theory of knowledge’ was criticized by Wittgenstein with the greatest of severity. This was an event of first-rate importance in my life, and affected everything I've done since. I saw he was right, and I saw that I could not hope ever again to do fundamental work in philosophy. My impulse was shattered, like a wave dashed to pieces against a breakwater.”
>
> — Bertrand Russell (1916), “Letter to Ottoline Morrell” [24]

(add)

Mill | Atheism sentence

Russell was the godson of John Mill. [7] In 1890, at age 18, Russell began reading Mill's autobiography, wherein he found a sentence that, as he says, began to turn him into an atheist, and event which he describes in his own autobiography as follows: [10]

> "At the age of eighteen ... I read Mill's *Autobiography*, where I found a sentence to the effect that his father taught him that the question 'Who made me?' cannot be answered, since it immediately suggests the further question 'Who made god?'. This led me to abandon the 'first cause' argument, and to become an atheist. Throughout the long period of religious doubt, I had been rendered very unhappy by the gradual loss of belief, but when the process was completed, I found to my surprise that I was quite glad to be done with the whole subject."

(add)

IQ | Uberman

> *See main: Uberman*

In 1961, John Platt ranked Russell's IQ at 180. [13] Russell, before or after this point, supposedly, estimated his own IQ at 180.

> "As a curiosity, it can be mentioned that **Bertrand Russell** sometimes interpreted Nietzsche's overman as a person with an IQ of at least 180 (Actually Russell considered himself to have this IQ!)."
>
> — ProCop (2003), SciForums.com post (Ñº), Dec 9 [12]

The 180 IQ estimate continues to be cited (Ñº) in 2001; others, less discerning, have gauged (Ñº) his IQ at 147. Russell, supposedly, said that an IQ of 180 was the cutoff IQ to being a Nietzsche uberman, and also gave the following seven candidates who in sum, supposedly, would embody the future "god theory" over-thrower, listed by top 500 geniuses ranking standing:

Uberman [Mean IQ:189] Archetypes: molds to future replacement for god theory			**Description**
1.	Johann Goethe (1749-1832) German polyintellect	IQ:225|#1 **[HD:19]** [FA:54]	(Cattell 1000:7) [RGM:23|1,250+] The famed "trainer of assassins of god", namely: Arthur Schopenhauer, Friedrich Nietzsche, and Libb Thims; among which, Nietzsche, according to Albert Camus (1942), is "the most famous of god's assassins."
2.	Leonardo da Vinci (1452-1519) Italian polymath	IQ:200|#7	(Cattell 1000:86) [RGM:1|1,250+] Rejected Biblical flood myth theory (see: Noah's ark).

3.	William Shakespeare (1564-1616) English writer	IQ:190|#49 **[HD:4]** [FA:23]	(Cattell 1000:2) [RGM:10|1,250+] His brand of atheism influenced Goethe greatly, second only in influence to that of Benedict Spinoza.
4.	Michelangelo (1475-1564) Italian artist	IQ:180|#116	(Cattell 1000:28) [RGM:11|1,250+]
5.	Napoleon Bonaparte (1769-1821) French leader	IQ:180|#106 **[HD:20]** [FA:57]	(Cattell 1000:1) [RGM:171|1,250+] Queried all the scientists of France about their atheism beliefs, and queried physicians about the location of the soul; noted for the Napoleon Laplace anecdote, the most famous atheism quip of all time.
6.	Julius Caesar (I00-44BC) Roman leader	IQ:170|#248	(Cattell 1000:8)
7.	Socrates (c.469-399BC) Greek philosopher	IQ:180|#159 [FA:57]	(Cattell 1000:29) [RGM:14|1,250+]

(add)

Earlier years

In adolescence, Russell stated that his thought time was divided among the following three subjects: [7]

> "I was obliged to preserve an impenetrable secrecy towards my people. My interests were divided between sex, religion, and mathematics."

great events of his reaction existence (life), Russell commenting that it was "as dazzling as first love", but one that left him with lasting questions about the foundations of mathematics—questions which went on to seed his so-called greatest desire, namely: "to find some reasons for supposing mathematics true."

At age sixteen, however, in dis-alignment with his own desire, in alignment with his mother's wishes for him to become a Unitarian minister, over that of his preference to follow a career in mathematics, he was sent to a "crammer" to prepare for scholarship examination at Trinity College, Cambridge. On this state of existence, as Russell explains in his autobiography: [6]

> "I was profoundly unhappy. There was a footpath leading across the fields to New Southgate, and I used to go there alone to watch the sunset and contemplate suicide. I did not, however, commit suicide, because I wished to know more of mathematics."

In reflection of his early years, Russell recalling the following from his youth: [6]

During the course of this tumultuous period of existence, Russell claimed that beginning at age 15, he spent considerable time thinking about the validity of Christian religious dogma, and by 18 had decided to discard the last of it.

Purpose, god, and heat death

In his 1927 lecture "Why I Am Not a Christian", delivered in London on a Sunday, in a subsection on objections to religions, Russell states his opinion on the relationship between conclusions of thermodynamics and religion as follows: [2]

> "Considered as the climax to such a vast process, we do not really seem to me sufficiently marvelous … nevertheless, even after making allowances under this head, I cannot but think that Omnipotence operating through all eternity might have produced something better. And then we have to reflect that even this result is only a flash in the pan. The earth will not always remain habitable; the human race will die out, and if the cosmic process is to justify itself hereafter it will have to do so elsewhere than on the surface of our planet. And even if this should occur, it must stop sooner or later."

He then famously remarks, in a negation of religious thermodynamics, that:

> "The second law of thermodynamics makes it scarcely possible to doubt that the universe is running down, and that ultimately nothing of the slightest interest will be possible anywhere. Of course, it is open to us to say that when the time comes god will wind up the machinery again; but if we do say this, we can base our assertion only upon faith, not upon one shred of scientific evidence. So far as scientific evidence goes, the universe has crawled by slow stages to a somewhat pitiful result on this earth and is going to crawl by still more pitiful stages to a condition of universal death."

In conclusion, he says:

> "If this is to be taken as evidence of purpose, I can only say that the purpose is one that does not appeal to me. I see no reason, therefore, to believe in any sort of God, however vague and however attenuated."

(add)

Other

In 1927, Russell, in his *Analysis of Matter*, was ambivalent on the possibility of reversibility of photon and electron movement according to quantum theory in relation to irreversibility in thermodynamics. [3]

A notable student of Russell's was American mathematician Norbert Wiener who studied under Russell during a fellowship at Cambridge in 1912. [4]

Russell won the 1950 Nobel Prize in literature in recognition of "his varied and significant writings in which he champions humanitarian ideals and freedom of thought." In his Nobel Lecture "What Desires are Politically Important", Russell comments on the topic of desire that: [5]

> "All human activity is prompted by desire. There is a wholly fallacious theory advanced by some earnest moralists to the effect that it is possible to resist desire in the interests of duty and moral principle. I say this is fallacious, not because no man ever acts from a sense of duty, but because duty has no hold on him unless he desires to be dutiful. If you wish to know what men will do, you must know not only, or principally, their material circumstances, but rather the whole system of their desires with their relative strengths."

(add)

Quotes | Employed

The following are quotes employed by Russell:

> "A living organism, then, from the point of view of the scientific observer, is a self-regulating, self-repairing, physico-chemical complex mechanism. What, from this point of view, we call 'life' is the sum of its physico-chemical processes, forming a continuous interdependent series without break, and without the interference of any mysterious extraneous force. No hard-and-fast line can be drawn between the living and the non-living. There is no special living chemical substance, no special vital element differing from dead matter, and no special vital force can be found at work. Ever step in the process is determined by that which preceded it and determines that which follows."
>
> — Edwin Goodrich (c.1925), "Evolution", in: *Encyclopedia Britannica*; cited by Bertrand Russell (1935) in: *Religion and Science* (pg. 200); both cited by Julien Musolino (2015) in: *The Soul Fallacy* (pg. 130) [25]

Quotes | On

The following are quotes on Russell:

> "Great spirits have always encountered violent opposition from mediocre minds."
>
> — Albert Einstein (1940), "Letter to Bertrand Russell", comment on his City College of New York fiasco court decision (opposition: Bishop Manning, judge Jane Kay, etc.), wherein he lost his teaching post owing to slander about his views on sexual morality and irreligion [20]

Quotes | By

The following are noted quotes:

> "Taking 'free will' first to consider, there is **no clear dividing line** between man and the protozoon. Therefore, if we give free will to man, we must give it also to the protozoon. This is rather hard to do. Therefore, unless we are willing to give free will to the protozoon, we must not give it to man. This however is possible, but it is difficult to imagine, if, as seems to me probable, protoplasm only came together in the ordinary course of nature, without any special providence from god, then **we and all living things are simply kept going by chemical forces** and are nothing more wonderful than a tree (which no

one pretends has free will) and even if we had a good enough knowledge of the forces acting on anyone at any time, the motives pro and con, the constitution of his brain at any time, then we could tell exactly what he will do. And not having free will we cannot have immortality."

— Bertrand Russell (1887), "Greek Exercise #5" (age 15), Apr 2 [21]

"Even if open windows of science at **first make us shiver** [chilling effect] after the cozy **indoor warmth** of traditional humanizing myths, in the end [warming effect] the fresh air brings vigor, and the great spaces have a splendor of their own."

— Bertrand Russell (1925), *What I Believe* [19]

"The plain man thinks that material objects must certainly exist, since they are evident to the senses. Whatever else may be doubted, it is certain that anything you can bump into must be real; this is the plain man's metaphysic. This is all very well, but the physicist comes along and shows that you never bump into anything: even when you run your hand along a stone wall, you do not really touch it. When you think you touch a thing, there are certain electrons and protons, forming part of your body, which are attracted and repelled by certain electrons and protons in the thing you think you are touching, but there is no actual contact. The electrons and protons in your body, becoming agitated by nearness to the other electrons and protons are disturbed, and transmit a disturbance along your nerves to the brain; the effect in the brain is what is necessary to your sensation of contact, and by suitable experiments this sensation can be made quite deceptive. The electrons and protons themselves, however, are only crude first approximations, a way of collecting into a bundle either trains of waves or the statistical probabilities of various different kinds of events. Thus matter has become altogether too ghostly to be used as an adequate stick with which to beat the mind. Matter in motion, which used to seem so unquestionable, turns out to be a concept quite inadequate for the needs of physics."

— Bertrand Russell (1928), "What is the Soul?" (Ñº)

"My own view on religion is that of Lucretius. I regard it as a disease born of fear and as a source of untold misery to the human race. I cannot, however, deny that it has made some contributions to civilization. It helped in early days to fix the calendar, and it caused Egyptian priests to chronicle eclipses with such care that in time they became able to predict them. These two services I am prepared to acknowledge, but I do not know of any others."

— Bertrand Russell (1930), "Has Religion Made Useful Contribution to Civilization?" (Ñº)

"So far as I can remember, there is not one word in the Gospels in praise of intelligence."

— Bertrand Russell (c.1930) in FSM app

"Man is a rational animal—so at least I have been told. Throughout a long life, I have looked diligently for evidence in favor of this statement, but so far I have not had the good fortune to come across it, though I have searched in many countries spread over three continents. On the contrary, I have seen the world plunging continually further into madness. I have seen great nations, formerly leaders of civilization, led astray by preachers of bombastic nonsense. I have seen cruelty, persecution, and superstition increasing by

leaps and bounds, until we have almost reached the point where praise of rationality is held to mark a man as an old fogey regrettably surviving from a bygone age. All this is depressing, but gloom is a useless emotion. In order to escape from it, I have been driven to study the past with more attention than I had formerly given to it, and have found, as Erasmus found, that folly is perennial and yet the human race has survived. The follies of our own times are easier to bear when they are seen against the background of past follies. In what follows I shall mix the sillinesses of our day with those of former centuries. Perhaps the result may help in seeing our own times in perspective, and as not much worse than other ages that our ancestors lived through without ultimate disaster."

— Bertrand Russell (1943), "An Outline of Intellectual Rubbish" [26]

"The freethinker's universe may seem bleak and cold to those who have been accustomed to the comfortable indoor warmth of the Christian cosmology. But to those who have grown accustomed to it, it has its own sublimity, and confers its own joys."

— Bertrand Russell (1944), "The Value of Free Thought" [20]

"I can't prove that either the Christian god or the Homeric gods do not exist, but I do not think that their existence is an alternative that is sufficiently probable to be worth serious consideration."

— Bertrand Russell (1947), "Am I an Atheist or an Agnostic" [17]

"I do not believe that a decay of dogmatic belief can do anything but good. I admit at once that the new systems of dogma, such as those of the Nazis and the Communists, are even worse than the old systems, but they could never have acquired a hold over men's minds if orthodox dogmatic habits had not been instilled in youth. Stalin's language, e.g., is full of reminiscences of the theological seminary. What the world needs is not dogma, but an attitude of scientific inquiry, combined with a belief that the torture of millions is not desirable, whether inflicted by Stalin or by a deity imagined in the likeness of the believer."

— Bertrand Russell (1954), *Human Society in Ethics and Politics* (see: atheism atrocities fallacy) [18]

"Three passions, simple but overwhelmingly strong, have governed my life: the longing for love, the search for knowledge, and unbearable pity for the suffering of mankind."

— Bertrand Russell (1956), "What I Have Lived For", Prologue to *Autobiography* [9]

"I am myself a dissenter from all known religions, and I hope that every kind of religious belief will die out."

— Bertrand Russell (1958), *The Will to Doubt* (pg. 17) [11]

"There can't be a practical belief for believing what isn't true. Either a thing is true or it isn't. If it is true, you should believe it. If it isn't, you shouldn't. If you can't find out whether it is true or it isn't, you should suspend judgment."

— Bertrand Russell (1959), response to query: “do you think there’s a practical reason for having religious beliefs?” (Ñº)

“I am not, myself, satisfied with what I have read or said on the philosophical basis of ethics. I cannot see how to refute the arguments for the subjectivity of ethical values, but I find myself incapable of believing that all that is wrong with wanton cruelty is that I don't like it. I have no difficulty in practical moral judgments, which I find that I make on a roughly hedonistic basis, but, when it comes to the philosophy of moral judgments, I am impelled in two opposite directions and remain perplexed. I have already expressed this perplexity in print, and I should deeply rejoice, if I could find or be shown a way to resolve it, but as yet I remain dissatisfied.”

— Bertrand Russell (1960) quote (Ñº) on morality

See also

â— The Theologian’s Nightmare

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Videos

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External links

â— Bertrand Russell – Wikipedia.

θΔics

In doubles, **Bertrand Russell 2** is []

→ **Bertrand Russell** (mobile; readable; NON-editable)
→ **Bertrand Russell** (online; readable) – WayBack (2017)
→ Bertrand Russell (hacked; Non-readable)

Bertrand Russell (1872-1970) (IQ:180|#108) (RGM:113|1,260+) [HD:51] [FA:117] (DN:7) (Stokes 100:77) (CR:44) was a British mathematician, philosopher, and top-ranked greatest atheist ever, an EPD product (mother two; father four), noted for his second law of thermodynamics based dismal view of human future in the explanation of his rejection of religion. The source of his main opinion on the second law seems to stem from his 1927 book *Why I Am Not a Christian*; a book listed by the New York Public Library as one of the most influential 150 books of the 20th century

θΔics

In publications, **best book** refers to the self-defined "best" publication by German polymath Johann Goethe, among his prodigious literary output of 142 plus collected works set—which, in terms of world literature library representation, ranks second only to that of Shakespeare—namely his 1809 physical chemistry based novella *Elective Affinities*.

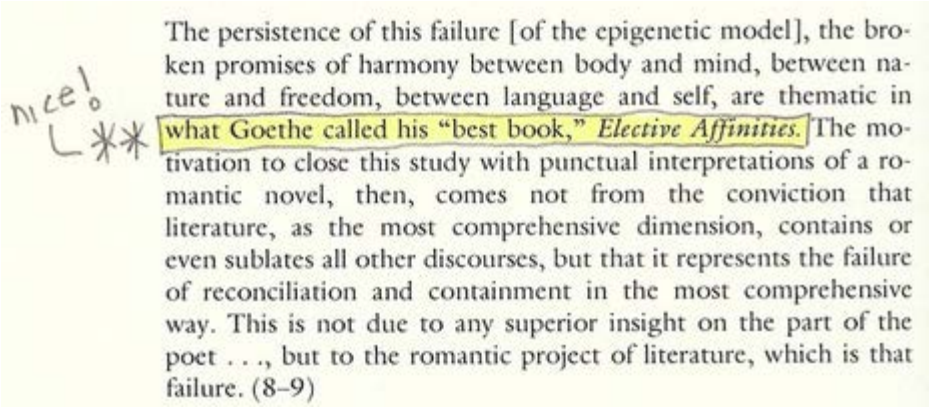
The persistence of this failure [of the epigenetic model], the broken promises of harmony between body and mind, between nature and freedom, between language and self, are thematic in what Goethe called his "best book," *Elective Affinities*. The motivation to close this study with punctual interpretations of a romantic novel, then, comes not from the conviction that literature, as the most comprehensive dimension, contains or even sublates all other discourses, but that it represents the failure of reconciliation and containment in the most comprehensive way. This is not due to any superior insight on the part of the poet . . ., but to the romantic project of literature, which is that failure. (8–9)

A an example quote, highlighted by Libb Thims (2006), of Goethe's *circa* 1820s "best book" comment, as described by Helmut Muller-Siever (1997), as found in Astrida Tantillo's 2001 *Goethe's Elective Affinities and the Critics*. [6]

Overview

Of Goethe's 142 plus collected works publications, his self-defined "best book" was his 1809 *Elective Affinities*. [1] As summarized by American musicologist Kristina Muxfeldt, it was a "work he counted among his greatest achievements". [2] Noted *Elective Affinities* critique Walter Benjamin (1892-1940) notes "the speechless irony" of a scene reported by German dramatist, novelist and theatre-director Heinrich Laube: [3]

> "A lady addressed Goethe on the subject of *Elective Affinities*: 'I do not approve of this book at all, Herr von Goethe; it is truly immoral and I do not recommend it to any women.'—Thereupon Goethe kept a serious silence for awhile, and finally, with great civility, replied: 'I am sorry, for it is my **best book**.'"

A fuller version of the incident, as recounted in the 1949 *Goethe: the Story of a Man: Being the Life of Johann Wolfgang Goethe as Told in his Own Words and the Words of his Contemporaries*, a collection of letters and correspondences, edited together by Ludwig Lewisohn, is as follows: [4]

> "A women friend of mine said to Goethe at that time: 'I cannot approve of *Elective Affinities*, Herr von Goethe; it really is an immoral book!' According to her report Goethe was silent for a while and had then said with great earnestness: 'I'm sorry you feel that way. It is my **best book**, and don't think that this is the mere whim of an aging man. I grant you that one loves most deeply the child of one's last marriage, the product of one's late power of generation. But you wrong me and the book. The principle illustrated in the book is true and not immoral. But you must regard it from a broader point of view and understand that the conventional moral norms can turn into sheer immorality when applied to situations of this character."

(add)

Date: 1809 or 1810?

The previous version by Lewisohn is dated as "late December", 1809.

American Goethean scholar Alfred Steer, in his 1990 *Goethe's Elective Affinities: the Robe of Nessus*, however, reports that the incident took place in 1810, as follows: [7]

German dramatist Heinrich Laube, source for the Goethe circa 1809-10 "**best book**" incident.

> "In 1810, as Heinrich Laube reports (1), a lady is supposed to have complained to Goethe about the immorality of the novel; the author is said to have replied: "I am sorry, but it is after all my best book."

The Steer (1) reference, here, then, disagrees with the Lewisohn (1949) reference.

The original Laube source thus needs to be tracked down.

Beyond this, if the incident was passed along through word of mouth, as it seems to have been, and first documented by Laube, this would imply that he would have had to have been at least the age of adult hood, circa age 20 (1826), to have lady friends bold enough to reproach Goethe who would later tell him such an incident.

Other

To corroborate the above view that Goethe held the deep opinion that *Elective Affinities* was his greatest work, in 1827 he commented to his literary associate German author Johann Eckermann: [5]

> "The only production of greater extent, in which I am conscious of having labored to set forth a pervading idea, is probably my *Elective Affinities*."

(add)

See also

â— Goethe timeline

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θΔics

In publications, **best sellers** are books that sell well, comparatively. Most newly published books (about 93%) sell fewer than 1,000 copies. The following table lists best sellers that contain, sections, digressions, or content on force, entropy, human energy, psychological entropy, human thermodynamics, thermodynamics, etc.:

#	Book	Thermodynamics/HT content	Year	Author	Copies
1.	*The Celestine Prophecy*	Built, in part on Berne's 1964 *The Games People Play*; discusses how all relationships function as means to get energy, via transformations, power, etc. (indirectly HT related).	1993	James Redfield	23 million (2008) [2]
2.	*The Exorcist*	The inspiration behind the character of Father Merrin was French science-philosopher and religious thermodynamicist Pierre Teilhard; and parts of the plot were themed on Teilhard's theory of evil (or the existence of Satan) in the world possibly being Lucifer [or matter-energy spirit] working out his [or its] salvation through the process of physical evolution ending in Teilhard's omega point.	1971 1973 film	William Blatty	11 million (2007) [10] 9th-highest grossing film ever (adjusted) [11]
3.	*A Brief History of Time*	Argues that study or reading lowers the entropy (human entropy) of the central nervous system; also that the time's arrow, the psychological arrow, and the thermodynamic arrow all point in the same direction.	1988	Stephen Hawking	10 million (2007) [3]
4.	*The Road Less Traveled*	Speculates on entropy, evil, evolution, and spiritual growth.	1978	Morgan Peck	7 million (2002) [4]
5.	*The Games People Play*	Builds on Freud's psychodynamic id-ego model to explain human interactions as role play in a game.	1964	Eric Berne	5 million (2004) [5]
6.	*The Crying of Lot 49*	Maxwell's demon, heat engines, entropy, etc.		Thomas Pynchon	3 million (2005) [9]
7.	*V*	Entropy/second law material.		Thomas Pynchon	3 million (2005) [9]
8.	*Wealth and Poverty*	Uses Shannon information theory to argue that knowledge is anti-entropic and that the accumulation of information in mental growth acts to circumvent the second law.	1981	George Gilder	1 million (1991) [6]
9.	*Introduction to Chemical Engineering Thermodynamics*	Standard chemical thermodynamics material.	1949	Hendrick van Ness (and others)	500,000 (2001) [7]
10.	*Gravity's Rainbow*	Entropy/second law material.		Thomas Pynchon	300,000 (2005) [9]
11.	*Spook: Science Tackles the Afterlife*	Devotes ten-pages to Gerald Nahum's thermodynamics consciousness weighing experiment.	2005	Mary Roach	100,000 (2006) [12]
		Argues that the principle of entropy, as in			

12.	*The Trouble With Canada*	social entropy, and the entropic force applies to creation and cooling of societies, similar to the formation and eventual heat death of galaxies	1994	William Gairdner	50,000 [8]

In the top books, only Hawking, Peck, and Gilder directly discuss energy or entropy in the context of thermodynamics; the others discuss energy and force in the context of human existence, human interaction, or function in a more indirect, everyday, or non-technical style of communication.

See also

â— Famous publications
â— Most-cited thermodynamics publications
â— Literature thermodynamics

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10. (a) Trachtenberg, Jeffrey A. (2007). "From Hardcover to Paper, How a Blockbuster Was Born: a Calculated Approach for 'Eat, Pary, Love'; Memoir Strikes a Nerve", The Wall Street Journal Quote on *The Exorcist*: "Back in the 1970s, those smaller, rack-sized paperbacks were the blockbusters of the business, led by such best sellers as William Peter Blatty's "The Exorcist" (11 million copies sold); Peter Benchley's "Jaws" (more than nine million copies), and Sidney Sheldon's "The Other Side of Midnight" (six million copies plus)." (14 September).
(b) Bill Blatty on "The Exorcist" – information on the novel, in the author's own words (Teilhard mentioned twice).
11. (a) All Time Box Office (adjusted) – BoxOfficeMojo.com.
(b) All Time US 100 Box Office Films (adjusted) – FilemSite.org.
12. (a) Roach, Mary. (2005). *Spook: Science Tackles the Afterlife* (Gerry Nahum, pgs. 97-106, 290, 297). W.W. Norton & Co.
(b) Google books excerpt: "2006 reprint + 100,000 first printing".

External links

â— List of best-selling books – Wikipedia.

θΔics

In human chemistry, **Betty Jo Teeter Dobbs** (1930-1994), often cited as B.J. Dobbs, was an American chemistry historian noted for her 1975 *The Foundations of Newton's Alchemy*, possibly touching on Query 31, wherein she, supposedly, "examines the rule of the 'mediator' by which two substances are made 'sociable'" a part of the famous footnote 2.5 of Ilya Prigogine's 1984 *Order Out of Chaos*. [1]

Education

Dobbs was a chemistry historian, specializing in the unpublished handwritten alchemical work of Isaac Newton, at the University of California, Davis. [1]

References

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(b) Prigogine, Ilya. (1984). *Order Out of Chaos – Man's New Dialogue with Nature* (note, pg. 64; endnote, pg. 319). New York: Bantam Books.
2. Betty Dobbs (obiturary) – Content.CDlib.org.

External links

â— Betty Jo Tetter Dobbs – Wikipedia.

θΔics

In dating systems, **BG**, short for “Before Goethe”, as can be compared to BC, short for “Before Christ” (a mythology-based dating system), refers to years, in the Goethean calendar, before 1750, according to which 1 Jan 1749 is the start of the year 1 BG (technically 7-months and 28.5 days before or reaction synthesis the birth of Goethe), 1 Jan 1748 to the start of the year 2 BG, etc.

See also

- AG | After Goethe

θΔics

In thermodynamics, **biased thermodynamics** refers to formulations of thermodynamics that are embedded with underlying formulator bias.

Pierre Teilhard (left) and Ilya Prigogine (right), two examples of scientists who presented their versions of human thermodynamics in **biased** manner, the former towards spiritualism, the latter towards partial indeterminism.

Determinism

An example is Belgian chemist Ilya Prigogine (pictured) and his assumption that "determinism", specifically as this applied to human choice and behavior, must be a false doctine in some way or another, a view captured in his three 1937 (age twenty) articles: “Essay on Physical Philosophy”, “The Problem of Determinism”, and “The Evolution”, and over the course of the next forty years drafted version of so-called “far-from-equilibrium thermodynamics” or Prigoginean thermodynamics, cruxed in the notion of speculations about “internal entropy”, symbol dS_i, which posits that systems on the surface of the earth are “far-from-equilibrium”, are defined as being “dissipative systems”, and to evolve to the next state follow determinate “thermodynamics braches” prior to reaching the bifurcation point, at which time, the change becomes “indeterminante”. In other words, Prigogine derived a type of thermodynamics biased, from the get-go, towards the view that determinism is a false postulate or doctrine.

Spirituality

Another noted example of biased thermodynamics is the corpus of the collected works of French philosopher, physical chemist, theologian, and paleontologist Pierre Teilhard who from the get-go in his thinking was under the opinion that the "spirit" must exist in the universe and so beginning in 1916 (age thirty-five) began to dig for this assumed-to-exist spirit in physical science and in particular chemistry and thermodynamics, eventually arriving at his 1938 *The Phenomenon of Man* and so-called "omega point" theory, which hold that sometime in the future the minds of the world will coalesce into a unified sphere of interconnected minds or "noosphere" a type of spiritual endpoint to evolution, thus being a physical science corroboration of the concept of the promised land of the Bible, or something to this effect, so to speak. In other words, Teilhard derived a type of thermodynamics biased, from the get-go, towards the view that the spirit must exist and hence must have explanation in terms of energy and entropy.

θΔics

In religio-mythology, **Bible** is a combination of the Old Testament (c.300BC), itself rooted in a Osiris rescript into the fictional character Moses, and the New Testament (c.200AD), itself rooted in an Osiris-Horus syncretistic rescript into the fictional character of Jesus, both generally based on a god reduction or god-to-prophet retelling of the astro-theology based tales and stories of the Egyptian Book of the Dead (2500BC) and negative confessions based morality system embedded therein.

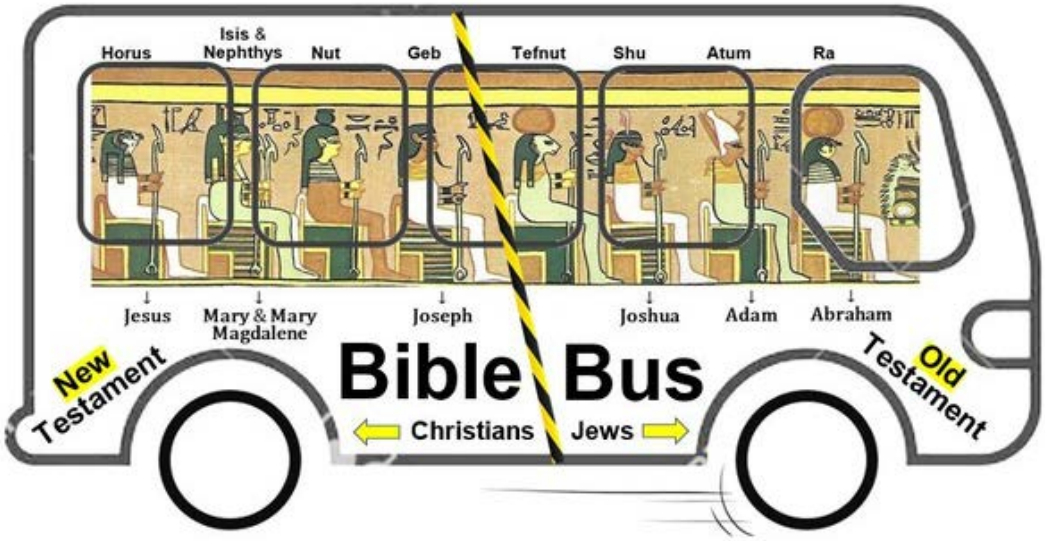

A "gods behind" the characters of Judaism and Christianity take on the **Bible**, showing the main gods of the Heliopolis Ennead, as shown in the Judgment Hall, in the Ani-version of the *Egyptian Book of the Dead* (1250BC), made into a humor stylized "**Bible Bus**" (Q)(Q) going on a field trip, with each of the Egyptian gods (see: Egyptian pantheon) shown with their Biblical character reformulations (see: Judeo-Christian Islamic pantheon; god character rescripts), demarcated with the Old Testament gods (or prophets) in the front of the bus, and the New Testament gods (prophets or figures) in the back of the bus.

Etymology

The term "Bible" derives from the Semitic-Greek *biblos* 'papyrus, scroll,' based on the ancient the city Byblos (Q), the port city through which papyrus was shipped, via the Aegean Sea.

Origin

See main: How the Bible was Written?

The Bible, comprised of the Old Testament, based on the astro-theology rooted beliefs themed in the characters: **Abraham** (Adam), Adam (Atum), Joshua (Shu), and Moses (Osiris), and the New Testament, based on the characters: **Jesus**, Virgin Mary (Isis), Mary Magdalene (Nephthys), and Joseph (Geb), is a collected works book, compiled during the years 1000 BC (BCM) to 300 AD (ACM), that is a "monotheistic" god-to-prophet reformulation (god reduction), rescript (see: god character rescripts), or recension (see: recension theory) of the world view contained in the "polytheistic" *Egyptian Book of the Dead*; a book containing a reduced version of the the extant Egyptian religion, e.g. Ra theology, Osirian worship, Heliopolis creation myth, and its variants, generally, along with partial synretism of various Mesopotamian religions (see: Mesopotamian mythology). [1]

The views contained in the Bible represent the dominate belief system of the modern world, accounting for 32 percent of the religious beliefs of the world.

Overview | Key sections

The following are the main verses of the Christian Bible that the free thinker needs to be aware of:

Old Testament

Section	Summary	Compare
1. Genesis		
→ Genesis 1:3	The paradoxical statement that "light" is created on the first day, but the sun and the stars are not created until the forth day? (Q) The confusion is resolved by noting that this a a reformulation of Thebian creation myth.	
→ Genesis 1:1-31	The "six days" model is based partly on the Babylonian myth, recounted in the 700BC Enuma Elis (Q), of the story (Q) of the creation of the six generations of gods; the opening words are based on the Hermopolis creation myth (2400BC), a version of which is recounted in the 310BC Nesi-Amsu Papyrus (Creation Version A). (Q)	
→ Genesis 2:21-22	God makes the first woman (Eve) from Adam's rib ; partly based on the Sumerian myth of Ninti healing Enki's rib.	
→ Genesis		

4:1-19	The story of Cain and Abel; a rescript of the story of Set vs Osiris.	
2. Exodus		
→ Exodus 21:20-21	Decrees that slavery is morally righteous, and that if a slave owner beats a slave, male or female, with a stick so severely that the slave dies (dereacts), the slave owner should be punished. If, however, the slaves survives a day or two, he or she should get back to work, being that the slave is still the owner's property. [4]	
→ Exodus 22:18	Death penalty for witches. [7]	
→ Exodus 31:15	Death penalty for sabbath-breakers. [7]	
3. Leviticus		
→ Leviticus 18	Gives a detailed ranked ordered list of who NOT to have sex with in terms of family, friends, and neighbors.	
→ Leviticus 18:22	“Do not have sexual relations with a man as one does with a woman; that is detestable.” (Q)(Q)	
→ Leviticus 20:13	Death penalty for homosexuals. [7]	Sura #
→ Leviticus 24:19-21	States: "And a man who injures his countryman– as he has done, so it shall be done to him [namely,] fracture for fracture, **eye for eye, tooth for tooth**. Just as he has injured a person, so it shall be done to him"; is a straight copy (Q) of §:196-201 (Q) the 1750BC Codes of Hammurabi.	
4. Numbers		
5. Deuteronomy		
→ Deuteronomy 13:6-11	States that if your family members turn to other gods they are to be put to death: (Q) 6If your very own brother, or your son or daughter, or the wife you love, or your closest friend secretly entices you, saying, “Let us go and worship other gods” (gods that neither you nor your ancestors have known, 7gods of the peoples around you, whether near or far, from one end of the land to the other), 8do not yield to them or listen to them. Show them no pity. Do not spare them or shield them. 9**You must certainly put them to death. Your hand must be the first in putting them to death**, and then the hands of all the people. 10**Stone them to death**, because they tried to turn you away from the Lord your God, who brought you out of Egypt, out of the land of slavery. 11Then all Israel will hear and be afraid, and no one among you will do such an evil thing again. Cited by Denis Diderot in the Diderot-Barthelemy dialogue (1773).	
→ Deuteronomy 22:13-21	States that only marriages to virgins are valid, and if “the wife is not a virgin, she shall be executed”. (Q)	
→ Deuteronomy 22:28-19	Decrees that if a man is caught in the act of raping a young women who is not engaged, he must pay fifty pieces of silver to the girl's father and then the girl must marry her rapist and never be allowed to divorce him. [4]	
→ Deuteronomy 33:17	Says the horns of Joseph are like the horns of unicorns; unicorns also mentioned (Q) in four other places in KJB; the Geneva Bible (1599) had Deuteronomy 14:5 stating that the unicorn was one of the clean animals permissible to eat, according to Mosaic law.	
→ Deuteronomy 34:5-8	Is the location of the "Moses pens his own death problem".	
	States that Joshua made both the sun and the moon stood still for an entire day; the physically-impossible descriptions, which has troubled geniuses (Maimonides, Gersonides, Galileo, Spinoza, Herder, Paine, Napoleon, etc.) for centuries, is a monotheistic rescript of the Egyptian mythology story	

6.	Joshua 10:13	of the Sorrows of Isis (line 205), wherein Isis finds her son Horus foaming at the mouth after being bitten by a scorpion and summons Ra the "sun" god and Thoth the "moon" god to her aid, to stop time and to heal her son; the god Shu, originally the grandfather of Isis, according to Heliopolis creation myth, becomes the man Joshua, from *Jo-* meaning "god" + *-Shua* meaning "Shu".
7.	2 Kings 2:24	Elisha and the two bears slaughter 42 kids; a retelling of Horus and Set battling in the stars, as the Orion and Bear constellations to avenge the slain Osiris (El-Sah).
8.	Ecclesiastes 3:19-20	"For that which befalleth the sons of men befalleth beasts; even one thing befalleth them: as the one dieth, so dieth the other; yea, they have all one breath; so that a man hath no preeminence above a beast; for all is vanity. All go unto one place; all are of the dust, and all turn to dust again", this, along with Genesis 3:19 ("In the sweat of thy face shalt thou eat bread, till thou return unto the ground; for out of it was thou taken"), is the origin of "ashes to ashes, dust to dust" burial phrase; Baron d'Holbach (1770) argues, in *The System of Nature* (pg. 130), this is Epicurean logic.
9.	Isaiah 7:14	The first mention of "virgin birth" (Q), i.e. a virgin that conceives, without sex, a son named Immanuel. (Q)
10.	Jeremiah 19:2-4	Says "Christmas trees" (aka Osiris trees) are forbidden (see: atheist holiday).
	Daniel 6	Daniel and the lion's den; a rescript of Aesop's 600BC tale of Androcles and the lion.

New Testament

	Section	Summary
1.	Matthew	The name "Matthew", aka Book of Matthew, is a rescript of the concept of 'Mati' (or Maat) or moral justice, i.e. Book of Maat.
	→ Matthew 1:18-25	First New Testament (compare: Isaiah 7:14) description (Q) of the Virgin Birth; it is a monotheistic rescript of Coffin Text Spell 148.
	→ Matthew 1:21	First mention of the name "Jesus" (see: How Osiris Became Jesus).
	→ Matthew 26:17–29	Describes Jesus' famous "Last Supper", during which time he says that one of you, at the dinner table, will betray me (see: Judas), which is a rescript of Osiris' Last Supper, and his betrayal after dinner by his brother Set.
2.	Mark	
	→ Mark 5:1-17	The story of Jesus casting 2,000 demons into herd of swine, who then plunged off a cliff (an Egyptian taboo rescript).
3.	Luke	
4.	John	
5.	1 Thessalonians	"**Prove all things**." — Anon (c.100AD), New Testament (1 Thessalonians 5:21 KJV); cited by Elihu Palmer (1801) in *Principles of Nature* (title page) "Test all things. Hold fast to that which is good." — Anon (c.100AD), New Testament (1 Thessalonians 5:21, NKJV); a Willem Zitman (c.2000) (Q) favorite quote

Other

	Section	Summary
1.	Lord's prayer	Found (Q) in Matthew 6:9-13 and Luke 11:1-4 of the Bible, a truncated version of spell #125 of the Egyptian *Book of the Dead*; a hymn originally sung to the Egyptian state god Amen; the Christian version places the "Amen" at the end, instead of the front.

2.	Raising of Lazarus	A rescript of Horus raising Osiris from the dead (e.g. as carved on the walls of Dendera Temple)
3.	Death and Resurrection of Jesus	A monotheistic rescript of the Death and Resurrection of Osiris
4.	Virgin birth	In Matthew 1:18-25 and Luke 1:26:38, the "virgin" birth of Jesus described; which is based on the "black rite" conception of Horus during the time stopped sexual resurrection between Isis in the form of a kite and the reassembled dead Osiris mummy with an artificial phallus, as described in the "Passion of Osiris" story, as found in the *Egyptian Book of the Dead*.

Matthew 1:21

See also: Silent historians problem

Gives first mention (O), according to 16th century translations, of the name "Jesus" (O) anywhere in the Bible (see: How Osiris Became Jesus); the original Greek to English jump is as follows:

"το ονομα αυτου ιησουν αυτος" (His name shall be his name) (Koine Greek version, 120AD)
"thou shalt call his name Jesus" (KJV version, 1611)

Or in more specifics: (O)(O)

1:21	ΤΕΞΕΤΑΙ	ΔΕ	ΥΙΟΝ	ΚΑΙ	ΚΑΛΕΣΕΙΣ	ΤΟ	ΟΝΟΜΑ
	texetai	de	huion	kai	kaleseis	to	onoma
	G5088	G1161	G5207	G2532	G2564	G3588	G3686
	vi Fut midD 3 Sg	Conj	n_ Acc Sg m	Conj	vi Fut Act 2 Sg	t_ Acc Sg n	n_ Acc Sg n
	she-SHALL-BE-BRINGING-FORTH	YET	SON	AND	YOU-SHALL-BE-CALLING	THE	NAME

21 And she shall bring forth a son, and thou shalt call his name JESUS: for he shall save his people from their sins.

ΑΥΤΟΥ	ΙΗϹΟΥΝ	ΑΥΤΟϹ	ΓΑΡ	ϹΩϹΕΙ	ΤΟΝ	ΛΑΟΝ	ΑΥΤΟΥ	ΑΠΟ	ΤΩΝ
autou	iEsoun	autos	gar	sOsei	ton	laon	autou	apo	tOn
G846	G2424	G846	G1063	G4982	G3588	G2992	G846	G575	G3588
pp Gen Sg m	n_ Acc Sg m	pp Nom Sg m	Conj	vi Fut Act 3 Sg	t_ Acc Sg m	n_ Acc Sg m	pp Gen Sg m	Prep	t_ Gen Pl f
OF-Him	JESUS	He	for	SHALL-BE-SAVING	THE	PEOPLE	OF-Him	FROM	THE

This Greek name of Jesus, per Wikipedia argument, namely: Ἰησοῦς (Iēsous), is a rendition of the Hebrew Yeshua (ישוע), related to the name Joshua. (O)

Bibles | Other

See also: Atheist's Bible

In 1798-99, Jefferson discussing the idea, with Benjamin Rush, about writing a new miracle-free and supernatural-free version of the Bible, starting with a review of the morals of the ancient philosophers, followed by the "deism and ethics of the Jews", followed by the "principles of pure deism" taught by Jesus Christ , explicitly "omitting the question of his deity", which by 1813 he had accomplished in the form of an octavo of forty-six pages, of "pure and unsophisticated doctrines"

In 1895, Elizabeth Stanton headed a committee, of about a dozen or so people, who each went through the Bible, and wherever they found passages about woman, cut that section out and pasted it onto a sheet, and wrote commentary about each snippet below the paste; the result was called *The Woman's Bible*. (O)

Scientific Bibles

See main: Scientific Bibles

Scientific treatises famously characterized "bibles" include: Isaac Newton's *Principia* (1687), Willard Gibbs' *On the Equilibrium of Heterogeneous Substances* (1876), Paul Dirac's *The Principles of Quantum Mechanics* (1930), and Linus Pauling's *The Nature of the Chemical Bond* (1938).

Genesis

The first five books of the Old Testament of the Bible are called Genesis, aka the Pentateuch (Greek), or the Five Books of Moses.

Joshua 10:13 | Sun stood still | Decoded

The following shows the puzzled "sun stood still" and the "moon stayed" passage of Joshua 10:13, decoded in the original Egyptian mythology version, below left, of how Horus, as described in the "Sorrows of Isis (line 205)", was stung by a scorpion and died and how Isis prayed for Ra to stop in his sun boat journey to come down and bring Horus back to life.

Immorality | Slavery

Regarding slavery, in Exodus 21:20-21, the Bible states that slavery is morally righteous, and that if a slave owner beats a slave, male or female, with a stick so severely that the slave dies (dereacts), the slave owner should be punished. If, however, the slaves survives a day or two, he or she should get back to work, being that the slave is still the owner's property. [4]

In 2006, American presidential candidate Barack Obama cites the following immoralities in the Bible as a point in case that in a modern nation of mixed faiths and nonbelievers we can no longer look to religious texts to guide national policy: [5]

> "Should we go with Leviticus, which suggests slavery is OK and that eating shellfish is abomination? How about Deuteronomy, which suggests stoning your child if he strays from the faith?"

Obama goes on to state that national policy needs now to be guided by universal principles accessible to both believers and nonbelievers.

Immorality | Rape

Regarding rape, in Deuteronomy 22:28-29, the Bible states that if a man is caught in the act of raping a young women who is not engaged, he must pay fifty pieces of silver to the girl's father and then the girl must marry her rapist and never be allowed to divorce him. [4]

Copernicus

> *See main: Copernican revolution*

The 1543 publication of *On the Revolution of the Heavenly Spheres* by Polish astronomer Nicolaus Copernicus, with its revolutionary finding that the "earth moves", was first major book to weaken the structure of the Bible, and its stationary flat earth central model of the universe.

Darwin

> *See main: Darwinian revolution*

The 1859 publication of *On the Origin of Species* by English naturalist Charles Darwin, and its revolutionary view that the species have "evolved", in structure, size, and complexity, over millions of year from earlier forms, was the second major book to weaken the structure of the Bible, and its seven days of creation view of humans having been created from clay by the hand of God about 5,000 years ago.

Clausius

> *See main: Carnotian revolution*

The 1865 publication of *The Mechanical Theory of Heat* by German physicist Rudolf Clausius, and its revolutionary view that the universe is "governed", not by God, by the laws of energy and entropy, is the third major book to have weakened the grip of the Bible, albeit a revolution that has not yet finished. The following is reference to the idiom that for many German physical chemist Wilhelm Ostwald's circa 1900 book *Energetics* book had come to replace the Christian Bible: [2]

> "On the shelves there was also to be found, naturally, Ostwald's *Energetics*, that sort of thermodynamic bible in which god is replaced by a lay entity called energy."

The Bible is the main impediment to acceptance of the modern scientific view of human existence, namely that humans were created by a great process (chemical synthesis), from the atoms of the earth to form human molecules (human molecular theory), driven into

formation by cyclical heat input from the sun (nebular hypothesis), and that humans, the solar system, the universe, and everything in between or above and below, are run by the equations defined by Clausius.

Quotes

The following are related quotes:

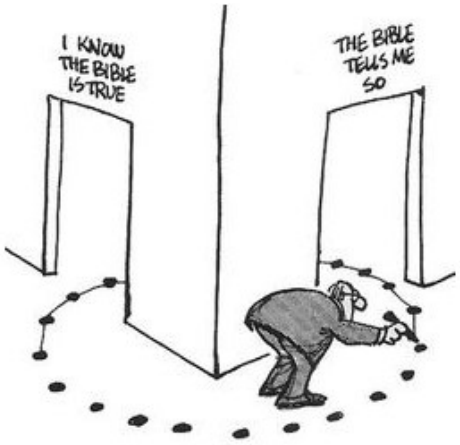

> "The church says the earth is flat, but I know that it is round, for I have seen the shadow on the moon, and I have more faith in a shadow than in the church."
>
> — Ferdinand Magellan (c.1510), Portuguese explorer

> "He was a practical electrician fond of whiskey, a heavy, red-haired brute with irregular teeth. He doubted the existence of a deity but accepted Carnot's cycle, and he had read Shakespeare and found him weak in chemistry."
>
> — H.G. Wells (1906) [3]

> "Everything in the **Bible** is taken from the *Book of the Dead*. Hellenistic, Roman religion, et al are copies of the Egyptian Book of Dead."
>
> — Calpurniso (2009), video (Q) text at 4:42; an oft-classified (Q) extreme atheist (albeit abrasive)

> "On the shelves there was also to be found, naturally, Lewis' *Thermodynamics*, that sort of thermodynamic bible in which 'god' is replaced by a lay entity called 'energy'."
>
> — Libb Thims (2019), updated paraphrase (Wilhelm Ostwald replaced by Gilbert Lewis; energetics replaced by thermodynamics) of Ernesto Sabato's 1981 quote from *On Heroes and Tombs* (pg. 256), Apr 29

See also

- How the Bible was written?
- Quran

References

1. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History*. Source Books.
2. Sabato, Ernesto R. (1981). *On Heroes and Tombs* (quote: 'On the shelves there was also to be found, naturally, Ostwald's Energetics, that sort of thermodynamic bible in which God is replaced by a lay entity called energy', pg. 256). Godine.
3. (a) Wells, H.G. (1906). *The Door in the Wall, and Other Stories*, Lord of the Dynamos, Chapter 7; *The Daily Chronicle*, Summer No. July 14th.
(b) Gaither, Carl C. and Cavazos-Gaither, Alma E. (2002). *Chemically Speaking: a Dictionary of Quotations* (pg. 125). CRC Press.
4. Gilgamesh, Horus and Tickheathen, Agnes. (2013). *Awkward Moments Children's Bible* (Foreword: David McAfee) (eB) (Q) (Get Back to Work, pgs. 15-16). CreateSpace.
5. Obama, Barack. (2006), "Call to Renewal: Obama on Church and State" (vid) (Q) (text), Jun 28.

Further reading

- Myers, Jeremy. (2016). "11 Bible Verses That Turn Christians Into Atheists" (Q), Patheos.com, Apr 27.

External links

- Bible – Wikipedia.

θΔics

In hmolscience, **Bible vs. physical science conflicts** refers to instances of conflict between so-called god-determined commandments, found in the Bible (or substitute religious book) and modern physical sciences, namely: physics and chemistry.

A depiction of the **Bible vs. physics science conflict**, namely physics being at odds with the Bible-centric subjects of: biology, history, and philosophy, and the Bible, according to American psychologist Jefferson Fish. [3]

Goethe | Sixth commandment

On 29 Jan 1830, German polyintellect Johann Goethe wrote the following to his friend, composer Carl Zelter:

> "Following on what went before, let me tell you in fun, that in my *Elective Affinities*, I took care to round off the inward, true catharsis, with as much purity and finish as possible, but I do not therefore imagine that any handsome fellow could thereby be purged from the lust of looking after the wife of another. The sixth commandment, which seemed to the Elohim-Jehovab to be so necessary, even in the wilderness, that he engraved it on granite tables with his own finger,—this it will still be necessary to uphold in our blotting-paper catechisms."

Goethe, in other words, was summarizing that the main subject of his 1809 physical chemistry based novella *Elective Affinities*, was the conflict of the Bible-centric "though shall not commit adultery" commandment with the nature of the way so-called "adultery"—voluntary sexual intercourse between a married man and someone other than his wife or between a married woman and someone other than her husband—occurs in the test tube world of chemicals:

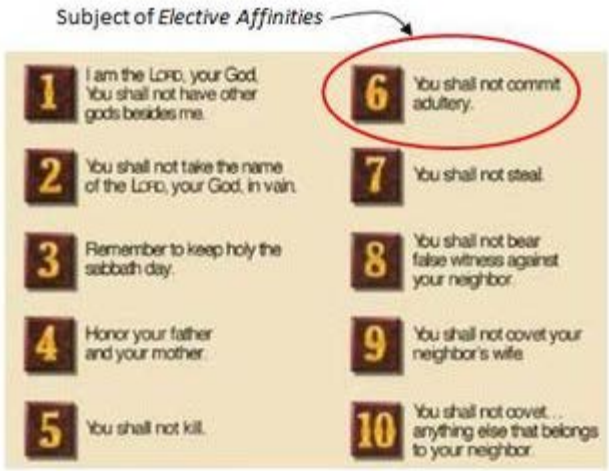

According to which if a marriage is conceptualized as as a chemical bond and the adultery conceptualized as contact with a third chemical species, in which atomic and or molecular exchange ensues, the governing nature of the process is not something within the control of the chemicals themselves, but within the governing nature of the process, conceptualized as the forces of chemical affinity, in pre-1882 years, or the measure of free energy change of the process in modern chemical thermodynamics terms:

Dostoyevsky | Mark 12:31

In 1866, Russian novelist Fyodor Dostoyevsky published *Crime and Punishment*, in which the character Raskolnikov is said to apply Adolphe Quetelet's social physics theories to the young women he meets on the street, reasoning that there is no point in helping her, since her fate had already been determined statistically by the laws of social physics.

In this example, according to a review by Harold Bloom, Dostoevsky is said to be exemplifying "how the laws of social

physics conflict with Christ's commandment to love one's neighbor", which, according to Mark 12:31 (Q), is the second greatest commandment in the Bible. [2]

See also

- Science vs religion debates
- Science v. religion legal cases
- Science-religion controversy

References

1. (a) Lewisohn, Ludwig. (1949). *Goethe: the Story of a Man: Being the Life of Johann Wolfgang Goethe as Told in his Own Words and the Words of his Contemporaries, Volume 2* (pgs. 165-66, 174). Farrar Straus and Co.
(b) Die Wahlverwandtschaften – GoetheZeitPortal.de.
(c) Goethe, Johann and Zelter, Carl F. (1892). *Goethe's Letters to Zelter: with Extracts from those of Zelter to Goethe* (sixth commandment, pg. 386). G. Bell and Sons.
2. Bloom, Harold. (2004). *Fyodor Dostoevsky's Crime and Punishment* (pg. 123). Infobase Publishing.
3. Fish, Jefferson M. (2010). "Science vs Religion Debate: It's Bigger than you might Think", *The Humanist*, Jul/Aug.

θΔics

In thermodynamics, a **bifurcation** or “bifurcation point” refers to the splitting of a thermodynamic branch, some distance from equilibrium, into two new branches.

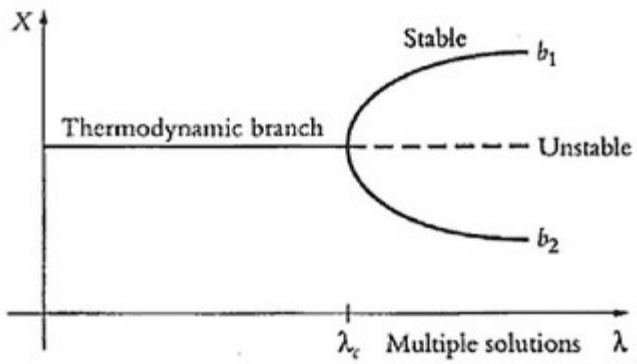

Diagram of a pitchfork bifurcation, in which concentration *X* is a function of parameter *λ*, which measures the distance from equilibrium, whereby at the **bifurcation point**, the thermodynamic branch becomes unstable, and the two new solutions b_1 and b_2 emerge. [1]

History

The term "bifurcation" seems to have originated in Henri Bergson's 1907 chapter "The Divergent Directions of the Evolution of Life", in his book *Creative Evolution*, where he states that "nature preserves the different tendencies that have bifurcated with their growth, creating them with diverging series of species that will evolve separately."

This book was most influential to Belgian chemist Ilya Prigogine, who worked for many decades to explain Bergson's views thermodynamically.

The term ‘bifurcation’ is closely related to the term ‘fluctuation’, which are both largely conceptions of the work of Prigogine who defines bifurcation as the branching of a solution into multiple solutions as a system parameter is varied. [1]

Determinism

The main interest of Prigogine in advancing the thesis that humans are far from equilibrium types of evolved dissipative structures that are changed into new structures past bifurcation points is that it allowed for Prigogine to argue against complete determinism, to the effect that, in his view, the reaction and choice of the chemical entity is determined while in the thermodynamic branch, prior to the bifurcation point, but that at the point of bifurcation new choices emerge and the path become indeterminate.

References

1. Prigogine, Ilya. (1996). *The End of Certainty: Time, Chaos, and the New Laws of Nature* (glossary: bifurcation, pg. 201; pitchfork bifurcation diagram, pg. 69). Free Press.

Further reading

● Perrot, Pierre. (1998). *A to Z of Thermodynamics* (bifurcation, pgs. 18-19). Oxford University Press.
● Conte, Joseph M. (2002). *Design and Debris: A Chaotics of Postmodern American Fiction* (ch. 6: The Perfect Game: Dynamic Equilibrium and the Bifurcation Point in Robert Coover’s *The Universal Baseball Association*, pgs. 140-62). University of Alabama Press.

Videos

● Prigogine, Ilya. (2008). “On Art and Bifurcations” (Q), formulador, Mar 4.

External links

● Bifurcation – Wikipedia.

θΔics

In science, the **big bang** is a theory according to which 13.7 billion years ago, on the evolution timeline, the universe existed as condensed small point, about an inch in size, which then exploded or “banged” in a rapid expansion (or inflation) of space-time (or matter-energy) at an initial maximal fourth law temperature (10E27 K), which over time formed the present observable cosmos, with human molecules existing at a standard system temperature of 300 K. The following is American physicist Alan Guth’s 1980 “inflation” depiction of the big bang theory start of the universe. [3]

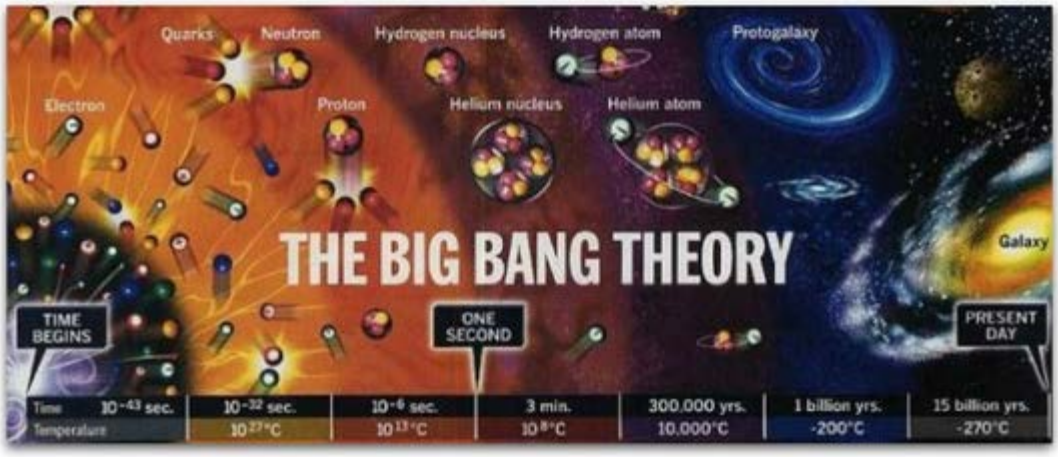

Standard scientific model of the **big bang** theory.

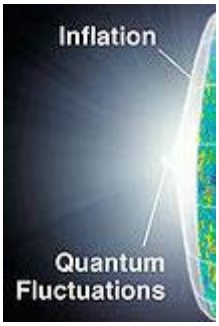

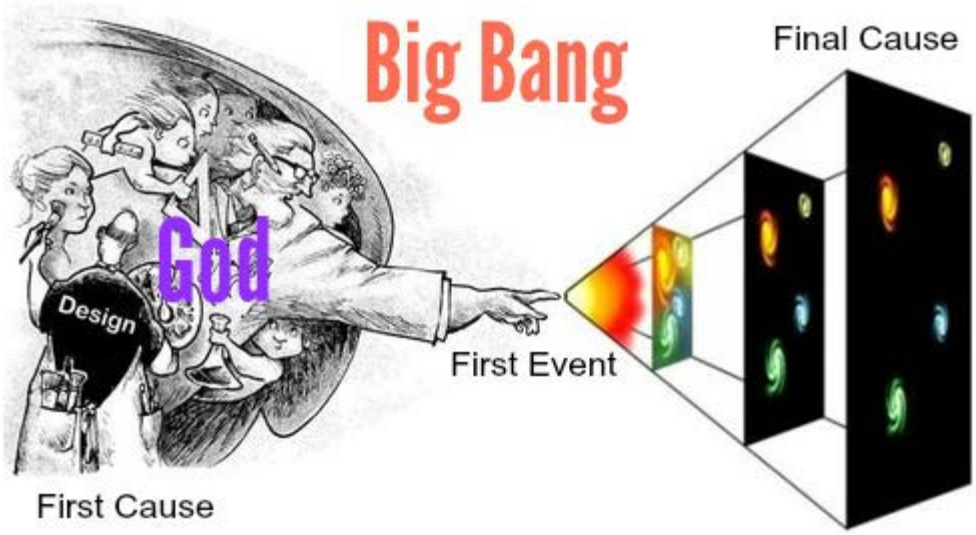

Typical laymanized half-scientific (right) half-religious (left) view of the **big bang**.

History

(add early theories)

In 1920, American polymath William Sidis postulated: [5]

> “The second law of thermodynamics must date from some sort of great collision out of which the present universe evolved.”

In 1929, American astronomer Edwin Hubble published his findings that the degree of "Doppler shift" (specifically "redshift") observed in the light spectra from other galaxies increases in proportion to a particular galaxy's distance from earth. This relationship became known as Hubble's law, and helped establish that the model that universe is expanding. [4]

In 1931, Belgian physicist Georges Lemaitre suggested that the evident expansion of the universe, if projected back in time, meant that the further in the past the smaller the universe was, until at some finite time in the past all the mass of the Universe was concentrated into a single point, a "primeval atom" where and when the fabric of time and space came into existence.

In 1949, Fred Hoyle coined the phrase that came to be applied to Lemaître's theory, referring to it as "this *big bang* idea" during a BBC Radio broadcast. In 1967, together with Jayant Narlikar, Hoyle would go on to state: [6]

> “In the **‘big bang’ cosmology** the universe must start with a marked degree of thermodynamic disequilibrium and must eventually run down.”

In 1964, Arno Penzias and Robert Wilson, at Bell Labs, measured cosmic microwave background radiation, the first evidence of big bang theory, using the following device, a cryogenic microwave receiver, measuring a background radiation of 3K in all directions:

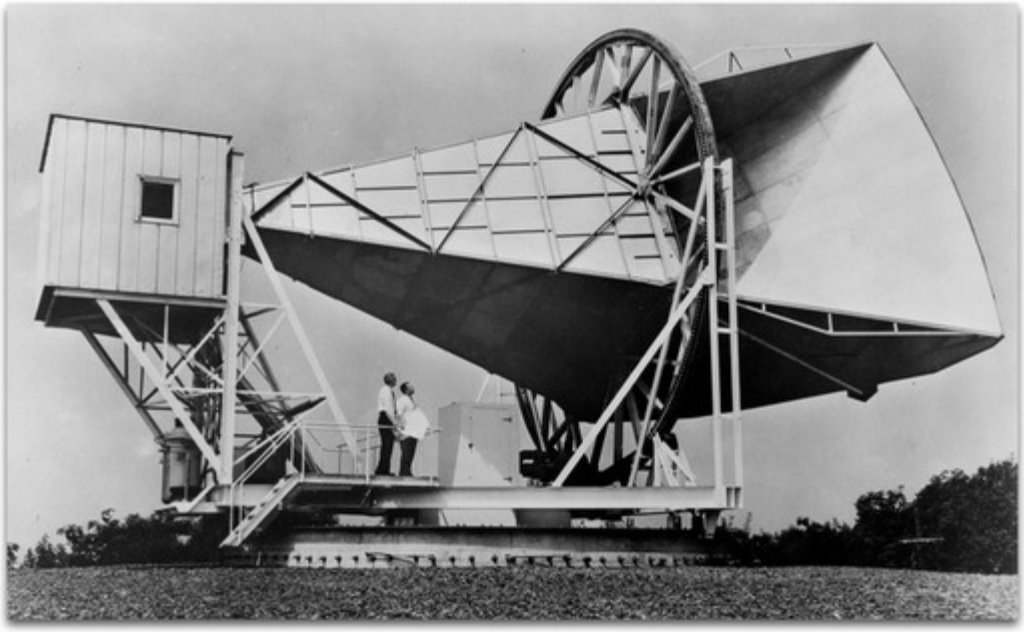

Other

In cosmological thermodynamics, the big bang is often considered to have been a singularity in the form of a low entropy state. [1] In religious thermodynamics, the big bang is often argued to have been initiated or created by god. [2]

Human molecules

In 2013, American evolutionary paleontologist Neil Shubin, in his *The Universe Within*, published a big bang to human molecule depiction, shown adjacent, of human formation. [7]

References

1. Penrose, Rodger. (2004). *The Road to Reality: A Complete Guide to the Laws of the Universe* (ch. 27: The Big Bang and its Thermodynamic Legacy, pgs. 686-734). London: Jonathan Cape.
2. Edwards, Rem B. (2001). *What Caused the Big Bang* (pg. 283). Rodopi.
3. Inflation (cosmology) – Wikipedia.
4. Hubble, Edwin. (1929). "A Relation Between Distance and Radial Velocity Among Extra-Galactic Nebulae", *Proceedings of the National Academy of Sciences*, 15 (3): 168–73
5. Sidis, William J. (1920). *The Animate and the*

$H_{375,000,000}$ $O_{132,000,000}$ $C_{85,700,000}$ $N_{6,430,000}$ $Ca_{1,500,000}$ $P_{1,020,000}$ $S_{206,000}$ $Na_{183,000}$ $K_{177,000}$ $Cl_{127,000}$ $Mg_{40,000}$ $Si_{38,600}$ $Fe_{2,680}$ $Zn_{2,110}$ Cu_{76} I_{14} Mn_{13} F_{13} Cr_7 Se_4 Mo_3 Co_1

American evolutionary paleontologist Neil Shubin's 2013 **big bang** to human molecule depiction. [7]

Inanimate, [PDF], (published in 1925, R.G. Badger).
6. (a) Hoyle, Fred and Narlikar, Jayant V. (1967). "Article", in: *The Nature of Time* (editor: Thomas Gold) (pg. 25). Cornell University Press.
(b) Layzer, David. (1975). "The Arrow of Time", *Scientific American*, 233:56-69.
7. Shubin, Neil. (2013). *The Universe Within: Discovering the Common History of Rocks, Planets, and People*. Random House.

Further reading

â— Williams, David A. and Hartquist, T.W. (2013). *The Cosmic-Chemical Bond: Chemistry from the Big bang to Planet Formation*. RSC Publishing.

External links

â— Big Bang – Wikipedia.

θΔics

In hmolscience, **Bikas Chakrabarti** (1952-) is an Indian physicist noted for 1995 to present work in econophysics and sociophysics, associated with what the formation of the Indian school of econophysics or what Russian-born American physicist Victor Yakovenko refers to as the "Kolkata school" of econophysics, a group which includes Indian physicist Anirban Chakraborti. [1]

Overview

In 1995, Chakrabarti was involved in the first Kolkata Econophysics Conference, discussed below.

In 2003, Chakrabarti, in his "Money in Gas-Like Markets: Gibbs and Pareto Laws", coauthored with Arnab Chatterjee and S.S. Manna, considered ideal-gas models of trading markets, where each agent is identified with a gas molecule and each trading as an elastic or money-conserving (two-body) collision. Unlike in the ideal gas, they introduce a quantity the "saving propensity" $\lambda of agents, such that each agent saves a fraction $\lambda of its money and trades with the rest. They show that steady-state money or wealth distribution in a market is Gibbs-like for relation $\lambda = 0, has a non-vanishing most-probable value for $\lambda \neq 0, and Pareto-like when $\lambda is widely distributed among the agents. They compare these results with observations on wealth distributions of various countries. [1]

In 2005, Chakrabarti was a coeditor of *Econophysics of Wealth Distribution*, with chapters themed on the Pareto principle of wealth distribution of Italian engineer and socioeconomist Vilfredo Pareto, and in 2006 was coeditor of *Econophysics and Sociophysics*, with its two noted thermodynamic formulation of socioeconomics by German physicist Jurgen Mimkes. [2]

In 2013, Chakrabarti coauthored *Sociophysics: an Introduction*, with chapters general social system modelling theory, social choice and popularity, crowd dynamics, etc., and six part appendix on topics including: phase transition, critical phenomena, magnetic systems, random walks, and Monte Carlo simulation. [4]

Education

Chakrabarti completed his PhD in physics, thesis: "Critical Behaviour of Annealed Disordered Systems" in 1979 at Saha Institute of Nuclear Physics, Calcutta University and in 1983 became a physics professor at Saha Institute of Nuclear Physics. Currently, Chakrabarti is a visiting economics professor at the Indian Statistical Institute.

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External links

- Bikas K Chakrabarti – Wikipedia.
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- Chakrabarti, Bikas K – WorldCat Identities.

θΔics

In science, **bildungstrieb** (German), *nisus formativus* or "formative drive" (English), the term *bildung* meaning "formation" and *trieb* meaning "drive", is a hypothesized epigenetic driving force posited to direct form reproduction in plants, animals, and humans. [1]

Overview

In 1781, German physician Johann Blumenbach, in his *On the Formative Drive of the Generation Process* (*Uber den Bildungstieb und das Zeugungsgeschafte*), the frontispiece of which is pictured adjacent, showing human, animal, and plant reproduction and growth, namely the hen laying an egg, the women breast feeding, a tree sprouting new branches following a trimming, shoot grafting, depicted lower right, along with an amputee, addressing the phenomenon of regeneration (Abrahman Trembley's 1751 discovery of freshwater hydra's ability to regenerate missing parts), introduced "bildungsteib" or formative drive theory. [2] Blumenbach summarized his theory as such: [1]

> "In all living creatures from the human to the maggot and from the cedar up to the steed there lies a particular, inborn, effective drive active throughout life, first in order to attain their specific form, then to maintain it, and if it is destroyed, to restore it where possible."

The 1781 frontispiece of German physician Johann Blumenbach's *On the Formative Drive of the Generation Process* (*Uber den Bildungstieb und das Zeugungsgeschafte*), giving a visual depiction of his **bildungsteib** (formative drive) theory. [2]

The theory was upgrade to the older preformationism (ovism; spermism), epigenesis (William Harvey, 1651), absurdities associated with the various regeneration theories that were discussed in respect to subject of reproduction and regrowth of cut parts, and to the mystically or religiously crouched vital force theories (vitalism, vital energy, vital heat).

Kant

German philosopher Immanuel Kant was influenced by Blumenbach's formative drive theory. [3]

Goethe

German polymath Johann Goethe wrote an essay on the theory entitled "Bildungstrieb" and seems to have incorporated parts of the theory in his *Elective Affinities*, the opening chapter (P1:C1) of which containing shoot grafting. [1]

Romanticism science scholar Robert Richards (2002) suggests that Goethe first learned of Blumenbach's formative drive theory through his association with Alexander Humboldt, whom he had met in 1794. [4] In particular, in his 1795 article "The Life Force or the Rhodian genius, a Tale", Humboldt used a poetical device to describe the character of the force, lebenskraft or "life force", that worked to unify life processes and to hold in check the tendency of matter so organized to disintegrate, to decompose into elemental parts. [5]

In his *Zur Morphologie* (*To Morphology*), on morphology, Goethe declared his preference for the idea of *Trieb* (drive) as representing the developmental dynamic of living nature, in contrast to *Kraft* (force), which indicated a material principle that could not explain organization. [3]

Animate thermodynamics

In modern chemical thermodynamic terms, or rather chnopsological thermodynamic terms, the formative drive theory seems to be a precursor to what we now refer to as Gibbs free energy, the driving force of freely going, earth-bound, isothermal-isobaric, surface-attached, chemical reaction processes, e.g. the human reproduction reaction, a mechanism step of which is depicted adjacent, i.e. breast feeding, an aspect of the turnover rate phenomenon.

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External links

â— Bildungstrieb (German → English) – Wikipedia.

θΔics

In existographies, **Bill Maher** (1956-) (RMS:126) (CR:5) is an American comedian, talk show host, atheism-agnostic sided religion commentator, and liberal-sided political satire commentator, noted for []

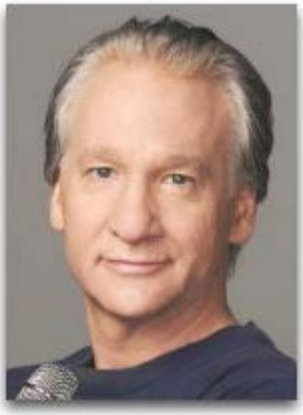

Overview

In 2008, Maher, in his film *Religulous*, ridiculed the idiocy of various aspects of religious, juxtaposed with atheism and rationalism.

In 2008, Maher, in his *Real Time with Bill Maher* show, interviewed Richard Dawkins, during which time Dawkins stated that his Dawkins number was 6.9.

In 2014, Maher, in his in his *Real Time with Bill Maher* show (Ñº), had Sam Harris pitted against what seems to have been a coked-up (Ñº) Ben Affleck, during which time Affleck famously exploded in a discussion of radical Islam.

Quotes | By

The following are quotes by Maher:

> "Political correctness is the elevation of sensitivity over truth."
>
> — Bill Maher (2018), definition (Ñº) he gave people in response to his 1990s show *Politically Incorrect*

External links

â— Bill Maher – Wikipedia.

θΔics

In human thermodynamics, **William Sanford Nye** (1955-), better known as 'Bill Nye' the science "guy", host of the Disney children's science show *Bill Nye the Science Guy* (1993-1998), is an American mechanical engineer and science educator noted for his 1993 summary quote of human thermodynamics, wherein he discusses the thermodynamics of love as an subject of history: [1]

> "So important and far-reaching are the laws of thermodynamics that some people try to use them to explain what governments should do, why people fall in love, and why there are car wrecks."

(add discussion)

Quote etymology

In the above quote, Nye makes reference to three different applications of thermodynamics in humanities: politics, love, and traffic. The etymology of the politics references seems to point to either the circa 1930s technocracy publications of the group led by American engineer Howard Scott or to the 1971 political thermodynamics of American chemical thermodynamicist Frederick Rossini. [2] The car wreck reference seems to be a reference to Belgian chemist Ilya Prigogine's 1971 "Kinetic Theory of Vehicular Traffic" and other precipitates of this. [3]

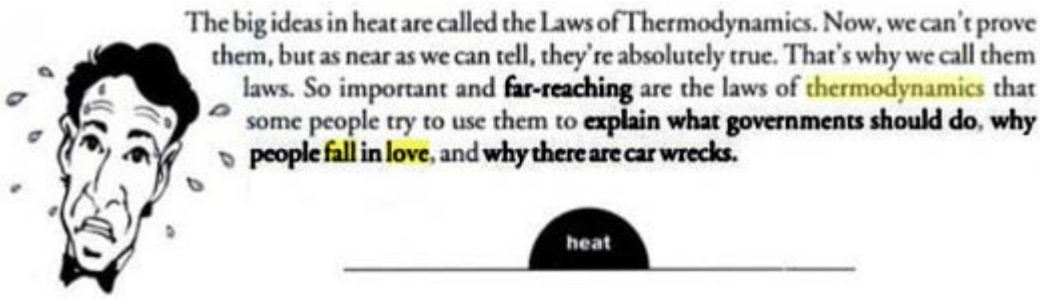

Bill Nye's 1993 description of human thermodynamics of how people, historically, have used the laws of thermodynamics to explain various facets of human existence, from car wreck behaviors, to politics, to the process of falling in love. [1]

Nye's pre-1993 reference to someone who used thermodynamics to explain "why people fall in love" is puzzling?

He could be making a reference to William Rankine's circa 1845 "The Mathematician in Love" poem, wherein falling in love is said to be a type of thermodynamic potential similar to gravity. This, however, is remote, as Rankine's poem a very little known piece of work, only recently discovered, via Hmolpedia scholars citation clues, in 2013 (Hmolpedia article #3,086).

It may be that he is making a reference to Iranian mechanical engineer Mehdi Bazargan who in his 1956 *Thermodynamics of Humans*, theorized about love and thermodynamics.

Nye also could be making a reference to German polymath Johann Goethe, and his 1809 human elective affinity work, but this was not pure thermodynamics, but rather pre-thermodynamics (in the sense that affinity was precursor to free energy); and it is doubtful that Nye knew at this time that affinity equates to free energy change, a fact that only people with a chemistry background or interest know about this factoid.

It is possible, however, that Nye is making reference to Tom Stoppard's play *Arcadia*, a modern-day remake or twist on Goethe's *Elective Affinities*, in which Stoppard uses the second law concepts, such as heat death and sexual heat, in discussions of human passions and love. Arcadia premiered on April 13th, 1993, and Nye's book was published on Sep 21, 1993, so it is possible Nye could have either saw the play or read a review.

To give an example summary of Stoppard's use of thermodynamics in his play, writer Katherine Kelly

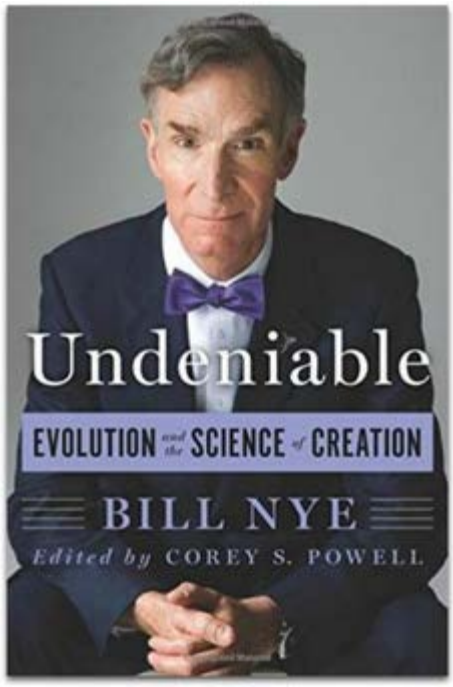

On 4 Feb 2014, Nye debated Ken Ham, above, for two-hours at the Creation Museum, which he followed up by his *Undeniable*, right, published 9-months later. [5]

summarizes in her 2001 *Cambridge Companion to Tom Stoppard* that the part in the play when Septimus quotes the tomb inscription 'Et in Ardccadia Ego', in Poussin's celebrated seventeenth-century painting, to mean 'even in paradise there is death', that Thomasina knows about the second law and how the "entire universe is dying, inevitably heading towards an entropic dead end", expressed as "heat goes to cold" as Valentine explains to Hanna. In another instance "It's a one-way street … It'll take a while but we're all going to end up at room temperature". In this scene, Kelly explains that: [4]

> "Thomasina refuses to give in into despair. She is thinking of heat in more than one sense: not just the heat of **thermodynamics** but the heat of Eros. For she is falling in love with Septimus, and begs him to teach her to waltz."

(add discussion)

Education

Nye completed his BS in mechanical engineering at Cornell University in 1977, where he studied under Carl Sagan, who was one of his professors, then worked as an engineer at Boeing on the 747, before creating his award-winning show *Bill Nye the Science Guy*.

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External links

â— Bill Nye – Wikipedia.

θΔics

In hmolscience, **L. William Poirier** (c.1970-), aka "Bill Poirier", is an American theoretical chemical physicist noted for his 2014 *A Conceptual Guide to Thermodynamics*, wherein he devotes an appendix section to what he refers to has tongue-in-cheek humanities applications of thermodynamics.

Human thermodynamics

See main: Thermodynamics textbooks with humanities applications

Poirier ventures, at one point, into the realm of human thermodynamics, via citation to his co-faculty member Bruce Clarke and his 2001 *Energy Forms*, and thereupon discussing H.G. Wells, D.H. Lawrence, and Matt Groening. [2]

Human molecules | Adams

On American historian Henry Adams, Poirier has the following to say:

> "Not a scientist himself, Henry Adams' fascination with thermodynamics nevertheless led to attempts to incorporate first and second law principles into other disciplines such as history. Alas, as Adams himself lamented, he was unable to achieve this goal with anything approximating thermodynamical rigor, owing to the fact that he was not really a 'math guy'. In retrospect, Henry should probably not have been so hard on himself: history is inherently harder than thermodynamics; people are not molecules."

There are a number of errors in this statement. Firstly, thermodynamics, by itself, is harder, than history, as standalone subjects. In terms of "intellectual difficulty", on a scale of 1 (easiest) to 100 (hardest), of all college subjects, history ranks at 41.7 and thermal science ranks at 81.7, according to polls of college students (see: Beckhap's law proof). This is not to say, however, that humanities, in general, is easier that the physical science, e.g. as Newton once said: "I an calculate the movements of the planets, but not the madness of men", but to point out that thermodynamics is notoriously the most difficult of all subjects.

In 2015, Poirier, in response to his commentary that history is harder than thermodynamics, elaborated the following, in communication to Libb Thims: [6]

> "For the record, I agree with you (and with Boltzmann and Adams, both of whom I have read and admire) that application of thermodynamics ideas to human societies is a fascinating and worthwhile endeavor—but also an extremely difficult one (I evendabbled in this area myself, many years ago, with a model applying thermodynamic ideas to human corruption vs. cooperation.) So whenI say 'history is inherently harder than thermodynamics', this is what I am referring to of course—not, say, history as it is taught as an undergraduate college course."

In any event, correctly, the "thermodynamics of history", which is what Adams was after, or "physico-chemical social dynamics" (see: physicochemical humanities) as he called it, however, is more-difficult than both of the former subjects; which is why Adams, a two cultures genius, is the second-ranked greatest social

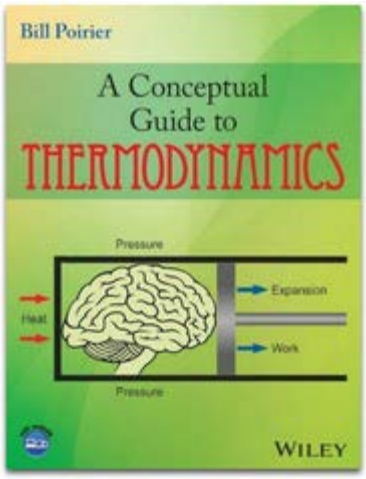

Left: **Poirier**, circa 2011, at the Boltzmann tombstone, Vienna, pointing to the S = k log W equation for entropy. Right: his 2014 *A Conceptual Guide to Thermodynamics*, showing a brain in a piston and cylinder, which hints at the Boltzmann brain problem, which he touches on (pgs. 102-03). [1]

Newton of all time.

The second error, in Poirier's purview, is his statement: "people are not molecules", which not only contradicts Adams' position, but also Boltzmann's position, stated below, whose tombstone, Poirier so happily poses next to (adjacent photo): [3]

> "Molecules are like to many individuals, having the most various states of motion, and the properties of gases only remain unaltered because the number of these molecules which on average have a given state of motion is constant."

In 2015, Poirier, in elaboration on his view of humans, as not being molecules, in communication with Libb Thims, stated the following: [6]

> "As for 'people are not molecules', tongue-in-cheek aspects ofthis passage notwithstanding, surely you would agree that a human being displays a much more complex range of available states than a single molecule—even if both, for purposes ofmodeling, may be thought of as entities described by various states? If so, then you can read my statement in that light, and it should become not the least bit controversial for you."

The two natures conceptual ideology that humans are not molecules also modern textbook science, e.g. Kalyan Annamalai's 2011 *Advanced Thermodynamics Engineering* (quote: humans are 26-element energy/heat driven dynamic atomic structures) or Robert Sterner and James Elser's 2002 *Ecological Stoichiometry* (quote: humans are 22-element abstract molecules).

Information theory

See main: Information entropy (quotes)

Poirier, of note, attempts to meld information theory into thermodynamics, and thereby seems to be unaware that this is a theoretically baseless endeavor (see: Shannon bandwagon); or as Dirk ter Haar (1954) put it "the entropy introduced in information theory is NOT a thermodynamical quantity." [4] Poirier, in commentary on this, stated the following: [6]

> "As for the information theory vs. entropy debate, I am well aware that there are some who do not like to interpret thermodynamic entropy in information terms, and others who see value in doing so.Moreover, there are unresolved foundational issues pertaining toprobabilitytheory itself, and if you like, to the formalism of statisticalensembles, that have botheredpeople from the 19th century right onthrough to our

own time, and which willlikely continue to do so in theforeseeable future. Rather than engage in that debate, my goalhere is to provide introductory students with a usefulpicture forconceptualizing entropy, which I believe the informationapproachsurely does provide. But ultimately, of course, that is for the students to decide."

(add discussion)

Education

Poirier completed his PhD in theoretical physics in 1997 at the University of California, Berkeley, and in 2001 became a professor of theoretical and computational chemistry Texas Tech University, where he has taught thermodynamics each fall semester, writing his *A Conceptual Guide to Thermodynamics* in 2011 while on sabbatical in France. [5]

References

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External links

â— L. William Poirier (faculty) – Texas Tech University.

θΔics

In social models, **billiard ball model** refers to the comparison of movements and collisions of humans to that of the movement and collisions billiard balls, often done in order to gain insight into the similarities and or differences between the two types of movement, and or to discuss or theorize about concepts such as purpose, meaning, morality, consciousness, intention, and or causality, among others philosophical inquiries.

Collisions abound on a billiards table. **Billiard balls** collide with each other and with the sides of the table. These collisions result in changes in the momentum of the billiard balls. They slow down, speed up and change directions. All three of these changes require a force acting upon the ball for some amount of time. This force acting over time is known as an impulse. An impulse causes a momentum change. Not only does the impulse cause a momentum change, it is also equal to the momentum change.

Overview

In 1898, Scottish physical chemist William Ramsay, in his discussion of the kinetic theory, compared the collisions of football players, defined as human molecules, to the collisions of gas molecules: [1]

> "I find, in my own case, that it helps greatly to a clear understanding of a concept if a mental picture can be called up which will illustrate the concept, if even imperfectly. Some such picture may be formed by thinking of the motions of the players in a game of football. At some critical point in the game, the players are running, some this way, some that; one has picked up the ball and is running with it, followed by two or three others; while players from the opposite side are slanting towards him, intent upon a collision. The backs are at rest, perhaps; but, on the approach of the ball to the goal, they quicken into activity, and the throng of human molecules is turned and pursues an opposite course. The failure of this analogy to represent what is believed to occur in a gas is that the players' motion is directed and has purpose; that they do not move in straight lines, but in any curves which may suit their purpose; and that they do not, as two **billiard-balls** do, communicate their rates of motion to the other by collision. But, making such reservations, some idea may be gained of the encounters of molecules by the encounters in a football-field."

In football, collisions are going to happen during every play. The offensive and defensive players approach each other momentum. They each have their mass in motion. Momentum, being a vector quantity, has a direction. The direction of the momentum is in the direction that the player is moving. So in effect, it is the goal of each player to gather more momentum in the direction opposite their opponent prior to the collision. During the collision, both objects change their momentum. The momentum changes of the two objects are equal in magnitude and opposite in direction. So the northward-moving play may lose 300 kg•m/s of northward momentum. If so, then the southward-moving player loses 300 kg•m/s of southward momentum. This is referred to as momentum conservation. [2]

Here we see the terms "goals" and "purpose" interjected into the discussion of the description of the motion of the humans as compared to the motion of the balls, which are comparison topics found in recent treatises, such as by Cuban-born American philosopher Alicia Juarrero (1999) and American anthropological neuroscientist Terrence Deacon (2011), in attempts to bridge the conceptual gap between the materialism-physicalism world and the human consciousness/mind teleology-conceptualized world by making amends to thermodynamics. [3]

The "billiard ball vs. human" comparison is similar to the classical "rock vs. human" comparison, albeit slightly more complex in that the former takes "collisional" motion, not just motion alone, into context.

See also

â— Chemistry set model
â— Social cannon ball model

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θΔics

In chemistry, **bind** (TR=97) or "binding" (e.g. molecular binding), as contrasted with bond (TR=476) or "bonding" (e.g. chemical bond), refers to []

Binding affinity

The term "binding affinity" refers to []

Binding energy

The term "binding energy" refers to []

Binding force

The term "binding force" refers to []

> "Chemical thermodynamics [applies] to present-day problems of our society. I will try to show that thermodynamics is a discipline highly relevant to the real world in which we live and that its fundamental laws may be related to human experience. A simple description of energy is that the energy of a [social] system arises from the **binding forces** [exchange forces] that hold together the elementary particles—nuclei, ions, atoms, molecules, and macromolecules [people]—constituting the system. The greater the binding forces, the more tightly bound is the system, and the lower is its energy. This corresponds to a state of greater [socioeconomic] security. The smaller the binding forces, the less tightly bound is the system, and the higher is its energy. This corresponds to a system of lesser [socioeconomic] security."
>
> — Frederick Rossini (1971), "Chemical Thermodynamics in the Real World"

Binding site

A term "binding site" is an area on the surface of a molecule or specific region (or atom) in a molecular entity that combines with another molecule or is capable of entering into a stabilizing interaction with another interaction, according to which two binding sites in different molecular entities are said to be complementary if their interaction is stabilizing; binding sites, on enzymes in particular, can be active sites or allosteric sites. [1]

Quotes

The following are related quotes:

> "We call love what **binds** us to certain creatures only by reference to a collective way of seeing for which books and legends are responsible. But of love I know only that mixture of desire, affection and intelligence that binds me to this or that creature. That compound is not the same for another person. I do not have the right to cover all these experiences with the same name."
>
> — Albert Camus (1942), *The Myth of Sisyphus* [2]

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(b) Solomon, Robert C. (1981). *Love: Emotion, Myth, & Metaphor* (pg. 3). Prometheus Books, 1990.

Further reading

â— Connors, Kenneth A. (1987). *Binding Constants: the Measure of Molecular Complex Stability*. Wiley.

External links

â— Molecular binding – Wikipedia.

θΔics

In physiology, **binding affinity** refers to the chemical force of affinity involved in the attraction or attachment of one chemical entity to another, of two molecules to each other, or of one molecule to a surface, such as a drug to a receptor (or host to a guest). Binding affinity is typically quantified via free energy or of enthalpic and entropic terms.

Further reading

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● Michel, Julien and Essex, Johathan W. (2010). "Prediction of Protein-Ligand Binding Affinity by Free Energy Simulations: Assumptions, Pitfalls, and Expectations" (abstract), *Journal of Computer-Aided Molecular Design*, May 28.

θΔics

In chemistry, **binding energy** is the amount of energy associated with the formation of a bond.

Binding energy is a thermodynamic property, and one can detect the heat being given off when molecules bind well. Calorimetry lets one break binding energy down into its enthalpic (ΔH) and entropic (TΔS) components, which is hard to do by other means. [1]

Albert Lehninger defines binding energy as the Gibbs free energy derived from enzyme-substrate interaction; a major source of free energy used by enzymes to lower the activation energies of reactions. [2]

See also

â— Bound energy
â— Bond energy

References

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External links

â— Binding energy – Wikipedia.

θΔics

In terminology, **bio-**, from the Greek “life”, originating in the works of Euripides (c.460BC), via term “bios” (Georg Misch, 1950), is a defunct (see: defunct theory of life) prefix, commonly found in: “biology”, biochemistry, or “biophysics”, etc., meant to signify a living thing or certain types of matter (e.g. living matter) that are “alive”, meaning, referring, and or related, in modern terms, to powered CHNOPS+ matter.

New | Old

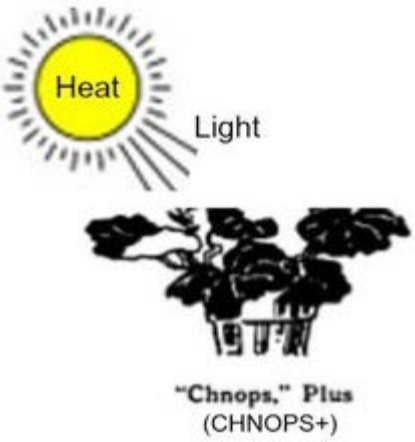

Powered CHNOPS+ | **Bio-**

Left: a 1936 depiction, by American plant physiologist Frank Thone, of a plant as a light powered "CHNOPS Plus" system; a chemical upgrade to older late 18th century, albeit now-defunct (2009), term "**bio**logical" system (right). [1]

Defunct | Obsolete

In the early 21st century, with the arrival of the defunct theory of life (2009) view, or life does not exist (2010) consensus, the theory of life is now classified as a defunct scientific theory, according to which, previously thought interred ideas such as vitalism or neo-vitalism, are but concluded to be Greek-coated historically ingrained religio-mythology notions, namely that certain things are “born”, “living”, and “die”, which is a premise not found in the modern hard sciences: chemistry, physics, and thermodynamics—or as English physiologist Charles Sherrington famously put it in 1936: [2]

> “Chemistry does not know the word life”.

Hence, terms such as: "biochemistry" (bio-chemistry), "biophysics" (bio-physics), or "biothermodynamics" (bio-thermodynamics) are defunct and nonfunctional neoplasm, rooted in religio-mythology. Or as English molecular genetics researcher Francis Crick put it in 1966: [3]

> “Let us abandon the word ‘alive’.”

If, subsequently, chemistry does not know the word "life" and as such we are suggested to abandon the term "alive" and the related we must also abandon all Greek translations of such, namely: the ubiquitous prefix "bio-" must be expunged, rectified, and or upgraded in the vernacular of modern science.

Upgrades

See main: life terminology upgrades

The prefix “bio-”, in short, is a defunct scientific prefix. Upgrade alternatives include: “chnops-” (c.1936), "powered CHNOPS matter" (Henry Swan, 1974), “animate matter” (Alfred Ubbelohde, 1954), as in bio-physicist (defunct) → chnops-physicist (modern), or bio-chemistry (defunct) → chnops-physics, or life thermodynamics (defunct) or biothermodynamics (defunct) → animate thermodynamics (modern).

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(b) Author. (1936). “Article”, *Science News Letter* (CHNOPS, pg. 110; protoplasm, pg. 110). Volumes 29-30.
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3. Crick, Francis. (1966). *Of Molecules and Men*. University of Washington Press.

θΔics

In thermodynamics, **biochemical thermodynamics**, a defunct neoplasm (see: bio-; defunct theory of life; life does not exist; life terminology upgrades), is the study of the thermodynamics of biochemical processes. [1] This subject of study is relatively new and in development. A notable thermodynamicist in this field is Englishman Keith Burton, the first to build thermodynamic tables of biochemical species.

Naming issues

The term "biochemical thermodynamics" seems to concern itself with the applications of thermodnamics in biochemistry. In other instances, it may be found synonymous with bioenergetics, biothermodynamics, and biological thermodynamics, among others. A distinction to be made here is the the contract between the thermodynamics internal to biological entities, e.g. inside a cell, and the thermodynamics of systems of biological organisms, e.g. a community of animals. The latter division is considered cutting-edge.

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θΔics

In chemistry, **biochemistry**, related to "organic chemistry", is a obsolete portmanteau, i.e. *bio*- (defunct) + *-chemistry* (not defunct), meant to signify the chemical study of powered CHNOPS+ systems, i.e. "biological", defunct colloquial speak, processes, structures, or systems in.

Etymology

The term "bio" traces to Greek Euripides (c.420BC); the term "biology" to German Theodore Roose (1797).

In 1877, Felix Seyler (1825-1895) (Ñº), German physician, pathologist, and physiological chemist, introduced the term "biochemistry" to be the name of a new department of chemistry he was aiming to found:

> "The term **'biochemistry'** [biochemie] is to be taken as short for 'physiological chemistry', and institutes dedicated to this field of study, taken as a new independent discipline with the physiological sciences, needs to be established."
>
> — Felix Seyler (1877), forward [paraphrase quote] to first issue (Ñº) of *Journal of Physiological Chemistry* [5]

In 1896, John Mandel, in his *Handbook for the Bio-Chemical Laboratory* (Ñº), was using term "bio-chemical" in respect to the methods used to obtain chemicals such as: glycogen (C6H10O5), i.e. multibranched polysaccharide of glucose, aka the white powder derived from the liver of a large rabbit, that serves as a form of energy storage in animals and fungi, lactose (C12H22O11), i.e. milk sugar, maltose (C12H22O11), i.e. potato starch, etc. The key-terms: life, alive, and living, however, are not used in Mandel's book.

In 1903, Carl Neuberg, a German chemist , supposedly, was using the term "biochemistry" as a classification term for the subjects he had been working on, namely: solubility and transport in cells, the chemistry of carbohydrates, photochemistry, investigating and classifying different types of fermentation, and the chemistry of amino acids and enzymes. [1]

Difficulties on term

In the 20th century, chemists began to point out that the term "biology", or the study of life, was not something recognized by the science of "chemistry", the study of atoms and their properties, a subject that does not utilized, recognize, understand, and or quantify physically the notions of "life" and "death". This was explicitly pointed out in 1939 by English physiologist Charles Sherrington: [2]

> "Chemistry does not know the word life."

In 1966, English molecular geneticist Francis Crick put forward the following suggestion, amid his neo-vitalism debates: [3]

> "Let us abandon the word 'alive'."

These issues become acute when one goes searching for the so-called "origin of life" at which point the molecular entity/biological entity divide, such as in the case of the cell (e.g. cell-as-molecule) or virus (e.g. virus molecule), becomes a striking problem in need of immediate solution and resolution, particularly when chemical thermodynamic analysis is used as the tool of dissection.

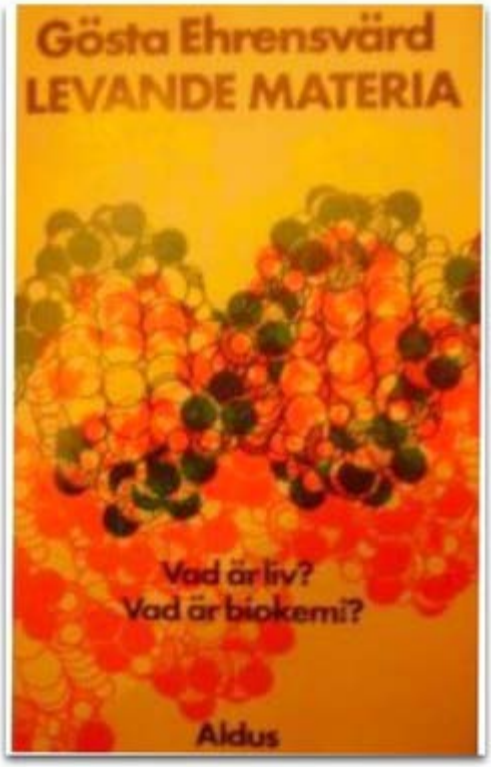

Swedish physiological-biochemist Gosta Ehrensvard's 1973 *Living Matter: What is Life? What is Biochemistry?*, showing DNA on the

Swedish physiological-biochemist Gosta Ehrensvard, following the proposal of his 1960 “life precedes organisms” living puddle theory, in his *We and They: Molecules and Life in the Cosmos* (1971) and *Living Matter: What is Life? What is Biochemistry?* (1973), seems to have begun to lay question to the functionability of the terms “biochemistry” and “living matter” as a working scientific labels. [4]

cover, wherein he questions the functionability of the terms “**biochemistry**” and “living matter” as a working scientific labels. [4]

Terminology upgrade

In the wake of the post 2009 "defunct theory of life" perspective, in *circa* 2012, to remedy this ongoing terminology malady, American electrochemical engineer Libb Thims began to initiate “life terminology upgrade” clarification measures in both Hmolpedia articles and submitted *Journal of Human Thermodynamics* articles. The term “biochemistry”, in all its usages, has subsequently been redacted as follows:

> bio-chemistry (**biochemistry**) → powered chnops-chemistry (chnopschemistry).

(add)

Quotes

The following are related quotes:

> “The prefix **bio** is essential; in living things we are dealing with bio-physical, **bio-chemical**, bio-mechanical phenomena. Life has a bio-physicochemico-mechanical basis.”
>
> — Henry Osborn (1925), “The Origin of Species as Revealed by Vertebrate Paleontology” [1]

References

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2. Sherrington, Charles. (1940). *Man on His Nature* (pg. #). CUP Archive.
3. Crick, Francis. (1966). *Of Molecules and Men*. University of Washington Press.
4. (a) Ehrensvard, Gosta. (1971). *We and They: Molecules and Life in the Cosmos* (*Vi och de: molekyler och liv i kosmos*) (editors: Gosta Ehrensvard and Jan Stenflo). Publisher.
(b) Ehrensvard, Gosta. (1973). *Living Matter: What is Life? What is Biochemistry?* (*Levande materia: vad är liv? vad är biokemi?*). Aldus.
5. (a) Teich, Makulas. (1970). “The Historical Foundations of Modern Biochemistry”, in: *The Chemistry of Life* (editor: Joseph Needham) (pgs. 171-91, quote, pgs. 190-91). Cambridge.
(b) Kremer, Richard. (1984). *The Thermodynamics of Life and Experimental Physiology, 1770-1880* (pg. 23). Publisher.

External links

â— Biochemistry – Wikipedia.

θΔics

In science, **biocule**, a portmanteau of *bio*- "life" + -molecule "small mass", a defunct (see: defunct theory of life) hypothetical entity, referring to the first molecule in possession of "life", a "living molecule", or biological molecule, or something along these lines, formed or "emerged" during the course of evolution.

Overview

In 1929, British animal psychologist Lloyd Morgan introduced the term biocule as follows: [1]

> "On the assumption that all are in accordance with nature, and that they stand in order of evolutionary genesis, it follows that, at some stage of evolution *a*, there were atoms only; at stage *b*, molecules (and atoms) only. Not until stage *c* was reached were there living units (may one say '**biocules**'?) in biochemical relationship. Here we come into touch with the hypothesis, the fullest knowledge of the nature and properties of the atomic world at stage *a* would not enable the most for-sighted atomic logician, so to speak, to deduce and foretell the nature and properties of the molecules at stage *b*; nor would the fullest knowledge of molecules at this stage of evolution enable the molecular logician to predict the distinctive character of 'biocules' at stage *c*, that is before any 'biocule' had come into existence."

On the assumption that all are in accordance with nature, and that they stand in order of evolutionary genesis, it follows that, at some stage of evolution *a*, there were atoms only; at stage *b*, molecules (and atoms) only. Not until stage *c* was reached were there living units (may one say "biocules"?) in biochemical fellowship. Here we come into touch with the hypothesis of emergent evolution. According to that hypothesis, the fullest knowledge of the nature and properties of the atomic world at stage *a* would not enable the most far-sighted atomic logician, so to speak, to deduce and foretell the nature and properties of the molecules in the world at stage *b*; nor would the fullest knowledge of molecules at this stage of evolution enable the molecular logician to predict the distinctive character of "biocules" at stage *c*, that is before any "biocule" had come into existence.

Morgan's discussion of his "**biocule**" conception (see also: half-alive theory), which he conceptualizes as the first "biological molecule" in possession of the quantity of "life", which he says has different rules, namely the "rules of life", as he calls them, than those of regular molecules and atoms. [1]

According to another rehash by Morgan of his emergence of life, in the form of a biocule, from atoms and molecules model: [2]

> "Let us provisionally arrange 'natural entities' in ascending order in an emergent hierarchy. Such a suit may be: atom, molecule, colloidal unit, '**biocule**', cell, multicellular organism, community of such organisms. Here 'biocule' stands for a hypothetical link in the chain."

(add discussion)

Discussion

Here is see the a number of issue, firstly (a) Morgan is digging around in the domain of the defunct theory of life, namely the premise of the existence of the first living molecule or biocule as he terms it or first living chemical reaction is a false conception, a contrivance of mythology forced into chemistry and thermodynamics, and (b) the argument of the notion of indeterminacy in nature (see: determinism), which does not corroborate with the view embodied in the logic of thermodynamic prediction, first outlined by Willard Gibbs in the 1870s, which can foretell the course of evolution, such as explained in C.G. Darwin's 1952 *The Next Million Years*.

See also

- Biogen | German physiologist Max Verworn's 1903 theory (see: living molecule).
- Evolution timeline
- Molecular evolution table
- Animacule | diminutive of animal or "little animal"; referring to microscopic organisms.
- Animolecule | animated molecule, e.g. retinal molecule, walking molecule, etc.

References

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2. Morgan, C. Lloyd. (1967). “A Conception of the Organism, Emergent and Resultant” (pgs. 141; biocule, pgs. 151-52), *Proceedings of the Aristotelian Society*.

Further reading

● Walshe, Thomas J. (1933). *The Quest of Reality: an Introduction to the Study of Philosophy* (biocule, pg. 478). K. Paul, Trench, Trubner.

θΔics

In science, **bioenergetics** is the study of energy transformations in living organisms. [1] The first books on bioenergetics began to appear in the late 1950s.

Overview

Danish biochemists Karel van Dam and Hans Westerhoff argued that biological systems are “always away out of equilibrium” so that classical thermodynamics has limited potential for biology. They claim that the work of Lars Onsager was the first to suggest that thermodynamics could be extended to the description of non-equilibrium systems and that a spin-off of this work suggested that in biological systems the key subject of study is the Gibbs free energy coupling of ‘uphill’ to ‘downhill’ processes as viewed in terms of the thermodynamic efficiency of the coupling. [5]

In 1941, Fritz Lipmann, in his “Metabolic Generation and Utilization of Phosphate Bond Energy”, presented the theory of free energy coupling in the context of phosphate bond energy use.

In the 1950s, books on bioenergetics began to appear.

In 1961, British biochemist Peter Mitchell proposed the chemiosmotic hypothesis, suggesting that most ATP synthesis in respiring cells come from the electrochemical gradient across the inner membranes of mitochondria by using the energy of NADH and $FADH_2$ formed from the breaking down of energy rich molecules such as glucose. [2]

Lowen

In the 1950s, in energy psychology, an obscure version of “bioenergetics”, as developed by American psychologist Alexander Lowen, a type of dynamic therapy based on the teachings of Austrian-born psychiatrist Wilhelm Reich, particularly Reich’s postulate of the existence of a type of energy, called “orgone”, which permeates the atmosphere and all living matter, being connected to sexual well-being and conflicts of neuroses. [3] Loosely, Lowen hypothesized that repressed emotions become transformed into muscle tension. Subsequently, according to this logic, the body "records" negative emotional reactions and stores them in the form of muscle tension and stiffness, poor posture, and low energy levels. To release these trapped emotions and return the body and mind to a balanced, healthy, peaceful state, patients must first release muscle tension and correct physical imbalances. [4]

Bio | Terminology

In the late 20th century, bioenergetics, and subfields, e.g. membrane bioenergetics, among others, began to be replaced with the terms: biothermodynamics, biological thermodynamics, and biochemical thermodynamics.

In 2009, the prefix "bio-" was shown to be defunct (see: defunct theory of life; life does not exist; life terminology upgrades), by virtue of the inherent difficulty in the term "life thermodynamics", which is without foundation, rather with baseless religio-mythology foundation, being that life is a property supposed to be breathed into matter (or clay) by god, and therefore non-existent. Upgrade terminological substitutions, at present, include: chnops-ological thermodynamics (or powered chnopsological thermodynamics).

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External links

â— BBA Bioenergetics – an Elsevier Journal.

θΔics

In terminology, **bioethics** (TR:14), from Greek *bio*- ("life") + -*ethics* (science of morals), is []

Etymology

In 1926, German theologian-philosopher Fritz Jahr (1895-1953), in his "Bio-Ethik" article (O), attempted to extend Immanuel Kant's "categorical imperative" to the intersection of moral theory applied, supposedly, between animal and plant interests and human interests, per the logic that:

> "Every living thing in principle as an end in itself, and treat it as such if possible!"

Jahr's summarized bioethics statement is as follows: [1]

> "So that the rule for our actions may be the **bio-ethical** demand: respect every living thing being on principle as a goal in itself and treat it, if possible as such!"

(add discussion)

In 1970, American biochemist Van Patter (1911-2001), independently, introduced a more general definition of bioethics. [2]

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External links

- Bioethics – Wikipedia.

θΔics

In science, **biogenesis** , from the Greek *bio*- ‘life’ + -*genesis* ‘to be born’ or ‘origin or coming into being of something’, as apposed to abiogenesis, refers to either a theory of "life-origination or commencement" (Bastian, c.1869) or the hypothesis that "living matter always arises by the agency of pre-existing living matter" (Huxley, 1870), both conceptualized in a physio-chemical sense or perspective.

Biogenesis, (bī-ō-jen′es-is). [G. *bios*, life; *genesis*, birth.]=Biogeny: the origin of life from life only: opposed to Abiogenesis, *q.v.*

An 1879 dictionary entry on **biogenesis** by English physicist William Rossiter. [1]

Etymology

The etymological origin of both the theory that "life can only come from life", variously attributed to: William Harvey (c.1630), Lorenz Oken (1803), Rudolf Virchow (1858), and Louis Pasteur (1861), among others, and the coining of the term "biogenesis", attributed to both Henry Bastian (c.1869) and or Thomas Huxley (1870), is rather spread out.

The gist of the term coining seems to have arisen in *circa* 1869 during which time English pathological anatomist Henry Bastian got into some type of exchange of letters debated with John Tyndall about the origin of life and dust and microorganisms, during which time Bastian was employing the term biogenesis in his unpublished writings; a debate about which Thomas Huxley in his 1870 BAAS address commented on.

The following timeline outlines some of this "life from life" theory terminology history:

	Date	English | Translation	
William Harvey (1578-1657)	c.1630	“Omne vivum ex ovo” | Latin (original) “Every living thing from an egg” [attributed]	[4]
Lorenz Oken (1779-1851)	1805	“Nullum vivum ex ovo! Omne vivum e vivo!” | Latin (original) “No living thing from an egg! Every living from the living!” | English (translation)	[2]
Rudolf Virchow (1821-1902)	1858	“Omnis cellula e cellula” | Latin (original) “Every cell of the cell” | English (translation)	[3]
Henry Bastian (1837-1915)	1860s	Employed the term "biogenesis", independently, in his unpublished writings, to mean "life-origination or commencement".	
Thomas Huxley (1825-1895)	1870	“The hypothesis that living matter always arises by the agency of pre-existing living matter, took definite shape; and had, henceforward, a right to be considered and a claim to be refuted, in each particular case, before the production of living matter in any other way could be admitted by careful reasoners. It will be necessary for me to refer to this hypothesis so frequently, that, to save circumlocution, I shall call it the hypothesis of ***Biogenesis****;* and I shall term the contrary doctrine—that living matter may be produced by not living matter—the hypothesis of *Abiogenesis*.”	[5]
William Thomson	c.1876	“Dead matter cannot become living matter without coming under the influence of matter previous alive.”	(Ñº)

Henry Bastian (1837-1915)	1871	"A word of explanation seems necessary with regard to the introduction of the new term *archebiosis*. I had originally, in unpublished writings, adopted the word ***biogenesis*** to express the same meaning—viz, life-origination or commencement. But in the mean time the word *biogenesis* has been made use of, quite independently, by a distinguished biologist [Huxley], who wished to make it bear a totally different meaning. He also introduced the term *abiogenesis*. I have been informed, however, on the best authority, that neither of these words can—with any regard to the language from which they are derived—be supposed to bear the meanings which have of late been publicly assigned to them. Wishing to avoid all needless confusion, I therefore renounced the use of the word *biogenesis*, and being, for the reason just given, unable to adopt the other term, I was compelled to introduce a new word, in order to designate the process by which living matter is supposed to come into being, independently of pre-existing living matter."	[6]
William Rossiter (c.1836-c.1900)	1879	"Biogenesis: the origin of life from life only: opposed to abiogenesis."	[1]

In the late 19th century, Ernst Haeckel, supposedly, formulated a "law of biogenesis", which states that species have evolved from one another. (Ñº)

References

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3. (a) Price, Paul and Frey, Kevin B. (2003). *Microbiology for Surgical Technologists* (pg. #). Cengage Learning.
(b) Talk:Omne vivum ex ovo – Wikipedia.
4. (a) Note: this phrase is not found "explicitly" in Harvey's writings, though seems to have been found "implicitly" throughout his writings as reported by many.
(b) Huxley, Thomas. (1878). "Scientific Worthies: William Harvey, Born April 1, 1578, Died June 3, 1658", *Nature*, 17:417-20 Mar 28.
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External links

â— Biogenesis – Wikipedia.

θΔics

In Hmolpedia, **biographies** is a bio-defunct file-tree header term, upgraded, in 2015, to existographies.

θΔics

In science, **biogravity** is a hypothetical force or set of forces, a type of "biological gravity", which accounts for the survival drive, the assembling and conservation of biological diversity, and evolution of more advanced forms. [1] In a thermodynamic sense, the term "biogravity" is used as a sort of filler-term to explain not the disorder in biology, but rather the neg-entropic ascent.

The term seems to have been first used, albiet in a functional religious thermodynamics sense, in 1999 by author Holmes Rolston who stated that: "one can posit god as a countercurrent to entropy, a sort of biogravity that lures life upward." [2] This latter theme, however, is an incorrect view. Correctly, it is the action of photons, the force carriers from the sun, which trigger earth-bound chemical mechanism (reaction), free energy, the main driving force, that lures life upward, and enthalpy that acts as the countercurrent to entropy. [3]

A 2007 clip of "Chemistry", by Swedish pop-singer *Velvet*, who sings about love and **biogravity**.

Human chemistry

In popular writing, biogravity is seen as the force or mechanism that draws biological entities together, such as in two people falling in love. In music chemistry, for instance, the chorus to the popular 2007 song "Chemistry", by Swedish pop-singer *Velvet*, is:

> I feel the chemistry
> Between you and me
> There's electricity
> when you're touching me
> I feel the chemistry
> feel the **biogravity**
> I want you touching me
> I feel you touching me

In a more technical sense, the description of what draws to human molecules (people) together is a thick subject full of details yet to be understood. When animate structures are categorized according to element-number, the trend emerges that the interactions of smaller entities, approximately 5-element or smaller molecules (see: molecular evolution table), are governed by the electromagnetic force, i.e. by the direct exchange of photons. As molecular entities become larger, up to the size of bacteria, a 15-element molecule, the gravitational force, specifically lunar influence, becomes a factor. In the human chemical reaction scenario, for instance, female sexual heat is cyclical, occurring every 27-days or one lunar period. Hence, the force that draws two people together in a state of love is a combination of the electromagnetic force and the gravitational force. [3] The gravitational force, however, may turn out to be an enhanced variation of chemical gravitation, resulting between large objects with mass.

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(c) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview). Morrisville, NC: LuLu.

θΔics

In hmolscience, **biological** (TR:240), as compared to social, physical, or chemical, is a dualism-defunct obsolete term (see: bio-), referring, in a modern physico-chemically neutral terms, generally to powered CHNOPS+ matter and or its processes, reactions, interactions, and or physiology.

See also

- Biological energy
- Biological free energy
- Biological TPs
- Biological thermodynamics
- Biological system

θΔics

In terminology, **biological energy** in an obsolete (see: bio-), albeit still used colloquially, term for energy associated with the physiology, reactions, processes, and or interactions of powered CHNOPS+ organisms.

Overview

In the early 20th century, thinkers such as Polish economist Leon Winiarsky and American physical chemist Alfred Lotka, among others, where theorizing about "biological energy".

In psychology, Austrian-born American Wilhelm Reich's theory of orgone energy is sometimes referred to as a radiating "biological energy", a sort of theoretical spin-off of psychic energy. [2]

In 1973, Albert Lehninger, in his *Bioenergetics*, discussed biological energy in terms of the Gibbs free energy involved in the driving of biological processes and reactions. [1]

References

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θΔics

In chnopsological thermodynamics, **biological free energy** is an obsolete scientific term, formerly employed in ecological thermodynamics, albeit now a defunct neoplasm (see: bio-), modeled on the state function formulation of "free energy" (Gibbs free energy or Helmholtz free energy), albeit viewed in the Raymond Lindeman "energy pyramid" model (1942) and the Charles Elton "food chain" model (1927) context, refers to the loose conception that mass structure of "food"—be it an autotroph (e.g. grass) or a heterotroph (e.g. a chicken)—is the clumped matter representative of the free energy or energy available to do work, or something along these lines, in evolutionary or ecological processes. This is similar to the way in which the "heat" (dQ) from the sun, when discussed in evolution thermodynamics contexts, is often misconstrued as "free energy" (dH or dG).

Etymology

In 1988, Canadian zoologist Daniel Brooks and American systems ecologist Edward Wiley, citing the cosmological free energy theories of Steven Frautschi (1988), gave the following definition of the term: [1]

> "Entropy is generated by the clumping of matter. Clumping in cosmological models produces heat as a result of gravitational work done; this heat is the free energy that allows other kinds of work to be done in the universe. We suggest that in an analogous manner ecosystems represent a 'clumping' of species that create **'biological free energy'**. This occurs because organisms can act as energy sources for other organisms, and those other organisms could not exist if it were not for the prior existence of the first organisms."

In 2011, English physicist Adam Moroz, in his *The Common Extremalities in Biology and Physics*, outlines a similar trophic pyramid (energy pyramid) take on the term "biological free energy", wherein he considers free energy to be synonymous with "biomass". [2]

The 2006 to 2012 work of English biotechnologist Mark Janes employs the term "bio-gibbs free energy". [3]

Discussion

The above examples represent a great misunderstanding of the term "free energy" (Hermann Helmholtz's 1882 term), or "available energy" (Willard Gibbs' 1876 term) in its actual formal chemical thermodynamic definition, as this extrapolates up to the chnopsological animate systems level of plant-animal-human reactions occurring on the surface of the earth (surface thermodynamics); namely a confusion between the energies of surface-molecule (surface-species) interactions and energies of molecule-molecule (species-species) interactions. [4]

This is similar to the way in which Nicholas Georgescu-Roegen famously misinterpreted "free energy" and "bound energy", in economic thermodynamics terms, to mean the available energy stored or used up, respectively, in fossil fuels (e.g. as discussed in energy crisis polemics)—which is hardly the way in which "free energy" is explained in the thermodynamics of the nature of the chemical reaction, wherein products will only go over to reactants if the system shows a decrease in free energy. In simplified terms, both of the above misuses incorrectly assign "free energy" to dietary and or consumer usage types of energy, rather than energies of interspecies relationships, e.g. sexual energy, energy of reproduction, energy of war, etc., i.e. those that involved changes in chemical bonds (see: human chemical reaction theory) and hence bond energies of species recombinations (similar to the ATP model of phosphate bond energy storage, release, and endergonic reaction drive), not those of say the energy associated with eating lettuce, eating a hamburger, or driving a car, in plain speak, the latter of which are activation energy lowering factor types of energy, not free energy types of energy. [4] In any event, these types of misunderstandings are common whenever chemical thermodynamics is applied outside of the laboratory standard: cell, test tube, or bomb calorimeter, chromatograph, etc., apparatuses, at which point an intimate knowledge of chemical thermodynamics is a prerequisite.

Defunct theory of life

A second salient inconsistency of the use of the term "biological free energy" is that the term is but Greek-disguised code for "living free energy", which is but vitalism (or rather neo-vitalism) in disguise, meaning that the term assumes that (a) life exists, which it does not (see: defunct theory of life), and (b) that at some so-called "origin of life" point or

mechanism step in the evolution timeline or on the molecular evolution table that the standard measureable "free energy" of chemical thermodynamics, that which accounts, e.g., for the reaction of oxygen and hydrogen to form water, became a type of "life energy", or energy that is "alive", among other absurdities; views that were all discarded in the 19th century.

References

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θΔics

In terminology, **biological system** is an expression, with the defunct prefix bio-, referring, historically, to a powered CHNOPS+ system; oft-used, but typically ill-defined, phrase referring to a "living system" or system containing biological entities, contained by a boundary, across which energy, matter, or work may pass. The typical example of a biological system, often used, is the cell, encased by a cell membrane. The term “biological system” is near-to synonymous with the term living system; although the latter is often used to convey a separate meaning in the sense of a system in possession of “life”. Belgian chemist Ilya Prigogine argues, in his 1972 article “Thermodynamics of Evolution”, that coherent behavior, similar to the act of Bénard cell formation, is “the characteristic feature of biological systems”. [5]

System stipulations

In biochemistry, a *biological system* is often defined as a cell, organism, or population. [1] In biological system situations, however, a caveat tends to stipulate that the system must be large relative to the molecular dimensions. [2] A simple definition would suffice that the system must contain a minimum of two molecules or two biological entities; thus allowing the definition of entropy, as the equivalence value of all uncompensated transformations, being loosely the measure of the internal work that the molecules of the system do on each other, to hold. [3]

Flows and affinities

The thermodynamic forces that drive most flows in biological systems, according to American physical chemist Dilip Kondepudi, are affinities. In particular, according to Kondepudi, when affinity is the difference in chemical potential between reactants and products, the corresponding flow is a chemical reaction; when it is the difference in chemical potential from one location to another, the flow is transport of matter. [4]

Gibbs free energy

The measure of affinity A, in biological systems is Gibbs free energy G, defined as follows:

$$A = -\Delta G$$

Subsequently, because biological or living systems tend to be modeled as open systems, exchanging matter and energy with their surroundings, both energy and entropy changes will occur in coordination with reactions and movements internal to the system. To quantify these effects, the function of state used in biochemistry is the Gibbs free energy, defined as: [1]

$$G = H – TS$$

where H is the enthalpy, T the temperature, and S the entropy of the biological system.

References

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5. (a) Prigogine, Ilya, Nicolis, Gregoire, and Babloyants, Agnes. (1972). "Thermodynamics of Evolution," (part I). *Physics Today* (pgs. 23-28), Vol. 25, November.
(b) Prigogine, Ilya, Nicolis, Gregoire, and Babloyants, Agnes. (1972). "Thermodynamics of Evolution," (part II). *Physics Today* (pgs. 38-44), Vol. 25, December.

Further reading

â— Reiner, J.M. and Spiegelman, S. (1945). “The Energetics of Transient and Steady States: with Special Reference to Biological Systems.” (abs) *J Phys Chem* 49: 81-92.

â— Gladyshev, Georgi P. (1999). "On Thermodynamics, Entropy and Evolution of Biological Systems: What Is Life from a Physical Chemist's Viewpoint." *Entropy* 1, no. 2: 9-20.

External links

â— Decrease in Entropy in Biological Systems - HyperPhysics.

θΔics

In thermodynamics, **biological thermodynamics** (defunct), i.e. "chnopsological thermodynamics" (modern), is a defunct neoplasm (see: bio-; defunct theory of life; life does not exist; life terminology upgrades), tending to refer to the use of thermodynamics in the study of so-called "biology" things, i.e. "powered chnopsological" things.

History

In 1961, Ilya Prigogine, Russian-born Belgian chemist, used the term "biological thermodynamics". [1] In 1965, Russian thermodynamicist Karl Trincher published the short 93-page booklet *Biology and Information: Elements of Biological Thermodynamics*, in which he discussed concepts such as negentropy, the inapplicability of Prigogine's theorem to embryogenesis, thermogenesis, among other topics. [2] In 2001, British-born American biophysicist Donald Haynie published one of the first standardized teaching textbooks on biological thermodynamics, deriving from his PhD dissertation on the thermodynamics of protein folding, a book now in its second edition (2008). [3]

Naming issues

See main: Thermodynamics (naming)

At present, in addition to the name "biological thermodynamics", the subject of thermodynamics in biology goes by various near-similar names such as bioenergetics, biothermodynamics, or biochemical thermodynamics, each having near synonymous overlap of material. The term "biological thermodynamics", for example, can refer to both the thermodynamics inside of biological objects, such as within a cell, as well as between biological objects, such as between a hawk and a dove (such as was discussed by American chemist Alfred Latoka in the 1920s), or the interactions between an organism and its environment. The cover of American biophysicist Donald Haynie's 2001 textbook *Biological Thermodynamics* (above), for instance, seems to imply that the subject has something to do with a lizard, moving about, being heated by the sun, whereas the book mostly focuses on protein thermodynamics, a subject that could fall under the category of either of the above names. [3]

References

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3. Haynie, Donald. (2001). *Biological Thermodynamics.* Cambridge: Cambridge University Press.

Further reading

● Lotka, Alfred J. (1926). *Elements of Physical Biology.* New York: Dover.
● Morowitz, Harold J. (1970). *Entropy for Biologists - an Introduction to Thermodynamics.* New York: Academic Press.
● Hammes, Gordon G. (2000). *Thermodynamics and Kinetics for the Biological Sciences.* New York: John Wiley & Sons, Inc.
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External links

● Gibbs Society of Biological Thermodynamics - University of Virginia.

θΔics

In thermodynamics pioneers, the **biological thermodynamics pioneers** (TPs) page is a file-tree header for grouping individuals, ordered in the dropbox to the left, in the category of pioneers of life thermodynamics or biological thermodynamics (chnopsological thermodynamics) in the general sense.

θΔics

In science, **biology** is a defunct scientific term (see: defunct theory of life), formerly defined as the study of that which is "alive" or "living systems", derived from the Greek prefix *bio*-, meaning "life".

"What about other definitions of life? Wikipedia, for example, posts that *life is a characteristic that distinguishes objects that have self-sustaining biological processes from those which do not*. The difficulty with this definition is that it refers to biological processes. **Biology** – as explained by Wikipedia – is defined as the study of life. Here we turn in a **circle**. This is elegant but not helpful."

— Uwe Meierhenrich (2012), On Edward Trifonov's 123+ definitions of life

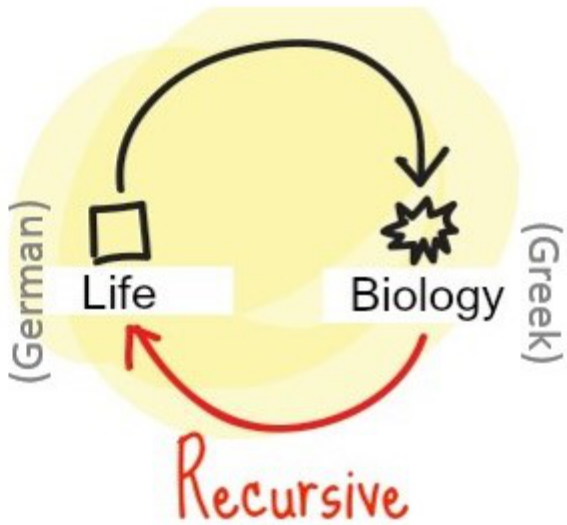

German physical chemist Uwe Meierhenrich on Russian-born Israeli molecular bio-physicist (chnops-physicist) Edward Trifonov's 2011 meta-analysis list of 123-definitions of life list (Popa list + Barbieri list), non-redundant, and the overtypical recursive definition formula found in attempts to define life: as objects having biological processes; **biology** defined as the study of life. [11]

Terminology reform

See main: Life terminology upgrades

The term "biology" has been superseded and replaced by a work-in-progress variety of upgrade terms: "chnopsology", the study of animate systems, the study of "medium powered CHNOPS+ regions, systems, or matrices" (Henry Swan, 1974), among other yet to be invented scientifically agreeable replacements.

Etymology

The prefix bio- is the combining form of the Greek term *bios*. [12]

The word "bios", itself, supposedly embodying the Greek idea or concept of life or theory of life, according to German philosopher Georg Misch, first appears in the work of Euripides, a top seven thinker in Aristotle's citation rankings. [13]

The coining of the term "biology" arose independently in the works of about five or so different people in the years 1797 to 1802 in England and Germany.

In 1797, German anatomist and physiologist Theodore Roose (1771-1803), in his 1797 book *Outlines of the Theory of Life Force*, designated by the term "biology" the doctrine of study of the "life force" (a vitalism term). [3]

In 1799, English physician Thomas Beddoes used the term biology, as a type of strict subset term of physiology, as follows: [10]

> "**Biology**: the doctrine of the living system in all its states."

In 1800, German physiologist and neuroanatomist Karl Burdach (1776-1847) used the term "biology" to denote the study of morphology, physiology, and psychology. [6]

In 1802, German physician and naturalist Gottfried Treviranus (1776-1837) employed the term in the title of his book *Biology or Philosophy of Living Nature for Naturalists and Physicians*, in the introduction of which he wrote (see translation note): [7]

> "The objects of our investigation

> "Die Gegenstände unserer Nachforschungen werden die

will be the various forms and manifestations of life, the conditions and laws under which held the state of life and the causes, whereby the same is effected. The science that deals with these things, we will designate by the name of **biology** or the science of life."	verschiedenen Formen und Erscheinungen des Lebens sein, die Bedingungen und Gesetze unter welchen der Lebenszustand stattfindet und die Ursachen, wodurch derselbe bewirkt wird. Die Wissenschaft, die sich mit diesen Gegenständen beschäftigt, werden wir mit dem Namen Biologie oder Lebenslehre bezeichnen."

Catherine Rigby (2004), misattributes Treviranus, in 1802, as using the term biology for the first time as a new branch of science defined as "conditions and laws under which the different forms of life exist and their causes."

In 1802, French naturalist Jean Lamarck, in his *Researches on the Organization of Living Bodies*, used the term biology, supposedly, in the sense of the study of "the unitary force over all species from the rudimentary worm to the splendor of man." [8] Lamarck's full definition reads: [9]

> "**Biology**: this is one of the three divisions of terrestrial physics; it includes all which pertains to living bodies and particularly to their organization, where developmental processes, the structural complexity resulting from prolonged action of vital movements, the tendency to create special organs and to isolate them by focusing activity in a center, and so on."

(add discussion)

Overview

The term "biology" itself is circular, with the Greek prefix rendered in English, the word amounts to: "life-ology is the study of life", and hence is a meaningless term. This shows through in the various so-called "coinings" of the term (above).

In the modern view, however, animated matter, otherwise known as "biological matter", in obsolete terminology, is atomic matter, and atoms are not alive, nor are molecules, animate molecules, or animated molecules with atomic turnover rate, otherwise known as metabolism and growth. [1]

The goal of what was called the so-called subject of "biology", in olden-days terminology, according to the 1966 views of English molecular biologist Francis Crick, is reductionism to a purely atomic physical chemistry description of behavior: "The ultimate aim of the modern movement in **biology** is to explain all biology in terms of physics and chemistry." [2]

Upgrade terminology

The suggested replacement terminology for the now defunct term biology include: "chnopsology" (2012) and or "animateology", the study of animate matter (or animate molecules); which are both Hmolpedia coined terms, the latter modeled on:

> (a) Belgian-born English thermodynamicist Alfred Ubbelohde 1954 definition that "animate matter [is] termed 'life' for short."
> (b) Swedish physical chemist Sture Nordholm 1997 use of "animate thermodynamics" as the study of the thermodynamics of human activity and behavior.

In this sense, animateology would comprise the study of animate thermodynamics, animate chemistry, and or animate physics applied to the study of animated structures, generally super-cellular in size, or thereabouts. Animateology, to note, is less focused, in that it could generally mean the study of everything that animates, including simple mechanical automatons.

Thermodynamics

In thermodynamics, terms that still have a certain usage include: biothermodynamics, biological thermodynamics, biochemical thermodynamics, etc., although each is in need of terminological upgrade. [4]

Chemistry

In a cultural sense, there is said to exist a certain "biology of love", that has recently been described by a unified theory of psychology and brain chemistry. [5]

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(c) Note: The term "Lebenslehre" is a somewhat indirect term to render, which translates either as "life lesson" (Google), "theory of life" (Google), or "science of life" (Coleman, 1971).
8. (a) Lamarck, J.B. (1802). *Researches on the Organization of Living Bodies* (*recherches sur l'organisation des corps vivans*) (pg. 202). Paris.
(b) Honeywill, Ross. (2008). *Lamarck's Evolution: Two Centuries of Genius and Jealously* (pg. #). Pier.
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10. Beddoes, Thomas. (1799). *Contributions to Physical and Medical Knowledge* (pg. 4). Biggs & Coggle.
11. (a) Meierhenrich, Uwe J. (2012). "Life in its Uniqueness Remains Difficult to Define in Scientific Terms" (pdf), *Journal of Biomolecular Structure & Dynamics*, 29(4):641-42.
(b) Life (Wikipedia) on 13 Jun 2009:

Life is a characteristic that distinguishes objects that have self-sustaining biological processes ("alive," "living"), from those which do not [1][2] —either because such functions have ceased (death), or else because they lack such functions and are classified as "inanimate."

(c) Uwe Meierhenrich – Wikipedia.
12. Bio- | Online Etymology Dictionary.
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External links

â— Biology – Wikipedia.

θΔics

In existographies, **Bion** (325-250BC) (FA:26), aka “Bion of Borysthenes”, was a Greek philosopher

Atheism

In 230AD, Diogenes Laertius, in his *Lives of Eminent Philosophers* (Ñº), said the following on Bion and his atheism:

> “Next he went over to Theodorean views, after he had heard the lectures of Theodorus the atheist, who used every kind of sophistical argument. And after Theodorus he attended the lectures of Theophrastus the Peripatetic. He was fond of display and great at cutting up anything with a jest, using vulgar names for things. Because he employed every style of speech in combination, Eratosthenes, we hear, said of him that he was the first to deck philosophy with bright-flowered robes. He was clever also at parody. Here is a specimen of his style:
>
> O gentle Archytas, musician-born, blessed in thine own conceit, most skilled of men to stir the bass of strife.
>
> And in general he made sport of music and geometry. He lived extravagantly, and for this reason he would move from one city to another, sometimes contriving to make a great show. Thus, at Rhodes he persuaded the sailors to put on students' garb and follow in his train. And when, attended by them, he made his way into the gymnasium, all eyes were fixed on him. It was his custom also to adopt certain young men for the gratification of his appetite and in order that he might be protected by their goodwill. He was extremely selfish and insisted strongly on the maxim that "friends share in common." And hence it came about that he is not credited with a single disciple, out of all the crowds who attended his lectures. And yet there were some who followed his lead in shamelessness. For instance, Betion, one of his intimates, is said once to have addressed Menedemus in these words: "For my part, Menedemus, I pass the night with Bion, and I don't think I am any the worse for it." In his familiar talk he **would often vehemently assail belief in the gods**, a taste which he had derived from Theodorus. Afterwards, when he fell ill (so it was said by the people of Chalcis where he died), he was persuaded to wear an amulet and to **repent of his offences against religion**. And even for want of nurses he was in a sad plight, until Antigonus sent him two servants. And it is stated by Favorinus in his *Miscellaneous History* that the king himself followed in a litter.
>
> Even so he died, and in these lines I have taken him to task:
>
> We hear that Bion, to whom the Scythian land of Borysthenes gave birth, **denied that the gods really exist**. Had he persisted in holding this opinion, it would have been right to say, "He thinks as he pleases: wrongly, to be sure, but still he does think so." But in fact, when he fell ill of a lingering disease and feared death, he who denied the existence of the gods, and would not even look at a temple, who often mocked at mortals for sacrificing to deities, not only over hearth and high altars and table, with sweet savour and fat and incense did he gladden the nostrils of the gods; nor was he content to say "I have sinned, forgive the past," but he cheerfully allowed an old woman to put a charm round his neck, and in full faith bound his arms with leather and placed the rhamnus and the laurel-branch over the door, being ready to submit to anything sooner than die. Fool for wishing that the divine favor might be purchased at a certain price, as if the gods existed just when Bion chose to recognize them! It was then with vain wisdom that, when the driveller was all ashes, he stretched out his hand and said "Hail, Pluto, hail!"”

Bion, in short, was considered an atheist, was a follower of the atheistic ideas of Theodorus and Theophrastus, was said to have “stated main things against the gods”, and lectured following the example of Theodorus. [2]

Quotes | On

The following are quotes on Bion:

> “In the list given by Drachmann [1922], others designated *atheoi* in the period up to the 3rd century BC are Diogenes of Apollonia, Hippo of Rhegium, Diagoras of Melos, Prodicus of Keos, the aristocrat Critias of Athens, Theodorus of Cyrene, **Bion of Borysthenes**, and Euhemerus of Messina.”
>
> — Michael Palmer (2013), *Atheism for Beginners* [1]

References

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(b) Drachmann, Anders B. (1922). *Atheism in Pagan Antiquity* (pg. 13). Gyldendal.
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External links

â— Bion of Borysthenes – Wikipedia.

θΔics

In science, **biophysical economics** is []

The **biophysical economics** logo from Charles Hall's workgroup.

Terminology | Issues

The term "biophysical economics", itself coined by Alfred Lotka (1925), as discussed below, is rooted in the divided usage of the terms "biophysics", also coined by Lotka, meant as a synonym of physiology or the physics "inside" of a so-called biological entity or bio-organism, as distinguished from the older term "physical biology", coined by Walter Porstmann (1886-1959), in his “A Problem from the Physical Zoology: influence of Physical Moments on the Shape of the Fish” (1915), who argued for the need for a new science of physical zoology and botany, along the lines of physical chemistry. The underlying inherent vexing issue in all of this, as outlined by Lotka, in his "Regarding Definitions", is that chemistry and physics or physical chemistry in particular do not recognize the prefix term "bio-" (i.e. life); though Lotka could not find resolution to the problem, he did speculatethat the term “life”, in time, may become “**wholly unnecessary**” in the literature of exact science; in his usage, he continues to use life-laden terms “as a matter of convenience”, but notes, throughout his *Elements*, that such usage no way undermines the argument of his “Regarding Definitions”, the gist of which being that attempts to defined “life” via physics or chemistry is a hunt for the Jabberwock, i.e. something that results in fictional nonsense.

Lotka

The origin of biophysical economics originated in the work of Alfred Lotka, specifically his *Elements of Physical Biology* (1925), in his §§: Networks of Chains of Interrelated Species”, of his §10: Analysis of the Growth Factor, building on his food chain models, he introduces network chains, as follows:

> “The relation between man and the domesticated species of animals and plants on which he so largely depends for food, in the present state of civilization, is only a particularly tangible, a particularly accessible example of an intricate network of relationships that connect more or less closely all living species. In this network each species or component is interlaced, like a link in a meshed coat of mail, with other species, which in turn connect with still others, and so forth. In our effort to get some sort of mental grasp of the complicated interlocking of these elements we seize upon some one link, some one species or component, and we note, first of all, that whatever is eliminated from one component of a self-contained system must pass into one or more other components of the system. So, for example, the component Si may be a herd of cattle. The matter eliminated from this component goes in part as food to build up or sustain a human population; in part it goes as fertilizer on the fields to furnish nutriment for crops; still other parts are worked up into various industrial products, such as leather, glue, etc. We thus have, in schematic representation:

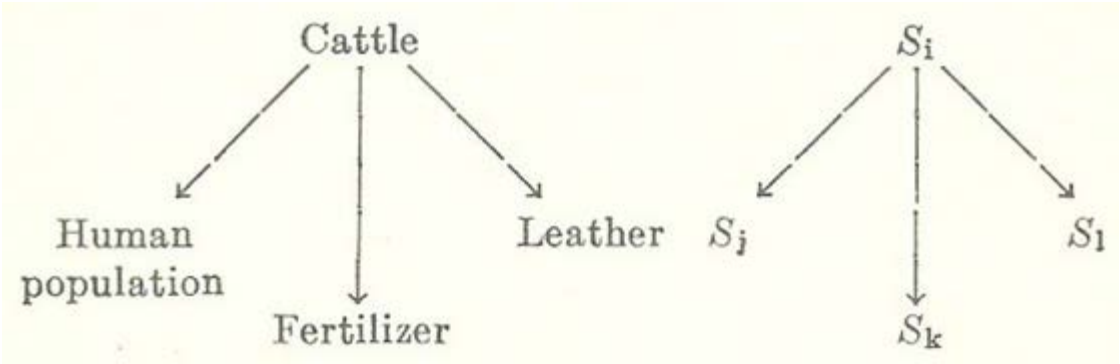

On the other hand, the substance of the herd itself is recruited from certain other components of the system, grass, clover, corn, etc., so that we may further develop the scheme:

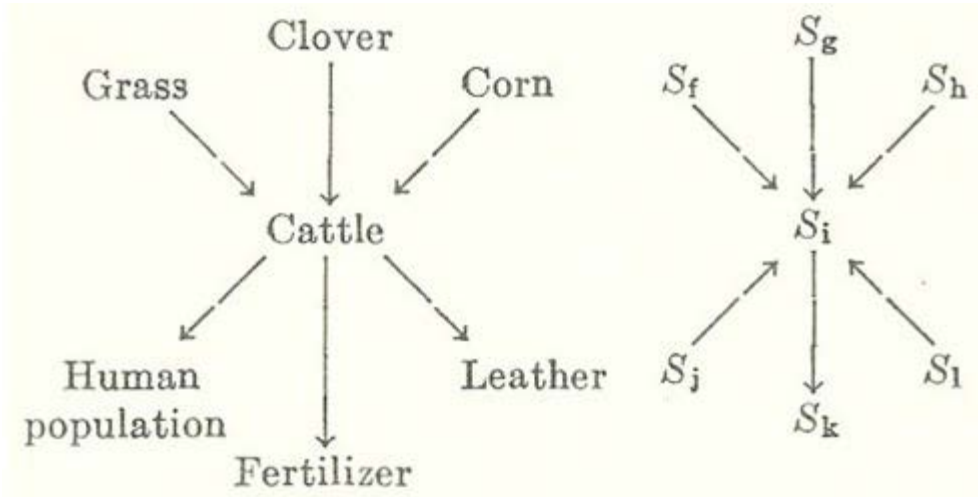

In general any one component thus appears as a link in a complicated chain or rather network of chains; the component Si, for example receives a certain fraction α of the mass VfXf eliminated per unit of time from the component Sf, it passes on to the component Sk certain fraction βik of the mass ViXi eliminated from Xi itself."

He then further elaborates on a "rate of growth" equation derivation; after which he coins the term "biophysical economics" as follows: [1]

"The restriction of this remark to the human species must not be taken to imply that there is in this feature something wholly peculiar to man, but rather, that underlying our economic manifestations are biological phenomena which we share in common with other species; and that the laying bare and clearly formulating of the relations thus involved. In other words, the analysis of the **biophysical** foundations of **economics** is one of the problems coming within the program of physical biology."

— Alfred Lotka (1925), *Elements of Physical Biology* (pgs. 138-39)

The assertion here, according to Lotka, at this point, is that a fundamental connection exists, amenable to differential equation formulation, connecting food chains and or like or akin "economic chains", in connective human-animal networks such as grass-cattle-fertilizer-leather and human population. The second usage of the term biophysical economics, discussed by Lotka, is as follows:

"On the mistaken identification of prices and related economic quantities with the intensity factor of an energy, some authors, namely: Georg Helm (1877), Leon Winiarski (1900), Wilhelm Ostwald (1909, 1913), Emil Budde (1902) (Q), and Julius Davidson (1919), have sought to build a system of biodynamics (social dynamics). The analogy which certain conjugate parameters of the perfectly general kind bear to intensity and capacity factors of an energy [see: intensive vs extensive] present the opportunity for such efforts, which are, in themselves, well worthwhile. But it must not be forgotten that the result of such efforts can be only a species of quasi-dynamics, something analogous to, but not identical with, the dynamics of physical forces. We may speak of the rent per unit area that the representative individual is willing to pay as a measure or at least an index of the 'population pressure'. Now this population pressure this willingness to sacrifice effort for the sake of gaining elbowroom is present quite independently of our peculiar method of expressing it in terms of rent. It exists also among other species, though we may lack so convenient a gauge

for it as we have, in our own case, in rent. We shall see later how at least a quantitative conception of such **biophysical (economic) entities** as population pressure and the like can be gained on a general basis, which applies to species other than human."

— Alfred Lotka (1925), *Elements of Physical Biology* (pg. 304)

Here, Lotka, via the mentioned citations, and discussion of population pressure and conjugate variables, is getting into a deeply entrenched rabbit hole of intellectual fortitude, e.g. Winiarski, Ostwald, Helm, and Davidson are each high ranking social Newtons; this one bulk citation is one of the core anchors of his entire book. He then, goes into a social ideal gas law derivation attempt, the first of its kind, historically speaking. Lastly, his discussion of the conjugate variables of area/rent and population pressure, gets into the deeper problem of what Paul Samuelson and his equation 133 problem.

Others

Others to expand on Lotka, and or to have elaborated biophysical economic ideas similar to his at about the same time, according to Cutler Cleveland (2010), as reviewed by Robert Costanza, include the following thinkers: Frederick Soddy (*Cartesian Economics*, 1922), Howard Scott (Technocracy, 1930s), Fred Cottrell (*Energy and Society*, 1955), and Howard Odum (Environment, Power, and Society, 1970). [2]

In 1970, American biologist-zoologist Charles Hall completed his PhD in systems ecology under Howard T. Odum at the University of Carolina

- Odum, Howard T. (1972). *Environment, Power and Society*. Columbia University Press, 2005.
- Odum, Howard T. (1988). "Self-organization, Transformity, and Information." Science, 242: 1132-
- Odum, Howard T. (1995). *Ecological and General Systems*. University Press of Colorado.
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In 2008, Hall began to organize the first biophysical economics conferences.

In 2012, Eric Zencey, at the 4th BioPhysical Economics Conference, gave a talk on "Energy as Master Resource". [3]

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(b) Biophysical economics – Encyclopedia of Earth.
3. Zencey, Eric. (2012). "Energy as Master Resource" (vid), Fourth Annual Biophysical Economics Conference, University of Vermont in Burlington, Vermont, Oct 26.
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External links

- Biophysical economics – GoogleSites.com.

θΔics

In science, **biophysics**, from Greek *bio*- "life" + -*physics* "ta physika", literally "the natural things" (name of Aristotle's 350BC treatise on nature), is a defunct neoplasm (see: defunct theory of life); colloquially defined as, e.g. "the study of animate matter" (Kurzynski, 2006), but a problematic term, e.g. windmills, synthetic walking molecules, etc., are types of "animate matter" not technically in the purview of the field of study of frogs and flowers, and one of foundation-lacking definition, per the conclusion that "life" is not definable according to physicochemical principles (Lotka, 1925) and or not recognized by physics and chemistry (Sherrington, 1938). [1]

The general "underlying" meaning of the circa 1920s introduced term "**biophysics**", a conjunction of "bio-" + "-physics", short for "physical biology" (1915), i.e. the physical chemistry of zoology and botany, generally meant to mean the study of the physics and chemistry and or physical chemistry of organisms (plants and animals), internally and or evolving systems, but anchored in the term "life" (or living matter) or "bio-" which has its definitional roots in ancient religion (i.e. god created "plant life" on the third day, "animal life" on the fifth day, and "human life", via clay creation myth, on the sixth day) and mythology (Greek mythology, in particular, per "bio-" origin), both preceded by Anunian theology (3100BC), and older folklore before that.

Etymology | Physical biology → Biophysics

In 1915, German engineer-mathematician Walter Porstmann (1886-1959), in his "A problem from the Physical Zoology: influence of Physical Moments on the Shape of the Fish", argued for the need for a new science of physical zoology and botany, along the lines of physical chemistry; his main statement on this is as follows: [1]

> "It will be the function of this new branch of science to investigate biological phenomena as regards their physical aspects, just as 'physical chemistry' has treated the physical aspects of chemical phenomena. Because this field has not yet been systematically explored the individual data of 'physical biology' appear, as yet, as more or less disconnected facts, or as regularities for which no proper place is found in the existing scheme of present-day science; and the investigations of isolated problems in this field are as yet carried on as something of a scientific hobby by amateurs, with the result that they are guided by chance rather than by plan, and are often totally lacking in any fundamental guiding principles or connecting theory. As results gathered in this disconnected fashion accumulate, the need of their unification into a harmonious whole, into a distinct discipline of science, becomes more and more acutely felt. Such unification necessarily involves the working out of a viewpoint that shall make the several facts and relations fall in line naturally in an orderly system; in other words, what is needed is a labor of organization. In the course of this, new and unforeseen problems will inevitably arise, and a fruitful field of scientific endeavor should thus be opened for the investigator."

In 1920, American electrophysiologist Alexander Forbes (1882-1965) (Q), in his *Science* article "Biophysics", according to Lotka (1925), outlined "what might be termed the program of biophysics". [2] This seems to be the first "coined" usage of the term "biophysics".

In 1921, Irish physiological chemist David Burns published his *An Introduction to Biophysics*, which was a basic physiology textbook of sorts. [5]

In Jan 1922, Alfred Lotka wrote a letter to Raymond Pearl wherein he vents on Burns' *An Introduction to Biophysics*, as a semi-contender to his own line of research, in the previous two-decades, albeit a physiology (physics inside the organism) book, thereby differing from Lotka's "nature as one gigantic whole" model: [6]

> “The time is ripe. I see many signs of the fact. Have you seen a recently published book by Burns and Paton, *An Introduction to Biophysics*? It also dug a spur into my side—not that there is anything to get excited over, the book would hardly be described as either inspired or inspiring. But it shows the undercurrent, which one of the days must break through to the surface.”

Sharon Kingsland (1995) suggests that “these currents” carried Lotka into a decision in 1922 to accept a fellowship at Johns Hopkins, wherein he would spend the next two years writing *Elements of Physical Biology*, completed in 1924 and published in 1925, wherein he differentiates between the terms biophysics (physics inside the organism) and physical biology (physics of systems of organisms).

In 1925, Alfred Lotka, in his §5:Program of Physical Biology”, citing Forbes and Porstmann, gave the following bold type definition:

> “Physical biology, as here conceived and discussed, is essentially a branch of the greater discipline of the ‘general mechanics of evolution, the mechanics of systems undergoing irreversible changes in the distribution of matter among the several components of such system. In introducing the term ‘physical biology’ the writer would suggest that the term ‘**biophysics**’ be employed (as hitherto) to denote that branch of science which treats of the physics of individual life processes, as exhibited in the individual organism (e.g., conduction of an impulse along nerve or muscle); and that the term ‘physical biology’ be reserved to denote the broader field of the application of physical principles in the study of life-bearing systems as a whole. Physical biology would, in this terminology, include biophysics as a subordinate province.”

This definition, of significant note, was preceded by his ripe §1:Regarding Definitions, wherein he goes into persuasive argument about how there are issues with the attempts to define “life”, i.e. the “bio-”, according to physicochemical principles, but that he does not know presently how to resolve the issue, and thereby retains the term “life”, and related, for practical purposes.

In 1950, John Butler, together with J.T. Randall, in their *Progress in Biophysics and Biophysical Chemistry*, the first of an annual journal of sorts, opened to the following synopsis or journal aim: (O)

> “While there is general agreement that biophysics is a very important and rapidly developing branch of science, it is a little difficult at present to decide precisely what should be its scope, and the editors of this volume, which is the first of a new series, have recognised the difficulty by including biophysical chemistry as well as biophysics in the title. The book itself consists of nine articles by authorities on particular topics, which vary widely in scope from a highly specialised discussion of "Local Refractometry" by Philpot to a four-page summary of "Phase-contrast Microscopy in Biological Research" by Hughes. Readers of a chemical turn of mind will particularly welcome Gutfreund's article on the "Properties of solutions of Large Molecules", Rudall's article on "Fundamental Structures in Biological System" and Crane's on "Bioelectric Potentials, their Maintenance and Function". Those who are more physically inclined will turn to Oster's review of the "Scatterig of Visible Light and X-rays by Solutions of Proteins", and Engstrom's on the "Use of soft X-rays in the Assay of Biological Materials", while physiologists will be particularly attracted by Pryor's discussion of the "Mechanical Properties of Fibres and Muscles" and Loutit's review of "The Tolerance of Man for Radioactive Isotopes". The book forms a useful addition to the now formidable and still rapidly expanding array of reviews and annuals, since it covers that land between the physical and the biological sciences which most reviews have until recently avoided. The editors are to be congratulated on the wide choice of material for this first volume of what should prove to be a very useful series. J. N. Davidson.”

(add discussion)

Bio | Note

The prefix “bio-”, in short, is a defunct term (see: defunct theory of life; life does not exist); the upgrade prefix substitute for “bio” presently is “powered CHNOPS+ matter” (or powered CHNOPS+# phase) (see: life terminology upgrades), e.g. Henry Adams (1908) defined himself as a "powered CHNOPS+20 phase" (see: social phase), so to speak, in modern exact mass composition terminology, and Wilhelm Ostwald (1926) defined himself as a "C-H-N-O-S-P combination"; a windmill or a robot, e.g., are types of animate matter, but one would not classify these as having the same “physics” properties as say a butterfly or a grass growing.

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(b) Lotka, Alfred J. (1925). *Elements of Physical Biology* (republished (Q) as: *Elements of Mathematical Biology*, which includes: corrections from Lotka’s notes and a completed list of his publications) (pdf) (Q) (txt) (Porstmann, pg. 45). Dover, 1956.
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(b) Kingsland, Sharon E. (1995). *Modelling Nature: Episodes in the History of Population Ecology* (Pearl, pg. 32; Ostwald, pg. 35). University of Chicago Press.

External links

- Biophysics – Wikipedia.

θΔics

In psychology, **biopsychodynamics**, or "bio-psychodynamics", a tending to be subset of biopsychology, refers to the study of the neuroscience and psychodynamic aspects of mental processes or as subset of evolutionary psychology that studies mate selection and evolution using Freudian-theory approach. [1]

Overview

The general field of biopsychology assumes that for every behavior, feeling, and thought, there is a corresponding physical event that takes place in the brain; whereby biopsychology is the study of the relationship between these two. In this sense, biopsychology + psychodynamics (the view that consciousness depends on a number of inner forces over which one has no control; a field initiated by Sigmund Freud), would be defined as the study of the behavior, feeling, and thoughts of consciousness, as these related to both internal physical events and to the forces behind these events. [4]

One might define biopsychodynamics, in this sense, as the internal bio-neurological communication systems linking physical sensations and cognitive sense and the way they work together to sustain bio-emotional equilibrium in order for individuals to establish understanding and logical sense as one becomes motivated to move about and to navigate his or her environment.

In 1932, the term "biopsychodynamics", although difficult to pin down, was being used, sporadically, in the sense of a conjunction of the terms biology (life) and psychodynamics (mind-movement).

In 1945, Henry Mencken, in an article in *The American Mercury* , used term bio-psycho-dynamics to refer to a person as a type of storage battery. [3]

In 1974, Argentinean-born American family therapist Salvador Minuchin, is popular in-context quote, said: [2]

> "The structural approach to families is based on the concept that a family is more than the individual **biopsychodynamics** of its members."

American evolutionary psychologist Peggy La Cerra, who argues that depression and depression energy are tools that, in the framework of the first law and second law, allow for slower time periods, enabling people the ability to break off from non-favorable reaction paths.

References

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θΔics

In science, **biosphere** is a defunct neoplasm (see: defunct theory of life), referring, originally, to the geosphere comprised of "living matter"; now correctly meaning the sphere of powered CHNOPS+ matter.

Overview

In 1928, Russian geochemist Alexander Fersman, associate of Vladimir Vernadsky, published the following spheres of the earth table, as cited by Alexander Oparin (1936), recursively depicting the "biosphere" as comprised of the minerals of "living matter", without any chemical characteristics listed: [1]

THE STRUCTURE OF THE EARTH AND OF ITS SEPARATE GEOSPHERES

Seismic limits	Depth in km.		Name of Geosphere	Thickness in km.	Pressure in Atmosphere	Temperature	State of Matter	Specific Gravity	Radiation	Relation of Mass to total Earth	Chemical characteristics	Minerals	Comments
			Inter-Stellar space				Rarefied gases Electrones	Insignificant	Cosmic Rays		H_2, He, residual O_2 and N_2 up to 300–500 km.		Meteorites from 200 up to 600 km.
	200	Atmosphere	1. Stratosphere	200–300	0.00001	−50° to −70°	Rarefied gases		Cosmic Rays	0.000002	Up to 100 km. N_2 and O_2 decrease H_2, He, O_3	Belt of periodic ozone. Limit of water vapor	Aurora borealis 85–750 km. Luminous clouds up to 80 km.
	10–15	Atmosphere	2. Troposphere	10–13	0.3–0.5	−55°	Gas Solid dust		Cosmic, Radium Rays	0.0001–0.00001	N_2, O_2, A, Ne, Kr, Xe, O_3, water vapor, CO_2		Balloons up to 377 km. Man up to 19 km. Increased thickness at poles.
	0	Hydrosphere and Biosphere	3. Biosphere	8	About 1 (up to 500)	−67.8 to +85°	Principally Colloids		Solar Rays Radium Emanation			Living matter	
	4	Hydrosphere and Biosphere	4. Hydrosphere	3.7 (mean) up to 10.8	About 1 (up to 500)	0 to + 7°	Solutions	1.03	Low Radioactivity	0.02	H_2, O_2, Cl, Na, Mg, S	Water, ice	

20–40 km. depth of earth-quakes	15–20	Lithosphere	Sharp Boundary 5. Zone of weather-ing	<0.8 (up to 8)	Not over 250	mean 16° to 80°	Princi-pally Colloids	2.2	Increased Radio-activity in Sediments		O_2, H_2, Si, Al, C, Cl, CO_2	Clay, quartz, limonite, gypsum, bauxite, etc.	Lowest limit of oxygen (0.5–1.0, very rarely 1.5 km.).
			6. Zone of Rocks	<4	<1000	Up to + 100°	Colloids + Crystal-loids	2.5	Medium Radio-activity	0.5		Same, also calcite, dolo-mite, coal	Usually absent under the ocean.
			7. Metamor-phic zone	5–10	<2500	Up to + 350°	Crystals	2.7	Increased Radio-activity	0.5		Quartz, feld-spar	Usually absent under the ocean.
			8. Granite zone	10–15	Up to 6000	600°	Crystals	2.6–2.8	Highest Radio-activity	0.5	O, Si, Al, K, Na, Fe, Mg, Ca, etc.	Quartz, mica, feldspar, apetite, magnetite	Under the ocean usually absent or very thin.
60	70		9. Basalt zone	70–85	Up to 20000	1000°	Crystals + melts	2.7–3.3	Medium Radio-activity	1.0	O, Si, Al, Na, Fe, Mg, Ca, Ti, P, S, Cl.	Plagioclases, pyroxenes, magnetite, apetite	Boundary be-tween crystal-line and glass basalt is placed at a depth of 60 km.
1200	1200		10. Zone of Perido-tite	1000–1200	Up to 500000	1200–1500°	Melts + glass	3.6–4.0	Low Radio-activity	36.0	O, Si, Fe, Mg, Ca, Cr, Ni, V	Olivine, py-roxenes, anor-tite (pyrope, diamond)	
1700 2450		Intermediate Geosphere	11. Zone of ferro-sporic magma	750	1000000	(1000°)	Glass	5.0–5.5	Very Low Radio-activity	20.0		Olivine, py-roxelenes, py-rites, chro-mite, magne-tite, hematite, rutile, ilmenite	Molten zone (70–120 km.).
2300	2900		12. Litho-sporic zone Sharp Boundary	750	1500000	(1000°)	Glass	6.0	"	10.0	S, Se and Te		Sharp boundary
	6370	Core	13. Central core	3400	2000000–3000000	2000°–8000° probably about 5000°	Glass	9–11		31.5		Native Fe, Ni, troilite, cohenite, schreibersite, etc.	

(add discussion)

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External links

â— Biosphere – Wikipedia.

θΔics

In thermodynamics, **biothermodynamics**, a defunct neoplasm (see: bio-), is study of energy and entropy, or more generally free energy, transformations IN powered CHNOPS+ organisms (living organisms); see also: defunct theory of life; life does not exist; life terminology upgrades.

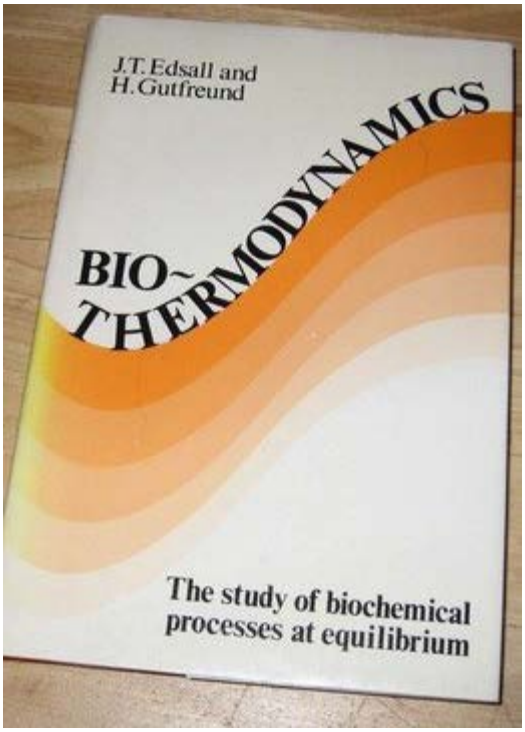

John Edsall and Hanoch Gutfreund's 1983 book on **biothermodynamics** which discusses the history and biological processes of thermodynamics; theoretical aspects of thermodynamic principles which aid in understanding biochemical processes; and the interpretation of data obtained from biochemical reactions, ligand binding, and calorimetric measurements on biological systems. [2]

Etymology

In 1940, Ludwig Bertalanffy, in his "Theoretical Biology" (Q), stated the following argument, of which only the first part is correct:

> "The new thermodynamics shows that it is necessary not only for biological theory to be based upon physics, but also that biological points of view can open new pathways in physical theory as well."

The mechanical equivalent of heat, e.g., is not going to change because of new "biological points of view".

In 1976, Israeli cellular membrane transport scientist S. Roy Caplan, penned a chapter on "biothermodynamics" (Q), which he generally meant as the study of energetics of coupling mechanism across membranes. (Q)

In 1977, biothermodynamics was being defined as follows: (Q)

> "We are considering the state of thermodynamic data referring to and useful in the various branches of the life sciences. For short we can refer to this as **biothermodynamics**."

In 1983, John Edsall and Hanoch Gutfreund, in their *Biothermodynamics*, employed the term **biothermodynamics** as the study of biochemical processes INSIDE a biological entity, e.g. cell, or organism, and related processes of thermodynamics; theoretical aspects of thermodynamic principles which aid in understanding biochemical processes; and the interpretation of data obtained from biochemical reactions, ligand binding, and calorimetric measurements on biological systems. [2]

Overview

A classic example of the use of thermodynamics in the study of animated systems (biological systems), supposedly, is Wyman's theory of linked functions. Topics include the study of and estimation of the thermodynamic parameters of specific protein-protein, protein-DNA, and small molecule interactions. [1]

In 1987, the annual "Gibbs Conference on Biothermodynamics" was launched which has focused on research, theory, and attempts to understand how ligand binding, subunit assembly and conformational change drive what we observe as physiological processes such as regulated transport, enzyme cascades, gene regulation, membrane permeability, viral infection, intracellular trafficking and folding of macromolecules.

The field of biothermodynamics is now said to be thoroughly integrated with the study of macromolecular structures, computational modeling and physiological studies of human health and disease. [3]

Synonyms

See main: Thermodynamics (naming)

The term 'biothermodynamics' is loosely synonymous with biochemical thermodynamics, biological thermodynamics, and bioenergetics, although each seems to have a subtle difference, the first focusing on the thermodynamics of biochemical reactions, the second on protein-protein interactions, and the latter on energy (first law) balancing involved cell membrane transport phenomena, in short.

Difficulties | Terminology

Correctly, to note, all subjects are classified under the auspices of "animate thermodynamics" (see: defunct theory of life), being that the Greek prefix "-bio", such as pictured adjacent, is representative of religious-mythology, but not something that exists in modern physical science.

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Further reading

● Ackers, Gary and Bolen Wayne. (1997). “The Gibbs Conference on Biothermodynamics: Origins and Evolution.” *Biophysical Chemistry*, 64: 3-5.
● Kennedy, Ivan R. (2001). *Action in Ecosystems: Biothermodynamics for Sustainability*. Research Studies Press.

θΔics

In terminology, **birth** is a colloquial albeit defunct (see: defunct theory of life) name to the start day of an entities out-of-womb state motile reaction existence; the upgrade term being "reaction start" (see: life terminology upgrades).

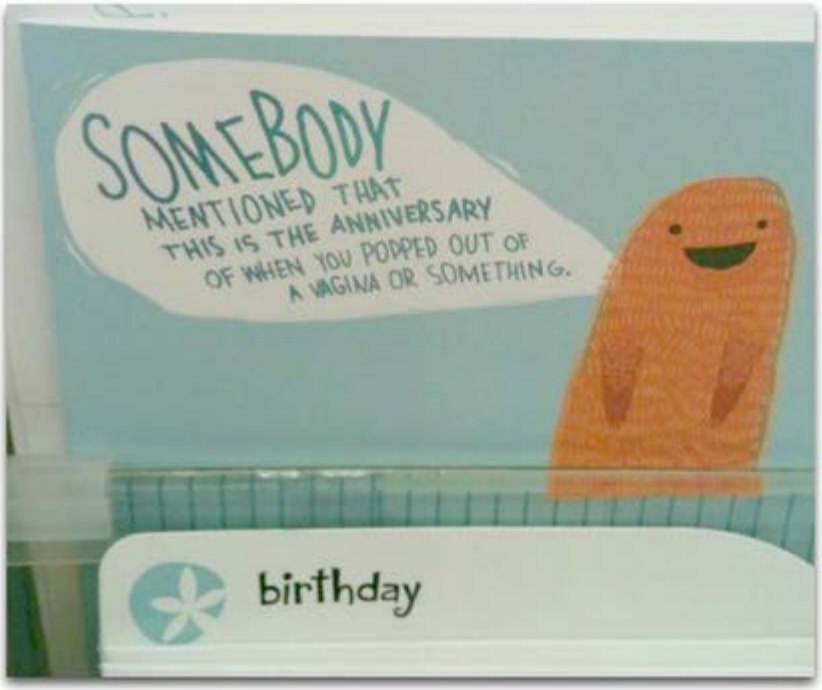

A humorous birthday card referring to "**birth**" as the day a person emerged from the womb; which is technically-correct, being that a human is a molecule (see: human molecular formula) and molecules are not "born" and do not "die", but do move in and out of cavities and adhere and detach from things.

Discussion

The term "birth" is non-chemical thermodynamically neutral term, largely associated with the olden religio-mythology based theory of life notions; but as English physiologist Charles Sherrington correctly put it in 1938 "chemistry does not know the word life"; hence, chemistry also does not know the word "birth", being that atoms and molecules, as chemistry understands things, are not "born", but are synthesized, and do not "die", but are analyzed.

The formation or rather synthesis of a human, to exemplify, tends to colloquially be seen through the following overview type of chemical reaction:

$$Man + Woman \rightarrow Baby$$

Technically, however, this reaction occurs through the process or rather mechanism of what is called a double displacement reaction (see: human reproduction reaction), of the following form:

$$AB + CD \rightarrow AC + BD$$

where *AB* is a male, with internal component active sperm *B*, put in contact or reaction orbital proximity to *CD*, a female, with internal component active egg *D*, which through interaction mechanisms, inclusive of sexual interactions, over time, yield products *AC*, a newly formed couple, and *BD*, the sperm *B* and egg *D* joined into the form of a new human molecule, which at the adulthood stage, *circa* age 15, begins to detach from the parental structure *AC*.

Nowhere in this continuous reaction mechanism can it be said that any of the component reactants or products are "alive", were "born", or "died", these being but carry-over terminologies from olden religio-mythology based theories of human intellectual heritage.

External links

â— Birth – Wikipedia.

θΔics

In computer science, a **bit** refers to one binary digit, i.e. a 0 or a 1, in Boolean algebra, which in a physical sense is typically represented by a low or high voltage, respectively, as stored in the geometry of semiconductor device, such as a flip-flop circuit or a relay, readable using logic gates. [1]

Etymology

The term "bit", shortened version of the term "binary digit", was introduced in 1948 by American electrical engineer Claude Shannon who was utilizing a suggestion made earlier by American mathematician John Tukey. [4] Shannon later estimated the "entropy", defined via a mixture of statistical mechanics and information transmission arguments, of written language to be 0.6 to 1.3 bits per character.

Zeilinger's principle

A related term is Zeilinger's principle, which states that any elementary system carries just one bit of information. This principle was put forward by Austrian physicist Anton Zeilinger in 1999 and subsequently developed by him to derive several aspects of quantum mechanics. Some have reasoned that this principle, in certain ways, links thermodynamics with information theory. [2]

Cessation thermodynamics

In 1998, in the context of cessation thermodynamics, American physician Gerry Nahum presented a derivation to quantify consciousness energetically in which he stated that in the consciousness: [3]

> "The change in heat that has to be liberated per bit of information lost is about three times ten to the minus-twenty-one joules."

or:

$$dQ_I = 3 \times 10^{-21} J$$

Nahum seems to have culled this value from previous estimates made in computer science. Nahum argues that this is the energy lost when one unit of consciousness information is destroyed.

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4. (a) John Tukey – Wikipedia.
(b) Bit (definition) – Linfo.org.

External links

â— Bit – Wikipedia.

θΔics

In hmolscience, **Bjorn Sponberg** (1976-) (DN:1) (CRI:16) is a Norwegian geneticist (Q) noted for []

Overview

In 2006, Sponberg began working a on a religion + science reconciling theory of everything, the latest version of which calls a new "fourth law of thermodynamics" aimed at deriving a thermodynamics based argument that describes purpose in or behind the universe, according to the realization that: (Q)

> "The difference between good and evil has always started with universal energy states. The universe can sense the difference between good and evil in life via energy states."

Sponberg, in his 2010 article "Hypothesis: Fourth Law of Thermodynamics", explains his ideas, which amount to a mixture of the Bible, a Nash equilibrium model of so-called 'good' and 'evil' phenotypes, intermixed with ideas about how systems always tend to their lowest energy states. [1]

As per religious thermodynamics writers go, Sponberg is very green in his writing and ideas and very religious-minded , believing that Jesus Christ was a real person (Q), rather than the "Osiris anointed" mythological rewrite of Anunian theology, and that the Bible statement: "Hell is a place where the flames never die" (Q) has something to do with thermodynamics (Q), rather than the mythological "lake of fire", over which animal monster Ammit sits during the weighing of the soul process, as the negative confessions are read, into which the overly heavy souls are said to descend, etc.

The writings of Mark Janes, in respect to thermodynamics of good and evil, and Tom Siegfried, in respect to Nash equilibrium and thermodynamics come to mind here.

Education

Sponberg completed a MS in 2009 in molecular medicine at Norwegian University of Science and Technology, Norway and a MS in 2012 with a thesis on "A New Model Argues Against Just in Time Synthesis in M phase", a new regulatory model for eukaryotic cell cycle (Q), at Stockholm University, Sweden.

References

1. Sponberg, Bjorn. (2010). "Hypothesis: Fourth Law of Thermodynamics", May, WordPress.com.

External links

- Bjorn Sponberg – YouTube.
- Bjorn Sponberg – Scribd.

θΔics

In radiation thermodynamics, a **black body** or "resonator" is a cavity, typically an iron stove with a small inlet hole, having the inside painted or sooted black, such that if light were introduced through the small hole all the radiation would be absorbed completely into the body and none would be reflected back out of the hole.

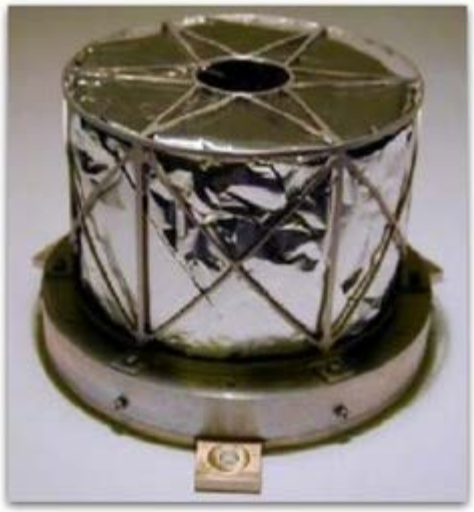

Modern example of a **black body** (a TIRFI black body), light goes in the hole, bounces around, and is assumed to be absorbed 100% into the black walls of the inside container.

Quantum mechanics

In 1900, Max Planck theorized that the internal energy *U* of a black body (resonator) could be divided into a discrete number of "energy elements" ε by the expression:

$$U = \epsilon P$$

where *P* is large integer. In his 1901 paper "On the Law of Distribution of Energy in the Normal Spectrum", Planck went a step further and, supposedly, used Boltzmann's 1872 H-function model to explain that the entropy *SN* of the black body system [resonator] is proportional to the logarithm of its probability or multiplicity *W*, within an arbitrary additive constant: [1]

$$S = k \log W + const$$

In his 1909 lectures, Planck was calling the following equation (without the added constant):

$$S = k \log W$$

the 'general definition of entropy', albeit discussed in his chapter on the equation of state of a monoatomic gas.

The supposition that bodies could be divided into energy elements later led German-born American physicist Albert Einstein, in 1905, to propose that light itself could be quantized and was composed of quantums of energy, i.e. light quantums. As Einstein wrote in the introduction to his March 1905 paper: [2]

> "According to the assumption to be contemplated here, when a light ray is spread from a point, the energy is not distributed continuously over ever-increasing spaces, but consists of a finite number of **energy quanta** that are localized in points in space, move without dividing, and can be absorbed or generated only as a whole."

These light quantums later came to be called "photons", a term introduced in 1926 by American physical chemist Gilbert Lewis. These developments launched the development quantum mechanics (1926), quantum chemistry (1930s), and quantum thermodynamics (c.1990s).

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External links

â— Black body – Wikipedia.
â— Blackbody – Eric Weisstein's World of Physics.

θΔics

In radiation thermodynamics, **black body radiation** is electromagnetic radiation emitted by a black body when heated.

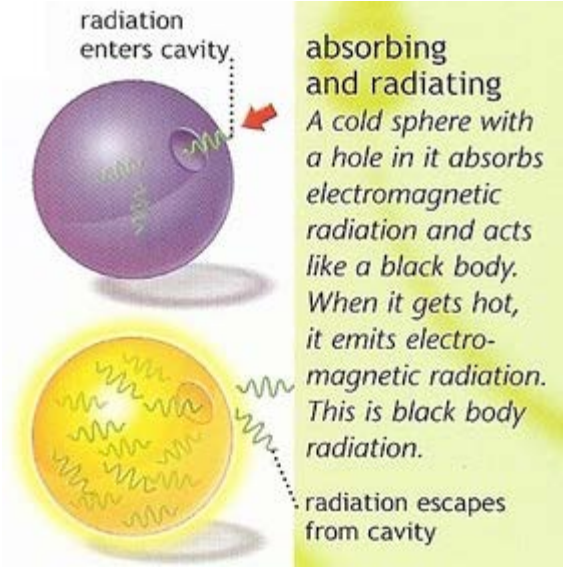

Generic depiction of **black body radiation** of radiation emitted from a cavity resonator or black body. [1]

History

In 1860, German physicist Gustav Kirchhoff introduced the term "black body" and formulated radiation equations that gave a partial solution to the phenomenon of radiation emitted by such bodies.

In 1894, German physicist Max Planck began to work on the thermodynamical understanding of black body radiation and in 1900 solved the then plaguing problems, e.g. ultraviolet catastrophe, and in doing so reformulated Kirchhoff's equations on black body radiation, using Ludwig Boltzmann's postulate that the energy of bodies could be divided up into discreet quantities or portions, and on this basis introduced the idea of the "energy element" and thus launched the quantum revolution.

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θΔics

In thermodynamics, the **black box** approach or "black box thermodynamics" is black box systems model that refers to the premise or conceptualization that according to the classical thermodynamic viewpoint systems, whatever the form or composition, can be studied or conceptualized as “black boxes”, about which the container contents are irrelevant, but ones whose nature can be quantified by boundary measurements.

A generic **black box**: the type of view used to model systems in thermodynamics.

Overview

The etymology of the term "black box" used in thermodynamics seems to be a late 19th century term use, although the exact source remains to be tracked down. The term “black box” may be a linguist cross over (similar to the way the 17th century term “perfect vacuum” was transformed linguistically into perfect gas, then perfect ideal gas, then ideal gas, as it is known in modern terms) derived from Gustav Kirchhoff and his 19th century radiation studies in his so-called “black box” or hollow body, covered in black soot, whose heated walls emitted or absorbed radiation. [5] This gave way to the idea of the black body, the radiation thermodynamics, and then quantum mechanics (or quantum thermodynamics), all generally introduced by Max Planck.

In 1925, Gilbert Lewis was discussing the thermodynamics of a "box of unknown contents" with two wires protruding, having a known voltage difference, known current drawn from the wires, and known amount of heat given off. [8]

In 1951, the phrase “thermodynamic analysis is essentially ‘black-body’ analysis”, had entered the engineering vernacular, and soon thereafter become a stable fixture of thermodynamics jargon. [6]

In 1982, plastics engineer Harry Hull published his *An Approach to Rheology through Multivariable Thermodynamics*, with the subtitle *Inside the Thermodynamic Black Box*, which he explains in namesake. [4]

In 1985, American physical chemist George Scott comments in his *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will*, that: [7]

> “The laws of thermodynamics, we assume, apply to the whole biosphere of life in exactly the same way they apply to machinery and black boxes.”

A variation of this was expressed by Venezuelan-born English thermodynamicist Erich Muller who stated in his 1998 article “Human Societies: a Curious Application of Thermodynamics: [3]

> “Curiously, none of the founding fathers of thermodynamics, Watt, Carnot, Joule, Clausius, Gibbs, among others, had an appreciable comprehension of the exact constitution of matter. The relations and results obtained in early classical thermodynamics are independent of the actual nature of the systems studied and are indeed very general. This happy occurrence is the reason we can extrapolate the fundamental concepts of thermodynamics to other modern disciplines.”

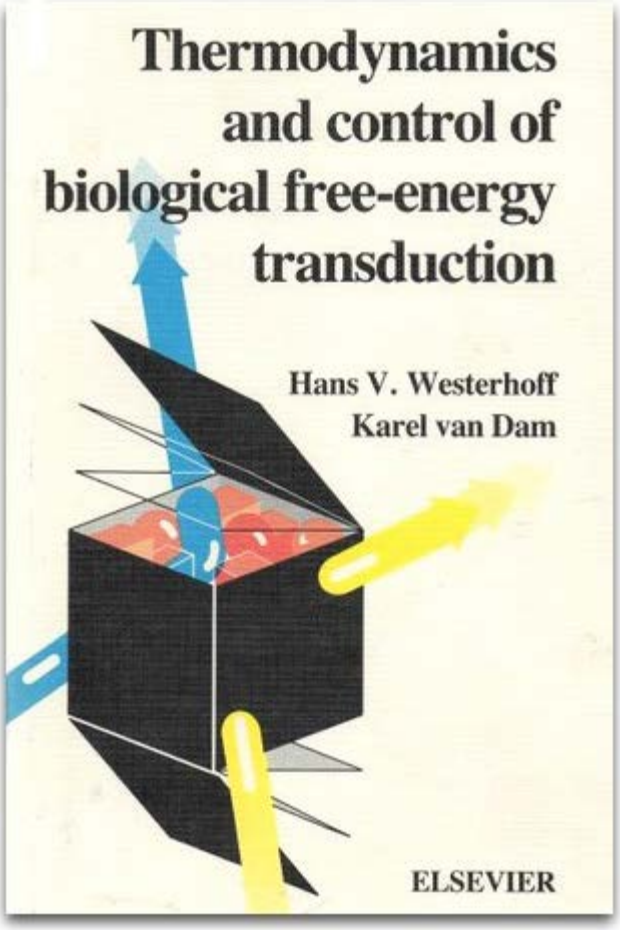

A depiction of the "**black box**" approach on Hans Westerhoff and Karel Dam's 1987 *Thermodynamics and Control of Biological Free Energy Transduction*, wherein the view different "biological" volumes, from a thermodynamic point of view, as a black box. [9]

To quote from a recent 2006 article on the mathematics of thermodynamics: [2]

> "Thermodynamics is unique among physical and chemical descriptions of our surroundings in that it does not rely on a detailed knowledge of any interior structure of the systems to which it pertains but rather treats such systems as **'black boxes'** whose equilibrium states are determined by the surroundings with which they can coexist and which can be described by a few parameters. This feature assures that the theory holds true when the system is a collection of molecules, or a beaker of water, or a black hole."

In 2010, mechanical engineer Robert Balmer states in his 2010 *Modern Engineering Thermodynamics* textbook: [1]

> "One of the most powerful aspects of thermodynamics is its **'black box'** approach to system analysis. It is not necessary to know what takes place inside the box, it is necessary only to watch the box's boundaries and see what, and how much, crosses them."

(add discussion)

Discussion

To note, although the black box conceptualization is a good introductory way to initially dig into a thermodynamic problem, there are a number of areas where this model begins to become non-applicable.

Firstly, on one hand, yes the "black box" model is universal in that it is founded on French physicist Sadi Carnot's 1824 statement that thermodynamics is the science of the study of "any" working substance, whatever it may be and by whatever means it may be operated; a statement which was based on Boerhaave's law (1720) of the premise that any body of the universe can be made to expand or contract in volume, by the addition or removal of heat.

Secondly, however, on the other had, an actually reading of German physicist Rudolf Clausius' 1865 *The Mechanical Theory of Heat*, which is the founding book of thermodynamics, will show that a number of formulations in thermodynamics are based on speculations about the work the molecules of the system do on each other, i.e. internal

work, as well as other derivations, such as in the forces that brought the system to its present internal energy configuration.

Moreover, in chemical thermodynamics, and in animate thermodynamics, all the way down to single particle thermodynamics, internal system descriptions become the key focus, where factors such as bond energy, energy coupling, transformation content energy, etc., become focused topics of discussion and theory development.

In sum, there are two sides to the so-called black box idiom of system modeling, albeit the black box model is a good starting point, but not the say all.

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External links

â— Black box – Wikipedia.

θΔics

In analogies, **black cat analogy** is an putting-the-issue in perspective thought model, originated as an old East European joke recast into philosophical argument by William James (1911), which compares different things, e.g. philosophy, theology, atheism, Marxism, metaphysics, ethics, among others, to that of a person (without light, blind, or blindfolded), theory, or occupation that looks for a black cat—of various sizes (or a non-existent cat)—in a dark room; some, e.g. Marxism (a quasi-religion) or theology (a religion), claiming to have found the cat.

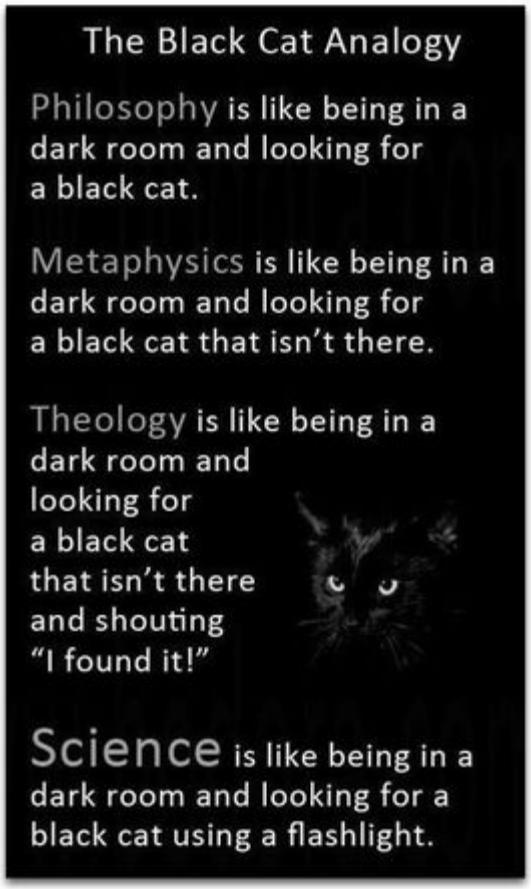

A 2012 viral image of the philosophy, metaphysics, theology, science spin on the "**black cat analogy**".

Etymology

In 1549, the saying "when all candles be out, all cats be grey; all things are then one color" was classified as proverb. In Hungarian, the proverb translates as "at night all cows are black." [7]

In 1807, Georg Hegel, in the preface to *Phenomenology of Mind*, criticized those philosophers, such as Friedrich Schelling and Aristotle, who dissolve philosophy into immeasurables; as follows: [8]

> "To consider any specific fact as it is in the absolute, consists here in nothing else than saying about it that, while it is now doubtless spoken of as something specific, yet in the absolute, in the abstract identity A = A, there is no such thing at all, for everything is there all one. To pit this single assertion, that 'in the absolute all is one', against the organized whole of determinate and complete knowledge, or of knowledge which at least aims at and demands complete development—to given out its absolute as the night in which, as we say, all cows [cats] are black—that is the very *naïveté* of vacuous knowledge [emptiness of knowledge]."

(add)

James | Philosophy

The black cat analogy, in respect to philosophy, seems to have been a thought product of American psychologist William James; or something told to him by a theological colleague:

> "With his obscure and uncertain speculations as to the intimate nature and causes of things, the philosopher is liken a 'blind man in a dark room looking for a **black cat** that is not there.' His occupation is described as the art of 'endlessly disputing without coming to any conclusions'."
>
> — William James (1911), *Some Problems of Philosophy* [1]

> "William James was being teased by a theological colleague who said to him: 'A philosopher is like a blind man in a dark cellar, looking for a **black cat** that isn't there.' 'Yes', said James, 'and the difference between philosophy and theology is that theology finds the cat'."
>
> — Alfred Ayer (c.1970), on William James and the "black cat analogy" [2]

(add)

Allen | Leap of Faith

In *circa* 1971, Irish comedian Dave Allen, a Catholic-raised individual turned self-defined "practicing atheist", in his BBC show *Dave Allen at Large* (1971-1979), did his famous Pope vs atheist spin on the "black cat analogy", via his so-called "The Leap of Faith" joke, which goes as follows: [3]

> "The Pope is discussing the existence of god with an out-and-out atheist. The discussion starts off very correctly, but as the hours go by it gets more and more heated, and eventually the Pope turns to the man and says: 'You are like a man who is totally blindfolded, in a dark room, looking for a **black cat** that is not there!' The fella says: 'With all respect, your holiness, I think there's great similarity between us both.' The Pope says, 'whaddya mean, "similarity"?' The fella says: 'well, as far as I'm concerned, *you* are like a man who is totally blindfolded in a totally dark room looking for a cat that isn't there. The only difference is that you found it."

(add discussion)

Gellner | Marxism

In circa 1985, British-Czech philosopher Ernest Gellner applied the black cat analogy to Marxism; as follows: [6]

> "There is an old East European joke concerning the differences between science, philosophy, and Marxism. What is science? It is trying to catch a very small black cat in a very large, entirely dark room. What is philosophy? It is trying to catch a very small cat in a very large, entirely dark room, when it is not there. What is Marxism? It is trying to catch a very small black cat in a very large, entirely dark room when it is not there, and pretending that one has caught it and knows about it."

(add)

Black cat | Bioethics

In 1989, Australian nursing professor and bioethicist Megan-Jane Johnstone (Ñº), in her *Bioethics: a Nursing Perspective*, employed the black cat analogy in respect to the question ethics and an supposed "amoral health professional", i.e. the existence of morality and rights from the point of view of a hypothetical extreme atheist nurse, who, not believing in god, might not, hypothetically, believe in morality or patient's rights: [4]

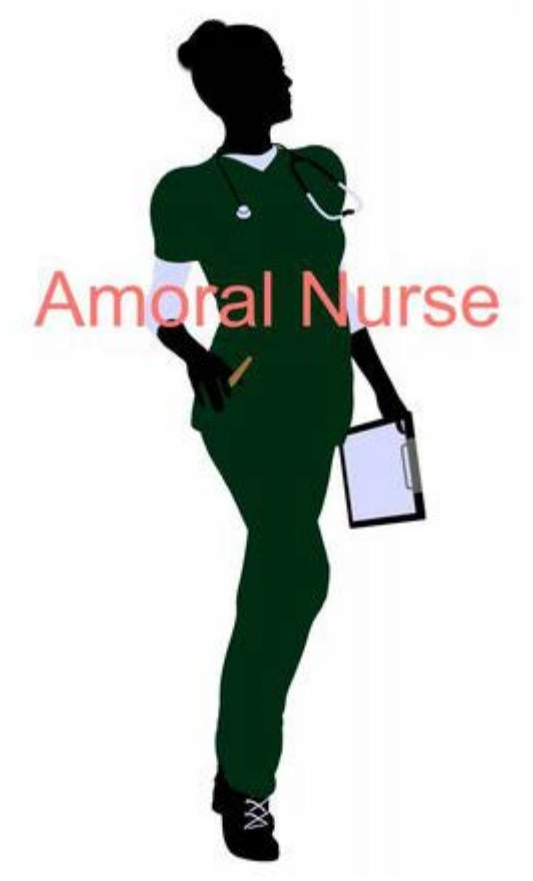

> "The amoral nurse might reject that he or she has a moral duty to uphold a patient's rights. The amoral nurse would also probably claim that it does not make any sense even to speak of things like a patient's 'rights' since moral language itself has no meaning. The amoralist's position in this respect is analogous to the atheist's rejection of certain religious terms. The extreme atheist, for example, would argue against uttering the word 'god', since it refers to nothing and therefore has no meaning. Such an atheist might also claim that there is no point in engaging in a religious debate on the existence of god, since there is just nothing there to debate. To try and debate the existence of god would be like trying to debate the existence of a '**black cat** in a darkened room when there isn't one'. The amoralist may argue in a similar way in relation to the issue of morality."

Johnstone concludes that in the case of a non-religious nurse, without an foundational ethical sense of right or wrong, in respect to patient's rights:

> "The only recourse in dealing with the amoral [atheist] health care professional would be to appeal to non-moral censuring mechanisms such as legal and or professional disciplinary measures."

Australian nursing professor and bioethicist Megan-Jane Johnstone argues (1989) that there might exist hypothetical "amoral nurses" (or health care professionals), in hospitals, who, being an extreme atheists in belief state, could, possibly, think that since god does not exist, then "morals" to not exist, and therein have no sort of ethical foundation, according to which a supervisor would have to appeal to "non-moral censuring mechanisms" to discipline such a health care professional; per the logic that the nurse would argue that looking for or arguing about morality is like looking for a non-existent **black cat** in a dark room. [4]

Here, this would seem to be a Zeno of Citium slave stealing anecdote type of disciplinary method.

In 2011, Vincent Barry, in his *Bioethics in a Cultural Context: Philosophy, Religion, History, Politics*, employed the philosopher vs theologian version of black cat analogy in respect to the 1974 National Research Act, an act passed by Congress charging the Health and Human Services to appoint a commission to "identify the basic ethical principles" that the federal government should use to protect human subjects of medical experiments. Barry concluded with the statement, to the effect that, it is difficult to "articulate a coherent position when the primary authors—theologians and philosophers—don't share the same belief system?" [5]

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External links

â— Black cat analogy – Wikipedia.

θΔics

In cosmological thermodynamics, a **black hole**, or singularity, is a region of space, delineated by an event horizon or boundary surface toward which any matter, energy and light in the immediate vicinity falls or is drawn into. In a technical sense, a black hole is any region of space where the gravitational escape velocity for the objects in that region is equal to the speed of light. [7]

Rendition of the side view of a black hole, predicted to exist in 1915 by American mathematical physicist William Sidis, showing Hawking radiation shooting out the sides, as was predicted to exist in 1974 by British astrophysicist Stephen Hawking, following earlier circa 1970 discussion between American theoretical physicist John Wheeler, coiner of the term “black hole” (1967), and his graduate student Mexican-born Jewish physicist Jacob Bekenstein as whether or not black holes flout the second law of thermodynamics. [8]

Sidis | Black body stars

In 1920, American mathematical astrophysicist William Sidis, at the age of seventeen, was the first to predict the existence of black holes or "black body stars", as he called them, into which all light and radiant energy would fall, thus making the star totally invisible, being volumetrically delineated by what he termed a "boundary surface", using terminology from classical thermodynamics and black body or radiation thermodynamics. [1] Numerous references now credit Sidis as the first to publish on this topic; although, to note, it seems his work was relatively unknown to academia until the 1970s. [8] As American philosopher Frank Magill put it in 1992: “Sidis had successfully predicted the existence of black holes at a time when no one had even dreamed of such things.” [9]
Sidis wrote out the theory in 1920, while curiously being locked in an asylum, eventually to be published in the 1925 book *The Animate and the Inanimate*. The book, supposedly, remained essentially lost to academia until found in an attic in circa 1978 by biographer Daniel Mahony and given to Sidis' old Harvard classmate Buckminster Fuller who after reading it in 1979 sent in a letter *Scientific America* extolling the work suggesting that it be reprinted. On black holes, Fuller comments: [2] “Imagine my excitement and joy on being handed this Xerox of Sidis’ 1925 book, in which he clearly predicts the black hole.” [2]

Early history

The next person to suggest the existence of black holes, according to biographer Amy Wallace, was Indian-born American astrophysicist Subrahmanyan Chandrasekhar as discussed in his the 1939 book *An Introduction to the Study of Stellar Structure*, in which he applies the newly invented 1908 axiomatic thermodynamics of Greek mathematician Constantin Caratheodory to the study of black holes viewed as abstract thermodynamic systems. [3] The term "black hole" was coined in 1967 by American theoretical physicist John Wheeler to describe this theoretical black star-space region phenomenon. [4]

Black hole thermodynamics

See main: Black hole thermodynamics

The first ideas as to what happens to the lost information or energy-matter falling into a black hole, in the context of entropy increase, traces to early 1970s discussions between Wheeler and his graduate student Mexican-born Jewish physicist Jacob Bekenstein. In 1971, Wheeler pointed out to Bekenstein that black holes seem to flout the second law of thermodynamics. [5] In 1972, to remedy this issue, Bekenstein suggested that black holes should have a well-defined entropy and went on to formulate a generalized second law of black hole thermodynamics which states that “the sum of black hole entropy and ordinary entropy outside a black hole never decreases.” To find and measure this “black hole entropy”, Bekenstein reasoned that, because of the effect that the massive gravity of black holes pulls light, energy, and matter into its body, according to German-born American Albert Einstein’s mass-energy relation $E=mc^2$, a black hole's entropy increase must be proportional or related to its surface area.

Hawking radiation

Two years later, in 1974, Beckenstein's postulate was confirmed when British astrophysicist Stephen Hawking

discovered that black holes radiate energy, now called Hawking radiation, and hence they must have a correlative temperature and thus an entropy (black hole entropy). [2]

Hawking temperature

(add)

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External links

â— Black hole – Wikipedia.

θΔics

In cosmological thermodynamics, **black hole entropy** or "Bekenstein-Hawking entropy" is the entropy of a black hole, hypothesized to measurable according to the surface area of the black hole; which, according to Stephen Hawking's 1970 area theorem, increases for any given process. The equation for black hole entropy is typically given by the formula:

$$S_{BH} = \frac{kA}{4\ell_{\mathrm{P}}^2}$$

where k is the Boltzmann constant, A is the surface area of the black hole, and l_P is the Planck length.

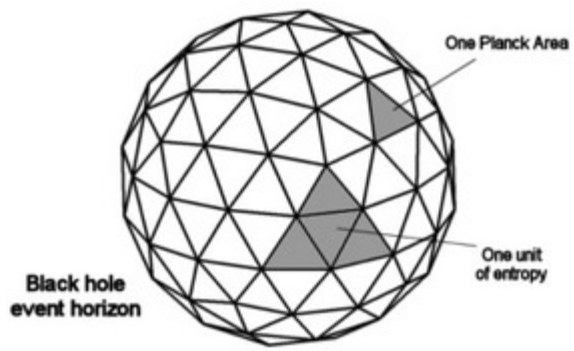

Geometric diagram of a black hole in units of entropy.

Tea cups, entropy, and black holes

In *circa* 1971, American theoretical physicist John Wheeler commented to Mexican-born Jewish physicist Jacob Bekenstein, a student of his at the time, that black holes seem to flout the second law of thermodynamics. Supposedly, Wheeler had been bothered by the notion that black holes provide for a loophole in the second law of thermodynamics in that they conceal actions associated with entropy increase. In recollection, Wheeler comments:

> "I told him [Bekenstein] of the concern I always feel when a hot cup of tea exchanges energy with a cold cup of tea … by allowing that transfer of heat I do not alter the energy of the universe, but I do increase its microscopic disorder, its information loss, its entropy. The entropy of the world always increases in an irreversible process like that. The consequences of my crime, Jacob, echo down to the end of time. But if a black hole swims by, and I drop the teacup into it, I conceal from all the world the evidence of my crime."

Bekenstein pondered the conundrum, and came back several months later with an idea of how to resolve it: [4]

> "You don't destroy entropy when you drop those teacups into the black hole," as Wheeler recalls the conversation, "the entropy already has entropy, and you only increase it!"

Bekenstein gave a picture in which black holes grow in size as their entropy increases. [3]

In short, in circa 1972 Bekenstein had showed that black holes should have a well-defined entropy. [1] Bekenstein built on the previous 1970 work of Stephen Hawking, in particular his "law of areas" for black holes (resembling the second law), showing that the area of a black hole called an event horizon always increases in all black hole processes, to argue that this area is a representative measure of the entropy of a black hole. [2] Hawking later came across this work and had objections or reservations about it and began to marinade on the issue. He eventually arrived at a remedy to the issue by contemplating the logic that if a black hole rotated it might then emit particles, thus having a temperature and an entropy. [3]

In 1999, American theoretical physicist Brian Greene argued that string theory has most impressively flexed its muscles on solving the issue of black hole entropy. [2]

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External links

â— Black hole entropy – String Theory Wiki.
â— Bekenstein-Hawking entropy – Scholarpedia.

θΔics

In cosmological thermodynamics, **black hole thermodynamics** is the study of the behaviors of black holes, according to measurements of quanities such as temperature, radiation, energy, entropy, etc., from a thermodynamics system point of view. A noted researcher in this field is American physicist Robert Wald. [2]

History

The term "black hole" was coined in 1967 by American theoretical physicist John Wheeler. [3] The first ideas on the thermodynamical understanding of black holes, traces to early 1970s discussions between Wheeler, the coiner of the term “black hole”, and his graduate student Mexican-born Jewish physicist Jacob Bekenstein. In 1971, Wheeler pointed out to Bekenstein that black holes seem to flout the second law of thermodynamics. [1] In 1972, to remedy this issue, Bekenstein suggested that black holes should have a well-defined entropy. On this premise, Bekenstein formulated the generalized second law of thermodynamics, which states that:

> “The sum of black-hole entropy and ordinary entropy outside a black hole never decreases.”

To find and measure this “black hole entropy”, Bekenstein reasoned that, because of the effect that the massive gravity of black holes pulls light, energy, and matter into its body, according to German-born American Albert Einstein’s mass-energy relation $E=mc^2$, a black hole's entropy increase must be proportional or related to its surface area. Two years later, in 1974, this postulate was confirmed when British astrophysicist Stephen Hawking discovered that black holes radiate energy, now called Hawking radiation, and hence they must have a correlative temperature and thus an entropy (black hole entropy). [2]

Limitations

In 1992, American particle physicist Steven Weinberg stated the following about black holes and thermodynamics: [4]

> “Thermodynamics applies to black holes, not because they contain a large number of atoms, but because they contain a large number of fundamental mass units of the quantum theory of gravitation, equal to about one hundred thousand of a gram and known as the Planck mass. It would not be possible to apply thermodynamics to a black hole that weighted less than a hundred thousandth of a gram.”

(add discussion)

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External links

● Black hole thermodynamics - Wikipedia.
● Black hole thermodynamics - Knowing the universe and its secrets.

θΔics

In religio-mythology, **black rite** refers to the magic, involving “lightning strikes” (Coffin Text Spell 148) and “time stoppage” (by the powers of the god Thoth), by which the mummified Osiris was raised from the dead, momentarily, to get an erection, and to therein impregnate the goddess Isis, then in the form of a kite or falcon, and therein to make the god Horus, via a so-called Egyptian resurrection sex “virgin birth” act of sorts. [1]

A depiction of the act of the "**black rite**", showing the momentarily resurrected god Osiris, with lightning powers around him, above which the goddess Isis however, awaiting his resurrected sperm, to the right of which the god Thoth stops time during the act. [4]

Overview

In c.2000BC, Coffin Text spell 148 described the "lightning strike" aspects of the black rite. [2]

In 450BC, Greek historian Herodotus, supposedly, claimed to know aspects of the details of the black rite. [3]

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θΔics

In existographies, **Blaise Pascal** (1623-1662) (IQ:185|#47) (Cattell 1000:61) [RGM:40|1,500+] (Murray 4000:8|M) (Gottlieb 1000:144) (GME:18) (GPE:57) (SIG:3) [CR:102] was a French physicist, mathematician, philosopher, and former child prodigy, popularly known for his c.1650 *Thoughts*, or "pan-say" (Hitchens, 2008) (Q), noted for []

Thoughts

In c.1650, Pascal, in his *Thoughts*, the gist of which, based on name dominance, seems to have been an attempt to grapple with the theistic views of Rene Descartes as compared to the atheistic views Michel Montaigne, predominantly, along with the stoic views of Epictetus and ideas of Plato, in respect to things such as: god, justice, truth, nature, Jesus Christ, Christianity, ennui, misery, soul, Pyrrhonism (Q), and or skepticism.

Purpose? | Why's of existence

See main: Einstein-Pascal dialogue on purpose

In c.1645, Pascal, in his *Thoughts*, stated the following: [1]

> "I know not who put me into the world, nor what the world is, nor what I myself am. I am in terrible ignorance of everything. I know not what my body is, nor my senses, nor my soul, not ever that part of me which thinks what I say, which reflects on all and on itself, and knows itself no more than the rest. I see those frightful spaces of the universe which surround me, and I find myself tied to one corner of this vast expanse, without knowing why I am put in this place rather than another, nor why this short time which is given me to live is assigned to me at this point rather than at another of the whole eternity which was before me or which shall come after me. I see nothing but infinities on all sides, which surround me as an atom, and as a shadow which endures only for an instant and returns no more. All I know is that I must die, but what I know least is this very death which I cannot escape."

In 1950, German-born American physicist Albert Einstein, in response to a 19-year-old engineering student on this problem, attempted an answer to this query. [2]

Pressure | Vacuum

See main: Pascal atmospheric pressure experiment

Pascal was one of the first, along with: Galileo Galilei, Evangelista Torricelli, and Otto Guericke, to experimentally disprove (see: defunct theory) the nature abhors a vacuum dictum. The following, supposedly (Q), is an artistic reconstruction of Pascal demonstrating the Torricelli barometer:

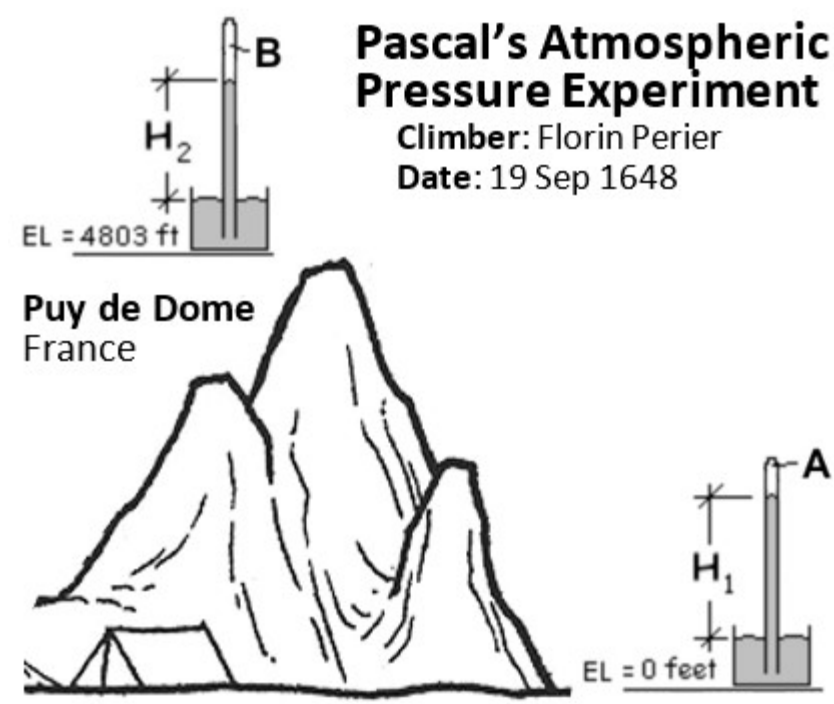

A depiction of Pascal's 1648 atmospheric pressure experiment, wherein he had his brother-in-law Florin Perier carry a Torricelli barometer to the top of Puy de Dome, France, to see if the height of the mercury column would fall as a result of decreasing atmospheric pressure, as he predicted.

In 1648, Pascal reasoned that if it true, according to the results of the Torricelli vacuum (1643), an experiment he had been told about by Marin Mersenne, were that earth's atmosphere must have a maximum height, air pressure on a high mountain must be less than at a lower altitude.

> "I have thought of an experiment which will remove all doubt, if it be executed with exactness. The experiment should be made *in vacuo* several times, in one day, with the same quicksilver, at the bottom and at the top of the mountain of Puy, which is near our town of Clermont. If, as I anticipate, the height of the quicksilver be less at top than at the base, it will follow that **the weight or pressure of the air is the cause of this**; there certainly is more air to press at the foot of the mountain than at its summit, while one cannot say that nature abhors a vacuum in one place more than in another."
>
> — Blaise Pascal (1648), "Letter to Florin Perier" (Q)

He resided near the Puy de Dome mountain, 4,790 feet (1,460 m) tall, but his health was poor so could not climb it.

On 19 Sep 1648, after many months, Pascal convinced Florin Perier, husband of Pascal's elder sister Gilberte, to make the climb; Perier described the results as follows: (Q)

> "At eight o'clock, we met in the gardens of the Minim Fathers, which has the lowest elevation in town. First, I poured 16 pounds of quicksilver into a vessel, then took several glass tubes, each four feet long and hermetically sealed at one end and opened at the other. Then placed them in the vessel of quicksilver. I found the quicksilver stood at 26" and 31⁄2 lines above the quicksilver in the vessel. I repeated the experiment two more times while standing in the same spot. They produced the same result each time.

> Taking the other tube and a portion of the quicksilver, I walked to the top of Puy-de-Dôme, about 500 fathoms higher than the monastery, where upon experiment, and found that the quicksilver reached a height of only 23" and 2 lines. I repeated the experiment five times with care. Each at different points on the summit, found the same height of quicksilver, in each case."

Pascal replicated the experiment in Paris by carrying a barometer up to the top of the bell tower at the church of Saint-Jacques-de-la-Boucherie, a height of about 50 metres. The mercury dropped two lines.

A depiction of one of Blaise Pascal's vacuum experiments, using a water column, in the city of Rouen, France. [7]

Pascal's wager

See main: Pascal's wager; See also: Neumann on soul (Q)

In c.1650, Pascal, in his *Thoughts*, attempted to grapple with the existence of god problem as follows:

> "Either god is or he is not. But to which view shall we be inclined? Reason cannot decide this question. Infinite chaos separates us. At the far end of this infinite distance a coin is being spun which will come down heads or tails. How will you wager? Reason cannot make you choose either, reason cannot prove either wrong."

He then attempts to solve the problem as follows:

> "You have two things to lose: the true and the good; and two things to stake: your reason and your will, your knowledge and your happiness. Since you must necessarily choose, your reason is no more affronted by choosing one rather than the other. But your happiness? Let us weigh up the gain and the loss involved in calling heads that god exists. Let us assess the two cases: if you win you win everything, if you lose you lose nothing. Do not hesitate then; wager that he does exist."

(add) (Q) [6]

Quotes | On

The following are quotes on Pascal:

> "In **Pascal** we have the curious combination of a refusal to accept the Copernican hypothesis with and unequivocal accretion of the Brunonian."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pg. 126)

> "**Pascal** also performed a void within a void experiment (Q)(Q) . A Torricellian tube was placed within the empty space above the mercury column of a second tube. In the 'inner barometer' the level of the mercury in the tube was equal to the level in the bath. In the absence of air, the mercury column was not sustained, and thus it seemed clear that the pressure of the surrounding air was the cause of the elevation of the mercury in Torricelli's experiment. The plenists, however, were not convinced. The experiment could well be explained by a 'restricted *horror vacui*'. Moreover, they considered air to be a light element, and thus the

explanation using the pressure or weight of air, according to the plenists, was absurd."

— Anne Helden (1991), "The Age of the Air-Pump" (pg. 151) [8]

Quotes | By

The following are notable and or relevant quotes:

"Most of the evils of the world arise from man's inability to sit still in a room."

— Blaise Pascal (c.1640), *Source*; cited by Walter Bagehot (c.1872); cited by Lawrence Henderson in "Sociology 23" [4]

"I have examine if this god, of whom all the world speak, might not have left some marks of himself. I look everywhere, and everywhere I see nothing but obscurity. Nature offers me nothing, that may not be a matter of doubt and inquietude. If I saw nothing in nature which indicated a divinity, I should determine with myself to believe nothing about it. If I everywhere saw the sign of a creator, I should repose myself in peace, in the belief of one. But seeing too much to deny, and too little to assure me of his existence, I am in a situation that I lament, and in which I have a hundred times wished, that if a god does sustain nature, he would give unequivocal marks of it, and that if the signs which he has given be deceitful, that he would suppress them entirely: that he said all or nothing, to the end that I might see which side I ought to follow."

— Blaise Pascal (c.1650), *Thoughts* (§8); cited by Baron d'Holbach (1770) in *The System of Nature* (pg. 306)

"The last thing one discovers in writing a book is what to put first."

— Blaise Pascal (c.1650)

"Cleopatra's nose, had it been shorter, the whole face of the world would have been changed."

— Blaise Pascal (c.1650), *Pensees* (pg. 180) (Q) [3]

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pg. 28; Guericke, pg. 44). Perseus Book Publishing, 1999.
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Further reading

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External links

● Blaise Pascal – Wikipedia.

θΔics

In terminology, **blind** is an adjective that tends to be employed, in an uncited manner, in evolution and or philosophical discussions, in respect to topics, such as origin and variety of species, e.g. "blind necessity" (Newton, 1867), concerning "forces" (e.g. blind force), or "chance" (e.g. blind random luck; blind random, accidental, chance, etc.); a laymanized anthropism, of sorts, of the electromagnetic force and or the gravitational force; often done as unwritten code for some type of religious objection, reaction, or retraction; a term used as synonym for ignorance of mode of action (Holbach, 1770).

Newton | Holbach

In 1687, Newton, in his *Principia*, stated the following on "blind necessity": [6]

> "From a physical and **blind necessity**, which should preside everywhere, and he always the same, there could not emanate any variety in beings; the diversity which we see, could only have their origin in the ideas and the will of a being which exists necessarily."

In 1770, Baron d'Holbach, in his ridicule of Newtons' theology, states the following on this peculiar term: [7]

> "As for the 'blind necessity', as is elsewhere said, it is that of which we ignore the energy, or of which, being blind ourselves, we have no knowledge of the mode of action."

(add)

Overview

Sometime going into the mid-20th century, or before, scientists began to employ the term "blind" in reference to physical forces, as some way as an explanatory tool, supposedly done as code for godlessness, or something along these lines; the following is one example quote:

> "The whole intricate fabric of civilized life was a standing record of achievement, not by atoms pushed and pulled by **blind** purposeless forces, but by resolute minds working to pre-selected ends."
>
> — James Jeans (1943), *Physics and Philosophy* [1]

(add)

Dawkins

In 1986, English zoologist Richard Dawkins published his *The Blind Watchmaker*, wherein he employed the term "blind" some 100+ times to explain the operation of Darwinian evolution, as he "saw" it, no pun intended. [4]

In 1995, Dawkins published his *River Out of Eden*, wherein he gives the following quote, oft-cited by anti-atheists: [2]

> "In a universe of electrons and selfish genes, **blind** physical forces and genetic replication, some people are going to get hurt, other people are going to get lucky, and you won't find any rhyme or reason in it, nor any justice. The universe that we observe has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil, no good, nothing but pitiless indifference."

(add discussion)

Discussion

In 2014, American political theory philosopher Curtis Johnson, in his *Darwin's Dice*, devoted a number of pages discussing the use of the term "blind" in respect to causality-based evolution; the following being one example: [3]

> "David Hull (2001) has urged evolutionary biologists and philosophers of biology to eschew any qualifying adjective for 'variation' in biological evolution. '**Blind**', 'random', 'chance', or what have you, are 'extremely misleading' terms, insofar as they cannot be accepted as literally true. Variations are *caused*, he notes. No one working in this area doubts this, and neither did Darwin. 'Chance' and associated ideas might seem to suggest otherwise."

(add discussion)

Quotes

The following are related quotes:

> "Those who have said that a '**blind** fate' has produced all the effects that we see in the world have said a great absurdity; for what greater absurdity is there than a blind fate that could have produced intelligent beings?"
>
> — Charles Montesquieu (1748), *The Spirit of the Laws* (pg. 3) (Ñº)

> "I protest against that **blind** and thoughtless mode of investigating nature which has become generally established since that corruption of philosophy by Bacon and of physics by Boyle and Newton."
>
> — Friedrich Schelling (c.1820)

> "Think about atheism for a second. As an atheist, you must believe that you are the result of the purely mindless, random chance interaction of particles over an immensely long period of time—the classic monkey typing Shakespeare scenario. (I know that the origin of species involves natural selection—however what created our universe with natural laws, which make life possible? **Blind chance**) Being a soulless bag of chemicals created by unguided, meaningless random chance you of course have no free will. You are merely a zombie acting automatically according to the chemicals swishing around in your brain. I don't find this too plausible for many reasons."
>
> — Jacob Stein (2012), "Does Egyptian History Contradict the Torah", Jan 10 [5]

See also

â— Forest blind

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Further reading

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θΔics

In hmolscience, **blind chance** (CR:6), akin to "random chance" (or "blind random chance", sometimes employed), refers to 'chance' under a sightless operation; non-intelligent chance; non-divine chance; chance that is blind; non-guided chance; atheistic chance.

A diagram of "**blind chance**", namely a blind man throwing dice (compare: passions and playing cards), a chance based game.

Quotes

The following are related quotes:

> "Opposite to the first is atheism in profession and idolatry in practice. Atheism is so senseless and odious to mankind that it never had many professors. Can it be by 'accident' that all birds beasts and men have their right side and left side alike shaped (except in their bowels) and just two eyes and no more on either side the face and just two ears on either side the head and a nose with two holes and no more between the eyes and one mouth under the nose and either two fore legs or two wings or two arms on the shoulders and two legs on the hips one on either side and no more? Whence arises this uniformity in all their outward shapes but from the counsel and contrivance of an author? Whence is it that the eyes of all sorts of living creatures are transparent to the very bottom and the only transparent members in the body, having on the outside a hard-transparent skin, and within transparent juices with a crystalline lens in the middle and a pupil before the Lens all of them so truly shaped and fitted for vision, that no artist can mend them? Did '**blind chance**' know that there was light and what was its refraction and fit the eyes of all creatures after the most curious manner to make use of it? These and such like considerations always have and ever will prevail with mankind to believe that there is a being who made all things and has all things in his power and who is therefore to be feared."
>
> — Isaac Newton (c.1705), "A Short Schematic of the True Religion" (see: Newton on god) [1]

"We shall thus be led to one vast question, which indeed lies at the root of the whole subject, and is simply this: are the actions of men, and therefore societies, governed by fixed laws, or are they the result of either chance or of supernatural interference? For, in reference to this matter, there are two doctrines, which appear to represent different stages of civilization. According to the first doctrine, every event is single and isolated, and is merely considered as the result of a **blind chance**. This opinion, which is most natural to a perfectly ignorant people, would soon be weakened by that extension of experience which supplies a knowledge of those uniformities of succession and of co-existence that nature constantly presents."

— Henry Buckle (1857). *History of Civilization, Volume One* [3-vol set] (pg. 8) [2]

"My theology is a simple muddle. I cannot look at the universe as the result of **'blind chance'**, yet I can see NO evidence of a beneficent design, or indeed or design of any kind."

— Charles Darwin (1870), "Letter to Joseph Hooker" (Q), Jul 12

"The scientist does not behold in nature what the poet does. He sees no **blind chance**, no miracles, no fate, unless you call perfection by that name."

— Henry Bray (1910), *The Living Universe* (pg. 216)

"Think about atheism for a second. As an atheist, you must believe that you are the result of the purely mindless, random chance interaction of particles over an immensely long period of time—the classic monkey typing Shakespeare scenario. (I know that the origin of species involves natural selection—however what created our universe with natural laws, which make life possible? **Blind chance**.) Being a soulless bag of chemicals created by unguided, meaningless random chance you of course have no free will. You are merely a zombie acting automatically according to the chemicals swishing around in your brain. I don't find this too plausible for many reasons."

— Jacob Stein (2012), "Does Egyptian History Contradict the Torah", Jan 10 [3]

See also

- Blind force

References

1. Newton, Isaac. (c.1705). "A Short Schematic of the True Religion" (Q)(Q) , Manuscript.
2. Buckle, Henry. (1861). *History of Civilization in England, Volume One* (3-vol set) (pg. 8). Printer, 1911.
3. Stein, Jacob. (2012). "Does Egyptian History Contradict the Torah" (Thread comment) (Q), TorahPhilosophy.com, Jan 10. Stein, Jacob. (2012). "Does Egyptian History Contradict the Torah" (Thread comment) (Q), TorahPhilosophy.com, Jan 10.

External links

- Blind chance – Wikipedia.

θΔics

In hmolscience, **blind force**, similar to living force (vis viva) or dead force (vis mortua), is a anthropomorphized physics jargon, an anti-religion neoplasm, so to say, that attributes "sightlessness" to force, i.e. a force that is blind; used commonly in religion vs science discussions.

Overview

In c.1800, Friedrich Schiller, in his "Pathos" essay, was referring to "instinct" as a "blind force". (Ñº)

In 1832, English freethinker Job Nott (Ñº), a fan of Thomas Paine and Voltaire, in his article "Re-Action" described "passion" and "prejudice" as being under the operation of "blind force". [1]

In 1899, Ernst Haeckel, in his *The Riddle of the Universe*, in the wake of Darwinism, outlined the then-prevalent five main variants of creation, the first of which he termed "dualistic creation", which, via citation to Johannes Reinke's *The World as Fact* (*Die Welt als That*) (1899), is described as follows: [2]

> "God restricted his interference to two creative acts. First he created the inorganic world, mere dead substance, to which alone the law of energy applies, **working blindly** and aimlessly in the mechanism of material things and the building of the mountains; then god attained intelligence and communicated it to the purposive intelligent forces which initiate and control organic evolution."

Here we see forces conceptually divided into two types, firstly: forces working "blindly" on "dead mechanism" in inorganic world, governed by the conservation of energy, secondly: forces that are in communication with god.

Quotes

The following are example quotes:

> "In a universe of electrons and selfish genes, **blind physical forces** and genetic replication, some people are going to get hurt, other people are going to get lucky, and you won't find any rhyme or reason in it, nor any justice. The universe that we observe has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil, no good, nothing but pitiless indifference."
>
> — Richard Dawkins (1995), *River Out of Eden: A Darwinian View of Life* (compare: Adams creed) [3]

See also

â— Blind chance

References

1. Nott, Job. (1932). "Re-Action" (Ñº), *The Bristol Job Nott: Laboring Man's Friend*, No LI, Nov 29.
2. Haeckel, Ernst. (1899). *The Riddle of the Universe: at the Close of the Nineteenth Century* (translator: Joseph McCabe) (pg. 236). Harper & Brother, 1900.
3. Dawkins, Richard. (1995). *River Out of Eden: A Darwinian View of Life* (pgs. 132-33) (Ñº). Basic Books, 2008.

θΔics

In genius studies, **Bloom 100** (Bloom 100:#) refers to the hundred greatest geniuses of language and literature according to Harold Bloom, as covered in his 2002 *Genius: a Mosaic of One Hundred Exemplary Creative Minds*. [1]

List

The following is Harold Bloom's list of 100 literary and language geniuses, categorized by group: [1]

Crown	Wisdom	Understanding	Kindness	Severity
1. William Shakespeare 2. Miguel de Cervantes 3. Michel Montaigne 4. John Milton 5. Leo Tolstoy 6. Lucretius 7. Virgil 8. Augustine 9. Dante Alighieri 10. Geoffrey Chaucer	11. The Yahwist 12. Socrates 13. Plato 14. Saint Paul 15. Muhammad 16. Samuel Johnson 17. James Boswell 18. Johann Goethe 19. Sigmund Freud 20. Thomas Mann	21. Friedrich Nietzsche 22. Soren Kierkegaard 23. Franz Kafka 24. Marcel Proust 25. Samuel Beckett 26. Moliere 27. Henrik Ibsen 28. Anton Chekhov 29. Oscar Wilde 30. Luigi Pirandello	31. John Donne 32. Alexander Pope 33. Jonathan Swift 34. Jane Austen 35. Lady Murasaki 36. Nathaniel Hawthorne 37. Herman Melville 38. Charlotte Bronte 39. Emily Jane Brontë 40. Virginia Woolf	41. Ralph Emerson 42. Emily Dickinson 43. Robert Frost 44. Wallace Stevens 45. T.S. Eliot 46. William Wordsworth 47. Percy Shelley 48. John Keats 49. Giacomo Leopardi 50. Alfred, Lord Tennyson

Beauty	Eternity	Foundation	Splendor	Kingship
51. Algernon Charles Swinburne 52. Dante Gabriel Rossetti 53. Christina Rossetti 54. Walter Pater 55. Hugo von Hofmannsthal 56. Victor Hugo 57. Gerard de Nerval 58. Charles Baudelaire 59. Arthur Rimbaud 60. Paul Valery	61. Homer 62. Luis Vaz de Camoes 63. James Joyce 64. Alejo Carpentier 65. Octavio Paz 66. Stendhal 67. Mark Twain 68. William Faulkner 69. Ernest Hemingway 70. Flannery O'Connor	81. Gustave Flaubert 82. Jose Maria Ica de Queiroz 83. Joaquim Machado de Assis 84. Jorge Luis Borges 85. Italo Calvin 86. William Blake 87. D.H. Lawrence 88. Tennessee Williams 89. Rainer Maria Rilke 90. Eugenio Montale	71. Walt Whitman 72. Fernando Pessoa 73. Hart Crane 74. Federico Garcia Lorca 75. Luis Cernuda 76. George Eliot 77. Willa Cather 78. Edith Wharton 79. Scott Fitzgerald 80. Iris Murdoch	91. Honore Balzac 92. Lewis Carroll 93. Henry James 94. Robert Browning 95. William Yeats 96. Charles Dickens 97. Fyodor Dostoevsky 98. Isaac Babel 99. Paul Celan 100. Ralph Ellison

(add)

References

1. Bloom, Harold. (2002). *Genius: a Mosaic of One Hundred Exemplary Creative Minds* (list). Fourth Estate.

θΔics

In queries, **blue sky problem**, or the "why the sky is blue?" question, refers to the riddle as to why the sky has a blue color. American aerosol physicist Pedro Lilienfeld, in his 2004 article "A Blue Sky History", give the following synopsis of the history of blue sky theory: [1]

> "Although ideas about the origins of the **sky's blue color** can be traced back to Greek antiquity, the first concerted effort to reach a plausible explanation is attributed to Leonardo da Vinci. The Italian master was followed by Newton, and later by Bouguer and de Saussure. Tyndall wrestled with the problem around 1869, but the definitive explanation would be proposed only in 1899, by Lord Rayleigh."

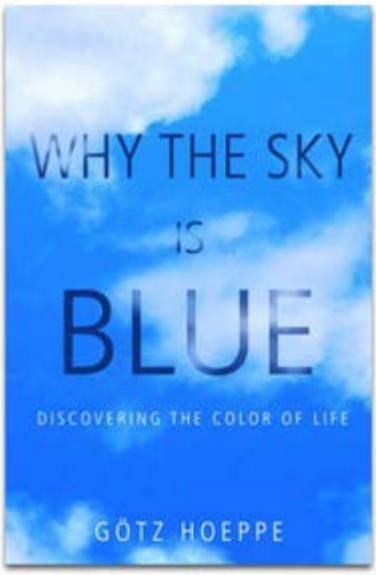

A 2007 revised and somewhat poorly re-subtitled English translation of German historian Götz Hoeppe's popular 1999 *Blau: Die Farbe des Himmels* (*Blue: the Color of the Sky*), which gives a rather detailed and comprehensive historical and scientific journey on the various ways people in different times and places have explained **why the sky looks blue**, starting with ancient Greek philosophers, who thought that blue was a mixture of black and white, through Arabic commentaries on Aristotle, medieval treatises on painting, Newton's experiments with prisms, Goethe's color theory and on up through the nineteenth-century development of the theory of Rayleigh and Mie scattering, that eventually provide the correct physical explanation for the blue color of the sky. [8]

The blue sky puzzle, prior to its complete solution in 1899 by English physicist John Strutt (IQ=190), the vacuum debate aside, was the longest-standing unsolved puzzle in science, worked on by the biggest thinkers of all time: Aristotle (IQ=190), Da Vinci (IQ=205), Newton (IQ=215), Goethe (IQ=230), Clausius (IQ=205), Maxwell (IQ=210)—in fact every single genius in the IQ=205+ range (see: genius IQs) worked on the blue sky problem, prior to its solution by Strutt. The best summary of the blue sky solution is given by James Maxwell himself, where, specifically, in a 15 March 1871 letter to his Cambridge friend mathematician Cecil Monro (1833-1882), he gives the following snapshot of the state of the solution to the blue sky problem during this year: [2]

> "I think Strutt on the **sky-blue** is very good. It settles Clausius' earlier vesicular theory to explain the blue sky."

German physicist Clausius, to give some historical context, completed his PhD dissertation in 1847 (1848?), entitled "On those Atmospheric Particles that Reflect Light", under German mathematician and physical chemist Johann Schweigger, which proposed, as Maxwell states, a "vesicular theory" explanation for the blue color of the sky, the red colors seen at sunrise and sunset, and the polarization of light, at the University of Halle, Germany. [3] In this sense, Clausius might well be the "true" solver of the blue sky problem, in the sense that although he did not complete the exact final solution, his theories were the main road work or construction outlines to the final solution, and the same sense that the 1690 Papin engine design, by French physicist Denis Papin, was the blue print or actual invention draft to the final "working" 1698 Miner's friend, built by English engineer Thomas Savery.

History

The Greeks, supposedly, were the first to speculate about the blue color of the sky, as embodied in Greek physicist-philosopher Aristotle's *Meteorology*, which supposedly the later Arab commentators read and supposedly Leonardo Da Vinci read or had a copy of in his library. [1]

In *circa* 850, Arab savant Al-Kindi (c.800-873) attributed the azure of the sky to "a mixture of the darkness of the night with the light of the dust and haze particles in the air illuminated by the sun." [6]

This view, however, is what is categorized as "Arabic commentaries on Aristotle". [8]

Opening page image of the 2004 article "A Blue Sky History" by American aerosol physicist Pedro Lilienfeld, which details the short history of the **blue sky problem**, from Aristotle up to its 1899 complete solution John Strutt. [1]

Italian polymath Leonardo da Vinci's circa 1508 72-page *Codex Leicester*, which to note in 1994 sold for an unprecedented $31 million dollars (to Bill Gates), making it the most expensive book ever sold, written in his trademark mirror hand writing, contains the first modern speculations on the blue sky color, containing insights into the sky's blueness. [5] In his notebooks, he states:

> "You know that in an atmosphere of equal density the remotest objects seen through it, as mountains, in consequence of the great quantity of atmosphere between your eye and them appear blue and almost of the same hue as the atmosphere itself when the sun is in the East. Hence you must make the nearest building above the wall of its real color, but make the more distant ones less defined and bluer; thus, if one is to be five times as distant, make it five times bluer. And by this rule the buildings which above a [given] line appear of the same size will plainly be distinguished as to which are the most remote and which are larger than the others."

In another writing he comments on the sky's whiteness: [1]

> "And if the sky, as you see it, ends on a low plain, that lowest portion of the sky will be seen through a denser and whiter atmosphere, which will weaken its true color as seen through that medium, and the sky will look whiter than it is above you, where the line of sight travels through a smaller space of air charged with heavy vapor."

Da Vinci also became aware that the sky darkens as one ascends the Alps, about which he theorized: [1]

> "I say that the blue which is seen in the atmosphere is not its own color, but is caused by the heated moisture having evaporated into the most minute imperceptible particles, which the beams of the solar rays attract and cause to seem luminous against the deep intense darkness of the region … above them. And this may be seen, as I myself saw it, by anyone who ascends Mon Boso [Moute Rosa], a peak of the Alps that divides France from Italy … And I saw the atmosphere dark overhead, and the rays of the sun striking the mountain had far more brightness than in the plains below, because less thickness of atmosphere lay between the summit of this mountain and the sun."

Newton, supposedly, in his 1704 *Opticks*, had the following to say on the matter:

> "The blue of the first Order, though

Blue sky theory timeline: 1400s-1700s, from the 2004 article "A Blue Sky History" by American aerosol physicist Pedro Lilienfeld. [1]

very faint and little, may possibly be the Colour of some Substances; and particularly the azure Colour of the Skies seems to be of this Order. For all Vapours when they begin to condense and coalesce into small Parcels, become first of that Bigness, whereby such an A so this being the first Colour which Vapours begin to reflect, it ought to be the Colour of the finest and most transparent Skies, in which Vapours are not arrived to that Grossness requisite to reflect other Colours, as we find it is by Experience."

In 1725, French scientist Pierre Bouguer (1698-1758) quantified the light attenuation of the earth's atmosphere. [1]

In 1789, French physicist Horace de Saussure (1740-1799), noted for his age 19 thesis "Dissertation on the Nature of Fire", wrote two papers, in which he described a cyanometer, an apparatus used to quantify the degree of blueness of the sky, concluding that the "the color of the sky determined by the cyanometer is the measure of the quantity of concrete vapors [particles in suspension] in suspension in the air." [1]

In 1809, French physicist Francois Arago (1786-1853) discovered the polarization of daytime skylight at 90 degrees to the direction of the sun. [1]

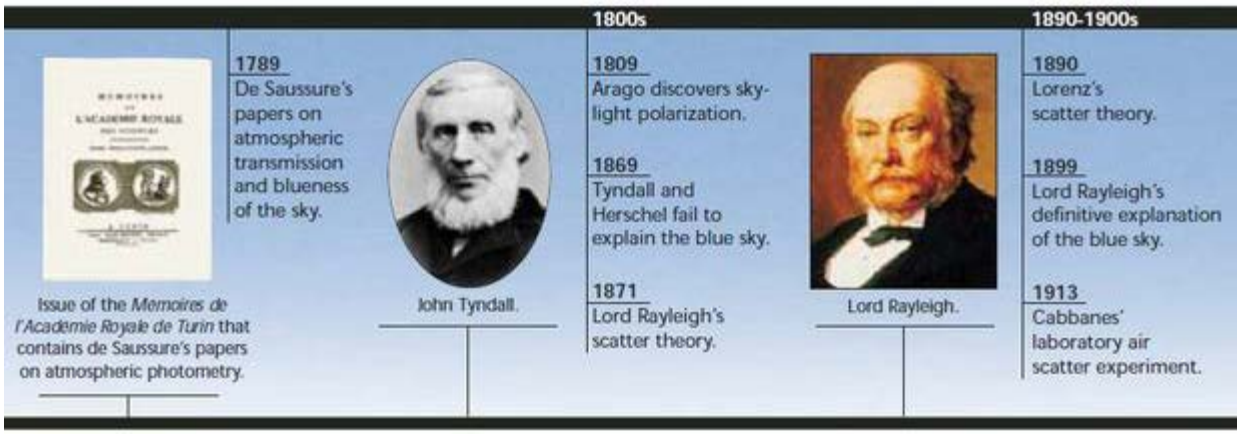

Blue sky theory timeline: late 1700s to early 1900s, from the 2004 article "A Blue Sky History" by American aerosol physicist Pedro Lilienfeld. [1]

In 1826, German polymath Johann Goethe was working out a law to explain the blue color of the sky (see: Goethe timeline) via his Newtonian-alternative color theory.

German physicist Rudolf Clausius, whose 1848 PhD dissertation, as noted, was on sky color problem, pointed out that refraction within macroscopic droplets could not explain the color of the sky, he postulated the presence of minute atmospheric water bubbles; this theory, however, supposedly, was inconsistent with Arago's results. [1]

Others to work on the problem, in the context of the 90 degree polarization data, include: William Herschel, James Forbes (c.1868), and John Tyndall who in 1869 concluded:

"When the air was so sifted as to entirely remove the visible floating matter, it no longer exerted any

sensible action upon the light, but behaved like a vacuum."

The next frame in the history of sky color theory involved the search to provide a mathematical solution of the scattering of light by particles with dimensions smaller than and comparable to the incident wavelength, the precise solution of which involves a cast of characters including: Alfred Clebsch, Ludwig Lorenz, James Maxwell, John Strutt, Gustav Mie, Peter Debye and others.

In 1871, Strutt published his first paper "On the light from the sky, its polarization and colour", followed immediately by another entitled "On the scattering of light by smaller particles". A 1873 letter from Maxwell prompted him to investigate the phenomenon further. In 1899, Strutt published what some have called his most-famous article "On the Transmission of Light Through an Atmosphere Containing Small Particles in Suspension, and on the Origin of the Blue of the Sky," which thus solved the problem. [7]

In 1908, German-born American physicist Albert Einstein, building on the earlier theories of Polish scientist Marian Smoluchowski, calculated the size of the density fluctuations in a gas, and then calculated the scattering of a light beam incident on these density fluctuations; as a byproduct of his calculations, he found, supposedly, a better explanation for the blue sky color, in solution to those who had objected to the flaw in Strutt's explanation that if the air is uniformly distributed throughout the atmosphere, the scattering of a beam of light by the air molecules should exactly cancel out. Einstein, supposedly, rescued Strutt's explanation from this disaster. [4]

Experimental confirmation that air molecules do scatter light was apparently achieve for the first time by Jean Cabannes (1885-1959) in 1913.

References

1. Lilienfeld, Pedro. (2004). "A Blue Sky History." *Optics and Photonics News*, 15(6): 32-39.
2. (a) Maxwell, James. (1871). "Letter to Cecil Monro", Publication.
(b) Maxwell, James, Garber, Elizabeth, Brush, Stephen G., Everitt, C.W. Francis. (1986). *Maxwell on Molecules and Gases* (pg. 506). MIT Press.
3. (a) Cropper, William H. (2001). *Great Physicists: the Life and Times of Leading Physicists from Galileo to Hawking* (pgs. 104-05). Oxford University Press.
(b) Rudolf Clausius – Mathematics Genealogy Project.
(c) Johann Schweigger – Wikipedia.
4. Ohanian, Hans C. (2009). *Einstein's Mistakes: the Human Failings of Genius* (pg. 126). W.W. Norton.
5. (a) Codex Leicester – Wikipedia.
(b) Newman, Sharan. (2005). *The Real History Behind the Da Vinci Code* (§: The Codex Leicester, pg. #). Penguin.
6. (a) Al-Kindi – Wikipedia.
(b) Lilienfeld, Pedro. (2004). "A Blue Sky History." *Optics and Photonics News*, 15(6): 32-39.
7. Strutt, John. (1899). "On the Transmission of Light Through an Atmosphere Containing Small Particles in Suspension, and on the Origin of the Blue of the Sky", *Phil. Mag.* Ser. 5. 47:375-84.
8. Hoeppe, Gotz. (2007). *Why the Sky is Blue: Discovering the Color of Life* (translated by John Stewart). Princeton University Press.

Further reading

â— Gribbin, John. (1998). *Q is for Quantum: An Encyclopedia of Particle Physics* (blue sky, pgs. 48). Simon & Schuster.

External links

â— Rayleigh scattering – Wikipedia.

θΔics

In acronyms, **BN** is the abbreviation for “before Newton”, or years before the birth of Isaac Newton, in the modern era dating system (Newtonian calendar), which occurred on 25 Dec 1642 (Old System, Julian calendar) or 4 Jan 1643 (New System, Gregorian calendar). [1]

References

1. Note: the term “before Newton” (BN) is an hmolscience alternative or rather terminology reform upgrade to the older religio-mythology based “before Christ” (BC) dating system notation.

θΔics

In religion, **Bo Jinn** (1980-) is the pen name—note: 'Jinn' are supernatural creatures, frequently found in Islamic folklore—a Maltesean agnostic turned anti-atheism author of the 2013 ebook *Illogical Atheism: a Comprehensive Response to the Contemporary Freethinker from a Lapsed Agnostic*, wherein employs the term "atheology" as the study of atheism, discusses "theodicists" (Q), i.e. those attempt to resolve the problem of evil, "negative atheism", and "fideism", among other agnostic leaning-toward-theism fence-sitter topics.

Life | Non-life

On the seeming life from non-life problem (aka the great problem of natural philosophy), Jinn states (loc. 2295) that "at some point, on both the theistic and atheist account, life *had* to have arisen from non-life anyway, whether God was responsible for it or not", after which he jumps to the following:

> "The real question is, could such an eventuality have come about purely as a result of random atomic collisions? That does not seem to me a question that science is apt to answer."

(add discussion)

Atheism | Miller-Urey experiment

In commentary (loc. 2282) on the 1952 Miller-Urey experiment, Jinn says the following:

> "I think that once we have discovered enough, science may well determine that life seems to someway arrange itself form water molecules, stardust, and other chemical compounds."

However, he then crouches this with the following:

> "I cannot help but sense it slightly mystifying that random elements subjected to the laws of physics and chemistry alone should magically arrange themselves into double helixes comprising incomprehensible volumes of information, eventually transmutating their way to macro-organismic life as we know it. What I want to know is why anyone would be compelled to interpret a bizarre idea like that as lending the slightest credibility to atheism."

(add discussion)

Jinn questions

The following (loc. 2080-93) are Jinn's seeming main philosophical questions:

> "Why do we inhabit a universe based on laws? Why does life exist? Why does anything at all exist? Where do morality, beauty, art, truth, and music come from? They seem fairly useless in purely evolutionary terms. Why do we even consider life's purpose if the universe has none? Why do the planets orbit suns? Why are humans self-aware?

Jinn continues:

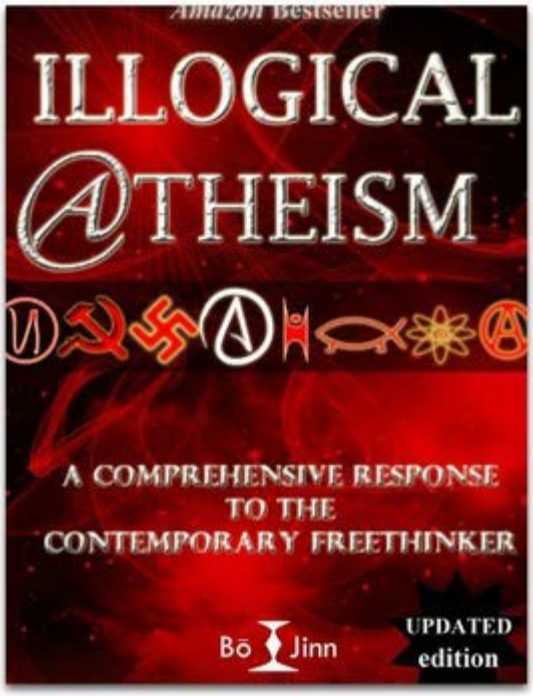

Jinn's 2013 *Illogical Atheism*, the cover of which depicting the so-called atheism atrocities fallacy, i.e. the "Hitler, Stalin, Pol Pot, Mao = atheism" assertion.

> "The atheist's response to all of these questions would no doubt consist in some chance-based explanation on the basis of evolution or Dawkins' ideas of cosmic Darwinism which, incidentally, would be no less faith-based than a theistic view."

On these queries, Jinn gives the following as what he conceives at the atheist-materialist worldview:

> "The universe somehow 'works' and all our beliefs concerning ultimate purpose are little more than biological blunders."

He continues:

> "Theists are inclined to view the universe as a grand and beautifully designed machine. Atheists, on the other hand, are disposed to see it as a chaotic mess."

Then he cited the following commentary, from Newton's religion-reconciling "General Scholium" (1713), as seeming rebuttal for Richard Dawkins and Sam Harris: [4]

> "Blind metaphysical necessity, which is certainly the same always and everywhere, could produce no variety of things."

(add discussion)

Plantinga's argument

Jinn gives the following nutshell summary (loc. 1979) of the so-called "evolutionary argument against naturalism" (or Darwin's doubt), which is attributed to American philosopher Alvin Plantinga (1993): [3]

> "Atheism gives us very good reasons to doubt the truth of any of our beliefs, bearing in mind that those beliefs are purely the result of matter and energy, unguided by any higher intelligence or scope (God),

> which is what naturalism (atheism) presupposes. There is no reason why a mindless evolutionary process centered only on survival is meant to produce beings capable of discovering truth, for the simple reason that evolution is not concerned in the very slightest with truth."

The first incorrect point of this assertion, in respect to "survival" was pointed out by Robert Pirsig (1991). The rest of the statement is incorrect, in that it misattributes presuppositions about "naturalism", i.e. what is natural and unnatural, in respect to matter and energy, to Darwin, whereas correctly the attribution is Clausius (or rather Gibbs, as per evolutionary systems are concerned, i.e. the replacement or rather usurpment of God's energy with Gibbs energy).

Atheist's reality | Misconception

Jinn gives the following formula (loc. 1746) for what he says is the "atheist's description of reality":

> Matter + Energy + Time + Chance/Necessity = Reality

(add discussion)

Atheist's view | Misconceptions

> *See main: Atheist misconceptions*

The following are atheism misconception statements by Jinn:

> "We are born, we live, we die, we do in between what we please and the only authority on reality the atheist can possibly logically recognize is his own; not matter, not energy and not science. This is the atheist view. And this is really the only thing that separates atheism from any other religion."
>
> — Bo Jinn (2013), *Illogical Atheism* (loc. 954)

This quote, to note, Jinn bases on the following statement by Dawkins:

> "In a universe of electrons and selfish genes, blind physical forces and genetic replication, some people are going to get hurt, other people are going to get lucky, and you won't find any rhyme or reason in it, nor any justice. The universe that we observe has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil, no good, nothing but pitiless indifference."
>
> — Richard Dawkins (1995), *River Out of Eden* (pg. 133)

(add discussion)

Purpose

The following are discussions on purpose:

> "Dawkins maintains the universe has no final purpose."
>
> — Richard Dawkins (1995), *River out of Eden* (pg. 133) (loc. 1655)

> "The neo-Darwinian account of evolution is that of a random and unguided process of human life evolving from matter and energy with no preceding scope or purpose."
>
> — Bo Jinn (2013), *Illogical Atheism* (loc. 2235), per citation of David Berlinski [5]

Determinism | Automata

Jinn, on the subject of the nature of our actions in a deterministic universe, cites (loc. 2365) the following:

> "If we were deterministic beings, what would validate the claim that our utterance constituted rational discourse? Would not the sounds issuing from mouths, or the marks issuing on paper, be simply the actions of automata?"
>
> — John Polkinghorne (1998), *Science and Theology* [7]

Here, the discourses of Rene Descartes (c.1610), on automatons and "I think therefore I am", and that of Gilbert Lewis (1925), on whether crystals think or the writing of his book was but a chemical reaction, are two noted ventures into this seeming problem. The general solution has to do with an electromagnetic chemical cybernetic feedback way in which photons flux through the chemical structure growth of the exoderm layer of the outer earth, in a cyclical regrowth manner.

God and the gaps

Jinn cites and discusses the God of the gap argument as follows:

> "Theologians, such as Bonhoeffer, worry that because the gaps shrink as science advances, that eventually God will be threatened with having nothing to do and nowhere to hide."
>
> — Richard Dawkins (2006), *The God Delusion* (pg. 125) (loc. 1586)

> "God does nothing more than perform the function of filling in the residual gray areas in present scientific wisdom."
>
> — Bo Jinn (2013), *Illogical Atheism* (loc. 1587)

Negative proof | Non-existence argument

Jinn says the following is a profoundly inane contention:

> "You cannot prove the non-existence of anything."
>
> — Richard Dawkins (2006), *The God Delusion* (pg. 54) (loc. 1334)

A variant of this, to note, is Ayn Rand's 1979 Donahue rebuttal: "you are never called upon to prove a negative. That is a law of logic." These reasonings, although sharp, are not without precedence: the famous 1798 cannon boring experiment (1798) proved the non-existence of caloric and the Michelson-Morley experiment (1887) proved (Q) the non-existence of aether. Similar such experiments should be able to prove the non-existence of God. The null results from American physician Duncan MacDougall's soul weighing experiments (1901) is one example of such.

Penrose | Low entropy condition

Jinn, at one point (loc. 2244), mentions what theists, e.g. William Craig, seem to cite often (Q), as the "low entropy condition", attributed to a quote by Roger Penrose about the improbability of the low entropy or low entropy state of the earlier universe, or something along these lines. [6]

New atheism

Jinn, whose book seems to be a reaction to the new atheism movement, characterizes the new atheists as such:

> "After Harris came high pope Dawkins, then cardinal Hitchens, the bishop Dennett, and then the lower and more moderate figures in this new atheist priesthood: Krauss, Stenger, Atkins, Shermer [and all the rest] *e bella compagnia*."
>
> — Bo Jinn (2013), *Illogical Atheism* (loc. 286)

Anti-theist

Jinn describes the anti-theist as follows:

> "The anti-theist not only does not believe that God exists, but hates the fact that other people do believe it. And this, essentially, is the most pronounced feature of the new atheist movement."
>
> — Bo Jinn (2013), *Illogical Atheism* (loc. 1215)

God believing | Scientists

Jinn cites the following as scientists who, in his view, saw no conflict between god and science:

> "People like Isaac Newton, Thomas Bayes, Kepler, Bacon, Leibniz, Faraday, Lord Kelvin, Max Planck and Einstein, were all men who saw no conflict between science and God."
>
> — Bo Jinn (2013), *Illogical Atheism* (loc. 1676)

The inclusion of Bacon and Planck in this listing seem to be an ongoing case of misattribution.

Education

Jinn describes himself, in religious position, as a "lapsed agnostic", and generally as a social critic, insufferable cynic, doctor of law, and minor scholar engaged in philosophy, sociology, psychology, and the classical literature. [3]

Quotes cited

The following are noted scholars and their representative quotes cited by Jinn:

> "New motor roads dustless,
> The latest steel is rustless,
> Our tennis courts are sodless,
> Our new religions, godless."
>
> — Arthur Guiterman (1936), *Gaily the Troubadour* (Q) (loc. 1263)

> "I ought to call myself an agnostic; but, for all practical purposes, I am an atheist."

— Bertrand Russell (1952), *Is There a God* (O), cited at loc. 2890

"I want atheism to be true and am made uneasy by the fact that some of the most intelligent and well-formed people I know are religious believers."

— Thomas Nagel (1997), *The Last Word*, cited at loc. 2995

"I regard it as ethically unacceptable and impractical to censor any aspect of trying to understand the nature of our world."

— Lewis Wolpert (2002) "Is Science Dangerous" (O)

"I have found it an amusing strategy, when asked whether I am an atheist, to point out that the questioner is also an atheist when considering Zeus, Apollo, Amon Ra, Mithras, Baal, Thor, Woton, the Golden Calf and the Flying Spaghetti Monster. I just go one god further."

— Richard Dawkins (2006), *The God Delusion* (pg. 53), cited at loc. 2422

"Atheism is a term that should not even exist. No one ever needs to identify himself as a 'non-astrologer' or a 'non-alchemist' Atheism is nothing more than the noises reasonable people make in the presence of unjustified religious beliefs."

— Sam Harris (2006), *Letter to a Christian Nation*, cited at loc. 2969

"Losing a belief in free will has not made me fatalistic. In fact, it has increased my feelings of freedom!"

— Sam Harris (2012), *Free Will*, cited at loc. 2347

Quotes

The following are noted quotes:

"Be religious …. or be smart."

— Bo Jinn (2013), *Illogical Atheism* (loc. 1129)

"Every gap that science closes, ten more seem to open up."

— Bo Jinn (2013), *Illogical Atheism* (loc. 1765)

"Jews/Christians/Muslims/Hindus are stupid; therefore God does not exist."

— Bo Jinn (2013), *Illogical Atheism* (loc. 1793)

"Sam Harris markets neo-Buddhist 'universal' spiritualism to his followers."

— Bo Jinn (2013), *Illogical Atheism* (loc. 2042)

"Psychological benefits of religious faith have a lot more to do with the reestablishment of an objective purpose in life, without which human existence logically and inevitably degenerates into nihilism."

— Bo Jinn (2013), *Illogical Atheism* (loc. 2056)

"The human being, on logarithmic scale, as John Lennox points out, is about half way between an atom and the universe."

— Bo Jinn (2013), *Illogical Atheism* (loc. 2143)

"People only believe in God/gods because they are forced to by social institutions, family, state, and so on."

— Bo Jinn (2013), *Illogical Atheism* (loc. 2751)

"The more belief in 'God' dwindles, the more belief in some kind of spirit or 'life force' rises."

— Bo Jinn (2013), *Illogical Atheism* (loc. 2761)

"The new atheist movement opened a Pandora's box."

— Bo Jinn (2013), *Illogical Atheism* (loc. 2864)

"God is a proposition unsupported by reason or evidence."

— Bo Jinn (2013), *Illogical Atheism* (loc. 2914)

References

1. Jinn, Bo. (2013). *Illogical Atheism: a Comprehensive Response to the Contemporary Freethinker from a Lapsed Agnostic* (eB). Sattwa Publishing, 2014.
2. Bo Jinn (about) – Amazon.com.
3. Evolutionary argument against naturalism – Wikipedia.
4. (a) Newton, Isaac. (1713). "General Scholium" (pdf), in: *Principia*. Publisher.
(b) General Scholium – Wikipedia.
5. Berlinski, David. (2008). *The Devil's Delusion: Atheism and its Scientific Pretensions*. Basic Books.
6. Penrose, Roger. (1989). *The Emperor's New Mind* (pg. 339-45). Penguin.
7. (a) Polkinghorne, John. (1998). *Science and Theology: an Introduction* (pg. 58). Fortress Press.

(b) Lennox, John. (2011). *God and Stephen Hawking: Whose Design is it Anyway?* Lion.

External links

- Bo Jinn (author) – Facebook.

θΔics

In existographies, **Bobby Henderson** (1980-) (FA:162), or “Robert Henderson”, is an American physicist noted for

Overview

In 2005, Henderson wrote a satirical letter, to the Kansas School Board, in concern of children being taught intelligent design alongside of evolution theory, as the two main theories of human evolution, wherein he suggested that a third alternative, namely the Flying Spaghetti Monster (FSM) god parody origin of humans should be taught as part of high school education. [1]

FSM | Pastafarianism

Shortly thereafter, the follow-up, Internet website based, parody religion “Pastafarianism” and accompanying parody “Church of the Flying Spaghetti Monster” (compare: Church of Elective Affinities) precipitated.

The following is an "In Pasta We Trust" parody of the "In God We Trust" motto:

The following are selection of no religion type (aka none-type) dog tags, showing two people listing their religion type as atheism/FSM or Pastafarianism: (Q)

Many people on Facebook, notably in 2005 to 2015, began to label their religious preference as "Pastafarianism".

FSM | Prayer

The following is 2017 FSM prayer pillow (Q) made by an atheist nurse to give to patients if they ask her to pray to her:

(add)

References

1. Henderson, Bobby. (2005). “Open Letter” (Q), to Kansas School Board.

Further reading

● Boxer, Sarah. (2005). “But Is There Intelligent Spaghetti Out There?” (Q), *New York Times*, Aug 29.

External links

● Bobby Henderson – Twitter.
● Home – Venganza.org.

θΔics

In thermodynamics, **body** refers to any volumetric region of matter or space (containing matter) that can be acted on by heat in a determinate manner. [1] The term varies in use according to context, e.g. a "hot body" (boiler) or "cold body" (condenser), but is generally used in reference to the quantity of matter made to do work via contraction or expansion, according to Boerhaave's law, being synonymous with the terms working substance (1824), working body (1850), system (1871), thermodynamic system (1923), working medium (2007), among others. [1]

Etymology

In 1783, French engineer Lazare Carnot defined body as such: [2]

> "When a body acts upon another on, it is always immediately or through some intermediate body; this intermediate **body** is in general what one calls a *machine*."

In 1824, French physicist Sadi Carnot, building on the work of his father, in laying out the framework of the soon-to-be established science of thermodynamics, stated that in order to understand "the phenomenon of the production of motion by heat," whenever heat acts in a determinate manner "on any body", that the laws of physics would need to be extended and generalized enough to make known beforehand all of the effects that occur in reference to the relations between heat and motion. [3]

In setting up a structural framework for his analysis, Carnot conceived of a generalized heat engine to which the fluid or malleable "body" (in general reference to a *body of steam*) moving about inside of a steam or heat engine, he referred to as the "working substance". This body could be made to do work, via expansion or contraction, by either receiving caloric (particles) from contact with boiler (or furnace), which he referred to as the "warm body" or by rejecting caloric (particles) via contact with the condenser (or stream of cooling water), which he referred to as the "cold body".

References

1. (a) Maxwell, James C. (1878). "Tait's 'Thermodynamics' (I)", (pgs. 257-59). *Nature*, Jan. 31.
(b) Maxwell, James C. (1878). "Tait's 'Thermodynamics' (II)", (pgs. 278-81). *Nature*, Feb. 07.
2. Lazare, Carnot. (1783). *Essay on Machines in General*, art. 8, trans. Ivor Grattan-Guinness.
3. Carnot, Sadi. (1824). "Reflections on the Motive Power of Fire and on Machines Fitted to Develop that Power." Paris: Chez Bachelier, Libraire, Quai Des Augustins, No. 55.

θΔics

In science, **Boerhaave's law** states that that every body, whether in the solid, fluid, or gas state, is augmented in all its dimensions by any increase of its sensible heat. [1] The law is named after Dutch physician and chemist Herman Boerhaave who discussed and experimentally demonstrated the law in his 1720s chemistry lectures at Leiden University.

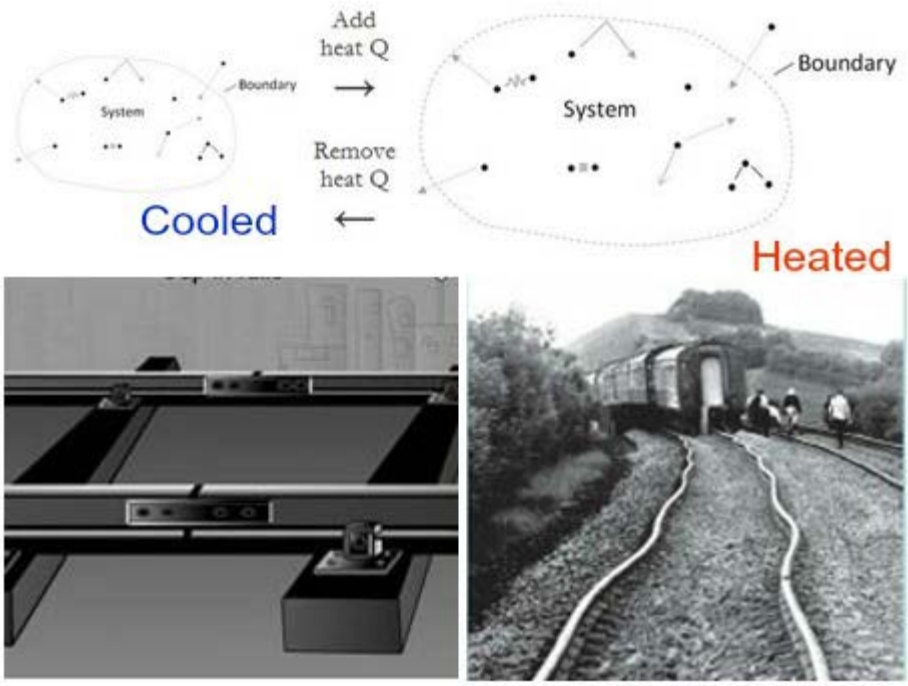

Top: The basic outline of **Boerhaave's law**, which states that adding heat Q to a body will cause volume expansion and that removal of heat will cause volume contraction, enunciated as a general law of nature in 1720 by Dutch physical chemist Herman Boeraave; a principle that formed the basis of French chemist Antoine Lavoisier's 1787 caloric theory; which, in turn, formed the basis for French physicist Sadi Carnot's 1824 general theory of the operation of heat engines; which, in turn, formed the basis of German physicist Rudolf Clausius' 1865 *The Mechanical Theory of Heat*, and thus the science of thermodynamics and the two central laws of universal operation, namely energy conservation (first law) and entropy increase (second law). Bottom (right): example of **Boerhaave's law** in metals: rail length expansion and subsequent rail buckling due to hot weather (heat). Bottom (left): modern tracks use "gaps" to prevent the buckling of tracks during hot weather.

Guericke

In 1663, Otto Guericke, in his *Magdeburg Experiments on the Vacuum of Space*, stated the following: [7]

> "Air extends and expands itself more or less according to a greater or lesser intensity of heat. Warm air, consequently, occupies a larger space and cold a smaller."
>
> — Otto Guericke (1663), *Magdeburg Experiments on the Vacuum of Space*

(add)

Papin's digester

In 1679, French physicist Denis Papin invented the "bone digester" or Papin digester as it later came to be called, a type of high temperature pressure cooker that could liquefy solid bones. Soon thereafter, Papin's digesting device became a standard research tool with which to show that that bodies can be made to change state, from solid to liquid to gas.

Hooke

In 1665, English scientist Robert Hooke, an associate of Papin, so to speak, asserted the principle that thermal expansion and contraction might be a general property of matter: [3]

> "The property of expansion with heat, and contraction with cold, is not peculiar to liquors only, but to all kinds of solid bodies, especially metals."
>
> — Robert Hooke (1665), *Micrographia* (pg. 39); post-dates Otto Guericke equivalent statement; pre-dates Boerhaave's law (c.1720), which is cited by Antoine Lavoisier (1789) as the basis of his caloric theory

(add)

Papin engine

See main: Papin engine

In 1690, French physicist Denis Papin published his "A New Method to Obtain Very Great Motive Powers at Small

Cost" wherein he conceived the view that he could utilize the expansive properties of water by heat to make a piston and cylinder lift weight using fire, the gist idea of which he outlines as follows:

> "Since it is a property of water, that a small quantity of it turned into vapor by heat has an elastic force like air, but upon cold supervening is resolved again into water, so that no trace of the said elastic force remains … [thus] I at once saw that machines could be constructed, in which water, by the help of a moderate heat, and a little cost, might produce that perfect vacuum."

His "New Method" goes into the details of this procedure.

This seems to be the first statement of the outline of the the general property of expansion of bodies by heat and contraction by cold.

Gravesande

Some time in the years 1718 to 1748, Dutch physicist Willem Gravesande, at Leyden university, conducted his classic ball and ring experiment to prove the phenomenon of volume expansion by heat. This research was communicated, shown, or conducted in joint operation (possibly) by Dutch physician and chemist Herman Boerhaave.

Boerhaave's lectures

In the 1720 to 1740s, Dutch physician and chemist Herman Boerhaave (1668-1738), in his his chemistry lectures at the University of Leyden, introduced the the idea of volume expansion by heat as a general law of nature. The main points of Boerhaave's "law of expansion" or expansion axiom are as follows: [2]

Left: the Papin engine operated via the action of **Boerhaave's law**. Right: a depiction of the famous "ball and ring experiment" famously performed in circa 1730 by Dutch physicist Willem Gravesande, at Leyden University, to the amazement of crowds in excess of 500, being that the phenomena was contrary to the prevailing theories of matter and heat and their operations.

> (a) The same degree of fire rarefies fluids sooner, and in greater degree, than it does solids. Without this law, the thermometer would be useless, since the cavity of the tube would then be dilated in the same proportion as the fluid is rarefied.
>
> (b) The lighter the fluid, the more it is dilated by fire. Air, the lightest of fluids known (to Boerhaave), expands the most; after air, spirit of wine.
>
> (c) All the motion in nature arises from fire alone; taking this away, all things become immovable. At the absence of only a certain degree of fire, all oils, waters, spirits, vegetables, and animals, become hard, rigid, and inert. If the greatest degree of cold was arrived at, and all fire was absolutely taken away, all nature would grow into one concrete body, sold as gold and hard as diamond: on the reapplication of fire it would recover its former mobility.

In a modern sense, these statements can be interpreted as being due to the actions of the photon, in the movement of heat in systems of atoms, molecules, and structures, being the force carrier of the electromagnetic force, causes electrons to jump up in atomic orbital making the attached atom more unstable and movable, thus creating the expansion.

Montesquieu

In 1748, French political philosopher Charles Montesquieu, in his *The Spirit of the Laws*, notes that iron bars tend to contract when cooled (also noted by Carnot in his 1824 *Reflections*, below), and that by extrapolation such an effect may occur in human nerve endings, thus mediating different personal behaviors in love, sex, courageousness, and passions, etc., of people in lands of different heat. Montesquieu's physics-based theories, according to John Q. Stewart, had a vicarious subtle influential effect on the thinkings of American political theorist James Madison (1751-1836), the fourth US president and so-called "father of the constitution", who was a student of Montesquieu political philosophy interpreter Scottish-born American John Witherspoon (1723-1794), a signatory of the Declaration of Independence. [6]

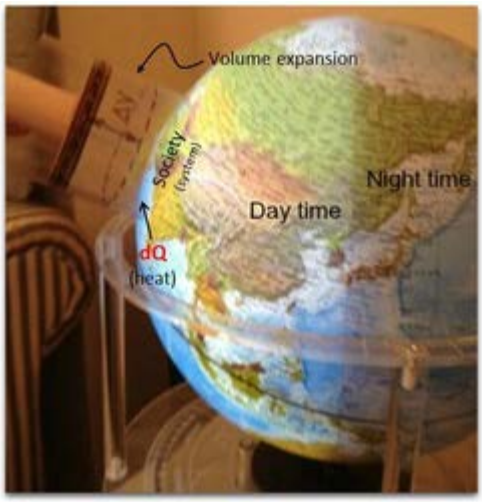

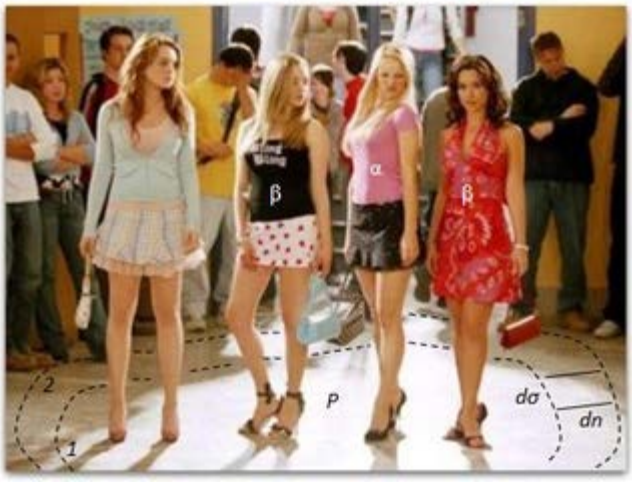

Left: a "social volume" piston and cylinder view of society "worked" according to the operation of **Boerhaave's law** each day when heat from the sun is put into each social system on the surface of the earth, thus causing volume expansion (social volume expansion), otherwise known as daily work. Right: a Mean Girls depiction of Boerhaave's law at work in the operation of human chemical reactions, wherein reaction heat causes volume expansion, when the alpha female walks though the hall of a local high school and the student contract backwards giving her more personal space.

Lavoisier

French chemist Antoine Lavoisier, in his 1787 *Elements of Chemistry*, cites Papin's digester as experimental proof that stones may be turned to vapor, in other words, in modern terms, that heat can be used to actuate or bring about phase change, and on his opening page credits Boerhaave as establishing principle of the augmentation of the dimension of bodies by heat as a universe rule as follows:

> "That every body, whether solid or fluid, is augmented in all its dimensions by any increase of its sensible heat, was long ago fully established as a **physical axiom**, or **universal proposition**, by the celebrated Boerhaave."

In other words, adding heat to a body or system (volume) causes expansion, and this fact is a physical axiom long ago established phenomenon of nature.

Lavoisier then goes on to cite Papin's digester as the experimental proof that all the solid bodies of the earth, such as "stones, salts, and the greater part of the substances that compose the mass of the earth", can be "softened and changed into fluids, etc.".

On this basic, Lavoisier defines three states of matter: solidity, liquidity, and aeriform elasticity. To explain Boerhaave's law, he then states that caloric particles are what constitute the matter of heat and that caloric is what "communicates a power of repulsion to the particles of bodies", to the effect that volume is function of the number of caloric particles in a given body. [1]

Carnot's general theory of heat engines

This expansion-by-heat contraction-by-cold principle was used as the basis of French physicist Sadi Carnot's 1824 general theory of heat engines, particularly in his definition of the working body, and the means by which the working body may be expanded or contracted, in cycle, to produce work.

In utilizing a combination of Boerhaave's law and Lavoisier's caloric theory, Carnot says: [4]

"All substances in nature can be employed for this purpose, all are susceptible of changes of volume, of successive contractions and dilatations, through the alternation of heat and cold. All are capable of overcoming in their changes in volume certain resistances, and of thus developing the impelling power.

A solid body—a metallic bar for example—alternately heated and cooled increases and diminishes in length, and can move bodies fastened to its ends. A liquid alternately heated and cooled increases and diminishes in volume, and can overcome obstacles of greater or less size, opposed to its dilatation.

An aeriform fluid is susceptible of considerable change of volume by variations of temperature. If it is enclosed in an expansible space, such as a cylinder provided with a piston, it will produce movements of great extent. Vapors of all substances capable of passing into a gaseous condition, as of alcohol, of mercury, of sulphur, etc., may fulfill the same office as vapor of water.

The latter, alternately heated and cooled, would produce motive power in the shape of permanent gases, that is, without ever returning to a liquid state. Most of these substances have been proposed, many even have been tried, although up to this time perhaps without remarkable success."

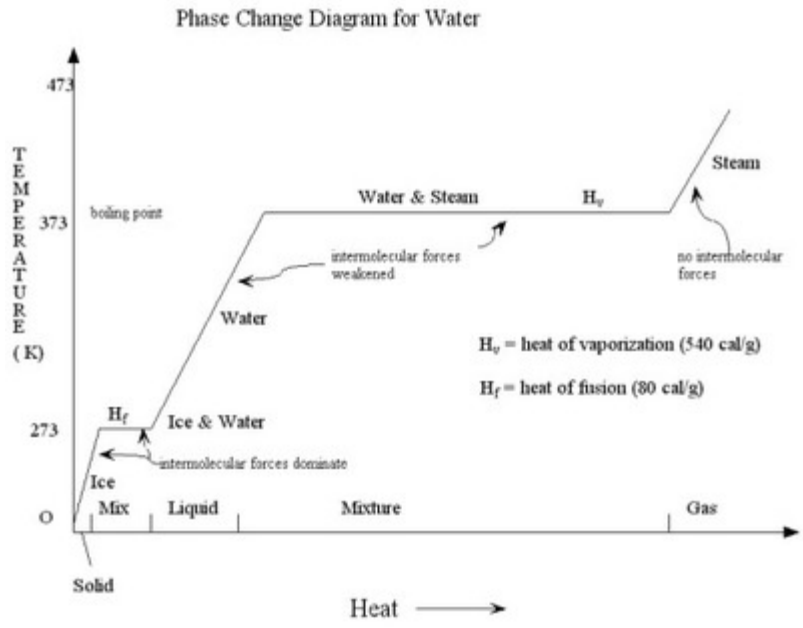

Phase change diagram for water on going from solid-to-liquid-to-vapor, with corresponding increase in volume, according to **Boerhaave's law** as heat is added; the horizontal sections, enthalpy of fusion H_f and enthalpy of vaporization H_v, to note, correspond to the points at which latent heat is added.

This is the basic operational methodology for what would soon become the science of thermodynamics in his definition of the basic heat cycle of heat engine operation.

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2. Dickens, Charles. (1862). *All the Year Round*, (Section: Fire, pg. 393-95). Jan. 18.
3. (a) Shachtman, Tom. (1999). *Absolute Zero and the Conquest of Cold* (pg. 42). Mariner Books.
(b) Quote, supposedly, from lecture by E.N. da C. Andrade before the Royal Society, printed in its *Proceedings*, 1950.
4. Carnot, Sadi. (1824). "Reflections on the Motive Power of Fire and on Machines Fitted to Develop that Power." Paris: Chez Bachelier, Libraire, Quai Des Augustins, No. 55.
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6. Staff. (1955). "Research in Progress: Social Physics", *Princeton Alumni Weekly*, 55:17.
7. Guericke, Otto. (1663). *The Vacuum of Space* (*De Spatio Vacuo*). Unpublished; *New Magdeburg Experiments on the Vacuum of Space* (*Ottonis De Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (preface, pdf) (pg. 112). Janssonius a Waesberge, 1672.

Further reading

â— Diemente, Damon. (2000). "Boerhaave on Fire" (abs), *J. Chem. Educ.* 77(1): 42.

θΔics

In existographies, **Boethius** (c.480-524AD) (IQ:175|#223) (Time 100:23) (Eells 100:96) (CR:10) was a Roman philosopher, mathematician, and senator, noted for []

Overview

In 523, Boethius, in his *The Consolation of Philosophy* – penned while in prison awaiting execution per charges of treason – following discussion of Epicurus, stoics, Anaxagoras, Socrates, and Zeno, concludes, supposedly, that, "there was an intelligence to the universe, that which was once called fate, and that now we understand it to be a universal force", or something to the effect, a summarized by Jennifer Hecht (2004). [1]

Influences

Boethius was influenced, to some extent, by Macrobius.

Quotes | On

The following are quotes on Boethius:

> "The complaint that good men suffer, and that evil men prosper, is a theme that preoccupies Augustine in the *City of God*, and **Boethius** in *The Consolation of Philosophy*."
>
> — Patrick Walsh (1997), commentary on the Epicureans [2]

Quotes | By

The following are noted quotes:

> "Who would give a law to lovers? Love is unto itself a higher law."
>
> — Boethius (c.520) (Ñº)

> "If there is a god, whence proceed so many evils? If there is no god, whence cometh any good?"
>
> — Boethius (c.520) (Ñº)

References

1. (a) Boethius. (523). *The Consolation of Philosophy* (force, 16+ pgs). Elliot Stock, 1897.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 203-04). HarperOne.
(c) The Consolation of Philosophy – Wikipedia.
2. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (pg. 211). Oxford University Press, 1998.

External links

â— Boethius – Wikipedia.

θΔics

In music thermodynamics, **Bogdan Anghel** (1984-) is a Romanian electronic music producer noted for his 2010 EP *Human Thermodynamics*, released on June 14th, featuring four tracks representing themes of the science of human thermodynamics: [1]

1. Pressure correlations (5:27) - themed on the gas laws.
2. Phase transition (7:10) - themed on phase transitions topics, e.g. Gibbs phase rule, enthalpy of vaporization, etc.
3. Aerospace race (7:07) - possibly themed on human molecules flying or racing about like gas molecules.
4. Transport phenomena (8:03) - possibly themed on heat or mass transport of humans?

The four songs, which as depicted on the album cover (below), seem to be intending to represent a sort of semi gas-phase, semi surface-attached depiction of human particles or human molecules, flying about and interacting sort of like the particles of an ideal gas in a state of Utopian natural harmony with the earth. [2]

Cover design

The visual design of the cover (adjacent) is by Wonderboy. The fern-like background may possibly have taken its cues from the web design of the sun-infused beach-moss greenery in the header background of the 2005 site humanthermodynamics.com, as shown below; a site at which, on the the homepage, the subject of human thermodynamics is prominently explained by English physicist C.G. Darwin as a subject of the science the future in which gas-like "human molecules", in a statistical sense, are said to be governed by the "laws of human thermodynamics", based on statistical mechanics, as explained in the introduction to his 1952 book *The Next Million Years*.

In other words, the artistic cover is themed on Darwin's statistical view of people as gas-like human molecules contained within "conservative dynamical systems", as Darwin puts it.

Education

Anghel has been active in the electronics music scene since at least 2004 and he describes his interests using the following key words: sound concepts, techno, experimentalism, minimalism, electricity, noise, layered imagination, flavors, dots, lines, circles, silence, poetic still, installations, experiments, old school, space, particle physics, elementary interactions, reductionism, patterns. [3] He is one of the founders of record label Local Records (LocalRec.ro), launched in 2010, aimed at promoting local electronics music in Bucharest. [4]

See also

â— Music chemistry

References

1. Human thermodynamics | Bogdan (2) – DiscCogs.com.
2. (a) EP Cover (500x475px) – Bogdan | Human Thermodynamics EP (2010).
(b) Phase transition (song 2) (listen) – Surround-around-sound.blogsopt.com.
2. Bogdan Anghel – DiscCogs.com.

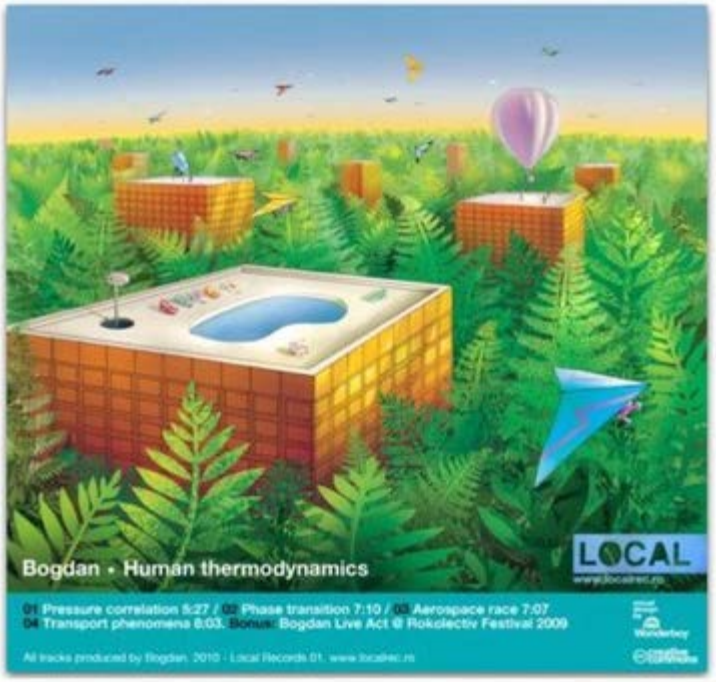

Cover of Anghel's 2010 EP **Human thermodynamics**, featuring four tracks: (1) pressure correlations 5:27, (2) phase transition 7:10,

3. Human Thermodynamics (Bogdan) – LocalRec.ro. (3) aerospace race 7:07, and (4) transport phenomena 8:03.

External links

â— Bogdan Anghel – MySpace.com.

In science, **Bohr model** is a quantum model of the atom in which negatively-charged electrons revolved in orbits (orbitals) about a positively-charged nucleus, at certain fixed "quantum" distances, whereby each spherical-shaped electron orbit has a specific energy associated with it and that for an electron to move down to a lower more stable orbital (closer to the nucleus) a photon, of a specific wavelength, has to be emitted and conversely for an electron to move up to a higher orbital (farther from the nucleus) a photon, of a specific wavelength, has to be absorbed.

When the electrons move up to less stable outer orbitals, the atom or molecule as a whole, tends to become more reactive, in a sense move more, and thus more likely to take place in combustion-like reactions.

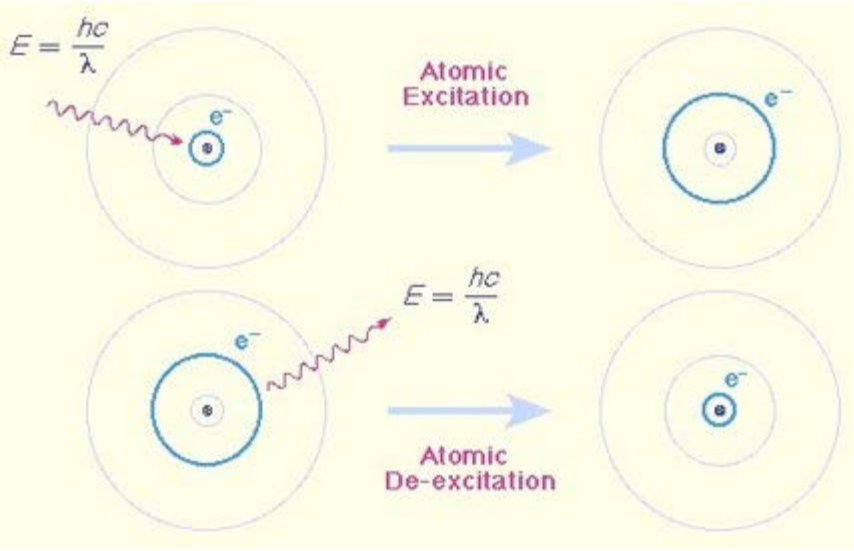

An excitation (light impact) de-excitation (light emission) depiction of the **Bohr model** of the atom, conceived by Danish physicist Niels Bohr (1913).

History

The model was introduced by Danish physicist Niels Bohr in 1913 and has since come to be known as the "Bohr model".

The historical timeline of the adoption of the quantization model of energy and light, aka the quantum hypothesis, the main stepping stones are: energy element (Max Planck, 1900), photon theory of light quanta (Albert Einstein, 1905), the Bohr model of the atom (Niels Bohr, 1913), the structure of spectroscopy (Arnold Sommerfeld, 1916), then the full-fledged quantum mechanics of the Schrodinger equation (Erwin Schrodinger, 1926) and exchange forces (Werner Heisenberg, 1926). [1]

Human chemistry

The Bohr model has huge implications for human molecular theory, by virtue of the fact that 37 to 90 percent of human sensory input (the force that animates humans) is sight; of which only an introductory overview of his application has been worked out in regards to the excitations (visual stimuli inputs and memories) and de-excitations (visual di-stimui and memories) of human interactions during light-induced waking daylight hours. [2]

Sociophysics

In 2015, Ram Poudel, in his “Atomic Analogy of Poverty” (Ñº), was theorizing about a Bohr model based sociophysics theory of poverty.

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1. Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature’s Economics* (pg. 71). Cambridge University Press.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (Bohr model, 8+ pgs.). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (Bohr, 3+ pgs.). Morrisville, NC: LuLu.
3. Poudel, Ram C., Zheng, Kangbin, Wood, David and McGowan, Joh G. (2015). “Atomic Analogy of Poverty” (pdf), Manuscript, Jun 16.

External links

â— Bohr model – Wikipedia.

θΔics

In cosmological thermodynamics, **Boltzmann brain problem**, or "Boltzmann's brain" or "Boltzmann's brain paradox" is an apples and oranges type of puzzle situated by American physicist Andreas Albrecht in 2002 which asks, to the effect, that if the universe began in a low entropy condition, an ordered state, and is now moving or inflating to high entropy final conditions, loosely a disordered state, thus giving directions to the arrow of time, then how does one explain the existence of so many "brains", modeled as low entropy fluctuations, which are considered as incredibly rare events, in the universe? To a good approximation, the Boltzmann brain problem is a reformulation of the 1858 Spencerian dilemma, albeit in the context of big bang theory.

Boltzmann brain hypothesis discussed in a Dilbert comic strip, April 27, 2009. [5]

In this frame of logic, a person or rather a brain is seen as a momentary fluctuation in a field of matter and energy in the inflationary space and time of the expanding universe. [4] The idea of fluctuation-produced hypothetical "Boltzmann Brains" has become a sort of journal writing past time for astrophysicists in recent years, just as the hypothetical Maxwell's demons have been for information theory physicists in the last dozen decades.

Etymology

American physicist Andreas Albrecht stated that the Boltzmann brain paradox was first discussed in his 2002 article "Cosmic Inflation and the Arrow of Time". [1] In this article, Albrecht states that typical discussions on cosmic inflation start out by presenting a series of cosmological "problems" that appear to be present in the standard big bang model, one being the "flatness problem", another being the "homogeneity problem."

In a subsection to this article entitled *Boltzmann's Efficient Fluctuation Problem*, Albrecht states his first presentation of what is now known as the Boltzmann brain problem:

> "Boltzmann worried that if our world really emerged from a random fluctuation, then a strong prediction is made that we exist in the midst of utter chaos. The fact that instead we live in a universe billions of light-years in size which is extremely quite an un-chaotic, and that seems to have room for not just our cozy planet, but many more like it seems to be in blatant contradiction to these predictions."

Albrecht goes on to argue that cosmic inflation gives a resolution to this so-called problem. He began dubbing the issue the "Boltzmann brain paradox" in 2004.

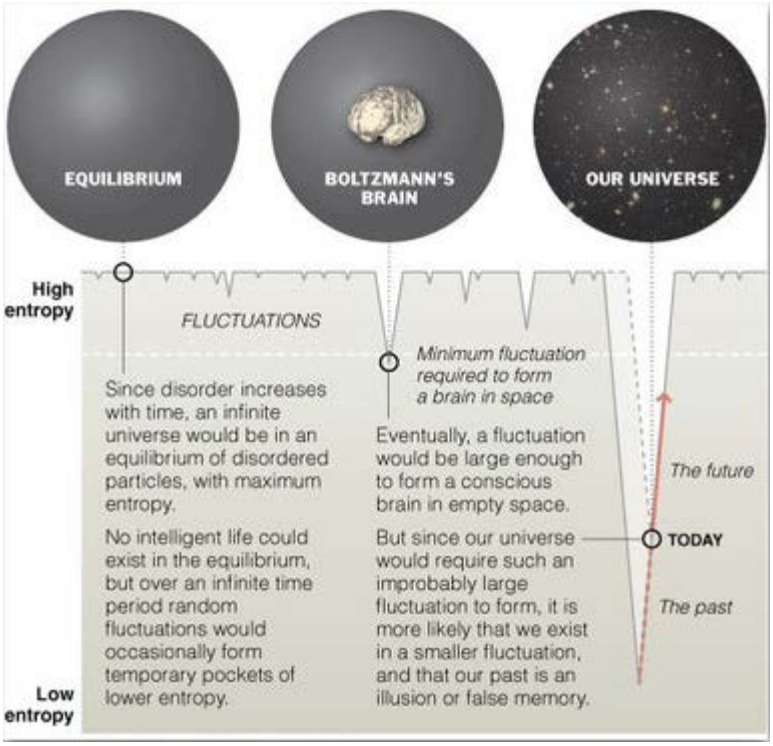

Boltzmann's brain fluctuation diagram by American physicist Sean Carroll. [6]

Boltzmann Brains

In 2006, owing to the over-prevalence of the use of this term "Boltzmann brains', Canadian theoretical physicist Don Page introduced the notation of BB or BBs as shorthand for: [3]

Boltzmann Brains (BB) = hypothetical brains resulting from thermal or vacuum fluctuations.

This notation, similar to Maxwell's demon, has since gained popularity in the astrophysics community. In fact, dueling papers have supposedly appeared in the last few years, replete with references to reincarnation, multiple universes, and death of spacetime, etc., all in attempts to reconcile cherished cosmology theories of big bang and inflation with the second law and human existence. [4]

Difficulties on theory

The entire theory, to note, takes a while to sift though, but the central issue seems to be the mixing of chemistry (reactions) and biology (evolution) together with concepts from statistical mechanics and cosmology (e.g. hydrogen burning, nucleosynthesis, etc.,) to make rather outlandish conclusions. The theme of the debate is similar to the underlying theme to the thermodynamical aspects of the famous creation vs evolution debates, which is that incorrect rephrasing of the standard second law, i.e. "the entropy of the universe tends to a maximum" [Clausius, 1865], which has to do simply with the mathematics of heat transforming into internal work per each heat cycle, into the Boltzmann/Planck second law variation, i.e. “there exists in nature a quantity, called entropy that depends on disorder, which changes always in the same sense in all natural processes” [Planck, 1897], reapplied to the entire universe, which is not technically correct.

References

1. Albrecht, Andres and Sorbo, Lorenzo. (2004). “Can the Universe Afford Inflation?” *Arxiv.org*, May.
2. Albrecht, Andres. (2002). “Cosmic Inflation and the Arrow of Time”, In: *Science and Ultimate Reality: From Quantum to Cosmos.* Cambridge University Press, 2004.
3. (a) Page, Don H. (2006). “Return of the Boltzmann Brains”, *Phys. Rev. D.* 78, 063536.
(b) Page, Don N. (2008). “Is our Universe Likely to Decay within 20 Billion Years?”, *Phys. Rev. D.* 78, 063535.
4. Overbye, Dennis. (2008). “Big Brain Theory: Have Cosmologists Lost Theirs?”, *NYTimes.com*, Jan 15.
5. Boltzmann brain hypothesis (Dilbert comic strip), April 27, 2009.
6. Boltzmann’s Brain (fluctuation diagram) by Sean Carroll, California Institute of Technology, NYTimes.com, Jan 14, 2008.

Further reading

● Carroll, Sean M. (2006). “Boltzmann’s Anthropic Brain”, *Discover Blogs.* Aug 01.
● Linde, Andrei. (2007). “Sinks in the Landscape, Boltzmann Brains and the Cosmological Constant Problem”, *Journal of Cosmological and Astroparticle Physics.* Jan.
● Gott, J. Richard. (2008). “Boltzmann Brains—I’d Rather See Than Be One”, *Arxiv.org.*

External links

● Boltzmann brain – Wikipedia.

θΔics

In statistical thermodynamics, **Boltzmann chaos assumption** or *molecular chaos assumption* postulates that during a two-body collision, between particles in an ideal gas system, there is no correlation of velocity. This assumption, outlined by Austrian physicist Ludwig Boltzmann in the 1870s, allowed for a molecular chaos view of particles in the gas phase, which thus fit the temperature-defined velocity distribution developed by Scottish physicist James Maxwell in 1859. [1]

Overview

A key insight applied by Boltzmann was to determine the collision term resulting solely from two-body collisions between particles that are assumed to be uncorrelated prior to the collision. This assumption was referred to by Boltzmann as the 'Stosszahl Ansatz', and is now known as the *Boltzmann chaos assumption* or 'molecular chaos assumption'. The Boltzmann chaos assumption, roughly speaking, postulates the non-correlation of velocities of particles which are about to collide. [2]

References

1. Boltzmann, Ludwig. (1964). *Lectures on Gas Theory* (pgs. 9, 74). New York: Dover.
2. Villani, Cédric. (2003). *Topics in Optimal Transportation* (pg. 224). AMS Bookstore.

θΔics

In thermodynamics, the **Boltzmann constant** k_B is the ratio of the gas constant R to Avogadro's number N_A: [1]

$$k_B = \frac{R}{N_A}$$

which numerically equates to 1.38E-23 J/K = (8.314 J /K*mol)/(6.022E23 particles/mol). The constant is named after Austrian physicist Ludwig Boltzmann.

History

In 1901, German physicist Max Planck calculated value for what he called "universal constants", one being Planck constant h, the other being: [2]

k = 1.346 * 10E-16 erg / deg

which he said he first made in his 1900 paper "Entropy and Temperature of Radiant Heat." [3] In 1920, Planck commented on his calculation that: [4]

> "This constant is often referred to as **Boltzmann's constant**, although, to my knowledge, Boltzmann himself never introduced it, a peculiar state of affairs, which can be explained by the fact that Boltzmann, as appears from his occasional utterances, never gave thought to the possibility of carrying out an exact measurement of the constant."

It may be, however, that similar variations or formulations of this constant may have been used by Walther Nernst (1893) and Willard Gibbs (1901).

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics* (pg. 22). Oxford: Oxford University Press.
2. Planck, Max. (1901). "On the Law of Distribution of Energy in the Normal Spectrum". *Annalen der Physik*, vol. 4, p. 553 ff.
3. Planck, Max. (1900). "Entropy and Temperature of Radiant Heat." (Entropie und Temperatur strahlender Wärme) *Annalen der Physik*, vol. 1. no 4. April, pg. 719-37.
4. Planck, Max. (1920). "The Genesis and Present State of Development of the Quantum Theory." *Nobel Lecture*, Jun 02.

External links

â— Boltzmann constant – Wikipedia.

θΔics

In thermodynamics, **Boltzmann entropy** refers to the H-theorem, introduced by Austrian physicist Ludwig Boltzmann in his famous 1872 paper "Further Studies on the Thermal Equilibrium of Gas Molecules", which statistically quantifies the entropy of an ideal gas system. [1]

See also

- Clausius entropy
- Gibbs entropy

References

1. Boltzmann, Ludwig. (1872). "Further Studies on the Thermal Equilibrium of Gas Molecules" ("Weitere Studien über das Wärmegleichgewicht unter Gasmolekülen"), in *Sitzungsberichte der Akademie der Wissenschaften, Mathematische-Naturwissenschaftliche Klasse* (pgs. 275-370), Bd. 66, Dritte Heft, Zweite Abteilung, Vienna: Gerold.

External links

- Boltzmann entropy – Wikipedia.

θΔics

In statistical thermodynamics, the **Boltzmann formula** is an equation concerning the entropy S of a system derived from statistic or probability arguments:

$$S = k \log W$$

where *k* is the Boltzmann constant (Gas constant R divided by Avogadro's number N) and W is the multiplicity or number of ways of describing the system. The Boltzmann formula, in quantitative terms, expresses the concept that entropy is a measure of disorder of a system. [1] The Boltzmann formula, in its modern form, was first given by German physicist Max Planck in 1901 as part of his principle of elementary disorder. [2]

See also

- S = k ln W

References

1. Daintith, John. (2004). *Oxford Dictionary of Science.* Oxford University Press.
2. Planck, Max. (1901). "On the Law of Distribution of Energy in the Normal Spectrum". *Annalen der Physik*, vol. 4, p. 553 ff.

External links

- Boltzmann's entropy formula – Wikipedia.

θΔics

In thermodynamics, **Boltzmann order-disorder principle**, a term originating in Erwin Schrodinger's famous 1943 *What is Life?* lecture-turned-book, his rebuttal Note to Chapter 6 in particular, refers to the model (see: entropy models) of the magnitude of entropy being representative of the atomic order or disorder of any given material body or system, the logic of which is embodied in the Boltzmann-Planck entropy (Boltzmann entropy) equation: [1]

$$S = k \log W$$

where S is the entropy, k the Boltzmann constant, and W the multiplicity or probability of the various microstates of the particles of the given body (order associated with low probability; disorder associated with high probability). [2] The logic of this, historically, originated in the 1870s H-theorem work of Ludwig Boltzmann (and later black body theory modifications of this by Max Planck), and prior to this in the 1860s disgregation theory models (precursors to entropy) of Rudolf Clausius and the velocity distribution work of James Maxwell (see: Maxwell-Boltzmann distribution) regarding the temperature of bodies and the average velocities of its particles (see: kinetic theory).

Free energy

In Schrodinger's lecture he attempted to argue that "life" is something that "feeds on negative entropy", a comment that was latter attacked by his fellow colleagues (including Linus Pauling, Max Perutz, and F. Simon, among others), after which he was forced to reply that if he were catering to the hard physical science community rather than the lay audience, he would have turned the discussion to free energy, which he defined as follows: [1]

> "Free energy is a highly technical, rather intricate concept, whose relation to the **Boltzmann order-disorder principle** is less easy to trace."

Indeed, there is much truth in this statement.

See also

- Principle of elementary disorder
- Boltzmann brain problem
- Boltzmann chaos assumption
- Boltzmann formula
- Boltzmann tombstone

References

1. Schrodinger, Erwin. (1944). *What is Life?* (pg. 74). Cambridge University Press.
2. Rigden, John S. (2005). *Einstein 1905: the Standard of Greatness* (pg. 30). Harvard University Press.

θΔics

In science, **Boltzmann tombstone** is the marker for the location of the entombment of Austrian physicist Ludwig Boltzmann (1844-1906), Vienna Central Cemetery, Vienna, Austria, showing a bust of Boltzmann with the equation S = k log W chiseled in stone above.

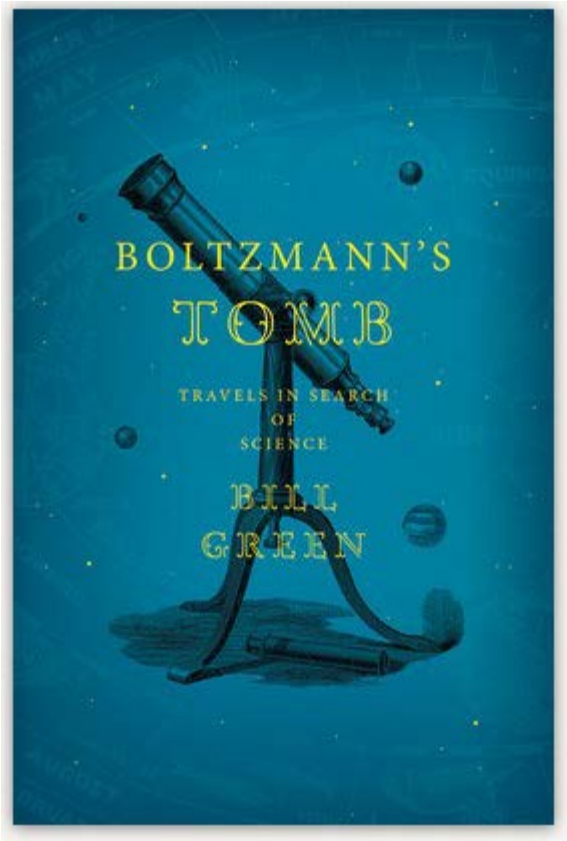

Left: a photo of the **Boltzmann tombstone** in Vienna, Austria. Right: American science writer Bill Green's 2010 *Boltzmann's Tomb*, on controversies in science, in general, and Boltzmann's last days. [4]

Reaction end

Boltzmann met his end by his own hand-- a phenomenon curiously common to many founders of thermodynamics—namely, he hung himself, while he had his family were on vacation. In 2010, writer Bill Green, in his *Boltzmann's Tomb: Travels in Search of Science*, depicted adjacent, recounts his visit to Boltzmann's tomb, and the nature of Boltzmann's reaction end, as follows: [4]

> "In late August of 1906, Boltzmann and his family left Vienna to spend a little time in the town of Duino lies near Trieste on the northeast coast of the Adriatic … [but] with him came that constant companion, that sense of failure, the recognition that maybe, as his great adversary Ernst Mach had said toward the end, he was the last pillar standing, the last who believed that behind the cliff and the castle and the air that he breathed were the unseen molecules and atoms he had argued for all his life. At least there were some who believed that this sense of rejection is why he had done it, though not Meitner, who professed never to have understood, though she thought it might have been the depression, the "black dog" that had come to visit. His fifteen year old daughter, Eva, discovered him. While she and her mother were out swimming in the bay, he had hanged himself with a short cord from a window frame in their hotel. Eva, disturbed by his long absence, had gone back to the hotel to find him. It was she who had made the horrible discovery, one she would never speak of again. The papers in Vienna, the memorials at the University spoke of a man of brilliance 'who had bestrode his time and his nation,' but who, as Franz Exner said, 'envious fortune had denied inner peace'."

(add summary)

Construction

In the 1930s, the Boltzmann-Planck entropy equation engraved tombstone was erected, after the full significance of Boltzmann's work was recognized. [2]

On the left is the name of his wife and one the right are the names of his three sons.

Scientific tourism

The Boltzmann tombstone has become a popular stomping ground for physical scientists and engineers, especially those interested in thermodynamics.

A 2015 3D animation view of the **Boltzmann tombstone** taken by Jeff Tuhtan. [5]

In circa 1980s, American biophysicist Harold Morowitz journeyed from America to Austria to see Boltzmann's tombstone, as recounted in his *Entropy and the Magic Flute* (1992); commenting, e.g., how the cemetery caretaker often gets "Ludwig B" mixed up with the tomb of Ludwig Beethoven. [3]

In Sep 2012, Jeff Tuhtan visited (Q) the Boltzmann grave; shown below is a photo of Tuhtan posing next to Boltzmann:

Quotes

The following are related quotes:

> "Of course the [tomb] stone will never last, Buckley laughed, and Jeffers knew it. And Boltzmann, too. But that equation, well, that's another matter."
>
> — Bill Green (2010) (Q)

See also

- Clausius tombstone
- Gibbs tombstone

● Founders of thermodynamics and suicide

References

1. (a) Boltzmann tombstone (Picture) - Wikipedia
(b) Zentralfriedhof (Central Cemetery, Vienna) – Wikipedia.
2. Muller, Ingo. (2007). *A History of Thermodynamics - the Doctrine of Energy and Entropy* (pg. 102). New York: Springer.
3. Morowitz, Harold J. (1996). *Entropy and the Magic Flute*: $S = k \ln W = dQ/T = - k\Sigma fi \ln fi$ (pgs. 1-3). Oxford University Press.
4. Green, Bill. (2010). *Boltzmann's Tomb: Travels in Search of Science* (abs). Bellevue Literary Press.
5. Boltzmann tomb (3D view) – SketchFab.com.

External links

● Julian Schwinger tombstone (O)

θΔics

In science, **bond** (TR:525), in chemistry, the result of the forces of attraction that hold together atoms in an element, molecule, or compound. [1]

Types

The principle types of bonds are: ionic, covalent, metallic and intermolecular; following are various types or term labels of bonds:

- Chemical bond
- Human chemical bond
- Human bonding

See also

- Bond energy
- Debonding
- Lewis chemical bond
- Hydrogen bond (e.g. Mark Granovetter)
- Metabolic Generation and Utilization of Phosphate Bond Energy
- Weak tie
- Strong tie

References

1. Clark, John O.E. (2004). *The Essential Dictionary of Science* (pg. 95). Barnes & Noble.

External links

- Bond – Wikipedia.

θΔics

In chemistry, **bond energy** is a view that certain chemical bonds, e.g. phosphate bonds, store large amounts of chemical energy and thus act as energy distributing types of storage systems within biochemical systems, functioning as sort of biochemical batteries in the driving of many endergonic reactions. [1]

Table of Bond Energies	
Type	Bond energy (kJ/mol)
Ionic bond	700-4,000
Covalent triple bond	800-1,000
Covalent double bond	500-700
Covalent single bond	200-500
Dipole attractions	40-400
Hydrogen bond	10-40
Phosphate bonds (ATP)	25-60
Human chemical bond	7.6E8 (kJ per bond)

Compound	Formula	Carbon-Nitrogen Bond Energy (kJ/mol)
Molecular nitrogen	N≡N	945
Hydrogen cyanide	H–C≡N	890
Isocyanic acid	H–N=C=O	615
Methylamine	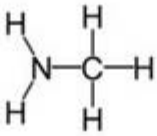	293

Bond energies for different bonds, single bond, double bond, triple bond, etc., and bonds in compounds. [5]

Chemical bond energy

In 1905, Fritz Haber, in *Thermodynamics of Technical Gas Reactions*, introduced a general outlined of the notion of "bonds" defined chemical thermodynamically; some examples:

> "In Helmholtz' point of view, a chemical reaction is considered to have a latent heat just as does any change in the state of aggregation; consequently, in my view the two parts into which total energy can be divided are not spoken of as free energy and bound energy but as '**reaction energy**' and 'latent energy'."
>
> — Fritz Haber (1905), *Thermodynamics of Technical Gas Reactions* (pg. ix)

> "These cases are generally explained by assuming the breaking of **weak, but 'real', bonds** between the phosphorus tricholoride and chlorine, the hydrochloric acid and the ammonia, and between he carbamic acid and the ammonia. When such an assumption does not agree with the current conception of valence, as in the case of acetic acid, which, like nitric oxide, shows a marked tendency to polymerize just above the boiling point, 'molecular compounds' are assume."
>
> — Fritz Haber (1905), *Thermodynamics of Technical Gas Reaction* (pg. 154)

In 1941, German-born American Fritz Lipmann derived the quantitative model of "bond energy", thermodynamically, in respect to the bonds and energy stored in ATP. [2]

In modern terms, bond energies, in chemicals, are measured in different ways; most often by the enthalpy change ΔH required to break a particular bond or molecule.

Human bond energy

Estimates of energy contained in different types of human bonds, e.g. marriage bond, social bond, family bond, political bonds, is a rather new subject; generally a repercussion of the fact that human chemical bond theories are sparse.

Nuclear bond energy

The following, shown adjacent, depicts the nuclear bond energy contained in a 3/50th of a gram of radium, which can be used to life a weight of 302,500 tons through a vertical distance (one foot), by the

power of the nuclear bond energy contained in a 3/50th of a gram of radium.

References

1. Lipmann, Fritz. (1953). "Development of the Acetylation Problem: A Personal Account." *Nobel Lecture*, Dec. 11.
2. Lipmann, Fritz. (1941). "Metabolic Generation and Utilization of Phosphate Bond Energy". New York. In: *Advances in Enzymology and Related Subjects – Vol. 1 (1941)*, (pg. 99-162). Interscience Publishers.
3. Wolke, Robert L. (2009). "Bond Energies", Science.Jrank.com.
4. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (keyword: bond energy, pgs.91-92, 103), (preview), (Google books). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (section: Bond energy, pgs. 553-60; human chemical bond energy, pg. 558), (preview), (Google books). Morrisville, NC: LuLu.
5. (a) Bond-dissociation energy – Wikipedia.
(b) Nitrogen compound bond energies – KentChemistry.com.

External links

â— Bond energy – Wikipedia.

θΔics

In chemistry, **bonding**, as compared to debonding, refers to the process of bond formation; the field particle exchange (see: exchange force) or interaction that brings about the realization of a bound state.

Quotes

The following are related quotes:

> "The Hauptmann [Captain] is invited to join Eduard and Ottilie; and it is the resulting threesome that one evening discusses the notion of 'Wahlverwandtschaften' (elective affinities), processes of **bonding** and rebonding in chemistry. At issue is the possibility that a particular compound can be fractured by the appearance of a third substance which then bonds with one of the previously conjoined substances—almost as though some kind of choice were being exercised. At one level, the discussion amongst the three friends genuinely does concern recently discovered chemical processes. At another level, the characters ceaselessly make metaphorical links between the behavior of chemical substances on the one hand and the chemistry of human attraction on the other. And, as soon as one formulated the matter in this way, in terms of 'human chemistry', one asks oneself whether this, too, is a literal or metaphorical statement. Are men and women subject to the same laws of material reality in the same way as chemical substances are? If so, what is the force of 'Sitten und Gesetze' [customs and laws] in the human sphere?"
>
> — Martin Swales (2002), *Reading Goethe* (co-author: Erika Swales) (pg. 73) [1]

References

1. Swales, Martin and Swales, Erika. (2002). *Reading Goethe: a Critical Introduction to the Literary Work* (pg. 73). Camden House.

Further reading

â— Thims, Libb. (2007). *Human Chemistry (Volume One)* (pdf) (bonding, 6+ pgs). Morrisville, NC: LuLu.
â— Thims, Libb. (2007). *Human Chemistry (Volume Two)* (bonding, 6+ pgs). Morrisville, NC: LuLu.

θΔics

In existographies, **Boniface VIII** (c.1230-1303) was pope, from 1294 to 1303, of the Roman empire, noted for []

Other

In 1330, Dante Alighieri, in his *Divine Comedy*, placed Boniface in the eight circle of hell.

In c.1564, Francois Rabelais, in his *Gargantua and Pantagruel*, lists the inhabitants of hell, stating that therein Boniface was found "skimming the scum off soup pots".

Quotes | On

The following are quotes on Boniface VIII:

> "Just look at the popes (Julius III, Leo X) who themselves mocked their dignity and the other (**Boniface VIII**) who said, joking with his friends, 'Ah! How rich we are from this fable of Christ!'"
>
> — Jean Meslier (1729), *Testament* (pg. 39) [1]

Quotes | By

The following are quotes by Boniface VIII:

> "The sums of money which the fable of Christ has produced the priests are incalculable."
>
> — Boniface VIII (c.1290) [2]

> "Fornication is one of the most beautiful laws of nature."
>
> — Boniface VIII (c.1290) [2]

> "The host is a piece of bread to which I pay no respect. There is no Jesus Christ in the eucharist."
>
> — Boniface VIII (c.1290) [2]

> "Men have souls like those of beasts, the one are as much immortal as the other."
>
> — Boniface VIII (c.1290) [2]

> "The Gospel teaches more falsehoods than truths; the delivery of the Virgin is absurd; the incarnation of the son of god is ridiculous; the dogma of transubstantiation is a folly."
>
> — Boniface VIII (c.1290) [2]

> "Religions are created by the ambitious to deceive men."
>
> — Boniface VIII (c.1290) [2]

> "It is no greater sin to abandon one's self to pleasure with a young girl or boy than to rub one's hands

together.”

— Boniface VIII (c.1290) [2]

References

1. Meslier, Jean. (1729). *Testament: Memoir of the Thoughts and Sentiments of Jean Meslier* (translator: Michael Shreve; preface: Michel Onfray). Prometheus Books.
2. (a) Villani, John. (c.1310). *Publication*. Publisher.
(b) Hallam, Henry. (1856). *View of the State of Europe during the Middle Ages* (ch. 7, pg. 304). Harper & Brothers.
(c) Thompson, Richard W. (1876). *The Papacy and the Civil Power* (pgs. 223-33) (Ñº). Harper & Bros.

External links

â— Pope Boniface VIII – Wikipedia.

In events, **book burning** refers to noted incidences of the combustion of literature works, considered "dangerous" and or poisonous to the person or group undertaking the burning; generally done because such works are averse to one's way of thinking and or beliefs.

A depiction of the **burning of the books** of the Library of Alexandria by Gustave Dore.

Overview

In c.440BC, Protagoras prefaced a book with the words: "I cannot say whether gods exist or not", and for this, by order of the Athenians, he was banished from their city and territory, and had his books publicly burnt. [7]

In 391AD, Roman emperor Theodosius I declared paganism illegal, after which either all or part of the Library of Alexandria, the storehouse of the world's knowledge, was **burned** down.

In 642, Alexandria was captured by the Muslims, who, under orders of Caliph Omar, burned all books, per the following logic:

> "If those books are in agreement with the Quran, we have no need of them; and if these are opposed to the Quran, destroy them."

In 1546, French scientific scholar Etienne Dolet (1509-1546), in 1535, was rumored to be a "materialist" and to deny the immortality of the soul (Ñº), and eventually was convicted of the "crime" of atheism, tortured and then **burned**, with his books:

In 1766, Francois-Jean de La Barre (1745-1766) (Ñº), at the age of 19, was burned, alongside a copy of Voltaire's *Philosophical Dictionary* (1764), for the treasonous act of owing a copy of the banned book.

Froude | Oxford book burning

In 1841, English

reverend and Oxford moral philosophy professor William Sewell published *Christian Morals*, wherein he argued that modern sciences, e.g. chemical findings, such as certain metals burn under water, sided with Christianity. [1]

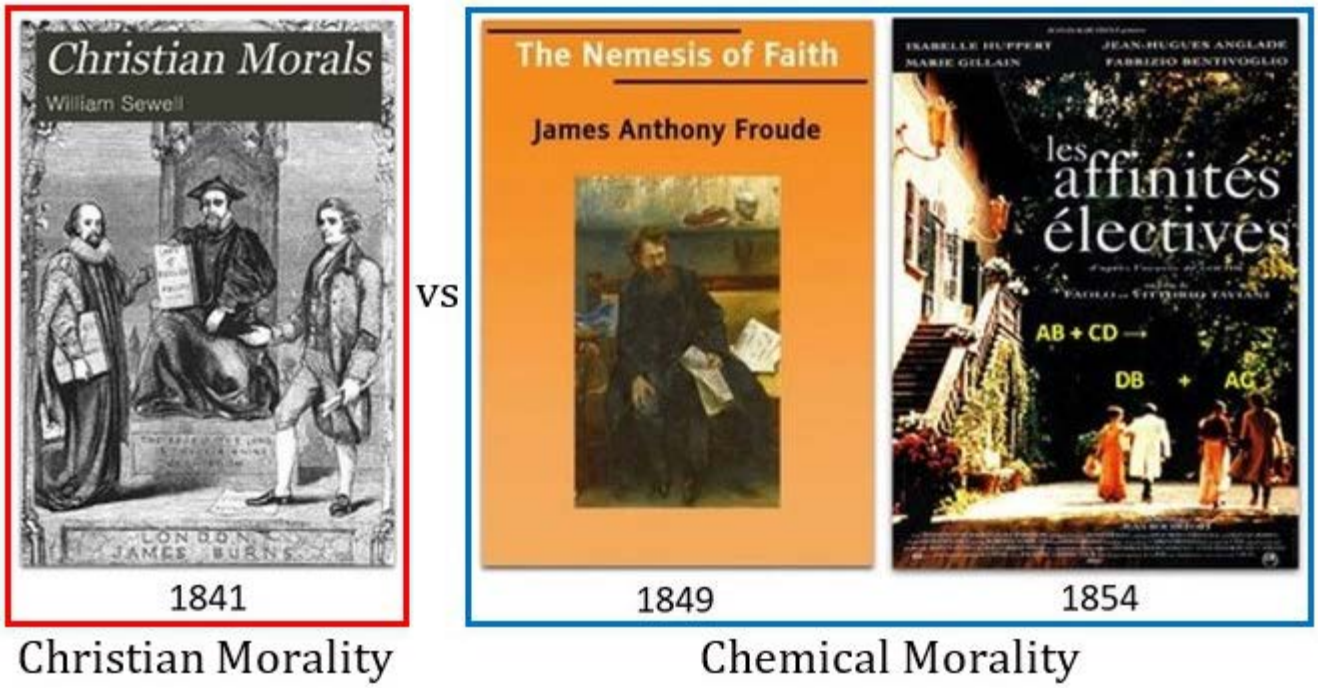

In 1841, English reverend and Oxford moral philosophy professor William Sewell published *Christian Morals*, wherein he argued that modern sciences, e.g. chemical findings, such as certain metals burn under water, sided with Christianity; in 1849, Sewell burned James Froude's *Nemesis of Faith*, a treatise on how modern science causes one to lose one's Christian faith; in 1854, Froude did the first English translation of Goethe's *Elective Affinities*, wherein it is shown how chemical findings allows one to create a new system of morality, based on physical chemistry, via interpretation of the "moral symbols" describing the heat and work aspects of chemical reactions, people explicitly conceived as being large "metamorphized", i.e. evolved, types of animate chemicals.

In 1849, English clergyman-abnegator and writer James Froude published his semi-autobiographical novel *Nemesis of Faith*, about a young priest whose faith comes into question in light of early 19th-century developments in science and history; the following is a representative statement from the novel: [2]

> "What is man the wiser or the happier for knowing how the air-plants feed, or how my centuries the flint-stone was in forming, unless the knowledge of them can be linked on to humanity, and elucidate for us some of our hard moral mysteries?"

While great thinkers, such as George Eliot, professed profound admiration for the novel, others, specifically English religious figures, condemned the novel. [3]

On 27 Feb 1849, Froude's book was burned in a Tuesday moral philosopher class at Oxford by Sewell—an incident summarized by Exeter College historian Charles Boase (1894), via citation to an 1892 letter published by the owner of the book Arthur Blomfield, as follows: [4]

> Charles Boase (1894): "It was at one of these lectures that Sewell burnt a book which he thought obnoxious, in 1849, the last time a book has been publicly burnt in a College hall. The scene is thus described by the owner of the book, Arthur Blomfield, now R. of Beverston and RD. of Dursley, Glouc. [Rev. A. Blomfield of Beverston Rectory, Tetbury, Gloucestershire]:

> Arthur Blomfield (1892): 'I had just bought the *Nemesis of Faith*, or as it was called, 'Faith with a Vengeance', when on Tuesday morning, Feb. 27, 1849, I, an undergraduate of Exeter

> College, attended a lecture in hall. The Rev. William Sewell, Sub-Rector of Exeter College (not ‘Dean of the Chapel’) was lecturer. He declaimed loudly against Froude’s *Nemesis of Faith*. Hearing, on my own confession, that I possessed it, he requested me to bring ‘that book’ to him. No sooner had I complied with his request (Sewell was my college tutor) than he snatched the book from my hands and thrust it into the blazing fire of the college hall (not ‘quadrangle’). I see him now, with hall poker in hand, in delightful indignation, poking at this, to him, obnoxious book. In a few hours this ‘burning of the book’ was known all over Oxford. As your article justly remarks, ‘the burning only served as an advertisement’. ’

Sewell, supposedly, decried Froude’s work as a “wicked book” and the incident gave rise to apocryphal story that the book was burned publicly (Ñº) at Oxford, i.e. not just in a classroom setting, but at some kind of out-door public gala or event.

In more detail, in a 1892 book section on the history of “book burning”, made amid a discussion of James Farrer’s 1892 *Books Condemned to be Burnt*, we find the following retelling of the Sewell book-burning incident as follows: [5]

> “Mr. Farrer's delightful book teems with facts, and he practically covers the whole range of the subject, so far as book-burning in England is concerned. But it seems more than passing strange that the institution existed, to a certain extent, just over forty years ago, for the Rev. A. Blomfield writes from Beverston Rectory, Tetbury, Gloucestershire: "My private journal records—' Sewell burnt Froude's book.' The history is this: The burnt book was mine. I had just bought the 'Nemesis of Faith,' or as it was called, ' Faith with a Vengeance,' when on Tuesday morning, Feb. 27, 1849,1, an undergraduate of Exeter College, attended a lecture in hall. The Rev. William Sewell, Sub-Rector of Exeter College (not 'Dean of the Chapel') was lecturer. He declaimed loudly against Froude's 'Nemesis of Faith.' Hearing, on my own confession, that I possessed it, he requested me to bring 'that book to him.' No sooner had I complied with his request (Sewell was my college tutor) than he snatched the book from my hands and thrust it into the blazing fire of the college hall. I see him now, with hall poker in hand, in delightful indignation, poking at this, to him, obnoxious book. In a few hours this ' burning of the book' was known all over Oxford. The book became famous—editions multiplied. I lost my 'Nemesis of Faith;' I think I lost 'Faith' in my college tutor, for at least he should have recouped costs (3s. 6d., I believe, was the book's price), or presented me with an antidote in the form of one of his books—*e.g.,*'Sewell's Christian Morals.' Not he. O temporal O mores!'”

(add discussion)

Dover mural

A photo of Dover High School student Zach Strausbaugh’s 1998 evolution mural, which was burned in 2003 by 68-year-old janitor Larry Reeser because it “offended his faith, was obscene, and was full of lies” and his granddaughter was about to start school there that year.

In Aug 2003, in Dover Area High School, Dover, Pennsylvania, Larry Reeser (1935-), the then 68-year-old building and groundskeeper, of the high school, whose granddaughter was about to start ninth grade there, took down art and science student Zach Strausbaugh’s 1998 evolution mural, a 4x16-foot depiction of prehumen hominids into more modern types, an “ape evolving into upright human” depiction, took it home, and together with one of the school board members, watched the mural burn, because as Reeser later told reporter Lauri Lebo, the painting “offended his faith, was obscene,

and was full of lies". The schoolboard member, who was there for the burning, either Alan Bonsell or Bill Buckingham, later told science department head Bertha Spahr, that he "gleefully watched it burn." [6]

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3. The Nemesis of Faith – Wikipedia.
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θΔics

In terminology, **boredom philosophy**, or "ennui philosophy", refers to the philosophical fruit of an ennui-sensitive thinker, i.e. someone very sensitive to boredom, according to which the philosophical work produced by such a thinker is a means fix the situation, i.e. to engage the "flow state", as Csikszentmihalyi would say, wherein a feeling of timelessness and freedom seemingly exists; or as German polymath Johann Goethe famously put it, at the age of eighty, a boredom philosopher, is a person who distances oneself from phenomena, interactions, reactions, processes or states of existence that might lead one to "die of *ennui*" in the mind.

Overview

The list of so-called "boredom philosophers", according to Lars Svendsen (2005), include: Pascal, Rousseau, Kant, Schopenhauer, Kierkegaard, Nietzsche, Heidegger, Benjamin, Adorno, Goethe (IQ:230|#1), Flaubert, Stendhal, Mann, Beckett, Buchner, Dostoevsky, Chekhov, Baudelaire, Leopardi, Proust, Byron, Eliot, Ibsen, Valery, Bernanos, and Pessoa, and Peter Zapffe. [1]

Writer Maria Popova conjectures that so-called Chsikszentmihalyi flow state the ennui philosopher's escape from the ravaged memories of past states of boredom:

> "**Boredom** appears to be the polar opposite of what Mihaly Csikszentmihalyi has famously termed 'flow', a state of intense focus you enter whilst absorbed in an enthralling task, when you lose track of time."
>
> — Maria Popova (2012), "The Cultural History and Adaptive Function of Boredome" (Ñº), a review of Peter Toohe's *Boredom: a Lively History*, Jun 6

This would seemly, according to this hypothesis, put Willard Gibbs (IQ:210|#5) into the classification of an "ennui philosopher":

> I had no sense of the value of time, of my own or others, when I wrote it."
>
> — Willard Gibbs (c.1890), reflection on writing *On the Equilibrium of Heterogeneous Substances* [3]

Likewise, Scottish physicist James Maxwell (IQ:210|#4), Gibbs' one intellectual playmate, and his famous age three repeated query "What's the go 'o that?", seems to have had a deep sensitivity to boredom, similar to

Goethe | Hirata

The similarities between German polymath Johann Goethe, cited with an IQ of 225 (Cox, 1926) and American prodigy Christopher Hirata, also cited with an IQ of 225 (Woods, 2001), who each, independently produced a variant of human chemical thermodynamics, seem to have both been afflicted with a similar type of "ennui bug".

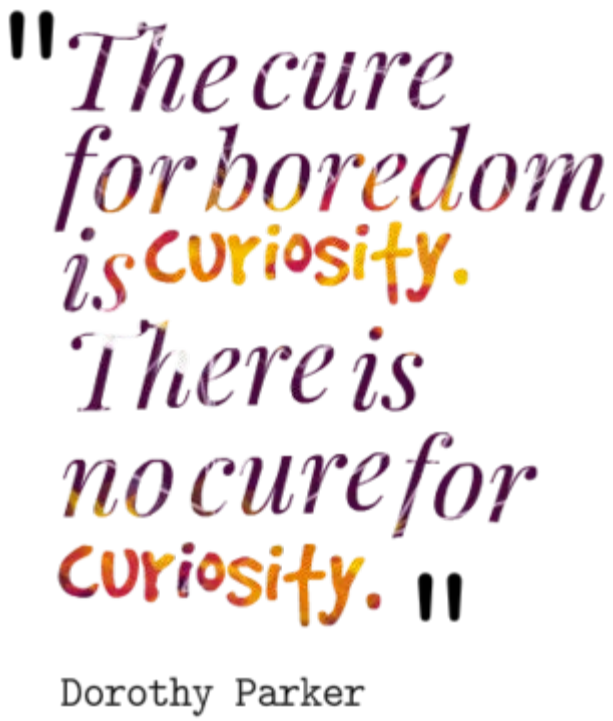

On 20 Jul 1831, Goethe, age 81, in conversation with Johann Eckermann, stated his views on ennui to the effect that the passions, whether in occupation (e.g. literature, scientific, etc.,) or with people, are the only cure for ennui for the deep-minded thinker:

> "After dinner, a short half hour with Goethe, whom I found in a very cheerful, mild humor. He spoke of various things, at last of Carlsbad; and he joked about the various love affairs which he had experienced there. "A little passion," said he, "is the only thing which can render a watering place supportable; without it, one **dies of *ennui***. I was almost always lucky enough to find there some little 'elective affinity' (*Wahlverwandtschaft*), which entertained me during the few weeks. I recollect one circumstance in particular, which even now gives me pleasure.
>
> I one day visited Frau von Reck. After a commonplace chat, I had taken my leave, and met, as I went out, a lady with two very pretty young girls. 'Who was that gentleman who just now left you?' asked the lady. 'It was Goethe,' answered Frau von Reck. 'O, how I regret,' returned the lady, 'that he did not stay, and that I have not had the happiness of making his acquaintance!' 'You have lost nothing by it, my dear,' said Frau von Reck. 'He is very dull among ladies, unless they are pretty enough to inspire him with some interest. Ladies of our age must not be expected to make him talkative or amiable.'
>
> When the two young ladies left the house with their mother, they thought of Frau von Reek's words. 'We are young, we are pretty,' said they, 'let us see if we cannot succeed in captivating and taming this renowned savage. The next morning, on the promenade by the Sprudel, they made me, in passing, the most graceful and amiable salutations, and I could not forbear taking the opportunity of approaching and accosting them. They were charming! I spoke to them again and again, they led me to their mother, and so I was caught. From that time we saw each other daily, nay, we spent whole days together. In order to make our connection more intimate, it happened that the betrothed of the one arrived, when I devoted myself more exclusively to the other. I was also very amiable to the mother, as may be imagined; in fact, we were all thoroughly pleased with one another, and I spent so many happy days with this family, that the recollection of them is even now highly agreeable. The two girls soon related to me the conversation between their mother and Frau von Reck, describing the conspiracy which they had contrived for my conquest, and brought to a fortunate issue."

In 1995, Hirata, age 12, similarly, while simultaneously enrolled in junior high and Deerfield High School, IL, where he was completing college-level courses in physics and multivariable calculus (see: prodigies and calculus), where he was tutored by the high school's top student, spending his spare time reading novels, such as Fyodor Dostoyevsky's *Crime and Punishment* (1866); stated the following:

> "I'm **bored** at the junior high school. The pace is too slow. It's a more stimulating environment at the high school."

— Christopher Hirata (1995), *Chicago Tribune* Interview

This, of course, was a year before he would score 5th in the world (and 1st among Americans) in the International Physics Olympiad in Oslo, Sweden, after 10-hours of completion, against 259 of the brightest (age 19 or less) minds in the world, from a total of 56-countries, therein setting a world record for "youngest medalist" at the IPO.

Thims

American electrochemical engineer Libb Thims would seem to be classified as a boredom philosopher, being that the seeming reason he was held-back in second grade, and made to take the entire year over again, at a new school, the following year, owed to report cards, by his teachers, stating that he was “board” in class (something Thims discovered in boxes in the basement, in his coming-into adult age (circa early teens). It was at this point, going forward until an age 19 high school graduation, that Thims completely detached from the educational process, sitting in the back of the class for the next 11 years (grades 2-12), remaining a passive observer, calmly waiting until the day he would be set-free from cultural mandated state educational “imprisonment”, so to say.

Quotes

The following are related quotes:

> “Two enemies of human happiness are pain and **boredom**.”
>
> — Arthur Schopenhauer (c.1840) (Ñº)

> “Real orgies are never so exciting as pornographic books. In a volume by Pierre Louys all the girls are young and their figures perfect; there's no hiccoughing or bad breath, no fatigue or **boredom**, no sudden recollections of unpaid bills or business letters unanswered, to interrupt the raptures. Art gives you the sensation, the thought, the feeling quite pure—chemically pure, I mean, [with a laugh] not morally.”
>
> — Aldous Huxley (1928), *Point Counter Point* [2]

> “What can possibly be more existentially disturbing than **boredom**?”
>
> — Jon Hellesnes (c.1990) [1]

> “**Boredom** always precedes a period of great creativity.”
>
> — Robert Pirsig (c.1991) (Ñº)

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3. Cropper, William H. (2004). *Great Physicists: the Life and Times of Leading Physicists from Galileo to Hawking*, (section II: Thermodynamics, pgs. 41-134; ch. 9: “The Greatest Simplicity: Willard Gibbs”, pgs 106-23). Oxford University Press.
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θΔics

In existographies, **Boris Sidis** (1867-1923) (CR:34) was a Russian-born American psychologist noted, in psychodynamics, for his development and testing with William James, of the 1890s reserve energy theory of accelerated mental development.

Overview

In 1890s, Boris Sidis began to develop the reserve energy theory of accelerated mental development with his mentor William James.

In 1898, his son William Sidis was born, and with him he began to test out, in theory, James' reserve energy theory on the new child, the result of which became the most-famous of all forced prodigy experiments. [3]

William Sidis, would later go on to write (1920) a treatise on life theorized to be the operation of reserve energy acting the part of Maxwell's demon. [1]

Education

In Russia, at age 15, he was locked in a body-sized cell for two years (1884-86) as punishment for teaching peasants to read, an act misconstrued as a conspiracy plot; was released on the condition that he renounce all education. Left to America, and upon arriving at age 17 commented that:

> "When I first set foot in the Boston Public Library, I felt as though the gates of heaven had opened to me."
>
> — Boris Sidis (1884), age 17 mental note, upon arriving in America

In short, Sidis was primarily autodidactic. A significantly influence, however, was his Harvard PhD advisor psychologist William James, to whom he named his son after.

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Further reading

â— Sidis, Boris. (1913). *The Psychology of Laughter* (ch. 8: The Ludicrous and Reserve Energy, pgs. 67-73). Appleton.

External links

â— Boris Sidis – Wikipedia.

θΔics

In existographies, **Borisas Cimbleris** (1923-2000) was a Lithuanian-born Brazilian metallurgical-nuclear engineer, physicist, and thermodynamicist noted, in economic thermodynamics, for his *circa* 1985 article "Economy and Thermodynamics", wherein he argues that money is equivalent to the 'ability to make other people work', and therefore since work is the central term of thermodynamics, money is one of the underlying functional units, or something along these lines, in the thermodynamics of economies.

Overview

In 1985, Cimbleris, in his "Economy and Thermodynamics", argued the following:

> "An elementary definition of energy is 'capacity of producing work'. A rough definition of money is the 'ability to make other people work'. Money and its equivalents are the motive power of human action. This is admittedly cheap philosophy, but it works. This paper tries to associate classical economists' ideas, of the last two centuries, with the concepts of thermodynamics. [Note: I must emphasize that this work is merely a translation of an unpublished paper written in the 80's. (I don't remember when and why). I'm sorry that I wasn't able to update it, 1998]."

His article is fairly decently researched, for a forgotten unpublished article, citing: Erwin Schrodinger, Leon Brillouin, Adam Smith, Paul Samuelson, Leon Walras, John Neumann, who he associates with the 1960 work of Italian economist Piero Sraffa, as both interpreting economy in terms of matter and energy, Vilfredo Pareto, Frederick Soddy, John Mill, Herbert Spencer, Balfour Stewart, Howard Scott, and Nicholas Georgescu-Roegen. He also introduces a few thermodynamics concepts and functions, such as: exergy, Gibbs free energy, and chemical potential, albeit with only superficial economic understanding.

Religion

The following is a quote from Cimbleris' 1998 "Economics and Thermodynamics" article, which gives some insight into his religious position:

> "A resource can be land, capital, energy, materials and combinations of such. Yet they have to be either tangible or measurable. The inborn resources of a human being are just body and soul. The soul is intangible. Gogol invented the business of selling dead souls, but nowadays there is little demand for these."

The selling of "dead souls" here refers to Russian author Nikolai Gogol's 1842 novel *Dead Souls*, a lampooning of sorts on the archaic Russian Empire practice of landowners owning surfs, and their "souls", to work their land, and how in bookkeeping counting terms such as "six souls of serfs" were being used, being bought and sold. [4]

Discussion

A noted difficulty in Cimbleris' theory is that "money", in itself is not the motive power or driving force of human action, but rather, correctly, Gibbs free energy is driving force of human chemical reaction and in these reactions (see: human chemical reaction theory) money is defined as a secondary field particle operating in the glue or rather exchange force of the dynamics of human-human interactions, human-human bondings, and human-human debondings. [1]

Thermodynamics

Cimberlis states that one of his thermodynamics teachers was American mechanical engineer Joseph Keenan, one of the founders of the MIT school of thermodynamics. In 1998, Cimbleris was a professor emeritus of thermodynamics at the Federal University of Minas Gerais, Brazil.

Education

Cimbleris completed his undergraduate degree[s] in mining engineering, civil and metallurgical engineering at the School of Mines, Federal University of Ouro Preto, Brazil, his MS in nuclear engineering at the University of North Carolina and at the Illinois Institute of Technology, a PhD in nuclear engineering at the University of Michigan, and a PhD in physics at the Brazilian Center for Physics Research. [3]

He began his career at Armour Research Foundation (USA). He was visiting professor at the University of Michigan, Polytechnic School of São Paulo, the Federal University of Pernambuco, and the Massachusetts Institute of Technology, Cambridge. He has held teaching positions at North Carolina State College, during graduate of Nuclear Engineering at UFMG, the National School of Engineering and the School of Engineering at UFMG. He was responsible, along with 6 more teachers for the implementation and development of postgraduate studies in management at UFMG teacher Aloisio pepper.

As a university administrator, he was head of the department of mechanical engineering and thermal engineering, School of Engineering, UFMG. Even at UFMG, was a member of the Board of Research, course coordinator of Nuclear Sciences and Techniques and course coordinator of graduate studies in thermal engineering. Worked in Comissariat à l'Énergie Atomique, Saclay, in France and in several laboratories thermal reactors in Germany, Sweden and England. Also, did the monitoring of licensing the reactor Aguirre (Puerto Rico).

Other

Cimbleris is the author of over 150 publications, 8 books (3 co-authored), and 8 translations of books. Entries about him are found in over five international encyclopedias. He was member of scientific societies such as the American Physical Society, History of Science Society, New York Academy of Sciences, the Brazilian Society for the Progress of Science and the Brazilian Society for the History of Science. He was a polyglot, mastered 35 languages, â€‹â€‹and was translator of over 25 technical publications. He left society's legacy with a library collection of over 15,000 copies, in several areas.

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3. Borisas Cimbleris (Portuguese → English) – Library School of Engineering, Federal University of Minas Gerais, Brazil.
4. Dead Souls – Wikipedia.

External links

â— Borisas Cimbleris (overview) – Ecen.com.

θΔics

In chemistry, **boron**, symbol B, atomic number 5, is a metalloid element, row one of the periodic table, the nineteenth most abundant element in the person, comprising 0.00003 percent by mass of the average human molecule.

Rank	CPK (jmol)	Symbol	Z	% Mass	Electron Configuration	Picture
19		B	5	0.00003	$[\mathrm{He}]2s^2 2p^1$	

Function

A trace mineral essential for healthy bones.

Human molecular formula

The position of the element nitrogen in the average human molecular formula is as follows:

Structure (Bohr model):

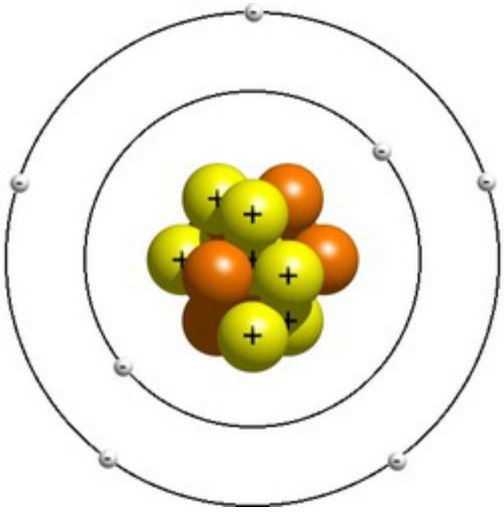

$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}$

$Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$

External links

â— Boron – Wikipedia.

θΔics

In particles, **boson**, as contrasted with fermion, is an elementary particle, with integer spin (1, 2, etc.), which conforms to Bose-Einstein statistics. [1]

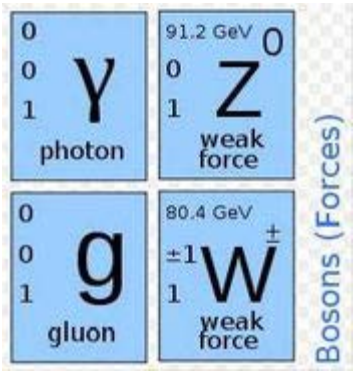

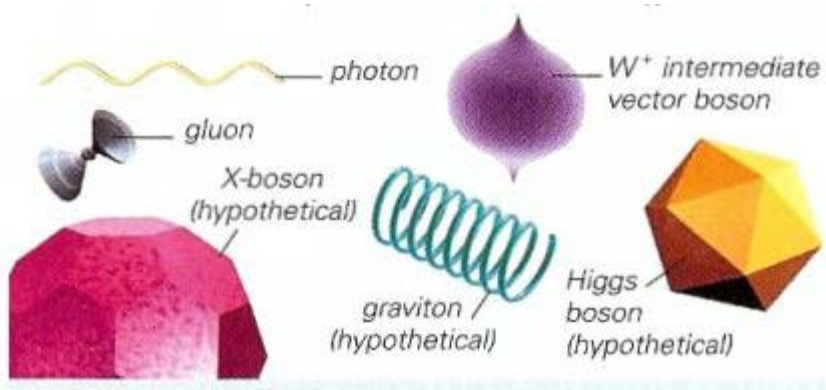

Representations of **bosons** or Gauge bosons. [6] A Higgs boson of mass ≈125 GeV has been tentatively confirmed by CERN on 14 March 2013, although unclear as yet which model the particle best supports or whether multiple Higgs bosons exist

Overview

Bosons are particles that make up what is usually conceptualized the as the transmission of forces, e.g. the photon carries the electromagnetic force. Photons are not conserved, e.g. photons are created in billions when a light switch is turned on, and disappear when they are absorbed by photons. [2]

Etymology

The term "boson", named in honor of Indian physicist Satyendra Bose (1894-1974), was coined by English theoretical physicist Paul Dirac (1902-1984), during his 6 Dec 1945 lecture "Developments in Atomic Theory", referring to quantum particles that obey laws set out by German-born American physicist Albert Einstein and Bose. [3]

Quotes

The following are related quotes:

> "Are humans fermions or **bosons**?"
>
> — Ed Stephan (1977), speculative discussions with physicist Louis Barrett [4]

> "All entities, whether fermions or humans, need some mediating agency to interconnect them into systems. This indispensable interrelating and interacting role is ultimately played by different field particles named **bosons**. Unlike fermions, which are characterized by a significant mass and charge, bosons do not take partake of these to attributes. Rather, they only have spins and provide connections as they are exchanged among fermions."
>
> — Paris Arnopoulos (1995), *Sociophysics* [5]

> **Bosons** are red
> Mesons are blue
> I like to classify
> Hadrons with you
>
> — Anon (c.2012)

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External links

â— Boson – Wikipedia.

θΔics

In thermodynamics, **bound energy** or *gebundene energie* (German), TS, is the amount of energy of a system that unavailable to do external work. [1] The product is defined, according to Hermann Helmholtz, the 1882 coiner of the term, as "expressing the mechanical equivalent of that quantity of heat Q which must be conveyed into a body at temperature *T* in order to raise its entropy to the value *S*."

The remaining portion of energy, namely that which can be converted into external useful work, is called "free energy". [4]

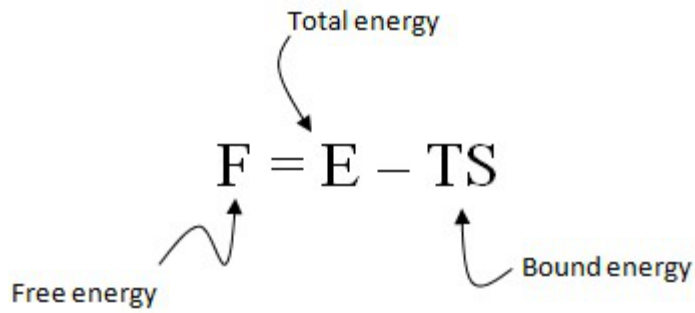

A depiction of the location of **bound energy** for the isothermal-isochoric potential, aka Helmholtz free energy (or Helmholtz energy).

Etymology

The etymology of the term derives from various difficulties in the development of the theory of chemical affinity, during the years 1750 to 1850, approximately. [2] Helmholtz's derivation rested primarily on the work of Clausius. In 1854, Clausius had stated, in a phrasing similar to French chemist Antoine Lavoisier's 'combined heat', that during a complete cycle there is a *Verwandlungsinhalt* or 'bound transformation content', which he denoted by the integral of dQ/T between T_1 and T_2, and which he later termed entropy [3]. On this terminology, Helmholtz conceptually divided the portion of the total energy *U* available for conversion to other forms as 'free energy', *G* or *F*, and the residual 'bound energy', *TS*. [5]

The term *bound energy* was latter used, via extrapolation, to distinguish conceptions of energies in human systems by those as Nicholas Georgescu-Roegen and Xenophon Zolotas**.**

Overview

In general, Helmholtz pointed out, any external work takes place at the expense of free energy, while heat production results in a loss of bound energy only (a result which is not valid for adiabatic processes). If the temperature of a chemical system increases, free energy is converted into bound energy. [2]

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5. Kubo, Ryogo. (1976). *Thermodynamics* (Divertissement 8: On the Names of Thermodynamic Functions). North Holland.

θΔics

In science, a **bound state** is a composite of two or more fundamental building blocks, such as particles, atoms, or bodies, that behaves as a single object and in which energy is required to split them. [1] As diagrammed adjacent, both a proton and a (human) family can be modeled as bound state structures, from certain perspectives.

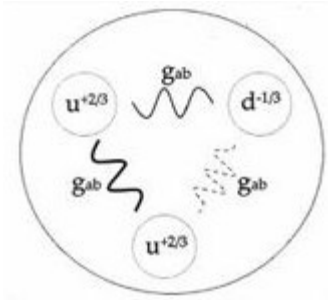

Proton: a **bound state** of three quarks.

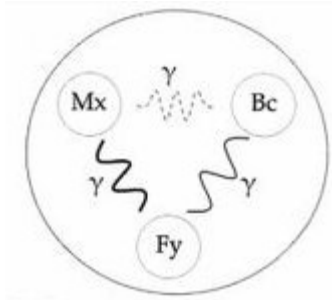

Family: a **bound state** of three human molecules.

Human chemistry

In certain calculations of human chemistry, such as in the simulation of human molecular orbitals, i.e. the high-speed, time-accelerated, satellite tracking movements of a person in their probabilistic activity spheres, or in the use of human particle Feynman diagrams, etc., it is expedient to define the person or human molecule, using the "human particle" model, to be a *bound state* atomic structure, of approximately 10E27 atoms, linked together via photon-electron binding interactions. [2]

Subsequently, examples of bound state structures include the proton, which is a bound state of three quarks, the atomic nuclei, which is a bound state of protons and neutrons, and a molecule, which is a bound state of atoms. Thus, not only is a human molecule scientifically defined as a bound state composite structure, but also so is a married couple, AB, which is a bound state of two human molecules *A* and *B*. A family, MxFyBc, similarly, is a bound state structure of three or more human molecules, Mx, Fy, and Bc, as diagrammed.

This terminology, likewise, applies to larger structures such as groups, friendships, networks, corporations, countries, a solar system, or even galaxies. Galaxies, for example, are cohesive bound states of star systems. Collections of galaxies, in turn, congregate to form what are called *galactic clusters*, which are also bound states. [3]

A Feynman diagram type depiction of three human particles, i.e. each human molecule (person) viewed as a **bound state** atomic structure, interacting via exchange forces.

In this sense, human interactions can be observed at a distance such that each human is seen or visualized as being a small point of undefined bound mass, symbolized by a finite dot 'â— ', moving on an approximate two-dimensional surface, such as would be the view through a large advanced-intelligence *macroscope*, as diagrammed adjacent.

References

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(b) Bound state – Wikipedia.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (pg. 183-86). (preview), (Google books). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (Google books). Morrisville, NC: LuLu.
3. Kaufmann, W.J. (1994). *Universe.* New York: W.H. Freeman and Co.

θΔics

In thermodynamics, a **boundary** or *thermodynamic boundary* is the division, which may be material or not, between a system and its surroundings. [1] The original thermodynamic boundary was edge or region of demarcation of the volumetric body of water or water vapor in a steam engine. Through the actions of the opening and closing of valves, the body of water was able to move around to different parts of the engine, specifically the region of the boiler (burning coal) and the region of the condenser (an external stream of cooling water); hence the boundary was moving one.

In 1824, French physicist Sadi Carnot generalized this by defining a "working substance" to be any generalized body, such as a metallic bar, an aeriform fluid, etc., that may configured to do work when put in alternating contact with hot and cold bodies able to supply or absorb heat. [2]

Human thermodynamics

In human thermodynamics the definition is the same, however, the assignment of a "boundary" to human systems, e.g. social, territorial, work, family, community, "relationship boundaries", etc., is difficult area of research. In general, a thermodynamic boundary in human terms can be defined as an "energetic boundary" that partitions off a set of thermodynamically-coupled human molecules in evolving interaction. [2] This boundary can be considered as a quantitative spatial demarcation, such as a town boarder, a social barrier, state lines, corporate boundaries, occupational orbitals, social circles, family boundaries, etc., comprise a closed thermodynamic system of working molecules, i.e. a *working body* in the words of Clausius, according to which first and second law energy balances apply in the production of system external work W due to the action of cyclical solar heat input Q_{in}. When human molecules pass into the system, across the boundary, inside of which energy interactions occur, chemical potential calculations must be introduced. [3]

See also

â— Boundary problem
â— Chimpanzee war

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics*, Oxford: Oxford University Press.
2. Carnot, Sadi. (1824). “Reflections on the Motive Power of Fire and on Machines Fitted to Develop that Power.” Paris: Chez Bachelier, Libraire, Quai Des Augustins, No. 55.
3. Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (Index: "boundary", pgs. 61-80). Morrisville, NC: LuLu.

θΔics

In hmolscience, **boundary problem** or boundary issue refers to the difficulties of having to determine and discern thermodynamics boundaries for social systems or economic systems, namely systems of reacting powered animate molecules socially affined into energetically regulated territories.

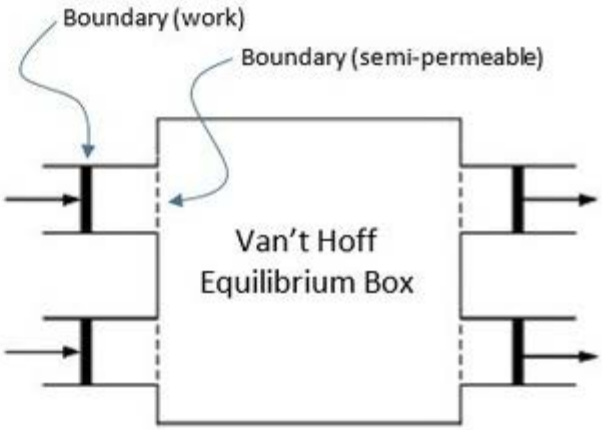

Left: an example of a social boundary demarcated by a boundary line sign on a barbed wired fence, which visually exemplifies the **boundary problem** difficulties in attempts to quantify societal "boundaries" in thermodynamic terms, in terms of work, energy, and heat crossings or closedness or openness aspects.
Right: a van't Hoff equilibrium box (1886), build and by Danish physical chemist Jacobus van't Hoff, used to calculate the work done when certain chemical species cross a semi-permeable membrane; such as could be deduced for when say a Mexican species of person crosses illegally (or legally) into the American system across the semi-permeable boundary of the US border, the work cost of which typically amounts to several thousands of dollars per smuggle.

Overview

In basic thermodynamic calculations, in a piston and cylinder or in reaction calorimeter, etc., the "boundary" is visually discernible and precisely quantifiable. In applications of thermodynamics to the humanities or lower animal forms, the issue becomes more complicated because in many cases, e.g. Mean girls example, the so-called "social boundary" is not something tactile that one can put one's hands on, such as the wall of a glass beaker or the wall of the cylinder of a piston, but rather a distance of space around certain people (e.g. personal space).

In the famous Jane Goodall chimpanzee war, to exemplify the difficulties in having to discern thermodynamic boundaries for social systems, the divisional "boundary" between the two warring factions, in this case, was but a region of forest near a large rock formation.

In 1989, American chemical engineer Linus Pauling in his criticism of Austrian physicist Erwin Schrodinger's 1943 "life feeds on negative entropy" postulate (see: Note to chapter 6), though he doesn't seem to specifically mention boundary, per se, he does criticize Schrodinger for not defining the boundary: [1]

> "Schrodinger's discussion of thermodynamics is vague and superficial to an extent that should not be tolerated even in a popular lecture. In the discussion of thermodynamic quantities it is important to define the system. When he is writing about a change in entropy of the system, Schrodinger never even defines the system. Sometimes he seems to consider that the system is a living organism with no interaction whatever with the environment; and sometimes it is a living organism in thermal equilibrium with the environment; and sometimes it is the living organism plus the environment, that is the universe as a whole."

In 1990, American social entropy theorist Kenneth Bailey spoke about the "boundary problem", discussing ideas such as boundary analysis and entropy breaks; though his presentation is largely marred by recourse to information theory. [2]

In 1996, American economist Julian Simon, in criticism of the economic thermodynamics theories of those including Nicholas Georgescu-Roegen (1971) and Jeremy Rifkin (1989), he comments on this difficult boundary issue in saying that: [3]

> "It is quite unclear where the boundary should be drawn for discussions of the quantity of energy, or if there is any relevant boundary."

(add)

Quotes

The following are related quotes:

> "Boundaries pose a problem for sociology."
>
> — Richard Adams (1988), *The Eight Day* (pg. 143)

See also

â— Boundary surface

References

1. Pauling, Linus. (1989). "Schrodinger's Contribution to Chemistry and Biology", in: *Schrodinger: Centenary Celebration of a Polymath* (§18, pgs. 225-). Cambridge University Press.
2. Bailey, Kenneth D. (1990). *Social Entropy Theory* (terms: "boundary problem", "boundary analysis", pg. 18-19; section: Boundaries, pgs. 157-62). New York: State University of New York Press.
3. Simon, Julian L. (1996). *The Ultimate Resource 2* (ch. 4: Grand Theory, section: Entropy and Finiteness: the Irrelevant Dismal Theory, pgs. 77-83). 1981 1st ed. Princeton University Press.

θΔics

In thermodynamics, a **boundary surface** is the term used by American mathematical physicist William Sidis in 1920 to describe the surface region or boundary of space around a black hole viewed in terms of it being thermodynamic system or working body. [1]

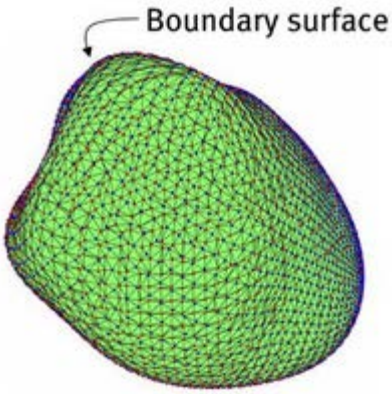

A generic example of a boundary surface around a shape.

References

1. Sidis, William J. (1920). *The Animate and the Inanimate* (ch. 8: Stellar Hypothesis). Publisher: R.G. Badger, 1925.

θΔics

In gas laws, **Boyle's law** (TR:69), aka "Towneley's hypothesis" (Boyle, 1662) or "Mariotte's law" (in Europe), states that for a system of gas particles (atoms and or molecules) at constant particle number and temperature the pressure and volume of the gas are inversely related. This is stated in equation form as:

$$PV = K\,|_{n,T}$$

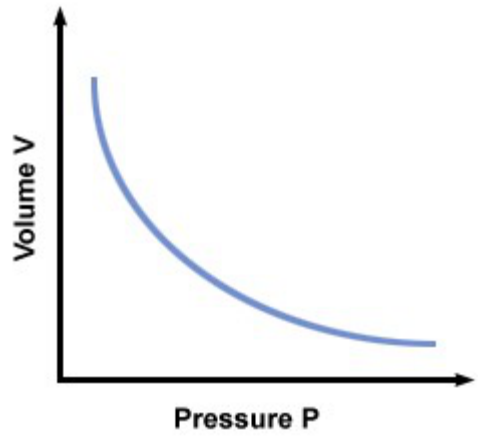

Graphical depiction of **Boyle's law**: that pressure *P* and volume *V* of a body of gas bodies vary inversely:

$$P \propto \frac{1}{V}$$

Said another way, Boyle's law states that for a body of gas at constant number of particles *n* and temperature *T* the product of the measure of the pressure *P* and volume *V* of gas will be a constant *K*. The law was stated in 1662 by Irish chemist Robert Boyle.

Towneley-Power

In 1653, Englishman scientist Richard Towneley and physician Henry Power began performing various experiments, supposedly with vacuums and barometers, among other devices, out of which they elucidated the gas law that pressure varies inversely with volume.

The story as to how this result came to be known as Boyle's law, however, is a bit convoluted. Initially, Towneley and Power, being amateur scientists, did not publish their results immediately, but that in 1660, following the publication of Irish chemist Robert Boyle's *New Experiments on the Spring of the Air*, Power sent a paper entitled "Additional Experiments Made at Towneley Hall, in the Years 1660 and 1661, by the Advice and Assistance of that Heroic and Worthy Gentleman Richard Towneley", to his friend English physician William Croone (1633-1684), in London. [3] Power, however, neglected to put his name on the paper and Croone, likewise, failed to mention who the author of the paper was, when he sent the paper to Boyle.

Boyle, in turn, read the paper and in the 1662, second edition of his *Spring of the Air*, credited Towneley for the discovery of the gas law, and stated in a reply to Jesuit scientist Francis Linus (1595-1675), a prominent objector to the first edition, that he had not realized that the relation that pressure times volume equals a constant applied to his own data until Richard Towneley pointed it out. [4] This was Boyle's first mention of the law that the volume of a gas varies inversely to the pressure of the gas.

According to another version as to how Boyle may have become acquainted with the Towneley-Power experimental work, there is some mention that Power may have incorporated some version of the pressure times volume equals constant gas law in his 1661 manuscript *Experimental Philosophy*, and that and early draft of this was seen by Boyle. [6] Another proposal is that Towneley may have discussed his gas law with Boyle when he visited London in the winter of 1661-62. These latter two suppositions, however, are in need of further corroboration.

Boyle-Hooke

Prior to receiving the Power-Towneley gas law theory, in 1658, Boyle and his assistant Robert Hooke had built a combination air pump-vacuum, or what they called a "pneumatical engine", based on the design of German engineer Otto Guericke's vacuum pump in the 1657 book *Mechanical Hydraulic Pneumatics* by German scientist Gaspar Schott. [1] After conducting a number of experiments with their air pump, Boyle, as mentioned, published the results in the 1660 book *New Experiments on the Spring of the Air*.

It is generally viewed that the actual first enunciation of the Boyle's law is found in appendix to the 1662 second edition. Specifically, an appended second edition section A Defence of the Doctrine Touching the Spring and Weight of the Air, chapter V, entitled "Two new experiments touching the measure of the force of the spring of the air compressed and dilated", contains a statement of the Law in column six of the first table (on the condensation of air): [2]

> "What that pressure should be according to the hypothesis, that supposes the pressures and expansions to be in reciprocal proportion."

In mathematical formulation, this would translate as:

$$\text{pressure} \propto \frac{1}{\text{volume}}$$

Boyle, supposedly, confirmed the Power-Towneley discovery through experiments and published the results. Boyle's law is based on experiments with air, which he considered to be a fluid of particles at rest, within or between small invisible springs. The actual person to call this "Boyle's law" is a bit elusive, although, by 1774, the name "Boyle's law" was in common usage.

Deviations

In 1787, Dutch scientist Martinus Marum (1750-1837) set out to test whether Boyle's famous law about the inverse relation between the volume of a gas and the pressure held under all circumstances. [7] Marum found deviations from ammonia, such that at about 70 pounds of pressure (5 atmospheres), the expected drop in volume did not occur, but rather the gas began to become liquid. Marum concluded: [8]

> "The aeriform state of whatever fluids ceases to exist, and they are changed into liquids, when they are exposed to the necessary degree of pressure."

(add)

References

1. (a) Schott, Gaspar. (1657). *Mechanical Hydraulic Pneumatics* (*Mechanicahydraulica-pneumatica*). Würtzburg.
(b) Wilson, George. (1849). "On the Early History of the Air-Pump in England", *The Edinburgh New Philosophical Journal*, (pgs. 330-54).
2. Baldwin, W.G. (1998). "Excerpts on Boyle's Law", *University of Manitoba.*
3. William Croone – Wikipedia.
4. Holton, Gerarld J. and Brush, Stephen G. (2001). *Physics, the Human Adventure: from Copernicus to Einstein and Beyond* (pg. 270). Rutgers University Press.
5. Francis Line – Wikipedia.
6. Power, Henry. (1663). *Experimental Philosophy, in Three Books: Containing New Experiments, Microscopical, Mercurial, Magnetical. With some Deductions, and Probable Hypotheses, Raised from Them, in Avouchment and Illustration of the Now Famous Atomical Hypothesis* (Boyle, 15+ pgs). London: Martin & Allestry.

Further reading

â— Agassi, Joseph. (1977). "Who Discovered Boyle's Law", *Studies in the History of Philosophy*, 8:202.

External links

â— Boyle's law – Wikipedia.

θΔics

In gas laws, **Boyle-Charles law** refers to the combination of Boyle's law (1969):

$$PV = K \mid_{n,T}$$

and Charles' law (1787):

$$V = KT \mid_{n,P}$$

into a single gas law formula, of which several varieties seem to exist. A derivation still needs to be found as to the typical way in which these two equations are combined.

To cite one example, however, in one 1890 publication, the phrase "ideal perfect gas" was being used in relation to gases that obeyed the 'laws of Charles and Boyle' (or Boyle-Charles law), as defined by the following "characteristic equation": [1]

$$\frac{PV}{T} = K$$

which says that the ratio of the product of the pressure and the volume of the gas by the temperature is constant for in ideal perfect gas. The term 'perfect' in this case a residual carry-over from the earlier days of attempts to make a 'perfect vacuum' (perfect gas) in gunpowder engine. In most cases the phrase Boyle-Charles law was a precursor synonym for the later term 'ideal gas law', which arrived after the concept of the mole or particle count unit *n* was invented. In short, the name Boyle-Charles law, in general sense, seems to be a layperson's term used as a synonym for the ideal gas law.

References

1. Robinson, William. (1890). *Gas and Petroleum Engines: A Practical Treatise on the Internal Combustion Engine*, (pg. 422). E. & F.N. Spon.

θΔics

In dating systems, **BP**, or “Before Printing”, as compared to PE, or “Printing Era”, is the modern hmolscience, non religio-mythology based, printing era dating system acronym for the older BC, or “Before Christ”, colloquial Western culture *Anno Domini* dating system, according to which the year zero (0 PE) is assigned to the year of the invention of the Guttenberg printing press, by German inventor Johannes Gutenberg, which occurred in the year 1450 AD, in the *Anno Domini* dating system, or 0 PE in the *Printing Era* dating system, which cosmologically occurred six years prior to the 23 documented passing of Haley’s comet, and in which the year 1 BP(1449 AD) occurred the year prior, which count backwards, similar to the years BC. [1]

4 BP	3 BP	2 BP	1 BP	0 PE	1 PE	2 PE	3 PE	4 PE
1446 AD	1447 AD	1448 AD	1449 AD	1450 AD	1451 AD	1452 AD	1453 AD	1454 AD

← Before Printing | Printing Era →

The **BP** (before printing) / PE (printing era) "printing era dating system", based on the year of the invention of the Gutenberg printing press, introduced in 2012 (562 PE) by American electrochemical engineer Libb Thims. [1]

English physicist Isaac Newton, in the 18th century, objected to the label "AD", based on his objection to the existence of the trinity, and would use "AC", or *Anno Christum*, in its place.

Etymology

English physicist Isaac Newton (1643-1727) (193-277 PE) was one of the first prominent researchers in this area, albeit research done incognito, and he would objectionably not label years as AD, but instead used AC (*Anno Christum*), signifying is objection to the argument of the existence of the trinity, namely his view that a person named Jesus may have existed, may have been the son of God, and may have been christened or arisen, but definitely was not the ‘Lord’ or God. [5]

The BP/PE Guttenberg dating system was introduced in the 2012 manuscript *Purpose? (in a Godless universe)* by American electrochemical engineer Libb Thims, based on the fact that the current BC/AD dating system is a baseless system, namely based on the birth (0 AD) (1450 BP) or synthesis of the religio-mythological figure of the god/person named Jesus Christ, and hence Christianity a "Ab-Ra-ham-ic" faith which, in turn is based or rather a transmogrification/syncretism of the earlier religio-mythological figure of the Egyptian god Osiris and his god/son Horus, as retold annually in the famous “Passion of Osiris” (2400-400BC) or “Passion of Christ” (300 AD-present), all of which, Hinduism (a "B-Ra-hma-ic" faith) and Islam (an "Ab-Ra-ham-ic" faith) included, date back or rather originated in the pre-Dynastic Egyptian era (4000 BC) sun (Ra) birth/death theory (Anunian theology/Ra mythology). [1]

To cite one dominant strong opinion on the matter, without further into prolonged discussion, the following is French emperor Napoleon Bonaparte's educated views on matter of the existence of a religio-mythology figure of Jesus Christ (Greek), a term which translates as "God Osiris-Horus Anointed" (Egyptian), as follows: [7]

“I have dictated thirty pages on the world’s three religions; and I have read the Bible. My own mind is made up. I do not think Jesus Christ ever existed.”

– Napoleon Bonaparte (367 PE)
French emperor

Hence, the use of a dating system based on the date of something that never existed, especially in a hard science encyclopedia, is in congruent and in need of reform—hence the new 2013 “BP/PE” dating system implementation in *Hmolpedia* articles.

The BP/PE dating system was introduced online, namely into the Empedocles article, on 14 Apr 2013, prior to Thims' 16 Apr 2013 lecture, entitled “A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies”, in which he planned to introduce Empedocles' circa 450 BC (1900 BP) chemical aphorisms about people, as poetically discussed in his *On Nature*; who, in turn, was cited by German polymath Johann Goethe, in his 1809 (359 PE) physical chemistry based *Elective Affinities*; whom, in turn, were both cited by German solid state physicist Jurgen Mimkes in his 2000 (550 PE) article "Society as a Many Particle System": [3]

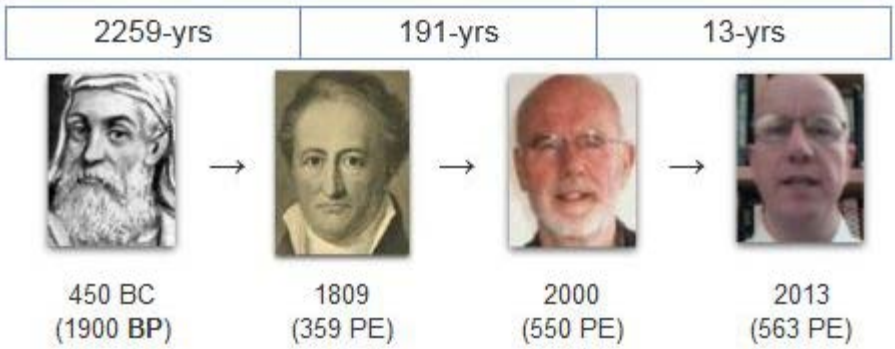

A gist learning curve chronology of the evolution of the BP/PE printing era dating system, in terms of the citation building blocks of the some of the main founders of hmolscience, namely: Empedocles (*On Nature*, 450BC), Goethe (*Elective Affinities*, 1809) Mimkes ("Society as a Many Particle System", 2000), and Thims ("A Guidemap to Human Chemical Thermodynamics"), who all, in turn, cited each other, progressively, in a successive build up.

> “This idea goes back to Empedocles of Acragas (495-435 BC). In his book *On Nature* he explains solubility of wine in water by the attraction and love of relatives, segregation of water and oil by the hate of enemies. J. W. Goethe (1749-1832) used this idea in his novel *Die Wahlverwandtschaften* to demonstrate that human relations depend on the chemical laws of society.”

who, all three of which, are planned to be cited in the opening of Thims' 2013 (563 PE) lecture. [4] The Empedocles-Goethe human chemical theory and modern version Mimkes-Thims human chemical thermodynamics theory are "godless" belief systems; hence the use of a god-based dating system in a godless belief system is antithetical and thus directly opposed or contrasted; mutually incompatible. The BP/PE dating system is a patch solution to this inconsistency problem.

On 15 Apr 2013, the BP/PE dating system began to be introduced online into a few Hmolpedia articles, namely: Empedocles, Isaac Newton, Johann Goethe, Libb Thims, Jurgen Mimkes, and Napoleon Bonaparte.

Anno Domini dating system

The *Anno Domini* dating system was devised in 525 AD (925 BP) by Dionysius Exiguus to enumerate the years in his Easter table. His system was to replace the Diocletian era that had been used in an old Easter table because he did not wish to continue the memory of a tyrant who persecuted Christians. The last year of the old table, Diocletian 247, was immediately followed by the first year of his table, AD 532. When he devised his table, Julian calendar years were identified by naming the consuls who held office that year—he himself stated that the "present year" was "the consulship of Probus Junior", which was 525 years "since the incarnation of our Lord Jesus Christ". Thus Dionysius implied that Jesus' Incarnation occurred 525 years earlier, without stating the specific year during which his birth or conception occurred. [2]

Quotes

The following are relevant quotes:

> “Since, we are looking at the history of God from the Jewish and Muslim as well as the Christian perspective, the terms ‘BC’ and ‘AD’, which are conventionally used in the West, are *not* appropriate.”
>
> — Karen Armstrong (1993) (542 PE), *A History of God* [6]

References

1. Thims, Libb. (2011). *Purpose? (in a Godless universe)*. (94-pg manuscript) (unfinished); Online as 105-page unfinished manuscript (14 Apr 2013) (§1: Dating system, pgs. 1-4). IoHT publications.
2. Anno Domini – Wikipedia.
3. Mimkes, Jürgen. (2000). "Society as a many-particle System" (abs), *Journal Thermal Analysis*, 60(3):1055-69.
4. Thims, Libb. (2013). "A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies" (abs) (cover) (main), Lecture to mechanical engineering thermodynamics students (professor: Milivoje Kostic), Northern Illinois University (NIU), Apr 16.
5. Gleick, James. (2003). *Isaac Newton* (pg.112). Vintage Books.
6. Armstrong, Karen. (1993). *A History of God* (Introduction, note pg. xxiii). Ballantine Books.
7. Gourgard, Gaspard. (1904). *The Talks of Napoleon at St. Helena with General Baron Gourgaud*: *together with the Journal Kept by Gourgard on Their Journey from Waterloo to St. Helena* (translated, and with notes, by Elizabeth Wormeley Latimer, author of *France in the Nineteenth Century*) (ch. 17: Religion, pgs. 270-81). A.C. McClurg & Co.

External links

â— Stardate – Wikipedia.

θΔics

In conferences, **BPE 2016** or 7th BioPhysical Economics (BPE) 2016 Meeting, see: Hmolpedia notice (Q), subtitled "Where Natural Science Meets Social Sciences" (Q), a semi-themed sociophysics conference, in association with International Society for Ecological Economics (ISEE), as coordinated by Ram Poudel, a conference originated by Charles Hall, with the original aims of studying "systems of humans and nature using ecosystems perspectives, that is, by studying material and energy flows, and applying this perspective to attempting to understand human economies from a biophysical rather than just social perspective." (Q)

A poster for the collocated joint BioPhysical Economics (BPE) 2016 + Ecological Economics (ISEE) 2016 conferences, 26-29 Jun 2016 at the University of District of Columbia, Washington, DC. [1]

Photos

The following is Libb Thims, Jurgen Mimkes, Ram Poudel, and Serge Galam discussing social physics at BPE 2016:

The following are other noted photos from the conference:

Libb Thims and Jurgen Mimkes, at BPE 2016 opening day reception; Thims holding a newly-minted copy of volume one of the 10-volume print set of *Hmolpedia*.

Victor Yakovenko, Jurgen Mimkes, and Libb Thims, grabbing some lunch, between BPE 2016 workshops, at Starbucks.

Victor Yakovenko, Robert Ayres, Jurgen Mimkes, and Libb Thims, at a conference workshop.

Reaction Existence

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

$$H_2 + \tfrac{1}{2}O_2 \rightarrow H_2O$$

A photo of the "reaction existence" icon, shown on Thims' specially-made conference shirt (adjacent left), the affinity-free energy equation shown at center, indicative of Thims' Lotka's Jabberwock talk (see: slide #5) on abioism, and the premise that one cannot, from the point of view of chemistry and physics, be alive, but one can be reactively existive.

A group dinner, of some of the 2016 BPE presenters, showing: Mrs. Mimkes, Libb Thims, a conference attendee, Robert Ayres, George Mobus, John Bryant, Gail Tverberg, Jurgen Mimkes, and conference organizer Ram Poudel.

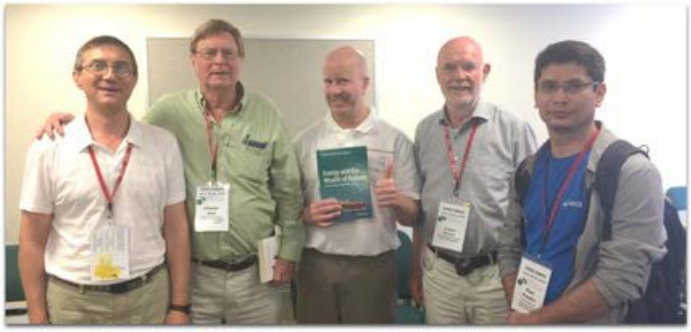

Victor Yakovenko, Charles Hall, Libb Thims, Jurgen Mimkes, and Ram Poudel; Thims holding copy of Hall's 2011 *Energy and the Wealth of Nations*, wherein he employs Roegen-Daly school + Odum school stylized thermodynamics.

Victor Yakovenko, Charles Hall, Libb Thims, Jurgen Mimkes, and George Mobus.

Serge Galam and Libb Thims in front of the Washington Monument talking about the "Forrest" scene from the *Forrest Gump*.

Libb Thims and Serge Galam at the Lincoln Memorial; Thims telling Galam how he had recently learned that Abraham Lincoln had used Euclidean logic in his political and presidential decisions (Galam having recently begun teaching "political physics", i.e. social physics based politics, course in Paris).

Libb Thims and Serge Galam at White House, trying to get a meeting with American President Barack Obama, to see if he can enact an education reform law requiring that American students pass a course in sociophysics, such as James Madison was taught, via the Princeton social physics, before graduating from high school.

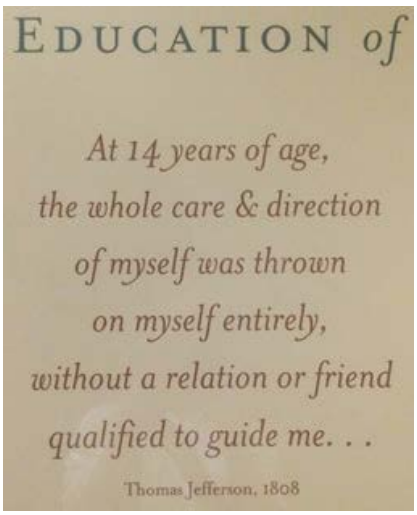

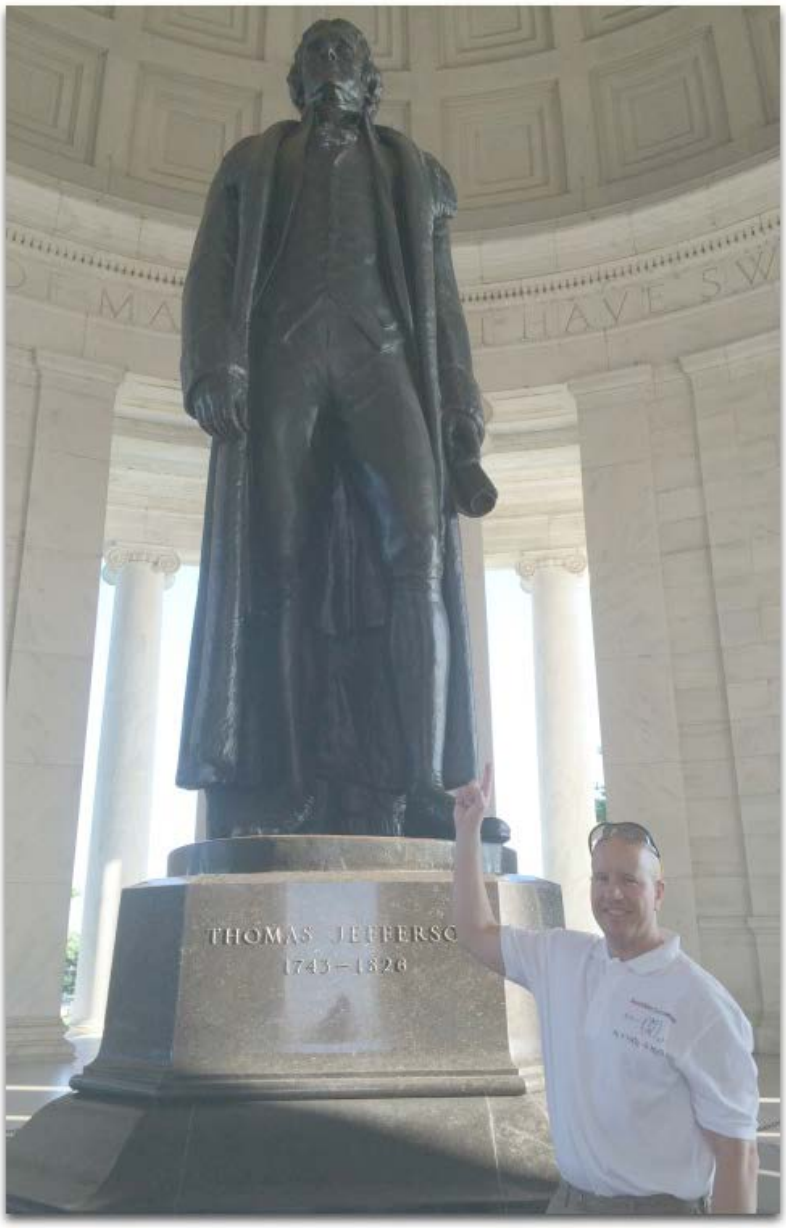

Libb Thims and Serge Galam at Jefferson Memorial; Thims and Galam spending a good amount of time at the Jefferson exhibit (at the level below the statue), showing, e.g., 1808 Jefferson education quote (shown), Jefferson's multi-swivel writing desk, and the Jefferson bookstore, whereat Thims bought Andrew Holowchak's 2014 *Thomas Jefferson: Uncovering his Unique Philosophy and Vision*, which touched on Jefferson's Epicurean materialism philosophy; Thims telling Galam how Thomas Jefferson amassed some 6,500 books in his time.

The following is an interesting division of knowledge diagram from the Jefferson Memorial exhibit:

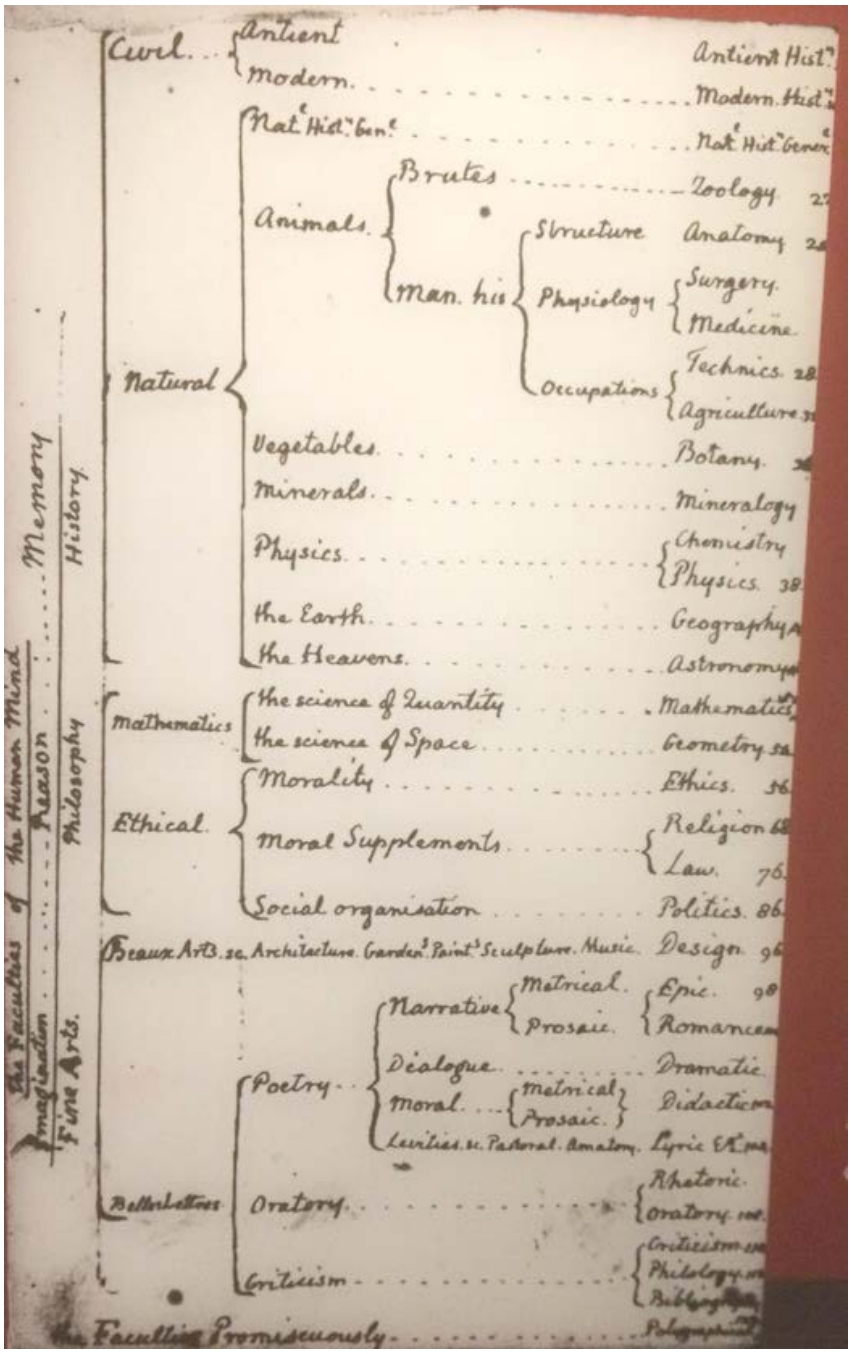

(add discussion)

Speakers

BPE 2016 is scheduled to have the following noted speakers: [5]

- **Juergen Mimkes** | Talk: Bio-Econo-Physics, Synthesis of Social and Natural Science?

  Abstract: Thermodynamics is a very general theory that is applied in natural sciences, in physics, chemistry, engineering, metallurgy, meteorology and many other fields. The theory depends on two parameters, temperature and pressure based on calculus in two dimensions and leads to the first and second law of thermodynamics. The Carnot process of engines depends on two temperatures, hot and cold. The efficiency grows with the temperature difference.

  Economic theory depends on two parameters, capital and labor. Double entry accounting leads to equations that correspond to the first and second law of thermodynamics. The oil price-fixing defines the equivalence of capital and energy and, accordingly, of economic and thermodynamic theory: surplus and heat, capital and energy, labor and work, production function and entropy, standard of living and temperature are the corresponding terms. Economic production is a two level

Carnot process, the efficiency grows with the difference of income and costs. Companies work like motors and banks like heat pumps. Motors require hot and cold, companies capital and labor, banks investors and savers, economies rich and poor. In a running motor the difference between hot and cold grows, in a running economy the difference between rich and poor grows.

Biology is a natural science and depending on two parameters, resources and work, the mechanism to build bodies of plants and animals. Again the laws of thermodynamics apply: Life is heat, resources are food and other energies, information for the genetic code is given by entropy. The Carnot process of production is the blood cycle of animals and the chlorophyll cycle of plants. No new theory is required for the full understanding of biophysical economics. Only existing theories have to be reinterpreted. Thermodynamics is a powerful tool in natural and social sciences and biophysical economics an excellent example for the success of inter-disciplinary research.

- **Jing Chen** | Talk: The Unity of Science and Economics: a New Foundation of Economic Theory

Abstract: Certain principles of established economic theories, such as perpetual growth or sustainable growth, are inconsistent with the physical principles. If an economic theory is more scientifically consistent, could it provide more accurate description of the reality? Many people may feel human societies are too complex to be described from physical principles. Life systems, which include human societies, are indeed very complex. But beneath this complexity lies two common properties. First, all life systems need to obtain resources from the environment to compensate for the continuous dissipation to maintain life. Second, for any life form to be viable, its cost to obtain resources cannot exceed the value of the resources over its life cycle. Similarly, for a business to be viable in the long term, its average cost of operation cannot exceed its revenue. Costs include fixed cost and variable cost.

The first property is a physical principle and the second property is an economic principle. In short, all organisms and organizations need to satisfy a physical principle and an economic principle. By applying mathematical techniques from quantum mechanics, financial economics and the information theory to these two principles, we have developed a mathematical theory of economics. This theory provides an analytical relation among main factors in economic activities. Many people have criticized mainstream economic theories for being inconsistent with physical principles. But it is often difficult connecting physical principles to specific economic policies, such as monetary policies, fiscal policies, retirement policies, health care policies, educational policies, and regulatory policies. Should the interest rate be higher or lower? Should the tax rate be higher or lower? Should the retirement age be later or earlier? Should governments spend more or less on medical systems? Should the number of years of mandatory education be increased or decreased? Can the magnitude of business cycles and financial crises be reduced? Should government regulate business activities more or less? Does the creation of a Euro zone benefit or harm Europe?

Through our mathematical theory, we can derive very specific long-term impacts of these economic policies. If it is so fruitful to study social issues based on observable quantities, why is the theoretical foundation of mainstream economics still based on utility, an unobservable quantity? Over half a century ago, George Zipf advocated that social sciences should be built on observable quantities. He further pointed out that the elite will resist this idea and use the power of academic appointment to deter people from pursuing this approach.

In general, the elite implement policies that favor themselves, often at the cost of the working class. Without a quantitative theory, the working class cannot measure the precise gains and losses of a particular policy to all the stakeholders involved. This is why the elite will suppress economic theories that are based on observable quantities. From our theory, it can be shown that many of the so called “unintended consequences” are really long term byproducts of the intended consequences for policymakers. Many of today’s social and economic problems arise from these “unintended consequences”. Over ten years ago, James Galbraith discussed the social environment within the profession of economists and the prospect of a theoretical revolution. He wrote:

> “Leading active members of today's economics profession …… have joined together into a kind of politburo for correct economic thinking. As a general rule--as one might expect from a gentleman's club--this has placed them on the wrong side of every important policy issue, and not just recently but for decades. …… And when finally they sense that some position cannot be sustained, they do not re-examine their ideas. Instead, they simply change the subject. No one loses face, in this club, for having been wrong. No one is disinvited from presenting papers at later annual meetings. And still less is anyone from the outside invited in. ……”

The reduction of many of today's leading economists to footnote status is overdue. But would those economists recognize a theoretical revolution if one were to occur? One is entitled to doubt it. Being right doesn't count for much in this club. For a theoretical revolution to occur and to flourish, it requires the active participation of many people outside the politburo to champion a consistent and objective way of understanding economics. Our theory was first systematically summarized in *The Physical Foundation of Economics: An Analytical Thermodynamic Theory* (2005). This theory includes three parts: theory of mind, theory of value and theory of production. An update is presented in a new book, *The Unity of Science and Economics: A New Foundation of Economic Theory* (2016). The preface (O) of the book provides a detailed introduction of

our theory.

- **Libb Thims** | Talk: Lotka's Jabberwock: On the 'Bio' of BioPhysical Economics (Q)

Abstract (short): "The 'B' of BPE is not recognized by the 'P'. Biology, as Lotka (1925) — the coiner of BPE — classified as a Jabberwocky-like 'nonsense' term, as Sherrington (1938) said is 'not' recognized by 'P', and as Crick (1966) — the co-discoverer of DNA — said should be 'abandoned', is not recognized by physics, thermodynamics, in particular, and therefore in immediate need of terminology reform. Thermodynamics, according to the Johnstone-Pavlovich rule, applies to some things and not to others, and the things which it does not apply are unreal and do not exist. Life, in short, is a 'thing' (fictional concept) that is not real and does not exist. Concept and terminology reform, accordingly, is in order."

Abstract (full): Lotka's Jabberwock

- John Bryant

  Abstract: [add]

- Robert Ayres

  Abstract: [add]

- Stephen Ternyik

  Abstract: [add]

- Victor Yakovenko

  Abstract: [add]

- **Ram Poudel**

  Abstract: [add]

- Charles Hall

  Abstract: [add]

- Bruce Boghosian | Since 2013, interested (Q) in kinetic theory applied to economics.

The following dropped out:

- **Alfred Rogers** | Talk: Life does not exist; dropped out [Apr 7], per financial reasons; with added note:

> "I regret not being able to hear [Thims] speak, but here are some things about my views you might want to mention in your discourse: (a) The non-existence of life does not mean human existence is cheap. If you were building a fire with wood and someone handed you a Stadivarius you would not throw it in. Why not, it's wood? Because some lifeless things are much more valuable than others. Humans fit this logical position. (b) The non-existence of life eliminates the need for a creation mythbut it does not eliminate the need for a value system to support a moral code. In my value system happiness (not pleasure) is the primary value inconsciousnessthat exists only from birth to death. Happiness is more likely to occur in a moral system similar to that proposed by Jesus of Nazarath in the gospels. There are many drawbacks in any belief system that includes life after death, witness today's suicide bombers, but Christianity is such a wide-spread teaching system that it probably makes more sense to utilize it than to try to replace it. Therefore I support it. I put up my web site [LifeDoesNotExist.com] to keep my ideas from dying in my sock drawer. Your interest has kept the web site from dying in obscurity. For this I cannot thank you enough."
>
> — Alfred Rogers (2016), "Email communicate to Libb Thims", Apr 7

Update: stated (Apr 18) that he will send a video synopsis of him explaining his abioism position to Thims for conference.

- Jason Smith | Talk: Information Equilibrium as an Economic Principle (Q) | Dropped out (Q) Mar 12

The ISEE portion of the event, of interest, is scheduled to include the following noted speakers:

- Herman Daly | Talk:
- Michelle Obama | See: Barack Obama (and his universal principles model of justice)

(add discussion)

Program

The following is the preliminary conference program, as of Feb 2016: [5]

BioPhysical Economics Meeting 2016 : Preliminary Program				
Session			Session Title	Convener/Author
1	Paper #		Social Energetics: Connecting Natural and Social Sciences	Robert Ayers
	1.1	2	The unity of science and economics: A new foundation of economic the	Jing Chen
	1.2	E007	Bio-econo-physics: Synthesis of Natural and Social Sciences?	Juergen Mimkes
	1.3	1	Energy based taxonomy of social assets: An Insight from Social Field The	Ram Poudel
2	Paper #		Energy Return on Investment (EROI)	David Murphy
	2.1	8	Using EROI for a limits analysis of variable renewable energy (VRE) and s	Graham Palmer
	2.2	6	EROI Analysis of the Production of Oil and Gas in China: A Company Leve	Zhaoyang Kong and Xiucheng Dong
	2.3	20	Energy Return on Investment (EROI) of Canadian oil sands extraction, a	Ke Wang, Harrie Vredenburg and Lianyong Feng
	2.4	32	Energy return on energy invested (EROEI) empirical model of an organic	Matthew Deason, John Schramski and Krista Jacobsen
3	Paper #		Energy and Economics: Is there symbiosis ?	John Schramski
	3.1	E005	Complexity: The Connection between Fossil Fuel EROI, Human Energy E	Gail Tverberg
	3.2	22	Application of Systems Science Principles to Economics	George Mobus
	3.3	25	Global Inequality in Energy Consumption from 1980 to 2010	Victor Yakovenko
4	Paper #		Entropy, Information and Economics	Juergen Mimkes
	4.1	27	Maximum entropy and information theory approaches to economics	Jason Smith
	4.2	29	Economics, Thermodynamics and Entropy – parallels, differences and re	John Bryant
	4.3	3	An Entropy Theory of Mind	Jing Chen
5	Paper #		Integrating BPE and Policy	Gail Tverberg
	5.1	E012	Is Context and Complexity a Bridge Too Far? Metaphors for Infusing Mu	Timothy Wojan
	5.2	E011	Extremism in a Resource Constrained World: How policy is being impact	Jessica Lambert and Charles A. S. Hall
	5.3	35	The Energy Pillars Diagram: an effective communication tool for biophys	John Day, Christopher D'Elia, Adrian Wiegman and Jeff Ruth
6	Paper #		Macro-Perspectives : Biophysical Economics	Stephen I. Ternyik
	6.1	E009	The universe as a heat engine doing work to create natural wealth	Robert AYRES
	6.2	E010	Lotka's Jabberwock: On the 'Bio' of BioPhysical Economics"?	Libb Thims
	6.3	31	Economics, Thermodynamics and Entropy – the impact of resources and	John Bryant
	6.4	5	Post-normal speculation in macro design of a wealth-based economy: R	Don Chisholm

7	Paper #		ASPO: Assessment of Peak Oil	Jan Muller
	7.1	7	Study on the relationship between the peak demand of fossil fuels and e	Jingxuan Feng, Lianyong Feng and Jianliang Wang
	7.2	36	Long term forecasts for oil prices: a review of oil supply and energy mar	Adrian Wiegman and John Day
	7.3	24	Analysis of the Influencing Factors of the Coal-based Synthetic Natural G	Cong Dong and Xiucheng Dong
8	Paper #		Money, Capital and Energy Resources	Jing Chen
	8.1	15	Integrated Circular Economy Evaluation Method of Chinese Refinery Ent	Kangyin Dong, Renjin Sun and Hui Li
	8.2	E002	A Banker, an Investor, and a Biophysical Economist	Jada Thacker
	8.3	23	Symbiotic Development & Co-Dependency of the Financial and Energy S	Roger Boyd
	8.4	26	Rent, Money and the Value of Natural Resources in the Global Economy	Stephen I. Ternyik
9	Paper #		BPE and Developing Nations	Adrian Wiegman
	9.1	21	Food Security: The Human Food System and the Laws of Thermodynami	John Schramski, Garrett Steck and James Brown
	9.2	33	Policy implication of air pollution in Kathmandu valley: valuing hea	Naveen Adhikari
	9.3	34	Challenges and Opportunities in Applying the Bio-Physical Economic Mo	Maria Aileen Leah G. Guzman and Jude Anthony N. Estiva
10	Paper #		Modelling Sustainability and Implementation	Ke Wang
	10.1	12	How to Calculate Sustainability (progress report)	Jack Alpert
	10.2	17	Modeling Inter-Generational Sustainability	Garvin Boyle
	10.3	9	Unwinding the Human Predicament	Jack Alpert
	10.4	19	The Economic Implications of Maximum Power in a Sustainable Society	Garvin Boyle
11	Paper #		Wealth Dynamics: Statistical/Mathematical Economics	Jason Smith
	11.1	28	Why Wealth Concentrates	Bruce Boghosian
	11.2	E008	Statistical Economics: Probability distributions of money, income, and e	Victor Yakovenko
	11.3	16	Dynamic regulation of human-activity through socio/biophysical econon	Don Chisholm
	11.4	E011	Mathematics and logic of Net Energy assessments	Carey King

The following are the time slots for the program:

Session Time Table: BPE 2016

Date→	27-Jun	28-Jun	29-Jun
Time↓	4	5	2
9:00	Welcome and Opening Remarks	6: BPE Macroperspectives	11: Wealth Dynamics: Statistical/Mathematical Economics
9:15			
9:30			
9:45			
10:00			
10:15			
10:30			
10:45	1: Social Energetics		
11:00			
11:15			
11:30			
11:45		7: ASPO	12. Closing Roundtable
12:00			
12:15			
12:30			
12:45			Adjournment
13:00			
13:15			
13:30	2: EROI		
13:45			
14:00		8: Money Capital and Energy Resource	
14:15			
14:30			
14:45	3: Energy & Economics		
15:00			
15:15			
15:30			
15:45			
16:00			
16:15			
16:30	4: Entropy, Information & Economics	9: BPE and Developing Nations	10: Modelling Sustainablity
16:45			
17:00			
17:15			
17:30		ISBPE Member Meeting	
18:30	5: Integrating BPE and Policy		
19:30		ISEE Awards Banquette	

Legend: Color code	
	Joint Session
	Overlap EE Plenary
	Lunch
	Coffee Break

Legend: Color code	
	Joint Session BPE and EE
	Overlap with EE Plenary
	Lunch
	Coffee Break

Session #	Session Name
1	Social Energetics: Connecting Natural and Social Sciences
2	Energy Return on Investment (EROI)
3	Energy and Economics: Is there symbiosis?
4	Entropy, Information and Economics
5	Integrating BPE and Policy
6	Macro-Perspectives : Biophysical Economics
7	ASPO: Assessment of Peak Oil
8	Money, Capital and Energy Resources
9	BPE and Devloping Nations
10	Modelling Sustainability and Implementation
11	Wealth Dynamics: Statistical/Mathematical Economics

(add discussion)

Two cultures | Department?

Some of the conference, at least in the after dinner meeting, at the suggestion of Ram Poudel in discussion with Libb Thims, will focus on group discussion about how to go about forming America's first fully-established two cultures department, an amalgamation, so to say, of the short-lived (see: two cultures synergy) and newly-forming precursors:

- Lausanne school of physical economics | Leon Walras (1890-1923)
- Oxford Chair of Social Physics | Florence Nightingale (1874-1991)
- Harvard Pareto Circle | Lawrence Henderson (1932-1942)
- Princeton Department of Social Physics | John Q. Stewart (1945-1955)
- Western Washington University Physical Chemical Sociology | Ed Stephan (1977-1995)
- Pitesti Econophysics and Sociophysics Department | Gheorghe Savoiu (2007-present)

thereby melding the physico-chemical sciences with the social sciences.

History

In 2006, Americans systems ecologist Charles Hall and economist Kent Klitgaard (Q), in their "The Need for a New Biophysically-based Paradigm in Economics for the Second Half of the Age of Oil", opened to the following abstract: [4]

Graduate student Rigoberto Melgar, Charles Hall, and Kent Kiltgaard, and another person, at the 5th BPE 2013 meeting (Q), Hall and Kiltgaard holding their 2011 *Energy and the Wealth of Nations: Understanding the Biophysical Economy*. [3]

> "The realization that the conceptual base for much of conventional economics is quite flimsy is no longer news to either those who follow events within the field or to many interested outsiders in the natural sciences. For an easy example, since 1998 a surprisingly large number of Nobel Laureates in economics (Joseph Stiglitz, George Akerlof, Daniel Kahneman, Robert Aumann, Thomas Schelling, and Amartya Sen) were people whose worked challenged, in various very fundamental ways, the basic existing paradigm of conventional neoclassical economics. More fundamentally, some twenty years ago [1982] in the *Science*, Nobel prize winner in economics Wassily Leontief found the basic models of economics 'unable to advance in any perceptible way a systematic understanding of the operation of a real economic system.' Instead they were based on 'sets of more or less plausible but entirely arbitrary assumptions [leading to] precisely stated but irrelevant theoretical conclusions." He asked others in 'demography, sociology, political science … ecology, biology, health sciences and engineering' to assist in removing economics from the 'splendid isolation in which it is found'."

Here, firstly, of course, we are reminded of the famous Samuelson dissertation defense anecdote: [6]

> "It is widely reported that at the end of Samuelson's dissertation defense at Harvard, the great economist Joseph Schumpeter turned to Nobel Laureate, Wassily Leontief, and asked, 'Well, Wassily, have we passed?'"

Secondly, we are keen that Leontief, in his 1953 mathematical economics publication "Mathematics in Economics", being well-seasoned in deeper roots discussions of Irving Fisher, Edwin Wilson, Leon Walrus, and Vilfredo Pareto, was well-honed to reality, when he makes pressing assertions that the majority of modern economics is foundationless.

In 2008, the first BPE meeting was held in Syracuse, New York, under Hall's leadership.

In 2010, Hall and Klitgaard published their *Energy and the Wealth of Nations: Understanding the Biophysical Economy*, pictured in photo, the abstract of which is as follows: [3]

> "For the past 150 years, economics has been treated as a social science in which economies are modeled as a circular flow of income between producers and consumers. In this "perpetual motion" of interactions between firms that produce and households that consume, little or no accounting is given of the flow of energy and materials from the environment and back again. In the standard economic model, energy and matter are completely recycled in these transactions, and economic activity is seemingly exempt from the second law of thermodynamics. As we enter the second half of the age of oil, and as energy supplies and the environmental impacts of energy production and consumption become major issues on the world stage, this exemption appears illusory at best."

A 2016 Facebook PBE logo, which brings to mind Alfred Lotka's 1925 photon mill model of biophysical economics. [7]

This indicates that their argument platform is the material entropy model. On this platform, they attempte to outline, thermodynamically, how the first law and second law, in their view, should be integrated into economic policy, albeit in what might be called the Roegen-Daly school of thought on entropy, i.e. the view of Nicholas Georgescu and his student Herman

Daly, namely the very tenable view that entropy, in economic terms, equates to "value lost to waste", and that this explains pollution, resource scarcity, unemployment, and depletion. They summarize that the two laws in biophysical economics equate to the translation that, in their own words: [3]

> 1. Energy conservation implies that every process of industrial and biotic production requires the input of energy
> 2. Entropy production implies that because of the unavoidable entropy production the valuable part of energy (called exergy) is transformed into useless heat at the temperature of the environment (called anergy), and usually matter is dispersed too.

A 2015 retrospect summary of the previous of sixth BPE conference, and promotion for the 7th conference, is as follows: [2]

> "The first meeting of BioPhysical Economics was held in Syracuse in 2008 under the leadership of Charles Hall, a disciple of systems ecologist Howard T. Odum. By 2015 we have had six very successful meetings without, however, formalizing our group. During our 2015 Joint Meeting of Canada and United States Societies for Ecological Economics (CANUSSEE 2015) at the University of British Columbia, Vancouver, the group decided to formalize its identity and become the "International Society for BioPhysical Economics (ISBPE)." We also decided to continue our loose ties to ecological economics. Thus the 7th BioPhysical Economics Meeting will be held in conjunction with the International Society of Ecological Economics in Washington."

BPE co-organizer Ram Poudel envisions that the 2016 conference could be an "important meeting for social energetics". [5]

References

1. Main – BPEconomics.org.
2. About – BPEconomics.org.
3. Hall, Charles A.S. and Kiltgaard, Kent. (2011). *Energy and the Wealth of Nations: Understanding the Biophysical Economy* (thermodynamics, 18+ pgs). Springer.
4. Hall, Charles A.S. and Klitgaard, Kent A. (2006). "The Need for a New Biophysically-based Paradigm in Economics for the Second Half of the Age of Oil" (pdf), *International Journal of Transdisciplinary Research*, 1(1):4-22.
5. Poudel, Ram. (2016). "Emails communications with Libb Thims", Feb 22-29.
6. Samuelson, Paul and Barnett, William A. (2007). *Inside the Economist's Mind: Conversations with Eminent Economists* (§:Coeditor's Preface: an Overview of the Objectives and Contents of the Volume, pgs. xi-). Wiley.
7. Internal Society for BioPhysical Economics – Facebook.

Videos

● Hall, Charles. (2012). "Biophysical Economics" (1-hr) (Q) (Q&A 45-min) (Q), Global Utmaning, Sweden, Nov 9.

External links

● International Society for BioPhysical Economics – LinkedIn.
● 7th BioPhysical Economics Meeting 2016 – Econophysics Forum.

θΔics

In hmolscience, **Brad Harrub** (c.1970-) is an American neurobiologist, anatomist, and creationist noted for being the co-author with Bert Thompson of their Oct 2002 65-page response article entitled "15 Answers to John Rennie and *Scientific American's* Nonsense", in response to John Rennie's 17 Jun 2002 *Scientific American* article "15 Answers to Creationist Nonsense", amid the Rennie creationism fiasco. [1]

Education

Harrub completed his BS in biology at Kentucky Wesleyan College and his PhD in anatomy and neurobiology for College of Medicine, University of Tennessee, after which he seems to have devoted efforts to explaining human origins, via lectures and publications, from the Christian perspective. [2]

References

1. Thompson, Bert and Harrub, Brad. (2002). "15 Answers to John Rennie and *Scientific American's* Nonsense" (Ñº) (pdf). ApologeticsPress.org, Oct 2.
2. Brad Harrub (about) – BradHarrub.com.

θΔics

In religio-mythology, **Brahma**, from *B-* (or *Ab-*) "father" or "water + Ra- "sun god" + *-hma* (*-keme*) "earth", is the creator god of Hinduism.

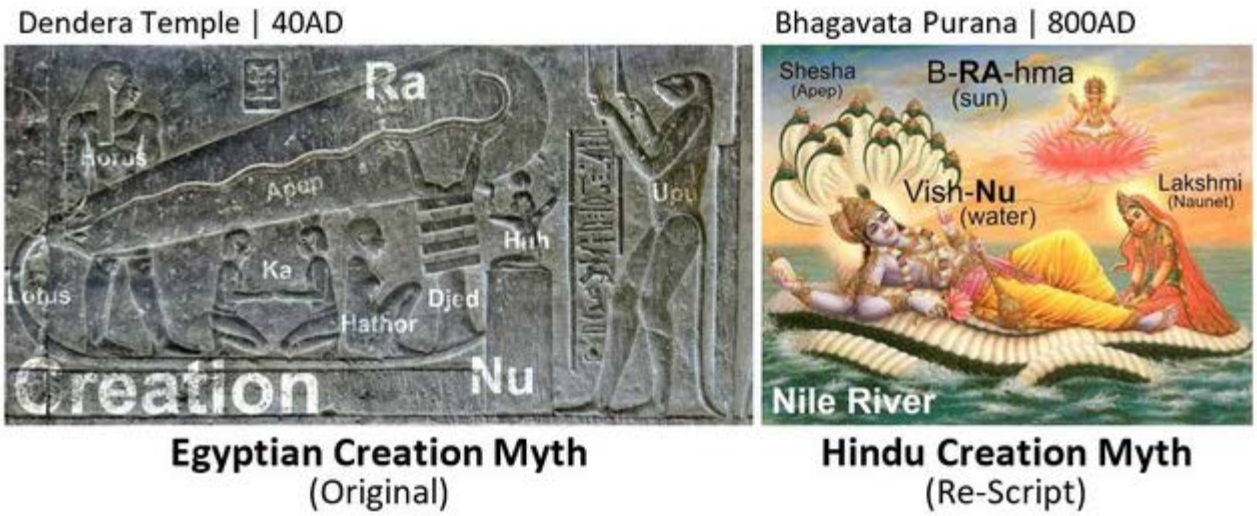

Egyptian Creation Myth (Original) | **Hindu Creation Myth** (Re-Script)

Left: the creation myth birth of Ra, the Egyptian sun god, out of a lotus flower, the stem of which descends into the Nu (or Nun) the water god or water abyss (Nile River) of Egyptian mythology (3100BC), as carved on the walls of Dendera Temple (38AD). Right: the Hindu mythology (800AD) re-write of the latter, according to which, as described in the Bhagavata Purana [SB 3.8.10-14], **Brahma** (Ra) is born out of a lotus, the stem of which comes out of the navel of the god Vishnu (Nun), wherein Apep, the mythical snake that Ra does battle with each night, becomes the multi-headed Hindu snake Shesha, and Naunet, the female counterpart of Nun, according to Hermopolis cosmology, becomes Lakshmi, the wife of Vishnu.

Quotes

The following are related quotes:

> "Let me not be called a wicked atheist for seeing the likeness between **Brahma** and Abraham.'"
>
> — Godfrey Higgins (1833), *Anacalypsis, Volume One* (pg. 391)

References

1. Higgins, Godfrey. (1833). *Anacalypsis: an Attempt to Draw Aside the Veil of the Saitic Isis: Or an Inquiry Into the Origin of Languages, Nations and Religions, Volume 1* (Brahma and Abraham [Hager], pg. 391). Longman, 1836.

External links

â— Brahma – Wikipedia.
â— Brahma (Buddhism) – Wikipedia.

θΔics

In science, the **brain** is the part of the central nervous system contained within the cranium. [1]

Thermodynamics

The brain is often considered as the control system of the human body. In this regard, a few attempts have been made to define this “control system” from a thermodynamic systems point of view, i.e. the energetic perspective of systems. The first to outline a thermodynamic theory of brain operation was Canadian materials science engineer Jack Kirkaldy, who in his 1965 *Biophysical Journal* article “Thermodynamics and the Human Brain”, argued that the “human brain may be regarded as an irreversible system which is constrained by a fixed inflow of free energy in the form of chemical nourishment from within the body and information from the environment.” [2] In the 1970s, a number of attempts were made to explain the emergence of dynamic neural patterns in the brain during the operation of neural networks within the Prigogine theory of dissipative structures. [3]

References

1. Brain (definition) – *Stedman’s Medical Dictionary*, 26th ed., 1995.
2. (a) Kirkaldy, J.S. (1965). "Thermodynamics of the Human Brain" (PDF), *Biophys J. Nov. 5(6): 981-986.*
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (pgs. 105-107), (preview), (Google books). Morrisville, NC: LuLu.
3. (a) Fehér, Márta, Kiss, Olga and Laszlo, Ropoli. (1999). *Hermeneutics and Science*, (pg. 184). Springer.
(b) Irsigler, F.J. (1994). “Prigogine Thermodynamics and the Human Brain”, *Mankind Quarterly*, XXXIV: 3, Spring, pgs. 155-74.

Videos

â— Carboni, Anthony. (2012). “Slime Mold Solves Mazes” (Ñº), DNews, Dec 26.

θΔics

In religion, **brainwashing** is a forcible indoctrination to induce someone to accept certain political, social, or religious beliefs or to accept contrasting regimented ideas; persuasion by propaganda or salesmanship. [1]

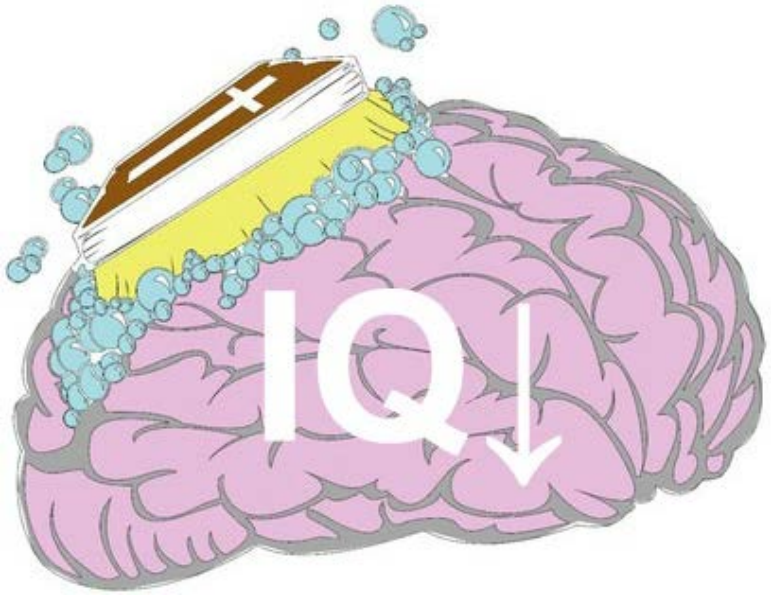

A child's brain being **brainwashed** by the myths and incorrect science, e.g. 10,000 year old earth, geocentrism, creation of the universe in 6-days, etc., Adam and Eve, Noah's ark, etc., of the Bible.

Mitchell

In 2013, Deborah Mitchell, in her viral essay "Why I Raise My Children Without God", opened to the following two nerve-touching paragraphs: [1]

> "When my son was around 3-years-old, he used to ask me a lot of questions about heaven. Where is it? How do people walk without a body? How will I find you? You know the questions that kids ask. For over a year, **I lied to him** and made up stories that I didn't believe about heaven. Like most parents, I love my child so much that I didn't want him to be scared. I wanted him to feel safe and loved and full of hope. But the trade-off was that I would have to **make stuff up**, and I would have to **brainwash** him into believing stories that didn't make sense, stories that I didn't believe either."

(add discussion)

Zerotheism for Kids

In 2015, Libb Thims posted a public Facebook notice that he and Atheism Reviews co-host Thor, father of a two year old, would be teaching an "atheism for kids" class on Mon Aug 10th, 2015. Friends of Thims and Thor, who were theists, posted back that they would be brainwashing the kids if they taught atheism; the following is one example:

> "What you're doing to those children is child abuse and **brain washing** in my view. You could invert that argument and point it at myself, but I don't hold classes for children telling them to knock down silly ideas of false claims."
>
> — Mr. O (2015), response to advert promo for "Zerotheism for Kids" lecture, Jul 29

Thims replied (Ñº), in short, if the child had been given the correct information, in the first place, there would be no need for such as class, which is but a **de-brainwashing** class or reversal of the original brainwashing, so to say (i.e. most kids are taught Egyptian mythology based morality and meaning, in the form of Christianity, which points them in a backwards direction, and then told to go forward into the world). The following is a visual of the "atheistic brainwashing" the kids actually received:

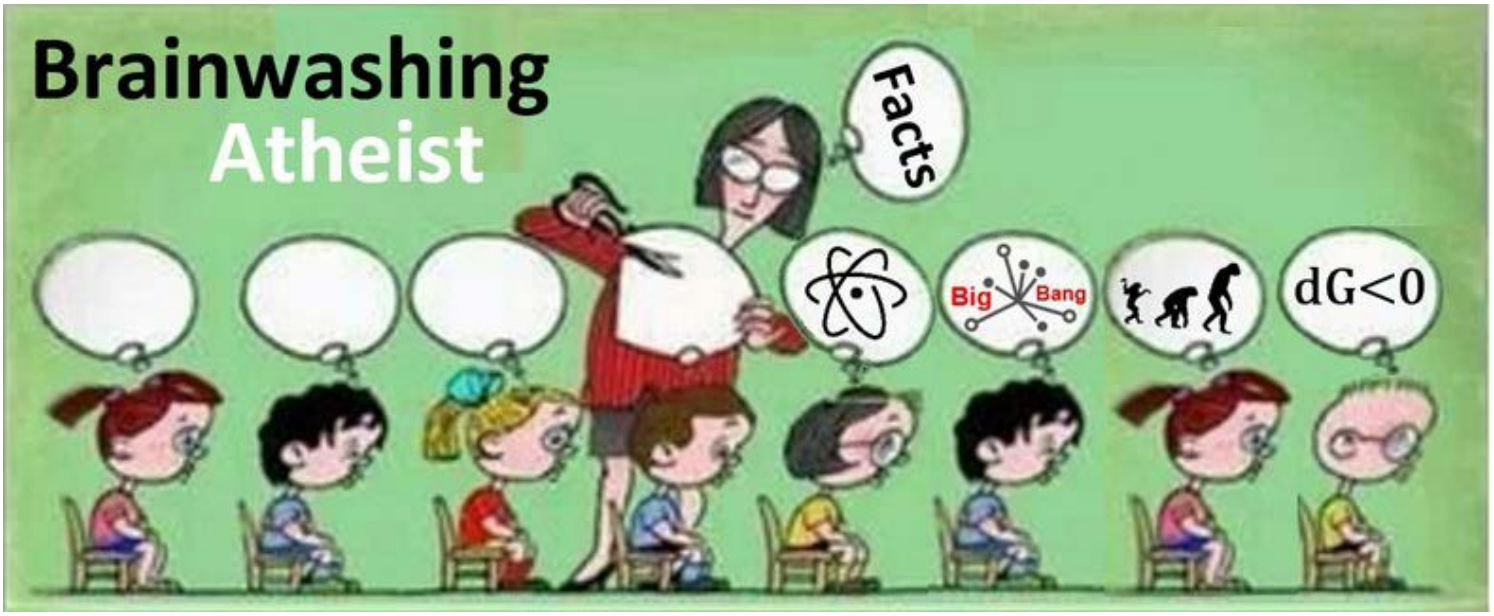

(add discussion)

Quotes

The following are related quotes:

> "All praise is due to Allah that I moved to Boston when I did. If I hadn't, I'd probably still be a **brainwashed** black Christian."
>
> — Malcolm X (1965), *The Autobiography of Malcolm X*; note this quote was one of the sparks of the Kanawha County textbook controversy

References

1. Merriam-Webster Collegiate Dictionary, 2000.
2. Mitchell, Deborah. (2013). "Why I Raise My Children Without God" (Ñº), iReport, CNN.com, Jan 14.

External links

â— Atheism Brainwashing (parody) – Pinterest.
â— Atheists are Brainwashing Kids!? (2016) – Reddit.

θΔics

In thermodynamics, **branches of human thermodynamics** refers to any of the various “categorical” subfields of thermodynamics applied to the study of human existence, in one particular area, such as economics (economic thermodynamics), sociology (sociological thermodynamics), history (history thermodynamics), literature (literature thermodynamics), psychology (psychological thermodynamics), etc.

List

The number of distinct divisional "branches" of human thermodynamics, not including subset branches (of which there are at least 22+ variations), as of 2011, stands at 36+. These are listed below (as well as in the adjacent drop down menu) along with date of subject inception and central topic initiator.

Branch	Icon	Date	Founder	Description
Government thermodynamics		1748	Charles Montesquieu	The study of theories of government in thermodynamics terms, such as the postulate that governmental laws need to be a function of the temperature of the land.
Relationship thermodynamics ● Relationship physics ● Love thermodynamics		1799	Johann Goethe	The use of thermodynamics to explain the passions and workings of individual relationships.
Cessation thermodynamics		1843	Ludwig Colding	The study of what thermodynamics has to say about death.
Religious thermodynamics		1847	James Joule	The study or use of thermodynamics to either explain or disprove religious theory.
Economic thermodynamics ● Lausanne school (of economics) ● Physioeconomics ● Technocracy ● Thermoeconomics ● Econophysics		1853	Hermann Gossen	The study of the use of thermodynamics to model economies as thermodynamic systems.
Philosophical thermodynamics		1856	Gustave Hirn	The study of the philosophical implications of thermodynamics.
Sociological thermodynamics ● Mechanistic school (of sociology) ● Social thermodynamics ● Socio-thermodynamics		1858	Henry Carey	The use of thermodynamics in social theory.

Ethics thermodynamics		1869	Francois Massieu	The study of the use of thermodynamics in theories of ethics and the difference between right and wrong.
History thermodynamics		1873	Henry Adams	The use of thermodynamics applied to the study of human history.
Happiness thermodynamics		1874	August Kronig	The subject of how thermodynamics applied to the understanding of human states of happiness.
Literature thermodynamics		1893	Camille Flammarion	The use or study of the use of thermodynamics logic in fiction.
Education human thermodynamics		1894	Léon Winiarski	The subject and art of teaching human thermodynamics in general or one of its branches in school.
Psychological thermodynamics ● Helmholtz school (of psychology) ● Energy psychology ● Psychodynamics ● Psycho-dynamics ● Biopsychodynamics ● Dynamic psychology		1895	Sigmund Freud	The study of the thermodynamics of the mind or mental states.
Fringe thermodynamics		1896	Frederic Myers	Thermodynamics applied to fringe subjects, such as telekinesis, ghost hunting, or sixth sense theories, etc.
Aesthetic thermodynamics		1898	Léon Winiarski	The study of how thermodynamics quantifies beauty.
Legal thermodynamics		1899	Maurice Hauriou	The study of the bearing of the laws of thermodynamics to the rules and laws of the land, country, or state.
Anthropic physics ● Energetics school		1912	Wilhelm Ostwald	The science of the physical chemistry of humans.
Business thermodynamics		1914	William Fairburn	The study of the application of thermodynamics in business consulting or business theory.
Sexual thermodynamics		1919	Sigmund Freud	The study of thermodynamics applied to the understanding of topics surrounding sex, such as sex drive, sexuality, libido, sexual heat, sexual tension, etc.
War thermodynamics		1919	Yevgeny Zamyatin	The study of thermodynamics applied to the art of war.
Financial thermodynamics		1926	Frederick Soddy	The study of thermodynamics applied to financial matters, e.g. debts, wealth, interest, budgets, etc.
Information theory thermodynamics ● MaxEnt school		1929	Leo Szilard	The attempt to explain facets of human existence using various logarithms, on the generally *fallacious* claim that entropy (heat) and information (binary

(1957)				digits) are the same thing.
Art thermodynamics		1933	René Magritte	The use of thermodynamics theory depicted in art form.
Anthropological thermodynamics		1943	Leslie White	The use of thermodynamics in anthropology, such as in the study of the comparison of different cultures.
Laymanized thermodynamics ● Folklore thermodynamics (1946) ● Contrived thermodynamics		1943	Erwin Schrodinger	The study, discussion, and or presentation of laymanized versions of thermodynamics.
Music thermodynamics		1964	Flanders and Swann	The use of thermodynamics theory or logic in song.
Architectural thermodynamics		1970	Alan Wilson	The study of how thermodynamics applies to the theory and design of buildings and architecture.
Political thermodynamics		1971	Frederick Rossini	The use of thermodynamics logic in political agenda.
Eco-economic thermodynamics ● Eco-thermodynamics ● Ecological thermodynamics ● Ecological economics ● Biophysical economics		1971	Nicholas Roegen	The study of the use of thermodynamics in regard to natural resources in relation to economic theory.
Sustainability thermodynamics		1989	Karl-Henrik Robert	The use of thermodynamics models in development of sustainability theories.
Racial thermodynamics		1990	Richard Delgado	The study of the thermodynamic explanations of racism or race and the issues and tensions surrounding this topic.
Integration and segregation thermodynamics		1994	Jurgen Mimkes	The study of the use of phase diagrams and solution thermodynamics logic in the explanation of the integrations and segregations behaviors of mixed cultures or people.
Dietary thermodynamics		c.2000		The study of the use of thermodynamics theory in the development of diets and dietary suggestions.
Human statistical thermodynamics		2008	Libb Thims	The study of human existence from the perspective of statistical thermodynamics.
Human chemical thermodynamics		2008	Libb Thims	The study of human existence from the perspective of chemical thermodynamics.
Human engineering				The study of the practical application of human chemical thermodynamics or human statistical

thermodynamics	2010 Libb Thims	thermodynamics for use in the engineering of humans or systems of humans.

See also

- Branches of thermodynamics

θΔics

In thermodynamics, **branches of thermodynamics** refers to the view of thermodynamics as a tree of knowledge with roots, sprouts, a trunk, and various branches, and spores and or seeds.

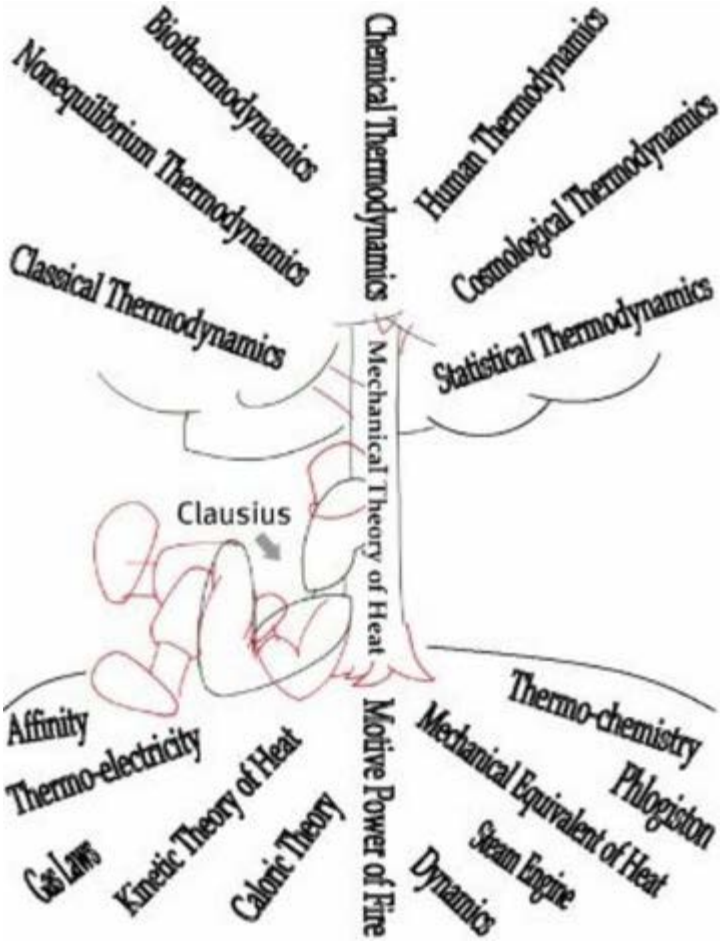

Overview

Thermodynamics has it roots in those as affinity-chemistry (1718), thermo-chemistry (1770s), thermo-electricity (1822), thus becoming a tree with foundations in the works of Sadi Carnot, William Thomson, Rudolf Clausius (trunk), and William Rankine, soon thereafter sprouting many branches, e.g. human thermodynamics (1952), and sub-branches of thermodynamics.

The following quote by Elias Gyftopoulos and Gian Beretta, gives an idea of the number of branches involved: [1]

> "Physics is the science that attempts to describe all aspects of all phenomenon pertaining to the perceivable universe … it can be viewed as a large **tree** with many **branches**, such as mechanics, electromagnetism, gravitation, and chemistry, each specialized in the description of a particular class of phenomenon … **thermodynamics** [however] is not a branch … it pervades the entire tree."

(add)

Roots

Thermodynamics has its roots in Boerhaave's Law (1620), Guericke's vacuum pump (1645), the gas laws (1662-1809), dynamics (1686), Papin's steam engine (1690), affinity-chemistry (1718), thermo-chemistry (1760s), caloric theory (1770s), kinetic theory of heat (1798), thermo-electricity (1822), thus becoming a sprouted tree with the seedling of Sadi Carnot's 1824 treatise "Reflections on the Motive Power of Fire", a seedling that was reformulated in graphical terms by Emile Clapeyron (1834) and later nurtured by William Thomson (1842), with a reformulation according to the mechanical equivalent of heat (1840s).

Newly added

â— Mathematical thermodynamics
â— Solution thermodynamics (link) (link)

Tree

The following set of tables, showing the thermodynamics tree (upside down), with German physicist Rudolf Clausius' 1865 textbook *The Mechanical Theory of Heat* forming the trunk** (with roots shown above), is a grouping and ordering of some of the various branches of thermodynamics:

Main Branches	System-specific Branches	Abstract Branches
Affinity-chemistry (1718)		
Thermo-chemistry (1770s)		

Thermo-electricity (1822)

"On the Motive Power of Fire" (1824)

** **Mechanical Theory of Heat** (1865) **

Classical thermodynamics (1850-99)

Statistical thermodynamics (1872-02)

Chemical thermodynamics (1876-23)

Atmospheric thermodynamics (1888)

Equilibrium thermodynamics

Engineering thermodynamics

Chemical engineering thermodynamics (1925)

Information thermodynamics (1920s)

Life thermodynamics (1920s)

Quantum thermodynamics (1927)

Relativistic thermodynamics (1930s)

Nonequilibrium thermodynamics (1931)

Computer science thermodynamics (1949)

Ecological thermodynamics (1950s)

Human thermodynamics (1952)

Biochemical thermodynamics (1957)

Aerothermodynamics (1960s)

Molecular thermodynamics (1960s)

Surface thermodynamics (1960s)

Geochemical thermodynamics (1964)

Earthquake thermodynamics (1964)

	Computational thermodynamics (1966)
	Network thermodynamics (1968)
Cosmological thermodynamics (1970s)	Drug-receptor thermodynamics (1970s)
	Hierarchical thermodynamics (1978)
	Evolutionary thermodynamics
	Action thermodynamics (1980s)
	Supramolecular thermodynamics
	Nanothermodynamics (2001)
	Neurothermodynamics (2002)

The following are spin-off subjects related to thermodynamics or using thermodynamics as part of their composition:

â— Stastistical mechanics (1901)
â— Thermal physics (1910s)

References

1. Gyftopoulos, Elias P. and Berretta, Gian-Paolo. (2005). *Thermodynamics: Foundations and Applications* (pg. xv). New York: Dover.

Further reading

â— Muschik, Wolfgang. (2008). "Survey of some branches of thermodynamics". *J. Non-Equilib*. *Thermodyn*. 33, 165-198.

θΔics

In films, **Breaking Bad** is American dark humor television drama series, created by American writer-producer Vince Gilligan, which aired on the cable channel AMC, from 2008 to 2013, centered around the story of a chemistry teacher, Walter White, aka “Professor White”, played by Bryan Cranston, who is diagnosed with terminal lung cancer and who teams up with an old student to make and sell crystal meth, out of an RV, so to leave money for his financially-troubled family, e.g. pregnant wife, handicap kid, credit card issues, working two jobs (teacher + carwasher), etc., and the dark morality that mediates out of the state of the situation.

The chemical alphabet style logo to the 2008-2013 series ***Breaking Bad***; a characteristic used in the name credits.

Overview

The show is unique in that it employs a certain amount of chemical philosophy, paralleled and or pitted against, in some scenes, Christian morality; resembling, in some aspects, Goethe’s 1809 physical chemistry based novel *Elective Affinities*, and the questions of “choice” amid times of dark morality, e.g. "whether to kill someone who might kill your family if you don't kill them?", the to kill or not to kill pros and cons, from S1:E3, is shown below, pitting Judaeo-Christian morality against street morality, so to say:

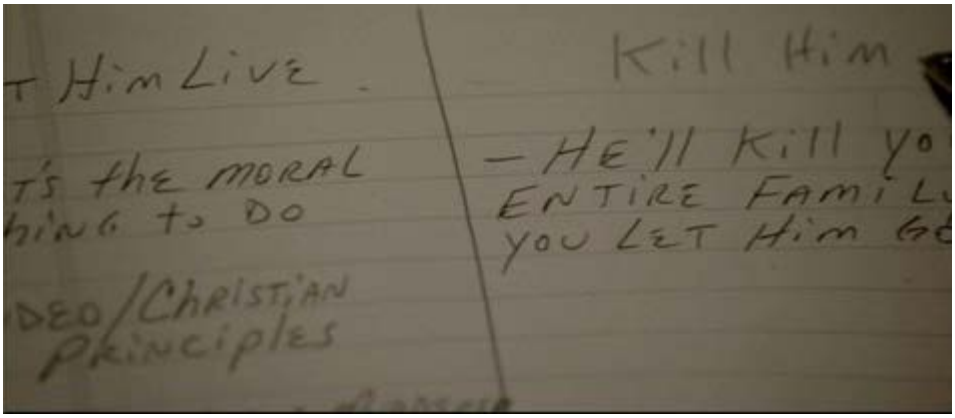

This is similar to what Goethe likewise discussed, e.g. "whether the mother who kills her newborn child should be given the death penalty" (Goethe, "Positions of Rights", 1771). The following are insight quotes into Gilligan's ideas, outlooks, religion, and general philosophy:

> “My goal was to turn Mr. Chips into Scarface.”
>
> — Vince Gilligan (2011), *NY Times* interview [2]

> “I was raised Catholic, [but] I’m pretty much agnostic at this point in my life. But I find atheism just as hard to get my head around as I find fundamental Christianity. Because if there is no such thing as cosmic justice [see: justice], what is the point of being good? [see: Jeffrey Dahmer] I feel some sort of need for biblical atonement, or justice, or something. I like to believe there is some comeuppance, that karma kicks in at some point, even if it takes years or decades to happen. My girlfriend says this great thing that’s become my philosophy as well. ‘I want to believe there’s a heaven. But I can’t not believe there’s a hell.’”
>
> — Vince Gilligan (2011), *NY Times* interview [2]

(add discussion)

Dark morality

The following is thematic statement about the questions of dark morality mediated out in the series:

> "You're going to see that underlying humanity, even when he's making the most devious, terrible decisions, and you need someone who has that humanity– deep down, bedrock humanity– so you say, watching this show, 'All right, I'll go for this ride. I don't like what he's doing, but I understand, and I'll go with it for as far as it goes.' If you don't have a guy who gives you that, despite the greatest acting chops in the world, the show is not going to succeed."
>
> — Vince Gilligan (2009), on the character Walter White (Bryan Cranston) (Q)

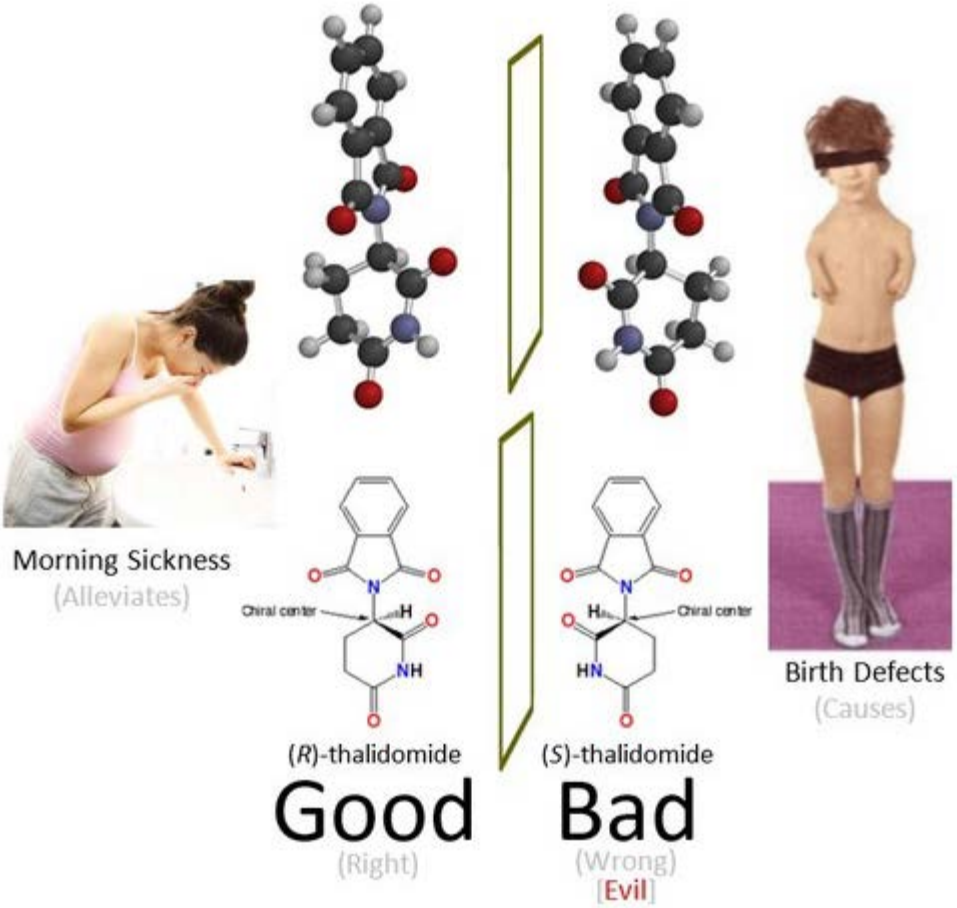

(add discussion)

Good | Bad

In S1:E3, from 10:21-10:58 (Q), White, while teaching his chemistry class, uses the example of chirality, connect chemical structure to "good" (right-handed isomer, thalidomide) and "bad" (left-handed isomer, thalidomide); the script of which is as follows:

> "Thalidomide. The... The right-handed isomer of the drug thalidomide is a perfectly fine, good medicine to give to a pregnant woman to prevent morning sickness. But make the mistake of giving that same pregnant woman the left-handed isomer of the drug thalidomide and her child will be born with horrible birth defects. Which is precisely what happened in the 1950s. So chiral, chirality, mirrored images, right? Active, inactive, good, bad."

(add discussion)

Chemical alphabet | People

See also: Human chemical; Human chemical element; People are chemicals;

In the credits, the title, names of actors and producers, were presented using "chemical letter" (or chemical alphabet) stylization, e.g. **Br**yan Cranston (Walter White), lead character, aka "Professor White"; some examples of which are shown below:

The show intro also uses a green gas, crystal meth stylized periodic table (see: hmolscience periodic table; human periodic table).

Soul scene

In the third episode, "… And the Bag's in the River", season one, the show opens to Professor White cleaning up the human that had been dissolved in hydrofluoric acid (shown adjacent; lower left), amid which his mind reflects back to, it seems, his college days, and dialogue with a woman, possibly his lover at the time, as shown adjacent right (main image), wherein she reads off the percentage of elements of a human, in moles, to him and he writes them down on a chalkboard, as follows:

Hydrogen (H) 63%
Oxygen (O) 26%
Carbon (C) 9%
Nitrogen (N) 1.25%
Calcium (Ca) 0.25%
Phosphorus (P) 0.19%
Sodium (Na) 0.04%
Iron (Fe) 0.00004%

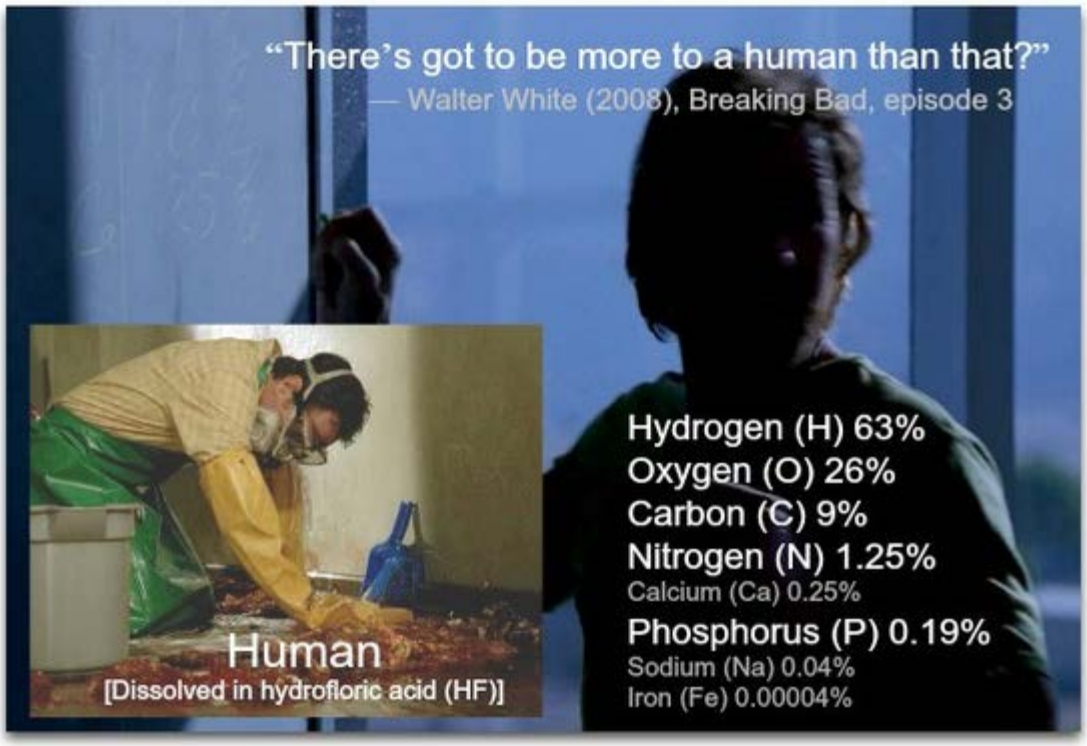

An illustrated diagram, with the CHNOPS elements enlarged, of the "soul" scene from the third episode, season one, of *Breaking Bad*, wherein Walter White and a woman list the elements of a human and speculate on the "soul" as the thing missing from the list.

at the end of which he comments how he thinks that something is missing, to which the woman replies “the soul”?

Technical advisor

Going into the second season (c.2009), approximately, American organic chemist Donna Nelson (Q) approached (Q) Gilligan offering to lend help in the area of scientific accuracy, and thereafter began act as the scientific advisor to the show.

Gerson

In 2013, Kirth Gerson, in his “Breaking Bad Pilot: People are Chemicals, Too!” lecture style video, analyzed *Breaking Bad* as a type of "people are chemicals" purview or each human is an element (or chemical) reacting in a social system that makes chemicals, a sort of modern *Elective Affinities* analysis, so to say. [4]

Quotes

The following are noted quotes:

> “There’s got to be more to a human than that?”
>
> — Walter White (2008), on the composition of a human; *Breaking Bad*, episode 3

References

1. Gerson, Kirth. (2013). “Breaking Bad Pilot: People are Chemicals, Too!” (Q), The University of College, Sep 2.
2. Segal, David. (2011). “The Dark Art of *Breaking Bad*” (Q), *The New York Times*, Jul 6.

External links

- Breaking Bad – Wikipedia
- List of Breaking Bad episodes – Wikipedia.
- Vince Gilligan – Wikipedia.
- Breaking Bad – Wikia.com.

θΔics

In science, **Brian Pippard** (1920-2008) was an experimental physicist, noted for his work in condensed matter physics.

Classical thermodynamics

Pippard, in his *Elements of Classical Thermodynamics for Students of Physics*, defines classical thermodynamics as "the method of approach that takes no account of the atomic constitution of matter [and] makes no attempt to provide a mechanistic explanation of why a given substance has the properties observed experimentally." [1]

Quotes

The following are noted quotes:

> "What is surely impossible is that a theoretical physicist, given unlimited computing power, should deduce from the laws of physics that a certain complex structure is aware of its own existence."
>
> — Brian Pippard (1988), "The Invincible Ignorance of Science" [2]

References

1. Pippard, A. Brian. (1957). *Elements of Classical Thermodynamics for Students of Physics* (pg. 1). Cambridge University Press.
2. (a) Pippard, Brian. (1988). "The Invincible Ignorance of Science" (abs) (pdf), Eddington Memorial Lecture, Cambridge, Jan 28; in: *Contemporary Physics*, 29:393.
(b) Weinberg, Steven. (1992). *Dreams of a Final Theory: the Scientist's Search for the Ultimate Laws of Nature*. Random House.

External links

â— Brian Pippard – Wikipedia.

θΔics

In hmolscience, **Brian Allen Schill** (c.1960-) is a paranormal investigator noted, in cessation thermodynamics, for his 2008 work on the physics of death.

Overview

In 2008, Shill, in his *Stalking Darkness*, attempted to explain death and ghosts in terms of thermodynamics and released bioelectric fields; a subject he has spent over a decade researching. Schill, interestingly, not only makes an attempt at discussing death in the context of the first two laws, but argues to explain the theory of 'cold spots', or anomalous regions of energy absorption, supposedly left by ghosts, in terms of the third law of thermodynamics. [1]

In 2009, at a Paranormal Conference, Shill was video-interviewed talking about death, energy, and thermodynamics. [2]

Education

Schill has completed his BS in physics from MIT and is the founder of International Parapsychology Research Foundation, Pittsburgh.

References

1. Schill, Brian. (2008). *Stalking Darkness: Surveillance and Investigation Techniques for Paranormal Investigators* (thermodynamics, pgs. 77-81, etc.). LuLu.
2. Shill, Brian. (2009). "Interview" (V), Apr 4.

External links

â— Brian Schill – iprfinc.com.

θΔics

In thermodynamics, **Eric Brian Smith** (1933-) is an English physical chemist noted for his short *Basic Chemical Thermodynamics*, having going through five editions from 1973 to 2004, in he opens famously to his remembrance, in his :

Smith's book aims to give the young chemist an introduction to the handful of thermodynamic relations he or she will need to be proficient in the working laboratory.

Education

Smith completed his BS and PhD at Liverpool University. He then spent two years at UC, Berkeley, working under Joel Hildebrand, after which he became a lecturer in physical chemistry at St. Catherine's College, Oxford. Smith was vice chancellor the Cardiff University from 1993 to 2001. His research interest include intermolecular forces and the biological effects of simple gases.

Quotes

The following are noted quotes:

> "The first time I heard about chemical thermodynamics was when a second-year undergraduate brought me the news early in my freshman year. He told me a spine-chilling story of endless lectures with almost three-hundred numbered equations, all of which, it appeared, had to be committed to memory and reproduced in exactly the same form in subsequent examinations. Not only did these equations contain all the normal algebraic symbols (+,-,÷, etc.) but in addition they were liberally sprinkled with stars (*), daggers (†, ‡), and circles (°,â¦µ) so as to stretch even the most powerful of minds."
>
> — Brian Smith (1973), reflection on undergraduate days, circa 1953, at Liverpool University [1]

References

1. Smith, Brian E. (2005). *Basic Chemical Thermodynamics.* Imperial College Press.
2. Anon (2008). "My Cardiff: Professor Sir Brian Smith." Cardiff University, 125th Anniversary.

External links

â— Smith, E. Brian (Eric Brian) (1933-) – WorldCat Identities.

θΔics

In existographies, **Brian Willcox** (1964-) is an English mechanical engineer noted for his 2013 to present work in the development of BrizeBox, a smartly-designed courier agnostic package mailbox.

Overview

Willcox, in his Amazon.com seller profile (Q), summarizes himself as follows:

> "BrizeBox was invented by Brian Willcox. He doesn't really know how he came up with the idea, it just happened! Brian started off life doing a mechanical engineering apprenticeship, so had a knowledge of things mechanical and how to make things from metal. He spent the next quarter of a century in the world of IT, seeing the Internet grow into the phenomenon that it is today. He regularly bought items online and faced the same problems as everyone else about getting it delivered. He was in a quiet period at home, not working between contracts, thinking of what he could do to start a business, when the idea just came to him. 'I was trying to think of something that I could sell online' he says 'when I realized that anything worth selling online was already being sold there.'
>
> 'I'd always been aware of what a nuisance it was to get parcels delivered, so I thought I'd come up with a solution! Rather than selling a product online to fulfil the needs of a specialist section of society, I realised that I could produce something that would be in demand by a vast number of people, globally. I recognized that it would help a lot of people by making their lives easier and also cut down on co2 pollution, and that was of great appeal to me. Anyone selling products online would want their customers to own a BrizeBox because then their customers would find it easier to order more items. Anyone who was delivering the products would want their customers to own a BrizeBox because there would be no more frustration about not being able to safely deliver parcels and having to leave tickets, repeated delivery attempts etc. And anyone ordering online would want a BrizeBox because they would no longer have the headache of whether their parcel would actually be delivered. Benefits all round'."

(add)

BrizeBox

In 2012, Willcox, frustrated with online ordering delivery issues, began to think seriously about inventing a smartly designed package mailbox, aka a "courier agnostic" design, as he says; the following are some of his early trial and error designs:

On 28 Jan 2013, Wilcox purchased the domain BrizeBox.com, and thereafter began working to bring his smart package mailbox company into realization.

MailCube | BrizeBox

See main: BrizeBox MailCube

In Sep 2017, Libb Thims, who since 2003 (see: below) had been working, intermittently, towards the launch of MailCubes, a smart package mailbox company (see: smart mailbox), discovered Willcox's BrizeBox designs, which were high quality and nearly akin to Thims' drop-floor designs, albeit Wilcox was farther along in the production stage, compared to Thims, and therein decided that it would be advantageous to combined forces with Wilcox, working towards a common goal: [2]

(add)

Education

In 1980, Willcox, aged 16, left home and began work in a four-year apprenticeship in mechanical engineering with Johnson Matthey, after which, from 1985 to 1987, completed a higher national degree (HND) in electrical and electronics engineering, and in 1989 started working as an IT contractor, working for many years with large corporations; in 2015, he gave up IT to focus on BrizeBox. [1]

References

1. Willcox, Brian. (2017). "Skype with Libb Thims", Oct.
2. Home – MailCubes.com.

External links

- Brian Willcox – LinkedIn.
- Home – BrizeBox.com.
- BrizeBox – Twitter.com.
- BrizeBox – YouTube.com.
- BrizeBox – Instagram.

θΔics

In thermodynamics, **Bridgman formulas** or "Bridgman equations" twenty-eight partial derivatives of the ten essential thermodynamic quantities, involving first and second derivatives, expressed in terms of measureable variables. These formulas were systematically derived by American physicist Percy Bridgman in 1914 using what has come to be known as the Bridgman formula method. [1]

Bridgman, in short, presented a clean and organized way of deriving thermodynamic expressions from the partial derivatives of the ten (or ten) main thermodynamic quantities (or variables), *P*, *V*, *T*, *E*, *H*, *S*, *A*, and *F* (see: symbols), of which there are 8 x 7 x 6 first (partial) derivatives.

In his 1925 "full version", in contrast to the 1914 "shorter version", of his systematic collection of thermodynamic formulas, he presented the first derivatives of the 10 fundamental quantities, which amounts to 720 equations, organized into 10 groups, based on which variable was held constant during the differentiation. [3]

$$
\begin{aligned}
(\partial T)_P &= -(\partial P)_T = 1 \\
(\partial V)_P &= -(\partial P)_V = (\partial V/\partial T)_P \\
(\partial S)_P &= -(\partial P)_S = C_P/T \\
(\partial E)_P &= -(\partial P)_E = C_P - P(\partial V/\partial T)_P \\
(\partial H)_P &= -(\partial P)_H = C_P \\
(\partial F)_P &= -(\partial P)_F = -S \\
(\partial A)_P &= -(\partial P)_A = -S - P(\partial V/\partial T)_P \\
(\partial V)_T &= -(\partial T)_V = -(\partial V/\partial P)_T \\
(\partial S)_T &= -(\partial T)_S = (\partial V/\partial T)_P \\
(\partial E)_T &= -(\partial T)_E = T(\partial V/\partial T)_P + P(\partial V/\partial P)_T \\
(\partial H)_T &= -(\partial T)_H = -V + T(\partial V/\partial T)_P \\
(\partial F)_T &= -(\partial T)_F = -V \\
(\partial A)_T &= -(\partial T)_A = P(\partial V/\partial P)_T \\
(\partial S)_V &= -(\partial V)_S = C_P(\partial V/\partial T)_P/T + (\partial V/\partial T)_P^2 \\
(\partial E)_V &= -(\partial V)_E = C_P(\partial V/\partial P)_T + T(\partial V/\partial T)_P^2 \\
(\partial H)_V &= -(\partial V)_H = C_P(\partial V/\partial P)_T + T(\partial V/\partial T)_P^2 - V(\partial V/\partial T)_P \\
(\partial F)_V &= -(\partial V)_F = -V(\partial V/\partial T)_P - S(\partial V/\partial P)_T \\
(\partial A)_V &= -(\partial V)_A = -S(\partial V/\partial P)_T \\
(\partial E)_S &= -(\partial S)_E = PC_P(\partial V/\partial T)_T/T + P(\partial V/\partial T)_P^2 \\
(\partial H)_S &= -(\partial S)_H = -VC_P/T \\
(\partial F)_S &= -(\partial S)_F = -VC_P/T + S(\partial V/\partial T)_P \\
(\partial A)_S &= -(\partial S)_A = PC_P(\partial V/\partial P)_T/T + P(\partial V/\partial T)_P^2 + S(\partial V/\partial T)_P \\
(\partial H)_E &= -(\partial E)_H = -V[C_P - P(\partial V/\partial T)_P] - P[C_P(\partial V/\partial P)_T + T(\partial V/\partial T)_P^2] \\
(\partial F)_E &= -(\partial E)_F = -V[C_P - P(\partial V/\partial T)_P] + S[T(\partial V/\partial T)_P + P(\partial V/\partial P)_T] \\
(\partial A)_E &= -(\partial E)_A = P[C_P(\partial V/\partial P)_T + T(\partial V/\partial T)_P^2] \\
(\partial F)_H &= -(\partial H)_F = -V(C_P + S) + TS(\partial V/\partial T)_P \\
(\partial A)_H &= -(\partial H)_A = -[S + P(\partial V/\partial T)_P][V - T(\partial V/\partial T)_P] + P(\partial V/\partial P)_T \\
(\partial A)_F &= -(\partial F)_A = -S[V + P(\partial V/\partial P)_T] - PV(\partial V/\partial T)_P.
\end{aligned}
$$

The twenty-eight essential results of the **Bridgman formula** method, according to a 1946 table by American physical chemist Samuel Glasstone. [5]

Bridgman devised a system that allows for the derivation of any of these first partial derivatives in terms of three quantities which are, in general, capable of experimental determination, namely (∂V/∂T)P, (∂V/∂P)T, and (∂H/∂T)P, i.e. CP. The twenty-eight essential formulas derived using this methodology are show adjacent. [1]

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2. Glasstone, Samuel B. (1946). *Thermodynamics for Chemists* (Bridgman's formulas, pg. 212). D. Van Nostrand Co.
3. Percy, Bridgman. (1925). *A Condensed Collection of Thermodynamic Formulas*. Harvard University Press; in: *The Thermodynamics of Electrical Phenomena in Metals*. Dover (§Appendix, pgs. 199-242), 1961.

Further reading

● Bridgman, Percy W. (1925). "Condensed Collection of Thermodynamic Formulas", *Phys. Rev.*
● Bridgman, Percy W. (1925). *A Condensed Collection of Thermodynamic Formulas* (34-pages, containing 720 derivatives). Harvard University Press.
● Bridgman, Percy W. (1934). *The Thermodynamics of Electrical Phenomena; and a Condensed Collection of Thermodynamics Formulas.* Dover, 1961.
● Bridgman, P. W. (1955). "Heat and Thermodynamics" in: *Fundamental Formulas of Physics, Volume 1* (ch. 10, pgs. 264-76), by Donald Menzel, Prentice-Hall, 1960.

External links

● Bridgman's thermodynamic equations – Wikipedia.

θΔics

In science, **Bridgman paradox** or “Paradox of Bridgman” refers to the paradox that while a living thing, i.e. powered CHNOPS+ molecule, has an entropy, as does any body in the universe, there, apparently, is no way to calculate this entropy, being that, according to standard calculation of entropy methods, one would have to either synthesize (create) or destroy (analyze) the organism in a reversible way.

The paradox was pointed out by American physicist Percy Bridgman during the famous 1946 Harvard "what is life in terms of physics and chemistry?" debate, during the course of which Bridgman commented how he saw a fundamental difficulty in the possibility of applying the laws of thermodynamics to any system containing living organisms (chnopsological organisms).

A synopsis of Bridgman’s paradoxical objection was given in French-born American physicist Leon Brillouin’s 1949 article “Life, Thermodynamics, and Cybernetics”, wherein he referred to it as the “Paradox of Bridgman”, summarizing Bridgman’s point as follows: [1]

> “How can we compute or even evaluate the entropy of a living being? In order to compute the entropy of a system, it is necessary to be able to create or to destroy it in a reversible way. We can think of no reversible process by which a living organism can be created or killed: both birth and death are irreversible processes. There is absolutely no way to define the change of entropy that takes place in an organism at the moment of death.”

Bridgman’s view on this seeming paradox can also be compared to American physical chemist Martin Goldstein's 1993 chapter subsection on the entropy of a mouse, which gives led into modern human free energy theories of human synthesis. [2]

See also

â— Bridgman formulas

References

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2. Goldstein, Martin and Goldstein, Inge F. (1993). *The Refrigerator and the Universe: Understanding the Laws of Energy* (section: Entropy of a mouse, pgs. 297-99). Harvard University Press.

θΔics

In physics, **brightness** refers to the power intensity of a light source. In the production of star light, the phenomenon of hydrogen burning occurs, where gravitation pressure acts to squeeze central "star" hydrogen atoms, causing chain thermonuclear reactions, which result to release energy, primarily as light. The unit of the measure brightness is candela (cd) defined as the power emitted by a light source in a particular direction. The common candle emits light with a luminous intensity of roughly one candela. In the burning of a candle, fuel in the form of wax, a type of lipid (oxygen hydrocarbon molecule), reacts with oxygen molecules to create light and heat.

Human thermodynamics

In extrapolation, regarding the terms intellectual "brightness", all-time "star" genius, "burnout" IQs, and "deburners", etc., is that these are not simply figures of speech or pure analogy (as many would argue), but rather terms modeled on stellar burning or other forms in which light is made, such as filament heating or combustion (fire).

In human context, brightness is a thermal word used to describe individuals on either an intellectual or social effect level. In terms of intellectual ability, brightness refers to the logic that IQ is defined as a measure which expresses the relative brightness or intelligence of any given individual. In terms of social effect, brightness refers to people who are said to have a ‘star like’ quality about themselves and thus to shine very bright, in many cases for centuries on end; examples being the terms ‘rock star’, football star, or superstar, etc.

In this logic, human beings can be considered as large hydrogen atoms (made of 26-elements to precise), termed "human molecules", and this same pressure-induced burning phenomenon acts in the human sphere, in which human electromagnetic pressure acts to squeeze central "star" human molecules, e.g. Geothe, Da Vinci, Newton, Einstein, etc., causing human thermonuclear reactions (an high energy type of human chemical reaction) which result to release energy. [1]

These types of high-energy reaction are indicative of the laws, workings, and movement of the universe. Those individuals forced into this universal current, so as to become adult star "human molecules" or all-time "bright" geniuses, are thus different than those who may have had the potential to become stars, but failed to react, for whatever reason.

On this model, in may be possible to measure human brightness in units of candela, as function of combustion-like reactions between human molecules.

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pgs. 290-95). Morrisville, NC: LuLu.

External link

â— Brightness – Wikipedia.

θΔics

In companies, **BrizeBox MailCube** refers to the "Brizebox" package mailbox, designed by English mechanical engineer Brian Wilcox, smart technology enhanced by "MailCubes", via the smart tech (see: smart mailbox) additions of American electrical engineer Libb Thims.

Colors | Overview

The following are color options requested in Japan, ranked by order of popularity, of the Brizebox Mailcube: [1]

Chocolate
(13.1% popularity Japan)

Bordeaux
(21.4% popularity Japan)

Dark Green
(16.7% popularity Japan)

Basic Operation

Dark Gray
(#1 popular in UK/Germany)

Architectural Gray
(15.5% popularity Japan)

Black / Night
(#2 popular in UK/Germany)

Blue
(9.5% popularity Japan)

St. Peter Blue

Snow

Ivory
(8.3% popularity Japan)

Latimer Cream

Forest

(Sc)

Challens Green

(Sc)

Green
(8.3% popularity Japan)

(Sc)

Pink
(7.1% popularity Japan)

Small | $263
MPS volume: **788 in³**
P/U ratio: 17.6%
Package: 7Hx12.5Wx9D"
Dimensions: 15Wx13Dx23H"

Large | $394
MPS volume: **1836 in³**
P/U ratio: 20.8%
Package: 9Hx17Wx12D"
Dimensions: 20Wx13Dx34H"

XLarge | $529
MPS volume: **3750 in³**
P/U ratio: 18.3%
Package: 12.5Hx20Wx15D"
Dimensions: 24Wx18Dx45H"

The following is a demo of the operation of the BB large unit:

Other

The following is a green BrizeBox spray painted "olive green" by the owner, to fit his surroundings better:

> "Bought the large standalone model a few months ago and couldn't be more pleased. Live out in the country so electric gate is needed for security. This meant that **lots of deliveries used to be missed**. The unit is similar to a metal office filing cabinet with the top draw having airplane bomb release style doors to let parcels and letters drop through to bottom holding area. Didn't like the color so sprayed unit olive green and masked decals. (see photo) It is secure however a determined thief could break into it without difficulty. Having said that most thieves wouldn't bother because most likely it would be empty. **Great when on holiday because of the volume of letters and parcel capacity** and courier/postman/thief can't see what's already in box resulting in less awareness of being away. Gave it a **5-star rating for looks**, peace **of mind and convenience** of not having to be at beck and call 24/7. There is even a unique barcode inside delivery draw, so that may allow for delivery after scanning by some companies without signature. **After a lot of research found this to be the best on the market** and looks good too. Have **since increased purchases online** because of the shear convenience and not forever having to go down to Post Office to collect missed parcels."
>
> — Mr. Blue Sky (2017), Amazon Review (England) (Sc), Oct 27

See also

1 — Package to unit ratio

References

1. Wilcox, Brian. (2017). "Email to Libb Thims" (attachment spread sheet of an 84 unit from Japan), Jul 31.

In hmolscience, **Brooks Adams** (1848-1927), noted younger brother of Henry Adams (1838-1918), was an American historian and lawyer noted for his 1895 publication *The Law of Civilization and Decay*, in which he applied the Helmholtz-version of the first law, i.e. that energy or force is conserved, Kelvin-version of the second law, i.e. that there is a universal tendency to the dissipation of energy, along with a theory of social contractions and dispersions, to develop a energetic theory or model of history, in reference, particularly, to its civilization rises and falls. [1] The following is a noted quote: [3]

> "Thought is one of the manifestations of human energy, and among the earlier and simpler phases of thought, two stand conspicuous: fear and greed. Fear, stimulated by the imagination, creates belief in an invisible world, and ultimately develops a priesthood; and greed, which dissipates energy in war and trade. In earlier stages of concentration, fear appears to be the channel through which energy finds the readiest outlet."

American comparative literature professor David Weir uses Adams' energy-entropy theory of rises and falls of civilization as a basis of the study of rises and falls of decadence in his 2007 book *Decadent Culture in the United States*. [2]

Overview

In order to characterize the "the intellectual phases through which human society must, apparently, pass," according to Adams, "in its oscillations between barbarism and civilization," in what amounts to movements from a "condition of physical dispersion to one of concentration", that history, like matter, must be governed by a law that would seem to "correspond, somewhat closely, with the laws which are supposed to regulate the movement of the material universe." [1] Brooks Adams, according to Eric Zencey (1983), argued that civilizations decline when their races run out of energy. [4]

Fundamental proposition

The theory that human intellectual history must be governed by the laws which regulate the material universe, according to Adams, is based on "the accepted scientific principle, that the law of force and energy is of universal application in nature, and that animal life is one of the outlets through which solar energy is dissipated". [1] Starting from this statement, in what Adams refers to as the "fundamental proposition", he then reaches two deductions:

> (a) Human societies are forms of animal life.
> (b) Societies must differ among themselves in energy, in proportion as nature has endowed them, more or less abundantly, with energetic material.

Beyond this, Adams outlines a number of very advanced social energy theories, for instance that "thought is one manifestation of human energy" or that "the velocity of a social movement of any community, is proportional to its energy and mass", among others.

Education

Adams graduated from Harvard University in 1870, attended Harvard Law School for one year in 1871, and was a lecturer at Boston University School of Law from 1904 to 1911. Brooks Adams was very influential, with his ideas of an energetic model of history, to his older brother Henry Adams, who later developed his own, more advanced, thermodynamic theories of history.

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3. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (pg. 225). AuthorHouse.
4. Zencey, Eric. (1983). “Entropy as Root Metaphor”, Conference on Science, Technology, and Literature, Feb, Long Island University, New York; in: *Beyond the Two Cultures: Essays on Science, Technology, and Literature* (editors: Joseph Slade and Judith Lee) (§9:185-200, esp. 195), Iowa State University Press, 1900.

External links

â— Brooks Adams – Wikipedia
â— Brooks Adams (biography) – NNBD, tracking the entire world.

θΔics

In evolution, **Brooks-Wiley theory**, or "Wiley-Brooks hypothesis", is a 1982 Shannon bandwagon melting pot type theory, conceived by Canadian zoologist Daniel Brooks and American systems ecologist Edward Wiley, which argues that evolution is explained by a mixture of Prigoginean thermodynamics, information theory, Americans geneticist Lila Gatlin's ideas on information theory thermodynamics and genetics, and physicist David Layzer's cosmological thermodynamics "entropy gap" models, among a few other melting pot theories. [1]

A cartoon parody of the **Brooks-Wiley theory**, from a 2011 article on the theory by David Tyler, portraying their work as a "melting pot theory" wherein, in the end, Canadian zoologist Daniel Brooks is the one who gets "burned". [5]

The theory drew a severely negative reaction by Danish zoophysiologist Soren Lovtrup, American zoologist Fred Bookstein, and American chemist Jeffrey Wicken, along with later attack and ridicule by American thermodynamicist Harold Morowitz and and an anonymous three-author attack from the University of California, Berkeley, home to the Lewis school of thermodynamics, among likely numerous others.

The theory is so ridiculous, being that it rides on the Shannon bandwagon into nearly inane and bend-over backward arguments, that the titles of the reaction articles say it all: "Victims of Ambition" (Lovtrup), "Entropy and Nonsense" (Morowitz), etc., yet, in the face of such opposition, Brooks and Wiley carried on for nearly a decade, producing many rebuttal articles, followup articles, and a book (*Evolution as Entropy*, 1986), that was again attacked, along with 100+ additional reference-boasting second volume (1988), that was again attacked, and Brooks, at least, as he stated in 2011, is still "begging" for an extension of his new neo synthesis. [7]

Criticisms and quotes

The following are noted criticisms and quotes in regards to the negative reactions to the Brooks-Wiley theory:

> "I see how you can do this with molecules, but I don't see how you can do it with species. I don't understand the extrapolation."
>
> — Ilya Prigogine (1982), comment to Brooks [6]

> "Responses to the proposal have been mixed and often quite strong. Some consider the theory to be a brilliant insight that will advance evolutionary biology immeasurably. Others vehemently reject it as an ill-founded attack on neo-Darwinism. Curiously, yet others regard it as nothing but neo-Darwinism translated into incomprehensible form. Still others contend that Brooks and Wiley's use of nonequilibrium thermodynamics is untenable in this context."
>
> — Roger Lewin (1982) [6]

> "The Wiley and Brooks (1982) discussion purportedly is based on nonequilibrium thermodynamics, as developed by Ilya Prigogine and his colleagues, and on some recent developments in information theory. Certainly, the cannibalistic nightmare depicted by the authors is completely unrealistic."
>
> — Soren Lovtrup (1983) [10]

“Wiley and Brooks misconstrued the meaning of their crucial conceptual borrowings.”

— Fred Bookstein (1983) [4]

“The **Wiley-Brooks’ hypothesis** itself is flawed and has been criticized by Lovtup (1983) and Bookstein (1983). I concur with most of these criticisms.”

— Jeffrey Wicken (1983) [8]

“The **Brooks-Wiley theory** has been criticized (Lovtrup, 1983; Bookstein, 1983; Wicken, 1983) for abusing terminology from thermodynamics and information theory and for not accurately describing the phenomena.”

— John Collier (1986) [2]

“I begin with this linguistic nitpicking because it is important to realize that [*Entropy as Evolution*] uses imprecise meanings and poor writing to cover up fundamental nonsense and emptiness of the underlying ideas. The only reason for reviewing such a work is that a number of biologists untrained in thermal physics and information science have been fooled into believing that there is some content in the **‘Unified Theory’ of Brooks and Wiley**, and it is important to realize these biologists [have but been] mesmerized by the language and equations of physics to support a [baseless] hypothesis [evolution is an information-entropic process].”

— Harold Morowitz (1986) [3]

“As useless as the book cited above is the book *Evolution as Entropy* by **Brooks and Wiley**. The basic **proposition** in this work is that speciation is controlled by the stochastic premises of the second law of thermodynamics. One may only regret that in the 43-years since the publication of Schrodinger's work [*What is Life?*] a book has appeared whose authors do not understand the role of the second law of thermodynamics in living nature...the authors are concerned only with the amount of information and, hence, with [Shannon] entropy. But, by confining oneself to these concepts alone, one can hardly say anything about evolution...in the world of living things the quality or value of information is often of decisive importance. No appropriate methods have yet been worked out for estimation of the quality of information.”

— Mikhail Volkenstein (1996) [9]

“By 1982, the centenary of Darwin's death, Niles Eldredge and Steven J. Gould had catalyzed a loosely connected group of evolutionary biologists unhappy with the New Synthesis to unleash a cascade of criticisms and proposals. Emboldened by this display of the scientific community at its meritocratic best, Ed Wiley and I entered the fray. The day we finished proofreading Evolution as Entropy [1986], David Hull presciently warned us the fun was over. Soon, I received an envelope from a friend who had seen a manuscript on a colleague's desk. Such privileged material is rarely copied and forwarded. My friend wrote, "I think you and Ed should know what you're up against." The privately circulated manuscript was authored by three academics at the University of California-Berkeley. Ed and I were stunned by its vicious tone. Why the rhetorical heat?”

— Daniel Brooks (2011) [7]

"Daniel Brooks is has been living with controversy ever since 1982, when his [information theoretic entropy] ideas first appeared in an academic paper, and then when, in 1986, he co-authored with Ed Wiley a book with the title *Evolution as Entropy*."

— David Tyler (2011) [5]

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Responses

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θΔics

In phenomenon, **Brownian motion** refers to the apparent microscopic observation of random motion of particles contained in the pollen of plants and or of the general existence of active molecules in organic and inorganic bodies. [1]

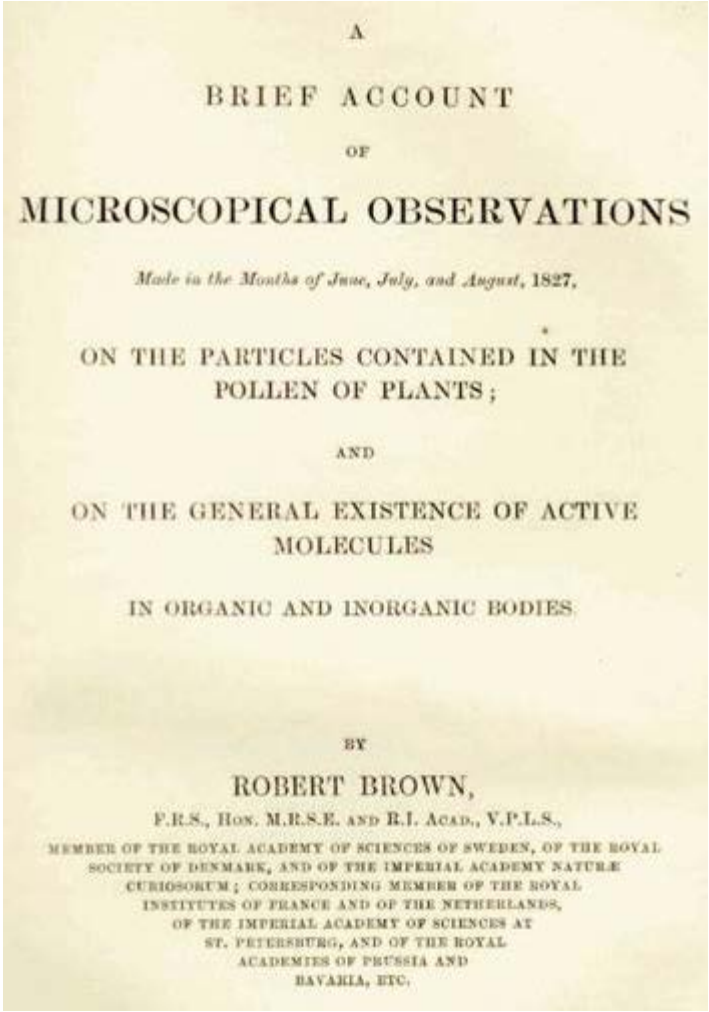

A

BRIEF ACCOUNT

OF

MICROSCOPICAL OBSERVATIONS

Made in the Months of June, July, and August, 1827,

ON THE PARTICLES CONTAINED IN THE POLLEN OF PLANTS;

AND

ON THE GENERAL EXISTENCE OF ACTIVE MOLECULES

IN ORGANIC AND INORGANIC BODIES

BY

ROBERT BROWN,

F.R.S., Hon. M.R.S.E. and R.I. Acad., V.P.L.S.,

MEMBER OF THE ROYAL ACADEMY OF SCIENCES OF SWEDEN, OF THE ROYAL SOCIETY OF DENMARK, AND OF THE IMPERIAL ACADEMY NATURÆ CURIOSORUM; CORRESPONDING MEMBER OF THE ROYAL INSTITUTES OF FRANCE AND OF THE NETHERLANDS, OF THE IMPERIAL ACADEMY OF SCIENCES AT ST. PETERSBURG, AND OF THE ROYAL ACADEMIES OF PRUSSIA AND BAVARIA, ETC.

Scottish botanist Robert Brown's 1828 *A Brief Account of Microscopical Observations*, wherein he reports on the ransom movement of active molecules. [1]

History

The term “Brownian motion” is named after Scottish botanist Robert Brown who studied the movement of pollen grains suspended in water in 1827.

In 1905, German-born physicist Albert Einstein explained Brownian motion mathematically. [2]

In 1909, French chemist Jean Perrin, in his “Brownian Motion and Molecular Reality”, building on Einstein's 1905 Brownian motion work, stated that Avogadro's hypothesis is equivalent to saying that 'any two gram-molecules contain the same number of molecules', and commented further by stated:

> “The invariable number N is a universal constant, which may appropriately be designated Avogadro’s constant.”

Perrin gave the following value: [8]

$$N = 70.5 \times 10^{22}$$

which, it seems, to the number of molecules in 32-grams of oxygen.

In 1912, Austrian-born Polish statistical physicist Marian Smoluchowski posited a conceptualized type of Maxwell demon trap door (Smoluchowski’s demon) that "vibrates" owing to Brownian motion energy impacts. [9]

in 1926, Perrin received the Nobel Prize in physics for proving, conclusively, the existence of molecules, by calculating Avogadro's number using three different methods, all involving liquid phase systems. First, he used a gamboge soap-like emulsion, second by doing experimental work on Brownian motion, and third by confirming Einstein’s theory of particle rotation in the liquid phase. [2]

Humans

In 1975, Austrian-born American astrophysicist Erich Jantsch, in his *Design for Evolution: Self-organization and planning in the Life of Human Systems*, discusses the second law of thermodynamics in the context of the Brownian motion of human molecules; an excerpt of which is as follows: [7]

> “… dream of a pressure-free end state of maximum entropy in physical and social energy, in which action is neither possible nor necessary in any direction, only a kind of thermal (so-called **Brownian**) motion of the human "molecules" **...**”

In 1978, American physicist Arthur Iberall applied the model of the thermodynamics of Brownian motion to interactions

in chnopsological (biological) systems. [4]

Economics

In economics, and especially, econophysics, Brownian motion is often found convoluted together with French mathematician Louis Bachelier's 1900 "random walk" hypothesis, wherein he treated securities prices similar to gas molecules, moving independently of each other, with future movements being independent of past movements. [2]

Quotes

The following are related quotes:

> "This suicide must be ranked as one of the great tragedies in the history of science, made all the more ironic by the fact that the scientific world made a complete turnabout in the next few years and accepted the existence of atoms, following Perrin's experiments on **Brownian motion**."
>
> — Stephen Brush (1964) on Boltzmann's ironic death [5]

> "Human beings mimicking **Brownian motion** seems not by itself much socially enlightening."
>
> — Aaron Agassi (2009), comment #19 in Moriarty-Thims debate

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θΔics

In hmolscience, **Bruce Bathurst** (c.1945-) is an American geologist noted for his 2009 participation in the Moriarty-Thims debate about the entropy of arrangements of people and his stated people are not molecules position. [1]

Education

Bathurst completed his completed PhD in geological thermodynamics at Princeton.

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θΔics

In hmolscience, **Bruce J. Caldwell** (1952-) is an American economics historian noted for

Overview

In 1992, Caldwell, in his "Commentary" chapter on American philosopher Alan Nelson's chapter "Human Molecules", gave a discussion of Nelson's statistical thermodynamics / economic thermodynamics based model of:

> Agent (economic) = Human molecule

commenting, for example, on the use of reductionism within social and physical sciences. [1]
Nelson, in turn, published a response chapter to Caldwell's criticism. [2] In the end of his commentary article, Caldwell seems to conclude that he is of a mindset similar to American physical economics historian Philip Mirowski:

> "A revisionist history that complements my thesis is Philip Mirowski's *More Heat Than Light* (1989). Mirowski argues that most of the developments in economic theory since the marginal revolution derive from the misappropriation of a mathematical metaphor from the energy physics of the mid-nineteenth century. The metaphor was borrowed in an attempt to make economics more scientific, an urge so prevalent among economists that Mirowski describes it as a kind of disease; he dubs it 'physics envy'."

(add discussion)

Human molecular theory views

In the opening of his 1992 "Commentary", Caldwell states the following:

> "Attempts at reductionism within the physical sciences founder because of a failure to satisfy the translatability condition."

In 2012, retrospect analysis of this statement, Caldwell clarifies that: [4]

> "The sentence quoted by you from my article was a restatement by me of Nelson's position. It was not my position. So it is wrong to characterize me as a 'human molecular theory objector'."

(add discussion)

Falsifiability

On the question of the use of Karl Popper's falsifiability criterion in economics, Caldwell states, gives the opinion that he is not against the use of empirical tests in economics, but that his is against the notion, which he feels is dogmatic, that falsificationism is the only responsible and legitimate methodology available to economists. [5]

Samuelson

Caldwell claims that American economist Paul Samuelson culled some of this ideas from a reading of the physics of Percy Bridgman. [2]

Social physics

In 2010, Caldwell was the editor of a collected works set of Austrian economist Friedrich Hayek (1899-1992), including a chapter on the social physics of Henri de Saint-Simon and Auguste Comte, in which, for example, Hayek, notes that, in 1817, Saint-Simon offered the newly christened aged-nineteen *École Polytechnique* graduate Comte (who had steeped himself in the writings of Joseph Lagrange), a position of secretary. [3]

Education

Caldwell completed his AB in economics (1974) at the College of William and Mary and his PhD (1979) in economics at the University of North Carolina, Chapel Hill. Presently, he is a professor of economics at Duke University, specializing in the history of political economics.

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â— Bruce Caldwell (faculty) – Duke University.

θΔics

In literature thermodynamics, **Bruce Clarke** (c. 1950-) is an American professor of literature and science noted for his 2001 book *Energy Forms: Allegory and Science in the Era of Classical Thermodynamics*. This work analyzes the interactions among energy and entropy, heat and radiation, and their symbolic presentations in the literature of the times, as in the Nefastis machine. It draws on the writings of well-known literary and scientific authors including James Maxwell, William Thomson, Balfour Stewart, H. G. Wells, Camille Flammarion, Yevgeny Zamyatin, and D.H. Lawrence. He critiques the use of thermodynamics in literature, e.g. social energy, by Zamyatin, in his 1920 novel *We*, or Thomas Pynchon, and his 1966 novel *The Crying of Lot 49*. [1]

Overview

In 1995, Clarke published *Allegories of Writing*, applying allegory theory to narratives of bodily metamorphosis. Soon thereafter, Clarke developed a fascination with Maxwell's demon, which can be thought of as an allegorical figure fulfilling a thermodynamic thought-experiment duty. In his 1996 book, *Dora Marsden and Early Modernism*, Clarke included studies of the 19th-century interplay between vitalistic and thermodynamic ideas.

Eventually Clarke's scholarship turned entirely toward the overlap of literature and science, where he came upon chaos theory and Weiner's cybernetics, coming under the impression that Boltzmann's entropy formula sat behind Shannon's calculus of information entropy, among other similar thoughts.

Since his high school science class years in the 1960s, Clarke has built up, autodidactically, upon his knowledge of science, occasional readings in popular science (Lewis Thomas, James Gleick, Primo Levi's *Periodic Table*, etc), especially using history-of-science scholarship as a guide, as well as following the growing body of work in literature and science, such as William Paulson and Katherine Hayles, and the philosophy of science of Michel Serres. This effort solidified in 1989 when Clarke joined the Society for Literature, Science, and the Arts (SLSA).

Education

Clarke completed his BA (1974) from Columbia College, and PhD (1980) from State University of New York at Buffalo, both in English. [2] Clarke is currently a professor of literature and science at Texas Tech University.

See also

- Bill Poirier

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External links

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θΔics

In economic thermodynamics, **Bruce R. Copeland** (c.1960-) is an American scientist noted for []

Overview

In 2008, Copeland, in his blog "The Economic Reality of the Laws of Thermodynamics", discussed the following:

> "Paramount among the fundamental laws of nature are the laws of thermodynamics. The laws of thermodynamics apply to everything, including economic activity!"

The following section talks humorously about the need to avoid making "perpetual motion of the economic kind" theories:

> "For years top accountants have been agonizing over how to produce standards for identifying dangerous or inappropriate investment schemes in derivatives. A very sound approach would be to use the laws of thermodynamics. In fact there is a specific formalism used by engineers and scientists to identify first and second law violations. It's called perpetual motion. It should not be difficult to establish concrete principles for testing financial instruments and schemes for perpetual motion of the economic kind. We would be much better off as a society if such approaches were used to monitor and regulate our economy and its various parts."

(add discussion)

Education

Copeland has a PhD in something and has researched and published in statistical mechanics, signal processing, biochemistry, molecular genetics, and medicine. He is also co-author of a popular press book on computer software design.

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θΔics

In hmolscience, **Bruce Gunn** (1937-) is an American business marketing and management theorist noted his 1968 Le Chatelier's principle based theory of business motivation.

Overview

In 1968, Gunn, in his "The Dynamic Synthesis Theory of Motivation", postulates a business chemistry/business thermodynamics type theory, according to which Le Chatelier's principle together with the transformation of energy, are what define employee motivation. The following is Gunn's abstract: [1]

> "An interdisciplinary perspective of employee motivation is presented, based on the premise that the principles of natural science provide the fundamental basis for analogizing the operational similarities of physical and social productive systems. This concept is applied to motivation by observing that all productive systems-whether physical, organic or social-are input-output systems. The lowest common denominators in these systems are energy and mass. Le Chatelier's principle provides the universal environment for motivation. Thus, the transformation of energy in a given productive system represents the essence of motivation. The usefulness of analogizing the process of energy transformation in these two seemingly diverse systems can be seen by tracing the essential factors leading to efficient energy expenditure in physical systems and applying similar strategies to energy transformation in social systems. Such an approach will provide the manager with a concrete frame of reference from which to draw plausible remedies in solving the innumerable problems of efficient motivation and utilization of employee energies."

Gunn, interestingly, was very interdisciplinary in peer review, his reviewers for this paper being: Ronald E. Jones (chemical engineering), Lee V. Mclean (electrical engineering), Leon C. Megginson (management), Stanley Preston (finance), Samuel H. Roy (statistics), and Roger A. Richardson (psychology).

Le Chatelier's principle | Motivation

The gist of Gunn's motivation theory in regards to Le Chatelier's principle seems to be the following argument: (O)

> "A threatening force to his survival or security from either of these environments will mobilize energies (ability to do work) of the entire organism in an active effort to restore the balance of the previous state. The result of these inner states of tension are thought of as motivation. The phenomenon of motivation can be seen in the tenets of physics; Le Chatelier's principle states: 'If a stress, any change in one of the variables that determines the state of a system in equilibrium, is applied to a system in equilibrium, the equilibrium is shifted in a way that tends to undo the effect of the stress'."

This is all fairly cogent, except for the fact that, previous to this, on his opening page, he stages:

> "The basic motive in life can perhaps be readily recognized by visualizing the continuum of evolution from life's simplest to most complex forms: molecular structure followed by instinct and the complex sensory mechanism of intelligent primates combine to make the drive for survival an irrepressible force. In essence, the law of self-preservation is the first law of nature."

In other words, there is no "drive for survival" at the molecular level or "law of self-preservation" found when we step down the great chain of being. Gunn, in short, is using the extrapolate down method, i.e. bending over backwards to incongrously force or carry Darwinian theory into the molecular, chemical, and thermodynamic realm, where it holds no sway. This was issue was famously first dealt with in 1991 by American philosopher Robert Pirsig, who gave the following ridicule to such logic: [2]

> "Why should a group of simple, stable compounds of carbon (C), hydrogen (H), oxygen (O), and nitrogen (N), 'struggle' for billions of years to organize themselves into a professor of chemistry? What's the motive?"

In short, atoms and molecules, do not struggle to survive; hence the same logic should apply to humans, which are but powered geometries of the former.

Critiques

To critiques of Gunn's article were given one by Arne Mjosund of University of Alabama another by Michael Brenner Bell Labs; a snippet summary of Gunn's theory by the latter states: [2]

> "In Gunn's paper, a framework is proposed for describing motivation of people within a business environment. The paper suggests that the universal principle[s] of physics may be the most appropriate vehicle for gaining insight into the complex process of this type of human behavior."

Education

In 1968, Gunn was a graduate teaching assistant in the marketing department of Louisiana State University. Gunn earned his BS in management at West Virginia and his MS and PhD in marketing and finance at Louisiana State University, the latter with a dissertation on "A Systems Approach to Consumer Motivation: with Emphasis on Procedures for Identifying Opinion Leaders" (Q). In 1989, Gunn was a professor of marketing, with the college of business at Florida State University. (Q)

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External links

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θΔics

In existographies, **Robert Bruce Lindsay** (1900-1985) (GMG:4) (CR:33), oft-cited as "R. Bruce Lindsay", was an American physicist noted for a nearly six-decade long quest to explain social phenomena in terms of physical science, as exemplified by his 1927 article “Physical Laws and Social Phenomena”, his 1959 discussions of a thermodynamics based model of human ethics, his 1963 introduction of the "thermodynamic imperative" (a update of Wilhelm Ostwald's energetic imperative), as well as his 1983 chapter “Social Exemplifications of Physical Principles”; much of this inquiry focused on a study of energy and thermodynamics. [4]

Purpose | Minimum principles

In 1983, Lindsay, aged 83, in his chapter “Social Exemplifications of Physical Principles”, in followup to his earlier article “Physical Laws and Social Phenomena” (1927), written in the "brashness of his youth", i.e. a then age 27, MIT-minted, Bohr-mentored, Yale physics professor, says the following on purpose and minimum principles: [7]

> “The teleological idea or **concept of purpose** is involved in several physical principles, notably Hamilton’s principle and the related but identical principle of least action, Hertz’s principle of the straightest path, Gauss’ principle of least constraint, and Fermat’s principle of least time. They all effectively state that things take place in the physical world, e.g. the motions of systems of particles, in such a way as to make a certain function assume a stationary value under certain boundary conditions, usually a minimum as compared with all possible values satisfying the given conditions.
>
> This means that the actual motion between the initial state and final states at the initial and final times, respectively, takes place in such a way that the integral in question is either greater than it would be for any other possible motion between these states or less than any other possible motion between these states, it being understood that the initial and final states are the same for all the possible motions being compared. In the majority of cases to which the principle has been applied in classical mechanics, the stationary value is a minimum.
>
> With respect to the possible idea of purpose involved philosophers have argued that since Hamilton’s principle is *not* necessary for the deduction of the actual motion of the dynamical systems, i.e. the Newtonian or Lagrangian equations are fully adequate, we have no real logical ground for insisting that nature imposes a teleological requirement on motions in our experience. Nevertheless the fact that one can exhibit the principles of mechanics in a teleological guise is persuasive, since it serves to tie physical principles with an idea basic to the interpretation that human beings give too much of their ordinary experience, particularly in their relations with other human beings.
>
> Hamilton’s principle, e.g., says that for a conservative dynamical system the motion between any two instants of time is such that the time integral of the difference between the kinetic and potential energies taken between these two instances has a stationary value. It has as if the system had a certain purpose to satisfy. A rational individual is said to arrange his actions so as to be sure of achieving his fundamental desires, whether it be to accumulate wealth or gain power over his fellow men. In particular, the aim here is almost always to try to attain the given desired end at minimum cost in human effort. This strongly suggests a heuristic connection with the [Gibbsian] minimum principles of physics.”

Lindsay, here, to note does not directly state that minimization of the Gibbsian for social systems is the quantitative function for the so-called "senses of purpose", as Einstein deemed things, felt by people in society, but he does previous to the above, in his section "The Principles of Thermodynamics", outline ideas on how Clausius-Gibbs based thermodynamics applies socially. The only connection Lindsay makes to the above is to give the example of George Zipf's 1949 principle of least effort.

Lindsay's purpose as minimum principle supposition, to note, is reminiscent (Ñº) of Soren Kierkegaard's "where is the director?"

Physical sociology

In 1927, at the age of 27, Lindsay, as a newly MIT-minted, Bohr-mentored, Yale physics professor boldly venturing, as he says, into the so-called field of physical sociology, with the publication of his "Physical Laws and Social Phenomena", a process which he describes, in 1983 retrospect, as follows: [5]

> "Many years ago in the *brashness of youth* the writer prepared an article ["Physical Laws and Social Phenomena", 1927] on the possible use of physical principles and concepts in the description and understanding of social phenomena. He called attention to the earlier efforts of social scientists like Auguste Comte, Herbert Spencer, and Lester Ward to apply physical concepts and laws more or less directly to social explanation. He emphasized the difficulties encountered in the use of such analogies, e.g., the attempt to introduce a 'social force' analogous to 'force' in mechanics, overlooking the highly specific meaning attributed to the term in physics, not always clearly grasped by the nonphysicist and indeed for a long time not even too precisely clear to many physicists and engineers. It was only later that his attention was drawn to the ideas and criticisms of Vilfredo Pareto, who in his monumental work *Treatise on General Sociology* (1916) stresses in great detail the same difficulties."

In 1983, in his "Social Exemplifications of Physical Principles", a followup to his 1927 article, Lindsay argues the following: [7]

> "Do not social exemplifications of physical principles have some value for somebody? And is not this value to be found in their heuristic and pedagogical suggestions? In other words, can such social exemplifications of physical principles illuminate our understanding of the principles themselves and lead us to ask more intelligent questions about them? Can they possess pedagogical value for those striving to understand physics without the intention of becoming physicists or even scientists of any sort?
>
> Affirmative answers to these questions will justify attention to the social examples even if their actual use in the development of the social theories is questionable. It is the purpose of the present essay to suggest that such social exemplifications of physical principles do indeed often have heuristic and pedagogical value. We begin with the principles of thermodynamics, a fruitful source of social examples."

(add discussion)

Ethics

In 1959, Lindsay, in his "Entropy Consumption and Values in Physical Science", as summarized by Vincenzo Cioci (2010), argued the following: [6]

> "Men should strive to increase the degree of order in their environment, opposing as much as possible to the natural tendency that the entropy has to grow in accordance with the second law of thermodynamics."

In 1963, Lindsay published his his so-called thermodynamic imperative, which states that: [2]

> "While we *do* live we ought always to act in all things in such a way as to produce as much order in our environment as possible."

In this sense, Lindsay reasons that since every human process or action exhibits an increase in entropy, everything one does leaves a mark in one's thermodynamic system, irrevocably. Hence, to counter this tendency, according to Lindsay, we should follow a certain code of conduct in life based on the laws of thermodynamics. [3]

American educator Dick Hammond has discussed and thought Lindsay's thermodynamics based ethics to some extent. [1]

Education

Lindsay, a seeming prodigy of sorts, at age 20, completed both his BA and an MS in physics from Brown University, then spent the 1922-23 academic year as a Fellow of The American-Scandinavian Foundation at the University of Copenhagen, under Niels Bohr and Hans Kramers, after which at age 24 he complete his PhD on atomic models of alkali metals at MIT.

Lindsay went to Yale University in 1923 as instructor in physics, and was promoted to assistant professor in 1927. He returned to Brown in 1930 as associate professor of theoretical physics, and was named Hazard Professor of Physics in 1936.

As a physics professor, he taught innovative human thermodynamics education courses, such as "The Role of Science in Civilization" and "Energy and Man". He acted as chairman of the Physics Department at Brown from 1934 until he became dean of the Graduate School in 1954. He retired as dean of the Graduate School in 1966 and from teaching in 1970.

Religion | Eating the forbidden fruit | Work

Lindsay, at one point, cites the Bible, Genesis section 3:19 specifically, namely the following statement: "In the sweat of thy brow shall thou eat bread", i.e. the supposed punishment for the sinners who have eating the forbidden fruit in the garden of Eden, as being an example of the first law of thermodynamics. Others, likewise, have cited this passage in efforts to argue that labor is evil and a disgrace. (Ñº) Lindsay, to clarify somewhat, concludes with the following: "In any case, we may be sure of one thing! There must be sweat (actual or metaphorical) in someone's face if our so-called civilization is to endure."

The full key passages, Genesis 3:17-19, according to the King James Version, which elaborate on the so-called Biblical reason behind man's inherent fate on earth as a perpetual laborer owing to past sacramental sin of eating the forbidden fruit, is the following: (Ñº)

> And unto Adam he said, Because thou hast hearkened unto the voice of thy wife, and hast eaten of the tree, of which I commanded thee, saying, Thou shalt not eat of it: cursed is the ground for thy sake; in sorrow shalt thou eat of it all the days of thy life; (3:17) Thorns also and thistles shall it bring forth to thee; and thou shalt eat the herb of the field; (3:18) In the sweat of thy face shalt thou eat bread, till thou return unto the ground; for out of it wast thou taken: for dust thou art, and unto dust shalt thou return. (3:19)

This, to note, is a religio-mythology rewrite combination of (a) the 300BC Egyptian-Christian conceptualized "clay creation myth", in the sense of 'thou art but dust from the ground' and (b) the 1700BC Sumerian mythology, story of the birth goddess Nammu, of the watery depths, said to have molding clay into the shapes of humans and bringing the molds to life to be a workforce replacement for the gods in the maintenance of the land, i.e. the point of man's existence, according to this myth, is to be workers for the gods, so they can rest in the heavens. Whatever the case, Lindsay takes this eating via someone else's sweat (or work) tale, whether actual or metaphorical, or whether he believed in the existence of god, e.g. he says "here we find the Lord admonishing the sinners of the garden ...", to be indicative or representative of the so-called game version of the first law of thermodynamics, namely that "there is no such thing as a free lunch, someone always pays!", as he says.

Difficulties on theory

Lindsay, on a few points, becomes rather opaque in regards to correctness; the following being one example:

> "Clausius: 'The entropy of the universe strives towards a maximum value.' Accepting this universal applicability (recognizing, of course, that many if not most professional thermodynamicists do not; why should they?—they are not interested in the universe, but in applying thermodynamics to engines and chemical reactions), and ignoring for the moment some very important purely local exceptions, we can state the principle roughly in common form as follows: 'Whenever a transformation of energy takes place it is accompanied by a certain loss in the ability to repeat that precise transformation.' … From the standpoint of human beings the most important exception to the principle is found in the local behavior of living things that can 'consume' entropy or undergo biological changes in the process of their production and maintenance in which there is an actual *reduction* in entropy locally."

Firstly, in regards to difficulties, human chemical reactions are no different than any other type of "chemical" reaction, powered CHNOPS+ natures aside, hence the existence of humans and human doings, goings, and behaviors are not "local exceptions" from the second law, as Lindsay deems things.

Secondly, the model of life being a type of local entropy decrease or reduction is a type of thermodynamic folklore, dating to at least the 1947 publications of Belgian-born English thermodynamicist Alfred Ubbelohde, if not before; hence, Lindsay's argument, in this respect, is but regurgitation.

Thirdly, most professional thermodynamicists do not object or are non-hospitable to Clausius' logic and extrapolations, about the universe, as Lindsay claims. In fact the opposite is true: very few, professional thermodynamicists reject Clausius, albeit possibly accept everything with some reservation. If there is rejection, it is usually for religious reasons.

Quotes

The following are other noted quotes:

> "From the standpoint of physics, chemistry, and engineering students, thermodynamics is a difficult discipline. Anything that can enable the student to grasp more readily the fundamental ideas involved is certainly worth of attention. As a human being the student is well equipped to feel at home in the field of social relations since they are a vital part of his or her everyday experience. Hence a study of the examples of thermodynamics in social phenomena can reinforce the student's grasp of the subject. At the same time, these exemplifications can encourage the raising of valid questions about social problems (e.g. the value of the thermodynamic imperative) which might otherwise never be considered."
>
> — Bruce Lindsay (1983). "Social Exemplifications of Physical Principles" (pg. 651)

> "It is true that while we live, if we are cautious enough, we have the chance to prolong the time intervals between our human 'phases' so as to minimize encountering the phase points of life we call 'accidents'."
>
> — Bruce Lindsay (1983). "Social Exemplifications of Physical Principles" (pg. 653); see also: Henry Adams (on human phases and social phases)

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θΔics

In hmolscience, **Bruce Weber** (c.1941-) is an American biochemist noted, in animate thermodynamics, for his work with American philosopher David Depew in furthering the understanding of the relation between evolution and thermodynamics, the gist of which is found in their 1988 multi-author book *Evolution, Entropy, and Information: New Perspectives on Physical and Biological Evolution*.

Overview

In 1985, Weber, together with American philosopher David Depew, organized a conference on "Evolution, Entropy, and Information" at California State University, the result of which was their 1988 multi-contributor book *Evolution, Entropy, and Information: New Perspectives on Physical and Biological Evolution*; in their chapter "Consequences of Nonequilibrium Thermodynamics for the Darwinian Tradition", on explaining Charles Darwin's evolution theory in terms of the nonequilibrium thermodynamics, particularly Ilya Prigogine and his dissipative structure theory, in conjunction with the theories of Alfred Lotka, Harold Morowitz, Jeffrey Wicken, and Robert Ulanowitz, among others, and for their 1996 book *Darwinism Evolving*, with chapters on Ronald Fisher's view of evolution, thermodynamics and evolution in general, and citing the works of those as Karl Marx, Erwin Schrodinger, among others. [1]

Life | Thermodynamics

Weber has written a number of articles on the origin of life and emergence from a chemical-thermodynamic point of view.

Religion

Weber seems to be interested in the overlap of religion and science and may be an intelligent design advocate as his 1996 book discusses God on over sixty pages, has written a 2004 chapter "Darwinism, Design, and Complex Systems Dynamics," edited by William Dembski, and he teaches a philosophy course on evolution and creation. [3]

Education

Weber completed his BS in 1963 at San Diego State University and PhD in 1968 at the University of California, San Diego. In 2010, Weber was a professor of science and natural philosophy at Bennington College and a professor of biochemistry at California State University, Fullerton. Weber self-describes his research focus as being "in macromolecular evolution with special emphasis on the application of nonequilibrium thermodynamics to the problems of the emergence of life, and the history of biochemistry, especially the conceptual development of bioenergetics." [2]

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External links

â— Bruce Weber – KLI theory labs.
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θΔics

In existographies, **Bruno Bauer** (1809-1882) (RMS:35) (FA:98) was a German philosopher, a characterized “fiery atheist” (Hecht, 2003), noted for []

Overview

In 1837, Bauer founded the Doctor's Club (aka the Free Society) a group of intellectuals who wrote (Q) the most anti-Christian pamphlets in Germany at the time; some in this period, he met and influenced a young Karl Marx. [1]

Christ myth

In 1838 to 1841, Bauer published four volumes on a critical examination of Christianity, wherein he argued, supposedly, that entire story of Jesus was a myth (see: Christ myth theory) per reason (Q) found no record of anyone named "Yeshua of Nazareth" in any then-extant Roman records; also that almost all prominent historical figures in antiquity are referenced in other works (e.g. Aristophanes mocking Socrates in his plays), but as he could not find any such references to Jesus, it was likely that the entire story of Jesus was fabricated. [2]

Quotes | By

The following are quotes by Bauer:

> “Take from religion its exclusive power and it will no longer exist.”
>
> — Bruno Bauer (c.1840), cited (Q) by Karl Marx in “The Jewish Question”

References

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2. (a) Bauer, Bruno. (1838). *Critical Exhibition of the Religion of the Old Testament* (*Kritische Darstellung der Religion des Alten Testaments*) (two volumes). Publisher.
(b) Bauer, Bruno. (1840). *Critique of the Evangelical History of John* (*Kritik der evangelischen Geschichte des Johannes*). Publisher.
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External links

- Bruno Bauer – Wikipedia.

θΔics

In science, **Bruno Latour** (1947-) (HCR:10) is a French sociologist of science and anthropologist, noted for []

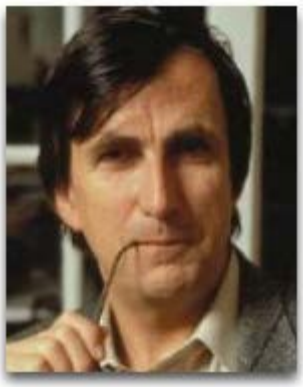

Overview

In 1995, Latour, in his *Conversations on Science, Culture, and Time*, coauthored with French philosopher Michel Serres, he spends time discussing how he wrote a book on Zola in relation to thermodynamics. [1]

In 2007, Latour, in his *Reassembling the Social: an Introduction to Actor-Network-Theory*, aimed to probe the following queries: [1]

> "We live in groups that seem firmly entrenched, and yet how is that they transform so rapidly? We are made to do things by other agencies over which he have no control and that seem plain and mundane enough. There is something invisible that weights on all of us that is more solid than steel and yet so incredibly labile. There exist forces that are strangely similar to those studied by natural scientists and yet distinctively different. This puzzling mixture of obdurate resistance and perverse complexity seems wide open to inquiry, and yet it defies all inquiries."

Latour goes not to state that nearly all social scientists are shaken by at least one of these statements. Latour, in his concluding chapter, goes onto argue that anthropomorphism is bad, reductionism is good, and that we should:

> "Please treat humans as things—e.g. whales in zoology, genes in biochemistry, baboons in primatology, soils in pedology, tumors in cancerology, or gas in thermodynamics—offer them at least the degree of realism you are ready to grant humble matters of concern, materialize them, and, yes, *reify* them as much as possible!"

(add discussion)

References

1. Serres, Michel and Latour, Bruno. (1995). *Conversations on Science, Culture, and Time* (thermodynamics, 5+ pgs). University of Michigan Press.
2. Latour, Bruno. (2007). *Reassembling the Social: an Introduction to Actor-Network Theory* (energy, 14+ pgs, esp. pg. 21; force, 88+ pgs; reify them, pg. 255). Oxford University Press.

External links

â— Bruno Latour – Wikipedia.
â— Latour, Bruno – WorldCat Identities.

θΔics

In existographies, **Bruno Ruttimann** (c.1950-) is German (or Swiss) manufacturing engineer and global economist noted for []

Overview

In 2007, Ruttimann, in his *Modeling Economic Globalization*, specifically in his §6: "Maximizing Value as an Overall Governing Economic Rationale", was using "free enthalpy", i.e. the German scientific name for Gibbs free energy (Gibbs energy), as the overall transformation factor of global economic changes; the following is the opening abstract synopsis of his argument: [1]

> "Similar to the thermodynamic entropy, the economic definition of risk presented here does not explain all the triggering of process evolution. Indeed, in thermodynamics, it is ultimately not the entropy but the free enthalpy that reveals whether a transformation takes place or not. The free enthalpy combines the internal and mechanical energy of the system with the related thermal change of entropy, i.e. the lower the resulting energetic content of the system, the more spontaneous the reaction is. The thermodynamic reaction can ultimately also take place when the entropy is increasing but it needs an exothermic reaction.
>
> In economy, it is also possible for a transaction to take place even when the final risk situation is higher than before. This leads to the insight that minimizing risk is only one governing objective. Indeed, the rational economic actor [see: agent] seeks primarily to maximize profit and ultimately maximize value creation as introduced in chapter 4.2. The final result will be the combination: maximizing risk deducted value creation. Indeed, in reality, organized systems accept a higher risk if it yields a higher return. The economic analogy to the thermodynamic free enthalpy is on the one hand the potential profit (internal energy) and the related risk (entropy). If the economic balance of the transaction is positive, the transaction will materialize. Let us in the following develop the maximizing risk deducted value creation as the antonomasia for today's post-neoclassic behavior of modern homo oeconomicus."

(add)

Education

Ruttimann has an MBA, with focus on international economics, and a PhD in engineering (supposedly in manufacturing engineering).

Keys

Ruttimann was found via the keys: enthalpy, economics.

References

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External links

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θΔics

In thermodynamics schools, the **Brussels school of thermodynamics** is a school of thermodynamic logic, born in 1918, centered around the work of mathematician and physicist Théophile de Donder and his noted student Russian-born Belgian chemist Ilya Prigogine at the Free University of Brussels, a university now divided between the French-speaking Université Libre de Bruxelles and the Dutch-speaking Vrije Universiteit Brussel. [1] The term "Brussels school" came into use in the 1950s. The following is a 1991 summary of the Brussels school by Ching-yao Hsieh and Meng-Hua Ye: [7]

> "The inherent wholeness of atomic process also give impetus to the emerging new paradigm of the 'self-organizing' principle expounded by the so-called **'Brussels school'** under the leadership of Ilya Prigogine, the Nobel Prize laureate of 1977."

American writer Alan Toffler summarizes the main ideas of the Brussels school as follows: [8]

> (a) The Newtonian mechanistic world view concerns itself mostly with closed systems and linear relationships. But the phenomena of high-technology industrial societies of today are open systems in which information and innovation are the critical resources.
> (b) All systems contain subsystems that are continually fluctuating. The order and organization of the existing system will be shattered when the fluctuations become very powerful. The critical point has been called the 'bifurcation point' It is impossible to determine in advance which direction change will take.
> (c) Order and organization can arise spontaneously out of chaos through a 'self-organization process.'

This 'self-organizing principle', as conceived, introduces an optimistic arrow of time model into the universe, in contrast to the colloquial pessimistic arrow of time of movement towards increasing disorder. [7]

Synonyms include the: Belgian school, Brussels school of irreversible thermodynamics, Prigogine school, or Prigogine school of non-equilibrium thermodynamics, Brussels school of thermodynamic chemistry, among others.

De Donder

In 1899, Théophile de Donder received his doctorate in physics and mathematics from the Université Libre de Bruxelles, for a thesis entitled *Sur la Théorie des Invariants Intégraux* (*On the Theory of Integral Invariants*). [2] He was professor between 1911 and 1942, at the Université Libre de Bruxelles. Initially he continued the work of Henri Poincaré and Elie Cartan. As from 1914 he was influenced by the work of Albert Einstein and was an enthusiastic proponent of the theory of relativity.

In 1918, the "birth year" of the Brussels school, the then 45 years old de Donder began to devote his time to superior teaching, after he was for some years appointed as a secondary school teacher, on the nature of thermodynamics. At this time, he was promoted to professor at the Department of Applied Science, and began without delay the writing of a course on theoretical thermodynamics for engineers. [4]

Starting with Clausius' second principle of thermodynamics, having been formulated as an inequality: "uncompensated heat" is positive - or, in more recent terms, entropy production is positive, where the inequality refers, of course, to phenomena that are *irreversible*, as are any natural processes, de Donder, in the words of Prigogine, extracted the entropy production out of this 'sfumato' when related it in a precise way to the pace of a chemical reaction, through the use of a new function that he was to call 'affinity'. [5] In his approach, de Donder gave a new formulation of the second principle, based on such concepts as affinity and degree of evolution of a reaction, considered as a chemical variable. [4] He gained significant reputation in 1923, when he developed his definition of chemical affinity. He pointed out a connection between the chemical affinity and the Gibbs free energy.

Prigogine

Russian-born Belgian Ilya Prigogine, one of de Donder's students, obtained both his undergraduate and graduate education in chemistry at the Free University of Brussels, receiving his first doctoral degree in 1941 and later becoming a professor in 1950. [4] A second teacher of thermodynamics influential to Prigogine, at the Brussels school, was Jean Timmermans (1882-1971) an experimentalist, especially interested in the applications of classical thermodynamics to liquid solutions, and in general to complex systems, in accordance with the approach of the great Dutch thermodynamics school of Johannes van der Waals and Bakhuis Roozeboom. [6]

In 1954, Prigogine, together with Raymond Defay, published *Treatise on Thermodynamics: Based on the Methods of Gibbs and De Donder*. [3] Five years later, in 1959, Prigogine was appointed director of the International Solvay Institute in Brussels, Belgium. In that year he also started teaching at the University of Texas at Austin in the United States, where he later was appointed Regental Professor and Ashbel Smith Professor of Physics and Chemical Engineering. In 1967 he co-founded there what is now called The Center for Complex Quantum Systems. In that year he also returned to Belgium where he became director of the *Center for Statistical Mechanics and Thermodynamics*.

Associates

Norwegian-born American physical chemist Lars Onsager is often said to be a proponent or associated with the Prigogine school or view. Greek-born Belgian physicist Grégoire Nicolis was a graduate student of Prigogine, later co-writting several human thermodynamics themed books with him.

A notable human thermodynamics student of Prigogine, via his University of Texas affiliation, is Dick Hammond.

References

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θΔics

In thermodynamics, **Bryan Donkin** (1836-1902) was an English engineer noted for the coining of the term "human thermodynamics", in his 1893 article "The Scientific Work of Gustav Adolph Hirn", on the life, work, and thermodynamics philosophy of French physicist Gustave Hirn. [1]

Human thermodynamics

In synopsis, to chapter seven of his article, Donkin defines human thermodynamics as the study of the vital heat of the body, experiments on the amount of heat developed by human beings in action, and measurements related to oxygen inhaled and respiration as the principle source of heat; in the two chapters to follow, to note, Donkin intertwines this definition with Hirn's speculations on physiology, psychology, and pathology, explaining how Hirn viewed the human being a motor governed by the soul, similar to how the steam engine is governed by dynamic force.

In his article, Donkin outlines Hirn's thermodynamic-based philosophy of life, developed in his later years, which resolves the universe into matter and force, to which in organic nature is added a third wholly separate element, the animating principle or soul. In defense of this view, according to Donkin:

> "[Hirn] protested all his life against *materialism* (a view that the whole universe consists of nothing but matter and that all dynamic action is the due to the movement of atoms and molecules) and *pantheism* (a view that man is composed of matter, force, and spirit, the three forming together one transmutable essence), maintaining that the researches of science, and especially the laws of thermodynamics, effectually refuted them."

Donkin maintains that the establishment of a thermodynamic-based doctrine of spiritualism and to disprove materialism was the keynote of his labors.

Background

Donkin was the son of English mechanical engineer and noted paper-making machine manufacturer Bryan Donkin (1768-1855), of the same name, who of the edler's six sons John, Bryan, and Thomas also became engineers. [2] Donkin was educated at the University College, London, and at the Ecole Centrals des Arts et Metiers, Paris, after words serving an apprenticeship at the Bermondsey works, which he joined as a partner in 1868. [6] In *circa* 1895, Donkin was the chairman of the family firm Bryan Donkin and Company, at which time his son electrical engineer Sydney Bryan Donkin was an apprentice. [3]

Donkin was the author of the 1894 textbook *Gas, Oil, and Air Engines*, the 1898 *Heat Efficiency of Steam Boilers*, and translator to 1898 *Entropy Diagram and its Applications*, the latter of which is described as "a short syllabus of the principles of thermodynamics applied to heat engines"; all of which indicating that Donkin Jr. was a civil engineer and a mechanical engineer. [4]

Interestingly, in his *Entropy Diagram* Donkin gives states that "as the subject of entropy is still in its infancy, and no complete works on it have yet appeared" and gives a Bibliography of Entropy, listing 20 works, including those of Willard Gibbs (1873), Hermann Helmholtz (1884), Gustav Zeuner (1890), Richard Mollier (1893), among others. [6]

References

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2. Bryan Donkin (1768-1855) – Wikipedia.
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Further reading

â— Donkin, Bryan. (1896). "Steam Raising: Practical Hints on Preventable Losses" (pgs. 99-102). *Cassier's Magazine*, Vol. 10, No. 1-6.

θΔics

In existographies, **Bryan Higgins** (1741-1818) was an Irish chemist, physicist, and natural philosopher, noted for []

Overview

In 1775, Higgins outlined an atomic hypothesis that recognized seven elements—earth, water, alkali, acid, air, phlogiston, and light—each one consisting of 'atoms homogeneal', being impenetrable, immutable in figure, inconvertible, and globular, or nearly so, and in which a speculation was made on the attractions and repulsions between these bodies. [1]

Influenced

The lectures of Higgins were attended by Joseph Priestley.

Education

In 1765, Higgins completed a doctorate of "physics" at the University of Leiden, after which in the 1770s he ran a "school of practical chemistry" in London.

Quotes | On

The following are quotes on Higgins:

> "In 1776, **Higgins** put forward a solution to the problem of the elasticity and expansion of gases. If, as nearly everyone agreed, gases are composed of material atoms that attract one another then, according to Higgins, their elasticity is accounted for by 'atmospheres of fire', or heat, which, he suggests, surround all atoms. Their atmospheres are themselves atomic but 'fire atoms' are unusual in that, while attracted to ordinary material atoms, they repel each other strongly. This very simple theory accounted satisfactorily for the thermal expansion of solids and liquids as well as for the elastic and expansion of gases. At about the same time, Torbern Bergman was propounding the same idea, and a few years later, very similar theories were put forward by William Cleghorn (Ñº) and Lavoisier."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pgs. 57-58)

> "**Higgins**' theory [1776] accounted for the phenomenon of the heating (or cooling) of a gas when it is suddenly compressed (or expanded): 'adiabatic' heating or cooling as it was later called. This had first been noticed in connection with experiments on the air pump. Cullen mentioned it but had no insight into its significance. Higgins also referred to it, and Johann Lambert pointed out that when air enters an evacuated vessel the temperature rises. His explanation was that even 'empty' space contains the 'matter of heat', so that the entry of air carrying more heat must cause a rise in temperature; and he went on to suggest that suddenly reducing the volume of a void should have a heating effect."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 58)

> "In 1786, in a book on the latest advances in heat, light, and pneumatic chemistry, **Bryan Higgins** wrote that there was no need for him to justify his 'material view of heat', since Cavendish together with "other distinguished philosophers have accepted it." If Cavendish took note of Higgins's mistake, he must at the same time have realized that he had not made sufficiently public his view of heat. With 'heat', Cavendish intended to set the record straight."
>
> — Christa Jungnickel (1999), *Cavendish: the Experimental Life* (co-author: Russell McCormmach) (pg. 415)

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Further reading

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External links

â— Bryan Higgins – Wikipedia.

θΔics

In existographies, **Richard Buckminster Fuller** (1895-1983) (IQ:#|#) [RGM:516|1,500+] (CR:17) was an American architect and philosopher noted, in human thermodynamics, for his 1944 to 1983 writings on a loose mixture of synergy, entropy, evolution, and god.

-

Breakdown

In 1927, Fuller, following the loss of his job and the death (cessation) of his four year old daughter, entered into a depressional suicide state, out of which he emerged with the mission to "search for the principles governing the universe and help advance the evolution of humanity in accordance with them". (Q)

-

Overview

In 1944, Fuller, introduced his energy slave concept.

In 1975, Fuller introduced a metaphorical theory of synergetics, where he loosely equated synergy to negentropy, and for writing about evolution as an eddy in the second law of thermodynamics; the logic of which he discusses fully in his 1976 book *And it Came to Pass—Not to Stay*. [1]

Fuller was writing on entropy and the second law, citing C. P. Snow, as early as 1969, in what seems to be theorizing on issue of sustainability of humans in the universe. [2]

In 1979, Fuller was given a copy of his old Harvard classmate William Sidis' undiscovered 1920 book *The Animate and the Inanimate*, which presents a entropy-reversal theory of life, and after reading it dispatched a letter of to *Scientific American*, proclaiming its value. [4]

In 1983, Fuller published *Humans in Universe*, which is filled with passages essentially amounting to a lot of nonsensical gibberish; although the idea of equating God to entropy or anti-entropy is not a new one. [3]

His writings on the energy and entropy seemed often to be presented in a poetic style, often found mixed with religious thermodynamics speculations.

-

Quotes | On

The following are quotes on Fuller:

-

> "Buckminster Fuller is considered one of the greatest geniuses of our time."
>
> — Robert Kiyosaki (2008), *Rich Dad's Increase Your Financial IQ* (pg. #)

-

Quotes | By

The following are noted quotes:

-

> "I live on earth at present, and I don't know what I am. I know that I am not a category. **I am not a thing — a noun. I seem to be a verb**, an evolutionary process – an integral function of the universe."
>
> — Buckminster Fuller (1970), *I Seem to Be a Verb* [5]

-

> "In order to change an existing paradigm you do not struggle to try and change the problematic model. Rather, create a new model that makes the old one obsolete."
>
> — Buckminster Fuller (c.1970) (Q)

> “Everyone is born a genius, but the process of living de-geniuses them.”
>
> — Buckminster Fuller (c.1970) (Q)

> “We should do away with the absolutely specious notion that everybody has to earn a living. It is a fact today that one in ten thousand of us can make a technological breakthrough capable of supporting all the rest. The youth of today are absolutely right in recognizing this nonsense of earning a living. We keep inventing jobs because of this false idea that everybody has to be employed at some kind of drudgery because, according to Malthusian Darwinian theory he must justify his right to exist. So we have inspectors of inspectors and people making instruments for inspectors to inspect inspectors. The true business of people should be to go back to school and think about whatever it was they were thinking about before somebody came along and told them they had to earn a living.”
>
> — Buckminster Fuller (c.1970) (Q)

References

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-

External links

- Buckminster Fuller – Wikipedia.
- Synergetics (Fuller) – Wikipedia.

θΔics

In religio-mythology, **Buddha**, aka “Fot” (Chinese) or “Beddou” (Volney, 1791) (Graves, 1875), the eponym of Buddhism, is the Indian (c.500BC) Osiris rescript. [1]

Quotes

The following are related quotes:

> “Beddou [Buddha] was born from the right flank of a virgin of royal blood, who did not cease to be a virgin for having become a mother; that the king of the country, uneasy at his birth, wished to destroy him, and for this purpose ordered a massacre of all the males born at that period, that being saved by shepherds, Beddou lived in the desert till the age of thirty years, at which time he began his mission to enlighten men and cast out devils; that he performed a multitude of the most astonishing miracles; that he spent his life in fasting and severe penitence, and at his death, bequeathed to his disciples a book containing his doctrines.”
>
> — Constantin Volney (1791), *The Ruins* (§XXI: Problem of Religious Contradictions)

References

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External links

â— Gautama Buddha – Wikipedia.

θΔics

In hmolscience, **Buddhi Weerasinghe** (c.1960-) is a Sri Lankan disaster management consultant noted for []

Overview

In 2010, Weerasinghe, in response to the wake of 2004 Indian Ocean earthquake and tsunami, published "Emergence of Resilience" and "Towards a Better Assessment Framework: the Case of Wanduruppa", wherein, via citation to thinkers including: Libb Thims, Willard Gibbs, Ilya Prigogine, Kenneth Bailey, among others, he outlined a post-disaster theory, in the wake of the 26 Dec 2004 Indian Ocean earthquake and tsunami. [1] The following is an example excerpt: [2]

> "The concept of resilience—time to recovery, the rate of speed of return to pre-existing conditions after disturbance (engineering resilience); the magnitude of disturbance that can be absorbed before the system changes its structure by changing the variables and processes that control behavior (ecological resilience)—has increasingly gained recognition and acceptance and it is now frequently used in many fields. In the early 20th century, economists and sociologists, such as Vilfredo Pareto began to apply J. Willard Gibbs' equilibrium criterion to the modeling of economic systems and social systems (Bailey, 1990)."

The Pareto connection to Gibbs here, to note, is a misattribution deriving from the 1935 Pareto equilibrium Gibbs equilibrium comparisons of Lawrence Henderson. [9] Some of what Weerasinghe suggests, in respect to the ability of a disaster location to return to equilibrium, was discussed by Henderson in his 1938 "Sociology 23" lectures, in terms of a social Le Chatelier principle.

Education

Weerasinghe has a PhD in something, in 2001 was a university lecturer in Sri Lanka, and in 2008 was noted national speaker on community disaster education. [2]

References

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2. (a) Weerasinghe, Buddhi. (2010). "Emergence of Resilience", in: *Strengthening Resilience in Post-Disaster Situations: Stories, Experience and Lessons from South Asia* (editors: Julian Gonsalves and Priyanka Mohan) (§31, pgs. 353-64; Gibbs, pg. 355). Academic Foundation, 2011.
(b) Bailey, Kenneth D. (1990). *Social Entropy Theory* (Gibbs, 8+ pgs). New York: State University of New York Press.
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â— Weerasinghe, Buddhi. (2010). "Climate Change Policy is Divorced from Disaster Risk Policy", SRC Sri Lanka National consultation, April. Vimeo.com.

θΔics

In religion, **Buddhism** (TR:15), a variant of Hinduism, is []

Overview

Buddhism is a variant of Hinduism, according to the re-scripted story-line logic that, according to the standard Buddhist tradition, the Hindu deity Brahma appeared before the young Buddha and urged him to teach, once the Buddha attained enlightenment but was unsure if he should teach his insights to anyone. [1]

Quotes

The following are related quotes:

> "If one were told that many centuries ago a celestial ray shone into the body of a sleeping woman [see: virgin birth], as it seemed to her in her dream; that thereupon the advent of a wondrous child was predicted by the soothsayers; that angels appeared at this child's birth; that merchants came from afar, bearing gifts to him; that an ancient saint recognized the babe as divine, and fell at his feet and worshiped him; that in his eighth year the child confounded his teachers with the amount of his knowledge, still showing them due reverence; that he grew up full of compassionate tenderness to all that lived and suffered; that to help his fellow-creatures he sacrificed every worldly prospect and enjoyment; that he went through the ordeal of a terrible temptation, in which all the powers of evil were let loose upon him, and came out a conqueror over them all; that he preached holiness and practiced charity; that he gathered disciples and sent out apostles, who spread his doctrine over many lands and peoples; that this 'helper of the world' could claim a more than earthly lineage and a life that dated from long before Abraham was — of whom would he think this wonderful tale was told? Would he not say at once that this must be another version of the story of one who came upon our earth in a Syrian village during the reign of Augustus Caesar, and died by violence during the reign of Tiberius? What would he say if he were told that the narrative was between five and six centuries older than that of the founder of Christianity [Jesus]? Such is the story of this poem. Such is the date assigned to the personage [**Buddha**] of whom it is told."
>
> — Oliver Holmes (1879), "Introduction to Edwin Arnold's *The Light of Asia*"; cited by Alvin Kuhn (1963) and Tom Harpur (2004) [2]

References

1. (a) Buswell, Robert E. and Lopez, Donald S. (2013). *The Princeton Dictionary of Buddhism* (pgs. 141-42). Princeton University Press.
(b) Brahma (Buddhism) – Wikipedia.
2. (a) Holmes, Oliver. (1879). "Introduction to Edwin Arnold's *The Light of Asia*", *International*; in: *Unity, Volumes 3-6* (pgs. 269-70). Publisher, 1879.
(b) Kuhn, Alvin B. (1963). *A Rebirth for Christianity* (pgs. 201-02). Quest Books, 2014.
(c) Harpur, Tom. (2004). *The Pagan Christ* (pgs. 31-32). Thomas Allan Publishers.

External links

â— Buddhism – Wikipedia.

θΔics

In numbers, **Buffett number**, the number "100", is the number of books that one has to read on a given subject to know more than the average college professor who teaches that subject knows. [1]

The *Buffett-number* is the gauge of basic intellectual competence on any given subject. That is, for one to be fluent in their line of work or topic of interest, one needs to read one-hundred books on that subject. To be relatively knowledgeable on any given subject, one needs read fifty books, so to reach the ½ *Buffett-number*. In human thermodynamics, then, to have a residual, basic, or intuitive understanding of the thermodynamics of human life, one needs to read, at a minimum, one hundred books and textbooks on thermodynamics, with focus on those in the specific area of chemical thermodynamics.[3] The seven books that best qualify, i.e. comprise, the foundation of human thermodynamics are:

"Human Thermodynamic" Fundamental Books	Authors	Pages
Reflections on the Motive Power of Fire (1824)	Sadi Carnot	66
The Mechanical Theory of Heat (1865)	Rudolf Clausius	365
On the Equilibrium of Heterogeneous Substances (1876)	Willard Gibbs	300
Thermodynamics and the Free Energy of Chemical Substances (1923)	Lewis & Randall	653
Modern Thermodynamics by the Methods of Willard Gibbs (1933)	Guggenheim	202
The Evolution of Desire – Strategies of Human Mating (1994)	David Buss	262
Thermodynamic Theory of the Evolution of Living Beings (1997)	Georgi Gladyshev	142

These seven fundamental books are the foundation of human thermodynamics. Any competent *human thermodynamicist* who builds on this set of core books will always theorize in the correct direction.

A definition of the **Buffett number**, by Libb Thims (2007), as ratio, to a hundred, of the number of books one has read on any given subject, a Buffett number of 0.5 being seasoned scholar, 1.0 being professor level, greater than 1.0 being expert level. [1]

Etymology

The term was coined by American chemical engineer Libb Thims, between 2001-2005, sometime after a reading of the 1995 book *Buffett: the Making of an American Capitalist*, which describes the early biography of American business mogul Warren Buffet. [2]

Overview

In 1947, two-months shy of his seventeenth birthday, American business mogul Warren Buffett had read at least one hundred books on business. Shortly thereafter, he entered the Wharton School of Finance, wherein upon arrival he reported that 'he knew more than the professors'. On a return trip home, Warren was warned not to neglect his studies. To this he replied insouciantly, 'all I need to do is open the book the night before and drink a big bottle of Pepsi-Cola and I'll make 100.' [2] The *Buffett-number* is the gauge of basic intellectual competence on any given subject. That is, for one to be fluent in their line of work or topic of interest, one needs to read one-hundred books on that subject. To be relatively knowledgeable on any given subject, one needs read fifty books, so to reach the ½ *Buffett-number*.

Human thermodynamics

A pre-requisite to a residual understanding of basic human thermodynamics, not necessarily in terms of elementary principles, but rather in terms of an intuitive idea of the visual conception of the state equations and the physics parameters used in the application and modeling of daily human life, in its most basic, i.e. work, play, love, hate, etc., is to have a *Buffett-number* level competency. In the 2007 textbook *Human Chemistry*, Thims outlined the view that "in human thermodynamics, to have a residual, basic, or intuitive understanding of the thermodynamics of human life, one needs to read, at a minimum, one hundred books and textbooks on thermodynamics, with focus on those in the specific area of chemical thermodynamics." [1]

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (pgs. 653-54). (preview), (Google books). Morrisville, NC: LuLu.
(b) Buffett number (HT Glossary) - Institute of Human Thermodynamics.
2. Lowenstein, Roger. (1995). *Buffett: the Making of an American Capitalist*, (pgs. 28-29). New York: Broadway Books.

θΔics

In science, **Buffon** (1707-1788) (IQ:175|#184), aka "Georges Leclerc" or Count of Buffon, was a French mathematician and natural philosopher noted for his 1745 comet impacting the sun nebular hypothesis planet formation model; for his circa 1774 experimental use of Newton's law of cooling on iron balls to attempt calculation of the age of earth—during which time he, supposedly, found an increase in weight of iron when heated (see: fluid theory of heat); for being one of the first pre-Goethean evolutionists, views he derived from his comparison of old and new world animals—he was the main French precursor to Jean Lamarck. [1] Many of his views are found in his 36 volume *Natural History*, published in the years 1749 to 1788, with an additional volume of his post humorous notes in 1789.

Buffon addressed the maternal imagination theory in one of the chapters of his *Natural History*. [3]

Religion | Science

In 1778, Buffon published *The Epochs of Nature* (*Epoques de la nature*), his most controversial book yet, wherein he professed views seriously at odds with beliefs in the Church and Genesis, e.g. he discussed the origin of the solar system; proposed that the planets had been created by comets colliding with the sun; estimated the age of the earth to be 75,000 years (Bible: 6,000-yrs; Quran: not mentioned: Modern: 4.5-bya), estimated via experiments of cooling iron balls; declared that Noah's flood had never occurred; and argued for a form if "implied evolution" via the assertion that animals retained parts that were vestigial and no longer useful. [5]

Living matter

In regards to the life/non-life subject, Buffon held the view that living bodies are distinct from inanimate matter in being composed of what her called "matiere vive" (live matter), whose particles have a propensity to move from the center to the edge of the bodies they constitute; whereas "matiere brut" (raw matter), conversely, is but *matire vive* that has died. He referred to active molecules in his discussion of this subject: [4]

> "The life of the whole (animal or vegetable) would seem to be only the result of all the actions, all the separate little lives—if I may be permitted so to express myself—of each of those active molecules whose life is primitive and apparently indestructible."

This "active molecule" position seems to be a type of living molecule theory.

Quotes

The following are noted quotes by Buffon:

> "Five: Newton (IQ:220|#2), Bacon (IQ:180|#86), Leibniz (IQ:195|#14), Montesquieu (IQ:175|#176), and myself."
>
> — Buffon (c.1780), when asked how many great men he could name. [2]

References

1. (a) Lachieze-Rey, Marc, Luminet, Jean-Pierre. (2001). *Celestial Treasury* (pg. 151). Cambridge University Press.
(b) Hankins, Thomas L. (1985). *Science and the Enlightenment* (wave theory of heat, pg. 80). Cambridge University Press.
(c) Newcomb, Sally. (2009). *The World in Crucible: Laboratory Practice and Geological Theory at the Beginning of Geology* (pg. 139). Geological Society of America.
(d) Osborn, Henry F. (1916). *The Origin of Life: on the Theory of Action, Reaction and Interaction of Energy* (pg. xii). Charles Scribner's Sons, 1921.

2. Packard, Alpheus S. (1901). *Lamarck, the Founder of Evolution* (pg. 199). Longmans, Green, and Co.
3. De Almeida, Hermoine. (1991). *Romantic Medicine and John Keats* (pg. 65-66). Oxford University Press.
4. Ball, Philip. (2011). *Unnatural: the Heretical Idea of Making People* (pg. 125). Vintage Books.
5. Stott, Rebecca. (2013). *Darwin's Ghosts: in Search of the First Evolutionists* (pg. 158). A&C Black.

External links

â— Georges Louis Leclerc, Count of Buffon – Wikipedia.

θΔics

In hmolscience, **burned out** (TR:7) is a thermal word referring, metaphorically or realistically, depending, to a time, situation, or state, wherein a person feels as though the fuel, mental or physical energy, or potential, to their ongoing social combustion reaction is spent, either in respect to direction, pace, task at hand, or sense of overarching purpose.

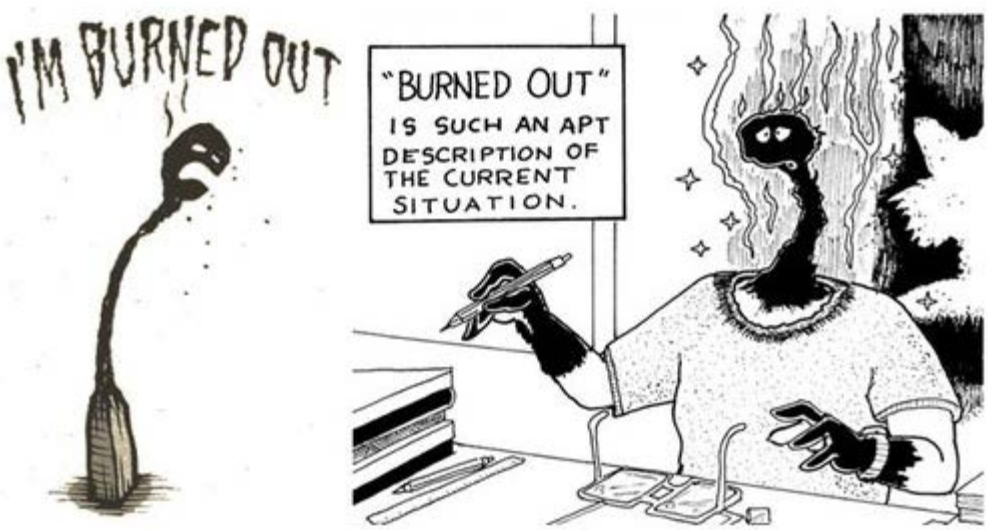

Some images of people, likened to a used match, getting '**burnt out**' in the rat race of the corporate world. [2]

Quotes

The following are related quotes:

> "IQ is thought to be a measure which expresses the relative 'brightness' or intelligence of any given individual."
>
> — Catherine Cox (1926), *Early Mental Traits of 300 Geniuses*

> "The intellect of William Sidis did not '**burn out**'. What the journalists did not report, and perhaps did not know, was that during all the years of his obscure employments he was writing original treatises on history, government, economics and political affairs."
>
> — Abraham Sperling (c.1946) [1]

> "For every child prodigy that you know about, at least 50 potential ones have **burned out** before you even heard about them."
>
> — Itzhak Perlman (c.1990), Israeli-American violinist

References

1. Thims, Libb. (2019). Comment (Ñº) to "My Personal Top 100 Geniuses (Containing both 'alive' and 'dead' individuals) list", RealGeniuses, Reddit, Feb 1
2. Why do people get 'burnt out' by the rat race of the corporate world? (Ñº) (2018) – Quora.

Further reading

â— Thims, Libb. (2019). *Human Chemical Thermodynamics: Chemical Thermodynamics Applied to the Humanities – Sociology, Economics, History, Philosophy, Ethics, Government, Politics, Business, Jurisprudence, Religion, and Relationship* (pdf). Publisher.

θΔics

In existographies, **Burrhus Skinner** (1904-1990) (IQ:160|#550) [RGM:332|1,500+] (Gottlieb 1000:121) (Stokes 100:97) (CR:5), aka B.F. Skinner, was and American psychologist, noted for his work in behaviorism.

Skinnerian

The eponym "Skinnerian" (Scott, 1985) refers to someone, e.g. philosopher Nancy Skeen (c.1945-) (Q), the chair person of University of South Dakota's philosophy department, keen to Skinner's behaviorist philosophy of things. [4]

Pigeon | Training

In 1940, Skinner, supposedly, conceived of his so-called “Project Pigeon”, while sitting on a train to Chicago, and thinking about the need to attack Nazi planes in the air, during which time he looked out the window and saw a flock of birds. “Suddenly I saw them as ‘devices’ with excellent vision and extraordinary maneuverability. Could they not guide a missile?” (Q) He bought some pigeons at a poultry store and proceeded, over a period of many months, to design an apparatus such that a bird could peck at the moving image of a target and thus steer the contraption. Skinner, in one experiment, took hungry pigeons, and when it made a turn clockwise, he would reward it with food, and soon he got the pigeons dancing in a clockwise circle. He then made the schedule of the reward more complex, e.g. the pigeon would have to first turn clockwise, then counterclockwise in a perfect figure eight, as shown below:

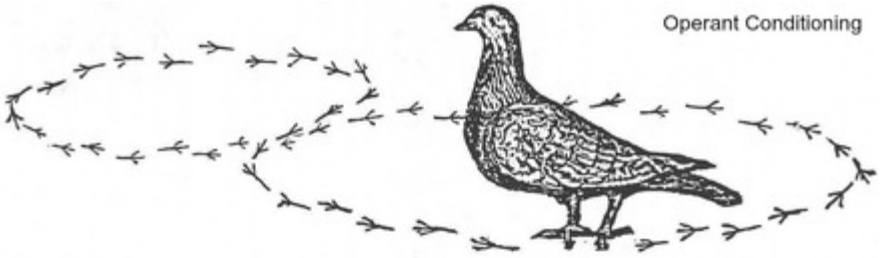

Skinner found found that within fifteen minutes, the pigeon would be responding like a "piece of machinery". The results of these experiments, led Skinner to believe that behavior is always deterministic. [4] Later, of note, Skinner grew increasingly frustrated, though, with Washington’s lack of interest in his invention. (Q)

Skinner box | Rat

In c.1940, Skinner, growing his idea of “operant conditioning”, in respect to rat behavior, showing that behaviors could be changed by positive or negative reinforcements; to test this he made so-called "Skinner boxes" wherein rats pressed levers to get food:

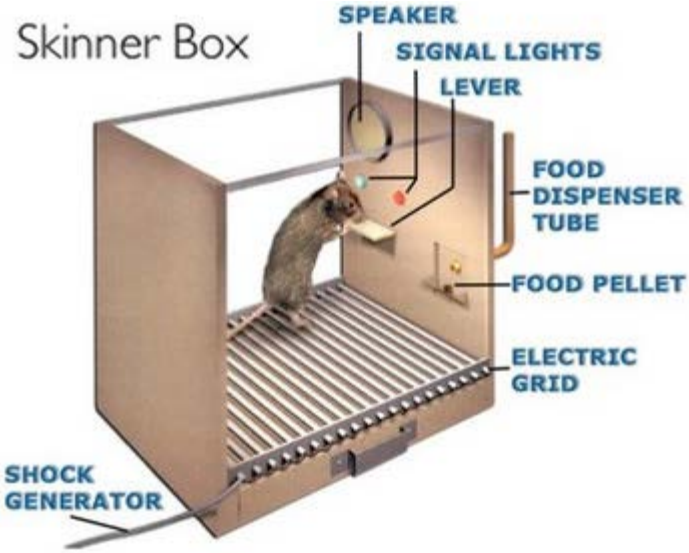

(add)

Skinner box | Baby

In 1945, Skinner built a "Skinner box" for his infant daughter Debby, a so-called "air crib" as he called it, or the "Baby in a Box", as the public later came to call it, wherein she had adjustable humidity and thermostat sensors, as shown below:

In studying the changes in behavior with variations in temperature and humidity, he found that, among other things, the crying and fussing would always be stopped by slightly lowering the temperature. [4]

Here, of note, we recall Frederick II's c.1235 various "experiments" on humans, such as his soul experiment, his "original language" experiments done with children, and his digestion experiment.

Other

In 1948, Skinner, in his novel *Walden Two*, outlined, in story form, a utopian community, wherein the characters reject belief in free will, reject the proposition that human behavior is controlled by a thing such as spirit our soul, and in its place embrace the proposition that behavior is determined by environmental variables, and that by systematically altering these variables, a cultural system can be realized that approximates utopia. [1]

Other

In 1955, Keller Breland and Marian Breland, two of Skinner's students, opened an "IQ Zoo", in Hot Springs, Arkansas,

which showcased some 160 types of animal training acts.

Quotes | By

The following are quotes by Skinner:

> "I deny that freedom exists at all. I must deny it, or my program would be absurd. You can't have a science about a subject matter which hops capriciously about. Perhaps we can never 'prove' that man isn't free; it's and assumption. But the increasing success of a science of behavior makes it more and more plausible."
>
> — Burrhus Skinner (1948), *Walden Two*; by George Scott (1985) in *Atoms of the Living Flame* (pg. 122)

> "Tolstoy was justified in calling every sickness a unique event. Every action of the individual is unique, as well as every event in physics and chemistry. But his objection to a science of medicine in terms of uniqueness was unwarranted."
>
> — Burrhus Skinner (1953), *Science and Human Behavior* (pg. 19)

> "I don't believe that I have a very high IQ; I think I've done very well with what I've got. There are skills I just don't have. Fortunately, I got into a field [behaviorism] where I could use the ones I do have — largely practical skills. I don't think I'm a classical picture of a great thinker, or anything of that sort."
>
> — Burrhus Skinner (1983), "Conversation with Alfie Kohn" [3]

References

1. (a) Stengel, Richard. (2011). *100 Ideas that Changed the World: History's Greatest Breakthroughs, Inventions, and Theories* (Amz). Time Magazine.
(b) Walden Two – Wikipedia.
2. Skinner, Burrhus. (1953). *Science and Human Behavior*. Simon and Schuster, 2012.
3. Kohn, Alfie. (1999). (§A: A Conversation with B.F. Skinner, pgs. 279-, quote, pg. 281) (Q). Houghton.
4. Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pgs. 128-30; Skinnerian, pg. 135). University Press of America.

Further reading

- Skinner, Burrhus. (1974). *About Behaviorism*. Knopf.

External links

- B.F. Skinner – Wikipedia.
- Skinner quotes – BrianyQuote.com.

θΔics

In humanities, **business** is the line of work a person is engaged in, i.e. occupation, one generally involving a monetary exchange of goods or services, paid in an hourly or yearly basis; a company or corporation, when two or more people are involved in the formation of the activated complex (see: Gates model) or working product.

Quotes

The following are related quotes:

> "There is no point in starting your own **business** unless you do it out of a sense of frustration."
>
> — Richard Branson (c.2009), "Article" (Q), *Magazine* [1]

References

1. (a) Branson, Richard. (c.2009). "Article" (Q), *Magazine*.
(b) Note: photo of quote from article, with 2009 image (Q) of him kite surfing with naked girlfriend of South African photographer on his back, is in Thims' "good pictures" folder

See also

- Business chemistry
- Business physics
- Business thermodynamics
- Financial physics

External links

- Business – Wikipedia.

θΔics

In human chemistry, **business chemistry** is the application and chemistry principles, e.g. catalyst (human catalyst), synthesis (planning), emulsification (human emulsifiers), reaction (human chemical reactions), transition state (e.g. start-ups), collision theory (e.g. mergers), bonding structure (infrastructure), etc., to the study, modeling, and management of business operations.

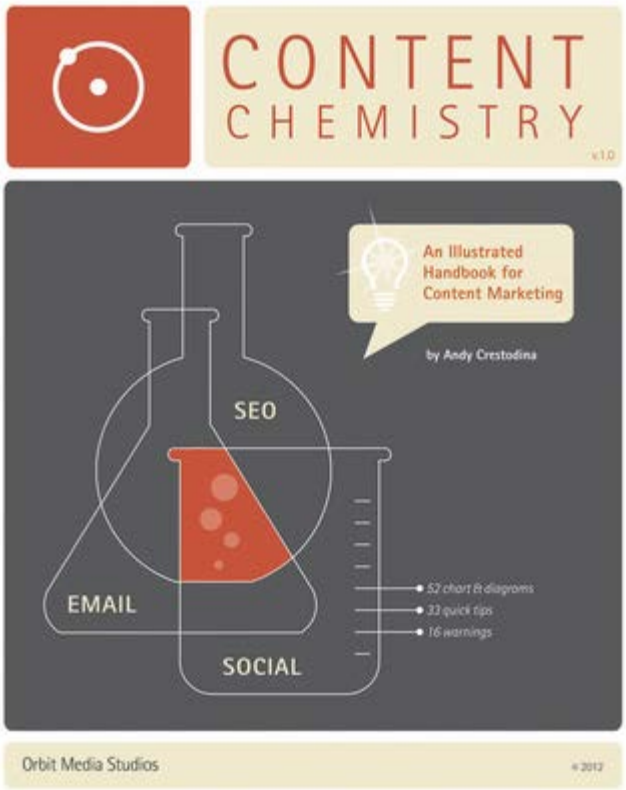

A 2012 **business chemistry** cover stylized book by American marketing theorist Andy Crestodina (Q).

History

The first to pioneer this subject, in large part, was American chemical engineer William Fairburn who, in 1914, outlined the view that a factory, for example, can be considered as a reactive system (or beaker), such that that the foreman acts as the "human chemist", aligning proper work reactions between individuals, and that in this sense, a manager must study the basic principles of chemistry so to intelligently perform their occupation. Fairburn suggested that workers may be classified by their energy, entropies, and properties, even explaining how some people can act as human emulsifiers, functioning to cause a mixing of unmixable groups or components, just as soda or gum Arabic, act to cause oil and water to blend. [1]

In 1921, American chemist-turned-consultant Arthur Little outlined the field of business chemistry as such:

> "Chemistry is the science that deals with the properties of matter and the changes which they undergo. Whether you know it or not, **chemistry** is, therefore, a partner in your **business**. As wise businessmen you carefully take into account the man-made laws of legislature and congress. Chemistry [however] has laws of its own that are not man-made: laws beyond the power of any legislature or congress to repeal. What do you know about them, or how far do you take them into account in the conduct of your business?"

On this basis, Little suggests that each business hire its own chemist to consult them. [2]

Terminology

To clarify, there are two ways in which the term 'business chemistry' is used: one in the sense of modeling a business as a chemical laboratory, test tube, work-producing reactive engine, etc., in which one applies the principles of chemistry, modeling people as chemical elements or human molecules, to facilitate business operation; the other in the sense of someone who, for example, has a degree in chemistry, but then goes to business school to learn to become a manager at a chemical or pharmaceutical plant. In the former sense of the term, one has to adopt the human chemistry/'human molecule' point of view of business operation; in the latter sense of the term, Southern Oregon University, for example, offers a 'business-chemistry' major, requiring coursework in both chemistry and business, at about a 50/50 ratio. [3]

Business thermodynamics

The connective field of business thermodynamics, specifically concerns the topics of thermodynamics, e.g. studies on energy, entropy, enthalpy, chemical potential, efficiency, system, etc., applied to business.

References

1. Fairburn, William Armstrong. (1914). *Human Chemistry*. The Nation Valley Press, Inc.
2. (a) Little, Arthur D. (1921). "The Place of Chemistry in Business", *Industrial & Engineering Chemistry*, 13 (5): 386-91.
(b) Little, Arthur D. (1922). "The Place of Chemistry in Business", *The Technology Review*, 25: 360-62.
(c) Little, Arthur D. (2009). "The Place of Chemistry in Business" (PDF), *Journal of Business Chemistry*, 6 (2): 57-63.

3. Business-Chemistry (major) - Southern Oregon University.

External links

- Journal of Business Chemistry (aim and scope) – BusinessChemistry.org.

θΔics

In human thermodynamics, **business thermodynamics** is the study of the energetic and entropic aspects involved in the transformative processes of business operation.

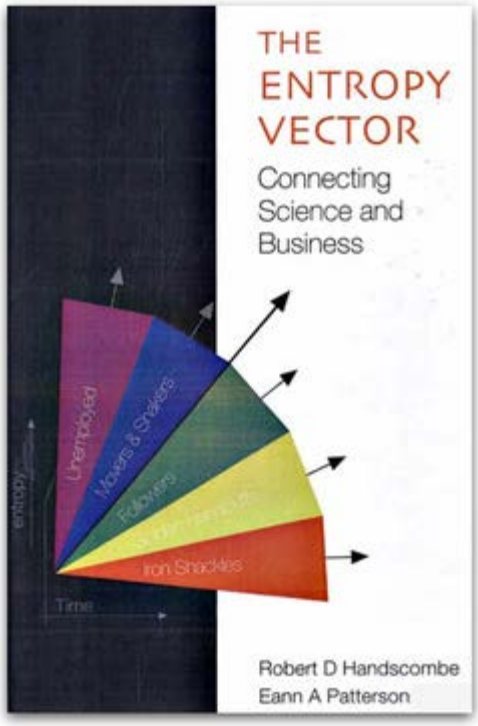

2004 book *The Entropy Vector: Connecting Science and Business* by English business manager Robert Handscombe and mechanical engineer Eann Patterson, in which entropy theory is applied to business operation.

Business chemistry

Business thermodynamics has a certain amount of overlap with 'business chemistry', just as chemistry overlaps with thermodynamics, in the science of chemical thermodynamics. A factory, as discussed by American chemical engineer William Fairburn in 1914, can be considered, for example, as a reactive system (or beaker), such that that the foreman acts as the "human chemist", aligning proper work reactions between individuals, quantifying people by their relative entropy (human entropy), etc., and that in this sense, a manager must study the basic principles of chemistry so to intelligently perform their occupation. [1]

History

In his 1968 *Management Science* article, American researcher Bruce Gunn argued that the essence of employee motivation is to found in Le Chatelier's principle and that the transformation of energy in a given productive system represents the "essence of motivation." [6]

Beginning in the late 1970s, thermodynamic terminologies, such as corporate entropy or thermodynamic efficiency, have begun to find application in theory and practice.

In 1987, in their popular *Peopleware* book, business consultants Tom DeMarco and Timothy Lister loosely outlined ideas on corporate entropy and stated a "second thermodynamic law of management." [2] In their presentation, they use a loose human chemistry metaphor, discussing topics such as "what it takes to make project chemistry", how some people can act as "human catalysts" who can help a project "jell", describing mobile workers as "free electrons", etc. Their latter chapters, according to the authors, discuss teams and what it takes to "build a sensible chemistry for team formation."

In 2005, Czechoslovakian-born American information systems executive Paul Strassman began lecturing and writting books on the connection between management, company organization, information theory, and entropy. [3]

One of the first articles in business thermodynamics, to specifically incorporate a human molecule, chemical thermodynamics point of view was the 2005 article "Human Thermodynamics and Business Efficiency" by American business strategist Lynn Liss. [4]

See also

- Sthar - Social Thermodynamics Applied Research.

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1. Fairburn, William Armstrong. (1914). *Human Chemistry*. The Nation Valley Press, Inc.
2. DeMarco, Tom and Lister, Timothy. (1999). *Peopleware: Productive Projects and Teams* (2nd ed.). Dorset House Pub.
3. (a) Strassmann, Paul A. (2005). "Information Management and Organization

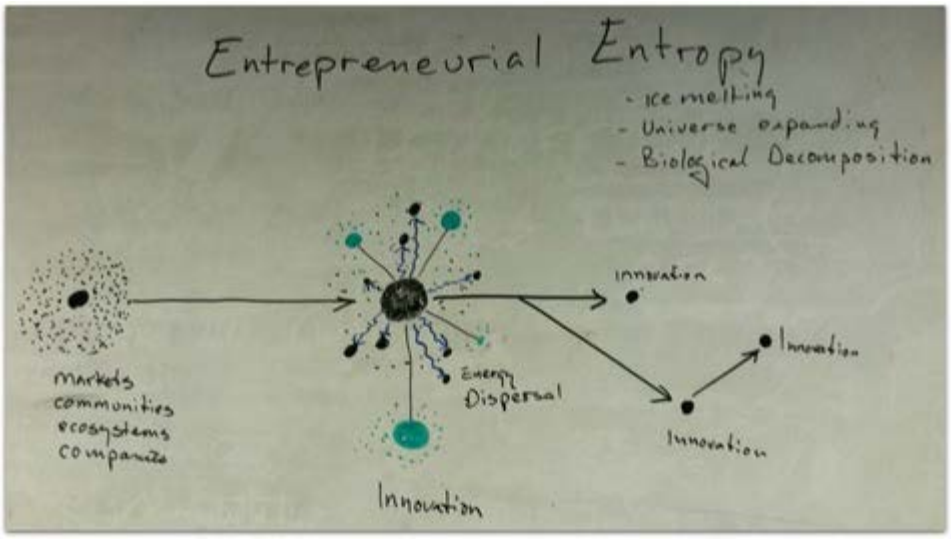

A 2012 whiteboard formulation of "entrepreneurial entropy" by Shawn Carson, in which he argues that entropy applies to the act or process of innovation in markets. [7]

Entropy", *George Mason University*, 29 March, Google Video.
(b) Strassmann, Paul A. (2007). *The Economics of Information Systems* (term: "entropy", pg. 153). Information Economics Press.
4. Liss, Lynn. (2005). "Human Thermodynamics and Business Efficiency", *Journal of Human Thermodynamics*, Vol. 1, Issue 6, pgs. 62-67, Dec.
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● Jessica. (2010). "Human Physics: Your Business and the Laws of Thermodynamics", Aug 21. 1029Consulting.net.

External links

● Business thermodynamics - IoHT Glossary.

θΔics

In studies, **Buss sexual receptivity study** is a 1993 sexual selection study, conducted by David Buss and Jennifer Summelroth, wherein 213 college women were polled about how upset they would be to outright sexual proposition by men differing by occupation.

The results of the 1993 **Buss sexual receptivity study**, showing that college women are most-intuitively willing to have sex with premedical students (2.65) and least-intuitively willing to have sex with garbage collectors (4.32).

Overview

In *circa* 1993, David Buss and graduate student Jennifer Semmelroth, polled 213 college women, half of which (N=109) were asked how flattered the would feel by being persistently asked out on a date by various men, differing by occupation, as shown below, the other half (N=104), were asked how upset they would feel by outright sexual proposition by various men, similarly differing by occupation, on a Likert scale of 7 being 'most upset' to 1 being 'least upset'.

The results, as shown adjacent, with the guesstimated inclusion of the explicitly-designed fictional occupationally-perfect idealized male Dr. John Wayde Prentice Jr., from the 1967 film *Guess Who's Coming to Dinner*, a person specifically scripted at the high end, or 1.0 on the upsetness scale, and an occupationless homeless man, at the low end, or 6.0 on the upsetness scale. [1]

The character "Dr. Prentice", of note, was specifically scripted by writers Stanley Kramer and William Rose to be occupationally perfect; to quote: [2]

> "According to Kramer, he and Rose intentionally structured the film to debunk ethnic stereotypes. The young doctor, a typical role for the young Sidney Poitier, was purposely created idealistically perfect, so that the only possible objection to his marrying Joanna would be his race, or the fact she had only known him for ten days: the character has thus graduated from a top school, begun innovative medical initiatives in Africa, refused to have premarital sex with his fiancée despite her willingness, and leaves money in an open container on his future father-in-law's desk in payment for a long distance phone call he has made."

We might also put "Frank Abagnale, Jr.", as portrayed in the 2002 film *Catch Me if You Can*, who worked occupationally as a doctor, lawyer, and a co-pilot, all before his 18th birthday, as occupationally ideal male.

See also

- Alley equation
- Beckhap's law
- Drive-thru paradox

● Max Meyer

References

1. (a) Buss, David M. (1994). *The Evolution of Desire: Strategies of Human Mating* (sexual proposition study, pgs. 161-62). New York: Basic Books.
(b) Jennifer S. Simmelroth (resume) – SaelmGastro.com.
2. Andersen, Christopher. (1997). An Affair to Remember: The Remarkable Love Story of Katharine Hepburn and Spencer Tracy (pg. 295) (Q). William Morrow and Company, Inc.

θΔics

In science, **butterfly effect** is the theory that a small change in one part of the world (or system), such as the flapping of a butterfly's wings in Japan, can, if the initial conditions are primed to a certain position of instability, effect a large change in another part of the world (or system), such as the initiation of a tornado in Texas.

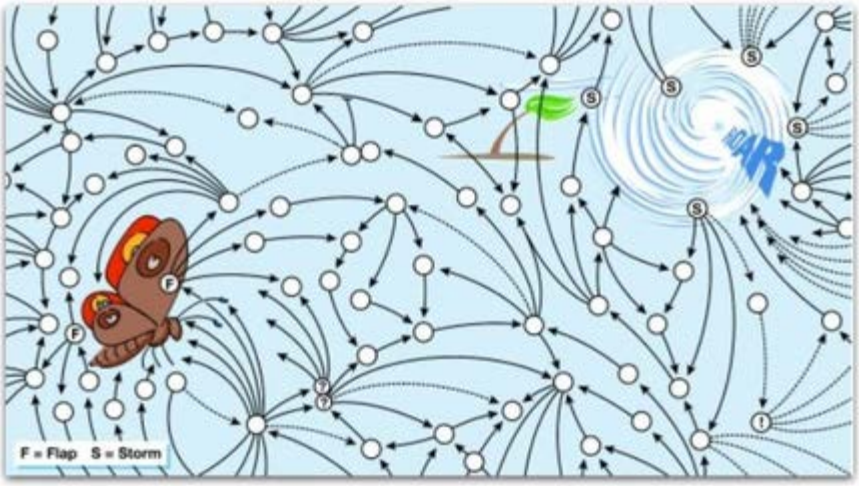

A 2008 artistic rendition of the **butterfly effect** used in an article attempting to argue that reductionism and determinism cannot be applied in biology and to humans. [3]

Overview

In 1770, Baron d'Holbach, in his §4: "Of the Laws of Motion common to all the Beings of Nature—of Attraction and Repulsion—of Inert Force—of Necessity", stated the following very-ripe anti-chance (or non-chance) view of a dust storm and a political revolution: [1]

> "It may, perhaps, be in the arid plains of Lybia, that are amassed the first elements of a storm or tempest, which, borne by the winds, approach our climate, render our atmosphere dense, and thus operating on the temperament, may influence the passions of a man, whose circumstances shall have capacitated him to influence many others, who shall **decide after his will** the fate of many nations."

The butterfly effect became a meme via its popularization in the 1987 book *Chaos: the Making of a New Science*, by James Gleick. [2]

The butterfly effect is a subject germane to chaos theory, complexity theory, far-from-equilibrium theory, and meteorology, but is sometimes involved in discussions of human implications, e.g. that Gavrilo Princip was the butterfly that started world wars one and two.

References

1. d'Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (pg. 32). J.P. Mendum, 1889.
2. Gleck, James. (1987). *Chaos: the Making of a New Science* (butterfly effect, pgs. 8, 20-23, 246-47, 261, 322). Penguin.
3. Mazzocchi, Fulvio. (2008). "Complexity in Biology: Exceeding the Limits of Reductionism and Determinism Using Complexity Theory", *European Molecular Biology Organization*, 9(1): 10-14.

External links

â— Butterfly effect – Wikipedia.

θΔics

In genius studies, a **Buzan IQ** is an IQ assigned by Englishmen accelerated learning expert Tony Buzan and grand chess master and literature scholar Raymond Keene, as found in their 1994 *Book of Genius*, in which they attempt to rank the hundred greatest geniuses of all-time using an eight category, 835-point, scoring methodology, assigning IQs to each genius along the way.

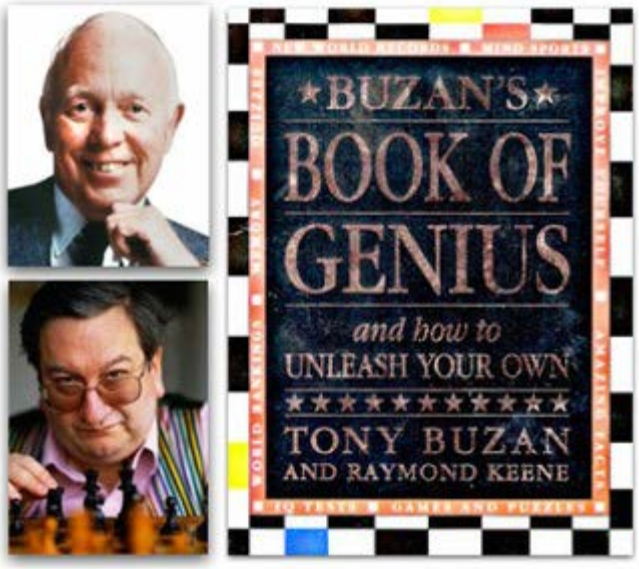

Englishmen accelerated-learning expert **Tony Buzan** (1942-), pictured left, and chess grandmaster and Oxford literature scholar **Raymond Keene** (1948-), pictured right.

Methodology

To make their list, Tony Buzan and Raymond Keene scored the world's leading minds on an 835-point scale (GS=Genius Score): dominance in the field (100), active longevity (100), polymath (100), versatility (100), strength and energy (100), IQ (100), ongoing influence (100), prolificness and achievement of prime goal (100), universality of vision (15), outstanding originality (10), deliberate desire to create teaching avenues or academies to further the genius' ideas (10).

Notes

Of note, in Buzan's list, we removed the great pyramid builders, ranked number three in Buzan's GS scale listing, as this is not one person—though, to note, Imhotep (2635-2595BC) may well fill this slot; also there is slight discrepancy between the IQs of the top fourteen geniuses as assigned in his 1994 book and those assigned as found in his 2005 book *Buzan's Book of Mental World Records*. [2] The values below use the newer estimates.

Top 14 | 2005

The following is Buzan-Keene top 14 ranked by IQ 2005 version:

Rank	Name	IQ
1	da Vinci	220
2	Goethe	215
3	Shakespeare	210
4	Einstein	205
5	Newton	195
6	Jefferson	195
7	Edison	195

Rank	Name	IQ
8	Archimedes	190
9	Aristotle	190
10	Brunelleschi	190
11	Copernicus	185
12	Franklin	185
13	G.Eliot	180
14	J.S.Mill	180

List

The following is the listing of 99 geniuses (excluding the Pyramid builders):

Ranked by IQ (1994) **Ranked by GS**

1. Da Vinci (IQ=220)

2. Goethe (IQ=215)

3. Shakespeare (IQ=210)

4. Einstein (IQ=205)

---

5. Newton (IQ=195)

6. Edison (IQ=195)

7. Jefferson (IQ=195)

---

8. Aristotle (IQ=190)

9. Archimedes (IQ=190)

10. Brunelleschi (IQ=190)

---

11. Copernicus (IQ=185)

12. Mill (IQ=185)

13. Franklin (IQ=185)

14. Eliot (IQ=185)

---

15. Leibnitz (IQ=182)

16. Euclid (IQ=182)

17. Borges (IQ=182)

---

1. Da Vinci (GS=822)

2. Shakespeare (GS=818)

2. Goethe (GS=816)

4. Michelangelo (GS=814)

5. Newton (GS=810)

6. Jefferson (GS=809)

7. Alexander the Great (GS=808)

8. Phidias (GS=808)

9. Einstein (GS=804)

10. Edison (GS=799)

11. Homer (GS=797)

12. Plato (GS=797)

13. Euclid (GS=795)

14. Elizabeth I (GS=795)

15. Archimedes

18. Galileo (IQ=180)

19. Faraday (IQ=180)

20. Curie (IQ=180)

21. Hawking (IQ=180)

22. Plato (IQ=180)
23. Alberti (IQ=180)
24. Bell (IQ=180)
25. Pitt (the Elder) (IQ=180)
26. Bonaparte (IQ=180)
27. Alexander the Great (IQ=180)
28. Khan (IQ=180)
29. Pavlov (IQ=180)
30. Phidias (IQ=180)
31. Dali (IQ=180)
32. Stravnsky (IQ=180)
33. Elizabeth I (IQ=180)
34. Carnegie (IQ=180)
35. Sinan (IQ=180)
36. Duchamp (IQ=180)

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37. Doyle (IQ=182)
38. Tinsley (IQ=182)

---

39. Descartes (IQ=175)

40. Michelangelo (IQ=175)

41. Spinoza (IQ=175)
42. Dante (IQ=175)
43. Homer (IQ=175)
44. Picasso (IQ=175)
45. 1st Ch'in Emperor (IQ=175)
46. Averroes (IQ=175)

(GS=798)

16. Aristotle (GS=798)

17. Brunelleschi (GS=788)
18. Carnegie (GS=785)
19. 1st Ch'in Emperor (GS=783)
20. Sinan (GS=782)

21. Copernicus (GS=780)

22. Beethoven (GS=779)
23. Picasso (GS=777)
24. Alberti (GS=777)
25. Pavlov (GS=776)

26. Faraday (GS=776)
27. Stravnsky (GS=770)

28. Franklin (GS=770)

29. Darwin (GS=769)
30. Sophocles (784)
31. Ali (GS=763)
32. Vyasa (GS=756)
33. Doyle (GS=755)
34. Bell (GS=754)
35. Dali (GS=752)
36. Aquinas (GS=750)
37. Borges (GS=750)
38. Milton (GS=746)
39. Khan (GS=744)
40. Bach (GS=741)
41. Disney (GS=740)
42. Columbus (GS=739)
43. Ueshiba (GS=739)
44. Graham (GS=739)

45. Curie (GS=738)

46. Leibnitz (GS=737)

47. Suli (IQ=175)
48. Erasmus, D. (IQ=175)

---

49. Heisenberg (IQ=173)
50. Gates (IQ=173)
51. Darwin (IQ=173)
52. Crick (IQ=173)
53. Sophocles (IQ=173)
54. Milton (IQ=173)
55. Stephenson (IQ=173)
56. Aeschylus (IQ=173)
57. Euripides (IQ=173)
58. Lao-Tzu (IQ=173)

---

59. Cesar (IQ=170)
60. Confucious (IQ=170)
61. Lincoln (IQ=170)
62. Raphael (IQ=170)

---

63. Marconi (IQ=165)
64. Wright (IQ=165)
65. Beethoven (IQ=165)
66. Machiavelli (IQ=165)
67. Aquinas (IQ=165)
68. Bach (IQ=165)
69. Lister (IQ=165)
70. Wren (IQ=165)
71. Brunel (IQ=165)
72. Sun Tzu (IQ=165)
73. Sappho (IQ=165)

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74. Socrates (IQ=160)
75. Mozart (IQ=160)

47. Cezanne (GS=734)
48. Marconi (GS=733)
49. Wright (GS=732)
50. Stephenson (GS=731)
51. Aeschylus (GS=730)
52. Crick (GS=725)
53. Montessori (GS=723)
54. Wren (GS=723)
55. Heisenberg (GS=722)
56. Socrates (GS=715)
57. Brunel (GS=714)
58. Gates (GS=713)
59. Cesar (GS=713)
60. Bonaparte (GS=712)
61. Lister (GS=710)
62. Jung (GS=708)
63. Hawking (GS=708)
64. Galileo (GS=707)
65. Alexander, F.M. (GS=707)
66. Suleyman (GS=706)
67. Pitt (the Elder) (GS=701)
68. Megellan (GS=699)
69. Eliot (GS=699)
70. Duchamp (GS=697)
71. Tinsley (GS=689)
72. Verdi (GS=689)
73. Dickens (GS=688)
74. Confucious (GS=687)
75. Lincoln (GS=683)
76. Chaplin (GS=680)
77. Mozart (GS=676)
78. Nelson (GS=675)
79. Euripides (GS=673)
80. Wellesley (GS=672)
81. Lao-Tzu (GS=671)
82. Averroes (GS=655)
83. Raphael (GS=654)
84. Dante (GS=653)
85. Sun Tzu (GS=652)
86. Gandhi (GS=639)
87. Washington

76. Jung (IQ=160)
77. Suleyman (IQ=160)
78. Gandhi (IQ=160)
---
79. Montessori (IQ=157)
80. Vyasa (IQ=156)
81. Hannibal (IQ=155)
82. Alexander, F.M. (IQ=150)
83. Verdi (IQ=150)
84. Dickens (IQ=150)
---
85. Cezanne (IQ=149)
86. Graham (IQ=148)
87. Ali (IQ=147)
88. Megellan (IQ=145)
89. Wellesley (IQ=145)
90. Nelson (IQ=145)
91. Titan (IQ=145)
92. Rembrandt (IQ=145)
93. Zizka (IQ=145)
94. Gutenberg (IQ=140)
95. Washington (IQ=140)
96. Columbus (IQ=140)
97. Chaplin (IQ=140)
---
98. Ueshiba (IQ=131)
99. Disney (IQ=123)

(GS=638)
88. Suli (GS=632)
89. Mill (GS=620)
90. Titan (GS=611)
91. Descartes (GS=609)
92. Machiavelli (GS=597)
93. Erasmus, D. (GS=569)
94. Rembrandt (GS=549)
95. Zizka (GS=540)
96. Hannibal (GS=536)
97. Gutenberg (GS=529)
98. Sappho (GS=514)
99. Spinoza (GS=491)

See also

â— Cox-Buzan IQ
â— Cox IQ

References

1. Buzan, Tony and Keene, Raymond. (1994). *Book of Genius*. Stanley Paul.
2. Buzan, Tony and Keene, Raymond. (2005). *Buzan's Book of Mental World Records* (IQ table: World's top 14 all-time highest IQs (180-220), pg. 31). D&B Publishing.

Further reading

â— Methodology (Buzan 100 Geniuses) – Braintrust.org.
â— Greatest Geniuses of All Time (1-50) – Buzan's book of Genius.
â— Top 10 Geniuses of All Time (1-10) - *Buzan's Book Of Genius*.

θΔics

In human thermodynamics, **Charles Galton Darwin** (1887-1962), or "C.G. Darwin", was an English physicist, grandson of evolution founder Charles Darwin (Charles Robert Darwin), notable, through the publication of his 1952 book *The Next Million Years*, written at the age of 65 (similar to Goethe who wrote *Elective Affinities* at age 60), to have conceived of people as "human molecules" and coined the term "human thermodynamics", a feat which larger part marks the start of the science of modern human thermodynamics, the thermodynamic study of systems of human molecules. [1] In this work, after defining people to be molecules, C.G. Darwin then grandly states: [2]

> "Through determining some kind of laws of **human thermodynamics**, we shall be more successful in doing good in the world."

On this objective, Darwin argued that in order to logically predict human history, one would first need to define the person as a point molecule and to model human social systems as "conservative dynamical systems" such that when human molecules collide there exists a conservative nature to the interaction and that both internal and external parameters must be accounted for in a statistical thermodynamic analysis of any human system. [2] Darwin spent the last 15 years of his life musing over these ideas.

This same logic, with the exception of the use of chemical thermodynamics (more correct for human social systems) verses statistical thermodynamics (less correct for human social systems), and terminology, i.e. "human molecule" and "human thermodynamics", was developed independently by American chemical engineer Libb Thims between 1995 to 2005. [1] C.G. Darwin also was the first to postulate the existence of a set of "laws of human thermodynamics". [2]

C.G. Darwin, in this light, was one of the founders of "history thermodynamics", the thermodynamic study of human history.

Education

C.G. Darwin was said to have inherited mathematical ability from his father G.H. Darwin, a subject he excelled at Marlborough College, where he learned a good deal of Latin, and some history. His mathematics ability won him a scholarship to Trinity College, Cambridge. At Cambridge, he took a course on the theory of sound, based on English physicist John Strutt (Lord Rayleigh)'s book on the subject; a subject which would server his later work. He graduated with a BA in mathematics in 1910.

Following Cambridge, Darwin joined Ernest Rutherford at Victoria University of Manchester as a lecturer in physics, where he lectured on topics such as kinetic theory and thermodynamics. His main work during this period was in the development of the mathematical work of Rutherford's gold foil alpha particle experiments.

In 1912, his interests developed into using his mathematical skills assisting English physicist Henry Moseley, notable for having established the concept of atomic number (1913), on X-ray diffraction of crystals using Rutherford's atomic theory. Later he would spend one year working at the California Institute of Technology. After this, Darwin began working with English physicist Henry Moseley, notable for having established the concept of atomic number, in circa 1913. Italian physical chemist Salvatore Califano, in his 2012 *Pathways to Modern Chemical Physics*, summarizes Darwin's contribution to physics as follows: [4]

> "**Charles Galton Darwin**, a student of Rutherford, highly gifted as a theoretician and mathematician, of noble academic origin as son of mathematician George Howard Darwin and grandson of the great Charles Darwin, also worked on the theory of diffusion of α particles (Darwin 1914a) contributing in particular to evaluate their slowing down due to the shielding effect of the external electrons of the atoms and proving that gradual energy loss of the α particle travelling through a metallic foil depended on the number of electrons that it encountered on its path (Darwin 1914b)."

On the outbreak of World War I (1914), he joined the Royal Engineers, where he worked on problems in ballistics, and later served in the Royal Flying Corps.

In 1919, Darwin took up a post at Christ's College, working on X-ray reflections, studying the orbits of electrons in terms of the newly developing quantum theory, and began working with Ralph Fowler in the development of the statistical theory of thermodynamics.

In more detail, following World War I, from 1919 to 1922, he was fellow and lecturer at Christ's College, Cambridge, where he and Ralph Fowler, the founder of the zeroth law of thermodynamics and author one of the first books on statistical thermodynamics (with chemical thermodynamics founder Edward Guggenheim), developed new methods of statistical mechanics, i.e. the *Darwin-Fowler method*, that later served as a foundation for quantum statistics.

Darwin was elected to the Royal Society in 1922 and became the Tait professor of natural philosophy in 1923 at Edinburgh University, where he ran the department of mathematical physics, and carried on his work in quantum mechanics, worked on quantum optics, and magneto-optic effects. During this period, his early coursework in wave theory enabled him to publish several papers on this topic and the 1931 book *The New Conceptions of Matter*. He also spent a term working with Niels Bohr in Copenhagen, during the time when the uncertainty principle and the 'spinning electron' were discovered.

In 1935, he returned to Cambridge, becoming director of the National Physics Laboratory. [3] He also anticipated some of P.A.M. Dirac's relativistic theory of the electron. He was a professor at Edinburgh from 1924 to 1936 and master of Christ's College from 1936, and directed the National Physical Laboratory during World War II, leaving the post in 1949.

The Next Million Years

In retirement, the last 15 years of his life were devoted to the study of the sociological implications of the population explosion, as reflected in his book *The Next Million Years* (1952), a sort of family tradition extension of his grandfather's 1859 *On the Origin of Species*, albeit applying the theory of evolution, mixed with modern physics arguments, towards the future.

C.G. Darwin (1956)

The first Introduction chapter, gives an excellent outline of the subject of human thermodynamics, arguing that humans can be modeled as molecules and that statistical thermodynamics methods can be employed to the predictions of human futures.

The latter chapters of the book, however, have become somewhat of a bugbear and controversial in that he gives a prediction that a disaster awaits humankind in the next 500 million years, loosely owing to overpopulation and limited means of sustenance, and argues for aggressive birth control methods.

In the years following publication, he modified his original catastrophe estimate to argue that in the next 50 years humanity will be outstripped of food production. It is said that, to the wider public, *The Next Million Years* is what C.G. Darwin is best known for. [3]

References

1. (a) Thims, Libb. (2008). *The Human Molecule*, (preview). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview). Morrisville, NC: LuLu.
(c) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
2. Darwin, Charles G. (1952). *The Next Million Years* (pg. 26), (Scribd) (Google Books). London: Rupert Hart-Davis.
3. Staff. (1960). "Profile: Sir Charles Darwin: From Physics to Population Problem", *New Scientist*, pgs. 1252-53. Nov 10.
4. Califano, Salvatore. (2012). *Pathways to Modern Chemical Physics* (pg. 117). Springer.

External links

â— Charles Galton Darwin – Wikipedia.
â— Charles Galton Darwin - The Columbia Encyclopedia, Sixth Edition 2007.
â— Charles Galton Darwin – GaltonInstitute.org.

θΔics

In existographies, **Clive Staples Lewis** (1898-1963) (IQ:150|#616) [RGM:169|1,500+] (CR:18), aka “C.S. Lewis”, was an Irish-born English writer, popularly known for his 1956 *The Chronicles of Narnia*, intellectually known for his 1940s atheism-turned-apologetics work, the most-cited of which being his 1952 *Mere Christianity*.

Overview

At age 15, Lewis became an atheist. [1]

In 1942 to 1944, Lewis gave a series of BBC radio talks on Christian apologetics, published as *Mere Christianity* (1952), most of which is an attempt to rebut or fortify the argument from morality. [2]

Natural laws | Education

In 1943, Lewis, in his *The Abolition of Man*, in an appendix, and later in his *That Hideous Strength* (1945), argued, thematically, that there are natural laws and objective values, which education should teach children to recognize. (Q)

Choice | Choiceless

Lewis seems to premise his entire argument on the argument that humans have a natural ability to choose between "right" and "wrong" whereas everything else in the universe is lacking in this peculiar nature; which he states as follows:

> “This law or rule about right or wrong used to be called the law of nature. Nowadays, when we talk of the ‘laws of nature’ we usually mean things like gravitation, or heredity, or the laws of chemistry. But when the old thinkers called the law of right and wrong the ‘law of nature’, the really meant the law of human nature. The idea was that just as all bodies are governed by the law of gravitation, and organisms by biological laws, so the creature called man also had this law—with this great difference, that a body could NOT choose whether it obeyed the law of gravitation or not, but a man COULD choose either to obey the law of human nature or to disobey it.”
>
> — C.S. Lewis (1944), *Mere Christianity* (pg. 4)

Namely, that all entities, namely: humans, animals, vegetables, or "inorganic things", as Lewis says, must obey the various physical laws, such as gravitation, for all four, or genetic biological laws, common to the organic group, as he says, but there is one law, he says, which is "peculiar to humans", not applicable to animals or vegetables, namely "choice" to obey or not obey the law of right and wrong of human nature. Lewis, following digression on the Nazis model of right and wrong, how differing cultures throughout time, e.g. Egyptians, Babylonians, Hindus, Chinese, Greeks, and Romans, each had different hues of morality (which he says he summarized in an appendix of his *The Abolition of Man*), then jumps to:

> “It seems, then, we are forced to believe in a real right and wrong. People may be sometimes mistaken about them, just as people sometimes get their sums wrong; but they are not a matter of mere taste and opinion any more than the multiplication table.”

(add discussion)

Collins | Stem cells

Lewis was influential to Francis Collins, who states that he culled his theory of “universal morality”, as described in his 2006 *The Language of God: A Scientist Presents Evidence for Belief*, that after evolution had prepared a sufficiently advanced “brain”, that at some point God gifted humanity with the knowledge of good and evil, what he calls the “moral law”, with free will, and an immortal soul, and that some humans use their free will to break the moral law,

leading to an estrangement from god, for which Jesus is the solution—from Lewis' *The Chronicles of Narnia*, in some way.

Collins, who in 2010 was the head of the NIH, the largest scientific research funding provider in the world, banned stem cell research, based on his Lewis-conceptualized system of morality, per the reasoning that the "soul enters the zygote" at or very near the moment of conception, sometime before embryo reaches the 150-cell-state, and therefore it is immoral to use embryos for stem cell research.

Other

In 2011, American deconversion philosopher Christopher Redford did a short a tongue-in-cheek critique of Lewis' *Mere Christianity*. (V)

Quotes | Related

The following are thematic Lewis quotes:

> "Let's focus on that one statement: 'love is a chemical reaction'. That's an incredibly deep statement and I think it's a lie from the pit of hell."
>
> — Anon (2011), Texas man (Q); one of whose favorite books is Lewis' *Mere Christianity*, Apr 6

Quotes | By

The following are quotes by Lewis:

> "Supposing there was no intelligence behind the universe, no creative mind. In that case, nobody designed my brain for the purpose of thinking. It is merely that when the atoms inside my skull happen, for physical or chemical reasons, to arrange themselves in a certain way, this gives me, as a by-product, the sensation I call thought. But, if so, how can I trust my own thinking to be true? It's like upsetting a milk jug and hoping that the way it splashes itself will give you a map of London. But if I can't trust my own thinking, of course I can't trust the arguments leading to atheism, and therefore have no reason to be an atheist, or anything else. Unless I believe in god, I cannot believe in thought: so I can never use thought to disbelieve in god."
>
> — C.S. Lewis (c.1950), an argument for the existence of god (Q); supposedly has something to do with Lewis' earlier "argument from reason", defended in his 1947 *Miracles: a Preliminary Study*, wherein he cited John Haldane's 1927 quote: "If my mental processes are determined wholly by the motions of atoms in my brain, I have no reason to suppose that my beliefs are true ... and hence I have no reason for supposing my brain to be composed of atoms." [3]

> "Some people draw unwarranted conclusions from the fact that I never say more about the blessed Virgin Mary that is involved in asserting the 'virgin birth' of Christ. But surely the reason for doing so would be obvious? To say more would take me at once into highly controversial regions. And there is no controversy between Christians which needs to be so delicately touched as this."
>
> — C.S. Lewis (1952), "Preface" to *Mere Christianity*, based on three 1942-44 wartime radio talks

References

1. (a) Lewis, C.S. (1955). *Surprised by Joy: the Shape of My Early Life* (atheism, 3+ pgs; age 15, pg. 115). Harvest Books, 1966.
(b) C.S. Lewis (Conversion to Christianity) – Wikipedia.
2. Mere Christianity – Wikipedia.

3. (a) Argument from reason – Wikipedia.
(b) Haldane, John. (1927). *Possible Worlds* (pg. 209). Publisher.

Further reading

● Lewis, C.S. (1952). *Mere Christianity, Revised and Enlarged Edition* (txt)(pdf). Harper San Francisco, 2015.

External links

● C. S. Lewis – Wikipedia.
● Lewis, C.S. – WorldCat Identities.

θΔics

In hmolscience, **C.W. Adams** (c.1940-) is an American [?] philosopher, anchored around a seeming search for a scientific spiritual evolutionist theory, in opposition to the "accidental evolutionist" theory, as he refers to *status quo* ideologies, most of which is found in his 2006 *Actuality: Life in the Real World*, a collection of essays surrounding the questions of identity (i.e. "who am I?"), origin (e.g. "how did desire, life, and survival, etc., arise from seemingly dead chemicals), and purpose (i.e. "what is my purpose for existing?"), all teetering amid religion and spirituality vs science and evolution, with implicit assumption in the existence of god, or "supreme being", the term he employs.

Chemicals | Desire

Adams, in his essay segment "How could Chemicals have a Desire to Survive", gives what seems to be an independent take on Robert Pirsig's 1991 chemistry professor paradox, as follows:

> "As the accidental evolutionist theory has been expanding over the last 100 years, it has been merged with 'big bang' and 'primordial soup' theories. Combined these ancillary theories, the accidental evolution theory now states that following the big bang, life spontaneously arose from chemicals. What is curious is that these chemicals somehow supposedly developed the desire to survive. Have we ever observed any lifeless chemicals develop a desire to survive? Have we ever seen chemicals doing anything but predictably reacting to each other?
>
> In other words, the accidental evolution theory says that out of lifeless chemicals single-celled living creatures have arisen, miraculously displaying a desire to survive. A desire to survive means having a need to improve survival factors and eliminate threats to survival. The need to improve survival means there is an intention to survive, and a value is put onto survival. Eliminating the threats to survival means survival is valued enough to put an effort into changing, adapting to, or destroying potential encroachments and dangers that could shorten life. These factors compound the problem presented: how could lifeless chemicals develop the ability to even *recognize* life, let alone value life enough to take persistent action to sustain it."

(add)

Chemicals | Propagation

Adams, in his essay segment "Chemicals Cannot Decide to Extend Their Successor' Lives", states the following:

> "Accidental evolution would require not only living chemicals somehow distinguishing themselves from dead chemicals, but also chemicals desiring to lengthen the lives of their descendent chemical combinations. What mechanism gave such living chemicals the impetus to increase the chances of their descendants' survival? The implication of this is that not only will a batch of chemicals struggle to survive and avoid death, but that they will also adapt in ways that won't necessarily help them survive any better, but will help their descendants. What gave these chemicals the ability to calculate structural changes to improve the chances of survival for future species?
>
> Accidental evolutionists seem to insist that through a desire to survive and adapt to environmental challenges, and passed on such a developed mechanism to offspring. While it may seem speculatively reasonable to consider this, there is still a gaping hole: where did such a mechanism—of adapting and passing genetic improvements to future generations—arise from? What incentive do lifeless chemicals have to code this ability into the genetic structure?
>
> The only answer accidental evolutionists seem to give us to these questions is that this all must have been a random accident. It should not have happened, but accidentally did, they claim. This is seemingly the accidental evolutionists' only answer to all the real puzzles of existence: *it was an accident that should not*

have happened.

The assumption that accidental evolutionists seem to make is that each event, from the initial combination of chemicals to each genetic variation, took millions if not billions of years to occur. With this much time at their disposal, all sorts of accidental variations could supposedly happen. They claim that from all the variations that did take place, the ones which extended or improved life were retained because those variations survived. The other accidental variations didn't work, so those species must have died off. The other variations felt to the wayside as the weaker creatures got killed off. This part of the theory is called 'survival of the fittest'. Improved variations were supposedly selected through 'natural selection'."

(add)

Quotes

The following are other related quotes:

"Why would a lifeless or previously lifeless bag of chemicals decide it was important that future generations even exist, let alone improve their chances of survival? While we might quickly assume that living organisms would want to produce offspring with grater chances of survival, there is no rational reason for this desire. Why would a selfishly motivated newly living organism care about a future generation? First accidental evolutionists make a huge leap assuming that life somehow spontaneously generated from chemicals. Then they make a huge leap that these newly living chemicals somehow preferred survival and pain as opposed to a painless existence of nonlife. Then they make another huge leap by assuming that these newly living chemicals could and would want to dilute their strength to produce offspring that require only trouble and work to maintain. They against all odds, evolution theory proponents take the leap in assuming that these newly living chemicals somehow created an 'unselfish gene' that somehow passed on improvements for the future survival of future generations who do nothing for that newly living chemical itself. All of this was done by newly living chemicals that not much different in substance from their dead chemical cousins? The only answer accidental evolutionists seem to give us to these questions is that this all must have been a series of random accidents."

— C.W. Adams (2008), *The Science of Truth* (Ñº)

References

1. Adams, C.W. (2006). *Actuality: Life in the Real World* (§:How could Chemicals have a Desire to Survive , pgs. 84-85; §:Chemicals Cannot Decide to Extend Their Successor's Lives", pgs. 86-87). Publisher.

External links

â— C.W. Adams (author page) – Amazon.

θΔics

In religio-mythology, **Cain and Abel** is a story from the Bible, section Genesis 4:1-19, wherein []

Set and Osiris

The Biblical story of Adam's three male offspring, namely of Cain killing Abel and Seth gaining the right to rule is a monotheistic rescript of the Egyptian mythology story of Atum's three male offspring, namely of Set killing Osiris and Horus acquiring the right to rule; the gist of which is as follows:

Set killing **Osiris**
(Egyptian, 3100BC)

Cain killing **Abel**
(Jewish, 200BC)

The Biblical story of **Cain and Abel**, wherein Cain kills his brother Abel, after which Seth acquires the right to rule in god's eyes, is a rescript of the Egyptian mythology story of Set killing Osiris, after which Horus becomes the legitimate heir.

Atum (father)

Set & Osiris | → Horus (legitimate heir)

Adam (father)

Cain & Abel | → Seth (legitimate heir)

The famous Egyptian mythology story, in turn, is astro-theological in basis; generally a tale of of the triumph of light over darkness, in respect to the yearly solar cycle, in short.

In 1907, Gerald Massey, in his *Ancient Egypt: Light of the Modern World*, summarized things as follows: [1]

> "The battle in Amenta was not only fought betwixt the Apap [Apep] of darkness and the sun god Ra. When the two brothers Sut [Set] and Horus were repeated in the solar mythos, as the sons of **Atum**, the conflict was continued for possession of the garden. This was now the motive of the warfare. Previously it was for the water of the inundation or light in the moon. Now it was for the water and the tree of life in the Aarru-garden. In one version of the mythos, **Sut [Set] is the murderer of the good brother as Osiris**. In the other, Sut pierces and puts out the eye of Horus. This is represented as the contest between **Cain and Abel**, the two sons of **Adam**, in the book of Genesis. Sut and Horus represented two contending nature-powers. They fought each other as the two rehus or lions in the light and dark halves of the moon, with Taht as the adjudicator of the landmarks. They also fought as two dragons, or as the crocodile of water and the dragon of drought, both of which were rightly represented in the astronomical mythology. 'Hydra' remains for all time as the 'hellish Apap' who drank up the water. And 'Draconis' is a figure of the good dragon or Horus-crocodile. Lastly, the two opponent powers were portrayed as twin-brothers, fighting for the birth-right, or seeking to overcome each other. Thus they contended for possession of the garden in Amenta, where they fought upon the mount of glory or were constellated as the Gemini contending in the zodiac. The conflict of the brothers was continued in the garden of Eden, and Cain fulfils the character of the murderer Sut, the slayer of his brother. There is an attempt even to discriminate betwixt the two domains of Sut and Horus,

when it is said that ‘Abel was a keeper of sheep, but Cain was a tiller of the ground’ (Genesis 4:2-3).”

In 1907, George St. Clair, in his *The Secret of Genesis: an Astro-Religious Record*, summarized things as follows: [2]

“Cain and Abel represent rival forms of the registration of time attempted next after the failure of the Adamic year. We may not unlikely find them associated with the seasons of autumn and spring, with the promise before them of winter or of summer. The divinities of the two hemispheres possess equal extent of domain, and have so much likeness as to be called twin brothers. Yet as one is dark and cold, the other warm and bright, they are a contrast; and as neither can brook the presence of the other, they are rivals. At the equinoxes they come face to face, and look over the boundary as though covetous of each other’s territory. Sometimes they seem to wrestle for the mastery. It can be shown that in the course of the Great Year of Precession they mutually occupy each other’s domain, and return to their own. They are also made to do so factitiously, by the Sothic Cycle of 1460 years; and may do so, in irregular ways, in any faulty calendar.

Cain and Abel are like Typhon [Set] and Osiris.—In Egypt the rival brothers were Typhon [Set] and Osiris. .Typhon got into his brother’s house and murdered him, and reigned in his stead. This reversed position of the hemispheres is set forth also in another way, by the statement that Osiris descended into the underworld and became the god of the dead. A new calendar was framed in which the god of light was Horus; and he, as the son of Osiris, assumed the task of avenging his father. It was not easily done, and for a long time the struggle went on between Horus and Set (Typhon is the Greek name for Set). It seems likely that this warfare, with alternate gain and loss, represents a troublesome experience of calendar mending before the seasons were accurately measured and adjusted.

Cain and Abel are like these Egyptian brothers, though with some differences. Cain seems to belong to the autumn equinox, the place and season of the fruits of the ground; and Abel to the spring, which is the place and season of the lambs of the flock. The vernal equinox is the more acceptable time for the beginning of the year; but the calendar is erroneous, and in some way the autumn proves to have the advantage. **Cain kills his brother Abel, as Typhon murdered Osiris**. Then, as **the place of Osiris was taken by Horus, the place of Abel is taken by Seth**; and we may look upon Seth as Abel *redivivus* without his weakness or defect. We are not favored, however, with any details of a struggle between Seth and Cain, like that which is chronicled concerning Horus and Set.

Jewish legends about Cain and Abel are of uncertain origin and doubtful meaning: yet some of them would admit of easy adaptation to the theory of rival calendars, and more than one looks like a fragment of astronomical tradition. In Egypt the twin brothers Typhon and Osiris had twin sisters, and were married to them (as the social custom of Egypt would allow)—Osiris to Isis, and Typhon to Nephthys. In the astronomic symbolism the sisters may have represented the solstices, or they may have stood by their brothers at the equinoxes as goddesses of New Year festivals. At all events, the error which brought one equinox to the place of the other and allowed Typhon to kill Osiris, brought each brother, in the same figurative way, to the couch of the other’s wife. Nephthys, in all innocence, bears a son to Osiris—there was something in the astronomic facts to justify this conception—and that son, Anubis the jackal, is no doubt a star of that name. It is very curious then to find Jewish legends declaring that **Cain and Abel were twins; and again that each had a twin sister**, and although Adam gave Cain’s sister to Abel, and Abel’s sister to Cain, Cain desired to marry his own sister Azrun. This is given as the cause of the quarrel which led to the murder. The fatal blow was dealt with a stone, or with a scythe or crooked hedging bill: and symbolism has meanings for fatal stones and murderous sickles.

The mark set upon Cain’s forehead is in one tradition **a horn growing out of it**. In the revised Old Testament the mark is a ‘sign’ appointed for Cain. The dog which guarded Abel‘s flock is said to have been

> given to Cain for a perpetual travelling companion. These details are too slight to build argument upon. Yet we may note that Cain the wanderer will be found bye and bye connected with the Dog-star [Sirius]. In the calendar of the 'Vague Year', i.e. the year of 365 days without intercalary, the Dog-star is caused to wander through all the months. Cain, like Typhon, gets more than his due—In our chapter on the Serpent we found that Typhon was rightly charged with the calendar mischief which displaced the equinox and the year's beginning factitiously, or contrary to the facts of nature. He was also wrongly blamed for the real movement of precession which causes stars of autumn to fall away from the equinox and disappear below the equator. The analogy of Cain to Typhon is confirmed by the fact that certain traditions connect him with those "children of failure," the fallen angels."

In 2000, Gary Greenberg, in his *101 Myths of the Bible*, argued similar to Massey and St. Clair, albeit without the astro-theology connections, but also added in the note that the Bible version had Sumerian mythology syncretized into the original Egyptian version: [3]

> "The story of Cain and Abel had its origins in the conflict between Set and Osiris, but subsequently the story was influenced by Sumerian myths about a shepherd named Dumuzi."

Greenberg elaborates on this via three pages of discussion.

References

1. Massey, Gerald. (1907). *Ancient Egypt: The Light of the World: a Work of Reclamation and Restitution in Twelve Books*, *Volume One* (pgs. 457-58). T. Fisher Unwin.
2. St. Clair, George. (1907). *The Secret of Genesis: an Astro-Religious Record -- The Legends and Their Interpretation, from the Fall of the Angels to the Building of the Babel Tower* (pg. 108-10). Publisher.
3. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (myth #30: Cain killed Abel, pgs. 68-70). Source Books.

External links

â— Cain and Able – Wikipedia.

θΔics

In chemistry, **calcium**, symbol Ca, atomic number 20, is a metallic element, the fifth most abundant element in an average person, comprising 1.4 percent by mass of the structural composition of one human molecule. [1]

Rank	CPK (jmol)	Symbol	% Mass	Picture	Z
5		Ca	1.4		20

Human molecular formula

The position of the element calcium in the average human molecular formula is as follows:

$$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}\mathbf{Ca}_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}$$

$$Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$$

Function

Calcium is used in the development and maintenance of bone structure and development. Functions in the clotting process, nerve transmission, muscle stimulation, parathyroid hormone function, and metabolism of vitamin D, etc. [1]

Quotes

The following are related quotes:

> "Why should a group of simple, stable compounds of carbon, hydrogen, oxygen and nitrogen struggle for billions of years to organize themselves into a professor of chemistry? What's the motive? If we leave a chemistry professor out on a rock in the sun long enough the forces of nature will convert him into simple compounds of carbon, oxygen, hydrogen and nitrogen, **calcium**, phosphorus, and small amounts of other minerals. It's a one-way reaction."
>
> — Robert Pirsig (1991), *Lila: An Inquiry into Morals* [2]

References

1. Thims, Libb. (2008). *The Human Molecule* (pg. 14) (issuu) (preview) (Google Books) (docstoc). LuLu.
2. Pirsig, Robert M. (1991). *Lila: An Inquiry into Morals* (excerpt, pg. 140; chemistry, 11+ pgs). Random House.

External links

â— Calcium – Wikipedia.

θΔics

In famous publications, ***Calculation of the Effect of Machines**, or Considerations on the Use of Engines and their Evaluation* is an 1829 textbook by French physicist Gustave Coriolis that introduced a number of fundamental modern concepts, such as the principle of the transmission of work, i.e. the standard definition of work as force times distance, the dynamode as a unit of work, and kinetic energy as one-half the mass times the squared velocity of an object. [1]

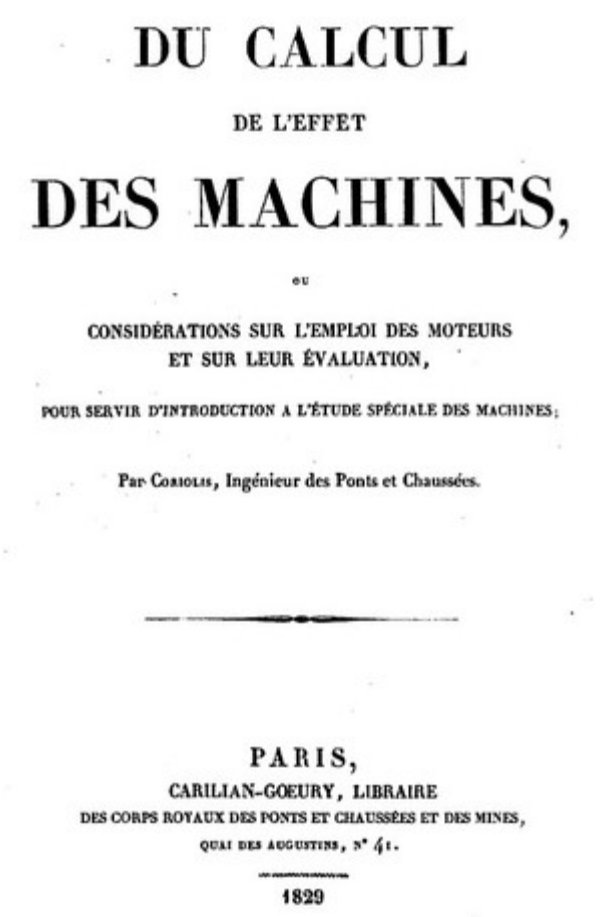

DU CALCUL

DE L'EFFET

DES MACHINES,

OU

CONSIDÉRATIONS SUR L'EMPLOI DES MOTEURS ET SUR LEUR ÉVALUATION,

POUR SERVIR D'INTRODUCTION A L'ÉTUDE SPÉCIALE DES MACHINES;

Par Coriolis, Ingénieur des Ponts et Chaussées.

PARIS,

CARILIAN-GOEURY, LIBRAIRE

DES CORPS ROYAUX DES PONTS ET CHAUSSÉES ET DES MINES,

QUAI DES AUGUSTINS, N° 41.

1829

Coverpage of Gustave Coriolis' 1829 textbook ***Calculation of the Effect of Machines***.

Overview

The following seems to be a circa 1844 posthumous abstract: [1]

> Done at the Academy of Sciences, a book entitled From Veffet of Calculating Machines or remarks on the use of motors and their evaluation, to serve as an introduction to the study of special machines; Mr. Corious, Bridges and Roads engineer.
>
> The theoretical considerations that govern the establishment and calculation of the effect of the machines are very worthy of the interest of the learned, either by themselves or by their influence on the progress of the arts. One of the main problems is proposed in construction machinery, is to replace, for the performance of useful work, our own forces by more powerful forces of natural agents. It is very important to use the most advantageous way as possible the considerable capital anjourd'hui which are devoted to this kind of companies.
>
> The science of machines, considered in its full extent, is very large and almost entirely embraces all the arts. By merely part of the science that belongs to mathematics, we recognize that it borrows key concepts in geometry, the Static and Dynamic. Of these, the main one being the consideration of the action of machines and engines that are applied to them, in distinguishing elements of this action, and research proportions that must be established between these elements, to obtain natural agents the largest amount of work it is possible. These considerations have long since attracted the attention of surveyors. It was soon recognized that the effect of a machine, it was always easy to assimilate to the elevation of a weight was proportional to the high weight and the speed of the vertical ascent; Parent seems to have noticed, but the first in the Memoirs of Academy of Sciences for the year 1704, that given the motor to operate a job, the effect could be obtained was liable to vary within certain limits and the need to give so much to proportion the effort and speeds, this effect reached the highest value that the nature of the engine could contain. These ideas have been adopted by the learned and engineers have been busy this material. Theoretical and experimental research Daniel Bernoulli, Euler, Borda De Parcieux, Coulomb, Carnot, Belidor, Smeaton had generally intended to enjoy the action of the various engines, and learn to adjust to satisfy the maximum of conditions occurring in all matters of this kind, as well as in most sciences applications to the arts and natural philosophy.
>
> Mr. Coriolis, in the work which the Academy has asked us to report to note that the theoretical concepts relating to the use of engines are item presented in the teaching of rational mechanics nor completely developed in treated special machines. These concepts are mainly in the application of the principle of conservation of kinetic energy, application specified by the illustrious Lagrange, in the last pages of the theory of analytic functions. Small, clever professor at École Polytechnique, whose untimely death has deeply distressed friends of science, gave a brief on this memory, printed in ...

To a good extent, Coriolis' 1829 textbook seems to be the main reference to German physicist Rudolf Clausius'

derivation of the energy *U* of a body or internal energy in the modern sense in the mathematical introduction to his 1875 textbook *The Mechanical Theory of Heat*, although, to note, he does not explicitly mention Coriolis.

References

1. (a) Coriolis, Gustave. (1829). *Calculation of the Effect of Machines, or Considerations on the Use of Engines and their Evaluation* (*Du Calcul de l'effet des Machines, ou Considérations sur l'emploi des Moteurs et sur Leur Evaluation*). Paris: Carilian-Goeury, Libraire.
(b) Coriolis, Gustave. (1844). *Treatise on the Mechanics of Solid Bodies and Calculation of the Effect on Machines* (*Traité de la Mécanique des Corps Solides et du Calcul de l'effet des Machines*) (section: Principle of the Transmission of Work in the Movement of a Material Point, pgs. 35-40). 2nd. Ed. Paris.

θΔics

In mathematics, **calculus**, from the Latin *calcis*- “small stone”, as in infinitesimal counting, refers to the method of mapping the motion of a moving point in time, on a two-dimensional Cartesian coordinate system, originally developed by Roberval (c.1635) (O), such that the curve, defined by the function *f*(x,y) = 0, is regarded as the locus of the intersection of two moving lines, one horizontal motion (x-axis) the other vertical motion (y-axis), whereby the “derivative” (see: differential calculus) of each motion, in respect to time, is the velocity in each respective direction, according to which the tangent of the curve is the velocity of the particle; the “integration” (see: integral calculus) of the function of the curve yields the area under the curve (Newton, 1666).

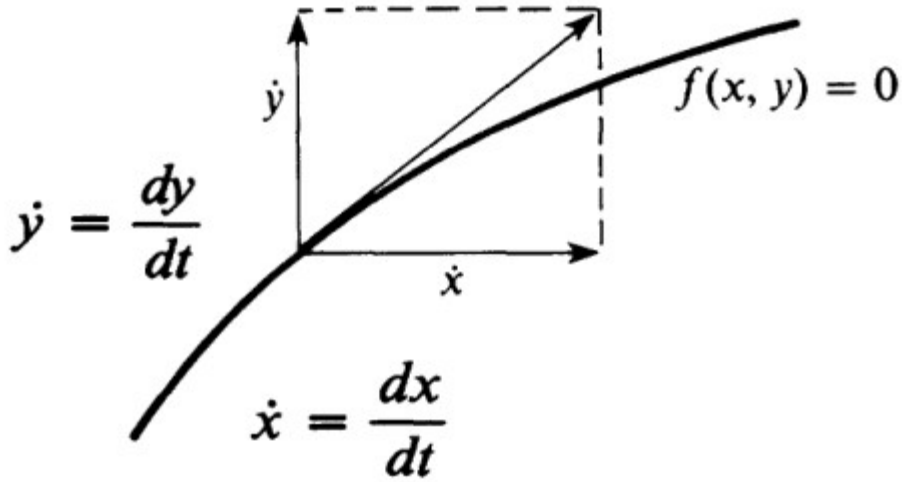

A general diagram of "**calculus**" of a moving point in a Cartesian system in time (Newton, 1666). [1]

References

1. (a) Newton, Isaac. (1666). “Tract on Fluxions”, Oct.
(b) Edwards, C.H. (1975). *The Historical Origin of Calculus* (§: Calculus According to Newton, pg. 191-92). Springer.

See also

- History of differential equations
- Prodigies and calculus

External links

- Calculus – Wikipedia.
- Calculus – EtymOnline.com.

θΔics

In religio-mythology, **Caleb**, in the Old Testament, is the name of the "dog", or person named "dog", that works as a military spy for Moses in the Bible; which is equivalent to the “dog” of Bacchus (or Dionysus); both of which are rescripts of the dog-like god “Anubis” that accompanies Osiris; both of which are astro-theology based god anthropisms of the “Canis Minor” (Anubis) and Orion (Osiris) constellations; the stories attributed to them, in each religious rescript, being based on the annual perceptual movement of each constellation in respect to the sun (Ra), milky way (Nile River), star Sirius (Isis), and the annual flooding of the Nile River. [1]

Strong's Concordance

keleb: a dog

Original Word: כֶּלֶב

Part of Speech: Noun Masculine

Transliteration: keleb

Phonetic Spelling: (keh'-leb)

Definition: a dog

The 1890 definition (Q) of **Caleb**, from James Strong’s *Concordance*, a term derived from the Egyptian god Anubis, symbolic of the Canis Minor constellation.

Overview

In 1858, Hubert Puisaye, in his *The Pagan World of Universal Mythology*, summarized the “Anubis = Caleb” connection as follows: (Q)

> “With regard to Anubis or the dog, as a distinct person, Diodorus shows him, in his history, as contemporaneous at the same time, and Hermes and Hercules, the scribe, the other general in chief of Osiris, but different, and in sub-order.
>
> In a suborder of the type of this Hermes and this Hercules, that is to say in the suborder of Moses, the Scripture also shows us a personage who could be called in Egyptian by the name of Anubis since it bears in Hebrew a name meaning ‘dog’; this character is Caleb. The role of lieutenant of the supreme chief played by Anubis in the army out of Egypt to go under the command of Hercules, to make conquests in the East, is identical to that played by his namesake Caleb in the army, which came out of Egypt also, under the guidance of Moses, to go to the east, to conquer the promised land.
>
> Evidently**, this Anubis or Caleb, lieutenant of the Egyptian Hercules or left Egypt (Moses), is therefore identical to Caleb or Anubis**, lieutenant of Moses, who was also named Hermes, following the testimony of d’Artapan.”

While this overview is not exactly perfect, e.g. we now know that Hercules is the rescript of Horus, it gives a good general overview.

Quotes

The following are related quotes:

> “Diodorus tells us that Osiris had in his army Anubis covered over with a **dog's skin**, which thence was pictured with a dog's head, and called the dog keeper, &c.; all which seems to refer to **Caleb***'s* name, which signifies *a dog*.”
>
> — Jonathan Edwards (c.1750), *Notes on the Bible* (Q)

"The god Pan gave Bacchus a **dog** to accompany him in his travels; **Caleb**, which, in Hebrew, signifies a dog, was the name of the faithful companion of Moses. Bacchus, by striking the earth with his thyrsus, produced rivers of wine. Moses, by striking the rock with his miraculous rod, caused water to gush out to satisfy the raging thirst of the Israelites."

— William Hort (1802), *The New Pantheon: an Introduction to the Mythology of the Ancients* (O)

"Jupiter commands Bacchus to go and destroy the impious people of the Indies, just as Moses is ordered to abolish the abominations of the idolatrous nations. Pan gave Bacchus a **dog** as his faithful companion, and in like manner Moses is accompanied by **Caleb** the dog. Bacchus married Zipporah, a name of one of the seven planets, Venus; so Moses married Zipporah, one of the seven daughters of the priest of Midian."

— Parish Ladd (1907), "The Hebrews: Egypt, Moses and Exodus" (O)

"The Canis Minor constellation, aka the 'small dog', placed in the sky for faithfulness, drinks from the Milky Way, once thought to be a river. In Egypt, he was **Anubis**, the jackal god. The Greeks called the whole group Prochon."

— Mark Chartrand (1982), *Skyguide: a Field Guide for Amateur Astronomers* [2]

"One thing of importance here is that **Caleb** means '**dog**', and in the Egyptian myths, it is the dog Anpu-Ap-Uat (a form of **Anubis**) that guides Shu-Anhur and souls of the deceased through the Amenta Underworld to the Paradise of Peace. In this view, Moses, Joshua, and **Caleb** match Anhur, Shu, and Anubis, and the Paradise of Peace of the Egyptians becomes the Promised Land of the Jews."

— Robert Clarke (2005), *An Order Outside time: a Jungian View of the Higher Order Self, from Egypt to Christ* (pg. #)

References

1. (a) Osiris, Dionysus-Bacchus, and Moses
(b) God character rescripts
2. Chartrand, Mark R. (1982). *Skyguide: a Field Guide for Amateur Astronomers* (pg. 126). Publisher, 1990.

External links

- Caleb – Wikipedia.

θΔics

In hmolscience, **Caleb Saleeby** (1878-1940) was an English physician noted for his 1904 *The Cycle of Life According to Modern Science* wherein he digresses in several locations on Goethe and his ideas on evolution, human chemistry; among a few other interesting points, e.g. making the discerning Empedocles and Goethe connection.

Quotes | Employed

The following are noted quotes employed by Saleeby:

> "The great soul of the world is just."
>
> — Heraclitus (c.470BC), "The First Evolutionist", in: *The Cycle of Life* (pg. 294)

Quotes

The following are noted quotes:

> "Has not Goethe, following **Empedocles**, told us how carbon and oxygen love each other, how passionately they fly, lover-like, into each other's arms? The union is extremely firm, as is testified by the quantity of heat evolved by a fire during the process of combination, and by the chemist's great difficulty when he seeks artificially to undo it."
>
> — Caleb Saleeby (1904), "The Green Leaf" [1]

References

1. Saleeby, Caleb. (1904). "The Green Leaf", in: *The Cycle of Life According to Modern Science: Being a Series of Essays Designed to Bring Science Home to Men's Business and Bosoms* (§3:19-28, esp. pg. 24). Harper & Brothers.

External links

â— Caleb Saleeby – Wikipedia.

θΔics

In chemistry, **caloric** was a supposed form of matter held responsible for the phenomena of heat and combustion. [1] The caloric was considered as a hypthetical elastic fluid-like substance, that when introduced into bodies was considered as the the repulsive cause that separates the particles of matter from each other. [2]

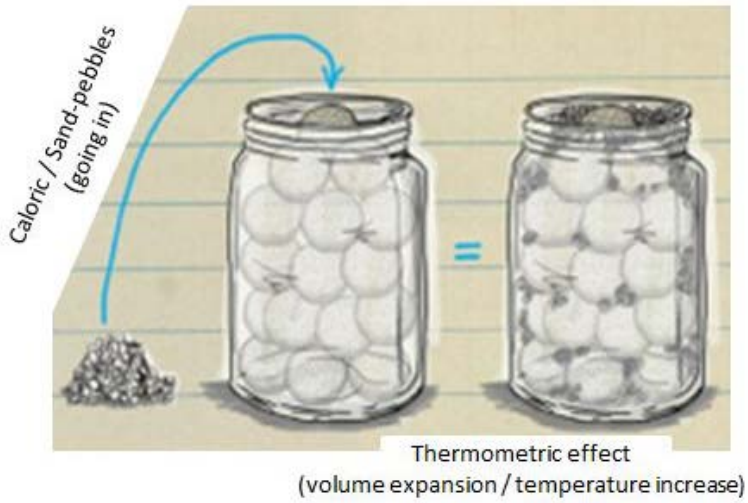

A depiction of English science writer Jane Marcet's 1805 sand-marble illustrative model of capacity of a body for caloric (see: heat capacity), in which the sand represents the "**caloric**" and the ping pong balls represent the atoms, according to which a given body will have so much capacity for caloric, i.e. heat as it was viewed in that period. [7]

Overview

The term "calorique" (caloric) was introduced in 1787 by French chemist Guyton de Morveau, working in coordination with French chemist Antoine Lavoisier, Savoyard chemist Claude Berthollet, and French chemist Antoine de Fourcroy in a paper presenting the suggestions on the reformulation of the chemical nomenclature. [3] Lavoisier, in 1777, had formerly used the names *igneous fluid* and *matter of heat* for the hypothetical fluid. [4] The postulate of the caloric particle came to be known as the "caloric theory".

In a 1780 memoir titled “On Combustion in General”, Lavoisier presented his new theory of combustion, with five key points:

(a) In combustion, there is disengagement of the *matter of fire* (caloric) or of light.
(b) A body can burn only in pure air [oxygen gas].
(c) There is “destruction or decomposition of pure air” and the increase in weight of the body burnt is exactly equal to the weight of the air “destroyed or decomposed”.
(d) The body burnt changes into an acid by addition of the substance which increases its weight.
(e) Pure air is compound of the *matter of heat* (caloric) or of light with a base; where in combustion, the burning body removes the base, which it attracts more strongly than does the matter of heat, and sets free the combined matter of heat, which appears as flame, heat, and light.

In this theory, as contrasted with the older phlogiston theory, which situated the matter of fire (phlogiston) in the combustible, the matter of heat was theorized to be located in pure air. [5]

In 1789, Lavoisier published the following listing what he considered to be the 33 known elements, including **caloric**:

	Noms nouveaux.	*Noms anciens correſpondans.*
Subſtances ſimples qui appartiennent aux trois règnes & qu'on peut regarder comme les élémens des corps.	Lumière	Lumière.
	Calorique	Chaleur. Principe de la chaleur. Fluide igné. Feu. Matière du feu & de la chaleur.
	Oxygène	Air déphlogiſtiqué. Air empiréal. Air vital. Baſe de l'air vital.
	Azote	Gaz phlogiſtiqué. Mofete. Baſe de la mofete.
	Hydrogène	Gaz inflammable. Baſe du gaz inflammable.

Subſtances ſimples non métalliques oxidables & acidifiables.	Soufre	Soufre.
	Phoſphore	Phoſphore.
	Carbone	Charbon pur.
	Radical muriatique	Inconnu.
	Radical fluorique	Inconnu.
	Radical boracique	Inconnu.
Subſtances ſimples métalliques oxidables & acidifiables.	Antimoine	Antimoine.
	Argent	Argent.
	Arſenic	Arſenic.
	Biſmuth	Biſmuth.
	Cobolt	Cobolt.
	Cuivre	Cuivre.
	Etain	Etain.
	Fer	Fer.
	Manganèſe	Manganèſe.
	Mercure	Mercure.
	Molybdène	Molybdène.
	Nickel	Nickel.
	Or	Or.
	Platine	Platine.
	Plomb	Plomb.
	Tungſtène	Tungſtene.
	Zinc	Zinc.

Subſtances ſimples ſalifiables terreuſes.	Chaux	Terre calcaire, chaux.
	Magnéſie	Magnéſie, baſe du ſel d'Epſom.
	Baryte	Barote, terre peſante.
	Alumine	Argile, terre de l'alun, baſe de l'alun.
	Silice	Terre ſiliceuſe, terre vitrifiable.

In 1799, English chemist William Jackson, in his “A Synopsis of the Chemical Characters: Adapted to the New Nomenclature”, presented the following basic chemical elements or what he referred to as “examples of simple characters” (left) and “examples of compound characters” (right), i.e. chemical compounds: [6]

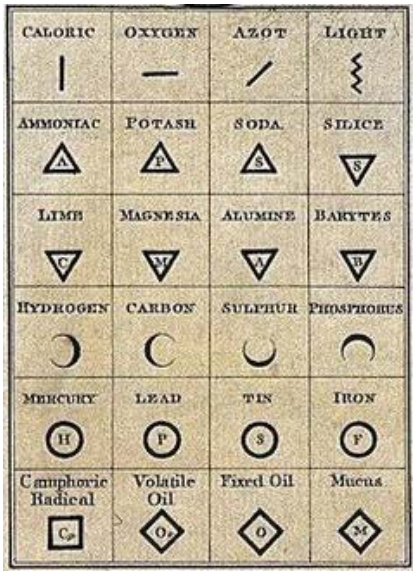

elements

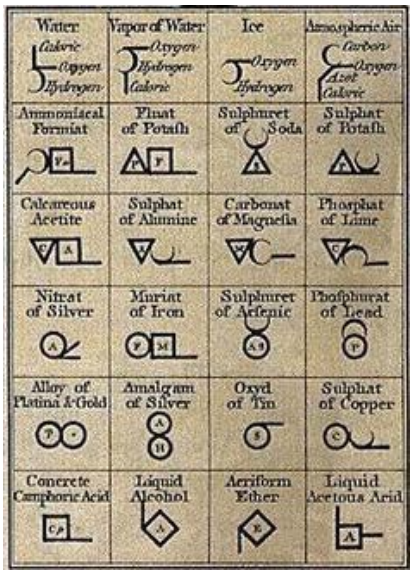

compounds

Accordingly, we have the following conception of ice (solid) to water (liquid) to vapor (gas) transitions:

which seems to signify or conceptualize the logic that ice is a chemical compound of oxygen and hydrogen with no caloric (no vertical line), water that of oxygen and hydrogen with some caloric added, signified by the caloric character (vertical line) on top, and vapor of water that of oxygen and hydrogen with more caloric, signified by the caloric character (vertical line) at the bottom of the compound symbol.

In 1805, English introductory science writer Jane Marcet, in her *Conversations on Chemistry*, gave the following Q&A summary conception of caloric: [7]

> *Mrs B:* Your reasoning is very good, as far as conducting power is concerned; but facts, as established by decisive experiments, overturn your theory, and leave no doubt that the quantity of **caloric** which enters into various substances to produce in them the same thermometric effect, is very different; and hence they are said to possess different capacities for caloric.
>
> *Caroline:* What do you mean by the *capacity* of a body for caloric [see: heat capacity]?
>
> *Mrs B:* I mean a certain disposition of bodies to require more or less caloric for raising their temperature to any given degree of heat. Perhaps the fact may be illustrated thus:
>
>> Let us put as many marbles into this glass as it will contain, and pour some sand over them; observe how the sand penetrates and lodges between them. We shall now fill another glass with pebbles of various forms; you see that they arrange themselves in a more compact manner than the marbles, which, being globular, can touch each other by a single point only. The pebbles, therefore, will not admit so much sand between them; and consequently one of these glasses will necessarily contain more sand than the other, though both of them be equally full.
>
> *Caroline:* This I understand perfectly. The marbles and the pebbles represent two bodies of different kinds, and the sand the caloric contained in them; and it appears very plain, from this comparison, that one body may admit of more caloric between its particles than another.

(add discussion)

See also

â— Re-establishment of equilibrium in the caloric

References

1. Caloric (definition) - *Merriam-Webster Collegiate Dictionary*, 2000, version 2.5.
2. Lavoisier, Antoine. (1789). *Elements of Chemistry*, (pg. 5). London: G.G. and J.J. Robinsons.
3. Morveau, Guyton de. (1787). *Méthode de Nomenclature Chimique (Method of Chemical Nomenclature)*, 31.
4. Collection of the *French Academy of Sciences* for that year, pg. 420.
5. Partington, J.R. (1957). *A Short History of Chemistry*, 3rd ed. (pg. 131-35). New York: Dover Reprint.
6. Jackson, William. (1799). "A Synopsis of the Chemical Characters: Adapted to the New Nomenclature" (Ñº), by Jean-Henri Hassenfratz and Pierre-Auguste Adet, Systematically Arranged by William Jackson, Practical Chemist. London: Harry Ashby & Son Engineers & Printer.
7. (a) Marcet, Jane. (1805). *Conversations on Chemistry* (pg. 66). Philadelphia: Grigg & Elliot, 1846.
(b) Jane Marcet – Wikipedia.

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â— Metcalfe, Samuel L. (1859). *Caloric: its Mechanical, Chemical and Vital Agencies in the Phenomena of Nature* (Volume 1). J.B. Lippincott & Co.

θΔics

In chemistry, **caloric theory** was a postulate that heat was composed of a type of fluid made of indestructible particles called "caloric". The fluid was conceived as being able to pass into the pores of bodies, such that the more caloric that was in the space of the pores the more the body had a tendency to expand, due to the action of heat. The caloric theory was developed in the late 18th century by French chemist Antoine Lavoisier; it supplanted the older 17th century "phlogiston theory", developed German chemist Georg Stahl, in the explanation of many aspects of heat and light. [1] The caloric theory was superseded, in a general sense, by the mechanical equivalent of heat, during the years 1798-1843, and the concept of "entropy", during the years 1850 to 1865.

History

The caloric theory was established in the late 18th century by French chemist Antoine Lavoisier, who between 1768 and 1787 published over sixty papers leading to his theory of combustion, in which the process of combustion resulted in the release of "caloric" particles. [2] His caloric theory of combustion found its way to the physicists of the world principally through the famous publication of this 1789 textbook *Elements of Chemistry*.

In 1777, Lavoisier outlined the view that in every combustion there is a disengagement of the *matter of heat* (or *igneous fluid*) or of light. [3] In 1786, he proved that the “matter of heat” is weightless by showing that phosphorous burned in air in a closed flask, with no appreciable change in weight. [4] In 1787, French chemist Guyton de Morveau, working in coordination with Lavoisier, Savoyard chemist Claude Berthollet, and French chemist Antoine de Fourcroy, named the matter of heat “calorique” (caloric). [5]

In 1789, in reference to their work in reformulating the chemical nomenclature, Lavoisier states: [6]

> “We have distinguished the cause of heat, or that exquisitely elastic fluid which produces it, by the term **caloric**.”

The start of the downfall of caloric theory was Benjamin Thompson's 1798 cannon boring experiment; then in 1824, the teetering point of the theory was reached in the work of French engineer Sadi Carnot who used the theory in his *Reflections on the Motive Power of Fire*, but began to recant his views in his personal notes. Caloric theory was eventually superseded or rather upgraded to entropy theory, beginning in 1850 by German physicist Rudolf Clausius.

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Further reading

â— Callendar, H.L. (1910). “The Caloric Theory of Heat and Carnot’s Principle”, *Proc. Phys. Soc*. London: 23, 153-89.

External links

â— Caloric theory – *Eric Weisstein’s World of Physics.*

â— Lavoisier’s Caloric Fluid Theory (early attempts to understand the nature of heat), physics department, *University of Virginia*.

θΔics

In science, **calorimeter**, from the French *calor*- "heat" + *-meter* "measure", is an instrument (see: thermodynamic instrument) that measures heat, e.g. reaction heat (see: reaction calorimeter), given off or absorbed by a substance, the substance typically confined to a chamber, which is surrounded by a body of water contained in a larger container, wherein a thermometer in the water measures the change in temperature, thus allowing for a calculation of the heat given off or absorbed, via use of the heat capacity of the water; a heat meter.

Overview

In 1782, Antoine Lavoisier and Pierre Laplace, using ideas on heat capacity, e.g. from Joseph Black, built the following calorimeter:

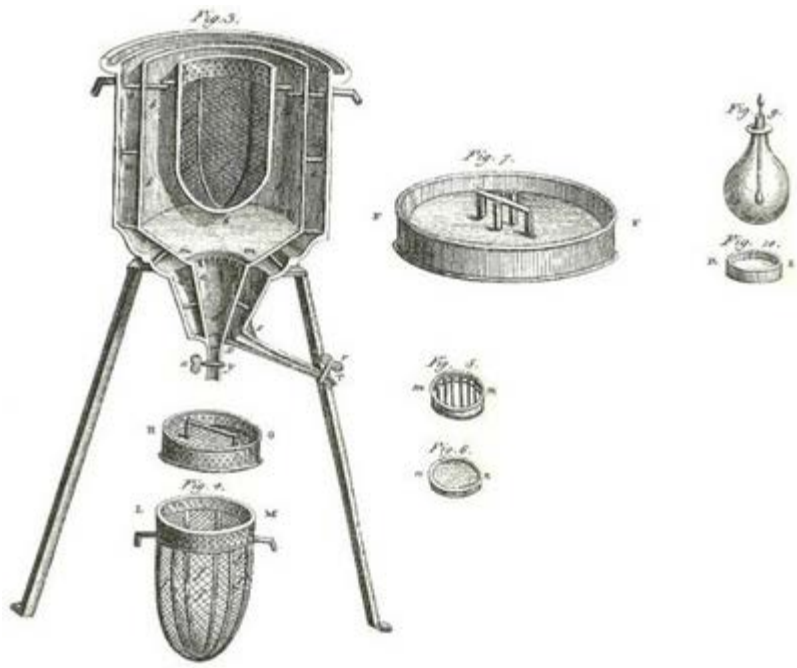

In 1844, James Joule, in his "On the Changes of Temperature produced by the Rarefaction and Condensation of Air", reported on two experiments, wherein he used two strong connecting copper vessels, and calorimeter, with double walls, designed to accommodate the two vessels, as shown below, wherein after evacuating one container, with an air pump (vacuum pump), leaving the other filled with gas, then opened the valve, and calculated the change in temperature in the water of the calorimeter: [1]

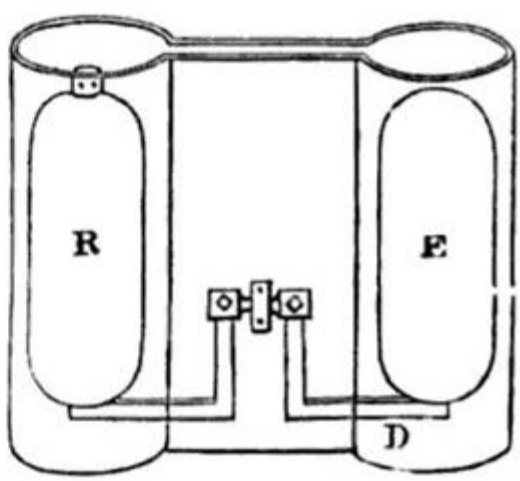

He then repeated this experiment, but this time by putting each copper vessel in its own calorimeter, so to ascertain a unique temperature change for each:

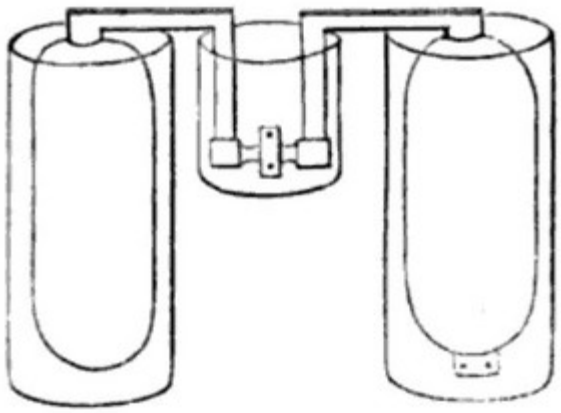

These two experiments enabled him to prove that when a "perfect gas" expands without doing work its "internal energy" remains unchanged.

Social calorimeter

See: Human thermodynamic instrument

In 2007, Libb Thims, in his *Human Chemistry*, gave an overview as to how to go about constructing a human reaction calorimeter and human molecular or human system thermometers, so to be able to measure quantities such as human reaction enthalpy change. [2]

See also

● Reaction calorimeter

References

1. (a) Joule, James. (1844). "On the Changes of Temperature produced by the Rarefaction and Condensation of Air" (abstract) (by: Dr. Roget) (note: paper, supposedly was rejected by Royal Society), *Proceedings of the Royal Society*, Jun 20; published in: *Philosophical Magazine, Series Three*; May; both in: *Scientific Papers, Volume One* (pg. 171-89; quote, pg. 189). Publisher.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 235; image, plate 23). Cornell University Press.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (human calorimeters, pgs. 431-330; proxemics, pgs. 550, 631). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (hot molecules and volume change, ch. 8: "Planck's quantum, pgs. 213-245; proxemics, pgs. 225-; ch. 9: Human Molecular Orbitals, pgs. 247-95). Morrisville, NC: LuLu.

External links

● Calorimeter – Wikipedia.

In human chemistry, **Calvin Thomas** (1854-1919) was an American Germanic-languages scholar noted for his 1913 “Introduction” section to Goethe’s 1809 *Elective Affinities*. [1] In his 1917 *Goethe*, Thomas comments on tentative real character behind Ottilie. [2]

Introduction

In the spring of the year 1807 Goethe began work on the second part of *Wilhelm Meister*. He had no very definite plot in view, but proposed to make room for a number of short stories, all relating to the subject of renunciation, which was to be the central theme of the *Wanderjahre*. In the course of the summer, while he was taking the waters at Karlsbad, two or three of the stories were written. The following spring he set about elaborating another tale of renunciation, the idea of which had occurred to him some time before. But somehow it refused to be confined within the limits of a novelette. As he proceeded the matter grew apace, until it finally developed into the novel which was given to the world in 1809 under the title of *The Elective Affinities*.

When that which should be a short story is expanded into a novel one can usually detect the padding and the embroidery. So it is certainly in this case. Those long descriptions of landscape-gardening; the copious extracts from Ottilie's diary, containing many thoughts which would hardly have entered the head of such a girl; the pages given to subordinate characters, whose comings and goings have no very obvious connection with the story,— all these retard the narrative and tend to hide the essential idea. The strange title, too, has served to divert attention from the real center of gravity. Had the tale been called, say, "Ottilie's Expiation," there would have been less room for misunderstanding and irrelevant criticism; there would have been less concern over the moral, and more over the artistic, aspect of the story.

What then was the essential idea? Simply to describe a peculiar tragedy resulting from the invasion of the marriage relation by lawless passion. As for the title, it should be remembered that there was just then a tendency to look for curious analogies between physical law and the operations of the human mind. Great interest was felt in suggestion, occult influence, and all that sort of thing. Goethe himself had lately been lecturing on magnetism. He had also observed, as no one can fail to observe, that the sexual attraction sometimes seems to act like chemical affinity: it breaks up old unions, forms new combinations, destroys preexisting bodies, as if it were a law that *must* work itself out, whatever the consequences. Such a process will now and then defy prudence, self-respect, duty, even religion,— going its way like a blind and ruthless law of physics. But if this is to happen the recombining elements must, of course, have each its specific character; else there is no affinity and no tragedy.

It is no part of the analogy that the pressure of sex is always and by its very nature like the attraction of atoms. Aside from the fact that character consists largely in the steady inhibition of instinct and passion by the will, there is this momentous difference between atoms or molecules, on the one hand, and souls on the other: the character of the atom or molecule is constant, that of the soul is highly variable. There is no room here for remarks on free will and determinism; suffice it to say that Goethe does not preach any doctrine of mechanical determinism in human relations. The scientific analogy must not be pressed too hard. It is really not important, since after all nothing turns on it. Whatever interest the novel has it would have if all reference to chemistry had been omitted. Goethe's thesis, if he can be said to have one, is simply that character is fate.

He imagines a middle-aged man and woman, Edward and Charlotte, who are, to all seeming, happily united in marriage. Each has been married before to an unloved mate who has conveniently died, leaving them both free to yield to the gentle pull of long-past youthful attachment. Their feeling for each other is only a mild friendship, but that does not appear to augur ill, since they are well-to-do, and their fine estate offers them both a plenty of interesting work. Edward has a highly esteemed friend called the Captain, who is for the moment without suitable employment for his ability and energy. Edward can give him just the needed work, with great advantage to the property, and would like to do so. Charlotte fears that the presence of the Captain may disturb their pleasant idyl, but finally yields. She herself has a niece, Ottilie, a beautiful girl whom no one understands and who is not doing well at her boarding-school. Charlotte would like to have the girl under her own care. After much debate the pair take both the Captain and Ottilie into their spacious castle.

And now the elective affinity begins to do its disastrous work. Edward, who has always indulged himself in every Whim and has no other standard of conduct, falls madly in love with the charming Ottilie, who has a passion for making herself useful and serving everybody. She adapts herself to Edward, fails to see what a shabby specimen of a man he really is, humors his whims, and worships him — at first in an innocent girlish way. Charlotte is not long in discovering that the Captain is a much better man than her husband; she loves him, but within the limits of wifely duty. In the vulgar world of prose such a tangle could be most easily straightened out by divorce and remarriage. This is what Edward proposes and tries to bring about. The others are almost won over to this solution when the event happens that precipitates the tragedy: the child of Edward and Charlotte is accidentally drowned by Ottilie's carelessness.

It is a very dubious link in Goethe's fiction that this child, while the genuine offspring of Edward and Charlotte, has the features of Ottilie and the Captain. From the moment of the drowning Ottilie is a changed being. Her character quickly matures; like a wakened sleep-walker she sees what a dangerous path she has been treading. She feels that marriage with Edward would be a crime. She resists his passionate appeals, and her remorse takes on a morbid tinge. It becomes a fixed idea. Happiness is not for her. She must renounce it all. She must atone — atone — for her awful sin. For a moment they plan to send her back to school, but she cannot tear herself away from Edward's sinister presence. At last she refuses food and gradually starves herself to death. The wretched Edward does likewise.

Any just appreciation of Goethe's art in *The Elective Affinities* must begin by recognizing that it is about Ottilie. For her sake the book was written. It is a study of a delicately organized virgin soul caught in the meshes of an ignoble fate and beating its wings in hopeless misery until death ends the struggle. The other characters are ordinary people: Charlotte and the Captain ordinary in their good sense and self-control, Edward ordinary in his moral flabbiness and his foolish infatuation. His death, to be sure, is unthinkable for such a man and does but testify to the unearthly attraction with which the girl is invested by Goethe's art. The figure of Ottilie, like that of her spiritual sister Mignon, is irradiated by a light that never was on sea or land. She is a creature of romance, and we learn without much surprise that her dead body performs miracles. One is reminded of that medieval lady who is doomed to eat the heart of her crusading lover and then refuses all other food and dies. That Edward is quite unworthy of the girl's love, that the death of the child is no sufficient reason for her morbid remorse, is quite immaterial, since at the end of the tale we are no longer in the realm of normal psychology. A season of dreamy happiness, as she moves about in a world unrealized; then a terrible shock, and after that, remorse, renunciation, hopelessness, the will to die. Such is the logic of the tale.

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External links

â— Calvin Thomas (linguist) – Wikipedia.

θΔics

In hmolscience, **Camille Flammarion** (1842-1925) was a French astronomer noted, in literature thermodynamics, for his 1893 heat death themed science fiction novel *The End of the World*.

Overview

In 1893, Flammarion, in his *The End of the World (La fin du Monde*), a philosophical thermodynamics-themed science fiction, about a comet colliding with the earth, in his final chapter, pictorially presents dismal heat death end view of life, shown below—the pictures captured "the wretched human race will freeze to death" and "this will be the end", respectively: : [1]

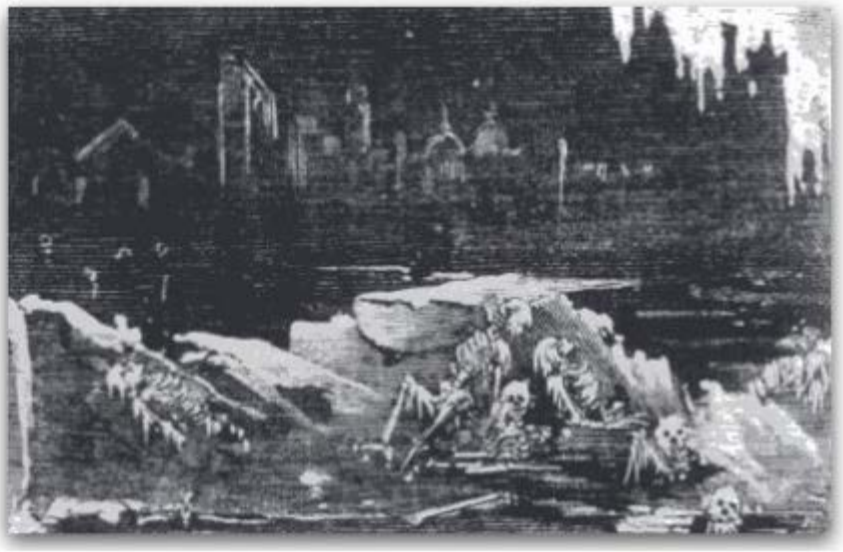

Flammarion's illustrator, in short, gives two dark pictures of the end of humanity based on thermodynamic speculation: [2]

In two wide-spread German history of science textbooks, these pictures are given as an illustration of the pessimistic conclusions nineteenth century physicists (among them Hermann von Helmholtz) had drawn from the second principle of thermodynamics. They believed that in a remote future, the entropy of the universe would grow to a maximum, and all available energy would be transformed into heat.

This apocalyptic vision was often called "heat death", but as the average temperature would then be very low, the expression "cold death" was used as well. [3]

References

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(b) Russett, Cynthia E. (1991). *Sexual Science* (pgs. 162-63; also: entropy, pg. 128). Harvard University Press.
(c) Morus, Iwan R. (2005). *When Physics Became King* (Fig. 5.5: heat death picture envisaged by Camille Flammarion in 1893).
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(b) ibid, Flammarion. (1893). "Eqiloque: Apres La Fin du Monde Terrestre—dissertation philosophique finale".
(c) Holton, Gerald J. and Brush, Stephen G. (2001). *Physics: the Human Adventure* (18.4: Entropy and the Heat Death, pgs. 259-61). Rutgers University Press.
3. Camille Flammarion's use of Thermodynamics – History of Science and Technology, Martin-Luther University.

External links

â— Camille Flammarion – Wikipedia.

θΔics

In education, **Camp Quest** is a summer camp, at about 16+ locations in America and Europe, tagline the "secular summer camp", designed for children from atheist, agnostic, humanist and freethinking families, skeptics, rationalists, and others who hold a naturalist, non-supernatural world view.

A 2012 **Camp Quest** poster (Q) for atheist and secular kids of military atheists and secular humanists (MASH) (Q) of Fort Bragg, North Carolina.

Overview

In 1995, Camp Quest was proposed by American attorney Edwin Kagin (1940-2014)—son of a Presbyterian minister, who was a boy scout as a child, a group that excludes non-theists, but turned freethinker in the late 1980s, in 1991 joining the Free Inquiry Group of greater Cincinnati and Norther Kentucky, later serving as vice president—as a non-theist alternative to boy scouts for kids who are free thinkers.

On 11 Aug 1996, first camp began, as a project of FIG, with Kagin as camp director, and 20 kids, and about 10 adults, in Boone County, Kentucky, at the Bullitsburg Baptist Church camp, which they rented for the week (and had to cover up all the "god this" and "god that" slogans and sayings).

The term QUEST is an acronym for Question, Understand, Explore, Search, Test. [2]

In 2015, American electrochemical engineer Libb Thims, with Atheism Reviews co-host Thor, in their 3.5-hour "Zerotheism for Kids" class, given to six kids (ages: 2,6,7,9,10,11) on the topic if zerotheism, showed segments, in the class, video lecture part #4 and #6, of one of the camp quest kids talking about how they don't believe in god, their relation to other believer kids, and morals. [4]

Quotes

The following are related quotes:

> "The point of the camp is not a case of being told *what* to think, about concepts such as god, just *how* to think."
>
> — Samantha Stein (2009), Camp Quest organizer, BBC News Interview [1]

> "Religious beliefs can hinder moral behavior."
>
> — BBC reporter (2009), "On what kids are taught at Camp Quest" [1]

References

1. Edwin Kagin – Wikipedia.
2. Anon. (2009). "Atheist Summer Camp Launched" (Q), BBC News, Jul 28.
3. Zindler, Frank. (2015). "Interview of Amanda Metskas, the Executive Director of Camp Quest" (Q), Mar 25.
4. (a) Thims, Libb. (2015). "Zerotheism for Kids" (co-host: Thor) (main), 14-part [4:41-hr] lecture playlist (Q), 5-intro sides (Q), 56-main sides (Q), 11AM-3PM, Chicago, Aug 10.
(b) Slide: #1 | Camp Quest kids on "you're gonna go to hell" and "morality" (Ohio/Ontario) (Q:0-1:56)

External links

- Camp Quest – Wikipedia.

θΔics

In models, **Camus model**, aka "Sisyphean purpose" model, refers to the premise, asserted by Albert Camus (1942), that purpose in a godless universe is a Sisyphean one, i.e. an endless repetition of work without meaning. [1]

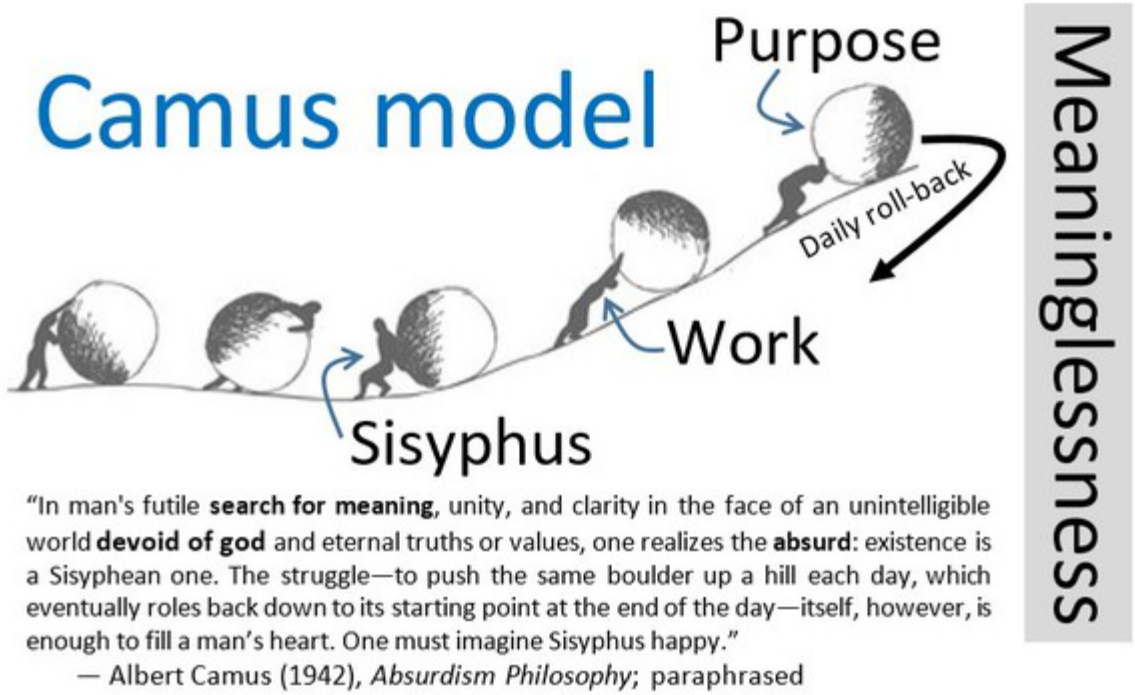

A depiction of the **Camus model**, from the Randall Schweller article, showing that purpose, in a godless universe, is a Sisyphean one; which is a general dumb atheism model as compared, e.g. to the Gates model.

Overview

In the 1880s, Friedrich Nietzsche was toying with the notion of eternal recurrence; an example of which is shown below:

> "Existence as it is, without meaning or aim, yet recurring inevitably without any finale of nothingness: "the eternal recurrence." This is the most extreme form of nihilism: the nothing (the "meaningless"), eternally!"
>
> — Friedrich Nietzsche (1887), WP:55, Jun 10; see also "eternal recurrence" clip from film *When Nietzsche Wept* (2007) (Q)

In 1893, Thomas Huxley, in his "Evolution and Ethics" lecture, described the growth and death process of a bean, from the evolution point of view, as a Sisyphean process: [2]

> "Neither the poetic nor the scientific imagination is put to much strain in the search after analogies with this process of going forth and, as it were, returning to the starting-point. It may be likened to the ascent and descent of a slung stone, or the course of an arrow along its trajectory. Or we may say that the living energy takes first an upward and then a downward road. Or it may seem preferable to compare the expansion of the germ into the full-grown plant, to the unfolding of a fan, or to the rolling forth and widening of a stream; and thus to arrive at the conception of 'development,' or 'evolution.' Here as elsewhere, names are 'noise and smoke'; the important point is to have a clear and adequate conception of the fact signified by a name. And, in this case, the fact is the **Sisyphæan process**, in the course of which, the living and growing plant passes from the relative simplicity and latent potentiality of the seed to the full epiphany of a highly differentiated type, thence to fall back to simplicity and potentiality."

In 1942, Albert Camus, supposedly influenced (Q) by Nietzsche's "eternal recurrence" conjecture, considered a top seven existentialist (Stokes 100), in his essay *The Myth of Sisyphus*, initiated a godlessness brand of existentialism, which rejected nihilism, termed "absurdism", themed on the conflict or apparent absurdity between (a) the human tendency to seek inherent value and meaning in existence and (b) the human inability to find any.

In 2008, Ravi Zacharias, in his chapter section "Atheism Led to My Suicide Attempt", of his *The End of Reason*, opens to the following: [4]

> "Albert Camus begins his essay **'The Myth of Sisyphus'** with these words: 'There is only one really serious question, and that is suicide. Judging whether life is or is not worth living amounts to answering this fundamental question.' It is a hunting question; in fact, as I followed atheism to its logical conclusion in my own life as I grew up, it became my question."

Zacharias, who grew up in a Hindu converted to nominal Anglican household, says that he was an atheist until the age of 17 when he tried to commit suicide by swallowing poison. While in the hospital, a local Christian worker brought him a Bible and told his mother to read to him from John 14. (Q) Zacharias says that it was John 14:19 that touched him and meant to him as the defining paradigm: "Because I live, you also will live." He said that he thought, "This may be my only hope: A new way of living. Life as defined by the Author of Life." and that he committed his life to Christ praying, "Jesus if You are the one who gives life as it is meant to be, I want it. Please get me out of this hospital bed well, and I promise I will leave no stone unturned in my pursuit of truth."

In 2014, Randall Schweller, in his *Maxwell's Demon and the Golden Apple*, attempted to outline an "entropy only applies" model of thermodynamics to humans, concluding with an ending wherein a "Sisyphean purpose" model of existence is the conclusion. [3]

> "We are all akin to Sisyphus, who, according to Greek mythology, was condemned by the gods to repeat forever the same meaningless task of pushing a boulder up a mountain, only to see it roll down again."

In 2016, Libb Thims pointed out that the Schweller-Camus model of purpose or existence is incorrect; whereas, correctly, the so-called "Gates model", depicted adjacent, is the correct model, as modern science sees things, wherein, speaking metaphorically, sometimes Sisyphus actually gets the boulder up and over the hill, i.e. a purpose reaction is activated.

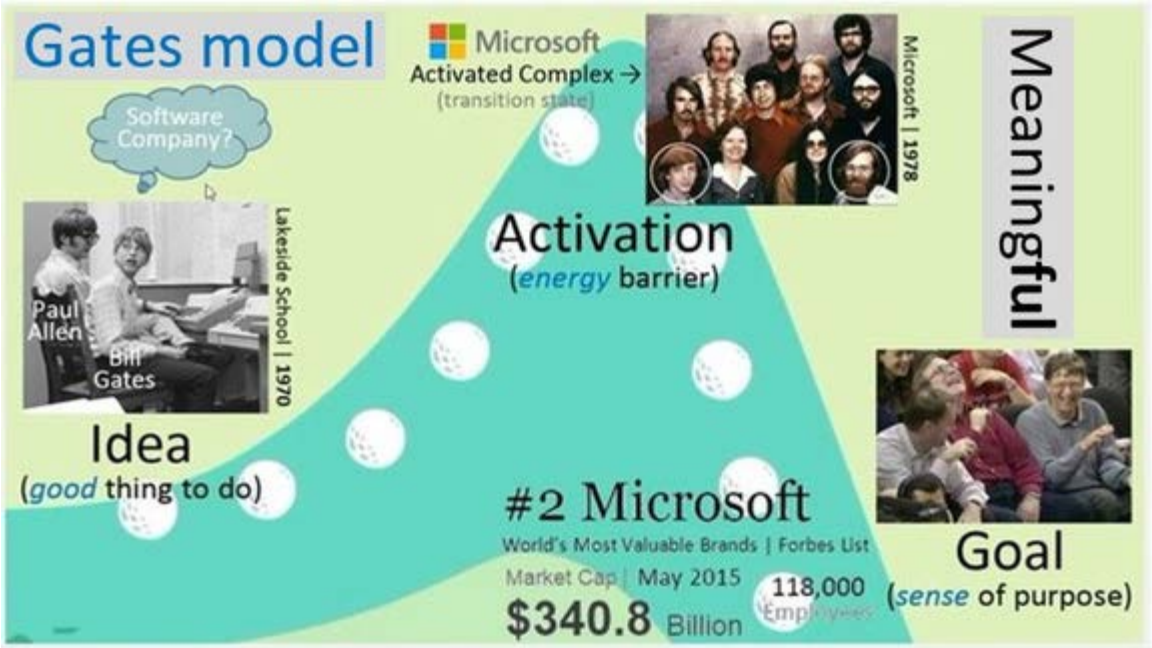

A depiction of the "Gates model", as physico-chemically correct upgrade to the Camus model of Sisyphean purpose.

Quotes

The following are related quotes:

> "This is something that atheist's do quote a bit. It's chaotic. And therefore, man imposes meaning and morality from his own knowledge and experience on it, to harness it and control it. That's foundationally an atheistic presupposition. Because, if the universe isn't the handywork of a good creator god, who has inherently endowed the creation with purpose, with that meaning, with that morality, or to recognize that with his revelation as the source of those things. His gracious condensation through his word. Right. If that's not the case, then you have a chaotic universe, in which you have to impose meaning upon."
>
> — Jeff Durbin (2019), "How to Answer the Fool (Atheist)" (0-0:42) (Q), Apologia Studios, YouTube, Apr 1; shared to r/Atheism (Q), Aug 3

See also

- Gates model
- Pointfullness

References

1. (a) Absurdism – Wikipedia.
(b) The Myth of Sisyphus – Wikipedia.
2. Huxley, Thomas. (1893). "Evolution and Ethics" (Q), Romanes Lecture; in: *Collected Essays*, Volume IX.
3. Schweller, Randall L. (2014). *Maxwell's Demon and the Golden Apple: Global Discord in the New Millennium* (Sisyphus, pg. 160). JHU Press.
4. Zacharias, Ravi. (2008). *The End of Reason: a Response to the New Atheists* (pg. 27). Zondervan.
5. Nietzsche, Friedrich. (1885). *Will to Power: An Attempt at a Revaluation of All Values* (translator: Walter Kaufmann and Reginald Hollingdale; editor: Walter Kaufmann) (pg. 53) (pdf) (txt). Random House, 2011.

θΔics

In engineering, **cannon** is a hollowed barrel-like device that uses combustion or heat to fire or impel a projectile, typically a large iron ball.

Overview

In c.1495, Leonardo da Vinci designed an upside-down cannon barrel (see: gunpowder engine), fitted with a piston, as sketched by him below (left), which had a rod attached to the bottom of the piston, which he stated could be used to lift a weight of large size, if gunpowder was ignited inside the cannon, therein consuming the oxygen inside of the working body volume, thereby making a vacuum, which, owing to the force of the atmospheric pressure, would lift the weight: [3]

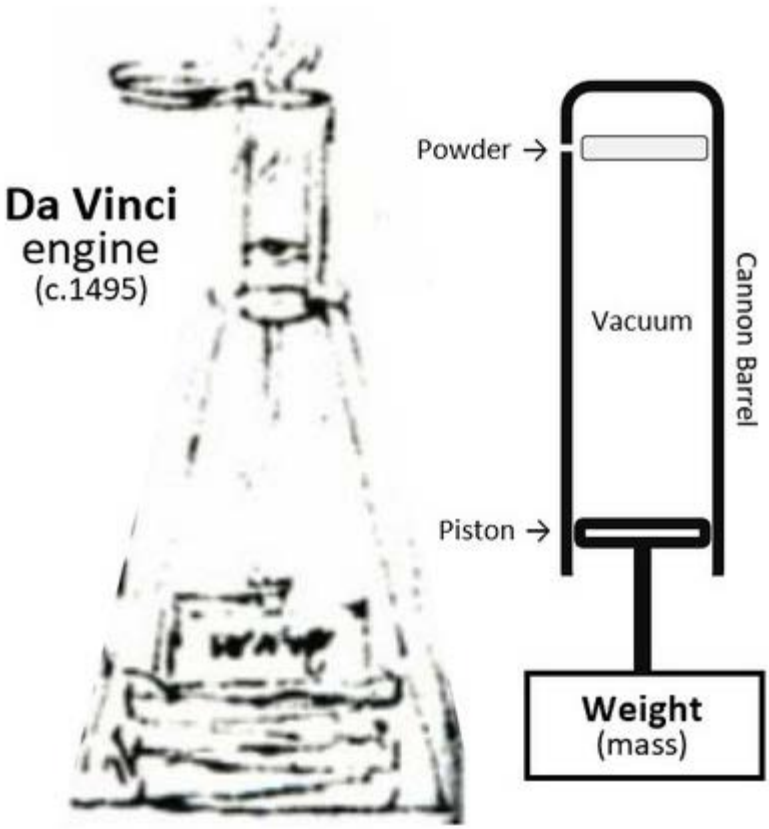

In 1673, Christiaan Huygens made a gunpowder engine that could lift a weight using a cannon.

In 1699, Guillaume Amontons, in his "Method of Substituting the Force of Fire for Horse and Man Power to Move Machines", supposedly, pointed out that the "cannon" was a type of heat engine, or "fire engine", that could be used to move machinery. [2]

Quotes

The following are related quotes:

> "The combustion engine, in the form of a **cannon**, is the oldest form of heat engine."
>
> — Osborne Reynolds (1883), "On the General Theory of Thermo-Dynamics" [1]

See also

- Cannon boring experiment
- Da Vinci engine

- Gunpowder engine
- Walter Cannon

References

1. (a) Reynolds, Osborne. (1883). "On the General Theory of Thermo-Dynamics", Lecture at Engineering School at Owens College, Manchester; in: *Papers on Mechanical and Physical Subjects, Volume Two: 1881-1900* (§47: pg. 151). Cambridge University Press, 1901.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age.* Cornell University Press.
2. (a) Amontons, Guillaume. (1699). "Method of Substituting the Force of Fire for Horse and Man Power to Move Machines", *Historie et Memoires de l'Academie Royale des Sciences* (pg. 112).
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 20). Cornell University Press.

External links

- Cannon – Wikipedia.

θΔics

In experiments, **cannon boring experiment** is a 1798 experiment, conducted by American-born English physicist Benjamin Thompson, in which he boiled water using the heat generated from the friction of continuous boring of a cannon. The results and details of the experiment are discussed in Thompson's paper "An Inquiry Concerning the Source of Heat which is Excited by Friction", the results of which acted to disprove the then-established "caloric theory" of heat, that heat was a type of indestructible fluid like particle called caloric. [1] To the amazement of onlookers, Thompson made water boil in 2.5-hours time, without the use of fire, something never before imagined.

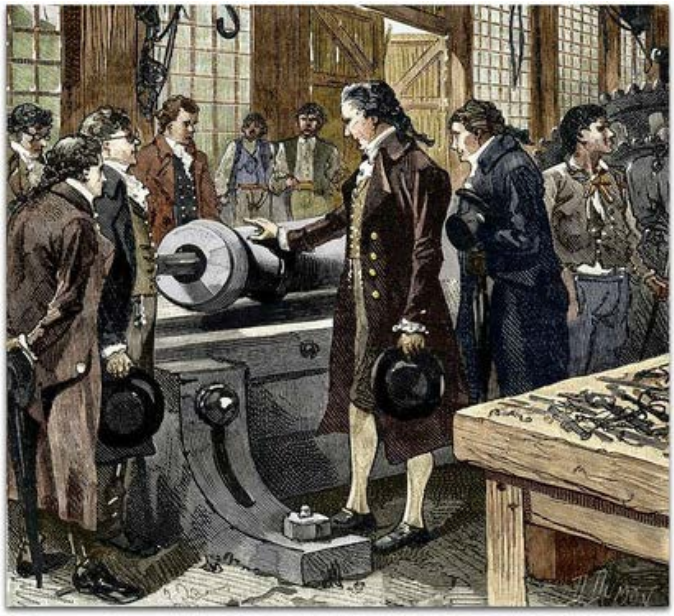

A possible depiction, drawn by D. Dumon (O), of Benjamin Thompson (Count Rumford) in 1798 describing his **cannon boring experiment** at the Munich Arsenal in Germany, in which water was made to boil (heat was generated) without the use of fire.

Origin

Thompson gives an account of his interest in discovering the "hidden nature of heat" during his years, early circa 1790s, at the military arsenal at Munich, as follows: [2]

> "Being engaged, lately, in superintending the boring of cannon, in the workshops of the military arsenal at Munich, I was struck with the very considerable degree of heat which a brass gun acquires, in a short time, in being bored; and with the still more intense heat (much greater than that of boiling water, as I found by experiment) of the metallic chips separated from it by the borer.
>
> The more I meditated on these phenomena the more they appeared to me to be curious and interesting. A thorough investigating of them seemed even to bid fair to give a farther insight into the *hidden nature of heat*; and to enable us to form some reasonable conjectures respecting the existence, or non-existence, of an igneous fluid: a subject on which the opinions of philosophers have, in all ages, been much divided."

(add)

Experiment

When he did actually get around to conduct his experiment in 1798, he showed that the "work" expended by a team of two draft horses (a 2 horsepower engine), turning a cannon boring drill bit at a rate of thirty-two revolutions per minute, inside of a cannon barrel, which itself was submerged in a tank of water, will generate "heat" in the cannon barrel to the effect that it caused the water to boil at 2 hours and 30 minutes. [1]

The following is a reconstruction (O) of Thompson's cannon boring experiment, showing the mechanical work of the horses, in turning the bore, converting into heat, as evidenced by the boiling of water in the tub in contact with the cannon being bored:

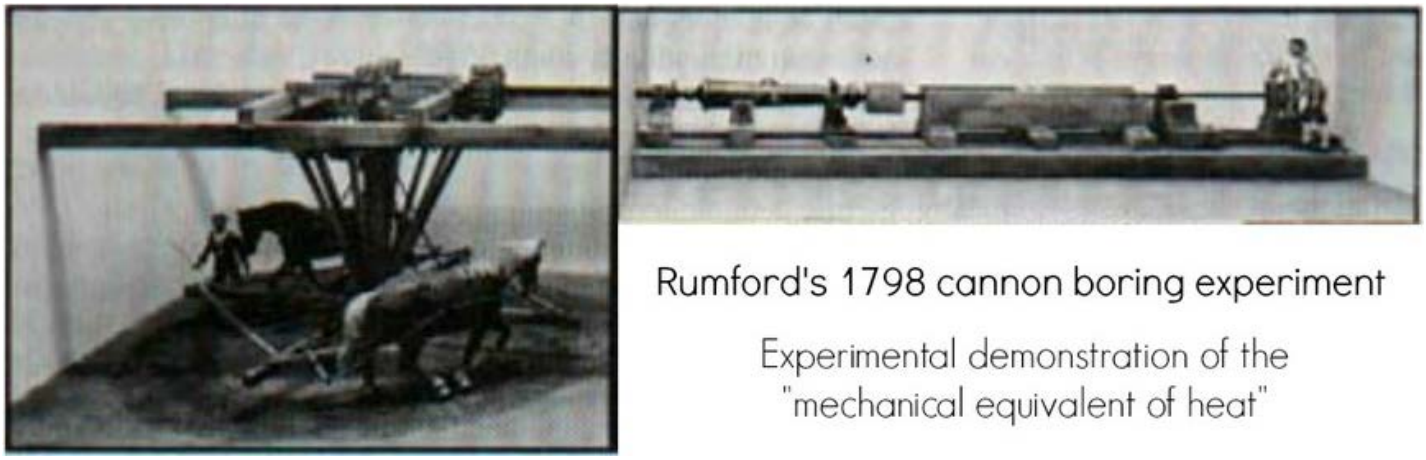

The following are other details and renditions of the experiment:

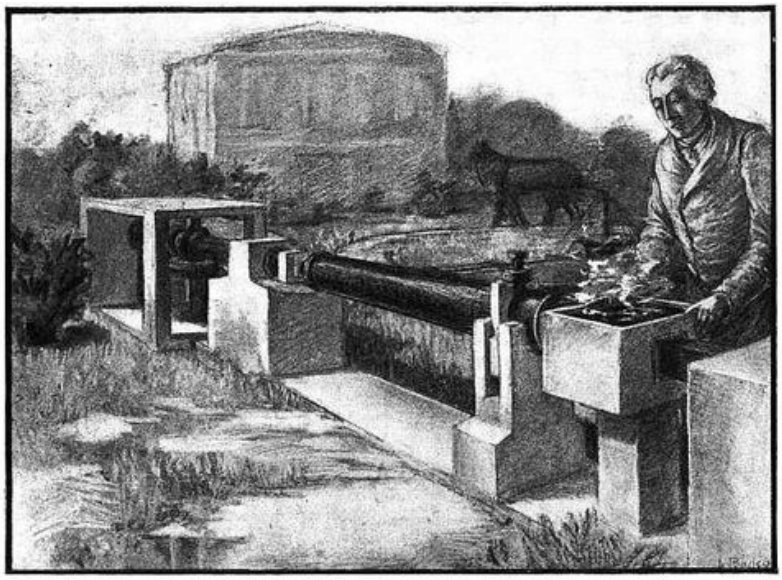

FIG. 20—COUNT RUMFORD'S EXPERIMENT WITH THE CANNON, MAKING WATER BOIL WITHOUT FIRE

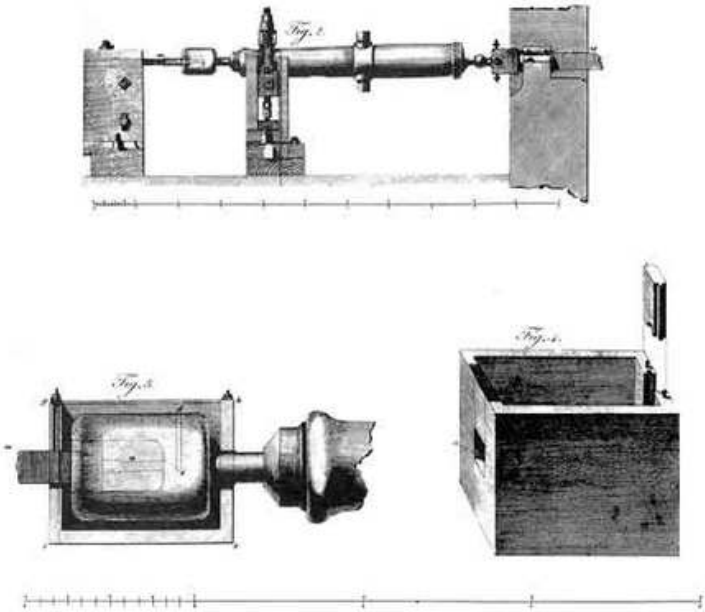

Left: a rendition of Thompson's cannon boring experiment from Elmer Burns' illustrated 1910 book *The Story of the Great Inventions*. [4] Right: diagram of some of Thompson's 1798 **cannon boring experimental** equipment.

Rumford states, in reaction to this un-explained phenomenon of the production of heat without fire, that "it would be difficult to describe the surprise and astonishment expressed in the countenances of the bystanders, on seeing so large a quantity of cold water heated, and actually made to boil, without any fire." [3] The following is an alternative color rendition of Thompson's cannon boring experiment: [5]

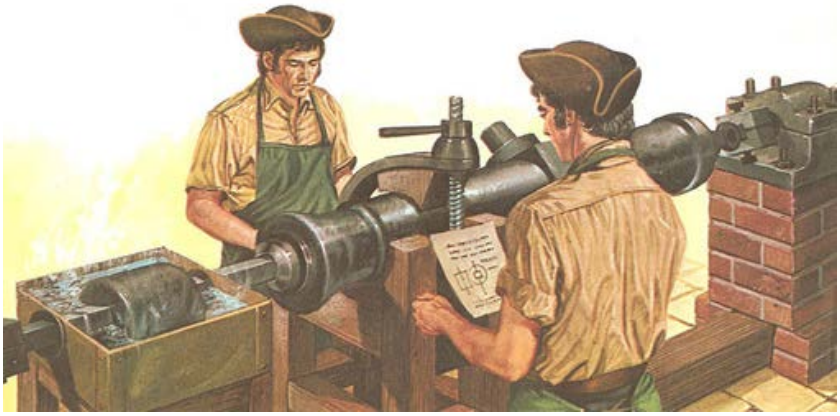

See also

- Paddle wheel experiment
- Ice-rubbing experiment
- Double-slit experiment

References

1. (a) Thomson, Benjamin. (1798). "An Inquiry Concerning the Source of Heat which is Excited by Friction", read before the Royal Society of London, Jan 25, *Philosophical Transactions.* Vol. XVIII, pg. 286.
(b) Thomson, Benjamin. (1798). "An Inquiry Concerning the Source of Heat which is Excited by Friction" in *The Complete Works of Count Rumford* (pgs. 469-93). Oxford University Press, 1870.
2. Count Rumford on Heat (1798) – a short excerpt.
3. Baeyer, Hans C. von (1999). *Warmth Disperses and Time Passes - the History of Heat*, (pg. 6). New York: The Modern Library.
4. Burns, Elmer E. (1910). *The Story of the Great Inventions* (fig 20). Harper & Brothers.
5. Rumford – DavidDarling.info.

θΔics

In economics, **capitalism**, as can be contrasted with "communism", is a political ideology, in which []

A Google-generated synopsis of "**capitalism**", meaning a country wherein trade and industry are privately controlled, rather than state-controlled.

Overview

In 2011, Robert Biel, in his *Entropy of Capitalism*, building on the work of John Foster and Peter Burley, attempted to discuss capitalism in terms of a revised thermodynamical interpretation of Karl Marx's ecological economics theories. [1]

References

1. Biel, Robert. (2011). *Entropy of Capitalism* (entropy, 91+ pgs; human thermodynamics, pg. 352; thermodynamics, 7+ pgs). BRILL.

Further reading

â— Kolaski, Erald. (2020). "The Physics of Capitalism" (Ñº), Thermodynamics 2.0 Conference, Worchester Polytechnic University, Jun 22-24.

External links

â— Capitalism – Wikipedia.

θΔics

In *Elective Affinities*, the **Captain**, the third dominate character behind Eduard and Charlotte, is the good friend of Eduard, who is introduced in the first chapter as been in need of occupation or employment; he is described as a man of knowledge, talents, and ability; presently unemployed, through no fault of his own; becomes a Major after the war; lectures to Eduard and Charlotte on the principles of modern chemistry in the famous chapter four.

Right: the famous 1857 Goethe-Schiller statue in Weimar (copies in San Francisco, Cleveland, Milwaukee, Syracuse, & Anting); Left: the circa 1805 Goethe-Schiller bust, depicting Goethe looking into the skull of Schiller trying to figure out where his old friend had gone—the passing of Schiller, in 1805, thus gave way to the imagined role of the **Captain** (mixed in with the character of Wilhelm Buchholz, pictured), with whom Eduard and Charlotte discusses the elective affinities; similar to how Goethe and Schiller discussed the elective and similar to how Schiller's wife, Charlotte von Schiller (1766-1826), would have discussed the elective affinities with the two of them. Charlotte von Schiller, for example, is thought that Goethe's *Elective Affinities*, as summarized by Astrida Tantillo (2001), "demonstrated Goethe's infinite understanding and genius as a writer and praised its realistic qualities." [4]

Character background

The main part of the character of the Captain seems to be Goethe's good friend German author Friedrich Schiller (1759-1805), who in 1788 (see: Goethe timeline) Goethe approved for appointment as professor of history at Jena (similar to the way Eduard brings the Captain over to his estate for employment in the remodeling of the land). Their mutual friendship begins in 1794 when Schiller invites Goethe to contribute to the journal *Die Horen*, after which frequent mutual visits in Jena and Weimar occur.

The 1916 article "Goethe and the Chemists", by Roy House, seems to convincingly indicate that German chemist-physician Wilhelm Buchholz, described as a "prosperous and jovial man of the world" and "genuine scientist", was the Captain based on the fact that Buchholz was lecturing to Goethe in 1798 at the weekly Friday Society meetings on the latest findings in chemistry and that in the novel, the Captain states that he will attempt to explain 'affinity' to Charlotte as he had learned it ten years ago, which coincides with Buchholz last lectures on the latest chemistry to Goethe in 1798 the year of his death.

Character		Assigned Person	Actual description	Novella description
Captain (Cap)	=	Wilhelm Buchholz (1734-1798)	German physician-chemist; part of Goethe's Friday Society at Weimar, where, from from 1791 to 1798, Buchholz presented the latest chemical findings.The death of Buchholz would corroborate with the "ten years ago" (1808 - 10 = 1798) comment by the Captain in the novella, the year when Goethe began to write *Elective Affinities*.	In describing affinity to Charlotte, the Captain comments: "as well as I can from what I learned from reading about it some ten years ago. Whether the scientific world still thinks of it in the same way, or whether it agrees with the latest theories, I cannot say."
	=	Friedrich Schiller		A man of knowledge, talents, and ability; presently unemployed, through no fault of his own; becomes a Major after the

(1759-1805)

war; lectures to Eduard and Charlotte on the principles of modern chemistry (chapter four).

= Jacob Spielmann (1722-1783)

French chemist; Goethe attended his lectures in 1770-71 at Strasbourg University.

Goethe is buried with Schiller at the Ducal Vault in Weimar, a fact that seems to very clearly indicate that Schiller was indeed the **Captain**, or at least the inspiration for the dominant portion of his character. [5]

Dovereiner

To note, in 2007 Thims argued that the Captain was likely based on a mixture of Goethe's alter-ego (as some have claimed) and Goethe's lifelong friend German chemist Johann Dobereiner (1780-1849), whose weekly chemistry lectures Goethe attended, just as the Captain in the novella lectures Eduard and Charlotte on the principles of modern chemistry in chapter four. [3] This, however, seems to have been an incorrect guess, as the Goethe seems not to have become acquainted with Dobereiner until 1810 (the year after his novella was already published). This false supposition, i.e. that Goethe based his human elective affinities theory as he had learned it from Dobereiner's lectures (an incorrect supposition), has been carried forward in print in at least one chemistry textbook. [15]

References

1. Goethe, Johann. (1971). *Elective Affinities* (translation and introduction by R.J. Hollingdale; chronology and further reading by David Deissner, 2005). Penguin.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (Captain and Dovereiner, pg. xv). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (ch. 10: Goethe's Affinities). Morrisville, NC: LuLu.
3. Syamal, Arun. (2008). *Living Science Chemistry 10* (pg. 136). Ratna Sagar.
4. (a) Tantillo, Astrida, O. (2001). *Goethe's Elective Affinities and the Critics* (pg. 10). Camden House.
(b) Charlotte von Lengefeld – Wikipedia.
5. (a) Ducal Vault – Klassik-Stiftung.de.
(b) Weimarer Furstengruft – Wikipedia.

θΔics

In mathematical thermodynamics, **Caratheodory's theorem**, Caratheodory's theory, or theorem of Caratheodory, is a sort of mathematical proof that the entropy function exists, which states that there exists an integrating factor that makes the equation of an adiabatic process exact. [1]

A more detailed statement is: [2]

> "If a Pfaffian expression has the property that, in every neighborhood of a point P, there are points which cannot be connected to P along curves which satisfy the Pfaffian equation, dQ = 0, then the Pfaffian expression must admit an integrating denominator."

Chapter i.—The laws of thermodynamics are here presented following Carathéodory's axiomatic standpoint. The reasons for including this chapter are twofold: first, there exists no treatise in English which gives **Carathéodory's theory**; and second, in the writer's view Carathéodory's theory is not merely an alternative, but elegant, approach to thermodynamics but is the only physically correct approach to the second law. Incidentally, the logical rigor and the beauty of Carathéodory's theory may be regarded as an example of the standard of perfection which should be demanded eventually of any physical theory, including the theory of stellar structure.

The first English presentation of the so-called **Caratheodory theorem**, of Greek mathematician Constantin Caratheodory's 1908 mathematical derivation of the second law or of the proof of the existence of a state function of quantities of heat, as found in chapter form given by Indian-born American astrophysicist Subrahmanyan Chandrasekhar in 1939. [4]

History

The so-called theory of Caratheodory, as it was called was presented by Greek mathematician Constantin Caratheodory in his 1908 "Studies in the Foundation of Thermodynamics". [3]

The subject of the Caratheodory's theorem, as it has since been called in thermodynamics, was first presented in English, in detail, in Indian-born American astrophysicist Subrahmanyan Chandrasekhar's 1939 book *An Introduction to the Study of Stellar Structure*, chapter one, where he presents the laws of thermodynamics following what he calls "Caratheodory's axiomatic standpoint" [4]

Soon thereafter, Caratheodory's mathematical version of the second law began to make its way into the various thermodynamics textbooks.

References

1. Achuthan, M. (2004). *Engineering Thermodynamics* (pg. 416; see: Appendix C). PHI Learning.
2. Kirkwood, John G. and Oppenheim, Irwin. (1961). *Chemical Thermodynamics* (pg. 36). McGraw-Hill.
3. Caratheodory, Constantin. (1908). *Studies in the Foundation of Thermodynamics* (*Untersuchungen uber die Grundlagen der Thermodynamik*). Bonn; published in: *Math. Ann.*, 67: 355-386, 1909.
4. (a) Chandrasekhar, Subrahmanyan. (1939). *An Introduction to the Study of Stellar Structure* (ch. 1). University of Chicago Press.
(b) Subrahmanyan Chandrasekhar – Wikipedia.

External links

â— Caratheodory's theorem (disambiguation) – Wikipedia.

θΔics

In chemistry, **carbon**, symbol C, atomic number 6, is an element on the periodic table consisting of six protons and six neutrons, in its nucleus, surrounded by six electrons in orbital movement about the nucleus, two in tightly bound S-orbitals and four in loosely bound P-orbitals.

Rank	CPK (jmol)	Symbol	% Mass	Picture	Z
2		C	23		6

Orbital

The following shows the orbital structure of carbon:

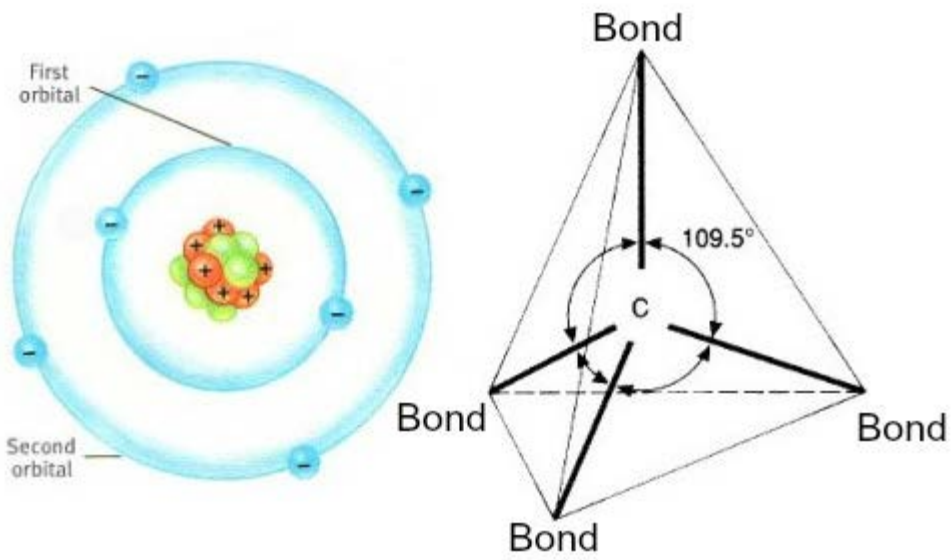

Human molecular formula

The position of the element calcium in the average human molecular formula is as follows:

$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}$

$Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$

Carbon-based life

An oft-used ideal in attempting to theorize in the overlapping gray area of the period table of elements, which are clearly not "alive" and the biological realm of phenomenon, which are considered as being "alive", by virtue of our ingrained mythological-religious heritage, is the term carbon life (carbon-life), carbon-based life, etc., according to which carbon-based entities are considered as being alive or living, which is a fact solely due to the "animation" and "flexibility" inherent in the carbon atom, owing to its four-pronged bonding geometry, which reacts to light stimulus.

Human molecule

In the average human molecule, carbon constitutes 23 percent by mass of the human and is a major elemental component of carbohydrates and fats. [2]

Hmolscience

In the context of hmol science, when thinkers begin to extrapolate evolution backwards to the atomic-level, in attempts to figure out or explain human existence, the carbon atom is a frequent stopping point for discussion. Most of the material substance of the central nervous system, for example, is comprised of hydrogen and carbon, such as in the animate retinal molecule.

English biotechnologist Mark Janes employs a carbon-centric view of a human in his Mr. Carbon Atom depiction and his 2009 carbonentromorphology theory.

Religion

In the 2010 book *The Universe, God, and Us*, American writer Provident Peterson outlined the view that humans are material substance made of atoms that formed from a descendant of the first God-infused Alpha 'human molecule', which itself formed from the first God-infused Alpha atom, which Peterson posits was carbon.

Quotes

The following are related quotes:

> "Why should a group of simple, stable compounds of **carbon** (C), hydrogen (H), oxygen (O), and nitrogen (N), 'struggle' for billions of years to organize themselves into a professor of chemistry? What's the motive?"
>
> – Robert Pirsig, *Lila: an Inquiry into Morals* (1991)

References

1. Peterson Jr., Provident G. (2010). *The Universe, God, and Us* (human molecule, pgs. 38, 55). Dorrance Publishing Co.
2. Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc) (pgs. 52-55). LuLu.

External links

â— Carbon – Wikipedia.

θΔics

In science, **carbon-based life**, or "carbon-based organism", refers to the 1950s model that humans and animate things similar to humans are based compositionally, structurally, and or mentally on the element carbon.

The versatilities of the bonding geometries and dynamics of the carbon atom, with its four available valencies or bonding sites, is what gives carbon-based molecules the ability to be animated when exposed to light and various other reaction environments.

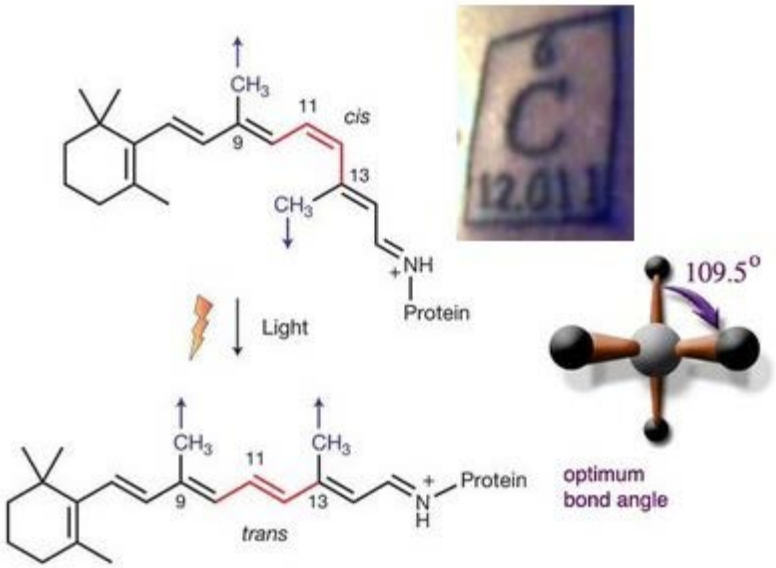

Left: a depiction of an light-induced animated carbon-based molecule (retinal); which is similar to a human, also a light-induced animated carbon-based molecule, a CHNOPS+22 molecule specifically. Right (top): a carbon element tattoo on a human, oft-conceptualized as a form of "**carbon-based life**", who states: "I am a biochemist, studying to be a molecular biologist, the tattoo is carbon on the periodic table of elements. Since all living things on this planet at least are carbon based, from a chemical standpoint, it doesn't get much more basic than carbon. Hence the tattoo." –Erin (2008)

Overview

In 1934, Harold Blum, in his chemical peneplanation theory, discussed the possibility of ammonia (NH_3) based life, in comparison to water (H_2O) based life, seen on earth.

In 1950s, the term "carbon-based", in contrast to silicon-based theories of life, began to appear in discussions of the possibility of life on Mars; the following begin one example:

> "Our knowledge of physics, therefore, seems to tell us that living things anywhere in the universe must depend either upon carbon or upon silicon. **Carbon-based** life must be essentially similar to our own; there is no room for doubt upon that."
>
> — Author (1955), "Article", *Science Digest* (Q), Vol 37

In 1967, people were citing Harold Morowitz per the assertion that "that if there is any life on Mars it is based on carbon. The chemical composition of the biosphere on Mars should be analogous to the terrestrial biosphere, though it may not be identical." (Q) The term 'carbon-based life', soon thereafter became a popular phrase in extraterrestrial life search circles, on the hypothesis that extraterrestrial life, if it exists, must be constructed primarily from carbon. [1]

CHNOPS-based

The 19th century model of a human as a carbon-based organism, eventually was supplanted by the CHNOPS-based organism model; which is outlined below:

Carbon | Based		
Carbon gorgon (Q)	Ernst Haeckel (attributed)	1888
Carbon-based organism	Harold Morowitz (attributed)	1960s
Carbon-based biped	Arthur Clarke [14]	1992
Scum		
Heated chemical scum	Stephen Hawking	1995
Pond scum	Neil Shubin	2008
Evolved pond scum	Ray Comfort	2013
C-H-N-O-S-P combination	Wilhelm Ostwald	1926
Evolved "CHNOPS" plus substance	Frank Thone	1936
CHNOPS system	George Armstrong	1964
CHNOPS organism	Harold Morowitz	1968
Powered CHNOPS+ matrix	Henry Swan	1974
HOCN+ mega-molecule	Rohann Solare	2009

(add discussion)

Light-induced movement

See main: Retinal molecule, Induced movement

In the absence of light, the carbon–carbon bond (red) at carbon 11 adopts a *cis* configuration and the chromophore adopts a bent structure (all of the other C=C bonds are *trans*). The two methyl groups (CH_3, blue) at carbon atoms 9 and 13 point away from each other as indicated by the arrows. When exposed to light, retinal absorbs photons and the double bond at carbon 11 isomerizes from *cis* to *trans* and the now 'all-*trans*' retinal molecule straightens. This process also aligns the two CH_3 groups, which now point in the same direction away from the main carbon chain. *In vivo*, the straightening of the retinal chromophore causes it to be released from the protein to which it is attached, because it no longer fits in the binding site. This, in turn, causes a change in the shape of the protein, which triggers a cascade that ultimately results in an electrical impulse being sent along the optic nerve, leading to visual perception. [2]

Quotes

The following are related quotes:

> "It is well known that carbon is required to make physicists."
>
> — Robert Dicke (1961), "Dirac's Cosmology and Mach's Principle" [1]

References

1. Venter, J. Craig. (2006). *What We Believe But Cannot Prove* (pg. 21). Harper.
2. Liu, Zheng, Yanagi, Kazuhiro, Suenaga, Kazu, Kataura, Hiromichi, and Iijima, Sumio. (2007). "Imaging the Dynamic Behavior of Individual retianal Chromophores Confined inside Nanotubes" (figure 1), *Nature nanotechnology*, 2: 422-25.
3. Dicke, Robert H. (1961). "Dirac's Cosmology and Mach's Principle" (abs)(Q), *Nature*, 192:440, Nov.

External links

- Carbon-based life – Wikipedia.

- Carbon chauvinism – Wikipedia.
- Hypothetical types of biochemistry – Wikipedia.

In existographies, **Carl Becker** (1873-1945) was an American historian, noted for []

Overview

In 1935, Becker, in his *Progress and Power*, a series of three lectures delivered in April at Stanford University, subtitled his third lecture as follows:

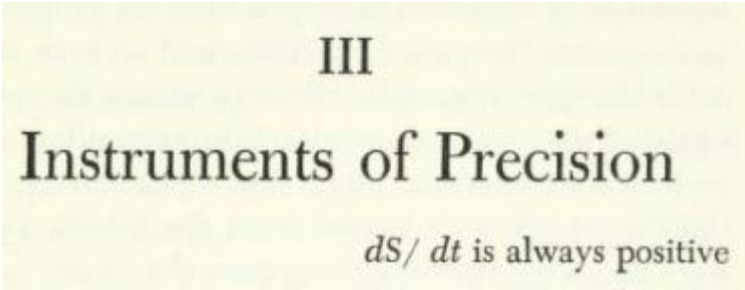

At the end of which he employs the 'cosmic intelligence' perspective (see: advanced perspective), describing humans as bits of animate matter, as follows:

> "Thus, conveniently placed, and equipped with 'cosmic intelligence', we look out upon a universe that comprises perhaps a billion galaxies, each galaxy comprising perhaps ten thousand million stars. If we look long and attentively we may detect, within one of the lesser galaxies, one of the lesser stars which is called the sun; and, circling round this sun, one of its lesser planets which is called the earth. At some moment, relatively early, in the 150,000 million years which is the sun's span of life, we note that certain bits of matter on the surface of the earth, by virtue of temperatures not elsewhere obtaining, assume unusually complicated forms and behave in unusually unstable ways. We understand that certain of these **bits of animated dust** distinguish themselves from others, dignify themselves with the name of 'man', and take credit for having a unique quality which they call 'intelligence'. They are not aware that intelligence is no merit; the reverse rather, since it is only an inferior form of energy which nature has given them in partial compensation for the extreme rapidity with which the law of entropy (dS/dt is always positive) degrades their vitality. So long as the sun maintains on earth the necessary temperature, these **bits of animated matter** will no doubt continue to manifest a perceptible movement, a measurable although diminishing energy. But their activities, however long continued, are infinitesimal in extent and impotent in effect, of no consequence to the universe, admittedly one of nature's indiscretions, worth noting only because rare and unaccountable: of no consequence to the universe, or in the end to them either, since within a brief moment of eternal time the light of the sun will inevitably wane, the earth will grow cold, and all of man's alleged 'imperishable monuments' and 'immortal deeds' will be as if they had never been, nor will anything that then is be either better or worse because of anything that man has ever done or ever wished to do."

Here, without prolonged digression, we see the over-typical laymanized so-called 'pessimistic or degradation' view of entropy, which is incorrect.

Quotes | On

The following are quotes on Becker:

> "The awareness of historic fatality or 'historic determinism' is deeply connected with the problem of time and irreversibility. But these ideas, no less than those notions of statistical averages and probabilities mentioned above, are concepts that belong primarily to the field of thermodynamics, where they possess greater scope, precision, and universality. It is therefore not surprising that a kinship of some kind has been suspected between their bearing in the domain of history and even more so in that of biology—particularly in relation to the theory of evolution—and their meaning in the field of thermodynamics. The exact nature

of this relationship has been a matter of growing interest to scientists if not to historians. Yet the challenge of the problem has not altogether escaped their attention: this professor **Carl Becker**, for instance, found occasion to use the symbol of increasing entropy — 'ds/dt is always positive' — as a suggestive subheading to the last chapter of his fascinating book *Progress and Power*. But certainly, among historians no one has been as instant as Henry Adams in attempting to establish a relationship between the historic process and the phase rule of Willard Gibbs in an effort to achieve that science of history which he believed to be firmly implied in the universal formulae of thermodynamics."

— Roderick Seidenberg (1950), *Post-Historic Man: an Inquiry* [1]

References

1. (a) Becker, Carl. (1935). *Progress and Power: Lectures delivered at Stanford University, April* (Introduction: Leo Gershoy) (Arc) (entropy, pg. 113). Alfred Knopf, 1958.
(b) Seidenberg, Roderick. (1950). *Posthistoric Man: an Inquiry* (pg. 113). University of North Carolina Press.

External links

â— Carl L. Becker – Wikipedia.
â— Carl Becker – Britannica.

θΔics

In existographies, **Carl Clausewitz** (1780-1831) (IQ:155|#605) [RGM:226|1,500+] (GMG:9) (CR:9) was a Prussian general noted for his moral, i.e. "moral force", and romantic theory of warfare, who in his 1832 posthumously-published treatise *On War*, used the principle of friction to distinguish real war from the mechanical, Newtonian world. [1]

Thermodynamics

Puzzlingly, there exist a number of publications making seemingly anachronistic statements that Clausewitz, in his work, employed some type of "thermodynamic" logic in his friction theory based war theories, in the years when thermodynamics just in initiation (Sadi Carnot, 1824) and not yet even founded (Rudolf Clausius, 1850) or coined (William Thomson, 1854) for that matter. [2] English complexity theory economist Antoione Bousqute, in 2008, to cite one example, stated the following: [3]

> "Thermodynamic thought also expressed itself in the writings of **Carl von Clausewitz** who recognized the essentially dynamic and irreducibly unpredictable nature of war, and theorized the inevitable friction and fog inherent in military operations."

Investigation will be needed to determine the roots of the assertions.

Quotes | By

The following are relevant quotes:

> "War is a continuation of politics by other means."
>
> — Carl Clausewitz (c.1820), *Publication*; cited in *Crimson Tide* (22:50)

References

1. Hage, Ghassan and Kowal, Emma. (2011). *Force, Movement, Intensity: the Newtonian Imagination in the Humanities and Social Science* (GB) (Amz) (thermodynamics, 3+ pgs). Melbourne University Press.
2. (a) Ghyczy, Tiha, Deteringer, Bolko, and Bassford, Christopher. (2002). *Clausewitz on Strategy: Inspiration and Insight form a Master Strategist* (§:Friction and Entropy, pgs. 88-). Wiley.
(b) Hage, Ghassan and Kowal, Emma. (2011). *Force, Movement, Intensity: the Newtonian Imagination in the Humanities and Social Science* (GB) (Amz) (thermodynamics, 3+ pgs). Melbourne University Press.
3. Bousquet, Antoine. (2008). *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity* (ch. 3: Thermodynamic Warfare and the Science of Energy, pgs. 63-92). Columbia University Press.

External links

â— Carl von Clausewitz – Wikipedia.

θΔics

In existographies, **Carl Gauss** (1777-1855) (IQ:190|#24) (Cattell 1000:848) [RGM:39|1,500+] (Murray 4000:4|M) (GME:2) [LPKE] (CR:73) was a German child prodigy turned mathematical physicist, described by James Maxwell as someone with a "powerful intellect", generally known for his work in electromagnetic theory, which went into the development of the mathematical theory of electromagnetism, developed by Maxwell in 1873, via his four Maxwell equations of electromagnetic phenomenon.

Religion

When Gauss began to near the age of 70, he become increasingly avoiding of scientific conversations with people, and instead began to spend his mornings in the Gottingen University library focusing on philosophy and religion questions, and began, according to mathematics biographer Jane Muir (1961), to become agnostic about his belief system; the following are example quotes from this period: [4]

> "Without immortality, the world would be meaningless and all of creation an absurdity."
>
> — Carl Gauss (c.1846)

> "Tell me, how does one begin to believe?"
>
> — Carl Gauss (c.1846)

> "There are problems to whose solution I would attach an infinitely greater importance than to those of mathematics, for example touching ethics, or our relation to god, or concerning our destiny and our future; but their solution lies wholly beyond us and completely outside the province of science."
>
> — Carl Gauss (c.1846)

Gauss also, supposedly, believed, in his earlier years, that he had solved difficult mathematical theorems not by mental effort, but via the grace of god; and example of which is as follows: [2]

> "I succeeded, not on account of my painful efforts, but by the grace of god. Like a sudden flash of lightening the riddle happened to be solved. I, myself, cannot say what was the conducting thread which connected what I previously knew with what made my success possible."

(add)

Humboldt Laplace anecdote

In circa 1805, sometime after Gauss solved the Ceres tracking problem (1801), Alexander Humboldt, looking for someone to fill the position of director at the Gottingen observatory, queried Pierre Laplace about who he thought were the greatest mathematicians; the conversation went as follows: [5]

> Humboldt: "Who is the greatest mathematician in Germany?
>
> Laplace: "Pfaff."

Humboldt: “But what about **Gauss**?”

Laplace: “Oh, Gauss is the greatest mathematician in the world!”

(add)

Quotes | By

The following are quotes by Gauss:

> “Sophie Germain proved to the world that even a woman can accomplish something in the most rigorous and abstract of sciences.”
>
> — Carl Gauss (c.1840) [3]

References

1. Maxwell, James. (1873). *A Treatise on Electricity and Magnetism* (pg. vii). Dover, 1954.
2. Sorokin, Pitirim A. (1964). *The Basic Trends of Our Times* (Gauss, pgs. 31-32). US Printing Services.
3. MacHale, Des. (1993). *Comic Sections: the Book of Mathematical Jokes, Humor, Wit, and Wisdom* (pg. 142) (Ñº). Dublin.
4. (a) Newman, James R. (1956). *The World of Mathematics, Volumes 1* (pg. 314) (Ñº). Publisher.
(b) Muir, Jane. (1961). *Of Men and Numbers: the Story of the Great Mathematicians* (pgs. 181-82). Courier Dover Publications.
5. Bell, E.T. (1937). *Men of Mathematics* (pg. 240). Simon and Schuster, 2014.

Further reading

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External links

â— Carl Gauss – Wikipedia.

θΔics

In existographies, **Carl von Holtzmann** (1811-1865) (CR:5), aka "Karl Holtzmann", was a German mathematical physicist, noted for []

Overview

In 1845, Holtzmann, in his “On the Heat and Elasticity of Gases and Vapors”, calculated a value for the mechanical equivalent of heat. [1]

Carnot

Holtzmann says that he learned of Sadi Carnot’s heat theories, as discussed in his 1824 *Reflections On the Motive Power of Fire*, through the 1834 publications of French physicist Émile Clapeyron. [2] Holtzmann, however, could not find a copy of Carnot's paper. [4]

Clausius

Holtzmann’s paper is significant in that it is cited on the opening pages of German physicist Rudolf Clausius’ 1850 paper “On the Motive Power of Heat”, where he states that it is incorrect for both Holtzmann and Clapeyron to assume that the “quantity of heat” (in reference to indestructible particles of caloric) is constant.

Correctly, as Clausius would show over the next fifteen years, “the accomplishment of work requires not merely a change in the distribution of heat, but also an actual *consumption of heat* (referring to lost system heat as molecules do internal work on each other, otherwise known as entropy) and that, conversely, heat can be developed again by the expenditure of work (referring to the mechanical equivalent of heat)”. [3]

References

1. Holtzmann, Carl von. (1845). “Ueber die Wärme und Elasticität der Gase und Dämpfe” (“On the Heat and Elasticity of Gases and Vapors”), Mannheim: Taylor’s Scientific Memoirs, iv. 189; also Pogg. *Ann*., vol. 72a.
2. Cardwell, Donald. (1971). *From Watt to Clausius: The Rise of Thermodynamics in the Early Industrial Age* (pg. 225-26). Cornell University Press.
3. Clausius, Rudolf. (1850). "On the Motive Power of Heat, and on the Laws Which can be Deduced From it for the Theory of Heat." Poggendorff's *Annalen der Physik*, LXXIX, 368, 500.
4. Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 225). Cornell University Press.

External links

â— Carl Holtzmann (German → English) – Wikipedia.

θΔics

In thermodynamics, **Carl Jacobi** (1804-1851) was a German mathematician notable for his 1841 re-introduction of the curl d symbol (∂), for the partial differential, and for his definition of the force function as the negative of the potential energy. [1]

References

1. (a) Helmholtz, Hermann. (1882). "On the Thermodynamics of Chemical Processes" (force function, pg. 49), in: *Physical Memoirs Selected and Translated from Foreign Sources*, 1: 43-97. Physical Society of London, Taylor and Francis, 1888.
(b) Jacobi, Carl G.J. (1841). "On the Determinant Functions" (De determinantibus Functionalibus)", in: *Crelle's Journal*, Band 22, pp. 319-352, (pp. 393-438 of vol. 1 of the *Collected Works*).

Further reading

â— James, Ioan M. (2002). *Remarkable Mathematicians: from Euler to von Neumann* (Carl Jacobi, pgs. 97). Cambridge University Press.

External links

â— Carl Gustav Jacob Jacobi – Wikipedia.

θΔics

In psychology, **Carl Jung** (1875-1961) (IQ:165|#312] [RGM:100|1,245+] (CR:63) was a Swiss psychiatrist noted, in psychodynamics, for his 1928 to 1960s work on an attempt to create a modified version of Sigmund Freud's energy-dynamics based psychology.

Overview

In 1928, Jung began to make modifications and additions to the 1895 thermodynamics-based psychology theories of Austrian psychiatrist Sigmund Freud, especially on the topics of "psychic energy" and of entropy in relation to the psyche, as in "psychic entropy".

Jung later attempted to make connections between alchemy and psychology; the latter being a sort of rudimentary precursor to human chemistry. [1]

Jung's branch of logic, which he referred to as "psychic energism and dynamism", is often now referred to as Jungian psychodynamics, in contrast to Freudian psychodynamics, or Kleinian psychodynamics, the latter referring to the Freudian-based child psychology theories of British psychologist Melanie Klein.

In *circa* 1960s, Hungarian-born psychologist Mihály Csíkszentmihályi stumbled upon a lecture of Jungs and was instantly converted into the path of becoming a psychologist, thereafter using Jung's theories on entropy to formulate parts of a flow theory of optimal experience.

Quotes | By

The following are quotes by Jung:

> "The meeting of two personalities is like the contact of chemical substances; if there is any reaction, both are transformed."
>
> — Carl Jung (1933), *Modern Man in Search of a Soul* [2]

References

1. (a) Jung, Carl. (1928). "On Psychic Energy" (subsection C: Entropy), in *On the Nature of the Psyche* (1960). Princeton University Press.
(b) First published as "Uber de Energetik der Seel" in a volume of the same title (Zurich, 1928), which was translated by H.G. and C.F. Baynes as "On Psychical Energy" in *Contributions to Analytical Psychology* (London and New York, 1928).
(c) The translators' forward to the latter volume states that this paper "was framed soon after the author had finished the *Psychology of the Unconscious* [i.e. *Wandlungenund Symbole der Libido*, pub. 1912]. It was, however, pressed aside by the greater importance of the type-problem …, and, originally entitled "The Theory of the Libido", was taken up again only last summer.
(d) The original version was republished, under the title, in *Uber Psychische Energetic und das Wesen der Traume* (Zurich, 1948).
(e) Thims, Libb. (2007). *Human Chemistry (Volume Two),* (preview), (section: "Psychodynamics", pgs. 675-77). Morrisville, NC: LuLu.
(f) Hall, Calvin S. and Nordby, Vernon J. (1973). *A Primer in Jungian Psychology.* New York: Meridian Books.
2. Jung, Carl G. (1933). *Modern Man in Search of Soul* (pg. 49). Harvest Books.

Further reading

● Jung, Carl. (1946). *The Structure and Dynamics of the Psyche.* Vol. 8 of the Collected Works of C. G. Jung.
● Jung, Carl. (1944). *Psychology and Alchemy*, Zurich.
● Schwartz-Salant, Nathan. (1998). *The Mystery of the Human Relationship: Alchemy and the Transformation of Self.* Routledge.
● Corlett, John G. and Pearson, Carol S. (2003). *Mapping the Organizational Psyche: A Jungian Theory of*

Organizational Dynamics and Change. Gainesville, Fl.: Center for Applications of Psychology, Inc.

External links

- Carl Jung – Wikipedia.

θΔics

In human chemistry, **Carl Krockel** (c.1980-) is an English German-cultures scholar noted for []

Overview

In 2007, Krockel published his *D.H. Lawrence and Germany: the Politics of Influence*, the final version of his PhD disseration, wherein he gives a fairly decent synopsis of the interrelationship and influence of German polymath Johann Goethe's 1809 *Elective Affinities* (*Die Wahlverwandtschaften*) on George Elliot, George Lewes, and Georg Lukacs, the key discussion of which is as follows: [1]

> "German culture played a dominate role in George Eliot's life, beginning with her shift from Evangelicism to free-thought when she studied German historical criticism of the Bible in the 1840s. Her lover George Lewes acknowledge her contribution to his analysis of *Die Wahlverwandtschaften* in his pioneering biography of Goethe and *The Mill on the Floss* shares similar scenes to those in Goethe's novel. George Eliot may be thinking about *Die Wahlverwandtschaften* in parts of her 1855 article 'The Morality of Wilhelm Meister', where she describes how Goethe 'quietly follows the steam of fact and of life; and waits patiently for the moral processes of nature as we all do for her maternal process.' George Eliot's appraisal of Goethe as 'the man who helps us to raise to a lofty point of observation, so that we may see things in their relative proportions' [see: advanced perspective] is comparable to Georg Lukacs's characterization of Goethe's 'consistently thought-out systemization of these relationships, contrasts and nuances, and his ability to transform all these features into a vivid plot with can characterize them'. For Lukacs, in the plot of *Die Wahlverwandtschaften* Goethe comes closest to the designs of the nineteenth-century realist novel, of which *Middlemarch* is the supreme example.
>
> The chemical theory [see: human chemical theory] is the structural backbone of Goethe and George Eliot's realism. Chemicals are only electively affined when their attraction excludes other chemicals. In his narrative Goethe uses the framework of two pairs of lovers, whose attraction to different aspects of each other reveals their psychological 'properties'. Eduard and Charlotte are married, having known each other since childhood; the Hauptmann arrives, and links up with Eduard in their horticultural plans while excluding Charlotte for being too fanciful. Charlotte is satisfied by the arrival of the childlike Ottilie, and is also finding her own measured nature in affinity with the Hauptmann's. Meanwhile, Ottilie appeals to Eduard's childlike side, but the Hauptmann finds her ideas disturbing. And so the narrative continues.
>
> In *Middlemarch* George Eliot systematically elaborates on what Goethe only suggests in *Die Wahlverwandtschaften*, since each of her four characters is also bound to wider social relationships through affinity."

Interestingly, Krockel also notes that English novelist and literary critic D.H. Lawrence (1885-1930) was "certainly aware of Goethe's theory of affinities, if only through reading of Ernst Haeckel's account of it in *The Riddle of the Universe*" and argues that Haeckel's pantheism helped Lawrence break from his Christian upbringing, for a monism based on the material universe. The Lukacs work mentioned above, to note, seems to be his 1968 *Goethe and His Age*.

Education

Krockel completed his PhD, with a dissertation on "D.H. Lawrence and Germany: the Politics of Influence", at the University of East Anglia, Norwich, United Kingdom; which was published by Rodopi in book format in 2007. Krockel taught at the University of East Anglia, and was a visiting professor at Seoul National University, South Korea. He is currently working on a book on contemporary poetry and global politics.

References

1. Krockel, Carl. (2007). *D.H. Lawrence and Germany: the Politics of Influence* (pgs. 21-22). Rodopi.

External links

â— Krockel, Carl – WorldCat Identities.

â— Carl Krockel – Facebook.

θΔics

In engineering, **Carl Linde** (1842-1934) was a German mechanical engineer who, supposedly, was the first person to use the science of thermodynamics to design machines, specifically in his 1870 system to refrigerate beer. [1]

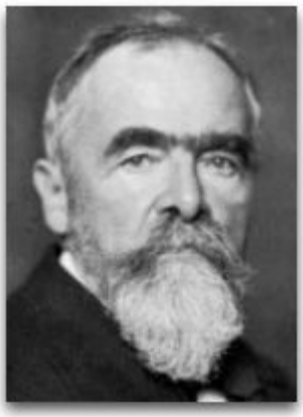

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(b) Zeuner, Gustav. (1907). *Technical Thermodynamics, Volume 2* (pgs. 462-63). D. Van Nostrand Co.

External links

â— Carl von Linde – Wikipedia.

θΔics

In existographies, **Carl Linnaeus** (1707-1778) (IQ:180|#156) [RGM:93|1,500+] (Cattell 1000:128) (CR:30), aka "Linne" (Haeckel, 1899), was a Swedish botanist, physician, and zoologist noted for his 1735 three kingdom classification of nature, for his 1735 binomial nomenclature classification (Linnaean classification) of species scheme, and for being the mentor of Swedish chemist Torbern Bergman, author of *A Dissertation on Elective Attractions* (1775), the biggest textbook on affinity tables and affinity chemistry, the logic of which was used by Goethe in circa 1808 to make a conceptual human affinity table (see: Goethe's affinity table), which thus initiated the science of human chemistry.

Theology

Linnaeus asserted a theological basis to his classification scheme by the statement: "there are just so many distinct species as there were distinct types created in the beginning by the infinite."

Centigrade scale

In the historical development of the thermometer, in 1758, Linnaeus claimed, its seems incorrectly, to have been the originator of the centigrade scale. [1] Linnaeus was the assistant to Swedish astronomer Anders Celsius (1701-1744) and in the years to follow Celsius' dereaction (death), encouraged the use of Celsius' scale among thermometer manufacturers, and also reversed Celsius' scale to make his own patented "Linnaeus thermometer", for use in greenhouses. [2]

Bergman

Influenced by his parents, Swede Torbern Bergman (1735-1784) initially studied theology and philosophy but in secret also mathematics, physics and astronomy. Bergman's broad interest in the natural sciences also brought him in contact with Linnaeus, who became his teacher, who became convinced that Bergman had a great talent for entomology. Linnaeus's famed classification scheme was said to be the inspiration for Bergman creation of similar binomial Latin names like *acidum aereum* for OCO in 1773 and scores of base + acid-adjective combinations like *argentum natratum* ($AgNO_3$), *calx aerata* ($CaCO_3$), *cuprum saltium* ($CuCl_2$), and *zincum vitriolatum* ($ZnSO_4$) in 1775. [3]

Goethe

German polyintellect Johann Goethe is said to have commented, at one point, that after William Shakespeare and Benedict Spinoza he was influenced most strongly by Linnaeus, the latter particularly with respect to his early botanical studies for form change. [4] After 1809, however, with the publication of his *Elective Affinities*, his self-defined "best book", which he embedded a morality system based on the moral symbols invented and employed chemically by the "great Bergman", it would seem that Goethe might have come to be aware of the affinity chemistry work of Bergman via Linnaeus. This connection, however, remains to be tracked down.

The **Carl Linnaeus** sculpture, taken by Libb Thims (2014), at the Chicago botanical gardens, shown reaching for some type of plant specimen for his bag (thrown over shoulder).

Quotes | On

The following are quotes on Linnaeus:

> "I know no greater man on earth than you."
>
> — Jean Rousseau (c.1770), message sent to Linnaeus [6]

> "His heart was remarkably noble, though I am well aware that he was accused of many faults. His intellect was keen and penetrating: you could see it in his eyes. But his greatest characteristic was his ability to

reason methodically: whatever he said or did was methodical and systematical. In his youth he had a wonderful memory, but all too soon it let him down... His passions were strong and violent...He could lose his temper abruptly or become very irritated; those feelings would disappear as quickly as they had appeared. You could rely on the constancy of his friendship; it was almost always founded on an interest in science, and all the world knows how much he did for his pupils and how devotedly, how ardently they returned his friendship and became his champions."

— Johan Fabricius (c.1800) [6]

"With the exception of Shakespeare and **Spinoza**, I know no one among the no longer living who has influenced me more strongly!"

— Johann Goethe (c.1820) [6]

Quotes | By

The following are quotes by Linnaeus:

"The apes are the nearest relations of the human race."

— Carl Linnaeus (c.1775), *The Cousins of Man* [7]

"No one has been a greater botanicus or zoologist. No one has written more books, more correctly, more methodically, from his own experience. No one has more completely changed a whole science and **initiated a new epoch**. No one has become more of a household name throughout the world."

— Carl Linnaeus (c.1775), Auto-Existography [6]

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2. History of the Thermometery – TMElectronics.co.uk.
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7. (a) Linnaeus, Carl. (c.1775). *The Cousins of Man*. Posthumous.
(b) Lonnberg, Einar. (1909). *Carl von Linne und die Lehre von der Wirbeltieren*. Fischer.
(c) Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea* (pg. 234). Harvard University Press, 1936.

External links

â— Cark Linnaeus – Wikipedia.

θΔics

In existographies, **Carl Nageli** (1817-1891) (CR:14), often cited as Nägeli, alternative spelling "von Naegeli", was a Swiss botanist and physiologist noted for his 1877 lecture “The Limits of Natural Knowledge”, in which, as commented on by James Maxwell, he addressed the issue of what happens to conceptions such as consciousness, sensation, mind, free will, pain and pleasure, etc., when one begins to descend down the evolutionary ladder to the atomic origin level. [1]

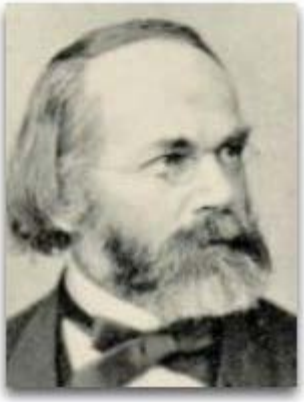

Overview

In 1850, Nageli published drawings of his “crystalloids”, as shown below, seen as a thing midway between a crystal and a cell, or inorganic and organic (Buchner, 1855), which gained him a certain amount of citation notoriety.

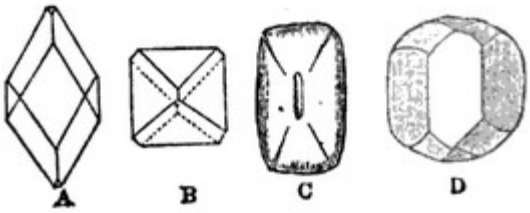

In 1877, Nageli, in his “The Limits of Natural Knowledge”, gave, supposedly, some type of Ernst Haeckel stylized, argument about physical-material souls in the form of atoms, or something along these lines. [1]

Soon thereafter, this caught the eye of James Maxwell; who began to discuss its contents with others; for example:

> “Have you seen Nageli in *Nature*? He is of the school which supposes that we think as well as we do is the result of the deliberations of *n* plastidule souls in every one of the *α* molecules of us. Now if *m* Masters of Arts, sleeping within *r* of Great St Mary constitute the Electoral Roll, the wisdom of the soul of that Roll must be *mnα* times that of a plastidule soul. The acts of the Roll are on record. Calculate the wisdom 1st of an MA 2nd of a plastidule soul. dp/dt.”
>
> — James Maxwell (1877), “Letter to Peter Tait”, Dec 12 (Q); see: [5] on plastidule souls

In 1878, Maxwell, in his "Paradoxical Philosophy" article, summarized the main points of Nageli’s lecture as follows: [2]

> “He can draw no line across the chain of being [unbridgeable gap], and say that sensation and consciousness do not extend below that line. He cannot doubt that every molecule possesses something related, though distantly, to sensation, ‘since each one feels the presence, the particular condition, the peculiar forces of the other, and, accordingly, has the inclination to move, and under circumstances really begins to move—becomes alive as it were; ... If therefore, the molecules feel something which is related to sensation, then this must be pleasure if they can respond to attraction and repulsion, *i.e.*, follow their inclination or disinclination; it must be displeasure if they are forced to execute some opposite movement, and it must be neither pleasure nor displeasure if they remain at rest’.”

Maxwell goes on to speculate as to whether or not atoms can have pleasure, in terms of pure dynamics, and concludes with the remark “even if a man were built up of thinking atoms would the thoughts of the man have any relation to the thoughts of the atoms?” This is what is known as the “binding problem” in modern philosophical parlance, a 1890 expression of American psychologist William James who commented “how can many consciousnesses be at the same time one consciousness?” This is what is called, according to American philosopher Christian de Quincey, the main issue in any standard critique of any form of panpsychism. [3]

Some have classified von Nageli as a "panpsychist philosopher" or an advocate of a version of panpsychism. [4]

Quotes | On

The following are related about quotes:

-

> "We are constrained to agree with **Nageli** when, basing his opinion on such facts, he declares that the difference between organic and inorganic is no other than that which exists between the simple and the complex."
>
> — Ludwig Buchner (1855), *Force and Matter* (pg. 71)

-

> "Spiritual life, may be understood, as the mediator of cause and effect."
>
> — Anon (1877), supposed synopsis or gist assertion Carl Nageli's "On the Limits of Natural Knowledge" address, *Nature*, Oct 4

Quotes | By

The following are quotes by Nageli:

> "If faith begins where knowledge ends, then as the empire of knowledge thus always increases in extent, that of faith decreases as constantly."
>
> — Carl Nageli (1877), "The Limits of Natural Knowledge" [1]

-

> "We are hence able to perceive the real things with certainly only insofar as we realize in them the mathematical notions, number and size, with all that mathematics deduces from them. Natural knowledge thus rests on the application of mathematical methods to the natural phenomena."
>
> — Carl Nageli (c.1877) (Q)

-

References

1. Von Nageli, Carl. (1877). "The Limits of Natural Knowledge" (abs), delivered before the German Association at Munich; synopsis (Q) in: *Nature*, 16:491-92, Oct 4; translation part I (Q) in: *Nature*, 16: 531-35, Oct 18; translation part II (Q), *Nature*, 16:559-63.
2. Maxwell, James. (1878). "Review: Paradoxical Philosophy", in: *Scientific Papers*, II, pg. 451; in *Nature*, 19 (19 Dec 1878): 141-43; in: *Scientific Papers*, 2, 756-62.
3. (a) De Quincey, Christian. (2002). *Radical Nature: Rediscovering the Soul of Matter* (section: Binding Problem, pgs. 230-37). Invisible Cities Press.
(b) James, William. (1890). *Principles of Psychology* (ch. 6: Mind Stuff Theory). Publisher.
(c) Binding problem – Wikipedia.
4. Skrbina, David. (2005). *Panpsychism in the West* (thermodynamics, pgs. 13, 151; panpsychist philosophers, pg. 155). MIT Press.
5. Haeckel, Ernst. (1877). "The Present Position of the Evolution Theory" (plastidule-soul: last factor of organic soul-life, pg. 685), *Nature*, 16:492-96, Oct 4.
6. Anon. (1877). Review: "The Limits of Natural Knowledge" (abs), delivered before the German Association at Munich; synopsis (Q) in: *Nature* (quote, pg. 492), 16:491-92, Oct 4; translation part I (Q) in: *Nature*, 16: 531-35, Oct

18; translation part II (Q), *Nature*, 16:559-63.

Further reading

● Nageli, Carl von. (1898). *A Mechanico-Physiological Theory of Organic Evolution.* Publisher.

External links

● Karl von Nageli – Wikipedia.

θΔics

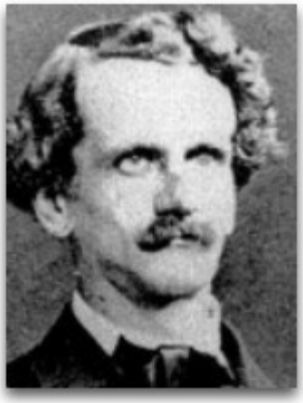

In thermodynamics, **Carl Neumann** (1832-1925) was a German mathematical physicist noted for his 1875 *Lectures on the Mechanical Theory of Heat* in which he introduction of the now-standard symbol notation $\bar{d}$ (d-hat), otherwise known as Neumann notation, or δ (Greek delta), in latter usages by others, to represent an inexact differential, i.e. one that is path dependent, such as are differentials of heat δQ and work δW. [1]

Neumann supposedly used his own methods, by passing the need for introducing the entropy function, to script his own version of thermodynamics. [2] His book on heat supposedly used methods on heat similar to German physicist Gustav Kirchhoff. [5]

Neumann seems to have developed an interested in thermodynamics via the overlap of heat and electricity. His 1873 book *Explanation of Electrical Forces and Expansion* gives evidence to this. [2] Neumann thought that mechanical explanations in physics were incomplete, contradictory, and overly complex. Having studied the analogies between electrodynamics and mechanics, specifically hydrodynamics, which Hermann Helmholtz, Gustav Kirchhoff, and Ludwig Boltzmann, and others had developed, Neumann convinced himself that the analogies lacked “deep foundations”. Moreover, the explanation of heat phenomena requires thermal principles and since heat is intimately related to electricity, he did not expect “merely mechanical principles” to succeed with electricity either. [2]

Inexact differential

See main: Inexact differential

German physicist Georg Helm seems to have been the first to point this origin out, specifically in his 1898 *History of Energetics*, wherein he comments Neumann was the one that suggested that the special differential sign $\bar{d}Q$ (d hat Q) should be used as a way of always keeping in mind the differentials, such as heat, that do not fit the condition for an exact differential. [8]

Economic thermodynamics

Neumann, supposedly, had views on how thermodynamics applied to economy. [6] Neumann argued that all economic life could be expressed by an exchange of energy or by “the transfer of energy of physical bodies”. Neumann, according to the 1887 views of Georg Helm, considered the “energy of the self as the capital of the body”, such that the body contained an energetic component considered as a commodity. [7] The actual citation used by Helm, in the Final Section to his *The Doctrine of Energy* is:

"Carl Neumann nennt die eigenenergie gelegentlich das Kapital des Körpers, und dass bei der Ausbildung der Energievorstellungen wirtschaftliche Analogien mitgewirkt haben, ist S. 18 von mir hervorgehoben worden (78)."	"Carl Neumann sets out on occasional discussion of the internal energy capital of the body, and that have participated in the training of energy performances economic analogies, p. 18 worden is highlighted by me (78)."
Note 78 Bezeichnend sind die Worte, die Du Bois Reymond (Berl. Monatsberichte 1870) von Leibniz anführt: „Les forces ne sont (pas) detruites, mais dissip6es parmi les parties menues. Ce n'est pas les perdre, mais c'est faire comme font ceux, qui changent la grosse monnaie en petite." Sie sind eben so merkwürdig hinsichtlich des Dissipationsgedankens, wie hinsichtlich der wirtschaftlichen Analogie.	Note 78 Typical are the words quoted by Du Bois Reymond (Berl. monthly reports in 1870) by Leibniz: "The forces are (not) destroyed, but among the minor parties disperses. This is not to lose them, but do like are those that change the currency in small wide." They are just as curious as to the Dissipationsgedankens as economic terms the analogy.

The term 'eigenenergy' (of translated as self-energy) may actually mean internal energy, possibly, as used in the sense of

Helm? The exact article (or book) that Helm made these economic speculations using thermodynamic theory still needs to be tracked down; but, nevertheless, the above quote does seem to indicate that Neumann's thermo-economic views predate those of Helm?

References

1. (a) Neumann, Carl. (1875). *Vorlesungen über die mechanische Theorie der Wärme* (*Lectures on the Mechanical Theory of Heat*). Germany.
(c) Anon. (1877). "Science (Review: *Lectures on the Mechanical Theory of Heat* by Carl Neumann, 1875)", *The Westminster Review* (pg. 250-), Jan-Apr.
(b) Laider, Keith, J. (1993). *The World of Physical Chemistry*. Oxford University Press.
2. Aris, Rutherford, David, Howard T, and Stuewer, Roger H. (1983). *Springs of Scientific Creativity: Essays on the Founders of Modern Science* (ch. 5: The Scientific Style of Josiah Willard Gibbs, pgs. 142-62; esp. pg. 150). University of Minnesota Press.
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4. (a) Jungnickel, Christa. (1986). *Intellectual Mastery of Nature: Theoretical Physics form Ohm to Einstein, Volume 2, 1870-1925* (Footnote 53: pg. 228). University of Chicago Press.
(b) Neumann, Carl. (1873?) *Beitrage zu einzelnen Theilen der Mathematischen Physik, insbesondere zur Elektordynamik und Hydrodynamik,* Elektrostatik und magnetischen Induction (Individual contributions to Theoretical Mathematical Physics, in particular to Electrodynamics and Hydrodynamics, Electrostatics and Magnetic induction) (Leipzig, 1893), iii-iv, 205-6.
5. Maxwell, James C., Elizabeth Garber, Stephen G. Brush, C. W. Francis Everitt. (1995). *Maxwell on Heat and Statistical Mechanics:* On "avoiding All Personal Enquiries of Molecules" (pgs. 255, 257). Lehigh University Press.
6. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (Carl Neumann, pgs. 59, 104-05). AuthorHouse.
7. (a) Helm, Georg. (1887). *The Theory of Energy: Historical-Critical Development* (*Die Lehre von der Energie: Historisch-kritisch Entwickelt*) (pg. 72). Leipzig.
(b) Rabinbach, Anson. (1990). *The Human Motor - Energy, Fatigue, and the Origins of Modernity* (pg. 71). Berkeley: University of California Press.
(c) Wallace, Thomas. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations* (Carl Neumann, pgs. 59, 104-05). Author House.
8. (a) Helm, Georg F. (1898). *Die Energetik: Nach Ihrer Geschichtlichen Entwickelung* (*Energetics: Historical Development*). Leipzig.
(b) Helm, Georg F. (2000). *The Historical Development of Energetics* (Carl Neumann: special differential sign, pg. 130). Kluwer Academic Press.

External links

â— Carl Neumann – Wikipedia.
â— Carl Gottfried Neumann – Mathematics genealogy Project.

θΔics

In existographies, **Carl Sagan** (1934-1996) (IQ:170|#262) (CR:17) (RGM:123|1,230+) (FA:125) (CR:28) was an American astronomer, noted for []

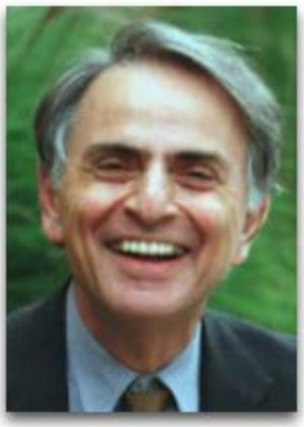

Cosmos

In 1980, Sagan, became famous for his PBS series *Cosmos*, co-written with his wife Ann Duryan, wherein he defines a human as "star-stuff"; used the term "cosmic perspective" for the advanced perspective; and seemed to conjecture for a universe that is god-free, though, it seems, not stated so explicitly.

Agnostic | Atheism

Sagan was a self-defined agnostic; albeit leaning towards atheism in commentary; he even is commonly cited as an atheist. The following are representative position statements:

> "Those who raise questions about the god hypothesis and the soul hypothesis are by no means all atheists. An atheist is someone who is certain that god does not exist, someone who has compelling evidence against the existence of God. I know of no such compelling evidence. Because God can be relegated to remote times and places and to ultimate causes, we would have to know a great deal more about the universe than we do now to be sure that no such God exists. To be certain of the existence of God and to be certain of the nonexistence of God seem to me to be the confident extremes in a subject so riddled with doubt and uncertainty as to inspire very little confidence indeed."
>
> — Carl Sagan (1981), interview with Edward Wakin [1]

> "Some people think God is an outsized, light-skinned male with a long white beard, sitting on a throne somewhere up there in the sky, busily tallying the fall of every sparrow. Others—for example Baruch Spinoza and Albert Einstein—considered God to be essentially the sum total of the physical laws which describe the universe. I do not know of any compelling evidence for anthropomorphic patriarchs controlling human destiny from some hidden celestial vantage point, but it would be madness to deny the existence of physical laws. But if by God one means the set of physical laws that govern the universe, then clearly there is such a God. This God, however, is emotionally unsatisfying. It does not make much sense to pray to the law of gravity."
>
> — Carl Sagan (1981), interview with Edward Wakin + latter (Q) re-statement [2]

> "In science, it often happens that scientists say, 'You know that's a really good argument; my position is mistaken,' and then they would actually change their minds (see: recant) and you never hear that old view from them again. They really do it. It doesn't happen as often as it should, because scientists are human and change is sometimes painful. But it happens every day. I cannot recall the last time something like that happened in politics or religion."
>
> — Carl Sagan (1987) (Q)

> "Do you understand how – assuming either of us ever did say 'The universe can be explained without postulating God' – this could be understood as dogmatic? I often talk about the 'god hypothesis' as something I'd be fully willing to accept if there were compelling evidence; unfortunately, there is nothing approaching compelling evidence. That attitude, it seems to me, is undogmatic."
>
> — Carl Sagan (1989), "To Stephen Gould", Dec 18 [3]

> “An atheist has to know a lot more than I know. An atheist is someone who knows there is no god.”
>
> — Carl Sagan (c.1995), Interview comment to Joel Achenbach [3]

> “I am not an atheist. An atheist is someone who has compelling evidence that there is no Judeo-Christian-Islamic God. I am not that wise, but neither do I consider there to be anything approaching adequate evidence for such a god. Why are you in such a hurry to make up your mind? Why not simply wait until there is compelling evidence?”
>
> — Carl Sagan (1996), “To Robert Pope”, Oct 2 [3]

Journalist Joel Achenbach surmises, of these quotes, that: “Does this wait-and-see attitude make Sagan an ‘agnostic’? That word seems inadequate to me. Yes, he held out the possibility of a god, but believed that possibility to be very small.” This “small possibility” would seem to put Sagan in the DN:6± range, likely more towards the negative side (e.g. DN:6-), being that Richard Dawkins, the supposed biggest “admitted” atheist presently, self-classifies as DN:6+, and has videos on the phrase “I’m an atheist, but …” (Q) The following comment, likewise, is telling:

> “In his adult life he was very close to being an atheist. I personally had several conversations with him about religion, belief, god, and yes I agree he was darn close. It’s really semantics at this level of distinction. He was certainly not a theist. And I suppose I can relate because I personally don’t call myself an atheist, although if you probed what I believe, it would be indistinguishable from many who do use that term.”
>
> — David Grinspoon (c.2014), “Email to Joel Achenbach” [3]

Sagan, here, then, would seem to be an "agnostoatheist", if there is such a term.

Family

Carl Sagan was the husband of Lynn Margulis and their son is Dorion Sagan.

Influence | Students

American mechanical engineer Bill Nye studies under Sagan, who was one of his professors, at Cornell University in 1977. In 1975, Neil Tyson, then aged 17, was exchanging letters (Q) with Sagan, in aims to study under him at Cornell.

Education

In 1954, Sagan, while attending the University of Chicago, made a reading list (Q)(Q) that he intended to tackle, some of which include Mark Zemansky’s *Heat and Thermodynamics* and Edward Guggenheim’s *Thermodynamics: and Advanced Treatment*.

Quotes | On

The following are notes of praise and or tribute:

> “Marvin Minsky and **Carl Sagan** are two men I conceded were more intelligent than I was.”
>
> — Isaac Asimov (1980), *In Joy Still Felt: Autobiography* [2]

"When my husband died, because he was so famous and known for not being a believer, many people would come up to me — it still sometimes happens — and ask me if Carl changed at the end and converted to a belief in an afterlife. They also frequently ask me if I think I will see him again. Carl faced his death with unflagging courage and never sought refuge in illusions. The tragedy was that we knew we would never see each other again. I don't ever expect to be reunited with Carl. But, the great thing is that when we were together, for nearly twenty years, we lived with a vivid appreciation of how brief and precious life is. We never trivialized the meaning of death by pretending it was anything other than a final parting. Every single moment that we were alive and we were together was miraculous-not miraculous in the sense of inexplicable or supernatural. We knew we were beneficiaries of chance. . . . That pure chance could be so generous and so kind. . . . That we could find each other, as Carl wrote so beautifully in Cosmos, you know, in the vastness of space and the immensity of time. . . . That we could be together for twenty years. That is something which sustains me and it's much more meaningful. . . . The way he treated me and the way I treated him, the way we took care of each other and our family, while he lived. That is so much more important than the idea I will see him someday. I don't think I'll ever see Carl again. But I saw him. We saw each other. We found each other in the cosmos, and that was wonderful."

— Ann Druyan (c.1996), letter (Q) written (see: atheist eulogy) after the passing of Carl Sagan

Quotes | By

The following are noted quotes:

"I am a collection of water, calcium, and organic molecules called **Carl Sagan**. You are a collection of almost identical molecules with a different collective label. But is that all? Is there nothing in here but molecules? Some people find this idea somehow demeaning to human dignity. For myself, I find it elevating that our universe permits the evolution of molecular machines as intricate and subtle as we are. But the essence of life is not so much the atoms and simple molecules that make us up as the way in which they are put together."

— Carl Sagan (1980), *Cosmos*, Episode 5 (Q)(Q)(Q); compare Wilhelm Ostwald (1926)

"These are some of the things hydrogen atoms do, given 15 billion year of evolution."

— Carl Sagan (c.1980) (Q); see modern variant (Q) (Q)

References

1. Sagan, Carl, Head, Tom. (2006). *Conversations with Carl Sagan* (pg. 70). University Press of Mississippi.
2. Asimov, Isaac. (1980). *In Joy Still Felt: the Autobiography of Isaac Asimov, 1954-1978* (pgs. 217, 302, 519). Doubleday.
3. Achenbach, Joel. (2014). "Carl Sagan denied being an Atheist. So What Did He Believe In? [Part 1]" (Q), *The Washington Post*, Jul 10.

External links

● Carl Sagan – Wikipedia.

θΔics

In existographies, **Carl Scheele** (1742-1786) (IQ:165|#475) (Murray 4000:3|C) (Partington 50:9) (GCE:10) (CR:9) was Swedish-German chemist, noted for discovery of: oxygen, molybdenum, tungsten, barium, hydrogen, chlorine, tartaric, oxalic, uric, lactic, and citric, as well as hydrofluoric, hydrocyanic, and arsenic acids; his *Chemical Treatise on Air and Fire* (1777), his only book, published the results of all of his discoveries.

Elements

In 1770, Scheele discovered oxygen, after Michael Sendivogius (1604), but before Joseph Priestley (1774).

Scheele also discovered chlorine (before Humphry Davy).

Heat

In 1777, Scheele, in his book *Chemical Treatise on Air and Fire*, or essay "On Air and Fire", he introduced the concept of "radiant heat", thus differentiating light from heat, or something along these lines. [3]

Education

In 1757, Scheele, aged 14, was apprenticed as a pharmacist, whereat he stated for eight years, during which time he read works of Nicolas Lemery, Caspar Neumann, Johann Kunckel and Georg Stahl. In c.1767, Scheele began (Ñº) working alongside Torbern Bergman.

Quotes | On

The following are quotes on Scheele:

> "Joseph Priestley is usually associated with the discovery of oxygen in 1774. Nowadays, it is generally recognized that **Scheele** should be credited with this discovery. Furthermore, Lavoisier's experiments on oxidation led to the evolution of the 'new chemistry' as we know it today. Yet some of these chemists were not the first who prepared oxygen from its compounds or who studied its properties. Almost two centuries earlier it was a Dutchman Cornelis Drebbel who prepared oxygen by heating saltpeter, a method still used today."
>
> — Jan Spronsen (1977), "Cornelis Drebbel and Oxygen" [2]

Quotes | By

The following are quotes by Scheele:

> "It is the truth alone that we desire to know and what a joy there is in discovering it."
>
> — Carl Scheele (c.1780), *Publication* (Ñº)

References

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2. Spronsen, Jan W. (1977). "Cornelis Drebbel and Oxygen" (abs), *Journal of Chemical Education*, 54(3):157.
3. (a) Scheele, Carl. (1777). "On Air and Fire", in: *Collected Papers of Carl Wilhelm Scheele* (translator: Leonard Dobbin). Bell & Sons, 1931.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 60-61). Cornell University Press.

External links

â— Carl Wilhelm Scheele – Wikipedia.

θΔics

In hmolscience, **Carl Snyder** (1869-1946) (SN:54) was an American economist, statistician, and chemistry historian noted for his outlines of some type of atomic theory and Gibbs + Goethe based deterministic realism philosophy.

Berthelot | Goethe | Gibbs

In 1902, Snyder, in his "Fifty Years of Synthetic Chemistry", outlined a rather rich history of the subject of synthetic chemistry, wherein he impressively connects the dots of the work of Marcellin Berthelot to Willard Gibbs and then back go Johann Goethe, in human chemistry, as follows: [1]

> "Berthelot had shown that this mysterious vital force of his predecessors does not exist. The line demarking the domains of organic and mineral chemism is a figment of the mind. The selfsame powers rule in each. It was time to show another mystery the door. For these chemical forces, these "affinities of the atoms," what are they? For the force of gravity we have the balance; for electricity, the electroscope and the galvanometer; for light, the photometer. A chemometer, a measure of chemical actions, was lacking. For a science of chemical mechanics not so much as a corner-stone had been laid. This was M. Berthelot's new task.
>
> Doctrines of energy were abroad in the world. The kinetic theory of gases had been worked out into a picture which explains the properties of gases in the bewildering flight and whirl and rebound of their smallest particles, the molecules. The mechanical theory of heat, that heat is simply the clash of the particles, had been built on the same foundations. A kinetic theory of matter was emerging. In the new view, all is motion; there is no "rest." Some experiments of M. Berthelot, made with Pean de St.-Giles, revealed a new factor in chemical action, the factor of time. This implied motion; it ought to be measurable.
>
> These two *savants* studied the speed of formation of some compound ethers by the interaction of alcohol with acids. The experiments threw a new light upon the subject, for they showed that the velocity of the reaction was not merely measurable in time, but conditioned by a variety of physical factors, among others that of the quantity or mass of the substances present. The formation of the ethers proceeds more and more slowly as the process goes on, until finally all action comes to an end, even though both alcohol and acid remain in the liquid. This influence of mass, as it is called, has since been disclosed in all chemical processes, and has been developed into a wide theory of chemical equilibrium, which has thrown a new light upon the atomic world. The working out of the theory has fallen to other hands than those of M. Berthelot—in foremost line, to a distinguished American chemist, Professor Willard **Gibbs**; but it is well to remember to whom the beginning was due.
>
> Meanwhile, in this play of the atoms, what dominating force presides? The old chemistry had assimilated the varying attractions between different substances to the human passions. The atoms hate and love, seek or reject, their fellows. They, too, have their "affinities." Of this antique idea we catch an echo in **Goethe**'s well-known tale. For M. Berthelot's iconoclastic spirit the affinities were but princely phantoms like the "vital forces" themselves. The real agent here is heat. With this conception the new science of thermo-chemistry was born, and its godfather was the founder of chemical synthesis."

In 1907, a German translation of this appeared as well. (Q)

Cosmic mechanism | Social mechanism

In 1907, Snyder, in his *The World Machine: the First Phase, the Cosmic Mechanism*, was advertising that he had two manuscripts: *The Mechanism of Life*

and *The Social Mechanism* in preparation.

(add discussion)

TO

THE ALL BUT FORGOTTEN MEMORY

OF

DEMOCRITUS OF ABDERA

(*ca.* 460–360 B.C.)

Justly esteemed by Bacon as the weightiest of the ancients ;

Forerunner by a century of Aristotle and Euclid ;

Geometer and traveller, physiologist and polyhistor, path-hewer and sage.

He wrote illuminatively upon almost every branch of natural knowledge, in an Attic praised by Cicero as rivalling Plato's ;

Founder of the Atomic Theory, and first of whom we know, historically to conceive this world and all it contains as a mechanism.

To his ideas, 2000 years of invention, discovery, and research have added much but changed little.

The above tribute to Democritus is found on the dedication page to *The World Machine*.

Dreiser

American novelist Theodore Dreiser (1871-1945), in his youth, in the learning of his deterministic realism philosophy of existence, grouped Herbert Spencer (*First Principles*), Ernst Haeckel, Jacques Loeb ("Mechanistic Conception of Life"), and Snyder (*The World Machine*), into one philosophical group (Q), according to which man's very identity as a speck of energy, a mechanism, driven by "chemic compulsions". [1]

Keys

Synder was found via the Google Books search key combination: Goethe, Gibbs, Empedocles; a key that returns similar thinkers including: Lawrence Henderson (*The Order of Nature*, 1917) (Q), Stephen Toulmin (*The Return to* Cosmology, 1985) (Q), Arthur Zajonc (*Catching the Light*, 1995) (Q), and Libb Thims (*Human Chemistry*, 2007) (Q).

Quotes

The following are noted and or relevant quotes:

> "The ordinary run of men live among phenomena of which they care nothing and know less. They see bodies fall to the earth, they hear sounds, they kindle fires, they see the heavens roll above them, but of the causes and inner workings of the whole they are ignorant, and with their ignorance they are content."
>
> — Oliver Lodge (c.1895), opening matter quote to Snyder's 1903 *New Conceptions in Science*

> "The line dividing the domains of organic and mineral chemism is a figment of the mind. The self-same forces rule in each."
>
> — Carl Snyder (1902), "Fifty Years of Synthetic Chemistry" [1]

> "Physical science will not stop short of a reduction of the universe and all it contains to the basis of mechanics; in more concrete terms, to the working of a machine."
>
> — Carl Snyder (1903), *New Conceptions in Science* (Q)

References

1. (a) Snyder, Carl. (1902). "Fifty Years of Synthetic Chemistry" (pg. 719), *Harper's Monthly Magazine*, 104:717-20.
(b) Snyder, Carl. (1903). *New Conceptions in Science: With a Foreword on the Relations of Science and Progress* (pg.

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θΔics

In biographies, **Carl Zelter** (1758-1832) was a German composer noted for being a close friend with German polymath Johann Goethe, with whom he exchanged letters with on Goethe's *Elective Affinities*, and commented on the relation of this with that of Ludwig van Beethoven (see: Goethe timeline).

01 Jun 1809
Goethe wrote to Zelter:

> "As it was not yet advisable for me to go to Carlsbad, I have come to Jena, where I am trying to finish a novel [*The Elective Affinities*], which I sketched and began a year ago, among the Bohemian mountains. It will probably come out this year, and I am all the more anxious to hurry on with the work, as it will be a means of thoroughly re-establishing an intercourse with my friends at a distance. I hope you will think it is in my old way and manner. I have stored away much in it, hidden many things in it; may this open secret give you pleasure!"

In sum, that in *Elective Affinities* he not only placed numerous different hidden elements within the text, but that many of these were hidden within it and that past the transparent or non-transparent veils on may be able to see the truly intended Gestalt.

14 Sep 1812
Letter from Zelter about Goethe's view of Beethoven:

> "What you say about Beethoven is certainly true. I, too, admire him with terror. His worn works seem to cause him secret horror—a perception that is dismissed all too lightly in our contemporary culture. His works seem to me like children whose father is a woman or mother is a man. The most recent work of his I have come to know (*Christ on the Mount of Olives*, 1811) seems to me like an impurity whose very foundation and goal are eternal death. Music critics, who seem better able to grasp and agree upon almost anything but singularity and the natural, have gushed over this composer in the most curious manner, in both praise and reproach. I know musical persons who used to find themselves alarmed, even indignant, upon hearing his works, but who are now gripped with enthusiasm for them like the partisans of Greek love. The attraction of this is not difficult to understand, and yet what can come of it you have demonstrated clearly enough in your *Elective Affinities*."

17 Apr 1815
A letter from Goethe to Zelter: [5]

> "When the play is frequently repeated, it is quite a different manner. Without bellows and flames, without art and intention, there arise the most delicate elective affinities, which, in the pleasantest way, unite those seemingly isolated members into a whole; on the actors' side, more certainly and pliability, acquired by practice, strengthened by applause, supported by an animated insight into, and a general survey of the whole; on the spectators' side, acquaintance, custom, favor, prejudice, enthusiasm, and whatever may be the names of all the good spirits, without which, even the *Iliad* and *Odyssey* would remain to us but a lifeless framework."

21 Nov 1827
Goethe wrote to Zelter:

“Customers, no doubt, sometimes allow the tailor to choose a particular stuff, but they insist upon having the coat fitted to their own bodies, and are highly indignant, if it proves too tight, or too loose; they are most comfortable, when wearing the loose dressing-gowns of the day and hour, in which they can feel as easy as they like; you may perhaps remember, that they treated my *Elective Affinities* as though it had been the garment of Nessus.”

29 Jan 1830 Goethe wrote to Zelter: [1]

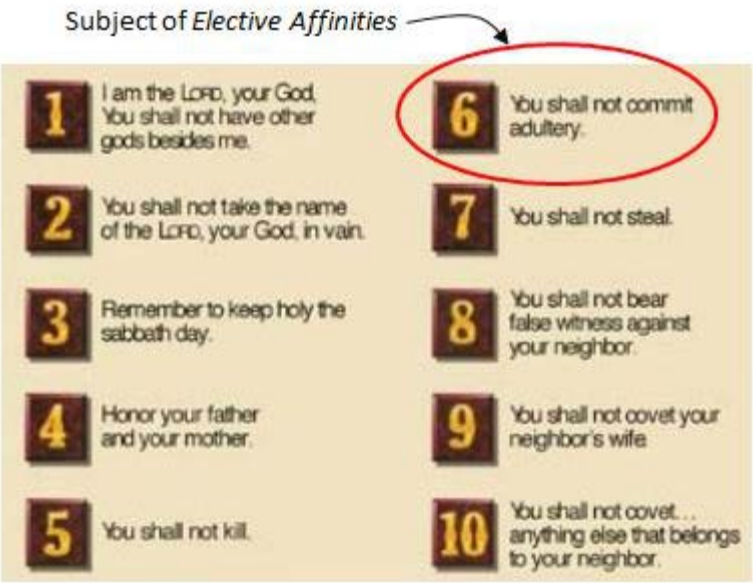

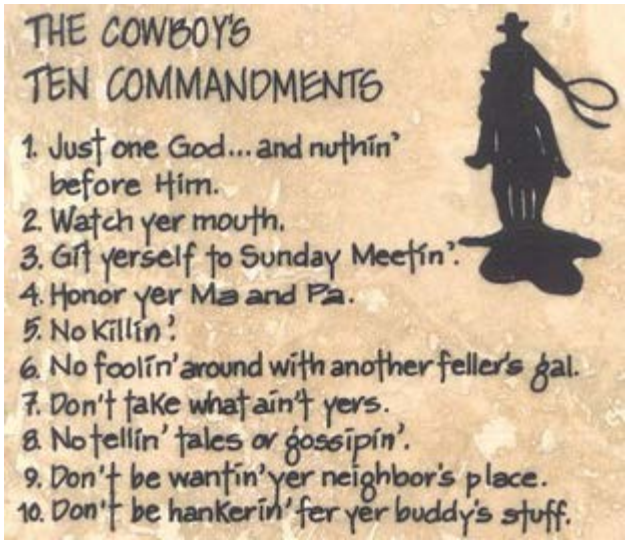

The ten commandments, derived from Exodus 20:1-17, left: as Goethe would have known them, in their typical Lutheran-Catholic reformulation; right: the redneck version, as many in the Bible belt states currently know them—the sixth commandment: "you shall not commit adultery", or "no foolin' around with another feller's gal", being the subject of inquire in Goethe's 1809 *Elective Affinities*, as he told Zelter (1830). [1]

“Following on what went before, let me tell you in fun, that in my *Wahlverwandtschaften*, I took care to round off the inward, true catharsis, with as much purity and finish as possible, but I do not therefore imagine that any pretty fellow could thereby be purged from the lust of looking after the wife of another. The sixth commandment, which seemed to the Elohim-Jehovab to be so necessary, even in the wilderness, that he engraved it on granite tables with his own finger,—this it will still be necessary to uphold in our blotting-paper catechisms.”

An alternative truncated version by Ludwig Lewisohn is as follows: [2]

“We fight for the perfection of a work of art, independently and in its own nature. Those other think of its effectiveness in the world. A true artist takes no thought of that,, as little as does nature when she produces a lion or a hummingbird. As jest and superfluity let me say in addition, that I used every effort in my *Elective Affinities* to bring to a close the true, inner catharsis as purely and perfectly as possible. But I never imagined on that account that a handsome man could be cleansed through my story of looking lustfully at the wife of another.”

In any event, curiously, here, in the former of these two translations, we see Goethe giving way to two of his mindsets, one that he is unaware that the commandments carved onto the tablets by a "finger" and through a "a mighty hand and by a stretched out arm" (Deuteronomy 5:15), as rewrite of the Akhenoten sun god aten; secondly, and most importantly, he gives way to the notion that his entire novel may have been a physical chemistry attack on the “sixth commandment”, which in the Lutheran-Catholic numbered version of the ten commandments is “thou shalt not commit adultery”, which the version Goethe read must have incorporated the "neither shalt thou desire thy neighbors wife" (Deuteronomy 5:21) version of the commandments; whether in pure mental lust (“thou shalt not commit mental adultery”) or in actual physical lust (“thou shalt not commit actual adultery”); hence the double mental adultery that plays out in the novel.

Of relevance, to note, some have argued that the word “six” in Latin is “sex”, meaning that the etymological origin of the modern word “sex” traces to the 14th century discussions of the “sixth commandment”. [3] Prior to this, historically, this commandment was a syncretism of a number of the Egyptian religion 42 negative confessions, namely: 11 (I have not committed adultery), 13 (I have made none to weep), and 21 (I have not debauched the wife of any man), of the Anunian theology / Osiris theology era (1500BC).

The number 42 itself tracing or having roots in the 3,100BC Egyptian statehood unification (first dynasty) of the 20 nomes of Lower Egypt and 22 nomes of Upper Egypt; in the newly formed Ra-centric state religion (Ra theology), the local god of each nome was carried over into the new religion, such that These 42 different nome gods were incorporated into the first dynasty period Ra theology, such that the 42 gods (or nome gods) sat in the judgment hall (of death), each god presiding over judgment of one particular sin.

28 Jun 1831
Goethe to Zelter: [4]

> “What man, what society dare express such sentiments? seeing that we cannot easily known anyone from his youth up, nor criticize the rise of his activity. How else does character finally prove itself, if it is not formed by the activity of the day, by reflective agencies which counteract each other? Who would venture to determine the value of contingencies, impulses, after-effects?
>
> > Who dare to estimate the influence of elective affinities?
>
> At all events, he who would presume to estimate what man is, must take into consideration what he was, and how he became so. But such barefaced pretension are common, and we have often enough met with them; indeed they are always recurring, and they must be tolerated.”

This last issue seems to well-capture the what is called the "standard human Gibbs free energy of formation", a summation of the past energies and entropies that went into the formation or synthesis of a given human in a given state of existence.

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â— Carl Friedrich Zelter – Wikipedia.

θΔics

In science, **Carlo Cercignani** (1939-2010) (CR=9) was an Italian mathematician and physicist, who specialized in the kinetic theory of gases, noted for his 1998 *Ludwig Boltzmann: the Man Who Trusted Atoms*, with forward by Roger Penrose, which gives a well-rounded inside biographical look at the Ludwig Boltzmann and those associated with his work in statistical mechanical thermodynamics. [1]

Quotes

The following are noted quotes:

> "Gibbs succinct and abstract style and unwillingness to include examples and applications to particular experimental situations made his work very difficult to read. Famous scientists such as Helmholtz and Planck developed their own thermodynamic methods in an independent fashion and remained quite unaware of the treasures buried in the third volume of *Transactions of the Connecticut Academy of Arts and Sciences*."
>
> — Carlo Cercignani (1998), *Ludwig Boltzmann: the Man Who Trusted Atoms* [1]

Reference

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θΔics

In human physics, **Carlos Allones Perez** (1955-) is a Spanish physicist and sociologist noted for his 2004 English online translation and commentary on Italian theoretical physicist Ettore Majorana's famous *circa* 1935 last article "The Value of Statistical Laws in Physics and Social Sciences" [1]

Education

Perez studied physics for two years in Santiago University after which he completed a PhD degree in political science and sociology in the Complutense University of Madrid. Currently, Perez is a sociology professor at the University of Santiago de Compostela. Perez has written at two books and several articles representative of his sociological views. [2]

Quotes | Favorites

The following are some of Perez' favorite quotes:

> "I deny such an accusation, madam. Whatever may be my personal opinions I am not trying to impose them on your planet. I have simply taken up the task of clarifying certain truths and making your people aware of certain cold and hard mathematical equations, which will add up in the end to disaster and which cannot be changed by beliefs, prayers nor by soap operas broadcast over your video-nets."
>
> — George Martin (1986), *Tuf Voyaging*

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θΔics

In hmolscience, **Carlos Ardenis Silva Hernandez** (c.1982-), cited as Carlos A. Silva, is a Venezuelan-born American mechanical engineer noted for his 2008 entropy generation theory of human aging, co-developed with Indian-born American mechanical engineer Kalyan Annamalai, and for their 2011 "Human Body: Formula" chapter subsection, of *Advanced Engineering Thermodynamics*, wherein, via citation of Thims human molecular formula (2002), they define a human, from a thermodynamic point of view, as "a 26-element energy/heat driven dynamic atomic structure."

Education

Silva completed his BS in mechanical engineering in 1994 at IUPFAN, Venezuela. From 1995 to 2003, Silva worked as a production supervisor at Tecpetrol de Venezuela. Silva then entered Texas A&M University, working as a research assistant and instructor, while doing graduate school coursework. One of his courses was Indian-born American mechanical engineer Kalyan Annamalai's graduate thermodynamics classes, whom Annamalai describes as a "very bright student". [3] In 2004, after reading the 1977 article "Measuring the rate of living of the Human Organism by Entropic Analysis" by Hsuan-Hsien Wang and "Entropy Generation in the Human Body: Estimation by Means of Energy Requirements", Daniel Hershey, Annamalai and Silva attempted to extend on this work by applying similar procedure on entropy generation of whole body as a sum of vital organ generation rates, which resulted the 2004 report "Entropy Generation in the Human Body: Estimation by Means of Energy Requirements" by Silva and two joint journal articles on human entropy generation by Annamalai and Silva. [4] Silva completed his MS in this general area in mechanical engineering in 2005. Silva did not, however, go on to complete his PhD on human entropy generation as funding for this type of human thermodynamics research or professorship at that time to support him in human entropy generation graduate school work was not available at this time. [3] Instead, Silva completed his PhD in 2010 with a dissertation on "Molecular Dynamic Simulation of Thermo-Mechanical Properties of Ultra-Thin Poly Methyl Methacrylate Films". [2] Silva, currently, is a project engineer at FMC Technologies, Texas.

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1. (a) Annamalia, Kalyan and Silvia, Carlos. (2011). "Thermodynamics and Biological Systems", in: *Advanced Thermodynamics Engineering*, *Second Edition* (Kalyan Annamalai, Ishwar K. Puri, and Milind A Jog) (§14; §§14.4.1: Human body | Formulae, pgs. 726-27; Thims, ref. 88). CRC Press.
(b) Silvia, Carlos and Annamalia, Kalyan. (2008). "Entropy Generation and Human Aging: Lifespan Entropy and Effect of Physical Activity Level", *Entropy*, Vol. 10 (2), pgs. 100-23.
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3. Email communication from Kalyan Annamalai to Libb Thims (17 Jun 2013).
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External links

â— Carlos Silva – LinkedIn.

θΔics

In thermodynamics, **Carnot cycle** (TR:85) is a reversible four state transformation cycle of a working substance (system), typically depicted on a PV diagram, such as shown adjacent, formed by two isothermals (paths 1:2, 3:4) and two adiabatics (paths 2:3, 4:1), wherein during the isothermal expansion step (1:2) the system absorbs an amount of heat Q_E (expansion heat) from the hot body (source), and during the isothermal compression step (3:4) the system releases an amount of heat Q_C (compression heat) to the cold body (sink). [1]

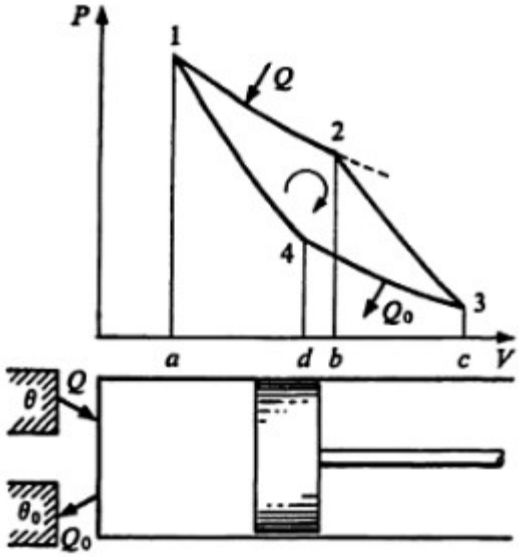

Left: a 1979 depiction of the four state **Carnot cycle** by American mechanical engineer Joseph Kestin, where the hot body and cold body temperatures are $\theta > \theta_0$, and the heats, Q and Q_0, are assumed to be different. [3] Right: The two step Papin cycle, as described by French physicist Denis Papin, in his 1690 Papin engine model, which is the basis for the Carnot cycle.

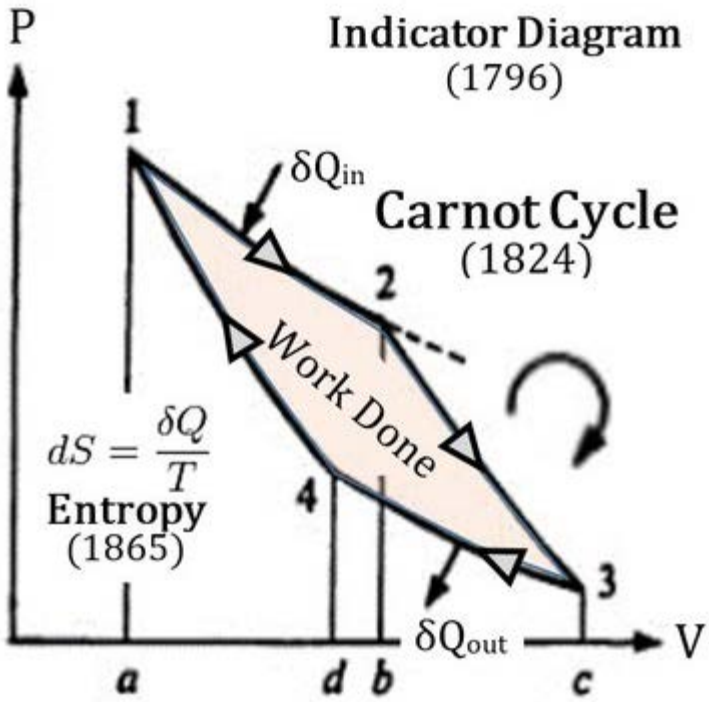

The working substance (generally water) of the Carnot cycle is typically contained within the volume confines of piston and cylinder, with the implicit assumption that the cylindrical container has nonconducting lateral walls and a nonconducting piston, such that heat can only enter or leave the working substance at the base of the cylinder, by contact with either the hot body (generally a boiler) and the cold body (generally a spray of cold water). [4]

Etymology

In 1690, French physicist Denis Papin, in his "A New Method to Obtain Very Great Motive Powers at Small Cost", introduced the two step Papin cycle description of a steam heat engine, loosely described by a step one of a person holding a fire under a water filled piston and cylinder (allowing expansion) followed by a step to of a person holding a

tub of cold water under the piston and cylinder (allowing contraction).

This formed the basis of the theoretical heat engine devised by French physicist Sadi Carnot in his 1824 *Reflections on the Motive Power of Fire*. In this memoir, Carnot himself (according to the 1960 English translation by Eric Mendoza) seems to have used the term "series of operations" to describe the operation of the generic heat engine.

In 1834, French physicist Emile Clapeyron used the term "cycle of operations", in his graphical description of Carnot's model of the operation of the heat engine, to describe the "quantity of action" developed by changes of state, on going through in the steps 1:2:3:4, after which, when the body returns to state one, according to Clapeyron, the system is "in precisely it original state".

The actual person who coined or first used the term "Carnot cycle" needs to be tracked down.

Irreversibility

The underlying 1690 two-step Papin cycle version of the Carnot cycle, in itself, is very simple: alternately heat and cool any given body (in the universe) and confine the resulting volume change expansions and contractions so as to to produce reciprocating motion (repetitive up-and-down or back-and-forth motion), motion which can be coupled to produce useful work, via a rocker arm (Newcomen engine, 1712), crank (Pickard engine, 1780), or sun and planet gear (Watt engine, 1781). [5]

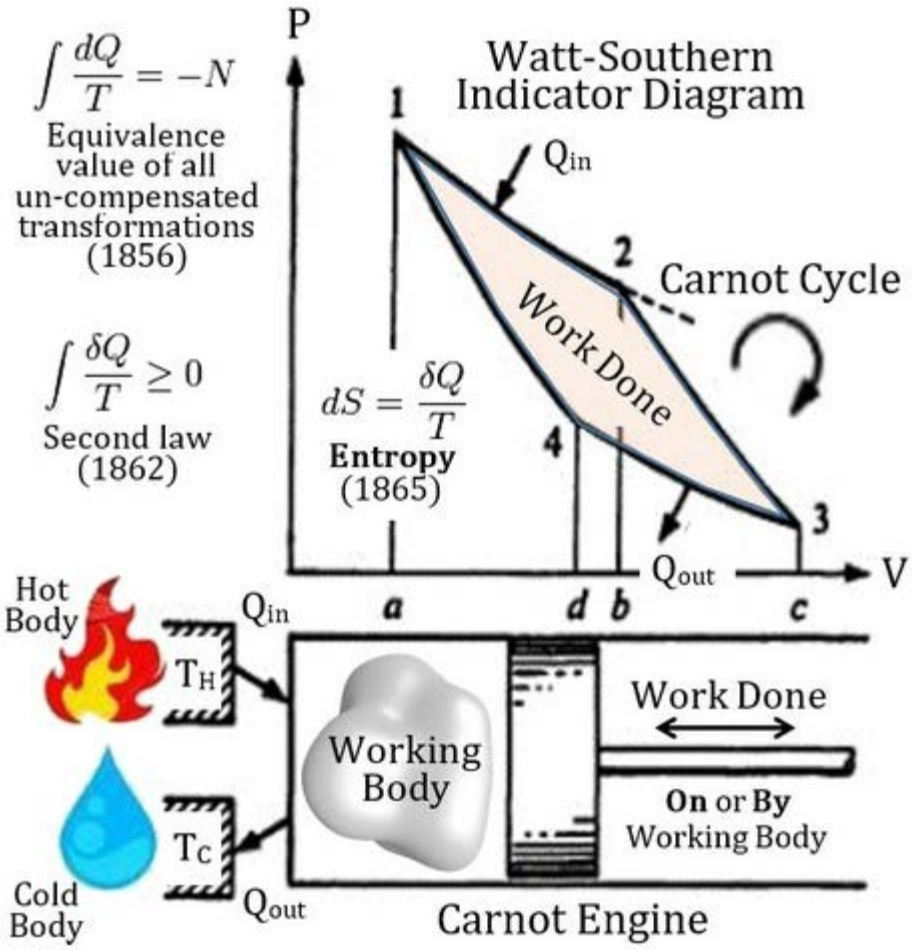

The crux of the model, which invariably accounts for the underlying difficulty of thermodynamics, is Carnot's "re-establishment of equilibrium in the caloric" assumption that the "quantity of heat", previously existing in the body in its start state, "remains unchanged" when the body returns to its original or rather final starting point state; which is described by Emile Clapeyron as a state where system is "in precisely it original state" (1834); which is described by German physicist Rudolf Clausius as an "ingenious method in which the body is allowed to undergo various changes in succession, which are so arranged that it returns at last to its original condition."

What this has come to mean, thermodynamically, is the conclusion that in the hypothetical "reversible cycle", which is what the Carnot cycle is, the internal energy change is zero:

$$\Delta U = 0$$

which says that the initial and final internal energy states of the system are the same. [4] The reasoning for Clausius' use of the term "ingenious" to describe Carnot's cycle, is that internal work, which the atoms and molecules of the system do on each other (which in human terms equates to non-compensated types of work people [human molecules] do on each other in a day), in the expansion stroke, W_{IE} is assumed to exactly cancel out or compensate for the amount or measure

of internal work done in the compression stroke, W_{IC}. Stated mathematically:

$$W_{I_E} = W_{I_C}$$

Hence, this amount of "internal molecular work", which Clausius says is "impossible to determine exactly, in most cases", cancels out or is assumed to cancel out in the reversible cycle or process. Hence, for the Carnot cycle, the first law:

$$dQ = dU + dW$$

with $\Delta U = 0$, becomes:

$$dQ = dW$$

and thus the external useful work, i.e. that coupled to the movement of the rocker arm, crank, or sun and planet gear, done in one reversible Carnot cycle is given by the expression:

$$W = Q_E - Q_C$$

which says that the work output of the engine equals the heat input of expansion Q_E, i.e. that given up by the hot body to the working body, less the heat release of compression Q_C, i.e. that given up by the working body to the cold body, a sum of work quantified graphically by the area enclosed in the curvilinear parallelogram on the PV diagram (1:2:3:4, above, or ABDC, below). If, however, the two types of internal work do not exactly compensate each other, which occurs in what is called the irreversible cycle or irreversible process, then we have:

$$W_{I_E} \neq W_{I_C}$$

and one must make recourse to the infamous Clausius inequality:

$$\oint \frac{dQ}{T} \leq 0$$

and the concept of exact differential (as compared to the inexact differential), the condition for an exact differential, and then eventually to a study of the history of differential equations, and to modern mathematical abstractions such as Caratheodory's theorem (1908), as well as to modern quantum mechanical (Bohr model, 1913), quantum electrodynamical (c.1960s), and to particle physics (c.1980-present) descriptions of quantities of heat.

Sticky point

Efficiency

A noted definition derived from the Carnot cycle is efficiency, symbol eta, which is defined as the ratio of the work output of the engine to the heat input:

$$\eta = \frac{W}{Q_E}$$

with substitution from previous derivation given above for the work output for the Carnot cycle:

$$\eta = \frac{Q_E - Q_C}{Q_E}$$

or with simplification:

$$\eta = 1 - \frac{Q_C}{Q_E}$$

where Q_C is the heat leaving the working body during the compression stroke and Q_E is the heat entering the working body during the expansion stroke; or, said another way, using in different notation:

$$\eta = 1 - \frac{Q_C}{Q_H}$$

where Q_C is the heat leaving the working body (entering the cold body) during the compression stroke and Q_H is the heat entering the working body (from the hot body) during the expansion stroke.

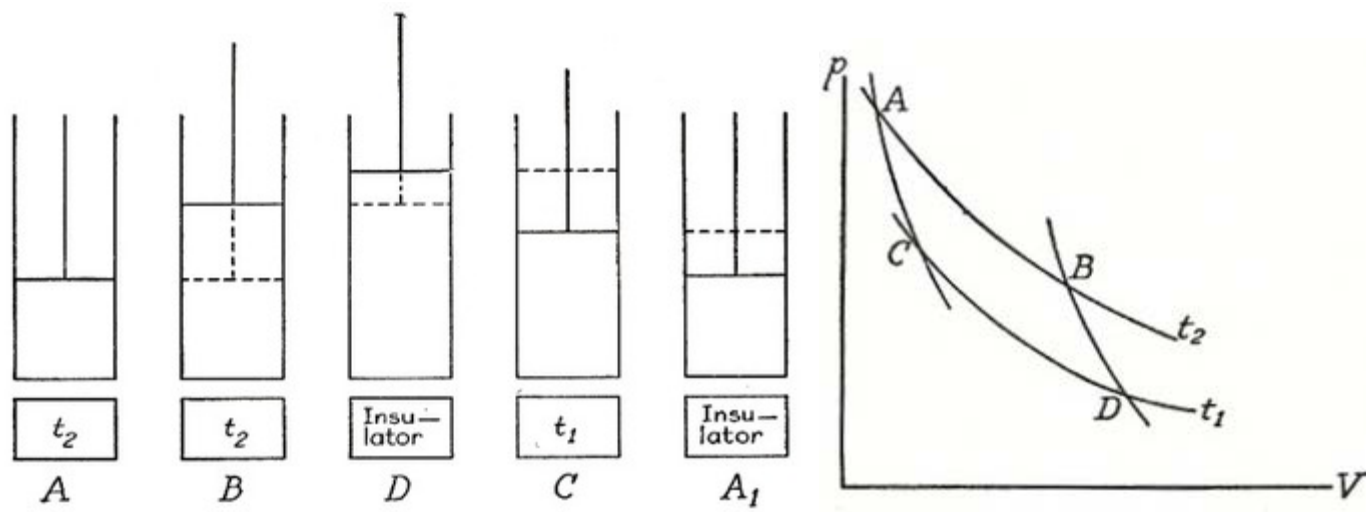

A 1937 physical depiction of the steps in the **Carnot cycle** by Italian-born American physicist Enrico Fermi, with the source and sink temperature description of $T_2 > T_1$. [4]

Overview

In his 1824 memoir 'On the Motive Power of Fire', Carnot explains how any physical body may be made to do work via expansions and contractions of its volume do to the action of heat additions or removals. This is based on what was then known as Boerhaave's law, formulated in 1620s by Dutch chemist Herman Boerhaave.

According to Carnot, the choice of working body is arbitrary; it could be, for instance, vapor of alcohol, of mercury, of a permanent gas, or even a metallic bar alternately heated or cooled. For his cycle, Carnot used atmospheric air. In this manner, Carnot's example working body, or *working substance* as he called it, was a system comprised of

approximately ten chemical species: nitrogen (N_2) 78%, oxygen (O_2) 21%, as well as argon (Ar), neon (Ne), helium (He), methane (CH_4), krypton (Kr), hydrogen (H_2), nitrous oxide (N_2O), and xenon (Xe), in smaller percentages.

To cause this working body of chemical species to perform useful work, we are told 'to imagine two bodies *A* and *B*, kept each at a constant temperature, that of *A* being higher than that of *B*. These two bodies, to which we can give or from which we can remove heat without causing their temperatures to vary, exercise the functions of two unlimited reservoirs of heat.' We shall call the first the *furnace* and the second the *refrigerator*. Motive power or work, according to Carnot, can thus be obtained by carrying a certain quantity of heat *Q* from body *A*, through the working body of chemical species, to body *B*.

Steps

The original description of the Carnot engine cycle process is actuated by following a series of heat movement steps, as detailed in seven stages, described by Carnot below, albeit with a few modern terminological substitutions (e.g. heat for caloric, etc.):

Step	Description	Diagram
1	Contact body *A* with the working body of chemical species or substance enclosed in space *abcd* or with the wall of this space; a wall that we will suppose to transmit heat readily. The working body becomes by such contact of the same temperature as body *A*; *cd* is the actual position of the piston.	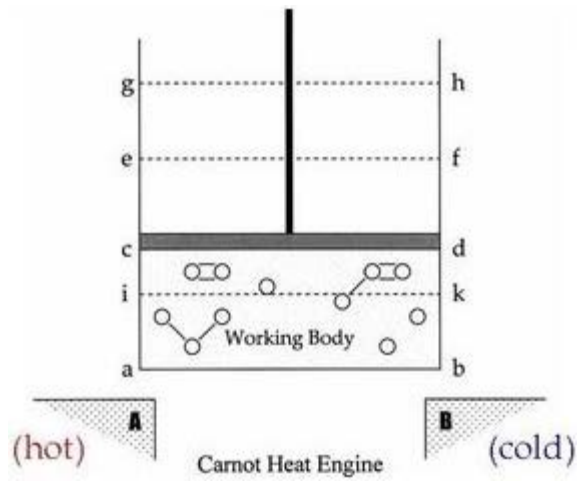
2	The piston gradually rises and takes position *ef*. Body *A* is at all times in contact with the working species, which is thus kept at a constant temperature during the rarefaction. Body *A* furnishes the heat necessary to keep the temperature constant.	
3	Body *A* is removed, and the working body is no longer in contact with any body capable of furnishing it with heat. The piston meanwhile continues to move, and passes to position *gh*. The working body is rarefied without receiving heat, and its temperature falls. Let us imagine that it falls till it becomes equal to that of body B; at which point the piston stops, remaining at *gh*.	
4	The working body is placed in contact with body *B*; it is compressed by the return of the piston as it is moved from the position *gh* to the position *cd*. The working body remains, however, at a constant temperature because of its contact with body *B*, to which it yields heat.	
5	Body *B* is removed, and the compression of the working body is continued, which being then isolated, its temperature rises. The compression is continued till the air acquires the temperature of body *A*. The piston passes at this time from the position *cd* to the position *ik*.	The hot body, working body, and cold body of the Carnot heat engine, labeled according to the stopping points in the various steps of the original version of seven-step **Carnot cycle**.
6	The working body is again placed in contact with body *A*. The piston returns from the position *ik* to the position *ef*; the temperature remains unchanged.	
7	The step described in 3 is renewed, then successively the steps 4, 5, 6, 3, 4, 5, 6, 3, 4, 5, and so on.	

In this cycle, we can define two types of work being done by the working body. During the expansion phase when the piston is being pushed outward, in steps 1-3, we can define this as useful or positive work. Conversely, during the compression phase when the piston is being contracted inward, in steps 2-5, this constitutes negative or contraction

work. The difference between the two constitutes the net work-output of the system.

Quotes

The following are related quotes:

> "He was a practical electrician fond of whiskey, a heavy, red-haired brute with irregular teeth. He doubted the existence of a deity but accepted **Carnot's cycle**, and he had read Shakespeare and found him weak in chemistry."
>
> — Herbert Wells (1906), "Lord of the Dynamos" (Ñº); in: *The Door in the Wall, and Other Stories* [1]

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(b) Crank (mechanism) – Wikipedia.
(c) Sun and planet gear – Wikipedia.
(d) James Pickard – Wikipedia.

Further reading

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External links

â— Carnot cycle – Wikipedia.

θΔics

In engines, **Carnot engine** is a heat engine, depicted adjacent, within which a working substance (typically steam; theoretically anything), contained within the piston-and-cylinder, is taken through a Carnot cycle of operations to produce mechanical work from heat.

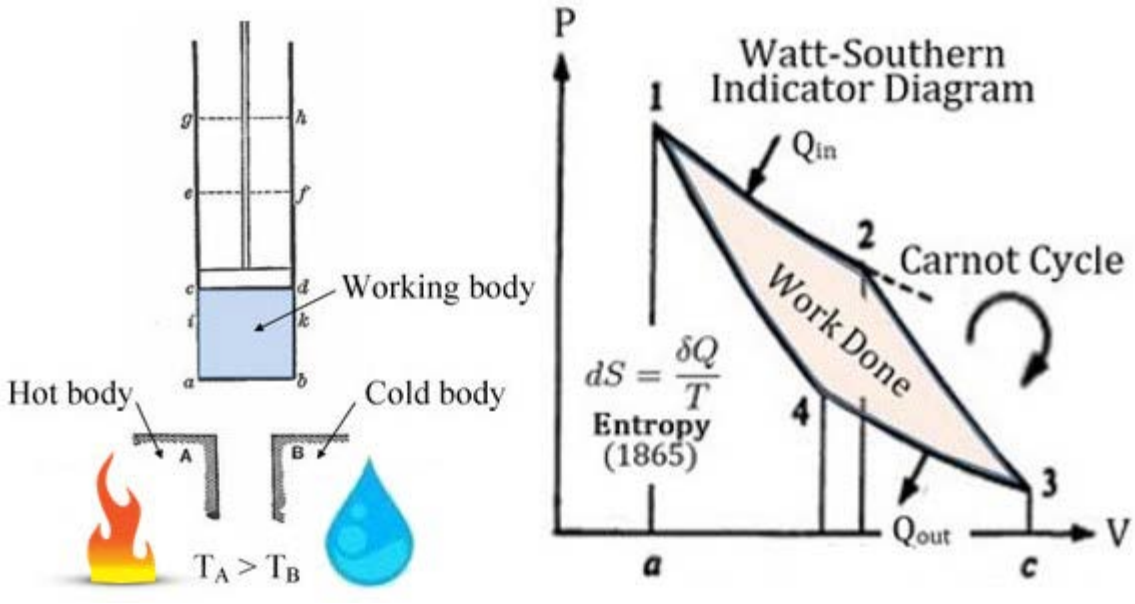

An annotated diagram of the original diagram of the **Carnot engine** (fig. 1 of Carnot's *Reflections*) left, along with the Carnot cycle (right).

Overview

The Carnot engine is a theoretical engine conceived by French physicist Sadi Carnot in 1824, in his *Reflections on the Motive Power of Fire*, based generally on the design of the typical steam engine of the era, i.e. on the Watt steam engine (c.1775), but in more exact detail on the design of the Papin engine (1690), according to which caloric heat particles were visualized to pass from the hot body (fire) to the cold body (stream of cool water) via what was called re-establishment of the equilibrium in the caloric. [2]

In 1871, the term “Carnot’s engine” was already in use by Scottish physicist James Maxwell. [3] The shortened term "Carnot engine" soon became a standard term in the decades to follow.

In 1899, American physicist John Shedd stated the following: [1]

> “There is, perhaps, no proposition in the range of physics that is more difficult of comprehension by the average student than that embodied in the so-called **Carnot engine** and *Carnot cycle*.”

A modern annotated version of the Carnot engine and Carnot cycle is as follows:

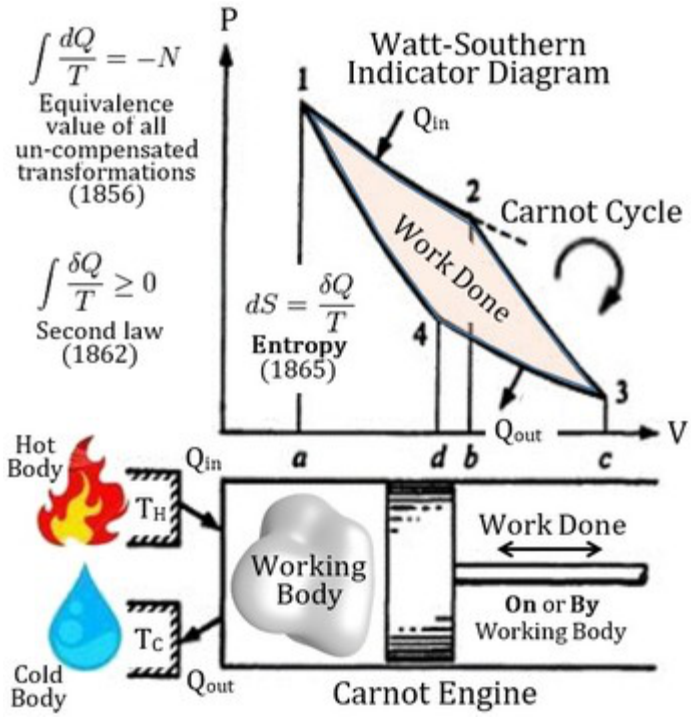

(add)

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2. Carnot, Sadi. (1824). "Reflections on the Motive Power of Fire and on Machines Fitted to Develop that Power." Paris: Chez Bachelier, Libraire, Quai Des Augustins, No. 55.
3. Maxwell, James C. (1871). *Theory of Heat* (pg. 148). Dover.

External links

â— Carnot heat engine – Wikipedia.
â— Carnot engine (in operation) – Java Script animation by Xing Min Wang.

θΔics

In thermodynamics, **Carnot function** (TR:9), symbol *C*, is the following function:

$$C = \frac{1}{T}$$

namely the inverse of the absolute temperature *T* of the body. [1]

Overview

In 1834, Emile Clapeyron, in his "Memoir on the Motive Power of Heat", in his discussion of the work of Sadi Carnot (1824), supposedly (Cardwell, 1971), alluded, defined, and or outlined the roots of the Carnot function in some way; the following is a take on this: [4]

In 1849, William Thomson, in his "An Account of Carnot's Theory of the Motive Power of Heat: with Numerical Results Deduced from Regnault's Experiments on Steam", is said (Cardwell, 1971) to have defined things such that μ (mu) was the reciprocal of Carnot's function C: [5]

$$\mu = \frac{1}{C}$$

In 1850, Rudolf Clausius, in his 1850 paper "On the Motive Power of Heat", building on precursory formulations of William Thomson (1849), Emile Clapeyron (1834), and Sadi Carnot (1824), is said to have derived the Carnot function exactly. [2] Specifically, Carnot had initially shown that the efficiency *e* of a Carnot engine working in the infinitesimal temperature range *dt* at temperature *t* is:

$$e = F(t)dt$$

where *F(t)* is a universal function of temperature *t*. [3] Building on this, Clausius showed that:

$$F(t) = \frac{1}{273 + t} = \frac{1}{T}$$

with *t* in degrees Celsius.

In 1865, Clausius, in the footnotes to Memoir One (1850), of his textbook of memoirs, following some derivation referred C as the Carnot function, which he was it was "frequently called", in the context of the following formula: [6]

$$\frac{\text{work produced}}{\text{heat transmitted}} = \frac{1}{C}dt$$

(add)

Quotes

The following are related quotes:

> "The reciprocal of **Carnot's function**, as defined by Clapeyron, is the work done by a unit of heat 'falling through' one degree, and on the gas scale it decreases as the temperature increase."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 239) [4]

See also

â— Thermodynamic function

References

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2. Clausius, Rudolf. (1850). "On the Moving Force of Heat and the Laws of Heat which may be Deduced Therefrom", Communicated to the Academy of Berlin, Feb.; in: Poggendorff's *Annalen*, March-April, Vol. lxxix, pgs. 368, 500; English translation in: *Philosophical Magazine*, July 1851, Vol. ii. pgs. 1, 102. Publisher.
3. Müller, Ingo. (2007). *A History of Thermodynamics: the Doctrine of Energy and Entropy* (Carnot function, pgs. 54-61). New York: Springer.
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(b) Clapeyron, Emile. (1837). "Memoir on the Motive Power of Fire" (pg. 347-58), *Taylor's Scientific Memoirs*, Volume One.
(c) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 239). Cornell University Press.
5. (a) Thomson, William. (1849). "An Account of Carnot's Theory of the Motive Power of Heat – with Numerical Results Deduced from Regnault's Experiments on Steam", (127-203) *Transactions of the Edinburgh Royal Society*, xiv.; *Annales de Chime*, xxxv. 1852.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 242). Cornell University Press.
6. Clausius, Rudolf. (1865). *The Mechanical Theory of Heat: with its Applications to the Steam Engine and to Physical Properties of Bodies* (translator: Thomas Hirst) (Ñº) (Carnot's function, pg. 46). John van Voorst, 1867.

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θΔics

In science, **Carnotian revolution** is an oft-used term for the thermodynamic revolution brought about following the publication of French physicist Sadi Carnot's 1824 treatise *Reflections on the Motive Power of Fire*. [1] Used as early as 1976, in economics, the term, according to one point of view, refers to the emergence of the new logtic that the material universe undergoes, from within itself and by itself, a continuous and irrevocable change in one particular direction. [2]

References

1. (a) Wilson, Kenneth D. (1977). *Prospects for Growth: Changing Expectations for the Future* (section: "The Carnotian Revolution", pg 293). Greenwood Pub Group.
(b) Vernadsky, Vladimir I. (1998). *The Biosphere*, (section: Introduction: pgs. 26, 31, by Jacques Grinevald). Springer.
2. Joint Economic Committee. (1976). "U.S. Economic Growth from 1976 to 1986", (pg. 69). *Unites States Congress*, US Govt. Print. Office.

θΔics

In thermodynamics, **Carnot's principle**, aka "principle of Carnot", is an 1824 postulate, made by French physicist Sadi Carnot, that in the construct of any generalized heat engine the motive power of heat is independent of the material of the working substance; depending solely on the temperatures between which the caloric (indestructible heat particles) is transported. [1]

Overview

In 1849, Irish physicist William Thomson restated a condensed version of Carnot's principle as follows:

> "At the end of a cycle of operations, when a body is left in precisely its primitive physical condition, if it has absorbed any heat during on part of the operations, it must have given out again exactly the same amount during the remainder of the cycle … the truth of this **principle** is considered as axiomatic by **Carnot**, who admits it as the foundation of his theory."

After further digression, Thomson then concludes by stating that: [2]

> "In the present state of science, no operation is known by which heat can be absorbed into a body without either elevating its temperature or becoming latent, and producing some alteration in its physical condition; and the fundamental axiom adopted by Carnot may be considered as still the most probable basis for an investigation of the motive power of heat; although this, and with it every other branch of the theory of heat, may ultimately require to be reconstructed upon another foundation, when our experimental data are more completed. On this understanding, and to avoid a repetition of doubts, I shall refer to **Carnot's fundamental principle**, in all that follows, as if its truth were thoroughly established."

The central issue of contention in Carnot's principle, addressed by Thomson, and later by German physicist Rudolf Clausius (1850), is the incompatibility between Carnot's assumption of the equivalence of caloric absorbed and emitted and during one engine cycle and the newly forming logic embodied in the mechanical equivalent of heat, as introduced by English physicist James Joule (1843) and others, which notes, based on experiment, that heat can be converted into work and vice versa; in the sense that, in a reformulation of Carnot's principle, during one engine cycle, some of the caloric must be converted or transformed into non-recoverable internal system work.

Clausius

In 1850, German physicist Rudolf Clausius begins his famous paper "On the Motive Power of Heat: and on the Laws which can be Deduced from It", by quoting Thomson in his 1849 paper as saying: "if we abandon his principle [of Carnot], we meet with innumerable other difficulties—insuperable without further experimental investigation—and an entire reconstruction of the theory of heat from its foundation." Then Clausius goes on to say that: "I do not think the difficulties are so serious as Thomson suggests [rather] we should not be daunted by these difficulties but should familiarize ourselves as much as possible with the consequences of the idea that heat is a mode of motion." Clausius concludes:

> "A careful examination shows that the new method does not stand in contradiction to the essential **principle of Carnot**, but only to the subsidiary statement that *no heat is lost*."

Clausius then, over the next fifteen-years, reformulated Carnot's principle (essentially be replacing the hypothesis of caloric by that of entropy) into the second principle of the mechanical theory of heat or the second law of thermodynamics, in the modern sense. In short, according to Clausius' refomulation, heat is lost in the body and that loss is quantified by an increase in entropy in the working body.

Carnot's theorem

A corollary of Carnot's principle, often called "Carnot's theorem" (although the two are somewhat intertwined), is that any two idealized (reversible) Carnot engines working between the same temperature differences ($\Delta T = T_H - T_C$) will always have the same efficiency η :

$$\eta = \frac{\Delta T}{T_H}$$

and that this is the maximum efficiency that any generalized heat engine can obtain. [4] This is sometimes called Carnot's rule. [5]

References

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● Meyerson, Emile. (1908). *Identity and Reality* (*Identité et Réalite*) (ch. 8: Carnot's principle, pgs. 259-90). Routledge.
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External links

● Carnot's principle – Engineer's edge.

θΔics

In thermodynamics, **Carnot's theorem**, a corollary of Carnot's principle, states that any two idealized (reversible) Carnot engines working between the same temperature differences ($\Delta T = T_H - T_C$) will always have the same efficiency η :

$$\eta = \frac{\Delta T}{T_H}$$

and that this is the maximum efficiency that any generalized heat engine can obtain. [1]

Notes

This heat engine efficiency theorem, sometimes called Carnot's rule, is named after French physicist Sadi Carnot who described the theorem in his 1824 memoir *Reflections on the Motive Power of Fire*. Another theorem, in the field of mechanics, by the same name, is attributed to Lazare Carnot, Sadi Carnot's father, which states that in any machine the accelerations and shocks of the moving parts all represent losses of moment of activity or of useful work done. [2]

References

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2. (a) Dugas, Rene, and Maddox, J.R. (1988). *A History of Mechanics* (3. Carnot's Theorem, pgs. 327-). Dover.
(b) Introduction by E. Mendoza in *Reflections on the Motive Power of Fire*, Dover, 1960.
(c) Carnot's theorem – Wikipedia.

External links

â— Carnot's theorem (thermodynamics) - Wikipedia.

θΔics

In hmolscience, **Carter Braxton Finn** (1935-) is an American writer noted for his 1974 thesis/dissertation *Religion, Philosophy, and the Second Law of Thermodynamics*, 164-leaves in length. [1]

Information on Finn seems to be non-existent; there seems to be only one copy available, held at the Library of the College of William and Mary. [2] Based on the title, however, Finn's work would seem to be on the topics of philosophy and religious thermodynamics in relation to the second law.

Education

Finn graduated from the College of William and Mary in 1964. [3]

Note

Carter B. Finn is not to be confused with C. B. P. Finn (i.e. Colin Finn), author of the 1993 textbook *Thermal Physics* (second edition), a Reader in physics at the University of Sussex. [4]

References

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(c) Finn, Carter Braxton (1935-) – WorldCat Identities Beta.
2. Finn, Carter Braxton. (1974). “Religion, Philosophy, and the Second Law of Thermodynamics” (WorldCat), *Thesis/dissertation.* College of William & Mary.
3. Carter B. Finn – W&M Alumni Association.
4. C. B. P. Finn – LibraryThing.com.

θΔics

In mononyms, **Cartesian** (CR:93) refers to the ideas, theories, and or models of Rene Descartes (1596-1650).

See also

- Cartesian coordinate system
- Cartesian economics
- Cartesian automaton
- Cartesian system
- Cartesian reductionism
- Descartes on the soul

External links

- Cartesian – Wikipedia.

θΔics

In dualism, **Cartesian dualism** is the belief that people are made of matter, specifically atoms and molecules, like other things in the universe, but that humans are particular to the universe, in that inside of the pineal gland, at the center of the brain, as posited by Rene Descartes (c.1620), there is a soul, which gives humans the unique property of free will and choice, the resulting actions (see: soul weight) of which are judged by god; hence, in short, normal matter is governed by the laws of motion (note: these weren't derived until the time of Newton, which post-date Descartes), whereas the type of matter we call humans, according to Descartes, is governed by two "dual" sets of laws: motion laws and god's laws, or something to this effect.

See also

â— Do atoms have souls?

External links

â— Cartesian dualism – AllAboutPhilosophy.org.

θΔics

In economics, **Cartesian economics** the study of economies from the perspective that the most important forms of knowledge useful to how do people live, is the force and processes of fire, of air, and all other bodies that surround humanity, so to employ people in the same fashion.

In 1920, English physical chemist Frederick Soddy introduced the subject of Cartesian economics, modeled on early views of French scientific philosopher Rene Descartes, as follows: [1]

> "The starting point of **Cartesian economics** is the well-known laws of the conservation and transformation of energy, usually referred to as the first and second laws of thermodynamics."

(add discussion)

See also

â— Cartesian system

References

1. Soddy, Frederick. (1921). "Cartesian Economics: the Bearing of Physical Science upon Start Stewardship", Nov. *Two Lectures to the Student Unions of Birkbeck College and the London School of Economics.*

θΔics

In terminology, **Cartesian reductionism**, refers to the brand of reductionism promoted by Rene Descartes (1637), according to which all operational things, such as animals and trees, can be reduced to the mechanisms of its parts in operation, similar to the way a clock marks the hours by means of the gears internal to its composition, driven by the power of the pendulum.

A still of the famous **Cartesian reductionism** scene (17:04-23:00), from the 1990 film *Mindwalk* (V), by Austrian-born American producer Bernt Capra, based on (Ñº) his brother Fritjof Capra's 1982 book *The Turning Point*, wherein, a dialogue accrues between a "romantic" poet, a "mechanistic" politician, and a "holist" physicist, wherein the physicist, at the bell tower of the Abbey of Mont St. Michel, France, explains how the gravitationally operated mechanisms of the clock, via Descartes (1637), became the standard model for the cosmos, after which, people began to mistake the model for the real thing, as the physicist argues, i.e. that nature was just a giant clock, not a living organism, but a machine—a "mechanistic view" that still dominates the world today, according to the physicist, even so-called political mechanics.

Overview

In 1637, French thinker Rene Descartes, in part five of his *Discourse on Method*, in elaboration on his so-called principles of philosophy argued that an organism is akin to a machine or automaton:

> "… a machine which having been made by the hands of God is incomparably better arranged, and is more admirable in its motions, than any that could be invented by men; and if there were such machines, which had the organs and appearances of an ape or some other nonrational animal, we would have no way of realizing that they were not of exactly the same nature as the animals …"

He then states that the whole world, animate and inanimate, operates like the mechanisms of clock:

> "I have described this earth, and the whole visible world in general, as if it were a machine in the shape and movements of its parts … for example, when a clock marks the hours by means of the wheels of which it is made, it is no less natural for it to do so than it is for a tree to produce its fruits."

(add discussion)

Religion | Science

The interjection of Descartes' machine model of nature, as summarized by the Capra brothers, in their 1990 film *Mindwalk* (V), initiated a revolutionary break with the church (20:45-22:00), because it situated the view that we no longer needed the Pope, or the teachings of religion, to tell people what to do, because the universe was a giant mechanism, the laws, rules, and operation of which people can figure out for themselves.

See also

â— Gibbsian reductionism
â— Newtonian reductionism

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θΔics

In mathematics, the **Cartesian system** or *Cartesian coordinate system* is a three-dimensional representation of space, in which a point *P* is referenced with respect to three axes, the x-axis (perpendicular to the y-axis), y-axis (perpendicular to the x-axis), and z-axis (perpendicular to the xy-plane). [1] The system is named after the French mathematician and philosopher René Descartes, who developed the system.

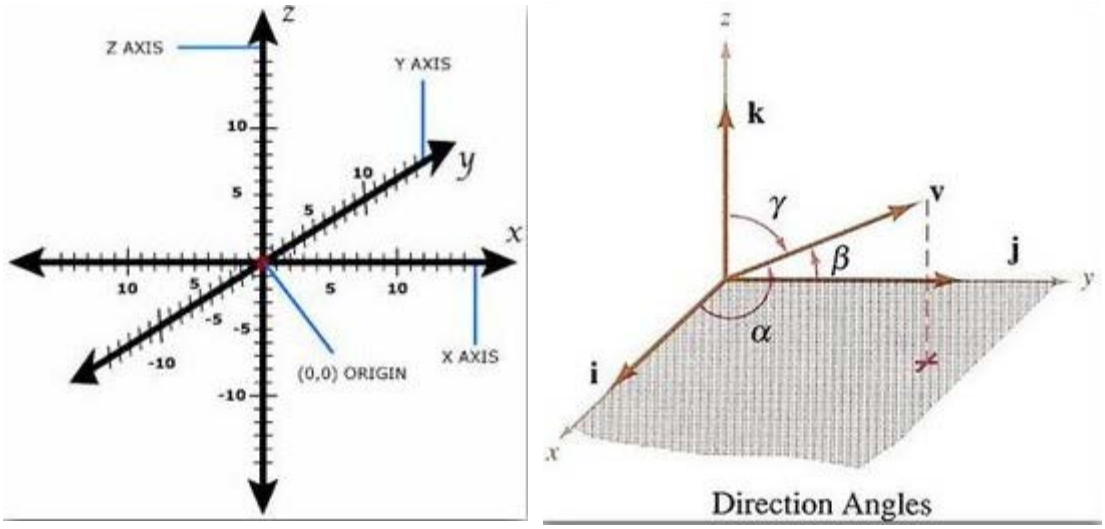

Left: a Cartesian coordinate system. Right: direction angles of in Cartesian coordinates.

History

The idea of this system was developed in 1637 by mathematician and philosopher René Descartes in his *Discourse on Method*, specifically in an appendix titled *La Géométrie*. The conception of the system was independently developed by French mathematician Pierre de Fermat, although Fermat did not publish the discovery. [2]

In part two of his *Discourse on Method*, Descartes introduces the new idea of specifying the position of a "point" or object on a surface, using two intersecting axes as measuring guides. In *La Géométrie*, he further explores the above-mentioned concepts. [3] Descartes' publication was the first to propose the idea of uniting algebra and geometry into a single subject "algebraic geometry" or *analytic geometry*, which means reducing geometry to a form of arithmetic and algebra and translating geometric shapes into algebraic equations.

Thermodynamics

The Cartesian coordinate system is often a starting point in the derivation of the science of thermodynamics, particulary in the 1850s derivations of German physicist Rudolf Clausius, in relation to a force acting on an infinitesimally small body, at a give point "â— " *P*, causing it to move through an small displacement *ds*, thus producing an amount of work *dW*. [4] This type of analytic geometric analysis was, in a way, a sort of mathematical quantification of productive results, i.e. functional work output obtained in the cyclical contraction and expansion of a body of steam (used to push a piston up and down, to which a rotative crank arm is attached), derived or inherent in the various "laws of Boerhaave", one in particular being that:

> "Ever body, whether solid or fluid, is augmented in all its dimensions by any increase of its sensible heat."

In other words, that "heat" causes bodies to expand or contract, through the action of a force, was a general law of the universe established as far back as 1724 by Dutch physician and chemist Herman Boerhaave. [6] The forceful movement of an infinitesimally small body through space is what is called work. The Cartesian system facilitates this type of analysis.

In particular, these types of calculations are facilitated via a vector analysis. For a vector in a plane, it is convenient to measure direction in terms of the angle, measured counterclockwise, *from* the positive axis to the vector. In three dimensional space, it is more convenient to measure direction in terms of the angles between the vector *v* and the three unit vectors *i*, *j*, and *k*, as shown (adjacent). The angles α, β, and γ are called the "direction angles" of *v*, and the quantities cos α, cos β, and cos γ, are called the "direction cosines" of *v*. [5]

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θΔics

In hmolscience, **Casper Hakfoort** (1955-1999) (RE=44), oft-cited as C. Hakfoort, was Dutch physicist and science historian noted for []

Overview

In 1992, Hakfoort, in his "masterpiece" article, as Dutch science historian Floris Cohen (2013) aptly describes it, "Science Deified: Wilhelm Ostwald's Energeticist World-View and the History of Scientism", penned a focused analysis on the social energetics theories of German physical chemist Wilhelm Ostwald; the abstract of which is as follows: [1]

> "The life and work of the German chemist and philosopher Wilhelm Ostwald (1853–1932) is studied from the angle of scientism. In Ostwald's case scientism amounted to: (i) the construction of a unified science of nature (energetics); (ii) its use as the 'scientific' basis for an all-embracing philosophy or world-view (energeticism); (iii) the programme to realize this philosophy in practice, as a secular religion to replace Christianity. Energetics, a generalized thermodynamics, was proposed by Ostwald and others to replace mechanics as the fundamental theory in physical science. Its contents and fortunes are briefly discussed. Ostwald's energeticist philosophy is illustrated by his classification of the pure sciences, his theory of happiness and his science-based ethics. Ostwald cherished a metaphysics in which energy and energy transformations were fundamental to all phenomena and processes. As a result, he transferred his optimism about science and technology to energeticism: philosophical, psychological and ethical questions were regarded as capable of solution by his scientistic philosophy. The practice of Ostwald's energeticism is illustrated by two of his 'Sunday sermons' (on prayer and on Christmas), as well as by a public lecture on science. He considered science the modern and legitimate substitute for God and claimed that science was, or would soon be, omnipresent, eternal, almighty, omniscient and perfectly good. Ostwald's substitute religion of science suggests the question, discussed in the last section of this paper, to what extent and in what sense historians might fruitfully interpret scientism as a secular religion."

(add discussion)

Education

Hakfoort completed his BS in physics in 1977 at Radboud University Nijmegen, his MS in 1980 at Utrecht University, with a thesis on the scientific method in the optics of Rene Descartes and Isaac Newton, where he focused on the principles and history of physics, and in 1985 completed his PhD with a dissertation on the issues in eighteenth-century optics under H.A.M. Snelders at the Institute for the History of Natural Science. [6] In 1995, Hakfoort's PhD was published in book form as *Optics in the Age of Euler: Conceptions of the Nature of Light, 1700-1795*, which discusses how Leonhard Euler published a wave theory of light in 1746, the abstract of which is as follows: [3]

> "According to received historiography, the fundamental issue in eighteenth-century optics was whether light could be understood as the emission of particles or as the motion of waves in a subtle medium. Moreover, the emission theory of light was supposed to have been dominant in the eighteenth century, backed by Newton's physical arguments. This picture is enriched and qualified by focusing on the origins, contents, and reception of Leonhard Euler's wave theory of light published in 1746, here studied in depth for the first time. Contrary to what has been assumed, in an important sense, the particle-wave debate only starts with Euler. In addition, Euler's wave theory was the most popular theory in Germany for thirty-five years. Finally, when the emission view of light suddenly became dominant in Germany around 1795, new chemical experiments were crucial. Reflecting on the mathematical, experimental, and metaphysical aspects of physical optics, **Casper Hakfoort** provides as an epilogue a general picture of early modern science."

In late 1986, Hakfoort became a lecturer (professor from 1990) in the group of Floris Cohen at the University of

Twente.

Scientism | Energetics

In the early 1990s, following his dissertation work, Hakfoort moved on to a focus centered on "scientism" in general, albeit centered on the energetics of Wilhelm Ostwald, which his associate Dutch science historian Floris Cohen (O) summarizes as follows: [4]

> "As **Casper** showed in his article 'The Historiography of Scientism: A Critical Review' (1995), the notion of scientism in a variety of meanings has been around for a long time; still, Casper put it to new uses by applying it to persistent efforts over the centuries, from Hobbes and d'Holbach to Capra and Hawking in our own day, to make the latest science serve the construction of a world-view."

Cohen, in his 2013 obituary-biography of Hakfoort, summarizes his turn to energetics history studies as follows: [5]

> "That theme he finally took the philosophical significance of science in modern society, to be more precise, the tendency of scientists to their theories, valid for a limited domain of reality, to build up complete worldviews and philosophies out. Both this phenomenon, also known as scientism, as the political counterpart, technocracy, **Hakfoort** ran against the grain and therefore deserved further investigation. His case he found in the late nineteenth-century ideas of the great German chemist and later Nobel laureate Wilhelm Ostwald. Ostwald strove his energetic teaching, which he saw as the basis for the whole of physics and chemistry, to build a comprehensive worldview. To this end, Ostwald designed amongst much more energetic happiness formula and he propagated energetic Sunday Meetings with associated rituals and chants, replacing traditional Christian worship. Hakfoort created, there is usually a great pleasure at hearing his lectures so far to get them singing along Ostwald replacement carols lustily. His most important publication on this subject, it is now almost be called classic 'Science deified Wilhelm Ostwald Energeticist world-view and the History of Scientism', published in 1992 in Annals of Science."

Cohen also notes that Hakfoort spent several times shorter or longer periods abroad, both in Germany, where he did research in the archives of Ostwald, as in the U.S. and England.

In 1992, Hakfoort was associated with the department of history of the University of Twente, Netherlands.

Ostwald book | Unfinished

At the start of 1998, Hakfoort was working on a new book on Ostwald, tentatively entitled *Science as Paradise: Wilhelm Ostwald's Energeticist World-View*, an expansion of his 1992 article of sorts, focused on 'what made this extraordinary man 'tick', in respect to his energetics replacing religion world view and its critics (supposedly Ludwig Boltzmann and Max Weber). The table of contents of the drafting book are shown below:

'SCIENCE AS PARADISE: WILHELM OSTWALD'S ENERGETICIST WORLD-VIEW'

LIST OF CONTENTS AS DRAWN UP DURING FINAL WEEK (with editor's notes in the third column)

title	**a/b/c***	**what written, to what extent**
PREFACE		1 page on sense of a personal bond with Ostwald
1. INTRODUCTION: PARADISE IS HERE	context b	complete
2. LEAVING HOME AND BECOMING A SCIENTIST	b	complete, but for a sentence here and there
3. ENERGETICS		
Inaugural lecture	a/b	complete
Giving birth to energetics	a/b	complete, except for section c. 'The origins and development of energetics': a few open places, and a few summary statements instead of the final paragraphs, but otherwise complete
Lübeck debate	a/c	• section a. 'The stakes and the issues' (on unification around 1700 vs. around 1900): a few summary sentences, but otherwise complete • b. 'The debate': complete, but for several open places and (on mathematical details and on some rival views) summary statements • c. 'Results': summary statements on energetics, otherwise (on Boltzmann's position) complete
Collapse and recovery	b	complete (i.e., 'Collapse', with 'Recovery' still in ch. 4)
4. NATURE AND HAPPINESS		opening section ('Recovery') complete
Philosophy of nature	a	extended account of *Vorlesungen*, complete but for notes in Dutch on ethics and on responses in general
Theory of happiness	a/b/c	• context of O.'s expounding the theory: not written • conceptual analysis of O.'s theory: complete,

		but for a few intermediate queries in Dutch • O.'s personal use of the theory: not written • Boltzmann's critique: complete, but for a few intermediate queries in Dutch why O. did not collapse this time: nothing but queries in Dutch
5. CULTURAL SCIENCE AND ETHICS		
Universal language & hierarchy of sciences	a/b	not written; one page of notes in Dutch only
Social theory, *Bildung* & natural science	b context	sketch of German social theory and of scientistic approaches to it: complete as far as it goes, but with many intermediate queries and a page of notes in Dutch at the end
Ostwald's energeticist theory	a	extended account of *Energetische Grundlagen der Kulturwissenschaft:* • 'Güteverhältnis': complete, with additional notes in Dutch • language: complete • law: passage on punishment complete; remainder only in notes in Dutch • economics (production, labor, money, market): complete, with intermediate notes in Dutch • science (and 'Gemeinschaft'): complete, with intermediate note in Dutch critical analysis of the book as a whole: only in rough outline, in 2 pages of notes in Dutch
Weber's critique	a/c	by and large complete; additional notes in Dutch
(Ostwald's moral theory)	a/b	---

6. SCIENCE AS RELIGION		devoted chiefly to *Religion und Monismus*
Becoming a preacher	b	O.'s becoming chairman of Monistenbund: only half a page of notes in Dutch
Public & functions	b/b context	O.'s aims with *Religion und Monismus*: complete
Historical development of Western culture	a	incomplete: account of 'Düsseldorf lecture' lacking; notes in Dutch on how to complete this section
Moral guidance and social organization	a	incomplete: notes in Dutch on how to complete this section
Emotional needs	a/b	passages on hunger, love, sociability: by and large complete as such, with intermediate notes in Dutch
(etc.)	a/b/c	5 pages outline in Dutch of *Religion und Monismus* and of 'Düsseldorf lecture'
7. EPILOGUE		---

During his last days, in this state, the unfinished book was partially completed, containing 55,000 words and being 427 kb in size, the table of contents of which recounted in respect to level of completion by his associate Floris Cohen, and Hakfoort expressed openness for the possibility of someone completing his book following is passing (reaction end). Unfortunately, all of Hakfoort's notes, computer files, photo copies of numerous books and articles, etc., that were for some time being kept stored at the department of history, at the University of Twente, were lost in a fire that destroyed the building in circa 2009. Some of chapter one is available as pdf via Floris Cohen. [4]

Reaction end

In the summer of 1998, Hakfoort fell ill and was no longer able to work; he died (dereacted) (ceased to exist) from a malignant brain tumor on 4 Mar 1999. [6]

Key | Find

The finding of the relatively unknown Hakfoort (Hmolpedia article #3,238), and his somewhat hidden gem article, occurred via reading of the citation of his work in the 2013 writings of American energetics historian Eric Zencey. [2]

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2. Zencey, Eric. (2013). "Energy as a Master Resource" (pdf), in: *State of the World 2013: Is Sustainability Still Possible?* (§7:##-; image, figure 1-2). Island Press, 2013.
3. (a) Hakfoort, Caspar. (1986). Optica in de eeuw van Euler : opvattingen over de natuur van het licht, 1700-1795 = Optics in the age of Euler : conceptions of the nature of light, 1700-1795. Publisher.
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Further reading

● Hakfoort, Casper. (1995). "The Historiography of Scientism: A Critical Review" (abs), *History of Science*, 33:375-395.

External links

● Hakfoort, Caspar – WorldCat Identities.
● Casper J.M. Hakfoort – Mathematics Genealogy Project.

θΔics

In hmolscience, **Caspar Isenkrahe** (1844-1921) was a German physicist noted, in religious thermodynamics, for his circa 1910s Christian apologetics publications, which tended to use entropy as an ontic opening like argument or proof for the existence of god. (Q)

Overview

In 1910, Isenkrahe, in his booklet *Energy, Entropy, and the Beginning and End of the Universe*, presented a systematical and critical investigation of the entropic argument in order to clarify precisely on which preconditions the argument rested.

Isenkrahe actively participated in the debate over entropy and theology, particularly on the subject of the entropic proof of God's existence. [1]

Most of his articles and books tended to focus on the intersection of physics and Christianity. His commentary included discussions of William Thomson's views of heat death, among others.

In 1915, Isenkrahe, in a book, discussed, via detailed and systematic account—but would not accept—the entropic argument as a proof for god's existence; he argued that the cosmological proof, as usually stated, rested on contradictions and erroneous reasoning, from which he concluded that it was in need of an improved, more exist formulation.

Education

From 1870 to 1911, Isenkrahe was a physics professor at *Gymnasium* schools in Krefeld, Bonn, and Trier.

References

1. (a) Isenkrahe, Caspar. (1910). *Energy, Entropy, and the Beginning and End of the Universe* (*Energie, Entropie, Weltanfang und Weltende*). Trier.
(b) Kragh, Helge. (2008). *Entropic Creation: Religious Contexts of Thermodynamics and Cosmology* (Isenkrahe, 17+ pgs). Ashgate Publishing, Ltd.
2. Kragh, Helge. (2008). *Entropic Creation: Religious Contexts of Thermodynamics and Cosmology* (contradictions, pg. 86). Ashgate Publishing, Ltd.

External links

- Caspar Isenkrahe – Wikipedia.

θΔics

In chemistry, **catalyst** is a molecular substance that increases the rate of a chemical reaction without itself undergoing any permanent change. [1] Catalysts that speed the reaction are called positive catalysts. Catalysts that slow down the reaction are called negative catalysts or inhibitors.

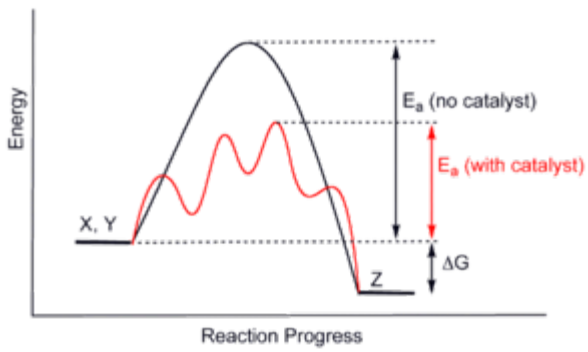

Generic potential energy diagram showing the effect of a **catalyst** in a hypothetical exergonic chemical reaction X + Y to give Z. The presence of the catalyst opens a different reaction pathway (shown in red) with a lower activation energy. The final result and the overall thermodynamics ΔG are the same.

Catalysis

The term "catalysis" is the action, process or result that occurs when a thing comes in contact with a catalyst.

Residence time

A related term is residence time, symbol τ (tau), being the average length of time a particle of reactant spends within a process vessel or in contact with a catalyst. [2]

Overview

The earliest use of catalysts occurred in the first millennium BC, where it was noted in the making of wine, cheese, and bread that it was necessary to add small amounts of the previous batch to make the current batch. [7]

In 1794, Elizabeth Fulhame (c.1750-c.1820), supposedly (Ñº), was the first to describe catalysis in detail.
In 1831, Alexander Mitscherlich referred to ‘contact processes’ and Johann Döbereiner who spoke of ‘contact action’. [6]

In 1835, the phrase ‘catalysis’ was coined by the Swedish chemist Jacob Berzelius who was the first to note that certain chemicals speed up a reaction. The following year, Berzelius postulated the idea of the “catalytic force”.

In c.1890, German physical chemist Wilhelm Ostwald was the first to realize that a catalyst acts without altering the energy relations of the reaction, and that it usually speeds up a reaction by lowering the activation energy. [5]

In c.1900, German chemist Fritz Haber developed the "Haber process" in which he was able to synthesize ammonia NH_3 from tightly bound oxygen molecules O_2 and hydrogen molecule H_2 via adding a catalyst surface of iron embedded with oxides in addition to higher temperatures.

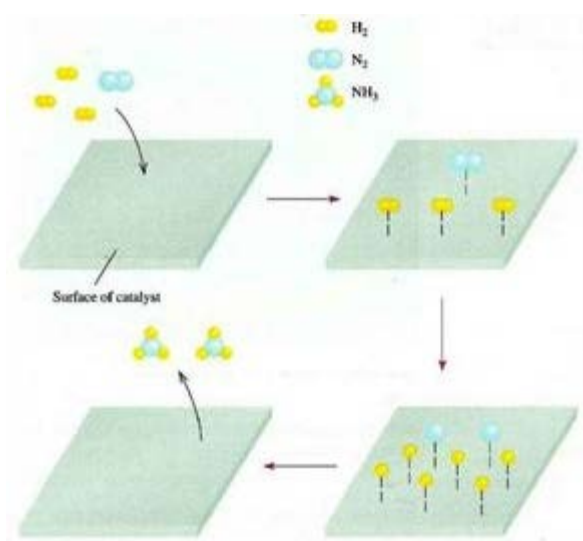

Steps of the Haber process, showing an iron surface (embedded with oxides) acting as a **catalyst** to the reaction of hydrogen with nitrogen to form ammonia. [4]

In 1928, in a landmark contribution to catalytic theory, English chemist Hugh Taylor suggested that a catalyzed chemical reaction is not catalyzed over the entire solid surface of the catalyst but only at certain ‘active sites’ or centers. [8] Taylor visualized active sites as unsaturated atoms or available binding regions in the solid that resulted from topological features such as surface irregularities, dislocations, edges of crystals, or cracks along grain boundaries, etc. Thus, an *active site* or binding site is a point on a catalytic reactive surface that can form strong chemical bonds with an absorbent molecule. [9]

Life origin | CHNOPS+ existence

In 1948, biochemist Jerome Alexander, in his chapter “Catalysis as the Efficient Cause of Evolution”, as cited by Judson Herrick (1956), speculated on the role catalysis played in the origin of life in the fabrication of what Ralph Lillie referred to as “novel emergents”, akin to the concept of “emergent evolution” (Ñº) of Lloyd Morgan (1922). [11]

In 1949, Lancelot Whyte touched on mechanism and autocatalysis in the context of biology. [12]

Human chemistry

See main: Human catalyst; Gavrilo Princip

The identification of what constitutes a "catalyst" in the process of a human chemical reaction is an advanced subject. The basic model, however, divides the matter of the biosphere into divisional categories: of reactive matter (e.g. human molecules), nutritive matter (e.g. an apple), substrate matter (e.g. the plot of land to a house), and catalytic matter (e.g. a television). [3] These tentative divisions, to note, serve only as crude guidelines, and where correctly each specific reaction must be studied in detail to determine the energy components effecting the human interactions.

In the study of the human chemical bond, for instance, the subject of secondary field particles, e.g. gold, as a type matter particle that transmits the force comes into play.

Quotes

The following are related quotes:

> "Ostwald talks of the possible new **catalytic** action of some new mind"
>
> — Henry Adams (1910), "Letter to Barrett Wendell", May 18

> "Speculators on the market play the same role as **catalysts** in chemistry. By buying when there is a tendency toward a rise in process, they hasten the change in the price. This bring the market into that state of equilibrium corresponding to the new conditions. Thy thus prevent the formation of false equilibria."
>
> — Jacques Rueff (1922), *From the Physical to the Social Science* [10]

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(b) Herrick, C. Judson. (1956). *The Evolution of Human Nature* (abs) (pg. 53). University of Texas Press.

12. (a) Whyte, Lancelot. (1949). *The Unitary Principle in Physics and Biology* (pg. 60). Holt.
(b) Herrick, C. Judson. (1956). *The Evolution of Human Nature* (abs) (pg. 53). University of Texas Press.

Further reading

â— Laidler, Keith J. (1986). “The Development of the Theories of Catalysis” (abs), *Archive for Historical Exact Sciences*, 35(4): 345-74.

External links

â— Catalysis – Wikipedia.

θΔics

In genius studies, **catch up effect** refers to the phenomenon that works produced by geniuses, in some cases, have such a significant erudition, acumen, and foresight—or in some cases impenetrability (density)—that the immediate intellectual world (or intelligencia) suffers from a "peculiar myopia" (Morris Zucker, 1945) or "mental inertia" (Henry Adams, 1907), the result of which is that there is a delay or "adjustment period" (Percy Bridgman, 1919), of several years or decades or some cases centuries before the world of the official intellectual elite is able to catch up, mentally, in conceptual assimilation terms, and adjustment or reformulation of belief system, to the work of the said genius.

Jean Sales
(211+ years ahead)

Johann Goethe
(210+ years ahead)

Henry Adams
(134-years ahead)

Three examples of accelerated "active mind" geniuses—namely: Jean Sales, who was imprisoned for his human molecule based moral philosophy, yet visited by Voltaire; Goethe, who for 23-years was not "vouchsafed many kind words" concerning his controversial *Elective Affinities*; and Henry Adams, coiner of the mental inertia theory, who was so far ahead of his time, in respect to the chemistry, physics, and thermodynamics of human social-history that in 1995 he was still being labeled, in a nearly upside down manner, as "more of a crank than a prophet" (John Diggins)—whose minds were so accelerated, as contrasted with immediate intelligencia, that the educated crowds of the generations to follow, afflicted from a type of myopic mental inertia, were forced to vicariously play a game of "**catch up**" to their work.

Density

The pinnacle example of a dense work is the 1876 appearance American engineer Willard Gibbs' science changing *On the Equilibrium of Heterogeneous Substances*, which he mailed to a significant number (see: Gibbs mailing list) of the of the leading scientists of the world, of which, as the story goes, only one person (James Maxwell) in the world could understand what he had did; the following are few example quotes:

> "Only one man lived who could understand Gibbs' papers. That was Maxwell, and now he is dead."
>
> — Connecticut Academy member (1879), *circa* Nov, said in meeting

> "It was a **number of years** before its value was generally known; this **delay** was due largely to the fact that its mathematical form and rigorous deductive processes make it difficulty reading for anyone, and especially so for students of experimental chemistry whom it concerns most."
>
> — Henry Bumstead (1903), "Josiah Willard Gibbs", *American Journal of Science*

It would not be until the arrival of Gilbert Lewis (1923), some 47-years later that Gibbs methods would be distilled and deciphered down into a usable form that typical physical chemists, lacking in the necessary mathematical background, could understand. It might well be said, moreover, that the world still has not yet caught up to Willard Gibbs, his work being like a giant wave that people are still riding, barely cling on to, many falling off.

Discussion

Some of this "catch up effect" phenomenon might have something to do with the fact that the so-called "active mind", as Henry Adams (1907), in the third person, described himself, differs in some way from the so-called "walking encyclopedia" mentality—as Daniel Dennett (2001) described the typical valedictorian—of the typical intelligencia (or elite intelligence) of the world, the result of which being that he active mind may spend more time focusing on adjustment and correction of belief system to be in alignment with the the findings of modern knowledge, whereas the walking encyclopedia type mentality may spend more time focusing on retention of knowledge, rather than on questioning of knowledge:

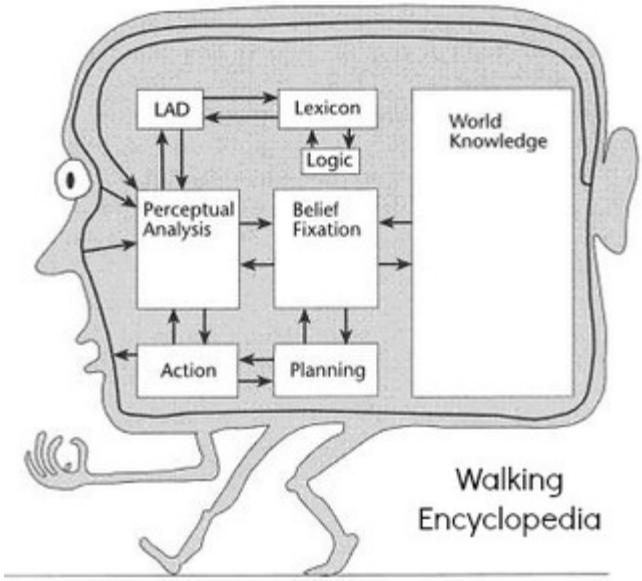

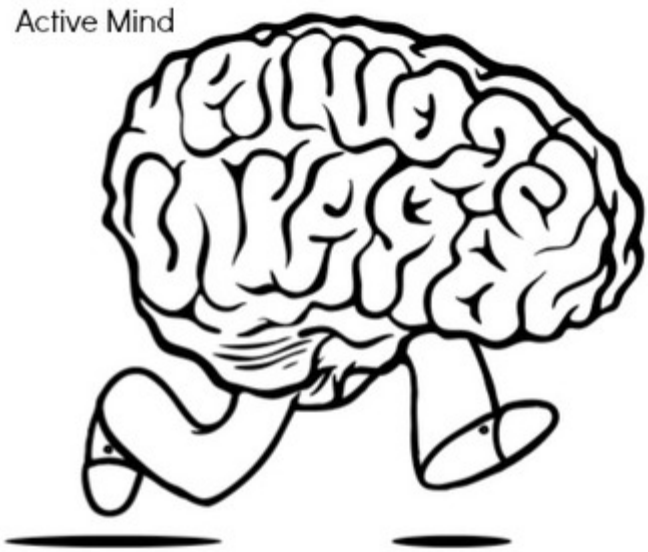

The result of which being that the walker, with their fixed belief system, will have a certain slow going crowd-like reactive "inertia" to sensory input, yielding a certain common or average trajectory, whereas the runner, focused on adjustment to belief system, will have a more accelerated momentum, often times with a trajectory not in alignment with the typical intelligentsia.

Gauge

The following 1945 statement by American physical historian Morris Zucker, indicating that it took the world 15-years to catch up to work of German history philosopher Oswald Spengler (IQ=), particularly the ideas found in his two-volume 1918/1922 *The Decline of the West*, and that it took 50-years to catch up to the work of Karl Marx (IQ=), particularly his 1867 three volume *Capital: a Critique of Political Economy*,

> "Over thirty-seven years ago, Seligman first published his *Economic Interpretation of History*. It has gone through several printings, editions and translations. In itself that work is a living example of the peculiar **myopia** which afflicts the intellectual world. Sometimes it takes ten or fifteen years for that world **to catch up** with a Spengler. Kyserling was more transparent. Seligman himself in 1902 commented upon the fact that fifty years after Marxism had made its first appearance and had stirred to the depths economic, social and philosophical thought among European scholars, here in America Marx was scarcely known outside of a few obscure immigrants socialists."

would seem to indicate that an "IQ" vs "time to catch up" correlation table could be constructed via crude extrapolation of Zucker's two datum point (15-years Spengler; 50-years Marx) if reliable IQ estimates can be obtained.

Overview

American two cultures genius Henry Adams, who was some 134-years ahead of his time in thinking, e.g. with with his view that: "social chemistry, the mutual attraction of equivalent human molecules, is a science yet to be created" (human chemistry was established as a science in 2007)—himself having to self-educate on his own beyond his Harvard education, which he considered to be a completed waste, that by 1907 he concluded that the highly "active mind" tends to be surrounded by less active minds moving with a type of "intellectual inertia", inertia defined as the resistance of any physical object to any change in its motion (including a change in direction):

> "The object of education should be the teaching [of] how to react with vigor and economy. No doubt the

world at large will always **lag so far behind the active mind** as to make a soft cushion of inertia to drop upon; but education should try to lessen the obstacles, diminish the friction, invigorate the energy, and should train minds to react, not at haphazard, but by choice, on the lines of force that attract their world."

— Henry Adams (1907), *The Education of Henry Adams*

The following are equivalent mental inertia quotes:

"When a **true genius** appears in this world, you may know him by this sign, that the dunces are all in confederacy against him."

— Jonathan Swift (c.1730), a Terrence Tao (IQ=180±) favorite quote [2]

"It is difficult to overestimate the value of Goethe's work to humanity. The bequest which he left to the world in his writings, and in the whole intellectual result of his life, is not as yet appreciated at its full worth; because, intellectually, the **world has not yet caught up to him**. His influence today asserts itself in a hundred minute ways—even where no one suspects it. The century has received the stamp and impress of his mighty personality. The intellectual currents of the age, swelled and amplified by later tributaries, flow today in the directions which Goethe indicated."

— Hjalmar Boyesen (1885), *The Life of Goethe*

"I must say, I started watching your videos over a year ago, and have re-watched many. And they still fascinate me. I'm only 17 and I'm seriously considering doing a degree in chemistry after watching your videos. The only downside is not many people I know can have a conversation about the things you're talking about. You were right your videos are **decades if not a century in front** of its time."

— Benjamin Cresdee (2011), comment on Human Chemistry 101 YouTube channel

"Sadly logic barely has any significance amongst a swarm of imbeciles. Some people are doomed to feel like an alien."

— Torandrius (2011), commentary on Libb Thims' HumanChemistry101 YouTube channel (Ñº)

In other words, active mind genius often suffers from what is called the "catch up effect", namely, a multi-century delay in respect to the ability of culture to digest what a " lightening bolt genius" (person, date) or "hammered genius" (William James, 1880) produces. While some of this "mental inertia" issue, that active geniuses have to face, can be attributed to the so-called Semmelweis reflex—the reflex-like tendency to reject new evidence or new knowledge because it contradicts established norms, beliefs, or paradigms—other aspects of it would seem to have to do something with the time it takes to rewire the cultural brain to the new truths perceived by the active mind, who may well be accelerated in thinking by some 1,000 books (e.g. Thomas Young) to 5,000 books (e.g. Goethe) in reading and digestion level, whereas for the cultural brain it may be delayed by multiple generations in respect to the same level of learning about nature and the universe. American physicist Percy Bridgman, in 1919, summarized this intellectual adjustment delay issue as follows:

"The first business of a man of science is to proclaim the truth as he finds it; and let the world adjust itself as best it can to the new knowledge."

This "world adjustment", for some truth seekers, e.g. Benedict Spinoza, will only accrue posthumously.

See also

â— Semmelweis effect (Ñº)

Reference

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2. Terrence Tao (favorite quotes) – Math.UCLA.edu.

θΔics

In philosophy, **categorical imperative** is the following rule: "act that your conduct may be taken as a universal law", as devised by German philosopher Immanuel Kant (1785),or "act only according to the maxim whereby you can at the same time will that it should become a universal law." [1][2] It has been called "perhaps the most famous prescription in all of moral philosophy"; although, in the correct sense, the golden rule is the most famous moral philosophy of all, behind the Ra theology concept of soul weight, which is the world's current dominate moral philosophy. [3]

Hypothetical imperatives

Kant distinguished two types of imperatives: *hypothetical imperatives*, those imperatives that distinguish the means to a certain end from the individual persons' perspective, e.g. "if you want an A on a test, start studying now", as contrasted with categorical imperatives, being imperatives that apply to all rational beings regardless of their desires. [5]

Thermodynamics

See main: Thermodynamic imperative; Energetic imperative

In 1912, German physical chemist Wilhelm Ostwald attempted to restate Kant's categorical imperative in terms of the pure energetics, or rather pure thermodynamics, on the logic that the so-called 'universal laws' are the first law and second law are the laws of the universe, according to the 1865 views of Rudolf Clausius. [4] In this sense, a Kant-Clausius restated imperative would read something along the lines of:

> "Act that your conduct may be taken as the combined law of thermodynamics in action."

Or, in truncated correct modern format:

> "Act that your conduct follows in accordance with the Lewis inequality."

The Lewis inequality being the 'universal law' that governs freely going earth bound reactions, human-human reactions being the prime example of such. Into the 20th century, various verbalized "thermodynamic imperatives" have been promoted along these lines.

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5. Wielenberg, Erik J. (2005). *Value and Virtue in a Godless Universe* (pgs. 77-78). Cambridge University Press.

Further reading

â— Wood, Frederick B. (date). "Ethics and the Thermodynamic Imperative", Working Paper.

External links

â— Categorical imperative – Wikipedia.

θΔics

In existographies, **Catharina Elisabeth Goethe** (1731-1808), born "Catharina Elisabeth Textor", her maiden name, husband of German lawyer Johann Caspar Goethe (1710-1782), mother to Johann Wolfgang Goethe (1749-1832), founder of human chemistry (1796), Cornelia Goethe (1750-1777), and three other children that did not reach adulthood.

Overview

The following is a photo of Catharina Goethe, the eldest daughter of the city mayor Johann Wolfgang Textor, who married German lawyer Johann Caspar Goethe (1710-1782) at age 17:

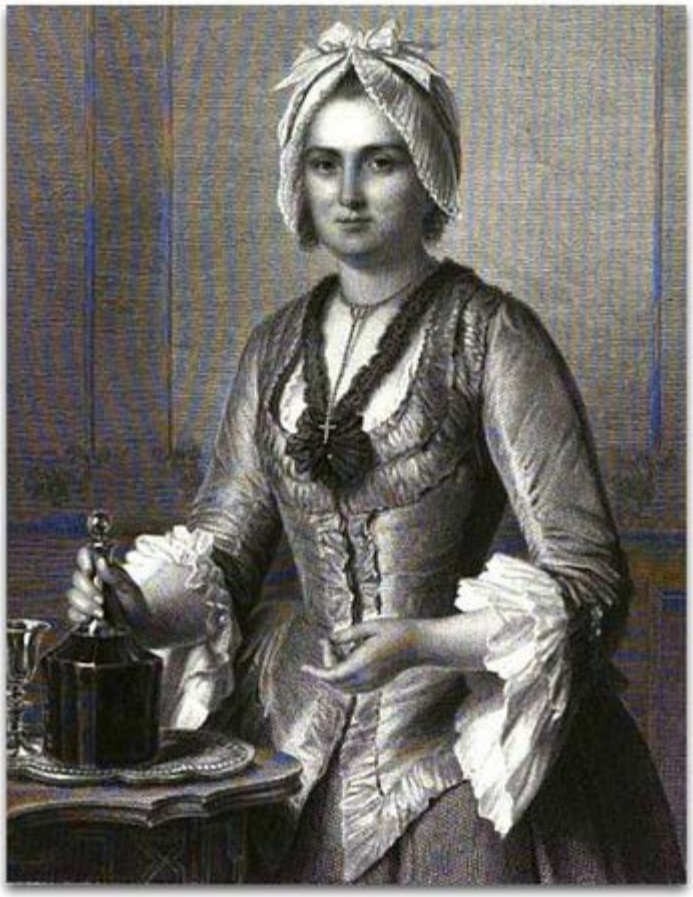

(add discussion)

References

1. Pecht, Friedrich, and Ramberg, Arthur. (1870). *Goethe Gallery: Containing Characters from Goethe's Works, drawn by Friederick Pecht and Arthur von Ramberg, fifty illustrations engraved on steel, with descriptive text by Frederick Pecht* (The Councillor's Lady Goethe, pgs. 24-29; Corneila Goethe, 32-35; *Elective Affinities*, pgs. 289-306). Appleton & Co.

External links

â— Catharina Elisabeth Textor (German → English) – Wikipedia.

θΔics

In genius studies, **Catherine Cox** (1890-1994) (CR:103) was an American psychologist noted for her 1926 book *Early Mental Traits of 300 Geniuses*, in which her and a group of psychologists at Stanford University methodologically assign IQ values (see: Cox IQ) to the top 300 geniuses, that lived in adulthood age during the years 1450 to 1850, based on the magnitude and density of their intellectual accomplishments over their lifespan. The following is Cox's famous summary quote of the study findings that German polymath Johann Goethe is the ceiling genius of individuals who lived during these years: [1]

> "One rater (M) has scored on the basis of the record of Goethe's youth an **IQ of 225**. Goethe's true IQ may in the history of mankind have been equaled in a few instances; one may well wonder whether it has ever been exceeded?"

It is of note to comment further in corroborating the findings of both Cox that Goethe was intellectual mentor to Einstein, who kept a bust of Goethe in his study along with a fifty-two volume set of Goethe's collected works in his personal library (more than any other author), was founder of human chemistry, and a key founding pioneer of human thermodynamics.

Overview

In the 1920s, American psychologist Lewis Terman, at Stanford University, creator of the 1916 Binet-Simon scale, a scale at which past the point of IQ 140 would be considered as genius range, assigned his new graduate student Cox the job of assigning IQ values to the world's "greatest" geniuses (those at or above 140), so to affix the top of his IQ scale to recognizable ceiling point or intelligence. [1]

In 1924, Cox, starting with the Cattell 1000, completed her PhD with a dissertation "On the Early Mental Development of a Group of Eminent Men". [3] She expanded this into the 1926 book *Early Mental Traits of 300 Geniuses*, in which she assigned IQ values to the top 300 geniuses who lived between 1450 and 1850, setting the ceiling genius IQ of 210 to Goethe. [1].

Buzan IQs

Cox's assignment of Goethe as the lead intellect of humanity was corroborated in 1994 independent study by Englishman accelerated-learning expert Tony Buzan (see: Buzan IQ) and English literature historian Raymond Keene who formulaically-ranked the top one-hundred geniuses of all time, arriving at the result that Goethe was the number two genius, behind Shakespeare. In their method, independent to that of Cox, they scored the top 100 leading minds on an 835-point scale (GS=Genius Score): dominance in the field (100), active longevity (100), polymath (100), versatility (100), strength and energy (100), IQ (100), ongoing influence (100), prolificness and achievement of prime goal (100), universality of vision (15), outstanding originality (10), deliberate desire to create teaching avenues or academies to further the genius' ideas (10).

Quotes | By

The following are quotes by Cox:

> "**IQ** is thought to be a measure which expresses the relative brightness or intelligence of any given individual."
>
> — Catherine Cox (1926), *Early Mental Traits of 300 Geniuses*

See also

â— Leta Hollingworth

References

1. (a) Cox, Catherine. (1924). "On the Early Mental Development of a Group of Eminent Men" (preliminary report of findings; fuller version in 1926 book) , dissertation/thesis. Stanford University.
(b) Terman, Lewis. (1925). *Genetic Studies of Genius. Volume I. Mental and Physical Traits of a Thousand Gifted Children* (Arc). Stanford University Press, 1926.
(c) Cox, Catharine. (1926). *Genetic Studies of Genius. Volume II. The Early Mental Traits of Three Hundred Geniuses* (GB) (Arc) (pdf) (ratings, pg. viii). Stanford University Press.
2. Catherine Cox – Human Intelligence, Indiana University.
3. Cox, Catherine. (1924). "On the Early Mental Development of a Group of Eminent Men", dissertation/thesis. Stanford University.

External links

â— Catherine Miles Cox – Wikipedia.

θΔics

In genius studies, **Cattell 1000** (Cattell 1000:#) is a list of the thousand most eminent individuals of history, made in 1894 by psychologist, *Science* editor, and *Popular Science Monthly* founding editor James Cattell, based on the degree of overlapping appearance and length of coverage in six biographical dictionaries and encyclopedias, two English, two French, one German, and one American.

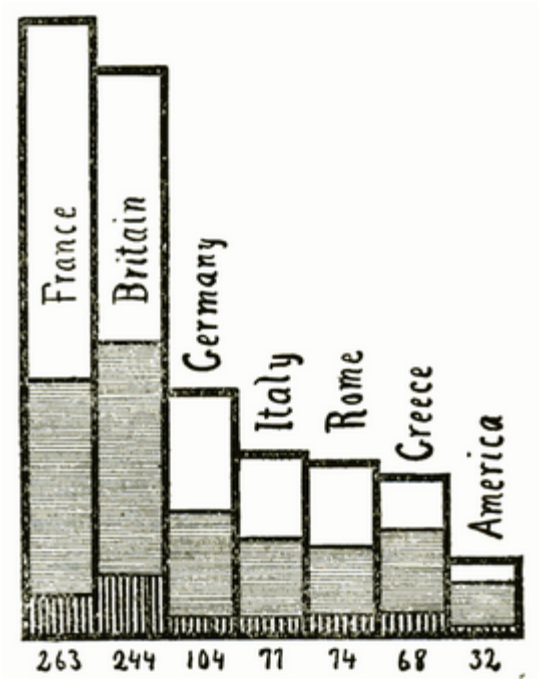

James Cattell (1860-1944)

American science magazine editor and America's first psychologist James Cattell, maker of the **Cattell 1000**, an 1894 listing of the top thousand preeminent people of history, based on multiple dictionary and encyclopedia space allocation. [1]

Greco-Roman geniuses

See main: Genius epochs

The following, derived from the eminence rankings, shows the distribution of eminent people during the Greco-Roman period: [1]

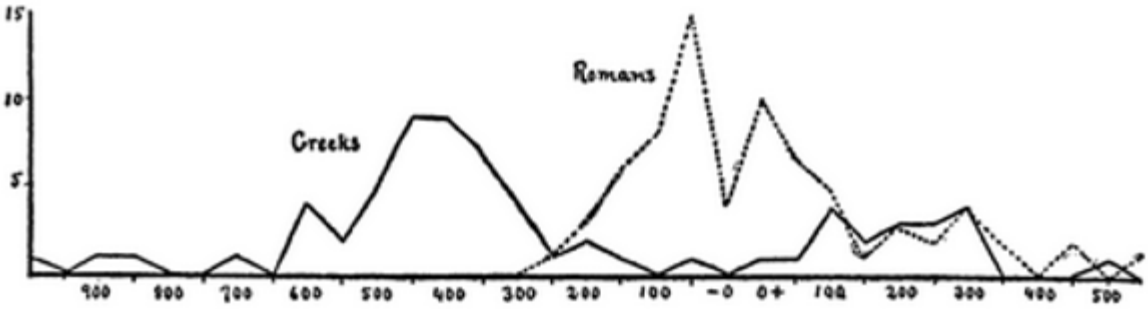

DISTRIBUTION OF EMINENT MEN IN THE GRECO-ROMAN PERIOD

Here, of note, we see Greek genius, peaking at 500-450BC, Roman genius, peaking at 100BC-100AD, followed by: Italian genius, British genius, Scottish genius, French genius, German genius, and American genius.

Cox geniuses

In 1924, American psychologist Catherine Cox, and her team of psychologists at Stanford University, under the direction of Lewis Terman, started with Cattell 1000, and took those who were of adulthood age between the years 1450 and 1850, and ranked them by IQ, arriving at a listing of the top 301 greatest geniuses (see: Cox IQ) existive during this period of history.

Methodology

The methodology used by Cattell is best described in his own words:

> "The method I followed to discover the 1,000 men who are preeminent was this: I took six biographical dictionaries or encyclopedias (*Lippincott's Biographical Dictionary*, *The Encyclopedia Britannica*, Rose's *Biographical Dictionary*, *Le Dictionnaire de Biographie Generale*, Beaugean's *Dictionnaire Biographique*, and Brockhaus' *Conversations lexicon*)—two English, two French, one German, and one American and found the two thousand men (approximately) in each who were allowed the longest articles. In this way

> some 6,000 men were found. I then selected the men who appeared in the lists of at least three of the dictionaries, and from these (some 1,600) selected the thousand who were allowed the greatest average space, the value of the separate dictionaries being reduced to a common standard. Thus was obtained not only the thousand men esteemed the most eminent, but also the order in which they stand."

A fairly interesting and discerning procedure, to say the least. The distribution of eminent people is shown in the adjacent bar graph, which Cattell describes as follows:

> "The rectangles are proportional to the numbers of the most eminent men produced by different nations. The shaded parts represent the more eminent five hundred, and the heavily shaded parts the hundred most eminent of all."

Here we see the 42-degree latitude (± 10°) rule of maximal genius evidenced.

List

The following are the results of Cattell's study, showing the top 1000 men of history, ranked by degree of eminence; the notation (Cattell 1000:#), e.g. Aristotle (Cattell 1000:6), shows an individual's Cattell ranking, when applicable, in Hmolpedia existographies:

1-100	101-200	201-300	201-300	401-500
1. Napoleon Bonaparte 2. William Shakespeare 3. Muhammad [not real] 4. Voltaire 5. Francis Bacon 6. Aristotle 7. Johann Goethe 8. Julius Caesar 9. Martin Luther 10. Plato 11. Napoleon III 12. Edmund Burke 13. Homer 14. Isaac Newton 15. Cicero 16. John Milton 17. Alexander the Great 18. Pitt 19. George Washington 20. Augustus 21. Wellington	101. Talleyrand 102. Fenelon 103. Thomas Carlyle 104. Pius IX 105. Pitt 106. More 107. Hannibal 108. Benedict Spinoza 109. Chateaubriand 110. Peter Abelard 111. Grant 112. Charles I (England) 113. Charles Darwin 114. Mazarin 115. Lord Bolingbroke 116. Elizabeth (England) 117. Ovid 118. Joan d'Arc 119. Livy 120. Corneille 121. Rabelais 122. Huss 123. a' Becket	201. Herodotus 202. Hadrian 203. Humphry Davy 204. Frederick II (Germany) 205. Catherine II 206. Conde 207. B. Jonson 208. Antony 209. Lucretius 210. Pompey 211. James II (England) 212. Canning 213. Strafford 214. Mencius 215. La Feyette 216. Alexander Hamilton 217. Alfred the Great 218. Pierre Gassendi 219. Cortez 220. Ludwig Beethoven 221. L. Bonaparte 222. Sevigne 223. Xenophon 224. Wycliffe	301. St. Basil 302. William of Orange 303. Longfellow 304. Philip IV 305. Sully 306. Christiaan Huygens 307. Louis VI 308. Charles Montesquieu 309. Eugene 310. Charles II (England) 311. Bernadotte 312. A. Severus 313. Klopstock 314. Innocent III 315. Zoroaster 316. Attila 317. G. Monk 318. Adam Smith 319. Ney 320. Victor Emmanuel 321. Prescott 322. Pindar 323. Beranger	401. Wilkes 402. Phidias 403. Philip Augustus 404. Moses Mendelssohn 405. Boniface VIII 406. Cobbett 407. Jean Bailly 408. Emerson 409. Joseph II (Germany) 410. Russell 411. Vauban 412. Ferdinand V. (Spain) 413. Bayle 414. Archimedes 415. Christina 416. Scipio 417. Thou 418. T. Fairfax 419. Metastasio 420. Louis IX

22. Raphael
23. Rene Descartes
24. Christopher Columbus
25. Confucius [not real]
26. Penn
27. Scott
28. Michelangelo
29. Socrates
30. Byron

31. Cromwell
32. Gautama [not real]
33. Immanuel Kant
34. Gottfried Leibniz
35. John Locke
36. Demosthenes
37. Mary Stuart
38. John Calvin
39. Moliere
40. Abraham Lincoln

41. Louis Philippe
42. Dante
43. Jean Rousseau
44. Nero
45. Benjamin Franklin
46. Galileo Galilei
47. Samuel Johnson
48. Robespierre
49. Frederick the Great
50. Marcus Aurelius

51. Hegel
52. Petrarch
53. Horace
54. Charles V. (Germany)
55. Mirabeau
56. Erasmus
57. Virgil
58. Hume
59. Guizot
60. Edward Gibbon

61. Blaise Pascal
62. Bossuet
63. Thomas Hobbes
64. Jonathan Swift
65. Thiers
66. Louis XIV
67. William

124. Jean d' Alembert
125. Grotius
126. Peter I
127. Polo
128. Carl Linnaeus
129. Raleigh [John Strutt]
130. Palmerston

131. Lamartine
132. Jos. Bonaparte
133. Tennyson
134. Plutarch
135. Charlemagne
136. Aristophanes
137. Philipp Melanchthon
138. St. Ambrose
139. Richelieu
140. James I.

141. John Hunter
142. Victor Hugo
143. Disraeli
144. Dryden
145. Origen
146. Titian
147. Boccaccio
148. Alberoni
149. Lessing
150. Johann Fichte

151. Etienne Condillac
152. Dickens
153. Wallenstein
154. Friedrich Schelling
155. Durer
156. Charles VII
157. Kepler
158. Trajan
159. Knox
160. Constantine

161. Jean La Fontaine
162. Van Dyck
163. Cervantes
164. Germaine Stael
165. Hippocrates
166. Louis XVIII
167. Clive
168. Rembrandt

225. Alfieri
226. Charles X (France)
227. William Harvey
228. Marius
229. Juvenal
230. Firdousee

231. Johannes Gutenberg
232. Lope de Vega Carpio
233. Pierre Laplace
234. Garibaldi
235. Necker
236. Froissart
237. Arius
238. Aeschylus
239. Etienne
240. Epicurus

241. Mithradates
242. Isocrates
243. Jerome
244. Andrew Jackson
245. Canova
246. Atterbury
247. Bulwer
248. Joseph Gay-Lussac
249. Wilhelm I. (Prussia)
250. Barthold Niebuhr

251. Fielding
252. George IV
253. Albrecht Haller
254. Friedrich Schleiermacher
255. James Watt
256. St. Bernard
257. William III
258. Joinville
259. Francois Arago
260. Fouche

261. Handel
262. Edmund Spenser
263. Joseph Lagrange
264. Johann Herder
265. Velasquez
266. Robert Bunsen
267. Alcibiades

324. Gregory VII
325. Beaumarchais
326. Rossini
327. Jeremy Bentham
328. Drake
329. Moreau
330. Michael Faraday

331. Boetius
332. Thomas Moore
333. S. Clarke
334. Channing
335. Alexander II (Russia)
336. Maria Theresa
337. Richard Wagner
338. Joseph Priestley
339. Josephine
340. Thackeray

341. Nicolaus Copernicus
342. Blucher
343. Soult
344. Maximilian
345. Sadi (or Lazare) Carnot?
346. Philo
347. Averroes
348. Calderon
349. Bolivar
350. Sulla

351. Ali-weli-zade
352. Le Sage
353. Heinrich Heine
354. Robert Boyle
355. Loyola
356. Marie Antoinette
357. Wesley
358. Poussin
359. Winckelmann
360. Turenne

361. R.B.B. Sheridan
362. Weber
363. William Hamilton
364. Avicenna
365. Anthony Shaftesbury
366. Bright
367. Catullus
368. Herman

421. L. Hopital
422. Marat
423. Guicciardini
424. Jacob Berzelius
425. Akbar
426. Sarpi
427. Marcus Varro
428. Armeniuis
429. Vergniaud
430. Bayard

431. Gregory I. (Pope)
432. Louis XIII
433. Beaton
434. Wilberforce
435. Tieck
436. Andrews
437. Lycurgus
438. O'Connell
439. Burnet
440. Reynolds

441. Seward
442. J. Franklin
443. Galen
444. A. Dumas
445. Alarie
446. Campanella
447. Arnauld
448. Honore Balzac
449. Plautus
450. a' Kemple

451. Richelieu
452. Pius VI.
453. Terence
454. Charles VII. (France)
455. Renan
456. Pizarro
457. Henry II (England)
458. Martial
459. Theodosius
460. R. Blake

461. J. J. Scaliger
462. Cardin
463. Cowper
464. Musset
465. Pius II
466. Villars
467. Helvetius
468. Belisarius

Wordsworth
68. Louis XVI
69. Nelson
70. Henry VIII

71. Joseph Addison
72. Thucydides
73. Fox
74. Racine
75. Friedrich Schiller
76. Henry IV (France)
77. William Herschel
78. Tasso
79. Thomas Jefferson
80. Ptolemy

81. Augustine
82. Alexander Pope
83. Niccolo Machiavelli
84. Emanuel Swedenborg
85. Philip II
86. Leonardo da Vinci
87. George III
88. Julian
89. Pythagoras
90. Macaulay

91. Rubens
92. Burns
93. Mosart
94. Humboldt
95. Auguste Comte
96. Cousin
97. Georges Cuvier
98. Justinian
99. Euripides
100. Camoens

169. Denis Diderot
170. Geoffrey Chaucer

171. Michel Montaigne
172. John Napier
173. Sand
174. Marmont
175. Tiberiius
176. Peel
177. Francis I (France)
178. Nicholas I
179. William I
180. John Mill

181. Sophocles
182. John Adams
183. Webster
184. Athanasius
185. Richard Bentley
186. Savonarola
187. Marlborough
188. J. Cook
189. Seneca
190. Zwingle

191. Cavour
192. Buffon
193. Goldsmith
194. Brougham
195. Alexander VI
196. Gerson
197. Alexander I (Russia)
198. Louis XV
199. Roger Bacon
200. Pericles

278. De Foe
279. Hastings
280. Colbert

281. Metternich
282. Richard I.
283. Tertullian
284. Lamennais
285. Leo X
286. Cobde
287. Gustavus Adolphus
288. Christoph Wieland
289. George Berkeley
290. John Law

281. Maintenon
282. Cranmber
283. Samuel Coleridge
284. Chrysostom
285. Beza
286. Murat
287. Mazzini
288. Marquis de Condorcet
289. Polybius
290. Ariosto

291. Chatterton
292. Phiny (Elder)
293. Turgot
294. Tacitus
295. Nicolas Malebranche
296. John of England
297. Danton
298. Chalmer
299. Germanicus
300. Joseph Haydn

Boerhaave
369. C. Grey
370. Leopold I. (Germany)

371. William Irving
372. Henry IV (Germany)
373. Tamerlane
374. Massena
375. Retz
376. B. Constant
377. Reuchlin
378. Sainte-Beuver
379. Baxter
380. K.W. Humboldt

381. Jenner
382. Justus Liebig
383. Philip II (Germany)
384. Thomas Aquinas
385. Dumouriez
386. Murillo
387. Lucian
388. Agassiz
389. Mehemet Ali
390. Thomas Wolsey

391. Solon
392. Jansen
393. Antoine Lavoisier
394. R. Walpole
395. Hogarth
396. Derby
397. Bichat
398. Sherman
399. Frederick W. III (Prussia)
400. St. Simon

469. Candolle
470. W. Temple

471. Palestrina
472. Robertson
473. David Strauss
474. Kotzebue
475. Bach
476. James Madison
477. Hesiod
478. George I. (England)
479. Dupin
480. F. A. Wolf

481. Geoffroy Hilaire
482. Farragut
483. John Q. Adams
484. Cato (Elder)
485. Gluck
486. Grote
487. Cyrus
488. John Bunyan
489. Grimm, L.
490. L. Bonaparte

491. Antoninus Pius
492. Chesterfield
493. Pius VII
494. Leopardi
495. L. de Medici
496. Richard II
497. Gouvion St. Cyr
498. Gregory Naz
499. Warburton
500. Strabo.

501-600	601-700	701-800	801-900	901-1000
501. Euclid 502. Desmoulins 503. Genii 504. Clarendon 505. De Witt 506. Essex 507. Brabe	601. Albertus Magnus 602. Boehme 603. E. T. W. Hoffmann 604. T. E. Hook 605. Marot 606. Henry I. (England) 607. Massillon	701. Sappho 702. Sarto 703. Anaxagoras 704. Isabella of Castile 705. A. W. Schlegel	801. Hammer-Purgstall 802. J. L. David 803. Propertius 804. Boileau	901. T. S. Gracchus 902. Delambre 903. Caligula 904. Edward III (England) 905. Richardson

508. Eusebius
509. Mahmud II
510. Ferdinand VII (Spain)

511. Frederick I (Germany)
512. Leonhard Euler
513. G. Howard
514. Reid
515. Gambetta
516. Ledru-Rollin
517. Ramon Llull
518. Michaelis
519. Mahmud
520. Robert Southey

521. Gaspard Monge
522. Lucullus
523. Hans Oersted
524. Hutten
525. Belden
526. Henry VI
527. Hawthorne
528. Villemain
529. Gall
530. Goldoni

531. Beaumont
532. Aguesseau
533. Beauharnais
534. J. F. Cooper
535. Catiline
536. Clement
537. J. B. Rousseau
538. Castlereagh
539. Bernard Fontenelle
540. Casaubon

541. Cellini
542. Charles VI (France)
543. L. R. St. Simon
544. Lavater
545. Carl Jacobi
546. Herod
547. Margaret of Anjou
548. Philip VI. (France)
549. Richter
550. Voss

608. Quintilian
609. Monmouth
610. Maecenas

611. Philip V
612. Michelet
613. Luxembourg
614. Tintoretto
615. Vespucci
616. Saladin
617. G. Buchannan
618. Henry V (England)
619. Samuel Butler
620. Anselm of Canterbury

621. Francois Rochefoucauld
622. Charles the bold
623. Manutius
624. Gustavus III
625. Cornelius
626. John of Austria
627. Delille
628. Michel Adanson
629. Cherubini
630. Jean Champollion

631. Mornay
632. Sieyes
633. Horace Walpole
634. Genghis Khan
635. Ferdinand Magellan
636. William IV (England)
637. Boleyn
638. Ronsard
639. Meyerbeer
640. Ramus

641. Richard Steele
642. Michael Servetus
643. Orleans d' P.
644. Stephen Gray
645. Josephus
646. Royer-Collard
647. Charles Fourier
648. St. Francis
649. Henry Clay
650. Vincenzo

706. Justin
707. Godoy
708. Epaminondae
709. P. Henry
710. Robert Fulton

711. Dumont d' UrviIle
712. Garrick
713. Andrieu
714. Ginguene
715. Regnard
716. Du °neselin
717. Wellesley
718. H. Vernet
719. George Eliot
720. Fuller

721. Hemclitus
722. Newman
723. Struensee
724. Thorwaldsen
725. Ckopofra
726. Zeno of Elea
727. Pouehkin
728. E. Coke
729. Augereau
730. Bronte

731. Jerome of Prag.
732. Aurungrebe
733. Vespasian
734. Philopeeman
735. Vane
736. Jouffroy
737. Charles Bonnet
738. Giotto
739. Agrippa
740. Alcuin

741. Gregory A Nyasa
742. Pierre Proudhon
743. PoMien
744. Arndt
745. Freret
746. R. Hall
747. Charles IX. (France)
748. Anne
749. Smollett
750. Demetrius Polior

751. Democritus

805. Leighton
806. Correggio
807. Grouchy
808. Francke
809. Lysias
810. Lannes

811. Donner
812. Pichegru
813. Erigena
814. Casanova
815. C. de Medici
816. Nadir (Shah)
817. Whitefield
818. J. P. J. d'Orleans
819. Lucan
820. Terriers

821. Richard III
822. ApeIles
823. Meckiewitz
824. Ximinee
825. Sobieski
826. E. Irving
827. Stein
828. Hoche
829. Louvois
830. Saadi

831. Montague
832. Alfonso X
833. Scribe
834. Oudino
835. Robert Livingston
836. E. Herbert
837. Friedrich Schlegel
838. Mariana
839. Rienzi
840. Sixtus V

841. Hahnemann
842. CeIsm
843. von Gentz
844. Deak
845. Pym
846. Gustavus IV
847. Monroe
848. Carl Gauss
849. Keats
850. C. Bell

906. Porphyry
907. Nicole
908. Waller
909. Balboa
910. Solyman

911. Catherine de Medici
912. La Harpe
913. Pole
914. Thales
915. Maria de Medici
916. Procopius
917. Lactantius
918. Borgia
919. Berengarius de Tours
920. Tallien

921. Camden
922. Armstrong
923. Jeffrey
924. Capo
925. Sismondi
926. R. Owen
→ Robert Owen | Richard Owen?
927. Apuleius
928. St, Just
929. Spontini
930. W. Laud

931. Irenaeus
932. Lacretelle
933. J. B. Lull
934. Paul I (Russia)
935. Stilicho
936. Arbuthnot
937. Dampier
938. Auber
939. Gregoire
940. Dole

941. La Chaise
942. Francis II (Germany)
943. Dolomieu
944. Aesop
945. F. M. Grimm
946. Dupuytren
947. M. J. Brutus
948. Ludwig Feuerbach
949. Barnaveldt

551. Mackintosh
552. Lao-Tsze (see: Taoism)
553. Paracelsus
554. Parsing
555. Themistocles
556. J. C. Wolf
557. Andre Ampere
558. George II (England)
559. Huskisson
560. Lachine

561. Albuquerque
562. Jean Bruyere
563. Dalhousie
564. Suwaroff
565. Hampden
566. Coligni
567. Photius
568. Ralph Cudworth
569. Alva
570. Pufendorf

571 Benjamin Thompson
572. Anderson
573. de Malherbe
574. Mary
575. J. B. Jourdan
576. Louis XII
577. Theodoric
578. Barren
579. Titus
580. Ranks

581. Aurelian
582. Caskell
583. Thomas Paine
584. Herbert
585. Lee
586. Phoeion
587. Mme. Roland
588. Henry III (France)
589. St. Pierre
590. Ingres

591. Warwick
592. Garrison
593. Erskine
594. Edmond Halley
595. Cato (younger)

Gioberti

651. Desaix de Voygoux
652. Grattan
653. Raimondo Montecuccoli
654. Sacy
655. Giordano Bruno
656. William Paley
657. Jerome Bonaparte
658. Barras
659. Maury
660. De la Vigne

661. Ali (Ibn abi talib)
662. Cavaignac
663. Cromwell
664. Charles d' Orleans
665. Sterne
666. Malesherbes
667. Middleton
668. Vico
669. Claude Berthollet
670. Jane Grey

671. A. Sidney
672. Salmasius
673. Pliny the younger
674. MacDonald
675. Sallust
676. Saxe
677. Marmontel
678. Clarendon
679. Sylvester II (Gerbert)

680. J. Taylor
681. Jean Lamarck
682. Holbein
683. Henry VII
684. Alessandro Volta
685. Rosa
686. Whiston
687. Hauy
688. Cyprian
689. A. Chenier
690. Diocletian

691. Pompadour
692. John Herschel
693. KauIliad

752. Gay
753. Cabanis
754. J. Flaxman
755. Gallatin
756. Fouquet
757. Cujas Guido Reni
758. C. S. Gracchus
759. Jeffreys
760. Gardiner

761. Oxenstierna
762. Kleber
763. Scipio
764. HabilIon
765. Lackpbde
766. Stewart
767. LyeII
768. Rameau
769. Cassini
770. Lalande

771. Sumner
772. Parker
773. Plotinus
774. Cagliari
775. Lacordaire
776. Marguerite d' ring
777. Larne
778. Kosciusko
779. P. H. Sheridan
780. Tooqueville

781. Hipparchus
782. Henry III. (England)
783. Whitegift
784. Rudolph I.
785. Constantin Volney
786. Jugurtba
787. Prior
788. Mingo
789. Oken
790. Murray

791. Bellarmino
792. Churchill
793. Laffitte
794. Henry II. (Franco)
795. W. Jones
796. J. Owen

851. Godwin
852. De la Croix
853. Charles VI (Germany)
854. Edward IV
855. Ennius
856. Epictetus
857. Ferdinand II
858. Harold II
859. Zeno of Citium
860. Fiesole

861. Pestalozzi
862. Dundonald
863. Tippoo Sahib
864. Clovis
865. Huet
866. Maistre
867. Cagliostro
868. John Ray
869. Thomas Malthus
870. Atticus

871. Barrow
872. Somers
873. Arkwright
874. Christopher Wren
875. Quinet
876. Nodier
877. Krudener
878. Bede
879. Claude of Lorraine
880. Theocritus

881. L. Stanislaus
882. Joseph Hooker
883. P. Sidney
884. Milner
885. Maimonidea
886. Odoacer
887. Henault
888. Theresa
889. Barthez
890. Espartero

891. Decazes
892. Harriet Martineau
893. T. Brown
894. Fermat
895. Agathocles
896. Empedocles

950. Farel

951. Akenside (Ñº)
952. Prince Albert
953. Bouillon
954. Hauser
955. Frederick Wilhelm II (Prussia)
956. Cerando
957. William Wallace
958. Chamfort
959. Agrippa
960. Garat

961. Audubon
962. A. Doria
963. Hareeree
964. Cowley
965. Heyne
966. Martinez
967. Petronius
968. Hortense
969. Mahommed II
970. Mai

971. Sue
972. J. Barry
973. Marivaux
974. Sebastian
975. Rotrou
976. W. Russell
977. Suchet
978. Paoli
979. Bopp
980. Romilly

981. Montalembert
982. John XXII
983. Rohan
984. Iamblicus
985. Bernhard
986. Simonides
987. Bagpsen
988. Raspail
989. William Thomson
990. Louis I

991. Otho
992. Sertorius
993. Macpherson
994. Claudianus
995. Domitian

596. Gustavus I
597. Vasco da Game
598. Pierre Maupertuis
599. Guyon
600. Courier

694. Poggio
695. Holberg
696. Miller
697. Henry IV (England)
698. Oehlenschlager
699. Boden
700. Manes

797. Cecil
798. Darius I.
799. Charles Edward Stuart
800. Donirotti

897. Charles V
898. Banks
899. Zinzendorf
900. Thierry

996. Bugeaud
997. Charles I (Naples)
998. Fauriel
999. Enfantin
1000. Babeuf

(add)

Proximity | Error effect

Cattell, of note, discusses the so-called "proximity error effect", i.e. the closer one gets to one's own time, the more prone to error the rankings become; for example:

> "As we come **nearer to our own times** it becomes increasingly difficult to measure tendencies by the methods we are using. The positions of men on the list are subject to **larger probable and constant errors**. Byron may be a household word on the continent and Shelley unknown, while the best criticism may place Shelley above Byron. Our list places Mendelssohn above Bach and ignores Schumann altogether—while the last thirty years have altered not only critical opinion, but also popular taste."

In other words, in 1894, George Byron (Cattell 1000:30) [RGM:347|1,260+] (IQ_C:180) (IQ:180|#134) was a "house hold" name, whereas Percy Shelley (1792-1822) (IQ_T:165) (IQ:185|#88), per posthumous genius reasons, was not yet making the top one-thousand eminence rankings, yet the "best criticism", aka the discerning mind (see: genius recognizes genius), as Cattell states, may well place Shelley above Byron; this reasoning affords to the modern consensus of things; by 1930, e.g., Lewis Terman calculated Shelley's IQ at 165 and by 2017, with Shelley's atheism rankings (HD:22) (FA:94) (GA:15) climbing, his citation (CR:14) climbing, and his human elective affinity work coming to light, he now rankings in at IQ 185 at top 500 genius position of #88 (May 2017).

The same can be said of Joseph Thomson, who in 1923 was ranked by *Time* magazine as the "greatest living physicist", likely owing to the hoopla over his recent 1897 discovery of the electron, but he was soon thereafter, particularly after Einstein's relativity-based light-bending (1920) measurement prediction confirmation, with the eclipse expedition of Arthur Eddington, Thomson was soon surpassed by Einstein, in greatest physicist rankings. Thomson, presently, e.g., does not even make the top ten rankings of most greatest physicist ever rankings.

Quotes

The following are related quotes:

> "It is an unquestionable fact, and one melancholy to contemplate, that during the sixty years which succeeded the death of Descartes, France had not possessed a single man who dared to think for himself. Metaphysicians, moralists, historians, all had become tainted by the servility of that bad age. During two generations, no Frenchman had been allowed to discuss with freedom any question either of politics or of religion. The consequence was, that the largest intellects, excluded from their legitimate field, lost their energy; the national spirit died away; the very materials and nutriment of thought seemed to be wanting."
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pgs. 524-25)

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1. Cattell, James, M. (1894). "A Statistical Study of Eminent Men", statistics of paper presented to the American

Psychological Association Dec.; abstract published in *the Psychological Review*, Mar., 1895; read in present form as a lecture before the Philosophical Club of Yale University, 1897; *Popular Science Monthly* (1903), 62: 359-77.
2. (a) Cox, Catherine. (1924). "On the Early Mental Development of a Group of Eminent Men", dissertation/thesis. Stanford University.
(b) Cox, Catharine, M. (1926). *Early Mental Traits of Three Hundred Geniuses (Genetic Studies of Genius Series).* Stanford Univ Press.

Further reading

â— Kaufman, James C. and Sternberg, Robert J. (2010). *The Cambridge Handbook of Creativity* (pg. 180). Cambridge University Press.

External links

â— James McKeen Catttell – Wikipedia.

θΔics

In science, **causality** (TR:126) is the premise—sometimes called "cause and effect"—that events in nature are caused or that events are actuated via preceding discernible mechanism.

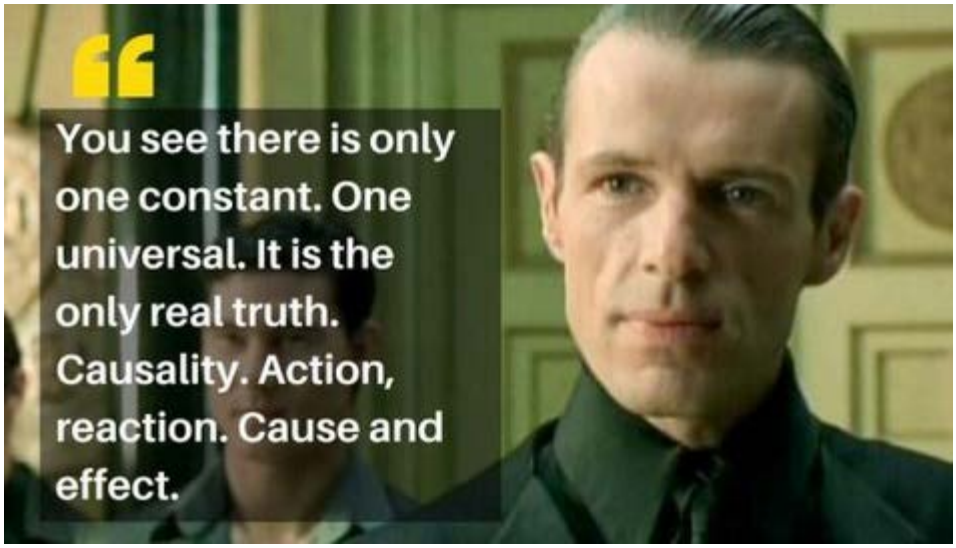

The famous "**causality**" versus choice paradox scene from the 2003 film *Matrix Reloaded*.

First cause

The premise of first cause and final cause generally dates to the theories of Aristotle. The following is a noted "first cause" quote:

> "First causes are not known to us, but they are subjected to simple and constant laws that can be studied by observation and whose study is the goal of natural philosophy … Heat penetrates, as does gravity, all the substances of the universe; its rays occupy all regions of space. The aim of our work is to expose the mathematical laws that this element follows … The differential equations for the propagation of heat express the most general conditions and reduce physical questions to problems in pure analysis that is properly the object of the theory."
>
> — James Maxwell (c.1870), Publication [1]

(add)

Final cause

In 1605, English philosopher Francis Bacon, in his *Advancement of Learning*, demolished the "final cause" theory of Aristotle, siding with Democritus in his place. [8]

Choice | Causality

The premise of the existence of "causality" is argued to negate the premise of the existence "choice", thus creating a perceptual paradox of sorts. While the latter aspect was vicariously dealt with, in a Platonic dialog style, by Goethe in his 1809 novella *Elective Affinities*, via the Narrator, Captain, or Edward, among others, the former was invariably dealt with, in supposed Hegelian dialectic style (Ñº), in the 2003 film *Matrix Reloaded*, by American philosophical film writers Lana Wachowski (1965-) and Andrew Wachowski (1967-), via the Merovingian character:

> **Merovingian:** It is the way of all things. **You see, there is only one constant, one universal, it is the only real truth: causality. Action. Reaction. Cause and effect**.
>
> **Morpheus:** Everything begins with choice.
>
> **Merovingian:** No. Wrong. **Choice is an illusion, created between those with power, and those without**. Look there, at that woman. My god, just look at her. Affecting everyone around her, so obvious, so bourgeois, so boring. But wait… Watch – you see, I have sent her dessert, a very special dessert. I wrote it myself. It starts so simply, each line of the program creating a new effect, just like poetry. First, a rush… heat… her heart flutters. You can see it, Neo, yes? She does not understand why – is it the wine? No. What is it then, what is the reason? And soon it does not matter, soon the why and the reason are gone, and **all that matters is the feeling itself**. This is the nature of the universe. We struggle against it, we fight to deny it, but it is of course pretense, it is a lie. Beneath our poised appearance, the truth is we are completely out of control. Causality. There is no escape from it, we are forever slaves to it. Our only hope, **our only peace**

> **is to understand it, to understand the 'why'**. 'Why' is what separates us from them, you from me. **'Why' is the only real source of power**, without it you are powerless.

(add)

Cause and effect

Causality is often found discussed in terms of "cause and effect". This too can often become intertwined with mentions of "action and reaction", e.g. *Matrix Reloaded* (2003), otherwise known as Newton's third law of motion (see: laws of motion). The following his Henry Adams famous 1900 comment about how he penned out a dozen volumes on American history for no other reason than to prove cause and effect:

> "Historians undertake to arrange sequences,—called stories, or histories,—assuming in silence a relation of **cause and effect**. These assumptions, hidden in the depths of dusty libraries, have been astounding, but commonly unconscious and childlike; so much so, that if any captious critic were to drag them to light, historians would probably reply, with one voice, that they had never supposed themselves required to know what they were talking about. Adams, for one, had toiled in vain to find out what he meant. He had even published a dozen volumes of American history for no other purpose than to satisfy himself whether, by severest process of stating, with the least possible comment, such facts as seemed sure, in such order as seemed rigorously consequent, he could fix for a familiar moment a necessary sequence of human movement. The result had satisfied him as little as at Harvard College.
>
> Where he saw sequence, other men saw something quite different, and no one saw the same unit of measure. He cared little about his experiments and less about his statesmen, who seemed to him quite as ignorant as himself and, as a rule, no more honest; but he insisted on a relation of sequence, and if he could not reach it by one method, he would try as many methods as science knew. Satisfied that the sequence of men led to nothing and that the sequence of their society could lead no further, while the mere sequence of time was artificial, and the sequence of thought was chaos, he turned at last to the sequence of force; and thus it happened that, after ten years' pursuit, he found himself lying in the Gallery of Machines at the Great Exposition of 1900, his historical neck broken by the sudden irruption of forces totally new."
>
> — Henry Adams (1900), *The Education of Henry Adams* (§25: The Dynamo and the Virgin)

The following is Cynthia Russett's 1966 attempted summary of the implicative work of the equilibrium logic of Willard Gibbs in respect to cause and effect in equilibriums in society, at least as she saw things according to her reading of Lawrence Henderson and his interpretation of Gibbs and Vilfredo Pareto: [7]

> "In treating society as a system, Pareto was doing for sociology what Gibbs had done for physical chemistry, what Bernard had adumbrated for physiology. Pareto's social system was in important respects analogous to Gibbs' physicochemical system. As Gibbs considered temperature, pressure, and concentration, so Pareto considered the manifestations of sentiments through words and deeds, verbal elaborations, and economic interests.
>
> Now within the confines of a physicochemical system it is quite clear that all the factors involved are in a condition of mutual dependence which defies explanation by means of a **cause-and-effect** relationship. Change in one variable means change in all others. For example, if a stopper is thrust deeper into a thermos bottle containing ice, soda water, and whiskey—thus increasing the pressure—the concentration in both liquid and gas phases will change, the temperature will change, and the concentration of the solid phase will change. Similarly, the social system does not operate in terms of **cause and effect**; social conditions, like physicochemical conditions, are the result of simultaneous variations in mutually dependent variables."

Most of the above argument, to note, is Henderson, as found in his 1935 chapter “The Physico-Chemical System”, the gist of which is his conclusion that the older cause and effect analysis must be replaced, particularly when system analysis is used, by “some method involving the simultaneous variations of mutually dependent variables” and he cites this sentence with his 1932 *An Approximate Definition of Fact*. [7] The direct statement “the social system does not operate in terms of cause and effect”, seems to be Russett’s accentuated addition to Henderson’s more innocuous presentation.

Goethe | Elective Affinities

German polyintellect Goethe, vicariously, seems to have situated causality in terms of forces largely external (see: external force) to the participants involved in human reactions, such as discussed in his 1796 *Third Lecture on Anatomy* (see: Goethe timeline). In his finished product on these matters, namely his 1809 *Elective Affinities*, the term "cause" comes into discussion in a number of places:

> “While he was in the ministry, no married couple were allowed to separate; and the district courts were untroubled with either **cause** or process. A knowledge of the law, he was well aware, was necessary to him. He gave himself with all his might to the study of it, and very soon felt himself a match for the best trained advocate.”
>
> — Narrator (P1:C2), background of Mittler

> “I think,” interrupted Edward, “we can make the thing more clear to her, and to ourselves, with examples; conceive water, or oil, or quicksilver; among these you will see a certain oneness, a certain connection of their parts; and this oneness is never lost, except through force or some other determining **cause**. Let the cause cease to operate, and at once the parts unite again.”
>
> — Edward (P1:C4), describing elective affinities

> “You are not so wrong in that,” returned the Captain; “I have experienced too much trouble myself in life in matters of that kind. How difficult it is to prevail on a man to venture boldly on making a sacrifice for an after-advantage! How hard to get him to desire an end, and not hesitate at the means! So many people confuse means with ends; they keep hanging over the first, without having the other before their eyes. Every evil is to be cured at the place where it comes to the surface, and they will not trouble themselves to look for the **cause** which produces it, or the remote effect which results from it. This is why it is so difficult to get advice listened to, especially among the many: they can see clearly enough from day to day, but their scope seldom reaches beyond the morrow; and if it comes to a point where with some general arrangement one person will gain while another will lose, there is no prevailing on them to strike a balance. Works of public advantage can only be carried through by an uncontrolled absolute authority.”
>
> — Captain (P1:C6)

> “The same friend,” he went on, “has another law which he proposes. A marriage shall only be held indissoluble when either both parties, or at least one or the other, enter into it for the third time. Such persons must be supposed to acknowledge beyond a doubt that they find marriage indispensable for themselves; they have had opportunities of thoroughly knowing themselves; of knowing how they conducted themselves in their earlier unions; whether they have any peculiarities of temper, which are a more frequent **cause** of separation than bad dispositions. People would then observe one another more closely; they would pay as much attention to the married as to the unmarried, no one being able to tell how things may turn out.”
>
> — A Friend (P1:C10)

(add)

Max Weber

Per key term Google Books search: “causality, elective affinities”, a significant number of Goethe protege Max Weber results return; the following being a few examples:

> “Historical **causality** determines the unique circumstances that have given rise to an event. Sociological causality assumes the establishment of a regular relationship between two phenomena which need not take the form ‘A makes B inevitable’, but may take the form ‘A is more or less favorable to B’.”
>
> — Max Weber (date), Publication (Ñº)

> “The most common interpretation, however, is that "elective affinity" is used by Weber to express the fact that two sets of social facts or mentalities are related to each other or gravitate to each other — even though no direct and simple **causality** between the two can be established.”
>
> — Richard Swedberg and Ola Agevall (2005), *The Max Weber Dictionary* (Ñº)

(add discussion)

Other

In 1915, American cultural anthropologist Alfred Kroeber, in his “Eighteen Professions” article, attempted to argue in favor of Aristotle over that of modern physico-chemical sciences, specifically, in his view: [3]

> “There are no laws in history similar to the laws of physico-chemical science. The **causality** of history is teleological.”

a backwards thinking point of view about which American physical historian Morris Zucker comments on the last of these: [5]

> “This mumbo-jumbo of medieval phraseology connecting **causality** with purpose in history is another evidence of that professorial phenomenon, while the body moves and breaths in the twentieth century, while the mind is five hundred years behind its time.”

In 1990, French elementary particle physicist and neuroscientist Remy Lestienne published *The Children of Time: Causality, Entropy, Becoming* with chapters on entropy and information, dissipative structures, what is life, the mind and time, among others, with discussion of Carnot, Clausius, and Boltzmann. [4]

Quotes

The following are relevant quotes:

> “There is only one method of apprehending the real nature of **causality**. This method is to begin with the world of data which we possess, i.e. our experiences, to generalize, to eliminate [deanthropomorphize] as far as possible all anthropomorphic elements and thus cautiously to elaborate an objective conception of

causality. The many attempts which have been made in this direction show us that the best approach to the concept of causality consists in attaching it to the capacity of foretelling future events which we have acquired and tested in daily experience. And indeed there is no better means of demonstrating the causal connection between two events than to show that the occurrence of the one event can regularly permit us to forecast the occurrence of the other."

— Max Planck (1936), *The Philosophy of Physics* [2]

See also

â— Causal entropic force | Alexander Wissner-Gross

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1. Myint-U, TYn, and Debnath, Lokkenath. (2007). *Linear Partial Differential Equations for Scientists and Engineers* (pdf) (pg. vii). Springer, 2011.
2. (a) Planck, Max. (1936). *The Philosophy of Physics* (pg. 44). Publisher.
(b) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory*. Arnold-Howard Publishing Co.
3. Kroeber, Alfred L. (1915). "Eighteen Professions" (pdf), Read at the Philadelphia meeting of the American Anthropological Association; in: *American Anthropologist*, 17(2):283-88.
4. Lestienne, Remy. (1990). *The Children of Time: Causality, Entropy, Becoming* (ch. 13: The Age of Things, Order and Chaos, Entropy and Information, pgs. 113-; ch. 14: Dissipative Structures, Cyclic Reactions, pgs. 127-; section. Time the Engine of Life, pgs. 143-187). Eng. Trans. by E.C. Neher, 1995. University of Illinois Press.
5. Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 254). Arnold-Howard Publishing Co.
6. Russett, Cynthia. (1966). *The Concept of Equilibrium in American Social Thought* (pg. 115). Yale College.
7. Henderson, Lawrence J. (1932). *An Approximate Definition of Fact* (pgs. 183-84). University of California Publications in Philosophy, Volume 14.
8. (a) Bacon, Francis. (1605). *The Advancement of Learning* (Ñº). Publisher.
(b) The Advancement of Learning – Wikipedia.
(c) Henderson, Lawrence J. (1917). *The Order of Nature* (pgs.23-24). Harvard University Press.

Further reading

â— Pearl, Judea. (2000). *Causality: Models, Reasoning, and Inference* (abs) . Cambridge University Press.

External links

â— Causality – Wikipedia.
â— Causality (physics) – Wikipedia.

θΔics

In terminology, **cause** (TR=437), as compared to effect (TR=752), both connected via the notional of causality, is the reason for an action or condition; something that brings about a result; a person, thing, or agent that is the occasion of an action, state, or that which brings something about. [1]

Quotes

The following are relate quotes:

> "The universe, as we see it, is the result of regularly working forces, having a **causal** connection with each other and therefore capable of being understood by human reason."
>
> — Ludwig Buchner (1884), *Force and Matter* (preface, pg. x) [2]

References

1. Merriam Webster Collegiate Dictionary, 2000.
2. Buchner, Ludwig. (1855). *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon* (15th German edition; 4th English edition). London: Asher and Co, 1884.

θΔics

In terminology, **cause and effect** refers to the phenomenon, i.e. "causality", wherein an antecedent, i.e. cause, seemingly produces a consequence, i.e. effect.

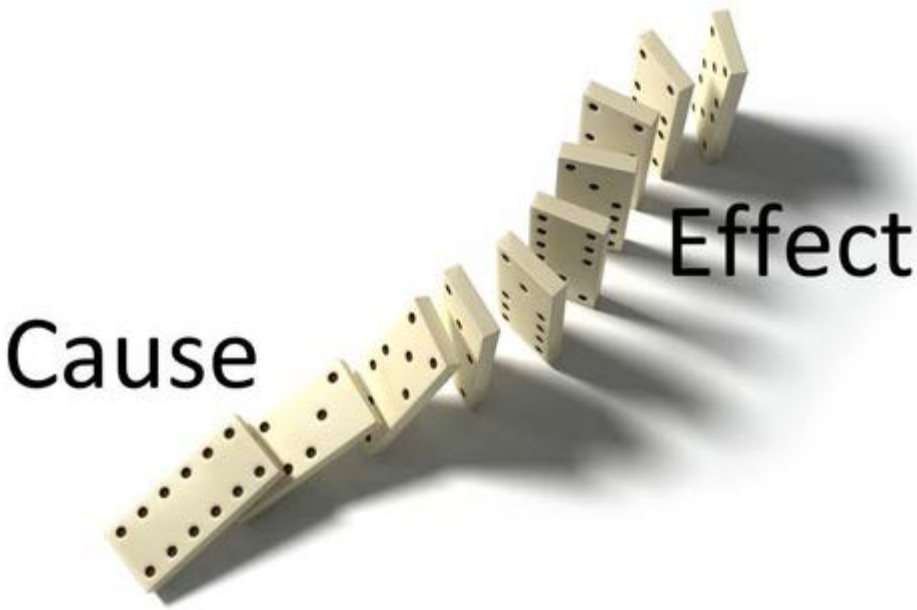

An over-common model of "**cause and effect**", that of dominoes, such that the slight touch or perturbation of the first domino produces a chain of events, i.e. the toppling of the adjacent dominoes, to produced the resulting of either the end domino being toppled or the series of dominoes being knocked down, depending on topic of discussion; this model being frequently used as a metaphor for social examples cause and effect.

Adams

In 1889 to 1891, Henry Adams published his nine volume *History of the United States of America*, supposedly, for no other reason than to prove to his own satisfaction that causality or cause and effect exists in the course of history: [1]

> "Historians undertake to arrange sequences,—called stories, or histories,—assuming in silence a relation of **cause and effect**. These assumptions, hidden in the depths of dusty libraries, have been astounding, but commonly unconscious and childlike; so much so, that if any captious critic were to drag them to light, historians would probably reply, with one voice, that they had never supposed themselves required to know what they were talking about. Adams, for one, had toiled in vain to find out what he meant.

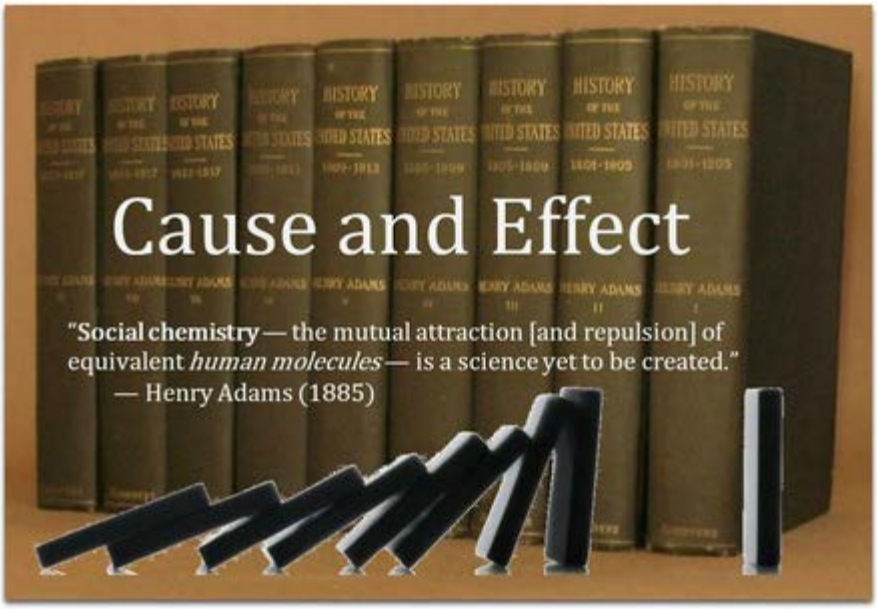

He had even published a **dozen volumes** of American history for **no other purpose** than to satisfy himself whether, by severest process of stating, with the least possible comment, such facts as seemed sure, in such order as seemed rigorously consequent, he could fix for a familiar moment a necessary sequence of human movement. The result had satisfied him as little as at Harvard College.

Where he saw sequence, other men saw something quite different, and no one saw the same unit of

measure. He cared little about his experiments and less about his statesmen, who seemed to him quite as ignorant as himself and, as a rule, no more honest; but he insisted on a relation of sequence, and if he could not reach it by one method, he would try as many methods as science knew. Satisfied that the sequence of men led to nothing and that the sequence of their society could lead no further, while the mere sequence of time was artificial, and the sequence of thought was chaos, he turned at last to the sequence of force; and thus it happened that, after ten years' pursuit, he found himself lying in the Gallery of Machines at the Great Exposition of 1900, his historical neck broken by the sudden irruption of forces totally new."

(add discussion)

Henderson

In the 1910s, Lawrence Henderson, in his *The Fitness of the Environment* (1913) and *The Order of Nature* (1917), began to contrast "cause-and-effect" analysis with reaction states and system view analysis, generally siding with the latter over the former; other view statements on this are as follows:

> "In organic processes, **cause-and-effect** analysis leads, in general, to erroneous conclusions."
>
> — Lawrence Henderson (1932), "An Approximate Definition of Fact", in: in: *L.J. Henderson on the Social System* (pg. 163)

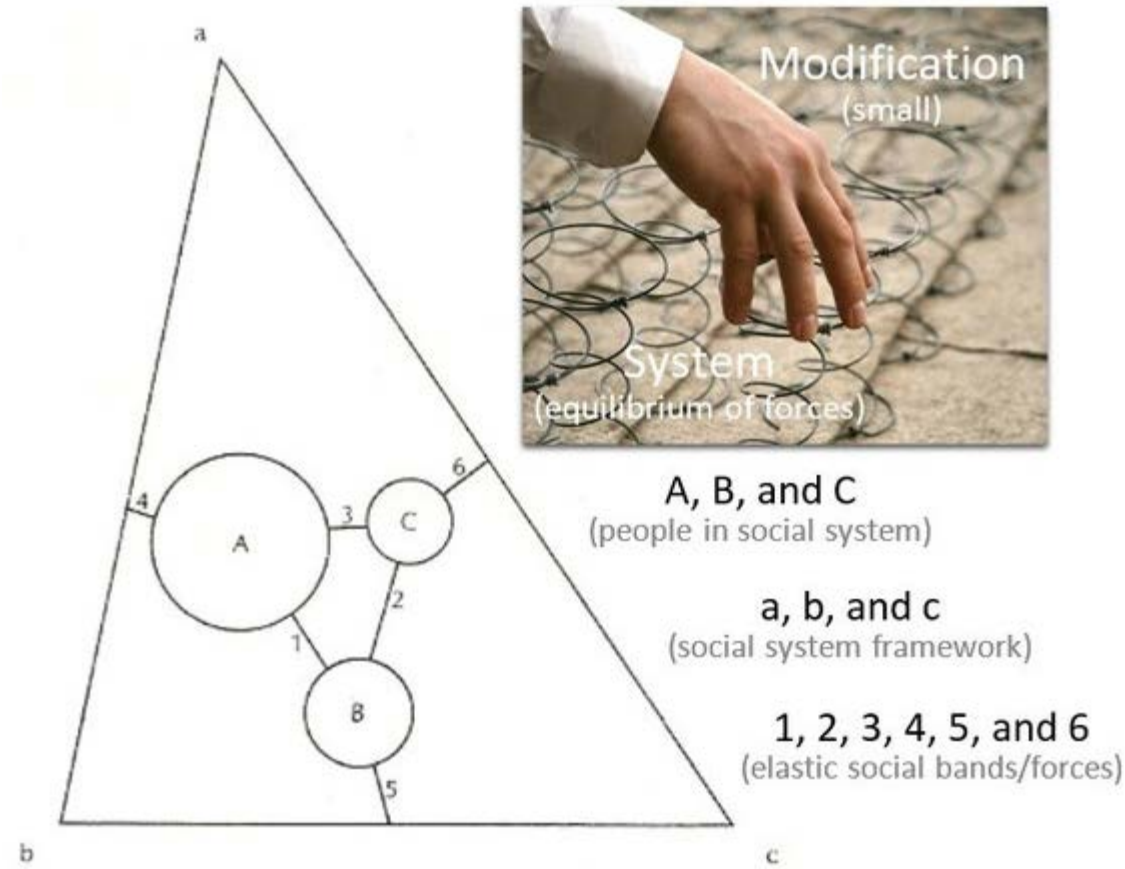

Lawrence Henderson's "box spring" social system model, from his "**Sociology 23**" lectures (pg. 137), according to which A, B, and C are people in social system abc, who are interconnected via elastic forces 1, 2, 3, 4, 5, and 6, all of which reacts according to Le Chatelier's principle (see: social Le Chatelier principle), such that if, say, a weighted force, that were not too large, were put (or pulled down on) individual A and they released, the system would restore back to its original configuration.

In 1935, Henderson, in his *Pareto's General Sociology: a Physiologists Interpretation* digressed on this further.

In 1938 to 1942, Henderson, in his his "Sociology 23" course, devoted a certain amount of time trying to connect or or visually depict Vilfredo Pareto's version of Le Chatelier's principle via a "box spring model" (see: social Le Chatelier principle), particularly on pages 137 to 143 of his "Sociology 23 Lectures", the diagram of which shown adjacent; with which he attempt to argue that in the "system" view of (a) changes from state one to state two to state three and (b) each person interconnected to each other via spring-like forces or bands, that cause and effect analysis becomes usurped, or obviated, in some sense; the following are example statements on this line of reasoning: [2]

> "A correlation between two things is observed, say, values of the pressure and of the volume of a gas. A simple algebraic expression for this correlation is then found, in this instance Boyle's law, PV = k. One is then tempted to say that pressure is the cause that a gas has a certain volume. But reasoning from this cause,

or from Boyle's law, may lead to conclusions that are misleading and altogether useless, because temperature and volume are mutually dependent, and likewise of course temperature and pressure."

— Lawrence Henderson (1938), "Sociology 23" (pg. 143)

"In a social system, and, as a rule, elsewhere, an action initiated in a certain thing leads to modifications everywhere in the system, and these modifications to further modifications which involve the very thing in which the process originated. So it is both **'cause' and 'effect'**. Moreover, the notion that the process originated at a certain point is, as often as not, no better than the legal fiction that it is sometimes actually as in the law courts, when it becomes necessary to somehow fix responsibility for a chain of event and there is no objective test, but only a perhaps ambiguous legal convention for doing so. Thus, reasoning from cause to effect in the study of concrete phenomena is often more misleading than more general reasoning of the same kind."

— Lawrence Henderson (1938), "Sociology 23" (pgs. 143)

"The misleading action of cause to effect reasoning is particularly true of the interactions of men. Thus, thousands of pages have been written about the causes of the war of 1914 to 1918. But there is no agreement about these causes, or about when or where they originated or about the chains of events that they initiated. And there can be none."

— Lawrence Henderson (1938), "Sociology 23" (pgs. 143-44); here Mark Buchanan (2000), we note, would beg to differ (see: tipping point)

"An enduring change in a social system, say, a change of form of government or, not infrequently, an apparently less important change like the change of a law or of a technological process may involve a change from one state of equilibrium of the social system to a very different state. The changes of the system somewhat resemble the changes observed in a game of cat's cradle."

— Lawrence Henderson (1938), "Sociology 23" (pg. 146)

Similar arguments, to note, are found in his earlier books; the subject of which requires further digestion.

Beard

In 1936, Charles Beard, similar in some sense to Henderson, in his *The Devil Theory of War: an Inquiry into the Nature of History and the Possibility of Keeping Out of War*, gave the following argument: [6]

"Let a chemist take ten chemicals in a test tube. He adds an eleventh. A precipitation follows. Did the elevenths chemical 'cause' the

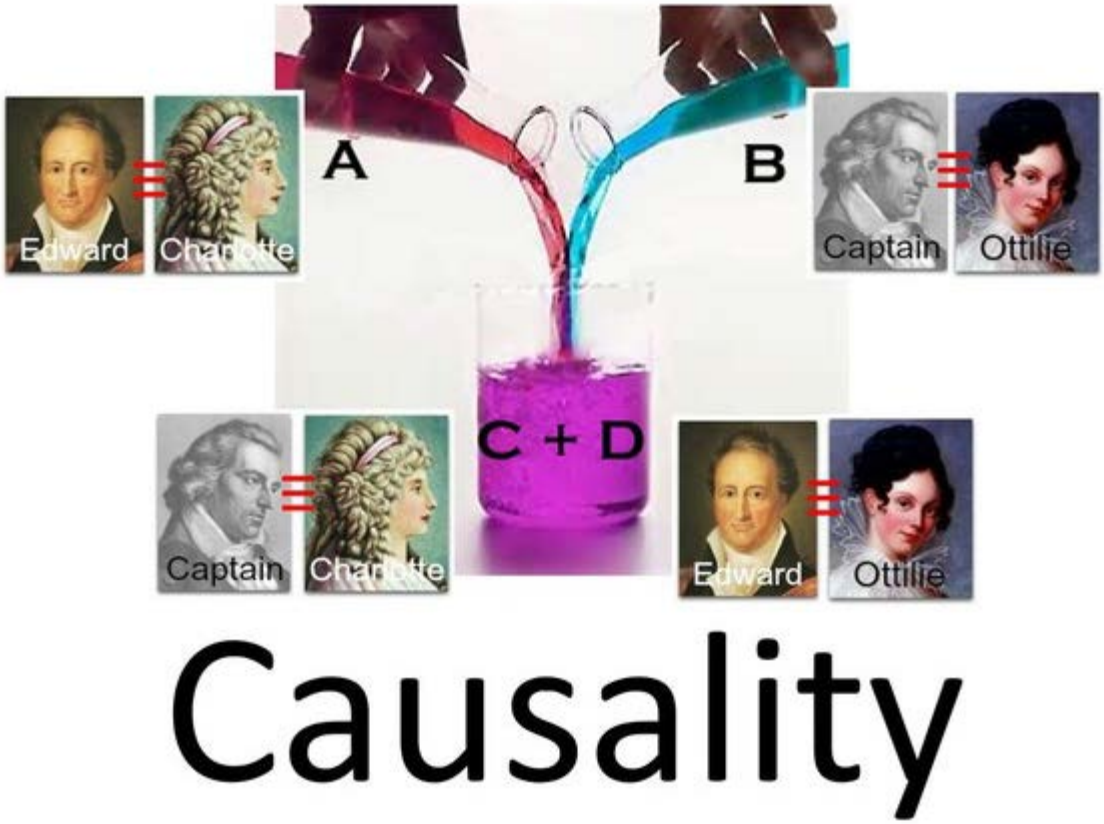

A rendition of Charles Beard's 1936 "ten chemicals argument" against finding causality in nature, in respect to WWI in particular, shown in the guise of Goethe's *Elective Affinities*; which is similar to Lawrence Henderson's assertion that cause-and-effect analysis becomes obviated when looked at in terms of reactions and changes of states of equilibrium.

> precipitation? Or was it 'caused' by the reaction of the other ten to the event of addition? Why speak of cause at all in this connection? The chemist is likely to be content with mere description: Ten chemicals: the addition of the eleventh chemical: precipitation. It adds nothing to his knowledge to say that the eleventh chemical 'caused' precipitation."

Beard's aim in arguing here, as summarized by Morris Zucker, is to fortify his rejection of the "wicked person" or impersonal "forces" theories of the cause of World War I (1914-1918), and to scorn, supposedly, the utopian forever peace theorists. [7]

Quotes

The following are related quotes:

> "The modern scientist is unwilling to depart from the test of causal relation or quantitative sequence. When he asks the question, Why? he insists on an answer in terms of **cause and effect**. He wants to reduce his solution of all problems to terms of the conservation of energy or the persistence of quantity."
>
> — Thorstein Veblen (1898), "Why is Economics Not an Evolutionary Science?" [3]

> "Our behavior should be motivated by the ever-present realization that human beings in their thoughts, feelings and actions are not free agents, but are subject to the inexorable laws of cause and effect as are the stars in their courses."
>
> — Albert Einstein (1933) [4]

> “A physical object is something which stays put unless something else starts it going, whereas an animal is something which under any circumstances does what it pleases. Isn’t a man a living creature and cannot he do pretty much as he pleases? … Heretofore, even if man entered somewhat into the matter, at least a given cause under a given set of conditions always produced the same effect. But along came Heisenberg with his principle of indeterminacy and apparently destroyed the pure and inevitable relations of **cause and effect**. On the analytical level of the laboratory, the mind sees things as determined. But in human behavior, in our daily lives, the decision is not simple. To his own mind, the behavior of a man seems to be free and of his own choosing, and all the accumulated moralities of the world exhort him to choose the good and to act righteously on the assumption that he is capable of free choice and action.”
>
> — Selig Hecht (1935), “The Uncertainty Principle and Human Behavior” [5]

> “Choice is an illusion created between those with power and those without. The ‘why’ is the source of power. You see there is only one constant. One universal. It is the only real truth: causality. Action, reaction. **Cause and effect**. ... Please, *ma cherie*, I told you, we are all victims of causality. I drank too much wine, I must take a piss. Cause and effect.”
>
> — Wachowski brothers (2003), character: Merovingian (Ñº) of *The Matrix Reloaded*

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4. (a) Einstein, Albert. (1933). “Address and Messages” (pgs. 28-29). Spinoza Institute of America.
(b) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 533). Arnold-Howard Publishing Co.
5. (a) Hecht, Selig. (1935). “The Uncertainty Principle and Human Behavior” (pdf), *Harper’s Magazine* (pgs. 237-49), Jan.
(b) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 37). Arnold-Howard Publishing Co.
6. Beard, Charles A. (1936). *The Devil Theory of War: an Inquiry into the Nature of History and the Possibility of Keeping Out of War* (pdf) (pg. 14). Vanguard Press.
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θΔics

In terminology, **cease to exist** is a life terminology upgrade, thing philosophy conceptualized, physico-chemically neutral, synonym to the now-defunct, anthropomorphic term death.

Quotes

The following are related quotes:

> "Believe me, dear Sir: there is not in the British Empire a man who more cordially loves a union with Great Britain than I do. But, by the god that made me, I will **cease to exist** before I yield to a connection on such terms as the British Parliament propose; and in this, I think I speak the sentiments of America."
>
> — Thomas Jefferson (1775), "Letter to John Randolph", Nov 29 [1]

> "I propose the following definition, which is applied to everything, including minerals: 'life is the faculty of reaction.' Everything in the universe tends toward inertia, or absence of reaction. The proof of this inertia, which thermodynamics seeks in 'absolute zero,' has never been given, nor will it ever be, because absolute inertia can only be attained through the cessation of the formed matter or 'thing'. This would be the moment the thing **ceased to exist**. Everything 'existing' is capable of reaction, insofar as it has 'weight', that is, fixed or specific energy. The vital phenomenon is the faculty of reacting, and to manifest itself this reaction requires a resistance of the same nature as the action."
>
> — Rene Lubicz (1949), *The Temple of Man* [2]

References

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2. (a) Schwaller de Lubicz, Rene A. (1949). *The Temple in Man: Sacred Architecture and The Perfect Man* (translators: Robert Lawlor and Deborah Lawlor) (pdf) (faculty of reaction, pgs. 28-29). Inner Traditions, 1998. (b) Cheak, Aaron. (2014). "The Call of Fire: the Hermetic Quest of Rene Schwaller de Lubicz" (Ñº), AaronCheak.com; in: *Clavis: Journal of Occult Arts, Letters, and Experience*, Volume 3: Cipher and Stone.

θΔics

In mechanics, **celestial mechanics** is the study of the motions of and forces between the celestial bodies, generally based on the laws of motion, the law of gravitation, with refinements coming from the general theory of relativity. [1]

Etymology

French physicist Pierre Laplace coined the term "celestial mechanics" in 1799. [3] This, supposedly, was a more specific variant of what English physicit Isaac Newton had called "rational mechanics", in regards to the work he had done. [4]

Quotes

The following are related quotes:

> "'Mecanique sociale' may one day take her place along with **'mecanique celeste'**, throned each upon the double-sided height of one maximum principle [principles of Lagrange], the supreme pinnacle of moral as of physical science. As the movements of each particle, constrained or loose, in a material cosmos are continually subordinated to one maximum sum-total of accumulated energy, so the movements of each soul, whether selfishly isolated or linked sympathetically, may continually be realising the maximum energy of pleasure. Mecanique sociale, in comparison with her elder sister, is less attractive to the vulgar worshipper in that she is discernible by the eye of faith alone. The statuesque beauty of the one is manifest; but the fairylike features of the other and her fluent form are veiled. But mathematics has long walked by the evidence of things not seen in the world of atoms (the methods whereof, it may incidentally be remarked, statistical and rough, may illustrate the possibility of social mathematics). The invisible energy of electricity is grasped by the marvellous methods of Lagrange; the invisible energy of pleasure may admit of a similar handling."
>
> — Francis Edgeworth (1881), *Mathematical Psychics: an Essay on the Application of Mathematics to the Moral Sciences*

> "The recurrence during the eighteenth century Enlightenment of the aspiration to be the 'Newton of the moral sciences' testifies to the prestige not just of **celestial mechanics**, but of the 'experimental method' more generally."
>
> — Stefan Collini (1993), 'Introduction' to C.P. Snow's *The Two Cultures* [2]

References

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2. Collini, Stefan. (1993). "Introduction", in: *The Two Cultures* (by Charles Snow) (pg. x). Canto.
3. Fitzpatrick, Richard. (2012). *An Introduction to Celestial Mechanics* (pg. ix). Cambridge University Press.
4. Celestial mechanics – Wikipedia.

θΔics

In chnopsology, **cell-as-molecule** approach or concept refers to the modelling of an individual cell, and in particular an individual mobile cell, from the physical chemistry perspective, as a large molecule, whose synthesis or aggregation, from smaller components or cell types, is governed by the principles of affinity chemistry and or chemical thermodynamics operations, depending on discussion. [1]

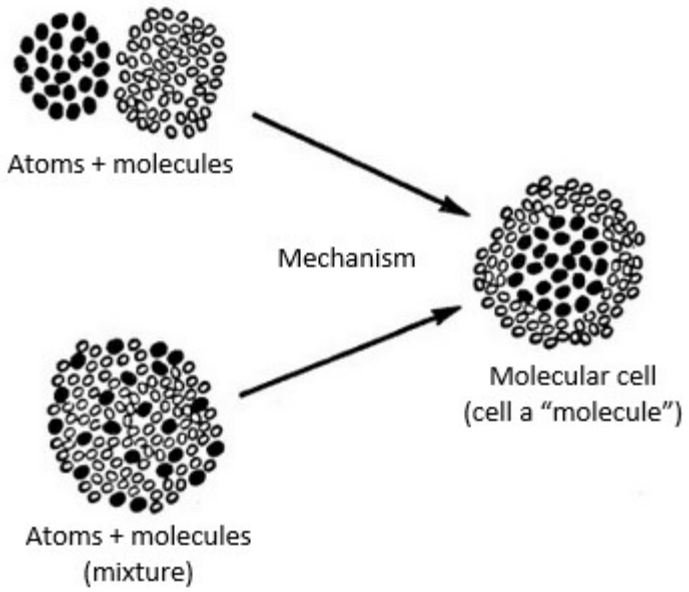

Diagram of the **cell-as-molecule** approach (viewing a cell as a type of large molecule), according to English physical biologist Lionel Harrison, based on the 1970 work of embryonic chick tissue formation experiments of American cellular pathologist Malcolm Steinberg. [1]

History

In 1665, Robert Hooke became the first person to see and draw cells, plant cells in particular, under microscope; describing them as such, being that they looked like prison "cells".

In 1930, Belgian physician and cellular researcher Albert Claude developed the cell fractionation technique, with which he discovered the cell organelles, namely: mitochondrion (which, in his Harvey Lecture, he famously first characterized as the "power plants of the cell"), chloroplast, endoplasmic reticulum, Golgi apparatus, ribosome, and lysosome; was the first to apply electron microscope in biology, thereby in 1945 publishing the first detailed structure of the cell.

In 1993, the physical chemistry viewed "cell-as-molecule" approach, in upgrade to cell as first living thing, was introduced in 1993 by English-born Canadian physical chemist and theoretical biologist Lionel Harrison (1929-2008). [2]

See also

â— Albert Claude
â— Human-as-molecule

References

1. Harrison, Lionel G. (2011). *The Shaping of Life: the Generation of Biological Pattern* (cell-as-molecule, 4+ pgs; image, pg. 145).
2. Harrison, Lionel G. (1993). *Kinetic Theory of Living Pattern* (pg. 136). Cambridge University Press.

Further reading

â— Brooks, Daniel R. and Wilson, Edward O. (1988). *Evolution as Entropy: Toward a Unified theory of Biology* (pgs. 124-28). University of Chicago Press.

θΔics

In animate thermodynamics, **cellular thermodynamics** is the thermodynamical study of the structure and behavior of the cell, a large part of which is the study of the energetics of membrane transport and regulation.

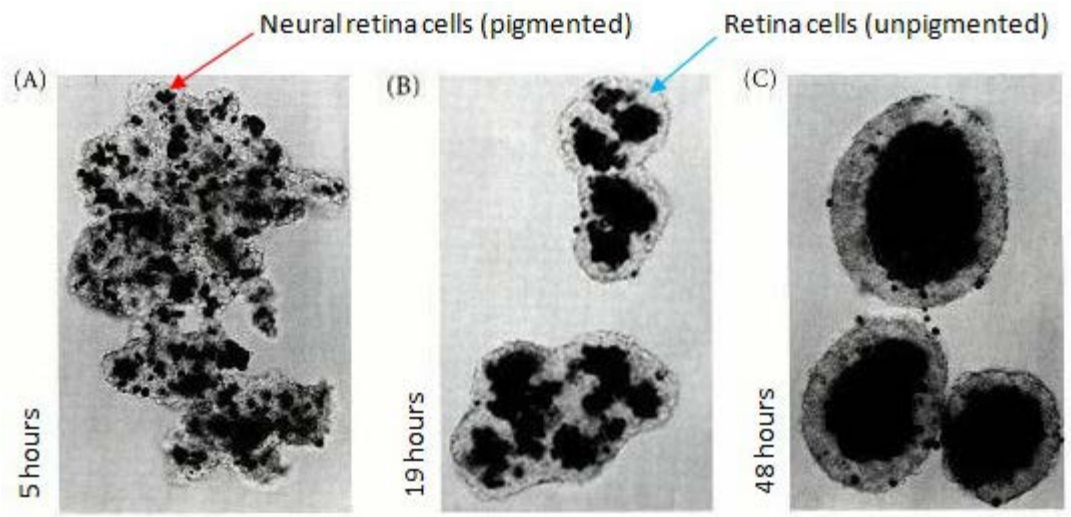

A visualization of **cellullar thermodynamic** processes: Aggregates formed by mixing 7-day-old chick embryo neural retina (unpigmented) cells with pigmented retina (dark) cells. (A) 5 hours after the single-cell suspensions are mixed, aggregates of randomly distributed cells are seen. (B) At 19 hours, the pigmented retina cells are no longer seen on the periphery. (C) At 2 days, a great majority of the pigmented retina cells are located in a central internal mass, surrounded by the neural retina cells. [5]

History

The origination of the field of cellular thermodynamics seems to trace to the "membrane bioenergetics" work of Peter Mitchell and his 1961 chemiosmotic theory of energy transduction, nearly all of which is based on Gibbsian thermodynamics (as presented via Guggenheim, 1933); a theory, which itself, is a spinoff of the early 1941 ATP thermodynamics work and theories of Fritz Lipmann, et al. [1]

In 1964, American cellular biologist Malcolm Steinberg who proposed the differential adhesion hypothesis, cell adhesion theory, which is sometimes referred to as "thermodynamic hypothesis" (although this term is also used to refer to 1950s protein folding theories of Christian Anfinsen), a model that explained patterns of cell sorting based on thermodynamics principles. [4] Steinberg's central hypothesis was cell sorting, such as pictured adjacent, as a phenomenon that minimizes the free energy of the system based on intercellular adhesivity and surface tension. Numerous cell sorting and adhesion studies, conducted in the 2000s, have experimentally supported Steinberg's hypothesis. [7]

It is difficult to say who exactly coined the term "cellular thermodynamics" or cell thermodynamics, but by at least 1979, to cite one example, the following terminology was in use: [3]

> "The advantage of this definition would be to provide a link between the local physicochemical thermodynamics of adhesive molecules on fluid PL and the more global **cellular thermodynamics** of the Steinberg models."

Another noted article is American pathologist Horton Johnson's 1974 "On the Thermodynamics of Cell Injury". [2]

Cell-as-molecule

See also: Human molecule, Human molecular hypothesis, Bacteria molecule, Fish molecule, Animate molecule, etc.

In modeling the individual cell atomically, chemically, or rather molecularly, building on the previous work of Steinberg, the "cell-as-molecule" approach (cell molecule) was used in 2011 by Lionel Harrison. [6]

References

1. Nicholls, David G. and Ferguson, Stuart J. (2001). *Bioenergetics3* (preface). Academic Press.
2. Johnson, Horton A. (1974). "On the Thermodynamics of Cell Injury" (abs), *Am J. Pathol.* 75: 13-26.
3. Author. (1979). "Article", *Journal of Theoretical Biology* (pg. 115), Volume 79.
4. (a) Gilbert, S.F. (2000). *Developmental Biology* (Morphogenesis and Cell Adhesion, §: The Thermodynamic Model

of Cell Interactions). Sinauer Associates.
(b) Cell adhesion – Wikipedia.
5. (a) Armstrong, P. B. (1989). "Cell sorting out: The self-assembly of tissues in vitro", *CRC Crit. Rev. Biochem. Mol. Biol* (Image). 24:119–149.
(b) Gilbert, S.F. (2000). *Developmental Biology* (Morphogenesis and Cell Adhesion, §: The Thermodynamic Model of Cell Interactions). Sinauer Associates.
6. Harrison, Lionel G. (2011). *The Shaping of Life: the Generation of Biological Pattern* (pg. 144). Cambridge University Press.
7. Johnson, Amy W. and Harley, Brendan. (2011). *Mechanobiology of the Cell-Cell and Cell-Matrix Interactions* (§: 4.2.1: Differential Adhesion Hypothesis, pg. 48-). Springer.

Further reading

● Blumenfeld, Lev A. and Tikhonov, Alexander N. (1994). *Biophysical Thermodynamics of Intracellular Processes: Molecular Machines of the Living Cell*. Springer.
● Wolfe, Joe. (2001). "Cellular Thermodynamics" (abs) (Mendeley), *Encyclopedia of Life Sciences*. John Wiley & Sons, Ltd, Pages: 1-17.
● Vallero, Daniel. (2010). *Environmental Biotechnology: a Biosystems Approach* (§: Cellular Thermodynamics, pgs. 99-). Academic Press.

External links

● Cellular thermodynamics (Joe Wolfe) – Wiley Online Library.

θΔics

In existographies, **Celsus** (c.125-180AD) (SHP:18) was a Greco-Roman philosopher, characterized as a dabbler in various schools of thought, including Platonism and Stoicism (Hoffmann, 1987), and Epicureanism (Origen, c.230), and a student of the history and religious customs of many nations, noted for [1]

Overview

In c.175AD, Celsus published *Reason of Truth: The True Word* (Λόγος Ἀληθής, *Logos Alēthēs*), various translated as *The True Word* (Q) or *The True Doctrine* (Hoffmann, 1987), wherein he attempted to refute the validity of the newly forming sect of Christianity. [3]

In c.230AD, Origen, in his *Against Celsus* (*Contra Celsum*), an apologetic treatise, argued against the ideas set forth by Celsus, and in which he quotes extensively from Celsus' *The True Doctrine*.

Quotes | On

The following are quotes on Celsus:

> "**Celsus** appears to have been to the second century what Voltaire was to the eighteenth."
>
> — DeRobigne Bennett (1876), *The World's Leading Sages* [2]

Quotes | By

The following are quotes by Celsus:

> "You may see weavers, tailors, fullers, and the most illiterate and rustic fellows, who dare not speak a word before wise men, when they can get a company of children and silly women together, set up to teach strange paradoxes among them. This is one of their [Christian] rules: Let no man that is learned, wise, or prudent come among us: but if they be unlearned, or a child, or an idiot, let him freely come. So they openly declare that none but the ignorant, and those devoid of understanding, slaves, women, and children, are fit disciples for the god they worship."
>
> — Celsus (c.175AD), *The True Word*; cited by Origen (c.230AD); cited by DeRobigne Bennett (1876) in *The World's Leading Sages* (1876) [1]

See also

- Anders Celsius (1701-1744) | eponym of the Celsius scale

References

1. (a) Celsus, Aulus. (c.45AD), *Publication* (Q). Publisher.
(b) Bennett, DeRobigne (1876). *The World's Sages, Thinkers and Reformers: Biographical Sketches of Leading Philosophers, Teachers, Skeptics, etc.* (Celsus, pg. 291). Truth Seeker Company.
2. Bennett, DeRobigne (1876). *The World's Sages, Thinkers and Reformers: Biographical Sketches of Leading Philosophers, Teachers, Skeptics, etc.* (§: Celsus, pgs. 288-; quote, pg. 291). Truth Seeker Company.
3. Celsus. (c.170AD). *The True Doctrine* (translator: R. Joseph Hoffmann) (abs). Oxford University Press, 1987.

External links

- Celsus – Wikipedia.
- The True Word – Wikipedia.

In human thermodynamics, **Cengel-Boles human thermodynamics** refers to the applications of thermodynamics to humans as found in Turkish mechanical engineer Yunus Cengel and American mechanical engineer Michael Boles 1989 textbook *Thermodynamics: an Engineering Approach*, in its seventh edition as of 2010, in which they intersperse arguments alluding to the premise that the second law and entropy apply to human interactions and activity and that someday second law analysis may be used to improve the quality of human existence, such as in eliminating human frictions and in economics.

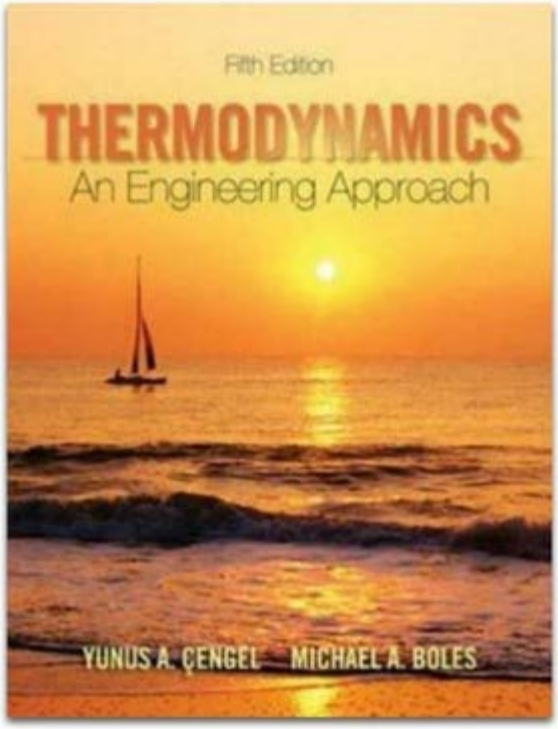

Cover to the fifth edition of Turkish mechanical engineer Yunus Cengel and American mechanical engineer Michael Boles 1989 textbook *Thermodynamics: an Engineering Approach*, wherein the give human thermodynamics examples.

Overview

See main: List of thermodynamics textbooks that include human thermodynamics

In 2002, Cengel and Boles, in their fourth edition of *Thermodynamics: an Engineering Approach*, open to the following economics thermodynamics quote by American-born English mathematical physicist Robert Ayres:

> "Economic activities are inherently dissipative and governed by the second law of thermodynamics."

Boles and Cengel seem to be one of the first thermodynamics textbook authors, aside from American chemical engineer Benjamin Kyle and his *Chemical and Process Thermodynamics* (1999), and a few others, to incorporate a section with applications of thermodynamics to human existence.

The chapter section in which Boles and Cengel do this in is their two their two-page entropy chapter subsection: "Entropy and Entropy Generation in Daily Life", in which state associate entropy as a measure of disorder, and go onto speculate on a number of possible ways that the second law, entropy, and irreversibility apply to human existence. They introduce the subject by stating that the extension of the entropy concept to nontechnical fields is not a novel idea: "It has been the topic of several articles, and even some books."

FIGURE 6–26
The use of entropy (disorganization, uncertainty) is not limited to thermodynamics.

Boles and Cengel's example of entropy

The only person they cite, however, to backup this claim is American economist Jeremy Rifkin and his 1980 book *Entropy*, which is hardly the best example out of the four hundred plus human thermodynamics pioneers to have theorized in this field, over the last two centuries. They also cite, to their credit, American economist Robert Ayres in their opening quotes section. In any event, Boles and Cengel go on to present several ordinary events and show their relevance to the concept of entropy and entropy generation, as outlined by topic below.

Efficient people

Boles and Cengel state that efficient people lead low-entropy or highly organized lives. The give diagram 6-26, pictured adjacent, to illustrate this idea. They state in full that:

"Efficient people lead low-entropy (highly organized) lives. They have a place for everything (minimum uncertainty), and it takes minimum energy for them to locate something. Inefficient people, on the other hand, are disorganized and lead high-entropy lives. It takes them minutes (if not hours) to find something they need, and they are likely to create a bigger disorder as they are searching

generation or entropy increase associated with human activity. [1]

since they will probably conduct the search in a disorganized manner."

Here they seem to be equating the term "high-entropy lives" to a human molecule in a "high-entropy state" of existence, which may or may not be correct, depending on discussion.

This passage and theory, to note, seem to be most-similar to the positive psychology concept of "Csíkszentmihályi flow" or flow states of mental work production associated with high-efficient hours, days, and year of optimized personal work experience, such as writing a masterpiece or composing a great sonata; a theory developed in the 1970s by Croatian-born American psychologist Mihály Csíkszentmihályi modeled on his earlier studies of the entropy and psychic entropy ideas of his mentor Swiss psychologist Carl Jung.

Low-entropy learners

Boles and Cengel state that some people have “low-entropy learning” styles and are quick learners. This may be similar to English physicist Stephen Hawking’s 1996 model of neurological entropy and reading (pictured adjacent).

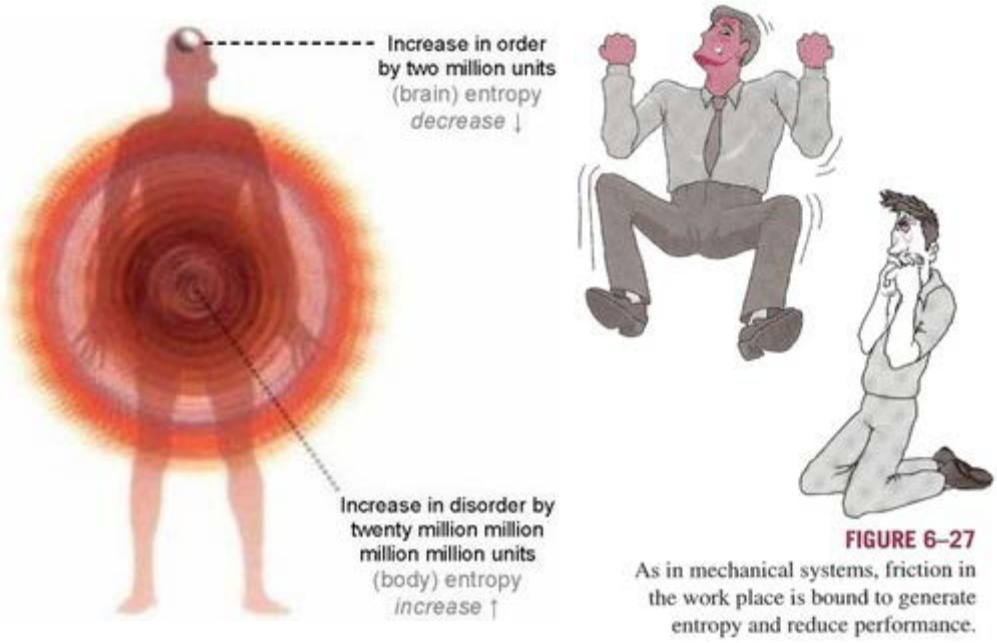

Left: English astrophysicist Stephen Hawking's 1996 diagram of entropy decrease, via learning, and entropy increase associated, supposedly, with the body or surroundings, which is assumed to be greater than the former, in accordance with the second law. [4] Right: Boles and Cengel's diagram example of human frictions, resulting from anger and arguments, that are said to be associated with entropy increase or entropy generation. [1]

Disordered libraries

Boles and Cengel state that a disorganized library is in a high entropy state. The association of entropy with disorder is large subject, to say the least, applicable only under select conditions, circumstances, and processes and one that is very difficult to extrapolate into the human sphere. Historically, in terms of entropy models, the idea of associating the magnitude of entropy |S| with disorder was first stated explicitly in 1882 by German physicist Hermann Helmholtz. Prior to this, however, the concept of disorder can be found in Rudolf Clausius' 1862 disgregation models of entropy and following that the Boltzmann chaos assumption as popularized by Max Planck with his usage of this model in near absolute zero situations (such as in the work of Walther Nernst) and in quantum mechanics.

Warfare thermodynamics

See main: War thermodynamics

Boles and Cengel state that that entropy can be applied to warfare organizations and processes, to the effect that a high entropy army is less powerful than a low-entropy army, namely one that is divided into divisions. The state that the old cliché ‘divide and conquer’ equates thermodynamically to the phrase ‘increase the entropy and conquer’. The use of thermodynamics arguments in warfare traces at least as far back as 1919 in the writings of Russian engineer Yevgeny Zamyatin and his idea that revolutions and wars are the product of thermodynamic laws.

Human friction

Boles and Cengel state that that friction in the workplace between co-workers equates is a type of human friction that is quantified as entropy generation. They state that:

> "We know that mechanical friction is always accompanied by entropy generation, and thus reduced performance. We can generalize this to daily life: friction in the workplace with fellow workers is bound to generate entropy, and thus adversely affect performance (Fig. 7–27). It results in reduced productivity."

The theory that human frictions generate a type or variant of physical heat (not in a metaphorical sense) was first proposed in 1858 by American sociologist and economist Henry Carey who outlined a theory of social heat associated with the rubbing together of human molecules in daily activity. The model that frictions in the workplace accrue and can be quantified as a type of entropy was first outlined by English-born American engineer William Fairburn in his 1914 book *Human Chemistry*.

Boles and Cengel go on to argue that unrestrained expansion, such as in an explosion or uncontrolled chemical reaction are highly irreversible processes that are similar to the unrestrained scattering of angry words and the damage these transmissions to in their generation of entropy.

Human thermodynamics education

See main: Human thermodynamics education

Boles and Cengel' outline arguments that someday the second law will be used to improve human well-being has been insipiration for some to do graduate school work in pursuit of this objection. In 2009, Hmolpedia member Turnkey13, a Turkey third-year undergraduate mechanical engineer, expressed desire to come to America to complete a master's degree in on a topic related to thermodynamic of human life, having been inspired by passages (shown below) in the 2006 thermodynamics textbook by Cengel and Boles who state that: [3]

> "The arguments presented here are exploratory in nature, and they are hoped to initiate some interesting discussion and research that may lead into better understanding of performance in various aspects of daily life. The second law may eventually be used to determine quantitatively the most effective way to improve the quality of life and performance in daily life, as it is presently used to improve the performance of engineering systems."

The above query about human thermodynamics graduate programs was sent to American electrochemical engineer Libb Thims, in reply to which Thims told the inquiring student engineer that there weren't yet graduate programs (or even undergraduate classes) of that sort yet in the US, as their have been in Europe (Leon Winiarski's 1894-1900 University of Geneva course being one of the earliest examples).

Thims suggested to the engineering student that to better understand this topic with regard to entropy and human relations, he should start off with Thims' 2007 textbook *Human Chemistry*, as (in 2009) it contained the majority of the known publications written on entropy and human relations. [3]

References

1. (a) Cengel, Yunus A. and Boles, Michael A. (2002). *Thermodynamics: an Engineering Approach* (4th ed) (ch. 6: Entropy; subsection: Entropy and Entropy Generation in Daily Life, pgs. 318-19). McGraw-Hill.
(b) Entropy and Entropy Generation in Daily Life (2010) – Technocktail.info.
3. (a) Cengel, Yunus A. and Boles, Michael A. (2006). *Thermodynamics: an Engineering Approach* (ch. 4, pg. 193, ch. 7, pg. 349, ch. 8, pgs. 465-69). McGraw-Hill.
(b) Email communicate to American chemical engineer Libb Thims.
4. Hawking, Stephen. (1996). *The Illustrated - A Brief History of Time*, (keyword: Entropy, pgs. 130-33, 137, 184, 190; ch. 9: "The Arrow of Time", pgs. 182-95). New York: Bantam Books.

See also

â— List of thermodynamics textbooks that include human thermodynamics

θΔics

In thermodynamics, **centropy** is a entropy antonym-like metaphor type of term posited to refer to energetic tendency for particles of a system to come together in an organized manner. The term 'centropy' is a combination of 'centration', meaning concentration, and 'negative entropy', meaning order.

Etymology

The term ‘centropy’, defined as ‘where all things come together’, has been around since 1985, depicted, it seems, as a religious-themed philosophical conception that connected to the ‘real essence of finding out who you are’. [1] The term, in this period, was defined as such: [2]

> “There is a thing called entropy where all things fall apart. There is also a thing called **centropy** where all things come together.”

The author of this definition goes on to state that most people don’t know about centropy.

In 1980, American writer Irving Simon published a 70-page booklet *Centropy: the Vertical Aspect of Evolution*, and followed this up by the 250-page book *Centropy: Evolution of Energy Systems*. [3] The 2004-launch site IrvingSimon.com, which seems to have uploaded the introductory pages of the book, becoming inactive in 2005. Simon defines the term centropy as such: [4]

> “Centropy comes from the term 'centration,' which has been introduced by Joseph Bois to indicate what happens when there is a pooling of human energies. It is a concentration of a sort; a uniting as exemplified by a group engaged in a cooperative venture. It is at those times when humans commingle (share in a common endeavor), that the outgrowth of their interaction may result in a new innovation leading to the enhancement of human relationships. Just such events occurred when single-celled organisms joined together to form multicellular organisms, and when complex organisms joined to form larger structures such as societies. Thus, when we speak of the vertical aspect of evolution, we imply the evolution of complexity. Let us differentiate it from the horizontal aspect of evolution by referring to it by the term 'centropy.' Also, let us refer to the process that is implied when we speak of the evolution of complexity, as a 'centropic process' rather than a 'negentropic process.'”

Simon suggests argues that centropy, as he uses it, is a more intuitive synonym type replacement term for Erwin Schrodinger’s 1943 negative entropy or negentropy theory.

See also

â— Anti-entropy difficulties

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θΔics

In genius studies, **certified genius** refers to a person with either an historically certified, psychologist certified, and or test certified 140+ range IQ; each of these so-called "certification" methods, however, may vary in terms of accuracy, and may indeed, more often than not have what Isaac Asimov (1990) refers to as a "paper IQ", namely an sheet of paper that says what one's IQ is, the value of which, however, not necessary matching up with reality (e.g. mislabeled geniuses and IQ tests).

Genius icon: used various eoht tables to signify that the person is known be a 200-range IQ certified genius.

Overview

In terms of what constitutes "certification", the issue is a bit murky, in the general sense of the term; as it is relatively easy for someone to go online, find the appropriate IQ test, and become a certified genius in a matter of a few hours (e.g. Mensa-certified, Mega-test certified, etc.). This, however, is not what is meant in the original Lewis Terman 1910s IQ-defined genius level (140+). The only true means of asserting genius certification is by peer-certification, namely when one well-known genius specifically labels another as a genius. The original psychology-based genius certifications were done in the 1920s by American psychologist Catherine Cox and here team of psychologists at Stanford University who ranked the 300 greatest genius who lived between 1450 and 1850. The second study on greatest geniuses of all-time was the 1994 ranking done by English accelerated learning expert Tony Buzan who ranked the 100 greatest geniuses of all time. The cream-of-the-crop of these geniuses, namely those with assigned IQs at or above the 200-range, from each respective study, are shown below, and can each be said to be "certified geniuses" in the true sense of the word:

Cox's 200-range Geniuses (1926) **of 300-geniuses**

1. Goethe (IQ=210)
2. Leibnitz (IQ=205)
3. Grotius (IQ=200)
4. Wolsey (IQ=200)

Buzan's 200-range Geniuses (1994) **of 100-geniuses**

1. Da Vinci (IQ=220)
2. Goethe (IQ=215)
3. Shakespeare (IQ=210)
4. Einstein (IQ=205)

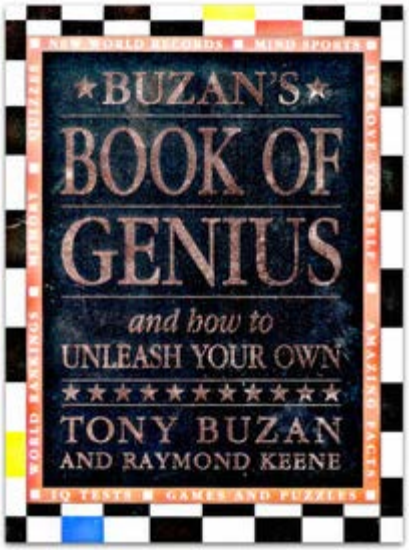

The best example of a real “certification” was when after, in 1905, a relatively unknown Albert Einstein had “predicted” that a large mass would cause light to bend, Arthur Eddington in May 1919 conducted a solar eclipse expedition, therein proving or “certifying” Einstein’s genius logic.

See also

- IQ: 200+
- IQ: 225+
- Cox-Buzan IQ
- IQ: 200 (±) candidates
- IQ: 200+ (references)

θΔics

In existographies, **Cesar Dumarsais** (1676-1756) was a French lawyer, philosopher, free thinker, and grammarian, noted for []

Overview

In 1743, Dumarsais, in his *The Philosopher*, argued, from a non-religious point of view, that the human is a machine, similar to a watch, in which there is a mainspring driving the rest. [1]

Influenced

Dumarsais, according to Ann Thomson (1996), influenced Julien la Mettrie.

Quotes | By

The following are quotes by Dumarsais:

> "The philosopher is a human machine like another man; but it is a machine which, by its mechanical constitution, reflects upon its motions. Other men are determined to act without feeling or knowing the causes that cause them to move, without even thinking that there is any."
>
> — Cesar Dumarsais (1743), *The Philosopher* [2]

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(b) Dumarsais, Cesar. (c.1751). "Philosophe", Diderot's Encyclopedia.
(c) La Mettrie, Julien. (1751). *Machine Man and Other Writings: Treatise on the Soul, Man as Plant, The System of Epicurus, Anti-Seneca or the Sovereign Good, Preliminary Discourse* (translator and editor: Ann Thomson) (pg. xix). Cambridge University Press, 1996.
2. Dumarsais, Cesar. (1743), *The Philosopher* (*Le Philosphe*) (Ñº). Publisher.

External links

â— Cesar Chesneau Dumarsais – Wikipedia.

θΔics

In cessation thermodynamics, **perspectives on cessation** is view that from the vantage point of those affected individuals remaining following the point termination of an individual person (human molecule) that there exist different variations of perspective in terms of how "life changing" or transforming, for the better or for the worse, the death was. The following table gives a rough idea of the gradient that exists: [1]

#	Cessation Variations per Perspective	Most Life Changing	Least Life Changing
1	Death of your child (0-12)	15 (M=54)	
2	Both parents die before your eighteenth birthday	12 (M=45)	
3	Death of a spouse	10 (M=19)	
4	Early parental suicide	9 (M=32)	
5	Death of someone you killed	8 (M=22)	
6	Accidental death (e.g. car accident)	8 (M=26)	1 (M=2)
7	Suicide (sibling)	7 (M=21)	
8	Accidental child-drowning death of your infant	6 (M=18)	
9	A horrible accident before your eyes	6 (M=15)	
10	Death of best friend	6 (M=14)	
11	Death of your teenager (age13-19)	5 (M=19)	
12	Early parental death (age 13-18)	5 (M=17)	
13	Death of your child in adulthood (age 20-80)	5 (M=15)	
14	Death of parent and child during pregnancy	5 (M=10)	
15	Parental death (age 19-35)	4 (M=13)	
16	Early parental death (age 4-12)	4 (M=12)	
17	Death of a boyfriend or girlfriend	4 (M=8)	
18	Parental death (age 36-80)	3 (M=9)	
19	Death for your cause	3 (M=7)	
20	Murder	3 (M=5)	1 (M=3)
21	Miscarriage	7 (M=16)	5 (M=16)
22	Death of a child during pregnancy	1 (M=2)	
23	Watching someone die from choking on food	1 (M=4)	
24	Death while in a state of torment	1 (M=3)	1 (M=3)
25	Early parental suicide	2 (M=10)	1 (M=1)
26	Suicide (extended family)	1 (M=2)	1 (M=5)
27	Unsolved deaths	2 (M=5)	2 (M=4)
28	Death of a cousin	0	0
29	Death of a half-brother or half-sister	0	0
30	Death wherein an unresolved grudge exists	1 (M=3)	2 (M=6)
31	Death while in a state of rage		1 (M=4)
32	Death of someone you fear	1 (M=4)	2 (M=2)
33	Death from terrorism		1 (M=1)
34	Death of someone you're having sex with		1 (M=2)
35	Death of an aunt or uncle		1 (M=1)
36	Death of an in-law		1 (M=1)
37	Death of your best friend's parent		2 (M=5)
38	Assassination	3 (M=13)	6 (M=13)
39	Gang-related death		3 (M=8)
40	Death of a teacher or mentor		3 (M=10)
41	Death from natural disaster (tsunami, fire, etc.)		3 (M=7)
42	P.O.W. death		4 (M=8)
43	War-related deaths		5 (M=13)
44	Death of co-worker		6 (M=15)
45	Death of enemy		8 (M=26)
46	Death of distant friend or acquaintance		11 (M=20)
47	A peaceful death at the end of a long, good life		17 (M=64)
48	Pet death	2 (M=5)	18 (M=51)
49	Celebrity death		20 (M=74)
50	Natural death from old age		22 (M=83)

Results of a 2005 survey (N=30) by Libb Thims on what people viewed as the most life changing and least life changing types of death. [1]

Discussion

From the table, we can discern a gradient of "states" of death, in which some deaths are favored and others disfavored. Seneca the Younger was one of the first to acknowledge this when he stated that:

> "Death is a punishment to some, to some a gift, and to many a favor."

In modern cessation thermodynamics, we can discern these gifts and punishments through the tools of energy transfers, mediated through the dynamic action of human chemical bonds, as the post-cessation structure of family and society reconfigures, for the better or for the worse, following point termination, according to the first law of thermodynamics.

References

1. (a) Thims, Libb (2005), "Poll: Most Life Changing and Least Life Changing Variations of Cessation" (N=30, random Chicagoans, aged 18-50). Chicago: Institute of Human Thermodynamics.
(b) Key: survey participants were shown the above list in random order and asked to pick the top five most life changing and top five least life changing variation on cessation, using a scale of 1 = 1st pick, 2 = 2nd pick, 3 = 3rd pick, 4 = 4th pick, and 5 = 5th pick. The results are shown in the columns above as # (M=#) in which former represents the total vote count for that answer and the latter, i.e. M=#, represents a "magnitude scale" weighted such that a "1st pick = 5 points, 2nd pick = 4 points, 3rd pick = 3 points, 4th pick = 2 points, and 5th pick = 1 point.

(c) Thims, Libb. (2005). *Cessation Thermodynamics* (manuscript), (pgs. 33-41). Chicago: Institute of Human Thermodynamics.

θΔics

In cessation thermodynamics, the **cessation conservation hypothesis** or *cessation conservation supposition* (CCS) postulates that when a person dies, a residual human chemical bond "energy signiture" remains in the post-cessation bond matrix of society that becomes reincorporated into the neurological structure of affected people (human molecules) in either an incremental or detrimental manner, depending on the moral nature of the momentum actions of deceased up to the point of termination, according to the conservation of energy or first law of thermodynamics. [1] The cessation conservation hypothesis, was developed between 2002 and 2005 by American chemical engineer Libb Thims.

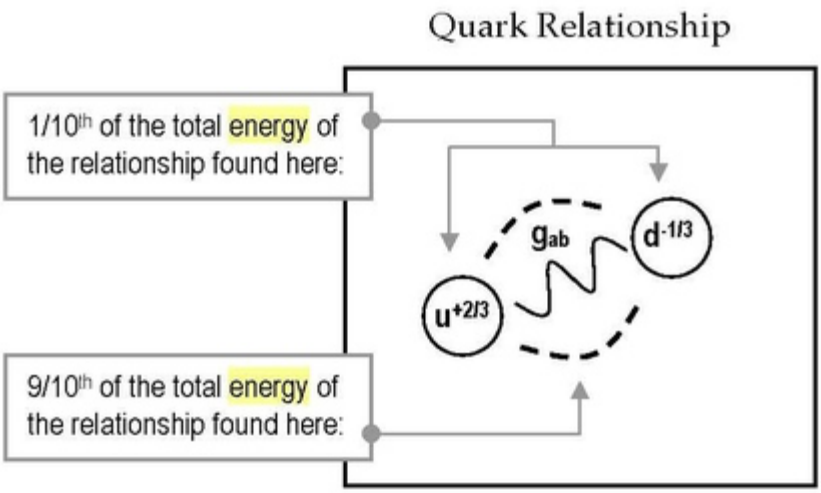

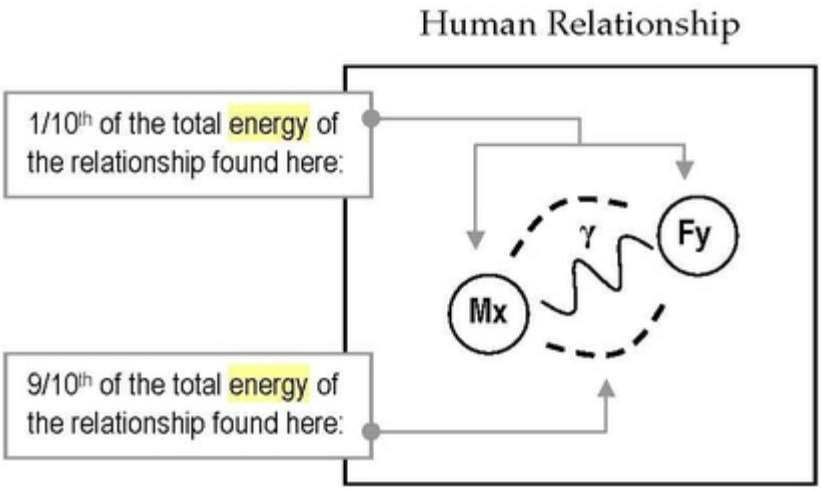

Overview

One of the first workable theories to explain the age-old question of "what happens to a person when they die?", was developed in rudimentary form by American chemical engineer Libb Thims in a chapter of the 2003 manuscript *Human Thermodynamics (Volume Three)* in which it was argued that following death the three components of a person that remain, aside from material possessions, are:

(a) the physical body (comprised of 26-elements that eventually are recycled in the biogeochemical cycle)
(b) the possible genetic material (in the form of offspring)
(c) a residual energy content (of the consequences of a person's actions throughout life).

The latter of these, was hypothesized to be transported into the central nervous systems of family, friends, and acquaintances in either an organizing or deorganizing manner depending on the moral character, virtue, or righteousness of the person at the point of termination. [2]

Mechanism of transfer

A detail that was missing in the theory in 2003 was both the mechanism of the energy transfer and the sub-atomic particle description of the hypothetical moral "energy content" remaining following termination.

A partial clue to this puzzle came from Dutch theoretical physicist Martinus Veltman, winner of the 1999 Nobel Prize in physics for in 1999 "for elucidating the quantum structure of electroweak interactions in physics", who in his 2003 book *Facts and Mysteries in Elementary Particle Physics* pointed out that most of the mass or "energy", as these are equivalent via Einstein's mass-energy equivalence relation, of sub-atomic particles actually resides within the bonds. In the proton, for instance, which consists of two up quarks and one down quark each connected together via gluon "g_{ab}" bonds, 923 MeV of its total mass (938 MeV) resides within the gluon bond. Hence, in colloquial terms, most of the essence of the proton or quark relationship is actually found within the bond.

In this perspective, modeling human relationships in a similar manner, Thims reasoned that possibly a large portion of any given human relationship may actually reside in the photon bond (human chemical bond) that connects people. This

is diagrammed adjacent, in which Mx and Fy represent a male and a female, from a point mass perspective, attached through the structure of a chemical or photon "γ" bond. Subsequently, when the body of the person (human molecule) terminates, what remains at that exact moment is residual bond energy.

Cessation thermodynamics, form this perspective, can be considered as the study of the transformation of his residual bond energy or "energy signature" of a person in the post-cessation structure or matrix of family and society, which is hypothesized to transform and reincorporate into previously connected central nervous systems constructively or destructively, depending on the state of death and the condition of the moral nature of the person at that instant. This can be discerned through the perspectives on cessation that exist in relation to the attached bonds.

Reception

On January 23, 2005 this preliminary outline was expanded into a 15-page "Tentative Hypothesis Concerning the Whereabouts of a Person Following Cessation". [3] In the months to follow, this was expanded into the 100-page manuscript *Cessation Thermodynamics*, of which one-hundred copies were produced and distributed around the U.S. [3] Of those who reviewed it, 87% agreed that the overall concept "sits well in their stomach". [4]

Principle of substance stability

In 2008 commentary on Thims' *cessation conservation hypothesis*, Russian physical chemist Georgi Gladyshev stated that CCS is "fully corresponded to the principle of substance stability." [5] The principle of substance stability, is a theory of structure movement in hierarchies during the course of evolution, which states that: during the formation or self-assembly of the most thermodynamically stable structures at the highest hierarchical level (j), e.g., the supramolecular level, Nature, in accordance with the second law, spontaneously uses predominantly the least thermodynamically stable structures available from a given local part of the biological system, belonging to a lower level, i.e. molecular level (j-1), and incorporates these unstable structures into next higher level, i.e. supramolecular level (j). Subsequently, according to the principle of substance stability, each subsystem of the biosphere evolves according to its thermodynamic tendency to seek a free energy minimum during each evolution cycle by the action of the incorporation of unstable structures into higher hierarchies.

To cite one example, when a child has a parent that commits suicide, the energy content of this act, specifically the residual parental bond energy content and quality mediated by totality of this process, will have a destabilizing effect on the child as he or she grows. One consequence of this is that the adult child will be less likely to reproduce and will be more likely or driven to work harder in life and in society. [3] Subsequently, such an unstable human molecule may find or have a greater tendency to incorporate into a higher hierarchical level in accordance with the conservation of energy and the principle of substance stability. In more detail the unification of these two postulates, i.e. the cessation conservation hypothesis and the principle of substance stability, according to Gladyshev, means that: [5]

> (a) Physical body during the evolution (phylogenies) and ontogenesis in accordance with the second law, spontaneously uses predominantly the least thermodynamically stable structures available from a given local part of the biological system, belonging to molecular level (j-1), and incorporates these unstable structures into next higher level, i.e. supramolecular level (j).
> (b) The possible genetic material during the evolution (phylogenies) and ontogenesis in accordance with the second law, spontaneously uses predominantly the least thermodynamically stable structures available from a given local part of the biological system, belonging to molecular level (j-1), and incorporates these unstable structures into next higher level, i.e. supramolecular level (the supramolecular levels j, j+n). In this case we have the same situation as (a) but in the other time scale and supramolecular environment.
> (c) The effects of an organizing or deorganizing energy transfer mediation, depending on the moral character, virtue, or righteousness of the person at the point of termination, correlates to the nation … structure of soils and traditions…, which should be more stable during evolution (phylogenies) and ontogenesis. These structures incorporate predominantly the least thermodynamically stable structures (available from a given local part of the biological system) from the soil's and tradition's fragments.

Difficulties on theory

Several difficulties on theory remain. One is that it is rather an obscure idea to conceive that a "moral nature" exists in a system of atoms and molecules. Another is the connection or significance of human life in relation to the big picture of the universe, namely that mass-extinctions occur on the earth about every 26-million years, that the life of the sun, and the dependence of life on earth for the sun's heat, has 10-billion years remaining, or how all of this relates to potential cycles or directions of the universe. Lastly, the study and quantum mechanical description of the human chemical bond is still in its very early stages of development and understanding. [6]

See also

â— Continuing bond
â— What happens when you die?

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θΔics

In human thermodynamics, **cessation thermodynamics** is the study of death, or termination of the physical movement or neurological activity of a person (human molecule), in relation to a potential or hypothetical conserved (moral or amoral) "essence of a person", in the post-cessation bonded structure of the universe or society, as discerned by the first law of thermodynamics (conservation of energy) which states that energy can be neither created nor destroyed. [1]

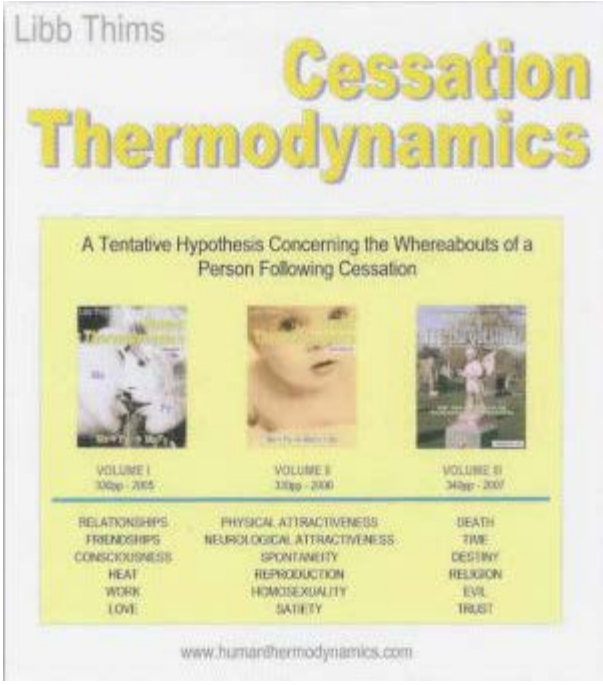

Cover of a 100-page 2005 manuscript ***Cessation Thermodynamics*** by American chemical engineer Libb Thims, of which 100-copies were printed and distributed around Chicago, on the subject of death in the context of the first law of thermodynamics. [10]

The term "cessation thermodynamics" was coined in 2005 by American chemical engineer Libb Thims as the study of death from the perspective of thermodynamics. In short, cessation thermodynamics studies how, if at all, the energy content of the being of a person, moral or amoral, as described via the fundamental forces, connects to the movement of the universe.

The topic of death, and particularly "what happens to a person when they die", although this philosophical puzzle is the most desired query to be answered in modern times, generally tends to remain a relatively mute one in science. [2] No satisfactory scientific solutions, to date, have been published. [3] The law of conservation of energy or generalized first law of thermodynamics, however, is the only law seated to provide a solution.

History

Historically, or colloquially, as discerned through the world's religions, which can be considered as the sciences of the past, a general theory pervades throughout that following the death of the physical body a type of *soul, spirit, essence, p'o, hun, yin, yang, pitri, atman, nafs, ruh, kami, jiva, pheuma, physche, élan vital, fravashi, totism, psychopomp, dooh, dusha, rauch, n'shama, ka*, or *ba*, etc., remains, transforms, or migrates into a post-cessation state of existence. [8] For most of history, these terms were explained by the various religious texts and the stories they derived from.

In the 1850s, however, with the development of the science of energetics (thermodynamics), the view of what these terms were in composition began to change.

The earliest views on this type of logic from the field of psychodynamic, or energy psychology, in combination with late 19th century animism or vitalist views, in which life forms were argued to have a special type of "vital energy" distinct from that of the physical energies. In the late 19th century, for instance, German psychologist Wilhelm Wundt, with his "System der Philosophie", sought to understand the human mind by identifying the constituent parts of human consciousness, in the same way that a chemical compound is broken into various elements and who viewed psychology as a science, much like physics or chemistry, in which consciousness is a collection of identifiable parts.

The first to postulate ideas along these lines was German physician and physicist Hermann Helmholtz who in 1892, in his discussions on the thermodynamics of Goethe's *Faust*, reasoned that the ebb and flow of life, and its relation to death, has an explanation in the total constancy of energy or active force, for both animate and inanimate life. [2]

The first to discuss the nature of human death in relation to energy, in particular reference to the law of conservation of energy, was German chemist Wilhelm Ostwald, one of the founders of the school of energetics, who, in the 1906 Ingersoll lecture *Individuality and Immortality*, asked the question: [9]

> "What has energetics to say about immortality."

In 1910, using Wundt as source, in reference to the thermodynamic aspects of death, American social historian Henry Adams stated that: [4]

> "The naturalist now readily admits that plants have souls—or will-power—but he appropriates the soul as an energy of thermodynamics."

In 1919, on the topic of death and its connection to the conservation of energy, Engish physical chemist Frederick Soddy outlined a short synopsis on his views in his article subsection "Immortality or the Conservation of Personality" in his book *Science and Life*. [11] He states, "the real part of a man is not his bodily organism, which is continually wasting away and being as continually renewed, nor the physical energy at its command, which is derived entirely from the inanimate world, but is the personality resident in the body and in control of it." On this perspective, he eludes to the hypothesis that this quantity is conserved after death; a kin to the conception of immortality of the soul; although, he notes, it is not a conservation phenomenon applicable to the inanimate world.

In the 1976 book *The Reflexive Universe*, American mathematician Arthur Young formulated ideas on the immortality of the soul as guaranteed by the first law of thermodynamics. [13]

In the 1950s, the first to outline the view that a "new science" of the study of the thermodynamics of death was needed was Iranian thermodynamicist Mehdi Bazargan who stated: [10]

> "Thermodynamics might be able to say, though very vaguely, if there is going to be a resurrection and another world, how this may occur and what the other world may look like … In this way, we may be able to examine to what extent the signs of the other world, as provided by the prophets, are plausible. If these signs about the resurrection, paradise and hell form a reasonable and sensible related collection that **new sciences**, to some extent, affirm, then such beliefs are not baseless."

In circa 1995, American physician Gerry Nahum, with a background in thermodynamics and information theory, supposedly, worked out a 25-page proposal, entitled "Proposal for Testing the Energetics of Consciousness and its Physical Foundation", to conduct a consciousness-weighing project to quantify the energy of consciousness or rather the "weight of the soul", at the point of death, estimated to cost $100,000, using a negative entropy theory. [14]

In circa 2000, using the works of Pierre Teilhard and Belgian thermodynamicist Ilya Prigogine as a basis, French engineer and biophysical chemist Louis-Marie Vincent gave a crude theory of how the qualities of life, love (as a thermodynic potential) and death may function in respect to the time of death and in relation to near-death-experiences. [12]

In modern terms with the rise of particle physics, where, according to general scientific consensus, everything in the universe is either matter or energy or variations therein; quantities which can be further divided into entities called fermions, i.e. half integer spin particles, or bosons, i.e. integer spin particles, cessation thermodynamics considers how the life and death of a person connects, if at all, in respect to the movement of the universe.

Cessation conservation hypothesis

See main: Cessation conservation hypothesis

One of the first workable theories of a scientific explanation of death, as to the question of particularly "what happens to a person when they die?", was a tentative hypothesis of human "essense" (virtuousness) energy conservation, developed in rudimentary form by American chemical engineer Libb Thims in a chapter of the 2003 manuscript *Human Thermodynamics (Volume Three)*, in which it was argued that following death the three components of a person that remain, aside from material possessions, are:

(a) the physical body (comprised of 26-elements that eventually are recycled in the biogeochemical cycle) (human molecule)
(b) the possible genetic material (in the form of offspring) (85% of people reproduce)
(c) a residual energy content (of the consequences of a person's actions throughout life) (human chemical bond energy) (energy signiture)

The latter of these, aspect (c), was hypothesized to be transported into the central nervous systems of family, friends, and acquaintances in either an organizing or deorganizing manner depending on the moral character, virtue, or righteousness of the person at the point of termination; acting through the medium of residual bond energy remain at the point of termination. [5] Thims wrote a 100-page manuscript titled *Cessation Thermodynamics* in 2005, of which one-hundred copies were distributed for feedback, and worte the first published chapter section entitled "Cessation Thermodynamics" in chapter sixteen of 2007 *Human Chemistry (Volume Two).* [10]

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External links

â— Cessation thermodynamics - IoHT Books.
â— Laws of Thermodynamics and Reincarnation (2005 discussion) – Belief.net.

θΔics

The **cessation thermodynamics pioneers** or "cessation TPs" is a file-header page for biographies (listed to the left) of theorists in cessation thermodynamics or the thermodynamics of the philosophical question what happens when you die.

θΔics

In things, **CH-based animation**, as compared to powered CHNOPS+ element things, or Si-based intelligence (e.g. computers), or the now defunct (see: abioism) phrase "carbon-based life" (see: Si-based life), refers to []

Overview

Among animate things of a decisively "intelligent" nature, e.g. robots, humans, or monkeys, etc., it is found that the nature of this intelligence derives from the geometric arraignment of the protons, neutrons, and electrons of the elements of column 14 of the periodic table (see: hmolscience periodic table), the elements carbon C, for humans and monkeys, and silicon Si, for robots or computers, in particular, which have the property of light-induced electron-rearrangement or flexibility.

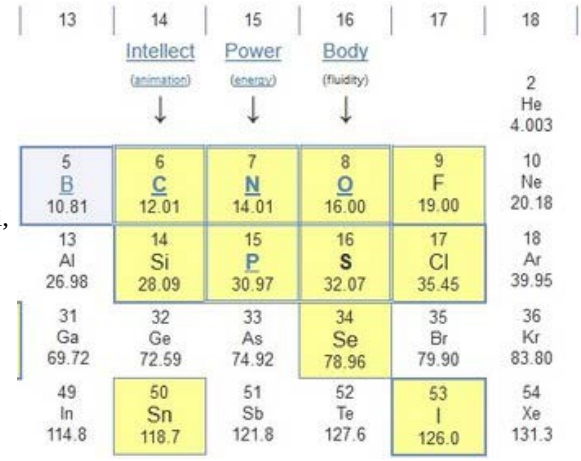

A section from the hmolscience periodic table, showing that column 14, wherein carbon C and silicon Si, are located, is the location of "intelligence", owing to the repeated geometry of electrons and protons in that column, which yields the property of light-induced animation.

Examples

The following are examples of four related intelligent CH-based animate things, namely: retinal, DTA, AQ, and human, the first three with the ability to bend, walk, and carry, respectively, and the human, with the ability to bend, walk, carry, as well as to plan and think about other types of movements: [1]

Animate CH-Based Things

	Thing	Movement
Bending	**Retinal** | $C_{20}H_{28}O$ | **Light**-powered 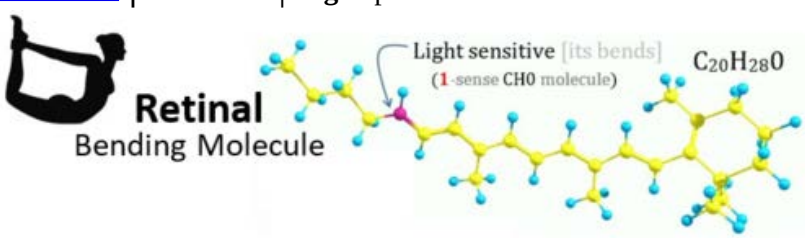	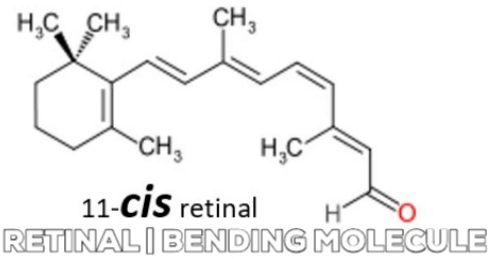
Walking	**DTA** | $C_{14}H_{10}S_2$ | **Heat**-powered 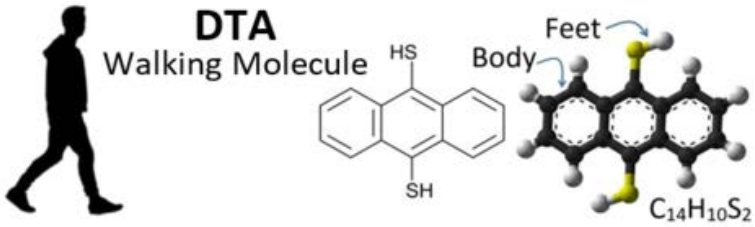	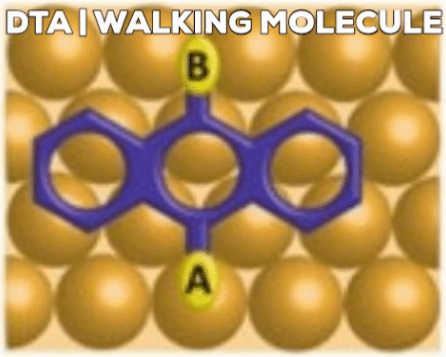
Carrying	**AQ** | $C_{14}H_{8}O_{2}$ | **Heat**-powered 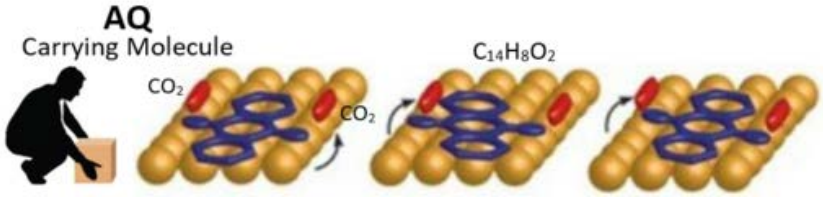	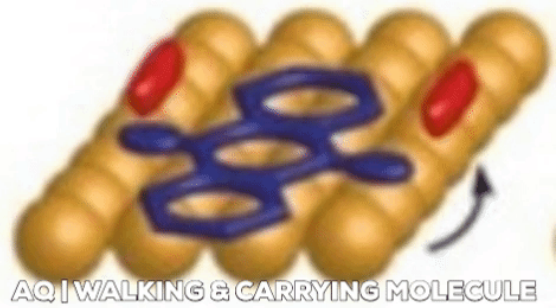
Bending **Walking** Talking	**Human** | CHNOPS+20 | **Heat**+**Light**-powered	

Carrying
Dancing
Thinking

Here, to pause, we see that a human (a powered CHNOPS+20 thing), as a walking, talking, bending, thinking, dancing animated atomic geometry, is but a more developed atomic form than things such as AQ ($C_{14}H_8O_2$), a carrying carbon-based thing, DTA ($C_{14}H_{10}S_2$), a walking carbon-based thing, or retinal ($C_{20}H_{28}O$), a bending carbon-based thing, by virtue of the fact that as more atoms, e.g. sulfur S (DTA) or oxygen O (retinal), are added to the carbon-based animate thing, over the course of evolution (see: molecular evolution table; evolution timeline; great chain of being), from hydrogen to human, more advanced movement properties are acquired.

Quotes

The following are related quotes:

> "Hydrogen is a light, odorless gas, which, given enough time, turns into people."
>
> — Edward Harrison (c.1990) *Publication* (Ñº); cited (Ñº) by John Wiley (1995) in "Phenomena, Comments and Notes" (Ñº); cited (Ñº) by David Christian (2004) in: *Maps of Time*

References

1.

θΔics

In science, **chain of being** (TR:91) or *scala naturae* (Latin), aka "golden chain" (Homer, c.750BC), "scale of being" (Robinet, 1761), "great chain of nature" (Stewart, 1789), or “scale of natural things”, refers to scales, ladders, steps, or chain-linked depictions connecting matter "continuously" (see: continuity theory) up through humans, as shown below, from rocks to plants to animals to people:

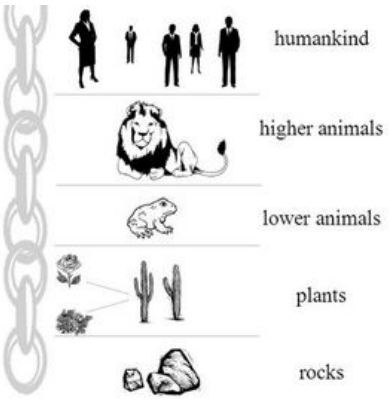

“Between the lowest and the highest degree of spiritual and corporal perfection, there is an almost infinite number of intermediate degrees. The succession of degrees comprises the universal **chain**. It unites all **beings**, ties together all worlds, embraces all the spheres.”

Top: Charles Bonnet and his 1764 statement about the existence of a "**chain**" connecting all beings. [5] Right: a depiction of Ramon Llull's 1303 “**chain of being**”, or scale of intellect, as he called it, rocks to humans.

Overview

In c.760 BC, Homer, in his *Iliad* (8.19), spoke about a "golden chain" that dropped mortal kinds to earth from the heavens above; it was propagated by the Stoics as an allegory of the divine nature of life; it was dismissed by Lucretius:

> “For, as I think, it was no **golden chain** that dropped mortal kinds from heaven above.”
>
> — Lucretius (55BC), *On the Nature of Things* [18]

A proto-concept of the existence of a natural scale or unbroken chain is also said to trace back to the ideas of Plato and Aristotle. Swiss natural philosopher Charles Bonnet, shown below, influenced by the monad ideas of Gottfried Leibniz, is the first to make an actual scale (1745) and step depiction (1783) and to describe the successive degrees of development as being chained together.

In 1932-33, German-born American philosopher Arthur Lovejoy, gave his Harvard lecture series turned book *The Great Chain of Being*, shown below (left), the first and its seems only historical book on the subject, which accounts the rise and fall of the once dominate theory of the enlightenment, its fall-off attributed to Descartes' dualism, the romantic movement, Darwin's evolution theory, and modern physics, supposedly, Einstein's relativity theory, in particular. [15]

Egyptians

In the period 3100BC-300BC, Egyptian scholars, whose apex seems to have been the mind of Egyptian polymath Imhotep (2635-2595BC), promulgated a number of cyclical "proto-chain of being" theories, most of which historically anchored in the Heliopolis creation myth, according to which land (earth) arose out of a flood (water) from which the sun (fire) burst forth, albeit each conceived as the gods: Geb (root of "geocentric"), Nun (suffix of "Abraham" and "Brahma), Ra (middle root of "Abraham" and "Brahma"), respectively, out of which humans were eventually self-engendered, which culminated in the clay creation myth, which became re-written into the story of Adam (clay) and Eve (breath) or life from divine spirit breathed into clay. Much of the Egyptian philosophy, to note, was also wrapped up in astrology and the observable cyclical movements of the sun, moon, and stars. The following gives 1963 book cover, by Thomas Burgoyne, depicts a semblance of an idea of how the Egyptians conceived of cyclical-like chain of being, the snake being what, at the end of each day, or creation cycle, swallowed the sun, from which it was re-born the next day, according to their Geb-based flat earth theory, humans fitting vicariously into this scheme via resurrection and or afterlife theories:

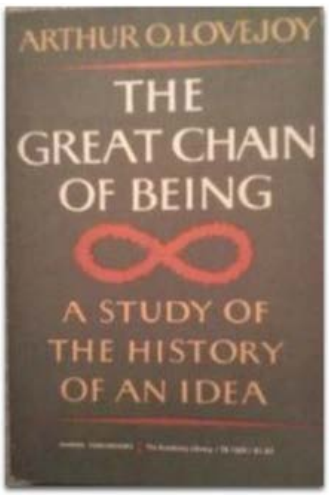

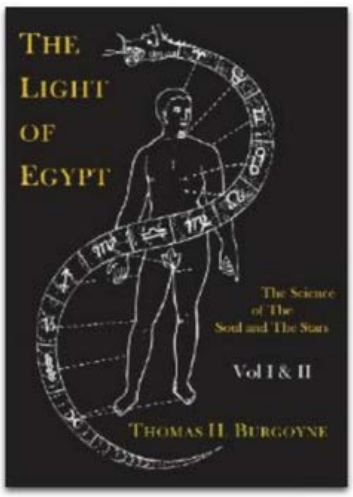

(Lovejoy, 1933) (Burgoyne, 1963)

Greek philosopher Thales of Miletus (c.624-c.546), who is attributed by Aristotle to have been the first philosopher in the Greek tradition, was the first to initiate the study of Egyptian philosophy of nature, by himself traveling to Egypt; a "study abroad" method followed by most of the Greek philosopher in the years to follow, Pythagoras, Democritus, and Plato, in particular, all studied in Egypt, whereby many of the basic principles of Egyptian philosophy, science, and mathematics, were absorbed into Greek thought, e.g. three element theory (earth, fire, water), which later became "four element theory" (and then four element and two force "standard model" theory), derived from Heliopolis creation myth; the dualism of life vs non-life, based on the clay creation myth, i.e. clay (dead) vs spirit-imbibed clay (alive); the theory of the soul, modified by Aristotle into his "three soul theory" (see: Aristotle on the soul) (O), the latter topic of which has vexed geniuses continuously: from Plato, and his "split soul theory" (O), up through Goethe (see: Goethe on the soul), James Maxwell (O), Thomas Edison (O), Einstein (see: Einstein on the soul), Werner Heisenberg (O), and John Neumann (O); see main: geniuses on the soul. (O)

Aristotle | Natural scale | 330BC

In c.330BC, Aristotle outlined some type of “scala natura” or natural scale, giving some type of vertical distinction among the layers of existence. [13] The following is rendition of Aristotle’s scale from Charles Singer’s 1931 *A Short History of Biology*: [14]

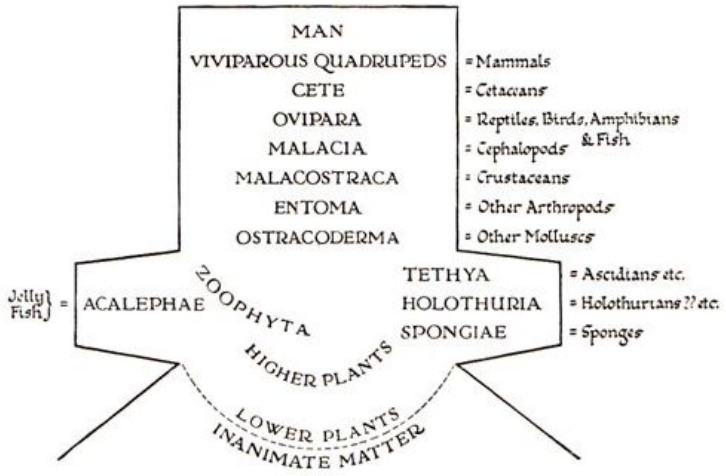

The *Scala Naturae* or ‘ Ladder of Life ’ according to the descriptions of Aristotle.

(add discussion)

Llull | Scale of intellect | 1303

The following is Ramon Llull's scale of intellect, connecting earth with the abode of god, from *Liber de Ascensu et Decensu Intellectus*, showing organized bodies, including fire, in the main scale, depicted as a scale: [16]

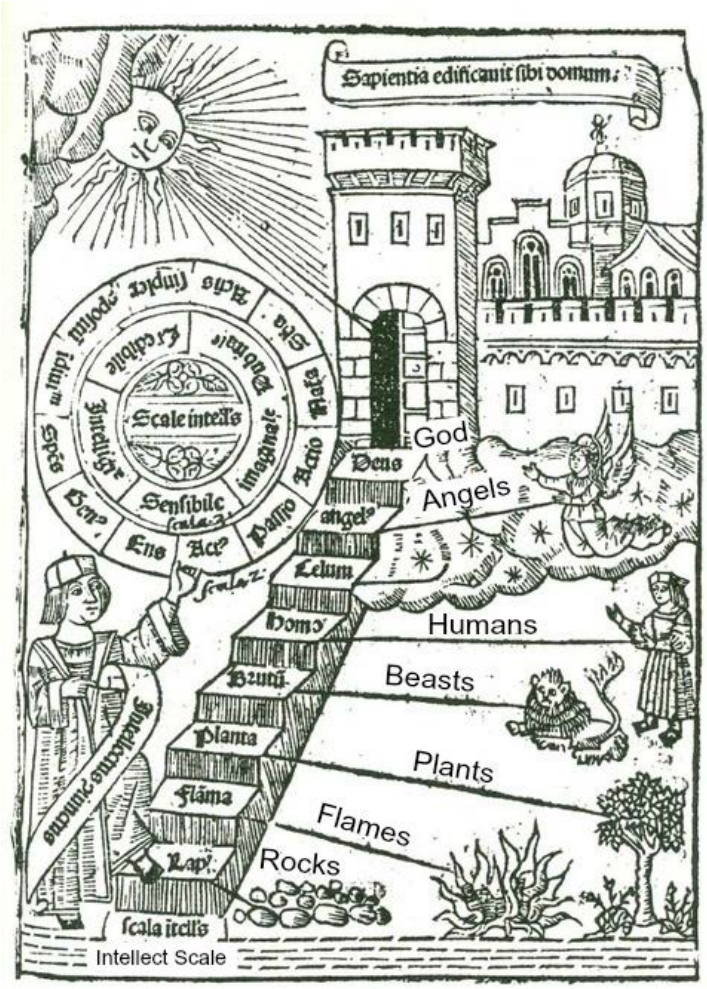

Here, interesting, we see one of the first "rock vs human" comparisons, in this case in regards to intelligence.

Bouelles | 1512

The following shows Charles de Bouelles 1512 linear order of nature diagram, from his *Physicorum Elementorum*: [16]

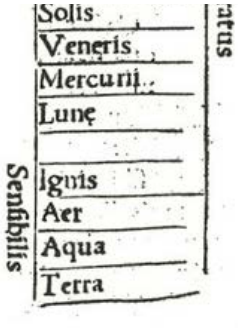

The bottom of the scale shows everything originating from earth (terra), water (aqua), air (aer), and fire (ignis), aka the four element theory.

Maillet | 1732

In 1732, Benoit de Maillet completed *Telliamed*, his surname "de Maillet" in reverse, based on manuscripts written in the previous ten years, albeit published posthumously in 1748, in impartial form, and full form in 1755, wherein he posited, based on the fact that iron rings of ancient moored ships now sat in the desert in the ruins of Memphis, that the earth could not have been created instantaneously, as the Bible decreed, but rather was 2 billion years old, based on the datum that the sea was receding at a rate of three inches per century, and that all land creatures originally derived from sea-based human-like creatures. [1]

These types of ideas, supposedly, are found represented, without citation, in Francesco Soldini's 1776 *De anima brutorum commentaria*, as shown below: (O)

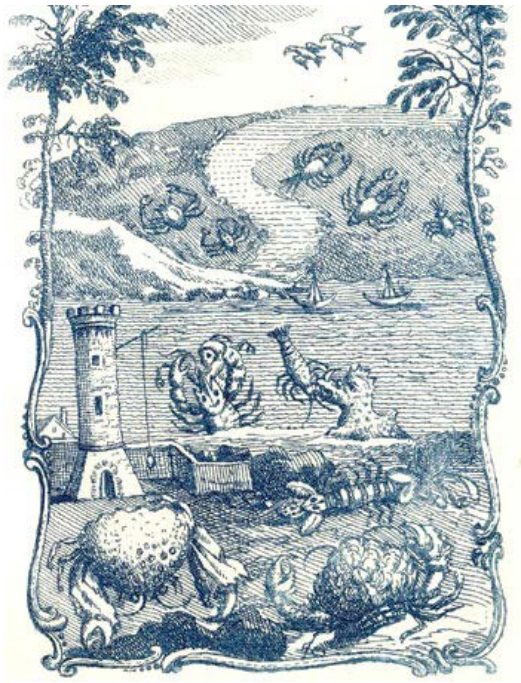

Maillet proposed that life began in the water in the form of minuscule seeds that joined together to create all aquatic forms, from which all terrestrial and winged creatures were then derived. In his opinion, all plants and animals would have analogous examples among the aquatic specimens. Some of Maillet's account of things are found in the first three volumes of Buffon's *Natural History*.

Bonnet's scale of natural beings | 1745

The following is Swiss natural philosopher and evolution-coiner Charles Bonnet's 1745 "Idea of a Scale of Natural Beings" (IDÉE D'UNE ECHELLE Des Etres Naturels) or "Idea of a Range of Natural Ones", depending on translation, wherein he seems to trace the evolution or metamorphosis of humans back to the four elements, or specifically earth, air, fire, and at the bottom what he calls "matières plus subtiles" or "more subtle materials", or finer matter, in 52 steps, degrees, or categories: [1]

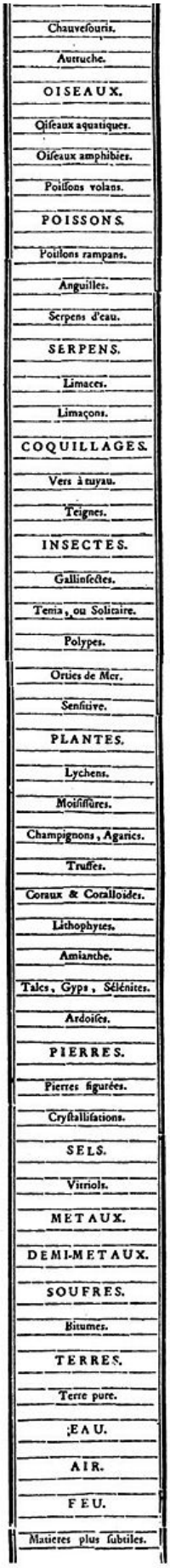

The following is a 28-step English translated version of Charles Bonnet's chain of being from his 1764 *Contemplation de la nature*: [6]

Man
monkey
quadrupeda
bats
ostrich
birds
aquatic birds
flying fish
fish
eels
sea serpents
reptiles
slugs
shellfish
insects
worms
polyps
sensitive plants
trees
shrubs
herbs
lichen
mold
minerals
earth
water
air
etherial matter

The following is a artistic step-wise type chain of being from Charles Bonnet's 1783 *Works of Natural History and Philosophy*: [4]

Robinet

In 1761, Jean Robinet, in his *Of the Nature*, the first volume of five (the last volume completed in 1768), sought to outline an sort of pan-rationalism themed evolutionist scale of being philosophy. In his *Of the Nature, Volume Two* (1763), he began to attack the category divisional aspects of Charles Bonnet's chain of being and his attempt to “divide the different orders which constitute the scale of being” into the following four classes:

1. Inorganic
2. Organic but inanimate (i.e. plants)
3. Organic and animate, but without reason (i.e. animals)
4. Organic, animate, and rational (i.e. humans)

Robinet viewed this four-part classification divide as an outright denial of continuity, because it credited some classes with possession of certain traits or positive attributes, which the others absolutely lack

Hermann | 1783

The following is Johann (Jean) Hermann's 1783 mineral to so-called table of animal affinities, from mineral region (bottom) to vegetable region (near bottom) to animal region (bulk of page) to homo (top): [16]

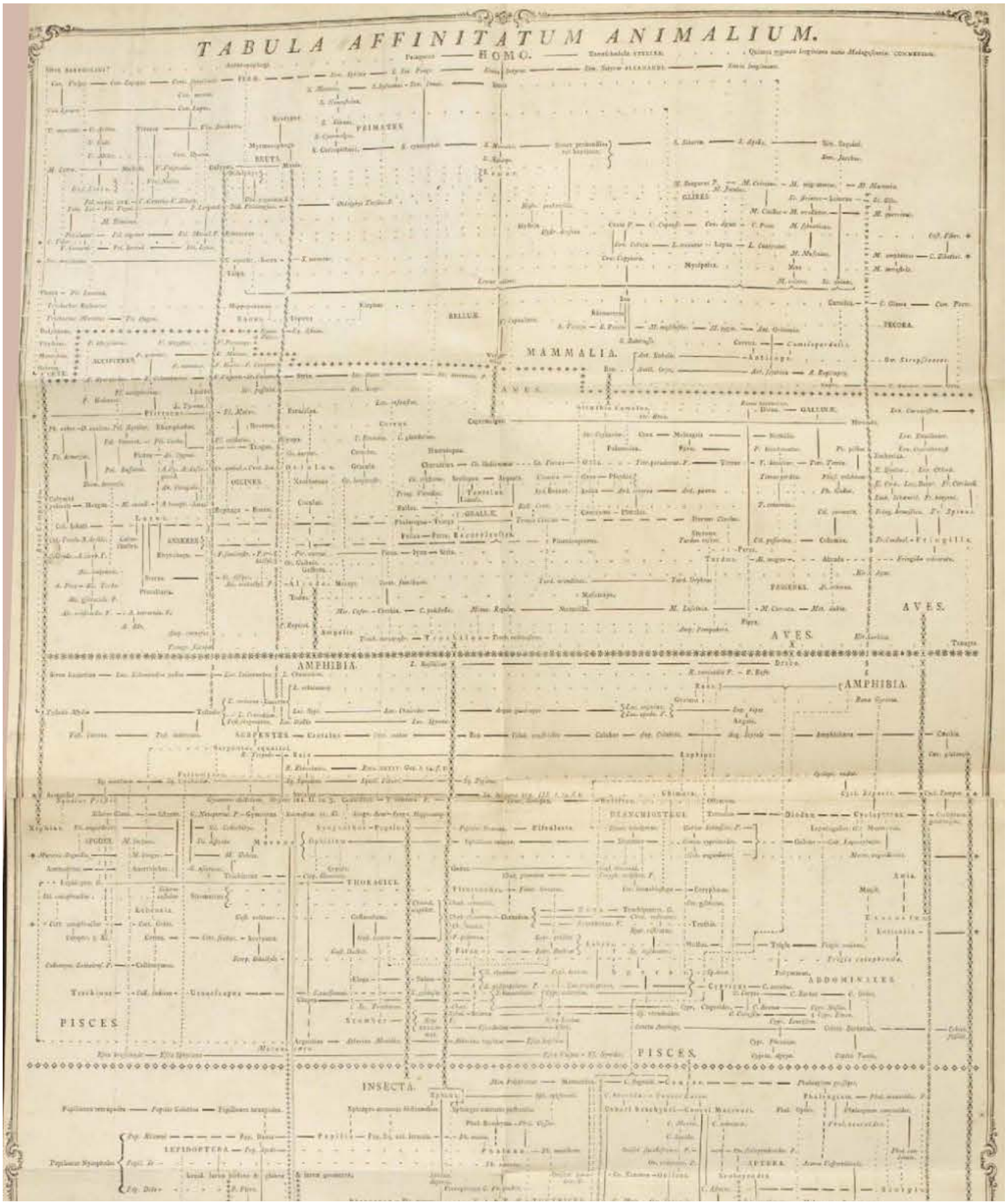

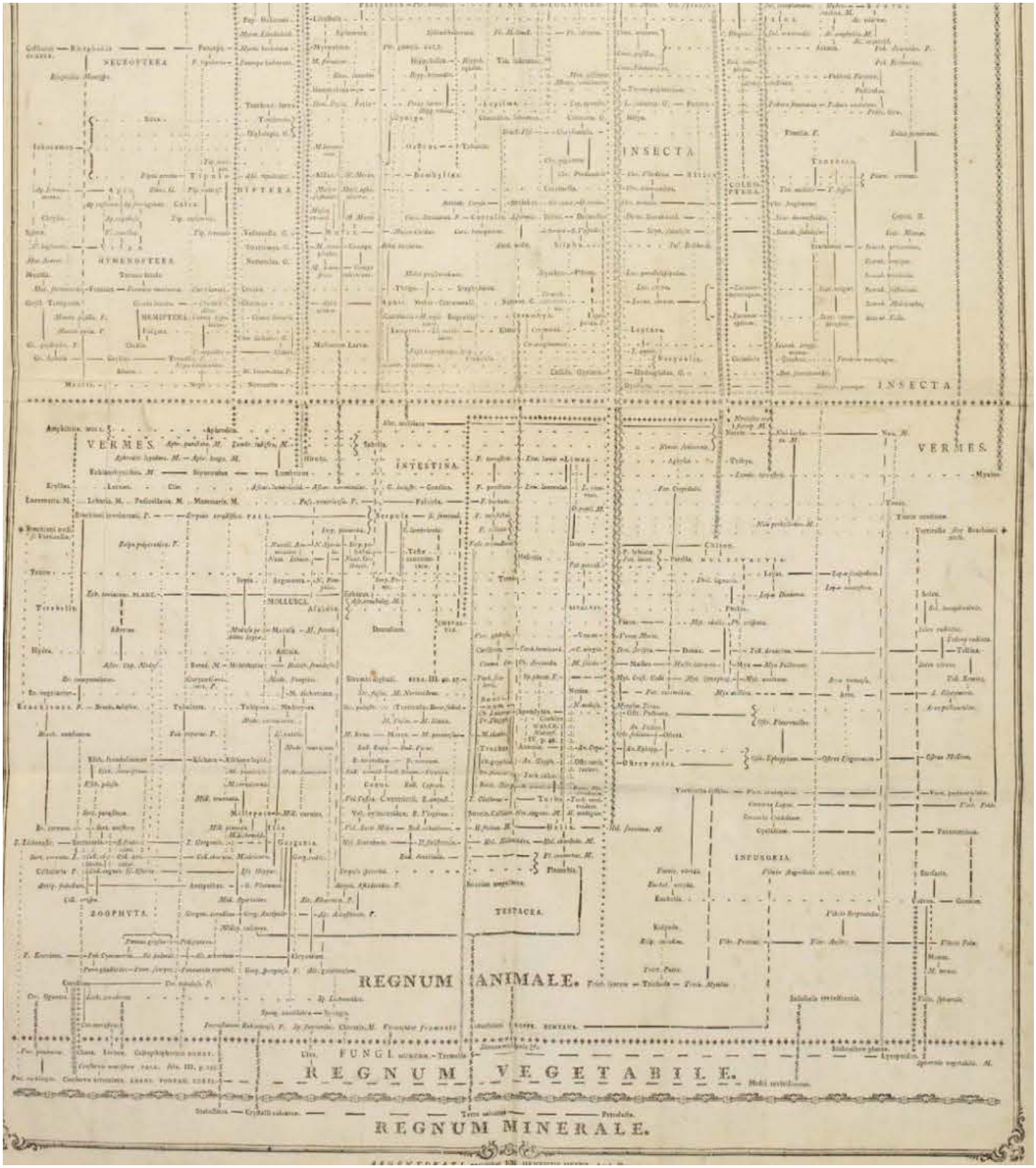

Lamarck | Origin of animals diagram | 1809

In 1809, Jean Lamarck, in his *Philosophie Zoologique*, gave the following tree depicting the origins of animals: [16]

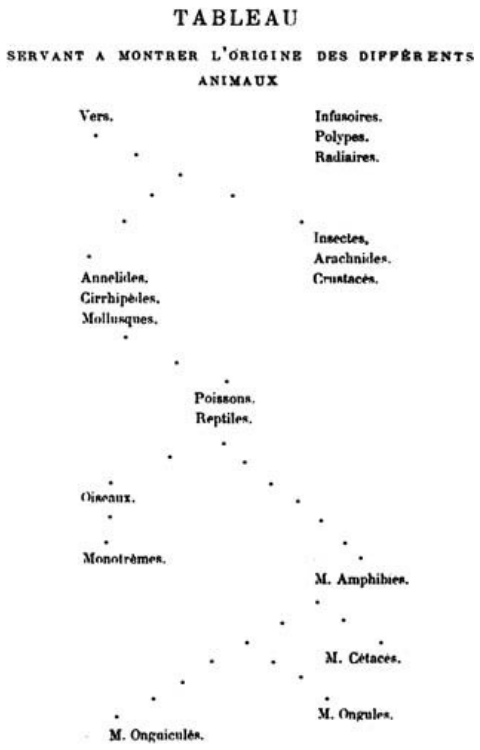

Darwin's origin of species tree | 1837

See also: Darwin on higher and lower

The following is English naturalist Charles Darwin's 1837 personal notebook origin of species evolution tree diagram, according to which species A, B, C, and D have evolved by the process of "natural selection" (or "evolution" as he began to call in in 1872) from species one or branch one: [7]

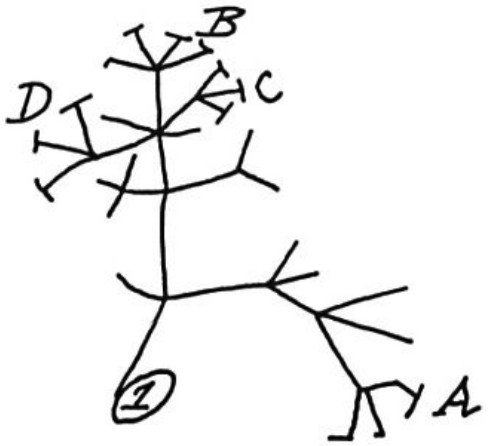

The text from Darwin's personal notebook accompanying the diagram reads: [8]

> "**I think**, case must be that one generation then should be as many living as now. To do this & to have many species in same genus (as is) requires extinction. Thus between A & B immense gap of relation. C & B the finest gradation, B & D rather greater distinction. Thus genera would be formed. — bearing relation to ancient types with several extinct forms."

Darwin | Origin of Species | 1859

The following is Darwin's 1859 tree of life from his *Origin of Species*: [16]

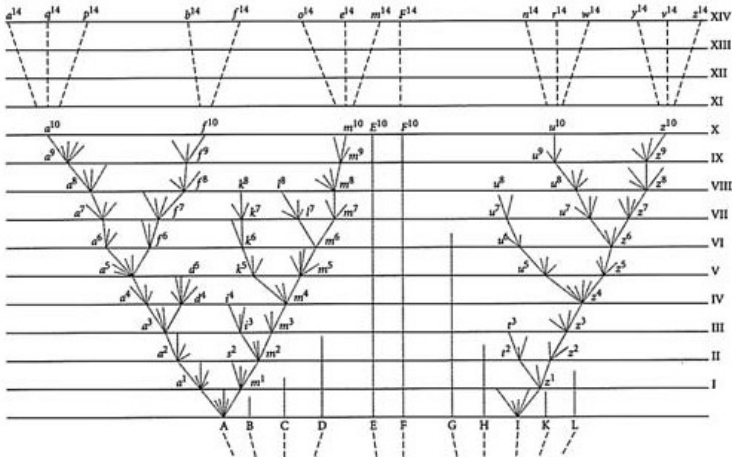

Darwin's origin of species tree + warm pond origin of life hypothesis | 1871

The following, to the left, is the famous 1952 Miller-Urey experiment, shown adjacent to is English naturalist Charles Darwin's 1871 hypothesis concerning the origin of life, in other words what comes before "point 1" on his origin of species tree diagram, which of course is the weakest link in his evolution theory, this eventually becoming the primordial soup model of the origin of life: [10]

In a famous 1871 letter to English botanist Joseph Hooker, Darwin made the suggestion that the origin of life, i.e. the forerunner to point one on his tree diagram, occurred as follows: [10]

> "The original spark of life may have begun in a **warm little pond**, with all sorts of ammonia and phosphoric salts, lights, heat, electricity, etc. present, so that a protein compound was chemically formed ready to undergo still more complex changes."

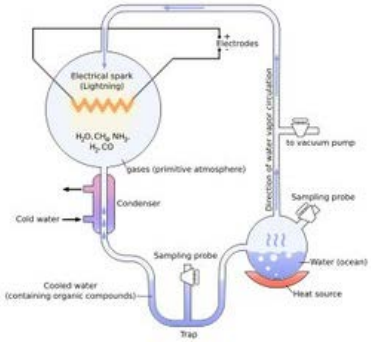

Haeckel's man from amoeba diagram | 1874

The following is German physician-zoologist Ernst Haeckel's evolution of man from amoeba diagram, illustrated by modern and fossil species: [3]

Legend:
1 Amoeba
1a Asexual reproduction (amoeba dividing)
2 Sexual reproduction (cell with spore)
3 Multi-cellular organism (early embryonic stage)
4 Muliticellular organism with three germ layers (blastula)
5 Organism with primitive mouth (gastrula)
6 Planaria
7 Worm (leech)
8 Primitive chordate (tunicate larva)
8a Adult tunicate
9 Lancelet
10 Jawless fish (lamprey)
11 Cartilaginous fishes (shark)
12 Australian lungfish
13 South American lungfish
14 Aquatic reptile (plesiosaur)
15 Early amphibian (labytinthodont)
16 Modern amphibian (newt)
17 Reptile (iguana)

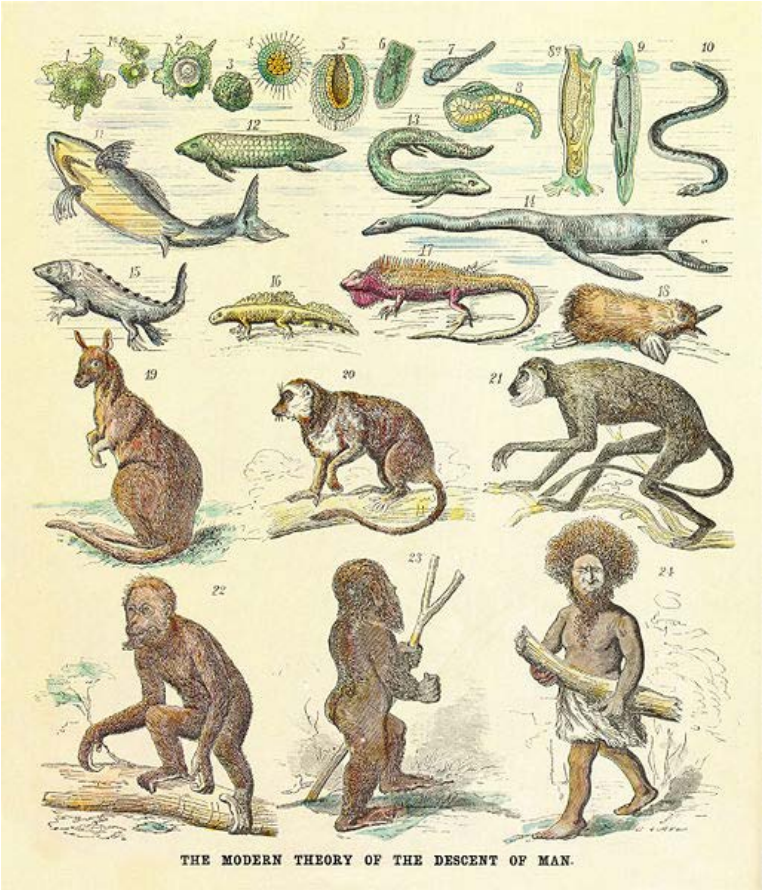

18 Monotreme (platypus)
19 Marsupial (kangaroo)
20 Prosimian (lemur)
21 Monkey (langur)
22 Ape (orangutan)
23 Ape-man (*Pithecanthropus*)
24 Modern human (a Papuan)

Of note here we see the prototype of a the organic | inorganic origin of life divide forming, namely the amoeba (first form of life) | inorganic matter (parts of amoeba) conceptual demarcation. A fuller reading of Haeckel's works, however, are in order here, being that Haeckel was an adherent to German polymath Johann Goethe's human chemical theory, which has in its structure an unbreakable chain model stretching downward from the human reactions to the test tube reactions. As German materialist philosopher Bartholomaus von Carneri (1821-1909) commented, in a 26 May 1876 letter to Haeckel, on one of Haeckel's recent publications: “I was full of jubilation at the clarity with which you pass from chemical elective affinity one side into the realm of life and on the other into the realm of mechanics.” [11] Hence, Haeckel is not easily dismissed as an "amoeba = first origin of life" theorist. Beyond this, Haeckel's also has his plastidule theory, a type origin of life theory similar to German polymath Gottfried Leibniz' monad theory, both of which are intricate and require further digression.

Haeckel | Tree of life | 1879

In 1879, Ernst Haeckel, in his *The Evolution of Man*, published the following "tree of life" depiction of man's origin: (Q)

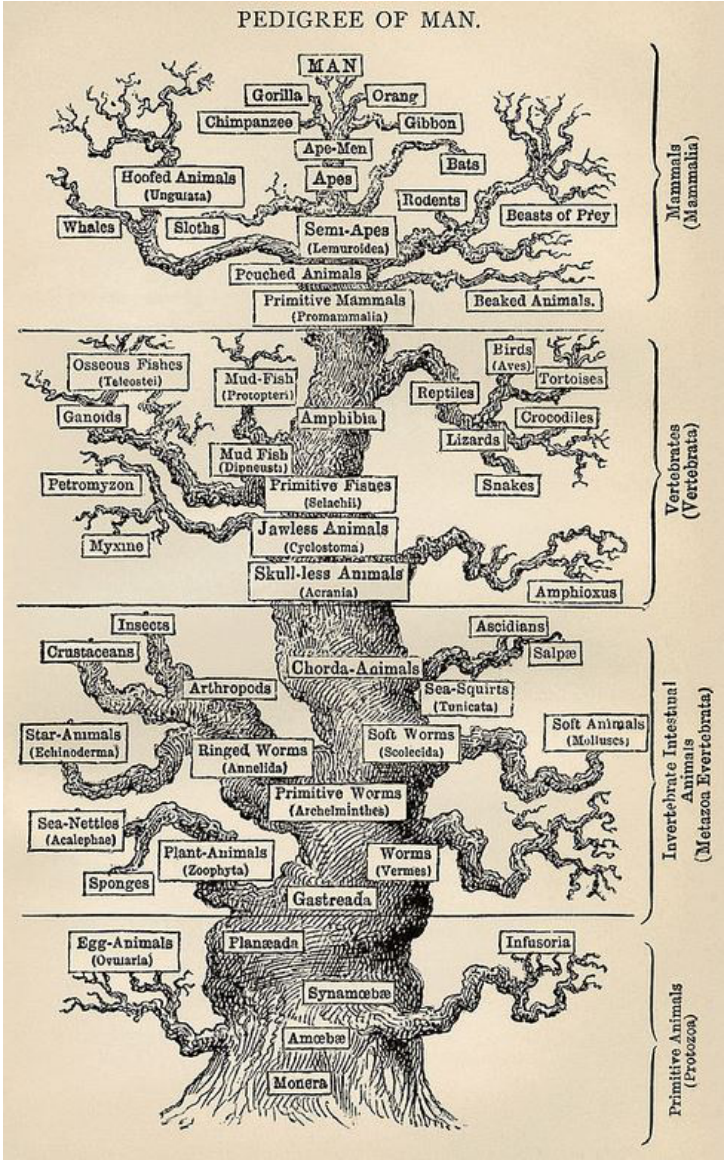

Satirical Darwinian man from chaos diagram | 1882

A satirical 1882 depiction “man is but a worm” depiction of Charles Darwin’s 1859 theory of **evolution**, showing man evolving from monkey, which evolved from a worm, which evolved from "chaos", all overlayed on some kind of times meter, with Darwin (representative of father time) and some other man: [2]

Reid | 1882

In 1882, American religious-minded science philosopher H.A. Reid published the following spiritually-extended Linnaean three kingdom stylized so-called "synoptic calendar of creation": (O) (O)

THE SYNOPTIC CALENDAR OF CREATION.

Calendar to be read from the bottom upward.

THE SPIRITUAL *KINGDOM.*	God, angels, "ministering spirits," and "the spiritual man" of the Bible—that is, those endowed with that faculty or spiritual sense (the "sixth sense" of my Psychic Calendar) whereby they discern God as a spirit, and "worship him in spirit and in truth."
THE ANIMAL *KINGDOM.*	All forms and conditions of animal tissue or animal product, including animal man, or "the carnal man" of the Bible.
THE VEGETABLE *KINGDOM.*	All vegetable growths, substances and products.
THE MINERAL *KINGDOM.*	Every solid and fluvial substance that is not or has not been a vitalized part of any vivific structure.
THE ELEMENTAL *KINGDOM.*	Preterrestrial elements, or nebulous and gasiform matter which ultimately condensed and formed the gaseous, fluviatile and solid substances composing our world.

Reid's spiritually topped ladder was introduced following discussion of creator-based "first cause", Herbert Spencer, along with the assertion that a "real atheist" is a phenomenal impossibility, and that the existence of god is an eternal fact; the calendar introduced so to show how the "discoveries, deductions, and logical sequences of modern science supplement and conform to what has been revealed in the Bible." (O) Here, to note, in some ways, we are reminded of the theories of Pierre Teilhard (1936).

Sparks | 1932

The following is the amoeba to man section of John Spark's 1932 histomap: (O)

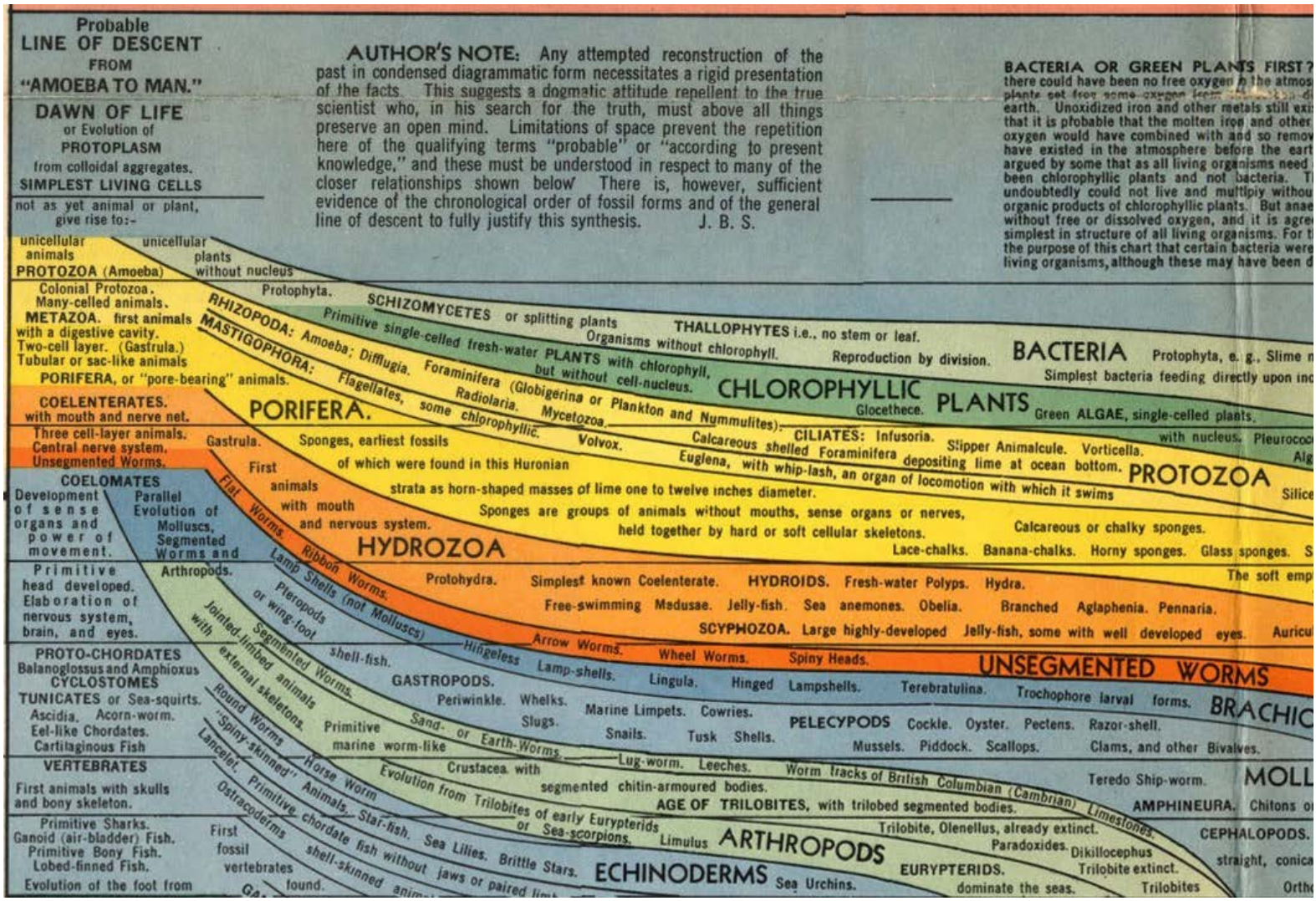

(add discussion)

Ham | 1975

In 1975, Australian-born American creationism evangelist Ken Ham, in his science classes, and later books and publications, began to use the phrase "molecules-to-man evolution", which he conceptualizes as follows below, in a polemical way, in debate, recently popularized in the 2014 Ken Ham vs Bill Nye debate, as a way to stump the evolutionist on the origin of life question, among other conundrums, e.g. mind-from-matter, and so on:

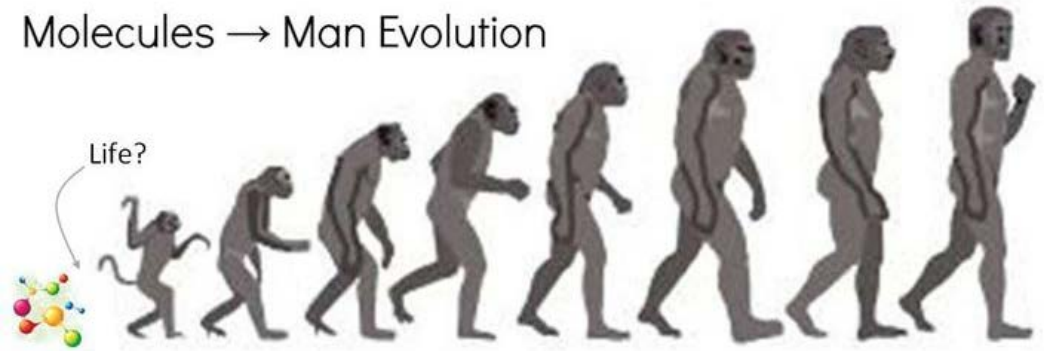

Lewis | General biology | 1992

The following is a basic evolution diagram, from the 1992 biology textbook *Life: Beginnings of Life, Animal Life, Plant Life, Evolution of Life, Behavior and Ecological Life*, by American geneticist Ricki Lewis (O), outlining the so-called "beginnings of life" from chemicals (CO_2, N, O_2, etc.), heat, and light, which is the textbook used by American pre-engineering student Libb Thims, while taking his first biology course at Washtenaw Community College, Michigan: [12]

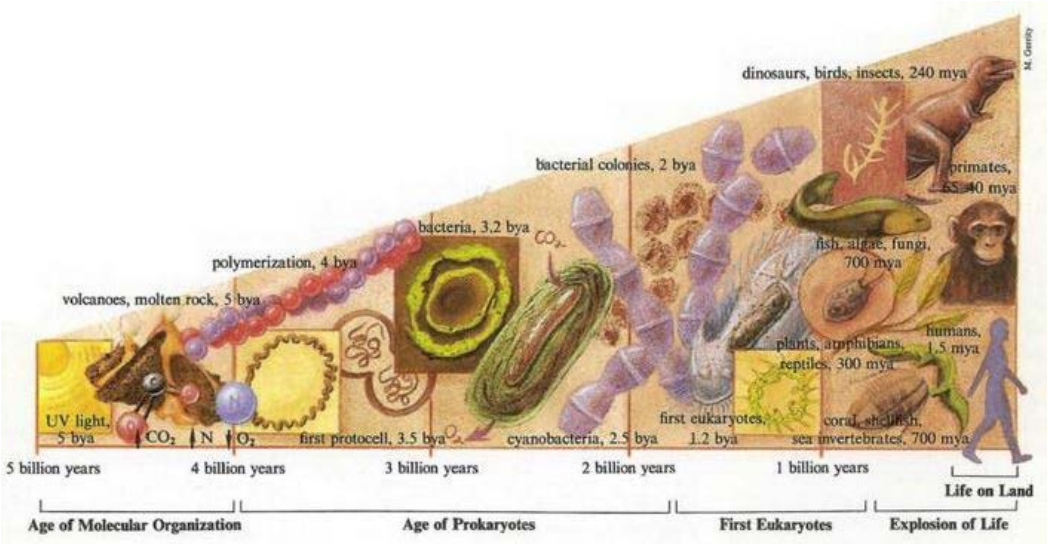

This scenario, of how soon-to-become chemical engineering student Thims went from the above 1992 “chemicals + heat and light → life” evolution model to “chemicals + heat and light → powered animated chemicals” (2014), along the way jettisoning the concept of "life" as defunct the way Einstein jettisoned the concept of "ether", might be akin to how chemical engineering student Linus Pauling in 1917, at Oregon Agricultural College, was being taught the John Dalton version of the "hook-and-eye bonding method" (see: history of chemical bonding theory) and how, after learning the basics of modern physics, this early 20th century teaching of archaic methods is what supposedly drove Pauling to write the now famous 1939 textbook *On The Nature of the Chemical Bond*, supplanting hooks and eyes with quantum mechanical hybridized bonding orbitals, thereafter becoming the "bible" of modern chemistry.

On 20 Dec 2015, Clifford Pickover relabeled and tweeted (Q) the above diagram with the equation:

Polymerization + Love = You

as follows:

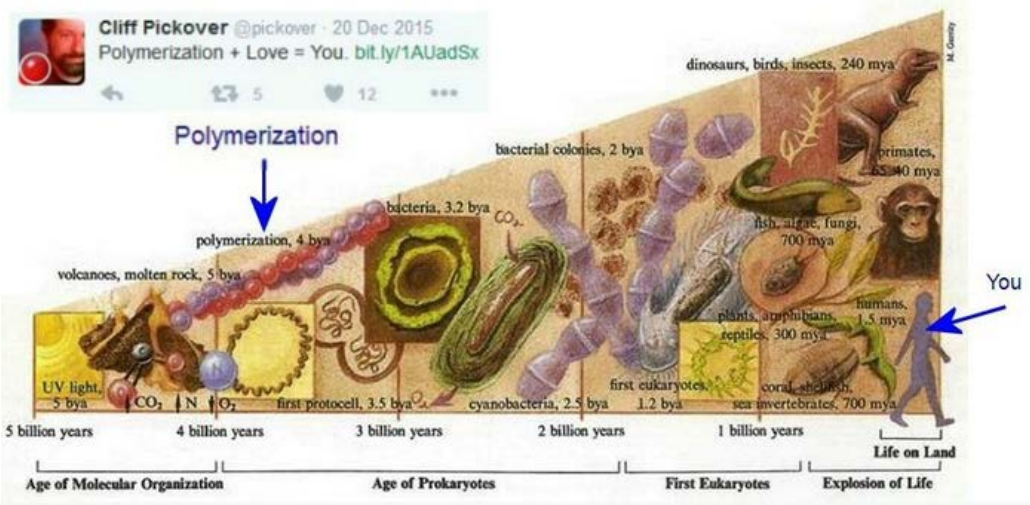

(add discussion)

Blackmore-Troscianko | Consciousness | 2003

The following are artistic renditions of the "great chain of being", by artist Jolyon Troscianko, from the from Susan Blackmore’s 2003 *Consciousness: an Introduction*, wherein the matter-energy to spirit-soul evolution conceptualized chain of being versions of Pierre Teilhard (1936) and Ken Wilber (2001) are cited: [17]

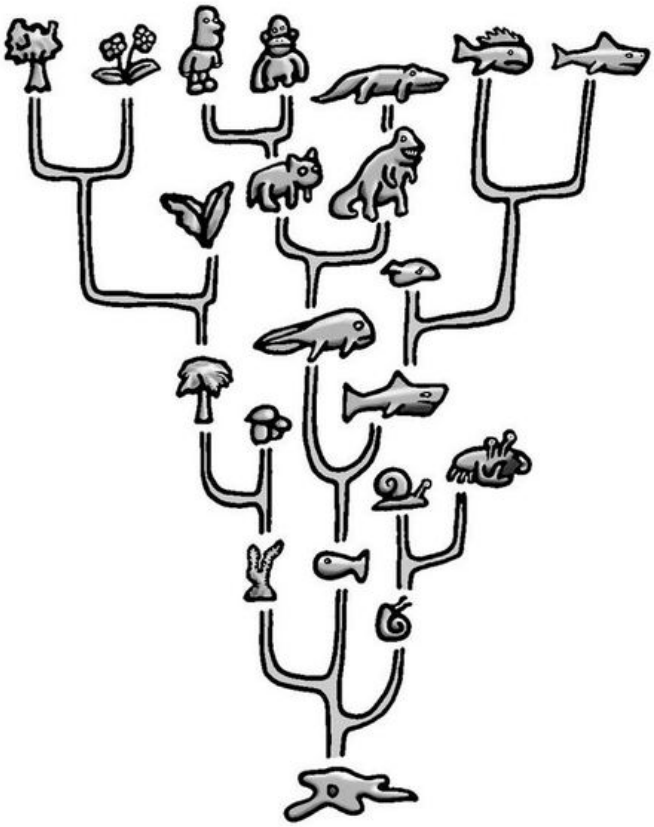

Here, we see the first link in the chain of "being" originating in an "origin of life" conceptualized "slime mold" or protozoa-like blob; which, not doubt, seems to be the generic model many 21st century people have in their mind. The following, from the same source, shows a fish-to-human lineage, from the above great chain of being branching diagram, by Troscianko:

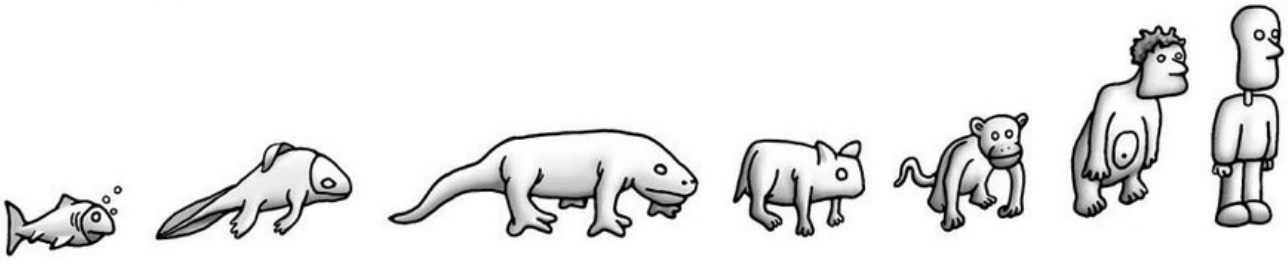

Compare this to Australian-born American creationism evangelist Ken Ham's term "molecules-to-man evolution", recently popularized in the 2014 Ken Ham vs Bill Nye debate.

Thims' molecular evolution table | 2005

The following is American electrochemical engineer Libb Thims' 2005 molecular evolution table (left), showing molecular formulas for each main entity in the decent backwards down the evolution scale: from the human (human molecule) to the hydrogen atom and below to fermions (matter) and bosons (energy), the same evolution table in poster format explained in a 10-min 2008 video summary (right):

Element Count	Molecular Evolution Table	Name	Date
N/A	*Fermions:* e^-, ν_e, u, d, μ^-, ν_μ, c, s, τ^-, ν_τ, t, b *Gauge bosons:* g_{ab}, γ, W^+, W^-, Z^0, G	Elementary Particles	13.7 BYA
1	H, He-3, He-4, Li	Atoms	3E5 YAB
1	H_2	Hydrogen	
2	H_2O	Water	2E8 YAB
3	CH_4O	Methanol	
4	CH_4ON_2	Urea	4.6 BYA
5	$C_{10}H_{16}O_{13}N_5P_3$	DNA	
6	$C_{21}H_{36}O_{16}N_7P_3S$	Coenzyme A	
7	$C_4H_3O_2NS_2NaI$	mol-7	4.4 BYA
8	$C_{20}H_{22}O_7N_2SNaIPt$	mol-8	
9			
10	$C_{E5}H_{E5}O_{E4}N_{E4}P_{E2}S_{E2}Ca_{E2}K_{E2}Cl_{E2}Na_{E2}$	Intermediate	4.2 BYA
11			
12	$C_{E7}H_{E7}O_{E6}N_{E6}P_{E4}S_{E4}Ca_{E4}K_{E3}Cl_{E3}Na_{E3}Mg_{E2}Fe_{E2}$	Pro-bacteria	4.0 BYA
13			
14			
15	$C_{E10}H_{E10}O_{E10}N_{E9}P_{E8}S_{E8}Ca_{E8}K_{E8}Cl_{E8}Na_{E8}Mg_{E8}Fe_{E5}$ $Si_{E4}Mn_{E2}Co_{E2}$	Prokaryote (Bacteria)	3.85 BYA
16			
17			
18	$C_{E16}H_{E16}O_{E16}N_{E15}P_{E14}S_{E14}Ca_{E14}K_{E12}Cl_{E12}Na_{E12}Mg_{E12}Fe_{E11}Fe_{E11}$ $Si_{E10}Cu_{E8}Mn_{E8}Se_{E8}Co_{E7}$	Pre-Aquatic Worm	2.6 BYA
19			
20			
21			
22	$C_{E22}H_{E22}O_{E22}N_{E21}P_{E20}S_{E19}Ca_{E20}K_{E19}Cl_{E19}Na_{E19}Mg_{E18}Fe_{E17}Fe_{E17}$ $Zn_{E16}Si_{E16}Cu_{E15}I_{E14}Mn_{E14}Se_{E14}Mo_{E13}Co_{E13}V_{E12}$	Fish	0.7 BYA
23		Reptile	350 MYA
24	$C_{E26}H_{E26}O_{E26}N_{E25}P_{E24}S_{E23}Ca_{E24}K_{E22}Cl_{E22}Na_{E22}Mg_{E22}Fe_{E21}Fe_{E21}$ $Zn_{E20}Si_{E20}Cu_{E19}B_{E19}I_{E18}Mn_{E18}Se_{E18}Cr_{E18}Mo_{E17}Co_{E17}V_{E16}$	Old World Monkey	30 MYA
25		*A. Afarensis*	5.0 MYA
26	$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}Fe_{E23}$ $Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$	Human (*H. Sapiens*)	0.2 MYA
27			
28		Evolution	

Shubin | Pond scum model | 2008

The following is American paleontologist Neil Shubin's 2008 pond scum chain of being model:

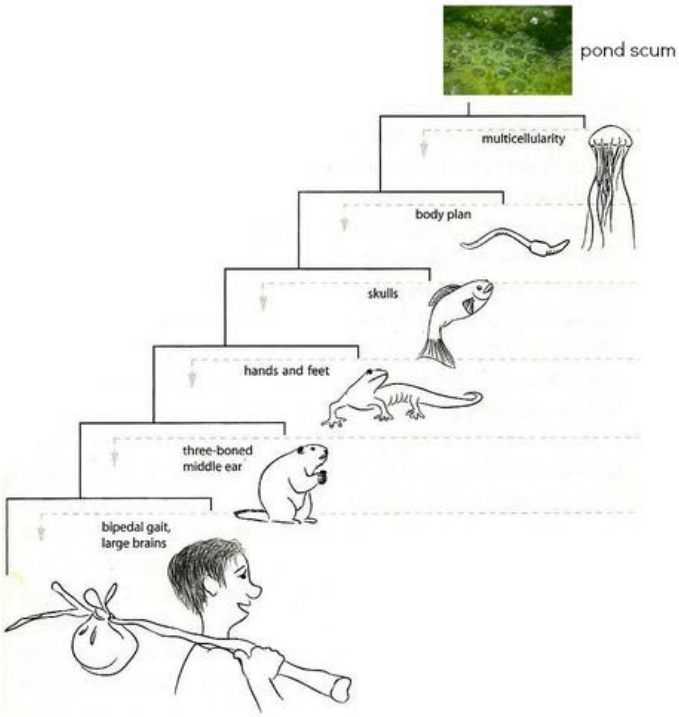

Here, to note, we are reminded of Stephen Hawking's 1995 description of humans as "heated chemical scum". (Q)

Thims' human evolution timeline video | 2009

The following is American electrochemical engineer Libb Thims' 2009 "Human Evolution Timeline | Big Bang to Present" video, a sound animated remake of the Hmolpedia side-scrolling 2009 evolution timeline:

Thims' Hmolpedia human evolution schematic | 2009

The following is American electrochemical engineer Libb Thims' 2009 Hmolpedia evolution article depiction of evolution (synthesis) as a series of coupled chemical reactions starting from the hydrogen atom mechanistically connected up through the reaction formation of the human molecule:

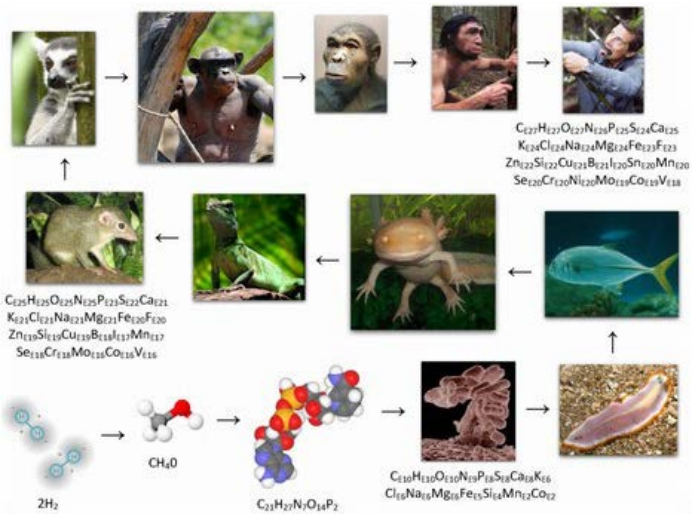

Wikinotes | Chain of being | Biology | 2012

The following shows a generic inorganic-to-organic conceptualized chain of being as taught in biology: (O)

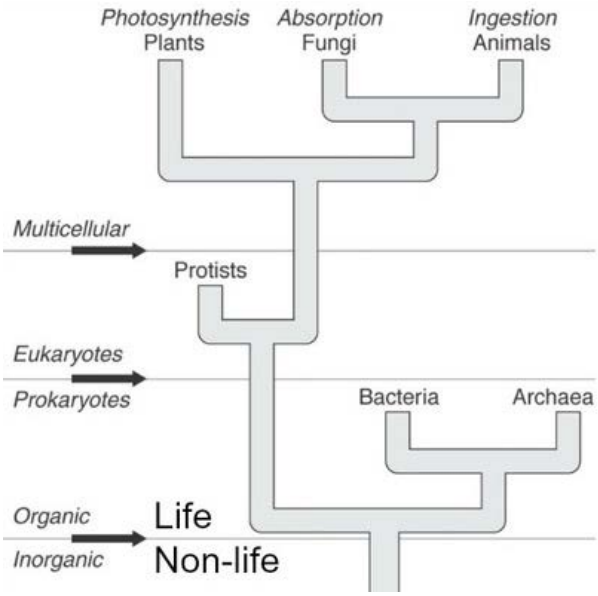

Thims | Hydrogen to human | 2012

The following is American electrochemical engineer Libb Thims' 2012 Hmolpedia elective affinities problem diagram:

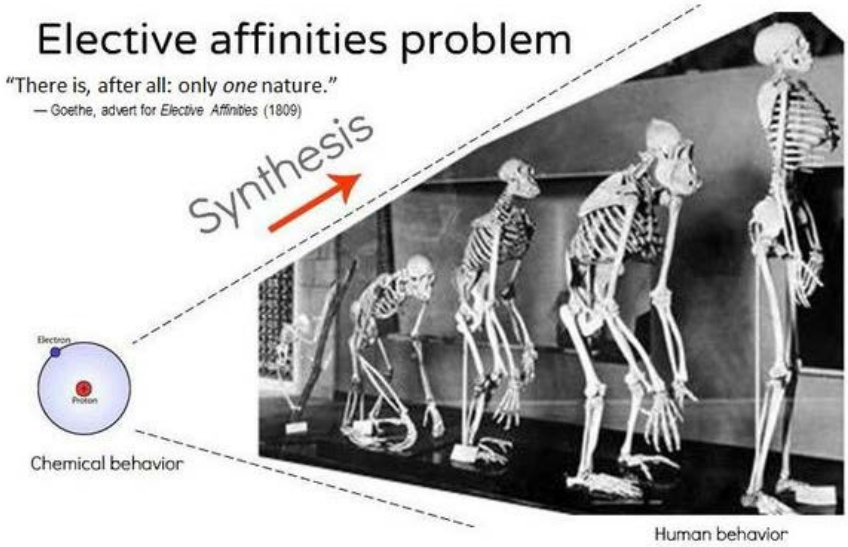

The following is a 2015 hydrogen-to-human diagram:

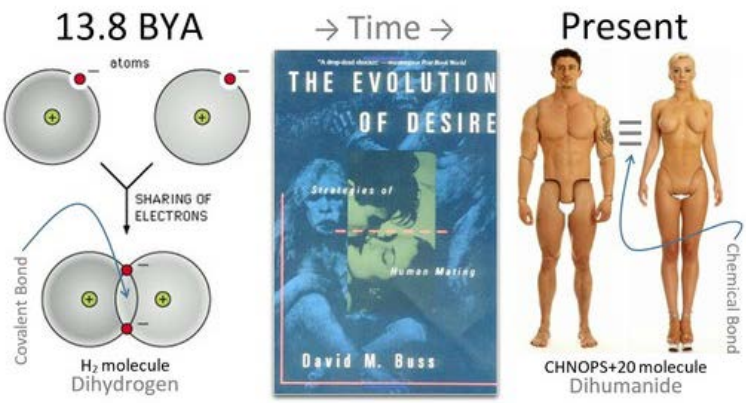

(add)

Thims' great problem of natural philosophy diagram | 2012

The following is American electrochemical engineer Libb Thims' 2012 Hmolpedia great problem of natural philosophy diagram:

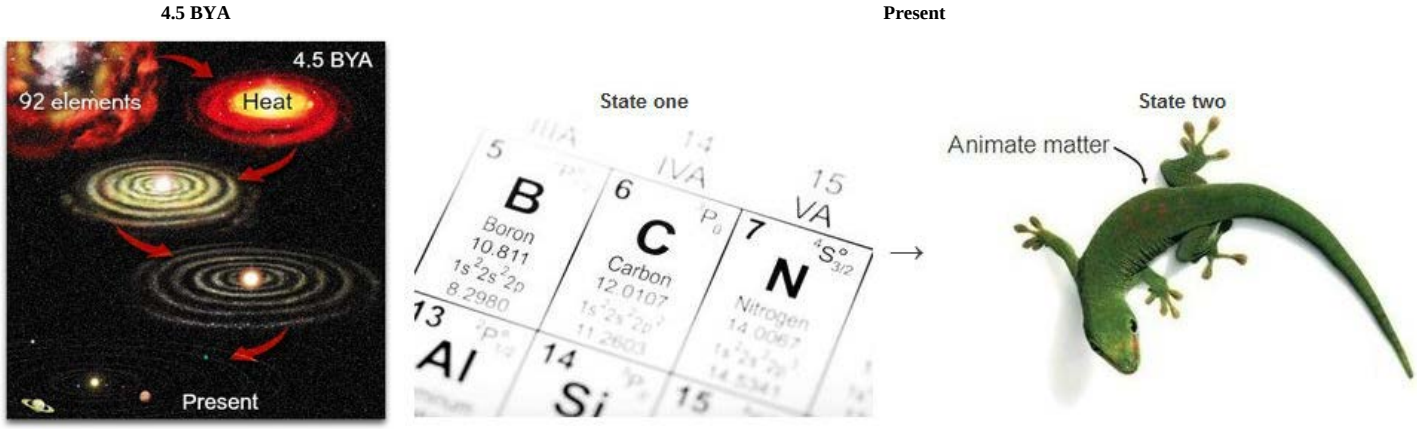

Defunct models | Smithsonian tree of life diagram | 2013

The following is a 2013 Smithsonian Institution "tree of life" diagram made in theme of Darwin's 1837 origin of species notebook diagram sketch, the problem with this diagram is that it situates a hypothetical "origin of life" as the start of the tree, which, being that the theory of life is a religious theory, is inconsistent with modern science, chemistry in particular, which as English physiologist Charles Sherrington pointed out in 1938 "does not know the word life" (see: defunct theory of life): [9]

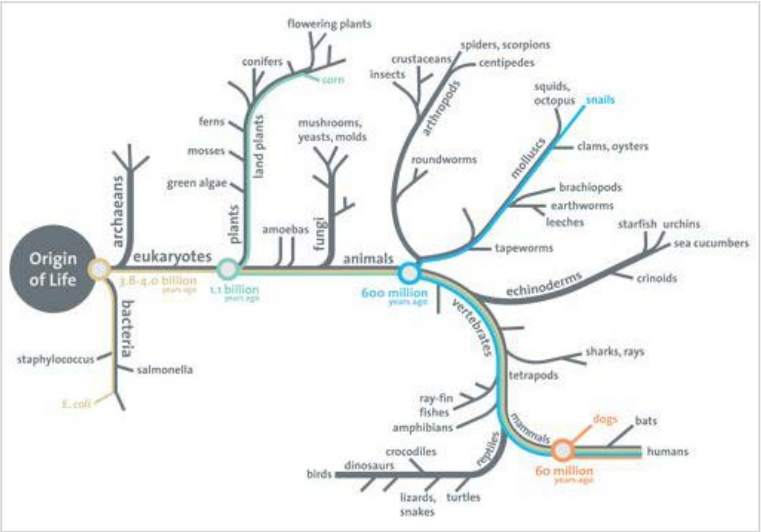

The above diagram, in short, is the point where god came down and touched the chain at one of its mechanism links, i.e. mythology.

Shubin | 2013

The following, below right, is Neil Shubin's 2013 "big bang to human molecule" diagram, from his *The Universe Within*, wherein he employs the Sterner-Elser human molecular formula (2002), as compared to his earlier walking fish to human model, as outlined in his 2008 *Your Inner Fish*:

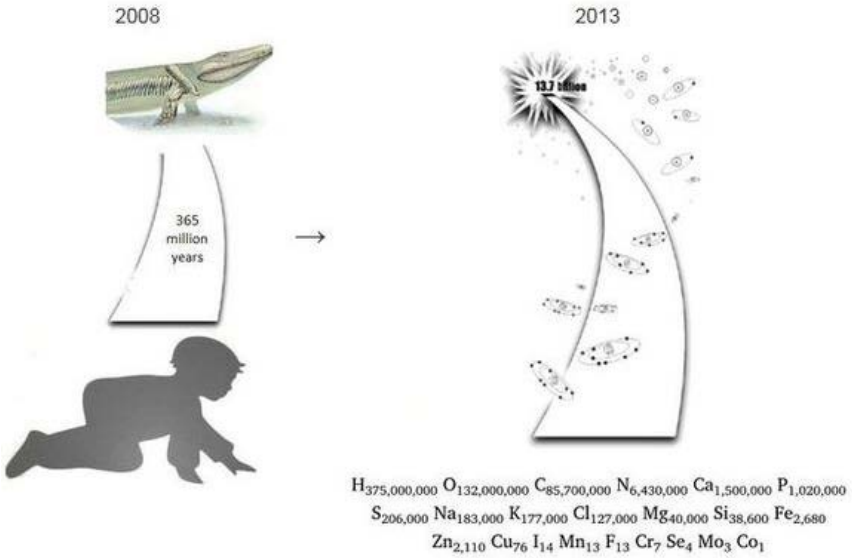

A modified variant of this "big bang to human molecule" diagram, to note was used in Libb Thims' 2015 Zerotheism for Kids class.

Discussion

A point to note in this historical development of ideas is that a certain amount of deanthropomorphism has occurred. One does not, in modern scientific terms, speak of the hydrogen atom as a "being" (an anthropomorphism) or as being "alive" (a religious theory) or as having a dualism "spiritual + corporal" composition (a religion/science blend concept), but rather as a bound state of one proton and one electron attached via photon exchange force interactions. This logic scales up to the human molecular level, albeit one that requires a great deal of conceptual language reformulation. Also, in stead of "chains" we now correctly speak of "coupled" chemical reaction mechanisms.

Quotes

The following are related quotes:

> "It was in the eighteenth century that the conception of the universe as a '**chain of being**', the principles which underlay this conception – plenitude, continuity, gradation – attained their widest diffusion and acceptance. The faith in speculative *a priori* metaphysics was waning, and the Baconian temper (if not precisely the Baconian procedure), the spirit of patient empirical inquiry, continued its triumphant march in science, and was an object of fervent enthusiasm among a large part of the general educated public. There has been no period in which writers of all sorts — men of science and

philosophers, poets and popular essayists, deists and orthodox divines — talked so much about the 'chain of being', or accepted more implicitly the general scheme of ideas connected with it, or more boldly drew from these their latent implications, or apparent implications. Addison, King, Bolingbroke, Pope, Haller, Thomson, Akenside, Buffon, Bonnet, Goldsmith, Diderot, Kant, Lambert, Herder, Schiller — all these and a host of lesser writers not only expatiated upon the theme but drew from it new, or previously evaded, consequences; while Voltaire and Samuel Johnson, a strange pair of companions in arms, led an attack upon the whole conception. Next to the word 'nature', the 'great chain of being' was the sacred phrase of the eighteenth century, playing a part somewhat analogous to that of the blessed word 'evolution' in the late nineteenth."

— Arthur Lovejoy (1933), *The Great Chain of Being* (pgs. 183-84)

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2. (a) Article. (1882), "Article" (full size), *Punch's Almanack* (Dec. 6, 1881).
(b) Darwin, Charles. (1881). *The Formation of the Vegetable Mould Through the Action of Worms.* Publisher.
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5. Bonnet, Charles. (1764). *Contemplation de la nature* , Vol. I, 27. Trans. Stephen Jay Gould, Ontogeny and Phylogeny (1977), 23.
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13. Arnopoulos, Paris. (1993). *Sociophysics: Cosmos and Chaos in Nature and Culture* (pg. 39). Nova Publishers, 2005.
14. (a) Singer, Charles. (1931). *A Short History of Biology* (scala naturae, pgs. 39, 227, fig. 18) (O). Publisher.
(b) Scala natura – Palaeos.com.
15. Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea*. Transaction Publishers, 2011.
16. Ragan, Mark A. (2009). "Trees and Networks Before and After Darwin" (O), *Biology Direct*, 4:43.
17. (a) Blackmore, Susan. (2003). *Consciousness: an Introduction* (great chain, 209-10). Publisher, 2013.
(b) Illustrations (Consciousness: an Introduction) – Jolyon.co.uk.
18. Lucretius. (55BC). *On the Nature of Things* (translator: Frank Copley) (pg. 55). W.W. Norton & Co., 2011.

External links

- Great chain of being – Wikipedia.

θΔics

In education, **Chair of Physico-Chemical Sociology** refers to an endowed university chair, bridged between the physics department, chemistry department, and the sociology department, focused on the teaching and research of physicochemical sociology.

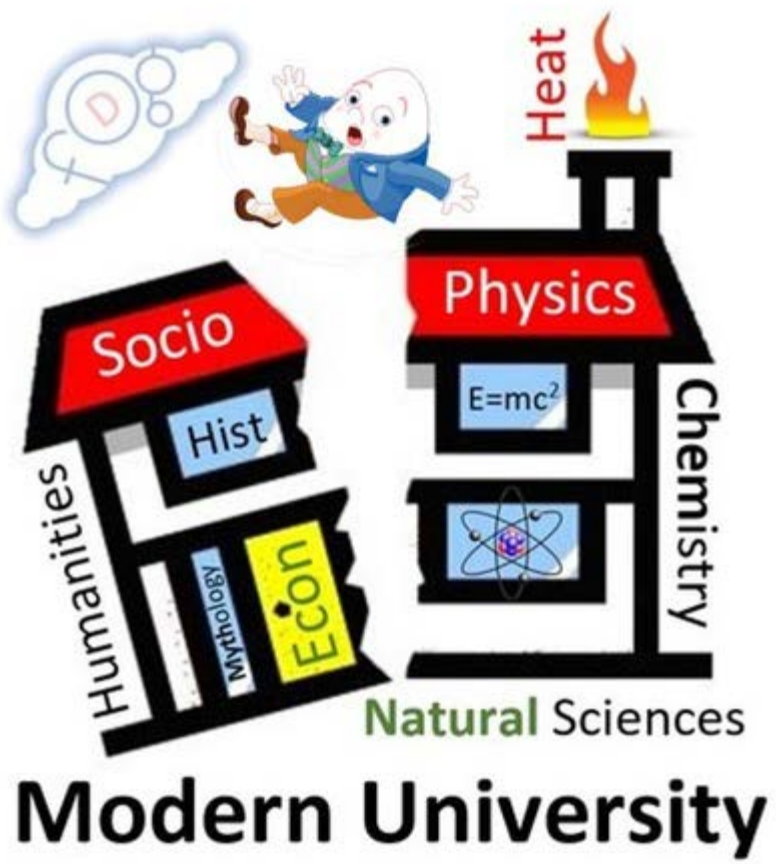

A generic picture of the proposed to be **"Chair of Physio-Chemical Sociology"**, situated in the broken section, a foundational chair that will work to bridge the two cultures of the humanities and the sciences; image based on Judson Herrick's 1930 University of Chicago speech "Humpty Dumpty and His Great Wall: The Scientific Study of Man and the Humanities" (see: Herrick's Humpty Dumpty).

Overview

In 1870, Florence Nightingale, inspired by the social physics of Adolphe Quetelet (1835), proposed that a chair of "social physics" be established at Oxford University (see: **Nightingale Chair of Social Physics**); by 1891, Nightingale had raise about **$200,000 USD** (modern terms), **$100K** from her own money, but failed to establish the chair. [1]

In the 1940s, John Q. Stewart, a physicist at Princeton University, acquired funding from the Rockefeller Foundation, at **160,000 USD** (modern term) to fund a social physics program at Princeton, which he ran for about a decade (see: Princeton Department of Social Physics), before funding was cut off, specifically by Warren Weaver, per reasons of the "believed inability" and applicability of being able to measure feelings and choice, scientifically, i.e. chemically and physically (see: Stewart-Weaver fallout).

In 2016, American philanthropist Louis Appignani, funded by the proceeds from the Barbizon Modeling School (Q), bought the world's first "Chair of Atheism, Humanities, and Secular Ethics" (see: Appignani Chair of Atheism), at the **University of Miami**, for **$2.2 million**, the aim of which is to make atheism a legitimate academic subject in America.

In 2017, Australian civil engineer Ramil Nigmatullin (Q), who relies on far from equilibrium models, at the engineering and information technologies department at the University of Sydney, raised **81,000 USD** in funding, to support (Q)(Q) a 3-year $27K annual stipend allowance for "student undertaking a PhD in social thermodynamics [aimed at] developing a framework to model social systems (e.g. urban development) using the state of the art techniques of non-equilibrium statistical mechanics and thermodynamics".

Thims | MailCubes.com

See main: Department of Physico-Chemical Humanities

In 2017, Libb Thims began working to bring MailCubes, a smart package mailbox company, into realization, to become the world's leading home smart technology delivery package receptacle company, an under-girding aim of which, to solve, via the "funding problem", the issues related to the two cultures "calls", "inquiries", and "tensions", is to found the world's first established and permanent "Chair of Physico-Chemical Sociology", thereafter seeded in such a manner to grow in the world's first department of physicochemical humanities (see: course outline).

As of May 2019, Thims, in this direction, had partnered with Brian Willcox of UK-based BrizeBox.com, had raised about **20,000 USD** in capital, was selling units in Chicago, via the online MailCubes.com storefront (Q), the main page of which, being footnoted with the curly d symbol "∂", for the partial derivative, introduced in 1786 by French mathematician Adrien-Marie Legendre:

In addition to the online storefront, an established Amazon.com storefront (Q), with annual US and Canada sales figures in the **5,000** (actual) **to 40,000 USD** (projected) **range** had been established (a work-in-progress).

In 2019, Mirza Beg, during his interview (see: Beg-Thims interview) with Libb Thims, Karachi, Pakistan, asked Thims about the Institute of Human Thermodynamics, which led to a 10-min discussion on the proposed Chair of Physico-Chemical Sociology". [2]

Quotes

The following are related quotes:

> "It would be hard to introduce politics or morality into a chemical thermodynamics class (without veering off topic)."
>
> — Gerard Harbison (2016), "Tweet (Q) to @dfreelon", Aug 4

See also

- Anti-interdisciplinarity
- Doctrinaire departmentalism
- Harvard Pareto circle
- Libb Thims (prospectus)
- Physical sociology falloff problem
- Polymathy degree problem
- Two cultures calls
- Two cultures department
- Two cultures inquires
- Two cultures namesakes
- Two cultures synergy
- Two cultures tensions
- Sociology 23
- Mathematical economics

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θΔics

In terminology, **chance**, from the Latin *cadare*, "to fall", a term used in dice, in the sense of "that which falls out" (Q), aka "hazard" (hazard) in French or Arabic, meaning dice, as opposed to anti-chance, refers to a thing that happens, in the general sense of the term, unpredictably, without discernible or observable cause. [1]

The presumed idea that the principle by which humans originated is based on "**chance**" or dice, is so commonplace that a number of board games exist catering to this belief, such as *Darwin's Dice* (Q), above, or *Darwin's Chance* (Q), not to mention Curtis Johnson's 2014 book *Darwin's Dice: the Idea of Chance in the Thought of Darwin*.

Determined dice

In 1973, Ernest Schoffeniels, in his *Anti-Chance*, gave the following description of deterministic dice: [17]

> "Chance is derived from *cheance*, designating the way in which the dice falls, whilst *hazard* is an Arabic word signifying dice. Thus, concepts of chance and hazard are associated with the notion of a game where calculation and competence have no part. In principle, it is **possible to determine** by calculation the position of the dice if one knows the "force" applied, the importance of friction due to the air, etc., parameters difficult to determine or to control in practice.
>
> This is why one can suppose *a priori* that the probability of obtaining a given face is 1/6. In order to verify this probabilistic theory, it is evidently necessary to throw the dice a considerable number of times. This example permits the identification of two important aspects of the geometry of chance: the significant number of identifiable factors difficult to control in practice (force and height of the throw, density of the air, position of the dice, asymmetry in the structure of the dice, etc.) as opposed to the restricted number of possibilities (faces of the dice). It is certain that all the parameters being known, the position of the dice is automatically determined. If therefore in practice the game of dice remains a game of chance, the parameters determining the position of the dice fluctuate about a mean value due principally to the inability of the player to reproduce the same movement twice in succession. The probabilistic nature of the phenomenon is only too apparent: it is the result of our ignorance wittingly or otherwise of the precise causes involved in its evolution."

(add)

Epicurus | Lucretius

Greek philosopher Epicurus is oft-cited as introducing the chance-based model of the workings of the universe. The following synopsis, by Patrick Walsh (1997), in his commentary on Cicero's discussions of Metrodorus and Hermarchus, gives an overview of the origin of the Epicurean chance model: [16]

> "It is said that Metrodorus would have followed his friend **Epicurus** as head of the Garden had he not died first; Hermarchus succeeded instead. They joined with Epicurus in attacking Pythagoras for equating all things with number, Plato for his notion of the demiurge initiating motion in the universe, and Empedocles for positing that love and strife combine and separate the four elements. All these views of purposive creation are at odds with the Epicurean doctrine of the fusion and separation of atoms by **chance**."

Lucretius, the pupil of Epicurus, described things as follows:

> "For surely the atoms did not hold council, assigning order to each, flexing their keen minds with questions of place and motion and who goes where. But shuffled and jumbled in many ways, in the course of endless time they are buffeted, driven along, **chancing** upon all motions, combinations. At last they fall into such an arrangement as would create this universe."
>
> — Lucretius (55BC), *On the Nature of Things*, on a non "created" universe

(add)

Cicero

In 55BC, Roman philosopher Cicero, *On the Nature of the Gods* or *On Destiny*, in his famous "scattered letters argument", argued, in ridicule of Epicurus, that nature, operating by chance alone, could not make the world: [15]

> "Is it not a wonder that anyone can bring himself to believe that a number of solid and separate particles by their **chance** collisions and moved only by the force of their own weight could bring into being so marvelous and beautiful a world."
>
> — Balbus (Cicero) (45BC), *On the Nature of the Gods* (pg. 161) [15]

Moreover: [13]

> "If one believes such a thing possible, I cannot conceive why one would not believe as well that by haphazardly throwing a vast quantity of the twenty-one letters onto the ground, the result could be Ennius' *Annals*, such that they could then be read. I doubt if **chance** could by itself complete even a single line."

Cicero, here, seems to outlining the general view that the two options to choose from are: "chance" or "gods".

Other

In 79AD, Pliny the elder stated the following about chance as god belief ideology:

> "Throughout the whole world, in all places and at all times, Fortuna alone is invoked, alone commended, alone accused and subject to reproaches, to her is credited all that is received and we are subject to chance that **'chance' herself takes the place of god**."

In 1903, William Thomson, in his infamous Christian apologeticist speeches (see: Thomson on religion), in reference to Cicero, began to use the phrase "fortuitous concourse of atoms" as a synonym for chance; for example:

> "Cicero denied that they could have come into existence by a fortuitous concourse of atoms. Was there anything so absurd as to believe that a number of atoms by falling together of their own accord could make a crystal, a sprig of moss, a microbe, a living animal?"

Others who advocate chance-based nature include: Ilya Prigogine and Richard Dawkins (Q),

Non-chance | Based

See main: Anti-chance

Those who adhere to a non-chance based operation of nature models seem to be generally captured in the "Goethe-Spinoza school" of thought:

> "Nothing in nature is by **chance**. Something appears to be chance only because of our lack of knowledge."
>
> — Benedict Spinoza (c.1675); *Publication* (Q); cited (Q) by Heinz-Otto Pietgen in *Baustein des Chaos* (1992)

> "There is no such thing as **chance**; and what seem to us merest accident springs from the deepest source of destiny."
>
> — Friedrich Schiller (c.1795), Ranker.com (Q)

The view of "chance", in Goethe's writings, according to Bernhard Kuhn (2013), is captured, in part, throughout his *Poetry and Truth*, in what he refers to as the "daemonic" (see: Goethe's daimonic), a type of force like chance, but not chance: (Q)

> "I perceived something in nature (whether living or lifeless, animate or inanimate) that manifested itself only in contradictions and therefore could not be expressed in any concept, much less any word. It was not divine, for it seemed irrational; not human, for it had no intelligence; not diabolical, for it was beneficent; and not angelic, for it often betrayed malice. It was like **chance**, for it laced continuity, and like providence, for it suggested context. Everything that limits us seemed penetrable by it, and it appeared to dispose at will over the elements necessary to our existence, to contract time and expand space. It seemed only to accept the impossible and scornfully to reject the possible."

Other Goethe adherents, who also are anti-chance thinkers, include:

> "Matter and energy have an original property, assuredly not by **chance**, which organizes the universe in space and time."
>
> — Lawrence Henderson (1913), *The Fitness of the Environment* [7]

> "Problems of evolution are in large measure problems of probabilities, statistical problems. Incidentally, this reflection disposes of the rather foolish objection sometimes raised against the theory of evolution, that it ascribes the course of events in an evolving system to **chance**. When we describe a phenomenon as being governed by chance, we do not, of course, mean that there are no definite causes (determining factors) at work; we merely state in these terms that the causes are complex and not known to us in detail."
>
> — Alfred Lotka (1925), *Elements of Physical Biology* (pg. 25)

Chance, in short, to the above thinkers, is a synonym for ignorance. A more recent anti-chance theorist is: Adrian Bejan.

Middle grounders

Some, e.g. Charles Darwin, vacillating in the middle, have expressed mixed views on the role of chance. Others, Sergius Morgulis (1952), as shown below, build arguments on anti-chance theorists, Margulis, e.g. cites Harold Blum, who in turn built his theory, in part, on the views of anti-chance theorist Lawrence Henderson, as quoted previous: [4]

> "Thermodynamically directed chemical evolution could conceivably proceed indefinitely without changing from a non-living [non-living state] to a living state. Only when organic matter had achieve a high degree of organization, and had acquired diverse propensities though concatenation of such substances—with '**chance**' as the only arbiter—did primordial life emerge as a new dimension in nature: matter perpetuating its own organization."

Morgulis' thermodynamic arguments, here, are based on Blum, who bases his ideas on Henderson, who denies chance; Morgulis, however, is ignorant of this.

Darwin | Chance variation

In 1859, English naturalist Charles Darwin published his evolution theory according to which, as modern truncated opinion sees things, natural selection acting upon chance variation in offspring determined the course of animate form change over time.

The term "chance variation", supposedly, first began to be used by Darwin, in his transmutation theory, in 1840. In his 1844 *Essay*, the term "chance" gets two mentions. [5]

In the first edition (1859) of his *On the Origin of Species*, Darwin uses the term "chance", in various ways, 43+ times. In one case he speaks of land isolation "decreasing the chance of the appearance of favourable variations" and also of great and open areas as making a "better chance of varourable variations" (pg. 105). In a latter instance (pg. 111), he states:

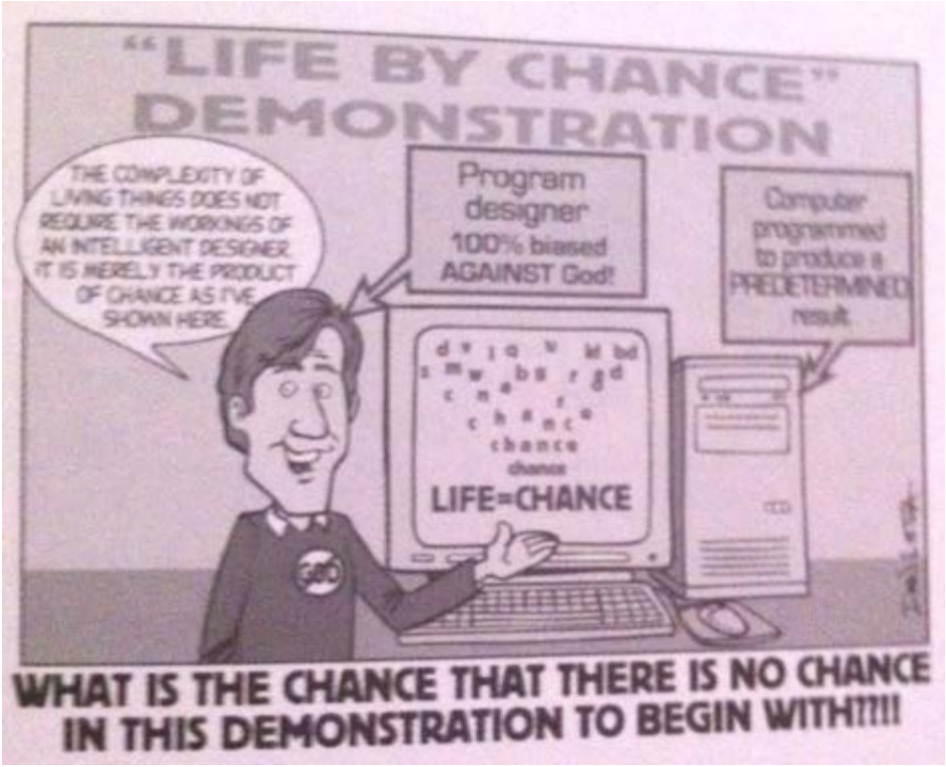

An anti-evolution cartoon (O) depicting an atheist scientist and his "life = **chance**" computer program, which randomly scuffles letters, aiming to disprove intelligent design — a semi-parody of Cicero's 45BC "scattered letters argument" against Lucretius and his chance-based atomic theory origin of the world (see: typing monkeys) — according to which the program produces a "living thing" from chance.

> "Mere **chance**, as we may call it, might cause one variety to differ in some character from its parents, and the offspring of this variety again to differ from its parent in the very same character and in a greater degree; but this alone would never account for so habitual and large an amount of difference as that between varieties of the same species and species of the same genus."

The first focused discussion on the term "chance" occurs in the opening of chapter five (pg. 131) titled "Laws of Variation" wherein he opens to the following:

> "I have hitherto sometimes spoken as if the variations —so common and multiform in organic beings under

> domestication, and in a lesser degree in those in a state of nature—had been due to **chance**. This, of course, is a wholly incorrect expression, but it serves to acknowledge plainly our ignorance of the cause of each particular variation."

In a 22 May 1860 letter to Asa Gray, Darwin commented further on his ambivalence with the term notion of chance:

> "I am inclined to look at everything as resulting from designed laws, with the details, whether good or bad, left to the working out of what we may call **chance**. Not that this notion *at all* satisfies me."

Though Darwin here expressly states that the model of "variations" as being by the result of "chance" as a wholly incorrect expression, one resulting from or ignorance, the colloquial seed was planted, and into the century to following Darwin's theory began to be conceptualized as one where natural selection acts on variations resulting from "random chance" or more commonly "blind random chance" a motto that gets repeated *ad nauseum* up to the present —atheism advocates: Richard Dawkins (1986) and Alexander Rosenberg (2011) being two examples. [9] Dawkins, in fact, has created so much hoopla about evolution being governed by "chance" that writers Scott Hahn and Benjamin Wiker entitled the first chapter of their *Answering the New Atheism* as "Dawkin's god, Chance". [10]

Thermodynamics

In 1914, French mathematician Emile Borel, in his book *Chance*, introduced the typing monkeys explanation of the statistical view of the second law.

In the 1970s, Belgian chemist Ilya Prigogine began to add thermodynamics arguments into Darwin's chance-based theory of evolution. In 1995, in a prebanquet speech of an international conference on thermodynamics in Nancy, France, Prigogine asserted that the tree-shaped structures that abound in nature—including river basins and deltas, the air passages in our lungs, and lightening bolts—*aléatoires* [random] or the "result of throwing the dice", in other words there is nothing underlying their similar design—it's just a cosmic coincidence. [3]

A Muslim ridiculing the "**chance**" based atheist explanation of evolution and the formation of complex things, such as helicopters.

Romanian-born American mechanical engineering thermodynamicist Adrian Bejan, who was in Prigogine's audience, reacted to this "nature is but the result of chance purview" in objection and went on to develop his constructal theory of flow channels, in which branching structures are not governed in their formation by "chance" but of geometrical flow laws. To quote from Bejan's 2012 book on his constructal theory: [3]

> "Designs we see in nature are not the result of **chance**."

Russian physical chemist Georgi Gladyshev, likewise, reacted against Progigine and his notion that blind random chance is behind nature, by developing his hierarchical thermodynamics theory, the following being a representative quote: [4]

> "The opinion that evolution is 'governed' by **chance** is not quite correct: the joint action of random events in a thermodynamic system should always satisfy the requirements of thermodynamics. The fan of thermodynamics always has a fixed direction."

(add)

Radioactivity

In 1896, the phenomenon of radioactivity was discovered by the French scientist Henri Becquerel, while working on phosphorescent materials that glow in the dark after exposure to light, which was found to be non-causal. In the century to follow, some began to use the "unpredictable" aspect of radioactive clicking of the meter to develop chance based philosophies of human nature.

In *circa* 1935, Italian engineer and theoretical physicist Ettore Majorana—who in 1929, completed his MS in physics with a dissertation on "The Quantum Theory of Radioactive Nuclei" at the Institute of Physics, University of Rome La Sapienza, under Italian theoretical physicist Enrico Fermi—published his "The Value of Statistical Laws in Physics and Social Sciences", derives a radioactive law based theory of sociology, the following being a representative: [2]

> "Quantum mechanics has taught us to see in the exponential law of radioactive transformations an elemental law which cannot be reduced to a simple causal mechanism. Naturally also the statistical laws recognized by classical mechanics and relative to complex systems keep their validity according to quantum mechanics. This modified on the other hand the rules for the determination of internal configurations and does so in two different ways depending on the nature of the physical systems, thus given rise respectively to the statistical theories of Bose-Einstein, and of Fermi. However, the introduction in physics of a new type of statistical law, or simply a probabilistic one, which was hidden under the supposed determinism of ordinary statistical laws, obliges us to revise the bases of the analogy which we have previously established with the statistical laws in social sciences."

In 1949, American isotope physicist Paul Aebersold, radioactivity, citing Becquerel, but throughout remained rather deterministic in respect to his evolution philosophy: [8]

> "The more we study living things, the more we study all of nature, including the atom itself, the more we can see that everything is not just a matter of **chance**. Figure out the chance that some protein molecule, or some hormone, or vitamin or enzyme, for example, was gotten together by the mere chance meeting of all its component atoms out of a chaos of atoms. Such molecules are so complex that even over the period of billions of years since the earth was formed, it is still extremely unlikely that any such molecules would be formed by pure chance. It is even more inconceivable to believe that that chance can account for all the hundreds of thousands of types of molecules that occur in nature, for all the exceedingly dynamic and complicated processes which these molecules take part, and much less for all the marvels of biology."

Although, to note, in his section on half-life, he commented:

> "One cannot predict when any particular unstable atom will disintegrate or 'die', just as the case for mice or men."

(add)

Other

Another variant of the chance model, according to Sudanese-born American philosopher Monydit Malieth, is the pieces of medal randomly forming a clock analogy: [11]

> "A philosopher once said: if you randomly throw pieces of metal together, they will never build a clock on

their own."

Malieth, however, goes onto state that his refutation of this claim by saying that: "as hard as it is to believe, a clock can build itself by accident if given infinite time and perpetual energy for motion".

Quotes

The following are related quotes:

A DreamsTime.com (Q) pic of relationship **chance** dice, entitled "Lucky in Love People Chance Game Dice", a play on the "lucky in love" motto; the opposite of which is determinism, the idea that neither chance nor dice, but fate or destiny determines relationship outcomes.

> "The idea—of life forming by random chance—is still very much alive at the popular level. For many college students who speculate about these things, '**chance**' is still the hero. They think if you let amino acids randomly interact over millions of years life is somehow going to emerge."
>
> — Lee Strobel (c.2003), dialogue (Q) with Stephen Meyer

> "The implications were fairly horrifying when it came to man's place in this Darwinian world. Higher purpose was gone. And what of the soul? Only men had souls, it was said, but if humans shared a legacy with apes and sharks and slugs, did that leave room for a soul? For an afterlife? The logic of Darwin suggests that human existence is nothing more than a happy accident brought about by blind **chance**."
>
> — Edward Humes (2007), *Monkey Girl: Evolution, Education, Religion, and the Battle for America's Soul*

See also

- Random chance
- Typing monkeys

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pg. 174). Lehigh University Press.
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Further reading

● Belo, Catarina. (2007). *Chance and Determinism: in Avicenna and Averroes*. Brill.

External links

● Chance – Wikipedia.

θΔics

In human chemistry, **Chanel Wood** (c.1982-) is a Canadian writer and philosopher notable for her 2007 HCR theory employing article "A Question of Social Chemistry", on the subject of social chemistry, in which, after thinking about how a logical theory of "human chemistry" between people would be developed, outlined a combination lock theory of dating using a synthesis of Plato's first law of affinity, i.e. like attracts to like, atomic energy level model bonding theories, and need compatibility. [1]

Education

In 2013, Wood was studying psychology at the University of British Columbia.

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1. (a) Wood, Chanel. (2007). "A Question of Social Chemistry" (WayBack), June 06. *Sociology*, ChanelWood.com.
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External links

â— Chanel Wood – Facebook.com.

θΔics

In terminology, **change**, from the Latin *cambire* “to exchange, barter”, from PIE root *kemb-* “to bend, crook”, means to make different in some particular; transform; to give a different position, course, or direction. [1]

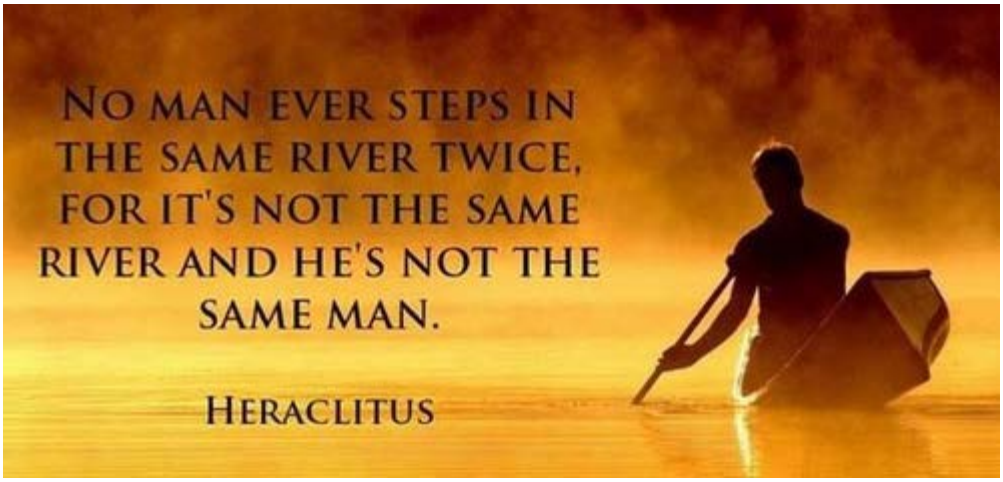

Greek flux and fire philosopher Heraclitus (c.475) on how **change** is the only eternal, as epitomized by his famous statement that "no man ever steps in the same river twice" for "its not the same and he's not the same" (see: turnover rate; Gibbs existence state)

Overview

In 1824, Sadi Carnot, in his *Reflections on the Motive Power of Fire*, using a caloric theory of heat mindset, stated that NO change occurs in the condition of the working body in one heat cycle:

> “Whenever work is done by heat (on a body in a cycle) no permanent **change** occurs in the condition of the working body [and that to deny this] would overthrow the whole theory of heat, of which it is the foundation.”

In 1856, Rudolf Clausius, fixed on the above errors in Carnot's "no change" statement, determined the measure of irreversible "change" in the universe, according to his Clausius inequality, specifically the value N called the equivalence value of all uncompensated transformations, thereby overthrowing the "whole theory of heat", replacing it with the new science of thermodynamics.

Quotes

The following are related quotes:

> “Nothing is permanent except **change**.”
>
> — Heraclitus (c.475BC), *Fragments* (Q)

> “It is in **changing** that we finding purpose.”
>
> — Heraclitus (c.475BC), *Fragments* (Q)

> “Crebillon … treats the passions like playing cards, that one can shuffle, play, reshuffle, and play again, without their **changing** at all. There is no trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover.”
>
> — Johann Goethe (1799), comment to Friedrich Schiller on the lack of realism in the work of Prosper Crebillon, Oct 23 [2]

See also

- Free energy change
- Gibbs free energy change
- Negative free energy change
- Turnover rate

- Volume change

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(b) Change – EtymOnline.com.
2. (a) Winnett, Susan. (1993). *Terrible Sociability: the Text of Manners in Laclos, Goethe, and James* (pg. 220). Stanford University Press.
(b) Lynch, Sandra. (2005). *Philosophy and Friendship* (Crebillon, pg. 37). Edinburgh University Press.
(c) Steer, Alfred G. (1990). *Goethe's Elective Affinities: the Robe of Nessus* (Crebillon, pg. 37; symbolically, pg. 158). Winter.

External links

- Change (disambiguation) – Wikipedia.

θΔics

In terminology, **chaos**, from the Greek *Χάος*, refers to utter confusion, an unorganized state, or a system in disorder; an ill-defined term (Epicurus, 329BC), generally derived from the Egyptian concept of the "Nun", a state of primordial watery abyss thought to originate the universe (see: Greek pantheon). [1]

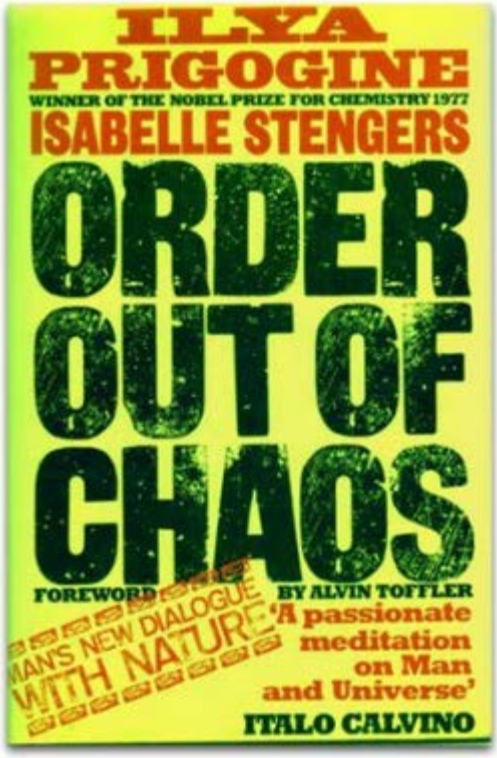

Ilya Prigogine's 1984 *Order Out of Chaos*, is the best-selling book on chaos and meaning.

Thermodynamics

In thermodynamic modern colloquial terms, when queried, people tend to associate entropy with chaos. [2] This, however, is late 20th century metaphor-crossover effect. None of the original founders of thermodynamics, such as Clausius, Maxwell, Gibbs, Boltzmann, Planck, etc., for instance, used the term “chaos”. [3]

Mythology

See main: Comparative mythology and religion

The etymology of the term chaos, in ancient origins, stems from early 4,000 BC mythological conceptions, primarily Egyptian, of a primordial deity (or set of deities) that personified the empty space or void that existed before the formation of the cosmos. [6] In particular, according to what is called the “documentary hypothesis”, when the Pentateuch, a Greek word meaning “five scrolls”, was written, between 1,000-500 BC, the Israelite authors, estimated to be four plus an editor, incorporated much of Egyptian and Babylonian mythology, from the places they had lived in, into the construction of the Bible. [15]

In reference to the etymology of the word *chaos*, the opening sentence of the 1600 version of the Bible, i.e. the first paragraph of the Genesis section of the Pentateuch, reads: “In the beginning God created the heaven and the earth. And the earth was **without form, and void**; and the darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters.” In etymology of this myth, the Hebrew scribes borrowed the Egyptian Hermopolitan creation scheme, from the ancient city of Hermopolis, to describe the state of the universe before creation begins.

In Hermopolis mythology, between c. 3100 BC - 2100 BC, the primeval universe was considered to be comprised of four basic elements, each element having a male and female counterpart. These elements or gods were known as the Ogdoad or “group of eight”. The deities and their associations were Nun and Naunet, the primordial water; Huh and Hauhet, **space or infinity** (also considered as the *flood force*); Kuk and Kauket, darkness; and Amen and Amenent, the invisibility of the winds. [15] At some point the eight elements interacted to create a burst of energy, allowing creation to take place. [17]

Hence, through etymological-evolution, the words translated as “without form and void” appear in the original Hebrew as “tohu” and “bohu”, and those two words sometimes appear in popular writing as an idiomatic way of expressing *chaos* or disorder, as in “all was tohu and bohu”. [16]

In short, in the biblical-version, the four male deities have been omitted from the story but their essential characteristics have been retained. Subsequently, the origin of the word “chaos” derives from the Egyptian frog headed god Huh, and his consort the snake-headed goddess Hauhet, personifying the “formless and infinity”.

[17] He is often represented anthropomorphically holding in each hand a notched palm-rib branch (as shown adjacent), the hieroglyph for 'year' symbolizing the passing of time (or "rib-of-time" analgous to arrow of time), where each notch represents one year.

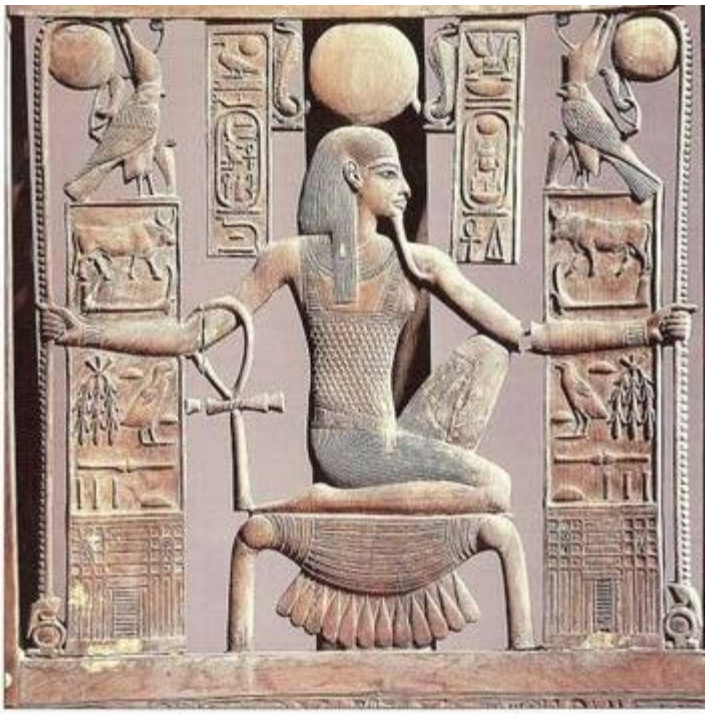

Huh (1550-1292 BC): primeval Egyptian god of formlessness and infinity (modern: entropy god)

In Egypt, in the Heliopolis creation myth, the universe was said to have originated from chaos in the form a a god named Huh.

Interestingly, then, in modern terms, we have come, unknowingly, to symbolize both chaos and the passage of time by one entity, that of "entropy", symbol *S*, in place of older Egyptian-deity/palm-rib combination. One can only imagine, what we will use in another 5,000-years from now?

By the year 1440, the term "chaos" had come to be known as "gaping void," from Latin chaos, from Greek *khaos* "abyss, that which gapes wide open, is vast and empty" and chaos meaning "utter confusion" (1606) is extended from theological use of chaos for "the void at the beginning of creation" in Vulgate version of Genesis. [7]

Chemistry

In 1632, Flemish physician and chemist Jan Baptista van Helmont coined the concept of "gas", as type of air having distinct physical and chemical properties, from the Greek word "chaos". [8] He wrote: "I call *Gas*, not far different from the *Chaos* of the ancients". [9] The particles of a gas, or of a gas, were in chaos, and gas could be a wild spirit because of its habit of escaping from chemical reactions. [10] Van Helmont called "this Spirit, unknown hitherto, by the new name of Gas, which can neither be constrained by Vessels, nor reduced into a visible body." [11]

Into the late 17th century, debates on the overlap of science and religion, in relation to chaos (of Genesis) and the new gas theories, were beginning to erupt. In 1663, for instance, British clergyman Richard Bentley argued that: "The Atoms or Particles, which now constitute Heaven and Earth, being once separate and diffused in Mundane Space, like the supposed *Chaos*, could never *without a God by their Mechanical affections* have convened into this present Frame of Things or any other like it."

Thermodynamics

In 1895, Ludwig Boltzmann finished is famous *Vorlesungen über Gastheorie* (*Lectures on Gas Theory*), in which he outlined a statistical thermodynamic interpretation of "molar-ordered" [*molar-geordnete*] and "molar-disordered" distributions of gas molecules in containers. In this work, originally published in two parts, 1896 (Part I) and 1898 (Part II), through a bit of derivation related to the logarithms of the probabilities of the arrangements of molecules and distributions of states among them in several gases, Boltzmann then concludes that:

> "The fact that in nature the entropy tends to a maximum shows that for all interactions (diffusion,

heat conduction, etc.) of actual gases the individual molecules behave according to the laws of probability in their interactions, or at least that the actual gas behaves like the molecular-disordered gas which we have in mind."

Hence, although Boltzmann never actually equated entropy with chaos, by way of these statements, most have come to attribute the molecular chaos/ entropy logic to the theories of Boltzmann. In the 1964 Translator's Introduction to Boltzmann's *Gas Theory*, for instance, physics historian Stephen Brush, comments that: "Boltzmann was able to deduce immediately a very important result from his equation, which was not at all obvious from Maxwell's original formulation: a quantity called *H*, which can be identified with the negative of the entropy, must always decrease or remain constant, if one assumes that the velocity distributions of two colliding molecules are uncorrelated. The molecular interpretation of the law of increasing entropy is thus intimately related to the assumption of ***molecular chaos*** and the relation between entropy and probability." He continues, "*H* remains constant only when the gas attains a special velocity distribution which had previously been deduced by Maxwell (1859) in a less convincing manner." [12]

To elaborate further on the association of the logic of Boltzmann with chaos, a key insight applied by Boltzmann was to determine the collision term resulting solely from two-body collisions between particles that are assumed to be uncorrelated prior to the collision. This assumption was referred to by Boltzmann as the 'Stosszahl Ansatz', and is now known as the Boltzmann chaos assumption or 'molecular chaos assumption'. The Boltzmann chaos assumption, roughly speaking, postulates the non-correlation of velocities of particles which are about to collide. [13] The translation of these terms into the loose public idea that "entropy = chaos" and that the second law states that "everything tends to chaos", however, did not involve a quantitative rigorous development, but rather a haphazard dumbing-down of the technicalities and stipulations involved in favor ball-park understanding.

One of the earliest references to the supposed equality of entropy and chaos is found in the 1920 *A System of Physical Chemistry* by William Lewis and James Rice, who state that "the molecules of a gas are in a continuous disordered movement, a gas being in fact a molecular chaos". [4] They refer to American mathematical physicist Willard Gibbs description of entropy as *mixed-up-ness* and state that "this definition of entropy will be understood to a certain extent if we think of a substance as a molecular chaos … owing to collisions between the molecules their motion tends to become more and more disordered until a final stage of disorder is reached." The section heading "entropy as mixed-up-ness" by Gibbs, however, was a planned, but never finished, chapter heading found in the unpublished fragments of Gibbs papers. [5] In any event, they incorrectly state that "Gibbs considered that the degree of the disorder was identical with entropy" and that "when the disorder or chaos is greatest the entropy of a substance is likewise a maximum". Gibbs, however, never once used the words "disorder" or "chaos".

In the 1967 book *Order and Chaos - Laws of Energy and Entropy,* authors Stanley Angrist and Loren Hepler attempt to show how the laws of thermodynamics apply to technology, culture, and life processes. [19] By 1971, "chaos theory" was beginning to be correlated with entropy and the second law of thermodynamics. [18] Belgian thermodynamicist Ilya Prigogine, having been greatly influenced by Boltzmann in his early days, was a great promoter of the word "chaos". His most popular book is the 1984 *Order Out of Chaos*, in which he set out to show that events called bifurcations and fluctuations, in non-equilibrium thermodynamic processes, can create "order out of chaos" in accordance with second law of thermodynamics, albeit with a modified version of internal entropy synthesized by him. [20] Another is this 1996 *The End of Certainty - Time, Chaos, and the New Laws of Nature.* [21]

Quotes

The following are related quotes:

> "In the beginning was **chaos**."
>
> — Isiodos (c.850BC) (Q)

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(b) O'Grady, John, F. (2005). *Men in the Bible: The Good, the Bad, and the Ugly,* (pgs. 3-4). Paulist Press.
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(b) Image of the god Heh: as he kneels on the hieroglyphic sign for gold, and clutches notched palm branches, symbolizing the passing of time, 18th Dynasty (1550-1292 BC); as found on the back of one of Tutankhamun's thrones.
18. Quote: Today, the theory of *chaos* can help with the answer. The second law of thermodynamics is, according to Arthur Eddington, the "supreme law of Nature". **...** (Source: *New Scientist*, 1971, pg. 41).
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External links

- Chaos – Wikipedia.

θΔics

In science, **chaos theory** is the mathematical study of systems that display non-periodic, irregular, unpredictable, or chaotic behaviors. [1] Chaos theory is sometimes considered as synonymous with complexity theory. Chaos theory, however, is a subject that emerged in the 1970s, with the development of computers, centered in larger part on doing computer simulations, of iteration formulas, with various initial conditions. The following is an synopsis of chaos theory: [5]

> "The important property of a chaotic system is that the state variable will eventually settle down to a finite set, i.e. the so-called strange attractor. This is what people say about order in chaos."

In the 1980s, with the rise of computer technology chaos theory bloomed, reaching its peak in the 1990s.

History

In 1903, French mathematical physicist Henri Poincare was said to have initiated chaos theory when he stated:

> "It may happen that the small differences in the initial conditions produced very great ones in the final phenomenon. A small error in the former will produce an enormous error in the latter. Prediction becomes impossible, and we have fortuitous phenomenon."

In 1963, American meteorologist Edward Lorenz did a computer simulation to enable the predictability of weather, and found that negligible perturbations are amplified, concluding that long-term predictions are impossible. His so-called "Lorenz attractor" diagrams are often found used in physical humanities like publications.

Thermodynamics

Chaos theory sometimes is found intertwined together, in an ill-contrived way, with discussions of time and the second law of thermodynamics. This loosely traces to Belgian chemist Ilya Prigogine's work, as captured in his 1984 book *Order Out of Chaos*, and his theories of bifurcations and fluctuations. [2] In 1996, Australian philosopher Huw Price tells explained: [3]

> "In recent years it has often been suggested that the key to the apparent conflict between thermodynamics and mechanics lies in **chaos theory**, and the application of the nonlinear methods in physics … this view is particularly associated with the Brussels School, led by theoretical chemist Ilya Prigogine."

Another popularized, albeit very nonsensical, connection between the second law and chaos theory was made by American author James Gleick in his 1987 national best-seller *Chaos: Making a New Science*, in which he cites Claude Shannon as being the general purveyor of thermodynamics and entropy, which of course is incorrect. [4] All-in-all, chaos theory has little connection to thermodynamics, except where found in fringe publications.

See also

â— Boltzmann chaos assumption

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External links

â— Chaos theory – Wikipedia.

θΔics

In famous publications, **chapter four** is the core chapter of German polymath Johann Goethe's 1809 novella *Elective Affinities*, in which the characters Eduard and his friend the Captain explain the scientific concept of "elective affinity" to Eduard's wife Charlotte in terms of descriptions of chemical reaction; also discussing the application of the chemical theory (chemical affinity) in the context of their own reactions. [1]

Many scholars have focused on the **famous fourth chapter** of *Die Wahlverwandtschaften* in which the elective affinities are discussed as a key to understanding the following events and symbols of the novel itself.

2002 summary of the "famous **chapter four**" of Goethe's 1809 masterpiece *Elective Affinities* by American literature scholar Susan Gustafson. [5]

Famous excerpts

Excerpts from chapter four are frequently quoted. The following, for example, is an opening chapter quote of chapter four as found as the header quote to the introduction section to Korean-born American chemistry historian Mi Gyung Kim's 2003 book *Affinity, That Elusive Dream*: [4]

> "I can put my meaning together with letters. Suppose an *A* connected so closely with *B* that all sorts of means, even violence, have been made use to separate them, without effect. Then suppose a *C* in exactly the same position with respect to *D*. Bring the two pairs into contact; A will fling himself on *D*, *C* on *B*, without it being possible to say which had first left its first connection, or made the first move toward the second."

The following, similarly, is a 2008 synopsis take of chapter four by English-born American philosopher Lydia Goehr: [2]

> "Wahlverwandtschaft – the natural affinity with which different elements adhere to but also repel one another, as if each were choosing its own particular arrangement. Eduard speaks of chemistry and physics; the Captain, too, of how cohesiveness can be seen in liquids with their tendency to form into round shapes-falling drops of water or little balls of quicksilver or molten lead. At the same time, they all hear descriptions of human relations. Elements and persons: each compelled to spring into activity to form novel and unexpected constellations, a lively movement that disturbs each along the way and of which the ending can't be predicted in advance."

Japanese chemical engineer Tominaga Keii quotes a full page from chapter four in his section on the thermodynamics of chemical reactions to his 2004 book *Heterogeneous Kinetics*. [3]

Overview

In the novella, the central chemical reaction that takes place is a double displacement reaction (double elective affinity), between a married couple Eduard and Charlotte (BA), at the end of their first year of marriage (for each their second marriage), and their

two good friends the Captain and Ottilie (CD), respectively.

Scene of **chapter four** from the 1996 French-Italian film version of Goethe's *Elective Affinities*.

The first marriages, for both Eduard and Charlotte, are described as having been marriages of financial convenience, essentially arranged marriages. Specifically, when they were younger, Eduard was married off to a rich older women through the workings and insatiable greed of his father; Charlotte, likewise, when her prospects were none the best, was compelled or obliged to marry a wealthy man, who she did not love. In the fourth chapter, the characters detail the world's first ever verbally-depicted human double displacement chemical reaction.

The chapter begins with description of the affinity map (reaction map) or 'topographical chart' as Goethe calls it. On this reaction map, we are told that on it 'the features of the estate and its surroundings were clearly depicted, on quite a large scale, in pen and in different colors, to which the Captain had give a firm basis by taking trigonometrical measurements'. Next, to explain the reaction, we are told:

> 'Provided it does not seem pedantic,' the Captain said, 'I think I can briefly sum up in the language of signs. Imagine an *A* intimately united with a *B*, so that no force is able to sunder them; imagine a *C* likewise related to a *D*; now bring the two couples into contact: *A* will throw itself at *D*, *C* at *B*, without our being able to say which first deserted its partner, which first embraced the other's partner.'
>
> $$AB + CD \rightarrow BD + AC$$
>
> 'Now then!' Eduard interposed: 'until we see all this with our own eyes, let us look on this formula as a metaphor from which we may extract a lesson we can apply immediately to ourselves. You, Charlotte, represent the *A*, and I represent your *B*; for in fact I do depend altogether on you and follow you as *A* follows *B*. The *C* is quite obviously the Captain, who for the moment is to some extent drawing me away from you. Now it is only fair that, if you are not to vanish into the limitless air, you must be provided with a *D*, and this *D* is unquestionably the charming little lady Ottilie, whose approaching presence you may no longer resist.'

This, of course, is the famous double elective affinity reaction.

See also

â— Goethe's human chemistry

References

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Further reading

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θΔics

In thermodynamics, **characteristic function**, aka "state functions", is a mathematical function that characterizes of the state of a given body.

Overview

In 1833, William Hamilton, in his “Problem of Three Bodies by my Characteristic Function”, penned in his Note Book 29, as found in his collected works (1940), built on the work of Joseph Lagrange and Pierre Laplace, to theorize about the the symbol V which he referred to as a “characteristic function”, defined as follows: [3]

$$V = \int_0^t \sum mv^2 dt$$

wherein m is the mass of three or four bodies, e.g. the sun and two planets, v is the velocity of the mass, mv^2 is the kinetic energy, or "living force" as it was called then, and t or dt was the "time element".

In 1869, French engineer Francois Massieu, in his “On the Various Functions Characteristic of Fluids”, introduced the concept of the existence of characteristic functions, in what seems to be the modern chemical thermodynamic sense of things. [1]

In 1876, American engineer Willard Gibbs summarized Massieu’s views as such: [2]

> “Massieu has shown how all the properties of a fluid ‘which are considered in thermodynamics’ may be deduced from a single function, which he calls a **characteristic function** of the fluid considered; he introduces two different functions of this kind, vis, a function of the temperature and volume, which he denotes by Ψ, and a function of the temperature and pressure, which he denotes by Ψ’; in both cases he considers a constant quantity (one kilogram) of the fluid, which is regarded as invariable in composition.”

(add)

Main functions

In terms of modern classification, there are generally considered to be five main characteristic functions::

Characteristic function:	Energy U	Entropy S	Enthalpy U + PV	Helmholtz free energy U – TS	Gibbs free energy U + PV – TS
Description (synonyms)**:**		(transformation content)	(heat content)	(constant: V,P free energy) (work function) (Helmholtz work function) (Helmholtz function)	(constant: T,P free energy) (available energy) (useful energy) (Gibbs function)

(add)

See also

â— Characteristic function notation table

References

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θΔics

In thermodynamics, **characteristic function notation table** lists the various notation symbol schemes used in signifying the main characteristic functions of thermodynamics: the energy (U) of a body, the entropy (S) of the body, the enthalpy (H) or heat content of a body, the free energy (available energy of useful energy) of a body for isochoric-isobaric processes or Helmholtz free energy (F), and the free energy (available energy or useful energy) of a body for isobaric-isothermal processes or Gibbs free energy (G).

η	ϵ	ψ	ζ	χ	μ	Gibbs
S	E	F	G	H	μ	Fowler and Guggenheim, *Statistical Thermodynamics* (1939)
S	U	F	G	H	μ	Zemansky, *Heat and Thermodynamics* (McGraw-Hill, 1937)
S	E	F	G	H	μ	Brönsted, *Physical Chemistry* (Heinemann, 1938)
S	E	F	G	H	μ	Van Rysselbergh, *Affinity* (Stanford, 1936)
S	E	F	G	H	μ	Fowler, *Statistical Mechanics*, Ed. 2 (Cambridge, 1936)
S	E	F	G	H	μ	Guggenheim, *Modern Thermodynamics* (Methuen, 1933)
S	U	F	G	H	μ	Schottky, *Thermodynamik* (Springer, 1929)
S	U	F	Z	H	μ	Partington, *Chemical Thermodynamics* (Constable, 1924)
S	E	A	F	H	$\bar{F}$	Lewis and Randall, *Thermodynamics* (McGraw-Hill, 1923)
Φ	U	F	—	—	—	Planck, *Treatise on Thermodynamics*, Ed. 3 (Longmans, 1927)

An example 1939 **symbol table**, compiled by Ralph Fowler and Edward Guggenheim, for the main six thermodynamic functions found commonly in modern textbooks of the day; the latter of which μ (mu) being the chemical potential. [2]

Symbol usage conflicts

The term "characteristic functions" is a term introduced in 1869 by French engineer Francois Massieu and for these functions, Massieu employed a Greek symbol notation scheme to represent the various thermodynamic functions characteristic of bodies. In 1873, this Greek symbol notation scheme was adopted by American engineer Willard Gibbs.

Prior to this, however, in 1865, the first two main thermodynamic functions, energy and entropy, were introduced using the English letter symbols U and S, respectively, by German physicist Rudolf Clausius. This was the start of a symbol use inconsistency that would last for at least a century, well into the early 21st century, with authors still inconsistent on their usage of the symbols A, short for *arbeit* (German for "work"), or F, short for *frieie energie* (German for "free energy"), to represent the Helmholtz free energy (U – TS).

Out of this conflict, into the 1930s, the symbol usage issue had become so chaotic and varied, that new thermodynamics textbooks were forced to compile notation tables and put this at the beginning of each book. The first of these notation tables seems to have been one compiled by Edward Guggenheim (1933), followed by a second made by Theophile de Donder (1936), and a third made by Ralph Fowler (1939).

In 1958, American geologist Hugh McKinstry, supposedly, wrote an extensive article on subject of the varieties of symbol use of the characteristic functions in thermodynamics; the article, supposedly, does not deal with thermodynamics directly, but is a commentary on the use of symbols. [4]

Function symbols table

An updated synthesis of these various notation tables (Guggenheim, de Donder, and Fowler) are regrouped together below, listed in chronological order:

Energy **U**	Entropy **S**	Enthalpy **U + PV**	Helmholtz free energy **U – TS**	Gibbs free energy **U + PV – TS**
		Heat content	**Constant: V, P** **Free energy** (Work function)	**Constant: T, P** **Free energy** (Available energy)

							(Useful energy)
Rudolf Clausius	**1865**	***Mechanical Theory of Heat***	**U**	**S**			
Francois Massieu	1869	“On the Various Functions Characteristic of Fluids”	U		U’ (U prime)	– tψ (name)	– tψ’ (name)
James Maxwell	1871	*Theory of Heat*	e	φ (phi)			
Willard Gibbs	**1876**	***On the Equilibrium of Heterogeneous Substances***	**ε** (epsilon)	**η** (eta)	**χ** (chi)	**ψ** (psi)	**ζ** (zeta)
Hermann Helmholtz	1882	"On the Thermodynamics of Chemical Processes"	U	S		𝔉, F German: ‘frieie energie’	
Walther Nernst	1893	*Theoretical Chemistry from the Standpoint of Avogadro’s Rule and Thermodynamics*	U				
Pierre Duhem	1897	*Thermodynamique et Chimie*	U			F	Φ (Phi)
Max Planck	1897	*Treatise on Thermodynamics*	U	Φ (Phi)	H	F	– Tψ (name)
Fritz Haber	1905	*Technical Thermodynamics of Gas Phase Reactions*	U	S		A German: ‘arbeit’ (work)	
Otto Sackur	1912	*Thermochemistry and Thermodynamics*	U		H	ψ (psi)	ζ (zeta)
Percy Bridgman	1914	"A Complete Collection of Thermodynamic Formulas"	E	S	H	ψ (psi)	Z
Gilbert Lewis	**1923**	***Thermodynamics***	**E**	**S**	**H**	**A**	**F**
James Partington	1924	*Chemical Thermodynamics*	U	S	H	F	Z
Theophile de Donder	1926	*L'Affinite*	U	S	ψ (psi)	F	H
John Butler	1928	*The Fundamentals of Chemical Thermodynamics*	E	S	H		F

Walter Schottky	1929	*Thermodynamik*	U	S	H	F	**G**
Ralph Fowler	1929	*Statistical Mechanics*	E	S	H	– Tψ	– TΦ
Hermann Ulich	1930	*Chemische Thermodynamik*	U		W	F	G
Georges Lerberghe	1931	*Calcul des Affinites Physico-Chimiques*	U		I	F	H
Edward Guggenheim	**1933**	***Modern Thermodynamics***	**E**	**S**	**H**	**F**	**G**
Theophile de Donder	1936	*Thermodynamic Theory of Affinity*	E	S	H	F	F
Mark Zemansky	**1937**	***Heat and Thermodynamics***	**U**	**S**	**H**	**F**	**G**
Paul Epstein	1937	*Textbook of Thermodynamics*	U	S	χ (chi)	ψ (psi)	Φ (Phi)
Johannes Bronsted	1938	*Physical Chemistry*	E	S	H	F	G
Joseph Keenan	1941	*Thermodynamics*	E	S	H	ψ (psi)	Z
Frederick Rossini	1950	*Chemical Thermodynamics*	E	S	H		F, u
Juliana Goates and Bevan Ott	2000	*Chemical Thermodynamics*	U	S	H	A	G
IUPAC [3]	2007	Chemical Thermodynamics Symbol Table	U	S	H	A, F	G

An important function not listed in this table, owing to its consistency is 'bound energy', symbol 'B', equal to the function 'TS', which is defined, according to Herman Helmholtz (1882), the coiner of this term, as "expressing the mechanical equivalent of that quantity of heat which must be conveyed into a body at temperature T in order to raise its entropy to the value S." Hence, total energy (or total energy plus pressure-volume work energy) less bound energy is what is called 'free energy' (Helmholtz or Gibbs, respectively):

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(c) McSween, Harry Y, Richardson, Steven M., Uhle, Maria. (2003). *Geochemistry: Pathways and Processes* (pg. 45).

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θΔics

In hmolscience, **Charles Babbage** (1791-1871) (IQ:170|#222) (CR:8) was an English mathematician, philosopher, and mechanical engineer, oft-characterized as one of the pre-eminent polymaths of the 19th century, a top 100 Eells mathematician (#60), a Ranker greatest mind (#243|1131), known generally for his 1827 "difference engine" or analytical engine, a computer forerunner, and for his *Ninth Bridgewater Treatise* (1837), which outline a theory of natural religion, a science and religion reconciliation attempt, arguing, among other things, that miracles are in accordance with the order of nature. [1]

Religion | Science

In 1837, Babbage, in his *Ninth Bridgewater Treatise*, argued the following:

> "There exists no fatal collision between the words of scripture and the facts of nature."

(add discussion)

References

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External links

â— Charles Babbage – Wikipedia.

θΔics

In hmolscience, **Charles Beard** (1874-1948) was an American historian for his 1936 "ten chemicals argument", a chemical analogy argument against causation.

Overview

In 1936, Beard, in his *The Devil Theory of War: an Inquiry into the Nature of History and the Possibility of Keeping Out of War*, gave the following argument: [1]

> "Let a chemist take ten chemicals in a test tube. He adds an eleventh. A precipitation follows. Did the elevenths chemical 'cause' the precipitation? Or was it 'caused' by the reaction of the other ten to the event of addition? Why speak of cause at all in this connection? The chemist is likely to be content with mere description: Ten chemicals: the addition of the eleventh chemical: precipitation. It adds nothing to his knowledge to say that the eleventh chemical 'caused' precipitation."

Beard's aim in arguing here, as summarized by Morris Zucker, is to fortify his rejection of the "wicked person" or impersonal "forces" theories of the cause of World War I (1914-1918), and to scorn, supposedly, the utopian forever peace theorists. [2]

Goethe

A simpler version of this query was pursued by German polyintellect Johann Goethe, who in the opening chapters of his physical chemistry based 1809 *Elective Affinities*, situated the following reaction scenario, each chapter representative of a step in the chemical mechanism:

> "Let a chemist take [two] chemicals [Edward & Charlotte] in a test tube [estate]. He adds an third [Captain]. A precipitation follows [Edward=Captain]. Did the [third] chemical 'cause' the precipitation? Or was it 'caused' by the reaction of the other [two] to the event of addition?"

It remains to be determined where—presumably it is embedded or hidden in his novella somewhere—exactly Goethe, in his novella, discusses causation; but, nevertheless, in his 1796 anatomy lecture, section on affinity, he states that the limits or order when chemical separations and recombinations occur do so according to deterministic laws, and that to explain these reactions, he states: [3]

> "Chemists speak of elective affinities, even though the forces that move mineral components [or humans] one way or another and create mineral structures are often purely external in origin."

The answer to Beard's question, then, in short, as Goethe sees things, rephrased in modern physical science terms, is that such reactions, human or chemical, are caused by gravito-electromagnetic forces "often purely external in origin" [see also: internal force], determined by the laws of physical science, thermodynamics predominately, quantified macroscopically by free energies, and spoken about, mechanistically (microscopically), in terms of chemical affinities.

Other

Here, to note, we are also reminded, in the reverse sense, of the chemical teleology embedded investigations of Mexican-born American chemist Vicente Talanquer. [4]

Quotes

The following are notable quotes:

> “Some things seem to be deeply rooted in the very constitution of the universe.”
>
> — Charles Beard (1930), *The Rise of American Civilization* [5]

References

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3. (a) Goethe, Johann. (1796). “On the Laws of Organization as Such, to the Extent That We Can Observe Them in the Structure of Types”, Lectures on Comparative Anatomy and Zoology.
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External links

- Charles A. Beard – Wikipedia.
- Beard, Charles A. (Charles Austin) (1874-1948) – WorldCat Identities.

θΔics

In hmolscience, **Charles Bennett** (1943-) is an American computational molecular dynamics researcher noted, in computer thermodynamics, whose name is oft-cited in discussions about information, energy, and entropy.

Overview

In circa 1970, Bennett came across one of German-born Rolf Landauer's 1961 paper on an attempt to prove experimentally American chemical engineer John Neumann's 1949 folklore lecture comment that:

> "A computer operating at a temperature *T* must dissipate at least *kT* ln 2 of energy per elementary act of information, that is, per elementary decision of a two-way alternative and per elementary transmittal of one unit of information."

Bennett then began working on this problem on his own and in 1973, in his own words, "showed that general purpose computation can be performed by a logically and thermodynamically reversible apparatus, one which is able to operate with arbitrarily little energy dissipation per step because it avoids throwing away information about past logical states." This statement, however, seems to be a mistranslation of thermodynamics, according to which the second law states that all natural processes are irreversible.

In the 1970s, he did work on constructing or theorizing about an "irreversible computer", i.e. one that does not show an entropy increase during computation processes, such as in the erasure of one bit of information.

His 1988 article "Notes on the History of Reversible Computation", gives a fairly decent summary of the history of the overlap of ideas on information, entropy, and computer processing theory.

In 1982, Bennett proposed a reinterpretation of Maxwell's demon, attributing its inability to break the second law to an irreducible thermodynamic cost of destroying, rather than acquiring, information.

In 1987, Bennett gave an artistic rendition of Szilard's demon. [3]

Soul weighting

See main: Soul weight

American chemical engineer Gerard Nahum 1988 article "A Proposal for Testing the Energetics of Consciousness and its Physical Foundation" cites Bennett, along with Claude Shannon (1949) and Alvin Weinberg (1982), as being justification for the view that the following expression:

$$\Delta Q_{bit} \leq -Tk \ln 2$$

quantifies heat loss per loss of bit of information in the nervous system, and uses this equation as a means to justify the idea that the soul of the person can be quantified and measured at the time of death. [2]

Education

Bennett competed his PhD in 1970 on molecular dynamic studies, specifically computer simulation of molecular motion, at Harvard University.

References

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(f) Nahum, Gerard. (2010). “A Proposal for Testing the Energetics of Consciousness and its Physical Foundation”, *Journal of Human Thermodynamics*, 6: 1-25, March.
3. Bennett, Charles H. (1987). “Demons, Engines, and the Second Law”, *Scientific American*, 257(5): 108-116, Nov.

External links

â— Charles Bennett (computer scientist) – Wikipedia.
â— Charles H. Bennett (publications) – Research.IBM.com.

θΔics

In existographies, **Charles Blount** (1654-1693) (FA:53) was an English philosopher, Hobbesian, stoicism devotee, and characterized "practical atheist" (Q), noted for []

Overview

In 1679, Blount, in his *Anima Mundi or World Soul* (Q)*: an Historical Narration of the Opinions of the Ancients Concerning Man's Soul after this Life according to Unenlightened Nature*, prefaced as an "atheistical, heretical pamphlet", wherein he aims to "compare Christianity with paganism". [1]

In 1683, Blount, in his *Miracles: No Violations of the Laws of Nature*, combined quotations from Bishop Burnet, Thomas Hobbes, Benedict Spinoza, among others, in an attempt to prove that accounts of miracles are without factual basis. [2]

Reaction end

Blount, after he grew ill, killed himself (suicide), an act that has been long-cited as proof of his commitment to stoicism over Christianity ideas. [4]

Quotes | Employed

The following are quotes employed by Blount:

> "After death no thing is, and no thing death [dies?]."
>
> — Seneca (50AD), favorite Blount quote

Quotes | On

The following are quotes on Blount:

> "Jacob Reimann, in his *Universal History of Atheism* (1725), included as atheists: Thomas Hobbes, John Toland, **Charles Blount**, and Anthony Collins."
>
> — Jennifer Hecht (2003), *Doubt: a History* [3]

Quotes | By

The following are quotes by Blount:

> "There are two forts of judges unto whom all writers are obnoxious, viz. the **ignorant**, and the **judicious**. As for the ignorant, they are such men as I before was speaking of, then whose approbation I dread nothing more: *simili simile gaudet* ['like rejoices in like'] (Q), is a maxim that holds true as well in all other things, as physics; and there is nothing would make me have so ill an opinion of myself, as to hear one of them commend me. But the other judge, viz. the man of learning and judgment, is the he I fear, and before him only will I arraign myself."
>
> — Charles Blount (1679), *Anima Mundi* (to the readers) [1]

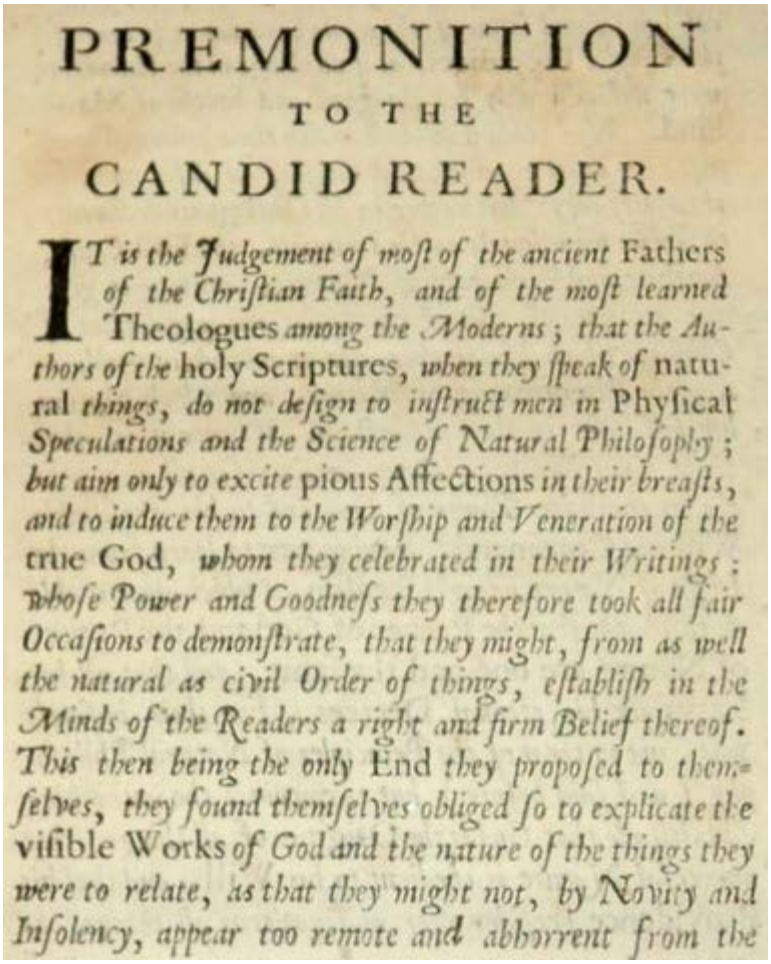

PREMONITION
TO THE
CANDID READER.

IT is the Judgement of most of the ancient Fathers of the Christian Faith, and of the most learned Theologues among the Moderns; that the Authors of the holy Scriptures, when they speak of natural things, do not design to instruct men in Physical Speculations and the Science of Natural Philosophy; but aim only to excite pious Affections in their breasts, and to induce them to the Worship and Veneration of the true God, whom they celebrated in their Writings: whose Power and Goodness they therefore took all fair Occasions to demonstrate, that they might, from as well the natural as civil Order of things, establish in the Minds of the Readers a right and firm Belief thereof. This then being the only End they proposed to themselves, they found themselves obliged so to explicate the visible Works of God and the nature of the things they were to relate, as that they might not, by Novity and Insolency, appear too remote and abhorrent from the

First page of **Blount's** 1683 *Miracles: No Violations of the Laws of Nature*, wherein he attempt say that authors of the Bible did not aim to teach people about physical science and natural philosophy, but only to "excite pious affections, so to induce worship and veneration" of god. [2]

References

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2. Blount, Charles. (1683). *Miracles: No Violations of the Laws of Nature* (GB)(Q). Robert Sollers.
3. (a) Reimann, Jacob F. (1725). *Universal History of Atheism* (Historia universalis atheismi et atheorum falso et merito suspectorum). Publisher.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 335). HarperOne
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Further reading

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● Sheppard, Kenneth. (2015). *Anti-Atheism in Early Modern England 1580-1720: The Atheist Answered and His Error Confuted* (Blount, 41+ pgs). Brill.

External links

● Charles Blount (deist) – Wikipedia.

θΔics

In existographies, **Charles Bonnet** (1720-1793) (Cattell 1000:737) (CR:18) was a French natural philosopher noted for his 1745 great chain of being diagram, tracing the so-called unbroken chain of existence from the human down to the minerals and elements, i.e. from organic to the inorganic, in one single gradation continuum, and for coining the term evolution.

Chain of being

In 1764, Bonnet gave the following statement about his chained existence model: [1]

> "Between the lowest and the highest degree of spiritual and corporal perfection, there is an almost infinite number of intermediate degrees. The succession of degrees comprises the universal chain. It unites all beings, ties together all worlds, embraces all the spheres."

Bonnet, in regards to his unbroken chain model of existence, in contrast to the unbridgeable gap model, was a student so-to-speak of the monad doctrines, a type of subatomic panbioism, of Gottfried Leibniz.

Soul theory

In 1769, Bonnet, in his *Regeneration Philosophy*, stated something along the lines of the following:

> "If someone ever demonstrated that the soul is material, they should not be alarmed; should we not admire the power which gave the material the ability to think?"
>
> — Charles Bonnet (1769), *Regeneration Philosophy* [2]

This statement is the opening quote to Joseph Priestley's 1777 soul treatise.

Quotes | On

The following are quotes on Bonnet:

> "As compared with the evolutionary hypotheses which had already been put forward by Maupertuis, Diderot, and Robinet, these speculations of **Bonnet** (*Philosophical Palingenesis*, 1770) were obviously crude and retrogressive."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* [1]

Quotes | By

The following are quotes by Bonnet:

> "Nature seems to make a great leap in passing from the vegetable to the fossil [i.e. rock]; them are no bonds, no links known to us, which unite the vegetable and the mineral kingdoms. But shall we judge of the chain of beings by our present knowledge? Because we discover some Interruptions, some gaps in It here and there, shall we conclude that these gaps are real? **The gap that we find between the vegetable and the mineral will apparently someday be filled up**. There was a similar gap between the animal and the vegetable; the polyp has come to fill it and to demonstrate the admirable gradation there is between all beings"
>
> — Charles Bonnet (1764), *Contemplation of Nature*; cited by Arthur Lovejoy (1933) in *The Great Chain of Being*

(pg. 233)

References

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3. (a) Bonnet, Charles. (1770). *Philosophical Palingenesia: Ideas on the past state and on the future state of the living beings* (*Palingenesie Philosophique, our Idees sur l'etat passe et sur l'etat future des etres vivans*). Publisher.
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External links

â— Charles Bonnet – Wikipedia.

θΔics

In existographies, **Charles Bradlaugh** (1833-1891) (FA:107) was an English political and atheism activist noted for []

Overview

As a youth, was kicked out of his family for questioning things in Sunday school, such as discrepancies between the 39 articles of the Anglican Church and the Bible; at 17, gave his first public lecture on atheism and published *A Few Words on the Christian Creed* (1850), *Who Was Jesus Christ, and What Did He Teach* (1860), and *A Plea for Atheism* (1864). Bradlaugh wrote that a large part of his atheism was based on having glimpsed Benedict Spinoza's *Ethics*, in secondary sources, and found that he was in agreement with the view that the universe is one, and has no other mystical part. [1]

In his lectures, Bradlaugh attracted audiences members that had been followers of *Robert Owen*, but who were being retooled by George Holyoake as secular clubs; in 1858, Bradlaugh replaced Holyoake as president of the London Secular Club. [1]

In 1868, Bradlaugh won some sort of law that granted the right of atheists to "affirm" in court cases, rather than to swear.

In 1880, Bradlaugh gained notoriety, when, after being elected to a seat in Parliament, he was kicked out for refusing to take the Oath of Allegiance, which invoked god: [2]

> "I, (*Insert full name*), do swear that I will be faithful and bear true allegiance to Her Majesty Queen Victoria, her heirs and successors, according to law. So help me god."

Legal battle ensued over the next five years, culminating in the Oaths Act of 1888. (Q)

Besant

In the early 1870s, Bradlaugh met Annie Besant (1847-1933) (Q), noted for the following lecture views:

> "An atheist is one of the grandest titles. It is the order of merit of the world heroes: Copernicus, Spinoza, Voltaire, Paine."
>
> — Annie Besant (1876), "The Gospel of Atheism"

In 1883, Bradlaugh and Besant co-authored *The Freethinker's Textbook*, which seems to be aimed at attacking Christianity as a barrier to social progress. [3]

Doubts in Dialogue

In 1884, Bradlaugh, in his "Christian Priest and Unbeliever", gave the following humorous take between a priest and an unbeliever: [2]

> Christian Priest: At least, belief is the safe side. When you die, if your unbelief be right, there is an end of you and of all your heresy ; and if it is wrong, there is eternal torment as your sad lot (see: Pascal's wager).
> **Unbeliever**: Hardly so. If I am right, my unbelief will live after me, in its encouragement to others to honest protest against the superstitions which hinder progress.
>
> Christian Priest: But you, at any rate, may be wrong, and belief is, therefore, safest for you.

Unbeliever: Which belief? Must I accept alike all creeds?

Christian Priest: No ; that is not possible. You are asked to accept the true Christian faith.
Unbeliever: Why not the true Jewish faith?

Christian Priest: A new dispensation was given through Jesus.
Unbeliever: Why not the true Mahommedan faith?

Christian Priest: Muhammad was an impostor (see: three impostors).
Unbeliever: About two hundred millions of human beings now believe that he was the prophet of god, and that the Koran is a divine revelation.

Christian Priest: He was a false prophet. His pretence that the Koran was revelation was an imposture.
Unbeliever: Then it would not be safe for me to believe in Mahommed?

Christian Priest: Certainly not ; you must believe in Christ and in the Gospels.
Unbeliever: Would it not be enough to believe in Buddha, and the blessing of eternal repose in Nirvana?

Christian Priest: Buddhism is the equivalent of atheism. Nirvana is another word for annihilation.
Unbeliever: But some four hundred millions are Buddhists, and the character of Buddha is placed very high.

Christian Priest: The true faith is that in Jesus, and in him crucified.
Unbeliever: Do you mean the man Jesus in whom the Unitarians believe?

Christian Priest: Unitarians! Do you not know that there is a special canon of the law-established Church against 'the damnable and cursed heresie of Socinianism'? It is belief in Jesus as god, the second person in the Holy Trinity.
Unbeliever: In the Trinity as painted at Holyrood? or in the new Cathedral at Moscow?

(add)

Hypatia Bonner

Bradlaugh, of note, named his daughter Hypatia Bradlaugh Bonner (1858-1935) (Q) after Greek philosopher Hypatia. In 1891, the daughter Hypatia penned *Did Charles Bradlaugh Die an Atheist?* to rebut rumors that he had a deathbed conversion back to theism. She later edited some of Thomas Paine's works and was friends with Ernestine Rose. [1] In her last year, one of her last statements was the following:

> "Now, in my seventy-eighth year, being of sane mind, I declare without reserve or hesitation that I have no belief, and never had any belief, in any of the religions which obsess and oppress the minds of millions or more or less unthinking people throughout the world. Away with these gods and godlings; they are the worse than useless. I take my stand by truth."
>
> — Hypatia Bonner (1935) statement (Q)(Q)(Q) to rebut any rumors

(add)

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External links

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θΔics

In hmolscience, **Charles Breder** (1897-1983), or "Charles M. Breder, Jr.", was an American ichthyologist noted for his 1942 theory about the arrow of time, entropy, and the origin of life.

Overview

In 1931 to 1937, Breder kept a meticulous journal or "hypothesis diary", on subjects including: symmetry, origin of the atmosphere, origin of life, mechanical analogies of organisms, aquaria as an organism, astrobiology, entropy, evolution of species, and others. (Ñº)

In 1942, Breder, in his "A Consideration of Evolutionary Hypothesis in Reference to the Origin of Life", according to Steven Polgar, argued that life as we know it may be just one of several processes retarding entropy in the universe and could conceivably contribute to a reversal of time's arrow. [1]

Education

Breder, having only a high school education, claimed that all he learned about biology and ichthyology was from the Newark Public Library. (Ñº)

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(b) Polgar, Steven. (1960). "Evolution and the Thermodynamic Imperative" (abs), presented during meeting of Section H of the American Association for the Advancement of Science, New York, Dec 30; in: *Human Biology* (1961), 33(2):99-109, May.

External links
â— Charles M. Breder Jr. (about) – Dspace.Mote.org.

θΔics

In thermodynamics, **Charles Cagniard de la Tour** (1777-1859), or Charles Cagniard-Latour, was a French engineer and physicist noted for his 1822 experiments with the Papin digester wherein he discovered the concept of critical point, the idea that a gas does not liquefy when compressed unless its temperature is below a certain critical value, called the critical temperature. [1]

In 1822, Cagniard discovered the existence of water's critical point—that is, the temperature and pressure at which the distinction between water's liquid and gaseous states disappears. His experiment was simple and ingenious.

Cagniard partially filled a steam digester with water and then added a flint ball. By rolling the digester like a log, he sent the ball in and out of the liquid, creating a splashing sound that he could hear. When the digester reached 362°C, not far from the true value of 374°C, the liquid–gas interface disappeared and the splashing stopped. The fluid in the digester had become supercritical. [2]

Other

Cagniard was a friend of French physicist Joseph Gay-Lussac. [3]

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External links

â— Charles Cagniard de la Tour – Wikipedia.

θΔics

In hmolscience, **Charles Cooley** (1864-1929) (Scott 50:5) was an American social psychologist noted for his anti-reductionist and unbridgeable gap arguments, generally being against any attempts to explain human faculties in physical science terms.

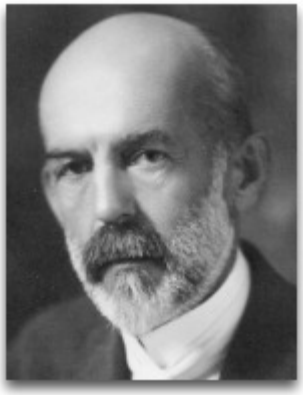

Overview

In 1926, Cooley, in his "The Roots of Social Knowledge", argued the following: [3]

> "When in reading a meditative writer like Marcus Aurelius, we know his consciousness and nothing else. There is no good reason to think that statistical methods can anticipate that which, after all, chiefly distinguishes human life from physical processes, namely, original mental synthesis."

Cooley, according to American philosopher-sociologist George Mead, questioned the validity of applying theories taken from the physical sciences to the activities of human beings—to the effect that thermodynamic laws, in their view, did not appear to make sense of psychological realities; Cooley wrote, for example: [1]

> "The physical law of persistence of energy in uniform quantity is a most illusive one to apply to human life. There is always a great deal of more mental energy than is utilized, and the amount that is really productive depends chiefly on the urgency of the suggestions."

In 1983, American sociologist Philip Rieff, in his introduction to a reprint of Cooley's 1902 *Human Nature and the Social Order*, employs a whole coterie of thermal words: [2]

> "*Human Nature and Social Order* is a classic examination, first published in 1902 and then again in a revised edition in 1922, of the flash point at which the human imagination ignites to produce the infinitely adjustable social temperature without which man has not yet learned to live. That flash point may produce the cold of the concentration camp or the warmth of family."

There is a lot going on in this statement, to say the least.

See also

â— Human thermodynamics (objections to)

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(b) George Herbert Mead – Wikipedia.
2. (a) Cooley, Charles H. (1902). *Human Nature and the Social Order* (Introduction by Philip Rieff, pg. ix). Transaction Publishers, 1983.
(b) Philip Rieff – Wikipedia.
(c) Flash point – Wikipedia.
3. (a) Cooley, Charles H. (1926). "The Roots of Social Knowledge" (pgs. 65, 77), *American Journal of Sociology*,12:59-79.
(b) Brown, Richard H. (1977). *A Poetic for Sociology: Toward a Logic of Discovery for the Human Sciences* (pg. 145). University of Chicago Press, 1989.

External links

â— Charles Cooley – Wikipedia.

θΔics

In science, **Charles Coryell** (1912-1971) was an American chemist (Q) noted for his 1940 coining of the terms "endergonic" and "exergonic". [1]

Exergonic | Endergonic

In circa 1890s, Wilhelm Ostwald, according to John Edsall (1974), introduced the concept of "coupled reactions". [2]

In 1940, Coryell, in his *Science* letter "The Proposed Terms 'Exergonic' and Endergonic' for Thermodynamics", introduced the terms 'exergonic' (energy-yielding) and 'endergonic' (energy-requiring), as definitive of reactions that provide free energy, and so can produce work, as opposed to reactions which work must be expended to cause the reactions to go. [1]

Quotes | About

The following are noted about quotes:

> "Charles seemed to take it for granted that everyone else shared his remarkable intelligence. He would talk to you as if, of course, you knew all this chemistry he was rattling off. He could not help being brilliant, but he seemed quite unaware that not everyone had this gift; he really seemed to think you were his equal."
>
> — Anon (c.2010), recollections (Q) of one of his former MIT grad students

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External links

- Charles D. Coryell – Wikipedia.

θΔics

In existographies, **Charles Coulomb** (1736-1806) (IQ:170|#317) (SIG:15) (CR:5) was physicist and military engineer, noted for []

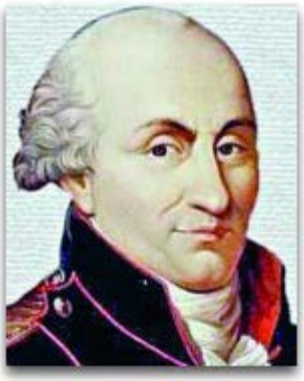

Coulomb's law

In 1766, Joseph Priestley inferred that the force of attraction or repulsion between two small charged spheres would be inversely proportional to the square of the distance between them. [3]

In 1785, Coulomb, in an effort to prove Priestley's inference, built a torsion balance (O), as shown below, wherein, using Hooke's spring law, showed that charged spheres haven an inverse proportionality relationship. [3]

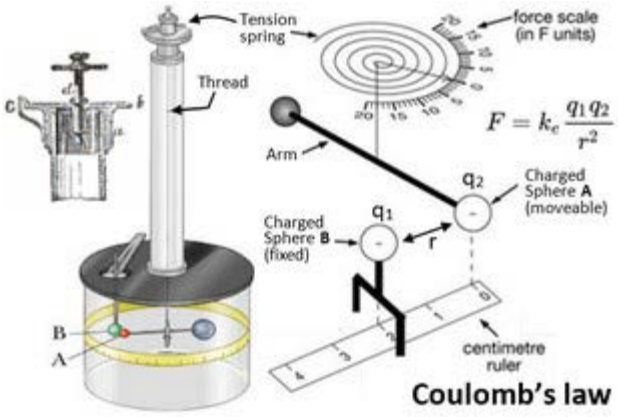

In short, Coulomb, building, supposedly, on the work of Franz Aepinus (1758), Joseph Priestley (1767), John Robinson (1769), and Henry Cavendish (c.1772), confirmed the inverse square law relationship, between point charges, by experimenting with a magnetic needle, suspended on a twistable spring, and thereby derived, using Hooke's spring law (O) and calculus, the following equation: [1]

$$F = k_e \frac{q_1 q_2}{r^2}$$

where q_1 and q_2 are the charges of the two particles, e.g. electron and proton, r is the distance of separation, and k is Coulomb's constant.

Quotes | On

The following are quotes on Coulomb:

> "Ohm found that the results could be summed up in such a simple law that he who runs may read it, and a schoolboy now can predict what a Faraday then could only guess at roughly. By Ohm's discovery a large part of the domain of electricity became annexed by **Coulomb**'s discovery of the law of inverse squares, and completely annexed by Green's investigations. Poisson attacked the difficult problem of induced magnetization, and his results, though differently expressed, are still the theory, as a most important first approximation. Ampere brought a multitude of phenomena into theory by his investigations of the mechanical forces between conductors supporting currents and magnets. Then there were the remarkable researches of Faraday, the prince of experimentalists, on electrostatics and electrodynamics and the induction of currents. These were rather long in being brought from the crude experimental state to a compact system, expressing the real essence. Unfortunately, in my opinion, Faraday was not a mathematician. It can scarcely be doubted that had he been one, he would have anticipated much later work. He would, for instance, knowing Ampere's theory, by his own results have readily been led to

Neumann's theory, and the connected work of Helmholtz and Thomson. But it is perhaps too much to expect a man to be both the prince of experimentalists and a competent mathematician."

— Oliver Heaviside (1891), "Electro-magnetic Theory II" [2]

"While we're on the topic of "anthropic principles", if Allah, as you believe, fine-tuned α (alpha), the fine-structure constant, equal to the ratio of the product of the **Coulomb** constant and the square of the electric charge and the product of the reduced Planck constant and speed of light, what fine-tuned constants did Allah bring into existence so that the Buraq was able to fly Muhammad around faster than the speed of light?"

— Libb Thims (2014), "Beg-Thims dialogue" (Q), post #19, Sep 4

"Have been traveling and caught two looks at this thread. To define "life" one must first define its ingredients, which are simply light and mass, each having a different role. These 'roles' are motion and growth, as mentioned earlier, to be elaborated upon my return to Chicago. For now, consider that light cannot "grow", but "moves" without recognition of time, while mass really cannot move, but grows AND recognizes time. This synergy is the origin of life which evolves causing a balance between energy depletion (entropy) and energy accumulation ...for limited time depending on "size". Gravity and **Coulomb** laws represent this synergy."

— Ted Erikson (2010), "Origin of Life" (Q) thread #50, Dec 14.

Quotes | By

The following are quotes by Coulomb:

"The sciences are monuments devoted to the public good; each citizen owes to them a tribute proportional to his talents. While the great men, carried to the summit of the edifice, draw and put up the higher floors, the ordinary artists scattered in the lower floors, or hidden in the obscurity of the foundations, must only seek to improve what cleverer hands have created."

— Charles Coulomb (1776), *Mémoires présentés par divers Savants à l'Académie des Sciences* (Introduction, 4) (Q)

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External links

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θΔics

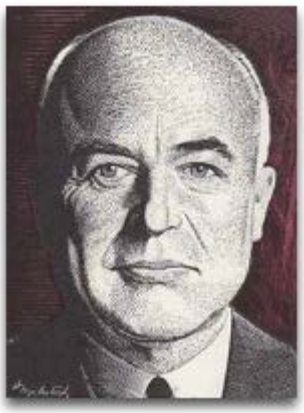

In hmolscience, **Charles Pelham Curtis Jr.** (1891-1959) was an American law and public affairs scholar noted for his co-authoring, with George Homans, the 1934 book *An Introduction to Pareto*, a summary of the two-year seminar on the Seminar on the Sociology of Pareto, conducted at Harvard University (1932-1933), by Lawrence Henderson, head of the Harvard Pareto circle. [1]

Education

Curtis was an American US Navy destroyer commander during WWI (Ñº), during which time he began to amass an anthology of passages from nonfiction books of recent centuries, read widely, copying passages he found intriguing into notebooks by hand, thereafter writing several books on law and public affairs.

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External links

â— Curtis, Charles P. (Charles Pelham) 1891-1959 – WorldCat Identities.

θΔics

In existographies, **Charles Robert Darwin** (1809-1882) (IQ:180|#107) (Cattell 1000:116) [RGM:19|1,500+] (Murray 4000:17|CS / 1|B) (Gottlieb 1000:7) (Glenn 20:10) (EvT:15|21+) [CR:514] was an English naturalist, evolutionist, and anti-chance philosopher, grandson of Erasmus Darwin and grandfather of C.G. Darwin, known for his theory of evolution, which states that all species of life have evolved over time from one or a few common ancestors through the process of natural selection.

Origin of Species

In 1837, Darwin notebooks (the precursors to his famous 1859 book) were given the provisional title *The Transmutation of Species*, which is said to have meant to convey a type of chemical language. [6]

In 1859, Darwin published the finalized version of his draft theory along with scientific evidence in his *On the Origin of Species - by Means of Natural Selection or the Preservation of Favored Races in the Struggle for Life*, in which he cites three people as having been forerunner theorists to his own evolution theory: Johann Goethe (1784), Erasmus Darwin (1791), and Etienne Saint-Hilaire (1833). [1]

Elective Affinities | Natural selection

Darwin was born the year of publication of Goethe's *Elective Affinities*; he later became aware of Goethe's work on evolution.

In 1861, in the third edition of *Origin of Species*, Darwin added the following concerning criticism raised about the term 'natural selection': [8]

> "Several writers have misapprehended or objected to the term 'natural selection' . Some have even imagined that natural selection induces variability, whereas it implies only the preservation of such variations as occur and are beneficial to the being under its conditions of life. No one objects to agriculturists speaking of the potent effects of man's selection; and in this case the individual differences given by nature, which man for some object selects, must of necessity first occur. Others have objected that the term selection implies conscious choice in the animals which become modified; and it has even been urged that as plants have no volition, natural selection is not applicable to them!
>
> In the literal sense of the word, no doubt, natural selection is a misnomer; but who ever objected to chemists speaking of the elective affinities of the various elements ? — and yet an acid cannot strictly be said to elect the base with which it will in preference combines.
>
> It has been said that I speak of natural selection as an active power or deity; but who objects to an author speaking of the attraction of gravity as ruling the movements of the planets? Every one knows what is meant and is implied by such metaphorical expressions; and they are almost necessary for brevity. So again it is difficult to avoid personifying the word 'nature'; but I mean by nature, only the aggregate action and product of many natural laws, and by laws the sequence of events as ascertained by us. With a little familiarity such superficial objections will be forgotten."

English two cultures literature scholar Gillian Beer notes that the issue here is that the term "selection" implies or imbues nature with "conscious agency", and that Darwin, aware of German polymath Johann Goethe's previous usage of the term—as the title of his grand 1809 metamorphology theory of form change (chemical to plant to animal to human)—whom he cited in his original 1859 edition as being one of three forerunners of evolution theory (along with Erasmus Darwin and) brought the science of affinity chemistry here into the discussion to deflect the attack. [10]

Religion

The following are representative statements

concerning Darwin's religious views:

> "Science has nothing to do with Christ, except insofar as the habit of scientific research makes a man cautious in admitting evidence. For myself, **I do not believe** that there ever has been any revelation. As for a future life, every man must judge for himself between conflicting vague probabilities."
>
> — Charles Darwin (1879), "Letter to German student" [14]

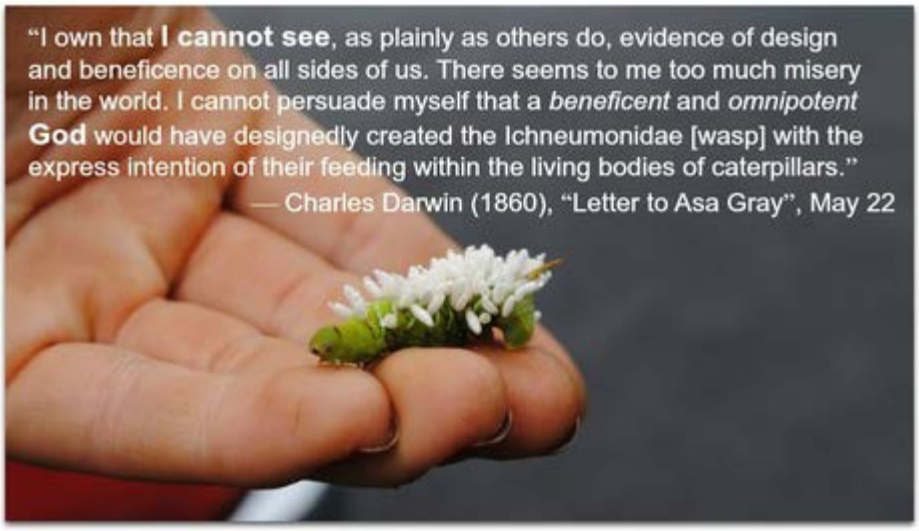

A photo (Ñº) of a Tomato Hornworm caterpillar victimized by the rice-like eggs of the wasp larvae, overlaid with **Charles Darwin**'s famous 1860 "wasp feeding quote", which worked to teeter him away from theism; and with which Richard Dawkins, in the 1970s and 1980s, admixtured with "selfish genes" + "Hamilton rule" + "blind forces", has used as his main atheism fuel, in the new atheism era, to promote a purposeless universe ideology as his modus operandi.

(add discussion; e.g. Richard Dawkins)

Warm little pond

See main: Warm pond model

In 1871, Darwin wrote a famous letter to English botanist Joseph Hooker, wherein he attempted to address the life from non-life issue:

> "[The original spark of life may have begun in] a warm little pond, with all sorts of ammonia and phosphoric salts, lights, heat, electricity, etc. present, so that a protein compound was chemically formed ready to undergo still more complex changes."

This postulate, together with the 1953 Miller-Urey experiment which showed that sparks ignited in a chemical broth over several days could make amino acids, combined with recent fossil records indicated that bacterial existed on the earth about 3.85 billion years ago, have led to the belief that once upon a time, three or four billion years ago, lightning struck a puddle of water containing a kind of warm chemical chicken broth and triggered the formation of amino acids, the building blocks of life. This type of logic, however, is inconsistent with standard molecular evolution tables that show a continuous build up and lineage of molecular structure, a table that cannot be divided by a certain hypothetical day. In other words, the laws of chemistry don't simply stop on a particular day and give their powers over to the laws of biology. The reverse is true, the laws of chemistry and thermodynamics are what define evolution and the laws of biology are only approximations. [4]

Darwin family

In 1952, Darwin's grandson English physicist C.G. Darwin (Charles Galton Darwin) published his *The Next Million Years*, wherein the "Introduction" chapter of which he defined the science of "human thermodynamics" as the statistical mechanical study of conservative dynamical systems of human molecules, a science through which, in his view, would be able to "predict" the next million years of human evolution. [5] C.G. Darwin is thus classified as one of the founders of human thermodynamics.

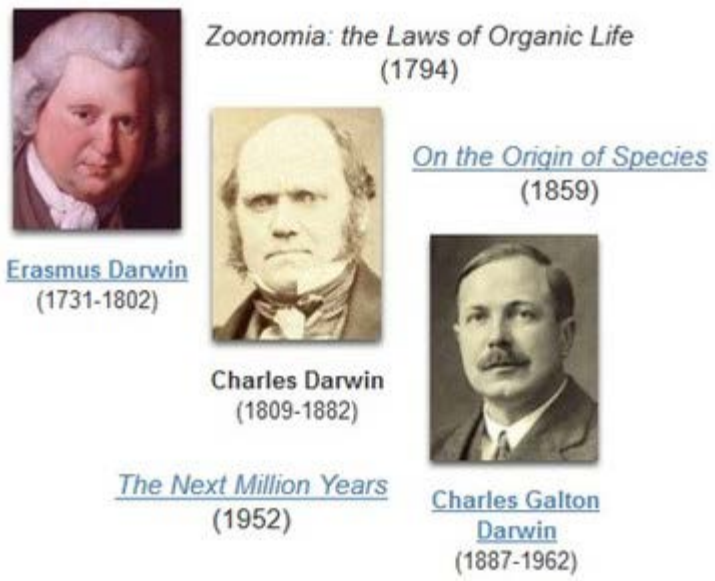

The deeply rooted 158-year genius of the Darwin family: from Erasmus, Charles' grandfather, who posted that humans all originated from one living filament; to **Charles Darwin**, who introduced a working mechanism of evolution; to his grandson C.G. Darwin, who proposed the logic that in order to study and predict the future course of evolution, the subject of "human thermodynamics", the investigation of systems of human molecules, needs to be developed and pursued.

Thermodynamics

In the years 1843 and 1865, coincidentally, the science of energetics (thermodynamics) was assembling. Bold statements deriving out of this new energy science, coming from respected physicists such as William Thomson and Rudolf Clausius, had declared as physical laws of the world that the "energy of the universe is constant" and the "entropy (or dissipation of energy) of the universe tends to a maximum". [2]

> "Clausius and Darwin cannot both be right."
>
> — Roger Caillois, *Coherences Aventureuses* (1973), [9]

English natural philosopher Herbert Spencer is one to have made one of the first attempts to reconcile the two theories: natural selection and thermodynamics.

Final words

In 1882, in the last letter Darwin is known to have dictated and signed, he wrote: [7]

> "I believe that I have somewhere said (but I cannot find the passage) that the principle of continuity renders it probable that the principle of life will hereafter be shown to be part or consequence of some general law."

(add)

Quotes | On

The following are Darwin-related quotes:

> "A completely **mad** book."
>
> — Anons (1860), two German colleagues of Ernst Haeckel on reading **Darwin**'s *On the Origin of Species* [12]

> "**Darwin** is the 'new Newton' who has explained the origin of organisms strictly via mechanical causes."
>
> — Ernst Haeckel (1868), *History of Creation* [13]

Quotes | By

The following are noted quotes:

"Avoid stating how far, I believe, in materialism, say only that emotions, instincts, degrees of talent, which are hereditary re so because brain of child resembles parent stock."

— Charles Darwin (1827), reflection on his friend atheist radical materialist Walter Browne (1805-1885) (Ñº) having his materialist perspective paper on life and mind 'expunged' from the minutes of the Plinian Society meeting [15]

"Origin of man now proved. Metaphysics must flourish. He who understands the baboon would do more towards metaphysics than Locke."

— Charles Darwin (1838), personal notes (Ñº)

"The monkeys understand the affinities of man better than the boasted philosopher himself."

— Charles Darwin (1838), personal notes (Ñº)

"Love of the 'deity effect' of organization, oh you materialist! Why is thought being a secretion of brain, more wonderful than gravity a property of matter? It is our arrogance, our admiration of ourselves."

— Charles Darwin (c.1850), *Transmutation Notebook* [15]

"We can allow satellites, planets, suns, universe, nay whole systems of universes, to be governed by laws, BUT the smallest insect, we wish to be created at once by special act."

— Charles Darwin (c.1860) (Ñº)

"I have called this principle, by which each slight variation, if useful, is preserved, by the term of natural selection."

— Charles Darwin (c.1860) (Ñº)

"Man is descended from a hairy, tailed quadruped, probably arboreal in its habits."

— Charles Darwin (c.1860) (Ñº)

"A moral being is one who is capable of reflecting on his past actions and their motives - of approving of some and disapproving of others."

— Charles Darwin (c.1860) (Ñº)

"It is mere rubbish, thinking at present of the origin of life; one might as well think of the origin of matter."

— Charles Darwin (1863) (Ñº); cited by Lawrence Krauss (2012) in *A Universe from Nothing* (pg. #)

"You have made a convert of an opponent in one sense [of your *Hereditary Genius*], for I have always maintained that, excepting fools, men did not differ much in intellect, only in zeal and hard work."

— Charles Darwin (c.1869), "Letter to Francis Galton" [16]

"My theology is a simple muddle. **I cannot look at the universe as the result of 'blind chance'**, yet I can see NO evidence of a beneficent design, or indeed or design of any kind."

— Charles Darwin (1870), "Letter to Joseph Hooker" (Ñº), Jul 12

"Ignorance more frequently begets confidence than does knowledge."

— Charles Darwin (1871), *Descent of Man* [1]

"Man is descended from a hairy, tailed quadruped, probably arboreal in its habits, and an inhabitant of the Old World. This creature, if its whole structure had been examined by a naturalist, would have been classed amongst the Quadrumana, as surely as the still more ancient progenitor of the Old and New World monkeys. The Quadrumana and all the higher mammals are probably derived from an ancient marsupial animal, and this through a long line of diversified forms, from some amphibian-like creature, and this again from some fish-like animal."

— Charles Darwin (1871), *The Descent of Man, Part 3* (§21:609) [17]

"I have steadily endeavored to keep my mind free (see: free thinker), so as to give up any hypothesis, however much beloved (and I cannot resist forming one on every subject), as soon as facts are shown to be opposed to it."

— Charles Darwin (1877), on his own intelligence and ability (Ñº)(Ñº)

"To kill an error is as good a service as, and sometimes even better than, the establishing of a new truth or fact."

— Charles Darwin (1879), "Letter to Wilson" (Ñº), Mar 5

"My judgment often fluctuates. In my most extreme fluctuations, I have never been an 'atheist' in the sense of denying the existence of a god. I think that generally – and more and more as I grow older, but not always – that 'agnostic' would be the most correct description of my state of mind."

— Charles Darwin (1879), "Letter to John Fordyce" (Ñº), Jul 7

"It seems to me (rightly or wrongly) that direct arguments against Christianity and theism hardly have any effect on the public; and that freedom of thought will be best promoted by that gradual enlightening of human understanding which follows the progress of science. I have therefore always avoided writing about religion and have confined myself to science."

— Charles Darwin (1880) (Ñº)

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External links

â— Charles Darwin – Wikipedia.

θΔics

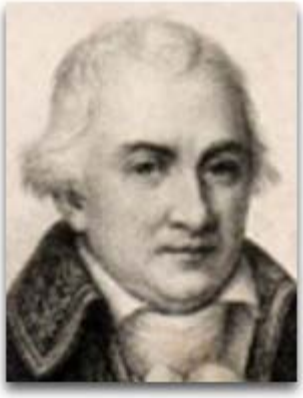

In existographies, **Charles Dupuis** (1742-1809) (IQ:#|#) (RMS:22) (CR:14) was French savant, a rhetoric professor, lawyer, mathematician, theologian, telegraph inventor, astronomer, and religio-mythologist, noted for his multi-volume 1794 *Universal Religion: Origin of All Cults*, oft-cited, along with the parallel works of Constantin Volney (1791), as one of the first Christ myth theory works.

Overview

In 1777, Dupuis, in the *Journal of Savants*, began publishing fragments of his common origin of all religions theory.

In 1781, Dupuis collected these scattered articles and fragments into one volume, which he published in Lalande's *Astronomy* journal, entitled "Memoirs on the Origin of the Constellations and on the Explanation of the Fable by Astronomy".

In 1794, Dupuis published volume one, of a dozen volumes in total, of his *Universal Religion: Origin of All Cults*, wherein he asserted that []

In 1806, Dupuis, in his *Explanatory Memorandum of the Zodiac, and Mythological Time* (*Mémoire explicatif du Zodiaque, chronologique et mythologique*) he maintains a common origin for the astronomical and religious opinions of the Greeks, Egyptians, Chinese, Persians, and Arabians.

Dupuis, in short, supposedly, argued that there was no human involved in the New Testament account which he saw as an intentional extended allegory of solar myths. [1]

Priestley

In 1797, Joseph Priestley, began attacking the Christ myth theory work of Constantin Volney (1791), who cites Dupuis, focusing on the perceived contentious assertions, by Volney, that: god of Moses was Egyptian, the linking of Christ with Bacchus and Krishna, and Volney's claim that the world was at least 17,000 years old, 'which entirely overturns the Mosaic account of the origin of the human race'. [4]

In 1799, after reading the work of Dupuis, Priestly resumed his attack with focus on the earlier suppositions of Dupuis. [4]

Quotes | On

The following are quotes on Dupuis:

> "With **Dupuis** rational erudition inquires into the common origin of the various religious traditions."
>
> — Marie-Joseph Chenier (c.1824), *Table of Literature* [3]

> "We think ourselves possessed, or, at least, we boast that we are so, of liberty of conscience on all subjects. Yet, how far are we from these exalted privileges in fact! There exists, I believe, throughout the whole Christian world, a law which makes it blasphemy to deny our doubt the divine inspiration of all the books of the Old and New Testaments, from Genesis to Revelation. Who would run the risk of translating **Dupuis**?"
>
> — John Adams (1825), "Letter to Thomas Jefferson", Jan 23 [5]

> "The French astronomer **Dupuis** in his great work *Origin of all Cults: the Universal Religion* of 1795 is the

first and primary modem mythographer to analyze the ancient religions as pointing to a universal solar religion. Dupuis compared the distinctive elements of Christianity and those of previous religions. The summary of his study is translated in Appendix 3."

— Pier Tulip (2013), *Krst: Jesus a Solar Myth* (pg. #)

Quotes | By

The following are noted quotes:

"The second treatise, entirely devoted to the examination of the religious system of the Christians, is also divided into three parts. The first contains the explanation of the sacred fable of the introduction of evil into the world by the famous Serpent of the Hesperides, which seduced Eve, and which necessitated the arrival of a Repairer, who could regenerate Nature. Is found in the second chapter of the Hebrew Cosmogony, known as the Genesis. The second deals with Repairer, of his birth, of his death, and of his resurrection; it presents us with all the features which are common to it with: Mithra, Adonis, Horus, Atys, Osiris, etc. And finally, which prove up to the dawn of time, that this designated Repairer, named the *Christ* by the Christians, is only the sun, or the divinity endured by all peoples, under so many different forms and names. The third part, much more abstract than the first two, contains an explanation of the famous Triad of the Christians, or the triple unity, known under the names of Father, Son, and Holy Spirit."

— Charles Dupuis (1771), "Article" in *Journal of Savants*; refined version as found in preface of volume one (pg. xxviii) of his 12-volume *Universal Religion* (1794) [1]

"It would appear almost an act of folly, in pretending to uproot that ancient Upas-tree of religious superstition, under the poisonous shade of which mankind has been for ages accustomed to repose, and the roots of which are so widespread and profound."

— Charles Dupuis (c.1794), cited as views in agreement with by 1872 English translator [3]

References

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● Dupuis, Charles. (1857). *Was Christ a Person or the Sun? An Argument from Dupuis, to Show that Christianity Had its Origin in Sun Worship*. Holyaoke and Co.

External links

● Charles François Dupuis – Wikipedia.
● Dupuis 1742-1809 – WorldCat Identities.

θΔics

In hmolscience, **Charles Dȳke** (c.1950-) is an American philosopher noted, in economic thermodynamics, for his 1988 book *The Evolutionary Dynamics of Complex* Systems, wherein he touches on thermodynamics topics, such as how things in evolution are "entropy driven", dissipative structures, etc., and followup 1994 chapter "From Thermodynamics to Economy: A Thorny Path", wherein he states that the 'classic treatments' of entropy and economy include: Nicholas Georgescu (1971), Howard Odum and Elisabeth Odum (1976), Kenneth Boulding (1981), Richard Adams (1982), Peter Allen (1985), and Jeffrey Wicken (1987). [1]

Education

Dȳke completed his BA at Brandeis University and PhD at Brown University. Since at least 1994, Dȳke has been philosophy professor at Temple University.

References

1. (a) Note: the letter accent 'ȳ' used being that the wiki software rejects offensive or derogatory words in article titles.
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External links

- Charles Dȳke (faculty) – Temple University.
- Charles Dȳke – WorldCat Identities.

θΔics

In science, **Charles Elton** (1900-1991) was an English zoologist noted for his 1926 energy-conceptualized food chain model.

Food chain

In 1926, Elton introduced the energy-based "food chain" model, a term he coined, as follows: [1]

> "Animals are not always struggling for existence, but when they do begin, they spend the greater part of their lives eating. Feeding is such a universal and commonplace business that we are inclined to forget its importance. The primary driving force of all animals is the necessity of finding the right kind of food and enough of it. Food is the burning question in animal society, and the whole structure and activities of the community are dependent upon questions of food-supply. We are not concerned here with the various devices employed by animals to enable them to obtain their food, or with the physiological processes which enable them to utilize in their tissues the energy derived from it. It is sufficient to bear in mind that animals have to depend ultimately upon plants for their supplies of energy, since plants alone are able to turn raw sunlight and chemicals into a form edible to animals. Consequently herbivores are the basic class in animal society. Another difference between animals and plants is that while plants are all competing for much the same class of food, animals have the most varied diets, and there is a great divergence in their food habits. The herbivores are usually preyed upon by carnivores, which get the energy of the sunlight at third-hand, and these again may be preyed upon by other carnivores, and so on, until we reach an animal which has no enemies, and which forms, as it were, a terminus on this food-cycle. There are, in fact, chains of animals linked together by food, and all dependent in the long run upon plants. We refer to these as '**food-chains**', and to all the food-chains in a community as the 'food-cycle'."

This simple outline, of course, is but a foray into the more advanced chemical thermodynamic energy coupling theory, developed by Fritz Lipmann in the 1940s.

Thermodynamics

Elton, in regards to his use of the term 'energy' in the context of food chains, seems to be occasionally misattributed as having used thermodynamics in his theories, which does not seem to be the case. In 1988, Americans Daniel Brooks and Edward Wiley, in their *Evolution as Entropy*, state the following: [2]

> "Beginning with Lotka (1924) and **Elton** (1927), continuing with Lindeman (1942) through today —Ulanowicz (1986), Wicken (1987), etc.—ecological processes have been characterized fruitfully in thermodynamic terms."

This, however, is misattribution: use of the word 'energy' in a book, such as by Elton, does not make one a thermodynamicist.

Driving force

In Elton's above food chain theory he asserts that the primary "driving force" of all animals is finding food. He even uses thermal words to define this as a "burning question" in animal society. Burning implies combustion: typically reaction of a hydrocarbon with oxygen The only sense in which combustion models come into play, in human affairs, are those in which reproduction is defined as a chemical reaction, as captured in the colloquial phrase love the chemical reaction: reaction of two human molecules to produce a third human molecule, wherein the heats of passions come into play.

In modern human society, where the work of two people produce the food of fifty, the term "burning question" does not

tend to be associated with "finding food" but rather with deeper questions: general purpose of human existence, ethical questions, mate selection questions, among other paradoxical dilemmas—that tend to "burn" in the minds of thinkers for centuries on end. This perspective brings Elton's driving force theory into question? Is finding food the driving force of the paramecium? Is finding food the driving force of the hydrogen atom?

Moreover, Elton's general assertion does not corroborate with chemical thermodynamics, animate thermodynamics in particular, according to which animals are animate "molecules", e.g. bacteria molecule, fish molecule, human molecule, moving about and reacting on a surface, in liquid, or in air, in generally an isothermal isobaric systems, according to which the driving force is free energy, Gibbs free energy in particular, as defined in 1923 by Gilbert Lewis, whereby form change is the primary end result of the overall reaction process—hence, when free energy (and bound energy) considerations are applied to animals and or humans (as Sigmund Freud did) the sexual drive, for instance, becomes one of the more primary embodiments of the free energy drive of chemical thermodynamics, and food becomes a factor of substrate-molecule interactions (activation energy lowering factor) rather than a molecule-molecule interaction factor, as is the case as Lewis defines the chemical thermodynamic driving force, which, of course, has roots in the older affinity model of the driving force of physical-chemical change (see: Goethe-Helmholtz equation).

This confusion has been one of the main roadblocks to thermodynamic analysis of human and animal behavior in the last century: the misattribution of the main factors of thermodynamical quantifications of animal behaviors to the energy of food, whereas correctly the energy of the more powerful desires, such as of passions and hatreds are the more decisive energy and entropy factors. Study of the thermodynamics of the Haber process gives indication of the correct view of the thermodynamics of animal behaviors, wherein substrate-molecule interactions can be studied in terms of the iron-oxide surface interactions with the hydrogen molecules H_2 and nitrogen molecules N_2, in terms of its ability to facilitate, via catalysis, the reaction between the two molecules, the free energy itself being a factor of only the molecule-molecule interaction, not the molecule-surface interactions. [3]

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External links

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θΔics

In hmolscience, **Charles Fourier** (1772-1837) (SN:29) was a French philosopher notable for his 1808 *The Social Destiny of Man: the Theory of the Four Movements*, wherein he seems to outline a Charles Montesquieu + Rene Descartes themed theory of the passions and work.

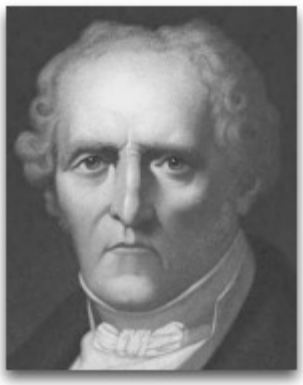

Overview

In 1799, Fourier introduced his four movements theory, called by him the "theory of the passions", later eponymized as "Fourierism", a theory that he elaborated on over the course of about thirty years, in six volumes. The gist of Fourier's theory of the passions, according to American anarchy social theorist Peter Wilson, is as follows: [6]

> "Passion draws humanity into association just as gravity draws celestial bodies into orbital systems."

Here we see Fourier's theory as a type of social gravitation theory focused on the nature and regulation of the passions. On this logic, Fourier sought to construct a model for the working arrangement of society according to his theory of the passions. The gist of his passion based social system, according to Wilson, is as follows: [6]

> "In Fourier's system of harmony all creative activity including industry, craft, agriculture, etc. will arise from liberated passion — this is the famous theory of 'attractive labor.' Fourier sexualizes work itself — the life of the Phalanstery is a continual orgy of intense feeling, intellection, and activity, a society of lovers and wild enthusiasts."

Here, in respect to focus on "liberated passions" throughout society, we may compare Sigmund Freud's alternative id, ego, superego theory, and its focus on how the passions get repressed, owing to subconscious actions, lying dormant often for many years, many times erupting in various conditions of psychoses.

In 1808, Fourier published his first volume entitled *Theory of the Four Movements and the General Destinies*, according to which he divides all movement in the universe into four types: social, animal, organic (light and matter), and material (planets), the latter of which he credits Isaac Newton and Gottfried Leibniz as having solved, the former two of which he attempts to solve by devoting effort to explain the forces of the passions acting on the bodies.

Fourier, In the opening pages of his 1808 work, cites Charles Montesquieu and Rene Descartes.

Fourier intended to write eight memoirs to elaborate on his conception, the 1808 anonymously-published *Theory of the Four Movements and the General Destinies*, in which he attempts to explain the human passions in terms of a semi-panbioism admixture of soul, spirit, and materialism, according to which the universe is one organic whole, albeit situated with God at the helm, according to certain layered arguments, with movement divided into human, animal, and mineral types. The gist his argument of which seems to be truncated in a footnote. [1] Fourier would seem to be aptly characterized as an earlier version of Pierre Teilhard, albeit less Bible and more novel synthesis on his own part.

Fourier was one of the earliest persons to be cited as a "social Newton" and someone who used the rare phrase "laws of social movement", a terminology common to thinkers including: Auguste Comte, Karl Marx, and Morris Zucker, each who, in their own way, envisioned the laws of social movement as "natural laws like the law of gravity". [2]

In 1874, Moritz Kaufmann, in his *Socialism: its Nature, its Dangers, and its Remedies Considered*, described Fourier as follows: [3]

> "In order to judge of his system it is necessary to note one or two salient points in his conception of the constitution of man and the universe. Happiness he acknowledges is 'our being's end and aim'; and the only

> true science which leads to its attainment is sociology. As the doctrine of the material movements in the universe has been fixed by Newton's discoveries, so too the laws which regulate the movements in the social world must first be ascertained before we can hope to render mankind happy. To become such a social Newton was undoubtedly **Fourier**'s ambition, and this is the fundamental law of his social Principia."

Fourier's main works include his 1808 *The Social Destiny of Man: the Theory of the Four Movements*, which contains his views of the world in general, and his 1822 *The Association of Domestic and Agricultural Economy*, which contains his special views of the social system. [2]

A leading expositor of Fourier's theories in America was Albert Brisbane.

Passions

Fourier seems to devote a significant amount of thought to the passions. Fourier believed that there were twelve common passions. Dutch utopian socialism theorist and feminist Saskia Poldervaart (1945-2011) summarized Fourier's model of the passions as follows: [7]

> "Fourier's theory posited that suppression of the passions was immediately harmful to the individual and in the long run destructive for society. He distinguished among twelve basic passions, each of which had to be satisfied (one person attaching more importance to certain passions than another, depending on their personalities). These were divided into three categories:
>
> Sensual passions
>
> (five in all)
>
> Affective passions
>
> (friendship, ambition, love, parenthood)
>
> Distributive passions
>
> (cabalist passion, for intrigue and rivalry; butterfly passion, for variety and contrasts; composition passion, for a mixture of physical and spiritual pleasure)
>
> With this final category of passions, Fourier explicitly acknowledged the role of conflict and rivalry, recognizing that people have a need to be continuously challenged."

These twelve passions, according to Fourier, resulted in 810 types of character, according to which the ideal phalanx (community) would have exactly 1620 people, and that one day there would be six million of these, loosely ruled by a world "omniarch" or congress of phalanxes.

Newton

In 1986, Jonathan Beecher, in his *Charles Fourier: the Visionary and his World*, questions the precise nature of Fourier's borrowings from Newton, and stresses that Fourier consciously used Newton as a model. [9]

Goethe

Interesting, the development of Fourier's theory, seems to parallel German polyintellect Johann Goethe's chemical theory of the passions (chemical passion theory or human chemical theory) in some respect, both Fourier and Goethe

theorizing about affinities and passions, over the course of the same decade: Goethe arrived at theory 1796 (published first account in 1809), Fourier arrived at theory in 1799 (published first account in 1808). In 1799, to exemplify, the year Fourier arrived at his theory, Goethe commented the following to German author Friedrich Schiller, in objection to the non-realistic work of work of French author Prosper Crebillon (1674-1762):

> "The passions [are not] like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. [In describing the passions] there [must be a] trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover."

Fourier, however, in his celestial theory of the passions (celestial passion theory), did treat the passions like playing cards. Visitors to his conceptualized phalanx community could consult the card-index of *personality types*, supposedly based on the passional type or character derivative of each person, for suitable partners for casual sex.

Implementations

Fourier's social theories, similar to Karl Marx, resulted in a number of short-lived implementations; in the case of Marx communism and socialism, in the case of Fourier, the founding of a number of communities in America, including: Utopia, Ohio, La Reunion near present-day Dallas, Texas; the North American Phalanx in Red Bank, New Jersey (lasted for 12 years); Brook Farm in West Roxbury, Massachusetts; the Community Place and Sodus Bay Phalanx in New York State, and several other communities in the United States, most lasting for only a year.

Quotes | On

The following are quotes on Fourier:

> "**Fourier** held that association is due an ever-present force which draws men together like the law of gravity in the physical world. And again in his 'theory of universal unity', he held that the earth will pass through life cycles similar to the life cycles of the human individual. Its present infancy will be succeeded by a millennium of seventy thousand years, due to the perfect and unimpeded operation of the 'power of attraction'. An age of decline will follow this, while the fourth and last stage will be a brief era of dotage."
>
> — Howard W. Odum (1929), *Introduction to Social Research* [8]

Quotes | By

The following are note quotes:

> "Attractions are proportional to destines."
>
> — Charles Fourier (c.1808) [5]

References

1. (a) Fourier, Charles. (1808). *Theory of the Four Movements and the General Destinies* (*Théorie des quatre mouvements et des destinées generals*) appeared anonymously in Lyon in 1808.
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Clapp, Jr., With a Treatise on the Functions of the Human Passions and An Outline of Fourier's System of Social Science by Albert Brisbane (note, pgs. 32-33). Robert M. Dewitt.
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External links

â— Charles Fourier – Wikipedia.

θΔics

In hmolscience, **Charles Gaskell** (1842-1919) (CR:23) was an English author, lawyer, and politician, a member of parliament from 1885-1892, noted for being one of the closest intellectual friends of American historian Henry Adams.

Overview

On 27 Apr 1863, Gaskell met Henry Adams, at Cambridge, after which the two were among each other's "closest friends". [2]

In 1866, amid his fallout with his older brother Charles Adams, Jr., Henry Adams switched to writing to Gaskell, instead of his older brother, as he formerly had done, as his new main intellectual correspondent. [7]

Quotes

The following are related quotes:

> "Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday within this law. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."
>
> — Henry Adams (1863), "Letter to Charles Gaskell" (Oct) [1]

> "Altogether, we go on with placidity unequalled, and the only question is what we live for. Nothing seems to come of it?"
>
> — Henry Adams (1878), "Letter to Charles Gaskell" (Aug 21) [4]

> "Gentle mathematicians and physicists still cling to their laws of thermodynamics, and are almost epileptic in their convulsive assurances that they have reached a generalization which will hold good. Perhaps it will. Who cares?"
>
> — Henry Adams (1903), "Letter to Charles Gaskell" (Jun 14) [5]

> "On the physico-chemical law of development and dynamics, our society has reached what is called the critical point where it is near a new phase or equilibrium."
>
> — Henry Adams (1908), "Letter to Charles Gaskell" (Sep 27) [6]

> "The solution of mind is certainly in the magnet."
>
> — Henry Adams (1908), "Letter to Charles Gaskell" (Sep 27) [6]

> "I have been studying science for ten years past, with keen interest, noting down my phrases of mind each year; and every new scientific method I try, shortens my view of the future. The last—thermodynamics—fetches me out on sea-level within ten years. I'm sorry Lord Kelvin is dead. I would travel a few thousand-million miles to discuss with him the thermodynamics of socialistic society. His law is awful in its rigidity and intensity of result."
>
> — Henry Adams (1909), "Letter to Charles Gaskell" (May 2) [4]

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4. (a) Adams, Henry. (1878). "Letter to Charles Gaskell", Aug.
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External links

â— Charles George Milnes Gaskell – Wikipedia.

θΔics

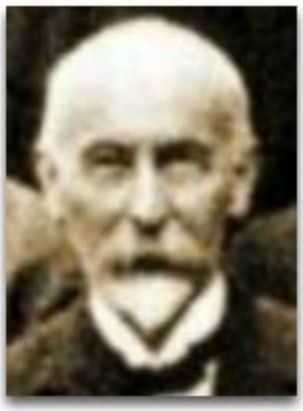

In hmolscience, **Charles Eugene Guye** (1866-1942), cited as C.E. Guye, was a Swiss physicist noted, in chnopsological thermodynamics, for his 1922 book *Physical Chemical Evolution*, supposedly a physical chemistry attempt at explaining evolution, in which he asked the question: how is it possible to understand life, when the whole world is ruled by the second law of thermodynamics, which points towards death and annihilation? [1]

Lewis

In American physical chemist Gilbert Lewis' 1925 lecture-chapter lecture six "Probability and Entropy", in his *The Anatomy of Science*, he states his figure 24 (shown below), as well as many of the references of that chapter, stem or rather are indebted to Guye's *Physical Chemical Evolution*, which shows black and white balls in tubes, which he says explain the rules of change arrangements in relation to the second law. [2]

French-born American physicist Leon Brillouin cites Guye in his 1949 article "Life, Thermodynamics, and Cybernetics". [3]

References

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External links

â— Charles-Eugene Guye (Swiss → English) – Wikipedia.
â— Charles-Eugene Guye – Numerica.com.

θΔics

In existographies, **Charles Hall** (c.1943-) (CR:21) is an American systems ecologist noted for his 1986 to present attempts to derive a semblance of a thermodynamics-based ecological economics theory, which he refers to as "biophysical economics", conceptualized as being related to ecological economics, albeit without recourse to monetary assignment, framed around an admixture of the Odum school, predominately, and the Roegen-Daly school, in some respects.

Overview

In 1986, Hall co-authored *Energy and Resource Quality: the Ecology of the Economic Process*, with Cutler Cleveland and Robert Kaufmann, wherein, via citation (Ñº) to David Pimentel, Herman Daly, and Robert Costanza, they discuss "energy subsidy", i.e. a measure of how much energy an organism or economy (the analogue of an ecosystem) can capture from outside its borders, and "energetic return on investment", i.e. computes the energy returned to an organism as a result of some expenditure, e.g., migration to better food sources; among other seeming verbal thermodynamics based arguments; the following are example quotes:

> "Some biologists view the process of Darwinian selection as a law of energy, the 'fourth law of thermodynamics'. This 'law' states that life is made up of unlikely, and hence nonrandom, combinations of molecules that superficially appear to be an exception to the second law of thermodynamics."
>
> — Charles Hall, et al (1986), *Energy and Resource Quality* (pg. 9)

> "The laws of thermodynamics and the law of conservation of mass form the basis of an energy perspective for economic production. Recall that the first law limits our supply of matter and energy, and hence the goods and services derived from them, because matter and energy can neither be created nor destroyed, only changed in form."
>
> — Charles Hall, et al (1986), *Energy and Resource Quality* (pg. 35)

In 2009, Hall, in his "What is the Minimum EROI that a Sustainable Society Must Have?", co-authored with Stephen Balogh and David Murphy, stated the following: [6]

> "To chemists Frederick Soddy and Wilhelm Ostwald, anthropologist Leslie White, anthropologist Joseph Tainter (Ñº), historian John Perlin (Ñº), systems ecologist Howard Odum, sociologist Frederick Cottrell, economist Nicholas Georgescu-Roegen, energy scientist Vaclav Smil and a number of others in these and other disciplines, human history, including contemporary events, is essentially about exploiting energy and the technologies to do so."

In 2011, Hall, in his *Energy and the Wealth of Nations: Understanding Biophysical Economics*, co-authored with Kent Klitgaard, attempted to usurp the neo-classical or Walrasian model of economics, diagramed by them below left, which they say "violates a number of laws and is inconsistent with actual human behavior", with the so-called Odum-Hall model of economics, shown below right:

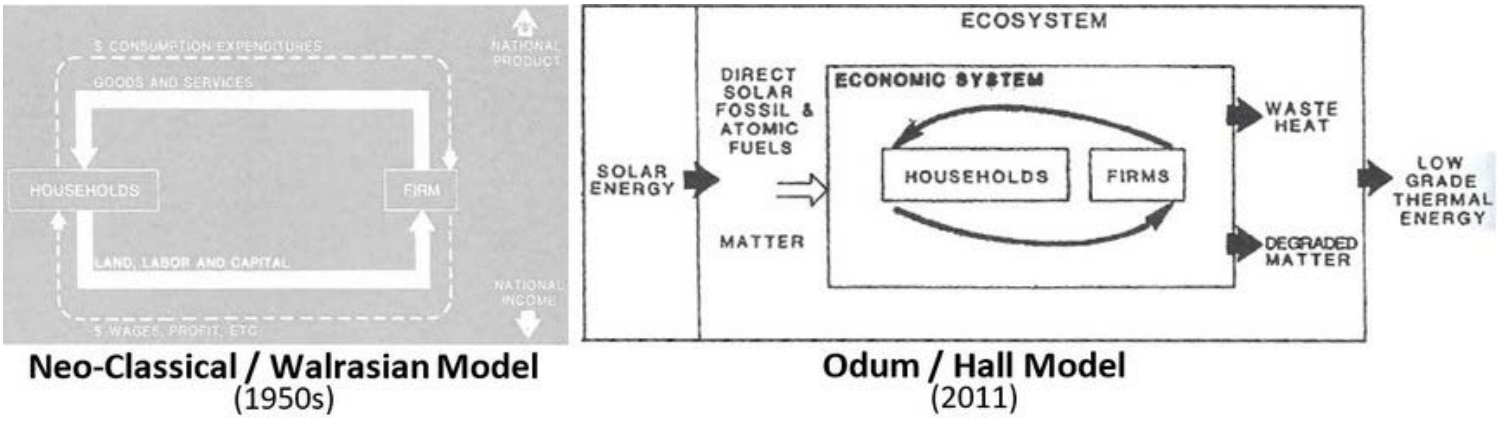

Hall and Klitgaard describe the left diagram as follows:

> "The neoclassical view of how economies work, is that households sell or rent land, natural resources, labor, and capital to firms in exchange for rent, wages, and profit, e.g. factor payments. Firms combine the factors of production and produce goods

and services in return for consumption expenditures, investment, government expenditures, and net exports. This view represents, essentially, a perpetual motion machine."

Hall and Klitgaard describe the right diagram as follows:

> "As the Neo-classical / Walras model does not include 'boundaries', the left figure should be reconstructed to one that include necessary resources and generation of wastages, as shown by the right figure."

This so-called Odum-Hall model, which is based earlier energy flow diagrams of Howard T Odum, while showing a loosely theoretical "boundary", is no boundary in the sense of thermodynamics.

In 2016, Hall, during the BPE 2016 conference, interacted with Libb Thims, might have passingly explained that his "system and boundary" model had problems, during the course of which Hall asked Thims if he would be willing to review his "thermodynamics" section, which amounts to the above diagrams, for the upcoming second edition of their book. This review never occurred, as it would require a complete overhaul of their entire model. [8]

In 2018, Hall and Klitgaard published a second edition of the *Energy and the Wealth of Nations*, this edition, like the previous, featuring an oil tanker on the cover, upgrade their boundary comparison models as follows: [7]

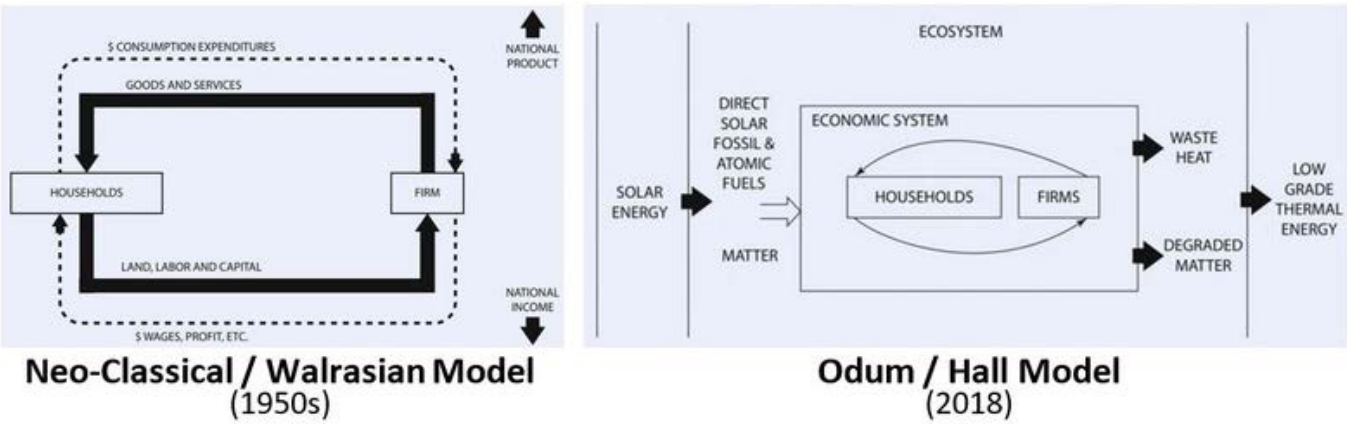

At a minimum, we see one economic "system", with a clearly defined "boundary", rather than what looks like a triple system in the previous diagram, or three boxes attempting to defined the solar system, ecosystem, and economic system inside the ecosystem, with "households" and "firms" exchanging things inside of the latter system.

Hall and Klitgaard, in this edition, also give the following so-called "Daly model", as introduced by Herman Daly: [7]

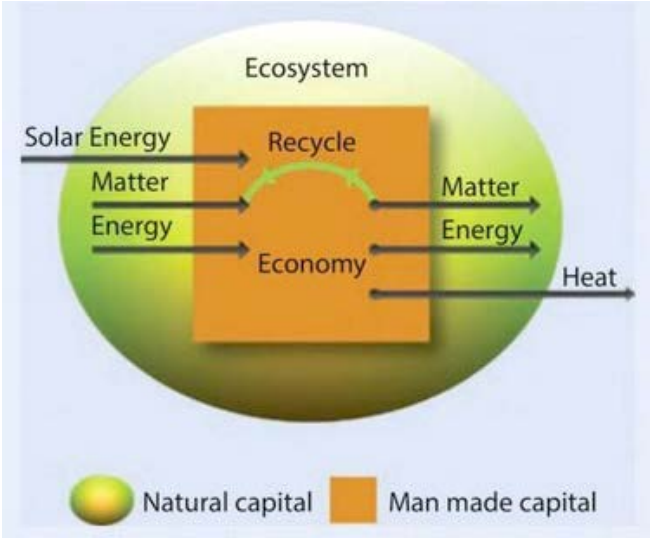

about which they say:

> "This figure is a depiction of the basic 'ecological economics model' developed by Herman Daly. It shows that the economy is embedded within in the ecosystem, and also shows the transformation of low-entropy solar energy into high-entropy heat."

Here, we see a confused mess as to what exactly "entropy" is, as defined by Clausius (1865), and how it related to the definition of ecosystems and economic systems; most of the error here, in large part, tracing to Nicholas Roegen's 1971 error-filled "material entropy" model; some error comes from the mind of Daly as well.

The following quotes, in overview, show the basic confused understanding of their conceptual "system" models as actual human chemical thermodynamics understands things:

> The first criticism of neoclassical economics in respect to thermodynamics. Contemporary economics and its fundamental household-firm market model (figure above left), pays only minimal attention to the first law of thermodynamics, and none at all to the second. In fact, the second law is completely incompatible with the conceptual model known as the circular flow. In the circular flow diagram, there is never any value lost to **waste or entropy**. This is a **serious conceptual flaw** and an obstacle to designing economic policies that can meet the challenges of pollution, resource scarcity, and depletion, and unemployment successfully. In effect, the two laws say: nothing happens in the world without energy conversion and entropy production. The consequences are firstly that every process of industrial and biotic production requires the input of energy, and secondly, because of the unavoidable 'entropy production', the valuable part of energy, called 'exergy' (or free energy) is transformed into useless heat at the temperature of the environment, called 'anergy', an usually matter is dispersed too."
>
> — Charles Hall (2011), *Energy and the Wealth of Nations* (pg. 133)

> "The human economy uses fossil and other fuels to support and empower labor and to produce and utilize capital. Energy, capital, and labor are then combined to upgrade natural resources to useful goods and services. Therefore, economic production can be viewed as the process of upgrading matter into highly 'ordered', i.e. thermodynamically improbable, structures, both physical structures and information. Where the economist speaks of 'adding value' at successive stages of production, one may also speak of 'adding order' to matter through the use of free energy (exergy). The perspective of examining economics in the 'hard sphere' of physical production, where energy and material stocks and flows are important, is called 'biophysical economics'. It must complement the social sphere perspective."
>
> — Charles Hall (2011), *Energy and the Wealth of Nations* (pg. 135)

These two quotes, combined, represent a confused mass of conceptual misunderstanding of how chemical thermodynamics actually applies to social systems firstly, and to economics, secondly. [8] These were the types of "vents" that Julian Simon repeated made against the Roegen-Daly school, in his battles with various economics, from 1981 to 1991, when he famously quipped that entropy and the second law is irrelevant to economics:

> "With respect to [the Roegen-Daly view of] energy, **there is no practical 'boundary' surrounding** any [economic] unit of interest to us. And without such a boundary, the notion of **entropy in the large is entirely irrelevant to us**."
>
> — Julian Simon (1981), *The Ultimate Resource 2* (pg. 79) [9]

Here, what he meant was that the Odum-Roegen-Daly interpretation of how economic and energy, as defined by thermodynamics, applies to ecologies and economies; hence, restated, the "Roegen-Daly view of entropy is entirely irrelevant to us", is what Simon was saying. We clarify this here, because the "entirely irrelevant" part of Simon's quote has been more than frequently taken out of context, to the effect that he denied the second law as being applicable to societies and economies; his point was that this has never been explained properly, and that the explanations that have been given are incorrect.

Hall and Klitgaard also, of note, give the following colorful Odum energy flow diagram, which looks nice, but hardly explains anything, as per thermodynamics goes, in other words, it is but a food chain diagram, extrapolated to the sphere of economic production:

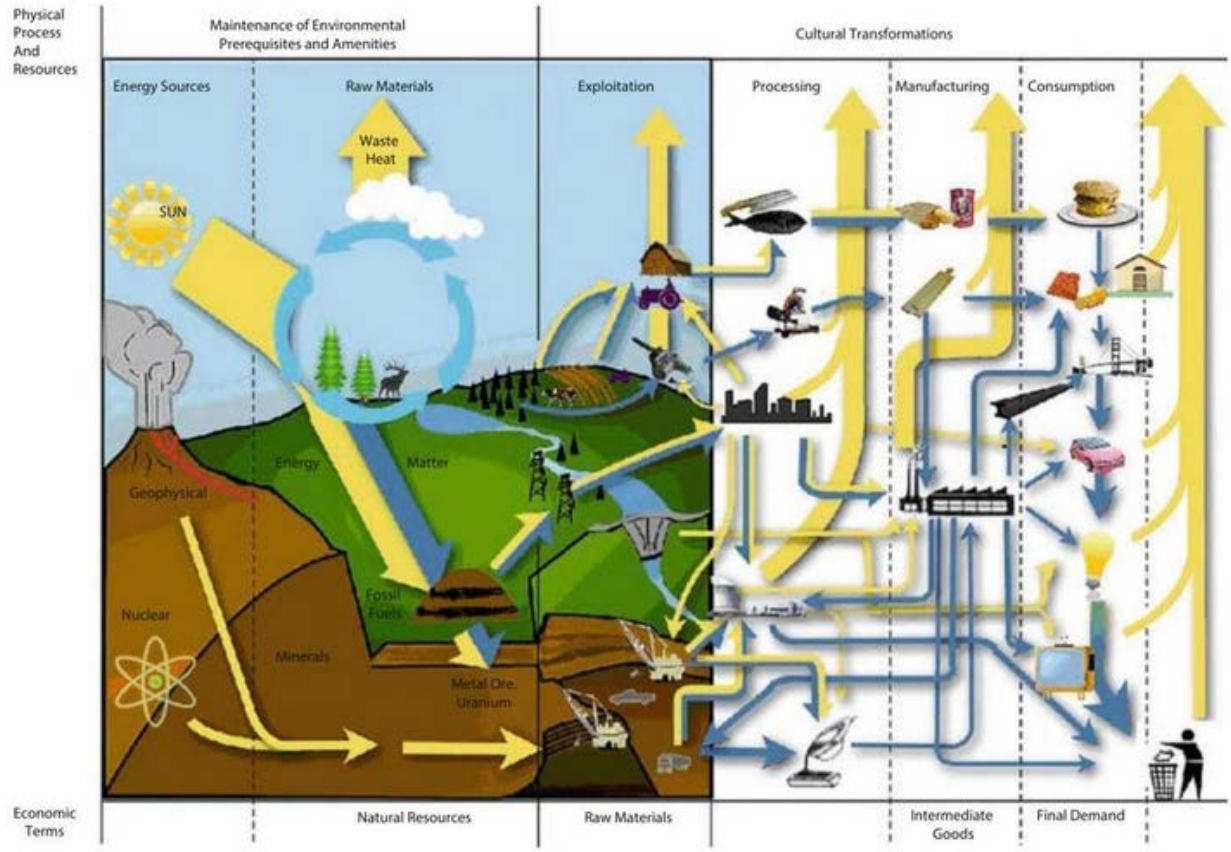

(add)

Wealth of Nations | Energy

In 2011, Hall, together with economist Kent Klitgaard, published their in his *Energy and the Wealth of Nations: Understanding the Biophysical Economy*, wherein they open to the erroneous assertion (pg. vii) that the following four "wealth of nation" themed books (book #s: 1-4), which are "on their shelves", as they say, don't use the following three terms: "energy", "oil", or "natural resources":

	Author	Date	Book	pgs	Force	Work	Energy	Power	Heat	θΔcs	Entropy	Enthalpy	Free energy
1.	Adam Smith	1776	*Inquiry into the Nature and Causes of the Wealth of Nations*	445	54(Ñº)	100+ (Ñº)	N/A	93(Ñº)	2(Ñº)	N/A	N/A	N/A	N/A
2.	David Landes	1998	*Wealth and the Poverty of Nations*	658			45(Ñº)			2(Ñº)			
3.	Eric Beinhocker	2006	*The Origin of Wealth: Evolution, Complexity, and the Radical Remaking of Economics*	527	40(Ñº)	78(Ñº)	49(Ñº)	56(Ñº)	13(Ñº)	27(Ñº)	31(Ñº)	N/A	4(Ñº)
			Knowledge and the Wealth										

4.	David Warsh	2007	*of Nations: a Story of Economic Discovery*	464	51(Ñº)		17(Ñº)							
5.	Thomas Wallace	2009	*Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America*	528	97(Ñº)	92(Ñº)	100+ (Ñº)	83(Ñº)	29(Ñº)	93(Ñº)	88(Ñº)	4(Ñº)	5(Ñº)	
6.	Charles Hall & Kent Klitgaard	2011	*Energy and the Wealth of Nations: Understanding the Biophysical Economy*	421	59(Ñº)	86(Ñº)	80(Ñº)	91(Ñº)	38(Ñº)	20(Ñº)	17(Ñº)	N/A	N/A	

A partial Beg analysis of each book is shown in the above table. The following are two obvious examples, contrary to their fallacious assertion:

> "Wealth, as Hobbes says, is power."
>
> — Adam Smith (1776), *Wealth of Nations* (pg. 13)

> "The energy represented by a barrel of oil was especially difficult to pin down."
>
> — David Warsh (2007), *Knowledge and the Wealth of Nations* (pg. 330)

This is just poor scholarship, whatever the case; particularly. Clearly, these books just sit on their shelves, unread.

In any event, Hall and Klitgaard attempt to outline, thermodynamically, how the first law and second law, should be integrated into economic policy, albeit in what might be called the Roegen-Daly school of thought on entropy, i.e. the view of Nicholas Georgescu and his student Herman Daly, namely the very tenable view that entropy, in economic terms, equates to "value lost to waste", and that this explains pollution, resource scarcity, unemployment, and depletion. Hall and KIltgaard summarize that the two laws in biophysical economics equate to the translation that, in their own words: (1) energy conservation implies that every process of industrial and biotic production requires the input of energy, and (2) entropy production implies that because of the unavoidable entropy production the valuable part of energy (called exergy) is transformed into useless heat at the temperature of the environment (called anergy), and usually matter is dispersed too. [1]

In 2011, Brigham Young University, was running a winter 400-level course called "Science Phy 453: Sociology and Physics", taught by professor David Samuels Barnard, whose course notes contain Mieczyslaw Dobija's 2004 "Theories of Chemistry and Physics Applied to Developing an Economic Theory of Intellectual Capital", Jing Chen's 2008 "Understanding Social Systems: a Free Energy Perspective", which, in turn, cities the works of John Bryant (2007), Bikas Chakrabarti (2005), Charles Hall (1986), Paul Colinvaux, Erich Muller (1998), Jurgen Mimkes (2005), Libb Thims (2007), and the Rossini debate works of Harold Leonard (2006) and Frederick Rossini (1971), among other residual works, such as Edwin Jaynes. [4]

BioPhysical Economics meetings

See main: BPE 2016

In 2008, Hall organized the first meeting of "BioPhysical Economics" scholars, held in Syracuse, NY. By 2015, their group had six very successful meetings without, however, formalizing the group. During the

2015 Joint Meeting of Canada and United States Societies for Ecological Economics (CANUSEE 2015) at the University of British Columbia, Vancouver, the group decided to formalize its identity and become the "International Association of BioPhysical Economists (IABPE)." The also decided to continue their loose ties to ecological economics. Thus, the 7th BioPhysical Economics Meeting will be held on 26-29 Jun 2016 in conjunction with the International Society of Ecological Economics in Washington. [5]

An 8 Dec 2015 screen shot of the countdown for the 7th BioPhysical Economics meeting, and event started by **Hall** (2008), scheduled to be held in Washington on 26-29 Jun 2016, subtitled rather boldly "where natural sciences meets social sciences. [5]

Influences

Hall was influenced greatly by Howard T. Odum, his PhD teacher in systems ecology, Frederick Soddy, Wilhelm Ostwald, Leslie White, Fred Cottrell, Joseph Tainter, Nicholas Roegen, John Perlin, Vaclav Smil, and Robert Costanza, another Odum student. [1]

Influenced

A noted student of Hall's was Cutler Cleveland, who at Cornell University, was turned on by energy models being introduced by Hall, and went from being a failing student to a star student; Hall refers to Cleveland as his one of his best students.

Education

Hall completed BS in biology in 1965 in Colgate University, Hamilton, New York, his MS in zoology, in 1966 at Pennsylvania State University, and PhD in 1970 in systems ecology under Howard T. Odum at the University of North Carolina at Chapel Hill. In 1986, Hall promoted a fourth law of thermodynamics (see: laws of thermodynamics), likely a variant of the Odum's.

Quotes | By

The following are quotes by Hall:

> "Neoclassical economics is inconsistent with the laws of thermodynamics."
>
> — Charles Hall (2009), interview with Nathanial Gronewold [2]

> "Real economies are subject to the forces and laws of nature, including thermodynamics, the conservation of matter, and a suite of environmental requirements. Neo-classical economics does not recognize or reflect this fact."
>
> — Charles Hall (2011), *Energy and the Wealth of Nations* (pg.132)

> "The term thermodynamics was [not] coined by James Joule in 1849 to designate the science of the relations between heat and power."
>
> — Charles Hall (2011), *Energy and the Wealth of Nations* (coauthor: Kent Klitgaard) (pg. 226); citation of the incorrect Perrot (Ñº) etymology, derived from Wikipedia edits originally added per unware error-based Perrot citation in 2005 by Libb Thims, albeit amended to Thomson 1854 etymology in Jul 2010 (Ñº), which became its own subsection, by other Wikipedians, via citation to external Hmolpedia etymology article, shortly thereafter; after which, when Thims left Wikipedia, the etymology fell into disarray.

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1. Hall, Charles and Klitgaard, Kent. (2011). *Energy and the Wealth of Nations: Understanding the Biophysical Economy* (thermodynamics, 18+ pgs; Roegen, 5+ pgs; influences, pg. 41; models and boundaries, pgs. 134-37 ; free energy, pgs. 73, 135). Springer.
2. Gronewold, Nathanial. (2009). "Does Economics Violate the Laws of Physics?" (Ñº), *Scientific American*, Oct 23.
3. Hall, Charles A.S., Cleveland, Cutler J., and Kaufmann, Robert K. (1986). *Energy and Resource Quality: the Ecology of the Economic Process* (thermodynamics, 29+ pgs) (abs). John Wiley & Sons.
4. (a) Barnard, David S. (2011). "Science Phy 453 – Sociology and Physics" (Ñº); SSRN-id1269035 (Ñº), Brigham Young University,

Winter, CourseHero.com.
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5. Biophysical Economics – BPEconomics.org.
6. Hall, Charles Balogh, Stephen, and Murphy, David J.R. (2009). “What is the Minimum EROI that a Sustainable Society Must Have?”, *Energy*, 2(1):25-47.
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8. Thims, Libb. (2020). *Human Chemical Thermodynamics — Chemical Thermodynamics Applied to the Humanities: Meaning, Morality, Purpose; Sociology, Economics, Ecology; History, Philosophy, Government, Anthropology, Politics, Business, Jurisprudence; Religion, Relationships, Warfare, and Love* (**pdf**). Publisher.
9. (a) Simon, Julian L. (1981). *The Ultimate Resource 2* (§4: Grand Theory (txt), pgs. 77-83; quote, pg. 79) (txt) . Princeton University Press, 1996.
(b) Simon, Julian. (1981). “Energy Accounting” (Ñº), Afternote 2 to §12: Today’s Energy Issues, of *The Ultimate Resource 2*. Princeton, JulianSimon.com, 1994.
(c) Simon, Julian. (1991). “Entropy and Energy Accounting: are They Relevant Concepts?” (Ñº), *Entropy*, Jan 15.

External links

â— Charles A.S. Hall (faculty) – State University of New York, College of Environmental Science and Forestry.

θΔics

In human thermodynamics, **Charles E. Hansen** (1943-) (DN=1) is an American systems analyst, economics consultant, and engineer noted for his 2004 book *The Technology of Love*, wherein he attempts to define "love" in scientific formalism, in part using entropy, anti-entropy, and thermodynamics logic (see: thermodynamics of love). The book, curiously, devotes at least thirty pages to discussion of entropy. [5]

The book, according to its synopsis, "offers the first formal 'working definition' of love applicable to the entirety of daily living and buttresses it with a breakthrough argument that love is a scientific reality of the universe that is here to stay [and] continues the work of Pitirim Sorokin who attempted a similar scientific approach to love in the 1950s and also offers a solution to the unfinished work of Charles Peirce, the founder of pragmatism." [1]

The book seems to be self-published by the "Corsense Institute", which has the tagline "Dedicated to the Philosophy, Science, and Technology of Love", a 2005-launched site run by Hansen. [2]

Mathematics of love

Interestingly, Hansen's book contains a chapter ten on the mathematics of love, wherein, building on work of Pitirim Sorokin and Talcott Parsons, among others, to outline a "vectors model" of human action. [4]

Education

Hansen completed his BS in engineering (electrical and aeronautical) and business at the University of Colorado, his MBA at Wright State University, Ohio, and studied at George Washington University in the doctoral program for economics from 1971 to 1977. [3] Hansen states that he informally began his "study of love" while a doctoral student. [1] He states that he formally started work on what he calls the "Technology of Love Project" in 1983. [3]

Difficulties on theory

A salient difficulty in Hansen's work is that it is crouched subtlety in suppositions on spirituality and God, although, to note, it does seem to be a grade above the typical Bible-pushing agenda books (e.g. Adrian Hough, Gilbert Wedekind, M. Scott Peck, John Sanford, etc.) in its level of complexity and readiblity. To give some idea, two example passages: [1]

> "Efficiency is one of our foremost higher needs; and because our entire human system, mind, and possibly spirit, run on energy, it is energy efficiency that is the basic issue, and it encompasses every technology humans have ever developed beginning with the first word and the first tool or the first learned technique, perhaps climbing a tree."

> "Auguste Comte took the proposition of love as such a grand social solution and pushed it beyond what many felt to be the limits of common sense—by, for instance, the incredulous proposal of having us worship woman in place of God."

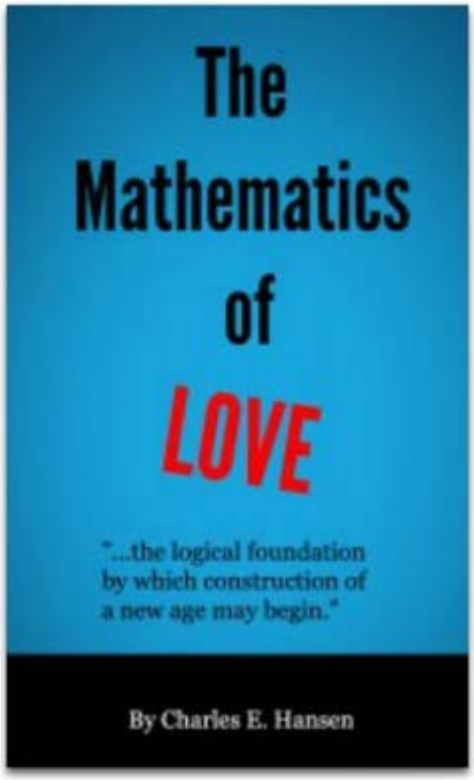

A pdf cover version (Ñº) of Hansen's 1988 article "The Mathematics of Love". [4]

He also mentions, on the back cover, that the book will be is for scholars of "David Hume, Adam Smith, Charles Peirce, Sigmund Freud, John Rawls, Jesus, and Einstein" (which implies that Hansen assumes Jesus was a real person, and not simply Osiris mythology); the book is also mixed with Hinduism, e.g. discussing Brahma, and the other B-ra-ham-ic religions, such as Buddhism, along with Confucius, among other religious and or possibly new age concepts, e.g. "biological-psychological-spirituality", etc.

References

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2. Coresense Institute: Dedicated to the Philosophy, Science, and Technology of Love (2005-launch) – Corsense.org.
3. About – Corsense.org.
4. (a) The Mathematics of Love (excerpts) – Corsense.org.
(b) Hansen, Charles E. (2004). *The Technology of Love*, *Volume 1* (mathematics of love, pgs. 467-512). Corsense Institute Inc.
(c) Hansen, Charles E. (1988). "The Mathematics of Love" (pdf), condensed version of chapter in *The Technology of Love*. GimpyWebsite.com.
5. Index (pdf) – Corsense.org.

External links

â— Excerpts (online) – Corsense.org.

θΔics

In existographies, **Charles King** (1818-1888) was an English writer, Plutarch translator, and religio-mythology scholar, noted for []

Overview

In 1864, King, in his *Gnostics and their Remains*, as cited by Wallis Budge (1904), is said to have done some interesting work on some of the "alleged connections of Anubis with Christ in the Gnostic system". [1]

Quotes | On

The following are quotes on King:

> "The story of Abraham is a myth. Abraham himself is a myth. It was usual with the Old Arabians to regard Saturn and Abram as their progenitor, and while looking upon Saturn as their father **...** He was a child named Ab-ram, and this name is later changed to Ab-ra-ham. **Charles King** in his work, *The Gnostics*, states that the words "brahma" and "abrahrn" have the same numerical value. When we run this 'allegory' down, we discover that Abram (Abraham) is just another myth of the sun."
>
> — Hilton Hotema (1963), *The Secret Regeneration* [2]

References

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(b) Budge, Wallis. (1904). *The Gods of the Egyptians*, *Volume Two* (pg. 266). Dover, 1969.

External links

â— Charles William King – Wikipedia.
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θΔics

In gas laws, **Charles' law** states that for a body of gas, at constant particle number *n* and pressure *P*, the volume *V* of the gas will vary directly with the temperature, i.e. be proportional to (according to proportionality constant *K*) the temperature of the gas. In mathematical terms, Charles's law is expressed as:

$$V = KT\,|_{n,P}$$

In simple wording, Charles' law states that if the pressure remains constant, the volume of a gas varies directly as the absolute temperature. [2]

History

In *circa* 1787, Jacques Charles, a French scientist, conducted an experiment where he filled five balloons to the same volume with different gases. He then raised the temperature of the balloons to 80ºC and noticed that they all increased in volume by the same amount.

In 1800, Joseph Gay-Lussac, a recent graduate of the École Polytechnique, met and became a lab assistant and protégé of chemist Claude Berthollet. While working under Berthollet, Gay-Lussac discovered that gases expand by the same proportion for an equivalent rise in temperature. Gay-Lussac's approach to chemistry was to express laws mathematically. [1]

Supposedly, Charles' unpublished experiment was later referenced by Gay-Lussac in 1802 when he published a paper on the precise relationship between the volume and temperature of a gas, which Gay-Lussac named "Charles' Law" in honor of Jacques Charles' original experiment.

Zero volume

It is said that it was either Charles (or Gay-Lussac) who first discovered that when a gas under constant pressure is heated from 0℃ to 1℃, it expands 1/273 of its volume and contracts the same amount when the temperature is dropped 1℃ to 0℃, and on this finding reasoned that if a gas were cooled to -273℃ (or -273.15℃ in modern terms) its volume would be zero. [3]

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1. Burns, William E. (2003). *Science in the Enlightenment: an Encyclopedia* (section: Gay-Lussac (1778-1850), pgs. 109-11). ABC-CLIO.
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3. (a) Muller, Ingo. (2007). *A History of Thermodynamics - the Doctrine of Energy and Entropy* (pg. 5). New York: Springer.
(b) Mascetta, Joseph A. (2003). *Chemistry the Easy Way* (Charles' law, pg. 101-02). Barron Educational Series.

External links

- Charles's law – Wikipedia.

θΔics

In existographies, **Charles Lebrun** (1753-1835), aka “Pigault-Lebrun” or “Pigault” (O), was French playwright and novelist noted for []

Overview

In 1803, Lebrun published his two-volume *Doubs of Infidels*, a collection of quotations against Christianity, which was forbidden, and or banned, yet reprinted several times. [1] Lebrun, in this work, as cited by Dorothy Murdock (2009), argued the following: [2]

> “The history of Moses is copied from the history of Bacchus, who was called Mises by the Egyptians, instead of Moses. Bacchus was born in Egypt; so was Moses... Bacchus passed through the Red Sea on dry ground; so did Moses. Bacchus was a lawgiver; so was Moses. Bacchus was picked up in a box that floated on the water; so was Moses.... Bacchus by striking a rock made wine gush forth... Bacchus was worshipped...in Egypt, Phenicia, Syria, Arabia, Asia and Greece, before Abraham‘s day.”

(add discussion)

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2. (a) Lebrun, Charles. (1803). *Doubts of Infidels*. Publisher.
(b) Murdock, Dorothy M (aka Acharya S). (2009). *The Gospel According to Acharya S* (Moses, pg. 72). Seattle: Stellar House Publishing.
(c) Murdock, Dorothy M. (aka Acharya S.) (c. 2010). “Zeitgeist: the Movie: Companion Source Guide” (pg. 79), ZeitgeistMovie.com.

External links

- Charles-Antoine-Guillaume Pigault-Lebrun – Wikipedia.

θΔics

In existographies, **Charles Lyell** (1797-1875) (IQ:150|#678) (Murray 4000:1|ES) (Gottlieb 1000:512) (Simmons 100:28) (CR:11) was Scottish-born English lawyer turned geologist, noted for his 1830 *Principles of Geology*, published in three volumes (1830-33), wherein he showed that according to geological evidence that the earth was more than 300-million years old, rather than 6,000-years-old, the Biblical view.

Darwin

In 1831, Charles Darwin, aged 22, was given a copy of volume one of Lyell's *Principles of Geology*, by HMS Beagle captain Robert FitzRoy, which he read during their famous voyage around south America, and was mailed the other two volumes during voyage. [1]

Quotes | On

The following are related quotes:

> "It is hardly possible for me even to recall to the reader, who may not be a practical geologist, the facts leading the mind feebly to comprehend the lapse of time. He who can read Sir **Charles Lyell**'s grand work on the *Principles of Geology*, which the future historian will recognize as having produced a revolution in natural science, yet does not admit how incomprehensibly vast have been the past periods of time, may at once close this volume. Not that it suffices to study the *Principles of Geology*, or to read special treatises by different observers on separate formations, and to mark how each author attempts to give an inadequate idea of the duration of each formation or even each stratum. A man must for years examine for himself great piles of superimposed strata, and watch the sea at work grinding down old rocks and making fresh sediment, before he can hope to comprehend anything of the lapse of time, the monuments of which we see around us."
>
> — Charles Darwin (1859), *On the Origin of Species* (Q)

> "After my return to England [2 Oct 1838] it appeared to me that by following the example of **Lyell** in *Geology*, and by collecting all facts which bore in any way on the variation of animals and plants under domestication and nature, some light might perhaps be thrown on the whole subject.... I worked on true Baconian principles, and without any theory collected facts on a wholesale scale, more especially with respect to domesticated productions, by printed enquiries, by conversation with skillful breeders and gardeners, and by extensive reading.... I soon perceived that **selection** was the keystone of man's success in making useful races of animals and plants. But **how selection could be applied to organisms living in a state of nature remained for some time a mystery to me**. In Oct 1838, that is, fifteen months after I had begun my systematic enquiry, I happened to read for amusement Malthus *on Population*, and being well prepared to appreciate the struggle for existence which everywhere goes on ... it at once struck me that under these circumstances **favorable variations** would tend to be preserved, and **unfavorable ones** to be destroyed. The result of this would be the **formation of new species**. Here, then, I had at last got a theory by which to work."
>
> — Charles Darwin (1887), *Autobiography* (Q)

> "It is to **Charles Lyell** that geology owes its thanks for its establishment upon its present sound and philosophical basis. Not until his publication, in 1830, of his *Principles of Geology*, was geology worth in any sense of being called a science."
>
> — Henry Bray (1910), *The Living Universe* [2]

Quotes | By

The following are noted quotes:

> "A discovery which seems to contradict the general tenor of previous investigations is naturally received with much hesitation."
>
> — Charles Lyell (c.1835), *Publication* (Q)

> "Hitherto, no rival hypothesis has been proposed as a substitute for the doctrine of **transmutation**; for 'independent creation', as it is often termed, or the direct intervention of the 'supreme cause', must simply be considered as an avowal that we deem the question to lie beyond the domain of science."
>
> — Charles Lyell (1863), *The Antiquity of Man* (pg. 421) (Q)

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Further reading

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External links

● Charles Lyell – Wikipedia.

θΔics

In existographies, **Charles Montesquieu** (1689-1755) (IQ:175|#225) (Cattell 1000:308) [RGM:164|1,500+] (SN:46) [HD:8] (CR:57) was a French political philosopher noted, in political thermodynamics, for his 1748 book *The Spirit of the Laws*, in which he differentiates between the behaviors and personalities of people in hot versus cold climates, arguing that the laws of government must be adapted to each peculiar region, each region being a function of the soil and climate; the logic of which, said to have been influential to Scottish-born American John Witherspoon, who in turn taught James Madison, the father of the US constitution, who is attributed as having made Newtonian government models the method of the American government system.

Powers | Balance

See main: Separation of powers

In 1689, John Locke, in his *Second Treatise on Government* (Ñº), building on the "state of nature" (Ñº) of Thomas Hobbes, proposed a two-part government consisting of an executive and a legislature. [8]

In 1748, Montesquieu, in his *Spirit of the Laws*, building on Locke, add the idea of a third branch, the courts, according to which each branch would exercise "checks and balances" on the other, ensuring that no one branch would obtain a runaway authority of power. [8]

Montesquieu, in his *On the Spirit of the Laws*, stated the following: [6]

> "Every man whom some power is granted tried to get more and eventually misuses it."

This posit, according to Bertrand Roehner (2007), led Montesquieu to conclude that only a balance of power between different branches of government can ensure that none of them will take precedence over the others.

Overview

Montesquieu argues that equality among people, and within the sexes in marriage, tend to increase 1) with latitude or 2) with decrease in average daily temperature. The following is one excerpt on the subject: [2]

> "We have observed that [in **hot** climates] great heat enervates the strength and courage of men , and that in **cold** climates they have a certain vigor of body and mind, which renders them patient and intrepid, and qualifies them for arduous enterprises. This remark holds good, not only between different nations, but even in different parts of the same country. We ought not, then, to be astonished that the effeminacy of the people in hot climates has always rendered them slaves; and that the bravery of those in cold climates has enabled them to maintain their liberties. This is an effect which springs from a natural cause."

To explain temperature-based behaviors, Montesquieu gives some 3,000 citations, one in particular being that iron bars tend to contract when cooled (similar Carnot in his 1824 *Reflections* and previous to that as Boerhaave's law (1720)), and that by extrapolation such an effect may occur in human nerve endings, thus mediating different personal behaviors in love, sex, courageousness, and passions, etc., of people in lands of different heat.

Montesquieu notes, for instance, that women of hot climates will tend to marry and reproduce earlier, at ages of eight to ten years of age, whereas women of temperate climates will tend to marry and have children later in maturity; subsequently, polygamy will tend to result in hotter climates, whereas monogamy is the trend in colder climates.

Social physics | Influence

Montesquieu's influence is difficult to underestimate. His ideas on liberty and equality, alongside those of Jean-Jacques Rousseau and Voltaire, led directly to the events of the French Revolution; whose views influenced others to follow. Montesquieu's application of science to political affairs seems, in particular, to have influenced James Madison, who would have a tremendous impact on the societal orchestration of the United States of America, as he is colloquially called "The Father of the Constitution". Madison, as John Q. Stewart points out, in regard to the historical formation of the Princeton Department of Social Physics, was a student of Scottish-born American John Witherspoon (1723-1794), a signatory of the Declaration of Independence and 6th president of Princeton University, who in turn was a noted interpreter of the political philosophy of French theorist Montesquieu.

Human thermodynamics

In modern terms, we can explain this as the effect of heat acting on the reaction to lower the activation energy, in the sense that hotter climates will tend to have higher reproduction rates (reaction rates), whereas in colder climates, entropic effects may dominate, instilling slower or lower reproduction rates. In other words, people in colder climates will be forced to do more to surmount the activation energy barrier, e.g. expend more energy on achievement and social status, before successful reproductive reaction will occur, whereas in hotter climates enthalpic effects will be favored, and reproduction may occur in the first decade of life, simply based on visual or visceral stimulation. [3]

Other

Of note, American economist Philip Parker based a larger part of his 2000 book *Physioeconomics* on Montesquieu's theories, albeit delving further into the issue with ideas on hypothalamic function. [4]

Quotes | On

The following are quotes on Montesquieu:

> "Open that famous new work [by **Montesquieu**] which reveals the *Spirit of the Laws* and you will learn that men depend on laws, and the laws depend on climate; that if legislators ignore its influence they give orders in vain; that nothing is more widespread and more powerful that the influence of the air; that it effects the mind, character, customs, laws, politics, religion and government of each country."
>
> — Julien la Mettrie (1751), "Anti-Seneca" (pg. 131)

> "Newton, Bacon, Leibniz, **Montesquieu**, and myself are the five greatest men I can name."
>
> — Buffon (c.1780), when asked how many great men he could name. [7]

> "**Montesquieu** held that there were certain fundamental and eternal principles similar to the laws of physics which result in relating all political and human relationships to their natural settings and causes."
>
> — Howard W. Odum (1929), *Introduction to Social Research* (pg. 163)

Quotes | By

The following are noted quotes:

> "Those who have said that a 'blind fate' has produced all the effects that we see in the world have said a great absurdity; for what greater absurdity is there than a blind fate that could have produced intelligent beings?"

— Charles Montesquieu (1748), *The Spirit of the Laws* (pg. 3) (Ñº)

> "Laws are the necessary relations which derive from the nature of things; and in this sense, all beings have their laws: the divinity has its laws, the material world its laws . . . man has his laws. Those who have said that a blind fatality has produced all the effects that we see in the world have uttered a great absurdity; for what greater absurdity than a blind fatality which has produced intelligent beings. Therefore, there is an original reason; and laws are the relations which are found between it and different beings and the relations of these beings among themselves."

— Charles Montesquieu (1748), *Spirit of the Laws* (§1); cited by Jacob Bronowski [5]

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(b) Blumberg, Mark S. (2002). *Body Heat: Temperature and Life on Earth* (pg. 158). Harvard University Press.
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3. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
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5. Nickles, Tom. (2007). "Vico versus Voltaire: The Natural Sciences versus the Humanities" (Ñº), WolfWeb.unr.edu.
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7. Packard, Alpheus S. (1901). *Lamarck, the Founder of Evolution* (pg. 199). Longmans, Green, and Co.
8. Lacayo, Richard. (2010). *Time: 100 Ideas that Changed the World* (Ideas #53: Political Thinkers Propose Dividing the Immense Power of Government, pg. 74). Publisher.

External links

- The Spirit of the Laws – Wikipedia.
- Charles de Montesquieu – Wikipedia.

θΔics

In human chemistry, **Charles Norton** (1827-1908) was an American editor noted for []

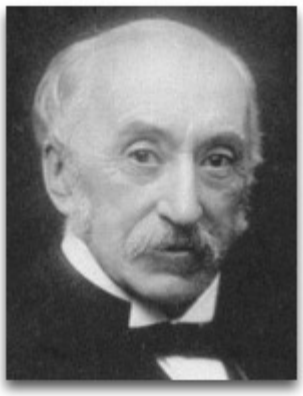

Overview

In 1887, Norton was the editor of *Correspondence between Goethe and Carlyle*, the collection of correspondences between Goethe and Thomas Carlyle who contacted Goethe in 1824, after becoming enamored with German philosophy from his reading of famous book on Germany by Germaine Stael (1766-1817). [2]

James Lowell?

Of note, American English literature professor Eugene Murray (1927-1995), in his 1968 article "'Elective Affinity' in *The Revolt of Islam*", attributes [possibly; check] the "men are not chemical substances" (Mary Shelley, 1939) quote [misattributed, tentatively, by Thims in 2012 to Norton] to American romantic writer James Lowell (1819-1891). [3]

Lowell, if the above quote was by him, would have been age 36 at the time, which would seem more reasonable of an age for a man to be making such a discernment.

Murray's citation, however, may be a misattribute, as the "Memoir of Shelley", in which the above quote is found, is listed in the 1855 addition as being written by Norton? Though, on the other hand, in *The Complete Writings of James Russell Lowell*, which seems to have been edited by Norton, Lowell's essay on John Milton speaks about the rule of elective affinities of opposites: [4]

> "Speaking of Mary Powell, he says, 'We have no portrait of her, nor any account of her appearance; but on the usual **rule of the elective affinities of opposites**, Milton being fair, we will vote her to have been dark-haired."

More research will have to be done on the actual source of the "men are not chemical substances" quote [Update (2015): the "men are not chemical substances" was written in 1839 by Mary Shelley in her "Memoir of Shelley" on the chemical philosophy of relationships, love, and marriage of Percy Shelley.

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(b) Lowell, James. (1864). "Memoir", in: *The Poetical Works of Percy Bysshe Shelley*, ed. Mary Shelley, 2 vols. [Boston], I, 22.
(c) James Russell Lowell – Wikipedia.
4. Lowell, James R. and Norton, Charles E. (1870). *Among My Books* (§:Milton, pgs. 243-312; quote, pg. 257). Houghton, Mifflin and Co., 1904.

External links

â— Charles Eliot Norton – Wikipedia.

θΔics

In chemistry, **Charles Skeele Palmer** (1858-1939) was an American chemist noted for his 1895 English translation of German physical chemist Walther Nernst's 1893 *Theoretical Chemistry: from the Standpoint of Avogadro's Rule & Thermodynamics*, wherein he mistakenly mistranslated Austrian physicist Ludwig Boltzmann's 1886 conjecture that the "struggle for existence is a struggle for entropy" to read "the struggle for existence is a struggle for free energy", which in the century to follow resulted in a number of mis-interpretations of Boltzmann's original statement about evolution and thermodynamics. [1]

Education

Palmer completed his AB and MA at Graduate Amherst College, his PhD at Johns Hopkins, after which he spent a year doing post-doctoral studies at the University of Leipzig, Germany, where he learned about the new physical chemistry from German physical chemist Wilhelm Ostwald. At one point Palmer was the head of the chemistry department of the University of Colorado. [2]

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θΔics

In existographies, **Charles Peirce** (1838-1914) (IQ:#|#) [RGM:667|1,500+] (Becker 139:51) (Stokes 100:60) (CR:15), pronounced 'purse' (Everett, 2019), was an American chance-based philosopher and logician, noted for []

Positivism

In 1868, Peirce, in a number of articles, supposedly, launched a systematic attack on the basic tenets of positivism. [3]

Tychism

In 1891, Peirce began to position an explicit and overt chance-based philosophy; the following year, he coined the term "tychism" to define this ideology or belief:

> "In an article published in *The Monist* for January, 1891, I endeavored to show what ideas ought to form the warp of **a system of philosophy, and particularly emphasized that of absolute chance**. In the number of April, 1892, I argued further in favor of that way of thinking, which it will be convenient to christen tychism (from *tyché*, chance). A serious student of philosophy will be in no haste to accept or reject this doctrine; but he will see in it one of the chief attitudes which speculative thought may take, feeling that it is not for an individual, nor for an age, to pronounce upon a fundamental question of philosophy. That is a task for a whole era to work out. I have begun by showing that tychism must give birth to an evolutionary cosmology, in which all the regularities of nature and of mind are regarded as products of growth, and to a Schelling-fashioned idealism which holds matter to be mere specialized and partially deadened mind."
>
> — Charles Pierce (1892), "The Law of Mind" [5]

This, of course, is the polar opposite of anti-chance philosophy.

Influences

Peirce has been classified, by David Skrbina (2005), as a noted western panpsychist philosopher, along with: Friedrich Schelling, William Clifford, Gustav Fechner, Paul Carus, Empedocles, Epicurus, William Gilbert, William James, Gottfried Leibniz, Carl von Nageli, Josiah Royce (mentor to John Boodin), and the Stoics, each of whom were read and cited by Peirce. [4]

Influenced

Peirce was a noted influence to the 1910s work Swedish-born American philosopher John Boodin. American thinker Charles Hansen's 2004 *The Technology of Love*, supposedly, offers a solution to some of the unfinished work of Peirce. [2] American philosopher Matthew Segall discusses (O) Peirce's work.

Quotes | By

The following are related quotes:

> "It is a common observation that a science first begins to be 'exact' when it is quantitatively treated. What are called the exact sciences are no others than the mathematical ones."
>
> — Charles Peirce (1878), *On the Doctrine of Chances* [1]

> "The discovery of the law of conservation or persistence of energy is the greatest that science has ever made, and nothing that can be discovered hereafter (unless it be of a supernatural kind) can equal it in importance."

— Charles Peirce (c.1885), *Writings* (Q)(Q)

"The undertaking to which this volume inaugurates is to make a philosophy like that of Aristotle, that is to say, to outline a theory so comprehensive that, for a long time to come, the entire work of human reason, in philosophy of every school and kind, in mathematics, in psychology, in physical science, in history, in sociology and in whatever other department there may be, shall appear as the filling up of its details."

— Charles Peirce (1886), "A Guess at the Riddle" (Q)

"I have read and thought more about Aristotle than any other man."

— Charles Peirce (1894), "My Reading in Philosophy" (Q)

"Three elements are active in the world, first: chance, second: law, and third: habit making."

— Charles Peirce (c.1890), "Article" (Q)

"Every plank of science's advance is first laid by the spontaneous conjectures of instinctive reason."

— Charles Peirce (c.1890), *Publication*; cited by Henry Swan (1974) in *Thermoregulation and Bioenergetics* (pg. ix)

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θΔics

In existographies, **Charles Sherrington** (1857-1952) (IQ:180|#98) [RGM:423|1,500+] (RE:95) [CR:123] was an English physiologist notable for his 1937-38 University of Edinburgh Gifford Lectures turned 1940 book *Man on His Nature*, revised second 1950 edition, wherein, building on the earlier Aristotelian-debunking work of Jean Fernel (1548), he hammers in solidifying the defunct theory of life point of view.

Neuroscience

In 1897, Sherrington postulated the existence of the synapse—a term which he coined, from the Greek *sunaptein*, meaning 'to fasten together'—as follows: [9]

> "So far as our present knowledge goes, we are led to think that the tip of a twig of the arborescence [of a neuron] is not continuous with but merely in contact with the substance of the dendrite or cell body on which it impinges. Such a special connection of one nerve cell with another might be called a ***synapse***."

In 1906, Sherrington, in his *The Integrative Action of the Nervous System*, a collection of ten lectures delivered two years before at Yale University, summarized two decades of painstaking experimental observations and his incisive interpretation of them; settling the then-current debate between the "Reticular Theory" versus "Neuron Doctrine" ideas about the fundamental nature of the nervous system in mammals in favor of the latter, and it changed forever the way in which subsequent generations have viewed the organization of the central nervous system. This book, being Sherrington's magnum opus, contains basic concepts and even terminology that are now second nature to every student of the subject. (Ñº)

In 1932, Sherrington won the Nobel Prize in physiology for work in neurophysiology.

Overview

In 1938, Sherrington, gave his *Man on His Nature* lecture turned a book., at the University of Edinburgh Gifford Lectures, wherein, building on Jean Fernel's 1548 *On the Hidden Causes of Things*, basically calls "bunk" all previous "models of life" as nonsensical anthropisms, as per chemistry and physics now see things; the following being examples:

> "Both the scientific and the everyday elbow are one and the same system of electrical charges. It is of no use asking physics and chemistry whether it is alive. They do not understand the word."
>
> — Charles Sherrington (1938), *Man on His Nature* (pg. 236)

> "When physics and chemistry have entered on their description of the perceptible, life disappears from the scene, and consequently death. Both are anthropisms."
>
> — Charles Sherrington (1938), *Man on His Nature* (pg. 260)

In his chapter three "Life in Little", he seems to have been the first to dig into the issues and irreconcilabilities with the term life, in the modern general chemical-physical-thermodynamical perspective, speculating on how there is no difference between life and non-life, only in namesake, that the term "life" is an artificial definition; he also discusses the second law of thermodynamics in relation to evolution.

Jean Fernel

Thematically, the thread of Sherrington's the lecture-book is interspliced with the philosophical views of French

physician-philosopher Jean Fernel (1497-1558)—noted for introduced the terms "physiology", as the study of the body's function, and also "pathology", the study of the body's disease—as his philosophical contrasted with the older views of Aristotle and the views of modern day. In his opening chapter, Sherrington cites a number of passages from Fernel's 1548 *On the Hidden Causes of Things*, a Platonic-style dialogue of sorts between the three fictional friends, Eudoxus, Brutus, and Philiatros. [6]

Fernel | Innate heat and life/death

See also: Animal heat; Combustion theory of animal heat; Vital heat

On the theory of "innate heat", in Fernel's day, in the context of the life/non-life issue, Sherrington quotes the following by Fernel, from his *On the Hidden Causes of Things*:

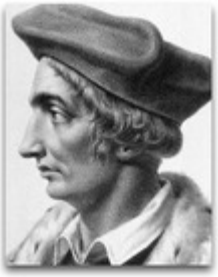

Sherrington uses the work and theories of French physician-philosopher Jean Fernel (1497-1558) as a springboard for many of the topics discussed in *Man and His Nature*.

> "If there is one attribute which more widely than any other is evident as inherent in life it is warmth. In that we come across a great thing. A great thing like those great things which were found by the ancients. It is the **innate heat**. A law common to all animal kind, an ordinance of nature, is that they live by innate heat. While they live they are possessed of heat appropriate to them. When dead that heat is extinguished and they are cold. That is plain even to sense; it is heat sensible to man; a touch demonstrates it. It is however not so evident in plants. Yet in them no less than in animals it holds true. Further, the more sentient and active the animal the greater and more liberal the heat it has. If you as a reason, think on the excellence of the sun, prime prince and controller of the world, favoring and forwarding every life that is. By its chastened heat it supports them from without in doing what life does. Now if its heat from without can so cherish, whereas cold checks, life, is there not within living things a heat which cherishes what they do, a heat which even of the same nature as the suns? Did not Aristotle well and truly say, and leave it written for all posterity, that: 'Heat is the condition of life'?
>
> He defined death as the extinction of heat. Now this heat is innate heat. The innate heat is a heat which can be observed to survive even in the coldness of the decrepitude of age. The coldness of old age dominates, it is true, the material fire which is in the temperament, by the old age cannot, so long as there is life, overcome the innate heat itself. It is in the virtue of this heat that the snake lives, although its temperament is cold. So too mandragora, and the poppy and all of the herbs of the frigid temperament.
>
> Whence it is clear that innate heat is superior to elemental heat. Elemental cold avails against elemental heat, but it avails nothing against this more excellent heat which is the innate heat of living things. Therefore this innate heat is not of the same nature as fire. It comes from a source superior to fire. In defining death, Aristotle, with the intuition of a master, said that: 'Coldness of death comes not by mere overthrow of the temperament—not by surcharge of elemental cold, but by lapse of innate heat. Innate heat, vital heat, like light has no opposite. Light had not 'contrary'; darkness is but privation of light. Death is a privation of innate heat, vital heat.'
>
> This heat is not of the commingling of the elements. The body at death demonstrates that. Death occurs and still the body retains the structure and shape in all its parts. We recognize our friend, although his life is not there, and his heat is not there. The innate heat has fled him. It is not therefore traceable to the elements. They still compose the body. Therefore the innate heat—the vital heat—must have its source 'elsewhere'."

On Aristotle's discussions of darkness being the privation of light, cold the lapse of innate heat, etc., here we recall the 2004 "Evil Does not Exist" video rendition of this (misattributed to Albert Einstein), which took the form, it seems of a

summary of French philosopher Rene Descartes expansion on Aristotle's light/darkness discussion; particularly Descartes' 1637 *Discourse on Method* (section: What Do Heat and Light of Fire Consist In?), and his 1641 *Meditations* (primarily the Third), in which he argues that cold is merely the absence of heat, that darkness is the absence or recess of ethereal substance of the heat of fire (or stars), discusses good and evil, and intertwines these in with discussion on the possible existence a Deity. [7] On heat in general, in relation to the above passage, Sherrington humorously states rather cogently: "in physical science no phenomenon perhaps has proved more puzzling, and no conception has had so chequered a career, as that of heat." In another passage from Fernel's dialogue:

> "The stone selenite holds the image of the moon even to her very phases. The magnet-stone points to the pole star. These are dead things, says Brutus, do living things likewise draw influences from the sky."

Spontaneous movement = life?

Sherrington, in giving is foray into his attack on the defunctness of the life concept, points out early on in his lecture that the belief in spontaneous movement equals life is deeply ingrained in people:

> "Deep down among human intuitions is one that spontaneous movement means life. Our kith and kin among the animals entertain it as well as we, though for them 'life' is, of course, an unconceptualized thought. We know from ourselves that the indirect field of sight will see what moves when it fails to see what does not move. Our horse may shy at a blown leaf on the roadway, not at a still one. The frog snaps at a fly that moves, but not at one which is still. The vine-tendril never lives so vividly as when at the cinema its clasping s speeded into visible movement. When the cardboard puppet dances it becomes thinkably alive, and Don Quixote's irruption at the puppet-theater becomes intelligible. The biologist knows this intuitive inference as native, even to a primitive mind.
>
> Movement accepted as spontaneous implies living. And the motion of the planets seemed to be spontaneous. Their movement told men that they were alive. All stars might be alive, but of them all the planets most so. The other stars were 'fixed', that is, relatively to each other did not move."

In the modern view, we know that "spontaneity" is gauged by free energy, specifically in the spontaneity criterion, and is a rule that scales up and down the molecular evolution table.

Sherrington points out also that "to think of the planets as we think of them today, masses neither alive nor, it would seem, abodes of life", would have saddened Fernel, who, supposedly, was of the four element / spontaneous movement implies life point of view, hence motion of the planets implies life.

Defunct theory of life

> *See main: Defunct theory of life*

Sherrington, in regards to the modern issues at a definition of life, in the modern physical chemistry perspective, was very keen person in his writing, a cogent step above the Aristotle privation theory of life/death, and the Fernel ambivalence dialogue views of life/death. The following statement by Sherrington specifically classifies life in the defunct theory category: [1]

> "Aristotle noted of life that its lower limit defies demarcation. The living and non-living, he thought, merge one in the other gradually. Today the very distinction between them is convention. **That deletes 'life' as a scientific category**; or, if you will, carries it down to embrace the atom. The vanishing point of life is lost."

The section following the colon—namely "or, if you will, carries it down to embrace the atom—specifies the alternative to the defunct view, namely soft panbioism or emergence, which in underlying argument holds or rather admits that the hydrogen atoms is alive, which, in the words of Sherrington, is a 'recital that trips along simple as a fairy tale.' (Ñº) Likewise, in other cogent instances, he states:

> "To ask the definition of life is to ask a something on which proverbially no satisfactory agreement obtains."
>
> "A speck of material which is said to 'live', while the vast majority of specks of material are said to be lifeless? Has it some particular element of matter in it which those other specks have not? No; that is not the key. The elements of matter—and we are thinking of them now not in Fernel's sense [four elements] but in that stricter one of the chemistry of today—in the living cell are among the very commonest of those spread broadcast in material which does not 'live', in soil, rock, air and water. Perhaps what strikes us most in the list of chemical elements which make up us, is the negative fact that the majority of elements are left out, and all the rarer ones. But in the speck that lives the common elements are differently compounded."

"Chemistry [does] not know the word life."

To continue with examples, in the following we see Sherrington begin to employ a thermodynamic system based attempt of a life definition:

> "Life is an example of the way in which an energy-system in its give and take with the energy-system around it can continue to maintain itself for a period as a self-centered, so to say, self-balanced unity."

A 2013 image of a T4 virus, which reproduces or infects its host (bacteria cells) via stinger-like injection of its DNA, a molecular structure that, as **Sherrington** says, we "hesitate whether or not to call it 'living'."

The issues, here, are two-fold: one that the system-with-in-a-system model is inconsistent with the internal system being autonomous or self-centered, and secondly, although subtle to detect, use of the prefix "self-", in life definition discussions, tends to amount to code for perpetual motion speak. In any event, he continues:

> "Perhaps the most striking feature of it is that it acts as though it 'desired' to maintain itself. But we do not say of the spinning of a heavy top which resists being upset that it 'desires' to go on spinning. The very constitution of the living system may compel it to increase; thus a self-fermenting protein system, granted its conditions, *must* increase. The behavior of a living body is an example of this, and we call it 'living'. **The behavior of the atom is an example of this and we *do not* call it 'living'.** The behavior of those newly discovered so-called 'viruses' is an example of this and there is hesitation whether or not to call it 'living'."

Indeed, in respect to the virus question, American chemical engineer Linus Pauling, in his *General Chemistry* (1969), grappled with the same question (see: virus molecule). The key passage to take note of here is the "atom is not alive" statement. This is a huge anchor point in the defunct theory of life position, one that one must pass through over the mind, again and again, to find solidity. In any event, Sherrington continues:

> "The difference is one not of ultimate nature but of scheme and degree of complexity. The atoms and sub-atoms are among earth's commonest. 'Living' becomes a name for certain complexes of them, arrangements of which it may be said that they are organized integratively, i.e. to form a solidarity, and individual."

This last statement is close, but ultimately incorrect. The molecular evolution table (2005) and evolution timeline (2009), show the above logic to be illusional, a false patch, if you will. Sherrington, however, saves face:

> "These 'faculties', as Fernel has described, of moving, of ingesting, of excreting and secreting, are processes which examination resolves wholly into chemistry and physics. Chemistry and physics finds them not separable from the rest of chemistry and physics. What we call by convention 'life' is then chemical-physical. **There is indeed no good ground for speaking of these as living, those as not-living**."

This is good stuff indeed. Sherrington continues, in a reference to English physicist Patrick Blackett and his work on the meson (mesotron): [8]

> "When Professor Blackett speaks of the mean life of the mesotron particle and the Insurance Office speaks of the mean life of ourselves his particle's behavior gives him no less right to do so than does ours the Insurance Office."

Indeed, in modern 21st century times, these very same arguments can be found scattered about the Hmolpedia forums (e.g. thread: "defunct theory of life", 10 Feb 2011, post: #49), in regards to the half-life of C-14 and the so-called "half-life" of an average human molecule, if the term is to be used as such (see: lifetime). Sherrington continues:

> "If a definition has to exclude as well as to include, it mist lean on a logical boundary of what it defines; the term life has no such boundary."

Sherrington then brings up the rock vs. human comparison in a well-honed manner:

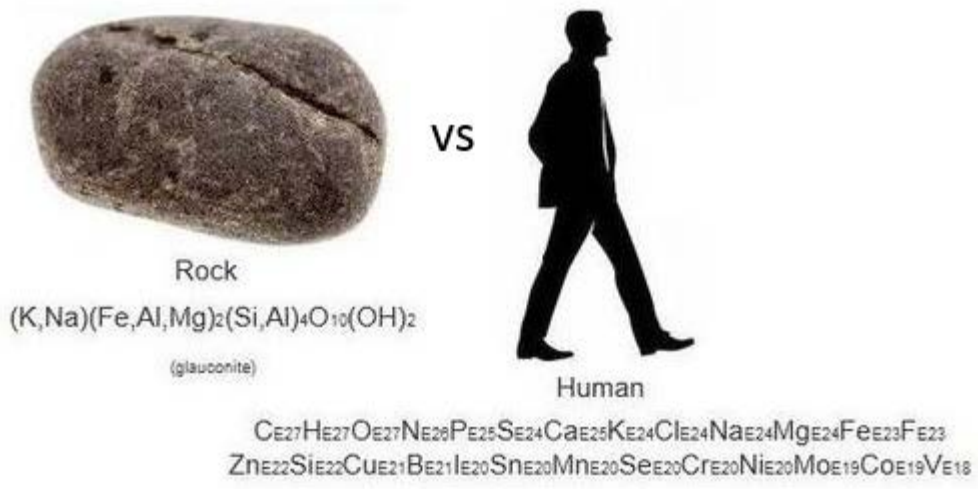

Sherrington brings up the age-old "rock vs. human" comparison, as discussed adjacent, in order to prove his point, namely that: "to make 'life' a distinction between them is at root to treat them both artificially."

> "The 'motion' of an energy system is its 'behavior'. Various types of organization of system produce on that basis various types of behavior. A gray rock, said Ruskin, is a good sitter. That is one type of behavior. A darting dragon-fly is another type of behavior. We call the one alive, the other not. But both are fundamentally balances of give and take of motion with their surround. **To make 'life' a distinction between them is at root to treat them both artificially."**

Other decisive quotes and opinions includes:

> "Perhaps it would be a matter of discussion whether to call the earliest 'living' systems alive or not."

Animate from inanimate

In his chapter five on evolution entitled "Earth's Reshuffling", Sherrington gives a very cogent summary of how there is no so-called dividing line or gap between animate and inanimate and that the former is a product of the latter:

> "The animate and the inanimate as we have seen are in their ultimate parts alike, and fundamentally so in the principle of their construction. When we systematize, the animate falls unconstrainedly into series with the inanimate. The animate then becomes merely a special case within the more general. Analogously, the chemistry of the whole series of the carbon compounds taken within the chemical system is merely a special case within the more general."

Non-life to life boundary issue

See main: Unbridgeable gap

Sherrington is fairly keen in attacking the issue of supposed-to-have-occurred transition from non-life to life in the early years of the earth's evolution/formation. On the platform of the work of American physiologist Lawrence Henderson, who set forth the view that particular physical and chemical conditions in the early phases of the earth may have rendered possible the existence of systems we call 'living', Sherrington inherent issues with the premise:

> "Now such a transition from lifeless to living is thinkable if it be at root an affair of chemical rearrangement. But as transition from one fundamental category of things to another fundamentally different one is unthinkable. The living and the lifeless studied as energy present no difference that rearrangements of their parts will not account for."

This pregnant comment about how when the two supposed 'types', lifeless and living, are studied from an energy perspective, there is no difference, is a decisive position. In modern times, this translates to the illuminating view that in terms of a free energy perspective, or specifically a Gibbs free energy of formation perspective, there is no conceptual difference, in the formation of one molecule to the next progressing upward on the molecular evolution timeline, say from row 6 to 7 or row 10 to 11 or whatever synthesis stage one is to jocularly suppose to be the first life form, a view according to which the concept of a first life form becomes incoherent and hence a defunct scientific theory (defunct theory of life). Sherrington, with a dialogue use of Cleanthes of David Hume's *Dialogue*, continues:

> "Perhaps we had left that mysterious transition from non-living to living as too akin to the miraculous to be understandable by as a process. That mysterious passage from 'lifeless' to 'living'—to 'life', the indefinable, the inexplicable! Life, we know, can be fed with matter but for us to comprehend that matter's becoming 'alive' to trace it 'en passage' from one category of nature to another? What question is there we can put to it about its change as it passes across the boundary from 'dead' to 'alive'? Yes; but suppose, Cleanthes, that boundary to be a figment? The passage then too becomes imaginary. The difficulty becomes an imaginary one. Chemical partial repatterning might then be all, and quite intelligible to the chemist."

Excellent insight indeed! Here Sherrington defining evolution or increase in size of animate matter formation as but "chemical partial repatterning" is keen foresight, well-ahead of its time. He concludes in the end:

> "In the middle ages, and after them with Fernel, as with Aristotle before, there was the difficulty of the animate and the inanimate and finding of the boundary between them. Today's scheme makes plain why that difficulty was, and dissolves it. **There is no boundary**."

Mind from matter

He continues, in the direction that seems to invoke the manner of how mind arises from matter issue:

> "But if there be no essential difference between 'life' and all the rest, what becomes of the difference between mind and no-mind."

Here, in modern terms, we take recourse in ABC model of choice as embodied in the retinal molecule "carbon brain" model of mind to explain the so-called mind from matter issue. In other words, at a certain points in the timeline of the nebular hypothesis formation dynamics of the solar system, heat release from the sun, cyclically, causes or rather "forces" various types of the 92 naturally occurring elements of the volume of the earth, particularly elements with three or more bonding valences, e.g. carbon (4-prong), nitrogen (3-prong), possibly silicon, etc., Sherrington continues:

> "To answer we may follow this hierarchy of systems and things downward and see at what point mind quits. Unless we can do that who knows that mind has left it? Of ourselves, yes we know we have a mind. And the dragon-fly? Yes, it may have a mind. And, amoeba? It may have, but how are we to know? Then of the grey rock?"

Does the gray rock have a mind indeed! Funny stuff, when one is lacking in human molecular theory. In a latter instance, in his chapter nine "Brain Collects with Psyche", Sherrington states:

> "Security of our inference regarding mind fades as traced downwards along the scale of being. Ultimately mind so traced seems to fade to no mind. It becomes so meager that the problem becomes that of trying to prove a negative."

Terminology?

Sherrington, at one point in his derision into the life theory, gives way to the ambivalent conclusion that:

> "The word 'life' still remains useful; a convenient, though not exact term."

This view, however, is incorrect. If "there is no thing endowed with life", in the famous 1925 words of Serbian-born American electrical engineer Nikola Tesla, then the term is vacuous and without meaning. The friction in the continued usage of the term 'life' becomes greatly accentuated when the term is conjoined to thermodynamics, specifically in the labeling attempt at a science called "life thermodynamics" or any of its Greek language camouflaged synonyms: biological thermodynamics, biothermodynamics, or even biochemical thermodynamics, which further blurs the issue. Since the inception of the Hmolpedia (2008) this has been the greatest "labeling" issue, in regards to categorization. The switch from biology (vacuous term) to chnopsology (2012) greatly alleviates this tension.

Evolution is an eddy in the second law

The following is a noted section, oft-quoted in later years: [1]

> “The living energy-system, in commerce with its surround, tends to increase itself. If we think of it as an eddy in the stream of energy it is an eddy which tends to grow; as part of this growth we have to reckon with its starting other eddies from its own resembling its own. This propensity it is which furnishes opportunity under the factors of evolution for a continual production of modified patterns of eddy. It is as though they progress toward something. But philosophy reflects that the motion for the eddy is in all cases drawn from the stream, and the stream is destined, so the second law of thermodynamics says, irrevocably to cease. The head driving it will, in accordance with the ascertained law of dynamics, run down. A state of static equilibrium will then replace the stream. And yet they will have been evolved. There purpose then was temporary? It would seem so.”

The Charles Sherrington commemorative stained glass window (1990), in the dining hall of Gonville and Caius College, Cambridge, depicting one of his own diagrams showing an afferent neuron or specifically: “two excitatory afferents with their field of supraliminal effect in the motoneurone pool of a muscle”, which might give a loose idea of his notion of an "organized complex" or tentatively “life” (a term which he puts to scrutiny), being but an “eddy in a stream of energy”, a stream “destined by the second law of thermodynamics.” [4]

Sherrington elaborated on his further in his lecture/chapter three "Life in Little". In another place, for instance, he states:

“The cell is a dynamic equilibrium. It is so constituted as to maintain itself for a time—a time which is very brief as compared with the persistence of many inanimate things. From and to the world around it takes and gives energy. It is an eddy in a stream of energy. It has the power of throwing off from itself other eddies specifically like itself. In that way, though its personal eddy is brief, its specific eddy is as a species lasts immensely longer. But that eddy has inherent in its tendencies toward change, so that, where we are able to look back far enough, we find great numbers of its specific forms have vanished, and a multitude of modifications taken their places. These too are all on their way to change. It remains at present largely beyond our forecasting.”

This passage brings to mind: bound state, stability, reproduction (power of throwing off from itself other eddies specifically like itself), cell-as-molecule, Heraclitus (“never step in the same river twice”), Charles Darwin (on modifications), and C.G. Darwin (on forecasting). In any event, by 1978, this "eddy view" of chnopsological structures, had been truncated, at least in the mind of Morgan Peck, who states he had been taught Sherrington in college, to the form: “Evolution is an eddy in the second law of thermodynamics.” [2]

Reaction end | Last words

The following, supposedly, Sherrington near-to-end last words:

> “For me now the only reality is the human soul.”
>
> — Charles Sherrington (1952), statement made to John Eccles, during “deeply moving discourse”, nine days before his death (reaction end), Feb 24 [10]

Quotes | On

The following are quotes on Sherrington:

"**Sherrington's** *Integrative Action of the Nervous Systems* (1904) in neurology holds a position similar to that of Newton's *Principia* in physics. Here is the imprint of a scientific genius."

— FMR Walsh (c.1920) (Ñº)

Quotes | By

The following are quotes by Sherrington:

"Natural science has studied life to the extent of explaining away life as any radically separate category of phenomena. The categories of living and lifeless as regards science disappear; there is no radical scientific difference between living and dead. Time was when to think and to breathe were on an equality as attributes of life. Now, living, so far as breathing, moving, assimilating, growing, reproducing, etc. amount to life, has by natural science been accounted for—some might say, 'explained'. There is nothing in them which does not fall within the province of science. There are chemistry and physics."

— Charles Sherrington (c.1938)

"The self is a unity. The continuity of its presence in time, sometimes hardly broken by sleep, its inalienable "interiority" in (sensual) space, its consistency of view-point, the privacy of its experience, combine to give it status as a unique existence. . . . It regards itself as one, others treat it as one. It is addressed as one, by a name to which it answers. The law and the state schedule it as one. It and they identify it with a body which is considered by it and them to belong to it integrally. In short, unchallenged and unargued conviction assumes it to be one. The logic of grammar endorses this by a pronoun in the singular. All its diversity is merged into oneness."

— Charles Sherrington (1947), "Preface" to *The Integrative Action of the Nervous System* [11]

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θΔics

In existographies, **Charles Percy Show** (1905-1980) [CR:58], aka “C.P. Snow”, was an English physicist, noted for his controversial 1959 Rede Lecture “The Two Cultures” in which he commented to the effect that culture is divided between those who have an understanding of the second law and those who have read a work of Shakespeare, and that each culture is abysmally ignorant of the intellectual details of the other culture, and moreover their is a "divide" between the two cultures (see: two cultures divide; two cultures namesakes; two cultures calls). [1] The eponym "Snowed" (Scott, 1985) refers to one culture attending a meeting, class, or conference of another culture and being completely "lost" as to what is being said.

The two cultures

On 7 May 1959, Snow, in his talk “The Two Cultures”, a Rede Lecture given at Cambridge, presented a thesis according to which science and the humanities, which represented "the intellectual life of the whole of western society", had become **split** into "two cultures" and that this division was a major handicap to both in solving the world's problems; the following is the most-cited quote from the lecture: [2]

> “A good many times I have been present at gatherings of people who, by the standards of the traditional culture, are thought highly educated and who have with considerable gusto been expressing their incredulity at the illiteracy of scientists. Once or twice, I have been provoked and have asked the company how many of them could describe the second law of thermodynamics. The **response was cold**: it was also negative. Yet, I was asking something which is about the scientific equivalent of: Have you read a work of Shakespeare's?”
>
> — Charles Snow (1950), “The Two Cultures”, Rede Lecture, Cambridge, May 7

The lecture was published as 51-page booklet entitled *The Two Cultures and the Scientific Revolution* (1959) and later expanded into a larger 107-page *The Two Cultures: and a Second Look: an Expanded Version of The Two Cultures* (1965); both of which having gone on to stimulate several other books on the same subject. [3]

In 1986, Frederick Burwick, an American literature scholar, gave the following etymology of when the so-called Snowdrift (see: Snowed) intellectual rift began:

> “The age of *Faust* [1772-1882] had been the age of the ‘Renaissance man’, a time when the possibility of a universal knowledge, mastery of the arts and sciences, still seemed to be open to the ambitious mind; [thereafter] the separation and dispersion of intellectual endeavors, dubbed the **‘**two cultures**’** by **C.P. Snow**, [resulted]; [in the years to follow, individuals such as] Thomas Young, Humphry Davy, and William Hamilton, could all make serious claims to humanistic breadth, if not universality, in their intellectual accomplishments; nevertheless, a rift between the arts and the sciences was evident.”

In short, Burwick, attributes the intellectual rift to have emerged following the passing of Goethe (1832), which seems to be correct, being that Goethe, and his 1799 elective affinities theory, was the last to successfully bridge the gap between the physical sciences and the social sciences.

Other

The oft-quoted rules-of-the-game formulation of the laws of thermodynamics has been attributed to Snow, who, supposedly, stated that the three laws of thermodynamics can be summarized as: 1) you can’t win; 2) you can’t break even; and 3) you can’t quit the game. [6]

Education

Snow completed his BA at Leicester University, and in 1930 his PhD in physics at Cambridge. [5]

Quotes | On

The following are quotes on Snow:

> "Luddites and anti-intellectuals do not master the [partial] differential equations of thermodynamics or the biochemical cures of illness; they stay in thatched huts and die young."
>
> — Edward Wilson (1978), *On Human Nature* (pg. 207); presumably a play on Snow's lecture

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θΔics

In existographies, **Charles Southwell** (1814-1860) (FA:121) was and English freethinker, noted for []

Overview

In 1841, Southwell, together with George Holyoake, dissented from the official policy of Owenism (Robert Owen's atheism utopia, of sorts), that lecturers should take a religious oath, to enable them to take collections on Sunday; founded the atheist publication *Oracle of Reason*, characterized as the first avowedly atheistic periodical published in Britain, because of which he, along with several editors, was soon imprisoned owing to its content; Holyoake took over as editor, and was moved to an atheist position as a result of his experiences. [1]

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External links

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θΔics

In existographies, **Charles Steinmetz** (1865-1923) (FA:150) was a German-born American mathematician, electrical engineer, and philosopher, noted for []

Religion | Atheism

Steinmetz, while frequently being quoted for his 1922 denial of god, soul, and immortality view, was raised Lutheran, confirmed, later becoming "nominally Lutheran", seems to used coded talk of how god could suggestively be in the infinities of spacetime, or something to this effect, but that science has nothing to say on this. [2]

Technocracy

In the winter of 1918-1919, Steinmetz was one of the members of Howard Scott's technocracy group, which included: Richard Tolman and Thorstein Veblen, among others.

Other

Steinmetz was an associate (Ñº) of Thomas Edison and Albert Einstein, to name a few.

Genius rankings

Some have speculatively ranked (2017) Steinmetz along with Nikola Tesla and or Einstein in respect to brilliance. (Ñº)

Quotes | By

The following are quotes by Steinmetz:

Photos of **Steinmetz** rubbing shoulders with Thomas Edison (1922), left, and Albert Einstein and Irving Langmuir (1921), right. [3]

"In the realm of science, all attempts to find any evidence of supernatural beings, of metaphysical concepts, as god, immortality, infinity, etc., have thus far failed, and if we are honest, we must confess that in science there exists no god, no immortality, no soul, or mind, as distinct from the body. Science has inevitably become atheist."

— Charles Steinmetz (1922), "Religion and Modern Science: How They Differ, and the Place of Each" [1]

"There has grown up an increasing antagonism between science and religion, making the two incompatible with each other. Our knowledge of the superior entitles with which historic religion deals has been derived by experience and by 'revelation'. Undoubtedly **experience led to the first conception of superior beings, or 'gods': the forces of nature personified**; the experiences in dreams; the orderly progress of nature, which seemed to imply a manager of the universe. With our increasing knowledge, this became less and less satisfactory."

— Charles Steinmetz (1922), "Religion and Modern Science: How They Differ, and the Place of Each" [1]

> “The terror of the thunderstorm, for instance, primitive man to the conception of a supreme being whose attribute was the thunderbolt [e.g. Zeus]. But when Franklin brought the lightning from the clouds and showed it to be a mere electric spark, when we learned to make the lightning harmless by the lightning rod, and when finally we harnessed electricity to do our work, naturally our reverence for the thrower of the thunderbolt decayed. So the gods of experience vanished.”
>
> — Charles Steinmetz (1922), “Religion and Modern Science: How They Differ, and the Place of Each” [1]

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θΔics

In existographies, **Charles Wheatstone** (1802-1879) (IQ:#|#) (Murray 4000:15|T) was an English scientist and inventor, a characterized "forgotten genius" (Gossick, 1968) (Q), noted for []

Speed of electricity

In 1834, Wheatstone used a Leyden jar, a conducting wire with a gap cut in it, and a rotating mirror, to measure the speed of electricity. [1]

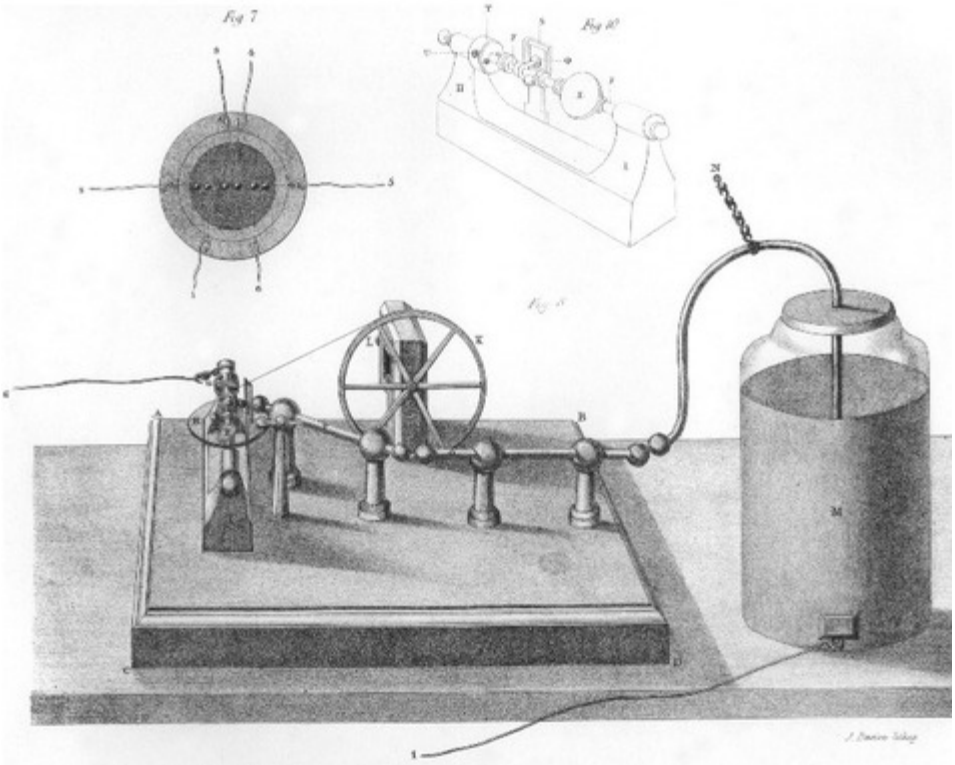

This revolving mirror design was later used by Leon Foucault and Hippolyte Fizeau to measure the velocity of light (or speed of light).

Telegraph

In 1836, Wheatstone and William Cooke (1806-1879), based on the Andre Ampere telegraph model (1820), built the first working telegraph system, and transmitted a message of one mile along a railway in London. [2]

References

1. Wheatstone, Charles. (1834). "An Account of some Experiments to Measure the Velocity of Electricity and the Duration of Electric Light" (pdf), *Philosophical Transactions of the Royal Society of London*, 124:583-91, Jun 19.
2. Kirby, Richard. (1956). *Engineering in History* (co-authors: Sidney Withington, Arthur Darling, Frederick Kilgour) (pg. 338). Courier, 1990.

External links

- Charles Wheatstone – Wikipedia.

θΔics

In existographies, **Charles Winslow** (1811-1877) was an American physician and philosopher noted for []

Overview

In 1869, Winslow, in his “Inertia, Force, and Mind” chapter, of his *Force and Nature, Attraction and Repulsion*, outlined his model of panbioism and “god code” speak to argue that “living forces” exist in atoms and molecules and that a “secret creating agency” lies within matter, so to therein attempt to extend the ideas of Plato, Aristotle, and Leibniz, into a metaphysically anchored energy theory of everything, with focus on "vis viva" and "vis formatrix" as his "final principle".

In 2007, Libb Thims, having only read a few sampled pages of Winslow’s work, specifically on molecular force (pgs. 54-58), thereby being unaware, at the time, of Winslow’s underlying god-based panbioism agenda, cited Winslow’s views in his *Human Chemistry*. [2]

Education

Winslow completes his MD at Harvard in 1834.

References

1. Winslow, Charles F. (1869). *Force and Nature, Attraction and Repulsion: the Radical Principles of Energy – Discussed in Relation to Their Morphological Development*. J.P. Lippincott & Co.
2. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pdf) (Winslow, pg. 172-74, 330). Morrisville, NC: LuLu.

External links

â— Charles F. Winslow – Wikipedia.

θΔics

In hmolscience, **Charles M. Wynn, Sr.** (1939-) is an American chemical engineer and organic chemist noted for his 1994 “Heat Flow vs. Cash Flow: A Banking Analogy”, wherein he attempts to model interpersonal cash flow in heat terms, i.e. exothermically and endothermically, and for his 2011 editorial efforts to reconcile faith and science.

Overview

In 1994, Wynn, in his “Heat Flow vs. Cash Flow: A Banking Analogy”, posits that a person’s amount of readily available case from an ATM is modeled as a thermodynamic system, according to which money withdrawal (exocash) is considered as an exothermic reaction and money deposit (endocash) an endothermic reaction; he abstract of which is as follows: [1]

> “An analogy is drawn between the withdrawal of money from an automated teller machine (ATM) and an exothermic chemical reaction. In the analogy the amount in an individual’s account is regarded as the system and the money withdrawn is regarded as part of the surroundings. Diagrams are used to present the analogy. An analogy can be drawn also between a deposit into an account and an endothermic chemical reaction.”

(add discussion)

Religion | Science

In 2011, Wynn, together with American physicist Arthur Wiggins (Q), edited the collaborative book *And God Said, Let There Be Evolution*, where a number of religious-minded scholars attempt to argue that evolution can be reconciled with religion, Christianity and Islam in particular, namely by a flexible re-interpretation and reading of the various Biblical and Quranic passages, and that one doesn’t have to abandon one’s faith in order to accept modern science. [3] The following is a representative quote from the their book, in respect to a view they seem to oppose:

> “Materialism is absolute and we cannot allow a divine foot in the door.”
>
> — Richard Lewontin (1997) [5]

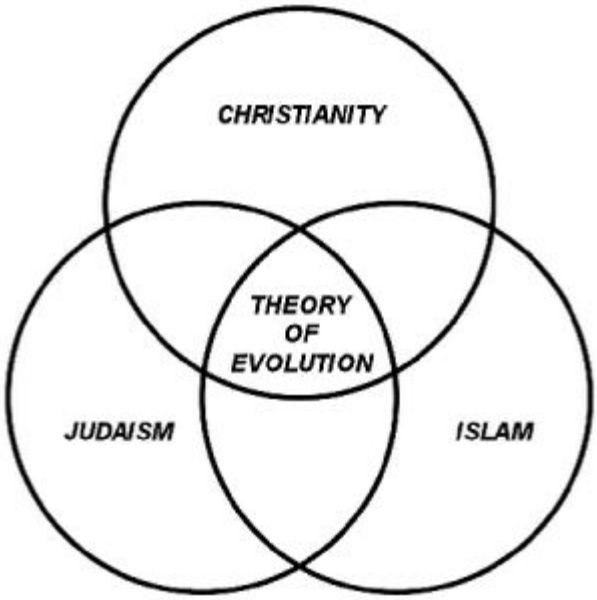

Wynn and Wiggins’ religious venn diagram, outlining the general view of the authors, namely acceptance that humans evolved, that the universe is 14-billion years old, that humans were not “created” all at once, but rather creation is the work of god, fitted into the beginning and or process in some way. [2]

(add discussion)

Kozliak

Wynn’s analogy, to note, inspired the 2002 article “Energy and Money, Chemical Bonding as Business, and Negative ΔH and ΔG as Investment” by Russian-born American physical chemist Evguenii Kozliak, who expanded on the former in a number of ways. [2]

Education

Wynn completed his BS in chemical engineering at the City College of New York and his MS in chemistry and PhD in 1965 organic chemistry, the latter with a dissertation on "Stereochemistry of Pyrrolidine Addition to Bicyclo[2.2.2]oct-2-ene-2-carbonitrile", at the University of Michigan. Wynn presently is assistant chair and professor at Eastern Connecticut State University. [4]

Note

Wynn senior not to be confused with his son, Charles M. Wynn, Jr., a research physicist at MIT's Lincoln Lab in Lexington, MA,

References

1. Wynn, Charles M. (1994). "Heat Flow vs Cash Flow: A Banking Analogy" (abs) (Q), Presented at the 13th International Conference on Chemical Education, Inter-American University of Puerto Rico, Aug 9; in: *Journal of Chemical Education*, 74(4):397, 1997.
2. Wynn, Charles M. and Wiggins, Arthur W. (2011). *And God Said, Let There Be Evolution!: Reconciling the Book of Genesis, the Quran, and the Theory of Evolution* (abs) (Amz) (Venn diagram, pg. 175). All Things That Matter Press.
3. Kozliak, Evguenii. (2002). "Energy and Money, Chemical Bonding as Business, and Negative ΔH and ΔG as Investment" (abs), *Journal of Chemical Education*, 79(12):1435.
4. Charles M. Wynn, Sr. (faculty) – Eastern Connecticut State University.
5. (a) Lewontin, Richard. (1997). "Review", *New York Review of Books*, Jan 9.
(b) Wynn, Charles M. and Wiggins, Arthur W. (2011). *And God Said, Let There Be Evolution!: Reconciling the Book of Genesis, the Quran, and the Theory of Evolution* (abs) (Amz) (Lewontin, pg. 160; Venn diagram, pg. 175). All Things That Matter Press.

Further reading

- Wynn, Charles M. (2014). "Scientific Methodology and its Religious Parallels" (Q), *Skeptical Inquirer*, 38(4):55.
- Wynn, Charles M. (2011). "An Ambitious, Hopeful Response to 9/11", *Skeptical Inquirer*, 35(5):11.

External links

- Charles M. Wynn (faculty) – Eastern Connecticut State University.
- Charles M. Wynn (profile) – Amazon.com.
- Wynn, Charles M. – WorldCat Identities.

θΔics

In *Elective Affinities*, **Charlotte** is the marriage partner, in a dulling marriage, to Eduard, whom from, at one point, he breaks away traveling incognito about the world; she is renowned for her aplomb in difficult social situations; she diffuses conflict and smooths over unpleasantness. Previously she tried to fix Ottilie for marriage with Eduard.

German socialite Charlotte von Stein (1742-1827), and her house in Weimer, Germany, whose affections Goethe in 1775 tried to win, although already married with seven children and seven years his senior—she is the main person behind the **Charlotte** character of Goethe's 1809 *Elective Affinities*.

Fix page

- Charlotte Buff (1753-1828) – Wikipedia.
- Charlotte von Stein (1742-1827) – Wikipedia.
- Charlotte von Lengefeld (1766-1826) – Wikipedia.

Charlotte von Stein

It is the general opinion of scholars that the character Charlotte is based on German high society lady Charlotte von Stein (1742-1827), whom in 1774, although seven years his senior and the mother of seven children, Goethe attempts to win her favor.

After arriving in Weimar, he was soon captivated by the charm of lady Charlotte von Stein (1742-1827), the main person behind the character Charlotte; for more than ten years Charlotte von Stein was his constant companion, and by her bright and genial nature and friendship she stimulated his efforts and assuaged his cares. In a January 1775 by Johann Zimmermann on Charlotte von Stein, he comments: [1]

> "You want me to speak to you of Goethe ... One who visited me the other day made me the following account of Goethe: 24 years old, lawyer, good lawyer, connoisseurs and readers of the ancients, especially the Greeks, poets and writers, orthodox, heretics, Poss driver, musician stands, striking, etched in copper pours in plaster, wood cuts in the - in short, he is a great genius, but a terrible human being. A woman of the world who saw him often, told me that Goethe was the most beautiful, the liveliest, the most original, most ardent, impetuous, at once gentle, seductive, short of the most dangerous for a woman's heart man she met in her entire life."

In a 1775 letter from Goethe to Charlotte von Stein: [1]

"Oh, I was wrong, once I had a lot of playmates, because I know you, I am almost alone."

A depiction of Goethe and **Charlotte von Stein** reading or discussing with each other (drawn by Goethe). [2]

Silhouette of Frau von **Stein's family**: her father stands behind her, while she plays chess with her brother.

On Goethe's return from Italy in 1788 the previous intimate relations between them were relaxed, and the poet's connection with the younger Christiane Vulpius (1765-1816) still further estranged them.

See also

- Goethe’s affinity table
- Goethe timeline

References

1. Goethe and Charlotte von Stein (German → English) – Ammermann.de.
2. In: Reinhard Lindenhahn, Weimar Classicism, Berlin 1996, p.60.

External links

- Charlotte von Stein – NNDB.com.
- Charlotte von Stein (German → English) – Wikipedia.

θΔics

In existographies, **Charlotte von Stein** (1742-1827) was a German baroness noted for her complex love affair with German polymath Johann Goethe, from 1774 to 1786, during which time Goethe sent her some more than 1,500 letters and notes, and who later formed a large part of the character Charlotte of Goethe's 1809 physical chemistry based novella *Elective Affinities*.

Goethe and **Charlotte von Stein** (O) to whom he wrote more than 1,500 letters and notes, and who formed the main character to "Charlotte" of *Elective Affinities*.

Love letter

See also: Goethe on the soul

In early 1770s, before Goethe met Charlotte he, supposedly, was shown a portrait of her, which he responded:

> "It would be a magnificent spectacle to see how the world is reflected in this soul. She sees the world as it is, and yet through the medium of love. And mildness is the predominant impression."
>
> — Goethe (c.1774), on photo of Charlotte von Stein [6]

Other statements made to Charlotte or related to her are as follows:

> "We first know we exist when we recognize ourselves in others."
>
> — Goethe (c.1778), On Charlotte von Stein [6]

> "My soul has grown fast to yours ... I am inseparable from you, an ... neither height nor depth can keep me from you. I wish there were some sort of vow or sacrament that would make me yours, visibly or legally. And my period of probation was long enough to think it all over."
>
> — Goethe (1781), "Letter to Charlotte von Stein", Mar 12 [6]

In 1783, Goethe became tutor to Charlotte's son, Fritz, which gave him further contact with her. He found consolation in the idealized image of Charlotte, present to him even when she was not there. Yet he declared himself lonely. [6]

Fix page | Below

Goethe, to note, seems to have been involved with or connected in some way with at least three different "Charlottes", as listed below:

- Charlotte Buff (1753-1828) – Wikipedia.
- Charlotte von Stein (1742-1827) – Wikipedia.

● Charlotte von Lengefeld (1766-1826) – Wikipedia.

not to mention the character Charlotte of *Elective Affinities*; some of the details of these various Charlottes, seem to be intermixed (by mistake) in the following article.

On 17 Jun 1784, only a few months after he had discovered the human intermaxillary bone (Mar 27), Goethe wrote the following love letter to Charlotte: [5]

> "My letters will have shown you how lovely I am. I don't dine at Court, I see few people, and take my walks alone, and at every beautiful spot I wish you were there.

I can't help loving you more than is good for me; I shall feel all the happier when I see you again. I am always conscious of my nearness to you, your presence never leaves me. In you I have a measure for every woman, for everyone; in your love a measure for all that is to be. Not in the sense that the rest of the world seems obscure tome, on the contrary, your love makes it clear; I see quite clearly what men are like and what they plan, wish, do and enjoy; I don't grudge them what they have, and comparing is a secret joy to me, possessing as I do such an imperishable treasure.

> You in your household must feel as I often do in my affairs; we often don't notice objects simply because we don't choose to look at them, but things acquire an interest as soon as we see clearly the way they are related to each other. For we always like to join in, and the good man takes pleasure in arranging, putting in order and furthering the right and its peaceful rule. Adieu, you whom I love a thousand times."

Very deep insight shown here indeed.

In 1758, Charlotte became a lady-in-waiting to Anna Amalia, Duchess of Saxe-Weimar-Eisenach whom she served until the Duchess's death in 1807. On 17 May 1764, Charlotte married "Johann Christian Kestner" or Baron Gottlob Ernst Josias Friedrich Freiherr von Stein (1735-1793).

This was not a marriage out of love, but for social and political interests, or one out of "necessity" as Goethe describes it in the former marriage of Charlotte, prior to her marriage with Eduard. Often Charlotte remained alone in Weimar, as her husband had to travel a lot, serving the duke of Jena-Weimar. From 1764 to 1773 she gave birth to seven children. The four daughters died, three boys (Karl, Ernst, Fritz) survived. After her seventh child was born she had to take several cures as she was physically exhausted.

Sections of the Charlotte von Stein mansion in Thuringia. [2]

In 1774, or Nov 1775 (O), Goethe and Charlotte von Stein met in Weimar.

It was the beginning of a deep friendship which lasted for twelve years. During this time she had a strong influence on Goethe′s work and life. Goethe took into his house her eleven-year old son Fritz (her darling), in May 1783, and took over the boy′s education to her satisfaction.

During this she was in the center of social life and attention and met many famous personalities, e.g. Friedrich Schiller, Karl Knebel, and Johann Zimmermann. She frequently corresponded with Schiller's wife Charlotte von Lengefeld (1766-1826)—who, supposedly, having never fully reconciling her aristocratic background with the bohemian lives of her poet husband and his friends, encouraged Schiller in his cruelty toward Goethe's mistress and later wife Christiane Vulpius; she wrote of Goethe after Christiane's death, "the poor man wept bitterly. It grieves me that he should shed tears for such objects." [1]

Husband's end

After her husband had died in 1793 Charlotte retired from society and became more and more lonely. This seems to be a turning point, during which, in the novella, Goethe began subconsciously contemplating a "what might have been" scenario, namely that if now, Charlotte, being "freed" from marital obligations, betrothed Goethe. The Eduard-Charlotte marriage, depicted in the novella, seems to capture this scenario.

In 1794 she wrote the drama Dido which was a literary self-portrait. It reflected the years from 1770 to 1790 and the situation in Weimar at that time.

Top row: Side profiles of Charlotte von Stein; Bottom row: Anna Amalia, and her family, whom Charlotte was a "lady in waiting" for from 1758 to 1807.

References

1. (a) Charlotte von Lengefeld – Wikipedia.
(b) Damm, Sigrid, *Christiane und Goethe: Eine Recherche* (Frankfurt: Insel, 1998), quoted in Karin Barton, "Goethe über alles," Eighteenth-Century Studies, Vol. 34, No. 4 (Summer, 2001), pp. 630-637.
2. Charlotte von Stein mansion (in Großkochberg/Thuringia) – TrekEarth.com.
3. Pastel drawing of Charlotte (Lotte) Buff, by Gustav Koennecke (link), Bilderatlas zur Gschichte der deutschen Nationalliterature —Graz: Akademische Durck – und Verlagsanstalt, 1981.
4. Armstrong, John. (2006). *Life, Love, Goethe* (pg. 54). Penguin.
5. Goethe, Johann. (1784). “Letter to Charlotte von Stein”, Jun 17.
6. Anon, Kim. (2009). “Johann Goethe to Charlotte von Stein” (Q), Geocities, Archive.

External links

- Charlotte von Stein – Wikipedia.
- Charlotte von Stein (German → English) – Wikipedia.
- Charlotte von Stein – NNDB.com.

θΔics

In schools, **Charvaka**, “Lokayata” (600BC), “Charwaka” (Taylor, 1893), or Carvaka (Hecht, 2004), is an atheistic materialism school of Indian philosophy that embraces philosophical skepticism and rejects Vedas, Vedic ritualism, supernaturalism, and afterlife.

The four elements: earth, air, water, and fire, are the original principles of the **Charvaka** atheistic philosophical system (600BC).

Overview

See also: Hindu atheism

In 600BC, the Charvaka, an Indian heterodox philosophical school, produced *Brihaspati Sutra*, which outlined an “extraordinary materialistic doctrine” (Hecht, 2004), which was averse to the Brahman class; the latter of whom systematically destroyed their works; the following are representative position quotes:

> “While life is yours, live joyously; none can escape death's searching eye: When once this frame of ours they burn, how shall it e'er again return?”
>
> — Anon (c.600BC), Charvaka position [4]

> “There is no other world other than this. There is no heaven and no hell. The realm of Shiva and like regions, are invented by stupid imposters.”
>
> — Anon (c.600BC), Charvaka position; in: Sarva-Siddhanta Samgraha (Verse 8) [3]

> “Uncivilized ignorant fools, who imagine that spirit is something different from body, and reaps the rewards of actions in future state; we might as well expect to find excellent fruit drip from trees growing in the air.”
>
> — Anon (c.600BC), Charvaka position; voice of: Passion in *The Rise of the Moon Intellect* (1200) [1]

(add)

Soul

The soul, according to this philosophical school, is conceptualized as such: [4]

> “The [Charvaka] quote the Śruti for this [Bṛihad Áraṇy. Up. ii. 4, 12], "Springing forth from these elements, itself solid knowledge, it is destroyed when they are destroyed,—after death no intelligence remains." Therefore the soul is only the body distinguished by the attribute of intelligence, since there is no evidence for any soul distinct from the body, as such cannot be proved, since this school holds that perception is the only source of knowledge and does not allow inference, &c.”

(add)

Quotes | On

The following are related quotes on the Charvaka:

> “In this school the four elements, earth, air, water fire, are the original principles; from these alone, when transformed into the body, intelligence is produced, just as the inebriating power is developed from the mixing of certain ingredients [e.g. Kinwa producing fermentation in the manufacture of spirits from sugar, bassia, &c]; and when these are destroyed, intelligence at once perishes also.”
>
> — Vidyaranya (1331), *Review of the Different Systems of Hindu Philosophy* [2]

> “Materialism is reverse panpsychism that equates matter with life. **Charvaka** philosophy is the ancient Indian materialism. But tell me do you really think that human actions and behavior are not self controlled but are controlled by external electromagnetic waves? I stop here.”
>
> — DMR Sekhar (2011), “Defunct Theory of Life” (Q), Hmolpedia Thread, Feb 8.

References

1. (a) Maithila (Kirsha Misra) (Q). (1200). *Prabôdha chandrôdaya, or Rise of the moon of intellect: a Spiritual Drama ; and, Âtma bodha, or The knowledge of self* (translator: J. Taylor). (Q). Publisher, 1893.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (§:The Carvaka, pgs. 94-100; fruit, pg. 95). HarperOne.
2. (a) Vidyaranya (Madhava Acarya) (Q). (1331). *Review of the Different Systems of Hindu Philosophy* (*Sarva-Darsana-Samgraha*) (translators E.B. Cowell and A.E. Gough) (§1: The Charvaka System, pgs. 2-11). Trubner & Co, 1882.
(b) Note: *Kiṇwa* is explained as "drug or seed used to produce fermentation in the manufacture of spirits from sugar, bassia, &c." Colebrooke quotes from Śaṅkara: "The faculty of thought results from a modification of the aggregate elements in like manner as sugar with a ferment and other ingredients becomes an inebriating liquor; and as betel, areca, lime, and extract of catechu chewed together have an exhilarating property not found in those substances severally."
(c) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (§:The Carvaka, pgs. 94-100). HarperOne.
3. Billington, Ray. (1997). *Understanding Eastern Philosophy* (pg. 44). Routledge.
4. Vidyaranya (Madhava Acarya) (Q). (1331). *Review of the Different Systems of Hindu Philosophy* (*Sarva-Darsana-Samgraha*) (translators E.B. Cowell and A.E. Gough) (§1: The Charvaka System, pgs. 2-11). Trubner & Co, 1882.

External links

- Charvaka – Wikipedia.

θΔics

In hmolscience, **ChE + H coupling** is the intellectual pairing of a chemical engineer (ChE) and a humanities (H) scholar, e.g. economist, historian, sociologist, psychologist, political scientist, or general philosopher, etc., in an intellectually-coupled manner, results in a two cultures synergy type of product, synthesis, or amalgamated fruit of some sorts.

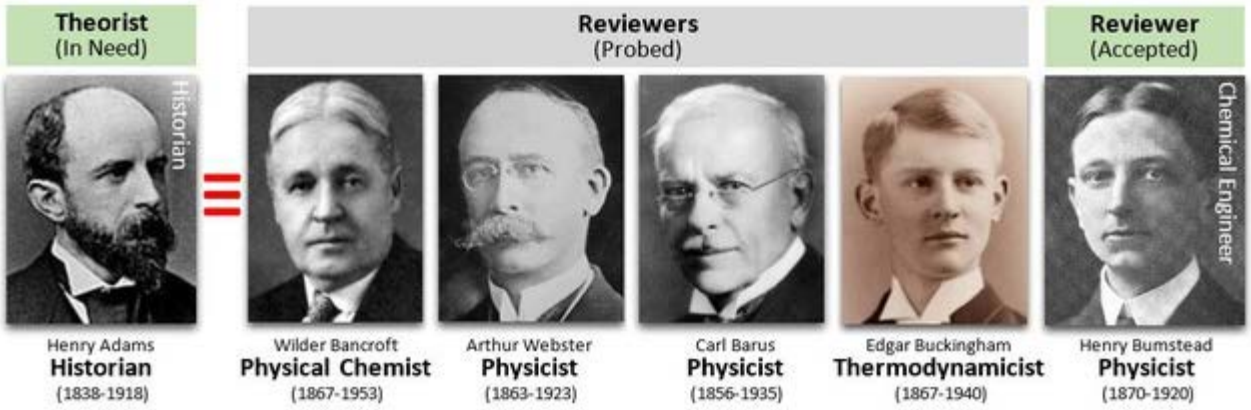

A visual of the difficulty of getting a **ChE + H coupling**, only five are known (as summarized below), namely the listing of people Henry Adams, an historian, i.e. humanities (**H**) scholar, went through (see: **soft science assistance**) to try to get peer review for his 1908 manuscript "The Rule of Phase Applied to History", a chemical thermodynamics based theory of history; the draft was pin-balled around through: Wilder Bancroft, Arthur Webster, Carl Barus, Edgar Buckingham (who said he would review it only AFTER it was typed up and for a fee $5,500 dollars [modern terms]), before finding a competent reviewer in the mind of Gibbs' student Henry Bumstead, an early proto chemical engineer (**ChE**) of sorts, who was in the middle of attempting to master Gibbs' *On the Equilibrium of Heterogeneous Substances*, the backbone of the chemical engineer and of all human free energy theories.

Overview

In 1894, German mega-intellect Hermann Helmholtz (1821-1894) passed and so went with him the mental embodiment of the "last" of the great lineage, preceded by Goethe and Leibniz, of last universal geniuses, one able to firmly grasp physical and chemical principles (aka chemical thermodynamics) in one hand and the rest of human knowledge in the other:

> "The matter of multiplicity of contributors needs no great explanation, for we are all used to this in the modern handbooks. I believe it is a common saying that Helmholtz was the **last universal genius**, and we are fast arriving at the point where even a single subject becomes too vast for one man. At any rate, whether or not any of my learned colleagues could write an entire chemical engineering handbook, I could not—hence the present form."
>
> — Donald Liddell (1922) *Handbook of Chemical Engineering* [1]

The only "thing" passingly able to fill the role, void, or wake in a post Goethe-Helmholtz era, i.e. an era of knowledge over-growth, has been, seemingly, a Gibbs-trained chemical engineer plus humanities mindset pairing; or equivalent.

Adams + Bumstead | History

The following is the 1908 Henry Bumstead + Henry Adams coupling, a Gibbs' protege (a physicist by label) advising or acting as "critic, a scientific, physico-chemical proof-reader" (as Adams wanted), an historian, on his social phase based, human molecular theory explicit, physio-chemical social dynamics theory of history and rise and falls of civilizations, the draft of which, entitled: "The Rule of Phase Applied to History", being reviewed by the former, who produced as 27-page detailed critique of the technical correctness of the theory:

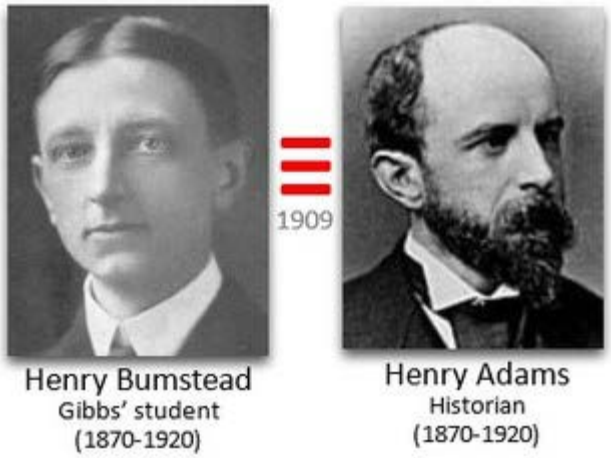

The Bumstead + Adams connection, as outlined above (right) and as discussed more in the "soft science assistance" article, evidences the difficulty of getting connection, using C.P. Snow's two cultures terminology, between a "Shakespeare mindset" and a "Clausius mindset", namely the driving force behind the mind of Adams was immense, and that was the reason the connection was made. The unaware Edgar Buckingham, ignorant of his own insignificance in respect to Adams, in the bigger picture of things, said he would only review Adams' manuscript after it was typed up (he had been sent a hand-written version) and for two hundred dollars, the equivalent of $5,500 dollars (Ñº) in 2016 terms. Adams, in 1909, to exemplify his intellectual fortitude, told Charles Gaskell, on the news of the passing of William Thomson, that he would have been more than willing, if he could reverse time, to walk a "few thousand-million miles" to discuss with Thomson the "thermodynamics of socialistic society".

Flexner + Neumann | Economics

The following is the 1934 John Neumann + Abraham Flexner coupling, a chemical engineer advising an educational reformer (and co-founder of the Princeton Institute for Advanced Study) on the chemical thermodynamics based economics theories of Georges Guillaume:

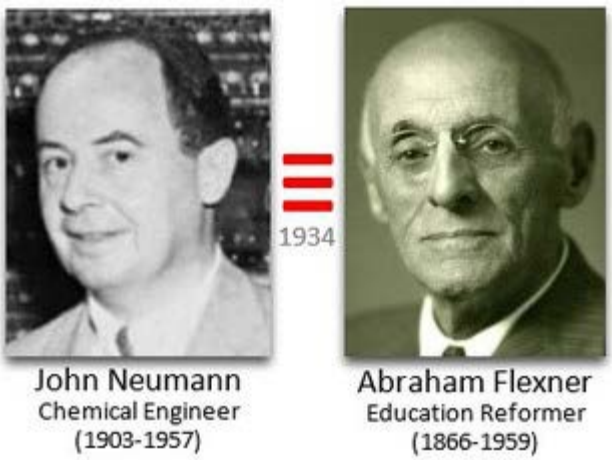

(add discussion)

Samuelson + Wilson | Economics

The following is the 1938 Edwin Wilson + Paul Samuelson coupling, a Gibbs' protege (and a professor of physical chemistry based economics; see: Mathematical Economics) mentoring an a physics-trained economist, which resulted in Wilson telling Samuelson to use Gibbs' equation 133 to formulate an general equilibrium model of economics:

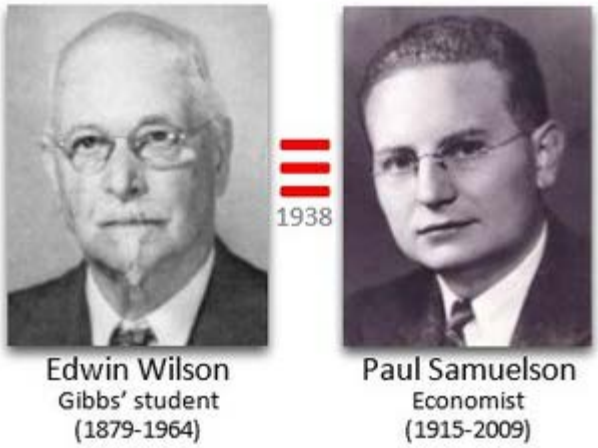

(add discussion)

Tukey + Coleman | Sociology

The following is 1966 James Coleman + John Tukey coupling, a chemical engineer discussing an "human free energy" based attitude reaction theory with a polymath, which resulted in the publication of a synopsis of the latter's theory:

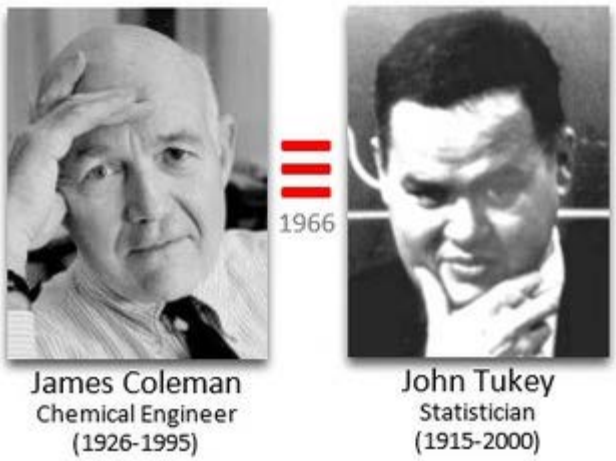

(add discussion)

Kilburg + Donohue | Psychology

The following is the 2012 Marc Donohue + Richard Kilburg coupling, a chemical engineer working with a leadership psychologist, which resulted in their joint publication "Leadership and Organization Behavior: a Thermodynamic Inquiry", which became the focus article of 12-author 10-article special edition of *Consulting Psychological Journal: Practice and Research*, focused on "The Physics of Leadership and Organizational Structure", aka chemical thermodynamics and molecular bonding based psychology:

(add discussion)

Other | Esselen + Dreier | Humanities

The following is the 1948 Gustavus Esselen + Thomas Dreier coupling, a chemist consulting an editor, which resulted in the production of the 1948 booklet *We Human Chemicals*, the second attempt at a general human chemistry book, following William Fairburn (1910).

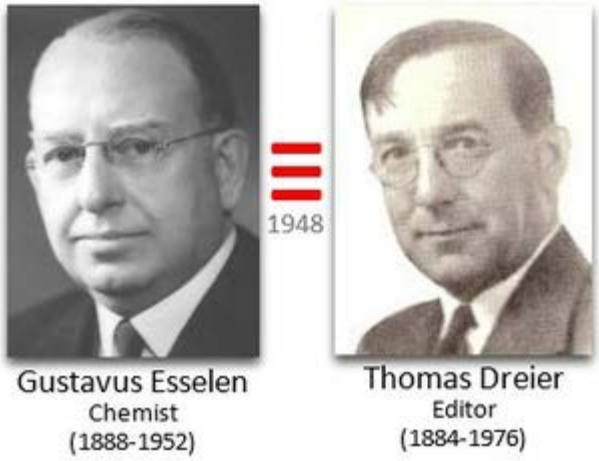

(add discussion)

Other | Barrett + Stephan + Gerhold | Sociology

The following is Louis Barrett + Ed Stephan + George Gerhold coupling, a physicist advising a sociologist who then works with a chemist on, among other things, social chemical potential theory, therein forming a proto two cultures department (see: two cultures synergy) at Western Washington University for some years:

(add discussion)

Other | Siman + Savoiu | Economics

The following is the 2006 to present coupling of Gheorghe Savoiu and Ion Siman, an economist paring with a physicists, the synergy of which has produced the Romanian school of physical socioeconomics and one of the world's first sociophysics and econophysics journals:

Of note, when Libb Thims visited with Simon and Savoiu, in 2013, studying the dynamics of their two cultures department, a salient comment, made by Savoiu, stood out, namely that the humanities scholar has to go to the physico-chemical sciences scholar to test ideas, for reality-checking feasibility, and in no way is this role reversed; economic theories have to answer to the laws of physics, in this case.

Other

Of note other more exotic two cultures couplings have occurred, e.g. Princeton Department of Social Physics, Harvard Pareto circle, or the Lausanne school of physical economics, but none of these involved chemical engineers directly; though Percy Bridgman, who was involved in the Princeton social physics project is an equivalent type.

ChE students | Non-joint

Of note — given the two known examples of ChE students produced humanities-like projects, namely: "Why Students Choose Chemical Engineering?" (2009), made by ChE senior Mary Guthrie, intermixed with the dialogue of economics and ChE student Jawad Mirza, and the student-produced "Thermodynamics of Life: Occupy Wall Street Edition" (2011), supervised by James Ferri, and made by chemical and biomolecular engineering students Angela Wnek (ChBE, 2013), Isaac Lavine (ChBE, 2014), Ashley Kaminski (ChBE, 2013) — when ChE-based humanities-like are made solo by ChE students, as lack of soberness and seriousness seems to be thematic, as compared to the extreme willing to burn at the state soberness of someone like Henry Adams or Lawrence Henderson.

Quotes

The following are related quotes:

> "It is interesting to note that socio-thermodynamics is only accessible to **chemical engineers** and metallurgists. These are the only people who know phase diagrams and their usefulness. It cannot be expected, in our society, that sociologists will appreciate the potential of these ideas."
>
> — Ingo Muller (2007), *A History of Thermodynamics* [2]

Notes

Note: the "ChE + H coupling" term was first used, on 16 Apr 2016, in the Randall Schweller article; out of an early Google Books snippet read confusion that Schweller, a global political science theorist, had consulted with chemical engineering professor Sharon Glotzer on entropy at the nano-scale and the political-scale, which was not the case.

References

1. Liddell. Donald M. (1922). *Handbook of Chemical Engineering, Volume 1* (quote, pg. ix). McGraw-Hill Company.
2. Müller, Ingo. (2007). *A History of Thermodynamics: the Doctrine of Energy and Entropy* (pg. 164). New York: Springer.

θΔics

In science, **chem**, from the Egyptian *keme*, ‘fertile black soil”, Egyptian hieroglyph "km.t", meaning ‘black’, a reference to the alluvial overly-fertilized black soil left on the banks of the Nile River, following the annual 150-day flood, carried down from Ethiopian mounts with the waters of the melting snow, which forms the roots of words such as: *chem*-istry, from the Muslim alchemy, i.e. al-chemie, or “the black art” (adopted from the Egyptians), bio-chem-istry, physical chemistry, biochemical thermodynamics, etc., along with names such as: Abraham (Ab-ra-ham) and Brahma (B-ra-hma), the Hebrew suffix *-ham* pronounced “chem” and the Hindu suffix *-hma*, a different pronunciation, but same religio-mythology etymology, namely: the Heliopolis creation myth, predominately.

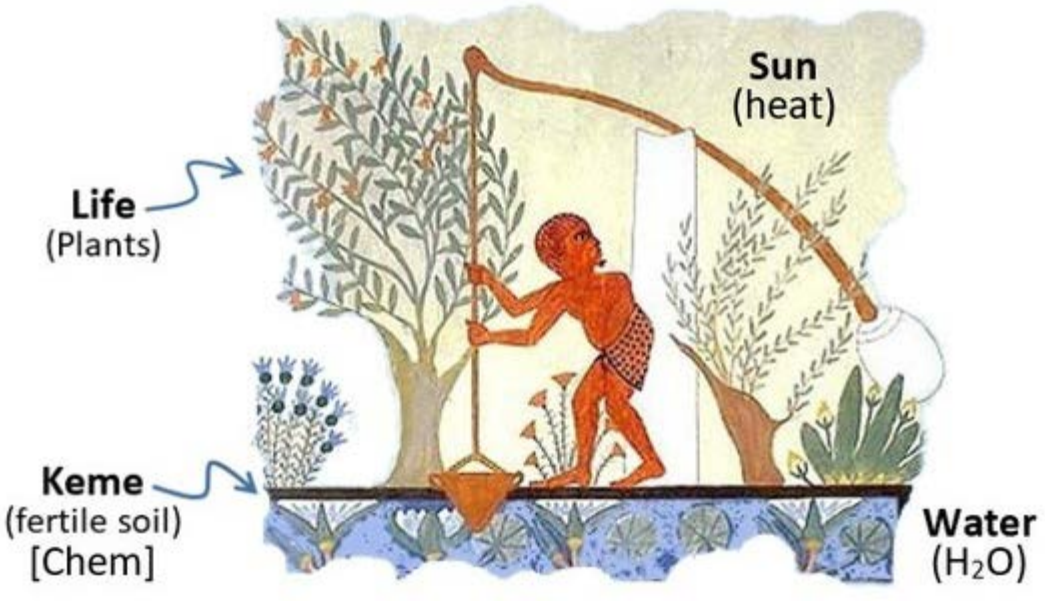

A diagram (Thims, 2016) of the Egyptian cosmological model of "**chem**" (or "keme"), the layer of black soil, in respect to crop or plant growth. [1]

Discussion

The following table (Ñº) shows the composition of average "soil" generally speaking, showing that soil tends to be comprised of 13 elements, an OSiAlNaKCa+7 element chemical substance or type of matter, crudely speaking:

Average content (% weight) of chemical elements in soils

Elements	Average content in soil %	Elements	Average content in soil %
Oxygen	49.00	Magnesium	0.60
Silicon	33.00	Carbon	2.00
Aluminum	7.13	Sulphur	0.08
Sodium	0.63	Nitrogen	0.10
Potassium	1.36	Phosphorous	0.09
Calcium	1.37	Titanium	0.46
Iron	3.80		

which can be compared with "plants", which are solar-powered CHNOKCa+10 species, or "animals", which are solar+nutrient powered CHNOPS+ species, e.g. a human, as shown above, is a CHNOPS+16 species.

Biochemistry | Terminology issues

The term “biochemistry”, in the correct etymological sense of things, means: the study of **"living chem"**, "living black soil", or "living OSiAlNaKCa+7 species", which becomes doubly-nonsensical, firstly that things like animals are not made of elements like aluminum, and secondly bio- is a defunct concept, physically, chemically, and thermodynamically.

Certainly, we can think of things, in the sense that when the flood waters receded, Egyptians, aka "Kemites", as they were originally called, started their crop season by planting seeds in the soil, during their month-long Egyptian Khoiak festival (Dec 10 to Jan 8), after which the combination of water, soil, and heat from the sun grew plants.

Quotes

The following are related quotes:

> "In coordination with these star [Sirius], flood, and sun rebirth patterns, these Egyptian thinkers also noted that a fertile black soil, called ***keme***, pronounced **'chem'**, as in ***chem***-istry, aka the 'black art', the term 'keme' spelled as the suffix ***-ham*** in Hebrew, as in Abra-***ham*** (or Ebra-***him*** in Islam), is left behind, i.e. deposited on the Nile banks, when the flood recedes, after which, via the action of sunlight (heat) and water (H2O), animate things, aka 'life', such as plants, e.g. wheat, and animals, e.g. mice, appeared seemingly to be 'born out' of this newly made black fertile soil."
>
> — Libb Thims (2016), *Smart Atheism: for Kids* [1]

> "Life is like **chem**; the goal's to be able / To bond well with others so we can be stable."
>
> — Mala Radhakrishnan (2013), tweet, Atomic Romances, Aug 17 [2]

See also

â— CHEM cypher
â— Chemistry (etymology)

References

1. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs) (pg. 94). Publisher.
2. Atomic Romances (Mala Radhakrishnan) – Twitter.

θΔics

In hmolscience, **CHEM cypher**, as compared to the OTTO cypher and ECHO cypher, refers to the coded acronym that people (or humans), as seen through the reality vision restoration eyes (aka Saint Ottilia), are different types of evolved or metamorphized CHEM things or "chemicals".

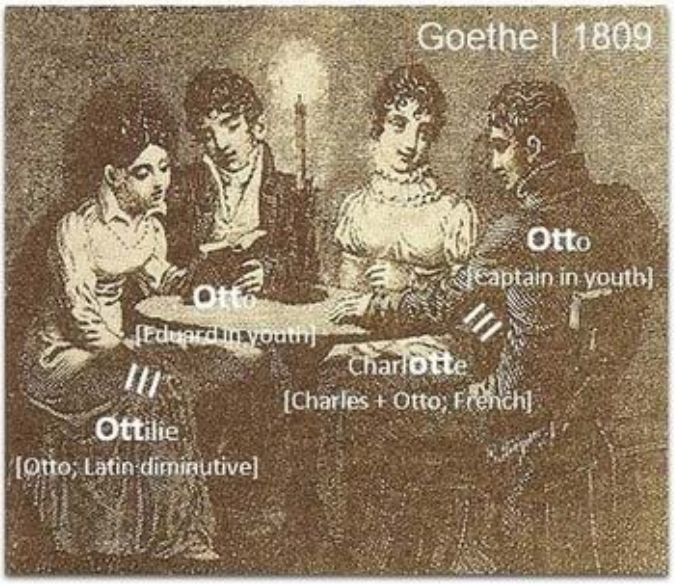

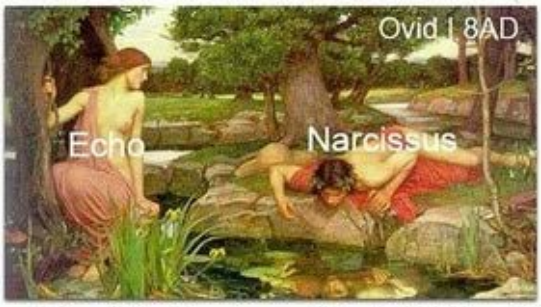

Eduard, Charlotte, Hauptmann [Captain], Otto = ECHO
[i.e. "Echo and Narcissus" myth of Ovid's *Metamorphosis* (8AD)]

OTT Cypher

Eduard, Charlotte, Hauptmann [Captain], Mittler = CHEM
[from –*keme* the Egyptian root of *Chemistry*]

A visual of the Goethe **CHEM cypher**, from Libb Thims' 2015 "Zerotheism for Kids" lecture, according to which each of the four main characters: "Charlotte" [**C**], the feminine variant of the French name "Charles + Otto", Captain, a term called Hauptmann [**H**] in German, who in youth was called Otto, Eduard [**E**], who in youth was also called Otto, and Mittler [**M**], the so-called marriage and or dispute mediator, the human catalyst of the novel, yield the combined term "**CHEM**", the root of the word chemistry, from the Egyptian -*keme*, a reference to the fertile black soil of the Nile River; the overlapping root term "Ott", a reference both the character "Ottilie", derived from the term "lily", the youthful flower-like child of the novel who brings "new life" so to say to the "dead marriage", of Charlotte and Eduard, and to Saint Ottilia, the patron saint of "vision' restoration, meaning that until we start "seeing" the social interaction world "chemically', we will remain blind to reality. [2]

Overview

In 1998, John Williams, a Scottish biographer and German literature lecturer, in his *The Life of Goethe*, gave one of the best summarizes of Goethe's intricate use of this CHEM anagram; which is basically the following:

> Charlotte [**C**] + Hauptmann [**H**] + Eduard [**E**] + Mittler [**M**] = **CHEM**
>
> Al-CHEM-Y → CHEM-istry → Chemistry

Williams surmises that Eduard, Charlotte, Otto form ECHO—which in turn relates to allusions to the myth of Narcissus and Echo and various points.

Charlotte, Hauptmann (Captain), Eduard, Mittler, form CHEM (see: chemistry etymology)—a significant acronym for the main theme of the novella (chemistry), even if, according to Williams, "Mittler (the mediator) fails to catalyze or restore the relationship between Charlotte and Eduard." Ott is the stem of the names of Eduard (his name youth was Otto), Charlotte, the Captain, Ottilie, and the child. [1]

As an anagram, OTT becomes TOT (dead); as a palindrome, OTTO represents an ironically harmonious mirror-image. Ottilie is near enough to OTT-LILIE: lilies are "symbols of purity, attributes of the Virgin Mary", according to Williams.

The initials E and O, such as are engraved on the glass that gets symbolically destroyed, according to Williams, are not only the initials of Eduard and Ottilie, or Eduard and Otto, but also of Eurydice and Orpheus—which, according to Williams, relates to the symbolism of Mittler as Hermes, the ubiquitous messenger and Psychopomp, the conductor of souls to the underworld.

The following diagram captures the gist of all four cyphers: CHEM, Echo, and OTT:

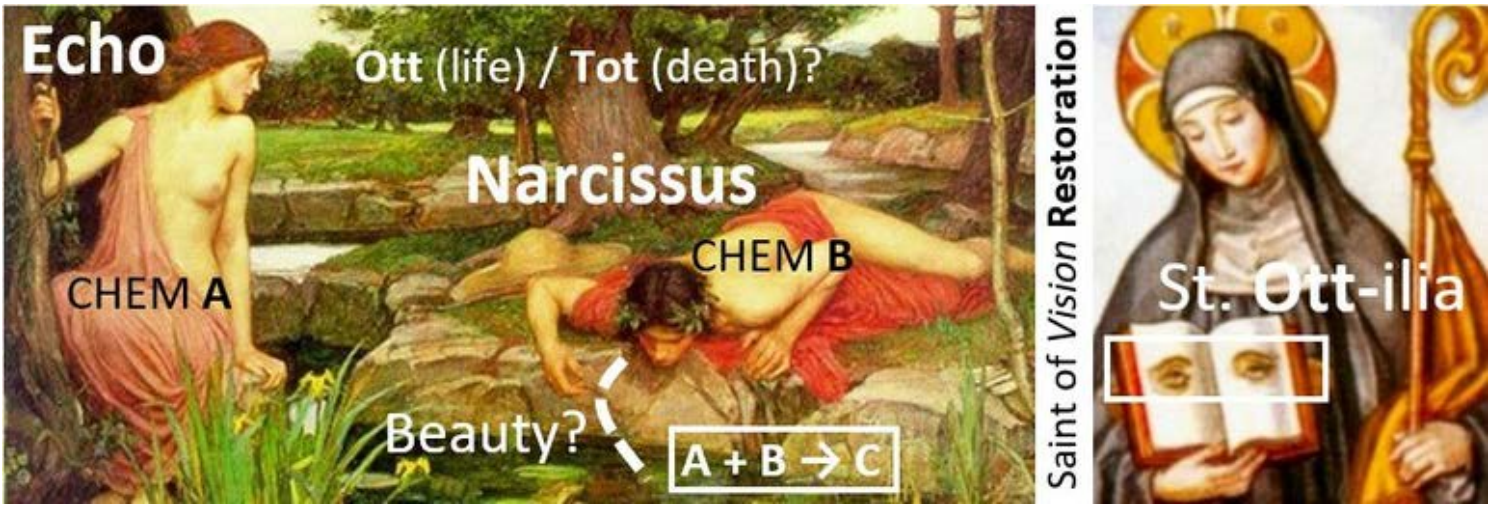

In 2015, Libb Thims, in his "Zerotheism for Kids" lecture, explained to the children that Goethe employed the Ott cypher as a means to explain that when we one comes to see people each as different but unique types of "chemicals" that a new "vision", previously blinded, of meaning and morality would be restored; a visual of this (lecture #6 (0:00-1:35); slide #15) is shown above. [2] Thims then summarized this to the children as follows:

> "When you start to see the world though 'chemical eyes' or **Gibbsian eyes** then you'll have a new morality."
>
> — Libb Thims (2015), "Zerotheism for Kids", Monday Lecture, Chicago, Sep 7 [2]

In short, in modern term, each person as being OTT-based, in the novella is prototype to the late 19th century model of each person being carbon-based or C-based, which is equivalent to, in the early 20th century, of each person being a CHNOPS-based chemical; such as stated by German physical chemist Wilhelm Ostwald, a modern Goethean human chemical theory philosopher, about himself, in 1926, as follows: [13]

> "I am made from the **C-H-N-O-S-P** combination from which a Bunsen, Helmholtz, Kirchhoff came."

Goethe, in short, was trying to say, in code, speaking in modern terms, that each of his four main protagonists, with the name root "OTT", was a "CHNOPS combination", as Ostwald would say, or, in modern terms, a "powered CHNOPS+20 chemical" (or molecule), whose affinities and combinations are determined by the elective affinities (or free energies in modern speak).

References

1. Williams, John R. (1998). *The Life of Goethe* (anagram, pg. 137; Otto anagram, pgs. 233-34). Blackwell.
2. Thims, Libb. (2015). "Zerotheism for Kids" (co-host: Thor) (main), 14-part [4:41-hr] lecture playlist (Ñº), 5-intro sides (Ñº), 56-main sides (Ñº), 11AM-3PM, Chicago, Sep 7.

θΔics

In science, **chemical** (TR=1741), from the Coptic *kēme* (pronounced: chem) or *chēmia*, meaning "earth", referring to the black fertile soil left behind on the Nile banks, following the annual flood, refers to any one of a number of compounds, molecules, substances or species of elemental aggregates.

θΔics

In chemistry, **chemical affinity** is the force of attraction (or affinity) between atoms that keeps them in combination in a molecule as well as the force of attraction between molecules, such as those of biological (chnopsological) significance. [1]

A human chemical affinity cartoon. [4]

The atoms of a given element, for example, may have a greater affinity for the atoms of one element than for another, e.g. hydrogen H has a great affinity for chlorine Cl, with which it easily and rapidly combines to form hydrogen chloride, but has little or no affinity for argon. The affinity between an enzyme and a substrate molecule is another example.

Human chemical affinity

See main: Human chemical affinity; Human elective affinity

The model of chemical affinity extrapolated up to the level of reaction occurring between human molecules (people) is called "human chemical affinity" or "human elective affinity" as German polymath Johann Goethe explained the phenomenon in his famous 1809 *Elective Affinities*. In 1910, American historian Henry Adams, in his *A Letter to American Teachers of History*, cogently connected the notion of chemical affinity, within the context of thermodynamics, to the "will" of a person: [3]

> "If thought is capable of being classified with electricity, or will with **chemical affinity**, as a mode of motion, it seems necessary to fall at once under the second law of thermodynamics. Of all possible theories, this is likely to prove the most fatal to professors of history."

In 1948, American author Thomas Dreier correctly explained human attraction as such:

> "The mystery of human attraction is really no mystery; it is a matter of **chemical affinity**, as powerful as it often is seemingly incomprehensible."

(add discussion)

Quotes

The following are example quotes:

> "**Chemical affinity** is that force in substance which brings and holds together what under general conditions are considered the indivisible elements of matter or atoms. In most cases such combinations are made at the expense of others previously existing: that is, there is dissolution of some existing combination, and a formation of a new one out of the atoms that had existed in the old. All chemical changes taking place in nature are the result of chemical affinity."
>
> — Henry Bray (1910), *The Living Universe* (pg. 368)

See also

- Affinity table
- Free energy table

- Elective affinity
- ReactionMatch.com

References

1. Clark, John O.E. (2004). *The Essential Dictionary of Science*. New York: Barnes & Noble Books.
2. Dreier, Thomas. (1948). *We Human Chemicals: the Knack of Getting Along with Everybody* (pg. 66-67). Updegraff Press.
3. (a) Adams, Henry. (1910). *A Letter to American Teachers of History* (pg. 102). Washington; in *The Degradation of the Democratic Dogma* (pg.195). MacMillan, 1919.
(b) Matthias, Ruth. (2011). "Entropy, Economics, and Policy", in: *Thermodynamics and the Destruction of Resources* (ch. 16, pgs. 402-28; quote, pg. 402). Cambridge University Press.
4. Jarape. (year), "Chemical Affinity", in: Chem 13 News, Mon.

Further reading

- Kane, Robert and Draper, John W. (1843). *Elements of Chemistry* (ch. VI: Of Chemical Affinity: and its relations to Heat, to Light, and to Cohesion, pgs. 157-). Harper & Brothers.
- Korevaar, A. (1921). "On Chemical Affinity" (abstract), *J. Phys. Chem.* 25(4): 304-10.
- Hudleston, Lawson J. (1928). *Chemical Affinity*. Longmans, Green
- Holmes, Frederic L. (1962). "From Elective Affinities to Chemical Equilibria: Berthollet's Law of Mass Action", *Chymica*, 8: 105:45.

External links

- Chemical affinity – Wikipedia.
- Chemical affinity – Britannica, 1911.

θΔics

In famous publications, **Chemical Affinity in 1806** is a two-page subsection discussion on the human chemical thermodynamics of German polymath Johann Goethe's 1809 novella *Elective Affinities*, found in chapter two "Thermodynamics and Chemical Reactions" of the 2004 book *Heterogeneous Kinetics*, by Japanese chemical engineer Tominaga Keii, in which Keii gives his opinion that Goethe's treatise "did not add any scientific knowledge." The section, which is shown below, seems to focus on the famous chapter four of Goethe's work, from which it quotes from at the end of the discussion: [1]

Discussion

(add)

Compare

See main: Gibbs and Goethe

The two only other people to have, independently, made connections between Gibbs and Goethe, being: American science historian and Gibbs science biographer Fielding Garrison (1910), who commented the following: [2]

> "Suppose chemical substances to be represented by a number of men and women of varying degrees of strength of character and "attractiveness," and suppose the marital combinations or what Goethe called the "elective affinities" between these men and women to be determined by certain mysterious "laws."
>
> If a man strong in character should mate with a woman, weaker but otherwise "attractive," or *vice versa*, one set of observers might affirm that the union was due to the

2.5 Chemical Affinity in 1806

The concept of chemical affinity was established by De Donder in 1922. Until the success of De Donder many scholars had devoted their efforts to learning how to measure and express the force of "affinities" which cause chemical changes. The work of Johan Wolfgang von Goethe[14] in 1806 as well as that of the great scientists such as Berzelius,[15] van't Hoff[16] and Gibbs[17] should also be noted. Although it did not add any scientific knowledge, the novel entitled *Die Wahlverwandtschaften* (Elective Affinities) (1806) of Goethe had made the concept of "affinities," which was a technical term used solely in chemistry, popular to the public at large. Since then many students probably had some knowledge of "affinities" before they studied it in a class of physical chemistry at college or university. According to Hollingdale,[18] who translated the novel into English, the novel was widely assumed to argue for the chemical origin of love and thus condemned as immoral when it was first published. The interesting point of the novel for us is that it shows Goethe's view on "affinity" at the beginning of the 18th century. According to the history of chemistry, the present term "chemical affinity" originates in the title, *De attractionibus electives*, (1775), of a book published by the Swedish scholar T. O. Bergmann (1735–84),[19] who listed up combinations of acid and alkaline. In 1811 Berzelius proposed his electric dualism of affinity. It was in 1836 that Berzelius pointed out some materials which have a new chemical force, "catalytic force," differentiated from "affinity."

Wahlverwandtschaften was the German translation by H. Tabor in 1785.[20] Even twenty years after Tabor, Goethe published his novel sixty years before Guldberg and Waage (1864) and over a hundred years before De Donder (1922). This corresponds to the dawn of chemical affinity. In spite of this, Goethe's view on "affinity" (Chapter 4 in his book)[14] is very precise, as can be noted from the section quoted from the English version below.[21]

> *'Now you have summoned us up,' Eduard said, 'You cannot get away as easily as that: for the most complicated cases are in fact the most interesting. It is only when you consider these that you get to know the degree of affinity, the closer and stronger, the distant and weaker relationships; the affinities become interesting only when they bring about divorces.'-----*
>
> *'Let us then go straight ahead,' said the Captain, 'and connect this idea with what we have already defined and discussed. For example: what we call limestone is more or less pure calcium oxide intimately unified with a thin acid known to us in a gaseous state. If you put a piece of this limestone into dilute sulfuric acid, the latter will seize on the lime and join with it to form calcium sulfate, or gypsum; that thin gaseous acid, on the other hand, escapes. Here there has feels justified even in employing the term "elective affinity," because it really does look as if one relationship was preferred to another and chosen instead of it.'*
>
> ------

The above is some of the dialogue on affinity between a couple, Eduard and Charlotte, together with his friend, a captain engineer.

man's superior potentiality or masculinity, others might maintain that the real strength in the combination or "affinity" lay in the woman's "attractiveness "; or *vice versa*. Curiously enough, these anthropomorphisms, which seem so plausible and fascinating in Goethe's novel, are daily and hourly employed to explain the facts of chemical combination."

Charlotte said, 'I wonder if you would tell me just briefly what is actually meant here by affinities?'

'Very gladly,' replied the Captain, to whom Charlotte had directed the question, 'as well as I can from what I learned from reading about it some ten years ago. Whether the scientific world still thinks of it in the same way, or whether it agrees with the latest theories, I cannot say.'

'It is a great annoyance,' cried Eduard, 'that one can no longer learn anything once and for all. Our ancestors observed their whole life long the instruction they received in their youth; but we have to learn anew every five years if we do not want to fall completely out of fashion.'

'------ that examples will make the matter clearer to her, and to us. If you think of water, or oil, or quicksilver, you will find a unity and coherence of their parts. They will not relinquish this unified state except through the action or force of some other agent. If this is removed, they immediately come together again.'---

'And therefore I may mention in passing this significant point,' the Captain added, 'that this unalloyed adherence made possible by liquidity is always definitely distinguished by the spherical form. The falling water-drop is round; you yourself have spoken of little balls of quicksilver; indeed, a falling drop of molten lead, if it has time completely to solidify, arrives in the form of a ball.'-----'Those natures which, when they meet, quickly lay hold on and mutually affect one another we call affined. This affinity is sufficiently striking in the case of alkalis and acids which, although they are mutually antithetical, and perhaps precisely because they are so, most decidedly seek and embrace one another, modify one another, and together form a new substance. Think only of lime, which evidences a great inclination, a decided desire for union with acids of every kind.----'.

and American electrochemical engineer Libb Thims, who after discovering Goethe in 2006 spent the following 18-months and 14-days writing out the world's first textbook on human chemistry. [3]

Works cited

The footnotes include references to the chemical affinity / chemical free energy works of Theophile De Donder (1922), Jacob Berzelius (?), Jacobus van't Hoff, Willard Gibbs (1876), Torbern Bergman (1775), and C.M. Guldbergh and P. Waage (1864):

[14] Goethe, Johann. (1972). *Elective Affinities*. Insel Taschenbuch 1. Insel Verlag. Frankfurt am Main.
[15] Bergelins, J.J. (2000). *Oxford Dictionary of Chemistry* (pg. 68). Oxford University Press.
[16] Van't Hoff, J.H. (1884). *Etudes de Dynamique Chemique*. Amsterdam: Frederick Muller & Co.
[17] Gibbs, J.W. (1961). *The Scientific Papers of J. W. Gibbs*. Dover.
[18] Goethe, J.W. (1971). *Elective Affinities*, trans. R.J. Hollingdale. Penguin Classics.
[19] Bergman, T.O. (1775). *De Attractionibus Electivis*, Upsala.
[20] ref. 18, Introduction to Hollingdale.
[21] ref. 18, pgs. 50-54.

â— (a) De Donder, Theophile. (1922). "article", *Bull. Ac. Roy. De Belgique*, Cl. des Sc. 5 serie, 8, 197.
(b) De Donder, Theophile. (1925). "article", *Comp. Rend. Acad. Sci.* 180, 1334.
(c) De Donder, Theophile. (1936). *Thermodynamic Theory of Affinity*. Sanford Univ. Press, London.
â— (a) Guldbergh and Waage (1867), are cited as the first to have arrived at the law of mass action.
(b) Quote: the most important issue of Guldberg and Waage seems to be that in an equilibrium system respective of processes balancing each other take place by a "chemical force" (chemical affinity) which is expressed in terms of "active masses" of chemical species.
(c) C.M. Guldbergh, P. Waage. (1879). "article", *J. Prakt. Chem.* 19, 69.

Note

The date of this chapter subsection seems to be a error, as Goethe did not even mention his soon-to-be scientific novella on human elective affinities until 1808. Hence, the date of 1806 by Keii seems to be a typo?

References

1. Keii, Tominaga. (2004). *Heterogeneous Kinetics: Theory of Ziegler-Natta-Kaminsky* (ch. 2: Thermodynamics of Chemical Reactions, pgs. 11-20; section: Chemical Affinity in 1806, pgs. 16-17). Springer.
2. Garrison, Fielding H. (1910). "A Note on Traube's Theory of Osmosis and 'Attraction-Pressure'" (elective affinities, pg. 285) *Science*, 32: 281-86.
3. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.

θΔics

In terminology, **chemical alphabet**, alphabet chemistry, or “chemical letters”, refers to the use of the letter abbreviations of the elements of the periodic table, e.g. A [Ar] (Argon), B [B] (Boron), C [C] (Carbon), D [Dy] Dysprosium, etc., to construct meaningful grammatical phrases or statements, often in the form of greeting card or posters, with an implied underlying "chemical" connotation, connection, or basis.

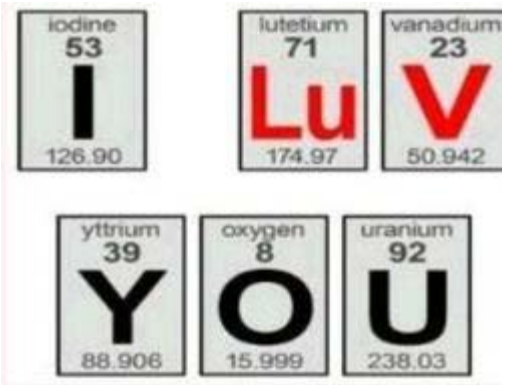

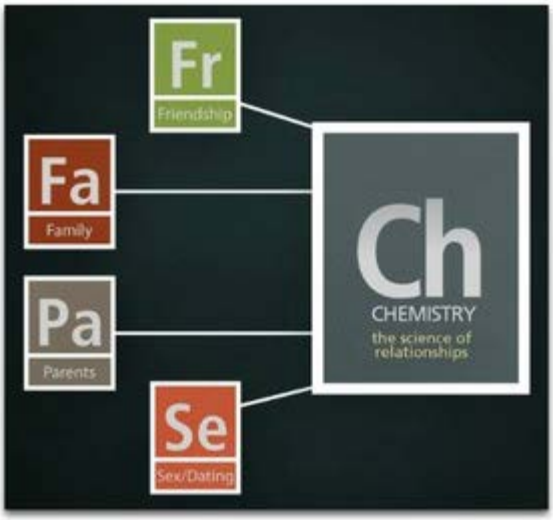

Left: A chemistry of love stylized **alphabet chemistry** example of using element abbreviations to construct grammatical phrases, such as "I Love You", in the form of image message. Right: A **chemical alphabet** style depiction of the elements of relationship chemistry: friendship, family, parents, sex and dating.

Such iconic representations are generally in the embodiment of the science of human chemistry, but since the subject is not part of the standard global education curriculum, recourse to this type of poetic chemistry (poetry chemistry), often around the time of Valentine's day (February 14), is common.

History

(add overview)

See also

â— Equation of love

θΔics

In analogies, **chemical analogy** refers to a comparison, modeling, or liking of a human quality, nature, or behavior in chemical terms.

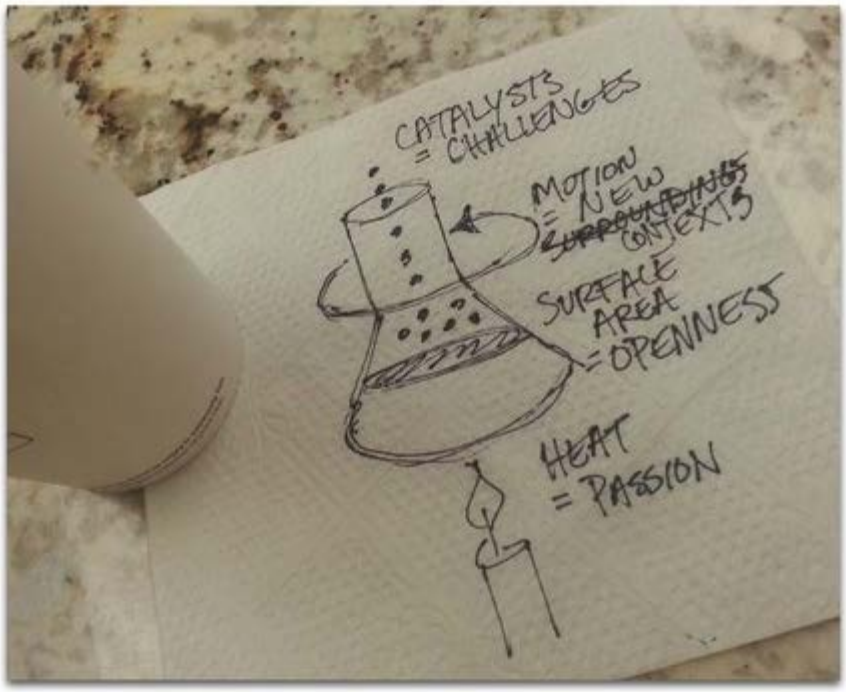

A 2013 **chemical analogy** type sketch by Ben Biddle in a blog entitled "Innovation is like a Chemical Reaction", the coffee napkin sketch representative of what he calls a "powerful analogy for innovation", which he describes as follows: "catalysts are problems in need of a solution. Adding heat means tapping into the passion of the individuals working on the problem. Increasing the surface area amounts to opening up your organization and exposing it to more ideas. Motion comes from changing the context – just mentally re-framing things in a new way or even physically moving your location, as you might do with an offsite. When they all come together, there's a transformative reaction."

Chemical analogies are types of grey analogies that range from quaint comparisons, such as Richard Brown's 1989 "social protons" jab at social physicist's models, to intermediate models, such as American sociologist Mark Granovetter in 1969 "weak ties" model of job finding, based on hydrogen bonding models, to realism, e.g. Goethe's 1809 *Elective Affinities*, and actual true statements, the latter of which are often a matter of heated debate, e.g. "human molecule", "human molecular formula", or "human chemical reaction".

Durkheim

The work of Emile Durkheim is first Google Book search return for key term pair "chemical analogy + sociology", who, as summarized well by Steven Lukes (1982), seems to employ not only chemical analogies, but thermodynamic analogies, electrical analogies, and physico-chemical analogies. [1]

Social bonds

See main: Social bond

American sociologist David Hachen comments on the 1859 work of Durkheim who distinguished between two types of "bonds" or "solidarity", in his terminology: mechanical solidarity, or social bonds among persons based on shared moral sentiments, and organic solidarity, or social bonds based on a complex division of labor that connects members of industrialized societies. Hatchen, however, not being a chemist by training, makes the following dismissive blunder, in his claim that social bonds are chemical bonds: [2]

> "The bonds that connect people together are not chemical bonds, although we sometimes use a **chemical analogy**, like when we say that there is real chemistry between two lovers. Rather, the bonds among people are social connections formed through social relationships, group affiliations, networks, and organizational memberships. Connections forge bonds, and it is these bonds that hold society together. Form his theoretical framework, much of what goes on in our social worlds concerns bonding, and sociologists who use this framework view the need to form bonds as the central driving force in society."

There is so much wrong with this statement that it is not even funny; but without being too derisive, the issue here seems to be but the result of two cultures atrophy, namely that sociologists are largely ignorant of chemistry and the fact that society is made up of atoms and that in systems or societies of atoms the central driving force is free energy, as clarified by Gilbert Lewis in 1923.

See also

â— Chemical aphorism

References

1. (a) Durkeheim, Emile. (1895). *Rules of Sociological Method* (introduction by Steven Lukes, pgs. 1-30; translator: W.D. Halls). Simon & Schuster.
(b) The Rules of Sociological Method – Wikipedia.
2. Hachen, David S. (2001). *Sociology in Action: Cases for Critical and Sociological Thinking* ("chemical analogy" + sociology, pgs. 67-68). Pine Forge Press.
3. (a) Biddle, Ben. (2013). "Innovation is Like a Chemical Reaction" (Ñº), May 15.
(b) Thims, Libb. (2014-15/16). *Chemical Thermodynamics: with Applications in the Humanities* (97-page version: pdf of 800-pages estimated total) (Biddle "Heat = Passion" diagram, pg. ix). Publisher.

θΔics

In hmolscience, **chemical**

CHEMICAL ANTHROPOMORPHISM

Anthropomorphism is the attribution of human-like behavior to creatures and things that are not human. In a pet store, a clerk told a customer that the turtle he was watching with his head pulled into its shell was "shy." Sure, the turtle's head was retracted, but how did the clerk know it was shy? Maybe pulling its head in was simply a turtle-like thing to do and had no significance at all. Who knows? Turtles can't talk. But you don't have to work in a pet store to anthropomorphize. Science writers do it, too.

Consider an example close at hand. The following sentence is in this chapter. ". . . fluorine wants to grab an electron to fill its outermost orbital, and cesium is barely holding on to one in its outermost orbital." Wait a minute. Does fluorine really "want" to grab an electron? Can a fluorine atom really "want" things?

Clearly, the answer is no. Atoms and molecules are not sentient beings. They don't want anything. Well, then, why do fluorine and cesium react? The answer lies in this simple statement: All systems seek to achieve a minimum of free energy.

Cesium and fluorine react because the free energy contained in a molecule of cesium fluoride is less than the free energy of the two separate atoms. When the two elements combine, most of the energy difference is given off as heat, creating the "vigorous reaction" mentioned earlier. Most scientists and science writers know this and use anthropomorphic language sparingly. The reason they use it at all is because it is a more colorful way of making a point. "Wants to grab" is more concrete and memorable than the sleeper: Cesium and fluorine react because the reaction product has lower free energy than the reactants. But both student and writer must remember that the latter is what really drives chemical reactions.

American physical chemist Philip Manning's **"age 12 and up"** geared chapter insert section on "chemical anthropomorphism", wherein he gives in to the view that it is incorrect to speculate about the "wants" of atoms, as it is to the wants of turtles, but that all one can say in regards to such a question as "why do fluorine and cesium react?", is that because "all systems seek to achieve a minimum of free energy." [2]

anthropomorphism refers to the process of anthropomorphizing (compare: deanthropomorphize) atoms, chemicals, molecules, or chemical species; the classic example being a chemistry professor saying that second row elements, e.g. carbon or oxygen, are "happy" when their valence shells are filled with eight electrons, thereby satisfying Abegg's rule (Q) .

Overview

In 1910, American science historian Fielding Garrison, noted Gibbsian biographer, commented how he believes Goethe's chemical "anthropomorphisms", as he calls them, "seem so plausible and fascinating", and are in some way related to American engineer Willard Gibbs' 1876 chemical thermodynamics: [1]

> "Suppose chemical substances to be represented by a number of men and women of varying degrees of strength of character and "attractiveness," and suppose the marital combinations or what Goethe called the "elective affinities" between these men and women to be determined by certain mysterious "laws." If a man strong in character should mate with a woman, weaker but otherwise "attractive," or *vice versa*, one set of observers might affirm that the union was due to the man's superior potentiality or masculinity, others might maintain that the real strength in the combination or "affinity" lay in the woman's "attractiveness"; or *vice versa*. Curiously enough, these **anthropomorphisms**, which seem so plausible and fascinating in Goethe's novel, are daily and hourly employed to explain the facts of chemical combination."

In 2005, Valery Ilyin was using chemical anthropomorphism on the cover of his *Thermodynamics and Sociology*, shown below, in his showing of gas molecules as happy and unhappy: [3]

(add)

See also

- Anthropic physics
- Anthropological thermodynamics
- Chemical party

References

1. Garrison, Fielding H. (1910). “A Note on Traube’s Theory of Osmosis and ‘Attraction-Pressure’” (elective affinities, pg. 285) *Science*, 32: 281-86.
2. Manning, Philip. (2009). *Chemical Bonds* (pg. 45). Infobase Publishing.
3. Ilyin, Valery N. (2005). *Thermodynamics and Sociology: Physical Basis of Social Processes and Phenomena* (Термодинамика и социология: физические основы социальных процессов и явлений) (Abs)(GB)(WorldCat). URSS; Moscow Aviation University, 2009.

θΔics

In human chemistry, a **chemical aphorism** or 'chemistry aphorism' is a pithy statement, of an extension of the chemistry to human affairs, containing a truth of general importance. [1] The first chemistry aphorist was Greek philosopher Empedocles who in circa 450BC famously stated that friends mix like water and wine, whereas enemies separate like oil and water, among other noted chemical aphorisms. The following is an example chemistry aphorism from the 1999 book *Milton's Progress* by writer Forbes Allan: [2]

> "People are like particles, they behave in groups as if they were molecules in a test-tube."

2002 *Little Fun Book of Molecules Humans*, by American writer John Hodgson, containing 98 **chemical aphorisms** on similarities between humans and molecules. The cover seems to allude to the idea that certain people adhere to each other similar to how liquid water molecules form droplets on a surface. [4]

450BC: Empedocles' aphorisms

The first and foremost to state chemical aphorism was Greek philosopher Empedocles and his circa 450BC suppositions on how humans behave as if they were types of chemicals. Empedocles famously explained the mixing of social groups on the model of the chemical solubility of liquids in stating that: [5]

> "People who love each other mix like water and wine; people who hate each other segregate like water and oil."

Another variant of this famous human chemistry quote is: [6]

> "Relatives mix like water and wine; enemies avoid each other like water and oil."

There seems to more of these given by Empedocles, which need to be tracked down.

1995: Lehn's aphorism

In the founding 1995 book of the science of supramolecular chemistry, *Supramolecular Chemistry: Concepts and Perspectives*, French chemist Jean-Marie Lehn gives a detailed Goethe-style chemical aphorism on the second opening page of his textbook: [3]

> "Supramolecular chemistry is a sort of molecular sociology! Non-covalent bonds define the inter-component bond, the action and reaction, in brief, the behavior of the molecular individuals and populations: their social structure as an ensemble of individuals having its own organization; their stability and their fragility; their tendency to associate or to isolate themselves; their selectivity, their 'elective affinities' and class structure, their ability to recognize each other; their dynamics, fluidity or rigidity or arrangements and of castes, tensions, motions and reorientations; their mutual action and their transformations by each other."

2002: Hodgson's aphorisms

In 2002, similar in theme to Greek philosopher Empedocles analogies of how people how like each other mix like water and wine, American writer John Hodgson published a short booklet of of sayings intended to look at the similarities existing between humans and molecules. In back cover synopsis of his book, Hodgson states "this book looks at how molecules behave as compared to human behavior with the use of metaphors and other common similarities." Each page

of the book contains a different aphorism of which below are shown a few representative examples: [4]

> "Different **molecules** or **humans** behave differently having different reactions or behaviors to changing situations."
>
> "When molecules or humans mesh they have chemical or physical reaction and or reproduction."
>
> "With experiment we can better understand these molecules or humans like we never knew before."
>
> "Molecules and humans take in elements or food."
>
> "Molecules and humans engage in different behaviors and or sex."
>
> "Molecules and humans make or change common bonds."

All-in-all, Hodgson's book contains ninety-eight of these aphorism sayings. To note, many of Hodgson's aphorisms are rather incoherent and, in many cases, having almost nothing to do with human chemistry.

References

1. Aphorism – Online Etymology Dictionary.
2. Allan, Forbes. (1999). *Milton's Progress*. Publisher.
3. Lehn, Jean-Marie. (1995). *Supramolecular Chemistry*. VCH.
4. (a) Hodgson, John. (2002). *Little Fun Book of Molecules/Humans*. 1st Books.
(b) Hodgson, John. (2010). *molecules humans*. Lulu.com.
5. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 169). Morrisville, NC: LuLu.
6. Mimkes, Jurgen. (2001). "Chemistry of the Social Bond" (German → English) (Chemie der Sozialen Bindung), University of Paderborn.

External links

â— Aphorism – Wikipedia.

θΔics

In chemistry, a **chemical bond** is the force that holds atoms and atomic aggregates, e.g. ions, molecular entities, molecules, crystals, or chemical species, etc., together in three-dimensional structures. [1]

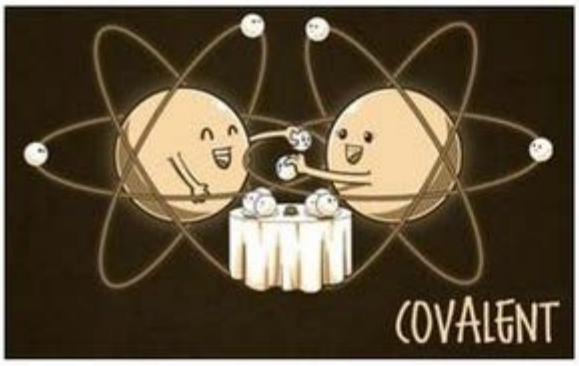

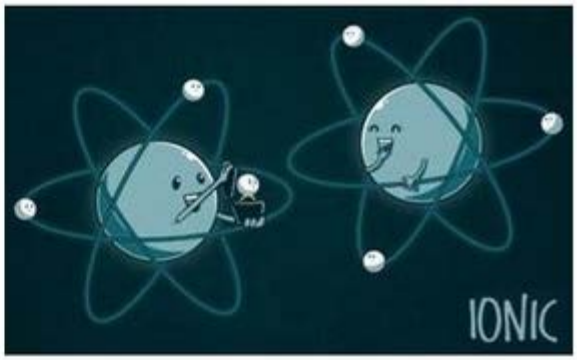

Type	Bond energy (kJ/mol)
Ionic bond	700-4,000
Covalent triple bond	800-1,000
Covalent double bond	500-700
Covalent single bond	200-500
Dipole attractions	40-400
Hydrogen bond	10-40
Phosphate bonds (ATP)	25-60
Human chemical bond	7.6E8 (kJ per bond)

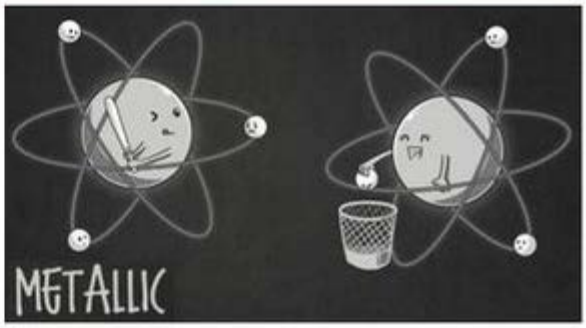

Wirdou.com anthropomorphized images (Q) of the three main types of **chemical bonds**: ionic, covalent, and metallic, shown alongside bond energy values per each type of bond.

Human chemistry

In human chemistry, a 'human chemical bond' is what holds 'human molecules', i.e. people, together in attached relationships. [2] Thermodynamically, chemical bonding is determined according to free energy interactions between molecules. This logic is explained by American-born Canadian biochemist Julie Forman-Kay as such: [3]

> "Whether two molecules will bind is determined by the free energy change (ΔG) of the interaction, composed of both enthalpic and entropic terms."

This logic, invariably, applies to interactions between human molecules, albeit the measurement of the enthalpic and entropic components in human-human interactions is conceptually difficult.

See also

- History of chemical bonding theory
- Human chemical bond

References

1. Daintith, John. (2004). *Oxford Dictionary of Chemistry*. New York: Oxford University Press.
2. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (§13: "Human Chemical Bonding", pgs. 515-560). Morrisville, NC: LuLu.
3. Forman-Kay, Julie D. (1999). "The 'Dynamics' in the Thermodynamics of Binding." *Nature Structure Biology*, 6: 1086-87.

External links

- Chemical bond – Wikipedia.

θΔics

In thermodynamics, **chemical energy** refers to energy associated with or derived from a chemical reaction or process.

Overview

The term "chemical energy", in thermodynamics, can refer types of energy, e.g. internal energy, free energy, enthalpy, entropy, bond energy, chemical potential, etc., of chemical reactions and processes. A loose definition of chemical energy refers to energy stored, released or absorbed in or from changes of chemical bonds and their associated changes in bond energy during chemical reactions. In short, chemical energy is the part of the energy of a substance that can be released by a chemical reaction. [1] Technically, to note, there is no exacting definition of chemical energy, but rather a one is led into lengthy discussions in chemical thermodynamics terms, unique to each reaction or process. [2]

References

1. Chemical energy – Visuwords.com.
2. Sato, Norio. (2004). *Chemical Energy and Exergy: An Introduction to Chemical Thermodynamics for Engineers*. Elsevier.

Further reading

â— Strong, Laurence E. and Stratton, Wilmer J. (1965). *Chemical Energy*. Reinhold Pub.Corp.

θΔics

In engineering, **chemical engineering** applies scientific principles, generally in industry, to the practical conversion of basic raw materials into a variety of products, and dealing with the design and operation of plants and equipment to perform such work; all products are formed in chemical processes involving chemical reactions carried out under a wide range of conditions and frequently accompanied by changes in physical state or form. [1]

History

In 1847, the Sheffield Scientific School was founded as a school of Yale College in New Haven, Connecticut for instruction in science and engineering.

In 1863, Willard Gibbs completed the first PhD in engineering in America and in 1871, two years after returning from a study abroad at various universities in Europe, Gibbs became Yale's first professor of mathematical physics, following which, in beginning in 1873, with the publication of his "Graphical Methods in the Thermodynamics of Fluids", and his two papers to follow, focused on the equilibrium of heterogeneous substances, he began to found chemical thermodynamics, the backbone of the chemical engineering.

In 1888, at MIT, first chemical engineering degree program was founded. [4]

In 1971, Hungarian chemical engineer turned theoretical biologist Tibor Ganti introduced his "chemoton" or chemical automaton theory.

In circa 2014, American electrochemical engineer Libb Thims was beginning to attempt to probe (see: two cultures inquiries) the establishment a humanities course explicitly designed for chemical engineers, and or physical science minded humanities students, stylized as physicochemical humanities and or physicochemical sociology, based on the drafting textbook *Chemical Thermodynamics: with Applications in the Humanities*, a seeming enactment of the long-sought so-called Nightingale Chair of Sociophysics.

Hmolscience

The following are noted chemical engineers to have produced, commented on, and or interjected into hmolscience theory:

	Chemical engineer	Date	Significance
1.	William Fairburn (1876-1947) English-born American naval architect, marine engineer, chemical engineer, and industrial executive	1914	His *Human Chemistry* is the first "book" attempted at formulating the outlines of a science of "human chemistry" with people defined specifically as "human chemicals", quantified by properties such as entropy, that have "reactions" to one another similar to any other chemical reaction, and that application of these basic principles to the operation of business management would facilitate working operations. 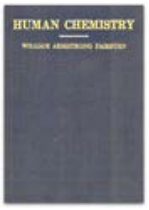
2.	Eugene Roeber (1867-1917) German-born American electrochemcial engineer	1914	His "The European War" stated that WWI (28 Jul 1914 – 11 Nov 1918) was a gigantic chemical reaction governed by the second law, wherein people's free will becomes like that of the will of "free" ions of dissociation theory; that entropy will increase as the war goes; that the end result will be a new Europe closer to absolute zero of temperature.
3.	John Neumann	1932	Published his "A Model of General Economic Equilibrium", derives a function φ (X, Y) related to the production of goods, based on the model of thermodynamic potentials, and is considered a classic; in 1934, reviewed Georges Guillaume's 1932 economic thermodynamics dissertation, concluded that: "if this [economic-

	(1903-1957) Hungarian-born American mathematician and chemical engineer		thermodynamic] analogy can be worked out at all, the analogon of 'entropy' must be sought in the direction of 'liquidity'. To be more specific: if the analogon of 'energy' is 'value' of the estate of an economical subject, then analogon of its thermodynamic 'free energy' should be its 'cash value'."; his 1944 *Theory of Games and Economic Behavior* compared heat measurement history with utility measurement history.
4.	James Coleman (1926-1995) American chemical engineer turned sociologist	1964	His *Introduction to Mathematical Sociology*, uses concepts such as: chemical reaction, temperature, entropy, molecular interactions, etc., as launching points for discussions in developing sociology theory.
5.	Frederick Rossini (1899-1990) American chemical engineer, physical chemist, and chemical thermodynamicist	1971	Retrospectively described by German-born American organic chemist Ernest Eliel as "one of the preeminent thermodynamicists of the twentieth century—his 1971 Priestley Medal address "Chemical Thermodynamics in the Real World" ended with a derivation the combined law of thermodynamics (equation shown), concluding, in respect to enthalpy âˆ†H° and entropy âˆ†S° changes in relation human freedom, that: "Here we have an interesting picture derived from our science of thermodynamics—equilibrium or stability is a compromise between freedom and security. In terms of human experience, the meaning of security can be interpreted to mean that one is secure and safe in his person, in his family, in his home, in control of his property, on the streets, and on his travels. The meaning of freedom is quite clear—the privilege of doing whatever one wants to do. However, in our civilized society, we have come to believe in behavior according to natural law—that one can do whatever he wishes so long as he does not abridge or infringe upon the rights and privileges of others. To me, all this means living with some rational kind of law and order. The picture we have developed from thermodynamics is very simple: One cannot have a maximum of freedom and a maximum of security at the same time. If there is a maximum of freedom, there will be zero security. I interpret this to mean that if we have total freedom, everyone can do whatever he wishes, including injuring others, stealing property, and the like. On the other hand, if there is a maximum of security, there will be zero freedom. I take this to mean that if we have total security, we will be constrained at every step and have a virtual straitjacket life"; this supposition that chemical thermodynamics applies to human social existence and experience, following 9/11, resulted in the 2006 *Journal of Chemical Education* "Rossini debate", a "heated" debate that continues to the present day, with lines being drawn and sides taken. $\ln K = -\frac{\Delta H^\circ}{R}\left(\frac{1}{T}\right) + \frac{\Delta S^\circ}{R}$
6.	James Beatty (1934-c.2005) American chemical engineer	c.1972	Interjected into extensive dialogue with Brazilian chemical engineering graduate student Edison Bittencourt on the subject of the implications of thermodynamics to humanities, i.e. economics and sociology, and seeming purpose behavior in biology (powered-chnopsology).
7.	Robert Ulanowicz (1943-) American chemical engineer and theoretical ecologist	1979	Conceived (in 1979) of an information theory based version of free energy applied to ecosystems, termed "ascendency", which he considered as a pseudo-thermodynamic function (first outlined in his 1980 article "An Hypothesis on the Development of Natural Communities"); his 1986 book *Growth and Development* extends on this using Helmholtz free energy (equation shown); his 2009 *A Third Window: Natural Life Beyond Newton and Darwin*, seems to argue for the existence of God in the context of an emergent (or process biology) thermodynamic depiction of evolution (or ascendency), supposedly, under the guise of the "ontic openness of nature"; is presently of the view that "entropy or entropy-related measures (such as free energy) should *not* be invoked for living systems!" (email communicate to Libb Thims, 2011), which he says he first argued on page 21 of his 1986 book. $F = U - \theta S$
8.	Daniel Hershey	1980	Starting with his 1980 *The New Age-Scale for Humans*, followed by about a dozen various publications, he builds significantly on the work of Ilya Prigogine to outline a thermodynamic theory of aging; in his 2009 *Entropy Theory of Aging Systems: Humans, Corporations, and the Universe*, in summarizing the free energy ideas of Prigogine, he states: "Thermodynamic equilibrium may be characterized by the minimum of the Helmholtz free energy, $F = E - TS$, where E is the internal energy, T is the absolute temperature, and S is entropy. Positive time, the direction of time's arrow, is associated with increase in entropy. Isolated or closed systems evolve to an equilibrium state characterized by the existence of a thermodynamic potential such as the Helmholtz or Gibbs free energy. These thermodynamic potentials and also entropy are, according to Prigogine, Lyapounov functions, which means $\frac{dS}{dt} = \frac{dS_e}{dt} + \frac{ds_i}{dt}$

	(c.1931-) American chemical engineer (stimulated by Prigogine)		they drive the system toward equilibrium in the face of small disturbances." Likewise, he in regards to free energy and aging he argues that: "Old age or senescence may be the decline in our ability to produce free energy. Less free energy means diminished cell function. Vitality might be defined as our biological and thermodynamic strength, the ability to expend energy to restore ourselves to near original conditions." He goes on to apply this basis to what he calls the "entropic analysis of a human living system", wherein he argues that "the living system is essentially and open system because it maintains itself by the exchange of matter and energy with the environment and by the continuous building up and breaking down of its internal components" and on this logic goes on to argue that Prigogine entropy (equation shown) applies to these so-called living systems, to corporations, etc.
9.	Benjamin Kyle (1927-) American chemical engineer and thermodynamicist	1988	His 1988 article "The Mystique of Entropy", turned 1999 CD-ROM textbook attachment entitled *Entropy: Reflections of a Classical Thermodynamicist*, found in his *Chemical and Process Thermodynamics*, summarizes historical attempts to use thermodynamics to explain things such as computers, art, poetry, or prove the existence of god, etc., and alludes to a entropy philosophy: $$\Delta S \approx 0$$ in which, given the knowledge of universal entropy increase, provides a saving grace by showing us the 'way', which he seems to equate with paths of negligible entropy change (equation shown).
10.	Linus Pauling (1901-1994) American chemical engineering	1989	In his memorial chapter "Schrodinger's Contribution to Chemistry and Biology", he rips apart Austrian physicist Erwin Schrodinger's 1943 life is something that feeds on negative entropy theory (see: Note to Chapter 6).
11.	Nedjeljka Petric (c.1941-) Croatian chemical engineer and thermodynamicist	1991	Published "Application of the Thermodynamic Theory to Social Events", in the *International Review of Modern Sociology*, wherein she argues, similar to Rossini, that entropy, as defined by the Boltzmann equation, is interpreted not as disorder but as freedom of individuals; this was followed by the publication of three more articles, over the next three years, in which she tries to explain the "spiritual condition" of a person, albeit mostly in a rather overt ontic opening theory manner, replete with attempts to side God, Jesus Christ, and Bible themed views.
12.	Cruz Iniguez (1948-) Mexican-born American chemical engineer and physical chemist	1993	His 1993 unpublished manuscript "negentropic thermodynamics", which tries to "debunk" Clausius so to explain life and evolution, resulted in his 2007 booklet *Negative Entropy: a Brief Incursion into the Uncharted Universe of Decreasing Entropy*, which amounts to a less-coherent version of a Pierre Teilhard like attempt to reformulate thermodynamics in the name of anthropomorphic conceptual ideals.
13.	Libb Thims (c.1975-) American chemical	1995	As a hobby, began to speculate as to how the spontaneity criterion: 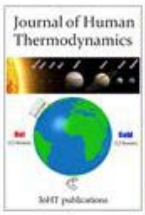 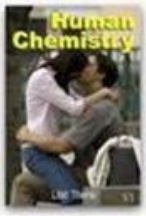 $$\Delta G < 0$$ mate selection, with enthalpy change ΔH and entropy change ΔS specifically quantified in terms of standard evolutionary psychology variables, mapped to second-by-second changing measures of individual differential human molecular Gibbs free energy variations d*G*, as shown below (see: HMO theory): $$G = (H_{AVG} + H_{AGE} + H_S + H_X + H_L + H_F + H_C) - T(S_P + S_O + S_I + S_S + S_N)$$

engineer, electrical engineer, and thermodynamicist		such as if one was to predict which of two mates would be more favored to bind "stably" into a standard 18-year human chemical reaction; a number of precipitates have followed from this endeavor: one of the first calculations of the human molecular formula (2002); first formulations of the physics model of the human chemical bond A≡B (2005); launched *Journal of Human Thermodynamics* (2005); authored first human chemistry textbook (2007); published *The Human Molecule* (2008); launched *Hmolpedia* (EoHT.info) (2008), and as of 2013 has authored over 2,800 online articles related to the hmolscience subjects: human physics, human chemistry, human thermodynamics.
14. Erich Muller (1963-) Venezuelan-born English chemical engineer and thermodynamicist	1998	His "Human Societies: a Curious Application of Thermodynamics", outlined a version of integration and segregation thermodynamics of attractions and repulsions of human molecules, defined in terms of thermodynamic potentials, and was the prototype model article for the JHT; the Muller stability ratio and Muller dispersion force are named after him; in his thermodynamics lectures he is noted for his use of human molecular themed descriptions, drawing analogies between the behaviors of molecules and people, to explain concepts.
15. Gerard Nahum (1956-) American chemical engineer and physician	1998	Was presenting a 25-page "A Proposal for Testing the Energetics of Consciousness", in which consciousness, viewed as a type of residual negative entropy of the conserved mind, might survive death and in which the measure of the deceased consciousness would be quantified by an equation (shown), to various universities and international consciousness studies meetings, in order to gain $100,000 in funding for experimental testing of his theory; in 2005, theory was covered in Mary Roach's *Spook: Science Tackles the Afterlife;* published in JHT in 2010. $\int_{t_0}^{t} W(t)dt = \frac{g}{c^2}\left(\int_{t_0}^{t} E(t)dt + \int_{t_0}^{t} C(t)dt\right)$
16. Edison Bittencourt (c.1948-) American-born Brazilian chemical engineer	1999	His engineering conference presentation "Teaching of Thermodynamics in Chemical Engineering" advocating the teaching of the thermodynamic imperative to chemical engineering students, based on his early 1970s dialogues with James Beatty, and defined living beings and ecosystems as "open, coherent, purposive, irreversible" systems (PICO systems); his 2011 "From Modern Thermodynamics to How Nature Works", argues that societies, economies, and ecological aggregates are emergent ordered dissipative structures and that nonlinear irreversible thermodynamics is the key to understanding these structures, in particular the problem of sustainability.
17. Alfredo Infante (c.1960-) Peruvian chemical engineer	2001	His "Social Entropy: A Paradigmatic Approach of the Second Law of Thermodynamics to an Unusual Domain" uses advanced intelligence perspective to argue that the Gibbs free energy of a social system is the total energy in the system less the energy that is unavailable and that this difference represents the 'state' of the system. $G = H - TS$
18. Alec Groysman (1948-) Russian-born Israeli chemical engineer	2004	His article "Aesthetic, Philosophical and Historical aspects in the Physical Chemistry education", speculated on how Gibbs energy is similar to Hamlet's 'to be or not to be?' of William Shakespeare; his 2011 conference presentation "Use of Art Media in Engineering and Scientific Education", Groysman cites the human chemistry work of Johann Goethe and Libb Thims, among others; and discusses how not only is their "two cultures" (as professed by Charles Snow) but more likely "three cultures"; and advocates the teaching of human chemistry in engineering.
		In his chapter two, "Thermodynamics of Chemical Reactions", devotes a subsection to "Chemical Affinity in 1806", wherein he quotes several paragraphs of Goethe's 1809 *Elective*

19.	Tominaga Keii (1920-2009) Japanese chemical engineer and chemical thermodynamicist	2004	*Affinities*, to only conclude, paradoxically, and puzzlingly, in the end, that, in his view, "it did not add any scientific value" (see also: ships not seen; forest amid the trees) 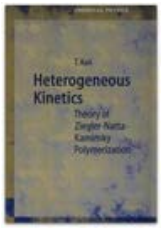
20.	Jaroslav Sestak (1938-) Czech chemical engineer, solid state physicists, and materials scientist	2005	His *Science of Heat and Thermophysical Studies* contains a chapter eight on "Thermodynamics, Econophysics, Ecosystems, and Societal Behavior", wherein he discusses Gilbert Lewis' 1925 economics article, arisen via conversation with Irving Fisher, Jurgen Mimkes' 1995 integration and segregation thermodynamics theories, along with discussions of thermodynamics of feelings, the econophysics works of Vilfredo Pareto, Ettore Majorana, among others.
21.	Mark Janes (1973-) English chemical engineering student turned biotechnologist	2006	His carbon entromorphology theory is a human atom based scheme, which considers the human being to be a 'type of gigantic carbon atom' (Mr. Carbon Atom), and uses aspects of thermodynamics, particle physics, and the atomic model logic (molecular orbital theory) to explain facets of humanity, via Gibbs free energy change: $$\Delta G = \Delta H - T\Delta S$$ an example being his "soulatrophic" model of morality, in which state of humanity is positied to be evolving to a future iron-like orbital structure of stability (similar to Pierre Teilhard's omega point theory).
22.	Andrew Morrow (1961-) American chemical engineer	2006	Outlined a type of internet-connectivity philosophy on the view that people are "mosaics of atoms with a mind", whereby, aware of this reality, one should attempt to see reality from the viewpoint of reactions of one's fellow human beings to oneself, so to see if further insight can be found. Comments, in his 2009 video *We are Made of Atoms*, "you are made of atoms and there is no escape from this knowledge. Peace and happiness but first you must be wiser"; as of 2010 is working on a new book, *A Periodic Table of Civics*, aimed at incorporating philosophy application.
23.	DMR Sekhar (1952-) Indian chemical engineer and mineral engineer	2006	Developed a anti-entropy self-drive type theory, called "genopsych", which argues that DNA is a self-programming conscious entity, inside of which exists a special extensive conscious ordering force or property, which is god or part of god, is undying and non-physical (i.e. soul), that runs counter to entropy and gives rise to and directs biological evolution.
24.	Mary Guthrie (c.1987-) American chemical engineer	2009	Her 2009 tongue-in-cheek CNN-stylized "investigative report" parody "Why Students Choose Chemical Engineering?", which she wrote and also acted in (as investigative reporter), wherein, via the dialogue of economics and chemical engineering student Jawad Mirza, alludes to a hue of human chemical thermodynamics logic, in the statements that: in learning chemical thermodynamics, students learn about "heat transfer taking place between people", among other commentary, e.g. American chemical engineer Rich Byrnes commenting "I'm happy to know that the thermodynamic forces that compel folks to become ChE's have not changed much over the years."

25.	Mohsen Mohsen-Nia (1958-) Iranian-born American chemical engineer	2011	His JHT article "A Thermodynamic Methodology for Evaluating Friendship Relations Stability", co-authored with Iranians human scientist F. Arfaei, thermodynamicist H. Amiri, and computer engineer A. Mohsen Nia, present the results of a small relationship study, of different pairings of male and female co-workers, in which they discuss the results in energetic terms and attempt to explain interhuman relationship potential modeled on the Lennard–Jones potential (shown). $\phi(r) = 4\epsilon\left[\left(\frac{\sigma}{r}\right)^{12} - \left(\frac{\sigma}{r}\right)^{6}\right]$
26.	James Ferri (c.1960-) American chemical engineer	2011	Initiated and supervised the engineering student-produced video "Thermodynamics of Life: Occupy Wall Street Edition", made by Angela Wnek (ChBE, 2013), Isaac Lavine (ChBe, 2014), Ashley Kaminski (ChBE, 2013), which applied a number of different molecular, physical chemistry, and chemical engineering principles to the ongoing "Occupy Wall Street" protests, and used equations such as Calvin equation, the Ostwald equation (shown), etc., to explain the Pareto principle, i.e. the 80-20 rule for the division of wealth in a society. $\langle R\rangle^3 - \langle R\rangle_0^3 = \frac{8\gamma c_\infty v^2 D}{9R_gT}t$
27.	Donna Riley (c.1971-) American chemical engineer	2011	Her course supplement booklet *Engineering Thermodynamics and 21st Century Energy Problems*, contains twenty modules targeted toward meeting five often-neglected ABET outcomes: ethics, communication, existence-long learning, social context, and contemporary issues, with human thermodynamics education chapter sections such as "entropy as a social construct" (e.g. social thermodynamics), "entropy's philosophical implications" (e.g. philosophical thermodynamics), "thermo to life" (e.g. defunct theory of life), among others, each with a four-part engage/analyze/reflect/change reading program with what seem to be classic human thermodynamic stylized "homework problem" assignments.
28.	Vamshi Regalla (c.1985-) Indian chemical engineer	2012	His short film "A Strange Thing Called Love", coproduced with American mechanical engineer Ravi Vedula, turned *Journal of Human Thermodynamics* article "A Strange Thing Called Love: in the View of Chemical Thermodynamics", outlines their take on the chemical thermodynamics of relationships, employing Thims-Pati style reaction mechanisms.
29.	Jose Aguilera (1947-) Chilean chemical engineer	2012	His *Edible Structures: the Basic Science of What We Eat* devotes has a six-page molecular sociology chapter subsection, citing Goethe (*Elective Affinities*, 1809) and Thims (*Human Chemistry*, 2007), wherein he outlines a number of Empedocles-style human-to-chemicals comparisons, aphorism, or analogies, depending, ranging from: speculations on how a marriage is like a weaker type of covalent bond and or Van der Waals interaction force, how uncharged molecules clustering together in a charged environment are like people discriminated against joining together, how enzymes can can break up and or catalyze the formation of bond between big molecules, like matchmakers, or about how there may be some type of "activity coefficient", similar to the water activity a_w, which quantifies the layers of water moisture around dry foods, that may quantify the way in which people are attracted to "high energy surfaces" (see: surface chemistry), among other comparisons. 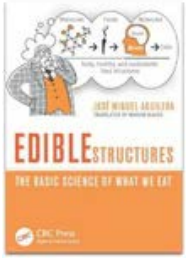
30.	Gungor Gunduz (c.1950-) Turkish chemical engineer,	2012	Published articles on sociophysics, econophysics, and one in particular on thermodynamics applied to (i) the behavior of the NASDAQ-100 index, (ii) a social revolt, and (iii) the structure of a melody were analyzed for their 'work-like', 'heat-like', and 'torque-like' energies in the course of their evolution.
31.	John Prausnitz (1928-) American chemical	2013	Gave the following opinion to American electrochemical engineer Libb Thims about the prospect of founding a two cultures department at the University of California, Berkeley, centered at the chemical and biomolecular engineering department: "I don't know what the Rossini debate is but I hope to find out. No, your idea for a department for teaching two cultures would not be appreciated at Berkeley. In the social sciences and in some

	engineer and molecular thermodynamicist		humanities, thermodynamics may be useful as an analogy, as a suggestion for looking at a problem (e.g., information theory) but beyond that, I see little use of thermodynamics outside science."
32.	Marc Donohue (1951-) American chemical engineer and thermodynamicist	2014	Co-authored, with American leadership psychologist Richard Kilburg, the 2014 "Leadership and Organization Behavior: a Thermodynamic Inquiry", wherein (see: ChE + H coupling) they outline a molecular thermodynamics based model of leadership and organizational behavior.
33.	Jaime Aguilar-Arias (c.1972-) Colombian chemical engineer	2014	His 2014 conference presentation "Chemical Engineering and Complexity, an Undissipated Structure … Yet", similar to what Alec Groysman suggested at the 2011 Generative Art Conference, Rome, suggested that chemical engineering students be introduced to applications *beyond* traditional "classical chemical engineering" applications, namely in the humanities-applied area of investigation, that of the: Erich Muller, Paul Samuelson, Mohsen Mohsen-Nia, John Bryant, *Journal of Human Thermodynamics*, Santa Fe Institute, etc., type of chemical thermodynamics based complexity approach applied to sociology and economics.

Quotes

The following are related quotes:

> "The matter of multiplicity of contributors needs no great explanation, for we are all used to this in the modern handbooks. I believe it is a common saying that Helmholtz was the **last universal genius**, and we are fast arriving at the point where even a single subject becomes too vast for one man. At any rate, whether or not any of my learned colleagues could write an entire **chemical engineering** handbook, I could not—hence the present form."
>
> — Donald Liddell (1922) *Handbook of Chemical Engineering*, McGraw-Hill [2]

> "It is interesting to note that socio-thermodynamics is only accessible to **chemical engineers** and metallurgists. These are the only people who know phase diagrams and their usefulness. It cannot be expected, in our society, that sociologists will appreciate the potential of these ideas."
>
> — Ingo Muller (2007), *A History of Thermodynamics* [3]

See also

â— Chemical engineering thermodynamics
â— Mechanical engineering

References

1. Licker, Mark D. (2003). *Dictionary of Engineering* (pgs. 99-100). McGraw-Hill.
2. Liddell, Donald M. (1922). *Handbook of Chemical Engineering, Volume 1* (quote, pg. ix). McGraw-Hill Company.
3. Müller, Ingo. (2007). *A History of Thermodynamics: the Doctrine of Energy and Entropy* (pg. 164). New York: Springer.
4. Hanesian, Deran, Buonopane, Ralph A., and Perna, Angelo J. (2010). *The History of the Summer Schools for Chemical Engineering Teachers (Faculty) – 1931-2007* (pdf) (pg. 12). New Jersey Institute of Technology.

Further reading

â— Furter, William. (1980). *History of Chemical Engineering*: based on a symposium cosponsored by the ACS Divisions of History of Chemistry and Industrial and Engineering Chemistry at the ACS/CSJ Chemical Congress, Honolulu, Hawaii, April 2-6. American Chemical Society.

â— Peppas, Nicholas. (1989). *One Hundred Years of Chemical Engineering: From Lewis M. Norton (MIT 1888) to Present*. Springer.

External links

â— Chemical engineering – Wikipedia.

θΔics

In education, **Chemical Engineering (University Rankings)** refers to the rankings of the top chemical engineering schools; some of which are listed below.

Global | 2015 rankings

The following are the 2016 rankings, according to QS World University Rankings, of the top chemical engineering schools in the world: [1]

	School	Country	Lat	Chair	Notes	Sent
1.	Massachusetts Institute of Technology (MIT)		42.4°	Paula Hammond (Q)	Wilhelm Ostwald (1905) Henry Pritchett (1906)	
2.	University of California, Berkeley (UCB)		37.9°	Jeffrey Reimer (Q) (Q)	Gilbert Lewis (1925) Frederick Rossini (1971) John Prausnitz (2013)	
3.	Stanford University		37.4°	Stacey Beng (Q)(Q)	Fernando Sanford (1899)	[N1]
4.	University of Cambridge	UK	52.1°			
5.	National University of Singapore (NUS)	Singapore	1.2°			
6.	Imperial College London	UK	51.5°		Erich Muller Alfred Ubbelohde	
7.	California Institute of Technology		34.1°			
8=	University of Tokyo	Japan	35.4°			
8=	University of Oxford	UK	51.8°		Nightingale Chair of Social Physics	
10.	Kyoto University	Japan	35.0°			
11=	ETH Zurich, Swiss Federal Institute of Technology	Sweden	47.2°			
11=	University of Minnesota		45.0°			
13.	University of Texas at Austin		30.3°			
14.	Delft University of Technology	Netherlands	52.1°			
15.	University of Wisconsin, Madison		43.0°		Erwin Hiebert Harold Davis Thomas Dreier Anson Rabinbach Barkley Rosser John Sanford Alan Nelson	
16.	Princeton University		40.3°		Princeton Department of Social Physics Princeton School of Social	

				Physics Princeton social physics
17.	KAIST – Korea Advanced Institute of Science & Technology	Korea	36.4°	
18.	The University of Melbourne	Australia	37.8°	
19.	Seoul National University	Korea	37.5°	
20.	Tsinghua University	China	40.0°	

(add discussion)

US | 2016 rankings

The following are the 2016 rankings, according to US News & World Report, of the top graduate chemical engineering schools in the US: [1]

	School	Lat	Chair	Notes
1.	Massachusetts Institute of Technology (MIT)	42.4°	Paula Hammond (Q)	
2.	University of California, Berkeley (UCB)	37.9°	Jeffrey Reimer (Q)(Q)	John Prausnitz
3.	California Institute of Technology	34.1°		
4.	Stanford University	37.4°	Stacey Beng (Q)(Q)	
5.	University of Minnesota, Twin Cities	45.0°		
6=	University of Texas, Austin	30.3°		
6=	University of Wisconsin, Madison	43.0°		
8.	Princeton University	40.3°		Princeton Department of Social Physics Princeton School of Social Physics Princeton social physics
9=	Georgia Institute of Technology	33.5°		
9=	University of California, Santa Barbara	34.4°		
9=	University of Delaware	39.4°		

(add discussion)

Notes

N1. The following is a related mental note:

> "I come from the bottom, and I'm not going anywhere but the top."
>
> — Libb Thims (2014), long-time reoccurring personal note/pledge, arisen to mind while watching *Crimson Tide* (1995), at 13:40-min point; semi-reflective note, possibly arisen in respect to earlier today two cultures inquires email query sent out, following discover of Fernando Sanford's 1899 address, to Stanford University bioengineering department chair Norbert Pelc, in regards to teaching a physiochemical humanities course at Stanford, Sep 2 @ 7:14 PM CST

References

1. Top Chemical Engineering Schools in 2015 – TopUniversities.com.

θΔics

In thermodynamics, **chemical engineering thermodynamics** is the study of thermodynamics with focus on topics and applications unique to the profession of chemical engineering, such as fluid mixtures, solution thermodynamics, chemical reaction equilibrium, phase equilibria, vapor-liquid equilibrium, adsorption, and osmotic equilibria. [1]

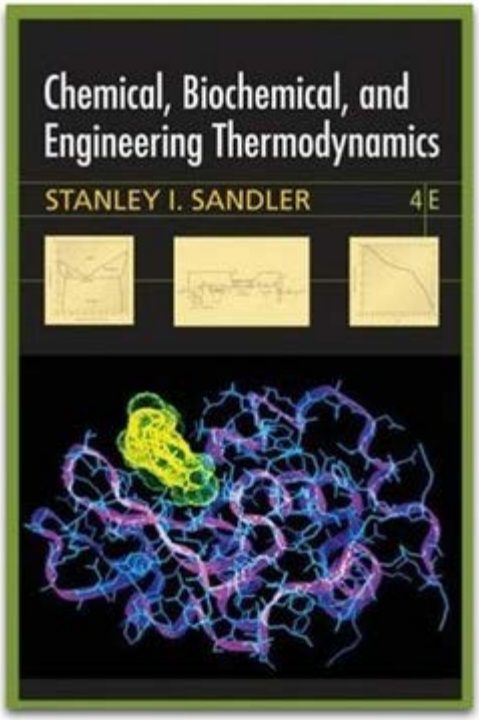

American chemical engineer Stanley Sandler's 2006 fourth edition *Chemical, Biochemical, and Engineering Thermodynamics*, a staple **chemical engineering thermodynamics** book. [5]

Overview

(add)

History

The subject of chemical engineering thermodynamics seems to have arisin in the 1920s. [4] Pioneers in this field include American chemical engineers Hendrick Van Ness and Stanley Sandler. Van Ness' textbook *Introduction to Chemical Engineering*, now in its seventh edition, having sold over a half-million copies, originated from 1945 lecture notes of Joe Mauk Smith at Purdue University, who was asked to develop a course for chemical engineering undergraduates to replace a general thermodynamics course given by the mechanical engineering department. [2]

Sandler's very-popular 2006 fourth edition textbook *Chemical, Biochemical, and Engineering Thermodynamics*, originally published in 1977 as *Chemical and Engineering Thermodynamics*, was the book used by American electrochemical engineer Libb Thims during his first indoctrination into the science of thermodynamics, in the mid 1990s, particularly the 1989 second edition. [3]

Timeline

The following timeline, shows the growth of chemical engineering thermodynamics publications from that of the earlier chemical thermodynamics publications in the curriculum of chemical engineers which uses more rigorous mathematics than that learned by the general chemist:

Date	Publication	Author [s]
1944	*Chemical Engineering Thermodynamics*	Barnett Dodge
1949	*Introduction to Chemical Engineering Thermodynamics*	Joe Smith (later editions with Hendrick Van Ness and Michael Abbott)
1949	*Introduction to Chemical Engineering Thermodynamics*	Frank Fowler
1956	*Principles of Chemical Engineering Thermodynamics*	Ernest Wilson and Harold Ries
1972	*Chemical Engineering Thermodynamics: the Study of Energy, Entropy, and Equilibrium*	Richard Balzhiser, Michael Samuels, and John Eliassen
1977	*Chemical and Engineering Thermodynamics*	Stanley Sandler

1985	*Chemical Engineering Thermodynamics*	Thomas Daubert
1996	*Chemical Engineering Thermodynamics: an Introduction to Thermodynamics for undergraduate Engineering Students*	Jack Winnick
1997	*Chemical Engineering Thermodynamics*	Y.V.C. Rao
1999	*Introductory Chemical Engineering Thermodynamics*	Richard Elliott and Carl Lira
2000	*A Unified Introduction to Chemical Engineering Thermodynamics: the Laws of Thermodynamics, Material and Energy Balances, Chemical Thermodynamics, Phase and Chemical Equilibrium*	Edward Thompson

See also

- Engineering thermodynamics

References

1. Smith, J.M. Van Ness, H.C., and Abbott, M.M. (2005). *Introduction to Chemical Engineering Thermodynamics* (7th ed.). New York: McGraw-Hill Book Co. Inc.
2. Van Ness, Hendrick C. (2001). "Evolution of a Textbook: Introduction to Chemical Engineering Thermodynamics", *Rensselaer Polytechnic Institute*.
3. Sandler, Stanley, I. (1989). *Chemical and Engineering Thermodynamics* (2nd ed.). New York: John Wiley & Sons.
4. Peppas, Nikolas, A. (1989). *One Hundred Years of Chemical Engineering* (thermodynamics, pgs. 9-11, etc). American Chemical Society.
5.Sandler, Stanley I. (2006). *Chemical, Biochemical, and Engineering Thermodynamics* (fourth edition). Wiley.

Further reading

- Dodge, Barnett F. (1944). *Chemical Engineering Thermodynamics.* McGraw-Hill.
- Gilmont, Roger. (1959). *Thermodynamic Principles for Chemical Engineers*. Prentice-Hall.
- Balzhiser, Richard, E., Samuels, Michael R., and Eliassen, John, D. (1972). *Chemical Engineering Thermodynamics - the Study of Energy, Entropy, and Equilibrium.* Englewood Cliffs, New Jersey: Prentice-Hall, Inc.
- Fogler, Scott H. (1992). *Elements of Chemical Reaction Engineering.* Englewood Cliffs, New Jersey: Prentice Hall.
- Elliott, J.R. and Lira, Carl T. (1999). *Introduction to Chemical Engineering Thermodynamics* (abstract). Prentice Hall PTR.

θΔics

In chemistry, a **chemical equation** is a way of denoting a chemical reaction using chemical symbols for the participating particles (atoms, molecules, ions, etc.) and a reaction arrow to signify time (before 'state' on going to an 'after' state). [1] A chemical reaction equation, said another way, is a symbolic representation of a chemical reaction where the reactant entities are given on the left hand side and the product entities are given on the right hand side. [2] The basic chemical reaction equation involves, typically, a one-way arrow, signifying an irreversible reaction in going from reactants to products:

$$\underset{\text{(reactants)}}{xA + yB} \rightarrow \underset{\text{(products)}}{zC + wD}$$

In the above standard chemical equation, the symbols *A*, *B*, *C*, *D*, represent the molecules involved in the reaction, and the numbers *x*, *y*, *z*, and *w* are called stoichiometric coefficients, and represent the relative numbers of reacting molecules. A chemical equation thus expresses a chemical change quantitatively by means of chemical formulas, e.g. H_2O, chemical symbols, e.g. H=hydrogen, and chemical process notation, e.g. reaction arrows (→), equilibrium reaction signifier ( ), chemical bonds (-, =, ≡), heated reaction (Δ), among others. [3]

History

See main: History of the chemical equation

The first chemical reaction diagrams were made by Scottish physician and chemist William Cullen in 1757, such as shown below, who pioneered the development of affinity reaction diagrams during his lectures. Cullen called the reaction arrow a 'dart', which he said expressed the elective affinity preference of the reacting species. Modified types of Cullen reaction diagrams were later employed in the lecture notes of Joseph Black, Cullen's student. [4]

The upgrade from the equal sign " = " symbol to the two-way reaction arrow "⇆" symbol (or ⇌), signifying a reversible reaction, to note, did not come about until 1884 through the work of Dutch physical chemist Jacobus van't Hoff. [5]

In modern terms, the agreed upon notation, according to IUPAC, is as follows: the symbol '=' for a stoichiometric relation; '→' for a net forward reaction; '⇆' for a reaction in both directions; and '⇌' for equilibrium. [2]

See also

- Human chemical reaction
- Human chemical reaction (history)

References

1. Daintith, John. (2005). *Oxford Dictionary of Chemistry*. Oxford University Press.
2. Chemical reaction equation – IUPAC.
3. Divers, Edward. (1902). “The Atomic Theory without Hypothesis” (chemical formula, pg. 503), *Nature*, 66: 495-504.
4. Crosland, Maurice P. (1959). “The use of diagrams as chemical 'equations' in the lectures of William Cullen and Joseph Black.” (abs) *Annals of Science, Vol 15, No. 2*, Jun.
5. (a) Nernst, Walther. (1895). *Theoretical Chemistry: from the Standpoint of Avogadro’s Rule & Thermodynamics* (⇆, pg. 358). MacMillan and Co.
(b) The exact publication of Van't Hoff likely being his 1884 *Studies in Chemical Dynamics.*

External links

- Chemical equation – Wikipedia.

θΔics

In chemistry, **chemical equilibrium** is a reaction condition or state in which the velocity of a process in one direction, e.g. forward reaction, is equal to the velocity in the opposite direction, e.g. reverse reaction, so that there is no net change and therefore no observable change in the composition of the system. [1]

History

In October 1873, August Horstmann, a student of Rudolf Clausius, Robert Bunsen, and Hans Landolt, famously announced the condition for chemical equilibrium to be that of maximum entropy. [2]

In 1884, Jacobus van't Hoff, drawing especially on the work of Horstmann and partially on Hermann Helmholtz's "On Thermodynamics of Chemical Processes" (1882), published his *Studies in Chemical Dynamics*, in which he demonstrated that heat of reaction is not a direct measure of affinity (see: thermal theory of affinity), introduced the double arrow sign ⇌ for denoting equilibrium, and wrote out an equation describing the variation of the equilibrium constant as a function of temperature. His starting point, according to American chemistry historian Mary Jo Nye, was reaction velocities, rather than a balance of opposing forces. He used the symbol A for the work (*Arbeit*) that is done by the force of affinity (*Affinitat*) that brings about the chemical reaction, and recognized the need to quantify the role of concentration of reactants in determining the rates of reaction. [3]

Hmolscience

In 1910, American physical chemist Wilder Bancroft, in his "A Universal Law" address, outlined a large number of non-typical chemical reaction examples, from animals to humans, wherein he say Le Chatelier's principle applying. [4]

In 1917, American economist Julius Davidson, in his "One of the Physical Foundations of Economics", cites Willard Gibbs' 1901 *Elementary Principles of Statistical Mechanics* as a basis, he argues that the law of diminishing returns, in economics, is based on chemistry and physics, and compares human chemical reactions to basic equilibrium adjusting chemical reactions. Specifically, Davidson compares the reaction of ethanol CH_3CH_2OH and acetic acid CH_3COOH to produce ethyl acetate $CH_3COOCH_2CH_3$ and water H_2O:

$$CH_3CH_2OH + CH_3COOH \rightleftharpoons CH_3COOCH_2CH_3 + H_2O$$

with different combinations of male-female reactions, such as follows:

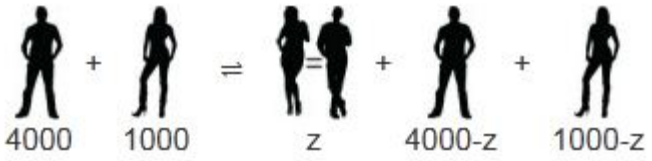

In 1935, American physical chemistry trained physiologist Lawrence Henderson, in his *Pareto's General Sociology: a Physiologists Interpretation*, goes through, in a step by step manner, an example Le Chatelier's principle like chemical equilibrium adjusting reaction, after which he discusses how, in outline, this logic was grasped at in the equilibrium sociology work of Vilfredo Pareto (*Treatise on General Sociology*, 1912), and how the modern path is involves the application of Willard Gibbs' chemical thermodynamics methods to the examination of social equilibrium adjustments. The

isolated physico-chemical system he employs in his example is a gas phase of carbon dioxide CO_2 in contact with a four component liquid phase system, namely an aqueous solution of carbonic acid H_2CO_3, sodium bicarbonate $NaHCO_3$, monosodium phosphate NaH_2PO_4, and disodium phosphate Ha_2HPO_4, as depicted adjacent. Henderson assumes the concentration of water and system temperature to be constant, as a first approximation. The equilibrium chemical reaction for the liquid phase is: [6]

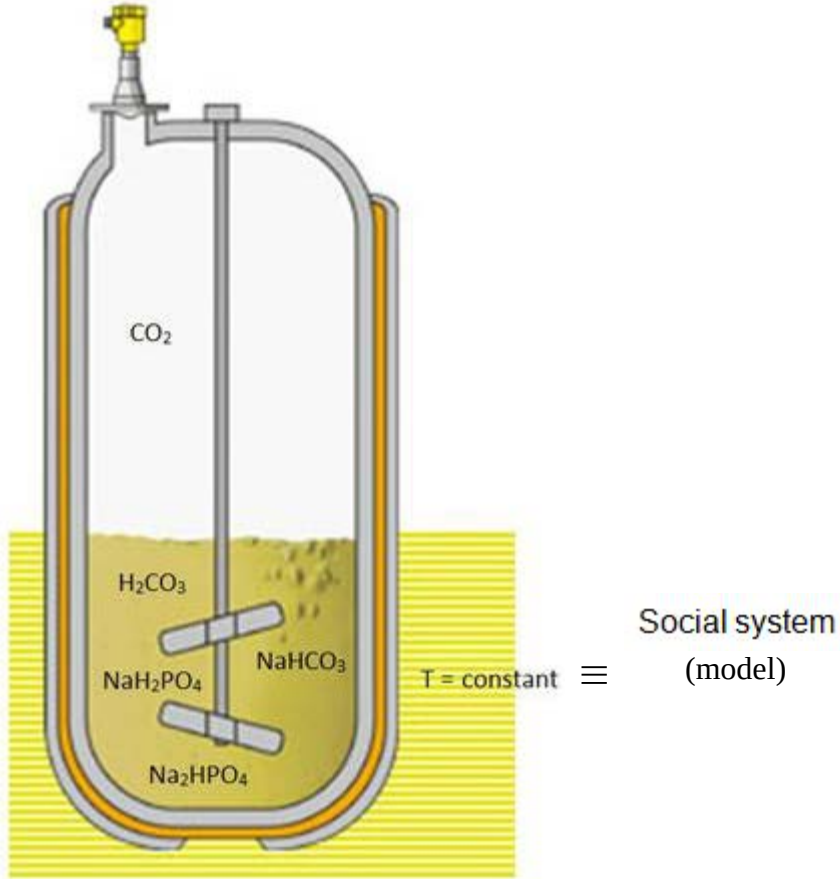

American physical chemist Lawrence Henderson's 1935 isolated five component liquid and gas phase physico-chemical system example model, wherein he shows how the **chemical equilibrium** of the system, according to Le Chatelier's principle (and Gibbs methods), shifts when carbon dioxide CO_2 is added, and goes on to assert that these reactive shifting equilibrium models apply universally to the social sciences, namely to connective semi-permeable boundaried (migrative) social systems. [2] Similar chemical-to-social equilibrium adjusting examples are found in the works of: Julius Davidson (1916), Frederick Rossini (1971), Christopher Hirata (2000), and Thomas Wallace (2009) .

$$H_2CO_3 + Na_2HPO_4 \rightleftharpoons NaHCO_3 + NaH_2PO_4$$

The chemical equilibrium for this reaction, per ratio of concentration ratio of products over reactant is, according to Henderson, is:

$$\frac{[NaHCO_3][NaH_2PO_4]}{[H_2CO_3][Na_2HPO_4]} = 3$$

The equilibrium of the gas phase carbon dioxide shifting into free carbonic acid in the liquid phase is:

$$[CO_2]_g = [H_2CO_3]_{aq}$$

Henderson then defines the condition of equilibrium as reaction condition or state in which the velocity of a process in one direction, namely forward reaction, is equal to the velocity in the opposite direction, namely reverse reaction, so that there is no net change and therefore no observable change in the composition of the system. He then goes through an

algebraic type of concentration calculation wherein he adds a 100 units of carbon dioxide CO_2 gas to the the system, shows how so much carbon dioxide converts into liquid carbonic acid H_2CO_3, after which all the individual species concentrations adjust, at the end of which the second state equilibrium concentration ratio becomes 3.011, i.e. the original state equilibrium reaction velocities. On systems, Henderson explains:

> "Isolation may be regarded as the case where exchanges between the system and the environment have the value zero. If these exchanges have some other known value, the requirements for logical analysis are likewise fulfilled, and the analysis ay not present any serious inconvenience. Thus a metal bar one end of which is being heated at a constant rate, or a country with constant immigration rate, may for certain purposes be treated as a system, without regard to the properties of the source of heat, or of the countries from which the immigrants come."

Moreover, in rather telling postulation, which juxtaposes the earlier century Le Chatelier principle based sociology of Vilfredo Pareto with the later century free energy minimization bases sociologies of the late 20th century burgeoning human free energy theorists (e.g. Christopher Hirata, 2000), we fine the following very excellent statement:

> "Another characteristic of many ideal systems that is, in general, indispensable in order that conditions shall be determinate is the establishment and use of some definition of equilibrium or some criterion of equilibrium, whether in the case of statical equilibrium or in the case of dynamical equilibrium. This criterion is often of such a character that some function like entropy or energy assumes a maximum or a minimum value or, as in the case of the derivatives or variations of such functions, vanishes. In the case of Pareto's social system the definition of equilibrium takes a form that closely resembles the theorem of Le Chatelier in physical chemistry, which expresses a property of physico-chemical equilibrium, and which may be deduced from the work of Gibbs."

Very excellent postulate indeed!

Verbal statements or assertions about chemical equilibrium models being the basis of social equilibrium models seem to exist in large numbers. In 2006, American science writer Tom Siegfried, for example, gave the following verbal statement: [7]

> "In a chemical reaction, all the atoms involved are seeking a stable arrangement, possessing a minimum amount of energy. It's because of the laws of thermodynamics. And just as in a chemical reaction all the atoms are simultaneously seeking a state with a minimum energy, in an economy all the people are seeking to maximize their utility. A chemical reaction reaches an equilibrium enforced by the laws of thermodynamics; an economy should reach a Nash equilibrium dictated by game theory."

Siegfried footnotes this statement with the following:

> "As one reviewer of the manuscript for this book [Steven Strogatz or Mario Livio?] pointed out, it is not necessarily true that all economic systems converge to equilibrium, and that in some cases a chaotic physical system might be a better analogy than a chemical equilibrium system. The idea of equilibrium is nevertheless an important fundamental concept, and much of modern economics involves efforts to understand when it works and when it doesn't."

Here we see the influence of the late 20th century far-from-equilibrium theories (Ilya Prigogine, 1972), chaos theory, nonequilibrium thermodynamics, self-organized criticality (Per Bak, 1987), etc., that have led some to believe that

human societies exist at very far from equilibrium or even at the "edge of chaos" (Len Fisher, 2009), a very common belief for many modern people.

The above footnote also brings to mind the Harvard Pareto circle effect on the assimilation of Gibbs-Pareto equilibrium models into the mind of sociologist George Homans. Adrift after graduating from Harvard in the depression year of 1932, Homans accepted an invitation of Henderson to sit in on his first series of seminars on Pareto. Toward the end of the conference, in 1934, lawyer Charles Curtis, a friend of the Homans' family, also an attendee of the seminar, suggested that they collaborate on an exposition of Pareto's sociology. The result was the 1934 *An Introduction to Pareto*. At this point, it seems, Homans gave what seems to be summaries of what he had just absorbed, e.g. "most societies at most times" have a tendency to be in equilibrium. Sixteen years later, at the time of his 1950 *The Human Group*, Homans had grown more, and he had begun to rethink his earlier formulations of equilibrium. He now wrote: "some social groups under some circumstances" are in equilibrium. Moreover:

> "Not every state of a social system is a state of equilibrium, nor does every social system 'seek' equilibrium."

In 1961, at the time of publication of his *Social Behavior: its Elementary Forms*, his views diverted even more: (Ñº)

> "Equilibrium is not a state toward which all creation moves."

Here, it seems, Homans is grasping with vestiges of coupling theory? Or possibly, on a remote chance, he had begun to read up on nonequilibrium state theory and or nonequilibrium thermodynamics?

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External links

â— Chemical equilibrium – Wikipedia.

θΔics

In chemistry, **chemical kinetics** refers to []

Overview

In 1864, Cato Guldberg and Peter Waage (1864) introduced subject of "chemical kinetics" via the general model that chemical reactions have both a forward reaction and a reverse reaction, that depends on the amount of active masses of the reactants and the affinities driving the activities of these masses.

In 1877, chemical kinetics was developed, independently, by Jacobus van't Hoff.

In 1884, Van't Hoff, in his *Studies of Chemical Dynamics*, drew the distinction between chemical kinetics and chemical thermodynamics.

Quotes

The following are related quotes:

> "Van't Hoff had shown chemists how thermodynamics could be applied to their science, especially with reference to ideas on affinity. In his work in 1884 he first drew the distinction between **chemical kinetics** and chemical thermodynamics and showed that the maximum external work obtained when a chemical reaction was carried out reversibly and isothermally could serve as a measure of chemical affinity. Helmholtz even earlier had called maximum work 'free energy'. Gilbert Lewis, of the University of California, Berkeley, proposed that this term be restricted to mean the work available for use. Thus, the maximum useful work obtained when one system passes spontaneously into another represents the decrease in free energy of the system. The influential textbook of G.N. Lewis and Merle Randall which represents these ideas has led to a replacement of the term 'affinity' by the term 'free energy' in much of the English-speaking world. The older term has never been entirely replaced in thermodynamic literature, since after 1922 the Belgian school under Theophile De Donder has made the concept of affinity still more precise."
>
> — Henry Leicester (1956), *The Historical Background of Chemistry* [1]

See also

â— Kinetic factor
â— Thermodynamic factor

References

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External links

â— Chemical kinetics – Wikipedia.

θΔics

In terminology, **chemical metaphor** refers to a figure of speech in which a word or phrase from chemistry is applied to an object or action, outside of chemistry proper, typically to an aspect of humans or a phenomenon in the humanities, which may or may not be literally applicable, depending.

chem·i·cal

/ˈkemikəl/

adjective

1. of or relating to chemistry or the interactions of substances as studied in chemistry.
   "the chemical composition of the atmosphere"

noun

1. a compound or substance that has been purified or prepared, especially artificially.
   "never mix disinfectant with other chemicals"

met·a·phor

/ˈmetəˌfôr,-fər/

noun

a figure of speech in which a word or phrase is applied to an object or action to which it is not literally applicable.
"'I had fallen through a trapdoor of depression,' said Mark, who was fond of theatrical metaphors"
synonyms: figure of speech, **image**, **trope**, **analogy**, **comparison**, **symbol**, word painting/picture
"the profusion of metaphors in her everyday speech has gotten pretty tiresome"

- a thing regarded as representative or symbolic of something else, especially something abstract.
  "the amounts of money being lost by the company were enough to make it a metaphor for an industry that was teetering"

Google definitions of "chemical" and "metaphor", to give a respective sense of the term "**chemical metaphor**", as in a figure of speech in which a word or phrase from chemistry is applied to an object or action, which may or may not be literally applicable, depending.

Overview

In 1809, German polyintellect Johann Goethe published his physical chemistry based novella *Elective Affinities*, which, in his 4 Sep 1809 advertisement, he described as "chemische Gleichnisrede", the German term "Gleichnisrede" translating, per Google auto-translate, as "parable". (Q) Authors, ever since, however, depending on one's disposition, outlook, and stance on the book, variously referred to Goethe's novella either as analogy, metaphor, or parable, among others, depending. German American studies scholar Susan Winnett, in 1993, e.g., translated Goethe's advertisement as follows: [3]

> "Thus he must have wanted to take an ethical case and to follow a **chemical metaphor** back to its intellectual origins, especially since there is ultimately only one nature everywhere, and even the realm of serene freedom of reason is ceaselessly permeated with the traces of dark, passionate necessity that are only extinguishable by a higher power and perhaps also not in this life."

Others, likewise, have characterized Max Weber's borrowing of Goethe's human chemical theory as metaphor upon metaphor; the following being one example from Polish-born Australian philosopher Harry Redner (2013) (Q): [4]

> "Of course, this idea must not be taken literally—any more than Weber's use of the term 'elective affinities,' also a **chemical metaphor** borrowed from Goethe, can be interpreted in terms of chemical valence. Such metaphors work in so far as theyare illuminating and their meaning guided by how well they serve to make things comprehensible."

In 1981, American philosopher Robert Solomon penned a chapter section entitled "Made for Each Other: the Metaphysical Model", wherein he touches on Aristophanes' split human model of love (see: soul mate), Gilbert and Sullivan (c.1896) inspired (supposedly), Melchior Lengyel filmed *Ninotchka* emotional love vs. physicochemical love debate scene, turned Cole Porter's 1955 electromagnetic-discussing song "It's a chemical reaction, that's all", to state the following: [1]

> "The metaphysical model is based not on the idea that love is a refuge from isolated individualism but, quite the opposite, on the idea that love is the realization of bonds that are already formed, even before one meets one's 'other half'. The ontology of loneliness treats individuals as atoms [see: human atom], bouncing around the universe alone looking for other atoms, occasionally forming more or less stable molecules [see: human molecule and dihumanide molecule]. But if we were to pursue the same **chemical**

metaphor into the metaphysical model, it would more nearly resemble what physicists today call 'field theory'. A magnetic field, for instance, retains all of its electromagnetic properties whether or not there is any material there to make them manifest. So too, an individual is already a network of human relationships and expectations and these exist whether or not one finds another individual whose radiated forces and properties are complementary. The old expression about love being a matter of 'chemical attraction', from Goethe to Gilbert and Sullivan, is, scientifically, a century out of date; 'attraction' is no longer a question of one atom affecting another but the product of two electromagnetic fields, each of which exists prior to and independently of any particular atoms within its range."

(add discussion)

In 2013, Norwegian sociologist Johan Galtung, began to be grouped with Libb Thims, as being one of the early "chemical metaphor" theorists, specifically for his 1977 "Chemical Structure and Social Structure: an Essay on Structuralism". [2]

See also

- Chemical analogy
- Chemical simile
- Chemical teleology
- Human chemical theory

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θΔics

In music chemistry, **Chemical Party** is a 2008 1:30-minute human chemistry style, periodic table parody video, of sorts, produced by Marie Curie Actions group, in which people at a party are each labeled as being certain types of atoms: carbon (C), hydrogen (H), argon (Ar), krypton (Kr), radon (Rn), helium (He), Zinc (Zn), etc., and as such react with each other in same manner as do each of those respective elements react with each other in reality.

The original article title promotional of the video was “Marie Curie Actions presents Chemical Party: Sexy Carbons, Bored Noble Gases, Explosive Reactions”. [1] The song to the video is the 2007 song “Fledermaus Can’t Get It” by Von Sudenfed. The video was directed by directed by Roderick Fenske. As of 2012, the video has received somewhere around 2-3 million views.

Bonding interactions:
The following are some of the opening bonding interactions, depicted by dancing couples:

â— Chlorine (Cl) dancing with hydrogen (H), i.e. HCl
â— Iron (Fe) dancing with
â— Platinum (Pt) dancing with

Marie Curie Actions' 2008 **Chemical Party** video, showing people acting as specific elements (individual people), or in some cases molecules, e.g. HCl (two people dancing), at a hypothetical "periodic table party", reacting to each other as do each respective naturally occurring 92 elements react with each other in reality.

HCl + Zn

The following is the HCl + Zn reaction, the first reaction shown in the video, depicted by a new dance partner displacing the former dance partner:

$$HCl + Zn \rightarrow ZnCl + H$$

or in words: hydrochloride + zinc "yields" zinc-chloride + hydrogen, the mechanism of which, taking place in 5-seconds, is shown below:

Stoichiometrically, to note, the balanced reaction would be:

$$Zn + 2\ HCl \rightarrow ZnCl_2 + H_2$$

Thinkers to discuss this type of logic verbally, as a basis to replace religion (or standing belief system), in include: Johann Goethe (1809), to replace Christianity, Henry Bray (1910), to modify Christianity with god-based, evolution-reformed, panbioism-themed monism, and Vladimir Cruz (2012), expanding on Goethe, as upgrade alternative to communism (or socialism).

H, Ne, and C reactions

The following shows the second "Chemical Party" video reaction, namely the first attempt at mixing of hydrogen H plus neon Ne, followed by the introduction of carbon C to the reaction system:

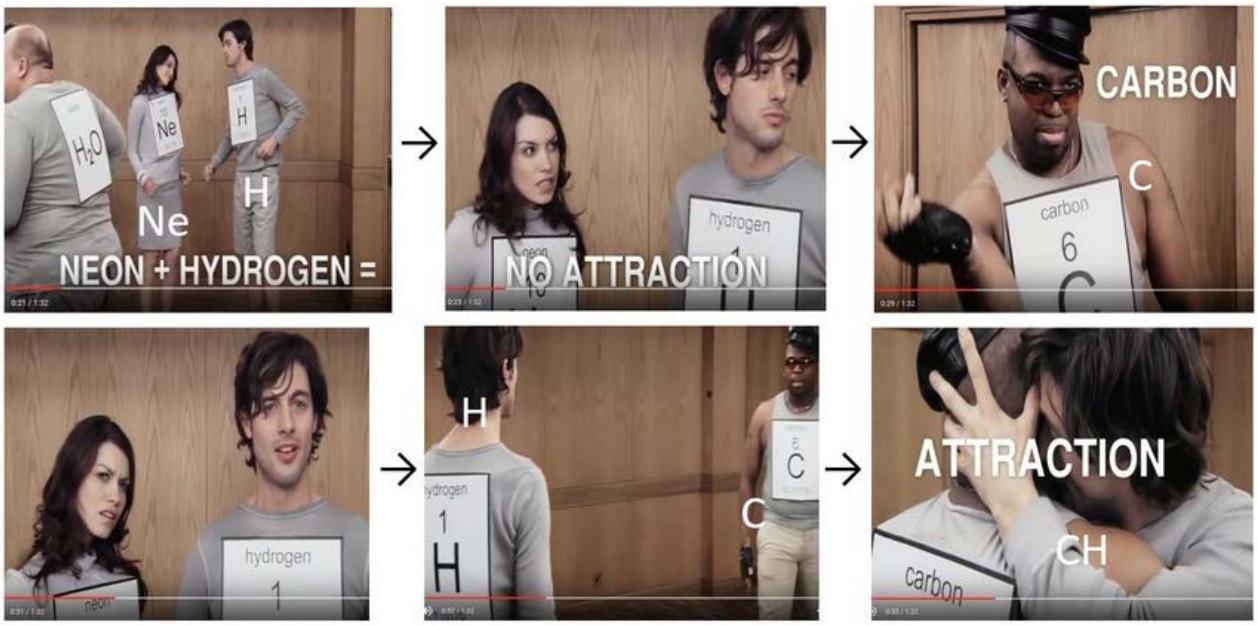

The first mingling of elements, between Ne and H, does not result in any combination, being that experimentally it is found that hydrogen can combine with all of the second role elements, which are shown below, except neon, to make molecules: [3]

lithium Li	beryllium Be	boron B	carbon C	nitrogen N	oxygen O	fluorine F	neon N
$[He]2s^1$ Li•	$[He]2s^2$ Be:	$[He]2s^22p^1$ •B:	$[He]2s^22p^2$ •C:	$[He]2s^22p^3$ •N:	$[He]2s^22p^4$:O:	$[He]2s^22p^5$:F:	$[He]2s^22p^6$:Ne:

Neon is a stable element "by itself" being that its valence shells are filled with eight electron, thus satisfying the octet rule (Abegg's rule); it is thus electromagnetically stated, as far as its protons and electrons are concerned (see: floating magnet experiment). The following shows the different potential reactions to hydrogen, which indicates that the half-filled hydrogen 1s orbital can combine with any other half-filled orbitals of second row elements (except neon) to form bonds: [3]

Li• •H ⟶ Li—H	Lithium has 2 valence electrons in the product because it can make only 1 bond with hydrogen.
H• •Be• •H ⟶ H—Be—H	Beryllium has 4 valence electrons in the product because it can only make 2 bonds. It has fewer electrons than neon and can react with electron donors. Each hydrogen has 2 valence electrons, the same as helium.
H• •B• •H ⟶ H—B(—H)—H	Boron has 6 valence electrons in the product because it can only make 3 bonds. It has fewer electrons than neon and can react with electron donors. Each hydrogen has 2 valence electrons, the same as helium.
H• •C• •H ⟶ H—C(—H)(—H)—H	Carbon has 8 valence electrons in the product, the same as neon. Each hydrogen has 2 valence electrons, the same as helium.
H• •N• •H ⟶ H—N(—H)—H	Nitrogen has 8 valence electrons in the product, the same as neon. Each hydrogen has 2 valence electrons, the same as helium.
H• •O• •H ⟶ H—O—H	Oxygen has 8 valence electrons in the product, the same as neon. Each hydrogen has 2 valence electrons, the same as helium.
:F• •H ⟶ :F—H	Fluorine has 8 valence electrons in the product, the same as neon. Hydrogen has 2 valence electrons, the same as helium.

Historically, the discovery that H atoms react with carbon, to note, was made by L.J. Aramenko in 1946; later studies found that by thermally producing a beam of atomic hydrogen, which was fired at a carbon target, between temperatures of 30-950°C, the major reaction products were: CH_4 (91%), C_2H_2 (8.4%), and C_2H_4, C_3H_6, and C_4 in lesser amounts. [4]

The video portrays a homosexual reaction preferred over a heterosexual reaction. Statistically, these types of reactions, for humans occur at a rate of about 3% of the population. Thinkers to discuss homosexual relationships via human chemical reaction theory include: Christopher Hirata (2000), Libb Thims (2007), and Thims in dialogue with Mirza Beg (2014), who, having his physiochemical sociology theories anchored in Islamic beliefs, rejected the assertion that some homosexual relationships can be more stable, and therefore preferred thermodynamically (see: Beg-Thims dialogue).

The video also shows, below left, neon Ne leaving with a "sad" face after being rejected from the reaction, which is paralleled in Goethe's *Elective Affinities* (**P1:C4**) wherein, in the reaction between limestone, i.e. calcium carbonate ($CaCO_3$), and sulfuric acid (H_2SO_4), which upon contact yields gypsum ($CaSO_4 \cdot 2H_2O$), in the form an aqueous crystal, and carbon dioxide (CO_2) gas, to compared and contrasted with the reactions that are occurring between the main characters in the novel: Charlotte (carbon dioxide), Edward (lime), Captain (sulfuric acid), the mention of the "poor acid gas" is addressed in attempts, as shown below right:

Chemical Party
(2008)

Elective Affinities
(1809)

"Forgive me," said Charlotte, "as I forgive the natural philosopher. I cannot see any choice in this; I see a natural necessity rather, and scarcely that. After all, it is perhaps merely a case of opportunity. Opportunity makes relations as it makes thieves, and as long as the talk is only of natural substances, the choice to me appears to be altogether in the hands of the chemist who brings the creatures together. Once, however, let them be brought together, and then god have mercy on them. In the present case, I cannot help being sorry for the **poor acid gas** [CO_2], which is driven out up and down infinity again."

"The acid's business," answered the Captain, "is now to get connected with water, and so serve as a mineral fountain for the refreshing of sound or disordered mankind."

"That is very well for the gypsum [$CaSO_4 \cdot 2H_2O$] to say," said Charlotte. "The gypsum is all right, is a body, is provided for. The other poor, desolate creature may have trouble enough to go through before it can find a second home for itself."

Interesting, in comparing the 2008 version as compared to the 1809 version, is how "secularily numb" culture has become to reality; Goethe addressing the deeper roots of the problem: choice, morality, god, etc., the modern version seemingly rug sweeping all of these deeper issues under the implicit or non-mentioned guise of soft humor.

The video also shows the various combinations of carbon to hydrogen:

The following are other video depictions:

(add discussion)

Discussion

The following are some of the top comments from the various versions of the video around:

Pardon the language, but electricity is an asshole! Let salt be salt!
serebii666 2 years ago 55

Carbon is a black person.....how appropriate!!!!
saudmahri 3 weeks ago 161

Neon is HAWT!
mulalalu 3 weeks ago 70

this acctualy makes chemistry look like fun XD
ThePeaceKiD95 2 years ago 22

oh man i would definitely bond with neon... if only she weren't inert :'(
FlabberFlob 6 months ago 5

gotta love this. :)
chemistry for dummies..
HardKre 2 years ago 2

One of the salient yet prevalent aspects about this video, as indicated by the above selection of popular comments, aside from the obvious fact that it is quite entertaining to watch, is that the video highlights very clearly global ignorance, not just in Europe, where the video stems, but especially so in America, and in other countries where the video has been remade, high school to college level.

In a sense, as the last comment indicates, the video does seem to give a gist of what can be described as chemistry or rather human chemistry "for dummies", which according to psychological classification is someone with an IQ below 90. On the other hand, quite paradoxically, in what seems to be the complete polar end of the spectrum, the subject of social chemistry, as Henry Adams so right spelled things out over a hundred years ago, does indeed require the "aid of another Newton" and this is evidenced by the fact that the elective affinities problem is the single most common genius puzzle that IQ=225+ genius are drawn to like magnets.

As of 2002, it has indeed been determined, by Sterner and Elser, that a human is a molecule with a measurable human molecular formula; and indeed, in 1910, the first book on human chemistry was written by English-born American navel and chemical engineer William Fairburn; and indeed the subject of "human chemistry" was founded in 1796 by German polygot Johann Goethe (IQ=230) with his human elective affinities reaction theories, a work that he considered his greatest work; which amounts to the conclusion that the "Chemical Party" video is scratching away, in a humorous manner, at a yet unearthed volcano of a very complex subject,

embedded in the minds of geniuses past, like a thorn waiting to be removed; or as Victoria Woodhull, America's first female US presidential candidate, put it in 1871, in summary of Goethe's work: "A great revolutionary doctrine pervades the whole."

What this indicates is that there is indeed a vast disjunct between what children are actually taught in school and reality as it is actually studied by the greatest geniuses of all time, Goethe (IQ=230), Schopenhaurer (IQ=185), Hirata (IQ=190), Adams (IQ=190), etc., which amounts to the first two-decades of the typical human education process, especially in America, being a complete waste of time, to say the least. The 2010 Mitch Garcia and Marcin Borkowski ChemistryForums.com thread responses to the query "Should Human Chemistry Be Taught In School?" is testimony to this viewpoint. [2] The following remakes show just how far down the two-hundred year decent into prolific ignorance we as a global community have fallen since the days of the great epicenter geniuses (Aristotle, Voltaire, Goethe, and Einstein):

A 2008 remake by Louisiana State University students.	A 2010 remake by Mrs. Tallant's physical science class.	A 2010 remake by what seems to be a chemistry high school class in Honduras.
A 2011 remake by what seems to be a chemistry class at the University of Pisa, Italy.	A 2011 remake by students at the International School of Belgrade, Serbia.	A 2012 remake by the physical science class of Andrews High School.

Intellectual de-evolution | Decline

It is difficult to put into words, but the above videos show just how childlike we as a culture have descended down into blissful "learned ignorance"; having been put through what seems to well be classified as a cookie-cutter educational upbringing, which by virtue of the two-cultures, three-cultures, four-cultures, or more correctly growing poly-cultural divide of modern knowledge, there is a great disjunct in the various schools of knowledge, one of the repercussions of which are the results shown in the above six videos. The whole situation is nearly abysmal in what seems to be a spiral descent into prolific ignorance of the big questions of human existence. The following two-hundred year comparison,1809 view compared to the 2009 view, shows difference between the state of of the decline in basic human knowledge of existence:

1809

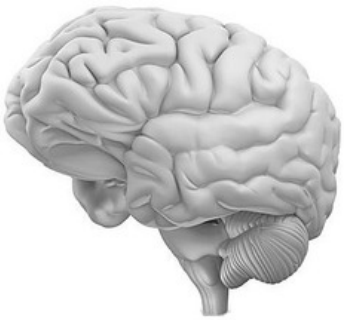

2009

↔

A film remake of the chemical scene of Goethe's famous 1809 "chapter four", of his *Elective Affinities*, which explains his 1796 human chemical theory.

A 2009 Chemical Party remake by students and professors at the Technical University Dresden, Germany.

Goethe would probably turn over in his grave if he saw how stupid we've become?

Other remakes

â— The Element Party (27 Oct 2009) – Korean-American remake?
â— Element Party (2011) – American highschool?
â— Festa dos Elementos: Club Version (28 Jun 2011) – College Marista Diocesano, Portuguese.

See also

â— Mr. Carbon Atom
â— Molecule man

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External links

â— Dancing periodic table of elements (2011) – American Chemical Society.

θΔics

In hmolscience, **chemical peneplanation** is []

Overview

In c.1927, Harold Blum, supposedly while working on his physiology PhD at Harvard, after already having completed his BS in zoology (1922), or therein, plus or minus, read (a) Lawrence Henderson's *The Fitness of the Environment: An Inquiry into the Biological Significance of the Properties of Matter* (1913) and (b) Gilbert Lewis' *Thermodynamics and the Free Energy of Chemical Substances* (1923), and therein surmised the following mental formulation for a new upgraded evolution model: [1]

A [Lewis] + B [Henderson] = C [Gibbs-based evolution]

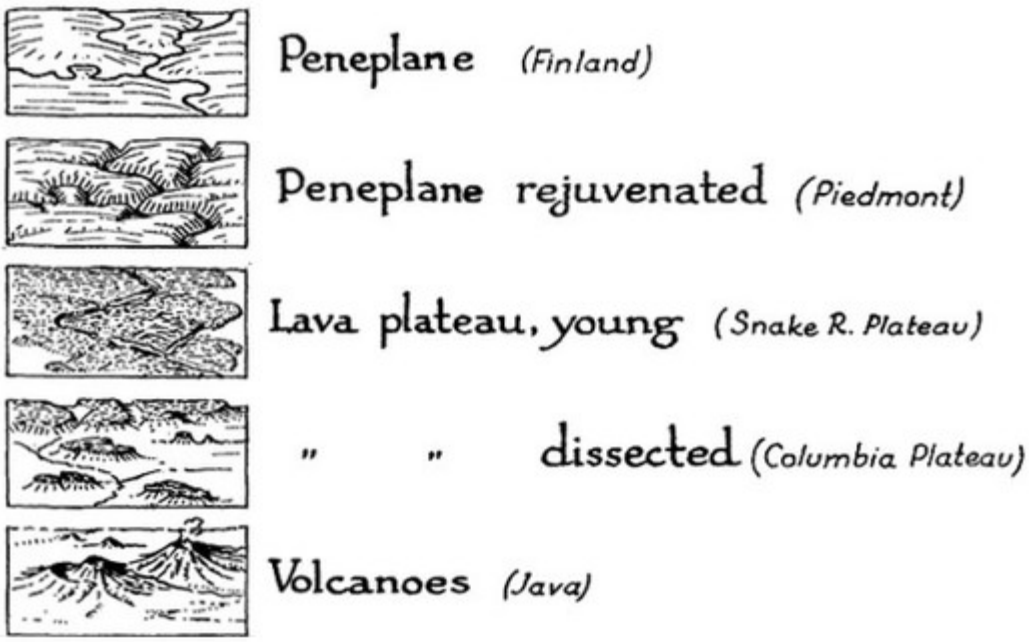

A depiction of "peneplains", from cartographer Erwin Raisz's "Table of Physiographic Symbols" (1931) (O); which Harold Blum, in his "**chemical peneplanation**" model (1934), suggests that non-chanced based, theologically-free thermodynamic potential based evolution landscapes (see: Gibbs landscapes) would look similar to, akin, e.g., to Maxwell's thermodynamic surface.

In 1934, Blum, in his "A Consideration of Evolution from a Thermodynamic View-Point", presented at the 94th meeting of the American Association for the Advancement of Science, citing Lewis and Henderson, opening page as shown below, elaborated on this mental formula, and, in short, sought to disabuse "chance-variation based natural selection" by supplanting it with "thermodynamic potential based natural selection"; he opens to the following: [2]

> "Practically since its first definite formulation by Darwin the concept of chance variation and natural selection has dominated the study of evolution, although frequent attempts have been made to replace or modify it."

He continues:

> "Probably most such attempts are provoked by a vaguely defined awareness of an insufficiency in the natural selection hypothesis, and the recognition of a directive factor in evolutionary processes which persists through successive generations. The latter concept which is commonly known as 'orthogenesis', is supported a by considerable amount of evidence (Leo Berg, 1926), but at present is not widely accepted among biologists. The general reason for abandoning or neglecting this concept has been the failure, thus far, to demonstrate the existence of the necessary directing factor **outside of the theological doctrine**; and one may suspect that fear of leaning too closely to such doctrine has caused most biologists to 'shy off' from orthogenesis. It will be the aim of the writer to indicate the actual existence of a directing factor in evolutionary processes, while at the same time avoiding all necessity of invoking theological concepts."

Blum, in short, states that the chance-based evolution persists owing to fear of treading into theological and or teleological terrain labeling. Blum then

states that mutations, e.g. A, B, C, in a given species, can go according to the following three reaction path scenarios:

$$A \rightarrow B \rightarrow C$$

$$C \rightarrow B \rightarrow A$$

$$A \rightleftarrows B \rightleftarrows C$$

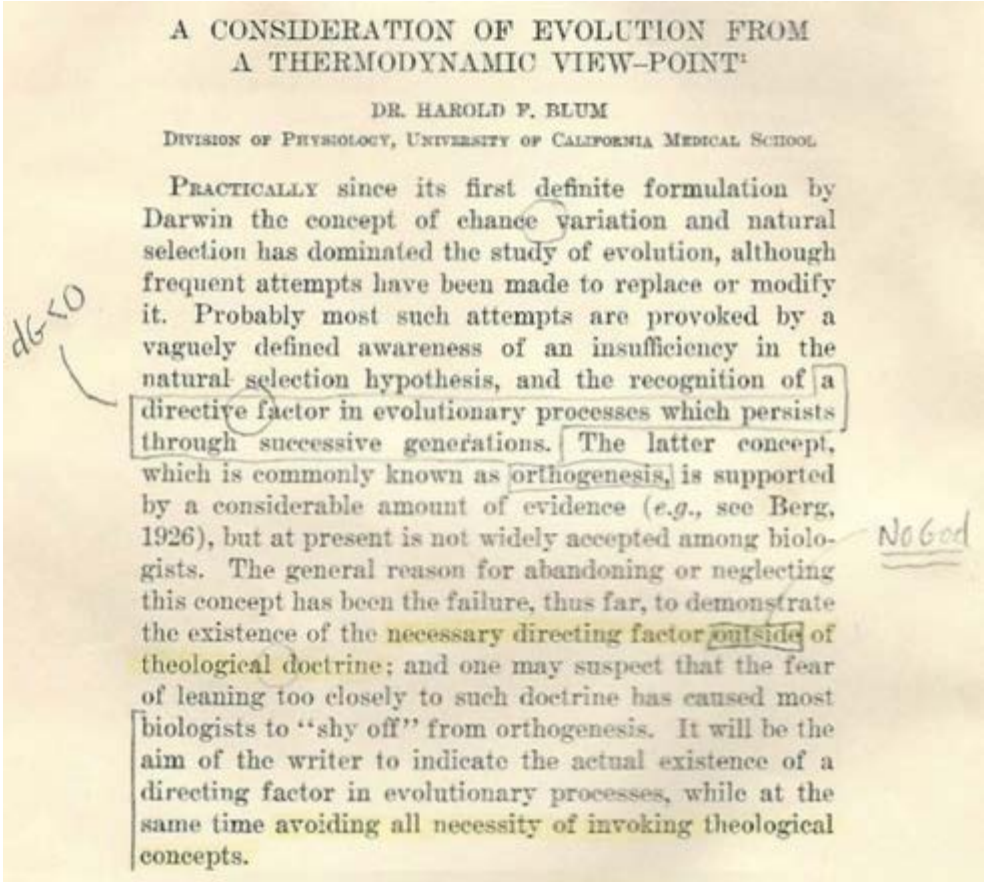

A CONSIDERATION OF EVOLUTION FROM A THERMODYNAMIC VIEW-POINT[1]

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PRACTICALLY since its first definite formulation by Darwin the concept of chance variation and natural selection has dominated the study of evolution, although frequent attempts have been made to replace or modify it. Probably most such attempts are provoked by a vaguely defined awareness of an insufficiency in the natural selection hypothesis, and the recognition of a directive factor in evolutionary processes which persists through successive generations. The latter concept, which is commonly known as orthogenesis, is supported by a considerable amount of evidence (*e.g.*, see Berg, 1926), but at present is not widely accepted among biologists. The general reason for abandoning or neglecting this concept has been the failure, thus far, to demonstrate the existence of the necessary directing factor outside of theological doctrine; and one may suspect that the fear of leaning too closely to such doctrine has caused most biologists to "shy off" from orthogenesis. It will be the aim of the writer to indicate the actual existence of a directing factor in evolutionary processes, while at the same time avoiding all necessity of invoking theological concepts.

dG<0

No God

Harold Blum's 1934 "A Consideration of Evolution from a Thermodynamic Viewpoint", wherein he adds Lawrence Henderson (1918) to Gilbert Lewis (1923) to outline a chemical potential model of directive evolution, i.e. "**chemical peneplanation**" as he calls it, a sort of Gibbs landscape peneplain, so to say; which he explicitly says is theologically-free (see: year god was disabused from science). [2]

Blum then speculates on how a certain statistical percentage of "fit" and "unfit" individuals (pg. 355) or chemical species can and will exist in a given equilibrium state; later giving the example (pg. 359), per citation of Henderson, that H_2O, with a free energy of formation of 56,000 calories per mol, is more "eminently fit as a major environmental component" than as compared to NH_3, with a free energy of formation of 3,000 calories per mol, i.e. they are both favored thermodynamically; the former, however, according to Blum, has a faster rate of reaction, which is why we see more of "fitted" to the environment of earth, presently. He continues (pg. 357-58):

> "A possible directive factor would seem to be provided by the second law of thermodynamics. The principle of irreversibility involved in this concept supplies the necessary irreversibility which has been shown to be required for the evolutionary process, the direction of development being such as would always be accompanied by an increase of entropy, the return over the same pathway being prohibited by the fact that it would involve a decrease in entropy.
>
> We may examine this hypothesis more fully: For our study we may consider the earth as an isolated system and for such a system we may safely assume that the second law of thermodynamics holds, i.e. that the entropy of the earth tends always to increase toward a maximum. The modification of the earth toward its present state must then have taken place with an increase of entropy which may be regarded as the directive agent for this change. Let us consider the evolution of the inorganic chemical compounds on the earth, assuming that this process commenced from a more or less homogeneous mixture of a given number of elements. The chemical reactions possible would be limited to those taking place with a decrease in free energy, and thus an increase in entropy."

Blum footnotes this last sentence with the following:

> "Those not acquainted with the terminology of thermodynamics may, for the purpose of this paper, simply regard free energy and entropy as quantities with opposite signs but not as equivalent; free energy

represents chemical potential. For a discussion of the principles of chemical thermodynamics see Lewis and Randall (1923)."

Here, we note, that Adriaan de Lange (1981) is the only other person, similar to Blum, to outline a Gibbs landscape like evolution model per citation to Lewis (1923). Blum continues:

> "The primary tendency would be to eliminate those reactions taking place with the greatest decrease in free energy, which would tend to go almost to completion. Thus we must find that most of the existing chemical compounds are the result of reactions which have taken place with a considerable decrease of free energy the probability of whose reversal would be small."

Here, of subtle note, Blum nearly envisages the solution of hydrogen to human evolution model, but his "inorganic" [aka nonlife] / "organic" [aka life] distinction seems evident and thus hindering his view.

Ammonia-based life | Speculation

Blum continues (pg. 359) with the following example logic:

> "The formation of NH3, like H20, takes place with a considerable decrease of free energy-about 3,000 calories per mol; and, since N2, H2 and 02 should all have been present in large quantities in the early history of our earth, it should have been possible for large quantities of both these substances to be formed. However, the rate of formation of NHs from its elements is extremely slow as compared to that of H20, so that the formation of the latter compound would have taken precedence."

Blum then humorously speculates on the possibility of ammonia-based life (see also: silicon-based life) on other planets, as opposed to water-based earth life:

> "We might speculate to the possibility of the development of life along an ammonia environment, in another solar system lacking in H2O; for NH3 is not impossible as an environment, as Henderson seems to intimate, but prohibitively improbable in our solar system, since elementary oxygen must have been present at one time or another in all the offspring of our sun so that H20 rather than NH3 must have been formed."

(add)

Peneplain | Chemical

Blum jumps (pg. 360-61) into his so-called peneplain chemical potential model as follow:

> "We may introduce at this point a useful analogy: a large mound of earth were allowed to be eroded away by a constant flow of water over its surface, the water being applied just at the top of the mound, the force producing erosion would be proportional to

the potential energy represented by the difference in level between the top of the mound and its base. Assuming purely mechanical factors, the rate of erosion would be proportional to this force.

Physical chemist Gunther Lauth (2014) talking (V|2:48) about Maxwell's thermodynamic surface (1875) and or Gibbs thermodynamic surfaces (1873), with thread commentary by Ronald Kriz (2015); which visually is what Harold Blum (1934) seems to be grasping at in his **chemical peneplanation** model of evolution.

This potential may for our purposes considered as analogous to chemical potential represented by free energy, although like all analogies this one is not exact but only useful in illustrating the general concept involved.

As the mound decreased in height the potential energy would decrease in proportion and consequently the rate of erosion would proceed more and more slowly; the geologist will recognize in this analogy the principle of peneplanation.

If we accept the concept that the entropy of the earth is and has been increasing, we must assume that, certainly so far as concerns chemical reactions, the rate of increase of entropy is decreasing, since those reactions taking place with the greatest decrease in free energy must have been eliminated first in this process of **chemical peneplanation**.

It might be objected that this analogy is false in that, as previously mentioned, rates of chemical reactions are not proportional to the free energies of the reactions concerned. However, given a great period of time such as has undoubtedly elapsed since the formation of our earth, most reactions would have had time to occur, given the proximity of reacting substances and the proper conditions. Thus, although the particular reactions occurring may have been selected according to their rates, the general tendency would be to eliminate first those reactions taking place with the greatest decrease in free energy."

This is really good stuff, indeed!

Peneplain | Geology

In geology, the peneplain concept or model was, supposedly, introduced by William David and Walther Penck (Q) in the early 1910s:

"Given sufficient time

Some visuals (O) of peneplain surfaces in geological terms.

for the action of denuding forces on a mass of land standing fixed with reference to a constant base-level, and it must be worn down so low and so smooth, that it would fully deserve the name of a plain. But it is very unusual for a mass of land to maintain a fixed position as long as is here assumed. I have therefore elsewhere suggested that an old region, nearly base-levelled, should be called an almost-plain; that is a **peneplain**."

— William David (c.1900) [3]

(add)

Quotes | On

The following are quotes on Blum's chemical peneplanation model:

"In Blum's 'Evolution from a Thermodynamic Point of View' (1935), we perceive in evolution a certain drive, an inherent direction, which is NOT to be identified on the basis here indicated with any teleological end."

— Roderick Seidenberg (1950), *Post-Historic Man* (pg. 151)

References

1. (a) Henderson, Lawrence. (1913). *The Fitness of the Environment: An Inquiry into the Biological Significance of the Properties of Matter*. MacMillan Company.
(b) Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances.* McGraw-Hill.
2. (a) Blum, Harold F. (1934). "A Consideration of Evolution from a Thermodynamic View-Point" (abs) (pdf), presented at the 94th meeting of the American Association for the Advancement of Science, Jun 20, in: *The American Naturalist*, 69(723):354-69, Jul-Aug, 1935.
(b) Peneplain – Wikipedia.

θΔics

In hmol science, **chemical philosophy** refers to the utilization of chemistry to build on and develop human philosophy, particularly using the view that a human being is a human molecule, and that chemical principles, theory, and law apply absolutely to the regulation of reaction between humans.

Overview

In 1813, English chemist Humphry Davy summarized the basics of "philosophy" based on chemistry, as follows: [1]

> "The true **chemical philosopher** sees good in all the diversified forms of the external world. Whilst he investigates the operations of infinite power guided by infinite wisdom, all low prejudices, all mean superstitions disappear from his mind. He sees **man** an **atom** amidst atoms fixed upon a point in space ; and yet modifying the laws that are around him by understanding them; and gaining, as it were, a kind of dominion over time, and an empire in material space, and exerting on a scale infinitely small a power seeming a sort of shadow or reflection of a creative energy, and which entitles him to the distinction of being made in the image of God and animated by a spark of the divine mind. Whilst chemical pursuits exalt the understanding, they do not depress the imagination or weaken genuine feelings; whilst they give the mind habits of accuracy, by obliging it to attend to facts, they likewise extend its analogies; and, though conversant with the minute forms of things, they have for their ultimate end the great and magnificent objects of nature."

In 1914, English-born American engineer William Fairburn, in his booklet *Human Chemistry*, using Empedocles-style chemistry aphorism, regarding how unmixing types of people will forever separate like oil and water, stated: [2]

> "A trained chemist would never attempt to mix oil and water alone, but employers, managers, and foreman are constantly endeavoring to bring about a corresponding physical impossibility. If, however, the chemist adds in a third substance—soda or gum Arabic—the oil and water will blend."

In 1989, Venezuelan-born English chemical engineer and thermodynamicist Erich Muller, who did his PhD on the thermodynamics of fluids, compared people to molecules and argues that one can use this methodology along with knowledge of the thermodynamics of fluids to apply and develop a philosophical methodology to deal with segregation issues associated with ghettos: [3]

> "Oil and water don't mix because they have a very different interaction—they prefer to be amongst molecules similar to each other instead. This is like humans in ghettos—in Copenhagen, for example, they tried to integrate the immigrant population with the otherwise rather homogeneous population by placing people in different parts of the city, but the immigrants eventually moved together and formed a ghetto. However, in a mayonnaise, you can have oil and water mixed together in an apparent single phase provided you have a molecule called a surfactant, which is fancied by both and can bring them together. In a similar way, only by including people who can talk to conflicting sides can different groups mix."

(add discussion)

See also

â— Goethean philosophy
â— Integration and segregation thermodynamics

References

1. Davy, Humphry. (1840). "Dialogue Five: the Chemical Philosopher", in: *The Collected Works of Humphry Davy* (pg.

361). Smith, Elder, and Co.
2. Fairburn, William Armstrong. (1914). *Human Chemistry* (pg. 18). The Nation Valley Press, Inc.
3. Gallagher, Laura. (2006). “A Thermodynamic Personality: Interview with Erich Müller”, *Reporter*, Issue 162, 24 February.

θΔics

In thermodynamics, **chemical potential**, for standard chemical or biological systems, is the change in Gibbs free energy with respect to change in amount of component, with pressure, temperature, and amounts of other components being constant. [1]

Overview

In 1876, American mathematical physicist Willard Gibbs, introduced the concept of chemical potential, symbolized by ***μ*,** which he defined as:

> "If to any homogeneous mass in a state of hydrostatic stress we suppose an infinitesimal quantity of any substance to be added, the mass remaining homogeneous and it entropy and volume remaining unchanged, the increase of the energy of the mass divided by the quantity of the substance added is the ***potential*** for that substance in the mass considered."

Gibbs noted also that for the purposes of this definition, any chemical element or combination of elements in given proportions may be considered a substance, whether capable or not of existing by itself as a homogeneous body. [2]

In 1885, author George Liveing, in developing a thermo-dynamic theory of molecular kinetic energy, defined potential, by stating that "the fundamental notion connected with equality of potential being that when two forms of energy are at the same *potential* in the same substance there is no tendency for either to be increased at the expense of the other; but that if they are at unequal potentials there is a tendency to an equalization; also that when two bodies have their energies at equal potentials there is no tendency for the energy of one to increase at the expense of the other, while if they are at unequal potentials there is a tendency to equalization by the passage of energy from one body to the other." [3] This process, from one point of view, is called thermalization in modern terms.

Gibbs, to note, never used the term ''chemical potential'', but only "potential" and "intrinsic potential", the latter of which he defined as a derivative that is "entirely determined at any point in a mass by the nature and state of the mass about that point."

In 1890s, American physical chemist Wilder Bancroft, a PhD student of Wilhelm Ostwald, began using the term "chemical potential" in references to Gibbs' conception of potential. [4]

Social potential

See main: Social chemical potential

In 1994, Australian physical chemist John Christie, in his "A Survey of Thermodynamical Ideas", built on the work of John Neumann (1932) and discusses how microcanonical ensembles can be used to formulate economic analogies, wherein he employs a 6-person "island model", in which goods are traded, resulting in a microstate currency distribution; how social equilibrium relates to Gibbs free energy; how coupling and time scales may play a role, etc., in economic processes; then discusses Gibbs free energy, in definitional terms, and alludes to the premise that when an inhabitant enters or leaves the island—if the island were an "open" system—the "component will move into or out of the system to minimize its chemical potential, i.e. it will tend to flow from regions of higher to lower chemical potential." [5]

In 2007, American electrochemical engineer Libb Thims extrapolated the concept of chemical potential to sociological movement of humans. [6]

See also

- Potential
- Potential energy
- Population potential

References

1. Daintith, John. (2004). *Oxford Dictionary of Chemistry*, (pg. 125). New York: Oxford University Press.
2. Gibbs, Willard. (1876). "On the Equilibrium of Heterogeneous Substances", *Transactions of the Connecticut Academy*, III. pp. 108-248, Oct., 1875-May, 1876, and pp. 343-524, may, 1877-July, 1878.
3. Liveing, G.D. (1886). "On the Measurement of Kinetic Energy on an Absolute Scale", *Proceedings of the Cambridge Philosophical Society* (pg. 318), University Press.
4. Baierlein, Ralph. (2000). "The Elusive Chemical Potential", *American Association of Physics Teachers*, Oct.
5. Christie, John R. (1994). "A Survey of Thermodynamical Ideas", in: *Economics and Thermodynamics: New Perspectives on Economic Analysis* (editors: Peter Burley and John Foster). Kluwer Academic Publishers.
6. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 106). Morrisville, NC: LuLu.

External links

- Chemical potential – Wikipedia.

θΔics

In chemistry, **chemical reaction** is a change in which one or more chemical elements, molecules, species, or compounds (the *reactants*) form new molecules, species, or compounds (the *products*). [1] In short, a chemical reaction is a process that results in the interconversion of chemical species. [2]

Why chemical reactions occur?

In 1854 and 1864, chemists Julius Thomsen and Marcellin Berthelot, respectively, which stated, via their Berthelot-Thompson principle, that the release of heat is what explains why chemical reactions go, the greater the heat release, the stronger the reaction; this is known as the thermal theory of affinity.

The Berthelot-Thompson "heat as the driving force" theory of chemical reactions, however, was eventually shown to be incorrect, specifically at all temperatures above absolute zero, being that entropy, otherwise known as the transformation content of a reaction process, aka the second law of thermodynamics, plays a significant role chemical reactions. It was German physicist Hermann Helmholtz' famous 1882 paper "On the Thermodynamics of Chemical Processes" that showed that heat production is not the reason chemical reactions occur, but rather the value of the free energy, which determines in what sense the affinities between the reactants are active and will react:

> "Given the unlimited validity of Clausius' law it would then be the value of the free energy, not that of the total energy resulting from heat production, which determines in which sense the chemical affinity can be active."

In 1893, German chemist Walther Nernst, in his *Theoretical Chemistry from the standpoint of Avogadro's rule and Thermodynamics*, furthered this logic to conclude that:

> "All reactions advance only in the sense of a diminution of free energy, i.e. only in the sense of the affinity."

In 1921, James Johnstone, in his *The Mechanism of Life in Relation to Modern Physical Theory*, gave the following work-based definition explains correctly why chemical reactions occur:

> "A chemical transformation will occur if in the occurrence work will be done. That is 'why' it occurs, and if no work can be done by the chemical substances by reacting with each other they will not react of themselves."

(add)

Human chemical reactions

A "human chemical reaction" is chemical reaction between two or more people (human molecules). [3]

Quotes

The following are related quotes:

> "A **chemical reaction** may thus be considered as a 'spontaneous' irreversible process driven toward equilibrium by its thermodynamic affinity, i.e. by the difference between the chemical potentials of the products and the reactants."
>
> — Alfonso Liquori (1980), "Cell Growth as an Autocatalytic Relaxation Process" (Q)(Q)

"**Chemical reactions** weren't supposed to write letters."

— Katie M. John (c.2010), *Publication* (Q)

"If love is a **chemical reaction**, then you are what I need to balance the chemical equation."

— Edewede Oriwoh (c.2012) (Q)

See also

- Love the chemical reaction

References

1. Daintith, John. (2004). *Oxford Dictionary of Chemistry*, (pg. 125). New York: Oxford University Press.
2. Chemical reaction - IUPAC Goldbook.
3. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 42). Morrisville, NC: LuLu.

Further reading

- Griffin, John. J. (1854). *Chemical Recreations*. J.J. Griffin.

Videos

- Thims, Libb. (2010). "Why Do Chemical Reactions Occur?" (Q), HumanChemistry101, Dec 15.

External links

- Chemical reaction – Wikipedia.

θΔics

In scientific revolutions, the **chemical revolution** (1718-1869) refers to the period of the transition of the mystical alchemy into the quantitative subject of modern chemistry, a period characterized by a huge amount of chemical theory development. The chemical revolution started with the publication of English physicist Isaac Newton's Query 31 appended to the 1718 edition of his *Opticks*, in which he verbally stated proportional affinity relationships to a number of chemical entities. [1] This verbal description converted into an affinity table, that year, by French chemist Etienne Geoffrey, thus giving chemists a functional tool with which to go about obtaining desired chemical reactions. The chemical revolution can be said to have ended with Russian chemist Dmitri Mendeleyev's 1869 construction of the periodic table.

Quotes

The following are related quotes:

> "The importance of the end in view prompted me to undertake all this work, which seemed to me destined to bring about a **revolution in . . . chemistry**."
>
> — Antoine Lavoisier (1773), Feb 20

References

1. (a) Muir, Matthew M.P. (1907). *A History of Chemical Theories and Laws* (ch. XIV: Chemical Affinity, pgs. 379-430). Wiley.
(b) Kim, Mi Gyung. (2003). *Affinity, That Elusive Dream – A Genealogy of the Chemical Revolution*. Cambridge, Mass: The MIT Press.

External links

â— Chemical revolution – Wikipedia.

θΔics

In hmolscience, **chemical simile** is figure of speech comparing two unlike things that is often introduced by *like* or *as*, e.g. a normal simile is "cheeks like roses", therefore a deemed chemical simile might be "people like atoms", a favorite of French sociophysicist Serge Galam. [1]

Goethe

Goethe's classic chemical tale is sometimes referred to as simile; the following, e.g., is one English-translation rendition of Goethe's advertisement: [4]

> "It seems that his continued work in physics made the author choose this strange title. He may have noticed that often in natural science ethical *similes* are used to bring something nearer that is remote from the region of human knowledge, and so, presumably, he may have wanted to trace the parlance of a **chemical simile** back to its spiritual origin, all the more so since there is after all just one nature."

In 1973, Beda Allemann, an anti-reductive determinist, in his "On the Function of the Chemical Parable in Goethe's *Elective Affinities*", supposedly referred to Goethe's human chemical theory as "chemical simile" that failed to conform to the plot. [3]

Roeber

In Oct 1914, German-born American chemical engineer Eugene Roeber, editor of *Metallurgical and Chemical Engineering*, during an American Institute dinner talk, described WWI as a large chemical reaction, in a way that was reported as "chemical simile, e.g. in comparing individuals to free ions, without free will, of dissociation theory. [3]

See also

â— Chemical analogy
â— Chemical metaphor

References

1. Simile – Merriam-Webster Collegiate Dictionary, 2000.
2. (a) Allemann, Beda. (1973). "On the Function of the Chemical Parable in Goethe's *Elective Affinities*" ("Zur Funktion der chemischen Gleichnisrede in Goethe's *Wahlverwandtschaften*" *Untersuchungen zur Literature als Geschichte* (pgs. 199-218). Ed. Vincent J. Gunther"), Helmut Koopmann, Peter Putz, and Hans Joachim Schrimpf. Berlin: Erich Schmidt Verlag.
(b) Engelstein, Stefani. (2008). *Anxious Anatomy: the Conception of the Human Form in Literary and Naturalist Discourse* (pgs. 54, 252). SUNY Press.
3. Anon. (1914). "Letter" (Ñº), *The Mining Magazine*, 11:221, Oct.
4. Kompridis, Nokolas. (2006). *Philosophical Romanticism* (pg. 246). Routledge.

θΔics

In hmolscience, **chemical sociology** is a "soft" two-cultures namesake term, as usage indicates (Grant, c.1940), presented in the

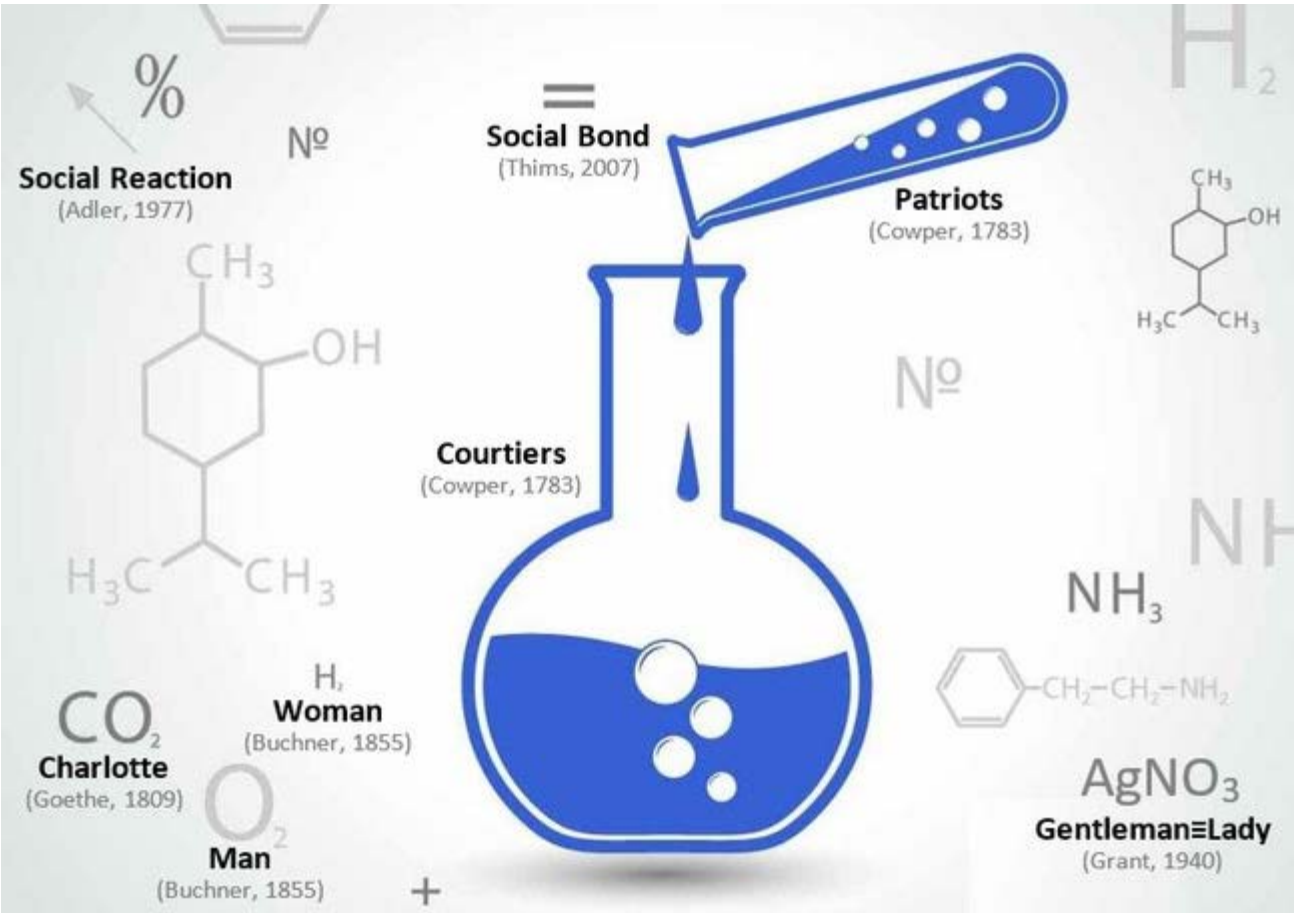

A "**chemical sociology**" representative image, showing: William Cowper (1783) on the mixing of patriots and courtiers akin to mixing salts and acids, Johann Goethe (1809) on how Charlotte becomes CO_2 after the introduction of the Captain, Ludwig Buchner (1855) on how man reacts with woman like oxygen attracts hydrogen, John Grant on how silver nitrate $AgNO_3$, seen as a gentleman with his lady, changes when brought into contact with sodium nitrate NaCl, Jeremy Adler (1977) his his human chemical reaction theory "dart" (→) or arrow usage, and Libb Thims (2007) the first to theorize about the human chemical bond in modern physical chemistry terms.

"anthropomorphize the chemicals", extrapolate-down, fun analogy style of presentation, similar to the terms:

- Human chemistry (Dreier, 1948)
- Molecular sociology (Lehn, 1991)
- Thermochemical relationship physics (Hirata, 2000)

as can be contrasted with contrasted with to the "hard" two-cultures namesake terms, presented in the "physicochemicalize the humanities", extrapolate-up, reality reductionist style of investigation.

- Social chemistry (Huxley, 1871)
- Human chemistry (1851, E.B.)
- Sociology 23 (Henderson, 1938)
- Physicocemical sociology (Beg, 1987)

(add)

Overview

In c.1940, John Grant, in his “Chemical Sociology”, outlined an anthropomorphized description of the elements and reactions between compounds, akin, thematically, to Thomas Dreier’s *We Human Chemicals* (1948), William Fairburn’s *Human Chemistry* (1910), Henry Bray’s *The Living Universe* (1910), and in some sense Goethe’s *Elective Affinities* (1809). [1]

Quotes

The following are related quotes:

> "The chances of developing a science of physiological psychology are about as good (or as bad) as the chances of developing a **chemical sociology** or a biological astronomy."
>
> — D. Bannister (1968), "The Myth of Physiological Psychology" [2]

See also

- Social mechanics

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1. Grant, John F. (c.1940). "Chemical Sociology" (pdf), *Quarterly Bulletin of Northwestern University Medical School*, 23(4):498-500, Winter, 1949.
2. Bannister, D. (1968). "The Myth of Physiological Psychology" (pg. 229) (Q), *Bulletin of the British Psychological Society*, 21:229-31.

Further reading

- Bonner, James. (1956). "Chemical Sociology Among the Plants", in: *Plant Life: a Scientific American Book* (pgs. 156-62). Publisher.

θΔics

In chemistry, **chemical species** is a chemical entity, such as a particular atom, ion, or molecule. [1] A chemical species, in technical terms, is defined as an ensemble of chemical identical molecular entities that can explore the same set of molecular energy levels on the time scale of the experiment. [2]

People as chemical species

In 1809, building on the logic of Swedish of naturalist Carolus Linnaeus, who had recently developed a Latin binomial classification scheme for plant species and who also suggested to his associate French chemist Antoine Lavoisier that all alchemical entities be classified in a similar manner, German polymath Johann von Goethe founded the science of human chemistry when he conceived the view of people as "chemical species", such as those found on the various chemical affinity tables of the 18th century, and wrote the scientific novella *Elective Affinities* on this view. [3]

See also

â— Human molecule
â— Human particle

References

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2. Chemical species (PDF) – IUPAC Goldbook
3. Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (ch. 10 "Goethe's Affinities", pgs. 371-422). Morrisville, NC: LuLu.

θΔics

In chemistry, a **chemical substance** is state of matter characterized by the entities, i.e. atoms, molecules, chemical species, formula units, etc., that it is composed of; characterized by physical properties, such as refractive index, electric conductivity, melting point, etc. [1] A typical chemical substance, such as water, H_20, is often defined as a material with a definite chemical composition. [2]

References

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(b) Pure substance – DiracDelta Science & Engineering Encyclopedia.
2. Hill, J. W.; Petrucci, R. H.; McCreary, T. W.; Perry, S. S. (2005). *General Chemistry*, 4th ed., p5, Pearson Prentice Hall, Upper Saddle River, New Jersey.

Further reading

â— Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances.* McGraw-Hill.

θΔics

In chemistry, **chemical symbol** is the use of letters or symbols to represent chemical entities (atoms, molecules, or ions, etc.) using shorthand notation. [1] The basic example is the use of H to represent the element hydrogen.

History

In 1775, Torbern Bergman, in his 1775 *A Dissertation on Elective Attractions*, began to use of letters (a, b, ab, etc.) to represent chemicals in a generalized manner. [2]

Quotes

The following are related quotes:

> "**Chemical signs** ought to be letters, for the greater facility of writing. I shall take therefore for the chemical sign, the initial letter of the Latin name of each elementary substance: but as several have the same initial letter, by writing the first two letters of the word."
>
> — Jacob Berzelius (c.1810), *Publication* (Q)

See also

- Chemical symbol notation
- Human molecular symbols

References

1. Licker, Mark. (2004). *McGraw-Hill Concise Encyclopedia of Chemistry*. McGraw-Hill.
2. Bergman, Torbern. (1775). *A Dissertation on Elective Attractions*. London: Frank Cass & Co.

External links

- Chemical symbol – Wikipedia.
- Thermochemistry of Chemical Reactions: Terminology and Symbols – IUPAC.

θΔics

In chemistry, **chemical symbol notation** refers to the usage of symbols, such as letters or alchemical symbols, and notation, such as subscripts or prefixed number multipliers, employed to represent atoms, molecules, chemical species, chemical substances, compounds, supermolecules, and or atomic geometries, etc., in the course of or description of chemical processes and or reactions in chemical equation specification.

Alchemy → Chemistry | Bergman

The switch from the usage of alchemical symbols, such as the crescent moon symbol for silver, which tended to have astrological meaning, to pure chemical generic letter representation, such as A or b, to represent chemical species, single, A, or attached in union, Ab, was introduced in the 1775 textbook *A Dissertation on Elective Attractions* by Swedish chemist Torbern Bergman. The famous transition paragraph, wherein, letter usage is introduced, occurs on page six of his treatise, wherein Bergman explains what he chapter subsections as the single elective attraction, as such:

Reaction one

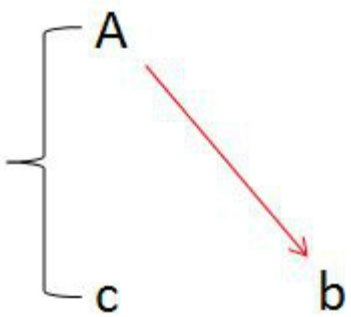

Reaction two

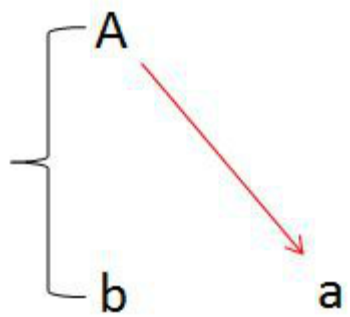

> "Suppose *A* to be a substance for which other heterogeneous substances *a*, *b*, *c*, etc., have and attraction; suppose, further, *A*, combined with *c* to saturation—this union I shall call *Ac*—should, upon the addition of *b*, tend to unite with it to the exclusion of *c*, *A* is then said to attract *b* more strongly than *c*, or to have a stronger elective attraction for it; lastly, let the union *Ab*, on the addition of *a*, be broken, let *b* be rejected, and *a* chosen in its place, it will follow, that *a* exceeds *b* in attractive power, and we shall have a series: *a*, *b*, *c*, in respect to efficacy. What I here call *attraction*, others call *denominate affinity*; I shall employ both terms promiscuously, though the latter, being more metaphorical, would seem less proper in philosophy."

In this manner, in namesake, the usage of alphabet letters to represent chemical species can be classified as "Bergman chemical symbol notation", being that Bergman was the first to implement this revolutionary procedure that we see used so commonly as the language of modern-day chemistry. [1]

The transition from alchemical symbols to alphabetical symbols, however, was not immediate. This is evidenced by the fact that later systems of chemical nomenclature, e.g. that of Hassenfratz and Adet of 1787, continued to used non-alphabetical symbols for chemical substances. It was not, supposedly, until 1813 when Jacob Berzelius, the so-called "scientific grandson of Bergman", i.e. Berzelius was a student of Peter Afzelius, who, in turn, was a student of Bergman, established alphabetical notation as the modern method. [2]

Human chemical symbol notation

See main: human molecular symbols

German polymath Johann Goethe, in the famous "chapter four" of his 1809 physical chemistry based novella *Elective Affinities*, was the first to employ Bergman chemical symbol

notation to represent humans as generic chemicals. The central paragraph explaining this as follows:

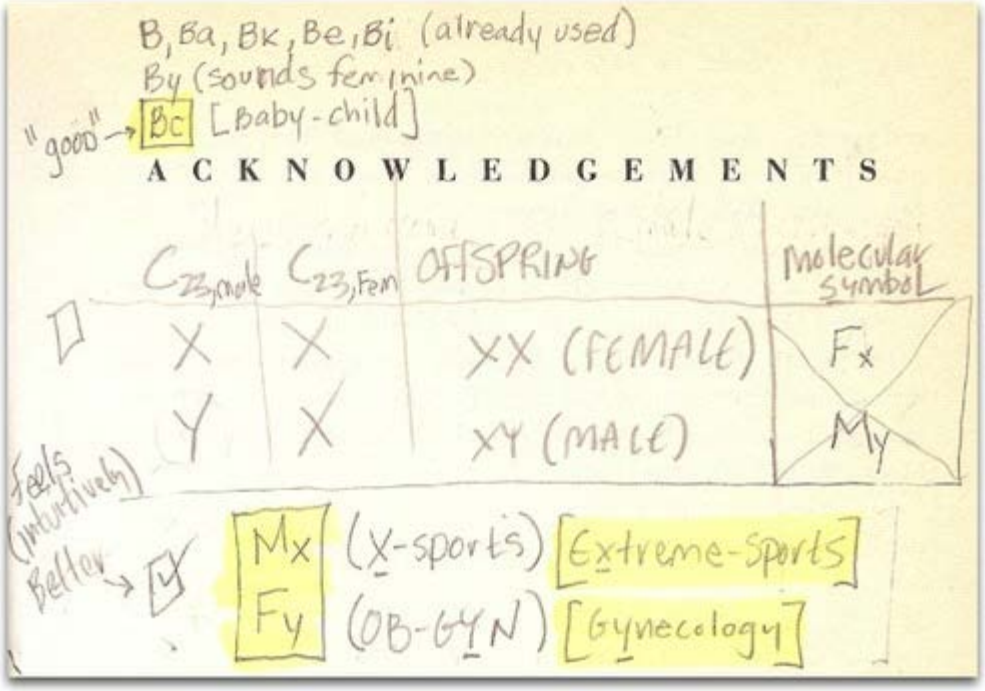

Early scratch paper notes (c.2003) on an attempt to systematize a basic set of **human chemical symbol notations**, in a manner not conflicting or overlapping with pre-established nomenclatures, made by American electrochemical engineer Libb Thims on the acknowledgements section of English evolutionary psychologist Matt Ridley's 1999 *Genome: the Autobiography of a Species in 23 Chapters*, the prototype book of the style of authorship Thims' originally began to conceptualize that he would write as (see: Thims history).

> 'Now then!' Eduard interposed: 'until we see all this with our own eyes, let us look on this formula as a metaphor from which we may extract a lesson we can apply immediately to ourselves. You, Charlotte, represent the *A*, and I represent your *B*; for in fact I do depend altogether on you and follow you as *A* follows *B*. The *C* is quite obviously the Captain, who for the moment is to some extent drawing me away from you. Now it is only fair that, if you are not to vanish into the limitless air, you must be provided with a *D*, and this *D* is unquestionably the charming little lady Ottilie, whose approaching presence you may no longer resist.'

In 1918, in commentary on American physical science humanities historian Henry Adams' 1910 *A Letter to American Teachers of History*, wherein Adam notably "calls for the aid of another Newton", American historian William Thayer comments, in his presidential address to the American Historical Association, that:

> "In reading Henry Adams' astonishing tract, I can not help suspecting at times that he is making fun of us historians; for he proposes, as I think you would agree with me, something which is not only impossible for anyone to carry out but which he himself never even attempted to carry out. In all the nine volumes of his *American History*, is there a hint of the second law of thermodynamics? Can you discover the slightest trace of a common formula for history and physical chemistry?"

In his address, Thayer seems to be ambivalent in his review, but at one point concedes:

> "The time may come when human affairs may be described no longer by words and sentences, but by a system of **symbols** or **notation** similar to those used in algebra or chemistry … then it may be possible, as Adams suggests, to invent a common formula for thermodynamics and history."

In end comment to Adams premise, to note, Thayer goes into a discussion on other past conflicts between the use of science in the humanities, such as the use of Darwin's "survival of the fittest" by the Germans in WWII and distinction of races, morality, as well as overlaps with religion.

Later commentaries, investigations, and commentaries on this Goethe-Bergman style human chemical symbol letter notation usage were given by Jeremy Adler (1977), Alfred Steer (1990), and Karl Fink (1999).

Latter human chemical reaction theorists, to have employed their own symbols, independent to or rather unaware of the Goethean model precedent, include: Libb Thims (1995), Christopher Hirata (2000), David Hwang (2001), Don Jorge (2007), Surya Pati (2009), and Thomas Wallace (2009), among others (see: human chemical reaction theory) to represent humans, individually, in unions, or in social aggregates, as molecules, chemicals, or molecular complexes.

See also

- Moral symbols

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External links

- Human molecule symbol methodologies – IoHT, Chicago.

θΔics

In hmolscience, **chemical teleology** refers to the usage of teleological argument, typically of the Aristotelian final cause variety, in the explanation of chemical phenomena, either in the form of subtle purpose-like descriptions of atomic and molecular behaviors found in modern chemistry textbooks and or, in respect to human behaviors, "emergent" chemical teleology theory, according to which teleology is argued to be an emergent property that arises at some point in evolution, theories which tend towards the use of ontic opening arguments.

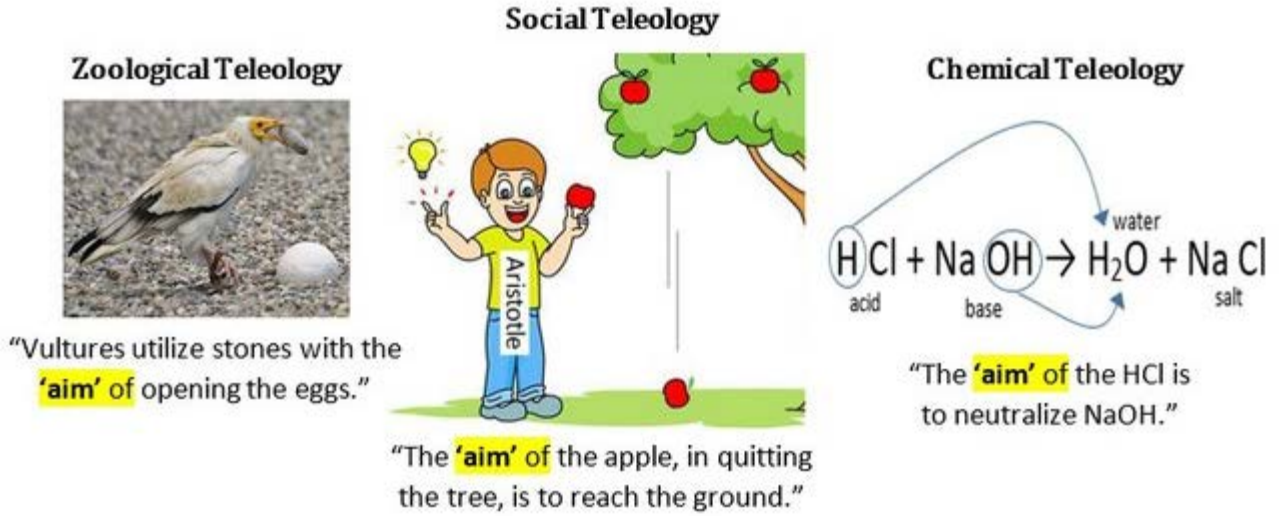

A depiction of Ernest Schoffeniels' excellent 1973 descriptions of the misuse of teleology in zoology, sociology, and physiology, and chemistry.

The following diagram shows that while at the chemical level, reactions are described teleologically free, human chemical reaction descriptions tend to be replete with teleological framed reasoning, which dates back to the reasonings of Aristotle:

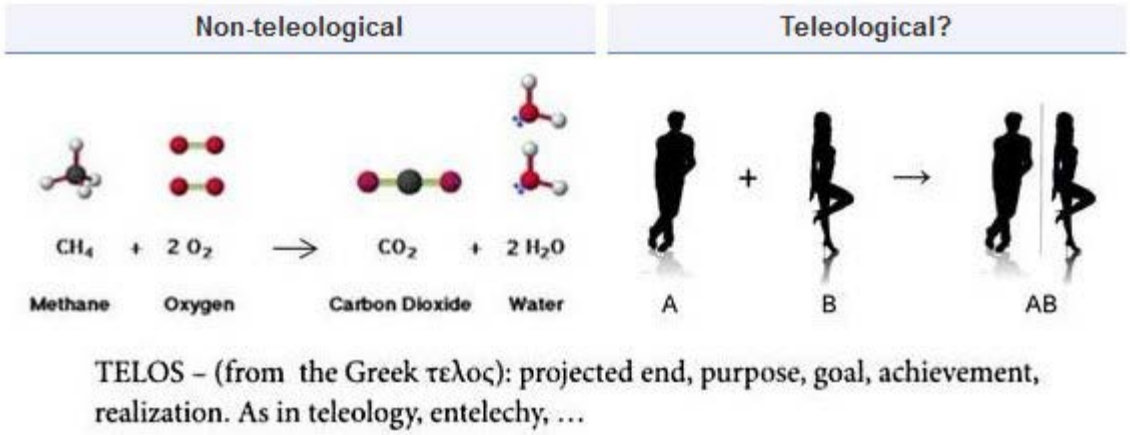

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Overview

In 1973, Ernest Schoffeniels, in his *Anti-Chance*, gives a good overview of the misuse of teleology at the chemical, zoological, and social level.

In 2007, Vicente Talanquer found, through his 2007 dissectional study of eight leading US college chemistry textbooks, that the mindsets of many leading American chemists are filled with subtle "teleological" explanations of chemical behavior, found particularly used in descriptions of the the second law, Le Chatelier's principle, and the octet rule (Abegg's rule), many of the examples he fines being so subtle they are difficult to detect. [1] An example of subtle textbook chemical teleology is the following statement:

> "Atoms react in order to maintain stability."

Though subtle to notice on first pass, the reason it is teleological, according to American psychologists Deborah Kelemen, Joshua Rottman, and Rebecca Seston, noted for their 2012 study on the use of "purpose-based reasoning" among professional physical scientists, is that the statement "violates temporal constraints by treating an entity's consequence as if it could be its own cause in a backward causal fashion." [2] The bullet point findings of Talanquer's textbook chemical teleology study are as follows: [1]

> ● Teleological explanations are in fact present in chemistry textbooks and they normally occur in explanations about transformations.
> ● These types of explanations are used to justify why submicroscopic particles adopt certain configuration (structure) or why certain substances react in a particular way (process).
> ● The occurrence of teleological explanations is tightly linked to the existence of a rule, principle, or law that governs the behavior of the system, and that explicitly or implicitly implies the minimisation or maximisation of some intrinsic property (e.g., total energy, entropy, free energy). This law or principle tends to provide a sense of preferred direction in the evolution of a transformation.
> ● The metaphorical "purpose" assigned to chemical systems that warrant the use of teleological explanations is frequently that of attaining stability or equilibrium (i.e., systems "strive" to become more stable or reach equilibrium).
> ● Teleological explanations in chemistry have pedagogical value because they help to provide an explanatory reason for the occurrence of a particular chemical transformation.

Second law

In more detail, in respect to the second law, Talanquer explains as follows: [5]

> "The second law only describes the characteristics of the final state attained by an isolated system that undergoes a process. The law states that the entropy increases during the process and reaches the maximum value possible given the existing constraints. The law DOES NOT state that the system "has a tendency", "seeks to", "desires to", or "wants to" achieve such a state. However, in educational talk it is common to express the law as if there was intentionality in how the system changes."

This is a very interesting point of view indeed. Talanquer states that he found teleological statements, in respect to the second law, in Peter Atkins and Loretta Jones 1998 *General Chemistry: Molecules, Matter, and Change*.

Octet rule

On the octet rule, Talanquer cites the following usages of teleological explanation: [1]

> "Main-group elements tend to undergo reactions that leave them with eight outer-shell electrons. That is, main group elements react so that they attain a noble gas electron configuration with filled s and p sublevels in their valence electron shell."
>
> — J. McMurray and R.C. Fay (2003), *Chemistry* [6]

> "To form bonds, main group elements gain, lose, or share electrons to achieve a stable electron configuration characterized by eight valence electrons."

— J.W. Moore, C.S. Stanitski, and P.C. Jurs (2005), *Chemistry: the Molecular Science* [7]

In commentary on how these octet rule statements would be restated non-teleologically, Talanquer commented the following: [5]

> "Atoms or molecules do no react "in order to" or "so that" they can attain an octet or an stable configuration. That is the outcome of the process. Electrons are exchanged randomly between particles in a system. However, the likelihood of the exchange in one direction is not the same as the probability of the reverse process. This probability is determined by many factors, such as the strength of interactions between electrons and protons, electrons and electrons etc. As a result of these random exchanges, the system ends adopting a new configuration that is the most probable given the existing constraints."

This clarification seems about right.

Le Chatelier principle | Free energy minimization

The following 2013 non-teleological Le Chatelier's principle, statement clarification by Talanquer, however, seems off: [5]

> "The same type of thinking can be applied to the chemical processes in equilibrium. For example, when pressure is applied on a reacting system in chemical equilibrium, the system does not shift towards reactants or products "so that" or "in order to" counterbalance the effect of the change. What happens is that the change in pressure affects the probability of the forward and backward chemical processes going on in the system. The change in pressure affects the probability of collisions for the backward and forward processes in different ways. As a result, the likelihood of one process becomes higher than the other. There is NO DRIVE to attain a new equilibrium state. There is only particles randomly moving and interacting, involved in competing processes with different probabilities."

Although he doesn't admit to it completely, namely in saying there is no DRIVING FORCE, which is paramount to saying that "force" does not exist, he does admit to a belief that to use the term "drive" in chemistry, physics, and thermodynamics is teleological. In short, something seems off in Talanquer's argument here, although, at this point, it is difficult to put a finger on it. The issue seems to need reconciliation in the exchange force view of chemical change and free energy minimization is the measure of reaction spontaneity.

Emergent chemical teleology

Several authors in recent years, namely Alicia Juarrero (1985) and Terrence Deacon (2007), have used Belgian chemist Ilya Prigogine's far-from-equilibrium theory of bifurcations to argue that "teleological properties", while not existing at the atomic-chemical level, can "emerge" in the form of "emergent properties" at a certain threshold of evolution, supposedly at about the imaginary life from non-life threshold, somewhere at the 3.85 billion years ago point in the great chain of being. [9]

This point of view however can be shown to be fallacious. Specifically, following the 2007 Vicente Talanquer argument, above, with insertion of the above 2007 Terrence Deacon and Jeremy Sherman chapter header definition of "telos", we have the following:

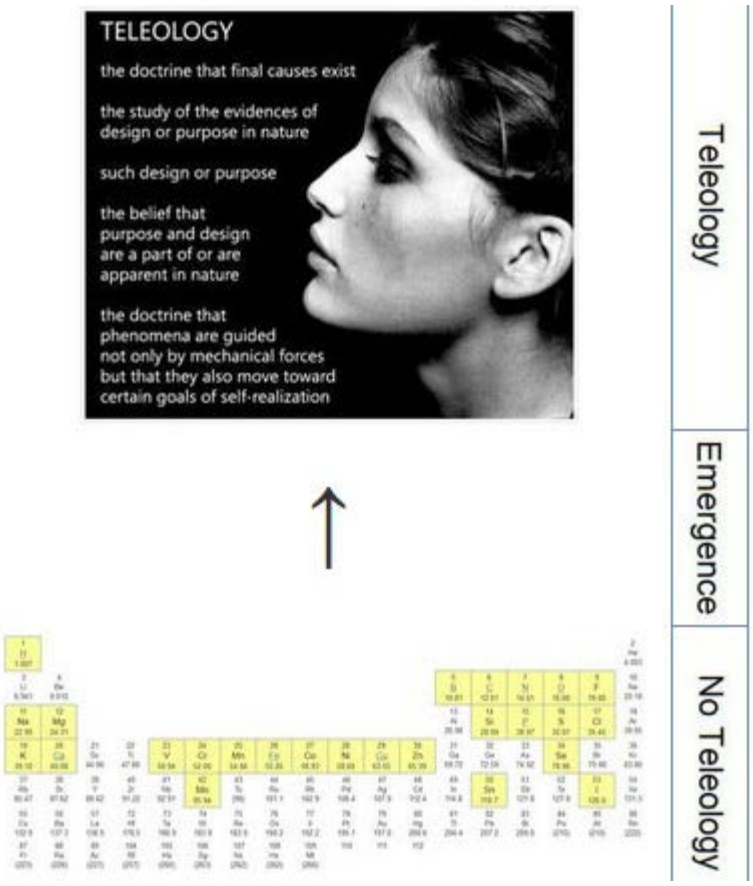

The gist of the so-called "emergent teleology argument", namely that while it is agreed that teleological governance does not exist in the periodic table—hmolscience period table shown here, indicating the number of active elements found in an average animated human—that teleology can "emerge", as some type of causative force, in the form of an "emergent property", according to certain ontic opening arguments, at a certain point backwards in the evolution timeline or great chain of being, which thus explains the nature of, e.g., why a woman cries, image from a 2013 blog on "The Purpose Problem", namely "asking oneself sooner or later about the purpose of being alive", by American English professor turned big questions science philosopher Brock Haussamen. [11]

> "Atoms or molecules do NOT react "in order to" or "so that" they can attain a [projected end, purpose, goal, achievement, or realization] [or] an octet or a stable configuration. That is the outcome of the process."

Then, with the insertion of the Robert Sterner and James Elser 2000 ecological stoichiometry definition of a human as a "human molecule", with a quantifiable 22-element "human molecular formula", according to which "whole organisms [are considered] as if they were single abstract molecules" (a definition and formula now found in two ecological textbooks and two ecology encyclopedias), and or the Libb Thims 2002 chemical thermodynamic definition of a human with a quantifiable 26-element "human molecular formula", according to which humans are defined as a "26-element energy/heat driven dynamic atomic structure" (a definition and formula now found in one thermodynamics textbook, one ecological engineering dissertation, and one book), we have the following:

> "Human molecules (people) do NOT react "in order to" or "so that" they can attain a [projected end, purpose, goal, achievement, or realization] [or] an octet or a stable configuration. That is the outcome of the process."

This is a very interesting philosophical perspective indeed—one that seems to be the correct view—and one that seems to require a mental re-working of sorts or a reconceptualization of standard "because" answers to "why" questions, throughout the intuition systems of the modern thinking world.

Some, such as Deacon, however, to note, would, in the face of this straight-forward logic, like to maintain that human molecules (people) are somehow different in "nature" from that other molecules, animate or not, governed by Talanquer's so-called non-teleological chemistry, and to maintain this false belief employ a number of ontic opening arguments, Ilya Prigogine's bifurcations, Manfred Eigen's hypercycles, Stuart Kauffman's autocatalytic closures, etc.,

and looped recursive arguments, e.g. "circles of reactions", "constraints", etc., in attempt to erect a vicariously unstable scaffolding on which to argue that Aristotle's final cause argument exists in modern physical science, and somehow "causes" the feeling of human purposeful behavior, but that it does not exist for the hydrogen atom, when, for instance, it bonds with oxygen to form water.

The following *circa* 1932 Socratic dialog between Irish science translator James Murphy and German-born American physicist Albert Einstein on the question of free will and freedom (see: Einstein-Murphy dialogue),, might well shed some light on the above "chemical teleology" discussion: [12]

> "**Murphy:** I have been collaborating with our friend, Planck, on a book which deals principally with the problem of causation and the freedom of the human will.
>
> **Einstein:** Honestly, I cannot understand what people mean when they talk about the freedom of the human will. I have a feeling, for instance, that I will do something or other; but what relation this has with freedom I cannot understand at all. I feel that I will light up my pipe and I do it; but how can I connect this up with the idea of freedom? What is behind the act of willing to light the pipe? Another act of willing? Schopenhauer once said: Man can do what he wills, but cannot will what he wills.

The Schopenhauer quote here, to note, comes from German philosopher Arthur Schopenhauer's 1839 *Essay on the Freedom of the Will*, which in turn is based on his mentor German polyintellect Johann Goethe's 1809 human chemical theory of the affinity force theory behind the will, the gist of which was elaborated on further by Schopenhauer as follows:

> "The will of the copper, claimed and preoccupied by the electrical opposition to the iron, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive."

which comes from his 1844 second volume *The World as Will and Representation*, wherein he cites German chemist Justus Liebig's description of the reaction of damp copper Cu in air containing carbonic acid H_2CO_3, the balanced reaction of which is as follows:

$$2CuOH + H_2CO_3 \rightarrow Cu_2CO_3 + 2H_2O$$

To continue with the Murphy-Einstein dialog:

> **Murphy:** But it is now the fashion in physical science to attribute something like free will even to the routine processes of organic nature.
>
> **Einstein:** That nonsense is not merely nonsense. It is objectionable nonsense."

Related to this, Einstein, in his 1932 "My Credo", also commented the following:

> "Strange is our situation here on earth. Each of us comes for a short visit, not knowing why, yet sometimes seeming to divine a purpose."

Hence, in sum, it is "objectionable nonsense" to apply teleological causation theory to inorganic nature, i.e. non-carbon based nature (e.g. silicon reactions) as well as to organic nature, i.e. carbon-based nature (e.g. human reactions), and hence it would thus seem to be the case the idea of "purpose", that just like feeling of "free will", is something that needs to find reconciliation not in Aristotle's final cause, but rather in the nature of the force—specifically the exchange force—that mediates one's "seeming" sense of divine purpose, as Einstein put it. This is a large issue to grapple with, to say the least, but at least one stated in outline.

Thermodynamic teleology

In 1981, American biochemist (chnops-chemist) Jeffrey Wicken penned an article on how thermodynamics and in particular statistical thermodynamics with its "appeal to certain *ends* served by irreversible processes", all of which are based on the quantification that the equivalence value of all uncompensated transformations will tend to increase until equilibrium is reached, which results in concepts such as heat death, entropy maximization, and free energy minimum, etc., have some kind of Aristotle "final cause" feel about them, if worded in the proper way. [10] Much of Wicken's argument, however, is slanted in wording and descriptions of thermodynamics, and hence off base.

Atheists vs. theists | Biasing

In 2011, American anthropologists Bethany Heywood and Jesse Bering conducted a semi-structured interview of atheists and theists about important autobiographical events; the following is the abstract of the results: [3]

> "Overall, results indicated that differing levels of cultural religiosity (i.e., whether participants were from the relatively religious USA or the relatively secular UK) did not affect the tendency to reason teleologically. As predicted, explicit religious beliefs had an effect in that atheists gave significantly fewer teleological explanations than theists; however, half the atheists (*n*=17) gave at least one teleological response and more than three-quarters (*n*=26) gave a teleological response or admitted feeling conflicted between teleological intuitions and more rational, naturalistic explanations for significant life events. We interpret these results as suggesting that basic theory-of-mind competencies underlie the propensity to reason teleologically about major life events."

The "admitted feeling conflicted between teleological intuitions and more rational, naturalistic explanations for significant life events" comment seems to give way to the view that there is something missing from the modern educational process, in respect to the reconciliation of this conflict of views?

In 1948, Robert Clark, an old earth creationism defending chemist, to cite an example of the theist side of the fence, in his *Order and Chaos in the World of Atoms*, defended anthropomorphism (and supposedly teleology) as a useful teaching method, as follows: [13]

> "In attempting to popularize and explain the essentials of chemistry it is very difficult to avoid anthropomorphizing the atoms at times. There are certain critics [e.g. Vicente Talanquer] who believe that this is an unpardonable crime. They claim that the public should never be told that an atom 'likes' this or that, or that it 'wants' to do anything! It is, however, somewhat difficult to see how their point of view can be defended. Modern chemistry is filled with notions of this character; indeed, many newly coined technical words are decidedly anthropomorphic—a fact which is usually concealed discreetly hidden by the use of Greek instead of English. There is surely no great gulf fixed between the older chemists [e.g. Empedocles] who spoke of atoms as 'loving' or 'hating' on another and the modern physical chemists who use such terms as 'lyophilic' [solvent-loving] and 'lyophobic' [solvent-hating]."

(add)

Quotes

The following are related quotes:

> "Fundamental teleology is a dead option in physics and chemistry."
>
> — John Hawthorne and Daniel Nolan (2005), Bellingham Summer Philosophy Conference [8]

See also

- Charles Beard

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(b) Planck, Max. (1933). *Where is Science Going?* (pg. 201). Allen & Unwin.
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Further reading

- Thims, Libb. (2013). "Juarrero, Deacon, Nonreductive Physical Materialism, and Chemical Teleology" (review) (pdf), *Journal of Human Thermodynamics*, 9(6):77-112.

θΔics

In thermodynamics, **chemical thermodynamics** is the energetic and entropic study of physical processes or chemical reactions. [1] The central aspects of study in chemical thermodynamics are the initial and final states of the process or reaction. If the energy and entropy are known, with respect to appropriate reference points, for all values of pressure, volume, and temperature to be covered in the investigation, then the thermodynamic examination can be a complete one. [1] In this sense, chemical thermodynamics is the study of energy, entropy, and equilibrium in chemical systems. [4]

Perspective

Chemical thermodynamics is generally considered the most intellectually-stimulating and difficult course in all of science. English physical chemist Brian Smith, gives an excellent description on the wondrous yet cautious intrigue many have with their first encounter with chemical thermodynamics: [5]

> "The first time I heard about **chemical thermodynamics** was when a second-year undergraduate brought me the news early in my freshman year. He told me a spine-chilling story of endless lectures with almost three-hundred numbered equations, all of which, it appeared, had to be committed to memory and reproduced in exactly the same form in subsequent examinations. Not only did these equations contain all the normal algebraic symbols but in addition they were liberally sprinkled with stars, daggers, and circles so as to stretch even the most powerful of minds."

Chemical thermodynamics, for instance, is commonly considered to be the weeder-course of chemical engineering.

History

See main: History of chemical thermodynamics

The "founder of chemical thermodynamics", in the dominant sense of the term, is American engineer Willard Gibbs, who seems to have first been given this epitaph by German physical chemist Wilhelm Ostwald. [11]

American chemistry historian Mary Jo Nye correctly summarizes the prehistory of chemical thermodynamics in the following quote: [9]

> "The roots of both **chemical thermodynamics** and contemporary chemical kinetics both lie in the eighteenth-century ideas of chemical 'affinity' and 'force', transformed into the nineteenth-century conceptions of 'work' and 'energy'."

German physical chemist August Horstmann was said to have done the first work in chemical thermodynamics. In circa 1865, he began to study the works of Rudolf Clausius for applications in the calculation of equilibriums in chemical systems. His 1869 paper "Dampfspannung und Verdampfungswärme des Salmiaks" (Vapor Pressure and the Heat of Evaporation of Ammonium Chloride) was the first to apply entropy to chemical problems. In October 1873, Horstmann announced the condition for chemical equilibrium to be that of maximum entropy. [7]

In December of 1873, independent of Horstmann, American mathematical physicist Willard Gibbs, in a footnote, stated that the condition for thermodynamic equilibrium in a chemical system at constant temperature and pressure is that a certain function, now universally known as the thermodynamic potential, should be a minimum. [8] Gibbs, however, would go on to present a more complete and rigorous treatise on the subject of equilibriums. The following in-context 1996 excerpt gives cogent indication as to the start of chemical thermodynamics: [11]

> "… criticized the thermal theory of chemical affinity and deplored that 'the chemical bearings on the theory of dissipation … have not hitherto received much attention.' This was true, but to a lesser degree than

imagined by Rayleigh, who knew neither Horstmann's work nor that of Willard Gibbs, with which **chemical thermodynamics** can be said to have begun."

Horstmann aside, the two central founders of the generalized subject of chemical thermodynamics are generally considered to be Gibbs, with the publication of his 1876 *On the Equilibrium of Heterogeneous Substances*, and German physician and physicist Hermann von Helmholtz (a mentor to Horstmann), with the publication of his 1882 *The Thermodynamics of Chemical Processes* (*Die Thermodynamik Chemischer Vorgänge*). [2]

The year 1876, with the work of Gibbs, however, is the generally agreed upon year in which chemical thermodynamics was born. As Gibbsian biographer Lynde Wheeler tells, the development of the prime or fundamental equation of Gibbs:

$$d\epsilon = td\eta - pdv + \mu_1 dm_1 + \mu_2 dm_2 ... + \mu_d m_n$$

or in modern notation:

$$dU = TdS - PdV + \sum_{i=1}^{n} \mu_i dm_i$$

which is the core equation of Gibbs' *Equilibrium* treatise, "marks the birth of the theory of chemical thermodynamics". [10]

In 1913, English chemist James Partington published his *Text-book of Thermodynamics with Special Reference to Chemistry*, followed by his 1924 updated second edition titled *Chemical Thermodynamics.* [6]

The founders of "modern" chemical thermodynamics are American physical chemists Gilbert Lewis and Merle Randall, for the publication of their 1923 *Thermodynamics and the Free Energy of Chemical Substances*, in which they were the first to apply the principles of Gibbs specifically to chemical processes, and English physical chemist Edward Guggenheim, for his 1933 *Modern Thermodynamics by the Methods of Willard Gibbs.* Together, the three of them unified the science of chemical thermodynamics into a coherent whole. [3]

See also

â— Chemical thermodynamics (etymology)

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9. Nye, Mary Jo. (1993). *From Chemical Philosophy to Theoretical Chemistry: Dynamics of Matter* (pg. 117). University of California Press.
10. Wheeler, Lynde Phelps. (1951). *Josiah Willard Gibbs: the History of a Great Mind* (pg. 77). Ox Bow Press.
11. Pauling, Linus. (1970). “History of Chemical Thermodynamics”, in *The Centennial of the Sheffield Scientific School* (pgs. 27-32) by Baitsell, George A. and Lawrence, Ernest O. Ayer Publishing.

External links

- Chemical thermodynamics - Wikipedia.
- International Conference on Chemical Thermodynamics - IACT.

θΔics

In etymologies, **chemical thermodynamics (etymology)** refers to the name "origin" and or coining of the formation of the unified single subject term "chemical thermodynamics", which seems to have arisen in the 1903 English translation of French physicist and chemist Pierre Duhem's *Thermodynamics and Chemistry*, if not before, and as a quoted term by Gilbert Lewis in 1921.

Publication timeline | Theory era

The following is a timeline of chemical thermodynamics articles, books, and textbooks, showing the general etymological formation of the the term chemical thermodynamics, in the subject's so-called "theory" era, i.e. theoretical chemical thermodynamics:

	Publication | Theory era	Main author	Approach [2]
1869	"Vapor Pressure and Heated Evaporation of Ammonium Chloride"	August Horstmann (1842-1929)	
1873	"Graphical Methods in the Thermodynamics of Fluids"	Willard Gibbs (1839-1903)	
1873	"A Method of Geometrical Representation of the Thermodynamic Properties of Substances by Means of Surfaces"	Willard Gibbs (1839-1903)	
1876	*On the Equilibrium of Heterogeneous Substances*	Willard Gibbs (1839-1903)	
1882	"The Thermodynamics of Chemical Processes"	Hermann Helmholtz (1821-1894)	
1884	*Studies in Chemical Dynamics*	Jacobus van't Hoff (1852-1911)	Arbeit or Affinity
1885	*Chemical Equilibrium the Result of Dissipation of Energy*	George Liveing (1827-1924)	Energy dissipation
1886	*Le Potential Thermo-Dynamique*	Pierre Duhem (1861-1916)	Chemical potential
1893	*Theoretical Chemistry from the Standpoint of Avogadro's Rule and Thermodynamics*	Walther Nernst (1864-1941)	Arbeit or Affinity
1893	*Die Thermodynamik in der Chemie*	Johannes van Laar (1860-1938)	Total entropy

1897	*Vorlesung uber Thermodynamik*	Max Planck (1858-1947)	Total entropy
1903	*Treatises on the Thermodynamics of Chemical Processes*	August Horstmann (1842-1929)	
1903	*Thermodynamics and Chemistry: A Non-mathematical Treatise for Chemists and Students of Chemistry*	Pierre Duhem (1861-1916)	
1906	*Sechs Vortrage uber das Thermodynamische Potential*	Johannes van Laar (1860-1938)	Chemical potential

Thus, given the above rule, the subject of "thermodynamics and chemistry" (1880s) became "chemical thermodynamics" (1920s) over a period of forty years. Hence, if one is to learn by example, in the naming of a new branch of thermodynamics, e.g. "the thermodynamics of surface interactions", one should skip to the chase (e.g. surface thermodynamics), and save years of thought on questions regarding name choice. In the 1940s, to note, the specialty branch of chemical engineering thermodynamics began to develop.

Publication timeline | Quantitative era

The following is a timeline of chemical thermodynamics articles, books, and textbooks, showing the general etymological formation of the the term chemical thermodynamics, in the subject's so-called "quantitative" era, i.e. quantitative chemical thermodynamics:

	Publication | Theory era	Main author	Approach [2]
1905	*Thermodynamics of Technical Gas Reactions*	Fritz Haber (1868-1934)	A Isochore
1907	*Experimental and Theoretical Applications of Thermodynamics to Chemistry*	Walther Nernst (1864-1941)	A Isochor
1908	*Die Chemische Affinitat und ihre Messung*	Otto Sackur (1880-1914)	A Isochor
1912	*A Text Book of Thermo-Chemistry and Thermodynamics*	Otto Sackur (1880-1914)	
1912	*Die Berechnung chemischer Affinitäten nach dem Nernstschen Wärmetheorem*	Franz Pollitzer (c.1985-c.1950)	A Isochor
	Text-book of		

1913	*Thermodynamics with special reference to Chemistry*	James Partington (1886-1965)	
1921	*Thermodynamics and Chemistry*	Frank MacDougall (1883-c.1960)	
1918	*Die theoretischen und experimentellen Grundlagen des neuen Warmstatzs*	Walther Nernst (1864-1941)	A Isochor

(add discussion)

Publication timeline | Modern era

The following is a timeline of chemical thermodynamics articles, books, and textbooks, showing the general etymological formation of the the term chemical thermodynamics, in the subject's so-called "modern" era, i.e. modern chemical thermodynamics:

	Publication | Theory era	Main author	Approach [2]
1923	*Thermodynamics and the Free Energy of Chemical Substances*	Gilbert Lewis (1875-1946)	
		Merle Randall (1888-1950)	
1924	*Chemical Thermodynamics*	James Partington (1886-1965)	
1928 1934	*The Fundamentals of Chemical Thermodynamics* (Part I) *The Fundamentals of Chemical Thermodynamics* (Part II)	John Butler (1899-1977)	
1933	*Modern Thermodynamics by the Method of Willard Gibbs*	Edward Guggenheim (1901–1970)	
1946	*Thermodynamics for Chemists*	Samuel Glasstone (1897-1986)	
1949	*Thermodynamics: Advanced Treatment for Chemists and Physicists*	Edward Guggenheim (1901–1970)	

1950	*Chemical Thermodynamics*	Ilya Prigogine (1917-2003)
		Raymond Dufay
1950	*Chemical Thermodynamics*	Frederick Rossini (1899-1990)
1950	*Chemical Thermodynamics: Basic Theory and Methods*	Irving Klotz (1916-2005)
1958	*Introduction to Chemical Thermodynamics*	E. F. Caldin
1959	*An Introduction to the Study of Chemical Thermodynamics*	D. H. Everett
1962	*Elements of Chemical Thermodynamics*	Leonard Nash
1963	*Elementary Chemical Thermodynamics*	Bruce Mahan
1965	*Chemical Thermodynamics*	John Kirkwood
		Irwin Oppeheim
1965	*Chemical Thermodynamics: a Course Study*	Frederick Wall
1966	*Basic Chemical Thermodynamics*	Jurg Waser
1969	*Chemical Thermodynamics*	Peter Rock (1939-2006)
1973	*Basic Chemical Thermodynamics*	Brian Smith (1933-)
1990	*Chemical Thermodynamics*	Charles Reid
1990	*Thermodynamics of Chemical Systems*	Scott Wood
		Rubin Battino
2000	*Chemical Thermodynamics: Principles and Applications* (Volume 1) *Chemical Thermodynamics: Advanced*	J. Bevan Ott (c.1930-)

Applications (Volume 2)

Juliana Goates
(c.1953-)

(add discussion)

Overview

In 1903, French physicist and chemist Pierre Duhem, in the introduction to the American (English) edition of his 1902 *Thermodynamics and Chemistry* (*Thermodynamique ct Chimie*) stated the following: [1]

> "One of the objects I had in mind when writing *Thermodynamics and Chemistry* was to make the work of J. Willard Gibbs known and admired. More and more clearly the author of the phase law appears as the initiator of a chemical revolution; and many do not hesitate to compare the Yale College professor to our Lavoisier. Chemists had fixed upon a certain number of properties by which they recognized a substance to be a definite compound; these characteristics are effaced by the *phase rule;* many substances, to which formulae had been attributed, are erased from the number of combinations; chemical science as a whole needs a revision at which the laboratories of America and Europe are working most diligently.
>
> Nevertheless, whatever be the outcome of this revolution, it seems to me there is injustice in making the glory of Gibbs consist in this alone, by seeing in him merely the author of the phase rule. In his immortal work. *On the Equilibrium of Heterogeneous Substances*, this rule is not all; it is but one theorem, and is accompanied by other propositions whose importance is not less; the theorems on indifferent points, the laws of dissociation of perfect gases, the properties of dilute solutions, the conditions of osmotic equilibrium, the theory of the voltaic cell, bear, not less than the phase rule, the mark of the genius of their author.
>
> The phase rule is not, therefore, by a great deal, the whole of Gibbs's work; *a fortiori* it is not the whole of **chemical thermodynamics**; other ideas, other principles, play an essential role in the development of this science. When a chemical system is studied, it is assuredly very important to determine its *variance*, whose value fixes the form of the equilibrium law for the system; but before even calculating the variance, it is expedient to answer this question: Is the equilibrium of the system stable, indifferent, or unstable? Thermodynamics teaches us that no chemical equilibrium is unstable. The equilibrium conditions which the chemist meets may therefore be classed in two categories: those which are stable and those which are indifferent. This classification seems the most natural this division the most radical which may be conceived."

In 1921, American physical chemist Gilbert Lewis, in his "The Activity Coefficient of Strong Electrolytes", was referring to his upcoming textbook—*Thermodynamics and the Free Energy of Chemical Substances* (1923)—as being on the subject of chemical thermodynamics, term in quotes: (Ñº)

> "This paper is a summary of several chapters of our book on **'chemical thermodynamics'**. Although the work is approaching completion, it seems that the material here considered may be of some immediate interest to the growing number of investigators who are engaged in this important work."

This may well be said to be the foundational start of the etymology of chemical thermodynamics.

See also

â— Chemistry (etymology)
â— Thermodynamics (etymology)

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θΔics

In famous publications, **"Chemical Thermodynamics in the Real World"** is a 1971 Priestley Medal Address—the precipitate to the 2006 to present **Rossini debate**—given by American chemical engineer, physical chemist, and Gilbert Lewis protege Frederick Rossini, wherein he argues, using the combined law of thermodynamics, equilibrium constant, and internal energy atomic binding forces descriptions, that the interplay between enthalpy and entropy explain the paradox between freedom and security in society.

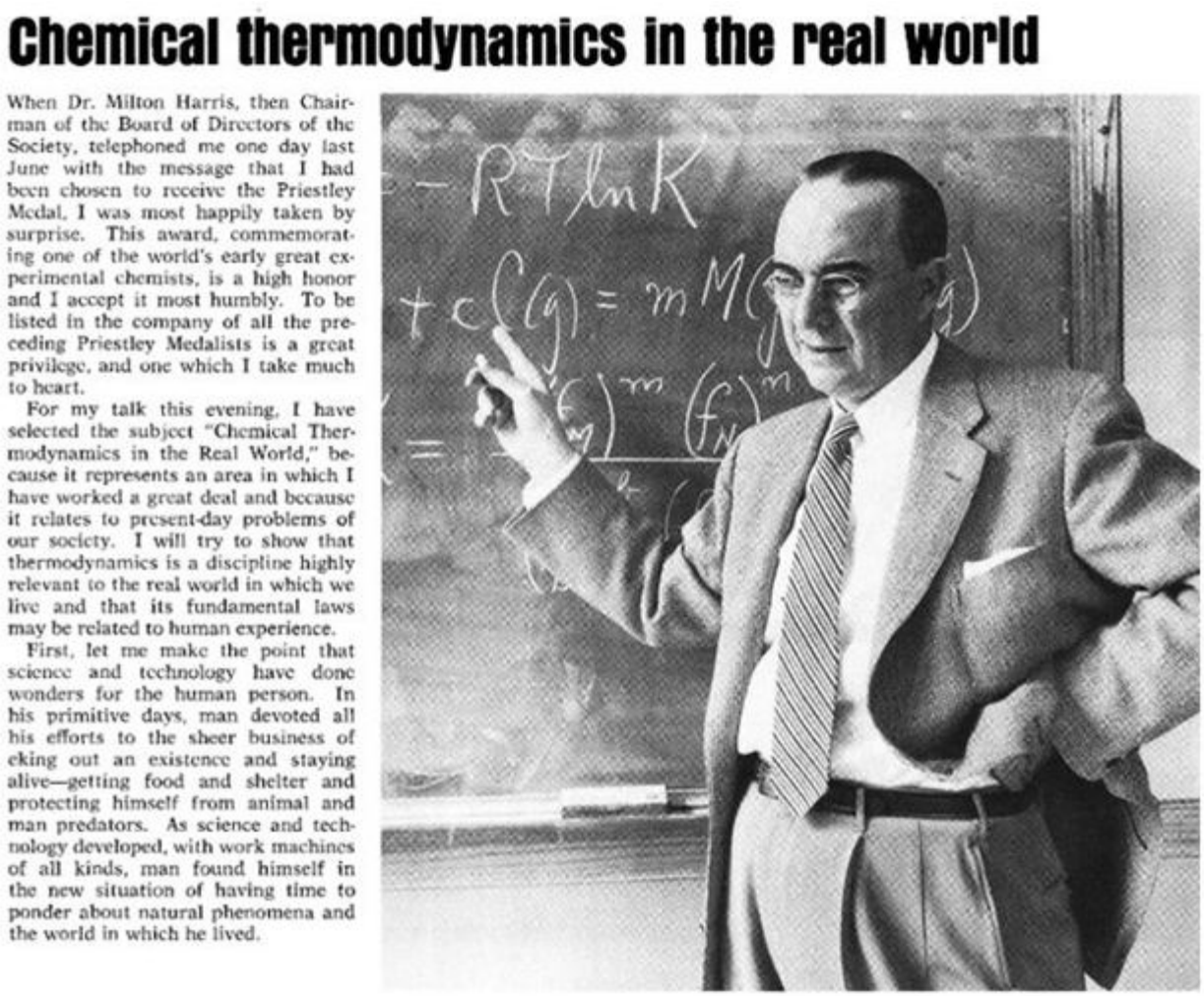

Chemical thermodynamics in the real world

When Dr. Milton Harris, then Chairman of the Board of Directors of the Society, telephoned me one day last June with the message that I had been chosen to receive the Priestley Medal, I was most happily taken by surprise. This award, commemorating one of the world's early great experimental chemists, is a high honor and I accept it most humbly. To be listed in the company of all the preceding Priestley Medalists is a great privilege, and one which I take much to heart.

For my talk this evening, I have selected the subject "Chemical Thermodynamics in the Real World," because it represents an area in which I have worked a great deal and because it relates to present-day problems of our society. I will try to show that thermodynamics is a discipline highly relevant to the real world in which we live and that its fundamental laws may be related to human experience.

First, let me make the point that science and technology have done wonders for the human person. In his primitive days, man devoted all his efforts to the sheer business of eking out an existence and staying alive—getting food and shelter and protecting himself from animal and man predators. As science and technology developed, with work machines of all kinds, man found himself in the new situation of having time to ponder about natural phenomena and the world in which he lived.

The opening page *Journal of Chemical & Engineering News* 5 Apr 1971 four-page article reprint of American chemical engineer and physical chemist Frederick Rossini's 29 March **"Chemical Thermodynamics in the Real World"** Priestley Medal Address, wherein he applies chemical thermodynamics to explain freedom and security of people in society. [1]

Overview

The following is Rossin's opening abstract: [1]

> "For my talk this evening, I have selected the subject **'Chemical Thermodynamics in the Real World,'** because it represents an area in which I have worked a great deal and because it relates to present-day problems of our society. I will try to show that thermodynamics is a discipline highly relevant to the real world in which we live and that its fundamental laws may be related to human experience."

In opening his physicochemical sociology [PCS] argument, following a short discussion on the thermodynamics of fuel cells and synthetic diamonds, Rossini explains the connection between internal energy and society in the following way; shown with added [PCS] insert clarifications:

> "A simple description of energy is that the energy of a [social] system arises from the binding forces [exchange forces] that hold together the elementary particles—nuclei, ions, atoms, molecules, and macromolecules [people]—constituting the system. The greater the binding forces, the more tightly bound is the system, and the lower is its energy. This corresponds to a state of greater [interpersonal or socioeconomic] security. The smaller the binding forces, the less tightly bound is the system, and the higher is its energy. This corresponds to a system of lesser [interpersonal or socioeconomic] security."

In short, Rossini goes through an example wherein he compares people to hydrogen molecules, according to which the association (H_2) and disassociation (H + H) reaction of hydrogen molecules into their atoms:

$$\mathrm{H{:}H} \rightleftharpoons H + H$$

has an equilibrium constant *K* the value of which determines the point when the reaction process stops and the forward and reverse reactions occur equally in both directions, which corresponds to time periods of socio-economic equilibrium or the 'end of a socioeconomic process' as Vilfredo Pareto saw it, or as British-French economist Alan Kirman put it in 1987 'Pareto regarded equilibrium as the termination point of a process … The time taken for this process is not specified but it certainly is not regarded as … as negligible.' [3]

In 1935, a similar example, to note, was done by American physiologist Lawrence Henderson, wherein, building on the work of Pareto, mixed with the chemical thermodynamics work of American engineer Willard Gibbs, goes through a comparison of the equilibrium properties of the following liquid phase chemical reaction, namely of reactants carbonic acid H_2CO_3 with disodium phosphate Na_2HPO_4 to form the products of sodium bicarbonate $NaHCO_3$ and monosodium phosphate NaH_2PO_4:

$$H_2CO_3 + Na_2HPO_4 \rightleftharpoons NaHCO_3 + NaH_2PO_4$$

to that of the equilibrium properties of social systems, at the end of which he states: [4]

> "This simple example illustrates [the] logical principles [physical chemistry] that find universal application in the physical, biological, and social sciences."

Rossini, to continue, goes on to state that from the first law and second law we can derive the following two equations:

$$\Delta G^\circ = -RT \ln K$$
$$\Delta G^\circ = \Delta H^\circ - T\Delta S^\circ$$

The first of which was derived in the *circa* 1884 so-called 'van't Hoff equilibrium box' experimental work of Dutch physical chemist Jacobus van't Hoff, the second of which was first derived in the 1923 'free energy table' work of American physical chemist Gilbert Lewis. Rossini then combines these two equations to arrive at the following governing equation:

$$\ln K = \frac{\Delta S^\circ}{R} - \frac{\Delta H^\circ}{RT}$$

Rossini then concludes rather boldly:

> "The final state of equilibrium is a

compromise between the ‘freedom’ term, ΔS°/R, and the ‘security’ term, a – ΔH°/RT. To repeat, the final state of equilibrium, then, is a compromise between two more or less opposing factors: greater freedom or greater entropy, as measure by ΔS°/R; and greater security or lesser energy, as measured by – ΔH°/RT.”

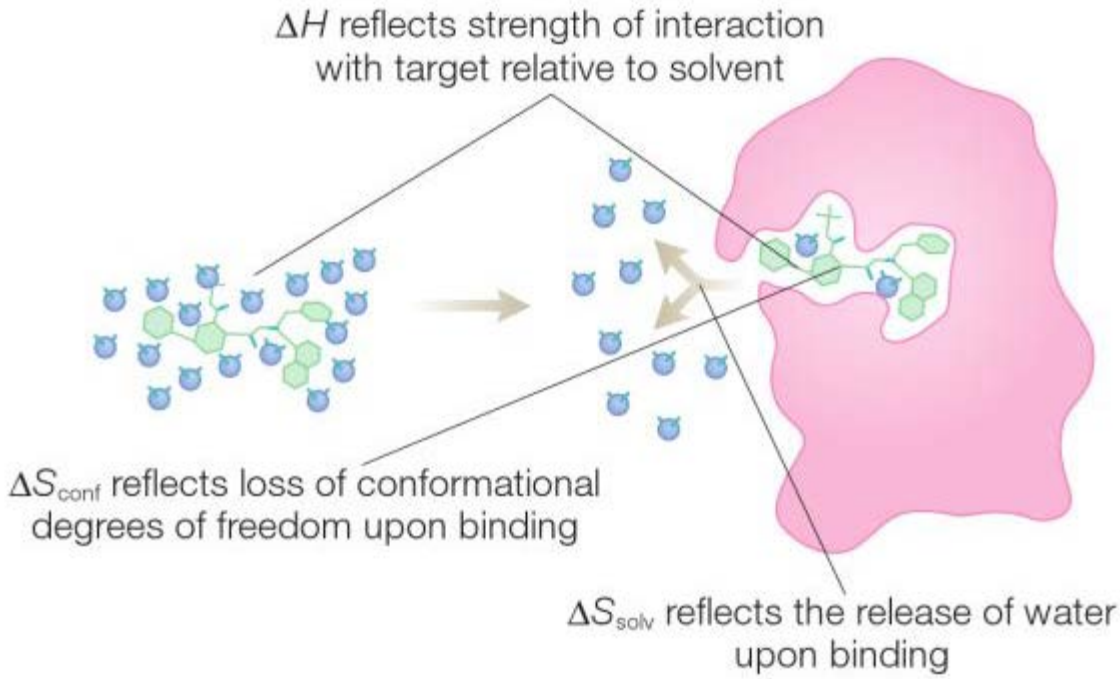

A depiction of binding affinity contributions—of a small molecule (green) to its target (red) amid solvent water (cyan)—of enthalpy ΔH and entropy ΔS, from American biophysical (chnops-physical) chemist Allen James' 2009 *Biophysical Chemistry*. [5] The Rossini corollary of this is that the green molecule is akin to a person (human molecule) being moved into or out of various binding sites.

In short:

Society

$$\frac{\Delta S^\circ}{R} \qquad -\frac{\Delta H^\circ}{RT}$$

↑ Freedom ↑ Security

and:

$$\mathrm{H{:}H} \rightleftharpoons H + H$$

↑ Social Reactions

Stated another way, as Swedish physical chemist Sture Nordholm put it, independently, in his 1997 “In Defense of Thermodynamics: An Animate Analogy”:

> “Many economists and marketing executives would like to know what drives human behavior in the so-called marketplace. Thermodynamics explains what ‘drives’ inanimate behavior, that is, which processes will spontaneously occur and towards what equilibrium conditions they strive. Thus we might apply this theory also to economic behavior of humans. In thermodynamics the two quantities of greatest interest are

the *energy* and the *entropy*."

(add discussion)

Rossini debate

In 2006, American chemistry professor Harold Leonard suggested unearthed Rossini's relatively unknown lecture, via suggestion, in the *Journal of Chemical Education*, that Rossini's premise about chemical thermodynamic descriptions of freedom and security might have real-world application to anti-terrorism efforts in a post 9/11-world. This seemingly straight suggestion launched the ongoing "heated" Rossini debate, naturally enough, owing to the religious overhaul implications of the suggestion.

Discussion

Rossini, noted student of Gilbert Lewis, author of the 1950 *Chemical Thermodynamics* textbook, as we see, was the last of the great chemical thermodynamicists, not afraid to jump the vast gap and to bridge the two cultures using the universal rules of chemical thermodynamics. No chemical thermodynamics textbook author since—American chemical engineer Benjamin Kyle (*Chemical and Process Thermodynamics*, 1999) aside, to some extent—has had the ability, not to mention the mentality to attempt such a bold transition. [2]

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(c) Alan Kirman (curriculum vitae) – Les Universites a Aix en Provence.
4. Henderson, Lawrence J. (1935). *Pareto's General Sociology: A Physiologists Interpretation* (pgs. 80-81). Harvard University Press.
5. (a) Allen, James P. (2009). *Biophysical Chemistry* (figure 3.6: Binding affinity, pg. 57; Modified from Freire, 2004, figure 1). Wiley.
(b) James Allen (faculty) – Arizona State University.
(c) Freire, Ernesto. (2004). "Isothermal Titration Calorimetry: Controlling Binding Forces in Lead Optimization" (abs), *Drug Discovery Today*, 1:295-59.
(d) Original caption: "Figure 1.The binding affinity of a small molecule to its target (red) is determined by the balance of the magnitude of its interactions with the target and those with the solvent water (cyan). Isothermal titration calorimetry is the only technique that measures directly the magnitude of the forces associated with binding. The most important binding determinants that can be controlled by drug developers are the binding enthalpy, ΔH, the solvation entropy, ΔSsolv, and the conformational entropy, ΔSconf, changes."

θΔics

In famous publications, ***The Chemical Wedding of Christian Rosenkreutz***, or "Chymical Wedding", is a 1616 alchemy-based novel by Johannes Andreae, wherein []

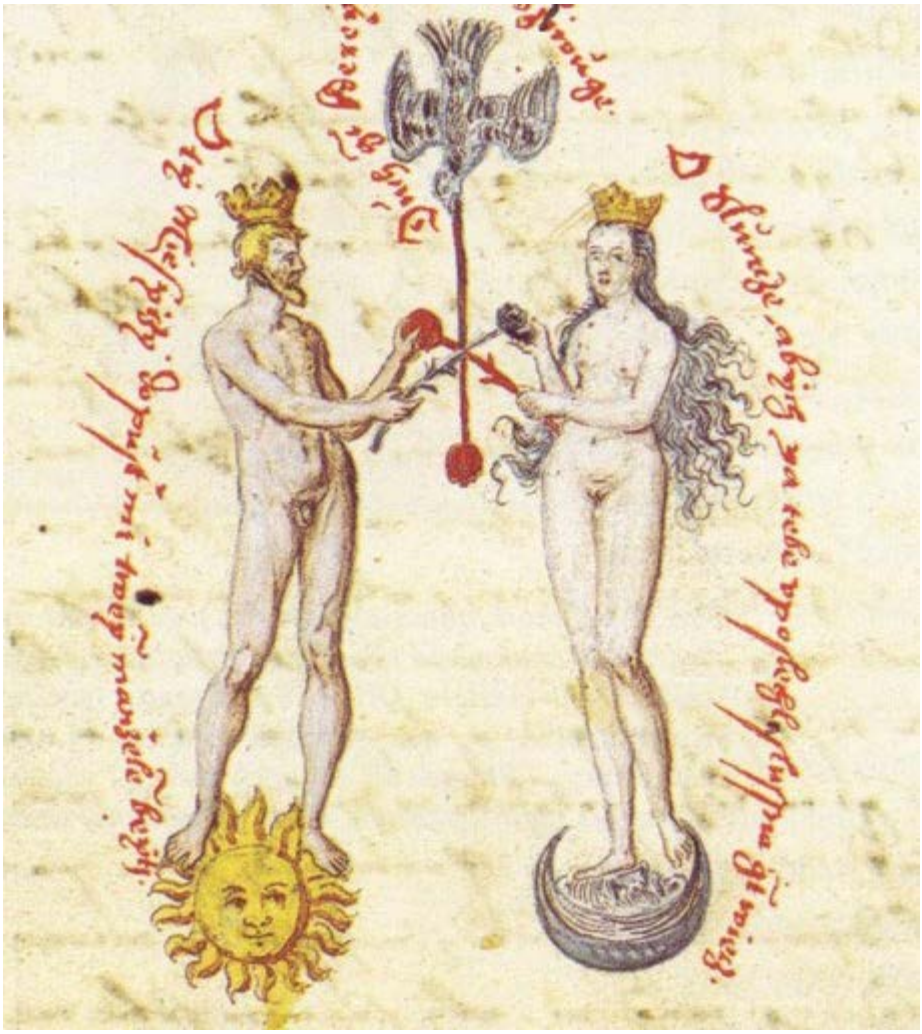

Goethe

In 1776, Johann Herder recommended the *Chemical Wedding* novel to Goethe. [1]

In 1786, Goethe wrote to Charlotte von Stein, mentioning that in *Chemical Wedding* saw the making of a good story; in particular: [2]

> "There will be a good fairy tale to tell at the right time, but it will have to be reborn, it can't be enjoyed in its old skin."

(add discussion)

In 2011, British artist Wolfe von **Lenkiewicz** used the Chemical Wedding man-woman alchemy marriage symbol on his oil on canvas "Elective Affinities" painting, themed on Goethe's 1809 *Elective Affinities*, and Alice and Wonderland.

References

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Videos

â— Anon. (2013). "Chemical Wedding" (Ñº) (audio), 1690 E. Foxcroft translation, Free Audio Books, Nov 16.

External links

â— *The Chemical Wedding of Christian Rosenkreutz* – Wikipedia.

θΔics

In science, **chemistry**, *keme*- "earth/black art" + *-ist* "performer" + *-ery* "activity", is the study of elements and the structures they form and is primarily concerned with effects due to the valence electrons in atoms and their effects on the formation and dynamics of molecules, chemical species, or other chemical entities. [1] In 1753, chemistry was defined as the physics of small bodies. [2]

Human chemistry

Human chemistry is the branch of chemistry concerned with the science, principles, and laws of chemistry applied to interactions between human beings. The study of human molecules (people) or human elements and the structures they form, focusing on the effects due to valence electrons in atoms is called "human chemistry". [3]

See also

- Affinity chemistry
- Neurochemistry
- Physical chemistry
- Surface chemistry
- Thermochemistry

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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview). Morrisville, NC: LuLu.

θΔics

In etymologies, **chemistry** derives from Coptic word for "Egypt", *kēme* (pronounced: chem), the name of the fertile black colored soil, carried down to Egypt from the Ethiopian highlands, left behind following the annual flooding of the Nile river; thus a name for the art, practiced in ancient Egyptian (particularly in Alexandria), of making various precious metals, dyes, and gems, such as described in steps in various ancient papyri recipes (Leyden Papyrus, Stockhom Papyrus, etc.), the science of which attributed to books of the lost Library of Alexandria; an etymology thus meaning the study and art of the transmutation of the elements.

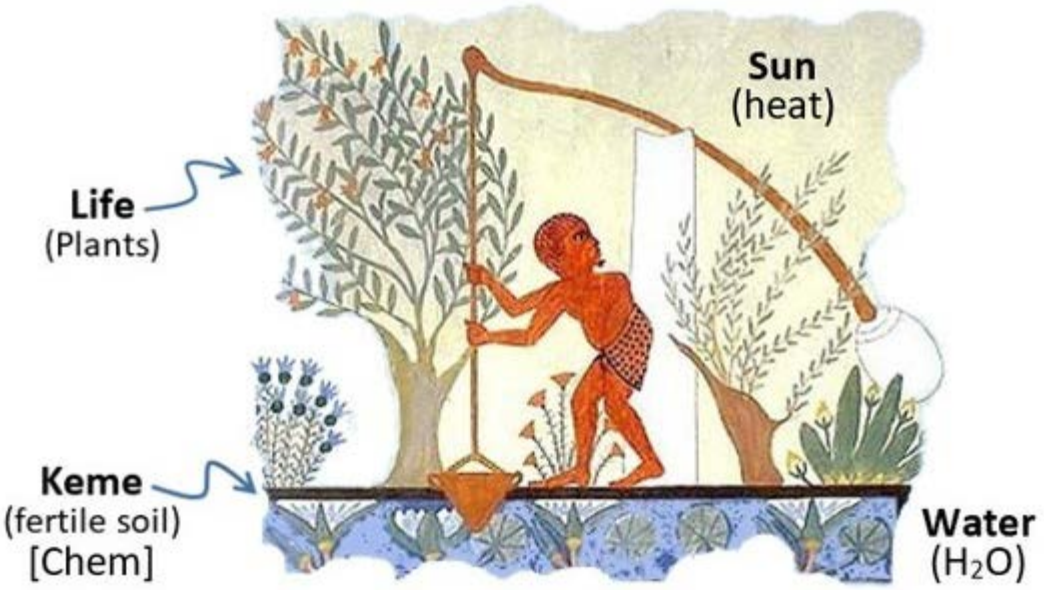

The term "keme", the name of the fertile black soil brought to the banks of the Nile River, at the end of each flood cycle, is the root of both the science chemistry, i.e. chem-istry, and the "kemites", the ancient name of the Egyptians.

Overview

The following is the hieroglyph for the name Egypt or kmt meaning "black" pronounced "Khme" in Coptic, as the Egyptians defined their own country: [4]

Egypt
(Hieroglyph)

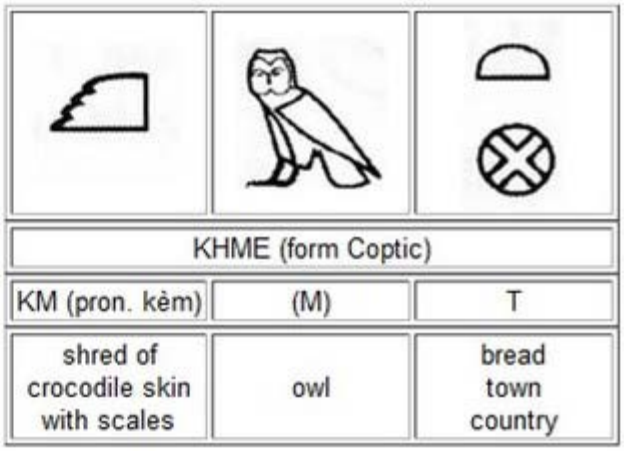

The feather looking symbol is a "black crocodile skin", pronounced "kem", the bird is an owl, the "half moon" symbol is bread and stand for the letter "t", the circle with a cross in it means "city".

In the first millennium BC, the Greeks, from Lycurgus (850BC) to Manetho (275BC), all travelled to Egypt to study in their great colleges, after which the began to call the so-called “kemetic art”, related to recipes for working with metals, dying cloth, and for preparing false silver, false, and false gems, as evidenced by two Egyptian chemistry papyri (c.300AD), found in a tomb in Thebes, namely the Leyden Papyrus X and the Stockholm Papyrus, by the Greek name Greek name χημεια or “Chemeia”, such as found in the works of Zosimos of Panopolis (300AD), phonetically sounded out as follows: [3]

In 100AD, Plutarch, to exemplify, was referring to Egypt by the Greek name chemia as follows:

> "Egypt, moreover, which has the blackest of soils, they call by the same name as the black portion of the eye, '**Chemia**', and compare it to a heart; for it is warm and moist and is enclosed by the southern portions of the inhabited world and adjoins them, like the heart in a man's left side."
>
> — Plutarch (100AD), *On Isis and Osiris* (pg. 83)

In 296AD, an official government documented of use of the term "chemeia", in reference to books of the Egyptians (in Alexandria) on making (i.e. imitating) gold and silver, first occurs in an edict of the Emperor Diocletian, given by Suidas (tenth century) from an older source, wherein the emperor order all such books to be burned.

Egyptian (3,100BC)							
		kmt					
Coptic (200BC)		K	e	m	e	tic	
Greek (300AD)		chi	eta	mu	epsilon	iota	alpha
		χ	η	μ	ε	ι	α
		Chem-e-ia					
Arab (700AD)	Al-	K	i	m	i	y	a
		Alchemy					
Boyle (1661)		Ch	y	m	is	try	
Stahl (1730)		Chym-iæ					
Macquer (1777)		Chemistry					

In 642, after the fall of Greco-Roman controlled Egyptian empire, the Arabs took over control of the Library of Alexandria, whose books began to be translated into Arabic, through the course of which, amid the Islamic golden age (800AD-1200AD), the Greek name "Chemeia" was re-named "**al-kimiya**" (alchemy), i.e. "the Egyptian art" or "the black art", as it was called in the time of Johann Faust (c.1530) who was famed for this science (Partington, 1837). [4] In the century to follow the publication of Robert Boyle's *The Sceptical Chymist* (1661), and particularly the publication of Newton's Query 31 (17818) the term alchemy slowly transformed into chymistry and then chemistry, as the science progressed in refinement.

Quotes

The following are related quotes:

> "The word 'chemistry' seems to be of Egyptian **origin**, and to have been originally equivalent to our phrase *natural philosophy* in its most extensive sense."
>
> — Thomas Thomson (1820), *A System of Chemistry* (pg. 3)

"No animosity is shown toward Egypt in the Jewish Scriptures. On the contrary they are favored (Deut. 23: 3-4-, 7-8). The word **Chem** [keme], the name of the country, is, indeed, attacked in the incident of cHam the son of Noach, but that was evidently on account of the Canaanites, and belongs to the Ezraic policy of exclusiveness."

— Constantine Grethenbach (1902), *Secular View of the Bible* [2]

"Chemistry implies that the amalgamation of metals was its first occupation, and many see in that form of the word a reference to ***Chemia***, which is, according to Plutarch, an old name of Egypt, in which this amalgamation was first practiced with success. The word druggist came from the drugs he sells."

— James Mitchell (1908), *Significant Etymology: Roots, Stems, and Branches of the English Language* (pg. 142)

"The art of alchemy was handed down through the centuries from Egypt and Arabia to Greece and Rome, and finally to western and central Europe. The word is derived from the Arabian phrase 'al-kimia', which refers to the preparation of the stone or elixir by the Egyptians. The Arabic root 'kimia' comes from the Coptic **'khem'** that alluded to the fertile black soil of the Nile delta. Esoterically and hieroglyphically, the word refers to the dark mystery of the primordial or first matter (the Khem)."

— Anon (2013), "What is Alchemy?" (Q), Royal Society of Chemistry, May

See also

- Abraham
- Thermodynamics (etymology)
- Entropy (etymology)
- Human thermodynamics (etymology)

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Further reading

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- Partington, Charles F. (1837). *The British Cyclopedia of Biography* (pg. 579). Publisher.

External links

- Chemistry (etymology) – Wikipedia.

θΔics

In famous publications, "**Chemistry in the Work of Goethe**" is a circa 2002 article written by German organic chemist Volker Wiskamp the result of class noted, discussion, and homework problems from an interdisciplinary circa 1997-2001 high school chemistry course on the relationship philosophy and moral implications of Goethe's *Elective Affinities* (1809) and a second similar similar project which had the focus on science and religion.

Origin

The following explains where the article originated:

> "The website [article: "Chemistry in the Work of Goethe"] was written approximately 10-years ago, but it has not been published in any journal. 10-15 years ago [1997-2002], I had a cooperation with a high school in Darmstadt [Germany]. One focus of that cooperation was to bring different fields of teaching together. At that time Goethe's novel 'affinities' was discussed in the German class and the 16-year-old pupils watched an Italian movie on Goethe's novel. The chemical aspects in that novel were discussed in the chemistry class and analogies between chemical interactions and human interactions, especially love, were worked out. The text which I put onto my website is the result of that class, a class report, so to say. A few years later I was involved in a similar project which had the focus on science and religion."
>
> — Volker Wiskamp (2012), explanation of origin of 2009-published online article "Chemistry in the Work of Goethe" [2]

(add discussion)

Article

The following is the original German and English translation of Volker Wiskamp's "Chemistry in the Work of Goethe": [1]

German

Chemie im Werk von Goethe

Die Wahlverwandtschaften chemisch betrachtet

Faust, das berühmteste Werk Goethes, ist ein alchemistisches Drama. Der historische Faust lebte zur Hochblütezeit der Alchemie. Die Alchemisten wollten u.a. verstehen, was die Welt im Innersten zusammen hält. Sie waren davon überzeugt, dass nicht nur der Makro-, sondern auch der Mikrokosmos das Leben der Menschen prägt. Sie glaubten daran, dass nicht nur die Bewegungen der Sterne, der Wechsel von Ebbe und Flut, von Tag und Nacht oder von Sommer und Winter etwas für die Menschen bedeutet, sondern dass auch die Veränderungen der Materie (der Moleküle) menschliches Leben und menschliche Beziehungen widerspiegeln.

Faust ist ein alter Gelehrter, der alles - auch die Alchemie - studiert und doch das Gefühl hat, nichts wirklich zu verstehen. Deshalb ist er frustriert. Hier sein berühmter Monolog, an wenigen Stellen (kursiv) von einem Chemiker modifiziert:

English

Chemistry in the work of Goethe

Considered Elective Affinities chemically

Faust, Goethe's most famous work, is an alchemical drama. The historic Faust lived in the high heyday of alchemy. The alchemists wanted et al understand what holds the world together in its innermost. They were convinced that not only the macro but also the microcosm characterizes the lives of people. They believed that not only the movements of the stars, the ebb and tide, of day and night or summer and winter means something for the people, but also that the changes of matter (of molecules) human life and human relationships reflect.

Faust is an old scholar who has everything - the alchemy - studied and yet has the feeling that nothing really understand. Therefore, he is frustrated. Here his famous

Habe nun, ach! Philosophie, Juristerei und
Medizin durchaus studiert, mit heißem
Bemühn,Da steh ich nun, ich armer Tor! Und
bin so klug als wie zuvor;
Heiße Doktor, heiße Professor gar, Und ziehe
schon so manches Jahr
Tagein, tagaus und quer und krumm Meine
Schüler an der Nase rum -
Und sehe, dass wir nichts wissen können! Das
will mit schier das Herz verbrennen.
Es ist mit alle Freud entrissen, Bilde mir nicht
ein, was Rechtes zu wissen,
Bilde mir nicht ein, ich könnte was lehren,
Meine Schüler zu bessern und zu bekehren.
Auch hab ich als Lehrer viel zu wenig Geld,
hab keine Ehr und Herrlichkeit der Welt;
Es möchte kein Hund so länger leben! Drum
hab ich mich der Chemie ergeben,
Ob mir durch der Moleküle Kraft und Mund
Nicht manches Geheimnis würde kund;
Dass ich nicht mehr, mit sauerm Schweiß, Zu
sagen brauche, was ich eh nicht weiß;
Auf dass ich erkenne, was die Welt Im
Innersten zusammenhält.

Was Faust noch auszeichnet ist seine Geilheit nach jungen Mädchen; er ist einer der größten Machos der Weltliteratur. Deshalb scheut er auch nicht davor zurück, mit dem Teufel einen Pakt zu schließen, wobei er verabredungsgemäß verjüngt wird und sich als attraktiver junger Mann an ein 14jähriges Mädchen heran machen und dieses schwängern kann. Der Glaube an die ewige Jugend, die man u.a. mit Hilfe des Steins des Weisen erreichen kann, war auch bei den Alchemisten ausgeprägt.

Goethe lebte zur Zeit der Chemischen Revolution. Lavoisier hatte in Paris zeitgleich mit der Französischen Revolution die Grundlagen für die wissenschaftliche Methodik der Chemie im heutigen Sinne erarbeitet, Liebig rund 50 Jahre später in Gießen wissenschaftliche Perfektion erreicht. Goethe, der ein bedeutender Förderer der Naturwissenschaft war, kannte die Neuentwicklungen in der Chemie recht gut, z.B. auch eine Arbeit des Schweden Bergman mit dem Titel Untersuchungen über die Wahlanziehungen, in der es u.a. um die Reaktion von Calciumcarbonat mit Schwefelsäure ging. Diese Umsetzung hat Goethe in seinem Gesellschaftsroman Die Wahlverwandtschaften als Gleichnis für Liebe und Ehebruch gedeutet. Für einen Chemiker von heute ist es faszinierend, Goethes Gedankengänge, die denen der Alchimisten in Hinblick auf die Analogie von Vorgängen im Mikrokosmos und im menschlichen Leben ähneln,

monologue, modified in a few places (in italics) of a chemist:

Have now, alas! Philosophy, Jurisprudence,
Medicine thoroughly studied through with
ardor keen, As I stand now, I, poor fool! And
am no wiser than before;
Hot doctor, hot Professor did, And now I've
so many years
Day in, day-cross and crooked my students by
the nose rum -
And see that we can not know anything! This
will burn with sheer heart.
It is torn with all Freud, imagining a not to
know what law,
Imagining no one, I could teach what to mend
my students and to convert.
Even I as a teacher far too little money, have
no honor and glory of the world;
It does not want a dog to live so long! So I've
resigned myself to the chemical,
Whether me by the molecules force and
mouth Not many secrets might be known;
That I no longer, with sauerm welding, have
to tell you what I do not know anyway;
On that I know what holds the world together
at heart.

What Faust is still distinguishes his lust for young girls; He is one of the biggest machos of world literature. Therefore, he does not shy away from being with the devil to make a pact, where he is rejuvenated as agreed and make an attractive young man approached a 14 year old girl and this can impregnate. The belief in the eternal youth that are, inter alia, can achieve with the help of the stone of the wise man, was pronounced even when the alchemists.

Goethe lived at the time of the Chemical Revolution. Lavoisier had simultaneously worked in Paris with the French Revolution, the foundations of the scientific methodology of chemistry in the modern sense, Liebig reached around 50 years later, in pouring scientific perfection. Goethe, who was an important patron of science, the developments in chemistry knew quite well, eg also a work of Sweden Bergman entitled studies on the choice attractions, in which it, inter alia, decreased by the reaction of calcium carbonate with sulfuric acid. This reaction has interpreted Goethe *Elective Affinities* as a

nachzuvollziehen und weiter zu entwickeln. Dabei muss dem Dichter hoher Respekt vor seinem chemischen Sachverstand ausgesprochen werden, denn immerhin war Goethes Fachwissen kaum größer als das, was heute im Chemie-Anfängerunterricht (der Klasse 8) vermittelt wird.

Chemie und Handlung des Romans

Die vier Personen, Charlotte, Eduard, Otto und Ottilie werden in den chemischen Gesprächen, die im über 300seitigen Roman etwa 10 Seiten umfassen, zunächst mit den abstrakten Buchstaben A, B, C, und D, später auch mit chemischen Stoffen benannt.

A ... Charlotte ... Carbonat-Anion
B ... Eduard ... Calcium-Kation
C ... Otto ... Proton
D ... Ottilie ... Sulfat-Anion

Am Anfang ist da das Ehepaar Charlotte und Eduard, A-B. Hinzu kommt Eduards Freund Otto, C. Charlotte ist zunächst gegen dessen Kommen. Sie befürchtet nämlich, dass Eduard durch den Ankömmling zu stark von ihr weggezogen und ihre harmonische Ehe beeinträchtig werde, dass sie durch eine Beziehung zwischen Eduard und Otto, B-C, - nicht im Sinne einer Homosexualität, sondern einer echten Männerfreundschaft -, recht verlassen zurück bliebe.

Eduard sieht diese Problematik auch und stimmt deshalb Charlottes Vorschlag zu, deren Nichte Ottilie, D, in ihrem Haus aufzunehmen, in der Erwartung, dass mit einer sich ausbildende Frauenfreundschaft, A-D, Charlotte für die vorüber gehende Zeit nicht alleine bliebe.

Noch bevor Ottilie ankommt, scherzt Eduard, dass zwischen Otto und Ottilie eine Beziehung, C-D, entstehen könne. Wenn dieser Verkupplungsversuch gelänge, wäre dies für Eduard nicht schlimm, denn er hätte dann ja wieder mehr Zeit sich seiner Ehefrau zu widmen, zu der er ja sowieso gehöre.

Kaum ist Ottilie da, schildert Goethe eine symbolträchtige Szene: Ottilie klagt über häufige Kopfschmerzen in der einen, Eduard über ähnliche Schmerzen in der anderen Kopfhälfte. Otto erkennt hier so etwas wie Bild und Spiegelbild (chirale Moleküle) und scherzt seinerseits, Eduard solle aufpassen, nicht zu sehr von seinem Spiegelbild angezogen zu werden. (Schauen Menschen nicht gerne in den Spiegel und sind dann selbstverliebt? Suchen Sie nicht häufig einen Partner, der ihnen im Aussehen gleicht?) Im Falle eine Bindung zwischen

parable of love and adultery in his social novel. For a chemist of today it is fascinating Goethe's thought processes, similar to those of the alchemists in regard to the analogy of processes in microcosm and in human life, to understand and develop. Here the poet high respect for his chemical expertise has to be pronounced, after all, was Goethe's expertise barely larger than what is now in Chemistry Beginner lessons (Class 8) conveys.

Chemistry and plot of the novel

The four people, Charlotte, Eduard, Otto and Ottilie are first, later named the abstract letters A, B, C, and D with chemical substances in the chemical conversations consisting in over 300seitigen Roman about 10 pages.

A ... ... Charlotte carbonate anion
B ... Edward ... calcium cation
C ... Otto ... Proton
D ... ... Ottilie sulfate anion

In the beginning there is the couple Charlotte and Eduard, AB. Moreover Eduards friend Otto, C. Charlotte's first against its coming. She fears namely that Eduard too strongly pulled by the comer of her and her harmonious marriage would adversely affect that through a relationship between Eduard and Otto, BC, - not in the sense of homosexuality, but a true male friendship -, rather leaving remain back.

Edward sees this issue as well, and therefore agrees to Charlotte's proposal, to take her niece Ottilie, D in their home, in the expectation that a woman that forms friendship, AD, Charlotte would not remain alone for over continuous time.

Even before arriving Ottilie, Eduard jokes that between Otto and Ottilie could a relationship, CD arise. If this Verkupplungsversuch succeed, this would be for Eduard not bad, because he would then have more time to devote so again his wife, to which he belonged anyway.

Hardly is there Ottilie, Goethe portrays a symbolic scene: Ottilie complains of frequent headaches in one, Eduard through similar pain in the other half of the head. Otto seen here something like image and mirror image (chiral molecules) and kids in turn, Eduard should be careful not

Eduard und Ottilie, B-D, läge ein Bruch der Ehe zwischen Charlotte und Eduard vor.

Das geplante Vorhaben und die möglichen, aber nicht überschaubaren Konsequenzen erinnern an die Syntheseplanung eines Chemikers. Es wird etwas zusammen gegeben, man rechnet mit einen bestimmten Produkt, ist aber auch auf andere Reaktionsabläufe gefasst. Deshalb wollen wir jetzt den Personen chemische Stoffe zuordnen und ausprobieren, wie diese miteinander reagieren.

Fast so wie im Roman, - Goethe kannte z.B. die Unterscheidung zwischen Anionen und Kationen noch nicht -, bezeichnen wir Charlotte als Carbonat-Anion, Eduard als Calcium-Kation, Eduard als Proton und Ottilie als Sulfat-Anion.

Experimente und deren Deutung

Wenn man ein Stück Marmor mit Salzsäure überschichtet, löst es sich allmählich unter Gasentwicklung auf.

Überschichtet man ein Stück Marmor hingegen mit Schwefelsäure, so erfolgt nur kurzzeitig eine Gasentwicklung, die dann aber weitgehend zum Erliegen kommt. Erst wenn die Oberfläche des Steins abgekratzt wird, geht die Gasentwicklung weiter, um nach kurzer Zeit erneut zum Stillstand zu kommen.
Gibt man pulverförmiges Calciumcarbonat im Salzsäure, so erfolgt die Auflösung sehr viel schneller als die von kompakten Calciumcarbonat in Form eines Marmorstückes. Pulverförmiges Calciumcarbonat, versetzt mit Schwefelsäure, ergibt unter Gasentwicklung (heftig, aber nicht ganz so heftig wie bei der Reaktion mit Salzsäure) eine weiße Suspension von Calciumsulfat (Gips).

Die experimentellen Befunde lassen sich durch Reaktionsgleichungen beschreiben und in einen Sinnzusammenhang mit dem Geschehen im Roman stellen.

Charlotte fühlt sich schnell und stark zu Otto, dem brillanten Architekten und Bewunderer ihrer Gartenkunst, hingezogen, so wie sich Carbonat und Protonen rasch zu Kohlensäure verbinden.

Die Beziehung zwischen Charlotte und Otto hält aber nicht, genau so wenig wie die Kohlensäure nicht lange existent ist, sondern rasch zu Wasser und Kohlenstoffdioxid, im Roman als Luftsäure bezeichnet, zerfällt.

to be too much attracted by its mirror image. (Look people do not like in the mirror and are then self-indulgent? Find Not often a partner who resembles them in appearance?)
In the case of a bond between Eduard and Ottilie, BD, would be present a fraction of marriage between Charlotte and Eduard.

The planned project and the possible, but not manageable consequences recall the synthesis planning a chemist. It is given something together, is expected to a certain product, but taken in a different reaction processes. That is why we now want to assign people and test how they react with each other chemicals.

Almost like in the novel - Goethe knew as the distinction between anions and cations not yet - we call Charlotte as a carbonate anion, calcium cation as Edward, Edward as Proton and Ottilie as sulfate anion.

Experiments and their interpretation

When overlaid a piece of marble with hydrochloric acid, it gradually dissolves with evolution of gas.

Overlayed a piece of marble contrast with sulfuric acid, takes place only briefly a gas development, but then largely come to a standstill. Only when the surface of the stone is scraped off, the gas development continues to come to a halt again after a short time.
Are you powdered calcium carbonate in hydrochloric acid, so the resolution is much faster than that of compact calcium carbonate in the form of a marble piece. Powdered calcium carbonate, treated with sulfuric acid yields, with gas evolution (violent, but not quite as vigorously as in the reaction with hydrochloric acid), a white suspension of calcium sulphate (gypsum).

The experimental results can be described by equations and put them into a sense of connection with the events in the novel.

Charlotte feels fast and strong to Otto, the brilliant architect and admirer of their garden art, drawn, just as carbonate and protons rapidly combine to form carbonic acid.

The relationship between Charlotte and Otto but not holding, as little as the carbon dioxide is not existing exactly long, but quickly to water and carbon dioxide, referred to in the novel as air acid decomposes.

Wäre Otto alleine auf das Gut von Charlotte und Eduard gekommen, wäre die Ehe vermutlich kaputt gegangen, ohne dass Eduard eine neue Partnerin gefunden hätte. Kommt nämlich Calciumcarbonat mit Protonen in Form der Salzsäure zusammen, resultiert nach dem Ausgasen von Kohlenstoffdioxid eine wässrige Lösung, in der Calcium- und Chlorid-Ionen nebeneinander in solvatisierter Form (aq) vorliegen. Es kristallisiert kein neues Salz aus. Calciumchlorid ist dafür zu gut wasserlöslich. (Anders ausgedrückt: Das Chlorid ist hier nicht die richtige Frau für das Calcium.) Kommt Calciumcarbonat aber mit Protonen in Form der Schwefelsäure zusammen, so entsteht suspendierter Gips, denn dieser ist nur mäßig wasserlöslich. (Anders ausgedrückt: Das Sulfat ist eine geeignete Frau für das Calcium.) Im übertragenen Sinne bedeutet dies, dass Eduard mit Ottilie eine neue Liebe findet.

Had Otto came alone to the estate of Charlotte and Edward, the marriage would probably be broke without Edward would have found a new partner. Comes namely calcium carbonate with protons in the form of the hydrochloric acid together, resulting after the outgassing of carbon dioxide, an aqueous solution in which calcium and chloride ions side by side in solvated form (aq) are present. It crystallized from no new salt. Calcium chloride is too good for water. (In other words: The chloride here is not the right woman for the calcium.) If calcium carbonate but with protons in the form of sulfuric acid together, the result is suspended plaster, because this is only moderately soluble in water. (In other words: The sulfate is a suitable wife for the calcium.) In a figurative sense, this means that Eduard with Ottilie found a new love.

Gelegentlich geschieht es, dass zwei befreundete Ehepaare gegenseitig ihre Partner tauschen, nach dem Motto: Lasst uns Spaß haben, am nächsten Tag ist alles wieder wie früher! Normalerweise scheitert dieses Vorhaben aus einem einfach Grund: Das eine neue Paar hat miteinander mehr Spaß als das andere. Bei der späteren Rückkehr in die alten Beziehungen bleiben Neid- und Eifersuchtsgefühle, die dann häufig zur Zerrüttung der Beziehungen führen.

Occasionally it happens that two married couples mutually exchange their partners, according to the motto: Let's have fun, the next day everything is back as before! Normally, this plan fails for a simple reason: The new couple has each more fun than the other. During the subsequent return to the old relations remain envy and jealousy feelings which then often lead to the breakdown of relationships.

Es wurde die unterschiedliche Reaktivität von Calciumcarbonat in Form eines Steins (Marmor) und eines Pulvers untersucht. Der Marmor soll hier eine junge Ehe, wie die von Charlotte und Eduard, darstellen, an der der Zahn der Zeit noch nicht genagt hat. Das pulverförmige Calciumcarbonat soll hingegen eine durch viele Widrigkeiten des Lebens zerrüttete Ehe symbolisieren. Eine solche ist für eine Zerstörung anfälliger als eine intakte Ehe; entsprechend wandelt sich pulverförmiges Calciumcarbonat rasch und nahezu quantitativ in Gips um, während sich Marmor nur oberflächlich mit Gips überzieht. (Die Geschwindigkeit einer heterogenen Reaktion hängt ganz maßgelblich von der Größe und dem Verteilungsgrad der Reaktionspartner ab.)

It was examined the different reactivity of calcium carbonate in the form of a stone (marble), and a powder. The marble is a young married here, like that of Charlotte and Eduard representing where the ravages of time has not been gnawed. The powdered calcium carbonate is however symbolizing a shattered through many adversities of life marriage. Such is susceptible to destruction than an intact marriage; Accordingly, powdered calcium carbonate transforms rapidly and almost quantitatively in plaster, while marble covers only superficially with plaster. (The rate of heterogeneous reaction depends entirely maßgelblich on the size and the degree of distribution of the reactants.)

Heute kommt es selten vor, dass die erste Liebe eines jungen Menschen seine einzige bleibt und ein Leben lang hält. Wenn die erste Liebe aber eine wirkliche Liebe war, bleibt sie - zumindest teilweise - später noch im Herzen des Menschen erhalten und kommt als positive Erinnerung und Lebensquelle gelegentlich wieder zum Vorschein. Sie schlummert sozusagen im Unterbewusstsein des Menschen.

Today it is rare that the first love of a young man remains his only and last a lifetime. But if the first love was a true love, it will remain - at least partially - later obtained in the human heart, and comes as a positive reminder and source of life occasionally reappear. They speak lies dormant in the subconscious mind of man.

Im weiteren Verlauf des Romans stellt sich Eduard die Frage, wie er aus der Beziehung zu Charlotte ganz heraus

Later in the novel, Edward, the question arises, how he come out of the relationship with Charlotte all the way out, and Charlotte asked how her husband can keep; In chemical terms, how can the calcium carbonate

kommen, bzw. für Charlotte die Frage, wie ihren Ehemann halten kann; chemisch ausgedrückt: Wie kann die Calciumcarbonat-Auflösung beschleunigt bzw. gestoppt und die Gips-Bildung gefördert bzw. unterbunden werden?

Eduard verschwindet für eine Zeit und drängt gleichzeitig seinen Freund Otto dazu, intensivere Beziehungen zu Charlotte aufzunehmen. Analog wird die Auflösung des unter dem Gips sitzenden Kalksteins durch Erhöhung der Säurekonzentration gefördert. Die Reaktion ist nämlich diffusionskontrolliert: die Protonen müssen durch die Gipsschicht diffundieren, um an das darunter liegende Calciumcarbonat zu gelangen. Wenn nun mehr Protonen da sind, verläuft diese Reaktion schneller.

Charlotte verfolgt die umgekehrte Strategie. Sie block den Kontakt zu Otto weitgehend ab. Chemisch gesehen entspricht dies dem Abfangen der Protonen zum Vermeiden eines Angriffs auf das Carbonat.

Eduard versucht, mit Ottilie alleine zusammen zu kommen. Chemisch heißt das, dass die Gips-Bildung begünstigt ist, wenn kein mit dem Sulfat um das Calcium konkurrierendes Carbonat da ist.

Charlottes Plan besteht hingegen darin, Ottilie wegzuschicken, um so die Rückkehr ihres Gatten zu erleichtern. Chemisch gesprochen: Die Calciumcarbonat-Bildung erfolgt leichter, wenn kein konkurrierendes Sulfat da ist.

Charlottes Eherettungsversuch wird durch das Verhalten von Ottilie begünstigt. Die junge Frau entsagt nämlich ihrer Liebe zu Eduard aus Respekt vor der Institution Ehe. Chemisch kann dies so ausgelegt werden, dass Calciumsulfat nicht entstehen soll, weil Calciumcarbonat stabiler ist. Im Kristallgitter ist die Anziehungskraft zwischen Calcium-Kationen und Carbonatanionen (Gitterenergie) größer als die zwischen Calcium-Kationen und Sulfat-Anionen, was durch Löseversuche einfach plausibel gemacht werden kann. Während Calciumcarboonat in Wasser völlig unlöslich ist, ist Calciumsulfat hingegen etwas löslich, vor allem in siedendem und salzsäurehaltigem Wasser. (Deshalb ist Gips als Baustoff auch bei weitem nicht so gut geeignet wird Kalkstein!)

Vorschlag für einen Eherettungsversuch

Wie müsste ein erfolgreicher Eherettungsversuch aus chemischer Sicht aussehen? Die Säure müsste vollständig aus dem Verkehr gezogen werden. Dies könnte beispielsweise durch Auswaschen erfolgen.

dissolution accelerated or stopped and be promoted or inhibited the gypsum formation?

Edward disappears for a time and at the same time urging his friend Otto to receive more intensive relations with Charlotte. Analog is promoted the dissolution of the seated under the plaster limestone by increasing the acid concentration. The reaction is diffusion controlled namely: the protons have to diffuse through the plaster layer to reach the underlying calcium carbonate. Now, if more protons are there, this reaction proceeds faster.

Charlotte followed the reverse strategy. They block the contact to Otto large extent. Chemically speaking, this corresponds to the interception of protons to avoid an attack on the carbonate.

Edward tried to come up with Ottilie alone together. Chemically, this means that the gypsum formation is favored when not competing with the calcium carbonate to sulphate is there.

Charlotte's plan is however the fact Ottilie send away, so as to facilitate the return of her husband. Chemically speaking: The calcium carbonate formation occurs easier if no competing sulphate is there.

Charlotte's marriage rescue attempt is favored by the behavior of Ottilie. The young woman renounces her love for Edward namely out of respect for the institution of marriage. Chemically, this can be designed so that the calcium sulfate should not arise because calcium carbonate is stable. In the crystal lattice the attractive force between calcium cations and carbonate anions (lattice energy) is greater than that between calcium cations and sulfate anions, which can be made by dissolving experiments simply plausible. While Calciumcarboonat is completely insoluble in water, calcium sulfate, however, is slightly soluble, especially in boiling water and acidified. (Why gypsum is as a building material also by far is not as well suited limestone!)

Proposal for a marriage rescue attempt

How would a successful marriage rescue attempt look from chemical point of view? The acid would have to be completely withdrawn from circulation. This could be done for example by washing.

Furthermore, the sulfate-bound already on calcium may have to be replaced with excess carbonate. Carbonate but is existent only in the alkaline medium, for example in the form of sodium carbonate, produced by bubbling carbon

Weiterhin müsste das bereits am Calcium gebundene Sulfat mit überschüssigem Carbonat verdrängt werden. Carbonat ist aber nur im alkalischen Medium existent, z.B. in Form von Natriumcarbonat, hergestellt durch Einleiten von Kohlenstoffdioxid in Natronlauge. (Damit wird die sog. Luftsäure wieder in einem wässrigen Medium gebunden.) Wenn man Gips mit Soda-Lösung kocht, entsteht in der Tat festes Calciumcarbonat, während die Sulfat-Ionen in solvatisierter Form in Lösung gehen

In der Qualitativen Analyse wird diese Reaktion u.a. ausgenutzt, um Sulfate aufzuschließen, d. h. Sulfationen in Lösung zu bringen und darin (Filtrat) mit zugesetzter Bariumsalz-Lösung als schwerlösliches Bariumsulfat nachzuweisen (Sodaauszug).

Wahl, Gelegenheit und höhere Bestimmung

Eduard führt den Begriff der Wahlverwandtschaften zwischen chemischen Stoffen ein. Er meint damit, dass sich Stoffe offensichtlich dann bevorzugt miteinander verbinden, wenn dabei besonders viel Bindungswärme frei wird. Im thermodynamischen Sinne spricht Eduard von Bindungsenthalphien, DH, insbesondere von der Exothermie (heiße Liebe) chemischer Reaktionen.

Charlotte findet, dass eine chemische Reaktion nur dann abläuft, wenn auch die Gelegenheit dazu besteht. Sie vergleicht, dass es den Diebstahl nur gibt, wenn es etwas zu stehlen gibt und auch griffbereit für den Dieb bereit liegt. Sie beschreibt damit klar und deutlich, dass die Lage eines chemischen Gleichgewichtes maßgeblich von den Konzentrationen der Reaktionsteilnehmer abhängt (Massenwirkungsgesetz). Extrem formuliert: Kommt Marmor gar nicht mit Schwefelsäure in Kontakt, so entstehen weder Gips noch Kohlenstoffdioxid; wären Otto und Ottilie nicht erschienen, wäre die Ehe von Charlotte und Eduard auch nicht gefährdet gewesen. Vielleicht meint Charlotte, wenn sie von Gelegenheiten spricht, auch andere Randbedingungen, die eine Ehe verändern können, z.B. wohnliche, finanzielle, gesundheitliche oder soziale, ähnlich wie z.B. die Temperatur auf die Geschwindigkeit einer chemischen Reaktion und die Einstellung des chemischen Gleichgewichtes einen maßgeblichen Einfluss hat.

Otto meint, dass der Ablauf einer chemischen Reaktion nach einer höheren Bestimmung erfolgt.

Der Chemiker weiß, dass die Triebkraft einer chemischen Reaktion, von der Otto hier spricht, einerseits von der Wärmetönung (Exothermie bzw. Endothermie) abhängt, andererseits aber auch von Temperatur und Entropie

dioxide in sodium hydroxide solution. (Thus, the so-called. Air acid is again bound in an aqueous medium.) When cooking plaster with sodium carbonate solution, arises in fact solid calcium carbonate, while the sulfate ions go in solvated form in solution.

In the qualitative analysis, this reaction is, inter alia, exploited to unlock sulfates, ie to bring sulphate ions in solution and is demonstrated (filtrate) with added barium solution as sparingly soluble barium sulfate (Sodaauszug).

Choice, opportunity and higher destiny

Edward introduces the concept of elective affinities between chemicals. He means that substances then obviously preferable to one another, particularly when a lot of latent heat is released. The thermodynamic sense, Edward speaks of enthalpy of formation, ΔH, especially the exothermic *(hot love)* chemical reactions

Charlotte finds that a chemical reaction takes place only when the opportunity arises. It compares that there is theft only if there is something to steal, and also handy for the thief is ready. It describes so clearly that the position of a chemical equilibrium depends crucially on the concentrations of the reactants (mass action). Extremely formulated: Come marble not contacted with sulfuric acid, so there are neither gypsum nor carbon dioxide; Otto and Ottilie were not published, the marriage of Charlotte and Edward would not have been compromised. Maybe thinks Charlotte, when she speaks of occasions, other boundary conditions, which can change a marriage, for example, homely, financial, medical or social, similar to e.g. the temperature on the rate of a chemical reaction and the setting of the chemical equilibrium has a significant influence.

Otto said that the process of a chemical reaction by a higher determination is made.
[Otto says that is the course of a chemical reaction by a higher purpose]

The chemist knows that the driving force of a chemical reaction by the Otto speaks, on the one hand depends on the heat of reaction (exothermic or endothermic), on the other hand but also of temperature and entropy of a measure of the disorder of the system, after the second law of thermodynamics, which states that the system strives toward a maximum, with the motto: the chaos is increasing.

einem Maß für die Unordnung des Systems, die nach dem 2. Hauptsatz der Thermodynamik einem Maximum entgegen strebt, nach dem Motto: Das Chaos wird immer größer.

Die Reaktion von Calciumcarbonat mit Schwefelsäure ist vor allem entropiekontrolliert, denn mit dem Kohlenstoff(IV)-oxid entweicht ein Reaktionsprodukt aus dem -gemisch in die ungeordnete (chaotische) Gasphase.

Auch bei den wechselseitigen Beziehungen der vier Hauptpersonen in Goethes Roman endet alles im Chaos.

Ist nun das Verhalten von Calciumcarbonat und Schwefelsäure uneingeschränkt mit den Beziehungen zwischen Charlotte, Eduard, Otto und Ottilie vergleichbar? Wenn ja, müsste Ehebruch als die natürlichste Sache der Welt angesehen werden und praktisch dem oben zitierten Gesetz der Naturwissenschaft entsprechen. Doch ist Charlotte wirklich ein seelenloses Carbonation, Eduard ein seelenloses Calciumion etc? Werden nicht beim Sich-Neu-Verlieben und beim Ehebruch nicht nur alte Beziehungen gelöst und neue geknüpft und viel Chaos erzeugt, sondern auch Gefühle von Menschen verletzt? Müssen deshalb nicht auch noch Gesetze berücksichtig werden, die über die rein naturwissenschaftlichen hinausgehen? Z.B. solche, die vor langer Zeit ein alter Mann von einem Berg herab brachte und von denen das sechste lautet: Du sollst nicht ehebrechen! Goethe stellt diese Frage in seinem Roman auch. Beschreiben die Naturwissenschaften mit ihren Gesetzen die einzige Wahrheit, oder gibt es noch andere Wirklichkeitsebenen, die wir nur erahnen, aber (noch) nicht kennen?

Ergänzende Anmerkungen

In den chemischen Gesprächen kommt u.a. zum Ausdruck, dass sich vom Charakter her ähnliche Menschen gerne wie Wasser und Ethanol zueinander gesellen. Sie vertragen sich gut miteinander und behalten gleichzeitig ihre wesentlichen, typischen Eigenschaften.
Genauso oft ziehen sich aber auch gegensätzliche Menschentypen an, so wie Säuren und Laugen.

Häufig stoßen sich gegensätzliche Menschen aber auch wie Wasser und Öl ab. Dennoch gelingt es meistens, solche Menschen durch ein gemeinsames, übergeordnetes Ziel zusammen zu halten, so wie eine Wasser/Öl-Mischung durch Zusatz eines Tensids zu einer stabilen Emulsion werden kann. Hierzu ein Beispiel: Die natürlichen Gegner Schüler und Lehrer kommen doch in der Regel ganz gut und vermutlich nur deshalb miteinander aus, weil es die Schule gibt.

The reaction of calcium carbonate with sulfuric is entropy-controlled especially because with the carbon (IV) oxide is a reaction product escapes from the mixture (chaotic) in the disordered gas phase.

Even with the mutual relations of the four main characters in his novel all ends in chaos.

Now the behavior of calcium carbonate and sulfuric acid is fully with the relationship between Charlotte, Edward, Otto and Ottilie comparable? If so, do adultery as the most natural thing in the world and are considered practically the above-cited law of science meet. But Charlotte is really a soulless carbonation, Edward etc. a soulless calcium? Are not the self-re-fall in love and committing adultery not only solved with old friends and new ones and creates a lot of chaos, but also feelings of hurt people? Therefore need not even be considered laws that go beyond the purely scientific? For example, those who long ago brought an old man of the mountain and down the sixth of which is: Thou shalt not commit adultery! Goethe asks this question in his novel also. Describe the natural sciences with its laws is the only truth, or are there other levels of reality, we only guess, but (still) do not know?”

Additional comments

In the chemical talks comes inter alia expressed that love to join in character similar people like water and ethanol each other. They get along well with each other while keeping their essentially, typical properties.

Equally often attract each other even opposing types of people, such as acids and alkalis.
Often people also encounter contradictory but from like water and oil. Nevertheless, it is possible most to keep such people through a common, overarching goal together as a water / oil mixture by addition of a surfactant may be in a stable emulsion. Here is an example: The natural enemies students and teachers come but generally quite good and probably the only reason why one another, because there is the school.

From the talk about the chemistry and the chemistry in the end two verbatim quotes:

Edward: It was even a more significant

Aus dem Gespräch über die Chemiker und die Chemie zum Schluss zwei wörtliche Zitate:

> Eduard: Es war sogar ein bezeichnender Ehrentitel der Chemiker, dass man sie Scheidekünstler nannte.
>
> Charlotte erwidert darauf: Das Vereinigen ist eine größere Kunst, ein größeres Verdienst.

Für den Chemiker sind Trennen, z.B. bei der Rohstoff-Gewinnung, in der Analytik und von Haupt- und Nebenprodukten, und Synthetisieren, z.B. von Kunststoffen oder Arzneimitteln, keine Gegensätze, sondern Kehrseiten einer Medaille, genauso wie sich ein chemisches Gleichgewicht aus der Dynamik von Hin- und Rückreaktion ergibt.

Experimente

1. In ein großes Reagenzglas werden 15 ml 5%ige Salzsäure und ein Marmorstückchen gegeben, das sich unter Gas-Entwicklung in einigen Minuten vollständig auflöst.

2. In ein großes Reagenzglas werden 15 ml 5%ige Schwefelsäure und ein Marmorstückchen gegeben. Die anfängliche Kohlenstoffdioxid-Entwicklung hört rasch auf, weil sich der Stein an seiner Oberfläche mit einer Säure-undurchlässigen Calciumsulfat-Schicht überzieht. Wenn man ihn aus der Säure nimmt, die Schutzschicht (mit Schmiergelpapier) abreibt und den Stein dann in die Säure zurückgibt, kommt es kurzzeitig wieder zur Gasentwicklung, bis eine erneute Passivierung eingetreten ist.

3. In einem großen Reagenzglas werden ca. 500 mg pulverförmiges Calciumcarbonat vorgelegt und portionsweise mit 15 ml 5%iger Salzsäure versetzt. Unter heftiger Kohlenstoffdioxid-Entwicklung entsteht eine Calciumchlorid-Lösung.

4. In einem großen Reagenzglas werden ca. 500 mg pulverförmiges Calciumcarbonat vorgelegt und mit 15 ml 5%iger Schwefelsäure versetzt. Unter Kohlenstoffdioxid-Entwicklung (nicht ganz so heftig wie bei der Einwirkung von Salzsäure auf das Pulver) entsteht eine Calciumsulfat-Suspension. Der Feststoff wird abzentrifugiert, dreimal mit Wasser gewaschen (Trennung vom Waschwasser ebenfalls durch Zentrifugation) und für die Versuche 5 und 6 auf zwei Reagenzgläser verteilt.

> honorary title of chemists that they were called vagina artist.
>
> Charlotte replies that: The Unite is a greater art, a greater merit.

For the chemist separating, for example, in raw materials extraction, in the analytics and of primary and secondary products, and synthesizing, for example, plastics or pharmaceuticals, are not opposites, but downside of the coin, just as there is a chemical equilibrium of the dynamics of forward and reverse reactions.

Experiments

1. In a large test tube 15 ml are added 5% hydrochloric acid and a marble chips that completely dissolves under gas development in a few minutes.

2. In a large test tube 15 ml will be given 5% sulfuric acid and a marble chips. The initial carbon dioxide evolution ceases rapidly, because covering the stone at its surface with an acid-impervious calcium sulfate layer. If you take him out of the acid, the protective layer abrades (with sandpaper) and the stone then returns in the acid, it will briefly return to the evolution of gas, until a new passivation has occurred.

3. In a large test tube about 500 mg of powdered calcium carbonate hydrochloric acid are introduced and mixed in portions with 15 ml of 5% was added. With vigorous carbon dioxide evolution produces a calcium chloride solution.

4. In a large test tube sulfuric acid 500 mg of powdered calcium carbonate are presented with 15 ml of 5% was added. Under carbon dioxide development (not quite as vigorously as in the action of hydrochloric acid on the powder) produces a calcium sulphate suspension. The solid is centrifuged, distributed three times washed with water (separation from the wash water also by centrifugation) and for the tests 5 and 6 on two test tubes.

5. The one serving of calcium sulfate slurry from Experiment 4 is mixed with about 5 ml of 5% hydrochloric acid, which, as expected, nothing happens. (By adding 3 ml of water and boil, however a clear solution can be obtained for comparison. Approximately 100 mg of calcium sulfate dihydrate can with 3 ml of 5% hydrochloric acid and 3 ml of water are dissolved during cooking In addition, calcium sulfate can be recrystallized

5. Die eine Portion des Calciumsulfat-Schlammes aus Versuch 4 wird mit ca. 5 ml 5%iger Salzsäure versetzt, wobei erwartungsgemäß nichts passiert. (Durch Zugabe von 3 ml Wasser und Aufkochen kann jedoch eine klare Lösung erhalten werden. Zum Vergleich: Etwa 100 mg Calciumsulfat-Dihydrat können mit 3 ml 5%iger Salzsäure und 3 ml Wasser beim Kochen gelöst werden. Außerdem lässt sich Calciumsulfat aus Wasser umkristallisieren. Um dies zu studieren, werden etwa 100 mg Calciuimsulfat-Dihydrat in 6 ml Wasser gekocht, die heiß-gesättigte Lösung wird filtriert, im Filtrat fallen beim Abkühlen (ggf. im Kühlschrank über Nacht) feine Nadeln aus.)

6. Die andere Portion des Calciumsulfat-Schlammes aus Versuch 4 wird mit 15 ml 5%iger Natriumcarbonat-Lösung zum Sieden erhitzt. Nach dem Abkühlen wird das entstandene Calciumcarbonat abzentrifugiert und dreimal mit Wasser gewaschen. (Im ersten und zweiten Waschwasser können nach Ansäuern mit Salzsäure und Zugabe von 3 Tropfen 3%iger Bariumchlorid-Lösung noch Sulfationen nachgewiesen werden, im dritten in der Regel nicht mehr.) Das recycelte Calciumcarbonat wird auf zwei Reagensgläser verteilt und tropfenweise mit 3 ml 5%iger Salzsäure bzw. 5 ml 5%iger Schwefelsäure behandelt (vgl. Versuche 3 und 4).

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from water. . In order to study this, about 100 mg Calciuimsulfat dihydrate in 6 ml of water are cooked, the hot-saturated solution is filtered, the filtrate drop during cooling (if necessary in the refrigerator overnight) fine needles.)

6. The other portion of the calcium sulfate slurry from Test 4 is heated to boiling with 15 ml of 5% sodium carbonate solution. After cooling, the resulting calcium carbonate is removed by centrifugation and washed three times with water. (In the first and second wash water strength barium chloride solution still sulfate ions by acidification with hydrochloric acid and addition of 3 drops of 3% are detected, the third is usually not more.) The recycled calcium carbonate is distributed in two test tubes and treated dropwise with 3 ml 5 % hydrochloric acid and 5 ml of 5% sulfuric acid (see FIG. Experiments 3 and 4).

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(add discussion)

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θΔics

In science, the **chemistry of love** is a popularized term that refers to any of various overview attempts or outlines to explain love in terms of the science of chemistry.

> "You can't force chemistry to exist where it doesn't in the same way you can't deny it when it does."
>
> — Anon (c.2014), Pinterest quote (Q) from Xushandwiz.com

Left: a 2010 depiction of the **chemistry of love**: two heart-shaped climber's hooks attached to together, signify a human chemical bond, by Indian blogger Prashant Mishra, who describes love as an action of beauty upon the heart, being an exothermic reaction ($\Delta H < 0$), resulting in faster heart beat, wherein two complex compounds (boy and girl) unite, through the help of certain catalysts (friends, cousins, movies, restaurants), reducing agents (parents, neighbors, teachers, and society). [4] Right: a 2011 DeviantArt.com poster depiction of the **"chemistry of love"** alluding to some hypothetical chemistry student meandering thoughts on the nature of love in terms of protons and electrons, chemical bonding or nuclear bonding, changes in atomic mass, or something along these lines. [6]

Kinetic factors | Thermodynamic factors

The following infelice.tumblr.com image on Pinterest (Q) highlights the so-called "kinetic factor" as compared to the "thermodynamic factor" involved in reactions between people:

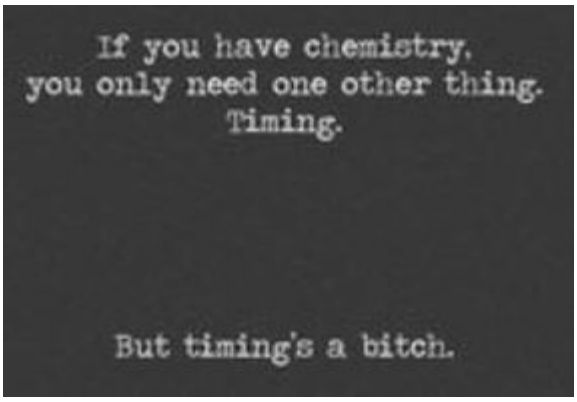

In other words, per collision theory arguments, two people may be thermodynamically feasible to bond, but the alignment of their reaction trajectories may be off or misaligned in time.

History

The earliest ideas on the chemistry of love can be found in early Egyptian poems, alluding to ideas on chemical bonding. One circa 1000BC poem speaks, for instance, of how "the nets of your love have trapped me". [1]

Into the Middle Ages, the Greco-Roman story of Cupid and Psyche evolved into the myth of Cupid carrying two sets of arrows: one set gold-headed, which inspire love; and the other lead-headed, which inspire hatred. In modern chemical terms, gold acts as secondary field particle as nuptial gift to inspire love, whereas lead is a poison.

Into the latter half of the second millennium, the theory of love potions was invented, supposing that a drink of a certain mixture could a suitor fall in love.

In 1809, German polymath Johann Goethe was the first to use a standard physical chemistry textbook to formulate a standard theory of love, based on the logic affinity chemistry and affinity reactions.

in 1922, the "chemical reaction theory of love", the view that “love is in its ultimate analysis nothing but a chemical reaction”, was established in the minds of typical scientists. [2]

Neurochemistry

With the rise of the field of neuroscience and the initiation of neurochemistry, the study of the chemicals of the brain, new chemical based theories of love began to crop up. A few of these are listed below in chronological order:

- Pheromone theory of love (1959)
- Endorphin theory of love (1976)
- Chocolate theory of love (1980)
- Oxytocin theory of love (1992)

New models are starting to focus on other neurochemicals such as serotonin or dopamine, etc., as well as neuroimaging, e.g. fMRI images of couples in love vs. people not in love.

Standard model

The standard model of the chemistry of love, as of 2007, holds that (a) a human is a molecule (a human molecule), and (b) that “love” or rather two people falling in love into a relationship is a chemical reaction, pure and simple, and (c) human reactions, such as love the chemical reactions, are governed by the Lewis inequality, as are all earth-bound reactions. [3]

Left: *Time* magazine's famous 1993 cover story article **"The Chemistry of Love"**, arguing that love is a function of (a) imprinting, bonding characteristics familiar from youth, (b) attraction, governed by phenylethylamine (PEA), dopamine, and norepinephrine, types of amphetamines, and (c) attachment (John Bowlby's theory), a function of endorphin (endorphin theory of love), the runner's high, and oxytocin (oxytocin theory of bonding), the cuddle chemical. Center: an artistic rendition of the so-called "love addict", modeled on the idea that people need to get their love fix from other people the way a junkie gets his or fix from his or her dope dealer. Right: a chemistry of love art T-Shirt design by Wenceslao Almazan. [7]

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θΔics

In hmolscience, **chemistry poetry** or "poetry chemistry" refers to chemical poems or poetry that employs chemical language and or chemical concepts, either to explain aspects of human nature and or to facilitate the learning of chemical concept via rhyme.

A "roses are red" stylized chemical equilibrium themed **chemistry poem** by Remi Jones. (Ñº)

Chemistry poets

Notable chemistry poets, who intermix chemical language, via poetry, to elucidate human nature, on one way or another, include: Friedrich Schlegel, Mario Markus, Roald Hoffmann, and Mala Radhakrishnan, and . [1]

Quotes

The following are related quotes:

> "What inspired me to write poems? After I had more or less completed my scientific career, I realized that there was one domain about which physics didn't give me answers, namely human nature. So I prepared myself for a journey within my old search for all corners of the universe. This included painting with the computer and writing a novel and poems. I write for people who think chemistry is cold and far from the humanities, for the literati, who reuse over and over the metaphors related to love, death, landscapes, and religion. Science renders an enormous amount of new metaphors for literati to enjoy."
>
> — Mario Markus (2013), poetry and chemistry interview [2]

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θΔics

In paradoxes, **chemistry professor paradox** (Pirsig, 1991; C.W. Adams, 2006), or "physics professor paradox" (Pearson, 1892), refers to the misalignments between the way a chemist, physicist, or physical chemist views the world and the origin of humans from the elements via natural selection and the way a biologist (i.e. Darwin) views the world and the origin of humans, and more importantly who's theory should yield on points of theoretical inconsistences, e.g. whether or not atoms "struggle to survive", and the absurdities erupting therefrom.

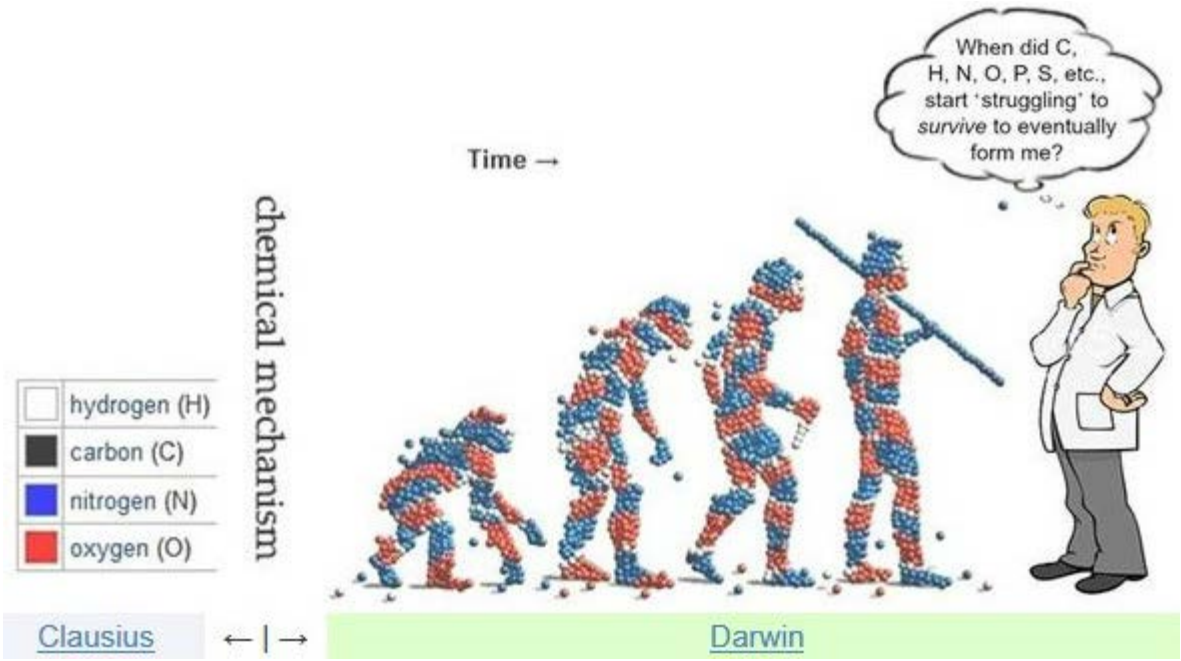

American philosopher Robert Pirsig, in his 1991 *Lila: Inquiry into Morals*, introduced the so-called **chemistry professor paradox**, namely he very-intelligently pits Clausius (entropy increase) against Darwin (struggle to survive), in the mind of a hypothetical physical chemistry professor, in a way that show obvious ridicule or rather absurdity in the logic of the latter at the chemical thermodynamic and or physiochemical level.

Pearson

In 1892, German physicist Karl Pearson, in his chapter subsection "Natural Selection in the Inorganic World", of his *The Grammar of Science*, the first book on Einstein's famous "Olympia Academy" reading list, asked the following discerning question: [9]

> "There is a problem, however, with regard to natural selection which deserves special attention from both physicist and biologist, namely: Within what limits is the Darwinian formula a valid description? Assuming the spontaneous generation of life as a plausible, if yet unproven, hypothesis, where are we to consider that selection as a result of the struggle for existence began? Again, for what, if any, forms of life are we to consider it as ceasing to be an essential factor in descriptive history? We may not be able to answer these questions definitely, but some few words at least must be said with regard to their purport. In the first place we notice that as soon as we conceive a perfectly gradual and continuous change from inorganic to organic substance, then we must either call upon the physicist to admit that natural selection applies to inorganic substances, or else we must seek from the biologist a description of how it came to be a factor in organic evolution."

(add discussion)

Perrin

In 1903, French physical chemist Jean Perrin, in his "The Principle of Evolution" chapter of his *Treatise on Physical Chemistry*, discussed the inconsistencies the notion of evolution, in the context of the second law, heat death theory, and so-called "life" originated or rather being synthesized from "dead" atoms (in the context of Carnot's principle), one of his comments being: [11]

> "Molecules and atoms are lifeless beings that never evolve."

(add discussion)

Lewis

In 1925, American physical chemist Gilbert Lewis, in his *Anatomy of Science* lecture (§7: Non-Mathematical Sciences), gave the perfect example of the puzzled professor, on the evolution question, when he attempted to dig into the tricky question of evolution of the "animate things" or living things (terms which he rotates usage of) from atoms and molecules in the context of physical science, at the end of which he concludes that he is confused about whether crystals "think" or conversely whether him writing his lecture book was "but" a chemical reaction, and that both alternatives are absurd:

> "Suppose that this hypothetical experiment could be realized, which seems not unlikely, and suppose we could discover a whole chain of phenomena [evolution timeline], leading by imperceptible gradations form the simplest chemical molecule to the most highly developed organism [**chemistry professor** or human molecule]. Would we then say that my preparation of this volume [*Anatomy of Science*] is only a chemical reaction [extrapolate up], or, conversely that a crystal is thinking [extrapolate down] about the concepts of science? Nothing could be more absurd, and I once more express the hope that in attacking the infallibility of categories I have not seemed to intimate that they are the less to be respected because they are not absolute. The interaction between two bodies is treated by methods of mechanics; the interaction of a billion such bodies must be treated by the statistical methods of thermodynamics."

Others who might fall into the classification of the "puzzled professor" category, might include: American physical chemistry Lawrence Henderson, though, to note, he was more concerned with economics and sociology, and possibly Austrian-born American physical Alfred Lotka, among a few others in the social Newton-related category.

Pirsig | Neglected Absurdity

In 1991, American philosopher Robert Pirsig, in his *Lila: an Inquiry into Morals*, introduces his dialogue on the chemistry professor paradox, firstly, with a greasing of the mind of the reader with the seemingly incompatibility between seeming indeterminacy at the quantum mechanical level of photons and electrons and the deterministic cause and effect level of evolution and the social sciences:

> "Life's just an extension of atoms, nothing more, it has to be that because atoms and varying forms of energy are all there is … At the time of [the] origin [of evolution theory] it wasn't yet understood that at the level of photons and electrons and other small particles the laws of cause and effect no longer apply; that electrons and photons simply appear and disappear without individual predictability and without cause. So today we have as a result a theory of evolution in which 'man' is ruthlessly controlled by the cause-and-effect laws of the universe while the particles of his body are not. The absurdity of this seems neglected. The problem doesn't lie in anyone's department. Physicists can ignore it because they are not concerned with man. Social scientists can ignore it because they are not concerned with subatomic particles."

Pirsig then asserts, as a matter-of-fact, that "although modern physics has pulled the rug out from under the deterministic explanation of evolution many decades ago", which isn't true, as Steven Weinberg (see: Scrooge Tiny Tim dialogue) as demonstrated, then says:

> "But right from the beginning, substance-caused evolution has always had a puzzling aspect that has never been able to eliminate. It goes into many volumes about how the fittest survive but never once answers the question of why."

Pirsig the jumps into the following ripe commentary about the strikingly salient incompatibility issues with Darwin's theory of evolution, as physical chemistry conflictingly sees things, namely that humans are chemicals and chemical don't struggle to survive, as Darwin's theory would have it: [1]

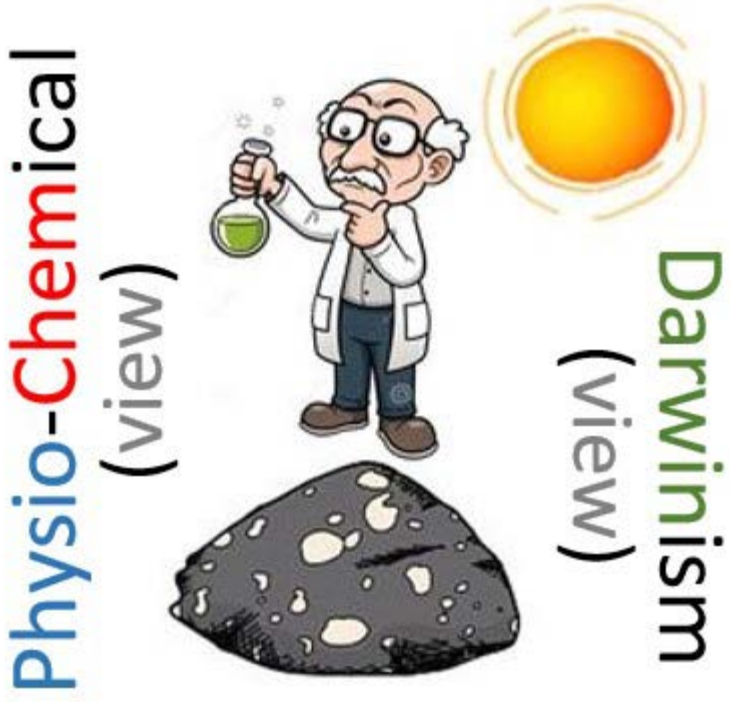

Pirsig asks: "if we leave a chemistry professor out on a rock in the sun long enough the forces of nature should convert him, according to the second law, into simple compounds." The question he asks is: why does nature reverse this process? The sun's energy and evolution theory, supposedly, according to Pirsig, don't seem to be answer. This, in short, is the gist of the **chemistry professor paradox**.

> "This is the sort of irrelevant-sounding question that seems minor at first, and the mind looks for a quick answer to dismiss it. It sounds like one of those hostile, ignorant questions some fundamentalist preacher might think up. But why do the fittest survive? Why does any life survive? It's illogical. It's self-contradictory that life should survive. If life is strictly a result of the physical and chemical forces of nature then why is life opposed to these same forces in its struggle to survive? Either life is with physical nature [natural] or it's against it. If it's with nature there's nothing to survive. If it's against physical nature [unnatural] then there must be something apart from the physical and chemical forces of nature that is motivating it to be against physical nature. The second law of thermodynamics states that all energy systems 'run down' like a clock and never rewind themselves. But life not only 'runs up,' converting low energy sea-water, sunlight and air into high-energy chemicals, it keeps multiplying itself into more and better clocks that keep "running up" faster and faster.
>
> Why, for example, should a group of simple, stable compounds of carbon (C), hydrogen (H), oxygen (O), and nitrogen (N), 'struggle' for billions of years to organize themselves into a professor of chemistry? What's the motive?
>
> If we leave a chemistry professor out on a rock in the sun long enough the forces of nature will convert him into simple compounds of carbon, oxygen, hydrogen and nitrogen, calcium, phosphorus, and small amounts of other minerals. It's a one-way reaction. No matter what kind of chemistry professor we use and no matter what process we use we can't turn these compounds back into a chemistry professor. Chemistry professors are unstable mixtures of predominantly unstable compounds which, in the exclusive presence of the sun's heat, decay irreversibly into simpler organic and inorganic compounds. That's a scientific fact.
>
> The question is: Then why does nature reverse this process? What on earth causes the inorganic compounds to go the other way? It isn't sun's energy. We just saw what the sun's energy did. It has to something else. What is it?"

One correction with the ending of this question positing is Pirsig's "what on earth causes inorganic compounds to go the other way?", in that herein he seems to be conceptualizing a "inorganic" compound to human (organic) compound ideology, in the sense of "organic = life" and "inorganic = non-life" dichotomy, which is an incorrect view ; which is similar to Vladimir Vernadsky's incorrect two-part grouping of the elements in respect to his green fire biosphere conceptualization.

Pirsig then boasts loudly, via his character Phaedrus, that modern science has been put carpet sweeping this large problem away:

> "Nowhere on the pages of all that he had read about evolution did Phaedrus see any answer. He knew the theological answers, of course, but these aren't supported by scientific observation. Evolutionists, in their reply, simply say that in the scientific observation of the facts of the universe no goal or pattern has ever appeared toward which life is heading. This last statement so neatly sweeps the whole matter under the carpet one would never guess that it was much concern to evolutionists at all."

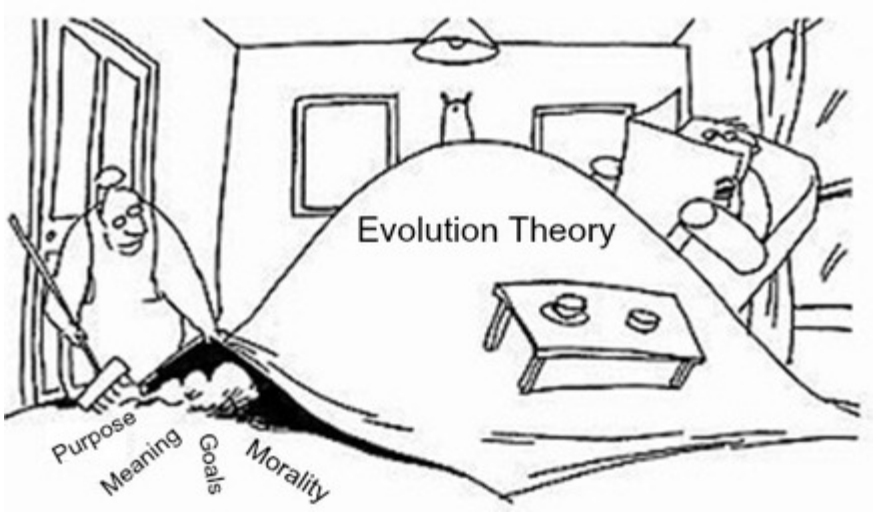

Pirsig, following his **chemistry professor paradox**, points out that, in the context of debates between theologians vs evolutionists, in respect to questions of goals or patterns towards which human existence is headed, the latter have been carpet sweeping the issue, with recourse to terms such as: 'blind', 'random', 'chance', 'accident', amid a goalless and patternless universe.

Pirsig follows his chemistry professor paradox discourse with discussion of Ernst Mayr's circa 1985 summaries of the various patch teleological drive theories, attempting to reconcile religion and evolution, i.e. meaning, goals, and purpose amid modern scientific discourse. Pirsig surmises that, via personal note to himself, via his character, that:

> "It seems clear that no mechanistic pattern exists—except chaos—toward which life is heading, but has the question been taken up of whether life is heading away from mechanistic patterns? What the substance-centered evolutionists were showing with their absence of final 'mechanisms' or 'programs' was not an air-tight case for the biological goallessness of life.

(add discussion)

Brey

In 2002, John Brey, in his *Tautological Oxymorons: Deconstructing Scientific Materialism*, stated the following: [10]

> "Our bodies represent a particular state of entropy. I our bodies were destroyed, the energy would now be in a new state of entropy. The point is that our physical body represents energy in a particular entropic state. While the heart is beating, the body guards its low entropy state, and when the heart stops beating, the entropy of the body rapidly increases as the energy (within the body) tries to find equilibrium with the environment outside the body. When we speak of 'survival', we are speaking of the desire to protect a low state of entropy (whether we're speaking of the universe itself, or a human body). But if 'survival' has positive meaning, then it would appear that low states of entropy are more desirable than high states of entropy, since all that is truly 'survived' is rising entropy.
>
> Why should low states of entropy be 'good', so that we guard low states of entropy with our life? And if low states of entropy are preferable to high states of entropy, wasn't the universe at its best, at or before the big bang, and won't it be at its worst at the heat death where entropy is in an absolutely 'high' state. Therefore, isn't the universe going from 'good' to 'bad'—from a low state of entropy, to a high state of entropy. Now if survival is good, then the universe is bad, for the universe will not *survive* the second law of thermodynamics, which states that the universe will eventually find itself in a state that is the antithesis of 'survival' (where survival is the retention of low entropy). If the universe is bad, the so is the human body, since inevitably the human body will not survive the second law of thermodynamics."

(add discussion)

Adams | Chemical desire & survival?

In 2006, philosopher C.W. Adams, in his essay segments "How Could Chemicals Have a Desire to Survive" and "Chemicals Cannot Decide to Extend Their Successor' Lives", stated a near-equivalent version of Pirsig's paradox, albeit without the second law additions, as follows: [3]

> "As the accidental evolutionist theory has been expanding over the last 100 years, it has been merged with 'big bang' and 'primordial soup' theories. Combined these ancillary theories, the accidental evolution theory now states that following the big bang, life spontaneously arose from chemicals. What is curious is that these chemicals somehow supposedly developed the desire to survive. Have we ever observed any lifeless chemicals develop a desire to survive? Have we ever seen chemicals doing anything but predictably reacting to each other?
>
> In other words, the accidental evolution theory says that out of lifeless chemicals single-celled living creatures have arisen, miraculously displaying a desire to survive. A desire to survive means having a need to improve survival factors and eliminate threats to survival. The need to improve survival means there is an intention to survive, and a value is put onto survival. Eliminating the threats to survival means survival is valued enough to put an effort into changing, adapting to, or destroying potential encroachments and dangers that could shorten life. These factors compound the problem presented: how could lifeless chemicals develop the ability to even *recognize* life, let alone value life enough to take persistent action to sustain it."

> "Accidental evolution would require not only living chemicals somehow distinguishing themselves from dead chemicals, but also chemicals desiring to lengthen the lives of their descendent chemical combinations. What mechanism gave such living chemicals the impetus to increase the chances of their descendants' survival? The implication of this is that not only will a batch of chemicals struggle to survive and avoid death, but that they will also adapt in ways that won't necessarily help them survive any better, but will help their descendants. What gave these chemicals the ability to calculate structural changes to improve the chances of survival for future species?
>
> Accidental evolutionists seem to insist that through a desire to survive and adapt to environmental challenges, and passed on such a developed mechanism to offspring. While it may seem speculatively reasonable to consider this, there is still a gaping hole: where did such a mechanism—of adapting and passing genetic improvements to future generations—arise from? What incentive do lifeless chemicals have to code this ability into the genetic structure?
>
> The only answer accidental evolutionists seem to give us to these questions is that this all must have been a random accident. It should not have happened, but accidentally did, they claim. This is seemingly the accidental evolutionists' only answer to all the real puzzles of existence: *it was an accident that should not have happened*.
>
> The assumption that accidental evolutionists seem to make is that each event, from the initial combination of chemicals to each genetic variation, took millions if not billions of years to occur. With this much time at their disposal, all sorts of accidental variations could supposedly happen. They claim that from all the variations that did take place, the ones which extended or improved life were retained because those variations survived. The other accidental variations didn't work, so those species must have died off. The other variations felt to the wayside as the weaker creatures got killed off. This part of the theory is called 'survival of the fittest'. Improved variations were supposedly selected through 'natural selection'."

(add discussion)

Quotes

The following are related quotes:

> "Prebiological natural selection is a contradiction in terms."
>
> — Theodosius Dobzhansky (1963), discussion with Gerhard Schramm on terminology [6]

> "A hydrogen molecule [H_2] is the thing which reacts. *Homo sapiens* [Hu] and other particular species are the things which evolve. Such individuals differ from classes by having particular origins in time and space. They may disappear or change into other things."
>
> — Daniel Brooks (1988), "metaphysics of individuality"; co-authored with Edward Wiley [8]

> "Could biochemistry be Darwin's Achilles heel? Pick up any biochemistry textbook, and you will find perhaps two or three references to evolution. Turn to one of these and lucky to find anything better than 'evolution selects the fittest molecules for their biological function'."
>
> — Andrew Pomiankowski (1996), "The God of the Tiny Gaps" [5]

> "Why should a bunch of atoms have thinking ability? Why should I, even as I write now, be able to reflect on what I am doing and why should you, even as you read now, be able to ponder my points, agreeing or disagreeing, with pleasure or pain, deciding to refute me or deciding that I am just not worth the effort? No one, certainly not the Darwinian as such, seems to have any answer to this. The point is that there is no scientific answer."
>
> — Michael Ruse (2000), *Can a Darwinian Be a Christian?* [7]

> "We should reject, as a matter of principle, the substitution of intelligent design for the dialogue of chance and necessity; but we must concede that there are presently no detailed Darwinian accounts of the evolution of any bio-chemical systems, only a variety of wishful speculations."
>
> — Harold Franklin (2001), *The Way of the Cell* [4]

See also

â— Accident | Chemical accident (e.g. Power Puff Girls)

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85; §:Chemicals Cannot Decide to Extend Their Successor's Lives", pgs. 86-87). Publisher.
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θΔics

In social models, **chemistry set model**, “reaction set model” or “molecular reaction set model”, refers to the use of a basic chemist set to explain and model human social interactions, reactions, and bond formations and changes.

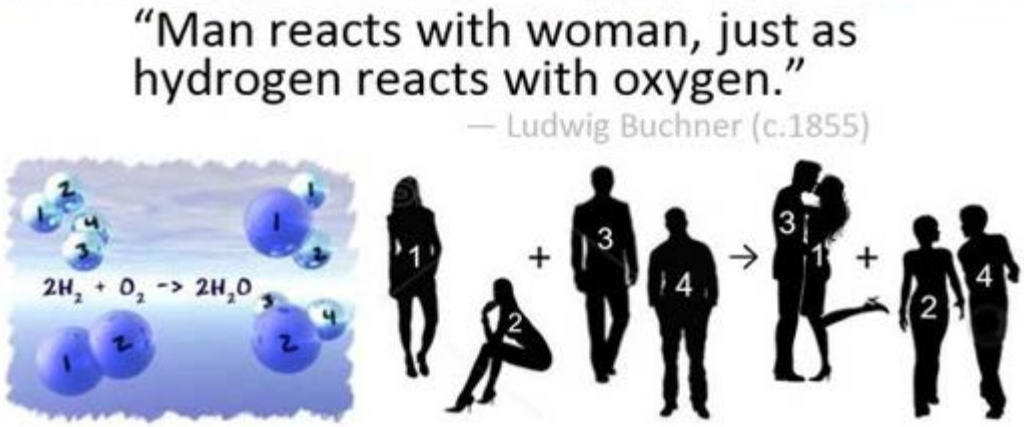

A 1940s Gilbert chemistry set (O) showing chemical such as: ammonium chloride (#2), ferric ammonium sulphate (#22), sodium bicarbonate (#42), tartaric acid (#55), etc., that kids could experiment with to understand the nature and operation of chemical reactions, similar to the one that Goethe used in 1809 to explain (see: video), via the logic of the **chemistry set model**, to his friends the nature of human social reactions and happenings.

Overview

In 1796 to 1809, German polyintellect Johann Goethe pioneered the logic that humans could be modeled or conceived as large evolved or metamorphosized chemicals and that their interactions, bondings, debondings, reactions, moralities, etc., can be explained by the physical chemistry “symbols” of Swedish chemist Torbern Bergman’s 1775 *A Dissertation on Elective Attractions*, specifically his reaction signs and symbols, affinity table, and reaction diagrams. This, historically, has been referred to as Goethe's human chemical theory or the "social retort" model, among other variants; the gist of which is captured in Goethe's affinity table.

In 1993, French sociophysicist Paris Arnopoulos outlined the gist of the transition from the billiard ball model, which is similar to the "cannon ball model" (or social cannon ball model), to the "chemistry set model", as he calls it, wherein chemical thermodynamics come into play, as follows: [3]

> “When we move from the [socio-] mechanical to the [socio-] thermal phenomena of energy, we rise from the atomic ‘billiard ball’ interaction to the **molecular ‘chemistry set’ reactions**. Unlike the former, the latter do not consider relations simply on the basis of mass, distance, and velocity, but rather temperature, pressure, and volume. The importance of a particular position is therefore, replaced by that of a substantive composition. The physical motion of bodies is replaced by the chemical reactions of compounds [sociomasses].”

(add discussion)

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θΔics

In science, **chemotropism**, from the Egyptian *chem-*, meaning "chemical" + "*-tropism*", from the Greek *trepein* "to turn", coined by Wilhelm Pfeffer (c.1893), in German (Chemotropismus), refers to the induced turning of a thing via chemical mediator, e.g. the male fern cells attracted to malic acid, or male moths to female moth pheromones.

Haeckel

In 1894, Ernst Haeckel, in his "The Phylogeny of the Plant Soul", differentiated the various tropisms as follows: [1]

> "All metaphyta are more or less sensitive to the influence of light (heliotropism), heat (thermotropism), gravity (geotropism), electricity (galvanotropism), and various chemical excitations (chemotropism). The quality and quantity of the sensation due to the irritation, as of the motor or trophic reaction produced by it, varies, however, exceedingly in the different groups of plants and frequently even in closely allied species of one genus or family. It is very small or hardly perceptible in many lower "sense-blunted" plants and especially in parasites."

Herein, Haeckel, of note, attempts to anthropomorphize cells, e.g. speaking of "erotic chemotropism" and "social chemotropism", when referring to cellular reproduction.

In 1893 to 1903, Haeckel, in his love letters, mentions the concept of elective affinity at least three times in respect to his own romantic relationships. In one letter to a Franziska von Altenhausen, Haeckel defines elective affinity as a strange psychological chemotropism: [2]

> "… seductive women—why should I, despite all scruples and obstacles, cast myself into the dust before you? Dearst Franziska, herein lies the enigma of 'elective affinity', of that strange **psychological 'chemotropism'**, of whose power I have spoken repeatedly in my books—little dreaming that I myself should fall a victim to it in my old age!"

(add)

Weininger

In 1903, Otto Weininger, in his *Sex and Character*, after citing (Ñº) Haeckel's work on "gonochorism", as a the subject of separation or classification of the sexes, refers, firstly, to the c.1870s chemotropism experiments of Wilhelm Pfeffer as follows: [3]

> "The experiments of Wilhelm Pfeffer have shown that the male cells of many cryptogams are naturally attracted not merely by the female cells, but also by substances which they have come in contact with under natural conditions, or which have been introduced to them experimentally, in the latter case the substances being sometimes of a kind with which they could not possibly have come in contact, except under the conditions of experiment. Thus the male cells of ferns are attracted not only by the malic acid secreted naturally by the archegonia, but by synthetically prepared malic acid, whilst the male cells of mosses are attracted either by the natural acid of the female cells or by acid prepared from cane sugar. A male cell, which, we know not how, is influenced by the degree of concentration of a solution, moves towards the most concentrated part of the fluid. Pfeffer named such movements "chemotactic " and coined the word "chemotropism" to include these and many other asexual cases of motion stimulated by chemical bodies. There is much to support the view that the attraction exercised by females on males which perceive them at a distance by sense organs is to be regarded as analogous in certain respects with chemotropism."
>
> — Otto Weininger (1903), *Sex and Character* (pg. 39)

> “It is plain that too much stress must not be laid on the analogy between sexual affinity and purely chemical processes. None the less, I thought it illuminating to make the comparison. It is not yet quite clear if the sexual attraction is to be ranked with the "tropisms," and the matter cannot be settled without going beyond mere sexuality to discuss the general problem of erotics. The phenomena of love require a different treatment, and I shall return to them in the second part of this book. None the less, there are analogies that cannot be denied when **human attractions and chemotropism** are compared. I may refer as an instance to the relation between Edward and Ottilie in Goethe's *Elective Affinities* (*Wahlverwandtschaften*).”
>
> — Otto Weininger (1903), *Sex and Character* (pgs. 42-43)

(add)

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Further reading

â— Bunning, Erwin. (1989). *Ahead of His Time, William Pfeffer: Early Advances in Plant Biology* (chemotropism, pg. 43). MQUP.

External links

â— Chemotropism – Wikipedia.

θΔics

In Egyptian mythology, **chest of Osiris** is a wooden box, symbolic of the "emblem of the hemisphere of winter" (Volney, 1791), in which the god Osiris is trapped in, by his brother Set, prior to being cut into 14 pieces (see: crucifixion). []

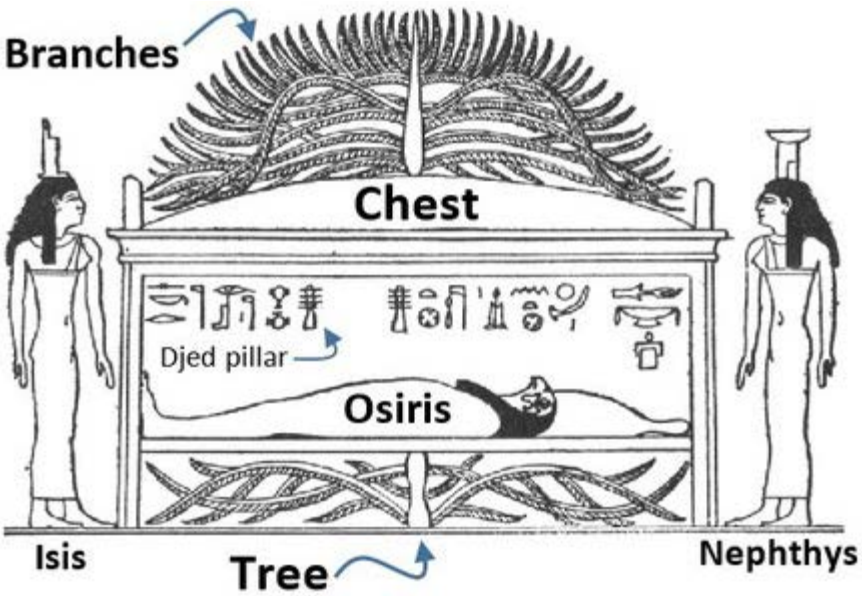

A depiction of the "**chest of Osiris**", carved on the walls of the Dendera Temple, made in 100BC to 37AD, about which an evergreen tree (tamerisk tree) (see: Christmas tree) grows, showing the dead Osiris within, to the sides of which stand two marries: Isis and Nephthys.

72 Conspirators

In the Osiris myth (Passion of Osiris or Legend of Osiris), during his so-called "last supper", Set tricks Osiris into getting into a "chest" (of coffin-like box), secretly built just to fit his body, after which Set along with "72 conspirator" pounce on the chest, seal the lid, and throw the chest into the Nile River:

The number 72, of note, is symbolic of the precession of the equinox, namely there is a one degree shift in axis of the equinox ever 72 years; this is summarized as follows:

> "The number seventy-two is significant in terms of astronomy since the sky bodies appear to move through one degree of their cycle over a period of seventy-two years. It was no coincidence that the original number of days in an Ancient Egyptian year was identical to the number of degrees in a circle; i.e. 360. The Thoth legend encodes the knowledge of precession by the specific reference to the numbers 360 and 72. When the number 72 is multiplied by the extra 5 days in the year gained by Thoth in the game of draughts with the moon, the result is 360, the number of degrees in a circle. Finally, when the seventy-two years are multiplied by the three hundred and sixty degrees of the complete cycle, we discover that it takes is 25,920 years for each heavenly cycle to be completed … at which time the process starts all over again. This cycle is referred to as precession."

— Audre Fletcher (1999), “Osiris Legend and Precession” [1]

Here, of note, one should not get the number 72 confused with 70, the number of days (Ñº) during which Sirius disappeared from the night sky before its heliacal rising, which marks the start of the annual 150-day Nile River flood (see: Noah's flood), was also the period of time between mummification and entombment, when through the ceremony of the opening of the mouth, the dead person was believed to reawake to eternal life in the underworld.

In the Bible, these numbers (70, 72) are found (Luke 10:1) as the number of disciples of Jesus, depending on edition: 70 (KJV) (Ñº) or 72 (NIV) (Ñº), as pointed out by Dorothy Murdock (2008). [2]

Sun | In Scorpion

The date at which Set was said to have trapped Osiris in his chest, according to Plutarch, occurred when the sun appeared to pass thought the Scorpion constellation of the Zodiac:

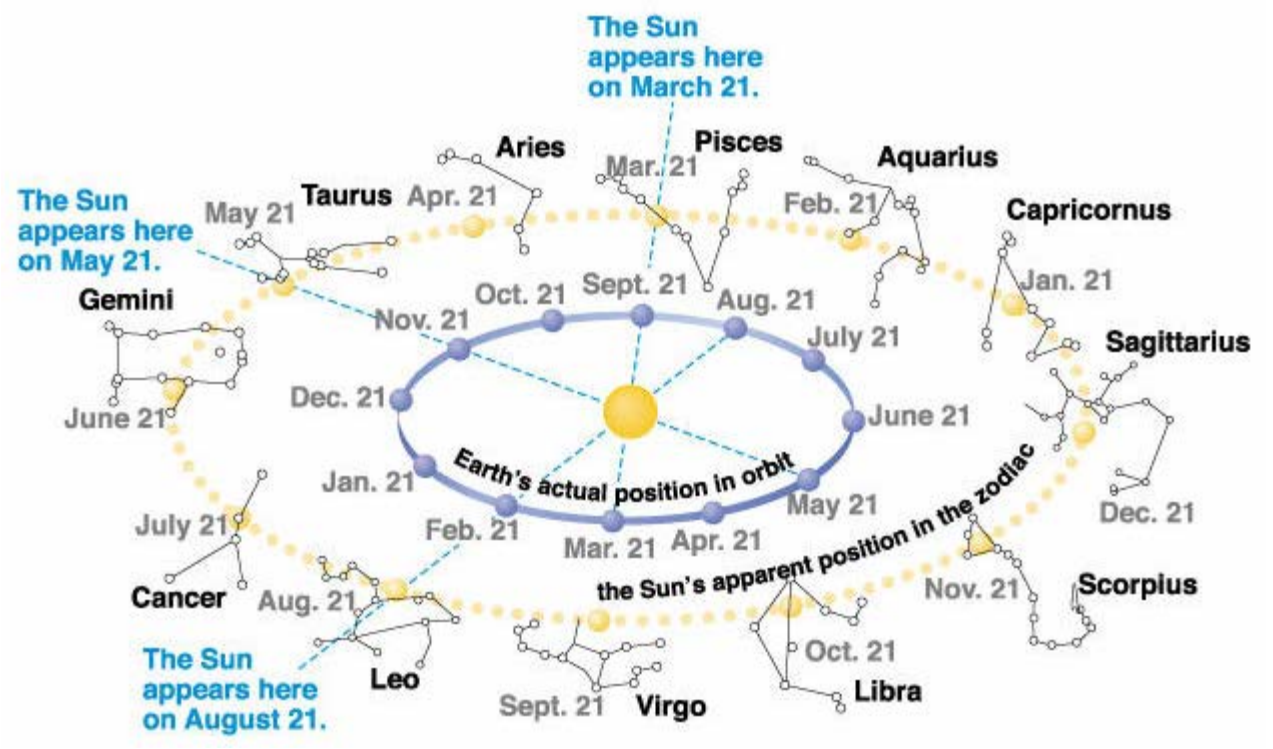

A depiction of the Zodiac (Ñº) or 12 animal-shaped star constellations “apparent” to humans, each month, as the earth completes its annual rotation around the sun; the period of the "sun passing through Scorpius", in Nov, is said to have been, in Egyptian calendar terms, when Set trapped **Osiris in his chest** and also, supposedly, when Horus is bitten by the scorpion (see: Joshua 10:13)

> “They say that the date on which this deed – Set trapping **Osiris in chest** and throwing it into the Nile – was done was the seventeenth day of Athyr [Nov 13] when the **sun passes through the Scorpion**, and in the twenty-eighth [lunar month] year of the reign of Osiris; but some say that these are the years of his life and not his reign.”
>
> — Plutarch (100AD), *On Isis and Osiris* (pg. 37); note: compare Horus being bitten by a scorpion and Isis summoning the sun and moon to heal him, as told in Sorrows of Isis (line 205), and as rescripted in Joshua 10:13

Volney gives his opinion that the "chest" is symbolic of the shutting up of the sun in the winter season:

> “It is the sun which, under the name of Horus, was born, like your god, at the winter solstice, in the arms of the celestial virgin, and who passed a childhood of obscurity, indigence, and want, answering to the season of cold and frost. It is he that, under the name of Osiris, persecuted by Typhon [Set] and by the tyrants of the air, was put to death, **shut up in a dark tomb**, emblem of the hemisphere of winter, and afterwards, ascending from the inferior zone towards the zenith of heaven, arose again [Orion rising] from the dead triumphant over the giants and the angels of destruction.”
>
> — Constantin Volney (1791), *The Ruins* (§XXII: Origin and Filiation of Religious Ideas)

(add)

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θΔics

In queries, **chicken and egg problem**, or chicken or egg puzzle (or paradox), refers to the perennial question "which came first the chicken or the egg?"

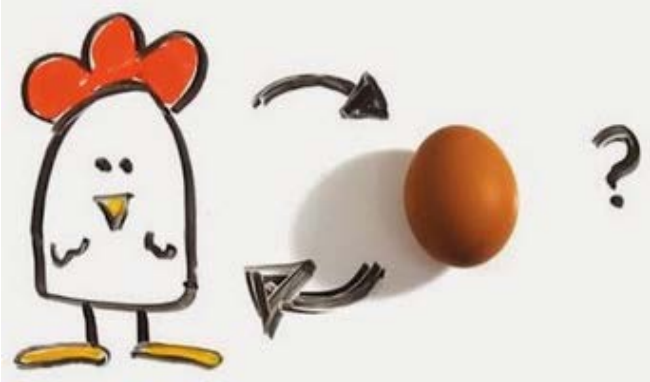

A 2013 AsapSCIENCE video depiction of the **chicken and egg problem**, which depicts the question: which came first the chicken or the egg? [3]

Overview

In c.90AD, Plutarch, essay "Table Talk", from his collected works Moralia, commented on the chicken and egg paradox; specifically, one speaker says with a laugh: [1]

> "Moreover, I'll sing to the knowers' the sacred Oprhic discourse that not only makes the egg prior to the chicken but comprehensively attributes to it absolute priority over all things let the rest of that remain in science (as Herodotus says), because it is reserved for the initiate, but the fact remains that the world contains a vast range of living creatures, but every class of them participates in generation from an egg."

The mention of the riddle as a "sacred Oprhic discourse", however, attributes the puzzle to an earlier source; possibly tracing to the ancient Egyptian myth of the primordial mound and the cosmic egg, a creation theory originating in the city of Hermopolis (c.2600 BC).

In 1909, William Ritter, "Life From the Biologist's Standpoint", wherein he digresses on the chicken and the egg problem, Herbert Spencer's views on whether life or organization came first, then ventures into chemistry discussion, during which time he tackles the so-called mind-body problem with the following hypothesis: [2]

> "Since we know absolutely nothing about the relation of the atoms in living substance, would it not be a reasonable hypothesis to say that the nature of that marvelous process called metabolism is due to just the fact that the atoms of carbon, nitrogen, hydrogen, oxygen, etc., are undergoing perpetual change of valence? I see no reason why we may not legitimately imagine even consciousness due to such a process. Were such a hypothesis to be seriously taken, it would seem to follow that consciousness would have its roots wherever metabolism is going on. What an excellent starting point this would make for dealing with the perennial puzzle of how it is that the 'mind influences the body'! The mind would then be part of the body."

Here we see Ritter breaking the problem down into the reduced form of atoms and valence change; he goes on to argue that there is no actual beginning of life in time position, aka the no origin theory of life argument.

In 2008, Libb Thims, when the Q&A voting forum Helium.com was active, ventured a digression into the problem, from the molecular evolution table and reaction mechanism point of view; explaining chicken reproduction as a double displacement reaction, visually (O) shown below: [1]

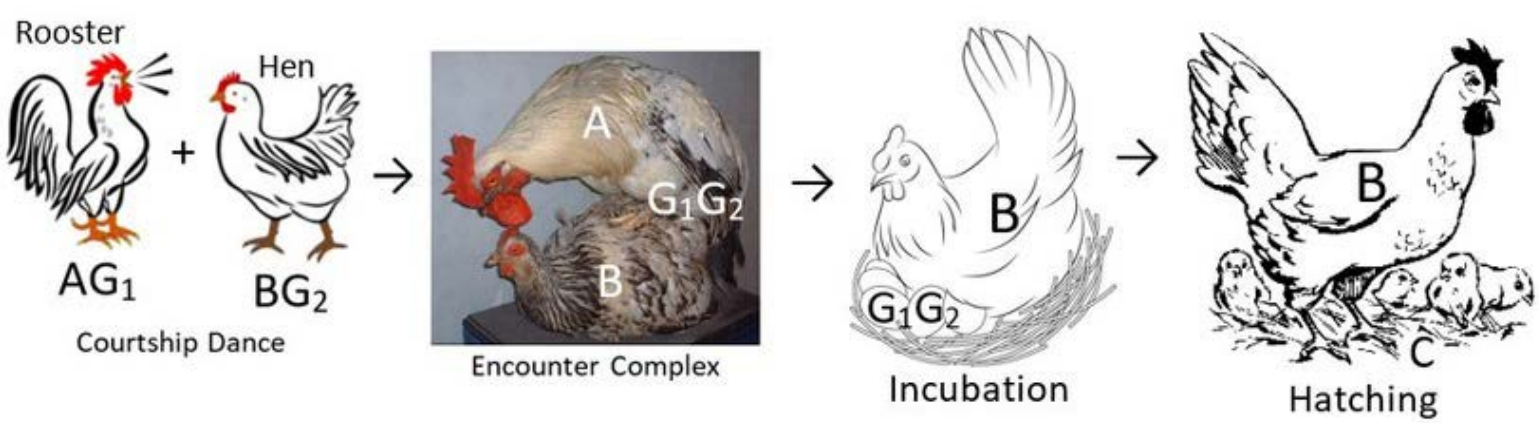

This, in mechanism overview, is an A + B → C type of reaction, as follows:

Hen + Rooster → New Chicken

The sexual reaction mechanism, in more detail, reduces, in step by step mechanism to a double displacement reaction, of the following general form:

AB + CD → AC + BD

where AC is the encounter complex of the hen and rooster following the courtship dance of the make, and BD is the joining of the two sperm cells G1 (sperm) and G2 (egg), which following incubation becomes a new motile chicken , BD (or chick C shown above). Using this model, one can trace the mechanism back to the formation of the first hydrogen atoms in the universe following the cooling of the big bang, during the inflation period:

$H + H \rightarrow H_2$

In this sense, hydrogen were chickens who came first, although the problem reduces to a bound state (chicken) to transition state (encounter complex / egg) to bound state (chicken), etc., *ad infinitum* back to the big bang, and whatever was before that. Alternatively, one can trace the problem back further to fermion and boson components, wherein the question looses definitiveness.

Quotes

The following are related quotes:

> "Much of present-day biological knowledge is ideological. A key symptom of ideological thinking is the explanation that has no implications and cannot be tested. I call such logical dead ends antitheories because they have exactly the opposite effect of real theories: they stop thinking rather than stimulate it. Evolution by natural selection, for instance, which Charles Darwin originally conceived as a great theory, has lately come to function more as an antitheory, called upon to cover up embarrassing experimental shortcomings and legitimize findings that are at best questionable and at worst not even wrong. Your protein defies the laws of mass action? Evolution did it! Your complicated mess of chemical reactions **turns into a chicken**? Evolution! The human brain works on logical principles no computer can emulate? Evolution is the cause!"
>
> — Robert Laughlin (2005), *A Different Universe* (pgs. 168-69); cited (Q) by William Dembski , 2005

> "If you **find an egg** in your refrigerator, you're not surprised. You don't say, 'Wow, that's a low-entropy configuration. That's unusual,' because you know that the egg is not alone in the universe. It **came out of a chicken**, which is part of a farm, which is part of the biosphere, etc., etc. But with the universe, we don't have that appeal to make."
>
> — Sean Carroll (c.2010) (Q)

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2. Ritter, William E. (1909). "Life from the Biologist's Standpoint" (beginning of life, pg. 190), *Popular Science Monthly*, 75:174-90, Aug.
3. Anon. (2013). "Which Came First: the Chicken or the Egg?" (Q), AsapSCIENCE, Jan 24.

External links

- Chicken or the egg – Wikipedia.

θΔics

In genius studies, **child prodigy**, of which there are two types: innate prodigy as contrasted with a forced prodigy, is a highly talented child or youth greatly accelerated intellectually and more prodigious as compared to others of a similar age.

Overview

(add discussion)

Innate Prodigy

THE WORLD'S BRIGHTEST BOY—?

Goethe

Forced Prodigy

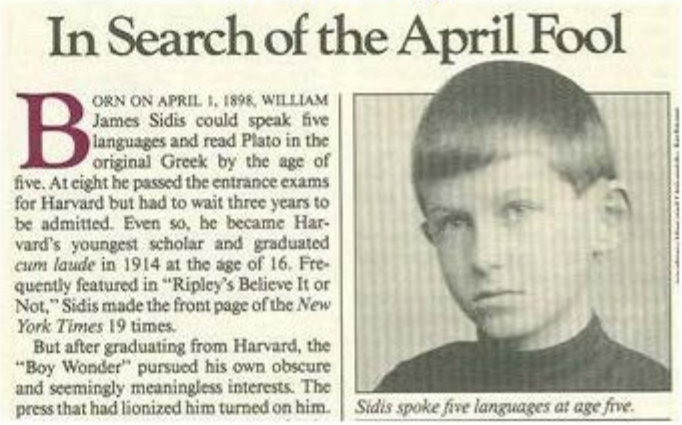

In Search of the April Fool

BORN ON APRIL 1, 1898, WILLIAM James Sidis could speak five languages and read Plato in the original Greek by the age of five. At eight he passed the entrance exams for Harvard but had to wait three years to be admitted. Even so, he became Harvard's youngest scholar and graduated *cum laude* in 1914 at the age of 16. Frequently featured in "Ripley's Believe It or Not," Sidis made the front page of the *New York Times* 19 times.

But after graduating from Harvard, the "Boy Wonder" pursued his own obscure and seemingly meaningless interests. The press that had lionized him turned on him.

Sidis spoke five languages at age five.

Sidis

Left: a photo and caption of German thinker Johann Goethe (age 15), from the 1927 *Journal of Heredity* article "The Child Hood of Genius", by scientist Paul Papenoe. [1] Right: a 1987 article, by Cathie Spense, on American reserve energy theory forced-genius prodigy William Sidis, America's so-called "greatest" **child prodigy**.

> "For every **child prodigy** that you know about, at least 50 potential ones have burned out before you even heard about them."
>
> — Itzhak Perlman (c.1990), Israeli-American violinist

The discussion here of "burning out" here needs further discussion, as this is a thermal word, in need of dissection.

Hmolpedia prodigies

The following, among the 1,000+ Hmolpedia biographies, are noted child prodigies, listed chronologically by date of reaction start (inception):

	Prodigy	IQ	Factoids
1.	Johann Goethe (1749-1832)	IQ=230 IQ=225+ cited (retrospect)	At 6½ was arranging and conducting plays on the miniature puppet theater stage, and had learned of *Faust*; at age 7, to sugar the pill of grammar, he invented a novel in which the members of a family in various parts of the world wrote letters to each other in six different languages and styles; at age 9, built his own alter to nature out of his father's natural history collection, surmounting it with a candle, which he lit when making his devotions; at age 15, completes his first landscape drawings of the Frankfurt area; studies the works of Plato, Aristotle, Plotin, and the Stoics; age 16, enters the University of Leipzig: starts to read law; further lessons on drawing with Adam Oeser; age 17 first reading of Shakespeare; age 18, began his studies in chemistry, particularly the work of Paracelsus and Susanne Klettenberg; and was conducting chemical experiments in his attic using a draught furnace (heat), so to reveal the "principle [secret principle] that permeates the whole universe."
2.	Carl Gauss (1777-	IQ=195	At age 3, corrected an error in his father's calculations of wages to be paid to his fellow workers; claimed to have learned to calculate before

	1855)		he could talk.
3.	William Thomson (1824-1907)	IQ=185	Entered Glasgow University at age 10.
4.	William Sidis (1898-1944)	IQ=185 IQ=225+ cited	Known as "America's greatest child prodigy"; BS mathematics at Harvard at age 16; thermodynamic theory of everything at age 18.
5.	John Neumann (1903-1957)	IQ:200 cited (retrospect)	Able to divide eight digit numbers in his head, exchange jokes in classical Greek, and to memorize the names, numbers, and addresses in phone books (displayed as a game to guests), all by the age of six; his early mathematical ability is said to have been a product of his intrigue of his grandfather's ability to rapidly perform complex mathematical calculations.
6.	Dean Wooldridge (1913-2006)		
7.	John Tukey (1915-2000)		
8.	Robert Pirsig (1928-)	IQ=160	A precocious child, cited with an IQ of 170 at age 9; at age 15, after finishing high school, he entered the University of Minnesota at age to study biochemistry, interested in science as a goal in itself, rather than a way to establish a career.
9.		IQ=140-185?±	Performing with the New York City Opera Children's Chorus at age 11; winning a number of state and national awards in mathematics, language, and computer science, and gifted talent searches by age 15; graduated first out of 225 students in high school, and at age 22 graduated first out of about 550 students of the MIT school of

Alexander Gross
(c.1981-)

engineering, simultaneously completing three undergraduate degrees: SB in physics, SB in electrical science and engineering, and SB in mathematics.

10.

Christopher Hirata
(1982-)

IQ=190
IQ:225 cited (age 16)

was noticed to have an accelerated mind at an early age. At age 3, he entertained himself, at the grocery story, by calculating the total bill of items in his parent's shopping cart, item-by-item, by weight, quantity, discounts, and sales tax. He was also reading the Dr. Seuss series to himself, able to recite the alphabet backwards, and had coded the alphabet sequence numerically, e.g. that the letter 'O' was 15th in the sequence. In 1st grade, he was doing algebra. By age 12, he was talking college-level courses in physics and multivariable calculus. At age 13, gained fame by winning gold medal at the 1996 International Physics Olympiad (IPhO), an international competition among the world's smartest math and science students (up to age 19), becoming the youngest medalist ever. At age 14, Hirata entered the California Institute of Technology (Caltech) and two years later began working with NASA on a project exploring the possibility of colonizing Mars. At age 18, completed his BS in mathematics at the Caltech, with a 4.2 GPA, and PhD in astrophysics in 2005 at Princeton,

11.

Luis Arroyo
(1990-)

IQ:200 cited (age 15)

(add discussion)

Encyclopedia | Read

It is semi-frequently reported that so-and-so prodigy read so-and-so encyclopedia before age so-and-so; tidbits of which gets passed around and elaborated on to an exaggerated extent as prodigy fodder folklore.

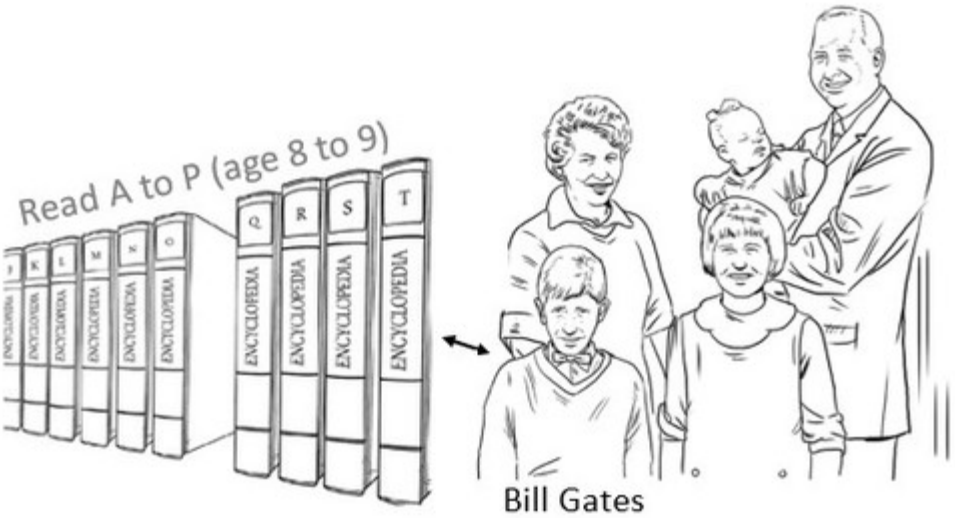

In 1866, Friedrich Nietzsche (age 22) read through Friedrich Lange's *A History of Materialism*, the seeming first proto encyclopedia of materialism, after which he wrote: [2]

> "Kant, Schopenhauer, and this book by Lange – I don't need anything else."

American forced prodigy Edith Stern is reported to have read read an entire encyclopedia, of some sort, before age 4. By age 4.5 four, she read straight through volume one of the *Encyclopedia Britannica* (Ñº), and by age 5 had read through the entire set. [3]

It is widely reported, e.g. by Clifford Pickover (1998), among others (Ñº)(Ñº), that Bill Gates, by age 8 or 9, had read the entire 1960 edition of *The World Book Encyclopedia*.

This, however, does not seem to be the case, but rather an elaboration of the fact that he attempted to read the entire set. He later recalled: "I was determined to read straight through every volume." By the time he reached the letter *P*, however, he had discovered a more detailed encyclopedia, and decided he would never have enough time or patience to read the entire new set. (Ñº)

Prodigy pressure

Some prodigies not only burn out, as Itzhak Perlman (c.1990) points out, but crack under pressure and commit suicide.

A noted example, is American prodigy Brandenn Bremmer (1991-2005), shown below left, in 2001, at age 10, next to the stack of books he had absorbed to finish high school prior to entering college that year, who shot himself in the head four years later (Ñº)(Ñº)(Ñº):

Another example is Chris (or Justin) Chapman (1996-) who in 2002, at age 6, was purported, by his mother Elizabeth Chapman, via underlying motive fabrication, to have an IQ of 298, and was removed by child services after he attempted suicide a year latter.

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2. Leiter, Brian. (2007). *Nietzsche on Morality* (pg. #). Routledge. 2014.
3. Cohen, Richard. (1977). "Edith Project Produced Genius, Not Perfection" (Ñº), *Washington Post Special*, in: *The Milwaukee Sentinel*, Apr 9.

External links

â— List of child prodigies – Wikipedia.

θΔics

In publications, **Children's Atheism Bible** is a refers any semi-attempt at a children's reading level version of classic adult "atheist's bibles", e.g. Baron d'Holbach's *The System of Nature* (1770), Lucretius' *On The Nature of Things* (50BC), or Thomas Paine's *The Age of Reason* (1794), with standard big bang cosmology upgrade, in place of the classical Egyptian mythology based models of standard Bibles (see: Judeo-Christian pantheon), morality is explained based on the modern scientific-based natural view (e.g. natural morality) of the world, and the old children's religious myths are explained, in terms of their precursor mythical origins (see: god character rescripts).

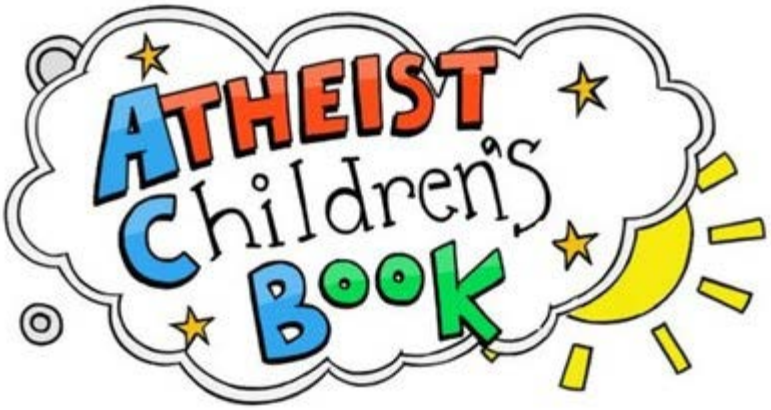

"My **brain** is getting bigger by the minute."

— Caleb (2015), **6-year-old** student of Thims' summer 'Zerotheism for Kids' class; comment during lecture #10 (6:30-35) on learning atheism-based **big bang** to synthesis of **human molecules** evolution, in upgrade to god-based six-day creation of humans from clay, Aug 10

Opening front matter quote from Libb Thims drafting Smart Atheism: for Kids book, the draft prototype for a standard reference **children's atheism bible**.

Overview

In c.1850, Harriet Martineau, after spending 1846 travelling around America to study the great religions, concluding "there is no theory of a god, of an author of nature, of an origin of the universe, which is not utterly repugnant to my faculties", began to call for a children's book for the "secular order of parents". [11]

In 1992, Dan Barker, in his *Maybe Right, Maybe Wrong*, attempted to pen out a atheism for children type of book, in attempts to differentiate "right" from "wrong" without divine-backing. [9] Barker followed this up with *Maybe Yes, Maybe Know* (1993) a guide for young people to have an open mind, who fact checks things to find out the truth, rather than blindly accepting everything one hears. [10]

In 2011, Horus Gilgamesh started the "Awkward Bible" Facebook page, which, in 2013, turned into the children's book *Awkward Moments Children's Bible*.

In 2014, Gene Weingarten penned *Me & Dog*, an atheism themed children's book, characterized as a "gentle catechism for the random universe crowd" (aka ignorant atheism). [5]

In 2013, Annaka Harris, wife of new atheism initiator Sam Harris, published *I Wonder*, seeded by a 2012-initated KickStarter (Ñº) campaign, wherein she uses oil paintings to illustrate an atheist mother-daughter Q&A, aimed at teaching the parent the ability to say: "I don't know" in response to kid's queries they can't answer, and to begin to develop a capacity for postulating theories without censoring oneself. [6]

In 2015, David Seidman, someone who says he "grew up Jewish", published *What If I'm an Atheist? A Teen's Guide to Exploring a Life Without Religion*, stemming from his 2006 publishing idea "what about the atheist kids", wherein he steps through a number of interviews of teens who are atheists; Amazon reviews of the book's writing style and position, to note, indicate that he is not an atheist, however, himself. [1]

On 29 Jul 2015, Libb Thims conceived the idea of penning a *Children's Atheist Bible*, amid promotion for the scheduled Aug "Zerotheism for Kids" class, during which time Mr. O, a god-believer, with newly-born child, complained that Thims' would be "brain washing" the kids before they even have a chance to think, or something along these lines; to which Thims replied that it's actually the reverse of that, the lecture was prompted into existence, being that one of the children (age 6) scheduled to attend was given a generic *Children's Bible*, after which the child asked "how did god create the world so fast?", i.e. in 6-days, according to standard Genesis explanations; a query to which the parental figure in charge really didn't have a response (which should have been, something along the lines of, correctly: "In the beginning, according to the current models, based on evidence, the universe came into existence via a big bang, through natural processes, etc., ... what you read was the old-fashion Egyptian cosmology model of origins, that our elders used to teach children to explain morality and meaning ..."). In short, if the child had been given the correct information, in

the first place, there would be no need for such as class, which is but a de-brainwashing class or reversal of the original brainwashing, so to say (i.e. to teach kids, from the get go, Egyptian cosmology based morality and meaning, is pointing them in a backwards position, and telling them to go into forward).

In 2016, Thims, based on the previous video recorded "Atheism for Kids" Sunday School class, available on YouTube, had drafted a *Smart Atheism: for Kids* booklet, based on the questions and content of the class. [12]

In 2016, Jessica Thorpe, in her 30-page booklet *Atheism for Kids*, presented a very simplistic overview of atheism, with illustration, attempting to answer questions such as: "where did we come from?", "why are we here?", and "what happens when we die?"; the result, however, was mostly lacking in substance. [13]

In Jul 2018, Richard Dawkins was tweeting (Ñº) that, in followup to his 2011 *The Magic of Reality: How We Know What's Really True* (Ñº), which was "partially aimed at children" (Ñº), he was actively working on two atheism explicit themed books for kids themed books, one tentatively titled *Outgrowing God*, for teenagers, and the other *Atheism for Children*, for adolescents.

Smart Atheism: For Kids

See main: Smart Atheism: For Kids

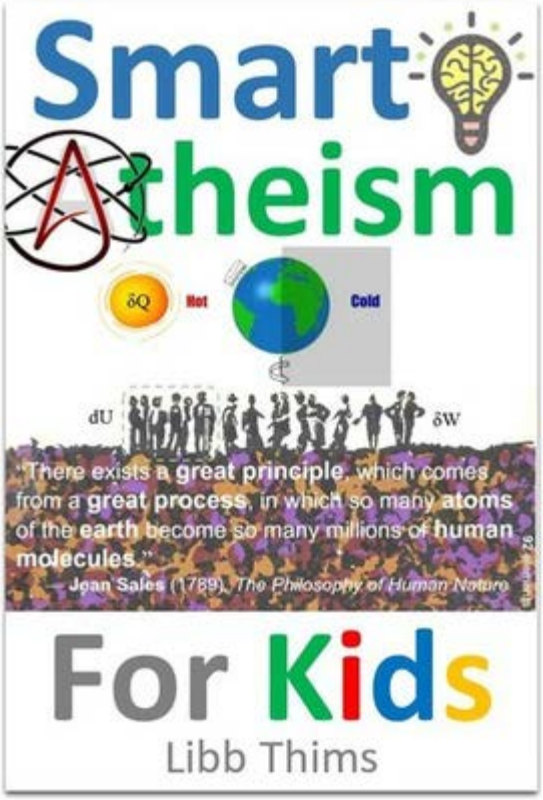

A 2016 cover to Libb Thims draft stage "atheism for kids" book. [12]

In Aug 2015, Libb Thims was ruminating on the idea of penning a "Children's Atheist's Bible", as a spinoff of the Zerotheism for Kids summer "Monday school" class (aka atheist's Sunday school). [N1]

On 26 Jul 2016, Libb Thims, prompted by a 10-year-old's query: 'prove to me there is no god!' and rebuttals such as 'atheist's don't have feelings', to her newly-out atheist mother, began penning *Smart Atheism: For Kids*.

On 22 Aug 2016, Thims had drafted 127+ pages; and was promoting the following abstract, to people such as Erich Muller and James Ferry, in email discussion:

> "Gibbs energy replaces Gods energy, Big Bang cosmology replaces Nile River (Noah's ark) flood cosmology, and evidence-based physiochemical morals replace angel-based prophesized morals."

On 5 Sep 2016, Thims had drafted 200+ pages, and amid Reddit diagram discussion on so-called atheistic "brainwashing", summarized the basic message that the kids, in the 2015 Zerotheism for Kids class, had learned as follows:

> "It's big bang to human molecules, and there is NO god."

In Oct 2018, the draft book had expanded into 300+ pages, where a five-volume set seemed to be needed; after which the writing began to stall out in the murky area of the Roman recension, and how Osiris-Horus model was turned into Jesus as Christ in the years 80 AD to 400 AD (see: silent historians problem). [12]

Secular moral relativism

The following was the first and most-dominate query put to Phil Zuckerman, during his *Los Angeles Times* follow-up interview to his talked about secular parents are doing a better job article: [4]

“The "Golden Rule" (empathetic reciprocity) is derived from Judeo-Christian traditions that lend itself a moral authority. Without that authority empathy becomes purely relative to each individual (secular moral relativism). With no authority we each set out to make our own morality.”

(add)

Quotes

The following are related quotes:

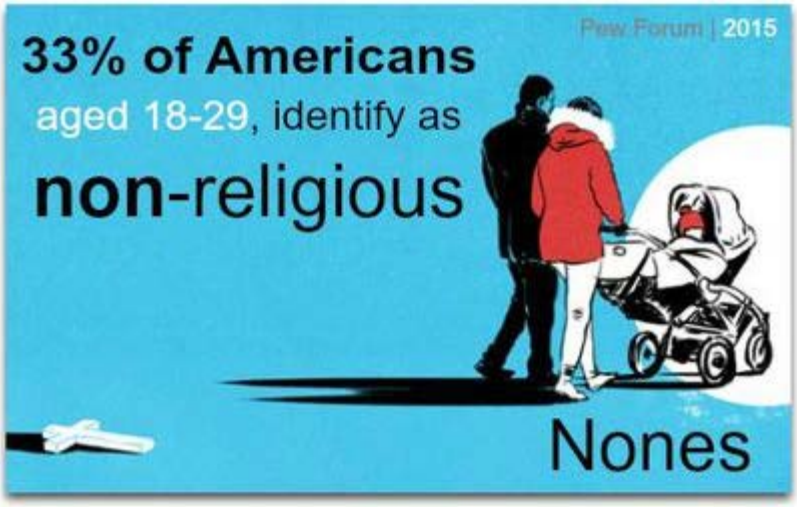

Data, reported by Phil Zuckerman, from Pew Forum (2015), indicate that 33% of Americans, aged 18-29, now identify as non-religious; which is up from 9% in the 1990s; data which also shows, via long-term longitudinal generational studies, that the secular parents are doing a better job at raising their kids. [3]

“Fables should be taught as fables, myths as myths, and miracles as poetic fancies. To teach superstitions as truth is a most terrible thing. The child mind accepts and believes them, and only through great pain and perhaps tragedy can he or she be in after years relieved of them. The reason for this is that a superstition is so intangible a thing that you cannot get at it to refute it.”

— Hypatia (360-415)

“You must acquire the best knowledge first, and without delay; it is the height of madness to learn what you will later have to unlearn.”

— Desiderius Erasmus (1497), “Letter to Christian Northoff”

“It takes the latter half of all of one’s lifetime to unlearn the falsehood that was instilled into us during the earlier half. Generation after generation we learn, unlearn, and re-learn the same lying legendary lore. Henceforth, our studies must begin from the evolutionist standpoint in order that they may not have to be gone over again.”

— Gerald Massey (1883), *The Natural Genesis*

“Christianity may be OK between consenting adults in private but **should not be taught** to young children.”

— Francis Crick (1969), “Notes from Rickman-Godlee Lecture, UCL” (Ñº)

“I don’t like being lied to. And I especially didn’t like being lied to as a child.”

— Aron Ra (2011), when queried, about his YouTube atheism channel, about what drives him, or what is the catalyst? (Ñº)(Ñº)(Ñº)

"I believe in the Hubble telescope. My Bible is the cosmos, narrated by Neil Tyson."

— Jesse (2015), anti-religion pro-science sign-carrier (Ñº) at Comic Con (6:58-7:06) (Ñº), San Diego, Jul 16

"I love the Carl Jung quote (Ñº), very moving. And obviously I love the human molecular formula (Ñº)(Ñº). I recently purchased a book *Molly and Wally Molecule* (Ñº) for the kids, which is OK but the kids really seem to like it, which reminds me how much a BETTER kid's book more in your space is needed. Thoughts?"

— Lynn Liss (2015), review of "Zerotheism for Kids" Flickr slides, 29 [1]

Notes

Some secular or atheist parents, implicitly using Charles Elton's food chain model, tell their children "the lion eats you" when asked by their kids what happens when they die. [2]

N1. Thims had the following title options in the water-testing stage: 1. Children's Atheist Bible; 2. Atheist's Children's Bible. Option #1 in a quick poll of ten people received 80 percent of votes. The "Zerotheism for Kids" lecture overview project page and title (option #1) where sent to Thims' sister (with kids 4 and 6) for feedback; to which the first response was: [1] "I like your transition to 'smart atheism' verbiage, which puts a positive spin on something that many perceive as negative or angry. Could you even go so far as to call it SmartAtheism? I really like that, it sounds fun and lively for the kids segment." After sleeping on this, Thims, inclined toward the idea, awoke with the following two title possibilities: 3. Smart Children's Atheist Bible or 4. **Children's Smart Atheism Bible**. The following, per synopsis of the "Zerotheism for Kids" lecture abstract, also comes to mind: 5. Zerotheism: the Children's Smart Atheism Bible, 6. Zerotheism: the Smart Children's Atheism Bible, 7. Children's Smart Atheism Bible: Zerotheism. The following title options (11:38AM CST 2 Aug 2015) were thought up, amid-following sleep, as title | subtitle secondary Flickr slide set, to the primary-draft Flickr slides, as a way to address the six-year-old's "how did god create the world so fast?" query directly, via a smart children's step-by-step zerotheism evidence-based explanation, i.e. correction to the classical, albeit incorrect, information he was given: 8. Zerotheism Bible: Smart Children's Atheism Handbook or 9. **Zerotheism Bible: Children's Smart Atheism Handbook**. A quick-poll of twelve people (*circa* 7-8PM CST 2 Aug 2015), as to which was a better title, between #8 and #9, found that 83 percent (10 of 12) preferred version nine; per logic that the former implies that dumb children would not be able to understand it; or something to this effect. The following is a newer, close-to-solidified variant: 10. Zerotheism Bible: Children's Smart Atheism Guidebook

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(c) Boorstein, Michelle. (2014). “A boy, his dog and atheism: Gene Weingarten talks about his new children’s book” (Ñº), *The Washington Post*, Sep 17.
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â— Shaha, Alom. (2015). *Young Atheist’s Handbook: Lessons for Living a Good Life without God* (Amz). Publisher.
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Videos

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External links

â— Books for kids about atheism and skepticism (2016) – Reddit.
â— Atheism and Religious Disbelief in Children’s Fiction – GoodReads.com.

In hmolscience, **chilling effect**, aka the "Brrrr reaction" (Smyth, 2015), as compared to the "warming effect", is a thermal term referring to the presumed assumption, and or felt reaction, that reduction is cold, unemotional, and impersonal, leaving a person floating in a chance-based accidental void.

Overview

Generally, it is thought that the father one steps down the belief system steps, as shown below, the colder it gets, per reason that many of the warm cozy things taught in childhood get jettisoned:

Spiritualism / Totemism
Polytheism →

Henotheism →

Theism / Monotheism

Deism →

Pantheism →

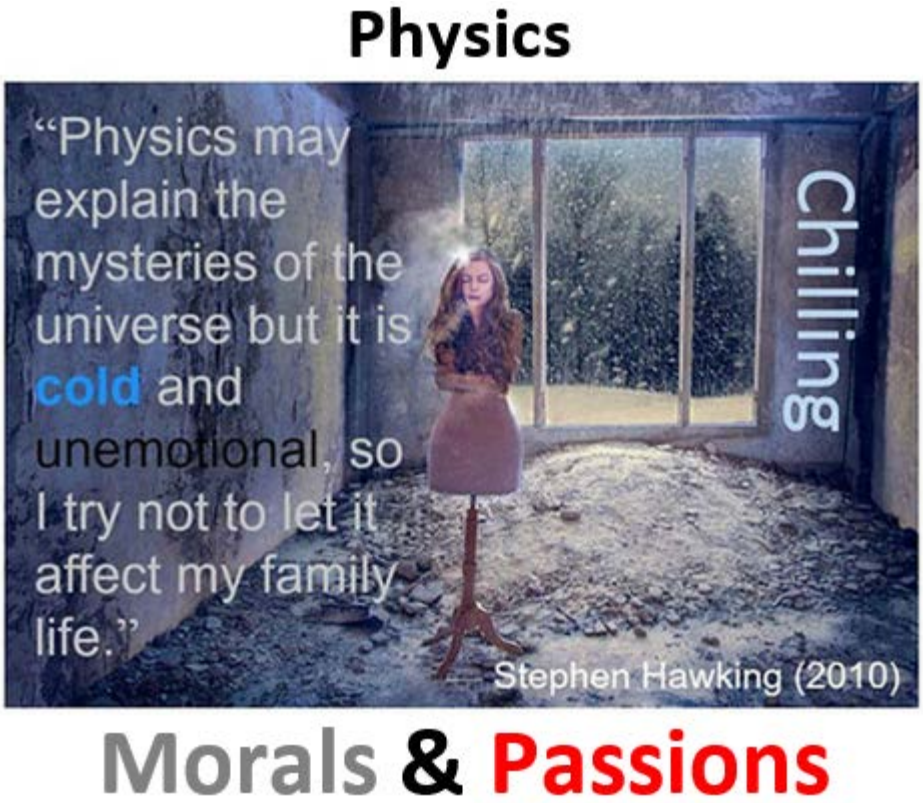

Slide #7 (Q) from Libb Thims 10 Aug 2015 "Zerotheism for Kids" class, a smart atheism for kids stylized "Monday School" lecture, wherein (V|12:27-14:57) reductionism was explained as seen by some, e.g. Steven Weinberg (1992), Stephen Hawking (2010), etc., owing to ignorance about the workings of the universe, in respect to passions and morals, as "**chilling**", per reason that un-enlightenment, by definition, reduces the amount of light available to the big picture view of things, therein "chilling" one's state of mind.

Agnosticism →

Atheism →

Extreme atheism →
Zerotheism

The "chilling effect", generally, is an emotion felt, in a reactionary sense, in the mind (of non universal genius mindsets), by those who ruminate, ponder, or think about the switch, in world views, on going from theism, i.e. a god-based universe, to atheism, i.e. a non-god-based universe, the latter of which is, therein, thought to be cold and empty.

Nearly all theists will tend to "feel" this chill, and therein react away from atheism accordingly, back to the cozy, albeit less secure, warmth of theism.

Some agnostics, e.g. Soren Kierkegaard, will deal with the coldness in terms of "fear and trembling" (1843).

Some less discerning atheists, e.g. Albert Camus (see: Camus model), Jean-Paul Sartre, etc., will accept the coldness, but calk it off to absurdism or confusion.

Some highly-educated reductionism-based atheists, e.g. Steven Weinberg (1992) or Stephen Hawking (2010), will ignorantly accept this chill as a matter of fact; this is classified as intelligent dumb atheism.

Those few historical smart atheists in the know, e.g. Johann Goethe (see: love thought experiment), Percy Shelley (see: Church of Elective Affinities), Honore Balzac (see: Balzac feelings and affinity dialogue), etc., however, who are keen

to the connection between the reductionist view of the morals and the passions to physical chemistry, understand that, although there are a still a few pieces to the puzzle to work out, the general resulting physicochemically-reduced picture or new world view is both warming and chilling and intelligible.

Hilaire

In 1830, there was a famous confrontation, or public collision, between the creationism theist Georges Cuvier and the pre-Darwinian evolutionist deist Geoffroy Hilaire, at the French Academy of Sciences, which has been recounted, in thermal word speak, by Adrian Desmond, in his *The Politics of Evolution* (1989), as follows: [1]

> "The famous 1830 confrontation between Georges Cuvier and Geoffroy Hilaire, at the French Academy of Sciences, was in effect a collision between Hilaire's '**coldly deterministic views** of animal form and evolution and Cuvier's 'extreme views' that animals were broken into discrete [god-created] 'divisions'."

(add)

Russell

In 1925, Bertrand Russell, in his *What I Believe*, stated things thusly: [6]

> "Even if open windows of science at **first make us shiver** [chilling effect] after the cozy **indoor warmth** of traditional humanizing myths, in the end [warming effect] the fresh air brings vigor, and the great spaces have a splendor of their own."

(add)

Weinberg

In 1992, atheist Steven Weinberg, in his *Dreams of a Final Theory*, in commentary on Fyodor Dostoyevsky's *Notes From the Underground* (1864), stated the following: [2]

> "At its nuttiest extreme are those with holistics in their heads, those whose reaction to reductionism takes the form of a a belief in psychic energies, life forces that cannot be described in terms of the ordinary laws of inanimate nature. The **reductionist worldview *is* chilling** and impersonal (see: individualism). It has to be accepted as it is, not because we like it, but because that is the way the world works."

In Jan 2015, Thims, in response to this, stated:

> "Weinberg, here, in his mention of "chilling" (see: chilling effect), obviously has not heard of Goethe and his human chemical theory of elective affinities, both in the form of interpersonal elective affinities and social elective affinities, which forms the basis or rather mechanistic understanding of human chemical thermodynamics."

(add)

Hawking

In 2010, atheist Stephen Hawking, in an ABC interview, in response to the query: "how does your knowledge impact

other areas of your life, e.g. your appreciation of music, of art, your family?", responded as follows: [3]

> "Physics may explain the mysteries of the universe but it is **cold and unemotional**. So I try not to let it affect my family life."

(add)

Smith

In 2015, Colm Smyth (Q)(Q), in his Quora answer to the question "What is the Future of Sociophysics", stated the following: [3]

> "I **shudder to think** what might actually lie inside 'the' book on this subject [sociophysics]: Couples as molecules? Mobs as Brownian motion? Social networks and chaos theory? **Brrrr**."

On Mar 2015, Thims, in response to this, stated:

> "Re: "I **shudder to think** what might actually lie inside "the" book on this subject: couples as molecules? [Yes, a person, by textbook definition (e.g. *Advanced Engineering Thermodynamics*, 2011), is a 26-element molecule, and two people bonded in a relationship, are "dihumanide" molecules, technically (Johann Goethe, 1809; Christopher Hirata, 2001)]; mobs as Brownian motion? [No, Brownian agent models are used in econophysics ("crowd dynamics" is the field that studies mob behavior, e.g. using liquid particle theory]; social networks and chaos theory? [That's outdated, but it is found in Paris Arnopoulos' 2005 *Sociophysics*] Brrrr." The last **comment "brrr"** is the subject of physicochemical sociology *par excellence*; it brings to mind Steven Weinberg's comment "The reductionist worldview ***is* chilling** and impersonal. It has to be accepted as it is, not because we like it, but because that is the way the world works." The flip side of this, is that once you come to understand the basics of a social interactions based on physiochemical sciences, the new world view becomes both "understandably" chilling and warming, depending on what reaction process or interaction is under discussion."

(add)

Thims | Zerotheism for Kids

In Aug 2015, Libb Thims, being aware of the above ignorance being popularized by Weinberg and Hawking about reduction being "cold", in his "Zerotheism for Kids" class, a smart atheism for kids stylized "Monday School" lecture (compare: Monistic Sunday Sermons), wherein (V|12:27-

Slide #7 (Q) from Libb Thims 10 Aug 2015 "Zerotheism for Kids" class, a smart atheism for kids stylized "Monday School" lecture (compare: Monistic Sunday Sermons), wherein (V|12:27-14:57), wherein reductionism was explained as "warming", per reason that enlightenment, by definition, adds light to the big picture, therein "warming" the state

of one's mind.

14:57) Thims explained, to a group of five children, that the physico-chemical reductionist view of reality, such as Goethe (1809), in full, and Jung (1933), in some sense, espoused, is NOT in all, in full, "chilling", or inevitably yields a "**chilling effect**" in the mind of the recipient (if believed), but can be "warming", i.e. produce a "warming effect", in the mind of the recipient (if believed), and fun, depending on how one understands the new world view model, and therein chooses to interact and react with the universe.

Quotes

The following are related quotes:

> "Weinberg's brand of reductionism has a nasty, inhuman odor about it. The idea that we are just a bunch of elementary particles **bouncing about in the void is chilling and impersonal**. If there is a meaning to the world, we would like it to be something more than whatever it is that elementary particle physicists will discover with their giant particle accelerators. What we are looking for, in other words, is something more akin to blue summer skies and bird songs and you and I."
>
> — Chet Raymo (2007), "Why Do Birds Sing?" (Q), Jun 3.

See also

- Balzac feelings and affinity dialogue

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2. Weinberg, Steven. (1992). Weinberg, Steven. (1992). *Dreams of a Final Theory: the Scientist's Search for the Ultimate Laws of Nature* (Dostoyevsky, pgs. 52-53; pointless, pgs. 255-56). Random House.
3. Hawking, Stephen. (2010). "ABC interview"; response to query: "how does your knowledge impact other areas of your life, e.g. your appreciation of music, of art, your family?" (Q), ABC News.
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6. (a) Russell, Bertrand. (1925). *What I Believe* (pg. 13). Dutton.
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θΔics

In hmolscience, **chimpanzee war** or "Gombe chimpanzee war" refers to the chimpanzee war documented by Jane Goodall, from 1970 to 1974, in the Gombe national reserve, northeastern Nigeria, where, in short, following a series of growing tensions, a splinter group of seven males and three females with their young split off from the main group and began to form their own troop; after which a war began. [1] The documented war gives an inside look into the nature of chemical mechanism (a step by step view of the process) and the nature of "boundaries" in animate matter interactions, which is a very complex subject.

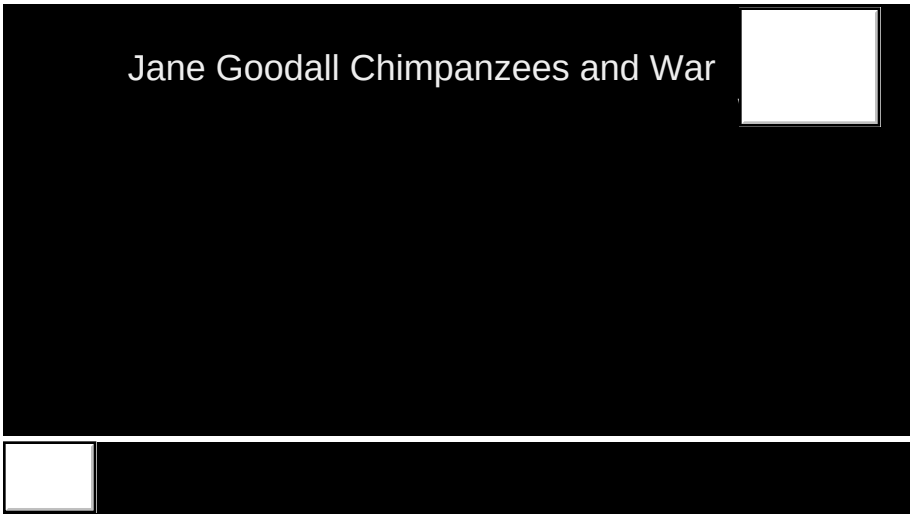

A clip, from 1997, where Jane Goodall compares the aggressive behavior found in **chimpanzees** to **war** (see also: war thermodynamics) and human nature.

Overview

In many cases, the chemical species (in this case chimpanzees), on their own accord, setup and define impermeable boundaries closed to the flow of certain species. A 1983 summary of the chimpanzee war by American anthropologist Helen Fisher is as follows: [2]

> "In the Gombe, wild chimps patrol **territories** of up to five to eight square miles. Regularly, small groups of males steal along the **border** of their range, sniffing the ground for the trace of strangers, and climbing trees to peer across neighboring territories. When an unfamiliar chimp, all except childless females, comes too close, they charge, attack, and occasionally severely injure the intruder. In one instance, an older female was attacked so severely by four males that she died five days later of her wounds. In 1970, a chimpanzee war began. A splinter group of seven males and three females with their young split off from their comrades in the north of the reserve and began a group of their own in the south. For a while individuals met at the **border** to solve their differences by loud calling, hurling branches and mock charges at each other. But in 1974 five males from the original Gombe community began to roam deep into the southern territory. Within three years, they attacked and murdered all of the adult males (except two who died of natural causes) and one old female—extinguishing the splinter enclave and extending their territory to the south."

Here, the boundaries in question (a) changing, as the story depicts, and (b) often demarcated merely by a natural formation, such as a large rock, river, or irregular tree or land formation.

Analysis

This multi-year interaction can be analyzed from three different perspectives: (a) pressure-volume boundary work, (b) chemical potential, and (c) a type of multi-year transformation reaction of the form: [1]

$$A \rightarrow B + C$$

The original troop breaking up chemically into two new factions, after which B (the dominate faction) destroys or consumes C (the weaker faction):

$$B + C \rightarrow B$$

and a new stable end state equilibrium or final state is established.

Prigogine entropy

In the language of Prigogine entropy, the boundary entropy changes would have involved entropy quantifications such as the heat of battle, at the front, territory-infringement murders, etc., and the the internal entropy changes internal work might have involved work related to total species genocide.

Single molecule thermodynamics

In this simple example, in the context of single-molecule thermodynamics, it is not at all "obvious" how the condition for an exact differential, which mathematically defines the extensity property of entropy, translates over to these types of heat measurement quantifications.

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2. Fisher, Helen. (1982). *The Sex Contract* (pgs. 62-63). Quill.

θΔics

In genius studies, **Chinese geniuses** refers to []

PhiloEpisteme rankings

In 2017, Hmolpedian Philoepisteme (Q), a John Nash (Q), Persian language (Q), Gottlob Frege (Q), Bertrand Russell, Jean Rousseau and Immanuel Kant (Q) scholar, ranked (Q) the top ten Chinese geniuses, in his opinion, as follows:

1. Zhuangzi
2. Laozi [**not real**?]
(604-531BC) (RGM:204|1,310+)
3. Xunzi
4. Qin Shi Huang
5. Lisi
6. Sun Tzu
(c.540-496BC) (IQ:165|#352) (RGM:47|1,310+)
7. Genghis Kahn
(IQ:180|#166) (IQ:180|#166) (RGM:313|1,310+)
8. Confucius [**not real**?]
(551-479BC) (IQ:170|#285) (RGM:30|1,310+)
9. Sima Qian
10. Zhang Heng

(add discussion)

Quotes

The following are related quotes:

> "**Chinese geniuses** are extremely scarce; that is a fact. In the past 2500 years, there were only two instances of spontaneous progress: one happened in ancient Greece; the other in Renaissance Italy. If western powers had not come to contact with China in mid 19th century, China today would not have been much different from the China of 210 BC. Ming dynasty (1368-1644 AD) fortified and extended the Great Wall built by Qin dynasty (221 to 206 BC), from which one can infer how much progress had taken place both in technology and in mental life over the intervening centuries."
>
> — George Chen (2016), Quora Answer to "Why are There so many Chinese but we hear about so few of their geniuses?" (Q), Mar 10

See also

- American geniuses
- Chinese social physics school
- Middle ages genius
- German geniuses
- French geniuses
- Roman geniuses
- Greek geniuses
- Italian geniuses

External links

- Do credible historians agree that other ancient religious founders such as Moses, Lao Tzu, Buddha and Zoroaster actually existed? (Q) (2016) – Quora.

θΔics

In schools, **Chinese social physics school**, or "Chinese school of social physics", refers to the social physics work and theories recently being developed in China, particularly by physicists, since *circa* 2000. [1]

Chinese social physics theorists include: Wenyuan Niu, on social combustion theory (2001), Miao Ning and Jifa Ju, on activation energy theory of social transformation (2009), Yi-Fang Chang, on social thermodynamics (2013), Yi-Cheng Zhang, founder of Econophysics Forum, among others.

Yi-Fang Chang
(1947-)

Wenyuan Niu
(c.1950-)

Miao Ning
(c.1969-)

Some of the key players in the **Chinese social physics school**.

In 2009, the term "Chinese social physics community" was used by Yun-lin Wang and Ding Li, in their article "Social Physics and China's Population Migration", wherein they cite social physics founders such as: Auguste Comte, French philosopher Simone Weil, who thought that Karl Marx was the first to study society as a physicist studies matter and the relationship of force, and American sociologist George Lundberg (1939).

See also

- Jitao Wang
- Princeton Department of Social Physics
- Stark classification
- Romanian school of physical socioeconomics
- Mechanistic school of social thermodynamics | Pitirim Sorokin (1928)

References

1. Wang, Yun-lin and Li, Ding. (2009). "Social Physics and China's Population Migration" (Chinese social physics, pg. 2284), in: *Complex Sciences: First International Conference, Complex 2009* (pgs. 2283-). Springer.

θΔics

In hmolscience, **Ching-Yao Hsieh** (1917-2001) was a Chinese-born American economist noted for his 1991 book *Economics, Philosophy, and Physics*, co-written with American economist Meng-Hua Ye—who of note completed his PhD with a dissertation on "Application of Brownian Motion to Economic Models of Optimal Stopping" in 1984 at the University of Wisconsin-Madison—their book written for students of economics interested in knowing the philosophical underpinnings and scientific foundations of contemporary economic models.

The book has sections on romanticism and science, thermodynamics and economics, chaos theory and philosophy, Newtonian physics and economics, relativity and economics, among other two cultures subjects.

Hsieh and Ye classify Austrian-born astrophysicist Erich Jantsch as Belgian chemist Ilya Prigogine's "most famous disciple and interpreter." [1]

Econophysics | Newtonian based

Hsieh and Ye state that only two books prior to them have related physics, in particular Newtonian mechanics, to economics, namely: American physical economics historian Philip Mirowski's 1988 *Against Mechanism*, especially part one, and Austrian-born American physicist Fritjof Capra's 1983 *The Turning Point*, especially chapter seven. [1]

Education

Hsieh completed his undergraduate education at St. John's University, Shanghai, where he taught history, after which he worked at the Central Bank of China, then migrated to America in 1954. He then completed a master's and doctorate degree in economics at George Washington University, after he began teaching economics there in 1961, and was professor emeritus in 1991. [2] In 1997, the "Ching-Yao Hsieh Prize" was established, by multiple donors, in Hsieh's honor, at George Washington University, awarded annually, one to an undergraduate and one to a graduate student in the economics department.

Quotes

The following are quotes from the book:

> "God if reason, the Bible is Newtonian physics; and the prophet is Voltaire."
>
> — Anon (c.1800), credited as a "wit in the past"

> "The philosophy of any period is always largely interwoven with the science of the period, so that any fundamental change in science must produce reactions in philosophy."
>
> — James Jeans (1943), *Physics and Philosophy* [3]

References

1. Hsieh, Ching-Yao, and Ye, Meng-Hua. (1991). *Economics, Philosophy, and Physics* (disciple, pg. 127). M.E. Sharpe.
2. Ching-Yao Hsieh (obituary) – WashingtonPost.com.
3. Jeans, James. (1943). *Physics and Philosophy* (pg. 2). University of Michigan Press, 1966.
4. (a) Hsieh, Ching-Yao, and Ye, Meng-Hua. (1991). *Economics, Philosophy, and Physics* (two books, pg. xxxvi). M.E. Sharpe.
(b) Capra, Fritjof. (1982). *The Turning Point: Science, Society, and the Rising Culture* (§7: The Impasse of Economics, pgs. 188-233). Simon & Schuster.
(c) Mirowski, Philip. (1988). *Against Mechanism: How to Protect Economics from Science* (pg. 1). Rowman & Littlefield.

External links

â— Hsieh, Ching-Yao (1917-) – WorldCat Identities.

θΔics

In science, **CHNOPS**, “CHONSP” (Berry, 1997) (Ñº) or SPONCH (Cockell, 2015) (Ñº), is an acronym short for the six dominant elements common to animated organisms, namely: carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur; the other dozen to twenty or so elements common to "animate organisms" (defunct term: living organism) sometimes referred to as trace elements, although the distinction is far from exact.

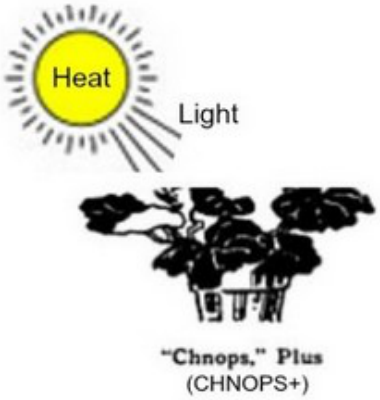

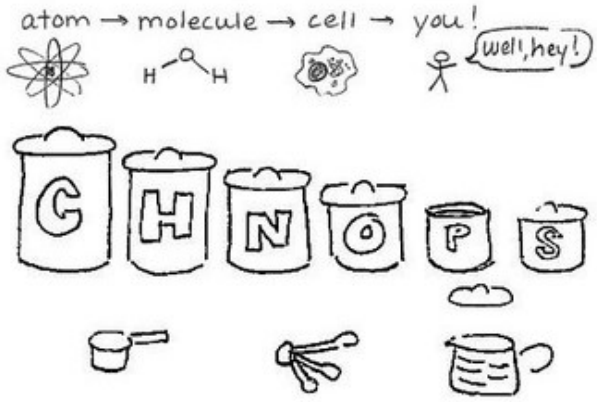

Left: American plant physiologist Frank Thone's 1936 depiction of a plant as a "CHNOPS plus" system, i.e. he described plant systems as systems comprised of the elements: carbon, hydrogen, nitrogen, oxygen, phosphorus, sulfur (**CHNOPS**) plus potassium and calcium, among others. This is chemical upgrade to older late 18th century, albeit now-defunct (2009), term "biological system" (see: bio-). [1] Right: a 2010 high school level rendition of the **CHNOPS** model by American illustrator and former high school biology teacher Katie McKissick from her blog article “That Which Life is Made of, Dude”, in which she explains: “At the most basic level, we are made of atoms, just like all matter is. Living things are mainly composed of the following ingredients: Carbon, Hydrogen, Nitrogen, Oxygen, Phosphorus, Sulfur.” [2]

Hill order

In 1900, American chemist Edwin Hill introduced the following set of rules for making formulas of carbon-based compounds and molecules:

1. For carbon-containing compounds, carbon (C) appears first.
2. Carbon is followed immediately by hydrogen (H), if present.
3. Compounds are listed by increasing number of atoms.
4. All non-carbon element symbols follow in alphabetical order, and within alphabetical order are listed by increasing atom count.

In this scheme of things, in alphabetical order, CH would be followed by N, O, P, S, and so on, hence the acronym: "CHNOPS". This come to be known as "Hill order".

It remains to be determined who exactly introduced the so-called acronym "CHNOPS", but it does seem to have something to do with the Hill order scheme for arranging atoms in a molecule or chemical species.

Overview

In 1926, German physical chemist Wilhelm Ostwald, in his *Lifelines: an Autobiography*, stated the following about himself: [11]

> “I am made from the **C-H-N-O-S-P** combination from which a Bunsen, Helmholtz, Kirchhoff came.”

In 1936, American plant physiologist Frank Thone described plants, pictured above, as "CHNOPS plus" systems. [1] In particular, Thone stated "Chnops: six chemical elements are essential parts of protoplasm, the living substance itself. These are carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur." [1]

In 1964, the term "CHNOPS system" was introduced in US National Bureau of Standards report entitled “Preliminary Report on Survey of Thermodynamic Properties of the Compounds of the Elements of CHNOPS” by a group of researchers led George Armstrong. [6]

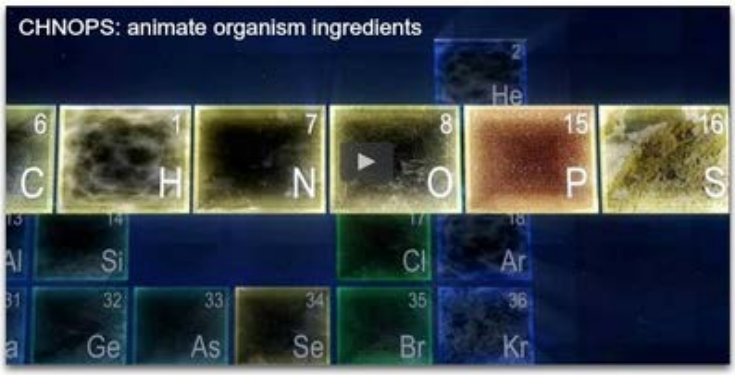

Image of the 2013 NOVA video (Ñº) special “CHNOPS: Ingredients for Life”.

In 1968, Harold Morowitz, per citation and work with Armstrong, was referring to humans, animals, plants, and bacteria as “CHNOPS organisms”. (Ñº)

In 1974, American thermoregulation heart surgeon Henry Swan, in his *Thermoregulation and Bioenergetics*, stated the following: [4]

> "But a biochemistry could emerge in which life is powered by the * This small group of low molecular-weight 'core elements of life' has been dubbed the '**CHNOPS System**' by Armstrong, et al. (1964)."

In 2005, American electrochemical engineer Libb Thims, following Hill order protocol, posted the following online first-draft listing of the molecular formula for one human: [5]

Note 6: in accordance with Hill Order, we arrange the (first approximation) formula for the human molecule as below:

$$C_{E28}H_{E28}N_{E27}O_{E27}P_{E25}S_{E25}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Se_{E24}Fe_{E23}Co_{E23}Cu_{E23}F_{E23}I_{E23}Zn_{E22}Si_{E22}Mn_{E20}B_{E20}Cr_{E20}V_{E20}Sn_{E19}Mo_{E18}Ni_{E16}$$

Further refined calculations, however, began to give way to the view that the old Hill order system (alphabetical) was an an inconsistent way of ordering atoms, particularly when dealing with a 26 atoms in one molecular formula. The new system, outlined below, lists atoms via decreasing atomic count in the molecule.

In 2015, Charles Cockell, in his *Astrobiology: Understanding Life in the Universe*, referred to carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur as the "bioelements", showing them as follows: (Ñº)

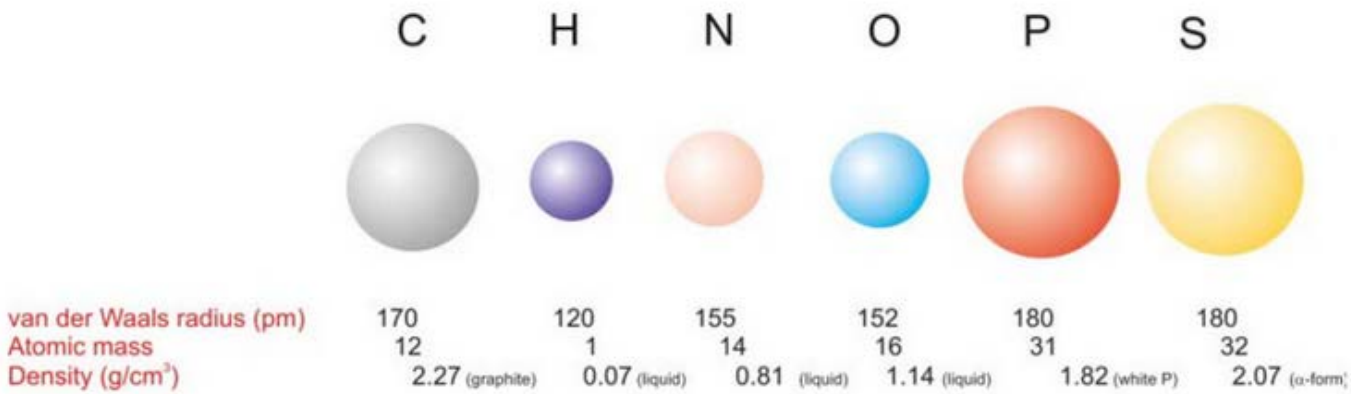

(add)

Pronunciation | Schnapps or Chin-ups

In 1936, Frank Thone, in his *Science News Letters* article "Nature Ramblings: 'Chnops,' Plus", stated the following on the chemistry of protoplasm: [1]

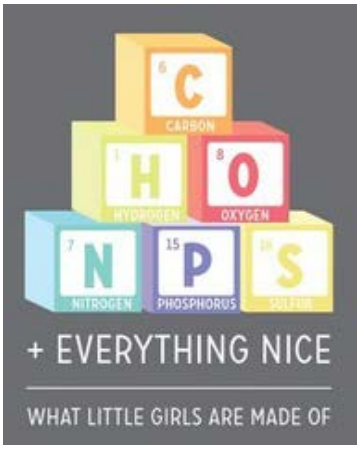

> "Six chemical elements are essential parts of protoplasm, the living substance itself. These are carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulphur. Their initial letters, which happen also to be their chemical symbols, have been arranged into a memory-saver word or mnemonic: **CHNOPS** — pronounced like the German

word for strong liquor, Schnapps. There is a considerable quantity of the first four elements in protoplasm, and only a very little of the other two; but those small amounts are indispensable to life. Take them away, and protoplasm is no longer protoplasm; neither is it any longer alive." "

Two CHNOPS representations: blocks and bracelet. (Ñº)

The English word "schnapps", according to the above view, is, supposedly, derived from the German Schnaps (plural, Schnäpse); a representative pronunciation example being the common American liqueur Peach Schnapps. [7]

Alternatively, however, to the English reader, a representative example being the mindset of American electrochemical engineer Libb Thims, the first to employ the pneumonic in human molecular formula memory device (c. 2003), has always thought of the pronunciation along the lines of someone doing "chin-ups" exercises. [7]

Mnemonic | Human formula

The following, using Hill order, for the first six element comprising a human, according to the 26-element Thims molecular formula, is a useful memory device—one employed by Libb Thims in 2005 to help remember the elements of a human molecule:

#s	Formula (section)	Mnemonic	Conceived by	Elements	Image[s]
1-6	Hill order: $C_{E27}H_{E27}N_{E26}$ | $O_{E27}P_{E25}S_{E24}$ Composition order: $C_{E27}H_{E27}O_{E27}$ | $N_{E26}P_{E25}S_{E24}$ Amounts (powers of 10): 27, 27, 27 | 26, 25, 24	"Schnapps" (CH-Nops) "Chin-ups" (Chn-Ops)	Throne (1936) Thims (2005)	C, H, N ; O, P, S	CHN-OPS (guy doing "chin ups") 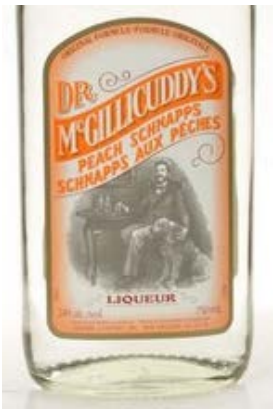 "Schnapps" (German for hard liquor)
7-12	Composition order: $Ca_{E25}K_{E24}Cl_{E24}$ | $Na_{E24}Mg_{E24}Fe_{E23}$ Amounts (powers of 10): 25, 24, 24 | 24, 24, 23	Parrot, pirate, and mug "**Cackl**e" (Ca+K+Cl) parrot on shoulder of pirate who's holding a "**Na**mless **M**ug that's **F**oam[**e**]" (Na+Mg+Fe)	Thims (2005)	Ca, K, Cl ; Na, Mg, Fe	
13-18	Composition order: $F_{E23}Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}$ Amounts (powers of 10):	Cute cubicle girl "**F**eel (F) **Z**estfully (Zn)	Thims (2005/15)	F, Zn, Si ; Cu, B, I	

	23, 22, 21 | 21, 21, 20	**Si**mple (Si) in **CuBI**cle (Cu+B+I)"			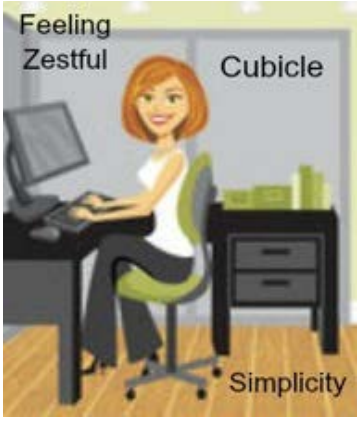
18-24	Composition order: $Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}$ Amounts (powers of 10): 20, 20, 20 | 20, 20, 19	Sinful coin maker "**Si**ful (Sn) **Mag**nanimously (Mn) **Se**cretive (Se) coin maker **Cr**eating (Cr) **Ni**ckel (Ni) **Mo**ney (Mo)"	Thims (2015)	Sn, Mn, Se ; Cr, Ni, Mo	
25-26	Composition order: $Co_{E19}V_{E18}$ Amounts (powers of 10): 19, 18	Cobalt vanadium blade "to buy an expensive **Co**balt (Co) **V**anadium (V) blade."	Thims (2015)	Co, V	

In sum, a good story mnemonic to help remember the elements and numbers of elements in one human, formulaically-speaking, is to remember the following story:

> "Once upon a time, a guy, while doing 26 **chin-ups** {CHNOPS}; remembered the story of a **cackl**ing parrot {CaKCl}, on the shoulder of a pirate, stairring at a **na**meless mug of beer, with a foamy top {NaMgFe}; who once was a beautiful girl, **f**eeling **z**estfully **si**mple {FZnSi}, while working, 27 to 18 days a month, in a pleasant **cubi**cle {CuBI}; but was transformed chemically into a pirate because of her association with a **sin**ful **magn**animously **se**cretive {SnMnSe} coin maker who **cr**eated **ni**ckel **mo**ney {CrNiMo}, so to buy an expensive **co**balt **v**anadium {CoV} blade, which was said to contain the the secret principle behind Empedocles' famous aphorism that friends mix like water and wine, whereas enemies separate like oil and water."

The number 26 here refers to the number of types of elements, in one human, the numbers 27 to 18 signify the range power subscripts, associated with each element, respectively, e.g. C (10E27), H (10E27), N (10E26) ... V

(10E18), i.e. there are, on average, e.g., 10 to the power of 18 vanadium atoms in one 150 kilogram human.

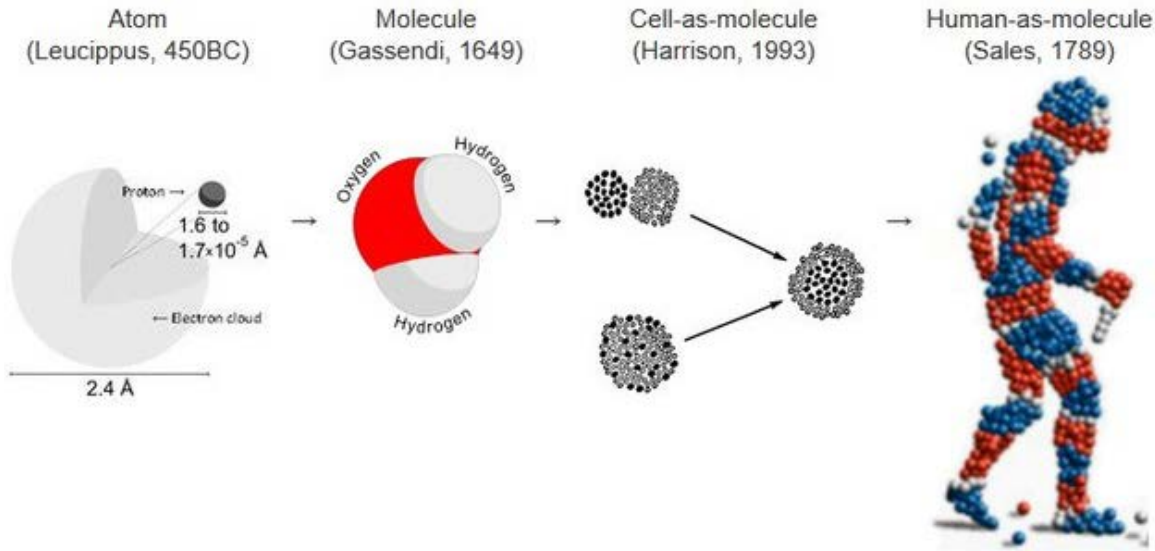

New system

In contrast to what might be called the "old system", i.e. the CHNOPS system model (1936), the "new system" is centered around animate molecular formula point of view, i.e animate molecule perspective.

The new system model is depicted well by the 1993 "cell-as-molecule" approach, pioneered by English physical chemist Lionel Harrison, and the 2002 "human-as-molecule" (human molecule) approach, pioneered by American limnologists Robert Sterner and James Elser, according to which organisms are defined as individual abstract molecules, each defined by a characteristic molecular formula: 22-elements according to the Sterner-Elser human molecular formula (2002):

$$H_{375,000,000}\ O_{132,000,000}\ C_{85,700,000}\ N_{6,430,000}\ Ca_{1,500,000}\ P_{1,020,000}\ S_{206,000}\ Na_{183,000}\ K_{177,000}$$
$$Cl_{127,000}\ Mg_{40,000}\ Si_{38,600}\ Fe_{2,680}\ Zn_{2,110}\ Cu_{76}\ I_{14}\ Mn_{13}\ F_{13}\ Cr_{7}\ Se_{4}\ Mo_{3}\ Co_{1}$$

or 26-elements according to the Thims human molecular formula (2007); a view according to which the old 6-element CHNOPS model becomes obsolete, archaic in a sense.

In the human-centric case, the human molecular formula perspective is followed, according to which there are 26 functional elements of relevance rather than 6 as described by the old system model. In this sense the CHNOPS ordering model becomes somewhat inoperable. The following, then, in modern terms, is the 26-element formula of the molecular formula for a typical 70kg (154lb) person: [2]

$$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}$$
$$Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$$

where EN, e.g. E22, means exponent to the power of ten.

In this sense, in stead of defining a human or a plant as a "biological system", which is a baseless term, being that in the famous 1915 by Serbian-born American electrical engineer Nikola Tesla "there is no thing endowed with life" (see: defunct theory of life), we can instead define a plant or a human as a "chnops plus system", which is a chemistry based terminology rather than a religious-mythology based terminology.

Thermodynamics of animation

The principles of thermodynamics are what define the nature of animation in "CHNOPS plus systems. This subject is sometimes called "animate thermodynamics" (Sture Nordholm, 1997), particularly when applied to humans.

Quotes

The following are related quotes:

> "Here, as elsewhere, evolution

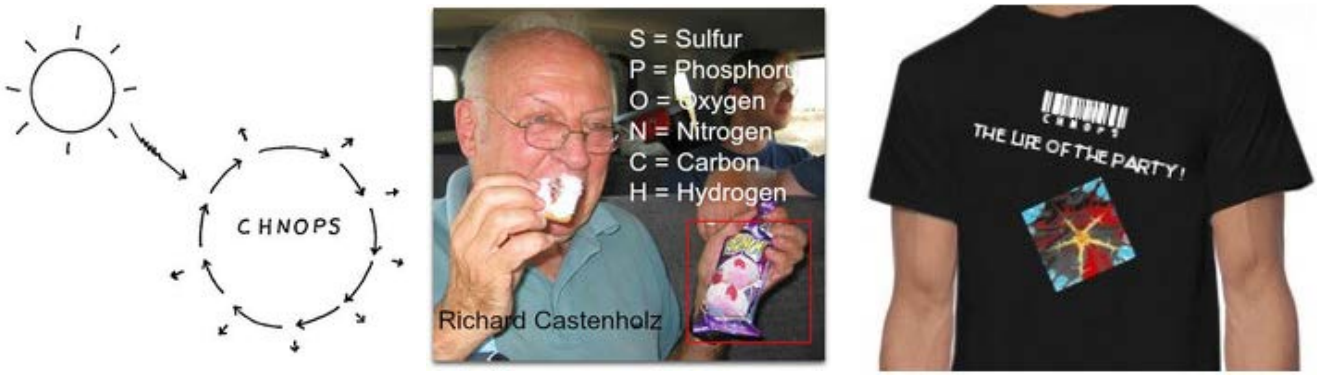

Left: A 1993 diagram of the "CHNOPS cycle and energy flow" from Chinese-born English biophysicist Mae-Wan Ho's *The Rainbow and the Worm: the Physics of Organism*; which seems to capture the notion of the photon mill concept. [3] Center: American ecologist Richard Castenholz (Ñº) eating a "Sponch" (variant of **CHNOPS**), a Mexican version of a Twinkie, his acronym to define life chemically. [12] Right: A 2012 "**CHNOPS**: the Life of the Party!" T-shirt, centered over what seems to be a big bang explosion artwork. [8]

may have proceeded partly by the loss of function and capacity, and the so-called bioelements, **C H N O P S** Na K Ca Fe etc., with which present-day organisms unenterprisingly carry out 99.99 per cent, of their activities, may have been economically selected from an initially more catholic approach to chemistry."

— Author (1954), "Article", *New Biology*, 16-17

"There is no evidence of a special life force, all of life on earth, including ourselves, is based on chemical processes and the four most common elements involved in the chemistry of life are hydrogen, carbon, oxygen and nitrogen, collectively known by the acronym **CHON**. We are made out of exactly the raw materials which are most easily available in the universe. The implication is that the earth is not a special place, and that life forms based on CHON are likely to be found across the universe, not just in our galaxy but in others. It is the ultimate removal of humankind from any special place in the cosmos, the completion of the process that began with Copernicus and *De Revolutionibus*."

— John Gribbin (2002), "CHON and Humankind's Place in the Universe" [10]

See also

â— Redfield ratio

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2. McKissick, Katie. (2010). "That Which Life is Made of, Dude", BeatricetheBiologist.com, Jul 22.
3. Ho, Mae-Won. (1993). *The Rainbow and the Worm: the Physics of Organism* (2008 3nd ed). World Scientific.
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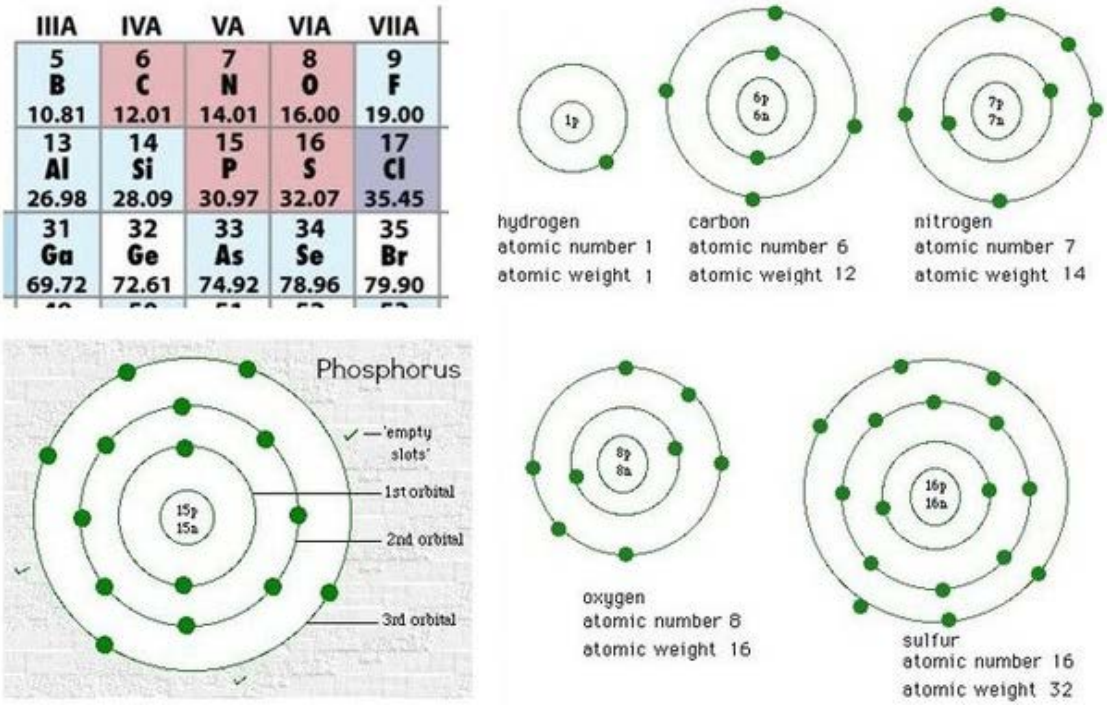

A 2010 *ScienceBlogs.com* depiction of the CHNOPS elements on the periodic table (see: hmolscience periodic table), shown in the top left corner, as found amid a discussion of a NASA press release about an extremophile bacterium that can be coaxed into substituting arsenic for phosphorus in some of its basic biochemistry, surrounded by orbital views of the six CHNOPS elements, which crudely shows that all of chnopsological based animate existence–human existence included–is but the result of the so-called "need" of the CHNOPS atoms, predominately, to fill the "empty slots", quantum electrodynamically (photon-electron dynamics) speaking, of their orbitals to achieve the stable noble gas configuration (see: octet rule) geometry (see: floating magnets experiment). [9]

6. Armstrong, George T., Domalski, E.S., Furukawa, George T., and Krivanec, M.A. (1964). "Preliminary Report on Survey of Thermodynamic Properties of the Compounds of the Elements of CHNOPS", *National Bureau of Standards* (US) Report number: 8521.
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(b) Fisher, Kathleen. (c.2005). "Atoms, Elements, and the Periodic Table", San Diego State University.
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(b) Farber, Eduard. (1961). *Great Chemists* (§:Wilhelm Ostwald, pgs. 1019-30; quote, pg. 1021). Interscience Publishers.
12. Hoehler, Tori. (2007). "Life and Extremes", Slide #11 (Ñº), from ppt presentation.

External links

â— CHNOP – Wikipedia.

θΔics

In hmolscience, **CHNOPS+**, or “CHNOPS plus” (Thone, 1936), is a short hand device employed to defined a CHNOPS-based thing, such as a bacterium, plant, animal, or human, etc., as being carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur based thing, PLUS (+) an additional number of elements, which varies per entity, e.g. 26 elements for humans. [1]

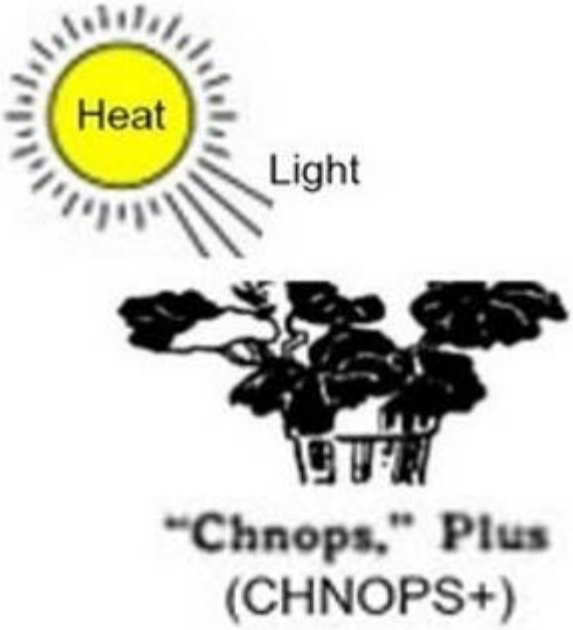

A depiction of Frank Thone's 1936 picture of a plant labeled as a "**CHNOPS plus**" thing or system. [1]

Overview

In 1936, Frank Thone, in his article “Nature Ramblings: ‘Chnops,’ Plus”, introduced the CHNOPS+ notation, by diagramming a plant, shown adjacent, as a “Chnops plus” system or thing. [1]

In 2012, Libb Thims, during research into the history of CHNOPS stylized notation, discovered Thone’s article, and thereafter began to incorporate this logic, via the "CHNOPS+", using the " + " symbol, style of notation, into his own terminology usages, to define things, such as a human, a CHNOPS+20 element existive.

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1. Thone, Frank. (1936). “Nature Ramblings: ‘Chnops,’ Plus”, *Science News Letters* (CHNOPS, pg. 110; protoplasm, pg. 110), 30(801), Aug 15.

θΔics

In thermodynamics, **chnops-thermodynamics**, chnopsological thermodynamics, or “chnopsthermodynamics”, referring to the thermodynamical study of CHNOPS-elemental based systems and entities, is a physical science correct life terminology upgrade term to the older now-defunct terms: life thermodynamics, biothermodynamics, biological thermodynamics, and to some extent biochemical thermodynamics.

Etymology

The term “chnopsthermdoynamics” is an Hmolpedia coined term (see: life terminology upgrades), used in several articles, e.g. Luigi Fantappie, prior to the start of this article.

θΔics

In science, **chnopsological system**, an upgrade term for the defunct term "biological system" (see: defunct theory of life), is an animate, heat-driven, reactive, CHNOPS-centric element based system. In animate thermodynamics terms, a chnopsological system, is a thermodynamic system comprised of CHNOPS matter.

θΔics

In thermodynamics, **chnopsological thermodynamics**, or "chnops-thermodynamics", is the thermodynamical study of CHNOPS-elemental based organisms chnopsological systems, reactions, or processes. [N1]

See also

- Chnops-chemistry (vs. bio-chemistry)
- Chnopsological system

Notes

N1. The term “chnopsological thermodynamics”, an upgrade to the defunct term biological thermodynamics, is an Hmolpedia coined term, first used in the bildungstrieb article on 29 Aug 2012.

θΔics

In science, a **chnopsologist** is a person who specializes in powered-chnopsology (formerly: biology), the study of CHNOPS-based animate systems (formerly: living systems).

Etymology

The term “chnopsologist” is an Hmolpedia-introduced term first used on the Jacques Monod article, on 23 Jul 2012, among a few other articles in this time period.

θΔics

In science, **chnopsology** is the study of CHNOPS-based reactive animate structures, animate organisms, animate systems, animate molecules, or animate matter.

â— Biochemistry → The study of 'powered CHNOPS systems' (Henry Swan, 1974)

Etymology

The term "chnopsology" is an Hmolpedia-coined term, first suggested as an upgrade replacement for the now-defunct term "biology" (see: defunct theory of life), introduced in a set of June 2012 Hmolpedia forum threads discussions between Belgian psychologist-philosopher David Bossens and Americans civil-ecological engineer Jeff Tuhtan and electrochemical engineer Libb Thims, namely in threads: "maximum entropy and heat death" (Jun 14), "life" (Jun 16), "misrepresentation" (Jun 20), and "animated organisms" (Jun 23). In the "life" thread, post #15, Thims commented in response to a query by Bossens:

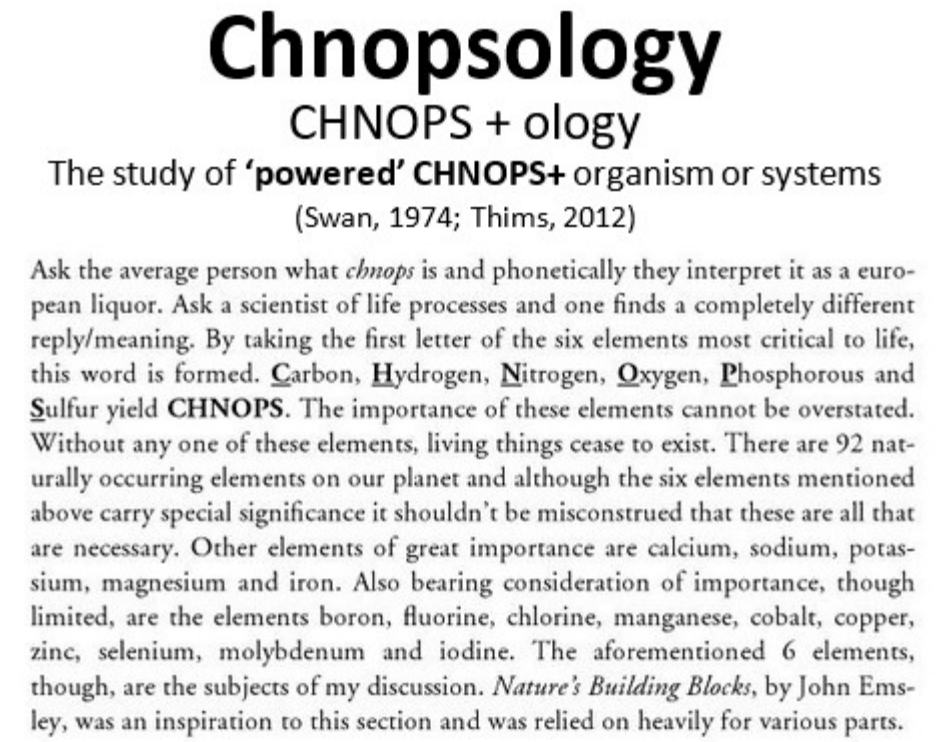

Chnopsology

CHNOPS + ology

The study of **'powered' CHNOPS+** organism or systems

(Swan, 1974; Thims, 2012)

Ask the average person what *chnops* is and phonetically they interpret it as a european liquor. Ask a scientist of life processes and one finds a completely different reply/meaning. By taking the first letter of the six elements most critical to life, this word is formed. **C**arbon, **H**ydrogen, **N**itrogen, **O**xygen, **P**hosphorous and **S**ulfur yield **CHNOPS**. The importance of these elements cannot be overstated. Without any one of these elements, living things cease to exist. There are 92 naturally occurring elements on our planet and although the six elements mentioned above carry special significance it shouldn't be misconstrued that these are all that are necessary. Other elements of great importance are calcium, sodium, potassium, magnesium and iron. Also bearing consideration of importance, though limited, are the elements boron, fluorine, chlorine, manganese, cobalt, copper, zinc, selenium, molybdenum and iodine. The aforementioned 6 elements, though, are the subjects of my discussion. *Nature's Building Blocks*, by John Emsley, was an inspiration to this section and was relied on heavily for various parts.

A book section from American protein chemist Scott Neuhaus' 2005 book *Handbook for the Deep Ecologist*, with the 2012 upgrade term **"chnopsology"** overlaid in gray, wherein he discusses how English chemist John Emsley's 2001 *Nature's Building Blocks*, was an inspiration for his CHNOPS chapter, a discussion of the six elements, as Neuhaus says, "most critical to life". [1]

> "Re: "[we] can['t] deny that bio/whatever-ology is different from a rock, a table, a chair, glass...", watch the following chemical party video. The carbon atom is the central entity of your "whatever-ology" subject, i.e. "carbon-ology", being that carbon is a light-sensitive atom, meaning that it has the property of flexibility and hence animation and as such is very "reactive" or the "life of the part" as the video shows. The argon (Ar) is like the "rock, table, chair, glass", notice how she is very non-reactive (although, technically, glass is silicon-based; rock can be seen has having a certain amount of reactivity, in the big history geochemical view of earth structure change). More correctly, however, I would say that "CHNOPS-ology" (chnops-ology or **chnopsology**), is the namesake you are looking for; e.g. Erik Andrulis' 2012 abstract (panbioism):
>
> > "This theory is based upon a straightforward and non-mathematical core model and proposes unique yet empirically consistent explanations for major phenomena including, but not limited to, why living systems [animate systems] are predominantly CHNOPS (carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur)."
>
> Notice how the questionable term "living system" easily drops out of the definition, and can easily be rewritten using the updated substitution of "animate systems", a term we all agree upon. I've used the CHNOPS mnemonic as well before, back in *circa* 2003, when I wrote out a memory crick to help memorize the human molecular formula. I'll start an Hmolpedia CHNOPS article soon, to help with the matter (being that there are numerous CHNOPS articles around [the internet])."

The term "chnopsology" was first used as a dead link on the animate organism page (23 Jun 2012) and used a second time as a dead link on the Gerald Joyce page (24 Jun 2012), upon which the chnopsology Hmolpedia article (this page) was started (24 Jun 2012), for lack of a better term (in replacement of biology); although, to note, the alternative term

animate science, used as a dead link on many pages has been also employed as an alternative synonym, themed on the well-established term "animate thermodynamics"; the alternative (animate science), however, in itself, does not seem to exactly capture the essence of what was in old defined as "biology", in the sense that something such as a windmill or a Hero hydrostatic automaton can both be considered "animate", but not necessarily "alive" (olden term) or "chemically reactive" (modern view) in a perceptual desire-directed motion, in the sense that the hydrogen atoms wants to bond with the oxygen atom; although what we call "want" technically is the result of the action of the exchange force acting on the bodies in question.

See also

â— Life terminology upgrades

References

1. (a) Neuhaus, Scott. (2005). *Handbook for the Deep Ecologist: What Everyone Should Know About the Self, Environment, and the Planet* (§:CHNOPS and the Cycles of Life, pgs. 23-; about the author, pgs. 125-). iUniverse.
(b) Scott J. Neuhaus (about) – ScottNeuhaus.com.
(c) Emsley, John. (2001). *Nature's Building Blocks.* Oxford University Press.

θΔics

In science, the **chocolate theory of love** or "PEA sex theory of love" argues that feeling of being in love is similar to the feeling one gets when eating chocolate; a theory substantiated on the basis that both people in love and amounts of chocolate contain high levels of the amphetamine-like neurotransmitter phenylethylamine (PEA). [1]

Spanish singer Veronica Romeo's 2012 single (O) "Tastes Like Chocolate", in which see sings how she is dreaming of someone whose kiss tastes like chocolate, a play on the premise that dreamed of perfect love will yield the amphetamine-high similar to the effect of eating chocolate. [1]

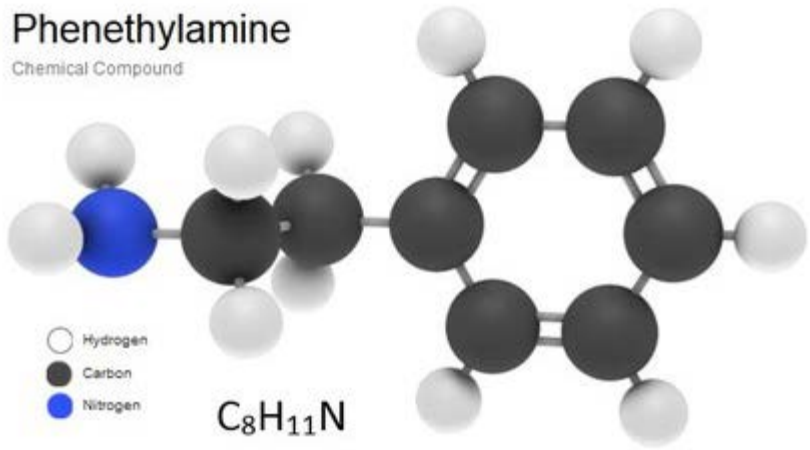

The theory is intuitively confirmed by noting that people recently dumped tend to consume a large amount of chocolate, indicating that such individuals are acting to elevate brain PEA levels to previous mid-relationship levels, and that people tend to give out chocolate on Valentine's day.

Origin

The chocolate theory originated, in *circa* 1980, through interviews of American psychologist Michael Liebowitz, author of the 1983 book *The Chemistry of Love*. [2] During an interview, according to Liebowitz, he remarked to reporters that "chocolate is loaded with PEA", and this side comment became the focus for an article in *The New York Time*, which was then taken up by the news wire services, then evolving into the non-eponymous "chocolate theory of love". In his own words: [3]

> "In one interview I remarked that chocolate was loaded with PEA, so perhaps people ate chocolate to enhance romantic feelings ... this became the focus for an article in *The New York Times*, which was then taken up by the wire

services, then by magazine free-lancers, and evolved into the **chocolate theory of love**."

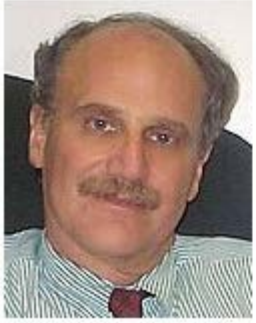

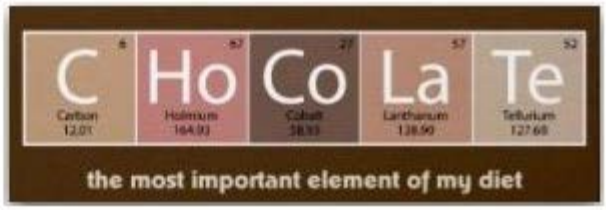

Left: American psychologist Michael Liebowitz, originator of the *circa* 1980 so-called "**chocolate theory of love**", that would go on to capture news headlines in the decades to follow. [3] Right: Humorous chemical alphabet depiction of the spelling of **chocolate** in relation to the elements: C (carbon), Ho (holmium), Co (cobalt), La (lanthanum), and Te (Tellurium); only two (C and Co), to note, are actually found in the structure (diet) of the human molecule (human being).

To test the theory, researchers at the National Institute of Health ate pounds of chocolate, and then measured the levels of PEA in their urine in the days to follow; the PEA levels, however, remained unchanged. [3]

In this case, these negative results are likely similar to earlier serotonin studies, which showed that to determine accurate changes in brain PEA levels, measurements must be taken from the jugular vein (of the neck), thus measuring blood directly leaving the brain.

See also

- Chemistry of love
- Endorphin theory of love

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2. Friedman, Max. (1996). "A Bittersweet Romance: Can a Heartfelt Love of Chocolate Really be Wrong." (pg. 80), *Vegetarian Times*, No. 221.
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4. Voronical Romeo – Wikipedia.

Further reading

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- Williams, Mary L. (2009). "Chocolate, Love and Myth-information", *FortMyersBeachTalk.com*, Feb. 12.

θΔics

In terminology, **choice** refers to the mental act of picking or deciding between one or more options or courses of action.

Overview

The act of choosing between different paths, showing adjacent, brings to mind Ernst Mach's sketch and description of turning tendencies of men, while lost in a snow blizzard in the woods, apparently, making the reasoned "choice" to walk in a straight line, but resultantly walking in circles, owing to the gravitational, magnetic, and electromagnetic field lines in their location.

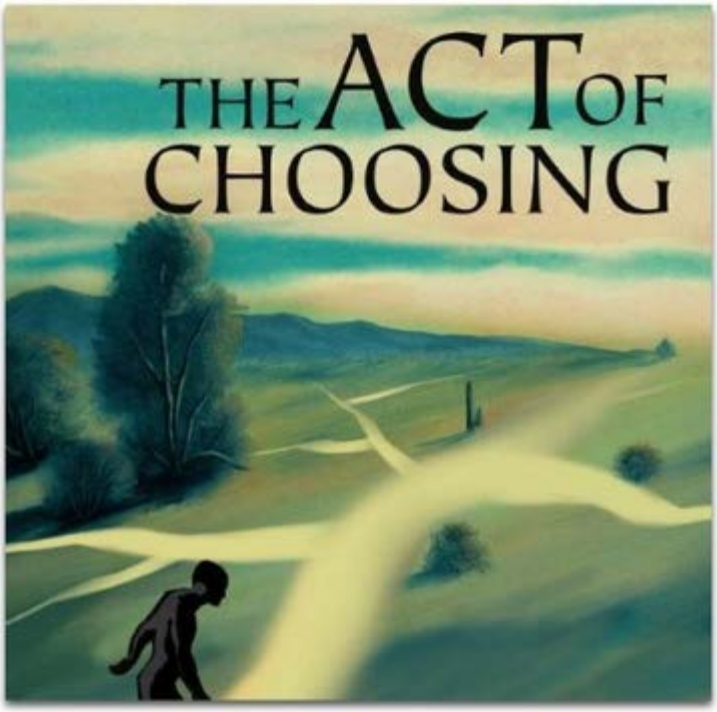

Cover section from Russell Rhyne's 2003 *The Act of Choosing*, wherein, citing Kurt Lewin, among others, he argues for a "socio field", or sociofield as Paris Arnopoulos (1993) calls it, and states that the ability to "choose", or make a **choice**, originated 4M years ago and that the "melding of reason with choosing gave our species its edge over all the other hominids". (Ñº)

Religion | Science

American orthodox rabbi Shmuley Boteach, in his 2009 religion vs science debate (V: 6:41-9:30) with Sam Harris, Christopher Hitchens, and Daniel Dennett argues rather cogently that the concept of free "choice" is the crux of the whole issue:

> "Religion isn't really only about how the world was created. That's just the sideshow. The chapters in Genesis that deal with creation of the world are only two or three. What religion really is, is the most radical statement in the history of the world, which is that every single one of you possesses the power to 'choose' the kind of person you want to be. There is a god who gave us moral commandments and that without god, the laws of do not kill, do not steal, do not commit adultery, are nothing but euphemisms for personal taste, because if there isn't a god who is the ultimate arbiter and thee standard by which these laws have definition then all we have are two different people who are disagreeing.
>
> I want Sam Harris to please address: a child is born and he has severe Down syndrome. He will never be anything but a burden to his parents. He is a financial strain. Special needs children often even ruin the marriages of their parents. Why should we not euthanize that child? We get so upset that Hitler euthanize the infirm, but doesn't that sort of makes sense? In fact Francis Crick, who won the Nobel Prize for mapping the DNA molecule, said that we should really define birth as two days after parturition so that a baby could be examined for defects and if those defects were sufficiently deleterious we could declare the child to not yet have been born. The only reason we keep that child alive, even though we all live in a society of limited resources, is because life is 'sacred', not because of the quality of life, but the sanctity of life. There's no rational reason.
>
> Somewhere right now, there is a police officer in the north of Mexico and he barely arms enough money to support his family and that drug dealer wants to give them a few extra bucks to look at the other way while they smuggle cocaine into the United States, and no one's ever going to find out, and no one's ever going to see, and no one's ever going to know. Tell me one reason why the police officer should not take the money when he needs it for his family? Give me one moral reason other than the idea that there is justice in the world and that we have the power to choose our moral character? Everything we've heard in this conference is that people almost have no choice. Science seems to be going against choice. Biological determinism. Genetic predisposition. Freud said we're far less far less masters of our own mental household than we otherwise suppose, an out of control id and ego. But religion says that at every moment you have the power to choose."

The topic of “choice”, in short, is a central one in the hmolsciences and often the deciding factor on whether or not a person is accepting or non-accepting of human molecular theory, the definition of a person as a molecule, chemical, atomic geometry, chemical species, giant molecule, or supermolecule, among other namesakes.

Unbridgeable gap | Two natures

Some will maintain an unbridgeable gap between the two, humans and chemicals, attributing the free choice to the former, but not the latter. The position of American economist Robert Heilbroner is an example of this mindset. He stated in 1953 that: [1]

> “There is an unbridgeable gap between the ‘behavior’ of [subatomic particles] and those of human beings who constitute the objects of study of social science. Aside from pure physical reflexes, human behavior cannot be understood without the concept of volition—the unbridgeable capacity to change our minds up to the very last minute. By way of contrast, the elements of nature ‘behave’ as they do for reasons of which we know only one thing: the particles of physics do not **‘choose’** to behave as they do.”

Here Heilbroner distinguishes between "chemical behavior" and "human behavior" the nature of each according to him being of different categories, separated by an unbridgeable gap. Long ago, however, Goethe dismissed all of this incongruity, with his famous advertisement, in which he stated clearly:

> "There is, after all, only one nature."

The Google query “is love a choice?”, as contrasted with the alternative (and correct) search term “is love a chemical reaction?”, is one of the most-frequently queried topics in regards to love and relationships.

Elective Affinities

See the article "Elective Affinities | IAD: **Title decoding**" for a detailed discussion of the how "choice" is explained, via hidden code, in the term "elective affinities" or in its original German:

> Die [The] + Wahlverwandtschaft [Elective Affinity] + en [s]

Goethe

German polyintellect Johann Goethe in 1809 addressed the question of the nature of choice in the context of physical chemistry by turning to the study of chemical reactions

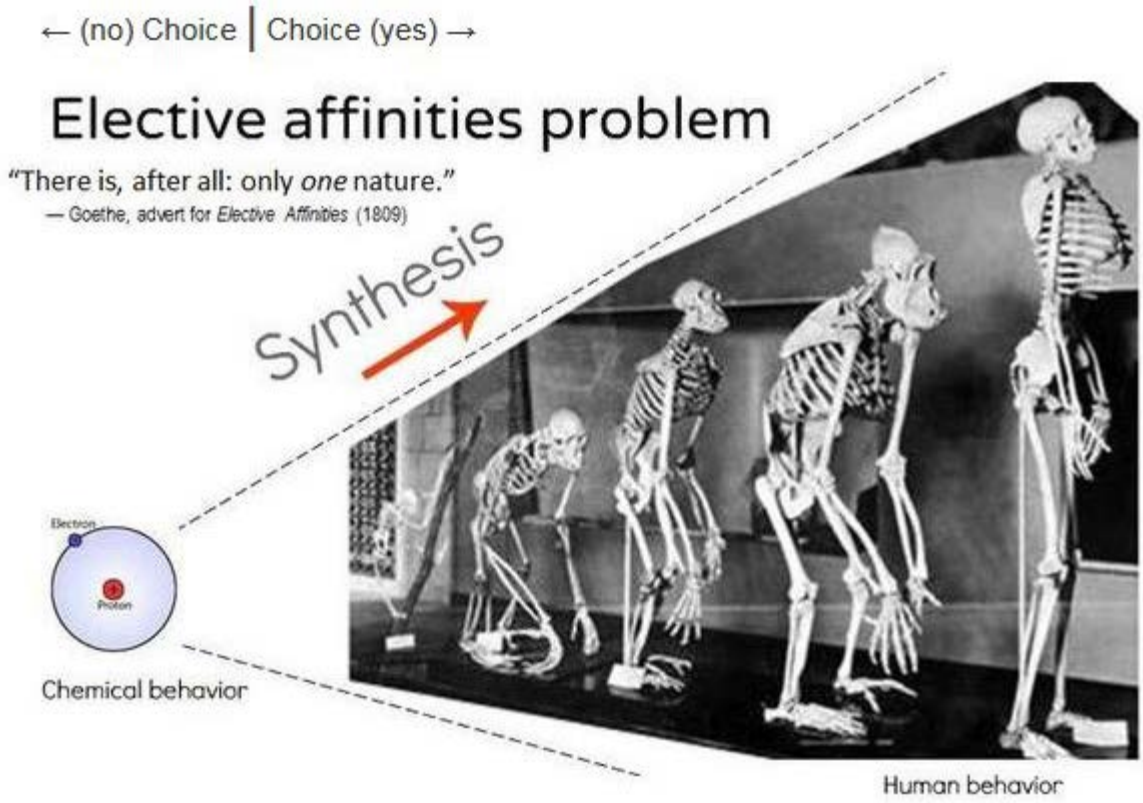

The general model that many have in regards to **choice**: the idea that the hydrogen atom has no choice whatsoever, but that at some blurry "emergent" or ontic opening point in the rise in form change to humans the property of molecules to "chose" (see: ABC model) on their own become evident or something along these lines.

as models of reality. In short, if humans are but evolved, synthesized, or "metamorphosized", as Goethe envisaged things, types of reactive animate chemicals, then just as, e.g., the carbon atom, say in the bonded geometry of the methane molecule CH_4, has no "choice" but to debond from its association with its cohort of four hydrogen H atoms, when put into contact with oxygen O_2 and ignited, to form the products carbon dioxide CO_2 and water H_20, via the heat-releasing process of combustion:

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$$

so to do humans, or rather "human molecules", via extrapolate up logic, likewise, have no "choice" in the bonding and debonding interactions, via similar heat-releasing or heat-absorbing processes, that he or she encounters in his or her course of daily reaction existence of combustion-like human chemical reactions (see: HCR theory). Acceptance of this premise, however, requires a completed "revolution" in human thought, particularly so in respect to the world's belief system, of which over 75 percent is dominated by a 5,000-year old soul/karma weight based morality system per culturally-transmitted Anunian theology.

Discussion

(add)

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1. (a) Heilbroner, Robert. (1953). *The Worldly Philosophers*, 7th ed. (pgs. 316-17). Penguin, 1999.
(b) Ball, Philip. (2004). *Critical Mass - How One Thing Leads to Another* (quote, pg. 207). Farrar, Straus and Giroux.
(c) The Worldly Philosophers – Wikipedia.

External links

â— Choice – Wikipedia.

θΔics

In terminology, **Christ**, the root of Christianity (see: Christopher etymology), via the namesake Jesus Christ, from Egyptian "krst", hieroglyphic: 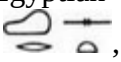 , meaning "mummy", derived from: "kasu", hieroglyphic: , meaning “burial place”, the name of the metropolis of the 14th nome of Southern Egypt; later conflated with the Greek "anointed", meaning rub with oil (part of the mummification process), translates as "reborn mummy", all based on the Osiris myth or Osirian religion (Harper, 2004), itself being a core thread of Heliopolis creation myth.

The hieroglyphic for **Christ** "krst" meaning mummy, the root meaning of the term Christ, Messiah, and or "the anointed".

Messiah | Etymology

In 1883, Gerald Massey, in his *The Natural Genesis, Volume Two* (pgs. 357-59), explained connects Messiah, anointed, and Christ as follows:

> “The true root of the name ‘**Messiah**’ is the Egyptian *mes*, which denotes birth and rebirth. Messiah is the reborn or AEonian Iu (Eg.), Iao or Jah, — even as the month *Mesore* was named from the rebirth of Horus the child, which was annual. In Egypt the Repa, prince or heir-apparent, was the Messiah by name and nature, as the *messiu* or *messui*, the representative of Ra, the ever-living, who was continued by transformation into the young one, the ever-coming Messiah. The Messiah of Christology and supposed prophecy was the manifestor who was forever being reborn in time. The Messiahship was cyclic, and wholly dependent on the fulfillment of the cycles of time. The Egyptian Ra and Repa were the representatives of this manifestation in time, as personifications of the divine or solar Messiah, in the two aspects of father and son.
>
> The Messiah, then, is the one who is reborn according to the cycle of time; but the natural genesis has to be traced beyond the symbolical aspect. The first Messiah was reborn at puberty. This was the earliest form of the **anointed** male. These things can only be fathomed in their fundamental phase. The anointed one did not commence from having oil poured on the head. The first male type of the prophet was the anointed by nature at puberty ; the aboriginal anointed, who preceded the oil-anointed, man-made prophet. As previously explained, the earliest mode of artificial anointing is that of Inner Africa, where the ointment was composed of red ochre mixed with grease or oil. In one of the Hottentot songs there is an allusion to the red ochre of anointing, and this is actually contrasted with the flesh-forming source. Lightning, the daughter-in-law of fire, is thus addressed: ‘*Thou who hast painted thy body red like Goro,*’ i.e. with ochre or red-clay, ‘*Thou who dost not drop the menses*’ or redden that way. The Hottentots also had a certain image or fetish-god which their women were accustomed to anoint by covering its head with a kind of red earth and buchu or sweet smelling herbs. This was their typical Messiah; and we learn from Egyptian thought and expression that anointing or coating with red ochre was a symbolical mode of refleshing. It was in this manner that Ptah refleshed the spirit for its rebirth from the womb of the underworld ; and the red earth represented the human or Adamic clay. In anointing the fetish image, the Hottentot women were imitating nature in fleshing the child for birth. Instead of calling on the saviour to come, they enacted the rebirth of the Messiah in the process of refleshing or, as it came to be called, anointing or embalming.
>
> The Egyptians had discovered how to preserve the dead body intact with the flesh upon it, and its lineaments wearing the likeness of life; by which art they superseded the incasing or refleshing of the bones in the red ochre of the earlier stage. This embalmment of the dead body is termed "*karas,*" and the embalmed mummy reborn by the preservative process, and placed in the tomb to await the rebirth in spirit

life, is named the *karast* or ***krust*** [christ] 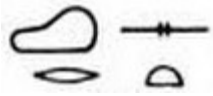 , as the mummy-type, the shebti or double, an image of rebirth. This type of immortality or continuity was the anointed, the Messiah, the *Christ*, who in the later application of the ointment or oil is literally the *greased.* Mes (Eg.), the root of Messiah, also means to anoint, to generate, as well as to give birth. The mother was the anointer with her own blood as embodier of the child. The primary anointing applied to birth. But the Messiah was the anointed at rebirth, or puberty. The virile male was the natural Messiah, the anointed of the totemic mysteries."

(add discussion)

Christ | Etymology

In 1883, Gerald Massey, in his *The Natural Genesis* (pg. #), explained that Christ derives from "krst" meaning embalming or mummification as follows: [1]

"**Christ** the anointed is none other than the Osiris-karast, and that the karast mummy risen to its feet as Osiris-sahu was the prototypal Christ. Unhappily, these demonstrations cannot be made without a wearisome mass of detail. And we are bound for the bottom this time.

Budge, in his book on the mummy, tells his readers that the Egyptian word for mummy is *ges*, which signifies to wrap up in bandages. But he does not point out that ges or kes, to embalm the corpse or make the mummy, is a reduced or abraded form of an earlier word, karas (whence **krst** for the mummy). The original word written in hieroglyphics is krst, whence kas, to embalm, to bandage, to knot, to make the mummy or **karast** (Birch, *Dictionary of the Hieroglyphics*, pp. 415-416; Champollion, *Grant. Egyptienne*, 86). The word krs denotes the embalmment of the mummy, and the krst, as the mummy, was made in the process of preparation by purifying, anointing, and embalming. To Kara's the dead body was to embalm it, to bandage it, to make the mummy. The mummy was the Osirian *Corpus Christi*, prepared for burial as the laid-out dead, the karast by name.

When raised to its feet, it was the risen mummy, or sahu. The place of embalmment was likewise the krs. Thus the process of making the mummy was to karas, the place in which it was laid is the karas, and the product was the krst, whose image is the upright mummy = the risen Christ. Hence the name of the Christ, Christos in Greek, Chrestus in Latin, for the anointed, was derived, as the present writer previously suggested, from the Egyptian word krst."

In 1907, Massey gave an elaboration of this. [2]

In 1904, Wallis Budge, in his *The Gods of Egypt, Volume Two*, in the index gave the following formula "**Osiris = Christ**", to which he pointed to the following passage:

"The rapid growth and progress of Christianity in Egypt were due mainly to the fact that the new religion, which was preached there by St. Mark and his immediate followers, in all essentials **so closely resembled** that which was the outcome of the worship of Osiris, Isis, and Horus that popular opposition was entirely disarmed. In certain places in the south of Egypt, e.g., Philae, the worship of Osiris and Isis maintained its own until the beginning of the fifth century of our era, though this was in reality due to the support which it received from the Nubians, but, speaking generally,

Osiris = Christ, ii. 220, 221
Osiris = Pluto, ii. 199
Osiris = Water, ii. 98
Osiris = Yesterday, i. 487
Osiris-Âāḥ, i. 414
Osiris - Ân - Bast - Temt-Âri-ḥes, i. 450
Osiris-Apis, ii. 47, 195-201, 349
Osiris-Isis-Horus, i. 114, 240
Osiris-Rā, i. 334
Osiris-Rā in Ṭaṭṭu, i. 148
Osiris-Seker, i. 218, 417
Osiris-Ṭeṭ, ii. 131

The index from Wallis Budge's *The Gods of Egypt, Volume Two*, wherein he gives the following equation "**Osiris = Christ**". [4]

> at this period in all other parts of Egypt Mary the Virgin and Christ had taken the places of Isis and Horus, and the "God-mother" or "mother of the god" , was no longer Isis, but Mary whom the Monophysites styled Θεοτοκος [mother of god]. ”

Here, of importance, we note the subtle transition in the first five centuries (0-500 ACM), the original formula "Osiris = Christ" becomes becomes "Horus = Christ" or "Osiris-Horus = Christ" which becomes "Jesus = Christ".

The other variants of Osiris, boxed in adjacent, are translated as follows:

- Osiris = Water | the phallus of Osiris eaten by a fish and submerged into the Nile (see: Baptism)
- Osiris-Apis | Osiris as the new god Serapis
- Osiris-Isis-Horus | God the father, Virgin Mary, and Jesus
- Osiris-Ra | Moses and Abraham

In 2014, French Egyptologist Dibombari Mbock, in his “passion of Osiris” equals “passion of Christ” explaining book *The Egyptian Philosophy of Christ*, translates “krs” as follows: (Q)

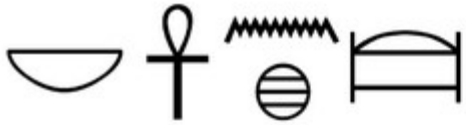

nb ankh (sarcophage)

krs (sarcophage, enterrer)

The term "Krs", in this sense, means sarcophagus (sarcophage) + buried (enterrer).

Kasu

Massey discusses the origin of the term karas as follows:

> “Karas also signifies the burial-place, and the word modifies into Kas or Chas. Kasu the "burial place" was a name of the 14th Nome in Upper Egypt. A god Kas is mentioned three or four times in the *Book of the Dead*, "the god Kas who is in the Tuat " (ch. 40). This was a title of the mummy Osiris in the funerary dwelling. In one passage Kas is described as the deliverer or saviour from all mortal needs. In "the chapter of raising the body" (178) it is said of the deceased that he had been hungry and thirsty (on earth), but he will never hunger or thirst any more, " for Kas delivers him" and does away with wants like these. That is, in the resurrection. Here the name of the god Osiris-Kas written at full is Osiris the Karast—the Egyptian Christ.”

The term “krst”, karas, Kas or Chas, according to Massey, derives from the name of the “burial place” of the 14th nome in Upper Egypt. The “kas”, according to the circa 1875 views of British Egyptologist Peter Renouf (1822-1897) (O), the successor to Samuel Birch, whose understudy was Wallis Budge, is described as follows: (O)

5. *Kasu.* , the ‘Burial Place,’ was the metropolis of the 14th Nome of Southern Egypt.

We note, by possible connection, that Osiris was cut into 14 pieces, the number 14 representative, astro-theologically, either as the half lunar cycle, in the sense of the moon being a god whose light is chopped up, or the number of the stars of the Orion constellation.

In 2008, Dorothy Murdock, in her *Christ in Egypt*, elaborated on some of Massey's views.

Other

Here, of note, the word "Karas", curiously, brings to mind the name "Father Karras" of the 1971 book turned film *The Exorcist*, by William Blatty, which is based (O) on the model of exorcisms dating back to ancient Egypt, and also has the character of Pierre Teilhard as Father Merrin.

Quotes

The following are related quotes:

> “We do not deny that many men called **Christ**, *may* in former times, have existed in Jerusalem and elsewhere, any more than we deny that such a person or persons as Hercules once existed in Greece—but we do distinctly deny that either Christ or Hercules were gods, demi-gods, or prophets, or performed the works commonly attributed to them. Christ no more foretold the destruction of Jerusalem than did Hercules conquer the Nemean lion. Christ no more performed the miracles, Testament-makers have ascribed to him, than did Prince Hohenloe the miracles ascribed to *him!* To destroy the divine and prophetic character of Jesus, is to destroy all that which renders him sacred in the eyes of Christians, and at once strips his character of that gaudy plumage which dazzles the eyes of his worshippers. When this *is* done, it will be time enough to consider whether one or **fifty Jesus Christs** walked about the streets of Jerusalem eighteen hundred years ago; and really, of no more practical consequence than it would be to inquire whether certain men called Bacchus once lived in Thebes.”
>
> — Anon German Jew (1841), *The Existence of Christ Disproved* (pg. 28) [3]

> “The coffin bore the hieroglyphic equivalent for KRST. Massey connects KRST with the Greek word *Christos*, messiah, or **Christ**. He says, ‘say what you will or believe what you may, there is no other origin for the Christ the anointed than ‘Horus the Karas’ or ‘anointed son of god the father’. The mystery of the

mummy is the mystery of Christ."

— Tom Harpur (2004), *The Pagan Christ* (pg. 101)

See also

- Christ fable
- Christian captain parable
- Christianity
- Jesus Christ

References

1. Massey, Gerald. (1883). *The Natural Genesis: Second Part of a Book of the Beginnings, Containing an Attempt to Recover and Reconstitute the Lost Origins of the Myths and Mysteries, Types and Symbols, Religion and Language, with Egypt for the Mouthpiece and Africa as the Birthplace, Volume Two* (pg. 437). Williams and Norgate.
2. Massey, Gerald. (1907). *Egyptian Book of the Dead and the Mysteries of Amenta* (pg. 172-73)*; Book IV of Ancient Egypt the Light of the World* (pg. 217-18). Cosmo, 2008.
3. Anon. (1841). *The Existence of Christ Disproved by Irresistible Evidence, in a series of letters, from a German Jew. [30 letters]* (pg. 4). Publisher.
4. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (Osiris = Christ, pgs. 221, 416) . Dover, 1969.

External links

- Christ – Online Etymology Dictionary.

θΔics

In religio-mythology, **Christ fable**, or “fable of Christ” (Boniface VIII, c.1290; Leo X, 1514), similar to “Christ myth”, Christ myth theory (or Jesus myth theory), or “Christian mythology” (Haeckel, 1899), refers to the view that the story of Jesus Christ is a fable, i.e. a fictitious narrative or statement; a legendary story of supernatural happenings ; and or a narration intended to enforce a useful truth. Technically, to note, the story of Jesus and the "Passion of Christ" is a monotheistic rewrite of the polytheistic story of Horus and the "Passion of Osiris", wherein the Egyptian gods and goddesses (except Horus) became humans, and Osiris became god, in short.

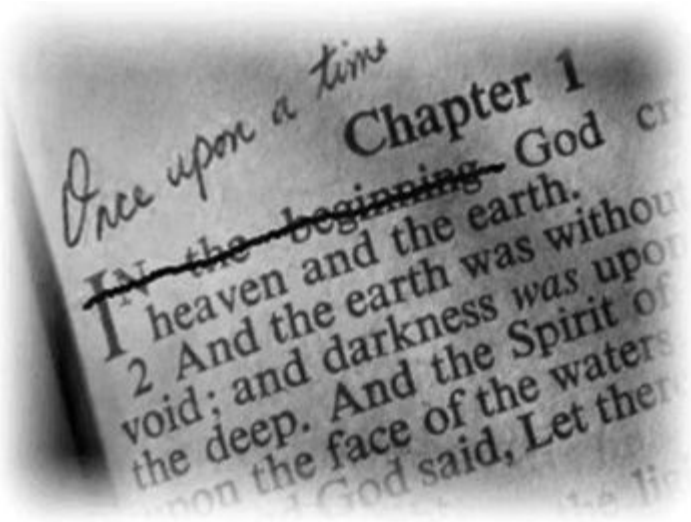

A Bible as children’s fable (O) retouching, the story Genesis, the backdrop to the “**fable of Christ**” being the centerpiece.

Overview

The first, supposedly, to refer to the profits of the fable of Christ was pope Boniface VIII:

> “The sums of money which the **fable of Christ** has produced the priests are incalculable.”
>
> — Boniface VIII (c.1290) [6]

> “Just look at the popes (Julius III, Leo X) who themselves mocked their dignity and the other (Boniface VIII) who said, joking with his friends, ‘Ah! How rich we are from this **fable of Christ**!’”
>
> — Jean Meslier (1729), *Testament* (pg. 39) [7]

In 1514, Pope Leo X, at a lavish Good Friday banquet, in the Vatican, in the company of seven intimates, Leo X famously stated the following as he raised his toast glass to the air: [1]

> “How well we know what a profitable superstition this **fable of Christ** has been for us and our predecessors.”

The pope's pronouncement, since characterized as the “most infamous and damaging statement about Christianity in the history of the Church”, was recorded in the diaries and records of both Pietro Cardinal Bembo (Letters and Comments on Pope Leo X, 1842 reprint) and Paolo Cardinal Giovio (De Vita Leonis Decimi..., op. cit.), two associates who were witnesses to it.

In circa 1789, French philosopher Constantin Volney, in his *The Ruins: a Survey of the Revolutions of Empires*, under partial influence of the readings of the draft works Charles Dupuis (1742-1766), argued that argued that Abraham and Sarah were derived from Brahma and his wife Saraswati, that Christ was related to “Christna” (Krishna), and that Brahmanism and Judaism shared a common Egyptian origin; Volney stated: [1]

> “These various theological opinions are mere chimeras, allegories and mysterious symbols, under which moral ideas, and the knowledge of the operations of nature in the actions of the elements and the revolutions of the planets, are ingeniously depicted.”

In circa 1810, Johann Goethe stated that Christianity is a fairy tale: [4]

> "**Christianity** is the **fairytale of Christ**."

(add)

Silent historians | Problem

See main: Silent historians problem

In 1909, freethinker John E. Remsburg (1848-1919), in his *The Christ: a Critical Review and Analysis of the Evidence of His Existence*, enumerated 41 Jesus-era writers, aka "silent" historians", who should have recorded Christ tales but did not. [2]

> "In the entire Christian century, Jesus is not mentioned by a single Greek or Roman historian, religious scholar, politician, philosopher or poet. His name never occurs in a single inscription, and it is never found in a single piece of private correspondence. Zero! Zip references!"
>
> — Bart Ehrman (c.2012)

In 2013, Michael Paulkovich, a former non-Christ-mythicist, i.e. he believed that "Jesus probably existed but had fantastic stories foisted upon", in his *No Meek Messiah: Christianity's Lies, Laws and Legacy* (Q), building Remsburg, listed 126 writers, shown below, who should have, owing to his supposed fame, but did NOT write about Jesus. [3]

In circa 2010, Libb Thims did something similar in respect to checking Aristotle's collected works (322BC) for the names of Moses (1300BC) and in some sense Abraham (1813BC); Thims, to note, previously determined that Abraham did not exist, i.e. that the name is a transliteration of "father Ra born out of the Nun following the annual Nile river flood", aka Ab-Ra-ham.

Quotes

The following are related quotes:

> "**Fables** should be taught as fables, myths as myths, and miracles as poetic fancies. To teach superstitions as truth is a most terrible thing. The child mind accepts and believes them, and only through great pain and perhaps tragedy can he or she be in after years relieved of them. The reason for this is that a superstition is so intangible a thing that you cannot get at it to refute it."
>
> — Hypatia (c.400)

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4. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§: Johann Goethe, pgs. 105-07). Prometheus.
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(b) Leask, Nigel. (2004). *British Romantic Writers and the East* (pgs. 104-105). Cambridge University Press.
6. (a) Villani, John. (c.1310). *Publication*. Publisher.

(b) Hallam, Henry. (1856). *View of the State of Europe during the Middle Ages* (ch. 7, pg. 304). Harper & Brothers.
(c) Thompson, Richard W. (1876). *The Papacy and the Civil Power* (pgs. 223-33) (Q). Harper & Bros.
7. Meslier, Jean. (1729). *Testament: Memoir of the Thoughts and Sentiments of Jean Meslier* (translator: Michael Shreve; preface: Michel Onfray). Prometheus Books.

External links

- Christ myth theory – Wikipedia.
- When did people start to deny Jesus as a historical person? (2014) – StackExchange.com.

θΔics

In mythology, **Christ myth**, aka Christian mythology, Christ fable, Christ myth theory, etc., refers the myth of the divine virgin birth of a man, named Jesus Christ, invented in the period 100-300AD (see: silent historians problem), rescripted as the god-man leader of the Judeo-Christian pantheon.

See also

- Achristism
- God character rescripts
- Jesus never existed
- Osiris rescripts

Further reading

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External links

- Christ myth theory – Wikipedia.

θΔics

In mythology, **Christ myth theory**, an early 20th century term, aka Christ fable (Leo X, 1514), “Christ fairytale” (Goethe, 1810), Jesus myth (Peebles, 1870), “Christian mythology” (Haeckel, 1899), Christ myth (Drews, 1909), refers to the conjecture that Jesus Christ never existed, but is but a mythological figure; an Osiris-Horus-Ra morph or god syncretism to be specific, predominately speaking.

Pharaoh Hor-Aha
[Aha Horus]
(c.3050BC)

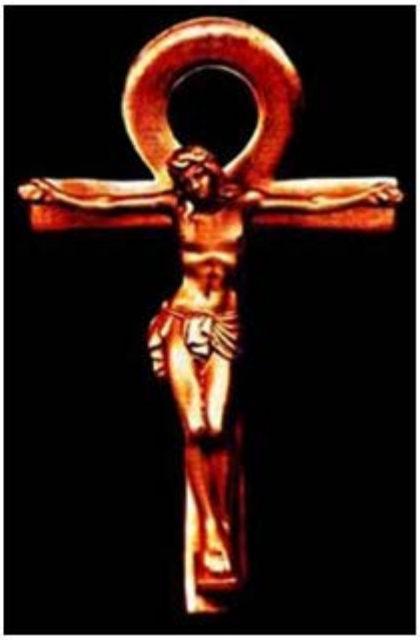

Jesus on Ankh
[Osiris-Horus-Ra Reborn]
(2001)

Left: The image (O) of the 1st dynasty pharaoh Hor-Aha (c.3050), i.e. “pharaoh Aha god Horus incarnate”, standing over or holding some type of Ankh (life symbol) figure. Right: image of Jesus on the Ankh, from the cover of Timothy Freke and Peter Gandy’s *Jesus and the Lost Goddess*. Jesus, according to **Christ myth theory**, is a morph of aspects of the Egyptian mythological gods: Ra, the sun god, the main god of Heliopolis, Osiris, the afterlife god, the nome god of Busiris, and Horus, one of the most ancient gods of Egypt, originally worshipped in three nomes of of Upper Egypt and two nomes of lower Egypt.

Overview

In 2000, Robert Price, in his *Deconstructing Jesus* (pg. 17), summarized things as follows:

> “Generations of Rationalists and freethinkers have held that Jesus Christ corresponds to no historical character: There never was a Jesus of Nazareth. We might call this categorical denial ‘Jesus atheism’ [see: achristism] What I am describing is something different, a ‘Jesus agnosticism’. There may have been a Jesus on earth in the past, but the state of the evidence is so ambiguous that we can never be sure what this figure was like or, indeed, whether there was such a person.”

In 2006, Peter Joseph published the viral documentary *Zeitgeist* which introduced the then-undergound field of Christ myth research, e.g. Gerald Massey, Dorothy Murdock, Jordan Maxwell, etc., to the general public, after which the term "Zeitgeist" became a cultural meme as code for loose knowledge that Jesus as a religious figure is but allegory of an older parallel religio-mythology story.

Quotes

The following are noted quotes:

> “Jesus, Moses, and Muhammad are imposters.”
>
> — Frederick II (c.1235), *Treatise on the Three Imposters*

> “How well we know what a profitable superstition this **fable of Christ** has been for us and our predecessors.”
>
> — Pope Leo X (1514), toast during Good Friday banquet, Vatican

"Christianity is the **fairytale of Christ**. Jesus Christ is not the author of Christianity, but rather it is a subject composed by a number of wise men. Christian religion is merely a rational, political institution."

— Johann Goethe (1770/1810), law school dissertation + later quote (see: Goethe on religion) [2]

"It is also extremely difficult to ascertain whether those books belong to the authors whose names they bear. In the first ages of Christianity there was a great number of gospels, different from one another, and composed for the use of different churches and different sects of Christians. The truth of this has been confessed by ecclesiastical historians of the greatest credit. (Tillemont, tom. ii. 47, etc. Epiphan. Homil. 84. Dodwell's Disser. on Irenaeus, p. 66. Freret's Examin. Critique. Codex Apocryphus, &c.) There is, therefore, reason to suspect, that the persons who composed the acknowledged gospels might, with the view of giving them more weight, have attributed them to apostles, or disciples, who actually had no share in them. That idea, once adopted by ignorant and credulous christians, might be transmitted from age to age, and pass at last for certainty, in times when it was no longer possible to ascertain the authors or the facts related. Among some fifty gospels, with which Christianity in its commencement was inundated, the church, assembled in council at Nice [325AD], chose four of them, and rejected the rest as apocryphal, although the latter had nothing more ridiculous in them than those which were admitted. Thus, at the end of three centuries, (*i.e.* in the three hundred and twenty-fifth year of the Christian era,) some bishops decided, that these four gospels were the only ones which ought to be adopted, or which had been inspired by the Holy Spirit. A miracle enabled them to discover this important truth, so difficult to be discerned at a time even then not very remote from that of the apostles."

— Baron d'Holbach (1770), *Critical History of Jesus Christ* (pgs. 10-11)

"The second treatise, entirely devoted to the examination of the religious system of the Christians, is also divided into three parts. The first contains the explanation of the sacred fable of the introduction of evil into the world by the famous Serpent of the Hesperides, which seduced Eve, and which necessitated the arrival of a Repairer, who could regenerate Nature. Is found in the second chapter of the Hebrew Cosmogony, known as the Genesis. The second deals with Repairer, of his birth, of his death, and of his resurrection; it presents us with all the features which are common to it with: Mithra, Adonis, Horus, Atys, Osiris, etc. And finally, which prove up to the dawn of time, that this designated Repairer, named the *Christ* by the Christians, is only the sun, or the divinity endured by all peoples, under so many different forms and names. The third part, much more abstract than the first two, contains an explanation of the famous Triad of the Christians, or the triple unity, known under the names of Father, Son, and Holy Spirit."

— Charles Dupuis (1771), "Article" in *Journal of Savants*; refined version as found in preface of volume one (pg. xxviii) of his 12-volume *Universal Religion* (1794)

"Christ is etymologically related to Bacchus and Christna [Krishna], i.e. sun god worship beliefs; Abraham and his wife Sarah are etymologically related to Brahma and his wife Saraswati; the god of Moses was Egyptian."

— Constantin Volney (1791), *The Ruins*; paraphrase of Joseph Priestley (1797) and Nigel Leask (2004)

"The Christian religion and Masonry have one and the same common origin: both are derived from the worship of the Sun. The difference between their origin is, that the Christian religion is a parody on the worship of the Sun, in which they put a man whom they call Christ, in the place of the Sun, and pay him the

same adoration which was originally paid to the Sun."

— Thomas Paine (c.1804), "Essay on the Origin of Free-Masonry"

"I have dictated thirty pages on the world's three religions; and I have read the Bible. My own mind is made up. I do not think Jesus Christ ever existed."

— Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr

"Jesus Christ in the New Testament, has no reference whatever to any event that ever did in reality take place upon this globe; or to any personages that ever in truth existed: and that the whole is an astronomical allegory, or parable, having invariably a primary and sacred allusion to the sun, and his passage through the signs of the zodiac; or a verbal representation of the phenomena of the solar year and seasons."

— Logan Mitchell (1842), *Christian Mythology Unveiled*

"There are few points on which the **Egyptian** and **Christians religions** so nearly **analogize**, and which are more striking in their resemblances than that one doctrine which has always been regarded, and rightly so, as a special result of revelation, —the doctrine of a 'vicarious deliverer' of mankind in the person of a mysterious Being, who is at once both very god and very man. The definite language of the Nicene Creed, and its commentary, the symbol of St. Athanasius, explains the nature and attributes of the founder of our religion, and it is my province, as far as I am able to do so, to show to-night in what degree that nature and those attributes were anticipated in the Egyptian dogma of Horus Nets, the only-begotten son of his father —the 'deliverer of mankind' from the 'evil one'."

— William Cooper (1877), *The Horus Myth in its Relation to Christianity*

"Christianity was not invented by the fathers of the church. It was all taken in a ready-made form from Egypt, only not from the Egypt that we know but from one which we do not know. This Egypt was in the same place as the other but it existed much earlier ... prehistoric Egypt was Christian many thousands of years before the birth of Christ."

— George Gurdjieff (c.1915), reported (Q) by P.D. Ouspensky; cited by Simson Najovits (2009)

"Historically, it is quite doubtful whether Christ ever existed at all, and if He did we do not know anything about Him, so that I am not concerned with the historical question, which is a very difficult one."

— Bertrand Russell (1927), "Why I Am Not a Christian" (Q)

"The **Christian myth** of the 'return' is a powerful allegory designed to guide us through the stages of initiation which lead to Gnosis. It was created by synthesizing the Jewish myth of Exodus with Pagan myths of the dying and resurrecting Godman Osiris-Dionysus. Originally a simple and abstract myth, it was revised and embellished over the course of the first and second centuries CE to become the most influential myth ever created: the Jesus story."

— Timothy Freke and Peter Gandy (2001), *Jesus and the Lost Goddess* [1]

"Since *The Christ Conspiracy* [Dorothy Murdock, 1999] perfectly explains how Christianity is astrotheology, and *Jesus and the Lost Goddess* [Timothy Freke and Peter Gandy, 2001] explains how

Christianity is Gnosticism and explains much of the religio-philosophy of Gnosticism, why should I bother buying and reading books about the history of established Christianity -- why bother studying the history of folly? It's remarkable how little the Christ-myth scholars and entheogen scholars are aware of each other. It shouldn't take long to introduce them to each other, Yes the **Christ-myth theory** (that Jesus is mythic/mystic and not historical) is greatly helpful in overall understanding of Christianity."

— Michael Hoffman (2004), "Studying Mainstream vs Proto-Christianity" (O)(O)

"The truth is that Christianity grew from neither a god nor a man, but out of what had gone before. A 'human Jesus' was no more necessary than was a human Horus, a human Dionysus, or a human Mithras."

— Kenneth Humphreys (2005), *Jesus Never Existed* (pg. 21)

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External links

- Christ myth theory – Wikipedia.
- Christ myth theory – WikiQuote.
- Jesus myth theory – RationalWiki.

θΔics

In existographies, **Christiaan Huygens** (1629-1695) (IQ:190|#33) (Cattell 1000:306) [RGM:186|1,500+] (Gottlieb 1000:333) (Murray 4000:7|CS / 17|P / 4|T) [Kanowitz 50:16] (EP:14) (GPE:27) (Eells 100:24) (GME:28) [CR:110], pronounced or "high-gens" (Ñº) or "ho-oue-gen" (Ñº), was a Dutch physicist, inventor, astronomer, and mathematician noted for his 1669 determination that the quantity of the mass of an object multiplied by its velocity squared mv^2 remains constant during perfectly elastic collisions, such as between steel balls, and for his 1674 work with French physicist Denis Papin on vacuum pumps. Huygens' quantity was later called vis viva by German mathematician Gottfried Leibniz in 1886. [1]

Wave theory of light

Huygens lens grinding work led him into an investigation as to how lens work, research that resulted in several published papers on light.

In 1677, he observed how Iceland spar spit light into two parts, rotated through different degrees.

In 1678 paper communicated to France's Royal Academy of Sciences, in which he suggested that light is a series of shock waves, spreading in wave fronts generated by impacting light particles and making waves among the tiny particles of the ether, the invisible substance permeating the universe. [4] This is now known as the wave theory of light. In his 1690 *Treatise on Light*, he summarized: [3]

> "I have thus shown in what manner one can imagine that light propagates successively by spherical waves."

The later theory of light by Isaac Newton in his *Opticks* (1704) proposed a different explanation for reflection, refraction, and interference of light assuming the existence of light particles. The double slit interference experiments of Thomas Young vindicated Huygens' wave theory in 1801, as the results could no longer be explained with light particles; these two views, following the invention of the light quanta (photon), resulted to yield the wave-particle duality model.

Vacuum pump

In 1647, Otto Guericke invented a vacuum pump; the invention was described in the 1657 book *Mechanical Hydraulic Pneumatics* by Gaspar Schott. [2] In Jan 1658, if not earlier, Robert Boyle had learned of Guericke's vacuum pump work, referring to it as the beautiful "German vacuum", and by early 1659, Boyle had Robert Hooke make a vacuum pump for him.

In 1661, Huygens, during his visit to the Royal Society, learned about the vacuum pump, from Boyle, who pointed out its many experimental possibilities. [8]

In late 1661, Huygens, upon his return to Holland, had built his own vacuum pump by the end of the year, and had done a test where he put a water column barometer in the vacuum bulb and also a second water column barometer, under a vacuum bulb, the latter with boiled water, which had been purged of air bubbles. He found that the normal tap water fell, but that the boiled water stayed at the same height. [8] The following is a summary of this:

> "Huygens' most important contribution to pneumatics was his discovery of 'anomalous suspension' (Ñº) in 1661. He had purged water of air, and filled a barometer with this water. Next, he put the barometer under his recipient [vacuum bulb] and evacuated it. To his astonishment, the water in the barometer did not descend. Today, the phenomenon is attributed to adhesion between the water and the glass tube, but in Huygens time it was rather puzzling. Boyle initially denied the effect, because he could not produce it with his own pump. He suggested that Huygens' pump could not evacuate sufficiently. Huygens on the other hand (correctly) believed it was Boyle's pump that was detective."

— Anne Helden (1991), “The Age of the Air Pump” (pg. 153)

The following is a sketch of Huygens 1661 air pump: [9]

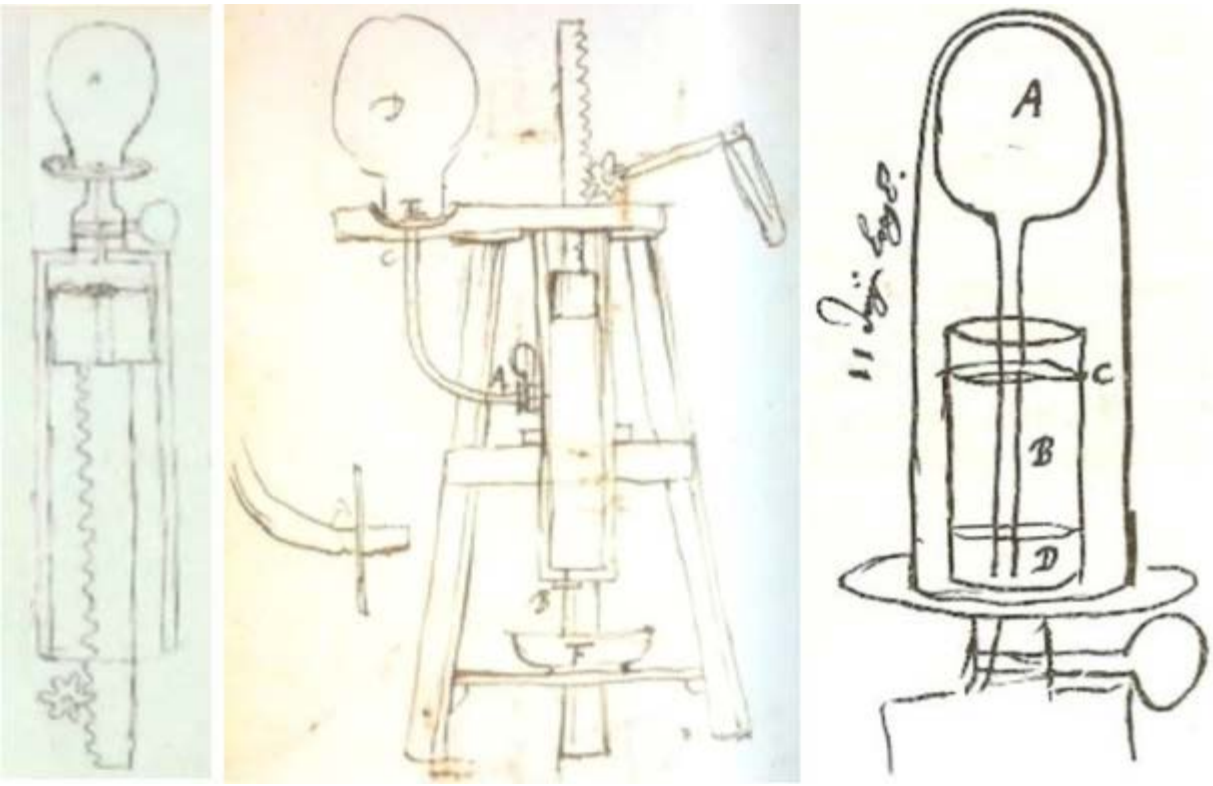

In 1662, Huygens built a second vacuum pump, employing his "own design", as shown below; first published by Denis Papin (1674), and later reprinted by Huygens. [8] This Huygens vacuum pump design, as shown, has the piston O inverted, with the rack H and pinion D on the top, done so that he could pour water on top of the piston, after O was fitted into cylinder LM, where by the piston would be pulled or cranked upward, the idea being to use the weight of water to improve air-tightness: [10]

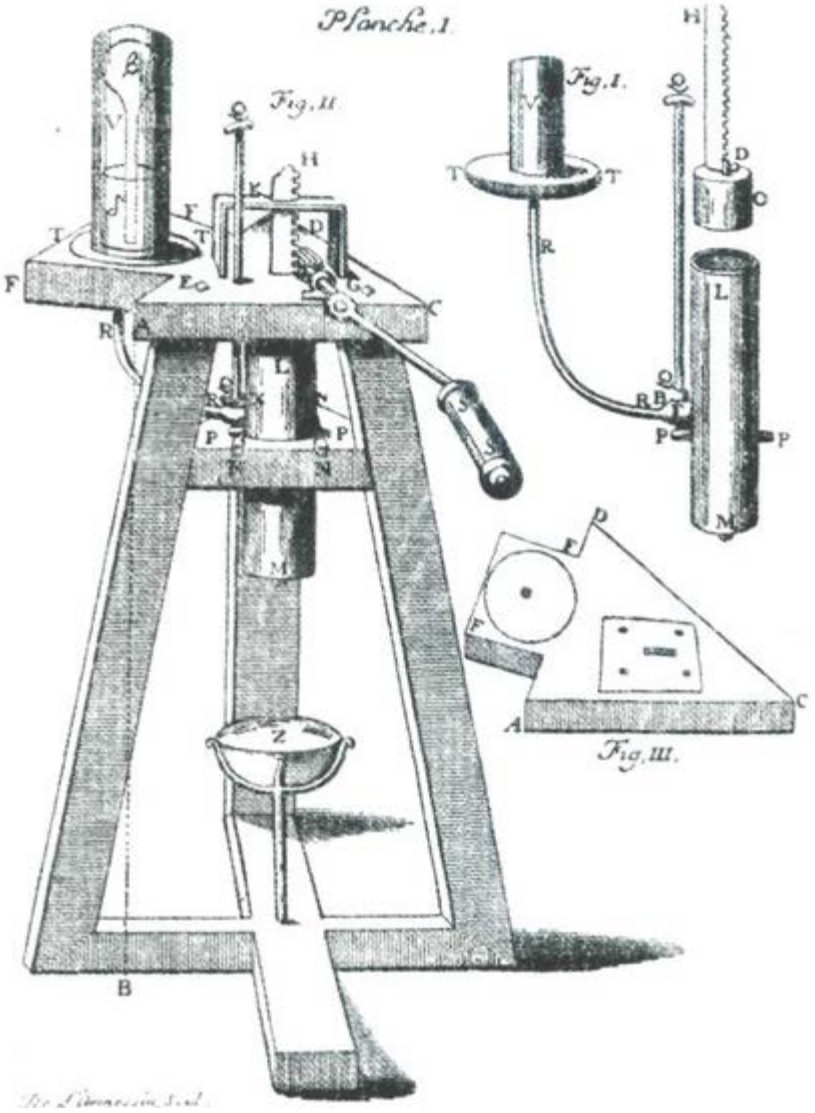

Boyle, supposedly (Helden, 2003), was the one who introduced Huygens to the merits of experimenting with vacuum pumps, and it was Huygens who constructed the first air pumps in Holland and France, with the assistance of Denis Papin. [7]

Some time prior to 1674, French physicist Denis Papin moved to Paris and assisted Huygens in his experiments with the air-pump and gunpowder piston and cylinder engines, the results of which *Experiences of the Void* (*Experiences du Vuide*) were published at Paris in that year, and also in the form of five papers by Huygens and Papin jointly, in the *Philosophical Transactions* for 1675. This association was a precursor to Papin's later invention of the first steam engine in 1690.

Education

Huygens was the well-traveled son of a rich and prominent Dutch family, that had entertained Rene Descartes. Huygens studied mathematics and law at the University of Leiden, spent time at Paris and London, where he met Isaac Newton, among other important people, and thereafter soon became an avid experimenter. In 1655, prior to developing skills as a lens-grinder, he and his brother built a telescope and discovered Titan and the rings of Saturn. [4]

Religion

In 1693, Huygens, in his *The Celestial Worlds Discovered* (Ñº), gave a short history on extraterrestrial life theories, at the end of which he invoked the hand of god in his reflections of the intricate design seen throughout the world. [5]

Quotes | On

The following are noted quotes on Huygens:

> "About 1678, Huygens constructed a cylinder and fitted it with a **piston, with a weight of some 1600 lbs., which he forced up for five or six feet by means of a thimbleful of powder**, in a gentle manner, and the return of which to the bottom of the cylinder lifted 'into the air' four or five boys who held on to the rope. Huygens appears to have rested satisfied with exhibiting this engine, and registering it in the Academy, but Papin, who had brought a copy of his treatise to Boyle, was employed by the latter, and for about three years was continually engaged with air-pumps and his private invention of the 'digester'. Papin oscillated between London and Paris for a few years, and twice held an appointment under the Royal Society, introducing many remarkable inventions to their notice. About 1687, he was appointed Professor of Mathematics, at Marburg, and appears to have taken up the gunpowder and air-engine, which he had become familiar with whilst assistant to Huygens. Papin published his account of his experiments in the *Acta Eruditorum*, and in that periodical for 1690 appears the description of his famous memoir in which the suggestion of a vacuum produced under a piston by the condensation of steam was first suggested. Huygens himself acknowledged the 'inconveniences' of attempting to produce a series of vacua by exploding gunpowder, and as **Papin says, 'he, therefore, endeavored to attain the same end in another way', and he 'at once saw' (after making some experiments) that 'machines could be constructed in which water, by the help of a moderate heat, and at little cost, might produce that perfect vacuum which could by no means be obtained by the aid of gunpowder'**. Papin proceeded to describe the construction which, amongst many he had devised, seemed 'most suitable', and he concluded by proposing to apply the power thus obtained for drawing water or ore from mines, for discharging iron bullets to a great distance, for propelling ships against the wind, and for a number of other purposes; but—and this is an important point in apportioning him his place on the roll—he does not appear to have constructed any successful engines, although Figuier gives an imaginative picture of the destruction of Papin's steamboat in 1695 by the bargemen of the Seine. Saussure and Pean give the credit of this act to the boatmen on the borders of the Hessian territory."
>
> — Anon (1881), "The History of the Steam Engine: Overview of Galloway's *The Steam Engine and its Inventors*" [6]

> "The famous controversy between Newton's emission theory and **Huygens**' wave theory of light is also a phantom problem of science."
>
> — Max Planck (c.1947), *Scientific Autobiography* (pg. 59)

Quotes | By

The following are related quotes:

> "In all of [Descartes'] physics, I find almost nothing to which I can subscribe as being correct."
>
> — Christiaan Huygens (c.1660) (Ñº)

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External links

â— Christiaan Huygens – Wikipedia.

θΔics

In protein thermodynamics, **Christian B. Anfinsen** (1916-1995) was an American biochemist noted for his circa 1955 thermodynamic hypothesis, which argued that the approximately thousand steps involved folding of proteins from is based on the thermodynamics. He received half the 1972 Nobel Prize in chemist for his work in proving his hypothesis. [1]

Education

Anfinsen completed his BS at Swarthmore College (1937), his MS in organic chemistry at the University of Pennsylvania (1939), and his PhD in biochemistry from Harvard Medical School (1943).

Religion

In the late 1970s, following his Nobel Prize win, Anfinsen, son of Bible-reading Lutherans, albeit himself an agnostic, began to "find God", some of which is outlined below: [2]

To the question, “Many prominent scientists - including Darwin, Einstein, and Planck - have considered the concept of God very seriously. What are your thoughts on the concept of God and on the existence of God?” Christian Anfinsen replied:

> “I think only an idiot can be an atheist. We must admit that there exists an incomprehensible power or force with limitless foresight and knowledge that started the whole universe going in the first place.” (Anfinsen, as cited in Margenau and Varghese, ‘Cosmos, Bios, Theos’, 1997, 139).

Anfinsen wrote to the compilers of the scientific anthology ‘Cosmos, Bios, Theos’ (1997) this:

> “I enclose a favorite quotation from Einstein that agrees almost completely with my own point of view.
>
> Einstein himself once said that ‘The most beautiful and most profound emotion we can experience is the sensation of the mystical. It is the sower of all true science. He to whom this emotion is a stranger, who can no longer stand rapt in awe, is as good as dead. That deeply emotional conviction of the presence of a superior reasoning power, which is revealed in the incomprehensible Universe, forms my idea of God’.” (Anfinsen, as cited in Margenau and Varghese, ‘Cosmos, Bios, Theos’, 1997, 140).

In his letter of 28 March 1989 to Prof. Henry Margenau (compiler of the scientific anthology ‘Cosmos, Bios, Theos’), Anfinsen wrote:

> “Thank you for your letter of March 13 and your kind words about my small contribution to your anthology. I can think of little more to add to my final point having to do with the nature of God and the existence of God. Clearly, an all-powerful, all-knowing entity must exist to explain our existence.” (Anfinsen 1989).

In 1979, Anfinsen converted to Orthodox Judaism, a commitment he retained for the rest of his life; he maintained that he had been deeply impressed by the “the history, practice and intensity of Judaism.”

On 16 November 1995, in her Memorial speech for Christian Anfinsen at Memorial Garden Dedication, Weizmann Institute, Libby Anfinsen (Prof. Anfinsen's wife) said:

> "His religious background is interesting in that his Jewish maternal grandmother's family disappeared when the Nazis invaded Bergen, Norway. His parents were Bible reading Lutherans, and he himself was an agnostic until the later 70's when he studied and converted to traditional Judaism. He felt the following quote from Einstein accurately expressed his beliefs. 'The most beautiful and most profound emotion we can experience is the sensation of the mystical. It is the sower of all true science. He to whom this emotion is a stranger, who can no longer stand rapt in awe, is as good as dead. That deeply emotional conviction of the presence of a superior reasoning power, which is revealed in the incomprehensible Universe, forms my idea of God.' He xeroxed and distributed this quote to many." (Libby Anfinsen, 1995).

(add discussion)

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2. Dimitrov, Tihomir. (2012). "Nobel Laureate Christian B. Anfinsen on the Existence of God", 11Prompt.com.

External links

â— Christian B. Anfinsen – Wikipedia.
â— Christian Anfinsen (biography) – NobelPrize.org.

θΔics

In anecdotes, **Christian captain parable** is an "atheism is the path to the dark side", and or destruction, themed parable, wherein the engaging in the atheistic works of Voltaire, Thomas Paine, and Robert Ingersoll are compare to the uncharted waters, with dangerous hidden rocks, that ship's captains are advised to avoid, and thereby stick to the true and tested safe chartered waters mapped out by the Bible.

A depiction of the **Christian captain** who "steers" his life (reaction path) according to the tried-and-true waters of the Bible; and stays clear of the uncharted dangerous waters of atheism.

Anecdote

The Christian captain anecdote, as told by Vance Ferrell (2001), is as follows: [1]

> "Have you studied Voltaire, Tom Paine, Robert Ingersoll, or any of those fellows?" asked a passenger as he stood by the captain at the wheel of a steamship.
>
> "No," replied the captain.
>
> "Well, you should. You can't fairly turn down their argument until you have thoroughly investigated for yourself," the passenger replied.
>
> "I've been captain of this ship a long time," said the captain. "The charts that I work with tell me the location of the deep water, so I can safely guide the ship into port. When I first became a sea captain, I decided that I would not investigate the rocks. The experience I've known other chaps to have with the rocks has been sufficient warning for me.
>
> "Over the years I've watched the lives of men who have read the Bible everyday and loved God. Those were the men who had solid families, stayed away from drink, and helped other people in the community.
>
> "And I've also seen the others: the drunkards, drug addicts, criminals, and all the rest. Those are the ones who have nothing to do with God and the Bible, and who never attend church.
>
> "No, I've made my decision; *I stay away from the rocks.* My mother taught me the Bible when I was little, and I worship and serve the God of heaven who made all things. I'm not a bit interested in anything that Ingersoll, Voltaire, and Paine have to offer."

(add discussion)

See also

- Heisenberg-Pauli dialogue

References

1. Ferrell, Vance. (2001). *The Evolution Cruncher: Scientific Facts which Annihilate Evolution Theory* (pg. 904) (Q) (Q). EvolutionFacts.com.

Videos

- Thims, Libb. (2015). "Christian Captain Parable" (Q), Atheism Reviews, Jun 29.

θΔics

In hmolscience, **Christian de Duve** (1917-2013) (RE=95) was a Belgian cytologist and biochemist noted for []

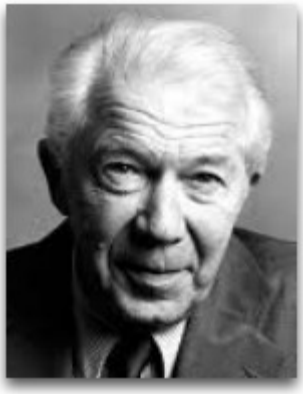

Free will

In 1995, de Duve, in his *Vital Dust*, commented the following: [1]

> "If neuronal events in the brain determine behavior, irrespective of whether they are conscious or unconscious, it is hard to find room for free will. But if free will does not exist, there can be no responsibility, and the structure of human societies must be revised."

This, of course, spills into the Goethean revolution, according to which the "blame" or "guilt" is not to be assigned to the to the person *per se* (or weight of soul in religio-mythology speak), but rather, correctly, in the human chemical thermodynamics perspective, as Goethe saw things in 1796 (see: Goethe timeline), to the external forces (predominately) and internal forces (marginally), the judgment decided by evolved weighted consensus of the system, the morality of which changes per era and population density size, all of which traced back to so-called "stealing slave parable" of Zeno of Citium.

Other

De Duve was the 1974 co-recipient of the Nobel Prize for physiology or Medicine for his work in establishing cell biology (cell powered-chnopsology). De Duve's works was influential to Ronald Fox.

Religion | Atheism

In circa 2001, de Duve stated the following:

> "There's no sense in which atheism is enforced or established by science."

De Duve died (dereacted), i.e. met his reaction end, at his "chosen", no pun intended per the above quote, time on 4 May (Saturday) 2013 by self-induced euthanasia, which is legal Belgium, at the age (reaction extent) of 95, in in the presence of all of his children, following increasing health issues: cancer, atrial fibrillation, and a recent fall in his home. In a recent interview published after his death (dereaction), by the Belgian newspaper Le Soir, de Duve said:

> "It would be an exaggeration to say I'm not afraid of my death, but I'm not afraid of what comes after because I am not a believer. When I disappear, I will disappear, there'll be nothing left."

This would seem to classify de Duve in the "agnostic atheist" category; or DN:5.5-6.5.

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2. Maugh, Thomas H. (2013). "Dr. Christian de Duve dies at 95; Nobel-winning scientist", *Los Angeles Times*, May 07.
3. (a) Easterbrook, Gregg. (2002). "The New Convergence" (Ñº), *Wired*, Dec.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 25). Zondervan, 2009.

External links

â— Christian de Duve – Wikipedia.

θΔics

In hmolscience, **Christian de Quincey** (c.1955-) is an American philosopher noted for his 2002 book *Radical Nature*, in which he argues that consciousness, spirit, and soul extend all the way down the evolutionary ladder to the atoms and molecules and beyond, and in doing so attempts to dispel the 'mindlessness of matter' view, that matter is inert and 'dead', and thus bring about dialog between the materialist and dualist schools of thought.

Panpsychism

The gist of his work seems to be to addressed in the following query:

> "How can a science of 'dead' matter ever account for the fact of consciousness?"

Quincey discusses thermodynamics in a few instances, discussing complexity theory, chaos theory, the far-from-equilibrium type dissipative structures theories of Ilya Prigogine, and the order-disorder paradox of the second law in relation to evolved ordered life (order from disorder) and the disorder tendency of entropy for isolated systems. In short, de Quincey's thesis is that if we adopt the panpsychism view of nature and assign consciousness to all matter, the premise of 'self-motion' to all entities of the universe, e.g. that an atom chooses to move itself from some internal principle, that photons have free will, etc., that this paradigm shift will dispel what he perceives as the standard materialist view, which views culture and civilization as a meaningless collection of atoms.

Influences

As discussed in his acknowledgments section, de Quincey's 'allies' are French philosopher-theologian Pierre Teilhard, and his 1936 *The Phenomenon of Man*, which promotes the view that consciousness accompanies matter and that matter-energy and spirit are intertwined, and Teilhard's 'compatriot' French philosopher Henri Bergson, and his two books *Creative Evolution* and *Matter and Memory*, which argue for that an elan vital or creative impulse, i.e. vitalism, exists in the course of the evolution. A third noted influence on Quincey are the views of American mathematician-philosopher Arthur Young, whom de Quincey studied under for several years, and his ideas that the photon, or quantum of action, acts as the fundamental unit of being and becoming in the course of the events and processes of human existence. [1] Another thinker de Quincey is: Steven Rosen.

Extrapolate downward | Model

The central methodology de Quincey uses in his theory is the "extrapolate downward approach" (apply anthropomorphism to explain chemistry and physics), as contrasted with the "extrapolate upward approach" (apply chemistry and physics to explain human behavior). To give an example of this, de Quincey states "as we know it to be certainly true, consciousness and the ability to make choices exist in our own case, then we can generalize and say that consciousness and choice exist at the macro level [and micro level]", and say that "some entity, say an electron or photon, is exercising its self-action, free will, or choice in how it will move." [1] The use of the term "self-caused" is cited as a coinage of American philosopher Arthur Young, who argues that the actions of subatomic entities, such as electrons, are self-caused, in a quantum mechanical or photonic sense, somehow. [13] In other words, both Young and de Quincey are attempting to argue that electrons, as well as any other atomic or subatomic particles, has free will, in order to justify the anthropomorphic conception that humans have free will, knowing that humans have evolved overtime from subatomic precursors.

Education

Quincey completed his MA in consciousness studies at JFK University and his PhD in philosophy and religion at the California Institute of Integral Studies, and currently is a professor of philosophy and consciousness studies at John F. Kennedy University.

Quotes | Self-motion

The following are example quotes, in respect to self-motion arguments:

“By ‘mechanical’, I mean matter that is moved about entirely by external forces—for example, the colliding and ricocheting of atoms like so many billiard balls, or even the invisible fields of force pushing and pulling matter through its gyrations. In a purely mechanical universe, all motion of matter is caused from without, there is no possibility of ***self*-motion** and therefore no possibility of aim or purpose.”

— Christian de Quincey (2002), *Radical Matter* (pg. 17)

“The universe is either already ‘dead’ or it is meaningful. If it is ‘dead’ in this sense of being wholly mechanical, without any intrinsic capacity for **self-motion** and feeling, then all instances of life and consciousness in the universe are ultimately insignificant evolutionary by-products. If this is true, then the universe would be essentially meaningless, it would be ‘absurd’, just as the existentialists Sartre and Camus said. All meaning would be contingent, created by minds that themselves arose by chance from blind mechanical collisions of atoms in the void.”

— Christian de Quincey (2002), *Radical Matter* (pgs. 37-38)

“For hundreds of years we lived in a world without a soul, a world made of matter and energy that lacks feeling and **self-motion**, a world without purpose or deep meaning. This, at least, is the complicated tale told to us by modern philosophy and science. Our culture’s dominate story, our materialist worldview and big bang cosmology, cannot account for the fact that anything like a storyteller, a conscious, feeling, observing, meaning-seeking being, could ever exist.”

— Christian de Quincey (2002), *Radical Matter* (pg. 79)

References

1. De Quincey, Christian. (2002). *Radical Nature: Rediscovering the Soul of Matter* (self-motion, 6+ pgs; thermodynamics, pgs. 32, 211; Teilhard, 8+ pgs.; dead matter, pg. 34). Invisible Cities Press.

Threads

â— Origin of life (thread) – Hmolpedia.

External links

â— Christian de Quincey – Wikipedia.
â— Christian de Quincey (home) – ChristiandeQuincey.com.

θΔics

In mythology, **Christian mythology**, the Roman recension (see: recension theory) of Hebrew mythology — itself a derivative of Egyptian mythology and Babylonian mythology — syncretized with aspects of Greek mythology, is the subject matter surrounding the mythological character of Jesus Christ, the monotheistic fusion of the gods Ra, Osiris, and Horus; Christianity defined explicitly as mythology, details expounded upon.

Overview

In 1514, Pope Leo X, toast during Good Friday banquet, Vatican, defined Jesus Christ as a fable (see: Christ fable):

> "How well we know what a profitable superstition this **fable of Christ** has been for us and our predecessors."

In 1728, Voltaire, in his commentary on the poetry of Torquato Tasso (1544-1595), employs the term christian mythology as follows: [1]

> "He is guilty of indulging the inaccurate Custom of calling the Evil Spirits by the Names of *Pluto, Alefto,* and of mingling often often *Pagan* Ideas with **Christian Mythology**. 'Tis strange that none of the modern Poets are free from that Fault. I: seems that our Devils and our Christian Hell, have something in them low and mean, and must be rais'd by the Hell of the *Pagans,* which owes its Dignity to its Antiquity. Certain it is, that the Hell of the Gospel is not so fitted for Poetry as that of *Homer* and *Virgil.* The Name of *Tisiphone* sounds better than that of *Beelzebub*; but with all that, it is as preposterous in a Poet to bring *Michael* and *Aleclo* together, as in some *Italian* and *Flemish* Painters to have represented the Virgin *Mary* with a Chapelet of Beads hangigg at her Girdle, to have plac'd some *Swiss* Guards at the Door of the Apartment of *Pharaoh,* and to have mix'd Cannons and Carabines with the ancient Arrows in the Battle of *Jojbuah.*"

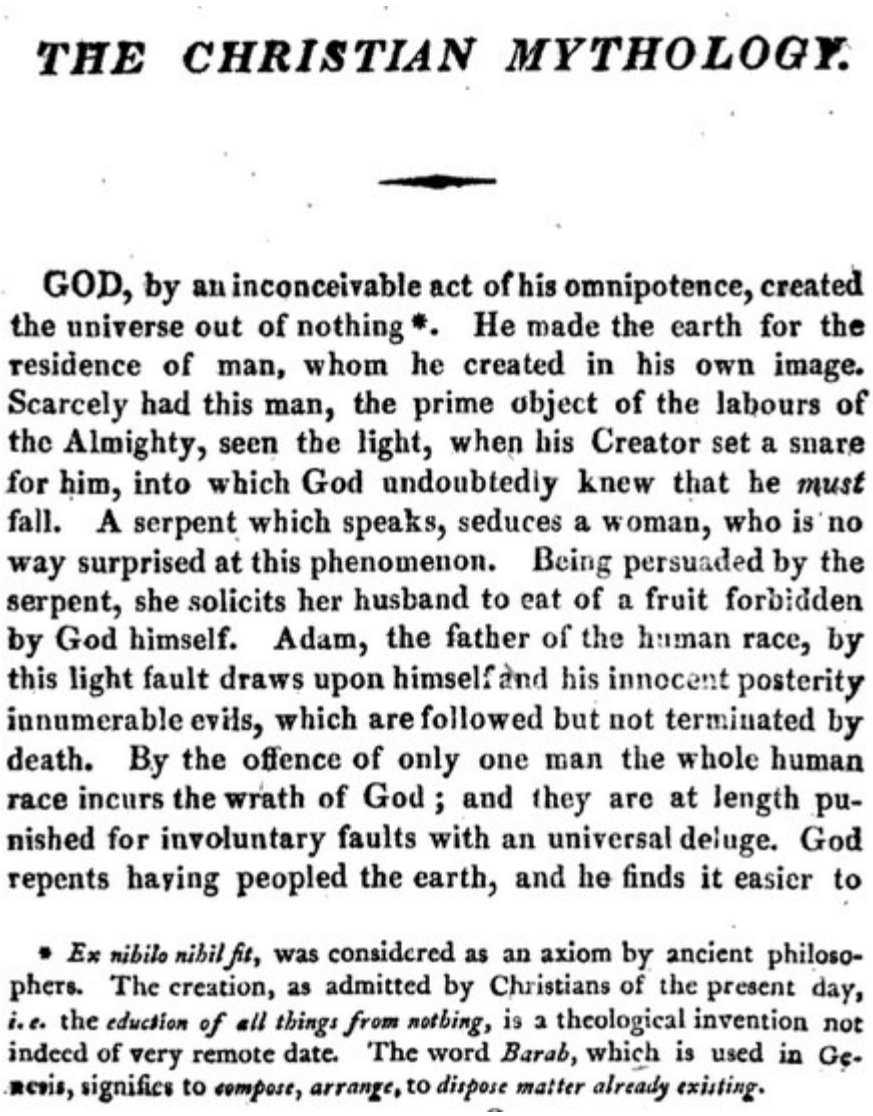

THE CHRISTIAN MYTHOLOGY.

GOD, by an inconceivable act of his omnipotence, created the universe out of nothing *. He made the earth for the residence of man, whom he created in his own image. Scarcely had this man, the prime object of the labours of the Almighty, seen the light, when his Creator set a snare for him, into which God undoubtedly knew that he *must* fall. A serpent which speaks, seduces a woman, who is no way surprised at this phenomenon. Being persuaded by the serpent, she solicits her husband to eat of a fruit forbidden by God himself. Adam, the father of the human race, by this light fault draws upon himself and his innocent posterity innumerable evils, which are followed but not terminated by death. By the offence of only one man the whole human race incurs the wrath of God; and they are at length punished for involuntary faults with an universal deluge. God repents having peopled the earth, and he finds it easier to

* *Ex nihilo nihil fit*, was considered as an axiom by ancient philosophers. The creation, as admitted by Christians of the present day, *i. e.* the *eduction of all things from nothing*, is a theological invention not indeed of very remote date. The word *Barab*, which is used in Genesis, signifies to *compose, arrange*, to *dispose matter already existing*.

The opening section from Nicolas Boulanger's 1761 chapter "The Christian Mythology", therein defining the a proto-outline of **Christian mythology**. [3]

In 1761, Nicolas Boulanger, in his "The Christian Mythology", the fourth chapter of his *Christianity Unveiled*, explicitly defined Christianity as a "mythology"; the opening section of which is as follows: [2]

> "God, by an inconceivable act of his omnipotence, created the universe out of nothing [N1]. He made the earth for the residence of man, whom he created in his own image. Scarcely had this man, the prime object of the labours of the almighty, seen the light, when his creator set a snare for him, into which god undoubtedly knew that he *must* fall. A serpent which speaks, seduces a woman, who is no way surprised at this phenomenon. Being persuaded by the serpent, she solicits her husband to eat of a fruit forbidden by god himself. Adam, the father of the human race, by this light fault draws upon himself and his innocent posterity innumerable evils, which are followed but not terminated by death. By the offense of only one

> man the whole human race incurs the wrath of god; and they are at length punished for involuntary faults with an universal deluge. God repents haying peopled the earth, and he finds it easier to drown and destroy the human race, than to change their hearts."

In 1770, Baron d'Holbach, in his *Critical History of Jesus Christ*, reprinted Boulanger's "The Christian Mythology" chapter as an appendix. [3]

In 1795, Thomas Paine, in his *The Age of Reason*, one of the so-dubbed Atheist's Bible, employed the term "Christian mythology" three times, and "Christian mythologists" many times; the first of which is: [4]

> "It is curious to observe how the theory of what is called the Christian church, sprung out of the tail of the Heathen mythology. A-direct incorporation took place in the first instance, by making the reputed founder to be celestially begotten. The trinity of gods that then followed was no other than a reduction of the formal plurality, which was about twenty or thirty thousand. The statue of Mary succeeded the statue of Diana of Ephesus. The deification of heroes, changed into the canonization of saints. The mythologists had gods for every thing; the **Christian mythologists** had saints for every thing. The church became as crowded with the one, as the pantheon had been with the other; and Rome was the place of both. The Christian theory is little else than the idolatry of the ancient mythologists, accommodated to the purposes of power and revenue; and it yet remains to reason and philosophy to abolish the amphibious fraud."

In a latter place (pg. 45), Paine defines things as such:

> "**Christian mythology** has five deities: there is god the father, god the son, god the holy ghost, god the providence, and the goddess nature."

In 1842, Logan Mitchell, in his *The Christian Mythology*, the first full-length book on Christianity defined as a mythology, opened to a quoted by Percy Shelley, and therein presented a lecture format of Christian mythology. [5]

In 1899, Ernst Haeckel, in his *The Riddle of the Universe*, was using the term Christian mythology as follows: [6]

> "What is known as the "immaculate oath "—that is, the confirmation of faith by an oath taken on the immaculate conception of Mary—is still regarded by millions of Christians as a sacred obligation. Many believers take the dogma in a twofold application; they think that the mother of Mary was impregnated by the Holy Ghost as well as Mary herself. Comparative and critical theology has recently shown that this myth has no greater claim to originality than most of the other stories in the **Christian mythology**; it has been borrowed from older religions, especially Buddhism. Similar myths were widely circulated in India, Persia, Asia Minor, and Greece several centuries before the birth of Christ."

(add discussion)

Hebrew mythology

Christian mythology, in short, is Hebrew mythology with the Osiris myth (see: Passion of Osiris) added in; the following are related quotes:

> "During the Middle Ages—especially during the domination of the papacy—scientific work in this direction entirely ceased. The torture and the stake of the Inquisition insured that an unconditional belief in

the Hebrew mythology should be the final answer to all the questions of creation."

— Ernst Haeckel (1899), *The Riddle of the Universe* (pg. 238)

"The Hebrew [mythology] redactors used Egyptian myths to make the biblical stories; which, from time to time, had Babylonian myths grafted onto earlier texts or replaced portions of the original stories."

— Gary Greenberg (2000), *101 Myths of the Bible* (pg. 7)

(add discussion)

Jesus Myth | Christ myth theory

The term "Christ myth theory", to note, is an early 21th century invented term, introduced generally as a term deemed less-offense (to Christians) than the de facto term "Christian mythology", such as Haeckel, and others defined Christianity in the 19th century. The term is equivalent to, for example, "Egyptian myth theory" being the "theory" that religion behind the belief system that built the pyramids is myth based.

The now-named (2016) "Christ myth theory" article of Wikipedia, to give some history, was started in 2005 as the article "Jesus-Myth" (Q), but, following 2006 debate (Q), was renamed firstly to the less-offensive "Jesus-myth hypothesis" (2007), then to "Jesus myth theory (2010), then to "Christ myth theory" (2012), its current form.

See also

- Akkadian mythology
- Canaanite mythology
- Greek mythology
- Jewish mythology
- Hindu mythology
- Islamic mythology
- Mesopotamian mythology
- Sumerian mythology
- Egyptian mythology

Notes

N1. *Ex nihilo nihil fit,* was considered as an axiom by ancient philosophers. The creation, as admitted by Christians of the present day, *i.e.* the eduction [*induction*] *of all thing from nothing,* is a theological invention not indeed of very remote date. The word *Barah,* which is used in Genesis, signifies to *tempest, arrange,* to *dispose matter already existing*.

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2. (a) Boulanger, Nicholas. (1761). *Christianity Unveiled: Being an Examination of the Principles and Effects of the Christian Religion* (*Le christianisme devoile, ou examination of principes et des effets de la religion chrétienne*) (§:The Christian Mythology). Publisher.
(b) Christianity Unveiled – Wikipedia.
3. d'Holbach, Baron. (1770). *Ecce Homo [Behold the Man]: a Critical Inquiry into the History of Jesus of Nazareth, Being a Rational Analysis of the Gospels* [*Critical History of Jesus Christ: a Rational Analysis of the Gospels*] (*Histoire critique de Jésus-Christ, ou Analyse raisonnée des Évangiles*) (Appendix I: The Christian Mythology, pgs. 325-28) (Gut)(txt). Gordon Press, 1977.
4. Paine, Thomas. (1795). *The Age of Reason* (editor: Moncure Conway) (txt) (Christian mythology, pgs. 10, 11, 45). Merchant Books, 1896.
5. Mitchell, Logan. (1842). *The Christian Mythology Unveiled: in a Series of Lectures*. Publisher.
6. Haeckel, Ernst. (1899). *The Riddle of the Universe: at the Close of the Nineteenth Century* (translator: Joseph McCabe) (Christian mythology, pg. 326). Harper & Brother, 1900.

External links

- Christian mythology – Wikipedia.

θΔics

In existographies, **Christian Thomasius** (1655-1728) (IQ:170|#355) [RGM:263|1,360+] was a German philosopher and jurist, noted for []

Overview

In 1705, Thomasius, in his *The Foundation of the Law of Nature and Nations*, opposed Aristotelianism, Lutheranism, the divine right of Kings and Roman Law, instead promoting a non-theological, natural foundation for ethics following in the style of Hugo Grotius and Samuel Pufendorf, a Hobbes + Grotius synthesizer. [1]

Genius rankings

Thomasius tends to be ranked, along with Christian Wolff and Moses Mendelssohn as precursors to Immanuel Kant [RGM:20|1,360+] and German empirical psychology.

Quotes | On

The following are quotes on Thomasius:

> "**Thomasius**, one of the founders of the University of Halle, who daringly lectured in German, not Latin, famously argued that nature, the source of law, exists independently of god's will, and that ethics stem from a 'special physics' — the empirical science of (human) nature. He devised what he called a 'calculus of the passions' as a result of which rational judgments about conduct are (should be) made possible. He went so far as to assign numerical grades to the various passions on a scale from five to sixty. The precision of this system seems absurd now but its importance lies in the fact that Thomasius conceived human nature as a psychological entity, not a theological one."
>
> — Peter Watson (2010), *The German Genius* [2]

References

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(b) Christian Thomasius – Oxford Reference.
2. Watson, Peter. (2010). *The German Genius: Europe's Third Renaissance, the Second Scientific Revolution and the Twentieth Century* (pg. #). Simon & Schuster.

External links

â— Christian Thomasius – Wikipedia.

θΔics

In existographies, **Christian Wolff** (1679-1754) (IQ:160|#505) (CR:2) was a German philosopher and mathematician, characterized a "great genius" (Mettrie, 1747), who tended to argue, synthetically, via a mixture of rationalism, empiricism, Newtonianism, and scholasticism (Blackwell, 1961), generally considered (Vidal, 2011) the world's leading philosopher in the years 1716, the dereaction of Leibniz, to the 1780s, with the rise of Kant's critical philosophy, whose vast works, supposedly, cover all areas of knowledge, noted for []

Genius | Rankings

In German geniuses, Wolff tends to be ranked, along with Christian Thomasius [RGM:263|1,360+], and Moses Mendelssohn [RGM:944|1,360+], as precursors to Immanuel Kant [RGM:20|1,360+] and empirical psychology. [3]

Soul | Theory

In 1732, Wolf, in his *Empirical Psychology*, building, in modified form, on Descartes, argued the following:

> "Whatever being is actually conscious of itself and of other things outside of itself exists. We are conscious of ourselves and of other things outside of ourselves. Therefore we exist."
>
> — Christian Wolf (1732), *Empirical Psychology* (pg. 16)

Herein, and in his *Rational Psychology* (1734), he went on to argue that the soul was "that in us that was conscious", or something to this effect.

Quotes | On

The following are quotes on Wolff:

> "We can, and even should, admire all those great geniuses – Descartes, Malebranche, Leibniz, **Wolff**, etc. – in their most futile labors; but pray, what fruits have we derived from their profound meditations and all their works? We should see not what people have thought, but what we should think for the sake of an untroubled life.'"
>
> — Julien la Mettrie (1747), *Man: a Machine* (pg. 5) [1]

References

1. Blackwell, Richard J. (1961). "Christian Wolff's Doctrine of the Soul" (Ñº), *Journal of the History of Ideas*, 22(3):339-54.
2. La Mettrie, Julien. (1751). *Machine Man and Other Writings: Treatise on the Soul, Man as Plant, The System of Epicurus, Anti-Seneca or the Sovereign Good, Preliminary Discourse* (translator and editor: Ann Thomson) (pg. 5). Cambridge University Press, 1996.
3. Watson, Peter. (2010). *The German Genius: Europe's Third Renaissance, the Second Scientific Revolution and the Twentieth Century* (pg. #). Simon & Schuster.

Further reading

â— Vidal, Fernando. (2011). *The Sciences of the Soul: the Early Modern Origins of the Psychology* (§:The New Psychology: Christian Wolff, pgs. 89-). University of Chicago Press.

External links

â— Christian Wolf (philosopher) – Wikipedia.

θΔics

In belief systems, **Christianity** is a branch of Ra theology (or Anunian theology), accounting for 33 percent of the world's religious belief, as described in the teachings and theories found in the Bible, centered the belief that man named "Jesus Christ" (aka Horus-Osiris synthesized), said, in story form, to have died for the sake of the sins of humankind, was reborn, and that for a person to achieve salvation and everlasting life or afterlife he or she must accept Jesus has their savior and follow the ten commandments among other prescriptions and rules of the Bible, which generally equate to be a good person.

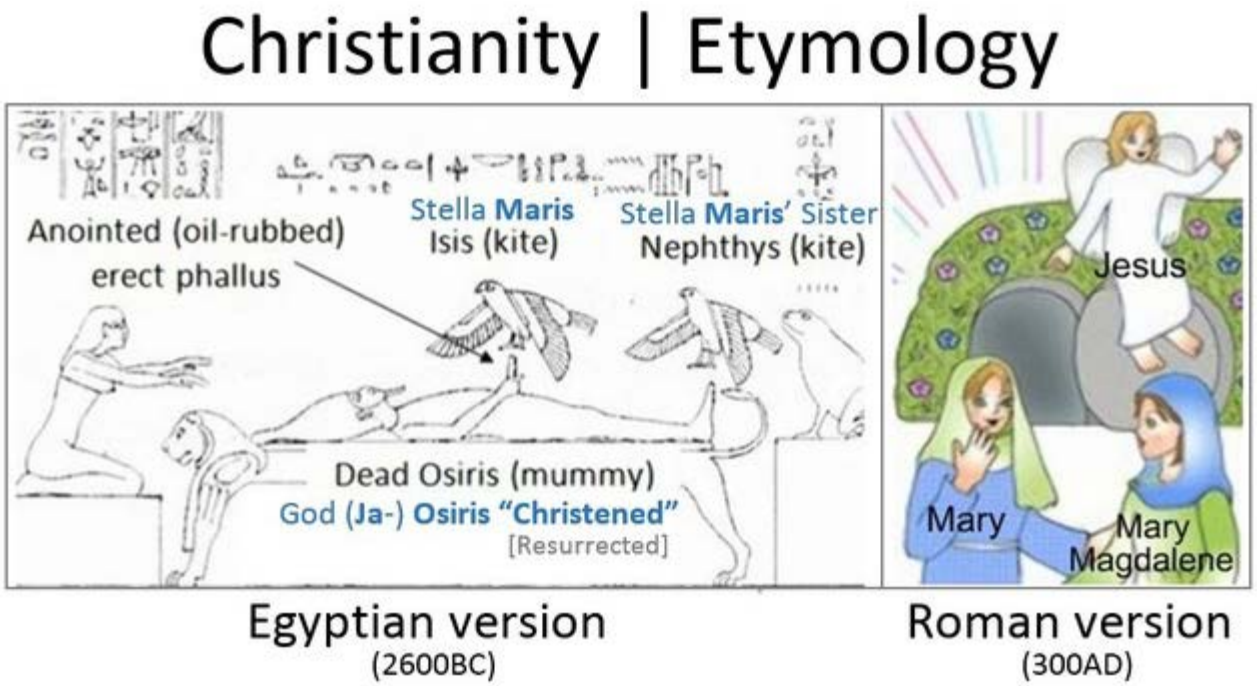

The Egyptian original version (left) of **Christianity**, namely: the resurrection of Osiris in which after he was mummified, wrapped in linen, and then had his phallus anointed with oil was "reborn" after having a type of resurrection sex with both the goddesses Isis and her sister Nephthys, as they hovered over Osiris' erect body, imparting the spirit of life into him, as compared to the Roman monotheistic rewritten version (right), where Mary and Mary Magdalene had to anoint the linen-wrapped mummified Jesus then both mount his sepulcher (Mathew 27:61), after which he rose from the dead, as explained in the video (below).

Fall of man | Destruction of man

The 500BC Biblical "fall of man" (Q), as found in part in the Greek story of Pandora's box (800BC), supposedly, is a reformulation of the Egyptian "legend of the destruction of man", as recorded (Q) on the tomb of Seti I (c.1220-1279BC), and dated to the Middle period (2000-1300BC).

Egyptian origins

See main: Egyptian-to-Christian transliteration; Christian-to-Egyptian transliteration; Religio-mythology transcription and syncretism

In large part, although there are some Mesopotamian and Sumerian influences in the construction of the Bible, which occurred from 1000 BC to 100 AD, undertaking about 52 writers and editors (four writers and one editor alone for the Book of Moses, 960-539BC), the dominant theme in the construction of the Bible was re-writing of the Egyptian pantheon of gods and goddess into story form as people, so to create a monotheistic version, centered around one God, his son, and the process through which a person could be reborn and enter the afterlife. The main steps involved in the rewrite of Ra theology into the format of Christianity are as follows:

- Nun → Noah
- Ra → Abraham
- Osiris (the child) → Moses (the child)
- Osiris → God
- Breath of life (Ankh) → Holy Spirit

● Isis (or Stella Maris or "star of the sea") → Mary
● Nephthys (Isis' or Stella Maris' sister) → Mary Magdalene
● Horus → Jesus
● Set (Horus' evil brother; depicted with a red face and horns) → Devil (or Satan)
● Heliopolis Ennead (creation myth) → 5 Books of Moses (7 days of creation story)
● Ba → Soul
● Ka → Spirit

● Life (human origin of life) → Creation by breath / Creation by clay

● Lesser gods and goddesses → Angels and demons
● Bird wings → Angel wings
● Sun disc→ Halo
● Ankh (symbol of the breath of life) → Cross
● Judgment hall → door way to heaven
● Ammit standing over lake of fire → gateway to hell
● Anubis and the Holy Lake (underlying each temple) → John the Baptist (and baptism)
● 120 days of the annual Nile flood → 120 days of Noah's flood.
● Benu bird (which burst forth out of the primordial land mound that arose following the flood, which carried the sun on its head) → Noah's 3 doves (sent out at 40-day intervals to check for dry land; the third of which, sent out on day 120, didn't return, a sign that land had arose).
● Release of the soul ritual → Abraham killing Isaac parable
● Osiris the child (released onto the Nile) → Moses the child (released onto the Nile)

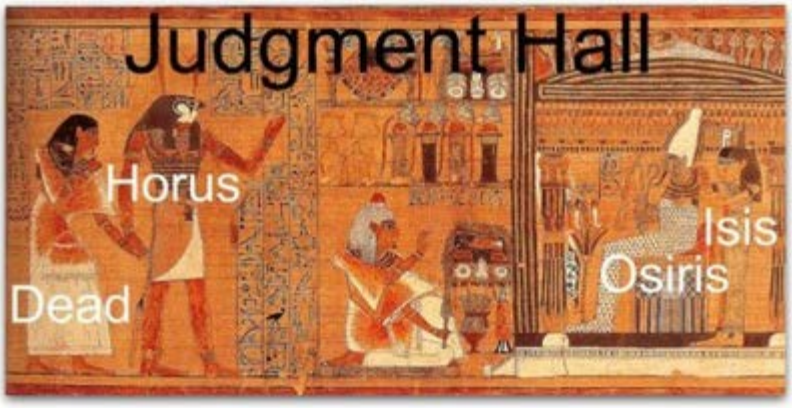

A depiction of the Egyptian afterlife judgment hall, into which Horus (Jesus) leads the deceased to be judged by Osiris (God), one of the the basis of tenets or theories on which **Christianity** is founded.

● Creation by incest genealogy (from Nun) → Thrice sister-wife parable of Abraham and Sarai
● 42 Negative confessions (modeled on the 42 predynastic nodes or kingdoms) → 10 commandments (truncated confessions)
● 42 gods of the Judgment Hall → 42 generations between God and Jesus
● Passion of Osiris → Passion of Christ
● Ripping apart of Osiris by his evil brother Set (modeled on corn shucking) → Crucifixion of Jesus
● 12 pieces of Osiris, scattered about the land, and the temple that grew in each spot → 12 tribes of Israel
● Pieces of Osiris collected back together by Isis and mummified → wrapping in linen of Jesus' body (Mathew 27:59)
● Rubbing of Osiris' dead phallus with oil → anointing of Jesus' body (Mathew 26:6-12)
● Burial of Osiris in a great primeval mound or pyramid → laying of Jesus in his own "rock hewn tomb", sealed with a great stone door (Mathew 27:60)
● 3 days of death of Osiris (modeled on the Dec 22-24 apparent stillness of the sun, before it's rebirth to longer days on December 25) → 3 days of death of Jesus
● 2 goddesses mounting the Osiris (Stella Maris and her Nephthys) to have resurrection sex → 2 Marys "sitting over" the sepulcher (Mathew 27:61)

The Egyptian god Khnum (right), creating two humans from clay, on his potter's wheel, seated next to the goddess Isis (left), who is imparting the breath of life into the clay figures by pointing the ankh at their nostrils, became the model for Adam and Eve (the name

● 3 wise men bringing gifts to the birth of Horus → 3 wise men bringing gifts to the birth of Jesus
● Acceptance of Horus the Savior → Acceptance of Jesus Christ as you Savior → Mary and Mary Magdalene mounting the sepulcher (Mathew 27:61)
● Khnum creating humans from clay (creation from clay) → Adam (Hebrew for "clay") and Eve
● Weighing of the soul (soul weight) → modern human morality system
● Ra having sex with the pharaoh's wife (from inscriptions the temple of Hatshepsut, the daughter of Thutmose I: "Ra gathered the lesser gods around his throne, and told them: 'I will create a queen to rule over Egypt'. Then accompanied by the messenger god Thoth, he went to the palace of King Thutmose I and taking the appearance of the pharaoh, appeared a the bed of his wife, Ahmose, who 'naturally rejoiced at his virility' and as 'the palace became inundated with the *sent of God*', he had his way with her.") → the Holy Spirit getting the Virgin Mary pregnant.

Adam, Hebrew for "clay").

This summary to note is only the basic model as to how the Bible was written. The inquisitive reader is encouraged to consult the expert scholars in this field, such as Gary Greenberg.

Etymology

The name "Christianity" refers to the religion centered on the teachings of Jesus Christ; the term "Christ" itself deriving from the Greek *kristos* or “anointed”, in the sense that Jesus Christ means Jesus "rubbed with oil" (Mathew 26:12); a action that derives from the mummification process and resurrection sex ritual of the Egyptian process called the awakening of Osiris, who prior to being resurrected on the third day after death, had to have his phallus rubbed with oil in order to facilitate copulatory divine sex with his wife the goddess Stella Maris (star of the sea), otherwise known as Isis, in the form of a kite, who hovered over him, and her sister, the goddess Nephthys, all of which was depicted in a play, called the Passion of Osiris, reenacted each year on the Nile Delta.

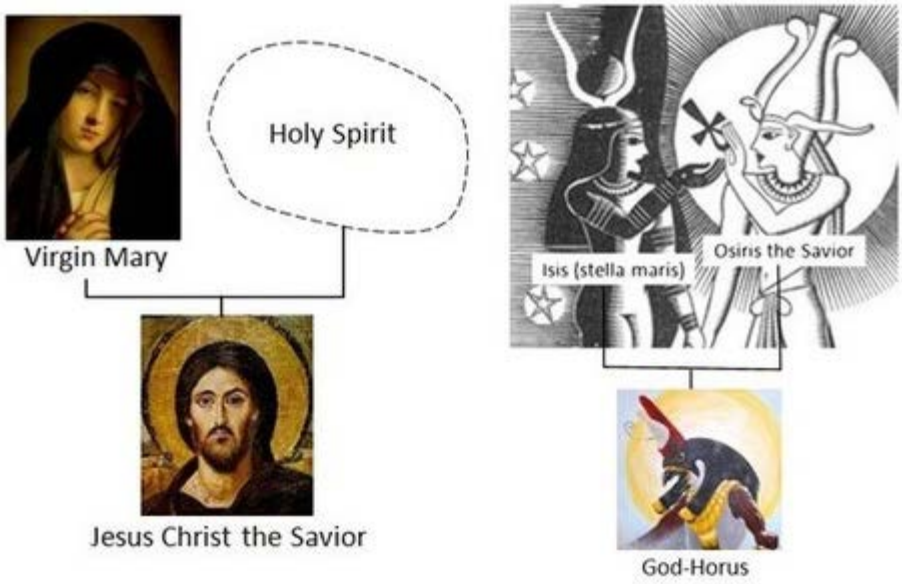

The **Christianity** version (left) of the Virgin Mary-Holy Spirit parentage of the man-god Jesus, as compared to the the original Egyptian Ra theology version (right) of Osiris-Isis (Stella Maris) parentage of the man-god Horus, on which the former is based.

Proof god does not exist

See main: Disproofs of the existence of god; God does not exist

The general laity type of individual, in contrast to the typical leading scientist (who tends to have no belief in god, whatsoever) tends to want a hold-on-to proof that God does not exist, prior to grasping on to an understanding of new alternatives that modern physical science presents to answer questions of human existence (e.g. the Lewis inequality theory of morality). The following is quick and short proof that God does not exist:

(a) The main God of the world’s belief systems, whether Abrahamic or Brahmaic, which accounts for about ¾-ths of the belief world's belief systems (Bible, Koran, Rig Veda, etc), is a derivative of the Egyptian theory that the sun is the creator god called Ra, self-generated from a primordial flood, land mound, or cosmic egg, or combination of these, called the Nun.
(b) In 1734, Swedish polymath Emanuel Swedenborg proposed the nebular hypothesis, which argues that the sun was not self-generated but rather ignited from the contraction of a nebula or fluid-like atmosphere of gases.

(c) The nebular hypothesis was soon thereafter confirmed by telescope observation and was presented in its finalized accepted form in French mathematician Pierre Laplace's 1796 *Exposition of the System of the World*.
(d) In the 1920s, English astronomer Arthur Eddington added to the nebular hypothesis, by showing that the sun, being comprise of primarily the element hydrogen, burns or releases heat, via a process called proton-proton chain reaction, in which hydrogen converts to helium.
(e) In 1939, German-born American physicist Hans Bethe added the final pieces to Eddington's proton-proton chain reaction model, by showing that a proton can beta decay into a neutron via the weak interaction during the brief moment of fusion, making deuterium the initial product in the chain.
(f) Points (b) through (e) prove that the sun is not a god, but rather a thermonuclear reaction in progress.
(g) Point (f) discredits the validity of the theory of point (a), and leads to the conclusion that God does not exist.

In other words, the gods of the major religions of the modern world, based on the Bible, Koran, Rig Vida, are all based on mythological gods, and hence do not exist. Certainly this is not the most rigorous proof one could come up with, nevertheless it does the job, freeing the mind to move on to more pressing problems at hand, such as explaining purpose, in the context of the movement of the observable universe.

See also

- Christian captain parable

Quotes

The following are related quotes:

> "**Christianity** is the fairytale of Christ."
>
> — Johann Goethe (c.1810) [1]

> "**Christianity** is a mythology with which I am perfectly familiar so I naturally use it."
>
> — Samuel Beckett (c.1950) [2]

References

1. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§: Johann Goethe, pgs. 105-07). Prometheus.
2. Waiting for Godot (philosophical) – Wikipedia.

External links

- Christianity – Wikipedia.

θΔics

In existographies, **Christina Alexandra** (1626-1689), aka Queen Christina, born “Christina Adolphus”, baptized as “Christina Augusta”, and renamed “Christina Alexandria”, her adopted name, which she signed letters with, was Queen of Sweden from 1632 to 1654, characterized as “one of the wittiest and most learned women of her age” (Q), noted for []

Enlightenment

Alexandra seems to have been an intellectual of sorts. She amassed a enormous collection of books and manuscripts, which is now in the Vatican library.

In 1645, Alexandra got Hugo Grotius to become her librarian; he died (dereacted), however, before he could realize this role. She associated with Blaise Pascal, who offered her a copy of his mechanical calculator. She was said to actively searched for a copy of *The Treatise of the Tree Impostors*.

Descartes

Alexandra was a fan of Alexander the Great, famously tutored by Aristotle, and like him, she desired to be educated by Rene Descartes, and got him to come to Sweden to organize a “scientific academy”. On 4 Oct 1649, he arrived via boat with 2,000 of his books. On 11 Feb 1650, four months later he was dead.

> “Virgil, the bishop of Saltzburg, was condemned by the church, for having dared to maintain the existence of the antipodes. All the world is acquainted with the persecutions which Galileo suffered for pretending that the sun did not make its revolution round the earth. Descartes was put to death in a foreign land.”
>
> — Baron d’Holbach (1770), *The System of Nature* (pg. 284)

Reasoning has it that he was poisoned by her priests, who feared the potential influence of his mechanical philosophy.

Quotes | By

The following are quotes by Alexandra:

> “I have received your father's book which you have sent me. I thank you with all my heart for it and can tell you that I have read it from cover to cover with great care and pleasure. Others are better capable than I of judging its worth and expressing their esteem but my ignorance does not inhibit me from saying that I consider this work to be one of the most worthy and admirable of our century. The experiments, beautiful as they are, have been repeated by others at Paris, London, Florence and even here at Rome. But the deductions and new ideas, or rather conjectures, which he infers from them, are, as it seems to me, specific to him — at least I have read nothing similar — unless British astronomy, which I have not yet had the leisure to consider, has produced something comparable. Be that as it may, it seems to me that no one else but your father has given us **an idea of the universe** so worthy of its adorable author. I leave it to the mathematicians and astronomers to argue his system with him; for myself, I assent willingly to most of his conjectures, in so far, of course, as is permissible to me by the authority of the Church of Rome. Meanwhile, I thank you both for your gift and for the pleasure which the reading of such a beautiful book has given me.”
>
> — Christina Alexandria (1672), “Letter to Hans Otto (son of Otto Guericke)”, Jul 9 [1]

References

1. Conlon, Thomas. (2011). *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum* (Amz) (pg. 91). Saint Austin Press/LuLu.

External links

- Christian, Queen of Sweden – Wikipedia.

θΔics

In existographies, **Christine Kamla** (c.1994-) (CR:4) is a Romanian thinker noted, in human chemistry, for her 2011 high school applied science project on reaction-based adoption, a pertinent topic in the post 1989 Romanian reconstruction era, after its break from communist-controlled socialism run government, in which she gave a said-to-be "brilliant lecture" entitled "If the Genes Are Not the Last Word: of Elective Affinities to Adoptive Families", wherein she employs German polyintellect Johann Goethe's 1809 elective affinity based human chemical theory to outline a modern human chemical reaction theory based model of the adoption process. [1]

Overview

In 2011, Kamla gave a presentation on the elective affinities of child adoption in terms of reactions, supposedly in some way modeled on the Ottilie adoption scenario of Goethe's *Elective Affinities* in the context of modern adoption policies. The overview of her presentation is as follows: [1]

> "**Christine Kamla** had the special topic "elective affinities" with the same group selected topic. She shared her brilliant lecture in "General", "Academic" and literary "(see poster image). Having discussed the conditions and the procedure for a child's adoption, she made an interesting trip into the chemistry and showed that even in this science some elements of their "Elective Affinities" pick, the finale was the reference to JWv Goethe's eponymous book, which also convert the fate of already existing relationships in the new Elective Affinities - The problematization resulted from the fact that when an adoption is an element of arbitrariness. must be excluded and you cannot adopt children how to shop goods in the supermarket."

Some of the talk seems to have themed on how the laws of adoption and methods of differ between Romania and Germany.

Poster presentation

Photos from the presentation—with the poster board title "If the Genes Are Not the Last Word: of Elective Affinities to Adoptive Families" ("Wenn Die Gene Nicht Das LetÆµte Wort Haben — von Wahlverwandtschaften Æµu Adoptivfamilien")—are shown below:

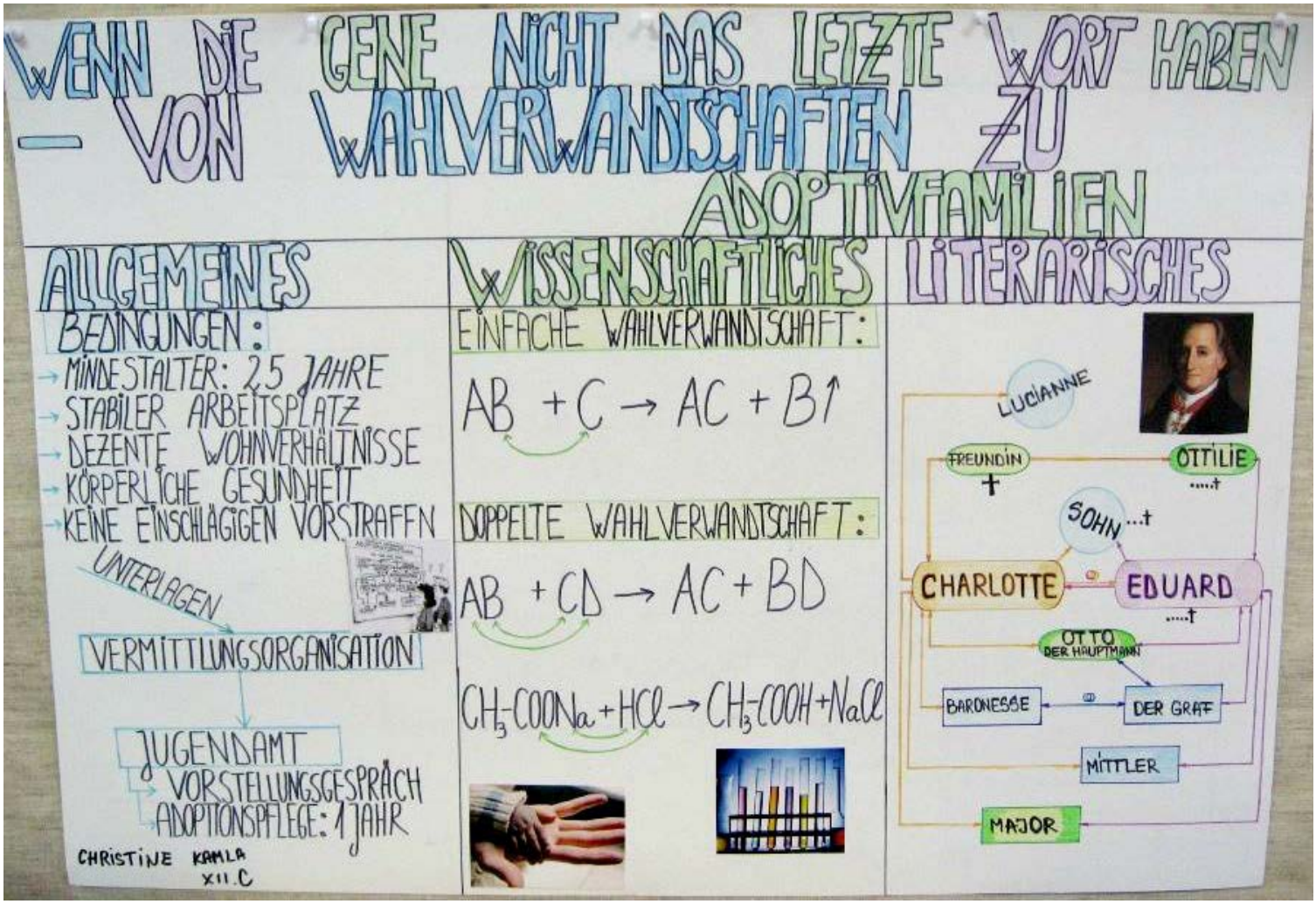

The following is a partially complete English-to-German translation of Kamla's adoption reaction diagram flow chart, which in some way shows the reaction flow of the adoption of Ottilie, Charlotte's deceased best friend (Freundin) into the home of the Charlotte-Edward family on the estate, wherein she seems to show some type of equilibrium or equilibration reaction (⇌) occurring between Edward and Charlotte, with some type of exchange entity (possibly sperm) over the two-way reaction arrow:

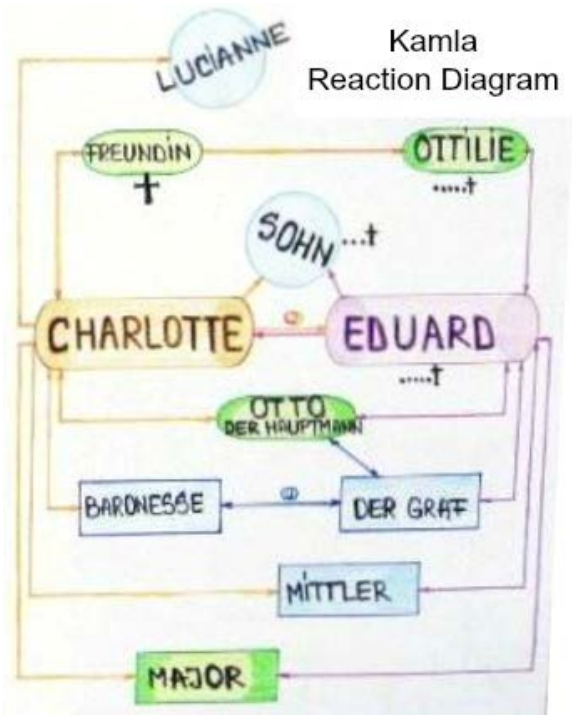

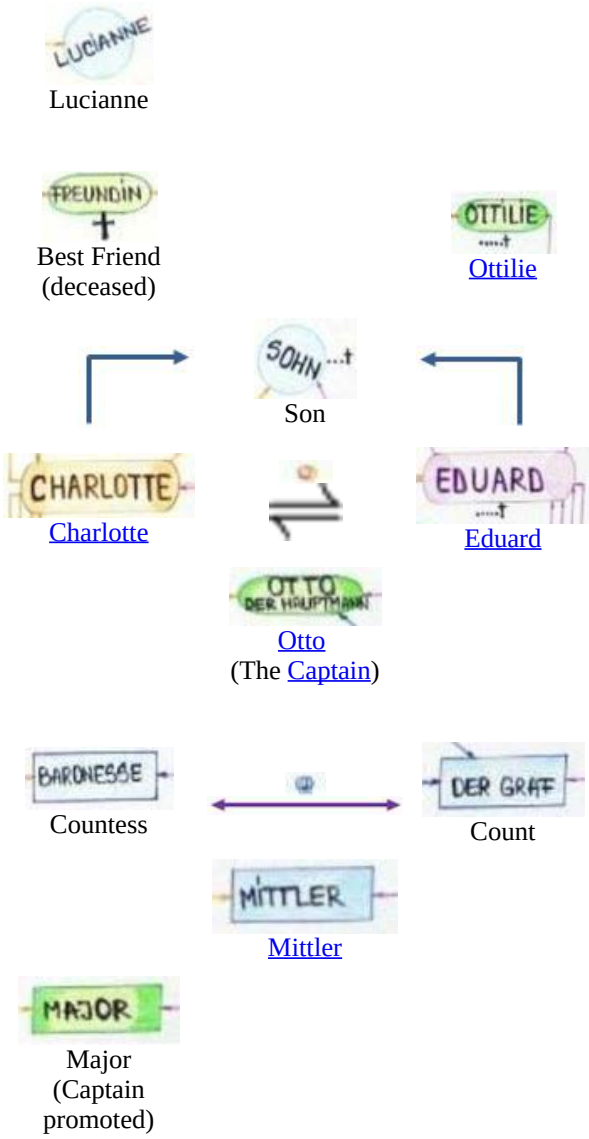

The following is a photo of Kamla during her talk:

Very interesting indeed, hardly anything remotely coming close to this can be found in any American schools.

References

1. Kamla, Christine. (2011). “If the Genes Are Not the Last Word: of Elective Affinities to Adoptive Families” ("Wenn Die Gene Nicht Das LetÆµte Wort Haben — von Wahlverwandtschaften Æµu Adoptivfamilien") (German → English), Jan 19, auslandsschulwesen.de.

θΔics

In festivals, **Christmas** (TR:14) is a holiday, celebrated annually, in modern times on Dec 25, symbolic of the birth of Jesus Christ, a date derived from the month-long Egyptian **Khoiak festival** (Dec 10 to Jan 8), wherein, in the original version, Osiris "corn mummies" were made and grown, at the end of which, on day 30 (Jan 6), the djed pillar, symbolic of the backbone of Osiris, mythically conceptualized as tamarisk tree (evergreen tree), was raised, signifying the reborn Osiris and the resurrection conception of the new man-god Horus.

A visual comparison of the original version of the evergreen "Osiris Christ mass" tree (left), carved in stone, shown the "angel", or soul (ba) of Osiris, above the evergreen tree (Persia tree), specifically relief #18, on the walls at the Temple of Dendera, commissioned under the rule of Roman emperor Tiberius, in 14 to 37AD, and the modern Christian-version of the Christmas tree, put up during the **Christmas** holiday season, a festival originally called the Koiak festival spanning a 30-day period of Dec 10 to Jan 8, at the end of which the djed pillar, a metaphorical Osiris backbone (or tamarisk evergreen tree) would be raised.

Overview

The modern Christmas season, centered around the putting up of a Christmas tree, originated, in 3,100BC, in what the Egyptians called the Khoiak festival, a celebration of the resurrection of Osiris, and the rebirth of the sun or sun god, centered around the rising of the djed pillar, symbolic of the "tamarisk evergreen tree" (or Persia tree), which, according to the "Legend of Osiris", grew up around his entombed body, was cut down, and brought into the palace of a king, as was famously summarized by Plutarch in 100AD. [2]

The following is the "Hermopolis version", one of about 16 varieties, of Horus (god the son, aka baby Jesus) raising Osiris (aka god the father), next to the Persia tree (Erica tree), aka Christmas tree, with the Ba or soul of Osiris, aka Christmas tree angel resting (hovering) above the tree, as depicted during the Koiak festival, on one of the walls of the Dendera Temple: [3]

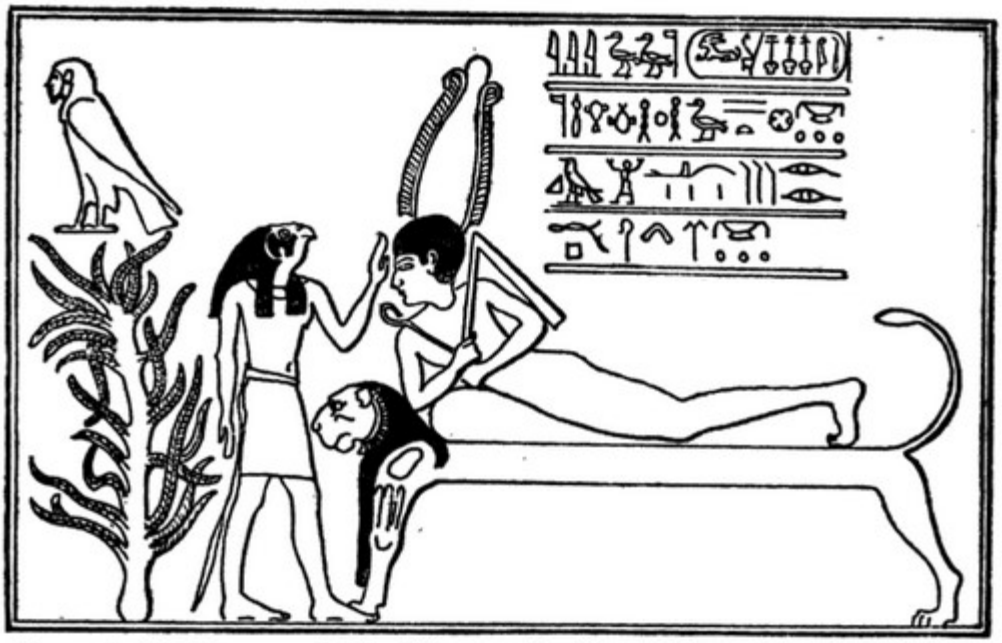

The soul of Osiris on the Erica tree.

Osiris of Hermopolis of Lower Egypt rising from his bier at the command of Horus.
Mariette, *Dendérah*, IV, 72.

(add)

Quotes

The following are related quotes:

> "1642 [Newton 's birth] is the **Christmas** of the modern age."
>
> — Johann Goethe (c.1810)

> "When Darwin's book hit the crowd, it was like Christmas for ex-Christians."
>
> — Jennifer Hecht (2003), *Doubt: a History* (pg. 405)

> "There is an assumption that atheists don't 'do **Christmas**'."
>
> — Elisabeth Cromwell (2011), "A Very Atheist Christmas" [1]

See also

- Christmas Tree

References

1. Flynn, Tom. (1993). *The Trouble with Christmas* (Osiris, pgs. 55-57). Prometheus Books.
2. Cromwell, Elisabeth. (2011). "A Very Atheist Christmas" (Q), *Washington Post*, Dec.
3. Budge, Wallis. (1911). *Osiris and the Egyptian Resurrection, Volume Two* (pg. 40). P.L. Warner.

External links

- Christmas – Wikipedia.
- Tom Flynn (author) – Wikipedia.

θΔics

In religio-mythology, **Christmas Tree**, the symbolic decoration tree of modern Christmas, is an act symbolic of the "raising of Osiris" (aka Raising of Lazarus or Orion rising), in the form of the tamarisk evergreen green, a holiday performed annually in ancient Egypt on about Dec 21, which is representative of the rebirth of Osiris, as told in the Passion of Osiris, which itself is symbolic, in the original astro-theology formulation, of the "raising of Orion" constellation, a mythological ritual that dates back over 5,000-years.

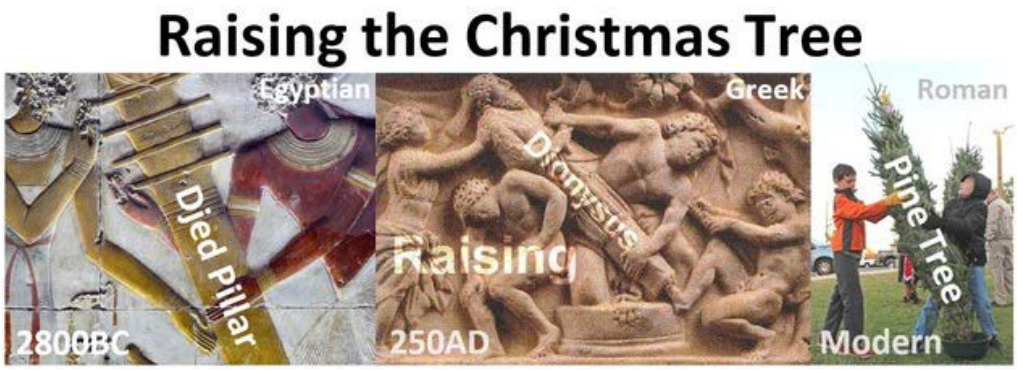

Left: the original Egyptian (3100BC) version of the raising of the Djed pillar, a tree-like rendition of the backbone of the reborn Osiris, raised annually, generally on Dec 21, as a tamarisk tree (evergreen), a few days before Dec 25 (Winter Solstice) and the birth of Horus (by Isis). Middle: Dionysus, the Greek version of Osiris, being raised like Orion, or Osiris as the re-born evergreen tree. Right: the modern Christian version of this, the annual raising of a pine tree (**Christmas tree**), decorated with a star at the top.

Persea tree | Christmas tree

The origin of the evergreen tree raised during the holidays, is a syncretism of the myth of Ra the sun god, in the form of the bennu bird (or phoenix) born out of the tip of an evergreen tree, as promulgated by the Priests of Ra, in Heliopolis, united with the Osiris cult model of Osiris reborn in the form of a tamarisk evergreen tree, aka Djed pillar, as told in the famous myth of the death and resurrection of Osiris.

In 1897, Alfred Wiedemann, in his *Religion of the Ancient Egyptians*, devoted a chapter section to the bennu, the mythical bird thought to be the form of the new born sun, born out the tip of an evergreen tree, called by the Greeks the Persea tree, about which he said the following: [17]

> "The phoenix, Egyptian ***bennu***, which classic and Christian artists often represented as an eagle, was imagined by the Egyptians rather as a heron, and was depicted with two long feathers growing out at the back of its head, and sometimes also with a tuft hanging from its breast. The name *bennu* signifies 'that which revolves' or 'turns back'.
>
> Myths told how the **bird was born** from the midst of flames which arose from out of the **summit of a tree** in Heliopolis, and that it was known to men by the beauty of its song, to which even the sun himself love to listen. The phoenix symbolized the morning sun arising out of that fiery glow of dawn which dies away as the new born luminary ascends the sky, and hence was regarded as the bird of Ra. But since the dead sun was held to become an Osiris and the new sun to arise from the embalmed body of the old which had been duly brought to Heliopolis, in like manner also the phoenix was supposed to be a form of Osiris in which the god returned to his own country.
>
> Further, as on the death of the sun it was from the Osiris sun that the phoenix sun arose, so it was taught in the case of humanity also that it was from his 'own Osiris' that there sprang the new man of the resurrection, and of this resurrection the phoenix became a symbol from a very early date. Hence, even in funerary texts of the Old Kingdom [c.2500BC] the deceased was likened to the phoenix: later it continued to serve as a symbol of the resurrection, and as such it is mentioned in patristic literature and figures in earliest Christian art."

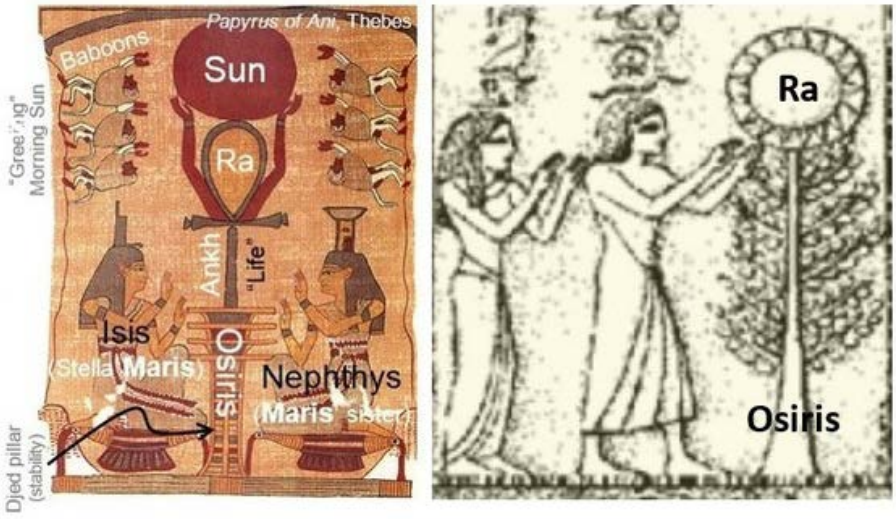

A depiction of the sun or Ra being born out of Osiris as a evergreen tree, a general rendition of the 1250-1150 second Thebian recension joint supreme god Osiris-Ra.

In 1904, Wallis Budge, citing Wiedemann, summarizes this bennu bird Persea tree sun birth belief as follows: [18]

> "On a hypocephalus quoted by Wiedemann, the deceased is made to say, "I am in the form "of the Bennu, which cometh forth from Het-Benbenet in Annu," and from many passages we learn that the Bennu, the Soul of Ra, which appeared each morning under the form of the rising sun, was supposed to shine upon the world from the top of the famous **Persea tree** wherein he renewed himself."

The following, relief #18 from the Dendera Temple, subtitled by Wallis Budge (1904), shows the sacred Persea tree growing out of the head of the bier of the mummified Osiris, shown with the soul (or ba) of Osiris at the top of the tree: [14]

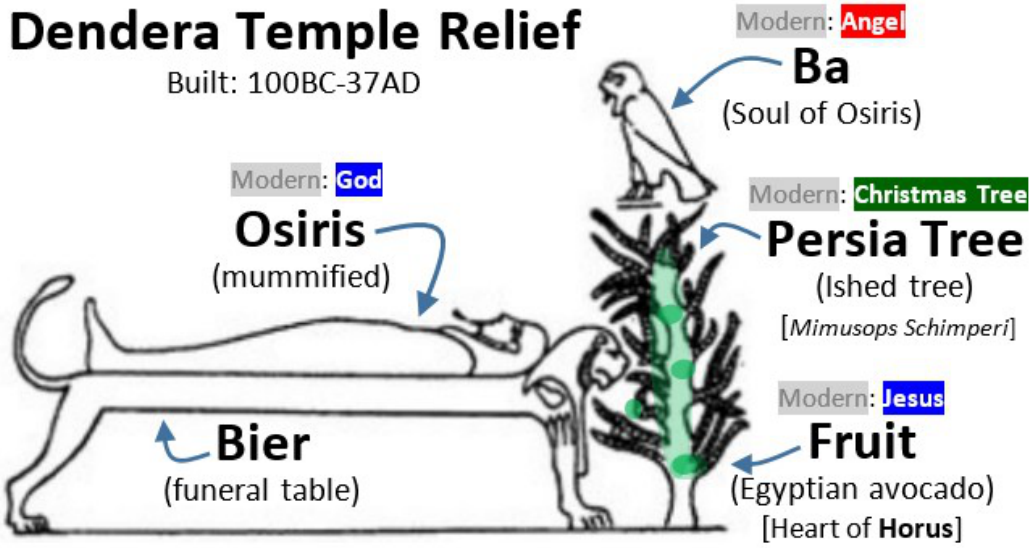

18. Osiris Un-nefer, in mummied form, lying on his bier, at the head of which grows the Persea tree, *Âsheṭ* ; above the upper branches stands a soul in the form of a man-headed hawk.

In 1977, William Darby, et al, in their *Food: the Gift of Osiris*, giver various interpretations concerning the significance of the "sacred" tree in Egyptian, called “Ished tree or S’w’b tree (Egyptian), or the “Persia tree” (Greek), named after the god Greek Perseus, which often depicted kings protected by its foliage or emerging from it. The high esteem which was afforded this tree is indicated by a law passed under Emperor Arcadius forbidding the uprooting or sale of any persea tree in Egypt. [15]

The “fruit” (i.e. Egyptian avocados) of the persea symbolized, supposedly, the “sacred heart” of Horus, and eating it gave eternal life and knowledge of the divine plan. [16] This, supposedly, is the origin or an aspect of the origin of the “tree of life” and or the “tree of knowledge”.

The following is a picture of Osiris transforming into the djed pillar (Christmas tree) along with some of his powers going into the the newly conceived baby Horus, where from the idea of the birth of the baby Jesus and Christmas trees originated:

The following is a corrected (O)(O) Christmas tree:

Osiris (and son Horus) IS the Reason for the Season

> "Yes, this is what they [Spong, etc.] say [that these 'stories', these 'myths', that were found in Egyptian religion, and in Greco-Roman religion, **simply *foreshadowed*** the existence and coming of Jesus] and I was **force-fed** that all through university seminary, and, in seven years [1964-1971] as professor of New Testament, I **force-fed** it to my students, and it was **hokum** and it was **wrong**! It's not just foreshadowing. When you get down to **180 exact parallels found between Horus and Jesus** – a hundred and eighty exact parallels. It is so precise, and so exact. You cannot argue against it. It blows you away."
> — Tom Harpur (2004), author: *The Pagan Christ*; Interview by Allen Gregg, Tvo.org, Sep

(add discussion)

Osiris | Tamarisk tree

In Egyptian mythology, the Osiris cult, which was well-established by 3100BC in Egypt, as told in one version (see also: version two) of the Passion of Osiris, Osiris, gets into a heated conflict with his brother Set, after he mistakenly sleeps with Nephthys, his brother's wife. Set, to get back at his brother, tricks Osiris, during a dinner party, into getting into a trunk, fit precisely to Osiris' body size. Plutarch, in his *On Isis and Osiris* (100AD), summarizes this as follows: [3]

> "When Osiris came again Typhon [Set] plotted with seventy two comrades, and with Aso, the queen of Ethiopia, to slay him; and secretly got the measure of the body of Osiris, and made ready a **fair chest**, which was brought into his banqueting hall when Osiris was present together with other guests. By a ruse, Osiris was induced to lie down in the chest, which was immediately closed by Typhon and his fellow conspirators, who conveyed it to the Titanic mouth of the Nile. These things happened on the seventeenth day of the month of Hathor, when Osiris was in the twenty-eighth year either of his reign or of his age."

Set then threw the chest, similar to that shown below (left) (Q), containing the body of Osiris into Nile, as shown below right: (Q)

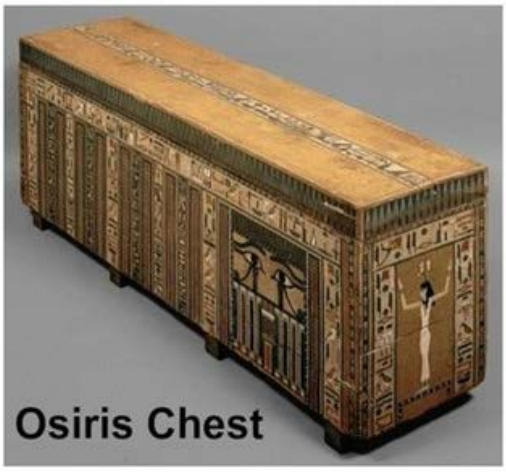

Plutarch, in his *On Isis and Osiris* (100AD), summarizes this as follows: [4]

> "Soon after she learned that the chest had been carried out by the sea to Byblos, where it had been gently laid by the waves among the branches of a **tamarisk tree** (Q) , which I a very short time had grown to a magnificent size and had enclosed the chest within it's trunk."

The following is an artistic rendition, by Hoda Hefzy (Q), of Isis on boat finding the tree of Osiris at Byblos:

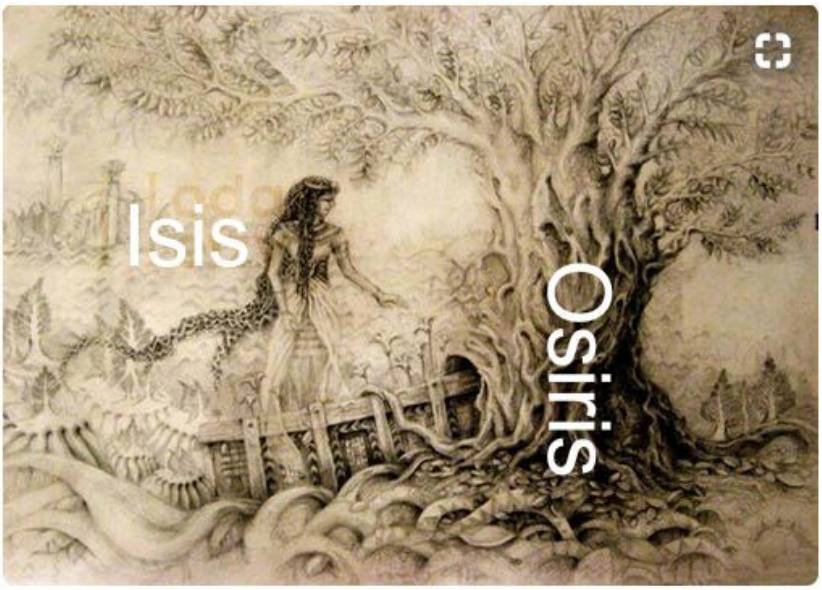

The following is an original Egyptian visual of this chest-turned-tree: [4]

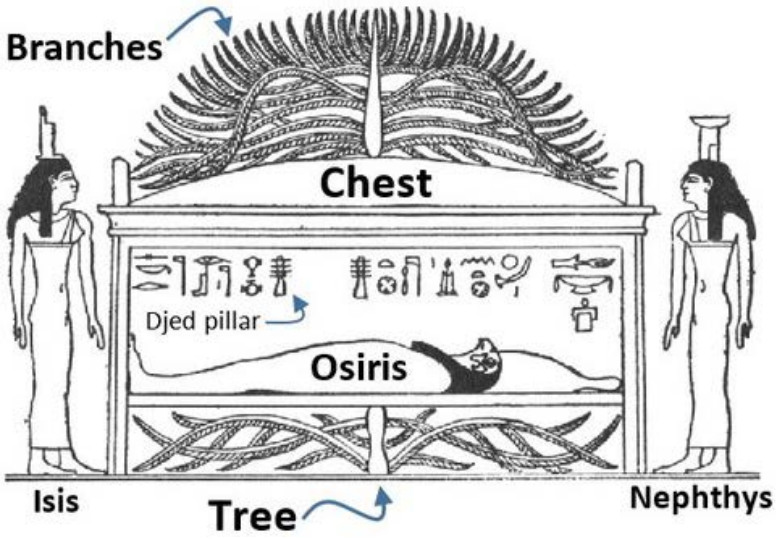

The following, below left, is a modern rendition (Q) of the so-called Osiris evergreen tree; below right is a real (Q) tamarind tree, such as Plutarch might have had in mind when he told (or heard) the Osiris and Isis tale:

The Egyptians, as summarized by Budge (Q), often referred to the divine food of the gods called “tchefau”; this is speculated to have been mushrooms (Q), and or resin-based “manna” (Q), that grew under the evergreen trees, e.g. tamarisk tree (Egypt) or pine tree (Europe).

Djed | Pillar

This chest, containing the body of Osiris, within a tree, according to the Plutarch version (100AD), was found by the king of that country and made into a pillar for the roof of his house; this is summarizes this as follows: [3]

> “The King of the country, admiring the tree, cut it down and **made a pillar** for the roof of his house of that part which contained the body of Osiris.”

This is the origin of the so-called "djed pillar", the four ringed shaped amulet, examples (Q)(Q) of which are shown below (right), which is said to be symbolic of the back bone of the reborn Osiris, as shown below below (left), said to be symbolic of stability:

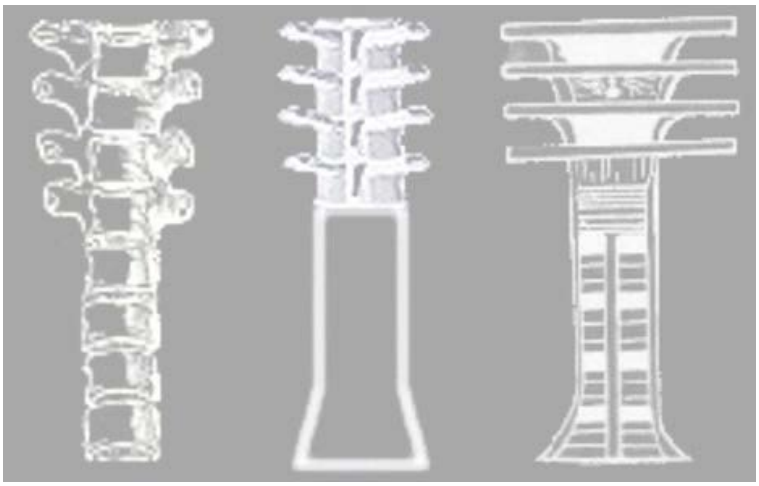

The flower-shape of each ring, seams to be symbolic of lotus plant sun god birth origin theory.

Koiak | Month

See main: Khoiak festival

In Egypt, annually, the 30-day period of Dec 10 to Jan 8, the fourth month of the Season of Akhet (Inundation), just as the waters receded to expose silt-covered fields fresh for sowing, was a festival month called the "month of Khoiak (or Koiak)", the forerunner to the modern Christmas season, each day of which a special holiday event or ritual occurred. [9] The festival of Khoiak was a seed-planting festival of sorts; the gist of which is summarized as follows: [10]

> "The **festivals of Khoiak** are among the best attested from ancient Egypt. They revolve around the myth of the god Osiris, murdered by his brother Seth, and revived by his sister-wife Isis to the point where she could conceive their son Horus. Osiris withdrew to rule the underworld, while Isis protected Horus until he was old enough to avenge his father in battle with Seth, and win the throne."

In 1550BC, the Osiris rebirth myth became a month-long festival, which involved the making of pottery-like Osiris mold planting beds, examples of which are shown adjacent, that were planted each year; the gist of which is summarized as follows: [10]

An example of an "Osiris Bed", aka **corn mummy**, a mold-shaped container, that was filled with mud and grain (typically barley; or millet or wheat), ranging in size from a few inches to body-sized, that beginning in the New Kingdom (1550BC) began to be put into the tombs of pharaohs. An Osiris Bed found in the tomb of Egyptian courtier Tuya (c.1390BC) (Q) had 8-inch sprouts growing out of it. [11] These Osiris Beds were precursors to the **Christmas tree**.

> "The death and revival of Osiris provide the mythic echo of the annual rebirth of crops. In the ceremony, seeds [barley, millet, wheat (Q)] were sown in earth, which was from the New Kingdom [1550BC] shaped in [corn mummy] moulds to the **form of Osiris**; the sown earth was watered until the seeds germinated, and then this guarantor of a successful crop was buried.
>
> The timing of the festival in the official year placed it in the fourth month of flood, just as the waters receded to expose silt-covered fields fresh for sowing. The name of the festival was ka-her-ka 'ka upon ka' (or 'sustenance upon sustenance'); it survived into Christian times as the name of the fourth month of the season of flood, rendered in Coptic as Khoiak."

The following is relate quote:

> "The deceased wears an onion necklace to prepare for the solarization of the Sokar-Osiris. A luminous rebirth occurs on the morning of the 26-th day in the month of Khoiak in the hnw-barge, which is protected by the five geese, daughters of Ra, and their barges. The

transport of the hnw was organized by the high priest of Ptah in Memphis."

— Donald Redford (2001), *The Oxford Encyclopedia of Ancient Egypt, Volume 3* (O)

The following shows the timeline "events", based on known sources, that occurred each day of the month of the Koiak festival; in the Hathor temple (100AD) column, to note, we see Osiris being identified with Sokar (Sekar), the underworld god of Memphis, which, according to Budge (pg.130), occurred sometime after the Pyramid Texts, at an unknown time:

Day	**Modern**	**Medinet Habu** [1150BC]	**Koptos Basin** [850BC]	**Jumilhac Papyrus** [100BC]	**Hathor temple** [100AD]	**Budge Summary** [1904]	**Christianity** [400AD]
1	Dec 10	[make new Osiris god mould case]	[make new Osiris god mould case]	[make new Osiris god mould case]	[make new Osiris god mould case]		
2-11	Dec 11-20						
12	Dec 21		watering the moulds		watering the Osiris/relic moulds	the Festival of the Ploughing of the Earth and the Festival of the Tena were celebrated.	
13	Dec 22		watering the moulds		watering the moulds		
14	Dec 23		watering the moulds		watering the moulds; **new Sokar [Osiris]** figure made	the great Festival of Pert	
15	Dec 24		watering the moulds		watering the moulds		
16	Dec 25		watering the moulds		watering the moulds; anointing the Sokar figure, placed on bier	the Festival of Osiris Khent Amenti	Christmas, aka Birth of Jesus, i.e. a **new Jesus** is born.
17	Dec 26		watering the moulds		watering the moulds		
18	Dec 27		watering the moulds		watering the moulds		
19	Dec 28		watering the moulds	finding the head of Osiris	watering the moulds; censing the Sokar figure		
20	Dec 29		watering the moulds	finding the eyes of Osiris	watering the moulds; weaving the shroud		
21	Dec 30	opening window in Shetayt shrine	watering the moulds	finding the jaws of Osiris	Osiris and relic figures taken out of moulds; cloth woven		
22	Dec 31	hoeing the earth	watering the moulds	finding the neck/arm of Osiris	search on the Sacred Lake		
23	Jan 1	making way in Shetayt shrine	watering the moulds	finding the innards of Osiris	burial preparations		
						the model of the god of	

24	Jan 2	placing Sokar in their midst	procession of figures	finding the intestines of Osiris	removal of figures of last year	the preceding year was taken out from its place and buried suitably, and the **new Osiris** [corn mummy] was embalmed in the sanctuary	
25	Jan 3	Netjeryt (tying onion strings in evening)	final rites on roof (or 26?)	finding the lungs/phallus of Osiris			
26	Jan 4	Sokar festival - circling the walls	inal rites on roof (or 25?)	finding the thighs/legs of Osiris		The new Osiris remained without burial for seven days because of the tradition which declared that the god had remained for seven days in the womb of his mother Nut when she was with child.	
27	Jan 5			finding the leg/fingers of Osiris			
28	Jan 6			finding the phallus/arm of Osiris			
29	Jan 7			finding the heart of Osiris			Eastern Orthodox Christmas, i.e. a **new Jesus** is made.
30	Jan 8	raising the Djed pillar		finding arm/Horus sons; raising the Djed pillar	burial of figures; raising the Djed pillar	the Tet was set up in Tettu [Busiris], because on this day the divine members of Osiris were brought."	

The following is a visual the so-called "raising of Osiris" or raising of Djed pillar ceremony:

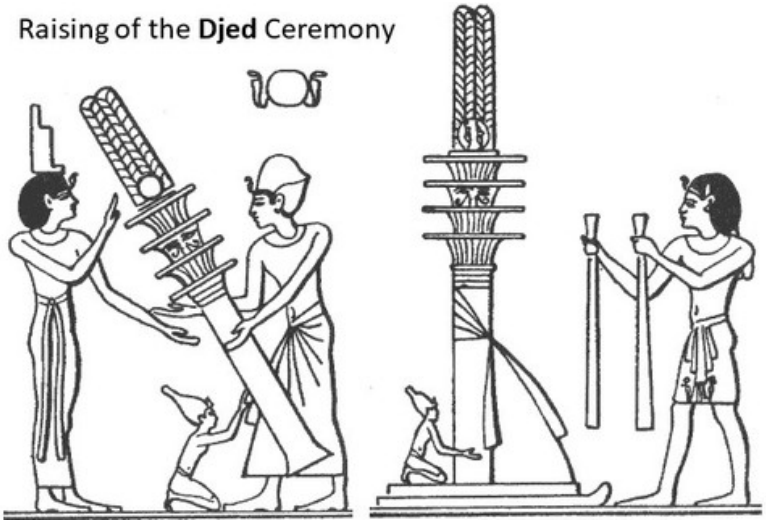

This thirty-day festival ending in the raising of the djed pillar eventually morphed into the Christmas tree celebration.

Dorothy Murdock (2010) comments how at some point in the Khoiak festival, the Egyptian baby son god Sokar was carried out of the temple on an ark (Q); also that Epiphanius (c.350AD) had his comments about how the Egyptians brought forth a "baby sun born of a virgin at winter solstice" censored.

Vincent Brown (2002) summarizes this as follows: [4]

> "The reconstruction of the body of Osiris occurred at a place called

Djedu,in the Delta region of Lower Egypt and it was here that the yearly ceremony of 'Raising the Djed Pillar' took place on the last day of the month of *Khoiak*, the eve of the agricultural New Year. The next day marked the beginning of the four month long season of *Pert*, or 'Going Forth' during which the lands rose out of the flood waters allowing the fields to be sown. *Djedu* was also referred to as *Per-Asar-Neb-Djedu*, meaning "The House of Osiris - the Lord of Djedu". The Greeks called it **Busiris**, after the shortened title *Per-Asar* - "The House of Osiris". Mythologically, the 'Raising of the Djed' symbolised the resurrection of Osiris, and with its annual re-enactment represented the death and renewal of the yearly cycle. Osiris is referred to as "Lord of the Year" in the Pyramid Texts and that he was also the god of agriculture meant that his annual resurrection ensured the stability of the abundance of the next season's crops."

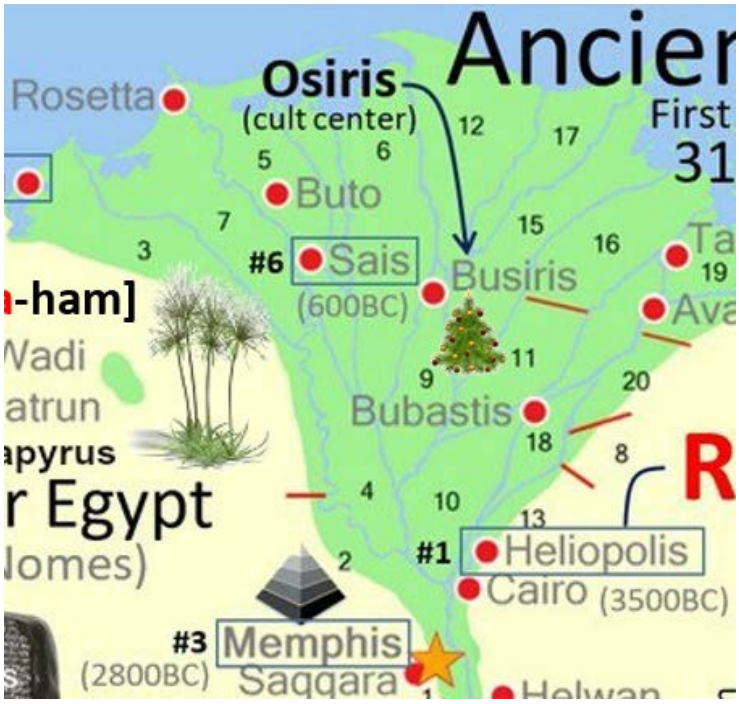

The Egyptian city of Busiris (Greek) or Tettu (Egyptian) were the annual setting up of the Tet (**Christmas tree**) was performed on the last day of the festival of the Passion of Osiris or month of Khoiak.

Below (left), an image (O) (O) from Gaston Maspero's *History of Egypt, Volume Six* (c.1895), we see a evergreen tree (tamarisk) growing out of the tomb of Osiris, when the story was being popularized in Assyria:

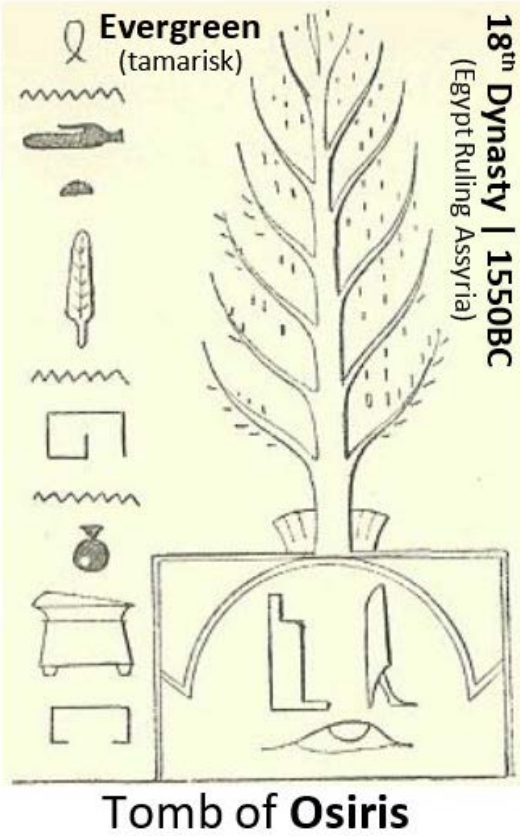

Above (right) we see (O) a 2015 rendition of the djed pillar, decorated Christmas style, made by someone at the TempleOfAnu.com website. Jarid Miller (2010) summarizes things as follows: [5]

"The idolatrous festival was on December 25th. This system began by Osiris and Isis and their son Horus about 3000BC; centuries before the birth of Yahshua [son of Yahweh]. When King Osiris died, his wife Isis claimed a **full-grown evergreen tree** sprang up overnight from a dead tree stump, which symbolized the springing forth unto new life of the dead Osiris. On each anniversary of his birth, she claimed Osiris would visit the evergreen tree and **leave gifts** upon it. December 25th was the birthday of King Osiris reborn as

the son, Horus. This was the **origin of the Christmas tree**. Jeremiah 10:2-4 speaks on the Christmas tree."

The Jeremiah citation is as follows:

> "Learn not the way of the nations,nor be dismayed at the signs of the heavensbecause the nations are dismayed at them,for the customs of the peoples are vanity.**A tree from the forest is cut down**and worked with an axe by the hands of a craftsman.They **decorate it with silver and gold**;they fasten it with hammer and nailsso that it cannot move."
>
> — Anon (c.500BC), *Bible*, Jeremiah 10 (Q)

(add)

Tammuz

In 1600BC, the Osiris/Isis rebirth model was reformulated into the story of Tammuz (Osiris) and Inanna (Isis) model: (Q)

> "The queen (Semiramis) told the worshippers that when Tammuz (aka Nimrod) was killed … some of his blood fell on the stump of an **evergreen tree**, and the stump grew into a full new tree overnight. This made the evergreen tree sacred by the blood of Tammuz."

Sheryl Karas, in her *The Solstice Evergreen* (1998), touches on some of this Tammuz tree variant. [20]

Dionysus | Bacchus

The following is a photo, from a c.250AD marble sarcophagus, of the Greek god Dionysus (1600BC), the Greek rescript of Osiris (2800BC), being lifted up as a pine tree, aka "Raising of Dionysus", during the spring festival of the mystery religion: [19]

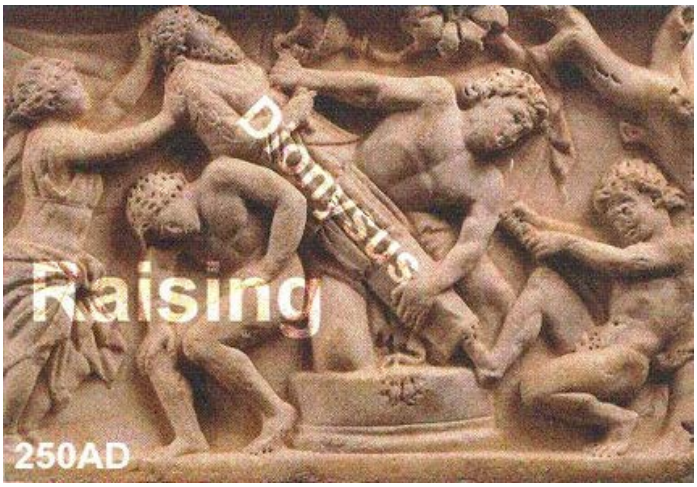

The following shows two Greek vases, dated from 600 to 500BC, respectively, wherein Dionysus is shown raised as the Osiris form of Djed pillar:

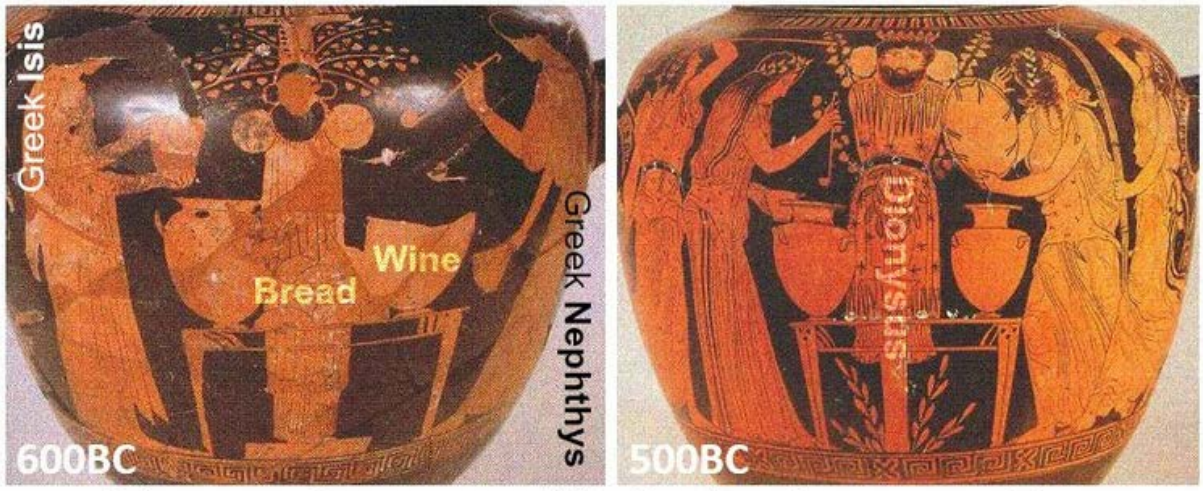

Dionysus Resurrected/Raised as Evergreen Tree
(Osiris as Djed Pillar)

It was Herodotus (450BC), supposedly, who first equated the Greek god Dionysus with the Egyptian god Osiris. (Q) The early era Romans (100AD) later called Dionysus Bacchus. The later era Romans (400AD) syncretized all of this with the namesake "Jesus".

Attis

In Phrygian mythology, the Attis cult (Q), modeled on the Osiris cult, originating c.1250BC in Turkey, Attis, the Phrygian god of vegetation, worshipped predominately from 500BC to 400AD, who is latter found in Greek mythology (400BC) and in turn Roman mythology (200BC), was worshiped to the effect that on Mar 22 a pine tree was carried into the Temple of Cybele and decorated with flowers and models of Attis. [1]

Attis, one version of the so-called Cybele and Attis myth, returned to life in the form an evergreen tree. [2]

In the mysteries of Attis, according to Christian church father Firmicus Maternus, a youthful image of the god-man Attis was "tied to a pine tree". [19]

In the Roman era, the Christian version of the Easter festival, according to Michael Jordan (1993), took over the date of the Attis rites. [1]

Christianity

In the Roman recension, all of the former evergreen versions of the god Osiris, practiced as Dionysus (Greece), Attis (Phrygia), and Bacchus (Rome), were morphed, by circa 400AD, to the effect that Jesus was "hung on a tree", such as Peter says in the Acts of the Apostles, as does St. Paul in his Letter to the Galatians. [19]

In later years, c.1500AD, Osiris, who originally was the Orion constellation, riding on his star barque, became Santa Claus, who road his sleigh around the earth in 24 hours delivering presents, the sleigh symbolic, supposedly, of the Big Dipper, which in Egypt seemed to go around the north star in 24 hours in December nights, who left presents under the Christmas tree:

A 2800BC figure (Q) of the Staff of Ptah, which combines the powers of the "Ankh" or life reviving power of Isis, the "Was Scepter" a symbol of Set tamed, and the Djed Pillar, a symbol of the re-born Osiris, and the son Horus born on Dec 25, from the union of the resurrected Osiris and Isis in act of the black rite.

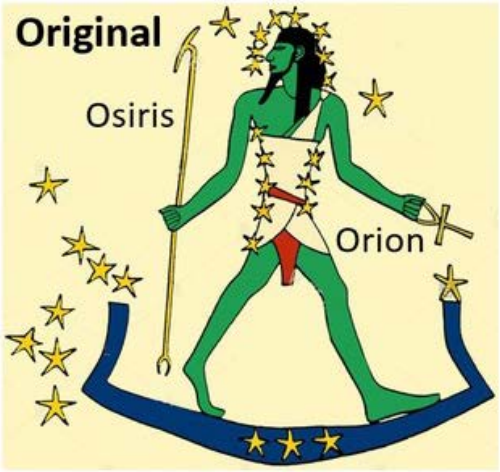

Osiris in Solar Boat riding around **North Star** in 24-Hours

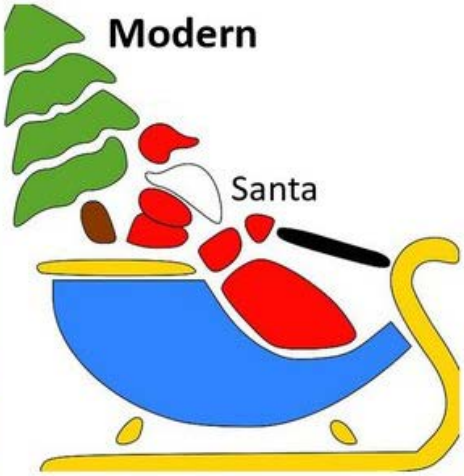

Santa in Sleigh riding around **Earth** 24-Hours

Therein, Horus born on Dec 25, the immaculate son of Osiris, became the baby Jesus born on Dec 25 in a manger.

In the Bible, in Genesis 21:33 (O), Abraham, in coded speak, is described as having planted a tamarind tree, which is said to parallel the tree of life (O) in some way.

Gadalla

In 1997, Egyptian-American Egyptologist and civil engineer Moustafa Gadalla (1944-), in his *The Ancient Egyptian Roots of Christianity*, summarized the tamarisk tree and Christmas tree connection as follows: [7]

> "The story continues that the coffin of Ausar (Osiris) was swept by the waves to the shoreline of a foreign land. A tree sprang up and grew around it, enclosing the body of Ausar in its trunk. The tree grew large, beautiful, and fragrant. [See an Ancient Egyptian temple depiction below.] News of this magnificent tree came to the king of this alien land, who ordered that the tree be cut down, and its trunk brought to him. He utilized the trunk as a pillar in his house without knowing the great secret it contained within. This is reference to the Tree of Life, and with all that that implies. It is also a reference to the Tet (Djed) pillar of Ausar (Osiris). In Christianity, this became the **Christmas tree**."

This is reference to the Tree of Life, and with all that that implies. It is also a reference to the Tet (Djed) pillar of Ausar (Osiris).

In Christianity, this became the Christmas tree.

Moustafa Gadalla's 1997 description of the Osiris tamarind tree trunk as the original "**Christmas tree**". [7]

(add)

Arthur | Santa-ology

In 2000, religio-mythologist James Arthur, in his *Mushrooms and Mankind*, outlines the subject he defines as "Santa-ology" or "Santa-ism", wherein he asserts the following: [8]

> "Today's Santa Claus is a metamorphosis of many older mythologies, including Thor or Donner (German Donar) who wears red and rides in a Golden Flying Chariot pulled by two Goats (Cracker and Gnasher). In a sense, these goats were the ancestors to the now popular reindeer. What would the red and gold clad angel be doing with that nice basket? An Easter basket at Christmas is an interesting concept.
>
> The icons, symbols, and relics that have managed to survive from the "Winter Solstice" celebrations of old, have a commonality that deserves some reflection, study, and perhaps even some reverence. Understanding that these traditions are borrowed ones, is central to getting at the heart of the true meaning of Christmas.
>
> Christmas is commonly thought of as a Christian holiday (the birth of Jesus). Many Christian beliefs and traditions were borrowed from more ancient religions and mythologies. This is well documented by authors such as Gerald Massey, Godfrey Higgins, Robert Graves, Kersey Graves, and many others. The virgin birth, the incarnation of god, the sacrament, Christmas, Easter, etc. have all been adopted/stolen by Christianity as its own."

Arthur, in continuation, comments on umbrella term 'Pagan' as follow:

> “It is well documented by fundamentalists (apologists) that the Christmas traditions are Pagan in origin. This simply means that their origin comes from the traditions of the country-folk (pagan). By contrast, the Pagan origins of most of the other attributes of Christianity are vigorously denied. It is also very easy to obscure, overlook and discredit the Egyptian, Mithraic, Germanic, Norse, Celtic, Greek, Hindu and Buddhist roots by lumping all non-Christian religions together and labeling them ‘Pagan’. These are certainly not simple country-folk religions. So to just say Christmas has Pagan roots, and not go further, is glossing over what exactly those roots are, and discrediting their study as worthless. Christmas icons, traditions and stories have hidden meanings. Although not initially apparent, a more thorough investigation reveals far more symbolic content (which is decipherable) than originally suspected. At the roots of this symbolism research is information about the secrets of the mushroom, regarding its habitats, forms, uses, preparations, and effects.”

Arthur continues:

> “Shaman of Siberia and the Russian icon, St. Nicholas, both play parts in the tale of Christmas, providing clues as to where Christmas came from and why there are certain symbols associated with the holiday. It is these types of clues that will help (the questors) in the deciphering of the symbols. Siberian Shaman used/use (despite governmental oppression) the Amanita muscaria as a religious sacrament. It is used for spiritual vision, out-of-body travel into the realms of the spirits, and as a plant-spirit guide in teaching and healing. The value of the inebriant is placed highly among the commodities of the native tribesmen, fetching reindeer pelts, meats, and all manner of tradable goods in payment and barter. Interesting to note: If you aren't quick enough in the hunt, you will find only the mushroom stubs, the rest greedily gobbled up by the hungry reindeer.
>
> The ancient shamanic use of Amanita muscaria in Siberia is well documented. Despite governmental oppression against its use, there are still many who refuse to accept the authorized state religion, and continue the shamanic traditions in secret. Just as the Siberian shaman (commonly dressing in red and white) would enter through the opening in the roof of a home where a ritual was to be done, Santa Claus also arrives on the roof and enters through the chimney. Just as the shamans would gather the mushrooms in bags which they would bring with them when performing a ceremony, Santa Claus also (on the Holy Day) brings presents in a bag. The Santa Claus we see today evolved from traditions developed in Germany. It is fairly common knowledge that the Weihnachtsmann (St. Nick) was an amalgamation of older Germanic/Norse gods such as Thor, Donner, Odin and Wotan. What's missing here is just as Santa flies through the skies in his sleigh, Odin (as well as the rest) rode through the sky in his chariot, which is depicted in the stars by "The Big Dipper". The Big Dipper is the chariot of Odin & Wotan, Thor, King Arthur, and even Osiris (of Egypt). The chariot that circles the North Star in a 24-hour period is thus also known as the sleigh of Santa Claus because it circles his mythological home, the North Pole. It is no surprise that Nordic/Germanic gods have connection to mushrooms in their mythology. As Thor throws his mushroom-shaped hammer to the ground, mighty thunders and lightning cracks cause the real mushroom(s) to appear. As the horses pulling Odin through the sky in his chariot become over-exerted, their blood-mingled spit falls to the ground and causes the Amanita mushrooms to grow at those exact points.”

This “Big Dipper” equals chariot of Odin, sleight of Santa, may be off, being that the star boat (solar barque) of Osiris was the Orion constellation, as is well-established, and the “Big Dipper” has to do with the opening of the mouth. Author continues:

> “The Osiris mythology has even more to add to this. To the Egyptians; South was up (North). Osiris was the lord of the underworld, the South, (South=down) which is why he circles the sky in the furthest possible lower (southern) area. Not only did Osiris ride the sky in a chariot, but after his death Isis found that an **evergreen (Cedar)** had grown overnight from a dead stump to full-sized (this also relates to the Djed pillar); which was understood as a sign of Osiris' rebirth and immortality. Interestingly, the traditional birth of Osiris is the 25th of December. The 25th of December was also celebrated annually by putting presents around the Cedar tree. This tradition is at least five thousand years old. The birth of Horus to the goddess-virgin-mother, Isis, is perhaps the eldest representation of the goddess/son mythology, yet it is impossible to know this or the real age of the Astro-theological-Virgo-giving-birth-to-the-child/god/star mythology for sure. However, it is the **oldest source** I have found; it is very old.
>
> Drying the mushrooms was/is a necessary procedure typically accomplished by stringing them up (like popcorn) and hanging them above the hearth of the fireplace. shamans and lay people alike, would gather and dry them. They gather all they can since they are a valuable commodity. Reindeer (native to Siberia) are known to be quite fond of eating these mushrooms. The mythology of flying Reindeer reflects the supposed pharmacological effects of such a meal.
>
> It is important to point out that this Christmas/Winter Solstice celebration, with all its various counterparts, transcends the world's religions. The reason that this celebration is held all over the planet in various forms may have something to do with this other commonality at which we are looking; it is certainly entwined in the symbolism.”

(add)

Quotes

The following are related quotes:

“To return to ancient Egypt, there is evidence that the great **Osiris was originally a tree-god**. According to Egyptian mythology, after he had been murdered his coffin was discovered enclosed in a tree-trunk, and he is spoken of in the inscriptions as ‘the one in the tree’, the ‘solitary one in the acacia’. The rites, too, by which his death and burial were annually celebrated appear to couple him closely with Tammuz, Adonis, Attis, Dionysus, and other gods whose worship was associated with a similar ritual.' Frazer, following Mannhardt; contends that all these deities were tree-gods, and that the ceremonial connected with their worship was symbolic of the annual death and revival of vegetation.”

— J.H. Philpot (1897), *The Sacred Tree: the Tree in Religion and Myth* (pg. 11)

“The **Christmas tree** is traced to the Roman Saturnalia. It is distinctly described by Virgil [c.30BC] with its suspended toys and images: ‘the farmers of Ansonia, a Race sent forth from Troy, in uncouth verse and unchecked laughter play and put on hideous vizards wrought of hollowed bark, and sing thee, O Bacchus, with joyful hymns, and in thy honor hang from the tall pine waving masks to thee’.”

— Lewis Burdick (1912), “Primary Economical and Political Significance of Our Christmas Anniversary” [21]

“The fruit of Hathor's tree in its human form was Osiris, whose **corpse was scattered like the seeds** [see: crucifixion] after he had been persuaded to enter a chest – the cave or tomb of earth ... Perhaps it is not too fanciful to see a survival of this conception in the Fairy Queen above the lighted **Christmas tree**.”

— Gertrude Levy (1963), *Religious Conceptions of the Stone Age: and Their Influence on European Thought* (pg. 121)

“The Decorated Cedar Djed Pillar ... In 1969, while visiting a temple of Seti in Upper Egypt, we were told by the keeper that Osiris ... Today we find little spiritual enchantment in setting up a cut **Christmas tree** or decorating it with ribbons and lights.”

— Author (1975), “A Christmas Legend” (O), *Rosicrucian Digest*, 53:31.

“Christmas & **Christmas tree** go back to ancient times to Egyptian civilization. In Egypt, it was believed that the husband of Isis, the ‘Queen of Heaven’ – King Osiris of Egypt, was born on December 25th. After the untimely death of the king After the untimely death of the king Osiris, his wife Isis, propagated the doctrine of the survival of Osiris as a spirit being. She claimed a **full-grown evergreen tree** sprang overnight from a dead tree stump, which symbolized the springing forth unto new life of the dead King. On each anniversary of his birth, she claimed, Osiris would visit the evergreen tree and leaves gifts upon it. This is the real origin of the Christmas tree.”

— Author (1990), “Article” (pg. 9), *Hindu Vishva*, 26

“Osiris remained in the box in the tamarisk tree for three days and three nights, but on the third day he rose and ascended into heaven at the time corresponding to the feast of Christmas. The lowest point of the sun at the winter solstice was on 22 Dec was believed to coincide with the death of Osiris, his resurrection or rebirth becoming a reality three days later, on the 25 December.”

— Murry Hope (1996), *The Sirius Connection: Unlocking the Secrets of Ancient Egypt* (pg. 72)

“The [Osiris] story continues that the coffin of Ausar [Osiris] was swept by the waves to the shoreline of a foreign land. A [tamarisk] tree sprang up and grew around it, enclosing the body of Ausar [Osiris] in its trunk. The tree grew large, beautiful, and fragrant. News of this magnificent tree came to the king of this alien land, who ordered that the tree be cut down, and its trunk brought to him. He utilized the trunk as a pillar [djed pillar] in his house without knowing the great secret it contained within. This is reference to the ‘tree of life’, and with all that that implies. It is also a reference to the Tet (Djed) pillar of Ausar (Osiris). In Christianity, this became the **Christmas tree**.”

— Moustafa Gadalla (1997), *The Egyptian Roots of Christianity* (pg. 105)

“The **origin of Christmas** as the festival of the Nativity dates far before our Christian era. The cult of Mithra, the unconquered Sun, celebrated the beginning of his ascension and the return of life on December 23 (the winter solstice). The custom became established little by little, among the Eastern Christians, of celebrating it on January 6. It wasn't until the fourth century that the Western Church moved the date back to December 25 to replace the pagan feast of the birth of the Sun, whose cult was formally condemned by Pope Leo the Great (ninth century). Thus, the Christian ritual of the Divine Nativity also rejoined the Egyptian ritual, the Feast of Khoiak, which on the same day celebrated the resurrection of Osiris, that is, his reanimation by the solar light. Osiris, Neter of Nature, is the principle of perpetuity—that is, of the cycles which are continually renewed. He is the vital Principle, which in all of dualized Nature is perpetually

being born, vegetating, growing, dying, and being reborn. That's why we find in certain tombs of Osiris the silhouette of a conifer whose symbol makes this tree the ancestor of our Christmas tree. Its trunk is replaced by the djed of Osiris, his spinal column, to which the four physical elements give stability. The Osirian world is that of earthly existence. What links our **Christmas tree** to the **tree of Osiris** is that both are illuminated by the awakening of the new fire. This fire is manifested in the star of the Magi on January 6, Epiphany. On this date, the sun, crossing the apsis, starts to prolong the day, and the mornings and the evenings are lengthened. That's why we have the tradition of keeping the Christmas lights until this date. **Christmas-Khoiak** is the instant when the fire of the seed, buried at Saint-Michel, has conquered the infernal dragon and reanimated the germ of the seed of Osiris is resuscitated with the sun."

— Sharon Seivert (2001), *The Balancing Act* (pg. 304)

"In the Hittite legend of the missing fertility god, Telepinu, and **evergreen tree** *asherah* was set up before him and decked with gifts and this idea of decorating the object seems to have been the convention in much of the Near East."

— Michael Jordan (2001), *The Historical Mary* (pg. 25)

"The idolatrous festival was on December 25th. This system began by Osiris and Isis and their son Horus about 3000BC; centuries before the birth of Yahshua [son of Yahweh]. When King Osiris died, his wife Isis claimed a **full-grown evergreen tree** sprang up overnight from a dead tree stump, which symbolized the springing forth unto new life of the dead Osiris. On each anniversary of his birth, she claimed Osiris would visit the evergreen tree and **leave gifts** upon it. December 25th was the birthday of King Osiris reborn as the son, Horus. This was the **origin of the Christmas tree**."

— Jarid Miller (2010), *Yahshua, the Man behind the Glory* (pg. 24)

"That we celebrate **Dec 25th**, based on the fact that three stars of Orion's belt, aka "three kings", align with the star Sirius, to point out the position of the rising sun, following the winter solstice, i.e. day of least amount of sunlight hours of the year, following the apparent "death" of the sun three days earlier, on the cross, i.e. "southern crux" star constellation, which originated with the celebration of the 3100BC (4850BG) birthday of Ra in the temples on Dec 25, wherein, of note, the Egyptians put **pine trees** in temples (origin of **Christmas tree** tradition), which was remolded into the story of the birth of Osiris (2800BC), then Horus (1800BC), then Jesus (300AD), with such joyous ignorance, has us "marching backwards into 20th century", as the saying goes, or 49th century (BG), as we would see it."

— Libb Thims (2014), "Jesus 'Jehovah' of Nazareth's IQ" (O), Hmolpedia Thread (#21), Dec 25

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External links

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θΔics

In thermodynamics, **Christoph Buys-Ballot** (1817-1890), or Buys Ballot, was a Dutch meteorologist noted for his 1858 so-called dining room anecdote objection to Rudolf Clausius' calculation of the speed of gas molecules.

Overview

In 1858, Buys-Ballot objected to the calculation of the speeds of gas molecules by German physicist Rudolf Clausius, said to be several hundred meters per second on the grounds that it takes up to several dozen seconds for the aroma of a hot dinner to travel across a long dining room. [1] The specific now-famous 'dining room anecdote' objection by Ballot is: [2]

> "If I were sitting at one end of a long dining room and a butler brought in dinner at the other end, it would be some moments before I could smell what I was about to eat. If atoms were flying at hundreds of meters per second, I should smell the dinner as soon as I saw it."

This objection spurred Clausius into the development of the rebuttal that the reason smell takes so much longer to cross a room is that the particles of gas constantly bang into each other, hence the path of any one given molecule is zig-zaggy, the overall magnitude of the path traversed by the particle referred to as the 'mean free path'; a term introduced the following year by Clausius to remedy Ballot's objection. [3] Clausius' short answer was that: [4]

> "Those portions of a path of a molecule throughout which the molecular forces are of influence in sensibly altering the motion of the molecule, either in direction or velocity, must be of vanishing value compared with those portions of the path throughout which such forces may be considered as inactive."

(add discussion)

Education

Ballot completed his BS in mathematics and physics in 1839 at Utrecht University. In 1842, he studied under chemist Gerrit Mulder and the following year published a book of tables for use in inorganic chemistry lab. In 1844, Ballot completed his PhD, with a thesis *On Cohesion and Adhesion* (*The Synaphia et Prosaphia*), under physics professor Richard Rees. At Utrecht University, he was professor of geology and mineralogy (1845), theoretical chemistry (1846), mathematics (1848), and physics (1867).

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θΔics

In human chemistry, **Christoph Wieland** (1733-1813) was a German poet and writer, a Cattell 1000 (#288), a neighbor of German polymath Johann Goethe, noted for his peculiar adversarial relationship to Goethe.

Childish nonsense

Wieland famously sent a letter—which he suggested should be burned after it is read—in 1810 to his close friend German philologist and archeologist Karl Böttiger, in commentary on Goethe's new 1809 novella *Elective Affinities*, stating that: [1]

> "To all rational readers, the use of the chemical theory [in *Elective Affinities*] is nonsense and childish fooling around."

Wieland seemed to consider Goethe's novella to be a sort of anathema, calling it a "truly horrible work", supposedly objecting to the radicalness of its Christianity. [2]

Read three times

It was to Wieland, in *circa* Nov 1809, that Goethe famously, commented that, to be understood properly, it must be read three times. [3]

Goethe | Soul theory

> *See main: Goethe on the soul*

It was on the return from Wieland's funeral that Goethe began to discuss speculative ideas about the soul in terms of Aristotle's entelechy and Gottfried Leibniz's monad theory, among other concepts.

References

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θΔics

In hmolscience, **Christopher Dawson** (1889-1970) was a British Catholic historian, noted for his 1957 *Dynamics of World History*, wherein he derides the fields of social mechanics, social energetics, and social physics as corpses of sociology; per underlying religious objection.

Overview

In 1957, Dawson, in his *Dynamics of World History*, stated the following: [1]

> "From the beginning sociology has been haunted by the dream of explaining social phenomena by the mathematical and quantitative methods of the physical sciences and thus creating a science of society which will be completely mechanistic and determinist. The path of sociology is strewn with the corpses of defunct systems of "social physics," "social energetics," and "social mechanics," and their failure does little to discourage fresh adventures. Such systems have little use for history or for social reality; they content themselves with generalizations that have significance and with "laws" which are nothing but false analogies … nothing but an apparatus for the transformation of solar energy into human energy (Carver and Ostwald), while Winiarsky argued that social change proceeds according to the laws of thermodynamics. Such extravagances explain the distrust shown towards sociology by historians, for the experience of the complexities of the complex reality of the social process makes them naturally hostile to the crude simplicity of pseudoscientific generalizations."

Dawson's vitriolic antagonism to these fields being an underlying religious objection; a reaction seen in the minds of those including: Christoph Wieland (1809), Pitirim Sorokin (1928) and John Wojcik (2006).

Christopher | Namesake

Of note, if a person's first name is "Christopher" (e.g. Christoph Wieland), which is etymologically Christian based, in respect to people discussed, mentioned or having articles in Hmolpedia, that person has a 60% probability (Ñº) of rejecting any and all types of chemistry, physics, mechanics, energetics, and or thermodynamics based sociology, being that the core principles of Christianity severely conflict physical science based sociology. This same trend, if not to more marked degree, is to be expected for people named "Muhammad" in Muslim countries.

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(b) Zahn, Gordan C. (1958). *Readings in Sociology* (pg. 11). Newman Press.
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θΔics

In hmolscience, **Christopher F. Edwards** (c.1959-) is an American mechanical engineer and thermodynamics professor noted, in human thermodynamics, for his 2006 theory that life is a path function, the choices made being the decisive steps in the integral of the function.

Overview

In 2006, Edwards commented, in his interview article "Professor of Thermodynamics Shares Best Practices for Teaching Tough Topics", that to help students understand entropy, i.e. to get students interested in what is notoriously a difficult subject, in thermodynamic terms, he explains how life is a path function, as follows: [1]

> "Life is a path function. You begin life, you end life—that's not so interesting, right? But quality of life is a path function. It's the path that you take from the beginning to the end, the integral of that path, that's the special part."

Edwards explains that it is the choices one makes along the path that are the important steps.

Education

Edwards completed his BS in mechanical engineering in 1981 at the University of Santa Clara and his MS (1982) and PhD (1985) in mechanical engineering at the University of California, Berkeley. He worked at Sandia National Laboratory, becoming a distinguished member of the technical staff until 1995, in which year he began teaching thermodynamics at Stanford University.

References

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External links

â— Chris Edward (faculty) – School of Engineering, Stanford University.
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θΔics

In

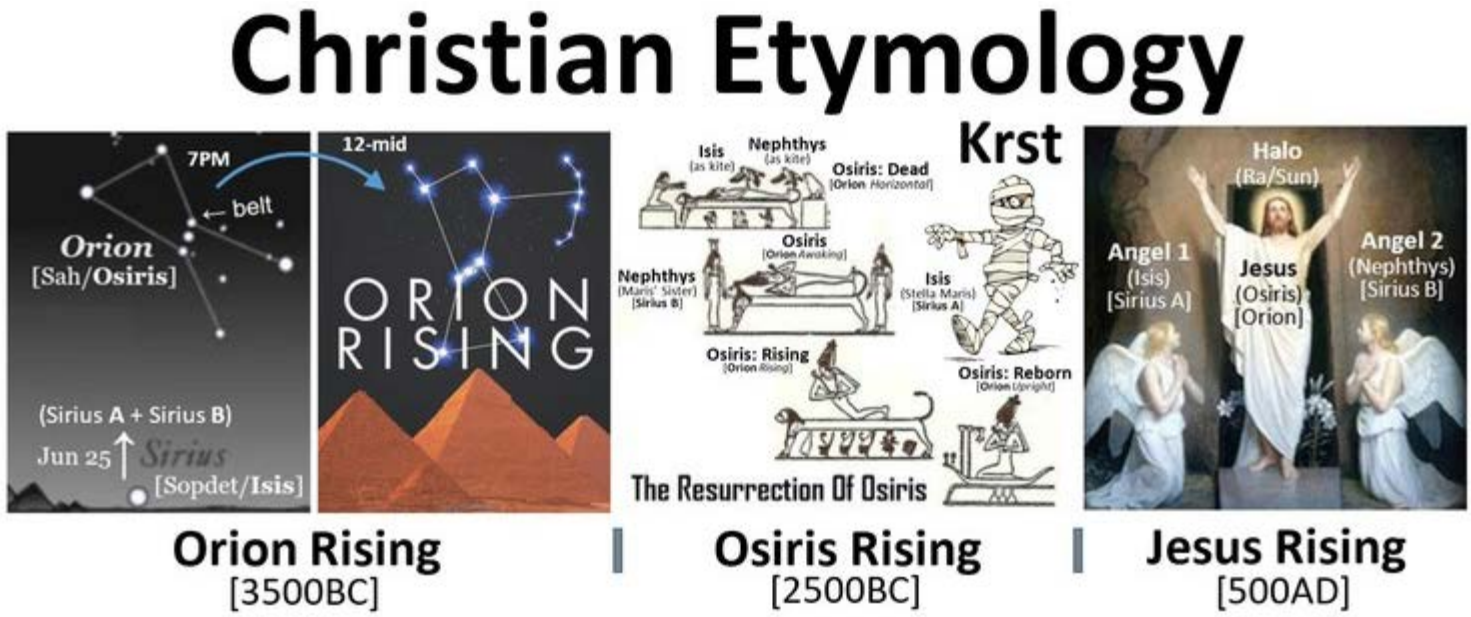

The basic etymology of the name "**Christian**", from the Greco-Roman "Christ"; from the Egyptian "krst", meaning: mummy, anointed, messiah, based on the rising of Osiris, as described in the Passion of Osiris; from the stellar phenomena of the perceptual "rising" of Orion (the warrior) constellation, which the early Egyptians personified as the god Sah (later syncretized with Osiris).

etymologies, **Christopher**, among other male variants, e.g. Chris, Christiaan, Christoph, Christian, etc, and female variants, e.g. Cristine, Christina, etc., is a popular first name given to children, the root of which is based on the the Egyptian term "krst" (pronounced: Christ), meaning mummy arisen, based on the rising of Osiris, which is based on the rising of the Orion constellation. [N1]

Overview

The first-layer, commonly-known, root of the name "Christian" is based on Jesus Christ; the second-layer deeper root of which being based on the Egyptian term *krst*, pronounced "Christ" in Greek, meaning "mummy or anointed", referring to the resurrection or rising of the dead Osiris, the world's first mummy, as explained in the Passion of Osiris; the third-layer root of which, being based on the god Sah, the personification of the Orion nebula, and the daily phenomena of the so-called "rising of Orion" from the dead, as the constellation, in the form of a person, i.e. Orion the Hunter (Greek) or Sah (Osiris) the conqueror or unifier of Upper and Lower Egypt riding his star boat (Egyptian), appears to a nighttime observer to "rise" from the horizontal to vertical position, from 8PM to midnight, and therein come, according to astro-theological beliefs, prevalent in 3100BC, come back to life. [N1]

The sighting of the phenomenon of the "rising of Orion", in the northern hemisphere, begins to be observable in Nov, in the east, by 8:30 or 9, and continues, supposedly, for a few weeks, arising earlier each night, and therein, the three belt stars become the brightest stars in the sky, outshining everything except the moon. (Ñº)

Sometime, between 3500 to 2500BC, the annual rebirth of the sun god Ra was syncretized with the rising of Orion, timed to the rising of the twin star Sirius (Sirius A and Sirius B), and the annual 150 day Nile River flood, so that the mummy, i.e. Osiris mummy or Jesus figure, was depicted with a sun disc (or halo) on his head, as shown above (right) or below (right):

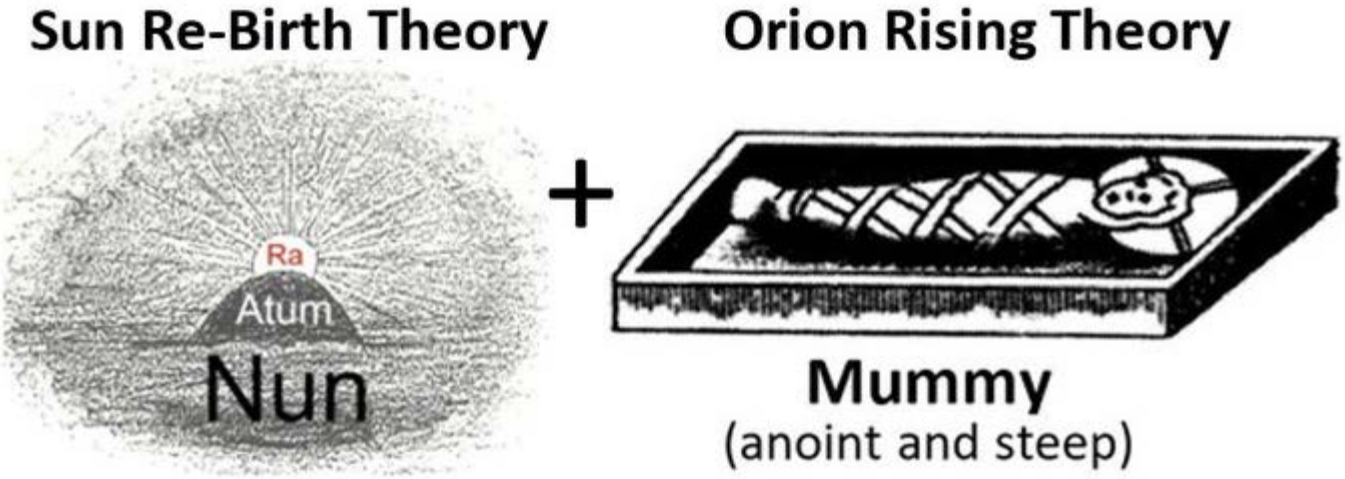

(add summary)

Hmolscience | Christophers

In hmolscience, an atomic theory based belief system, the name "Christopher" is an uncommon name, per reason that the school "most accused of atheism", as English natural philosopher Francis Bacon put in *circa* 1601, is the school of "Leucippus and Democritus and Epicurus", according to which their exists a paucity of Christopher names, among the 1,000+ Hmolpedia biographies. Those known are listed below:

	Person	Date	R	Description
1.	Christiaan Huygens (1629-1695)	c.1680	?	Turned away from Calvinism and from Catholicism; though seems, in the end, to have harbored some "first cause" (see: causality) belief in god framework, similar to his associate atomic theory reviver Pierre Gassendi. (Ñº)
2.	Christoph Wieland (1733-1813)	1809	✝	Argued vehemently against Goethe's human chemical theory.
3.	Christoph Ballot (1817-1890)	1858	✝	In 1849, published "Sketch of a Physiology of the Inorganic Realm of Nature", which argued, mathematically, that atoms, in matter, attract each other, but the surrounding ether particles repelled each other; argued (1858) against the calculation of the speeds of gas molecules by Clausius; was the "was the son of a minister from Kloetinge in the Netherlands" (Ñº); was "was quite religious and an active member of the Walloon church" (Ñº).
4.	Christopher Dawson (1889-1970)	1957	✝	[?] Describes social mechanics (discussed here), along with social physics, and social energetics, as one of the defunct corpses of sociology's past.
5.	Christian Anfinsen (1916-1995)	1970s	✝	Son of Bible reading Lutherans, was agnostic throughout existence, until after his 1972 Nobel Prize in chemistry win, after which he "found God", commenting famously, views such as: "I think only an idiot can be an atheist" (1989), etc.
6.	Christopher Gray (1941-)	2010	✝	[?] Writes about the "danger of a mechanistic social science", in the theories of Maurice Hauriou; the same warnings emanating from the pen of John Wojcik (2006) of the Christianity-based Villanova University (see: Rossini debate).

7.	Christopher Langan (1952-)	c.1995	✝	Cited on the IQ: 200+ page; advocates for an information theory of God.
8.	Christopher Southgate (1953-)	1993	✝	Biochemist turned science-religion debate scholar.
9.	Christian de Quincey (c.1955-)	2002	✝	His *Radical Nature* argues that consciousness, spirit, and soul extend all the way down the evolutionary ladder to the atoms and molecules.
10.	Christopher Edwards (c.1959-)	c.2010	?	Teaches that "life is a path function; the integral of that path, that's the special part."
11.	Christopher Hirata (1982-)	c.2000	✝	Noted for HCR theory based "The Physics of Relationships".
12.	Christine Kamla (c.1994-)	2011	?	Noted for Goethe-based HCR theory of modern adoption legislation.

Here, accordingly, we see that the the majority of "Christophers" are theistic objectors or detractors to hmolscience, per reason that to embrace energy-based materialism philosophy, he or she has to break with their familial-ingrained beliefs, i.e. both parents had to agree to and like the name "Christian", which is NOT something an antheistically minded parent would do. Goethe, who famously said the cross was one of the four things he hated most (see: Goethe on religion), e.g., named his son August (see: Goethe genealogy).

Noting that nine of twelve or 75 percent of "Christ-named" individuals in Hmolpedia are religious belief adherers, in belief system, in some sense or another, the supposition here is that a person born into the name "Christopher", or equivalently Mary (or Christine), is one thus born deeper into the belief system of Christianity, more so than the average person, via action of their parent's idealized belief systems. Redford, in the 2012 *Artificial Intelligence Review* publication of his dissertation, lists himself as "Chris", which would seem to be unwritten code for religious belief system detachment.

Note

N1. Note: This page was originally started on the Christopher Redford page, out of curiosity as to how many "Christopher" names there are in Hmolpedia existographies, and moreover the difficulty that must exist for a person born "Christian" to break out of this birth given theological structure to become atheist, like Redford. This would be similar to the oxymoronic-like "atheist Muhammad", i.e. a boy born with the given name Muhammad who as an adult becomes atheist, therein breaking out of the Islamic faith.

References

1. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

θΔics

In hmolscience, **Christopher Gray** (1941-) is an American-born Canadian law philosopher noted for 2010 to present discussion of the social thermodynamics publications of French law professor Maurice Hauriou.

Overview

In 2010, Gray, in his *The Methodology of Maurice Hauriou: Legal, Sociological, and Philosophical*, summarized the jurisprudence thermodynamics theories of French law professor Maurice Hauriou; the following is a representative excerpt: [1]

> "The dominate analogy Hauriou uses from the sciences of inorganic matter couches the whole of *Leçons sur le movement social* [*Lessons on Social Movement*] in terms of the science of thermodynamics to illustrate his conception of society. His purpose is to show similarities between social and physical movement by juxtaposing the science of the one with the science of the other (pg. 6). Because Hauriou is interested in society in terms of power, the transition to the science of chemical and physical power is easy for in (pg. v). Physics and sociology both have as their objects something with mass; for example, in society, mass is embodied in the number and bonds of its members. Thus, the laws inertia, relativity, equal action and reaction will apply to both (pgs. 12 and 17). At different places, Hauriou also employs the laws of conservation of energy, of parsimonious activity, and entropy.
>
> The danger of a mechanistic social science is closer, however, with a mechanical analogy than with a biological one. Hauriou's chief task is to avoid the reduction of human energy with chemical energy. Within the analogy, the way he does this is by rejecting the vision of society as a hermetically sealed [closed] container [*vas hermétiquement clos*]; freedom is corrective to the principle of constraint.
>
> To continue the analogy, Hauriou has to find something in physics approximating liberty in social science; this he finds in the free movement of energy from physical movement to thermal phenomena, and back. This is to parallel the discontinuity between social stimulation and human thought; the thermal phenomena and the thought are the 'representing' element, the physical movement and social movement the 'represented'. Thus, the physical structure of thermodynamics is meaningfully representative, humanized; it becomes the fundamental analogy [*analogie fondamentale*] between society and the natural world (pgs. 7, 57, 62)."

In 2011, after completion of *The Methodology of Maurice Hauriou*, Gray did the first English translator of Hauriou's 1896 *Tradition in Social Science*, with its chapters on "social matter", the dynamic point of view, social material, among others, in which he includes a translator's introduction, explaining who the second book was a followup to the first with focus on the thermodynamics as the basis for social movement. The opening paragraph of Hauriou's *Tradition in Social Science*, is as follows: [2]

> "Social science can be defined either as science of society, of the social condition, or of social matter. The only important point is to provide some material as an object. All observational sciences work upon some material, physics and chemistry upon physical matter, biology on living matter, experimental psychology on psychical matter broken down into states of consciousness. It is natural to rest social science upon social matter."

(add discussion)

Translations

On 7 Oct 2013, Libb Thims queried Gray about doing a possible English translation of Maurice Hauriou's 1899 *Leçons sur le Mouvement Social*. On 27 May 2014, Gray communicated to Thims about how he had been considering doing an

English translation and that he now has some time this coming summer (2014) to do the translation. [3]

Education

Gray completed three degrees in philosophy: his BA in 1963 at St. Bonaventure University, MA in 1965 and PhD in 1970 both at the Catholic University of America, Washington DC. He completed degrees in civil law and in common law, BCL in 1978 and LLB in 1979, from McGill University, Montreal. He has taught philosophy at Concordia University and Loyola College in Montreal since 1967, specializing in philosophy of law.

References

1. (a) Gray, Christopher B. (2010). *The Methodology of Maurice Hauriou: Legal, Sociological, and Philosophical* (§A. Material Analogy, pg. 54). Rodopi.
(b) Hauriou, Maurice. (1899). *Leçons sur le Mouvement Social* (*Lessons on Social Movement*) (thermodynamique, 23+ pgs; entropie, 19+ pgs; quote, pg. 79). Paris: Larose.
2. Hauriou, Maurice. (2011). *Tradition in Social Science* (translation and introduction: Christopher Gray) (thermodynamic, pg. xix; about translator, pg. 283). Rodopi.
3. Email communications between Christopher Gray and Libb Thims (7 Oct 2013; 27 May 2014).

Further reading

â— Gray, Christopher. (1982). *The Philosophy of Maurice Hauriou, Jurist*. University of Michigan Press.

External links

â— Gray, Christopher B. (1941-) – WorldCat Identities.
â— Christopher Gray (faculty) – Concordia University.

θΔics

In existographies, **Christopher Harding** (1944-) (IIQ:200|#21) (CR:5), aka "Chris Harding", is an English-born Australian auto-popularized "high IQ" celebrity, IQ test maker, and high IQ society founder, noted for []

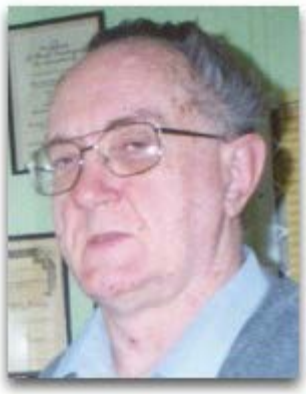

Overview

In 1966, Harding, age 22, was listed in the *Guinness Book of World Records* under the category "Smartest Man in the World", with an IQ of 196-197, based, as reported, on an ratio IQ calculation using his Stanford-Binet scale scores. He continued to be listed in this category, until 1988, after which he was usurped by Marilyn Savant, with her contrived IQ of 228, shortly after which, in 1991, Guinness removed the "highest IQ category" per IQ scamming issues, as evidenced by Savant.

In 1974, Harding founded the International Society for Philosophical Enquiry, which supposedly is one of the third oldest high IQ society, following Mensa, or something to this effect.

In 1981, Harding founded the "606 Society", meant to be inclusive to the top 6 of every 10E6 humans in the world; the society lasted, supposedly, for one year.

In 2010, Harding uploaded a photo (Ñº) of himself standing next to all his "certificates" or "paper IQs" as Isaac Asimov would call them.

Quotes | On

The following are quotes on Harding:

> "In Australia, I was fortunate to come into contact with and employ one of the then three most intelligent people in the world, **Chris Harding**. This trio all had IQ's over 200, well off the Stanford/Binet scale."
>
> — Allan Skertchly (c.1985.), *Publication* (Ñº)

Quotes | By

The following are quotes by Harding:

> "Genius is not intelligence. Genius is creative ability of the highest possible kind. True, most geniuses are highly intelligent, but this depends on the field their genius was recognized in. And here there is a plethora of problems. Recognized by whom; which people, what society, when and where. There is an old joke that goes something like I will believe in psychologists devising tests from geniuses when monkeys devise tests for psychologists. I do have ideas of my own on this, but so far no one seems interested in this. I was listed in the *Guinness Book of World Records* seven editions 1982-88 under "Highest IQ" and was given a certificate for this. I was also listed in 500 Great Minds of the Early 21st Century in 2002. All such lists-comparisons are temporary. There appears less and less match between persons and outcomes these days. Humanity hangs by it's intellectual neck on the tree of tragedy –there are no Leonardo's in the 19th, 20th, and so far in the 21st Century. Yet he/she must still exist we should think? With mass education has come the noisy ones but no Geniuses to show for it all. Bad money has driven out good money, bad people good people. The masses have come to judge the best and are part of this process to drive out the very people they need most, all in the name of incorrectly accessed political correctness. Today the system has driven down performance; today big institutional science has been a spoiler of great insights delaying progress everywhere. Today it is business as usual. The criminal come to the top. My greatest fear is that an end is coming to the centuries of progress that mankind has grown use to. The age of genius may be at an end. I'm sorry to ramble on this in such a `scatter gun' way."

— Christopher Harding (2013), post to article “13 Most Intelligent People in the World” [1]

References

1. (a) Broderick, Damien. (2009). *Quipu: a Novel* (Christopher P. Harding, IQ=197, pg. 1). E-rights.
(b) McWhirter, Norris. (1985). *Guinness Book of World Records* (pg. 17). Random House.
2. Harding, Christopher. (2013). “13 Most Intelligent People in the World” (Ñº), post, FinancesOnline.

External links

â— Christopher Harding (about) – Olymp.IQSociety.org.

θΔics

In existographies, **Christopher Hirata** (1982-) (IQE:185|2016) (LR:52|#1) (SNE:4) (CR:182) is an American child prodigy turned astrophysicist, noted for his c.2000 human chemical thermodynamics and human physics based five-part article "The Physics of Relationships" (see: relationship physics) on the topics of a thermochemical approach to relationships, complex equilibria of men and women, reaction kinetics, neutron scattering, and shell model, written at the age of about 18 that harks of genius ranking near to that of the great insights of German polyintellect Johann Goethe and his 1796 human chemical theory. [1]

Hirata's "The Physics of Relationships", to note, is similar (Ñº), in many ways, to Kaj Lang's extremely hilarious "The Thermodynamic Activity of the Male Housefly" (1956). [15]

Cosmology | Dark Matter

Hirata's focus, in astrophysics, is on cosmology and the exploration of dark energy. Hirata, according to some, is considered a leading exponent of precision cosmology, combining interdisciplinary computer studies, theoretical studies and observational astronomy including instrument development.

In 2010, with Dmitriy Tseliakhovich, he pointed to an unprecedented effect in cosmological perturbation theory for the calculation of the formation of the first structures in the universe. It is based on the fact that the speed of sound in baryonic matter (as opposed to dark matter) decreased drastically (from relativistic to thermal velocities) when the first atoms formed (recombination epoch), which leads to supersonic velocity currents of baryonic matter (which under gravitational) Influence of faster dark matter moves) and quadratic perturbation terms. According to Hirata and Tseliakhovich, this leads to a suppression of the formation of the first structures with observable effects.

He initiated with others an observational program that analyzes information from astronomical observational data for inferences on fundamental questions of particle physics and proposes new observation programs. A central question is whether the acceleration of the universe to dark energy (retention of general relativity but with an additional dynamic scalar field) or a modification of the general theory of relativity indicates. He is a member of NASA's proposed Wide Field Infrared Survey Telescope (WFIRST) space telescope.

Human chemical thermodynamics

See also: Human chemical reaction theory

In c. 2000, Hirata, then aged 18, published his "The Physics of Relationships" (see: relationship physics), a rarely seen brand of human chemical thermodynamics, a set of notes from his undergraduate days at CalTech, published as an online subpage to his Princeton University (see: Princeton Department of Social Physics) faculty page, consisting of five parts:

1. Thermochemical Approach to Relationships
2. Complex Equilibria of Men and Women
3. Reaction Kinetics
4. Neutron Scattering: A Cautionary Tale
5. The Shell Model

Hirata, in approaching the subject of dating and mate selection, uses the student body at Caltech, observed during this undergraduate years (1996-2000), which he says consisted of N=900 total students, of which 600 were male, and according to his observations about 200 were in paired relationships. He uses the symbols of X = girl, Y = boy, and XY = paired relationship (see: dihumanide molecule), calling the single boys and girls as "basic elements", of which he says the simplest reaction is:

$$X + Y \leftrightarrow XY$$

This type of reaction, to note, uses the "reversible reaction" notation introduced by Jacobus van't Hoff in 1884. [10]

Hirata also comments, interestingly, in reference to the subject of queer chemistry (and other poly-amorphous relationships), in his human chemical reaction modeling that he is neglecting "rare and non-traditional" products or compounds (human molecules) that may form such as "the gay molecule Y_2, the lesbian molecule X_2, and the middle-Eastern polygamous molecule X_4Y." Here, in addition, we see Hirata using not only the dihumanide molecule point of view (two people viewed as one molecule), in his Y_2 and X_2 formulas, but also the penta-human-ide model (five humans viewed as one molecule), in his X_4Y formula. This is a very complex subject, when considered from the free energy point of view (see: human free energy). In any event, on this basis he states that the equilibrium constant K for this reaction is:

$$K_{eq} = \frac{[XY]}{[X][Y]}$$

where [X], [Y], and [XY] are the concentrations of the single girls, single boys, and paired relationships, respectively. This constant, according to Hirata, can be calculated from the following expression:

$$-k_B T \ln K_{eq} = \Delta E + P\Delta V - T\Delta S^{\ominus}$$

where K_B is the Boltzmann constant, T the temperature, ΔE the internal energy change, ΔV the volume change, and ΔS the entropy change at standard conditions. He goes on to calculate that K_B at Caltech is 4.5. On this basis, he goes on to calculate, assuming that the equilibrium constant is independent of concentration and is a function of only temperature and pressure, that if the female to male ratio were 50:50 the percentage of singe males would drop from 67% to 48%.

Comment | Worthless applications?

Some, as discussed further below, have commented, in argument and or debate with American electrochemical engineer Libb Thims, who is also cited in the IQ=225+ range, that Hirata's "relationship physics" and "relationship thermochemistry", as he calls them, are nothing but physics humor or thermodynamics humor, pointing out, for example, that Hirata himself footnoted or rather headed his article as follows: [1]

> In the true spirit of Caltech (I'm not sure if this applies to Princeton), I devote this section of my website to the application of basic physical principles to relationships, particularly the romantic kind. Before I do this, I will make a few comments. You should understand them before you proceed. They aren't hard to understand:
>
> - Don't take it too seriously. This site is for your amusement, and it does not serve any other purpose. I am not a counselor, and if you have a real problem with your "significant other" then this page won't help you solve it. I take no responsibility for what you do with this information. Also recall that I don't have a girlfriend, so what do I know about this? Only what physics can tell me. [**UPDATE:** Since I wrote this page I have found Annika and we are engaged. This confirms that I know what I'm talking about.] [11]
> - This site is geared primarily toward nerds. If you're not a nerd, this doesn't mean I want you to go

away. In fact, it will give you some idea of the types of jokes frequently made in Caltech dorms. You may or may not find it interesting.
- This is not a dirty site. For my younger audience: since this is the Internet, and I recognize that little kids have access to any material I put here, this site contains no sexually explicit material. (This is also because I don't want losers reading my page.)

So enjoy the compilation of worthless applications of physics and mathematics to relationships:

It is bit puzzling why Hirata put this advert above his article? Possibly it is a deflection technique to avoid attack, "violent opposition" being the second stage of in the acceptance of scientific truth as Arthur Schopenhauer commented in 1818 in respect to Goethe's human chemical theory (see: HCT | Truth):

> "All **truth** passes through three stages. First, it is *ridiculed*. Second, it is *violently opposed*. Third, it is accepted as being *self-evident*."

In this sense, Hirata's advert may have been done in the same sense as Goethe's anonymous advertisement to his *Elective Affinities*, Hirata's theory being basically a modern reformulation of Goethe's theory, the Rossini debate being a ripe example of the heated tensions that result what happens when goes beyond the humor stage of argument and into this is real stage of argument.

Thermodynamics | Battle of the prodigies

See main: HCT IQ:200-range prodigies

On 30 Apr 2013, to exemplify the use of the "not to be taken seriously" pejorative technique to discredit Hirata's theory as a humorous joke, Thims queried American former child prodigy turned physicist Alexander Wissner-Gross, the 2003 MIT valedictorian (of 550 engineering students), who was the last person to simultaneously obtain an MIT triple major (SB in physics, SB in electrical science and engineering, and SB

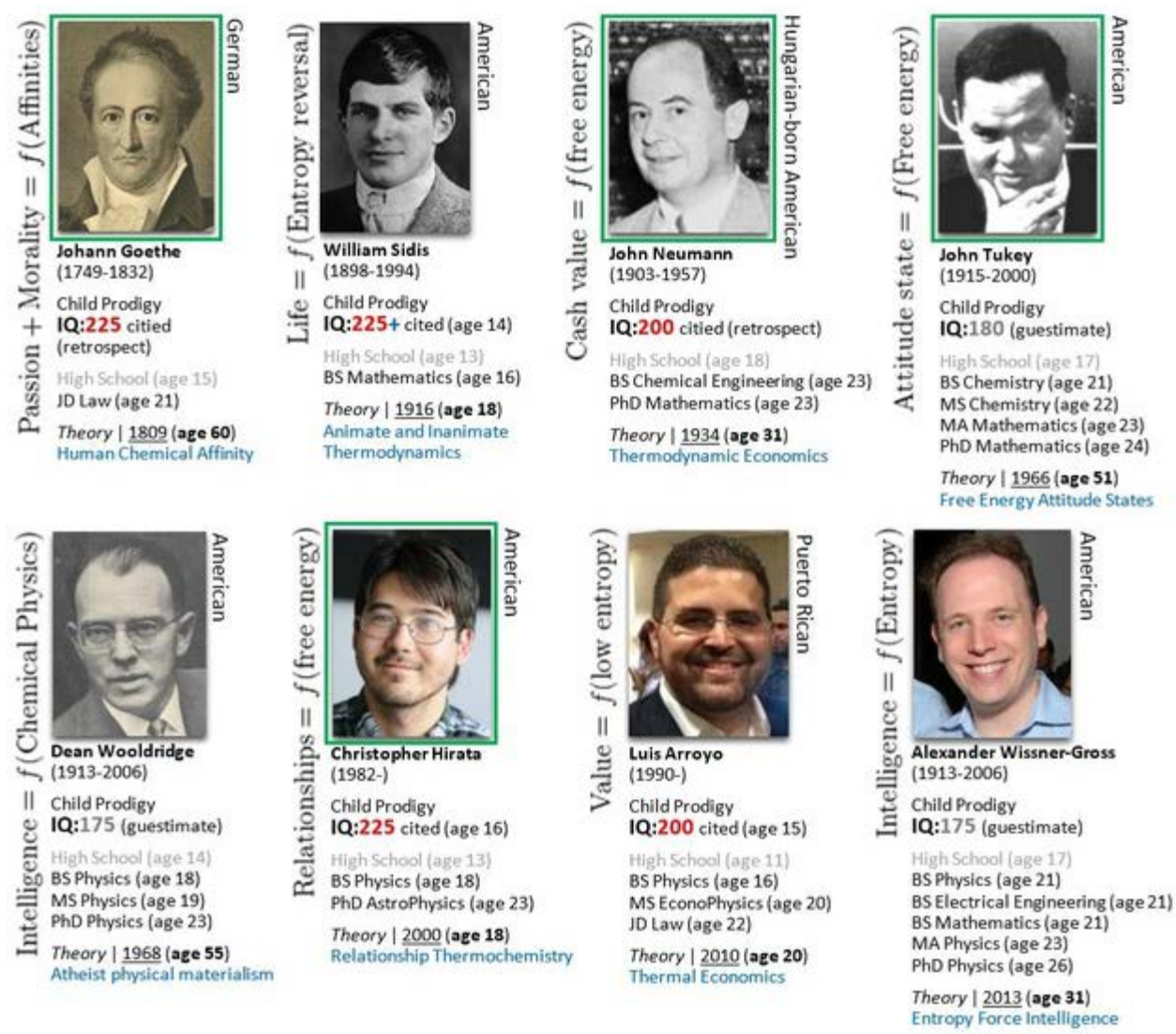

in mathematics), before they outlawed the practice, who recently received considerable press frenzy for his 19 Apr 2013 article "Causal Entropic Forces", co-written with American mathematician Cameron Freer, wherein they attempt to argue that "intelligence" and intelligent behavior stem from what they call "entropic forces", as to whether or not he thought he was smarter than Hirata as follows:

A visual of the so-called "battle of the prodigies", i.e. eight noted theory related child prodigies, namely: Johann Goethe (1809|60), William Sidis (1916|18), John Neumann (1934|31), John Tukey (1966|51), Dean Wooldridge (1968|55), **Christopher Hirata** (2000|18), Luis arroyo (2010|20), and Alexander Wissner-Gross (2013|31), five cited with IQ:200+ range (Goethe, Sidis, Neumann, Hirata, and Arroyo), three of which cited in the IQ:225+ range (Goethe, Sidis, and Hirata), who into adulthood (age 18+) independently derived and or arrived at physiochemical, thermodynamic, and or chemical thermodynamics formulation one or more aspects of existence, date (age) of theory publication shown next to each name; Neumann's theory, to note, not quite independent (but nevertheless original), being that it resulted following a request, by Abraham Flexner, to read and comment on Georges Guillaume's 1932 economic thermodynamics PhD dissertation. The **GREEN** box indicates theorists whose model is about the same, i.e. free energy / affinity based; the two related by the Goethe-Helmholtz equation (i.e. thermodynamic theory of affinity).

> "Your new article popped up on my RSS feed today, so I started an Hmolpedia article on you: Alexander Wissner-Gross. As you seem to be a bit of an accelerated learner, where do you see yourself fitting currently on the genius IQs table? Or have you had estimates made by others of your IQ? For example, do you think you are above or below **Christopher Hirata**, who similar to you was an age 13 national physics olympiad winner, who also developed his own thermodynamics theory of humans, in intelligence?"

To which Wissner-Gross replied: [12]

> "Hard to say where I would fit in your table, but I would say that my causal entropic force theory is intended to be treated more seriously than the **Hirata** work you mention. :-)."

In Nov 2013, interestingly, related or not, a few months after this dialogue, Wissner-Gross gave a local TED talk entitled "A New Equation for Intelligence", the gist of which was discussion of his proposed intelligence equation; the main statement of which is as follows: (Ñº)

> "I asked, starting several years ago, is there an underlying mechanism for intelligence that we can factor out of all of these different threads? Is there a single equation for intelligence? The answer, I believe, is yes. [$F = T \quad S\tau$] What you're seeing is probably the closest equivalent to an $E = mc^2$ for intelligence that I've seen. So what you're seeing here is a statement of correspondence that intelligence is a force, F, that acts so as to maximize future freedom of action. It acts to maximize future freedom of action, or keep options open, with some strength T, with the diversity of possible accessible futures, S, up to some future time horizon, tau. In short, intelligence doesn't like to get trapped. Intelligence tries to maximize future freedom of action and keep options open."

Whatever the case, Wissner-Gross seems to think his theory is better than Hirata's theory, which, however is not the case. To give some comparison, there is no denying the fact that the great German polyintellect Goethe, also a child prodigy cited with a 225+ IQ did the exact same derivation as Hirata 200 years ago (see: Goethe timeline), considering his finished product to be his greatest publication and something to be taken very seriously as its theoretical implications overthrow the foundations of modern thought (as can be gleaned from some of the commentary of his enemies). The deeper issue, however, which this type of derivation tends to bring to the fore (see, e.g. the 2006 Rossini debate and 2009 Moriarty-Thims debate), is that the chemical thermodynamic dissection of humanity strips away fundamental beliefs concerning morality, purpose, life/death, religion, etc., reducing them to pure physics and chemistry, leaving the unacquainted reader with a residual anger and irritation. This is exemplified is exemplified by German writer Christoph Wieland's 1810 comment, found in a letter (which he suggested should be burned after it is read) to his close friend German philologist and archaeologist Karl Böttiger, on Goethe's *Elective Affinities* (which gives the same type of

derivation as Hirata) that "to all rational readers, the use of the chemical theory is nonsense and childish fooling around."

Motl

In 2010, Czech-American theoretical physics Lubos Motl, a supposed black hole thermodynamics theorist, and former Harvard physics professor commented the following, after watching several of American electrochemical engineer Libb Thims' Human Chemistry 101 videos, on topics such as sexual heat and enthalpy, human reactions and chemical thermodynamics, etc., commented the following (his punctuation emphasis): [14]

"You've GOT to realize the **blatant absurdity** of trying to model the laws governing human relationships using the rules of **thermodynamics**, a set of rules that only apply at a molecular level. *Human beings are NOT molecules, they are composed of molecules*, but we aren't **giant molecules**. Human relationships are governed mostly by human psychology. I can only assume you're senile or crazy to believe this nonsense. Thermodynamics of human relationships is bullcrap. **The stuff Hirata said about human thermodynamics was a JOKE**. You don't seriously believe that he was serious about this, do you? Your obsession with human thermodynamics is silly."
— Lubos Motl (2010), YouTube dialogue with Libb Thims, Nov 16-20

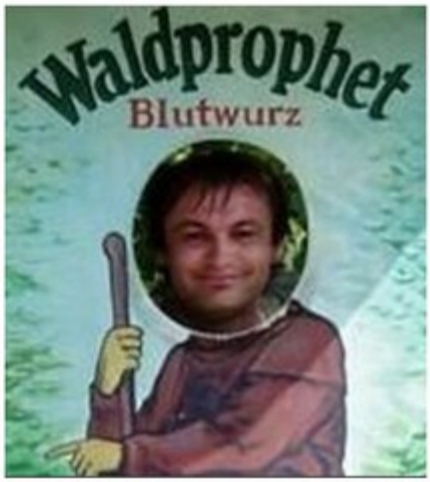

The 16-20 Nov 2010 opinions of wildcard Lubos Motl (photo shown being his Twitter (Ñº) page avatar)– a former Harvard physics professor, who in 2007 was forced (Ñº) to resign, owing to his over-typical approach of using flaming criticism of anti-string theory advocates, such as Lee Smolin and Peter Woit, whose books he described as "crank" and "crackpot" – on Hirata and Thims versions of human chemical thermodynamics theories, dismissing Hirata as "but a joke" and Thims as senile or crazy. [14]

> "You've GOT to realize the blatant absurdity of trying to model theï»¿ laws governing human relationships using the rules of thermodynamics, a set of rules that only apply at a molecular level. *Human beings are NOT molecules, they are composed of molecules*, but we aren't giant molecules. Human relationships are governed mostly by human psychology. I can only assume you're senile or crazy to believe this nonsense. Thermodynamics of human relationships is bullcrap. The stuff **Hirata** said about human thermodynamics was a JOKE. You don'tï»¿ seriously believe that he was serious about this, do you ? Your obsession with human thermodynamics is silly."

Motl, related to this Hirata theory discussion, in 2007, also gave his view that he considered American mathematician, electrical engineer, and physicist Alexander Wissner-Gross, discussed below, who in turn thinks his theory is better than Hirata's, as an "interdisciplinary genius".

Anecdote | Mathematics problem

Upon arriving at Caltech in 1997, Hirata registered one of the highest scores in history on the Institute's mathematics diagnostic tests, thereby foregoing freshman calculus and sophomore differential equations (see: prodigies and calculus) for a more difficult upper-division class. (Ñº) And his early mastery of physics, his chosen field, is even more impressive. On the GRE advanced subject test in physics, he scored a perfect 990. Caltech mathematics instructor Markus Keel recalls his favorite anecdote about Hirata concerning a difficult problem on the final exam, in his class of class of 22 physics and mathematics majors included a couple of graduate students. Before putting the problem on the test, he had consulted two colleagues in the department. One colleague said he didn't see right away how to solve the exercise, while the other said—at terrific volume—that he didn't even believe the conclusion of the problem. On the final itself, Hirata not only solved the problem as Keel had framed it, but left a note saying that he knew of an easier way to solve it, and wrote the easier solution on the back of the page. (Ñº)

Discover | Thims

On 15 Feb 2010, Libb Thims discovered Hirata specifically by searching for individuals cited with an IQ of 225. Specifically, after previously finding that both Goethe, discovered in 2006, and William Sidis, discovered in circa 2008, were independently cited with 225+ IQ estimates, Thims became innately "curious" as to exactly how many people have been estimated in such range of intelligence? AFTER finding a news article citing Hirata with an IQ of 225, Thims then

began to investigate Hirata to see who he was and what his work was about, and therein, by digging around in the personal pages of his faculty page, found that Hirata, in his "The Physics of Relationships" (c.2000) article, did work on the elective affinities problem, as did Thims, Goethe, and Sidis (in a partial sense) before him.

In other words, prior to 15 Feb 2010, the only IQs at or above the 225 estimate that Thims was aware of where: Leonardo da Vinci, Johann Goethe, Marilyn Savant, William Sidis, and Michael Kearney. Terence Tao, of note, also seems to have been discovered, via IQ: 200+ range key term searching.

Prior to this, Hirata, aside from a few early 2000s online news clippings, was generally off the "high IQ radar", e.g. compare the 9 Dec 2009 IQ: 200+ page (version 183) with the 15 Feb 2010 IQ: 200+ page (version 204), and his work on human chemical thermodynamics was completely unknown, at least to Libb Thims, who by that time had compiled an online listing of the top 360+ people, e.g. see: HT pioneers (version 3), made on 24 Aug 2010, known to have applied thermodynamics to the humanities.

Goethe | Hirata | Sidis

There seems to be some correlative evidence that the "elective affinities problem", common to IQ 225+ thinkers, is the new "blue sky problem", which prior to the early 20th century was puzzle of curiosity common to every IQ 200+ range genius (note Hirata "curiosity drives me to inquire" quote, below).

IQ=225+ cited

Goethe

Hirata and Goethe were both famous child prodigies in youth, both cited in the IQ=225+ range, and both did work on the elective affinities problem.

Historically, to explain, in *circa* 1995, American electrochemical engineer Libb Thims, as an undergraduate chemical engineering student, out of an insatiable curiosity, began working on a variant of the elective affinities problem, specifically in terms of how the human reproduction reaction (man + woman → child) could be mapped out and predicted in terms of free energy differentials per unit time; in 2006, through prolonged research efforts, Thims eventually found Goethe, via footnote 2.5 of of the work of Ilya Prigogine, the first human ever cited with an IQ of 225, by Catherine Cox (1926), and how he had worked on the very same problem from 1796 to 1809, the result of which he considered his greatest work (see: best book).

In May 2012, Thims, similar to Goethe, Sidis, and Hirata, began to be cited with an IQ of 225± or specifically as the "highest IQ" ever, by YouTube vote. (Ñº)

While some may dismissively find it but coincidence that Goethe, Thims, Hirata, and Sidis, three of the four former child prodigies, each, independently, cited at the IQ 225 level, each independently produced the same essential theory, in regards to human chemical thermodynamics, and that Goethe, Thims, and Hirata, the more apt conclusion is that the modelling of human interactions in chemical reaction terms is something seen only through great erudition, foresight, and perspicacity; the average person remaining but forest blind to this higher vision of reality.

Child prodigy | Education

Hirata was noticed to have an accelerated mind at an early age. At age 3, he entertained himself, at the grocery story, by calculating the total bill of items in his parent's shopping cart, item-by-item, by weight, quantity, discounts, and sales tax. He was also reading the Dr. Seuss series to himself, able to recite the alphabet backwards, and had coded the

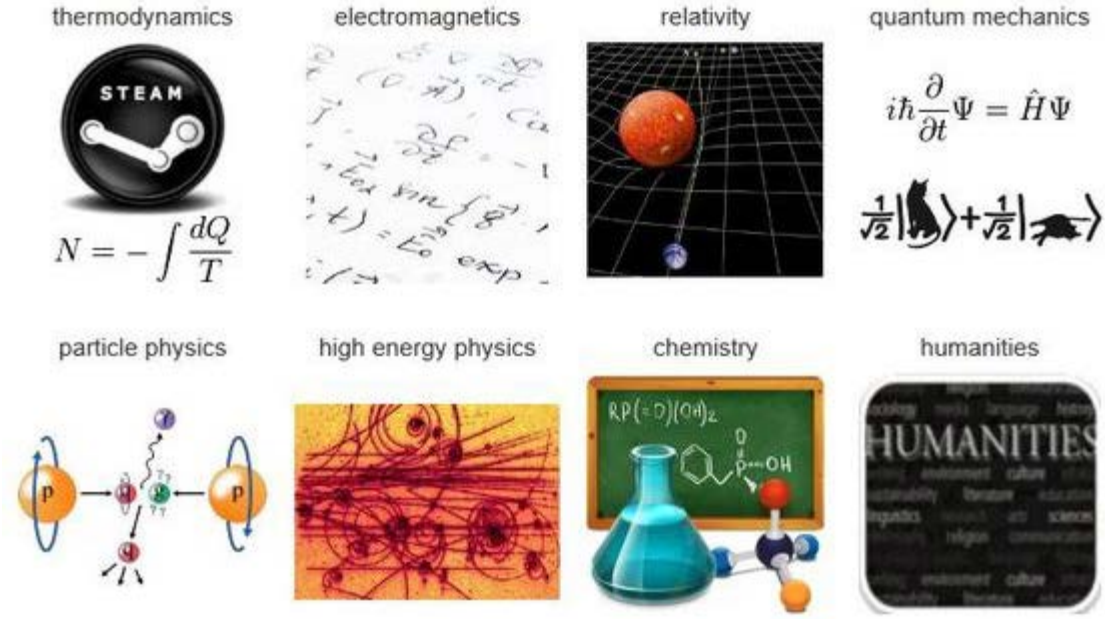

A sampling of the some of the main intellectual road blocks a "modern" universal genius needs to grapple with, in order to have a modern "universal' understanding of reality; Hungarian chemical engineer and mathematician John Neumann (IQ=190) being the last of lineage of so-called "last universal geniuses". The only other person that comes to mind, following Neumann, is American IQ:225+ cited, former child prodigy (as was Neumann), youngest-ever (age 13) winner of the international Physics Olympiad, thinker **Christopher Hirata**, noted for his age-17 written *circa* 2000 human chemical thermodynamics based "The Physics of Relationships" theory (see: relationship physics); presently an astrophysics professor at Ohio State University, working on gravitational lensing, relativity, dark energy, and accelerating universe problems, among other topics on modern astronomy. Hirata is also listed, according to OnlineColleges.net., among "the 10 youngest PhDs of all time" (Neumann, similarly, simultaneously completed a BS in chemical engineering and PhD in mathematics at age 23). [33] Presently, as of 2013, however, Hirata has disassociated himself from relationship physics, and seems to now only confine himself to physical-astronomy problems.

alphabet sequence numerically, e.g. that the letter 'O' was 15th in the sequence. In 1st grade, he was doing algebra. In regards to his elementary and middle school years: [9]

> "I had some good teachers, but it was mostly a waste."

By age 12, he was talking college-level courses in physics and multivariable calculus. [5]

Hirata, at age 13, gained fame by winning gold medal at the 1996 International Physics Olympiad (IPhO), an international competition among the world's smartest math and science students (up to age 19), becoming the youngest medalist ever. Hirata's showing at the IPhO was considered so record-breaking that IPhO organizers announced a special award for "Youngest Medalist", awarded that year to Hirata, an award that has since become one of the most-coveted awards. [3] During meetings at the local McDonald's, during this period, he and his friend Ben Newman, from the Physics Olympiad camp, "sat around writing general relativity equations out on the napkins," recalls Newman. That year Hirata was ranked fifth in the world in physics, math, science. [7]

At age 14, Hirata entered the California Institute of Technology (Caltech) and two years later began working with NASA on a project exploring the possibility of colonizing Mars.

In 1998 (Ñº), age 15, and in 2000 (Ñº), age 17, Hirata was on the three person Caltech team, which, in each year, took 4th in the Putman mathematics completion.

In 1999, at age 16, Hirata was cited as having an IQ of 225. [7]

In 2000, Hirata, together with Caltech teammates Kevin Costello and Michael Shulman, took 4th place in the famous Putnam Mathematics Competition. (Ñº)

In 2001, at age 18, Hirata completed his BS in physics (Ñº)(Ñº) at the Caltech, with a 4.2 GPA, and his PhD in physics in 2005 with a dissertation on "Weak Gravitational Lensing Theory and Data Analysis" at Princeton. [2] Hirata was an assistant professor of astrophysics at CalTech from 2006 to 2012. Currently, Hirata is visiting professor of physics and astronomy at Ohio State University.

Religion | Beliefs

See main: Prodigies on god; See also: Hirata timeline

Hirata, prior to age 30, circa 2010, did not seem to given any public clues as to his belief system or belief state or creed, if at all he had one?

On 13 Oct 2013, Hirata posted, on his Facebook page, that he said the Lord's prayer with a homeless person, in Southern California, and that he hoped it would make a difference: [19]

> "Today's experience: saying the Lord's prayer with a homeless couple on Colorado Boulevard (Ñº). It may not feed or shelter them, but I hope that it made a difference in their lives."

In 2013, **Hirata** posted, on his Facebook page, that he "prayed", specifically using the Lord's prayer, with a homeless person, which seems to belie a theistic (Christian), i.e. god-believing belief system? This is peculiar in that some 95% of "greater scientists", in this year, profess no belief in god.

This prompted a certain amount of Internet buzz speculation about his belief system:

> "**Christopher Hirata** – has a verified IQ of 225, calculated when he was in his teens. Hirata skipped middle school, and at 16 was working with NASA on a project exploring the possibility of colonizing Mars. The Daily Princetonian, Princeton's student paper, where Hirata began attending for his PhD in Astrophysics at 18, reported that his IQ is around 225. Hirata posted the following to his Facebook on October 31, 2013: 'Today's experience: saying the Lord's prayer with a homeless couple on Colorado Boulevard. It may not feed or shelter them, but I hope that it made a difference in their lives.' So he is clearly both a Theist and a Christian."
>
> — Tim (2014), "Of 10 highest IQ's on Earth" [17]

> "**Chris Hirata** [#20] - could not find any info on religious views (I'm not convinced by the Lord's prayer post)."
>
> — TrollSponge (2014), "Out of the World's 30 Smartest People" [18]

Here, supposedly, we see that Hirata, not only believes in the "power of prayer", which has been scientifically disproven by the Heart Prayer Study, but also is ignorant of the fact that the Lord's prayer is but a reduced version of the Egyptian mythology "spell 125", i.e. chapter 125, of the *Egyptian Book of the Dead* (1500BC)? Hirata, here, supposedly, accordingly, is an implicit theist, believing in the ability of prayer and the existence of god?

This would seem to align with the factoid that if one is given the birth name of "Christopher" (see: Christopher etymology), meaning that both mother and father had affinity to that name, i.e. to Christian ideologies, he or she has a 67 percent chance of remaining theist into adulthood and moreover to openly reject any type of atomic theory + energy based materialism philosophy. His mother (see: Hirata timeline) Terese Hirata's 24 Mar 2013 Facebook comment: "Oh! My God", upon reading her son post that he "hit a pothole on the 210 and lost a tire", is indicative of an ingrained reactionary Christian belief system. [16]

This would seem to corroborate with the fact that Hirata, as compared to other hmolscience-minded thinkers, is averse to communication with Libb Thims, in respect to his physics of relationship theory.

This admission, discovered by Thims on 19 Oct 2016, accordingly, namely according to the so-called god belief rule (see: prodigies on god), drops his IQ estimate five points at a minimum, from 190 (2015 guesstimate) to 185 (2016 guesstimate).

Here, we can compare this science vs religion belief system internal conflict scenario with that of IQ:200 cited Puerto Rican child prodigy Luis Arroyo's whose 2010, age 20 completed, MS physics thesis "A Thermal Model of the Economy", is very similar to Hirta's 2000, age 18 completed "The Physics of Relationships", and how at age 15 he was interviewed about his Jehovah's Witness beliefs in respect to science.

IQ | Estimate

The "existence state" real time estimate of Hirata's IQ is a very unusual case, say as compared to the dozens of other news-hyped so-deemed prodigies with age ratioed IQs in the 200 range, and specifically the handful of prodigies cited in the IQ of 225 range. In 1999, as discussed, Hirata, at age 16, was cited as having an IQ of 225. He had accomplished some intellectual feats during this period, e.g. "youngest medalist at IPO" (1996), "4th place in Putnam" (2000), human chemical thermodynamics (c.2000), and 4.2 GPA BS physics Caltech (2001), to name a few. On 24 Aug 2010, Thims discovered Hirata, following a week or so of research of searching for people specifically cited with IQ of 225, and therein found his secret faculty page notes on his circa 2000 (age 18) human chemical thermodynamics derivation. Thims, at this point, began to loosely gauge Hirata with a real time IQ of 190, give or take, in respect to the big chief geniuses in that range among the top 500 geniuses. On 19 Oct 2016, Thims discovered Hirata's "Lord's prayer" admission, which dropped his previous IQ gauge of 190 (2015 guesstimate) to 185 (2016 guesstimate), if not lower. Hirata, however, is working on the dark matter and accelerating universe problem, which if fruitful, in the future, could bump his numbers back up.

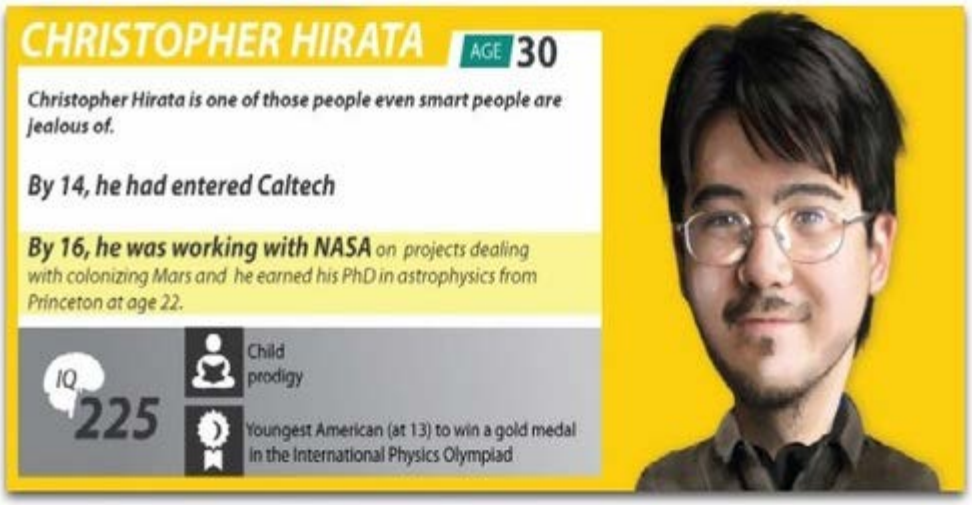

SuperScholar.org's August 2012 profile of **Hirata** as one of the 10 smartest people alive. [8] In July 2012, Hirata was two of 96 researchers President Obama named this week as recipients of the Presidential Early Career Awards for Scientists and Engineers—the highest honor given by the U.S. Government to science and engineering professionals in the early stages of their research careers. [6]

Facts | Hirata

In 2006, Hirata, age 24, on his CalTech faculty page, had the following so-called "fact sheet" webpage listing posted on himself: [19]

Basic Data

Time of birth	1982 Nov 30 05:46 GMT
Place of birth	Ypsilanti, Michigan, United States of America
Location of birth	Earth. 42deg15min N. 083deg38min W.
Height	5 ft 8 in (173 cm)

Weight	Zero. (see note 1)
Rest mass	136 lbm (62 kg)
Rest mass energy equivalent	1300 megatons TNT
Integer part of age in years	23 (see note 2)
Ethnicity	non-ethnic
Occupation	postdoc
Employer	Institute for Advanced Study
Thermal neutron cross section	1.3E+27 barns (total, spin-averaged)
Moment of inertia	17 to 120 lbm ft^2 (0.7 to 5 kg m^2) (see note 3)
Thermal power output	0.1 Btu/sec (100 W)
Radioisotopic power output	1.6E-12 Btu/sec (1.7 nW)

Notes

1. My metaphysical interpretation of the Equivalence Principle is that gravity is a fictitious force.
2. Used to be 21 at parties. Still wish I were.
3. Moment of inertia is given about center of mass, but varies depending on direction of axis and time of measurement.

Here we see the unusual but interesting listing of zero weight per reason that he believes gravity to be a fictitious force.

Hirata | Favorites

In 2006, Hirata, age 24, on his CalTech faculty page, had the following so-called “favorites” webpage section listing posted on himself: [19]

Favorites	
State	California
Chemical element	Carbon, C (Z=6)
Isotope	Uranium 235, U235 (Z=92, A=235, N=143, I=7/2, P=-1)
Color	405 nm (the Hg I line)
Scaling law	gravity's inverse-square law
Symmetry	isospin SU(2) (even though it's approximate)
Group	J = A5 (see note 4)

Field	C (see note 5)
Elementary particles	neutral pion and neutron
Function	f(x)=0
Special function	the gamma function
Flavor	charm
Multipole expansion term	quadrupole
Type of rock	granite
Type of star	white dwarf
Type of volcano	cinder cone
Type of organism	mushroom
Type of cloud	mushroom
Conic section	ellipse
Quadric surface	hyperboloid of one sheet
Girl	Annika Peter (Ñº)(Ñº)

Notes.

4. My original favorite group was *J*, the group of parity-conserving symmetries of the buckyball. It has order 60, and is simple. I have since learned that *J* is isomorphic to the alternating group of the fifth order, *A*5.
5. My friend Michael Schein (a graduate student at Harvard) writes to me: "If your favorite field is C, then you are a really boring person. The problem is that C is algebraically closed. While that gives you the Nullstellensatz and makes algebraic geometry much simpler, it also means that there isn't much interesting arithmetic. The field Q and its finite extensions are much more exciting. You should go into number theory and study them." I maintain that C has far more demonstrated relevance to the world than the finite extensions of Q. (C is the complex numbers, Q is the rational numbers.)

On 20 Aug 2005, Hirata, a month after completed his PhD dissertation (28 Jul), to note, married (see: Hirata timeline) his “favorite girl”, namely: astrophysicist Annika Peter (1982-) (Ñº), as listed above; this would seem to preclude Hirata from the effects of bachelorhood and genius.

IQ 200+ | Smartest person ever (3 of 4

25 Smartest People Alive | Existive (201

Left: the 2010 video IQ=200+ | Smartest Person Ever (3 of 4), wherein Hirata is discussed (3:57-6:14). Right: the 2014 video 25 Smartest Person Alive | Existive (2014) (5 of 5), wherein Hirata is discussed (11:49-17:28).

Quotes | On

The following are quotes on or about Hirata:

> "If I were to say that **Chris Hirata** is one in a million, that would understate his intellectual ability."
>
> — Vincent Malek (1997), Deerfield High School science chairman, on Hirata at age 14, during his last semester of high school, prior to going to CalTech (Ñº)

> "It seems that some of the smartest people of all time, e.g. see: top 30 or so geniuses of all time playlist [2010] (Ñº), spent some of their IQ parsing away the problems of social behaviour. As you get near the top, three names stand out. Turns out **Christopher Hirata** (#16) has developed a social model outlined in 'The Physics Of Relationships'. William Sidis (#8) also discussed 'chemical affinity' [enthalpy and entropy] as being a formulaic basis for human relations, and before them both and Einstein's personal favorite Johann Goethe (#1) not only [explicated] a vast model of human behaviour [see: *Elective Affinities*], but demonstrated its function in his fictional work *Faust*."
>
> — Matthew Newhall (2013), "Real Genius" (Ñº), Nov 25

> "This kid [**Hirata**] was in my high school AP class, near Chicago. He carried two backpacks, one on the front and one on the back. He was in third grade at the time."
>
> — PipeLayersUnion (2014), reddit "today I learned thread" (Ñº)

> "Hirata (IQ:225|#3) is an astrophysicist who is known for his work 'The Physics of Relationships.' His fame came at age 13 when became the youngest competitor ever to win a gold medal at the International Physics Olympiad. At 16, he began working with NASA on a project dedicated to colonizing Mars. He produced a similar theory on human chemical thermodynamics to Johann Wolfgang von Goethe (IQ:220|#4)."
>
> — Roxy Farrah (2014). "20 Smartest People to Ever Exist" (Ñº), Aug 30

Quotes | By

The following are noted quote by Hirata:

> "What I want to do is actually find the equation instead of using the same equation over and over."
>
> — Christopher Hirata (1996), age 13 comment (Ñº) on trying to figure out how long it takes to a pendulum ruler to make one swing

“The consideration [of] the nature of the forces involved in [human] relationships is not an easy subject. There are numerous pitfalls in applying what we know about ordinary human behavior to love, or even to sexual desires; and so to reinforce this fact I provide you with the following to consider: these processes occur on human time [human time] and length scales which are well known to us, and yet extrapolating (or interpolating?) from the known into the unknown may be dangerous. So one asks, what is the nature of sex and love and so on, and their relation to the other everyday experiences around us? And the answer, of course, follows only from an observation of this world and the processes that occur in it. It must be noted, if it is not obvious, that I have never experienced any sort of romance. It is also true that I [likely] never will, and yet my **curiosity** drives me to inquire as to the nature of the experience. And it is true that physical theory is the only way in which to answer this question, other than direct experience. While direct experience is undeniably a more reliable way to answer such questions, a few major problems with direct experience must be addressed: first, that it is [probably] not going to happen; and second, that various other people whom I know have been involved in romances, and in some cases they have been involved in many consecutive romances, but have failed to take data during those treasured minutes of sex. Love lasts longer but they don't want to analyze their relationships for fear of destroying them. More seriously, they do not take time to step back and make objective and scientific observations. Thus, for all practical purposes, the mysteries of sex and love can for the time being only be revealed by theory.”

— Christopher Hirata (c.2000), age 18 article “The Physics of Relationships” (§4:Neutron Scattering: a Cautionary Tale) (Ñº)

“This morning, I observed the formation of a circular queue: a situation in which a group of people at the airport are all patiently following the person in front of them, except that there is no beginning or end. It's like a bacterial chromosome, except that base pairs don't get irate.”

— Christopher Hirata (2014), Facebook Post, Mar 9 [16]

See also

â— Hirata timeline
â— IQ:200+ HCT prodigies
â— Julius Davidson (1916)
â— Lawrence Henderson (1935)
â— Frederick Rossini (1971)

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(b) Note: WayBack listing starts at 2010; but Hirata timeline shows that he was working at the Institute for Advanced Study in 2006; hence the date cited.

Further reading

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External links

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â— Christopher Hirata – Mathematics Genealogy Project.
â— Chris Hirata (faculty) – Ohio State University.
â— Christopher Hirata (faculty) – CalTech.
â— Christopher Hirata – Twitter.

θΔics

In existographies, **Christopher Hirata 2** (1982-) is []

→ Christopher Hirata (mobile; readable)
→ Christopher Hirata (online; readable) – WayBack (2007)
→ Christopher Hirata (online; unreadable) – Hacked (being recovered)

θΔics

In existographies, **Christopher Hitchens** (1949-2011) (IQ:170|#321) [RGM:313|1,500+] (FA:215) (CR:65) was an English-born American atheist philosopher, political and literature commentator, auto-characterized "anti-theist", i.e. someone opposed to religion, and random selection chance based (Q) theorist, noted for his 2007 *God is Not Great*, one of the books in the new atheism movement, wherein he grapples with the Moses pens his own death problem; and atheism vs religion debates with those including: William Craig, Alister McGrath, and Frank Turek, among others.

Overview

In 2005, Hitchens, in his "Equal Tax: No Tax-Exempt Status for Churches that Refuse to Distribute Pro-Evolution Propaganda!", reflected on how the Huxley vs Wilberforce debate was one of the memorably points of his education, himself setting the stage to be come a new Huxley, in his own mind, so to say: [4]

> "I found myself asking: How do I know about Darwin to begin with? And the answer was this: I was taught him as part of history as well as part of biology. After the voyage of the good ship Beagle and the amazing discoveries that attended it, Darwin decided to change his own theistic views and also to challenge the rooted conceptions of Christian Victorian society. He succeeded beyond any expectation. The great set piece, which I was taught in school, involved the debate at Oxford between Darwin's supporter Thomas Huxley (ancestor of Aldous and Julian and coiner of the word "agnostic") and Bishop Wilberforce, known even to his own flock as Soapy Sam. In front of a large audience, Huxley cleaned Wilberforce's clock, ate his lunch, used him as a mop for the floor, and all that. It was a "tipping point." After that, there were still those who believed that god had put fossils in the rock to test our faith, and those like Bishop Ussher who claimed to have dated the birth of the world to an exact time (4004 BC), but they were a spent force."

In 2007, Hitchens published his *God is Not Great: How Religion Poisons Everything*, which catapulted him into the top slot of the new atheists.

In Jul 2008, Hitchens, in his debate with Dinesh D'Souza, cogently digressed on how the Jesus was a fabrication and also on how exodus was fabrication. [2]

In Sep 2008, Hitches debated Frank Turek, amid which Turek employed the if were just "molecules in motion", a seeming new apologetics tactic, where does the atheist get their sense of morals from query, directed at Hitchens: [3]

> "Now **Christopher** talked about atrocities, but again, on the atheistic world view—here's the main point—how do you define what an atrocity is? Who defines it? Who has the authority to define what an atrocity is? The carbon atom? The benzene molecule? I'm not saying you have to believe in god to be moral. I'm not saying that only religious people are moral. I'm not saying atheists can't be moral. I'm not saying atheists don't know morality. I'm saying there's no way to justify what is right and what is wrong unless there's some authority that provides it. What is the authority? In a materialistic world view there is no authority. The carbon atom has no moral authority over you. And it seems that Christopher goes on and on about how he does not want to be under any some kind of divine totalitarianism. That is a moral rejection of god. Where does he come up with this immoral totalitarianism? His world view does not afford immorality because his world view does not afford morality. He has to borrow from the Christian world view in order to argue against it. In fact, he has to sit in god's lap to slap his face. Where does he get morality from?"

(add discussion)

Suicide

In Nov 1973, Hitchens, aged 24, learned that mother committed suicide in Athens in a pact with her lover, a defrocked clergyman named Timothy Bryan; the pair overdosed on sleeping pills in adjoining hotel rooms, and Bryan slit his wrists in the bathtub.

Religion | Early years

Hitchens was raised nominally Christian, attended Christian boarding school, and took part in prayers.

In 1987, Hitchens, aged 38, learned from his brother Peter, who had visited their maternal grandmother, who was in her 90s, that his mother's side of the family was Jewish. (Q)

Hitchens in a "halo" (2011) (see also: Gilbert Lewis), by artist Arian Covert, who says: "Hitchens is depicted making a point, while toasting his Johnny Walker Black & Perrier. He has what appears to be a halo behind his head, but that's just superstition. His suit is designed using collage from the writings of Albert Einstein, Richard Dawkins, Salman Rushdie, David Hume, Mark Twain, and John Updike. The background is designed using collage from the King James Bible and the Holy Quran. For reasons both ethical and artistic, no books were harmed in the creation of this painting, or of these prints" (Q)

Quotes | On

The following are quotes on Hitchens:

> "**Hitchens** was wonderfully witty, immensely erudite, seemed to have read absolutely everything, he could quote by the yard. He was a devastating wit and his opponents in debate had reason to regret taking him on. Martin Amis said that he would triumph even against Cicero and Demosthenes."
>
> — Richard Dawkins (2011), comment (Q) Hitchens passing, Dec 16

> "I think **Hitchens** was probably the best orator I've ever heard. He was a stunning public speaker. Beautifully modulated, he was extremely quick on his feet, extremely well read, erudite, resourceful and charming at the same time."
>
> — Richard Dawkins (2013) (Q)

> "A genius is someone who is so intellectually powerful as to overawe an even intelligent audience, and believe me, of the four horsemen, Dennett, Dawkins, Harris and **Hitchens**, none could hold a candle to Hitchens—his enormous breadth and depth of knowledge from the classics, to Shakespeare, to being able to quote chapter and verse from the Bible, are rivalled by none."
>
> — Anon (c.2017), "Was Christopher Hitchens a Genius" (Q), Debate.org

Quotes | By

The following are quotes by Hitchens:

> "Gullibility and credulity are considered undesirable qualities in every department of human life—except religion. Why are we praised by godly men for surrendering our 'godly gift' of reason when we cross their

mental thresholds? Atheism strikes me as morally superior, as well as intellectually superior, to religion. Since it is obviously inconceivable that all religions can be right, the most reasonable conclusion is that they are all wrong. Does this leave us shorn of hope? Not a bit of it. Atheism, and the related conviction that we have just one life to live, is the only sure way to regard all our fellow creatures as brothers and sisters. Even the compromise of agnosticism is better than faith. It minimizes the totalitarian temptation, the witless worship of the absolute and the surrender of reason."

— Christopher Hitchens (1982), "The Lord and the Intellectuals" [5]

"What can be asserted without evidence, can be dismissed without evidence."

— Christopher Hitchens (2003) (Q)

"You find me a state or society that threw off theocracy and threw off religion and said we adopt the teachings of Lucretius and Democritus and Galileo and Spinoza and Darwin and Russell and Jefferson and Thomas Paine, and we make those **what we teach our children**. We make that scientific and rational humanism our teaching. You find me that state, that did that, and fell into tyranny, and slavery, and famine, and torture, and then we'll be on a level playing field."

— Christopher Hitchens (2008), "Debate with Peter Hitchens on Iraq War and Religion" (Q), Grand Valley State University, Apr 3

"I can't find a seconder usually when I propose this, but I don't care. I don't need a seconder. My own opinion is enough for me, and I claim the right to have it defended against any consensus, any majority, anywhere, any place, anytime. And anyone who disagrees with this can pick a number, get in line, and kiss my ass."

— Christopher Hitchens (c.2008) (Q)

"I am more of an 'anti-theist', than an 'atheist'. In other words, my view is not just that there is no reason to believe that there is a deity, and all the arguments that there is one, have all long since been 'exploded' by philosophers, astronomers, scientists, physicists, biologists, and so forth, mainly by philosophers though, but that **it's a 'good' thing that it's not the case** [that there is a god]. In other words, I do know some non-believers that 'wish it was true', who think it would be nice if there was a celestial dictatorship. I cannot want to make myself want there to be a celestial dictatorship. I think it would be the absolute definition of unfreedom, if there was an unchanging, undying, all-knowing father, who kept you under surveillance, before you were born, all your life, and after you were dead."

— Christopher Hitchens (2009), "Interview Response" (to statement, by host Jian Ghomeshi, that Hitchens is a 'renowned atheist'), Q on CBC, YouTube, Sep 21

"Picture if you will the following: that it is conclusively demonstrated that the figures of Abraham, Moses, Jesus, Muhammad, Joseph Smith, all the other 'impostors', are nothing more than that, namely legendary, mythical, for fraudulent figures."

— Christopher Hitchens (c.2009) (Q)

"There is, and there always has been, an unusually high and consistent correlation between the stupidity of a given person and that person's propensity to be impressed by the measurement of IQ."

— Christopher Hitchens (c.2009) (Q)

"If Jesus, and Muhammad, and Abraham, and Moses, had never been born, which in any case I tend to doubt, or if all the stories told about them were untruth, as was suddenly found, and everyone had to admit it, some people, I know, would go into a panic, [thinking]: 'now what will we do, we have no morals suddenly?' What could be more nonsensical than that?"

— Christopher Hitches (c.2009), Video debate (2:34-)

"All religions are wrong in the same way, in that they privilege faith over reason, but they're not all equally bad in the same way all the time. I mean, if I had been writing in the 1930s, I might certainly have said that the Catholic religion was the most dangerous religion in the world, because of its open alliance with fascism and anti-Semitism, the damage from that our culture has never recovered and never will. But at the moment, it is very clear to me that the most toxic form that religion takes is the **Islamic** form and the horrible idea of wanting to end up with Sharia law, with a religion governed state, a state of religious law, and that the best means of getting there is jihad or holy war, that Muslims have a special right to feel aggrieved enough to demand this, I think, is obscene, absolute wickedness, and I think their religion is nonsense—in its entirety. God speaks to some illiterate merchant warlord in Arabia, and he's able to write this down perfectly, and it contains the answers to all—**don't waste my time, it's bullsh*t!**"

— Christopher Hitchens (2010), response (Q) to Sufi Muslim on why he choose the literal negation of the phrase "Allah hu Akbar" for the title of his book *God is Not Great*, Mar 23; favorite Angela Jabari Hitchens quote (2017)

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(b) Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pg. 290). Prometheus.

Further reading

● Hitchens, Christopher. (2007). *The Portable Atheist: Essential Readings for the Nonbeliever, Selected and with Introductions by Christopher Hitchens*. De Capo Press.

External links

● Christopher Hitchens – Wikipedia.
● Hitchens Debates Transcripts – Hitchens Debates, BlogSpot.com.

In hmolscience, **Christopher Langan** (1952-) (DN:1) (CR:23) (CIR:24) is an American autodidact, with a claimed IQ of 190 to 210 (2001), notable as a weed theorist who since circa 1990 as been promoting anti-reductionism (i.e. he argues for "informational reductionism", the view that the basis of reality is not matter and energy, but information), self-motion anthropic principle teleology-themed theory of intelligent design in order to prove the existence of god, via recourse a hodgepodge of standard melting plot theory + ontic opening polemics, namely: complexity theory, information theory, self-organization theory, Markoff processes (i.e. chance), via citation to fellow creationists such as David Berlinski (CIR:19), Michael Behe (CIR:1), William Dembski (CIR:5), intermixed with ideas of John Wheeler (quantum information), Kurt Godel (incompleteness), and David Bohm (holographic universe).

Self-theory

The following are 13 red-flag variants of the prefix "self-" employed by Langan, in his 2002 abstract alone, to promote his self-motion theory:

> Self-configuring
> Self-configuration
> Self-containing
> Self-characterized
> Self-definition
> Self-execution
> Self-generating
> Self-modelling
> Self-processing
> Self-recognizing
> Self-reference
> Self-selection
> Self-transducing

This, as god-believer scientist pattern indicates, e.g. DMR Sekhar, is all but Sokal affair-stylized code for perpetual motion theory, perpetual motion of the living kind in general, and soul "choice" theory salvage efforts, directly.

God | Soul | Afterlife

The following are Langan's views on death, god, and the soul:

> "There's a subjective aspect to reality and to time. In other words, there's nothing in principle what would stop your memories from being generated retrospectively from your current awareness of what's going on around you. You can play certain tricks with time like that. As for where you came from and where you're going, after you exit this mortal coil (see: Mor), you are and endomorphic image of god, and after you exit this mortal coil, you will be retracted upward along the mapping that created you, and you will have a chance to reunite with god. And if your soul has not been interdicted by some atrocious bad behavior, or refuseance or unwillingness to get with teleology, then you will be reunited with god. God lives forever. There's no such thing as death."
>
> — Chris Langan (2018), "Answer to Query: What Happens After Death?" (Q), Patreon Audio stream, Jul 22

Here, as we see, Langan has become like a Deepak Chopra Patreon-funded preacher of sorts, selling his own unique new age version of god (a word he employs four times in the above response). Real geniuses don't talk like this when it comes to these terms (see: geniuses on).

IQ claim | Overview

See main: Fake IQ

In circa 1990, Langan began to be wrapped up on the imaginary “high IQ society” social world of Rick Rosner (*Noesis* editor), Ronald Hoeflin (Mega Test creator), and Marilyn Savant (Guinness Book IQ delisting effector).

In 1991, Langan, in his “Prologue to Buffoonery” letter, was promoting, among what he referred to as the “high IQ readers”, i.e. Mensa social gathering like people, his cognitive theory model of the universe. (Q)

In Nov 1999, Langan became semi-famous when *Esquire* magazine, in their *Genius Issue*, shown below, ran an article dubbing him as “The Smartest Man in the World”, wherein interview commentary on Langan, claiming an IQ of 195, and Mega Test creator Ronald Hoeflin, claiming an IQ of 175, is presented. [1]

On 9 Dec 1999, the show 20/20 did an interview special on Langan, entitled “The Smart Guy”, during the course of which they had American neurophsychologist Bob Novelly supervise Langan in taking a two-hour IQ test, after which Novelly commented that Langan was the highest individual he has measured in 25 years. Cynthia McFadden, then interviewed Langan at his northern Missouri farm about his background and his work-in-progress mathematical proof of the existence of god theory, in which he comments how as a child he asked his grandfather: "is there a god?"; some of the interview dialogue is as follows: [4]

> **Langan:** There is a new way to prove the existence of god, a new proof that has not been refuted, yes.
> **McFadden:** And the soul?
> **Langan:** Well, yes.
> **McFadden:** And life after death?
> **Langan:** Part of the same thing, yes.
> **McFadden:** (voiceover) Christopher’s startling theory that you can prove the existence of god, the soul and an afterlife, using mathematics.

> **McFadden:** You know, there’s a sort of expression, ‘If you’re so smart, why ain’t you rich?’ So, I say it to you.
> **Langan:** Well, because there is no logical connection between being smart and having money. But if you aren’t necessarily focused on getting money in the first place, there’s no reason smarts should make money roll to you.

Left: the Nov 1999 *Esquire* magazine "Genius Issue", wherein **Langan** was dubbed the smartest man in the world. Right: a image still from the Dec 1999 20/20 interview of Langan at his farm in Missouri on him and his god theory.

> **Langan:** My [theory] provides the logical framework of the theory of everything. Yielding an enhanced model of space time, affording explanations of cosmogony, accelerating cosmic expansion, quantemonocality, the area of time, the physical and cosmological riddles that cannot be satisfactorily explained by other means.

In 2001, Errol Morris filmed a 30-minute interview with Langan entitled "The Smartest Man in the World", wherein Langan claims that based on an Omni Magazine intelligence test that he boasts: [6]

> "My IQ is somewhere between 190 of 210. I am closer to absolute truth than any man who has come before me."

Langan's humorous boasting prompted several parodies; an on-target one in particular by Andrew Osborne (2012). (Q)

In 2002, Langan, published 42-page version of his theory, entitled "The Cognitive-Theoretic Model of the Universe: a New Kind of Reality", wherein, as he reflects in 2010 interview retrospect, he attempts to put forward an teleological information self-motion theory argument for the existence of god, based on the following Biblical passage: [2]

> "In the New Testament, John 1 (Q) begins as follows: 'In the beginning was the Word, and the Word was with God, and the Word was God' (my italics). Much controversy has centered on this passage, as it seems to be saying that God is literally equivalent to logos, meaning 'word', 'wisdom', 'reason', or 'truth'."

Sometime, thereafter, Langan began to be a sort of Internet catchphrase, particularly in discussion forums. for anecdotal proof of the assertion "you can be smart and believe in god", in an era where 95 percent of leading scientists don't believe in the existence of god.

In 2008, Malcolm Gladwell, in his *Outliers: the Story of Success*, featured Langan and his story, as an example of a social outlier. [3]

In 2009, American electrochemical engineer Libb Thims, in version 78 of his growing IQ: 200+ claimant collection, began to list Langan among people cited, referenced, tested, and or claimed to have an IQ of 200 or above; in 2010, Thims included Langan in the 37 person video version of this listing, entitled "IQ 200+ | Smartest Person Ever", albeit Langan classified as one of the top three "IQ fakers" of the late 20th century, alongside Marilyn Savant and Rick Rosner. [5]

Education

At age 5, Langan his first book *Snakes, Lizards, and Turtles*. Early on he says, he was able to memorize large portions of books, but that from about age 6 to 14, he had an abusive step-father who beat him, and discouraged his intellectual development. Langan entered college, but dropped out after his mother forgot to send some type of academic scholarship form. He then became a "blue collar" worker, as he says, dabbling in reading, research, and god theory on the side.

Quotes | On

The following are related quotes:

> "I would actually pay Libb $200 USD to debate **Chris Langan** on a talk-back radio program, in the near future."
>
> — Biff Tannen (2015), forum (Q)(Q) commentary on the extreme atheism views of Libb Thims, Jan 25

Quotes | By

The following are quotes by Langan:

> "An atheist who considers himself "rational" has no choice but to deny that justice exists in any necessary sense, thus voiding any responsibility to explain its absence. And as the concept of justice flies out the window, so does any en-force-able basis for morality, thus reducing phrases like "moral atheist" and "atheistic morality" to meaninglessness."
>
> — Chris Langan (2017), Quora answer (Q) to atheist justice question, Jul 17

References

1. (a) Sager, Mike. (1999). "The Smartest Man in the World" (Q) (Q), *Esquire*, 132(5), Nov.
(b) Ferry, Jim, Lygeros, Nik; McGaug, Bill; Preston, Heather; Rottler, Andreas; Scoville, John; Smith, Tommy; and Wahl, Patrick. (1999). "Gεπ1us Tεst", *Esquire*, Nov.
2. (a) Langan, Christopher. (2002). "The Cognitive-Theoretic Model of the Universe: a New Kind of Reality" (pdf), MegaFoundation.org.
(b) Anon. (2010). "Interview of Christopher Langan" (Q), SuperScholar.org.
3. Gladwell, Malcolm. (2008). *Outliers: the Story of Success* (Langan, 22+ pgs). Little, Brown and Co.
4. McFadden, Cynthia. (1999). "The Smart Guy" (Q) (V), Dec 9.
5. Thims, Libb. (2010). "IQ 200+ | Smartest Person Ever (1 of 4)" (Q), HumanChemistry101, Oct 19.
6. Morris, Errol. (2001). "Interview: Christopher Michael Langan" (Q), First Person series.

External links

- Christopher Langan – Wikipedia.

θΔics

In hmolscience, **Christopher L. Redford** (c.1982-), known as Chris or evid3nc3, is an American computer scientist and religious deconversion philosopher noted for his so-called Redford deconversion model as outline in his 2009 to 2012 “Why I Am No Longer a Christian” video series—thematically similar in some sense to English mathematical philosopher Bertrand Russell's 1927 *Why I Am Not a Christian*—wherein he documents, in a very inside-the-mind look at his 2004 to 2008 Christianity belief system deconversion, from that of a devout Pentecostal Christian (2001) to, as he now refers to himself, a evidentialist secular humanist (2013), i.e. a secular humanist who bases their belief system on evidence. [1]

God concept

The following is representation of the "god concept", which the typical believer hold in their mind, as Redford explains things:

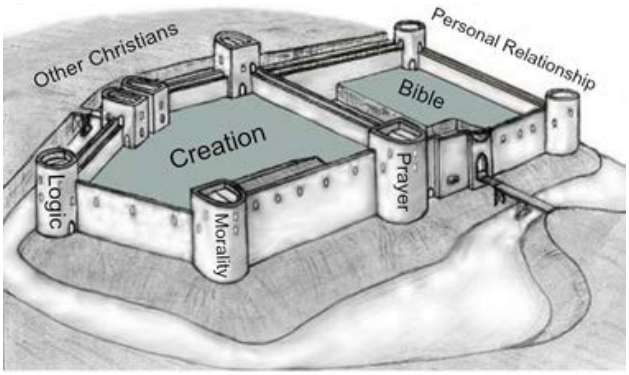

Even if one to three of their towers, of their mental belief nodal structures, comes under attack, such as "logical arguments" (e.g. how come there were no dinosaurs on the Ark?) or "morality" (e.g. how can a person be moral if we don't have free will), the castle (belief in the existence of God or "God concept") will still hold-fast in the mind, in respect to belief system or belief state. In short, in order to for a believer to be deconverted to disbelief, four of the seven "nodes" or towers (of God concept) have to simultaneously come under attack, and the battle or deconversion process typically lasts three-years.

Education

Redford completed his BS in computer science in 2005 and his PhD in 2012 in computer science, subfocus of intelligent systems, dissertation “Evidentialist Foundationalist Augumentation Applied to Multi-Agent Systems”, both in the 3.83 GPA range, at the University of Kansas. [4]

Deconversion | Overview

In 2001, Redford, a devout Church going, religious organization participating Christian, for some 17-years, entered the University of Kansas as a freshman with a mission to ‘spread the word of Christ’.

In 2004, after two years of science and philosophy classes, however, Redford’s beliefs began to change, the biggest shift—or tipping point—in his religious transformation came in March when he read a New Mexico professor’s [name] controversial review of the Bible on Amazon, an experience which Redford reflects on as follows: [2]

> “I found it kind of offensive, but I thought I would try to reach out to him,” Redford said. “It turned out that he had more to teach me than I had to teach him.”

Redford communicated with the professor over email for a week and the logic of the professor’s arguments began a dramatic change in his religious ideals. Redford began to see ‘holes’ in the religion he had been committed to for his entire life (reaction existence).

In 2007, Redford made his first YouTube video, entitled “Re: Proof God is Real”, a response to a video by Canadian religion debate evoking vlogger Shawn Karon (VenomFangX) who attempted to give some proof of the existence of god discussion via the "first cause" argument. (Q) On 11 May 2009, Redford uploaded “VenomFangX” Leaves!”

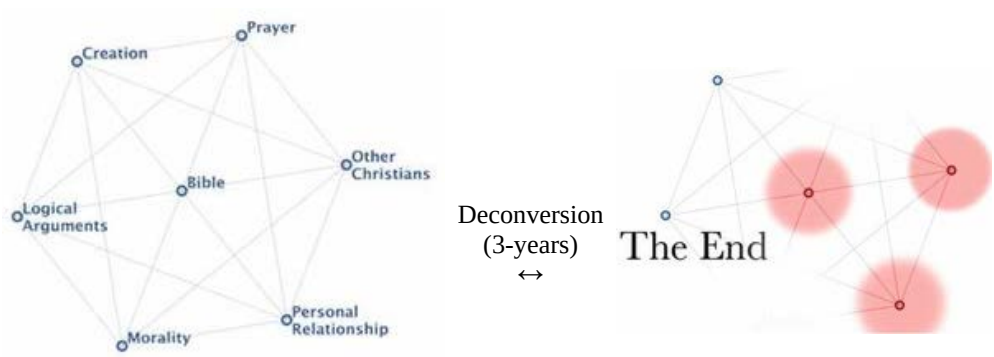

Redford's 7-nodal belief system of the mind model of the "God Concept", according to which belief in God is not one belief by a interlinked network of seven main belief aspects: morality, personal relationship, other Christians, prayer, creation, logical arguments, all

discussing how he doesn't know how to feel about this, explaining that "VenomFangX was the reason that I and many people came to YouTube", namely out of irritation concerning his overconfident technique of spreading misinformation, e.g. about the Dead Sea Scrolls, etc., about religion. (Q)

centered around the Bible, and that before religious deconversion to a new belief system can accrue, three or more belief system nodal points have to come come under attack in regards to question of validity.

On 3 May 2009, Redford uploaded his "Why I Am No Longer a Christian" video, in which he outlined the new series he was intending to make in respect to the steps of his deconversion.

Redford's resulting three-year video series documents his metamorphosis into atheism, via video—the result of which, him studying intelligent systems theory as the focus of his computer science PhD work, is a rather surreal look inside the mind of someone's step-by-step belief system reconstruction, his 'nodal representation' of the structural framework of the average belief system, being very illuminating in respect to belief system structure and strength. [3] His presentation is rather well-honed, as far as religio-mythology and comparative mythology and religious studies go, citing Karen Armstrong (*A History of God*, 1993), among others.

Title: 0 Overview
Description: Abridged overview of the "Why I am no longer a Christian" series for the purpose of brevity to newcomers.
Uploaded: May 3, 2009
Views: 406,232 (Nov 30, 2013)

Title: 1 My Christian Life
Description: A short but comprehensive look into my life as a Christian (which spanned 15 years) to prove to Christians that I was a genuine born-again, Holy Spirit baptised, and deeply committed Christian who had a strong relationship with Jesus Christ. **Uploaded:** May 19, 2009
Views: 216,143 (Nov 30, 2013)

Title: 2.0 Deconversion: The God Concept
Description: The concept of God, while having the appearance of being a single, coherent belief is often actually supported by multiple pillars of intertwined sub-beliefs. I give an overview of some of the most important sub-beliefs for my personal conception of God here. I will detail how at least most of these sub-beliefs fell for me, under the weight of logic and evidence, in later videos.
Uploaded: Jun 19, 2009
Views: 211,967 (Nov 30, 2013)

Title: 2.1 Deconversion: Prayer
Description: I explain why, for theological reasons, I stopped believing in the validity of intercessory prayer as a Christian.
Citations:
● Carey, Benedict. (2006). "Long-Awaited Medical Study Questions the Power of Prayer" (Q), *New York Times*, Mar 31.
● Benson, Herbert, et al. (2006). "Study of the Therapeutic

Title: 2.2 Deconversion: Morality
Description: I explain how, through the study of Ethics, I came to believe that morality was something separate from God that He wanted us to discover using reason, evidence, and experience.
Uploaded: Aug 13, 2009

Title: 2.3 Deconversion: Other Christians (Part 1)
Description: I explain how I came to see science and the Bible as compatible and started sharing this argument with atheists and non-believers through the Internet.
Citations:
● *The Science of God* (Gerald Schroeder, 1997)
● *A History of God* (Karen Armstrong, 1993)

Effects of Intercessory Prayer (STEP) in cardiac bypass patients: a multicenter randomized trial of uncertainty and certainty of receiving intercessory prayer" (abs), *American Heart Journal*, 151(4): 934-42.
Uploaded: Jul 16, 2009
Views: 143,370 on Nov 30, 2013

Views: 122,106 on Nov 30, 2013

● Who Wrote the New Testament? (Burton Mack, 1996)
Uploaded: Sep 1, 2009
Views: 117,024 on Nov 30, 2013

Title: 2.3 Deconversion: Other Christians (Part 2)
Description: I explain how I came to meet a true Christian who had deconverted and how I came to believe that I was at a different rational stage of development than some believers.
Citations:
● *Some Mistakes of Moses* (Robert Ingersoll, 1880)
Uploaded: Sep 20, 2009
Views: 105,563 (Nov 30, 2013)

Title: 2.4 Deconversion: The Bible (Part 1)
Description: I explain how, through my own personal readings, I came to see the Bible from a less literal and more liberal perspective.
Citations:
Matthew 7:6 (Pearls to pigs)
Proverbs 3:5 (Your own understanding)
Romans 1:22 (Wise but fools)
Genesis 12:11-20 (Lying Sarah)
Exodus 9:12 & 10:20 (Hardening Pharaoh's heart)
Leviticus 2 (Mundane flour rituals)
Numbers 2 (Counting Hebrews)
Romans 2:14-15 (Written on our hearts)
Acts 1:18 v Matthew 27:5 (Judas's death)
Uploaded: Oct 20, 2009
Views: 122,850 (Nov 30, 2013)

Title: 2.4 Deconversion: The Bible (Part 2)
Description: I explain how the professor's knowledge of the Bible's construction brought into question my belief that it was divinely inspired.
Citations:
2 Kings 2:24 (Children killed by bears)
Deut. 20:16 (Leave alive nothing that breathes)
● Documentary hypothesis – Wikipedia.
● The Bible with Sources Revealed – Wikipedia.
● The Bible with Sources Revealed (Richard Friedman, 2003)
Uploaded: Nov 18, 2009
Views: 106,523 (Nov 30, 2013)

Title: 2.5 Deconversion: Personal Relationship (Part 1)
Description: I explain how I was raised to see God in everything, how I came to believe I had a personal relationship with him, and how I began to enter a personal crisis in college when that relationship started failing and feeling distant and confused.
Uploaded: Dec 29, 2009
Views: 99,396 (Nov 30, 2013)

Title: 2.5 Deconversion: Personal Relationship (Part 2)
Description: The beginning of my final battle with the professor and the professor's perspective of the concept of a personal God.
Uploaded: Dec 31, 2009
Views: 113,812 (Nov 30, 2013)

Title: 2.6 Deconversion: The End
Description: I explain the end of my confident faith in God and the beginning of what became irreparable doubts about God's existence, given the current lack of motivating evidence for believing in Him.
Uploaded: Feb 06, 2010
Views: 130,638 (Nov 30, 2013)

Title: 2.7 Deconversion: Losing God
Description: I explain the torturous emotional roller-coaster and eventual desolate hopelessness and terror that resulted from losing my theistic God.
Uploaded: Mar 16, 2010
Views: 107,907 (Nov 30, 2013)

Title: 3.0 Atheism: A New Way of Seeing God
Description: I explain how I came to reject the Theistic conception of God in favor of Pantheism.
Uploaded: Apr 25, 2010
Views: 115,902 (Nov 30, 2013)

Title: 3.1 Atheism: Definitions
Description: I discuss various definitions of "atheism" and explain why I have chosen the one I have.
Citations:
● Appeal to ridicule – Wikipedia.
● Argumentum ad populum – Wikipedia.
● Liebeck v. McDonald's Restaurants – Wikipedia.
● Weak and strong atheism – Wikipedia.
● Agnostic atheism – Wikipedia.
Uploaded: Jun 01, 2010
Views: 91,722 (Nov 30, 2013)

Title: 3.2 Atheism: Nontheistic Gods
Description: I explain why I remained with the church after becoming an atheist and discuss more nontheistic God concepts I considered in my theological journey.
Citations:
● Jonathan Livingston Seagull – Wikipedia.
● Eberhart, Russell C., Shi, Yuhui, and Kennedy, James. (2001). *Swarm Intelligence*. Morgan Kaufmann.
● Schroeder, Gerald L. (2001). *The Hidden Face of God* (review, Q). Free Press.
● Dawkins, Richard. (2009). *The Greatest Show on Earth: the Evidence for Evolution* (evidence, Q). Free Press.
Uploaded: Jul 27, 2010
Views:82,159 (Nov 30, 2013)

Title: 3.3.1 Atheism: Ingersoll & Mack
Description: I relate the inspiring experiences of reading Ingersoll for the first time, observing the successful application of reductio ad absurdum to religion, perceiving the growth and maturing of my own mind, and encountering the concept of different Jesus movements from Mack.
Citations: add
Uploaded: Sep 7, 2010
Views:81,741 (Nov 30, 2013)

Title: 3.3.2 Atheism: Spong
Description: I relate the insights of reading Spong for the first time, solidifying the displacement of theism by the insights of science, seeing how we had created the theistic God in our own image, learning about the first images of Jesus from the letters of Paul, and trying to extract concepts from my Christian experience that were still meaningful in a non-theistic universe.**Citations:** add
Uploaded: Dec 11, 2010
Views:78,860 (Nov 30, 2013)

Title: 3.3.3 Atheism: A History of God (Part 1)
Description: I explain how I learned from A History of God by Karen Armstrong that the evidence indicates that the Jewish concept of monotheism evolved from the syncretism of various polytheistic sources like Canaanite and Babylonian polytheism.
Citations: add
Uploaded: Jan 07, 2011

Title: 3.3.3 Atheism: A History of God (Part 2)
Description: I explain why I stopped using the word "God" to describe anything correlated with a reality outside of our own minds, pending evidence that would persuade me to do so.
Citations: add
Uploaded: Mar 18, 2011
Views: 138,725 (Nov 30, 2013)

Title: 3.4.1(1) Atheism: Evidence
Description: I lay the philosophical groundwork for my epistemological position of Evidentialist Foundationalism by contrasting it with the First Principles journey of the Rationalist Descartes.
Citations: add
Uploaded: May 19, 2011
Views:130,568 (Nov 30, 2013)

Views:324,881 (Nov 30, 2013)

Title:3.4.1(2) Atheism: Objections to Evidentialism
Description: I respond to objections to Evidentialism regarding the use of provisional hypotheses, the alleged self-refuting properties of Evidentialism, the evidential bases of mathematics and logic, and the relation of Evidentialism to Logical Positivism.
Citations: add
Uploaded: Jan 05, 2012
Views: 83,194 (Nov 30, 2013)

(add discussion)

Christopher | Etymology

See main: Christopher etymology

In hmolscience, an atomic theory based belief system, the name "Christopher", the surname of Jesus Christ and of Christianity, is an uncommon name—the term "Christ", from the Greek *Christos*, literally, anointed, meaning to rub with oil, from the Egyptian resurrection myth of Osiris, specifically to rub the re-attached erect phallus, of the crucified (cut apart), albeit reconnected (mummified) body of Osiris, with "oil" before divine resurrection sex, with goddess sisters Isis (Stella Maris → Virgin Mary) and Nephthys (Mary Magdalene), as described in the play *Passion of Osiris*, shown below (left), or as re-written in the *Passion of Christ*, as shown below (right):

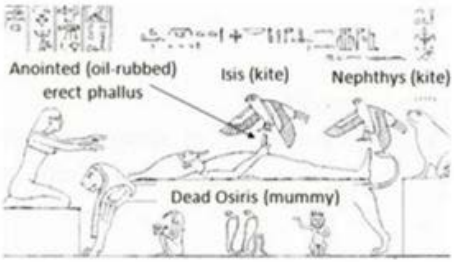

Original version (2000BC): the goddess Isis, otherwise known as stella Maris, and her sister Nephthys, have 'anoint' (Christen), meaning to rub with oil, the phallus of the mummified god Osiris, having a type of resurrection sex, to bring him back to life.	**Biblical version** (100AD): two Marys wrap Jesus in linen, then anoint him (rub him with oil), then both 'climb onto' the sepulcher, after which he is resin from the dead.

As the school "most accused of atheism", as English natural philosopher Francis Bacon put in *circa* 1601, is the school of "Leucippus and Democritus and Epicurus", the paucity of Christopher names, among the 1,000+ Hmolpedia biographies, listed below, is no coincidence; the majority of "Christophers" being objectors or detractors to hmolscience—the cross symbol signifying Christian or God-based objection reasoning logic:

Person	Date	Description
Christiaan Huygens (1629-1695)		He turned away from Calvinism and from Catholicism; though seems, in the end, to have harbored some "first cause" (see: causality) belief in god framework, similar to his associate atomic theory reviver Pierre Gassendi. (O)

Christoph Wieland (1733-1813)	1809	✝Argued vehemently against Goethe's human chemical theory.
Christoph Ballot (1817-1890)	1858	Argued against the calculation of the speeds of gas molecules by Clausius.
Christopher Dawson (1889-1970)	1957	✝[?] Describes social mechanics (discussed here), along with social physics, and social energetics, as one of the defunct corpses of sociology's past.
Christian Anfinsen (1916-1995)	1970s	✝Son of Bible reading Lutherans, was agnostic throughout existence, until after his 1972 Nobel Prize in chemistry win, after which he "found God", commenting famously, views such as: "I think only an idiot can be an atheist" (1989), etc.
Christopher Gray (1941-)	2010	✝[?] Writes about the "danger of a mechanistic social science", in the theories of Maurice Hauriou; the same warnings emanating from the pen of John Wojcik (2006) of the Christianity-based Villanova University (see: Rossini debate).
Christopher Langan (1952-)	c.1995	✝Cited on the IQ: 200+ page; advocates for an information theory of God.
Christopher Southgate (1953-)	1993	✝Biochemist turned science-religion debate scholar.
Christian de Quincey (c.1955-)	2002	✝His *Radical Nature* argues that consciousness, spirit, and soul extend all the way down the evolutionary ladder to the atoms and molecules.
Christopher Edwards (c.1959-)	c.2010	Teaches that "life is a path function; the integral of that path, that's the special part."
Christopher Hirata (1982-)	c.2000	Noted for HCR theory based "The Physics of Relationships".
Christine Kamla (c.1994-)	2011	Noted for Goethe-based HCR theory of modern adoption legislation.

Noting that about 60 percent of the twelve "Christ-named" individuals in Hmolpedia are religious belief adherers, in belief system, in some sense or another, the supposition here is that a person born into the name "Christopher", or equivalently Mary (or Christine), is one thus born deeper into the belief system of Christianity, more so than the average person, via action of their parent's idealized belief systems. Redford, in the 2012 *Artificial Intelligence Review* publication of his dissertation, lists himself as "Chris", which would seem to be unwritten code for religious belief system detachment.

Quotes

The following are related quotes:

> "It takes the latter half of all of one's lifetime to unlearn the falsehood that was instilled into us during the earlier half. Generation after generation we learn, unlearn, and re-learn the same lying legendary lore. Henceforth, our studies must begin from the evolutionist standpoint in order that they mat not have to be gone over again."
>
> — Gerald Massey (1883), *The Natural Genesis*

Redford's 2010 video "The Values We All Stand For", discussing the 1953 Red Atheism Scare add of "In God We Trust" (see also: "In ΘΔics we trust" dollar bill Q) to the US one dollar bill and the "one nation under god" add to the US constitution was the $10,000 winner of the Sam Harris based Project Reason video contest.

A tongue-in-cheek critique of C.S. Lewis' book *Mere Christianity*. (That successfully horrified many of my atheist subscribers on April 1st, when it was presented as a "reconversion" video as the end result of a fundraiser for the Society of Open-Minded Atheists and Agnostics [SOMA] at KU.

References

1. Evid3nc3 – Facebook.
2. Archibald, Anna. (2010). "Student Atheist's Video Wins Award", *Daily Kansan*, Mar 30.
3. Evid3nc3 – YouTube.
4. (a) Christopher Redford (curriculum vitae) – EECS.KU.edu.
(b) Arvin Agah (students) – EECS.KU.edu.
(c) Redford, Chris and Agah, Arvin. (2012). "Evidentialist Foundationalist Argumentation for Multi-Agent Sensor Fusion" (abs), *Artificial Intelligence Review*, Mar 11.

External links

- Evid3nc3 – Twitter.

- Evid3nc3 – WordPress.

θΔics

In hmolscience, **Christopher Southgate** (1953-) is an English biochemist noted for his 1993 to present publications and teaching efforts on the science-religion debate.

Overview

In 1991, New Testament scholar Richard Burridge suggested to Southgate that he use his background in experimental science to work on and discussion on the science-religion debate; which resulted in a course he began teaching at in 1993 at the University of Exeter. [1]

In 2005, Southgate, in his *God, Humanity, and the Cosmos*, noted that in 1984 Robert Russell developed the theory that a future universal eschatological state will be characterized by a suspension of the second law of thermodynamics. [2]

In 2008, Southgate, in his *The Groaning of Creation: God, Evolution, and the Problem of Evil*, discussed views on the second law of thermodynamics in the context of evil, e.g. the problem of evil, and other religious thought. [3]

Education

Southgate originally trained as a biochemist at the University of Cambridge. He is an honorary fellow in theology at the University of Exeter, England and a visiting scholar at the graduate theology union in Berkeley, California.

Quotes | Cited

The following are quotes cited by Southgate:

> "Should the final future as forecasted by the combination of big bang cosmology and the second law of thermodynamics come to pass, then we would have proof that our faith has been in vain. It would turn out that there is not God, at least not the God in whom the followers of Jesus have put their faith."
>
> — Ted Peters (1993), *God and Trinity* [3]

References

1. Southgate, Christopher. (2004). "Environmental Ethics and the Science-Religion Debate: A British Perspective on Barbour", in: *Fifty Years in Science and Religion: Ian G. Barbour and his Legacy* (ch. 14, pgs. 239-). Ashgate Publishing.
2. Southgate, Christopher. (2005). *God, Humanity, and the Cosmos* (thermodynamics, pgs. 124, 293, 299). Continuum International Publishing Group.
3. Southgate, Christopher. (2008). *The Groaning of Creation: God, Evolution, and the Problem of Evil* (thermodynamics, pgs. 38, 47, 79, 81, 85, 88, 90, 95). Westminster John Knox Press.
4. Peters, Ted. (1993). *God as Trinity* (thermodynamics, pgs. 159-62, 172, 175-76). Westminster John Knox Press.

External links

â— Christopher Southgate (faculty) – University of Exeter, England.

θΔics

In existographies, **Christopher Taylor** (1931-), aka C.C.W. Taylor, is an English classical philosophy scholar, a specialist in Greek philosophy, particularly in the area of atomic theory, Leucippus and Democritus in particular, noted for []

Education

In1958, Taylor completed his MA in classics at Edinburgh University, after which he attended Balliol College, Oxford, supposedly completing his PhD in something. In the 1990s, Taylor was a philosophy professor at Cambridge University, specializing in pre-Socratic philosophers, centered around atomic theorists. [2]

Quotes | By

The following are quotes by Taylor:

> "In fragment 71b, Simplicius says that although Democritus appeared (*edokei*) to have made use of 'chance' in his account of the formation of the worlds, in his more detailed discussion (*entois merikoterois*) he says that chance is not the cause of anything. That suggests that he merely seemed to ascribe cosmogony to chance, perhaps by speaking of it as a chance occurrence in the sense of an occurrence whose cause is unknown."
>
> — Christopher Taylor (1999), Commentary on Atomists' Fragments [1]

> "The belief that animal, including human, life was originally generated from primeval slime (154a-c) is common to many early cosmologies, including those of Anaximander (DK 12 A11, A30), Archelaus (DK 60 AI), and the source of the cosmogony in Diodorus (I.7 as printed by DK with 68 B5)."
>
> — Christopher Taylor (1999), *The Atomists: Leucippus and Democritus* [1]

References

1. Taylor, Christopher C.W. (1999). *The Atomists: Leucippus and Democritus: Fragments: a Text and Translation with a Commentary by C.C.W. Taylor* (Archelaus, pgs. 197-98). University of Toronto Press.
2. Christopher Charles Whiston Taylor (about) – OxfordReference.com.

External links

â— Christopher Charles Whiston Taylor – PraBook.com.

θΔics

In existographies, **Christopher Wren** (1632-1723) (Cattell 1000:874) was an English architect, astronomer, anatomist, geometer, and mathematical physicist, noted for []

Quotes | On

The following are quotes on Wren:

> "Newton recalled from a conversation in 1677 that **Wren** had known the inverse square law then, before Hooke, and asked Haley to find out when Wren had first learned of the law."
>
> — Stephen Inwood (2002), *The Man Who Knew Too Much* (pg. 362); on the response of Newton to the news by Edmond Halley that Hooke wants acknowledge credit, in the second book of *Principia*, for his work on the inverse square law [1]

References

1. (a) Newton, Isaac. (1686). "Letter to Edmund Halley", Mar 27
(b) Trunbull, H.W. (1960). *The Correspondence of Isaac Newton, Volume Two* (pgs. 433-344). Cambridge University Press.
(c) Inwood, Stephen. (2003). *The Man Who Knew Too Much: the Strange and Inventive Life of Robert Hooke 1653-1703* (pg. 362). Pan MacMillan.

External links

â— Christopher Wren – Wikipedia.

θΔics

In thermodynamics, **chromatographic thermodynamics** is the study of how to explain molecular separation behaviors in chromatographic methods thermodynamically.

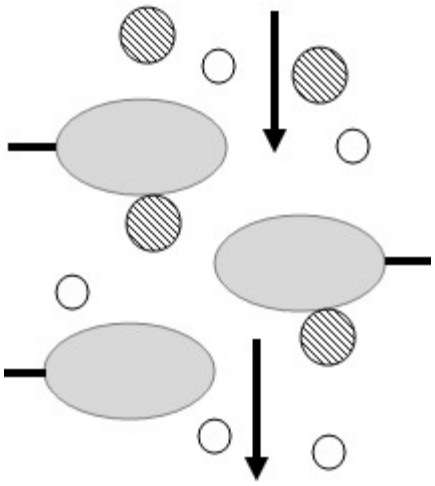

Generic diagram of molecules separating, according to size and bonding affinities, as the mobile phase moves through the stationary phase.

Further reading

â— Guiochon, Georges and Guillemin, Claude. (1988). *Quantitative Gas Chromatography* (ch. 3: Fundamentals of the Chromatographic Process: The Thermodynamics of Retention in Gas Chromatography, pgs. 55-). Elsevier.

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θΔics

In hmolscience, **Church of Elective Affinities** or “Church of the Elective Affinities” is the place or conceptualization, philosophical or actual, wherein Mary Shelley, in her posthumous existography of her husband Percy Shelley, “Britain’s most famous atheist”, alluded to or insinuated that she and him were married in, abiding in the principles of elective affinities.

An artistic rendition of Mary Shelley's so-called "**Church of Elective Affinities**", affixed with the symbol of atomic atheism, i.e. belief in atoms, and disbelief in gods (atheism); wherein, in 1816, she alludes to have married Percy Shelley, accompanied with a "Miss Claremont" a deaconess in the church, whose doctrines and creeds (see: atheist's creed) are based on the "elective-affinity scheme", as she puts it (referring to Percy's conception of it), some of which are found in the "Atheist's Bible", which teach "atheistic morality" and meaning; much of which is based on Goethean philosophy, Goethe being the thinker who in 1796 was the first to outline an elective affinity based model of the passions.

Goethe

See main: Goethe on religion

In 1758, German polyintellect Johann Goethe, age 9, as described in his *Dichtung und Wahrheit*, in poetic language, built his own altar to nature out of his father’s natural history collection, surmounting it with sulfur, and lit a candle, when making his devotions; his readings of the works of Benedict Spinoza later confirmed these feelings.

In 1796, Goethe began ferreting out the outline of an "elective affinity" based model of the passions; the result of which was his 1809 physical chemistry based novella *Elective Affinities*, which shows how to upgrade the ten commandments via "what nature teaches the creatures it makes" (*Positions of Rights*, 1777).

Shelley

In 1804, English romantic poet and philosopher Percy Shelley, age 14, entered Eton College, during which time he translated half of Pliny’s *Natural History*, spent his money on books, chemical instruments, and acts of liberality; one of his oft-spoken pronouncements during this time was: [3]

> “Nothing ever delighted me so much as the discovery that there were no *elements* of earth, fire, or water.”

In 1806, age 16, Shelley entered Oxford University, where his favorite amusements were chemistry, microscopic investigations, and boating.

In 1811, Shelley, age 19, penned "The Necessity of Atheism", wherein he does a modern physical science based upgrade of Francis Bacon style atheism, affirmatively states "there is no god", questions the existence of "life" amid a materialism view, and derides the supposition of afterlife with recourse to elements, reduction, and science; an exert of which is as follows:

> “It has been the persuasion of an immense majority of human beings in all ages and nations that we continue to live after death that apparent termination of all the functions of sensitive and intellectual existence. Nor has mankind been contented with supposing that species of existence which some philosophers have asserted; namely, the resolution of the component parts of the mechanism of a living

being into its elements, and the impossibility of the minutest particle of these sustaining the smallest diminution. They have clung to the idea that sensibility and thought, which they have distinguished from the objects of it, under the several names of spirit and matter, is, in its own nature, less susceptible of division and decay, and that, when the body is resolved into its elements, the principle which animated it will remain perpetual and unchanged. Some philosophers and those to whom we are indebted for the most stupendous discoveries in physical science suppose, on the other hand, that intelligence is the mere result of certain combinations among the particles of its objects; and those among them who believe that we live after death recur to the interposition of a supernatural power, which shall overcome the tendency inherent in all material combinations, to dissipate and be absorbed into other forms."

In 1816, Shelley, age 24, shortly after the 10 Nov 1816 suicide of his first wife Harriet Westbrook (1795-1816), with whom he had two children, married Mary Shelley [Mary Godwin] in which Mary Shelley retrospectively refers to as the "Church of Elective Affinities".

In 1839, Mary Shelley, in her "Memoir of Shelley" (Ñº), who has passed in 1822, age 29, amid a boating accident (or suicide), writing in the third person, gives a short existography of Percy Shelley, particularly during his tumultuous years, and seems to speak in a mutual language of chemical philosophy, particularly where she says that they were married in the "Church of Elective Affinities" as seems to be the case: [3]

"It is a little odd, considering Shelley's "opinions about marriage", that he should have been married twice to his first wife. After their return from Gretna Green, the ceremony was performed again at Cuckfield in Sussex. For some time, he seems to have led a rather migratory life. We find him for a time at Keswick, where he became acquainted with Southey, for whose poetry he had at this time an extravagant admiration; then in Dublin, projecting histories of Ireland, which result in a small political pamphlet, now irrecoverable; then in the Isle of Man, as a kind of Alsatia, sacred from the foot of bailiff; and last in Wales, whence he appears to have come to London again.

The results of this marriage were two children, a daughter and a son, and a separation. The circumstances of the disagreement between Shelley and his wife, have never been cleared up. Perhaps it would have been quite as noble if Shelley had continued the martyr of a youthful misstep instead of making his wife the victim of notions about marriage in which there is no evidence that she shared. However this may be, he made himself so acceptable to Miss Godwin, daughter of the novelist and Mary Wolstonecraft, that she consented to elope with him to Switzerland in July, 1814. They crossed to Calais in an open boat, not without danger of being lost. A Miss Claremont went with them. She also was a deaconess in the **Church of the Elective Affinities**, and (Lord Byron having joined the party) became the mother of the Allegra, mentioned in his will. This, however, seems to have been on a second visit to the Continent, the fugitives having in the meanwhile returned for a short time to England. This last continental tour occupied but a few months, during which the northern part of Italy was visited.

Shelley came back to England again, bringing with him a child by his new connection, and went to Bath. But now was to come the terrible recoil which almost inevitably results from an attempt to bend an entire social system out of the way of the passions of a single man. However the brain may philosophize, the heart remains loyal to its traditions, and though Mrs. Shelley [Harriet Westbrook] may have been captivated with the doctrine of attractions while it drew her husband to her, she was not prepared for the more liberal application of it which drew him away. No theorizing can sweeten desertion; and the unhappy woman, disenchanted of the dream, and forsaken by the substance, sought shelter in death.

The lovers of Shelley as a man and a poet have done what they could to palliate his conduct in this matter. But a question of morals, as between man and society, cannot be reduced to any individual standard however exalted. Our partiality for the man only heightens our detestation of the error. The greater Shelley's genius, the nobler his character and impulses, so much the more startling is the warning. If we make our own inclinations the measure of what is right, we must be the sterner in curbing them. A woman's heart is

too delicate a thing to serve as a fulcrum for the lever with which a man would overturn any system, however conventional. The misery of the **elective-affinity scheme** is that men are not chemical substances, and that in nine cases in ten the force of the attraction works more constantly and lastingly upon the woman than the man. There is no stronger argument against it than the *Memoirs of Mary Wollstonecraft* (1798) (Ñº). The Mormon polygamy is nothing more than a plant from the same evil seed sown in a baser soil, and is an attempt to compromise between the higher instincts of mankind, organized in their institutions, and the bestial propensities of sensualized individuals.

The suicide of Shelley's wife took place on the 10th of November, 1816, and shortly afterward he married Miss Godwin [Mary Shelley], at her father's solicitation, and took up his abode at Great Marlow in Buckinghamshire. His means of support were ample, as he had succeeded to some property in his own right which yielded a yearly income of one thousand pounds. During his residence here the custody of his two children by his first wife was taken away from him by a decision of the Lord Chancellor Eldon, on the ground of atheistical principles attributed to their father. Shelley felt this deeply, and all his life."

(add discussion)

Goethe | Shelley

Shelley's social "elective affinities" model, derived from the physical sciences, seems to have been done parallel, yet independent, from that done by Goethe. Shelley scholar Teddi Bonca (1999) reasons that Shelley "may or may not have read" Goethe's *Die Wahlverwandtschaften* [*Elective Affinities*]. [4] Goethe's work, however, was not available in English until 1854 [James Froude]; and Shelley was known only to read German when the translations where available.

Related

In 1910, German physical chemist Wilhelm Ostwald, was giving his "Monistic Sunday Sermons", on how energy-based monism replaces theism, and the repercussions and details of this view; a type of natural science based atheism Sunday school, so to say, devoid of any supernatural suppositions; a visual synopsis of which is as follows:

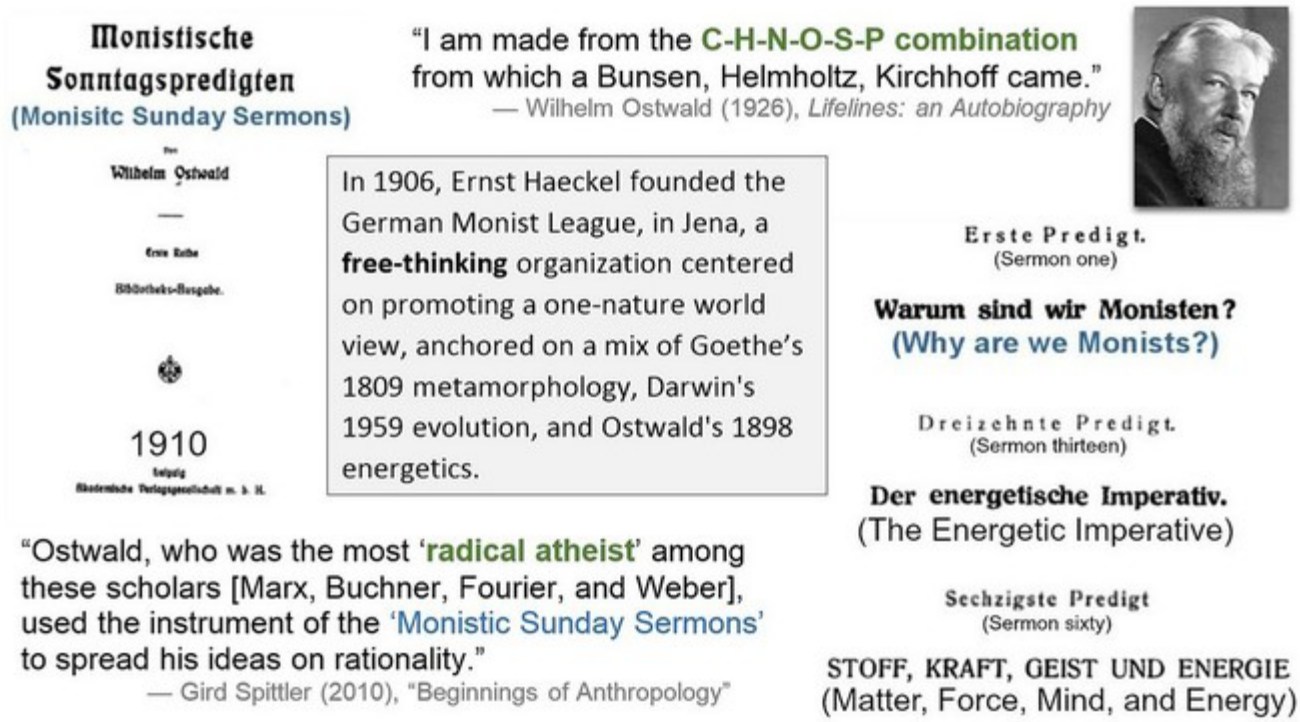

In 2007, American historian William Jensen drew the following caricature of Gilbert Lewis, shown above, as the prophet or preacher of the new or future

brand of atheistic physiochemical-based religion:

In 2010, English atheists and comedians Sanderson Jones and Pippa Evans (Ñº), during an Oct drive to Bath, conceived the idea for an “atheist church” per the following logic: (Ñº)

> “We wanted to do something like a church for people who don’t believe in god but do believe in good.”

In 2013, longing for that sense of community they used to have as believers, the launched the first started so-named Sunday Assembly (Ñº), the first of which occurred in London; crowds later drawing some 300 to 500 people.

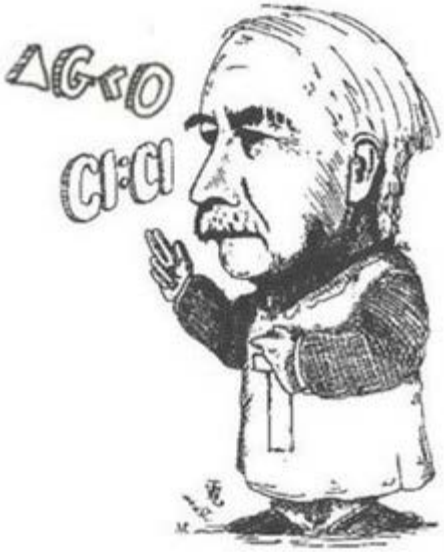

A sketch of Gilbert Lewis, by William Jensen (2007), one of the prophets of monism based beliefs found in the teachings of the **Church of Elective Affinities**; him shown pointing to Gibbs energy change and photon-electron bonds, the 20th century versions of elective affinities and bonding brackets, of the 18th century affinity chemistry.

The idea soon went viral and as of Oct 2015, there are some 68+ Assemblies worldwide (16+ in the US); some of which have been document in video news in recently, e.g. Huffington Post (2014) (Ñº), CNN (2015) (Ñº).

In 2015, American electrochemical engineer Libb Thims, together with co-host Thor, gave a "Zerotheism for Kids" lecture, to six kids, aged 2 to 11, an Ostwald-stylized type of traditional Sunday school for modern free thinking children, whose parents want straight modern, non-supernatural answers taught to their children.

See also

â— Atheistic religion

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θΔics

In existographies, **Marcus Tullius Cicero** (106-43BC) (IQ:180|#103) (Cattell 1000:15) [RGM:116|1,500+] (Stokes 100:13|Stoics) (GPhE:#) [CR:200], aka "Tully", was a Roman philosopher and politician, noted for his 45BC *On the Nature of the Gods*, a discourse on Greek and Roman theologies, namely a dialogue on a comparison of the pros and cons of stoicism (character: Balbus), Epicurean theology (character: Velleius), and Platonic Academy based skepticism (character: Cotta); also known for thoughts on morals, society, the legal system, etc., as both religion and and Epicurean atomic theory would each see things.

Heat | Life

On heat and life, Cicero says the following:

> "When the heart has been plucked out of a living creature, it pulsates with such rapid movement as to resemble a flickering flame. Therefore, every living thing, be it animal or vegetable, lives because of the heat enclosed within it. This forces us to the conclusion that the element heat possesses within it a life-sustaining force which extends throughout the whole universe."
>
> — Cicero (45BC), *On the Nature of the Gods* (2.24), voice of the Stoic Balbus (see: abioism)

In commentary on this, Patrick Walsh (1997) states that the ultimate citation for this view is Heraclitus, and also that Aristotle develops this argument in *De Anima* (2.8) and elsewhere.

On Fate

In 45BC, Cicero published *On Fate*, wherein, supposedly, he coins (§:II.i) the term "moral" and "moral science".

On Moral Ends

In 45BC, Cicero published *On Moral Ends*, wherein he gives objection to Greek philosopher Epicurus' *circa* 280BC "swerve of the atom" theory of free will and, supposedly, soul, arguing that if it was necessary first to go all out for natural law to dispense with divine intervention by gods then suddenly and capriciously cancel out all of this beautiful logic by inventing an uncaused swerve, then the entire atomic theory of Leucippus, Democritus, Epicurus, and Lucretius was probably after all just so much "childish fancy". [1] Cicero devotes a number of pages of discussion to compare and contrast Democritus with Epicurus. [3] Swerve issue aside, Cicero seems to have been in favor of Lucretius: [2]

> "The poetry of Lucretius is, as you said in your letter, rich in brilliant genius, yet highly artistic."
>
> — Cicero (54BC) Letter to brother (Quintus), Feb 11

(add)

Gods | General

In 45BC, Cicero published *On the Nature of the Gods* (*De Natura Deorum*), a discourse on Greek and Roman theologies, namely a dialogue on a comparison of the pros and cons of stoicism (character: Balbus), Epicurean theology (character: Velleius), and Platonic Academy based skepticism (character: Cotta); the following are representative quotes:

> "Protagoras however professed himself in doubt on the matter and Diagoras of Melos and Theodorus of Cyrene did not believe them to exist at all."
>
> — Cicero (45BC), *On the Nature of the Gods* (pg. 69-70) [9]

“And when these [religious rituals] are gone, there is anarchy and complete confusion in our way of life. Indeed, I do not know whether, if our reverence for the gods were lost, we should not also see the end of good faith, of human brotherhood, and even of justice itself.”

— Cicero (45BC), *On the Nature of the Gods* (§1, pg. #) [9]

“From me you will get no mere figments of the imagination, such as the god whom Plato describes in his *Timaeus* as the creator and artificer of the world, or the fortune-telling old which whom the Stoics call ‘providence’, or some theory of the universe being itself endowed with mind and senses [Anaxagoras], a sort of spherical, incandescent and revolving god. All such marvels and monstrosities are as these are not philosophy by merely dreams.”

— Velleius [Cicero] (45BC), *On the Nature of the Gods* (pg. #) [9]

“In this immensity of breadth and length and height there swarms the infinite power of atoms beyond number, and although they move in vacuum, they cohere amongst themselves, and then are held together by a mutual attraction. Thus are created all the shapes and forms of nature, which you imagine can only be created by some divine blacksmith with his anvil and his bellows! So you have smuggled into our minds the idea of some eternal overlord, whom we must fear by day and night. Who would not fear a god who foresees everything, ponders everything, notices everting? A god who makes everything his own concern, a curious god, a universal busy body? Epicurus has saved us from all such fears and set us free.

— Velleius [Cicero] (45BC), *On the Nature of the Gods* (pgs. 91-92) [9]

“What a fortunate clash of atoms, from which suddenly men are born in the image of gods! It is egocentric to imagine our own shape as that of the gods. No doubt ants feel the same way.”

— Cotta (Cicero) (45BC), *On the Nature of the Gods* (pg. #) [9]

“It is obviously true, as our mutual friend Posidonius [c.135-51BC] (Q) argued in the fifth book on the nature of the gods, that Epicurus did not believe the gods existed at all and that what he said about them was merely to avoid the odium of atheism.”

— Cotta (Cicero) (45BC), *On the Nature of the Gods* (pg. #) [9]

“That which we call ‘nature’ is therefore the power which permeates and preserves the whole universe, and this power is not devoid of sense and reason.”

— Balbus (Cicero) (45BC), *On the Nature of the Gods* (pg. #) [9]

“Is it not a wonder that anyone can bring himself to believe that a number of solid and separate particles by their chance collisions and moved only by the force of their own weight could bring into being so marvelous and beautiful a world. If one believes such a thing possible, I cannot conceive why one would not believe as well that by haphazardly throwing a vast quantity of the twenty-one golden letters onto the ground, the result could be Ennius’ *Annals*, such that they could then be read. I doubt if chance could by itself complete even a single line.”

— Balbus (Cicero) (45BC), *On the Nature of the Gods* (pg. 161) [10]

> “Nothing which is devoid of life and intelligence can give birth to any living creature which has intelligence. But the universe does give birth to living creatures which partake of intelligence in their degree. The universe is therefore itself a living intelligence.”
>
> — Balbus (Cicero) (45BC), *On the Nature of the Gods* (pg. 132); compare: Henry Bray (see: living universe) [9]

French thinker Voltaire described *On the Nature of the Gods* as “perhaps the best book of all antiquity.” [6]

In 2004, Jennifer Hecht, inspired by the Cotta character, penned *Doubt: a History*, an attempt to upgrade of Cicero's *On the Nature of the Gods.*

Atheism

Cicero, supposedly, was first to transliterate the Greek word ἄθεος, from the privative ἀ- + θεός "god", meaning "godless", into the Latin *átheos* (O), i.e. to introduce the "atheism" to the modern western world.

Throwing letters | Typing monkeys

Cicero, in his treatises *On the Nature of the Gods* or *On Destiny*, seems to be the originator of the famous typing monkeys example: [8]

> “If one believes such a thing possible, I cannot conceive why one would not believe as well that by haphazardly throwing a vast quantity of the twenty-one letters onto the ground, the result could be Ennius’ *Annals*, such that they could then be read. I doubt if chance could by itself complete even a single line.”

(add discussion)

To each his own

In 45BC, Cicero, in his *On the Nature of the Gods*, introduced the phrase *Suum cuique* (Latin) or as now commonly known: [4]

> “To each his own.”

Cicero, supposedly, again also uses this "to each his own" phrase in his 43BC *On the Laws* (*De Legibus*), only partially finished at the time of his assignation. [5]

Goethe, in scene 16 of *Faust*, seems to vicariously cite Cicero’s to each his own idiom, as to the gods, via the following dialogue: [7]

> Margaret: Promise me, Henry!—
>
> Faust: What I can!
>
> Margaret: How is't with thy religion, pray?
> Thou art a dear, good-hearted man,
> And yet, I think, dost not incline that way.
>
> Faust: Leave that, my child! Thou know'st my love is tender;

For love, my blood and life would I surrender,
And as for Faith and Church, I grant **to each his own**.

Margaret: That's not enough: we must believe thereon.

Faust: Must we?

(add)

Discovery

In 1345, Petrarch, after years of searching in monasteries and libraries, found a volume of the lost letters of Cicero. [1] Some have credited this with initiating the renaissance (compare: Poggio Bracciolini). Petrarch, supposedly, had a list of books, among with Cicero's *On the Nature of the Gods*, was one of his favorites.

Reaction end

In 43BC, Cicero, after getting on the wrong side of Augustus Caesar, was put to death (or assassinated).

Quotes | On

The following are quotes on Cicero:

> "**Cicero** provided the 'renaissance' with its prime methods of philosophical dialogue, and its fullest knowledge about the ancient philosophical schools."
>
> — Michel Montaigne (c.1580), *Publication* [12]

> "**Cicero**'s *Tusculan Disputations* (Q) and *On the Nature of the Gods* are the supreme manifestations of human wisdom, and of the two, the latter ranks higher.
>
> — Voltaire (c.1770) [12]

Quotes | By

The following are quotes by Cicero:

> "We must perpetuate religious belief, which is closely associated with the knowledge of nature, but we must likewise eradicate superstition root and branch."
>
> — Cicero (44BC), *On Divination* [12]

> "If you give way to superstition, it will forever haunt you. I you go to a prophet, or regard omens; if you sacrifice or observe the flight of birds; if you consult an astrologer or Haruspex; if it thunders or lightens, or any place is consumed with lightening, or such-like prodigy happens all the tranquility of the mind is destroyed. And sleep itself, which seems to be an asylum and refuge from all trouble and uneasiness, does by the aid of superstition increase your troubles and fears."
>
> — Cicero (44BC), *Concerning Divination* 2.72 [11]

"These writings are mere copies, produced with no heavy labor; I supply only the words, of which I have a rich store."

— Cicero (45BC)

"I myself tend to disapprove of the alleged practice of the Pythagoreans: the story goes that if hey were maintaining some position in an argument, and were asked why, they would reply: 'the master said so', the master being Pythagoras."

— Cicero (45BC), *On the Nature of the Gods* (§1, pgs. 6); see: appeal to authority

"When we engage in argument we must look to the weight of reason rather than authority. Indeed, students who are keen to learn often find the authority of those who claim to be teachers to be an obstacle, for they cease to apply their own judgment and regard as definitive the solution offered by the mentor of whom they approve."

— Cicero (45BC), *On the Nature of the Gods* (§1, pgs. 6); see: appeal to authority

"Britons are too stupid to make good slaves."

— Cicero (50BC), paraphrased attributed (Q)(Q)

"If no use is made of the labor of past ages, the world must remain always in the infancy of knowledge."

— Cicero (c.60BC) (Q)

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5. (c) Cicero (43 BC). *De Legibus* (I). Unfinished.
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(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (§:Cicero, pgs. 131-46). HarperOne.

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Further reading

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● Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (pg. xxvi). Oxford University Press, 1998.

External links

● Cicero – Wikipedia.
● Writings of Marcus Tullius Cicero – Wikipedia.

θΔics

In acronyms, **CIR** is short for “Creationist Idiocy Ranking”, rankings of which are found on the creationism scientists ranked by idiocy; e.g. Michael Behe (CIR:1), means that Michael Behe has the first ranked position among scientists who believe in the existence of god and who attempt to promote scientific sounding theories to argue for a god theory, in an era where 95 percent of the world’s leading scientists no longer believe in the existence of god.

θΔics

In humanities, **civilization** (TR:107) is []

Overview

The following, see: larger photo (O), shows the state of human civilization from 8,000BC to 500BC: [1]

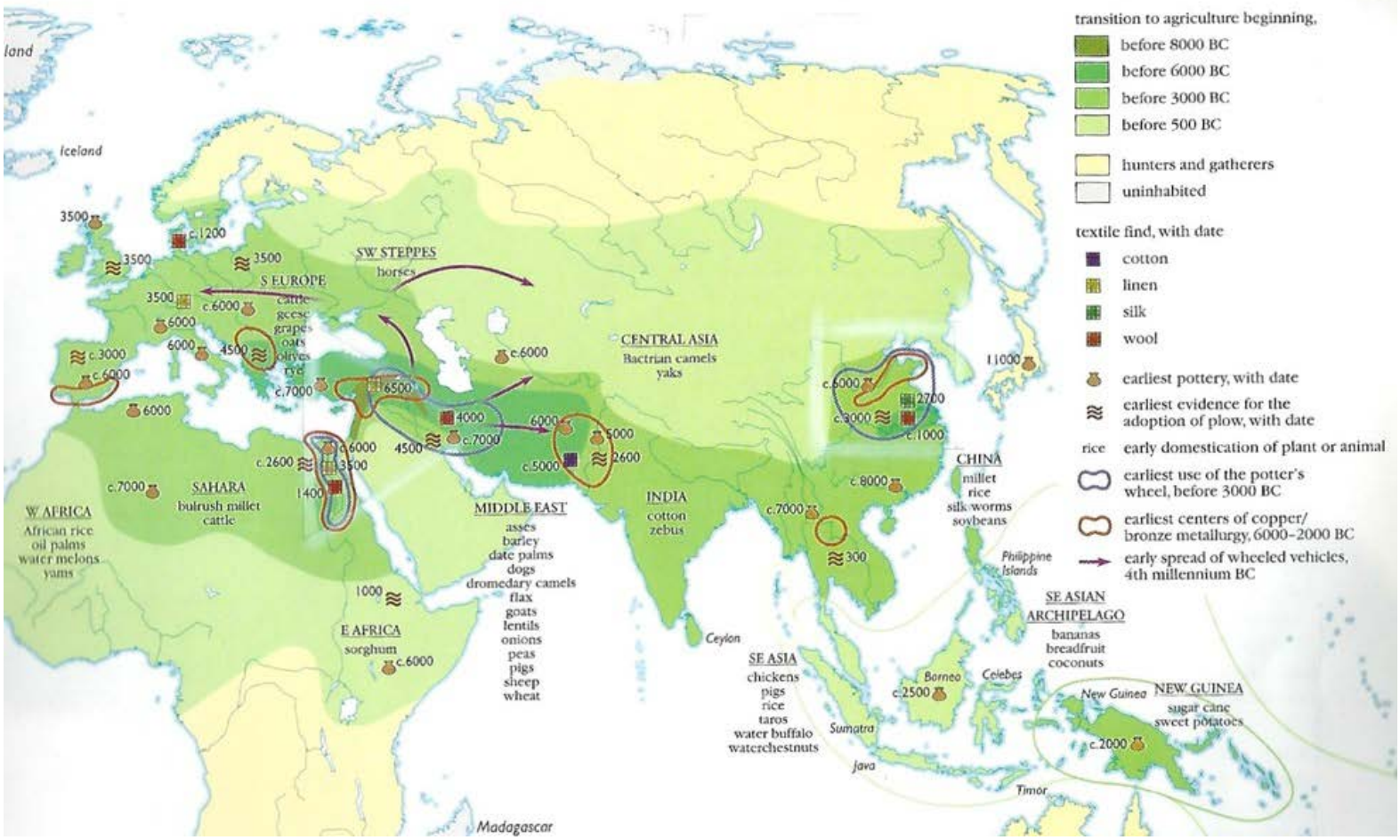

Here, we see that, following the rise of humans from ape-like ancestors (6.5 MYA) apes, from the East African Rift Valley (200,000 YA), that the three major civilizations to develop were the Egyptian civilization, around the Nile River, the so-called "fertile crescent" civilization, around the Tigris river, and the Chinese civilization, around the Yellow River.

See also

- Rise and fall of civilization

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External links

- Civilization – Wikipedia.

θΔics

In hmolscience, **Claes G. L. Johnson** (1943-) is a Swedish mathematician noted, in human thermodynamics, for his 2008 Leonhard Euler conceptualized new second law model that explains evolution in terms of emergence, or something along these lines.

Overview

In 2008, Johnson introduced a computational thermodynamics argument, co-written with his doctoral student Johan Hoffman, that the emergence of ordered life forms, such as humans, are explained not by classical thermodynamics, but by a "new second law", one not based on entropy, but derived via a "Euler equations", which are equations in fluid dynamics for inviscid flows, type of reformulation of the first law of thermodynamics. [1] To quote Johnson's dismal view of the classical version of the second law, as formulated by German physicist Rudolf Clausius and interpreted by Austrian physicist Ludwig Boltzmann, Johnson states: [2]

> "No doubt, it [second law] would seem to contradict the many observations of *emergence* of ordered non-organic structures (like crystals or waves and cyclones) and organic structures (like DNA and human beings), seemingly out of disordered chaos, as evidenced by the physics Nobel Laureate Robert Laughlin."

In replacement of the standard two laws of thermodynamics, Johnson suggests that they can be replaced by a by a *deterministic finite precision computation* or, more precisely, by a *least squares stabilized finite element method* for the Euler equations, which they refer to as the "Euler General Galerkin", a term symbolic of the fluid dynamics type mathematics of the Swiss mathematician Leonard Euler and Russian mathematician Boris Galerkin. In particular, they state. [3]

Emergence

On the oft-quoted postulate that the classical second law, according to Johnson, "is often described as a general tendency of heat to spread or temperature gradients to decrease in a steady march to a heat death with uniform temperature, or more generally a tendency in physical processes of decreasing differences with increasing time", he states that "this form the classical second law seems to contradict all forms of emergence of ordered structures in the form of crystals, waves and life, characterized by increasing difference."

Conversely, as Johnson argues here, "the new second law does not contradict emergence of ordered structures, only states that increasing difference and creating order cannot be done quickly." [4] Strangely enough, however, Johnson never goes beyond this statement in the extrapolation to human society, although he mentions traffic patterns, and economics to a certain verbal degree, but simply, instead, seems to refer the reader to American physicist Robert Laughlin's 2005 book *A Different Universe*, which argues for the theory of "emergence" as a replacement for atomic-molecular reductionism. [3]

Difficulties on theory

The general difficulty in the entire treatise is that it seems to be a general hodgepodge of unfounded derivations, grave mathematical typos, such as the use of *dT* verses *dU* in the first law of thermodynamics, misapplied substitutions of terms, such as *D*, dissipation, for *Q*, in the combined law of thermodynamics, and a weak attempt to give a Prigoginean-like solution to the theory of emergence, references to information theory, Maxwell's demon, as well as Loschmidt's paradox, amid a general slew of quotes as to how confusing the entropy concept is for many, particularly to mathematicians.

Education

Johnson completed a MS in engineering in 1969 and a PhD in mathematics in 1973, both at the Chalmers University of Technology, Gothenburg, Sweden, becoming a docent there in 1978. [5]

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θΔics

In genius studies, **claimed IQ** is an intelligence quotient that an existive person declares, proclaims, or self-gauges to possess in a given existence state (IQ state), whether accurate or not; the IQ one claims to have at a given time.

A few "**claimed IQs**" of members of the HighIQForum.com (Q), the avatar of the third member, Cornucopia (claimed IQ: 140+), being the "ouroboros" icon, aka representative of the origin of life puzzle, aka great problem of natural philosophy; which was solved by Libb Thims in 2009 (see: defunct theory of life).

Overview

Real geniuses who gauge their own IQ or intelligence level, in respect to other geniuses, accurately, are very rare.

Feigned geniuses, conversely, i.e. one's who over-inflate their self-gauged intellectual level, are as numerous as fool's gold is to real gold.

In 1946, with founding of Mensa, whose members claim to boast IQs of 132 or above, the phenomenon of high IQ societies began to emerge, filled with basically nobodies who "claim" to be geniuses. There are literally 100s to 1000s of individuals in this niche who claim genius IQs (140+) but are not geniuses, by any measure of the word.

Russell

In c.1925, Bertrand Russell, to cited a noted example, is said to have claimed his IQ was 180 and or that his mind was that of a Nietzsche uberman. [1] This is an example of a real IQ self-estimation, per reason that this is how his IQ, a century or so in retrospect, is now ranked, e.g. (IQ:180|#103) (RGM:113|1,260+).

King

In 1950, Martin King (1929-1968), a child prodigy of sorts who entered Morehouse College in his teens (age 15), at age 21, in an essay for a course on religious development of the personality, taught by George W. Davis, stated the following: [3]

> "I have always been somewhat precocious, both physical and mentally. **My IQ stands somewhat above the average**. So, it seems that from a hereditary point of view, nature was very kind to me."

Davis, graded the essay "excellent", and wrote the following comment in the margins:

> "Good! I like a man who has an intelligent evaluation of his abilities."

In six+ decade retrospect, we find King (IQ:140|#493) [RGM:68|1,260+] in greatest minds rankings and a generally considered genius (Q).

Feigned IQs

In 2001, Christopher Langan, to cite an infamous example, in video interview, claimed his IQ was "between 190 and 210" and that he is "closer to absolute truth than any man who has come before". This is an example of a feigned IQ self-estimation.

HighIQForum

In 2013, the domain HighIQForum.com was registered; forum members who join this site, are given the option of setting their "claimed IQ" (max setting of 150), per various IQ certification (Q) methods; site member SolemnDream

(Sep 2015) posted the following (Q) about claimed IQs:

> "When I first joined this board, it asked me if I wanted to set a **claimed IQ**. I set mine, not turning down the chance to get some attention. (I'm an extremely honest man, and I'm sure any lonely idealists out there would understand.) I set mine to 150+. If there was a 160 mark, I would have set that. But why? **What justifies a high self-claimed IQ?** Well, I don't know why you guys did it. And I want to know what you guys think. But for me, it was several things.
>
> One, there are multiple IQ standards, and any score is in a nice, big grey area. What counts as an IQ of 140 on one standard would count as an IQ of 160 in another. You didn't have "160" listed, so I did whatever I felt. I mean, I don't have an absolute. How am I supposed to know what I should be doing? Not to mention that all IQ tests have a high margin of error, especially for the ones that require a tenth or hundredth of a percentile or worse so you can join the closed IQ communities elsewhere on the net. Two, IQ isn't an absolute. Everyone's IQ changes constantly, because IQ is based on the overall population's intelligence—something that differs by trend and culture. Depending on the IQ standard being used, if you are smarter than 1 out of 10,000 people, you can have an IQ of 160. And that's what I went by. I've lived closely with a much larger number of people in my life than most people live closely with their entire lives; and having been communicating with and hearing from such a large group, I feel like I can estimate how many people I am smarter than.
>
> However, there are always people I feel stupid around. I mean, if you end up reading around about any of the posts I wrote or will write about problem-solving, weighing of fiction and tropes, analysis of dreams, and a lot of other things... well, you'll see I'm pretty gifted. But there's always people who are better linguists, scientists, or mathematicians than I am-- even people that I think might be less biased when they argue than I am. People like TrueSpock are so awesome that they make me feel anxious that people won't accept my intellect (and I am always dealing with self-worth issues). I mean, I never claimed to be incredibly verbose, or good at chess. I just claimed to be very passionate, creative, analytical, a very good problem-solver, and have an exceptional moral compass (self-centered and jerkish way of communicating aside). When it all comes down to it, I'm judging my IQ by the number and complexity of problems that I am able to solve in comparison to the rest of the world-- or by the variety, subtlety, and value of details that I am able to notice, comprehend, and analyze in comparison to the rest of the world. And isn't that what intelligence is made of? But what do you guys think? I mean, what verifies your high IQ to you? Do any of you ever worry that people won't accept your claims, maybe because you don't fit a stereotype? Any other thoughts?"

(add)

Other

In 2014, Inderjit Singh, aged 18, devised, using a three part Buzan IQ methodology, a "real IQ" calculation formula, of his own device, from which he claimed (version 6) to have calculated his his own IQ was 160. [1] On 17 May 2016, Singh edited his IQ to 165; and then for months later, on 29 Sep 2016, edited his IQ to 170 per reason: "I suppose my IQ is at 170 now, though the climb to 185 or 185 will be significantly slower than the explosive progress of the past few years". On 31 May 2017, Singh attempted to change his existive Hmolpedia IQ to 175 with comment "quickly editing my own page for better clarity".

Keys

In IQ keys, the abbreviation IQ_{CE} or IQ_{CE} is short for claimed IQ of existive person.

Quotes

The following are related quotes:

> “I have always been somewhat precocious, both physical and mentally. My IQ stands somewhat above the average. So it seems that from a hereditary point of view, nature was very kind to me.”
>
> — Martin King (1950), “An Autobiography of Religious Development” [1]

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External links

- Why do a lot of people on the Internet claim to have IQs of 140? (O) (2016) – Quora.

θΔics

In existographies, **Clarence Birdseye** (1886-1956) was an American taxidermist and entomologist noted for the idea behind fast freezing of foods.

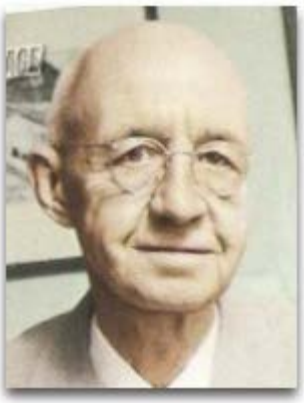

Overview

In 1912, Birdseye went to Labrador, Canada, on a mission for a US Biological Survey, during which time he was taught by the Inuit how to ice fish, under very thick ice, in -40°C weather, during which time he noticed that a fish would almost instantly stiffen when brought into the cold air, and also that if the fish was thrown back into the water within a short time it would presently gain a "semblance of life". [1] Birdseye, from this observation, noted that the frozen fish of Labrador, as compared to the frozen fish of New York, tasted fresher, per reason of fast freezing, and (b) that vegetables fast frozen would likewise taste fresher.

The reason fast freezing works, as is now known, is that that slow freezing introduces ice crystal formation into the tissue of animals and plants, which ruptures the membranes, yielding a mushy taste upon reheating.

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External links

â— Clarence Birdseye – Wikipedia.

θΔics

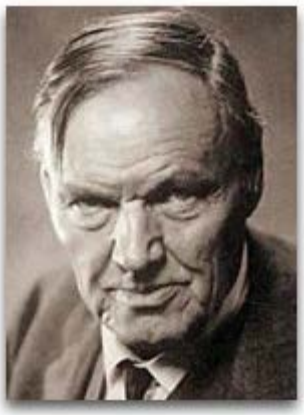

In existographies, **Clarence Darrow** (1857-1938) (IQ:145|#659) (CR:13) was an American lawyer noted for his 1925 defense, in collaboration with journalist Henry Mencken, of American biology teacher John Scopes, in the Scopes Monkey Trial, who was fined and jailed for teaching evolution to high school students. [1]

Religion | Atheism

Darrow was the son of Amirus Darrow, an open atheist, known throughout Kinsman, Ohio as the "village infidel".

Bryan | Bryan College

Darrow's aim was to either get the judge to overturn the law as unconstitutional or have the jury declare John Scopes guilty of breaking the law, so that he could get the decision overturned. The latter option followed, Scopes was found guilty and fined $100 dollars, after which Darrow got the case overturned the following year by the Tennessee Supreme Court, which commented that:

> "Nothing was to be gained by prolonging the life of this bizarre case."

Scopes prosecutor was William Bryan (1860-1925), who—like Ken Ham, head of the Creation Museum, to give a modern example—was taught by his father that the Bible was the absolute arbiter of truth, and the only basis on which a decent society could function. Although, technically, Bryan won the case, the humiliation he had been suffered to publicly endure for his fundamentalist views, caused him to die (dereact) five days after the trail. Journalist Henry Mencken reportedly boasted to Darrow: "we killed the bastard", after Bryan was savaged as a witness by Darrow. [2]

The school superintendent Walter White proposed that Dayton should create a Christian college as a lasting memorial to Bryan; fund raising was successful and Bryan College opened in 1930.

In 2014, the so-called "Bryan way", i.e. strong evangelicalism, amid declining Christian values nationally, spurred Bryan College into changing its original 1930 belief statement clause "the origin of man was by fiat of God", which professors have to sign as part of their employment contract, to: (Ñº)

> "Adam and Eve are historical persons created by god in a special formative act, and not from previously existing life-forms."

which caused several teachers to leave, and 100s of students to protest.

Quotes | On

The following are quotes on Darrow:

> "With the death of **Clarence Darrow** in 1938, American public life lost the last well-known secularist crusader who stood squarely in the enlightenment freethought tradition of Thomas Paine and Robert Ingersoll."
>
> — Susan Jacoby (2004), *Freethinkers: a History of American Secularism* [6]

Quotes | By

The following are noted quotes:

“Nature is strong and she is pitiless. We are her victims. Each act, criminal or otherwise, follows a cause; give the same conditions, the same result will follow forever and ever.”

— Clarence Darrow (1924), “Closing Argument”, said to jury in Leopold and Loeb trial [4]

“If today you can take a thing like evolution and make it a crime to teach it in the public school, tomorrow you can make it a crime to teach it in the private schools, and the next year you can make it a crime to teach it to the hustings or in the church. At the next session you may ban books and the newspapers. Soon you may set Catholic against Protestant and Protestant against Protestant, and try to foist your own religion upon the minds of men. If you can do one you can do the other. Ignorance and fanaticism is ever busy and needs feeding. Always it is feeding and gloating for more. Today it is the public school teachers, tomorrow the private. The next day the preachers and the lectures, the magazines, the books, the newspapers. After a while, your honor, it is the setting of man against man and creed against creed until with flying banners and beating drums we are marching backward to the glorious ages of the sixteenth century when bigots lighted fagots to burn the men who dared to bring any intelligence and enlightenment and culture to the human mind.”

— Clarence Darrow (1925), Court room argument at Scopes Trial, Dayton, Tennessee, Jul 13 (Ñº) (vid at 37:17)

“Do you, good people, believe that Adam and Eve were created in the Garden of Eden and that they were forbidden to eat from the tree of knowledge? I do. The church has always been afraid of that tree. It still is afraid of knowledge. Some of you say religion makes people happy. So does laughing gas. So does whiskey. I believe in the brain of man.”

— Clarence Darrow (c.1925)

“I didn’t choose to be born, and if I’d been given the option, I’d have asked to been let off.”

— Clarence Darrow (c.1925), Scopes Monkey Trial documentary (18:25-18:44)

“Chase after truth like all hell and you’ll free yourself, even though you never touch its coattails.”

— Clarence Darrow (c.1925) (Ñº)

“I am agnostic as to the question of god. Since man ceased to worship openly an anthropomorphic god and talked vaguely and not intelligently about ‘some force’ in the universe, higher than man (see: higher force; higher power), that is responsible for the existence of man and the universe, he cannot be said to believe in god. One cannot believe in a force excepting as a force that pervades matter and is not an individual entity.”

— Clarence Darrow (1929), “Why I Am Agnostic” [3]

“The number of people on the borderline of insanity in a big country is simply appalling, and these seem especially addicted to believing themselves, saviors, and prophets. It only takes a slight stimulus to throw them entirely off their balance.”

— Clarence Darrow (1932), *The Story of My Life* [5]

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External links

â— Clarence Darrow – Wikipedia.

θΔics

In thermodynamics history, **classical thermodynamics** is a loose synonym for thermodynamics developed before atomic structure had been discerned, beginning in the 1890s; although, to note, there does seem to be some discrepancy of opinion as to what year marks the end of the classical period. To a good approximation, classical thermodynamics is likely represented by German physicist Rudolf Clausius 1875 ten fundamental equations. The term classical thermodynamics, as it is often used, is said to be independent of atomic and molecular models. [1] The term itself, is rather ill-defined; often used as a crutch for a lack of a direct reference.

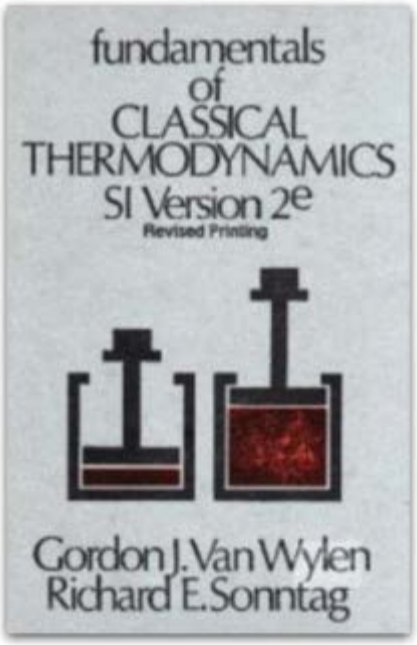

Gordon van Wylen's 1959 *Fundamentals of Classical Thermodynamics*, having gone through three editions (1985). [7]

Overview

The term *classical thermodynamics* seems to have an elusive coinage history. According to one account, it was German physicist Georg Helm who wrote the first section devoted to a discussion on the use of the term 'classical'. [10] Specifically, in his 1898 *Historical Development of Energetics*, Helm was said to have included a section on "Classical Thermodynamics", arguing to the effect that thermodynamics had reached such a well-established state that "it can certainly be called 'classical'", hence the name classical thermodynamics. Helm, supposedly, comments, however, that the label 'classical' had first been used not by him but by those who opposed all efforts to develop thermodynamics further. [11]

Yet, according to the 1905 views of American physicist Edgar Buckingham, the term 'classical thermodynamics' had been introduced by French physicist Pierre Duhem, a noted student of German physical chemist and energetics founder Wilhelm Ostwald. In Buckingham's own words: [6]

> "Aside from these three difficulties [(a) the definition of temperature; (b) the definition of quantity of heat; and (c) the statement of the theorem of Clausius for irreversible processes], the rest of **'classical thermodynamics'**, as Pierre Duhem has named it, seems to be a fairly logical and satisfactory whole."

American physicist Paul Epstein, in his 1937 *Textbook of Thermodynamics*, states that "the writings of the classical period culminated in German physicist Max Planck's 'Lectures on Thermodynamics'." [8] Epstein, however, does not specify which lectures of Planck to which he refers. It is probable that he referring to Planck's famous series of eight lectures delivered at Columbia University in 1909, most of which were on thermodynamics. [9]

Most-notably, in a general sense, the phrase "classical thermodynamics" seems to have drifted into lay science folklore in the following *circa* 1940s quote by German-born American physicist Albert Einstein: [2]

> "A theory is the more impressive the greater the simplicity of its premises, the more different kinds of things it relates, and the more extended its area of applicability. Therefore the deep impression that **classical thermodynamics** made upon me. It is the only physical theory of universal content which I am convinced will never be overthrown, within the framework of applicability of its basic concepts."

In the years to follow, and specifically in the 1950s, a number of books and textbooks began to appear with this title, a trend that continued into the 1970s. [3] The term "classical thermodynamics", as used by Einstein, as judged by his first 30 published scientific papers (85% of which were in thermodynamics), would seem to refer generally to the thermodynamic publications of German physicist Rudolf Clausius, and those surrounding or connected to his work. [4]

In the 1957 publication *Elements of Classical Thermodynamics*, British physicist Brian Pippard defined classical thermodynamics as "the method of approach that takes no account of the atomic constitution of matter [and] makes no attempt to provide a mechanistic explanation of why a given substance has the properties observed experimentally." [5]

This would generally date classical thermodynamics to the publication up until the year 1889 or the years before the thermodynamic publications of German physicist Max Planck and his theory of energy quanta in black bodies.

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External links

â— Classical thermodynamics – Wikipedia.

θΔics

In existographies, **Claude Bernard** (1813-1878) (IQ:160|#501) (Murray 4000:12|B) (CR:24) was a French physiologist, the "founder" of general physiology (Henderson, 1927), noted for his views on relation of chemistry, heat, and life; commonly known for his "homeostasis" theory, namely that the hypothesis that "stability of the internal environment [the *milieu intérieur*] is the condition for the free and independent life". [7]

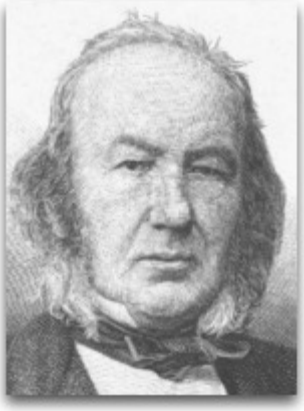

Overview

In circa 1870s, Bernard produced some ripe defunct theory of life like stylized physiology works; some representative quotes are as follows:

> "We must not read into [living organisms] either a chemical retort or a soul: we must read into them what there is."
>
> — Claude Bernard (c.1870) [2]

> "The metaphysical evolutive force by which we may characterize life is useless in science, because, existing apart from physical forces, it can exercise no influence upon them."
>
> — Claude Bernard (1878), *Experimental Science* [5]

On the subject of 'life', Bernard, according to American science historian Everett Mendelsohn (1964), gives discussions of how the term 'life' is nothing but a word which means ignorance, but a term nevertheless closely associated with heat. [1]

French writer Emile Zola, in his literature chemistry essay "The Experimental Novel" (1880), stated that his great source of inspiration as a novelist was Bernard, owing to his study of the chemistry of the body.

Henderson

Bernard's work on equilibrium physiology in the animal body, particularly his view that biology could profit from the application of the rigorous methods of physics and chemistry, and its later exegesis by Walter Cannon, at Harvard, became one of the two backbone theories, along side that of Willard Gibbs, employed by Lawrence Henderson. [3]

Quotes | On

The following are notes of praise or tribute:

> "**Claude Bernard**—the successor to von Baer and Bichat—is a great man, whose purely mechanistic researches stand at the foundation of many departments of physiology."
>
> — Lawrence Henderson (1917), *The Order of Nature* [4]

> "Science was seen by **Claude Bernard** with clear but prophetic vision, for he lived almost a half-century before his time. He perceived that physiology rests securely upon the physico-chemical sciences, because all that these sciences bring to light is true of organic as of inorganic phenomena. Also there is nothing but the difficulty of the task to hinder the reduction of physiological processes to physical and chemical phenomena."
>
> — Lawrence Henderson (1927), "The Process of Scientific Discovery" [7]

> "If Pareto had truly joined the social sciences to the natural sciences, an achievement Henderson very much wanted to see, it is only to be expected that he would put Pareto in the great company of Gibbs, **Bernard**, and even Newton."
>
> — Bernard Barber (1970), *L.J. Henderson on the Social System* [6]

Quotes | By

The following are quotes by Bernard:

> "It is what we know already that often prevents us from learning."
>
> — Claude Bernard (c.1870)

> "Man can learn nothing except by going from the known to the unknown."
>
> — Claude Bernard (c.1870)

> "Observation is a passive science, experimentation an active science."
>
> — Claude Bernard (c.1870)

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External links

â— Claude Bernard – Wikipedia.

θΔics

In existographies, **Claude Berthollet** (1748-1822) (IQ:#|#) (Cattell 1000:669) (Murray 4000:13|C) (GCE:11) (DN:7) (CR:56) was a French chemist noted for his *circa* 1800 studies on chemical affinity, the laws of affinity, and in particular his objection to the original notion of "elective affinity", in that there may the splitting of affinities. [1] He was one of the mental references used by German polymath Johann Goethe in the scripting of his novella *Elective Affinities*. [4]

Egyptian expedition | Affinity partitions

See main: Berthollet's affinity theory

In 1798, Berthollet accompanied Napoleon's military expedition to Egypt, during which time his observations of the Natron Lakes, led to new insights about affinity theory. (Ñº) (Ñº)

In his 1799 paper "Research on the Laws of Affinity", Berthollet summarized his issues with the theory of elective affinity as follows: [2]

> "The very term *elective affinity* must lead into error, as it supposes the union of the whole of one substance with another, in preference to a third; whereas there is only a partition of action, which is itself subordinate to other chemical circumstances … care must be taken not to consider this affinity as a uniform force which produces compositions and decompositions … Such a conclusion would lead us to neglect all the modifications which it undergoes form the commencement of action to the term of equilibrium."

(add)

Goethe | Elective Affinities

As to the theoretical basis of German polymath Johann Goethe's 1809 novella *Elective Affinities*, German historian Jeremy Adler notes that aside from the logic of the 1775 textbook of Swedish chemist Torbern Bergman, which formed the bulk of Goethe's theories of human elective affinity reactions, Goethe also mentioned Berthollet in connection with his studies on affinity. [4]

In the novella, according to Adler, Goethe subtly acknowledges his lack of understanding of the new theories of Berthollet in the famous chapter four, when the Captain and Eduard are discussing the theory of affinity, we are told that the Captain will explain affinity as "I [he] learned from reading about it some ten years ago".

Taken literally, according to Adler, this would date the Captain's knowledge to the time just before Berthollet's main findings appeared, i.e. to the years around 1799. "Whether it still fits the newer doctrines", the Captain adds, "I am unable to say." This proviso signals a divergence between the Captain's knowledge and the narrator's awareness that newer theories had begun to appear. Moreover, in a 26 September 1826 letter, Goethe commented that: [4]

> "For decades [I have been struggling] with **Berthollet** in the matter of the affinities."

(add discussion)

Students

Berthollet, on a friend's recommendation hired a young French chemist Joseph Gay-Lussac, the eponym of Gay-Lussac's law (P = kT, at constant volume), one of the gas laws, to work as his assistant in his laboratory. Upon his retirement, Gay-Lussac was appointed to his position at the Ecole Polytechnique. [5]

See also

â— Marcellin Berthelot (1827-1907) – a French chemist, with a similar last name, who also did work on affinity.

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External links

â— Claude Louis Berthollet – Wikipedia.

θΔics

In existographies, **Claude Lévi-Strauss** (1908-2009) (CR:24) was a French anthropologist noted, in anthropological thermodynamics, for having, in his 1955 *Tristes tropiques (Sad Tropics)*, coined the terms entropology and entropologist, and for his 1959 theories on the energetic and entropic nature of "hot" (primitive cultures) and "cold" (modern cultures) societies. [1]

Overview

The following is a popular, albeit rather riddled, quote by Levi-Strauss: [4]

> "Cultures are societies which produce little disorder – what doctors call 'entropy' – and tend to remain indefinitely as they originally were: which is why they look to us like societies that lack both history and progress. Whereas our societies, those corresponding to modern civilizations, are powered by a difference of electrical pressure, as it were, expressed in various forms of social hierarchy. Such societies have managed to establish within them a social imbalance which they use to produce both much greater order – we have societies that work like machines – and much greater disorder, much less entropy, in relations between people."

Of interest here is Strauss' discussion of the production of entropy in relations between people, which is a very rare gem of insight, being that this is the sense in which entropy was originally defined by Rudolf Clausius, loosely being associated with the 'work the molecules of the system do on each other', which translates as the work people in societies do on each other in the context of daily relationships and interactions.

Influence

Lévi-Strauss was said to have read the cybernetics theories of American mathematician Norbert Wiener, which is likely from where he culled his entropy theories. [2] From Wiener, Lévi-Strauss is said to have developed his theories of cultural "transformation". [3]

Quotes | On

The following are quotes on Levi-Strauss:

> "The study of human experience glitters with imaginative and insightful approaches—Marxist modes of production, **Levi-Straussian** structures, Weberian verstehen, the Batesonian mind, and many others, all of which share one characteristic: they pertain to no common universe; most are untranslatable one to another."
>
> — Richard Adams (1988), *The Eight Day* (pg. xiv)

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(c) Claude Levi-Strauss, pgs. 3, 16-17). Penguin Press.
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External links

- Claude Lévi-Strauss – Wikipedia.
- Tristes Tropiques – Wikipedia.
- Claude Lévi-Strauss - NNDB

θΔics

In existographies, **Claude Shannon** (1916-2001) (IQ:175|#212) [CR:180] was an American electrical engineer and mathematician noted for his 1948 article “A Mathematical Theory of Communication”, in which he situated a new type of logarithmic-based, communication information transmission measure that, on the spurious suggestion of his associate John Neumann, he called "entropy" (borrowed from statistical mechanics; specifically Ludwig Boltzmann's H-function), to which he assigned the symbol *H* (same as Boltzmann's H), a type of telegraphy signal transmission measurement, *completely* unrelated to thermodynamics (except in the sense of being a mathematical isomorphism), which Shannon described as a measure of “information, choice and uncertainty”. In effect, Shannon, for no apparent discernible reason (except possibly theory promotion), convoluted two unrelated subjects, i.e. the general theory of heat engines and the general theory of information transmission and reception, together. The backlash was such that by 1955 Shannon had to put forward the following clarifying defense of his action: [4]

> “Workers in other fields should realize that the basic results of the subject [communication channels] are aimed in a very specific direction, a direction that is not necessarily relevant to such fields as psychology, economics, and other social sciences.”

Very few people in the decades to follow, however, ever received this memo, the result of which is that many people in modern times actually believe that Shannon's information theory is rooted in thermodynamics, in the sense that his so-called "Shannon entropy" (a measure of Hi's and Lo's in information transmissions) is exactly the same as "Boltzmann entropy" (a particle velocity/position interpretation of "Clausius entropy"), which is incorrect.

Genius rankings

As a boy, he rigged a telegraph machine to the barbed wired fence that ran along his country road, so that he could talk to his friend ½-mile away *via* Morse code; his 1937 (age 22) master’s thesis, which single-handedly founded the digital age, via applying Boolean algebra (0,1 number logic) to telecommunication signals and computer circuitry (switches and relays), has been described as "possibly the most important, and also the most famous, master's thesis of the century" (Howard Gardner); quote: “apparently, Shannon is a genius” (Vannevar Bush, 1939) [16]; in 1948, he founded information theory; he described John Neumann, as the ‘smartest person he had ever met’, above that of Einstein's (IQ=220) whom he occasionally bumped into at the Institute for Advanced Study, Princeton, where the three of them worked in 1940 to 1941; quote: “I think [Norbert Wiener] (see: *Ex-Prodigy: My Childhood and Youth*, 1953) had a great brilliance. I’m not putting down his great mind. I think he really did have a tremendous IQ and a tremendous grasp of many things” (Shannon, 1982). [17] quote: "There were many at Bell Labs and MIT who compared Shannon's insight to Einstein's. Others found the comparison unfair—*unfair* to Shannon"; quote: "Shannon's genius was like Leonardo's (IQ=205), skipping restlessly from one project to another, leaving few unfinished"; friends rated John L. Kelly, Jr., a gun collector who predicted football results by computer, as the “second smartest man at Bell Labs—next to Shannon himself.” [16]

The Bandwagon

> *See main: Shannon bandwagon*

In 1956, Shannon penned a now-infamous editorial memo article “The Bandwagon” wherein he makes a plea to everyone to stop using his new so-called information entropy theory outside of communications engineering proper. [10] Reaction bandwagon stylized articles to this bandwagon editorial article followed in the aftermath, including one from Norbert Wiener entitled "What is Information Theory?". [13] In 1958, American electrical engineer Peter Elias (1923-2001) published "Two Famous Papers" a parody of Shannon's bandwagon. [12] See the 2001 MIT Project History article “Information Theory and the Digital Age” for an inside look at the early bandwagon years. [11]

Thermodynamics

A huge misconception in the mind of many modern scientists is the view that Shannon's information theory is based on or derived from thermodynamics. This could not be farther from the truth. The truth behind the myth was that sometime in the 1940s, while Shannon was developing his theory, he happen to visit Hungarian chemical engineer John Neumann, a close friend to Leo Szilard, who previously had published a 1929 article on Maxwell's demon, containing a calculation of the entropy generated during the information collection and storage processing of the demon's mind. Owing to this influence, Neumann suggested, humorously, to calls voltage and current type information (highs and lows in telephone wires) by the name entropy. On this suggestion, in his 1948 paper, Shannon infamously states, in a subtle, yet very influential, way that seemed to connect his work to thermodynamics, that:

> "The form of H will be recognized as that of entropy as defined in statistical mechanics."

Then, after explaining his formulation of H as a function of a set of probabilities involved in the transmission of information (line currents), he concludes, in reference to Austrian physicist Ludwig Boltzmann's famous 1882 paper *Further Studies on the Thermal Equilibrium of Gas Molecules*, "H is then ... the H of Boltzmann's famous H theorem." [1] Boltzmann's H theorem, of course, was a statistical formulation of Clausius entropy (1865), for an ideal gas system. In short, what Shannon did, for whatever motive, was convolute telegraph theory together with heat engine theory as though it were the same subject matter, via a very crude unsubstantiated (verbalized) derivation. In 1961, to cite one opinion on this matter, French mathematician Benoit Mandelbrot commented that: [4]

> "Everyone knows that **Shannon's** derivation is in error."

One of the greatest misconceptions in modern science, perpetuated most likely from the fragmenting and relative isolation of the various modern branches of science, is the view that Shannon was a great thermodynamicist. This is a hugely erroneous myth. Shannon was an electrical engineer who studied the transmission and coding of voltage and electrical currents in telephone wires, no more no less. Shannon never had any formal education or training in thermodynamics and his work had nothing to do with thermodynamics. Yet, for reasons which require further discussion, in online polls as to who is the greatest thermodynamicist of all-time?, Shannon's name pops up, which is a puzzling phenomenon. [6]

Questionable applications

After hearing of Mandelbrot's 1961 criticism, Shannon continued to express "misgivings about using his definition of entropy for applications beyond communication channels." [3] In any event, Shannon's warnings didn't help and in the decades to follow his euphemistic verbalized derivation of his communication theory H function in relation to Boltzmann's statistical thermodynamic H function soon led hundreds of individuals (examples: James Coleman (1964), Stephen Coleman (1975), Orrin Klapp (1978), Jay Teachman (1980), Kenneth Bailey (1990), etc.) to write theoretical papers and books on connections between communication, information, entropy, and thermodynamics; all of which, of course, being unsubstantiated. Shannon's formulation has come to be known as information entropy, Shannon entropy, information theoretic entropy, among others.

Tribus

To cite one dominant example of the influence of Shannon's thermodynamics-borrowed terminology, in 1948 American engineer Myron Tribus was asked during his examination for his doctoral degree, at UCLA, to explain the connection between Shannon entropy and Clausius entropy. In retrospect, in 1998, Tribus commented that he went on to spend ten-years on this issue: [3]

> "Neither I nor my committee knew the answer. I was not at all satisfied with the answer I gave. That was in 1948 and I continued to fret about it for the next ten years. I read everything I could find that promised to explain the connection between the entropy of Clausius and the entropy of **Shannon**. I got nowhere. I felt in my bones there had to be a connection; I couldn't see it."

Information entropy

See main: Information entropy, Shannon entropy, etc.

Shannon's revolutionary idea of digital representation was to sample the information source at an appropriate rate, and convert the samples to a bit stream. He characterized the source by a single number, the entropy, adapting a term from statistical mechanics, to quantify the information content of the source. For English language text, Shannon viewed entropy as a statistical parameter that measured how much information is produced on the average by each letter. [2] The equation for H that Shannon defines as entropy is:

$$H = -K \sum_{i=1}^{n} p_i \log p_i$$

in which *H* is a measure of "information, choice and uncertainty", the constant *K* is a variable that "merely amounts to a unit of measurement", and $p_1, ..., p_n$ are a "set of probabilities." Through this equation, dozens of writers have, unknowingly, jumped from verbal descriptions of all varieties of information, e.g. genetic, computer, knowledge, etc., to mixtures of Boltzmann-Clausius statements of the second law of thermodynamics, in attempts to explain enumerable aspects of life and evolution, among other subjects.

Difficulties on theory

The essential difficulty of Shannon's idea of entropy is that it's terminology is a verbal-crossover theory, culled from statistical thermodynamics, but having little connection, if any at all, to thermodynamics. This has lead countless writers, having little training in thermodynamics, to proffer up some of the most illogical backwardly reasoned papers every written, however novel the intentions. These papers, from a thermodynamic point of view, become an almost strain on the mind to read. The 2007 views of German physicist Ingo Müller summarizes the matter near to a tee: [3]

> "No doubt Shannon and von Neumann thought that this was a funny joke, but it is not, it merely exposes Shannon and von Neumann as intellectual snobs. Indeed, it may sound philistine, but a scientist *must* be clear, as clear as he can be, and avoid wanton obfuscation at all cost. And if von Neumann had a problem with entropy, he had no right to compound that problem for others, students and teachers alike, by suggesting that entropy had anything to do with information."

Müller clarifies that "for level-headed physicists, entropy (or order and disorder) is nothing by itself. It has to be seen and discussed in conjunction with temperature and heat, and energy and work. And, if there is to be an extrapolation of entropy to a foreign field, it must be accompanied by the appropriate extrapolations of temperature, heat, and work."

OMNI interview

In a 1987 interview, by Anthony Liversidge of *Omni* magazine, Shannon was asked several decisive questions, a few telling Q&A responses are shown below: [8]

> OMNI: Before you wrote your classic paper on *The Mathematical Theory of Communication*, Norbert Wiener went around the office at Bell Labs announcing 'information is entropy'. Did that remark provoke you in any way to come up with information theory?
>
> Shannon: No, I hadn't even heard of that remark when I started my work. I don't think Wiener had much to do with information theory. He wasn't a big influence on my ideas there, though I once took a course from him.

OMNI: Do you agree with Norbert Wiener, who is reported to have denied any basic distinction between life and non-life, man and machine?

Shannon: That's a loaded question! Let me say this. I am an atheist to begin with. I believe in evolution theory and that we are basically machines, but a very complex type.

OMNI: Does your theory give a hint of how life might have evolved, seemingly in the face of the second law of thermodynamics, which says that order should slowly disintegrate?

Shannon: The evolution of the universe is certainly a puzzling thing to me as well as to everybody else. It's fantastic we've ever come to the level of organization we have, starting from a big bang. Nonetheless, I believe in the big bang.

(add)

Education

Shannon completed a BS in electrical engineering and a BS in mathematics at the University of Michigan in 1936. Shannon completed a MS in 1937, with a thesis "A Symbolic Analysis of Relay and Switching Circuits", wherein he showed how the mathematics of British mathematician George Boole, which deals with such concepts as "if X or Y happens but not Z, the Q results", could represent the workings of switches and relays in electronic circuits. Circuit design could now thus be treated mathematically and Shannon's master's thesis, written at the age of 22, came to be heralded as "possibly the most important master's thesis in the century." [9]

Shannon then completed his PhD in 1940, under the direction of Vannevar Bush, with a dissertation "An Algebra for Theoretical Genetics" at the Massachusetts Institute of Technology, in which he tried to do for genetics what he had done for electronic circuits, but, according to according to physical economics historian Philip Mirowski, the attempt was premature. [15] It may be that this is from where Lila Gatlin gleaned her misaligned inspiration to apply information theory to DNA transcription and gene expression, but his is only a conjecture.

In 1940, Shannon became a National Research Fellow at the Institute for Advanced Study in Princeton, New Jersey, staying there for one year, during which time the famous Neumann-Shannon anecdote occurred. [14]

In 1941, Shannon joined Bell Labs, remaining affiliated with this group, university appointments aside, until 1972.

Quotes | On

The following are quotes on Shannon:

> "Apparently, **Shannon** is a genius."
>
> — Vannevar Bush (1939), written comment

> "**Shannon** is the most important genius you've never heard of, a man whose intellect was on par with Albert Einstein and Isaac Newton."
>
> — Jimmy Soni (2017), "10,000 Hours With Claude Shannon" (Ñº)

Quotes | By

The following are quotes by Shannon:

"Neumann is the smartest person I have ever met."

— Claude Shannon (c.1941)

"I think Wiener had a great brilliance. I'm not putting down his great mind. I think he really did have a **tremendous IQ** and a tremendous grasp of many things."

— Claude Shannon (1982)

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Further reading

â— Shannon, Claude E. (1950). "Prediction and Entropy of Printed English", Bell Sys. Tech. J (3) p. 50-64.

External links

â— Claude Shannon – Wikipedia.

θΔics

In hmolscience, **Claudia Rotondi** (c.1969-) is an Italian political economist noted, in economic thermodynamics, for her 2001 chapter "Competition and Economic Temperature: the Entropy Law in Emanuele Sella's Work" in which she revives the near-forgotten 1910 work on economic temperature and economic entropy of Italian economist Emanuele Sella. [1] Her PhD was on the economics theories of Maffeo Pantaleoni, Vilfredo Pareto, and Sella.

Education

Rotondi completed a degree in political science at the Catholic University of Milan in 1991 with a thesis on "The Problem of European Economic Integration in the Thought of Francesco Vito"; and completed a PhD in the history of economic thought at the University of Florence in 1995 with a thesis on "Theory of competitive companies in the thought of Maffeo Pantaleoni, Vilfredo Pareto, and Emanuele Sella." Rotondi currently is an economics professor at the University of Cattolica de Sacro Cuore di Milano. [2]

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2. Claudia Rotondi (profile) - University of Cattolica (cached page).

θΔics

In human chemistry, **Claus Bock** (1926-2008) was a German scholar, who read Nietzsche for pleasure (Q), noted his his 1960s mentoring of Jeremy Adler in his historical on the chemistry background of the theory behind Goethe's *Elective Affinities.*

Overview

In the 1960s, Bock doctoral adviser to Jeremy Adler and suggested decisively to him that he do his PhD dissertation on the chemistry theory (see: Goethe's human chemistry) used by German polymath Johann Goethe in the scripting of his 1809 novella *Elective Affinities*, the founding book of the science of human chemistry. [1] One of Bock's interests in his occupation as a professor of German literature was Goethe. Bock, for instance, was the compiler of the 1960 book *Goethe the Critic*. [2]

Education

In the early 1950s, Bock studied with Ronald Peacock at Manchester University, attracted by the latter's research on Hölderlin, and obtained a PhD at Basle under Walter Muschg. After working briefly as an assistant lecturer at his Alma Mater, he became a lecturer at Queen Mary College, London (1958), then reader (1964), and finally professor of German, Westfield College, London (1969).

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External links

- Claus Victor Bock (German → English).

θΔics

In science, **Claus Wedekind** (c.1967-) is a Swiss mate selection researcher noted for his 1995 Sweaty T-shirt study, wherein he found the result that women—not on the contraceptive pill—were most sexually attracted to males in possession of the most dissimilar major histocompatibility complex (MHC). [1]

T-shirt study

See main: Sweaty T-shirt study

In the study, Wedekind and his team collected DNA samples from 49 female students from the university, mostly in biology and psychology, and 44 male students, mostly from chemistry, physics and geography (see also: Beckhap's law). He asked the men to wear cotton T-shirts on a Sunday and a Monday night, to keep the shirt in a plastic bag, to use perfume-free detergents and soaps and to avoid smelly rooms, smell-producing foods and activities, like smoking and sex, that create odors. Meanwhile, the women were given a nasal spray to use for two weeks before the test to protect their nasal membranes from infection. They also each got a copy of the Patrick Suskind novel "Perfume" to make them more conscious of odors.

After the T-shirts were collected, each woman was asked to give ratings, for intensity, pleasantness, and sexiness, to three T-shirts from men with similar MHC genes and three from men whose MHC genes were less similar. They did not know which shirts were which. Wedekind and his colleagues famously reported the following result in the 1995 Proceedings of the Royal Society of London: [2]

> "Women who are not taking oral contraceptives and who are dissimilar to a particular male's MHC perceive his odor as more pleasant than women whose MHC is more similar to that of the test man."

A screenshot from a 2001 PBS educational video on sweaty T-shirts and human mate choice, with interview commentary from American evolutionary psychologists Geoffrey Miller and Meredith Small. [3]

In the two decades to follow, numerous extensions of this work followed, including at the launching of at least two operational gene-matching science-based dating sites, namely the 2003-launched GenePartner.com and 2007-launched ScientificMatch.com.

Education

Wedekind completed his PhD in 1994 with a dissertation on "The Extended Parasite Hypothesis for Sexual Selection: Selection for Complementary Disease" at the University of Bern. Currently, he is a professor of biology at the University of Lausanne, with research focus on the selective forces that currently act especially on fish populations, e.g. the effects of human activities in interaction with natural and sexual selection; and the evolution of cooperation in conflict situations.

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External links

â— Claus Wedekind – Wikipedia.
â— Claus Wedekind (faculty) – University of Lausanne.

θΔics

In mononyms, **Clausius** [CR:126] is the surname of German physicist Rudolf Clausius (1822-1888).

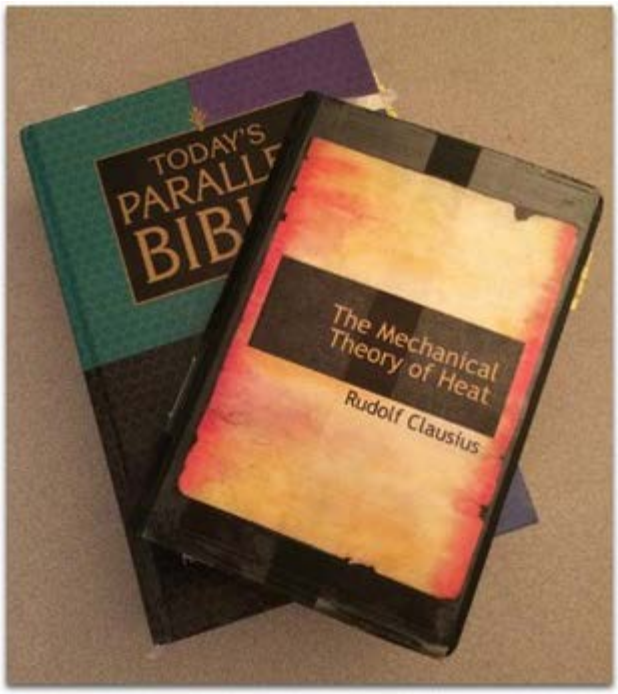

See also

- Clausius entropy
- Clausius postulate
- Clausius tombstone
- Clausius inequality
- Clausiusian

θΔics

In thermodynamics, **Clausius entropy** is a term used, in various publications, to differentiate between the original 1865 formulation of entropy, by German physicist Rudolf Clausius, and other more abstract formulations. Polish physicist Michal Kurzynski outlines one take on this view as such: [1]

> "The function *S* was introduced into thermodynamics at the phenomenological level by Clausius in 1865, and we this call it the **Clausius entropy**, in contrast to the statistical *Boltzmann-Gibbs entropy*, being in general only a function of the probability density."

Many non standard variants of entropy, such as Shannon entropy, Hartley entropy, or Teachman-Shannon entropy, among others exotics, exist, many having nothing to do with thermodynamics, yet are often named as such to make an indirect claim to have something to do with universal laws.

References

1. Kurzynski, Michal. (2006). *The Thermodynamic Machinery of Life* (pg. 40). New York: Springer.

Further reading

â— Medvedeva, M.L. (1995). "Thermomechanical Tnterpretation of Clausius Entropy." (abstract) *Chemical and Petroleum Engineering*, Vol. 31, No. 10. Oct.
â— Eu, Byung C. (2002). *Generalized Thermodynamics* (section: Clausius Entropy for Reversible Processes, pgs. 45-46). Springer.

θΔics

In inequalities, the **Clausius inequality**, or "inequality of Clausius", refers to the argument that when a body is taken from an initial state, e.g. state one, to a final state, e.g. state two, and then back again to its initial state, the entropy *S* added to the body S_1 will *not* equal the entropy removed from the body S_2. In other words, S_1 and S_2 will be not be equal and will thus be unequal:

$$S_2 \neq S_1$$

hence an "inequality", of the form < or >, will be found in the mathematical expression for the change in internal energy (or its equivalent potential) of the system. This is a state function way of saying that caloric particles do not exist in the sense that some of the heat Q of expansion, less the heat of contraction, was converted into internal molecular work, in an irreversible manner. There are different ways of expressing this concisely. American thermodynamicist George Goodenough's 1911 expression of the Clausius inequality is:

The Inequality of Clausius. — If an actual irreversible change be represented by the path *i*, Fig. 20 (assuming it to be possible to give such a representation), a correct value of the change cannot be obtained from the integral $\int_{T_1}^{T_2} \frac{dQ_i}{T}$ taken along the path *i*. For as we have seen

$$S_2 - S_1 = \int_{T_1}^{T_2} \frac{dQ_i}{T} + \Sigma,$$

where Σ is the increase of entropy due to the internal irreversible changes. For the actual irreversible change we have, therefore,

$$S_2 - S_1 > \int_{T_1}^{T_2} \frac{dQ}{T}.$$

This is the inequality of Clausius.

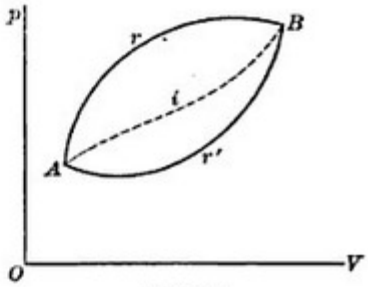

Fig. 20.

1911 definition of the "inequality of Clausius" by American thermodynamics professor George Goodenough. [6]

$$S_2 - S_1 > \int_{T_1}^{T_2} \frac{dQ}{T}$$

In modern terms, the Clausius inequality often defined as: [1]

$$\oint \frac{dQ}{T} \leq 0$$

where the circle integral $\oint$ symbol means that the integration is done over the surface of the working substance over the entire cycle, *dQ* is an inexact differential amount of heat, often signified as Ä'Q or δQ, added to the body of substance, *T* is the absolute temperature of the surface of the substance, the value of the integral equal zero for a reversible or ideal cycle, and is less than zero for an irreversible cycle. [2] The equation is named after German physicist Rudolf Clausius. The term "Clausius inequality" essentially is a mathematical synonym for the verbal version of the second law of thermodynamics. A full reading of the Clausius' textbook *The Mechanical Theory of Heat* is required to fully-understand the definition of the logic of the inequality as developed and utilized by Clausius.

Etymology

The expression, according to the 1875 views of Clausius, is a mathematical way of stating that the sum of uncompensated transformations in a cyclical process must always be positive; and is thus an amendment of the proof of the second main principle (second law) for variations of the body that are irreversible. [3]

At the turn of the 20th century the expression "Clausius' theorem" was common. One definitive 1904 version of Clausius' theorem, from Irish mathematician William Orr, was: "if a body or system of bodies undergoes any

irreversible cycle of operations in which, in addition to interchanges of heat which may take place between different parts of the system, it receives heat from (or gives heat to) any external bodies, then for the cycle (using the symbols H for heat and θ for temperature)", the quantity:

$$\iint \frac{\delta H}{\theta} < 0$$

is negative, where "δH denotes the small quantity of heat absorbed by any small portion of the system when at the absolute temperature θ, whether this heat be supplied by conduction or by radiation, and whether by external bodies or by any other part of the system, the double sign of the integration being used to indicate that the integration is to be performed over the whole mass as throughout the cycle."

Simple proof

The simplified proof of the Clausius inequality goes something like this. First, according to Carnot's theorem: [9]

> "The motive power [or work] of heat is independent of the agents [working substance] employed to realize it; its quantity is fixed solely by the temperature differences of the bodies [hot body and cold body] between which is effected, finally, the transfer of caloric [heat]."

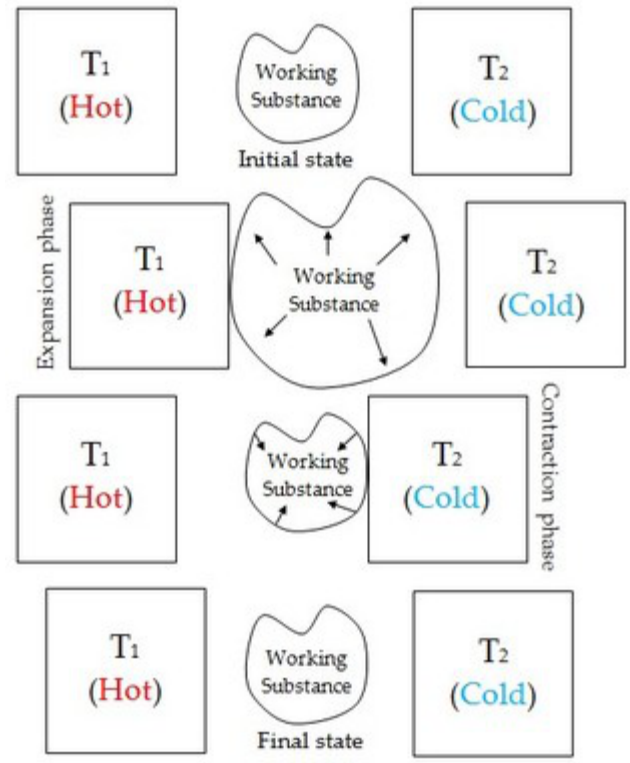

Generic model of the basic heat cycle (or Carnot cycle).

as enunciated in 1824 by French physicist Sadi Carnot, the efficiency, symbol eta η, of the Carnot engine η_c, or perfect idealized engine, will always be greater than or equal to the efficiency of any other type of heat engine η_h, as expressed by the following inequality:

$$\eta_c \geq \eta_h$$

The Carnot efficiency (η_c) is the efficiency of an engine where caloric is hypothetically conserved; a real heat engine efficiency (η_h) is one where part of the heat is irreversibly converted into internal work according to the principle of the mechanical equivalent of heat. This equality sign is the start of the derivation of the Clausius inequality and thus the second law. [5] In short, what this inequality says is that no engine operating between two heat reservoirs, i.e. hot body and cold body, can be more efficient than a Carnot engine operating between the same reservoirs, and by corollary the work output of any and all heat engines is a function of the difference in the temperatures between the hot body T_1 and cold body T_2:

$$W = T_1 - T_2$$

We can then call the efficiency η, of a given heat engine to produce work output, i.e. how efficient the engine is, by ratio of its work output to heat input:

$$\eta = \frac{W_{out}}{Q_{in}}$$

or, through a bit of simple derivation, this idealized efficiency, can be written in terms of temperature: [10]

$$\eta = \frac{T_1 - T_2}{T_1}$$

and this will be the maximal possible efficiency that a heat engine can have. Carnot's efficiency inequality can then be rewritten as such, when comparing the efficiency an ideal engine (right side of equation) with say the efficiency of actual measured heat engine, say gas-engine or air-engine (right side of equation):

$$\frac{T_1 - T_2}{T_1} \geq \frac{Q_1 - Q_2}{Q_1}$$

Note: the details of this last step, in the derivation, need to be studied further and tracked down. In any event, this can be solved, through simple algebra, to show that:

$$\frac{Q_1}{T_1} \leq \frac{Q_2}{T_2}$$

or:

$$0 \leq \frac{Q_2}{T_2} - \frac{Q_1}{T_1}$$

Similarly, in the notation of Lebanese-born Danish physical chemist John Avery: [13]

$$dS = \frac{dq}{T_2} - \frac{dq}{T_1} > 0$$

Or form the original formulation in Clausius' 1854 theorem of the equivalence of transformations, the quantity:

$$\frac{Q}{T_2} - \frac{Q}{T_1}$$

is called the "double transformation" and will always have a positive. To exemplify, supposed one unit of heat Q = 1 flows into the working body, at a temperature of T_1 = 300K, causing an expansion, then flows out of the working body, at a temperature of T_2 = 200K, then the equivalence value of the double transformation will be:

$$\frac{1}{200} - \frac{1}{300}$$

or 0.0017 units of transformation content change, i.e. entropy change in modern parlance. Hence, we conclude with the view that in all natural processes are irreversible, and thus show an entropy increase in the working substance. [8]

To give some comparison, in the original 1703 phlogiston model of heat, proposed by German chemist Georg Stahl, heat was considered to be a type of matter called "phlogiston", symbol Ï• (phi), which left bodies when burned, but could be restored to the original substance by supplying a replacement phlogiston from any material containing it, whereby, in this model the transformation change four this double transformation would be of the form:

$$\frac{\phi}{T_2} - \frac{\phi}{T_1}$$

The central issue with this theory is that experiments were soon showing that heat seemed to be weightless and this view was in fact proved in a 1786 experiment conducted by French chemist Antoine Lavoisier, wherein he let phosphorus burn in air in a closed flask, and measured no appreciable change in weight, thus proving that "matter of heat is weightless". In replacement of Stahl's "phlogiston", Lavoisier proposed the "caloric", a weightless fluid-like particle of the composition of heat that was (a) indestructible, (b) actuated a repulsive force between the atoms of bodies, (c) created a defining volume based on the number of caloric particles in a given body, and (d) could be added or removed by contact with other bodies of higher or lower temperature or by combustion.

Rigorous proof

The actual full "proof" of the so-called Clausius inequality, or Clausius theorem, as it is some times called, is a bit illusive, being that there are five different versions of this inequality formulation, spread among three different articles.To summarize the situation, (a) the proof is hidden in the footnotes and verbiage of at least three different memoirs (1854, 1856, and 1865), (b) the sign or rather direction of the inequality differs between the two main versions, which is based on Clausius' differing assignment of the + or – signs associated with the respective heat flows (into or out of the working body) in the respective manuscripts (1854 and 1865), (c) in the early stage of development he toyed with the notion of what a variable N (as well as – N) that he called the equivalence-value of all uncompensated transformations, and (d) the unified proof seems to have been rewritten, reworked, or regrouped to a certain unified extent in the second edition of his textbook, his chapter ten "On Non-Reversible Processes", in particular.

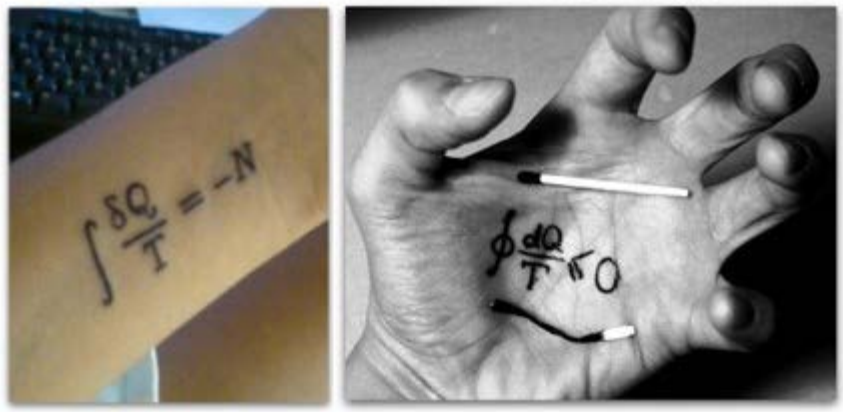

Left: the 1856 version of the **Clausius inequality** tattooed in 2010 on the arm of newly graduated philosophy student named Ivanka. [11] Right: a *circa* 1900 version of the **Clausius inequality** tattooed (or inked) in 2008 on the hand of a man, who views the total image as follows "the hand represents the capacity of the human mind to analyze and understand natural phenomena [such as] the power and imperative of irreversibility." [12]

Originally, the general outline of the proof, not in terms of inequalities, but rather equals signs, i.e. reversible processes, was given by Clausius in his 1854 fourth memoir "On a Modified Form of the Second Fundamental Theorem in the Mechanical Theory of Heat". He referred back to this, in retrospect, in an asterisk footnote in his 1865 ninth memoir "On Several Convenient Forms of the Fundamental Equations of the Mechanical Theory of Heat", where he stated the integral of the differential units of entropy (dQ/T) entering or leaving the body over the cyclical process is greater than equal. In the text of the ninth memoir, however, he uses a different sign convention, in which he states that the integral of the differential units of entropy (dQ/T) entering or leaving the body over the cyclical process is less than or equal to zero. This situation is summarized below:

Formulation	Date	Notes
$\int \frac{dQ}{T} = N$	1854	Where "the integral extends over all the quantities of heat received by several bodies"; where N is the mathematical summation of all the equivalence-values involved in the process, i.e. the sum of the total number of positive transformations and negative transformations.
$\int \frac{dQ}{T} = 0$	1854	Holds for a "reversible process, however complicated it may be, such that the transformations which occur must exactly cancel each other, so that their algebraic sum is zero."
$\int \frac{dQ}{T} = -N$	1856	Where "Q signifies the heat imparted to the changeable body during a cyclical process, and dQ an element of of the same, whereby any heat withdrawn from the body is to be considered as an imparted negative quantity of heat. The integral is extended over the whole quantity Q"; and where "N denotes the equivalence-value of all uncompensated transformations* involved in a cyclical process"; where "N = 0 denotes a cyclical process that can be reversed" and where N > 0 denotes a cyclical process that is not reversible, i.e. those in which uncompensated transformations necessarily arise" (**to note**: Clausius does not use the famed inequality sign at this point, but instead introduced the inequality verbally by stating that that for irreversible processes "the magnitude of N has consequently a determinable and necessarily positive value."
$\int \frac{dQ}{T} = 0$	1862	Where "dQ is an element of heat given up by a body to any reservoir of heat during its own changes (heat which it may absorb from a reservoir being here reckoned as negative)"; this expression holding for "every reversible cyclical process".
$\int \frac{dQ}{T} \geq 0$	1862	Where "dQ is an element of heat given up by a body to any reservoir of heat during its own changes (heat which it may absorb from a reservoir being here reckoned as negative)"; this expression holding for "every cyclical process which is in any way possible".
$\int \frac{dQ}{T} \geq 0$	1865	Based on the assignment that "a thermal element given up by a changing body to a reservoir of heat is reckoned as positive, and element withdrawn from a reservoir of heat is reckoned negative"; and that this form is convenient in "certain general theoretical considerations", for cyclical processes where the changes occur in a non-reversible manner.
$\int \frac{dQ}{T} \leq 0$	1865	Based on the assignment that "a quantity of heat absorbed by a changing body is positive, and a quantity of heat given off by it is negative", for cyclical processes where the changes occur in a non-reversible manner.
$\int \frac{dQ}{T} = 0$	1875	
$N = -\int \frac{dQ}{T}$	1875	
$\int \frac{dQ}{T} \leq 0$	1875	
$dQ \leq TdS$	1875	

Notice, specifically, the asterisk mark* used by Clausius in the 1856 version, which he cites to the following lengthy footnote, which also has an extended end bracketed sub-footnote [] within it:

* One species of uncompensated transformations requires further remark. The sources from which the changing matter derives heat must have higher temperatures than itself; and, on the other hand, those from which it derives negative quantities of heat, or which deprive it of heat, must have lower temperatures than itself. Therefore whenever heat is interchanged between the changing body and any source whatever, heat passes immediately from the body at a higher to the one at a lower temperature, and thus an uncompensated transformation occurs which is greater the greater the difference between the temperatures. In determining such uncompensated transformations, not only must the changes in the condition of the variable matter be taken into consideration, but also the temperatures of the sources of heatwhich are employed; and these uncompensated transformations will be included in N or not, according to the signification which is attached to the temperature occurring in equation (II). If thereby the temperature of the *source of heat* belonging to *d*Q is understood, the above changes will be included in *N*. If, however, agreeably to the above definition, and to our intention throughout this memoir, the temperature of the changing matter is understood, then the above transformations are excluded from *N*.

One more remark must be added concerning the minus sign prefixed to *N*, which did not appear in the same equation in my former memoir. This difference arises from the different application of the terms negative and positive with respect to quantities of heat. Before, a quantity of heat received by the changeable body was considered as negative because it was lost by the source of heat; now, however, it is considered as positive. Hereby every element of heat embraced by the integral, and consequently the integral itself, changes its sign; and hence, to preserve the correctness of the equation, the sign on the other side must be changed.

[The reason why, in different investigations, I have changed the significations of positive and negative quantities of heat, is that the points of view from which the processes in question are regarded, differ according to the nature of the investigations. In purely theoretical investigations on the transformations between heat and work, and on the other transformations connected therewith, it is convenient to consider heat generated by work as positive, and heat converted into work as negative. Now the heat generated by work during any cyclical process must be imparted to some body serving as a reservoir or as a source of heat, and the heat converted into work must be withdrawn from one of these bodies. Quantities of heat will receive appropriate signs in theoretical investigation, therefore, when the heat gained by a reservoir is calculated as positive, and that which it loses as negative. There are investigations, however, in which it is not necessary to take into special consideration the reservoirs or sources which receive the heat that is generated, or furnish the heat that is consumed by work, the condition of the variable body being the chief object of research. In such cases it is customary to regard the heat received by the changing body as positive, and the heat which it loses as negative; to deviate from this custom, for the sake of consistency, would be attended with many inconveniences. Researches on the interior processes in a steam-engine are of the latter kind, and accordingly I have deemed it advisable to adopt the customary choice of signs.—1864]

This 1864 date is a bit difficult to track down, possibly referring to experimental work done by Clausius, but generally seems to refer to his 1865 ninth memoir.

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics.* Oxford University Press.
2. (a) Dincer, Ibrahim, Rosen, Marc A. (2007). *Exergy* (section 1.3.7.: The Clausius inequality, pgs. 10-12). Elsevier.
(b) Cengel, Yunus A., and Turner, Robert A. (2004). *Fundamentals of Thermal-Fluid Sciences* (pg. 274). McGraw-Hill.
3. Clausius, Rudolf. (1879). *The Mechanical Theory of Heat* (ch. 10: On Non-Reversible Processes, pgs. 213-34). London: Macmillan & Co.
4. (a) Orr, William McFadden. (1904). “On Clausius’ Theorem for Irreversible Cycles, and on the Increase of Entropy” (section: Clausius’ Theorem: an Enunciation, pg. 519), *Philosophical Magazine*, Vol. 8, pgs. 509-27. Taylor & Francis.
(b) William McFadden Orr – Wikipedia.
5. Adkins, Clement J. (1983). *Equilibrium Thermodynamics* (section 5.1: Clausius’ theorem, pgs. 68-71). Cambridge University Press.

6. Goodenough, George A. (1911). *Principles of Thermodynamics* (Inequality of Clausius, pg. 63). 1916, 2nd ed. New York: Henry Holt & Co.
7. Clausius, Rudolf. (1865). *The Mechanical Theory of Heat: with its Applications to the Steam Engine and to Physical Properties of Bodies* (Clausius inequality, pgs. 125-30, 329). John van Voorst.
8. Ubbelohde, Alfred René. (1947). *Time and Thermodynamics* (pgs. 36-40, 80). Oxford University Press.
9. Carnot, Sadi. (1824). "Reflections on the Motive Power of Fire and on Machines Fitted to Develop that Power." (pg. 20). Paris: Chez Bachelier, Libraire, Quai Des Augustins, No. 55.
10. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pgs. 129-31). McGraw-Hill.
11. (a) The equation shown uses a modern variation of German physicist Carl Neumann 1875 notation for the inexact differential, of little Greek delta δ.
(b) Equation on arm was taken from the mathematical descriptions section of the Wikipedia on second law of thermodynamics article, as was added by American chemical engineer Libb Thims on 18 Sep 2006.
(c) Zimmer, Carl. (2010). "Graduating into Entropy", Discover Magazine Blog, May 02.
(d) The Second law of Thermodynamics (05 Apr 2010) – GeekyTattoo.com.
12. (a) Irreversibility (photo by Marco Fantoni; March, 2008) - Flickr.
(b) Irreversibility – Flickr (Italian → English).
13. Avery, John. (2003). *Information Theory and Evolution* (pg. 74). World Scientific.

Further reading

â— Bryan, George H. (1907). *Thermodynamics: An introductory treatise dealing mainly with first principles and their direct applications* (Clausius inequality, proof, pg. 60). B.G. Tuebner.

External links

â— Clausius inequality – Wikipedia.
â— Clausius theorem and inequality – HyperPhysics.

θΔics

In science, **Clausius postulate** refers to the truncated view of thermodynamics, extended to the operation of the universe, namely that the laws governing the operation of the known universe are energy conservation and entropy increase, i.e. the first law and second law of the mechanical theory of heat, aka thermodynamics.

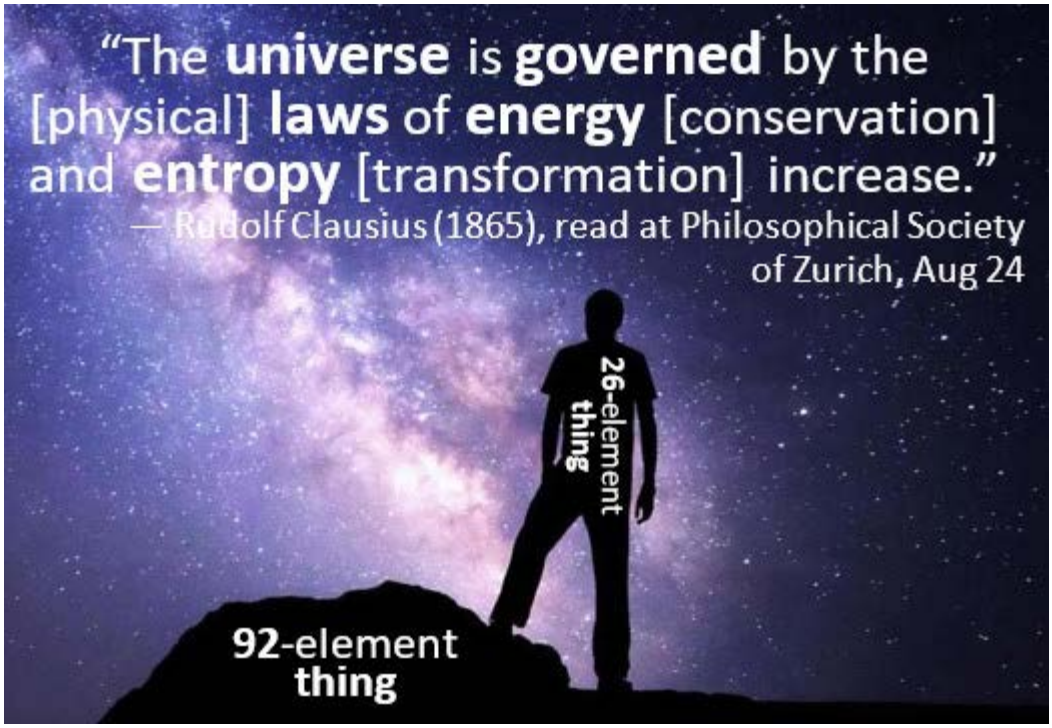

A visual of the the **Clausius postulate**, namely that the constancy of energy and the tendency towards energy increase governs the operation of the universe; term clarified in the sense of the 2014 University of Dublin Science Gallery atheist Christmas (see: atheist holiday) card motto: "All I want for Christmas is a rational view of a universe by physical laws". (Q)(Q)

Overview

In 1865, German physicist Rudolf Clausius summarized the results of his now-mature mechanical theory of heat, derived in the previous 15-years, via 9-memoirs, which he famously enunciated during a reading at the *Philosophical Society of Zurich* on April 24th as follows:

> "For the present I will confine myself to the statement of one result. If for the entire universe we conceive the same magnitude to be determined, consistently and with due regard to all circumstances, which for a single body I have called *entropy*, and if at the same time we introduce the other and simpler conception of energy, we may express in the following manner the fundamental laws of the universe which correspond to the two fundamental theorems of the mechanical theory of heat: first, that *the energy of the universe is constant*, second that *the entropy of the universe tends to a maximum.*"

Of note, the term "system" was not used by Clausius, but rather he employs the terms "body" or "working body", a synonym of the 1824 term "working substance" (Carnot's term for system), all of which are equivalent to the modern-day term "system" or "thermodynamic system" as any boundaried region space.

Stature

In the modern view, according to the Eddington rule (1928) and Einstein postulate (c.1940), the above statement by Clausius is the foundation statement in all of science and human knowledge, will likely never be overthrown, and all future theories will need to conform to the second law or become defunct.

See also

- Rosetta stone (and mistranslations)
- Hawking radiation
- Black hole thermodynamics

References

1. Clausius, Rudolf. (1865). "On Several Convenient Forms of the Fundamental Equations of the Mechanical Theory of Heat" (ninth memoir), Read at the *Philosophical Society of Zurich* on the 24th of April, 1865; published in the *Vierteljahrsschrift* of this society, Bd. x. S. 1.; *Pogg. Ann*. July, 1865, Bd. cxxv. S. 353; *Journ. de Liouville*, 2e ser. t. x. p. 361; *The Mechanical Theory of Heat*, ch. 9 (pg. 365). J. Van Voorst, 1867.

External links

- Life, liberty, and the pursuit of happiness – Wikipedia.

θΔics

In tombstones, **Clausius tombstone** is the marker for the final resting place for German physicist Rudolf Clausius (1822-1888), the central founder of thermodynamics, located in the Old Cemetery of Bonn (Alter Friedhor Bonn) in Bornheimer Strasse, which is about 400m north of Bonn station. [1] A stone cross is on the top of the gravestone, letters on the stone are painted gold, and the gravestone is enclosed by a low iron fence.

Left: the **Clausius tombstone**, in Old Bonn Cemetery, the burial place of German physicist Rudolf Clausius. Right: a video documentary on Old Bonn Cemetery, explaining how most of the founding professors of the University of Bonn are buried here.

Location | Map

The following map shows the location of the Clausius tombstone, to the right at the West Entrance, at Bonn cemetery:

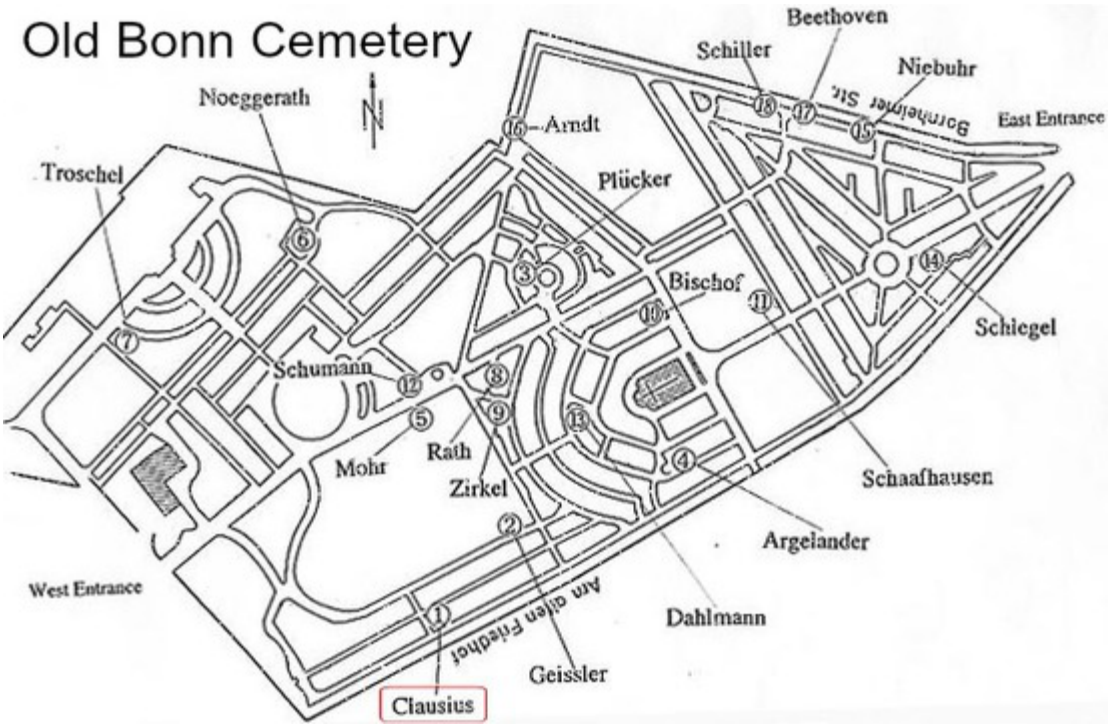

See also

â— Gibbs tombstone
â— Boltzmann tombstone

References

1. Pilgrimage through the History of Natural Science (Bonn, Germany) – Origin-life.gr.jp.

External links

â— Rudolf Julius Emanuel Clausius – FindAGrave.com.

θΔics

In terminology, **Clausiusian** refers to thermodynamical views, model, system, and general school of thought of the pioneering 1850 to 1865 work of German physicist Rudolf Clausius on the nature of heat, work, and energy; and or those views deduced therefrom.

Quotes

The following are representative quotes:

> "This excellent work [*Thermodynamics of the Steam-Engine and other Heat Engines* (1898) by Cecil Peabody] has now been ten years before the public and is well known to every member of the engineering profession. It has been, during these years, the representative, in this country and in the English language, of the **Clausiusian system** of thermodynamics, as applied in the work of the engineer, and it has been from the first, a standard treatise. … The book constitutes an excellent treatise for use in engineering schools and colleges as a text-book-based upon the methods of Clausius and of Zeuner.
>
> — Robert Thurston (1899) [1]

> "Every chapter [of Sidney Reeve's *Thermodynamics of Heat-Engines*, 1903] gives proof of independent thought, and while, unquestionably, many of the modes of expression of fundamental ideas and facts would be differently presented and probably sometimes criticized by one trained in the forms of the great school of **Clausiusian writers**, every competent critic will probably admit the soundness of the philosophy and the clarity of expression which distinguish the book."
>
> — Robert Thurston (1903) [2]

References

1. Thurston, Robert H. (1899). "Review of Cecil Peabody's *Thermodynamics and the Steam-Engine and other Heat Engines*" (pg. 86), *Sibley Journal of Engineering*, Volume 13.
2. Thurston, Robert H. (1903). "Review of Sidney Reeve's *Thermodynamics of Heat Engines*" (pg. 305), *Science*, Volume 17.

θΔics

In religio-mythology, **clay creation myth**, is a defunct scientific theory which argues that humans originated at a certain point in time in the past when a certain god, e.g. Enki (3500BC), Khnum (330BC), god the father of Jesus (200AD), Allah, etc., took clay from the ground, molded it into the shape of a human, then brought it to 'life', by giving the clay mold either the breath of life (see: Ankh), some type of imparted spirit, a soul, or by stealing fire from the heaven (see: Prometheus) to animate the clay, after which the clay-formed humans began to reproduce and grow.

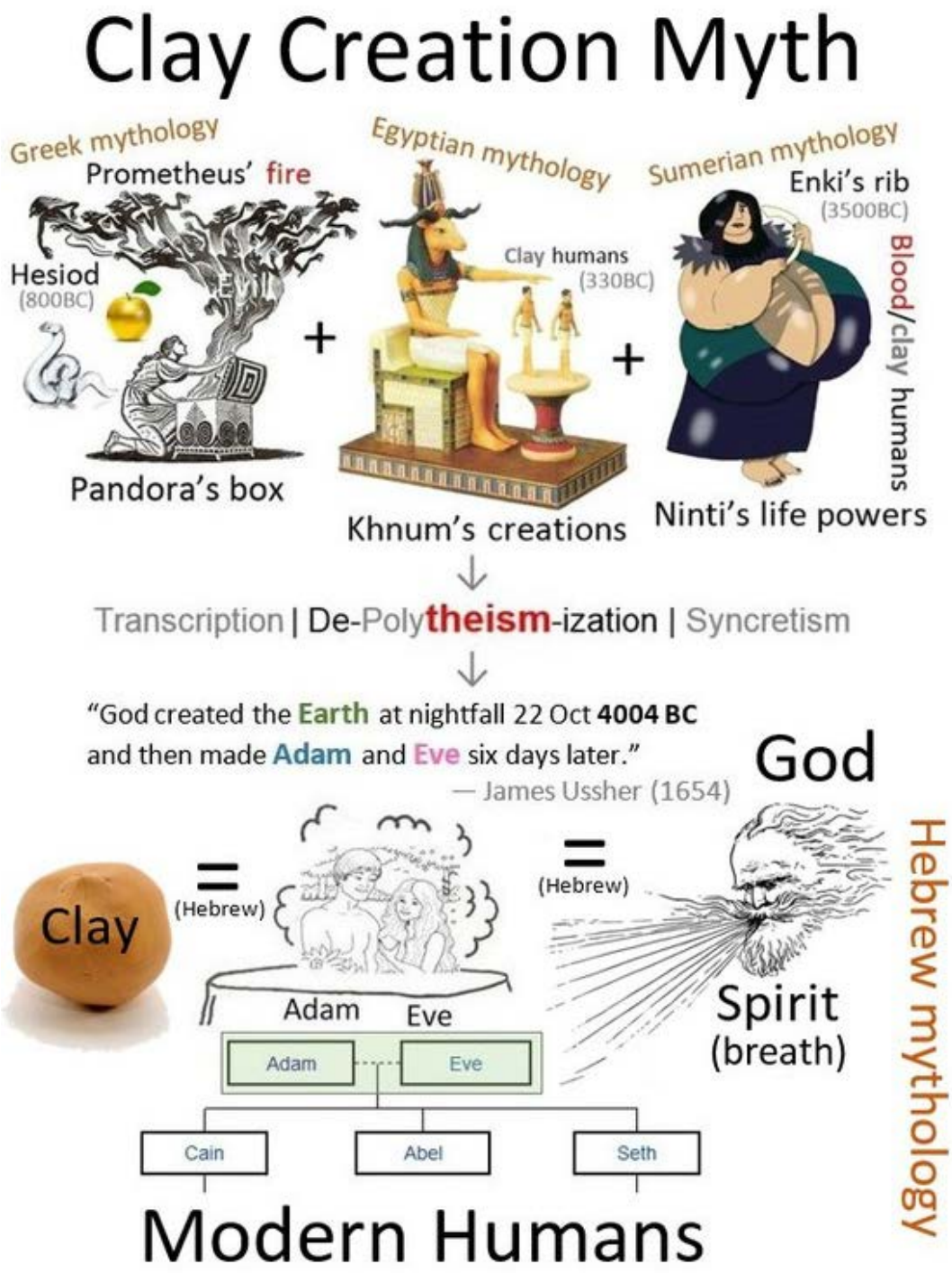

A general overview of the **clay creation myth**, derived from the religio-mythology genealogy page (as summarized in more detail in the "Zerotheism for Kids" lecture), showning how, over time, Sumerian mythology (3500), Greek mythology (800BC), and Egyptian mythology (330BC) were added together, as polytheism morphed into monotheism, to make Hebrew mythology (c.100BC) to eventually form the basis of Christian mythology (400AD) and Islam mythology (800AD), in short, which is now morphing into something new, i.e. physicochemical periodic table synthesis, as monotheism morphs into zerotheism; note: 56% of Americans (2015) believe that Adam and Eve were real people.

Science | Debunking

In 1925, Alfred Lotka, in his *Elements of Physical Biology*, was to first to point out that, chemically-speaking, humans do not have the same elemental composition of clay, and that the clay creation origin of humans is but a poetical fancy; specifically:

> "On the whole it may be said the living organisms are composed of comparatively rare elements. We are, indeed, earth-born, but yet not altogether common clay. Indeed, taken literally the expression "common clay," as applied to man, is an extreme case of poetic license; for aluminum and silicon the chief constituents of clay, and taking second and third place in rank of abundance among the components of the earth's crust, are both present only in traces in the human body."

Lotka, in short, gave the first so-called "aluminum disproof", of the various disproofs of the existence of god, i.e. in indirect reference to the clay creation myth of humans. This, in short, is indirect implicit Bible debunking, wherein he relegates the creation of humans according to Genesis (or Heliopolis creation myth) as being but a form of poetry.

In 2014, Libb Thims, independent of Lotka, began employing the aluminum disproof in dialogue with theists, as a tool to falter their "god complex" belief system, e.g. see: 7 Jul 2014 Beg-Thims dialogue (comment #10); then on 6 Jan 2015, by Libb Thims (V:5:40-6:05), as an effective disproof of the existence of god.

Clay

The substance called clay (Ñº) is a naturally occurring aluminum silicate ($Al_2(SiO_3)_3$,) composed primarily of fine-grained minerals, including: Andalusite (Al_2SiO_5), Sillimanite (Al_2SiO_5), and Kyanite (Al_2SiO_5). In this sense, early clay origin views would posit a human to be:

Human = f{Al, Si, O}

a type of 3-element chemical structure. Each of these elements are found in the modern human molecular formulas.

Races

A latter aspect of the clay creation myth is that the the different races of the land, as distinguished between the colors white, yellow, and brown, resulted from differences in the color of the clay used to make the humans. Chinese people, for example, were said to have been made from yellow clay.

Adam and Eve

In circa 300BC, the Egyptian version of the creation of humans from clay on Khnum's potter's wheel, became monotheistically rewritten into the story of Adam and Eve and the Garden if Eden:

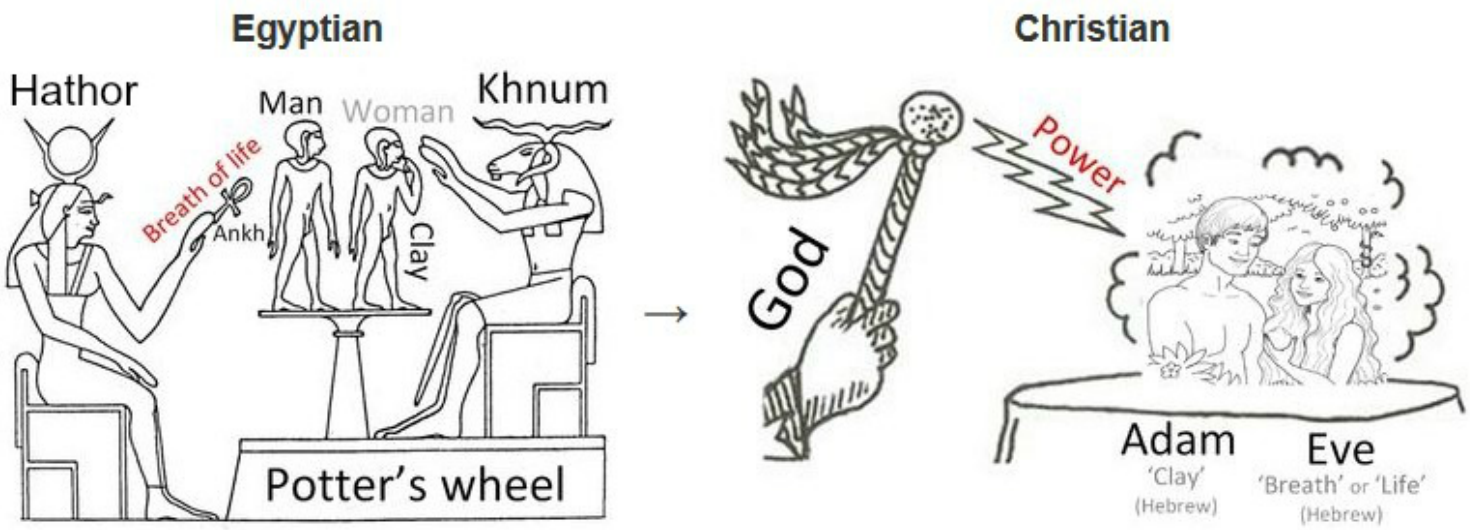

In the diagram, the Egyptian god Khnum (right) is creating two **humans from clay**, on his potter's wheel, seated next to the goddess Hathor (left), who is imparting the breath of life into the clay figures by pointing the ankh at their nostrils. **Right:** Khnum making the pharaoh out of clay on his potter's wheel at the Temple of Khnum at Esna (323-30BC). [12]

Modern

The following is the modern physicochemical understanding of human origins, via thermodynamically quantifiable chemical synthesis:

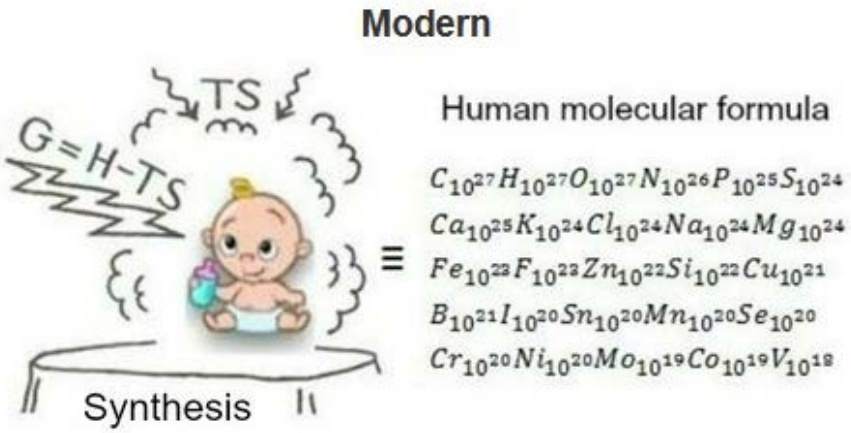

Original version | Heliopolis creation myth

The origin of the “creation by clay” theory of human origins, seems to have originated in 3100BC in the ancient Egyptian city of Heliopolis, where, in the framework of Ra theology, it was theorized that creator fire god Atum, was self-generated or rather born out of a mound of mud (or clay), after which he created the first two forms of life, Shu, his son, and Tefnut, his daughter, via "breath" and "spit", respectively.

Khnum

A latter spin-off off the Heliopolis creation model, held humans were said to have been formed in a similar manner, to the birth of the sun (Ra) out of the Nile soil (Nun), according to which ram-headed god Khnum made people from clay, on his potter’s wheel, in the waters of the Nile.

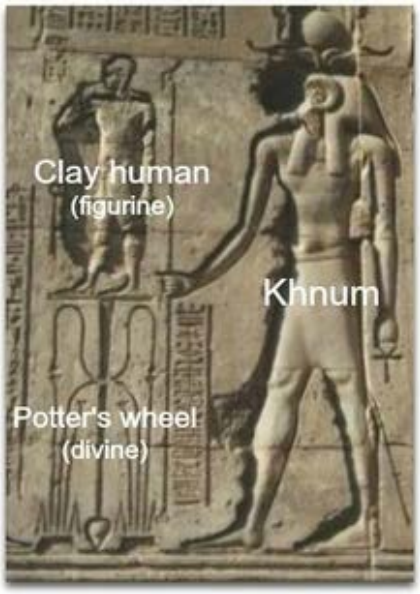

The ram-headed god Khnum (center) fashions a man (left) from **clay** upon his potter’s wheel, while the ibis-headed god Thoth (right) stands behind and records the number of years (see: aging) allotted to the man. [13]

One of the earliest mentions of Khnum associates him with the Nile flood: namely a third dynasty (2686-2613BC) inscription by King Zoser, per guidance of Egyptian polymath Imhotep, on the rocks at Sehel Island, near Elephantine (his main cult center), records a seven-year famine and states that Khnum would let the Nile flood once again if his temple was renovated. His height of power came in the years 332BC-395AD, during the Greek and Roman periods, centered at Elephantine Island, where rams sacred to Khnum were mummified, elaborately wrapped, decorated with gilded masks, and placed in stone sarcophagi. [13]

Since the annual flooding of the Nile brought with it silt and clay, and its water brought life to its surroundings, he was thought to be the creator of the bodies of human children, which he made at a potter's wheel, from clay, and placed in their mothers' wombs. [1]

God made the first woman from Adam's rib

In the Biblical version of the Heliopolis creation myth, the first woman was made from Adam's rib. This is a re-write of the original Egyptian version of how Shu, the sky-air god, son of Atum (Re) and father of Geb (earth), "pulled Nut (sky) from Geb's body" and separated heaven and earth. In short, the Biblical story of god creating Adam from clay and Eve from Adam's body, and their three sons (Cain, Abel, and Seth), and the murder that occurs (see: Cain and Abel), is de-deification

re-write of the story of Atum-Re self-generating out of the Nun or formless water of beginning to create Geb and Nut and their three offspring sons (Osiris, Horus, and Set), wherein Set murders Osiris. [9]

In Surah 4:1 of the Quran, this "creation of women" story is re-stated as such:

> "O people! be careful of (your duty to) your Lord, Who created you from a single being and created its mate of the same (kink) and spread from these two, many men and women"

(add)

Derivatives

The original Egyptian creation by clay prototype yielded may spinoffs derivative theories in the centuries to follow: [2]

In 1700BC Sumerian mythology, the birth goddess Nammu, of the watery depths, was said to have molding clay into the shapes of humans and bringing the molds to life to be a workforce replacement for the gods in the maintenance of the land.

In the 1500BC Babylonian creation epic *Enuma Elish*, the goddess Ninhursag was said to have created humans from clay. Made from clay, a living being in this version is said to be possessed of a breath-life-force called *napistu*, cognate with the Hebrew word *nefesh*. [7]

In 800BC Greek mythology, it is said that Prometheus made man of clay and stole fire from the heaven to animate them, a type of animation fire which came to be known as Promethean heat. [3]

According to 500BC book of *Genesis*. [6]

> "And the lord god formed man of the **dust** of the ground, and breathed into his nostrils the breath of life; and man became a living soul."

The first human was called "Adam", the Hebrew word for ‘clay’. The part about the living soul is a re-write of the various Hymns of Khnum centered around the annual festival in the ancient city of Esna as carved into the walls of the Temple of Esna. The *Morning Hymn*, in particular, associates Khnum with Amun, Re, and Shu (the breath of life god).

The *Great Hymn to Khnum* (built during the Ptolemaic period 323-30BC), as inscribed in the Esna temple, which was sung at the feast of installing the potter’s wheel, celebrated on the first day of the month of Phamenot, Khnum is described as being born of the Nun and the creator of all life; and in the section entitled *The Diverse*

The diverse forms of Khnum

In “First-of-towns” he is Ba-of-Re,[7]
Fashioning people throughout this land;
At Iunyt he is Ba-of-Shu,
Modeling people on his wheel.
He has fashioned men, engendered gods,
They live by that which comes from him,
He makes breathe those who rest in their tombs.

In Shas-hotep he is Ba-of-Osiris,
Making all herds by his handiwork;
In Herwer he is Ba-of-Geb,
Fashioning all beings in this land.
He is Horus-Metenu in Semenhor,
Making birds from the sweat of his body.

He changes his form (18) to Lord-of-the-booth,[8]
To wrap Osiris in the place of embalmment;
He models all things between his hands,
To guard Osiris on his right side,
Save him from the water by his Twins,[9]
Guard the King on his left side, ever-living.

He changes his form to Suwadjenba of Pi-neter,[10]
Who makes all things in his field,
He grows trees, he raises crops,
To nourish all by his products.
He alters his form to beneficent Nourisher,
On top of nestling-hill,
To fashion all men and beasts.

They[11] have placed their four Mesekhnet[12] at their sides,
To repel the designs of evil by incantations;
They stand as lords of the shrines of South and North,
At the place of creation of all that (20) exists.
Beneficent god,
Contenting god,

God who forms bodies,
God who equips nostrils,
God who binds the Two Lands,
So that they join their natures.

When Nun and Tatenen first came into being,
They appeared as lotus on his back,
As heir to Djed-shepsy at the start.[13]
Their *ka* will not perish,
None shall hinder their action,
No land is lacking in all that he made.
They are concealed among mankind,[14]
Creating all beings since god's time,
They are alive and abiding,
Like Re rising and setting,
May your fair face be kind to *Pharaoh ever living*!

The Hymn of "The Diverse Forms of Khnum", as carved onto the walls of the Temple of Esna, which was built during the Ptolemaic period (323-30BC), following the conquest of Egypt by Alexander the Great in 332BC, outlining the essential points of the monotheism-model that would later be crafted into the description of the God of Christianity and of Islam. [10]

Forms of Khnum, Khnum is described as "in first of towns, he is Ba-of-Re, fashioning people throughout the land; at lunyt, he is Ba-of-Shu, modelling people on his wheel; in Shas-hotep, he is Ba-of-Osiris; he is Horus-Metenu in Semenhor, etc.", created "all beings since god's time, there are alive and abiding, like Re rising and setting" and their "ka (spirit) will not perish." This model seems to be essentially starting point for the model of the God of Christianity and later Islam.

Alexander the great

The conquest of Egypt by Alexander the great in 332BC seems to have been the start of what would eventually become, seven centuries later, Christianity or the new state religion of Egypt, an edict made official by Roman emperor Theodosius I's 391 decree that made Christianity the official state religion of the Roman Empire.

When Alexander was thirteen years old, Philip began to search for a tutor. Many people were passed over including Isocrates and Speusippus, the latter of whom was Plato's successor at the Academy and who offered to resign to take up the post. In the end, Philip offered the job to Aristotle, who accepted, and Philip provided the Temple of the Nymphs at Mieza as a classroom. In return for teaching Alexander, Philip agreed to rebuild Aristotle's hometown of Stageira, which Philip had razed, and to repopulate it by buying and freeing the ex-citizens who were slaves, or pardoning those who were in exile.

Mieza was like a boarding school for Alexander and the children of Macedonian nobles, such as Ptolemy, Hephaistion, and Cassander. Many of those studying by Alexander's side would become his friends and future generals, and are often known as the 'Companions'. At Mieza, Aristotle taught Alexander and his companions about medicine, philosophy, morals, religion, logic, and art. Under Aristotle's tutelage, Alexander developed a passion for the works of Homer, and in particular the *Iliad*; Aristotle gave him an annotated copy, which Alexander was to take on his campaigns.

In 332 BC, Alexander conquered Egypt with little resistance from the Persians. He was welcomed by the Egyptians as a deliverer. He visited Memphis, and went on pilgrimage to the oracle of Amun at the Oasis of Siwa. The oracle declared him to be the son of Amun-Re (Ra). He conciliated the Egyptians by the respect which he showed for their religion. While Macedonians commanded military garrisons, including at Memphis and Pelusium, Alexander left the civil administration in local control; initially there were two, later one governor. Alexander founded a new Greek city, Alexandria, to be a major commercial port. This city, where Alexander was buried, grew, quickly becoming as well Egypt's administrative capital and an intellectual centre.

Islam

In 642, Alexandria was captured by the Muslims, who were given militant instructions, by order of the Caliph Omar, in regards to the 'books in the royal library', namely those scrolls that survived the first burning, that 'if those books are in agreement with the Quran, we have no need of them; and if these are opposed to the Quran, destroy them.' In some way or another the, during this period of Muslim-run

Alexandria, the Khnum creation of humans from clay theory found its way in to the Qur'an as the standard explanation for human origins.

According to 630AD *Qur'an* , the god Allah created man from clay by shaping clay into human form and breathing a spirit into him: [5]

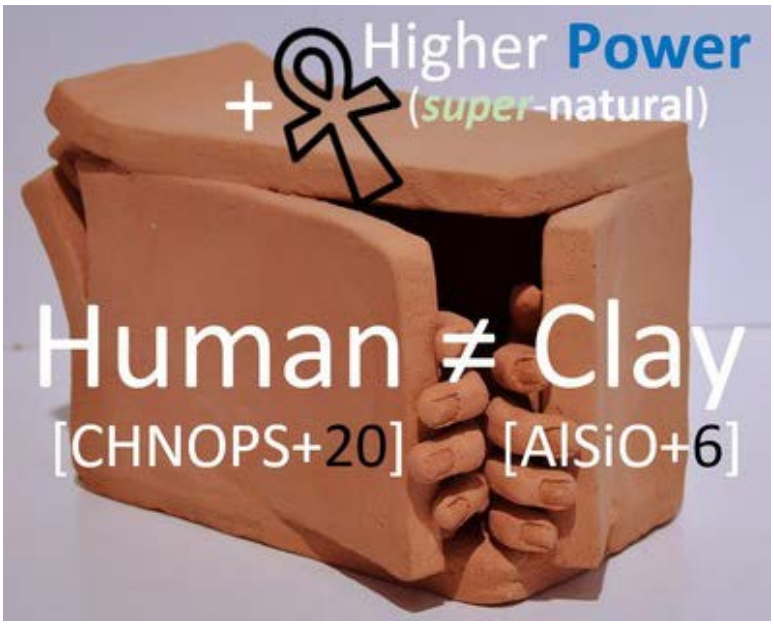

A rendition of discernment, first pointed out by Alfred Lotka (1925), that chemically speaking, according to elemental composition, humans, as CHNOPS+20 entities, are not made of "clay", which is a AlSiO+6 type of matter, and that the **clay creation myth** of humans is but ancient mythological "poetry", i.e. religio-mythology.

> "We created man from **sounding clay**, from mud moulded into shape [altered black mud]."
>
> — Surah 15:26 (Ñº)(Ñº)

> "We created man from the 'essence' (Ñº) [Ø³Ù Ù„ÙŽØ§Ù„ÙŽØ©Ù] [strain, quintessence, extract, parentage] **of clay**; we made out of that lump bones and clothed the bones with flesh; then we developed out of it another creature [woman]."
>
> — Surah 23:12-14 (Ñº)(Ñº)(Ñº)

> "Who perfected everything which He created and began the creation of man **from clay**."
>
> — Surah 32:7 (Ñº)

> "Then inquire of them: Is it they who are stronger in structure or other things We have created? We created them from **sticky clay**."
>
> — Surah 37:11 (Ñº)

> "I am going to create a human being out of **clay**. When I have formed him and breathed My Spirit into him, fall down in prostration to him!"
>
> — Surah 38:71-72 (Ñº)

> "He it is who created you **from dust**, then from a sperm-drop, then from a leech-like clot, then brings you forth as a child."
>
> — Surah 40:67 (Ñº)

A number (Ñº) of confusions and contradictions in the Quran, as pertains to what man was created out of (congealed blood [§96:1-2], water [§25:45], clay [§15:26], mud [§15:26], dust [§30:20], sperm drop [§40:67], drop of clot [§23:12-14]). The

following is a general recipe on how to make a human according to the Quran:

1. Add: blood, clay, sperm, water, mud, and dust
2. Shake well
3. Mold into shape of human [§15:26]
4. Place it as in a safe lodging [§23:12-14]
5. Breath a created soul into it [§38:72]

(add discussion)

Hinduism

In Hinduism, Brahma, the Hindu version of Abraham, creates human beings and all life. All different species come out from different parts of Brahma's body. He created man as the first of the animals and the strongest. He created him from his own soul. One of the stories mentions that Brahma splits himself (see: soul mate) into two to create male and female. In other texts the Prajapati (a group of deities), the sons of Brahma, are said to be creating all living beings, both gods and mortal creatures. (Ñº) As Brahma, an accordingly Abraham, are clay-based (or earth-based) conceptions, i.e. Ra (sun) born out of the Nun (land mound) following the flood (water), the clay-creation of humans is implicit in this version of creation.

Golem

A artistic rendition of a golem, by Philippe Semeria (1999), shown adjacent, the Hebrew version of human origins according to the mystical book *Kabbalah*, according to which a living human is made by shaping clay into the form a human, putting the word *emeth* (truth) on its forehead, and hovering the *shem-ha-mephorash* (YHWH) over it; to reverse the process, and return the golem to lifeless clay, the first character of *emeth* is erased to leave *meth*, Hebrew for 'dead'. [11]

A **golem**, the Hebrew-Kabbalah version of the clay creation myth; the golem legend held sway up through the Holocaust (1945), many believing in the golem as the guardian of the Jews in the ghetto. [11]

Other derivatives

â— Mayan myth holds that Tepeu and Kukulkán (Quetzalcoatl) made the first humans from clay, but they were unsatisfactory.
â— The MÄ ori people of New Zealand believe that TÄ ne Mahuta, god of the forest, created the first woman out of clay and breathed life into her.
â— In Akkadian literature, the creation from clay model is the dominant image of the origin of man.
â— In Africa, the Yoruba culture holds that the god Obatala likewise created the human race.
â— In Chinese myth, the goddess Nuwa created the first humans from mud and clay.

Philosophical implications

The premise of humans deriving from clay, dirt, dust, and or mud, depending on description, has deep philosophical implications, particularly when it comes to questions of purpose or meaning. The following, below (left), shows a 2010 tattoo saying "lucky me, lucky mud", on a young women's back, which is a truncated meaning of the a discussion between God and mud, below (right), in American writer Kurt Vonnegut's 1963 *Cat's Cradle*, on purpose in the context of the creation by clay myth as it is known to most Abrahamic faiths as the Adam and Eve story as told in the story of Genesis; a section of which is shown below: [14]

And God said, "Let Us make living creatures out of mud, so the mud can see what We have done." And God created every living creature that now moveth, and one was man. Mud as man alone could speak. God leaned close as mud as man sat up, looked around, and spoke. Man blinked. "What is the *purpose* of all this?" he asked politely.

"Everything must have a purpose?" asked God.

"Certainly," said man.

"Then I leave it to you to think of one for all this," said God. And He went away.

(add discussion)

See also

â— Soul mate

References

1. Khnum – Wikipedia.
2. The creation of man from clay (Prometheus section) – Wikipedia.
3. Ubbelohde, Alfred René. (1954). *Man and Energy. Illustrated* (ch. 8: life and thermodynamics, pgs. 183-200). Hutchinson's Scientific & Technical Publications.
4. Human clay – Wikipedia.
5. Muhammad. (630AD). *Qur'an* (38:71-72) (37:11) (23:12-15). Publisher.
6. Five Authors. (500BC). *Five Books of Moses* (*Genesis* 2:7). Publisher.
7. Segal, Alan F. (2004). *Life after Death: a History of the Afterlife in the Religions of the West* (pg. 73). Random House.

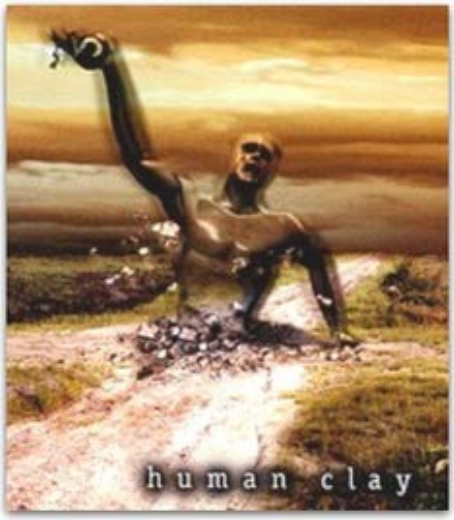

Left: A 1999 artistic rendition of the creation from clay theory of the origin of humans. [4] Right: A creation science conference cartoon, making a parody of the **clay creation myth**, i.e. that god created man from clay, dust, or dirt, and breathed life (or spirit) into it, and the, god created woman from Adam's rib, which has its origins in a mixture (a) Egyptian god Khnum's circa 2600BC making man and women from splitting a ball of clay in two and (b) Plato's circa 380 story, voice of Aristophanes, in his *Symposium*, of Zeus splitting the once joined (at the back) paired human in two, thereafter becoming soul mates.

8. Fenkl, Heinz I. (1997). "Of Men and Mud", *Realms of Fantasy*.
9. Greenberg, Gary. (2000). *101 Myths of the Bible* (Myth #18: Adam and Eve were the first Humans, pgs. 43-45). Source Books, Inc.
10. (a) Lichtheim, Miriam. (1980). *Ancient Egyptian Literature: the Late Period* (Hymns to Khnum, pgs. 109-15). University of California Press.
(b) History of Ptolemaic Egypt – Wikipedia.
11. (a) Golem – Wikipedia.
(b) Ball, Philip. (2011). *Unnatural: the Heretical Idea of Making People* (pg. 148-50). Vintage Books.
12. (a) Walton, John H., Cornelius, Izak., et. al. (2009). (pg. 266). *Zondervan Illustrated Bible Backgrounds Commentary*. Zondervan.
(b) Khnum, at the Temple of Khnum, Esna, forming the pharaoh from clay on his potter's wheel (photos: by Brian J.

McMorrow).
13. Remler, Pat. (2010). *Egyptian Mythology, A to Z* (pgs. 104-05). Infobase Publishing.
14. (a) Vonnegut, Kurt. (1963). *Cat's Cradle* (pg. 265). RosettaBooks, 2002.
(b) Lucky me, luck mud (2010) – Blog.PassionTask.com.

Further reading

â— Leeming, David A, and Leeming, Margaret A. (1994). *Encyclopedia of Creation Myths* (creation by clay, 40+ pgs). ABC-CLIO.
â— Pinch, Geraldine. (2004). *Egyptian Mythology: a Guide to the Gods, Goddess, and Traditions of Ancient Egypt* (§:Creation of Humanity, pgs. 66-68). Oxford University Press.

External links

â— Creation of man from clay – Wikipedia.
â— Creation of humans from clay – WikiIslam.
â— Esna Temple – AncientEtyptONline.co.uk.
â— Cameron, Kirk. (2013). "Creation of Humans from Dirt" (clay creation myth), in: "Unstoppable" (clip), YouTube.

θΔics

In theories, **clay substrate theory** refers to the conjecture that life originated (see: origin of life) when organic-like molecules became activated or form-shaped on some type of clay substrate or clay crystal.

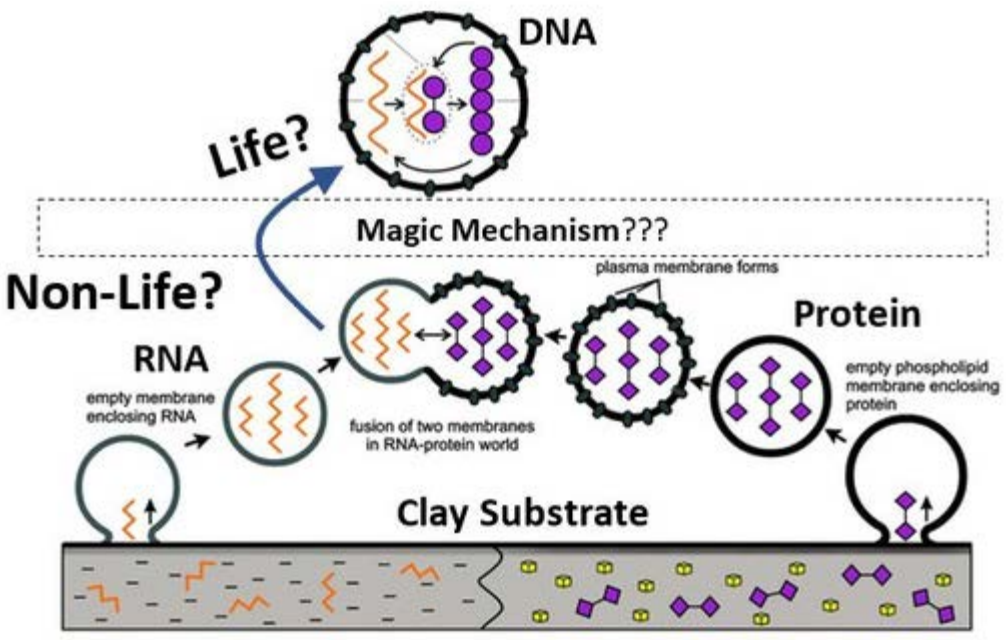

A parody remake of this image version (Ñº) of the **clay substrate theory** combined with the hydrothermal vent theory origin of life.

Clay creation myth

The clay substrate theory itself, in an oft-uncited manner, has thematic connection to the religious clay creation myth origin of life, and hence is pleasing to those who would like to find compatibility between science and religion; although this is rarely stated explicitly.

Overview

In 1948, John Bernal discussed the theory. [1]

In 1970, Aharon Katchalsky discussed the possibility of the theory. [1]

In 1985, Graham Smith, in his *Seven Clues to the Origin of Life*, posted that life might have started in respect to self-replication of clay crystals allowed other molecules to become catalyzed by the surface properties of silicates, or something along these lines. [2]

Defunct

In 2009, the clay substrate theory, as the origin of life, was usurped, predominately by Libb Thims, by the abioism view of the molecular evolution table, namely that there is no "life origin point", but rather that the carbon atom has the property of light-induced animation, and that "animate things", e.g. walking molecules, gradually formed over time, as Carnot cycles of daily solar heat input worked the surface of the earth, over 4.5-million years.

References

1. Katchalsky, Aharon. (1971). “Thermodynamics of Flow and Biological Organization” (abs)(Ñº) (clay substrate, pgs. 119-20), *Zygon*, 6(2):99-125.
2. Clay hypothesis (section) – Wikipedia.

θΔics

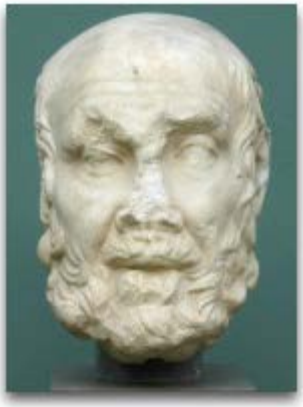

In existographies, **Cleanthes** (c.330-230BC) (IQ:165|#469) was a Greek stoic philosopher, student of Zeno of Citium (see: Greek philosophy), mentor to Chrysippus (279-206BC), noted for developing, with the addition of this "tension" theory of matter, the basic the tenets of so-called "stoic physics".

Stoicism

In 262, Cleanthes, following the passing of Zeno, became the head of the stoic school; he was succeeded by Chrysippus (279-206BC).

Cleanthes, penned some 50 works, on fragments of which survived, wherein, supposedly, he upgraded Stoic materialism, via his introduction of "tension" (tonos), which distinguished matter from being dead and inert; also outlined some type of pantheism, according to which the sun was divine, and had some type of divine fire which animated "living things", or something to this effect; he argued that the soul was a material substance, that survived death, but that the intensity of its existence would vary according to the strength or weakness of the particular soul.

Other

Cleanthes is said to be the teacher of the stoic philosopher character "Balbus" in Cicero's three person dialogued *The Nature of the Gods* (45BC); as well as later being the "deist philosopher" character "Cleanthes" in David Hume's *Dialogues Concerning Natural Religion* (c.1750).

Quotes | On

The following are quotes on Cleanthes:

> "Anaximander stated that the earth was like a column, Leucippus, a cylinder or war drum; **Cleanthes**, a cone or top; Heraclitus, a boat-shaped vessel; Democritus, a concave disc; Anaximenes and Empedocles, etc., a level table."
>
> — Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* (pg. 3) [1]

> "An essential part of the stoic theory of sense perception is the hypothesis that there exists a center of perception and consciousness, named the 'hegemonikon' or 'ruling part of the soul', which is located in a defined part of the body; most stoics identified it with the heart, which is in control of the five sensor organs, the generative part of the body, and the faculty of speech. Every stimulus from outside is conducted from the specific sense organ excited by it to the hegemonikon, which centralizes and co-ordinates the various impressions, elevates them into consciousness and then releases the impulse reacting to the sensation. The stoics regarded the movement of the pneuma as some sort of propagation of state. One of them, the 'seven parts of the soul', growing out of the hegemonikon and extending throughout the body are compared to the tentacles of an octopus. **Cleanthes** defined walking, as in choosing a particular instance of an activity directed by the mind, as pneuma emitted from the hegemonikon to the feet, whereas his disciple Chrysippus maintained that it is the hegemonikon itself which reaches the feet.
>
> — Samuel Sambursky (1959), *Physics of the Stoics* [2]

Quotes | By

The following are quotes by Cleanthes:

> "The fates guide the person who accepts them, and hinder the person who resists them."
>
> — Cleanthes (c.290BC) (Ñº)

References

1. Guericke, Otto and Schott, Kaspar. (1672). *Otto Guericke's New Experiments: on (as they are called) on the Magdeburg vacuum space* (*Ottonis De Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (15+ diagrams, various pages) (preface, pdf) (pg. xvii). Janssonius a Waesberge.
2. Sambursky, Samuel. (1959). *The Physics of the Stoics* (pgs. 22-24). Princeton University Press, 2014.

External links

â— Cleanthes – Wikipedia.

θΔics

In science, **clepsydra**, aka a “decanting vessel” (Grant, 1981), refers to []

Quotes

The following are related quotes:

> “In the medieval literature on nature’s ‘abhorrence of a vacuum’, the two most popular demonstrations were the **clepsydra** and the separation of two plane surface.”
>
> — Edward Grant (1981), *Much Ado About Nothing* [2]

> “The **clepsydra**, basically a decanting vessel, is characterized by a narrow, open neck and wide body with small holes at the bottom, which is the part first submerged into the liquid to be decanted, usually water or wine. When all the air in the vessel is expelled and released by the incoming rising water, the narrow orifice at the top is stopped up, usually by covering it with the thumb. Upon lifting the vessel from the water, one observes that the water remains in the now elevated clepsydra despite the expectation that it would fall through the tiny holes at the bottom. Already in the first half of the twelfth century, Adelard of Bath had not only described the clepsydra without naming it, but also attributed its seemingly 'magical behavior' to a natural 'affection' existing among the four elements that constituted the universe, an affection so powerful 'that as soon as one of them leaves its position, another immediately takes its place; nor is this again able to leave its position, until another which it regards with special affection is able to succeed it'.”
>
> — Edward Grant (1981), *Much Ado About Nothing* [2]

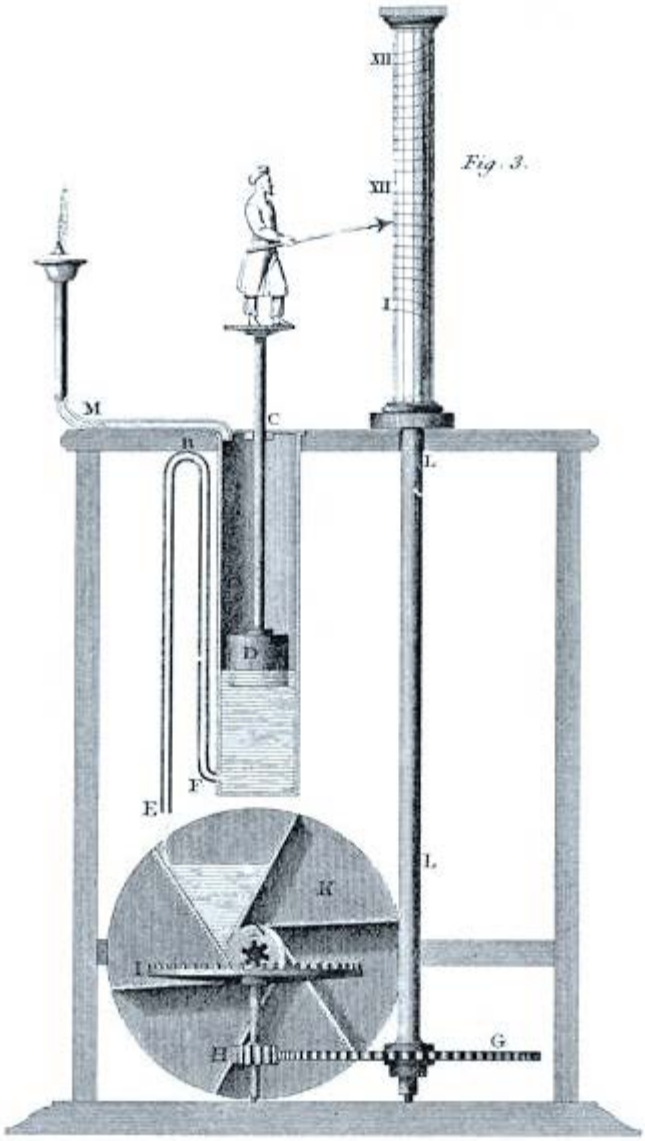

Image of “**clepsydra**” (Q); a presumed variation of one invented, supposedly, by Ctesibius (c.c.250BC).

References

1. Grant, Edward. (1981). *Much Ado About Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution* (clepsydra, 7+ pgs, quote, pg. 83). Cambridge.

External links

- Water clock (Clepsydra) – Wikipedia.

θΔics

In existographies, **Clifford Pickover** (1957-) (CR:15) is an American molecular biophysicist, science writer, and genius studies scholar, noted for []

Overview

In 1998, Pickover, in his *Strange Brains and Genius*, seems to have been one of the first to comment on the correlation between milk and genius. [1]

In 2008, Pickover, in his *Archimedes to Hawking*, wrote about Gibbs on Clausius, among other topics. [2]

Twitter

Pickover notably tweets Hmolpedia articles he finds interesting, e.g. greatest physicist ever (16 Aug 2015) (Q), great chain of being (20 Dec 2015) (Q), to name two; the latter was tweeted with the following existence equation (see also: equation of love):

> Polymerization + Love = You

as follows:

A 2012 photo (Q) of Pickover's writing loft.

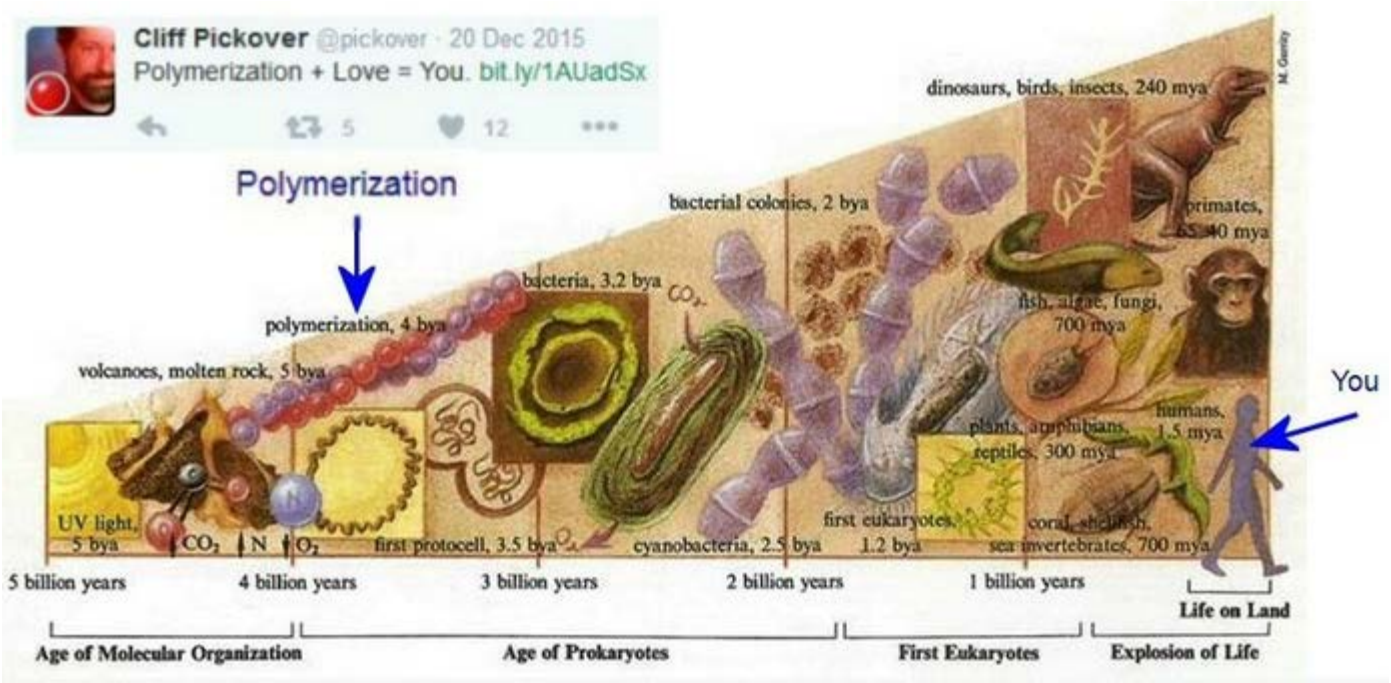

(add discussion)

Education

In circa 1978, Pickover completed undergraduate degree in something Franklin and Marshall College, graduating valedictorian, and in 1982 completed a PhD in molecular biophysics, with a dissertation on x-ray scattering and protein structure, at Yale.

References

1. Pickover, Clifford. (1998). *Strange Brains and Genius: the Secret Lives of Eccentric Scientist and Madmen*. New York: Quill.
2. Pickover, Clifford A. (2008). *Archimedes to Hawking* (pg. 339). Oxford University Press.

External links

- Clifford Pickover – Wikipedia.
- Cliff Pickover – Twitter.

θΔics

In thermodynamics, **Clifford Ambrose Truesdell III** (1919-2000) was an American mathematician noted for his 1969 *Rational Thermodynamics* and predominately for his 1980 *Tragicomical History of Thermodynamics*. [1]

Rational thermodynamics

In 1952, Truesdell, in a footnote, stated the following: [2]

> "The rational student must cleave the stinging fog of pseudo-philosophical mysticism which hides this statement [of the second law] in the usual physical treatments."

This view may be from whence the subject of 'rational thermodynamics' stems in premise, of which Truesdell seems to be the creator. [4] Truesdell is also noted for his summary of the thermodynamic views of French marine engineer Ferdinand Reech (1805-1884) (or Frederick or Frédéric). [5]

Education

Truesdell completed a BS in mathematics, BS in physics, and MS in 1933, in mathematics, each at California Institute of Technology, and his PhD in mathematics from Princeton University in 1934. [2] Truesdell was a one-time mentor to German physicist Ingo Muller, author of the 2007 *History of Thermodynamics*. [3]

Quotes

The following are related quotes:

> "I hesitate to use the terms 'first law' and 'second law', because there are almost as many 'first laws' as there are thermodynamicists, and I have been told by these people for so many years that I disobey their laws that now I prefer to exult in my criminal status and non-condemning names to the concrete mathematical axioms I wish to use in my outlaw studies of heat and temperature. The term 'entropy' seems superfluous, also, since it suggest nothing to ordinary persons and only intense headaches to those who have studied thermodynamics but have not given in and joined the professionals."
>
> — Clifford Truesdell (1969), *Rational Thermodynamics* (pg. 11)

> "The second new line of thought was initiated by Gibbs (1873, 1875/1878). This shy and exotic newcomer found himself before the altar of a goddess far from virgin, her morals eroded by callous abuse and her territory shrunk by the timorosity of her champions. There were two easy possibilities: to set out on a campaign to rejuvenate the goddess and re-conquer her lost dominions, or to make her an honest old lady in a safe and clean cottage. Gibbs chose neither. Perceiving that results like those obtained in the thermodynamics of processes in bodies of especially simple material ought hold also for all bodies in equilibrium, he created a pure statics of the effects of temperature and heat. Accepting the restrictions Clausius had imposed one by one in his years of retreat from irreversible processes, Gibbs recognizes the subject in its starved and shrunken form as being no longer the theory of motion and heat interacting, no longer thermodynamics, but only the beginnings of thermostatics. It is Gibbs' singular merit to have seen the essence of this thermostatics: a variational definition of equilibrium, including its stabilities and instabilities, in which infinitely many putative equilibria are compared, and variational criteria are imposed to select from this class of fields that which, for a given caloric equation of state, corresponds to actual equilibrium, namely that field of fixed total energy which renders the total entropy a maximum. A competitor is not required to obey "equations of state" and need not be the outcome of any process undergone by the body in question."
>
> — Clifford Truesdell (1969), *Rational Thermodynamics* (pg. 20) (Ñº)

“Thermodynamics is the kingdom of deltas.”

— Clifford Truesdell (1980), *The Tragicomical History of Thermodynamics* [7]

References

1. (a) Truesdell, Clifford A. (1969). *Rational Thermodynamics: A Course of Lectures on Selected Topics.* Springer-Verlag.
(b) Truesdell, Clifford A. (1980). *The Tragicomical History of Thermodynamics, 1822-1854.* Springer.
2. Coleman, Bernard D. (2003). “Memories of Clifford Truesdell.” *Volume of Journalf of Elasticity*, Feb.
3. Muller, Ingo. (2007). *A History of Thermodynamics: the Doctrine of Energy and Entropy* (Rational thermodynamics, pgs. 250-54, Truesdell, pg. 154). Springer.
4. Maugin, Gerard A. (1999). *The Thermomechanics of Nonlinear Irreversible Behaviors* (rational thermodynamics, pgs. 9-10, etc). World Scientific.
5. Truesdell, Clifford A. and Bharatha, Subramanyam. (1978). *The Concepts of Logic of Classical Thermodynamics as a Theory of Heat Engines: Rigorously Constructed upon the Foundation Laid by S. Carnot and F. Reech (Theoretical and Mathematical Physics)* (Reech, 25+ pgs). Springer.
6. (a) Truesdell, Clifford A. (1969). *Rational Thermodynamics: A Course of Lectures on Selected Topics* (pg. 11). Springer-Verlag.
(b) Gal-Or, Benjamin. (1974). *Modern Developments in Thermodynamics: an Interdisciplinary Collective Treatise* (§: Thought-Provoking and Thought-Depressing Quotations” (43 quotes selected by B. Gal-Or), pgs. 435-42). Wiley.
7. Truesdell, Clifford A. (1980). *The Tragicomical History of Thermodynamics, 1822-1854.* Springer.

External links

â— Clifford Truesdell – Wikipedia.

θΔics

In thermodynamics, **Clinton D. Stoner** (1933-) is an American physical scientist noted for his 2000 article "Inquiries into the Nature of Free Energy and Entropy in Respect to Biochemical Thermodynamics" on the subject of free energy changes in biochemical thermodynamics. [1]

Education

Stoner graduated from South Dakota State University, 1957 (BS), 1960 (MS) and then University of Illinois, 1964 (Ph.D). Faculty member at Ohio State University, 1965-present (Research: Biochemistry, Physical Chemistry, Physics). [2] In 2011, Stoner was working for several year on a paper entitled “What Photons Must Look Like.”

References

1. Stoner, Clinton D. (2000). "Inquiries into the Nature of Free Energy and Entropy in Respect to Biochemical Thermodynamics." *Entropy* 2 (3) pgs. 106-141.
2. Clinton D. Stoner – Facebook.

Further reading

â— Stoner, Clinton D. (1992). “An Investigation of the Relationships between Rate and Driving Force in Simple Uncatalysed and Enzyme-Catalysed Reactions with Applications of the Findings to Chemiosmotic Reactions.” *Biochem. J. 283*, 541-552.

θΔics

In hmolscience, **Clio Cresswell** (c.1972-) (CR:2) is an English-born (O) Australian mathematician noted for her 2003 work on the human mathematics of marriages.

Overview

In 2003, Cresswell published *Mathematics and* Sex , which seemingly attempted to ferret an outline of what she referred to as the **mathematics of love**, along with a subject she calls "sexual mathematics"; the abstract is as follows: [1]

> "Mathematics and sex may make odd bedfellows, but this fun, flirty look at the relationship between the two subjects shows that they are closely related. Revealing the ways in which math can help unlock the secrets of love, lust, and life's search for the ideal partner, this intriguing text covers topics such as dating services, dating as game theory, the mathematical logic of affairs, and the numbers behind orgasms. Math's answers to love's burning questions: How much should one compromise in a relationship? Exactly what is it that is attractive in a lover? How many partners should one have before settling down? and What makes the infamous biological clock tick? are also revealed."

In 2009, Cresswell was being cited for having published a theory of the mathematics of love and or sex, claiming that singles can increase their chances of finding true love by rejecting at least 12 potential partners before settling down. [2]

In 2014, Cresswell, in her "Mathematics and Sex" Tedx Sydney talk, stated that the following two equations model a successful marriage: [3]

$$W_{t+1} = a + r_1 W_t + I_{HW}(H_t)$$
$$H_{t+1} = b + r_2 H_t + I_{WH}(W_t)$$

where W stands for wife, H for husband, about which she says the following:

> "These are very sophisticated equations that model a successful marriage. They're ground breaking equations, because it was the first time that truly sophisticated mathematics was used in the field of romance."

Here, we not only see intellectual ineptitude, in respect to communication, e.g. "sophisticated" is used twice in the same sentence (as though there were unsophisticated equations that modeled successful marriages), but also an attempt at over-zealousness, specifically she fails to recognize an historical precedence to her subject matter, one of the earliest examples being William Rankine's 1845 love equation, shown below, from his "The Mathematician in Love":

$$L = \phi(x, y, z) = \iiint \frac{f(x, y, z)}{\sqrt{(\xi - x)^2 + (\eta - y)^2 + (\zeta - z)^2}} \, d\xi \, d\eta \, d\zeta.$$

Let x denote beauty, y manners well-bred,
z fortune (this last is essential),
Let L stand for love—our philosopher said—
Then L is a function of x, y and z
Of the kind that is known as potential.

Now integrate L with respect to dt
(t standing for time and persuasion)
Then, between proper limits, 'tis easy to see
The definite integral Marriage must be
(A very concise demonstration).*

which is far more "sophisticated" than Cresswell's dabblings. She also fails to mention modern pioneers, e.g. Steven Strogatz (1998), John Gottman (1994), or Helen Fisher (1994).

Education

In 1999, Cresswell completed her PhD in mathematics with a dissertation on "The discrete Painlevé equations: hierarchies, Bäcklund transformations and singularity confinement", at the University of South Wales.

References

1. Cresswell, Clio. (2003). *Mathematics and Sex*. Allen & Unwin.
2. Browne, Rachel. (2009). "The Mathematical Formula for Love", *Stuff.co.nz*, Aug 25.
3. Cresswell, Clio. (2014). "Mathematics and Sex" (Q), Tedx Sydney, Jun 10.

External links

- Clio Cresswell (faculty) – University of Sydney.
- Cresswell, Clio – WorldCat Identities.

θΔics

In thermodynamics, **close to equilibrium** or near equilibrium are processes quantified by the following condition:

$$\Delta G \ll 1.5 kJ/mol$$

signifying a negative Gibbs free energy change ΔG much less than 1.5 kilo-joules per mol. [1] The name near equilibrium thermodynamics is sometimes used as the branch of thermodynamics that studies these types of processes.

References

1. Ernster, Lars. (1984). *Bioenergetics* (ch. 1: Thermodynamic Aspects of Bioenergetics, pgs. 1-10, by Karel van Dam and Hans V. Westerhoff). Elsevier.

θΔics

In thermodynamics, **closed** refers to a system in which energy, in the form of work or heat, but not matter, may pass or be exchanged, through the boundary, with its surroundings. [1]

Overview

A "closed system", in short, can only have an "energy" interaction with its surroundings.

See also

- Open
- Isolated

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics* (pg. 42). Oxford: Oxford University Press.

θΔics

In thermodynamics, **closed system** refers to a "system" that is "closed", meaning that it has a boundary that is "closed off" to the passage of matter, but not to energy, e.g. in the form of pressure boundary work or heat. [1]

Quotes

The following are related quotes:

> "As to the scarcity of matter in a **closed system**, such as the earth, the issue may, in my opinion, prove in the end more critical than that of energy."
>
> — Nicholas Roegen (1979), "Comments on the Papers by Daly and Stiglitz" (pgs. 98-99); cited by Julian Simon (1981) in *The Ultimate Resource 2* (pg. 79) [2]

> "The concept of 'entropy' is unquestionably valid and relevant for a closed container in the laboratory. It may also be relevant for any larger entity that can reasonably be considered a **closed system**. But it is quite *unclear* where the boundary should be drawn for discussions of the quantity of energy, or if there is any relevant boundary. It is clearly wrong to say that 'as to the scarcity of matter in a closed system, such as the earth, the issue may, in my opinion, prove in the end more critical than that of energy' (Roegen, 1979): the earth is NOT a closed system because both energy (from the sun) and matter (cosmic dust, asteroids, debris from many planets) constantly rain down on the earth. Perhaps the solar system will prove to be an isolated system for some period in the future, conceivably for the entire life of the human species. But even then, it will last perhaps seven billion years. And the chances would seem excellent that during that span of time humans will be in touch with other solar systems, or will find ways to convert the matter on other planets into the energy we need to continue longer. So, with respect to energy there is no practical 'boundary' surrounding any [economic] unit of interest to us. And without such a boundary, the notion of entropy in the large is entirely irrelevant to us."
>
> — Julian Simon (1981), *The Ultimate Resource 2* (pg. 79) [3]

See also

â— Open system
â— Isolated system

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics* (pg. 42). Oxford: Oxford University Press.
2. (a) Roegen, Nicholas. (1979). "Comments on the Papers by Daly and Stiglitz", in: *Scarcity and Growth Revisited* (editor: Kerry Smith) (pgs. 95-105). Johns Hopkins.
(b) Simon, Julian L. (1981). *The Ultimate Resource 2* (§4: Grand Theory (txt), pgs. 77-83; quote, pg. 79) (txt) . Princeton University Press, 1996.
3. Simon, Julian L. (1981). *The Ultimate Resource 2* (§4: Grand Theory (txt), pgs. 77-83; quote, pg. 79) (txt) . Princeton University Press, 1996.

External links

â— Closed system – Wikipedia.

θΔics

In atheism types, **closet atheism** refers to individuals possessing a lack of belief in the existence of god or gods, i.e. unbelievers, but who, per reasons of aversion to social opprobrium, fear of familial or occupational repercussions, or per state established legalities, do not openly admit as such, nor publicly classify their personhood by the label "atheist", in any of its terminological variants.

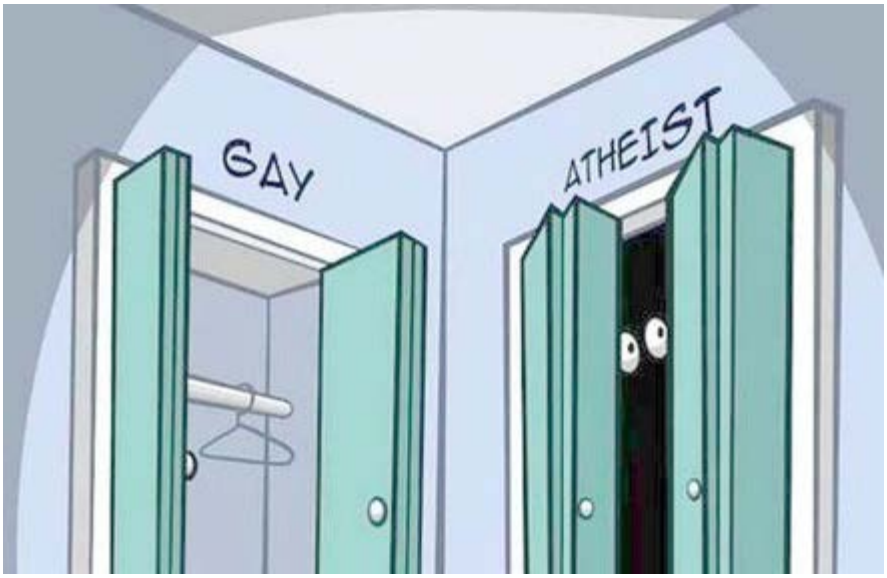

A Reddit image, depicting "**closet atheism**" as compared to "closet homosexuality", the latter of which is publicly an "open" and an accepted status presently, from a 2015 thread post (Ñº) "Who is in the closet?".

Quotes

The following are related quotes:

> "How comes it, then, that Laplace was an atheist? At the Institute neither he nor Monge, nor Berthollet, nor Lagrange believed in god. But they **do not like to say so**."
>
> — Napoleon Bonaparte (c.1814), dialogue with Gaspard Gourgaud

> "If we need an atheist for a debate, I go to the philosophy department. The physics department isn't much use."
>
> — Robert Griffiths (1987) [1]

> "At the University of California, Berkeley, where I was a professor for 18 years, we had 50 chemistry professors. But for many years there was only who was willing to **publicly identify** himself as an atheist, my good friend Robert Harris. A more recent addition to the Berkeley chemistry faculty is a second open atheist, Richard Saykally."
>
> — Henry Schaefer (2003), *Science and Christianity: Conflict or Coherence?* [2]

> "We are living in a totally ridiculous world. We have all kinds of things from horoscopes to Zen Buddhism to faith healers to religions to what have you. The whole world around us is full of nonsense, baloney, big speak and what have you. The fact that I'm busy in science has little or nothing to do with religion. In fact, I protect myself, I don't want to have to do with religion. Because once I start with that, I don't know where it will end. But probably I will be **burned** or **shot** or something in the end. I don't want anything to do with it. I talk about things I can observe and other things I can predict and for the rest you can have it."
>
> — Martinus Veltman (2004) interview (Ñº) with Harold Kroto (quote, 10:05-) (Ñº)

> "**Closet atheism**, take it from me, is one of the most comfortable positions for one's psyche in America. No quarrels, no arguments, especially with the immediate family, and one gets along fine with bosses, other acquaintances and the larger society. After all, buttonholed at a cocktail party, it's much more chic to proclaim one is an "agnostic" than an atheist! The **term agnostic carries within it a kind of detached, above-it-all wisdom**, rather than the total capitulation to feigned ignorance truly at its core. In my **closet years**, up until I went public in the article "My Path to Atheism" (1992), life was fine. I got on famously with my parents, and experienced no problems at work or in the larger community. The publication of the

article changed all that, especially with my family."

— Philip Stahl (2007), *Atheism: a Beginner's Handbook* (§3: The Downsides of Closet Atheism) [4]

References

1. (a) Griffiths, Robert. (1987). "Article", *Christianity Today*, Apr 3.
(b) Schaefer, Henry F. (2003). *Science and Christianity: Conflict or Coherence?* (debate, pg. 26; Harris, pg. 77). The Apollos Trust.
2. (a) Schaefer, Henry F. (2003). *Science and Christianity: Conflict or Coherence?* (debate, pg. 26; Harris, pg. 77). The Apollos Trust.
(b) Roberg A. Harris (faculty) – UC Berkeley.
(c) Richard Saykally (faculty) – UC Berkeley.
2. (a) Stahl, Philip A. (1992). "My Path to Atheism", *The American Atheism Magazine*, Jun.
(b) Stahl, Philip A. (2007). *Atheism: a Beginner's Handbook – All You Wanted to Know About Atheism and Why* (§3: The Downsides of Closet Atheism, pgs. 112-). iUniverse.

External links

â— Closet atheism – Conservapedia.

θΔics

In biographies, **Marian "Clover" Hooper Adams** (1843-1885), born Marian Hooper, was an American socialite, from a wealthy Bostonian family, who in 1872 became the wife of American physical humanities historian Henry Adams and who on 6 Dec 1885 died (dereacted) by her own hand (suicide) via potassium cyanide ingestion exactly one year to the date that Henry had secretly declared his love, in letter and poem, to another women (Elizabeth Cameron) and eight months after Henry had consoled to Clover in letter that his daily study was the new subject that he called "social chemistry", which he defined as the mutual attraction of "equivalent" human molecules, and that it was his "only satisfaction in life".

Overview | Depression

Clover seems to have had a death wish (see also: death drive), or desire to die by her own hand before she went insane, as she believed would eventually happen to herself.

Suicide seems to have run in her family. Both Clover's mother, Ellen Sturgis Hooper, and Grandmother Sturgis had a tendency toward depression. As a child, Clover was present when her aunt, Susan Sturgis Bigelow, had taken arsenic that ended her life and that of her unborn child. [4]

Clover was five when her mother died of tuberculosis. Her subsequent affection for and life-imbibing attachment to her father, Dr. Robert Hooper, remained throughout her marriage. As girls, Clover and her sister Ellen had accompanied their father on his charitable professional visits to Worcester Asylum for the mentally ill, so they were aware of the terrors that lay within those walls. In subsequent letters, they revealed their vulnerabilities and fears of confinement in these institutions. Clover's letters also make it clear that she regarded suicide as preferable to becoming a burden for family or friends, and confinement would be avoided. She had once remarked on learning of the suicide of William Morris Hunt, who had painted a portrait of Henry's father, "He has put an end to his wild, restless, unhappy life. Perhaps it has saved him years of insanity which his temperament pointed to." [5]

On 27 Jun 1872, Clover married Henry Adams, in Beverly, Massachusetts, and spent their honeymoon in and around Europe; during which time, in her first long separation from her father, when Clover was on her honeymoon along the Nile, she apparently suffered a brief nervous breakdown. [2] The following are third party perspective quotes relevant to the reaction path that Clover seems to have been on:

> "Heavens! – No – they're crazy as coots. She'll kill herself like her aunt!"
>
> — Charles Adams (c.1871), comment to his younger brother Henry upon hearing about his intended betrothal [6]

> "My dear, I dislike auctions very much, but I mean to go to yours after you die."
>
> — Elizabeth Bliss Bancroft (c.1880), comment to Clover [1]

Cameron | Equivalent human molecules

In Jan 1881, Henry Adams met American a 24-year-old Elizabeth Cameron, for the first time, in the drawing room of the house of John Hay can Clara Hay. [1] On 19 May 1883, when Cameron and her husband departed for Europe, Adams initiated a correspondence with Cameron, expressing unhappiness with her departure and his

longing for her return.

On 7 Dec 1884, *exactly* one year before the suicide of Clover Adams, Henry Adams wrote to Cameron:

> "I shall dedicate my next poem to you. I shall have you carved over the arch of my stone doorway. I shall publish your volume of extracts with your portrait on the title page. None of these methods can fully express the extent to which I am yours."

On 12 Apr 1885, Adams, while on an extended work stay-over in Washington, wrote Clover the following:

> "Social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life."

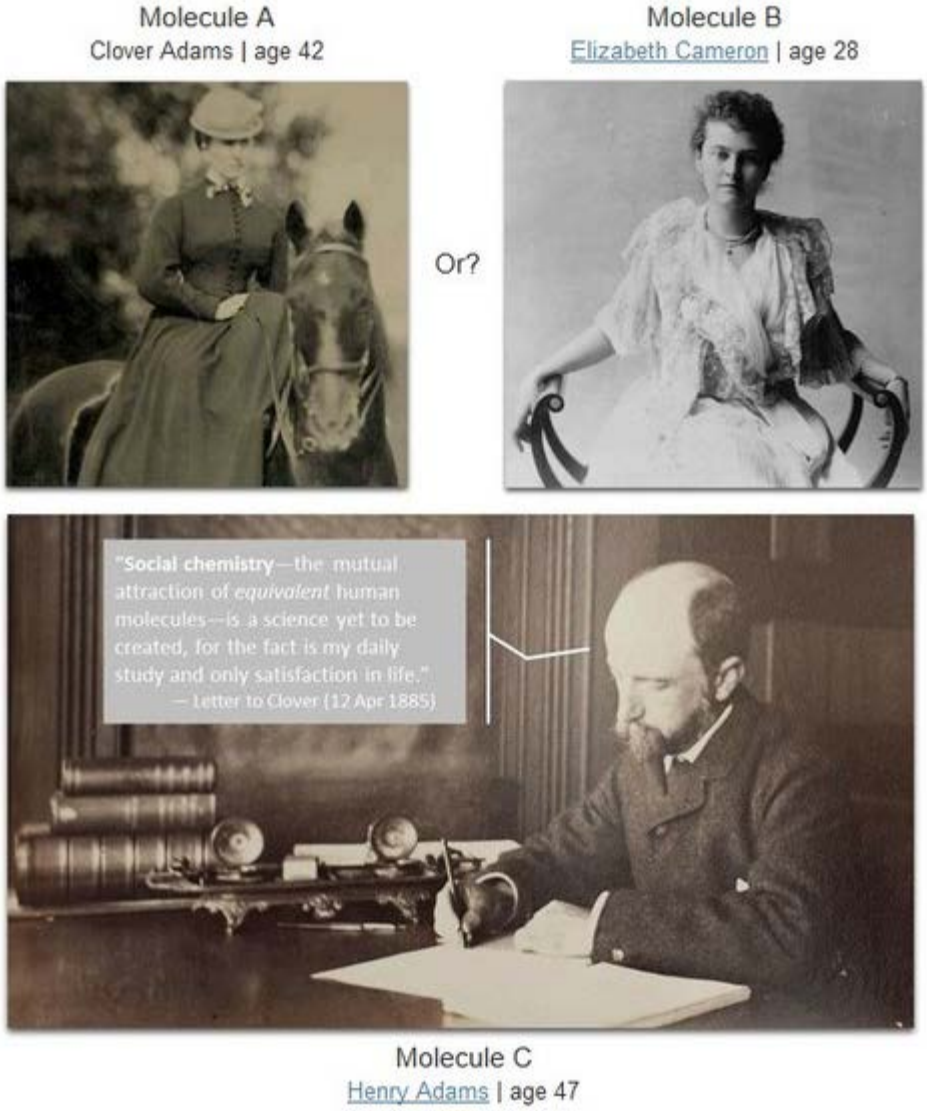

A depiction of the so-called "Henry Adams love triangle" (see: love thought experiment), in 1885, wherein, seemingly, the introduction of molecule B (Elizabeth Cameron), into the reaction system of Henry Adams, seems to have worked to precipitate the dissolution or detachment of molecule A (Clover Adams) from the AC marriage bond (Henry-Clover relationship), via the action of suicide, on 6 Dec 1885.

It would seem, here, to be the case, speculatively speaking, that the three human molecules Adams had in mind in this statement, subsequently, would have been himself, his side love affair (or interest) Elizabeth Cameron, and his wife Clover Adams.

On 13 Apr 1885, Clover's father died, and this was said to have initiated a period of mourning which evolved into mental depression from which she did not recover. [3]

On 4 Dec 1885, two days before her suicide by cyanide (Dec 6), Clover Adams, visited Elizabeth Cameron, who was then three-months pregnant. [1]

On 6 Dec 1885, Clover died by suicide via swallowing potassium cyanide. [8]

In 1887, two years after Clover's suicide, her sister Ellen, anguishing over the death of her husband, walked into an oncoming train. Her brother Edward suffered a nervous breakdown for six weeks as a result of that tragedy, and in 1901 he leaped from the third floor of his home, survived briefly, but died two months later of pneumonia in an asylum. [5]

Photos/ letters | Destruction

Though Clover was an accomplished photographer, no close–up picture of her face exists. [8] After her death, Adams destroyed all of her photos at their home, and neither her father nor her family had ever received a picture of Clover's face. [5]

Adams also destroyed all of his letter correspondence with Clover and in his *The Education of Henry Adams* famously skips a 20-year period, namely the years following Clover's death.

References

1. Dykstra, Natalie. (2012). *Clover Adams: a Gilded and Heartbreaking Life* (Q) (Bancroft comment, pg. prologue). Publisher.
2. (a) Friedrich, Otto. (1979). *Clover* (pgs. 164-65). Simon and Schuster.
(b) O'Tooke, Patricia. (1990). *The Five of Hearts* (pg. 21). Ballantine Books.
(c) Kaledin, Eugenia. (1981). *The Education of Mrs. Henry Adams* (pg. 124). Temple University Press.
(d) Krinsley, Daniel B. (1998). "An Unexpected Rendezvous at the Cosmos Club on Lafayette Square: the Strange Odyssey of the Pirated Copy of the Adams Memorial by Saint Gaudens" (Q), CosmosClub.org.
3. (a) Kaledin, Eugenia. (1981). *The Education of Mrs. Henry Adams* (pg. 221-22). Temple University Press.
(b) Friedrich, Otto. (1979). *Clover* (pgs. 313-14). Simon and Schuster.
(c) Krinsley, Daniel B. (1998). "An Unexpected Rendezvous at the Cosmos Club on Lafayette Square: the Strange Odyssey of the Pirated Copy of the Adams Memorial by Saint Gaudens" (Q), CosmosClub.org.
4. (a) Kaledin, Eugenia. (1981). *The Education of Mrs. Henry Adams* (pg. 34-35). Temple University Press.
(b) Friedrich, Otto. (1979). *Clover* (pgs. 138). Simon and Schuster.
(c) Krinsley, Daniel B. (1998). "An Unexpected Rendezvous at the Cosmos Club on Lafayette Square: the Strange Odyssey of the Pirated Copy of the Adams Memorial by Saint Gaudens" (Q), CosmosClub.org.
5. Krinsley, Daniel B. (1998). "An Unexpected Rendezvous at the Cosmos Club on Lafayette Square: the Strange Odyssey of the Pirated Copy of the Adams Memorial by Saint Gaudens" (Q), CosmosClub.org.
6. (a) Friedrich, Otto. (1979). *Clover* (pgs. 138). Simon and Schuster.
(b) Krinsley, Daniel B. (1998). "An Unexpected Rendezvous at the Cosmos Club on Lafayette Square: the Strange Odyssey of the Pirated Copy of the Adams Memorial by Saint Gaudens" (Q), CosmosClub.org.
7. (a) Tehan, Arline B. (1983). *Henry Adams in Love: The Pursuit of Elizabeth Sherman Cameron* (first meeting, pg. 53; visit, pg. 88). Universe Books.
(b) Krinsley, Daniel B. (1998). "An Unexpected Rendezvous at the Cosmos Club on Lafayette Square: the Strange Odyssey of the Pirated Copy of the Adams Memorial by Saint Gaudens" (Q), CosmosClub.org.
8. Kaledin, Eugenia. (1981). *The Education of Mrs. Henry Adams* (death date, pg. 222; photo destruction, pg. 100). Temple University Press.

External links

- Mariam Hooper Adams – Wikipedia.
- Who was Marian 'Clover' Hopper Adams? (photos and letters) – MassHist.org.

θΔics

In science, **cold**, as contrasted with "hot" (i.e. hot body), refers to a description a body (i.e. cold body), or system, whose internal parts have a lower state of "motion" (Bacon, 1620), gauged, via zeroth law, by a third body, the thermometer, which discerns the relative state of motion, or temperature; which decreases to a minimum at absolute zero, according to the third law. [1]

A 1768 rendition of English physicist and chemist Robert Boyle's *circa* 1660 bird in vacuum experiments, by English artist Joseph Wright, somewhat incorrectly entitled "An Experiment on a Bird in an Air Pump" (incorrect on the fact that the bird as depicted is in a vacuum bulb, and not in the air pump); a noted thermodynamics anecdote: the odd experiment done so to test and hence disprove English scientist Thomas Hobbes' "wind theory of cold". [2]

Overview

In the 18th century, Robert Boyle did some of the first experimental work on the so-called "power of the cold", e.g. by measuring the weight required to hold a cork in a bottle as the liquid in it froze and expanded during the night.

The descriptor "cold" is rooted in the framework of the zeroth law of thermodynamics.

Human thermodynamics

French political theorist Charles Montesquieu, in his 1748 *The Spirit of the Laws*, discussed differences in behaviors of people in hot vs. cold climates. Camille Flammarion wrote about the apocalyptic vision often called "heat death", but also in the sense of average temperature becoming very low, also used the expression "cold death".

French anthropologist Claude Levi-Strauss theorized on the nature of hot societies and cold societies.

Thermal music

See main: Music chemistry; Music thermodynamic

The following are pop culture examples of the thermal word "cold" used in telling descriptions of emotional states:

Lyric: "You see, I haven't been the same since that **cold** November day."

Song: "Where do Broken Hearts Go" (1988), Whitney Houston.

Lyrics: "Nothing lasts forever,
and we both know hearts can change;
and it's hard to hold a candle
in the **cold** November rain."

Song: November Rain (1992), Guns N' Roses

Lyrics: "From this dark, **cold** hotel room
And the endlessness that you feel
You are pulled from the wreckage
Of your silent reverie"

Song: Angel (1997), Sarah McLachlan

Lyrics" "It's **cold** outside but between us it's worse in here."

Song: I hate this part (2008), Pu**Y Cat Dolls

It is difficult to say, of the above, whether they are depictions of aspects of human endergonic reactions or possibly human endothermic reactions?

Quotes

The following are related quotes:

"The **cold** has philosophical value of reminding men that the universe does not love us. Cold as absolute as black tomb rules space; sunshine is a local condition, and the moon hangs in the sky to illustrate that matter is usually inanimate."

— John Updike (date) [1]

"It will be a **cold** day in hell before I sleep with you."

— Theresa Banyan (c.1990), comment to freshman Mick White

See also

â— Absolute zero

References

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θΔics

In thermodynamics, a **cold body** is the body of lower temperature, in the structure of a heat engine, as compared to another, called the hot body, in which it is elevated. In equation form:

T_A (hot body) > T_B (cold body)

The cold body is typically referred to as the condenser or refrigerator, typically a stream of cool water, which is sprayed onto the working body during the contraction phase, which serves as a heat sink, as contrasted with a heat source (the boiler), readily able to take up or absorb heat from the working body of expanding and contracting substance (typically water) in side of the piston and cylinder.

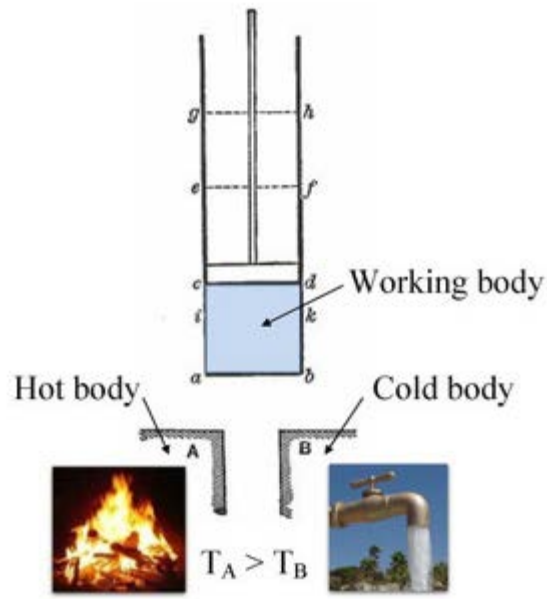

Hot body, **cold body**, working body diagram or view of the Carnot engine.

History

The definition of the cold body was defined by French physicist Sadi Carnot in 1824 in his description of the production of motive power in steam engines or heat engines, in which he utilized the logic of the cycle or Carnot cycle. To quote:

> "The production of motive power [work] in the steam engine is due the transportation of caloric [heat] from a warm body to a **cold body**, i.e. to its re-establishment of equilibrium—an equilibrium considered as destroyed by any cause whatever, by chemical action, such as combustion, or by any other."

This terminology was taken up French engineer Emile Clapeyron in 1834 who graphically described the Carnot cycle utilizing the hot body / cold body terminology. [2]

Human thermodynamics

In studies of human thermodynamic systems, the location of the cold body is an intricate subject of study. The basic model of any generic social system is that the cool night sky acts as the cold body. In studies of small number human molecule interactions, a cold body can be distinguished by a facet of perceptual physical or mental anti-beauty qualities. When a relationship grows "cold" for example, it signifies a point in time when the relationship is said to stop "working", as in "its not working between us anymore", a state signified by a volume contraction, in that a person in this state has no energy or drive to get out and be productive goal-driven person in life. In another sense, cold people are said to absorb energy from others. In these types of studies, the determination of where the three different bodies (hot, cold, and working) are becomes a very complicated subject. [3]

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1. Carnot, Sadi. (1824). "Reflections on the Motive Power of Fire and on Machines Fitted to Develop that Power (excerpt)" Paris: Chez Bachelier, Libraire, Quai Des Augustins, No. 55.
2. Clapeyron, Emile. (1834). "Memoir on the Motive Power of Heat", *Journal de l'Ecole Polytechnique.* XIV, 153 (and Poggendorff's *Annalender Physick*, LIX, [1843] 446, 566).
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θΔics

In paranormal theory, a **cold spot** is localized area of temperature decrease, measured via an infrared thermometer, which is hypothesized to be representative of a ghost, dead person, paranormal activity. The subject seems to be more along the lines of folklore, but nevertheless, a few people have attempted to explain the postulate of cold spots using the laws of thermodynamics.

In the 2008 book *Stalking Darkness*, American physicist and paranormal researcher Brian Schill attempts to explain cold spots as anomalous regions of energy absorption, supposedly left by ghosts, in terms of the third law of thermodynamics. [1]

In circa 2009, American paranormal researcher formulated a loose hypothesis called the "thermodynamic macroscopic transference hypothesis" to explain how cold spots are formed. [2]

References

1. Schill, Brian. (2008). *Stalking Darkness: Surveillance and Investigation Techniques for Paranormal Investigators* (thermodynamics, pgs. 77-81, etc.). LuLu.
2. Milhorn, Anthony. (2009). "Thermodynamics: Understanding the Macroscopic Paranormal", Southern States Paranormal Research Society.

External links

â— Cold spots – Wikipedia.

θΔics

In genius studies, **college degrees by intellectual difficulty** refers to []

Overview

In c.1991, Libb Thims, via research in the education section a community college library, had determined that chemical engineering and neurosurgery were colloquially considered as the most intellectually difficult degrees to pursue, study, and obtain.

In 2002, Thims, in a study of physical attractiveness (beauty) vs. intellectual ability (brains), in efforts to find quantifiable proof behind Beckhap's law (see: Beckhap's law proof), had 14 college students rank the "intellectual difficulty" of the 90 degrees obtained by female students of the 1969 and 1970 graduating classes of the University of Illinois, Chicago, on a scale of 1 "easiest" to 100 "hardest", the results of which are shown below: [1]

Hardest

Bio-Engineering	88.3
Electrical Engineering: Wave Propagation & Radiation	87.5
Science & Engineering	85.8
Mathematics	83.3
Chemistry	82.5
Energy Engineering	81.7
Thermal Science	81.7
Wave Propagation & Radiation	80
Aerospace Science	79.2
Physics	79.2
Aerospace Engineering	78.3
Computer Science & Communication	78.3
Engineering: Mechanical Analysis	78.3
Information Engineering	77.5
Mechanical Analysis & Design Engineering	77.5
Metallurgical Engineering	76.7
Systems Analysis Engineering	76.7
Engineering Systems Analysis	75.8
Engineering: Structural Design	75.8
Structural Design Engineering	75.8
Applied Physics Engineering	75
Finance	75
Applied Mechanics Engineering	74.2
System Analysis	74.2
Biology	73.3
Computer Science & Communication Engineering	73.3
Architectural Structures	72.5
Electrical Engineering	72.5
Operations Research Engineering	72.5
Physics: Education	72.5
Structural Mechanics	72.5
Chemistry & Geography	71.7
Mechanical Engineering	71.7
Structural Design	70.8
Psychology	70.8
Spanish & Political Science	70.8
Accounting	70
Computer Science	70
Electronics Engineering	70

Mechanical Analysis & Design	69.2
Systems Engineering	69.2
Civil Engineering	68.3
Manufacturing Engineering	67.5
Behavioral Science	65.8
Quantitative Methods	65.8
Engineering: Structural Mechanics	65
English Literature	64.2
Business Marketing	63.3
Education - Mathematics	63.3
Wave Radio & Property	63.3
Architecture & Art	62.5
Systems Management	62.5
Marketing	49.2
Spanish Literature	49.2
Social Studies	48.3
Design	48.2
Economics	47.5
English	47.5
Business Administration - Marketing	46.7
German	46.6
Business Administration - Operations & Systems	45.8
Business Management	45
Geography	45
Spanish	44.2
Business Administration	43.3
History	41.7
Sociology	40
Music	39.2
Management	35
Speech (Radio & Television Directing)	34.2
Speech & Theater	33.3
Speech: Television & Radio	32.5
Physical Education	27.5

Easiest

(add)

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(a) Thims, Libb. (2003). *Human Thermodynamics, Volumes 1-3* (Research project #, pg. 221). IoHT Publications.
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External links

- What are the hardest undergraduate college degrees in the world? (2017) – Quora.
- Which university degree is the most intellectually difficult? (2016) – Quora.
- What is the most difficult degree? (2016) – Quora.
- IQ Estimates by College Major (2017) – StatisticBrain.com.

θΔics

In chemistry, **collision theory** is states that in order for a chemical reaction to occur, atoms, molecules, or chemical species, have to "collide", in such a manner that the activation energy barrier is surmounted. Collision theory is sometimes summarized by the idiom: [15]

> "You can't react if you don't collide."

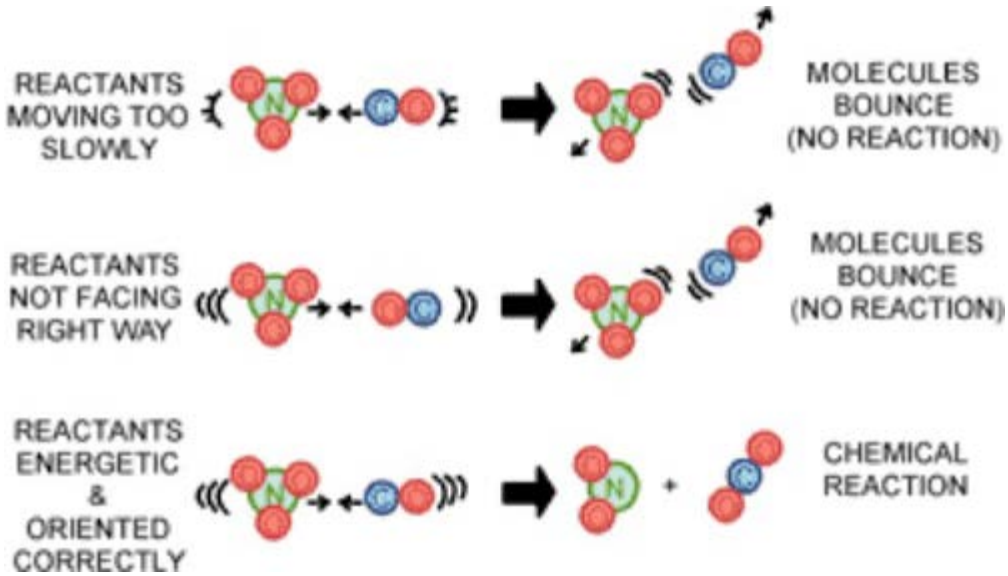

The orientation aspect of **collision theory**, for the reaction $NO_3 + CO$ $NO_2 + CO_2$, the idea that colliding molecules have to be aligned in a certain favorable way, during the instance of impact, in order for a reaction to occur or for the activation energy barrier to be surmounted. [15]

In gas phase reactions, where particles, such as those found in the air of a room, move about a speeds in excess of a 1,000 miles per hour, at room temperature, collision theory becomes visually intuitive (particularly when viewed in the context of the Boltzmann chaos assumption), whereas in the liquid phase, and for surface catalyzed reactions, where particles move about at slower speeds, in the neighborhood of one mile per hour for human chemical reactions, collision theory becomes a bit more of a gray area.

History

Collision theory was proposed in 1916 by German chemist Max Trautz and British scientist William Lewis, in order to qualitatively explain how chemical reactions occur and why reaction rates differ for different reactions. [1]

Collision theory, in simple terms, is based on the assumption that for a chemical reaction to occur it is necessary for the reacting species, i.e. atoms or molecules, to come together or collide with one another. [2]

Overview

According to collision theory, in order for a chemical reaction to occur, the chemical entities have to collide. Not all collisions, however, bring about chemical change. A collision will be effective in producing chemical change only if the species brought together possess a certain minimum value of internal energy U, equal to the activation energy E_A of the reaction. [2] These are called *effective collisions* and result in the transformation of reactant molecules into products. [3] In human terms, a pair that collides, dates, and then transforms into a married couple, would be an example of an effective collision.

Effective collisions occur as a consequence of the fact that only a fraction of the molecules have sufficient energy and the right orientation at the moment of impact to break the existing bonds and form new bonds. In other words, not only must the colliding species posses certain energies, but they must also be oriented in a manner favorable to the necessary rearrangement of bonds, atoms, and electrons involved. Thus, according to collision theory, the rate at which a chemical reaction proceeds is equal to the frequency of effective collisions.

Social collision theory

See main: Social collision theory

In human reaction terms, collision theory applies absolutely; however, the visual conception of collisions

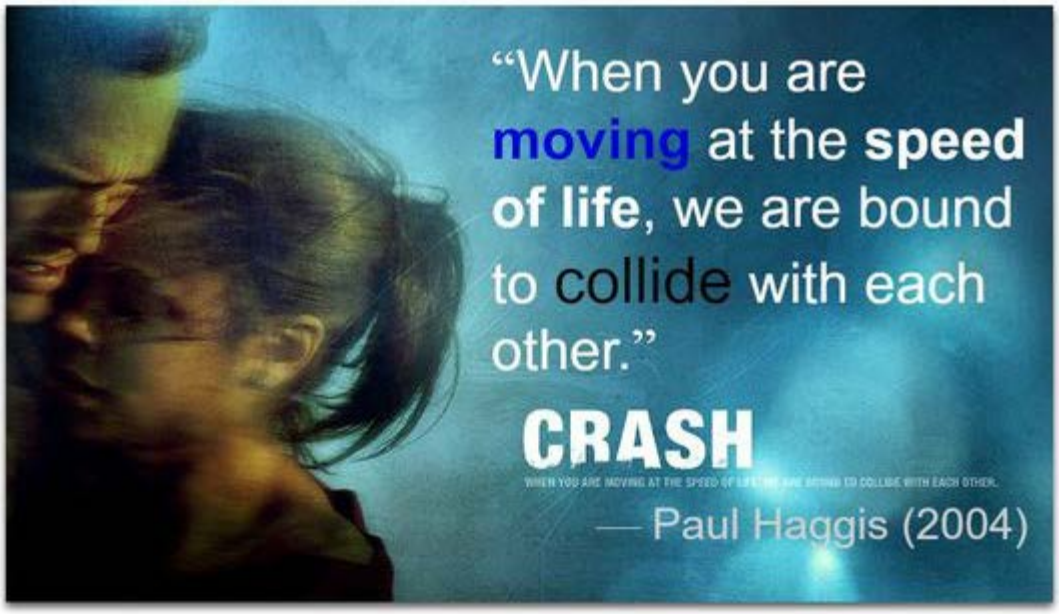

Promo slogan (O) for the 2004 film *Crash* by Paul Haggis, giving an detailed look at "collisions" in the social sphere (see: social collision theory).

between human molecules, moving over substrate, requires a bit of discussion, as well as the development of new terminologies. In other words, collision theory was developed originally for reactions between atoms and molecules in the gas or liquid phase. Subsequently, applying it to human reactions occurring over substrate will require further development. In particular, a theory of human molecular reaction orbitals, i.e. probabilistic activity orbitals, describes collisions such that from a time-accelerated point of view, collisions of human probability orbitals, oriented in various unique energetic manners, will play a significant role in determining the outcome of basic human molecular collisions.

Hence, collision theory supposes that molecular collisions must always precede a chemical reaction. [4] To give examples of frequency, in normal gas phase systems each molecule hits other molecules at a rate of 10E9 times per second in bimolecular collisions, whereas trimolecular collisions occur at a rate of 10E5 per second. In liquid phase systems, the collision rates are less frequent than this. In human molecular systems, i.e. air-vapor phase, substrate-attached systems, collision rates are more difficult to estimate; moreover there are social collisions as well as intimate collisions to consider, among others.

The 2004 Award-winning film *Crash* gives an excellent overview of the intricacies involved social collisions. In the film, several characters, living in Los Angeles, collide during an eventful 36-hour period in which car accidents, shootings, and carjackings bring them together. Most of the characters depicted in the film are racially prejudiced in some way and become involved in conflicts which force them to examine their own prejudices. Through these characters' interactions, the film attempts to depict and examine not only racial tension but the distance between strangers in America. [5]

Along these lines, we see that collision theory can also be interpreted in terms of the *force of the collision*, namely that the likelihood of reaction upon the collision of two molecules must certainly be affected by the force of the collision. Forceful collisions are much more apt to lead to the breaking and making of chemical bonds than are less forceful collisions. The film *Crash*, for example, a self-described 'passion piece' for Canadian screen-writer Paul Haggis, was inspired by a real life incident where Haggis' Porsche was *forcefully* carjacked outside a video store on Wilshire Boulevard in Los Angeles in 1991. [6] This is an example of a real-life social bimolecular effective collision, between two human molecules, resulting in a human chemical reaction (life transformation), resultant change (moviegoers moved by the film), and work output (script writing).

In human romantic collisions, we note that molecules with less than sufficient energy to exert this force will not react, whereas molecules with a higher energy than this minimum can react. [4] Along these lines, statistically it is known that 20-28 percent of couples fall in love at first site. [7] In these love-at-first sight collisions, out of the many collisions that didn't activate, a situation occurred in which one or both of the reactant pairs, owing to necessary and sufficient internal energy requirements, at the moment of collision, e.g. looks, humor, class, education, occupation (substrate attachment), fitness, wealth, status, integrity, etc., exerted a *force* on the other, so as to create an effective collision. In other

interactive situations, collisions may be more subtle; yet the chemistry can be felt. One study, for example, found that 40 percent of single adults say that they know whether or not they have chemistry either instantly or within 15 minutes of meeting someone. [8]

Species concentration is also a factor in collision theory. In short, an increase in concentration of reactants increases the collision frequency between the reactants; subsequently, the effective collision frequency also increases. In other words, at higher species concentrations, more collisions will occur, resulting in more reactions. In human molecular terms, for example, more effective collisions, and subsequent reactions, will occur in a packed nightclub, than will occur in a dead nightclub.

Temperature is also a factor in collision theory. Essentially, an increase in temperature increases the average speed of the reactant molecules, the number or frequency of collisions, and fraction of molecules having kinetic energy higher than the activation energy. Resultantly, the effective collision frequency increases. In human terms, as an example, one is more likely either get pregnant or get someone pregnant during spring break, i.e. a system at warmer temperatures, as compared to winter break, i.e. a system at colder temperatures. Population densities confirm this: temperate climates, on average, are more populated, i.e. have yielded more product of a diversified variety, than polar climates. [9] There are more varieties of species in the tropics, for example, than anywhere else on earth.

To note, temperature *T*, pressure *P*, and volume *V* in human system terms are intricate topics, requiring a great deal of mental thought and discussion. There are those who will adamantly argue that the inherent 'heat' of human attraction, the 'pressure' of stressed or tense situations, or the 'volume' of territory, for instance, are only verbal metaphors, having nothing whatsoever to do with physics; and that they are not quantifiable by the standard gauges of *thermometers*, i.e. devices that measure temperature or temperature gradient, *barometers*, i.e. instruments used to measure atmospheric pressure, or *indicator diagrams*, i.e. devices that measure pressure and volume changes in working systems. The inherent difficulty lies in the fact that basic human energies and pressures are smaller in comparison to atmospheric energies and pressures. As such, no one has yet built agreed upon human thermodynamic instruments, to adequately quantify pressure (the force of neighboring molecules) and temperature (the energy transfer effect of neighboring molecules) in human systems. This is a topic of further inquiry.

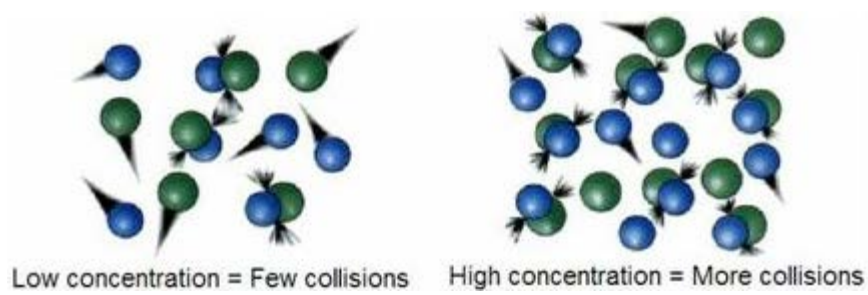

The **collision rate** being inversely proportional to reactant concentration aspect of collision theory.

In any event, in sum, chemical reaction rates tend to increase with both reactant concentration and with system temperature. In biological terms, it is well documented that the varieties of life increase, i.e. reaction rate is faster, in warmer climates than as compared to colder climates. Similarly, the first to note a correlation between reaction rate and biological species concentration was German zoologist Carl Semper who, in 1881, observed that the multiplication of organisms in small ponds diminished as the number of individuals increased. [10] Later experiments confirmed Semper's concentration generalizations with fruit flies and fowls in other environments. [11]

Assuming an initial stage species *A* and a final stage species *B*, while neglecting a large number of intermediate reaction evolutions, these types of overall system evolution reactions can be approximated as follows: $A \rightarrow B$ Thus, using Semper's terminology, as the number of individuals, or concentration of *B*, increases, the multiplication, or reaction rate, of organisms, in small ponds diminishes:

$$Rate \propto \frac{1}{B}$$

In other words, the reaction rate is inversely proportion to the concentration of the products, whereby the rate decreases

as product concentration increases. In this direction, the earliest collision theories regarded reactant molecules as hard spheres such that a collision was considered to have occurred when the distance *d* between the centers of the two molecules was equal to the sum of their radii. [1] In the gas phase, as discussed, an increase in concentration of the moving reactant species increases the collision frequency between the reactants, thus increasing the number of effective collisions or 'conversion encounters', which thus results to increase reaction rate.

Collision scenarios in human reaction life are similar, only here the collisions occur over substrate and are dynamic and non-reversible. [12] If, for example, a twenty-five-thousand person capacity high school begins the year with a thousand students, i.e. a low concentration of students, there will be relatively fewer reactions between students than as compared to if the school was at full-capacity. If then, by chance, a new batch of one-thousand students is suddenly introduced into the existing school system, due to possibly the closing of a neighboring school, then we should expect the reaction rate of the system to increase according to collision theory.

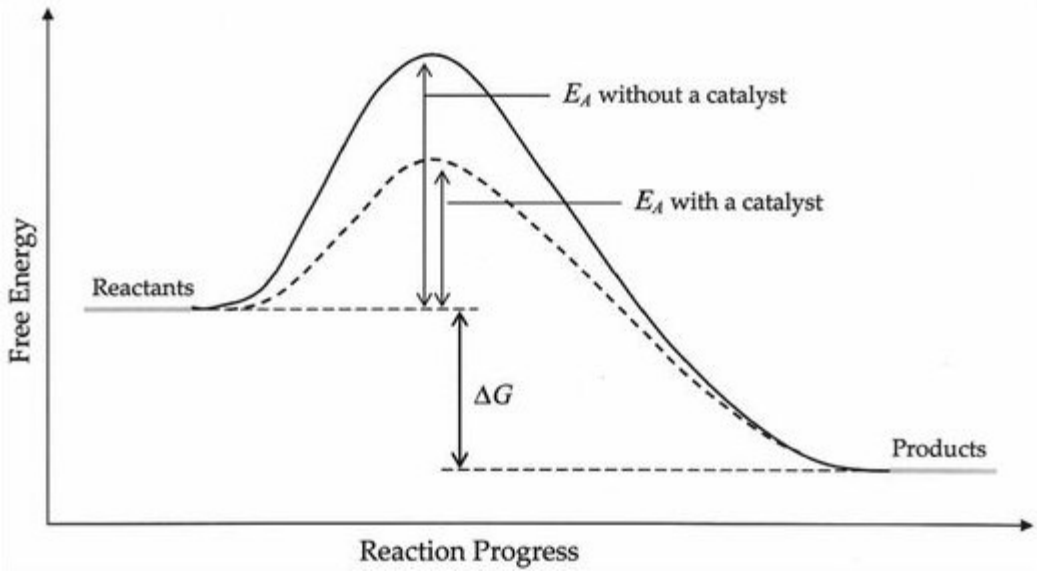

The activation energy aspect of **collision theory**: with a catalyst, reactions occur more easily, without catalyst only with more impact energy.

In a typical chemical reaction, as described, the reactant species come together in a collisional manner. During the collision, many chemical bonds are stretched, broken, and or formed in the products of the reaction. In human life, as an example, during the process of courtship and marriage, previous family, friendship, occupational, and social bonds, etc., will invariably be either adjusted or broken, in a significant manner, and new ones will be formed, so to fuse the requisite marriage bonds with the new developing family. During these collisional periods, the energy of the system increases to a maximum, at a point or energy height called the 'potential barrier' that separates the two potential energy minimas, and then decreases to the energy of the products, as detailed adjacent.

To explain *collision* in biological terms, we will refer to Alfred Lotka's famous 1922 paper 'Natural Selection as a Physical Principle'. In this paper, Lotka defines *survival of the fittest* as persistence of stable forms. Furthermore, after a discussion of the first and second laws of thermodynamics, he defines *evolution* as a change in the distribution of matter among the components of a physical system. [13] Next, Lotka states that living organisms are little Carnot energy transformers, which, from a second perspective, according to Lotka, can be thought of as tiny *material particles* in larger statistical systems. 'Real phenomena,' according to Lotka, 'are irreversible; and in particular, trigger action, which plays so important a role in the process of life, is a typical irreversible process, which releases available energy from a false equilibrium.' The term *trigger action* is used, by Lotka, as an overarching label to categorize sensory inputs, and the correlative nervous system processing, that trigger a significant energetic response.

Lotka approximates that organic evolution involves two types of energy transformers: accumulators (plants) and engines (animals). Moreover, Lotka argues that the similarity of the units of individual organisms invites a statistical treatment, in which the units are not just simple material particles, from the ordinary reversible elastic collisions of kinetic theory, e.g. the pool table analogy, collisions in which action and reaction are equal; but rather, the units of biological statistical mechanics are energy transformers subject to inelastic *irreversible collisions* of a peculiar type, i.e. collisions in which trigger action is the dominate feature. [12] For example, according to Lotka, 'when the beast of prey *A* sights its quarry *B*, the latter may be said to enter the field of influence of *A*, and, in that sense, to *collide* with *A*. The energy that enters the eye of *A* in these circumstances may be insignificant, but it is enough to work the relay, to release the energy for the fatal encounter.'

Human collisions actuate according to similar principles. Romantic collisions, of course, the most interesting collisions in human chemistry and immensely more complicated in mechanism, than atomic collisions. Stories abound, for instance, in which a spouse recalls having first had their mate enter their 'field of vision' and knowing right then and there that he or she was the one for them. From a day-by-day perspective, we may not be directly inclined to think of human interactions as collisions, per se; but when human life is viewed at a sped-up pace, most can easily look back and remember encounters or collisions with certain people that resultantly functioned to change one's life forever.

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15. Elementary kinetics – Wiley.

External links

- Collision theory – Wikipedia.

θΔics

In human chemistry, **combination lock theory** is a chemistry-metaphor type model of dating, conceived in 2007 by Canadian writer Chanel Wood, where single unattached individuals are considered as "reactants", the resultant couple the "product", such that a synthesis of energy level satiety bonding patterns and matrix compatibility factors determine the desired "we just clicked" scenario of successful pairings. [1]

A depiction of Canadian writer and philosopher Chanel Wood's 2007 so-called "**combination lock theory**" of dating: a mixture of the "we just clicked" catch phrase of successful relationships and the "reactant + reactant = product" model of chemical reactions. [1]

Overview

In Wood's June 2007 article "A Questions of Social Chemistry", she stated that when thinking about the question of human chemistry, was "completely mystified and very curious". In her analysis of the question, Wood asks: "what *exactly* is chemistry between two people?" She states that, "few people actually seem to be able to define it" and that, for the most part, "the majority of us have never given it a deeper thought, or if we have, we came to the highly logical definition of "that intangible something"… But does that really explain *anything*?"

Wood states, in excellent form, that:

> "When I was first brought with this question of human chemistry, I was both completely mystified and very curious. Like most people, I'd never really stopped to think about it. But if chemistry in the social world is anything like chemistry is in the physical world, there has to be a logical, tangible definition."

In conclusion of her musings on the issue, Wood conceived an outline of what she called a "combination lock theory" of dating arguing that a relationship can be thought of, using the reaction model of single people as "reactants", as a:

> Reactant + Reactant → Product

chemistry point of view; such that "chemistry" is a result of all the elements between any two people—character, personality traits, timing, goals, dreams, priorities, lifestyle, etc., and how they 'react' with the other person's elements.

Theory

In the physical world, according to Wood, "chemistry" explains how elements combine, behave, and relate to one another. Likewise, in Wood's view, in the social world, "chemistry" also explains how individuals combine, behave, and relate to one another. With that technical definition of social chemistry is, however, as Wood states, "brings up another question: What creates chemistry?" To answer this question, Wood focuses on the elusive phrase "we just *clicked*" used prominently in descriptions of successful dating interactions. In more detail, when Woods first starting thinking of this question, she thought of a combination lock. As she states "you turn the dial a number of times to certain numbers in a special sequence, and then the lock pops open." When we date, according to Woods, we look for people we 'click' with. She reasons, "whether we know it or not, we're measuring them up against ourselves. This is why most people never date outside their true playing field—you look for *compatibility*. If you want to have kids, you look for someone who does too. If you're very career-orientated, you'll look for someone who is, even if you're not aware of it conscious level."

Law of attraction

In a colloquial sense, pair matching is often described using the "laws of affinity" or laws of attraction, as they are sometimes called. In Wood's view, the logic of compatibility clicking can be described as the law of attraction (or

Plato's first law of affinity), or simply put, "like attracts like". When we 'click' with someone, according to Woods, "the elements match (the numbers on the lock) and timing is right (the sequence of the dial). It's almost like drawing by the numbers. In terms of thinking of people as "human elements", Woods reasons that "some elements might be like the noble gases from physical chemistry - they have no combining capacity. Some elements have one combining capacity. Some elements have more than one combining capacity, and therefore can combine with a more wider selection of elements."

For example, as she states, "for me physical appearance is one of those elements that has several combining capacities. I don't have a 'type', and therefore my 'significant other' could have black hair/brown eyes, brown hair/green eyes, blond hair/blue eyes, or any mix of those six. On the flip side, my leadership element has only one combining capacity: with another leader of equal or stronger leadership."

Energy levels

Woods also theorizes on a energy level basis of combination, such that only two people with the matching energy levels, meaning that the creation of the "product" (the bonded couple), fills the correlative energy levels to desired satiety. This would explain, according to Wood, the whole "is there one person out there specifically perfect for me?" question. Elements can react with a number of different elements, she points out, but of those only a few will result in filled energy levels.

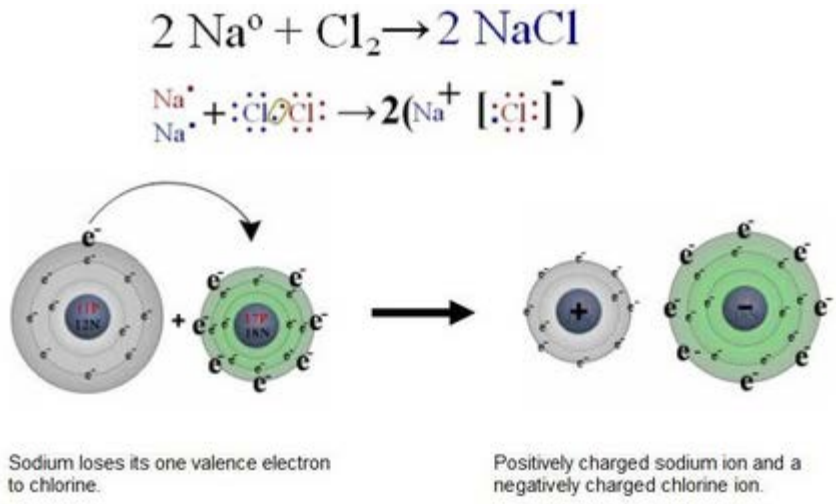

When sodium loses its one valence electron it gets smaller in size, while chlorine gains an additional valence electron and grows larger in size. The charged Na+ and Cl- ions are held together by electrostatic forces, thus forming an ionic bond. [3]

An example of this, as Wood's interestingly elaborates, is the combination NaCl, which has a filled energy level because the Sodium (Na) has a charge (combining capacity) of +1 and an electron arrangement of 2, 8, 1 and Chloride (Cl) has a charge (combining capacity) of -1 and an electron arrangement of 2, 8, 7. Together they make the element Sodium Chloride (NaCl) with an electron arrangement of 2, 8, 8 - a stable compound with filled energy levels. This logic, she reasons, explains the "he (or she) *completes* me" motto.

On the flip side, as Wood points out, Na and Cl can combine with other elements and create compounds that do *not* have filled energy levels. If this could apply to social chemistry in any way, she states, it would prove that "there are a number of people in the world you could combine with, but a smaller select few who would 'complete' you (and vice versa)." This example describes, according to Wood, the differences in compatibility in her combination lock theory. She concludes that this energy level logic also "proves that some people are like noble gases - they have no combining capacity and do not easily combine with other people" and that "in ideal circumstances social chemistry could perhaps be 3/4s of the way 'created' on paper or in vitro much like physical chemistry (the last 1/4 being the physical attraction.)" [1]

Wood's energy level combination lock compatibility theory of dating is similar to American chemical engineer Libb Thims' description of the human chemical bond in which couples combine such to complete each other's bonding valencies. [2]

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3. Properties of salt – Tutor.vista.com.

θΔics

In chemistry, a **combination reaction** is a chemical reaction in which two or more reactants combine or bond to form a new single product. The generic combination reaction, in which two reactants, A and B, combine to form a single product C, is typically written as:

Example	Description
$A + B \rightarrow C$	The atomic compositions of the reactants, A and B, are modified.
$A + B \rightarrow AB$	The reactants, A and B, retain their atomic geometry.
$A + B + C \rightarrow ABC$	Three reactants, A, B, and C, combined into a singe unit, while retaining their internal atomic geometry.

In the older eighteenth century affinity reaction nomenclature this reaction likely has a name, similar to a single elective affinity reaction, but the name needs to be tracked down.

Classification

The five basic or rather simplest chemical reactions are listed below: [1]

Type	Name (modern chemistry)	Synonyms	Name (affinity chemistry)	Formula
1.	Combination reaction			$A + B \rightarrow C$
2.	Decomposition reaction	Debonding reaction Dissolution reaction		$A \rightarrow B + C$
3.	Substitution reaction		single elective affinity	$AB + C \rightarrow AC + B$
4.	Double substitution reaction		double elective affinity	$AB + CD \rightarrow AC + BD$
5.	Combustion reaction			$\text{Fuel} + \text{Oxidant} \rightarrow \text{Product} + H_2O$

There are many other varieties of reactions than these five.

See also

â— Combination lock theory

References

1. Goldberg, David E. (2003). *Beginning Chemistry* (combination reaction, pg. 57). McGraw-Hill.

External links

â— Combination reaction – Wikipedia.

θΔics

In thermodynamics, the **combined law of thermodynamics**, also called the Gibbs fundamental equation, is a mathematical summation of the first law of thermodynamics and the second law of thermodynamics subsumed into a single concise mathematical statement as shown below: [1]

$$dU - TdS + PdV \leq 0$$

where d*U* is a variation in internal energy, *T* is temperature, *dS* is variation entropy, *P* is pressure, and d*V* is variation in volume of a simple working body in which there are no flows of particles or out of the body nor external forces, other than gravity, acting on the body. In theoretical structure, in addition to the obvious inclusion of the first two laws, the combined law incorporates the implications of the zeroth law, via temperature *T*, and the third law, through its use of free energy as related to the calculation of chemical affinities near absolute zero. [2]

Shortened form

In concise form, knowing that the expression to the left of the inequality sign is the Gibbs free energy dG, the combined law for cyclical heat driven processes, in closed reactive systems, at constant pressure and constant temperature:

$$dG \leq 0$$

states that a "spontaneous process" will ensue when their is a decrease in the free energy of the system. This can be restated in terms of the difference between the measure of Gibbs free energy between two states of a system:

$$G_{final} - G_{initial} \leq 0$$

or

$$\hat{a}\hat{\dagger}G \leq 0$$

In simple terms, according to geo-thermodynamicists Raymond Kern and Alain Weisbrod, for earth systems, the combined law of thermodynamics tells us that: *"when a system evolves naturally, i.e. undergoes a natural process, in an isothermal manner, at constant volume or pressure, its Gibbs free energy G (or Helmholtz free energy F) always decreases."* They define this as the conditional statement for all types of evolution in isothermal earth-bound systems in which thermo-mechanical and thermo-chemical changes take place at constant volume or constant pressure. For more complex systems, in which generalized forces act or in which species migrate across the system boundary, then the generalized combined law of thermodynamics takes the form: [3]

$$TdS \geq dU + pdV - \sum_k X_k dx_k - \sum_k \mu_k dm_k$$

Here, *T* denotes temperature, *S* the entropy, *U* the internal energy, *p* pressure, *V* volume, X_k any generalized force except pressure, x_k any generalized coordinate except volume, μ_k *chemical potential*, m_k the mass of the *k-th* substance, which can be replaced by the number of moles. [4]

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (ch. 4: "Combined Law of Thermodynamics", pgs. 73-119). Morrisville, NC: LuLu.
(b) Alberty, S. (2001). Physical Chemistry, 3rd Ed. (textbook). New York: John Wiley & Sons, Inc.; *combined law of*

thermodynamics (definition): *dU = TdS - PdV*
(c) Combined Law of Thermodynamics - Wolfram's World of Science.
2. (a) Quote: “the following important relation, which is the *central equation of thermodynamics*, relates the *zeroth law* through the concept of temperature, the *first law* through the internal energy function, and the *second law* through entropy and the absolute temperature: *dU = Tâˆ†S – pdV*.”
(b) Dugdale, J.S. (1998). *Entropy and its Physical Meaning*, (pg. 49). Philadelphia: Taylor & Francis.
3. Gladyshev, G.P. (1997). *Thermodynamic Theory of the Evolution of Living Beings*. (pg. 117). New York, Commack: Nova Science Publishers, Inc.
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θΔics

In science, **combustion** is a chemical reaction in which a substance reacts rapidly with oxygen with the production of heat and light. [1]

History

The theory of combustion was the progressive development of a number of theories, as outlined below:

In 450BC, Greek philosopher Empedocles introduced the "standard model" of physics, in which everything consisted of four elements (earth, air, water, and fire) (above left), and two forces (attraction and repulsion); in 350 BC, Aristotle added to this a density model (above right), in which denser elements tend to rise; lighter elements fall; earth is the heaviest element (and the center of the universe); fire the lightest; burning (or combustion) was simply the movement of the elements to their natural inherent position.

In 790, Arabian chemist Geber introduced the "three principles" model of combustion, in which metals are formed of two elements: *sulphur*, 'the stone which burns', the principle of combustibility, and *mercury*, the principle of metallic properties; and the third principle salt, is what gives gives solidity.

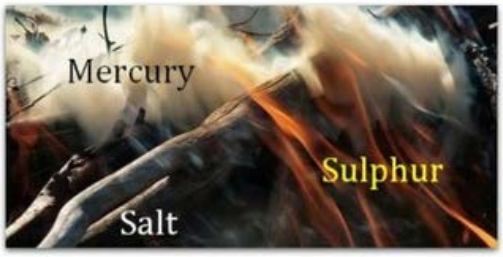

In 1524, Swiss chemist Paracelsus introduced the "sulphur combustion model", in which he adopted Aristotle's version of the four element theory, but reasoned that they appeared in bodies as Geber's three principles, such that mercury included the cohesive principle, so that when it left in smoke the wood fell apart; smoke represented the volatility (the mercury principle); the heat-giving flames represented flammability (sulphur); the remnant ash represented solidity (salt).

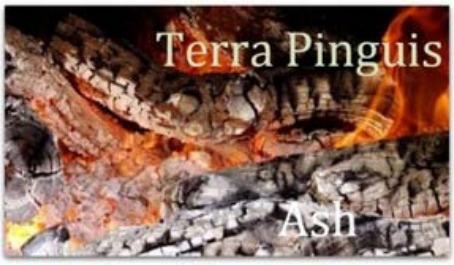

In 1699, German chemist Johann Becher introduced the terra pinguis model of combustion, in which a fatty, oily material substance called"terra pinguis" was considered as the material of bodies that gives things the property of combustion.

In 1703, German chemist Georg Stahl, Becher's student, introduced the phlogiston model of combustion, in which in which heat was viewed as a fire-like element, having mass, called "phlogiston", contained within combustible bodies and released during combustion.

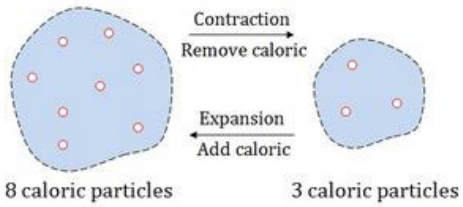

In 1789, French chemist Antoine Lavoisier introduced the caloric model of combustion, in which the process of combustion was said to result in the release of weightless "caloric" particles, or rather that in every combustion there is a disengagement of the *matter of heat* (or *igneous fluid*) or of light.

The dominant theory here was the caloric theory, established in the late 18th century by French chemist Antoine Lavoisier, who between 1768 and 1787 published over sixty papers leading to his theory of combustion, in which the process of combustion resulted in the release of "caloric" particles, or rather that in every combustion there is a disengagement of the *matter of heat* (or *igneous fluid*) or of light. [2]

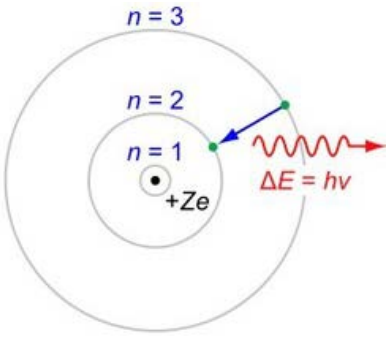

The 1913 Bohr model of the atom, in light of which **combustion** models became more

Thermodynamics

Following the transformation of the notion of heat as a caloric particle to that of heat as motion (electron photon quantum electrodynamic interaction), with the invention of the the mathematical state variable entropy (Rudolf Clausius, 1865), the definition of combustion became quantified, generally, as an enthalpy quantity. [3]

Quantum electrodynamics

In 1913, Danish physicist Niels Bohr hypothesized a new quantum model of the atom in which negatively-charged electrons revolved in orbits (orbitals) about a positively-charged nucleus, at certain fixed "quantum" distances, whereby each spherical-shaped electron orbit has a specific energy associated with it and that for an electron to move down to a lower more stable orbital (closer to the nucleus) a photon, of a specific wavelength, has to be emitted and conversely for an electron to move up to a higher orbital (farther from the nucleus) a photon, of a specific wavelength, has to be absorbed; a model which as come to be known as the "Bohr model". When the electrons move up to less stable outer orbitals, the atom or molecule as a whole, tends to become more

complicated, requiring discussion of the subject of quantum electrodynamics.

reactive, in a sense move more, and thus more likely to take place in combustion-like reactions.

Subsequently, in the years to follow, combustion models needed to take into account "quantum electrodynamics" (QED), the subject of the interaction of electrons with photons, and hence combustion models invariably became more complicated, in the sense that light and heat release involved the movement of electrons downward in orbital structure and the release of light as photons.

Human chemical reactions

Somewhere along the line, in this historical development of the theory of combustion, such as alluded to in the works of William Fairburn (*Human Chemistry*, 1914) and Thomas Dreier (*We Human Chemicals*, 1948), the model of hydrocarbon-like chemical structures (such as wood) reacting with oxygen to produce heat and light in the process of combustion, thinkers began to scale up the burning model to explain love the chemical reaction, passion, the heat of sex, the warmth of relationships, etc.

An artistic depiction of love, passion, or love the chemical reaction, being analogous to the process of **combustion** or having something to do with burning, being inflamed, fire, or heat release. [5]

The first extensive review of the metaphorical or analogy usages of heat, flame, or combustion as models for human relationships, love, or friction in literature (literature chemistry and literature thermodynamics), seems to have been French philosopher Gaston Bachelard's 1938 book *The Psychoanalysis of Fire* in which he analyzes the existence of fire (as well as heat and light), both as a real presence throughout the history of humankind and more importantly a literary, symbolic presence. Bachelard addresses the subject of the psychoanalysis or critique of the use of thermal words (or thermal phrases), such as the fire of passion, the heat of love, the light of my life, etc., used by various famous authors throughout history. He cites, for example, German philosopher Gotthilf Schubert's use of fire or heat as a psychoanalytic tool:

> "Just as friendship prepares us for love, so by rubbing together of similar bodies, nostalgia (heat) is created and love (flame) spurts forth."

Bachelard goes on to cite, what seems to be about two dozen or so, other various usages of heat or fire as a metaphor, analogy, or model for the intricacies of human romance, relationships, and love; one example being Bohemian–Austrian poet Rainer Rilke:

> "To be loved means to be consumed in the flame; to love is to shine with an inexhaustible light."

One of the first textbook sections on the validity and technical details of this "love as a combustion reaction" model, scaled up the the human molecular level of reactions between human molecules, in respect to smaller hydrocarbon combustion reactions, was presented by American electrochemical engineer Libb Thims in 2007 who, in a section on human chemical reaction rate variations, explained how slow combustion reactions, such as rusting may be comparable to long term diamond wedding anniversary marriages, whereas, conversely, quick combustion reactions, such as methane gas reacting with oxygen: [4]

$$CH_4 + 2O_2 \rightarrow CO_2 + H_2O$$

may be comparable to a very hot and intense relationship:

$$Mx + Fy \rightarrow MxFy$$

in which a male human and female human molecule, Mx and Fy, react to form an intense passionate relationship, but one that is too hot, exploding into chaos, and eventual quick to end termination; or to short-lived human reproduction reaction (double displacement reaction) wherein sparks fly, passion bubbles, and a child Bc is produced:

$$Mx + Fy \rightarrow MxFy + Bc$$

but one were eventually the heat and friction of argument result in a divorce, the result of which the reaction burns out and grows cold to the state of non-existence.

See also

â— Combustion theory of animal heat

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(b) Lavoisier, Antoine. (1777). “On Combustion in General”, Sept. 5th. *Euvres*, ii, 225.
3. Perrot, Pierre. (1998). *A to Z of Thermodynamics* (combustion, pg. 43). Oxford University Press.
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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (combustion, 12+ pgs) . Morrisville, NC: LuLu.
5. The Brain vs. The Heart in Love – HubPages.

External links

â— Combustion – Wikipedia.

θΔics

In engineering, **combustion engine**, is an engine, specifically a heat engine, wherein combustion of fuel is employed to make the hot body or working body, depending; when the combustion occurs within the piston and cylinder, e.g. the gunpowder engine, it is an "internal combustion engine", which can be contrasted with an "external combustion engine", wherein the combustion occurs external to the piston and cylinder, e.g. a steam engine, wherein the water is heated by burning coal.

Quotes

The following are related quotes:

> "The **combustion engine**, in the form of a cannon, is the oldest form of heat engine."
>
> — Osborne Reynolds (1883), "On the General Theory of Thermo-Dynamics" [1]

References

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(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age.* Cornell University Press.

External links

â— Combustion engine – Wikipedia.

θΔics

In science, **combustion theory of animal heat** was an 18th century theory originated by French chemist Antoine Lavoiser, which argued that heat produced in animals (animal heat) was the result of combustion of oxygen with the tissue of the lungs, which was viewed as a furnace. [1]

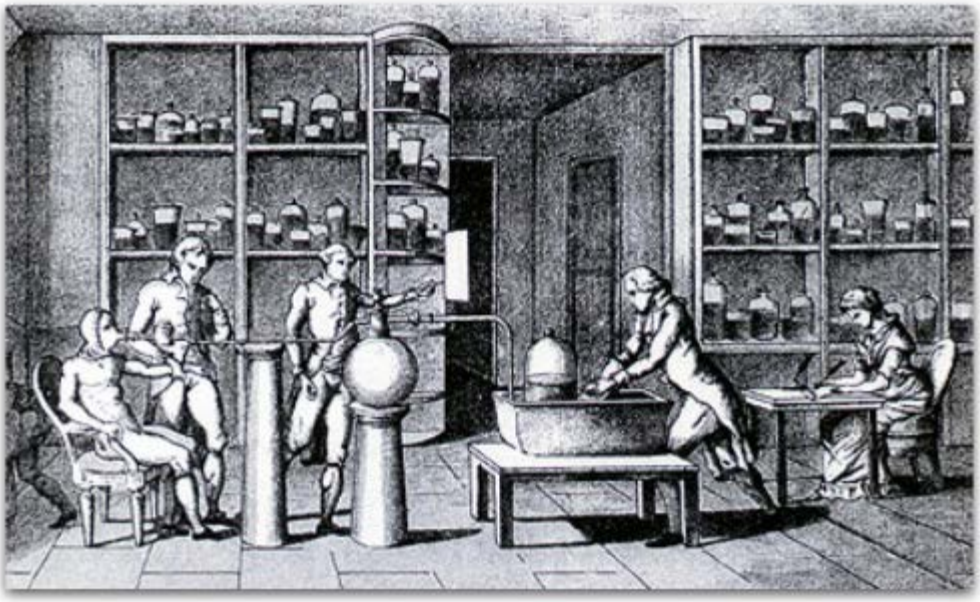

French chemist Antoine Lavoisier (center) shown conducting **animal heat combustion experiments** on his assistant, French chemist Armand Seguin; his wife chemist Marie-Anne Paulze (Madame Lavoisier) seated. [6]

History

In circa 1770s, the "phlogiston theory of animal heat", a spin-off German chemist Georg Stahl's 1718 phlogiston theory of burning, was in full swing; although, towards the end of the decade, experimental evidence was beginning to cast doubt on this theory.

In circa 1780, French chemist Antoine Lavoisier and several of his associates began to carry out various experiments in the area of metabolic heat generation—in the midst of which was the upgrade of the phlogiston theory of heat to that of the caloric theory of heat; a theory which, in turn, was applied to explain the generation of heat in animals.

The germ of the new combustion theory of animal heat, according to American animal heat historian Everett Mendelsohn, was clearly present in Lavoisier's early papers on respiration and combustion; the transition took place in a series of studies first by Lavoisier and Pierre Laplace and later by Lavoisier with the assistance of French chemist and physiologist Armand Seguin. [2]

In Lavoisier's 1785 memoir "Les Alterations a l'Air" he suggested that vital air (oxygen + caloric) extracted some carbonaceous substance from the lungs during respiration. [4]

Sometime thereafter, Seguin expanded on this view to argue that a chemical combination of hydrogen with carbon (hydrogene carbone) was released by the blood into the lungs. [5]

In the decades to follow, modifications to the combustion theory of animal heat ensued, including: Bernard (moved the stove to the tissue); Justus Liebig (called the blood the stove, and food the fuel); Claude Berthollet (originated the theory that bodily heat is due to molecular as well as chemical changes); Marshall (respiration is the functional source of heat); Dutrochet (overthrew the combustion theory, by his discovery that vital heat of vegetables is greatest when oxygen is being exhaled); John Dalton (argued that higher bodily temperatures in animals is due to a variety of nutritive chemical processes). [1]

Mechanical equivalent of heat

A consequence of the Leibig school of thought, a logic taught in German universities in the early 19th century, was that when blood is warmed by combustion of carbon from food, a consequence is the changing of red arterial blood coming from the heart into the darker venous blood that carries the ashes back to the lungs in the form of carbon dioxide. [7] This model was taught to Liebig's student Robert Mayer while in medical school in 1838. One question from Mayer's state medical exam in Stuttgart had been: "what influence does continued damp and warm weather exert on a person's state of health?" Mayer's answer, according to his records, was: "the blood becomes richer in carbon, darker, and the difference between red and black blood is less."

In 1840, while a ship's physician aboard a Dutch merchantman ship destined for a round trip to Java, Mayer employed this "darker blood = more combustion" model when examining patients blood in the "warmer" tropical climates, and on

the observation of the bright redness of the blood intuited his first formulation of the mechanical equivalent of heat.

References

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6. (a) Sketch by Madame Lavoisier, first published in E. Grimauzi, *Lavoisier 1743-1794*, Paris, 1889, Opposite, pg. 128.
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θΔics

In terminology, **common sense** refers to []

Quotes

The following are related quotes:

> "I wrote ***Common Sense*** the latter end of the year 1775, and published it the first of January, 1776. Independence was declared the fourth of July following."
>
> — Thomas Paine (1794), *The Age of Reason* (pg. 63)

> "The soul seems to reside in the judgment, and the judgment would seem to be seated in that part where all the senses meet; and this is called the **'common sense'** and is not all-pervading throughout the body as many have thought. Rather it is entirely in one part. Because, if it were all-pervading and the same in every part, there would have been no need to make the instruments of the senses meet in one center and in one single spot; on the contrary it would have sufficed that the eye should fulfil the function of its sensation on its surface only and not transmit the image of the things seen, to the sense, by means of the optic nerves, so that the soul—for the reason given above—may perceive it in the surface of the eye. In the same way as to the sense of hearing , it would have sufficed if the voice had merely sounded in the porous cavity of the indurated portion of the temporal bone which lies within the ear, without making any farther transit from this bone to the common sense, where the voice confers with and discourses to the common judgment. The sense of smell, again, is compelled by necessity to refer itself to that same judgment. Feeling passes through the perforated cords and is conveyed to this common sense. These cords diverge with infinite ramifications into the skin which encloses the members of the body and the viscera. The perforated cords convey volition and sensation to the subordinate limbs. These cords and the nerves direct the motions of the muscles and sinews, between which they are placed; these obey, and this obedience takes effect by reducing their thickness; for in swelling, their length is reduced, and the nerves shrink which are interwoven among the particles of the limbs; being extended to the tips of the fingers, hey transmit to the sense the object which they touch. The nerves with their muscles obey the tendons as soldiers obey the officers, and the tendons obey the common [central] sense as the officers obey the general. Thus, the joint of the bones obeys the never, and the never the muscle, and the muscle the tendon and the tendon the common sense. And the **common sense is the seat of the soul**, and memory is its ammunition, and the impressiblity is its referendary since the sense waits on the soul and not the soul on the sense. And where the sense that ministers to the soul is not at the service of the soul, all the functions of that sense are also wanting in that man's life, as it is seen in those born mute and blind."
>
> — Leonardo da Vinci (c.1500), "How the Five Senses are the Ministers of the Soul" (#838) [1]

> "In physics, as in every other science, **common sense** alone is not supreme; there must also be a place for reason. Further, the mere absence of logical contradiction does no necessarily imply that everything is reasonable. Now reason tells that if we turn our back upon a so-called object and cease to attend to it, the object still continues to exist. Reason tells us further that both the individual and mankind as a whole, together with the entire world which we apprehend through our senses, is no more than a tiny fragment of the vastness of nature, whose laws are in no way affected by any brain. On the contrary, they existed long before there was any life on earth, and will continue to exist long after the last physicist has perished."
>
> — Max Planck (1931), *The Universe in the Light of Modern Science* [2]

> "What the founders of modern science, among them Galileo, had to do, was not to criticize and to combat faulty theories, and to correct or replace them by better ones. They had to do something different. They had to destroy one world [view] and to replace it by another. They had to reshape the framework of our intellect

itself, to restate and reform its concepts, to evolve a new approach to 'being', an new concept of knowledge, a new concept of science—and even to replace a pretty natural approach, that of **common sense**, by another."

— Alexandre Koyre (1943), "Galileo and Plato" [3]

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3. Koyre, Alexandre. (1943). "Galileo and Plato" (abs), *Journal of the History of Ideas*, 4(4):400-28; in: *Metaphysics and Measurement: Essays in the Scientific Revolution* (pgs. 20-21). Gordon and Breach Science, 1992.

Further reading

â— Saul, John. (1994). *Doubter's Companion: a Dictionary of Aggressive Common Sense*. Publisher.

External links

â— Common sense – Wikipedia.

θΔics

In humanities, **comparative religion and mythology** (TR:58) is the study of the complex mythical heritage and syncretism underlying the formation, derivation, and origin of the world's modern religions.

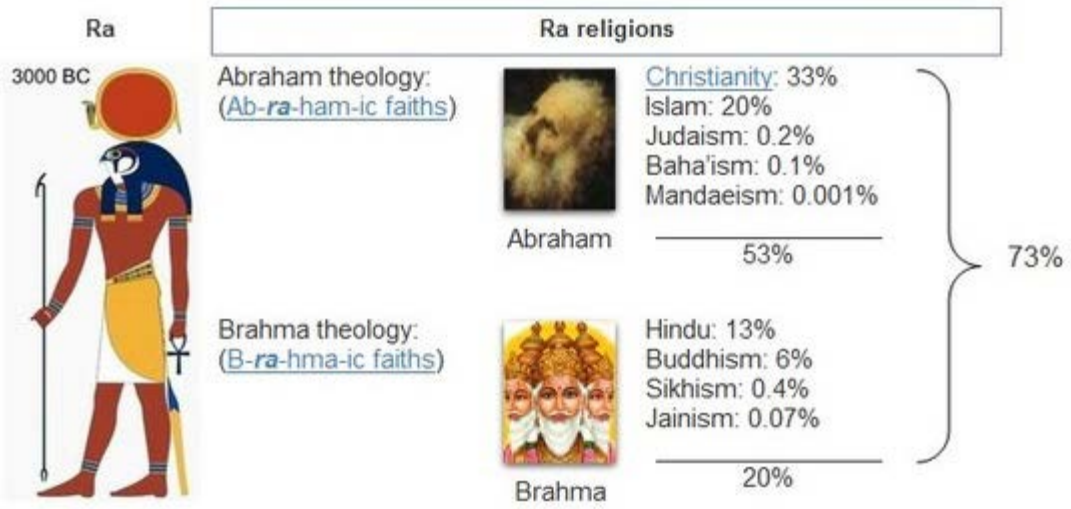

Through **comparative mythology** it can be shown that the Egyptian **myth** of the birth of the sun (Ra) out of the land mound (Nun) following a great flood (annual 150-day Nile River), a model that came to be known as Anunian theology (Ra theology), forms the backbone to 73 percent of modern religions (Ab-*ra*-ham-ic / B-*ra*-hma-ic faiths), and hence the historical origins to modern man's ideas about God, soul (negative confession), spirit, the creation of humans (creationism) (creation from clay), and most importantly belief in the theory of "life" and "death", concepts that do not exist in the framework of modern physics and chemistry.

> "The theological dependency of Christendom on ancient Egypt is much stronger than its theological link with the Hebrew tradition."
>
> — Karl Luckert (1991), *Egyptian Light and Hebrew Fire* [18]

> "The prominence in the texts of Asclepius, a thinly-disguised Imhotep, suggest an association with Heliopolis ... Although even the *Pyramid Texts* fail to set out the beliefs of Heliopolis systematically, why should we expect them to? After all, the people who mattered—the priests and worshipers—were already familiar with their own religion. The *Texts* do, however, allow the core theology and cosmology behind them to be reconstructed. The most successful attempt is found in Karl Luckert's *Egyptian Light and Hebrew Fire* (1991), which isolates two related aspects: the overall understanding in the origins and nature of the cosmos, and its relationship to human beings."
>
> — Lynn Picknett and Clive Prince (2013), *The Forbidden Universe: the Occult Origins of Science* [19]

The parent religion to 72 percent of the worlds religions, according to comparative mythology studies (as depicted adjacent), is the Egyptian religion sun god (Ra) worship religion Anunian theology (Ra theology), which originated primarily in the ancient Egyptian city of Heliopolis, the "city of the sun", in circa 3100BC, during which year the 20 nomes (cities) of lower Egypt united with the 22 nomes of upper Egypt to form the Egyptian first dynasty, an empire that would go on to dominate the world, both militarily and religiously, for nearly 3000-years. [12]

Modern science

One of the reasons for necessity of the study comparative religion and mythology, in the context of the hmolsciences, is that the subjects of human thermodynamics, human chemistry, and human physics, and the principles derived therefrom, are the replacements for the older mythology-based modern religions, and thus when addressing questions about purpose, existence, meaning, and morality, etc., it becomes requisite to have some semblance of historical basis.

In plain speak, a typical layperson (atheist, agnostic, secularist, or religious) will ask queries such as what do modern thermodynamics, chemistry, and physics have to say about terms such as soul, spirit, life, death, purpose, existence of god, etc., whereby it becomes imperative if one is to give cogent answers to such questions to have an semblance of an of historical framework to the etymologies of these various terms and older proto-scientific theories. Without such pause for historical digression, many modern hardened scientists will waste decades searching for baseless ideas, such as the origin of life, whereas in fact "life" is a religious-mythological theory and not one that holds in modern hard science (where things are viewed as atoms and molecules, which are not, by definition, considered to be alive).

Pre-Rosetta stone history

It is difficult to say exactly when the field of comparative mythology, in regards to the de-riddling of modern religion, arose as a distinct subject.

In circa 230, Alexandrian scholar Origen (185-254) penned the following: (Ñº)

> "To what person of intelligence, I ask, will the account seem logically consistent that says there was a "first day" and a "second" and "third," in which also "evening" and "morning" are named, without a sun, without a moon, and without stars, and even in the case of the first day without a heaven (Gen. 1:5-13)? …. Surely, I think no one doubts that these statements are made by Scripture in the form of a type by which they point toward certain mysteries."

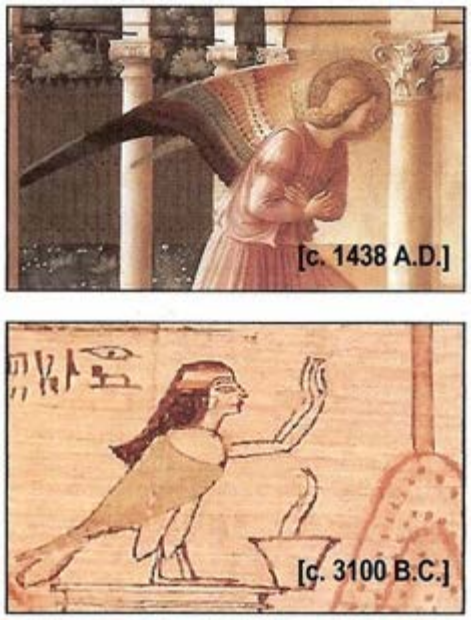

An example of **comparing myths**: top the Christian theory of angels; bottom the Egyptian theory of birds carrying the sun in the sky in its daily journey. [5]

The first two thinkers to have completed massive studies on comparative mythology and modern religion were Dutch theologian Gerardus Vossius, whose works as of 2008 have never been translated from the Latin, and French bishop Pierre Huet (1630-1721). [7]

French genius Voltaire (1694-1778), cites both Vossius and Huet, and concluded, among other things, that Moses is a re-write of the Roman god Bacchus (400BC-400AD). [8]

In 1770, German polymath Johann Goethe completing a dissertation (rejected on the grounds that it was unorthodox) on "The Legislature, On the Power of the Magistrate to Determine Religion and Culture" at the University of Strasbourg, in which he contended, among other things, that "Jesus Christ is not the author of Christianity, but rather a subject composed by a number of wise men and that Christian religion is merely a rational, political institution." [1]

In 1803, French writer Charles Lebrun, in his *Doubts of Infidels*, as cited by Dorothy Murdock (2009), stated: [9]

> "The history of Moses is copied from the history of Bacchus, who was called Mises by the Egyptians, instead of Moses. Bacchus was born in Egypt; so was Moses... Bacchus passed through the Red Sea on dry ground; so did Moses. Bacchus was a lawgiver; so was Moses. Bacchus was picked up in a box that floated on the water; so was Moses.... Bacchus by striking a rock made wine gush forth... Bacchus was worshipped...in Egypt, Phenicia, Syria, Arabia, Asia and Greece, before Abraham's day."

(add discussion)

Rosetta stone

See main: Rosetta stone

In 1799, during a French expedition to Egypt, the famous tri-lingual inscribed Rosetta stone was discovered which aroused widespread public interest with its potential to decipher the hitherto untranslated Ancient Egyptian hieroglyphic language.

In 1820s, English physicist Thomas Young and French scholar Jean Champollion, translated the stone, after which modern comparative mythology and religion

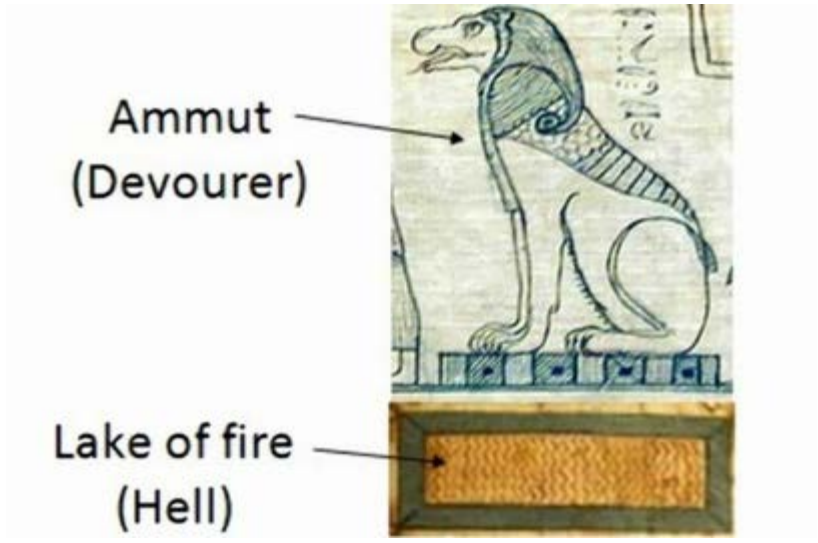

scholars began to emerge.

The Egyptian god Ammut standing over the lake of fire (hell) awaiting to devour the ba (soul) of the deceased if it is found too heavy during the weighting of the soul process. [17]

Soon thereafter, people began to see clearly that the main tenets of the major modern day religions (Christianity, Islam, Hinduism, etc.) originated from the core tenets of Egyptian mythology, those upon which the pyramids were built, particularly the story of the birth of the sun (sun disc) (later sun god Ra) out of the water or chaos / primordial mound of of beginning (later god Nun).

In 1883, English Egyptologist Gerald Massey published his *The Natural Genesis* (among other works), wherein he began to debunk a number of Bible mythologies, focusing on the overlaps of Horus and Jesus; a noted opening quote is: [16]

> "It takes the latter half of all of one's lifetime to unlearn the falsehood that was instilled into us during the earlier half. Generation after generation we learn, unlearn, and re-learn the same lying legendary lore. Henceforth, our studies must begin from the evolutionist standpoint in order that they mat not have to be gone over again."

This issue of religious syncretism became definitively clear to the inquisitive thinker when in 1895 Egyptologist Wallis Budge published *The Egyptian Book of the Dead* (*Papyrus of Ani*), wherein after "untold numbers of people began to write books, papers, and dissertations on the parallels between Jesus and Osiris (Ra's great grandson). [2]

Nun | Nu = Noah

The Christian story of man named Noah landing on an mountain, following a flood, following the release of three doves, after which the sun shines, is a monotheistic rewrite of the Egyptian theory of the birth of the sun (Ra) following the primordial flood (150-day Nile River flood), out of a land mound (pyramid) Nu, that rises out of the flood, the sun being carried through the sky by a heron or "phoenix" as Herodotus described things.

In Hinduism, this was described as the story of Ma-Nu.

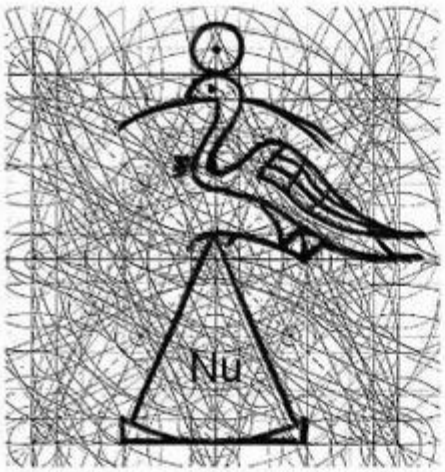

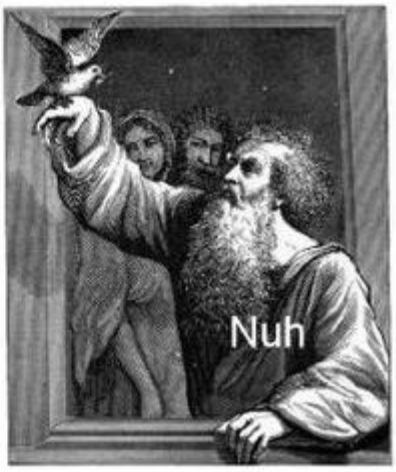

A depiction of the transformation of the Egyptian sun birth theory into the story of Noah and the ark.

Abraham | Brahma = Ra

See main: Abraham and Brahma

In 2004, American electrochemical engineer Libb Thims, after reading through the work of Gary Greenberg (among other works), independently arrived at the conclusion that the Abraham/Brahma theologies (Ab-*ra*-ham-ic faiths / B-*ra*-hma-ic faiths) are re-writes of the older Egyptian "Ra born of Nun" origin of the universe model/theologies, as hidden in their respective stories and name etymologies. [6]

One of the more significant unifying decipherments is the connection between the similarities of Jewish-Christian-Islam patriarch Abraham and the Hindu creator god Brahma, which overlap in at least six ways:

(a) Both Abraham and Brahma are the said-to-be creators all humans (Ra is the main creator god of the Egyptian pantheon).
(b) Both Abraham and Brahma have the same etymology: "Father Ra son of Nun" (water-fire-earth theory).
(c) Both Abraham and Brahma derived from the Nun (Noah and Ma-Nu, respectively).

(d) Both Abraham and Brahma have the same sister-wife, in namesake, Sarai and Saraswati, respectively.
(e) Both Abraham and Brahma have the same thrice sister-wife parable (creation by incest rewrite).
(f) The slaying of son reoccurs in both cases (release of the soul rewrite / Osiris-Horus splitting rewrite).

In 1975, American mythologist Lloyd Graham, in his *Deceptions and Myths of the Bible*, stated: [10]

> "Abram is but the Hindu Brama, with *a* as prefix instead of suffix; and Brama was the original name of the Hindu creator. Later the letter *h* was added, thus making it Brahma. The letter *h* signifies life, and thus did Brama, Abram, and Sarai in due time receive life, or being, which implies that in the beginning they did not have it."

All of this "letter change signifying life", to summarize, was re-written in the Bible as stories of god changing each person's respective name, for some unspecified reason, whereas the original etymology is one of the Egyptian origin of life theories.

The 1996-2000 work of American religious scholar and Egyptologist Gary Greenberg seems to have been the first to explain points (e) and (f), such as in his chapter sections "Abraham pretended that Sarah was his Sister" (2000) and "The Osirian Iconography in Isaac's Sacrifice" (1996). [3]

In 2009, religio-mythology scholar Dorothy Murdock, in her book *The Gospel According to Acharya S.*, penned a section entitled "Abraham is Brahma? Moses is Dionysus?". [11]

Jesus = Osiris/Horus

The story of the the death and resurrection of a person named "Jesus Christ" said to have conceived of virgin birth, from a virgin women named Mary, via impregnation with the "holly spirit", is a monotheism rewrite of the polytheistic story of the death and resurrection of Osiris by the help of his god-wife sister Isis or Stella Maris (aka "star of the sea") and their sun Horus. Some of this is outlined adjacent.

Sarai (Sarah) | Saraswati = Sirius (star)

The subject of the etymological origin of the character Sarai (Sarah), Abrahamic-version, or Saraswati , Brahmaic version, is generally traced to the Sirius, the brightest star in the sky, whose helical rising (following a 70-day absence from the sky), marks the start of the annual flooding of the Nile River. [13] All of this data of measured and observed natural phenomena formed the basis for Egyptian theology.

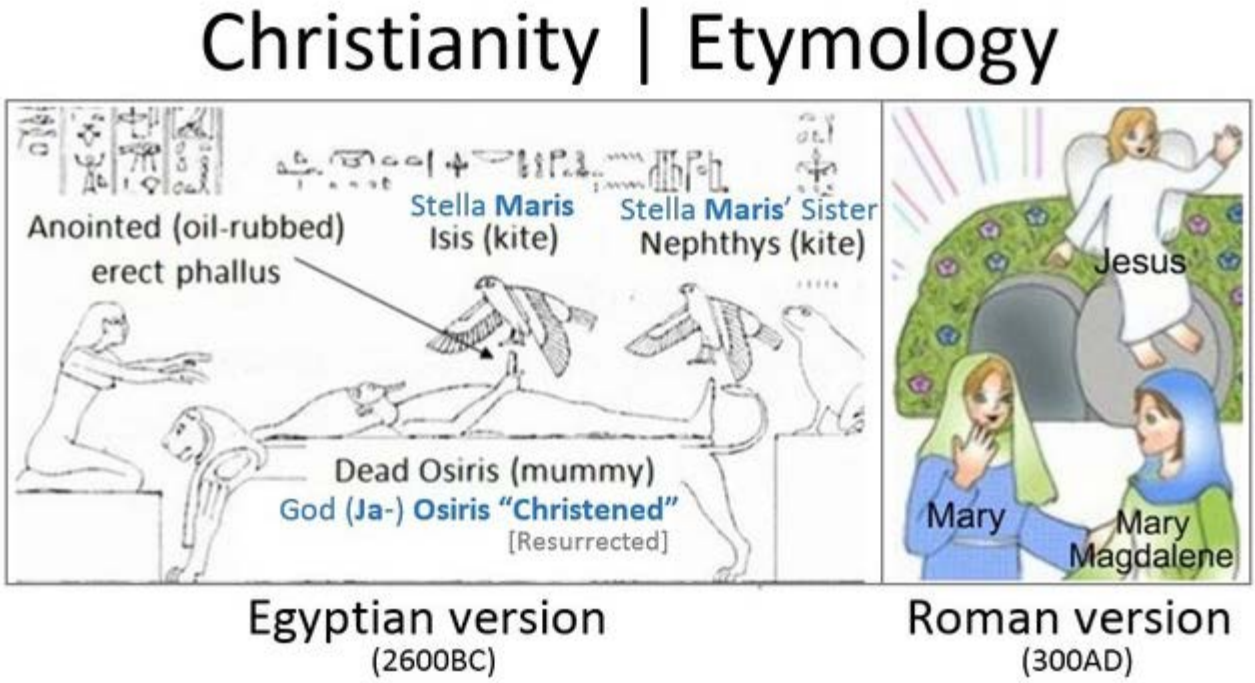

A snapshot of the how the Egyptian model of the resurrection of Osiris was re-written, in Christianity, into the resurrection of **Jesus**, and, in Hinduism, in to the reincarnation of Buddha. [1]

In 1830-33, reverend Robert Taylor discussed the connections between Sarah, Sirius (Dog Star), and the start of the annual flooding of the Nile. [14] Similar summaries were given by Logan Mitchell (*The Christian Mythology*, 1842) and Herbert Hardwicke (*The Popular Faith Unveiled*, 1881).

American religious scholar and Egyptologist Gary Greenberg gives the best account as to why the wife-sister parable is repeated three times, which is to cover-up the three unsavory points of creation by incest in the Heliopolis Ennead creation myth. [3]

Recent scholars

American religious scholar and Egyptologist Gary Greenberg's well-researched 2000 book *101 Myths of the Bible*, wherein he steps through the nearly ever story in the Bible and shows the original Egyptian version (Pyramid texts + Coffin texts), from which these stories (Bible, Koran, Rig Vida, etc.) originated, is one of the best modern comparative mythology books. [3]

In 2009, Canadian lay Egyptologist John Pippy, in his *Egyptian Origin of the Book of Revelation*, attempts to argue that entire structure of the Book of Revelation, one of the final books of the New Testament, can be accounted for in the organization of text and paintings on the walls and ceilings of the tomb of Ramesses VI in Egypt's Valley of the Kings. [21]

Solar disc | halo etymology

One of the easiest ways to explain "comparative mythology and modern religion" is visually. The best example is the 5,000-year artistic and conceptual evolution of the "halo" which originated from the myth of the sun or rather "sun disc" being carried through the sky by a bird (called the benu bird or phoenix) who balanced the sun on its head, and how this evolved over time into the halo, and then eventually the "thorns" depicted on the head of Jesus during the crucifixion.

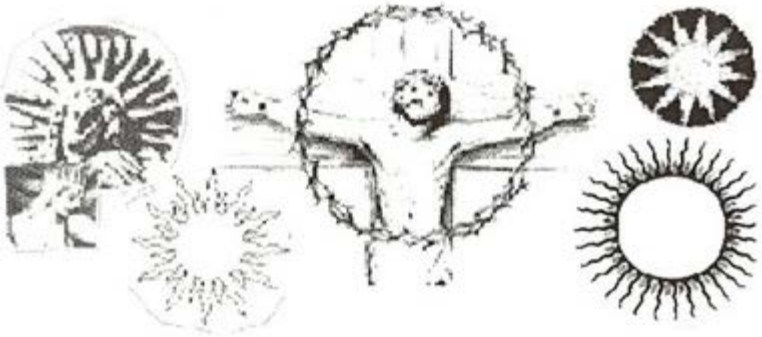

A solar corona "crown of thorns" depiction, aka halo, from American mythologist Jordan Maxwell's 2000 chapter "The Solar Cult". [5]

See also

â— Bible
â— Intelligent design
â— Karma weight
â— Religious thermodynamics
â— Thims religio-mythology, science, and atheism book collection

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External links

â— Comparative mythology – Wikipedia.
â— Jesus Christ in comparative mythology – Wikipedia.
â— Christian mythology – Wikipedia.
â— Islamic mythology – Wikipedia.
â— Hindu mythology – Wikipedia.
â— Jewish mythology – Wikipedia.
â— Religion and mythology – Wikipedia.
â— Wife-sister narratives in Genesis – Wikipedia.

θΔics

In thermodynamics, a **complete differential** (or exact differential) is a two or more variable differential equation that satisfies the condition for an exact differential (or the condition of immediate integrability).

Overview

The idea of a "complete differential" plays an important part in the theory of differential equations. An expression $Xdx + Ydy$ is called a complete differential when X, Y are functions of the independent variables x, y, such that:

$$\left(\frac{\partial Y}{\partial x}\right)_y = \left(\frac{\partial X}{\partial y}\right)_x$$

In this case, then, under certain restrictions, the value of $\int (Xdx + Ydy)$ depends only on the limiting values of the variables, and not on the intermediate ones by which these limits are connected, or, as generally expressed, on the path along which the integration is taken. [11] Hence, if a differential of the form

$$dW = Xdx + Ydy$$

where supposing that dW is the work done by force in the movement of a material point in the x-y plane, is determined to be complete differential, then it follows that:

$$W = F(x,y) + c$$

where c is a constant. In this case if we conceive the point to move from a given initial position (x_i, y_i) to any final position (x_f, y_f) the work done by the force during the motion will be resented by:

$$F(x_f,y_f) - F(x_o,y_o)$$

If then we suppose $F(x,y)$ to be such that it has only a single value for any one point in space, the work done will be completely determined by the orignal and final positions. [1]

Etymology

The use of the both terms "exact differential" and "complete differential", to note, were in common use in 1841. [7] The explicit use of the exact different was brought into thermodynamics in 1858 by German physicist Rudolf Clausius. [8]

The term "complete differential" was used in the English translations of Clausius' *The Mechanical Theory of Heat* (1865, 1875), in the mathematical introduction, thus establishing its use to some extent. Into the 1940s, however, the terms "exact differential" (vs "inexact differential") were in common use by those as Joseph Keenan (1941) and Mark Zemansky (1943). A less used synonym is: perfect differential (vs imperfect differential). Sometimes, to note, the term total differential is used in this context, but this term has a unique and different meaning in calculus.

Notation

Point functions, i.e. functions that depend on the state of the body only, generally characterized by a point on the graph of the quantifying variables, and not on how the body reaches that state, have exact differentials. These types of differentials are signified by the symbol d. [4]

Path functions, i.e. functions in which their magnitudes depend on the path followed during a process as well as the end states, have inexact differentials. These types of differentials are signified by the symbols δ (Greek delta), often used in modern days, or Ä‘ (d-crossbar), used generally between 1875 and 1950.

This symbol differentiation seemed to have originated from the 1875 lectures on the mechanical theory of heat by German mathematician Carl Neumann. [5] Neumann, supposedly, began using the d crossbar symbol Ä‘ to signify that heat Q and work W functions, as used in the first law:

dU = Ä‘Q + Ä‘W

are not state functions, and that their values depend on how the processes are carried out. [6]

One-variable complete differential

A function of one variable, such as:

$$dQ = A(x)\, dx$$

is always exact. [3]

Two-variable complete differential

Given a function of the form:

$$dW = Xdx + Ydy$$

the expression on the right hand side is a complete differential if it satisfies the following condition of immediate integrability: [1]

$$\frac{dX}{dy} = \frac{dY}{dx}$$

To repeat, using Mark Zemansky's notation, differentials of the type: [2]

$$dz = M\, dx + N\, dy$$

where *z*, *M*, and *N* are all functions of *x* and *y*, the following equality:

$$\left(\frac{\partial M}{\partial y}\right)_x = \left(\frac{\partial N}{\partial x}\right)_y$$

is the "condition for an exact differential", which states that the partial of the function *M* with respect to *y* at constant *x*

equals the partial of the function *N* with respect to *x* at constant *y*, signifies that the differential *dz* is exact. The thermodynamic potentials *U*, *H*, *A*, and *G* are actual functions and their differentials are exact. [2]

Three-variable complete differential

Given a function of the form:

$$dW = Xdx + Ydy + Zdz$$

the expression on the right hand side is the complete differential of a function of *x*, *y*, *z*, in which these may be treated as independent variables, if the following three conditions in integrability are satisfied:

$$\frac{dX}{dy} = \frac{dY}{dx}\,;\ \frac{dY}{dz} = \frac{dZ}{dy}\,;\ \frac{dZ}{dx} = \frac{dX}{dz}$$

To repeat using Pierre Perrot's notation, differentials of the type: [3]

$$dQ = A\,dx + B\,dy + C\,dz$$

where *Q*, *A*, *B*, and *C* are functions of *x*, *y*, and *z*, is an exact differential if the following relations hold:

$$\left(\frac{\partial A}{\partial y}\right)_{x,z} = \left(\frac{\partial B}{\partial x}\right)_{y,z}\,;\ \left(\frac{\partial A}{\partial z}\right)_{x,y} = \left(\frac{\partial C}{\partial x}\right)_{y,z}\,;\ \left(\frac{\partial B}{\partial z}\right)_{x,y} = \left(\frac{\partial C}{\partial y}\right)_{x,z}$$

In other words, the three component functions of *dQ* must be differentially symmetric with respect to each other.

Four variable complete differential

The conditions above, for two-variable and three-variable differentials, are easy to generalize, in that they arise from the rule of independence of the order of differentiation in the calculation of second derivatives. Subsequently, for a differential of four variables to be exact, there are six conditions to satisfy. [3]

Entropy

It seems that Clausius gave so much attention to the use and understanding of the completed differential because the differential function of heat *dQ* is not a complete differential. In particular, according to American mechanical engineer William Durand, it is well known that the integral of the derivative of heat *dQ*:

$$\int dQ$$

involved in any reversible change in a given substance or system is not independent of the path followed, or in other words of the intermediate conditions passed through. It follows that *dQ* is not a complete differential and that the integral of *dQ* cannot be expressed as a function of the initial and terminal conditions. [9]

This may possibly, however, have been the mode of logic that French physicist Sadi Carnot was using in 1824 with his re-establishment of equilibrium of the caloric; whereby heat was considered as a indestructable fluid particle (caloric) that could from an initial to an final point in a body unchanged, independent of path. In other words, if heat was a caloric particle, the following relation would hold:

$$\int_i^f dQ = Q(f) - Q(i)$$

being independent of the path followed. This, however, is not generally true in that due to the principle of the mechanical equivalence of heat, part of the heat transforms into mechanical work inside the body in its path motion, and hence does not simply depend on the initial and final values. It is well known, however, says Durand, that it is possible by means of an integrating factor to reduce *dQ* to a complete differential, and hence to express its integral thus transformed, as a new function of the initial and end conditions. [9] In other words, a differential *dQ* that is not exact is said to be integrable when there is a function $1/\tau$ such that the new differential dQ/τ is exact. The function $1/\tau$ is called the integrating factor, τ being the integrating denominator. [10] The factor that Clausius used for this purpose is the reciprocal of the absolute temperature *T*, such that a new function of heat can be said to exist:

$$\frac{dQ}{T} = dS$$

In which *dS* is a complete differential. The integral of *dS* is then termed the entropy, symbol S, and convenient set of initial conditions being taken from which to measure its value.

It is also well known, says Durand, that where one integrating factor, as *1/T*, exists, there will also exist an indefinite number of other factors, leading to a corresponding indefinite series of values of the complete integral. Hence, there may very well exist various resultant forms of the entropy function *S*. [9]

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â— Forsyth, Andrew R. (1890). *Theory of Differential Equations* (ch. 1: Single Exact Equation, pgs. 1-12). Cambridge University Press.
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θΔics

In chemistry, **complex** (TR:619) is a molecular entity formed by loose association involving two or more component molecular entities (ionic or uncharged), or corresponding chemical species; wherein the bonding between components is normally weaker than in a covalent bond, hence the term "binding", as in "molecular binding" tends to be employed, to distinguish that non-covalent bonding, e.g. van der Waals force interaction is accruing. [1]

See also

- Complexity theory

References

1. Complex – IUPAC Gold Book.

θΔics

In science, **complexity theory** is an ill-defined subject generally consisting of attempted classifications of a variety of complex systems according to difficulty of algorithms, computational methods, and computer simulations. [1]

Artist's interpretation of **complexity**, of a lecture by Paul Davies entitled "Taming complexity: opening a new scientific frontier," delivered at the Future Summit of the Australian Davos Connection in Sydney, Australia 12 May 2008).

The term complexity theory or complexity science, all-in-all, is a general umbrella term for the study of a number of disperse fields that use mathematical methods of investigation, without any uniform framework or core principles; an example being the use of Edwin Jaynes' so-called maximum entropy principle, blended together with Riemannian metrics to explain complex systems. [3]

History

The so-called science of complexity tends to refer to an admixture of 1990s going into the 2000s theories, for the most part chaos theory mixed together with computer simulations.

The following, for example, is a 2009 complexity theory-science flow chart style timeline is American medical sociologist Brian Castellani's interpretation of complexity science, which shows, rather correctly, that what is often referred to as "complexity theory" (or complexity science), essentially, is an umbrella term for a mixture of a number of related cousin subjects, in particular Austrian biologist Ludwig Bertalanffy's 1940 general systems theory and American mathematician Norbert Wiener's 1948 cybernetics theory, in core structure, with appendage additions, including: Kenneth Boulding (economic systems), Howard T. Odum (ecological systems), James Miller (biological systems theory), James Lovelock and Lynn Margulis (gaia hypothesis), John Neumann (mathematics), Claude Shannon (information theory), Edgar Morin (sociology and philosophy), Fritjof Capra (web of life), Niklas Luhmann (sociology), Erich Jantsch (self-organizing universe), Ilya Prigogine (dissipative structures), Stuart Kauffman (autocatalytic emergence), Albert-Lazlo Barabasi (linked theory), Mark Granovetter (weak ties), all connected together with a general kindred towards computer modeling and chaos theory. [4]

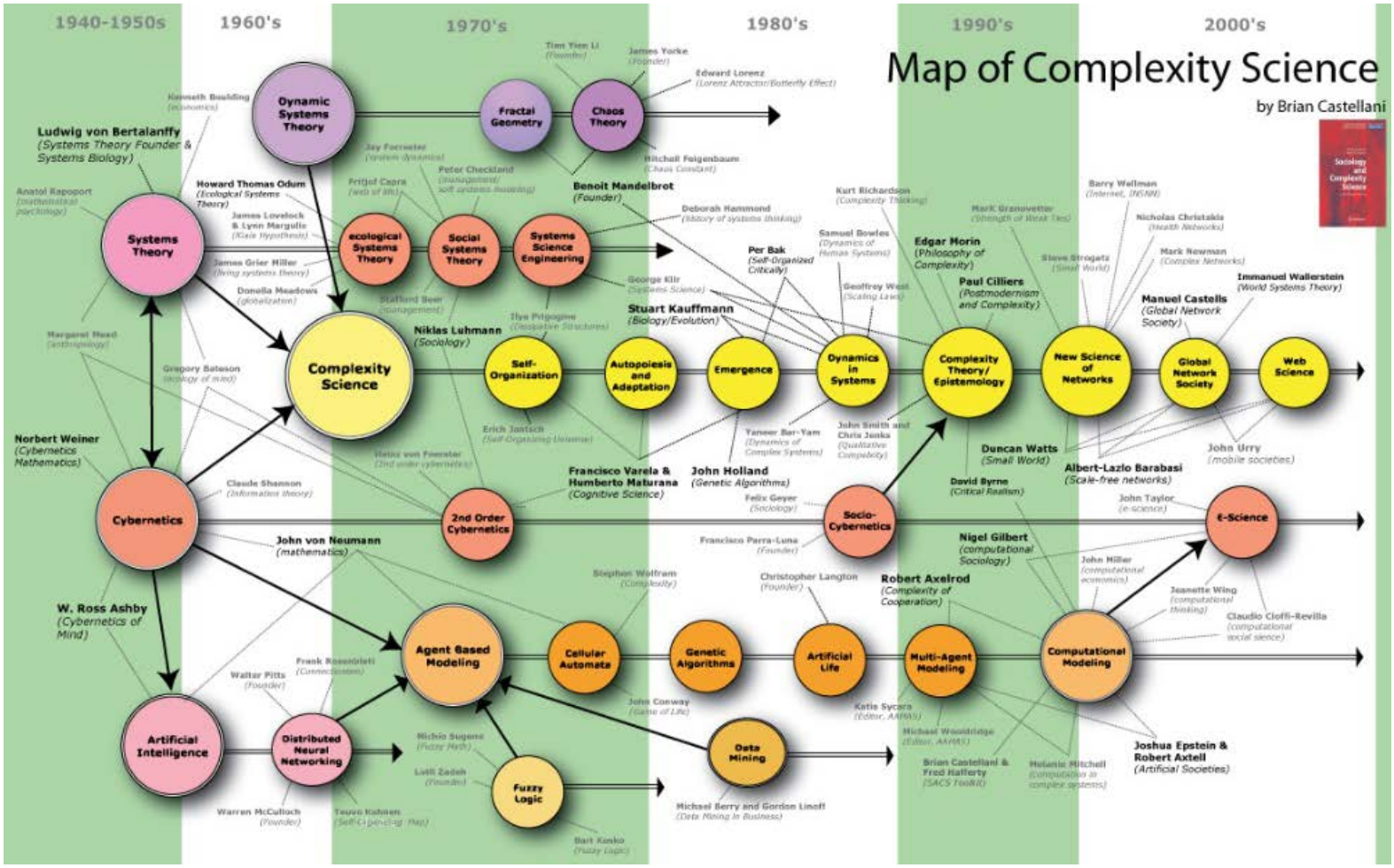

It is difficult to say, however, as of 2010, if complexity is a legitimate branch of science. In any event, in sum, complexity theory, in biology and sociology, is often used as an umbrella term for a mixture of chaos theory, cybernetics, information theory, general systems theory, along with superficial mentions of thermodynamics, among others.

Other

Belgian chemist Ilya Prigogine dates the start of complexity science to the heat transfer work of Fourier: [2]

> "As for the birth of the 'science of **complexity**', we propose to date it in 1811, the year Joseph Fourier won the prize of the French Academy of Science for his mathematical description of the propagation of heat in solids."

This, however, is a biased misattribution, being that Fourier's work forms the basis of the subject of heat transfer

See also

â— Complex

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â— Gregoire, Nicolis and Prigogine, Illya. (1989). *Exploring Complexity - an Introduction.* New York: Freeman and Co.

External links

â— Complexity – Wikipedia.

θΔics

In chemistry, **compound** is a substance formed by the combination of elements in fixed proportions; terminologically, there are some 800+ named types of compounds. [1]

Quotes

The following are related quotes:

> "The image of elective affinities proposes the likeness between the attraction of charged radicals, on the one hand, and the attraction of pairs of persons, on the other—an attraction that proceeds chiastically (Q), over and against their original linkages and domiciles, which in the first instance are chemical **compounds** and in the second instance aristocratic manor-houses."
>
> — Stanley Corngold (2003), "Compulsive Affinities: Goethe, Kafka, Benjamin" [2]

References

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(b) Compound (search) – IUPAC Goldbook.
2. Corngold, Stanley. (2003). "Compulsive Affinities: Goethe, Kafka, Benjamin", Keynote Address, Conference: "Distortion", University of Western Ontario, Apr 6.

External links

- Chemical compound – Wikipedia.

θΔics

In thermodynamics, **computational thermodynamics** is the facilitative use of computers in the solving and simulation of thermodynamical problems and models, particularly used in the construction of phase diagrams.

History

The computational modeling of classic Gibbsian thermodynamics, in what has come to be called the CALPHAD (CALculation of PHAse Diagrams) approach or "method", a 1973 term, was pioneered by American metallurgist Larry Kaufman beginning in 1966. [1] The term "computational thermodynamics", thought to have been coined by Swedish physical metallurgist Bo Sundman as a branch of science, began to come of use in the late 1990s. [2]

Emergence

In 2008, Swedish mathematician Claes Johnson argued that the emergence of ordered structures, such as human beings, could be explained by a "new second law", not based on entropy, but derived via a computational thermodynamics based reformulation of the first law of thermodynamics. [3]

References

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(b) Turchi, Patrice E.A. and Gonis, Antonios. (2002). *CALPHAD and Alloy Thermodynamics,* (section: Computational Thermodynamics, by Z-K. Liu, pgs. 205-14). The Minerals, Metals & Materials Society.
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External links

â— Calphad – Elsevier Journal (homepage).
â— CALPHAD – Wikipedia.

θΔics

In thermodynamics, **computer science thermodynamics** is the application of thermodynamics to the study, operation, modeling, and design of computer systems. A closely related filed is information theory, which relies on Shannon entropy to study information.

History

The first formal connection between thermodynamics and computation was made by Hungarian-born American chemical engineer John von Neumann who in a 1949 lecture asserted that any computer operating at a temperature T must dissipate at least $kT \ln 2$ unit of energy, approximately 3E-21 joules at room temperature, "per elementary act of information, that is per elementary decision of a two-way alternative and per elementary transmittal of one unit of information." [1]

References

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Further reading

â— Garcia, Narciso. (1986). *Physics for Computer Science Students: With Emphasis on Atomic and Semiconductor Physics*. John Wiley & Sons.

External links

â— Basic Computer Thermodynamics - Bucaro TecHelp Newsletter.

θΔics

In religio-mythology, **Condemnation of 1277**, aka “Tempier’s condemnations”, refers to a numbered list of 219 supposed error-filled propositions, being discussed by the “Aristotelian radicals” of the University of Paris, most of which based on reason, and therein going against faith, compiled by French bishop Etienne Tempier (c.1210-1279) (Q) working with a team of theologians, that if taught, listened to, or discussed, the persons involved would be subject to excommunication and subject other disciplinary actions. (Q)

List

The following is the list ordered according to Edward Grant (2001), who takes them from several sources, as cited by Jennifer Hecht (2004): [1]

#	Forbidden	Discussion
1.	That there is no more excellent state than to study philosophy.	
6.	That when all celestial bodies have returned to the same point—which will happen in 36,000 years—the same effects now in operation will he repeated.	
9.	That there was no first man, nor will there be a last; on the contrary, there always was and always will be generation of man from man.	
21.	That nothing happens by chance, but all things occur from necessity and that all future things that will be will he of necessity, and those that will not be it is impossible for them to be; and that upon considering all causes, (it will be seen that] nothing happens contingently. [This is an] error because by definition a concourse of causes occurs by chance, as Boethius says in his book On Consolation of Philosophy.	
34.	That the first cause could not make several worlds.	
35.	That without a proper agent, as a father and a man, a man could not be made by god [alone].	
37.	That nothing should be believed unless it is self-evident or could be asserted from things that are self-evident.	
38.	That god could not have made prime matter without the mediation of a celestial body.	
48.	That god cannot be the cause of a new act [or thing], nor can he produce something anew.	
49.	That god could not move the heavens [that is, the world] with rectilinear motion; and the reason is that a vacuum would remain.	
	That that which is self-determined, as god, either always acts or never acts; and	

52.	that many things are eternal.	
66.	That that are several first movers.	
74.	That a motive intelligence of the heavens influences the rational soul just as a celestial body influences the human body.	
87.	That the world is eternal as to all the species contained in it; and that time is eternal, as are motion, matter, agent, and recipient; and because the world is [derived] from the infinite power of god, it is impossible that there he novelty in an effect without novelty in the cause.	
88.	That nothing could be new unless the sky were varied with respect to the matter of generable things.	
89.		
90.	That natural philosopher ought to deny absolutely the newness [that is, the creation] of the world because he depends on natural causes and natural reams. The faithful, however, can deny the eternity of the world because they depend upon supernatural causes.	
91.	That the argument of the philosopher demonstrating that motion of the sky is eternal is not sophistical; and it is amazing that profound men do not see this.	
92.	That celestial bodies are moved by an internal principle, which is soul; and that they are moved by is soul and by an appetitive power (*per virtutem appertitivam*) [that is, by force of desire] just as an animal; for just as an animal is moved by desire, so also is the sky.	This one is very humorous; reminiscent of Johannes Kepler's belief that planets moved by angel power.
93.	That celestial bodies have eternity of substance but not eternity of motion.	
94.	That there are two eternal principles, namely the body of the sky and its soul.	
95.	That there are three principles in celestial bodies: (I) a subject of eternal motion, (2) a soul of II celestial body, and (3) the prime mover as that which is desired. —The error concerns only the first two.	
98.	That the world is eternal because that which has a nature by (means of] which it could exist through the whole future [surely) has a nature by means of] which it could have existed through the whole past.	
99.	That the world, though it was made from nothing, was not, however, made anew; and although it came into being from nonbeing, nevertheless nonbeing did not precede being in duration, but only in nature.	
100.	That theologians who say that the sky [or heavens] sometimes rests argue from a false assumption; and that to say that the sky exists and is not moved is to utter contradictories.	
101.	That an infinite [number] of celestial revolutions have preceded which it was not impossible for the first cause (that is, god) to comprehend, but (which are impossible of comprehension) by a created intellect.	
102.	That the soul of the sky is an intelligence and the celestial orbs are not instruments of the intelligence, but organs, just as the ear and the eye are organs	

of the sensitive power.

106. That the immediate effective cause of all forms is an orb.

107. That the elements are eternal. However, they have been made [or created] anew in the relationship which they now have.

110. That the celestial motions occur because of an intellective soul; but an intellective soul or intellect cannot be produced except by means of a body.

152. **That theological discussions are based on fables.**

Here we see that the subject of religio-mythology was being discussed, but deemed illegal in the late 13th century.

153. That nothing is known better because of knowing theology.

154. That the only wise men of the world are philosophers.

161. That the effects of the stars on free will are hidden.

162. That our will is subject to the power of the celestial bodies.

180. That the Christian law impedes learning.

181. That there are fables and falsehoods in the Christian law just as in others.

185. That it is not true that something could be made from nothing, and also not true that it was made in the first creation.

186. That the sky never rests because the generation of the lower things, which is the end purpose of celestial motion, ought not to cease; another reason is because the heaven has its being and power from its mover which things are preserved by its motion. Whence if its motion should cease, its existence would cease.

188. That it is not true that something comes from nothing or was made in a first creation.

189. That creation is not possible, even though the contrary must be held according to the faith.

199. That in efficient causes when the first cause [god (?)] ceases [to act] the second for secondary cause does not cease its operation since it could operate in accordance with nature.

201. That he who generates the whole world assumes a vacuum because place necessarily precedes what is generated in that place; therefore, before the generation of the world there was a located place which is a vacuum.

202. That the elements have been made in a previous generation from chaos; but they are eternal.

216.	That a philosopher must not concede the resurrection to come, because it cannot be investigated by reason. – This is erroneous because even a philosopher must bring his mind into captivity to the obedience of Christ	See: Death and Resurrection of Osiris; Death and Resurrection of Jesus

219.

Those #s shown bolded above were added from this list (Q), which has a differing numbering scheme.

Overview

The Condemnation of 1277 was a response to radical thinkers such as Siger of Brabant; in latter centuries, the list attracted commentaries of minds such as Pierre Duhem.

References

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External links

- Condemnations of 1210-1277 – Wikipedia.

θΔics

In engineering, **condenser** is the part of the heat engine or steam engine that cools the steam or working body via the use of surrounding cold water, aka the cold body, typically.

Overview

In c.1699, Thomas Savery had built his steam engine (see: Savery engine), as shown below, which operated such that steam was made in the boiler C, by boiling water over a fire, and through the connecting pipe E, the steam was put into the "receiver" B, which was then sealed shut, or disconnected form the boiler, after which valve F was turned thus letting a cooling fountain spray fall upon the outside of the receiver, which thus cooled the "working body" of steam in the receiver, thereby producing a "vacuum", thus enabling his engine to "work" or mechanically pump or lift a certain amount of water out of flooded mines:

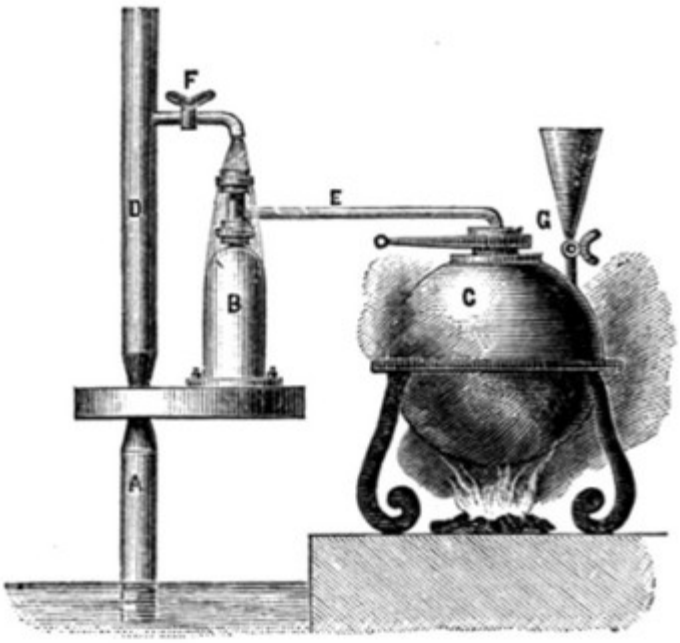

In 1765, James Watt, after ruminating about the above design, envisioned the idea that if would save time and be more economically efficient if the working body of steam in the receiver or volume of space inside the piston and cylinder were transmitted into a new container and "condensed" therein, by cooling water, thereby allowing the piston and cylinder to remain hot, thus saving a loss of heat to waste; the thereafter built the "condenser" as shown below:

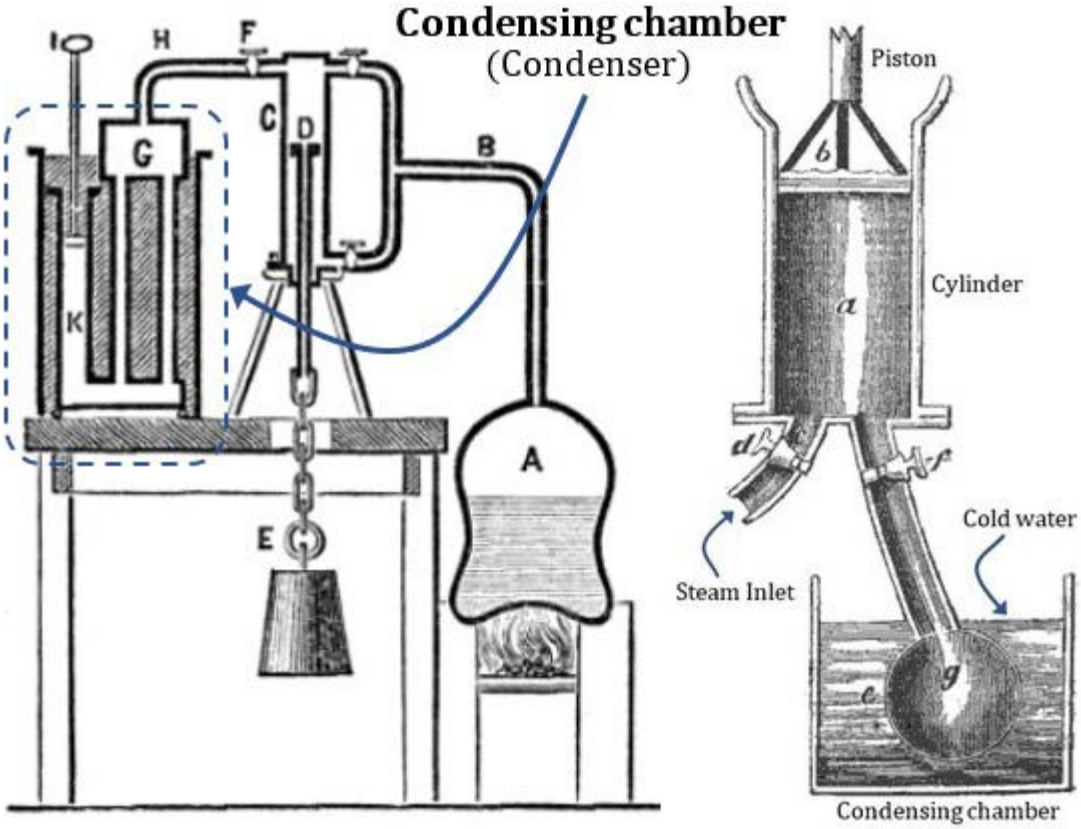

(add)

Quotes

The following are related quotes:

> "*Barometer gauge.* This is an instrument to indicate the degrees of exhaustion within the **condenser**; it is constructed like a weather-glass or barometer, except that the upper end of the glass tube communicates by a small copper pipe with the condenser: the lower end of the glass tube is open, and is immersed in mercury contained in a small cistern or basin, the surface being exposed to the atmospheric pressure. The glass tube, which is about 32-inches long, is placed in a perpendicular direction, and the copper pipe from the condenser is very closely cemented to the glass at the upper end. When the engine is at work, and a vacuum is formed in the condenser, the barometer tube is exhausted, so that the surface of the mercury in that tube is relieved from pressure, and the weight of the atmosphere which presses upon the surface of the mercury in the basin, causes a column thereof to mount up in the tube, to a greater or less height according as the vacuum in the condenser is more or less perfect, and according to the weight of the atmosphere, which will be shown by a common Torricellian barometer or weather-glass.
>
> — John Farey (1827), *A Treatise on the Steam Engine* [1]

References

1. Farey, John. (1827). *A Treatise on the Steam Engine: Historical, Practical, and Descriptive* (§: Barometer gauge, pgs. 377-79). Longman.

External links

â— Separate condenser (section) – Wikipedia.
â— Condenser (heat transfer) – Wikipedia.

θΔics

In mathematical thermodynamics, the **condition for an exact differential** is that given some function *u* of two or more variables, such as:

$$du = P\,dx + Q\,dy$$

the expression on the right side of the equation *Pdx* + *Qdy* is an exact differential only when *P* and *Q* satisfy the following condition or criterion:

$$\left(\frac{\partial P}{\partial y}\right)_x = \left(\frac{\partial Q}{\partial x}\right)_y$$

If F is a state function, then $dF = \left(\frac{\partial F}{\partial x}\right)_y dx + \left(\frac{\partial F}{\partial y}\right)_x dy$

where x and y are variables of state of the system.

The Euler reciprocity relation (for F a state function):

If $dF = Mdx + Ndy$, then $\left(\frac{\partial M}{\partial y}\right)_x = \left(\frac{\partial N}{\partial x}\right)_y$

A summary of the "Euler reciprocity relation", a synonym for what Rudolf Clausius calls the "**condition for an exact differential**", which would seem to indicate that this logic was originated by Swiss mathematician Leonhard Euler. [5]

meaning that the partial derivative of the function *P* with respect to *y* at constant *x* equals the partial derivative of the function *P* with respect to *x* at constant *y*.

Examples

The expression *ydx* + *xdy* is an exact differential, because it is the differential of *xy*; whereas, *2ydx* + *xdy* is not an exact differential, because it is not the differential of any function of *x* and *y*.

Proof

To prove or derive this condition, we first start with the function of two variables:

$$du = P\,dx + Q\,dy$$

and note that the definition of a total differential *of a function of several independent variables* is the sum of its partial differentials arising from the separate variation of the variables, whereby the derivative of *u* can be written also as:

$$du = \left(\frac{\partial u}{\partial x}\right)_y dx + \left(\frac{\partial u}{\partial y}\right)_x dy$$

hence, by comparison of these two expressions, we find that:

$$P = \left(\frac{\partial u}{\partial x}\right)_y \quad \text{and} \quad Q = \left(\frac{\partial u}{\partial y}\right)_x$$

Differentiating the first of these with respect to *y*, and the second with respect to *x*, we have:

$$\left(\frac{\partial P}{\partial y}\right)_x = \left(\frac{\partial^2 u}{\partial y \partial x}\right) \quad \text{and} \quad \left(\frac{\partial Q}{\partial x}\right)_y = \left(\frac{\partial^2 u}{\partial x \partial y}\right)$$

Whence, by the calculus principle that the order of differentiation is immaterial, we have:

$$\left(\frac{\partial^2 u}{\partial x \partial y}\right) = \left(\frac{\partial^2 u}{\partial y \partial x}\right)$$

whereby it is proved that:

$$\left(\frac{\partial P}{\partial y}\right)_x = \left(\frac{\partial Q}{\partial x}\right)_y$$

and that this is called the "condition for an exact differential".

Maxwell's equations

See main: Maxwell's relations

The application of the condition for an exact differential for functions of two variables that are already known to exist or be actual functions, such as internal energy *U*, enthalpy *H*, Helmholtz energy *A*, and Gibbs energy *G*, gives the quick derivation of what are called "Maxwell's equations". [2] In short, applying the results of the condition for an exact differential to the four exact differentials *dU*, *dH*, *dA*, and *dG*, gives the following relations as tabulated below to the right:

Potential function		Relation
$dU = T\,dS - P\,dV$	hence	$\left(\frac{\partial T}{\partial V}\right)_S = -\left(\frac{\partial P}{\partial S}\right)_V$
$dH = T\,dS + V\,dP$	hence	$\left(\frac{\partial T}{\partial P}\right)_S = \left(\frac{\partial V}{\partial S}\right)_P$
$dA = -P\,dV - S\,dT$	hence	$\left(\frac{\partial P}{\partial T}\right)_V = \left(\frac{\partial S}{\partial V}\right)_T$
$dG = dH - S\,dT$	hence	$\left(\frac{\partial V}{\partial T}\right)_P = -\left(\frac{\partial S}{\partial P}\right)_T$

These relations are sometimes also called Maxwell relations. [3] It is not necessary, according to American physicist Mark Zemansky, to memorize these relations since they are so easily derived. The Maxwell equations do not refer to a process but merely express relations that hold at any equilibrium state of a chemical system. [2] The great interest of

Maxwell's equations according French thermodynamicst Pierre Perrot, is that they lead to the partial derivatives of entropy as a function of physical quantities directly available by experiment. [4]

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2. Zemansky, Mark W. (1943). *Heat and Thermodynamics - an Intermediate Textbook for Students of Physics, Chemistry, and Engineering* (exact differential, pg. 27, condition for an exact differential, pg. 220). McGraw-Hill Book Co., Inc.
3. Maxwell relations - Wikipedia.
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5. The Terrible Beauty of Thermodynamics (2010) – ScribD.com.

θΔics

In science, **conferences** are scheduled meetings, symposiums, and or workshops where scientists and interested parties meet to discuss focused topics in common areas of research. Some of these conferences are organized below.

A photo of Israeli chemical engineer Alec Groysman at the 2011 Generative Art Conference, Rome, discussing how chemical engineering based human chemistry should become a part of scientific education and the engineering curriculum of the 21st century. [1]

Overview

In 2011, Israeli chemical engineer Alec Groysman, at the 14th Generative Art Conference, Rome, in his "Use of Art Media in Engineering and Scientific Education", discussing how chemical engineering based human chemistry should become a part of scientific education and the engineering curriculum of the 21st century; the main statement of which is as follows: [1]

> "Dobereiner helped in refining Russian platinum, discovered catalysis, and reported his work to Goethe. The latter's novella *Elective Affinities*, a work of art, gave impulse to a new scientific field named 'human chemistry' (Thims, 2007). In the exact sciences there are quantitative measures of estimation of each value: mass, length, force, energy. In the humanistic disciplines (history, philosophy, psychology) as well as art there are no quantitative criteria. This is similar to the question of how to measure beauty, love, friendship, democracy? The function named Gibbs energy defines 'love' between substances [and] people ... and is similar to Hamlet's 'to be or not to be?' of William Shakespeare."

In 2013, American electrochemical engineer Libb Thims, at the 5th University of Pitesti Econophysics and Sociophysics Workshop, Pitesti, Romania, in his "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?", gave an overview of the dos and don'ts of "human" modeling techniques as seen being used in the emerging fields of sociophysics, econophysics, econoengineering. [2]

In 2014, Brazilian chemical engineer Jaime Aguilar-Arias, at the 20th Brazilian Congress of Chemical Engineering, Florianopolis, Brazil, in his "Chemical Engineering and Complexity, an Undissipated Structure … Yet", suggested that modern chemical engineering education curriculum begin to incorporate a "human chemical thermodynamics" themed type of teaching methodology in engineering schools:

> "In contrast, other fields, such as biology, economics, health sciences, among other, have found practical applications of *complexity* in their disciplines. The purpose of this work is to show some possible applications of complexity, not necessarily in the traditional field of chemical engineering, but where clearly chemical engineers can uniquely contribute due to our formation and basic elements of thermodynamics, and processes analysis, compared to other disciplines, in matters of study that are not the classical chemical engineering applications, but where their application is necessary, even not being chemical processes."

Aguilar-Arias goes on to cite, first and foremost, Venezuelan-born English chemical engineer Erich Muller, his famous "Human Societies: a Curious Application of Thermodynamics" (1997), and his human-as-molecules classroom stylized approach to teaching chemical engineering students how chemical thermodynamics applies socially. He then discusses how this new field is fermenting by new emerging journals, such as the *Journal of Human Thermodynamics*, in particular, via articles such as Iranian-born American chemical engineer Mohsen Mohsen-Nia's 2013 "Social Equation of State", which he compares to earlier work by English mechanical engineer John Bryant (2011), the two of which he truncates into the following two human thermodynamics variables tables: [3]

Table 1. Analogies for thermodynamic variables proposed by Mohsen

Symbol	Thermodynamics	Mohsen Analogy
U	Internal Energy	Energy Stored in Societies
Q	Heat	Energy flowing due to difference of society excitement
P	Pressure	Social Rules (Laws, Culture, Religion, etc.)
V	Volume	Freedom
T	Temperature	Motivation in society
W	Work	Energy necessary for making a regular social system
S	Entropy	Social system desorder

Table 2. Analogies for thermodynamic variables proposed by Bryant

Symbol	Thermodynamics	Bryant Analogy
U	Internal Energy	Internal Value, depending on T
Q	Heat	Entropic Value
P	Pressure	Unit price
V	Volume	Units per unit of time
T	Temperature	Index of trading value
W	Work	Work Value per unit of time
S	Entropy	Entropy
k	Boltzmann constant	Productive content

Aguilar-Arias then cites Brian Arthur, of the Sante Fe Institute, in respect to arguments about "economies" being in either equilibrium, non-equilibrium, or unstable equilibrium states, as Paul Samuelson has argue, or as compared to far-from-equilibrium views, as Ilya Prigogine has argued. Aguilar-Arias then notes:

> "A relevant anecdotic, is the strong debate including economic Nobel Prize winners such as Kenneth Arrow, 1972 winner, and Paul Krugman, 2008 winner, the first in favor and the last against the application of complexity in economics. This debate is agitated by the use of defiant expressions used by the authors, such as they have 'changed economic thinking', which generated comments like the other 'has just invented…economics'. This work, by the way, doesn't want to generate such comments, instead, its purpose is to reinforce arguments to the fields of action that chemical engineers can, and must be prepared to participate."

(add discussion)

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3. Aguilar-Arias, Jaime L. (2014). "Chemical Engineering and Complexity, an Undissipated Structure … Yet", 20th Brazilian Congress of Chemical Engineering (*Congresso Brasilerro de Enenharia Quimica*, XX) (pdf), Florianopolis, Brazil, Oct 19-22.

Other

● Savoiu, Gheorghe. (2013). *University of Pitesti Econophysics and Sociophysics Workshop 2013*, Pitesti, Romania, Jun 29.
● Pogany, Peter. (2009). "Fifth Structure Emergence in Economics: Observations Through the Thermodynamic Lens of World History (lecture)" (reference to the EoHT website in the presentation) *International Gebser Society Conference*, Hofstra University, New York. Oct. 15.

External links

● Annual Gibbs Conference on Biological Thermodynamics – Gibbs Society
● Statistical thermodynamics (conference listings) – SklogWiki
● Thermodynamics, Fluid Dynamics, and Statistical Physics (conferences and meetings) – Conference-Service.com

θΔics

In thermodynamics, **conjugate variables** or "conjugate pairs" are sets of intensive X and extensive x variables whose product Xdx has the dimensions of energy. [1] A central example of a conjugate pair is pressure-volume work, where the multiplication of the intensive variable pressure P by the extensive variable volume dV equates to an amount of spatial work energy dW done. Other conjugate pairs are listed below:

Intensive Variable	Extensive Variable	Energy	Function	Product	Person
Pressure P	Volume dV	pressure-volume work	δW	pdV	Clapeyron (1834)
Temperature T	Entropy dS	internal work (transformational content energy)	δQ	TdS	Clausius (1865)
Chemical potential μ	Particle number dn	species transfer work		μdn	Gibbs (1876)
Force F	Length dx	stress-strain work		Fdx	Hooke (1660)
Electromotive force ε	Charge de	electrical work		εde	Gibbs (1876) - Helmholtz (1882)
Surface tension γ (superficial tension σ)	Surface area dA (area of surface considered s)	surface work		γdA (σδs)	Gibbs (1876)
Gravitational potential ψ	Mass dm	gravitation work		ψdm	
Electric field E	Electric dipole moment dp	electric polarization		Edp	
Magnetic field B	Magnetic moment dm	magnetic polarization		Bdm	

The general use of the conjugate pairs perspective is that one can quantify the internal energy of a system as the sum of the conjugate variables. In short, with any extensity x_i (extensive variable) it is always possible to associate a tension variable X_i (intensive variable):

$$X_i = \frac{\partial U}{\partial x_i}$$

which is called the "conjugate", whereby, according to the first law, the change in internal energy dU of a system is given by the summation of the product of the conjugate pairs:

$$dU = \sum_{i=1}^{k} X_i dx_i$$

The right side of this expression is what is called a Pfaffian form. To give a simple example, in the process whereby an indefinitely small quantity of heat dQ (which according to German physicist Rudolf Clausius is equal to the product TdS) is imparted to a body, thus causing a certain amount of pressure-volume work to be done, in accordance with Boerhaave's law, the change in the internal energy will be the heat added less the work done:

$$dU = TdS - PdV$$

which is the first and the second law of thermodynamics combined into an analysis of the process. [3]

History

It is difficult to track down the origin of this topic, although it might be derived from the homogeneous function of Swiss mathematician Leonhard Euler. [4]

One of the first to summarize this as a “work principle” seems to have been Danish physical chemist Johannes Bronsted who in a 1946 monograph, reprinted in 1955 as *Principles and Problems in Energetics*, summarized the main topics in thermodynamics in terms of energetics. [2] In particular, he stated that the overall work *â†W* performed by a system is the sum of contributions due to transport of extensive quantities *â†Ki* across a difference of "conjugated potentials" P_{i1} - P_{i2}:

$$\Delta W = \sum_{i=1}^{k} (P_{i1} - P_{i2}) \Delta K_i$$

in which P_{i1} - P_{i2} may be T_1 - T_2 (thermal potential difference), μ_1 - μ_2 (chemical potential difference), or ψ_1 - ψ_2 (electric potential difference) and *â†Ki* will be *â†S* (quantity of entropy), *â†n* (quantity of substance), or *â†e* (quantity of electricity), respectively .

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External links

â— Conjugate variables (thermodynamics) – Wikipedia.

θΔics

In hmolscience, **connections** refers to groupings of scholars who make discernible connections between the connective works of key thinkers; some of which are listed in the adjacent dropmenu.

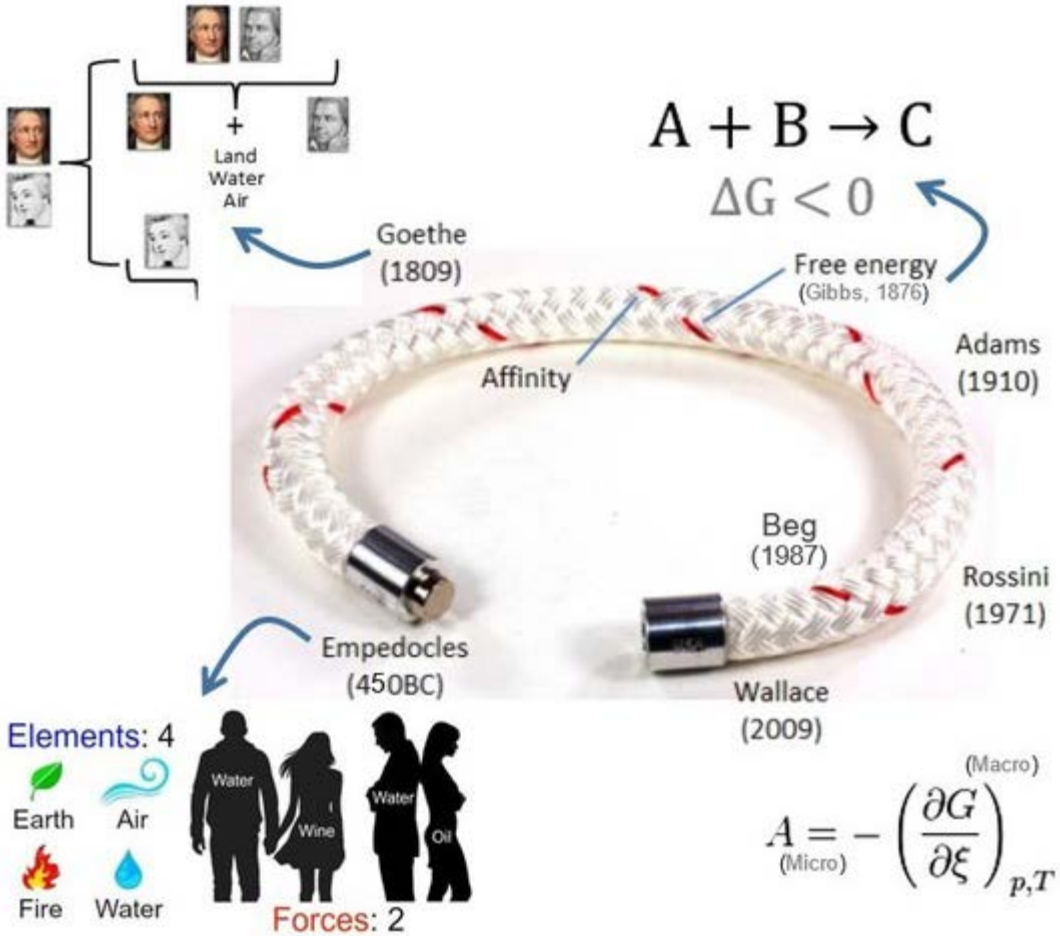

List

The following are core hmolscience connection groupings:

- Gibbs and Goethe
- Gibbs, Goethe, and Empedocles
- Goethe and Empedocles
- Empedocles, Goethe, and Beg

(add disucssion)

In science, **Conrad Waddington** (1905-1975) was an English theoretical geneticist noted for lectures on the origin of life—platformed, it seems, on the Charles Sherrington views—and for his usage of thermodynamics and statistical mechanics models in the development of his genetics-evolution models. In his 1966 *New Patterns in Genetics and Development*, to exemplify some of his views, Waddington stated the following conception of his notion of theoretical biology: [1]

> "The first question to ask is not, what is the detailed nature of the components—we can hardly expect to get an answer to this—but rather, what stable states will survive a disturbing stimulus? What we need is statistical mechanics comparable to the thermodynamics of physical theory. But we shall have to elaborate one that applies to open systems which do not conserve either matter or energy; whose final state is not determined by initial conditions; and in which entropy is increased."

Americans zoologist Daniel Brooks and ecologist Edward Wiley summarize that Waddington's major contribution was the notion that the search for a causal mechanism in evolution must involve causal laws of physics and chemistry, especially those pertaining to open systems. [2]

Education

Waddington was influenced by Alfred Whitehead's philosophy in the 1920s and Norbert Wiener's cybernetics in the 1930s.

Associations

Conrad seems to have cultivated a number of associations with thinkers common or connective to the hmolsciences, including: Ilya Prigogine, Erich Jantsch, Gregory Bateson, C. P. Snow, and Joseph Needham, to name a few—a number of which, such as Prigogine and Jantsch, he seems to have worked with when he co-edited the 1976 book *Evolution and Consciousness: Human Systems in Transition*. [3]

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External links

- Conrad Hal Waddington – Wikipedia.

θΔics

In science, **consciousness**, from Latin *conscius*, from *com-* "with" + *-scire* "to know", refers to a mental state of alertness or wakefulness of an individual, as opposed to dormant or inert state, an example of the latter being someone who remains viscerally-animate, i.e. breathing, but non-responsive, e.g. coma owing to head trauma.

One of the first issue have with the logic of a person defined as a human molecule is consciousness.

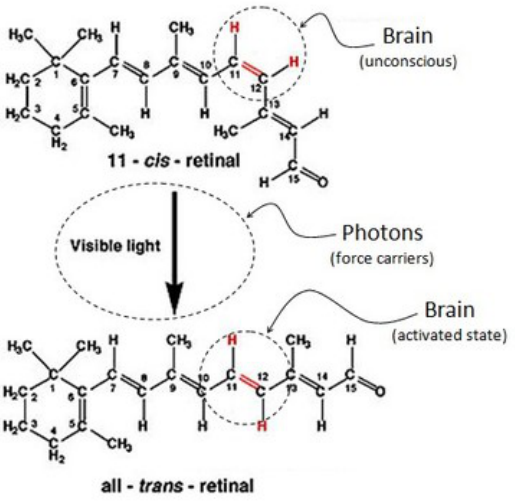

The retinal molecule model of so-called consciousness choice in a 3-element molecule, which equates to a type of induced movement animation mechanism.

Thermodynamics

Various individuals have attempted to explain consciousness based on thermodynamics.

Many have attempted to explain consciousness, thermodynamically. In the 1920s, Swiss psychiatrist Carl Jung began theorizing about the consciousness and entropy, to the effect that extensity, according to one definition, is an ordering parameter of a complex system, associated with energy, defined as the area of consciousness in phase space; where phase space for the ego is a two-dimensional chart showing the relationships between consciousness, the personal unconsciousness, and the collective unconsciousness over time. [1] This work was carried over into positive positive psychology by Jung's student Mihály Csíkszentmihályi in the 1980s. [5]

In 1965, Canadian materials science engineer Jack Kirkaldy presented a Gibbs free energy theory of consciousness in his article “Thermodynamics of the Human Brain.” [6]

In 1976, American engineer Richard Weiss postulated that: [2]

> “The part of the brain which is the seat of consciousness may be a thermodynamic system no larger than a grain of sand.”

In 1995, American chemical engineer and physician Gerry Nahum outlined a 30-page proposal to conduct a consciousness weighing experiment, on the premise that consciousness can be quantified using (a) conservation of energy, (b) the equivalence of energy/negative entropy with neurological system information content, and (c) mass-energy equivalence. [3]

In 2007, on the premise that evolution applies to human consciousness, Indian chemical engineer DMR Sekhar postulated that DNA has a sort of consciousness, arguing for the existence of an extensive anti-entropy property of DNA called genopsych. [4]

In 2007, American chemical engineer Libb Thims explained consciousness as a type of induced movement in the human molecule, connected to changes in states of reactivity associated with the carbon atoms of the central nervous system, similar to that which happens in the process by which a retinal molecule moves in response to external forces. [7]

In 2010, Ted Erikson, following his talk at the Illinois Institute of Technology, gave his opinion to Libb Thims that he believed that consciousness arose at the Planck length scale, which he points to on the following printed version of the molecular evolution timeline:

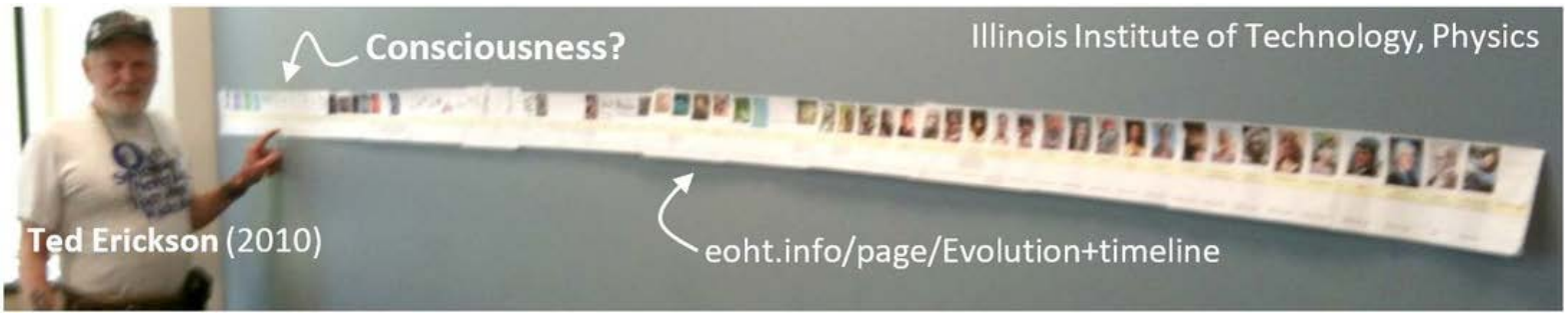

(add)

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External links

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θΔics

In science, a **conservation law** refers to something, such as mass or energy, which is understood to be a conserved quantity. The central conservation law is the conservation of energy. Others include: conservation of force (a near synonym), conservation of mass (a derivative via mass-energy equivalence), conservation of matter-energy (a verbalized version of the conservation of mass, conservation of energy, intertwined with mass-energy equivalence), conservation of information (a speculative analogy).

External links

â— Conservation law – Wikipedia.

θΔics

In science, the **conservation of energy** or "law of conservation of energy" one of the conservation laws, states that energy can be transferred from one form to another but cannot be created or destroyed. [1] In generalized form, the conservation of energy is a statement that, while energy can be converted from one form to another, e.g. kinetic, electrostatic, gravitational, chemical, nuclear, and others, the total amount of energy in the universe (isolated system) never changes. [2]

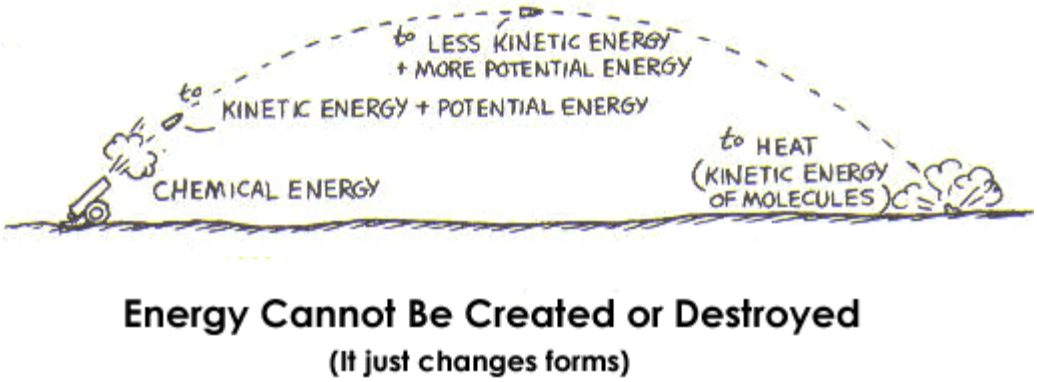

A simplified sketch of the **conservation of energy**, by American physics cartoonist Paul Hewitt (Ñº), showing the transformation of chemical energy into kinetic energy into potential energy into the heat and the work of explosion of impact.

Discoverers

The following *circa* 1863 quote by German physicist Hermann Helmholtz, a co-discoverer himself with his theories on the conservation of force, expresses the gist of the conservation of energy in relation to its developers: [12]

> "Kirchhoff's predecessors in the field of radiation bore him much the same relation as, in the **conservation of energy**, Mayer, Colding, and Seguin bore to Joule and Thomson."

Names attributed to the graduate establishment of this of the of the conservation of energy include: German pharmacist Karl Mohr (1837), French engineer Marc Seguin (1839), German physicist Robert Mayer (1841), English physicist James Joule (1843), Danish physicist Ludwig Colding (1843), Carl Holtzmann (1845), Welsh physicist William Grove (1846), German physicist Hermann Helmholtz (1847), William Thomson (1849), among others.

Kraft conservation

Early versions of the conservation of energy, often tended to employ the German word "Kraft", which can be loosely translated as force, power, or energy, depending, but most often as "force", stating to the effect that "kraft" was conserved. Force and energy, however, are not technically equivalent. Energy, in the form of work, is related to force, via the principle of the transmission of work (1829), when the force moves and object through a distance:

$$W = Fd$$

In modern terms, it is understood that energy, but not force, is conserved. The details of this, in respect to the German-to-English renditions of the term "kraft", however, do not seem to have solidified into the late 19th century.

In 1837, German chemist Karl Mohr gave one of the earliest statements of the conservation of kraft: [3]

> "Besides the fifty-four known chemical elements there is in the physical world one agent only, and this is called **Kraft**. It may appear, according to circumstances, as motion, chemical affinity, cohesion, electricity, light and magnetism; and from any one of these forms it can be transformed into any of the others."

In the late 1840s, using conclusions reached by Mayer and Joule, Helmholtz formulated, very clearly, the existence of the law of conservation of energy or of "force" (as energy was called at that time). [7] Specifically, in 1847 Helmholtz stated an equivalent version: "vital heat is the product of mechanical forces within the organism; all heat is related to ordinary forces" and that: [6]

> "Force itself can never be destroyed."

One of Helmholtz' more famous publications on this subject was a series of lectures delivered at Karlsruhe, in the winter of 1862, titled "On the Conservation of Force". [8] Helmholtz introduced the subject by stating that "the last decades of scientific development have led us to the recognition of a new universal law of all natural phenomena", which asserts that:

> "The quantity of force which can be brought into action in the whole of nature is unchangeable, and can neither be increased nor diminished."

Using the example of gravity, one of the fundamental forces, Helmholtz shows how gravity can be used to do work by detailing the actions of a falling weight that drives the workings of a clock. Although the weight will have lost it capability to perform work when it reaches the floor, it will not lose its force, in that gravity remains. The amount of work can then be determined by the weight times the distance travelled.

Heat can also produce work, such as in the operation of a steam engine. Here, Helmholtz recalls the point that heat must not be considered as a substance but merely as a movement of internal particles. This is in contrast to the older views in which heat was considered as a type of substance called caloric or, before that, phlogiston, whose amount was believed to be constant. The amount of heat needed to melt a piece of ice is the same, for instance, as the amount of heat that must be extracted to refreeze the water. Helmholtz explained, however, that as soon as heat is converted into work, that an equivalent amount of heat is destroyed or "consumed" using the terminology of Rudolf Clausius.

Other examples where work is generated at a cost, described by Helmholtz, include: a raised weight can do work but while doing that it must sink and no longer do work; a stretched spring can do work but will become loose; the velocity of a mass can do work but will eventually come to rest; chemical forces (energy) can do work but they will get exhausted; electrical force can do work but will consume chemical or mechanical forces. On this logic, Helmholtz concluded that all natural forces (energy) can do work but they are at the same time exhausted to the degree of work performed. He then formulated that the total quantity of all forces capable of doing work in the whole universe remains constant. He compared this with the laws of constant mass or constant chemical elements. In conclusion, he touches briefly on the topic of perpetual motion and states that force cannot be produced from nothing: something must be consumed.

Energy conservation

The principle of the conservation of energy has a long and elaborate history, stemming from the 1670s theory of *vis viva* or "living force" of German mathematician Gottfried Leibniz, to debates on the caloric theory in contrast to the mechanical equivalent of heat beginning in the years 1787 to 1798, to the coining of the term "energy" in 1807 by English physician and physicist Thomas Young. Scottish physicists Peter Tait and Balfour Stewart argue that the conservation of energy has its roots in one interpretation of Newton's third law of motion (1687); they define the conservation of energy as follows: [13]

> "In any system of bodies whatever, to which no energy is communicated by external bodies, and which parts with no energy to external bodies, the sum of the various potential and kinetic energies remains forever unaltered."

On this note, two principle formulators of the modern understanding of the conservation of energy were German physician Robert Mayer and German physician and physicist Hermann Helmholtz who both spoke of the "law of the conservation of force." [4]

In 1841, Mayer stated the most famous version of the conservation of energy: [5]

> "Energy can be neither created nor destroyed."

In 1849, in a footnote to a discussion of a perfect thermo-dynamic engine (a footnote mentioning the 1843 work of Joule), Irish physicist William Thomson stated, in his famous paper "An Account of Carnot's Theory of the Motive Power of Heat', that: [10]

> "Nothing can be lost in nature—no energy can be destroyed."

In 1874, English physicist Balfour Steward published the book *The Conservation of Energy*, a book that went through nine-editions over following twenty-five years. [11]

Chemistry

In chemistry, the conservation of energy is a principle which states that in a chemical reaction, the total amount of energy in the system remains unchanged. [1] In a chemical reaction, to elaborate, for each component there may be changes in energy due to change of physical state, changes in the nature of the chemical bonds, and either an input or output of energy. In this process, there is, however, no net gain or loss of energy. The energy of a battery, for instance, which is a direct result of a chemical reaction inside the battery, can be transferred into an electrical circuit, which can then used to produce heat or light a bulb; in this process, the total amount of energy is constant.

Thermodynamics

The principle of the conservation of energy was introduced into thermodynamics, specifically via the mechanical equivalent of heat as embodied in the first and second laws of thermodynamics, principally through the writings of German physicists Rudolf Clausius, with his 1865 textbook *Mechanical Theory of Heat*, and Hermann Helmholtz, with his 1882 article "The Thermodynamics of Chemical Operations". [9] The "law of dissipation of energy" is often seen as its counterpart.

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7. Hermann von Helmholtz (1821-1888) reported on July 23 in 1847 on the principle of conservation of energy and showed that he had acquired a deep understanding of this principle. He was, together with Rudolf Clausius, the founder of what was called the *Berlin School of Thermodynamics* where he succeeded Magnus as the director of the Physical Institute. The influence of this school on the development of thermodynamics was crucial; to name a few famous scientists were connected to this school: Walther Nernst, Max Planck, Albert Einstein, Erwin Schrödinger, and Leo Szilard.
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θΔics

In thermodynamics, the **conservation of force** or "law of conservation of force" is a view, promoted largely by German physicist Hermann Helmholtz, beginning in 1847, which argues that the quantity of force in the universe, called “kraft”, is conserved. [1] The logic of the theory was later re-incorporated into the more robust law of conservation of energy and then into the first law of thermodynamics, by German physicist Rudolf Clausius. The law of conservation of force, according to Helmholtz, states:

> “The quantity of force which can be brought into action in the whole of nature is unchangeable, and can neither be increased nor diminished.”

History

The theory of the conservation of force has a long and elaborate history. According to Helmholtz, the primary curator of this principle, the "law of conservation of force", as he called, had been enunciated prior to him by Isaac Newton, Daniel Bernoulli, Benjamin Thomson, and Humphry Davy. [2] Likewise, in the 1670s the theory of *vis viva* or “living force” of German mathematician Gottfried Leibniz was prominant. In 1837, German pharmacist Karl Mohr gave one of the earliest statements of the conservation of force or Kraft: [3]

> “Besides the fifty-four known chemical elements there is in the physical world one agent only, and this is called Kraft. It may appear, according to circumstances, as motion, chemical affinity, cohesion, electricity, light and magnetism; and from any one of these forms it can be transformed into any of the others.”

In the years to follow, building on Helmholtz, others began to profess their views on the conservation of force, such as English chemist Michael Faraday who later developed the theory of "lines of force" (field lines), a theory very influential to Scottish physicist James Maxwell. [4]

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θΔics

In science, **conservation of heat** was an assumption, as employed in, e.g., the matter theory of heat (or material theory of heat) and caloric theory, now classified as a "fallacious principle" (Garrison, 1909), that heat is an indestructible substance, which flows from a warmer to a colder object (Einstein, 1946). [1]

The theory or implicit assumption of the conservation of heat, such as employed in Sadi Carnot's 1824 so-called Carnot cycle model of heat engine operation (see: re-establishment of equilibrium in the caloric), was disproved in 1798 by Benjamin Thompson's famous cannon boring experiment.

The theory of the conservation of heat, historically, was usurped by the second law of thermodynamics, aka the law of entropy increase, in colloquial speak, the increase in transformation content in Clausius-speak, or the logic of the increase in the equivalence-value of all uncompensated transformations in all irreversible cyclical processes.

The phrase "conservation of heat", however, persisted in semi-employed usage into the early 20th century.

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θΔics

In information theory thermodynamics, **conservation of information** refers to the hypothesis or argument that "information" is physically equivalent to "energy", or in some versions of the argument "entropy", and that there exists a conservation law for information, analogous to the other conserved quantities, e.g. mass, charge, etc., of physics.

History

The hypothesis of the so-called "conservation of information" seems to have originated in certain arguments in the 1975 "The Arrow of Time" by American astrophysicist David Layzer, who using a rather backward and inane blend of statistical mechanics and information theory, concludes: [5]

> "Entropy and information are related by a simple conservation law, which states that the sum of the information and the entropy is constant and equal to the system's maximum attainable information or entropy under the given conditions."

Layzer then states that this is expressed mathematically as:

> H + I = constant

and concludes that a "gain of information is always compensated for by an equal loss of entropy." This statement, to note, seems to be a rephrasement of American physical chemist Gilbert Lewis' 1930 Maxwell's demon molecule distribution based conclusion that "gain in entropy always means the loss of information, and nothing more." [6]

In 1988, citing Layzer, Canadian zoologist Daniel Brooks and American systems ecologist Edward Wiley give the following four bullet points of their so-called hierarchical information theory:

> 1. Total information capacity is conserved.
> 2. Order capacity plus disorder capacity equals total information capacity.
> 3. Disorder capacity always increases or stays the same.
> 4. Order capacity always decrease or stays the same.

which they call the "informational analog of the second law of thermodynamics for closed systems". In any event, they conclude with the inane statement that "this definition is entirely consistent with classical thermodynamics definitions". [7]

In 1998, American mathematician and intelligent design advocate William Dembski proposed a conservation of information type theory, modeled on the conservation of energy, in his paper “Intelligent Design as a Theory of Information”. In this paper, Dembski reasons that there exists a “conservation law that governs the origin and flow of information”; that “information is not reducible to natural causes”; and that “the origin of information is best sought in intelligent causes”, such that “intelligent design thereby becomes a theory for detecting and measuring information, explaining its origin, and tracing its flow.” [2] The corollaries of the proposed law are the following:

> (a) The specified complexity in a closed system of natural causes remains constant or decreases.
> (b) The specified complexity cannot be generated spontaneously, originate endogenously or organize itself (as these terms are used in origins-of-life research).
> (c) The specified complexity in a closed system of natural causes either has been in the system eternally or was at some point added exogenously (implying that the system, though now closed, was not always closed).

(d) In particular any closed system of natural causes that is also of finite duration received whatever specified complexity it contains before it became a closed system.

The theory was later elaborated on further in the 2004 book *Uncommon Dissent: Intellectuals Who Find Darwinism Unconvincing.* [3] The concept was elaborated on further in Dembski's 2007 book *No Free Lunch: Why Specified Complexity Cannot be Purchased without Intelligence.* [4]

Religion

In religious thermodynamics, the conservation of information or "law of conservation of information" states that natural causes are incapable of generating *complex specified information* (markers of design by an intelligent agent) and that the complex specified information in a closed system of natural causes remains constant or decreases. [1]

Difficulties on theory

Among the numerous difficulties with this contrived theory is that, by definition, something that decreases in amount cannot be considered as being conserved. Another salient difficulty is that Dembski uses the term "closed system" in place of what should be "isolated system". This type of misuse of thermodynamic terms and conceptions are common among mathematicans who attempt to extrapolate new thermodynamics theories. As famously stated in 1989 by Russian mathematician Vladimir Arnold: "every mathematician knows it is impossible to understand an elementary course in thermodynamics." Beyond this, information is anthropomorphic conception and is not something defined in the inherent structure of the composition of the universe. In this light, a simple reading of the history of the Library at Alexandria, the ancient world's largest library, confirms that information is not conserved.

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External links

â— Law of conservation of Information (overview) - by Les Lane.

θΔics

In chemistry, **conservation of mass**, one of the conservation laws, states that in a chemical reaction or process the mass of the compoments of atoms in the reactants will equal that of the products.

History

The first to clearly announce the law of conservation of mass, according to Gilbert Lewis (1925), was French physician-chemist Jean Rey, who in his 1630 *The Increase in Weight of Tin and Lead on Calcination* stated the following: [1]

> "Let there be taken a portion of earth which shall have in it the smallest possible weight, beyond which no weight can subsist: let this earth be converted into water by means known and practiced by nature; it is evident that this water will have weight, since all water must have it, and this weight will either be greater than that of the earth, or less than it, or else equal to it. My opponents will not say that it is greater, for they profess the contrary, and I also am of their opinion: smaller it cannot be, since we too the smallest weight that can exist: there remains then only the case that the two are equal, which I undertook to prove."

French thinker Emilie Chatelet (1706-1749) performed what would eventually come to be known as Lavoisier's rust experiment (1774), at a time at which it is said that if her scales were more accurate, she would have arrived at the law of conservation of mass.

The first to enunciate the conservation of mass, according to Leon Winiarski (1898), however, was French chemist Antoine Lavoisier. [2] Lavoisier, in circa 1789, supposedly, confirmed many of Rey's hypotheses by more exact experiment.

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External links

â— Conservation of mass – Wikipedia.

θΔics

In science, the **conservation of mass-energy** or matter-energy states that the total amount of mass (or matter) plus energy in a system, or sometimes it is said the the universe, is constant. [1]

Overview

In 1896, the concept of the of conservation of mass-energy is said to have entered into the corpus of science following firstly French scientist Antoine Becquerel's 1896 discovery of radioactivity in uranium, in which energy seemed to be coming from nowhere, and second German-born American physicist Albert Einstein's 1905 formulation of the mass energy equivalence formula. [4] There does not seem to be, however, any specific publication that purports the law of conservation of mass-energy as a new scientific principle of science, but rather this seems to be a urban version of blend of the conservation of mass and the conservation of energy.

In 1983, chemists Robert Smoot and Jack Price stated that: [2]

> "Scientist [believe] that the total amount of matter and the total amount of energy in the universe [are] each constant. These laws are the conservation of energy and the conservation of mass. Thus we see that the two conservation laws are really just one law. This law is known as the law of **conservation of matter-energy**."

The statement of there being a law of conservation of matter-energy, to clarify, is a non-scientific verbalized aggregation of several principles: conservation of mass (Lavoisier, c. 1780), conservation of energy (Joule, 1843), first law of thermodynamics (Clausius, 1850), mass-energy equivalence (Einstein, 1905), intertwined with references to an ill-defined type of 'matter-energy', such as used in discussing proton-proton chain reactions (Eddington, c. 1920), confused with particle physics (c. 1980s) descriptions of the fundamental matter of the universe, defined as types of fermions, and the energy of the universe defined as types bosons. Subsequently, in an oversimplified way, this set of principles is sometimes referred to, in a colloquial, non-rigorous scientific way, as the law of conservation of matter-energy (or conservation of mass-energy).

To give an example, in stellar proton-proton chain reactions, hydrogen atoms transform into helium atoms and in the process part of the hydrogen mass is converted into energy. Specifically, in each reaction set, comparing the mass of the final helium-4 atom with the masses of the four initial protons, reveals that 0.007 or 0.7% of the mass of the original protons has been lost. This mass has been converted into energy, in the form of gamma rays and neutrinos released during each of the individual reactions. The total energy produced in one whole chain is 26.73 MeV. The exact details of these types of particle physics reactions, however, tend to become lost in translation when simplified into simpler science.

In 2003, authors Charles Carraher and Raymond Seymour declared: [3]

> "The universe is composed of matter/energy and space. Matter/energy is conserved as described by the law of **conservation of matter/energy**."

No one, however, has actually formally proposed a 'law of conservation of matter-energy'.

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External links

â— Conservation mass-energy – ChemTeam.info.

θΔics

In thermodynamics, **conservative dynamical system** is a system consisting of moving molecules in which the total energy of all collisions is conserved. The term was used significantly by English physicist C.G. Darwin's 1952 book *The Next Million Years* to describe both an ideal gas system, defined by Boyle's law, and, by analogy, a system of human molecules, confined to the earth "containing vessel", defined by "the Boyle's law which controls the behavior of those very complicated molecules, the members of the human race." [1]

References

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θΔics

In science, **constant** is a quantity found to be unvarying throughout nature and or throughout the universe, depending, e.g. the solar constant is peculiar to sun, whereas the speed of light is universal.

List

The following is a work-in-progress listing of notable and or significant constants found in nature:

- Solar constant | Solar flux
- Boltzmann constant
- Mechanical equivalent of heat
- Energy (of the universe) | Laws of the universe
- Speed of light
- Planck's constant
- Gas constant

Humanities

In hmolscience, a number of constants are directly relevant to the humanities, including: the gravitational constant, responsible for holding humans to the earth, the speed of light, plays a role in love at first sight, relativity, exchange force operating between humans, among others, and most importantly the mechanical equivalent of heat, which quantifies the ratio of solar heat transformed into social work. [1]

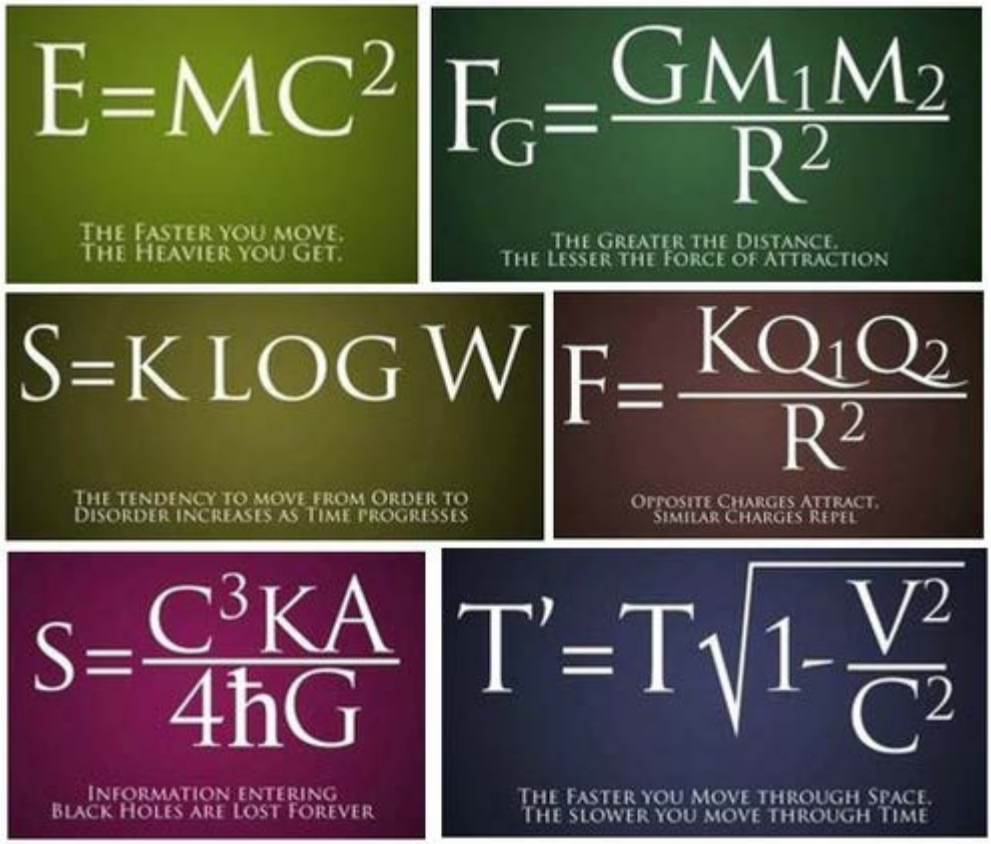

Laymanized descriptions of six of the big equations of physics and four of the main **constants** utilized therein, namely: speed of light *c*, gravitational constant *G*, reduced Planck-Dirac constant *ħ* (check for error here with possible extra *K* constant in black hole entropy (O) formula) Coulomb's constant K, Boltzmann constant K, the third of which, "tendency to move from order to disorder" is misunderstood description, which in its original (correct) statement reads the "entropy of the universe tends to a maximum", entropy meaning transformation content, per system transformation mechanical equivalent of heat formulation basis.

The following, conversely, is a representative statement, made by Morris Zucker, from his chapter subsection on constants which function in the science of history, arguing to the affect that the constants of physics are inapplicable to the science of history: [2]

> "There is no valid analogy between the **constants** of history and physics, yet we hand no difficulty whatever in recognizing *homo sapiens* wherever we found them and in whatever degree of development."

(add discussion)

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External links

- Constant (disambiguation) – Wikipedia.

θΔics

In hmolscience, **Constantin Bratianu** (1946-) is a Romanian engineer and business management theorist noted []

Overview

In 2007, Bratianu began to work on the subjects of synergy, entropy, and thermodynamics, applied to concepts such as learning and team projects. The following is a representative quote: [1]

> "The team management acts as in integrator at the team level: an integrator is a powerful field of forces capable of combining two or more elements into a new entity, based on interdependence and synergy. These elements may have a physical or virtual nature, and they must possess the capacity of interacting in a controlled way."

(add discussion)

Education

Bratianu completed a BS in engineering, specializing in thermo-energetics, in 1970 at the Polytechnic Institute of Bucharest, after which he completed his MS (1977), in nuclear engineering, his PhD (1980), in nuclear engineering, both at the Georgia Institute of Technology, the latter with a thesis on "Mixed and Hybrid Element Models in Fluid Dynamics", and his doctor of management in 2002 at the Academy of Economic Studies Bucharest, Romania. Bratianu then worked as a power engineering professor from 1970 until 1992 at series of universities, after which he began to migrate over to business administration. In 2012, he became professor emeritus of the faculty of business administration, UNESCO Department for Business Administration. Bratianu's areas of interest in teaching include: knowledge dynamics, knowledge management, intellectual capital, and strategic management.

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External links

● Constantin Bratianu (profile) – Academic-Conferences.org.
● Constantin Bratianu (profile) – Astr.ro.

θΔics

In existographies, **Constantin Caratheodory** (1873-1950) (CR:16) was a German mathematician, a student of the Berlin school of thermodynamics in 1900, who is noted for his pure axiomatic mathematical interpretation of thermodynamics, specifically his so-called Caratheodory's theorem (or theorem of Caratheodory, as it has come to be called), centered around a proof of the necessary relation between the Pfaffian form, differential quantities of heat, and the integrating denominator. [1]

Overview

In Xirokrini on the Bosphorus, Caratheodory worked from July to September 1908 on his "Studies in the Foundation of Thermodynamics", which he completed in Bonn of that year, published as a 31-page article in the German journal *Mathematische Annalen* in 1909. [2] During this period, he became officially a professor on October 3rd, 1908, after lecturing in Bonn for two months. Caratheodory commented on this work that it was the only work that he had thought through from the beginning to the end before writing it down. He also commented:

> "We can derive the whole theory, without assuming the existence of heat, i.e. a physical quantity that differs from the usually mechanical quantities."

In his work he reformulated the first and second laws of thermodynamics as the first and second axioms. He then introduced two assumptions differing from the traditional approach, one that heat was reduced to mechanical work and second that the system was treated mainly as an adiabatic process instead of a cyclic process. [1]

In 1939, Indian-born American astrophysicist Subrahmanyan Chandrasekhar gave the first English presentation of Carathedory's 1908 article in his chapter one to his *An Introduction to the Study of Stellar Structure*.

Of note, there does not seem to exist a readily available full English translation of Caratheodory's original article, and most commentary on his work is of a secondary nature. [3]

Quotes | On

The following are quotes on Caratheodory:

> "The problem as it seemed to many scientists was to explain in terms of the real laws of physics (like Maxwell's and Einstein's) why entropy never decreased. Perhaps the most penetrating analysis of this question was given in 1909 by the German mathematician **C. Caratheodory**. His work did not commend itself generally, however, because it did not arrive at the wanted result. What Caratheodory proved was that either entropy could never decrease or it could never increase, but he couldn't say which! To agree with the observed situation, it was still necessary to make an arbitrary choice."
>
> — Fred Hoyle (1981), *Evolution From Space: a Theory of Cosmic Creationism* (Ñº)

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MacMillan.

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External links

â— Constantin Caratheodory – Wikipedia.

θΔics

In existographies, **Constantin Udriste** (1940-) is a Romanian mathematician noted for his 2003 to 2008 publications, with Massimiliano Ferrara, in an attempt to extend the entropy ideas of Nicholas-Georgescu Roegen to the economic systems, e.g. a model for the equilibrium of the European Union.

Education

In 1971, Udriste completed his PhD in mathematics, with a thesis on "Almost Coquaternion Structures", at Babe-Bolyai University, Romania, in 1964 became a professor at Polytechnic Institute of Bucharest, then chair of mathematics in 1990, and dean of faculty of applied sciences in 2005, and is presently retired. (Q)

Further reading

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External links

● Constantin Udriste (faculty) – University of Politehnica of Buchares.

θΔics

In existographies, **Constantin Volney** (1757-1820) (IQ:170|#321) (Cattell 1000:785) (RMS:29) was a French religio-mythologist, system of government philosopher, and Voltaire proselyte, noted for his 1791 *The Ruins*, wherein, among other things, he connects the main characters of Judaism and Christianity to Hinduism, and both, in some sense, back to Egyptian mythology.

Egypt

In 1782, Volney travelled to Egypt (Ottoman Egypt), spending several months there, after which he resided in greater Syria, what today is Lebanon and Israel-Palestine, to learn Arabic; in 1785, he returned to France, and spent two years compiling his notes into *Voyage in Egypt and Syria* (*Voyage en Egypte et en Syrie*), published in 1787.

Abraham | Moses

In 1791, Volney, in his *The Ruins: a Survey of the Revolutions of Empires*, citing the Isis and Osiris descriptions of Plutarch, the constellation theory work of Charles Dupuis (1742-1809), among others digresses on Moses (pgs. 194-96), cited the opinion of a Zoroastrian high priest named Mobed, as follows:

> "When the Mobed [high priest] of the Parses begged leave to speak [he said] 'We have heard said he to the legislators, the account of the Jews and Christians respecting the origin of the world, and though they have introduced various corruptions, they have related a number of facts which our religion admits; but we deny that they are to be attributed to the Hebrew legislator. It was not he who made known to mankind these sublime dogmas, these celestial events; it was not to him that God revealed them, but to our holy prophet Zoroaster and proofs of this are to be found in the very books in question. If you examine with attention the detail of laws, of rights, and of precepts established by Moles, you will nowhere find the most tacit indication of what constitutes at present the basis of the Jewish and Christian theology. You will perceive no trace either of the immortality: of the soul, or a life to come, or hell, or paradise, or the revolt of the principal angel, author of all the evils which have afflicted the human race, &c. These ideas were unknown to Moses, and this appears from indisputable evidence, since it was not till four hundred years after him that they were first; promulgated by Zoroaster in Asia (27).'
>
> The Mobed added, addressing himself to the Rabbins: 'It was not till this epocha, till after the age of your first kings, that these ideas appeared in your writings; and then their appearance was furtive and gradual, according as there grew up a political relation between your ancestors and ours. It was particularly at the period when, conquered and dispersed by the kings of Nineveh and Babylon, your progenitors resorted to the banks of the Tigris and the Euphrates, and resided in our country for three successive generations, that they imbibed our manners and opinions, which before they had regarded with aversion, as contrary to their law. When our king, Cyrus, had delivered them from slavery they felt attached to us from sentiments of gratitude; they became our disciples and imitators, and introduced our peculiar doctrines into the corrected publication of their sacred books (28); for your Genesis in particular was never the work of Moses, but a compilation digested after the return from the Babylonith captivity, and containing in it the Chaldean opinions respecting the origin of the world. At first the pure followers of the law, opposing to the emigrants the letter of the text and the absolute silence of the prophet, endeavored to overpower these innovations; but they ultimately prevailed, and our doctrines, modified according to your ideas, gave rise to a new sect. You expected a king, the restorer of your political independence; we announced a God, the regenerator of the world, and the savior of mankind. These ideas blended together, constituted the tenets of the Essenians, and through them became the basis of Christianity. Jews, Christians, Mahometans, however lofty may be your pretensions, you are, in your spiritual and immaterial system, only the blundering followers of Zoroaster!"

Volney, in his end note (pg. 348), to note 28 (page 196), above, digresses on Abraham [whose name is does not mention in them text] as follows:

> "Page 196. (28). In the corrected publication of their sacred books. In the first periods of the Christian church, not only the most learned of those who have since been denominated heretics, but many of the orthodox, conceived Moses to have written neither the law nor the Pentateuch, but that the work was a compilation made by the elders of the people and the Seventy, who, after the death of Moses, collected his scattered ordinances, and mixed with them things that were extraneous; similar to what happened as to the Koran of Mahomet (See *Les Clementines*, Homel. 2. sect. 51. and Homel. 3. sect. 42).
>
> "Modern critics, more enlightened or more attentive than the ancients, have found in Genesis in particular, marks of its having been composed on the return from the captivity; but the principal proofs have escaped them. These I mean to exhibit in an analysis of the book of Genesis, in which I shall demonstrate that the tenth chapter, among others, which treats of the pretended generations of the man called Noah, is a real geographical picture of the world, as it was known to the Hebrews at the epoch of the captivity, which was bounded by Greece or Hellas at the West, mount Caucasus at the North, Persia at the East, and Arabia and Upper Egypt at the South. All the pretended personages from Adam to Abraham or his father Terah, are mythological beings, stars, constellations, countries. Adam is Bootes; Noah is Osiris, Xisuthrus Janus, Saturn; that is to say Capricorn, or the celestial Genius that opened the year. The Alexandrian Chronicle says expressly, page 85, that Nimrod was supposed by the Persians to be their first king, as having invented the art of hunting, and that he was translated into heaven, where he appears under the name of Orion [see: Sah]."

This, as we see, while off-target somewhat, e.g. Noah is Nun (not Osiris), is pretty good digression, for the pre-Rosetta stone era (pre-1820s); correctly, as Volney points out, Adam (clay), Abraham (Ra), and Terah (Geb) are mythical beings.

Christ | Krishna

Volney (pg. 292) gives his famous Christ [=] Christna [Krishna] digression as follows:

Photo of **Volney** as founding in the frontispiece of the Jefferson-Barlow translation of *The Ruins*. [6]

> "That being put to death by the wicked, he would gloriously rise again, ascend from hell into heaven, where he would reign forever.'
>
> By these expressions was described the life of the same Sun, who, terminating his career at the winter solstice, when Typhon [Set] and the rebellious angels exercised their sway, seemed to be put to death by them; but shortly after revived and rose again (note 97) in the firmament, where he still remains.
>
> These traditions went still farther, specifying his astrological and mysterious names, maintaining that he was called sometimes Chris or Conservator (note 98); and hence the Hindu God, *Chris-en*, or *Christna*; and the Christian *Chris-tos*, the son of Mary. That at other times he was called Yes, by the union of three letters, which, according to there numerical value, form the number 608, one of the solar periods (note 99). And behold, oh Europeans, the name which, with a Latin termination has become your *Yes-us* or Jesus; the ancient and cabalistical name given to young Bacchus, the clandestine son of the virgin Minerva, who in the whole history of his life, and even in his death, calls to mind the history of the God of the Christians; that is, the star of day, of which they are both of them emblems."

The reference to the number 608 was touched on later by Robert Taylor (Ñº) and Godfrey Higgins (Ñº), but it is difficult to say which solar period this refers to?

The footnote (#98, #99) to this are as follows:

Page id. (98). Chris, or conservator. The Greeks used to express by X, or Spanish iota, the aspirated ha of the Oriental5, who said haris. In Hebrew heres signifies the fun, but in Arabic the meaning of the radical word is, to guard, to preserve, and of haris, guardian, preserver. It is the proper epithet of Vichenou, which demonstrates at once the identity of the Indian and Christian Trinities, and their common origin. It is manifestly but one system, which, divided into two branches, one extending to the east, and the other to the west, assumed two different forms: its principal trunk is the Pythagorean system of the soul of the world, or, Iou-piter. The epithet piter, or father, having been applied to the demi-ourgos of Plato, gave rife to an ambiguity which caused an enquiry to be made respecting the son of this father. In the opinion of the philosophers the son was understanding, Nons and Logos, from which the Latins made their Vtrbum. And thus we clearly perceive the origin of the eternalfather and of the Verbum his son, proceeding from him (Mens ex Deo nata, says Macrobius): the anima orspiritus mundi was the Holy Ghost; and it is for this reason that Manes, Basilides, Valentinius, and other pretended heretics of the first ages, who traced things to their source, said, that God the Father was the supreme inaccessible light (that of the heaven, the primum mobile, or the aplanes); the Son the secondary light resident in the sun, and the Holy Ghost the atmosphere of the earth (See Beaufob. Vol. II. p. 586): hence, among the Syrians, the representation of the Holy Ghost by a dove? the bird of Venus Urania, that is, of the air. The Syrians (lays Nigidlus de Germanico) assert that a dove fat for a certain number of days on the egg of a fish, and that from this incubation Venus was born: Sextus Empiricus also observes (Inst. Pyrrh. lib. 3. c. 23.) that the Syrians abstain from eating doves; which intimates to us a period commencing in the sign Pisces, in the winter solstice. We may farther observe, that if Chris comes from Harisch by a chin, it will signify artificer, an epithet belonging to the sun. These variations, which must have embarrassed the ancients, prove it to be the real type of Jesus, as had been already remarked in the time of Tertullian. "Many," fays this writer, " suppose with "greater probability that the sun is our God, and they re"for us to the religion of the Persians." Jpologet. c. 16.

Page 293. (99). One of the solar periods. See a curious ode to the Sun, by Martianus Capella, translated by Gebeiin.

Volney, according to George Wells (1969), said that the resurrection of Jesus was an allegory for the growth of the sun's strength in the sign of Aries at the spring equinox. [4]

Abraham / Brahma | Sarah / Saraswati

See main: Abraham and Brahma

Volney's complementary Abraham [=] Braham, Sarah [=] Saraswati digression, supposedly, is in another part of the book. Nigel Leask, in his *British Romantic Writers and the East* (2004), summarized Volney's Abraham / Brahma connection as follows: [3]

"Egyptian mythology. **Volney** infuriated Christian apologists in Britain by arguing that 'Christ was etymologically connected to Christna', and that 'Abraham' and his wife 'Sarah' were derived from 'Brahma' and his wife 'Saraswadi'. Notwithstanding the expediency which Volney had urged on Napoleon in governing Egypt 'orientally'', on the home front the French ideologues Volney and Dupuis could be more scientific in breaking down the complex elaborations of religious myths into their basic elements, showing them to originate in a zodiacal system derived from astronomical observations. 'These various theological opinions are mere chimeras', wrote Volney, '…allegories and mysterious symbols, under which moral ideas, and the knowledge of the operations of nature in the actions of the elements and the revolutions of the planets, are ingeniously depicted!' The whole world was exposed in its transparency to the penetrating gaze of reason and natural law, the official, cosmopolitan ideology of the new French regime and its sympathizers (like the young Shelley) abroad."

In 2016, Reddit user -Ecce_Homo- posted (Ñº), in the linguistics section, a thread query: 'Common origin of biblical names and ancient Hindu names?', per the Volney citation in the Wikipedia "Christ myth theory" (§: Volney and Dupuis), to which religio-mythology denialists quickly attempted to etymologically argue that "it's just coincidence".

Influence | On

In 1795, Volney, during his stay in America, arranged with Thomas Jefferson, via secret arrangement, for Jefferson to do a translation of his *Ruins of Empires*. Jefferson, based on evidence discovered by the French researcher Gilbert Chinard, translated the invocation plus the first 20 or 25 (Jacoby, 2004) chapters of the 1802 Paris edition of Volney's *Ruins*.

Volney was influential to Mary Shelley (Ñº); in her *Frankenstein* (1818), the Creature first learns (Ñº) about mankind through his reading of Volney's *The Ruins*; this is recounted as follows: (Ñº)

> "The Monster acquired a remarkable knowledge of human civilization. It found shelter in a shed near a farmhouse, and it tried to observe and imitate its new neighbors as closely as possible. In this way, it quickly mastered the French language; and because its unsuspecting host family consisted of educated persons who had the habit of regularly reading aloud to each other, the Monster soon was introduced to several masterpieces of European literature. These writings offered an uncomforting view of the world in which it so abruptly found itself: Milton's Paradise Lost, a volume of Plutarch's Lives, and Goethe's Sorrows of Young Werther. But the Monster had already learned about doubt and dejection from the very first book which it overheard being read by the fireplace in the evening hours. This was The Ruins by **C.-F. Volney**."

In 1831 to 1837, Abraham Lincoln read Volney's *The Ruins*, supposedly the Jefferson translated American edition. [2]

In 1897, Robert Ingersoll, in his "Why I Am an Agnostic", cites Volney. [5] Walt Whitman also read Volney.

Surname

Volnay was first surnamed "Boisgirais" after his father's estate, but afterwards assumed the name of Volney, a portmanteau (see: anagram) of Voltaire, the philosopher, and Ferney (Ñº), a town in eastern France were Voltaire resided.

Quotes | On

The following are quotes on Volney:

> "**Volney**'s *Ruins of Empires* (*Les Ruines*, 1791) is a lost classic in Western Literature. Thomas Jefferson like the book so much he anonymously translated it into English. Jefferson believed the book's central premise—Empires Rise If Government Allows Enlightened Self-Interest to Flourish—best described the enlightenment-based principles upon which the United States was founded. Volney saw his book as a direct challenge to Jean Rousseau's *Social Contract*—if you refute the Social Contract, you refute the moral foundation of the big government social programs that exist in the world today. Jefferson, however, insisted on complete anonymity for his translation due to the book's controversial religious content. In the last four chapters of the book (translated by Joel Barlow) Volney reviews the history of the world's major religions and concludes with a call for all nations to adopt the principle of separation of church and state—only then, Volney writes, can our species achieve world peace. These last four chapters have a renewed resonance in the post-9/11 world. The Jefferson/Barlow translation went through many reprints in the USA during the 19th & 20th centuries. The book was read by the likes of George Washington, Abraham Lincoln and Walt Whitman, but has fallen out of favor in recent decades. The Left does not like Volney because he refutes

Rousseau. The Right does not like him because Volney constructs a universal system of morality without reference to god. But in a world beset by massive government deficits and resurgent religious conflict, Volney's Ruins of Empires provides a roadmap for the future. In a word, Volney's Ruins isn't about Yesterday. It's about Today. And Tomorrow."

— Thomas Williams (2013), Amazon Review (Ñº), Nov 17

Quotes | By

The following are quotes by Volney:

"But that passion which mistaketh, that ignorance which observeth neither causes nor effects, hath said in its folly: "All things flow from 'chance'; a blind fatality poureth out good and evil upon the earth; success is not to the prudent, nor felicity to the wise;" or, assuming the language of hypocrisy, she hath said, "all things are from 'god'; he taketh pleasure in deceiving wisdom and confounding reason.""

— Constantin Volney (1791), *The Ruins* (§III: The Apparition) (see: chance or god)

"Let man then know these laws! let him comprehend the nature of the elements which surround him, and also his own nature, and he will know the regulators of his destiny; he will know the causes of his evils and the remedies he should apply."

— Constantin Volney (1791), *The Ruins* (§V: Condition of Man in the Universe)

"When the hidden power which animates the universe, formed the globe which man inhabits, he implanted in the beings composing it, essential properties which became the law of their individual motion, the bond of their reciprocal relations, the cause of the harmony of the whole; he thereby established a regular order of causes and effects, of principles and consequences, which, under an appearance of chance, governs the universe, and maintains the equilibrium of the world. Thus, he gave to fire, motion and activity; to air, elasticity; weight and density to matter; he made air lighter than water, metal heavier than earth, wood less cohesive than steel; he decreed flame to ascend, stones to fall, plants to vegetate; to man, who was to be exposed to the action of so many different beings, and still to preserve his frail life, he gave the faculty of sensation."

— Constantin Volney (1791), *The Ruins* (§V: Condition of Man in the Universe)

"By this faculty all action hurtful to his existence gives him a feeling of pain and evil, and all which is salutary, of pleasure and happiness. By these sensations, man, sometimes averted from that which wounds his senses, sometimes allured towards that which soothes them, has been obliged to cherish and preserve his own life; thus, self-love, the desire of happiness, aversion to pain, become the essential and primary laws imposed on man by nature herself—the laws which the directing power, whatever it be, has established for his government—and which laws, like those of motion in the physical world, are the simple and fruitful principle of whatever happens in the moral world."

— Constantin Volney (1791), *The Ruins* (§V: Condition of Man in the Universe)

"In the [future] modern world, especially in Europe, great nations having allied themselves in language, and established vast communities of opinions, the minds of men are assimilated, and their affections extended; there is a sympathy of opinion and a unity of action; then that gift of heavenly Genius, the holy art of

printing, having furnished the means of communicating in an instant the same idea to millions of men, and of fixing it in a durable manner, beyond the power of tyrants to arrest or annihilate, there arose a mass of progressive instruction, an expanding atmosphere of science, which assures to future ages a solid amelioration. This amelioration is a necessary effect of the laws of nature; for, by the law of sensibility, man as invincibly tends to render himself happy as the flame to mount, the stone to descend, or the water to find its level. His obstacle is his ignorance, which misleads him in the means, and deceives him in causes and effects. He will enlighten himself by experience; he will become right by dint of errors; he will grow wise and good because it is his interest so to be. Ideas being communicated through the nation, whole classes will gain instruction; science will become a vulgar possession, and all men will know what are the principles of individual happiness and of public prosperity. They will know the relations they bear to society, their duties and their rights; they will learn to guard against the illusions of the lust of gain; **they will perceive that the science of morals is a physical science**, composed, indeed, of elements complicated in their operation, but simple and invariable in their nature, since they are only the elements of the organization of man. They will see the propriety of being moderate and just, because in that is found the advantage and security of each; they will perceive that the wish to enjoy at the expense of another is a false calculation of ignorance, because it gives rise to reprisal, hatred, and vengeance, and that dishonesty is the never-failing offspring of folly."

— Constantin Volney (1791), *The Ruins* (§XIII: Will the Human Race Improve?)

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3. (a) Volney, Constantin. (1795). *The Ruins: a Survey of the Revolutions of Empires* (2nd edition) (pg. 292). London: Joseph Johnson.
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External links

â— Constantin Volney – Wikipedia.

θΔics

In existographies, **Constantine Grethenbach** (c.1852-c.1915) was an American secular Jewish religio-mythology scholar noted for []

Overview

In 1902, Grethenbach, in his *Secular View of the Bible: From Studies of the Hebrew; with the Evidences as to Jesus*, gave one of the first cogent attempts to deconstruct the Hebrew Bible, backwards, via translation decoding, into: its original Egyptian mythology, Greek mythology, and Chaldaic literature roots, e.g. commentary on the Eve [Latin] = cHavah [Hebrew] meaning; the following (pgs. 42-43) is a representative quote: [1]

> "Sar-ai or Sar-ah takes name from A-Sar or Osiris, who was the mutilated or "eunuch" (Hebrew *Sar-is)*; and from Seruah the wife of As-Shur, the barren Zur or 'rock'. She was of course barren, but, after she has ceased to be capable of offspring, three Aenosh-im (Egyptian 'wolves') promised her she would have a child, and so Jehoah visited her (Genesis 21: 1). In the Egyptian story Typhon or Seth charges that Har or Horus is illegitimate, as Plutarch tells us; and so Vulcan was Juno's child without the aid of her husband, and lightning begat Apis from a heifer, and cHannah had Shemu-El after she visited Aal-i the priest, and cHavah after her visit from Nachash in Eden, so that Sarai asks if she shall have *Eden-ah* (translation: 'pleasure ') at her time of life."

Here, as we see, with his 'as Plutarch tells us', is rather free-wheeling in his translation etymologies, but, nevertheless, in the neighborhood.

In 1903, Grethenbach, in his "Hammurabi and Abraham", a one-page letter sent to *Open Court*, vents his condensed opinions on etymologies of Abraham [Hamu-Rabi], Noah [prophet], Jacob [Bacchus], and Moses [the Name]. The letter in full is as follows: [2]

> "Why should Ramu-Rabi be confused with the Biblical Amraphel? Each name has four consonants, yet only two in common. It seems to me that it would be easier to identify Ramu-Rabi with Abraham, since their four consonants are the same. Ibra-Hamu is a paranomasism that is not difficult.
>
> Indeed, Khamor-Abi is Arabic for 'Moon-father', and Abraham's father is said to have come out of Hur or Ur, which was the best known name of the Moon or Moon-god in Babylonia: as in Egypt the Moon-god Tachut or Decade was like Khamor-Abi, the lawgiver, and Bath-Tachuti appears with Jehoah at Sinai and proclaims him, for she is Azab-ea or Sibyl, not 'finger', that wrote the ten commandments, since A-Zab and Sebel both mean laborer in the sense of contortion as was the case with the classic Sibyls. But it is a long story.
>
> Our Hebrew writings often show such examples. Thus, Noach or 'Noah' is said to have found cHen or ''grace'; but the two consonants which we make into Noach are N-ch, and when reversed we have cH-N, which in Egyptian is 'prophet', as Khn is prophet in Ethiopic; hence the Hebrew word Cohen or 'priest'. So Jakob or A-Keh means in 'Hebrew a 'wine-vat', and when read backwards we have Bak-ai, which we have in Greek as Bacch-us; hence in the wrestling at Ja-Bock (Bak-ai) he acquires the name I-Sara-El, for he is coming toward Egypt where O-Sar-is first planted the vine; and so the first thing Jacob does when he has supplanted Esau is to build Succ-oth, and Succ-oth was 'Tabernacles' or the grape harvest; the Athenian O-Socha-phoria, when there were songs to Bacchus and Ari-Adan-e.
>
> There is more important play on the name of Mosheh, our Grecized 'Moses'. His name is composed of the three consonants M-Sh-H, which, when reversed, may be rendered in to ha-Sh-m or 'the Shem', which means 'the Name'. On pain of death Jews were not to blaspheme 'the Name', but it seems that only Mosheh may be meant, for the ancients appear to have concealed their name of Deity from their own populace, and

hence these could not blaspheme it by the use of the sacred name."

(add discussion)

Education

Grethenbach lists himself has having MA and TOA degrees.

Keys

The following search keys: "chavah, eve, Egyptian, mythology" led to the discovery of Gretchenbach's interesting book, following a reading of Genesis 3.5, 'eritis sicut deus', as found on Hugo Rheinhold's 1893 *Ape with Skull* (Q) statue, as employed as a phrase (Q) in Goethe's *Faust*, the statue kept on the desks of atheists Vladimir Lenin (Q) and Louis Appignani (Q), wherein Genesis 3:20 has the sentence: 'Adam called his wife's name 'Eve' because she was the mother of all living', alternatively translated in Hebrew as Eve = 'Chavah', i.e. 'living', in KJV footnote. Grethenbach devotes considerable discussion to a person named cHavah (Q) in his book, in an attempt to stitch the Hebrew translation back into their Egyptian mythology, Greek mythology, and Chaldaic literature roots (pg. v), admixture with talk about how stories such as how 'Joshua made the sun stand still for a whole day' or how Jesus 'reanimated Lazarus after his body had putrefied' are against science.

Quotes

The following are noted quotes:

> "No one can deny the importance of Sippara, since it was in that twin town, divided as it was by the Pur-at, that the Chaldean Noach built his boat, buried his books, and set afloat, as the cuneiform inscriptions tell us; nay, more, we are told that its special deity was called Malik, and that its sacred name was Ma-Oru; though Greek writers called it "City of the Sun" [Heliopolis]; but it is nowhere else suspected of connection with this record unless it was used to make odious the name of Baal-Ak, son of Zippar, who sent Baal-Am to curse Isra-el, as well as the repudiated (Ex. 18:2) wife of Mosheh, and even the liar Sephira of Christian story (The Acts 5: 1.&c)."
>
> — Constantine Grethenbach (1902), *Secular View of the Bible* (pg. 15-16)

> "No animosity is shown toward Egypt in the Jewish Scriptures. On the contrary they are favored (Deut. 23: 3-4-, 7-8). The word **Chem** [keme], the name of the country, is, indeed, attacked in the incident of cHam the son of Noach, but that was evidently on account of the Canaanites, and belongs to the Ezraic policy of exclusiveness."
>
> — Constantine Grethenbach (1902), *Secular View of the Bible* (pg. 16)

See also

- Gary Greenberg

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θΔics

In science, **constructal theory** or "constructal law" argues that the design of any open or closed system, animate, e.g. a human society, or inanimate, e.g. a river basin, is based on the postulate that: [1]

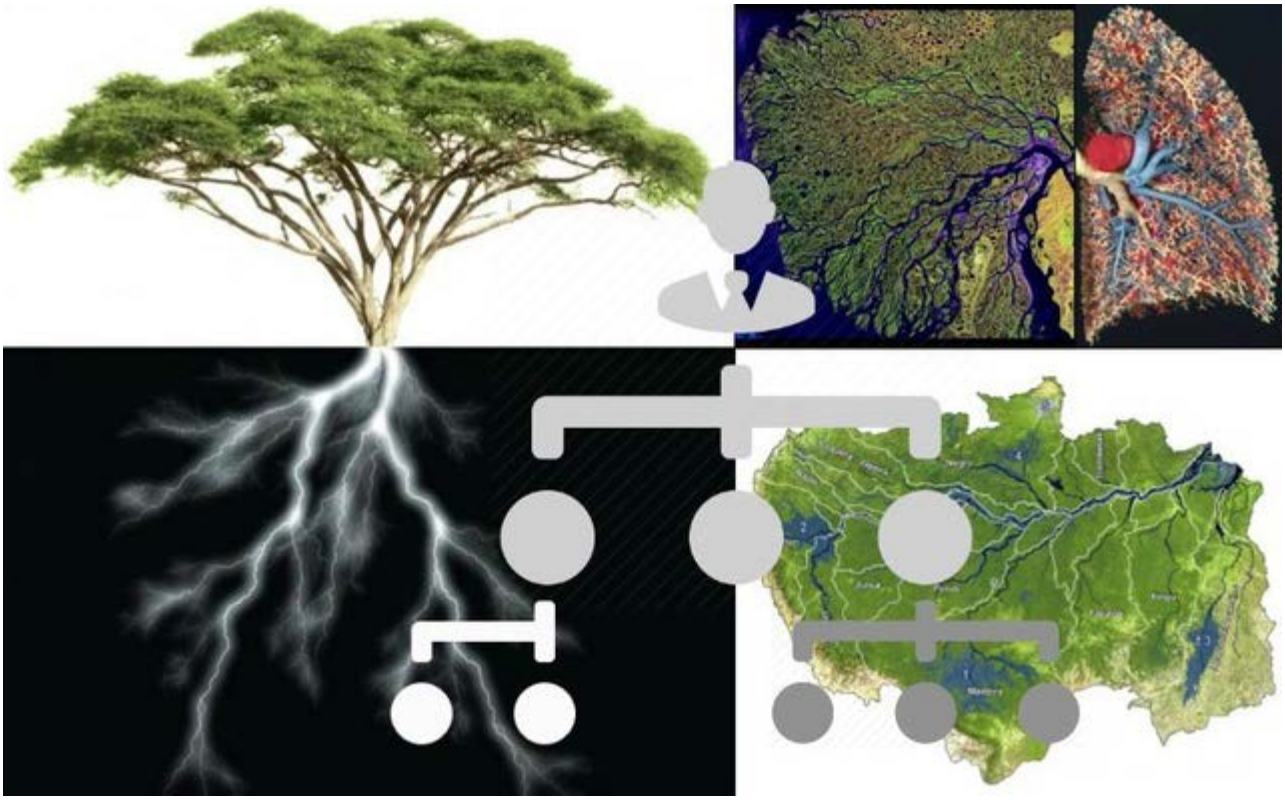

A five part depiction of Began's "constructal theory" of energy flow through structures.

> "For a finite sized flow system to persist in time (live or survive), its configuration must evolve (change in time) in such a way that it provides easier and easier access to the currents that flow through it."

The constructal theory was conceived in 1996, by accident, at Duke University by Romanian-born American mechanical engineer Adrian Bejan, as a "thermodynamics principle that unites physics with biology"; a theory later argued to underlie the generation of design in societies. [1]

Overview

The theory was first presented in the 1997 book *Advanced Engineering Thermodynamics* (2nd edition) by Bejan. [3] The theory seems to have been culled from the subject of heat transfer, Bejan's teaching curriculum at Duke University.

The term "constructal", from the Latin *construere* "to construct", was coined by Bejan. In 2005, an exploratory grant from the Human and Social Dynamics program of the National Science Foundation fueled cross-discipline research on the theory. The 2007 book *Constructal Theory of Social Dynamics* summarizes contributions made by prominent invited speakers at the First International Workshop on the constructal theory of social dynamics, held on 4-5 April 2006 at Duke University. The postulate, as stated above, in the view of Bejan, supposedly has become a new law of physics. Moreover, according to Bejan, his corpus of work has supposedly become a new addition of nonequilibrium thermodynamics: [5]

> "This entire body of work represents a new extension of thermodynamics: the thermodynamics of flow systems of configuration."

In 2007, Bejan argued that his new "constructal law" may be a new law of physics, similar to other "fourth laws" of thermodynamics, themed on flow states, such as Alfred Lotka's 1922 fourth law, or Harold Morowitz' 1968 fourth law, etc. [4] Bejan states that since the first and second laws are black box laws saying nothing about configuration, that a

new law of thermodynamics or of physics is needed to explain the phenomenon of configuration generation in biology. On this premise, Bejan argues that just as the second law proclaims the existence of a final state (equilibrium for isolated system), the constructal law proclaims the existence of an "equilibrium flow architecture", when all possibilities of increasing morphing freedom have been exhausted. [2]

Bejan's theory, to note, is very similar in theme and feel to Belgian chemist Ilya Prigogine's 1955 dissipative structure theory based on heat flows and Bénard cell formations. The theory also seems to have overlap with chaos theory, emergence, and complexity theory.

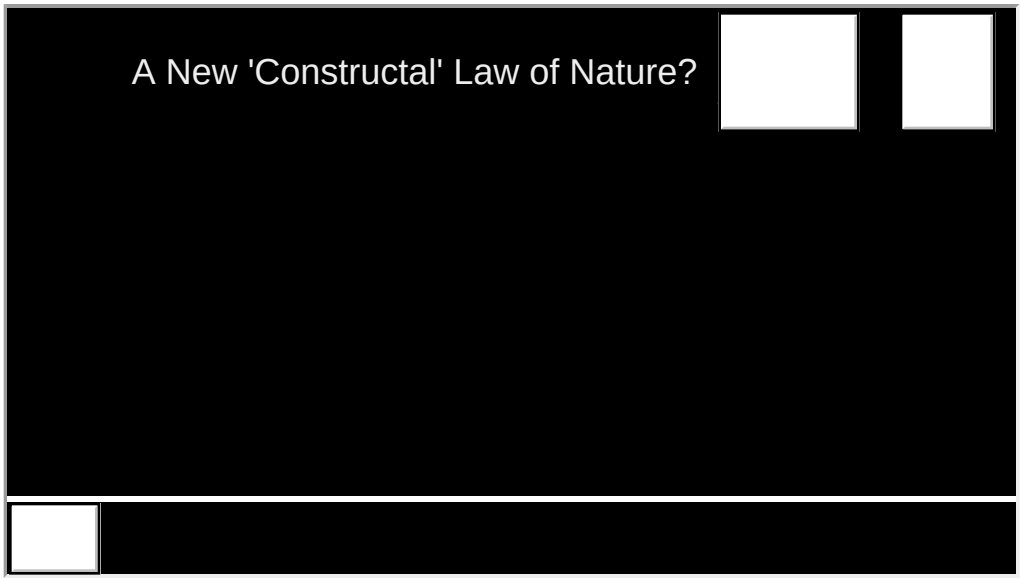

Romanian-born American mechanical engineer Adrian Bejan explaining **"constructal law"** of design in nature, which he says unites the animate and inanimate realms of biology and geophysics.

See also

- Thermodynamic flow
- Entropy flow
- Gibbs energy flow
- Csíkszentmihályi flow

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External links

- Constructal theory (portal) – Constructal.org.
- Constructal theory – Wikipedia.
- Adrian Bejan – Wikipedia.
- Adrian Bejan – ISIHighlyCited.com

θΔics

In human chemistry, a **continuing bond** is an attachment or bond to a deceased individual that is maintained rather than relinquished. [1]

The term was introduced in the 1996 book *Continuing Bonds*, a presentation of study results from several populations, presented by twenty-two authors. [2] In this book, edited by psychologists Dennis Klass, Phyllis Silverman, and Steven Nickman, findings showed that in actual practice people tend to maintain very real connections to the deceased, a view contrary to the standard dogma, supposedly promoted by Freudian psychologists, that it was healthier to completely break-off bonds from the deceased. The term 'continuing bonds' has since become something of a vogue theoretical concept in the psychology bereavement community, with yearly publications on the subject.

Cessation bonds

The general logic of continuity bonds, in theme, seems to be similar to American chemical engineer Libb Thims' 2005 cessation conservation hypothesis, in which residual 'energy signature' of formerly active human chemical bonds remains following the termination of an individual.

American psychologist Stephen Kosslyn, in his 2006 section on what he believes but can't prove, outlines a fairly decent model of what he calls "social prosthetic systems", wherein people rely on others to extend one's reasoning ability and emotional regulation, particularly in areas where one is deficient. Kosslyn posits, in what seems to be an aspect of a dihumanide molecule description, that a "good marriage" arises when two pairs act as effective social prosthetics for each other. In regards to death, Kosslyn posits that: [3]

> "One might argue that when your body dies, part of your mind may survive."

Technically, to correct Kosslyn, a molecule cannot die, but the latter part of his supposition may have some sense to it.

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● Field, N. P., Gal-Oz, e., and Bonanno, G.A. (2003). "Continuing Bonds and Adjustment at 5 Years after Death of a Spouse." *Journal of Consulting & Clinical Psychology*, 71: 110-17.
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● Valentine, Christine. (2008). *Bereavement Narratives: Continuing Bonds in the Twenty-first Century.* Taylor & Francis.

External links

● Continuing bonds – Encyclopedia of Death and Dying.

θΔics

In thermodynamics, **contrived thermodynamics** refers to contrived versions of thermodynamics, where one unknowingly takes conclusions and results specific to one field of thermodynamics, and applies them in a contrived way to different field in which the originally-assumed conditions do not hold or are not met.

Most of the applications of statistical mechanics, a subject generally valid for systems which meet the Boltzmann chaos assumption, outside of non ideal gas systems, can generally be considered a contrived type of thermodynamics.

Another example of contrived thermodynamics is the attempt to blend telegraph wire coding probability theory, a field otherwise known as information theory, with standard piston and cylinder heat engine theory, a field otherwise known as thermodynamics, resulting in a contrived claimed to be field of study called “information theoretic thermodynamics”, information theory thermodynamics, or information thermodynamics, which includes terms such as Shannon entropy and is well represented by the MaxEnt school.

θΔics

In thermodynamics, a **control volume** is a type of system, delineated by a control surface, which is the surface that completely surrounds the control volume, the system itself focused on a volume in space into which or from which a substance flows. [1]

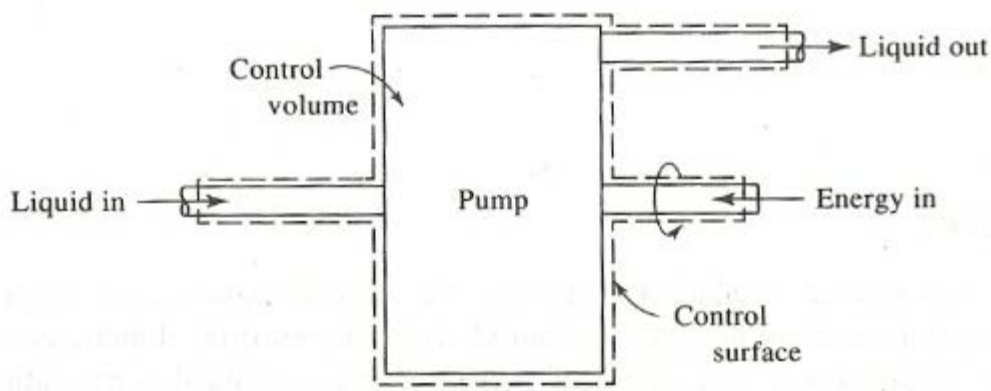

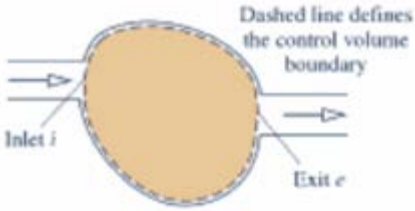

Above: a generic **control volume** defined for a pump. [1] Adjacent: a generic one inlet, one outlet control volume. [2]

See also

â— Flow system

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Further reading

â— Kreith, Frank. (2000). *The CRC Handbook of Thermal Engineering* (§1.2: Control Volume Applications, pgs. 1-14-). Springer.

External links

â— Control volume – Wikipedia.

θΔics

In terminology, **cool** (TR:93) (compare: cold), a thermal term, as compared to warm (compare: hot), refers to []

Further reading

● Lethen, Helmut. (2002). *Cool Conduct: the Culture of Distance in Weimar Germany* (translator: Don Reneau). University of California Press.

External links

● The Coolest Actors of All Time – Ranker.

θΔics

In chemistry, **copper**, symbol Cu, atomic number 29, is a metallic element, row four of the periodic table, the sixteenth most abundant element in a human, comprising 0.0003 percent by mass of the composition of one human molecule. [1]

Rank	CPK (jmol)	Symbol	Z	% Mass	Picture	Electron configuration
16		Cu	29	0.0003		(add)

Human molecular formula

The position of the element copper in the average human molecular formula is as follows:

$$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}$$

$$Zn_{E22}Si_{E22}\mathbf{Cu}_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$$

Function

Involved in the synthesis of hemoglobin, collagen, and the neurotransmitter noradrenalin. Is an important blood antioxidant, prevents the rancidity of polyunsaturated fatty acids, and helps cell membranes remain healthy.

Schopenhauer

In German natural philosopher Arthur Schopenhauer's 1844 *The World as Will and Representation, Volume II*, he cites German chemist Justus Liebig's description of the reaction of damp copper Cu in air containing carbonic acid H_2CO_3, to argue rather cogently that the: [2]

> "The will of the **copper**, claimed and preoccupied by the electrical opposition to the iron, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive."

This logic, of course, being an expanded version of the his mentor and associate German polymath Johann Goethe and his 1809 *Elective Affinities*.

References

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2. (a) Schopenhauer, Arthur. (1818). *The World as Will and Representation*, *Volume I* (Elective Affinity, pgs. 110, 122, 148), trans. E.F.J. Payne. Dover, 1966.
(b) Schopenhauer, Arthur. (1844). *The World as Will and Representation, Volume II* (Goethe, 41+ pgs; Elective Affinity, pgs. 174, 297-98, 386, 396; inorganic will, pg. 297), trans. E.F.J. Payne. Dover, 1969.

External links

â— Copper – Wikipedia.

θΔics

In biographies, **Cornelia Friederica Christiana Goethe** (1750-1777), turned "Cornelia Schosser" (marriage name, age 22), was the older sister, by 15-months, to Johann Wolfgang Goethe (1749-1832), founder of human chemistry (1796).

Overview

The following is a sketch of Cornelia Goethe, the sister of Johann Goethe: [1]

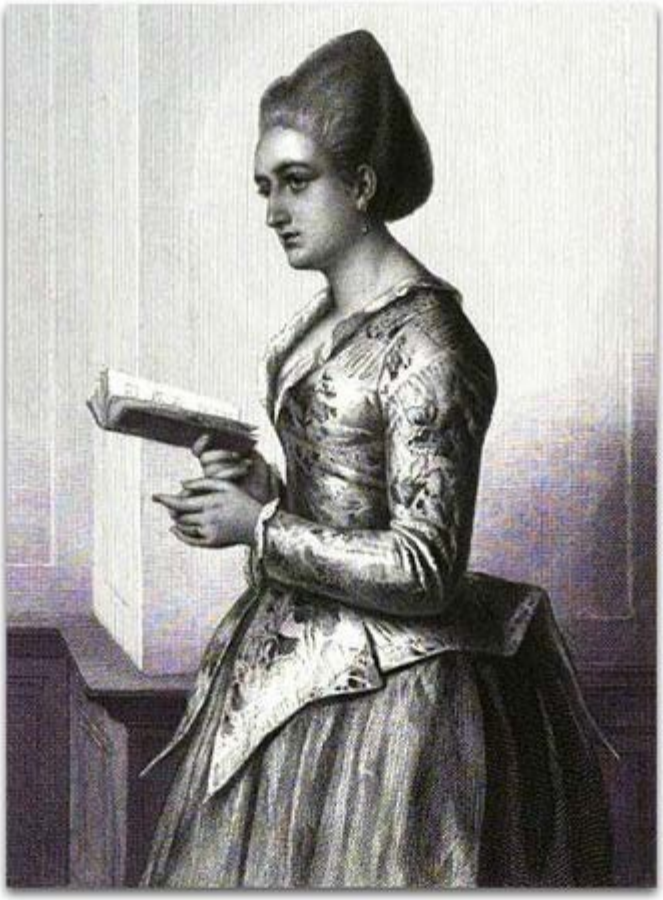

(add discussion)

References

1. Pecht, Friedrich, and Ramberg, Arthur. (1870). *Goethe Gallery: Containing Characters from Goethe's Works, drawn by Friederick Pecht and Arthur von Ramberg, fifty illustrations engraved on steel, with descriptive text by Frederick Pecht* (The Councillor's Lady Goethe, pgs. 24-29; Corneila Goethe, 32-35; *Elective Affinities*, pgs. 289-306). Appleton & Co.

External links

â— Cornelia Schlosser (German → English) – Wikipedia.

θΔics

In existographies **Cornelis Drebbel** (1572-1634) (IQ:170|#401) (EP:7) (CR:3) was a Dutch engineer, naturalist, inventor, and chemist, a characterized "neglected genius" (Harris, 1959) or "bewitching Dutch genius" (Ashley, 2014), noted for []

Pump | Clock

In 1598, Drebbel had a patent for a pump and clock with, supposedly, a claimed perpetual motion. [8]

Solar-powered | Musical instrument

In 1609, Drebbel is said to have built a solar-powered musical instrument, a clavichord of some sort; this is summarized as follows:

> "That musical instrument invented by **Cornelis Drebbel**, which being set in the sun shine, would of itself render a soft and pleasant harmony, but being removed into the shade would presently become silent. The reason was this, the warmth of the sun, working upon some moisture within it, and rarifying the inward air unto so great an extension, that it must needs seek for a vent or issue, did thereby give several motions unto the instrument."
>
> — John Wilkins (1648), *Mathematical Magic* (pgs. 148-)

The device, in all likelihood, was built on one of Hero's musical devices, presuming Drebbel read his work.

Thermostat | Circulating oven

In c.1620, Drebbel built, supposedly, a circulating oven, with a thermometer, and thermostat, for incubating chicken eggs. [7]

> "It is certain that **Drebbel**, that great, singular, learned mechanician, did by help of this instrument [thermometer] make a dial continually to move of itself regularly showing both the time of the day and the motions of the heavens."
>
> — Francis Bacon (c.1615), *Publication* (Q)

(add)

Microscope

Drebbel is said to be one of the early inventors of the microscope. [2]

> "**Cornelis Drebbel**, Zacharias Janssen, Galileo Galilei, and Robert Hooke are some of the scientists credited with the invention and development of microscopes. Robert Hooke's book, *Micrographia*, published in 1665, depicted his microscopic observations and was one of the best sellers of that time. However, the adaptation of microscopy was greatly impacted by Antonie Leeuwenhoek, a Dutch fabric merchant. Referred to as the 'father of microbiology'; he was neither a biologist nor the inventor of the microscope, though he is responsible for some of the greatest improvements to the tool."
>
> — Ivana Markova (2019), *Textile Fiber Microscopy* (pg. 13)

(add)

Submarine | Oxygen

In c.1620, or before, Drebbel built three working submarines. [1]

> "Sometime after 1620, Dutch scientist **Cornelis Drebbel** is said to have made a boat which 'swam under water' of the Thames from Westminster to Greenwich."
>
> — Richard Kirby (1956), *History of Engineering* (pg. 151)

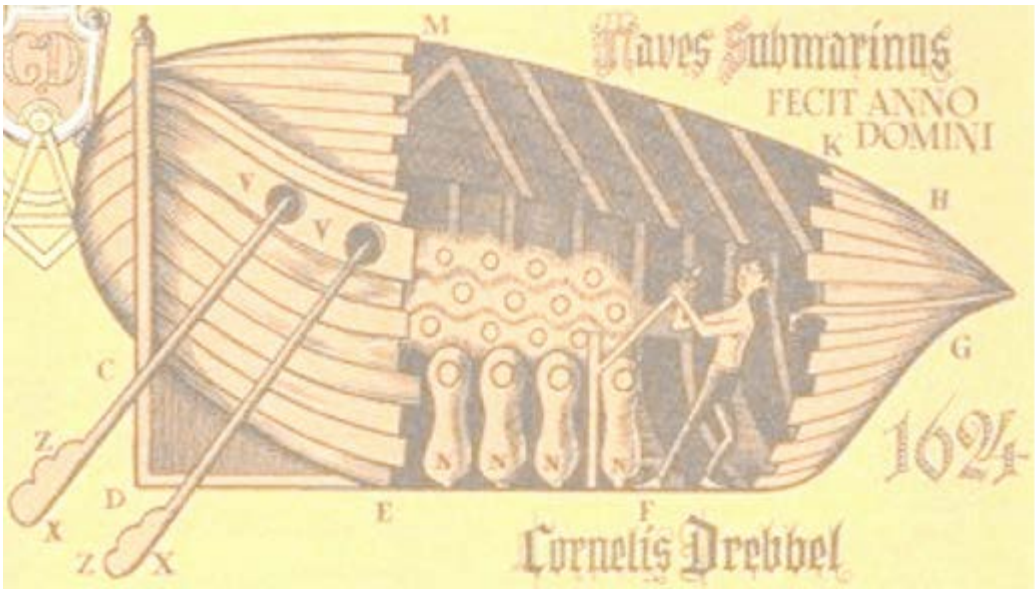

An early depiction of a Drebbel submarine (1624).

There is some conjectural detail, as recorded by Robert Boyle (1662), as told to him by an "excellent mathematician" who had been on one of Drebbel's submarines, that Drebbel had, on board the submarine, a "chemical liquor" that when unstopped would replace the "quintessence of air" and able to "cherish the vital flame residing in the heart" and in effect allow people to breath oxygen under water. [5] The chemical liquor was supposedly obtained by heating saltpeter, i.e. potassium nitrate (KNO3), the chemical reaction (Q) of which is:

$$4KNO_3(s) \rightarrow 2K_2O\ (s) + 2N_2(s) + 5O_2(g)$$

The following is one summary of this:

> "Joseph Priestley is usually associated with the discovery of oxygen in 1774. Nowadays, it is generally recognized that Scheele should be credited with this discovery. Furthermore, Lavoisier's experiments on oxidation led to the evolution of the 'new chemistry' as we know it today. Yet some of these chemists were not the first who prepared oxygen from its compounds or who studied its properties. Almost two centuries earlier it was a Dutchman **Cornells Drebbel** (1572-1633) who prepared oxygen by heating saltpeter, a method still used today."
>
> — Jan Spronsen (1977), "Cornelis Drebbel and Oxygen" [6]

Drebbel, supposedly, learned about making oxygen from heating saltpeter from his associate Sendivogius (1566-1636) (Q).

Education

Drebbel, early on, became an apprentice or assistant to Hendrick Goltzius (1558-1617), a celebrated engraver, who had an interest in alchemy. [8]

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3. Wilkins, John. (1648). *Mathematical Magic: the Wonders that May be Performed by Mechanical Geometry; in Two Books, Concerning Mechanical Powers and Motions* (§:Book Two: Daedalus: Mechanical Motions, §§1:145-; esp. pg.

148-49). Baldwin, 1691.
4. Hero. (c.55AD). *Pneumatics* (translator: Bennet Woodcroft). Taylor, 1851.
5. Davis, Adam. (1999). *100 Local Heros* (pgs. #). Publisher.
6. Spronsen, Jan W. (1977). "Cornelis Drebbel and Oxygen" (abs), *Journal of Chemical Education*, 54(3):157.
7. Ashley, Steven. (2014). "The Vulgar Mechanic and His Magical Oven: a Renaissance Alchemist Pioneers Feedback Control" (Illustrator: Jonathon Rosen) (Q), Nautilus, Apr 10.
8. Tierie, Gerrit. (1932). "Cornelis Drebbel (1572-1633)" (pdf). Amsterdam: Geboren.

Further reading

● Harris, L.E. (1959). "Cornelis Drebbel: a Neglected Genius of Seventeenth Century Technology" (abs), *Transactions of the Newcomen Society*, 31:194-204.

External links

● Cornelis Drebbel – Wikipedia.

θΔics

In hmolscience, **Cornelis Hoede** (1936-2009) is a Dutch social mathematician noted for 1990 to 2003 social physics like publications, wherein he conceptualizes people as atoms, theorizing on concepts such as "social volume", social atoms, social velocity, etc..

Overview

In 1990, Hoede, in his *Social Atoms*, modeling people or society some way on the atoms of physics, i.e. social atoms, in which he employs concepts such as “social velocity”, based on ego theory and kinetics, "social volume", among others. [1] The following is a snippet of Hoede's physics-to-social variables table: [1]

coordinates	Learning velocity, social velocity } = coordinates
Molecules	Molecules
Volume	Social volume, inversely proportional to the sum of all charges of the actors

In 1990, Hoede, in his "Social Atoms: Kinetics", gave the following interpretation of social molecules: [2]

> “Note that we have not said anything about the structure of the network formed by the atoms in the molecule. As in physics, molecules of the same kind may be in different states of excitation. Standard examples of social molecules are single persons with low nuclear social charge, solitaires, pairs of persons, and families. Two families, each consisting of father, a mother, a son, and a daughter may be identical according to our definition.”

Although Hoede does seem to use physics to make social analogies, as of 2000, he seems to model people simply as automata, and to use graph theory to make is models. [3]

In 2004, Yuri Tarnopolsky, in his “The Chemistry of Protolanguage”, was cited some of Hoede’s 2003 work on graph theory. [4]

Education

In 2001, Hoede was on the faculty of mathematical sciences at University of Twente, Netherlands.

References

1. Hoede, Cornelis. (1990). *Social Atoms* (social volume, pg. 63). Fac., Univ.
2. Hoede, Cornelis. (1990). "Social Atoms: Kinetics", in J. Weesie & H. Flap (eds.), *Social Networks Through Time* (pgs. 45-63; "social velocity", 7+ pgs; "social molecule", pg. 55). Utrecht, ISOR.
3. (a) Hoede, Cornelis. (2000). “Basic Concepts in Social Sciences I”, Doc.Utwente.nl, Dec.
(b) Hoede, Cornelis. (2001). “Basic Concepts in Social Sciences II”, Doc.Utwente.nl, Feb.
4. Tarnopolsky, Yuri. (2004). “The Chemistry of Protolanguage” (pdf), SpiroSpero.net.

External links

â— Cornelis Hoede – Mathematics Genealogy Project.
â— Hoede, Cornelis (1936-) – WorldCat Identities.

θΔics

In existographies, **Cornelius Agrippa** (1486-1535) (IQ:160|#550) (Cattell 1000:739) (CR:5) was a German occult philosopher, theologian, physician, legal expert, and soldier, noted for []

Influenced

Agrippa was influential to: Giordano Bruno, John Dee, Jean Meslier, Mary Shelley, and Soren Kierkegaard.

Quotes | On

The following are quotes on or about Magnus:

> "When I, Victor Frankenstein, returned home my first care was to procure the whole works of this author [**Cornelius Agrippa**], and afterwards of Paracelsus and Albertus Magnus. I read and studied the wild fancies of these writers with delight; they appeared to me treasures known to few besides myself. I have described myself as always having been imbued with a fervent longing to penetrate the secrets of nature. In spite of the intense labor and wonderful discoveries of modern philosophers, I always came from my studies discontented and unsatisfied. Sir Isaac Newton is said to have avowed that he felt like a child picking up shells beside the great and unexplored ocean of truth. Those of his successors in each branch of natural philosophy with whom I was acquainted appeared even to my boy's apprehensions as tyros engaged in the same pursuit."
>
> — Mary Shelley (1818), *Frankenstein: the Modern Prometheus* (§2)

> "Next in respect of time to **Cornelius Agrippa** comes the celebrated Dr. Faustus. Little in point of fact is known respecting this eminent personage in the annals of necromancy. His pretended history does not seem to have been written till about the year 1587, perhaps half a century after his death. This work is apparently in its principal features altogether fictitious. We have no reason however to deny the early statements as to his life. He is asserted by Camerarius and Wierus to have been born at Cundling, near Cracow, in the kingdom of Poland, and is understood to have passed the principal part of his life at the university of Wittenberg. He was probably well known to Cornelius Agrippa and Paracelsus. Melanchthon mentions him in his letters; and Conrad Gessner refers to him as a contemporary. The author of his life cites the opinions entertained respecting him by Luther. Philip Camerarius speaks of him in his 'Horas Subsecivae' as a celebrated name among magicians, apparently without reference to the life that has come down to us; and Wierus does the same thing. He was probably nothing more than an accomplished juggler, who appears to have practiced his art with great success in several towns of Germany. He was also no doubt a pretender to necromancy."
>
> — William Godwin (1834), *Lives of Necromancers* [1]

Quotes | By

The following are quotes by Agrippa:

> "The knowledge of all sciences is so difficult, if I may not say impossible, that the age of man will not suffice to learn the perfection of one art as it ought to be: which Ecclesiastes seems to intimate, where he saith, 'I beheld the whole work of god, that man cannot find out the work that is wrought under the sun; for the which man laboureth to seek it, and cannot find it: yea, and though the wise man think to know it, he cannot find it'."
>
> — Cornelius Agrippa (1526), *On the Vanity of the Sciences* (pg. 6)

References

1. Godwin, William. (1834). *Lives of Necromancers* (pg. 199). Mason, 1876.

External links

â— Heinrich Cornelius Agrippa – Wikipedia.

θΔics

In business thermodynamics, **corporate entropy** is a loosely defined term referring to a loss of productive energy inside the working actions of a corporation. In short, the concept of corporate entropy is the application of the thermodynamic definition of entropy, as the portion of a system's energy that cannot be converted into external work, to the description and operation of corporations. Said another way, in the phrasing of Clausius, it is the work the molecules, e.g. human molecules, of the system do on each other that is lost irreversibly. [6]

One of the first to write in this frame of logic was French author C. H. Berry, as discussed in his 1978 working paper *Alternative Dimensions of Corporate Diversification: an Entropy Approach.* [1] The first to use the term in a figurative sense was American author and professor of management science Russell Ackoff who in his 1981 book *Creating the Corporate Future* outlined a design for the use of managerial time and energy at work in a way that *corporate energy*, what he defines as "wasted energy", is minimized. [2] Into the late 1980s and 90s, the term had begun to slowly sink in and authors were beginning to devote short sections to the topic of corporate entropy and phraseologies such as the "second thermodynamic law of management". [4]

History of concept

In 1978, French author C. H. Berry published the working paper *Alternative Dimensions of Corporate Diversification: an Entropy Approach.* [1] The 1987 book *The Creative Corporation*, by authors Karl Albrecht and Steven Albrecht, uses the word entropy nine times and has a section devoted to "Entropy and Synergy: In Search of the Corporate Force". [3]

Ackoff's 1981 definition

One of the first to outline a reasonable definition of corporate entropy was American author and professor of management science Russell Ackoff. In his 1981 book *Creating the Corporate Future* Ackoff outlined his views of the analogy idea of corporate energy, using the logic that if a manager utilizes his board meeting time in a way that stimulates the function of his subordinates, he will have reduced corporate entropy.

To outline this logic, first he cites data showing that the average number of distinct activities that a manager can think about simultaneously is seven. Next, he states that the boards generally meet for no more than four hours per month and that if a manager is on ten or fewer boards (most are on less than ten) that he or she would spend no more than forty hours per month, or no more than 25 percent of their time at work. This framework, he states, leaves plenty of time for other activities in that most of his or her responsibilities can be fulfilled through participation in these boards.

Through them, he argues, the manager can "coordinate and integrate the work done under him and his own work with that of others, and to keep abreast of what is going on above and alongside." Skipping a few details, Ackoff notes that most managers and other members of an organization, who are worth their salt, are always planning either consciously or unconsciously, and that the design he presents, as outlined above and further in his book, "organizes this huge informal effort and extracts more its great potential (on the analogy of chemical potential) than is realized from the disorganized way it is usually carried out." He continues, "once under way, it actually saves time over the entire enterprise", in that "it taps the energy wasted in worry, complaints, beefing, and partial, hence abortive, efforts at reform by converting corporate entropy into useful work (on the analogy of free energy), play, and learning."

Moreover, as he concludes, "it provides all those who feel that they are either being served unfairly or are serving inadequately with a chance to put up or shut up." He calls this a "design for participative planning" and suggests that it need not be introduced to an entire organization at once, but can be implemented independently in a unit, department, or a division and that once the functionality of the design catches on it will "spread to other parts or levels of the organization". [2]

DeMarco and Lister's 1999 definition

The very-popular 1999 book *Peopleware – Productive Projects and Teams*, by American software business consultants Tom DeMarco and Timothy Lister, has a half-page section devoted to corporate entropy. They define entropy in a corporation as "levelness or sameness" and that "the more it increases, the less potential there is to generate energy or do work." [4] Furthermore, in a corporation or organization, according to DeMarco and Lister, "entropy can be thought of as uniformity or attitude, appearance, and thought processes." They suppose that "just as thermodynamic entropy is

always increasing in the universe, so too corporate entropy is on the rise".

There definition of what they call the *second thermodynamic law of management* is that "entropy is always increasing in the organization". This, to note, is incorrect to suppose special "human laws of thermodynamics". [5] In any event, they postulate that the effect of the second law of thermodynamics, via entropy, is the reason that "elderly institutions are tighter and a lot less fun than sprightly young companies." To fight the effect of entropy, the argue that the most successful manager is the one who "shakes up the local entropy to bring in the right people and let them be themselves, even though they may deviate from the norm of the corporate norm.". [4]

References

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2. Ackoff, Russell, L. (1981). *Creating the Corporate Future: Plan or be Planned for*, (pg. 69-70). New York: John Wiley and Sons.
3. Albrecht, Karl and Albrecht, Steven. (1987). *The Creative Corporation*, (section: "Entropy and Synergy: In Search of the Corporate Force", pg. 23). Publisher: Richard D Irwin.
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â— Anon. (2002). "Entropy (strategy focus)", Norelli & Company, Norelli.com.

θΔics

In business chemistry, a **corporate molecule** is a term that refers, either metaphorically or literally, to the view of a corporation as being a large molecule, comprised of individual human particles or human molecules.

Usage

In 1975, Joseph Sander, in his *Hunger Can't Wait*, devoted a several page section to the concept or term ‘corporate molecule’. [1]

In 1991, authors Robert Moran and William Stripp were outlining the view of how the ‘corporate molecule’ was bound by shared cultural ties. [2]

In 2005, Lynn Lyss, employed the related term 'business molecular organism', i.e. a type of business molecule logic. [5]

In 2010, Indian business executive Vineet Nayar outlined the following view: [3]

> “When a critical mass of employees [activate] (usually, 5 or 10 percent is all you need), throughout the company, it creates a kind of fusion – a coming together of the human particles in the **corporate molecule** that releases a massive amount of energy.”

(add discussion)

See also

â— Corporate entropy

References

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2. Moran, Robert, Stripp, William G. (1991). *Dynamics of Successful International Business Negotiations* (corporate molecule, pgs. 63, 240). Gulf Pub. Co.
3. Nayar, Vineet. (2010). *Employees First, Customers Second* (corporate molecule, pg. 165). Harvard Business Books.
5. Liss, Lynn. (2005). "Human Thermodynamics and Business Efficiency", *Journal of Human Thermodynamics*, Vol. 1, Issue 6, pgs. 62-67, Dec.

See also

â— Corporate molecule (animation) – ThomasGranbois.com.

θΔics

In existographies, **Corrado Giannantoni** (1950-) is an Italian nuclear engineer noted, in ecological thermodynamics, for "thermodynamics of quality" theory, first outlined in his 2002 book *The Maximum Em-Power Principle as the Basis for Thermodynamics of Quality*, in which, building on the work Alfred Lotka and Howard T. Odum, he outlines a rather peculiar, nearly incohesive, and somewhat choppy brand of fourth law stylized thermodynamics, centered largely around the concepts of emergy and empower (of Odum) and to some extent exergy (of Zoran Rant).

Difficulties

A large number of difficulties exist in a read of any part Giannantoni's theory. The first and foremost, aside from the fact that Giannantoni's work is an extension of the Odum school, which itself is a school of thought way off the reservation of standard thermodynamics, is his uncouth and nearly unedited writing style: nearly three-fourths of his entire 2002 book, for example, is italicized, page-after-page, the result of which it is sore to the eyes to even flip through, let alone read cover to cover. Beyond this, the difficulties are nearly intractable, as far as presentation and mathematical content go, too many to list. The following book review summary by American public management professor Donald Adolphson, gives an overall idea that Giannantoni seems to be presenting a sort of overunity version of thermodynamics: [2]

> "Thermodynamics of quality include other more subtle but important forms of energy, referred to as *meta-mechanical* forms of energy, that depend on quality of organization rather than quantity of matter. Giannantoni's framework embraces the main conclusion of the traditional laws that the *quantities* of mechanical energy are decreasing due to losses incurred in energy transformations. However, his framework also shows that gains in meta-mechanical energy, through judicious choices of energy transformations, exceed losses in mechanical energy. To summarize, the traditional laws describe a universe that is necessarily decreasing in productive capacity while the new laws describe a universe that is potentially ever increasing in productive capacity."

Here we see what seems to be a prime example of someone lost in what Erwin Hiebert calls the "garden of thermodynamics" where "all kinds of private metaphysics and theology grow like weeds." A comparison to Giannantoni and his "quality thermodynamics" theory might be Ivan Kennedy and his "action thermodynamics" theory, both of which are far lost in the outer edges of the garden.

Fourth law | Dreams

In 2004, Giannantoni, in his "How Many 'Fourth' Principles Are There in Thermodynamics?" stated the following, as a way to parlay his work as the new fourth law of thermodynamics, a common phenomenon with newly-zealous scholars aiming at grand theories: [4]

> "The paper considers four different proposals (found in Literature) concerning a possible fourth

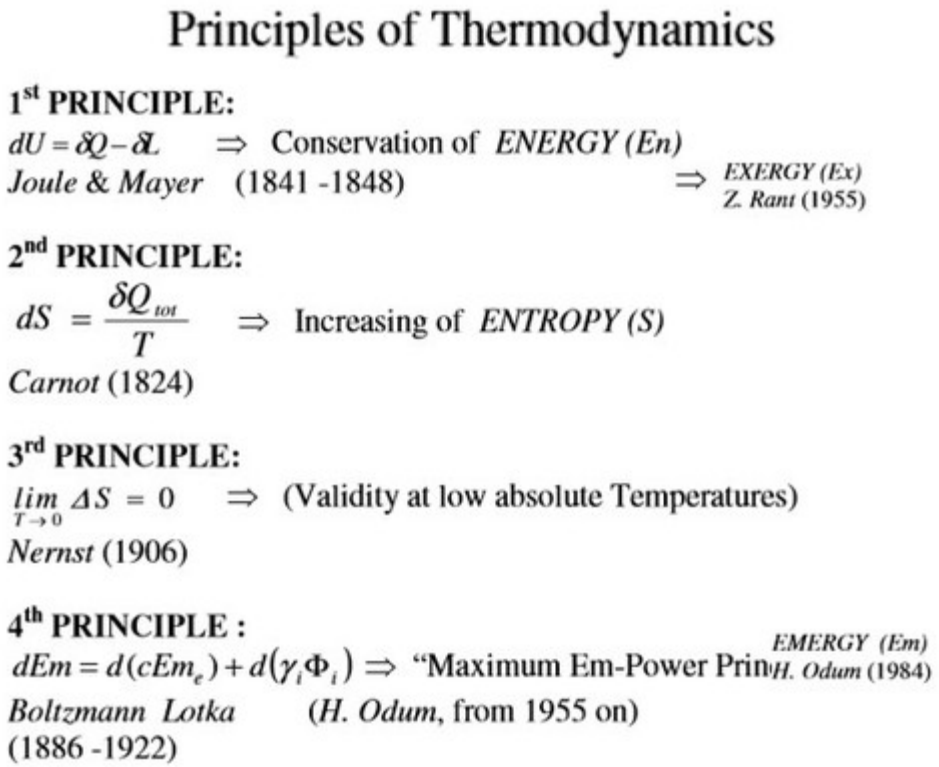

Giannantoni's conception of the four principles of thermodynamics, from his "Thermodynamics of Quality and Society", wherein he Zoran Rant (1955), and his exergy models, Alfred Lotka (1922), and Howard Odum (1955) as they new thermodynamics

Thermodynamic Principle, namely: Onsager's Reciprocal Relations (1931), Prigogine's Excess Entropy Production (1971), Georgescu-Roegen's Matter Entropy (1972) and Jorgensen's Ecological Law of Thermodynamics (1992). Such Principles, when analyzed in the light of Odum's Maximum Em-Power Principle (1994), appear as being four different reductive quantitative versions of the latter. Consequently, the Maximum Em-Power Principle can be considered as being not only a new Thermodynamic Principle (as already shown in (Giannantoni 2001, 2002)), but also the only candidate to be recognized as the real Fourth Thermodynamic Principle"

principles expanders. [3]

(add discussion)

Economics

Giannantoni has written a second book in Italian in 2007 and is currently in the early stages of his third book, which is an extension of his theories into economics.

Education

Giannantoni completed a nuclear engineering degree in 1977 at the La Sapienza University of Rome.

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4. Giannantoni, Corrado. (2004). "How Many 'Fourth' Principles Are There in Thermodynamics?" (pdf), in: *Emergy Synthesis 3: Theory and Applications of the Emergy Methodology* (editors: Mark Brown), Proceedings form the Third Biennial Emergy Conference, Gainesville, Florida. Publisher, 2005.

External links

â— Corrado Giannantoni – Wikipedia.

θΔics

In existographies, **Cort Johns** (c.1962-) is Swiss steam engine historian (see: history of the steam engine), noted for []

Overview

In 2019, Johns, in his *The Lost Industrial Revolution*, an expanded version of his 1992 PhD dissertation, attempted to stitch out the origin of the steam engine, starting with Ctesibius to Leonardo Da Vinci, Denis Papin, and Thomas Savery, with intermittent focus on steam engine based organs (his father's profession). [1]

Education

In 1992, Johns completed his PhD in economics with a dissertation "Technology, Culture, and Creativity: Factors Connecting Invention and Scientific Discovery", at Hochschule St. Gallen, Switzerland.

Note

Johns published book, content aside, has a number of poor publishing quality issues, such as over-large text, line spaces between each paragraph, no page numbers, and his references numbers 1 to 850, with no sort of chapter by chapter break up of the references.

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In science, **Cosimo Boscaglia** (c.1550-1621) was an Italian philosopher who in 1613 launched a crusade to have Italian physicist Galileo Galilei tried for heresy for his experimental findings in support of his so-called "theory of the moving earth", and moreover to have the Medici, a leading philosophical association of philosophers in Florence and Pisa, expunge and "oppose Galileo's conception of science."

Dinner party talk

In debates, it is said that a certain snippet of table talk, occurring at a dinner or breakfast party in December of 1613 at the house of the Grand Duke (Ferdinando I de Medici) and Duchess (Christina) of Tuscany, between Boscaglia and the Duchess (the person who appointed Galileo to the professorship of mathematics at the University of Pisa in 1588) is what sparked the start of the Galilean inquisitions and eventual 1633 trial and conviction of Galileo for heresy.

As the story goes, the Duke and Duchess asked physics professor Benedetto Castelli, a student and friend of Galileo, to explain the latest findings in astronomy, which naturally enough led to an explanation of Galileo's version of heliocentric theory with its implicit conclusion that the earth moves. [1] This "earth movement" view point, however, goes directly against the Bible, including passages such as: [2]

> "The world is established and cannot be moved."

In objection to the heliocentric view, it is said that Boscaglia began to whisper in the Duchess' ear something to the effect that earth's motion theory is doubtful and most importantly that it contradicts Biblical scripture.

The Grand Duchess, a pious and devout lady, was concerned about these objections, queried Castelli and he answered as best he could. Later, however, Castelli wrote to Galileo telling him of the incident. [2] This, in turn, sparked a series of response defense letters by Galileo, including one famous *Letter to the Grand Duchess Christina*, on the topic concerning the use of Biblical quotations in matters of science. To quote Galileo in this letter: [3]

> "I hold the sun to be situated motionless in the center of the revolution of the celestial orbs while the earth rotates on its axis and revolves about the sun."

Although he wrote these letters in attempt at defense, they only acted to irritate Church authorities and two draw them into the debate. A domino effect of this eventually led to Galileo being tried and found guilty of heresy in 1633.

Education

In 1613, Boscaglia was a professor of philosophy at the University of Pisa.

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(b) Galileo, Galilei. (1615). "Letter to Madame Christian of Lorraine, Grand Duchess of Tuscany: Concerning the Use of Biblical Quotations in Matters of Science." (*Lettera a Cristina di Lorena, Granduchessa di* Toscana); in *Opere* , edited by Antonio Favaro, Giunti-Barbera, Firenze 1968, vol. V, pp. 309-348]
(c) Letter to the Grand Duchess Christina – Wikipedia.

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â— Farina, Fabio J.A. (2003). *Four Treatises for the Reconsideration of the History of Science* (pg. 22-23). iUniverse.com.

External links

â— Cosimo Boscaglia – Wikipedia.

θΔics

In thermodynamics, **cosmological thermodynamics** or "astrothermodynamics" is the study of the relation between the laws of thermodynamics and the functioning, dynamics, and evolution of the universe, from the sub-atomic to super-galactic range. Topics in this field is black hole thermodynamics, black hole entropy, and the Boltzmann brain problem.

Overview

In 1970, Stephen Hawking introduced the model of black hole entropy, and hence black hole thermodynamics.

In 1939, Subrahmanyan Chandrasekhar, in his book *An Introduction to the Study of Stellar Structure*, devoted his the first chapter, on astrophysical thermodynamics, to laying out a thermodynamic foundation for the study of stellar structure using the thermodynamics of Greek mathematician Constantin Caratheodory (1908), in particular the so-called Caratheodory theorem.

In 2001, Eric Chaisson, his *Cosmic Evolution: the Rise of Complexity in Nature*, outlined a “lightly quantitative, thermodynamics-oriented treatment” of radiation, matter, and ‘life’ (powered CHNOPS+ things), using what he calls “energy flow-rate density” (Q), in units of ergs per second per gram, as a complexity measure for phenomena of all kinds and scales. [2]
The general nature of the thermodynamic operation of the universe, however, is relatively unknown, depending on phenomenon such as dark energy, boson-fermion relationships, the open or closed thermodynamic system possibilities of the universe, the puzzling rate of expansion of the universe, a lack of a unified theory of the fundamental forces or interactions, e.g. electromagnetic vs. gravity, the nature of black holes and entropy, etc. The central question in human thermodynamics is how does the thermodynamic operation of the universe relate, interact, or connect to the thermodynamic operation of human life, if at all?

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External links

● Thermodynamics of the universe - Wikipedia.

θΔics

In science, **coupled reactions** are two or more reactions, at least on being endergonic (energy requiring), one or more of the others being exergonic (energy yielding), which are "coupled" thermodynamically such that the exergonic reactions drive or power the endergonic reactions, such that the system of reactions or processes as a whole "goes", i.e. occurs naturally.

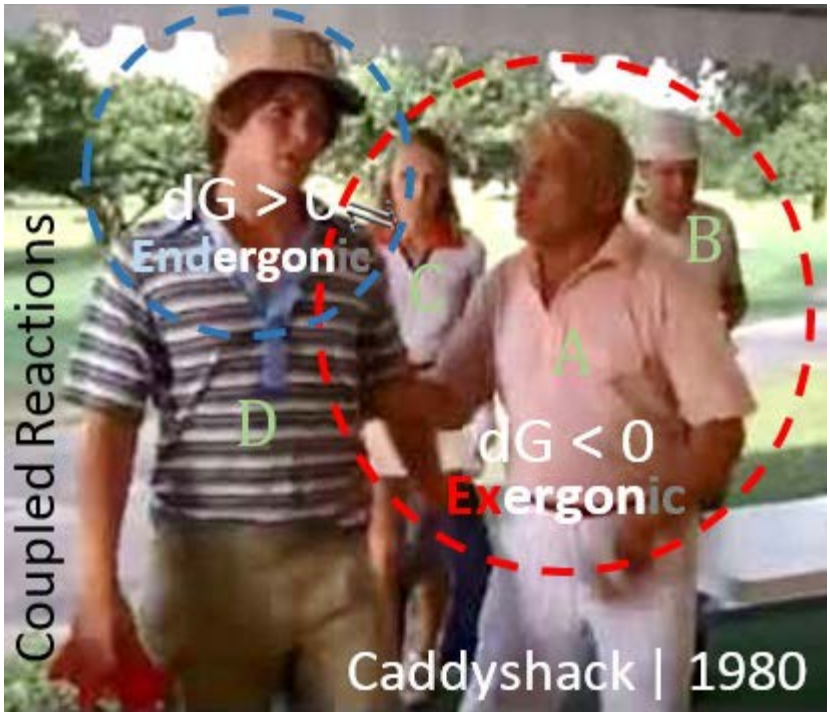

The Caddyshack social coupling diagram, lecture part 12 (O), from Libb Thims' 2015 "Zerotheism for Kids" lecture, illustrating **coupled reactions** in social terms, via the example of nepotism, from the 1980 film *Caddyshack.*

Overview

In circa 1890s, German physical chemist Wilhelm Ostwald, according to energetics historian John Edsall (1974), was the first, apparently, to discuss coupled reactions, whereby, to use modern terminology (Ostwald used some type of general "energetics" conceptual terminology), the free energy released by an exergonic process can be used to drive an endergonic process that would not go by itself. [1]

In 1920 to 1936, Belgian physical chemist Theophile de Donder was discussing coupled reactions, thermodynamically, in terms of affinity theory. [2]

Quotes

The following are related quotes:

> "For a *total* process it is impossible to escape the rigorous requirement that the *total* free energy change, at constant pressure and temperature, must be negative if the process is to go. Such spontaneous processes (ΔG negative) have been termed 'exergonic' by Charles Coryell, in analogy to the term exothermic for processes in which ΔH is negative. A process which taken alone would be endergonic (ΔG positive), and therefore thermodynamically forbidden, may nevertheless proceed if it is coupled with another process which is so highly exergonic that the total value of ΔG for the **combined reaction** is negative. Such coupled reactions are of profound importance in biochemistry. The supply of free energy in many **coupled biochemical reactions** is provided by the hydrolysis of adenosine triphosphate (ATP to adenosine diphosphate (ADP) and inorganic phosphate."
>
> — John Edsall (1958), *Biophysical Chemistry* [3]

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Further reading

● Crofts, Antony. (2009). "Coupled reactions" (lecture 5), Biophysics 354. Illinois.edu.

External links

- Coupled reactions – Wiley.com.
- What is a coupled reaction? (2012) – StackExchange.com.

θΔics

In chemistry, **coupling** refers to reactions, i.e. coupled reactions, that are 'coupled' together in the sense that a thermodynamic coupling allows one of the reactions to progress in a direction contrary to that prescribed by its own affinity. [1]

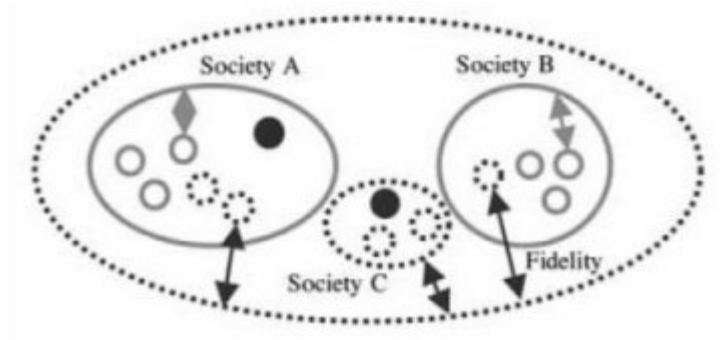

A schematic of Iranian-born American Robert Kenoun's 2006 "internal energy **coupling** theory", an aspect of his social internal energy minimization theory, of social history, wherein he views each subsystem or society as tending to a thermodynamic potential of internal energy minimum (U → 0), and that these sub-system societies are energetically connected together in the larger global system. [3]

History

In the 1890s, German physical chemist Wilhelm Ostwald, according to energetics historian John Edsall (1974), was the first, apparently, to discuss coupled reactions, whereby (to use modern terminology) the free energy released by an exergonic process can be used to drive an endergonic process that would not go by itself. [7]

In the years 1920 to 1936, Belgian physical chemist Theophile de Donder worked out the basics of "affinity coupling", such that if in a system two simultaneous reactions occur:

$$A_1v_1 < 0$$

$$A_2v_2 > 0$$

where A and v are the chemical affinity and chemical reaction rate, respectively, and the subscripts refer to reaction one and reaction two, respectively, that the overall reaction will occur as long as:

$$A_1v_1 + A_2v_2 > 0$$

at which point the reactions are said to be "coupled" reactions. In this sense, according to de Donder's protege Belgian chemist Ilya Prigogine, "thermodynamic coupling" allows one of the reactions to progress in a direction contrary to that proscribed by its own affinity. The rules for affinities of reaction are defined as follows: [5]

Measure	Description
$A > 0$	reaction proceeds to the right
$A < 0$	reaction proceeds to the left
$A = 0$	reaction is in a state of equilibrium

The formula de Donder employs to measure affinity A is:

$$A = -\sum_{i=1}^{j} \nu_i \mu_i$$

where μ (mu) is the chemical potential, as defined in the work of Willard Gibbs (1876), of one associated molecular entity or mass ν (nu).

In 1961, Frederick Koenig, et al, published on thermodynamics of coupling, via citation to de Donder. [8]

Free energy coupling

In 1934, American physicochemical physiologist Harold Blum, in his “A Consideration of Evolution from a Thermodynamic View-Point”, outlined what seems to be the first version of free energy coupling theory as well as its first application toward a reformulation of a non-theological directive-based version of evolution via natural selection.

In 1941, German-born American biochemist Fritz Lipmann, in his "Metabolic Generation and Utilization of Phosphate Bond Energy", which itself was based on previous scatters works on the puzzle as to how to explain the energetics of frog leg movement, outlined a more robust free energy coupling model, which is summed up by the following equation:

$$\sum_{i=1}^{j} \Delta G_{N_i} + \sum_{i=1}^{k} \Delta G_{\tilde{N}_i} < 0$$

Herein, this is called the Lipmann coupling inequality and states that as long as the sum of the Gibbs free energy changes for all "natural", symbol N, processes or reactions, in a given coupled system, plus the the sum of the Gibbs free energy changes for all "unnatural", symbol $\tilde{N}$, processes or reactions, in a given coupled system, is negative or has a measurement value less than zero then the process as a whole will be natural and spontaneously progress or occur.

In modern times, this is known popularly as the "free energy coupling" model of driven energy transformations, the textbook example being the model of ATP as a type of "energy currency".

A later spin-off the coupling model is English biochemist Peter Mitchell’s 1961 chemiosmotic theory, or chemiosmotic hypothesis, the theory which explains the coupling processes that made ATP in the first place as well as the thermodynamics of membrane transport in general.

Human thermodynamics

In 2006, Iranian-born American material science electrical engineer Robert Kenoun outlined a generalized model of social coupling, i.e. his "social internal energy minimization theory, where in so-called "relational bonds" are posited to exist between societies or systems, exchanging energy and matter, and the tendency for each system is towards an internal energy minimum (U → 0). [3] The main difficulty in Kenoun's coupling theory is that he is using the wrong is

In 2007, Russian bioelectrician Octavian Ksenzhek outlined a crude type of economic coupling theory, viewing money as a type of "virtual energy" analogous to the way in which ATP acts a a power or energy source in the cell driving a variety of endergonic processes in the cell. [4]

Thermodynamic potentials

	System	Potential	Conditions	Equilibrium
Coupled bulbs	Isolated system	Entropy (negative) Negentropy		dS = 0 (S = max)
System?	(add)	Internal energy (dS = 0, dV = 0)	Quantities of extensity constant	dU = 0 (U = min)
System?	Closed isentropic isobaric system	Enthalpy (dS = 0, dP = 0)	Entropy, pressure, and amount of substance constant	dH = 0 (H = min)
Battery	Closed isochoric isothermal system	Helmholtz free energy (dT = 0, dV = 0)	Temperature, volume, and amount of substance constant	dF = 0 (F = min)

References

Social systems	Closed isobaric isothermal system	Gibbs free energy (dT = 0, dP = 0) Note: (freely running)	Temperature, pressure, and amount of substance constant	dG = 0 (G = min)
Social systems	Open isobaric isothermal system	Gibbs free energy (dT = 0, dP = 0) Addition factors: (chemical potential: μ) (turnover rate)	Temperature and pressure constant; amount of substance varies	dG = 0 (G = min)

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θΔics

In IQs, a **Cox IQ** is one of the 301 IQs assigned by American psychologist Catherine Cox of the three-hundred greatest geniuses that lived between 1450 and 1850, as published in her famous 1926 book *Early Mental Traits of Three Hundred Geniuses*. [1]

This was the first attempt at assigning geniuses IQs, generally based on the methodology Cox's PhD advisor Lewis Terman, inventor of the modern IQ scale, used in assigning Francis Galton with an IQ of 200.

Cox's 301 Geniuses

Volume 2 of Terman's *Genetic Studies of Genius* was written by Catherine Cox, one of his graduate students. In this volume, entitled *The Early Mental Traits of Three Hundred Geniuses*, Cox subjected 301 creators and leaders to historiometric rigors. The explicit model was Terman's calculation of Galton's IQ, but the sample was much larger and more diverse. She began with the 1,000 most eminent creators and leaders in the list compiled by James McKeen Cattell in 1903. Individuals were selected according to several objective factors. Those sampled had to be born since 1450, achieve eminence on their own rather than inherit a throne, receive the highest eminence rankings, and the like. Those making the final cut included leaders such as Richelieu, Disraeli, Washington, Garibaldi, Cortés, and Luther, and creators such as Watt, Kepler, Spinoza, Montaigne, Calderón, Raphael, and Rossini. For each, Cox compiled a huge data base on early childhood and adolescent achievements. Although the raw data were deposited in the Terman archives at Stanford University, Cox abstracted the key facts in the published volume. No doubt, this is one reason the tome is 842 pages long!

A 1994 summary of Cox's IQs by Dean Simonton. [2]

Cattell 1000

See main: Cattell 1000

In 1894, American psychologist, *Science* editor, and *Popular Science Monthly* founding editor James Cattell, starting with several standard reference works, compiled a list of the 1,000 most eminent creators and leaders in Western civilization, ranked according to amount of space they received, the results of which he summarized in his lecture "A Statistical Study of Eminent Men". [3] Started with Cattell's list, Cox selected the best of the best, in terms of criterion such as those who achieved eminence own their own (as contrasted with throne inheritance based eminence), highest eminence rankings, etc., and also those who were of adulthood age from 1450 to 1850. [2]

Ranking methodology

To make this list, a team led by Cox, Lewis Terman, the co-inventor of the IQ test, and psychologists Florence Goodenaugh and Kate Gordon gave an historically determined IQ ranked listing of the top 300 geniuses who lived between 1450 and 1850, by reading through 1,500 biographies and to each genius independently assign an estimated intelligence quotient, based on *The Stanford Revision of the Binet-Simon Intelligence Scale*, based on each individual's life accomplishments and childhood abilities.

The IQ ratings, for each of the 300 geniuses, were done by Catherine Cox, Lewis Terman, Maud Merrill, Florence Goodenaugh, and Kate Gordon.

List | 1-100

The following is the listing of Cox's IQs:

1-100 **101-200** **201-301**

1. Goethe (IQ=210)

2. Leibnitz (IQ=205)

3. Grotius (IQ=200)

4. Wolsey (IQ=200)

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5. Pascal (IQ=195)

6. Sarpi (IQ=195)

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7. Newton (IQ=190)

8. Laplace (IQ=190)

9. Voltaire (IQ=190)

10. Schelling (IQ=190)

11. Arnauld (IQ=190)

12. Berkeley (IQ=190)

13. Haller (IQ=190)

14. Melanchthon (IQ=190)

15. Pitt (the Younger) (IQ=190)

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16. Galileo (IQ=185)

17. Lagrange (IQ=185)

18. Davy (IQ=185)

19. D'Alembert (IQ=185)

18. Comte (IQ=185)

17. Campanella (IQ=185)

21. Gassendi (IQ=185)

22. Humboldt, the Younger (IQ=185)

24. Leopardi (IQ=185)

25. Mirabeau (IQ=185)

26. Niebuhr (IQ=185)

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27. Da Vinci (IQ=180)

29. Descartes (IQ=180)

101. Reuchlin (IQ=170)

102. Robespierre (IQ=170)

103. Smith, A. (IQ=170)

104. Strauss (IQ=170)

105. Tennyson (IQ=170)

106. Turgot (IQ=170)

107. Velasquez (IQ=170)

108. Vergniaud (IQ=170)

109. Wagner (IQ=170)

110. Wieland (IQ=170)

---

111. Boerhaave (IQ=165)

112. Darwin (IQ=165)

113. Watt (IQ=165)

114. Diderot (IQ=165)

115. Beethoven (IQ=165)

116. Bach (IQ=165)

117. Addison (IQ=165)

118. Bayle (IQ=165)

119. Beaumarchais (IQ=165)

120. Beza (IQ=165)

121. Bronte, C. (IQ=165)

122. Burnet (IQ=165)

123. Canning (IQ=165)

124. DeFoe (IQ=165)

125. Disraeli (IQ=165)

126. Fielding (IQ=165)

127. Fouche (IQ=165)

128. Guicciardini (IQ=165)

129. Guizot (IQ=165)

130. Guizot (IQ=165)

131. Hastings (IQ=165)

132. Hegel (IQ=165)

133. Heine (IQ=165)

134. Herder (IQ=165)

135. Herschel, W. (IQ=165)

136. Hobbes (IQ=165)

201. Schleiermacher (IQ=160)

202. Sevigne (IQ=160)

203. Sumner, C. (IQ=160)

204. Thiers (IQ=160)

205. Wesley (IQ=160)

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206. Adams, J. (IQ=155)

207. Ait Weil Zade (IQ=155)

208. Balzac (IQ=155)

209. Baxter (IQ=155)

210. Beranger (IQ=155)

Bulwer (IQ=155)

Cervantes (IQ=155)

Pitt (the Younter) (IQ=155)

Cervantes (IQ=155)

Cobden (IQ=155)

Danton (IQ=155)

Durer (IQ=155)

Emerson (IQ=155)

Fox, G. J. (IQ=155)

Fox, George (IQ=155)

Fulton, R. (IQ=155)

Gambetta, L.M. (IQ=155)

Hamilton, A. (IQ=155)

Hawthorne, N. (IQ=155)

La Fontaine (IQ=155)

Maintenon (IQ=155)

Miller, Hugh (IQ=155)

More (IQ=155)

Necker (IQ=155)

30. Bacon (IQ=180)

30. Michelangelo (IQ=180)

31. Mill (IQ=180)
32. Byron (IQ=180)
33. Arago (IQ=180)
34. Bailly (IQ=180)
35. Bentham (IQ=180)
36. Bossuet (IQ=180)
37. Brougham (IQ=180)
38. Chattterton (IQ=180)
39. Condorcet (IQ=180)
40. Dickens (IQ=180)
41. Erasmus (IQ=180)
42. Fenelon (IQ=180)
43. Gibbon (IQ=180)
44. Hugo (IQ=180)

45. Liebig (IQ=180)
46. Malebranche (IQ=180)
47. Milton (IQ=180)
48. Musset (IQ=180)
49. Oersted (IQ=180)
50. Peel (IQ=180)
51. Pope (IQ=180)
52. Scalinger (IQ=180)
53. Stael (IQ=180)
54. Tasso (IQ=180)

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55. Huygens (IQ=175)
56. Kepler (IQ=175)
â— Kant (IQ=175)

57. Spinoza (IQ=175)

58. Gay-Lussac (IQ=175)
59. Humboldt, W. (IQ=175)
60. Bunsen (IQ=175)
61. Spenser (IQ=175)
62. Adams, J. Q. (IQ=175)
63. Agassiz (IQ=175)
64. Bichat (IQ=175)
65. Buffon (IQ=175)
66. Calvin (IQ=175)
67. Cardan (IQ=175)
68. Coleridge (IQ=175)
69. Cuvier (IQ=175)
70. Jonson, B. (IQ=175)

137. Holberg, L. von (IQ=165)
138. Jenner (IQ=165)
139. Johnson (IQ=165)
140. Law (IQ=165)

141. Linnaeus (IQ=165)
142. Locke (IQ=165)
143. Mazzini (IQ=165)
144. Mendelssohn (IQ=165)
145. Montaigne (IQ=165)

146. Mozart (IQ=165)
147. Newman, J.H. (IQ=165)

148. Priestley (IQ=165)

149. Raleigh (IQ=165)
150. Robertson (IQ=165)
151. Sainte-Beuve (IQ=165)

152. Schiller (IQ=165)
153. Scott (IQ=165)
154. Shaftesbury (IQ=165)
155. Sheridan, R.B. (IQ=165)
156. St. Simon (IQ=165)
157. Swedenborg (IQ=165)
158. Tieck (IQ=165)
159. Weber (IQ=165)
160. Webster (IQ=165)
161. Winckelmann (IQ=165)
162. Wordsworth (IQ=165)
163. Zwingli (IQ=165)

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164. Alfieri (IQ=160)
165. Andrewes (IQ=160)

166. Berzelius (IQ=160)

167. Boyle (IQ=160)
168. Bunyan (IQ=160)
169. Canova (IQ=160)
170. Channing (IQ=160)
171. Chateaubriand (IQ=160)
172. Chesterfield (IQ=160)
173. Claredon (IQ=160)
174. Clarke, S. (IQ=160)

175. Copernicus (IQ=160)
176. Corneille (IQ=160)
177. Cowper (IQ=160)
178. Dryden (IQ=160)

O'Connell (IQ=155)
Palestrina (IQ=155)
Pitt (the Elder) (IQ=155)
Prescott (IQ=155)
Rembrandt (IQ=155)
Savonarola (IQ=155)
Seward (IQ=155)
Swift (IQ=155)
Temple, W. (IQ=155)
Van Dyck (IQ=155)
Walpole (IQ=155)
Warburton (IQ=155)
Wilberforce (IQ=155)
Blake, H. (IQ=155)

Bright (IQ=150)
Burns (IQ=150)
Cobbett (IQ=150)
Franklin (IQ=150)
Lincoln (IQ=150)
Marmont (IQ=150)
Moore (IQ=150)
Murillo (IQ=150)
Nelson (IQ=150)
Rousseau (IQ=150)
Soult (IQ=150)
Thackeray (IQ=150)
Wilkes (IQ=150)

Alberoni (IQ=145)
Anderson, H. C. (IQ=145)
Blucher (IQ=145)
Garrison, W.L. (IQ=145)
Gluck (IQ=145)
Hogarth (IQ=145)
Jackson, A. (IQ=145)
Marlborough (IQ=145)
Meheme Ali (IQ=145)
Moreau (IQ=145)
Napoleon (IQ=145)
Poussin (IQ=145)
Reynolds (IQ=145)
Rossini (IQ=145)
Sherman (IQ=145)

Bernadotte (IQ=140)
Clive (IQ=140)
Cortez (IQ=140)
Garibaldi (IQ=140)
Lee, R.E. (IQ=140)
Monk (IQ=140)
Vauban (IQ=140)
Washington (IQ=140)

71. Lamennais (IQ=175)
72. Macaulay (IQ=175)
73. Southey, R. (IQ=175)
74. Thou (IQ=175)
75. Vega, de (IQ=175)
76. Wolf, F.A. (IQ=175)

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77. Lavoisier (IQ=170)
78. Faraday (IQ=170)
79. Carnot (IQ=170)
80. Hamilton (IQ=170)
81. Atterbury (IQ=170)
82. Bentley (IQ=170)
83. Calderon (IQ=170)
84. Canope (IQ=170)
85. Chalmers (IQ=170)
86. Chalmers (IQ=170)
87. Constant (IQ=170)
88. Fichte (IQ=170)
89. Handel (IQ=170)
90. Irving W. (IQ=170)
91. Kotzebue (IQ=170)
92. Longfellow (IQ=170)
93. Luther (IQ=170)
94. Marat (IQ=170)
95. Metastasio (IQ=170)
96. Napier (IQ=170)
97. Penn (IQ=170)
98. Racine (IQ=170)
99. Raphael (IQ=170)
100. Renan (IQ=170)

179. Dupin (IQ=160)
180. Eliot, G. (IQ=160)
181. Etienne (IQ=160)
182. Franklin, B. (IQ=160)
183. Gaskell, E.C.S. (IQ=160)
184. Grimm, J.L. (IQ=160)
185. Grote (IQ=160)
186. Haydn (IQ=160)
187. Helvetius (IQ=160)
188. Hunter (IQ=160)
189. Jansen (IQ=160)
190. Jefferson (IQ=160)
191. Lamartine (IQ=160)
192. Lessing (IQ=160)
193. L'Hopital (IQ=160)
194. Madison (IQ=160)
195. Martineau, H. (IQ=160)
196. Mazarin (IQ=160)
197. Moliere (IQ=160)
198. Richelieu (IQ=160)
199. Rubens (IQ=160)
200. Sand (IQ=160)

+ 11 more below 140

(add discussion)

Gould | 2006

In 2006, Stephen Gould, in his *The Mismeasure of Man*, attacked the anomalies in the Terman IQs and Cox IQs, as follows: [5]

> "The American hereditarian Lewis Terman, the man most responsible for instituting IQ tests in America, retrospectively calculated Gallon's IQ at above 200, but accorded only 135 to Darwin and a mere 100-110 to Copernicus (see pp. 213-218 on this ludicrous incident in the history of mental testing). Darwin, who approached hereditarian arguments with strong suspicion, wrote after reading *Hereditary Genius*: 'You have made a convert of an opponent in one sense, for I have always maintained that, excepting fools, men did not differ much in intellect, only in zeal and hard work' (in Galton, 1909, p. 290). Galton responded: 'The rejoinder that might be made to his remark about hard work, is that character, including the aptitude for work, is heritable like every other faculty'."

In genius studies, in short, it is frequently reported that, in the early decade of the invention of the IQ scale (1916 to 1926), the IQ of Francis Galton was calculated to be twice that of Copernicus. The current (Jun 2017) correct real IQ rankings for the three said geniuses are as follows:

- â— **Nicolaus Copernicus** (1473-1543) (IQ:185|#58) [RGM:21|1,260+] (Cattell 1000:341)
- â— **Charles Darwin** (1809-1882) (IQ:180|#104) [RGM:13|1,260+] (Cattell 1000:116)
- **â—** **Francis Galton** (1822-1911) (IQ:145|#472) [RGM:325|1,260+] (Cattell 1000:N/A)

Moreover, it is difficult to envisage the future ranking Galton as a top 500 genius, at all. Gould, in his bracket note "see pp. 213-218 on this ludicrous incident in the history of mental testing", elaborates on this as follows:

> "Fossil IQ's of past geniuses: Society may need masses of the "merely inferior" to run its machines, Terman believed, but its ultimate health depends upon the leadership of rare geniuses with elevated IQ's. Terman and his associates published a five-volume series on *Genetic Studies of Genius* in an attempt to define and follow people at the upper end of the Stanford-Binet scale.
>
> In one volume, Terman decided to measure, retrospectively, the IQ of history's prime movers—its statesmen, soldiers, and intellectuals. If they ranked at the top, then IQ is surely the single measure of ultimate worth. But how can a fossil IQ be recovered without conjuring up young Copernicus and asking him what the white man was riding? Undaunted, Terman and his colleagues tried to reconstruct the IQ of past notables, and published a thick book (Cox, 1926) that must rank as a primary curiosity within a literature already studded with absurdity—though Jensen (1979, pp. 113 and 355) and others still take it seriously.
>
> Terman (1917) had already published a preliminary study of Francis Galton and awarded a staggering IQ of 200 to this pioneer of mental testing. He therefore encouraged his associates to proceed with a larger investigation. James Cattell had published a ranking of the 1,000 prime movers of history by measuring the lengths of their entries in biographical dictionaries. Catherine Cox, Terman's associate, whittled the list to 282, assembled detailed biographical information about their early life, and proceeded to estimate two IQ values for each—one, called Al IQ [age range one IQ], for birth to seventeen years; the other, A2 IQ [age range two IQ], for ages seventeen to twenty-six.
>
> Cox ran into problems right at the start. She asked five people, including Terman [Maud Merrill, Florence Goodenaugh, and Kate Gordon], to read her dossiers and to estimate the two IQ scores for each person. Three of the five agreed substantially in their mean values, with Al IQ clustering around 135 and A2 IQ near 145. But two of the raters differed markedly, one awarding an average IQ well above, the other well below, the common figure. Cox simply eliminated their scores, thereby throwing out 40 percent of her data. Their low and high scores would have balanced each other at the mean in any case, she argued (1926, p. 72). Yet if five people working in the same research group could not agree, what hope for uniformity or consistency—not to mention objectivity—could be offered?
>
> Apart from these debilitating practical difficulties, the basic logic of the study was hopelessly flawed from the first. The differences in IQ that Cox recorded among her subjects do not measure their varying accomplishments, not to mention their native intelligence. Instead, the differences are a methodological artifact of the varying quality of information that Cox was able to compile about the childhood and early youth of her subjects. Cox began by assigning a base IQ of 100 to

each individual; the raters then added to (or, rarely, subtracted from) this value according to the data provided.

Cox's dossiers are motley lists of childhood and youthful accomplishments, with an emphasis on examples of precocity. Since her method involved adding to the base figure of 100 for each notable item in the dossier, estimated IQ records little more than the volume of available information. In general, low IQ's reflect an absence of information, and high IQ's an extensive list. (Cox even admits that she is not measuring true IQ, but only what can be deduced from limited data, though this disclaimer was invariably lost in translation to popular accounts.) To believe, even for a moment, that such a procedure can recover the proper ordering of IQ among "men of genius," one must assume that the childhood of all subjects was watched and recorded with roughly equal attention. One must claim (as Cox does) that an absence of documented childhood precocity indicates a humdrum life not worth writing about, not an extraordinary giftedness that no one bothered to record.

Two basic results of Cox's study immediately arouse our strong suspicion that her IQ scores reflect the historical accidents of surviving records, rather than the true accomplishments of her geniuses. First, IQ is not supposed to alter in a definite direction during a person's life. Yet average Al IQ is 135 in her study, and average A2 IQ is a substantially higher 145. When we scrutinize her dossiers (printed in full in Cox, 1926), the reason is readily apparent, and a clear artifact of her method. She has more information on her subjects as young adults than as children (A2 IQ records achievements during ages seventeen through twenty-six; Al IQ marks the earlier years). Second, Cox published disturbingly low Al IQ figures for some formidable characters, including Cervantes and Copernicus, both at 105. Her dossiers show the reason: little or nothing is known about their childhood, providing no data for addition to the base figure of 100. Cox established seven levels of reliability for her figures. The seventh, believe it or not, is "guess, based on no data."

As a further and obvious test, consider geniuses born into humble circumstances, where tutors and scribes did not abound to encourage and then to record daring feats of precocity. John Mill may have learned Greek in his cradle, but did Faraday or Bunyan ever get the chance? Poor children are at a double disadvantage; not only did no one bother to record their early years, but they are also demoted as a direct result of their poverty. For Cox, using the favorite ploy of eugenicists, inferred innate parental intelligence from their occupations and social standing! She ranked parents on a scale of professions from 1 to 5, awarding their children an IQ of 100 for parental rank 3, and a bonus (or deficit) of 10 IQ points for each step above or below. A child who did nothing worth noting for the first seventeen years of his life could still score an IQ of 120 by virtue of his parent's wealth or professional standing.

Consider the case of poor Massena, Napoleon's great general, who bottomed out at 100 Al IQ and about whom, as a child, we know nothing except that he served as a cabin boy for two long voyages on his uncle's ship. Cox writes (p. 88): Nephews of battleship commanders probably rate somewhat above 100 IQ; but cabin boys who remain cabin boys for two long voyages and of whom there is nothing more to report until the age of 17 than their service as cabin boys, may average below 100 IQ.

Other admirable subjects with impoverished parents and meager records should have suffered the ignominy of scores below 100. But Cox managed to fudge and temporize, pushing them all above the triple-digit divide, if only slightly. Consider the unfortunate Saint-Cyr, saved only by remote kin, and granted an Al IQ of 105: "The father was a tanner after having been a butcher, which would give his son an occupational IQ status of 90 to 100; but two distant relatives

achieved signal martial honors, thus indicating a higher strain in the family" (pp. 90-91). John Bunyan faced more familial obstacles than his famous Pilgrim, but Cox managed to extract a score of 105 for him:

Bunyan's father was a brazier or tinker, but a tinker of recognized position in the village; and the mother was not of the squalid poor, but of people who were "decent and worthy in their ways." This would be sufficient evidence for a rating between 90 and 100. But the record goes further, and we read that notwithstanding their "meanness and inconsiderableness," Bunyan's parents put their boy to school to learn "both to read and write," which probably indicates that he showed something more than the promise of a future tinker (p. 90).

Michael Faraday squeaked by at 105, overcoming the demerit of parental standing with snippets about his reliability as an errand boy and his questioning nature. His elevated A2 IQ of 150 only records increasing information about his more notable young manhood. In one case, however, Cox couldn't bear to record the unpleasant result that her methods dictated. Shakespeare, of humble origin and unknown childhood, would have scored below 100. So Cox simply left him out, even though she included several others with equally inadequate childhood records.

Among other curiosities of scoring that reflect Cox and Terman's social prejudices, several precocious youngsters (Clive, Liebig, and Swift, in particular) were downgraded for their rebelliousness in school, particularly for their unwillingness to study classics. An animus against the performing arts is evident in the rating of composers, who (as a group) rank just above soldiers at the bottom of the final list. Consider the following understatement about Mozart (p. 129): "A child who learns to play the piano at 3, who receives and benefits by musical instruction at that age, and who studies and executes the most difficult counterpoint at age 14, is probably above the average level of his social group."

In the end, I suspect that Cox recognized the shaky basis of her work, but persisted bravely nonetheless. Correlations between rank in eminence (length of Cattell's entry) and awarded IQ were disappointing to say the least—a mere 0.25 for eminence vs. A2 IQ, with no figure recorded at all for eminence vs. Al IQ (it is a lower 0.20 by my calculation). Instead, Cox makes much of the fact that her ten most eminent subjects average 4—yes only 4—Al IQ points above her ten least eminent.

Cox calculated her strongest correlation (0.77) between A2 IQ and "index of reliability," a measure of available information about her subjects. I can imagine no better demonstration that Cox's IQ's are artifacts of differential amounts of data, not measures of innate ability or even, for that matter, of simple talent. Cox recognized this and, in a final effort, tried to "correct" her scores for missing information by adjusting poorly documented subjects upward toward the group means of 135 for Al IQ and 145 for A2 IQ. These adjustments boosted average IQ's substantially, but led to other embarrassments. For uncorrected scores, the most eminent fifty averaged 142 for Al IQ, while the least eminent fifty scored comfortably lower at 133. With corrections, the first fifty scored 160, the last fifty, 165. Ultimately, only Goethe and Voltaire scored near the top both in IQ and eminence. One might paraphrase Voltaire's famous quip about god and conclude that even though adequate information on the IQ of history's eminent men does not exist, it was probably inevitable that the American hereditarians would try to invent it.”

(add)

Robinson | 2010

In 2010, British genius studies (Ñº) scholar Andrew Robinson, in his *Sudden Genius? The Gradual Path to Creative Breakthroughs*, listed the following "missing geniuses" from Cox's rankings, shown in conjunction with top 500 geniuses IQ rankings (if included) or not top five-hundred (NTF) material, if known:

Francis Galton (IQ:165|#266)
William Shakespeare (IQ:190|#48)
Marie Curie (IQ:185|#65)
Albert Einstein (IQ:215|#3)
George Shaw (IQ:165|#261)
William Yeats (IQ:170|#252)
Jean Champollion (IQ:175|#180)
Carl Gauss (IQ:190|#25)
Robert Hooke (IQ:195|#22)
August Kekule
Charles Lyell
James Maxwell (IQ:210|#4)
Dmitri Mendeleyev (IQ:175|#182)
Louis Pasteur (IQ:175|#92)
Christopher Wren
Gian Lorenzo Bernini
Johannes Brahms
Paul Cezanne (IQ:150|#422)
Anton Chekhov
Francisco de Goya
Franz Schubert
Percy Shelley (IQ:185|#80)
Leo Tolstoy (IQ:180|#96)
Oscar Wild

(add discussion)

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1. (a) Cox, Catherine. (1924). "On the Early Mental Development of a Group of Eminent Men" (preliminary report of findings; fuller version in 1926 book) , dissertation/thesis. Stanford University.
(b) Terman, Lewis. (1925). *Genetic Studies of Genius. Volume I. Mental and Physical Traits of a Thousand Gifted Children* (Arc). Stanford University Press, 1926.
(c) Cox, Catharine. (1926). *Genetic Studies of Genius. Volume II. The Early Mental Traits of Three Hundred Geniuses* (GB) (Arc) (pdf) (ratings, pg. viii). Stanford University Press.
2. Simonton, Dean K. (1994). *Greatness: Who Makes History and Why* (pgs. 224-25). Guilford Press.
3. (a) Cattell, James McKeen. (1894). "A Statistical Study of Eminent Men", statistics of paper presented to the American Psychological Association Dec.; abstract published in *the Psychological Review*, Mar., 1895; read in present form as a lecture before the Philosophical Club of Yale University, 1897; *Popular Science Monthly* (1903), 62: 359-77.
(b) Kaufman, James C. and Sternberg, Robert J. (2010). *The Cambridge Handbook of Creativity* (pg. 180). Cambridge University Press.
(c) James McKeen Catttell – Wikipedia.
4. Robinson, Andrew. (2010). *Sudden Genius? The Gradual Path to Creative Breakthroughs* (pg. 20). Oxford University Press.
5. Gould, Stephen. (2006). *The Mismeasure of Man* (pgs. #, 213-18). Publisher.

See also

â— Hart, Michael. (1978). *The 100: A Ranking of the Most Influential Persons in History*. Citadel Press.
â— Simmons, John G. (2000). *The Scientific 100: a Ranking of the Most Influential Scientists, Past and Present*. Citadel Press.

External links

â— Estimated IQs of the Greatest Geniuses – (Goethe ranked 1st (IQ = 210))
â— Cox's IQ Estimates of 301 Geniuses - IQComparisonSite.com.
â— List of 301 geniuses by IQ (Catherine Cox Miles) – Wikipedia.

θΔics

In IQs, **Cox-Buzan IQ** is the mean IQ of the geniuses common to both the 1926 Catherine Cox genius list (300 geniuses) and the 1994 Tony Buzan genius list (100 geniuses). The following table shows the geniuses common to both the Cox and Buzan genius IQ lists, named as CB IQs in short. HCR stands for Hmolpedia citation ranking, which gives the modern corrective to the Cox-Buzan IQ, each adjusted up or down per HCR number, respectively:

#	Person	IQ_{CB}	CR
1.	Goethe (1749-1832)	213	347
2.	Da Vinci (1452-1519)	200	43
3.	Leibnitz (1646-1716)	194	62
4.	Newton (1643-1727)	193	235
5.	Galileo (1564-1642)	183	73
6.	Mill (1806-1873)	183	28
7.	Descartes (1596-1650)	178	58
8.	Michelangelo (1475-1564)	178	
9.	Erasmus (1466-1537)	178	10
10.	Milton (1608-1674)	177	
11.	Faraday (1791-1867)	175	44
12.	Spinoza (1632-1677)	175	21
13.	Copernicus (1473-1543)	173	41
14.	Franklin (1706-1790)	173	
15.	Eliot (1819-1880)	173	12
16.	Raphael (1483-1520)	170	
17.	Darwin (1809-1882)	169	218
18.	Dickens (1812-1870)	165	
19.	Beethoven	165	15

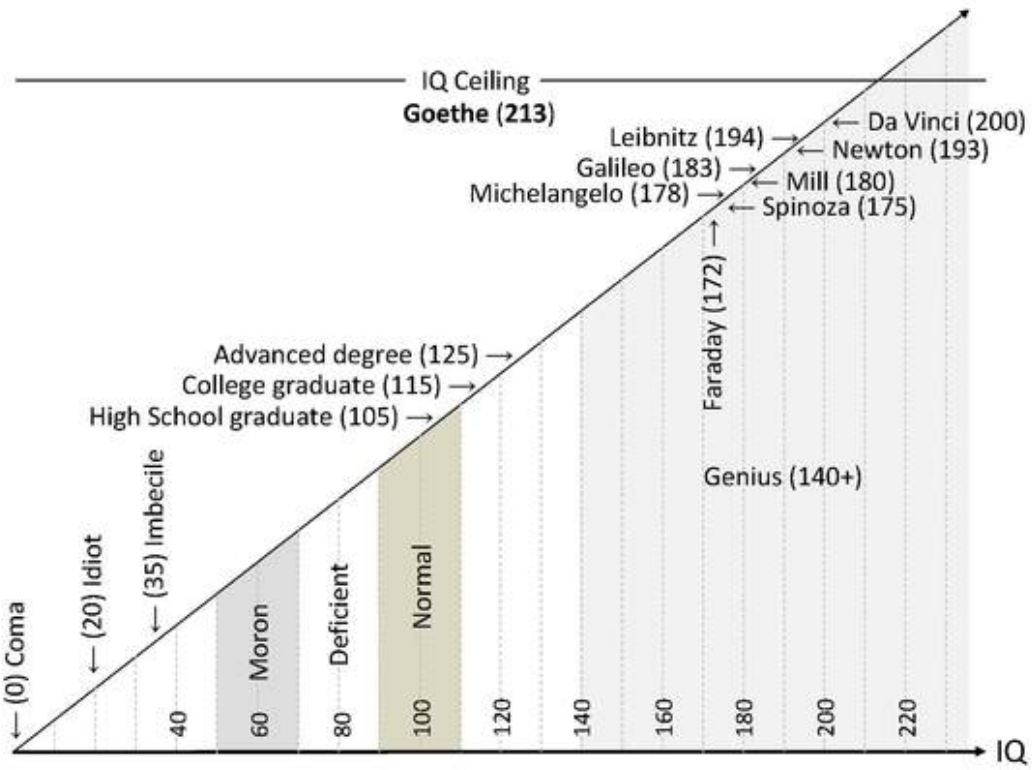

Cox IQs (top 300 genius IQs) + **Buzan IQs** (top 100 genius)

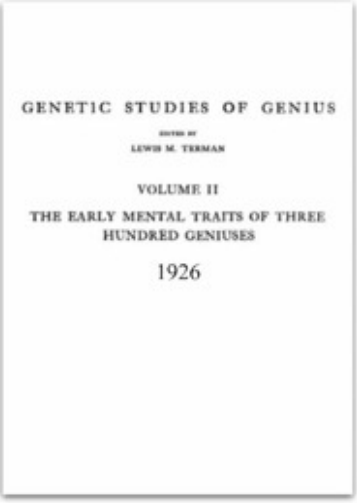

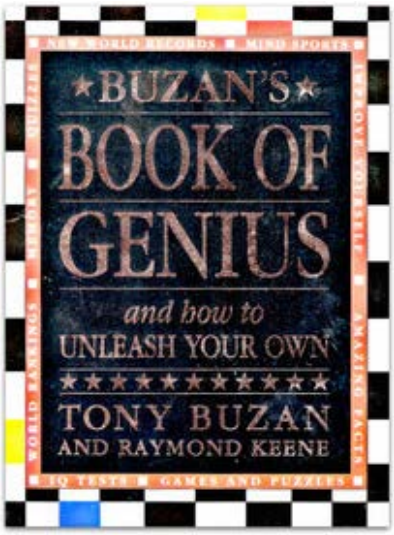

		(1770-1827)		
20.		Bach (1685-1750)	165	
21.		Napoleon (1769-1821)	163	36
22.		Mozart (1756-1791)	163	
23.		Lincoln (1809-1865)	160	

The following is the list in text-copy format:

1. Goethe IQ 213
2. Da Vinci IQ 200
3. Leibnitz IQ 194
4. Newton IQ 193
5. Galileo IQ 183
6. Mill IQ 183
7. Descartes IQ 178
8. Michelangelo IQ 178
9. Erasmus IQ 178
10. Milton IQ 177
11. Faraday IQ 175
12. Spinoza IQ 175
13. Copernicus IQ 173
14. Franklin IQ 173
15. Eliot IQ 173
16. Raphael IQ 170
17. Darwin IQ 169
18. Dickens IQ 165
19. Beethoven IQ 165
20. Bach IQ 165
21. Napoleon IQ 163
22. Mozart IQ 163
23 Lincoln IQ 160

Discussion

A key benchmark on the IQ scale is the number 140, above which one is said to be in the genius level of intellect. The question immediately becomes: 'Who is the ceiling genius?' and 'What do the IQ values look like at the ceiling?' A solution

to answering these two questions, noting that there are numbers far-fetched IQ estimates on the 200+ IQ page in the 200-400 range, is to average the independent estimated geniuses IQs of individuals reoccurring in the top 100 geniuses of all-time on both the Cox (1923) and the Buzan (1994) genius lists. This gives the above fifteen-point ceiling to affix to the top of the standard IQ scale, each of which can be considered as a representation of a hard-core 'anchor point genius':

These combined genius IQs give a excellent estimate to the top "ceiling IQ" on standard IQ scale as devised by Stanford psychologist Lewis Terman, in which IQ: idiot (below 20), imbecile (20-49), moron (50-69), deficient (70-80), dull (80-90), normal (90-110), smart (110-120), superior (120-140), genius (140 and over), top 100 all time genius (172 and over), ceiling genius (213) . [19] To be considered near the ceiling in IQ one would have to meet the following requirements, at a minimum:

(a) Have continuously produced genius work past the age of 60.
(b) Work must have two-century long "star quality"; i.e. still producing heat or brightness 200-years after publication.
(c) Have had an active vocabulary near the 100,000 word range.
(d) Have had a near mastery of all branched of knowledge, particularly the sciences.
(e) Have had pushed known knowledge into new uncharted territories.

As key rule here, then, according to the ceiling Cox-Buzan geniuses, to have had a legitimate IQ score in the 172 to 213 range, one would, at a minimum have been dead for at least 100-200 years, so as to allow for ‘generational judgment’ on the question of whether or not their accomplishments were truly genius and thus deserving of on of the world’s highest IQ scores.

See also

â— IQ
â— IQ: 225+
â— IQ: 200+ (references)
â— IQ: 200(±) candidates

External links

â— IQ – Wikipedia.

θΔics

In genius studies, **Cox-Buzan-Platt IQ** refers to "mean IQ" of geniuses common to the 1926 Cox IQ ranking (300 geniuses), the 1962 Platt IQ ranking (11 geniuses), and the 1994 Buzan IQ ranking (100 geniuses), which only amounts to two, namely: Newton (IQ_{CPB}:192) and Darwin (IQ_{CPB}:173); these two IQ numbers, to a good approximation, might be the only two unbiased sober rankings in the entire top 1000 genius rankings.

Overview

The following are the mean IQs of the geniuses common to the Cox IQs (1926), Platt IQs (1962), and Buzan IQs (1994):

		Cox IQ (1926)	**Platt IQ** (1962)	**Buzan IQ** (1994)	**Mean**
1.	Isaac Newton	190	190	195	**192**
2.	Carl Gauss	190			
3.	Archimedes	190		190	
4.	Albert Einstein		180+	205	
5.	Louis Pasteur			180	
6.	John Neumann			180	
7.	Linus Pauling			180	
8.	Percy Bridgman			180	
9.	Bertrand Russell			180	
10.	Sigmund Freud			180	
11.	Charles Darwin	165	173	180	**173**
12.	Bernard Shaw			180	

Here, of curiosity, we see only two geniuses, namely Newton (mean IQ:192) and Darwin (mean IQ:173), common to the 300 Cox geniuses, the 11 Platt geniuses, and the 100 Buzan geniuses, and two geniuses, namely Archimedes (mean IQ:190) and Einstein (mean IQ:195) (note: used "185" as Platt measurement for Einstein's IQ), common to two.

A second pattern noticeable, is that Darwin's IQ seems to "grown" by about 5 points every 23 years, on average, baring prolonged discussions of the methods of each estimation method; meaning, in some sense, that the intellectual influence of his ideas are impacting more, in retrospect.

Thims-Cox-Buzan-Platt IQ

See main: Thims-Cox-Buzan-Platt IQ

The following are the mean IQs of the geniuses common to the: Thims IQs (2019), Cox IQs (1926), Platt IQs (1962), and Buzan IQs (1994):

		Cox IQ (1926)	**Platt IQ** (1962)	**Buzan IQ** (1994)	**Thims IQ** (2019)	**Mean**
1.	Isaac Newton	190	190	195	220	**199**
2.	Carl Gauss	190			190	
3.	Archimedes	190		190	190	
4.	Albert Einstein		180+	205	215	
5.	Louis Pasteur			180	175	
6.	John Neumann			180	190	
7.	Linus Pauling			180	190	
8.	Percy Bridgman			180	185	
9.	Bertrand Russell			180	180	
10.	Sigmund Freud			180	185	
11.	Charles Darwin	165	173	180	180	**175**
12.	Bernard Shaw			180	180	

Here, we see the rule, in respect to IQ and genius rankings, that "time begets discernment".

θΔics

In hmolscience, a **CPK human molecule** is the depiction of a human, atomically, as a N-element human molecule, human chemical, or human chemical species, where N is from 2 to 26 types of atoms, using the 1952 CPK coloring scheme, where individual atoms are labeled such that: **red** = oxygen, **blue** = nitrogen, **gray** = hydrogen, **black** = carbon, among several other color assignments. [1]

	hydrogen (H)
	carbon (C)
	nitrogen (N)
	oxygen (O)

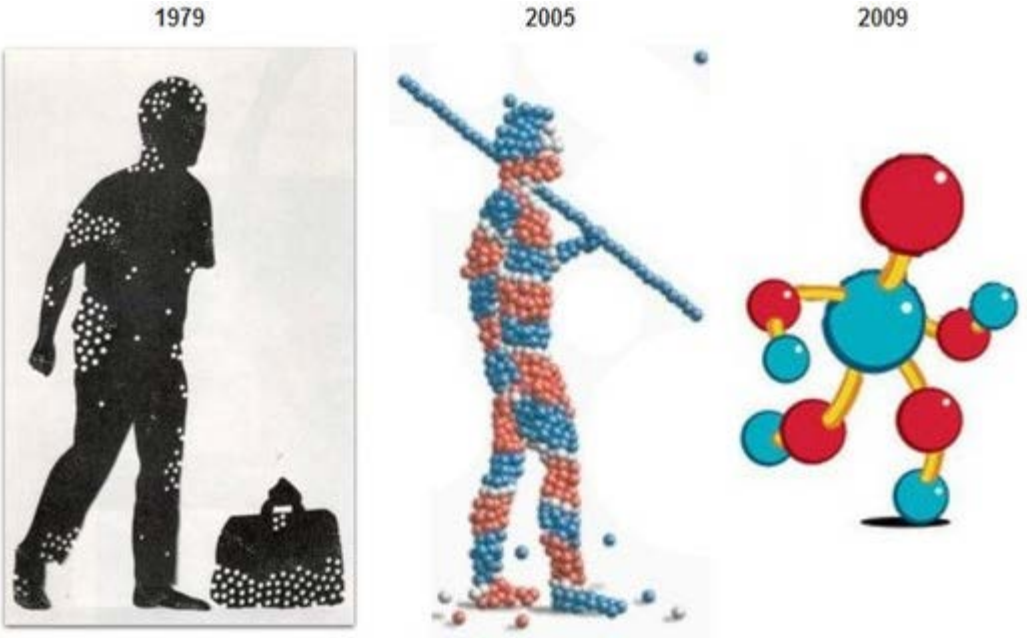

Left: A 1979 drawing of a molecule man by American sculpture artist Jonathan Borofsky, holes representative of "molecules", a pre-cursor to the CPK model. Center: A 2005 **CPK**-stylized **human molecule** made by Canadian designer Shawn LaPaix for the University of British Columbia Art Gallery. [2] Right: A 2009 CPK-style human molecule representation made by American illustration artist Chris Gash for the *New York Times*. [3]

The letters CPK, is acronym of the surnames of chemists Robert Corey, Linus Pauling, and Walter Koltun, the inventors of the atom color coding system.

History

The first proto-type CPK human molecule depictions, so to speak, were the various hole-filled molecule man drawings and multi-story sculptures made American sculpture artist Jonathan Borofsky, first built in Los Angeles, in 1977 and 1978, originating because, as Borofsky says: [1]

> "I was fascinated by this 'molecule idea', the simple fact that even though we appear to be quite solid, we are in fact composed of a molecular structure which in itself is mostly composed of water and air."

The holes, varying in size from about seven inches to one foot or more (depending on sculpture), are indicated by the following idea:

> "Holes represent the molecules of all human beings coming together to create our existence".

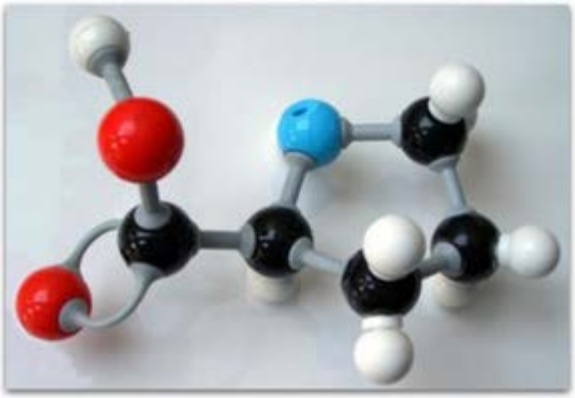

A CPK color coded ball and stick model of the amino acid proline (**$C_5H_9NO_2$**).

In theory, then, expanding or rather upgrading this "holes = molecules" model of a human, one could then extrapolate on this statement to make a CPK model of the atoms of a human, where each color represents the representative atoms that actually exist in people.

The first actual CPK human molecule was the 3-element nitrogen-oxygen-hydrogen made in 2005 by Canadian designer Shawn LaPaix for a poster "The Human Body in History" made for the University of British Columbia Art Gallery exhibit. [2]

In 2009, although it seems unaware of the previous work of LaPaix, American illustrator Chris Gash made 2-element

nitrogen-oxygen (blue-red) CPK human molecule in the form of a running stick figure, as an illustration for a New York Times article on walking walking molecules. [3]

Full CPK depictions

See also: Human molecular orbital

One of the limitations of the CPK human molecule depiction is that humans, according to mass composition tables, and recent human molecular formula calculations, are made of 26 functional elements:

Human molecular formula

$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}$
$Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$

hence a 26-color coded representation of the human as a "molecular formula in action", in the prophetic 1919 word of American physician George Carey. The following, for example, would be the coloring scheme according to the popular molecular visualizer jmol:

Human molecular formula (color coded)

C_{E27}( )H_{E27}( )O_{E27}( )N_{E26}( )
P_{E25}( )S_{E24}( )Ca_{E25}( )K_{E24}( )
Cl_{E24}( )Na_{E24}( )Mg_{E24}( )Fe_{E23}( )
F_{E23}( )Zn_{E22}( )Si_{E22}( )Cu_{E21}( )
B_{E21}( )I_{E20}( )Sn_{E20}( )Mn_{E20}( )
Se_{E20}( )Cr_{E20}( )Ni_{E20}( )Mo_{E19}( )
Co_{E19}( )V_{E18}( )

Left: A "Mr. Carbon Atom" depiction of a human as type of valence shell carbon 12 atom with an type orbital electronegativity, by English biotechnologist Mark Janes. Right: A 26-element depiction of a human, which is in line with the known mass-composition based molecular formula of an average human.

This would be a bit tricky to visually depict a human via this color coding scheme, but nevertheless possibly a good introductory hmolscience "homework assignment" would be a classroom poster project assigned to children as a way to learn both the philosophical implications of notion of the human as a reactive molecule and also to learn the general location and function of each element in the body.

Advanced

To note, with the rise of quantum mechanics (1900-1932), the field of quantum chemistry needs to be taken into account, according to which topics such as electronegativity, spin, molecular orbital theory (human molecular orbital theory), chemical bonding, etc., need to be taken into account in the representation of a human molecule; such as shown below, namely a thermodynamic system / molecular bubbles depiction of a human molecular orbital for one human molecule, or rather one person's average daily trajectories and movements, viewed at a sped-up rate of viewing, according to human molecular orbital theory. [4]

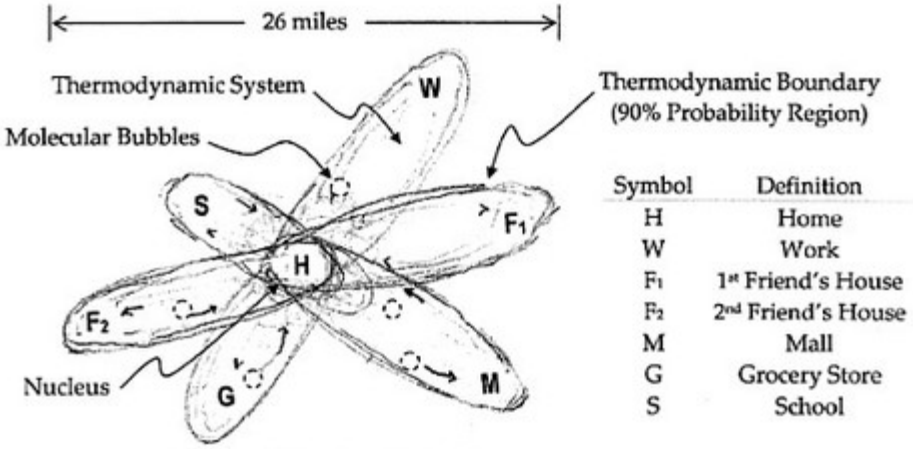

Human Molecular Orbital

One example of this approach is that taken by English biotechnologist Mark Janes and his "Mr. Carbon Atom" outfit, above left, wherein he uses part metaphor, part analogy, part extrapolation, and part scientific concept, to model a human as a type of evolved carbon atom.

References

1. CPK coloring – Wikipedia.
2. (a) shawnlapaix.com/#ubc (sample works) – ShawnLaPaix.com (dead site?).
(b) UBC – Wayback Machine.
3. (a) Gash, Chris (illustrator) and Fountain, Henry (writer). (2009). "Experiments Show that Molecules Can Walk, but Can They Dance?", *New York Times*, Science, Apr 07.
(b) Chris Gash (about) – ChrisGash.com.
4. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (ch. 9: Human Molecular Orbitals, pgs. 247-95. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.

θΔics

In acronyms, **CR** is short for "Citation Ranking", specifically Hmolpedia Citation Ranking, referring to the number of pages in which a person's name is cited or employed within Hmolpedia.

To exemplify, the Hmolpedia article on Sigmund Freud, on 24 Apr 2012, was coded as (CR=162 | #16), meaning that the surname "Freud" was used in 162 Hmolpedia pages or articles and he was, on that day, the 16th most-cited name in hmolscience. A more recent coding format being used is (CR:16|162).

See also

- GS

θΔics

In science, a **crackpot**, crank, wacko, fool, deranged, etc., is someone whose ideas or theories are classified by some correctly or incorrectly as crackpottery (something that doesn't hold water), and as such are far removed from the boundaries of hard science, if at all within the bounds of reality; pejoratively dismissed as fringe science, pseudoscience, or metaphysics, depending.

Classic examples of mislabeling of geniuses as cranks, such as American historian John Diggins incorrectly 1995 labeling of American physical science historian Henry Adams (IQ=195), noted for his 1885 social chemistry of human molecules in relationships theory, for his 1895 first and second laws of thermodynamics applied to the rise and fall of civilizations, and for his 1909 phase rule applied to history—whose two cultures genius is near to on par with that of Goethe (IQ=230)—as "more of a **crank** than a prophet", which is but the result of the growing dividedness and fragmentation of the body of modern knowledge, the totality of which few are able to presently hold in one mindset. [15]

Overview

The following are classic quotes on the subject:

> "There was never a genius without a tincture of madness."
>
> — Aristotle (c.310BC), Greek physicist-philosopher

> "There is no great genius without a touch of madness."
>
> — Seneca the Younger (c.50AD) (Ñº)

> "Genius is more often found in a **cracked pot** than in a whole one."
>
> — E.B. White (c.1950) (Ñº)

A large part of this genius-labeled as "childish", "lunatic", "crank", or "deranged", examples of which shown adjacent, seems to have something to do with the catch up effect of works produced by geniuses that have significant foresight, whereas the immediate "intellectual world" suffers from a "peculiar myopia", as Morris Zucker (1945) described things, or "mental inertia", as Henry Adams (1907) described things; as is evidenced by the following quotes about how physical chemists Frederick Soddy, in respect to economic thermodynamics, and Wilhelm Ostwald, in respect to social energetics, were dismissed as cranks:

> "Frederick Soddy's experience in the 1920s and 1930s offers a clear example of Kuhn's dicta on the reception afforded those who are untutored in the prevailing paradigm; a Nobel laureate in chemistry, he was dismissed as a **crank** for his economic writings, because he presumed to take thermodynamics seriously and to argue that the practice of charging compound interest was an attempt to violate the second law."
>
> — Eric Zencey (1983), "Entropy as Root Metaphor" [18]

> "Few economists gave Soddy's ideas serious attention and found merit in them. The discipline as a whole closed ranks against him, ignoring his ideas and dismissing him as a **crank**, a scientist who had overstepped his expertise—much as the physicists in Berlin had responded to Ostwald."
>
> — Eric Zencey (2013), "Energy as Master Resource" [19]

Are we to presume, in other words, that Henry Adams, Wilhelm Ostwald, and Frederick Soddy are both "cranks" for believing that thermodynamics under-girds the movements in society? Not so. Correctly, we have a two cultures conflict issue.

Fool or genius? | Point-of-view

Often times the ability to recognize genius amid crackpottery is a difficult issue. As American chemistry historian Arthur Greenberg discusses, in his *From Alchemy to Chemistry*, citing the examples of: phlogiston theory, before Robert Harrington (1786), atomic theory, before Wilhelm Ostwald's recant (1909), and continental drift theory, before Alfred Wegner (1912), the boundary line between scientific ‘crouch’ and scientific ‘crank’ is sometimes not a very clear one. [20]

Italian thinker Galileo Galilei, now considered a top 8 genius of all time, e.g., was considered a ‘crackpot’ for his assertion that the ‘earth moved’, a belief that was contrary to that believed (i.e. geocentric cosmology) by the general authorizes of his time. (Ñº) This situation, likewise, is prominent in the field of hmolscience, namely in the subjects (see: two cultures namesakes) of the application of the principles mechanics, chemistry, physics, and or thermodynamics to the humanities, wherein often times belief system conflicts, many of which tend to be earlier beliefs engrained as a child, may often tend to produce denigrating reaction commentary, particularly when either human chemical (Goethe) and or human molecule (Carey, Adams, and Thims) models of a human are employed as non-analogy descriptions of reality, wherein labelings such as "childlike nonsense" and "fooling around" (Wieland on Goethe's 1796 theory), "lunatic" or "back in his straight jacket" (Stark on Carey's 1858 theory), "more of a crank than a prophet" (Diggins on Adams' 1860s theory), "deranged imagination" (Moriarty on Thims' 2001 theory), all shown adjacent, or recent denigrate labelings such as "senile or crazy" (Lubos Motl 2010 comment on enthalpy of human molecules) or "wacko" (Terrence Deacon 2013 comment on Thims and human molecular theory), and so on. The following statement by Czechoslovakian-born English sociologist Werner Stark seems to capture the gist of why he considers American sociologist Henry Carey the "extreme form" of social mechanism: [17]

> “The essential submission is the assertion that development is due, not to human effort, but to the automatic effect of certain external circumstances or events. It comes about in the manner in which a flame is produced when a match is struck against the side of the box. Surely, there are few who would accept this theory of culture-growth as realistic. But then the whole idea of ‘social heat’ is no more than a downright absurdity.”

Stark, moreover, classifies the following 1858 statement by Carey:

> “In the inorganic world, every act of combination is an act of motion. So it is in the social one. If it is true that there is but one system of laws for the government of all matter, then those which govern the movements of the various inorganic bodies should be the same with those by which is regulated the motion of society; and that such is the case can readily be shown.”

as being someone in **"back in his strait-jacket"**, as Stark sees things, which is but the exact same philosophical approach followed by Goethe, before Carey, and Adams and Thims, after. The following popular 1965 quote by Max Gluckman well summarizes this point of view issue: [16]

> “A science is any discipline in which the **fool** of this generation can go beyond the point reached by the genius of the last generation.”

In short, the difference between a "fool" and a "genius", in some cases, is very subtle.

The subject of "human chemistry", as developed by the subject founder German polymath Johann Goethe, during the years 1796 to 1809, the finalized version of which being published in novella format (*Elective Affinities*, 1809), was defined, from the get-go, as being childish nonsense and fooling around by German poet and writer Christoph Wieland, a neighbor of Goethe, who sent a letter (which he suggested should be burned after it is read) in 1810 to his close friend German philologist and archeologist Karl Böttiger, in commentary on Goethe’s version of human chemistry, that: [5]

> “To all rational readers, the use of the chemical theory [in *Elective Affinities*] is **nonsense** and **childish fooling** around.”

Czechoslovakian-born English sociologist Werner Stark (1962) believes that anyone, e.g. Henry Carey (1858), who argues that the combinations and motions in the inorganic world (chemical) and organic world (social) are governed by one and the same laws is but the view of someone **“back in his strait-jacket”**. [17]

Wieland considered the theoretical implications contained in Goethe's novella to be a sort of anathema, calling it a "truly horrible work", supposedly objecting solely to the radicalness of its Christianity. [6] It was to Wieland, to note, that Goethe famously commented that, to be understood properly, it must be read three times. [3]

Human molecule

Those who are against the "molecule" definition of a human (human molecule + human molecular formula), which as of 2011 is becoming a standard textbook definition in chemistry, thermodynamics, and ecology, and the physical science theories implicative therein (chemistry, physics, thermodynamics, applied to this definition), will often, on first reaction, make recourse to the pejorative labeling the theorist and their theories as "nonsense" (Christoph Wieland on Goethe, 1810), "crank" (John Diggins on Henry Adams, 1995), "crackpot" (Stephen Lower on Libb Thims, 2007), "wacko" (Terrence Deacon on Libb Thims, 2013), among others, in what is but the result of divisional ignorance and not seeing the forest among the trees.

The following comment, to exemplify common usage of the term crank or crackpot, posted by an anonymous German user to a 2010 deletion review discussion on whether or not to have a revised *Wikipedia* "human molecule" article (which at one point, to note, was a featured *Wikipedia* Did You Know? main page article, prior to its deletion) article on the subject of the "human molecule" (*Hmolpedia* version) to have a Wikipedia-version article on the subject of the person defined as a human molecule: [8]

> “The incubator human molecule article is a horror show. It’s not fringe, it's beyond that: this is a piece of original research kookery at its very worst. It's not even *pseudo*science: it does not even try to be anything close to science. A textbook case of absurd absurdity **cranked** up to absurd.”

This, of course, is one point of view; but, conversely, for those in the field of limnology or ecological stoichiometry, the definition of a person as a human molecule, with a measurable human molecular formula, is now a textbook subject (*Ecological Stoichiometry*, 2002)—hence, here we see how perspective (or rather belief system) can alter one’s perception of what constitutes crank—which in many cases has to do with education or lack thereof.

Insanity and genius

See main: Insanity and genius

As physician Bernard Hollander comments in the 1921 preface to John Nisbet’s *The Insanity of Genius*: [14]

> “For over two thousand years some subtle relationship has been thought to exist between genius and insanity.”

Crank or genius?

In some rare cases, as discussed by Fred Gruenberger in his 1962 article “A Measure for Crackpots”, some work deemed crackpottery in one generation may result to be the new branch of science or future science of the next generation (or one or two millennia, such as in the case of atomic theory). [1]

Human chemistry | Human thermodynamics

In the fields of human chemistry and human thermodynamics, which tend to overlap each other, such as in the form of human chemical thermodynamics, there has historically been much precedence to pejoratively label efforts to apply either chemical theory or thermodynamic theory to the humanities to be the sign of a loon. The case of thermodynamics being applied to humans, of the two, is the pinnacle example of hypocrisy: state of pretending to have virtues, moral or beliefs, principles, etc., that one does not actually have; in this case the holding onto the belief that first law and second law govern the working behavior of "every" system or body in the universe, but that when this universal belief or "universal rule", as Lewis called it, is turned around and applied to human and systems of humans, the previewer of this newly distinguished perspective quickly cries "crackpottery", noted examples being: Stephen Lower (2007), Philip Moriarty (2009), Mitch Garcia (2010), Marcin Borkowski (2010), Ian Forrester (2010).

TEST	MAXIMUM POINTS	PHYSICIST	ESP-er	DOWSER
1. Public verifiability	12	12	5	0
2. Predictability	12	11	2	2
3. Controlled experimentation	13	13	5	0
4. Occam's razor	5	4	0	4
5. Fruitfulness	10	10	7	5
6. Authority	10	10	3	0
7. Communication	8	8	4	4
8. Humility	5	5	1	0
9. Open mindedness	5	4	0	0
10. Fulton non-sequitur	5	5	5	5
11. Paranoia	5	5	4	4
12. Dollar complex	5	5	2	2
13. Statistics compulsion	5	5	0	2
Total	100	97	38	28

Fred Gruenberger' 1962 **crackpot** scale. [1]

Likewise, in regards to human thermodynamics, in 1972 American economist Paul Samuelson gave the following definition of the criteria for being half-baked in regards to the use of thermodynamics in sociology: [4]

> “The sign of a **half-baked speculator** in the social sciences is his search for something in the social system that corresponds to the physicist's notion of entropy.”

In 2007, American-born Canadian biochemical and physical chemist Stephen Lower, likewise, classified the modern-interpretation of Goethe’s 1796 human elective affinities theory as a crackpot subject: [3]

Crackpot?

Crackpot

Weird Science - a collection of files and links dealing with unconventional physics including energy machines, gravity devices, Tesla, anomalies, etc.

Crackpot energy-conversion schemes - Learn how you, too, can violate the laws of thermodynamics! This large collection of annotated links makes fascinating reading.

Institute of Human Thermodynamics - stuff such as: "Human chemistry is the study of reactions between individuals who are viewed as chemical species and with the energy, entropy, and work that quantify these processes. In modern human chemistry, people are viewed as chemical species, or specifically "human molecules" (a term coined by Charles Galton Darwin), A or B, and processes such as marriage or divorce are viewed as chemical reactions between individuals..."

"Human chemistry is the study of reactions between individuals who are viewed as chemical species and with the energy, entropy, and work that quantify these processes. In modern human chemistry, people are viewed as chemical species, or specifically "human molecules" (a term coined by Charles Galton Darwin), A or B, and processes such as marriage or divorce are viewed as reactions between individuals."

American-born Canadian biochemical and physical chemist Stephen Lower's 2007 online classification of both human chemistry and human thermodynamics as crackpot (correction: Jean Sales coined the term "human molecules" in 1798; see: human molecular hypothesis).

This ranking, however, conflicts greatly with Goethe being uniformly ranked at one of the last universal genius, with the highest assigned genius IQ, second rank behind Shakespeare in terms of world library book holdings, and that of all his publications his 1809 *Elective Affinities*, which contains his theory, was his self-defined “best book”. In this case who are we to believe, Lower or

Goethe? When the matter is looked into in more detail, however, we find that one of Lower's hobbies is to collect "scary Bible quotes", which positions him on the 1-4 range of the Dawkins scale (believer in God), and hence his listing of human chemistry as "crackpot" is a religious objection; just as was Christopher Weiland's original objection to Goethe's human chemistry theory when he called it "childish nonsense and fooling around".

Beyond this, Lower labels English physicist C.G. Darwin as a "crackpot", which conflicts, firstly with Gruenberger's classification of physicists (adjacent) as being, generally speaking, non-crackpots; second with the fact that C.G. Darwin, his eugenics controversies aside, was a well-schooled thermodynamicist, having done founding work in statistical thermodynamics with Ralph Fowler the co-coiner of the term "zeroth law of thermodynamics"; and beyond this, C.G. Darwin, of course, was the grandson of the great Charles Darwin, a clan hardly known to scientists as crackpot lineage. [1]

Baez crackpot index

In 1992, American mathematical physicist John Baez posted an online "crackpot index", listing the following numerically-point ranked criteria for being a crack pot:

American mathematical physicist John Baez, maker of the 1992 **Beaz crackpot index**. [9]

1. A -5 point starting credit.
2. 1 point for every statement that is widely agreed on to be false.
3. 2 points for every statement that is clearly vacuous.
4. 3 points for every statement that is logically inconsistent.
5. 5 points for each such statement that is adhered to despite careful correction.
6. 5 points for using a thought experiment that contradicts the results of a widely accepted real experiment.
7. 5 points for each word in all capital letters (except for those with defective keyboards).
8. 5 points for each mention of "Einstien", "Hawkins" or "Feynmann".
9. 10 points for each claim that quantum mechanics is fundamentally misguided (without good evidence).
10. 10 points for pointing out that you have gone to school, as if this were evidence of sanity.
11. 10 points for beginning the description of your theory by saying how long you have been working on it. (10 more for emphasizing that you worked on your own.)
12. 10 points for mailing your theory to someone you don't know personally and asking them not to tell anyone else about it, for fear that your ideas will be stolen.
13. 10 points for offering prize money to anyone who proves and/or finds any flaws in your theory.
14. 10 points for each new term you invent and use without properly defining it.
15. 10 points for each statement along the lines of "I'm not good at math, but my theory is conceptually right, so all I need is for someone to express it in terms of equations".
16. 10 points for arguing that a current well-established theory is "only a theory", as if this were somehow a point against it.
17. 10 points for arguing that while a current well-established theory predicts phenomena correctly, it doesn't explain "why" they occur, or fails to provide a "mechanism".
18. 10 points for each favorable comparison of yourself to Einstein, or claim that special or general relativity are fundamentally misguided (without good evidence).
19. 10 points for claiming that your work is on the cutting edge of a "paradigm shift".
20. 20 points for emailing me and complaining about the crackpot index. (E.g., saying that it "suppresses original thinkers" or saying that I misspelled "Einstein" in item 8.)
21. 20 points for suggesting that you deserve a Nobel prize.
22. 20 points for each favorable comparison of yourself to Newton or claim that classical mechanics is fundamentally misguided (without good evidence).
23. 20 points for every use of science fiction works or myths as if they were fact.
24. 20 points for defending yourself by bringing up (real or imagined) ridicule accorded to your past theories.
25. 20 points for naming something after yourself. (E.g., talking about the "The Evans Field Equation" when your name happens to be Evans.)
26. 20 points for talking about how great your theory is, but never actually explaining it.
27. 20 points for each use of the phrase "hidebound reactionary".
28. 20 points for each use of the phrase "self-appointed defender of the orthodoxy".
29. 30 points for suggesting that a famous figure secretly disbelieved in a theory which he or she publicly supported. (E.g., that Feynman was a closet opponent of special relativity, as deduced by reading between the lines in his freshman physics textbooks.)

30. 30 points for suggesting that Einstein, in his later years, was groping his way towards the ideas you now advocate.
31. 30 points for claiming that your theories were developed by an extraterrestrial civilization (without good evidence).
32. 30 points for allusions to a delay in your work while you spent time in an asylum, or references to the psychiatrist who tried to talk you out of your theory.
33. 40 points for comparing those who argue against your ideas to Nazis, stormtroopers, or brownshirts.
34. 40 points for claiming that the "scientific establishment" is engaged in a "conspiracy" to prevent your work from gaining its well-deserved fame, or suchlike.
35. 40 points for comparing yourself to Galileo, suggesting that a modern-day Inquisition is hard at work on your case, and so on.
36. 40 points for claiming that when your theory is finally appreciated, present-day science will be seen for the sham it truly is. (30 more points for fantasizing about show trials in which scientists who mocked your theories will be forced to recant.)
37. 50 points for claiming you have a revolutionary theory but giving no concrete testable predictions.

Thims-Moriarty debate

To exemplify the usage of the so-called Baez crackpot index during debates on hmolscience-related topics, two scientists, independently, have used the Baez index to pejoratively label American electrochemical engineer Libb Thims as a crackpot during debate and discussion with him. The first was Irish physicist Philip Moriarty who during the 2009 Moriarty-Thims debate (comments #134-135), on the question of whether or not an arrangement of students in a field has a thermodynamic entropy, stated the following:

— —

Comment **#134**

Anonymous (Philip Moriarty)
Sep 13 2009, 3:45 PM EDT

> "To Petrologist, what you and your two scientific associates consider “not a valid scientific theory”, others consider a Nobel Prize. To cite one example, in 2007 Russian physical chemist Georgi Gladyshev, author other 1998 book *Thermodynamic Theory of the Evolution of Living Beings* (something he has spent 30-years working on), flew out from Moscow to Chicago, with his wife, to take me out to dinner to tell me that he had sent my work into the Nobel Prize organization for nomination. To quote from social anthropologist Max Gluckman: 'A science is any discipline in which the fool of this generation can go beyond the point reached by the genius of the last generation'.”

(Another) reply to Comment #137:

I note from the "Human Thermodynamics (Objections to)" page at this Wiki that Stephen Lower has previously (and quite correctly) described Libb Thims' "theories" as crackpot. I came across a wonderful webpage by John Baez called the "**Crackpot Index**" - see . Congratulations, Libb, you've just scored 20 points on the Baez scale for suggesting that you deserve a Nobel Prize.

— —

Comment **#135**

Anonymous (Philip Moriarty)
Sep 13 2009, 3:55 PM EDT

> "To quote from social anthropoligist Max Gluckman: A science is any discipline in which the fool of this generation can go beyond the point reached by the genius of the last generation."

Libb, you're *really* racking up the points on **Baez's crackpot index**. You get "40 points for claiming that when your theory is finally appreciated, present-day science will be seen for the sham it truly is." (Point 36 on Baez's list). I'll leave you to tick off the other points on Baez's list...

— —

Supposedly, then, according to Moriarty, Thims at least scores 60 points on the crack pot index, at a minimum.

Human chemistry in school?

In 2010, Thims posted the following query thread "Should Human Chemistry be Taught in School?" to ChemicalForums.com: [10]

Should human chemistry be taught in school?
« **on:** September 27, 2010, 12:06:56 PM »

I don't know if I am alone in this view, but would anyone else like to see the subject of human chemistry taught as part of required college education?

By the name "human chemistry", I am referring to the Henry Adams (1887) definition of the subject as people defined as reactive human chemicals or "human molecules" and subject of human chemistry being the study of the behaviors and reactions of interacting human molecules according to the laws and principles of chemistry.

Any comments?

Re: Should human chemistry be taught in school?
« **Reply #1 on:** September 27, 2010, 12:31:34 PM »

The following 1991 query by American philosopher Robert Pirsig gives a decent summary idea of the types of basic questions people struggle with in this subject:

"Why should a group of simple, stable compounds of carbon (C), hydrogen (H), oxygen (O), and nitrogen (N), 'struggle' for billions of years to organize themselves into a professor of chemistry? What's the motive?"

The following link gives a decent historical overview, starting with Empedocles' 450 BC chemistry aphorisms of how people mix like water and wine or separate like oil and water, up to the 2000 calculation for the molecular formula for a human by Sterner and Elser:

link deleted

Children as young as seven begin asking questions such as "is love a purely chemical reaction?" As far as I know, however, in America at least, there is no structure for teaching this subject in high school or college? If I could go back again to before age fifteen, I would have liked to have been taught the basics of this subject. I have thus far been putting forth some effort in this end by giving guest lectures on this subject to various college bioengineering classes and am thinking about doing the same for some general chemistry classes in the near future. Do people think this would be a waste of time or useful?

Here's a few topic-related chemistry forum posts I found that would be covered in such a course:

Entropy and the theoretical effects of the second law (2008):
http://www.chemicalforums.com/index.php?topic=24859.0

Entropy of human civilization increasing (2005):
http://www.chemicalforums.com/index.php?topic=1839.0

Here's an overview page of the Rossini debate (1971-2008), between a group of chemistry professors, about whether chemical thermodynamics has anything to say about human existence:

link deleted

The basic idea here, in my view, is that this should be taught, at least one day in year's worth of chemistry, so that students have some kind of framework for these type of debates and discussions.

Polish analytical chemist Marcin Borkowski, a leading administrator of the site, commented the following: [10]

Re: Should human chemistry be taught in school?
« **Reply #2 on:** September 27, 2010, 01:02:50 PM »

No idea what you mean, sounds like crackpottery to me so far. Please elaborate.

Assuming I understand what you mean - are you sure it is not abuse of the word "chemistry"? If you are interested in learning about human interactions they are covered by sociology and psychology.

Thims then comment the following elaboration response:

Re: Watch the video (this was human chemistry in 1809)
« **Reply #3 on:** September 27, 2010, 03:18:54 PM »

The subject often sounds like crackpot to the new comer, but it has been developed by some of the greatest geniuses of history. The central founder of the subject of human chemistry, German polymath Johann Goethe (IQ=225), began conducting chemistry experiments in his youth, studied chemistry for over forty years, and even employed his own chemist in later years (German chemist Johann Dobereiner), before he developed his version of human chemistry, as presented in his 1809 *Elective Affinities* (a theory based primarily on Swedish chemist Torbern Bergman's 1775 chemistry textbook *A Dissertation on Elective Attractions*). Watch the following clip of the film version to get the idea:

http://www.youtube.com/watch?v=wV2o8gEmW0A

The subject is common to thinkers with IQ=225+, as is evidenced by the fact that American astrophysicist Christopher Hirata (youngest ever winner of the International Physics Olympiad, age 13, 1996), independent of Goethe, developed a near duplicate version of human chemistry:

link deleted

In simple terms, the following is the empirical molecular formula for a human (you or I), as calculated by Robert Sterner and James Elser (*Ecological Stoichiometry*, 2002):

$H_{375,000,000}$ $O_{132,000,000}$ $C_{85,700,000}$ $N_{6,430,000}$ $Ca_{1,500,000}$ $P_{1,020,000}$ $S_{206,000}$ $Na_{183,000}$
$K_{177,000}$ $Cl_{127,000}$ $Mg_{40,000}$ $Si_{38,600}$ $Fe_{2,680}$ $Zn_{2,110}$ Cu_{76} I_{14} Mn_{13} F_{13} Cr_7 Se_4 Mo_3 Co_1

According to their view, people, which they define as "human molecules", are to be "considered as single abstract molecules", that interact through complex chemical reactions. Now, suppose we define one person as molecule *A* and another as molecule *B*, and bring them into contact to react:

$A + B \rightarrow AB$

We can now ask questions such as will the reaction occur, will there be a Gibbs free energy change for his reaction?, do the reactants have free will in this process?, what is type of chemical bond will hold the products in an AB complex?, etc., etc. As it turns out, there are volumes of material published on this subject, by various authors. The modern chemistry student, however, is taught none of this. In my case, for example, I had to suck down a chemical engineering degree and then research this topic for over ten years, of independent study, to find out who originated this subject and what theories have been proposed and established, etc. There is no reason the average student of chemistry should have this exquisite branch of chemistry hidden from his or her education curriculum. Any comments, suggestions, ideas?

Re: Should human chemistry be taught in school?
« **Reply #5 on:** September 27, 2010, 04:34:57 PM »

Thanks for the comments. The only thinker, however, to have mixed chemistry and psychology was Carl Jung (and his school of followers), who mixed in alchemy, and later ideas on entropy. Likewise, after hearing Jung lecture, Mihaly Csikszentmihalyi brought entropy ideas over into the field of "positive psychology", but he uses little chemistry theory in his works. Then there is French philosopher Hippolyte Taine who outlined the view that the future job of the historian-psychologist will be to "write the psychology of the human molecule, or a particular group of human molecules, in their various transformations." This particular quote inspired Henry Adams to spend forty years developing his version of how chemistry and thermodynamics apply to people viewed as "human molecules", he even used Gibbs phase rule to construct his theory, if you can believe that. In any event, recent books on this subject go far beyond simple ideas culled from psychology. American physical chemist Thomas Wallace's recent 2009 book *Wealth, Energy, and Human Values*, is one example of this, wherein he explains the rise and fall of civilization from the point of view of chemical mechanism, transition states, Gibbs free energy, among other tools of chemistry.

My concern is that there is no reason why people, such as Goethe, Adams, and Wallace, should toil away for decades on end to develop their theories as to how chemistry applies to human movement, independently, when all that is needed is a few hours of teaching this subject in introductory chemistry classes. Any comments?

Re: Do you think you are a molecule?
« **Reply #6 on:** September 27, 2010, 04:52:09 PM »

To give an idea why education is lacking in this area, English physicist Jim Eadon has been running a poll now for about ten years on whether or not people think they are a molecule?

link deleted

The poll finds that 43 percent of people do not consider themselves to be a molecule. The biggest hurdles to acceptance of this view, stem from religious conflict, i.e. life, death, and meaning. Many, even PhD Ivy league educated scientists, will come right out and say that they object to being a molecule, because they believe themselves to be in possession of a soul that is under the control of God, and that a water molecule cannot have soul, and so on. Here's one example thread of this:

link deleted

These are people in retirement years, who have to grapple with these deep questions on their own.

Borkowski then comment the following while at the same time locking the thread from further discussion: [10]

Re: Watch the video (this was human chemistry in 1809)
« **Reply #8 on:** September 27, 2010, 11:52:49 PM »

Quote from: Libb on September 27, 2010, 03:18:54 PM

H375,000,000 O132,000,000 C85,700,000 N6,430,000 Ca1,500,000 P1,020,000 S206,000 Na183,000
K177,000 Cl127,000 Mg40,000 Si38,600 Fe2,680 Zn2,110 Cu76 I14 Mn13 F13 Cr7 Se4 Mo3 Co1

This is not even wrong.

Humans are not molecules, they are complex objects composed of many molecules.

This is not leading anywhere.

Topic locked.

I have also deleted all links to eoht.

In sum, Borkowski's take on the subject is as follows:

> "Human chemistry sounds like **crackpottery** to me and abuse of the word 'chemistry'? If you are interested in learning about human interactions they are covered by sociology and psychology; humans are not molecules, they are complex objects composed of many molecules."

Thims then messaged ChemicalForums creator Mitch Garcia: [11]

Re: Banning question?
« **Sent to:** Borek, Libb **on:** September 28, 2010, 06:11:32 PM »

Reply to All | Quote | Reply | Remove

Quote from: Libb on September 28, 2010, 02:45:29 AM

Mitch,
You seem to be the curator of this site (which I just found yesterday). The topic I tend to post on is very controversial, namely the definition of a person as a molecule, and discussing how chemistry, thermodynamics, physics apply to this viewpoint. Historically people have been banned and or imprisoned for writing about this, over the last 230 years:

http://www.eoht.info/page/Human+molecule+%28banned%29

My first posting to this site on this topic was quickly thread locked and linked banned (by admin Borak, who considers the subject crackpot):

http://www.chemicalforums.com/index.php?topic=43811.0

Similarly, the following article was banned from Wikipedia (by similar-minded admins, who commented that they wanted to "kill" the article):

http://www.eoht.info/page/Human+molecule+%28Wikipedia%29

My question, subsequently, is that is open discussion of this subject not going to be allowed at chemical forums? The basic timeline of who's theorized on this subject is here:

http://www.eoht.info/page/HMS+pioneers

Thanks,
Libb Thims

To which Garcia responded: [11]

> Honestly, the idea seems pure crackpottery to me. Crackpots always seem to think they are victims of the "mainstream". They always seem to think no one is intelligent enough to understand their points. Oddly, they all also tend to write a lot in their internet postings. And unfortunately no matter how much we argue with the crackpots they never give an inch in return.

Borkowski further commented, during this inter-memo discussion, that he was completed against allowing any discussion at all about human chemistry in ChemicalFormums.com:

Re: Banning question?
« **Sent to:** Mitch, Libb **on:** September 28, 2010, 09:10:49 PM »
« You have forwarded or responded to this message. »

Reply to All | Quote | Reply | Remove

Quote from: Mitch on September 28, 2010, 06:11:32 PM

> Honestly, the idea seems pure crackpottery to me. Crackpots always seem to think they are victims of the "mainstream". They always seem to think no one is intelligent enough to understand their points. Oddly, they all also tend to write a lot in their internet postings. And unfortunately no matter how much we argue with the crackpots they never give an inch in return.
>
> However, assuming it is okay with Borek I'll greenlight you to post in the forum linked below under the condition that you don't link to your website from Chemical Forums:
> http://www.chemicalforums.com/index.php?board=54.0

If it is up to me to decide - I am against. What Mitch said sums up well what I think. Plus, we are read by students that have enough problems grasping real concepts, no need to expose them to crackpottery that can further derail them.

Borek

General Chemistry Software - pH calculator, concentration calculator, equation balancer, buffer calculator
pH meter, pH measurements and pH electrodes; chemistry quizzes, refractometer
www.titrations.info - titration, acid-base titration, complexometric titration and more

Re: Banning question?
« **Sent to:** Mitch, Libb **on:** September 29, 2010, 10:02:03 AM »

Reply to All | Quote | Reply | Remove

No.

With each paragraph you get more Baez crackpot index points.

In sum, to review, according to Borkowski:

> "With each paragraph you get more **Baez crackpot index** points."

Likewise, according to American nuclear chemist Mitch Garcia, the 2003 founder of ChemicalForums.com: [11]

> “Honestly, the idea of human chemistry seems pure **crackpottery** to me. Crackpots always seem to think they are victims of the ‘mainstream’. They always seem to think no one is intelligent enough to understand their points. Oddly, they all also tend to write a lot in their internet postings. And unfortunately no matter how much we argue with the crackpots they never give an inch in return.”

Thims

The following is a rough crackpot index scoring tabulation for American electrochemical engineer Libb Thims, tallied up through his attack-years of public interjection (2005-present), being that both Irish physicist Philip Moriarty (2009) and Polish analytical chemist Marcin Borkowski (2010), independently, have jeered the Baez crackpot scale at him. Some of these scorings, to note, are not exactly one-to-one correspondences, e.g. #19: Thims has never claimed that his work is on the cutting edge of a paradigm shift (but others have); #18: Thims has never compared himself to Einstein (but others have); #11: Thims has never "started out" his theory by stating how long he has been working on it, but does frequently comment that it did take him six years to crack the reverse engineering puzzle (see: Thims history), and eleven years to find Goethe and his human chemistry theory after asking a question about this in his undergraduate chemical engineering thermodynamics class (see: Goethe timeline), and so on, but in the name of sport, humor, and a grain of salt, each index point is given a maximal value if remote similarity can be found:

Points	Description	Index #	Location	Date
-5	A -5 point starting credit.	1		

20	10 points for beginning the description of your theory by saying how long you have been working on it. (10 more for emphasizing that you worked on your own.)	11	ChemicalForums.com; Thread: Should human chemistry be thought in school? (above); quote:“there are volumes of material published on this subject, by various authors. The modern chemistry student, however, is taught none of this. In my case, for example, I had to suck down a chemical engineering degree and then research this topic for over ten years, of independent study, to find out who originated this subject and what theories have been proposed and established.”	2010
10	10 points for each favorable comparison of yourself to Einstein.	18	Canadian mathematical physicist and computer scientist Steven Pierce: “I stumbled onto your website by accident but I have to confess this might be one of the most stunning undiscovered intellectual achievements of the 21st century. I have browsed through your wiki and I cannot express how tragic it must be to a man in your position—to be a pioneering thinker yet to be rejected by an uptight academic community with neither the depth nor will to understand your unique work, defending their own turf like dogs. I can only compare you to the many other pioneering heroes of science, Newton (IQ=193-200), Einstein (IQ=160-225), Tesla (IQ=140-310), men who like you blazed own paths but were too victims of their own genius, only to be validated years after their death. Perhaps one day historians will look back and have a chuckle - that the pioneer of enthropology published by a vanity press in a book resembling a third rate romance.”	2009
10	10 points for claiming that your work is on the cutting edge of a "paradigm shift".	19	See: Goethean revolution, section: Thimsian revolution, in which American civil engineer and ecological thermodynamicist Jeff Tuhtan comments in 2011: “whether you ultimately agree with this work or not, it represents a paradigm shift in viewing our place in the world.”	2012
20	20 points for suggesting that you deserve a Nobel prize.	21	In 2005, in his HumanThermodynamics.com biog, listed himself (as discussed on the "early parental death and genius" page) among the characteristic similarities (early parental death and educational path) of the four individuals to have won two Nobel Prizes; in 2007, Russian physical chemist Georgi Gladyshev flew out to Chicago from Moscow to inform Thims that he had sent his work into the Nobel prize committee; Thims' brought up this latter fact in the 2009 Moriarty-Thims debate (as discussed above), to which he was ridiculed for.	2005 2007 2009
20	20 points for each favorable comparison of yourself to Newton.	22	Pierce comparison (above) + Thims listing on the "early parental death and genius" page (Thims mother ended when she was 12, Newton's father ended when he was 0);	2007
20	20 points for naming something after yourself. (e.g., talking about the "The Evans Field Equation" when your name happens to be Evans.)	25	The subsection on the Goethean revolution page about the continued work of Thims in carrying forward the human chemistry revolution started by Goethe (1796) is section titled "Thimsian revolution" (the only thing he has ever tentatively associated with his name), with much reservation, but an apt term, one no doubt the future will see much usage of, in Thims' view.	2012
40	40 points for comparing yourself to Galileo, suggesting that a modern-day Inquisition is hard at work on your case, and so on.	35	During the 2005-2010 Wikipedia fiasco, involving the prolonged effort by Thims to get three articles established: human chemistry, human thermodynamics, and human molecule (see: human molecule (banned)); as he commented in his 2010 effort: "It is my view that the ban of this topic from Wikipedia is equivalent to the hysteria that results in acts of book burning of olden days or the inquisitions of Galileo for believing in the work of Copernicus. As Physchim62 put in on 11 Jun 2010 "It seems like the witch hunt is still on, more than eighteen months after the original events".	2010

In total, Thims scores 135 on the Baez crackpot scale, or crackpot index (CI) as Baez originally called it—nevertheless, crackpot or not, the theory, originated by Goethe, and carried forward by Thims, is "true" (as discussed below) as Goethe so rightly surmised over two hundred years ago, and those who do not see it as such are ignorant, pure and simple.

Discussion

The following quote by German philosopher Arthur Schopenhauer, notable for having incorporated much of Goethe's human chemistry morality theory into his *The World As Will and Representation* (1818; 1844), seems to capture the gist of what is going on here:

> "All **truth** passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident."

namely that the Goethean revolution is still in the ridicule state of truth. This is corroborated by Goethe himself who, in a circa 1810-32 scene reported by Heinrich Laube (1806-1884), had to answer to a women who told him his work was immoral (see: Goethe's collected works; section: best book): [12]

> "A women friend of mine said to Goethe at that time: 'I cannot approve of *Elective Affinities*, Herr von Goethe; it really is an immoral book!' According to her report Goethe was silent for a while and had then said with great earnestness: 'I'm sorry you feel that way. It is my best book, and don't think that this is the mere whim of an aging man. I grant you that one loves most deeply the child of one's last marriage, the product of one's late power of generation. But you wrong me and the book. The principle illustrated in the book is **true** and not immoral. But you must regard it from a broader point of view and understand that the conventional moral norms can turn into sheer immorality when applied to situations of this character."

Hence, then, to summarize, in the above sections we see a representative sampling of generic modern scientists, namely: Paul Samuelson (1972; economics), Stephen Lower (2007; physical chemistry), Philip Moriarty (2009; physics), Mitch Garcia (2010; nuclear chemistry), Marcin Borkowski (2010; analytical chemistry), overly pompous in their deflated view of reality, who each view Goethe, the smartest person ever (see: Genius IQs) (last universal genius), and his 1796 human chemical thermodynamics morality theory as "crackpot", whereas in the correct sense, as Goethe viewed things (and as modern human chemical thermodynamics views things), his theory is true—thus, two centuries have passed and we are still in the ridicule stage of scientific truth, with many, such as Samuelson, Lower, Moriarty, Garcia, Borkowski, and a large percentage of the modern scientific body, existing in complete and blind ignorance of reality—and not just day-to-day ignorance, but two-century long delayed and regressed ignorance—a pitiful situation, to say the least—a state of affairs possibly akin to something like Hypatia must have experienced for promotion of heliocentrism, and being stoned-to-termination for this (415AD), some 1,128-years before it was even tentatively accepted as truth (Copernicus, *On the Revolutions of the Heavenly Orbs*, 1543), or some 1,218-years before it would be possible to give published public support for it as truth without being tried for "suspicion of heresy" and put under house arrest (Galileo, religion vs science legal cases, 1633); and some 2,420-years before one could get fired from their job for teaching it (religion vs science legal cases, 2005).

Newcomers to this subject would be wise to heed the following words of French physicist Sadi Carnot, from his "rules of conduct" personal notes: [13]

> "Say little about what you know and nothing at all about what you don't know. When a discussion degenerates into a dispute, keep silent. Do not do anything which the whole world cannot know about."

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External links

â— Crackpot index – Wikipedia.

θΔics

In psychological thermodynamics, **Craig A. Anderson** (c. 1954-) is an American psychologist noted for his work and research, since 1995, on the heat hypothesis, which correlates aggressiveness and violence in humans with increases in average daily temperature. [1]

Education

Anderson completed his BA from Butler University in 1976 and his MA (1978) and PhD (1980) from Stanford University. He is currently a psychology professor at Iowa State University.

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Further reading

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External links

- Craig Anderson (homepage) – Iowa State University.
- Craig Anderson (publications) – Psychology.IaState.edu.

θΔics

In hmolscience, **Crane Brinton** (1898-1968) was an American historian noted for his participation in the Harvard Pareto circle, for his later adoption of Pareto's "circulation of elites" theory, as applied to revolutions, such as, supposedly, discussed in his *The Jacobins* (1930) and his "The Residue of Pareto" (1954) published in *Foreign Affairs*. [1]

Brinton established a friendship with Lawrence Henderson in 1918 which he maintained until Henderson's passing (reaction end) in 1942, the two often dining together and visiting each other at summer homes. In 1936, Brinton began to acknowledge Henderson's influence in his books. [2]

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External links

â— Crane Brinton – Wikipedia.

θΔics

In terminology, **crazy**, or "insane", refers to []

Quotes

The following are related quotes:

Sociologist Werner Stark (1962) stated that sociologist Henry Carey, who in 1858 who argued that the combinations and motions in the inorganic world (chemical) and organic world (social) are governed by one and the same laws, has the view of someone "back in his strait-jacket", i.e. **crazy**. [1]

> "We are obliged to regard many of our original minds as **crazy**, at least until we have become as clever as they are."
>
> — Georg Lichtenberg (c.1774), *Notebook D* (aphorism #97)

> "The notion that the brain itself feels and thinks is a 'revolting opinion' reminiscent of the '**insane** author [Holbach] of the *System of Nature*."
>
> — Mathieu Buisson (c.1802) (Q), as cited by L.S. Jacyna (1987) in summary of Buisson's criticism (Q) (Q) of Xavier Bichat's 1801 theory (Q) of physiological properties; note: quoted misattributed, by Jennifer Hecht (2003), to Louis de Bonald

> "One day instead of (or in addition to) regular math, chemistry, physics, etc., kids in school will be learning something like one human molecule + another human molecule = ? ... it's just a **crazy** thought, but hey, we'll see or somebody will."
>
> — Natalia Roubanenko (2006), comment to Libb Thims after review of one of *Cessation Thermodynamics* or *Human Thermodynamics, Volume One*

> "Since as a kid I was aware of the abyss (super rift) between the material and mental worlds. I tried to bridge this abyss, but could not. Yet I kept on with my own "Steigerung" as Goethe did. Then during 1982-83 I discovered empirically that the law of entropy production applies to the spiritual [*humanistic*] world as it applies to the physical world. My joy knew no bounds. I have found the bridge between these two worlds with which to cross the abyss between them. Others thought I was **crazy** and would not dare to publish my account. Then, in 1986, if I remember correctly, I was teaching university students the intricate calculations concerning free energy in chemical reactions. During that lecture I suddenly became aware how my mind was rushing along two levels. The lower level was concerned with chemical processes as a physical phenomenon. I executed this level almost automatically. But the higher level of my mind was exploring free energy in the process of knowing-learning as a spiritual [*thermodynamics*] phenomenon. I followed this level with great curiosity. I think the students became aware that I was rather absent minded that day, not perceiving my higher most thoughts. That day marks the beginning of my continual exploring of the role of free energy in the spiritulization [*actualization*] of humankind."
>
> — Adriaan de Lange (2010), retrospect reflection on arrival of human free energy theory

> "It surprises me how disinterested we are today about things like physics, space, the universe and philosophy of our existence, our purpose, our final destination. It's a **crazy** world out there. Be curious."
>
> — Stephen Hawking (c.2014) (Q)

> “I think we have found the manifesto of a **crazy** person.”
>
> — Person (2017), “Taking a Look at Hmolpedia” (1:06:30) (Q), Aug 5

See also

- Crackpot
- Stark classification

References

1. Stark, Werner. (1962). *The Fundamental Forms of Social Thought*. Routledge & Kegan Paul.

θΔics

In terminology, **creation** refers to the method by which things of the universe, in particular water, land, animals, and humans, the stars, etc., came about, arose, or were formed, via the power of a god or gods.

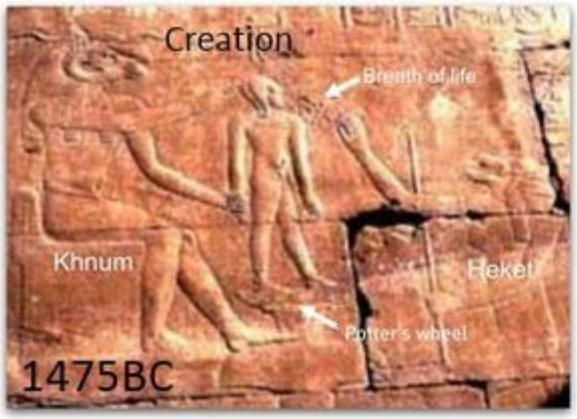

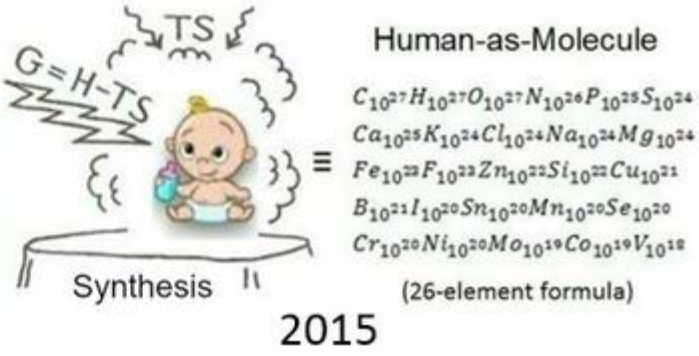

Left: **creation** of a human, a person named Hatshepsut (1508–1458 BC), the fifth pharaoh of the Eighteenth dynasty of Egypt, in particular, shown at the Temple of Deir el Bahari (1475 BC), depicting a mixture of the "creation by clay" and "creation by breath" theories, defining creation as the work or power of two Gods (Khnum and Heket). Right: a depiction of the "synthesis" of human, according to chemical thermodynamics, as depicted in Daniel Schroeder's 2000 *Thermal Physics* textbook, defining creation of an animated molecule or animate matter (such as a rabbit) as being the product of chemical synthesis, quantified by a standard Gibbs free energy of formation (as described historically on affinity tables or free energy tables in modern terms).

Overview

The history of "creation theory" is a long and intricate subject, but one with a discernible thread of borrowed continuity, particularly in regards to the Anunian theologies (Ab-ra-ham-ic / B-ra-hma-ic theologies) as these frame out 72% of the belief systems of the modern world.

Heliopolis cosmology | 3100 BC

See main: Heliopolis creation myth

The pyramid texts describe the first dominate creation theories, which were developed in the ancient Egyptian city of Heliopolis, in circa 3100 BC. In this model, there were four distinct creation theories:

● Self-generated creation | Atum (creator god) born out of the Nun (land mound), which itself arises or rather is self-generated out of the primordial waters or chaos of beginning.

● Creation by masturbation | Atum, according to one version of the theory, masturbates to bring forth eight other gods (Shu, Tefēnet, Gēb, Nūt, Osiris, Isis, Seth, and Nephthys) to assist him in creation.

● Creation by sneeze or spit | Atum, according to alternative version of the theory, "sneezes" out Shu and "spits" out Tefnut, the first two gods, who in turn, copulate to make the next two gods: Geb (earth) and Nut (heaven), who in turn copulate to make the next four gods: Osiris and Isis (sibling-mate pair) and Seth and Nephthys (sibling mate pair).

Memphis cosmology | 2800 BC

See main: Memphis creation myth

In the centuries to follow the city of Memphis (c.2800BC) came to power, becoming the religious epicenter of the Egypt. Here, building on Heliopolis creation theory, the introduced creation by spoken word:

● Creation by word | Creator god brings things into being by pronouncing the necessary command for it to be.

Hermopolis cosmology | 2400 BC

See main: Hermopolis creation myth

(add)

Theban cosmology | 2040 BC
(add)

Creation by breath | Breath of life | Humans

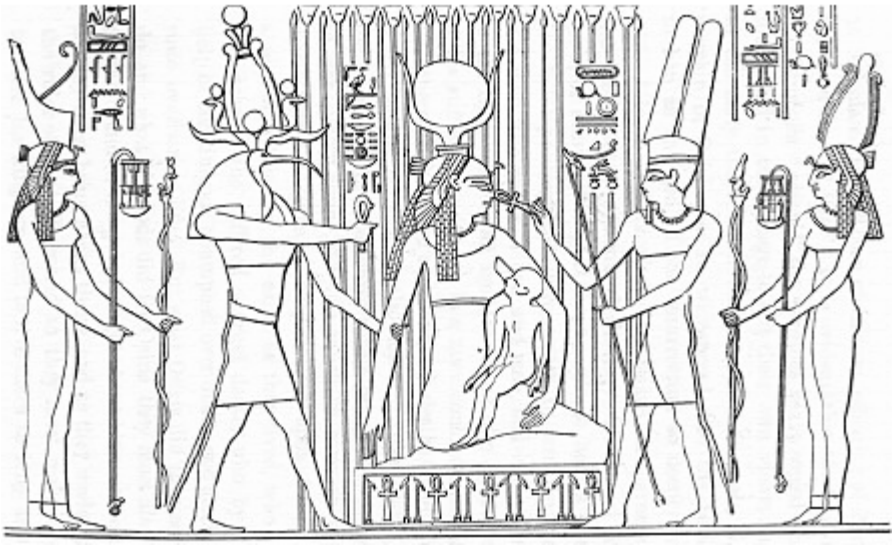

Isis is receiving the breath of life from Ra and transferring it to Horus via her breast. Standing before her, ankh or Key of Life in hand, is Amon-Ra the Egyptian 'Lord of Eternal Light'. Standing behind her is Thoth. The second chapter of Genesis offers a similar description of the Key in use: "And Yahweh, Elohim (Shining One), fashioned the Adam of the clay of the soil; and He blew in his nostril the breath of life, and the Adam turned into a living Soul."

The creation of humans as clay formations, embedded with the *ba* (soul), into which the *ka* (spirit) and or breath of life is imparted (using the ankh) to bring about animation was centered around the god Khnum whose chief cult center was situated on the island of Elephantine. [1]

It is difficult to say exactly where the creation by breath or rather God putting the "breath of life" into humans theory as it came to be known (particularly in Christianity), in regards to the origins of humans, originated, but at least by the time of the rule of Hatshepsut (1508-1458) the theory was in full swing. In the Temple of Deir el Bahari, for example, Hatshepsut had a relief carved on one of the walls depicting Khnum fashioning her and her *ka* (spirit) out of clay on his potter's turntable. Khnum creates humans and animals on his potter's wheel using the silt of the Nile, i.e., clay. After fashioning a person, his consort Heket offers the "breath of life," symbolized by the *ankh*, to the nose of the clay figure. This animates the clay effigy and the person receives an allotted life-span, personified as Shay meaning "That-which-is-ordained." [2] As carved onto the walls of Hatsheput's mortuary temple:

> "Amen-Ra called for Khnum, the creator, the fashioner of the bodies of men. Fashion for me the body of my daughter and the body of her ka," said Amen-Ra, "A great queen shall I make of her, and honour and power shall be worthy of her dignity and glory. O Amen-Ra," answered Khnum, "It shall be done as you have said. The beauty of your daughter shall surpass that of the gods and shall be worthy of her dignity and glory." So Khnum fashioned the body of Amen-Ra's daughter and the body of her ka, the two forms exactly alike and more beautiful than the daughters of men. He fashioned them of clay with the air of his potter's wheel and Heqet, goddess of birth, knelt by his side holding the sign of life towards the clay that the bodies of Hatshepsut and her ka might be filled with the breath of life."

The creation by clay theory, itself, is older than this, dating back at least to 1700BC in Sumerian mythology, where the birth goddess Nammu, of the watery depths, was said to have molding clay into the shapes of humans and bringing the molds to life to be a workforce replacement for the gods in the maintenance of the land. The addition of the "ankh" (or "cross", as it came to be in Christianity) as being able to impart the "breath of life" as an addition theory counterpart is something unique to Egypt and to the god Khnum.

● Creation by breath | Creator god brings things into animation by breathing life into them.

This "breath of life" theory, in turn, was incorporated into Hinduism, Christianity, and Islam, and hence into the vernacular of the modern world.

References

1. Oakes, Lorna and Gahlin, Lucia. (2002). *Ancient Egypt* (pg. 287) Hermes House.

2. Watterson, Barbara. (1996). *Gods of Ancient Egypt* (pgs. 189, 191). Godalming, Surrey: Bramley Books Limited.

See also

- Creationism

External links

- Shetter, Tony L. (c.2010). "Genesis 1-2 in Light of Ancient Egyptian Creation Myths", Bible.org.

θΔics

In creation theories, **creation by breath** or "breath of life" theory argues that humans are given life when a god moves the ankh (or key of life) close to the nose and mouth of the un-animated clay-formed body (dead), which thus acts to impart the "breath of life", spirit, or ka into the body, made of ba-infused (soul-based) clay, after which the body becomes animated.

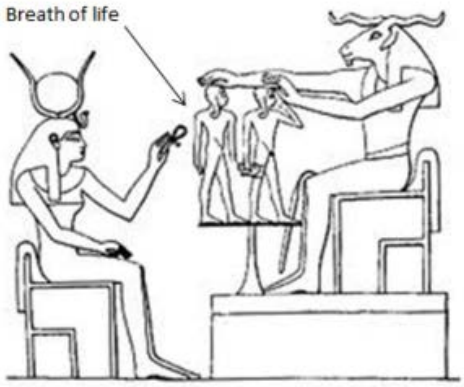

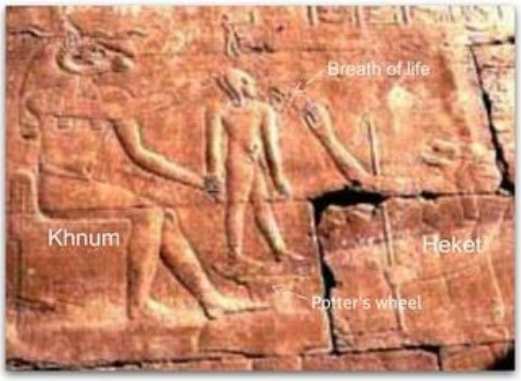

Left: The goddess Isis (left) imparting the **breath of life** into two clay-formed human figures, made by the god Khnum (right), with brings them to life (animates them). The Khnum cult dates back to the pre-dynastic period (3,100BC) and is also associated with the cosmic egg from which all living creatures stem, which played a dominant role in the Brahmaic faiths. [3]Right: A depiction of the creation of the Egyptian queen Hatshepsut), at the Temple of Deir el Bahari (1475 BC), who after being formed from clay by Khnum, is brought to life by having the goddess Heket impart the **breath of life** into her nostrils, using the ankh (key of life).

Nun

The original model for the creation by breath theory seems from the 3100 BC Heliopolis creation myth, according to which out of the self-engendered "Nun" arose the primeval land mound out of which "Atum", in the form of fire, the first god, came forth, who created the first to offspring, Shu (air) and Tefnut (moisture), by the power of breath and spit, respectively.

This model was expanded upon in the next millennium to explain the creation of humans out of clay, imbibed with the breath of life, as shown adjacent (1475BC), in the Ab-ra-ham-ic faiths, or creation of humans from the cosmic egg (c. 2000BC), in the B-ra-ham-ic faiths.

Ab-ra-ham-ic / B-ra-hma-ic religions

The original Egyptian creation by breath theory was rewritten in Christianity (Ab-ra-ham-ic theology), in the second chapter of Genesis as follows, in the original Hebrew version (500 BC):

> "And Yahweh, Elohim (Shining One), fashioned the Adam of the clay of the soil; and He blew in his nostril the **breath of life**, and the Adam turned into a living soul."
>
> — Anon (500BC), *Genesis* 2:7 (Ñº)

This key passage was latter re-written in the famous King James version of the Bible (1611) as follows, where Yahweh, a volcano god, and Elohim, a shining god, were linguistically morphed, via syncretism, into one perceptual term "Lord God": [1]

> "And the Lord God formed man of the dust of the ground, and breathed into his nostrils the **breath of life**; and man became a living soul."

In modern terms, this has been re-written in the *New American Standard Bible* (1995) as follows:

> "Then the Lord God formed man of dust from the ground, and breathed into his nostrils the **breath of life**; and man became a living being."

Similar versions can be found in the and the Koran (Ab-ra-ham-ic theology), wherein the creation by breath theory was re-written to the effect that the god Allah created man from clay by shaping clay into human form and breathing a spirit into him: [2]

> "I am going to create a human being out of clay. When I have formed him and **breathed My Spirit** into him, fall down in prostration to him! Then inquire of them: Is it they who are stronger in structure or other things We have created? We created them from sticky clay."

The details of the creations of humans and in particular "life", according to the Rig Vida (B-ra-hma-ic theology), is not as straight forward, but nevertheless have the same origin in the birth of Ra, born out the land mound (clay or Nile soot). Hence, this outline substantiates the view that for over 72 percent of the world, the notion of "life" and "death", which is a defunct theory in the context of modern physical science, is a hold-over from the creation by breath theory of the Egyptians.

Other depictions

A few other original Egyptian depictions of the ankh acting to impart the breath of life into the dead are shown below:

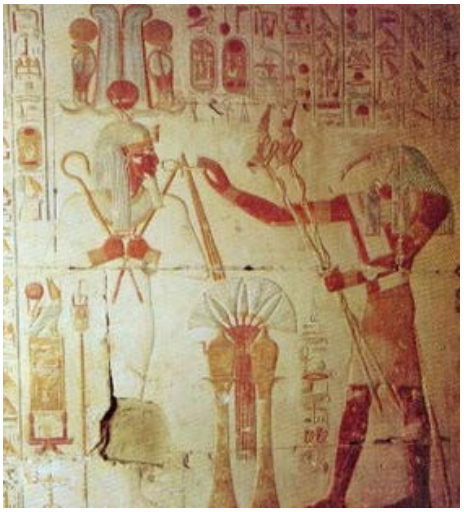
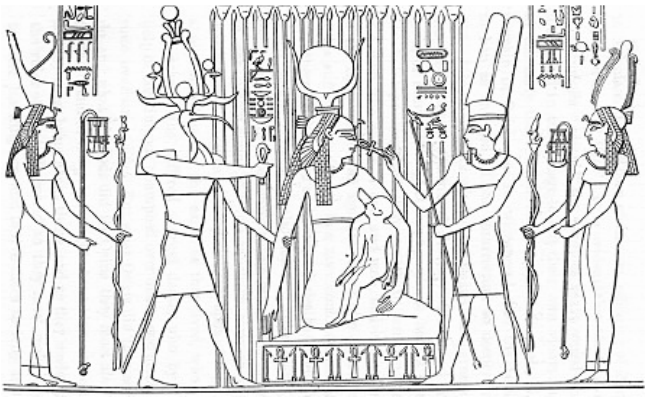

Left: Thoth (right) resurrects Osiris (left), using the ankh (key of life) to impart the breath of life into his dead body.
Center: Isis is receiving the breath of life from Ra and transferring it to Horus via her breast. Standing before her, ankh or Key of Life in hand, is Amon-Ra the Egyptian 'Lord of Eternal Light'. Standing behind her is Thoth. Right: Akhenaton and his bride Nefertiti receive the Key of Life from the Aton disk.

References

1. Author. (1611). *Bible* (Genesis 2:7). King James.
2. Author. (630AD). *Qur'an* (38:71-72; 37:11; 23:12-15). Publisher.
3. Bunson, Margaret. (2009). *Encyclopedia of Ancient Egypt* (pg. 202). Infobase Publishing.

θΔics

In religio-mythology, **creation myth** refers to mythology that explains the origin of things via gods and supernatural processes, admixtured with certain physical regularities, e.g. the perceptual increase and decrease in the strength of the sun, annual Nile River flood, the helical rising of Sirius, the movements of the constellations, e.g. Orion, etc.

Nile River | Creation myths

In c.4000BC, Egypt, centered around the Nile River, and its annual 150-day flood, at the end of which initiated their crop season (see: Khoiak festival), as religio-political power shifted, the Egyptian creation myths, as dominate state religions, changed as follows:

0. Pre-Dynastic creation myth | 3500BC | Supreme god: Horus
1. **Heliopolis creation myth** | 3100BC | Supreme god:

→ Atum or Atum-Khepri (Pyramid Texts, 2500BC)
→ Atum-Ra (Coffin Texts, 2100BC) / **Ennead**

2. Memphis creation myth | 2800BC | Supreme god: **Ptah**
3. Hermopolis creation myth | 2400 BC | Supreme god: **Ogdoad**
4. Thebian creation myth | 2050 BC | Supreme god: Amen

5. Amarnan creation myth | 1300BC | Supreme god: Aten
6. Saite recension | 670BC | *Book of Dead* (canonized)

7. Biblical creation myth | 500BC | Supreme god: El-Yahweh-Amen
8. Muslim creation myth | 700AD | Supreme god: Allah

In 100AD, El-Yahweh-Amen, rescripted the father of Jesus [Osiris-Horus], became rendered, via Hebrew to Greek to Latin transliteration effects, as "god" or more generally as "Lord [Yahweh] god [Elohim] Almighty [El] Amen [Amen]".

Tigris-Euphrates River | Creation myths

In c.3500BC, there is some evidence, not full agreed upon, which points to the possibility that Sumerian pictograph developed in the culture of the Tigris-Euphrates river system, before that of the Nile River culture; such as shown below:

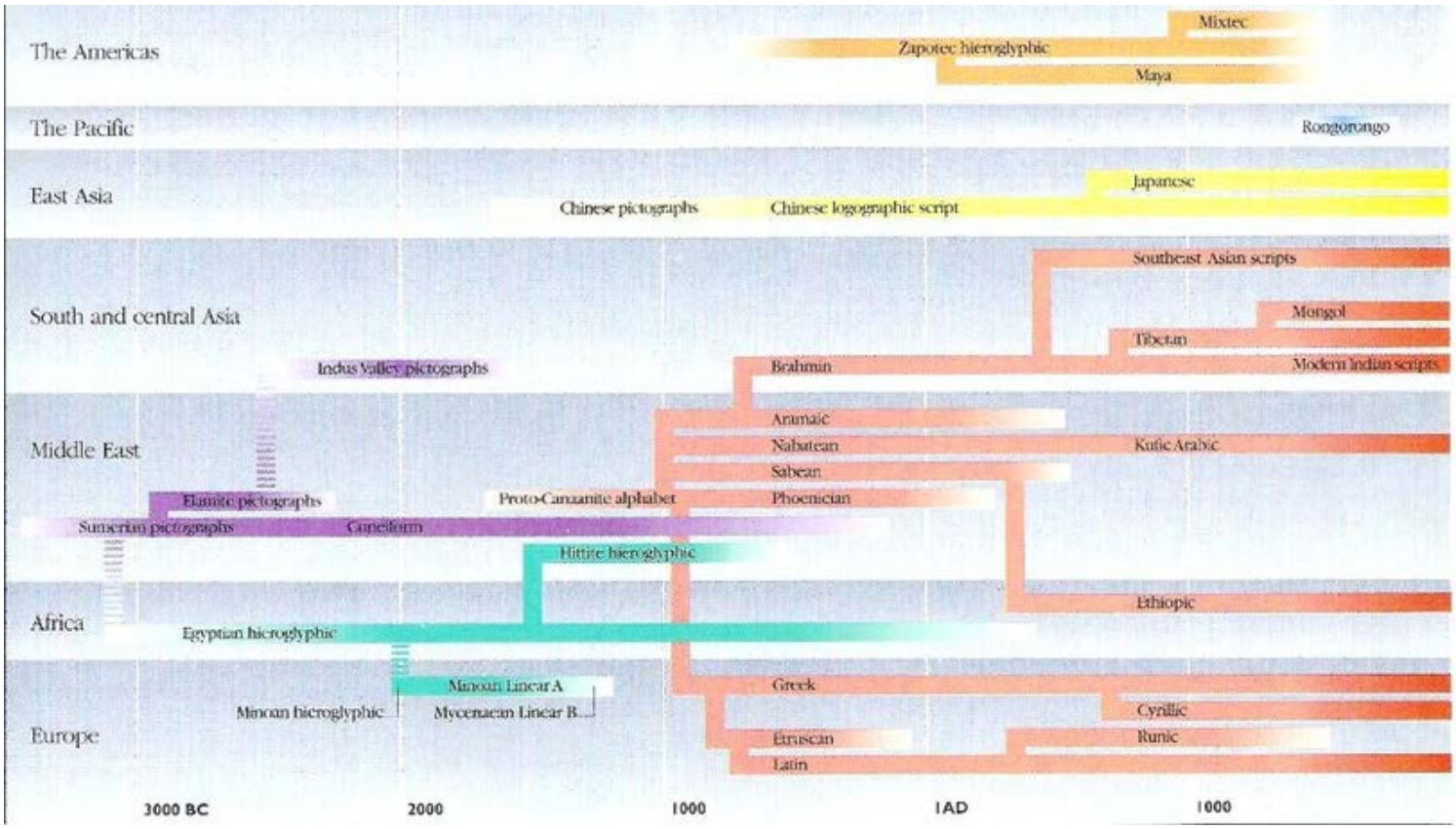

There is, e.g. some overlap with Egyptian mythology, e.g. the Egyptian water god is called Nu, the Sumerian sky water god is called Anu. The extant Sumerian pictography, however, is so scant, that a picture of known mythology for each tends to date as follows

- **Egyptian** (3100-2400BC) | Egyptian mythology
- **Sumerian** (2100-1600BC) | Sumerian mythology / Mesopotamian mythology

Little of this mythology is currently practiced in the modern world, aside from some aspects of Zoroastrianism follows in Iran.

Yellow River | Creation myths

In c.1800BC, around the Yellow River, Chinese pictograph began to appear, as shown below after which a yin-yang religion began to flourish:

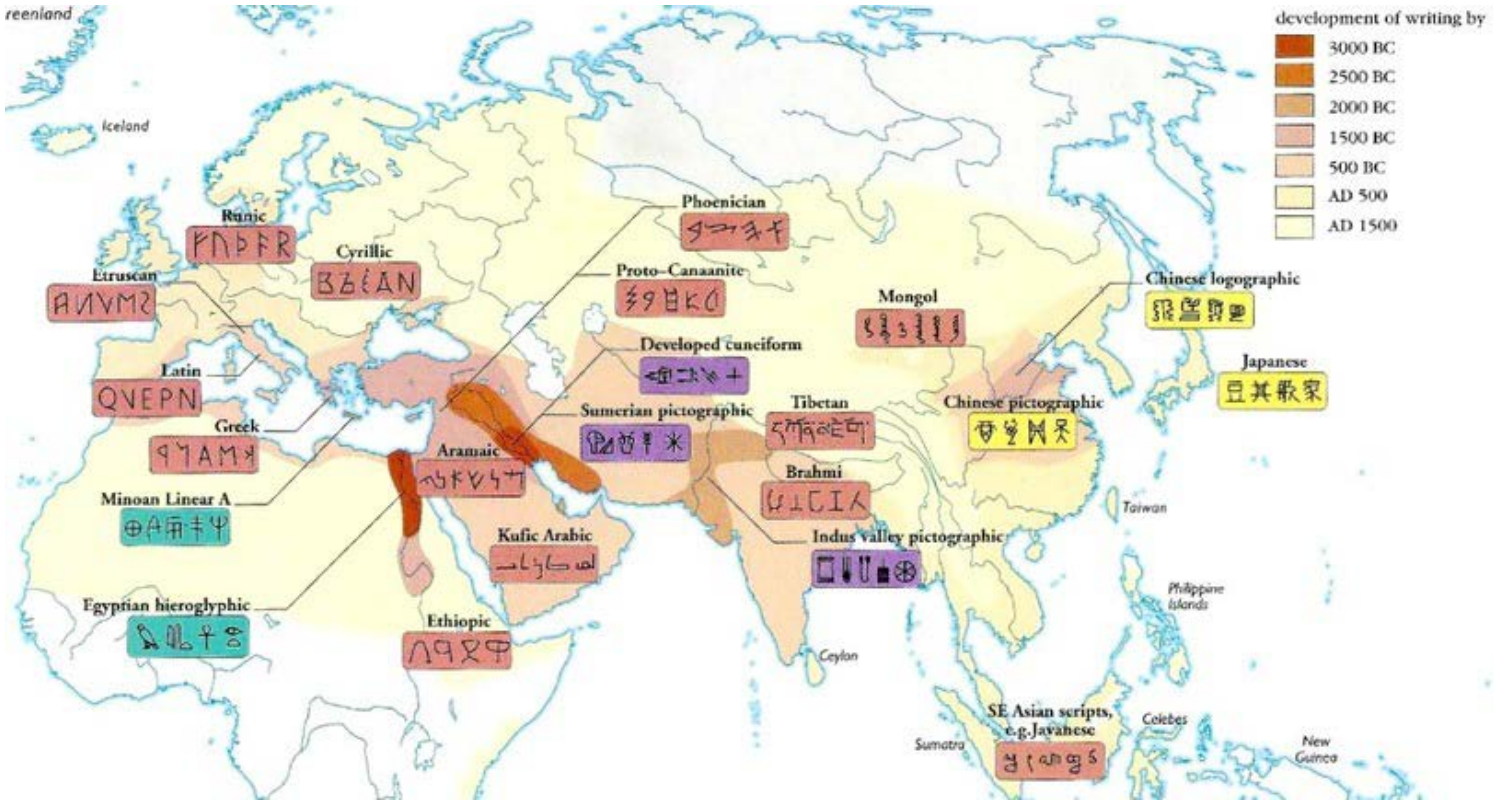

(add)

See also

- Clay creation myth
- Creation by breath
- Memphis creation myth
- Genesis
- Heliopolis creation myth
- Hermopolis creation myth
- Thebian creation myth

References

1. Haywood, John. (1997). *Atlas of the World* (§1.7). Barnes and Noble, 2001.

External links

- Creation myth – Wikipedia.

θΔics

In terminology, **creationism**, or "creation science" (1960s), "intelligent design" (2000s), or "spontaneous emergence" (2010s), is a supernatural theory, taught predominately by the Abrahamic religions (Christianity, Islam, Hinduism, and Judaism) that all things, particularly life and human beings were created by a deity or God. The term “creationist” is often given to someone who adheres to the creationism doctrine.

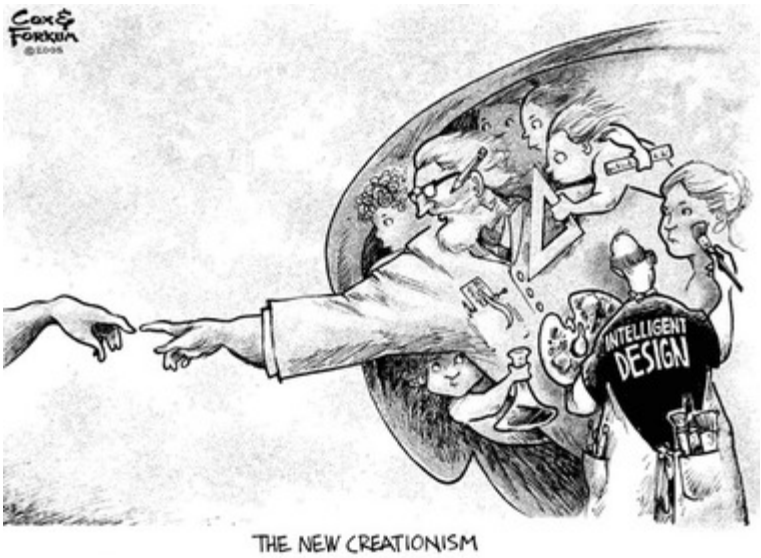

A 2005 depiction of the so-called "new creationism", a sort of Biblical view of man created by the hand of God, mixed with chemistry, mathematics, physics, promulgated by the new intelligent design movement, the 21st century re-branding of creation science.

Overview

In religious thermodynamics, the first and second laws of thermodynamics are often used to disprove evolution in favor of creationism. American civil engineer Henry Morris’ 1974 book *The Troubled Waters of Evolution* is a popular book that uses the second law to argue against evolution in favor of creationism. [1]

The creationism theory, as taught currently, originated 5,000 years ago, predominantly, from the ancient Egyptian theory of Ra (or Re) the sun god (see: Anunian theology or Ra theology).

Abraham, in translation, means “Father Ra son of Nun” (where Ab = father, Ra = sun, ham = chem = *keme* or mound of black soil that arose following the flood). In short, in *circa* 5,000-3,000 BC, to explain how the sun got into the sky, leading Egyptian theorists conceived a view that following the primordial flood of the universe, a land mound (called the nun or noah) arose out of the waters and out of the land mound a bird carried the newly born sun on its head into the sky in its daily cycle. [3]

This theory, in turn, was later reincorporated, via syncretism, into Christianity, Islam, and Judaism (through the story of Abraham, father of all living humans) and Hinduism, Buddhism, etc. (through Brahma, the creator god).

Difficulties on theory

The theory of creationism and gods, all trace back to mythology, and therefore are defunct theories, as can be discerned through a well-detailed study of the world's religions (16 active ones), mythology, and Egyptology, Mesopotamian texts, etc. The central issue then is not with the existence of gods and creationism, but rather with the residual topics that modern science has not yet come to grips with, namely morality, life, death, love, purpose, continuity, etc., which still have more cogent answers in the older religious teachings.

In a sense, successful mental abandonment of the theory of creationism would simultaneous require the adoption of a new scientific explanation of life and death, in the sense of universal continuity, as a replacement for the older religious “promised land” theory of death and afterlife. This is a large part of what keeps the average person moving.

Due to this inadequacy of science, the theory of creationism is believed by a large percentage of the world; more than 72% of the world has an Abrahamic religious affiliation. In the United States, in fact, 60 percent of people (adjacent graph) favor some kind of belief in divine creation of humans over that of evolution of humans through physical and chemical means. [2]

Thermodynamics

The central thermodynamics topic found in the modern evolution creationism debate, which seems to be a popular pastime for many, is that concerning entropy, on the logic that entropy = disorder, that according to the second law “the entropy of the universe tends to a maximum”, that humans as ordered structures represent a exception to the rule of the second law, and that subsequently God must be responsible for this. Other types of first law arguments can be found as well, often used in big bang theory verses God bang theory discussions.

The difficultly involved in this issue, on both sides of the debate, is that no author as of yet had satisfactorily explained human existence and evolution in the context of Clausius' 1865 textbook *The Mechanical Theory of Heat*. There are a least a dozen refutation arguments in this direction, e.g. "humans represent local decreases of entropy at the expense of the greater increases of the surroundings" or "the earth is not a isolated system", etc., but these are all verbal regurgitations, having little mathematical basis.

Patterson

American engineering professor John Patterson, of note, famously gave handouts of various creationist claims about thermodynamics to his thermodynamics students to find the reason for the incorrectness of each statement as homework assignments. [4]

References

1. Morris, Henry. (1974). *The Troubled Waters of Evolution* (pgs. 110-11). Creation-Life Publishers.
2. (a) Miller, Jon D., Scott, Eugenie C., Okamoto, Shinji. (2006). "Public Acceptance of Evolution", *Science* 11, Aug. Vol. 313, pgs. 765-66.
(b) Anon. (2006). "Did Humans Evolve? Not Us, Say Americans", *The New York Times*, Aug. 16.
3. (a) Greenberg, Gary. (2002). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History.* Source Books.
(b) Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World.* Facts On File, Inc.
4. Patterson, John W. (2002). "Thermodynamics and the Supernatural: Some Comments on Walters' and Gordon's Replies in the Last issue." *Access Research Network*, Vol. 10, No.
6. Carl Wieland – Wikipedia.

Further reading

â— All Things Thermodynamics (audio podcast) – by Robert Lippens, an American physics student, on creationism and the second law.
â— Morris, Edward A. (2001). "Evolution and the Second Law of Thermodynamics", *Noble-Minded.org*, May 06.

External links

â— Creationism – Wikipedia.

θΔics

In rankings, **creationism scientists ranked by idiocy** is a ranking of scientists who believe in creationism, in any of its forms, who mix science and religious arguments together, to "create", no pun intended, published or stated idiocy.

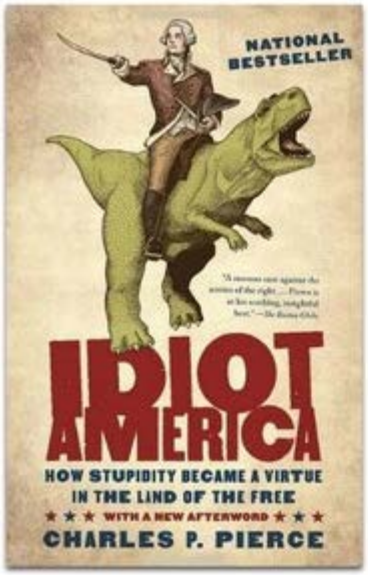

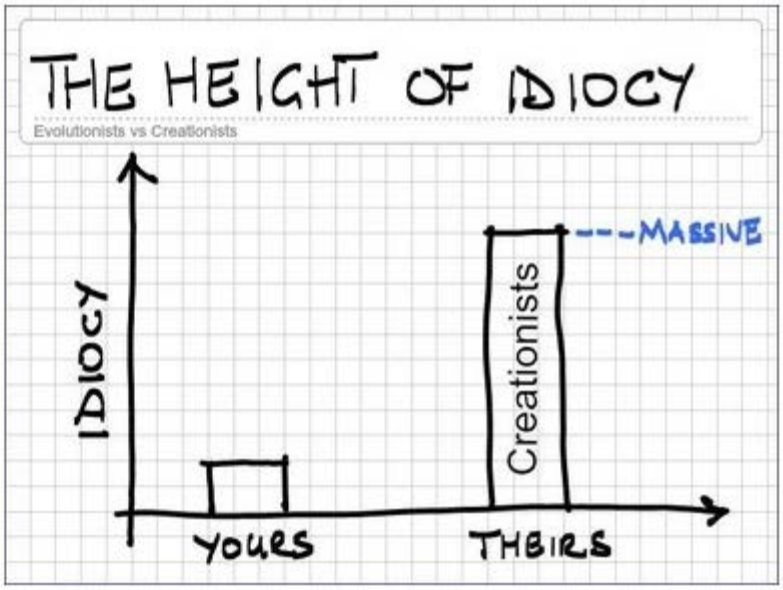

American investigative journalist Charles Pierce's 2009 *Idiot America: How Stupidity Became a Virtue in the Land of the Free*, depicting George Washington riding a dinosaur, is scathing raucous rant on the prevalence of ubiquitous idiocy and lunacy in America, largely surrounding creationism beliefs, using the Ken Ham's 2007-launched Creation Museum (Q) as a starting point, a discussion on how America as gone "marching backwards into the twenty-first century", as Pierce puts it. [6]

> "An intellectually honest 'Christian evolutionist', a term which itself is an oxymoron, has to check their brains at the church door."
>
> — William Provine (1988), "Scientists Face It! Science and Religion are Incompatible" [5]

> "Behe is an **IDiot**. It's the same thing as a creationist, only with a thin veneer of more lies coated over it in an attempt to come across as scientific."
>
> — Anon (2011), blogspot post on the works of Michael Behe (Q)

> "I lost 5 IQ points reading Strobel's book, which was nothing more than mindless propaganda."
>
> — Anon (2003), commentary on Lee Strobel's *The Case For Christ* (Q)

The term "idiocy", while not aiming to be derogatory or *ad hominem*, is used herein to refer to a scientist who (a) believes in the existence of god—knowing specifically that fewer than 5% of leading scientists currently believe in the existence of god—who created humans, earth, and or universe and (b) openly states, produces, and or publishes work arguing for "something notably stupid or foolish", in the Merriam-Webster Dictionary sense of the matter, in support of point (a).

Acronym | Links

The abbreviation: CIR:#, e.g. Michael Behe (CIR:1), short for "Creationist Idiocy Ranking", or IR:#, David Roemer IR:20, are existography hyperlink acronym shortcuts.

List

The following is the work in progress ranked listing of creationism scientists ranked by descending order of idiocy:

#	Creationist	Nickname	Reasoning/Description

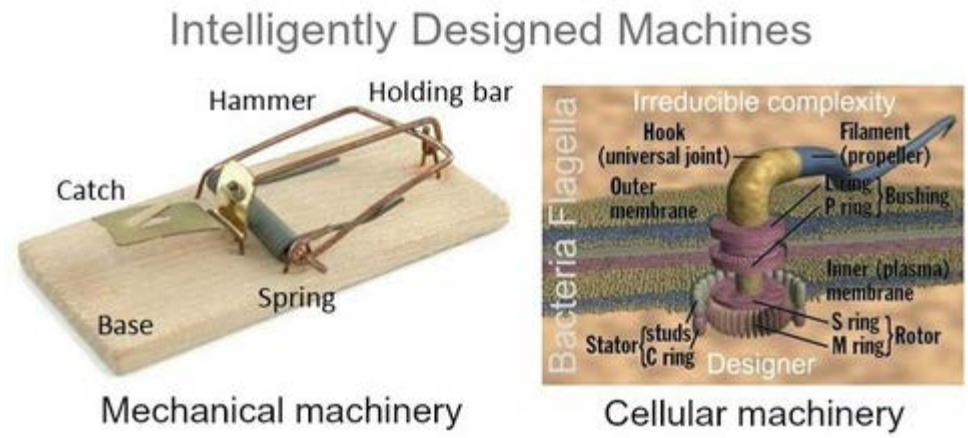

1.
Michael Behe (1952-) American biochemist

"an IDiot" (Q) "Irreducibly stupid" (Q) "Proven moron" (Q)

In EpicIdiot.com (Q); he takes the cake!; his biochemical arguments in *Darwin's Black Box*, make the head hurt more and more, with each turn of the page, they are so incorrect.

Behe, who keeps a mousetrap in his office, uses what he calls a "mousetrap analogy" to argue that if "mechanical" parts of the trap were "designed" than so to must have been the "mechanical" parts of the cell; the designer of the former a person, the designer of the latter god.

2.
Kent Hovind (1953-) American amateur scientist

"Krazy Kent" (Q)

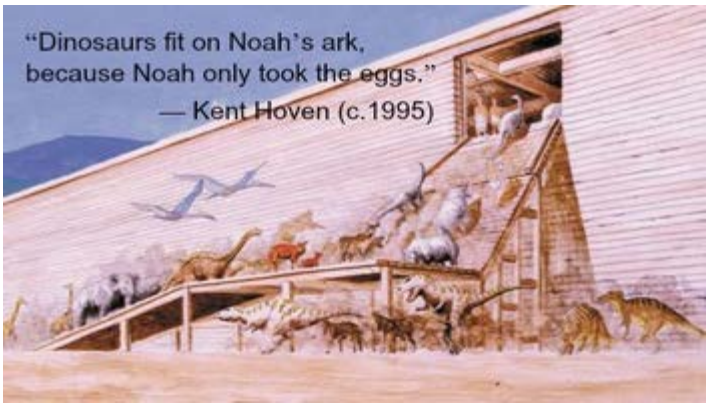

In EpicIdiot.com (Q);

"I was a high school science teacher for 15 years. I had become a Christian at age 16, and right away ran into the conflict between what I was taught in my science textbook and what I'm reading in the Bible, so I knew somebody was wrong."

— Kent Hoven (2000), Coast-to-Coast AM interview, Aug 2 (Q)

See: *Monkey Girl* (pg. 33); known as "Dr. Dino" because he said that dinosaurs fit on Noah's ark, because Noah only took the eggs with him.

3.
John Sanford (1950-) American plant geneticist

"Creatard idiot" (Q)

Believes that people used to live to the age of 900 as stated in the Bible and argues that God gave us the genome and that the second law of thermodynamics can be found by plotting the descendents of Noah vs. life-span of each descendent.

4. Henry Morris (1918-2006)

"Morris the moron" (Q)

Believes in the existence of Noah's ark (Q); his 1961 *The Genesis Flood* (1961), co-written with John Whitcomb, argues that geological theories do not truly depend on scientific data but are rather a "moral

American civil engineer

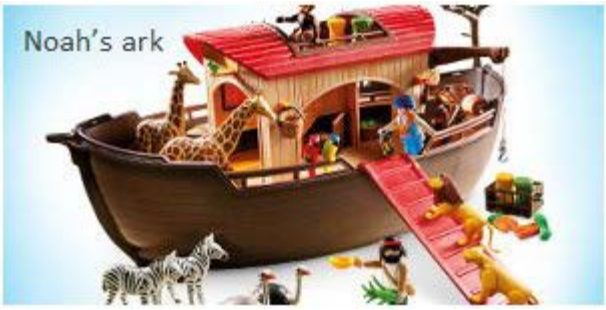

and emotional decision," in which evolutionists seek "intellectual justification for escape from personal responsibility to his Creator and escape from the 'way of the Cross' as the necessary and sufficient means of his personal redemption"; was eventually kicked out of Virginia Tech, in 1970, because his creationism writings were becoming "too controversial."

5.

William Dembski (1960-) American mathematician-theologian

"Dumbski Dembski" (Q)

In EpicIdiot.com (Q); stated, in his 2005 "A Reply to Henry Morris" that" (Q), that "ID is part of God's general revelation," and "I've found that it opens the path for people to come to Christ" (Q); see also: *Monkey Girl* (pgs. 288-89), 2007.

6.

Stephen Meyer (1958-) Philosopher physicist

"moron Mr. Meyer" (Q)

Described as the leader of the "Idiots at the Discovery Institute", conceived in 1994 over during a dinner conversation with George Gilder as "think tank opposed to materialism"; his 2013 *Darwin's Doubts* turned him into a "fumbling bumbling fool" (Q); has debated atheists:

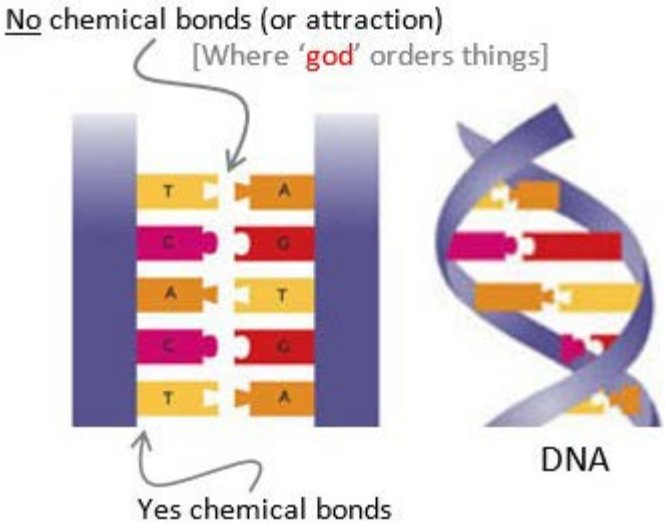

Peter Atkins, Eugenie Scott, and Michael Shermer; his Q&A dialogue, during his Lee Strobel (2004), is near on par with Michael Behe, in terms of "classic imbecility" of scientific distortion and reasoning—amid which he demurs that he is a basic a "William Paley" arguer in modern guise.

7.

Deepak Chopra (1947-) Indian-born American physician and new age author

"Blithering moron" (Q)

Uses

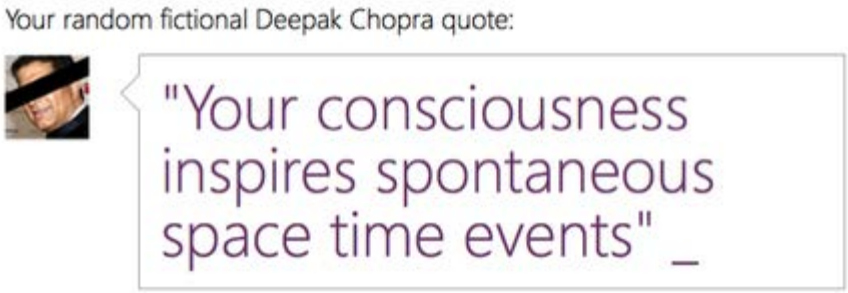

quantum mechanics to promote "woo woo physics" (Michael Shermer,

2010) quantum spirituality; spews out sentences like a typing monkey, as the random Chopra random quote generator (Q) evidences.

8. Ken Ham (1951-) Australian-born American philosopher

"Cuckoo Ken" (Q)

In 1980, he spearheaded the formation of Answers in Genesis, in Australia, to promote creation science, centered around the premise of Biblical inerrancy in the Book of Genesis; in 2007, built the Creation Museum, Petersburg, Kentucky, showing humans playing with dinosaurs, all conceptualized as coming off Noah's ark after the Biblical flood; in 2014, he debated Bill Nye the science guy, at the Creation Museum, the supreme loss by Nye being one of the goads to the initiation of Atheism Reviews.

9. David Menton (c.1937-) American anatomist

"American loon" (#270)

Guy behind the so-called "homology" exhibit at the Creation Museum (see: atheism timeline, 2007); contributed to the study of baraminology (Q), a god-friendly alternative to Linnaean taxonomy classification. Exhibit Description: (Q)

> "Dr. David Menton, biologist, talks about the similarities (known as homology) in the skeletons of vertebrates. While the biology is similar in many ways, the differences between man and any of the animals are obvious. Most importantly, God created man in His image and with the ability to communicate with Him by reading the Bible and talking to God in prayer."

10. Nickolas Dorfman (1941-) Russian-born American tumor immunologist

His *Was Mona Lisa Created by Physicochemical Reactions Alone?*, poses (pg. 33), that the trinity (father, son, and holy spirit) division of Christianity is representative of the science trinity or three "building blocks" of: protons, electrons, and radiation (or a soul); prior to this page 33, of his 91-page booklet, the margin notes: "stupid" (6), "what a mess" (1), "so stupid" (1), "retarted" (2), "very retarted" (5), "V.V.R" (1), abbreviation for "very very retarted", and "jumped off the boat" (1), numbers indicated the number of times that epitaph is employed, are written in the Thims personal copy; the book cites Bernard Haisch (#13) and his *The God Theory* (2006) (Q), but goes downhill from there.

11. Fred Wolf (1934-)

American loon (#421) Quantum kook (Q)

His *Taking the Quantum Leap* (1981) uses quantum mechanics to argue that "God's order appears to us as a principle of uncertainty", that we are "free to choose", but that we "cannot predict the results of our choices"; his dozen or so books thereafter venture off into new age kingdom, e.g. his *The Spiritual Universe: How Quantum Mechanics Proves the Existence of the Soul* (1996), argues that individual souls don't exist, but rather there is one cosmic soul which is mysteriously linked with the vacuum of space; American theoretical physicist Jack Sarfatti (1939-) claims (Q) that he and Wolf started the "new age physics" movement with the publication of their 1975 book *Space-Time and Beyond*, whose work was cited in Gary Zukav's 1979 *The Dancing Wu Li Masters: an Overview of the New Physics*. (Q)

Hugh

Runs Reasons.org; believes that while the earth is billions of years old, life

12. Ross (1945-) Canadian astrophysicist

"useful idiot" (Q)

did not appear by natural forces alone but that a supernatural agent formed different lifeforms in incremental (progressive) stages; asserts that the creation word "days" of Genesis, translated from the Hebrew word *yom*) are historic, distinct, and sequential, but not 24 hours in length nor equal in length, but rather interpretive to fit whatever scale one wants ; connected to Allan Sandage (#22) and Richard Smalley (#36).

13. Carl Wieland (c.1940-) Austrian physician

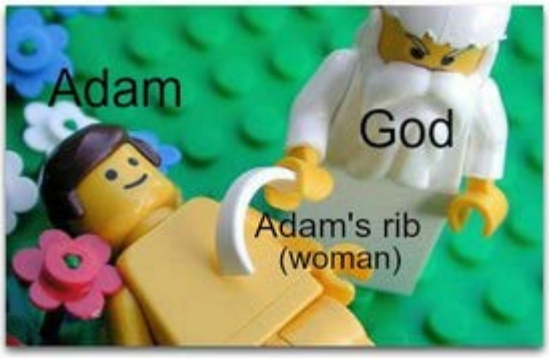

Runs Creation.com (aka Creation Ministries International) the parallel of Ken Ham, who runs AnswersInGenesis.org, the two once united; believes (Q) that Eve was physically generated from Adam's rib, because his surgeon told him: "we leave the periosteum intact, so the rib usually just grows right back again", while taking bones from his ribs to re-construct his face, following a car accident; has given a talk on second law, miracles, and laws of nature. (Q)

14. Michael Denton (1943-) British-Australian biochemist

"Knowledgeable IDiot" (Q)

His *Evolution: a Theory in Crisis* (1985) was inspiration to Michael Behe (#1). [2]

15. Grady McMurtry (c.1958-)

American loon #1981 (Q)

American Christian apologist;

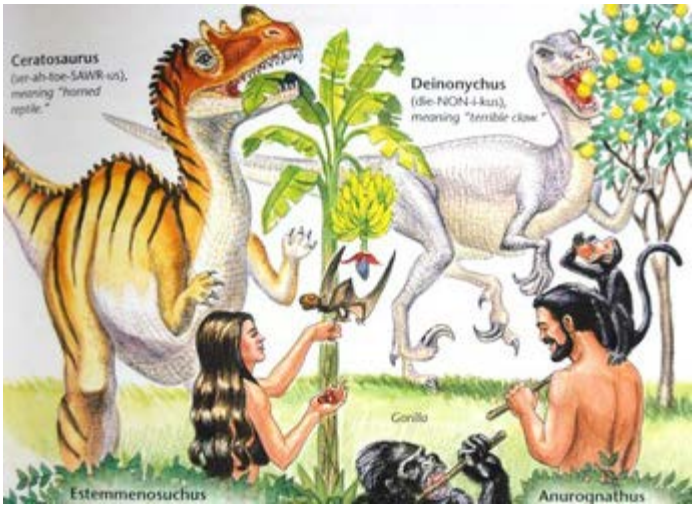

"People should not be surprised when mass shootings occur, such as the one on the Blacksburg university campus on Monday. And at Virginia Tech, what do we have? We have a person who, unfortunately, thought that humans had no more value than cats and dogs — and unfortunately, I think, probably felt the same way about themselves. And so what happens? If we are nothing but thinking animals, [and] if you have excess people, then you can just put them in a bag, throw them in the river the way you would too many kittens or too many puppies."

— Grady McMurtry (2007) (Q)

a former evolutionist (20-years) and theistic evolutionist (1.5-years) and now a biblical creationist (35+ years) (Q); has a BS in agriculture (forestry),

			and MS in in environmental science, and a DD in theology (Q); tweets (2018) (Q)(Q) that he is a “distinguished biblical scientist” with an IQ of 218; believes (Q) that dinosaurs and people lived together in the recent past; discusses in video (Q) his belief in Noah’s flood.
16.	Jonathan Wells (1942-)	“Loony IDiot” (Q)	His 1994 PhD molecular and cellular biology, completed at UC Berkeley, was funded by Sun Myung Moon’s Unification Church, with the expressed aim to learn how to “destroy Darwinism”; some of which resulted in his *Icons of Evolution* (2000), wherein his main destruction technique is to attempt to discredit the Miller-Urey experiment by arguing that they used the wrong gases, therefore god is the correct solution; in 2004 was working at the Discovery Institute. [8]
17.	Bjorn Sponberg (1976-) Norwegian geneticist		Your basic lightweight Internet quack "god head" sideliner; thinks that Jesus Christ was a real person; that the Bible discussion about the lake of fire have something to do with thermodynamics, etc.; popped up in Hmolpedia threads promoting views (c.2014).
18.	Bernard Haisch (c.1950-)		Astrophysicist and former editor of *Astrophysical Journal*; his *The God Theory: Universes, Zero-Point Fields, and What’s Behind it All* (2006), is cited by Nikolas Dorfman (2008), employs double ontic opening arguments, e.g. “the Heisenberg principle mandates that all of space must be filled with zero-point energy” [hence] “living consciousness is the offspring of God, temporarily living in the realm of matter … we are immortal spiritual beings”.
19.	Mirza Beg (1932-) Indian-born Pakistani organometallic chemist	“Babbling baboon” (Q)	Believes in the existence of Allah, Muhammad, and his superluminal "flying horse" (Q); believes: (a) that physicochemical principles govern human interactions and reactions but also believes that (b) “it is only those who do not believe in the doomsday and the life after death that are the disciples of Satan and are bent on consuming for the so called development.” [1]
20.	Chandra Wickramasinghe (1939-) Sri Lankan-born British astrobiologist		A student and collaborator of Fred Hoyle whom with promoted panspermia; in 1974 they proposed the hypothesis that some dust in interstellar space was largely organic; in McLean vs Arkansas (1981), was the sole scientist who testified in defense of teaching creation science in public schools, alongside evolution, single scientist testifying for the defense of creationism, per the panspermia hypothesis of "the possibility of high intelligence in the universe and of many increasing levels of intelligence converging toward a god as an ideal limit." (Q)
21.	William Craig (1949-) American philosopher	“well-spoken idiot” (Q)	e.g. Boltzmann brains, thermodynamics arguments, relativity as ontic opening, etc. (Q)

22.
Francis Collins (1950-) American geneticist

"Lightweight dufus" (Q)

Described by Paul Myers (2009) as a "lovable dufus" when it comes to issues of religion and some scientific principles (Q); as head of NIH, banned US stem cell research because he believed that stem cells have souls put into them by god; as described in his 2006 book *The Language of God: A Scientist Presents Evidence for Belief*, that after evolution had prepared a sufficiently advanced "brain", that at some point God gifted humanity with the knowledge of good and evil, what he calls the "moral law", with free will, and an immortal soul, and that some humans use their free will to break the moral law, leading to an estrangement from God, for which Jesus is the solution. [6] When pressed about the scientific details of his belief in soul and resurrection, according to Sam Harris (Q), he deflects the question to consultation of English theoretical physicist and priest John Polkinghorne and English bishop N.T. Wright, whose work, according to Harris is "pure madness, a bizarre conflation, a word salad".

23.
Allan Sandage (1926-2010) American astronomer

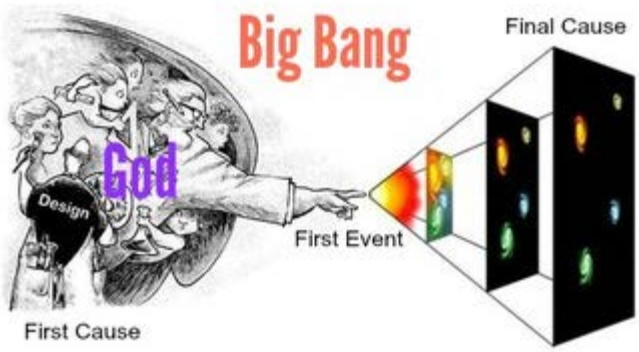

Of Jewish ethnicity; a virtual atheist as a child; came out in 1985, at age 50, during a conference on science and religion, as a Christian, telling the audience that the big bang was a supernatural event, that science had taking us to the "first event", but it could not take us further to the "first cause", i.e. the sudden emergence of matter, space, time, and energy, which pointed the need for some kind of transcendence; in 1998, he told a reporter: "It is only through the supernatural that I can understand the mystery of existence." [9] Thinks science and religion are not in conflict. (Q)

24.
John Polkinghorne (1930-) English physicist and priest

His acceptance of the Templeton Prize is cited by Martinus Veltman (2003) as someone able to "bridge the gap between sense and nonsense"; cited (Q) in the oxymoronically entitled 2006 book: *The Complete Idiot's Guide to Understanding Intelligent Design*; his views are described by Sam Harris as: "pure madness, a bizarre conflation, a word salad".

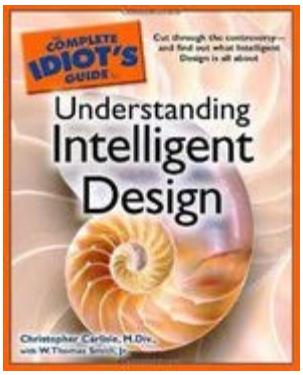

25.
Gordon Wylen (1920-) is an American mechanical engineer

The 1973 edition of his *Fundamentals of Classical Thermodynamics*, co-authored with American mechanical engineer Richard Sonntag (1933-2010), wherein he states that the second law is "man's description of the prior and continuing work of a creator", has become a citation classic by creationists, and idol for other creationist thermodynamicist authors, e.g. see: Gilbert Wedekind (#20) and his 2003 *Spiritual Entropy* (pg. 148).

David

An agnostic leaning towards believer; author: *The Devil's Delusion:*

26. Berlinski (1942-) American philosopher and mathematician

Atheism and Its Scientific Pretensions (2008); Berlinski, along with fellow Discovery Institute associates Michael Behe and William Dembski, tutored Ann Coulter on science and evolution for her book *Godless: The Church of Liberalism* (2006); Gives arguments against evolution (Q) and atheism (Q)

27. David Roemer (c.1942-) American physicist

"Creationist crank" (Q)

Mailed his US senator Kirsten Gillibrand to American physicist Daniel Styer's 2008 article "Entropy and Evolution" retracted from the *American Journal of Physics*, because of its "absurd" assertion that second law applies to biological evolution, hence contradicting the Bible ideology that the tendency to disorder views of the second law is proof of God's handwork in ordering human evolutionarily.

28. Gerald Schroeder (c.1937-)

A 2008 "Moron of the month" at Creationist Idiocy blogspot (Q); Quote (2005): "several people have said *The Science of God* (1997) is completely unconvincing [because] reason #3: the author is an idiot" (Q); Quote (2011): "Today's crackpot is Gerald Schroeder. " (Q)

29. Dean Kenyon (c.1939-) American biophysicist

His *Biochemical Predestination* (1969), supposedly, parlayed Jacques Monod's so-labeled "conceptual dichotomy between chance and necessity", into a "necessity = predestination" ideology, according to which the "creator" is behind the predestination ; cited (Q) in *Idiot America* (2009), is the idiot who, after losing the "creationism = science" argument, in the Edwards v. Aguillard (1987) case, went through *Panda's and People*, with a software editor and simply replaced "creation" and "creationist" with "intelligent design" and "design proponent"; a key piece of testimony that was uncovered by philosopher and anti Discovery Institute activist Barbara Forrest during the Kitzmiller vs Dover (2005) trial; following which both "creationism" and intelligent design" were legally defined as non-scientific and religion-based.

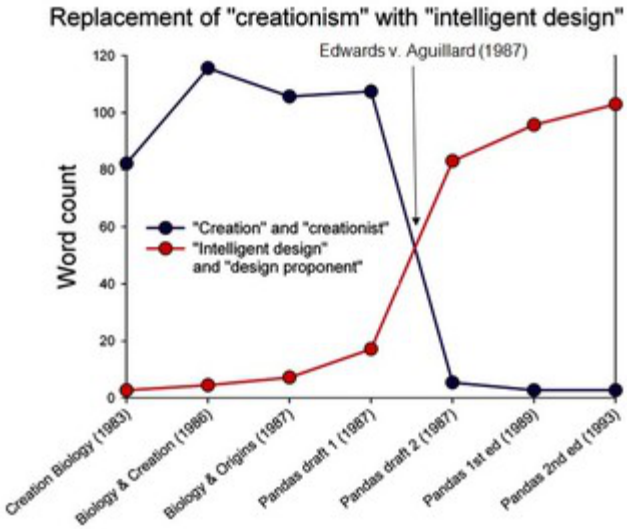

30. Gilbert Wedekind (1946-) American thermodynamicist

A thermodynamics professor who believes that entropy is spiritual and wrote a book on this.

31. Adrian Hough (c.1958-) English

His his 2010 *The Flaw in the Universe* attempts to explain both sin and natural disaster in terms of the second law

	physical chemist and priest		
32.	Christopher Langan (1952-) American autodidact	"American loon" (#226)	He's a crank who objects (Q) to being called a "crank" or "crackpot"; promotes what he calls a "theory model", a terminology redundancy, which he further confabulates into the acronym CTMU, which he repeats ad nauseum, to argue that the Boolean algebra work of George Boole explains everything, including God. His "An Introduction to Mathematical Metaphysics" (2017) (Q) uses Sokal affair stylized language to argue for teleological-based "self-theories" (a violation of the principle of inertia) of the universe.
33.	Ian Hutchinson (1951-) Plasma physicist and engineer		Advocates for Christianity in debate (15:45); in 2013 debate with Lawrence Krauss and Michael Shermer, argues for miracles in physics terms (Q).
34.	Emmett Williams (c.1935-)		Published: *Physical Science for Christian Schools* (1974), *Chemistry for Christian Schools* (1978), and edited *Thermodynamics and the Development of the Order* (1981).
35.	DMR Sekhar (1952-) Indian chemical engineer		Developed a concept (2007) called "genopsych" (or genpsy), a contraction of gene + psyche, which he believes is god or a part of god, inside of humans, that counters entropy, giving humans self-drive or self-motion, acting to evolve humans to their present form.
36.	Granville Sewell (c.1944-) American mathematician		As stated in his "A Mathematician's View of Evolution" (2000), began working with Michael Behe in 1997, suggesting that mathematics, physics, and computer science could facilitate his "irreducible complexity" theory, and cites people, such as George Simpson ("The History of Life", 1960) and Francis Hitchens (*The Neck of the Giraffe: Where Darwin Went Wrong*, 1982) to argue that gaps exist in fossil records therefore god exists.
37.	Arno Penzias (1933-) German-born American physicist		Thinks his CMB radiation data, which supports big bang theory, fits the "predictions" found in the first five books of Moses; thinks the Jews were the chosen people, etc. 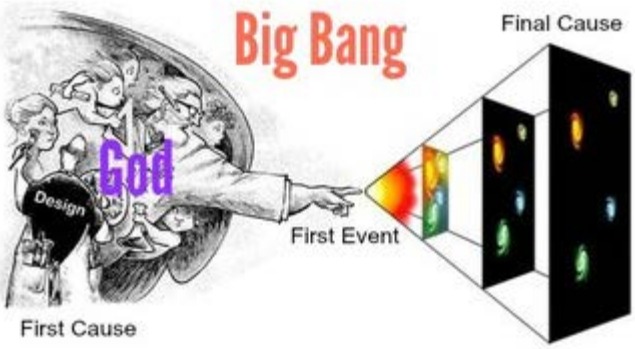
38.	Robert E. Clark (1906-1984) British organic chemist		
	Richard Smalley		He "pulled a Neumann", so to say, see: Neumann on god, in his last two

39.	(1943-2005) American chemist and physicist	years of existence, while dying (dereacting) from Leukemia, joined the cause
40.	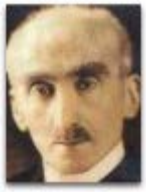 Henri Bergson (1858-1941) French philosopher	Curator of thermodynamic-themed "creative evolution" theory (1907); not necessarily idiot, but embedded or rather riddled with coded error.
41.	Alister McGrath (1953-) English chemist and molecular biochemist	A chemistry, molecular biochemistry, turned theologian; has debated Richard Dawkins, Christopher Hitchens; and given talks such as “The Bankruptcy of Scientific Atheism” (2015). (O)
42.	Stuart Kauffman (1939-) American physician and biochemist	Not necessarily idiot (actually the last of the sharp ontic opening theorists), but embedded or rather riddled with coded error.
43.	Pierre Teilhard (1881-1995) French priest and physical chemist	Very sharp guy, whose theories boarder on reality, albeit slightly slanted towards religious patching.
44.	Edwin Slosson (1865-1929) American religion	Fairly sharp ideologies; his belief system consisted of the core belief that "God's willings are the immutable laws of nature".

reconciling chemist

Ilya

45. Prigogine (1917-2003) Russian-born Belgian chemist and thermodynamicist

A self-defined Jewish scientist; his views are a bit camouflaged by nonequilibrium thermodynamics, are a modified Pierre Teilhard bifurcation-divided omega point theory, a god-guided automaton universe, as he says in his 1983 Omni magazine interview with Robert Tucker (Q), wherein we approach increased spirituality up to each new bifurcation.

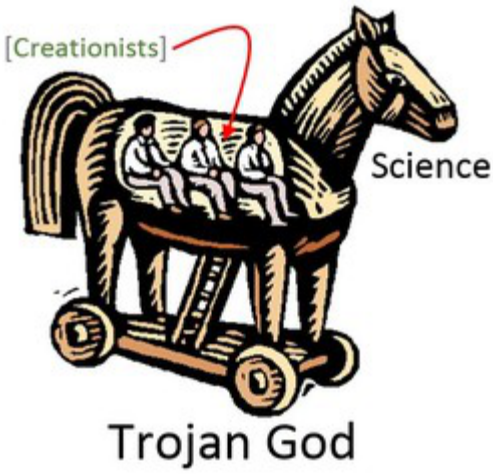

Prigogine's theory, in short, is a thermodynamics-masquerading Trojan horse, with Henri Bergson's creative evolution inside, thereby letting "spirituality" into the house of science.

John

46. Neumann (1903-1957) Hungarian-born American

Was a joking secular non-practicing Jewish-Christian agnostic throughout his existence, but during his last last 18-months dereacting (dying) from cancer, was begging for a priest so he could take Pascal's wager (see: Neumann on god), because he couldn't figure out if god existed or not, and was terrified of non-existence; not necessarily overtly idiotic, but in an era (1950s) when some 85 to 90 percent of the world's leading scientists (see: plot below) no longer believed in the existence of god, this would seem to be a glaring oversight for the supposed world's last contender for title of the "last of the last universal geniuses"?

Adds | Possible

The following are possible religious-minded scientists in need of idiocy ranking :

- Charles Wynn (1939-) | American chemical engineer and organic chemist
- Brad Harrub (c.1970-) (see: Rennie creationism fiasco)
- Bert Thompson (c.1960-) | AL#1203 (Q) (see: Rennie creationism fiasco)

(add discussion)

Religious IQ

The term "idiocy", employed herein is

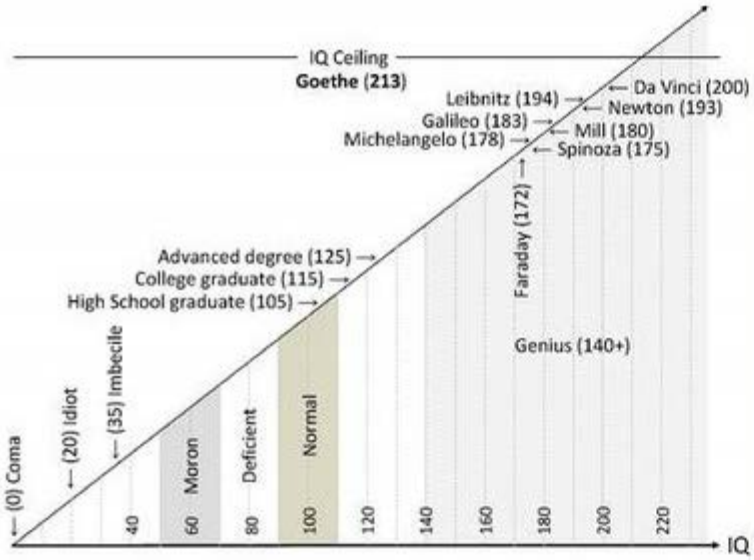

A general range IQ scale, according to which "**idiots**" are classified as having an IQ of 20 in general intelligence; someone, scientists in particular, likewise, who makes belief system statements comprised of idiotic logic has a "religious IQ" in the 20-point range.

used in the reference not necessarily to one's "general" IQ, on the 100 = average (normal) scale, a modern 21st century person may very well be a Harvard-educated Christian, but specifically with reference to one's "religious IQ", the term religion employed herein—nor necessarily per the notion of "Religious IQ" as 2010 Pew researchers define the term, based on a 32-question quiz (Q), e.g. "when does the Jewish Sabbath begin?" (Fri, Sat, or Sun) or "what is Ramadan? (Hindu festival, Jewish day, or Islamic month), etc.—but rather in the etymological sense of the Latin -*ligare* "to bind" meaning the belief system or belief state that binds a person to an ideology or group of people in possession of similar ideologies:

according to which one's actions are guided or in "restrained, tied back", in the sense of *religare*, i.e. beliefs one relies on, wherein IQ_R = 100 equates to average (or normal). Hence, someone such as Benedict Spinoza, in whose *Ethics* very few if any at all "idiotic" arguments can be found, cited with a general Cox-Buzan IQ of 175, also has a very high "religious IQ". Conversely, however, when one is a science-educated Christian, Muslim, or Hindu there is occurs a collision in the mind of the recipient of two competing and incongruent belief systems, whereby, often times, amendment, reconciliation, or two belief system patching is attempted, ripe statements of idiocy quickly tend to arise, according to which one's religious IQ falls into the "idiocy" (IQ=20) category range. A physical science trained scientist who, e.g. believes in both speed of light traveling flying horses and the theory of relativity, simultaneously, becomes an "idiot", pure and simple, being that the former idea is impossible under implications of the latter.

Rosetta stone | Turning point

With fewer than 5% of leading scientists believing in the

existence of god, shown adjacent, scientists who go against the grain and argue for a theory considered defunct by 95 percent of modern scientific thinkers, idiocy is sure to sprout. There was, however, a time when this was not so. Isaac Newton, e.g., was a believe in the existence of god.

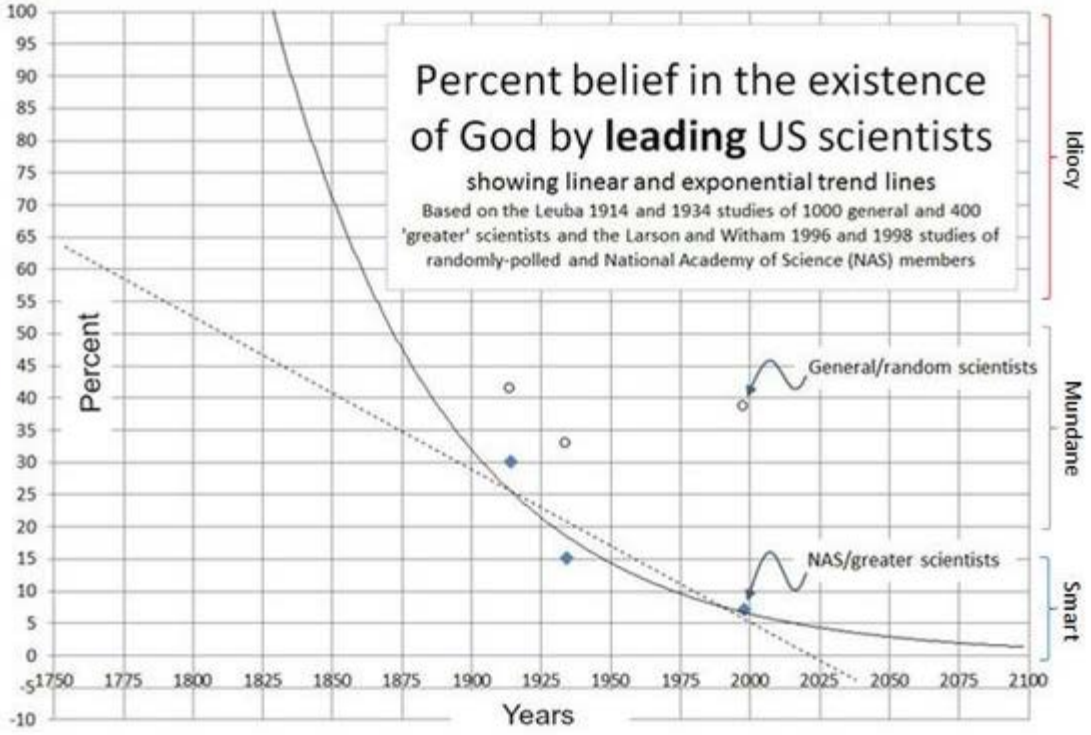

A graph showing the trend lines for **belief in the existence of god by scientists**, both general or randomly polled US **scientists** (o) and 'greater' or National Academy of Science (NAS) member scientists (♦), based on the James Leuba (1912,1924) studies and the Edward Larson and Larry Witham (1996,1998) studies, of over 3,000+ American scientists combined. [3]

As to when the turning point or tipping point occurred, the adjacent graph indicates that the point at which the switch from leading scientists believing in god being a majority to a minority, i.e. the 50% belief view, occurred in the period 1812 to 1870.

The years 1814 to 1818, in which English polyintellect Thomas Young (IQ=200), a devout Quaker, by religion—who, for the most part, remained private about his faith—began to translate the Rosetta Stone, the key to Egyptian origin to seventy-two percent of all modern religions, might well be the demarcation point in which true scientist would seemingly need to begin to come to grips with the foundations his or her faith, as far as existing knowledge allows or be left with one of two options: (a) remain private about one's own faith or (b) speak out about one's faith in the face of both growing scientific knowledge and understanding about natural phenomena and the mythological basis of Egyptian origins to the world's modern religions. [4] It is in option (b), particularly into the 20th century, wherein one begins to find idiocy in argued opinion among so-called "scientists", albeit not "real scientists", as Peter Atkins (1997) sees things, quote below on results of adjacent data set: [5]

> "You clearly can be a scientist and have religious beliefs. But I don't think you can be a real scientist in the deepest sense of the word because they are such alien categories of knowledge."

Young, in short, was a genius par excellence, yet he never published not stated any "idiocy" regarding his faith; though, to note, he did publically cease to be a Quaker in his mid-twenties, marry a non-Quaker, and later began to regard himself as a member of the Church of England in adulthood. [3] In this scenario, owing to the taciturn philosophy of Young, in regards to his religious opinion, it is very difficult to find any citation referring to Thomas Young as an "idiot".

When, conversely, a modern scientist, or semi-modern, e.g. William Thomson (c.1905), follows the path of option

(b), statements to the effect of near-idiocy may accrue:

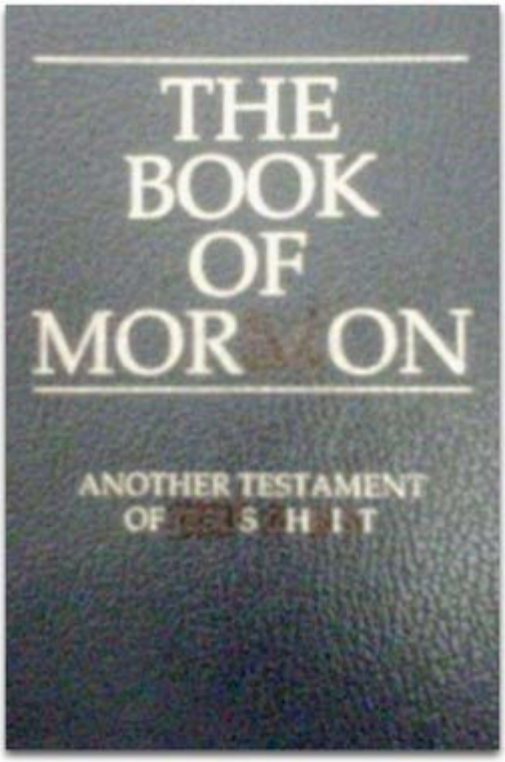

Left: the Big Valley Creation Science Museum (Q) opened in 2007 in Big Valley, Alberta, Canada, to promote "creation science" (or creationism science), i.e. idiocy, e.g. trying to explain why dinosaurs weren't mentioned in the Bible. Right: *The Book of Moron* (Q) one of the good books in the library of the creationist scientist.

> "Mathematics and dynamics fail us when we contemplate the earth, fitted for life but lifeless, and try to imagine the commencement of life upon it. This certainly did not take place by any action of chemistry, or electricity, or crystalline grouping of molecules under the influence of force, or by any possible kind of fortuitous concourse of atoms. We must pause, face to face with the mystery and miracle of creation of living creatures."

While not completely "idiotic", Thomson does chalk off the issue to the hands of god and miracles. In any event, into the mid 20th century and going forward is where some of the more idiotic publications are found, the idiocy of which tends to increase in reciprocal proportion to disbelief in god by leading scientists.

Quotes

The following are related quotes:

> "Religion is so absurd that it comes close to **imbecility**."
>
> — Henry Mencken (1930), "Treatise on the Gods"

> "Who exactly are these 'smart people' you speak of still advocating god? I happen to be on page 220 of Stuart Kauffman's 2008 *Reinventing the Sacred*, and I have written the terms: **idiot**, moron, stupid, garbage, retarded, etc., in the margins over several dozen times so far. The worst of all of them is Michael Behe, and Kauffman is not far off."
>
> — Libb Thims (2010), post #9 reply to "Whoever wrote the 'God' section" thread, Nov 27 (Q)

> "And you know, I get a lot of grief out there. People say, 'How can you be a scientist and believe that god

created the earth? Obviously, you know [they say] we developed from a puddle of promiscuous biochemicals. And if you believe in anything other than that, you're a **moron**.' I don't criticize them. I say, 'Can you tell me how something came from nothing?' And of course they can't. They say 'well, we don't understand everything.' I say 'ok, no problem'. 'I'm just going to give you that there's something'. And now you're going to tell me there's a big bang, and it comes into perfect order? So that we can predict seventy-years hence when a comet is coming, that kind of precision. And they say, 'Well, yeah.' And I say, 'But don't you also believe in entropy, that things move toward a state of disorganization?' [they say] 'Well yah'. [I say] 'So how does that work? "And they say, 'We don't understand everything.' And I said 'I'm not sure you understand anything! ' But, I said, 'I'm not going to be critical of you, not a problem. You're entitled to believe what you believe, even though it requires a lot more faith than what I believe. But everybody believe what you want to believe."

— Ben Carson (2015), campaign speech (Q) (V:0:08-1:42), Liberty University, Nov 11; in 6 Oct 2015 Carson commented (Q), on *The View*, how some of the people he talked to about this evolution question included Nobel laureates; and in 2011, he was in a theist debate team (Q) with Francis Collins against atheists Richard Dawkins and Daniel Dennett

References

1. Beg, Mirza. (c.2014). "Population Growth No Constraint to Development" (Q), Academia.edu.
2. Humes, Edward. (2007). *Monkey Girl: Evolution, Education, Religion, and the Battle for America's Soul* (pg. 129). Harper Perennial.
3. (a) Leuba, James H. (1916). *The Belief in God and Immortality: A Psycholgical, Anthropolgical and Statistical Study*. Sherman, French & Co.
(b) Leuba, James H. (1933). "Religious Beliefs of American Scientists," *Harper's Magazine*, 169, 291-300.
(c) James H. Leuba – Wikipedia.
4. Graves, Dan. (1996). *Scientists of Faith: Forty-Eight Scientists and Their Christian Faiths* (§24: Thomas Young, pgs. 91-93). Kregel Resources.
5. (a) Atkins, Peter. (1997). "Comment", in: "Article" (Highfield, R.), *The Daily Telegraph* (pg. 3), Apr 3.
(b) Larson, Edward J. and Witham, Larry. (1998). "Leading Scientists Still Reject God", *Nature*, 394:313, Jul 23.
6. Harris, Sam. (2010). *The Moral Landscape: How Science Can Determine Moral Values* (pgs. 160-173). Free Press.
7. (a) Provine, William. (1988). "Scientists Face It! Science and Religion are Incompatible", *The Scientist*, 2.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 27). Zondervan, 2009.
8. Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (Wells, pg. 45). Zondervan, 2009.
9. (a) Begley, Sharon. (1998). "Science Finds God", *Newsweek*, Jul 20.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 84). Zondervan, 2009.

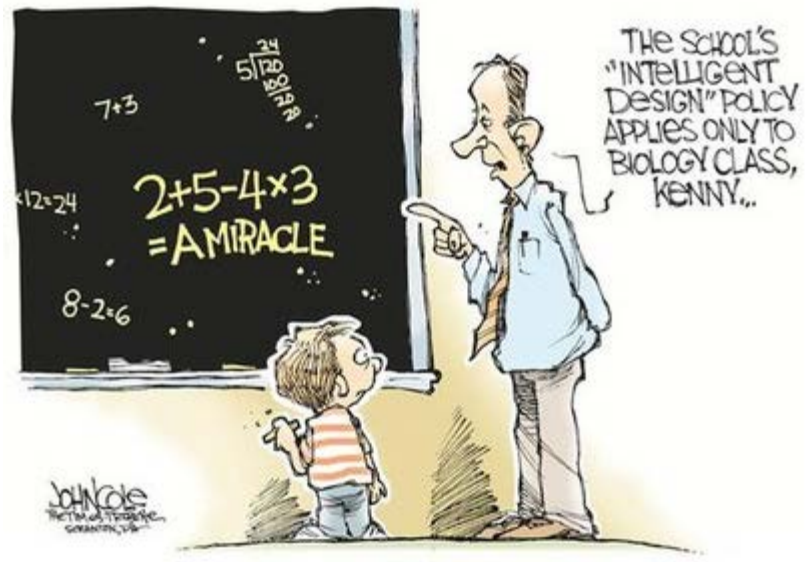

A cartoon showing the **idiocy** of belief in miracles and intelligent design.

External links

- List of creationist scientists – Creation.com.
- Main (2009) – CreationistIdiocy.Blogspot.com.

θΔics

In hmolscience, **creationist thermodynamicist**, an oxymoron, is a thermodynamicist who believes that people were "created" by god (a creator) and or that the the laws of thermodynamics are god's laws and or god's will at work in human affairs, among other variants; someone with conflicting set of beliefs.

List

The following are thermodynamics professors who believe in creation, i.e. that they were created by god:

1.	James Joule (1818-1889) English physicist	1843	He believed that his numerous experiments on the calculation of the mechanical equivalent of heat, e.g. his Niagara falls honey moon trip temperature measurements, were the means to justify the validity of the descriptions of churning of water as described in creation of the world according Genesis; he even lectured in churches on this.
2.	William Thomson (1824-1907) Irish-born Scottish physicist-mathematician	1852	In 1852, stylized the second law around discussion of "vegetable life" and the "will of animate creators"; in 1862, was arguing against Darwin's evolution theory; by 1897, he was arguing for all sorts of religion explicit ideas (see: Thomson on religion).
3.	Mehdi Bazargan (1907-1995) Iranian mechanical engineer and thermodynamicist	1942	Wrote on "The Thermodynamics of Love" (c.1942), *Labor in Islam* (1946), wrote a chapter on physiological thermodynamics of human labor in the context of will power, *Human Thermodynamics* (1956), wherein he used a thermodynamics-based framework, conceptualized as "Allah's will based", in particular Helmholtz free energy equation (adjacent) to explain Islam, work, death, desire, love, and reincarnation scientifically.
4.	Gordon Van Wylen (1920-) American mechanical engineer	1959	His *Fundamentals of Classical Thermodynamics*, included an unusual, to-common-practice, paragraph, wherein he cites the laws of thermodynamics as being man's description of god's continuing work.
5.	Frederick Rossini (1899-1990) American chemical thermodynamicist	1971	Was a devout Catholic who, like Mirza Beg (Allah's will based), believed that chemical thermodynamics and physical chemistry described human social interactions, but that this was god working through his laws:

> "The point of all of this is that our creator has fashioned laws that are deep seated and broadly applicable, that science is heavily intertwined in our everyday life, frequently without our realization, that we need to break down the compartmentalization of knowledge, that we need to work for a unification of learning, and that we need to understand better the meaning and purpose of life."
>
> — Frederick Rossini (1971), "Chemical Thermodynamics in the Real World" [1]

	Mirza Beg (1932) Pakistani		is *New Dimensions in Sociology: a Physico-Chemical Approach to Human*

6.	organometallic chemist	1987	*Behavior*, outlines the subject of "physicochemical sociology" via chemical thermodynamics, conceived as the Allah's will based.
7.	Nedjeljka Petric (c.1941-) Croatian chemical engineer and thermodynamicist	1991	✝Published "Application of the Thermodynamic Theory to Social Events", in the *International Review of Modern Sociology*, wherein she argues, similar to Rossini, that entropy, as defined by the Boltzmann equation, is interpreted not as disorder but as freedom of individuals; this was followed by the publication of three more articles, over the next three years, in which she tries to explain the "spiritual condition" of a person, albeit mostly in a rather overt ontic opening theory manner, replete with attempts to side God, Jesus Christ, and Bible themed views.
8.	Andrew McIntosh (c.1950-) English thermodynamics professor	1999	✝Believes that thermodynamics applies to human interactions, but uses a double ontic opening (information + teleonomy) to allow the work of god into the picture.
9.	Juliana Goates (c.1953-) American physical chemist and chemical thermodynamicist	2000	✝Posted on the door to Boerio-Goates' office is the eighth verse from Micah, chapter 6: "And what does the Lord require of you but to do justly and to love mercy and to walk humbly with your god?" — Bible (100AD), Micah 6:8 (Ñº), posted above Juliana Goates' office door (compare: Johannes Wislicenus) The verse is there, she says, because "that's how I view things and how I remind myself what I think is important." In 2001 Boerio-Goates contributed a chapter to the book Finding God at BYU. Her essay, "A Catholic Rediscovers God," describes how being a minority in the constant company of Latter-day Saint colleagues, students, and neighbors compelled her to examine her own religion more closely and recommit herself to it. In her physical science class, she makes an announcement in the first lecture about her deep Catholic faith, which is typically greeted with an audible gasp. Her studies of chemistry and thermodynamics, supposedly, have instilled in her the belief that the universe has been under the operation of a "divine Creator with an intellect".
10.	Gilbert Wedekind (c.1946-) American thermodynamics professor, engineer, and pastor	2003	✝His book *Spiritual Entropy* attempts to explain what the second law has to say about the social, moral, and spiritual realms; he seems to advocate both creationism and intelligent design.

11.	DMR Sekhar (1952-) Indian chemical engineer and mineral engineer	2006	ॐUses his theory of "genopsych", an entropy antonym, to argue for god inside of genes model of self-motion (or self-drive) theory.

(add discussion)

Quotes

The following are related quotes:

> "The point of all of this is that our creator has fashioned laws that are deep seated and broadly applicable, that science is heavily intertwined in our everyday life, frequently without our realization, that we need to break down the compartmentalization of knowledge, that we need to work for a unification of learning, and that we need to understand better the meaning and purpose of life."
>
> — Frederick Rossini (1971), "Chemical Thermodynamics in the Real World" [1]

References

1. Rossini, Frederick D. (1971). "Chemical Thermodynamics in the Real World" (abs) (pdf), Priestley Medal Address, delivered Mar 29 at the national American Chemical Society meeting, Los Angeles, California; in: *Chemical Engineering News*, April 5, *49* (14): 50-53.

θΔics

In existographies, **Critias** (c.460-403BC) (CR:13) (FA:6) was a Greek politician and philosopher, an associate of Socrates, noted for his atheism views, the Critias hypothesis in particular.

Quotes | On

The following are Critias-related quotes:

> "Critias seems to be from the ranks of the atheists when he says that the lawgivers of ancient times invented god as a kind of overseer of the right and wrong actions of men. Their purpose was to prevent anyone from wronging his neighbors secretly, as he would incur the risk of vengeance at the hands of the gods."
>
> — Sextus Empiricus (c.200AD) (Ñº); outline of the Critias hypothesis

Further reading

â— Sutton, Dana. (1981). "Critias and Atheism" (Ñº), *The Classical Quarterly*, 31(1):33-38.

External links

â— Critias – Wikipedia.

θΔics

In atheism, **Critias hypothesis** (CR:5) is the assertion that gods (and god) are an invention of lawgivers of ancient times, a theoretical tool employed as a kind of overseer of the right and wrong actions of men.

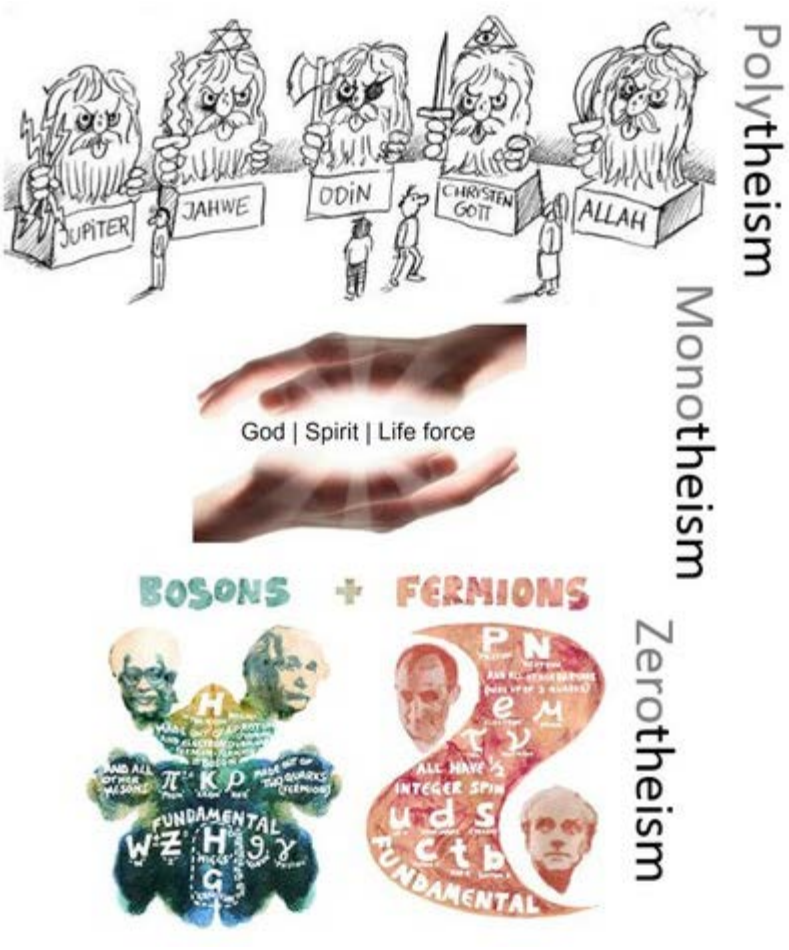

A depiction of the **Critias hypothesis** reductionism god disproof, namely the logical progression from polytheism, to monotheism—which in modern terms (Ñº) equates to belief in personal god, god, spirit, or life force—to zerotheism, i.e. belief in fermions, bosons, and "zero" gods (no gods), as Paul Dirac (1927), below right (Ñº), saw things.

Overview

The Critias hypothesis god reductionism to zero disproof, one of the top ten god disproofs, is the following logic:

> **Polytheism**, i.e. belief in multiple gods, according to Greek philosopher Critias (c.410BC), was an invention of lawgivers of ancient times employed to justify social laws:
>
> > "Critias seems to be from the ranks of the atheists when he says that the lawgivers of ancient times invented god as a kind of overseer of the right and wrong actions of men. Their purpose was to prevent anyone from wronging his neighbors secretly, as he would incur the risk of vengeance at the hands of the gods."
> >
> > — Sextus Empiricus (c.200AD) (Ñº)

(add discussion)

Critias reductionism

The Critias hypothesis conjoined to the untenability of polytheism as per the inconsistent logic of having differing governing principles and laws in different provinces, as the universe would see things:

> "As I try to discern the origin of that conviction, I seem to find it in a basic notion discovered 2,000 or 3,000 years ago, and enunciated first in the western world by the ancient Hebrews: namely that the universe is governed by a single god, and is not the product of the whims of many gods, each governing its own province according to his own laws. This monotheistic view seems to be the historical foundation for modern science."
>
> — Melvin Calvin (1969), *Chemical Evolution* [1]

leads to a method of "god reductionism" to zero gods of sorts; as follows:

> **Monotheism**, i.e. belief in one god, was an invention of lawgivers of ancient times, Egyptian pharaoh Akhenaten (1320BC) in rough draft, arrived at to account for the growing discernment of the conflicting view that differing "regions", i.e. towns, cities, or states, with their differing gods (lawgivers), seemingly had peculiarly similar "laws", e.g. stealing was wrong, rocks fell at the same speed, the stars moved

similarly, etc.; accordingly, the multiple lawgivers hypothesis seemed to be in error and therefore there must be “one” lawgiver.

> “The thought that all the phenomena of motion should follow from one set of principles might seem grandiose and inordinate, but it occurred very naturally to the religious mathematicians of the 17th century. God had designed the universe, and it was to be expected that all phenomena of nature would follow one master plan. One mind designing a universe would almost surely have employed one set of basic principles to govern related phenomena.”
>
> — Morris Kline (1982), *Mathematics: the Loss of Certainty*; on Newton attempting to reconcile Galileo’s laws of terrestrial motions and Kepler’s laws of celestial motions (Ñº)(Ñº)

Atheism, i.e. belief in zero gods, was initiated, predominantly by Goethe (1796), when it was realized that if the laws governing the social realm were similar, if not the same, as the laws governing the chemical “realm”, the realm where there was NO god, but only strict determinism, then there must be, therefore, no god.

The theory of “multiple gods”, according to the Critias hypothesis, to elaborate, arose per the logic that each town, of ancient times, beyond 150 in size (see: Dunbar model morality, §6 below), needed “laws” to regulate unruly behavior, therefore there had to be conceptualized “lawgiver” (possibly akin to the way we think presently as Newton being the lawgiver of the laws of motion, so to say); subsequently, each town of ancient times invented their own special unique town or city god as the deemed lawgiver, with its own unique properties.

As science (knowledge) progressed, however, thinkers began to find that certain laws, e.g. gravity, the movement of the stars, or the tides, etc., were the same in each town, therefore the “multiple lawgivers hypothesis” became suspect and problematic, i.e. there had to be ONE lawgiver [god] for all of the towns, because the measurement of “laws” in each town, e.g. rate of acceleration when a stone is dropped, were found to be uniform; after which "monotheism" was invented as the upgrade solution to multiple gods = multiple laws problem. The upgrade from monotheism to atheism, like the former historical transition, is presently underway, as the solution to the “multiple monotheistic gods = multiple monotheistic laws” problem; particularly when it comes to questions of morality, e.g. Quranic morality vs Biblical morality vs Hindu morality (although this, technically, is polytheistic; approximately), when the sciences, e.g. neuroscience (e.g. Greene), physical chemistry (e.g. Goethe), and chemical thermodynamics (e.g. Rossini), are beginning to show one set of moral laws in each land, the same way as the stone drops at the same rate in each land.

References

1. Calvin, Melvin. (1969). *Chemical Evolution: Molecular Evolution towards the Origin of Living Systems on the Earth and Elsewhere* (pg. 258). Clarendon Press.

θΔics

In human physics, **critical mass** is a term that refers to a specific number of humans who, through influenced or connective association, become activated at a tipping point, past which large-scale social change takes place.

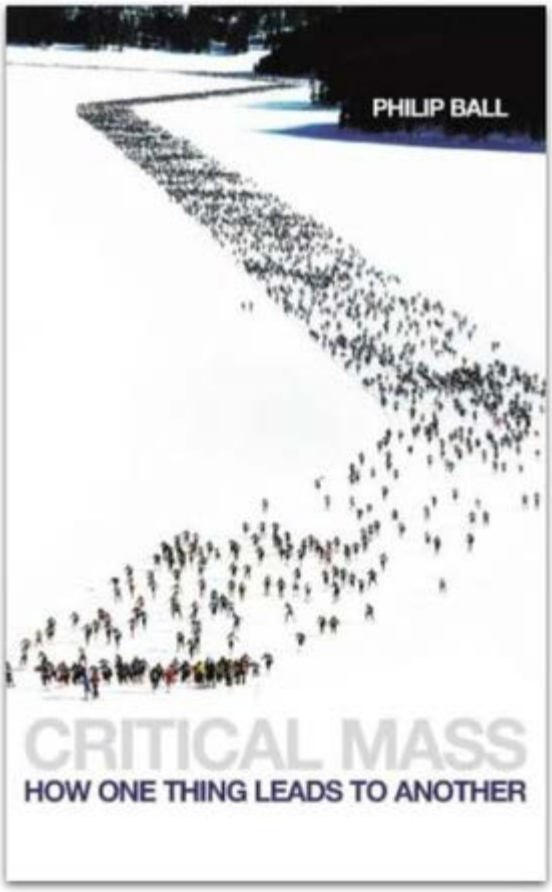

Cover of Philip Ball's 2004 *Critical Mass*, showing a **critical mass** of what looks like either a mass exodus, mass pilgrimage, or large column of troops marching to war. [2]

Overview

The term seem to have come into popularity during the 2003 talks on the "physics of society" by English chemist and physicist Philip Ball and follow-up 2004 book. [1] The following 2010 quote by Indian business theorist Vineet Nayar indicates an incorporated utilization of the critical mass theory: [2]

> "When a **critical mass** of employees [activate] (usually, 5 or 10 percent is all you need), throughout the company, it creates a kind of fusion – a coming together of the human particles in the corporate molecule that releases a massive amount of energy."

Critical mass can be defined in the sense of "attracting attention and anticipating influence." [3]

See also

- Muller stability ratio
- Muller dispersion force

References

1. (a) Ball, Philip. (2003). "The Physics of Society", A talk Delivered at the London School of Economics, March.
(b) Ball, Philip. (2004). *Critical Mass - How One Thing Leads to Another* (social physics, social mechanics, pg. 58; free will, pgs. 71-72, Buckle, 65-69, 205). New York: Farrar, Straus and Giroux.
2. Nayar, Vineet. (2010). *Employees First, Customers Second* (quote, pg. 165; energy, 11+ pgs.). Harvard Business Books.
3. Walker, James W. and Thomson, Andrew S. (2008). *Critical Mass: the Emergence of Global Society* (critical mass (def), pg. xvi). Wilfrid Laurier Univ. Press.

External links

- Critical mass (sociodynamics) – Wikipedia.
- Critical mass (disambiguation) – Wikipedia.

θΔics

In physics, **critical temperature** is the temperature above which each liquid must pass into the gaseous state. The concept of “critical temperature” was conceived in 1822-23 by French engineer and physicist Charles Cagniard. [1]

French physicist Charles Cagniard's 1822 "curved tube" apparatus, filled with air (G), mercury (B) and liquid (A), with which he discovered the phenomenon of critical state and **critical temperature**. [2]

Overview

In early experiments by Charles Cagniard and a person Drion (1859), peculiar effects were obtained, such that a substance was obtained in an intermediate condition, when it was neither liquid nor gas.

Cagniard employed a curved tube, ABG (figure), nearly full of mercury. He confined a liquid at A in a space very little larger than itself, and inclosed a quantity of air at G to serve as a manometer The tube was placed in a suitable bath, and as the temperature rose the vapour of the liquid in A exerted a continually increasing pressure, which was registered by the compression of the air in G. When the temperature reached a certain value the surface of separation between liquid and vapour ceased to exist; the whole became homogeneous. The pressure was very great, but at the somewhat high temperatures employed neither ether, alcohol, nor water could be retained in the liquid state.

In 1859, a person by the name of Drion carried out similar experiments. [3]

The critical point studies of carbon dioxide was continued in the later 1869 work of Thomas Andrews. [4]

References

1. Shachtman, Tom. (1999). *Absolute Zero and the Quest for Absolute Cold* (Charles Cagniard de la Tour, pg. 67). Mariner Books.
2. Draper, Charles H. (1906). *Heat and the Principles of Thermodynamics* (pg. 140). Blackie and Son Limitied.
3. Drion. (1859). “Article”, *Ann. de Chim. Et de Phys.* Pg. 221; and *Comptes Rendus*, t. xlviii.
4. Byran, George H. (1907). *Thermodynamics: An Introductory Treatise Dealing Mainly with First Principles* (§20. Critical Point, pg. 12). B.G. Teubner.

External links

â— Critical temperature – IUPAC Goldbook.

θΔics

In genius studies, **Cropper 30** refers to the thirty greatest physicists, from Galileo to Stephen Hawking, according to American physical-quantum chemist William Cropper (2001).

Overview

In 2001, William Cropper, in his *Great Physicists: the Life and Times of Leading Physicists from Galileo to Hawking*, devoted a chapter to each of the following physicists, grouped according to nine categories, names ordered chronologically: [1]

Mechanics	Thermodynamics	Electromagnitism	Statistical mechanics	Relativity
1. Galileo Galilei	1. Sadi Carnot	1. Michael Faraday	1. Ludwig Boltzmann	1. Albert Einstein
2. Isaac Newton	2. Robert Mayer	2. James Maxwell		
	3. James Joule			
	4. Hermann Helmholtz			
	5. William Thomson			
	6. Rudolf Clausius			
	7. Willard Gibbs			

Quantum mechanics	Nuclear physics	Particle physics	Astrophysics
1. Max Planck	1. Marie Curie	1. Paul Dirac	1. Edwin Hubble
2. Niels Bohr	2. Ernest Rutherford	2. Richard Feynman	2. Subrahmanyan Chandrasekhar
3. Wolfgang Pauli	3. Lise Meitner	3. Murray Gell-Mann	3. Stephen Hawking
4. Werner Heisenberg	4. Enrico Fermi		
5. Louis de Broglie			
6. Erwin Schrodinger			

(add)

References

1. Cropper, William H. (2001). *Great Physicists: the Life and Times of Leading Physicists from Galileo to Hawking.* Oxford University Press.

θΔics

In existographies, **Crosbie Wimperis Smith** (c.1950-) is an English thermodynamics historian, noted for []

Political thermodynamics

In 1986, Smith, together with physics historian Norton Wise (1940-) (Q), in their "Measurement, Work, and Industry in Lord Kelvin's Britain", supposedly (Q), thermodynamics and political metaphors (see: political thermodynamics), in the view of William Thomson's ideologies. [3]

In 1989 and 1990, Smith and Wise, in their three-part "Measurement, Work, and Industry in Lord Kelvin's Britain" article, supposedly (Q), elaborated on more political thermodynamics metaphors. [4]

Other

In 1989, Smith, in his *Energy and Empire*, followed up by his 1998 book *The Science of Energy*, gave particular historical coverage of Scottish physicist William Thomson. [1]

Education

Smith studied history and philosophy of science at Clare College, Cambridge. Smith completed his PhD in 1975, with a dissertation on "Natural Philosophy and Thermo-dynamics: Patterns of Thought in Mid-nineteenth Century Physics", focused on the history of Victorian steam power, at the University of Cambridge. [2]

Quotes | On

The following are quotes on Smith:

> "#histtech, can you help me out? I cannot for the life of me remember who wrote the classic article on steam engines and thermodynamics as political metaphors. Help?"
>
> — Audra Wolfe (2019), "Tweet via @ColdWarScience" (Q), Mar 27

See also

- David Lindley
- Tom Shachtman
- Stephen Brush

References

1. (a) Smith, Crosbie and Wise, Norton. (1989). *Energy and Empire: a Biographical Study of Lord Kelvin.* Cambridge University Press.
(b) Smith, Crosbie. (1998). *The Science of Energy: A Cultural History of Energy Physics in Victorian Britain.* University of Chicago Press.
2. Crosbie, Smith W. (1975). "Natural Philosophy and Thermo-dynamics: Patterns of Thought in Mid-nineteenth Century Physics", PhD thesis, University of Cambridge.
3. Wise, M. Norton and Smith, Crosbie. (1986). "Measurement, Work, and Industry in Lord Kelvin's Britain" (JST), *Historical Studies in the Physical and Biological Sciences*, 17:147-73.
4. Wise, M. Norton and Smith, Crosbie. (1989-90). "Work and Waste: Political Economy and Natural Philosophy in Nineteenth-Century Britain", *History of Science*, 27:263-301; 27:391-449; 28:221-61.

External links

- Crosbie Smith (faculty) – University of Kent, England.
- Smith, Crosbie – WorldCat Identities.

θΔics

The **ankh**[a] (/ˈæŋkɪ/)[1]

Overview

The hieroglyph for **ankh** (𓋹) represents a **sandal strap**[2] or **knot**[3], i.e. something to tie or bind, and is conceptually "life", or something that binds life together. The ankh is also known as the **key of life**, the **cross of life**, the **cross of the Nile**, the **cross of Isis**, the **cross of Ptah**, the **cross of Amun**, the **cross of Hermes**, the **cross of Venus**, the **cross of the sun**, the **cross of the gods**, the **cross of the Egyptians**, the **cross of the Nile**, the **cross of the Sun**, the **cross of the Sun God**, the **cross of the Sun Gods**, the **cross of the Sun Goddess**, the **cross of the Sun Goddesses**, the **cross of the Sun Gods and Goddesses**, the **cross of the Sun Gods and Goddesses of the Nile**, the **cross of the Sun Gods and Goddesses of the Nile Valley**, the **cross of the Sun Gods and Goddesses of the Nile Valley and Egypt**, the **cross of the Sun Gods and Goddesses of the Nile Valley and Egypt and the Egyptians**, the **cross of the Sun Gods and Goddesses of the Nile Valley and Egypt and the Egyptians and the Egyptian people**, the **cross of the Sun Gods and Goddesses of the Nile Valley and Egypt and the Egyptians and the Egyptian people and the Egyptian people and the Egyptian people**, the **cross of the Sun Gods and Goddesses of the Nile Valley and Egypt and the Egyptians and the Egyptian people and the Egyptian people and the Egyptian people

In human physics, **crowd dynamics** is the study of "crowd behaviors" in particular abnormal crowd behavior such as people's reactions and movement patterns in emergencies, such as fire, or in heightened festivity situations such as when critical density levels (four people per square meter) are reached; often times, theories involved computation models in which people are modeled as particles (human particles) or fluids (human fluids) and crowds are studied in masse.

Left: a 2011 **crowd dynamics** depiction showing a large auditorium cleared calmly through a small exist. In other scenerios, according to American NSF researcher Paul Torrens, "from an initial start point of rest, agents begin to evacuate a large auditorium quickly by running as fast as possible to safety through a narrow exit. Wedge-like bottlenecks soon form at the mouth of the exit corridor and congestion begins to ripple back through the crowd, impeding further clearing. Similar dynamics are often observed during rush hour commutes on highways." [5] Right: Andreas Schadschneider's 2010 video (Ñº)from above opposite flow dynamics studies.

History

In 1895, Gustave le Bon, in his *The Crowd*, outlined some early physics-like ideas on how people in crowds are in a special magnetized like state.

The science of crowd dynamics seems to have been around since at least the 1950s.

The fluid mechanics or gas system models of crowd dynamics was first introduced in 1971 by Australian mechanical engineer Roy Henderson.

In 1995, Dirk Helbing, in his *Quantitative Sociodynamics*, outlines a social force model, according to which the motion of pedestrians can be ascribed to a combination of a driving force, that reflects the person's internal motivation to move in a given direction at a certain speed, and repulsive forces describing the effects of interactions with other pedestrians and boundaries such as walls or obstacles in streets.

Scottish mathematician Keith Still, who did his 2000 PhD dissertation on "Crowd Dynamics", is sometimes slated as the world's leading expert on crowd dynamics. [1]

Recent models by S. Hoogendoorn (2004), W.J. Yu (2005), and B. Steffen (2008), have used Newtonian force models. [3]

In 2010, German physicist Andreas Schadschneider was working on a project to develop an "evacuation assistant", still of video (V) from above study, shown (above), aimed to make the evacuation of large buildings safer; using pedestrian dynamics theories borrow ideas from physics to model people as particles. [4] Schadschneider recorded various interaction scenarios of people from above as opposite flows interject in close-paced hallways and as people leave stadiums. [2]

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1. Still, G. Keith. (2000). "Crowd Dynamics" (abstract), PhD dissertation, University of Warwick, Department of Mathematics.
2. Edwards, Lin. (2010). "Crowd Dynamics in the Spotlight after Duisburg Disaster" (two videos), Phys.org, Jul 29.
3. Moussaid, Mehdi. (2011). "The Collective Dynamics of Human Crowd Motion: Where Physics Meets Cognitive Science" (summary), PhD thesis, University of Toulouse, Jan 14.

4. Staff. (2010). “I’m a Football Fan … Get me Out of Here” (abs), *Physics World*, Jul 1.
5. Torrens, Paul M. (2011). “A Crowded World”, National Science Foundation.

θΔics

In materialism, **crude materialism** is []

Overview

A proponent of 'crude materialism', often mentioned (Q) associated with this term, is Ludwig Feuerbach, and or, in many contexts, Karl Marx's use of Feuerbach's ideas in his so-labeled 'historical materialism' (or dialectic materialism). [1]

Gillian Howie (2010) defines crude materialism as follows: [2]

> "The world appears to be governed by empirically discoverable, natural, and unalterable laws, and individuals apprehend their own activities in terms of quantifiable laws. The thingification of people (reification) presents itself in philosophy as **crude materialism**, and the personification of things (fetishism) presents itself as crude idealism. Crude materialists tend to regard social relations of production as though they are natural properties inherent in things."

Elena Possardt (2013), et al, defines crude materialism, as distinguished from dualism and idealism—which grant an equal primary status to a realm of ideas, mind, spirit, or deity, understood to exist completely separately from the material realm—as the explicit philosophical assumption which entails the attribution of primary ontological status or primary reality to material events, which can be comprehended through sense organs; they also assert that scientism is an outgrowth of ontological crude materialism. [3]

Quotes

The following are related quotes:

> "While rejecting vitalism, teleology, and mysticism, Haeckel taught a view of nature that advocated a cosmic perspective and an evolutionary framework, and thereby surpassed the **crudely mechanistic and materialistic** explanations of the world. Going beyond Darwin, Haeckel proposed that life had emerged spontaneously from matter; an hypothesis anticipated by over fifty years: the abiogenetic theory of Alexander Oparin."
>
> — James Birx (1992), "Introduction to *The Riddle of the Universe*" [4]

References

1. Nash, Ronald H. (2010). *Life's Ultimate Questions: an Introduction to Philosphy* (§:Crude Materialism, pg. #). Harper Collins.
2. Howie, Gillian. (2010). *Between Feminism and Materialism: a Question of Method* (pgs. 46-47). Palgrave Macmillan.
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4. Birx, H. James. (1992). "Introduction", in: *The Riddle of the Universe* (by: Ernst Haeckel, translator: Joseph McCabe) (pgs. ix-xiv). Prometheus Books, 1992.

θΔics

In astronomy, **crux,** or “southern crux”, croix (French), kreuz (German), croce (Italian), salib (Persian), or cruz (Spanich), the forerunner to the Christian "cross", refers to []

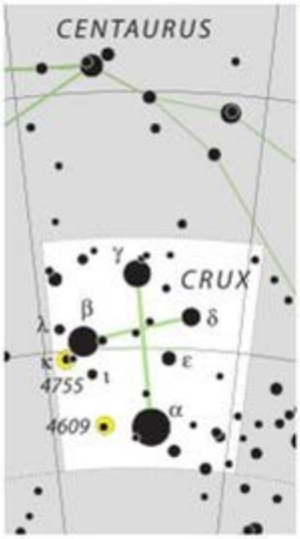

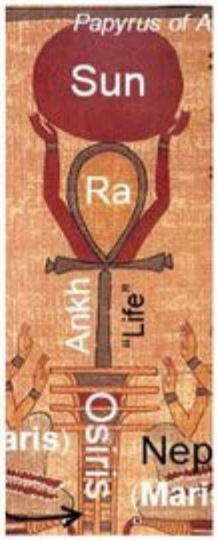

Overview

In 3100BC, crux star configuration was known to the Egyptians and Ancient Greeks due to the fact that it can be seen from southern Egypt; Ptolemy, incorrectly, regarded it as part of the constellation Centaurus. The crux entirely visible as far north as Britain in the fourth millennium BC. However, the precession of the equinoxes gradually lowered its stars below the European horizon, and they were eventually forgotten by the inhabitants of northern latitudes. By 400AD, most of the constellation never rose above the horizon for Athenians.

The southern cross points directly to the north pole, which is why, among seafarers, it was the most famous of all constellations of the south. (Ñº)

To see the crux, presently, one has to be south of the Tropic of Cancer, wherein it can be seen to peak above the horizon in the month of May. [1]

In 300BC, Egyptian thinkers, centered around the Island of Elephantine, via clay creation myth, popularized the notion that humans came to life when the goddess Hathor put the ankh to the mouth of clay human figurines, molded by the god Khnum, thereby bringing them to life, which later became the central basis of the monotheistic retelling of this model as the story of Adam and Eve:

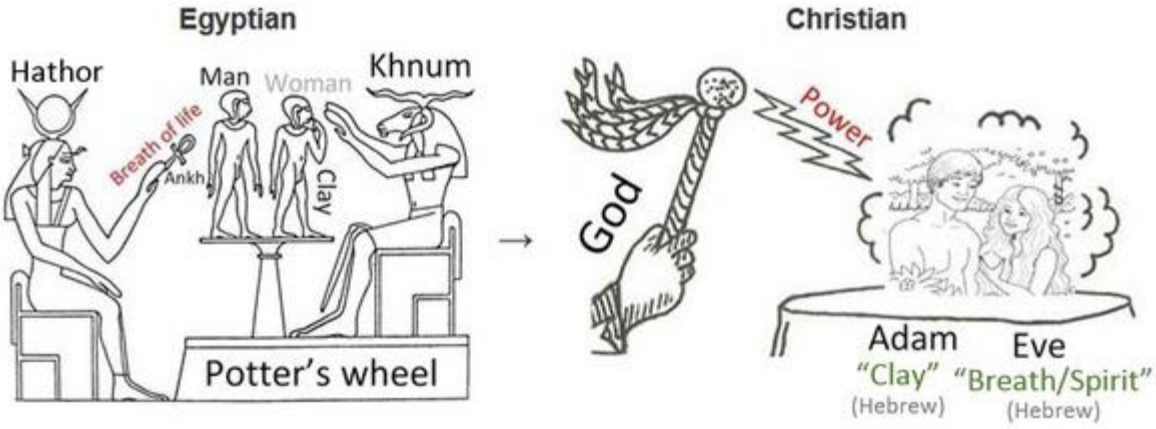

In 1885, Edward Balfour noted that the Chakra in the hands of Brahma, Vishnu, and Siva, such as shown below, is a modification of the crux: [1]

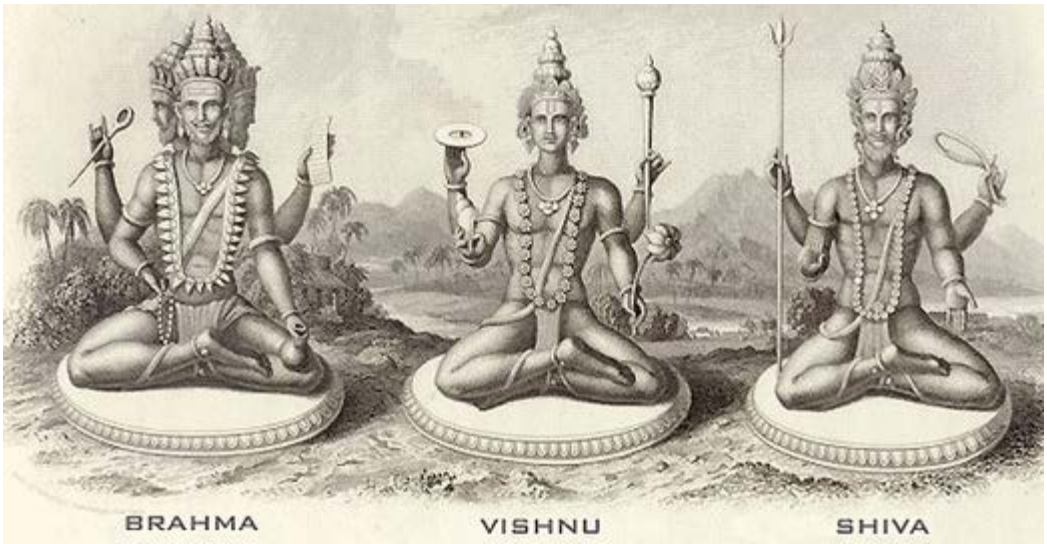

In 2007, Peter Joseph, in his *Zeitgeist*, via citation to Dorothy Murdock, Gerald Massey, among others, famously pointed out that the sun perceptually "dies" on the location of the crux for three days, Dec 22-24, before being "reborn" in its new yearly solar cycle.

Other

The Egyptians, of note, considered the Orion nebula, to be the final resting place of Osiris, after he was murdered by Set. [1]

Quotes

The following are related quotes:

> "*Crux*, the cross. There are four stars in this constellation forming a cross, by which mariners, sailing in the southern hemisphere, readily find the situation of the antartic pole, by means of the stars α and γ which, nearly point in this direction. This is a new constellation, and formed, no doubt, in honour of that instrument on which the Son of God redeemed mankind."
>
> — James Wallace (1812), *A New Treatise on the Use of Globes* (pg. 41)

> "The symbol of the circle and the cross, under every variety of circumstance, in Egypt, Africa, Britain, China, Scandinavia, and America, in every age, by every people, from the dawn of secular history to the present hour, has been held by all in the same superstitious veneration, has been honored with the same distinguishing rites, and has always expressed the same doctrine or mystery. Divine potentiality was sometimes indicated by two or more sceptres arranged at right angles or quadrinally, with the nave of a wheel, or a simple circle, or Bix or eight round stars, at the point of intersection, with other orbs or ornaments. Osiris by the cross gave eternal life to the spirits of the just. The Crux ansata is the earliest known form of the cross. It is commonly called the key of the Nile, because often seen on Coptic and Egyptian monuments. It was very similar to the Roman letter T, with a roundlet or oval placed immediately above it, and signified hidden wisdom or the life to come. It was used by the Chaldeans, Phoenicians, Mexicans, and Peruvians; doubtless it was intended to denote the solar and terrestrial spheres. And, subsequently, sovereigns each adopted the circle, associated with it the cross, and this symbol of royalty is in use with every king of Europe. The Chakra in the hands of Brahma, Vishnu, and Siva, is a modification of it."
>
> — Edward Balfour (1885), *The Cyclopedia of India and of Eastern and Southern Asia* [2]

References

1. Dewdney, Christopher. (2008). *Acquainted with the Night: Excursions Through the World After Dark* (pg. 218). Bloomsbury.
2. Balfour, Edward. (1885). *The Cyclopedia of India and of Eastern and Southern Asia: Commercial, Industrial and Scientific, Products of the Mineral, Vegetable, and Animal Kingdoms, Useful Arts and Manufactures, Volume 1* (pg. 841). B. Quaritch.

External links

â— Crux – Wikipedia.

θΔics

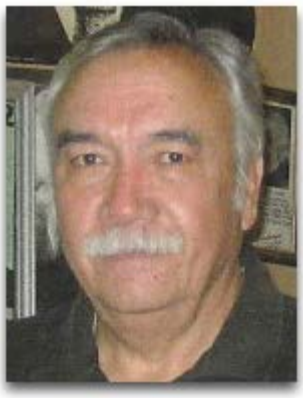

In hmolscience, **Jose Cruz Iniguez Romero** (1948-), who also publishes as “Cruz Iniguez” or “Jose C. Iniguez”, is a Mexican-born American chemical engineer and physical chemist noted for his 1993 "negentropic thermodynamics" theory, wherein he tries to "debunk" Clausius so to explain life and evolution, the result of which is his 2007 booklet *Negative Entropy: a Brief Incursion into the Uncharted Universe of Decreasing Entropy*. [1]

Overview

In 1993, Cruz penned an unpublished manuscript on the subject he refers to as “negentropic thermodynamics”, according to which, in his view, spontaneous processes take place with a “negative universal entropy change”, an self-conceptualized overthrow of thermodynamics, in short—not just a violations of thermodynamics polemic, but a seeming overthrow of the whole subject; the aim of which, it seems, is to develop a “rational approach to self-organizing phenomena, including the most puzzling phenomenon of all: life and its evolution”. [1] In 1999, Cruz, in volume one of newly-launched *Entropy* journal, published a version of his manuscript in the form of a four-part (Q) article series entitled “A Revision of Clausius Work on the Second Law”; part one of which being subtitled “On the Lack of Inner Consistency of Clausius Analysis Leading to the Law of Increasing Entropy”, wherein he aims to “expose Clausius” in the name of life, or something along these lines. (Q) Cruz reported further work on his Clausius debunking theory, in shortly-existed e-journal *Acta Negentropica*, created by himself, in 2000.

Education

Iniguez, at one point, was a chemical thermodynamics and chemical kinetics instructor and head the chemical engineering department of the Universidad de Sonora, México. He is now retired. [4]

Quotes | Cited

The following are some of the quotes employed by Iniguez:

> “To fully embrace the evolving economy of the universe (including life), there should be added a third principle, that of the reflexion of energy, to those already admitted, namely the conservation and degradation of energy.”
>
> — Pierre Teilhard (c.1940), *The Activation of Energy* [1]

> “Entropy as a prevalent force makes itself felt whenever violence triumphs over peace, hate over love, foolishness over reason, disease overhealthiness, misery over abundance, death over life, ignorance over knowledge, stupidity over wiseness, and falsity over truth.”
>
> — Eduardo Cesarman (1997), *Entropy and Man* [2]

> “Magic and myth take over when reason gives up.”
>
> — Eduardo Cesarman (1997), *Order and Chaos* [3]

References

1. Iniguez, Cruz. (1993). *Negative Entropy: a Brief Incursion into the Uncharted Universe of Decreasing Entropy* (abs) (Teilhard quote, pg. vi; negentropic thermodynamics, pg. xii). Infinity, 2007.
2. Cesarman, Eduardo. (1997). *Hombre Y Entropia: Termodinamica de la Vida* (pg. 17) (Q). Ediciones Gernika,México, D.F.
3. Cesarman, Eduardo. (1997). *Orden y Caos: Termodinámicade la Vida* (pg. ##) (Q). Ediciones Gernika,México, D.F.

4. Negentropology – Google Sites.

Further reading

● Iniguez, Cruz. (1993). *A Critical Study of the Law of Increasing Entropy* (abs). Infinity.

External links

● Quimica Y Termoddinamica (Chemistry and Thermodynamics) – Google Sites.
● Negentropology – Google Sites.

θΔics

In science, **cryophobia** is a morbid fear of cold. [1] Cryophobia or being “cryophobic” can also refer to an abnormal and persistent fear of cold, including cold weather and cold objects. Sufferers from cryophobia experience anxiety even though they realize their fear is irrational. To avoid cold, they may live in a warm climate, dress more warmly than necessary, stay indoors on cold days, and avoid cold foods and ice cubes. [2] A synonym is *crymophobic*. An antonym is *crymophilic* or *cryophilic* or living and thriving in relatively cold temperatures.

See also

â— Thermophobia

References

1. Stedman, Thomas Lathrop. (1995). *Stedman’s Medical Dictionary*, 26th ed. Baltimore, MD: Williams & Wilkins.
2. Cryophobia - MedTerms.com

θΔics

In science, **crystal model**, or "crystal model of life" (Scott, 1985), refers to the comparison or modeling of person or life form to a crystal, i.e. a solid with a regular polyhedral shape, the the ability to reproduce. [1]

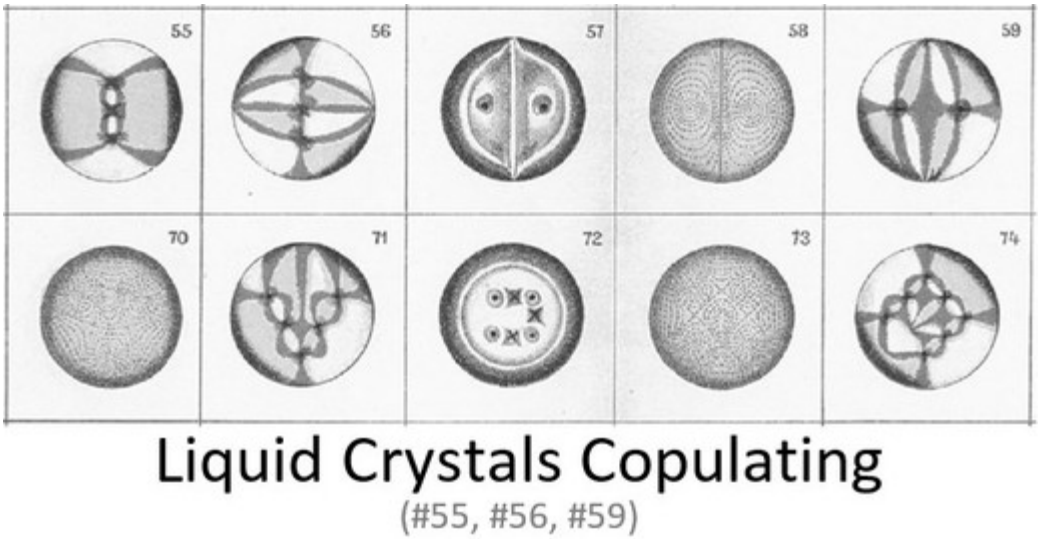

Images of (c.1890) liquid crystals, numbers: 55, 56, and 59 being what Ludwig Gattermann and Otto Lehmann called “copulating drops” (Ñº); the ability to reproduce being one of the so-called "properties" of the multi-property definition of life.

Haeckel | Lehmann

In 1872, Ernst Haeckel (1834-1919), supposedly, discovered something called “biocrystals”, as Spyros Papapetros (2012) refers to them. [5]

In the late 1880s, crystallographer Otto Lehmann (1855-1922), a protégé of Haeckel, starting with the findings of chemist-botanist Friedrich Reinitzer, conducted a series of experiments that, supposedly, transformed scientific opinions on crystals.

In 1904, Lehmann was describing what he called “analytic or flowing crystals”, a namesake related to Heraclitus and his “everything flows”, including stones, motto of everything.

Lehmann called these “rheocrystals”, a mixture of mineral substances, e.g. calcite or flint, with organic plasma.

Using a special microscope and polarized light, Lehmann heated and cooled crystals, allowing for measurements of changes in expansion and contraction, which allowed him to posit that (a) they had “plastic” qualities. He also Lehman showed (b) that they had the ability to form a “skin” through which they appeared to breath, and he showed (c) that they had a peculiar form of “copulation”, e.g. when two spindle-form rheocrystals came into contact, their skins would combine and the substance of one crystal would flow into the other until their bodies merged into a single new longer crystal.

In 1917, Haeckel, relying on the texts and drawings Lehmann, published *Crystal Souls: Studies of Inorganic Life*; which, supposedly, has a flavor similar to Gustav Fechner’s *The Soul of Plants* (1848). [5]

Thomson | Recant

In 1897, William Thomson, in his “The Age of the Earth as an Abode Fitted for Life”, stated the following: [7]

> “My task has been rigorously confined to what, humanly speaking, we may call the ‘fortuitous concourse of

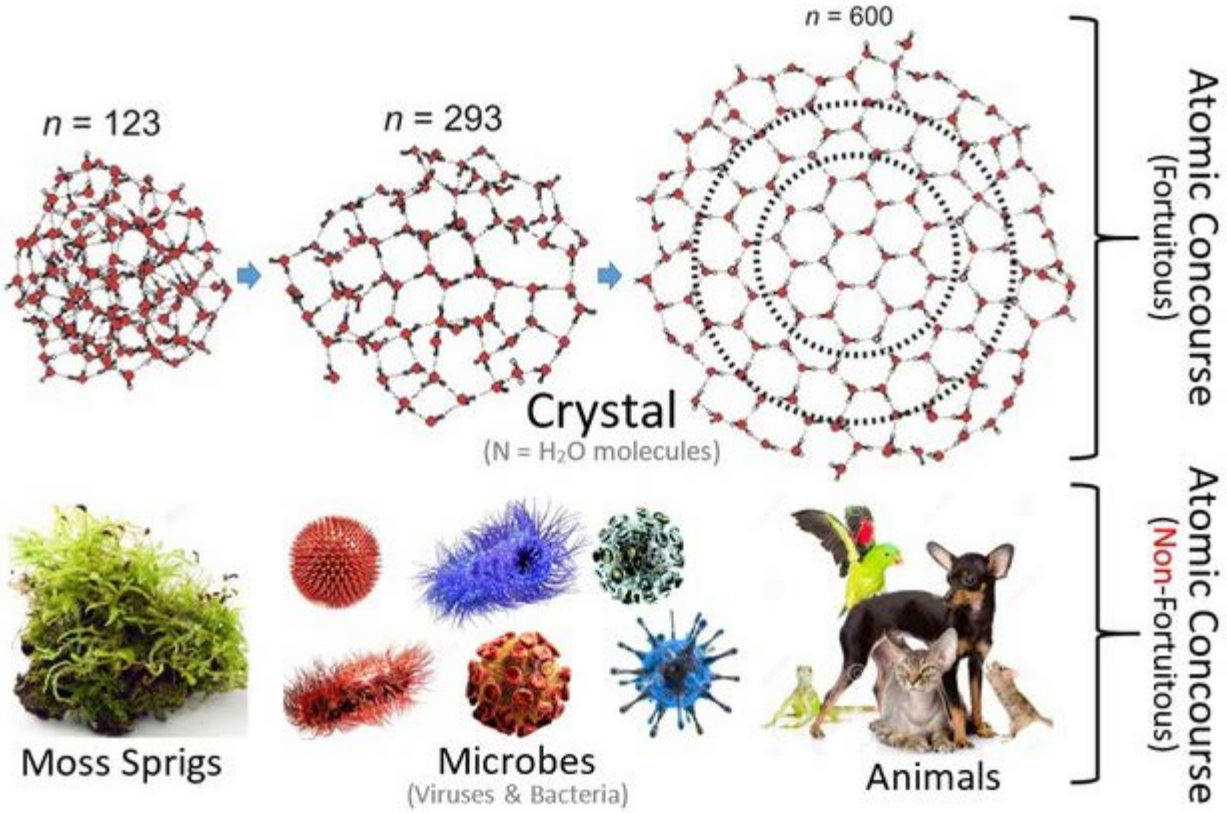

A synopsis of William Thomson's vacillating 1897-1903 views on "**crystals**", e.g. water crystal (Ñº) formation shown above, which he believes are formed by the "fortuitous concourse of atoms" (Cicero on Greek atomic theory), whereas moss sprigs, microbes, and animals are formed by the "creative power" of god acting on atoms, via a miracle; though in his 2 May 1903 impromptu speech he slips and says it is absurd to believe that crystals could form by the "fortuitous concourse of atoms", then request a recant two days later, after reading his published statements in *The Times*.

atoms', in the preparation of the earth as an abode fitted for life. Mathematics and dynamics fail us when we contemplate the earth, fitted for life but lifeless, and try to imagine the commencement of life upon it. This certainly did not take place by any action of chemistry, or electricity, or **crystalline** grouping of molecules under the influence of force, or by any possible kind of fortuitous concourse of atoms. We must pause, face to face with the mystery and miracle of creation of living creatures."

In 2 May 1903, Thomson, amid a five part public lecture by professor George Henslow (1835-1925), on "Christian Apologetics", delivered at the Botanical Theater, at University College, the first of which being on "Present-day Rationalism: an Examination of Darwinism", gave thanks to Henslow by say a few words, as follows: [6]

> "Science positively affirmed creative power. Science made everyone feel a miracle in himself. It was not in dead matter that they lived and moved and had their being, but in the creative and directing power which science compelled them to accept as an article of belief. They could not escape from that when they studied the physics and dynamics of living and dead matter all around. Modern biologists were coming once more to a firm acceptance of something, and that was a vital principle. They had an unknown object put before them in science. In thinking of that object they were all agnostics. They only knew god in his works, but they were absolutely forced by science to admit and to believe with absolute confidence in a directive power—in an influence other than physical, dynamical, electrical forces.
>
> Cicero denied that they could have come into existence by a fortuitous concourse of atoms. Was there anything so absurd as to believe that a number of atoms by falling together of their own accord could make a **crystal**, a sprig of moss, a microbe, a living animal? People thought that, given millions of years, these might come to pass, but they could not think that a million of millions of years could give them unaided a

> beautiful world like ours. They had a spiritual influence, and in science a knowledge that there was that influence in the world around them. He admired the healthy, breezy atmosphere of free thought in professor [John] Henslow's (Ñº) lecture. Let no one be afraid of true freedom. They could be free in their thoughts, in their criticisms, and with freedom of thought they were bound to come to the conclusion that science was not antagonistic to religion but a help for religion."

Thomson, then, after reading his praise commentary, as printed in *The Times*, sent a "request to amend" letter to the editor of *The Times*, which was printed on May 4, 1903, wherein he states the following humorous request:

> "Sir,—In your report of a few words which I said in proposing a vote of thanks to Professor Henslow for his lecture 'On Present Day Rationalism' yesterday evening, in University College, I find the following: —'Was there anything so absurd as to believe that a number of atoms by falling together of their own accord could make a crystal, a sprig of moss, a microbe, a living animal?' **I wish to delete 'a crystal,'** though no doubt your report of what I said is correct."

Thomson elaborates on his reasoning behind this request as follows:

> "Exceedingly narrow limits of time prevented me from endeavoring to explain how different is the structure of a crystal from that of any portion, large or small, of an animal or plant, or the cellular formation of which the bodies of animals and plants are made; but I desired to point out that, while 'fortuitous concourse of atoms' is not an inappropriate description of the formation of a **crystal**, it is utterly absurd in respect to the coming into existence, or the growth, or the continuation of the molecular combinations presented in the bodies of living things. Here scientific thought is compelled to accept the idea of creative power. Forty years ago I asked Liebig, walking somewhere in the country, if he believed that the grass and flowers which we saw around us grew by mere chemical forces. He answered, 'No, no more than I could believe that a book of botany describing them could grow by mere chemical forces.' Every action of human free will is a miracle to physical and chemical and mathematical science."

(add discussion)

Lewis | Disproofs + Thinking

In 1925, American physical chemist Gilbert Lewis, in his *Anatomy of Science*, discredited the reproduction-definition of life, via citation to how :sodium thiosulfate", which Lewis implicitly defines as non-living, reproduces: [4]

> "Living creatures have been characterized by their capacity for reproduction, but it has been pointed out that in a minor way **crystals** have the power of reproduction. If into this beaker (containing a supersaturated solution of sodium thiosulfate) I drop a minute crystal, it grows."

Lewis, having refuted the reproduction trait model of life, leaves open the possibility that crystals might "think", which he states as an open question as follows:

A 2009 video of sodium thiosulfate **crystal** growth, which American physical chemist Gilbert Lewis uses (1925) as a counter example to discredit the reproduction definition of

life. [4]

> "We should see a process of evolution, each molecule reproducing itself exactly, until an accidental rearrangement would set a new molecule to propagating itself. Would not this be reproduction with transmission of acquired characteristics?"
>
> "Suppose that this hypothetical experiment could be realized, which seems not unlikely, and suppose we could discover a whole chain of phenomena [evolution timeline], leading by imperceptible gradations form the simplest chemical molecule to the most highly developed organism [human molecule]. Would we then say that my preparation of this volume [*Anatomy of Science*] is only a chemical reaction [extrapolate up approach], or, conversely that a **crystal is thinking** [extrapolate down approach] about the concepts of science?"
>
> "Nothing could be more absurd, and I once more express the hope that in attacking the infallibility of categories I have not seemed to intimate that they are the less to be respected because they are not absolute. The interaction between two bodies is treated by methods of mechanics; the interaction of a billion such bodies must be treated by the statistical methods of thermodynamics."

(add discussion)

Other

In 1924, Alfred Tutton, in his *The Natural History of Crystals*, stated the following: [3]

> "It is a remarkable fact that no definition of life has yet been advanced which will not apply to a **crystal** with as much veracity as to those obviously animate objects of the animal and vegetable world which we are accustomed to regard in the ordinary sense as 'living'."

In 1985, American physical organic chemist George Scott, in his *Atoms of the Living Flame*, stated the following: [2]

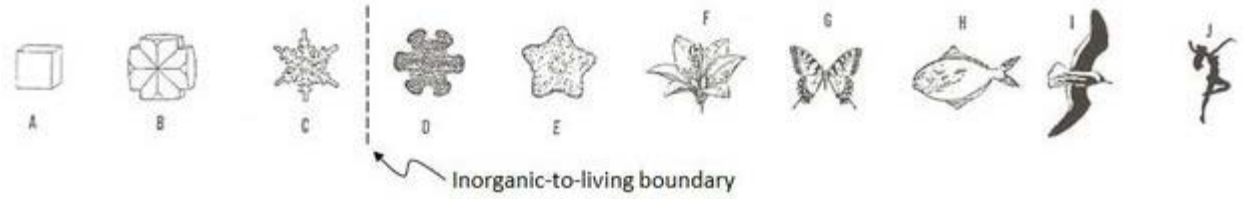

American physical organic chemist George Scott's 1985 pseudo-continuum comparison between crystals to life model, which he calls a "crystalline forms to living forms pseudo-continuum", wherein, as he states, the "inorganic-to-living boundary is passed between the snowflake (C) and the radiolarian protozoan (D)". [2]

> "Crystals as well as flames have frequently been compared to living organisms."

Scott refers to the comparison of crystals to life as the "crystal model", which he seems to categorized as an historical precursor to more modern models, e.g. "flame model" of life, or the various thermodynamic theories of life seen semi-recently. Scott's crystal continuum model, visually shown above, is similar to the unbridgeable gap model, i.e. the notion that there is some inorganic-life/organic-life or life/non-life divide, and also seems to be a crude stepping stone away from the 2009 molecular evolution timeline.

Quotes

The following are related quotes:

> “At the turn of the century, monists, such as Ernst Haeckel, discovered that inorganic materials, including **crystals** and other mineral substances, possess sensation and memory, and thus ought to be granted a soul.”
>
> — Spyros Papapetros (2012), *On the Animation of the Inorganic* (p. viii)

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1. Daintith, John. (2005). *Oxford Dictionary of Chemistry*. Oxford University Press.
2. Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pgs. 153, 171). University Press of America.
3. Tutton, Alfred H. (1924). *The Natural History of Crystals*. K. Paul, Trench, Trubner & Co.
4. Lewis, Gilbert N. (1925). *The Anatomy of Science* (pgs. 178-79), Silliman Lectures; Yale University Press, 1926.
5. Papapetros, Spyros. (2012). *On the Animation of the Inorganic: Art, Architecture, and Extension of Life* (§3:The Afterlife of Crystals, pgs. 113-60; Haeckel, 16+ pgs; granted a soul, pg. viii). University of Chicago Press.
6. (a) Thomson, William. (1903). “On Religion and Science”, praise commentary of George Henslow’s (Ñº), lecture on Christian Apologetics, Botanical Theater, University College.
(b) Thomson, William. (1903). “On Religion and Science”, in: London *Times*, May 2.
(c) Walsh, James J. (1908). “Lord Kelvin” (Ñº), *Catholic World* (quote, pgs. 758-59), 86:757-68.
7. (a) Thomson, William. (1897). “The Age of the Earth as an Abode Fitted for Life” (Ñº), Annual Address of the Victoria Institute (with additions written at various times from Jun 1897 to May 1898, in: *Philosophical Magazine*, 5(47):66-90, 1899.
(b) Smith, Crosbie and Wise, Norton. (1989). *Energy and Empire: a Biographical Study of Lord Kelvin* (pg. 612). Cambridge University Press.
(b) Kelvin’s quotes on science and religion? (2009) – Yahoo Answers.

External links

â— Crystal – Wikipedia.

θΔics

In existographies, **Ctesibius** (c.285-222BC) (IQ:185|#73) (EP:2) (CR:11), pronounced "Ta-sib-e-us" (Q), was a Greek engineer and mathematician, noted for a number of inventions, such as the 'aeolipile' (heat engine), piston and cylinder, pipe organ (hydraulis), counterweight adjustable mirrors, a water clock (clepsydra), force pumps (water lifting device), the principle of the siphon; he published *On Pneumatics* (now lost) on the elasticity of the air.

Influence

Ctesibius' ideas and inventions are cited by Vitruvius, Athenaeus, Pliny the Elder, Philo of Byzantium, Proclus (the commentator on Euclid), and Hero of Alexandria.

Other

In 50 ACM (AD), Hero, in his *Pneumatica*, was said to overview the physics of Strato and Ctesibius, via outlining an atomic theory in which matter consists of particles mixed with distributed vacua.

Quotes | On

The following are quotes on Ctesibius:

> "It is said that **Ctesibius** invented the piston and cylinder before 200BC."
>
> — Richard Kirby (1956), *History of Engineering* (pg. 154) [1]

> "**Ctesibius** had been responsible, about -230, for a simple and fundamental machine, the piston air-pump, known from the descriptions of later mechanicians. This simplest of pumps entered upon a new incarnation in the +17th century, when the virtuosi began to explore with excitement the properties of vacuous spaces, for what had been invented originally as a bellows for pumping air into something now found fresh employment as the 'air-pump' for getting as much air as possible out of it."
>
> — Joseph Needham (1987), *Science and Civilization in China: Volume 5* (pg. 555) [2]

> "Ctesibius' pump powered what is confusingly known as a 'water-organ' because the air was pumped into a reservoir where it was held at approximately constant pressure by means of a water-seal. Though the Vitruvian text describes two cylinders, the Philonic and the Heronic speak only of one, and the apparatus has nearly always been so reconstructed—in any case the pump or pumps were invariably single-acting, 'inhaling' and 'exhaling' on alternate strokes. The double-acting piston-pump 'air-bellows' of China probably goes back well before Ctesibius (Vol. 4, pt. 2, p. 39) but it was not destined to stimulate the vacuum pumps of the +17th century because Europe did not have it until the +18th (ibid. pp. 151, 380)."
>
> — Joseph Needham (1987), *Science and Civilization in China: Volume 5* (pg. 555) [2]

References

1. Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 154). Courier, 1990.
2. (a) Needham, Joseph. (1987). *Science and Civilization in China: Volume 5, Chemistry and Chemical Technology, Part 7, Military Technology: The Gunpowder Epic* (pg. 563). Cambridge.
(b) See: Heron, *Pneumatica* (ch. 1, no. 42); Philon, *Pneumatica* (App. 1); Vitruvius (x, 8). Discussion in Beck (1, pg. 24ff); Drachmann [s, pgs. 7ff, 100, 9, pgs. 206]. Woodcraft (1, chs. 76, 77, pg. 105, 108).

External links

- Ctesibius – Wikipedia.

θΔics

In systems, a **cultural system** is a volume or number of people delineated by a characteristic culture. The term is used significantly in anthropological thermodynamics.

Overview

In his 1964 book *Cultural and Social Anthropology*, American anthropologist Peter Hammond attempt to understand cultural systems in terms of thermodynamics: [1]

> "To understand man in particular we must understand living material systems in general; **cultural systems**, like biological systems, expend energy that is captured [by the sun]; in performing a ritual, playing a game, regarding a churinga with awe, or breathing a silent prayer, the event is an expression of energy expended."

American anthropologist Leslie White also argued that a cultural system is a thermodynamic system, beginning in 1969. [2] As discussed in his 1975 book *The Concept of Cultural Systems*, White explains that: [3]

> "**Cultural systems**, like all material systems, are thermodynamic systems. Their existence and operation require energy. Every cultural event involves the expenditure of energy."

He also explains that this is a relatively untouched conception:

> "In the application of the laws of thermodynamics to cultural systems we have one of the most illuminating and profound interpretations of cultural systems that is currently available to us. The extent to which the laws of thermodynamics have been applied to cultural systems is so far very limited and not well understood."

His first views on culture as a thermodynamic system are found in his 1969 book *The Science of Culture*: [4]

> "The primary function of culture is to harness and control energy so that it may be put in man's service. Culture thus confronts us as an elaborate thermodynamic mechanical system."

References

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2. (a) Erickson, Paul A., Murphy, Liam D. (2008). *A History of Anthropological Theory* (Leslie White, pgs. 142-). University of Toronto Press.
(b) Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (pg. 102). AuthorHouse.
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External links

â— Cultural systems – Wikipedia.

θΔics

In mythology, **Cupid** is the iconic representation of love and or desire, the process of love, falling in love, or the chemistry, in general, that brings about love, typically depicted as a winged cherub holding a magical bow and arrow, a shot from which makes a person fall in love.

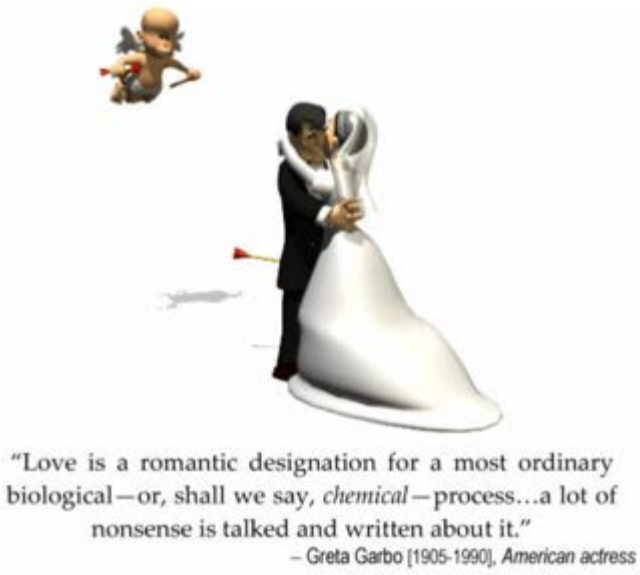

Left: a depiction of **Cupid** hitting a wall, possibly iconic of love ending, in a 2011 article on the down and outs of Valentine 's Day. [2] Right: a depiction of **Cupid** and his arrow bring about marriage, on the back cover of American electrochemical engineer Libb Thims' 2007 textbook *Human Chemistry*. [1]

History

In the Middle Ages, the Greco-Roman story of Cupid and Psyche evolved into the myth of Cupid carrying two sets of arrows: one set gold-headed, which inspire love; and the other lead-headed, which inspire hatred.

Modern cupid

In modern terms, following the publication of German polymath Johann Goethe's 1809 *Elective Affinities*, the myth of Cupid's arrow bring about love, has been replaced by the measure of change of Gibbs free energy pre-determining love, which amounts to love and hate being explained not in terms of two sets of arrows, gold and lead, but rather by two sets of reaction tendencies or drives: negative free energy change (engendering love) and positive free energy change (dis-engendering love). [1]

References

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â— Sternberg, Robert J. (1998). *Cupid's Arrow: the Course of Love through Time*. New York: Cambridge University Press.

External links

â— Cupid – Wikipedia.

θΔics

In terminology, **curiosity** (TR:70) refers to []

Overview

In 1888, Jacques Loeb, in his “The Orientation of Animals to Light”, introduced his tropism theory or forced movement theory of action (see also: induced movement), the beginning of a long effort to overthrow that anthropomorphic-view of animal and plant movement, e.g. that protoplasmic substances move toward the source of light, "because of curiosity", as many argued during Loeb's day. [1]

Quotes

The following are noted quotes:

> “You must begin a child's education as soon as he displays any power to think. Everybody knows how hard it is to learn a new language late in life. The same holds good of all our acquisitions. The earlier they are acquired the more truly they become part of us. At the same time keep alive within the child the quickening power of **curiosity**. Do not repress him. Answer his questions; give him the information he craves, seeing to it always that he understands your explanations.”
>
> — Boris Sidis (c.1910), commentary on William James' 1890s “reserve energy” theory, which he employed in the forced prodigy raising of his son William Sidis (1898-1944) [2]

> “The consideration [of] the nature of the forces involved in [human] relationships is not an easy subject. There are numerous pitfalls in applying what we know about ordinary human behavior to love, or even to sexual desires; and so to reinforce this fact I provide you with the following to consider: these processes occur on human time [human time] and length scales which are well known to us, and yet extrapolating (or interpolating?) from the known into the unknown may be dangerous. So one asks, what is the nature of sex and love and so on, and their relation to the other everyday experiences around us? And the answer, of course, follows only from an observation of this world and the processes that occur in it. It must be noted, if it is not obvious, that I have never experienced any sort of romance. It is also true that I [likely] never will, and yet my **curiosity** drives me to inquire as to the nature of the experience. And it is true that physical theory is the only way in which to answer this question, other than direct experience. While direct experience is undeniably a more reliable way to answer such questions, a few major problems with direct experience must be addressed: first, that it is [probably] not going to happen; and second, that various other people whom I know have been involved in romances, and in some cases they have been involved in many consecutive romances, but have failed to take data during those treasured minutes of sex. Love lasts longer but they don't want to analyze their relationships for fear of destroying them. More seriously, they do not take time to step back and make objective and scientific observations. Thus, for all practical purposes, the mysteries of sex and love can for the time being only be revealed by theory.”
>
> — Christopher Hirata (2000), “The Physics of Relationships” (§4:Neutron Scattering: a Cautionary Tale) [3]

> “Since as a kid I was aware of the abyss (super rift) between the material and mental worlds. I tried to bridge this abyss, but could not. Yet I kept on with my own "Steigerung" as Goethe did. Then during 1982-83 I discovered empirically that the law of entropy production applies to the spiritual [*humanistic*] world as it applies to the physical world. My joy knew no bounds. I have found the bridge between these two worlds with which to cross the abyss between them. Others thought I was crazy and would not dare to publish my account. Then, in 1986, if I remember correctly, I was teaching university students the intricate calculations concerning free energy in chemical reactions. During that lecture I suddenly became aware how my mind was rushing along two levels. The lower level was concerned with chemical processes as a physical phenomenon. I executed this level almost automatically. But the higher level of my mind was exploring

free energy in the process of knowing-learning as a spiritual [*thermodynamics*] phenomenon. I followed this level with great **curiosity**. I think the students became aware that I was rather absent minded that day, not perceiving my higher most thoughts. That day marks the beginning of my continual exploring of the role of free energy in the spiritulization [*actualization*] of humankind."

— Adriaan de Lange (2001), "Fitness Landscape and other Landscapes" [4]

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3. (a) Hirata, Christopher M. (c.2000). "The Physics of Relationships" (§4:Neutron Scattering: a Cautionary Tale) (Ñº) (section: Fun), Tapir.Caltech.edu; (WayBack Machine).
(b) Hirata, Christopher M. (2010). "The Physics of Relationships", *Journal of Human Thermodynamics*, 6(5): 62-76.
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θΔics

In human physics, **Curtis R. Blakely** (c.1970-) is an American justice systems professor noted for his 2010 to present work on the physics or rather social physics of prisons.

Overview

In 2010, Blakely, in his "Sub-atomic Particles and Prisoners: A Novel Examination of Socio-Physics and Penology", explaind how he had to learn sociophysics, all on his own, so to be able to apply theory to penology cogently, and calls for the launching of sociophysics as a formal discipline. [1]

Education

Blakely completed bachelors and masters degree from University of Nebraska and a PhD in Sociology/Criminal Justice from Southern Illinois University. In 2009, he became a justice systems professor at Truman State University.

See also

- Maurice Hauriou | judicial social mechanics theory (1899)
- Bertrand Roehner | molecular inmate suicide theory (2005)

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External links

- Curtis Blakely (faculty) – Truman State University.

θΔics

In ecological economics, **Cutler Cleveland** (c.1958-) is an American earth scientist noted for his 1999 article "Biophysical Economics: From Physiocracy to Ecological Economics and Industrial Ecology", which attempts to summarize "biophysical economics", which he defines as Alfred Lotka's 1924 coining, along the way giving a fairly a decent historical overview of early attempts to incorporate thermodynamics ideas into economics, such as done by Sergei Podolinsky, Friedrich Engels, Wilhelm Ostwald, Frederick Soddy, Nicholas Georgescu, among others. [1]

Cleveland is also a noted topic editor for a number of energy dictionaries and encyclopedias, albeit written from the "energy and the environment" point of view rather than the "physics and thermodynamics" perspective; and is one overseers of the online *Encyclopedia of Earth.* In 2007, Cleveland launched a beta-stage online Energy Library (2007-2009), which contains a number of articles on energy in a general sense; the site, however, seems to be abandoned, and is riddled with errors, e.g. the timeline of the site lists Hermann Helmholtz as having conceived the theory that the sun derives its energy from gravitational contraction in 1854, whereas the snippet article on the same topic lists 1869; and seems to lack a consistent URL.

Education

Cleveland completed his BS in ecology and systematic from Cornell University in 1980, his MS in marine science at Louisiana State University in 1982, and his PhD in geography at the University of Illinois at Urbana-Champaign in 1988. Cleveland currently is a professor in the department of geography and the environment at Boston University.

References

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- Cleveland, Cutler, J. (2009). *Concise Encyclopedia of the History of Energy*. Academic Press.

External links

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- Cutler Cleveland – Encyclopedia of Earth.
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- Cutler J. Cleveland (faculty) – Boston University.

θΔics

In science, **cybernetics** is the study of control and communication in the animals and machines, based on the postulate that entropy and information are two sides of the same coin, in that just as information in a system is the measure of its degree of organization, so the entropy of a system is a measure of its degree of disorganization; and the one is "simply the negative of the other." [1]

Overview

In 1834, Andre-Marie Ampere, in his *Essay on the Philosophy of Science*, introduced the term cybernetics as follows: [6]

> "The future science of government should be called 'cybernetics' ('la cybernetique')."
>
> — Andre Ampere (1834), *Essay on the philosophy of science*; coined from (O) the French word meaning "the art of governing", from the Greek *kybernetes* "navigator or steersman"; adopted by Norbert Weiner for the field of control and communication theory

In 1949, Norbert Wiener popularized the term cybernetics. [1]
In *circa* 1950, cybernetics was incorporated into Austrian biologist Ludwig Bertalanffy's general systems theory. [2]
French anthropologist Claude Levi-Strauss also, supposedly, gained his understanding of entropy from cybernetics in the 1950s.

In 1968, Robert Mueller used cybernetics to formulate a theory of mental entropy. [3]

In 1971, Bruce Lindsay, in his "The Larger Cybernetic", summarized the history of the term as follows: [7]

> "Later in his career (in 1834) Ampère wrote a brilliant document, "Essai sur Ie philosophie des sciences," in which he took a particularly broad view of the philosophy of science, including social and political studies as well as the better-established natural sciences, in his discussion. It was in this memoir that Ampère first introduced the term ***cybernetique*** to refer to the science of government. He evidently felt that this was appropriate terminology since *κγβερντεσ* is the Greek for helmsman or governor, the one who controls the direction of the ship. This may be considered the beginning of the formal recognition of the science of control, though it does not appear that Ampère's definition gained much attention in the nineteenth century, nor in our own century for that matter, until Norbert Wiener resurrected the term in his book called *Cybernetics*, published in 1948, and attempted to put the subject on a more formal basis. "

In 1998, American electrical engineer Richard Coren published a cybernetics theory of evolution. [4] The 2008 book *Entropy of Mind and Negative Entropy* by Italian psychiatrist Tullio Scrimali uses cybernetics. [5]

References

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3. Mueller, Robert E. (1968). *The Science of Art: The Cybernetics of Creative Communication,* (pg. 67). Rapp & Whiting.
4. Coren, Richard L. (1998). *Evolutionary Trajectory: the Growth of Information in the History and Future of Earth* (ch. 7: Entropy, pgs 111-26). CRC Press.
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(b) Cybernetics (etymology) – Wikipedia.

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● Wiener, Norber. (1950). *The Human Uses of Human Beings: Cybernetics and Society*, (pgs. 26-27). Boston: Houghton Mifflin Co.
● Corning, Peter A. (2005). *Holistic Darwinism: Synergy, Cybernetics, and the Bioeconomics of Evolution.* (pg. 337). University of Chicago Press.

External links

● Cybernetics – Wikipedia.

θΔics

In thermodynamics, a **cycle** refers to the process by which a working body undergoes a series of transformations in which its final state results to be identical with its initial state, in terms of variables, such as pressure and volume. [1] The concept of the "cycle" was first outlined by French physicist Sadi Carnot in 1824. [2]

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics*, Oxford: Oxford University Press.
2. (a) Carnot, Sadi. (1824). “Reflections on the Motive Power of Fire and on Machines Fitted to Develop that Power.” Paris: Chez Bachelier, Libraire, Quai Des Augustins, No. 55.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (ch. 3: Carnot's Cycle, pgs. 37-71), (preview), (Google books). Morrisville, NC: LuLu.

External links

â— Thermodynamic cycle – Wikipedia.

θΔics

In mathematics, a **cycle integral**, mathematical operator (link), or the integration sign with a circle in it:

$$\oint$$

sometimes called the closed path integral, or circle integral, and refers to an "integration is done around a closed path" of a path-dependent function, i.e. state variable, as compared to an path-independent function, such as heat or work, specifically with reference to the a body returning to its "ideal original condition", as defined by the reversible cycle (reversible process), or "non-ideal original condition", as defined by the irreversible cycle (irreversible process).

History

The mathematics of the cycle integral stem from German physicist Rudolf Clausius' 1858 article “On the Treatment of Differential Equations which are Not Directly Integrable”, published in Dingler’s *Polytechnisches Journal*, which was then expanded on as the "mathematical introduction" section to the first (1865) and second (1875) editions of *The Mechanical Theory of Heat*. [1] The logic of this derivation, however, seems to predate Clausius and needs to be tracked down.

References

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(c) Clausius, Rudolf. (1875). *The Mechanical Theory of Heat* (section: Mathematical Introduction: on Mechanical Work, on Energy, and on the Treatment of Non-Integrable Differential Equations, pgs. 1-20). London: Macmillan & Co.

θΔics

In thermodynamics, a **cyclical process** is one in which the body undergoes a series of changes such that it is finally brought back to its initial condition. [1]

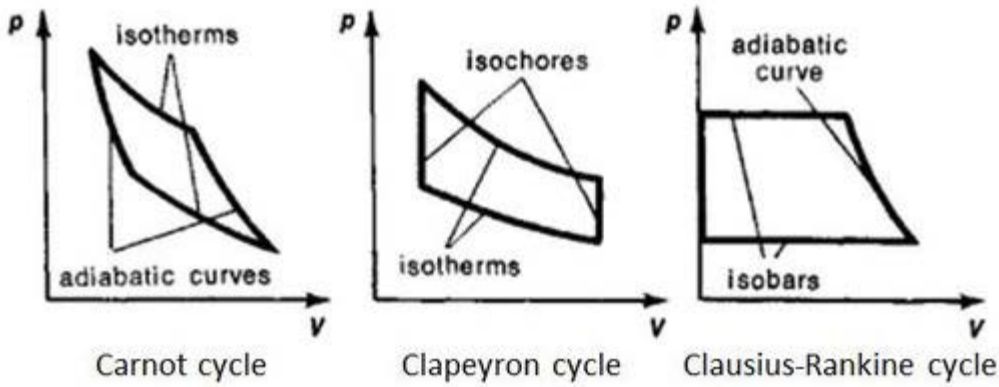

Three of the more famous **cyclical processes** of thermodynamics: the Carnot cycle, showing isotherms and adiabatic curves, the Clapeyron cycle, showing isochores and isotherms, and the Clausius-Rankine cycle, showing adiabatic curves and isobars, each showing the changes of stage of the body on pressure-volume diagrams. [3]

The essential example, as visualized in the concept of "re-establishment of equilibrium in the caloric" as described by French physicist Sadi Carnot in his 1824 *Reflections on the Motive Power of Fire*, being that in which a body of gas, enclosed in cylinder and piston, at a specific pressure and volume, is expanded, due to the input of heat, and then contracted, due to the removal of heat, back to its original position (and assumed molecular arrangement) quantified by the values of the original pressure and volume.

Internal energy

The integral of an indefinitely "small change" in internal energy is given by the following expression:

$$\int dU = U_2 - U_1$$

where

$$U_1 = H_1 + J_1$$

and

$$U_2 = H_2 + J_2$$

each signifying, respectively, the initial and final values of the sums of the heat contents *H* and ergal contents *J* of the body.

For a cyclical process, according to German physicist Rudolf Clausius, the integral of the change in internal energy is zero, being that initial and final conditions of the body are assumed, by definition, to be the same, or U_1 equals U_2. [1]

Quotes

The following are related quotes:

> "A conception not reducible to the small change of daily experience is like a currency not exchangeable for articles of consumption; it is not a symbol, but a fraud."
>
> — George Santayana (1906), "Reason in Society" [2]

References

1. Clausius, Rudolf. (1879). *The Mechanical Theory of Heat* (pg. 33). London: Macmillan & Co.
2. (a) Santayana, George. (1906). *The Life of Reason* (§8: Reason in Society) (Ñº) Publisher.
(b) Andrews, Robert. (1993). *The Columbia Dictionary of Quotations* (pg. 906). Columbia University Press.
3. Author. (1979). *The Great Soviet Encyclopedia* (Ñº). Publisher.

External links

â— Cyclic process – TheFreeDictionary.com.

θΔics

In thermodynamics, **cyclical transformation** is a transformation of a body or system in which the initial state and final state are the same. [1]

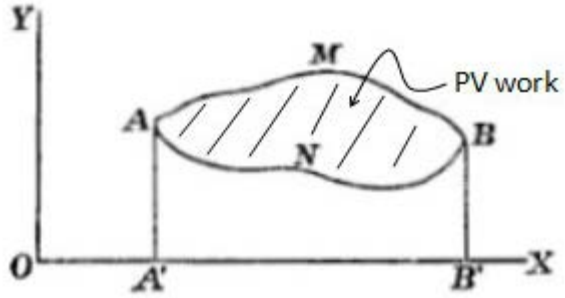

A graphical depiction of a **cyclical transformation** of a body or system, on a Y,X-plane, the variables typically being pressure and volume, respectively, showing a body at an initial state A transforming along path M to state B in the expansion stroke, then transforming again along path N, in the contraction stroke, to final state A, which is also the initial state (macroscopically speaking). [2]

A cyclic transformation is sometimes called a cycle, for short, if the initial and final states are the same; although a cycle tends to refer to a two step cycle, i.e. an expansion stroke, followed by a contraction stroke; whereas a transformation may follow any number of intermediate paths.

A cyclical transformation, subsequently, brings the system back to its initial state. If the state of the system can be represented on a PV diagram, then a cyclical transformation can be represented by a closed curve, such as the curve AMBN, depicted adjacent. [2]

The pressure volume work (PV work) done by the system during the cyclical transformation, if the ordinate (vertical axis) and abscissa (horizontal axis) are pressure and volume, is represented geometrically by the area enclosed by the curve representing the cycle or AMBN, which equals the area of the region enclosed by AMBB'A'A less the area ANBB'A'A or expansion work less contraction work.

To note, if the cycle is performed in the counterclockwise direction, ANBM, the work again will be given by the enclosed region, only in this case it will have a negative value.

Mathematics

Cyclical transformations are quantified or calculated by the cycle integral.

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2. Preston, Thomas.(1894). *A Theory of Heat* (section 283: Remarks on the Energy Equation: Cyclical Transformations, pgs. 597-99). MacMillan.
3. Isochoric process – Wikipedia.

θΔics

In engineering, **cylinder** is the tube-shaped container, typically sealed at one end, either with or without intake and out-take ports or valves, into which the adjustable piston fits, in the so-called piston and cylinder engine.

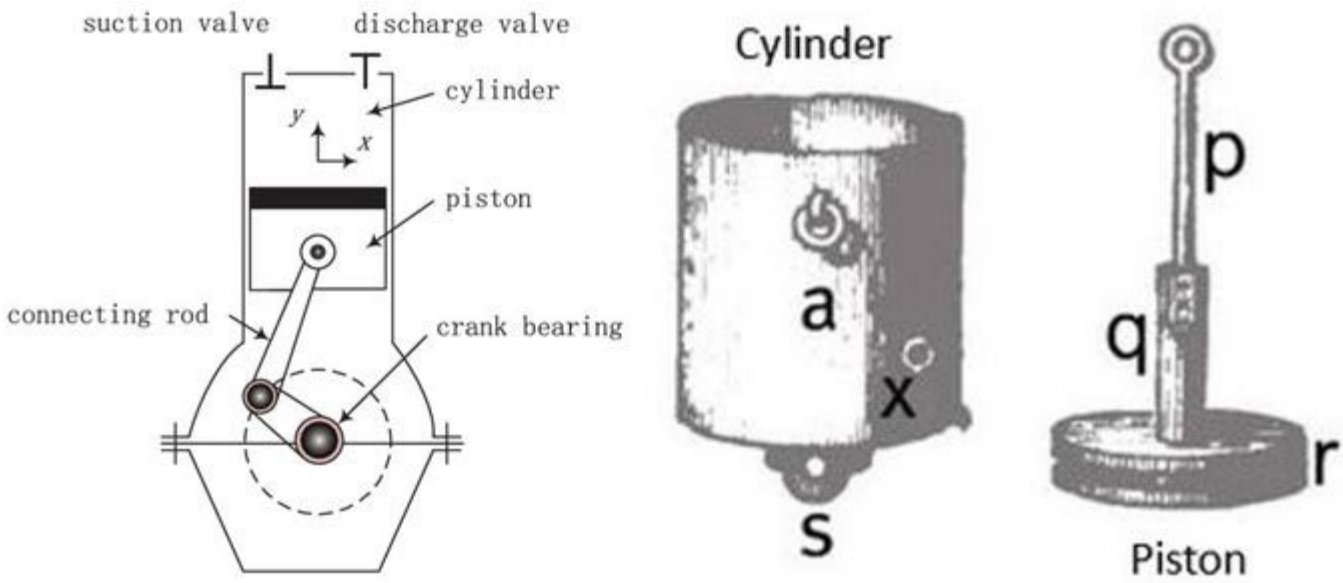

Left: a modern internal combustion engine, showing a steel **cylinder** with an intake valve and discharge valve. Right: an 1654 **cylinder** and wooden piston from the Guericke engine.

External links

â— Cylinder (engine) – Wikipedia.

θΔics

In hmolscience, **Cynthia Russett** (1937-2013) was an American historian noted for her 1964 PhD dissertation turned book *The Concept of Equilibrium in American Social Thought* (1966)—winner of prize for best dissertation in American history—wherein she seems to give a history and reverberation and integration effect synopsis of the Harvard Pareto circle, focusing on a discussion of the equilibrium theories of physical sciences, such as Willard Gibbs and Henry le Chatelier, the cross-over equilibrium theories, such as Vilfredo Pareto, and their carryover into sociology theory, such as found in the works of Lawrence Henderson. [5]

Organisms | Thermodynamics

At one point, in her discussion of George Lundberg, Russett long winded statement, involving a footnote, which in turn cites a footnote of a previous page, of her view about individual organisms not obeying thermodynamics (see: violations)—the sum aggregate of which is shown below: [6]

> "Clearly organisms and mechanism were mismatched paradigmatic bedfellows. Individual organisms, precisely because they are open systems, do not obey the rules of statistical mechanics or thermodynamics. Although the organic world taken as a whole does ultimately fall under the second law. In *Time's Arrow and Evolution* (1951), Harold Blum has pointed out that at the most inclusive level living systems undergoing evolution, far from acting in a way antithetical to the second law, actually obey it. Individual organisms do indeed evolve toward greater organization, win a consequent decrease in entropy. Organisms are able to do this because they are open systems constantly importing energy from their environment. But each local decrease in entropy is obtained only at the cost of an increase in the entropy of the universe as a whole. As long as an organism remains alive, it is open to new sources of energy from its environment and continually renews itself in interaction with that environment. Its entire lifetime is a flouting of the second law, until death imposes conformity. Furthermore life—with all that life implies in the way of organization and coordinated activity—is by no means 'the most probable state' of a given assemblage of molecules; indeed it is the most improbable. In the realm of probability theory, order is much less likely than disorder."

(add discussion)

Interest

Russett states that she was pulled into the Henderson project, out of some type of early 1960s graduate seminar paper:

> "My interest in equilibrium as a component of American social theory grew out of a graduate seminar paper on Lawrence J. Henderson, the Harvard physiologist and one of the men most responsible for disseminating the concept in this country."

Pareto

The following is an example Pareto synopsis by Russett: [2]

> "Having framed the society within a 'system' schema, Pareto could facilitate his work enormously by establishing determinate conditions within it, conditions, that is to say, which did not vary at random but were completely described with reference to some general laws. Probably the commonest means to this end in the physical sciences is the use of some definition of equilibrium. Pareto had used just such a definition years before as a student at Turin. Bearing in mind his student experience, Pareto now invoked a definition of equilibrium not unlike the one set forth in his thesis: equilibrium was 'such a state that if it is artificially subject to some modification different from the modification it undergoes normally, a reaction at once takes place tending to restore it to its real, its normal, state.' This particular formula was very close to that of Le

Chatelier in physical chemistry."

(add discussion)

Other

Russett's 1989 *Sexual Science* discusses the heat death writings of Camille Flammarion. [4]

Education

Russett graduated from Trinity College, Washington, D.C., in 1958, then completed her MA (1959) and PhD (1964) from Yale, winning the prize for best dissertation in American history, after which she became a Yale lecturer in 1967, became full professor in 1990, where she focused on American intellectual life (existence) in the 20th century, retiring in 2002. [3]

References

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â— Cynthia Russett (archive) – Yale University.

θΔics

In existographies, **Cyril Bailey** (1871-1957) was a British philologist, Latin scholar, tending to focus on the works of Lucretius, Cicero, and Aristophanes, noted particularly for his 1947 popularly-used [e.g. Frank Copley (1977)] three-volume English translation of Lucretius' *On the Nature of Things*, with prolegomena, critical apparatus, and commentary. [1]

Overview

In 1928, Bailey, in his *The Greek Atomists and Epicurus*, contrasts and compares the three main Greek atomic theorists: Leucippus, Democritus, and Epicurus, and discusses the general "atomic school" fervent in the years 430BC to 280BC. [2]

References

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- Bailey, Cyril. (1907). *The Religion of Ancient Rome.* Publisher.
- Bailey, Cyril. (1926). *Epicurus. The Extant Remains.* Oxford.
- Bailey, Cyril. (1932). *Phases in the Religion of Ancient Rome.* Berkeley.

External links

- Cyril Bailey (German → English) – Wikipedia.

θΔics

In existographies, **D.H. Lawrence** (1885-1930) (CR:4) was an English novelist, poet, playwright, essayist, literary critic, painter, and philosopher, noted for []

Overview

The works Lawrence, according to Bruce Clarke, is said to use thermodynamics logic in an allegorical sense to discuss sexual energy. [1]

In 2007, English German-cultures scholar Carl Krockel, in his PhD dissertation "D.H. Lawrence and Germany: the Politics of Influence" turned book, summarized the Goethe-Eliot connection. [2]

Quotes | By

The following are quotes by Lawrence:

> "The essential American soul is hard, isolate, stoic, and a killer. It has never yet melted."
>
> — D.H. Lawrence (c.1910), *Publication*; opening quote in film *Hostiles* (2018)

References

1. Clarke, Bruce. (1998). "A Different Sun: The Allegory of Thermodynamics in D. H. Lawrence", in *Myth and Making of Modernity* (pgs. 81-98, esp. pg. 97), edited by Michael Bell and Peter Poellner. Rodopi.
2. Krockel, Carl. (2007). *D.H. Lawrence and Germany: the Politics of Influence* (pgs. 21-22). Rodopi.

External links

â— D.H. Lawrence – Wikipedia.

θΔics

In engines, **Da Vinci engine** refers to []

Overview

In 1508, Leonardo da Vinci, in his notes of his folio 16v of MS F, sketched a gunpowder engine, shown adjacent at center.

At left, is rendition of da Vinci's engine (Needham, 1987), showing a cannon barrel fitted with a closable lid, and a exhaust fumes release valve, which operates such that when gunpowder is placed on the piston and ignited, an explosion occurs, the reactant vapors leave through the release valve, and a vacuum is thus created inside the piston and cylinder, thereby acting to make the piston rise in the cylinder, lifting weight, by the force of atmospheric pressure. [2] That diagram at right shows a thicker cannon barrel like design, which seems closer to what da Vinci envisioned.

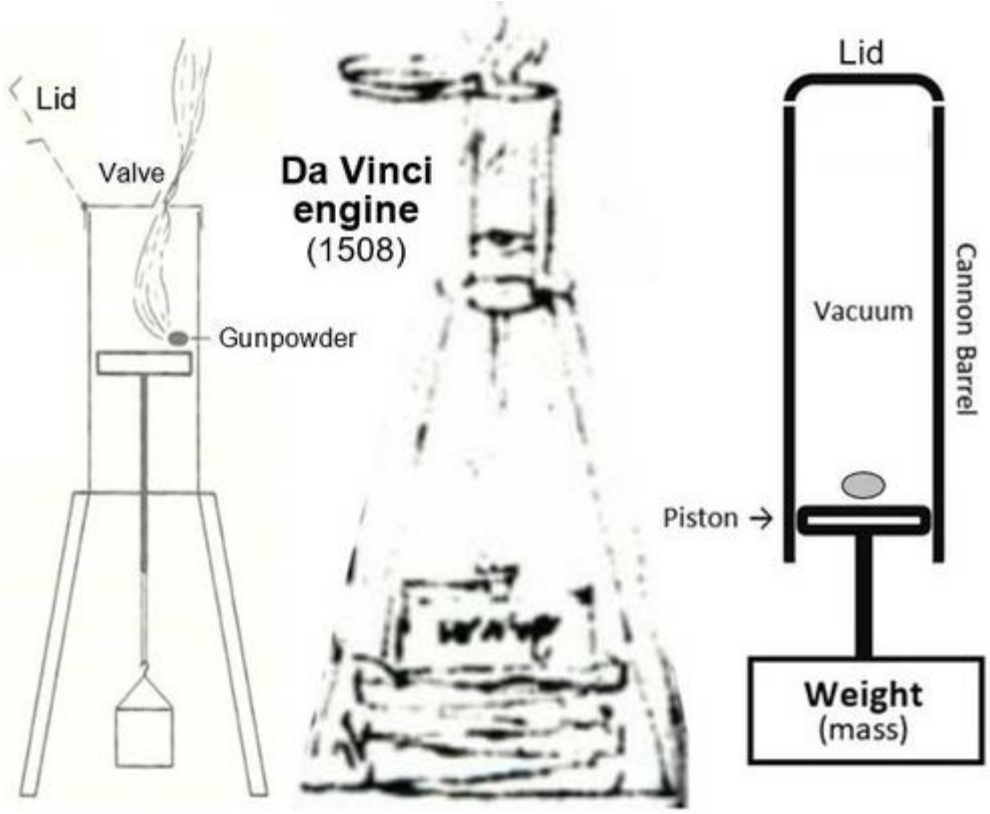

The original sketch of **da Vinci engine** (1508), above center, an upside-down cannon barrel fitted with a piston, as sketched by Leonardo Da Vinci (1508), along with a clearer visual of his design at right, which operates such that when the gunpowder is exploded above the piston, the explosive combustion creates a vacuum, in the area above the piston, which causes the surrounding atmosphere to push the bottom of the piston upward, thereby lifting the attached weight. [1]

Da Vinci described his engine as follows:

> "A mechanism to lift heavy weights. To lift a heavy weight with fire, like a cupping glass. And the vessel should be one braccio [about 2 feet] wide and ten long, and should be strong. It should be lit from below like a bombard (Ñº) and the touchhole rapidly and immediately closed on top. The bottom, that has a very strong leather, like a bellow, will rise and this is the way to lift any heavy weight."
>
> — Leonardo da Vinci (1508), "note on device to lift heavy weight with fire", Folio 16v of MS F [1]

(add)

Quotes

The following are related quotes:

> "The only detail that differentiates **Leonardo's machine** from those of Huygens and Papin is the system adopted for raising the weight sustained by the piston. Huygens and Papin use a pulley and rope transmission (the same that Leonardo adopted in his experiments with steam), while Leonardo preferred to attach a rod to the bottom of the piston."
>
> — Ladislao Reti (1969), "Leonardo da Vinci the Technologist: the Problem of Prime Movers" [17]

References

1. (a) Da Vinci, Leonardo. (1508). "Cannon-barrel gunpowder engine", Folio 16v of MS F.

(b) Da Vinci, Leonardo. (1508). “Title”, mod auct. Seq. Ret. Codex F (Institute of France), 1v; cf. Codex Atlanticus, 5, r.a., 7 r.a.
(c) Hart, I.B. (1961). *The World of Leonardo da Vinci: Man of Science, Engineer, and Dreamer of Flight* (with a note on Leonardo’s helicopter model by C.H. Gibbs-Smith) (pg. 299). McDonald.
2. Needham, Joseph. (1987). *Science and Civilization in China: Volume 5, Chemistry and Chemical Technology, Part 7, Military Technology: The Gunpowder Epic* (§§: Gunpowder as the Fourth Force: its Role in the History of Steam Engines, pgs. 544-67; Da Vinci, pgs. 552-563). Cambridge.

θΔics

In human thermodynamics, **Daedalus** (c.1930-c.2000) is the penname to an anonymous thinker, noted for his theories on molecular sociology and financial thermodynamics as were described in several weekly columns of *New Scientist*, in the early 1970s. Each week the writer discusses various aspects of his 'friend's' theory, in a half-serious, half-humorous manner.

The column seems to have been spurred into existence with human statistical mechanics publications of American physicist Elihu Fein (1970) and Australian mechanical engineer Roy Henderson (1971). [1]

To quote one example, from the April 20th, 1972 Ariadne column: [2]

> "Some while back my pecunientropic friend **Daedalus** developed a 'molecular sociology' an analogy between people and molecules. In particular he identified wealth in people with energy in molecules; he is now developing a financial thermodynamics or thermodynamics of money."

From the April 27th, 1972 issue: [4]

> "This week my fiscothermal friend **Daedalus** continues his exposition of the thermodynamics of money, regarding it as a heat-like entity whose concentration determines a financial temperature."

The person 'Daedalus' is described as friend of an anonymous *New Scientist* columnist writer, and his weekly column 'Ariadne', the column itself named after the daughter of King Minos of Crete, of Greek mythology. [3] The name Daedalus, itself, originated as the famous wing maker, maze maker, mythological figure of the circa 900 BC stories of Homer, referred to as a 'great worker'. [1] In the 1924 book *Daedalus* by John Haldane, uses the name in the sense of a symbol of the revolutionary spirit of science; a book which was cited by Vladimir Vernadsky and his biosphere theory.

References

1. (a) Fein, Elihu. (1970). "Demography and Thermodynamics", *American Journal of Physics*, Vol. 38, pg. 1373.
(b) Henderson, L. F. (1971). "The Statistics of Crowd Fluids", *Nature*, 229: 381-83.
(c) Staff. (1971). "Molecular Sociology Arrives at Last", *New Scientist*, pg. 286. Feb 11.
2. Staff. (1972). "Ariadne", *New Scientist* (pg. 165), Apr 20.
3. (a) Ariadne – Wikipedia.
(b) Daedalus – Wikipedia.
4. Staff. (1972). "Ariadne", *New Scientist* (pg. 232), Apr 27.

θΔics

In existographies, **Dale McGowan** (1963-) (CR:6) is an American atheism advocate noted for []

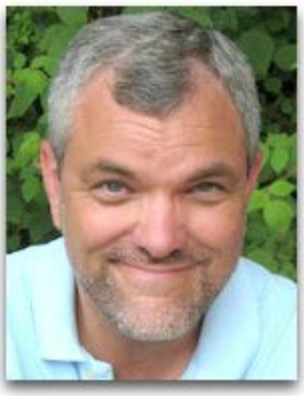

Overview

In the early 2000s, McGowan was gaining notoriety in the raising kids without religion blogosphere, to those including to Deborah Mitchell.

In 2005, McGowan floated the idea of a book on nonreligious parenting to his agent who floated the idea to various publishers; most replied that "there is no market for it" per the reasoning: "if there were a market, there would already be books for it." [1]

In 2007, McGowan edited *Parenting Beyond Belief*, which includes a foreword by Michael Shermer, and contributions from: Richard Dawkins, Penn Jillette, and Julia Sweeney, among others. [2]

In 2013, McGowan, in his *Atheism for Dummies*, discusses atheism terminology, such as implicit atheism vs explicit atheism. [3]

In 2016, McGowan was a consultant to Harvard's atheist Sunday school stylized "Big Questions Lab".

Education

In 1986, McGowan completed a BA in music and anthropology at the University of California, Berkeley, then studied film scoring at UCLA, then completed his MA in instrumental conducting at Cal State Northridge in 1991, then completed his PhD in composition at the University of Minnesota, and from 1991 to 2006 was an associate professor of music at St. Catherine University. [4]

References

1. Mitchell, Deborah. (2014). *Growing Up Godless: a Parent's Guide to Raising Kids Without Religion* (foreword: Dale McGowan). Sterling Publishing.
2. McGowan, Dale. (2007). *Parenting Beyond Belief: On Raising Ethical, Caring Kids Without Religion*. AMACOM.
3. McGowan, Dale. (2013). *Atheism for Dummies* (implicit vs explicit, pgs. 20-22). John Wiley & Sons.
4. Dale McGowan (about) – DaleMcGowan.com.

External links

â— Dale McGowan – Wikipedia.

θΔics

In existographies, **Dan Barker** (1949-) (FA:120) is an American evangelical Minister turned 1984 to present evangelical atheist noted for []

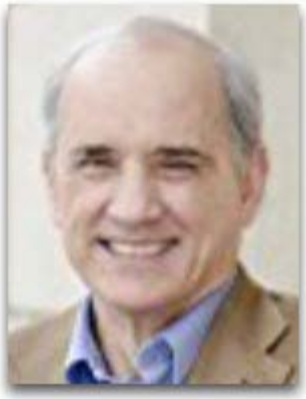

Deconversion

In 1984, Barker a former preacher of 19-years, came out, amid a deconversion process, as an atheist, going on a number of talk shows, e.g. Oprah (Q); later followed by publications, such as *Losing Faith in Faith: From Preacher to Atheist* (1992).

Gaylor

Barker is husband of Annie Laurie Gaylor (FA:112).

Atheism | Kids

> *See main: Children's Atheist Bible*

In 1992, Barker, in his *Maybe Right, Maybe Wrong*, attempted to pen out a atheism for children type of book, in attempts to differentiate "right" from "wrong" without divine-backing. [1]

In 1993, Baker, in his *Maybe Yes, Maybe Know*, penned out a guide for young people to have an open mind, who fact checks things to find out the truth, rather than blindly accepting everything one hears. [2]

References

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2. Barker, Dan. (1993). *Maybe Yes, Maybe Known: Guide for Young Skeptics* (illustrator: Brian Strassburg). Prometheus Press.

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● Barker, Dan. (2008). *Godless: How an Evangelical Preacher Became One of America's Leading Atheists* (foreword: Richard Dawkins). Ulysses Press.
● Barker, Dan. (2010). *The Good Atheist: Living a Purpose-Filled Life Without God*. Ulysses Press.
● Barker, Dan. (2015). *Life Driven Purpose: How an Atheist Finds Meaning*. Pitchsone Publishing.
● Barker, Dan (2016). God: The Most Unpleasant Character in All Fiction. Sterling.

Videos

● Barker, Dan. (2012). "God Does Not Exist" (Q), OxfordUnion, YouTube, Dec 21.

External links

● Dan Barker – Wikipedia.

θΔics

In existographies, **Dan Brown** (1964-) is an American author noted for []

Overview

In 2003, Brown published *The Da Vinci Code*, which as of 2009 had sold 80 million copies and been translated into 44 languages; the passages discussing the connection of Osiris and or Horus to Christianity (see: Osiris-Horus) are as follows:

> "Langdon sensed Fache did not see at all. Jacques Sauniere was con-sidered the premiere goddess iconographer on earth. Not only did Sauniere have a personal passion for relics relating to fertility, goddess cults, Wicca, and the sacred feminine, but during his twenty-year tenure as curator, Sauniere had helped the Louvre amass the largest collection of goddess art on earth—labrys axes from the priestesses' oldest Greek shrine in Delphi, gold caducei wands, hundreds of Tjet ankhs resembling small standing angels, sistrum rattles used in ancient Egypt to dispel evil spirits, and an astonishing array of statues depicting **Horus being nursed by the goddess Isis**."
>
> — Dan Brown (2003), *The Da Vinci Code* (pg. 23) [1]

The bulk of the discussion, on what might be called the "Brown thesis", is that Jesus was a mortal prophet, i.e. real person who had followers, who was made "son of god" by emperor Constantine (272-337) who was a pagan in religious belief:

> "I thought Constantine was a Christian," Sophie said.
>
> "Hardly," Teabing scoffed. "He was a lifelong pagan who was baptized on his deathbed, too weak to protest. In Constantine's day, Rome's official religion [see: state religion] was sun worship—the cult of Sol Invictus, or the Invincible Sun—and Constantine was its head priest. Unfortunately for him, a growing religious turmoil was gripping Rome. Three centuries after the crucifixion of Jesus Christ, Christ's followers [see: silent historians problem] had multiplied exponentially. Christians and pagans began warring, and the conflict grew to such proportions that it threatened to rend Rome in two. Constantine decided something had to be done. In 325 AD, he decided to unify Rome under a single religion. Christianity."
>
> Sophie was surprised. "Why would a pagan emperor choose Christianity as the official religion?"
>
> Teabing chuckled. "Constantine was a very good businessman. He could see that Christianity was on the rise, and he simply backed the winning horse. Historians still marvel at the brilliance with which Constantine converted the sun-worshipping pagans to Christianity. By fusing pagan symbols, dates, and rituals into the growing Christian tradition, he created a kind of hybrid religion that was acceptable to both parties."
>
> "Transmogrification," Langdon said. 'The vestiges of pagan religion in Christian symbology are undeniable. **Egyptian sun disks became the halos of Catholic saints**. Pictograms of **Isis nursing her miraculously conceived**

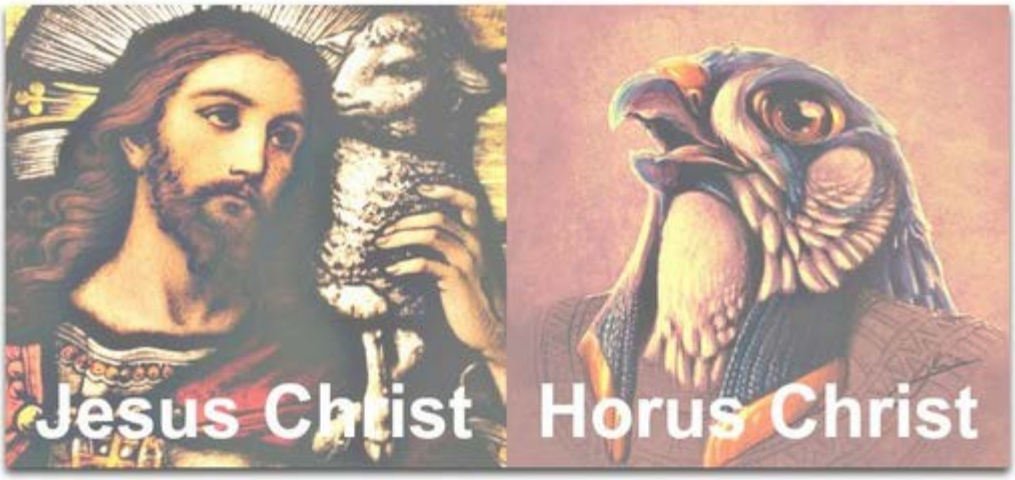

An image from an article (Ñº), by theist James Bishop (2017), which attempts to refute **Brown**'s pagan theft thesis origin of Christianity.

son Horus became the blueprint for our modem images of the Virgin Mary nursing Baby Jesus. And virtually all the elements of the Catholic ritual—the miter, the altar, the doxology, and communion, the act of "God-eating" [see: Osiris cakes and transubstantiation] — were taken directly from earlier pagan mystery religions."

Teabing groaned. "Don't get a symbologist started on Christian icons. **Nothing in Christianity is original**. The pre-Christian god Mithras—called the 'son of god' and the "light of the world"—was born on December 25, died, was buried in a rock tomb, and then resurrected in three days. By the way, December 25 is also the birthday of Osiris, Adonis, and Dionysus. The newborn Krishna was presented with gold, frankincense, and myrrh. Even Christianity's weekly holy day was stolen from the pagans"

"What do you mean?"

"Originally," Langdon said, "Christianity honored the Jewish Sabbath of Saturday, but Constantine shifted it to coincide with the pagan's veneration day of the sun." He pawed, grinning. "To this day, most churchgoers attend services on Sunday morning with no idea that they are there on account of the pagan sun god's weekly tribute—Sun-day."

Sophie's head was spinning. And all of this relates to the Grail?"

"Indeed," Teabing said. "Stay with me. During this fusion of religions, Constantine needed to strengthen the new Christian tradition, and held a famous ecumenical gathering known as the Council of Nicaea."

Sophie had heard of it only insofar as its being the birthplace of the Nicene Creed.

"At this gathering," Teabing said, "many aspects of Christianity were debated and voted upon—the date of Easter, the role of the bishops, the administration of sacraments, and, of course, the divinity of Jesus."

"I don't follow. His divinity?"

"My dear," Teabing declared, "**until that moment in history, Jesus was viewed by His followers** [see: silent historians problem] **as a mortal prophet** . . . a great and powerful man, but a man nonetheless. A mortal."

"Not the 'son of god'?"

"Right," Teabing said. "Jesus' establishment as 'the Son of God' was officially proposed and voted on by the Council of Nicaea."

"Hold on. You're saying Jesus' divinity was the result of a vote?'

"A relatively close vote at that," Teabing added. "Nonetheless, establishing Christ's divinity was critical to the further unification of the Roman empire [see: Roman recension] and to the new Vatican power base. By officially endorsing Jesus as the 'son of god', Constantine turned Jesus into a deity who existed beyond the scope of the human world, an entity whose power was unchallengeable. This not only precluded further pagan challenges to Christianity, but now the followers of Christ were able to redeem themselves only via the established sacred channel—the Roman Catholic Church."

Sophie glanced at Langdon, and he gave her a soft nod of concurrence.

"It was all about power," Teabing continued. "Christ as Messiah was critical to the functioning of Church and state. Many scholars claim that the early Church literally stole Jesus from His original followers, hijacking his human message, shrouding it in an impenetrable cloak of divinity, and using it to expand their own power. I've written several books on the topic."

(add)

References

1. Brown, Dan. (2003). *The Da Vinci Code* (pgs. 232-33). Publisher.

External links

â— Dan Brown – Wikipedia.

θΔics

In human physics, **Dan Cobley** (c.1960-) is an English physicist and marketing director noted for his 2010 TED talk in which he discusses how as the marketing director for companies such as Google, Capital One, and Ask Jeeves, he employs physics concepts such as Newton's second law, Heisenberg's uncertainty principle, the scientific method, and the second law of thermodynamics to explain the fundamental theories of branding. [1]

Newton's second law

In his 2010 TED talk on marketing and physics, Cobley first introduces the following form of Newton's second law: [2]

$$\vec{F} = m\vec{a}$$

which states that force F equals mass m of a body or object times its acceleration a; the arrow hat signifying a vector quantity, namely a value with magnitude and direction. He rearranges this equation to the form:

$$\vec{a} = \frac{\vec{F}}{m}$$

which he says means that:

> "For a larger particle or larger mass it requires more force to change its direction. It's the same with brands. The more massive a brand the more baggage it has the more force is needed to change its position."

Cobley's marketing physics diagram.

Examples he gives include the conclusion that Hoover found it difficult to convince the world it was anything more than vacuum cleaners; why Anderson Consulting had to rebrand as "Accenture"; and why companies like Unilever and Procter & Gamble keep brands separate (adjacent) rather than having one giant parent brand. He summarizes this by saying that:

> "The physics is the bigger the more massive an object the more force is needed to change its direction. The marketing is the bigger the brand the more difficult it is to reposition it."

The suggested conclusion is to lean towards using a portfolio of brands or new brands for new ventures.

Thermodynamics

In regards to marketing and thermodynamics, Cobley cites the following time derivative version of the second law:

$$\frac{dS}{dt} \geq 0$$

which he says represents entropy increase, as mandated by the second law, where he defines entropy as the measure of the disorder of a system. He then goes on argue that in marketing these means that, in the modern internet age, as soon as a brand is uploaded, with the high-speed tools available to Internet users, the brand soon becomes dispersed, modified, and changed to the "more chaotic". He goes on to state that this "distribution of brand energy" gets the brand closer to the people, more in with the people. The distribution of energy, he says is a democratizing force, which is ultimately good for brands. He concludes with:

> "The lesson from physics is that entropy will always increase, it's a fundamental law. The message from marketing is that your brand is more dispersed, you can't fight it, so embrace it and try to find a way to work with it."

One salient issue in this argument, aside from the fact that Gibbs free energy is the central driving force of marketing, is that he utilizes the rather unsound Atkins-Lambert dumbed-down "energy dispersal" interpretation of the second law and of entropy, with has little fundamental basis to it.

Heisenberg's uncertainty principle

On extrapolating the uncertainty principle into marketing, Cobley first gives the following version of the uncertainty principle:

$$\Delta x \, \Delta p \geq \frac{\hbar}{2}$$

which he says means that means that it's impossible to measure the state, namely both the position x or momentum p of a particle, because the acts of measuring the particle changes it, where Ä§ is the reduced Planck's constant.

As with most cases of the use of the uncertainty principle extrapolated up to the human interaction scenario, however, the model leans towards the far end of unsound analogical extrapolation. [3] He says that just as when a particle is changed during the act of observation, namely when the momentum of the photon of light perturbs the momentum of particle, so to does the act of observing a consumer change their behavior. One of several examples he gives is that when surveyed people hardly admit to searching for porn, yet according to Google this is the number one searched for term. What Cobley is alluding to here, however, sounds more along the lines of the double blind placebo controlled issue, reputation affect issue, or peer observation affect, etc., than that of quantum mechanical uncertainty. The marketing message is try to measure what consumers actually do rather than what they say they'll do.

Dan Cobley at TED (2010) talking about his use of physics in marketing and advertising.

Scientific method

Cobley states on the scientific method (which is said to have originated in the work of Francis Bacon) that you cannot prove a hypothesis though observation you can only disprove it. What this means is that you can gather more and more data around an hypothesis, which may strengthen it, but it will never conclusively prove it, and only one contradictory date point can blow the theory out of the water. He gives the example of the BP oil spill brand tarnishing, the Toyota break problem recall brand tarnishing, and the Tiger Woods fall from grace, as examples.

He gives the example of how the one robust data point of Nicolaus Copernicus to "blow" Ptolemy's geocentric model

out of the water. The parallel for marketing is that one can invest for a long time in a brand, but a single contrary observation on that positioning will destroy consumer's belief.

This extrapolation of Copernicus "blowing" Ptolemy away with one single contrary observation, however, is a bit truncated, being that the Nun cosmology (3100-2040) based geocentric model (130AD) was not blown out of the water in a single day, but rather it took nearly five millennia, from the time of Aristarchus of Samos (*c*. 270 BC) up well past the time of Galileo Galilei's *Dialogue Concerning the Two Chief World Systems* (1632), a defense of the heliocentric system, a publication for which he was put under house arrest for, to overthrow the 3100BC earth-centric model of the universe.

In conclusion, the real marketing extrapolation, in regards to established brand overturn, is that some brands have deep unconsciously rooted connections of trust that are difficult to overturn in spite of evidence to the contrary and thus established brands may take centuries to overturn, in spite of their shortcomings.

Education

Cobley completed a BS in physics (his first degree) at Oxford, prior to going into marketing. Cobley worked as vice president of branding and marketing for Capital One and was the marketing director of Ask Jeeves. In 2006, he became director of marketing at Google for central and northern Europe.

References

1. (a) Cobley, Dan. (2010). "Dan Cobley: What Physics Taught me About Marketing", TED talks, Aug 27.
(b) Young, Laurie. (2011). *The Marketer's Handbook* (pg. #). Wiley.
2. Newton's second law – Wikipedia.
3. Uncertainty principle – Wikipedia.

External links

â— Dan Cobley (profile) – TED.com.
â— Dan Cobley – Google+

θΔics

In terminology, **danger** refers to something that might cause harm or damage. [1] The term is frequently evoked in attempts at materialism, physicalism, mechanism, and or chemicalism formulations of the humanities, and or combinations there of, e.g. molecular sociology, human chemical thermodynamics, etc.

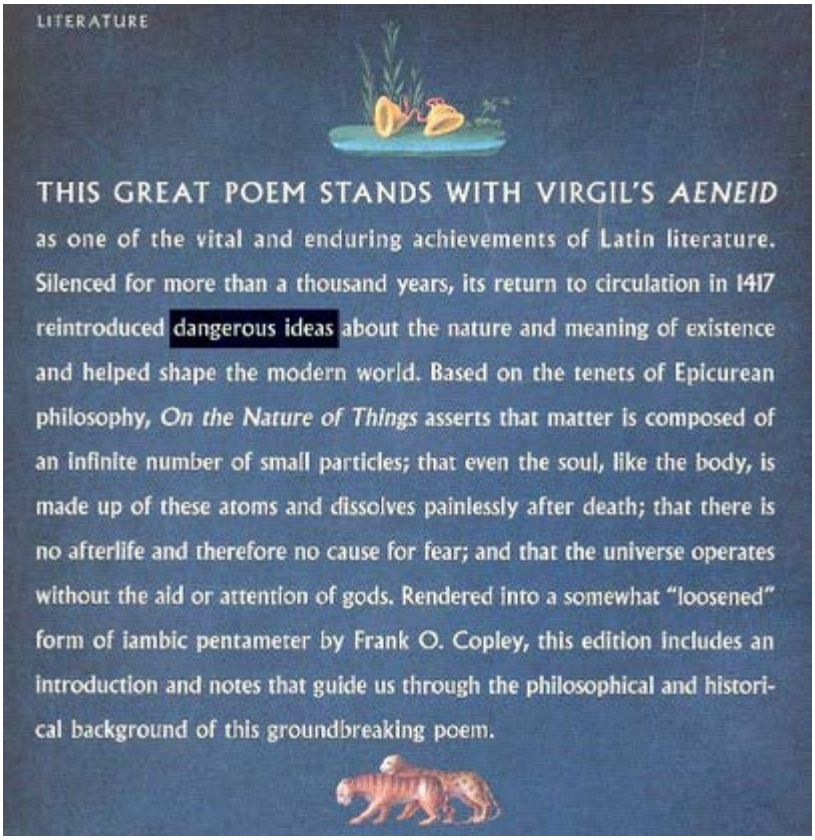

Back cover to the 1977 Frank Copley translation (O) of Lucretius' 55BC atheistic-themed atomic theory-advocating *On the Nature of Things*, which has since "reintroduced **dangerous** ideas about the nature and meaning of existence" in a world made of only atoms and voids governed by material forces; all of which finding recurring surfacing in the dangerous waters of intellectual revolution of Jean Sales, Johann Goethe, Frederick Rossini, and Libb Thims, to name a few prominent examples.

Overview

In 1600, Giordano Bruno burned at the stake for promoting the dangerous Lucretian-Copernican view.

In 1775, Jean Sales was imprisoned for promoting the view that humans are molecules formed via a great principle from the atoms of the earth.

In 1809, German polyintellect Johann Goethe published his physical chemistry based treatise *Elective Affinities*, which went on to become his "most dangerous" work; later causing James Froude to lose his post at Oxford and to have his 1848 *Nemesis of Faith* publicly burned.

In 1889 to 1893, the public lectures of Vilfredo Pareto's, the third social Newton behind Goethe and Henry Adams, were closed by the police; sometime therein, or at least by 1895, he began to pen out his signature theory of "man, a kind of molecule, acting only in response to the forces of ophelimity."

In the 20th century, Karl Marx's atomic theory based historical materialism sociology theory was adopted by Vladimir Lenin and used to reform the national belief system in Russia, resulting in death tolls upwards of 6-7 million people owing to starvation resulting from misaligned social policy.

In 2006, Frederick Rossini's "Chemical Thermodynamics in the Real World" (1971) arguments, were harpooned publicly in the *Journal of Chemical Education*, by physical chemist John Wojcik, as being a danger to society.

In 2005 to 2010, all human molecule, human chemistry, and human thermodynamics topics as articles have been perpetually banned from Wikipedia and threatened to be banned from ChemistryForums.com; and in 2011 it was commented, by Peggy La Cerra, that the PhD advisors who allow graduate students to use Hmolpedia as resource tool to complete PhD dissertations should be shot.

Epicureanism

The works of Epicurus, e.g. as discussed in the Epicurean swerve theory, are the earliest mentions of "danger" in respect to moral philosophy adoption. In 2011, American historian Stephen Greenblatt, in his *The Swerve: How the Renaissance Began*, seems to credit the start of the renaissance to the discovery of Epicurean swerve theory, via discovery Lucretius' *On the Nature of Things*, the abstract of which is as follows: [9]

> "One of the world's most celebrated scholars, Stephen Greenblatt has crafted both an innovative work of history and a thrilling story of discovery, in which one manuscript, plucked from a thousand years of neglect, changed the course of human thought and made possible the world as we know it. Nearly six hundred years ago, a short, genial, cannily alert man [Poggio Bracciolini] in his late thirties took a very old

manuscript off a library shelf, saw with excitement what he had discovered, and ordered that it be copied. That book was [known at that time] the last surviving manuscript of an ancient Roman philosophical epic, *On the Nature of Things*, by Lucretius a beautiful poem of the most **dangerous** ideas: that the universe functioned without the aid of gods, that religious fear was damaging to human life, and that matter was made up of very small particles in eternal motion, colliding and swerving in new directions. The copying and translation of this ancient book-the greatest discovery of the greatest book-hunter of his age-fueled the Renaissance, inspiring artists such as Botticelli and thinkers such as Giordano Bruno; shaped the thought of Galileo and Freud, Darwin and Einstein; and had a revolutionary influence on writers such as Montaigne and Shakespeare and even Thomas Jefferson."

(add discussion)

Social mechanics | Molecular sociology

The following is a statements attest to the so-called dangers of the late 19th century early 20th century social mechanics and social chemistry like theories:

> "Between the method of Quetelet, who represents, so to speak, molecular sociology, and that of Comte, who especially represents synthetic sociology, Spencer takes the mean, which, although it is without the qualities of the first, is also without the qualities of the first, is also without the **dangers** of second."
>
> — Guillaume de Greef (1902), "Introduction to Sociology" [10]

> "In 1900, Alessandro Grappali wrote: 'It has been more than fifty years since Auguste Comte gave birth to his young discipline [social physics]: the baptism of life by clearly defining the methods, but the task and the fuel, have not been able to change the state of crisis that inevitably beset any discipline in its infancy.' These lines could also be written now. Probably Durkheim with his *Rules of Sociological Method* said the way, the only real way of scientific sociology. But the inevitable mistakes that Groppali reported, have not disappeared, especially as Durkheim has left for the moment no one after him to continue his work. Mr. combat Bouglé Professor those mistakes which even their authors return. Witness Mr. René Worms whose *Sociology*, reduced to fair value the organicist theories. But there is a more 'pure' design, more 'scientific', so-called sociology, which has long been adeptness, which gave her the safest works between 1896 and 1914. It is more false and more **dangerous**; we want to talk about the mechanistic conception of social science. Comte especially Quetelet and Spencer also have their responsibility for this design. These are especially Mr. Haret, Lester Ward, Winiarski, and A.-P. Barcelo, who developed the mechanistic conception."
>
> — Petre Trisca (1922), *Preliminaries on Social Mechanics: Analysis of Works* (pg. 1)

(add discussion)

Human molecules

> *See main: Human molecule (banned)*

In 1775, French philosopher Jean Sales was imprisoned, by the Chatelet, and later sentenced to perpetual banishment, from France, for writing about people as "human molecules" formed from the "atoms" of the earth by a "great process". The erudite two cultures genius Voltaire (IQ=195) was the only thinker of the time who has insight enough to see through to the way ahead of its time genius of Sales' work and in 1777, at the age 83, a year before his reaction end (death), gave 500 pounds, the equivalent of about $100,000 USD in modern terms, to towards his release. French philosopher, chemist, physicist, paleontologist, and priest Pierre Teilhard's writings on "human molecules" were

perpetually banned by the church, throughout his life, 1925 to 1955, and because of his views he was excommunicated from the church; his writings were all published posthumously.

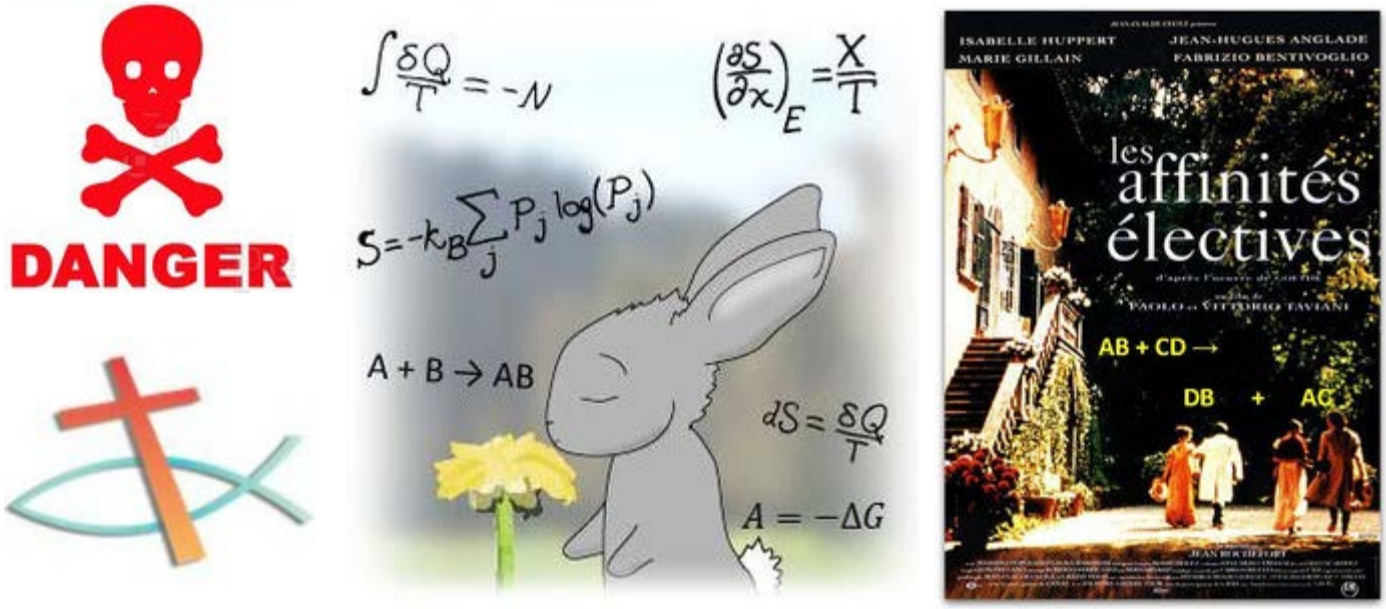

A frank representative of the perceived "**danger**" associated with the ramifications inherent and embedded within the revolutionary subject of human chemical thermodynamics, whether discussed in reference to Goethe's 1809 *Elective Affinities* or Rossini's 1971 "Chemical Thermodynamics in the Real World", a subject, namely the "moral symbols" of physical chemistry, in direct conflict to the religio-mythology based morality and belief system of modern the modern world.

Goetheanisn | Elective Affinities

The following outlines the perceived "danger" associated with the ramifications inherent and embedded in the subject of human chemical thermodynamics—a subject in direct opposition to that of modern religion, and the ancient belief systems (primarily Egyptian) embedded therein.

> "Adler disputes the reductive determinism in Goethe's idea of nature, thus relieving the most **dangerous** consequence of the analogy for human decision making. Allemann goes one step further and demonstrates definitively that the analogy between chemicals and characters fails."
>
> — Stefani Engelstein (2008), *Anxious Anatomy* [8]

The following is British translator David Constantine's 1994 synopsis of German polyintellect Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*, which situates the views that true morality is based on the "symbols" (see: moral symbols) and "reactions" of physical chemistry: [7]

> "In *Elective Affinities* Goethe conducts an experiment with the lives of people who are living badly. Charlotte and Eduard, aristocracts with little to occupy them, invite Ottilie and the Captain into their lives; against morality, good sense, and conscious volition all four are drawn into relationships as inexorably as if they were substances in a chemical equation. The novel asks whether we have free will or not; more **disturbingly**, it confronts its characters with the monstrous consequences of their repression of any real life in themselves. Goethe wrote *Elective Affinities* when he was sixty and long established as Germany's literary giant. He remained an uneasy and scandalous figure, none the less, and readers of *Elective Affinities* were **profoundly disturbed** by its penetrating study of marriage and passion."

This premise would go onto become what has been called, by Herman Grimm (1880), as Goethe's "most dangerous" work.

In short, Goethe's physical chemistry based 1809 novella *Elective Affinities* famous has been called by himself his "best book" and by commentators his most "dangerous book", particularly for the religiously-conservative English speaking public. The first two English translations, in fact, were done anonymously. In the first of these, a 1854 collected works set for Bohn's Library, the publisher Henry Bohn gives a preface section "warning" to the readers:

> "**Exceptions may be taken** to some of the statements contained in this production of Goethe."

and comments further that: "The [translation of] *Elective Affinities* has been executed by a gentleman [identified posthumously in 1901 as James Froude] well known in the literary world, who does not wish his name to appear." This is anonymity is explained well by English science historian and philosopher David Knight and his 2009 synopsis of the situation: [6]

> "Froude's semi-autobiographical *Nemesis of Faith* [a renunciation of Christian faith], published in 1848, owed much to Goethe's novel of human and chemical reactions, *Elective Affinities*, which he translated. *Nemesis* lost him his fellowship at Exeter College, Oxford, where his book was publicly burned."

Likewise, in the second "anonymous" English translation (1872), albeit Froude's translation announced in 1901, American woman's rights and sexual freedom activist Victoria Woodhull is asked to provide the introduction section, to the D.W. Niles edition, wherein she comments: [3]

> "Indeed, it strikes me almost ludicrous, that the translator has shrunk from appending his name to the work, if he has done so from any idea that its **dangerous views** might tend to impair his reputation."

In 1880, German author, art historian, philosopher, and Goethean biographer Herman Grimm summarized things as such: [2]

> "A just exposition of [Goethe's] views has not been arrived at, because *Elective Affinities*, after having been spoken of for fifty years as Goethe's **most dangerous work**, is today passed over and very little known."

A depiction of an olden days Christian book burning, which is similar, in semi-recent terms, to James Froude's 1849 *Elective Affinities* influenced Christian-faith renouncing *Nemesis of Faith* being publicly burned, after which he lost his post at Oxford, and thus resultantly did the first English translation of Goethe's revolutionary-doctrine containing self-defined "best book" anonymously. [6]

The danger inherent here, in straight-forward talk, is that currently 3/4ths of the modern world holds a morality belief system structured around belief in the existence of God—Goethe's work overthrows this premise entirely—and in affect overthrows modern religion—the system that binds—for a new system that binds—a godless one—based on belief that humans are made of atoms, nothing more, nothing less, and that morality—right or wrong movement—is governed by the symbols of physical chemistry.

Rossini debate

The view of Goethe's *Elective Affinities*, as summarized by Grimm as "Goethe's most dangerous work" (as recounted by Astrida Tantillo, 2001), is near synonymous in reactionary style to the reactionary language used, nearly two-

hundred years later, in the 2006 Rossini debate, on the possibility of American chemical thermodynamicist Frederick Rossini's hypothesis that chemical thermodynamics might be able to explain the nature of the freedom vs. security, as would be applicable to a post 9/11 world. [4] Specifically, American religiously-based belief system physical chemist John Wojcik, in one heated part of his response letter to *Journal of Chemical Education*, uses the term "danger" four times: [5]

> "The **danger** of such anthropomorphisms is that we really come to believe that there is substance in them. In this particular case, there is the **danger** that true human freedom will be reduced to some sort of physical freedom on the same par with entropy. There is the **danger** that some will think that true human freedom can be measured in terms of some sort of calculus of simultaneous maximums and minimums. And worst of all, there is the **danger** that chemical thermodynamics will have ascribed to it a power that it simply does not have, namely, the power to "explain" the human condition. There may be a sense in which chemistry is the "central science". This is certainly not it."

No doubt, being that affinity chemistry was the forerunner to chemical thermodynamics, similar arguments were voiced during these fifty-years, as Grimm summarized, as to the underlying premise and implications of Goethe's novella: namely that Goethe's version of affinity chemistry based morality (or physical chemistry base morality in modern terms) supplants and in fact replaces all of the world religions, and as such the unwritten bedrock of modern society; meaning that a very dangerous revolution in thinking may possibly be awaiting future generations of humankind.

Hmolpedia

The same sense of "danger" can be felt in the paradigm changing work of American electrochemical engineer Libb Thims. While and editor at Wikipedia, in regards to a repeated attempt to get three articles established at Wikipedia, namely: human thermodynamics, human chemistry, and human molecule, a modern-day internet "witch hunt" resulted. One example is the following which comes from Wikipedia administrator Kww in 2007 in efforts to get the human chemistry/human thermodynamics articles removed from Wikipedia:

> "Delete and salt and ban author: Another in the web of "human chemistry' garbage perpetrated by [Libb Thims]. No real notability, an involvement with a fringe pseudoscience that is so far on the fringe that it nearly seems to be an analogy, no good third-party sources, and the only Wikipedia editor that has taken any interest in him writes dishonest self-promoting articles as a hobby. **Kill the article, ban the author**."

Similarly, in Thims' first university lecture in 2010, at University of Illinois at Chicago, which occurred in the aftermath of the heated Moriarty-Thims debate, both Irish physicist Philip Moriarty and American organic chemist Frank Lambert emailed lecture hosting professor, Iranian-born American Ali Mansoori with a stern warning that he should not allow Thims to lecture to his students.

Likewise, in 2011, in regards to graduate students beginning to use Hmolpedia as resource tool to complete PhD dissertations, American evolutionary psychologist Peggy La Cerra, noted for her circa 1990 depression energy theory of the mind, commented the following to Thims:

> "If people are using this site to do their PhD dissertations and getting away with that, **their advisors should be shot**."

(add discussion)

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External links

- Danger – Wikipedia.

θΔics

In religio-mythology, **Daniel 6**, aka “Daniel and the Lion’s Den”, is section 6 of the Book of Daniel, of the Old Testament of the Bible, wherein []

Androcles and the Lion
(Aesop, 600BC)

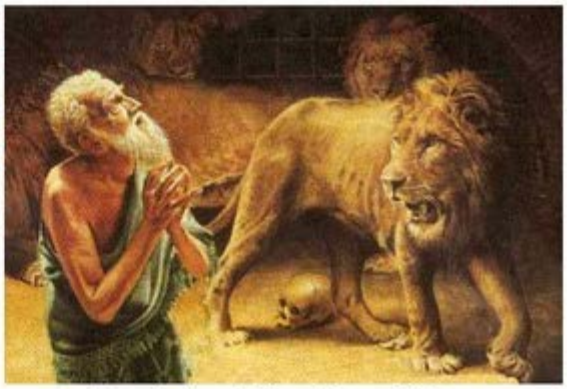

Daniel and the Lions’ Den
(Bible, 200BC)

A comparison of Aesop’s fable of “Androcles and the Lion”, wherein the lion befriends Androcles after he pulls a thorn from the lion’s paw, with “Daniel and the Lions’ Den” of the Bible, in **Daniel 6**, wherein Daniel, after being thrown into the lions’ den, is not eaten because an angel appears and closes their mouths.

Androcles

In 1926, Nathan Schmidt, in his “Daniel and Androcles” makes a connection between "Daniel and the Lions' Den" Biblical story, the older story of "Androcles and the Lion", from Aesop's fables (600BC), and other early Roman period Lion slave stories. [1]

Kanawha Country | Controversy

See main: Kanawha County textbook controversy

In 1974, in Kanawha County, West Virginia, a new secularly progressive school curriculum was installed wherein teachers were instructed to assign children the task of comparing Aesop’s fable story of “Androcles and the Lion” with the Biblical story of “Daniel and the Lion’s Den”, as recorded in Daniel 6. This was one of the sparks that lead to the enflamed year-long televised textbook controversy that ensued, resulting, in the end, in one person getting shot.

Quotes

The following are related quotes:

> “Have you seen the teacher’s manual? It says students should compare the Bible story of **Daniel in the Lion’s Den** to that [slave and the thorn in the lion’s paw] myth [**Androcles and the Lion**]. What does it tell our kids when they’re supposed to compare that to the Bible? That the Bible is just a bunch of fairy tales? That it’s all myth? That you can interpret the Bible any way you darn please, even if it rips the guts out of what it really says?”
>
> — Businessman (1974), dialogue with Lee Strobel on Kanawha County textbook controversy [2]

> “The most obvious example of an attack on the Bible is (*Kanawha County Teacher’s Manual*, pg. 38] where the children are asked to compare the fable ‘Androcles and the Lion’ to ‘Daniel in the Lion's Den’. The latter story is a fact as recorded in the Bible (**Daniel 6**:4-27). In the communicating book the teacher is supposed to ask a student to tell the story of Daniel in the Lion's Den and ‘if it is told in any detail, you could then discuss the similarities between that story and ‘Androcles and the Lion’.’”
>
> — Karl Priest (2010), *Protestor Voices* [3]

See also

- Genesis
- Joshua 10:13
- 2 Kings 2:24

References

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2. (a) Strobel, Lee. (1974). “Textbook Battle Rages in Bible Belt County” (O), *Chicago Tribune*, Sun, Oct 20.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pgs. 7-18). Zondervan, 2009.
3. Priest, Karl C. (2010). *Protestor Voices: The 1974 Textbook Tea Party: a First Time First-hand Protester Account of the Event that Launched the Fight for the Heart and Soul of America* (pg. 89). Publisher.

External links

- Daniel 6 – BibleGateway.com.
- Daniel and the lions’ den – Wikipedia.
- Androcles – Wikipedia.

θΔics

In existographies, **Daniel Bernoulli** (1700-1782) (IQ:170|#350) [RGM:1309|1,500+] (GPE:#) (CR:52) was a Dutch-born Swiss mathematician, physicist, and physician noted for his 1738 *Hydrodynamica* in which he outlined the basics of the ideal gas law, the precursors for the kinetic theory of gases, and gave the first basic definition of pressure.

Overview

In 1738, Bernoulli, in his *Hydrodynamica*, defined pressure as: [1]

> "The weight *P* holding down the piston in [a given] position is the same as the weight of the overlying atmosphere, which we shall designate *P* in what follows."

(add)

Bernoulli family

See main: Bernoulli family

In the history of differential equations, Swiss mathematicians, brothers Jacob Bernoulli (1654-1705) and Johann Bernoulli (1667-1748), the latter father of Daniel Bernoulli and mentor to Leonhard Euler (teacher of Joseph Lagrange), in Basel, Switzerland, were among the first interpreters of German mathematician Gottfried Leibniz' version of differential calculus. They were both critical of English physicist Isaac Newton's theories and maintained that Newton's theory of fluxions was plagiarized from Leibniz' original theories, and went to great lengths, using differential calculus, to disprove Newton's *Principia*, on account that the brothers could not accept the theory, which Newton had proven, that the earth and the planets rotate around the sun in elliptical orbits. [2]

Ideal gas law

The origin of the modern formulation of the ideal gas law is difficult to pin down. Bernoulli, however, may have been the first to give a verbal derivation this law. The following diagram shows his famous depiction of fluid particles sealed by the piston and weighted down by the pressure of the atmosphere and weights, which he used to describe the various gas laws. In what seems to be a reference to

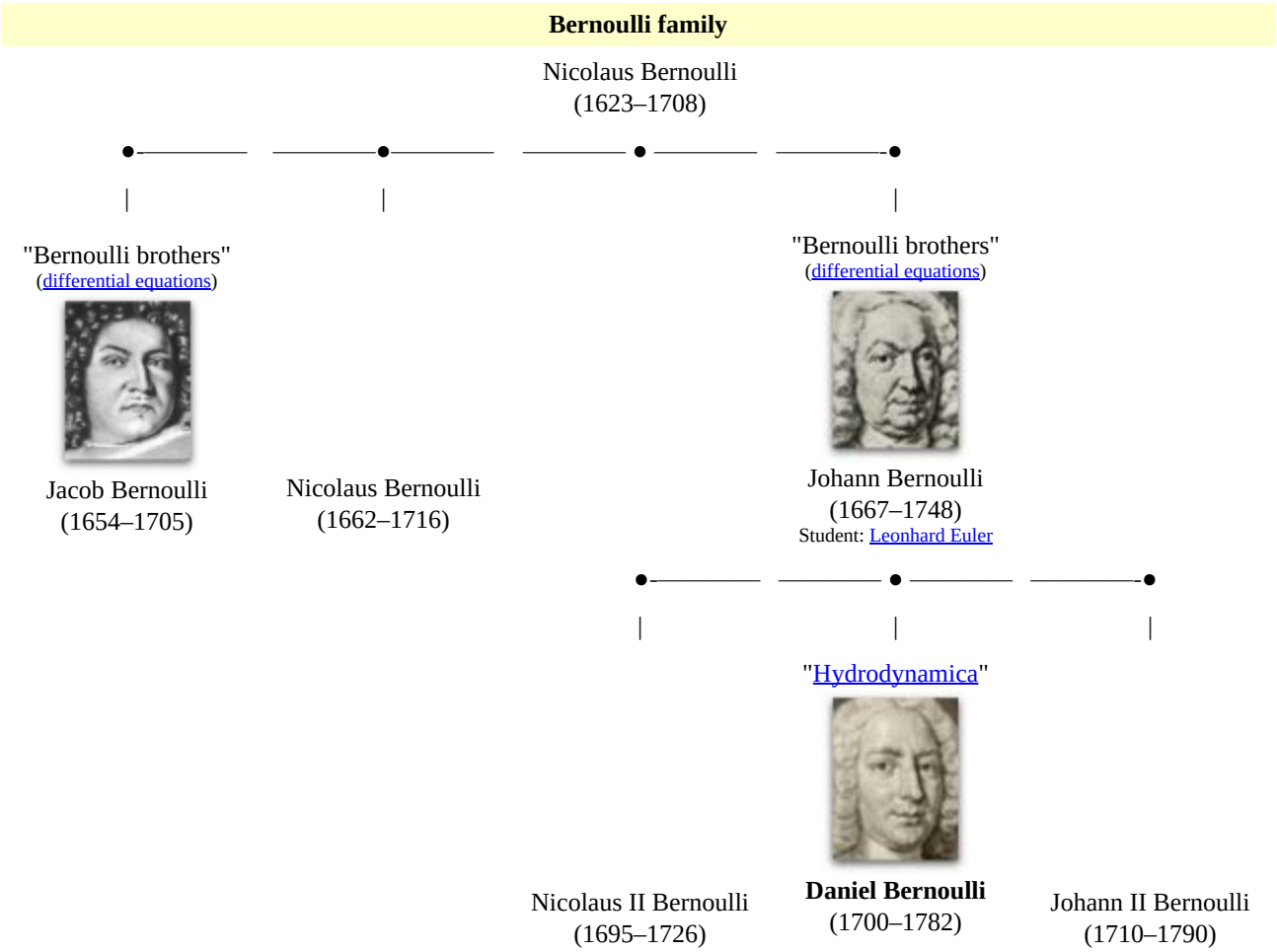

Boyle's law (1662), Bernoulli states:

Friend: Leonhard Euler

> "The force of compression is approximately inversely proportional to the volume occupied by the air. This is confirmed by a variety of experiments. This law can certainly be safely applied to air less dense than normal; thought I have not adequately examined whether it also applies to air very much more dense; [also] the temperature of the air should be carefully kept constant while it is being compressed."

In equation form this would be:

$$P \propto \frac{1}{V} \text{ or } P = \frac{k}{V}$$

where *k* is a proportionality constant (indicative of experimental data to be determined). He then states:

> "The pressure of the air is increased not only by reduction in volume but also by the rise in temperature. As it is well known that heat is intensified as the internal motion of the particles increases, it follows that any increase in the pressure of air that has not changed its volume indicates more intense motion of its particles, which is in agreement with our hypothesis."

In equation form this would be:

$$P \propto \frac{T}{V} \text{ or } P = \frac{kT}{V}$$

In conclusion of these two aspects of the laws of gas behavior, Bernoulli then summarizes combined theorem as:

> "In any air whatever density, but at a given temperature, the pressure varies as the density, and furthermore, that increases of pressure arising from equal increases of temperature are proportional to the density."

In equation form, noting that Bernoulli assigned the symbol "*n*" to *number* of particles, which gives a particle density ρ of *n* divided by volume *V*, we would have:

$$P \propto \left(\frac{n}{V}\right)_T \text{ or } P = k\left(\frac{n}{V}\right)_T$$

Bernoulli notes that this theorem was discovered by experiment by French physicist Guillaume Amontons, who had given an account of his work in the Memoires of the Royal Academy of Sciences in Paris for 1702. In any event, it is not to far to see how from these precursory statements of gas laws, and the equations they embody, that the modern ideal gas law can be obtained; particularly from the last equation, with substitution of the modern ideal gas constant *R*

for *k*:

$$PV = nRT$$

The form of the above equation, however, did not come in use until the early 20th century.

Heat

Science writer Tom Siegfried asserts, via citation of Stephen Brush, that Daniel Bernoulli based his 1738 kinetic theory of gases on the notion that heat is merely the motion of molecules. [3] This, however, sound off. While Daniel Bernoulli discussed the operation of the heat engine, as Peter Harman (Q) discusses, his models seem to have been tied up in the conservation of living force theories of Johann Bernoulli and Gottfried Leibniz. [4]

Quotes | On

The following are quotes on Bernoulli:

> "The screw-propeller, which, as has been stated, was probably first proposed [by Leonardo da Vinci (c.1495) (Q)] by Robert Hooke (Q) in 1681, and by **Daniel Bernoulli** [1752], of Groningen, and by Watt in 1784, was, at the end of the century, tried experimentally in the United States by David Bushnell, an ingenious American, who was then conducting the experiments with torpedoes."
>
> — Robert Thurston (1878), *A History of the Steam Engine* (pg. 292)

> "Bernoulli, in his *Hydrodynamics*, dispensed with 'fire particles' and 'subtle fluid', instead situating the constituent atoms being all that are required to account for the known physical properties of elastic fluids. He introduces the fundamental notion of the average distance that an atom travels between collisions—the mean free path D—and he shows that the number of times and atom strikes the walls of the containing vessel must be proportional to 1/D, while the number of atoms making such impacts must be proportional to $1/D^2$. The product of these two, $1/D^3$, gives him the pressure of the gas, and as D^3 is proportional to V, the volume of the gas, it follows that Boyle's law is obeyed. He was also able to show that if the effect of heat is to increase the velocity, u, of the atoms the pressure must vary as u^2/V, which is consistent with Amontons' discovery that the pressure of an elastic fluid varies with temperature."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 25)

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External links

- Daniel Bernoulli –Wikipedia.

θΔics

In evolution thermodynamics, **Daniel Brooks** (1951-) is a Canadian zoologist noted for his 1982 so-called Brooks-Wiley theory, co-developed with American natural historian and systems ecologist Edward Wiley, as full-explained in their 1986 book *Evolution as Entropy: Towards a Unified Theory of Biology*; the gist of their thesis being that: [1]

> "Evolution is a manifestation of the second law of thermodynamics. The entropy functions, or, more correctly, the partial entropy functions, associated with organismic diversity, however, are not the usual entropy functions encountered in the thermodynamic behavior of non-living systems, rather they are they are the partial entropy functions associated with the genetic code and with other hierarchically organized aspects of the information systems of organisms."

The first difficulty in this statement is that Brooks and Wiley attempt to reconcile the so-called life vs non-life "dividing wall" issue, with recourse to information theory, a type of scientific fool's good, when used outside of computer science proper.

Overview

It seems that the first collaboration of Brooks and Wiley was the 1984 chapter "Evolution as an Entropic Phenomenon". [2]

The book is well-researched with numerous references, all-in-all presenting a sort of melting pot theory of thermodynamics and evolution, interspersing the discussion with a wide range of dissimilar theories, including Ludwig Boltzmann's complexions, Gibbs free energy change, Helmholtz free energy change, Carnot efficiency, Ilya Prigogine's internal entropy model, the "energy flow" models of Charles Elton and Raymond Lindeman, Alfred Lotka, Robert Ulanowicz, Jeffrey Wicken, Harold Morowitz, arrow of time, Dollo's law, Boltzmann-Planck entropy equation:

$$S = k \ln W$$

which they assume to be equivalent to Shannon entropy, all centered around the hypothesis that living organisms differ from nonliving systems in that organisms contain something Brooks and Wiley term "instructional information".

Difficulty on theory

The weakness in their entire book is their theory being crouched in the telegraphy information theory transmission model of American electrical engineer Claude Shannon (1949), which has nothing to do with thermodynamics, entropy, or evolution, as well as the later variants of Leon Brillouin (1962), and John Collier (1986), among others. Canadian physical information theorist John Collier, in his review, summarized the reception of the book as follows: [3]

> "Critics argued that they abused terminology from information theory and thermodynamics."

One of the most derisive and onpoint critics was American biophysicist Harold Morowitz, whose cogent review entitled "Entropy and Nonsense" was retitled in clandestine manner innocuously as "Review of Brooks and Wiley", in the reference section of their rebuttal second edition, in which Morowitz concludes that Brooks and Wiley simply have been "mesmerized by the language and equations of physics" to produce a vacuous theory. Morowitz states:

> "At the beginning of the Preface, the authors of *Evolution as Entropy* point out that the first and foremost evolution is a *process*. With this in mind the title can be restated as 'a process as an extensive thermodynamic state variable'. It has the same grammatical status as *Evolution as Volume* or *Evolution as*

> *Mass*. I begin with this linguistic nitpicking because it is important to realize that this book uses imprecise meanings and poor writing to cover up the fundamental nonsense and emptiness of the underlying ideas."

Morowitz goes on paragraph after paragraph basically just ripping apart to so-called Brooks-Wiley hypothesis, which as Wiley says is "hardly anything to get excited about." The reason for Morowitz even bothering to give a review is as follows:

> "The only reason for reviewing such a work is that a number of biologists untrained in thermal physics and information science have been fooled into believing that there is some content in the 'Unified Theory' of Brooks and Wiley."

This, of course, is the crux of the issue: information theory has become a type of scientific fool's gold and is creating profound confusion for many in the soft science community. Morowitz, again, spells the situation out as such:

> "Science C.E. Shannon introduced the information measure in 1948 and showed a formal analogy between the information measure ($-\sum p_i \ln_2 p_i$) and the entropy measure of statistical mechanics ($-k\sum f_i \ln f_i$), a number of works have appeared trying to relate 'entropy' to all sorts of academic disciplines. Many of these theories involving profound confusion about the underlying thermal physics to bolster otherwise trivial and vacuous theories."

Likewise, five years later, American systems scientist Cliff Joslyn, in his 1991 article "On the Semantics of Entropy Measures in Emergent Phenomena", which touches on the same topic, summarizes that the "literature on the relation between thermodynamics and information is vast." In other words, confusion breeds confusion. [5] This is what Morowitz is aiming at: to end the confusion and inter the every-growing proliferation of vacuous theory development.

Driven processes

To their credit, in introducing their thermodynamic argument, they do mention this in passing on one page of their book, stating that processes can be either enthalpy driven ($\Delta H < 0$) or entropy driven ($\Delta S > 0$), or a mixture of both (enthalpy-entropy compensation), mentioning that the most favorable conditions are those process favored both enthalpically and entropically $\Delta H > 0$ and $\Delta S > 0$, but also note that some reactions will proceed when $\Delta H > 0$, as long as $T\Delta S > \Delta H$. A significant point they leave out is that of thermodynamic coupling, namely that natural process are mixed with unnatural processes in such a way that nature always wins out over what is unnatural, as quantified by the Lipmann coupling inequality.

Correct view

The correct view is that the theory of life is a defunct theory, replaced by modern-day molecular view, in which moving structures, such as retinal, bacteria, fish, ants, mice, fleas, birds, butterflies, and humans, are considered as heat-driven, surface-catalyzed, reactive, animate molecules, with turnover rate, formed by synthesis, not by evolution, a process governed by the Lewis equality for natural processes.

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Further reading

● Brooks, Daniel R. and O'Grady, Richard T. (1986). "Nonequilibrium Thermodynamics and Different Axioms of Evolution" (abs), *Acta Biotheoretica*, 35(1-2): 77-106.
● Brooks, Daniel R., Cumming, David D, and LeBlond, Paul. (1988) "Dollo's Law and the Second Law of Thermodynamics: Analogy or Extension?" in Weber, Depew, and JD Smith, *Entropy, Information, and Evolution* (pgs. 189-224). MIT Press.
● O'Grady, Richard T., and Brooks, Daniel R. (1988) "Teleology and Biology" in Weber, Depew, and JD Smith, *Entropy, Information, and Evolution* (pgs. 285-316). MIT Press.

External links

● Daniel Brooks (faculty) Department of Ecology and Evolutionary Biology, University of Toronto.
● Brooks, Daniel R. (1951-) – WorldCat Identities.

θΔics

In hmolscience, **Daniel Dennett** (1942-) (CR=16) is an American philosopher and atheism advocate, a Ranker greatest minds (#251), oft-cited as one of the modern four horsemen of atheism, noted for []

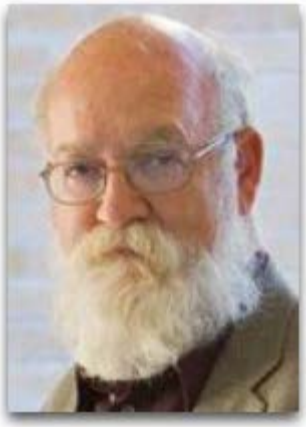

People | Unlike atoms and molecules

See main: People are not molecules; People are unlike atoms and molecules;

In 1987, Dennett, in his "The Three Kinds of Intentional Psychology", stated the following: [1]

> "The success of valence theory in chemistry is no coincidence, and people were entirely right to expect that deep microphysical similarities would be discovered between elements with the same valence and that the structural similarities found would explain the dispositional similarities. But since **people and animals are unlike atoms and molecules** not only in being the products of their individual learning histories, there is no reason to suppose that individual (human) believers that *p*—like individual (carbon) atoms with valence four—regulate their dispositions with exactly the same machinery."

(add discussion)

References

1. Dennett, Daniel C. (1987). *The Intentional Stance* (pg. 60). MIT Press.

External links

â— Daniel Dennett – Wikipedia.

θΔics

In existographies, **Daniel Fahrenheit** (1686-1736) (Gottlieb 1000:261) (CR:10) was a Polish-born German physicist noted for his *circa* 1720 invention of the mercury thermometer.

Overview

In c.1724, Fahrenheit, influenced by Guillaume Amontons' 1699 constant volume air thermometer work and finding that water boils at constant temperature, made a mercury thermometer.

In prior alcohol thermometers, the variability in alcohol's purity made it difficult to obtain reproducible results; the use of mercury by Fahrenheit solved this issue. [1]

In a letter to his associate Herman Boerhaave, eponym of Boerhaave's law, Fahrenheit acknowledged that he got his idea for his thermometer from Danish astronomer Ole Romer (who had invented his own thermometer in 1701), albeit using a renumbered scale, in which he used the fixed points of 96 (instead of 22.5 or 90), the temperature of his wife's armpit, 32 the temperature of ice melting in water), and 0 the temperature of a bath of ice melting in a solution of common salt; a scale that he says he began using in 1717. [2] In the letter, Fahrenheit is said to have commented: "as this graduation is inconvenient and awkward because of the fractions, I decided to alter the scale, and to use 96 instead of 22½ or 90; this I have always used since then." [3]

The Fahrenheit scale (˚F), along with the improved Celsius scale (˚C), made by Anders Celsius in 1742, and eventual universal thermodynamics-based Kelvin scale (˚K), made by William Thomson in 1848, is one of the main indicators with which to measure temperature.

Education

Fahrenheit was orphaned in 1701, at the age of 16, when both his parents died of mushroom poisoning. He then was sent by his new guardians to Holland to apprentice at a bookkeeping firm, which he eventually ran away from. He then travelled about from city to city, studying under the likes of Gottfried Leibniz and Herman Boerhaave, among others.

Photo | Note

No extant photos of Fahrenheit exist; the one shown, above right, is a 2012 computer-generated image (O) based on images of his relatives.

Quotes | By

The following are quotes by Fahrenheit:

> "I read that the celebrated Amontons, using a thermometer of his own invention, had discovered that water boils at a fixed degree of heat. I was at once inflamed with a great desire to make for myself a thermometer of the same sort, so that I might with my own eyes perceive this beautiful phenomenon of nature."
>
> — Daniel Fahrenheit (1724), "Experiments and Observations Concerning the Congealment of Water in a Vacuum" [4]

References

1. Blumberg, Mark S. (2002). *Body Heat: Temperature and Life on Earth* (pgs. 18-17). Harvard University Press.
2. Romer scale – Wikipedia.
3. (a) Ernst Cohen discovered in a Leningrad archive a letter in Dutch from Fahrenheit to Herman Boerhaave.
(b) Cohen, Ernst and Cohen-De Meester, W.A.T. (1936). "article", *Chemisch Weekblad*, Vol. 33: 374-93.
(c) Middleton, W.E. Knowles. (1966). *A History of the Thermometer and its Use in Meteorology* (pg. 71). Johns Hopkins Press.
4. Fahrenheit, D.G. (1724). "Experiments and Observations Concerning the Congealment of Water in a Vacuum" ("Experimenta et Observationes de Congelatione aquae in vacuo factae a D. G. Fahrenheit" (O), *Philosophical*

Transactions, London, Vol. 33, pg. 78.

Further reading

● Fahrenheit, Daniel. (1724). “Experiments on the Degree of Heat in Boiling Liquids”, *Philosophical Transactions of the Royal Society* (pg. 1).
● Bolton, Henry Carrington (1900). Evolution of the Thermometer, 1592-1743 (section: "Fahrenheit and the First Reliable Thermometers", pgs. 61-79). The Chemical Publishing Company.

External links

● Daniel Fahrenheit – Wikipedia.

θΔics

In human thermodynamics, **Daniel Hershey** (c.1931-) is an American chemical engineer noted for his 1980 to 2009 effort to ferret out an entropy theory of aging.

Overview

In 1980, Hershey, in his *The New Age-Scale for Humans*, argued that the derivative of the Prigogine entropy with respect to time:

$$\frac{dS}{dt} = \frac{dS_e}{dt} + \frac{ds_i}{dt}$$

applies to human systems. [4] He also mentions the entropy of fish work on aging of American engineer Robert Balmer.

In 1988, Hershey began to publish a number of articles on the application of entropy to aging theory and corporation growth and dynamics. [3]

In 2009, Hershey, in his *Entropy Theory of Aging Systems*, argued that entropy is a measure of disorder, and that systems left to their own tend to age towards disorder. The theory of the book culls from the nonequilibrium thermodynamics theories of Belgian chemist Ilya Prigogine and also from the information theory of American electrical engineer Claude Shannon. [1]

Education

Hershey completed his BS in 1953 at The Cooper Union and PhD in 1961 at the University of Tennessee, both in chemical engineering. Hershey currently is a professor emeritus of chemical engineering at the University of Cincinnati. [2]

References

1. Hershey, Daniel. (2009). *Entropy Theory of Aging Systems: Humans, Corporations and the Universe*. World Scientific.
2. Faculty – College of Engineering, Department of Chemical and Materials Engineering, University of Cincinnati.
3. (a) Hershey, Daniel. (1988). "Excess Entropy (EE) and Excess Entropy Production (EEP) in Aging, Evolving Systems," Systems Research, 5, pp. 261-263.
(b) Hershey, Daniel. (1988). "Aging and Evolving Systems," Systems Research, 5, p. 167.
(c) Hershey, Daniel. (1989). "Entropy Analysis of an Aging, Evolving Corporate System," Systems Research, 6, pp. 75-79.
(d) Hershey, Daniel. (1990). "Speculation on Organizational Structure, Entropy, and Function," Systems Research, 7, pp. 207-208.
(e) Hershey, Daniel. (1990). "Longevity Projections for Females Using Excess Entropy Production," Systems Research, 7, pp. 127-128.
(f) Hershey, Daniel. (1990). "The World as an Evolving System," in "Toward a Just Society," Proceedings of the Thirty-Fourth Annual Meeting, International Society for the Systems Sciences, Portland, Vol. I, pp. 456-461.
(g) Hershey, Daniel. (1990). "Evolving Systems, Entropy and Death," a chapter in "Time, Rhythms, and Chaos," Iowa State University Press, 1990, pp. 117-129.
(e) Hershey, Daniel. (1992)."A Rational Design of a Governing Structure for Czechoslovakia, in General Systems Alternative Economics and Values," Proceedings of the 36th Annual Meeting, International Society for the Systems Sciences, Denver, Vol. I, 134-140.
(f) Hershey, Daniel. (1993). "Entropy as a Biological Marker in Human Aging, a Chapter in Practical Handbook of Human Biologic Age Determination," CRC Press, A. Balin, editor.
4. Hershey, Daniel and Wang, Hsuan-Hsien. (1980). *The New Age-Scale for Humans* (thermodynamics, pgs. 24, 59, 62). Lexington Books.

Further reading

â— Hershey, Daniel. (1997). *The Universe and Beyond, Entropy, Infinity, and God*. Basil Books.

External links

â— Daniel Hershey (research interests) – chemical and materials engineering, University of Cincinnati.
â— Hershey, Daniel – WorldCat Identities.

θΔics

In hmolscience, **Daniel Katz** (1903-1998) was an American psychologist noted, in human thermodynamics, for his 1966 *Social Psychology of Organizations*, coauthored with Robert Kahn, which presents an entropy-entropy conceptualized theory of open organizational psychology.

Overview

In 1966, Katz, in his *The Social Psychology of Organization*, co-authored with Robert Kahn, build on the work of Ludwig Bertalanffy, i.e. general systems theory, living systems approach of American psychologist James Miller, Talcott Parsons, and American psychologist Floyd Allport, i.e. event-structure theory, outlined an energy-entropy based open systems model of organizations; the gist of which is as follows:

> "Open-systems theory seems to us to permit assumption of entropy, the necessary dependence of any organization upon its environment. The open-system concepts of energic input and maintenance point to the motives and behavior of the individuals who are the **carriers of energies** input for human organizations; the concept of output and its necessary absorption by the larger environment also links the micro- and macro levels of discourse."

Katz and Kahn's *Social Psychology*, in their own words, is an attempt to extend the description and explanation of organizational processes, away from the traditional concept of individual psychology and interpersonal relationship, on the interdependent behavior of many people in their supportive and complementary actions via an open system point of view for the study of large scale organization

References

1. (a) Katz, Daniel and Kahn, Robert L. (1966). *The Social Psychology of Organization* (terms: entropy, pgs. 9, 13, 19; thermodynamics, pg. 19, negentropy, pgs. 150, 453; energetic return, pg. 127). Wiley.
(b) Bailey, Kenneth D. (1990). *Social Entropy Theory* (pg. 82). New York: State University of New York Press.
2. (a) ibid, Katz and Kahn. (1966). Intro and Ch. 1.
(b) Panchal, Dhiren N. (2009). "Review: *The Social Psychology of Organizations.*" (23-pgs). HRFolks.com.
3. Katterman, Lee. (1999). "Michigan Greats: Robert L. Kahn – Michigan Social Scientist Makes his Mark in Many Ways." June, *University of Michigan.*

External links

â— Daniel Katz – Wikipedia.
â— Katz, Daniel (1903-) – WorldCat Identities.

θΔics

In hmolscience, **Daniel Rigney** (1949-) (CR=10) is an American sociologist noted for his 2001 *The Metaphorical Society*, in his chapter three of which he examines the "society as machine" metaphor, in which he explains how:

> "The vocabulary of the social sciences is piled high with allusions to physics, chemistry, geology, and mathematics."

Rigney sites staple theorists such as: Karl Marx (1867), Vilfredo Pareto (1916), Kurt Lewin (1937), George Lundberg (1947), John Q. Stewart (1948), Kurt Lewin (1951), Richard Adams (1975), Jeremy Rifkin (1980), Malcolm Gladwell (1996), and Paul Samuelson (2000), among others.

Pareto | Gibbs

Rigney, per citation Kenneth Bailey (1990), and his distorted and malaligned reasonings, states the following vacuous assertion, namely that Pareto culled from Gibbs:

> "In popular parlance we speak of 'chemistry' of personal and group relationships. Vilfredo Pareto (1916) had a rather different sort of social chemistry in mind when he transposed his theory of social equilibria directly from the theory of chemical equilibria advanced by chemist J. Willard Gibbs."

Pareto, in short, as per his *General Sociology* index indicates, did not cite Gibbs, and likely was not aware of his work at all. The connection between Gibbs and Pareto is a melding done by the hands of Lawrence Henderson and his so-called Harvard Pareto circle.

Education

Rigney completed his MS in 1973 with a thesis on "The Dramaturgy of Power: A Case Study" and his PhD in 1975 with a dissertation on "Organization Secrecy: an Investigation of Hidden Realities" both at the University of Texas at Austin, after which he worked as a sociologist at the St. Mary's University in San Antonio, where he was director of the university's honors program for 23 years. Presently, Rigney is professor emeritus of sociology at St. Mary's University in San Antonio and complimentary visiting humanities scholar at Rice University, Houston. (Ñº)

Quotes

The following are noted quotes:

> "The clarion call for a return to the dream of a social physics does not, at this moment, seem to be winning the day. Many social theorists are now more inclined to turn to historical and literary studies than to physics and chemistry for inspiration. Whether new developments in the natural sciences can breathe new life into the dream of a social physics is an open-ended and uncertain prospect."
>
> — Daniel Rigney (2001), *The Metaphorical Society* (pg. 49)

> "Concepts taken loosely from the physical sciences include references to: social pressures, stresses and strains, friction, attraction and polarization, social movements, social momentum and inertia, atomistic individuals and nuclear families, push and pull factors in migration, ripple effects, social pendula, balances of power, scales of justice, social equilibria, social circulation, social entropy (Adams, 1975; Rifkin, 1980), critical mass, thresholds, and tipping points (Gladwell, 1996)."

— Daniel Rigney (2001), *The Metaphorical Society* (pg. 50)

"Nineteenth-century social theorists favored metaphors that mimicked the more successful natural sciences, selecting analogies mainly from biology, chemistry, and physics. Social scientists, modeling themselves after physical scientists, sought to discover the natural 'laws' of society and history. In recent decades, however, the ground has shifted. Today, the positivist dream of a social physics seems, if not dead, at least dormant."

— Daniel Rigney (2001), *The Metaphorical Society* (pg. 197)

References

1. Rigney, Daniel. (2001). *The Metaphorical Society: an Invitation to Social Theory* (§3: Society as Machine, pgs. 41-62, esp. pg. 50). Rowman & Littlefield.
2. (a) Bailey, Kenneth D. (1990). *Social Entropy Theory* (section: "Pareto", pg. 59-61). State University of New York Press.
(b) Rigney, Daniel. (2001). *The Metaphorical Society: an Invitation to Social Theory* (Gibbs, pg. 50). Rowman & Littlefield.

External links

â— Rigney, Daniel (1949-) – WorldCat Identities.

θΔics

In existographies, **Daniel Scargill** (1647-c.1690) [FA:53] was an English Hobbesian-Epicurean stylized mechanical philosopher noted for []

Overview

In 1668, Scargill, age 21, defended a thesis which asserted that the origin of the world could be explained mechanically. [1]

In Mar 1668, Scargill was expelled from Cambridge for having "asserted several impious and atheistical tenets to the great dishonor of god". Ralph Cudworth, one of Hobbes most intellectually formidable opponents, was one of the one's who signed the expulsion order.

Scargill, some months later, was informed that he could be reinstated to the university, provided that he make a public recantation, i.e. recant his atheist views.

On 25 Jul 1669, Scargill, after making two drafts that were rejected by the university, delivered his now famous "Public Recantation", delivered at the University Church of St. Mary the Great, main part of the recant is as follows: [2]

> "Whereas I **Daniel Scargill**, late batchelour of arts, and fellow of Corpus Christi College; in the University of Cambridge, being through the instigation of the devil possessed with a foolish proud conceit of my own wit and not having the fear of god before my eyes: Have lately vented and publicly asserted in the said university diverse wicked, blasphemous, and atheistical positions (particularly, that all right of dominion is founded only in power: that all moral righteousness is founded only in the positive law of the civil magistrate ...), professing that I gloried to be an Hobbist and an atheist; and vaunting, that Hobbs should be maintained by 'Daniel', that is, by me. Agreeably unto which principles and positions, I have lived in great licentiousness; swearing rashly; drinking intemperately; boasting myself insolently; corrupting others by my pernicious principles and examples: to the dishonor of god; the reproach of the university; the scandal of Christianity; and the just offence of mankind. Wherefore, I do here in the presence of god, angels, and men, cast myself down in a deep dread of the just judgements and vengeance of god upon the accursed atheism of this age, acknowledging myself to be highly guilty of the growth and spreading thereof, having contributed what my profane wit could devise, or my foul mouth express, to instill it into others or confirm them therein. In a deep sense of that wretched part I have acted in the propagating thereof, I do now abhor myself in dust and ashes, and from the bottom of my heart, I do disclaim, renounce, detest, and abhor those execrable positions asserted by me or any other: particularly: that **there is a desirable glory in being and being reputed an atheist**: which I implied when I expressly affirmed that I gloried to be an Hobbist and an atheist."

(add)

Education

In 1662, Scargill, age 15, was admitted "sizar" (Ñº), i.e. financially assisted undergraduate, at Corpus Christi, Cambridge, during which time he came under the guidance of physician and new science advocate Thomas Tenison, close friend of John Spencer (1630-1693) (Ñº) and son-in-law of Richard Love. Scargill, according to John Parkin (2001), started off as one of Spencer's "brightest proteges", but soon turned into his worst nightmares, after learning where he was going with his radical views.

Other

In 2003, Jennifer Hecht, in her *Doubt: a History*, incorrectly and or typographically cited Scargill as "David" Scargill, which has led to a certain amount of citation misinformation.

Quotes

The following are noted quotes:

> “The soul of man is but a trembling atom.”
>
> — Daniel Scargill (1668), comment to Thomas Tenison [1]

> “There is desirable glory in being, and being reputed, an atheist; which I implied when I expressly affirmed that I gloried to be a Hobbist and an atheist.”
>
> — Daniel Scargill (1669), “Recantation” at Cambridge University [2]

References

1. Parkin, Jon. (1999). “Hobbism in the Later 1660s: Daniel Scargill and Samuel Parker” (pdf), *Historical Journal*, University of York.2. (a) Berman, David. (2013). *A History of Atheism in Britain: From Hobbes to Russell* (Scargill, 8+ pgs; quote, pg. 59). Routledge.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 324). HarperOne.
2. (a) Scargill, Daniel. (1669). “Public Recantation”, delivered at University Church of St. Mary the Great, Cambridge University, Jul 25.
(b) Mintz, Samuel I. (2010). *The Hunting of Leviathan: Seventeenth-century Reactions to the Materialism and Moral Philosophy of Thomas Hobbes* (pgs. 50-51). Cambridge University Press.

External links

â— Daniel Scargill (fl.1669) – OxfordReference.com.

θΔics

In animate thermodynamics, **Daniel Schroeder** (c.1962-) is an American high-energy physicist noted for []

Overview

In 2000, Schroeder, in his *An Introduction to Thermal Physics*, included a diagram that explains the "creation" of a rabbit (or human) in chemical thermodynamic terms, namely that: [1]

> "To create a rabbit [or human] out of nothing and place it on the table, the magician need not summon up the entire enthalpy, $H = U + PV$. Some energy, equal to TS, can flow in spontaneously as heat; the magician must provide only the difference, $G = H - TS$, as work."

(add discussion)

Education

Schroeder completed his BS (in physics?) at Carleton College in 1984, his PhD at Stanford University, with the 1990 dissertation "Beamstrahlung and QED backgrounds at future linear colliders", done at the Stanford Linear Accelerator Center, after which he then taught physics at Pomona College, Grinnell College, and since 1993 has been a physics professor at Weber State University, Utah.

Original version (by Karen Thurber)

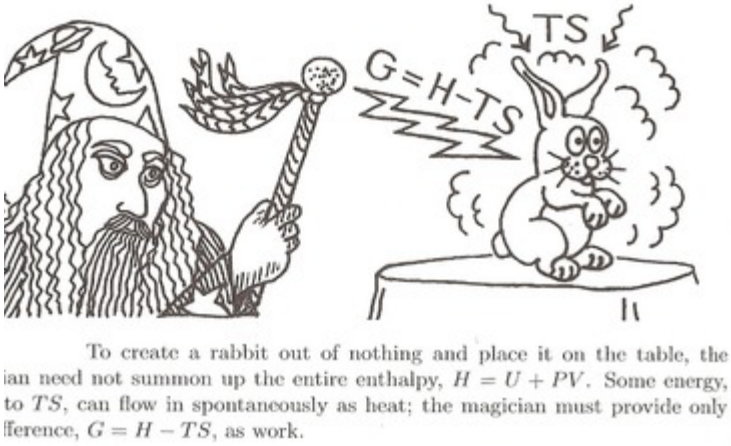

Hmolpedia version (by Libb Thims)

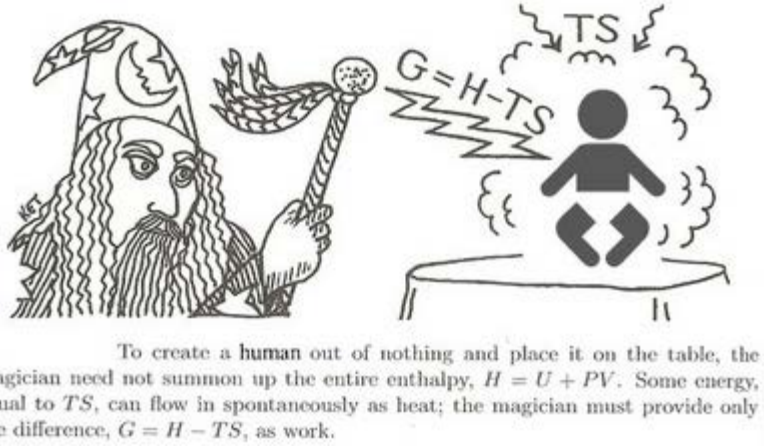

ermodynamic magician creating a rabbit diagram (Figure 5.1) (above left) and remade Hmolpedia version (above right) by American artist Karen E. er, as found in Schroeder's 2000 *Thermal Physics*.

See also

- Human free energy
- Affinity table
- Ascendency

References

1. Schroeder, Daniel V. (2000). *An Introduction to Thermal Physics* (magician diagram, pg. 150; one rabbit, two rabbit diagram, pg. 163). Addison Wesley Longman.

External links

- Schroeder, Daniel V. – WorldCat Identities.
- Daniel V. Schroeder (faculty) – Weber State University.

θΔics

In existographies, **Daniel Sennert** (1572-1637) (IQ:170|#361) was a German physician, philosopher, chemist, aka "German Galen" (Mettrie, 1748), noted for []

Atomic theory

In 1618, Sennert, in his *Epitome Naturalis Scientiae*, influenced (O) by Averroes, gave speculative support for atomic theory.

In 1636, Sennert, in his *Hypomnemata Physicae*, outlined the view that each substance can be broken down into its *minima naturalia* a sort of atom, stable small corpuscle, or smallest possible component of a substance. [1]

Soul

Sennert promoted some type of soul theory, being a blend of Aristotle's hylomorphism and Democritus' atomic theory. [2]

Influenced

Sennert was a major citation stable for Robert Boyle. [2]

Quotes | By

The following are quotes by Sennert:

> "Now there are atoms not only of inanimate bodies, but also of certain animate ones; and the soul itself can sometimes lie hidden in its integrity and preserve itself in these very small corpuscles, as will be related below regarding the mixture and spontaneous generation of living beings. And it is upon this doctrine of atoms that the most learned Fortunio Liceti has built almost the whole of his opinion on spontaneous generation?"
>
> — Daniel Sennert (1636), *On the Spontaneous Generation of Living Beings* [2]

References

1. LoLordo, Antonia. (2007). *Pierre Gassendi and the Birth of Modern Philosophy* (Daniel Sennert, 6+ pgs). Cambridge.
2. Hirai, Hiro. (2011). *Medical Humanism and Natural Philosophy: Renaissance Debates on Matter, Life* (§6: Daniel Sennert on Living Atoms, Hylomorphism and Spontaneous Generation, pgs. 151-). Brill.

External links

- Daniel Sennert – Wikipedia.

θΔics

In hmolscience, **Daniel Styer** (1955-) (CR:4) is an American physicist noted for his 2008 "Entropy and Evolution", wherein he uses the Boltzmann entropy formula, i.e. $S = k \ln W$, to calculate the entropy of a hypothetical evolving organism per second and the entropy change of the biosphere, a contention that in 2012 worked to spark the rather involved Roemer-Styer fiasco with American noma creationism physicist David Roemer, who saw that if Styer's entropy of organisms evolving calculations are correct, they make god superfluous (i.e. it makes the argument that god is the anti-entropy ordering force, against the disordering tendency of the second law, keeping evolution and thermodynamics balanced, defunct).

References

1. (a) Styer, Daniel. (2008). "Entropy and Evolution" (pdf), *American Journal of Physics*, 76(11), Nov.
(b) Home – PseudoScience123.com.

External links

â— Daniel F. Styer – Wikipedia.
â— Daniel Styer (faculty) – Oberlin College, Ohio.
â— Concerning "Entropy and Evolution" (faculty subpage) – Oberlin College, Ohio.

θΔics

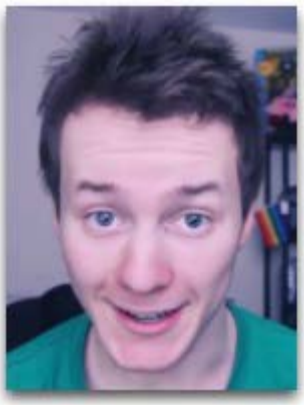

In belief studies, **Daniel Sulzbach** (c.1991-), aka MrRepzion, is an American YouTube personality noted for his 2011 to 2014 inside-the-mind deconversion chronological video uploads on his conversion from Christianity (2006) to atheism-curious (2008) to leaving-religion (2012) to deism (2013) to agnostic atheism (2013/14) to a retracted state of open discussion and "anti-new-atheist" (2014) in stance, though supposedly still identifying as an atheist (Q), then in 2015 back to atheism-promoting; possibly similar to how people such as Peter Higgs and Noam Chomsky self-identify as atheist yet are against the new atheism movement. (Q)

Deconversion | Overview

Sulzbach joined YouTube, as a teen, in a separate channel, in 2006/2007, making some videos, then with a strong Christian belief, of helping people who were going to hell.

In late 2008, or thereabouts, he subscribed to TheAmazingAtheist's channel, when there were about 20,000 subscribers; he had 17,835 on (Q) 12 Jul 2008.

In 2009, he launched "MrRepzion" channel, themed as a geek/gamer channel.

In 2011 had one of his favorite channels "The Amazing Atheist" was banned (Q), from his parent's house, per reasons of ubiquity of F-word profanity;

On 25 Mar 2012, in his "Re: Atheists Have Lost the War!", he does response to a stupid Christian, as he says, video. (Q)

On 29 Jul 2012, made a "Saying Goodbye to Religion" video. (Q)

On 10 Jan 2013, made "Stepping Towards Atheism" (Q), wherein he explains how he recently left Christianity for deism, how he is now, after reading books such as Richard Dawkins' *The Greatest Show on Earth* (2009), which a subscriber bought him, agnostic leaning toward atheism, stating that he has believed in evolution since age 18, but that his parents are evangelical Christians.

On 16 Feb 2013, made "Why I Choose Atheism" (Q), wherein he tries to answer the question of why he has chosen to be an "agnostic atheist" or why he has chosen atheism in general;

In his "Re: From Christian to Atheist", on 7 Oct 2013, he says (3:40) that he was religious up until 16-17 years of age, because, as he says, he had no one to question him on his beliefs. (Q)

Soon thereafter, he starts making "Atheist vs Christian" commentary videos, e.g. "Re: Don't Feed The Atheists" (26 Jan 2014)—which was Atheism Reviewed (Q) on 30 Dec 2014—along with a draft debate series entitled "Face Palm Sunday".

On 11 Jan 2014, made a "My Mom on Religion" video, with his mother. (Q)

On 23 Jun 2014, posts on his Facebook page (Q), that he is going to stop making YouTube atheism videos, per the reasons: "I have no desire to talk about or defend atheism anymore", that he is sick of these "new atheists", that he dislikes the idea of "atheist churches", etc.;

His last two atheism videos seemingly are: "Re: Can Atheists be Moral? (Q), on 24 Aug 2014, and "Re: Why Jesus is The Only Way!" (Q), on 5 Sep 2014, a response video.

Channel stats

See main: Top YouTube atheism channels

The following are Sulzbach's channel stats:

● MrRepzion | Daniel Sulzbach (Q)
Launch: 20 Dec 2009
47M views | 373 subs (127 v/s)

See also

● Christopher Redford
● Redford deconversion model

External links

● MrRepzion (official) – Facebook.

θΔics

In existographies, **Dante Alighieri** (c.1265-1321) (IQ:175|#218) [RGM:51|1,260+] (Cattell 1000:42) was an Italian poet noted for his c.1310 *Divine Comedy*, wherein he tells the story of how he and Latin poet Virgil travel through the nine circles of hell towards, the ninth of which is frozen and at the center of the earth, where Satan resides, the location to which all heavy sinful matter is attracted; a logic based on an Aristotelian universe conception of things, where fire, being the lightest of the four elements, rises to the outer circles of the earth, in geocentric terms. [1]

References

1. Cooper, Leon N. (1976). *Science and the Human Experience: Mephistopheles is Alive and Well and Living in the Space Age – Values, Culture, and Mind* (Amz) (pg. 49). Cambridge University Press.

External links

â— Dante Alighieri – Wikipedia.

θΔics

In

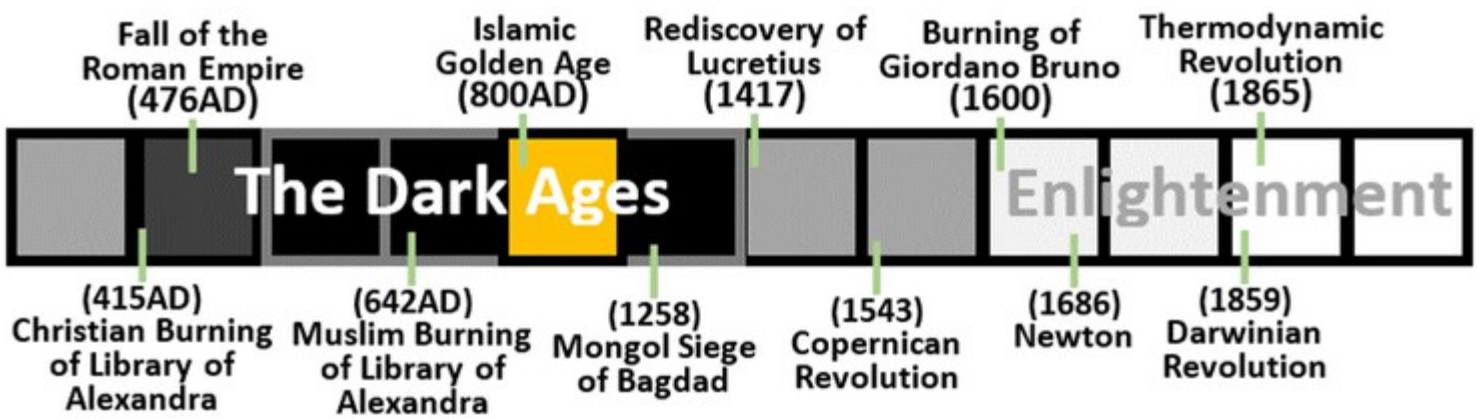

A general diagram of the **dark ages**, spanning from the burning of the Library of Alexandra (415), enlightened for a period during the Islamic golden age (c.800-1258AD) (Q) by a number of middle ages geniuses, then darkened, to eventually be re-lighted by the rediscovery of Lucretius (1417). [3]

terminology, **dark ages** refers to []

Overview

In 415, Hypatia was stoned to death (deboundstate), and shortly thereafter the Library of Alexandria was burned and the Roman empire fell (see: rise and fall of civilization); this generally marks the start of the "dark ages".

From c.1100 to 1453, there was a "middle ages" (see: middle ages geniuses), amid which there was a short "golden age" of middle eastern genius brightness.

In c.1367, Petrarch, after discovering the works of Cicero, and others sharp thinkers of antiquity, introduced, supposedly, the concept of the dark ages. [2]

In 1562, the works of Sextus Empiricus were published for the first time, in post dark age era, therein fostering the Renaissance.

Quotes

The following are related quotes:

> "Amidst the errors there shone forth men of genius; no less keen were their eyes, although they were ***surrounded by darkness*** and dense gloom."
>
> — Petrarch (1367), *Defense Against the Calumnies of an Anonymous Frenchman*

> "In the **dark ages** people are best guided by religion, as in a pitch-black night a blind man is the best guide; he knows the roads and paths better than a man who can see. When daylight comes, however, it is foolish to use blind, old men as guides."
>
> — Heinrich Heine (c.1830), *Thoughts and Ideas* [4]

> "When, towards the end of the fifth century, the Roman empire was broken up, there followed, as is well known, a long period of ignorance and of crime, in which even the ablest minds were immersed in the grossest superstitions. During these, which are rightly called the **dark ages**, the clergy were supreme: they ruled the consciences of the most despotic sovereigns, and they were respected as men of vast learning, because they alone were able to read and write. Such was the degradation of the European intellect for about five hundred years, during which the credulity of men reached a height unparalleled in the annals of

ignorance."

> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 440) [1]

"While some people think we have come out of the **dark ages**, I would intuit that we are still residing in Plato's cave."

> — Libb Thims (2016), "mental note reflection", upon looking at the new revision #1851 of the Hmolpedia main page, after receiving the full 10-volume print set, and marinating in the jump from the Goethe-Schiller dialogue (1799) to the Beg view (1987) to the visual of the print set, with the de Donder view (1936) of the relation between affinity and free energy shown on the cover, repeated ten times, 3:37PM CST Mar 28

References

1. Buckle, Henry. (1857). *History of Civilization, Volume One*. Appleton, 1862.
2. Mommsen, Theodore E. (1942). "Petrarch's Conception of the 'Dark Ages'", *Speculum*, 17.2:226–42, Apr.
3. Thims, Libb. (2019). *Human Chemical Thermodynamics: Chemical Thermodynamics Applied to the Humanities – Sociology, Economics, History, Philosophy, Ethics, Government, Politics, Business, Jurisprudence, Religion, Relationships, Warfare, and Meaning* (pdf) (pg. 27). Publisher.
4. (a) Heine, Heinrich. (c.1830). *Thoughts and Ideas, Volume Ten* (*Gedanken und Einfalle, Volume Ten*). Publisher.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 376). HarperOne.

External links

- Dark ages – Wikipedia.
- Dark ages (historiography) – Wikipedia.

θΔics

In mononyms, **Darwin** [CR:181] is the surname of English naturalist and evolution theory establisher Charles Darwin (1809-1882), predominately; and also of his grandfather pre-evolution theory thinker physician Erasmus Darwin (1731-1802), and his grandson post-evolution theory thinker and modern human thermodynamics pioneer physicist C.G. Darwin (1887-1962).

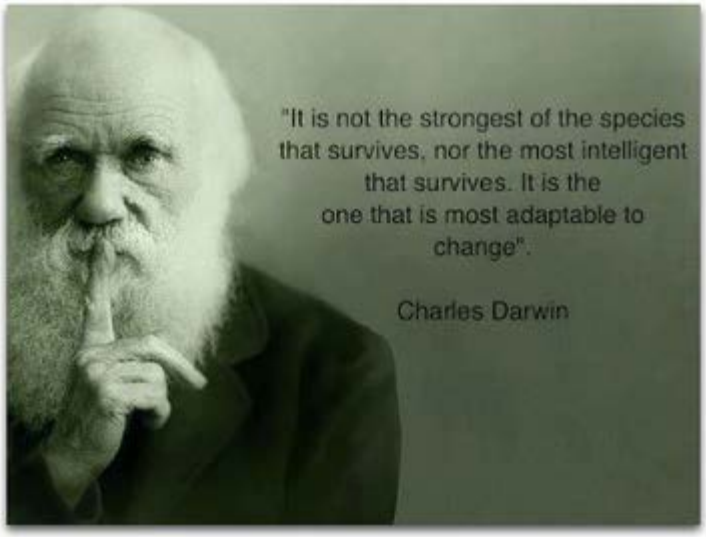

Darwin shown with a popular 1963 misattributed paraphrasing of his theory of evolution, by American marketing manager Leon Megginson (O)(O), supposedly angled as a type of business and or marketing theory, i.e. that businesses need to adapt to change in order to survive new markets.

See also

- Darwin-Lotka energy law
- Darwin family
- Warm pond model

Quotes

The following are relevant Darwin mononym quotes:

> "The Constitution was founded on the law of gravitation. The government was to exist and move by virtue of the efficacy of 'checks and balances.' The trouble with the theory is that government is not a machine, but a living thing. It falls, not under the theory of the universe, but under the theory of organic life. It is accountable to **Darwin**, not to Newton. It is modified by its environment, necessitated by its tasks, shaped by the sheer pressure of life."
>
> — Woodrow Wilson (1912), Presidential candidate campaign speech [1]

> "Clausius and **Darwin** cannot both be right."
>
> — Roger Caillois (1973) *Coherences Aventureuses* [2]

Images

The following are noted Darwin images:

From: science v. religion legal cases.

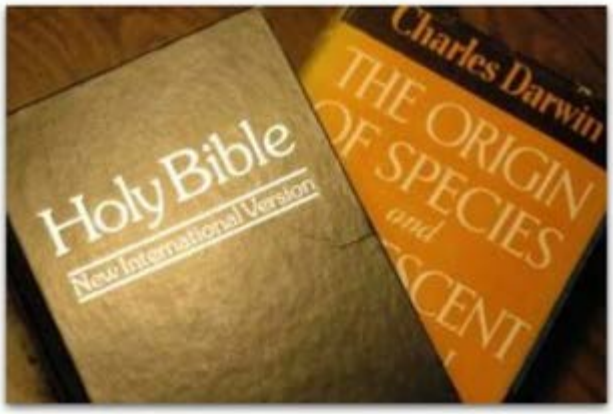

From: science vs religion debates.

References

1. (a) Wilson, Woodrow. (1912). "What is Progress?", Campaign speech; in: *The New Freedom* (§2). Publisher, 1913.

(b) Connelly, William F. (2010). *James Madison Rules America: the Constitutional Originals of Congressional Partisanship* (§: Wilson versus Madison: The Separation of Powers, pgs. 119-). Rowman & Littlefield Publishers.
2.(a) Caillois, Roger. (1976). *Coherences Aventureuses*. Paris: Gallimard.
(b) Thaxton, Charles B., Bradley, Walter L., Olsen, Roger L. (1992). *The Mystery of Life's Origin: Reassessing Current Theories*, (ch. 7: "Thermodynamics of Living Systems", ch. 8: "Thermodynamics and the Origin of Life"). Lewis and Stanley.
(c) Bushev, Michael. (1994). *Synergetics: Chaos, Order, Self-organization* (pg. 130). World Scientific.
(d) Prigogine Ilya, (1981). *From Being to Becoming: Time and Complexity in the Physical Sciences*. San Francisco: W.H. Freeman and Co.

θΔics

In science, **Darwin on higher and lower** refers to Charles Darwin's mental notes about how one should never, particularly in evolution discussions, use of the terms "higher" or "lower" in respect to classification in the chain of development, or synthesis of reactants from products, modern speak, or organic from inorganic, in Berzelius speak, being that it leads to absurdities.

Overview

The following are Darwin's main notes on the use of the terms higher or lower:

> "It is absurd to talk of one animal being **higher** than another. *We* consider those, when the cerebral structure / intellectual faculties most developed, as highest. A bee doubtless would when the instincts were."
>
> — Charles Darwin (1837), notebook jottings [1]

> "Never use the words **higher** or **lower**."
>
> — Charles Darwin (c.1845), note written on the margin of his copy of Robert Chambers' 1844 *Vestiges of The Natural History of Creation* [2]

> "With respect to '**highness**' and '**lowness**', my ideas are only *eclectic* and *not very clear*. It appears to me that an unavoidable wish to compare all animals with men, as supreme, causes some confusion; and I think that nothing besides some such vague comparison is intended, or perhaps is even possible, when the question is whether two kingdoms such as the articulata or mollusca are the highest. Within the same kingdom, I am inclined to think that 'highest' usually means that form, which has undergone most 'morphological differentiation' from the common embryo or archetype of the class; but then every now and then one is bothered (as Milne Edwards has remarked) by 'retrograde development', i.e. the mature animal having fewer and less important organs than its own embryo. The specialization of parts to different functions, or 'the division of physiological labor' of Milne Edwards exactly agrees (and to my mind is the best definition, when it can be applied) with what you state is your idea in regard to plants. I do not think zoologists agree in any definite ideas on this subject; and my ideas are not clearer than those of my brethren."
>
> — Charles Darwin (1854), "Letter to Joseph Hooker", Jun 27 [3]

(add discussion)

Superior | Inferior

In 1993, Canadian thinker Paris Arnopoulos, in his "Life" chapter, to his *Sociophysics*, sited Aristotle's natural scale theory (see: great chain of being), and stated the following: [4]

> "In making this vertical distinction of existential layers we expostulate an order of priority in things; thereby attributing to them **'inferior'** and **'superior'** status. Ever since Aristotle's *scala natura* became responsible for both the quantitative and the qualitative similarities and differences in everything. With increases in quantities of matter and energy, systems become more complex to the point they undergo qualitative changes."

Here, as with Darwin, we see a similar issue. To state, for example, that the hydrogen atom H is somehow "inferior" or "lower" than the dihydrogen molecule H_2, which is to be thereby slotted to be labeled as "superior" or "higher", in the

synthesis of the latter from the components of former, is a nonsensical and untenable position to hold.

References

1. Darwin, Charles. (1837). “Notebook Passage” (Ñº), Genomicron.Evolverzone.com.
2. (a) Chambers, Robert. (1844). *Vestiges of The Natural History of Creation* (higher, 34+ pgs; lower, 28+ pgs). W&R Chambers.
(b) Mayr, Ernst. (1988). *Toward a New Philosophy of Biology* (pg. 251). Harvard University Press.
(c) Klyce, Brig. (2013). “The Second Law of Thermodynamics” (Ñº), Panspermia.org.
3. Darwin, Charles. (1854). “Letter to Joseph Hooker” (Ñº), Jun 27.
4. Arnopoulos, Paris. (1993). *Sociophysics: Cosmos and Chaos in Nature and Culture* (pg. 39). Nova Publishers, 2005.

θΔics

In ecological thermodynamics, **Darwin-Lotka energy law** states that there is an evolutionary advantage to organisms that maximize energy flow. [1] This has also been states such that whenever it is necessary to transform and restore a given amount of energy at the fastest possible rate, some fifty percent of it must be lost due to the work involved. [3]

Etymology

The statement comes from Austrian-born American physical chemist Alfred Lotka's 1922 article "Contributions to the Energetics of Evolution" and was proclaimed a law by Howard Odum in his 1971 *Energy, Power, and Society*. [2]

References

1. Fernández-Galiano, Luis. (2000). *Fire and Memory: On Architecture and Energy* (pg.203-04). MIT Press (written: 1982).
2. (a) Lotka, Alfred J. (1922a). "Contribution to the energetics of evolution" [PDF]. *Proc Natl Acad Sci*, 8: pp. 147–51.
(b) Odum, Howard. (1971). *Energy, Power, and Society* (pg. 31). Wiley-Interscience.
(c) Odum, Howard. (2007). *Energy, Power, and Society for the Twenty-first Century: the Hierarch of Energy* (Maximum Power, Darwin, Lotka Energy Law, and Fourth Energy Law, pg. 37). Columbia University Press.
3. Bennett, Robert J. and Chorley, Richard J. (1978). *Environmental Systems: Philosophy, Analysis, and Control* (pg. 486). Taylor & Francis.

θΔics

In terminology, **Darwinism** is a theory of the origin and perpetuation of new species of animals and plants that offspring of a given organism vary, that natural selection favors the survival of some of these variations over others, that new species have arisen and may continue to arise by these processes, and that widely divergent groups of plants and animals have arisen from the same ancestors; broadly: biological evolutionism. [1]

Quotes

The following are related quotes:

> "If **Darwinism** is true, then there are five inescapable conclusions: 1) there's no evidence for god, 2) there's no life after death, 3) there's no absolute foundation for right or wrong, 4) there's no ultimate meaning for life, and 5) people don't really have free will."
>
> — William Provine (1988), as summarized by Lee Strobel (*The Case for a Creator*, 2004) [2]

See also

â— Goetheanism

References

1. Merriam-Webster Collegiate Dictionary, 2000.
2. (a) Provine, William. (1988), "Evolution and the Foundation of Ethics", *MLB Science*, 3(1):25-29; a shorter version appeared as a guest editorial in the Sep 5, 1988 issue of *The Scientist*, with correspondence and rebuttals in succeeding issues; in: *Science, Technology, and Social Progress* (editor: Steven Goldman) (pg. 261-62). Lehigh University Press.
(b) Johnson, Phillip E. (1993). *Darwin on Trial* (pgs. 155-56). Intervarsity Press, 2010.
(c) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 18). Zondervan, 2009.

Further reading

â— Numbers, Ronald. (1998). *Darwinism Comes to America*. Publisher.

External links

â— Darwinism – Wikipedia.

θΔics

In terminology, **Darwin's warm pond**, aka "warm pond model", or "Darwin's warm little pond', refers to []

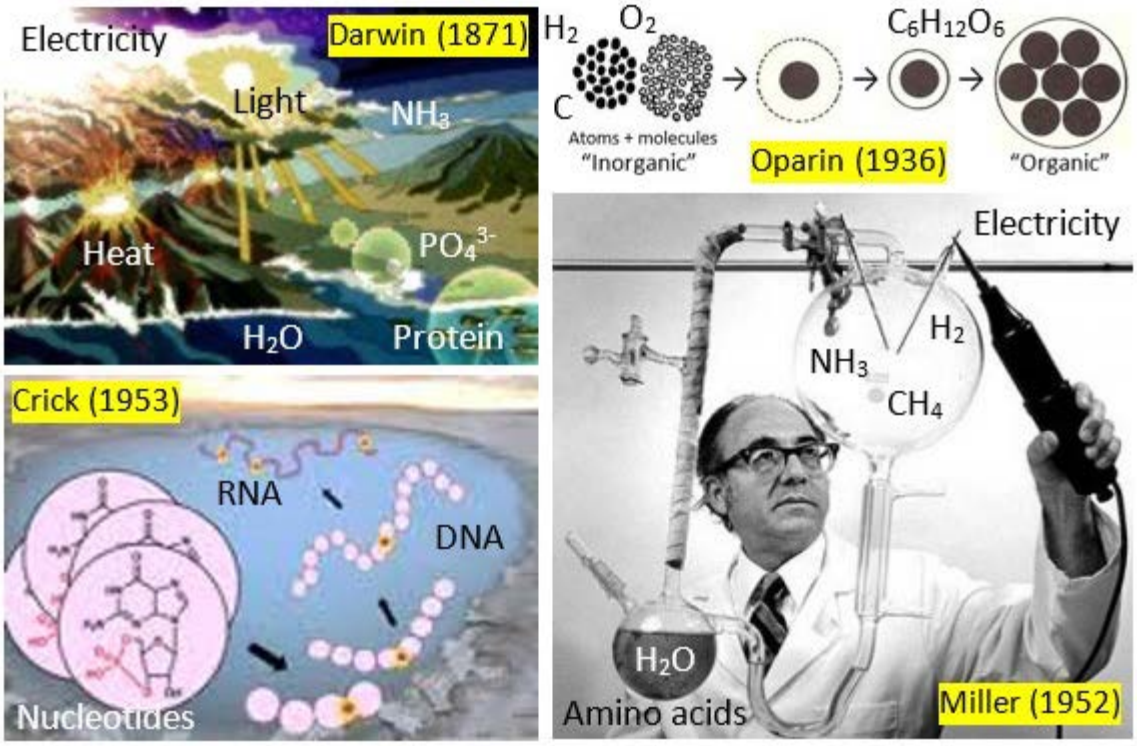

Darwin's Warm Pond

The general late 20th century early 21st century "conception" of **Darwin's warm pond**, a conjunction of Darwin's 1871 conjecture about life arising from non-life, or organic arising from inorganic, in a lit, electrified, warm pond, filled with ammonia and phosphoric salts, plus Alexander Oparin's 1936 conjecture that an early reducing atmosphere allowed for the formation of a sea of organic droplets, aka primordial soup, plus Stanley Miller's 1952 electrical amino acid synthesis experiment (see: Miller-Urey experiment), plus Francis Crick and James Watson's 1953 discovery of the structure the gene as DNA made of stands of RNA made of nucleotides.

Overview

The following synopsis quotes give well-rounded conception of how modern scientists tend to conceptualized Darwin's warm pond, in modern terms:

> "Indeed, scores of organic compounds have been identified in Miller-type experiments, including almost all common amino acids, the purine and pyrimidine bases of DNA and RNA, many types of hydrocarbons and fatty acids, and more than forty different sugars. Some protocols are more efficient than others, some more plausibly prebiotic, but all give biologiclike products if free oxygen is shut out of the system. The conclusion is inescapable—monomers of CHON *are* easy to make under simulated early-earth conditions. But because the amounts produced would have been limited by the scarceness of hydrogen gas in the early atmosphere, organics formed this way were probably not plentiful and may have been augmented by other sources. Evidently **Darwin's warm pond** and Oparin's primordial soup were close to the mark, though the soup may have been more a dilute consommé than a thick organic broth."
>
> — William Schoph (2001), *Cradle of Life* [1]

> "One can only speculate whether twentieth century chemists were inspired by **Darwin's warm pond** scenario when they set out to discuss and explore the chemical evolution of life in laboratory flasks (Oparin 1936; Urey 1952; Miller 1953, 1955). The letter to Hooker is quoted by Oparin, Hardin (1950), and Calvin (1969); but as far as we could ascertain, it was not mentioned in the early experimental contributions from other authors."
>
> — Hartmut Follmann et al (2009), "Darwin's Warm Pond Revisited"

(add discussion)

Religion | Conflict

The direct religious implications of the Darwin warm pond model, i.e. that life arose from non-living chemicals, via the action of heat, electricity, and light, seemingly remove "god", and concordant "god baggage" theories, e.g. spirit, soul, afterlife, morality, meaning, etc., from the picture. This, naturally enough irks, creationists, and the related; some of which are is captured in the following example quotes:

> "Darwin suggested that the first living creature evolved in a **'**warm little pond**'**. Some recent writers have imagined that life arose in 'organic soup' [see: primordial soup]— a more sophisticated, but equally vague, version of **Darwin's warm pond**."
>
> — Walter Brown (1989), *In the Beginning* (pg. 10)

> "Beadle's 1962 view that it is 'awe-inspiring to conceive of a universe created of hydrogen with the capacity to evolve into man', framed within Crick's 1966 view that 'ultimate aim of the modern movement in biology is in fact to explain *all* biology in terms of physics and chemistry', according to which 'hydrogen is turned into thinking and purposive beings' is scientifically undemonstrated, and philosophically devoid of merit. Thinking about atoms discussing morals is absurd."
>
> — Ravi Zacharias (1990), *The Real Face of Atheism* (pgs. 44 + 128)

> "The evolutionist wants to assert that [life] arose from inorganic material — from the original chemicals in **Darwin's 'warm pond'**. The only explanation scientists have is the assumption that the laws of chemistry and physics must have been different when the earth was formed."
>
> — Erwin Lutzer (1993), *Twelve Myths Americans Believe* (pg. 35)

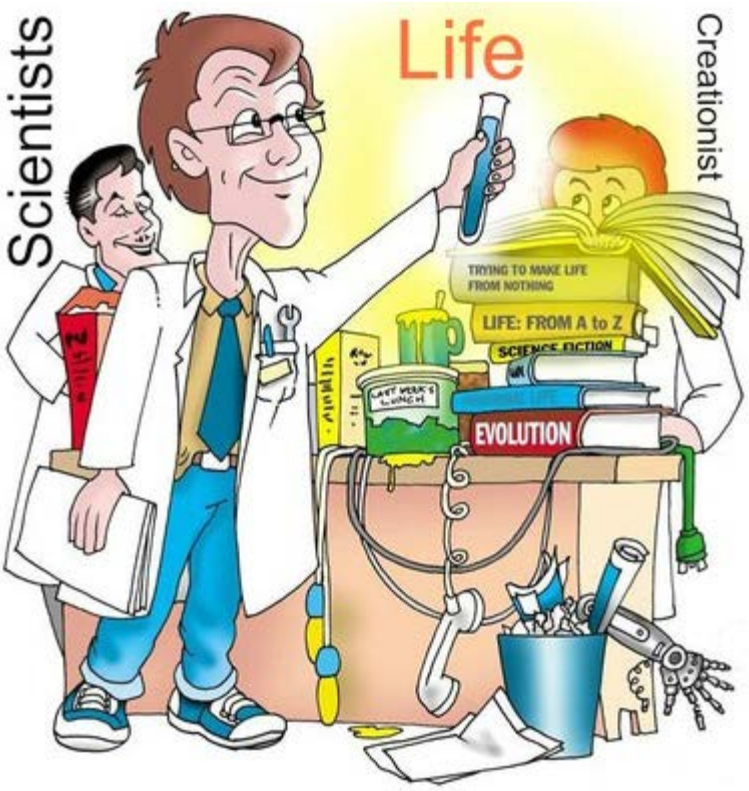

A 2013 "life created from nothing" cartoon (Q), ridiculing scientists for believing that "life" can come from "dead" chemicals, aka the nutshell synopsis of **Darwin's warm pond** model origin of life, by Don Batten of Creation.com.

(add discussion)

References

1. (a) Schoph, William. (2001). *Cradle of Life: the Discovery of Earth's Earliest Fossils* (pg. 131). Publisher.
(b) J. William Schopf – Wikipedia.
2. Zacharias, Ravi. (1990). *The Real Face of Atheism* (hydrogen, pg. 44; absurd, 3+ pgs). Baker Books, 2004.

Further reading

● Thims, Libb. (2007). *Human Chemistry (Volume One)* (pdf) (Darwin's warm pond, pg. 126). Morrisville, NC: LuLu.
● Follmann, Hartmut. and Brownson, Carol. (2009). "Darwin's Warm Little Pond Revisited: From Molecules to the Origin of Life" (pdf), In: *Beyond the Origin: Charles Darwin and Modern Biology* (editor: U. Kutschera). Publisher.

θΔics

In hmolscience, **dating system** refers to a method for chronologically ordering events in the framework of an epoch or an instant in time chosen as the origin of a particular era.

Overview

The current Western hemisphere dating system—the epoch of the anno Domini calendar era—is religio-mythology based, namely epoch of the Christian era, in which the instant in time chosen as the origin is the birth of the fictional character Jesus Christ, a semi-anthropomorphized syncretism rewrite of the Egyptian god "Osiris anointed", the literal etymological translation of the former, of Anunian theology. Scientists and other discerning thinkers, subsequently, often have tended to take issues with this incongruent mode of dating; one example of which is shown below, the statement dated with three alternative dating system modes:

> "I have dictated thirty pages on the world's religions; and I have read the Bible. My own mind is made up. I do not think that Jesus Christ ever existed."
>
> — Napoleon Bonaparte (1817 AD) (367 PE) (175 ME)

If, in short, Jesus never existed, which is the case, being that the story of the birth of Jesus is a re-telling of the story of the birth of Horus, then the dating of years presently is baseless, other than signifies years since the general start, plus or minus a century, of the Greco-Roman empire, after the fall of the 3100-year Egyptian dynasty.

Varro

In *circa* 50BC (or *circa* 703 AUC), Marcus Varro introduced the *anno urbis conditae* (AUC) or "from city founding" dating system, which dated years from the founding of Rome or 21 Apr 753BC (in Christian era years). [1] The AUC dating system, supposedly, came to be superseded, in usage, by the AD/BC dating system, invented in 525AD (1260AUC) by Roman monk Dionysius Exiguus, during the reign of Charlemagne (742-814). [2]

Newton

In *circa* 1700, English physicist Isaac Newton, in incognito, would objectionably not label years as AD, but instead used AC (*Anno Christum*), signifying is objection to the argument of the existence of the trinity, namely his view that a person named Jesus may have existed, may have been the son of God, and may have been christened or arisen, but definitely was not the 'Lord' or God. [1]

Stewart

In 1790, John Stewart seems to have invented his own unique god-free morality dating system, according to which dates the zero year to the "start of man's retrospective knowledge", which he deduces by astronomical calculations (similar to Thims; see below), to have occurred 5,000-years prior to the publication of his *Treatise on the Source of Moral Motion and the Moral State of Nations*, or in abbreviated full:

> â— Stewart, John. (1790). *The Moral State of Nations: Travels Over the Most Interesting Parts of the Globe, to Discover the Source of Moral Motion; Communicated to Lead Mankind Through the Conviction of the Senses to Intellectual Existence, and an Enlightened State of Nature. In the Year of Man's Retrospective Knowledge, by Astronomical Calculation 5000. Year of the Common Era, 1790*. George H. Evans, 1837.

(add)

French revolution | Secular calendar

In 1789, the French revolution began, during which time a considerable amount of Church property, in the form of

French land and wealth, were seized for redistribution. On Jan 1793, the revolutionaries guillotined the king, and in Oct, of this year, the newly elected body, called the “Convention”, adopted a new secular calendar, calling 1792 year one, wherein months were 30 days long, divided into 3 ten-day weeks, each day called by its number, in place of the pagan god day of week namesakes. The calendar lasted until 1806, after which Napoleon Bonaparte brought back the Gregorian calendar. [5]

Paine

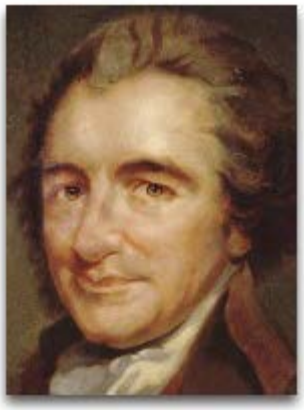

See main: Paine dating system

In 1802, Thomas Paine, in his letters to Elihu Palmer, was dating them as follows:

> “Paris, February 21st, 1802, since the fable of Christ”

(add)

Mussolini

In 1923, Benito Mussolini (1883-1945) was dating letters “Year One of the Fascist Era”. [5]

Asimov

In 1951, Isaac Asimov, American chemist turned science fiction writer, published the first of his *Foundation*, in which he introduces the socio-physical chemical prediction mathematician character “Hari Seldon”, born in the 10th month of the 11,988th year of the Galactic Era (GE) (-79 Foundation Era (FE)) and died 12,069 GE (1 FE).

Needham

In 1954, Joseph Needham spearheaded the multi-volume *Science and Civilization in China*, which went through 28-volumes, completed 2004, where a +/- notation system was employed; one example:

> “**Ctesibius** had been responsible, about -230, for a simple and fundamental machine, the piston air-pump, known from the descriptions of later mechanicians. This simplest of pumps entered upon a new incarnation in the +17th century, when the virtuosi began to explore with excitement the properties of vacuous spaces, for what had been invented originally as a bellows for pumping air into something now found fresh employment as the ‘air-pump’ for getting as much air as possible out of it.”
>
> — Joseph Needham (1987), *Science and Civilization in China: Volume 5* (pg. 555) [6]

(add)

1450 | Before Print | Printing Era _ BP/PE

In 2012, American electrochemical engineer Libb Thims, in the overtly atheistic manuscript *Purpose? (in a Godless universe)*, began to employ the “printing era” dating system, dating the modern era to years before or after 1450 the year of the invention of the printing press, throughout, using the abbreviations BP (before printing) and PE (printing era) in place of BC/AD dating method. [3] On 14 Apr 2013, the printing era BP/PE dating system was introduced online, namely into the Empedocles article, and thereafter into about 100 other articles. (Ñº) This calendar system, to note has issues with it as some, e.g. in Mirza Beg publications, use the abbreviation "BP" and "PE" to mean "before present" and "present era", respectively.

1543 | Before Copernicus | After Copernicus _ BP/AP

Some atheists, in recent years, of note, prefer to date years from the year of publication of Nicolas Copernicus’ *On the Revolution of the Heavenly Orbs*, which occurred (Ñº) in 1543 in

Nuremberg, Holy Roman Empire; the following is an example statement of this:

> "Excellent point. Personally, I prefer the Copernican dating system in which we count the number of years before and after the year of the publication of the De revolutionibus orbium coelestium (of course with the inclusion of a year 0, being the year of publication). In which case we live in the year 473 AP. Sadly not a lot of people know about this dating system so I am forced to use the BCE, CE system on occasion."
>
> — AlwaysUnite (2016), Reddit message to Libb Thims, Oct 4

The Copernican dating system was used in a lecture by Dutch atheism campaigning philosopher Floris van den Berg. (Ñº)

This is a reasonable dating system, being that many often tend to date this year to the start of the history of science, one example being John Gribbin's 2002 tome *Science: a History 1543-2001*. Three downsides of this dating system, however, are (a) firstly the lack of easy of quick on-the-go mental calculation, e.g. 2016 CE = 473 AP [Anno Publication] or 2016 – 1543 = 473, say as compared to the Goethean dating system, where 2016 CE = 266 AG [Anno Goethe] or 2016 – 1750 = 266 or 250 + 16 = 266, as quickly done in the mind; (b) that 1543 isn't necessarily the start of heliocentrism, as supposedly it was previously advanced by Philolaus (c.399BC), Aristarchus (250BC), and promoted by Hypatia (400AD), but rather it is the second wave of new data based idea pressure that was able to push through the barricaded resistance of older religious ideological pressure; (c) it is pre Julian calendar to Gregorian calendar correction switch years.

1642 | Before Newton | Anno Newton _ BN/AN

On 23 Nov 2013, the alternative "modern era", using the abbreviations BN (before Newton) and AN (Anno Newton) or ME (modern era) dating system, dating the epoch to the birth of Isaac Newton, began to be used online, first introduced in the Isaac Newton article.

> "**1642** [the year of Newton's birth] is the Christmas of the **modern age**."
>
> — Johann Goethe (c.1810), Publication

This dating system was devised in tribute quotation form circa 1610 by Johann Goethe, per above quote, was implemented online in Hmolpedia on 23 Nov 2013 by Libb Thims, slowly coming into test stage use in the following year.

This Newtonian or "modern era" calendar era is based on the traditionally reckoned year of the conception or birth (reaction synthesis) of Isaac Newton, with *AN* "Anno Newton" or *ME* "Modern Era" counting years from the start of this epoch, and *BN* denoting years before the start of the era.

This dating system has some subtle issue with, in regards to the date of Newton's birth (reaction synthesis) and death (reaction end), is that modern era dating will vary according to whether one uses the Julian calender system (older calender) or the Gregorian calendar system (modern calender), a transition that occurred, depending on country, during the years 1582 to 1752: [6]

> Newton (Old System, Julian calendar) reaction existence: 25 Dec 1642 – 20 Mar 1726

Newton (New System, Gregorian calendar) reaction existence: 4 Jan 1643 – 31 Mar 1727

Using Newton's birth (4 Jan 1643) one can calculate the modern era date using on online date calculator, specifically a "date duration calculator" (Ñº), as found at TimeAndDate.com

1750 | Before Goethe | Anno Goethe _ BG/AG

An alternative dating system, suggested by Ralph Emerson (1852), is the BG/AG dating system:

> "All before Goethe are ancients, and all who have read him are **modern**."
>
> — Ralph Emerson (1852), commentary on Margaret Fuller [4]

This Goethean "modern era" calendar era is based on the traditionally reckoned year of the conception or birth (reaction synthesis) of Johann Goethe (28 Aug 1749), with *AG* "Anno Goethe" counting years from the start of this epoch, and *BG* denoting years before the start of the era.

In this scheme, the tentative placement of the "zero year", or 0 AG, in round-off time (discarding 4-months and 3.5-days, per round off), would be the the year 1 Jan 1750 to 31 Dec 1750. Hence, someone born (synthesized) in the year 2000 (in Christian era years) would be born in the year 250 AG (2000 minus 1750) in Goethe era calendar years; whereas someone born in the year 1748 would be born in the year 1 BG (1749 minus 1748) in Goethean calender years. The BG/AG dating system was first tested out on 21 Jul 2014 in the Libb Thims article.

1948 | Before Cybernetics | After Cybernetics _ BC/AC

In 1953, American economist Herbert Simon was referring to BC as "before cybernetics" as follows:

> "In the era BC (before cybernetics) it [*Elements of Physical Biology*] was an important source of education and encouragement for few souls who had gleam in their eyes about the prospective mathematization of the social sciences. It had a substantial influence on Henry Schultz and Paul Samuelson, and, I am sure, many others besides myself. As a matter of fact, most of the ideas of [Norbert] Wiener emphasizes—for example, the relation of entropy to organizational behavior—can be found in Lotka, and I have felt some annoyance at the lack of recognition of the latter's contributions."

This one has issues with it as one either date BC to the year 1948 (Norbert Wiener, *Cybernetics: or Control and Communication in the Animal and the Machine*), as the above usage suggests, the year 1834 (Andre Ampere, *Essay on the Philosophy of Science*), or, as some will argue, date the term back to the works of Plato, depending.

Quotes

The following are related quotes:

> "Written in the land of the living; on the right bank of the Adige, in Verona, in the year of that **god whom you never knew** the 1345th."
>
> — Petrarch (1345), signoff to a letter; compare: Goethean calendar [1]

> "When referencing dates based on the approximate birth of Jesus, give appropriate credit for the basis of the

date (B.C. or A.D.). "BCE" and "CE" are unacceptable substitutes because they deny the historical basis—i.e. they are anti-Christian. *See* CE."

— Benjamin S. (2006), *Conservapedia*, Commandments (Ñº)

"10 Jul 2014? Nah. The Christian Calendar is disgustingly deleterious."

— NikolaTesla (2014), post #58 in the Beg-Thims discussion

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External links

â— Calendar era – Wikipedia.
â— Common Era – Wikipedia.
â— Epoch (reference date) – Wikipedia.

θΔics

In anthropological thermodynamics, **David Friend Aberle** (1918-2004) was a Canadian anthropologist noted for his 1987 lecture "What Kind of Science is Anthropology?", in which he suggests that anthropology needs to discard the Newtonian reversible model and instead to use thermodynamic irreversible models; or specifically to "catch up with the new views of entropy, information, and evolution". [1] Aberle notes, in his opinion, that Americans anthropologist Richard Adams (1975, 78) and writer Jeremy Campbell (1982) have made efforts in this area in "bringing us up to date". [2]

Aberle was one of the reviewers of Daniel Brooks and Edward Wiley's 1986 book *Evolution as Entropy*. [3]

Education

In 1968, Aberle was a professor of anthropology, at the University of British Columbia, and by 1987 he was a professor emeritus of anthropology and sociology.

References

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External links

â— Thomas Merton's Correspondence with: Aberle, David Friend, 1918-2004 – Merton.org.

External links

â— David Aberle – Wikipedia.
â— Aberle, David – WorldCat Identities.

θΔics

In hmolscience, **David S. Alkek** (c.1931-) is an American dermatologist noted, in human thermodynamics, for his 2007 theory that the purpose of humankind is to increase complexity so to counter the second law.

Overview

In 2007, Alkek, in his *The Self-Creating Universe*, argued that the universe, life, and human societies have a purpose in a new-paradigm "law of increasing complexity", a complexity theory law counter to the second law (he defines as the law which predicts progressive disorganization), which instills a "self-development" of increased form, organization, and complexity. He introduces the term "ipsa-creation" to define the self-development of the "unfinished universe". [1]

Education

Alkek completed his BS in chemistry at the University of Texas, Austin, and his MD at University of Texas Southwestern Medical School, Dallas, and did his dermatology residency at Temple University Skin and Cancer Hospitals in Philadelphia. [2] He has been in private practice since 1971.

References

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(b) Alkek, David S. (2009). *The Self-Creating Universe* (bigger with more "big history" and charts). Strategic Book Publishing.
2. David Alkek MD – Alkek.com.

θΔics

In existographies, **David Berlinski** (1942-) (CRI:26) is an American mathematician and anti-Darwinist, noted for []

Beliefs

Berlinski auto-characterizes as "secular Jew" (2008); but gives indication of theism-leaning agnostic, e.g. as indicated by the fact that he is a Discovery Institute fellow.

Other

Berlinski, along with fellow Discovery Institute associates Michael Behe and William Dembski, tutored Ann Coulter on science and evolution for her book *Godless: The Church of Liberalism* (2006).

In 2008, Berlinski was one of the anti-Darwin scientists interviewed by Ben Stein in the film *Expelled: No Intelligence Allowed*.

Quotes | Employed

The following are quotes employed by Berlinski:

> "Methodological naturalism, the view that natural phenomena can be explained without reference to supernatural beings or events, is the foundation of the natural sciences."
>
> — Hector Avalos (c.2005), *Publication*; cited by David Berlinski (2008) in *The Devil Delusion* (pg. 52)

> "It is absolutely safe to say, that if you meet somebody who claims not to believe in evolution, that person is ignorant, stupid or insane."
>
> — Richard Dawkins. (c.2007), *Publication*; cited by David Berlinski (2008) in *The Devil Delusion* (pg. 7)

Quotes | By

The following are quotes by Berlinski:

> "The order of the battle is no different. It has been the *scientists* — Richard Dawkins, Victor Stenger, Taner Edis, Emile Zuckerkandl, Peter Atkins, Steven Weinberg (*vast mole superbus*) — who have undertaken a wide-ranging attack on religious belief and sentiment."
>
> — David Berlinski (2008), *The Devil's Delusion* (pg. 3) [1]

> "The thesis that we are nothing more than vehicles for a number of 'selfish genes' has accordingly entered deeply into the simian gabble of academic life, where together with materialism and moral relativism it now seems as self-evident as the law of affirmative action."
>
> — David Berlinski (2008), *The Devil's Delusion* (pg. 3) [1]

References

1. Berlinski, David. (2008). *The Devil's Delusion: Atheism and Its Scientific Pretensions*. Publisher, 2010.

External links

â— David Berlinski – Wikipedia.

θΔics

In hmolscience, **David Bossens** (1989-) is a Belgian psychologist and philosopher noted for []

Overview

In 2012, Bossens, in his "Reflections: Criticisms of Science", discusses free will and social sciences in the context of thermodynamics, complexity theory, quantum mechanics, Darwinian evolution, and human chemistry, among others, the abstract of which is as follows: [1]

> "Can we make free choices, or are we determined by our environment? Is science on the right path? Can we predict love? These and other questions are discussed."

The article is very *Hmolpedia*-centric, discussing the Tesla-Thims version of the defunct theory of life, William Sidis's "animate and inanimate", Rene Descartes' automaton theory, Laplace's demon; the question of free will from the chemical, thermodynamic, and quantum perspectives; the subject of prediction, among other topics, such a possible relation of Goethe and his human elective affinities theory to Darwin and modern genetics. The article opens to the following Tesla quote:

> "There is no thing endowed with life—from man, who is enslaving the elements, to the nimblest creature—in all this world that does not sway in its turn. Whenever action is born from force, though it be infinitesimal, the cosmic balance is upset and the universal motion results."

The article also digs in to the "religion needs to be discarded" issue; and in its place put the modern physical science framework of moral movement.

In 2013, Bossens collected his discussions and learned dialogues into the book *Debates of the Hmolpedians*, shown adjacent; the contents of which are as follows:

Table of contents

1. What is the Hmolpedia? 3-4
2. Some Challenges and Suggestions 5-11
3. The long life debate 12-62
4. Intelligence, consciousness and free will 63-92
5. Other interesting people at the Hmolpedia 93-96
6. Morality 97-108
7. Final thoughts 109-112

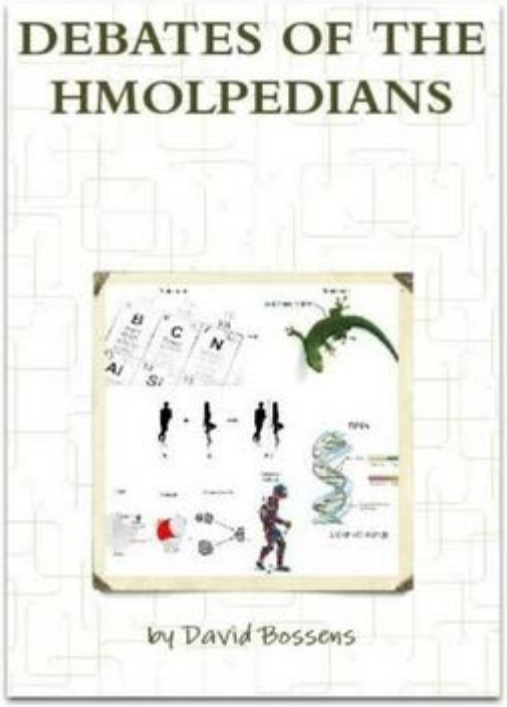

Bossens' 2013 book *Debates of the Hmolpedians*, wherein he discusses his newly-learned views on hmolscience, in regards to questions on the defunct theory of life, biology, free will, prediction, DNA, human molecular theory, among others. [8]

(add discussion)

Human thermodynamics

On the subject of human thermodynamics, Bossens gives the following views on the matter:

> "[Human thermodynamics] is a branch of science that attempts to predict the behavior of people via chemical and thermodynamical

> equations. It is an interesting philosophy, a change of paradigm, perhaps even leaving having a broader explanation for human behavior than Darwinian evolution. Human thermodynamics can also be useful as a new framework for the origin of life. For instance, Libb Thims, proposed online that the idea of Darwin's 'dark pond' which suddenly sprang to 'life', is not a very coherent one, and that it would be much more creditable and parsimonious to have as a rule that molecules bond and form ever more complex beings. Libb Thims also proposed a 'human molecule' where people are attracted to each other by chemical bonds. All this I believe to be a reasonable explanation: even if Darwin's theory is still correct, they approach of thermodynamics and chemistry is a much more simple, and at the same time broader view. If the concept of biology is somehow redundant, then we must study it by means of chemistry and physics."

Biology ≠ Defunct term

Bossens, in regards to the defunct theory of life view, is of the opinion that biology is not a defunct term; such as he has commented, in 2012, in a conversation with American civil-ecological engineer Jeff Tuhtan. Specifically, Bossens defines biological organisms as 'having genes that code for proteins'. A few counterexamples can be found, such as erythrocytes which don't have DNA or RNA. But, it is clear, Bossens says, that 'having genes coding for proteins' or 'consisting of one or more cell' are concepts unique and very universal to what is commonly referred to as biology. Furthermore, Bossens argues a biological organism need not consist entirely out of biology, since the only necessary condition is that, at the level of the biological organism as a whole, it has genes that code for proteins. Bossens gives the example of a brain chip, which would be a non-biological part of a biological organism. Both Thims and Tuhtan argued that, if the organism is deemed to be alive, then so should its molecules and its atoms. However, Bossens claims this results from using another definition than the one he used. Bossens then claims that atoms and molecules should not be deemed alive in this definition because they do not qualify the conditions 'has, or consists of one or more cells' and 'has genes coding for its proteins'. Still, Bossens claims that this does not imply free will or a soul for any organism, saying: "life sounds a bit religious is because it recalls of soul (and thus free will, a 'life force' if you will), and if for one way or another bio would recall of the same, then we should leave that term as well. But since biology is a science by now, that has a good definition not relating to free will, it would be somewhat unnecessary to change the definition of a clearly defined subject." Bossens also has stated this conversation will be discussed in his yet to be published book 'Reflections'. [7]

Quantum mechanics

Bossens touches on the wave-function collapse model of free will, the idea that "we choose, and choice makes the wave function collapse", citing American theoretical physicist Michio Kaku as an advocate of this view. On the question of "awareness", Bossens states:

> "Low-level consciousness, as in 'reacting', which even ants can do, could be explained by introducing the idea that quanta have some kind of 'awareness', and that they react to an observer'. Or you could explain this by the more simple postulate that chemical molecules react to each other's presence and that this explains why even non-living things can react and seem to be conscious. How to explain the reacting to the observer, or rather the act of measurement, is not clear. Anyhow, it seems that quanta do not have eyes, and therefore are not 'aware' in the traditional sense that we are observing them. They might react as they do, but this has nothing to do with the 'awareness', no more than a molecule could react if another molecule is placed in its vicinity."

One point to note in this statement is that there is the hypothesis of Irish physicist John Bell (1928-1990) who devised an experiment to the prove the nonlocal nature of the world; the results of his work, supposedly, showing that it would be possible, in principle, to make measurements on two such quantum entities, such as photons, that has once been in contact, and discover if they remained 'aware' of each other when far apart. These experiments were actually carried out recently by Alain Aspect in Paris, which, supposedly, proved conclusively that quantum systems are nonlocal.

Likewise, in the 1990s, researchers in Geneva sent photons along a fiber optic cable 6.2 (10 km) in length, finding that the two photons acted like one particle even when they were more than six miles apart. In short, the experiments showed

nonlocality. [2] Unresolved issues with the double slits experiment would seem to leave this query as an unresolved issue.

Prediction

On the subject of prediction, Bossens seems to be digging around in the right area. The root of the explanation of prediction is that a person is a molecule, the formula of which has been calculated by Robert Sterner and James Elser (2002). Every molecule in the universe has to result, i.e. come into existence in a specific state, in the form of a bound state structure, through a process of chemical synthesis. The methodological framework in which molecules in a given state are defined is via their placement on free energy tables, otherwise known as thermodynamic data tables, on which the standard Gibbs free energy of synthesis, entropy, and enthalpy for each atom and molecule on up are listed. Once the basic set of reactant precursors are listed on the table, the potential synthesis or rather feasibility for any given larger molecule (product) can be predicted, and hence listed on the table, or rather its thermodynamic feasibility can be predetermined or in the 1923 words of Gilbert Lewis, and his universal rule, one can discern if the process if "thermodynamically possible". If it is not possible, however, then one will know absolutely that the process will not go or occur or the molecule will not form and in this sense predict that the process will not occur; likewise for the converse scenario. This is what Polish solid state physicist and thermodynamicist Michal Kurzynski calls "principle of mechanical determinism" (2006):

> "The laws of motion and the **state** of a physical system at a given moment in time unambiguously and uniquely determine the state of the system at all other moments of time, both in the future and in the past."

The first free energy table for animate chemical species (biochemical species), containing about 100 species, was 1957 table English electrical engineer and physicist Keith Burton. [5]

In the context of scientific demons, this logic, assuming each human can be listed as a synthesized molecule, and a human free energy table (see: human free energy), would result in prediction by a Gibbsian demon, named after American engineer Willard Gibbs, the curator and formulator of the prediction via free energy method, in what would be called thermodynamic determinism: meaning that one is able "predict" human chemical reactions, in the same way we currently predict test tube sized chemical reactions by measuring free energy, namely chemical determinism defined by the first law and second law of thermodynamics:

Date	Name		Inventor	Description	Implication
2007	Advanced intelligence (Gibbsian demon)		Libb Thims	A type of advanced "intellect", possibly a 30-40 element molecule (in the sense that a human is a less-intelligent 26-element molecule), that would be able to look down at us and measure and calculate our reactions to each other (in terms of thermodynamic variables) the way we do in calculating statevariables in thermodynamic tables. [3]	Thermodynamic determinism: An entity that is able "predict" human chemical reactions, in the same way we predict chemical reactions by measuring free energy.

German polymath Johann Goethe and his circa 1808 human affinity table, of course, was the forerunner to this model. Goethe definitive view on free will is as such: "no are so hopelessly enslaved than those who believe they are free". The repercussions and logic of which are embodied in his Goethean philosophy, a chemical philosophy model of human existence and experience.

Religion | Existence of God | Origins

In his 7 Jun 2012 30-page article “Reflections: Our Origins”, the synopsis of which is “insight into our origins; not only into the origins of mankind, but perhaps mainly into the universe as a whole; the Big Bang, the question of god and evolution are discussed from an interesting standpoint”, Bossens mentions Libb Thims’ stance on god [DN=10] and goes into a debate with some of the Thims' statements. [2]

Education

In 2012, Bossens completed his BS in psychology, in the area of theory and research, at the Catholic University of Leuven, Belgium. Bossens is tentatively working a second bachelors in mathematics and physics, to be completed in 2014; and aims towards completion of a doctoral degree. Bossens states that he is “self-schooled on physics, especially on the philosophical implications”. [6]

See also

â— Physical intelligence

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(b) Thims, Libb. (2008). *The Human Molecule* (ch. Advanced Intelligence Perspective, pgs. 39-42) (issuu) (preview) (Google Books) (docstoc). LuLu.
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5. (a) Krebs, H.A. and Kornberg, H.L. (1957). *Energy Transformations in Living Matter* (with an Appendix by K. Burton with 21 figures). Berlin: Springer-Verlag.
(b) Alberty, Robert, A. (2003). *Thermodynamic of Biochemical Reactions,* (pg. 2). Hoboken, New Jersey: John Wiley & Sons, Inc.
6. Email communication with Libb Thims (7 Jun 2012).
7. (a) Maximum entropy, equilibrium and death (Jun 2012) – Hmolpedia threads.
(b) Life (Jun 2012) – Hmolpedia threads.
8. Bossens, David. (2013). *Debates of the Hmolpedians* (Amz) (Ñº). Lulu.

External links

â— David Bossens – Facebook.

θΔics

In hmolscience, **David Marshall Brooks** (1902-1994) was an American writer and famous atheist noted for his 1933 *The Necessity of Atheism*, in which he pens a chapter on "Religion and Chemistry and Physics". [1]

Religion | Physics & Chemistry

Brooks opens his "Religion and Physics and Chemistry" chapter to the following:

> "The establishment of Christianity, beginning a new evolution of theology, arrested the normal development of the physical sciences for more than 1500 years. The work begun by Aristotle and carried on to such a high state of relative perfection by Archimedes, was stifled by the early Christians. An atmosphere was then created in which physical science could not grow. The general belief derived from the New Testament was that the end of the world was at hand, and the early Church fathers poured contempt upon all investigators of the science of nature."

He then notes that in 1163, Pope Alexander III forbade the study of physics to all ecclesiastics.

Brooks then points out how Francis Bacon tried to breech this forbidden barrier, by using the experimental method of science; the result of which the Pope threw him into prison for 14-years, finally being released at the age of 80, he declared:

> "Would that I had not given myself so much trouble for the love of science."

(add discussion)

Education

Brooks completed his MD somewhere, was a practicing psychologist (Ñº), and a *New York Times* columnist. [1]

Quotes

The following are noted quotes:

> "By predicating a first cause, the theist removes the mystery a stage further back. Such a belief is a logical absurdity, and is an example of the ancient custom of creating a mystery to explain a mystery. Moreover, if it is reasonable to assume a first cause as having always existed, why is it unreasonable to assume that the materials of the universe always existed? If everything must have a cause, then the first cause must be caused and therefore: who made god? To say that this first cause always existed is to deny the basic assumption of this theory. To explain the unknown by the known is a logical procedure; to explain the known by the unknown is a form of theological lunacy."
>
> — David Brooks (1933), *The Necessity of Atheism* [3]

References

1. Brooks, David M. (1933). *The Necessity of Atheism* (§10:Religion and Chemistry and Physics, pgs. 154-) (aud). Freethought Press Association.
2. Huberman, Jack. (2007). *The Quotable Atheist: Ammunition for Nonbelievers, Political Junkies, Gadflies, and those Generally Hell-Bound* (pg. 52-53). Nation Books.
3. (a) Huberman, Jack. (2007). *The Quotable Atheist: Ammunition for Nonbelievers, Political Junkies, Gadflies, and those Generally Hell-Bound* (pg. 52-53). Nation Books.

(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 133). Zondervan.

θΔics

In existographies, **David Buss** (1953-) [CR:56] is an American psychologist, generally considered to be the central founder of evolutionary psychology, noted for his 1994 book *The Evolution of Desire: Strategies of Human Mating*, which presented the results of a cross-cultural study, conducted in the 1970s and 1980s, on "human mating" behaviors, encompassing more than 10,000 people, of all ages, from thirty-seven cultures worldwide, on the nature of sexual selection, that sought to identify underlying evolutionary-mediated psychological mechanisms of human sexual behavior and desire. [1]

Sexual proposition study

See main: Buss study; See also: Alley equation

In *circa* 1993, Buss and graduate student Jennifer Semmelroth, polled 213 college women, half of which (N:109) were asked how flattered the would feel by being persistently asked out on a date by various men, differing by occupation, shown below, the other half (N:104), were asked how upset they would feel by outright sexual proposition by various men, similarly differing by occupation, on a Likert scale of 7 being 'most upset' to 1 being 'least upset', the results of which are shown below, with the guesstimated inclusion of the explicitly-designed occupationally-perfect idealized male Dr. John Wayde Prentice Jr., from the 1967 film *Guess Who's Coming to Dinner* and and an occupationless homeless man:

Reaction of College Women to Outright **Sexual** Proposition
by Various Men, Differing by Occupation

Occupation	Least upset (0)
	0.75
Dr. John Wayde Prentice Jr. → fall in love in 20 minutes	1.00
	1.88
Premedical students (2.65)	
Rock stars (2.71)	2.75
Graduate students (2.80)	
	3.38
Construction workers (4.04)	4.00
Cleaning men (4.19)	
Garbage collectors (4.32)	4.25
	5.13
Homeless man [±]	6.00
	6.75

↑
Less upset

More upset
↓

Most upset (7.00)

In a thermodynamic point of view, occupation is pure measure of work, in a physical sense, whereas, similarly, the closer the typical man is to the 'least upset' range (1.00), the easier it will be for him to date or have sex with a 'hotter' female, in a physical sense, and with human thermodynamics being the study of the relationship between heat and work and other forms of energy, involved in the dynamics of human systems, the results of the above study is representative of quintessential human thermodynamics.

Human chemical thermodynamics

Buss' 1994 book *The Evolution of Desire* was very influential in the development of the sciences of human chemistry and human thermodynamics by American chemical engineer Libb Thims, who began reading it in *circa* 1994-95, as chemical engineering student at the University of Michigan, thereafter reading about 140+ more books on the same subject, at the same time he began to think about the issue of how the spontaneity of processes criterion ($\Delta G < 0$) of chemical thermodynamics applied to variations in the spontaneity of the formation of human relationships, e.g. love at first sight relationships (very spontaneous) vs. ambivalent relationships (not spontaneous) ($\Delta G = 0$) vs. arranged or forced relationships (opposite of spontaneous) ($\Delta G > 0$), etc. [2] The two topics, free energy and mate selection, were thus very formative in Thims' mind in his thinking.

Education

Buss earned his Ph.D. in psychology at University of California, Berkeley in 1981, became an assistant professor for four years at Harvard University, was a professor at the University of Michigan for eleven years, and now is a professor at The University of Texas, where he runs Buss Labs on Evolutionary Psychology. [3] He is the author of the noted *Evolutionary Psychology* textbook, the first of its kind, now in its third edition. [4]

The following set of videos, in seven parts, is Buss speaking at the USM on 12 February 2007. The last video is an interview of American anthropologist Don Symons, author of the 1979 book *The Evolution of Human Sexuality*, on the subject of evolutionary psychology and sexual selection; the first person Buss began to collaborate with, in the early 1980s, in the development of evolutionary psychology:.

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(b) Jennifer S. Simmelroth (resume) – SaelmGastro.com.
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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (pg. 670) (preview), (Google books). Morrisville, NC: LuLu.
3. Buss Labs (evolutionary psychology) – University of Texas
4. Buss, David M. (2008). Evolutionary Psychology: The New Science of the Mind, 3rd ed. Boston, MA: Omegatype Typography, Inc.

External links

â— David Buss – Wikipedia.
â— David Buss (profile) – SocialPsychology.org.

θΔics

In existographies, **David Christian** (1946-) (CR:8) is an American-born English historian noted, in history thermodynamics, for his 2004 *Maps of Time* wherein he outlines a thermodynamics themed model of "big history", 13.7 billion years ago to present.

Overview

In 2004, Christian, in his *Maps of Time: an Introduction to Big History*, outlined what he calls "big history" a recant of time, in the context of modern science, over the last 13.7 billion years, which embeds various entropy and free energy explanations of life and civilization emergence against the context of the second law of thermodynamics, with loose connections to ideas on complexity. [1] The following gives a synopsis view of Christian's take on chaos and order in relation to humanity:

> "Did the universe start out with a stock of free energy on which all ordered entities have drawn ever since? If so, where did that energy capital come from and how long will it be before it runs out? Something (or someone?) must have done some heavy lifting in the early days of the universe to create the gradients and differences that create and sustain the patterns we see around us … if it was not a creator god who did this, then how was it done?"

Christian surmises that the ultimate source of free energy and therefore, he reasons, of order, remains one of the greatest puzzles of modern cosmology. [2] Christian's thermodynamic view of big history, and others influenced by Christian, such as Danish historian Fred Spier, who also teaches a course on big history, seem to rely heavily on the views American astrophysicist Eric Chaisson who in 1970s began teaching a course on cosmic evolution at Harvard and in 2001 authored the book *Cosmic Evolution: the Rise of Complexity in Nature*, an attendee at the annual big history conferences. [3] Chaisson argues that the complexity of a living organism can be measured by the density of energy flows that sustain them against the destructive pressure of the second law. Aside from Chaisson, Christian culls a bit of basic life thermodynamic views from Austrain physicist Erwin Schrodinger, Belgian chemist Ilya Prigogine, and American biochemist Stuart Kauffman, among a few others.

Big history origin

The origins of Christian's big history teaching objective began in 1989 during discussions at the Macquarie history department, as to what type of "introduction to history" the department should teach. Christian suggested, on the theme of French historian Fernand Braudel's suggestion that "the way to study history is to view it as a long duration", that they begin with the beginning of the universe itself, and in the years to follow, with help from colleagues in other departments of the university, he single handedly developed a big history course of teaching. [4]

Education

Christian completed his BA, in modern history from Oxford in 1968. In circa 1970, while tutoring at University of Western Ontario, Canada, he completed his MA. In 1974, Christian completed his PhD on Russian history at Oxford with a dissertation on "Administrative Reforms Under tsar Alexander I". From 1975 to 2000 he taught Russian history at Macquarie University in Sydney, Australia. In 2001, he accepted an invitation to teach "big history" at San Diego State University, a subject he helped to initiate not taught at various universities around the world. [4]

References

1. Christian, David. (2004). *Maps of Time: an Introduction to Big History*. University of California Press.
2. ibid, Christain (2004). appendix 2: Chaos and Order, pgs. 505-11.
3. Spier, Fred. (2005). "The Small History of the Big History Course at the University of Amsterdam." World History Connected, *HistoryCooperative.org*.
4. (a) McNeill, William H. (2002). "Forward" (to *Maps of Time*), pgs. xv-xviii.
(b) David Christian (curriculum vitae) - San Diego State University.

External links

â— David Christian (historian) – Wikipedia.
â— David Christian (biography) – San Diego State University.

θΔics

In human chemistry, **David Constantine** (1944-) is a British German literature translator, poet, and freelance writer noted for []

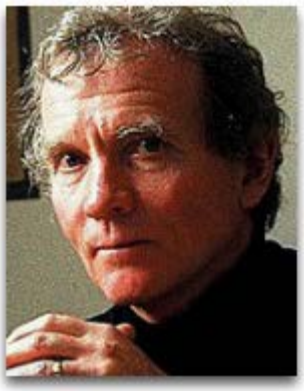

Overview

In 1994, Constantine did Oxford University Press English translation of German polymath Johann Goethe's 1809 *Elective Affinities* (see: translations), wherein he provides a rather detailed introduction, a note on translation, giving the history of the various language translations (first [1854] and second [1972] English translation being anonymous), along with a note on translation, selected bibliography, chronology, and explanatory notes.

The following is Constantine's synopsis of the novella: [1]

> "In *Elective Affinities* Goethe conducts an experiment with the lives of people who are living badly. Charlotte and Eduard, aristocracts with little to occupy them, invite Ottilie and the Captain into their lives; against morality, good sense, and conscious volition all four are drawn into relationships as inexorably as if they were substances in a chemical equation. The novel asks whether we have free will or not; more disturbingly, it confronts its characters with the monstrous consequences of their repression of any real life in themselves. Goethe wrote *Elective Affinities* when he was sixty and long established as Germany's literary giant. He remained an uneasy and scandalous figure, none the less, and readers of *Elective Affinities* were profoundly disturbed by its penetrating study of marriage and passion."

Constantine's introduction section also gives a re-translation of Goethe's riddle and famous "advertisement".

References

1. Goethe, Johann. (1994). *Elective Affinities* (introduction, note on translation, selected bibliography, chronology, and explanatory notes by David Constantine) (abs). World Classics.

External links

â— David Constantine – Wikipedia.
â— David Constantine (about) – CommaPress.co.uk.
â— David J. Constantine (about) – BritishCouncil.org.

θΔics

In existographies, **David Darling** (1953-) is an English physicist-astronomer turned science-writer note for 2002 launched online *Encyclopedia of Science*, aka DavidDarling.info, with covers a number of Hmolpedia-overlapping topic and existographies, e.g. Harold Blum, origin of life topics, etc.

Education

Darling completed his BS in physics in 1974 at Sheffield University and his PhD in in 1977 in astronomy at the University of Manchester, after which, as of 2002, he has lectured and penned some 40+ science books for adults and children, such as his *Equations of Eternity* (1993), a lay science book on the interplay between mind, matter, and mathematics, themed on the anthropic principle, his *The Universal Book of Mathematics: from Abracadabra to Zeno's Paradoxes* (2004), his most popular. [1]

Quotes

The following are noted quotes:

> "Life may arise inevitably whenever a suitable energy source, a concentrate supply of organic (carbon-based) material and water occur together."
>
> — David Darling (2001), *Life Everywhere* [2]

References

1. David Darling (about) – DavidDarling.info.
2. (a) Darling, David. (2001). *Life Everywhere: the Maverick Science of Astrobiology* (pg. xii). Basic Books, 2007.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pgs. 190). Zondervan, 2009.

External links

â— David J. Darling – Wikipedia.
â— Origin of life – DavidDarling.info.
â— DavidDarling.info (ranking) – Alexa.com.

θΔics

In evolution thermodynamics, **David Joseph Depew** (1942-) is an American science philosopher noted for a number of articles and books on the overlap of thermodynamics, evolution, and philosophy.

Overview

In 1996, Depew, in his *Darwinism Evolving*, co-authored and Bruce Weber, according to a review by blogger Jeremy Lent, used a good amount of physics and thermodynamics in an attempt to update the Darwin-view of evolution theory, citing the works of those as Karl Marx, Ronald Fisher, Alfred Lotka, Erwin Schrodinger, Ilya Prigogine, among others. [1]

Depew seems to have also written on Aristotle and the various pre-Darwin theories of evolution.

Education

Depew completed his BA in (1965) at St. Mary's College of California, and his MA in 1972 and PhD in 1878, the latter with a thesis on "Narration and Explanation in History", both at the University of California, San Diego. Currently Depew is professor emeritus of the University of Iowa.

References

1. (a) Depew, David J. and Weber, Bruce H. (1996). *Darwinism Evolving: Systems Dynamics and the Genealogy of Natural Selection.* MIT Press.
(b) Lent, Jeremy. (2010). "Crossing the Complexity Barrier: Book Review: *Darwinism Evolving*", *Finding the Li.*

Further reading

● Depew, David J. (1986). "Nonequilibrium Thermodynamics and Evolution: A Philosophical Perspective", *Philosophica*, 37(1):27-58.
● Weber, Bruce H., Depew, David J., Smith, James D. (1988). *Entropy, Information, and Evolution: New Perspectives on Physical and Biological Evolution*. MIT Press.
● Depew, David. (2003). "From Heat Engines to Digital Printouts: a Tropology of the Organism from the Victorian Era to the Human Genome Project", in: L. Rabinovitz (ed.), *Memory Bytes: History, Technology, and Digital Culture* (pgs. 47-75). Duke University Press.

External links

● David J. Depew (faculty) – University of Iowa.
● David Depew – Curriculum vitae.
● Depew, David J. (1942-) – WorldCat Identities.

θΔics

In existographies, **David Fitzgerald** (c.1965-) (RMS:150) is an American atheist activist and historical researcher on Jesus mythicism or Christian mythology, noted for []

Overview

In c.2005, Fitzgerald completed a degree in history.

In 2007, Fitzgerald began blogging (Q) some of his Jesus mythicism ideas, i.e. the view that Jesus never existed.

In 2010, Fitzgerald published *Nailed: Ten Christian Myths That Show Jesus Never Existed*, wherein [add] [1]

In 2015, Fitzgerald, during his Q&A interview on the Mythicist Milwaukee podcast, when queried about where the names of the gospels, i.e. Matthew, Mark, Luke, John, Paul, etc., came from, gave a very "green response", seeming to be very ignorant of the Egyptian origins of these names; the same green answers are seen in his discussions of astro-theology. [2]

Quotes | Employed

The following are quotes employed by Fitzgerald:

> "In matters of religion it is very easy to deceive a man, and very hard to undeceive him."
>
> — Pierre Bayle (c.1685), *Publication*; cited by David Fitzgerald in *Nailed* (pg. #)

Quotes | By

The following are quotes by Fitzgerald:

> "Christianity before the gospels were written, worships a Jesus that's very different from the Jesus or 'Jesuses', if you will, that came after the gospels were written towards the end of the first century and the beginning of the second century. That was one of the red flags that got me, when I first got interested in the subject [about 10 years ago]."
>
> — David Fitzgerald (2015), response (9:06-) [2]

> "Biblical scholars, being predominately Christian Biblical scholars, are not just dependent upon him [Jesus] for their salvation, they are dependent upon him for their salaries."
>
> — David Fitzgerald (2015), response (4:15-) to query about why Jesus mythicism is not taken seriously by the academic community [2]

References

1. Fitzgerald, David. (2010). *Nailed: Ten Christian Myths That Show Jesus Never Existed* (Amz). LuLu.
2. Anon. (2015). "David Fitzgerald Reveals the Roots of Christian Mythology" (Q), Mythicist Milwaukee, YouTube, Jan 28.

External links

- David Fitzgerald (profile) – CenterForInquiry.org.

θΔics

In religious thermodynamics, **David Blythe Foster** (c.1919-) is an English scientist noted for his 1985 book *The Philosophical Scientists*, wherein he outlines a rather convoluted existence of god theory in which he employs a concept he calls "specificity" (improbability) along with cybernetics to argue that something called "logos", that which is behind DNA, "circumnavigates the second law" (compare: genopsych), and that universe was brought into existence by the void of god's mental space as justified by German-born American Albert Einstein's concept of matter-tensor, among other contrived ideas, all to argue against the blind random chance mutation interpretation of Darwinism.

Foster also utilizes a contrived type of statistical mechanics, e.g. arguing for the existence of zero entropy. [1]

Overview

Foster attempts to reconcile twentieth century science with theistic mathematical certitude, linking and taking as a new base of statistical thermodynamics and quantum physics of Max Planck, Albert Einstein, Niels Bohr, Werner Heisenberg, and Wolfgang Pauli, utilizing common scientific thesis that a non specialist can comfortably conceive.

Foster's treatment, starts historically with some of the finest last mid century philosophic scientists including Arthur Eddington, James Jeans, and Alfred Whitehead, and attempts to employ statistical thermodynamics discussions to debase Charles Darwin 'thesis' on the origin of the species. Foster, for instance, uses Thomas Huxley's typing monkeys second law analogy, and argues for a theory of specificity (for improbability) to explain humans as something opposite to entropy, or something to this effect.

Foster, supposedly, attempts to bring the “mechanistic entropic schools of thought” into harmony with relativity, quantum physics, and the uncertainty principle.

In 2000, American Greco-Roman historian Richard Carrier critiqued some of this thermodynamic propositions. [2]

Education

Foster completed MS and PhD, in what seems to be synthetic biology or possibly engineering (as evidenced by his 1963 book *Modern Automation*), both at King's College London. In 1985, Foster was retired from a career as a scientific consultant.

References

1. Foster, David. (1985). *The Philosophical Scientists* (thermodynamics, 14+ pgs). C. Hurst.
2. Carrier, Richard. (2000). “Why Foster Needs to Take a Basic Thermodynamics Course” (Addendum E: Zero Entropy), Infidels.org.

Further reading

â— Foster, David. (1975). *Intelligent Universe: a Cybernetic Philosophy* (thermodynamics, 6+ pgs). Putnam.

External links

â— Foster, David Blythe – WorldCat Identities.

θΔics

In existographies, **David Goodstein** (1939-) (CR:4) is an American physicist noted for []

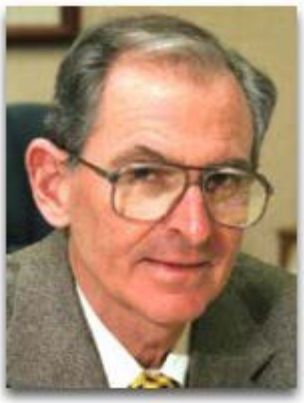

Overview

In 1975, Goodstein, in his book *States of Matter*, opened to the following very "frank" founders of thermodynamics and suicide quote: [1]

> "Ludwig Boltzmann, who spent much of his life studying statistical mechanics, died in 1906, by his own hand. Paul Ehrenfest, carrying on the work, died similarly in 1933. Now it is our turn to study statistical mechanics. Perhaps it will be wise to approach the subject cautiously."

(add)

References

1. Goodstein, David. (1975). *States of Matter* (pg. 1). Dover.

External links

â— David Goodstein – Wikipedia.

θΔics

In existographies, **David Hilbert** (1862-1943) (IQ:175|#216) [RGM:421|1,500+] (Murray 4000:11|M) (GME:12) was a German mathematician, considered by some as the "greatest mathematician of the 20th century" (Q), noted for []

Influence

Hilbert was mentor of Emmy Noether, Ernst Zermelo, and Hermann Weyl.

Quotes | By

The following are quotes by Hilbert:

> "Mathematics is a presuppositionless science. To found it I do not need god, as does Kronecker, or the assumption of a special faculty of our understanding attuned to the principle of mathematical induction, as does Poincaré, or the primal intuition of Brouwer, or, finally, as do Russell and Whitehead, axioms of infinity, reducibility, or completeness, which in fact are actual, contentual assumptions that cannot be compensated for by consistency proofs."
>
> — David Hilbert (c.1920), *Die Grundlagen der Mathematik* (Q)

> "One of the properties inherent in mathematics is that any real progress is accompanied by the discovery and development of new methods and simplifications of previous procedures … The unified character of mathematics lies in its very nature; indeed, mathematics is the foundation of all exact natural sciences."
>
> — David Hilbert (c.1920), Publication [1]

> "I would ask whether anyone had proved the Riemann Hypothesis."
>
> — David Hilbert (c.1930), response (Q) to being asked what he would do if he were magically awakened after centuries

> "Every boy in the streets of Gottingen understands more about four-dimensional geometry than Einstein. Yet, in spite of that, Einstein did the work and not the mathematicians."
>
> — David Hilbert (c.1930), *Publication* (Q)

References

1. Myint-U, TYn, and Debnath, Lokkenath. (2007). *Linear Partial Differential Equations for Scientists and Engineers* (pdf) (pg. vii). Springer, 2011.

External links

- David Hilbert – Wikipedia.

θΔics

In existographies, **David Hume** (1711-1776) (IQ:180|#111) (Cattell 1000:58) [RGM:109|1,500+] (Murray 4000:4|WP) (Gottlieb 1000:185) (SN:49) (GMG:7) (EPD|F2) (GPhE:#) [CR:90] was a Scottish philosopher, an oft-referred to "Newton of moral sciences" (Foley, 1990), a semi-ranked greatest philosopher ever, noted for []

Science of man

In 1739, Hume, age 27, in his *A Treatise on Human Nature: an Attempt to Introduce the Experimental Method of Reasoning into Moral Subjects*, proposed a new 'science of man' (see: two cultures namesakes) in the theme of mathematics, physics, and experimental method. [12]

Dialog | Natural Religion

In c.1750, Hume outlined a plan of his *Dialogues Concerning Natural Religion*, which he kept in his study drawer, which he had reviewed by his friend Gilbert Elliott, eventually published posthumously (1779), per his will, did a modern remake of Cicero's *The Nature of the Gods*, via a dialogue between the following three characters: [6]

- Philo (Hume) | Philo, in Cicero's work, was teacher of Cotta (skeptic)
- Cleanthes (deist philosopher) | Cleanthes, in Cicero's work, was teacher of Balbus (stoic)
- Demea (rigid inflexible orthodox person)

The following are noted quotes:

> "In reality, would not a man be ridiculous, who pretended to reject Newton's explanation of the wonderful phenomenon of the rainbow, because that explication gives a minute anatomy of the rays of light; a subject, forsooth, too refined for human comprehension."
>
> — David Hume (c.1775), Cleanthes to Philo

> "They firmly believe in witches, though they will not believe nor attend to the simplest propositions of Euclid."
>
> — David Hume (c.1775), on the vulgar and their prejudice against what they do not easily understand

Philo defends the Epicurean hypothesis that the world came into being by chance, that matter can acquire motion without any voluntary agent or first mover, that gravity, elasticity, and electricity all move things "without volition", and posits that "why may not motion have been propagated by impulse though all eternity, and the same stock of it, or nearly the same be still upheld in the universe." The dialogue ends with Philo promoting "quite atheism". [7]

Hume, in this work, of note, brings in the ancient idea, as professed by those including: the Charvaka, Al-Ghazali (c.1058-1111), and Nicholas of Autrecourt (199-1369) (O), that there is no reason to believe in cause and effect in the first place.

Hume, in this work, supposedly, also said that John Locke was the first to say that religion is only a "branch of philosophy", and that just as on any other subject, religionists are always revising toward truth (see: revisionist theory; recension theory) on the question of god. [7]

Religion | History

In 1757, Hume, in his *Natural History of Religion*, presented an anthropological argument based outline of religion; the argument is said to be similar to Edward Tylor's later *Primitive Culture* (1871). [10]

Hume | d'Holbach collision

See main: Hume-Holbach dinner party

In 1763, Hume (aged 52) visited Paris, a point in time, when most of his works were well-known and he was the toast of the town, during which time he visited the house of Baron d'Holbach (aged 40) during which time a "legendary dinner party" was thrown, which was attended by Denis Diderot (aged 50), Voltaire (age 69), Charles Montesquieu (age 74), among 14 others. The gathering has been described as an salon-style philosophical dinner. Diderot related the encounter, between the great agnostic-leaning-atheist Hume, seated next to the extreme atheist d'Holbach, as follows:

> **Hume:** "I do not believe in atheists, because I have never seen one!"
>
> **Holbach:** "Count how many we are here. We are eighteen."
>
> **Holbach:** "It is not too bad a showing to be able to point out to you fifteen at once; the three others have not mad up their minds."

Ernest Mossner (1954) has described Holbach's group as an "atheistical club". [9] David Berman (1988) has argued that Hume took it into his head to make this remark per reason that his "opening gambit was rather like a Masonic handshake: an attempt to elicit a response from, and communicate with, someone whose secret identity he guesses." [8] Jennifer Hecht (2003) dubs this "doubt's greatest coming-out party". [7]

Atheism | Causality

Hume, in the history of atheism, is said to represent the supreme position of 18th century skepticism, his views being something to the effect that no "religious hypothesis" can be deployed with any cognitive certainty. His objections, as summarized by Michael Palmer, first appear in his *Treatise of Human Understanding* (1740), and then in his *Enquiry Concerning Human Understanding* (1748), receiving their fullest expression in his *Dialogues Concerning Natural Religion* (1779), his main stopping ground being an attack on the claim, enshrined in Thomas Aquinas' *Summa Theologica*, that an infinite regression of causes and their effects, with each cause in turn being the effect of another cause, offers no satisfactory explanation of why things exist. [1] The gist of Hume's argument, supposedly, is some type of *a priori* vs *a posteriori* statement argument, a type of verbal solipsism; which seems to lack in punch. Hume, according to Leon Cooper (1976), suggested that "causality" was not in the phenomena themselves, but was a concept introduced to order our experience. [12]

Kant

In 1788, Immanuel Kant penned *Critique of Practical Reason*, wherein his categorical imperative is presented, which, according to Miguel Unamuno, are both criticism launching points off Hume's 1740 *A Treatise of Human Nature* (1740) and "On the Immortality of the Soul" (c.1770).

Education

Hume, whose father died (dereacted) when he was two, falls into the early parental death and genius category. In this categorical sense, we note that in 1763 to 1765 he met, quarreled with, and later fell out with Jean-Jacques Rousseau, whose mother dereacted at age 9. At age 12, Hume entered the University of Edinburg, at an intellectually precocious two years, at a time when age 14 was normal. At some point, therein, circa age 14, Hume, supposedly, made some type of philosophical discovery that opened up to him "...a new scene of thought," which inspired him "to throw up every other pleasure or business to apply entirely to it"; thought he did not recount what this "scene" was, he thereafter set out to spend a minimum of ten years devoted to reading and writing. Hume stated, at an early age, that "he had an an insurmountable aversion to everything but the pursuits of philosophy and general learning".

Quotes | By

The following are noted Hume quotes:

> "There is nothing to be learned from a professor, which is not to be met with in the books."
>
> — David Hume (1735), "Letter to Jemmy Birch" [2]

> "It seems then, say I, that you leave politics entirely out of the question, and never suppose, that a wise magistrate can justly be jealous of certain tenets of philosophy, such as those of Epicurus, which denying a divine existence and consequently a providence of and a future state, seem to loosen, in a great measure, the ties of morality, and may be supposed, for that reason, pernicious to the peace of civil society."
>
> — David Hume (1748), *Enquiry into Human Understanding* [4]

> "A wise man proportions his belief to the evidence."
>
> — David Hume (1748), "Of Miracles" [10]

> "Students of philosophy ought to learn logics, then ethics, next physics, last of all, of the nature of the gods."
>
> — David Hume (1776), *Dialogues Concerning Natural Theology* [3]

> "It appears difficult by the mere light of reason to prove the immortality of the soul."
>
> — David Hume (c.1775), "On the Immorality of the Soul" [5]

> "I now reckon upon a speedy dissolution. I consider, besides, that a man of sixty-five, by dying, cuts off only a few years of infirmities."
>
> — David Hume (1775), when his health began to fail; in: *My Own Life* (Q)

References

1. Palmer, Michael. (2013). *Atheism for Beginners: a Coursebook for Schools and Colleges* (pg. 24-31). Lutterworth Press.
2. Mossner, E.C. (2001). *The Life of David Hume* (pg. 626). Oxford University Press.
3. (a) Hume, David. (1776). *Dialogues Concerning Natural Theology* (pgs. 6-7). London, 1907.
(b) Dialogues Concerning Natural Religion – Wikipedia.
(c) Henderson, Lawrence J. (1917). *The Order of Nature* (pg. 43). Harvard University Press.
4. (a) Hume, David. (1748). *An Enquiry Concerning Human Understanding: and An Enquiry Concerning the Principles of Morals* (Epicurus, 7+pgs; quote, pgs. 133-34). Clarendon Press.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 347-53). HarperOne.
5. Hume, David. (c.1775). "On the Immorality of the Soul" (GB)(Q). T. Spilsbury, 1784.
6. (a) Hume, David. (c.1775). *Dialog Concerning Natural Religion*. Publisher, 1777.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 347-53, cause and effect, pg. 349). HarperOne.

7. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 347-53, revision, pg. 349; quite atheism, pg. 350). HarperOne.
8. (a) Berman, David. (1988). *A History of Atheism in Britain: From Hobbes to Russell* (pg. 101). Routledge. 2013.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (party, pg. 352). HarperOne.
9. Mossner, Ernest C. (1954). *The Life of David Hume* (atheistical club, pgs. 467). Publisher.
10. Joshi, Sunand T. (2014). *The Original Atheists: First Thoughts on Nonbelief* (pg. 11; evidence, pg. 165). Prometheus Books.
11. Cooper, Leon N. (1976). *Science and the Human Experience: Mephistopheles is Alive and Well and Living in the Space Age – Values, Culture, and Mind* (Amz) (pg. 44). 12. Cambridge University Press.
12. (a) Hume, David. (1739). *A Treatise on Human Nature*: *an Attempt to Introduce the Experimental Method of Reasoning into Moral Subjects*. Oxford University Press, 1888.
(b) Schweltzer, Frank. (2018). "Sociophysics: To the extent that individuals interact with each other in prescribed ways, their collective social behavior can be modeled and analyzed", *Physics Today*, 72(2):40.

Further reading

● Hume, David. (1751). *An Enquiry Concerning the Principles of Morals*. A. Millar.
● Hume, David. (1740). *A Treatise on Human Nature*. Oxford University Press, 1888.

External links

● David Hume – Wikipedia.

θΔics

In existographies, **David Y. Hwang** (c.1979-) (SNE:10) (CR:41) is an American chemist, neuroscientist, and physician noted, in human thermodynamics, for his 2001 article "The Thermodynamics of Love", written while a senior at Emory University, in which he outlined, in a somewhat jokingly, albeit semi-accurate manner, some of the basic rules and principles in the thermodynamics of human chemical reactions; the following being Hwang's abstract: [1]

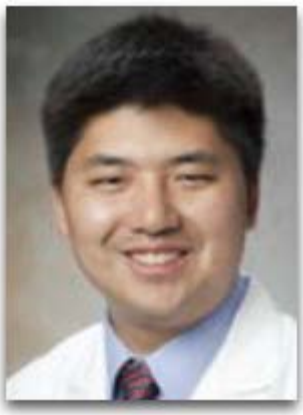

> "Two people who fall in love with one another are often described as having a certain personal 'chemistry.' Although most people would probably be quite content with accepting this convention at face value, the truth is that the correlation between romance and everyone's favorite branch of the natural sciences runs quite deep. In fact, while the terminology of thermodynamics explains the spontaneity of chemical reactions very well, it also applies directly to various factors determining the success of human relationships."

(add)

Human chemical thermodynamics

Only five people, independently, have written theory on human chemical thermodynamics—employing the explicit view or mindset that humans are reactive bonding-debonding molecules governed by affinity, enthalpy, entropy, and or free energy, i.e. chemical thermodynamics, depending:

- Johann Goethe (IQ=230): 1796 theory | *Elective Affinities* (1809)
- Libb Thims (IQ=140-225±): 1995 theory | *Human Chemistry* (2007)
- Christopher Hirata (IQ=190, 225): c.2000 theory | "The Physics of Relationships"
- David Hwang (Harvard Medical School): 2001 theory | "The Thermodynamics of Love"
- Surya Pati: 2009 theory | "The Thermodynamics of the Human Bond!"

Also, among HCR theorists, Hwang was also one of the first, aside from Johann Goethe (1809), Jeremy Adler (1987), Libb Thims (1995), and Chanel Wood (2007), among a few others, to write out human reaction formulas, i.e. chemical equations, using symbols and reaction arrows, such as shown below, using Hwang notation:

$$M + F \rightarrow M\text{-}F$$

which equates to the following, using Bergman-Goethe reaction notation:

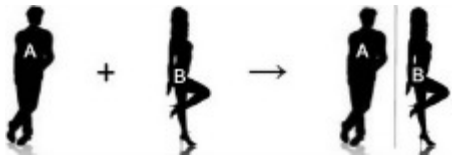

to describe basic human relationship transforming reactions, such as bond formation or bond dissolution. [2]

Education

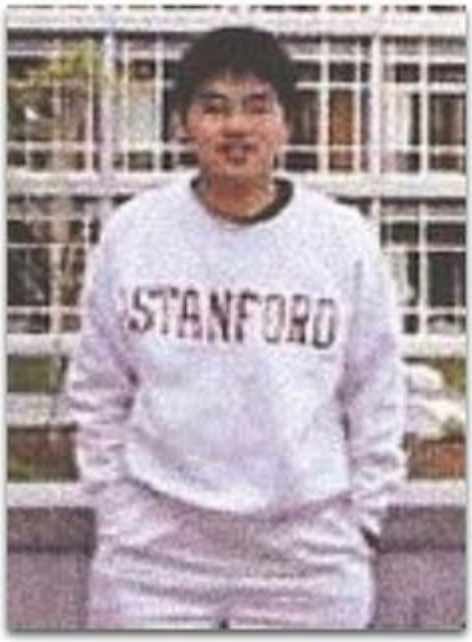

Hwang at Emory University in 2001 when he wrote his "The Thermodynamics of Love" article. [1]

Hwang, in 2000, was a visiting biochemistry student at Oxford University, St. Edmund Hall, in 2001, he competed his BS in chemist at Emory College, in 2006 he completed his MD at Harvard Medical School, in 2010 became board certified in neurology, and currently is an assistant professor of neurology and staff neurointensivist at Yale Medical School. [3]

See also

- Christopher Hirata
- Human chemical reaction (history)
- Hwang free energy princple

References

1. Hwang, David. (2001). "The Thermodynamics of Love" (WB) (pdf), *Journal of Hybrid Vigor*, Issue 1, Emory University.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (ch. 4: section: "Love and the Combined law of Thermodynamics", pgs. 116-19), (preview), (Google books). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (pgs. 673-74). (preview), (Google books). Morrisville, NC: LuLu.
(c) Thims, Libb. (2008). *The Human Molecule*, (pg. 62), (preview). Morrisville, NC: LuLu.
3. (a) David Y. Hwang (faculty) – Yale School of Medicine.

θΔics

In human chemistry, **David M. Knight** (1936-) is an English chemist and science historian noted for his 2003 work on sympathy, attraction, and affinity.

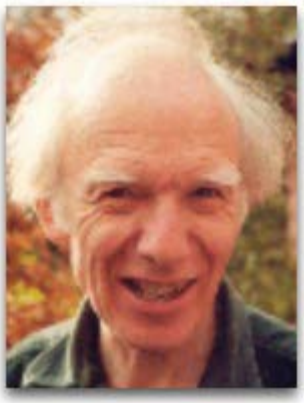

Overview

In 2003, Knight, in his article "Sympathy, Attraction and Elective Affinity", touched on ideas about sympathy, attraction, and elective affinity, up through German polyintellect Johann Goethe's 1809 human chemical theory, the following being an opening excerpt from the article: [1]

> "Lavoisier's triumph was sufficiently complete to make the language of sympathy, antipathy, affinity and attraction seem utterly archaic by about the time that Goethe's famous novel, *Elective Affinities*, was published in 1809. In that tour de force, in the context of learning about chemical combination and decomposition, human relationships are formed and broken: the result is tragic, inviting us to reflect upon the differences and similarities of people and things. Chemistry and its associated industry have since evoked all sorts of reactions, in the past often sublime, but nowadays often negative. Where would we be without catalysis or chain-reaction? – but the constant transfer back and forth of serious metaphors between chemistry and human life has ceased for the last two centuries."

The first part of this statement, a common ploy used to derogate Goethe's theory (see: Elective Affinities (confusion)), is incorrect: Lavoisier, in 1787 specifically states, in the preface to his *Elements of Chemistry*, that he has not been able to fully comprehend the the subject of elective affinities, being that: [5]

> "The absence of facts has prevented me from comprehending in this work the branch of chemistry which treats affinities, although it is perhaps the best calculated of any part of chemistry for being reduced into a completely systematic body. Messrs Geoffroy, Gellert, Bergman, Scheel, De Morveau, Kirwan, and many others, have collected a number of particular facts upon this subject, which only waits for a proper arrangement; but the principle data are still wanting, or, at least, those we have are either not sufficiently defined, or not sufficiently provided, to become the foundation upon which to build so very important a branch of chemistry. This science of affinities, or elective attractions, holds the same place with regard to the other branches of chemistry, as the higher or transcendental geometry does with respect to the simpler and elementary parts."

In short, the science of affinity chemistry was hardly "utterly archaic" when in 1796, less than a decade after Lavoisier proclaimed that the subject was still awaiting proper arrangement, that Goethe first began to develop his human chemical theory (see: Goethe timeline).

The last part of the above statement, namely: "the constant transfer back and forth of serious metaphors (see: metaphor) between chemistry and human life [reaction existence] has ceased for the last two centuries" is very true. The only known reason for this puzzling situation is that Goethe, with his 5,000 personal library book mind, was the "last true polymath to walk the earth", as George Eliot so aptly put it, and thereby subsequently, after Goethe, people—Goethe's few students aside (namely Arthur Schopenhauer and Otto Weininger)—were not intellectually capable enough to do the transfer, back and forth, between chemicals and humans and behaviors, mutually-governed both by the same laws of chemical thermodynamics.

Knight also authored the 1998 book *Science in the Romantic Era*, the abstract of which is as follows: [2]

> "The romantic era was a time when society, religion and other beliefs, and science were all in flux. The idea that the universe was a great clock, and that men were little clocks, all built by a divine watchmaker, was giving way to a more dynamic and pantheistic way of thinking. A new language was invented for

chemistry, replacing metaphor with algebra; and scientific illustration came to play the role of a visual language, deeply involved with theory. A scientific community came gradually into being as the 19th century wore on."

Knight's 1998 book *Humphry Davy: Science and Power* discusses the "point atom" theory. [3]

Knight seems to have also done some joint work with Canadian chemistry historian Trevor Levere, noted for his *Affinity and Matter: Elements of Chemical Philosophy 1800-1865*. [4]

Religion

Knight's course on 'Science and Religion in the Nineteenth Century' was given a prize by the Templeton Foundation in 1997, and in 1998 he won an award from the Foundation and the Center for Theology and Natural Sciences in Berkeley California for 'Quality and Excellence in Teaching Science and Religion'. He has done a stint as Chairman of the Philosophy Department, and a term of six years as the first Chairman of the Ethics Advisory Committee of Durham University.

Education

Knight completed his BA in chemistry, surrounding work on Humphry Davy's electrochemistry work, followed by some type of diploma in the history and philosophy of science, and a PhD, with a dissertation on the theories of the chemical elements in the 19th century, in 1964, all at Oxford University, after which he was appointed to a new lectureship in the history of science in the University of Durham, and in 1991 promoted to professor of history and philosophy of science, retiring from that position in 2002. Knight was editor of the *British Journal for the History of Science* from 1982-88; and from 1994-96 was president of the British Society for the History of Science.

References

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External links

â— David M. Knight (faculty) – University of Durham.
â— David M. Knight – Wikipedia.

θΔics

In cosmological thermodynamics, **David Layzer** (c.1925-) is an American astrophysicist note for his 1975 *Scientific American* article "The Arrow of Time", in which he discusses entropy changes in an expanding universe (in the context of the arrow of time), and for his 1990 book *Cosmogenesis*, in which he attempts to explain how the expansion of the universe allows ordered, or correlated, relational regimes to arise and persist, notwithstanding the second law, in terms of the rate of expansion outrunning the rate of equilibration involved at local scales. [1]

Education

Layzer completed his BS in physics (1947) and PhD in astrophysics (1950) at Harvard University and retired as a Harvard astrophysics professor in 1998. [2]

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1. (a) Layzer, David. (1975). "The Arrow of Time", *Scientific American*, 233:56-69.
(b) Layzer, David. (1990). *Cosmogenesis: the Growth of Order in the Universe* (section: "Biological Order", pgs. 28-32). Oxford University Press.
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● Layzer, David. (1977). "Information in Cosmology, Physics and Biology", *Int. J. Quantum Chem*. 12(suppl. 1): 185-95.
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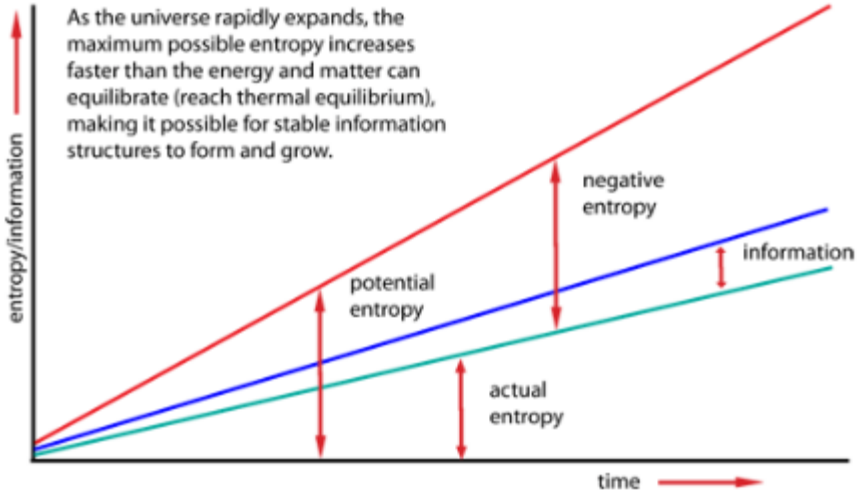

A summary of Layzer's 1975 entropy gap model of the universe, according to a 2011 summary by American physicist Robert Doyle. [3]

External links

● David Layzer - InformationPhilosopher.com.
● Layzer, David – WorldCat Identities.

θΔics

In thermodynamics, **David Lindley** (1956-) is an American theoretical physicist noted for his two detailed biographies on the life and work of thermodynamicists Ludwig Boltzmann (2001) and William Thomson (2004). [1]

Education

Lindley completed his PhD in astrophysics at the University of Sussex, England. In 2001, Lindley resided in Wisconsin, and in 2004, in the Washington, DC area.

References

1. (a) Lindley, David. (2001). *Boltzmann's Atom: the Great Debate that Launched a Revolution in Physics* (pgs. 17-18). The Free Press.
(b) Lindley, David. (2004). *Degrees Kelvin: a Tale of Genius, Invention, and Tragedy*. Washington, D.C.: Joseph Henry Press.

Further reading

â— Ross, Greg. (2004). "An Interview with David Lindley", *American Scientist.*

External links

â— David Lindley (physicist) – Wikipedia.
â— Lindley, David (1956-) – WorldCat Identities.

θΔics

In hmolsciece, **David Ng** (1969-) is an English-born Canadian immunologist noted, in music thermodynamics, for his 2009 song “Thermodynamics of Love”, a mixture of human relationships in the context of the first three laws of thermodynamics. [1]

Lyrics explained

Ng explains that as he was composing a general song about thermodynamics, that it quickly occurred to him how ‘the first three laws could easily describe various elements of love”. In explaining this view, he states:

> “You've got the first law, a testament to bookkeeping, where explicit in equations like *dU=dQ-dW* is the idea that what you'll get out (a relationship) is directly determined by what you put in (to a relationship).
>
> Then, of course, there is the second law - a statement on the notion of entropy, often laymanized (is that a word?) as a reflection of "disorder." (I don't think anyone would argue about the disorderly nature of love).
>
> Finally, you have the third law, which addresses the thermodynamic principle of absolute zero - a place where everything stops, and presumably a bad place to be in a relationship. Anyway, a bit of a stretch I'll admit, but song lyrics are great outlets for metaphorically attuned stretches, right?”

In any event, the lyrics and idea for the song, to note are similar to American computational chemist David Hwang’s 2001 article “The Thermodynamics of Love” and to Indian chemist Surya Pati’s 2009 blog article on “Thermodynamics and Human Bond”. [2]

Etymology

The song originated when, on April 03, Ng posted a blog asking people what scientific concept deserves its own song. Response comments suggested that entropy and thermodynamics generally deserve their own song, sung to the tune of the three laws. [2] A week later, Ng had finished and recorded his song on the thermodynamics of love.

Education

Ng completed his BS and PhD in immunology at the University of British Columbia. He is currently the director and senior instructor of the Advanced Molecular Biology Laboratory at UBC.

References

1. (a) Ng, David (2009). “Thermodynamics of Love (demo)”, *ScienceBlogs.com*, Apr 14.
(b) Ng, David (2009). “What Scientific Concept is Worth of its own Song?”, *ScienceBlogs.com*, Apr 03.
2. (a) Hwang, David. (2001). "The Thermodynamics of Love", *Journal of Hybrid Vigor*, Issue 1, Emory University.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (ch. 4: section: "Love and the Combined law of Thermodynamics", pgs. 116-19), (preview), (Google books). Morrisville, NC: LuLu.
(c) Pati, Surva P. (2009). “The Thermodynamics of Human Bond!”, Sep. 09, MentalProjections.Blogspt.com.

Videos

â— Ng, David. (2009). “Thermodynamics of Love” (V), HumanChemistry101, Sep 29.

External links

â— David Ng (faculty) – University of British Columbia.

θΔics

In history thermodynamics, **David Porreca** (c.1973-) is a Canadian classical and medieval studies scholar noted for []

Overview

In 2012, Porreca launched a project to study the "big history" of the rise and fall of civilizations in terms of thermodynamics; possibly something along the lines of David Christian's 2004 *Maps of Time: an Introduction to Big History*, which utilizes thermodynamics. [1] The following is one of Porreca's Q&A answers to this teaching method, in regards to thermodynamics incorporation:

> "My lecturing involves raising provocative questions in contexts that would not, *a priori*, lead in those directions. How, for example, are the laws of thermodynamics related to the capacity of organized societies to centralize control over resources? How are both related to levels of literacy? How is the "collapse" of a society actually experienced by its inhabitants?"

Interesting to see Porreca here, posting openly on his faculty page, how he openly lectures on human thermodynamics to his classical and medieval studies students. Other noted historical college human thermodynamics lecturers include: Leon Winiarski (1894-1900), Richard Piccard (1997-2006), Bruce Clarke (2009), Libb Thims (2010-present; see: Thims lectures), to name a few.

Education

Porreca competed his PhD in 2001 with a dissertation on "The Influence of Hermetic Texts on Western Europe Philosophers and Theologians (1160-1300)" at the University of London. Currently, he is a professor of classical and medieval studies at the University of Waterloo, Canada.

See also

â— Human thermodynamics education

External links

â— David Porreca (faculty) – University of Waterloo, Canada.

An interview of **Porreca** discussing his 2012-launched research project into the thermodynamics of rise and fall of civilizations.

θΔics

In existographies, **David Ramsay** (c.1590-1653) (EP:7) or "Ramseye" (Thurston, 1878), was a Scottish engineer and clockmaker, noted for []

Overview

In 1618, Ramsay was appointed the royal “chief clockmaker” for James VI and I (1566-1625) (Cattell 1000:140), a post which he held into the reign of Charles I (1600-1649).

In this period, Ramsay, as pointed out by Harry Kitsikopoulos (2015), would have become acquainted with the steam device work of Salomon de Caus, whom James VI and I had employed as a tutor for his eldest son Henry, prince of Wales (1594-1612).

On 21 Jan 1630, Ramsay was granted a patent, by Charles I, for nine purported inventions, the following four seemingly having to do with heat engines: [4]

> 2. To raise water from low pitts by fire.
> 3. To make any sort of mills to goe on standing waters by continual motion, without help of wind, water, or horse.
> 5. To make boats, shippes, and barges to goe against strong wind and tide.
> 7. To raise water from low places and mynes, and coal pitts, by a new waie never yet in use.

There is no information, however, concerning what he had in mind or what he did with it. [1] In any event, this has been cited (Thurston, 1878) being the first authentic reference of the use of steam in literature in England.

Quotes | On

The following are quotes on Ramsay:

> “In 1618, **David Ramsay** obtained a patent for a new engine to plough without horses or oxen, to raise water, and propel ships without sails; also, in 1630, to raise water by fire from deep pits, move ships against wind or tide, and to fertilize the earth.”
>
> — Daniel Clark (1892), *An Elementary Treatise on Steam and the Steam-Engine* [2]

References

1. (a) Kirby, Richard. (1956). *Engineering in History* (co-authors: Sidney Withington, Arthur Darling, Frederick Kilgour) (pg. 155). Courier, 1990.
(b) Forrester, Rochelle. (2006). “The Invention of the Steam Engine” (Ñº), RochelleForrester.ac.nz.
2. Clark, Daniel K. (1892). *An Elementary Treatise on Steam and the Steam-Engine: Stationary and Portable* (pg. 17). Lockwood.
3. (a) Cust, Lionel H. (1900). *Dictionary of National Biography, 1885-1900, Volume 14* (§: De Caus, Salomon) (WS). Publisher.
(b) Kitsikopoulos, Harry. (2105). *Innovation and Technological Diffusion: and Economic History of Early Steam Engines* (pg. #). Routledge.
4. Thurston, Robert. (1878). *A History of the Growth of the Steam-Engine* (pg. 17). Appleton and Company.

External links

â— David Ramsay (watchmaker) – Wikipedia.

θΔics

In religious thermodynamics, **David Roemer** (c.1942-) (DN:1) (CIR:25) is an American creationist physicist, a self-conceptualized blurry type of god-anchored noma philosopher (Q) (Q), known for his involvement in the Roemer-Styer fiasco (2012-present), known commonly as a "religious zealot" (Libb Thims, 2013) (Q) or "attention-seeking serial pest and nut case" (Matthew Ellard, 2015) (Q), who since 2006 has been on a super-zealous god-fueled mission to covertly attack seemingly people on all sides of the fence, creationists, intelligent design advocates, theologians, Catholics, evolution theorists, and general scientists, among others, whom he believers (a) "misrepresent science" (Q), generally in respect to evolution and religion, or (b) presents views that conflict with his belief in: god, soul, free will, afterlife, and Jesus Christ, using a spider-like method of inquisition, going through entire social networks of individuals, staffs of entire colleges, science journals, organizations, etc., up through their superiors, state, and national representatives, senators (e.g. he mailed everyone in the US House of Representatives), via a grand mailing scheme, all of which he documents on his extensive correspondence presenting sites: NewEvangelist.me (2011-launch) and PseudoScience123.com (2014-launched), whom he sees as transgressing the absurd.

Physics | Teacher dismissal

In 1994, Roemer was removed from his 10-year tenured position as a physics teacher at Midwood High School, which he began in 1984, because "students reacted negatively to [his] teaching and there were many complaints" (Q), supposedly because he was teaching physics using a "constructionist" (Q) methodology, lesson plans of which are shown here (Q), instead of a "developmental" (Q) approach. Roemer then seems to devote the next 12-years, devoting his energy to suing New York Department of Education, over "wrongful termination", in state and federal courts, making petitions in 2006 to the US Supreme Court. (Q)

DKRoemer.com

In 2006, Roemer launched DKRoemer.com (Q), wherein he began to post a number of things, such as book reviews he had done on: Daniel Dennett's *Breaking the Spell: Religion as a Natural Phenomenon* (2006), Richard Dawkins' *The God Delusion* (2006), Karen Armstrong's *A History of God* (1993), Kenneth Miller's *Only a Theory: Evolution and the Battle for America's Soul* (2008) (Q), among others; a 13 proposition proof of the existence of god (Q); letters he sent to the US District Judge of Pennsylvania (on evolution), the New York Commission on Judicial Conduct (on his firing), among others.

YouTube

On 2 Jun 2009, Roemer started a YouTube channel, and made a 10-min video entitled "The Truth About Evolution and Religion", wherein he argues the following: [1]

> "The debate between advocates of intelligent design/creationism and mainstream biologists is disingenuous on both sides for two reasons. 1) Evolution only applies to the bodies of humans, not their souls. Biologists don't have to admit the soul is spiritual, but they have to admit evolution only applies to human bodies. 2) All biologists agree that Darwinian evolution only explains the adaptation of species to their environments. It does not explain the increase in complexity, i. e., common descent. I prove these assertions by quoting from mainstream biologists."

In the video, he touching on the 1925 Butler Act (see: science vs religious legal cases) up to a 2009 *New York Times* criticism about the Texas school board hearings about teaching evolution in schools, being generally an interjection on the science vs religion debate (see: science vs religion debate), wherein he gives his view that: [1
and in which he goes on to state that he "knows he has free will", which is of course is the linchpin on the Biblical-based salvation model, i.e. the notion that people have the free ability to "choose" between right (good) and wrong (evil), which of course is something that does not happen at the chemical level, hence the near two-century long ongoing conflict between the two belief systems (Biblical belief vs physio-chemical belief)

SkepticForum

On 9 Jul 2009, Roemer joined SkepticForum.com, posting and discussing extensively there; eventually getting banned (Q) in May 2015, at the end of 250-post thread on “Biological Evolution and the Second Law of Thermodynamics”.

Styer | Entropy of evolution

See main: Roemer-Styer fiasco

On 19 Jan 2012, Roemer was busy, at the SkepticsForum.com, as usual, with his attack on the atheism and evolution views of Richard Dawkins, during which time he emailed Glenn Branch (Q), head of the National Center for Science Education (NCSE) director, on his squabbles, amid which, as he says, Branch “squelched me” by citing American physicist Daniel Styer’s 2008 *American Journal of Physics* (AJP) article “Entropy and Evolution” (Q), wherein he uses the statistical definition of entropy, i.e. Boltzmann entropy, S = k ln W, admixtured with a microstate of organisms argument, to calculate the entropy change of an evolving organism per second, which he determines to be: [5]

> Entropy change per organism: -3x10E-30 J/K (per second)

Then concludes:

> “Presumably the entropy of the earth’s biosphere is indeed decreasing by a tiny amount [$\Delta S_{biosphere}$ = -302 J/K•s] due to evolution, and the entropy of the cosmic microwave background is increasing by an even greater amount to compensate for that decrease.”

This infuriated Roemer, who would go on to spend the next three years plus focused on an effort to get the *American Journal of Physics* to recant (or retract) the article. The following seems to be Roemer’s main objection:

> “Performing calculations to show evolution does not violate the second law of thermodynamics implies that natural selection explains the complexity of living organisms. The second law of thermodynamics is an absolute truth. It is like saying the chance of getting heads when you flip a coin is 50%. When a tree grows from a seed by absorbing oxygen and carbon dioxide there is no violation of this law. However, the idea of calculating the entropy of the tree and heat flows into the plant to prove this strikes me as being absurd. I may be wrong, but this is how I understood the article.”
>
> — David Roemer (2012), “Letter to David Jackson, Editor of AJP” (Q), Feb 1

> “Two American Journal of Physics articles are promoting misinformation. According to the second law of thermodynamics, an isolated system of non-interacting particles will either be in equilibrium or go to a state of greater disorder. In other words, nature goes from the more complex state of speed and location to the less complex state. The two articles report scientific calculations showing that evolution does not violate the second law of thermodynamics. Laymen interpret this to mean that natural selection explains the complexity of life.”
>
> — David Roemer (2012), “Evolution and the Second Law of Thermodynamics” (Q), Article submitted to AJP (but rejected), Feb 24

In short, firstly the premise that the "entropy of an organism" can be calculated, let alone calculated at various states of existence in evolution, has a long contentious and debatable history: "entropy of a human" (or human entropy) Siegfried Bernfeld and Sergei Feitelberg (1936), Bridgman paradox (1946), entropy of a mouse, Martin Goldstein (1993); entropy

of students in a field [Moriarty-Thims debate, 2009], among others.

Secondly, Styer's argument that entropy of an organism can be calculated, at various states of evolution, at say an initial state entropy S_i, e.g. a humming bird in 1925, and a final state entropy S_f, an evolved version of the same humming bird lineage in 2025, via Boltzmann entropy formula, a decent throw at the dart board first attempt calculation, but one that is incorrect in that the "system" involved, according to Max Planck, has to meet the Boltzmann chaos assumption, which evolving system (e.g. social systems) do not, i.e. animals do interact and social systems are not "chaotic" (e.g. like gas phase systems are assumed to be).

Thirdly, Styer's assumption that his calculations shows an measurable biomass "entropy decrease", which in scientific common opinion parlance corresponds to an "order increase", which is assumed, via regurgitation argument, namely the time-honored so-called "local entropy decrease" postulate (Alfred Ubbelohde, 1947), to be less than the entropy increase in the surroundings, thereby meeting the requirements of the second law, that the total system [evolving system + surrounding system] tend towards and increase in entropy, is a finger-holding the **** argument, a bubble greatly in need of cultural explication, such as touched on by Percy Bridgman (1946) and Martin Goldstein (1993), namely explication via human free energy of formation discussion, some of which lightly touched on by Mirza Beg (1987) and Libb Thims (2007); but one that confronts religion with extreme atheism in a way much greater than simpler social heat that Roemer is venting; something that goes back to the deeper revolutionary independent views of Johann Goethe (1809) and Percy Shelley (1814) and how "chemical affinity" (or free energy) and physical chemistry replaces god and gives a new one nature morality basis (see: Church of Elective Affinities).

CreationWiki

On 1 Jan 2013, Roemer joined (Q) CreationWiki.org, and wrote one wiki article entitled "Pseudoscience in the American Journal of Physics", wherein he cited fellow creation scientist Andrew McIntosh, uses information theory, among other polemics to state his case. [2]

Hmolpedia

On 26 Apt 2013, Roemer, joined Hmolpedia, started a thread on "Pseudoscience on Evolution and the Second Law", which was thread-locked after 14 posts because Roemer wouldn't state his Dawkins number; amid which he stated his belief system as follows: [1]

> "I believ[e] in God, [which] means believing in life after death. This is the belief of Christians, Muslims, Jews, Hindus, and Buddhists."

United States Senate
WASHINGTON, DC 20510-3205

Mr. David Roemer
345 Webster Avenue, Apartment 4O
Brooklyn, New York 11230

June 2, 2014

Dear Mr. Roemer:

Senator Gillibrand has received your request for assistance regarding your concerns with the American Journal of Physics.

The Senator appreciates the trust and confidence that your request represents; however, we are unable to influence the publication, amendment, or redaction of articles appearing in peer reviewed scientific journals. Insofar as the staff of Rep. Yvette Clarke's office has expressed a willingness to assist you, please contact them directly.

Please be assured that your request received a thorough review, and it is our hope that your matter can be resolved to your satisfaction as soon as possible.

Sincerely yours,

Kirsten E. Gillibrand

Kirsten E. Gillibrand

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COMMITTEES:
ARMED SERVICES
ENVIRONMENT AND PUBLIC WORKS
AGRICULTURE
SPECIAL COMMITTEE ON AGING

A copy of the 2014 letter (Q) **Roemer** received from his senator Kirsten Gillibrand on his efforts to get American physicist Daniel Styer's 2008 article "Entropy and Evolution" retracted from the *American Journal of Physics*, because of its "absurd" assertion that second law applies to biological evolution.

The central issue here, a common perceptual misunderstanding afflicting over 72 percent of the world, which is dominated by the Anunian theology belief system (Ab-ra-ham-ic theologies/B-ra-hma-ic theologies), is belief, firstly, in the theory of life, which as of 2009 is now classified as a defunct scientific theory (see: defunct theory of life) or as Nikola Tesla correctly put it in 1915:

> "There is no thing endowed with life."

Hence, not only is the theory of life defunct, but the theory of afterlife is also defunct, which is the more problematic area of debate for most thinkers caught in the midst of the science vs religion debate. The solution ongoing heated and tensioned debate is the new physical chemistry based "moral symbols" belief and guidance system introduced in the 1809 coded novella *Elective Affinities* by German polymath Johann Goethe, namely the moral symbols of physical chemistry, chemical thermodynamics, and quantum mechanics, a chemical-to-human metamorphology theory of form change (evolution) that "novel overturns "everything holy" and is an attack against religion, morality, and the social forms" as German poet Heinrich Heine correctly described it in circa 1810 (see: enemies/admirers).

In other words, in the future, people will no longer turn to the Bible, Koran, and Rig Vida for direction in respect to moral guidance and sense of purpose, but instead will turn to calculations of free energy differentials (see: human free energy), being that through the affinity-free energy equation, proved in 1882 by German physicist Hermann Helmholtz, reaction affinities are now measured by free energy changes of the system, with which, according to Goethe, one can now give quantifiably sound, physical science grounded answers to moral questions such as "should the woman who kills her newly born child suffer the death penalty?" (Goethe's thesis 55, 1771); see: student reactions for more on this.

Education

Roemer completed his BS in physics in 1964 at Fordham University, his PhD in 1971 with a thesis: "Correction to the Fine-Structure of Positronium", at New York State University; during which time he studied metaphysics under Norris Clarke. (Q) Roemer then worked in sales and marketing for manufacturers of radiation therapy equipment, for a number of years, and from 1984 to 1994 taught physics and general science and physics at various high schools in Brooklyn, New York, before being dismissed for his disliked teaching methods.

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1. Roemer, David. (2009). "The Truth About Evolution and Religion" (quote in forum) (Q) , YouTube, Jun 02.
2. Roemer, David. (2013). "Pseudoscience in the American Journal of Physics", CreationWiki.org, Jan 01.
3. Roemer, David. (2013). "Committee on Publication Ethics", NewEvangelst.me, Apr 15.
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5. (a) Styer, Daniel. (2008). "Entropy and Evolution" (pdf), *American Journal of Physics*, 76(11), Nov.
(b) Daniel Styer (faculty) – Oberlin College, Ohio.

Audio

● Roemer, David. (2011). "Interview with David Roemer: the Role of Christianity in Politics" (podcast), Truth Talk Radio CSW, Sep 16.

External links

● David Roemer – NewEvangelist.me.
● David Roemer (home) – NewEvangelization.info.
● David Roemer – LinkedIn.

θΔics

In hmolscience, **David Silverman** (1966-) (CR:4) is an American atheism activist noted for his 2010 to present efforts, as president of American Atheists, to promote atheism equality, righteousness, and awareness in the United States.

Overview

In Nov 2010, Silverman organized the "You Know It's a Myth" Christmas billboard in New Jersey, portraying the three wise man (three King Stars) following the bright star (Sirius) to the birth of Jesus Christ (Osiris christened). (Q) In 2012, Silverman organized the Reason Rally at Washington, D.C., which included a key not speech by Richard Dawkins (Q), shown below middle. [3] In Jun 2013, Silverman organized the instillation of the atheism bench memorial outside of Bradford County Courthouse, Florida, in response to the Ten Commandments monument installed on public ground, in violation of the first amendment, the year prior. (Q)

2010 2012 2013

Silverman, of note, considers: Ed Buckner and Dawkins his predecessors or influencers. [3]

In Dec 2013, Silverman, commented in interview, about his attempts to write a chapter, for his draft book, on "Jewish atheism", which he struggled on, that: [1]

> "Judaism is, at its heart, a religion—one that is incompatible with atheism."

In 2015, Silverman published *Fighting God: An Atheist Manifesto for a Religious World*, his first book. [2]

Judaism | Atheism

Silverman, born into a Jewish family, asserts (Q) that he became an atheist at age 6, thereabouts becoming open about his disbeliefs; he explains this as follows, during a 2011 Q&A with David Pakman: (Q)

> **Pakman**: Last thing: did you grow up an atheist? When did you ... were your parents atheists? How did this all happen?
>
> **Silverman**: I could spend a lot more than just a few minutes on this. I was raised in a Jewish home. My mother insisted I was an atheist when I was six. I remember the moment I became an atheist when I was six years old very clearly. Nothing happened to instigate it. I lost god, the Easter Bunny, the Tooth Fairy, and Santa Claus all at the same time. I didn't believe ever. I went to [and] had my Bar Mitzvah as an atheist. And I stood up in front of my friends and my family during my Bar Mitzvah and I said, 'Let us declare the greatness of our god and render honor under the Torah which god gave through Moses as a heritage through the congregation of Jacob...' I had the whole thing memorized, didn't believe a word of it. My mother knew I didn't believe a word of it, but I didn't get a choice, because I was 13. So I went through the whole Bar Mitzvah, I went through the confirmation process as an atheist, and I asked a whole bunch of questions in Hebrew school, and it never stuck. Interestingly, it wasn't until I was 30 years old and New Jersey State Director of American Atheists that my father came out to me and told me he was an

atheist.

(add discussion)

Education

Silverman completed his BS in computer science at Brandeis University, his MBA in marketing at Penn State University, after which he worked at worked at Bell Labs in the area of telecommunications, prior to engaging in the American Atheists group in 1996 in New Jersey.

See also

- Sam Harris

References

1. Silberstein, Rachel. (2013). “Can You Be an Atheist and a Jew at the Same Time? David Silverman Says No” (O), TabletMag.com, Dec 9.
2. Silverman, David. (2015). *Fighting God: An Atheist Manifesto for a Religious World*. MacMillan.
3. Reason Rally – Wikipedia.
4. (a) Silverman, David. (2015). "Email to Libb Thims", Jan 15.
(b) Ed Buckner – Wikipedia.

Videos

- Carlson, Gretchen. (2013). “Silverman vs Rabbi and Preacher on Satan Monument” (O), Fox News, Dec 10.
- Silverman, David. (2015). “Interview on Atheistic Morality, Atheist Conservatism, etc., at CPAC 2015” (O), Apr 18.

External links

- David Silverman (activist) – Wikipedia.
- American Atheists – YouTube.

θΔics

In existographies, **David Skrbina** (c.1969-) is an American philosopher, focused on panpsychism and environmental ethics, noted for []

Panpsychists

In 2005, Skrbina, in his *Panpsychism in the West*, classified the following: Gustav Fechner, Friedrich Schelling, William Clifford, Paul Carus, Empedocles, Epicurus, William Gilbert, William James, Gottfried Leibniz, Carl von Nageli, Josiah Royce (mentor to John Boodin), and the Stoics, each of whom were read and cited by Charles Peirce, as western panpsychists. [1]

Skrbina also discusses (Ñº) Bernard Rensch (1900-1990) (Ñº), who, supposedly, argued the following, as summarized by Theodosius Dobzhansky (1967): [3]

> "… embedded in a continuous stream of consciousness." The evolutionary continuum extends, however, down to the inorganic realm; hence, molecules and atoms should "also be credited with basic parallel components of some kind." Rejecting all forms of vitalism, Rensch concludes, "since all …"

(add)

Education

Skrbina completed his MA in mathematics in 1993 at the university of Michigan, his PhD in philosophy in 2001 at the University of Bath, United Kingdom, and presently is professor of philosophy, with focus on philosophy of mind, at the University of Michigan, Dearborn. [2]

Quotes | Employed

The following are quotes employed by Skrbina:

> "All things are animate in varying degrees."
>
> — Benedict Spinoza (1674), "Letter to Schuller"; cited by David Skrbina (2017), in *Panpsychism in the West* (pg. 142)

> "Spinoza says that if a stone which has been catapulted though the air had consciousness, it would think that it was flying of its own will. I only add that the stone would be right. That catapulting is for the stone what the motive is for me."
>
> — Arthur Schopenhauer (1819), *The World as Will and Representation* (pg. #); cited by David Skrbina (2017), in *Panpsychism in the West* (pg. 142)

> "The will is manifest in every force of nature that operates blindly, and it is manifest, too, in the deliberate action of man; and the great difference between these two is a matter only of degree of the manifestation, not in the nature of that is made manifest."
>
> — Arthur Schopenhauer (1819), *The World as Will and Representation* (pg. #); cited by David Skrbina (2017), in *Panpsychism in the West* (pg. 142)

Quotes | By

The following are quotes by Skrbina:

> "Panpsychism is a very naturalistic approach to mind. To me, it's not a divine god-given sense of mind. It's not some mysterious 'mind' popping out of nowhere. It's a mind that was at the root of nature all along from the very beginning."
>
> — David Skrbina (2011), "What is Eco-Philosophy" (Ñº), Nov 8

References

1. (a) Skrbina, David. (2005). *Panpsychism in the West* (thermodynamics, pgs. 13, 151; panpsychist philosophers, pg. 155). MIT Press.
(b) Skrbina, David. (2017). *Panpsychism in the West: Revised Edition* (Carus, 4+ pgs; panbiotism, pg. 14; read by Peirce, pg. 190). MIT Press.
2. David Frank Skrbina (curriculum vitae) – Umich.app.box.com.
3. Dobzhansky, Theodosius. (1967). *The Biology of Ultimate Concerns* (molecules, 12+ pgs; quote, pg. 28). New American Library.

External links

â— David Skrbina (faculty) – University of Michigan-Dearborn.

θΔics

In existographies, **David Strauss** (1808-1874) (IQ:170|#290) [RGM:N/A|1,260+] (Cattell 1000:473) (RMS:35) was a German radical theologian, philosopher, characterized as the most famous of the Young Hegelians, noted for []

Overview

In 1835, Strauss, in his *Life of Jesus: Critically Examined*, argued that Jesus Christ was an historical figure, but not divine, and that he miracles of the Bible were not mistaken perceptions, but rather meaningful myth. [1]

Isis | Mary

Strauss, of note, never mentions Osiris or Horus, the actual syncretistic god pre-scripts to Jesus mythology (see: How Osiris Became Jesus); and only mentions Isis, the pre-script goddess to the Virgin Mary, once as follows:

> "The author of the *Natural History of the Great Prophet of Nazareth* is, in this instance, to be considered as the worthiest interpreter of Paulus; for though the former could not, in this part of his work, have made use of Paulus' *Commentary*, yet, in exactly the same spirit, he unreservedly avows what the latter carefully veils. He brings into comparison a story in Josephus, according to which, in the very time of Jesus, a Roman knight won the chaste wife of a Roman noble to his wishes, by causing her to be invited by a priest of Isis into the temple of the goddess, under the pretext that the god Anubis desired to embrace her. In innocence and faith, the woman resigned herself, and would perhaps afterwards have believed she had given birth to the child of a god, had not the intriguer, with bitter scorn, soon after discovered to her the true state of the case. It is the opinion of the author that Mary, the betrothed bride of the aged Joseph, was in like manner deceived by some amorous and fanatic young man (in the sequel to the history he represents him to be Joseph of Arimathea), and that she on her part, in perfect innocence, continued to deceive others. It is evident that this interpretation does not differ from the ancient Jewish blasphemy, which we find in Celsus and in the Talmud; that Jesus falsely represented himself as born of a pure virgin, whereas, in fact, he was the offspring of the adultery of Mary with a certain Panthera."

(add)

Nietzsche

In 1873, Friedrich Nietzsche, supposedly, published a work that had been influenced by the ideas of Strauss.

References

1. (a) Strauss, David. (1835). *Life of Jesus* (*Leben Jesu*) (translator: George Eliot; Introduction Otto Pfleiderer) (Isis, pg. 139). Sonnenschein, 1892.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 412). HarperOne.

Further reading

â— Cox, Catharine. (1926). *Genetic Studies of Genius. Volume II. The Early Mental Traits of Three Hundred Geniuses* (GB) (Arc) (pdf) (§:David Strauss, pgs. 491-). Stanford University Press.

External links

â— David Strauss – Wikipedia.

θΔics

In hmolscience, **David Weir** (1947-) is an American comparative literature scholar noted, in literature thermodynamics, for his 2007 discussions of the 1890s thermodynamical theories of Henry Adams and Brooks Adams.

Overview

In 2007, Weir, in his *Decadent Culture in the United States*, situates the cyclical rises and falls of decadence in the United States at the turn of the 20th century in the context of American historian Brooks Adams 1895 theory of energy and entropy acting on civilization, in the form of expansions and contractions, as well as Henry Adams views on thermodynamics and civilization. [1]

Quotes | Cited

The following are quoted cited, discussed, and or analyzed by Weir:

> "The theory proposed is based on the accepted scientific principle that the law of force and energy is of universal application in nature, and that animal life is one of the outlets through which solar energy is dissipated."
>
> — Adams (Henry or Brooks), cited by Weir (pg. 12)

> "Probably the velocity of the social movement of any community is proportionate to its energy and mass, and its centralization is proportionate to its velocity; therefore, as human movement is accelerated, societies centralize. In the earlier stages of concentration, fear appears to be the channel through which energy finds the readiest outlet; accordingly, in primitive and scattered communities, the imagination is vivid, and the mental types produced are religious, military, artistic. As consolidation advances, fear yields to greed, and the economic organism tends to supersede the emotional and martial."
>
> — Adams (Henry or Brooks), cited by Weir (pg. 12)

Education

Weir presently is a comparative literature professor at Cooper Union, New York.

References

1. Weir, David. (2007). *Decadent Culture in the United States: Art and Literature against the American Grain, 1890-1926* (pgs. 11-16). SUNY Press.

External links

â— David Weir (academic) – Wikipedia.

θΔics

In existographies, **Davies Gilbert** (1767-1839), born "Davies Giddy", was an English mathematician, noted for []

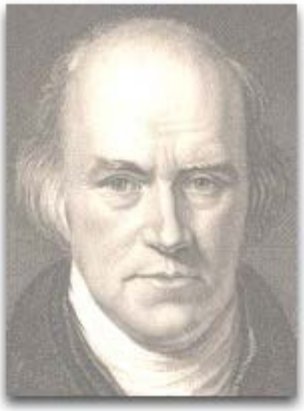

Overview

In 1792, Gilbert, according to James Watt (1792), is said to have used Newton's calculus method of "fluents" and "fluxions", in court, to graphically calculate the area under the pressure-volume curve of Jonathan Hornblower's (Q)(Q) compound steam engine (1781), which Gilbert called "efficiency", which is now called "work" or PV work in modern terms. The details of this purported mathematical "integration" pressure-volume work of a steam engine, however, are incomplete; the following is one synopsis:

> "From MSS (Q) in the Royal Institution in Truro it is apparent that Gilbert had obtained a **mathematical expression for the expansive power of steam** that was formally similar to that of Daniel Bernoulli. This would, therefore, have been the first time it had been realized that in the case of an actual, expansively operated steam engine the work done (in this case Gilbert denotes this as the 'efficiency') is given by the area under the pressure/volume curve: in other words, the area under the **indicator diagram**. The modern symbol for this, of course, is: $\int PdV = W$. In fact, this involved integration [fluents] and not differentiation [fluxions], so Watt should have referred to 'fluents' rather than 'fluxions', but this is technical quibble."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pgs. 79-80) [1]

This summary, to clarify, is an anacronym, per reason that it was not until 1796, four years after Gilbert's court presentation, that the "indicator diagram", as we now understand it, was invented by John Southern, albeit likely stimulated or spurred into exception, via the guidance of Watt, by the Gilbert court appearance.

Quotes | On

The following are quotes on Gilbert:

> "They have brought **Mr. Giddy**, the high sheriff of Cornwall, and Oxford boy, to prove by fluxions, the superiority of their engine [Hornblower engine, 1781], perhaps we shall be obliged to call upon you to come up Thursday to face his fluxions by common sense."
>
> — James Watt (1792), "Letter to John Southern" (on the litigation with Hornblower), Apr 21

References

1. (a) Bernoulli, Danile. (1738). *Hydrodynamica* (§10:200-204). Strasbourgh.
(b) Pacey, A.J.; Fisher, S.J. (1967). "Daniel Bernoulli and the Vis-Viva of Compressed Air" (abs), *British Journal for the History of Science*, 3(4)::388-92.
(c) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pgs. 79-80). Cornell University Press.

Further reading

● Bejan, Adrian. (2016). *Advanced Engineering Thermodynamics* (pg. 40). Wiley.
● Hanlon, Robert. (2020). *Block by Block: the Historical and Theoretical Foundations of Thermodynamics* (Illustrators: Robert Hanlon and Carly Sanker) (Gilbert, pg. 218). Oxford University Press.

External links

● Davies Gilbert – Wikipedia.

θΔics

In religious classification, **Dawkins number** (DN), "Dawkins level" or "Dawkins scale number", is the numerical classification one's self-professed religious beliefs (see also: belief system) concerning the existence of God, on the **Dawkins scale**, a 1-10 verbalized range of beliefs scale, made famous by English evolutionary biologist Richard Dawkins, in his best-selling 2006 book *The God Delusion*. [1]

Noted examples

The following page lists a few representative examples (capitalization emphasis or de-emphasis has been left in the original format) :

Date	Person	#	Description	
2006	Richard Dawkins (1941-) English zoologist and evolutionary biologist	6-7	"I count myself in **category 6**, but leaning towards **7**. I am agnostic only to the extent that I am agnostic about fairies at the bottom of the garden" (although in a 2008 interview on the Bill Maher show he says he might be a **6.9**).	[1] [4]
2009	Philip Moriarty (c.1968-) Irish nanophysicist and thermal physicist	6	"I am what Richard Dawkins would classify as a **level 6 'agnostic'** - agnostic in the sense that although I cannot prove that there is or isn't a god, there are an infinite number of possibilities I can't definitively disprove. I was brought up in a very devout Catholic family and 'kicked against' religion from the age of nine (when I began to ask questions about the ludicrous concept of transubstantiation in Catholicism)."	[2]
2009	Libb Thims (c.1975-) American electrochemical engineer and thermodynamicist	10	"In the Dawkins scheme, I would be **level 10**, but I don't like the word atheist (I like the word scientist better). I've read over 50 books on religion (currently practiced, and active (about 18 main varieties), mythology, Egyptology, etc., and I know very clearly as to the background of most of the 10,000+ gods to have come and gone as well as the active ones. In the future, I might do some modern clarification videos on these topics (e.g. is there a god, what happens when you die, good vs evil, etc.), but I am somewhat hesitant, as these get very emotional for many."	[2]
2010	Georgi Gladyshev (1936-) Russian physical chemist	8-10	"I believe, like [Thims], I am closer to the **10 point** range."	[2]
2010	Adriaan de Lange (1945-) South African chemical physicist	1-10	"As for the Dawkins scale and your modification of it, I probably belong to **level 1**. But I have to qualify it. Since my 1982-83 discovery, I have become extremely skeptical on how other believers model their knowledge of God. They use metaphors from many walks of life coming from the public knowledge of others. Thus they suppress their own personal knowledge. Because of this, you will probably have to place me in **level 10** ([Thims] scale). Like St Paul writes, that which we see is but an image in a mirror, not the real thing." "Regarding the Dawkins scale I cannot easily place myself because I don't believe in a super natural entity that designed and created the universe so I	[2]

2010	Mark Janes (1973-) English biotechnologist	6-10	would be a **strict 7**. However my theory that there is a natural arrow of time driving increasing order in the universe to a point where life becomes God like or my appropriately very stable (Iron instability arrow of time). I do, however, still believe in the long term effect of the 2nd law. So in terms of the classical definition I am a **strict 7**. However I do think people are entitled to their belief as long as they are peaceful and respect others belief so perhaps that drops me to a **< 6**. I used to be a **strong 10** for fifteen years, but the effect of belief on human evolution and its production of scientific logic gave it some limited justification. I am actually an atheist. My philosophy on God is as described by yourself a response to free energy, so called islands of negative entropy and a 'future' evolutionary level of human consciousness not some unsupportable metaphysical entity.	[2]
2011	Arieh Ben-Naim (1934-) Israeli physical chemist	11-12+	"I looked at the SCALE. I do not fit there, perhaps you should add me at **number 11 or 12 or higher**. When I was a boy I used to say that 'I don't believe in god.' Later, I realized that even that statement is not correct. Now, if someone asks me 'Do you believe in god?' I say I don't understand the question, and I ask: 'What is god?' I really do not know what people are talking about when they say 'GOD'."	[2]
2011	Richard Crant (1959-) Newfoundland-born Canadian philosopher	1	"I would have to say I agree with C.G. Jung. So it must a **1**. Although I cannot claim to understand God or what true form God exists in exactly, this does not make God any less real for me personally. Do you believe the Higgs boson exists (God Particle)?" "As to my Dawkins' scale, I consider myself "beyond atheism" [**8+**] as you describe it. I think religion is reinvented by every society because humans have a most developed foresight. We can anticipate our own death, unlike other animals. Consequently, we imagine the possibility of avoiding it by an afterlife, and invent supernatural beings already in this world beyond material molecules, as you might put it. I find an additional religious sensibility arising from the notion of a "creation" and a "providence." My own work on the origin of information structures - without which you and I could not exist and (perhaps more important to the concept of immortality) could not communicate with one another - hopes to identify the science behind creation to give us a purely materialistic explanation for the existence of immaterial information. Might it satisfy a few rational people as an explanation for this sensibility of a benevolent universe?" (17 Jan 2012)	[3]

Thims

Firstly, on Dawkins scale, I've read into page thirteen of your book and these pages tell a different story than what you say in email. I need a straight answer out of you, in your view: does God exist (yes or no)? You state, on page 13, there is a still-present divine "creator of the universe" with providence that is the source of good and evil. This would put you at **DN=1**. But you tell me in email that you are **DN=8-10?** Your underlying views on this matter underlies the entire structure of your book, of which the first dozen or so pages are replete with mention of "God" and "creation". If you

> believe that God exists as the creative force of the universe, come out and say this. One thing I can't stand is bush beaters."

"The straight answer: there is no God in the form of a person-like creator of the universe, just like there is no Santa Claus. But I believe that my work has identified the cosmic creation process that religious thinkers have so often anthropomorphized into a Being. I hope that this is no small contribution to the advance of thought. I am no doubt guilty of overdramatizing this discovery of the proper physical (purely material, molecular in your terms) explanation for the non-material (informational in my terms, spiritual in theological terms) aspects of the world.

I don't mind if some religious persons anthropomorphize my explanation of the creation. There was a creation even if there was no Creator. And my work shows that humans are co-creators of the future. Discovering and explaining why humans have so often invented gods is my modest first step towards a purely rational explanation of the great archetypal myths and mysteries of conventional religion. Discovering an objective - and cosmic (and ultimately thermodynamic!) - source of good can replace "god-given" ideas of good and evil, right and wrong, with ideas based in physics, chemistry, and biology, is my second contribution. Otherwise, I am concerned that my work toward enlightenment and disenchantment would be attacked as "value-free."

Finally, developing the most plausible and practical scientific model for free will is not motivated by any religious considerations (you are quite right that most libertarians on free will are so motivated). Simply put, my two-stage model is not a metaphysical and supernatural free will, it is a purely natural and biophysical free will. It is based on the denial of an idealistic determinism, even pre-determinism, that grew out of a misplaced confidence in the time-reversible "primary laws" of nature" that did not appreciate the "secondary" statistical laws embodied in thermodynamics and statistical physics, as finally established by quantum mechanics. As I write on my I-Phi home page:

> Information philosophy explores some classical problems in philosophy with deeper and more fundamental insights than is possible with the logic and language approach of modern analytic philosophy. By exploring the origins of structure in the universe, information philosophy transcends humanity and even life itself, though it is not a mystical metaphysical transcendence. Information philosophy uncovers the providential creative process working in the universe to which we owe our existence, and therefore perhaps our reverence.
> It locates the fundamental source of all values not in humanity ("man the measure"), not in bioethics ("life the ultimate good"), but in the origin and evolution of the cosmos.
>
> Information philosophy is an idealistic philosophy, a process philosophy, and a systematic philosophy, the first in many decades. It provides important new insights into the Kantian transcendental problems of epistemology, ethics, freedom of the will, god, and immortality, as well as the mind-body

2012	Robert Doyle (1936-) American	8+	

physicist and philosopher

problem, consciousness, and the problem of evil. In physics, information philosophy provides new insights into the problem of measurement, the paradox of Schrödinger's Cat, the two paradoxes of microscopic reversibility and macroscopic recurrence that Josef Loschmidt and Ernst Zermelo used to criticize Ludwig Boltzmann's explanation of the entropy increase required by the second law of thermodynamics, and finally information provides a better understanding of the entanglement and nonlocality phenomena that are the basis for modern quantum cryptography and quantum computing...

Information Philosophy is an account of continuous information creation, a story about the origin and evolution of the universe, of life, and of intelligence from an original chaos that is still present in the microcosmos. More than anything else, it is the creation and maintenance of stable information structures that distinguishes biology from physics and chemistry. Living things maintain information in a memory of the past that they can use to shape the future.
Information Philosophy is a story about knowledge and ignorance, about good and evil, about freedom and determinism. There is a great battle going on - between originary chaos and emergent cosmos. The struggle is between destructive chaotic processes that drive a microscopic underworld of random events versus constructive cosmic processes that create information structures with extraordinary emergent properties that include adequately determined scientific laws; despite, and in many cases making use of, the microscopic chaos.

Created information structures range from galaxies, stars, and planets, to molecules, atoms, and subatomic particles. They are the structures of terrestrial life from viruses and bacteria to sensible and intelligent beings. And they are the constructed ideal world of thought, of intellect, of spirit, including the laws of nature, in which we humans play a role as co-creator.

I believe that information philosophy can shed light on the common-sense intuition of a cosmic creative process often anthropomorphized as a God or divine Providence; the problem of evil (chaotic entropic forces are the devil incarnate); the mind-body problem (the mind can be seen as the realm of information in its free thoughts, the body a biological system creating and maintaining information); and the "hard problem" of consciousness (agents responding to their environment, and originating new causal chains, based on information processing).

Please read a bit in chapter 30 on the cosmic creation process. I very much

appreciate your taking the time to criticize my work. I am getting quite old now. I perhaps have taken too long to formulate my ideas and get them published. You, on the other hand, are quite young and likely will have a great influence on future thought. Thank you for including my informational approach to philosophy and science in your websites and future books. It gives me a little bit of what I call "information immortality".” (18 Jan 2012)

> Thims Robert, your answer, however, is still affixed with a modifier: "there is no God (in the form of a person-like creator of the universe)", but there is a "cosmic creation process" that "that religious thinkers have anthropomorphized into a Being." This is all verbal camouflage. You did not answer: there is not God. You answered: there is a God in the form of a cosmic creation process. In short, you believe that God does exist? Is this not correct?

Libb, there is no God (or gods). There is a process of cosmic creation that manages to evade the second law in some sense. The universe began in equilibrium with minimal information. It is now in a state far from equilibrium, with vast amounts of free energy flying around. Information philosophy starts with an explanation of this cosmic creation process. It then tries to identify the increase of information (or negative entropy, or free energy) as an objective cosmic good. My work attempts to show that there is indeed something going on that many religions think needs a god or gods, viz., providing a beneficial environment. There are no gods. But we should appreciate and even show something like reverence for the providence that science finds in our universe. (24 Jan 2012)

2012		Sean Dickinson (c.1988-) Hmolpedia member	0

“My Dawkin's number is ... "**0**" . Not that that means I think I'm god, more akin to my a way of defying the whole number system to unmask the question to derail the rating system, as **8** to **10+** augments / defy Dawkins original **1** to **7** so my "**0**" rating is much like the famed atheist quip about "believing in just one less god", I am one less category, no-category. At the lowest rank **1**, I take away **1** = **0**, at the "highest rank" of **10**, I conceptually take away again a **1**, this time being the **1** coming in front of the **0** which is **10** = **0** closing the loop and defying the need for categorization, again akin to the **8** to **10** answer to Dawkins original rating system, I defy the rating system all together because to rate along it is still "Posing an answer to a question about god". Thus "**nothing**" being the answer, the question is undone, meaningless, as is the higher conceptual categorizations **8** to **10+** which asks "What do you mean by GOD?" / "The question doesn't make sense?". It makes enough sense to know it doesn't make sense and thus be ranked and that I defy, hence an answer of **0.** I refute categorization. So even if I choose not to decide, I have made a choice, that choices closes approximation on the rating system is **0**.”

Other

The following Dawkins numbers are either polled via email by Libb Thims or estimated based on historically documented views, such as were discerned during Napoleon's polling of the religious views of the leading scientists of France (see: Napoleon Laplace Anecdote):

â— William Jensen (1948-) (DN=7) American chemistry historian (polled)
â— Robert Ulanowicz (1943-) (DN=2-3) American chemical engineer and theoretical ecologist (polled)
â— Charles Hansen (1943-) (DN =1) American systems analyst, economics consultant, and engineer

â— Joseph Lagrange (1736-1813) (DN=5-7) Italian mathematician (estimated)
â— Gaspard Monge (1746-1818) (DN =7) French mathematician (estimated)
â— Pierre Laplace (1749-1827) (DN =7.5) French mathematician, physicist, and astronomer (estimated)
â— Claude Berthollet (1748-1822) (DN =7) French chemist (estimated)

References

1. Dawkins, Richard. (2006). *The God Delusion* (pgs. 50-51, pg. 102). Houghton Mifflin Harcout.
2. Communication to Libb Thims (at date cited).
3. Re: Crant and C=ea2 (2011) – Hmolpedia thread.
4. Maher, Bill. (2008). "Interview: Richard Dawkins", Apr 11, YouTube.

θΔics

In religion, **Dawkins scale** is a semi-popular tool used by people (and particularly scientists), among themselves, to quantify belief in the existence of god, in a numerical way (1-10). One's Dawkins number (1-12) is thus a numerical way to represent a person's religious outlook. [1]

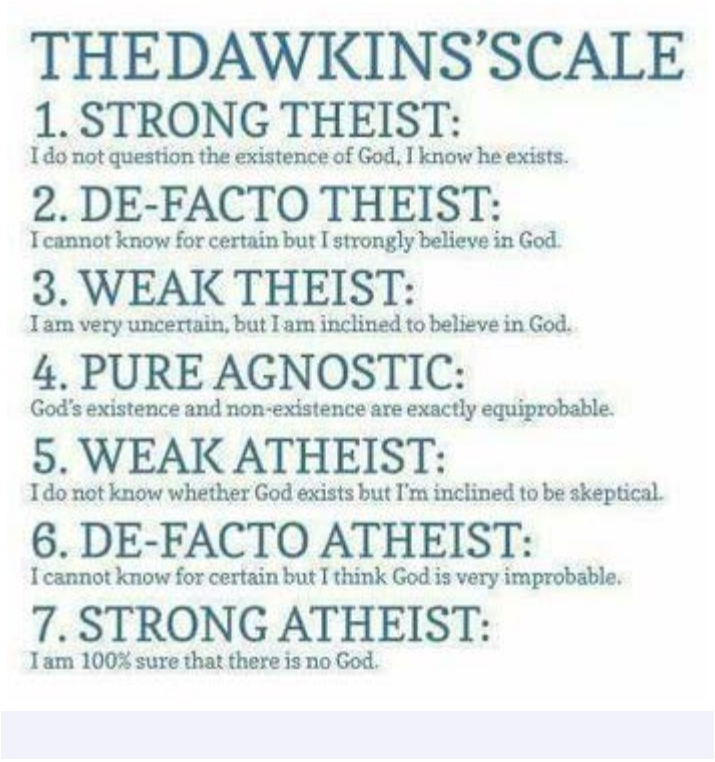

History

The original Dawkins scale, shown below (or pictured adjacent), was first presented in the popular 2006 book *The God Delusion* by English evolutionary biologist Richard Dawkins, who used a 7-point Likert scale, assigning 1 to strong belief in god and 7 to strong disbelief in god.

The fact that 1-7 range does not adequately capture all points of view is evidenced by the votes of 8 in the 2009 Yahoo Answers query on the question. [7] The scale was extended to the 10-point range by American electrochemical engineer Libb Thims in 2009, in response to various email conversations with scientists on the question of whether or not objection to thermodynamic application to human existence was religiously-based or not. Thims thereafter began to query other scientists as to their stance on the matter, some opinions of which are shown below, and also to list known and or estimate Dawkins numbers in Hmolpedia biographies, signified by "DN:#", e.g. Paul Dirac (DN=7), meaning that, based on published views on the hypothesis of god, he was Dawkins # 7 atheist.

Scale

The following is the extended 10-point Dawkins scale, showing the original 7-point range, with the inclusion of numbers in the 8-10 range; though, to note, some have responded with numbers in the 0 to negative range, as well as 11+ range:

Level	Belief in the Existence of God		
1	Strong theist. 100 percent probability of God. In the words of C.G. Jung (IQ=160), 'I do not believe, I know.'	←	**Strong Theist:** I do not question the existence of God, I KNOW he exists.
2	Very high probability but short of 100 percent. De facto theist. 'I cannot know for certain, but strongly believe in God and live my life on the assumption that he is there.'	←	**De facto Theist:** I cannot know for certain, but I strongly believe in God and live my life on the assumption that he is there.
3	Higher than 50 percent but not very high. Technically agnostic but leaning towards theism. 'I am very certain, but I am inclined to believe in God.'	←	**Weak Theist:** I am very uncertain, but I am inclined to believe in God.
4	Exactly 50 percent. Completely impartial agnostic. 'God's existence and non-existence are exactly equiprobable.'	←	**Pure Agnostic:** God's existence and non-existence are exactly equiprobable.
5	Lower than 50 percent but not very low. Technically agnostic but leaning towards atheism. ''I don't know whether God exists	←	

	but I'm inclined to be skeptical.'		**Weak Atheist:** I do not know whether God exists but I'm inclined to be skeptical.
6	Very low probability, but short of zero. *De facto* atheist. 'I cannot know for certain but I think God is very improbable, and I live my life on the assumption that he is not there.'	←	**De-facto Atheist:** I cannot know for certain but I think God is very improbable and I live my life under the assumption that he is not there.
7	Strong atheist. 'I know there is no God, with the same conviction as Jung 'knows' there is one.'	←	**Strong Atheist:** I am 100% sure that there is no God,
8	Beyond atheism (110% sure there is no God): "Do not prefer to be associated with term 'a-theist' to the same extent that I do not prefer to be associated with the term 'a-fairyist' in the sense that I am an adherent to a disbelief in tooth fairies"; Pierre Laplace (IQ=190), who in 1802 commented to Napoleon that he has "no need of that hypothesis", might well fall in this range.	←	**Beyond Atheism:** **I have no need of that hypothesis.** Beyond 110% sure there is no God (well read in comparative religion and mythology)
9	Somewhere between "beyond atheism" ...		
10	Consider the entire discussion to be something akin to a flat earth theory debate; albeit a topic that irritatively seems to rear its head, recurrently, in modern scientific discussions concerning human activity. A human being is molecule, whose synthesis, movements, and future are governed by scientific laws. God is a defunct theory of olden days, used to reconcile questions that were then unanswerable; whose current following or belief, for 72 percent of the world's populous (religions), is nothing but reformulated Egyptian mythology, centered around the 5,000 BC story of the birth of the sun god Ra out of the land mound Nun.	←	**Goetheanist:** **Humans** are evolved chemicals **Morality** is based on the laws of physical chemistry Very "hardened" scientist range No God No Spirituality (spirits/supernatural forces) Yes Morality (physical chemistry based)

Examples

Dawkins comments, in his 2006 book, as to his own position on the scale, that he is in the 6 to 7 range: [1]

> "I count myself in **category 6**, but leaning towards **7**. I am agnostic only to the extent that I am agnostic about fairies at the bottom of the garden."

In 2008, American science humanist writer Christopher Sisk created a set of 14 images (7 for light backgrounds and 7

for dark) of the Dawkins scale, shown above, that people can download and put on their blog to show where he or she stands on the scale. [5] Dawkins considers himself to be "in category 6" along with most of the atheists he knows. When queried as to Einstein's position on the scale, Sisk reasons that Einstein would have fallen at level 6, based on several of Einstein's quotes, e.g. that "he does not believe in a personal God", that he considers "the word of God to be nothing more than the expression and product of human weaknesses", and that he considers the Bible to be a collection of childish primitive legends.

The range of level 10 was added on by American chemical engineer Libb Thims in a 2009 discussion with Irish nanophysicist Philip Moriarty, who when queried by Thims as to his possible underlying religious motives, regarding his objections to human chemistry and human thermodynamics, commented:

> "I am what Richard Dawkins would classify as a **level 6 'agnostic'** - agnostic in the sense that although I cannot prove that there is or isn't a god, there are an infinite number of possibilities I can't definitively disprove."

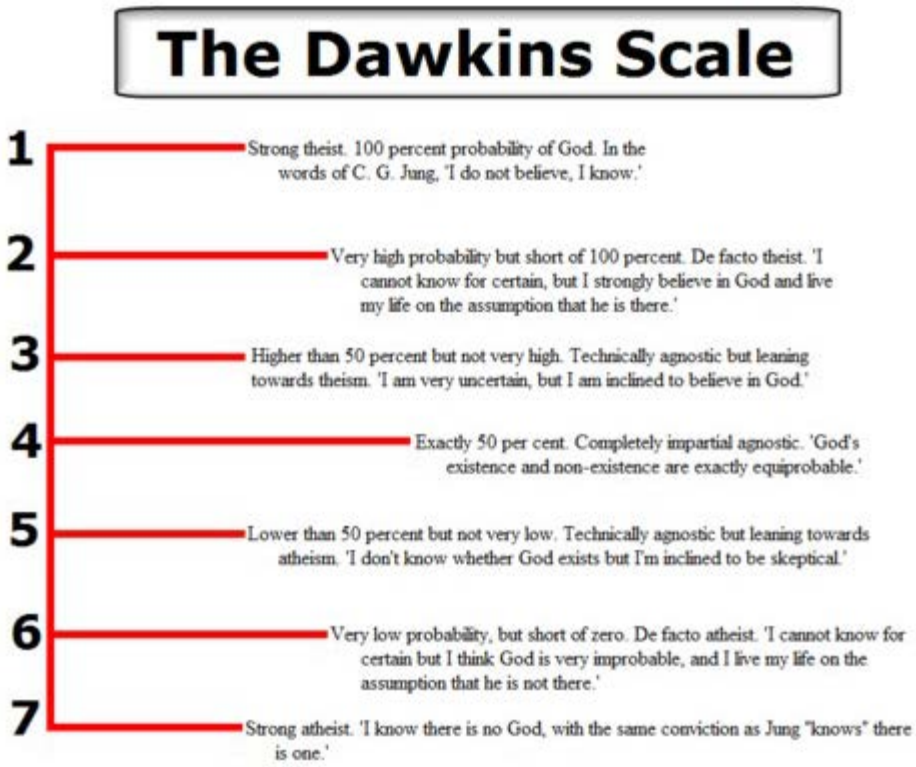

A 2011 **Dawkins scale** made by Tumblr user Jon Webb, a high school student who defines himself as an intelligent Christian and on the scale comments: "Practically I'm a **1**. Logically I'm a **2**. The existence of God cannever be proven100% true, but I live like it is because I am 100% convinced that it is true." [11]

Thims commented back, after reading the Dawkins scale (something he had never heard of before): [2]

> "In the Dawkins scheme, I would be **level 10**, but I don't like the word atheist (I like the word scientist better). I've read over 50 books on religion (currently practiced, and active (about 18 main varieties), mythology, Egyptology, etc., and I know very clearly as to the background of most of the 10,000+ gods to have come and gone as well as the active ones. In the future, I might do some modern clarification videos on these topics (e.g. is there a god, what happens when you die, good vs evil, etc.), but I am somewhat hesitant, as these get very emotional for many."

The professor than commented back:

> "There is no **'level 10'** in the Dawkins scheme. I was brought up in a very devout Catholic family and 'kicked against' religion from the age of nine (when I began to ask questions about the ludicrous concept of transubstantiation in Catholicism). You may therefore understand my irritation at the inference that my arguments are religiously driven. Please try not to throw around accusations of that type in the future when there is no evidence to support them."

In 2010, Georgi Gladyshev, a Russian physical chemist, commented to Thims on this scale: [3]

> "I believe, like you, I am closer to the **10 point range**."

On 21 April 2010, South African chemical physicist Adriaan de Lange commented to Thims that:

> "As for the Dawkins scale and your modification of it, I probably belong to **level 1**. But I have to qualify it. Since my 1982-83 discovery, I have become extremely skeptical on how other believers model their knowledge of god. They use metaphors from many walks of life coming from the public knowledge of others. Thus they suppress their own personal knowledge. Because of this, you will probably have to place me in **level 10** (your scale). Like St Paul writes, that which we see is but an image in a mirror, not the real thing."

In Aug 2010, English biologist Mark Janes commented on the scale to Thims: [8]

> "Regarding the Dawkins scale I cannot easily place myself because I don't believe in a super natural entity that designed and created the universe so I would be a **strict 7**. However my theory that there is a natural arrow of time driving increasing order in the universe to a point where life becomes God like or my appropriately very stable (Iron instability arrow of time). I do, however, still believe in the long term effect of the 2nd law. So in terms of the classical definition I am a strict 7. However I do think people are entitled to their belief as long as they are peaceful and respect others belief so perhaps that drops me to a **< 6**. It's very interesting, thanks for showing this to me. I used to be a **strong 10** for fifteen years, but the effect of belief on human evolution and its production of scientific logic gave it some limited justification. I am actually an atheist. My philosophy on God is as described by yourself a response to free energy, so called islands of negative entropy and a 'future' evolutionary level of human consciousness not some unsupportable metaphysical entity."

To exemplify that this topic rears its head in origin of life discussions, Gladyshev includes a two-page discussion on the role of divine initiation in his chapter on the evolution of living systems, in which he builds his theory "without the concept of God", instead putting his "belief in "the general laws and exact theories created by Rudolf Clausius, Willard Gibbs, and other classics of modern science." [4]

In his 2007 book *Entropy Demystified*, Israeli physical chemist Arieh Ben-Naim commented devoted a short section to heat death and god (pictured adjacent) in which he argued, supposedly in a joking manner, that since the Genesis story states that in the beginning there the universe was created from chaos, that this contradicts the big bang theory of the universe starting from a low entropy or ordered initial state. [9] When queried about this section in 2011 and his views on god in relation to the Dawkins scale, Ben-Naim stated: [10]

> "I looked at the SCALE. I do not fit there, perhaps you should add me at **number 11 or 12 or higher**.... When I was a boy I used to say that 'I don't believe in god.' Later, I realized that even that statement is not correct. Now, if someone asks me 'Do you believe in god?' I say I don't understand the question, and I ask: 'What is god?' I really do not know what people are talking about when they say 'GOD'."

In the context of modern cosmology, people speculate on the gloomy fate of the universe, which ultimately will reach a state of thermal equilibrium or "thermal death."

Perhaps not?!

On the other end of the time scale, it has been speculated that since entropy always increases, the universe must have started in the "beginning" with a lowest value of the entropy.

Perhaps not?!

And besides, the last speculation is in direct "conflict" with the Bible:

> *"1. In the beginning God created the heaven and the earth.*
> *2. And the earth was unformed, and void." Genesis 1:1*

א בְּרֵאשִׁית, בָּרָא אֱל֫וֹהִים, אֵת הַשָּׁמַיִם, וְאֵת הָאָרֶץ.
ב וְהָאָרֶץ, הָיְתָה תֹ֫הוּ וָבֹ֫הוּ, וְחֹשֶׁךְ, עַל-פְּנֵי תְהוֹם; וְרוּחַ אֱל֫וֹהִים, מְרַחֶפֶת עַל-פְּנֵי הַמָּיִם.

The original Hebrew version includes the expression "Tohu Vavohu," instead of "unformed" and "void." The traditional interpretation of "Tohu Vavohu," is total chaos, or total *disorder*, or if you prefer, highest entropy!

Excerpt on God and heat death from Israeli physical chemist Arieh Ben-Naim's 2007 book *Entropy Demystified* (indicative of DN: **5-6**); a published view that seems, however, seems to conflict with a 2011 email query (adjacent) in which he considers himself to be a **Dawkins number 11-12** or higher. [9]

And on the underlying motive for adding the adjacent god section to his 2007 book, he stated:

> "What you have written in the site about me is totally wrong. I never discussed anything about god. I did mention the Bible but that was as a kind of joke, that everyone who read it understood the jock. And besides the whole paragraph had nothing to do with the main content of the book. I recommend you to read the entire book."

People who give evasive answers to the existence of god question, like Ben-Naim, and who write ontic opening books, like Ben-Naim, tend to harbor some hidden or closeted belief, that may tend to emerge into one's last decade, i.e. so-called "Kauffman slide" phenomenon, named after Stuart Kauffman, who went from 1995 self-proclaimed "humanist atheist" (Ñº) to 2008 sneak god in via ontic openings writer.

Notes

The utility of the scale is that it often works to clear up the matter of what exactly a person is objecting to when it comes to applying chemistry and physics to the modeling of human behavior. If a person is strongly religious and an adherent to a realistic interpretation of a religious text as being factual, the person will often tend to object to what science has to say on an overlapping topic, solely on the basis that it conflicts with scripture, or what the person considers to be the 'word of god' and thus unquestionable. When, conversely, a person's religious convictions or ulterior motivations remain hidden, it becomes difficult to see from where the emotional reaction concerning the objection to theory stems?

One example is German writer Christoph Wieland's 1810 letter (which he suggested should be burned after it is read) to his close friend German philologist and archeologist Karl Böttiger stating that German polymath Johann Goethe's 1809 treatise on human chemical affinities is nonsense: "To all rational readers, the use of the chemical theory [in *Elective Affinities*] is nonsense and childish fooling around." [6] One is quite puzzled by this statement, on first pass, in that Goethe's presentation is very accurate? The puzzlement disappears, however, after one reads that Wieland considered Geothe's book to be a "truly horrible work", objecting solely based on the radicalness of its Christianity.

A more recent example includes American physical chemist John Wojcik's 2006 Rossini debate response letter, to the *Journal of Chemical Education*, in objection to American chemical thermodynamicist Frederick Rossini 1971 conception of using chemical thermodynamics to develop a type of political thermodynamics, wherein Wojcik comments with emotional aggressiveness that "worst of all, there is the danger that chemical thermodynamics will have ascribed to it a power that it simply does not have, namely, the power to 'explain' the human condition. There may be a sense in which chemistry is the 'Central Science'. This is certainly not it." On first pass, knowing that Rossini's postulate if quite accurate and applicable, one is quite puzzled by Wokcik's objection? After digging into his background, however, the issue becomes resolved when we find out that he is a professor of physical chemistry at the Catholic-based Villanova University, Pennsylvania. In other words, Wokcik's reaction to this type of application stems from the fact that he is a Catholic.

References

1. Dawkins, Richard. (2006). *The God Delusion* (scale: spectrum of belief, pg. 73). Houghton Mifflin Harcout.
2. YouTube messaging (Sep 07 2009): P.M. to Libb Thims: "Re. YouTube message - there is no 'Level 10' in the Dawkins scheme. I was brought up in a very devout Catholic family and 'kicked against' religion from the age of nine (when I began to ask questions about the ludicrous concept of transubstantiation in Catholicism). You may therefore understand my irritation at the inference that my arguments are religiously driven. Please try not to throw around accusations of that type in the future when there is no evidence to support them."
3. Email communicate from Georgi Gladyshev to Libb Thims on 22 Mar 2010.
4. Gladyshev, Georgi. (1997). *Thermodynamic Theory of the Evolution of Living Beings* (section: 1.3: The Origin of Life and the Role of Divine Initiation, pgs. 7-8). Nova Science Publishers.
5. Sisk, Christopher. (2008). "Dawkins Belief Scale Images", *ChristopherSisk.com.*
6. Sisk, Christopher. (2008). "I'm a Six on the Dawkins Scale", *ChristopherSisk.com.* May 13.
The fact that 1-7 range does not adequately capture all points of view is evidenced by the votes of 8 in the 2009 Yahoo Answers query on the question. [6]
7. What are you on the Richard Dawkins belief scale? (2009) – Yahoo Answers.
8. Email communications to Libb Thims from Mark James (09 and 11 Aug 2010)
9. Ben-Naim, Arieh. (2007). *Entropy Demystified: the Second Law of Thermodynamics Reduced to Plain Common Sense* (pg. 215). World Scientific Publishing Co.
10. Email communicate from Ben-Naim to Libb Thims (10 Jan 2011).
11. The Dawkins scale (2011) – Intelligent Christianity, Tumblr.com.

Further reading

â— Alexis, Jones E. (2007). *In the Name of Education* (famous scientists on god, pg. 233). Xulon Press.

External links

â— Spectrum of theistic probability – Wikipedia.
â— Stephens, Mitchell. (2006). "Dawkins belief scale", Oct 22, *FutureOfTheBook.org.*
â— Where are you and the Richard Dawkin's Belief Scale? (2008) – ZuneBoards.com.
â— Where do you fall on the Richard Dawkin's Belief Scale? (2009) – MeetUp.com.
â— What are you and the Dawkins scale? (2010) – QuarterToThree.com.

θΔics

Article
On the Differences Between a Person and a Particle | **Peer Review**
(a JHT submission)

Article | Review versions
â— Original article | Received: 13 Nov 2012 | Pages: 9
â— **Formatted article** | 8 May 2013 | Pages: 12 | Format: PDF

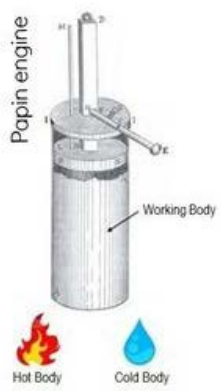

This is a new **JHT peer review stage article**, in the re-formatting and or re-construction stage of development, about which: comments, suggestions, and or criticism are welcome, which can be submitted via: (a) the threads below, (b) comments added into the "this" wiki page, via the EasyEdit button, (c) attachment added to this page, via EasyEdit tools, (d) review posted externally, e.g. in beta wiki, WordPress, Blogger, your own website, etc., or (e) email comments sent to JHT editor Libb Thims directly *via* libbthims@gmail.com, which will be made public.

Abstract
The formatted abstract of the working draft-article is as follows:

A seemingly innocuous question is ‘what is the difference between a person and a particle? Although the variety of physical properties and behaviors of these two obviously differentiated systems may at first render the consideration of the question trivial, there do remain some issues of practical interest. The purpose of this paper is to investigate and elucidate a few of the differences between systems containing people and those consisting of particles in order to increase the efficacy of thermodynamics as applied to ecosystems.

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Received: 13 Nov 2012; *Reviewed:* 8 May 2013-Date; *Published:* Date

Review period
This article entered the review period on 8 May 2013 and will close prior to 27 Jun 2013, the date when JHT editor Libb Thims leaves for the University of Pitesti Econophysics and Sociophysics Workshop 2013, if not sooner as Thims will need to focus on completion of his key speaker talk. [1] Comments and review in between these two points will be appreciated.

Editorial issues

Formatting | Other

Libb Thims | 6 May 2013 | **Email**

FQ1. I'll just need two homework problems (fixed✓@ 6 May 2013).

FQ2. And I'll need a variables table, in which you give your definition of a human and correlative explanations of any thermodynamic variables you discuss and or employ in your article; historical examples shown here (human thermodynamics variable table).

Jeff Tuhtan | 6 May 2013 | **Email**

Re: FQ2: Comment: I don't use any deviations from the classical intepretations of work, heat, temperature or pressure in my paper. The human particle is described as an ideal sphere, but there are no formulations thus far which seem to warrant such a table. Pending reviewers comments, I can add the table if equations become necessary.

To note, I have a hard time supporting the use of equivalence tables which allow for the liberal transcription of known physical quantities used in thermodynamics to the study human society, ecological systems, etc. In continuum mechanics, a similar phenomena of "constitutive relations" has allowed the field to be flooded with nonsense equations and bogus physics, much of which is still gospel today.
Whenever I see such tables, it reminds me of Ingo Müller's oft-quoted statement on the subject: "for level-headed physicists, entropy (or order and disorder) is nothing by itself. It has to be seen and discussed in conjunction with temperature and heat, and energy and work. And, if there is to be an extrapolation of entropy to a foreign field, it must be accompanied by the appropriate extrapolations of temperature, heat, and work.”

Beware the pull of the "foreign field", for therin lies the womb of alchemy, vitalism, phlogiston, and the luminiferous aether! ;)

Libb Thims | 7 May 2013 | **Post**

Re: FQ2: I still have to go though your paper in detail, but the need for variables table—see for instance Percy Bridgman's 1914 ten fundamental quantities table (here)—is for the reader to know exactly, firstly your theoretical definition of a human, e.g. Irving Fisher, under the direct supervision of Willard Gibbs, in his 1892 variables table, states explicitly "a particle (in mechanics) corresponds to an individual (in economics)". There is no ambiguity past this point. Tom Schneider sent me the following quote when I was writing my "Thermodynamics ≠ Information Theory" (quote added, pg. 90) article last year, which seems apt here:

> "The first thing needed is the rectification of names"
>
> — Confucius, Analects 13:3

You state above that a human, in your paper, is an "ideal sphere", which solves that part of the problem. The second need of variables table is clarification of thermodynamic terms, e.g. if you say in your article the "pressure" or "entropy" on this school or system of fish in this so-and-so ecosystem causes this much effect, etc., I need to know are you referring conceptually to the use of some kind of barometer device (or entropy measuring device) attached to some fish you are monitoring, or are you referring to the classical interpretation of pressure as "force per unit area" in respect to particles impacting on a surface, such as in the original Daniel Bernoulli 1738 *Hydrodynamica* definition of pressure:

> "The weight *P* holding down the piston in [a given] position is the same as the weight of the overlying atmosphere, which we shall designate *P* in what follows."

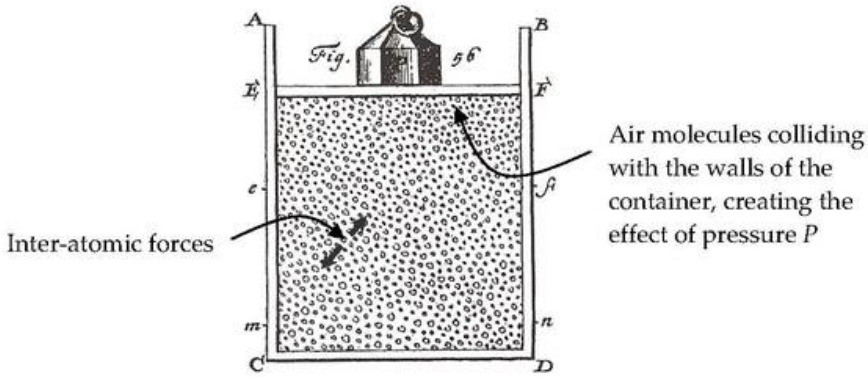

Bernoulli's 1738 kinetic theory of gases diagram

which in this case would mean, e.g., fish impacting on a territorial boundary (e.g. see: chimpanzee war and the pressure issues at the boundary of the rock formation where the two warring factions of chimpanzee troops would meet up and hurl rocks at each other, etc., occasionally crossing over into the other tribe's territory). In short, in respect to this example, is your use of the term "pressure" (if this is in your article), some oceanic pressure at some depth in some water system or is it of the type of force per unit area, in respect to the movement of a number of fish, normal or force normal to some boundary?

Hence, for my myself as well as likely for readers I need to know, if the author is employing standard thermodynamics terms in non-standard scenarios (a river or a human society), what exactly we are talking about, in plain speak.

Thermodynamics, historically, is rich in confusion; James Maxwell's famous misunderstanding of entropy (see: entropy misinterpretations) and later editorial retractions is a prime example. To quote from Ingo Müller again (see: information theory), the aim in employing these variable tables is to eliminate "obfuscation":

> "Indeed, it may sound philistine, but a scientist *must* be clear, as clear as he can be, and avoid wanton obfuscation at all cost."

I'll comment more on this "variables tables" requirement issue after reading your paper in detail.

Libb Thims | 8 May 2013 | 3:24 AM CST | **Post**

Editorial note: I'm presently going through your article, and a few points to take note of in regards to future JHT submissions, which all have to do generally with readability issues:

(a) Don't use inline citations.
(b) Use full names, e.g. "American engineer Willard Gibbs" (good) vs. "Gibbs" (less clear to new readers).
(c) Use first name in citations.
(d) Full journal article spelling.

These issues are explained fully in the "JHT formatting" page.

> Yes, the formatting of my submission (13th Nov 2012) was based on the formatting of a paper you had sent me as a template. Now that I see

you have changed the formatting, I will adjust my future submissions accordingly.

Libb Thims | 8 May 2013 | 8:11 AM CST | **Post**

Editorial note: the table I need filled in is the following, as shown in the formatted version of your submission, being that you use the terms in your article in quotes and terms such as "societal enthalpy" or "free energy of a society" are not standard terms, which is why an appendix section is needed with term clarification/definition:

Variables table

The following—on the protocol of American economist Irving Fisher's 1892 mechanics-to-economics variables table, wherein he states explicitly 'a particle (in mechanics) corresponds to an individual (in economics)' —is the author's thermodynamics-to-ecosystems variables table:

Thermodynamics	Ecosystems
Particle / Ideal sphere (1-m in diameter)	Person
Societal enthalpy	
Free energy of a society	
Entropic contribution	
Boundary	

Libb Thims | 8 May 2013 | 8:24 AM CST | **Post**

Editorial note: as shown in the formatted article (which is now linked), the following editorial clarifications are in need of answering:

Q1. Re: 'a 'social system' can best be seen as relaxing *towards* equilibrium, but never actually achieves it', what is this supposed to mean?

A1. A social system in this work is a system of interacting human particles. If we were to plot the position and momenta of each particle as a function of time, we would create a graph of the phase space of the particular society under study. The attractor of this phase space is a state of minimum entropy, or equilibrium. However, because any given society is not ideal in the sense that is never perfectly enclosed by some arbitrarily defined boundary, we can only view the effects of the attractor (equilibrium) over a finite time period as relaxing towards equilibrium. Equilibrium can be seen a sort of "moving target" but such systems can never achieve equilibrium.

Q2. (a) Re: 'Society and ecosystems are fundamentally nonequilibrium systems', what does this mean? Can you graphically, e.g. potential vs. extent graph (ref b), explain what you envision here?
(b) eoht.info/page/HCT+|+Fitness+landscapes

A2. Please refer to A1.

Q3. Explain Markov model in more detail, for readers not familiar with this, and in particular how you envisage this model applying to social/ecosystems.

A3. The approach taken by Willard Gibbs can be generalized in two different ways: The first is to look at the dynamics of the system in contact with an equilibrium bath, the second is to view the system as being in a steady-state but in contact with a nonequilibrium environment having a fixed difference in the chemcal potential. The Markov model is a relatively new approach which allows for the study of both generalizations. The Markov model represents a molecular system (here the molecules are further reduced to the aforementioned spheres) having a unique long-time stationary probability distribution $\{p_i^e\}$ which corresponds to the ideal equilibrium state under conditions *i* at energy *e*. From this formulation it is possible to derive a free energy function relating the probability distributions of a given state to the equilibrium distribution and to the thermodynamic variables internal energy, U, temperature, T and entropy S:

$$F = U - TS = T\sum_i p_i ln\left(\frac{p_i}{p_i^e}\right)$$

Thus if it were possible to model or map the probability distributions of a human society under given conditions, then their current state could feasibly be described in terms of changes in the free energy of the system. However, due to the huge number of degrees of freedom of such

systems, it remains to be seen if such an approach will ever be practicable. Please refer to my quote by Willard Gibbs on this matter.

Furthermore, notice the lack of time as a variable in the formulation. For closed systems (an idealization here is required for viewing a society or ecosystem as truely closed) the free energy dissipation (spontaneous irreversibility) and the entropy production (total irreversibiltiy) are identical. For open systems (driven systems) there is a difference between the free energy dissipation and entropy production, called the "housekeeping heat". This quantity may be considered to be time-dependent.

Q4. (a) Re: 'our systems are fundamentally irreversible and never reach equilibrium', what exactly do you mean by this statement? What variables, differentiation conditions, or description do you use to justify this point of view?
(b) Historical excursions down this line of reasoning often tend to yield absurd conclusions, e.g. Prigogine theorists often model social formations and people as being so far far away from equilibrium that they (we) are continuously at the 'edge of chaos'. When I walk my door today will I find downtown Chicago out of equilibrium and or happily at the edge of chaos (Len Fisher and his 2009 *The Perfect Swarm*, comes to mind here). Only rarely will one hear a finger raised objection to these types of questionable statements. In 2005, authors Eric Schneider and Dorion Sagan, in their *Into the Cool*, ask, in question of the term far-from-equilibrium:

"Is life a far-from-equilibrium system? If so, how far are organisms from equilibrium? And what does this phrase mean? In fact, the term *far-from-equilibrium* may be more applicable to backfiring engines than smoothly running life-forms."

"Life is made up of [so] many reactions in the near equilibrium range [that it] may not be so 'far' from equilibrium as has been suggested."

(c) eoht.info/page/far-from-equilibrium

A4. Your quotations, although interesting, do not appear to be relevant to my submission. I have no mention of life, nor have I attempted to describe it in thermodynamic terms. The focus of the paper is on some thermodynamic issues surrounding how the many-body problem applies to large aggegates of humans, organisms, etc. The fact that these systems are irreversible and not at equilibrium is however germane to the submission topic.

Societies and ecosystems are not in mechanical, thermal, or chemical equilibrium. Thus they are not in thermodynamic equilibrium. They generate entropy via a myriad of ways: friction, heat exchange, chemical reactions, etc. and are thus irreversible. A river is not a reversible system, a human system containing cars on the road is also not reversible. Abstractions of these systems to ideal equilibrium states may in some cases be necessary, but in no way should be considered true to the physical nature of the systems themselves. The quote from Willard Gibbs was carefully chosen to reflect his opinion on this matter to the reader.

This is a very good comment. I am not sure how one would go about determining the distance from equilibrium for a system as complex as an ecosystem or human society. I am not confident that an "equilibrium displacement distance" metric would even make physical sense, since it would ultimately depend on the integrated interactions between all entities of the given system, and could thus deliver identical values for very different configurations.

Jeff Tuhtan | 9 May 2013 | **Post**

Re: Variables Table. Below is the requested table, including entries for the specific catagories requested. The changes are with respect to the amount of work performed or energy transduced, and are not changes in time.

Thermodynamics	**Societies / Ecosystems**
Particle / Ideal Sphere (1-m in diameter)	Individual organism, person, etc.
Change in Societal Enthalpy	Total energy change of the system, including boundary work (pressure volume work).
Change in the Free Energy of a Society	Measure of the work performed or required to build the structure of some evolving system, e.g. an ecosystem or a human society. This work is connected to the energy of work a person invests into the efforts related to the evolution of such a system.
Change in the Entropic Contribution	That portion of the total system energy change which cannot do work.
Boundary	An imaginary region in space with finite volume.

Peer review

Reviews | **Review board** | Other

Curtis Blakely | 14 May 2012 | **Email**

Comments: Here are a few comments about "On the Differences between a Person and a Particle":

I really enjoyed this article. Once of the reasons it resonated so well with me is that the first real socio-physics paper that I composed was on this very topic, so it is a subject that is close to my heart.

Having said that, I offer a few brief comments. First, I enjoyed the background that Tuhtan provides. Mention of Comte, Lucretius, Goethe, Mimke and Gibbs quickly provided credibility and a much needed review of the thoughts and progress that has been made in our discipline(s).

I especially liked the notion of the adult as a particle with a radius of 1 m (i.e. human sized particles). This permitted me to visualize Tuhtan's conceptions more clearly than if he had he not provided this suggestion.

I also found the author's discussion of one of the fundamental differences between the particle and a person being that of "control" intriguing. In my particular area, the goal of applying physics and thermodynamic principles to human behavior is that of "control and prediction". While we can much more accurately predict the behaviors of groups, we are much less capable at predicting the behaviors of individuals. The author is precisely correct, control and prediction are fundamental differences, but that is where we can make our greatest contributions. Yes, individuals have desires, motives, feeling and thoughts that make their control and behaviors difficult to understand and predict, but with continued work, we may make progress into these areas, provided we continue to push ahead.

I applaud the author on a job well done and would refer his attention and that of his reader's to those editorial questions that are offered on page 74 of his article. I always read these thoughtful comments - they continue to guide both my writings and thought-processes.

Libb Thims | 31 Dec 2013 | 12:56 PM CST | **Post**

Comments: Per a quick retrospect skim of the article, overall it seems cogent, as a piece on human statistical thermodynamics (statistical thermodynamics or statistical mechanics) vs. human chemical thermodynamics (or chemical thermodynamics) applied to the aquatic world (fish as particle vs. fish-as-molecule); although, as I recall, the original aim was to do a piece on internal force vs. external force, but as I understand this is a more involved topic.

Exercises | Problems

Exercises | **Homework problems** | Other

On the wise protocol of Swedish physical chemist Sture Nordholm's penning of eight homework problems to his 1997 *Journal of Chemical Education* article "In Defense of Thermodynamics: an Animate Analogy", the submitting author has provide (6 May 2013) two homework problems and or exercises, shown below, that will be added to the finial version of the submitted article, if published:

- â— Problem #1: What impact would changing the shape of ideal human molecule have on the large-scale interactions between human particles?
- â— Problem #2: In this paper, there is little discussion on the topic of individual behavior. Try to describe human behavior in quantities such as work and heat.

JHT editor Libb Thims, in his university lectures to thermodynamics students, frequently assigns students the task to attempt to solve one of the problems on the Hmolpedia "homework problems" page; Thims also, down the road, may end up writing a *Chemical Thermodynamics: with Applications in the Humanities* textbook, built on Gilbert Lewis' famous 1923 *Thermodynamics and the Free Energy of Chemical Substances*; some of these newly-proposed JHT end of article problems/exercises may find their way into the end of chapter exercises and or into the Hmolpedia homework problems page.

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1. Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (abs) (main), University of Pitesti Econophysics and Sociophysics Workshop (UPESW) 2013 / Exploratory Domains of Econophysics News (EDEN V) (organizer: Gheorghe Savoiu). University of Pitesti, Pitesti, Romania, Jun 29.

JHT

In terminology, **dead**, as contrasted with alive, is a defunct theory layspeak term that tends to signify a point past the termination of the existence of what historically or religio-mythologically has been conceptualized as a "living entity" (or living being, living matter, living molecule, life, etc).

The model of a "**dead**" battery, a state in which the free energy change of the electrochemical potential of the reaction is zero; a model that applies to humans and to human chemical reactions, e.g. as in a "dead marriage" (or dead relationship), after which divorce tends to follow.

Difficulties on term

The term "dead", in the context of the defunct theory of life, wherein past a certain point of reduction, often called the unbridgeable gap, down the evolution timeline, molecular ancestors to humans (human molecules) become purely viewed (under the atomic microscope) as powered animated matter or "molecules" (animate molecules or inanimate molecules), chemicals (or chemical species), atomic structures, or atoms, etc., is a concept that does not hold and looses sway as workable model.

To exemplify, one cannot say, at some point in the following reaction, that the water molecule is “born” or comes “alive”:

$$2H + O \rightarrow H_2O$$

anymore than one can say that the water molecule “dies” or is “dead” past a certain point in time in the following reaction:

$$H_2O \rightarrow 2H + O$$

In chemical speak, to note, language often employed assigns borrowed terms, such as “half-life” (see: Paul Aebersold), to quantify or describe the state (or bound state) of the state of existence of atomic or molecular entities. To exemplify, the half-life of carbon-14 is 5,730 years. The carbon-14 atom, in earth-bound conditions, forms naturally when neutrons from cosmic ray interactions participate in the following reaction:

$$n + {}^{14}_{7}\mathrm{N} \rightarrow {}^{14}_{6}\mathrm{C} + p$$

We do not, however, as intelligent chemists, say or believe that the carbon-14 atom ${}^{14}_{6}\mathrm{C}$ is "alive" or comes "alive" or is "born" at any point in this reaction any more than we say or conclude that the carbon-14 atoms "dies" or becomes "dead" at any point in the following reaction:

$${}^{14}_{6}\mathrm{C} \rightarrow {}^{14}_{7}\mathrm{N} + e^- + \bar{\nu}_e$$

This same logic scales up to the scenario of human chemical reactions occurring on the surface of the earth. The prime example, being the human reproduction reaction (a larger version of ${}^{14}_{6}\mathrm{C}$ formation reaction, previous):

$$\mathrm{MxSp} + \mathrm{FyEg} \rightarrow \mathrm{MxFy} + \mathrm{SpEg}$$

In this case the sperm-egg $SpEg$ molecular structure, which eventually buds off from the parental orbital structure (at around age 15-years), is analogous (or rather a scaled up version) to the newly-formed semi-stable carbon-14 atom $^{14}_{6}C$ that forms in the cosmic ray induced combination reaction (above), yet in neither case do we say that either of the newly produced entities is "alive" nor their previous reactants "dead".

Some may naively be quick to argue for a said-to-exist "emergence" phenomena that brings about the first form of life some 3.85-billion years ago (such as hypothesized famously in the warm pond model, tested in the Miller-Urey experiment, or theorized about to no end via contrived thermodynamical theories about the hypothetical origin of life), but whatever position one argues, the bottom line is that the process is still a chemical reaction, and there is no such thing as a "living chemical reaction". Even worse, some may take recourse in the panpsychism position the "everything is alive" position, but again this only recourse to nothingness, a baseless argument that requires that one throw one's chemical thermodynamics textbook in the trash.

The central issue is that what invariably clouds the discussion is a rooted ingrained adherence to the older beliefs passed along to us via comparative religions and mythologies of the past, the foremost of these being the concepts of "life" and "death", a theory that is predominately of Egyptian origin, rooted in the model of the sun (Ra) cyclically "living" each day and "dying" each night.

See also

- Death
- Death drive
- Vis mortua (dead force)

External links

- Radiocarbon dating – Wikipedia.

θΔics

In hmolscience, a **dead atom**, or “dead atoms”, as compared to a living atom, or “living atoms”, is a religio-mythology based chemistry term, often found in origin of life discussions, particularly in anti-materialism arguments, according to which the atoms of the periodic table are classified as being “dead” or not in possession of “life”, or not alive, but which, according to the doctrine of evolution, some of which, such as hydrogen, carbon, nitrogen, oxygen, phosphorus, sulfur, etc., are the so-called "dead" components that go into the formation of the first living thing or first living molecule.

Tyndall

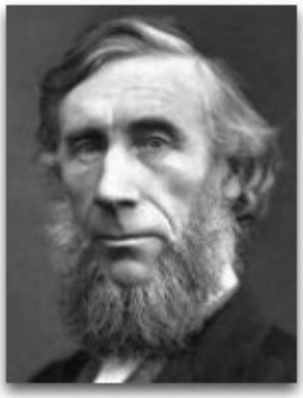

In 1874, rish physicist John Tyndall, Belfast BAAS *Address* (see: Tyndall-Stewart-Tait debate), gave one of the clearest and most famous examples or parodies of the so-called "dead atoms" argument; specifically, he gives the following Platonic dialogue using Greek atomic theorist Lucretius as one of the protagonists: [2]

> “You are a Lucretian, and from the combination and separation of insensate atoms deduce all terrestrial things, including organic forms and their phenomena. Let me tell you, in the first instance, how far I am prepared to go with you. I admit that you can build crystalline forms out of this play of molecular force; that the diamond, amethyst, and snow-star are truly wonderful structures which are thus produced. I will go further and acknowledge that even a tree or flower might in this way be organized. Nay, if you can show me an animal without sensation, I will concede to you that it also might be put together by the suitable play of molecular force.
>
> Thus far our way is clear; but now comes my difficulty. Your atoms are individually without sensation, much more are they without intelligence. May I ask you, then, to try your hand upon this problem? Take your *dead hydrogen atoms*, your *dead oxygen atoms*, your *dead carbon atoms*, your *dead nitrogen atoms*, your *dead phosphorus atoms*, and all the other atoms, dead as grains of shot, of which the brain is formed. Imagine them separate and sensationless, observe them running together and forming all imaginable combinations. This, as a purely mechanical process, is *seeable* by the mind. But can you see, or dream, or in any way imagine, how out of that mechanical act, and from these individually **dead atoms**, sensation, thought, and emotion are to arise? Are you likely to extract Homer out of the rattling of dice, or the differential calculus out of the clash of billiard balls?”

In 1915, American naturalist John Burroughs, in his *The Breath of Life*, commenting on Tyndall's address, stated the following: “Tyndall was another great scientist with an inborn idealistic strain in him. His famous, and to many minds disquieting, declaration, made in his Belfast address over thirty years ago, that in matter itself he saw the promise and the potency of all terrestrial life, stamps him as a scientific materialist. But his conception of matter, as "at bottom essentially mystical and transcendental," stamps him as also an idealist. The idealist in him speaks very eloquently in the passage which, in the same address, he puts into the mouth of Bishop Butler, in the latter's imaginary debate with Lucretius, quoting the above dead atoms paragraph in full, and concludes: [3]

> “Could any vitalist, or Bergsonian idealist have stated his case better?”

Whitehorn

In 1917, American age 23 newly-minted biochemist John Clare Whitehorn (1894-1973), a year before entering Harvard Medical School, published his first article: “The Nature of Matter: This is Not a Universe of Dead Atoms”, based on the review of the evidence for the electronic nature of matter, published in *Popular Astronomy* and also republished by request in *Scientific American*, the opening paragraph of which is as follows: [4]

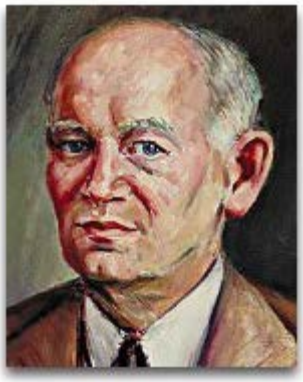

> "From the time when men began to wonder at the world and ponder its problems they have puzzled over the nature of the universe. Sensing an external world of objects and feeling the vital necessity of dealing with these objects, they have sought for an understanding of the universe which would give them a mastery over it. And in their more contemplative moments they have tried to attain to a more comprehensive view which would not only be serviceable in handling objects but would also give a true presentation of the reality of the universe. Through the whole range of solutions offered one can find an everpresent attempt to conceive the universe in some unitary and comprehensive manner. Some have looked upon it as a chance collection of **dead atoms** propelled by blind force; others as pure idea or thought. Between these two extremes there have been all sorts of gradations and compromises."

Whitehorn's article prompted a response article entitled "A Universe of Active Energy" by a T. Henry, in *The Theosophical Path*, wherein the discussion was turned towards Whitehorn's use of the term "active energy" as the solution to the problem. [5]

Mathews

In 1924, American biochemist, physical chemist, and physiologist Albert Mathews, in his *General Cytology* textbook chapter "Chemistry and Psychism", gave the following rather hilarious view of life arising out the the dead hydrogen and oxygen atoms via the action of light and ether: [6]

> "It is perfectly correct, therefore, from this point of view to speak of living and **dead** hydrogen **atoms**. We can even go farther with the simile if we wish and say that when the living high reactive form of the atom passes to the dead, unreactive form, the soul of the atom escapes at the moment of death, for a ray of light leaves the dying atom an travels onward in space, until perhaps it encounters and is absorbed by some other dead hydrogen atom, which it again raises to life by thus giving it a soul. What is this soul? It is a minute portion of the luminiferous ether; of time and space; of eternity and infinity.
>
> For us it is oxygen which thus summons the dead from the tomb; which vitalizes the dead molecules and atoms. The energy is stored in certain of the atoms of the molecules of the protoplasm in the form of widened orbits of rotation of the electrons. It is this which gives them the power of reacting and of passing back to the dead. When such electrons fall back to more stable configuration, the atom and molecule reverts to the dead and inert form such as we keep in bottles. It is the oxygen, then, which vitalizes all animals; but it is from the sun that the vital, radiant energy has come. It is in fact the luminiferous ether which has made they thing alive, for the ether is the great storehouse of energy; it is itself nothing else than space and time; energy and time. Energy is but ether divided by time. Quantity of energy is quantity of ether per second. So all goes back to the either; infinity and eternity. From it is derived our energy and life."

(add discussion)

Discussion

Though difficult to see, the “dead atoms” concept is a forced contrivance a forcing of the religious-mythology view (life/death theory) into chemistry (atomic theory), of which the latter is hard science, the former mythology, primarily Egyptian mythology.

Some, such as German polymath Johann Goethe, approached the question, with inquisitive caution, and tend to side with physical chemistry (e.g. moral symbols); others, with human-grandeur ideals, may tend to slip into the "pan-views", i.e. panpsychism, panbioism, panexperientialism, etc., perspective, concluding that the hydrogen atom is alive, as is all the universe, or variants of this position. An example of the latter position is German polymath Gottfried Leibniz, who to rid himself of the problem of deriving life from death, displaced Greek atoms with his theory of “monads”, out the summation and integration of which he supposed all the phenomenon of life—sentient, intellectual, and emotional—to arise.

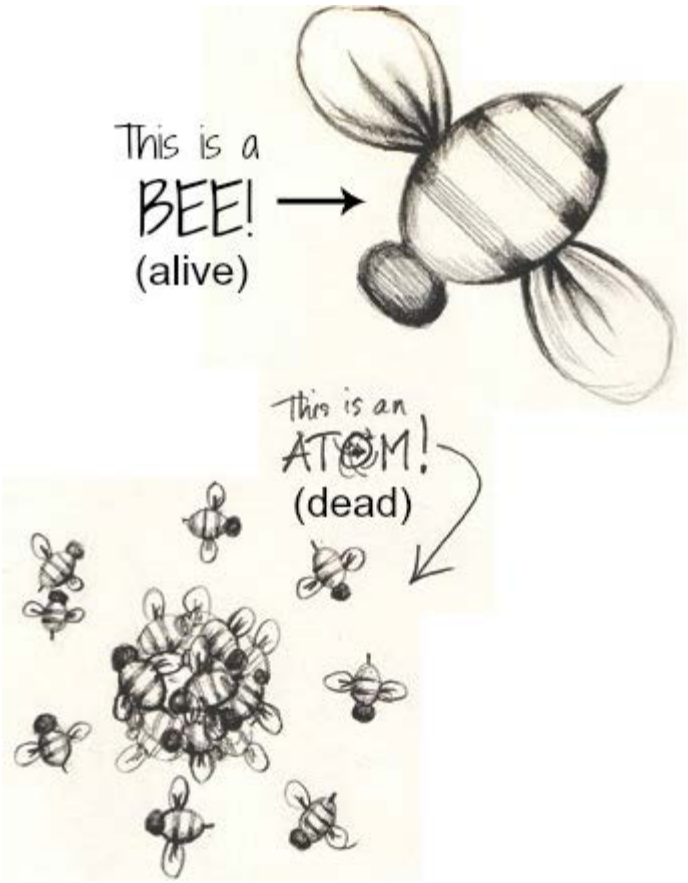

American illustrator Linda Hensley’s 2010 illustration of American nuclear physicist Philip Ugorowski’s description of the “nucleus as a jostling swarm of bees, and I happily absorbed his explanation of the orbiting electrons as more bees, or maybe gnats” to illustrate the apparent (or non-apparent) "**dead atom**" / "living molecule" (bee) divide, dichotomy, or dualism. [1]

A recent example is American polymath Libb Thims, who in circa 2007 mindset was ruminating on Goethe's solution, vacillating in the vicinity of the Leibniz monad mindset, albeit more along the lines of the possibility of a fermion/boson type of rudimentary panbioism, but eventually, in 2009, arriving at the defunct theory of life position, a difficult position to arrive at, to say the least, according to which all religio-mythology based terms and conceptions need to be jettisoned, and as such the idea of a "dead atom" and the like term "living molecule" are both, in modern hard science terms, defunct neoplasms, a heritage of our ancient beliefs, passed along through the last five millennia of syncretism-evolved Anunian theology teachings, known commonly as: Christianity, Islam, Hinduism, all rooted in ancient mythology of the life/death daily rebirth cycle of the sun (Ra), but which is now is explained via a combination of the nebular hypothesis, big bang theory, and hydrogen-helium thermonuclear reaction theory.

See also

â— Dead matter

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2. Tyndall, John. (1874). “Address” (pg. 32), Delivered before the British Association assembled at Belfast. Longmans, Green, and Co.
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(b) John Burroughs – Wikipedia.
4. (a) Whitehorn, John C. (1917). “The Nature of Matter: This is Not a Universe of Dead Atoms” (scan), *Popular Astronomy*, 25:229-44; in *Scientific American Supplement*, Aug 11, Part I, (pg. 82-), Aug 18, Part II (pg. 1-6-).
(b) Brosin, Henry W. (1951). “John C. Whitehorn: A Biographical Sketch” (abs), *American Journal of Psychiatry*, 108:7-9.
(c) John Clare Whitehorn (photo) – Flickr.com.
5. Henry, T.. (1917). “A Universe of Active Energy” (dead atoms, pg. 481). *The Theosophical Path*, Volume 12-13.
6. (a) Mathews, Albert P. (1924). “Chemistry and Psychism”, in: *General Cytology* (pgs. 25-28, 92), Edmund V. Cowdry, ed. University of Chicago Press.
(b) Slosson, Edwin E. (1925). *Sermons of a Chemist* (pgs. 11-12). Harcourt, Brace, and Co.

Further reading

â— Whitehorn, J.C. (1917). “The Nature of Matter: This is Not a Universe of Dead Atoms” (Part I, Part II) (scan), *Popular Astronomy*, 25:229.
â— Henry, T.. (1917). “A Universe of Active Energy” (dead atoms, pg. 481). *The Theosophical Path*, Volume 12-13.

θΔics

In terminology, **dead chemical**, as contrasted with a living chemical, is a religio-mythology anthropism of a chemical, i.e. atom, molecule, complex, or compound, etc., affixed with label of not being alive (i.e. dead or having no life); akin to a "soulless atom", by comparison.

Overview

In 1799, German philosopher Friedrich Schelling, in his *First Outline of a System of Philosophical Nature*, in discussion of animal electricity work of Luigi Galvani, stated the following: [1]

> "This process is an effect of galvanism, and for the time being can only be argued analogically from the action of galvanism on **dead chemical** substances (about which, moreover, still little is known) to the higher action."

In 1809, Goethe, in his *Elective Affinities* (P1:**C4**), via the voice of the Captain, in his three-person dialogue on the comparisons between human interactions and chemical reactions, states the following:

> "What we call limestone is more or less pure calcium oxide intimately united with a thin acid known to us in the gaseous state. If you put a piece of this limestone into dilute sulfuric acid, the latter will seize on the lime and join with it to form calcium sulfate, or gypsum; that thin gaseous acid, on the other hand escapes. Here there has occurred a separation and new combination, and one then feels justified even in employing the term 'elective affinity', because it really does look as if one relationship was preferred to another and chosen instead of it. You ought yourself to see these creatures, **which seem so dead** [**appear lifeless**], and which are yet so full of inward energy and force, at work before your eyes. You should observe them with a real personal interest. Now they seek each other out, attract each other, seize, crush, devour, destroy each other, and then suddenly reappear again out of their combinations, and come forward in fresh, renovated, unexpected form; thus you will comprehend how we attribute to them a **sort of immortality** [credits them with an **eternal life**]—how we speak of them as having sense and understanding; because we feel our own senses to be insufficient to observe them adequately, and our reason too weak to follow them."

In 1903, Austrian polyintellectual philosopher Otto Weininger, in his *Eros and Psyche or Sex and Character: A Fundamental Investigation*, building on the human chemical theory platform of Goethe (1809), stated the following: [4]

> "The law of sexual affinity is analogous in another respect to a well-known law of theoretical chemistry, although, indeed, there are marked differences. The violence of a chemical reaction is proportionate to the mass of the substances involved, as, or instance, a stronger acid solution unites with a stronger basic solution with greater avidity, just as is the case of the union of a pair of living beings with strong maleness and femaleness. But there is a difference between the living process and the reaction of the **lifeless chemical substances**. The living organism is not homogenous and isotropic in its composition; it is not divisible into a number of small parts of identical properties. The difference depends on the principle of individuality, on the fact that that every living thing is an individual, and that its individuality is essentially structural. And so in the vital process it is not as in inorganic chemistry; and there is no possibility of a larger proportion forming one compound, a smaller proportion forming another."

In 2006, philosopher C.W. Adams, in his *Actuality: Life in the Real World*, outlined a number of dead chemicals to humans stylized arguments; such as: [2]

> "Accidental evolution would require not only living chemicals somehow distinguishing themselves from **dead chemicals**, but also chemicals desiring to lengthen the lives of their descendent chemical

combinations. What mechanism gave such living chemicals the impetus to increase the chances of their descendants' survival? The implication of this is that not only will a batch of chemicals struggle to survive and avoid death, but that they will also adapt in ways that won't necessarily help them survive any better, but will help their descendants. What gave these chemicals the ability to calculate structural changes to improve the chances of survival for future species?

In 2008, Adams, in his *The Science of Truth*, stated the same argument as follows: [3]

> "Why would a lifeless or previously lifeless bag of chemicals decide it was important that future generations even exist, let alone improve their chances of survival? While we might quickly assume that living organisms would want to produce offspring with grater chances of survival, there is no rational reason for this desire. Why would a selfishly motivated newly living organism care about a future generation? First accidental evolutionists make a huge leap assuming that life somehow spontaneously generated from chemicals. Then they make a huge leap that these newly living chemicals somehow preferred survival and pain as opposed to a painless existence of nonlife. Then they make another huge leap by assuming that these newly living chemicals could and would want to dilute their strength to produce offspring that require only trouble and work to maintain. They against all odds, evolution theory proponents take the leap in assuming that these newly living chemicals somehow created an 'unselfish gene' that somehow passed on improvements for the future survival of future generations who do nothing for that newly living chemical itself. All of this was done by newly living chemicals that not much different in substance from their **dead chemical** cousins? The only answer accidental evolutionists seem to give us to these questions is that this all must have been a series of random accidents."

(add discussion)

Quotes

The following are other related quotes:

> "To get series of even 1,500 events to happen on order, events that might be moving from non-living chemicals to a living cell, there is only one chance in ten to the power of 450! This means that the probability of godless evolution even getting started is zero. Without belief in God, the only option [is to believe that] purposeless, mindless evolution of non-living chemicals over aeons of time [resulted in the formation of] a living cell and ultimately into man."
>
> — Jobe Martin (1994) (Ñº)

> "Some microbiologists even go so far as to say that viruses are non-living chemicals. Viruses occupy the twilight zone between the living and the nonliving. ln 1935, Stanley demonstrated that viruses could be crystallised like chemicals. In 1956, Geire and Sehramn extracted infections nucleic acid from a virus that could infect a host cell and go on to replicate. This made them classify viruses as **living chemicals**."
>
> — Pushpa Khurana (2005) (Ñº)

> "Spontaneous generation is a term referring to the manifestation of living organisms from non-living chemicals (also called abiogenesis). Evolutionists vehemently deny that they believe in spontaneous generation, but if you probe them about the appearance the first living organism, they will say that somehow it must have come from non-living chemicals. The name for this non-living mixture that they think spawned life varies: primordial goo, prebiotic soup, ancient oceans, etc. Some evolutionists, after

admitting that they believe nonlife produced life, will argue with you that they do not believe in spontaneously generation, though they believe precisely the definition of spontaneous generation."

— Brock Lee (2009) (Ñº)

References

1. Schelling, Friedrich. (1799). *First Outline of a System of Philosophical Nature* (pg. 129). SUNY Press, 2012.
2. Adams, C.W. (2006). *Actuality: Life in the Real World* (§:How could Chemicals have a Desire to Survive , pgs. 84-85; §:Chemicals Cannot Decide to Extend Their Successor's Lives", pgs. 86-87). C.W. Adams.
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4. Weininger, Otto. (1903). *Eros and Psyche or Sex and Character: A Fundamental Investigation* (*Geschlecht und Charakter: Eine prinzipielle Untersuchung*) (lifeless chemical substances, pg. 41). Vienna: Braumüller & Co.

θΔics

In hmolscience, **dead force**, or "vis mortua" (Latin), as compared to living force or "vis viva" (Latin), a religio-mythology + physics amalgamation (originated from Gottfried Leibniz), refers, in defunct non-physicochemcially neutral terminology, to a force that is dead; or, in semi-modern scientific translation to a force in a state of potential, approximately.

Quotes

The following are related quotes:

> "In considering the origin and manifestation of life, it would be foolish to suppose that a being with the very limited powers of man, could possibly discriminate between the manifestation of so-called **dead force** and so-called living [living force], when having under consideration objects of such infinitely small proportions. Because therefore man cannot see the muscles of an atom contract, or its lips articulating, or watch its organs perform their various functions, there is no reason for affirming that the atom is not a living being. When the thing itself is infinitely beyond the understanding of the greatest mind, it were only madness to suppose that we could know all its attributes and qualities. If I have affirmed, and if I believe that the atom is a thinking conscious being, it is not because I have scientifically demonstrated its intelligence or personality; but because of far higher reasons than those of physical science: I am a thinking conscious being; and whatever is in me, must be in the atom either actually or potentially, it matters not which."
>
> — Henry Bray (1910), *The Living Universe* [1]

References

1. Bray, Henry T. (1910). *The Living Universe* (§20: "Infinitesimal Architects, Builders, and Guardians", pg. 266). Truro Publishing Co., 1920.

θΔics

In religio-science, **dead matter**, as contrasted with living matter, is a defunct classification scheme, predominantly mythology-based, primarily rooted in the breath of life theory of creation (belief held by over ½ the world), which supposes that there exists types of matter that are "dead", namely atoms (dead atoms vs living atoms), molecules (dead molecules vs living molecules), compounds, molecular structures, etc., as contrasted with types of matter that are "alive".

Table 2.2d
Combustion heat of components of biomass

Material	ΔH protein (kcal/g)	ΔH fat (kcal/g)	ΔH carbohydrate (kcal/g)
Eggs	−5.75	−9.50	−3.75
Gelatin	−5.27	−9.50	–
Glycogen	–	–	−4.19
Meat, fish	−5.65	−9.50	–
Milk	−5.65	−9.25	−3.95
Fruits	−5.20	−9.30	−4.00
Grain	−5.80	−9.30	−4.20
Sucrose	–	–	−3.95
Glucose	–	–	−3.75
Mushroom	−5.00	−9.30	−4.10
Yeast	−5.00	−9.30	−4.20

Source: Morowitz (1968).

pursue the same lines as those mentioned in context with Eq. (6.3), where the mass conservation principle was applied. The conversion of biomass to chemical energy is illustrated in Table 2.2. The energy content per 1 g ash-free organic material is surprisingly uniform, as illustrated in Table 2.2 (see also the discussion in Chapter 7). Notice that the energy content in the table is the energy of "dead matter" applied as fuel due to its elementary composition. Table 2.2d indicates ΔH, which symbolises the increase in enthalpy, defined (see Section 2.4) as $H = U - pV$. The energy is originated from the following chemical process: organic matter + oxygen = carbon dioxide + water + other inorganic compounds as nitrate, sulphate and phosphate.

An excerpt of a description of biomass as "**dead matter**" in regards to the enthalpy of combustion of the each material, from Danish chemical engineer and ecologist Sven Jorgensen's 2004 *Toward's a Thermodynamic Theory for Ecological Systems* (citation Harold Morowitz), which is not the same type or in fact correct type of "enthalpy", namely enthalpy of formation (see: standard Gibbs free energy of formation), that went into the chemical synthesis, of an animated something such as an egg, fish (fish molecule), or animal, etc., which involves a double displacement reaction (reproduction) and is quite a different thermodynamic calculation all together, in regards to the methodology of making free energy tables (or affinity tables, historically). [5]

Overview

In 1879, Irish natural philosopher Joseph Murphy, in his *Habit and Intelligence*, devoted his third chapter to the issue of the physical chemical nature of the question of the origin of life, framed with in the context of physics (thermodynamics), chemistry, and Darwin's new theory of evolution, opening with a query on how "dead matter" gives rise to "living matter": [1]

> "Question whether life can evolve from matter.—We have seen in the preceding chapter that life appears to consist in the peculiar relations of the organism, or living being, to matter and energy. This however does not solve the questions, whether the peculiar vital principle is a resultant from the powers of **dead matter**, and whether life can be produced from inorganic matter by any physico-chemical process."

In 1926, Russian geochemical mineralogist Vladimir Vernadsky, in his famous *The Biosphere*, spent a good deal of time attempting to classify the biosphere ("sphere of life") form the physical chemical point of view, in which he made recourse to the classifications (a) living matter and (b) *kosnoe* matter or inert matter. In the end, however, is theory drifted off into the nonsensical, arguing, e.g. that the two types of matter are separated by an "impassable gulf" and recursively that living matter can only be generated by life. The English translation commentary seems to have equated "kosnoe matter" with "dead matter", although not exactly. To cite the example, on one page Vernadsky states: "the vitalistic and mechanistic representations of life are two reflections of related philosophical and religious ideas that are not deductions base upon scientific facts." [2] This sentence is than footnoted to the annotated explanation, by idea of annotator Mark A.S. McMenamin, that this passage is synonymous with Alexander Oparin's comment: [3]

> "At the dawn of the European civilization, with the Greek philosophers, there were two clear tendencies in this problem. Those are the Platonic and Democritian trends, either the view that **dead matter** was made alive by some spiritual principle or the assumption of a spontaneous generation from that matter, from dead or inert matter."

This sticky point living matter/dead matter issue quickly rises to the fore in the works of authors attempting to reconcile religion and science; a recent example being the work of American philosopher Christian de Quincey, who asks in his 2002 book *Radical Nature:* [4]

> "How can a science of **'dead' matter** ever account for the fact of consciousness?"

In a latter passage, in more detail, de Quincey gives the modern view:

> "Life and consciousness eventually appeared much later—only when conditions on a lump of rock and water circling one of the stars (and perhaps elsewhere) permitted the evolutionary process to shape **dead matter** into sufficiently complex forms, such as cells, nervous system, and brains. Any living biological forms, according to this view, are merely the chance results of 'accidental collections of atoms' that are themselves dead—without any trace of life or consciousness."

Here we see examples of forced-language, namely the study of matter, at standard temperatures and pressures, is chemistry, and chemistry does not defined matter according to the classifications of "living matter" and "dead matter".

Equilibrium = Death | Heat death

When the notion of heat death and or the idea that equilibrium equals death, according to certain arguments (e.g. Erwin Schrodinger, *What is Life?*), the notion of dead matter often arises. One example is German chemist Friedrich Cramer's 1993 cosmology and philosophy conference proceedings chapter "The Entropic Versus the Anthropic Principle: on the Self-Organization of Life", wherein he outright says frankly that the notion of "self-organization" lets the metaphysical into physics and justifies the notion of creation by God, and on the specific subject of dead matter, in conclusion states:

> "The incompatibility of the entropic and anthropic principles rests upon a too narrow a concept of matter, especially of living matter. The entropic principle is prevalent at or near equilibrium. All classical thermodynamics and the first and second laws of thermodynamics refer to situations at and near equilibrium and therefore deal with **dead matter**. Modern science now approaching such important problems as life, brain, evolution of the universe, etc., has to do with systems far away from equilibrium in which irreversible thermodynamics must be applied. In these systems phenomena of self-organization are observed. In my discussion on self-organization I have shown that with the term 'self-organization' one touches on the metaphysical element of a scientific evolution theory. There are no physics without metaphysical basis, but it is of the utmost importance to define precisely the connecting point between physics and metaphysics in order to avoid a confusion of categories. In the term of evolution the self-organization is this connecting point between theory and metatheory … With my new broader concept of matter which has been sketched briefly here, the biblical story of creation can neither be explained nor denied in an evolutionary field theory."

Here, of course, in regards to self-organization he is referring to theories of Belgian chemist Ilya Prigogine, which in and of themselves are crouched in anti-determinism and ideas on Henri Bergson's religious notion of "creative evolution".

See also

â— Defunct theory of life

References

1. Murphy, Joseph J. (1879). *Habit and Intelligence: a Series of Essays on the Laws of Life and Mind*. MacMillan and Co.
2. Vernadsky, Vladimir I. (1926). *The Biosphere* (dead matter, pg. 52). Copernicus.
3. Fox, S.W. ed. (1965). *The Origins of Prebiological Systems and of their Molecular Matrices*. New York: Academic Press.
4. De Quincey, Christian. (2002). *Radical Nature: Rediscovering the Soul of Matter* (dead, 25+ pgs). Invisible Cities Press.
5. Jorgenseon, Sven. (2004). *Toward's a Thermodynamic Theory for Ecological Systems* (dead matter, pg. 32). Gulf Professional Publication.
6. Cramer, Friedfrich. (1993)."The Entropic Versus the Anthropic Principle: on the Self-Organization of Life", in: *The Anthropic Principle: Proceedings of the Second Venice Conference on Cosmology and Philosophy* (pgs. 117-27). Cambridge University Press.

θΔics

In terminology, **dead molecule**, “dead molecular species” or dead chemical, as contrasted with a “living molecule” or living molecular species, is a molecule or molecular species not in possession of the hypothetical entity “life”.

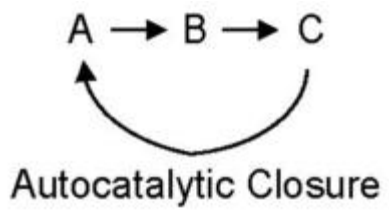

American Stuart Kauffman posits that alone A, B, and C are "**dead molecules**" or molecular species, but once auto-catalytic closure is achieved, the come alive.

Overview

In 1995, American biochemist Stuart Kauffman put forward a popular theory of catalytic closure (or auto-catalytic closure) in which, as he argues, at a certain threshold of molecular diversity in the course of the evolution of a system that a collection of molecular species can suddenly become “alive”. In his own words: [1]

> “If a sufficiently diverse mix of molecules accumulates somewhere, the chances that an autocatalytic system—a self-maintaining and self-reproducing metabolism—will spring forth becomes a near certainty … life, at its roots, lies in the property of catalytic closure among a collection of molecular species. Alone, each molecular species is dead. Jointly, once catalytic closure among them is achieved, the collective system of molecules is alive.”

In short, what Kauffman argues is that reactions such as:

$$A \rightarrow B \rightarrow C$$

in which one of the end products C acts as a catalyst to one of the initial reactants A, can be described as being auto-catalyzing or self-catalyzing and are thus the prototypes of life.

Discussion

This is one of the better "self-term arguments", but is still paramount to a biological perpetual motion reaction or mechanism. Moreover, there is no such thing a an "alive molecule". [2] The so-called "dead molecule" argument is one of several "absurdities", in Karl Pearson's terminology, that one arrives at when one begins to use hardened physical science positions to pry away at olden and cherished religio-mythology based notions and beliefs.

See also

â— Dead atom
â— Dead matter

References

1. Kauffman, Stuart. (1995). *At Home in the Universe - the Search for the Laws of Self-Organization and Complexity* (pg. 50). Oxford: Oxford University Press.
2. Thims, Libb. (2009). “Letter: Life a Defunct Scientific Theory”, *Journal of Human Thermodynamics*, Vol. 5, pgs. 20-21.

θΔics

In science, a **dead thing**, as contrasted with a so-called 'living thing', is religio-mythology based term referring to something that tends to lack the properties associated with bound state entities with powered reactive carbon-based animation.

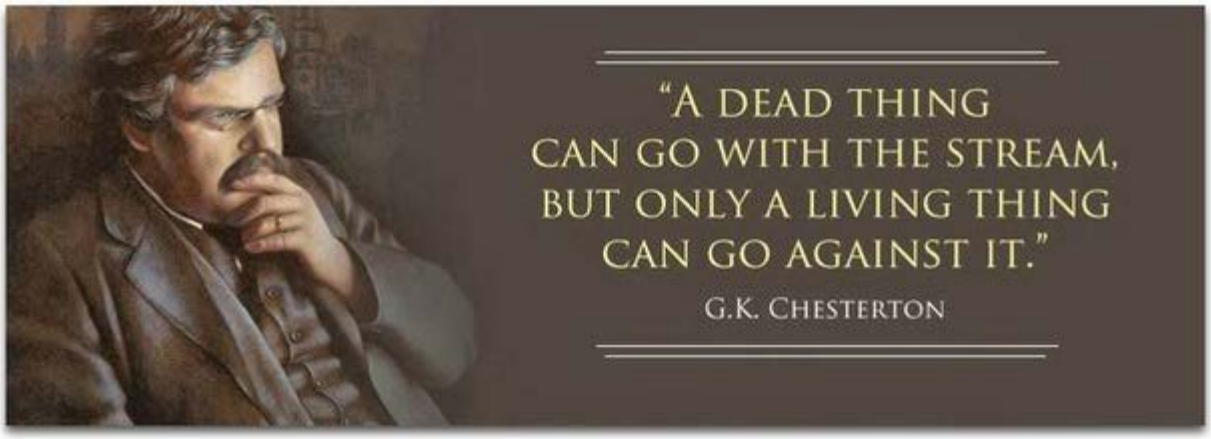

English writer philosopher Gilbert Chesterton (1874-1936) and his 1925 speculations on the nature of "**dead things**". [2]

Quotes

The following are related quotes:

> "The stone selenite holds the image of the moon even to her very phases. The magnet-stone points to the pole star. These are **dead things**, says Brutus, do living things likewise draw influences from the sky."
>
> — Jean Fernel (1548), *On the Hidden Causes of Things*, quoted by Charles Sherrington [1]

> "A **dead thing** can go with the stream, but only a living thing can go against it."
>
> — Gilbert Chesterton (1925), *The Everlasting Man* [2]

> "Men believe that death is stronger than life, and therefore **dead things** must be stronger than living things; whether those dead things are gold and iron and machinery or rocks and rivers and forces of nature. It may sound fanciful to say that men we meet at tea tables or talk to at garden-parties are secretly worshippers of Baal or Moloch. But this sort of commercial mind has its own cosmic vision and it is the vision of Carthage. It has in it the brutal blunder that was the ruin of Carthage. The Punic power fell, because there is in this materialism a mad indifference to real thought. By disbelieving in the soul, it comes to disbelieving in the mind."
>
> — Gilbert Chesterton (1925), *The Everlasting Man* [2]

See also

- Dead atom
- Dead chemical | an oft-employed 19th century term (Q)
- Dead energy | some type of feng shui spatial concept (Q)
- Dead force | a Gottfried Leibniz concept (Q)
- Dead matter
- Dead molecule

References

1. (a) Fernel, Jean. (1548). *On the Hidden Causes of Things* (*Dialog*. II, 18). Paris.
(b) Sherrington, Charles. (1938). *Man on His Nature* (pg. 54). Cambridge University Press, 1950.
2. (a) Chesterton, Gilbert K. (1925). *The Everlasting Man* (dead things, pgs. 130, 235) (Q) . Hodder & Stoughton.
(b) The Everlasting Man – Wikipedia.

θΔics

In human physics, **Dean I. Hamden** (c.1950-) is an American physicist noted for his 2008 to present efforts to ferret out a physics of human behavior model for college students.

Overview

In 2008, Hamden, at BehaviorPhysics.Blogspot.com, began blogging about his new physics of human behavior research project, using students as data.

In circa 2012, Hamden supposedly published a book summary of his efforts entitled *The Physics of Human Behavior*, based on four years of research, conducted on 500 individuals, in which a number of correlations are drawn out between anecdotal evidence observed in human behavior and some of the various laws and principles of physics.

The six chapter book, some of which is presented at the 2008 BehaviorPhysics.Blogspot.com, is said to touch on the application of various physics subjects, such as Newtons laws of motion, Hooke's law, the laws of thermodynamics, entropy, Heisenberg's uncertainty principle, the conservation of energy in relation to economics and wealth, the conservation of momentum, among others, all applied to human behavior, and framed around an end run effort to facilitate guidance on happiness attainment and relationship satisfaction.

Hamden employs terms such as "relational entropy", elastic constant (of relationships), resistance and uncertainty in relationships, among other theories. The project seems to have involved the students of Montclair State University.

To exemplify a few ideas, Hamden uses Newton's first law, which says that an object which is stationary or moving at a constant speed will continue indefinitely unless acted upon by an external force, to explain things such as why a parent won't give money to their child to buy new cloths, the effect of being rejected at a club, arguments that occur between people, marketing, etc., and gives advice on how to use Newton's law to the advantage.

Hamden defines a single human as "an integral part of nature, not a critical or even an important part, representing [as] a very complex composition of atoms and molecules, constituting multiple cell structures and organs communicating together and functioning as a whole." In regards to choice and human response to stimuli, he states "the process, by which man responds to a signal, is not random, but rather controlled by a set of natural laws of quantum mechanics and electrodynamics."

Table of contents

The following is the somewhat humorous table of contents for Hamden's book:

Ch.	Description
1.	Explore Newton's laws of dynamics, those of equilibrium and action-reaction to show you how to get what one desires from others and how to avoid conflict.
2.	Explore elastic behavior and Hooke's law, to help one realize how to control one's life and advise one's children to set the proper limitations in conduct and relationships, and to assess the likelihood of success in one's present relationship.
3.	Explore the laws of thermodynamics and entropy to learn how one can keep one's relationship healthy and how to assess the suitability of an intended mate.
4.	Explores the dynamics of Newton's second law to learn how to persuade people and win arguments.
5.	Explore the laws of uncertainty, and how to use it for a happier and better life.
6.	Explore the laws of conservation and energy to help balance and control one's life. Discusses the laws of economics in respect to the laws of physics and how one can become rich in the process.
A1.	Contains questionnaires that will assess the predictability of success in one's relationship.
A2.	Contains a questionnaire that evaluates the elastic constant in one's relationship and the happiness level it will produce.

Education

Hamden completed his BS and MAT at Fairleigh Dickinson University and PhD at Walden University. Hamden currently is a physics professor at Montclair State University, NJ, in the mathematical sciences division. In 2013, in his faculty page profile, Hamden listed the physics of human behavior and happiness as his research areas. [2]

See also

â— Dan Cobley

References

1. The Physics of Human Behavior – BehaviorPhysics.Blogspot.com.
2. Dean I. Hamden (faculty) – Montclair State University.

External links

â— Dean Hamden – Facebook.

â— Dean Hamden (@silwan23) – Twitter.

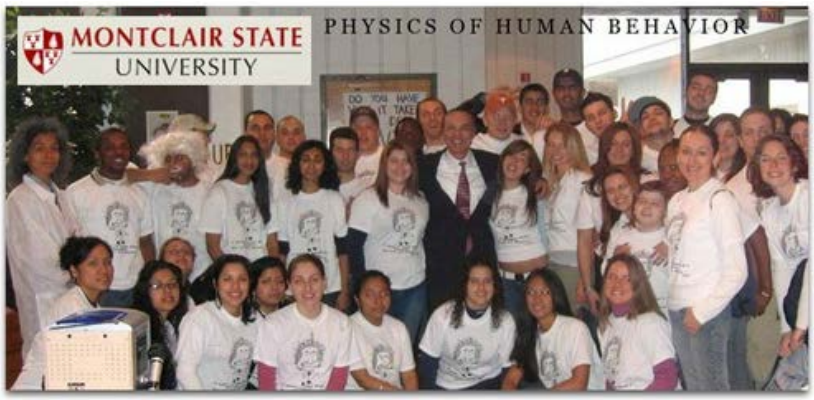

A 2009 photo of **Hamden**'s Montclair State University "physics of human behavior" student research group, wherein they apply concepts such as Hooke's law and elasticity coefficients to human relationships, in regards to flexibility in relationships, relationship elasticity coefficients, and correlative levels of happiness . [1]

In hmolscience, **Dean H. Kenyon** (c.1939-) is an American biophysicist noted for his 1969 *Biochemical Predestination*, co-authored with Gary Steinman, wherein they theologically distort Jacques Monod's "necessity" term into "predestination" as a type of anti-chance god-through-chemistry divination argument for where "biological information" came from, approximately.

Education

In 1959, Kenyon, while studying physics as an under graduate at the University of Chicago, went to the Darwin centennial celebration and listed to people speak, which sparked his interest in evolution vs creationism conflict; which piqued his interest, therein giving him direction of what he would do in graduate school. (Q)

Kenyon eventually completed his PhD at Stanford (and or Berkeley) under biochemist and origin of life researcher Melvin Calvin; and by the late 1960s had become steeped in the origin of life literature and was well aware of Jacques Monod's so-labeled "conceptual dichotomy between chance and necessity", as Stephen Meyer (2009) phrases it. [3]

Necessity | Predestination

Kenyon, supposedly, interpreted Monod's ideology such that "necessity", i.e. the law-like forces of physics and chemistry, was the logical alternative to "chance"; Kenyon reasoned, according to Meyer, that if "chance events" couldn't explain the origin of "biological information" (Meyer's term, supposedly), then, Kenyon thought, perhaps necessity could. Meyer teamed up with colleague Gary Steinman and together they renamed necessity as "predestination" or "biological predestination", which became the title of their 1969 book. Meyer seems, of note, to think that Kenyon and Steinman, here, were the originators of the "self-organization" theory of the origin of life. [3]

The gist of Kenyon's theory, as summarized by Meyer, is anti-chance (unlike Oparin), employs "deterministic chemical reactions", but is in some blurry way is creator-chosen; something along the lines of the following argument, as summarized by Meyer: [3]

> "From a purely chemical point of view nothing discriminates the silver in a spoon from that in a knife or fork. Nor does the chemistry of these items explain their arrangement in a standard place setting with the fork on the left and knife and spoon on the right. The chemistry of the silverware is indifferent to how the silver is arranged on the table. The arrangement is 'determined' NOT by the properties of the silver or by chemical laws describing them, but by the 'choice' of the *rational agent* to follow a human convention."

Here, supposedly, this a "sneaking god in the chemistry" type argument; though a reading of the actual book will be needed to corroborate the details of the misalignments in the argument.

Creation science

In the mid-1970s, Kenyon began to doubt his chemical predestination theory, or aspects of it, and switched over from Roman Catholic in belief to young earth creationism ideologies, such as were being argued by Henry Morris. [4]

In 1993 Kenyon was removed from teaching Biology 101 at San Francisco State University. On December 6, 1993 the Wall Street Journal published an article detailing Kenyon's treatment: "Unlike Scopes, the teacher was forbidden to teach his course not because he taught evolutionary theory (which he did) but because he offered a critical assessment of it." (Q)

Related | Creationist cuckoos

The following are AZQuotes' group of "birds of a feather flock together" authors related to Kenyon: [2]

People, at Amazon, who bought Kenyon's *Biological Predestination* also bought Michael Behe's *Darwin's Black Box*.

Quotes

The following are representative quotes:

> "If the association of amino acids were a completely random event, there would not be enough mass in the entire earth, assuming it was composed exclusively of amino acids, to make even one molecule of every possible sequence of a low-molecular weight protein."
>
> — Dean Kenyon (c.1975) [3]

> "Let us dispose of a common misconception. The complete transmutation of even one animal species into a different species has never been directly observed either in the laboratory or in the field."
>
> — Dean Kenyon (c.1975) [2]

> "It is my conviction that if any professional biologist will take adequate time to examine carefully the assumptions upon which the macro-evolution doctrine rests, and the observational and laboratory evidence that bears on the problem of origins, he or she will conclude that there are substantial reasons for doubting the truth of this doctrine. Moreover, I believe that a scientifically sound creationist view of origins is not only possible, but it is to be preferred over the evolutionary one."
>
> — Dean Kenyon (c.1975) [2]

References

1. (a) Kenyon, Dean and Steinman, Gary. (1969). *Biochemical Predestination*. McGraw-Hill.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pgs. 287-88). Zondervan, 2009.
(c) Meyer, Stephen C. (2009). *Signature in the Cell: DNA and the Evidence for Intelligent Design* (§11: Self-Organization and Biochemical Predestination, pgs. 229-). Zondervan.
2. Dean H. Kenyon – AZQuotes.com.

3. Meyer, Stephen C. (2009). *Signature in the Cell: DNA and the Evidence for Intelligent Design* (§11: Self-Organization and Biochemical Predestination, pgs. 229-). Zondervan.
4. Biochemical Predestination – Wikipedia.

Further reading

● Thaxton, Charles B., Bradley, Walter L., Olsen, Roger L., and Kenyon, Dean H. (1992). *The Mystery of Life's Origin: Reassessing Current Theories* (ch. 7: "Thermodynamics of Living Systems", ch. 8: "Thermodynamics and the Origin of Life"). Lewis and Stanely.

External links

● Dean H. Kenyon – Wikipedia.
● Dean Kenyon – Discovery Institute.

θΔics

In existographies, **Dean Simonton** (1948-) (CR:21) is an American social psychologist noted for his 1980-present genius studies work, particularly those of American Presidents.

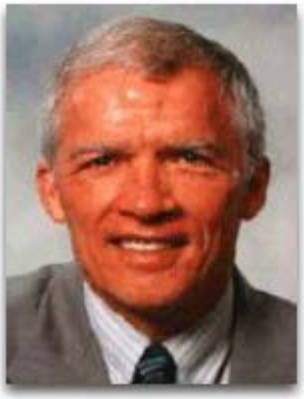

Early parental death | Geniuses

In 2002, Simonton, in his *Great Psychologists and Their Times*, gave a partial list of scientists, philosophers, and psychologists, common to the phenomenon of early parental death and genius. [4]

Race | IQ

Simonton has done a certain amount of work on "race", which he calls an "extremely slippery concept" and IQ. In his "Race and Racism" section of his 1994 *Greatness: Who Makes History and Why*, he comments about how someone in the 1930s calculated an IQ 200 estimate for a 9-year old African-American girl. [2] In 2009, one of his articles received an Award for Excellence in Research, for a study of the association between childhood giftedness and adulthood genius in a sample of 291 eminent African Americans. [3]

Presidential IQs

The following, below right, are the top 16 smartest American Presidents according to Simonton's 2006 study, as compared to a 2013 colloquial poll, below left, conducted by American genius studies scholar Libb Thims, the results of about 25-35 people who were the in-person queried with: "Who are the Three Smartest American Presidents", of which 18 were able to give answers: [6]

Rank	**Smartest Presidents** (2013 colloquial opinion)	**Votes**	**IQG**	**Smartest Presidents** (2006 Simonton ranking)	**IQs**
1.	Thomas Jefferson (1743-1826)	11	180	John Adams (1735-1826)	173
2.	Abraham Lincoln (1809–1865)	8	160	Thomas Jefferson (1743-1826)	160
3.	John F. Kennedy (1917–1963)	6		John F. Kennedy (1917–1963)	158
4.	Franklin D. Roosevelt (1882–1945)	6		Bill Clinton (1946-)	156
5.	Bill Clinton (1946-)	5		James Madison (1751-1836)	155
6.	Theodore Roosevelt (1858–1919)	5		Jimmy Carter (1924-)	153
7.	John Adams (1735-1826)	2			
8.	Woodrow Wilson (1856–1924)	2		Woodrow Wilson (1856–1924)	152
9.	George Washington (1732-1799)	2		Theodore Roosevelt (1858–1919)	149
	James Madison			James Garfield	

10.	(1751-1836)	1		(1831–1881)	148
11	Jimmy Carter (1924-)	1		Chester Arthur (1829–1886)	148
12.	Ronald Reagan (1911–2004)	1		Abraham Lincoln (1809–1865)	148
13.	Barack Obama (1961-)	1	134	Franklin D. Roosevelt (1882–1945)	146
14.	Lyndon Johnson (1908–1973)	1		Millard Fillmore (1800–1874)	143
15.	Harry Truman (1884–1972)	1		John Tyler (1790–1862)	142
16.	James Monroe (1758–1831)	1		Franklin Pierce (1804–1869)	141

Simonton, curiously, seems to consider John Adams to have the highest IQ, ahead of Thomas Jefferson (who he ranks second in intelligence), which is odd being that Jefferson was often known as a walking encyclopedia, interested not just in political science, but also natural science, philosophy, and atheism/religion conflicts. While John Adams may very well have been the patriarch in the creation of his two cultures genius protege great grandson Henry Adams, the second greatest of the social Newtons, it remains to be seen of Adams senior was sharper than Jefferson.

Education | Creativity

In the 1980s, Simonton conducted a study of geniuses, creative geniuses vs. leadership geniuses, and educational level for each. The following is The following is Simonton's 1983 "Formal Education, Eminence, and Dogmatism: the Curvilinear Relationship" diagram, showing the eminence (of the 301 Cox geniuses) versus level of formal education, shown adjacent to a verbal synopsis of his findings: [1]

"These days it is virtually impossible to get anywhere in these fields without a JD, MD, or PhD. On the other hand, most artistic creators, revolutionary scientists, and other more unconventional achievers may have much to lose and little to gain form continuing with more than a smattering of higher education. They may need enough formal training to acquire certain basic knowledge and skills, such as the ability to write well and to carry on an informed conversation. Beyond that, the

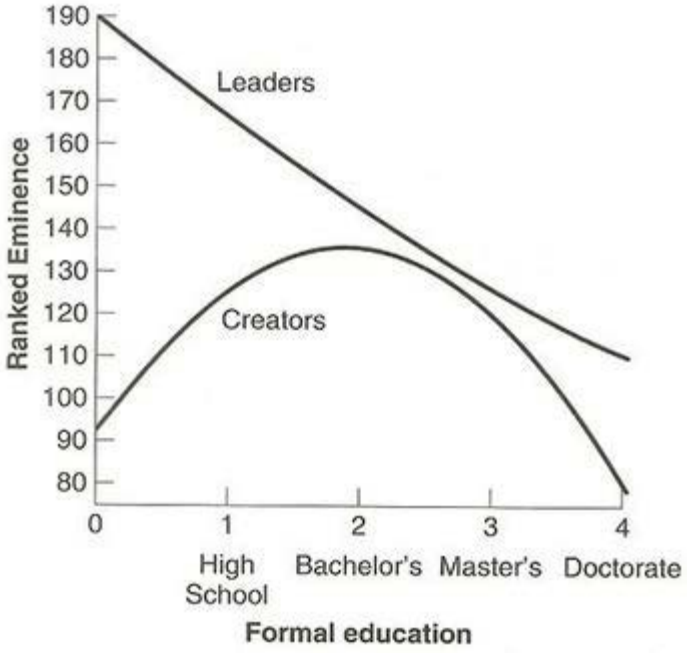

increased inculcation of more specialized disciplinary preoccupations may only interfere with more important pursuits. For instance, success in many fields is strongly correlated with voracious and omnivorous reading, and undisciplined activity that may suffer under academic demands."

(add discussion)

Education

Simonton completed his BA in 1970 in psychology at Occidental College, and his MA (1973) and PhD (1975) both in social psychology at Harvard University, the latter of which he traces his academic lineage (Ñº), supposedly, back through James Cattell, Wilhelm Wundt, and William James. Simonton currently is a psychology professor, teaching courses on the history of psychology and genius and creativity, at the University of California, Davis.

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(b) IQ estimates [of US Presidents] by academics (section) – Wikipedia.
(c) Thims, Libb. (2013). "Poll: 3 Smartest American Presidents?" (N=25-35/18), Nov 11.
(d) Note: a quick estimate for Obama's IQ was made based on the mean of a number of spurious Internet sources: 110-160 (Ñº), 120-130 (Ñº), 130 (Ñº), 145 (Ñº).

Further reading

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External links

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â— Dean Simonton – InformationPhilosopher.com.
â— Simonton, Dean – WorldCat Identities.
â— Dean Simonton – Google Scholar.

θΔics

In hmolscience, **Dean Wooldridge** (1913-2006) was an American child prodigy turned physicist, aerospace engineer, and "through-going physics-based mechanistic materialist" philosopher, of a Charles Sherrington flavor (e.g. he cites Gosta Ehrensvard, 1960), noted for his 1968 *The Mechanical Man: the Physical Basis of Intelligent Life*, wherein he lays out the view that human functions and properties, e.g. behavior, intelligence, consciousness, personality, and free will, etc., are entirely reducible to and operate according to the laws of physics.

Overview

Wooldridge's first two books, on the application of physics to the biological realm were: *The Machinery of the Brain* (1963) and *The Machinery of Life* (1966) wherein he attempted the "reducibility of biology to physics" in his words. [2] The content of these first two books, in turn, was shortened and simplified, making it more accessible for non-scientists, into chapters 1-6 and 13-15 of his *The Mechanical Man: the Physical Basis of Intelligent Life* (1968), wherein he expands with chapters on the physical science of: intelligence, personality, and free will.

Soul | Reductionism

Wooldridge mentions the "soul" in three places; first in respect to consciousness, noting that the ancients, i.e. Egyptians, believed that the heart was the seat of the soul, but that with recent surgical achievements involving heart modification, and artificial heart replacement near—a milestone completed in 1982 by Robert Jarvik—that the heart is now proved to be irrelevant to consciousness (and in turn the soul); the second and third usage, is in his end section five "Implications of the Physical Explanation of Biology", is the rather peculiar view that conscious is akin to a light bulb, according to which when the current or power is turned off a person is "dead" and when the power is turned on the person is "alive", but wherein we do not attribute these properties to the bulb, so should it be with consciousness, according to which:

> "A state of consciousness whose existence and properties are completely determined by the operation of the laws of physics in the material of the brain, and which experiences death and rebirth several times a minute, would appear to leave conventional religion very little to work with. With no independently surviving soul to reward or punish in an afterlife, there can be no purely religious compulsion toward acceptable social behavior."

This type of reductionism to reality reasoning, according to Thomas Georges (2013), is both amazing and disturbing because it upsets a "lifetime of Catholic doctrine about the immortality of the soul and the spiritual nature of the human mind." [1]

Religion

Wooldridge's style of writing was of the implicit atheism and or atheism defense variety; the following quote is one example:

> "With the general recognition of the meaninglessness of the traditional and essentially mystical concepts of 'right' and 'wrong', will immorality and crime run so rampant that human society will become impossible? Almost certainly not. Indeed, there is evidence that the incidence of crime and immoral behavior is any higher in several large atheistic countries that exist today than in the Christian democracies. According to our mechanistic point of view, a tendency toward moral behavior is a genetically determined, evolutionary developed physical property of the human animal, just like the number of fingers and the size of the brain."
>
> — Dean Wooldridge (1968), *Mechanical Man: The Physical Basis of Intelligent Life* (pgs. 190-91)

Wooldridge, of note, in 1936, after receiving his PhD, married Helene Detweiler, a Methodist minister's daughter who

had obtained her MA in social work from the University of Southern California, and according to Dean's son, Jim Wooldridge, that the 65-year marriage (up to her passing in 2001) was a strong one. There dialogue on this topic, no doubt, would have been similar to Francis Crick and his wife Odilie Watson (1920-2007) and her childhood confusion about the soul as "living bean" (bean NOT being) model of right and wrong.

Education

Wooldridge, cited as a child prodigy, graduated from high school at age of 14, entered the University of Oklahoma (Q), via a scholarship obtained by winning a typing contest (200 words per minute), wherein, originally aiming to study law, he completed his BS in physics (Q) in 1932 (age 18) and his MS in 1933 (age 19), and then completed his PhD in 1936 (age 23) in physics (*summa *** laude*), under electromagnetism expert William Smythe (also PhD advisor to laser inventor Charles Townes), studying the separation of isotopes (prepared an isotopically enriched target of carbon-13) (Q). He then went to work for Bell Labs, where he supervised the first air-born fire-controls system; later forming the TRW Corporation, which built one of the first American spacecrafts. [4]

Quotes

The following are noted quotes:

> "The impressive past successes of physical science in transferring one after another of the details of human experience out of the supernatural into the realm of the understandable — including: rain and wind, lightening and earthquake, and the rising and setting of the sun and stars, which have long since been accepted as manifestations of the workings of the laws of gravity, mechanics, thermodynamics, and electricity — inspire the present attempt to account for the origin and properties of organisms, including man, e.g. behavior, intelligence, consciousness, personality, and free will, by means of the principles of physics."
>
> — Dean Wooldridge (1968), *Mechanical Man: the Physical Basis of Intelligent Life* (truncation quote; pgs. 1+4)

> "Even the existence among the laws of a principle of indeterminacy limiting the precision with which the future can be predicted does not permit entry of caprice into the world of the physical scientist. Within a calculable and frequently very narrow range of uncertainty, the future is completely determined by the past. Given the laws and the particles, all else follows inexorably."
>
> — Dean Wooldridge (1968), *Mechanical Man: the Physical Basis of Intelligent Life* (pgs. 2-3)

> "The properties we call lifelike that differentiate living cells from inanimate matter result directly from the nucleic acid and protein enzyme mechanisms, and a complete explanation of these mechanisms is possible in terms of the operation in inert chemical ingredients of ordinary laws of physical science."
>
> — Dean Wooldridge (1968), *Mechanical Man: the Physical Basis of Intelligent Life* (pg. 17)

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External links

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θΔics

In science, **deanthropomorphize**, in contrast to anthropomorphize, from *de-* a privative connoting 'absence of a quality', the Greek *anthropos*, meaning 'man', and *morphe*, meaning 'form', refers to the process of removing human-biased notions and concepts from the understanding of a subject.

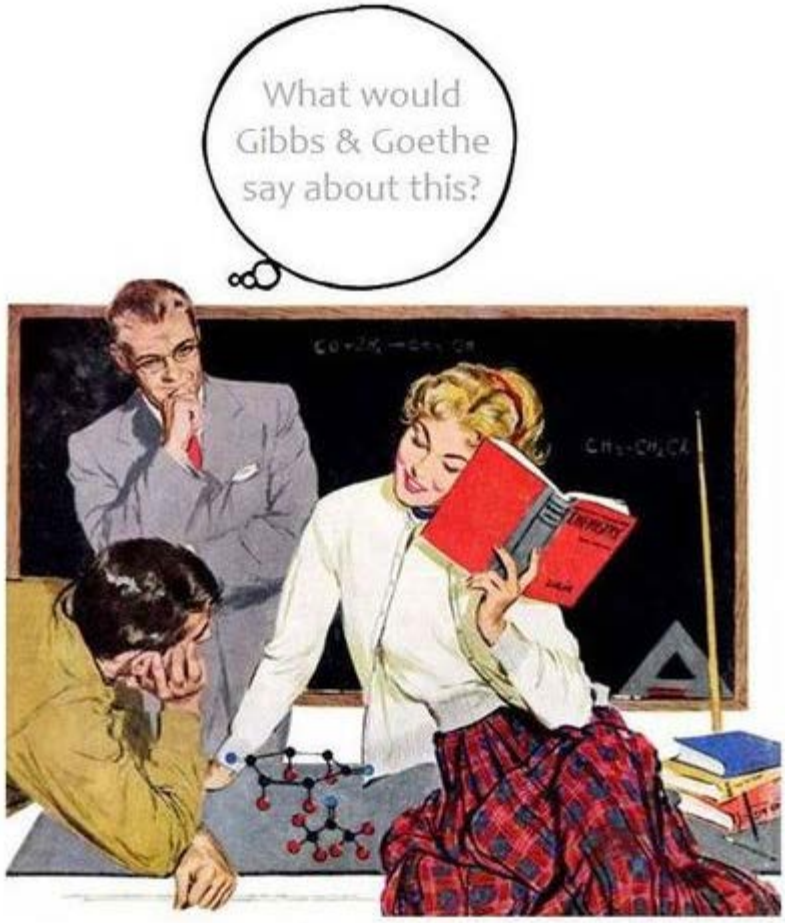

A physical chemist attempt to understand the phenomena depicted in **deanthropomorphized** terms, namely those of chemical thermodynamics.

Overview

The deanthropomorphize model is one of the stages of human belief system development, following the anthropomorphizing stage of theorizing about nature, e.g. the Egyptians conceiving of universe creation/formation, i.e. the Ennead of Heliopolis, in terms of the generations of god families (see: Anunian theology), Johannes Kepler thinking that each planet was ridden by an angel, or Rene Descartes' human automaton actuating itself, etc., is the "deanthropize" or de-anthropomorphizing stage of theorizing about nature, according to which the human mind looking at nature has to dehumanize its point of view. [1] To deanthropomorphize, in short, means to free from anthropomorphic attributes or notions; or to rid philosophy or science of anthropomorphic beliefs or anthropomorphism. [2]

In 1882, American theologian Charles Shields referred to the "deanthropomorphizing tendency" of modern science. [3]

In the 1920s, Australian-born British philosopher Samuel Alexander (1859-1938), noted space-time human existence theory philosopher, explained how humanity has had to "deanthropize" itself, in regards to many of its belief systems. [1]

In the 2011, Canadian chemists Peter Mahaffy, Bob Bucat, Roy Tasker, et. al., in their textbook *Chemistry: Human Activity, Chemical Reactivity*, explicitly outline their chemical language philosophy as follows: [4]

> "We have taken great care in our use of language, terminology, chemical notation, and artwork to avoid confirming, or worse still, generating misconceptions. We avoid, for example, language that suggests that a chemical species can 'attack' another molecule in some pre-destined way."

A modern example of a deanthropomorphism or a "deanthropomorphism process" is the 21st century ridding or jettisoning of the notion of 'life' (or theory of life) from the science, philosophy, and the humanities (see: defunct theory of life) and residual effect classification of the 'biology', and its related bio- prefixed derivatives, as a defunct term, upgraded or rather deanthropomorphized to chnopsology.

Quotes

The following are related quotes:

> "There is only one method of apprehending the real nature of causality. This method is to begin with the world of data which we possess, i.e. our experiences, to generalize, to **eliminate** as far as possible all

anthropomorphic elements and thus cautiously to elaborate an objective conception of causality. The many attempts which have been made in this direction show us that the best approach to the concept of causality consists in attaching it to the capacity of foretelling future events which we have acquired and tested in daily experience. And indeed there is no better means of demonstrating the causal connection between two events than to show that the occurrence of the one event can regularly permit us to forecast the occurrence of the other."

— Max Planck (1936), *The Philosophy of Physics* [5]

"Our sixteenth-century Fernel viewed the body as a tenement for faculties. One faculty was that which actuated the various bodily movements. Then came Descartes with is robot [see: Cartesian automata], a mechanism actuating itself. Such too had been Descartes' thought with respect to the motions of the macrocosm. For Kepler still, a century later than Fernel, each planet was ridden by an angel. Then later with the 'reign of law' that guidance became a 'force', e.g. gravitational. Today that 'force' has in turn disappeared. There remains a curvature of space. The human mind looking at nature has had to dehumanize its point of view—it has, using Samuel Alexander's word, to **'deanthropize'** itself. It has to dispense with 'causation', which is regarded as an anthropism, but is yet a final cause. It is more faithful to William of Occam."

— Charles Sherrington (1938), *Man on His Nature* [1]

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External links

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θΔics

In terminology, **death** is a defunct scientific term (see: defunct theory of life), of religio-mythology origin, formerly defined as the termination of life, conceptualized to refer to a "special" end state (see: life principle) of conatus-like existence of powered animated motile carbon-based or CHNOPS-plus based matter. [1]

Life terminology upgrades

See main: Life terminology upgrades

As "chemistry does not know the word life" (see: defunct theory of life), as English physiologist Charles Sherrington aptly put it in 1938, so to does chemistry not recognize the word "death". In this sense, in respect to post 2010 *Hmolpedia* and 2012 JHT terminology reform initiatives, a few water-testing stage death-upgrade chemical thermodynamically neutral terms that have been used include:

- Died → Dereacted (Q) ; Deboundstated
- Dead → Debounded; No reaction existence
- Death → Reaction end

Though, to note, it is difficult to find actual historical precedence in respect to reform of this specific term.

Cultural death

In 1944, American anthropologist Alfred Kroeber defined the death of a society or cultural “dying”, in what seem to be physical chemistry terms, as follows: [6]

> “Cultural dying is a replacement of most of the material and patterns with new material and patterns developed within the culture, until after a sufficient length of time, the transformation is so great that it is descriptively more useful to speak of the end product as a new culture, or one different from the original one.”

This is an intuitive view being that what are perceptually conceived as "biological entities", such as birds and bees, are actually carbon-centric reactive molecules, formed through chemical reaction synthesis, and transformed likewise in a reverse type of reaction, but do not actually "live" or "die", in a physical chemistry sense.

Heat death

In the 1850s, Scottish physicist William Thomson and German physicist Rudolf Clausius proposed the "heat death" end state model of the universe. [3]

In 1944, Austrian physicist physicist Erwin Schrödinger defined death, thermodynamically, as "the dangerous state of maximum entropy". [2] The study of what happens to a person when they die, according to the laws of thermodynamics, is called cessation thermodynamics. [4]

Author Stephen Haines, an engineer, management consultant, and human systems theorist, states, based on extrapolations of the heat death theory, that entropy refers to the natural characteristic of all living systems to eventually slow down and die. [5]

Quotes

The following are popular death quotes:

> “There is neither birth nor **death** for any mortal, but only a combination and separation of that which was combined, and this is what amongst laymen they call ‘birth’ and ‘death’. Only infants or short-sighted persons imagine any thing is ‘born’ which did not exist before, or that any thing can ‘die’ or parish totally.”

— Empedocles (c.450BC) fragment; cited by Baron d'Holbach in *The System of Nature* (pg. 27); cited by cited by Alfred Lotka (1925) in *Elements of Physical Biology* (pg. 185, 246)

"**Death** is a punishment to some, to some a gift, and to many a favor."

— Seneca (c.55AD) (Q)

"Sleep is lovely, **death** is better still, not to have been born is of course the miracle."

— Heinrich Heine (c.1835) (Q)

"**Death** is a stripping away of all that is not you. The secret of life is to die before you die—and find that there is no death."

— Eckhart Tolle (1997), *The Power of Now* (Q) [7]

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External links

- Death – Wikipedia.

θΔics

In religio-mythology, **death and resurrection of Jesus**, the Roman recension of the death and resurrection of Osiris, refers to story of the trial, crucifixion, death, and resurrection of the god-man figure of Jesus (or Jesus Christ).

Resurrection | Accounts

The four different and varied accounts of the resurrection of Jesus are summarized by Thomas Paine (1794) as follows: [1]

> "The book of Matthew [28:1] that at the end of the Sabbath, as it began to dawn, towards the first day of the week, came Mary Magdalene and the other Mary, to see the sepulcher. Mark says it was sun-rising, and John says it was dark. Luke says it was Mary Magdalene and Joanna, and Mary the mother of James, and other women, that came to the sepulcher; and John states that Mary Magdalene came alone. So well do they agree about their first evidence! They all, however, appear to have known most about Mary Magdalene"

Paine continues:

> "The book of Matthew goes on to say (28:2): "And behold there was a great earthquake, for the angel of the Lord descended from heaven, and came and rolled back the stone from the door, and sat upon it" But the other books say nothing about any earthquake, nor about the angel rolling back the stone, and sitting upon it and, according to their account, there was no angel sitting there. Mark says the angel [Mark says 'a young man', and Luke 'two men' (Conway, 1896)] was within the sepulcher, sitting on the right side. Luke says there were two, and they were both standing up; and John says they were both sitting down, one at the head and the other at the feet.
>
> Matthew says, that the angel that was sitting upon the stone on the outside of the sepulcher told the two Marys that Christ was risen, and that the women went away quickly. Mark says, that the women, upon seeing the stone rolled away, and wondering at it, went into the sepulcher, and that it was the angel that was sitting within on the right side, that told them so. Luke says, it was the two angels that were Standing up; and John says, it was Jesus Christ himself that told it to Mary Magdalene; and that she did not go into the sepulcher, but only stooped down and looked in."

(add discussion)

John | Version

The following is the description of the sentencing, crucifixion, and death of Jesus, according to the KJV of John 19: (Ñº)

John 19:1-16 | Jesus Sentenced

1 Then Pilate therefore took Jesus, and scourged him.
2And the soldiers platted a crown of thorns, and put it on his head, and they put on him a purple robe,
3And said, Hail, King of the Jews! and they smote him with their hands.
4Pilate therefore went forth again, and saith unto them, Behold, I bring him forth to you, that ye may know that I find no fault in him.
5Then came Jesus forth, wearing the crown of thorns, and the purple robe. And Pilate saith unto

them, Behold the man!
6When the chief priests therefore and officers saw him, they cried out, saying, Crucify him, crucify him. Pilate saith unto them, Take ye him, and crucify him: for I find no fault in him.
7The Jews answered him, We have a law, and by our law he ought to die, because he made himself the Son of God.
8When Pilate therefore heard that saying, he was the more afraid;
9And went again into the judgment hall, and saith unto Jesus, Whence art thou? But Jesus gave him no answer.
10Then saith Pilate unto him, Speakest thou not unto me? knowest thou not that I have power to crucify thee, and have power to release thee?
11Jesus answered, Thou couldest have no power at all against me, except it were given thee from above: therefore he that delivered me unto thee hath the greater sin.
12And from thenceforth Pilate sought to release him: but the Jews cried out, saying, If thou let this man go, thou art not Caesar's friend: whosoever maketh himself a king speaketh against Caesar.
13When Pilate therefore heard that saying, he brought Jesus forth, and sat down in the judgment seat in a place that is called the Pavement, but in the Hebrew, Gabbatha.
14And it was the preparation of the passover, and about the sixth hour: and he saith unto the Jews, Behold your King!
15But they cried out, Away with him, away with him, crucify him. Pilate saith unto them, Shall I crucify your King? The chief priests answered, **We have no king but Caesar**.
16Then delivered he him therefore unto them to be crucified. And they took Jesus, and led him away.

John 19:17-27 | Jesus Crucified

17And he bearing his cross went forth into a place called the place of a skull, which is called in the Hebrew Golgotha:
18Where they crucified him, and two other with him, on either side one, and Jesus in the midst.
19And Pilate wrote a title, and put it on the cross. And the writing was Jesus Of Nazareth The King Of The Jews.
20This title then read many of the Jews: for the place where Jesus was crucified was nigh to the city: and it was **written in Hebrew, and Greek, and Latin** .

21Then said the chief priests of the Jews to Pilate, Write not, The King of the Jews; but that he said, I

Compare

Here, in John 19:15-20, we see, in the context of recension theory, the gist of "Roman recension", i.e. an ancient religious reformulated in aims to unify the Hebrew, Greek, and Latin speaking people, and their respective religions, under a new Roman empire state religion, with Caesar as king, Jesus as savior, and god as syncretism of all previous supreme gods.

am King of the Jews.
22Pilate answered, What I have written I have written.
23Then the soldiers, when they had crucified Jesus, took his garments, and made four parts, to every soldier a part; and also his coat: now the coat was without seam, woven from the top throughout.
24They said therefore among themselves, Let us not rend it, but cast lots for it, whose it shall be: that the scripture might be fulfilled, which saith, They parted my raiment among them, and for my vesture they did cast lots. These things therefore the soldiers did.

25Now there stood by the cross of Jesus his mother **[Virgin Mary]**, and his mother's sister, **Mary** the wife of Cleophas, and **Mary Magdalene**.

"Now there stood by the cross of Jesus his mother [**Mary**], and his mother's sister, **Mary** the wife of Cleophas, and **Mary** Magdalene."
— Anon (c.200AD), *Bible*, John 19:25

26When Jesus therefore saw his mother, and the disciple standing by, whom he loved, he saith unto his mother, Woman, behold thy son!
27Then saith he to the disciple, Behold thy mother! And from that hour that disciple took her unto his own home.

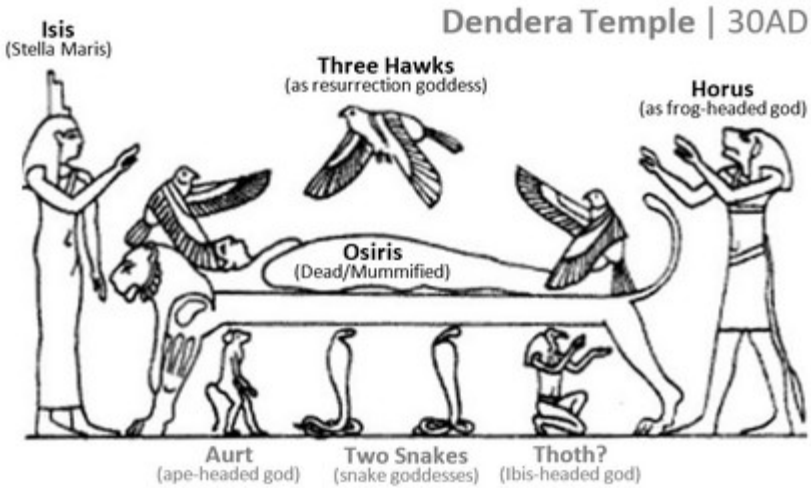

Here, we can compare the three "Mary" figures as the side of Jesus with the three "hawk" goddess, as shown above, above Osiris, along with Isis (aka Stella Maris), as shown in scene #12 of the Death and Resurrection of Osiris as depicted at Dendera Temple.

John 19:28-37 | Death of Jesus

28After this, Jesus

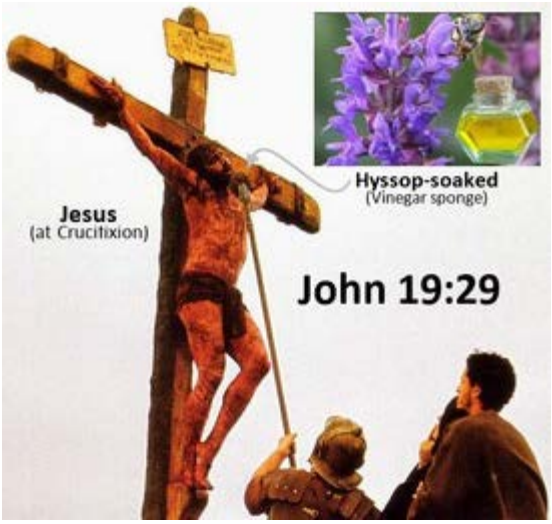

Compare

Hyssop was used as a cleansing and protective herb in Biblical times (Ñº); has something to do, supposedly, with or related to the incents and oils used in the 70-mummification process, first done on Osiris, mythically speaking.

knowing that all things were now accomplished,
that the scripture might be fulfilled, saith, I thirst.
29Now there was set a vessel full of vinegar: and
they **filled a spunge with vinegar**, and **put it**
upon hyssop, and **put it to his mouth**.
30When Jesus therefore had received the vinegar,
he said, It is finished: and he bowed his head, and
gave up the ghost.

31The Jews therefore, because it was the
preparation, that the bodies should not remain upon
the cross on the sabbath day, (for that sabbath day
was an high day,) besought Pilate that their legs
might be broken, and that they might be taken
away.
32Then came the soldiers, and brake the legs of the
first, and of the other which was crucified with
him.

33But when they came to Jesus, and saw that he
was dead already, they brake not his legs:
34But one of the soldiers with a **spear pierced**
his side, and forthwith came there out blood and
water.

35And he that saw it bare record, and his record is
true: and he knoweth that he saith true, that ye
might believe.
36For these things were done, that the scripture
should be fulfilled, A bone of him shall not be
broken.
37And again another scripture saith, They shall
look on him whom they pierced.

John 19:38-43 | Preparation of Body

38And after this Joseph of Arimathaea, being a
disciple of Jesus, but secretly for fear of the Jews,
besought Pilate that he might take away the body
of Jesus: and Pilate gave him leave. He came
therefore, and took the body of Jesus.

Compare

"In the Theban Recension [2040-720BC] of the *Book of the Dead*, **Anubis** [**John**] plays some very prominent parts, the most important of all being those which are connected with the judgment and the embalming of the deceased. Tradition declared that Anubis embalmed the **body of Osiris**, and that he **swathed it in the linen swathings** which were woven by Isis and Nephthys for their brother; and it was believed that his work was so thoroughly well performed under the direction of Horus and Isis and Nephthys, that it resisted the influences of time and decay."

39And there came also Nicodemus, which at the first came to Jesus by night, and brought a mixture of myrrh and aloes, about an hundred pound weight.
40Then took they the **body of Jesus**, and **wound it in linen clothes** with the spices, as the manner of the Jews is to bury.

41Now in the place where he was crucified there was a garden; and in the garden a new sepulchre, wherein was never man yet laid.
42There laid they Jesus therefore because of the Jews' preparation day; for the sepulchre was nigh at hand.

John 20:1-10 | Resurrection of Jesus

1 The first day of the week cometh Mary Magdalene early, when it was yet dark, unto the sepulchre, and seeth the stone taken away from the sepulchre.
2Then she runneth, and cometh to Simon Peter, and to the other disciple, whom Jesus loved, and saith unto them, They have taken away the Lord out of the sepulchre, and we know not where they have laid him.
3Peter therefore went forth, and that other disciple, and came to the sepulchre.
4So they ran both together: and the other disciple did outrun Peter, and came first to the sepulchre.
5And he stooping down, and looking in, saw the linen clothes lying; yet went he not in.
6Then cometh Simon Peter following him, and went into the sepulchre, and seeth the linen clothes lie,
7And the napkin, that was about his head, not lying with the linen clothes, but wrapped together in a place by itself.
8Then went in also that other disciple, which came first to the sepulchre, and he saw, and believed.
9For as yet they knew not the scripture, that he must rise again from the dead.
10Then the disciples went away again unto their own home.

John 20:11-23 | Jesus Appears

11But **Mary** stood without at the sepulchre weeping: and as she wept, she stooped down, and looked into the sepulchre,

— Wallis Budge (1904), *The Gods of the Egyptians, Volume Two* (pg. 262)

Here, we see that the role of “Anubis”, as the embalmer of Osiris, has been replaced by the characters “Joseph of Arimathaea” and “Nicodemus”, the latter of whom, as Massey (1907) points out (Ñº), in the so-called “Sermon on Regeneration”, a dialogue between Jesus and Nicodemus, the earliest discourse of Jesus, according to John, which occurs before the more famous “Sermon on the Mount”, is but a re-telling of an older “Sermon of Hermes”, which is Greek for “Sermon of Thoth”.

12And seeth **two angels** in white sitting, the one
at the head, and the other at the feet, where the
body of Jesus had lain.
13And they say unto her, Woman, why weepest
thou? She saith unto them, Because they have
taken away my Lord, and I know not where they
have laid him.
14And when she had thus said, she turned herself
back, and saw Jesus standing, and knew not that it
was Jesus.
15Jesus saith unto her, Woman, why weepest
thou? whom seekest thou? She, supposing him to
be the gardener, saith unto him, Sir, if thou have
borne him hence, tell me where thou hast laid him,
and I will take him away.
16Jesus saith unto her, Mary. She turned herself,
and saith unto him, Rabboni; which is to say,
Master.
17Jesus saith unto her, Touch me not; for I am not
yet ascended to my Father: but go to my brethren,
and say unto them, I ascend unto my Father, and
your Father; and to my God, and your God.

18Mary Magdalene came and told the disciples
that she had seen the Lord, and that he had spoken
these things unto her.
19Then the same day at evening, being the first
day of the week, when the doors were shut where
the disciples were assembled for fear of the Jews,
came Jesus and stood in the midst, and saith unto
them, Peace be unto you.
20And when he had so said, he shewed unto them
his hands and his side. Then were the disciples
glad, when they saw the Lord.
21Then said Jesus to them again, Peace be unto
you: as my Father hath sent me, even so send I
you.
22And when he had said this, he breathed on them,
and saith unto them, Receive ye the Holy Ghost:
23Whose soever sins ye remit, they are remitted
unto them; and whose soever sins ye retain, they
are retained.

John 20:24-29 | Doubting Thomas

24But Thomas, one of the twelve, called Didymus,
was not with them when Jesus came.
25The other disciples therefore said unto him, We
have seen the Lord. But he said unto them, Except
I shall see in his hands the print of the nails, and
put my finger into the print of the nails, and thrust
my hand into his side, I will not believe.
26And after eight days again his disciples were
within, and Thomas with them: then came Jesus,
the doors being shut, and stood in the midst, and

said, Peace be unto you.
27Then saith he to Thomas, Reach hither thy finger, and behold my hands; and reach hither thy hand, and thrust it into my side: and be not faithless, but believing.
28And Thomas answered and said unto him, My Lord and my God.
29Jesus saith unto him, Thomas, because thou hast seen me, thou hast believed: blessed are they that have not seen, and yet have believed.

John 20:30-31 | Purpose of Gospel

30And many other signs truly did Jesus in the presence of his disciples, which are not written in this book:
31But these are written, that ye might believe that Jesus is the Christ, the Son of God; and that believing ye might have life through his name.

An alternative re-telling (Ñº) of this, to note, is found in Matthew 27.

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θΔics

01. Death of Osiris | **02a. Threshing Grain into Flour** | **02b. Jars Gestating Grain**

The Mysteries of Osiris or Christian
The walls of one of the tiny rooms which line one of the corridors of the Temple of Osiris at Abydos, the shrine for Isis and Osiris, Osiris is
SUMMARY
Osiris
Isis
Horus
Anubis
Thoth
Nephthys
Seven Spirits of Amenti
Seven Spirits of Amenti
Seven Spirits of Amenti

In non-existences, **death does not exist**, the parallel to "life does not exist", is the purview that "death" is a thing, event, or spacetime moment, that does not exist; an imagined non-reality; that what one formerly refers to as "death", is, in reality, but a separation of the elements, and therefore while "analysis" exists (compare synthesis), death does not (Empedocles, c.450BC); that death is an "anthropism" not recognized by physics and chemistry, and therefore does not exist (Sherrington, 1938); that death is a culturally-ingrained religio-mythology based concept, e.g. "god giveth life; god taketh away", much of which verbalized, etymologically, by the Egyptian mythology based Greco-Roman god Mor, e.g. mortality, mortuary, vis mortua, etc., according to which death is a mythical concept, and therefore not real.

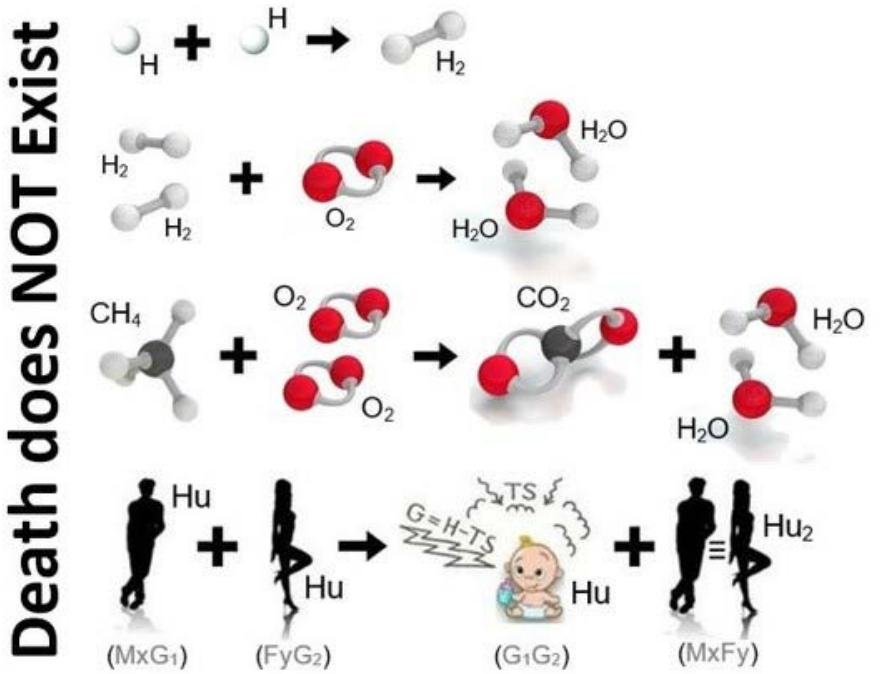

Some basic "chemical reactions" (top three) as compared to a "human chemical reaction" (bottom reaction) mechanism, showing the human reproduction reaction, all of which being governed by one and the same combined law of chemical thermodynamics, showing that all four are one and the same process, of "reactants" transforming to "products", as Empedocles (450BC) explained, according to which, to assign one of these reactions to have the religio-mythology based properties of "life" or "death" is but anthropomorphism, as Sherrington (1938) explained; accordingly, "**death does not exist**", a parallel to the concordant finding that life does not exist.

Empedocles

The following quote statement by Empedocles on the falsity of belief in life and death is renowned:

> "There is neither birth nor death for any mortal, but only a combination and separation of that which was combined, and this is what amongst laymen they call 'birth' and 'death'. **Only infants or short-sighted persons imagine** any thing is 'born' which did not exist before, or that any thing can 'die' or parish totally."
>
> — Empedocles (c.450BC), Fragment I21 / DK8 + Fragment I23 / DK11; cited by Baron d'Holbach in *The System of Nature* (pg. 27); cited by cited by Alfred Lotka (1925) in *Elements of Physical Biology* (pg. 185, 246)

> "When the elements have been 'mingled' in the fashion of a man, and come to the light of day, or in the fashion of the race of wild beasts or plants or birds, then men say that these 'come into being', and when they are 'separated', they call that in common parlance, death .... let not the error prevail over the mind that there is any other source of all the perishable creatures that appear in countless numbers."
>
> — Empedocles (c.450BC), cited by Alfred Lotka (1925) in *Elements of Physical Biology* (pg. 185) [1]

> "There is no coming into being of aught that perishes, nor any end for it .... but only mingling, and separation of what has been mingled."
>
> — Empedocles (c.450BC), cited by Alfred Lotka (1925) in *Elements of Physical Biology* (pg. 246) [1]

In other words, in modern parlance, using the adjacent diagram for illustration, when an atomic aggregate or "being" comes into existence, e.g. carbon monoxide CO, we do not say that it gains "life" or conversely that when it is separated, and goes out of being, into its components, that it "dies", because chemistry and physics to not see things this way. This logic, according to Empedocles, applies to other larger atomic formations, such as plants, animals, or humans.

There general non-death and non-birth ideology, to note, is also found, sometimes, attributed to the sayings of **Leucippus** (c.500-450BC) or Anaxagoras (500-428BC) two contemporaries of Empedocles, albeit of different branches of the tree of Greek philosophy.

> "Birth is the aggregation of atoms, death is their disaggregation or destruction of atomic composite, without anything being derived from nothing and nothing going into anything in the process."
>
> — Leucippus (c.460BC), and or the analogous views of **Empedocles** and Anaxagoras [2]

Greek philosopher Anaxagoras (500-428BC), like Empedocles, was also said to have held the atomic theory view that "birth is the aggregation of atoms, and death is their disaggregation or the destruction of the atomic composite, without anything being derived from nothing and nothing

going into anything in the process. [7]

Sherrington

In 1937-38, Charles Sherrington, in his University of Edinburgh Gifford Lectures, turned 1940 book *Man on His Nature*, building on the earlier arguments of Jean Fernel (1548), who attacked the Aristotle model of life, hammered away on the defunct theory of life point of view, page after page, such as exemplified by the following statements of many on this difficult subject that has beguiled thinkers for millennia:

> "Both the scientific and the everyday elbow are one and the same system of electrical charges. It is of no use asking physics and chemistry whether it is alive. They do not understand the word."
>
> — Charles Sherrington (1938), *Man on His Nature* (pg. 236)

> "When physics and chemistry have entered on their description of the perceptible, life disappears from the scene, and consequently death. Both are anthropisms."
>
> — Charles Sherrington (1938), *Man on His Nature* (pg. 260)

(add)

Lotka

In 1925, Alfred Lotka, in his "Regarding Definitions" chapter, of his *Elements of Physical Biology*, basically said that any physico-chemical scientist who attempts to defined life or explain the origin of life using chemistry, physics, and or thermodynamics is but someone hunting for a Jabberwock; the resulting argument they produce being by Jaberwocky or scientific nonsense (see: Lotkean Jabberwocky).

Thims

In 2016, Libb Thims, building on Lotka, Sherrington, Fernel, and Empedocles, and many others, basically summarized things via the following diagram, wherein the middle shows a basic molecular evolution table, subatomic particles to hydrogen to man (see: hydrogen to human), the right side shows a Lotkean Jabberwock, shown with a chemical reaction above and below him, and at the far left, is an imaginary "life/non-life" sliding bar, which the Jabberwocky-hunting scientist attempts to move up and down to fit their argument:
:

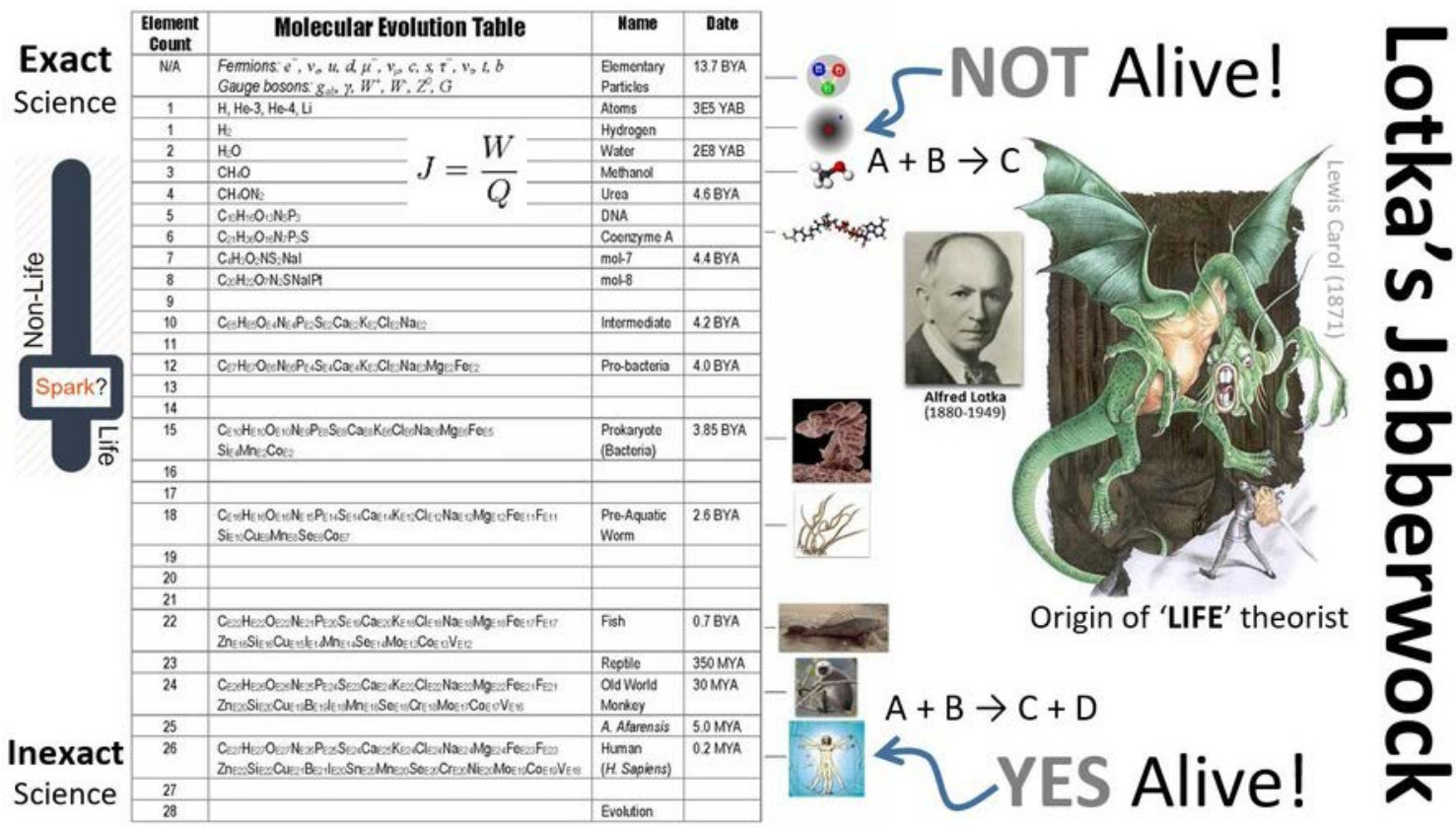

Shown on the molecular evolution table, is the mechanical equivalent of heat equation, which holds up and down the entire table, at every single row, which is the equation behind the first law of thermodynamics. The second law also hold up and down the table. The combined law of thermodynamics also holds up and down the table. When, in short, one gets to the imagined "start of life" row, wherein, in their mind, they attempt to make a "living chemical reaction", e.g. A + B → C + D, is the form of the human reproduction reaction (a double displacement reaction), which is the out of a standard, deanthropomorphized, "chemical reaction" (e.g. A + B → C), both of which being governed by one and the same combined law of thermodynamics:

A + B → C | Chemical Reaction

becomes, in some imagined "magical" emergence mechanism, the following:

A + B → C + D | Living Chemical Reaction [??]

is where the Jabberwocky hits the fan, so to say, one therein one comes to the absolute realization that both "life" and "death" do not exist. [3] Hence, to go through a simple, albeit time-scale truncated example, when hydrogen H reacts with hydrogen H, to form dihydrogen:

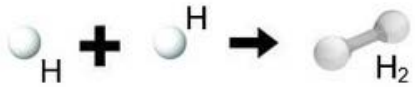

There is no “life” or “death” involved in any step of the mechanism. Likewise, when dihydrogen Hâ,, reacts with oxygen Oâ,, to form water Hâ ,,O:

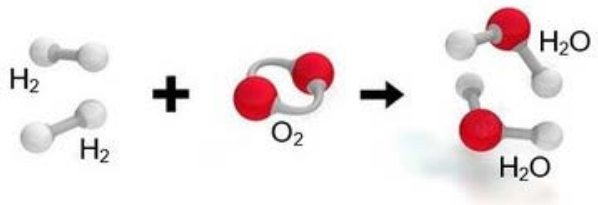

There is no “life” or “death” involved in any step of the mechanism. Similarly, if methane CH_4, a "carbon-based" (or CH-based) species, reacts with oxygen Oâ,,, to form carbon dioxide COâ,, and water Hâ,,O:

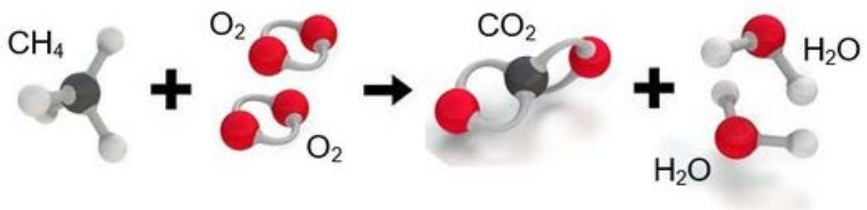

There is no “life” or “death” involved in any step of the mechanism. Similarly, scaling this mechanism upwards, skipping a number of years of mechanism development, when male human element Hu, a "carbon-based" (or CH-based) species, reacts with a female human element Hu to form a dihumanide molecule Huâ,, and a new human element Hu:

Hu + Hu → Huâ,, + Hu

which technically is a double displacement reaction of the form, where the germ cell G1 (sperm) of the male combines with the germ cell G2 (egg) of the female:

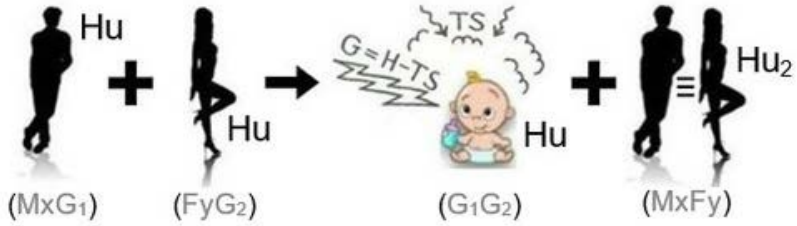

There is no “life” or “death” involved in any step of the mechanism. Because, accordingly, of our ingrained anthropisms, we are conditioned to "believe" that the latter reaction involves "life", is some sort of "living chemical reaction", and or originated from a "spark of life" (e.g. warm pond model) or on a heated clay substrate (e.g. clay substrate model), among dozens of other convoluted models (see: life models), whereas the former three reactions involve no "life". Correctly, the latter types of reactions, involving large forms of CH-based species, e.g. CHNOPS+ species, are but reactions that form more complex types of powered-animation (see: animate things). The motion and animation exist in these latter forms, but "life" and "death" do not.

Quotes

The following are related quotes:

> “We do not regard a vacuum, in terms of its vacuity, as something of ‘real existence’, but rather as a lack or absence as shadow is the absence of light or as blindness is the absence of sight, conditions which have no real existence in themselves. Furthermore, as death is the extinction of life, so **death is without reality**. In the same way a vacuum is the absence of fullness, but in no way does it follow that a lack or absence of this or that thing, which is commonly called a ‘vacuum’, is of real existence.”
>
> — Otto Guericke (1663), *New Magdeburg Experiments on the Vacuum of Space* (pg. 88)

See also

â— Afterlife does not exist

References

1. Lotka, Alfred J. (1925). *Elements of Physical Biology* (republished (Ñº) as: *Elements of Mathematical Biology*, which includes: corrections from Lotka’s notes and a completed list of his publications) (pdf) (Ñº) (txt) (Empedocles, pg. 185, 246). Dover, 1956.
2. Reale, Giovanni. (1987). *A History of Ancient Philosophy I: From Origins to Socrates* (pg. 120). SUNY Press.
3. (a) Thims, Libb. (2009). “Letter: Life a Defunct Scientific Theory”, *Journal of Human Thermodynamics*, Vol. 5, pgs. 20-21.
(b) Thims, Libb. (2016). “Lotka’s Jabberwock: on the ‘Bio’ of BioPhysical Economics” (slides: Flickr), 7th BioPhysical Economics meeting, University of District of Columbia, Washington DC, Jun 28.

θΔics

In psychodynamics, **death drive** or "death instinct" a theory which posits that just as in chemistry how there exist drives or driving forces in both synthesis (integration or formation) and analysis (dis-integration or dissolution, debonding, decomposition, etc.) processes, so to must there exist equivalent drives or driving forces for the reverse of the process of the synthesis, combination, or formation processes that are often termed "life" for short. American entropy in the social sciences scholar Eric Zencey summarizes things as follows: [5]

> "Psychology, too, felt the impulse of thermodynamic ideas, which lurk behind such concepts as libidinal energy, affect charge, and arguably, the **death instinct**. The lines of debate between those who do and those who do not find the second law behind Freud's death instinct are admirably drawn by Frank Sulloway (*Freud: Biologist of the Mind*, 1979)."

Zencey also comments that the thermodynamics of Freud's work are more generally summarized in Judith Winter's 1971 "The Concept of Energy in Psychoanalytic Theory". [6]

A caricature (Q) of Freudian **death instinct** theorist Frank Sulloway, by artist David Levine, for the 1996 *The New York Review of Books* article "The Roots of Radicalism" by Jarad Diamond, in review of Sulloway's new book *Born to Rebel: Birth Order, Family Dynamics, and Creative Lives*, on why Theodore Kaczynski becomes a "driven serial murderer", whereas his brother, who shares half his genes, becomes normal. (Q)

Overview

The death drive theory, in particular, was posited by Austrian psychologist Sigmund Freud in *circa* 1919 and based on the logic that that combination and dissolution of elements into aggregate substances are balancing processes. In his balancing of drives model, Freud postulated, in short, two basic human drives: *eros*, the sex drive, *and thanotos*, the death drive. [1] Freud seems to have culled his death drive theory from physical chemist, specifically the model of decomposition or "dissolving of units", in his own words: [2]

> "Starting from speculations on the beginning of life and from biological parallels, I drew the conclusion that, besides the instinct to preserve living substance and to join into ever larger units, there must exist another, contrary instinct to seek to dissolve those units and to bring them back to their primeval, inorganic state. That is to say, as well as Eros there was an **instinct of death**. The phenomena of life could be explained from the concurrent or mutually opposing action of these two instincts."

The theory or the death drive, or *todestribe* in the original German, sometimes translated in English as 'death instinct', although Freud seems to have employed both terms. The finalized version of Freud's death drive theory was published in his 1920 *Beyond the Pleasure Principle*. [4]

Schopenhauer

The development of Freud's death drive theory, in part, was said to have been influenced by the earlier ideas of German philosopher Arthur Schopenhauer. In a 1919 letter, for instance, Freud wrote that regarding:

> "The theme of death, [that I] have stumbled onto [is] an odd idea via the drives and [I] must now read all sorts of things that belong to it, for instance Schopenhauer."

This would implicate Freud's concept of death or the will to death as the opposite of the will to life, in the Schopenhauer sense, who taught that "death is the goal of life", or something to this effect. [3]

See also

- Heat death
- Hunger drive
- Sex drive

References

1. Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Life* (pg. 305). The University of Chicago Press.
2. Rifkin, Jeremy. (2010). *The Empathic Civilization: the Race to Global Consciousness in a World of Crisis* (death instinct, pg. #). Polity Press.
3. Gay, Peter. (1989). *Freud: A Life for Our Time* (pg. 391). Publisher.
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(b) Zencey, Eric. (1983). "Entropy as Root Metaphor", Conference on Science, Technology, and Literature, Feb, Long Island University, New York; in: *Beyond the Two Cultures: Essays on Science, Technology, and Literature* (editors: Joseph Slade and Judith Lee) (§9:185-200), Iowa State University Press, 1900.
6. Winter, Judith B. (1971). "The Concept of Energy in Psychoanalytic Theory" (abs), *Inquiry*, 14:138-47.

External links

- Death drive – Wikipedia.

θΔics

In thermodynamics, **debates** are various back-and-forth discussions arising between scientists on various issues, in the form of exchanged articles, letters, online threads, response videos, or emails, etc.

> "[Although] there is an ongoing **debate** among economists and natural scientists on the relevance of the laws of thermodynamics for the performance of economic systems, [invariably] physical laws govern production and consumption processes in a fundamental way. A world constrained by the laws of thermodynamics ultimately alters its structure through transformation of matter and dissipation of energy."
>
> — Matthias Ruth (1993), *Integrating Economics, Ecology, and Thermodynamics* [3]

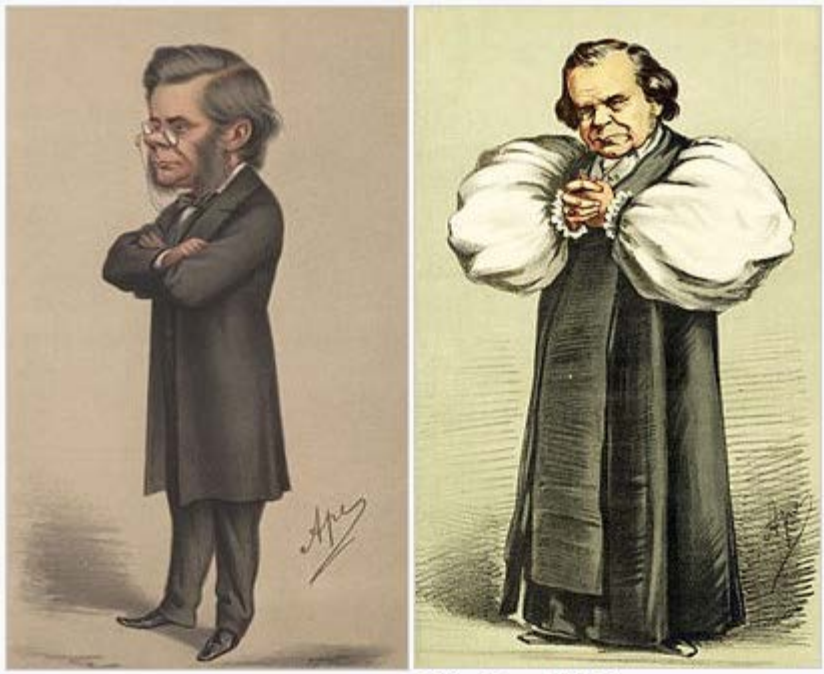

Above: a depiction of the main participants, namely Darwin's bulldog Thomas Huxley and Bishop Samuel of the 30 Jun 1860 Oxford evolution debate (O), held seven months after the publication of Charles Darwin's *On the Origin of Species*; comparable, in terms of cultural awareness, in some sense, to the 2009 Bill Nye vs Ken Ham debate at the Creation Museum.

The adjacent video shows in an actual record spontaneously formed street debate, which occurred in 2009 on the campus of Penn State University, between a random opinionated man who, using a contrived laymanized thermodynamics, believes that the "law of entropy", as he puts it, applies to humankind, and a group of four college students, who, using folklore thermodynamics, rebut the mans position by using the "closed system" response.

Overview

In the years 1750 to 1900, there was said to have been what was called the "extraterrestrial life debate", regarding the existence or nonexistence of intelligent extraterrestrial life, involving thinkers such as Immanuel Kant, William Herschel, Voltaire, Percival Lowell, among others, an idea which supposedly was crouched with embroiled tensions with religion, supposedly because the possibility of life beyond earth, conflicted with the seven-days of creation view of the Bible, the earth being at the center of the universe, with God creating vegetable life on day three, animal life on day five, and human life (in his likeness) on day six. [1]

In 1833, the Whewell-Coleridge debate was launched when English science historian William Whewell and English romantic philosopher Samuel Coleridge interjected into the question of what exactly someone who works 'in the real sciences', as Coleridge had phrased it, should be called, and what exactly are the real sciences, in the context of the tree of knowledge? A result of this debate is that the term "scientist" was coined.

When protein was discovered in 1838 by Dutch chemist Gerhardus Mulder, who carried out elemental analysis of common proteins and found that nearly all proteins had the same empirical formula, $C_{400}H_{620}N_{100}O_{120}P_1S_1$, the discovery was said to have sparked a heated debate between the difference between "animal life" and "plant life" (or vegetable life).

The ongoing existence of a "Maxwell's demon" debate is a sort of underground debate that originated in an exchange of letters between Scottish physicists James Maxwell and Peter Tait in 1867, a discussion-debate that eventually found its way into articles by others such Irish physicist William Thomson (1874), Hungarian-American physicist Leó Szilárd (1929), and French physicist Léon Brillouin (1951), and others. In addition, any group or conference about entropy, usually turns into a debate.

The 1874 to 1875 Tyndall-Stewart-Tait debate can be said to fairly well mark the start of the modern science-religion

controversy.

In 1897 to 1907, the famous "what is entropy debate" was a heated prolonged discussion, in meetings and journals, on the nature of entropy involving a number of noted scientists, including: Max Planck, Henri Poincare, Oliver Lodge, John Perry, Sydney Evershed, James Swinburne, and Oliver Heaviside.

In 1946, during the Harvard "what is life in terms of physics and chemistry?" debate, the Bridgman paradox was introduced, by Percy Bridgman, as summarized later by Leon Brillouin (1949), the just of which being that while a "living being" does have an entropy, we, supposedly, cannot measure it, because the organism would have to be destroyed, because, one would need "to create or to destroy it in a reversible way", as Brillouin put it.

The 1971-2006 Rossini-Leonard-Wojcik debate, is a noted human thermodynamics debate on whether state functions apply to the understanding of freedom and security in social life.

The 2009 Moriarty-Thims debate was a 60-page thread discussion between a number of authors, thinkers, professors of physics and thermodynamics on whether or not different arrangements of students in a field (close packed or spread out) has a thermodynamic entropy or specifically whether a group of students has an entropy.

Other debates, in the context of religious thermodynamics, which tend to become intertwined with discussions on the first and second laws of thermodynamics, include the famous ongoing creation-evolution debates. [2]

See also

- What is entropy debate | 1897-1907
- Jeans, Donnan, Guggenheim debate | Jan to Aug 1934
- Harvard what is life in terms of physics and chemistry debate | 1946 (see: Bridgman paradox)
- Rossini debate | 2007
- Morarity-Thims debate | 2009

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3. Ruth, Matthias. (1993). *Integrating Economics, Ecology, and Thermodynamics*. Springer.

Further reading

- White, Andrew D. (1896). *A History of Warfare of Science with Theology in Christendom* (Vol 1; Vol 2). Publisher.

Videos

- Anons. (2009). “Debate: Entropy Applies to Humankind?” (Q), Penn State University, Feb 9.

θΔics

In chemistry, **debonding** is a term used to describe a decomposition or dissolution reaction or that in which an atom, molecule, or species detaches from a host or surface. In human chemistry, the term is often used in reference to a relationship breakup or the process in which a person slowly begins to leave a structure, such as an infant detaching from a parent, a student leaving for college, a daughter leaving her birth family to start a family of her own, etc. [1] Technically, a breakup in an intimate relationship involves the a weakening of the human chemical bond between a attached pair A≡B of human molecules. The quintessential debonding process is a relationship break-up or divorce in which a previously attached structure, e.g. a couple AB or friendship, detaches where person *A* begins to separate from person *B*, as shown below:

$$AB \rightarrow A + B \text{ (bond dissolution)}$$

Debonding typically involves energy absorption, meaning that energy in the form of productive external work is being used up negatively in the relationship, often via arguments, and is thus an "endergonic process". [1]

Sociology

One of the first to study the debonding process in human relationships was American sociologist Diane Vaughan as discussed in her 1986 book *Uncoupling - Turning Points in Intimate Relationships.* [2]

Psychology

In relationships between a parent and a child, however, the a theory of "detachment" was outlined in the 1960s by British developmental psychologist John Bowlby and his associate British psychiatric social worker James Robertson. [3]

References

1. Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (ch. 14: "Bond Theories", pgs. 561-607). (preview). Morrisville, NC: LuLu.
2. Vaughan, Diane. (1986). *Uncoupling: Turning Points in Intimate Relationships.* Vintage Books.
3. Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (section: "Detachment", pgs. 595-96). (preview). Morrisville, NC: LuLu.

θΔics

In atheism, **Deborah Ann Mitchell** (c.1970-) is an American writer, a deconverted Catholic turned agnostic turned "secular humanist" (Q), "non-believer" (Q), press-popularized "atheist mother" (2013), turned "humanist sometimes leaning towards atheism" (2014), noted for []

Kids Without Religion | Blog

In 2009, Mitchell started a WordPress blog entitled "Kids Without Religion: Raising Kids as Independent, Logical Thinkers", turned (Q) 2013 personalized URL RaisingKidsWithoutReligion.net, wherein she began to blog about how she choose to raise her kids without religion. In 2010, her blog was getting flow from: parentingbeyondbelief.com and search queries: raising kids without religion, raising children without religion, and religion for kids. (Q)

In Jan 2013, Mitchell penned an essay entitled "Why I Raise My Children Without God", which she decided to share with CNN.com's iReport, because: [1]

> "I just felt there is not a voice out there for women or moms like me. I think people misunderstand or are fearful of people who don't believe in god."

(add discussion)

Viralness

The essay, which as of Sep 2016 had over 9,500 comments and 885,000 views, within two became the most commented on story in iReport's history, and the second-most viewed iReport ever, since the 2008 (Q) launching of iReports. [2] In the course of two weeks, from Jan 14 to Jan 31, the essay was viewed by more than 758,300 people, recommended by 65,000 and shared more than 7,700 times. The essay was also flagged, for inappropriateness, so many times, that CNN producers had to affix the following banner to the essay:

The tombstone of a dog named Sosume, buried on 25 Jan 2001, that accompanies **Mitchell's** viral iReport article "Why I Raise My Children Without God". [1]

> **Update:** CNN hasn't flagged this iReport as inappropriate, but some community members have. This is a divisive topic, however it does not violate our Community Guidelines, so we ask people to please stop flagging it. We will continue to review the story as often as possible.
>
> - dsashin, CNN iReport producer

On 30 Jan 2013, Mitchell appeared on Current TV to speak with host John Fugelsang about her viral essay.

Brainwashing

The opening two nerve-touching paragraphs, condensed below, are evidence to this viralness:

> "When my son was around 3-years-old, he used to ask me a lot of questions about heaven. Where is it? How do people walk without a body? How will I find you? You know the questions that kids ask. For over a year, **I lied to him** and made up stories that I didn't believe about heaven. Like most parents, I love my

> child so much that I didn't want him to be scared. I wanted him to feel safe and loved and full of hope. But the trade-off was that I would have to **make stuff up**, and I would have to **brainwash** him into believing stories that didn't make sense, stories that I didn't believe either."

This brings to mind the following Facebook reaction commentary, following Libb Thims public notice that he and Atheism Reviews co-host Thor, father of a two year old, would be teaching an "atheism for kids" class on Mon Aug 10th, 2015:

> "What you're doing to those children is child abuse and **brain washing** in my view. You could invert that argument and point it at myself, but I don't hold classes for children telling them to knock down silly ideas of false claims."
>
> — Tim (2015), response to advert promo for "Zerotheism for Kids" lecture, Jul 29

Thims replied (Q), in short, if the child had been given the correct information, in the first place, there would be no need for such as class, which is but a **de-brainwashing** class or reversal of the original brainwashing, so to say (i.e. most kids are taught Egyptian mythology based morality and meaning, in the form of Christianity, which points them in a backwards direction, and then told to go forward into the world).

Boy Scouts

Among other subjects, Mitchell also spoke about the Boy Scouts and problems she and her family ran into when her son was asked to earn a religious badge. When the mother told the organization that the family is agnostic and doesn't believe in a specific god, she was told that her son must believe in god to be in the Scouts.

Religion

Mitchell was raised Catholic, but "lost her religion" in her early 20s.

Education

Mitchell has completed her undergraduate degree at North Carolina State University and her MA at the University of Texas at Dallas in the humanities with a major in the history of ideas.

Further reading

1. Mitchell, Deborah. (2013). "Why I Raise My Children Without God" (Q), iReport, CNN.com, Jan 14.
2. Hallowell, Billy. (2013). "Atheist Mom Who Penned Viral Essay About Raising Kids 'Without God' Speaks Out" (Q), TheBlaze.com, Jan 31.
3. Mitchell, Deborah. (2014). *Growing Up Godless: a Parent's Guide to Raising Kids Without Religion* (foreword: Dale McGowan). Sterling Publishing.

Further reading

● Mitchell, Deborah. (2014). "How to Spot an Atheist: Fine-tune Your Atheist Radar and Be on the Lookout" (Q), Deilhy.org, Mar 20.
● Mitchell, Deborah. (2014). "How the Devil Made Me Keep My Faith: Recollections from a Demon-filled Catholic Childhood" (Q), FaithStreet.com, Jun 25.

Videos

● Pakman, David. (2014). "Raising Kids Godless in Texas: Interview with Deborah Mitchell" (9:51) (Q), Apr 10, David Pakman Show.

Podcast

● Episode 79: Author Deborah Mitchell: Growing Up Godless (2014), The Intellectual Saviors – PodcastPedia.org.

θΔics

In terminology, **deconversion** refers to the reverse of the conversion into religious belief; a removal of religious belief, practices, and faith from one's mind.

Theism → Atheism | Documentaries

In 2004, American Christopher Redford, aka evid3nc3, engaged into the deconversion, from a devout Pentecostal Christian (2001) to that of an "evidence-based secular humanist (2013), all of which is documented in his 2009 to 2012 "Why I Am No Longer a Christian" video series (see: Redford deconversion model).

In 2008, American Daniel Sulzbach, aka MrRepzion, engaged into the atheism-curious stage, and the documented his deconversion, via YouTube, in going from Christianity (2006) to atheism-curious (2008) to leaving-religion (2012) to deism (2013) to agnostic atheism (2013/14) to a retracted state of open discussion and "anti-new-atheist" (2014) in stance, though supposedly still identifying as an atheist (Ñº), then in 2015 back to atheism-promoting.

In 2012, American Seth Andrews, a former dinosaur Ark believing Christian radio talk show host turned reason-based atheism, now-curator of TheThinkingAtheist.com and corresponding video-producing The Thinking Atheist, a top 20 YouTube atheism channel, published his *Deconverted: a Journey from Religion to Reason*, discussing insights such as: [1]

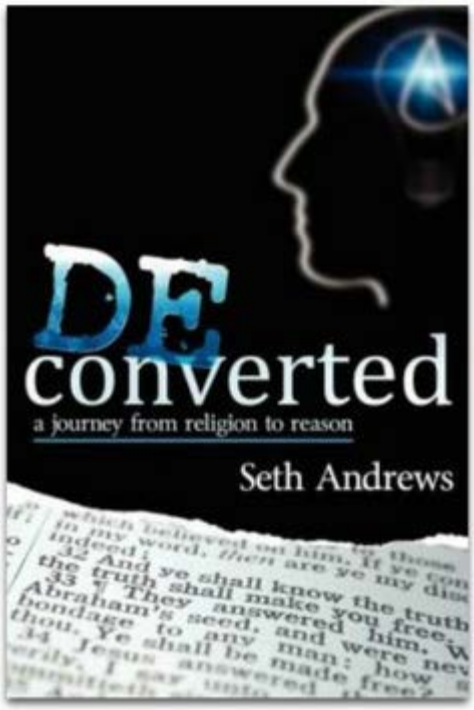

American Seth Andrew's 2012 details his **deconversion** from being a dinosaur Ark believing Christian radio talk show host to reason-based atheism. [1]

> "The [moniker] 'thinking atheist' simply reflects the fact that my own liberation came when I stopped assuming and broke the chain of inherited belief through reason, curiosity and common sense. My freedom came when I began *thinking* for myself."

(add discussion)

Research

In 2014, Christian-to-atheism deconverter Kristi Winters made a two-part video on "deconversion research." (Ñº)(Ñº)

Atomic theory | Belief conversion

In science, deconversion-like comparison example can be noted in comparing Ernst Mach and Wilhelm Ostwald, and how the latter deconverted to belief in atomic theory, whereas the latter would not make the conversion.

Quotes

The following are related quotes:

> "It takes the **latter half** of all of one's lifetime to **unlearn** the falsehood that was instilled into us during the earlier half. Generation after generation we learn, unlearn, and re-learn the same lying legendary lore. Henceforth, our studies must begin from the evolutionist standpoint in order that they may not have to be gone over again."
>
> — Gerald Massey (1883), *The Natural Genesis*

References

1. Andrews, Seth. (2012). *Deconverted: a Journey from Religion to Reason*. Outskirts Press.

External links

â— Main – De-conversion.com.

θΔics

In existographies, **Deepak Chopra** (1947-) (CIR:7|40) (CR:18) is an Indian-born American physician, turned new age writer, noted, in fringe science, as of late, as has been frequenting the atheism vs religion debate arena (see: Atheism Reviews), noted generally for his bridging of quantum mechanics, with Ayurveda (Hindu traditional medicine), with teleology, to promote a blurry version of quantum spirituality, classified by Michael Shermer (2010) as "woo woo physics", whose work is cited by similar-minded scholars such as Lex Sisney. [1]

Quote generator

The following is a quote generator selection of Chopra's views, i.e. words randomly put together from his Tweeter feed: [3]

> The unpredictable undertakes self-righteous success
> Your desire requires species specific truth
> Eternal stillness is the wisdom of immortal miracles
> The secret of the universe fascinates humble joy
> The future belongs to intrinsic photons
> Knowledge is the progressive expansion of photons

The famous "typing monkeys" model comes to mind here.

Influences

Chopra states that he was "spellbound" after reading Alan Watts' 1951 *The Wisdom of Insecurity*, along with Carl Jung, who met at one point. [2]

Turnover rate

The following is a quote by Chopra on turnover rate:

> "Quantum physicists have proven through radioactive isotope studies that 98% of the atoms in your body are replaced within one year. In three months your body produces an entirely new skeleton. Every six weeks, all the cells have been replaced in your liver. You have a new stomach lining every five days. You are continually replacing old blood cells with new ones. Your skin is sloughing off dead cells and producing a new skin monthly."
>
> — Deepak Chopra (1989), *Quantum Healing* (Q)

Mlodinow

In c.2010, Chopra, in the Q&A of a talk (Q), was queried by theoretical physicist Leonard Mlodinow (Q), a co-author of Stephen Hawking, who asked Chopra, as reported by Julien Musolino (2015), whether he would be interested in taking a course in quantum mechanics to straighten out his misuse of terminology; to which Chopra passively accepted, with the caveat that the day of the talk was 3/14 and that 3.14 was an approximation to infinity and that as long as the course would help him to understand the "infinities" (theistic code for god), he would accept. The two, of note, ended up collaborating (Q) in the book *War of the Worldviews* (2011).

Quotes | On

The following are quotes on or about Chopra:

> "**Deepak Chopra** has a MBA in gobbledygook."

— TheF86Sabrer (2014), YouTube forum (Q), 84+ likes, Dec.

References

1. Review: Sam Harris and Michael Shermer vs Deepak Chopra (2010) (Q)
2. Chopra, Deepak. (2011). "Introduction", in: *The Wisdom of Insecurity* (by Alan Watts). Random House.
3. (a) Chopra quote generator – WisdomOfChopra.com.
(b) What do physicists think if Deepak Chopra – Quora.com.

Videos

- Sweeney, Julia. (2008). "Deepak" (Q), *Letting Go of God* (1:12:39-1:16:08) (Q), PatrickReads.
- Dawkins, Richard. (2009). "Dawkins Exposes Charlatan Deepak Chopra" (Q), Atheism: Keeping it Real, Oct 25.
- Thims, Libb. (2015). "Best of Deepak Chopra" (Q), Atheism Reviews, Mar 16.

External links

- Deepak Chopra – Wikipedia.

θΔics

In science, **definitions of life**, or "life definition" model, as contrasted with the life principle approach, refers to lists or collections of comparative attempts to define or quantify the term "life" or the theory of life by a set of criterion or specifications.

A 2012 Wordle scramble representation of terms, by Uwe Meierhenrich, surrounding the ongoing **definitions of life** debate. [7]

Overview

In 2000, a “What is Life?” conference was held in Modena, Italy, attended by about a hundred scientists, philosophers, and theologians, during which a debate erupted in respect to what the first form of life was and definitions of life. [1] Soon thereafter, various scholars began to amass and analyze lists of definitions of life, including: one by Russian bio-chemist (chnops-chemist) Vladimir Kompanichenko, two versions by American bio-logist (chnops-ologist) Radu Popa (40-definition, 2002; 90-definitions, 2004), one by Italian embryologist Marcello Barbieri (60-definitions, 2003), and one meta-analysis list by Russian-born Israeli molecular bio-physicist (chnops-physicist) Edward Trifonov (123-definitions, 2011). [2]

Kompanichenko's list

Vladimir Kompanichenko: 63-definitions, 2002. [8]
(add)

Popa's list

Radu Popa: 40-definitions, 2002 (pre-print); 90-definitions, 2004. [3]
(add)

Barbieri's list

Marcello Barbieri: 60-definitions, 2003. [4]
(add)

Trifonov's list

Edward Trifonov: 150-definitions (Popa list + Barbieri list); 123-definitions (non-redundant), 2011. [5]
(add)

Analysis

The following table, compiled by Trifonov, shows the combined vocabulary of words used in the 60-definition set of Barbieri and the 90-definition list of Popa, yielding a non-redundant total size of 123 definitions:

List of most frequent words in the definitions of life.

Life	123	Organic	11	Internal	7	Capacity	5
Living	47	Alive	10	Replication	7	Different	5
System	43	Evolution	10	Being	6	Force	5
Matter	25	Materials	10	Change	6	Form	5
Systems	22	Reproduction	10	Characteristics	6	Functional	5
Environment	20	Existence	9	Entity	6	Highly	5
Energy	18	Defined	8	External	6	More	5
Chemical	17	Growth	8	Means	6	Mutation	5
Process	15	Information	8	Molecules	6	Necessary	5
Metabolism	14	Open	8	One	6	Network	5
Organism	14	Processes	8	Order	6	Objects	5
Organization	14	Properties	8	Organisms	6	Only	5
Complexity	13	Property	8	State	6	Organized	5
Ability	12	Reproduce	8	Things	6	Reactions	5
Itself	12	Through	8	Time	6	Self-reproduction	5
Able	11	Complex	7	Way	6	Some	5
Capable	11	Evolve	7	Based	5	Three	5
Definition	11	Genetic	7	Biological	5		

The following shows the same table, albeit organized by common group:

Groups of words with similar meaning.

LIFE	123	**COMPLEXITY**	13
living	47	information	8
alive	10	complex	7
being	6	other related words	46
biological	5	Sum	**74**
other related words	8	**REPRODUCTION**	10
Sum	**199**	reproduce	8
SYSTEM	43	replication	7
systems	22	self-reproduction	5
organization	14	other related words	33
organism	14	Sum	**63**
order	6	**EVOLUTION**	10
organisms	6	evolve	7
network	5	change	6
organized	5	mutation	5
other related words	40	other related words	20
Sum	**155**	Sum	**48**
MATTER	25	**ENVIRONMENT**	20
organic	11	external	6
materials	10	other related words	15
molecules	6	Sum	**41**
other related words	36	**ENERGY**	18
Sum	**88**	force	5
CHEMICAL	17	other related words	17
process	15	Sum	**40**
metabolism	14	**ABILITY**	12
processes	8	able	11
reactions	5	capable	11
other related words	26	capacity	5
Sum	**85**	other related words	1
		Sum	**40**

The first categorical grouping is but a grouping of what is called the circular definition technique, plain and simple:

"What about other definitions of life? (Wordle scramble) Wikipedia, for example, posts that *Life is a*

characteristic that distinguishes objects that have self-sustaining biological processes from those which do not. The difficulty with this definition is that it refers to biological processes. Biology – as explained by Wikipedia – is defined as the study of life. Here we turn in a **circle**. This is elegant but not helpful."

— Uwe Meierhenrich (2012), "Life in its Uniqueness Remains Difficult to Define in Scientific Terms" [7]

The use of the prefix "self-" in the sixth dominate group (reproduction) is but code for perpetual motion of the living kind, and hence not acceptable scientifically, because perpetual motion does not exist. The fifth dominate group (complexity) is but a meaningless word-helot way of camouflaging emptiness of content (i.e. complexity theory), the concept of "information", for example is not an SI unit, hence not quantitative. The rest are all about relatively acceptable, the central issue with them all is that they each in turn begin to fall apart as one descends down the great chain of being into the pure fermion (matter) boson (energy) realm of atoms, molecules, and reactions, at or about the virus so-called life/non-life divide, at which point confusion sets in, after which one is forced to take recourse in (a) panbioism, (b) emergence, or (c) defunct theory of life, only the latter of which is the correct option, being that the middle choice it but soft-panbioism, according to which one has concede to the conclusion that the hydrogen atom is sort of alive, which is but a "recital that trips along simply as a fairly tale" as Charles Sherrington put it.

Discussion

In 2008, American physicist Michael Brooks summarized how traditionally there have been three ways to unravel the essential nature of life: first, find and quantify the supposed "origin" point of life; second, build something that is supposedly "alive" from scratch; third, is the definition method. Brooks comment, in summary of the three, that the latter is widely admitted to be a dead end: [6]

> "[The third option to unraveling the essence of life is] to sit down and think about what exactly is it that marks the difference between living [matter] and nonliving matter and **come up with the definition** of life. It is this latter path that is perhaps the most well trodden. It is also the one widely admitted to be a dead end."

A YouTube video of the famous "Businessman's Special" riddle, aka the missing dollar bill puzzle, the punchline of which is that "there is NO missing dollar bill!", which is the about the same punchline to the what is life riddle, which is that "there is NO such thing as life!", it is a religio-mythology concept, not a term not recognized by physical science, explicitly stated in 1938 by English physiologist Charles Sherrington, because it is something that does not exist, as Serbian electrical engineer Nikola Tesla stated correctly in 1915 (see: defunct theory of life).

The answer, in short, as to why the definition method is a dead end is that searching for the definition of life is akin to searching from the missing dollar bill in the famous "businessman's special joke", wherein the punch line is that "there is no missing dollar bill!", it's a play on words and math angled so to trick the person into thinking there is a missing dollar bill.

The same is the case with the search for a definition of life, wherein the punch line is that there is no such thing as "life", just as there is no missing dollar, both are things the inquisitor are "told" exist, but in reality do not exist.

The latter takes a bit longer to see through the riddle, being that we as a lineaged culture having been told that life exists for some 5,000+ years now, since at least the time of Heliopolis creation myth (3,1000BC), i.e. sun life death theory (Ra theology), assumed logic which has been passed down to us from our parents and culture, through generally the Ab-ra-ham-ic theologies and B-ra-hma-ic theologies, a group which dominates the thinking mindsets of over 75-percent of the modern world, but a concept not in accordance with modern physical science, which "does not recognize the term life" as Charles Sherrington famously put, in respect to chemistry, it in 1938:

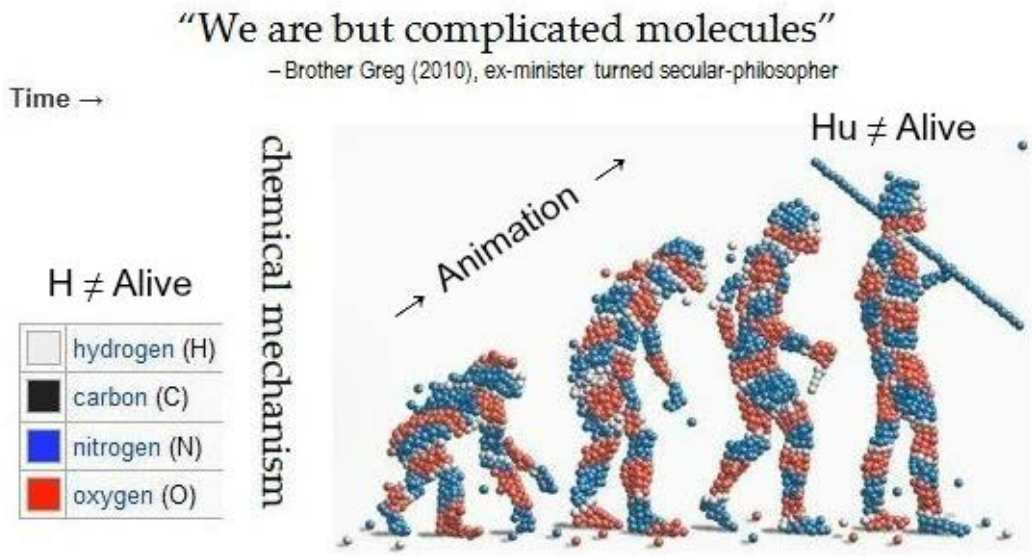

See also

â— Life terminology upgrades

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 126). Morrisville, NC: LuLu.
2. (a) Pross, Addy. (2012). *What is Life? How Chemistry Becomes Biology* (pgs. 39-40). Oxford University Press.
(b) Hansman, Helen G. (2012). "Life = Self-Reproduction with Variation?" (pdf), *Journal of Biomolecular Structure & Dynamics*, 29(4):621-22.
3. (a) Popa, Radu. (2002). "40-definition list", in: *Between Necessity and Probability: Searching for the Definition and Origin of Life* (pgs. 197-205; 227-252). Springer, 2004.
(b) Radu Popa – RPopa.net.
4. (a) Barbieri, Marcello. (2003). *The Organic Codes: an Introduction to Semantic Biology*. Cambridge University Press.
(b) Marcello Barbieri – BioSemiotica.it.
5. (a) Trifonov, Edward N. (2011). "Vocabulary of Definitions of Life Suggests a Definition" (abs) (pdf), *Journal of Biomolecular Structure and Dynamics*, 29(2):259-66.
(b) Edward Trifonov – Wikipedia.
6. Brooks, Michael. (2008). *13 Things That Don't Make Sense: the Most Baffling Mysteries of Our Time* (ch. 5: Life, pgs. 69-82). DoubleDay.
7. (a) Meierhenrich, Uwe J. (2012). "Life in its Uniqueness Remains Difficult to Define in Scientific Terms" (pdf), *Journal of Biomolecular Structure & Dynamics*, 29(4):641-42.
(b) Uwe Meierhenrich – Wikipedia.
8. Kompanichenko, Vladimir N. (2002). "Short Definitions of Life", in: *Fundamentals of Life* (editor: G. Palyi, C. Zucchi, L. Caglioti) (pg. 38). Elsevier.

θΔics

In science, a **defunct theory** is a theory that has become obsolete, disproved, irrelevant, non-functional, superseded, and or replaced by a newer theory, generally owing to newer insights and or scientific discoveries that invalidate the former.

List

The following are noted defunct theories:

Theory	Reign	Superseded by	Transition	Disproved by	Comment
Nature abhors a vacuum		Nearly perfect vacuums can exist (although some contend that recent particle physics theories abrogate this view)		Galileo Galilei Evangelista Torricelli Blaise Pascal Otto Guericke	
Sulphur principle	1524-c.1669	Terra pinguis theory	c.1669	Johann Becher	
Terra pinguis theory	1669-1703	Phlogiston theory	1697-1703	Georg Stahl	
Phlogiston theory	1703-1787	Caloric theory	1768-1787	Antoine Lavoisier	
God		Matter (fermions), energy (force) (bosions), vacuum, and laws (of the universe) defining their operations.	1802	Pierre Laplace	Comment (to Napoleon): “I had no need of that hypothesis.” See: Napoleon Laplace anecdote
Free will		Affinities, exchange force, readiness potential, induced movement, etc.	1799-1809	Johann Goethe	Comment: “None are so hopelessly enslaved than those who believe they are free.” (c.1809); see *Elective Affinities*.
Caloric theory	1787-c.1824	Heat as motion, mechanical equivalent of heat, kinetic theory, entropy, photon, Bohr model, retinal molecule model (of movement)	1798-1865	Benjamin Thompson Humphry Davy	
Vitalism (life force)	1771-1842 (although derivatives remained)	Physical-chemical explanations (although the origin of life issue remained, i.e. "life" vs. "non-life" divide or gap).	1828-early 20th century	Emil Reymond Ernst Brücke Hermann Helmholtz	See: Helmholtz school and the 1842 Reymond-Brucke oath.
Ether		Space-time; relativity.	1905	Albert Einstein	
Origin of life	18th century up into 1916 (and further)	There is no origin.	1916	William Sidis	Summary: “Our theory of the origin of life is that there is *no* origin, but only a constant development and change in form.”
Life	3100BC-2009	Defunct theory of life	1925-ongoing	Nikola Tesla Libb Thims	

Further reading

- Bothamley, Jennifer. (2002). *Dictionary of Theories: One Stop to more than 5,000 Theories*. Visible Ink Press.

External links

- Defunct theories (quiz) – Sporcle.com.
- Superseded scientific theories – Wikipedia.
- Obsolete scientific theories (category) – Wikipedia.

θΔics

In science, **defunct theory of life**, aka "life does not exist" (Rogers, 2010) or **abioism** (Thims, 2015), is the conclusion—correctly, the technical solution to the great problem of natural philosophy (i.e. the abiogenesis problem)—first stated, partially, in 1915 by Nikola Tesla, thusly: [16]

> "There is no thing endowed with life."

Pictorially, the defunct theory of life—similar, by comparison, to how Einstein in 1905 disabused the notion of 'ether', the medium in which electromagnetic waves were *thought* to be propagating, from physics—is the view that the "theory of life", from a physical science point of view, is defunct (something that does not exist), according to which the assertion that the hypothesized life-from-nonlife demarcation, gap, boundary, or emergence point or region, said to have occurred 3.85 billion years ago, does not exist:

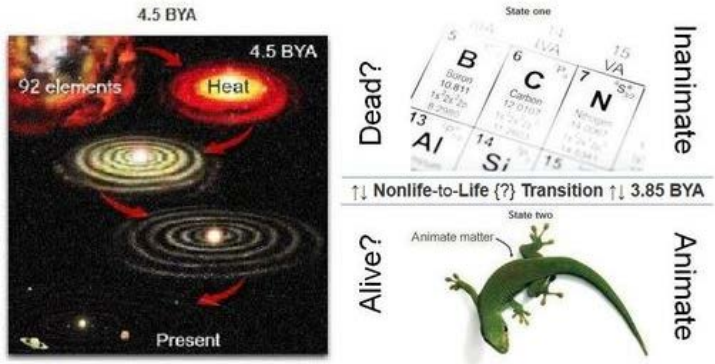

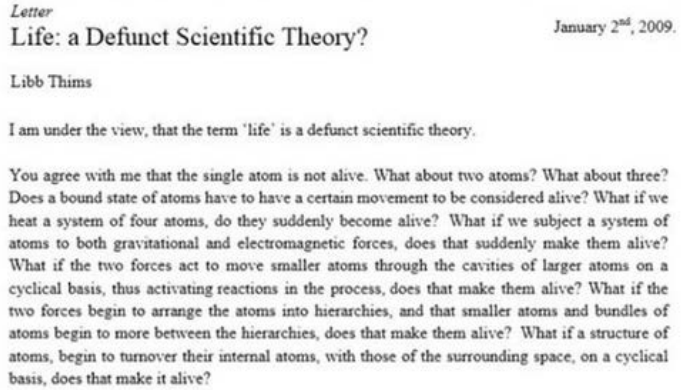

Letter

Life: a Defunct Scientific Theory?

January 2nd, 2009.

Libb Thims

I am under the view, that the term 'life' is a defunct scientific theory.

You agree with me that the single atom is not alive. What about two atoms? What about three? Does a bound state of atoms have to have a certain movement to be considered alive? What if we heat a system of four atoms, do they suddenly become alive? What if we subject a system of atoms to both gravitational and electromagnetic forces, does that suddenly make them alive? What if the two forces act to move smaller atoms through the cavities of larger atoms on a cyclical basis, thus activating reactions in the process, does that make them alive? What if the two forces begin to arrange the atoms into hierarchies, and that smaller atoms and bundles of atoms begin to more between the hierarchies, does that make them alive? What if a structure of atoms, begin to turnover their internal atoms, with those of the surrounding space, on a cyclical basis, does that make it alive?

Top: **defunct theory of life** theorists. Bottom: first page of 16 Mar 2009 *JHT* article "Life: a Defunct Scientific Theory?", by American chemical engineer Libb Thims, a summary of a letter, originally sent to Russian physical chemist Georgi Gladyshev (02 Jan 2009), introducing the newly concluded view that the theory of "life", particularly in the context of molecular evolution tables (and attempts to decide which rows have "life" and which do not), does not hold up in modern physical science; a reactionary response to heated discussions with (a) Gladyshev, and his 1978 hierarchical thermodynamics theory of life, (b) Indian chemical engineer DMR Sekhar, and his 2007 genopsych anti-entropy theory of life, and (c) American chemical engineer Ted Erikson's and his 2005 Planck-scale panpsychism (or panexperientialism) awareness theory of life (a panbioism theory). [1]

Nor does the alternative panbioism "everything is alive" position hold, namely: the hydrogen atom is not alive nor *sort of* alive (which results from the so-called gradual emergence theory); whereas, correctly, what was previous considered "alive" or life is now understood as being but a powered animation-energy property of columns 14 and 15, respectively, of the periodic table (see: hmolscience periodic table), of heated gravitationally-bound systems, in the so-called habitable zone around stars, the latter chemical thermodynamics-based descriptions superseding and in fact supplanting the former, thus classifying the religio-mythology based "life theory" model as a defunct, non-tenable, specifically a non-chemical thermodynamically recognized paradigm, a "perpetual motion of the living kind" theory, in technical speak.

This discerning view was first grappled with cogently by French physician Jean Fernel (1548), Germans polyintellect Johann Goethe (1770-1809) and physicist Karl Pearson (1900), later by Englishman physiologist Charles Sherrington (1938) and geneticist Francis Crick (1966), and eventually classified, in full thermodynamics journal article format, as a "defunct" scientific theory by American electrochemical engineer Libb Thims in 2009.

In other words, the theory (theory of life) that something exists in the universe termed "life", and the related synonyms: living matter, living system, living being, alive, living thing, life force, life principle, living energy, living organism, living molecule, vegetable life, etc., and in particular the premise of a start second to the so-called "origin of life" second, are defunct and obsolete and the term "living" does not conform to modern physical science. The defunct classification was first enunciated by English physiologist Charles Sherrington, in his 1938/39 *Man on His Nature* lectures turned book, as follows: [10]

> "Aristotle noted of life that its lower limit defies demarcation. The living and non-living, he thought, merge one in the other gradually. Today the very distinction between them is convention. That **deletes 'life' as a scientific category**; or, if you will, carries it down to embrace the atom. The vanishing point of life is lost."

The section following the colon—namely "or, if you will, carries it down to embrace the atom—specifies the alternative to the defunct view, namely soft panbioism or emergence, which in underlying argument holds or rather admits that the hydrogen atoms is alive, which, in the keen words of Sherrington, is a 'recital that trips along simple as a fairy tale.'

In the molecular evolution table and evolution timeline perspective, wherein each step in the evolution process is viewed as a specific step in the contiguous chemical reaction mechanism on going from the hydrogen atom to the human molecule (person), in the course of the dynamics of the universe, the view emerges that a moving molecule, however complex be its movement, retinal molecule (bending molecule), walking molecule (surface moving molecule), cell molecule (boundaried molecule), fish molecule (aquatic reactive turnover rate molecule), etc., must be discarded as an outdated and defunct scientific theory (a religious neoplasm carryover; generally derivative of the (Egyptian based) Ab-ra-ham-ic/B-ra-hma-ic creation myths: creation by divine breath or creation by clay theory, etc), which dominate underlying belief systems of near to ninety-percent of the world's mindsets.

Things we were taught as children

See main: Belief system (child)

The following is an outline of the different "big question" coming into being stages of a typical child, up through adulthood, ending, supposedly, with Jean-Paul Satre's *Being and Nothingness* and existentialism, according to the 2010 views of American economist Jeremy Rifkin. [38] The issue here is that before age 3-5 the average person,

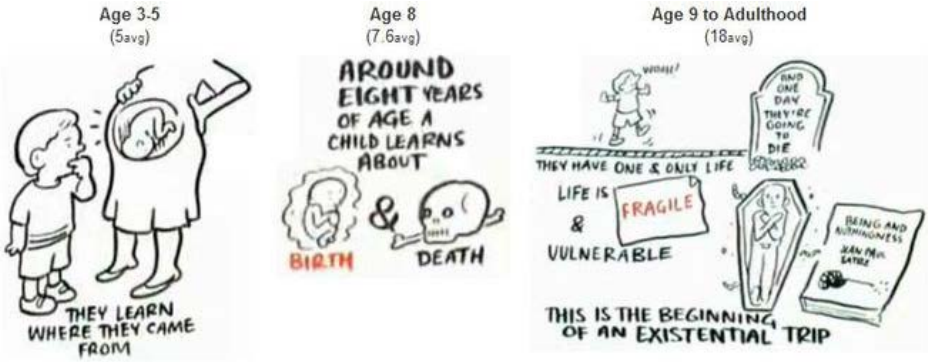

according to modern religio-mythology belief system classifications, is taught/told about where they come from according to the god/spirit/life force models—91 percent of Americans for instance believe in one of these life theory models—based Abrahamic/Brahmaic, aka Anunian theology rooted, belief system (below left), about which over 72 percent of the modern world adheres to, which does NOT corroborate with the modern physical science belief system (below right), according to which humans are 26-element "molecules" (human molecules), that were "synthesized" (not born), "reactive" (not alive), and in the end "analyzed" (do not die), as is the case for any other animate atomic geometry in the universe that comes into and out of "bound state" existence.

Empedocles

Greek standard model philosopher Empedocles, as summarized by Scottish engineer and comparative religions scholar James Forlong (1906), held that people were but comprised of four types of atoms, two forces, and that "and life and death are mere questions of mixture and separation." [46]

Fernel | Aristotle on innate heat

In 1548, French physician philosopher Jean Fernel, in his *On the Hidden Causes of Things*, digs into Aristotle's assertion that the solution to the what is life problem is to be found in or attributed to "heat" or innate heat, via a Platonic-style dialogue of sorts between the three fictional friends, Eudoxus, Brutus, and Philiatros, an example ripe and erudite dialogue of which is as follows:

French physician philosopher Jean Fernel, in his 1548 *On the Hidden Causes of Things*, seems to have been the first to question Aristotle's assertion that the nature of "life" vs "death" is to be found in heat, or rather "innate heat", supposed to be of a class above that or different in nature for the heat of fire.

> "The stone selenite holds the image of the moon even to her very phases. The magnet-stone points to the pole star. These are dead things, says Brutus, do living things likewise draw influences from the sky."

Here we see Fernel discussing so-called "dead things" in the pre electromagnetic field theory days, very impressive. Fernel, moreover, goes on to say:

> "Did not Aristotle well and truly say, and leave it written for all posterity, that: 'Heat is the condition of life'?"

Following this, however, Fernel lapses to the side of error, with his siding with Aristotle comments about how "innate heat is superior to elemental heat", how "innate heat is not of the same nature as fire", thereafter lapsing into vital heat dualism type of argument. Whatever error we may attribute to Fernel, at this period in history, we commend him for broaching the problem; for it was is proselyte Charles Sherrington, discussed below, who ripped the problem wide open, leaving no only the path forward available.

Diderot's dialog

In 1769, French materialist philosopher Denis Diderot penned is Platonic dialogue stylized *D'Alembert's Dream*, in which the character D'Alembert, modeled on his associate French mathematician Jean D'Alembert (1717-1783), outlines material, atheistic view of the universe, and on the puzzle of the origin of life tries to reason how an animal can be constructed from the union of so-called dead or inert atoms and molecules to form that he calls 'living points' or 'living molecules' to then form what he calls a 'living unity', which is summarized as follows: [28]

French materialist philosopher Denis Diderot grappled with what he called the "living point" issue, problem, or paradox in his 1769 *D'Alembert's Dream*, via Platonic dialogue style.

> "Nothing at first, then a living point … Another living point attaches itself to this one, and then another—and from these successive conjoinings a single living unity results, for I am certainly a unity …. It's certain that contact between two living molecules is something different from the contiguity of two inert masses … and this difference—what could it be? … a customary action and reaction … That way everything comes together to produce a sort of unity which exists only in an animal … My goodness, if this isn't the truth, it's really close to it."

Here, in modern retrospect terms, we see the same issue arising in the study and construction of molecular evolution tables (shown below), according to which the top row is the hydrogen atom (a bound state entity "not" considered to be alive) and in which successive descending rows are larger molecular structures "synthesized" from the hydrogen atom or its derivatives (the other 91 naturally-occurring elements), according to which one is forced into addressing the question as to what row one is assign as the first atomic life—after which, following introspection, one is forced to side with the defunct theory of life perspective and in its place the induced movement / animate perspective. In any event, the Diderot's dialog is fairly impressive for such a time period.

The view or conclusion that "life" is a defunct, i.e. untenable, concept is not a view one immediately is able to jump to—although we do see Diderot teetering close to this view in his "my goodness, if this isn't the truth, it's really close to it" comment. German polymath Johann Goethe was the first to actually venture down this road.

Goethe | Metamorphosis theory

In circa 1770, German polyintellect Johann Goethe grasped the following discerning view about the movements around him: [40]

In *circa* 1770, German polyintellect Johann Goethe began to search for a secret principle that would explain nature, whether "living or lifeless, animate or inanimate", as he put it; by the time of his 1809 *Elective Affinities*, was vacillating on whether or not to attribute life/death properties and descriptions to chemicals, such as calcium carbonate ($CaCO_3$) or sulfuric acid (H_2SO_4); as humans and human associations, in his view, are but larger time "metamorphosized" versions of smaller reactive chemicals.

> "I perceived something in nature (whether living or lifeless, animate or inanimate) that manifested itself only in contradictions and therefore could not be expressed in any concept, much less any word. It was not divine, for it seemed irrational; not human, for it had no intelligence; not diabolical, for it was beneficent; and not angelic, for it often betrayed malice. It was like chance, for it laced continuity, and like providence, for it suggested context. Everything that limits us seemed penetrable by it, and it appeared to dispose at will over the elements necessary to our existence, to contract time and expand space. It seemed only to accept the impossible and scornfully to reject the possible."

This being retrospect autobiographical comments on youth and his search for "secret principle" of the universe (see: timeline).
In his 1809 physical chemistry based novel *Elective Affinities* (P1:C4), through the Platonic dialogue lecture discussions of the character the Captain, who is said to have recently studied the latest physical chemistry methods, we find a discussion of the reaction between limestone, i.e. calcium carbonate ($CaCO_3$), and sulfuric acid (H_2SO_4) which upon contact yields gypsum ($CaSO_4 \cdot 2H_2O$), in the form an aqueous crystal, and carbon dioxide (CO_2) gas, a reaction that is compared and contrasted with the reactions that are occurring between the main characters in the novel: Charlotte (carbon dioxide), Edward (lime), Captain (sulfuric acid):

> "What we call limestone is more or less pure calcium oxide intimately united with a thin acid known to us in the gaseous state. If you put a piece of this limestone into dilute sulfuric acid, the latter will seize on the lime and join with it to form calcium sulfate, or gypsum; that thin gaseous acid, on the other hand escapes. Here there has occurred a separation and new combination, and one then feels justified even in employing the term 'elective affinity', because it really does look as if one relationship was preferred to another and chosen instead of it."

The modern chemical equation for the limestone sulfuric acid reaction is shown below; a video of reaction of calcium carbonate chips with sulfuric acid is shown to the right —which shows that in the course of 13-minutes, the "extent", symbol ξ, pronounced xi or "zi", starting from an initial 50 grams total of reactant remains, only 49.13 grams remain, measurable by the scale, meaning that 0.83 grams of carbon dioxide gas was produced as reaction product:

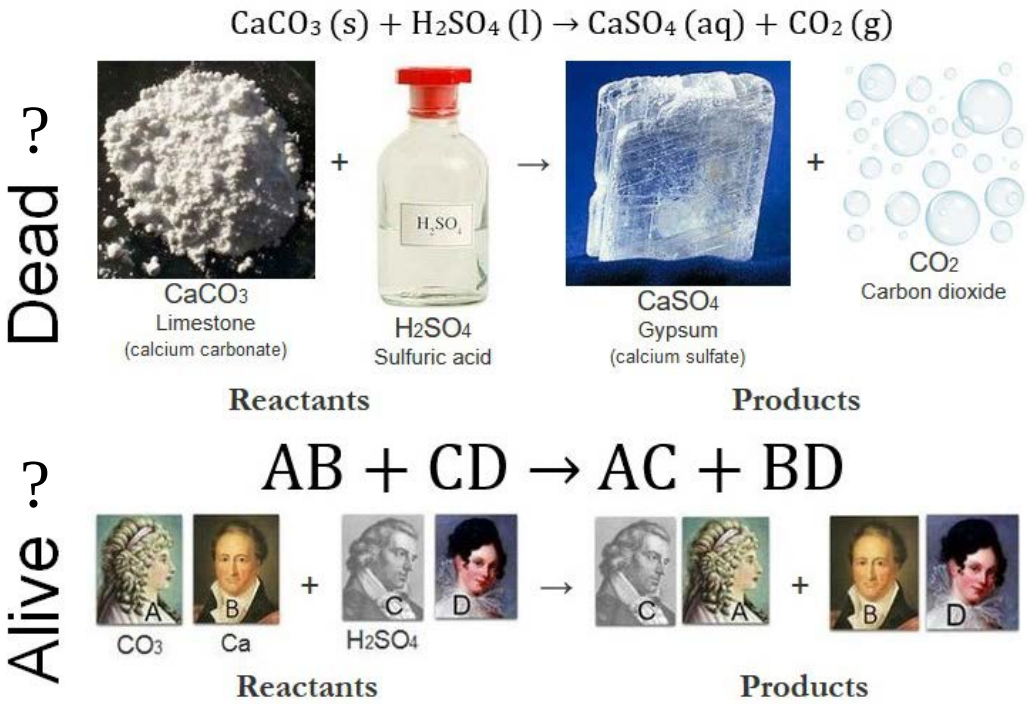

The Captain, elaborating on the above comparison of humans to chemicals and human relationship interactions to chemical reactions, continues (James Froude translation, 1854) onward in his discussion as follows:

> "You ought yourself to see these creatures, **which seem so dead**, and which are yet so full of inward energy and force, at work before your eyes. You should observe them with a real personal interest. Now they seek each other out, attract each other, seize, crush, devour, destroy each other, and then suddenly reappear again out of their combinations, and come forward in fresh, renovated, unexpected form; thus you will comprehend how we attribute to them a **sort of immortality**—how we speak of them as having sense and understanding; because we feel our own senses to be insufficient to observe them adequately, and our reason too weak to follow them."

Alternatively (Reginald Hollingdale translation, 1971):

> "One has to have these entities before one's eyes, and see how, although they **appear lifeless**, they are in fact perpetually ready to spring into activity; one has to watch sympathetically how they seek one another out, attract, seize, destroy, devour, consume one another, and they emerge again from this most intimate union in renewed, novel and unexpected shape: it is only then that one credits them with an **eternal life**, yes, with possessing mind and reason, because our own minds seem scarcely adequate to observing them properly and our understanding scarcely sufficient to comprehend them."

Here we see Goethe, who founded the science of human chemistry with these bold statements, teetering on the defunct theory of life solution, albeit on the panpsychism (atoms have mind) / panbioism (atoms have life) / panexperientialism (atoms have sense and or experience) tentative side of the suppositional fence; similar to the way in which Libb Thims was indecisive on this issue, prior to the 2009 arrival at the defunct view—after which the correct view was seen to be the extrapolate up approach, rather than the extrapolate down view.

Tyndall | Dead atoms argument

See main: Dead atom

In 1874, Irish physicist John Tyndall dug into the "dead atoms" argument, by asking how sensation, thought, emotion can arise from "dead" carbon, hydrogen, oxygen, nitrogen, and phosphorus

In 1874, Irish physicist John Tyndall gave his infamous Belfast BAAS Address, wherein he rips away at the 'dead atoms' argument (i.e. how did life arise from dead atoms?)—often found used today (e.g. Christian de Quincey, 2002)—via Platonic dialogue using Greek atomic theorist Lucretius as one of the protagonists: [29]

> "You are a Lucretian, and from the combination and separation of insensate atoms deduce all terrestrial things, including organic forms and their phenomena. Let me tell you, in the first instance, how far I am prepared to go with you. I admit that you can build crystalline forms out of this play of molecular force; that the diamond, amethyst, and snow-star are truly wonderful structures which are thus produced. I will go further and acknowledge that even a tree or flower might in this way be organized. Nay, if you can show me an animal without sensation, I will concede to you that it also might be put together by the suitable play of molecular force.
>
> Thus far our way is clear; but now comes my difficulty. Your atoms are individually without sensation, much more are they without intelligence. May I ask you, then, to try your hand upon this problem? Take your *dead hydrogen atoms*, your *dead oxygen atoms*, your *dead carbon atoms*, your *dead nitrogen atoms*, your *dead phosphorus atoms*, and all the other atoms, dead as grains of shot, of which the brain is formed. Imagine them separate and sensationless, observe them running together and forming all imaginable combinations. This, as a purely mechanical process, is *seeable* by the mind. But can you see, or dream, or in any way imagine, how out of that mechanical act, and from these individually **dead atoms**, sensation, thought, and emotion are to arise?"

Though difficult to see, at this point, the "dead atoms" concept is a forced contrivance a forcing of the religious-mythology view (life/death theory) into chemistry (atomic theory), of which the latter is hard science, the former mythology, primarily Egyptian mythology. Some, such as Goethe (above), approach the question, with inquisitive caution, and tend to side with physical chemistry (e.g. moral symbols); others, with human-grandeur ideals, may tend to slip into the "pan-views", i.e. panpsychism, panbioism, panexperientialism, etc., perspective, concluding that the hydrogen atom is alive, as is all the universe, or variants of this position. An example of the latter position is German polymath Gottfried Leibniz, who to rid himself of the problem of deriving life from death, displaced Greek atoms with his theory of "monads", out the summation and integration of which he supposed all the phenomenon of life—sentient, intellectual, and emotional—to arise.

Bernard | Physiology

In circa 1870s, French physiologist Claude Bernard produced some ripe defunct theory of life like stylized physiology works; some representative quotes are as follows:

> "We must not read into [living organisms] either a chemical retort or a soul: we must read into them what there is."
>
> — Claude Bernard (c.1870)

> "The metaphysical evolutive force by which we may characterize life is useless in science, because, existing apart from physical forces, it can exercise no influence upon them."
>
> — Claude Bernard (1878), *Experimental Science*

On the subject of 'life', Bernard, according to American science historian Everett Mendelsohn (1964), gives discussions of how the term 'life' is nothing but a word which means ignorance, but a term nevertheless closely associated with heat.

Pearson | Dead mechanism | Extrapolate down

In 1885, English physicist Karl Pearson cleverly used the extrapolate down method to ridicule the assumption that humans have the properties of life and consciousness, which by continuity are supposed to have arisen from dead mechanism at or below the level of the cell, which results in the 'absurd' conclusion that matter is conscious.

In 1885, English physicist philosopher Karl Pearson, in his "Matter and Soul" lecture (a physicalist reaction against English statesman William Gladstone's creationism article), gives us the following very telling argument, wherein he puts the extrapolate down argument in the form of an Aunt Sally in regards to consciousness and life (as a mechanism), supposedly, arisen from "dead mechanism": [44]

> "But I fancy one of you objecting: This may be very true, but it neglects the fundamental distinction between matter and life, namely the phenomenon of consciousness. Very good, my dear sir, let us endeavour to analyse this phenomenon of consciousness, and see whether denying consciousness to matter may not be just as dogmatic as asserting that matter possesses it. Now let me ask you a question: Do you think I am a conscious being, and if so, why? The only answer you can give to that question will be agnostic. You really do not know whether I am conscious or not. Each individual *ego* can assert of itself that it is conscious, but to assert that that group of sensations which you term me is conscious, is an assumption, however reasonable it may appear. For you, sir, I and the rest of the external world are automata, pure bits of mechanism; it may be practically advisable for you to endow us with consciousness, but how can you prove it? You will reply: I see spontaneous actions on your part, similar to those I can produce myself. I am compelled by analogy to endow you with will and consciousness. Good! you argue by analogy that I have consciousness; you will doubtless grant it to the animal world; now you cannot break the chain of

> analogy anywhere till you have descended through the whole plant world to the simple cell, there you find apparently spontaneous motion and argue life—consciousness. Now I carry your argument a step further and tell you that I find in the ultimate atom of matter most complex phases of motion and capacity for influencing the motion of others. All these things are to me inexplicable. They *appear* spontaneous motion; *ergo* by analogy, dear sir, matter is conscious.
>
> Now the only thing, which I am certain is conscious, is my own individual *ego;* I find nothing, however, more absurd in the assertion that matter is conscious, than in the assertion that the simple cell is conscious, or working upwards that *you* are conscious. They are all at present unproven assertions. That matter is conscious is no more nonsense than that life is mechanism; possibly some day, as the human intellect develops with the centuries, we may be able to show that one or other of these statements is true, or more probably that both are true."

This is excellent discernment indeed, particularly for a 28-year old. Here, Pearson sets up the Aunt Sally, in regards to which statement is true, for some 'intellect' in the coming centuries to knock down, an act that would not occur until some 124-years later (Libb Thims, 2009). Here we may recall the circa 1932 comment by Albert Einstein (see: Einstein-Murphy dialogue), who, as noted below, read Pearson, that attributing something like free will to the routine processes of organic nature is "not merely nonsense. It is objectionable nonsense."

In 1900, Pearson, in his Einstein-recommended (see: Olympia Academy) *Grammar of Science*, penned two chapters on the numerous inconsistencies resulting from the collision of physical science with biological science; to cite a few excerpts: [24]

> "There is no single sense impression which can be said to be that of life."
>
> "How, therefore, we must ask, is it possible for us to distinguish the living from the lifeless if we can describe both conceptually by the motion of inorganic corpuscles?"
>
> "Those who believe that the organic has been developed from inorganic, that living has proceeded from dead 'matter' [dead matter], may then assert that there must be in matter 'something-which-is-not-yet-life-but-which-may-develop-into-life', and may fitly term this side of matter *supermateriality*."

Pearson, in short, goes fairly deep into the problem, nearing the point of solution.

Tesla's forces view

Serbian-born American electrical engineer Nikola Tesla's views are very similar to those of German polymath Johann Goethe, being that Tesla read the philosophy of Goethe (see: Goethean philosophy) to the exclusion of all other philosophies. The following is the famous opening section from Tesla's 1915 *New York American* article "How Cosmic Forces Shape Our Destines", which extols a mixture of the defunct theory of life and the panbioism perspective, i.e. the everything is alive point of view, to some extent: [16]

In 1915, Serbian-born American electrical engineer Nikola Tesla, in his "How Cosmic Forces Shape Our Destines", stated as a matter of fact that "there is no thing endowed with life", and that all that exists is motion resulting from upset cosmic balances. Tesla, however, avers to an extent by attaching this to a panbioism conclusion.

> "Every living being is an engine geared to the wheelwork of the universe. Though seemingly affected only by its immediate surrounding, the sphere of external influence extends to infinite distance. There is no constellation or nebula, no sun or planet, in all the depths of limitless space, no passing wanderer of the starry heavens, that does not exercise some control over its destiny—not in the vague and delusive sense of astrology, but in the rigid and positive meaning of physical science.
>
> More than this can be said. **There is no thing endowed with life**—from man, who is enslaving the elements, to the humblest creature—in all this world that does not sway it in turn. Whenever action is born from force, though it be infinitesimal, the cosmic balance is upset and universal motion result.
>
> Herbert Spencer has interpreted life as a continuous adjustment to the environment, a definition of this inconceivably complex manifestation quite in accord with advanced scientific thought, but, perhaps, not broad enough to express our present views. With each step forward in the investigation of its laws and mysteries our conceptions of nature and its phases have been gaining in depth and breadth.
>
> In the early stages of intellectual development man was conscious of but a small part of the macrocosm. He knew nothing of the wonders of the microscopic world, of the molecules composing it, of the atoms making up the molecules and of the dwindlingly small world of electrons within the atoms. To him life was synonymous with voluntary motion and action. A plant did not suggest to him what it does to us—that it lives and feels, fights for its existence, that it suffers and enjoys. Not only have we found this to be true, but we have ascertained that even matter called inorganic, believed to be dead, responds to irritants and gives unmistakable evidence of the presence of a living principle within.
>
> Thus, everything that exists, organic or inorganic, animated or inert, is susceptible to stimulus from the outside. There is no gap between, no break of continuity, no special and distinguishing vital agent. The same law governs all matter, all the universe is alive. The momentous question of Spencer, "What is it that causes inorganic matter to run into organic forms!" has been answered. It is the sun's heat and light. Wherever they are there is life. Only in the boundless wastes of interstellar space, in the eternal darkness and cold, is animation suspended, and, possibly, at the temperature of absolute zero all matter may die."

The first two paragraphs, of this opening article section, corroborate with the now confirmed and accepted 2009 defunct theory of life, i.e. that life is something that does not exist. Very deep insight indeed. In the last paragraph we see Tesla: conclude that the unbridgeable gap model is bunk (correct), that vitalism is bunk (correct), that the same law (thermodynamics) governs all matter (correct), discuss the heat death theory (seems cogent), and attempt to give his solution to the Spencer-version of the great problem of natural philosophy (close). In the last of these, however, his mention that "all the universe is alive" (incorrect) is one step away from the rigid physical science defunct view of life, namely that correctly "nothing in the universe is alive" (correct). When one first delves into the matter, such as via descent down to smaller scales, e.g. as viewed on the molecular evolution table or evolution timeline, the first possibility that comes to mind, knowing that atoms and nucleons are teeming with movement and activity, is to conclude that "all is alive" in some sense of the matter. This view, however, does not hold water in the long run after which one concludes that the "all is alive" possibility is an anthropomorphism and that correctly what is needed is a deanthropomorphism.

Lotka | Regarding definitions

> *See main: Regarding Definitions*

In 1925, Alfred Lotka, in his *Elements of Physical Biology*, set out to outline the subject of physical biology, namely of "physics" applied to ecological, zoological, and social systems, as opposed to biophysics, aka physiology, or physics *inside* of organism; and therein, in his opening chapter "Regarding Definitions", defined attempts to define life via physics as "jabberwocky" or fictional nonsense.

Sherrington

In 1937-38, English physiologist Charles Sherrington, in his Edinburgh University Gifford Lectures turned book *Man on His Nature* (1940), in his lecture/chapter three "Life in Little", seems to have been the first to dig into the issues and irreconcilabilities with the term life in the modern general chemical-physics-thermodynamics perspective:

In 1940, English physiologist Charles Sherrington (left) published his *Man on His Nature*, based his University of Edinburgh Gifford Lectures (1937-1938), wherein he vociferously, assiduously, and densely rips apart all of the various absurdities resulting when the numerous life-centric anthropomorphisms are carried down to the chemical level, where chemistry and physics rule. In 1966, English molecular geneticist Francis Crick (right), in his *Of Molecules and Men*, similar to Sherrington, grappled with the men arising from atoms and molecules issue, concluding that the term "alive" needs to be abandoned (see: life terminology upgrades).

> "Chemistry does not know the word life."

A full read of the Sherrington's Hmolpedia article is requisite here, as Sherrington gives keen discernment.

Crick

In 1966, English molecular geneticist Francis Crick, in his *Of Molecules and Men*, delved into the question of neo-vitalism and gives his cogent view that: [35]

> "Let us abandon the word 'alive'."

A full read of Crick's Hmolpedia article is requisite here, as he comes very close to the complete abandonment of the theory of life.

Intermediate views

In 1818, Scottish moral philosopher Francis Macnab, in his religion and science reconciliation attempting treatise *A Theory of the Moral and Physical System of the Universe*, arrived at the following rather hilarious logic: [49]

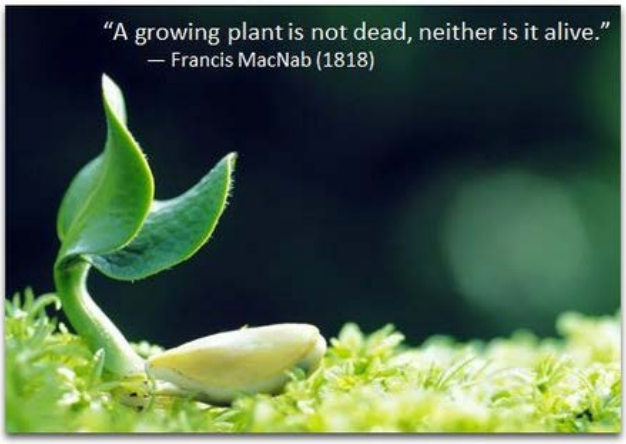

One of Scottish moral philosopher Francis Macnab's arrived at absurdities, i.e. that growing plants are neither alive nor dead, an intermediate view to the **defunct theory of life**, resulting from his 1818 attempt to reconcile religious theory (Biblical views) with modern science (fossil evidence, Copernican system, law of gravitation, atomic theory, chemistry, etc.). [49]

> §40. Between matter and mind, there is, as I have said, a perfect antithesis or contrast (§2-3). The first is passive, the second is active; the first is acted upon by general laws, the second acts by its own particular volition; the first is *dead*, the second is *alive*. But, between the animal spirit, and the inanimate clod, there is a middle state partaking of both. It is neither a passive, inert substance, nor is it an active living principle. The growing plant is not dead, neither is it alive. It has no volition, like the animal spirit, neither is it under the dominion of those general laws which operate upon inanimate matter. It possesses a kind of life or vitality, depending upon the influence of the sun, which seems, in a special manner, to rule over the vegetable kingdom, and inspire and quicken it. Accordingly, the *sun* may be said to the *soul* of the vegetable world. In his presence they live; in his absence they sleep, or die.

Matter.	*Central state.*	*Mind.*
1, 2, 3,	4,	5, 6, 7.

> §41. But though we can thus discern, by our outward senses, not only the organic bodies of vegetables, but also the glorious luminary which quickens them, we cannot thus discern the principle which quickens the organic bodies of animals: for every animal is quickened by a principle which belongs to itself, and has a will of its own. Its body, indeed, may be called a *moveable vegetable*, because it is an organic machine, exactly analogous to that of the vegetable. The difference lies here: that the vegetable organic machine is set a-going and kept in order by the sun; but the animal organic machine is set a-going and kept in order by a particular agent which inhabits it. This agent is its *soul*, or *animal spirit*, and belongs to the predicament of mind, or the right side of the scale (§39).

In short, according to Macnab, in scale between so-called "dead" inanimate matter, governed by general laws, and so-called "living" animate humans (or animal organic machines), governed by a principle (and a will) which belongs to itself, lies the vegetable organic machine, which is neither alive nor dead.

In 1842, Emil Du Bois-Reymond and Ernst Brücke made the following honor pact (Reymond-Brucke oath): [4]

> "[We pledge] to put in power this truth: no other forces than the common physical chemical ones are active within the organism. In those cases which cannot at the time be explained by these forces one has either to find a specific way or form of their action by means of physical mathematical method, or to assume new forces equal in dignity to the chemical physical forces inherent in matter, reducible to the force of attraction and repulsion."

The oath was, in turn, adopted by German physicist-physician Hermann Helmholtz, a motto which became the backbone of the famous Helmholtz school of thermodynamics and psychology. The gist of the belief system was that there is no such thing as vitalism or vital energy, but only physical-chemical forces at work in the operation of the organism. A salient unwritten footnote in this belief system pact, however, is the retained belief that life exists—a belief that does not corroborate with the fact that atoms, chemicals, and molecules, are "not" alive—nor are they necessarily "dead" as some, e.g. Christian de Quincey (2002), into the 21st century, would come to trumpet. In short, here after, people would retain to incompatible belief systems: (a) organism are operate purely by chemical physical forces and (b) moving organisms are alive. That the two are

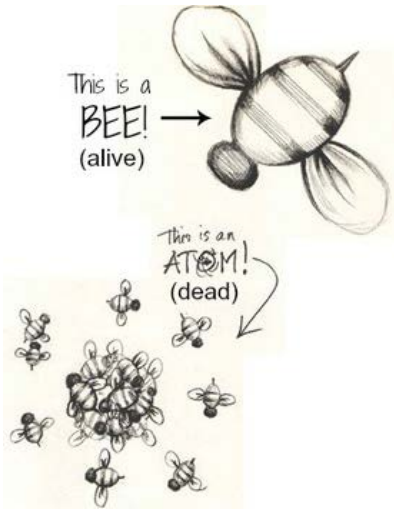

An modified version of American illustrator Linda Hensley's 2010 illustration of American nuclear physicist Philip Ugorowski's description of the "nucleus as a jostling swarm of bees, and I happily absorbed his explanation of the orbiting electrons as more bees, or maybe gnats" (link) to illustrate the apparent (or non-apparent) absurdity of "**dead atom**" / "living molecule" (bee) divide, dichotomy, or dualism.

incompatible, however, is not immediate.

In 1847, English physicist James Joule noted for following issue with the name "living force", for which in his day there was no alternative term: [26]

> "The force expended in setting a body in motion is carried by the body itself, and exists with it and in it, throughout the whole course of its motion. This force possessed by moving bodies is termed by mechanical philosophers *vis viva*, or living force. The term may be deemed by some inappropriate, inasmuch as **there is no life, properly speaking**, in question; but it is useful, in order to distinguish the moving force from that which is stationary in its character, as the force of gravity."

The term was upgraded first to "actual energy" (William Rankine, 1853) and then eventually to "kinetic energy" (William Thomson, 1862). Although Joule is not stating in a general sense that, in his view, there is no life, his excerpt "there is no life, properly speaking" does indeed apply to everywhere and to every body in the universe; as such, Joule's terminology note, is a precursor to the general conclusion that life is a defunct theory and that "there is no life, properly speaking" anywhere in the universe, the surface of the earth included. The upgrade of vis viva (1686) to kinetic energy (1862) is thus parallel to the upgrade of the term "biology" (1797) to "chnopsology" (2012).

In 1870 to 1874, Spanish physicist, chemist, and natural philosopher Enrique Fatigati published a thermodynamic-based model of the evolution of matter in the universe, according to which there was no "life | non-life" divide, but rather all material forms, from stars to man, were conceptually organized and based on the same chemical and dynamical grounds, in which there exists a "unity of constitution, phenomena, and a common origin, in the general progress of matter" and a "necessity law" that orders the series from simplest to more complicated forms; the following are his views: [52]

> "Organic character means that all matter has a soul—internal, active force conscious of itself—which directs its transformation. Some philosophers call this active principle 'God', I prefer to call it 'natural energy' or activity. The two laws of thermodynamics are the fundamental laws governing the universe."

In 1903, French physical chemist Jean Perrin, noted winner of the 1926 Nobel prize for proving that molecules exist, in his *Treatise on Physical Chemistry* (chapter: "The Principle of Evolution"), was one of the first to discuss the inconsistencies the notion of evolution, in the context of the second law, heat death theory, and so-called "life" originated or rather being synthesized from "dead" atoms (in the context of Carnot's principle), one of his comments being: [14]

> "Molecules and atoms are lifeless beings that never evolve."

The first part of this statement is quite accurate: atoms and molecules are indeed lifeless. A single hydrogen atom is not alive, nor are its derivatives (molecules). When one first begins to calculate the molecular formula for a single human (e.g. Sterner and Elser, 2002; Thims, 2007, etc.) and to specifically define a human as a "molecule" one is quickly confronted with a paradox: at what point, second, or reaction mechanism step (in the evolution timeline) on going from hydrogen to human, do molecules come alive? The beginning student will likely have been told that the Urey-Miller experiment (laboratory produced life) or Darwin's warm pond model solved this issue long ago, and that there only remain a few pieces of the puzzle to work out: but this could not be father from the truth.

In 1920, American bio-zoologist William Patten, in his *The Grand Strategy of Evolution*, after already speculating the year prior ("The Message of a Biologist", 1919) on how the modern person might go about deriving a science-based system of morality and future governing constitution for a 'molecular society', of people considered as 'human social atoms' (social atoms) or 'human molecules', based on the pure science teachings of chemistry, physics, and astronomy, stated the following:

> "When we attempt to follow up these vital processes within the body, they break up into countless larger and smaller ones, mingling inextricably the living and the dead; into organs, cells, and molecules, each a system in itself, and yet interlocking with all the others in a common give and take, with merely nominal, or purely arbitrary boundaries between them, like different departments in one department store. And when the chemist, or biologist turns his sharpest scrutiny on the most vital fragments of life, the dead and the living appear not less mingled than before. **Precisely what parts are 'dead' and what 'alive' does not appear**. Only this is sure: what once was dead is now a part of life; and what was once a part of life, is now a part of things called 'dead.'

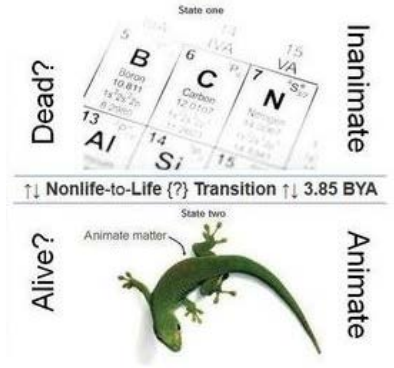

Into the 1920s, the seemingly paradoxical question about how, where, or **if**, when scaling down the evolution ladder, one is stop referring to atoms and molecules via the confusing terminology "dead" or "alive", began to come to the fore, particularly in the works of William Patten (1920), Albert Mathews (1924), and Gilbert Lewis (1925), among others.

In 1924, American physical biochemist Albert Mathews, in his article "Chemistry and Psychism", spoke of the difference between "living and dead hydrogen atoms", albeit in the end his discussion teetered on the nonsensical, but nevertheless is an interesting example of the perplexity one faces when deciding on which theory to side with, i.e. theory of life, no origin theory of life, or defunct theory of life, in the context of the periodic table view of a cell or a human. [13]

In 1925, American physical chemist Gilbert Lewis classified "life" as one of the main subjects or rather human abstractions of study in metaphysics, meaning that the term "life" it is not something recognized withing the field of physics proper, and may in fact be something akin to the defunct scientific concepts of phlogiston and ether, in Lewis' view. [17]

English mathematical philosopher Bertrand Russell seemed to teetering on the solution when in 1946 article "Mind and Matter in Modern Science", he commented: [12]

> “There is increasing reason to think that the whole of difference between living and dead matter is chemical: living matter has the capacity of transforming suitable other matter into something of the same chemical composition as itself.”

In 1929, British animal psychologist Lloyd Morgan introduced the term "biocule", a term Morgan, being a student of English Darwinian evolution promoter and social molecule theorist Thomas Huxley, employed as being representative of the borderland between the atom/molecule scale and the amoeba/rabbit/oak tree scale of atomic organization, which according to English mathematical philosopher Alfred Whitehead (1861-1947) are to be both seen as different "organisms"—albeit, as Morgan specifies, "not a living organism". [23] In this sense, Morgan, and his "biocule" or "living molecule" notion, footnoted with a side mention of "not living", seems to be close to the defunct theory of life position, but not yet at the finish line.

In 1947, English thermodynamicist Alfred Ubbelohde became the first to take a stab at the suggestion that, from a thermodynamic point of view, there are issues in attempting to differentiate or distinguish "simple forms of life" from "inanimate matter", as discussed in his 1947 chapter on "Life and Thermodynamics", in his book *Time and Thermodynamics.* At this point in his writing, however, he was still ambivalent on the issue, postulating to the effect that "living things" might be able to be explained in terms of their "disentropic behavior". [6] In the 1954 version of the same chapter, in *Man and Energy*, however, Ubbelohde opens to the decisive statement that:

> "Animate matter is termed 'life' for short."

This is a large step towards the view that the term life in all its uses must be replaced by the term "animate" or something equivalent (such as "reactive"), if the modern thinker is to be cogent with modern science.

In this direction, Ubbelohde devotes an entire chapter section to the topic of "Animate and Inanimate Matter" commenting to the effect that when we look into the question of the origin of life or emergence of life, in the thermodynamic perspective, we are not much beyond the 800BC Greek myth of Prometheus making men of clay, and stealing fire from heaven to animate them. [8] To exemplify, Ubbelohde quotes Shakespeare's summarizing view on this, from his 1603 *Othello, the Moor of Venice*: “I know not where is that Promethean heat, that can thy life relum.” Ubbelohde goes on to cite Erwin Schrodinger's famous 1943 lectures on the physics and thermodynamics of what constitutes life, wherein Schrodinger states, through mathematical riddle, that life is something feeds on negative entropy, but who goes on to recants this statement in later additions, following attack from fellow physicists, that he would rather have turned the discussion to free energy to explain life, but assume the topic to difficult for the lay public.

To note, although Ubbelohde seems to be stepping in the right direction, in his advisement that we replace the term life by the term "animate matter", he still holds fast to a grasp of the older dualism view, by giving an asterisk mention of how one must divide animated matter into non-rational beings (selection processes are unconscious) and rational beings (selection processes are conscious), the latter category of which he says human beings fall in. [7]

In 1991, American philosopher Robert Pirsig was in the neighborhood of the problem in his attempts to grapple with the theory of "struggle to survive" situated in the context of atoms forming a professor in the context of the second law, a section of which is as follows: [37]

> “This is the sort of irrelevant-sounding question that seems minor at first, and the mind looks for a quick answer to dismiss it. It sounds like one of those hostile, ignorant questions some fundamentalist preacher might think up. But why do the fittest survive? Why does any life survive? It's illogical. It's self-contradictory that life should survive. If life is strictly a result of the physical and chemical forces of nature then why is life opposed to these same forces in its struggle to survive? Either life is with physical nature or it's against it. If it's with nature there's nothing to survive. If it's against physical nature then there must be something apart from the physical and chemical forces of nature that is motivating it to be against physical nature.”

In 1997, Swedish physical chemist Sture Nordholm, in his *Journal of Chemical Education* article “In Defense of Thermodynamics: an Animate Analogy”, first outlined the subject of what he called animate thermodynamics, or thermodynamics applied to the humanities, and then concluded with eight example homework problems, the last of which he leaves to the so-called "life" question, as follows:

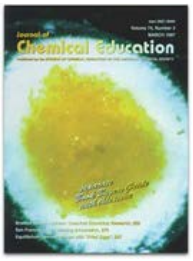

> **Problem #8:** Thermodynamics is often applied to the evolution of life-forms on earth. Critics have opposed such applications, arguing that thermodynamics only become applicable when, for example, and animal dies. Which side of this argument do you favor? Why?

> **Comment:** the very definition of life in distinction from lifeless existence seems capable of generating interminable argument. Perhaps the scale is continuous and divided into life and lifeless only by personal predilection. Where on such a continuous scale [see: evolution timeline; great chain of being; molecular evolution table] would thermodynamics cease to be relevant?

Here, in Nordholm's discerning comment, we see him at the precipice of the solution to the very question he proposes. Possibly, if Nordholm had stayed with the problem long enough he would have arrived at the solution? To give some comparison, it took American electrochemical engineer Libb Thims nearly a decade to solve: began loosely grappling with the problem in 2001 to 2005, laying the problem out on the table in 2007 (chapter 5: "Molecular Evolution", *Human Chemistry*), solution arriving in 2009, and still feeling like a wound healing in the mind in 2013, as outlined further below. The particular mental anchor point that allows the solution to precipitate, similar in theme to Nordhom's comment "where on such a continuous scale would thermodynamics cease to be relevant?", is the view that entropy increase, in general, or in particular free energy decrease, in respect to freely going earth-bound standard state surface reactions, is the governing principle for each step in the mechanism, hydrogen (13.7 BYA) to human (present), and to affix a specific point in this ongoing mechanism, e.g. 3.85 BYA, the oldest fossilized bacteria dating, knowing that a bacteria or virus, etc., can still be defined as a molecule (e.g. cell-as-molecule) and hence governed by rules of reaction, is as Sherrington put it in 1938 a ‘recital that trips along simple as a fairy tale.’

Into the 2000s, with the 2002 publication of the Sterner-Elser human molecular formula, and with the rise of modern human chemical thermodynamics, the question of when exactly is one to stop calling a "molecule" alive began to come into view, particularly in the context of the 2005 molecular evolution table and the 2009 evolution timeline, and doubly in particular in the context of human free energy theory, according to which there is no recognizable difference between the free energy that forms the water molecule and the free energy that forms the human molecule, following which one is forced to look under the scanning tunneling microscope at what exactly one means by the term "life", following which the term quickly becomes defunct beyond repair.

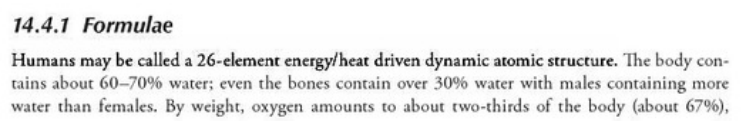

14.4.1 Formulae

Humans may be called a 26-element energy/heat driven dynamic atomic structure. The body contains about 60–70% water; even the bones contain over 30% water with males containing more water than females. By weight, oxygen amounts to about two-thirds of the body (about 67%),

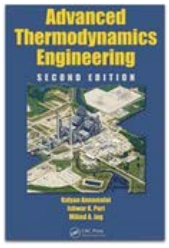

The new 2011 textbook definition of a human as a "26-element energy/heat driven dynamic atomic structure",as found in Indian-born American mechanical engineers Kalyan Annamalai, Ishwar Puri, and Milind Jog's *Advanced Engineering Thermodynamics*, based on American electrochemical engineer Libb Thims' 2002 calculation of the 26-element human molecular formula, [2]

The following switch of terms in the opening abstract sentence as compared to the opening article sentence of Israeli chemist Addy Pross, from his 2003 article "The Driving Force for Life's Emergence: Kinetic and Thermodynamic Considerations", gives a view of how, in the early 2000s, researchers began to vacillate ambivalently between the terms "life" and "animate matter", using the former in more pressurized summaries, the latter in more loosened dialogs: [1]

> Abstract: "The principles that govern the emergence of **life** from non-life remain a subject of intense debate."
>
> Article: "The nature of the driving force that led to the emergence of **animate matter** remains a subject of continuing debate and uncertainty."

Stepping into the 21st century, the discussion has indeed turned to free energy, specifically Gibbs free energy (see: human free energy timeline). In the free energy view, the search for the origin of life, in the context, of the human molecule perspective, , i.e. humans viewed as animate molecules, which have evolved or synthesized over time, through chemical mechanism, starting from hydrogen atom reactant precursors, the theory of life begins to fall apart to the point that it is no longer tenable (Thims, 2009).

The precariousness of the term "life", in the context of viewing animated structures, such as bacteria and humans, as "molecules" began to come into view in the 2007 chapter "Molecular Evolution" in the 2007 textbook *Human Chemistry* by American chemical engineer Libb Thims.

In 2008 and 2009, heated discussions began to erupt between Thims and other thermodynamicists, such as Russian physical chemist Georgi Gladyshev, and his 1978 hierarchical thermodynamics theory of life, Indian chemical engineer DMR Sekhar, and his 2007 genopsych anti-entropy theory of life, and American chemical engineer Ted Erikson's and his 2005 Planck-scale panpsychism (or panexperientialism) awareness theory of life, who each would attempt to argue to Thims, possibly to publish their theory in the Journal of Human Thermodynamics (edited by Thims), that life is explained or "mandated" (Gladyshev's expression) by their respective thermodynamic theory. In Thims view, each, it seemed, was searching for the modern-day equivalent of the mythological "Promethean heat" that started the first life.

In sum, the defunct theory of life holds that antiquated pre-scientific theory of "life", in the modern hmol sciences viewpoint, is a defunct theory, in the sense that one cannot define the hydrogen atom to be alive, therefore structures of modified hydrogen atoms (such as a human) cannot be alive.

Replacement | Life → Animate

In the modern sense, the term life is replaced with the term "animate", on the suggestion of those as American polymath William Sidis, *The Animate and the Inanimate* (1920), English thermodynamicist Alfred Ubbelohde, "animate matter is termed 'life' for short" (1955), and Swedish physical chemist Sture Nordholm, "animate thermodynamics is the study of human behavior " (1997).

Alternative substitutions include the names reactive as compared to inert, which replace the defunct terms "living molecule" as compared to "dead molecules", the latter of which are nonsensical. Technically, a person, or human molecule, cannot be alive anymore so than can a hydrogen atom or any other molecule in the universe be considered to be alive. The question of what is life has long plagued human thought. The human chemistry viewpoint breaks into this question with such acidity that a mental retrograde-rewiring-detractment effect occurs.

Thims | Irreconcilable with molecular evolution

The "defunct theory of life", as arrived upon by American chemical engineer Libb Thims, as the solution to the "great problem of natural philosophy", originated with meandering thoughts on the notion of a type of particle physics panbioism on the descent down the great chain of being in circa 2005 with the construction of the first molecular evolution table; the theory of life, however, began to be ridiculed in 2007, in Thims' *Human Chemistry* chapter "Molecular Evolution", in which Thims' commented:

> "This type of reasoning, in which small 4-element molecules, such as aspartic acid, a crystalline amino acid found especially in plants, are not alive, whereas 5-element molecules, such a RNA, are alive, is clearly ridiculous."

was conceived in partial-glimpse in 2007 and then in full-view in 2009, following nearly a decade of thought on the matter, by American chemical engineer Libb Thims. [1]

2005 **2007**

↑
(inorganic)
(inanimate)
Non-life?

Life?
(animate)
(organic)
↓

Element Count	Molecular Evolution Table	Name	Date
N/A	*Fermions:* $e^-, \nu_e, u, d, \mu^-, \nu_\mu, c, s, \tau^-, \nu_\tau, t, b$ *Gauge bosons:* $g_{ub}, \gamma, W^+, W^-, Z^0, G$	Elementary Particles	13.7 BYA
1	H, He-3, He-4, Li	Atoms	3E5 YAB
1	H_2	Hydrogen	
2	H_2O	Water	2E8 YAB
3	CH_4O	Methanol	
4	CH_4ON_2	Urea	4.6 BYA
5	$C_{10}H_{16}O_{13}N_5P_3$	DNA	
6	$C_{21}H_{36}O_{16}N_7P_3S$	Coenzyme A	
7	$C_4H_7O_4NS_2NaI$	mol-7	4.4 BYA
8	$C_{22}H_{32}O_7N_5SNaIPt$	mol-8	
9			
10	$C_{55}H_{83}O_{21}N_{14}P_{12}S_{12}Ca_{12}K_{12}Cl_{12}Na_{12}$	Intermediate	4.2 BYA
11			
12	$C_{57}H_{87}O_{23}N_{15}P_{14}S_{14}Ca_{14}K_{12}Cl_{12}Na_{12}Mg_{12}Fe_{12}$	Pro-bacteria	4.0 BYA
13			
14			
15	$C_{61}H_{93}O_{25}N_{16}P_{15}S_{15}Ca_{15}K_{15}Cl_{15}Na_{15}Mg_{15}Fe_{15}$ $Si_{14}Mn_{12}Co_{12}$	Prokaryote (Bacteria)	3.85 BYA
16			
17			
18	$C_{63}H_{95}O_{26}N_{16}P_{16}S_{16}Ca_{16}K_{15}Cl_{15}Na_{15}Mg_{15}Fe_{11}Fe_{11}$ $Si_{15}Cu_{13}Mn_{13}Se_{13}Co_{13}$	Pro-Aquatic Worm	2.6 BYA
19			
20			
21			
22	$C_{65}H_{99}O_{28}N_{18}P_{18}S_{18}Ca_{18}K_{18}Cl_{18}Na_{18}Mg_{18}Fe_{17}Fe_{17}$ $Zn_{16}Si_{16}Cu_{16}B_{16}Mn_{16}Se_{16}Mo_{16}Co_{16}V_{16}$	Fish	0.7 BYA
23		Reptile	350 MYA
24	$C_{67}H_{103}O_{29}N_{20}P_{19}S_{20}Ca_{20}K_{20}Cl_{20}Na_{20}Mg_{20}Fe_{21}Fe_{21}$ $Zn_{20}Si_{20}Cu_{19}B_{19}B_{19}Mn_{19}Se_{19}Cr_{19}Mo_{19}Co_{19}V_{19}$	Old World Monkey	30 MYA
25		*A. Afarensis*	5.0 MYA
26	$C_{67}H_{103}O_{29}N_{20}P_{19}S_{20}Ca_{20}K_{20}Cl_{20}Na_{20}Mg_{20}Fe_{22}Fe_{22}$ $Zn_{20}Si_{20}Cu_{20}B_{20}B_{20}Sn_{20}Mn_{20}Se_{20}Cr_{20}Ni_{20}Mo_{19}Co_{19}V_{19}$	Human (*H. Sapiens*)	0.2 MYA
27			
28		Evolution	

The 2005 online "molecular evolution table" (precursor to the scrolling 2008 evolution timeline), from which the **defunct theory of life** began to come into view: in other words, from the molecular formula point of view, it is difficult to decide which row of the table is "alive" or the first point of life, after which one is forced to migrate to one of four conclusions: (a) emergence (untenable), (b) panpsychism (untenable), or (c) "life principle" (puzzling), or (d) defunctness (tenable); the latter of which leads one into the modern view that what in olden days one would call "life" is simply a property of (primarily) the light-induced reactionary "animateness" of the carbon atom (the prime examples being the retinal molecule, walking molecule, etc.)

naively believe that the 5-element RNA was the first from of life, then we would also have to believe in the following backwards logic:

$C_4H_7O_4N$ (aspartic acid) – not alive
$C_{10}H_{12}O_6N_5P$ (ribonucleic acid) – alive
$C_{21}H_{36}O_{16}N_7P_3S$ (coenzyme A) – more alive

This type of reasoning, in which small 4-element molecules, such as aspartic acid, a crystalline amino acid found especially in plants, are not alive, whereas 5-element molecules, such as RNA, are alive, is clearly ridiculous. The hypothesis put forward herein, to reconcile these areas of theoretical inconsistency, is that the human organism is 26-element molecule and that it as well as all other large-element molecules are dynamic atomic structures found within a 92-element, heat-fluxed, environment, which together react, form, and break bonds, evolve, and reproduce according to the four laws of thermodynamics. Moreover, there is no such reality as there being a specific energy-filled 'spark day' in earth's past in which molecules suddenly became lifelike, alive, or imbued with life, etc., as it is currently believed.

Excerpt from the 2007 *Human Chemistry*, chapter "Molecular Evolution", in which American chemical engineer Libb Thims first began to grapple with the **defunct theory of life** issue, namely illogical supposition that the first form of life was a small molecular entity such as RNA (a 5-element molecule) or a single-cell bacteria (a 15-element molecule), which leads to the absurd conclusion that the precursor molecules or reactant molecules that went into the synthesis of that first "living molecule" were either sort of alive or a dead molecule or something nonsensical to this effect. [1]

2009
(Jan 2)

Letter

Life: a Defunct Scientific Theory?

Libb Thims

Abstract

The following is correspondence letter on the issue irreconcilabilities of attempts at a definition of life in the context of molecular evolution tables, sent from American chemical engineer Libb Thims to Russian physical chemist Georgi Gladyshev dated January 2nd, 2009.

Letter

I am under the view, that the term 'life' is a defunct scientific theory.

You agree with me that the single atom is not alive. What about two atoms? What about three? Does a bound state of atoms have to have a certain movement to be considered alive? What if we heat a system of four atoms, do they suddenly become alive? What if we subject a system of atoms to both gravitational and electromagnetic forces, does that suddenly make them alive? What if the two forces act to move smaller atoms through the cavities of larger atoms on a cyclical basis, thus activating reactions in the process, does that make them alive? What if the two forces begin to arrange the atoms into hierarchies, and that smaller atoms and bundles of atoms begin to more between the hierarchies, does that make them alive? What if a structure of atoms, begin to turnover their internal atoms, with those of the surrounding space, on a cyclical basis, does that make it alive?

On 2 Jan 2009, Thims' vents his new position, in argumentative stance, in opposition to primarily Russian physical chemist Georgi Gladyshev, and his view that "thermodynamics mandates life", that he now sees the term and concept of "life" to be an untenable position.

2009
(Jun 15)

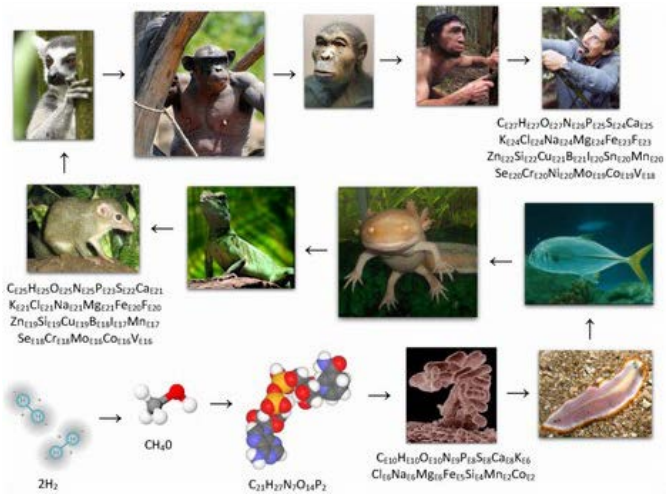

On 15 Jun 2009, the Hmolpedia "evolution" article is updated with the above hydrogen to human form change schematic: a snapshot look at the development of animate matter (chnopsological matter), from inanimate matter (elements of the periodic table), which shows that from the point of view of human molecular theory, i.e. that each structure —hydrogen molecule H_2 to human molecule Mx—has as specific molecular formula, the search for the so-called "emergence" or origin of life, becomes a search for a philosopher's stone: a **mythological** entity, and hence a **fictional concept**; a view arrived at by American electrochemical engineer Libb Thims during the years when he began molecular evolution tables (2005) and an online evolution timeline (2009), according to which, in the colloquial scientific view, the notion that in the step of the transition of about the "third arrow", shown above, that something called "life" originated, emerged, or started, becomes an **absurdity** (particularly from the thermodynamical perspective): a view paramount to the conclusion that the hydrogen atom is alive, which is not the case as far as chemistry and physics are concerned—a conclusion discerned in 1938 by English physiologist Charles Sherrington.

2010

From the preface: In present compemium of ideas on the philosophy of evolution Stanley Sessions set the tune of discussions in Darwinian perspective. Dr. Rossi is exploring the co evolution of brain, mind and consciousness from the stand point of neuroscience. Chris King examines the phenomenal nature of subjective consciousness to elucidate a possible biophysical basis for its existence. Ruggero Rapparani aims to understand how the physical neural processes going on in the brain give rise to the sum of feelings that we call mind. Sreenivasa Rao reminds us of the Buddhist view of consciousness, while **Libb Thims asserts that life is a defunct scientific theory** and consciousness has no physical basis, Ted thinks that everything in the universe is conscious. Sekhar thinks that consciousness is the property of living beings only. John Patrick explores the possibility of developing unified theory of evolution, an attempt to reconcile entropy and evolution. Shajan Mathew explores an explanation for evolution alternate to Darwin's theory.

The VedamsBooks.com advertisement, supposedly typed out by Indian chemical engineer DMR Sekhar, project head, for the 2010 *The Philosophy of Evolution*, showing the preface section with American electrochemical engineer Libb Thims' **defunct theory of life** position highlighted; although, to note, the actual chapter contribution by Thims does not touch on the details of this. [30]

2012

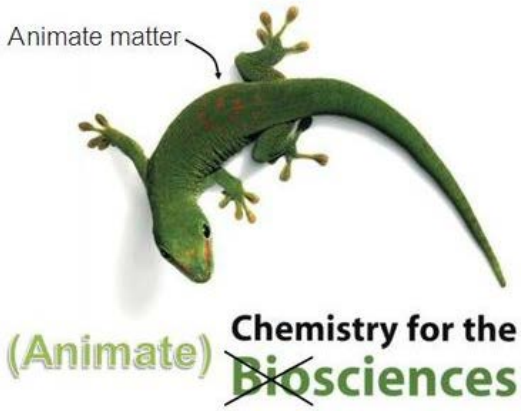

1 Biophysics: An Experimental Tool of Biology or the Physics of Animate Matter?

Thims puts the above crossed out "bio-" prefixed on the Hmolpedia homepage; along with Polish solid state physicist Michal Kurzynski's 2006 opening chapter one, form his *The Thermodynamic Theory Machinery of Life*, wherein he vacillates the question of how to define biophysics, either as a type of experimental biology or the "physics of animate matter", implying that biology is not the study of life (an undefined/mythology-based term), as we have been led to believe, but rather the study of animate matter, as would be the correct physical science perspective (as was outlined earlier by Alfred Ubbelohde, *Man and* Energy, 1954). [15]

2012-2013

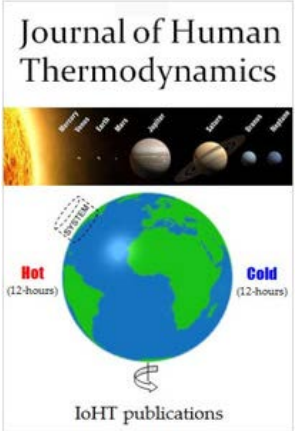

"Let us **abandon** the word 'alive'."

— Francis Crick, *Of Molecules and Men* (1966) [9]

"[If] these terms ['unit-mass of living matter', 'resultant of organic forces', 'continuity of organic substance', etc.], biologists have adopted from physics, are used figuratively, we ought to find them **re-defined**."
— Karl Pearson (1892), *Grammar of Science* [11]

Thims begins to editorially make redaction rewrites and initiate restrictions on use of all bio-related terms and antonyms in JHT articles (see: life terminology upgrades) per classification as being perpetual motion theory terms (perpetual motion of the living kind and hence not acceptable to a thermodynamics journal.

Another to arrive at the same viewpoint is American physicist Michael Brooks, who his popular science article-turned-book, the 2007 *13 Things That Don't Make Sense*, he devotes fifth biggest problem in science to that of the topic or theory of life "not making any sense". Specifically, as discussed in his chapter five "Life: are you more than just a bag of chemicals", Brooks states: [2]

> "Stop taking it for granted, and think for a moment about what sets the biological world apart from the world of nonliving matter. No scientist on earth can tell you the fundamental difference between these two states."

Brooks goes on to explain how every historical attempt do define life has ended in failure. Likewise, in his 2010 *Moral Landscapes*, American neuroscientist Sam Harris comments: [11]

> "What do I mean by 'dead'? Do I mean 'dead' with reference to specific goals? Well, if you must, yes—goals like respiration, energy metabolism, responsiveness to stimuli, etc. The definition of 'life' remains, to this day, difficult to pin down?"

American physicist Michael Brooks' popular science article-turned 2007 book *13 Things That Don't Make Sense*, he devotes fifth biggest problem in science to the issue that the concept of "life", as a bag of chemicals, does "not making any sense". [2]

The solution to this conceptual "dividing wall" finds resolution in a combination of perspective (advanced perspective) and relativity (reaction speed), with a concurrent interment of the out-dated "theory of life", which finds that a moving "human" can never be said to be "alive", but rather "reactive" or "bound" or other chemical terminology variations.

Said another way, in the correct modern sense, any given molecule (human molecule included), such as a hydrogen molecule, water molecule, or a bacteria molecule, etc., cannot technically be said to be alive, any more than the hydrogen or a star can be said to be alive. A chemical reaction cannot technically be said to be alive. This is a huge rewiring thought in the framework of human knowledge. One must side with either the fact that they themselves are not alive or that the hydrogen atom is alive. The latter alternative, as one will find, leads to a number of absurdities.

Unbridgeable gap

See main: Unbridgeable gap

This new scientific perspective arises from the modern discernment of prolonged study of molecular evolution tables and timelines, that it is technically impossible to find a specific "spark day" (or rather spark second), in the contiguous chemical synthesis mechanism, on the evolution timeline, starting with hydrogen reactants H (13.7 billion years ago), stepping through a number of molecular species intermediates M_I, and ending with modern human molecule products M_H (200,000 years ago), at which it can technically be said that the chemical mechanism suddenly "came alive":

$$\overbrace{\text{nonlife} \cdots \rightleftarrows \cdots \text{warm pond} \cdots \rightleftarrows \cdots \text{life}}^{\text{Unbridgeable Gap?}}$$

(warm pond model)

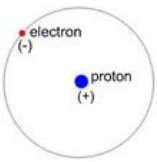

Hydrogen atom

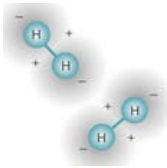

Hydrogen molecule

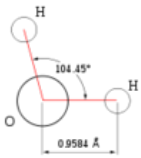

Human molecule

$$H \rightarrow 2H_2 \rightarrow C \rightarrow H_2O \rightarrow M_{I1} \rightarrow M_{I2} \rightarrow M_{I3} \rightarrow M_{I4} \rightarrow M_{I5} \rightarrow M_{I6} \rightarrow M_{Ii} \rightarrow 2M_H$$

$$\underbrace{\text{alive}_{no} + \cdots \text{alive}_{maybe} + \cdots \text{alive}_{yes}}$$

$$\uparrow$$

Not alive!	Alive?
No soul!	Has a soul?
No consciousness	Has free will?
No brain (thinking)	Is conscious?
No free will!	Has brain/thinks?

The thinker who holds-fast to the ancient mythological doctrines of 'life', 'soul', 'consciousness', 'free will', 'choice', a 'brain', etc., will argue, to their grave, that, in some contrived-way or another, at one particular second in time, in the course of human evolution mechanism, that molecules, somehow, came to life, acquired souls, developed a free will, obtained the state of consciousness, evolved the ability to think, among other now-defunct traits that do not apply to the hydrogen atom, nor to any other molecule, known in science.

(see correct formulations: animate chemistry, animate physics, animate thermodynamics)

In other words, in modern view, every intermediate, M_{I1}, M_{I2}, M_{I3}, etc., in the steps of chemical synthesis of the human molecule, over time, are simply only bigger-and-bigger, more-and-more dynamic molecules, derivative of the hydrogen atom. Subsequently, one is forced into one of two conclusions, either the hydrogen atom is alive or the human molecule is not alive. The former is nonsensical.

Others, as history has shown, will argue that these olden-days properties said to be characteristic of "living beings" (living matter, living system, living organism, living molecules, etc.), are "emergent", "self-organizing", "self-replicating", or "auto-catalytic", etc., properties, or in possession of some type of "living energy" (or living force), or in a specific "living state", etc., and write entire books and spend decades in attempts to salvage the olden-days concepts.

A few prime examples, used to explain the "missing link" mechanism step (dividing life from non-life) in the above contiguous mechanism, include the 1926 theory of Vladimir Vernadsky who argues that "living matter" of the "biosphere" (sphere of life) is a type of "green fire" of stable compounds in a thermodynamics field living off of free energy; the 1970s views of Ilya Prigogine, who posits that living things are a far-from-equilibrium sort of Benard cell state or type of dissipative structure; to the 1990s views of Stuart Kaufman to argues that life is an auto catalytic reaction, able to complete one thermodynamic cycle, that somehow that 'catches fire'.

In any event, in summary, many newcomers to the subject of the "human molecule" will object to the definition of a human being as 'molecule' on the grounds that a human being has a soul (religious objection), that humans have internal crystalline structures, e.g. teeth enamel, hence the term molecule cannot be used (technical jargon objection), that living things have an atomic turnover rate of about 48-percent of structural atoms per year and thus cannot be a molecule (theoretical issue), or that a human cannot be a molecule because a person has a brain (conceptual issue), that a human cannot be a molecule because a human has consciousness, choice, and free will (educational issues), and so on.

Whatever the objection, there is no doubt that humans are made purely of atoms, meaning that humans can be categorized as a type of chemical entity using whatever name one prefers, and that humans are reactive to each other, hence the subject of 'human chemical reactions' is a topic germane to human chemistry.

Sekhar's 2010 response

The following 2010 blog-post by Indian chemical engineer DMR Sekhar gives in idea of the issues arising in process of abandonment of the "life theory": [3]

knol A unit of knowledge.

The paradox of life

Life: a Defunct Scientific Theory?

Any attempt to describe life within the scope of physical laws will lead to precarious positions that life has no purpose or we are not alive in the same way as water molecules are not alive. Let us consider an experiment where a jar of water and a conscious man were placed on two hot plates of two feet by two feet size and let us switch on the hot plates. What we will observe is that in the first case the jar remains on the hot plate and the water will become hot. In the second case the man will jump out of the hot plate trying to preserve himself and hence he is alive unlike the water molecules.

Indian chemical engineer DMR Sekhar's 2010 response article "The Paradox of Life | Life: a Defunct Scientific Theory" article in which gives his "hot plate objection", wherein he attempts to say that humans (as molecules) are alive because humans will reactively jump of hot plates, whereas water molecules (dead), supposedly, won't. [4]

> "The question of 'self' is a tough problem and modern scientists abandoned this question long back. One of my friends an American chemical engineer Libb Thims says that "life is a **defunct scientific theory**" in other words there is nothing called life. Honestly Libb's position is the position of the present day science. I respect Libb for his honesty though I disagree with him."

Sekhar then followed up his blog post, which itself gathered some reply discussion, with a multi-part knol article "The Paradox of Life | Life: a Defunct Scientific Theory?", in which he gives a hotplate objection to the defunct theory of life view. Sekhar's hotplate objection is summarized by Sekhar as follows:

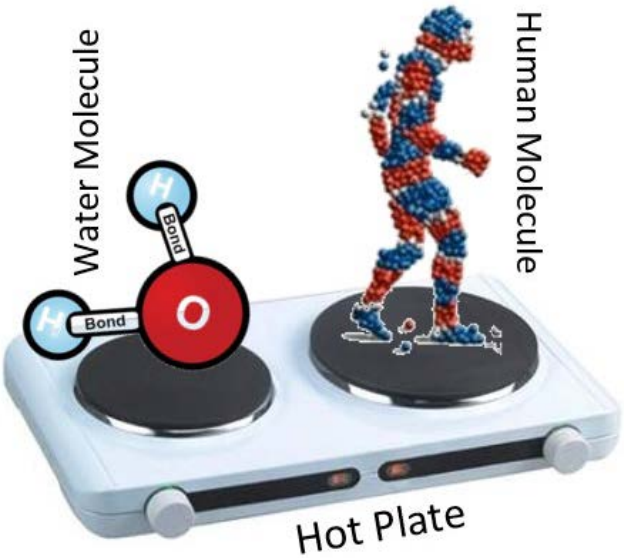

Indian chemical engineer DMR Sekhar's 2010 "hot plate objection" thought experiment, according to which one water molecule (left) and human molecule (right) are placed on a hot plate, the heat is then turned on, and supposedly the person will "jump" off because he is "conscious" and "alive", whereas the water molecule will remain on the hot page, because it is "unconscious" and "dead", a misconstrued logic that Sekhar thinks disproves the **defunct theory of life**.

> "Let us consider an experiment where a jar of water and a conscious man were placed on **two hot plates** of two feet by two feet size and let us switch on the hot plates. What we will observe is that in the first case the jar remains on the hot plate and the water will become hot. In the second case the man will jump out of the hot plate trying to preserve himself and hence he is alive unlike the water molecules."

The above argument is similar to a well-paid lawyer in a courtroom distorting the facts around to make it seem as though his guilty client is innocent; whereas, correctly, if a single human molecule and a single water molecule (or a single drop of water; or beaker of water), as shown adjacent, were placed on a hotplate and the heat was turned up, both molecules, human and water, will be "forced" to remove themselves, the human via induced movement sensory input, the water by evaporation—both driven by the quantum electrodynamic exchange force—photon/electron interaction—mechanism of the electromagnetic force.

In any event, Sekhar then goes on to argue that the difference between the behavior of the water molecule and human molecule can be quantified by the following argument or rather equation to describe the behavior:

$$f(L) - f(D) = f(g)$$

where: f(L) = the state of a being that is alive, f(D) = the state of a being that has just died, f(g) = 0 to x. Sekhar states that:"if the behavior of a live being equates to that of a dead being, then f(g) = 0, otherwise, it could be any other value. A value of 0 would support Thims' contention that there is no such thing as "life"—there is only the material world. However, we have observed in our theoretical experiment that a living object will display different behavior to a recently dead object therefore it is abundantly clear that f(g) is not in fact equal to zero."

Sekhar's so-called "hot plate objection", i.e. that human molecule and a water molecule will react differently when placed on a hot plate, is nearly absurd in its silliness. Both "molecules", as experiment will show, will be "forced" off the hot plate, the water by evaporation, the human by sensory exchange force induced movement. The objection shows nothing more than Sekhar's unwillingness to look deeper into the problem and moreover his uncompromising view to retain his "self drive" theory of human motion, i.e. that "a human uses his or her internal biological energy and their will, but this is not same as perpetual motion machine, because a human takes in food from external environment to accumulate and or store internal biological energy" (notice the use of the term "bio" twice), as he believes emerged or came about miraculously somehow when DNA formed and that DNA has some type of anti-entropy God-infused consciousness; all of which is crouched in perpetual motion theory. [25]

Stamatopoulos' 2010 summary

The debate, or rather rebuttal proof by Sekhar, was commented on further on November 15, 2010 by Australian engineer Vangelis Stamatopoulos, who surmised:

All Blog Posts My Blog + Add

It's life Jim but not as we know it!

Posted by Vangelis Stamatopoulos on November 15, 2010 at 4:18am

View Vangelis Stamatopoulos's blog

Atheism is often portrayed as being materialistic so when I came across a debate on life or life essence or life force or whatever you want to call it, I was immediately intrigued. Here were two enigineers, one based in the US and the other in Jordan discussing the nature of life. The two "protagonists" are Libb Thims an American chemical engineer, electrical engineer, and thermodynamicist known for his work and research in the development of the newly emerging sciences of human chemistry, the study of reactions between human molecules, and human thermodynamics, the study of energy, work, and heat aspects of systems of human molecules and DMR Sekhar a Mineral Process Engineer at JPMC Ltd.

Australian engineer Vangelis Stamatopoulos' 15 Nov 2010 blog opinion on the defunct theory of life debate between Indian chemical engineer DMR Sekhar and American chemical engineer Libb Thims. [5]

> "Atheism is often portrayed as being materialistic so when I came across a debate on life or life essence or life force or whatever you want to call it, I was immediately intrigued. Here were two engineers, one based in the US and the other in Jordan discussing the nature of life. The two "protagonists" are Libb Thims an American chemical engineer, electrical engineer, and thermodynamicist known for his work and research in the development of the newly emerging sciences of human chemistry, the study of reactions between human molecules, and human thermodynamics, the study of energy, work, and heat aspects of systems of human molecules and DMR Sekhar a Mineral Process Engineer at JPMC Ltd."

Then side in conclusion, firstly with Thims:

> "Thims argument, which makes a compelling argument for the materialist point of view - claiming that the concept of 'life' is a defunct theory, is very

logical, rational and totally convincing argument indeed. When I first read it, it certainly made me think about my views and understanding of the experience of existence or consciousness (i.e. life?) that I began to doubt my understanding of it."

Then, siding with Sekhar, stated:

"Next, I came across Sekhar's response (hot plate objection) to Thims' argument and I have to say that is just as compelling and maybe even a bit more so."

Stamatopoulos' bipartisan siding here is a good example of the newcomer's reaction to the issue, being that it takes a prolonged amount of time to see through to the crux of the issue, namely that the so-called "origin of life" supposedly occurring on one specific day 3.85-billion years ago, somewhere on earth, is an allusion; the correct view being that first organism argument, reduces to the irreconcilable position that if entity "C" is the first form of life, commonly assumed to be unicellular type of bacteria, virus, or RNA molecule, etc. (each of which are large 6-16 element molecule, comprised of upwards of billion atoms, in the bacteria molecule case), then the reactant "A" and "B" in this so-called "first life chemical reaction", as depicted below:

$$A + B \rightarrow C$$

would, firstly, spontaneous occur owing to a free energy decease (Schrodinger's 1944 position), but somehow conclude that this was somehow a special or, we might say, magical reaction mechanism, not known to chemistry in which "dead" reactants became "alive" products, which is untenable and completely nonsensical. The central issue, as exemplified in Ubbelohde's attempt at a rational matter (unconscious) / non-rational matter (conscious), is a near-childlike reversion attempt to salvage olden days concepts connected to human or anthropocentric ideals of purpose and, in many cases, religious afterlife theories, most-often centered on the issue of free will or that a person chooses his or her own actions (the basis of morality), whereas, as atoms and molecules don't.

Bossens' 2012 views

In early 2012, Belgian psychologist David Bossens began researching into the hmolsciences, investigating questions surrounding free will, choice, the social sciences in the context of thermodynamics, quantum mechanics, evolution, religion, and human chemistry, among others, and by 06 Jun 2012 had published a series of short eBook style articles, one entitled "Reflections: Criticisms of Science". [18] A sticky point for Bossens, in his discussions, concerned the defunct theory of life view, which he seemed to agree with for the most part, except for the view, however, that the term "biology" should be retained, albeit redefined as the study of structures with cells and genes. [19]

In a Squidoo article entitled "Life, a defunct concept?", shown adjacent, Bossens summarized his view that "life" should be redefined as "a force that moves biological organisms", where biological organism strictly means an entity that "has or consists of one or more cells and has genes (DNA or RNA) for coding its proteins." [20]

Home » Culture & Society » Philosophy » Contemporary Philosophy

Life, a defunct concept?

squidoo

0 Comments

Not yet ranked or recalculating rank.

Short into

Well, the title may sound a bit strange, saying life to be a defunct concept. However, there is some truth to it. Libb Thims first proposed the theory that the concept of life is a defunct, religious concept that has no place in scientific understanding. He adheres to the view that all is forces and reactions, which can all be explained by the laws of physics and chemistry. In short, there is no such thing that seperates the live from the dead.

Personal view

Where Libb emphasizes the fact that the living, just as the 'dead' things like a table, are determined by exactly the same laws, I argue that that there are subtle distinctions which need to be made to correctly declare defunct. In other words, we need a clear definition before we say that a word has no sensible meaning in scientific terms.

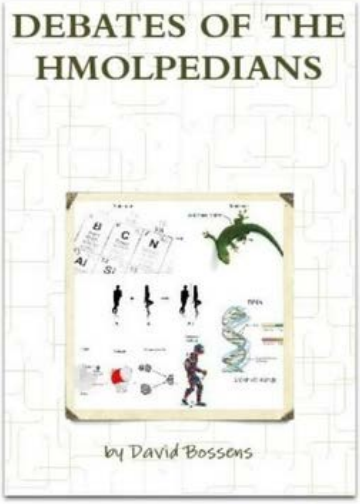

Left: Belgian psychologist and scientific philosopher David Bossens' 2012 Squidoo article "Life, a Defunct Concept?", wherein he states his view that while the term "life" may in fact be defunct, the related term "biology" should still be retained, for utility sake, but redefined as the study of structures consisting of cells and genes. [19] Right: Bossens' 2013 book *Debates of the Hmolpedians*, wherein he discusses his newly-learned views on hmolscience, in regards to questions on the **defunct theory of life**, biology, free will, prediction, DNA, human molecular theory, among others. [31]

Bossens' logic, however, is error-ridden on a number of points. Firstly, Bossens' definition is recursive amounting to "life is a force that moves life", in short, which is meaningless. Bossens seems to think that by mixing together Greek (bio-) and English (life) synonyms of the same word in once sentence that he has achieved something? Secondly, an easy disproof his his life definition is the example of a resin fossilized coccoid cyanobacteria from 3.5 billion years ago, such as depicted on the evolution timeline, which clearly (a) has one or more cells and (b) had DNA, but does not, however, in the colloquial sense, seem to be "alive", as Bossens' definition would entail. Thirdly, he states "biology has a very clear definition". This could not be farther from the truth. Biology—by world-over agreed upon definition—is "the study of life" and as Bossens answers later in his article "So, is life a defunct term? Yes." This amounts to Bossens' new 2012 definition of "biology" as "the study of a defunct term". Hence, the article is recursive and circular all in the name of "practicality", which seems to be his objection, i.e. "biology is a practical term", thus we should keep. Bossens here would be wise to heed the famous words of Aristotle: "Plato is my friend, but truth my greater friend." If there is no truth in a term it should not be kept.

The issue here, to elaborate via historical comparison, is similar to the late 17th century usage of the terms *vis viva*, Latin for "living force", coined by German mathematician Gottfried Leibniz in 1686 as the name for Dutch physicist Christiaan Huygens's quantity mv^2. Some three centuries have since passed and we now, of course, no longer use the term "living force" to describe the motion of a body by the formula mv^2, but instead use the term energy (Thomas Young, 1807) or kinetic energy (William Thomson, 1862). [21] The same is the case, historically, with the conversion of the term *vis mortua* (Emilie du Chatelet, c.1740) or dead essence into potential energy (William Rankine, 1853).

From these examples, we can extrapolate that about a hundred or so years from now the obsolete term "biology" will no longer be in use, likely replaced by something along the lines of "animate science" (similar to the historical protocol of "life thermodynamics", an early 20th century term, replaced by "animate thermodynamics", a late 20th century term, i.e. the study of animated organisms (or animate systems, animate matter, or animate molecules, etc.); or possibly "chnops-ology" the study of carbon, hydrogen, nitrogen, oxygen, phosphorus, sulfur based (CHNOPS-based) molecular organisms; other terms may result as well.

Lastly, Bossens entire memorandum skirts around the central issue of the "origin of life" problem. He seems to allude to the premise, but not state it specifically and outright, that once—at one particular second in the past history of the movement of the universe—a phospholipid bilayer formed around the molecular structure of $[C_{10}H_{16}O_{13}N_5P_2]_N$ or RNA and that this momentous moment marks the start second of life, or something to this effect—and hence would seem to want to maintain the infamous materialistic dividing wall in his conception of the universe of something along the lines of a "Physics + Chemistry | Biology" model. The Lynn Margulis

endosymbiotic hypothesis, however, shows that there was no such start second, or dividing wall, but rather that cellular mergers formed by types of bacterial combination reactions, which naturally enough trace back to the formation of the hydrogen atom, which is not alive nor is it dead. The same logic, in turn, holds upward through the formation and synthesis of human molecules, which are types of hydrogen atom derivatives, neither alive nor dead, but only reactive or nonreactive (or inert) among other periodic table neutral namesakes.

Life | Non-existence

In 2013, American science journalist Ferris Jabr, in his *Scientific American* blog article "Why Life Does Not Really Exist", argues that life does not exist, an argument which he begins as follows: [51]

> "Recently, however, I had an epiphany that has forced me to rethink why I love living things so much and reexamine what life is, really. For as long as people have studied life they have struggled to define it. Even today, scientists have no satisfactory or universally accepted definition of life. While pondering this problem, I remembered my brother's devotion to K'Nex roller coasters and my curiosity about the family cat.
>
> Why do we think of the former as inanimate and the latter as alive? In the end, aren't they both machines? Granted, a cat is an incredibly complex machine capable of amazing behaviors that a K'Nex set could probably never mimic. But on the most fundamental level, what is the difference between an inanimate machine and a living one? Do people, cats, plants and other creatures belong in one category and K'Nex, computers, stars and rocks in another? My conclusion: No. In fact, I decided, **life does not actually exist**."

Cat vs. **K'Nex**

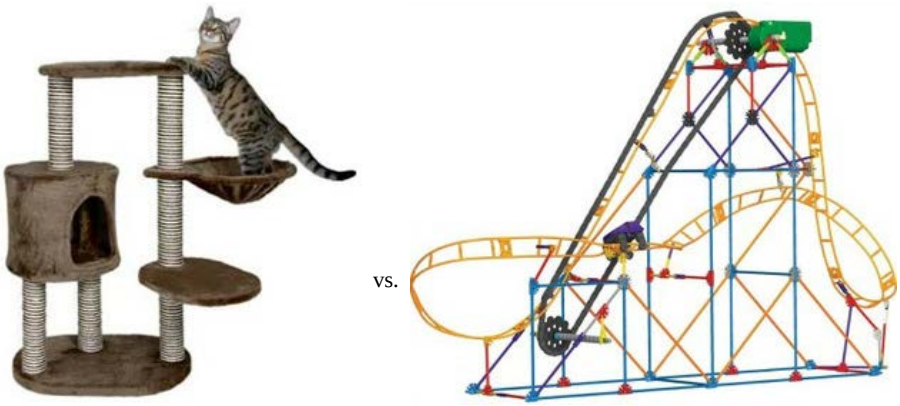

American science journalist Ferris Jabr's 2013 musings on the animate nature between his cat and his brother's K'Nex roller coaster led him to the 2013 conclusion that "life" is something that does not exist; a view independently arrived at in 2009 by American electrochemical engineer Libb Thims, per similar reasons; and also concurred, in part, by those including: Francis Crick (1966) and Charles Sherrington (1938).

(add summary)

Defunct views: Panpsychism | Emergence | Life principle

Within thinking distance of the defunct theory of life, aside from the (a) "life principle view", are firstly the (b) "emergence view", namely that over time enough properties, e.g. ability to reproduce, a membrane, a type of catalytic based atomic turnover rate metabolism, animation, etc., that at some definite point in time, one can assign one particular structure will the minimal amount of properties that one can definitively assign as "life"; and secondly is the (c) "panbioism view" the view that all things are alive, some more than others, to some extent. These three views are to be avoided as all lead to nonsensical results and conclusions.

Terminology upgrades

> *See main: Life terminology upgrades*

In 1966, English molecular biologist (chnopsologist) Francis Crick, in his *Of Molecules and Men*, delved into the question of neo-vitalism and gives his cogent view that: [35]

> "Let us abandon the word 'alive'."

A few precipitative terminology upgrades to have resulted from the defunct theory of life perspective include the following recent (2009-present) Hmolpedia-introduced terms:

- â— Birth → Reaction start
- â— Life → Reaction existence
- â— Death → Reaction end

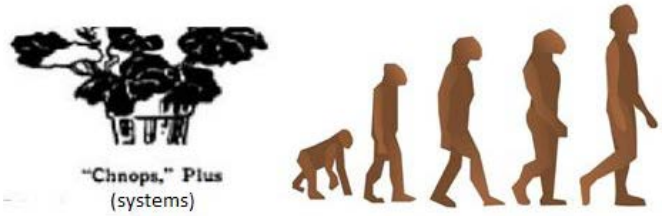

Left: American plant physiologist Frank Thone's 1936 depiction and definition of a plant NOT is a living system (or vegetible life), but, using chemically-neutral terminology, as a "CHNOPS plus system". [36] **Right:** modern evolutionary-depicted examples of "CHNOPS plus" systems, monkeys upwards through humans, each comprised, elementally, in composition, using agreed upon neutral terminology, as: carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur (CHNOPS), *plus* calcium, potassium, etc. up to vanadium, depending, reactive animate systems.

Quotes

The following are related quotes:

> "Birth is the aggregation of atoms, death is their disaggregation or destruction of atomic composite, without anything being derived from nothing and nothing going into anything in the process."
>
> — Leucippus (c.460BC), and or the analogous views of Empedocles and Anaxagoras, summarized by Giovanni Reale | 1987

> "Life and death are more questions of mixture and separation."
>
> — Empedocles (c.450BC), synopsis of views by James Furlong | 1906

> "If failure attends all our efforts to obtain a generation of organisms from lifeless matter, it seems to me a thoroughly correct procedure to inquire **whether there has ever been** an origination of life, or whether it is not as old as matter, and whether its germs, borne from one world to another, have not been developed wherever they have found a favorable soil."

— Hermann Helmholtz (1874), “On the Use and Abuse of the Deductive Method in Physical Science” [45]

“The hypothesis of an actual beginning of life in time seems to be growing **less and less fruitful** with the advance of experiential knowledge.”

— William Ritter (1909), “Life from the Biologist’s Standpoint” [50]

“The ‘energy’ of mechanics must not be confused with the ‘energy’ of ordinary parlance, **nor is it excusable** to imagine that a mechanical ‘live force’ is a force that is alive. If one would know the meaning of ‘entropy’ one had better glance at a treatise on thermodynamics.”

— Vilfredo Pareto (1916), *Treatise on General Sociology*, *Volume Four* [41]

“Certain analogies of behavior are observed between the machine and the living organism, the problem as to whether the machine is alive or not is, for our purposes, semantic … if we use the word ‘life’ to cover all phenomena which locally swim upstream against the current of entropy, we are at liberty to do so; however, we shall then include many astronomical phenomena … **it is** my opinion, therefore, **best to avoid all question-begging epithets such as ‘life’,** ‘soul’, ‘vitalism’, and the like, and say merely that machines [and] human beings [are] pockets of decreasing entropy in a framework in which the large entropy tends to increase.”

— Norbert Wiener (1950), *The Human Uses of Human Beings* [32]

“To say that life is nothing but a property of certain peculiar combinations of atoms is like saying that Shakespeare's Hamlet is nothing but a property of a peculiar combination of letters.”

— Ernst Schumacher (1977), *A Guide for the Perplexed* (Ñº)

“Physical chemistry [is] a mathematical language, and it is a large part of my evangelistic attitude to suppose that much of developmental biology will some day have to be **[re-]written in** much [of] the same language that physical chemists have been using for decades.”

— Lionel Harrison (2008), *The Shaping of Life* [43]

“One of the most interesting topics [human molecule] I have ever had the pleasure to read. Going through it a second time, and looking forward to the third. [*The Human Molecule*] covers the most fundamental change in human knowledge since Charles Darwin's *On the Origin of Species* [1859], by presenting a theory that we are fundamentally molecules, and that the question of life itself is a **fundamentally flawed** one. Especially important is the carefully laid out historical narrative of how **Thims** came to his theory of the human as a molecule. Whether you ultimately agree with this work or not, it represents a paradigm shift in viewing our place in the world.”

— Jeff Tuhtan (2011), Amazon book review [48]

“Part two is an original article produced for publication in the *Journal of Human Thermodynamics*. The peer reviewer Libb Thims highlighted concerns regarding the use of terms such as ‘soul’ and ‘life’ stating that these terms have **no physical meaning** in modern scientific publications. Although it is difficult for a working biologist (life scientist) such as this author to accept that the word life has no physical meaning, it is an important observation. Here, the word ‘soul’ is associated with ‘soulatrophicity’, which is intended to refer to the origin of life, but will be replaced with ‘fractional dimension’. The word ‘life’ will also be replaced by ‘self-aware organic accretion’ or similar associated with carbon and the other 25 elements.”

— Mark Janes (2012), *Mr Carbon Atom* (pg.70)

“Origins: probably 4-5 yrs old, I believed that I came from some sort of light source, probably the sun. My first word was also "light". Life and death: I grew up in the country, so we had dead animals around all the time. Probably 6 or so before I thought about my own death as inevitable. Existence: I neglected this question until coming across your *Human Molecule* book at around age 30. I don't believe in the common sense notion of life. **There does not seem to be any evidence that I am alive**.”

— Jeff Tuhtan (2013), response to query on “big questions” recollections (see: belief system (children)) [39]

“At this juncture, I would like to express my opinion about many new big publications of Libb. I do not want to have any relation to the manifestly absurd notions about **‘non-existent theory of life’** and the widespread use of the term ‘molecule’.”

— Georgi Gladyshev (2013), “Life as a Phenomenon” [42]

“This [are viruses alive] debate could take an entirely different route if you consider a letter published [2009] in the *Journal of Human Thermodynamics* by Libb Thims in which he discussed the idea that a theory of life was in fact defunct. The point was made that we do not consider a single atom to be alive, nor two atoms, or three. He builds on this statement to say that ‘it should be very obvious that no matter how many atoms one adds to the argument that an atom or a structure made of two or more atoms cannot be alive’. **This is a bold statement as it clearly implies that it is impossible to apply the idea of life to anything, even us**. Nikola Tesla also outlined a ‘defunct theory of life’ in 1915 where he said that ‘There is no thing endowed withlife’. This is obviously a very pedantic way to look at the definition of life but a relevant viewpoint nonetheless. Is anything living, or nothing? Or everything?”

— David Busse (2013), “Viruses: Living or Not?”, Dec 10 [47]

See also

â— Life does not exist

Threads

â— Origin of life (2010) – Hmolpedia threads.
â— N.T.’s views on Jabr (2014) – Hmolpedia threads.

A 2011 symposium, Jun 17-19, at the Multimedia Institute, Zagreb, organized by Nathan Brown (UC Davis) and Petar Milat (MaMa), on the subject of addressing **vitalism** and antivitalism in contemporary philosophy, the synopsis of with is: [27]

> “‘Life’ is the site of a formidable lacuna. There is no firmly established scientific account of its constitutive properties or the process of its genesis. Varieties of “vital materialism” prone to describing physical forces in terms of an inherent “life of things” have done little to clarify the problematic nature of the concept, and insofar as “life” functions as an empty signifier concealing an absence of theoretical coherence we might be better to have done with it.”

This symposium seems to be digging around is in the neighborhood the view of "life" as a defunct theory.

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θΔics

In thermodynamics, **degradation**, as in the act or process of degrading or decline to a low, destitute, or demoralized state, is a term commonly associated with entropy and the second law of thermodynamics. In fact, the second law is sometimes referred to as the "principle of degradation of energy".

Overview

In 191, American mechanical engineer George Goodenough, in his textbook *Principles of Thermodynamics*, defined the idea of degradation of energy as such: [1]

> "A classification of energy on the basis of complete conversion [is such that] energy that is capable of complete conversion, like mechanical and electrical, we may call **high-grade** energy; while heat, which is not capable of completed conversion, we may call **low-grade energy**. There seems to be in nature a universal tendency for energy to degenerate into a form less available for transformation. High-grade energy tends to degenerate into low-grade heat energy."

Goodenough notes that the terms degradation of energy, dissipation of energy, and thermodynamic degeneration are applied by different writers to this same phenomenon, but concludes that the *principle of degradation of energy* may be stated as: "every natural process is accompanied by a certain degradation of energy or thermodynamic degeneration." [1]

In human thermodynamics application, the view degradation was captured famously in the catchy 1919 title *The Degradation of the Democratic Dogma*, by American historian Henry Adams, themed on a second law degradation view of human history. [2] In the 1986 book *The Control Revolution*, American sociologist James Beniger defines the second law as such: [3]

> "The so-called **principle of the degradation** of energy [states that] a system's energy cannot be converted from one form to another—including work—without decreasing it organization and hence ability to do further work."

In the 2005 book *Into the Cool*, American ecologist Eric Schneider argues that second law acts in material systems to "degrade the gradient" of heat flow from the sun. [4]

Etymology

It is difficult to track down the etymological origin of this point of view, but it mostly seems to originate in the writings of Irish physicist William Thomson, to a good extent, although not exactly. [5]

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θΔics

In terminology, **deism** (TR:11), a distinction away from atheism (Pierre Viret, 1564), refers to someone who believes in the existence of god by not the exist of the trinity (16th century); and or not in the existence of the supernatural (18th century); among several other possible disbeliefs; the classical example is Voltaire (see: Voltaire on religion) who self-identified as a deist. [1]

A artistic rendition of fundamental "theism", cafeteria "theism", and "**deism**" (or pantheism) as compared to "atheism", the result of freedom in thinking (see: free thinker).

Overview

In 1624, English soldier, poet, and philosopher Edward Herbert (1583-1648), in his *Truth*, gave deism its first tenets, namely a belief in a supreme deity, who should be worshiped and who metes out justice in this life and after it, and that everything else added by the church was bunk. [3]

In 1696, John Toland published *Christianity Not Mysterious*, wherein the Bible was read in a new critical mode, which included the most doubting aspects of John Locke's philosophy; the publication was said to have started the "deist controversy"; the book was burned in Ireland in 1697 and Toland had to flee the country. [3]

Quotes

The following are related quotes:

> “The **deist** is a man who in his short existence has not had time to become an atheist.”
>
> — Louis de Bonald (c.1830)

> "By '**deism**' let us understand the view of the existence of a deity that has created the cosmos, but thereafter sits apart from and is uninvolved with what has been created. By 'theism' let us understand the view of the existence of a deity that has created the cosmos and is thereafter in some sense intimately involved with it."
>
> -- Andrew Holowchak (2014), *Thomas Jefferson: Uncovering His Unique Philosophy and Vision* [2]

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External links

â— Deism – Wikipedia.

θΔics

In existographies, **Demetrius** (c.160-90BC), aka the "Laconian" (O), was an Epicurean philosopher, disciple of Protarchus, teacher of Philodemus, noted for []

Quotes | Employed

The following are quotes employed by Demetrius:

> "Time is an accident of accident."
>
> — Epicurus (c.300BC), *On Nature*; cited by Demetrius (c.120BC); cited by Sextus Empiricus (c.200AD) in *Against Professors* (§10.219-27)

Quotes | On

The following are quotes on Demetrius:

> "All the natural philosophers form Thales to Plato rejected a vacuum. Empedocles says that there is nothing of a vacuity in nature, nor anything superabundant. Leucippus, Democritus, **Demetrius**, Metrodorus, and Epicurus as say that the atoms are in number infinite; and that a vacuum is infinite in magnitude. The stoics say that within the compass of the world there is no vacuum, but beyond it the vacuum is infinite. Aristotle says that the vacuum beyond the world is so great that the heaven has liberty to breath into it, for the heaven is fiery."
>
> — Pseudo Plutarch (c.150AD), *The Opinions of the Philosophers* (§1.18: Of a Vacuum); cited by Otto Guericke (1672) in chapter "Empty Space" [1]

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External links

- Demetrius Lacon – Wikipedia.

θΔics

In politics, **democracy**, from Greek *demos* "the people" + *kratis* "rule", is a form of government carried out directly by the people; by means of elected representatives of the people, called representative democracy. Some have attempted to define democracy in terms of chemistry and or thermodynamics.

Overview

In 1948, American author Thomas Dreier gave the following crude description of "heat" generated in the context of human chemical reactions: [1]

> "What is **democracy** but a successful formula for controlling the chemical reactions of our 145,000,000 people, and turning the friction and heat generated by our living together into production and progress?"

In 1994, Canadian cyberspace philosopher Pierre Levy defining groups on the context of chemistry: [2]

> "Families, clans, and tribes are *organic* groups [carbon-based entities]. Nations, institutions, religions, larger corporations, as well as the revolutionary 'masses' are organized groups, molar groups, which undergo a process of transcendence or exteriority in forming and maintaining themselves. Finally, self-organized, or molecular, groups realize the ideal of direct **democracy** within very larger communities in the process of mutation and deterritorialization."

Beyond this, Levy also has ideas on how entropy relates to this model. On the topic of entropy and democracy, in the 2006 book *The Case for Democracy*, writers Natan Sharansky and Ron Dermer argue that in fear-governed type societies (as contrasted with free societies), external influences of the dictators or totalitarian regime, act to keep the thoughts, ideas, and reactions of the people in order, i.e. aligned within the regime, like the movement of gas molecules in a closed system. They argue, on metaphor, that these external governing fear influences act to counter the actions of the second law, or of entropy, within the system of people, on the reasoning that systems left to themselves (without external influence present) will tend to states of high entropy or high disorder. [3]

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External links

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θΔics

In existographies, **Democritus** (c.470-390BC) (IQ:190|#36) (Cattell 1000:751) [RGM:68|1,500+] (FA:14) (ACR:4) [CR:285], pronounced “De-mock-rea-tus” (Q), was a Greek materialism philosopher (see: Greek philosophy), who “thought about everything” (Aristotle, 322BC), the “weightiest of the ancients” (Bacon, c.1610), a “universal scholar” (Melsen, 1952), student of atomic theory inventor Leucippus (c.500-450BC), intellectual mentor to Epicurus (341-270BC), noted for [].

Plato | Book burning

In c.380BC, Plato, as reported by Aristoxenus, in his *Historical Discourse* (c.335BC) (Q), is said to have stated a desire to burn all of books of Democritus:

> “Aristoxenus in his *Historical Notes* affirms that Plato wished to burn all the writings of **Democritus** that he could collect, but that Amyclas and Clinias the Pythagoreans prevented him, saying that there was no advantage in doing so, for already the books were widely circulated. And there is clear evidence for this in the fact that Plato, who mentions almost all the early philosophers, never once alludes to Democritus, not even where it would be necessary to controvert him, obviously because he knew that he would have to match himself against the prince of philosophers, for whom, to be sure, Timon has this meed of praise: ‘Such is the wise Democritus, the guardian of discourse, keen-witted disputant, among the best I ever read’.”
>
> — Diogenes Laertius (c.230), *Lives and Opinions of Eminent Philosophers* (Q)

> “Plato speaks of him nowhere, though it is a matter of dispute whether, in some places, he has not controverted his opinions without mention of his name. Hence arose, it may be, the story that Plato in fanatical zeal would have liked to buy up and burn all the works of **Democritus**.”
>
> — Friedrich Lange (1865), *History of Materialism* (pg. 18)

Here, we are reminded of the insipid hatred with English moral philosophy professor, semi-rector, and reverend William Sewell, in 1849, in his moral philosophy class at Oxford, happily tossed, with great reverie, James Froude’s *Nemesis of Faith* into the fire in front of the students.

Atoms and voids

Democritus is famous for his motto: [1]

> “Nothing exists but atoms and voids.”

This has sometimes been paraphrased as “there are atoms, and there is the void, nothing more”; the latter of which is sometimes called the dictum of Lucretius (student of Epicurus). [2] The following also is attributed to Democritus: [3]

> “According to convention there is a sweet and a bitter, a hot and a cold, and according to convention there is color. In truth there are atoms and a void.”

(add)

Gods

Democritus, according to Pliny the elder (77AD), held the opinion that there were two gods, namely: "punishment" and

"benefit". [10]

Principles of Democritus

The six main tenets or principles of Democritus, according to John Tyndall, are as follows: [4]

> 1. From nothing comes nothing. Nothing that exists can be destroyed. All changes are due to the combination and separation of molecules.
> 2. Nothing happens by chance. Every occurrence has its cause from which it follows by necessity.
> 3. The only existing things are the atoms and empty space; all else is mere opinion.
> 4. The atoms are infinite in number and infinitely various in form; they strike together, and the lateral motions and whirlings which thus arise are the beginnings of worlds.
> 5. The varieties of all things depend upon the varieties of their atoms, in number, size, and aggregation.
> 6. The soul consists of fine, smooth, round atoms, like those of fire. These are the most mobile of all. They interpenetrate the whole body, and in their motions the phenomena of life arise.

In regards to principle two, some, such as Jacques Monod (1970), attribute Democritus as saying "everything in the universe is the fruit of chance and necessity." Ancient sources, however, attribute some 300 various quotes to him; hence some misattribution seems to be the case here, in regards to this chance quote. [6]

Evolution

Democritus, as summarized by Alexander Oparin (1936), has the following atomic based evolution model:

> “Democritus, like Anaximander, thought that the organic world took its origin in water and that animals passed through a long developmental process before they became such as we find them today. Mechanical self-creation of life resulted from an inherent movement of atoms, according to which the atoms of lifeless, moist earth meet accidentally and unite with atoms of the live and energizing fire.”
>
> — Alexander Oparin (1936), *The Origin of Life* (pg. 5)

(add)

Moral teaching | Naturalistic morality

According to the *Encyclopedia of World Biography*, Democritus is said to have had the following morality views: [8]

> "Just as Democritus's cosmogony invoked no creator-god, so his moral teachings appealed to no supernatural judge of human conduct. He attributed the popular belief in Zeus and other deities to primitive man's incomprehension of meteorological and astronomical phenomena. To support his theory about the origin of worship of the various divinities, Democritus assailed the widespread notion that rewards for righteous actions and punishments for wrong-doing were administered in an afterlife. In the long history of Greek speculation Democritus was the first thinker to deny that every human being has an individual soul which survives the death of the body [this assertion seems to contradict Tyndall's summary above (check)].
>
> Democritus sought to diminish pain during life, of which "the goal is cheerfulness." Cheerfulness is identical not with pleasure, as he was

Democritus, one of the four founding fathers of atomic theory, mediating (O) on the seat of the "soul" (Paris Salon, 1868), the inscription below the statue reading as follows:

> "Hippocrates in time arrived at the conclusion that he had not sought whether the heart or the head was the seat of either reason or sense in man and beast."
>
> — Jean La Fontaine (c.1680), 29th fable

The soul being the Ab-ra-ham-ic religious term for "moral movement" and "continunity", combined—which, in the views of Miguel de Unamuno (1912), is the world viewpoint that constitutes the "basis for action and morals."

misinterpreted by some people, but "with a calm and steady mind, undisturbed by any fear or superstition or other irrational feeling." Yet Democritus did not advocate a quiet life of repose. His was not the outlook of the retired citizen, drowsing in his rocking chair on the front porch and idly watching the world go by. Democritus taught a naturalistic morality, avoiding ascetic renunciation as well as excessive indulgence, and urging energetic participation in beneficial activities. In particular, "Democritus recommends mastering the art of politics as most important, and undertaking its tasks, from which significant and magnificent benefits are obtained for the people."

Perhaps from his governmental experience in Abdera, Democritus learned that "good conduct seems to be procured better by the use of encouraging and convincing words than by statute and coercion. For he who is restrained by law from wrongdoing is likely to commit crime covertly. On the other hand, he who is attracted to uprightness by persuasion is unlikely to transgress either secretly or openly."

(add)

Education

Democritus was said to have been the son of a wealthy father, who devoted the whole of his inherited fortune to the culture of the mind. He traveled everywhere; visited Athens when Socrates and Plato were there, but left the city without making himself known, supposedly, because the dialectic strife in which Socrates employed had no attraction for Democritus, who held that: "the man who readily contradicts and uses many words is unfit to learn anything truly right." He returned poor from his travels, was supported by his brother, and at length wrote his main publication the *Great World-System* (*Megas Diakosmos*). [4]

Democritus is reported to have traveled to Egypt, Persia, and India in search of knowledge, all along maintaining a sense of humor—sometimes referred to as the “laughing philosopher”, for his tendency to mock fellow citizens for their follies—an effort that is said to have resulted in the writing of some 60-70 books and or commentaries on diverse subjects including: ethics, logic, planets, colors, senses, air, earth’s surface, fire, geometry, geography, harmony, poetry, painting, military tactics, and diet. [7]

A list of Democritus' works, which according to the list preserved in Diogenes Laertius' *Life*, were many and encyclopedic in scope, including: astronomy, mathematics, literature, epistemology, and ethics—none of which, however, survived. [6]

Suicide | Resurrection

Democritus, according to Lucretius, took his own life, when at old age he realized that his mind and memory were fading:

> "**Democritus**, when at ripe old age warned him that mind and memory were failing, went freely to place his person in death's path. Epicurus himself died when life's light ran out, he who in mind surpassed all men—eclipsed them all, as the sun hung high in heaven, the stars."
>
> — Lucretius (55BC), *On the Nature of Things* (pg. 81; 3:1039-44)

Democritus was of the belief, likely learned from his studies in Egypt, that after he ceased to exist, he would be resurrected:

> "All these things are only daydreams of little children in inventions of men would never want to fade away. What a great folly to protect the body in hope of resurrection, as **Democritus** promised, who has not yet been resurrected himself."
>
> — Pliny (77AD), *Natural History* (§7.55)

(add)

Quotes | On

The following are quotes on Democritus:

> "Eudoxus first discovered the proof that the cone is one-third of the cylinder of equal height on the same base, and the pyramid one-third of the prism. No small share [of the discovery] should be assigned to **Democritus**, who first made the assertion about the above-mentioned figure without proof."
>
> — Archimedes (c.220BC), *Mathematical Theorems Addressed to Eratosthenes* (see: Eratosthenes) [11]

> "**Democritus**, a man who was not only the **most learned man about nature of all the ancients** but no less industrious than any other inquirer, says that music is more recent, and indemnifies its cause, saying that it was not singled out by necessity, but arose as a result of plenty."
>
> — Philodemus (c.45BC), *On Music*; Herculaneum papyrus 1497 (col. CCCVI 29-39)

> "The words 'the ancient theory that denies chance' [by Aristotle] seem to refer to Democritus; for although he appears to have made use of chance in his theory of the formation of the worlds, in his more detailed discussions he says that **'chance is not the cause of anything'**, but refers everything to other causes, e.g. the cause of finding treasure is digging or planting the olive, or of the bald man's fracturing his skull is the eagle's having dropped the tortoise to break its shell."

— Simplicius (c.530), Fragment 71b; in: *Commentary on Physics* (196a14-15; 330.14-20) [11]

"**Democritus** also mastered the whole extent of the science of his time, and that probably with greater independence and thoroughness than was the case with Aristotle; but we have no trace whatever of his having brought all these sciences under the yoke of his system.."

— Friedrich Lange (1875), *The History of Materialism, Volume One* (pg. 82)

"With few great men of antiquity can history have dealt so despitefully as with **Democritus**. In the distorted picture of unscientific tradition, almost nothing appears of him except the name of the " laughing philosopher," while figures of incomparably less importance extend themselves at full length. So much the more must we admire the tact with which Bacon, ordinarily no great hero in historical learning, chose exactly Demokritos out of all the philosophers of antiquity, and awarded him the premium for true investigation, whilst he considers Aristotle, the philosophical idol of the Middle Ages, only as the originator of an injurious appearance of knowledge, falsely so called, and of an empty philosophy of words."

— Friedrich Lange (1873), *History of Materialism, Volume One* (pg. 14)

Quotes | By

The following are various Democritus attributed quotes:

"It has often been demonstrated that we do not grasp how each thing is or is not. Sweet exists by convention, bitter by convention, color by convention. **Atoms and void** alone exist in reality. . . We know nothing accurately in reality, but only as it changes according to the bodily condition, and the constitution of those things that flow upon the body and impinge upon it. It will be obvious that it is impossible to understand how in reality each thing is."

— Democritus (c.420BC), Pay (Q) fragment #26

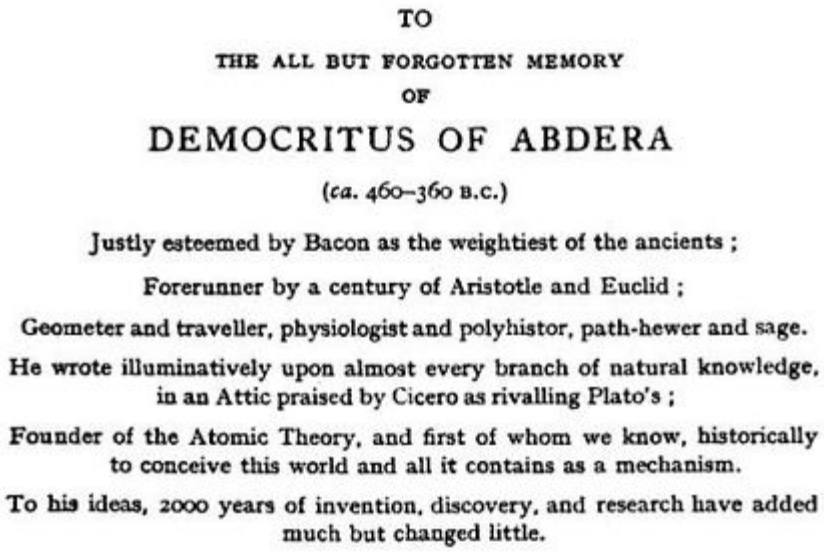
TO
THE ALL BUT FORGOTTEN MEMORY
OF
DEMOCRITUS OF ABDERA
(*ca.* 460–360 B.C.)
Justly esteemed by Bacon as the weightiest of the ancients ;
Forerunner by a century of Aristotle and Euclid ;
Geometer and traveller, physiologist and polyhistor, path-hewer and sage.
He wrote illuminatively upon almost every branch of natural knowledge, in an Attic praised by Cicero as rivalling Plato's ;
Founder of the Atomic Theory, and first of whom we know, historically to conceive this world and all it contains as a mechanism.
To his ideas, 2000 years of invention, discovery, and research have added much but changed little.

A well-honed tribute to **Democritus** from American economist, statistician, and chemistry historian Carl Snyder's 1907 *The World Machine: the First Phase, the Cosmic Mechanism.* [9]

"The universe is infinite because it has **not been produced by a creator**. The causes of what now exists had no beginning."

— Democritus (c.420BC), Pay (Q) fragment #45

"The material cause of all things that exist is the coming together of atoms and void. Atoms are too small to be perceived by the senses. They are eternal and have many different shapes, and they can cluster together to create things that are perceivable. Differences in shape, arrangement, and position of atoms produce different things. By aggregation they provide bulky objects that we can perceive with our sight and other senses."

— Democritus (c.420BC), Pay (Q) fragment #47

"We see changes in things because of the rearrangement of atoms, but atoms themselves are eternal. Words such as 'nothing', 'the void', and 'the infinite' describe space. Individual atoms are describable as 'not nothing', 'being', and 'the compact'. There is no void in atoms, so they cannot be divided. I hold the same view as Leucippus regarding atoms and space: atoms are always in motion in space."

— Democritus (c.420BC), Pay (Q) fragment #48

"Nothing exists except atoms and empty space; everything else is opinion."

— Democritus (c.420BC), Pay (Q) fragment #49

"Nothing exists except atoms and empty space; everything else is opinion."

— Democritus (c.380BC) (Q)

"Happiness resides not in possessions, and not in gold, happiness dwells in the soul."

— Democritus (c.380BC) (Q)

"Men should strive to think much, and know little."

— Democritus (c.380BC) (Q)

"One should strive not after fullness of knowledge, but fullness of understanding."

— Democritus (c.380BC), Fragment #; cited by Friedrich Lange (1865) in *History of Materialism, Volume One* (pg. 17) (see: information obesity)

"He who is fond of contradiction and makes many words is incapable of learning anything that is right."

— Democritus (c.380BC), Fragment #; cited by Friedrich Lange (1865) in *History of Materialism, Volume One* (pg. 17)

"Among all my contemporaries, I have travelled over the largest portion of the earth in search of things the most remote, and have seen the most climates and countries, heard the largest number of thinkers, and **no one has excelled me in geometric** construction and demonstration—not even the geometers of the Egyptians, with whom I spent in all five years as a guest."

— Democritus (c.380BC), Fragment #; cited by Friedrich Lange (1865) in *History of Materialism, Volume One* (pg. 17)

"I would rather discover a single explanation than acquire the Persian kingdom."

— Democritus (c.420BC), Fragment D2; cited by Eusebius (c.310AD) in *Praeparatio Evangelica* (XIV.27.4) [11]

"Animals flock together with animals of the same kind, doves with doves and cranes with cranes and similarly with the other irrational creatures, and so with non-living things too, as one can see in the case of seeds in a sieve and pebbles on a beach. In the one lentils are sorted out by the swirl of the sieve to lie together with lentils, barley with barley, and wheat with wheat, and in the other oblong pebbles are pushed by the motion of the waves into the same place as oblong and round into the same place as round, as if that sort of similarity in things had a kind of attractive force."

— Democritus (c.420BC), Fragment D6; cited by Sextus Empiricus (c.200AD) in: *Against the Mathematicians* (V11.116-18) [11]

"In reality we know nothing; for truth is in the depths. By convention sweet and by convention bitter, by convention hot, by convention cold; but in reality atoms and void."

— Democritus (c.430BC), Fragment D15, cited by Diogenes Laertius (c.220) in *Publication* (9.72), + Fragment D16, cited by Sextus Empiricus (c.200AD) in *Against the Mathematicians* (7.135); by Galen (c.180AD) in *On Medical Experience* (15.7) and *On the Elements According to Hippocrates* (1.2) [11]

"Easy is the worst of all teachers for the young; for it is that which gives birth to those pleasures from which the wickedness arises."

— Democritus (c.420BC), Fragment D42; cited by Stobaeus (c.550BC) in *Publication* (II.31.56) [11]

"One will seem to promote virtue better by using encouragement and persuasion of speech than law and necessity. For it is likely that he who is held back from wrongdoing by law will err in secret, but that he who is urged to what he should by persuasion will do nothing wrong either in secret or openly. Therefore, he who acts rightly from understanding and knowledge proves to be at the same time courageous and right-minded."

— Democritus (c.420BC), Fragment D46; cited by Stobaeus (c.550BC) in *Publication* (II.31.59) [11]

"The unwise are shaped by the gifts of fortune, but those who understand such things by the gifts of wisdom."

— Democritus (c.420BC), Fragment D61; cited by Stobaeus (c.550BC) in *Ethics* (III.4.71) [11]

"The unwise hate their life, yet want to live for fear of Hades."

— Democritus (c.420BC), Fragment D63; cited by Stobaeus (c.550BC) in *Ethics* (III.4.73) [11]

"Justice is doing what should be, injustice is not doing what should be, but turning aside from it."

— Democritus (c.420BC), Fragment D120; cited by Stobaeus (c.550BC) in *Ethics* (IV.2.14) [11]

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(b) Melsen, Andrew G.M. van. (1952). *From Atomos to Atom: the History of the Concept Atom* (§4: Democritus, pgs. 17-). Dover, 2004.
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4. Tyndall, John. (1874). "Address" (pgs. 3-4), Delivered before the British Association assembled at Belfast. Longmans, Green, and Co.
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7. Furley, David J. (1967). *Two Studies in the Greek Atomists: Study I – Indivisible Magnitudes, Study II – Aristotle and Epicurus on Voluntary Action*. Princeton University Press.
(b) Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pgs. 33-34). University Press of America.
(c) Works (section) – Wikipedia.
8. Democritus – YourDictionary.com.
9. Snyder, Carl. (1907). *The World Machine: the First Phase, the Cosmic Mechanism* (dedication page). Longmans, Green.
10. Pliny. (77AD), *Natural History* (Q)(Q). Publisher.
11. Taylor, C.C.W. (1999). *The Atomists: Leucippus and Democritus: Fragments: a Text and Translation with a Commentary by C.C.W. Taylor* (pg. 3, 5; Archimedes, pg. 136; Simplicius, pgs. 92, 192). University of Toronto Press.

Further reading

● Laertius, Diogenes. (c.230). *Lives and Opinions of Eminent Philosophers* (TOC) (txt) (WS) (Democritus, §9.7). Publisher.

External links

● Democritus – Wikipedia.

θΔics

In religio-mythology, **demon**, as compared to "angel", refers to any number of god reduction rescripts of the dark side gods of the Egyptian pantheon, e.g. Set becoming the demon Satan (or devil), the chief of the demons in the Christian pantheon.

Quotes

The following are related quotes:

> "As for the opinions of Epigenes, Bienewitz, Cardano, Scaliger, let these pass because they are not apposite to the subject and I do not have the at hand right now a copy of their work. As for whether storms are stirred by **demons**, as Paracelsus holds, this should be discussed at some length and a distinction should be made between the demons."
>
> — Otto Guericke (1665), "Reply Letter to Sanislaus Lubienietzki", Mar 29; in *New Experiments on the Vacuum of Space* (pg. 289)

Further reading

â— Mack, Carol K and Mack, Dinah. (1998). *A Field Guide to Demons, Fairies, Fallen Angels, and Other Subversive Spirits*. Owl Books.

External links

â— Demon – Wikipedia.

θΔics

In existographies, **Demosthenes** (384-322 BCM) (IQ:160|#564) (Cattell 1000:36) (Singh 100:99) was a Greek statesman and orator; noted for []

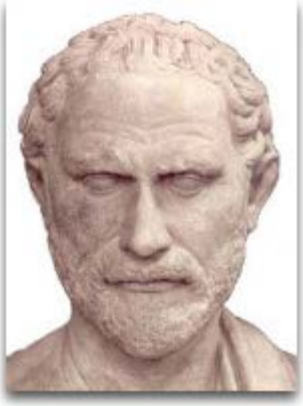

Quotes | On

The following are quotes on Demosthenes:

> "A thousand **Demosthenes**, a thousand Aristotles can be laid prostrate by a single man of mediocre talent who has seized upon a better way to find the truth. Such a hope, therefore, must be removed: for indeed, men, more learned and superior to us in book-learning, will be found who, to the same of nature itself, can make that which is, in fact, false, true."
>
> — Galileo (1632), *Dialogue on the Two Chief World Systems*; cited by Guericke in "Preface" to *Magdeburg Experiments* [1]

> "Hitchens was wonderfully witty, immensely erudite, seemed to have read absolutely everything, he could quote by the yard. He was a devastating wit and his opponents in debate had reason to regret taking him on. Martin Amis said that he would triumph even against Cicero and **Demosthenes**."
>
> — Richard Dawkins (2011), comment (Ñº) Hitchens passing, Dec 16

References

1. Guericke, Otto and Schott, Kaspar. (1672). *Otto Guericke's New Experiments: on (as they are called) on the Magdeburg vacuum space* (*Ottonis De Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (15+ diagrams, various pages) (preface, pdf) (pg. xvii). Janssonius a Waesberge.

External links

â— Demosthenes – Wikipedia.

θΔics

In religious sites,

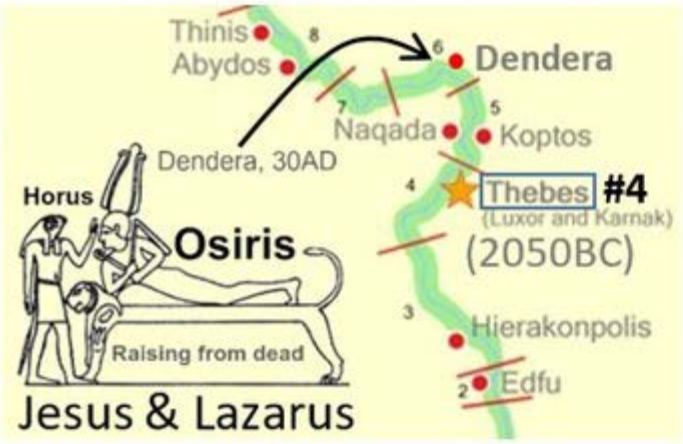

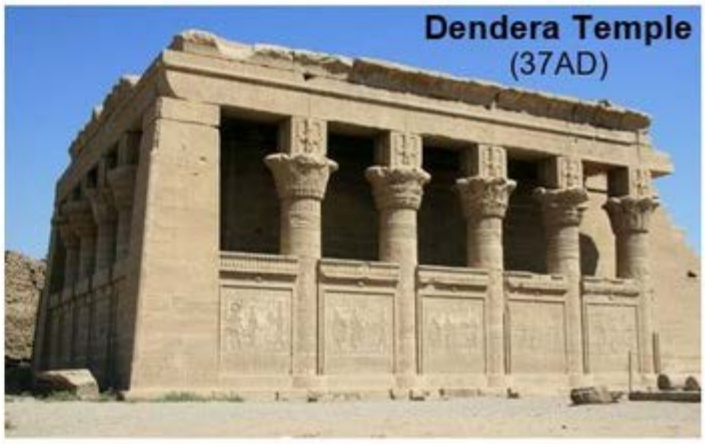

A visual of the location of Dendera and the main temple of the **Dendera Temple** complex, wherein the famous "Death and resurrection of Osiris" (the polytheistic version of the story of Jesus) is depicted in storyboard form with Hieroglyphic text description.

Dendera Temple, or "Dendera Temple Complex", is temple compound in Dendera, or Ant (Egyptian), in Egypt, 3 mi (5 km) south of Qena, 37 mi (60 km) north of Luxor, which depicts a number of scenes of the Egyptian religion, e.g. creation of the cosmos, resurrection of Osiris, immaculate conception of Horus (compare: virgin birth), etc., as these religio-mythologies existed in belief structure or belief state in c.100BC to 37AD, the time of its construction.

Resurrection | Osiris

See main: Death and Resurrection of Osiris

In 1873, Auguste Mariette, in his *Dendera*, published series of about 25 story-board like illustrations of carved scenes, at the Dendera Temple, of the death and resurrection of Osiris. [1] In 1904, Wallis Budge, in his *The Gods of the Egyptians, Volume Two*, steps through 23 of the Mariette illustrations. [2] In 1911, Budge, in his *Osiris and the Egyptian Resurrection*, goes through all of the Mariette illustrations, among others, to fully step through the death and resurrection of Osiris.In he following, from the Dendera Temple, shows Osiris being resurrected (or raised) by Horus: [1]

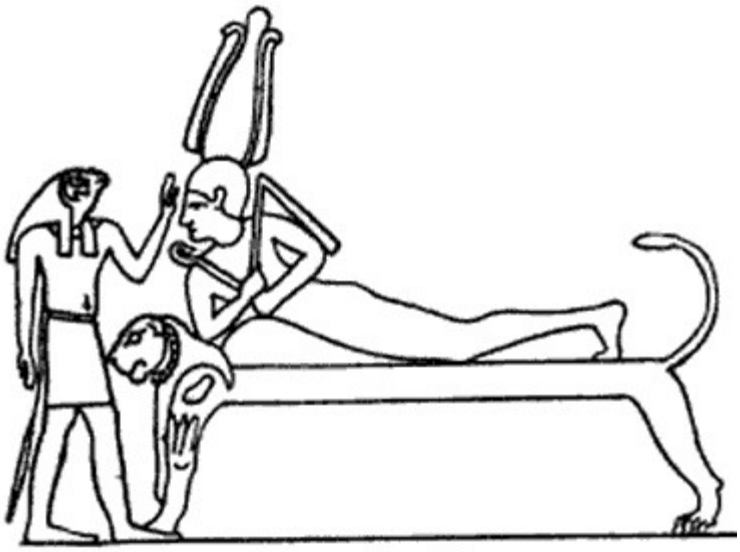

No. 17.

(add)

Nero | 54-68AD

The following image, supposedly, from the Dendera Temple, is Roman Emperor Nero (Ñº): [4]

Photo-journalist Mick Palarczyk captions this image as follows: [2]

> “A relief in the Hathor Temple at Dendera shows Isis (with sundisk) and Osiris sitting on thrones. The latter is actually described here as "Osiris Unefer", the last part of the name ("He who is always good") being presented within a cartouche. On the left Roman Emperor (and Pharaoh) Nero is presenting two sistrums, ritual musical instruments decorated with the head of Hathor. Before him stands the child god Ihy, son of Hathor and Horus. The relief is located on the (interior) eastern wall of the outer hypostyle hall of the Dendera temple and dates from the first century AD.”

(add)

Creation

The following, an image, from the Hathor Temple at Dendera, found in the crypt beneath its southern wall, shows "creation" of the universe: [2]

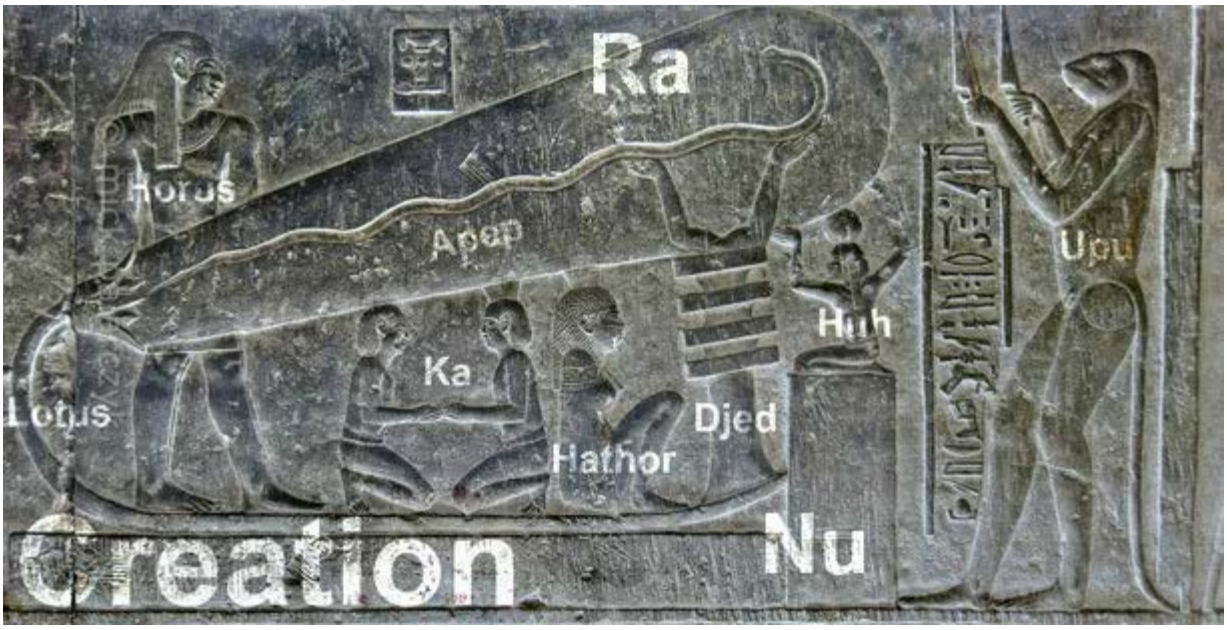

Photo-journalist Mick Palarczyk captions this photo semi-correctly as follows: [2]

> "The reliefs here portray human figures next to bulb-like objects reminiscent of oversized light bulbs. What we witness here is the creation of the cosmos, in the from of an elongated bulb. It springs from a lotus-flower on a boat, the lotus being the first object that floated on the primordial sea, according to Egyptian cosmology. From the flower also appears a snake [Apep], which is equated to the rising sun and the god Harsomptus [Horus] and which is enveloped by the cosmos. Harsomptus is also present in human form, standing behind the bulb. The top of the cosmos-bulb is supported by the God of Infinity, Heh [Huh] (see: Ogdoad), kneeling on a square base, while the sun-snake is supported by a Djed pillar with arms, symbol of stability and continuity. Sitting beneath the bulb are the goddess Hathor [Isis] (on the right) and, facing each other, two representations of the ka (living essence) of Harsomptus. Upu, the frog-headed baboon on the right holding two knives in his hands, is a protective genie. It is in this crypt below the southern wall that the golden statue of the ba (soul) of Hathor [Isis] (mother of Harsomptus) was kept. And it was probably here that the sacred [Khoiak festival] procession started on the eve of the first day of the New Year, bringing the statue of the goddess to the roof of the temple, just as the newly created sun rose from the abyss on the First Day. This part of the **Dendera Temple** was built during the later Ptolemaic period (first century BC)."

Here, to note, we see a visual of the gist of the Hinduism creation myth, namely of Brahma being born out of a lotus flower, or Ra (the bulb) being born out of the Lotus as shown above.

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(b) Mick Palarczyk (about) – Palarczyk.com.

External links

â— Dendera – Wikipedia.

θΔics

In existographies, **Denis Diderot** (1713-1784) (IQ:180|#173) (Cattell 1000:169) [RGM:448|1,360+] (HD:11) (FA:68) (CR:26) was a French philosopher, art critic, encyclopedist, and "physician" (Mettrie, 1747), aka the "father of the encyclopedia" (Stark, 2006), noted for his views on determinism, atheism, anti-chance, among others.

Chance, god, or nature?

In c.1745, Diderot, in his *Philosophical Thoughts*, juxtaposed chance, god, and nature as the three choices of operation of the universe, as follows:

> "We do not know nature at all; causes hidden deep within her may have produced everything. Look in your turn at Trembley's polyp! Does it not contain inside it the causes of its own regeneration? Why then would it be absurd to believe that there exist physical causes for which everything was made and to which the whole chain of this vast universe is so necessarily linked and subordinated that nothing that happens could not have happened; that it is our absolutely invincible ignorance of these causes that has made us look to a god, who is not even a being of reason, according to some? Thus, destroying chance does not mean proving the existence of a supreme being, for **there may be something else which is neither *chance* nor *god***; I mean 'nature', the study of which can as a result only produce unbelievers, as is proved by the manner of thinking of all its most successful observers."
>
> — Denis Diderot (c.1745), *Philosophical Thoughts*; cited by Julien la Mettrie (1747) in *Man: a Machine* (pg. 24)

(add)

Rameau's Nephew

In 1762, Diderot, in his *Rameau's Nephew*, published posthumously in German (1805) by Goethe (Q), outlined, in dialogue form, supposedly, the problems posed by a Diderot-Holbach like atheistic morality and a Mettrie-like atheistic amorality, in the opening part of which he characterizes great geniuses as a juxtaposition between Caesar, Marcus Aurelius, Socrates, on one side, and Diogenes and Phryne the prostitute, on the other. [6]

La Mettrie

Diderot's *D'Alembert's Dream* (1769) (Q) and his *Refutation of Helvetius* (1773) (Q) are said to share many affinities with Julien La Mettrie's ideas. [5]

Religion | Atheism

Some have attempted to labeled Diderot as "France's first true atheist" (Q); other's classify him as an apatheist, i.e. one who is apathetic about theism/atheism distinction, based on his reply when being accused of being an atheist that he simply did not care whether god existed or not. (Q) The following are other related quotes:

> "If you want me to believe in god, you must make me touch him."
>
> — Denis Diderot (1749), portrayal of fictional conversation of Nicholas Saunderson with a priest, in *Letters of the Blind* (Q)

> "I believe in god, but I also live happily with atheists. It is very important not to mistake hemlock for parsley; but not at all so to believe or not in god."
>
> — Denis Diderot (c.1765), "Response to Voltaire" (Q); note: in his Diderot-Barthelemy dialogue (1773), Diderot states that he said this "I believe in god" statement only to flatter Voltaire, and when on to state correctly that he was an "unbeliever". [4]

Sunand Joshi (2014) characterizes him as a "materialist who all but openly espoused atheism".

Animate atoms

Diderot had some type of "animate atom" theory, speculating, e.g., how possibly that when to people die (dereact) and are interred next to each other, their atoms might co-mingle in the future by some type of law of affinity. [2]

Encyclopedia

Diderot's 1772 *Encyclopedie*, co-written with Jean D'Alembert, culminating as a 35-volume set, which contains an affinity table (attributed to Diderot), is said to mark "end of an area in which a single human being was able to comprehend the totality of knowledge" (see: "last persons to know everything").

Determinism

Diderot was an adherent to strict historical determinism, according to which it is nothing but external forces that make people behave as they do, in which consciousness was an experienced allusion. He conceived of a mathematician who gets up, works on geometry, writes and posts letters, and dines with his friends, and yet all the while, according to Diderot: [1]

> "He knows nothing, but nothing of what he has done, and I see this man—machine pure and simple—experiencing different motives which have impelled it without having freed it; it has not produced a single expressly voluntary act."

This is an example of the human machine model.

Quotes | On

The following are quotes on Diderot:

> "I have read with extreme pleasure your book [*Letter on the Blind*, 1749]. I am concerned with the absence of an 'infinitely cleaver workman' in your universe? I desire passionately to converse with you, no matter whether you think you are one of his works or whether you think you are a necessarily organized portion of an eternal and necessary matter."
>
> — Voltaire (c.1749), "Letter to Denis Diderot" [8]

> "Vartanian (Q), as many critics do, believes that in 1746 **Diderot** truly was a deist: he prefaced the *Philosophic Letters* with 'I write about god.' Soon Spinozism (the notion that god and the universe are one and the same and that god does not exist outside the universe) replaced Diderot's deism. However, by 1749, La Mettrie's materialism convinced Diderot to embrace atheism. When Diderot sat down to write the *Letter on the Blind* in 1749, atheism had replaced Spinozism. Vartanian says that Diderot embraced 'Nature capitalized . . . and endowed with several of the creative powers formerly reserved to god.' Vartanian points out that La Mettrie, who in *Man machine*, published a year before the *Letter on the Blind*, declared: "Let us not limit the resources of nature; they are infinite'."
>
> — Mary Gregory (2007), *Diderot and the Metamorphosis of Species* (pg. 83)

Quotes | By

The following are noted quotes by Diderot:

"The philosopher has never killed any priests, whereas the priest has killed a great many philosophers."

— Denis Diderot (c.1770) [3]

"Skepticism is the first step on the road to philosophy."

— Dennis Diderot (c.1770) (Q)

"Man will never be free until the last king is strangled with the entrails of the last priest."

— Dennis Diderot (c.1770) (Q); paraphrase (or mis-attribution) of Jean Meslier

"There are three principal means of acquiring knowledge: observation of nature, reflection, and experimentation. Observation collects facts; reflection combines them; experimentation verifies the result of that combination."

— Dennis Diderot (c.1770) (Q)

"Pithy sentences are like sharp nails which force truth upon our memory."

— Dennis Diderot (c.1770) (Q)

"There are things I can't force. I must adjust. There are times when the greatest change needed is a change of my viewpoint."

— Dennis Diderot (c.1770) (Q)

"Only passions, great passions can elevate the soul to great things."

— Dennis Diderot (c.1770) (Q)

"Lost in an immense forest during the night I only have a small light to guide me. An unknown man appears and says to me: 'my friend, blow out your candle so you can better find your way.' This unknown man is a theologian."

— Denis Diderot (c.1770), "Thoughts on Religion" [7]

See also

- Diderot-Barthelemy dialogue
- Maupertuis-Diderot debate

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External links

● Denis Diderot – Wikipedia.

θΔics

In existographies, **Denis Papin** (1647-1712) (IQ:180|#185) (Murray 4000:18|T) [CR:95], also referred to as Denys or Dionysius, was a French physician, physicist, and mathematician notable for inventing the Papin digester (1679) and for inventing the Papin engine (1690), the first prototype design for a steam engine; which, in theory, could be worked in a cycle, a process which he was the first to describe, and produce usable work output or cause the "intended movement", i.e. downward movement of the piston, through the action of vacuum creation when steam was cooled in a piston and cylinder. He published his design in the 1690 memoir "A New Method to Obtain Very Great Motive Powers at Small Cost." In this paper, the term "energy" is first used in a modern sense. [1]

Vacuum pump

In 1674, Papin, as detailed in his “New Experiences on the Void: with a Description of the Machines Used to Make It”, based on the Huygens vacuum pump (1662), made the following vacuum pump [see: Papin vacuum pump (1674)], which had two pistons on one rod, the lower piston carrying a quantity of water that sealed off leaks in the top piston, and the piston rod was connected to a "stirrup" I, designed to be worked with one's foot, so to make the task of pumping less tiring, thus also leaving one hand free to operate the cÏŒck; the cÏŒck itself being a special three-way-cÏŒck, with a combined inlet valve and outlet valve, which was easier to handle than a separate inlet-cÏŒck and stopper: [17]

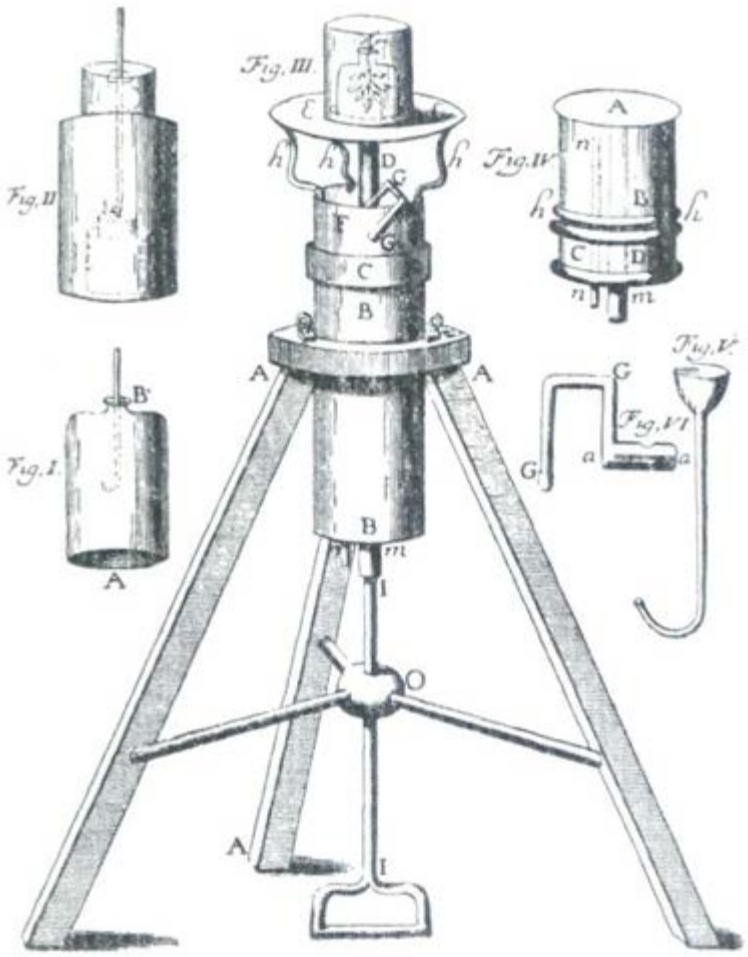

This vacuum pump of Papin's was also able to work as a compressor, an air pump and vacuum pump combination. Papin also seems to have done a plant in a vacuum (fig 3) experiment of some kind. [16]

In 1676, Papin, as described in Robert Boyle's *A Second Continuation*, made a double barrel air pump, as shown below, that were operated by turning a wheel, the use of two barrels employed so that the time to achieve a vacuum was

reduced: [17]

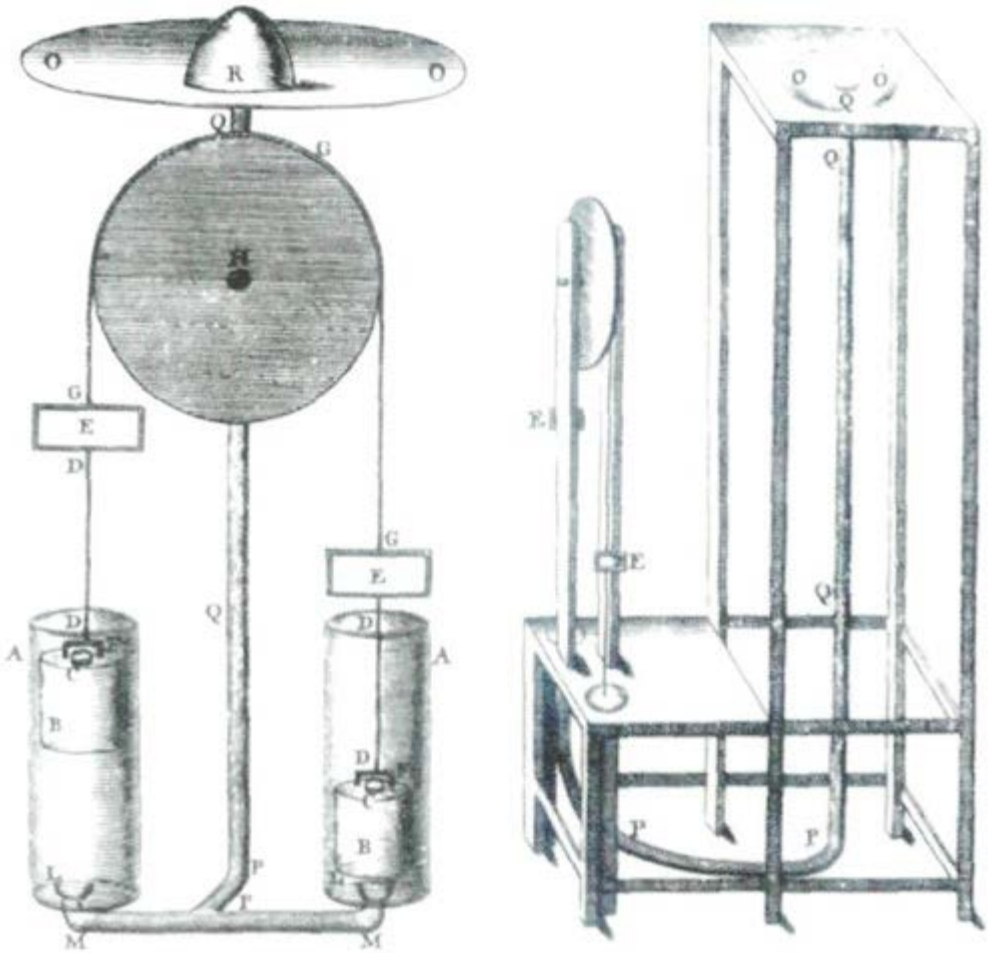

(add)

Huygens | Boyle | Hooke

In 1669, Papin obtained his MD, some work of which involved experiments with vacuums to preserve food. [15]

In 1670 or 1671 (Needham, 1987), Papin became the assistant of Christiaan Huygens, during which time he met Gottfried Leibniz; an alternative dating is shown below:

> "At the time that **Papin** joined him in 1673, Huygens was investigating the force of gunpowder as a means of creating a vacuum under a piston in order to drive machinery, in particular to operate a pump to **raise water from the Seine to the palace of Versailles**. Papin, who was continuing the investigations into the preservation of foodstuffs under vacuum that he had begun [c.1668] at university, was led to consider the vacuum as a possible motive force. During this period Leibniz, then in Paris, became a regular visitor to Huygens's laboratory. Papin learnt a great deal from Leibniz and the friendship thus engendered lasted for many years. The pumps that Papin developed, together with his vacuum experiments, were described in his first treatise, *Nouvelles experiences du Vuide* (1674); favorably received by the Academie des Sciences, it was republished in the Journal des Savants in 1765."
>
> — Anita McConnell (2007), "Denis Papin" [15]

In 1670 to 1674, Papin devoted himself to natural philosophy and mechanics and became an assistant to Christiaan Huygens, at the laboratory of the academy of Paris, his experiments with the air pump and gunpowder piston and cylinder engines, the results of which (*Experiences du Vuide*) were published at Paris in 1674, and also in the form of five papers by Huygens and Papin jointly, in the *Philosophical Transactions* for 1675.

In 1675, Papin, went to London whereat he became acquainted with Robert Boyle, who employed him to make a translation of a theological treatise.

In 1676 to 1679, Papin assisted Boyle in air pump experiments. It was during this period that Papin invented his digester, or apparatus for boiling food under pressure; this invention was presented to the Royal Society on 22 May 1679 and published formerly in 1680 as “A New Digester or Engine for Softening Bones”, and in 1682, some of the Royal Society's dinners were being cooked in Papin's digestor. [11]

In Jul to Dec 1679, Papin was employed at the Royal Society by Robert Hooke as an amanuensis. [11]

In Oct 1675, Hooke, we will note, in his *A Description of Helioscopes and some other Instruments*, presented his future invention he intended to publish or make, invention number nine of which was a “New Invention in Mechanics of Prodigious Use, Exceeding the Chimera’s of Perpetual Motions for Several Uses”, the secret of which, when decoded by Hooke out of his Latin anagram, was: "Pondere premit aer vacuum quod ab igne relictum est" which translates as: “the vacuum left by fire lifts a weight” (Inwood, 2003). [13]

> “Hooke’s ‘**pondere** [weight] **premit** [exerts] **aer** [air] **vacuum** [vacuum] **quod ab igne** [from] **relictum** [left] **est** [it is]’ is one of the principles upon which Savery's late invented engine for raising water is founded.”
>
> — Richard Waller (1705), *The Posthumous Works of Robert Hooke* (pg. xxi)

> “This [Hooke engine principle], which was restated by Jean de Hautefeuille [1678] and Huygens [1678] in the late 1670s, was regarded by some of Hooke’s admirers as the principle behind the invention of the steam pump by Thomas Savery in the 1690s.”
>
> — Stephen Inwood (2002), *The Main Who Knew Too Much* (pg. 211)

It is difficult to see exactly what type of engine Hooke had in mind here, but it could have been a gunpowder engine, or combustion engine, a Papin engine (1690), or possibly a Hero engine of some sort?

In 1680, Papin was a “doctor of physic” and professor of mathematics at Marburg, Germany. [5] In 1680, he was admitted, on Boyle's nomination, to the Royal Society. [4]

In 1684, Papin was back in London, after three years in Venice, and was employed as a temporary curator of the Royal Society tasked with providing weekly experiments for the society. [13]

Pneumatic tubes

In 1667, in a paper read before the Royal Society of London, Papin described a plan to deliver parcels using “pneumatic tubes”, according to which the air in a tube was exhausted in such a way that the piston working in the tube would be drawn in the direction of the suction, pulling with it an attached carrier. [10]

Papin digester

See main: Papin digester

In 1679, Papin exhibited a "digester" to the Royal Society. This device consisted of a vessel provided with a tightly fitting lid, so that under pressure its contents could be raised to a high temperature. The device was in essence a bone digester or pressure cooker for softening or rather dissolving bones and other solids of animals. [3]

The first designs exploded from the high pressures, after which he added in a pressure release valve. It is said that by watching the pressure release valve on his cooker rhythmically move up and down, he conceived of the steam engine.

In 1680, he published Continuation of New Experiments. This was followed by a published a description of his digester in 1681, under the title A New Digester or Engine for Softening Bones. [6]

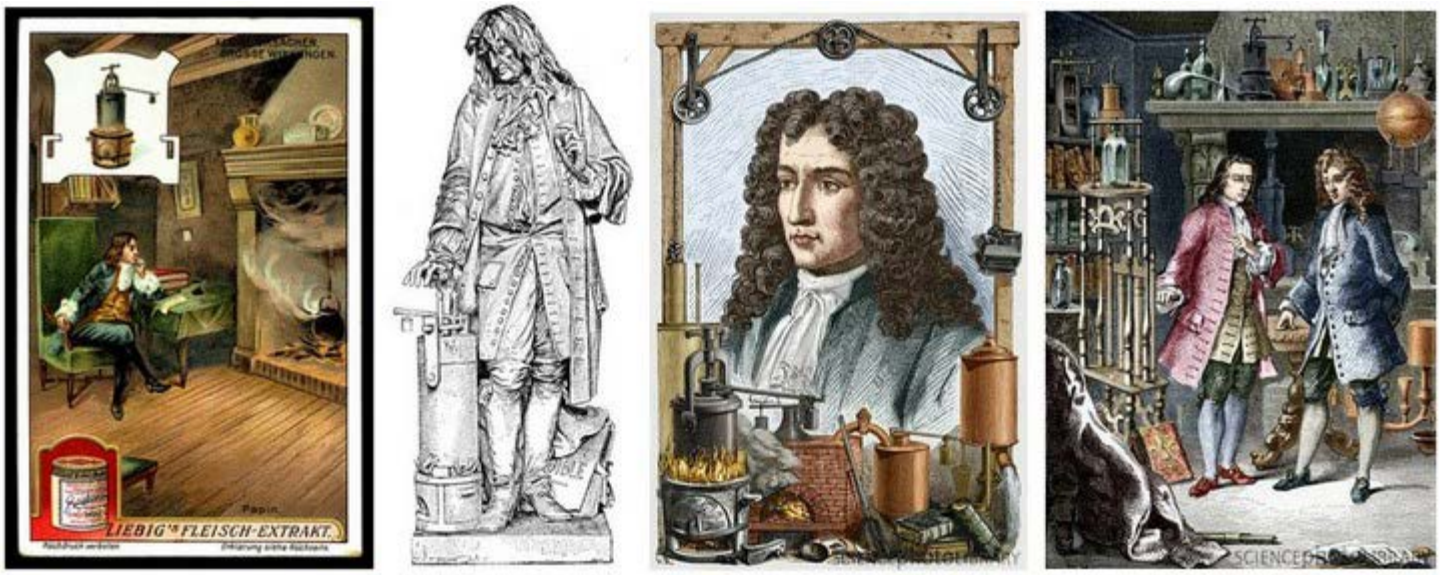

Various imaged of Papin and his inventions; center left is a statue of Papin in Paris. [7][8][9]

Papin steam engine

See main: Papin engine

In 1690, Papin developed an engine that used a combination of steam and atmospheric pressure to move a piston. The device consisted of a three-inch-diameter vertical tube that was filled halfway with water and sealed at one end with a movable piston. Heating the cylinder converted the water into steam. The steam pushed the piston up until, at its highest position, it was grabbed by a fastener at the head. As the steam condensed the atmospheric pressure pushed the piston back down. The power stroke thus occured during the condensation phase rather than the steam phase. Papin hoped he could used this engine to drive a ship, transmitting the motion of a row of pistons through racks and pinions to paddle wheels, but he was unable to obtain any financing for the project. [6]

In 1696, Papin found a patron in the Landgrave of Hesse-Kassel (Germany). The Landgrave asked Papin to build an engine that could lift water to a defined height and then release into an elevated garden or fountain. Papin's engine used a free-swimming piston which prevented the steam from condensing on the cold water surface. But, after the joints and valves of the prototype machine leaked, the Landgrave lost all interest in Papin's work. He spent the next several years working on a variety of machines. [6]

Papin took up steam engine research again in 1705, after receiving a sketch of Thomas Savery's steam engine. Recognizing the superiority of Savery's machine to his own, Papin set out to make improvements to the basic design. His principal improvement was to incorporate a piston, instead of a vacuum chamber, to provide suction. One prototype was built; it caused a stir locally, but was not exploited and eventually dismantled. [6]

In 1707, Papin published The New Art of Pumping Water by Using Steam. That same year, he revived his notion of a steam-driven paddle-wheel boat, and decided to return to London as there would be more call for such a ship in a great port. A small manually operated paddle-boat had been tried out on the river Fulda, in Germany, but was smashed up by local boatmen afraid of potential competition. In London, Papin tried to persuade the Royal Society to sponsor his boat,

asking for no more than £15 to cover the cost of the boiler, but was unsuccessful. [6]

Other

In 1696, Papin, supposedly, built two submarines. (Ñº)

Education

In 1661 or 1662, Papin entered upon the study of medicine at the university of Angers, where he graduated in 1669.

Quotes | On

The following are quotes on Papin:

> "A method of draining mines where you have not the convenience of a near river to play the aforesaid engine (with air-pumps and cylinders connected by an air pipe); where, having touched upon the inconveniency of making a vacuum in the cylinder for this purpose with gunpowder (according to his first scheme of 1687) he proposes the alternately turning a small surface of water into vapor, by fire applied to the bottom of the cylinder that contains it, which vapor forces up the plug in the cylinder to a considerable height, and which (as the vapor condenses as the water cools when taken from the fire) descends again by the air's pressure, and is applied to raise the water out of the mine."
>
> — Anon (1697), "Account of Papin's steam engine", *Philosophical Transactions*, No. 226, Vol 19, pg. 481; cited by John Farey (1827) in *A Treatise on the Steam Engine* (pg. 98) [14]

> "Among the philosophers who applied themselves to the invention of machines to be actuated by the force of steam, the celebrated **Denys Papin** deserves most honorable mention; and his projects being all published, are more on record than those of his predecessors. Papin was born at Blois in France, and was educated as a physician. After obtaining a degree of doctor in medicine in his own country, and making some new experiments at Paris, he travelled into England, and taking an active part in the new philosophy, he was elected a fellow of the Royal Society in December, 1680. He passed some years in London, and assisted the celebrated Mr. Boyle in various experiments with the air-pump, of which an account is given in the *History of the Royal Society*, and in Mr. Boyle's *Continuation of New Experiments Physico-Mechanical* (1682)."
>
> — John Farey (1827) in *A Treatise on the Steam Engine* (pg. 93)

> "Among further improvements in the [Huygens-improved Boyle] air-pump during the latter part of the seventeenth century were the two-way tap, introduced by Papin; and the double cylindered pump, probably introduced by Papin and perfected by Hauksbee, through whom the air-pump assumed what long remained its standard form."
>
> — Abraham Wolf (1959), *A History of Science, Technology, and Philosophy, Volume One* (pg. 107)

Quotes | By

The following are quotes by Papin:

> "We now raise water by the force of fire, in a more advantageous manner than that which I had published some years before; for, besides the suction, we now also use the pressure which water exerts upon other bodies, in dilating itself by heat, instead of which I before employed the suction only, the effects of which are much more limited."

— Denis Papin (1698), “Letter to Gottfried Leibniz”; cited by John Farey (1827) in *A Treatise on the Steam Engine* (pg. 126) [14]

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External links

â— Denis Papin – Wikipedia.

θΔics

In human thermodynamics, **Dennis Glenn Collins** (1944-) is an American applied mathematician noted for about 25 different publications on sociological thermodynamics modeling, in which he attempts to explain, according to his abstract, how "social science extends from Willard Gibbs' thermodynamic models."

Collins' first human thermodynamics paper was his 1978 "A Thermodynamic Goal Model" and his latest was his 2003 "Divvy Economies Based on (an Abstract) Temperature".

A chronological listing of these 25 articles, which he summarizes as being "thermodynamic modeling papers", is given in his 2011 book *Conflict in History, Measuring Symmetry, Thermodynamic Modeling and Other Work*. [1]

Thermodynamics publications

In 1997, Collins, in his "On the Generalized Thermodynamics of Mime-Matter Interactions", gave the following abstract: [2]

> "Through the combinatorial problem of how many ways there are to place one square inside a larger square with parallel sides, this paper sets up a thermodynamic system to study the question of what scale on which to realize a pattern. Relative to an energy defined as the area of the inside square, this example has negative temperature. Various probability distributions are derived for the ensembles based on this as well as on Helmholtz and Gibbs free energy."

This seems to put his approach, possibly, akin to those of Constantin Carathéodory.

Florida school

One of this book chapters, entitled "Tropical Emergy and (Dis-)Order", which seems to be on the topic of emergy and ecology from the Odum school, namely the theories of Howard T. Odum and Corrado Giannantoni. [2]

Education

Collins, after graduating high school valedictorian (class of 200), completed his BS in 1966 at Valparaiso University, Indiana; then completed his MS in 1970 with a thesis on "Aggregate Logic" and PhD in 1975 with a dissertation on "An Analysis of Preference Matrices" both at the Illinois Institute of Technology, finishing with a 3.41 GPA, which included advanced applied courses in six other departments. From 1970 to 1990, he taught at a number of universities, prior to entering into a professorship of mathematics at the University of Puerto Rico, retiring from that position in circa 2003-2009. In 2004, he described himself as

A Thermodynamic Setting for the Phillips Curve (*Mathematical and Computer Modeling, Vol.14*, pp. 1183-1188) (19990)
A Case Study of Puerto Rican Wage Level (P) Versus Unemployment (U) for 1980-1988 by Thermodynamic Modeling (Feb 24, 1990, Arecibo, PR)
A Thermodynamic Version of the Phillips Curve (August 9, 1990, Baden-Baden, (West) Germany)
Remarks on the Gulf Crisis (Jan 17, 1991)
Measurement of Temperature in Economic Systems Considered as Thermodynamic Models (July 1991)
On the Dangers of Downsizing from a Thermodynamic Modeling Viewpoint (June 23, 1994, World Bank, Washington, DC)
On the Thermodynamics of Mime-Matter Interactions (April 20, 1996, Arecibo, PR)(June 7, 1996, Kalamazoo, MI)(July 10, 1996, Gainesville, FL)(May 3, 1997, Deroit, MI)
Business-Generalized Thermodynamics (April 12, 1997)
On the Generalized Thermodynamics of Mime-Matter Interactions (1997)
Temperature-Based Ascendancy Derived from a Cost or Reward Function (Aug 4, 1999, Boise, ID MAXENT)
IPO's and the Vapor-Pressure Curve (July 21, 2000, Toronto, Canada ISSS)
Thermodynamic Modeling of Moral Codes (=Moral Codes I) (Nov 16, 2000, Mayaguez, PR) (Feb 24, 2001 Humacao, PR)
SigmaXi poster (Nov 10, 2001, Raleigh, NC, SigmaXi Annual Meeting, discussion one year later 2002)
Moral Codes II (Nov 2003)
Divvy Economies Based on (an Abstract) Temperature (Aug 2003, Jackson Hole, Wyoming MAXENT)

being on a sabbatical to "study entropy and synergy".

A listing of Collins' 1990 to 2003 publications.

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θΔics

In existographies, **Dennis Gabor** (1900-1979) (GPE:#) was a Hungarian electrical engineer and physicist noted, generally for his 1948 invention of holography; noted, in information thermodynamics, for his 1964 disproof of Maxwell's demon (based on his 1951 lecture), in which he argues, similar to Leon Brillouin (1951), that the use of light by the demon, in attempting to gain information about the speeds of the particles, acts to dissipate energy in accordance with the second law. [1]

Overview

In Gabor's proof, he constructed a model showing that the demon can exist according to classical physics, but not according to quantum mechanics. [2] Gabor discusses entropy to a small extent in his 1972 book *The Mature Society*. [3]

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2. Popper, Karl R., Petersen, Arne F., and Mejer, Jorgen. (1998). *The World of Parmenides* (pg. 179). Routledge.
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External links

â— Dennis Gabor – Wikipedia.
â— Dennis Gabor (autobiography) – NobelPrize.org.

θΔics

In science, **derivation** refers to sequence of statements or equations according to which one result, in a chain of proofs, is a necessary consequence or logical deduction of previously accepted statements or relations, based on sound verifiable evidence, established truth, and or measured observations of natural phenomena. [1]

Thermodynamics

In thermodynamics, the so-called Bridgman formulas, done by Percy Bridgman (1925), are the most replete, clean, and organized way of deriving thermodynamic expressions from the partial derivatives of the ten (or eight) main thermodynamic quantities (or variables), *P*, *V*, *T*, *E*, *H*, *S*, *A*, and *F* (see: symbols), of which there are 8 x 7 x 6 first (partial) derivatives; which in full amounts to the first derivatives of the 10 fundamental quantities, yeilding 720 equations, organized into 10 groups, based on which variable was held constant during the differentiation.

Quotes

The following are related quotes:

> "Everyone knows that Shannon's **derivation** is in error."
>
> — Benoit Mandelbrot (1961), audience comment to Myron Tribus on Claude Shannon's 1948 information entropy derivation [2]

See also

â— Letter rhyming derivation method

References

1. Derivation – Merriam-Webster Collegiate Dictionary, 2000.
2.Tribus, M. (1998). "A Tribute to Edwin T. Jaynes". In *Maximum Entropy and Bayesian Methods, Garching, Germany 1998: Proceedings of the 18th International Workshop on Maximum Entropy and Bayesian Methods of Statistical Analysis* (pgs. 11-20; quote, pg. 13) by Wolfgang von der Linde, Volker Dose, Rainer Fischer, and Roland Preuss. 1999. Springer.

External links

â— Derivation (disambiguation) – Wikipedia.

θΔics

In existographies, **DeRobigne Bennett** (1818-1882) (FA:137) (RMS:73) (CR:5), aka D.M. Bennett, was an American radical publisher, noted for his 1873 founding of *The Truth Seeker*, the leading organ of the American atheism in the late 19th century.

Overview

In 1873, he started the newspaper *Truth Seeker*, with the masthead: "Devoted to: science, morals, free thought, free discussions, liberalism, sexual equality, labor reform, progression, free education and whatever tends to elevate and emancipate the human race; Opposed to: priestcraft, ecclesiasticism, dogmas, creeds, false theology, superstition, bigotry, ignorance, monopolies, aristocracies, privileged classes, tyranny, oppression, and everything that degrades or burdens mankind mentally or physically", which in the 1880s was the world's largest and best freethought journal, and was the organ of the American Association for the Advancement of Atheism (Le Beau, 2003), and in which are found interesting silent historians problem quotes by Celsus (c.175AD). [1]

Quotes | By

The following are quotes by Bennett:

> "Whether Abraham is a myth or a real personage [see: Abraham never existed] can probably never be known. Without Abraham, no Jews, no Jesus, no Christianity, and no salvation for the world. But some have asserted that Brahma and Abraham are alike corruptions [see: Abraham and Brahma] of Abba Rama, or Abrama, and that Sarah is identical with Saravasti, thus showing a Hindoo origin for the man and woman standing at the head of all the Jews. If Abraham is a myth—and the chances that he is are at least equal to the belief that there was such a man—then the story about Isaac, Jacob, his twelve sons, Moses, Aaron, Joshua, Samson, Job, Samuel, Saul, David, Solomon, etc., is also mythical."
>
> — DeRobigne Bennett (1881), *The Gods and Religions of Ancient and Modern Times* (pg. 481) [2]

References

1. Bennett, DeRobigne (1876). *The World's Sages, Thinkers and Reformers: Biographical Sketches of Leading Philosophers, Teachers, Skeptics, etc.* (Celsus, pg. 291). Truth Seeker Company.
2. Bennett, DeRobigne. (1881). *The Gods and Religions of Ancient and Modern Times* (pg. 481). Publisher.

External links

â— D.M. Bennett – Wikipedia.

θΔics

In geniuses on, **Descartes on the soul** refers to the ideas, comments, theories, and opinions of Rene Descartes on the topic of the soul, generally discussed in respect to its purported existence in vegetables, animals, and humans, in respect to principles of motion.

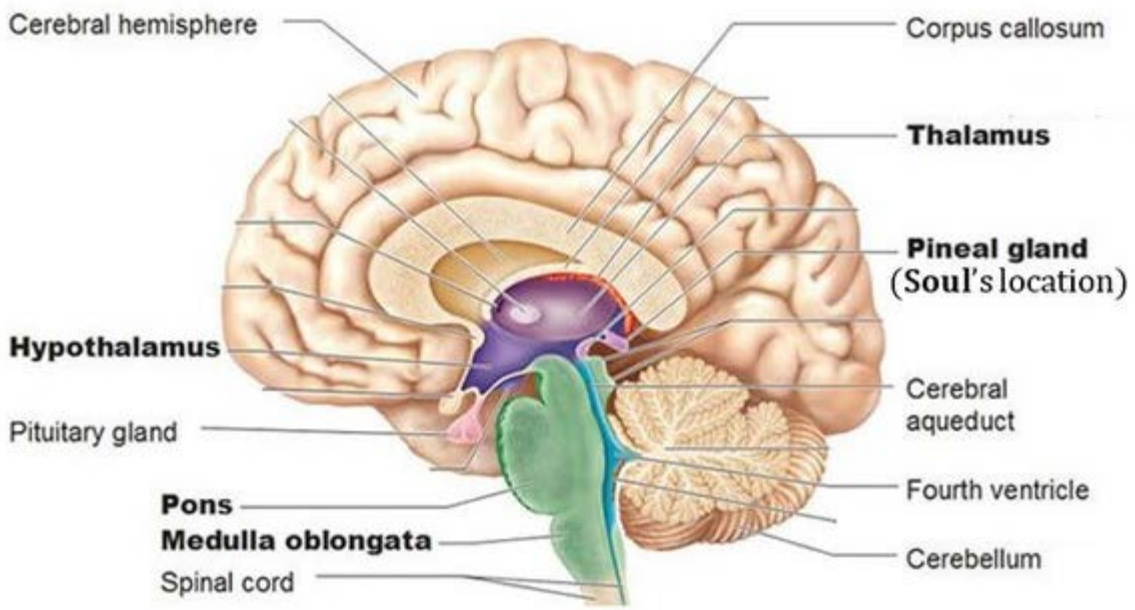

Descartes, in his *The Passions of the Soul* (1649), famously conjectured that the pineal gland, shown above, is the "principle seat of the soul", in the sense of being the thing which allows a person, in theory, to move themselves, in a manner different than as compared to an automaton.

Overview

In 1598, when Descartes was age two, Tommaso Francini and Alessandro Francini, Florentine hydraulics engineering brothers, built, in garden terraces at Saint-Germain-en-Laye, Paris, a number of water-driven automata, that turned around, played music, and even one where a hero slayed a rising dragon. (Ñº) Descartes, as he grew up, was greatly intrigued by these automaton, in respect to their philosophical implications

In 1633, Descartes, aged 37, in his *Treatise on Man*, posited that a human was an automaton, a type of spring-loaded machine, similar to animals, except in one respect, that it contained a "rational soul" that could initiate volition of the body by its own accord. [2] The following is the main statement:

> "These functions [digestion, beating of heart, growth, respiration, waking, sleeping, etc.] follow in this [human] machine simply from the disposition of the organs as wholly naturally as the movements of a clock or other automaton follow from the disposition of its counterweights and wheels. As far as these functions are concerned, it is not necessary to conceive any other **vegetative [soul]** or **'sensitive soul'**, nor any other **principle of motion or of life**, than the blood and the spirits agitated by the fire which burns continually in the heart, and which is in no wise different from the fires which exist in inanimate bodies."
>
> — Rene Descartes (1633), *Treatise on Man* [3]

In 1649, Descartes, in his *The Passions of the Soul*, his last published book, gives his most extensive account (Ñº), of his theory that the soul resides in the pineal gland; the following is the main quote: [1]

> "My view is that this **[pineal] gland is the principal seat of the soul**, and the place in which all our thoughts are formed. The reason I believe this is that I cannot find any part of the brain, except this, which is not double. Since we see only one thing with two eyes, and hear only one voice with two ears, and in short have never more than one thought at a time, it must necessarily be the case that the impressions which enter by the two eyes or by the two ears, and so on, unite with each other in some part of the body before being considered by the soul. Now it is impossible to find any such place in the whole head except this gland; moreover it is situated in the most suitable possible place for this purpose, in the middle of all the concavities; and it is supported and surrounded by the little branches of the carotid arteries which bring the spirits into the brain."

(add)

Quotes

The following are related quotes:

> "Descartes saw that souls cannot at all impart force to bodies, because there is always the same quantity of force in matter. Yet, he thought that the soul could change the direction of bodies. This was, however, because at that time the law of nature, which affirms also the conservation of the same total direction in the motion of matter, was not known. If he had known that law, he would have fallen upon my system of pre-established harmony. According to this system bodies act as if (to suppose the impossible) there were no souls at all."
>
> — Gottfried Leibniz (1714), *Monadology* (pg. 265-66)

> "The embarrassments which animals have thrown in the way of the partisans of the doctrine of spirituality is well known: they have been fearful, if they allowed them to have a spiritual soul of elevating them to the condition of human creatures; on the other hand, in not allowing them to have a soul, they have furnished their adversaries with authority to deny it in like manner to man, who thus finds himself debased to the condition of the animal. Theologians have never known how to extricate themselves from this difficulty. Descartes fancied he solved it by saying that beasts have no souls, are mere machines. Nothing can be nearer the surface than the absurdity of this principle. Whoever contemplates nature without prejudice, will readily acknowledge, that there is no other difference between the man and the beast than that which is to be attributed to the diversity of his organization."
>
> — Baron d'Holbach (1770), *The System of Nature* (pgs. 81-82)

References

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(b) Chalmers, David. (2002). *Philosophy of the Mind* (pg. #). Oxford University Press.
(c) Pineal gland – Wikipedia.
2. (a) Automaton – Wikipedia.
(b) Johnstone, James. (1921). *The Mechanism of Life in Relation to Modern Physical Theory* (pgs. 153-54). Longmans, Green & Co.
3. (a) Tyndall, John. (1874). "Address" (pg. 20), Delivered before the British Association assembled at Belfast. Longmans, Green, and Co.
(b) Musolino, Julien. (2015). *The Soul Fallacy: What Science Shows We Gain from Letting Go of Our Soul Beliefs* (foreword: Victor Stenger) (Gardens, pg. 46, wheels, pg. 47). Prometheus.

θΔics

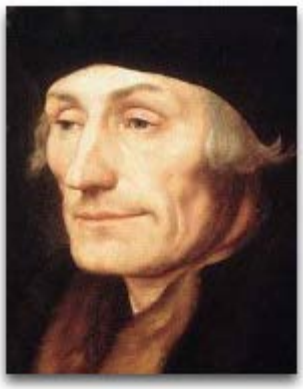

In existographies, **Desiderius Erasmus** (1466-1536) (IQ:185|#62) [RGM:108|1,500+] (Cattell 1000:56) (Gottlieb 1000:97) (Stokes 100:27) (CR:37), oft-cited as "Erasmus", not to be confused with Erasmus Darwin (1731-1802), was a Dutch intellectual, universal genius, and fabled "last person to know everything", noted for introducing the term "Pandora's box", the precursor to Eve's apple (see: Adam and Eve), into the cultural vernacular, a term he used in respect to the gift box given to Pandora, a penned during his translation of Hesiod's 700BC *Theogony*.

Civilization

In 1530, Erasmus, in his *On Civility in Children*, a book dedicated to the instruction of noble youth, table manners, etc., defined "civility" as non-rude behavior. The term "civilization", supposedly, derives from this publication. [4]

Quotes | On

The following are quotes about Erasmus:

> "**Erasmus** advises students to read only the best books on the subjects with which they are occupied. He cautions them against loading their memories with the errors of inferior writers which they will afterwards have to throw off and forget."
>
> — James Froude (1894), *Life and Letters of Erasmus* [1]

Quotes | By

The following are noted quotes by Erasmus:

> "You must acquire the best knowledge first, and without delay; it is the height of madness to learn what you will later have to unlearn."
>
> — Desiderius Erasmus (1497), "Letter to Christian Northoff" [2]

> "I consider as lovers of books not those who keep their books hidden in their store-chests and never handle them, but those who, by nightly as well as daily use thumb them, batter them, wear them out, who fill out all the margins with annotations of many kinds, and who prefer the marks of a fault they have erased to a neat copy full of faults."
>
> — Desiderius Erasmus (1489), "Letter to unidentified friend" [2]

> "In the country of the blind, the one-eyed man is king."
>
> — Desiderius Erasmus (1500), *Publication* (Ñº)

> "When I get a little money I buy books; and if any is left I buy food and clothes."
>
> — Desiderius Erasmus (1500), "Letter to Jacob Batt", Apr 12; popularized variant (Ñº) of original

> "Could god have taken on the form of a woman, a devil, a donkey, a gourd, or a flintstone? If so, how could

a gourd have preached sermons, performed miracles, and been nailed to the cross?”

— Desiderius Erasmus (1509), *Praise of Folly* [3]

References

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3. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 274). HarperOne.
4. Adams, Richard N. (1988). *The Eighth Day: Social Evolution as the Self-Organization of Energy* (pg. 159). University of Texas Press.

External links

â— Desiderius Erasmus – Wikipedia.

θΔics

In science, **desire** refers to an inherent want or need of an entity.

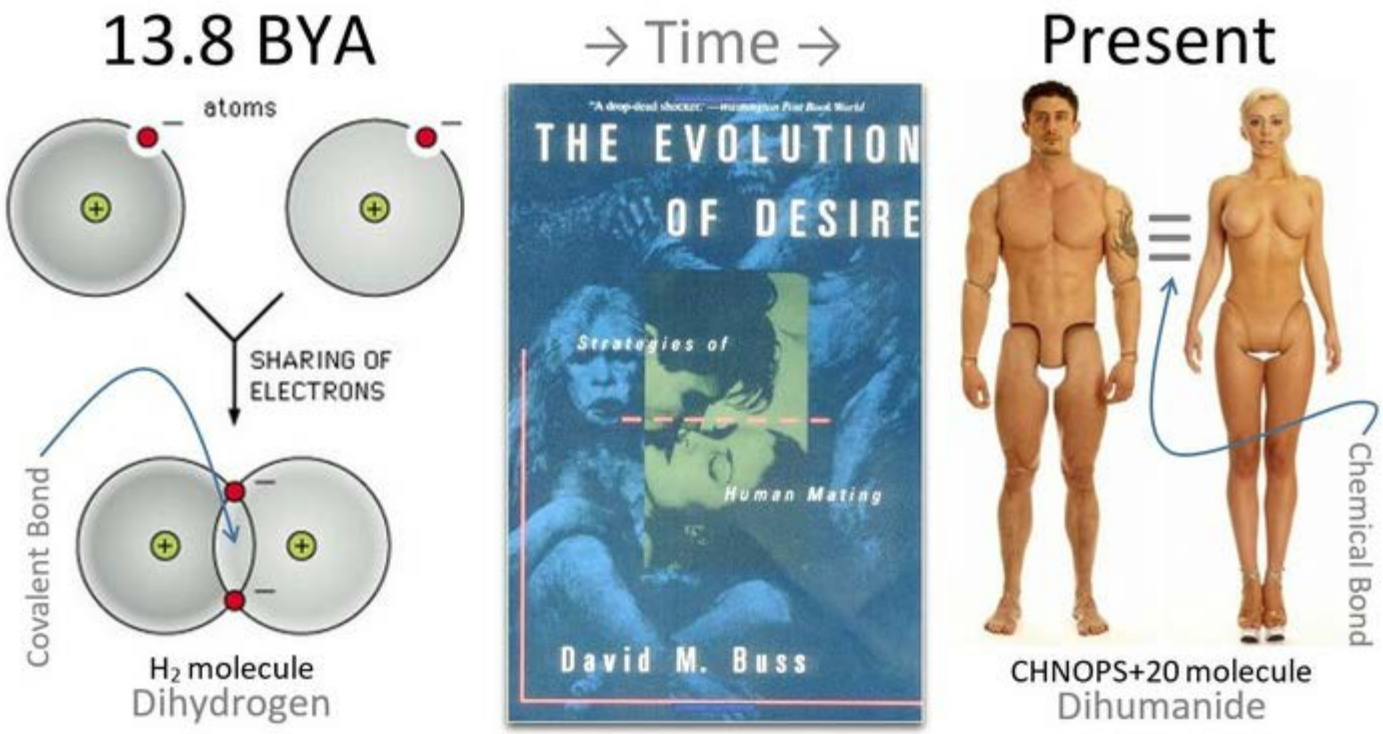

Left: two hydrogen atoms form a covalent bond, via a balancing of attraction and repulsion. Center: David Buss's 1994 *The Evolution of Desire*, the classic work breaking down desire evolution-wise and cross-culturally, in terms of mechanism. Right: a doll-like man and woman: typical objects of **desire**, made with attractive properties of: averageness, symmetry, fitness, age (ripeness), sexuality (high testosterone to estrogen ratios; or conversely), and complexion; latitude markers (skin color) (immune system optimality), etc., who are found to form stable long-term marriage bonds when the attraction to repulsion ratio is 5-to-1 (Gottman stability ratio).

Overview

In 1871, English biologist Thomas Huxley defined the subject of 'social chemistry' and in the context of people, viewed as atoms, satisfying their desires in the formation of the social molecule: [1]

> "Every society, great or small, resembles ... a complex molecule, in which the *atoms* are represented by *men*, possessed of all those multifarious attractions and repulsions which are manifested in their **desires** and volitions, the unlimited power of satisfying which we call freedom ... the social molecule exists in virtue of the renunciation of more or less of this freedom by every individual. It is decomposed, when the attraction of desire leads to the resumption of that freedom the expression of which is essential to the existence of the social molecule. The great problem of social chemistry we call politics, is to discover what desires of mankind may be gratified, and what must be suppressed, if the highly complex compound, society, is to avoid decomposition."

In Polish economist Leon Winiarski's 1898 *Essay on Social Mechanics*, he is said to have defined desire as a form of energy, in a thermodynamic sense. In commentary on this, in 1907 American sociologist Edward Ross stated that: "Desire may or may not be a form of energy. In any case it is certain that a mechanical interpretation cannot help to predict the choices of people." [5] In 1925, American chemist E.J. Brockman stated that: [2]

> "It is suggested that the formation of complex compounds be due to an inherent **desire** on the part of the atom of certain elements to complete its outer shell of electrons."

American chemist-theologian Edwin Slosson cites this passage as an example of anthropomorphism in chemistry. [3] Slosson also cites the teachings of his University of Chicago chemistry professor Nef, who described the

transformations of molecules drawn on the board as:

> "The atoms are uncomfortable when they are in this position. They do not feel happy till they have rearranged themselves so."

Slosson then quotes from Johann Goethe, the emperor of human chemistry, albeit he doesn't seem to be aware of Goethe's *Elective Affinities*. The forerunner to this type of logic, of course, is Greek philosopher Parmenides and his 450BC chemical aphorisms.

In Iranian thermodynamicist Mehdi Bazargan's 1956 *Thermodynamics of Humans*, in using the following Helmholtz version of free energy as the model for human work W:

$$W = U - TS$$

he equates 'initial internal energy' with desire, need, and love. [4] This is an interesting view in that it associates the inherent desires of an individual as being a function of or a driving force bound up in the nature of the initial state of the internal energy of a person's existence at the start of a powerful reaction.

Objection to "anthropomorphism in chemistry" was expressed in the recent 2007 Rossini debate, particularly by the religiously-biased chemists, such as American physical chemist John Wojcik.

References

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2. Brockman, E.J. (1925). "Paper", read before the Baltimore meeting of the American Chemical Society.
3. Slosson, Edwin. (1925). *The Sermons of a Chemist* (pg. 73). Harcourt, Brace, and Co.
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5. Ross, Edward A. (1907). *Foundations of Sociology* (Winiarski, pgs. 156-60). MacMillan Co.

Further reading

â— Buss, David M. (1994). *The Evolution of Desire: Strategies of Human Mating.* Basic Books.

External links

â— Desire – Wikipedia.

θΔics

In terminology, **destiny**, near synonymous to fate, in opposition to chance, refers to the philosophical doctrine according to which there exists something to which a person or thing is destined; a predetermined course of events—often held to be an irresistible power or agency. [1]

"Accept the things to which fate binds you, and love the people with whom fate brings you together, but do so with all your heart."
– Marcus Aurelius (date)

Roman emperor and philosopher Marcus Aurelius' *circa* 160AD advice on **fate** (and or **destiny**) (see: quotes); also note for his circa 175AD *Medications* query: "For any particular thing, ask: What is it in itself? What is its nature?" (*Silence of the Lambs*, 1991).

Fate

American DNA-structure co-discoverer James Watson said on fate: [6]

> "We used to think our fate was in the stars. Now we know, in large measure, our fate is in our genes."

This point of view is what is known as genetic determinism (see: determinism).

Goethe

The following is German polymath Johann Goethe's view of destiny:

> "Only by joy and sorrow does a person know anything about themselves and their **destiny**. They learn what to do and what to avoid."

(add disucssion)

Thermodynamics

See also: Prediction

The seventh sketch of French physicist Gustave Hirn's 1868 *Philosophical Implications of Thermodynamics* discusses destiny; the crude French-to-English translation of abstract of which is as follows: [2]

> SKETCH SEVENTH: Thought expresses the whole universe. - The words **destiny** and destination nation shall not apply to any being, one to the exclusion of another. - Every being and the whole process of beings and carry-sui efore a universal law of development. - The existence of this Act alters the ideas that men are on purpose beings. - Lack of distinction of the three kingdoms. - Analogy and radical distinction between the inanimate universe and the universe animated [see: unbridgeable gap]. - Laws of universal harmony, common; \ all beings. . . . . (151)

In French-born American mathematician, biophysicist, and religious philosopher Pierre Lecomte du Nouy's 1942 book *Human Destiny*, he uses a Boltzmann-stylized statistical view of thermodynamics, to argue that the second law does not apply to humanity and that God is synonymous with anti-chance. [3]

In English thermodynamicist Alfred Ubbelohde 1946 *Time and Thermodynamics*, in his opening chapter "Contributions to the Thermodynamics of Scientific Humanism", he comments: [4]

> "Contributions to the thermodynamics of scientific humanism [concerns] insights on the nature of time, [as

in] personal or psychological time, and refers to the unification of the specialized sciences effected by the contributions they make to the proper study of mankind, man's nature and **destiny**."

Heat death

The model of "heat death" argues that the ultimate fate (or destiny) of the universe, according to the second law, is an end state of complete dissipation, zero available energy, and maximal entropy, a temperature of the universe near absolute zero, or something along these lines, where energy will no longer be available to produce work or movement of bodies by force through distance. [5]

References

1. Merriam-Webster Collegiate Dictionary, 2000.
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3. (a) Nouy, Pierre Lecomte du. (1947). *Human Destiny*. Longmans, Green and Co.
(b) Nouy, Pierre Lecomte du. (1948). *L'homme et sa Destine.* Paris: Colombe.
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5. Cox, Brian and Cohen, Andrew. (2011). *Wonders of the World* (pg. #; ch. 4: Destiny, pgs. 200-43). HarperCollins.
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External links

â— Destiny – Wikipedia.

θΔics

In mythology, **Destruction of Mankind** is a motif, found in Egyptian mythology, Sumerian mythology/Babylonian mythology, and Hebrew mythology, referring to the destruction of mankind via a great flood for either sins or blasphemies against the supreme god.

A depiction (Q) of the **destruction of mankind**, namely of Sekhmet, per orders of Ra, killing the wicked humans, with the flames from her mouth, the flames being the metaphor of the destructive heat of the sun, in the sense of the "dry desert", in a period of too much sunlight and too little rain or water.

Egyptian mythology

In 1350BC, in Egyptian mythology, the so-called of the "Destruction of Mankind", as recounted in the first part of the *Book of the Heavenly Cow*, tells the story of how the god Ra sends a flood destroy mankind for rebelling against him or "blaspheming him" by saying he had "grown old in life, strength, and health", which has a mountain, a bird (ibis); the following is the 1904 Budge translation: [1]

> "[Ra is] the god who created himself after he had risen in sovereignty over men, and gods, as well as over things, the One. And mankind was uttering words of complaint, saying:
>
> > 'Behold now, his Majesty, life, strength, and health [to him]! hath become old, his bones are like silver, his limbs are like gold, and his hair is like unto real lapis-lazuli.'
>
> Now his majesty heard the words which mankind spake [concerning him], and he said unto those who were following him:
>
> > 'Cry out, and bring ye unto me mine Eye, and Shu, and Tefnut, and Seb (Geb), and Nut, and the fathers and the mothers who were with me when I was in Nu (Nun), together with my god Nu. Let him bring his ministers with him, and let them be brought silently, so that mankind may not perceive it and take to flight with their hearts. Come thou with them to the Great House, and let them declare their plans, for I will go forth from Nu unto the place wherein I performed creations, and let those [gods] be brought unto me there.'
>
> Now the gods were on both sides of Ra, and they bowed down even to the ground in presence of his Majesty, and he spake his words in the presence of the father of the firstborn gods, the maker of men, and the king of those who have knowledge. And they spake before his Majesty, [saying]:
>
> > 'Speak unto us, for we are listening';
>
> and Ra spake unto Nu (Nun), saying:
>
> > 'O thou firstborn god, from whom I came into being, O ye gods [my] ancestors, behold ye what mankind is doing, they who were created by mine Eye are uttering murmurs against me. Give

me your attention, and seek ye out a plan for me, and I will not slay them until ye shall say [what I am to do] concerning: it.'

Then the Majesty of the god Nu (Nun), the son of Ra, spake [saying], Thou art the god who art greater than he that made thee, and who art the sovereign of those who were created by him, thy throne is set, and the fear of thee is great; let then thine Eye be upon those who have **uttered blasphemies** against thee.' And the Majesty of Rā spake [saying]:

'Behold ye how they have taken **flight into the mountain** [Mount Ararat]!

Their hearts are afraid because of what they have said.' Then the gods spake before his Majesty, saying:

'Make thine Eye to go forth, and let it **destroy for thee those who utter evil words of blasphemy against thee**. There is not an eye upon all this earth which can resist thine when it descendeth in the form of Hathor.'

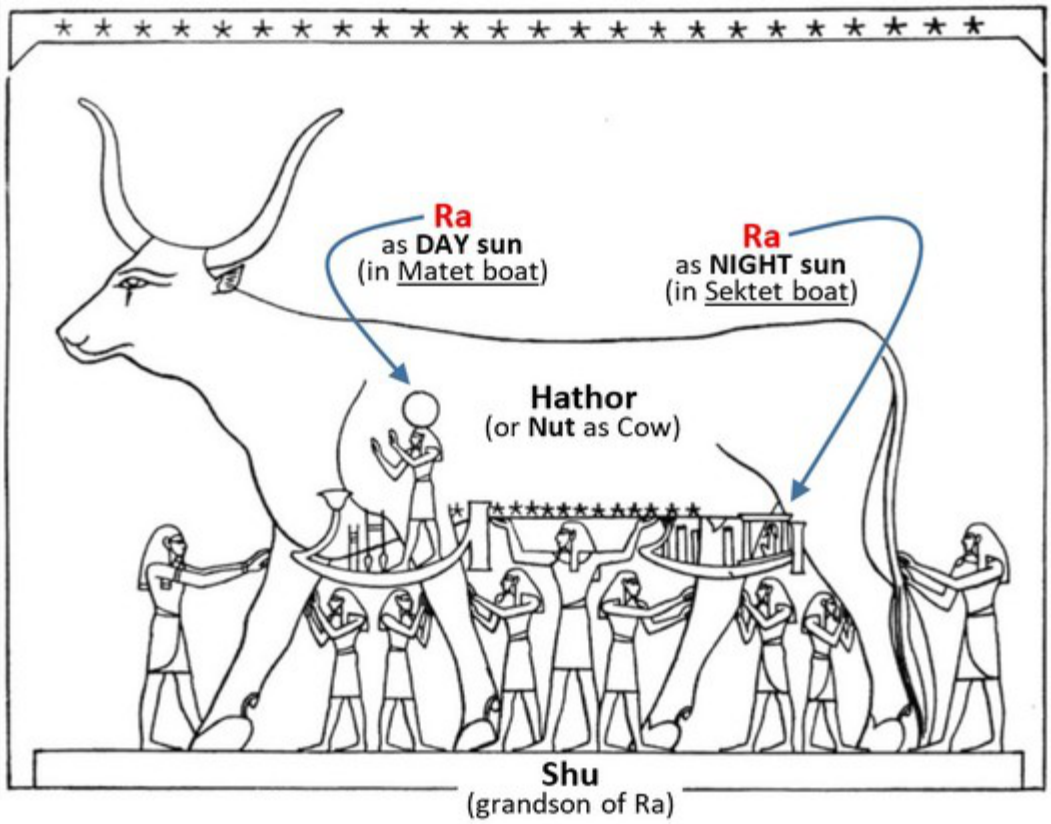

The Egyptian version of the **destruction of mankind** states that the "eye of Ra" descended in the "form of Hathor", a cow, and slaughtered all the wicked humans, and that, after which, to stop her killing, he made 7,000 vessels of red beer to "flood the regions", which Hathor or Sekhet drank, became happy, and stopped the killing, or something to this effect.

And the goddess [Hathor] went forth and **slew the people on the mountain**, and the Majesty of this god spake, [saying]:

'Come, come in peace, Hathor, the work is accomplished.'

And the goddess said:

'Thou livest for me. When I had gained the mastery over men it was well pleasing to my heart.'

And the Majesty of Ra spake, [saying]:

‘I will gain the mastery over them as king, and [I] will destroy them’;

and it came to pass that Sekhmet waded about in the night season in their blood, beginning at Suten-ḥenen (Herakleopolis Magna). Then the Majesty of Ra spake, [saying]:

‘Cry out and fetch me swift and speedy messengers who can run like the wind’;

and straightway one brought these messengers. And the Majesty of this god spake, [saying]:

‘Let them go to Abu (Elephantine), and bring me mandrakes in great number’ ;

and one brought to him these mandrakes, and the Majesty of this god gave them to Sekhet who [dwelleth] in Annu (Heliopolis) to crush. And behold, when the women were crushing the barley to [make] beer, he placed these mandrakes in the vessels which were to hold the beer, and some of the blood of the **men [who had been slain]**. Now they made seven thousand vessels of beer. Now when the king of the South and North, Ra, had come with the gods to look at the beer, and the daylight appeared after the goddess had slaughtered mankind in their season as she sailed up the river, the Majesty of Ra said:

‘It is doubly good, but I must protect mankind against her.’

And Ra spake, [saying]:

‘Let them take up the vases and carry them to the place where men and women are being slaughtered.’

Then the Majesty of the king of the South and North, Ra, commanded them to pour out from the vessels during the [time of the] beauty of the night the beer which made [men] wish to lie down, and the regions of the four heavens were filled therewith even according to the Will of the Majesty of this god. Now when the goddess Sekhmet came in the morning and **found the regions flooded**, her face beamed with joy, and she drank of the beer and blood, and her heart was glad, and she became drunk, and she took no further heed of mankind. And the Majesty of Ra spake unto this goddess, [saying]:

‘Come, come in peace, O fair and gracious goddess;’

[and henceforth] there were young and beautiful women in the city of Amen. Then the Majesty of Ra said unto this goddess:

‘There shall be prepared for thee vases of drink which shall make thee wish to sleep at every festival of the New Year, and the number thereof shall be in proportion to the number of my handmaidens;’

and from that day until this present men have been wont to make on the occasions of the festival of Hathor vases of beer which will make them sleep, in number according to the number of the handmaidens of Ra. And the Majesty of Ra spake unto this goddess, [saying]:

> ‘Behold, the pain of the burning heat of sickness hath come upon me; whence cometh [this] pain?’

Then the Majesty of Ra said:

> ‘I am alone, but my heart hath become exceedingly weary of being with them (i.e., with men); I have slain [some of] them, but there is a remnant of worthless ones, and the destruction which I wrought among them was not commensurate with my power.’

And the gods who were in his train said [unto him], Tarry not in thy weariness, for thy might is in proportion to thine own will.’ Then the Majesty of this god said unto the Majesty of Nu (Nun):

> ‘For the first time my limbs have lost their power, and I will never permit this thing to happen a second time.’”

At this point the inscription becomes much broken, and it is difficult, to make out the general meaning which is to be attached to the scattered words ; according to the Heinrich Brugsch, the myth ends somewhat as follows: [5]

When Ra had described his weariness to Nu, this god commanded Shu to perform the work of Rā and to take the place of his Eye, and directed the sky goddess Nut to help Rā. Nut asked Nu how this was to be done, and he told her to take Rā upon her back ; thereupon Nut took the form of a cow, and Rā seated himself upon her back. In due course mankind saw Rā on the back of Nut, and they were filled with remorse at their former behaviour towards him, and they wished to see slain his enemies who had blasphemed him, but his Majesty did not tarry, and he went on into the temple.
On the following day as soon as the morning had come, men went forth armed with bows and spears in order to do battle with the enemies of Rā, and as soon as the god saw this he said to them:

> “Your sins are forgiven you, for the **sacrificial slaughters** which ye have made have done away with the murders [which mine enemies have committed].”

Then Ra raised himself from the back of the goddess Nut into the sky, where he made for himself a kingdom in which all people were to be assembled.

This story, which is is inscribed walls of the tombs of Tutankhamun (1323BC), Seti I (1279BC), Ramesses II (1213BC), Ramesses III (1155BC), and Ramesses VI (c.1125BC), at Thebes, is said to have originated in the middle kingdom (2050-1710BC),. [2]

In 1874 (or 1876), Edouard Naville published the first English and French translations Legend of the Destruction of Mankind of the based on the Seti I tomb descriptions. [3]

In 1906, Wallis Budge, in his *Gods of Egypt, Volume One* (§12) describes the myth along with showing the original

hieroglyphics. [1] He elaborates further in his *Egyptian Literature, Volume One*, “Legend of the Gods” (1912), where the hieroglyphic text and English translation are printed on opposite pages.

Sumerian mythology

In c.1250BC, in Sumerian mythology, as inscribed on the Nippur tablets, in fragments, is found the following destruction of humankind via flood myth, shown with Egyptian equivalent gods inserted:

Column 1
1. [……..] [……]
My **human-kind on its destruction** I will (let us)
My, Nintu's, creations I will (let us)

5. The people in their settlements I will (let us)
Cities …… he may build, their shade (protection) I will (let us) ……..
The brick of our houses may he cast in a clean spot,
Our …….. places may he establish in a clean spot.

10. …….. of the temennu she made straight for it,
The sublime commandments and precepts she made perfect for it,
After An [Nun], Enlil, Enki and Nin-harsagga
Had created the blackheaded,
The ……. of the ground the ground

15. The **animals, the four legged** [Hathor], of the field artfully they called into existence.

COLUMN 2
5. [……..] [……..] I will (let us) …. upon him
[……..] I will (let us) look upon him.
After the maker of the …. of the land, the establisher of the foundations of the ….
Had created the …. of royalty,

10. Created the sublime …. the …. of royalty,
The sublime commandments and precepts he made perfect for it.
In clean places, *five* cities he founded,
(And) after their names he had called, (and) they had been allotted to kabdu(ga)s
The …. of these cities, Eridu, the leader of Nudimmut he gave,

15. Secondly, to …. Bad-Nagar+dis he gave
Thirdly, Larak to Pabilbarsag he gave,
Fourthly, Sippar to the hero Samas he gave,
Fifthly, Suruppak to … he gave—;

20. After the names of these cities he had called, (and) to kabdu(ga)s they had been allotted.
The … he …, … he … , …. small rivers and suluhs … he established ...

COLUMN 3
[….]
The ... place …
The people …
A **rainstorm** [flood] …
Their … they made,

15. At that time Nintu (Ninti) [Hathor] (Q) screamed like a woman in travail

The holy Ishtar [Isis] wailed on account of her people.
Enki in his own heart held counsel.
Anu, Enlil, Enki and Nin-harsagga …
The gods of Heaven [Nut] and Earth [Geb] invoked the name of Anu [Nun] (and) Enlil.

20. At that time Ziugiddu was king, the pasisu of …
A huge … he made, …
In humility prostrating himself, in reverence …
Daily and perseveringly standing in attendance …
…ing by dreams which had not been (before), …

25. Conjuring by the name of Heaven [Nut] and Earth [Geb]

COLUMN 4
For …, …. the gods a wall …
Ziugiddu standing at its (?) side heard …
At the wall at my left side stand and ....
At the wall I will speak a word to thee

5. Oh my holy one, thy ear open to me
By our hand (?) **a rainstorm … will be sent;**
To destroy the seed of mankind, to …
Is the decision, the saying of the assembly of the gods, to …

10. The commands of Anu [Nun] (and) Enlil …
It's (their) kingdom, its (their) rule …
To him …

COLUMN 5
All the windstorms which possess immense power, they all (and) together came,
The **rainstorm … raged** with them.
When for **seven days, for seven nights**
The rainstorm in the land had raged,

5. The **huge boat** on the great waters by the windstorms had been carried away,
Samas came forth (again), shedding light over Heaven [Nut] and Earth [Geb].
Ziugiddu opened a … of the huge boat,
The light of the hero Samas he lets (thou lettest) enter into the interior (?) of the huge boat.
Ziugiddu, the king,

10. Before Samas he prostrates himself,
The king, an ox he sacrifices, a sheep he slaughters.
While … great born?
he … for him …

15. … he filled … two …
After …

COLUMN 6
By the soul of Heaven, by the soul of the earth, ye shall conjure him,
that he may ... . with you.
Anu [Nun] (and) Enlil by the soul of Heaven and by the soul of the earth ye shall conjure, and he will …
with you.

5. The … of the ground (with the earth), rising it rises.
Ziugiddu, the king,
Before Anu (and) Enlil he prostrates himself.
Life like (that of) a god he gives (I give ?) to him,
An eternal soul like (that of) a god he creates for him.

10. At that time Ziugiddu, the king,
The name of the … "Preserver of the seed of mankind".... On a … mountain, the mountain of Dilmun …
they caused him to dwell
After … they had caused him to dwell.

These flood descriptions, were found on tablets excavated in 1889, in Nippur, Iraq, by the University of Pennsylvania (Q), as found among a total of some 35,000 cuneiform tablets, many written in Sumerian (Q), which contain a destruction of mankind via a flood description, the story is dated to c.1250BC, according to Arno Poebel (1914), based on the fact that the order ranking of the gods, namely: Ninharsag, Anu (or An), Enlil, and Enki, are listed in the same order as found in the kudurru inscriptions of the 13th and 12th centuries BC.

In c.1150BC, Sin-leqi-unninni (Q), compiled a more complete version of the myth, written in Akkadian, called the Epic of Gilgamesh.

Hebrew mythology

In c.300BC, in Hebrew mythology, as told in the Bible, Genesis 6:9 to 9:17, the previous two variants of the myth of the destruction of mankind by god via a flood, were reformulated, monotheistically, into the story of Noah, wherein the water god Nun was turned into a prophet, Ra's solar boat is turned into Noah's ark, and the 150 day annual Nile River flood, conceptualized, as the god Nun, becomes the Biblical flood; the gist of which is told as follows: (Q)

> "Noah [Nun] was a righteous man and walked with god. Seeing that the earth was corrupt and filled with violence, god instructed Noah to build an ark in which he, his sons, and their wives, together with male and female of all living creatures, would be saved from the waters. Noah entered the ark in his six hundredth year, and on the 17th day of the 2nd month of that year "the fountains of the Great Deep burst apart and the floodgates of heaven broke open" and rain fell for forty days and forty nights until the highest mountains were covered 15 cubits, and all life perished except Noah and those with him in the ark. After 150 days "god remembered Noah ... and the waters subsided" until the ark rested on the mountains of Ararat. On the 27th day of the 2nd month of Noah's six hundred and first year the earth was dry. Then Noah built an altar and **made a sacrifice**, and god made a covenant with Noah that man would be allowed to eat every living thing but not its blood, and that god would never again destroy all life by a flood."

(add)

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (destruction of mankind, pgs. 363-71 §12: The Destruction of Mankind: Egyptian Text with Transliteration and Translation, pgs. 388-99). Dover, 1969.
2. Lichtheim, Miriam. (1976). *Ancient Egyptian Literature* (pgs. 197-98). University of California Press.
3. (a) Naville, Edouard. (1874). "Article", *Transactions of the Society of Biblical Archeology, Volume 4.*
(b) King, Leonard. (1916). *Legends of Babylon and Egypt in Relation to Hebrew Tradition: Schweich Lecture* (Driver, pg. 20; §2: Deluge Stories and the New Sumerian Version, pgs. 41-101; Egyptian legend of the destruction of mankind, pg. 48) (Q)(txt). Oxford University Press, 1918; Cosimo, 2005.
4. (a) Poebel, Arno. (1914). *Historical Texts, Issue One* (translation, pgs. 17-20; date, pg. 24). Publisher.
(b) Note: other more speculative dating claims ranger from: 1595-1000BC, according to Benjamin Foster and E.J. Gordon, 1792-1150BC, according to Thoephilus Pinches and Fritz Hommel, and 2100BC, according (Q) to Hermann Hilprecht (1910). (Q)

5. Brugsch, Heinrich. (1881). *The New World Order after the Annihilation of the Sinful Human Race* (Die Neue Weltordnung nach Vernichtung des sündigen Menschengeschlechtes) (pg. 23). Publisher.

External links

- Book of the Heavenly Cow – Wikipedia.

θΔics

In famous publications, “**On the Determination of the Energy and Entropy of a Body**” is [add]

Overview

In 1866, German physicist Rudolf Clausius, in Schlomilch’s *Zeitschrift fur Mathematik und Physik*, published a "note" entitled “On the Determination of the Energy and Entropy of a Body”, latter appended to chapter nine of the first edition of his *The Mechanical Theory of Heat*, wherein, building on the work of German physicist Gustav Kirchhoff, who in prior had done research on the calculation of the energy of bodies, a methodology is set forth on how to calculate and measure both the energy U and entropy S of bodies. [1]

In 1879, Clausius, in the second edition of his *The Mechanical Theory of Heat*, re-wrote this into a more polished or shall we say textbook presentable format. [2]

Notes

The calculations in this chapter are based on the assumption of reversible processes. In chapter ten, "On Non-Reversible Processes", Clausius clarifies the measure of entropy for irreversible processes.

References

1. Clausius, Rudolph. (1866). “On the Determination of the Energy and Entropy of a Body”, Schlomilch’s *Zeitschrift fur Mathematik und Physik*, Bd. Xi. S. 31 (note); in (English): *Philosophical Magazine*, 4(32):1; in: *The Mechanical Theory of Heat: with its Applications to the Steam Engine and to Physical Properties of Bodies* (§:Appendix to Ninth Memoir, pgs. 366-74). London: John van Voorst.
2. Clausius, Rudolf. (1879). *The Mechanical Theory of Heat* (chapter IX: "Determination of Energy and Entropy", pg. 195-211). London: Macmillan & Co. (second edition).

CHAPTER IX.

DETERMINATION OF ENERGY AND ENTROPY.

§ 1. *General Equations.*

In former chapters we have repeatedly spoken of the Energy and Entropy of a body as being two magnitudes of great importance in the Science of Heat, which are determined by the condition of the body at the moment, without its being necessary to know the way in which the body has come into this condition. Knowing these magnitudes, we can easily make by their aid various calculations relating to the body's changes in condition, and the quantity of heat thereby brought into action. One of these, the Energy, has already been made the subject of many valuable researches, especially by Kirchhoff*, and the method of determining it is therefore more accurately known. We will here treat of Energy and Entropy simultaneously, and set forth side by side the equations which serve to determine them.

In Chapters I. and III. the two following fundamental equations, denoted by (III.) and (VI.) were developed:

$$dQ = dU + dW \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(III)},$$

$$dQ = TdS \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(VI)}.$$

Here U and S denote the Energy and Entropy of the body, and dU and dS the changes produced in them by an indefinitely small change in the body's condition: dQ is the quantity of heat taken in by the body during its change;

* Pogg. *Ann.*, Vol. CIII. p. 177.

13—2

Opening page to Rudolf Clausius' 1875 **Determination of Energy and Entropy** chapter IX.

θΔics

In belief systems, **determinism**, as compared to anti-determinism (indeterminate or non-deterministic), is the view that everything that takes place in the universe is determined or pre-determined; the theory or doctrine that acts of the will, occurrences in nature, or social or psychological phenomena are causally determined by preceding events or natural laws. [1]

> "If **determinism** is true, then our acts are the consequences of the laws of nature and events in the remote past. But it is not up to us what went on before we were born, and neither is it up to us what the laws of nature are. Therefore, the consequences of those things (including our present acts) are not up to us."
>
> — Peter van Inwagen (1983), *An Essay on Free Will* [2]

(add discussion)

Nichols-Knobe determinism study

> *See: Nichols-Knobe determinism study* (cited by Joshua Greene [5])

(add section)

Justice | Punishment

> *See: Slave stealing parable*

(add discussion)

Thermodynamics

The hmolscience view of determinism, in the view of humans defined specifically as cyclically powered "molecules" (human molecules), is captured well by the following 1999 synopsis on "The 'Dynamics' in the Thermodynamics of Binding" by American-born Canadian biophysical chemist Julie Forman-Kay: [3]

> "Whether two molecules will bind is [completely] **determined** by the free energy change (ΔG) of the interaction, composed of both enthalpic and entropic terms."

This statement, without change—being that this is a universal rule—can be scaled up to the human-human reaction level, to the affect that:

> "Whether two people [human molecules] will bind is [completely] **determined** by the free energy change (ΔG) of the interaction, composed of both enthalpic and entropic terms."

An analysis first worked out by Goethe, in terms of chemical affinities, the precursor to free energy, in 1796 (see: Goethe timeline), the principles of which he latter had to defend himself against stating that they were in fact "true" no matter who wants to raise objection (see: best book).

Einstein

In 1936, German-born American physicist Albert Einstein commented the following statement on determinism, in response to a query by a six-year-old child in regards to whether or not he prayed: [4]

> "Everything that takes place is **determined** by laws of nature—and this holds for the actions of people."

Likewise, a few years earlier, in 1929, Einstein commented the following:

> "Everything is **determined** … by forces over which we have no control. It is determined for the insect as well as the star. Human beings, vegetables, or cosmic dust—we all dance to a mysterious tune, intoned in the distance by an invisible piper."

Prigogine | Incomplete determinism

A few have attempted to construct "blend theories", arguing for both determinism and indeterminism.

The most intricate attempts in this direction is found in the work and theories of Russian-born Belgian chemist and thermodynamicist Ilya Prigogine who spent the better part of nearly 60-years working to formulate a version of nonequilibrium thermodynamics (see: Prigoginean thermodynamics) that would leave room for indeterminism (see: ontic opening).

At the age of twenty (1937), after reading Henri Bergson's *Creative Evolution* (1907), he began to devote himself to solving the riddle of the relationship between time, human existence, thermodynamics, and evolution, starting with three articles: "Essay on Physical Philosophy", "The Problem of Determinism", and "The Evolution", on the topics of determinism, quantum mechanics, biological evolution, and time.

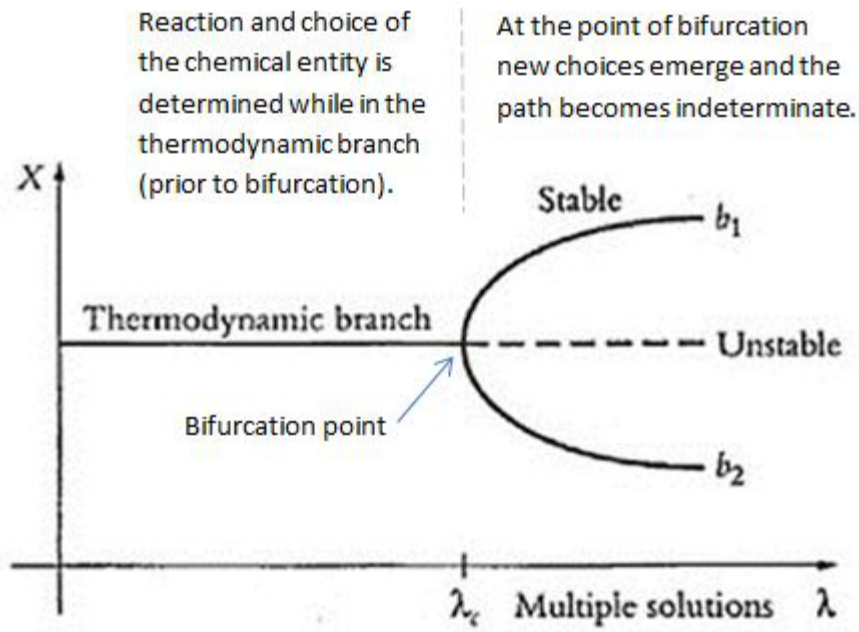

Russian-born Belgian chemist Ilya Prigogine spent nearly 60 years on the problem of determinism/indeterminism, developing a theory which argued that prior to the bifurcation point things are **determined**, but that at the bifurcation point, indeterminacy reins, and that this model is what governs chemical systems, evolution, humans, and society.

Shortly thereafter, in 1941, after completing his his PhD on *The Thermodynamics of Irreversible Phenomena*, under Theophile de Donder, and would go on to obtained cult status (with "disciples") with the publication of his 1977 *Self-Organization in Non-Equilibrium Systems: from Dissipative Structures to Order through Fluctuations* (the year he also won the Nobel Prize for his theories); and obtained layperson icon status with his 1984 *Order Out of Chaos*; went on to published numerous articles, books, and lectures on his theories up until the year of his death (*Is the Future Given?*, 2003).

The gist of Prigogine's theory, in regards to determinism/indeterminism is that prior to the bifurcation point things are pre-determined, but that at the bifurcation point, indeterminacy reins, and that this model is what governs humans.

In 2003, American physicist and philosopher Robert Doyle launched his site InformationPhilosopher.com, a collection of biographies and articles on statistical thermodynamics, quantum mechanics, and philosophy, with the overall aim to formulating a "two-stage" model of of free will themed on a semi-materialistic theory of information that connects the "creation processes" of the universe with a belief in the existence of human free will; he summarized this in his 2011 book *Free Will: the Scandal in Philosophy*, which attempts to grapple with the second law, determinism, and the wave function collapse, with an overall siding with free will over that of determinism.

Anti-determinism thermodynamics

In *circa* 1909, American psychologist William James , noted for his "reserve energy" theory, argued against

determinism and physicalism, by stating that the second law was irrelevant to the study of human history; on his deathbed, reviewed his friend American historian Henry Adams' newly published *Letter to American Teachers of History* (1910) to object, on what seems to be religious grounds, to the heat death model of societal end.

In 1952, American physicist Jerome Rothstein argued for the equivalence of system "organization" and the information theory version of "negative entropy"; his 1960 lecture "Thermodynamics and Some Undecidable Physical Questions" argued that the second law is violated in the cases of: determinism and free will, the origin of the universe, the fate of the universe, and the discovery or causes of purposes in nature.

In 1976, American engineer and philosopher Arthur Young, in his *Reflexive Universe*, he attempts to discredit determinism using negentropy ideas and attempts to explain consciousness and the soul in terms of the first law.

Religion

The notion of determinism, i.e. that "choices", mediating actions, originate largely from forces external (see: external force) and antecedent in time to those choices, directly contradicts soul weight / karma weight theory of Anunian theology (aka Ra theology), the underlying belief system of over 75 percent of the modern world, i.e. that premise that weight of "good" and or "evil" choices, originating inside of a person (see: internal force), determine one's passage into the afterlife, in the form of resurrection (Abrahamic theologies) or reincarnation (Brahamic theologies).

Quotes

The following are related quotes:

> "Spinoza was the first who, with real consistency, applied **determinism** to human thinking and feeling."
>
> — Albert Einstein (c.1932), commentary on why he declined to contribute to the *Spinoza-Festschrift 1632-1932* [6]

References

1. Merriam Webster Collegiate Dictionary, 2000.
2. Inwagen, Peter van. (1983). *An Essay on Free Will* (pg. v). Oxford University Press.
3. Forman-Kay, Julie D. (1999). "The 'Dynamics' in the Thermodynamics of Binding." *Nature Structure Biology*, 6: 1086-87.
4. Einstein, Albert. (1981). *Albert Einstein: the Human Side* (pg. 32). Princeton University Press.
5. Greene, Joshua. (2013). *Moral Tribes: Emotion, Reason, and the Gap Between Us and Them* (Nichols-Knobe determinism study, pg. 274). Penguin.
6. Naess, Arne. (1983). "Einstein, Spinoza, and God"; in: *Old and New Questions in Physics, Cosmology, Philosophy, and Theoretical Biology: Essays in Honor of Wolfgang Yourgrau* (editor: Alwyn Merwe) (§B10:683-88; pg. 683). Plenum Press.

External links

â— Determinism – Wikipedia.

θΔics

In science, **deterministic** refers to the doctrine or view that the universe will always produce the same output, result, or final state from a given starting condition or initial state.

de·ter·min·is·tic

/dəˌtərməˈnistik/

adjective

adjective: **deterministic**

relating to the philosophical doctrine that all events, including human action, are ultimately determined by causes regarded as external to the will.

"a deterministic theory"

A 2020 Google-generated definition of "**deterministic**", meaning events determined by causes regarded as external to the will.

Quotes

The following are related quotes:

> "The science of thermodynamics had its origin in severely practical problems relating to the efficiency of engines, but it was soon extended to cover the operations of nature as a whole. All this happened in the days when nature WAS assumed, without question, to be mechanical and **deterministic**."
>
> — James Jeans (1933), *The New Background of Science* (pg. 261) (Q)

See also

- Determinism
- Deterministic universe
- Determination of Energy and Entropy

External links

- Deterministic – Dictionary.com.

θΔics

In science, **deterministic universe** (GS:885K), which tends to be associated with free will discussions, as compared to the related term "mechanistic universe" (GS:529K), which tends to be associated with Newton and, for those of the religious bent, the premise of a "mechanistic universe fashioned by a creator", refers a universe in which mechanism and determinism reign supreme.

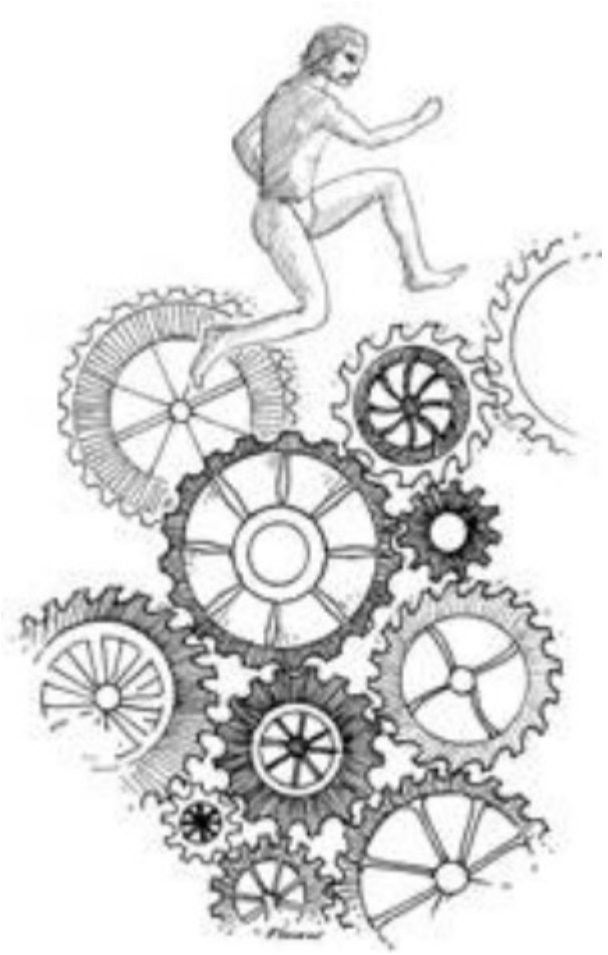

A depiction of man running in a mechanistic and or **deterministic universe**, in which mechanism and determinism reign supreme. [1]

Elective Affinities

The following is a 2015 cover to the electronic track Las Afinidades Selectivas, which seems to be thematic to Goethe's *Elective Affinities*, such as seen in the 2010 Spanish remake film *Afinidades*:

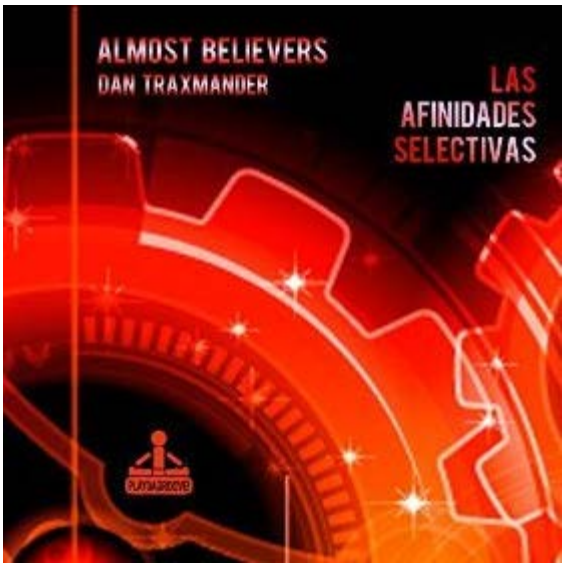

Thereby seemingly showing a sort of chemical mechanism, symbolized by gears, underlying the selection of human affinities.

Quotes

The following are related quotes:

> "Dawkins' bleak portrayal [Quote: "the universe we observe has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil and no good, nothing but blind, pitiless indifference. As that unhappy poet A.E. Housman put it: `For nature, heartless, witless nature will neither care nor know.' DNA neither cares nor knows. DNA just is. And we dance to its music." (*River Out of Eden*, 1996)] of our activities and involvements as something analogous to Brownian Motion in a **deterministic universe** is a crude nihilism. Purpose and meaning then has to be our private existential response to materialism. In other words, there is no meaning in anything but what we inject for ourselves."
>
> — David Tyler (2006), "How to Live with Delusion" [1]

See also

â— Laplace's demon

References

1. Tyler, David J. (2006). "How to Live with Delusion: a Response to *The God Delusion* by Richard Dawkins",

BiblicalCreation.org, Nov.

External links

â— Is the universe deterministic? (2010) – PhysicsForums.com.

θΔics

In hmolscience, **detractors** are those scientists or scholars that disparage, attack, or label as a "danger" someone or something related to the premise that a human is a molecule and or that the laws of physics, chemistry, mechanics, and or thermodynamics apply or govern human activities, operations, or relationships.

List

The following is the work in progress collection of detractors. Those listed before 2005, are considered historical detractors; those listed after 2005, unless indicated, voiced their objections typically after encounters with the views of American chemical engineer Libb Thims. [1] The cross icon signifies that the person detracts on religious grounds. For those scientists who do not believe in religion, their object becomes very puzzling?

	Detractor	View
1810	Christoph Wieland (1733-1813) German author	Commented on Goethe's *Elective Affinities*, that it was nonsense and childish fooling around; objecting to the radicalness of its Christianity, calling it a "truly horrible work".
1922	Petre Trisca (c.1890-c.1956) Romanian social concerns scholar	His *Preliminaries on Social Mechanics: Analysis of Works*, engages “an almost pathologically savage attack” on the mechanistic school, namely the social mechanics works produced during the period 1896 and 1914, namely those of Spiru Haret, Lester Ward, Leon Winiarski, and Antonio Portuendo.
1925	Edwin Slosson (1865-1929) American chemist-theologian	In his *Sermons of a Chemist*, he went back and forth in promoting types of "chemical anthropomorhizing" and chemical aphorisms, but warned that "we must beware of carrying over into the realm of psychology the laws of inanimate matter"; likewise, "the seers and augurs made a mistake that is often made yet, when a man thinks he can explain all of biology by the laws of chemistry and all of sociology by the laws of biology, which is the common mistake of carrying a thing too far."
1928	Pitirim Sorokin (1889-1968) Russian-born American sociologist	In his 785-page *Contemporary Sociological Theories*, devotes the entire first chapter (The Mechanistic School), over sixty-pages of argument, to an attack and criticism of the various human physics/social physics, human energetics/human thermodynamics, social mechanics thinkers (Carey, Pareto, Winiarski, Ostwald, etc.) who have argued that people are social atoms or human molecules governed by the application of the hard sciences physics, chemistry, mechanics, energetics, and thermodynamics; claiming that they are all "pseudo-sciences" and mere "superficial analogies". Quote: "As far as they try to identify physical and mechanical analogies with social ones, the give only fallacious analogies which do not, and cannot, explain anything in the field of social mechanics." (one of many example views expressed)
1953	Robert Heilbroner (1919-2005) American economist	Quote: “there is an unbridgeable gap between the ‘behavior’ of [subatomic particles] and those of human beings who constitute the objects of study of social science. Aside from pure physical reflexes, human behavior cannot be understood without the concept of volition—the unbridgeable capacity to change our minds up to the very last minute. By way of contrast, the elements of nature ‘behave’ as they do for reasons of which we know only one thing: the particles of

physics do not ‘choose’ to behave as they do.”

1969	John Bowlby (1907-1990) British developmental psychologist	Devoted the entire first chapter, titled “Point of View”, of his monumental three-volume *Attachment* series treatise, towards an effort to discredit psychodynamics founder Sigmund Freud in his use of physics terms, such as energy, entropy, force, pressure, or inertia, as in "principle of inertia", etc., in psychology; arguing, for instance, that “nor is it to be supposed that the principle of entropy apples to living as it does to non-living systems.”
1970	Paul Samuelson (1915-2009) American economist Nobel Prize winner in Economics (1970) Second generation student of Gibbs	Stated (1970) that it is “pathetic to have an economist or engineer try to force analogies between concepts of physics, such as entropy or energy, into economics”; stated (1972) that “sign of a half-baked speculator in the social sciences is his search for something in the social system that corresponds to the physicist's notion of entropy."
2004	Tominaga Keii (1920-2009) Japanese chemical engineer and chemical thermodynamicist	Commented, in his chemical thermodynamics textbook chapter, about Goethe's *Elective Affinities* that it "did not add any scientific value."
2005	Steve Fuller (1959-) American philosopher and sociologist Sociology professor, Warwick University	Thinks that he is not a molecule and considers even the thought of the idea to be "infuriating", as expressed in his *New Scientist* article "I Am Not a Molecule"; objects in particular to the Philip Ball's 2004 book *Critical Mass*, which outlines a "physics of society" (social physics) in which masses of people are viewed in bulk as particles that interact according to the laws of statistical mechanics.
2005	Edward Sanville (c.1979-) American computational chemist BS chemistry (2001), University of New Hampshire; PhD computational chemistry 2005, Dartmouth College; post-graduate research in quantum molecular dynamics, Loughborough University.	Commented (Sep 21): that “human thermodynamics is pseudoscience”, because of the “interchanging of words with precise scientific meanings, (i.e. "bond," "energy," "reaction," "hot"), with their everyday meanings or referring to things which would not fit the scientific definition at all, which is one of the cornerstones of pseudoscience. Of course, human beings obey the laws of thermodynamics like everything else in the universe, but the Gibbs free energy equation only [can be used] to describe large systems of microscopic particles; [and cannot be applied] to analogous situations between human beings, just because the everyday and scientific words involved happen to correspond (in English).”
	John Wojcik (1938-) American physical chemist	(Rossini) In the Rossini debate, argued that there is great “danger” in the use of “anthropomorphism in chemistry” in that some may “come to believe that there is substance in them”; moreover: “worst of all, there is the danger that

2006	Retired chemistry professor, Villanova University Stephen Lower (c.1945-) Canadian physical chemist	chemical thermodynamics will have ascribed to it a power that it simply does not have, namely, the power to 'explain' the human condition.”
 2007	Chemistry professor (retired), Simon Fraser University (1965-1999); BA biochemistry, University of California, Berkeley; PhD in physical chemistry, University of British Columbia.	Considers the idea of chemical reactions occurring between humans molecules to be a crackpot-subject, pseudoscience, and a lunatic notion.
 2007	Tim Vickers User:W (c.1980-) Scottish-American biochemist PhD on trypanothione metabolism, Dundee University, Scottland; post-doctorial research on leishmaniasis in US.	Considers (Oct 08) human chemistry to be semi-plausible twaddle, not a genuine field of study, and junk; quote: “human chemistry is just not a scientific theory - it's an analogy at best”; in 2010 (Jun 11), commented further that he sees the subject of the human molecule to be not a real field of study, but rather "a metaphor or joke".
 2008	John Correia (c.1950-) American biochemist Biochemistry professor, University of Mississippi Medical Center BS (chemistry?) 1972, Villanova University; PhD 1981, University of Connecticut;	Considers (Mar 18) a proposal, by Libb Thims, to give a presentation on the "thermodynamics of human molecules", at the annual Gibbs Conference on Biothermodynamics, which was focused that year on molecular thermodynamics, to be "a joke".
	Bruce Bathurst User:W (c.1945-) American geological thermodynamicist PhD in geological	Comments (Aug 24): that he is not a molecule because (a) one need not slavishly adopt terminology from the physical sciences; (b) new terms are of value only if they are synonyms of terms in other sciences, mathematics, or everyday language; (c) being made of atoms is not sufficient to be a molecule; (d) humans have a soul which is something that only God can examine, then that's not a question science is qualified to address. Thinks that asking someone

2009	thermodynamic, Princeton	whether or not he or she considers themselves to be a molecule is "an insincere trap or snare attempting to destroy the spirituality of individuals."
2009	Philip Moriarty (c.1965-) Irish thermal physicist; nano-physicist Physics professor, University of Nottingham	Quote (Sep 02-19): “what's flawed is [Thims’] remarkable assertion that thermodynamic principles can be applied to ‘human molecules’. His view: 'It is only a matter of extrapolation to apply this logic to systems of human molecules...', beggars belief! No, it is not a matter of extrapolation. Just as it is not a matter of extrapolation to take fundamental quantum mechanics and apply it to 'human molecules'. What physical evidence does [Thims’] have for a 'human wavefunction'? Has [he] somehow carried out the equivalent of the double slit experiment for humans?! Does [he] understand what is meant by decoherence or complementarity in the context of QM?”
2010	Marcin Borkowski (1963-) Polish chemist Founded ChemBuddy.com in 1997	Quote (Sep 27): “[human chemistry] sounds like crackpottery to me [and] abuse of the word ‘chemistry’? If you are interested in learning about human interactions they are covered by sociology and psychology”; also "*Humans are not molecules, they are complex objects composed of many molecules*."
2010	Mitch Garcia (c.1981-) American nuclear chemist Founded ChemicalForums.com in 2003; BS chemistry (2003), University of California, Riverside; PhD chemistry (2009), University of California, Berkeley; postdoctoral research in molecular and medical pharmacology, 2010, UCLA.	Quote (Sep 29): “Honestly, the idea [human chemistry] seems pure crackpottery to me. Crackpots always seem to think they are victims of the "mainstream". They always seem to think no one is intelligent enough to understand their points. Oddly, they all also tend to write a lot in their internet postings. And unfortunately no matter how much we argue with the crackpots they never give an inch in return.”
2010	Lubos Motl (1973-) Czech-American theoretical physicist (string theory) and black hole thermodynamicist Physics professor, Harvard University (2004-2007); junior fellow (2001-2004) PhD, thesis “Nonperturbative Formulations of	Quote: (Nov 20): “Is this some sort of joke ? Surely, as someone who holds a PhD, you've GOT to realize the blatant absurdity of trying to model theï»¿ laws governing human relationships using the rules of thermodynamics, a set of rules that only apply at a molecular level. *Human beings are NOT molecules, they are composed of molecules*, but we aren't giant molecules. Human relationships are governed mostly by human psychology. I can only assume you're senile or crazy to believe this nonsense…” Quote (Nov 19): “Thermodynamics of human relationships is bullcrap.” Quote (Nov 16): “The stuff Hirata said about human thermodynamics was a

	Superstring Theory" (2001), Rutgers University; MS (physics?) Charles University, Prague	JOKE. You don'tï»¿ seriously believe that he was serious about this, do you ? Your obsession with human thermodynamics is silly."
2013	Lucien Benguigui (1936-) French-Israeli physicist	Quote: (11 Sep 2012): "Not all these [human] applications [of entropy] or ['of mathematical formula of thermodynamics to the economic and social sciences like car wreck behavior, politics, the process of falling in love' (Bill Nye, 1993)] have a real rational basis connected firmly with physical laws." [2] Quote: (5 Feb 2013): "About entropy: If you want to use the concept of entropy outside physics you have to define precisely what it is in a new context. Until now entropy receives precise definitions only in the frame of physics, so you cannot use it outside of physics." [3]

See also

â— Libb Thims (attack)
â— Elective Affinities (enemies)
â— Human thermodynamics (objectors)

References

1. Interaction sites such as: Wikipedia (articles, discussions, talk pages), YouTube (videos or discussion threads), the Internet (e.g. HumanChemistry.net, HumanThermodynamics.com), Threads (EoHT.info, ChemicalForums.com, etc.), or emails, among other places.
2. (a) Benguigui, Lucien. (2013). "The Different Paths to Entropy" (abs), *European Journal of Physics*, 34(2):303-.
(b) Nye, Bill. (1993). *Bill Nye the Science Guy's Big Blast of Science* (pg. 50). Basic Books.
3. Email communication to Libb Thims (5 Feb 2013).

θΔics

In genius studies, **deviation IQ** refers to an IQ (see: IQ key) that is based on the premise of standard deviation of test results, reasoned IQs "normed" or assigned to each deviation.

Oxford Reference

deviation IQ

The modern, statistical conception of IQ, introduced in 1939 by the Romanian-born US psychologist David Wechsler (1896–1981), according to which IQ is a normally distributed variable with a mean of 100 and a standard deviation of 15 (usually). By definition, an IQ of 100 is average, approximately 68 per cent of IQ scores fall between 85 and 115, approximately 95 per cent fall between 70 and 130, approximately 99.74 fall between 55 and 145, and so on. See also normal distribution. Compare ratio IQ. [So called because it is based on standard deviations]

A 2019 Oxford Reference definition of **deviation IQ**. [2]

Overview

In c.1939, David Wechlser (1896-1981) introduced the deviation IQ method owing to the inadequacies of the applicability of the ratio IQ method when used with adults. [1]

The gist of which being the premise that the norm or normal scores at the center of the bell curve will be made by people with average or normal IQs (100), that those scoring to the right of the curve will have higher IQs, as compared with the norm; something along the lines of the following:

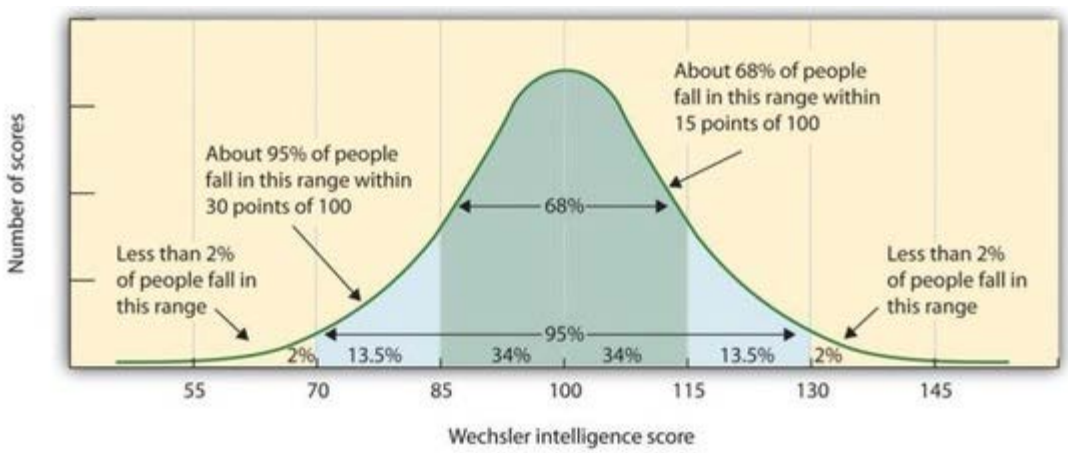

In the years to following, various people began what is called "norming" various tests, using basically personal invented means, so as to assign higher IQs, far into the genius range (140+), for various tests, e.g. the Wechsler IQ test, the Stanford-Binet, etc.; such as follows:

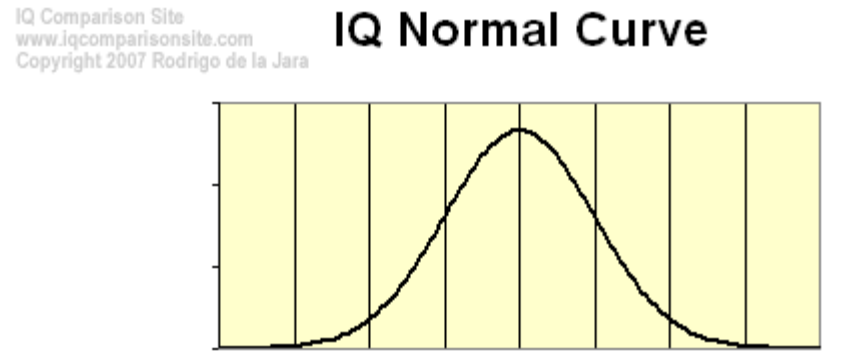

Standard Deviations	-4	-3	-2	-1	0	1	2	3	4
Wechsler IQ	40	55	70	85	100	115	130	145	160
Stanford-Binet IQ	36	52	68	84	100	116	132	148	164
Cumulative %	0.003	0.135	2.275	15.866	50.000	84.134	97.725	99.865	99.997

Meaning, according to the so-called "deviation IQ" method, that if one scores perfect, or in the top 1 to 2 percent of scores, that one has a deviation IQ or simply IQ of 130+ to 160+, as shown by example above. The problem here is that geniuses tend not to take test that have answers, but rather to take tests that are unsolved or unsurmounted. In other words, scoring perfect on the Stanford-Binet, Wechsler IQ test, Mensa IQ test, or Mega IQ test, etc., does not, by default, make one a genius.

References

1. Colangelo, Nicholas and Davis, Gary A. (1991). *Handbook of Gifted Education* (pg. 92). Allyn and Bacon.
2. Deviation IQ – Oxford Reference.

θΔics

In religio-mythology, **Devil** (TR:18), aka Satan (Set) or Sheitan (Islam), Lucifer, Baal (Semitic), Beelzebub, among other names, refers to the deity-like personification of the force, energy, or power of evil, darkness, and or causality behind wrong-doings; the character mold of which derived from the Egyptian god Set.

Set
(God of Evil, 1700BC)

Devil
(Angel of Evil, Modern)

A visual of the artistic form change of "Set", the Egyptian god of evil (1700BC), a red-skin colored fallen god, who does battle each night with the sun god Ra, in the form of a serpent, to the "**Devil**", the Christian angel of evil, a red-skin colored fallen angel, who also appears in the form of a serpent, who does battle with the forces of good, in modern terms.

Set | Fallen angel

The modern concept of the Devil, in the Abrahamic religions, is derived from the Egyptian god Set, a god typically described as "horned", with “red or reddish-brown hair or skin”, who is a fallen god. [1]

In 1879, Peter Renouf, in his *Origin and Growth of Religion: as Illustrated by the Ancient Religion of Ancient Egypt*, summarized Set’s fall from grace, as a leading god, as follows: [6]

> “Set, though the antagonist of light in the myths of Ra, Osiris and Horus, is not a god of evil. He represents a physical reality, a constant and everlasting law of nature, and is as true a god as his opponents. His worship is as ancient as any. The kings of Egypt were as devoted to Set as to Horus, and derived from them the sovereignty over north and south. On some monuments one god is represented with **two heads**, one being that of Horus, the other that of Set.”

This two-head depiction (with description) is as follows: [1]

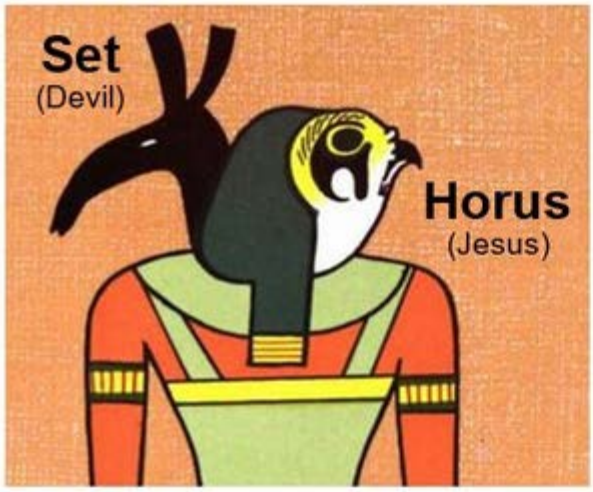

“The attributes of **Horus** changed somewhat in early dynastic times, but they were always the opposite of those of **Set**, whether we regard the two gods as personifications of **two powers of nature**, i.e., Light and Darkness, Day and Night, or as Cosmos and Chaos, Life and Death, or Good and Evil.”

— Wallis Budge (1904), *The Gods of the Egyptians* (pg. 243)

Renouf continues:

> “The name of the great conqueror, 'Seti' [1290BC] signifies 'he that is devoted to Set.' It was not till the decline of the Empire that this deity came to be **regarded as an evil demon**, that his name was effaced from monuments, and other names substituted for his in the ritual.”

In 1883, Frederic Hall, in his *The Pedigree of the Devil*, citing Renouf, summarized the Set as fallen god turned “devil” or demon figure as follows: [6]

> “Set was the **devil** of the later Egyptian mythology.”

Christianity also over-typically describes the Devil as a "fallen angel" who terrorizes the world through evil. [4] This refers to the fall of the god Set from good god to bad god after 18th dynasty Egypt; Wallis Budge (1904) summarizes as follows: [1]

> “In the early dynastic times, it is tolerably certain that the worship of Set was widespread, and his cult seems to have flourished until the period which lies between the XII and the XVIIIth Dynasties; but about BC 1700 a change came over his fortunes, and the Egyptians began to show the greatest detestation for him. He had, of course, always been connected with evil, but it appears that the popularity of his cult suffered greatly at this period because he was associated with the occupation of Northern Egypt by the Hyksos, who identified him with certain Semitic, Syrian gods.”

Set, in other words, originally, in 1st dynasty Egypt (3,100BC), was the great god of Southern Egypt who battled Horus, the great god of Northern Egypt, for rule of the Empire. Horus, according to the famous "Passion of Osiris" one in the end and therein proclaimed the right to rule Egypt, which is why most of the early dynasty pharaohs had Hor (or Horus) as part of their name. Set, after the fall of Hyksos dynasty, which was in power in Egypt from 1650 to 1550BC (see: supreme god timeline), went from being a "chief god" to a fallen god. Then, in the course of the Hebrew recension (see: recension theory), a polytheism to monotheism religious reformation, wherein lesser gods were reshaped into the guise of either angels, demons, of fictional humans, Set went from being a "fallen god" to a "fallen angel".

Set | Red color

In 1970, Jeffery Russell, in his *The Devil: Perceptions of Evil Antiquity to Primitive Christianity*, stitched together connections between Set and the Devil; in particular, Russell notes that the "red color", contrary to the modern view that the red of the devil has to do with the red color of the flames of hell, originated from the death-bring "red" color of the hot dessert sand, surrounding the fertile part of Nile region, as opposed to the life-giving (crop-growing) "black" soil, called keme, brought down from the Ethiopian Mountains, each Nile flood season: [2]

> “No deity ever becomes the principle of evil, but in one god, **Seth** [Set], the destructive and unharmonious element is more evident than in others. The myth of Seth as the antagonist of the sky god Hor or Horus (hor = ‘face’ or ‘sky’) is as ancient as the Pyramid Texts; the hostility between the two grows in time, and finally in the Hellenistic period [323BC-30BC], Seth has become almost entirely evil. Some scholars interpret the origin of the myth as political: Horus is a god of lower Egypt, the north, and Seth is a god of upper Egypt, the south. Others insist that Seth and Horus (or Osiris in the myths) are deities of opposite ecologies, Seth representing the dry desert and Horus or Osiris the **black earth** [keme] or the fertilizing Nile. Egypt is one of the few cultures in which black is not the color of evil, but the color of the fertile, life-giving alluvial plains of the delta. **Red was** the evil color, the hostile hue of the **scorching sands**. Because of Seth's association with the desert, his color most commonly is red, and red-haired or ruddy people were considered in some special way his own.”

(add)

Set | Horns

In 1978, Anthony Mercante, in his *Who's Who: in Egyptian Mythology*, elaborated on Set as follows: [5]

> "Set is sometimes portrayed with horns, which made him the ideal image for the **devil** in Egyptian Christianity."

(add)

Set | Snake & Tree

In modern terms, Christianity identifies the Devil ("Satan") with the Serpent who tempted Adam and Eve to eat the forbidden fruit. [4] This refers to the characteristic of Set in the form of Apep the snake that does battle with Ra the sun god, in and around the Persia Tree [see: Christmas tree], each night. [1]

Set | Namesakes

Set assumed many names, one of the first of which was Baal; Wallis Budge (1904) summarizes this as follows: [1]

> "In the North and South of Egypt, Set was called both Nubti and Sutekh, 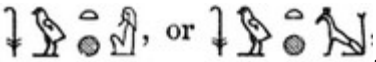 , and there is no doubt whatsoever that he was endowed by the peoples in the Delta with all the attributes of the Semitic god Baal, ×'×¢×œ, whose name appears in Egyptian under the form Bar, or Balu 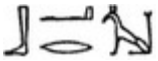 ."

The history of how Set subsumed Baal in namesake became the modern day namesake "devil" (or Satan) is involved; Matthew Chris, in his *Modern Satanism* (2009) gives a fairly cogent synopsis of this overall recension as follows: [8]

> "Satan's ancestry is the result of an elaborate cross-breeding of traditions that has spanned millennia. Numerous faiths and folklores have contributed to his bloodline as it has passed through history, creating a figure rich in resonance and lore. Though widely regarded in the present day as a single supernatural entity, the preeminent embodiment of evil, Satan is actually a reduction or hybridization of a number of individual demons and mythical beings. The list of his progenitors, kinsmen and co-conspirators includes Lucifer, Mephistopheles, Beelzebub, Belial, Azazel, the **Devil**, various lesser devils, Ahriman, and even the Egyptian deity Set (Seth). This impressive gallery of seducers, liars, and destroyers gradually coalesced into the grand figure of the archfiend as he is now known, the great adversity of god and humanity."

Set, as the antithesis of light, over the course of the last 5,000-plus years, in short, via religious recension, redaction, and synretism, became the modern religious mythical figure of the "devil", the embodiment of evil.

Other

In 2011, in the supernatural horror-thriller *The Rite*, staring Anthony Hopkins, the agnostic-skeptic American priest in training Michael Kovak (Colin O'Donoghue) is only able to "exorcise" the demon, using the "knowing the name" technique of the Egyptian human model, by speaking the secret name of the demon, at the end of the movie, which is Baal. (Ñº)

Quotes

The following are related quotes:

> "I do not intend to do here what other scholars already have done well. Jeffrey Russell [1970] and others, e.g., have attempted to investigate cross-cultural parallels between the figure of **Satan** [Devil] and such

figures as the Egyptian god **Set** or the Zoroastrian evil power Ahriman. What interest me are the specific *social* implications of the figure of Satan."

— Elaine Pagels (1995), *The Origin of Satin* [3]

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (§:Set, pgs. 241-60; Horus-Set double head image, pg. 242-243; Apep, pg. 245; fallen angel, pg. 250; Baal, pg. 250). Dover, 1969.
2. Russell, Jeffrey B. (1970). *The Devil: Perceptions of Evil Antiquity to Primitive Christianity* (Seth, 13+ pgs; quote, pg. 78). Cornell University Press, 1987.
3. Pagels, Elaine. (1995). *The Origin of Satan* (pg. xviii). Vintage Books.
4. Leeming, David. (2005). *Oxford Companion to World Mythology* (Devil, 22+ pgs). Oxford University Press.
5. Mercante, Anthony S. (1978). *Who's Who in Egyptian Mythology* (editor and reviser: Robert Bianchi) (pg. 144). Metro Books, 1995.
6. Renouf, Peter Le Page. (1879). *Lectures on the Origin and Growth of Religion: as Illustrated by the Ancient Religion of Ancient Egypt*, Hibbert Lectures (pgs. 117). Publisher.
7. Hall, Frederick T. (1883). *The Pedigree of the Devil* (pg. 130). Publisher.
8. Mathews, Chris. (2009). *Modern Satanism: Anatomy of a Radical Subculture* (Earliest Origins, pg. 2). Greenwood Publishing Group.

External links

â— Devil – Wikipedia.
â— Beelzebub – Wikipedia.
â— Baal – Wikipedia.

θΔics

In existographies, **Diagoras** (c.448-388BC) (IQ:155|#475) (FA:17), aka "Diagoras of Melos" was a Greek lyric poet, philosopher, and sophist, student of Democritus, noted for []. [N1]

Overview

Diagoras is semi-labeled, by some, as the "first true atheist", followed by Theodorus; known as "Diagoras 'the Atheist' of Melos", a disciple of Democritus (Ñº), cited by Cicero, among others, sometimes referred to, in the history of atheism (Ñº), as the "first atheist" or history's earliest known "confirmed atheist", as some (Ñº) describe him.

In 423BC, Aristophanes, in is comedy *Clouds*, lampooned Diagoras as an anti-religious contrarian. [2]

In 1697, Pierre Bayle, in his *Historical and Critical Dictionary*, penned the first serious attempt to present Diagoras as a person in article form. [1]

In 2016, Marek Winiarczky, in his *Diagoras of Melos: a Contribution to the History of Atheism*, argues that "cannot be considered to have been an atheist in the modern sense." [1]

Quotes | On

The following are related quotes:

> "With reason did the Athenians adjudge **Diagoras** guilty of atheism, in that he not only divulged the Orphic doctrine, and published the mysteries of Eleusis and of the Cabiri, and chopped up the wooden statue of Hercules to boil his turnips, but openly declared that there was no god at all."
>
> — Athenagoras (200AD), *A Plea for the Christians*

> "Diagoras and Theodorus flatly deny that there were ever gods at all."
>
> — Michel Montaigne (c.1580)

> "Diagoras, nicknamed 'the atheist', was the Hitchens of ancient Athens."
>
> — Boyd Tonkin (2016) [2]

Notes

N1. Diagoras was Hmolpedia article #4,000.

References

1. Winiarczyk, Marek. (2016). *Diagoras of Melos: a Contribution to the History of Atheism* (§1, pg. #). Walter de Gruyter.
2. Tonkin, Boyd. (2016). "Battling the Gods: Atheism in the Ancient World by Tim Whitmarsh, book review. Tim Whitmarsh salutes the Ancient Sceptics who Cocked a Snook at Organized Religion" (Ñº), *The Independent*, Feb 18.

External links

â— Diagoras of Melos – Wikipedia.

θΔics

In science, **dialectical materialism** is Georg Hegel's thesis-antithesis-synthesis method applied to material economic change, albeit reformulated as presented in Karl Marx's 1867 *Capital: Critique of Political Economy*, and is the philosophical basis of Stalinist Marxism.

The term "dialectical materialism", an extension in some way of Friedrich Engels' Marxist philosophy term "historical materialism", e.g. to include the laws of thought, was used in 1891 by Russian political theorists Georgi Plekhanov and in 1894 by Vladimir Lenin to describe Marx's philosophy. [2]

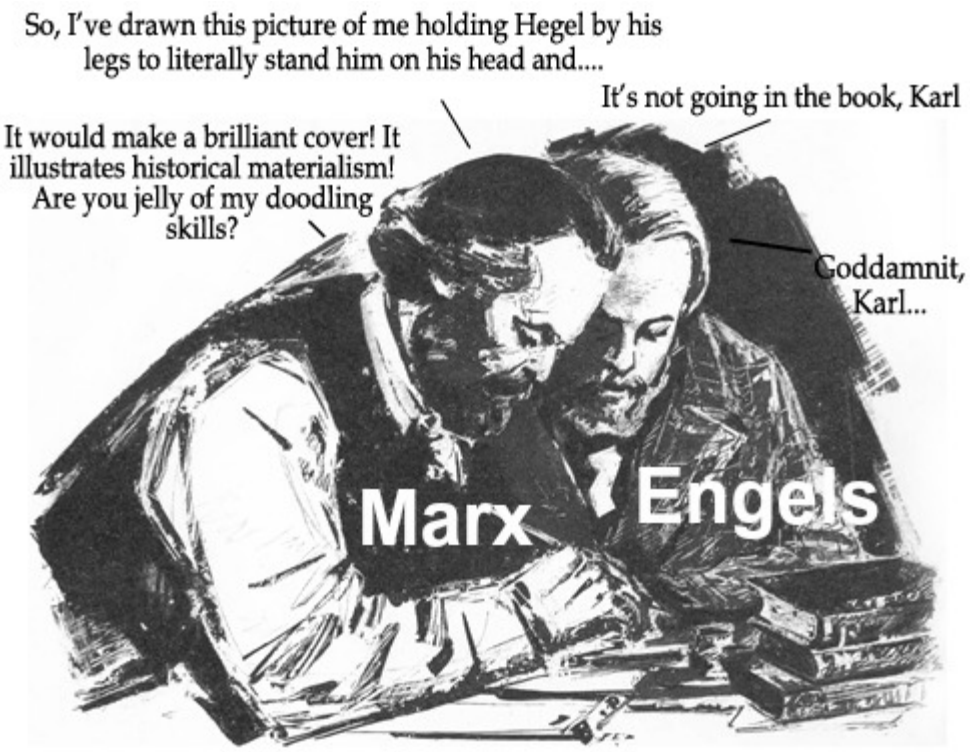

A humorous sketch of Karl Marx and Friedrich Engels, in 1867, putting the finishing touches on their their dialectical materialism philosophy, which outlines an explanation of the "laws of motion" of the capitalist economic system.

Scientific conflicts

The logic of dialectical materialism, over the 20th century, has been the theoretical backbone of communism, in respect to governmental direction and as the basis of moral standards.

Both quantum mechanics and general relativity, since at least the 1930s, in communist-controlled areas, have either been banned and or censored and presented in a manner that conform to dialectical materialist principles.

In 1931, in Russian, George Gamow was forbidden to speak about Werner Heisenberg's version of quantum mechanics as it was deemed anti-materialistic and incompatible with the state's increasingly rigid version of Marxist philosophy. [1]

The Russian translation of Paul Dirac's 1930 *The Principles of Quantum Mechanics* fell out with censors on the objection that his quantum mechanics was in conflict with dialectical materialism and eventually found translation only after an apologetic note was put in before the preface, arguing that its methods are needed to advance dialectical materialism. [1]

At the time, conducting researches on relativity theory and cosmology in China was very risky politically, because these theories were considered to be "idealistic" theories in contradiction with the dialectical materialism theory, which is the official philosophy of the Communist Party. According to the dialectical materialism philosophy, both time and space must be infinite, while the big bang theory allows the possibility of the finiteness of space and time.

In China, during the Culture Revolution, campaigns were waged against Albert Einstein and the theory of relativity in Beijing and Shanghai, as evidenced in the resistance of Chinese astrophysicist Fang Lizhi, top ten Google Books scientist existive (Q) , who found that after he published his theory, some of the critics of the theory of relativity, especially a group based in Shanghai, prepared to attack Fang politically. Into the 1980s and even as late as the 1990s, articles criticizing the big bang theory as "pseudo-science from the west ... in violation of the principles of Marxism philosophy", and "politically incorrect" still appeared frequently in newspapers and magazines in paper.

See also

- Materialism
- Eliminative materialism
- Social engineering

References

1. Farmelo, Graham. (2009). *The Strangest Man: the Hidden Life of Paul Dirac, Mystic of the Atom* (pgs. 199-200). Basic Books.
2. Thomas, Paul. (2008). *Marxism & Scientific Socialism: From Engels to Aothusser* (pg. 87). Routledge.

Further reading

● Ruyle, Eugene E. (1988). "Anthropology for Marxists: Prehistoric Revolutions." *Nature, Society, and Thought: A Journal of Dialectical Materialism* 1(4):469-499.

External links

● Dialectical materialism – Wikipedia.

θΔics

In terminology, **dialogue** (TR=103) is conversation or discussion between two or more people; often in aims to resolve some problem.

di·a·logue

/ˈdīəˌläg, ˈdīəˌlôg/

noun

1. conversation between two or more people as a feature of a book, play, or movie.
   "the book consisted of a series of dialogues"
   synonyms: conversation, talk, discussion, interchange, discourse; More

verb NORTH AMERICAN

1. take part in a conversation or discussion to resolve a problem.
   "he stated that he wasn't going to dialogue with the guerrillas"

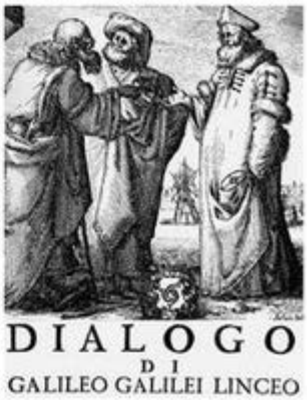

Top: a Google definition of **dialogue**: a conversation between two or more people on some problem. Right: Frontispiece of Italian physicist Galileo Galilei's 1632 *Dialogue Concerning the Two Chief World Systems*, on the debated between whether the heliocentric or geocentric model is correct, showing three thinkers in "dialogue" on the question.

Overview

Greek philosopher Plato was one of the first to popularize the "dialogue" or Socratic dialogue method of of discussion. In his *Symposium*, via dialogue, e.g., he introduced the soul mate theory or split humans theory. In his circa 360BC dialogue *Timaeus*, supposedly following Pythagoras, introduced the semi atomic theory like proposition that ideal geometric forms serve as atoms, according to which atoms broke down mathematically into triangles, such that the form elements had the following shape: fire (tetrahedron), air (octahedron), water (icosahedron), earth (cube). [1]

In 1548, French physician-philosopher Jean Fernel, in his *On the Hidden Causes of Things*, situated a Platonic-style dialogue of sorts between the three fictional friends, Eudoxus, Brutus, and Philiatros. [2] Fernel's dialogue became very influential to Charles Sherrington and his 1938 lecture turned book *Man on His Nature*.

Into the mid to late 1650s, English thinker Thomas Hobbes, specifically in his *Dialogus Physicus* (1661) and *Elementorum Philosophias sectio prima de Corpore* (1655), mounted a strong critique of vacuum and temperature work of Irish scientist Robert Boyle.

In 1809, German polyintellect Johann Goethe, in his famous "chapter four", of his *Elective Affinities*, interjects into a dialogue on the possibility and potential ramifications on the physical chemistry modelling of love and relationships as types of chemical reactions, a discourse that actuated between the three characters: Eduard, Captain, and Charlotte, who each venture angled points of view on the matter.

In 1939, the film *Ninotchka*, written by Hungarian writer Melchior Lengyel (1880-1974), has a famous dialogue between the characters Ninotchka and Leon on the subject of whether or not love is romantic designation for an otherwise ordinary biological (i.e. powered chnopsological) chemical process (see: It's a Chemical Reaction, That's All).

In 2005, Russian-born American science fiction writer Lev Shneider, in his novel *Matryoshka*, initiates a Goethean *Elective Affinities* like dialogue between the character ZeeBrain and his pen-pal Ginnie, on whether or not a person is a molecule, whether two people in a bond are a new type of molecule, and the ramifications of this logic in the context of love, particularly in terms of stability.

In 2014, American electrochemical engineer Libb Thims initially proposed the name "Atheist Dialogues" to be the name of his new atheism YouTube channel, before settling on Atheism Reviews.

Quotes

The following are related quotes:

> "There seem to be 'laws' [of] social systems that have at least something of the character of natural physical laws, in that they do not yield easily to planned and arbitrary interventions. Over the past several decades, social, economic and political scientists have begun a **dialogue** with physical and biological

scientists to try to discover whether there is truly a 'physics of society', and if so, what its laws and principles are. In particular, they have begun to regard complex modes of human activity as collections of many interacting 'agents'—somewhat analogous to a fluid of interacting atoms or molecules, but within which there is scope for decision-making, learning and adaptation."

— Philip Ball (2003), "The Physics of Society", talk delivered at the London School of Economics

See also

- Beg-Thims dialogue | Physicochemical humanities
- Einstein-Murphy dialogue | Free will
- Einstein-Pascal dialogue | Purpose
- Heisenberg-Pauli dialogue | God
- Scrooge Tiny Tim dialogue | Quantum determinism

References

1. (a) Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pgs. 58). University Press of America.
(b) Timaeus (dialogue) – Wikipedia.
2. (a) Fernel, Jean. (1548). *On the Hidden Causes of Things* (*De Abditis Rerum Causis*). Paris.
(b) Hirai, Hiro. (2011). *Medical Humanism and Natural Philosophy: Renaissance Debates on Matter, Life and the Soul* (pgs. 47-48). Brill.

θΔics

In existographies, **Richard E. Hammond** (c.1938-), commonly known as Dick, is an American writer and energy science educator noted, in human thermodynamics education, for his publications on "entropy ethics" and efforts to develop an energy education program for students using a thermodynamic-based type of "moral education". [1] Hammond's view of human development and entropy is that: [3]

> "Each human must grow and develop from a single fertilized egg to an open, low-entropy, complex, flexible, highly organized system."

In this view, Hammond considers it the role of education to facilitate this process. As to noble behaviors and entropy, Hammond states: [3]

> "Writing, painting, sculpture, the crafts, architecture, drafting, building and technologizing are acceptable in all cultures [and] their nobility comes from [the fact] that they are anti-entropic, since they locally reduce entropy."

Entropy ethics

See main: Entropy ethics

In short, *entropy ethics* is a theory, developed by Hammond in the late 1970s, which argues that what is "ethical" in human life are those processes that lead to a reduction in entropy (or disorder, as Hammond equates the two). Although an interesting approach, Hammond's theory is steeped in difficulty on the assumed equivalence of information theory and the laws of thermodynamics and the relavence of the Boltzmann equation $S = k \ln W$ in human life, which is not a gas phase system.

Hammond's postdoctoral mentor was Belgian chemist and thermodynamicist Ilya Prigogine. Under his influence, Hammond completed his Ed.D. thesis in 1978 on *Analysis of Entropy Reduction and its Implications for Ethical Instruction in Public Education* also published as a book. [2] Aside from Prigogine, scientists considered by Hammond as revolutionaries, for their publications and conceptions about entropy, include: Ludwig Bertalanffy, for his 1968 *General Systems Theory*, Jeremy Rifkin, for his 1980 *Entropy: a New World View*, and Jarvey Leff and Andrew Rex for their 1990 *Maxwell's Demon: Entropy, Information, Computing*, and Mihály Csíkszentmihályi for his 1994 *The Evolving Self.* [3]

Hammond studied science education at Indiana University obtaining a BA in 1960 and a MAT/MS in 1966. He earned his Ed.D. from the University of Arkansas. He taught K-12 science for ten years and later became a professor of curriculum and instruction at Southwest Texas State University before returning to study as a post-doctoral student under Nobel Laureate Ilya Prigogine at the University of Texas from 1977 to 2003.

In 1988, Hammond published the book *Human System from Entropy to Ethics* in which he endeavors to help educators classify energy, list the basic binding forces in the universe, compare the laws of energy and the laws of information, know how information differs from knowledge, conceptualize energy flow, teach how systems are classified, explain the differences between personal beliefs and scientific theories, comprehend how they use the "entropy ethic" and why they should. [3] The proceeds of his book go toward scholarships for students studying communication disorders. [1]

Information laws

See main: Laws of information

As to the evolution of life, information theory, and thermodynamics, Hammond states that "what has been discovered

are a new set of laws which necessarily evolved for life to cope with the laws of thermodynamics". He then gives the following three information laws:

> First law of information: Information, genetic or learned, exists in the arrangement of matter.
> Second law of information: Information, genetic or learned, regulates time, organizes matter, and controls energy flow.
> Third law of information: Information, genetic or learned, is inversely related to entropy.
> Fourth law of information: Information, genetic or learned, is created and destroyed.

These, to note, are similar to Italian philosopher Luciano Floridi's four principles of information ethics.

Difficulties on theory

The central difficulty on Hammond's idea of teaching a theory of entropy reduction is that his presentation is given at what generally seems to be a kindergarten or elementary school level of discussion, geared towards ages 5-8, replete with all sorts of unsubstantiated claims about how people should act, behave, and grow according to what Hammond freely declares to be "entropy reducing". He states, for instance, that "stealing, suicide, and other forms of self and structure mutilation cannot be sanctioned from an analysis of entropy reduction", but gives this statement without any kind of thermodynamic substantiation other than a repeated mantra that order is good and disorder is bad.

Regarding Hammond's connection of information to thermodynamics and his ideas on laws of information, he seems to be going down the wrong path. He reasons that "information, genetic or learned, is inversely proportional to entropy", and states, for instance, that information storage, information replication, information transmission, and information retrieval are components of information which allow it to "dominate over the second law." [3] Lastly, Hammond, who writes that the statement of entropy of the universe tending to a maximum was declared in the 1850s (correct April 24th, 1865), is one of a number of authors (e.g. Ilya Prigogine or Pierre Perrot) who write books and textbooks about thermodynamics or entropy, yet incorrectly state when and how the term entropy was coined.

References

1. Staff Writer. (2006). "Psych Notes", Section: Dick E. Hammond (pg. 10). (Alumni Notebook). pgs. 1-12, Vol. 11, Fall. (PDF).
2. Hammond, Dick E. (1978). *Analysis of Entropy Reduction and its Implications for Ethical Instruction in Public Education*. University of Arkansas.
3. Hammond, Dick E. (2005). *Human System from Entropy to Ethics*, 4th ed. (eulogy ed. with commentary on post-doctorial mentor Ilya Prigogine). Publisher: Dick Hammond.
4. ibid, pgs. 105-08.

Further reading

â— Hammond, Richard E. (2002). *The Entropy Machine*. Tantalus Research Ltd.

θΔics

In hmolscience, **Dickey Eason** (c. 1965-) is an American social dynamics theorist noted, in human thermodynamics, for his 2009 proton-electron modeled dynamic driving stylized civilization theory, albeit one that is presented in a an blurry mixture of amateurish, laymanized, and anthropomorphized ideology that it is a "male (proton) versus female (electron) universe".

Overview

In 2009, Eason, in his *The Impacts Dynamic*, attempted to explain human history and behavior using the energy dispersal view of the second law postulated to be the basic driving force for both society and the universe, intermixed with a elementary type of human chemical bonding model in which he extrapolates atomic bonding models, e.g. of protons bonding with electrons, up to the human-human interaction scale, particularly in how male and females find stability in their bonding as a sort of needed energy. [1] The following is back-cover excerpt:

> "Understand the simple hydrogen atom, with its one proton and one electron, and you understand human civilization. The dynamic driving the social world is exactly the same dynamic driving the physical world."

In short, Eason posits that human behavior parallels that of physical molecules and compounds and that each has been driven by the same compelling forces for millennia. In this scheme, Eason seems to be digging around at the concept of the human molecule, but does not specifically use this term. Interestingly, much of Eason's theory surrounds an effort to explain the thermodynamic underpinning to the dynamics involved the various tribal groups in Africa.

Impacts

Eason uses the term "impacts" over and over again in his book, follow up writings, and interviews. He defines this term as such: [2]

> "The 'impacts' are a group within human populations that take the responsibility for answering critical needs—just as the shaman did. The San-shaman and the remainder of the San tribe are the progenitors of the personality profile that developed into the impacts. The impacts generally are androgynous—just as the San and shaman were. Seeing that this profile was the fuel for the human race, I traced it back to the valence electron—which according to the way I see things is also androgynous. The proton is male – the electron is female. So while the valence electron is at its basis female, it also has strong influence from the male proton. The same is true for the impacts group—they are androgynous but lean heavily to the female orientation. I think it is a male (proton) versus female (electron) universe."

One interesting point of argument developed by Eason is the view that in history certain tribes or civilizations have been utilized by other larger civilizations sort of energy work horses, the way the Pyramids were said to be built by slaves, in the same way that, according to the endosymbiotic hypothesis, cells in evolutionary development incorporated other smaller work horse type cells or bacteria, turning them into 'mitochondria', or energy engines of the cells.

This type of argument gives some possible insight into the further understanding of how Fritz Lipmann's 1941 energy coupling theory functions in the dynamics of social operation.

Education

Eason completed his BA in economics from North Carolina State University and works as a small business entrepreneur. In 2000, Eason entered into a quest to

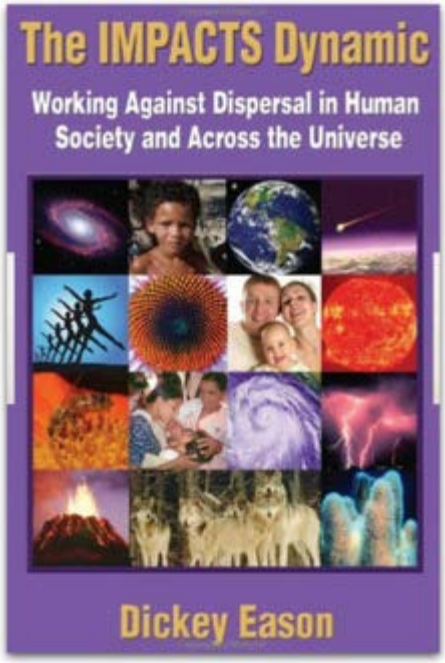

Eason's 2009 book ***The Impacts Dynamic***, in which society is explains using chemical bonding logic and the second law thermodynamics.

understand customer dynamics and in so doing followed his insatiable curiosity to better understand how about how and why the world and universe works the way they do, particularly in terms of modern universal physical theory. During the writing of his book, to note, Eason consulted American theoretical physicist Frank Wilczek, noted for his co-win of the 2004 Nobel Prize for discovery of asymptotic freedom in strong interactions, on various physics questions.

Difficulties on theory

One issue of difficulty in Eason's theory is his predominant use of the energy dispersal perspective of the second law of thermodynamics, which is not necessarily pure Clausius-based thermodynamics but rather a verbal interpretation of the second law, promoted by those as English physicist William Thomson (1850s) and American chemist Frank Lambert (2000s).

A second difficulty on theory, is that Eason's human chemical bonding theory, although a step in the right direction (as these types of theories are rare), and possibly correct in some areas, seems to be a very elementary verbal extrapolation of the simple proton-electron bond, on the logic that the proton represents a sort of 'male energy' and the electron represents a sort of 'female energy' and that the two need each other.

This, male energy / female energy model, based crudely on atomic compositions, is similar to Joseph Dewey's 1988 theory as found *The Molecule Relationship.*

References

1. Eason, Dickey. (2009). *The Impacts Dynamics: Working Against Dispersal in Human Society and Across the Universe* (thermodynamics, 22+ pgs.). Impacts Publishing.
2. Eason, Dickey. (2010). "Email to Libb Thims", Jul 15.

Further reading

â— Eason, Dickey. (2010). “The IMPACTS Concept: A New Way to View the World and the Universe”, Jun 22, DisInfo.com.
â— Eason, Dickey. (2010). “The IMPACTS Concept: A New Way to View Human Society and Human Civilization”, Jun 29, DisInfo.com.

External links

â— The Impacts (overview) – TheImpacts.com.

θΔics

In dialogues, **Diderot-Barthelemy dialogue** is a purported to conversation between Denis Diderot, a self-proclaimed god believer and materialist who all but openly espoused atheism, and an Jean Barthelemy (1716-1795) (Q), a French abbe (catholic clergyman), writer, and oriental language scholar, the text of which was written in 1772 and 1773, but not published (French) until 1921, on the subject of god, soul, and Christianity in general.

Re-Discovery

The so-called apocryphal text was found or rediscovered, in the early 20th century, among the papers of Charles Sainte-Beuve (1804-1869) (Q), by Beuve's secretary Jules Troubat (1836-1914) (Q), who had intended to see the dialogue published within his reaction existence, but failed to realize as such. Albert Cim (1845-1924) (Q), and associate of Troubat, however, had made a copy of the dialogue, and, after WWI, coordinated with Jean Finot, managing editor of *Revue Mondaile*, to get the dialogue published in the monthly review. A year later, Albert Messein, a publisher, who had just published a collection of anecdotes on the life of Diderot, worked with Cim to get the dialogue published as a thin volume. [3]

Overview

The following are selected sections from the dialogue: [1]

> Barthelemy: In fact, for you Diderot, death is the end of everything.
> **Diderot**: Don't make me say that, Abbe. Don't let us go so far. Although I might very well quote against you a certain legend, a corollary of the resurrection of Lazarus by the Christ: 'What did you see down there, when you were dead?' – 'Nothing, Master; there is nothing,' answered Lazarus. And Jesus whispered in his ear: 'No, there is nothing; but do not tell.'
>
> Barthelemy: Legend, assuredly! Pure legend!
> **Diderot**: Agreed! But for myself, I hold to what we have before our eyes. Our soul, its essence, its origin, its destiny, what it will become after us, and in the very first place, **if we really have one**, … for, indeed, I don't know. I can affirm nothing about it, and Ive and idea that those who speak so freely and so willingly about it *ex cathedra* do not know any more about it than I do.
>
> Barthelemy: However, if you abolish the soul …
> **Diderot**: I abolish nothing at all: I do not know.
> Barthelemy: … you will have to abolish god.

— — — — — — — — — —

> **Diderot**: A **virgin who receives the visit of a young man and a bird and who becomes pregnant, not by the young man, but by the bird**; this virgin who bears a child and remains a virgin; this god who dies on the cross to appease god, then comes to life again and ascends into heaven (where, to heaven?), all that is mythology, my dear Abbe, it is paganism, it is worthy of Uranus, Saturn, and the Titans, Minerva springing full formed from the head of Jupiter, Juno pregnant with Mars from having breathed the perfume of a flower, Phoebus-Apollo driving the chariot of the sun … These are the same delirious adventures. Our friend d'Holbach freely declares that the supernatural does not interest him. No, it tells him nothing; it is an aberration, unreason. **Isn't it really folly, now, to go imagining that with the simple words**, that is to say, moving the air with the tip of the tongue, **one is going to change the laws of the universe** and what one calls the decrees of providence?

— — — — — — — — — —

> **Diderot**: Does not the Bible, in Deuteronomy [13:6-11], command the massacre of those of our fellow-citizens who do not share our religious beliefs? (add)

— — — — — — — — — —

Diderot: Well, would you believe, my dear friend, sometimes I suspect you of having, besides your profound learning, too much good sense not to be enlightened about the value of these Catholic dogmas, and to be decided, in this respect, just as I am? Naturally, you will not agree to this, and in your conscience you think me terrible indiscreet … But finally, yes—why are you a Catholic?
Barthelemy: What! Why?

Diderot: Yes!
Barthelemy: But …

Diderot: Well then, I'll tell you. It is soley—soley!—because you were born in France and were brought up, 'nourished', by Catholics. Exactly! Suppose yourself for a moment a native of the Antipodes, of Aanzibar, of Cathay, of Patagonia, and see what would have become of you. You would be perhaps not even an Israelite, Lutheran, Calvinist, or Muslim but very likely a Buddhist, Brahmin, idolater, or animal-worshipper for all I know! We have the choice. **You see, my dear Abbe, all that is an affair of latitude**, a pure chance, luck.

(add)

God | Name?

The following "what is god" statement, from the dialogue, is said to resonate with similar statements by Shelley and Holbach::

> "What is god but a word, a simple vocable to explain the existence of the world? And note well that after all, this word explains nothing."
>
> — Denis Diderot (1773), "Dialogue with Barthelemy" [2]

> "The word 'god', will rarely be found to designate more than the unknown cause of those effects which man has either admired or dreaded."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 207) [2]

> "What then is a god, it is a name which expresses the unknown cause, the supposititious [sic] origin of all existence."
>
> — Percy Shelley (1811), "Letter to Elizabeth Hitchener", Jun 11 [2]

(add)

Quotes | On

The following are quotes on the dialogue:

> "The importance of the dialogue in the life and thought of Diderot is apparent to anyone who has read it. In no other place has Diderot shown himself so clearly an anti-Catholic, anti-revelationionist; in no other place is he so unreservedly an atheistic materialist."
>
> — Robert Loy (1958), ""Notes on the Apocryphal Diderot Text" [3]

References

1. (a) Diderot, Denis. (1773). “Conversations Between the Abbe Barthelemy and Diderot” (“Diderot, et l'abbé Barthélemy, dialogue philosophique inédit; la prière, Dieu, l'ame, la vie future, etc”) (Arc), Publisher, 1921.
(b) Joshi, Sunand T. (2014). *The Original Atheists: First Thoughts on Nonbelief* (pgs. 91-110). Prometheus Books.
2. Shelley, Percy. (2004). *The Complete Poetry of Percy Bysshe Shelley, Volume 2* (pg. #). JHU Press.
3. Loy, J. Robert. (1958). “Notes on the Apocryphal Diderot Text *Le Dialogue entre Diderot et l’abbe Barthelemey*” (JST), *PMLA*, 73(3):221-27.

θΔics

In terminology, **die**, in colloquial speak, is the verb form of death; in physico-chemically neutral terminology, it is a defunct term (see: life terminology upgrades) correctly meaning the point in time or spacetime when a thing, typically a CHNOPS+ thing, "ceases to exist" (see: cease to exist); the reaction end of a person.

Difficulties

> *See main: Death does not exist; life terminology reform*

One cannot say, to note, that a hydrogen atom, e.g., or a water molecule "dies" at any point of its formation, synthesis, state of existence, or analysis. Scaling this logic up the chain of being, or "molecular evolution table", the same logic holds for the human, Hu, human molecule, human chemical, or human species.

Quotes

The following are related quotes:

> "There is neither birth nor death for any mortal, but only a combination and separation of that which was combined, and this is what amongst laymen they call 'birth' and 'death'. Only infants or short-sighted persons imagine any thing is 'born' which did not exist before, or that any thing can '**die**' or parish totally."
>
> — Empedocles (c.450BC), Fragment I21 / DK8 + Fragment I23 / DK11; cited by Baron d'Holbach in *The System of Nature* (pg. 27); cited by cited by Alfred Lotka (1925) in *Elements of Physical Biology* (pg. 185, 246)

> "When you **die**, you turn into an 'angel' with very pretty wings, and god is a boy with a nice white shirt."
>
> — Girl #5 (2016), "Video of Kids aged 4 and 5 who were asked: What Happens When You Die? For Dying Matters Awareness Week" (1:21-1:40), Keech Hospice Care, Luton, England [1]

> "If we're alive we **die**, [if] we're not [we don't]."
>
> — Patrick Fergus (2015), an Atheism Reviews video; in: *Best of Pat Fergus* (28:28); made shortly before he met his own reaction end

See also

â— What happens when you die?

References

1. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs) (angels, pgs. 99, 113, 191, 273, 284, 287; Girl #5, pg. 5; Obama, pgs. 87). Publisher.

External links

â— Die – Wikipedia.

θΔics

In human chemistry, ***Die Wahlverwandtschaften*** is the original German title of German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities* (most common English rendition), the terms breaking down as Die [The] + Wahlverwandtschaft [Elective Affinity] + en [s]. As Claudia Brodsky comments on the subject of language translations attempts of the original title: [1]

> "The attempt to identify the equivalent of 'Wahlverwandtschaften' in another language makes evident a semantic difficulty already present in its 'original form'."

A 2011 Albatros reprint cover depiction of ***Die Wahlverwandtschaften***.

See EA-IAD: title decoding for further discussion on this "semantic difficulty".

References

1. Brodsky, Claudia. (1982). "The Coloring of Relations: Die Wahlverwandtschaften as Farbenlehre" (abs), *MLN*, 97(5): 1147-79.

External links

â— Die Wahlverwandtschaften – Wikipedia.
â— Die Wahlverwandtschaften (German → English) – Wikipedia.
â— *Die Wahlverwandtschaften* – Project Guttenberg.

θΔics

In remakes, **Die Wahlverwandtschaften (drama)** refers a 1982 118-minute France, West Germany television drama remake of German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*, directed by Claude Chabrol, first broadcast: ARD, 4 April 1982, including Helmut Griem as Edward Otto, Stéphane Audran as Charlotte, Michael Degen as Captain Otto, Pascale Reynaud as Ottilie. [1]

Description: "Stéphane Audran, Michael Degen, Helmut Griem, Pascale Reynaud, Die Wahlverwandtschaften"; a screen shot of from an part in the 1982 television remake drama of Goethe's 1809 *Elective Affinities*.

Synopsis

The following is the synopsis for the television version of the novella:

> "Edward Baron (Helmut Griem) and his wife Charlotte (Stephane Audran) live peacefully and quietly in the country. That changes when his friend Edward, the Captain (Michael Degen) arrives at the same time inviting and Charlotte's niece Ottilie (Pascale Reynaud) on the property. Soon Charlotte falls in love with the Captain and master of the house Edward in love with the beautiful Ottilie. The "elective affinities" position, however, all social conventions on their head."

Starring:

Helmut Griem | Edward
Stephane Audran | Charlotte
Michael Degen | Captain
Pascale Reynaud | Ottilie
Josef Lang Miller | Mediator

Images

Stéphane Audran, Michael Degen, Die Wahlverwandtschaften

Stéphane Audran, Michael Degen, Helmut Griem, Pascale Reynaud, Die Wahlverwandtschaften

Helmut Griem, Pascale Reynaud, Die Wahlverwandtschaften

Reviews

Reviewers at TVSpielFilm.de give the TV drama the following ratings:

References

1. (a) Die Wahlverwandtschaften (German) – TVSpielFilm.de.
(b) The Affinities (German → English) – TVSpielFilm.de.

θΔics

In science, **diet** refers to the food stuffs a thing consumes for its metabolism, growth, and continued existence.

Quotes

The following are related quotes:

> "Why is it 'worse', in an atheist's opinion, to eat a zucchini than to eat a baby?"
>
> — Anon (2015), Debate (2:36:53-)

> "In mammals, filial cannibalism has been reported in rodents (like voles, mice, and wood rats), and lagomorphs (rabbits and their relatives), as well as shrews, moles, and hedgehogs. These mammal moms sometimes eat their young to reduce litter size during periods when food is scarce. Cannibalism also occurs when litter size exceeds the number of available teats or when pups are deformed, weak, or dead."
>
> — Bill Schutt (2018), *Cannibalism: a Perfectly Natural History* (pg. 24)

See also

- Dietary thermodynamics
- Newton in Senegal
- John Stewart

External links

- Diet (nutrition) – Wikipedia.

θΔics

In human thermodynamics, **dietary thermodynamics** is the study of the relation between thermodynamics and weight loss or weight control or balance, referring to the subject of applying the laws of thermodynamics to facilitate weight loss or weight control or to develop diet theories on how to lose weight or control weight.

Overview

It is difficult to pin down exactly who originated this subject, although it does seem to have a loose historical connection to body building, if not dieting in general; generally seeming to be a subject that arose in the 2000s.

In 2011, diet expert Zoe Harcombe explained how the laws of **thermodynamics** have been misapplied, in recent years, to **weight loss** theory, and that in addition to the first law, the second law needs to be factored into diet theory to quantify available energy and the overall energy balance of a person. [1]

First law

The central debate in diet theories, concerning thermodynamics, seems to be how to going about applying the thermodynamics to understand weight loss formulaically. The original old school method seems to be the “calorie counting” method of weight loss, often theorized to be a first law based model, such that weight loss formulaically would be defined as:

$$W_L = \frac{C_{out} - C_{in}}{3,600}$$

where W_L is the amount of weight loss (in pounds), C_{out} is calories burned, and C_{in} is calories taken, such as via food substance or liquid calories. In this model, if, for instance, a typical person goes on a low calorie diet, say Cin = 800 calories per day, and goes about their normal day, thus equating Cout to the typical daily metabolic rate of say Cout = 1600 calories per day, then one would formulaically conclude that a person who adheres to this formula to the calorie would expect to loose one pound ever 4.5 days.

Second law

In recent years, some have begun to argue that the second law needs to be factored into the weight loss equation. A simple model in this direction would argue that weight loss is a isothermal-isobaric process of the state of a human molecule on going from an initial state to a final state, and that the Lewis inequality would have to hold in order for this process to occur:

$$\Delta G < 0$$

A first issue in this type of analysis is the "turnover rate" factor, namely the difficult issue of differentiating between human-surface interactions and human-human interactions, the former of which, according to standard model, being attributed to activation energy lowering or rising factors, the latter of which being attributed to enthalpy and entropy change factors.

Along these lines, one may well note that "mental factors", generally deemed an entropy factor, such as one's serotonin level would play a key role in the weight loss equation. It is known, for instance, that when one is in a stable strong positional relationship (not depressed), that serotonin levels are high and that the feeling of hunger drive is low; whereas, conversely, when one in unstable positional relationships (depressed) or in fact completely unbonded with no sort of stability, that serotonin levels are low, and resultantly the hunger drive is high, whereby, resultantly food consumption tends to increase and weight tends to gain. This approach tends to explain why depression and obesity tend to be linked.

Activation energy

The general model as to how to go about quantifying atomic turnover in humans is that this factor plays a role in the activation energy of reactions between humans, in the sense that food intake and hence atomic turnover are a substrate factor, i.e. an interaction factor with the surface of the earth, which acts to facilitate human-human reactions, in the same manner as does the oxide-embedded iron surface, in the Haber process, act as a catalyst that works to lower the activation energy barrier to reaction between H_2 and N_2 just as does a fertile earth surface facilitate reactions between a male Mx and female Fy human molecule. There are, however, a number of issue to be worked out in overall nature of this subject applied to human-human reactions. [2]

Summary

In any event, sorting out the thermodynamics of dieting, in thermodynamic terms, i.e. whether diet and weight loss is best quantified as an either an enthalpy, entropy, activation, or free energy factor or some other attribute, is a difficult subject.

Objections

Many argue that thermodynamics has nothing to say in regards to weight loss, often tending to object to the first law method of weight loss diet formulas, arguing to the effect that all calories are not the same, or something to this effect. [3]

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θΔics

In economic thermodynamics, **Dieter Braun** (c.1966-) is a German applied physicist noted for []

Overview

In 2001 to 2007, Braun produced some econophysics work, given at various German Physical Society talks, on what he calls "bookkeeping mechanics" or bookkeeping described as physical momentum, an example of which is typified in his 2006 article "Nonequilibrium Thermodynamics of Wealth Condensation", the abstract of which is: [1]

> "We analyze wealth condensation for a wide class of stochastic economy models on the basis of the economic analog of thermodynamic potentials, termed transfer potentials. The economy model is based on three common transfers modes of wealth: random transfer, profit proportional to wealth and motivation of poor agents to work harder. The economies never reach steady state. Wealth condensation is the result of stochastic tunneling through a metastable transfer potential. In accordance with reality, both wealth and income distribution transiently show Pareto tails for high-income subjects. For metastable transfer potentials, exponential wealth condensation is a robust feature. For example with 10% annual profit 1% of the population owns 50% of the wealth after 50 years. The time to reach such a strong wealth condensation is a hyperbolic function of the annual profit rate."

Some have discussed this in the context of American historian-philosopher Will Durant's cyclical Pareto principle quote: [3]

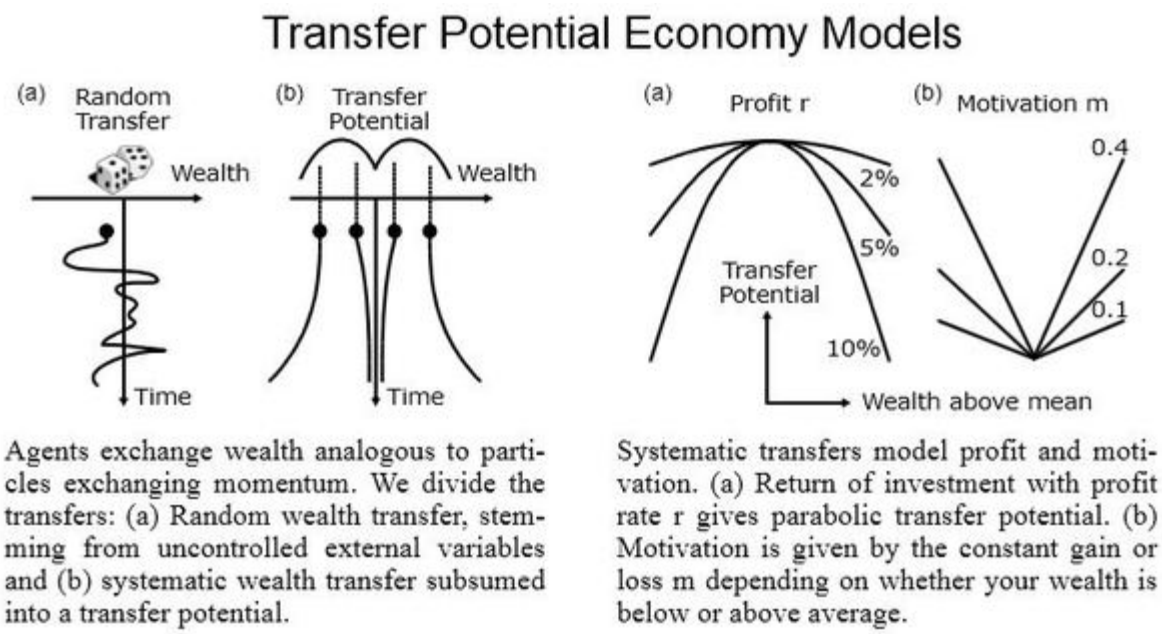

A diagram with caption of Braun's "transfer potential economic model" presented at a talk given at the 2006 German Physical Society meeting on econophysics. [2]

> "We conclude that the concentration of wealth is natural and inevitable, and is periodically alleviated by violent or peaceable partial redistribution. In this view all economic history is the slow heartbeat of the social organism, a vast systole and diastole of concentrating wealth and compulsive redistribution."

Braun hosts the relevant publications and posters about his theory at BookkeepingMechanics.com. [4]

Education

Braun completed his PhD in 1993 with a dissertation on "High-resolution spectroscopy of metal-ligand charge transfer UÌˆbergaÌˆngen [bridge?] in Ru (II) - and Os (II) complexes" at Regensburg University. Currently he is a professor of systems biophysics at Ludwig Maximilians University, Munich.

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External links

â— Dieter Braun (faculty) – Ludwig-Maximilians-University, Munchen.
â— Dieter Braun – Dieterb.ed.

θΔics

In human physics, **Dietrich Stauffer** (1943-) is a German theoretical physicist noted for his application of statistical physics and in particular computational physics in the areas of econophysics (since 1998) and sociophysics (since 2000).

Econophysics and sociophysics motivation

In regards to what stimulated Stauffer, a statistical physicist, into the study of econophysics and sociophysics problems, the seeds began to plant when as a graduate student he became interested in biological applications of condensed-matter physics; and in 1985 began to simulate some biologically models.

In *circa* 1995, Stauffer read American physicist Eugene Stanley's papers on econophysics, and when in 1997 Rama Cont and Jean-Philippe Bouchard applied percolation theory (Stauffer's specialty) to stock market fluctuations, he jumped onto that subject. Polish physicist Kasia Sznajd's preprint (with her father) on opinion dynamics made Stauffer interested in this model to the effect that he would like to simulate war and peace. [6]

His 1999 book *Evolution, Money, War and Computers* , co-written with S. Moss de Oliveira and P.M.C. de Oliveira, outlines the non-traditional applications (evolution, money, and war, etc.) of computational statistical physics. [1]

In 2003, Stauffer was already being cited, biographically, as being an unconventional physicist having done work in the areas of "socio-physics" and "econophysics". (Q)

In 2003, international conference *Unconventional Applications of Statistical Physics: Physics of Random Networks, Econophysics, and Models of Biophysics and Sociophysics* was organized in honor of the 60th birthday of Stauffer. [2]

In 2006, Stauffer, in his *Biology, Sociology, Geology by Computation Physicists*, co-authored with Suzana Maria Moss de Oliveira, Paulo Murilo Castro de Oliveira, and Jorge Simoes de Sa Martins, begins with the following appeasement to the anti-reductionist and religious crowds: [3]

> "In biology, people are accustomed to think that from simple animals up to dinosaurs, all species originated by Darwinian evolution and selection of the fittest. Once the principle is applied to human beings, some dislike it and rely instead on creationism. Similarly for sociophysics, not much emotion is aroused if ants are simulated by mathematically defined probabilities. But to apply the same type of modelling to humans is disliked by some: We are not just atoms. Of course we are not; neither is the planet earth a point mass. Nevertheless, for Kepler's law of how the earth rotates around our sun, a point mass is a good approximation."

Then devote an end chapter to the social science, wherein they start their history section with mention of the chemical aphorisms of Empedocles, followed by mention how in the early 20th century Italian theoretical physicist Ettore Majorana suggested to apply quantum statistical physics to social sciences, along with mentions of Thomas Schelling, Serge Galam, Wolfgang Weidlich, and Jurgen Mimkes.

In his 2008 lecture "The Schelling Model of Urban Segregation", Stauffer gives a bit of history of sociophysics, comments on how German historian Imanuel Geiss demanded that historians work with physics like laws or "with laws like in physics." [5]

Stauffer's 2011 article "Statistical Physics for Humanities: A Tutorial" gives a bit of historical overview, contains sections such as "humans are neither spins nor atoms", schelling model for social segregation", on the work of Thomas Schelling, extols on an Ising model of the physics of human behavior or choice, and concludes with a suggested outline to use Fortran to build computer simulations for a type of human statistical physics. [4]

Education

From 1961 to 1967, Stauffer completed his BS and MS in physics in Munich; in 1970 he completed his PhD at Munich Technical University; from 1971 to 1975, he was a post-doctorial researcher in Munich (Germany), Urbana (IL), Atlanta (GA), and Saarbrucken (Germany); in 1975 he obtained habilitation (non-tenured associate professor) at Saar State University, under a professor Binder.

In 1977, Stauffer became an associate professor of theoretical physics at the University of Cologne, Germany, where his focus has been on computer simulations (Monte Carlo), retiring from that position in 2008. Stauffer began researching biophysics in 1986, ageing in 1993, econophysics since 1998, sociophysics since 2000, and linguistics since 2004.

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- Dietrich Stauffer (faculty) - theoretical physics department, University of Cologne.
- Dietrich Stauffer – JASSS.soc.surrey.ac.uk.

θΔics

In mathematics, a **differential** refers to a variable that relates to or constitutes a difference or small change. [1]

Symbols

See also: History of differential equations, Symbols

There are three types of differential symbols used in thermodynamics: ordinary differential, partial differential, and exact differential. The notation for these three types of differentials is generally consistent, although notation sometimes varies. These types of differentials are summarized below:

Text	LaTex	Spoken	Type/Date	Notes/Synonyms	History
d	d	English letter "d"	Ordinary differential (1665)		The symbols *dx*, *dy*, and *dx/dy* were all introduced by German mathematician Gottfried Leibniz in his 1675 notebook. [5] In 1770, French mathematician Marquis Condorcet, in his “Memoir on Partial Differential Equations”, introduced the so-called “curly d” symbol, as follows: [6] “Throughout this paper, both *dz* and ∂*z* will either denote two partial differences of *z*, where one of them is with respect to *x*, and the other, with respect to *y*, or *dz* and ∂*z* will be employed as symbols of total difference, and of partial difference, respectively.” To note, it is difficult to see, in this translation, if this corresponds to the modern concept of total differential and partial differential? The modern standard curly d (∂) notation in equation form was first used in 1786 by French mathematician Adrien-Marie Legendre who stated the following: [7] “Pour éviter toute ambiguité, je répresentarie par ∂u/∂x le coefficient de *x* dans la différence de *u*, and par du/dx la différence complète de *u* divisée par *dx*.” or: "To avoid any ambiguity, I represent ∂u/∂x as the coefficient of x in the difference of u, and by du/dx the complete difference of u divided by dx." Again, the translation of "différence complète" to complete differential, needs to be fact-checked. In any event, Legendre is said to have abandoned this symbol usage. The
∂	∂	"curly d" rounded d curved d Jacobi's delta	Partial differential (1770)	Used to denote a partial derivative, such as: $$\frac{\partial z}{\partial x}$$ which is read as "the partial derivative of *z* with respect to *x*" or "the partial of *z* with respect to *x*".	

					curly d symbol (∂) was later re-introduced in 1841 by German mathematician Carl Jacobi, who stated in Latin: [3] > “Sed quia uncorum accumulatio et legenti et scribenti molestior fieri solet, praetuli characteristica *d* differentialia vulgaria, differentialia autem partialia characteristica ∂ denotare.” which translates as: we will denote the partial differential by the character " ∂ ", or something to this effect. In 1882, German physicist Hermann Helmholtz was using both the partial differential ∂ and the standard differential d in his "On the Thermodynamics of Chemical Processes". [9]
			Inexact differential (1858)	Synonyms: imperfect differential, incomplete differential.	In 1858, German physicist Rudolf Clausius published his his 1858 article “On the Treatment of Differential Equations which are Not Directly Integrable” and followup chapter section "Mathematical Introduction" (1865, 1875), wherein he laid out the thermodynamic version of the so-called "exact differential" as compared to the "inexact differential".
	$\bar{d}$	d hat	(1875)	Synonyms: total differential, completed differential	The d hat notation ($\bar{d}$) was introduced in 1875 by German mathematician Carl Neumann to represent an inexact differential, i.e. one that is path dependent, which is the case with differential units of heat $\bar{d}Q$ and work $\bar{d}W$. [4]
Ä‘		d crossbar	Inexact differential	Often used, in 20th century thermodynamics textbooks, to represent an exact differential; inconsistent use.	The first person to use or introduce this this notation needs to be tracked down.
δ	δ	Greek lower case letter delta	Exact differential	Sometimes used to represent an exact differential; inconsistent use.	Used by Johann Bernoulli in 1706 to denote the difference of functions; used in 1821 by Augustin-Louis Cauchy to denote “difference”. [5] In 1924, James Partington was using δ to denote that “δQ and δA are not perfect differentials, since each depends on the path of change.” Partington footnotes this statement, directing readers to his 1920 *Higher Mathematics for Chemical Students*, in which he says that he gives a proper treatment of the properties of perfect differentials, as presented by Rudolf Clausius (1875). [8]
		Greek capital	Difference		Introduced in 1923 by Gilbert Lewis to represent a change of state of a system in going from an initial state to final state, such as:

Δ	Δ	letter Delta	(1923)	$\Delta G = G_f - G_i$ or rather the "difference" in the values between the final state and the initial state.

History

The term "differential" was first used in 1647. [1]

Cartesian systems

The differential *dF* of a Cartesian coordinates defined function F(x,y,z) is given by: [2]

$$dF = \left(\frac{\partial F}{\partial x}\right)_{y,z} + \left(\frac{\partial F}{\partial y}\right)_{x,z} + \left(\frac{\partial F}{\partial z}\right)_{x,y}$$

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External links

â— ∂ – Wikipedia.

θΔics

In mathematics, a **differential equation** is an equation in which the derivative or differential of one variable or quantity, say y, with respect to a second variable, say x, appears as well as the variables themselves, x and y. [1]

Quotes

The following are notable quotes:

> "First causes are not known to us, but they are subjected to simple and constant laws that can be studied by observation and whose study is the goal of natural philosophy … Heat penetrates, as does gravity, all the substances of the universe; its rays occupy all regions of space. The aim of our work is to expose the mathematical laws that this element follows … The **differential equations** for the propagation of heat express the most general conditions and reduce physical questions to problems in pure analysis that is properly the object of the theory."
>
> — James Maxwell (date), Publication [2]

> "**Differential equations** form the basis for the scientific view of the world."
>
> — Vladimir Arnold (date), Publication [2]

> "The solution to this paradox is that an organism inherits rules that spell out the progression. The rules are, or are like, time-based **differential equations** which have the ability to encode complex sequences with high efficiency. Thus on hast to regard development as an integration through space and time, the genome providing the equivalent of the differential equations."
>
> — Paul Green (c.1990) (Q) [3]

See also

- Complete differential
- Exact differential
- History of differential equations
- Partial differential equation
- Total differential

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External links

- Differential equation – Wikipedia.

θΔics

In science, **difficulties on theory** refers to the apparent issues, fallacies, and or insurmountable barriers, depending, with a given argument or line of reasoning, point of view, or position on an issue.

> "Long before arriving at this part of my work, a crowd of **difficulties** will have occurred to the reader. Some of them are so grave that to this day I can never reflect on them without being staggered; but, to the best of my judgment, the greater number are only apparent, and those that are real are not, I think fatal to my **theory**."
>
> — Charles Darwin (1859), *Origin of Species* (§6: Difficulties on Theory) [1]

A theory, in short, is an unproven assertion; advanced for some or another reason, generally for the sake of explanation. The majority of theories or theorems will tend to fail; those that do not become law.

Etymology

The term and concept of "difficulties on theory" was made popular by English naturalist Charles Darwin who employed the term as the title of chapter six of his *Origin of Species*, which he again addressed in his closing chapter "Recapitulation and Conclusion".

Hmolpedia

In all Hmolpedia articles, wherein a theory is discussed or summarized, a standing practice, aim, and or rule of thumb, modeled on the Darwin protocol, is to append a so-called difficulties on theory section to the end of each article, wherein the apparent issues with the said theory are addressed openly, with citation when available, so as to not have to re-tread old ground—to get all the cards out on the table, so to say.

Hmolpedia "difficulties on theory" sections tend to act as time savers. Generally, it takes a certain amount of time and mental energy to dissect and pick apart a given theory, the subtle issues of each held in purview, in clear view, only in that point in time when the bulk of the said theorist's work has recently been consumed; hence, it is advisable to state the facts or difficulties as they are apparent, when they are apparent, so as to not have to re-work the issue over again upon each return. If a given theory is a dead end cul-de-sac, it should be stated so frankly, allowing the reader to move on to more fruitful work.

Quotes

The following are related quotes:

> "That many and grave objections may be advanced against the theory of descent with modification though natural selection, I do not deny. I have endeavored to give them their full force."
>
> — Charles Darwin (1859), *Origin of Species* (§14: Recapitulation and Conclusion) [1]

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θΔics

In human chemistry, **dihumanide molecule** is the scientific name of the formation of two human molecules attached, via a human chemical bond, in union, e.g. AB, A-B, A=B, A≡B, etc., considered as a unit more so than two separate entities. [1] The suffix "-ide" signifies a molecular compound or structure usually derived from or related to another, usually specified, compound or structure. [2] The prefix "di-" is the Greek term used to signify two.

Di-human-ide molecule – 2 humans bonded in a relationship or marriage, etc.
Tri-human-ide molecule – 3 humans bonded in a relationship, association, or family.
Deca-human-ide molecule – 10 humans bonded in a group
Hecta-human molecule structure – 10E2 humans bonded in a system.
Kilo-human molecule structure – 10E3 humans bonded in a corporation.
Mega-human molecule structure – 10E6 humans bonded in a society.
Giga-human molecular structure – 10E9 humans bonded in a worldly-community.

American electrochemical engineer Libb Thims' 2007 definitions of a **dihumanide molecule**, as a structure comprised of two human molecules. [1]

Overview

In 1987, Indian-born Pakistani organometallic chemist Mirza Beg, in his *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, referred to bonded associations of individual people: A, B, C, etc., which he refers to as chemical species or molecules, as he alludes, of form AB, BC, AC, AA, etc., as "dimers", such as the formation of "close friends denoted by AB formed according to reaction":

$$A + B \rightleftharpoons AB$$

and groupings or associations such as ABC as "trimmers". [3] In this sense, in Beg terminology, a bonded couple would be referred to as "human dimer" and a bonded union of three human molecules (or human chemicals) would be referred to as a "human trimer".

In circa 2000, American child prodigy turned astrophysicist Christopher Hirata, in his "The Physics of Relationships", was uses the symbols of X = girl, Y = boy, and XY = paired relationship, calling the single boys and girls, i.e. men and women on his college campus, as "basic elements", defining the pair bonding reaction as follows: [4]

$$X + Y \leftrightarrow XY$$

Hirata also comments, in reference to the subject of queer chemistry (and other poly-amorphous relationships), in his human chemical reaction modeling that he is neglecting "rare and non-traditional" products or compounds (human molecules) that may form such as "the gay molecule Y_2, the lesbian molecule X_2, and the middle-Eastern polygamous molecule X_4Y."

In 2007, American electrochemical engineer Libb Thims, in his *Human Chemistry*, building in some historical sense on the earlier work of David Hwang, was employing the following notation for male human molecule, female human molecule, and a baby or child human molecule: [5]

Mx = male human molecule (a man)
Fy = female human molecule (a woman)
Bc = immature human molecule (a baby or a child)

Mx = Male	Up = Paternal Uncle	Gf = Girlfriend
Fy = Female	Um = Maternal Uncle	Fc = Close Friend
MxFy = Bonded Couple	Ap = Paternal Aunt	F = Friend
Bc = Baby or Child	Am = Maternal Aunt	Fd = Distant Friend
Fa = Father	Cp = Paternal Cousin	Nr = Neighbor
Ma = Mother	Cm = Maternal Cousin	W = Work or Job
Sb = Sibling	Ne = Niece	Sc = School
Gf = Grandfather	Nw = Nephew	Si = Society
Gm = Grandmother	Bf = Boyfriend	Ob = Objective

The "human molecular symbols" articles goes into more detail.

See also

â— Polyhumanide molecule

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θΔics

In thermodynamics, **Dilip Kumar Kondepudi** (1952-) is an Indian-born American physical chemist noted for the 2008 textbook *Introduction to Modern Thermodynamics*, which is a follow-up to the 1998 *Modern Thermodynamics* co-written with Belgian chemist Ilya Prigogine, both publications being products of the Brussels school, particularly the affinity theories of Belgian thermodynamicist Théophile De Donder. Kondepudi seems to be the first to have used the term Gibbs energy flow, particularly in relation to biological systems.

Education

Kondepudi completed his BS in chemistry in 1971 at Madras University, his MS in physics in 1973 at the Indian Institute of Technology, Bombay, and his PhD in physics, thesis "On the Influence of External Fields on Non-Equilibrium Systems", under the supervision of Belgian chemist Ilya Prigogine, in 1979 at the University of Texas at Austin. [2]

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External links

â— Dilip K. Kondepudi (homepage) – Wake Forest University.
â— Dilip K. Kondepudi (research and publications) – Wake Forest University.

θΔics

In thermodynamics, the **dilute solution model** or "ideal dilute solution model" assumes the solvent obeys Raoult's law and that the solute obeys Henry's law. In real system applications, to correct for deviations from the ideal model, often concepts such as 'activity' are introduced. [1] The dilute solution model is often employed in electrochemical engineering applications.

History

The thermodynamic theory of a 'dilute solution', was introduced by German physicist Max Planck as part of his *Lectures on Thermodynamics*, sometime between the first edition 1897 and 1913 edition; a book which itself was an expanded version of his earlier 1893 *Outline of General Thermochemistry*, a summary of the results of his electrochemical and thermochemical investigations; investigations which trace to earlier 1889-90 papers of Planck published on the electromotive force. [5]

Ecological thermodynamics

The dilute solution model, in ecological thermodynamics, was first proposed for use in ecology by German ecological physicists Rainer Feistel and Werner Ebeling, in their 1981 "On the Thermodynamics of Irreversible Processes in Ecosystems", as a way to represent a collection of species in an ecosystem based on the laws of thermodynamics and standard equations of mathematical ecology (e.g. the Lotka-Volterra equations). [3] In their paper, Feistel and Ebeling develop model of "ideal ecological solutions" using relations for the thermodynamic functions which correspond to Max Planck's theory of ideal anorganic solutions, wherein they derive several thermodynamic relations including an ecological-style first and the second law and a kinetic potential. [4] Features of the approach include:

- The assumption of organism 'death' if it reaches an equilibrium state.
- A concept of ecological pressure, corresponding to the osmotic pressure of a solution.
- The use of the fundamental Gibbs equation in its derivation.
- The ability to directly determine the Gibbs potential and free energy of an ecosystem as a sum of the number and variety of individuals of a series of species.

Danish chemical-ecology engineering ecologist Sven Jorgensen summarized the ecological version of the dilute solution as follows:

> "We apply the Planck theory of a dilute solution when living organisms are considered as molecules of different chemical substances submerged into an environment, which is considered as a solvent."

Jorgensen points out that in the vicinity of thermodynamic equilibrium, the 'living particles' must exist in their constituent forms, leading to results which resemble nothing more than an 'inorganic soup.' [2]

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2. Jorgensen, Sven E. and Svirezhev, Yuri M. (2004). *Towards a Thermodynamic Theory for Ecological Systems* (dilute solution model, pg. 155). New York: Elsevier.
3. Lotka-Volterra equations – Wikipedia.
4. Feistel, Rainer and Ebeling, Werner. (1981). "On the Thermodynamics of Irreversible Processes in Ecosystems" (abs), *Studia Biophys*. 86: 237-44.
5. (a) Planck, Max. (1913). *Vorlesungen über Thermodynamik* (*Lectures on Thermodynamics*). (§ 249: Verdünnte Lösungen, pgs. 212-252). Berlin: Walter De Gruyter & Co.
(b) Barkan, Diana K. (1999). *Walther Nernst and the Transition to Modern Physical Chemistry* (Lectures on thermodynamics, pgs. 83-85). Cambridge University Press.

Further reading

â— Kaufman, Myron. (2002). *Principles of Thermodynamics* (8.5: Ideal Dilute Solution Model, pgs. 222-). CRC

Press.

θΔics

In hmolscience, **Dimitri F. Katakis** (c. 1950-) is a Greek psychologist noted, in psychological thermodynamics, for his 1978 to 1986 theory, developed with with Charis Katakis, of teleonomic entropy or goal-directed or purposefulness entropy.

Overview

In 1978, Katakis, together with Charis Katakis, according to Kenneth Bailey, began applying the concept of entropy, in the general sense, to psychotherapy. [1]

In 1982, Kimitri Kataks, together with Charis Katakis, in their "Teleonomic Entropy in Biopsychosocial Systems", hypothesize a teleological-themed entropy, or entropy antonym, the abstract of which is as follows: [2]

> "The concept of entropy has been developed from, and has usually been applied to, systems on one level. Due to its unifying potential, however, interest in applying entropy to, complex multilevel systems as well has recently increased. The concept's distributional and statistical formulations, nevertheless, have little relevance to the apparently purposeful, decision-making properties of complex living systems. In order to make it more suitable for understanding the functioning of such biopsychosocial systems (particularly organisms, groups, organizations, and societies), its definition has to be extended. This paper introduces the new concept of teleonomic entropy. In order to distinguish this generalized concept from that of thermodynamics and statistical mechanics, we shall refer to the latter as physicochemical entropy. Teleonomic entropy at the physicochemical level is related to, but not identical to, physicochemical entropy."

(add discussion)

Education

Katakis completed his PhD in psychology from the University of Thessaloniki.

References

1. Bailey, Kenneth D. (1990). *Social Entropy Theory* (pgs. 85-86). New York: State University of New York Press.
2. (a) Katakis, Dimitri F. and Katakis, Charis D. (1982). "Teleonomic Entropy in Biopsychosocial Systems" (abs) *Behavioral Science*, 27(2)118-24.
(b) Charis Katakis – Wikipedia.

Further reading

â— Katakis, Dimitri F. and Katakis, Charis D. (1986). "Transference and Transformation of Teleonomic Entropy." (abs) *Behavioral Science*, Vol. 31, Issue 1, pgs. 52-62.

θΔics

In existographies, **Dimitris N. Keranis** (1948-) (SNE:14) (CR:7) is a Greek lawyer and thermodynamic social theorist noted, in economic thermodynamics, for his 2005 human free energy theory of economics and human values.

Overview

In 2005, Keranis, in his "Human Values and the Second Law of Thermodynamics", published at Entropy-and-HumanValues.gr (Ñº), argued that Gibb's function, of the following form:

$$G = H - TS$$

where *G* is the Gibbs free energy, *H* the enthalpy, *T* the temperature, and *S* the entropy of the system, an equation which quantifies the relationship between energy and entropy, contains the two opposing forces in the production of not just chemical work but work in a social system. [1] A social system's production of work and entropy, according to Keranis depends on two antithetically opposed factors: the flow of economic acts and the flow of values. [2] In addition, according to Keranis, from the perspective of economic analysis, this relationship between the flow of economic acts and the flow of values is captured by Zolotas' function, developed in 1881 by Greek social economist Xenophon Zolotas which relates economic growth to social welfare. [3]

The following is Keranis' abstract to his essay:

> The author initially applies a philosophical criterion, of spoken words and physical acts, to the categorization of human purposeful action on the basis of the distinct qualities of verbal expression, on the one hand, and human acts, on the other hand. He then identifies specific functions related to each of the three categories defined as loci of human social becoming:
>
> > (a) First category: speech that commands and acts that comply with it reflect nature's tendency to organize itself through the production of work. These acts are responsible for the flow of energy within the social system. All economic activity constitutes the core of this type of acts.
> > (b) Second category: speech acts-expressed as ontological or scientific and normative propositions.
> > (c) Third category: the unuttered acts of poetic and literary speech and of the fine arts; identified as unique expressions of an evolving humanity that translate into value flows within the social system.
>
> When conceived as social dispersal structures, they reflect a natural tendency to diminish the intensity and to downgrade the capacity of energy to produce work. At the economic level, they reflect the tendency of the social system towards equilibrium, through the dispersal of wealth, income redistribution, decentralization of power etc. This linkage between flows of economic acts and value flows leads to an unexpected finding: The social system's production of work and entropy depends on two antithetically opposed factors: the flow of economic acts and the flow of values. We have here the same qualitative relationship expressed by Gibb's function (G=H-TS), in which energy and entropy are the two opposing forces in the production of work. From the perspective of economic analysis, the author claims that this relationship between the flow of economic acts and the flow of values is captured by Zolotas' function (1982), which relates economic growth to social welfare. He then asks: Is there a criterion (the author suggests the humanist criterion) for determining the optimum equilibrium of the social system? Is human society moving away from it? What are the resulting consequences and what can be done about it? This essay, in sum, places the reader at the critical point where the humanities meet the natural sciences.

(add discussion)

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1. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (Section: "Keranis' social organization free energy theories", pgs. 452-455). Morrisville, NC: LuLu.
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3. Zolotas, Xenophon. (1981). *Economic Growth and Social Welfare*. New York University Press.

External links

â— Keranes, Demetrios N. – WorldCat Identies.

θΔics

In existographies, **Diodorus** (c.90-20BC) (IQ:160|#515) (CR:18), aka "Diodorus Siculus" or “Diodorus of Sicily”, was a Greek historian noted for his c.40BC *Historical Library*, aka *Bibliotheca Historica* (Q), a 40 volume set, of which only 1-5 and 11-20 survive, arranged into part one (Ancient Egypt up to destruction of Troy), part two (Trojan War to dereaction of Alexander the Great), and part three (post Alexander to beginning of Caesar’s Gallic War, c.59BC).

Influenced

Siculus' views on the origin of man, from the slime of the earth, influenced Lucilio Vanini (1616).

Quotes | On

The following are quotes on Diodorus:

> “Cicero mentions four of this name. Pausanias and Herodotus, rank Apollo among the Egyptian deities. **Diodorus Siculus** expressly states, that Isis, after having invented the practice of medicine, taught this art to her son Orus [Horus], named also Apollo, who was the last of the gods that reigned in Egypt. It is easy to trace almost all the Grecian fables and mythologies from Egypt. If the Apollo of the Greeks, was said to be the son of Jupiter, it was because Orus [Horus], the Apollo of the Egyptians, had Osiris for his father, whom the Greeks confounded with Jupiter.”
>
> — Robert Taylor (1829), *The Diegesis* (pg. 180)

> “It is impossible to ignore the similarities between the Egyptian quarternity: Isis and Nephthys (known as 'the Two Goddesses' in Egypt), Osiris and Set (personifications of life and death), and the leading characters of the Eleusinian drama: Demeter and Persephone (also known simply as 'the Two Goddesses'), Dionysus and Hades. **Diodorus of Sicily**, first century BC, clearly states that the initiatory rites of Demeter in Eleusis were transferred from Egypt (**Diodorus Siculus**, 1.29.2). Later he states: The rite of Osiris is the same as that of Dionysus and that of Isis very similar to that of Demeter; the names alone having been interchanged, and the punishments in Hades of the unrighteous, the Fields of the Righteous and the fantastic conceptions, current among the many - all these were introduced by Orpheus in imitation of the Egyptian funeral customs.' (1.96.4-5).”
>
> — Timothy Freke and Peter Gandy (2001), *Jesus and the Lost Goddess* [1]

> “In later legend, according to **Diodorus** (c.30BC) and Plutarch (100AD), the establishment of various social structures and customs was attributed to Osiris during his reign. Plutarch relates how, as king, he taught the Egyptians how to cultivate the land; he also gave them laws and taught them to honor he gods. Osiris, according to Diodorus, did many good deeds for the social life of mankind, for a start, by making them give up cannibalism, since Isis had discovered wheat and barley, they took up eating these instead of each other. Isis also established laws, while Osiris built temples to his parents and other gods at Thebes. Both deities honored those who advanced who nurtured the arts and made technological advances. One advance in particular was the development of copper tools, which helped people to kill animals and conduct agricultural activities more effectively. Osiris, according to Diodorus, was the first to invent and taste wine [compare: Dionysus], and he took counsel with Thoth on every matter.”
>
> — Garry Shaw (2014), *The Egyptian Myths* [3]

Quotes | By

The following are quotes by Diodorus:

> “It is moreover reported, that Osiris being a prince of a public spirit, and very ambitious of glory, raised a great army, with which he resolved to go through all parts of the world that were inhabited, and to teach men how to plant vines, and to sow wheat and barley. For he hoped that if he could civilize men, and take them off from their rude and beast-like course of lives, by such a public good and advantage, he should raise a foundation amongst all mankind...”
>
> — Diodorus (c.30BC), cited by Dorothy Murdock (2014), in *Did Moses Exist?* (pg. 201), in conjecture that the Biblical “exodus” is a rescript of the exodus of Osiris from Egypt [2]

See also

- Osiris, Dionysus, and Bacchus
- Herodotus
- Manetho

References

1. Freke, Timothy and Grandy, Peter. (2001). *Jesus and the Lost Goddess: The Secret Teachings of the Original Christians* (Osiris, 18+ pgs; quote, pg. 255). Random House.
2. Murdock, Dorothy M. (2014). *Did Moses Exist? The Myth of the Israelite Lawgiver* (pg. 201). Stellar House Publishing.
3. Shaw, Garry J. (2014). *The Egyptian Myths: a Guide to the Ancient Gods and Legends* (pg. #). Thames & Hudson.

External links

- Diodorus Siculus – Wikipedia.

θΔics

In existographies, **Diogenes** (c.408-323BC) (IQ:170|#350) (Perry 80:2|Li) (ACR:26) (CR:12), aka "Diogenes of Sinope", was a Greek cynic philosopher, noted for []

Influenced

Diogenes was the teacher of Crates, who was teacher to Zeno of Citium.

Quotes | By

The following are quotes by Diogenes:

> "I am looking for an honest man (or real human)."
>
> — Diogenes (c.340BC), response when queried as to why he was walking around (Q) in daylight with a lantern

See also

- Diogenes of Apollonia (c.460-400BC) (FA:14) Greek air philosopher;
- Diogenes Laertius (c.190-250AD) (IQ:155|#505) (CR:11) Greco-Roman philosopher historian;

External links

- Diogenes – Wikipedia.

θΔics

In existographies, **Diogenes Laertius** (c.190-250AD) (IQ:155|#505) (CR:31) was Greco-Roman historian noted for his circa 230 *The Lives and Opinions of Eminent Philosophers*, oft-cited for a number of historical topics, such as discussion of Democritus, monad theory, Zeno of Citium and the slave stealing parable (Q), the existographic data on Epicurus, being and nonbeing, etc.

Democritus | Atomic theory

Laertius summarizes Greek philosopher physicist Democritus' atomic theory model as follows: [1]

> "The principles of all things are atoms and the void, and everything else exists only by convention. The worlds are unlimited and subject to generation and corruption. Nothing could come to be from nonbeing, and nothing could return by corruption to nonbeing. Atoms are unlimited in size and number, and are the seat of a vortex motion in the universe, which results in the creation of all compounds: fire, water, air, and earth, which are simply organizations of certain atoms, themselves resistant to change and alteration by virtue of their hardness. The sun and the moon are composed of such particles, smooth and round, as is the soul, which is the same thing as the intellect."

Laertius, in his *The Lives*, published list of Democritus' works, were many and encyclopedic in scope, including: astronomy, mathematics, literature, epistemology, and ethics—none of which, however, survived. [3]

Monad

Laertius, citing Hippolytus, states that the term "monad" originated in the works of Pythagoras and or his followers (Pythagoreans), who called the first thing that came into existence the 'monad', which begat the dyad, which begat the numbers, which begat the point, begetting lines or finiteness, etc. [2]

See also

- Diogenes of Apollonia (c.460-400BC) (FA:14) Greek air principle philosopher
- Diogenes (c.408-323BC) (Cattell 1000:N/A) [RGM:386|1,310+] (PGT:2|Li) (Q) Greek cynic philosopher
- Diogenes of Oenoanda (c.77-142AD) Greek Epicurean philosopher

References

1. (a) Pullman, Bernard. (1983). *The Atom in the History of Human Thought: a Panoramic Intellectual History of a Quest That Has Engaged Scientists and Philosophers for 2,500 Years* (pgs. 31-32). Oxford University Press.
(b) Stenger, Victor J. (2013). *God and the Atom: from Democritus to the Higgs Boson: the Story of a Triumphant Idea*. Prometheus Books.
2. (a) Laertius, Diogenes. (c.230). *Lives and Opinions of Eminent Philosophers* (TOC) (txt). Publisher.
(b) Lives and Opinions of Eminent Philosophers – Wikipedia.
(c) Lives of Eminent Philosophers – Wikisource.
(d) Monad (philosophy) – Wikipedia.
3. Taylor, Christopher. (1999). *The Atomists, Leucippus and Democritus: Fragments: a Text with Translation with Commentary* (pg. 158). University of Toronto Press.

Further reading

- Laertius, Diogenes. (c.230). *Lives and Opinions of Eminent Philosophers* (TOC) (txt) (WS). Publisher.
- Laertius, Diogenes. (c.230). *Lives of Eminent Philosophers* (translator: Pamela Mensche; editor: James Miller) (Amz). Publisher, 2018.

External links

- Diogenes Laertius – Wikipedia.

θΔics

In existographies, **Diogenes of Apollonia** (c.460-400BC) (FA:13), named derived from the Milesian colony Apollonia in Thrace, was a Greek philosopher, noted for his air theory of everything, according to which he identified the reason that regulated the world with the original substance, which he considered to be "air". [1]

Atheism

Diogenes of Apollonia was labeled an "atheist", by Irenaeus (130-202AD), per his materialistic account of the world.

Quotes | By

The following are quotes by the Apollonian Diogenes:

> "And it seems to me that that which possessed thought is what people call air, and that by this everyone both is governed and has power over everything. For it is this which seems to me to be god and to have reached everything and to arrange everything and to be in everything. And there is not a single thing which does not share in it."
>
> — Diogenes of Apollonia (c.410BC), *On Nature* (Q); Frag. B 5. Simplicius, *Commentary on the Physics*, 152

See also

- Diogenes (c.408-323BC) (Cattell 1000:N/A) [RGM:386|1,310+] (PGT:2|Li) (Q) Greek cynic philosopher
- Diogenes Laertius (c.190-250AD) (IQ:155|#505) (CR:11) Greco-Roman historian

References

1. Lange, Friedrich A. (1875). *The History of Materialism: and Criticism of its Present Importance*, *Volume 1*: *Materialism in Antiquity*. *The Period of Transition* (translator: Ernst Thomas). *The Seventeenth Century* (translator: Ernest Thomas) (pg. 13). Houghton, Osgood, and Co, 1879.

External links

- Diogenes of Apollonia – Wikipedia.

θΔics

In existographies, **Diogenes of Oenoanda** (c.77-142AD), aka "Diogenes of Oinoanda" (Q) was a Greek Epicurean philosopher, noted for []

Overview

In c.127AD, Diogenes, in the Greek city (now Turkey) of Oenoanda (Q), constructed a rectangular piazza (town square) surrounded by a portico, and furnished with statues, on two sides of which he inscribed (Q) a lengthy account of Epicurean doctrines, that was 2.37 meters high, filling about 260 square meters of wall space, containing about 25,000 words, on physics, epistemology, and ethics; a reconstruction of which is shown below left, along with fallen blocks extant, below right:

About a quarter of the original Epicurean wall has survived; the following is a reconstruction of the wall and its contents:

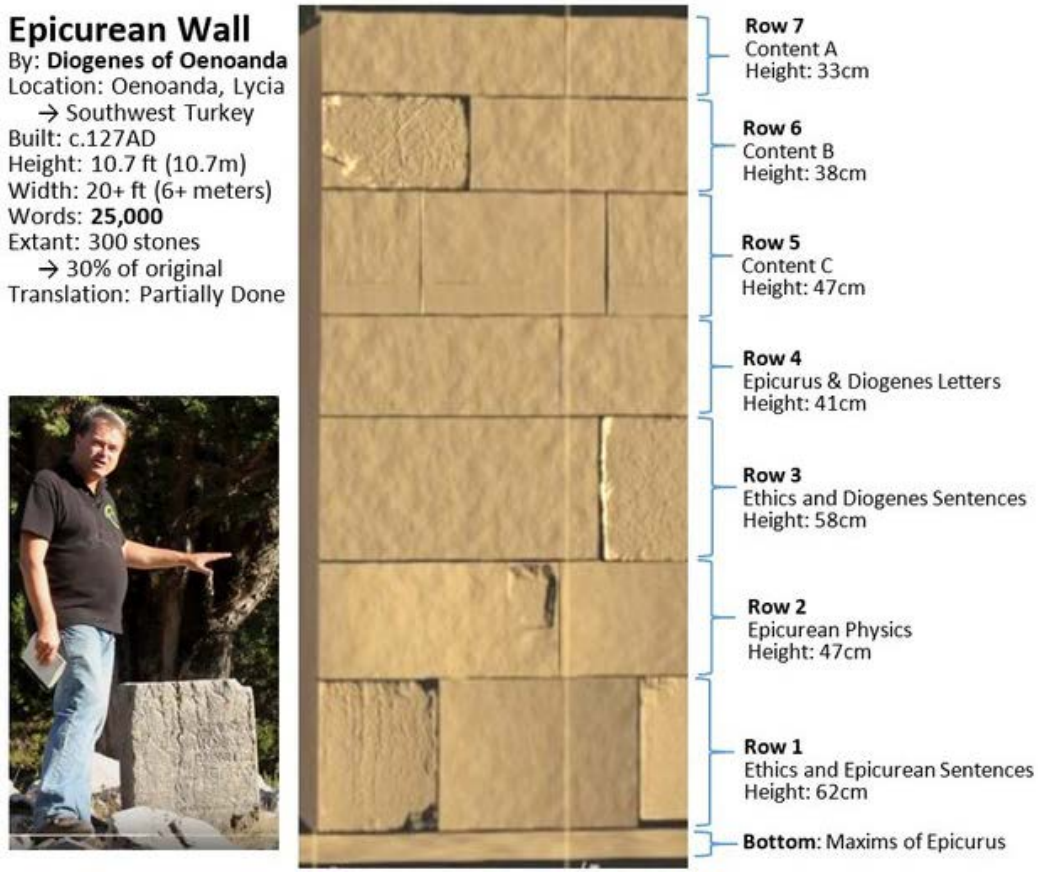

In 1892, 64 fragments (Q) were first published; presently, some 300 fragments and or blocks, supposedly, have been discovered, with recovery ongoing. [2]

Quotes | By

The following are quotes by Diogenes of Oenoanda:

> "For if anyone follows Democritus' theory, saying that the **atoms have no free motion**, since they collide with one another, from which it appears that the motion of everything is necessitated, we shall say to him 'Do you not know, whoever you are, that the atoms have a free motion, which Democritus did not discover, but Epicurus revealed, namely the motion of the swerve, as he shows from the phenomena?"
>
> — Diogenes of Oenoanda (c.127AD), Fragment 54; Smith, II3-III.9 [1]

> "Having already reached the sunset of my life (being almost on the verge of departure from the world on account of old age), I wanted, before being overtaken by death, to compose a fine anthem to celebrate the fullness of pleasure and so to help now those who are well-constituted. Now, if only one person or two or three or four or five or six or any larger number you choose, sir, provided that it is not very large, were in a bad predicament, I should address them individually and do all in my power to give them the best advice. But, as I have said before, **the majority of people suffer from a common disease, as in a plague, with their false notions about things**, and their number is increasing (for in mutual emulation they catch the disease from one another, like sheep) moreover, it is right to help also generations to come (for they too belong to us, though they are still unborn) and, besides, love of humanity prompts us to aid also the foreigners who come here. Now, since the remedies of the inscription reach a larger number of people, I wished to use this stoa to advertise publicly the medicines that bring salvation. These medicines we have put fully to the test; for we have dispelled the fears that grip us without justification, and, as for pains, those that are groundless we have completely excised, while those that are natural, we have reduced to an absolute minimum, making their magnitude minute."
>
> — Diogenes of Oenoanda (127AD), Fragment Block #1 [3]

See also

- Diogenes of Apollonia (c.460-400BC) (FA:14) Greek air principle philosopher
- Diogenes (c.408-323BC) [RGM:386|1,310+] (PGT:2|Li) (Q) Greek cynic philosopher
- Diogenes Laertius (c.190-250AD) Greco-Roman historian

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1. Taylor, C.C.W. (1999). *The Atomists: Leucippus and Democritus: Fragments: a Text and Translation with a Commentary by C.C.W. Taylor* (pg. 154). University of Toronto Press.
2. Oinoanda, Diogenes. (c.127AD). *Diogenes of Oinoanda: Epicureanism and Philosophical Debates* (abs). Publisher.
3. (a) Diogenes of Oenoanda (fragments) – NewEpicurean.com.
(b) Anon. (2015). "A Gigantic Jigsaw Puzzle: The Epicurean Inscription of Diogenes of Oinoanda" (Q), YouTube, Middle East Technical University, Mar 10.

External links

- Diogenes of Oenoanda – Wikipedia.

θΔics

In religio-mythology, **Dionysus**, period of worship: c.1600-400AD, was the Greek god of wine and resurrection, himself a rescript of Osiris (Herodotus, 450BC), the Egyptian god of wine and resurrection; who later became transcribed as the man Moses in the Jewish recension, and as god Bacchus, in early Roman times.

A 500BC picture of **Dionysus**, on a Greek vase, reborn in the the form of an evergreen tree.

Osiris

In 450BC, Herodotus discerned that Dionysus was a cultural rewrite or rescript of the Egyptian god Osiris; James Frazer (1907) summarizes this as follows: [1]

> "Herodotus found the similarity between the rites of Osiris and **Dionysus** so great, that he thought it impossible the latter could have arisen independently; they must, he thought, have been recently borrowed, with slight alternations, by the Greeks from the Egyptians."

In 100AD, Plutarch, in his *On Isis and Osiris* (§35) said the following:

> "That Osiris is identical with Dionysus who could more fittingly know than yourself, Clea? For you are at the head of the inspired maidens of Delphi, and have been consecrated by your father and mother in the holy rites of Osiris. If, however, for the benefit of others it is needful to adduce proofs of this identity, let us leave undisturbed what may not be told, but the public ceremonies which the priests perform in the burial of the Apis, when they convey his body on an improvised bier, do not in any way come short of a Bacchic procession; for they fasten skins of fawns about themselves, and carry Bacchic wands [Thyrsus] and indulge in shoutings and movements exactly as do those who are under the spell of the Dionysiac ecstasies."

Those, following Herodotus, as summarized by Frazer, to have identified Osiris with Dionysus, include: Plutarch, Diodorus Siculus, Eusebius, Servius (on Virgil), J. Tzetzes, Nonnus, and Cornutus, Ausonius. [1]

Osiris djed pillar | Dionysus tree

The following, below left, is depiction (1250BC), of Ra being reborn out of the djed pillar or backbone tree of Osiris; below center, is a depiction of the Greek god Dionysus, in the form a tree, amid the sacrificial table of wine and bread; below right (Ñº), a mural painting from Pompeii (Boetticher's *Baumcultus*, fig. 12), shows a depiction of the sacrificial table (with terminal bust of Pripns, and implement of sacrifice) and sacred tree of Dionysus (with thyrsus and tympanum):

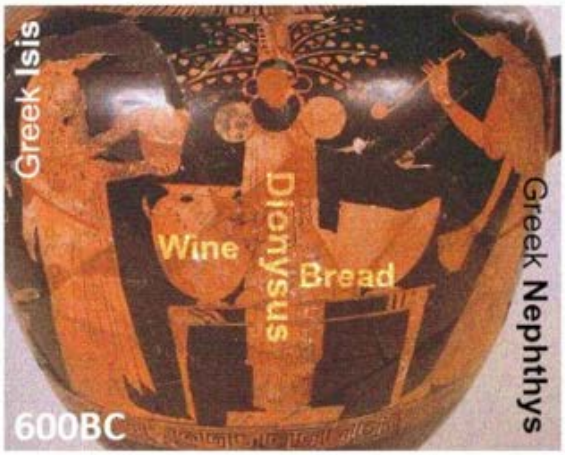

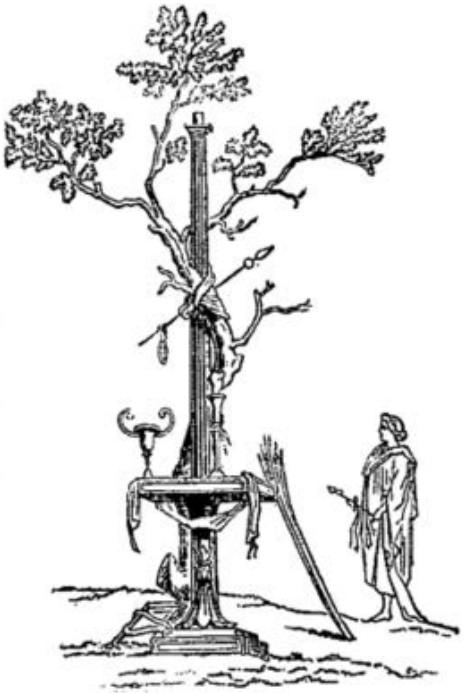

In the Jewish recension, the thyrsus of Dionysus became the magical rod of Moses; in the Roman recension, the thyrsus became the

thyrsus of Bacchus.

Dionysian

In 1885, Friedrich Nietzsche, in his *Will to Power*, in his last and final fragment (WP:1067), mentions force, energy, power, in the context of Dionysian.

> “I am a disciple of the philosopher **Dionysos**, I prefer to be even a satyr rather than a saint.”
>
> — Friedrich Nietzsche (1888), *Ecce Homo* (pg. 3)

Di·o·ny·sian

adjective

1. GREEK MYTHOLOGY
   of or relating to the god Dionysus.
2. of or relating to the sensual, spontaneous, and emotional aspects of human nature.
   "dark, grand Dionysian music"

More on this Nietzsche interest in Apollo and Dionysus is in video. (Ñº)

Quotes

The following are related quotes:

> “It is impossible to ignore the similarities between the Egyptian quarternity: Isis and Nephthys (known as 'the Two Goddesses' in Egypt), Osiris and Set (personifications of life and death), and the leading characters of the Eleusinian drama: Demeter and Persephone (also known simply as 'the Two Goddesses'), Dionysus and Hades. Diodorus of Sicily, first century BC, clearly states that the initiatory rites of Demeter in Eleusis were transferred from Egypt (Diodorus Siculus, 1.29.2). Later he states: The rite of Osiris is the same as that of **Dionysus** and that of Isis very similar to that of Demeter; the names alone having been interchanged, and the punishments in Hades of the unrighteous, the Fields of the Righteous and the fantastic conceptions, current among the many - all these were introduced by Orpheus in imitation of the Egyptian funeral customs.' (1.96.4-5).”
>
> — Timothy Freke and Peter Gandy (2001), *Jesus and the Lost Goddess* [2]

References

1. Frazer, James. (1907). *Adonis, Attis, Osiris* (pg. 357). MacMillan.
2. Freke, Timothy and Grandy, Peter. (2001). *Jesus and the Lost Goddess: The Secret Teachings of the Original Christians* (Osiris, 18+ pgs; quote, pg. 255). Random House.

External links

â— Dionysus – Wikipedia.

θΔics

In anecdotes, **Dirac dancing anecdote** refers the the mid Aug 1929 bemusement of Werner Heisenberg of Paul Dirac's wonderment as to why he was dancing with the flapper girls on the cruse ship they were on, going to Japan; Dirac not understanding why people dance, in short.

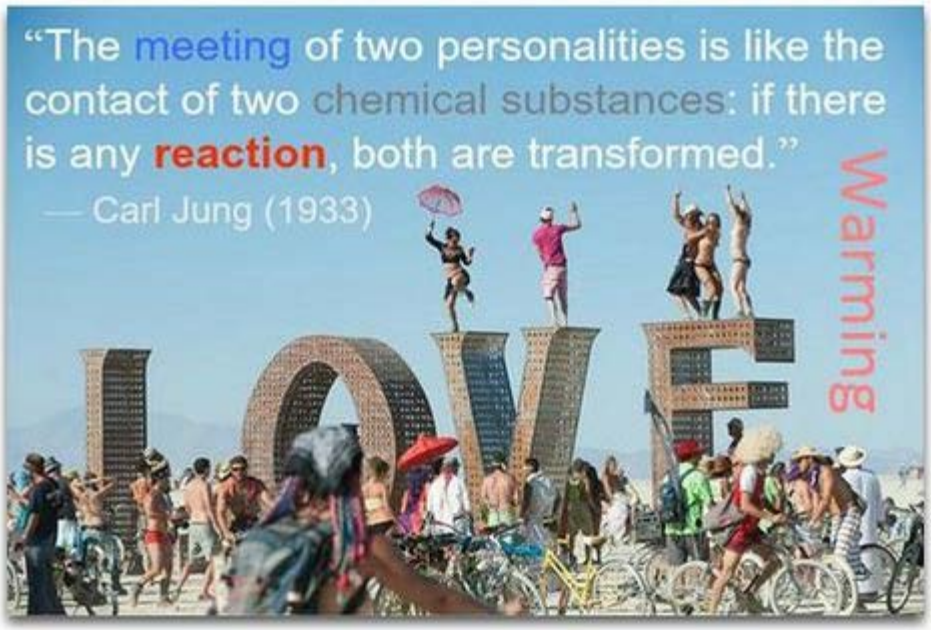

People dancing at Burning Man 2014 (Q), something Paul Dirac couldn't understand the reason of, i.e. the "why' of dancing?

Overview

In 1929, mid August, Werner Heisenberg and Paul Dirac, after each had given a series of lectures in Robert Oppenheimer's department at the University of California, Berkeley, set off from San Francisco on a two-week cruise to Japan, during which time Heisenberg was "conventionally hedonistic", as Graham Farmelo reports, likely partying and dancing with the flapper girls. Heisenberg long remembers Dirac looking on quizzically and asking: [3]

> "Why do you dance?"

In 2015, Libb Thims, in his "Zerotheism for Kids" class, employed the Dirac dancing anecdote as a means to teaching "meaning" to kids, in opposition to the the "blind random chance" motto, of the Greek atomic theorist origin, parlayed by many modern day atheists (e.g. Richard Dawkins), in conjunction with Adams creed, on the supposition of waves and tides existing in the universe. [2]

Rankine

In circa 1845, mathematical physicist and engineer William Rankine penned his "The Mathematician in Love" poem, wherein the fourth section of which he speculates on dancing:

> The lady loved dancing: — he therefore applied,
> To the polka and waltz, an equation;
> But when to rotate on his axis he tried,
> His center of gravity swayed to one side,
> And he fell, by the earth's gravitation.

(add discussion)

Quotes

The following are related quotes:

> "What good is studying Euclid, if you can't use it to explain why Elvis played the ukulele?"
>
> — Libb Thims (2013), personal note (reminiscent of Dirac dancing anecdote); arisen in respect to pure mathematicians ranking in current smartest person existive genius rankings, Nov 18

> “Unbidden and unwarned, nature receives us into the circuits of her dance, drifting onward with us herself, until we grow tired and drop from her arms.”
>
> — Johann Goethe (c.1800), an Inderjit Singh favorite quote (Q)

See also

- Einstein on love

References

1. Farmelo, Graham. (2009). *The Strangest Man: the Hidden Life of Paul Dirac, Mystic of the Atom* (pgs. 163-64). Basic Books.
2. Thims, Libb. (2015). “Zerotheism for Kids” (co-host: Thor) (main), 14-part [4:41-hr] lecture playlist (Q), 5-intro sides (Q), 56-main sides (Q), 11AM-3PM, Chicago, Aug 10 (recorded), Sep 7 (published).

θΔics

In existographies, **Dirk Helbing** (1965-) is German-born Swiss computational social scientist noted for []

Overview

In 1994, Helbing, as cited by Yi-Fang Chang (2013), developed a mathematical model for behavioral changes under the influence of a social field. [1]

In 1995, Dirk Helbing, in his *Quantitative Sociodynamics*, outlines a social force model, oft-cited in the crowd dynamics studies, according to which the motion of pedestrians can be ascribed to a combination of a driving force, that reflects the person's internal motivation to move in a given direction at a certain speed, and repulsive forces describing the effects of interactions with other pedestrians and boundaries such as walls or obstacles in streets.

Quotes | By

The following are quotes by Helbing:

> "It is suggested that the motion of pedestrians can be described as if they would be subject to 'social forces'. These 'forces' are not directly exerted by the pedestrians' personal environment, but they are a measure for the internal motivations of the individuals to perform certain actions (movements). The corresponding force concept is discussed in more detail and can be also applied to the description of other behaviors."
>
> — Dirk Helbing (1998), "Social Force Model for Pedestrian Dynamics" (co-author: Peter Molnar) [2]

References

1. (a) Helbing, Dirk. (1994). "Article", *Journal of Mathematical Sociology*, 19(3):189.
(b) Chang, Yi-Fang. (2013). "Social Thermodynamics, Social Hydrodynamics, and Some Mathematical Applications in Social Sciences" (pdf), *International Journal of Modern Social Sciences*, 2(2):94-108.
2. Helbing, Dirk and Molnar, Peter. (1998). "Social Force Model for Pedestrian Dynamics" (pdf), ArXiv.org, May 20.

External links

â— Dirk Helbing – Wikipedia.

θΔics

In existographies, **Dirk ter Haar** (1919-2002) (CR:6) was a Anglo-Dutch physicist, noted for his *Elements of Statistical Mechanics*, a classic statistical mechanics textbook that argues firmly against any identification of information with thermodynamic entropy, and also for his c.1963 initiative to have 21 classic articles on the nature of gasses, heat, and irreversibly translated into English and printed in one book, for the sake of researchers.

Overview

In c.1963, Haar initiated a series called "Selected Readings in Physics", which he edited for Pergamon Press, wherein he orchestrated a collective of 11 classic papers on the "nature of gases and heat" (part one), with papers by: Robert Boyle, Isaac Newton, Daniel Bernoulli, George Gregory, Robert Mayer, James Joule, Hermann Helmholtz, Rudolf Clausius, and James Maxwell, and 10 papers on "irreversible processes" (part two), by James Maxwell, Ludwig Boltzmann, William Thomson, Henri Poincare, and Ernst Zermelo. The project was eventually finalized in by Stephen Brush, who had begun to interact with Haar as a graduate student at Oxford in 1953, who in 2003 added a part three "historical discussion" and part four: a guide to historical commentaries: kinetic theory of gases, thermodynamics, and related topics. [3]

In 1966, ter Haar penned a book on thermostatics. [2]

Quotes | By

The following are quoted by Harr:

> "The relation between entropy and lack of information has led many authors, notably Shannon, to introduce 'entropy' as a measure for the information transmitted by telephone lines, and so on, and in this way entropy has figured largely in discussions in information theory. It must be STRESSED here that the **entropy introduced in information theory is *not* a thermodynamical quantity** and that the use of the same term is rather misleading."
>
> — Dirk ter Haar (1954), *Elements of Statistical Mechanics* (pg. 232); see: information entropy (quotes) [1]

References

1. (a) Ter Haar, Dirk. (1954). *Elements of Statistical Mechanics* (pg. 232). Rinehart.
(b) Thims, Libb. (2012). "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair" (url), *Journal of Human Thermodynamics*, 8(1): 1-120, Dec 19.
2. Haar, Dirk ter. (1966). *Elements of Thermostatistics*. Holt, Rinehart & Winston.
3. Brush, Stephen. (2003). *Kinetic Theory of Gases: an Anthology of Classic Papers with Historical Commentary, Volume One* (editor: Nancy Hall) (pg. ix). Imperial College Press.

External links

â— Dirk ter Haar – Wikipedia.
â— Zuzemsky, A.L. (2006). "Dirk ter Haar (1919-2002)", Jinr.ru.

θΔics

In thermodynamics, **disentropic** is an entropy antonym conceptualized term referring to behaviors of living organisms that are opposite to that of entropic behaviors, in the loose sense of ordering behaviors. The term was introduced in the 1947 book *Time and Thermodynamics* by Belgian-born English thermodynamicist Alfred Ubbelohde. [1]

Overview

In 1947, Alfred Ubbelohde, in his "Thermodynamics and Life", stated the following:

> "For the sake of brevity it may be excusable to commit a minor offense against the Greek language; we propose to term happenings which turn against the trend towards increasing entropy, '**disentropic**'."

(add discussion)

See also

â— Anti-entropy difficulties

References

1. Ubbelohde, Alfred René. (1947). *Time and Thermodynamics*, (pg. 97). Oxford University Press.

θΔics

In thermodynamics, **disgregation**, as contrasted with aggregation, refers to entropy being a measure of the separation distance of the particles of a system. Disgregation is the alternative definition of entropy, introduced by German physicist Rudolf Clausius in 1862, introduced to mean that entropy can be thought of as the "arrangement of the body" or ordering of the constituent particles of the body. [1]

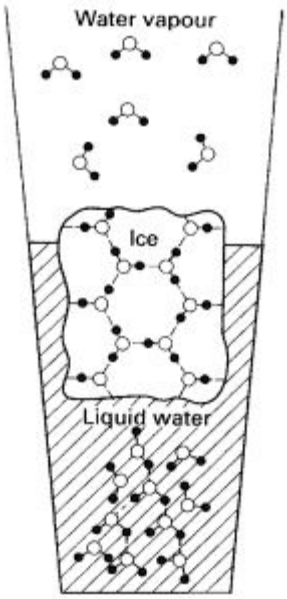

Two depictions of Ice melting, molecular and visual, described in 1862 by Rudolf Clausius as an increase in the **disgregation** of the water molecules in ice, a precursor to the later order-disorder views of entropy. [2]

References

1. (a) Clausius, Rudolf. (1862). "On the Application of the Theorem of the Equivalence of Transformations to Interior Work." Communicated to the *Naturforschende Gesellschaft of Zurich*, Jan. 27th, 1862; published in the *Viertaljahrschrift of this Society*, vol. vii. P. 48; in *Poggendorff's Annalen*, May 1862, vol. cxvi. p. 73; in the *Philosophical Magazine*, S. 4. vol. xxiv. pp. 81, 201; and in the Journal *des Mathematiques of Paris*, S. 2. vol. vii. P. 209;
(b) Clausius, R. (1865). *The Mechanical Theory of Heat – with its Applications to the Steam Engine and to Physical Properties of Bodies* (Sixth Memoir, pgs. 215-66). London: John van Voorst, 1 Paternoster Row. MDCCCLXVII.
2. Williams, R.J.P. and da Silva, J.R.R. Frausto. (2008). *The Chemistry of Evolution: the Development of our Ecosystem* (pg. 80). Elsevier.

Further reading

â— Pellegrino, Emilio M., Ghibaudi, Elena, and Cerruti, Luigi. (2015). "Clausius' Disgregation: a Conceptual Relic that Sheds Light on the Second Law" (abs), *Entropy*, 17(7):4500-18.

External links

â— Disgregation – Wikipedia.

θΔics

In thermodynamics, the amount of **disorder**, in contrast to order, in system is often considered as a representation of entropy or as a proportional measure or correlate of entropy. [1] In a sense, the higher the entropy of a structure or system the greater disorder. [2] This interpretation of entropy, stems from the statistical theories of particularly Austrian physicist Ludwig Boltzmann (1870s) and the later interpretation of his work by German physicist Max Planck (1901) as well as the earlier terminologies of German physician and physicist Hermann von Helmholtz (1882), as well as having a connectivity to Walther Nernst's heat theorem (1907) and the third law of thermodynamics, all of which seem to be captured in Planck's principle of elementary disorder.

Entropy

In 1862, German physicist Rudolf Clausius introduced the aggregation and disgregation model of entropy.

Austrian physicist Ludwig Boltzmann seems to have been the origin of the disorder view of entropy, but the exact article needs to be tracked down.

In 1882, German physicist Hermann Helmholtz used the word "Unordnung" (disorder) to describe entropy. [3] Specifically, in February 1882 in an address to the *Akademie der Wissenschaften zu Berlin,* Helmholtz stated the following on the topic of the second law: [6]

> "Unordered motion, in contrast, would be such that the motion of each individual particle need have no similarity to its neighbors. We have ample grounds to believe that heat-motion is of the latter kind, and one may in this sense characterize the magnitude of entropy as the measure of **disorder**."

This famous disorder definition of entropy, of course, soon led to the great "evolution second law debate", being the public debate on the seeming conflict between evolution and the second law. In short, the argument goes as such: if, in the 1865 words of Clausius, the second laws declares that (a) the entropy of the universe tends to a maximum, and if, according to the 1882 views of Helmholtz, that (b) entropy is a measure of disorder, then the sum of these two latter points, on the surface, seem to contradict the earlier 1859 view of Darwin that (c) species of higher orders have evolved over time from species of lesser orders. Mathematically speaking, when these comments are taken on face value:

$$a + b \neq c$$

In 1973, French sociological anthropologist Roger Caillois famously summarized the debate as such: "Clausius and Darwin cannot both be right." [7]

One of the first to summarize the development of this conception was American mechanical engineer Joseph Klein in his 98-page, 1910 book *Physical Significance of Entropy or of the Second Law.* [3] In the preface, he summarizes what he calls the "interpretations reached by Boltzmann and Planck" and that he draws most heavily upon Planck, in that he views Planck as being "the clearest expositor of Boltzmann". Klein summarizes the view that Boltzmann and Planck have reached the result that "the entropy of any physical state is the logarithm of the probability of that state, and this probability is identical with the number of *complexions* of the state." Moreover, "this number is the measure of the permutability of certain elements of the state and in this sense entropy is the *measure of the disorder of the motions of a system of mass points.*" [3]

The most notable derivation of a thermodynamic measure or interpretation of disorder was given in the famous 1944 book *What is Life?,* chapter six: "Order, Disorder and Entropy", by Austrian physicist Erwin Schrödinger, who stated in loose terms that for any body in question entropy is proportion to the logarithm of disorder. Schrödinger argues, it is argued that based on the statistical thermodynamics investigations of Austrian physicist Ludwig Boltzmann and American engineer Willard Gibbs, that disorder is given by the following expression:

$$\text{entropy} = k \log D$$

where *k* is the Boltzmann constant and *D* is a "quantitative measure of the atomistic disorder of the body in question". [5]

References

1. (a) *Entropy* – a measure of disorder; the higher the entropy the greater the disorder (Source: *Oxford Dictionary of Chemistry*, 2004).
(b) *Entropy* – in thermodynamics, a parameter representing the state of disorder of a system at the atomic, ionic, or molecular level; the greater the disorder the higher the entropy (Source: Barnes & Noble's *Essential Dictionary of Science*, 2004).
(c) *Entropy* – a measure of disorder in the universe or of the availability of the energy in a system to do work (Source: Gribbin's *Encyclopedia of Particle Physics*, 2000).
2. *Entropy – a measure of disorder; the higher the entropy the greater the disorder (Source: Daintith, John. Oxford Dictionary of Science, 2005).*
3. Anderson, Greg (2005). *Thermodynamics of Natural Systems*. (pg. 105). Cambridge University Press.
4. *Klein, Joseph Frederic. (1910). "Physical Significance of Entropy or of the Second Law"*, (Preface). *New York: D. Van Nostrand Co.*
5. Schrödinger, Erwin. (1944). *What is Life?* (ch. 6 "Order, Disorder, and Entropy). pgs. 67-75 Cambridge: Cambridge University Press.
6. Capri, Anton Z. (2007). *Quips, Quotes, and Quanta* (ch. 1: Thermodynamics: Founders and Flounderers, pgs. 1-10) [PDF]. World Scientific.
7. Caillois, Roger. (1973). *Coherence Adventures: Aesthetics Generalized, in the Heart of Fantastic, the Asymmetry* (*Coherences Aventureuses: Esthetique Generalisee, au Coeur du Fantasitique, la Dissymetrie*). Paris: Gallimard.

External links

â— Denbigh, K. G. (1989). "Note on Entropy, Disorder and Disorganization". *Brit. J. Phil. Sci.*; 40: 323 -332.

θΔics

In non existences, **disproofs of the existence of god**, deity disproofs, “proofs for the non-existence of god”, aka “natural atheology”, as Alvin Plantinga (1974) defines things, refers to one or more definitive and conclusive proofs — experimental, logical, evidential, and or scientific — that “god” does not exist, namely that the presumed existence of god is not a reality; which, conceptually, be compared, in similar vein, to how the Michelson-Morley experiment (1887) plus Einstein’s relativity theory (1905) proved that “ether” does not exist; which is similar to how Benjamin Thompson’s 1798 cannon boring experiment, combined with Clausius’ entropy theory (1865), proved that “caloric” does not exist, the latter two being disabused from science thereafter.

Screenshot of the 2015 Atheism Reviews video “15 Disproofs of the Existence of God” (Q) by Libb Thims.

Overview

In 1729, Jean Meslier, in his *The Testament*, devoted some 600-pages, divided into 97 sections, give or take, to various logical disproofs of the existence of god.

In 1955, Australian philosopher John Mackie, in his “Evil and Omnipotence”, deployed the problem of evil as a disproof for the existence of god. [1] In 2007, American physicist Victor Stenger, as a guest host on the Atheist Experience, discussed his new book *God: the Failed Hypothesis*, and how science can, in his view, disprove the existence of god, wherein he states that because the hypothesis of god lacks empirical evidence, the concept of god is not part of modern science, and therefore does not exist. He says that “we can find positive evidence to falsify the god hypothesis”, one example being the intercessory prayer experiment. [6]

List

The following is a work-in-progress ranking of the top 20 disproofs of the existence of god, in ranked descending order: [5]

#	Proof	Description	Commentary	Image
1.	Critias hypothesis disproof	Per the logic that (a) “gods” are an invention of lawgivers of ancient times, employed to as kind of overseers of the right and wrong actions of men (Critias, c.410BC), which became reduced to the logic that (b) the universe must be governed by a single “god”, and NOT the product of the whims of many gods, each governing its own province according to his own laws (Melvin Calvin, 1969), which became reduced to the logic that (c) if all the phenomena of motion follow from one set of principles (Morris Kline, 1982) then of the phenomenon of human motion follow from the set of principles of chemical thermodynamics where there is NO god (or gods), then god, by repercussion, does not exist.	This logic is the basis of zerotheism.	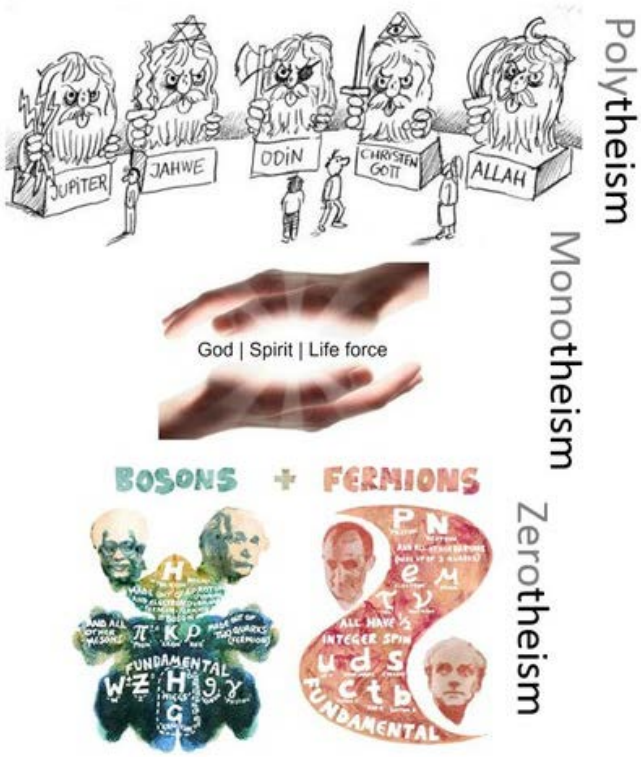
2.	God's work disproof	That the ancient saying that the “lord works in mysterious ways” (Isaiah 45:15), has now been superseded and thereby supplanted by “work” explained thermodynamically makes the supposition of the	See: Beg-Thims dialogue for specifics.	

		existence of a "supernatural power" (higher power), thereby null, invalid, and superfluous.		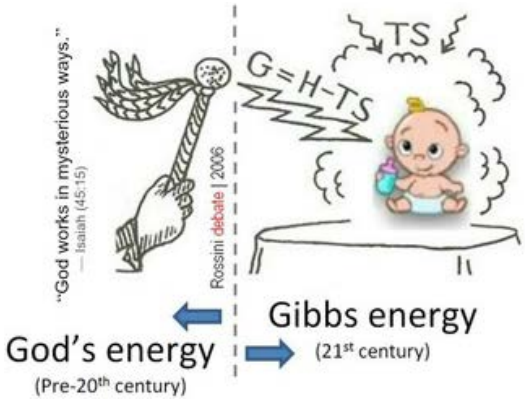
3.	Aluminum disproof	That god said (Gen 2:7) he created man from a mixture of clay ("Adam" is Hebrew for clay) and divine breath or spirit (Eve is Hebrew for breath or spirit), and that the primary elements of clay (see: clay creation myth) are: aluminum, silicon, and oxygen, but that humans, according to mass composition (see: human molecular formula), are not comprised of aluminum, proves that god does not exist.	First pointed out by Alfred Lotka (1925). Pointed out, independently, on 7 Jul 2014 in the Beg-Thims dialogue (comment #10); then on 6 Jan 2015, by Libb Thims (V:5:40-6:05), as an effective disproof of the existence of god.	
4.	Afterlife does not exist argument (aka "eternal life argument")	If, per **disproof #5**, namely: life does not exist, meaning that "moving creatures" are but powered atomic geometries, neither alive nor dead, but correctly existing in prolonged states of trajectory-based animation, then, per corollary, "afterlife" (i.e. eternal life), the assumed post-cessation state of existence, in the abode of god, does not exist, i.e. eternal life constitutes perpetual motion, therefore god does not exist.	Documented, on 24 Sep 2012, as a hand-written person note (Q) by Libb Thims: > "Not only do I not believe in the principle of the afterlife, but also do not believe in the principle of life." Hidden LED marquee near-death experiments invalidate out-of-body claims. [10]	
5.	Life does not exist argument	That god said (Gen 1:20) he created "moving creatures that have life", on the fifth day of creation, but that, as science finds, "life does not exist" (see: defunct theory of life), e.g. as stated by Tesla: "there is no thing endowed with life" (1916), as concluded by Crick: "we should abandon the word alive" (1966), or as evidenced by experiment, e.g. Miller-Urey experiment (1952), proves that god does not	That "life", similar to the now defunct concepts of ether, caloric, or phlogiston, etc., does not exist, as either a property nor measureable or conceptual entity, as been independently deduced by Libb Thims (2009), Alfred Rogers (2010), and Ferris Jabr (2013).	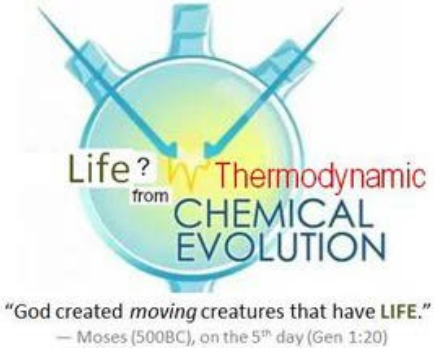

		exist.			
			First point out by Goethe:		
6.	Moral symbols argument	That morality in nature explained by the symbols and laws of physical chemistry and not based on the laws of the Bible, proves that god does not exist.		"Science shows that what is moral or amoral in nature is found, not in the Bible, but in the reaction symbols of physical chemistry." — Johann Goethe (1809/30), "Conversation with Riemer and Zelter" (see: timeline)	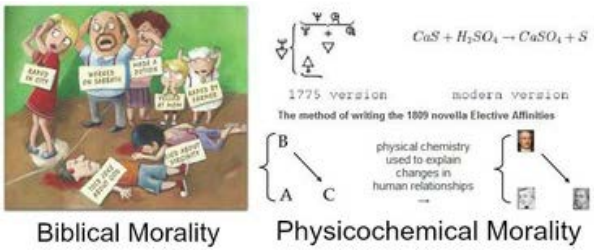
7.	Existence of evil argument	That "evil" exists, e.g. Hitler was born, natural catastrophes occur, etc., proves that god does not exist; Francis Bradley (1893) stated the problem thusly: [8] "The trouble has come from the idea that the Absolute [God] is a moral person. I you start from that basis, then the relation of evil to the Absolute [God] presents at once an irreducible dilemma. The problem then becomes insoluble, but not because it is obscure or in any way mysterious. To anyone who has the sense and courage to see things as they are, and is resolved not to mystify others or himself, there is really no question to discuss. The dilemma is plainly insoluble because it is	First stated by Epicurus and is circa 270BC "problem of evil" argument; ; scholars such as John Mill ("Theology", 1874) and Francis Bradley (*Appearance and Reality*, 1893) (Q), stated that the existence of perfectly moral, perfectly good, omnipotent (all-powerful), omniscient (all-knowing) god, on one hand, and the existence of evil, on the other, is an insoluble self-contradiction; problem solved in 2011, by Libb Thims, via coupling theory. [4] The problem of evil, according to Alvin Plantinga (1974), is the most-impressive piece of atheology, i.e. the subject of god disproofs. David Berlinski (2011): "the traditional question that is supposed to flummox believers is the existence of evil." (Q) Adjacent: 1991 *Time* best cover. [9]		

		based on a clear self-contradiction.”		
8.	Free will argument	That soul (or karma) theory is based on the assumed existence of free will, but that science finds that free will doesn't exist, e.g. Libet experiment, proves that god does not exist.		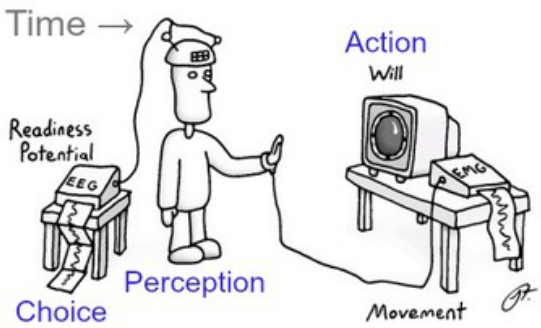
9.	Imperfect world argument (aka "argument from undesign" or the "disteleolgy" objection)	Thinkers such as Kenneth Miller, Richard Dawkins, and George Williams, have decried the eye's structure as poorly or "stupidly" designed, supposing there were an "intelligent designer", in terms of neural wiring, light scattering, and retina position; as Lee Strobel put it to Stephen Meyer: [105] “If there is a designer, doesn’t the botched eye design **prove** he’s not really that intelligent? [doesn't exist]”	The following atomic theory based statement by Lucretius, from his *De rerum natura* (5.198–9), according to C.S. Lewis (1955): “Had God designed the world, it would not be a world so frail and faulty as we see.” is the strongest argument for atheism—or “argument from undesign” as he refers to it: [3]	
10.	Evolution argument	That god said (Gen 1:20-27) he “created” humans and animals, in their present form, on a particular day, some 5,000-years ago, but that fossil record, DNA evidence, morphology studies, chemical origins, etc., shows that humans "evolved", morphed, or were chemical synthesized over time, from hydrogen atom precursors, over the last 13.8-billion years, proves that god does not exist.	Made famous by Darwin’s *The Origin of Species* (1859); the biggest blow to religion since atomic theory.	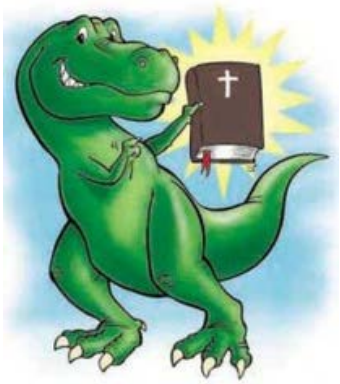
11.	Heart prayer study	The 2006 Heart Prayer Study (Q), which found that those prayed for faired “worse”, following coronary artery bypass surgery, than those not		

		prayed for, proves that god does not exist.		
12.	Glowing olive oil disproof (Infinite energy disproof)	Muslim's equate Allah (God) to ever-glowing olive oil, in a dark cave, i.e. energy infinite (Noorun Ala Noor)	Infinite energy as well as light-emitting oil is thermodynamically impossible, i.e. a perpetual motion theory; see: Beg-Thims dialogue (threads: #130-35)	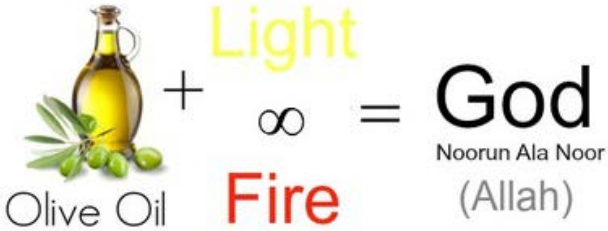
13.	Earth moves argument	That the Bible, i.e. the revealed word of gods, says that the earth is immobile, e.g. "the world is established and cannot be moved" (Psalms 93:1; Book of Isaiah 23), and at the center of the universe, but that science finds that the earth does move and is not the center of the universe, proves that god does not exist.	Italian physicist Galileo Galilei was tried in 1633 and convicted for pointing out this issue (Q), made to recant, and put under house arrest. (Q)	
14.	Religious disagreement argument	That there are so-many religions, with so many gods, and inconsistencies and disagreement on points, proves that god does not exist.		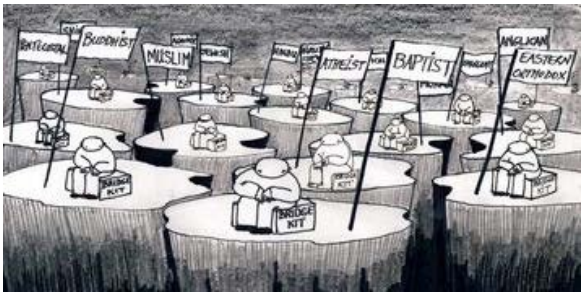
15	Blood bath argument	The number of people killed in the name of god proves that god does not exist.		
16.	Hypothesis by default argument	That the existence of "god" is but an hypothesis, with no evidence in its favor, and thereby never verified as true, is proof by default that god does not exist.	Dismissed as an unneeded hypothesis by Pierre Laplace, in 1802 (see: Napoleon Laplace anecdote), in respect to the operation of the universe.	

17.	Mythology argument	That Christianity, Islam, Hinduism, and the other residual religions, which constitute 75 percent of the world's beliefs, are based on mythology (see: religio-mythology transcription and syncretism), and that myths aren't real, proves that god is not real, and therefore does not exist.		
18.	Materialism argument	That all that exists is but "atoms and void" (Leucippus, 450BC) or "fermions and bosons" (Dirac, 1945), all else being but "opinion" (Democritus, 370BC) or metaphysical speculation (Lewis, 1925), proves that god does not exist.		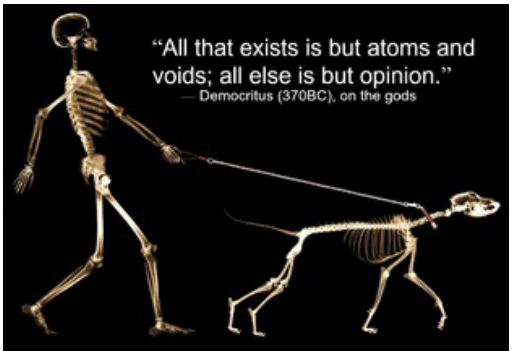
19.	Argument from ignorance (Hippocratic reductionism)	Based on the historical progressive tendency to de-divine a previously once-considered mysterious natural phenomena, e.g. "lightening" was once attributed to the god Thor, but now understood as the result of an electromagnetic potential difference between the clouds and the sky, or mysterious human phenomena, e.g. "love" was once attributed to the god Cupid, but now understood as a purely chemical reaction, once its physical or chemical workings are understood, it is assumed, by future extension, that the gods will eventually be worked out of all phenomena, and therefore, by reasoned conclusion, god does not exist.	Several alternative statements of the argument exist, such as: "Men think epilepsy divine, merely because they do not understand it. We will one day understand what causes it, and then cease to call it divine. And so it is with everything in the universe." — Hippocrates (370BC) "My object is to dispel the fear of the gods, which arises simply from the fact that there are so many things which men do not yet understand, and therefore imagine to be effected by divine power." — Lucretius (55BC)	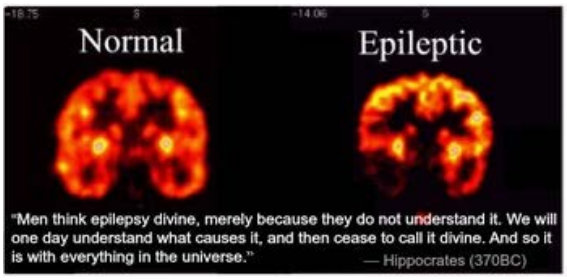
20.	No one's ever seen him (aka lack of evidence argument)	That "god" has never been seen, observed, measured, tested, and or quantified, in such a way as to provide empirical verifiable evidence, proves that such an entity does not exist.		

(add)

See also

- Belief in the existence of god by scientists

Quotes

The following are related quotes:

> "It is not possible to **disprove the existence of god**, as far as I know."
>
> — Richard Feynman (1963), *The Meaning of It All* [2]

> "Natural atheology, the attempt to prove that god does not exist or that at any rate it is unreasonable or irrational to believe that he does —in which the most widely accepted and impressive piece or representative has to do with the so-called problem of evil—is the opposite of natural theology, attempts to give successful arguments or proofs for the existence of God [in nature]."
>
> — Alvin Plantinga (1974), *God, Freedom, and Evil* [7]

> "You are never called upon to prove a negative; that is a law of logic."
>
> — Ayn Rand (1979), response to being asked (V) if the reason she does not believe in the existence of god was because that you can't prove that such an "entity, being, or energy" exists, by Phil Donahue; to which she responded that there is no proof and no one can give such a proof

> "Yes, I do have proof that god does not exist. It is perfect and irrefutable. I'm not going to show it to you however. You cannot detect it in any way. You cannot deduct it from the laws of logic either. You might claim that I do in fact have no such proof, but you have not proof that I don't. Sound familiar?"
>
> — Rune Friberg (c.2013)

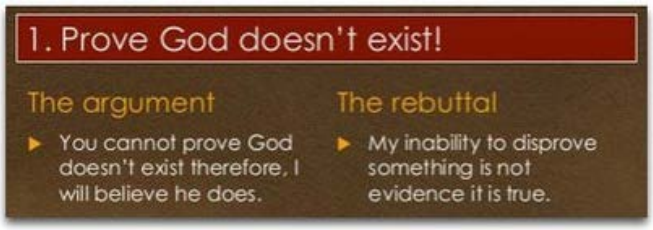

A SlideShare.net clip #29 (Q), of Kenyan Bill Flavell's 2014 deconversion story, on how the seeming inability to **disprove the existence of god** is one of the top seven popular arguments for god.

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θΔics

In thermodynamics, **dissipation** refers to the process of the loss of mechanical energy or energy in general.

History

The term "dissipation" was introduced, significantly, in the 1852 article "On a Universal Tendency in Nature to the Dissipation of Mechanical Energy" by British physicist and mathematician William Thomson; a phraseology later to be interpreted as the "law of dissipation of energy" [1] In Thomson's view, according to "known facts with reference to the mechanics of animal and vegetable bodies" there is "at present in the material world a universal tendency to the *dissipation* of mechanical energy" and that "any *restoration* of mechanical energy, without more than an equivalent of dissipation, is impossible in inanimate material processes, and is probably never effected by means of organized matter, either endowed with vegetable life or subject to the will of an animated creature". This terminology was later employed by Belgian thermodynamicist Ilya Prigogine in his theory of "dissipative structures". [2]

Difficulties

In the second law work of William Thomson the idea is inferred that the vague idea of the "dissipation of energy" is an alternative yet equivalent to Rudolf Clausius' "entropy increase" version of the second law of thermodynamics. To this day, the two versions by many are seen as being synonymous. The dissipation of heat, contrary to what Thomson believed, according to science historians Stephen Weininger and Helge Kragh (who cite Edward Daub's 1970 article "Entropy and Dissipation"), does not correspond to a change in entropy, and in general the dissipation theorem is weaker than the entropy theorem in explaining why some processes occur spontaneously and some do not. [3]

Human thermodynamics

See also: social friction; human friction; human entropy

In regards to how the physical notion of dissipation translated over into human thermodynamic terminology, the extension is a bit blurry.

In 1885, while musing upon the subject of thermodynamics one day, Scottish physicist William Thomson suddenly realized that his wife was discussing plans for an afternoon excursion. "At what time," he asked, glancing up, "does the dissipation of energy begin?" [4]

In recent legal terminologies, the wasting of marital assets through extravagant spending, gambling or excessive borrowing or fraudulent conveyance of a third parties is called dissipation. [5]

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External links

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θΔics

In science, a **dissipative structure** is an organized nonequilibrium state of matter created and maintained due to dissipative processes. [1] The term was proposed in 1967 by Belgian chemist and thermodynamicist Ilya Prigogine to describe the spontaneous appearance of ordered structures in the non-linear domain, far from equilibrium. [2] Classic examples of dissipative structures include: Bénard cells (adjacent), the Belousov-Zhabotinskii reaction, Taylor vortices, cyclones, hurricanes, and lasers. [3] The loose spin-off of the theory is that all life forms, humans included, are, by definition, far-from-equilibrium dissipative structures. [4] A newer variant of the term is "dissipative system".

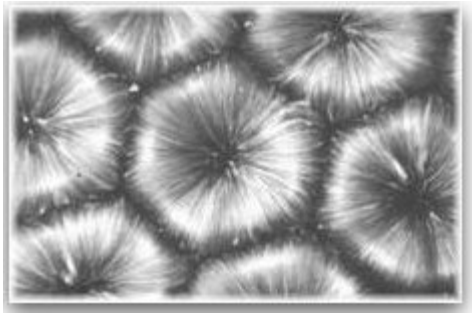

The top view of Bernard cells formation; a type of **dissipative structure**, i.e. heat dissipation through the liquid, works to form hexagonal "structures:.

Life | Prigogine

The contention alluded to by Prigogine, in regards to a thermodynamic theory of life, is that dissipative structures not only maintain themselves in a stable state far from equilibrium, but may even evolve. When the flow of energy and matter through them increases, they may go through new instabilities and transform themselves into new structures of increased complexity. Said another way, dissipative structures grow more complex by exporting, or dissipating, entropy into their surroundings. [3] In 1973, Prigogine stated his views on the matter as such: [12]

> "It would be too simple to say that the concepts of life and **dissipative structures** are intermingled ... But it is not just one instability that makes it possible to cross the threshold between life and non-life; it is, rather, a succession of instabilities of which we are only now beginning to identify certain stages. But let us have no illusions. If today we look into the situation where the analogy with the life sciences is the most striking — even if we discovered within biological systems some operations distant from the state of equilibrium — our research would still leave us quite unable to grasp the extreme complexity of the simplest of organisms."

In the years to follow, the view soon emerged, for many, that life is a dissipative structure. [3]

History

The idea of dissipative structures began to seed in Prigogine's 1955 book *Thermodynamics of Irreversible Processes.* [5] Its phraseology is said to have been borrowed from American mathematical physical chemist Alfred Lotka who, in his 1924 book *Elements of Physical Biology*, discussed how "dissipative effects" and "dissipative forces" related to the process of organic evolution in the equilibrium or new-equilibrium regime. [6]

Prigogine has been particularly captivated by the problem of explaining how ordered structures, e.g. biological systems, can develop from disorder. Prigogine and his assistants chose instead to study systems which follow non-linear kinetic laws and which, moreover, are in contact with their surroundings so that energy exchange can take place - *open systems*, in other words. If these systems are driven far from equilibrium, a completely different situation results. New systems can then be formed which display order in both time and space and which are stable to perturbations. Prigogine has called these systems *dissipative systems*, because they are formed and maintained by the dissipative processes which take place because of the exchange of energy between the system and its environment and because they disappear if that exchange ceases. They may be said to live in symbiosis with their environment. [7]

Prigogine first presented his concept of dissipative structures in a 1967 lecture at a Nobel Symposium in Stockholm. [8] Four years later, together with his French physicist Paul Glansdorff, he published the first formulation of the full theory. [9] Prigogine won the 1977 Nobel Prize in Chemistry for this work. [10]

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External links

â— Dissipative structure - Cosma Shalizi, self-organization researcher, Carnegie Mellon University.

θΔics

In science, a **dissipative system** refers to a thermodynamic system that is “dissipative” in that usable energy is converted into non-recoverable forms of work. [1] The term, in large part, is an etymological evolution of Belgian thermodynamicist Ilya Prigogine’s 1967 theory of “dissipative structures”, a nonequilibrium thermodynamics type of theory which itself modeled on the spontaneous formations of the heat-transfer driven Bénard cells “structures”.

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External links

â— Dissipative system – Wikipedia.

θΔics

In existographies, **Ditmar Schneider** (c.1952-) is a German historian, an Otto Guericke scholar, noted for []

Education

In 1982, Schneider completed his PhD with a dissertation on "For modeling fluidized beds on inclined fluid bed cross-flow floors" ("Zur Modellierung von Wirbelschichten auf geneigten Fliessbettquerstromböden") at the Otto von Guericke University Magdeburg; in recent years, Schneider has been involved in Guericke (O) conferences of some sort.

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θΔics

In terminology, **divorce** refers to the point in time at which a legal marriage becomes legally dissolved.

A generic **divorce** image of two people ceasing to have further interaction, at which point the bond breaks or dissolves. [3]

Overview | Reaction

The chemical reaction notation for divorce is:

$$AB \rightarrow A + B$$

where reactant AB is a dihumanide molecule and the products, A and B, are "single" unattached human molecules, and is called a debonding reaction or dissolution reaction. Statistically speaking, in American, about 43 percent of new marriages will go through a "divorce reaction" of this type by the point of the 15-year mark.

If there is an affair involved the reaction is what is called a single elective affinity or single displacement reaction, the type of reaction that formed the basis of much of German polymath Johann Goethe's 1809 scientific novella *Elective Affinities*.

A few examples of these latter types of single displacement divorce reactions, shown in the style of Cullen reaction diagrams, are depicted below, showing that the force of chemical affinity is has a stronger preference for one over another, as indicated by the "reaction dart", to the effect that the person will be "forced" to leave the confines of the established bond, signified by the bonding bracket, and to form a new relationship with the more reactant to which the force of affinity is stronger:

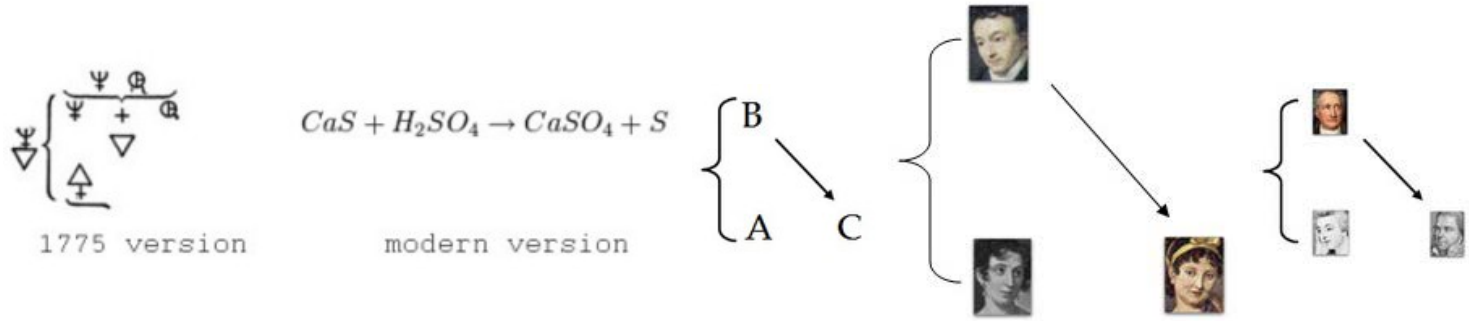

Examples of simple chemical single elective affinity reactions (left) and human single elective affinity reactions (right).

The 1990s work of American mathematical psychologist John Gottman arrived at a formula able to predict divorce to within a 94% accuracy videotaping and studying the micro-second-by-microsecond exchange rate of interactions of couples in his love labs, findings which underlie the theory of the Gottman stability ratio. [1]

Thermodynamics

In 2009, Indian chemist Surya Pati argued that the underlying thermodynamic reason for divorce, which in India occur in 45% of marriages, is entropy, which he defines as the measure of disorderliness in a system. He argues that because the 'entropy law' states that systems always tend to disorder, that to counter this in relationships, pairs tend to become structured towards each other, often making extreme sacrifices, in such a way that freedom tends to be reduced. In this context, Pati postulates that in those who divorce, stress builds, up due to entropy, reaching a tipping point that he calls a volcano effect. [2]

The so-called "divorce season" is said to begin January 02, a day which corresponds to the point in time at which day light hours begin to increase, and hence the point in time when the system begins to be heated more and more each day. [2] A spontaneity table interpretation of this may conclude with the view that this may correspond to a reaction where both ΔH and ΔS are negative where in such situations the "reverse reaction", in this case bond break up or dissolution, becomes spontaneous at higher temperatures.

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θΔics

In Egyptian mythology, **djed pillar**, or "tet", generally refers to Osiris reborn in the form of an evergreen tree (see: Christmas tree), after he had been trapped in a chest by his brother Set and thrown into the Nile River; beyond this, little is agreed upon as to its four tiered structure.

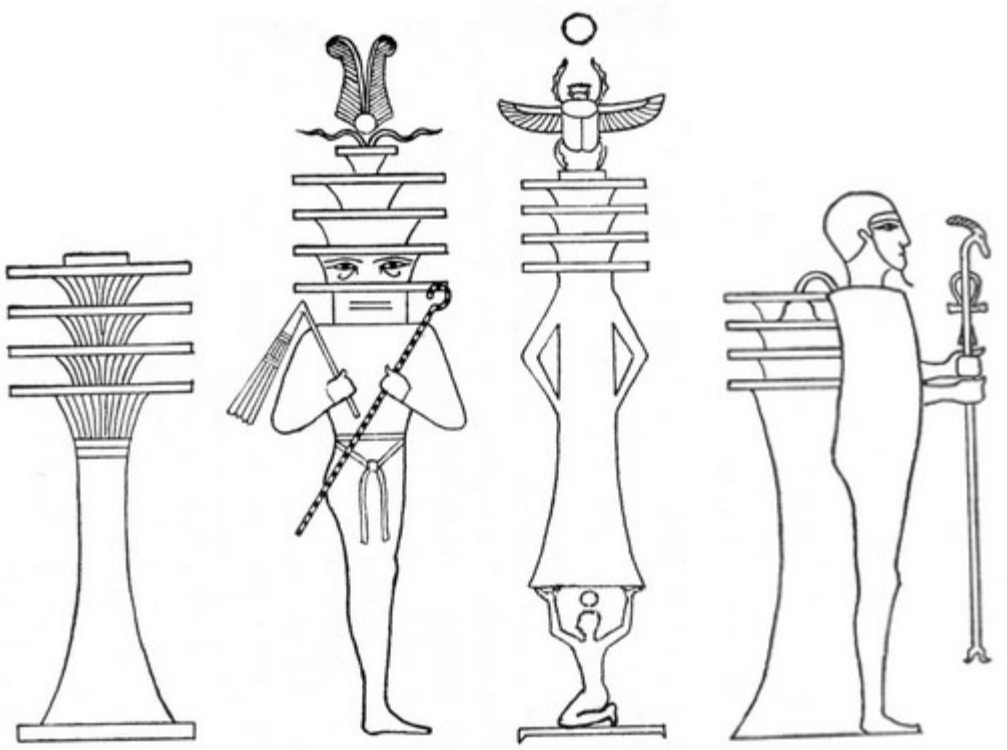

Four depictions of the **djed pillar**: first, the stand form of the djed pillar, representing Osiris reborn as an evergreen tree (see: Christmas tree); second, Osiris in mummified form as djed pillar, in semi-human form, holding a flagellum and shepherd's crook; third, a human-like form, with sun disc on his head, holding the djed pillar above him, out of which Ra-Khepri, aka the morning sun, arises; forth, Ptah, supposedly, in the mummified form of Osiris, holding the was scepter and the ankh. [1]

Overview

In 1892, Flinders Petrie suggested that the djed was derived from a pillar with four superimposed capitals; or alternatively, a picture of four pillars one behind another, according to the Egyptian ideas of perspective. [2]

In c.1910s, Wallis Budge popularized the theory that the djed pillar was the backbone of Osiris. [2]

In 1925, W. Kristensen suggested that the djed with its four crenels was the four pillars of heaven. [2]

In 1935, H. Gauthier suggested that the djed was a column made of reeds used to support the roof of a predynastic building. [2]

In c.1993, Jacobus van Dijk suggested that it was representative of Shu (or Heh) holding the heavens. [2]

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See also

- Christmas tree
- Khoiak festival

External links

- Djed pillar – Wikipedia.

θΔics

In existographies, **Dmitri Mendeleyev** (1834-1907) (IQ:175|#240) (Murray 20:16|C) (CR:21) was a Russian chemist noted for his 1869 construction of the periodic table of elements, which after struggling with for some time prior, he found say the table in a dream: [1]

> "I saw in a dream a table where all the elements fell into place as required. Awakening, I immediately wrote it down on a piece of paper."

Of curiosity, this is similar to German chemist August Kekule's famous 1865 dream about a snake circling around to bite its tale as the visualization of the structural model for Benzene. Mendeleyev's table that he wrote down, containing a total of 66 known (and some unknown) elements, is shown below:

Students

A noted student of Mendeleyev was "biosphere" theorist Vladimir Vernadsky.

Other

Mendeleev is also credited for scientific justification of the "optimal" ratio of alcohol of 40% (80 proof) used in Russian vodka. (Q)

Table

The original version of Mendeleyev's table is shown adjacent.

Quotes | On

The following are related quotes about Mendeleyev:

> "Mendeleev is dead", looking at a personal signed photograph of the chemist, "Now where is his will? He was a very great man. His will has the greatest part of him. What has become of that will? I don't know."
>
> — Thomas Edison (1909), Interview with Edward Marshall on religious theories [2]

Quotes | By

The following are related quotes:

> "There exists everywhere a medium in things, determined by equilibrium."
>
> — Dmitri Mendeleyev (c.1880) (Q)

> "It is the function of science to discover the existence of a general reign of order in nature and to find the causes governing this order. And this refers in equal measure to the relations of man - social and political - and to the entire universe as a whole."
>
> — Dmitri Mendeleyev (c.1880) (Q)

> "The elements, if arranged according to their atomic

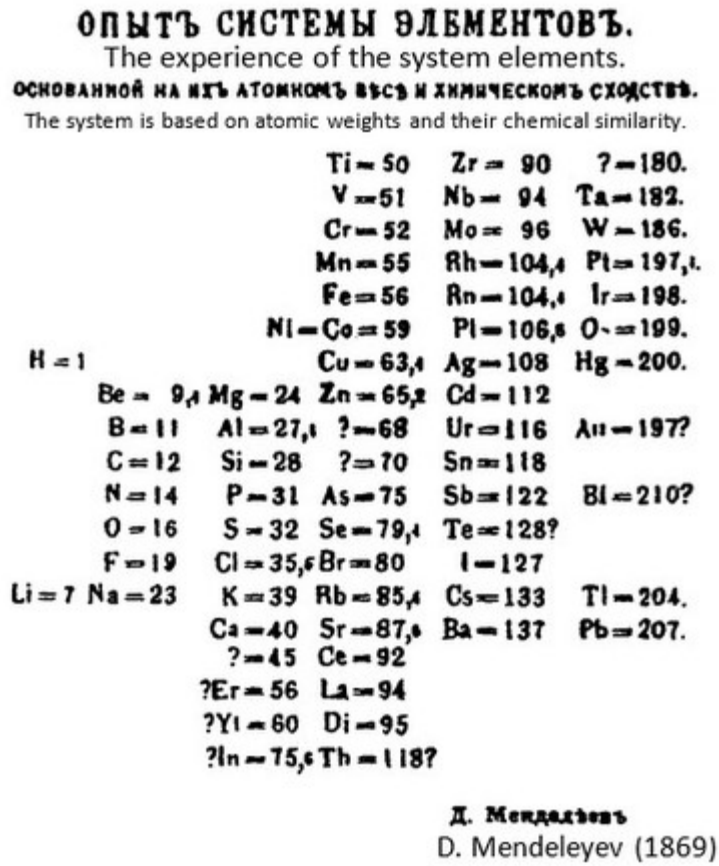

ОПЫТЪ СИСТЕМЫ ЭЛЕМЕНТОВЪ.

The experience of the system elements.

ОСНОВАННОЙ НА ИХЪ АТОМНОМЪ ВѢСѢ И ХИМИЧЕСКОМЪ СХОДСТВѢ.

The system is based on atomic weights and their chemical similarity.

			Ti = 50	Zr = 90	? = 180.
			V = 51	Nb = 94	Ta = 182.
			Cr = 52	Mo = 96	W = 186.
			Mn = 55	Rh = 104,4	Pt = 197,4.
			Fe = 56	Rn = 104,4	Ir = 198.
			Ni = Co = 59	Pl = 106,6	Os = 199.
H = 1			Cu = 63,4	Ag = 108	Hg = 200.
	Be = 9,4	Mg = 24	Zn = 65,2	Cd = 112	
	B = 11	Al = 27,4	? = 68	Ur = 116	Au = 197?
	C = 12	Si = 28	? = 70	Sn = 118	
	N = 14	P = 31	As = 75	Sb = 122	Bi = 210?
	O = 16	S = 32	Se = 79,4	Te = 128?	
	F = 19	Cl = 35,5	Br = 80	I = 127	
Li = 7	Na = 23	K = 39	Rb = 85,4	Cs = 133	Tl = 204.
		Ca = 40	Sr = 87,6	Ba = 137	Pb = 207.
		? = 45	Ce = 92		
		?Er = 56	La = 94		
		?Yt = 60	Di = 95		
		?In = 75,6	Th = 118?		

Д. Менделѣевъ

D. Mendeleyev (1869)

Mendeleyev's 1869 periodic table.

weights, exhibit an apparent periodicity of properties."

— Dmitri Mendeleyev (c.1880) (O)

"We could live at the present day without a Plato, but a double number of Newtons is required to discover the secrets of nature, and to bring life into harmony with the laws of nature."

— Dmitri Mendeleyev (c.1880) (O)

"No law of nature, however general, has been established all at once; its recognition has always been preceded by many presentiments."

— Dmitri Mendeleyev (c.1880) (O)

"Certain characteristic properties of elements can be foretold from their atomic weights."

— Dmitri Mendeleyev (c.1880) (O)

"I have achieved an inner freedom."

— Dmitri Mendeleyev (c.1880) (O)

"The establishment of a law, moreover, does not take place when the first thought of it takes form, or even when its significance is recognized, but only when it has been confirmed by the results of the experiment."

— Dmitri Mendeleyev (c.1880) (O)

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External links

- Dmitri Mendeleev – Wikipedia.

θΔics

In hmolscience, **DMR Sekhar** (1952-) is an Indian chemical engineer and mineral engineer noted, in religious thermodynamics, for his theory of "genopsych" (or genpsy), a contraction of gene + psyche, an hypothesized biological extensive-like thermodynamic property, which is is god or a part of God inside of humans, that is argued to operate counter to entropy, a type of conscious ordering force acting in the biosphere, thus reconciling the disorder view of second law of thermodynamics with evolution and creation. Sekhar seems to have conceived of his theory in the mid 2000s, promoting it in various blogs and discussion boards, later submitting a draft article of this theory, titled "On the Incompatibilities of the Second Law of Thermodynamics, Primary Instincts, Natural Selection, and the Properties of DNA" (see: attached PDF), to the *Journal of Human Thermodynamics* in 2007. [1]

Education

Sekhar BS in chemical engineering, MS in mineral process engineering, and PhD in chemical engineering, with dissertation on "Separation of Sulfide Minerals from complex Ores", at the Andhra University. Sekhar is currently employed as an executive director of Wharton Overseas FZE, and is on deputation to JPMC Ltd, working at, Eshidiya Mine, in Jordan.

Genopsych

See main: Genopsych

The theory of a "genetic psychology" or genopsych, according to Sekhar, argues that the genome is conscious self-programmed entity struggling to exist and that genopsych is an extensive like emergent systems property operating counter to entropy, giving directionality to the process of evolution, causing non-random variations in the genome indicative of information creation, and is the basis of native intelligence of plants and microorganisms, such as bacteria. [2]

Religion and God

See main: God; Religious thermodynamics

Although not part of his main theory, in various blog posts and discussion, Sekhar maintains that genopsych may be or is god or a part of God inside of humans [and all living beings] that has evolved people to their present form. [3] Sekhar's theory is an effort to find unification between genetics, evolution, thermodynamics, the Bhagavat Gita, and the Holy Bible. In short, Sekhar believes that the idea of genpsy has the potential to change the way people look at religions and may help some understand themselves better in the context of genetics and thermodynamics. In the latter context, Sekhar's aim is to resolve the issue surrounding the common view that entropy is a measure of disorder and that the total entropy tends to a maximum over time in isolated systems. [4]

In cessation thermodynamics, Sekhar argues that genopsych equates to the soul as the "undying and essential non-physical", but that the soul is unchanging whereas genopsych undergoes updating and development due to evolutionary reasons. In addition, he states "the soul is described to exist without physical body whereas genopsych may not exist unattached to genes … the concept of soul allows the possibility of reincarnation while the model of genopsych probably does not." [5]

Difficulty on theory

The difficulty with Sekhar's theory is that theories on concepts that are said to be "counter to entropy" are numerous: anti-entropy, disentropic, ectropy, ektropy, entropy ethics, entropy reduction, entropy reversal, genetic entropy, gentropy, inverse entropy, local entropy decrease, entropy islands, low entropy, mental entropy, syntropy, syntropic, teleonomic entropy, among others. To quote one example, 'syntropic' is a term, conceived by Italian mathematician Luigi Fantappié in the 1940s, which is said to describe *phenomena* governed by a force, opposed to entropy, which attracts living systems towards higher levels of organization and order. This, along with the rest of these terms, is exactly the same as Sekhar's genopsych conception. The ubiquity of these similar conceptions has generally to do with a

perpetual misunderstanding of what entropy means, as defined by Rudolf Clausius and used in chemical thermodynamics.

These "opposite to entropy" conceptions, in turn, are thermodynamic cousins to terms such as élan vital, panpsychism, living force, vitalism, vis viva, living being, living molecule, living matter, living organisms, living energy, living affinity, vegetable life, animal life, organic life, etc., all terms which are a weak attempt to distinguish life from non-life as is captured in the idea of the uroboros puzzle. All of this logic, however, is defunct. The correct description is to use universal terms, such as animate verses inanimate, or reactive verses nonreactive (or inert), heat driven molecules, molecules active by way of induced movement, etc. Certainly there is much to be worked out in the explanation of human movement, but the invention of luminous aether type theoretical constructs to explain biology is not the correct direction to take.

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Further reading

- Sekhar, DMR. (2010). "The Primacy of DNA as a Unit of Life", *Knol*.
- Sekhar, DMR. (2011). "Gene, Brain and Behavior" (abs), *DNA Decipher Journal*, 1(3).
- Sekhar, DMR. (2011). "Genome and Plausible Genopsych" (abs), *Journal of Consciousness Exploration & Research*, 2(10).

External links

- Sekhar dmr's profile – Nature.Network.com
- User:DMR Sekhar – Wikiversity
- Evolution of Consciousness – DMR Sekhar talk page (Wikiversity).
- Genopsych – Wetpaint.

θΔics

In acronyms, **DN** is short for "Dawkins number", a 1-7 number (in original Dawkins 2006 formulation) or 1-10 number (in extended Thims 2009 formulation), or numbers in the range … -2, -1, 0, **1, 2, 3, 4, 5, 6, 7**, 8, 9, 10, 11 …16+ (in some recent answers), on the so-called Dawkins scale, invented by Richard Dawkins, in his *The God Delusion* (2006), and employed in Hmolpedia biographies, beginning in circa 2010, as shorthand to quickly note a person's religious belief system or belief state outlook, as to the question of the existence of god or the "hypothesis of god" as Pierre Laplace (1802) referred to it.

The notation Paul Dirac (DN=7), e.g., signifies that, based on his published views and statements on the hypothesis of god, Dirac was Dawkins # 7 atheist, at best approximation. The notation Mirza Beg (DN=1), with his mentions of Muhammad the "Prophet (b.p.u.h.)" and statements such as may "Allah bless his soul" in his book dedications, signifies that Beg is a Dawkins #1 theist in religious outlook.

θΔics

In science, **DNA**, an acronym of deoxyribonucleic acid, is the genetic material of most organisms, which is a major constituent of chromosomes within the cell nucleus and plays a major role in the determination of the hereditary characteristics by controlling protein synthesis in cells. [1]

History

In 1869, Swiss physician Friedrich Miescher noted a microscopic substance in the pus of discarded surgical bandages, which he called “nuclein”, because it was found to reside in the nucleus of the cells.

The term “gene” was coined in 1909 by Danish botanist Wilhelm Johannsen, invented to describe the “particles” of inheritance that pass characteristics from one generation to another.

The base, sugar, and phosphate nucleotide units to Miescher’s nuclein pus were identified in 1919 by Russian-American biochemist Phoebus Levene.

In 1937, English molecular biologist William Astbury produced X-ray diffraction patterns which showed a regular structure of the genetic substance.

In 1944, Austrian physicist Erwin Schrödinger published his famous "What is Life?" Dublin lecture, in which he outlined the physics, chemistry, and thermodynamics of what he called the "hereditary substance", described as a type of molecular aperoidic crystal chromosome fibre. [2]

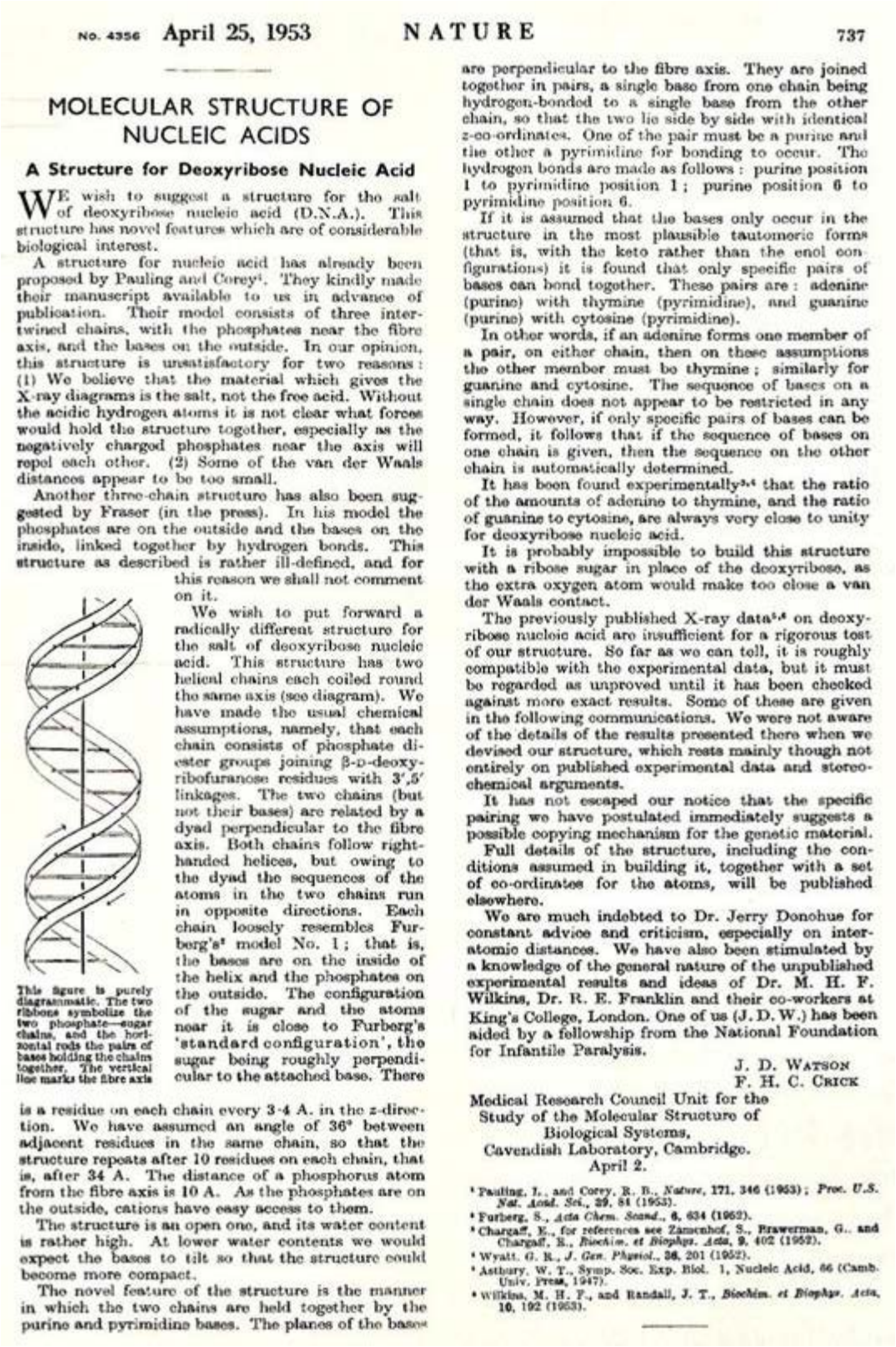

No. 4356 April 25, 1953 NATURE 737

MOLECULAR STRUCTURE OF NUCLEIC ACIDS

A Structure for Deoxyribose Nucleic Acid

We wish to suggest a structure for the salt of deoxyribose nucleic acid (D.N.A.). This structure has novel features which are of considerable biological interest.

A structure for nucleic acid has already been proposed by Pauling and Corey[1]. They kindly made their manuscript available to us in advance of publication. Their model consists of three intertwined chains, with the phosphates near the fibre axis, and the bases on the outside. In our opinion, this structure is unsatisfactory for two reasons: (1) We believe that the material which gives the X-ray diagrams is the salt, not the free acid. Without the acidic hydrogen atoms it is not clear what forces would hold the structure together, especially as the negatively charged phosphates near the axis will repel each other. (2) Some of the van der Waals distances appear to be too small.

Another three-chain structure has also been suggested by Fraser (in the press). In his model the phosphates are on the outside and the bases on the inside, linked together by hydrogen bonds. This structure as described is rather ill-defined, and for this reason we shall not comment on it.

We wish to put forward a radically different structure for the salt of deoxyribose nucleic acid. This structure has two helical chains each coiled round the same axis (see diagram). We have made the usual chemical assumptions, namely, that each chain consists of phosphate diester groups joining β-D-deoxyribofuranose residues with 3′,5′ linkages. The two chains (but not their bases) are related by a dyad perpendicular to the fibre axis. Both chains follow right-handed helices, but owing to the dyad the sequences of the atoms in the two chains run in opposite directions. Each chain loosely resembles Furberg's[2] model No. 1; that is, the bases are on the inside of the helix and the phosphates on the outside. The configuration of the sugar and the atoms near it is close to Furberg's 'standard configuration', the sugar being roughly perpendicular to the attached base. There is a residue on each chain every 3·4 A. in the z-direction. We have assumed an angle of 36° between adjacent residues in the same chain, so that the structure repeats after 10 residues on each chain, that is, after 34 A. The distance of a phosphorus atom from the fibre axis is 10 A. As the phosphates are on the outside, cations have easy access to them.

This figure is purely diagrammatic. The two ribbons symbolize the two phosphate—sugar chains, and the horizontal rods the pairs of bases holding the chains together. The vertical line marks the fibre axis

The structure is an open one, and its water content is rather high. At lower water contents we would expect the bases to tilt so that the structure could become more compact.

The novel feature of the structure is the manner in which the two chains are held together by the purine and pyrimidine bases. The planes of the bases are perpendicular to the fibre axis. They are joined together in pairs, a single base from one chain being hydrogen-bonded to a single base from the other chain, so that the two lie side by side with identical z-co-ordinates. One of the pair must be a purine and the other a pyrimidine for bonding to occur. The hydrogen bonds are made as follows: purine position 1 to pyrimidine position 1; purine position 6 to pyrimidine position 6.

If it is assumed that the bases only occur in the structure in the most plausible tautomeric forms (that is, with the keto rather than the enol configurations) it is found that only specific pairs of bases can bond together. These pairs are: adenine (purine) with thymine (pyrimidine), and guanine (purine) with cytosine (pyrimidine).

In other words, if an adenine forms one member of a pair, on either chain, then on these assumptions the other member must be thymine; similarly for guanine and cytosine. The sequence of bases on a single chain does not appear to be restricted in any way. However, if only specific pairs of bases can be formed, it follows that if the sequence of bases on one chain is given, then the sequence on the other chain is automatically determined.

It has been found experimentally[3,4] that the ratio of the amounts of adenine to thymine, and the ratio of guanine to cytosine, are always very close to unity for deoxyribose nucleic acid.

It is probably impossible to build this structure with a ribose sugar in place of the deoxyribose, as the extra oxygen atom would make too close a van der Waals contact.

The previously published X-ray data[5,6] on deoxyribose nucleic acid are insufficient for a rigorous test of our structure. So far as we can tell, it is roughly compatible with the experimental data, but it must be regarded as unproved until it has been checked against more exact results. Some of these are given in the following communications. We were not aware of the details of the results presented there when we devised our structure, which rests mainly though not entirely on published experimental data and stereochemical arguments.

It has not escaped our notice that the specific pairing we have postulated immediately suggests a possible copying mechanism for the genetic material.

Full details of the structure, including the conditions assumed in building it, together with a set of co-ordinates for the atoms, will be published elsewhere.

We are much indebted to Dr. Jerry Donohue for constant advice and criticism, especially on intermolecular distances. We have also been stimulated by a knowledge of the general nature of the unpublished experimental results and ideas of Dr. M. H. F. Wilkins, Dr. R. E. Franklin and their co-workers at King's College, London. One of us (J. D. W.) has been aided by a fellowship from the National Foundation for Infantile Paralysis.

J. D. Watson
F. H. C. Crick

Medical Research Council Unit for the Study of the Molecular Structure of Biological Systems, Cavendish Laboratory, Cambridge.

April 2.

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The famous 1953 article "Molecular Structure of Nucleic Acid" by James Watson and Francis Crick that introduced the world to **DNA** in name and structure. [5]

Schrodinger's physical science model stimulated the direction of American James Watson, who in 1947 had plans to complete his PhD dissertation on the gene and Indiana University.

In 1953, biochemists James Watson and Francis Crick famously elucidated the three-dimensional structure for what they called the “salt of deoxyribose nucleic acid (D.N.A.) in their famous article “Molecular Structure of Nucleic

Acids". [5]

Vitalism

In the years to follow, religiously-inclined thinkers began to seize on premise of DNA being the essence or secret of life or key to the transmission of life by inserting hypothetical vitalism models into the picture.

> "The 'central dogma' of molecular biology, which states that the information upon which the chemistry of life depends is provided by the genetic material **DNA**. But the refusal of biologists to regress further than this point and to confront the question as to where the information contained in DNA came from in the first place has, according to Stephen Black [1972], reintroduced a quasi-vitalism in to biology."
>
> — Michael Foley (1990), *Laws, Men and Machines* [7]

This resulted in Crick writing a 1966 response book called *Of Molecules and Men*, in which he describes the position of several scientists who posit an invisible, purposeful substance or influence which cause life to exist within the gene, called vitalism. Crick is highly critical of this position as being based on wishful thinking, or an attempt to support a theological assumption. [6]

A resent type of vitalism-insertion model is the 2007 genopsych theory of Indian chemical engineer DMR Sekhar who argues that something called "geno-psych" exists inside of the DNA molecule, and is an extensive thermodynamics property called running counter to entropy, driving (or self-driving) the genes in or into a state of consciousness, causing them to evolve, thus giving free will and choice to humans.

Mate selection | MHC

In sexual selection studies, it is found that mates are most attracted to opposites who have the most dissimilar major histocompatibility complex (MHC), a large genomic region or gene family found in most vertebrates. MHC genes make molecules that enable the immune system to recognize invaders; generally, the more diverse the MHC genes of the parents, the stronger the immune system of the offspring.

In a 1995 experiment by Swiss biologist Claus Wedekind, a group of female college students smelled t-shirts that had been worn by male students for two nights, without deodorant, cologne or scented soaps. Overwhelmingly, the women preferred the odors of men with dissimilar MHCs to their own. [3] Their preference, however, was reversed if they were taking oral contraceptives. This famous experiment is known as the "sweaty T-Shirt study". [4]

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(b) Foley, Michael. (1990). *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian Mechanics* (pg. 84). Routledge, 2014.

Further reading

â— Watson, James. (2003). *DNA: the Secret of Life.* Alfred A. Knopf.

External links

â— DNA – Wikipedia.

θΔics

In questions, "**do atoms have souls?**" is a semi-involved query as to whether Egyptian soul (or soul weight) theory has any physical basis in Greek atomic theory (or periodic table), standard model physics, and or the physicochemical sciences, in general; the query is akin to asking, e.g. Otto Weininger (1903), if atoms are moral?, in semi-modern layspeak.

Overview

In circa 400BC, the atomic theory school of the Greeks had some type of atom-based theory of the soul; the details of this theory, however, are in need of summary.

In 1696, German polymath Gottfried Leibniz began to employ the term "monad", a type of soul-infused atom concept, which he conceived as a solution to Cartesian dualism, the mind-body problem, and difficulties over the concepts of origin of forms, entelechies or souls. [1]

In 1813, Goethe, following the passing of Christoph Wieland, and up until 1830, began discussing, in passing conversation, some of his tentative views on the speculative nature of the concept of the "soul" (see: Goethe on the soul) using a mixture of Aristotle's "entelechy" and Gottfried Leibniz's "monad", admixture with talk of "initial points" and "animation of the whole", as synonyms for a term he couldn't put his finger on. [2]

In 1907, German-born American philosopher Johannes Barandun, in his "Excursion Into the Infinitely Small", outlined views similar to "Goethe's monadology of the soul", as Paul Carus refers to things, wherein he outlines a modification of Ernst Haeckel's "animate atoms" theory and Wilhelm Wundt's "animated will-centers" theory. [5]

HAVE ATOMS SOULS?

BY THE EDITOR.

OUR readers may remember an editorial article published in *The Open Court* of December, 1907, on "Goethe's Soul-Conception" which contains a number of quotations from the great German poet on the subject of immortality.

He speaks of the soul as an entelechy or monad and apparently seeks the mystery of its persistence in the infinitesimal realm of molecules or atoms. So far as we can see this idea is untenable but it appears that it suggests itself to a thoughtful man when he dimly feels the truth of the preservation of man's life after death in some form or other. Mr. J. Barandun, the editor of the German Milwaukee periodical, the *Freidenker*, without any apparent acquaintance with these little-known passages of his great countryman, proposes in his "Excursion Into the Infinitely Small" a theory which in its essentials bears a close similarity to Goethe's monadology of the soul. Mr. Barandun also believes that the problem of the soul must somehow be sought in the infinitely small, the molecule or atom, and takes pains to make it plausible that a molecule can be possessed of concepts. In the beginning of the article he speaks of "those mysterious depths whither chemical investigation has never penetrated" and grants that his theory may be a mere dream, to be sure the dream of a thinker, of a man who forms a definite theory, and we will here make a few comments which in our opinion will shatter that beautiful dream but will place the underlying hope of man's life after death on a sounder and more scientific foundation.

The German freethinkers are frequently assumed to be materialists pure and simple, but here we learn that they are not indifferent to the deeper problems of life, and the editor of the *Freidenker* himself attempts the investigation of the nature of the soul in a new line. If we can not agree with Mr. Barandun, we must yet grant that we read his expressions with much interest, and believe at the

A 1910 article "Have Atoms Souls?" by Paul Carus, which compares Goethe's speculatively discussed talk of an entelechy-monad initial point animation theory of the soul, compared to German-born American editor J. Barandum's circa 1910 article "Excursion Into the Infinitely Small", who thinks the problem of the soul also can be solved in the area of the atom or molecule. [2]

In 1924, American physiologist Albert Mathews, in his *General Cytology*, chapter "Chemistry and Psychism", cited by Edwin Slosson (1925), gives a discussion on the life, death (see: dead atoms), and the 'souls' of atoms, in terms of energy, light, and ether, as follows: [3]

> "It is perfectly correct, therefore, from this point of view to speak of living and dead hydrogen atoms. We can even go farther with the simile if we wish and say that when the living high reactive form of the atom passes to the dead, unreactive form, the **soul of the atom** escapes at the moment of death, for a ray of light leaves the dying atom an travels onward in space, until perhaps it encounters and is absorbed by some other dead hydrogen atom, which it again raises to life by thus giving it a soul. What is this soul? It is a minute portion of the luminiferous ether; of time and space; of eternity and infinity.
>
> For us it is oxygen which thus summons the dead from the tomb; which vitalizes the dead molecules and atoms. The energy is stored in certain of the atoms of the molecules of the protoplasm in the form of

widened orbits of rotation of the electrons. It is this which gives them the power of reacting and of passing back to the dead. When such electrons fall back to more stable configuration, the atom and molecule reverts to the dead and inert form such as we keep in bottles. It is the oxygen, then, which vitalizes all animals; but it is from the sun that the vital, radiant energy has come. It is in fact the luminiferous ether which has made they thing alive, for the ether is the great storehouse of energy; it is itself nothing else than space and time; energy and time. Energy is but ether divided by time. Quantity of energy is quantity of ether per second. So all goes back to the either; infinity and eternity. From it is derived our energy and life."

(add discussion)

In 2000, American physicist Jerome Elbert published *Are Souls Real?*, wherein goes from Greek atomic theory up through modern times to question the existence of the reality of the "soul" in light of modern science. [4]

In 2015, American electrochemical engineer Libb Thims polled a selection of random Americans on the question "do atoms have souls?", founding that 77% believe they don't, 14% didn't know, and 9% believe they do. [6]

Discussion

The real nature of the query do atoms have a soul is equivalent to asking if current moral theory can be extended down the great chain of being to the chemical realm or conversely if our current moral theory is in need of reformulation, e.g. via the extrapolate up methodology.

See also

â— Is the hydrogen atom alive? | Are atoms alive?

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External links

â— Do atoms have souls? (2006) – Yahoo Answers.

θΔics

In terminology, **doctrinaire departmentalism** (TR:7) is a type of anti-interdepartmentalism (or anti-interdisciplinarity), according to which “doctrines” of each respective divided department—divided in the Herrick Humpty Dumpty (1930) sense and or C.P. Snow two cultures (1959) sense—prevent students from receiving a unified “one nature” big picture educational view of things.

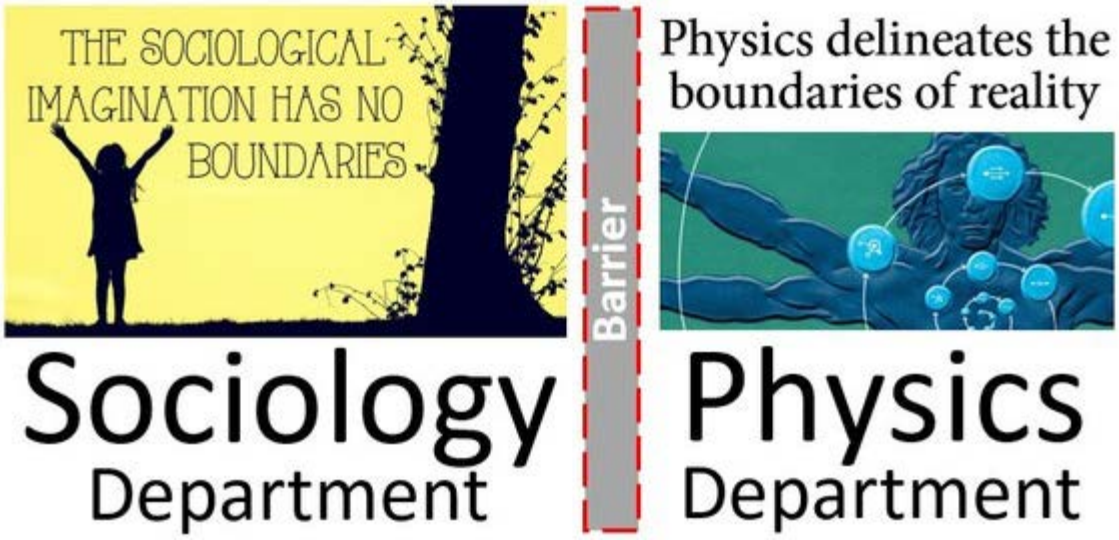

A depiction of "**doctrinaire departmentalism**", as seen by John Q. Stewart (1954), the view that, owing to hydraism, universities are divided into their own distinct "departments", each with their own "doctrines", which do NOT mix with the doctrines of other departments.

Stewart | Princeton social physics

In 1950s, John Q. Stewart coined the term "doctrinaire departmentalism", when he attempted to bridge the gap between the physics department and the social sciences departments at Princeton (see: Princeton Department of Social Physics); some statements of this are as follows:

> “**Doctrinaire departmentalism** has blinded the universities to the spectacular possibilities of adapting the successful methods of physics in the lagging social field. We have at Princeton a young social physics project, with the cooperation of the Department of Astronomy, which supplies office facilities, and with …”
>
> — John Q. Stewart (1951), “The New Discipline of Social Physics Examines Instances of Free Competition” [1]

> “[Stewart] has irritated the social scientists further by criticizing them for immaturity, lack of imagination and ‘**doctrinaire departmentalism**’. Overspecialization, he feels, is choking modern scholarship and limiting man’s communication with his fellows.”
>
> — Staff (1954), “Article” [2]

(add)

Human thermodynamics | ABET problem

In engineering education, professors are only allowed to teach subject matter that is ABET-certified, i.e. educational material that will enable a student to be American Board of Engineering and Technology certified; teaching engineering students subject matter outside of ABET-proper educational material is frowned upon, and may often result dismissal of the professor.

In 2008, Indian-born American mechanical engineer Satish Boregowda, while a professor at Purdue University, found that his colleagues and his tenure reviewers were not in favor of his work in thermodynamics applied to the humanities, i.e. on the “human thermodynamics” of stress, being that it was not ABET (Accreditation Board for Engineering and Technology) certification relevant; as a result of which he left academia and went into industry. In this example, ABET focus is the "doctrine" of the engineering department, which is the "departmentalism", as Stewart would say, of the department of engineering. Teaching an engineering student something "outside" of the department doctrine, e.g. thermodynamics-based morality (Goethe), meaning (Name), or sense of purpose (Blum/Lindsay), etc., in short, is not

allowed; the following is a recent attempt in this direction:

> "I seek to revise engineering curricula to be relevant to a fuller range of student experiences and career destinations, integrating concerns related to public policy, professional ethics and social responsibility; de-centering Western civilization; and uncovering contributions of women and other underrepresented groups. 21st century engineering thermodynamics needs to focus on meeting five often-neglected ABET outcomes: ethics, communication, existence-long learning, social context, and contemporary issues."
>
> — Donna Riley (2011), *Engineering Thermodynamics and 21st Century Energy Problems*

(add)

Quotes

The following are related quotes:

> "The history of 'ideas', particularly in respect to the great chain of being, is no subject for highly **departmentalized** minds; and it is pursued with some difficulty in an age of departmentalized minds."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pg. 22)

See also

â— Herrick's Humpty Dumpty

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θΔics

In terminology reform, **does not exist** or “nonexistence”, as compared to exist or existence, refers to some "thing" believed to not exist and or conclusively proved, via experiment and or evidence, to not have reality.

A visual of two famous experiments, namely the cannon boring experiment, performed by Benjamin Thompson (1798), and the ice rubbing experiment, performed by Humphry Davy (1799), which conclusively proved that the fire element (aka matter of fire, heat element, terra pinguis, phlogiston, or caloric) **does not exist**, therein laying out the basis for the science of thermodynamics, executed by Clausius (1865) and his entropy model of heat, which thus filled the "void" — a vacuum said to also be something that **does not exist** — left in the wake of the newly demonstrated evidence.

Overview

(add)

Phlogiston | Entropy exists

The following are phlogiston does not exist related nonexistences:

Affirmative | Fire element DOES exists / Heat element DOES exist (Empedocles, 450BC)

→ Oak burning experiment (Helmont, c.1620)

Defirmative | Terra pinguis does not exist (Stahl, 1703)
Defirmative | Phlogiston does not exist

→ Sulfur burning experiments (Lavoisier, 1772) (Q)

Defirmative | Caloric does not exist

→ Cannon boring experiment (Thompson, 1798)

“I am now as much convinced of the **non-existence** of caloric as I am of the existence of light.”

— Humphry Davy (1799), “Letter to Davies Gilbert”, Feb 22

→ Ice rubbing experiment (Davy, 1799)

- Entropy model (Clausius, 1865)

(add discussion)

Vacuum

The following are void related nonexistences:

“If the vacuum cannot be recognized either by the senses or by the intellect, how have you managed to find out that it **does not exist**?”

— Galileo (c.1620), annotations, in his copy of Julius Galla’s *On the Appearance of the Orbit of the Moon* (*De phaenomenis in orbe lunare*), after the phrase ‘concerning the vacuum’; cited by William Middleton (1964) in *The*

Affirmative | Voids DO exist (Leucippus, 450BC)
Defirmative | Voids do NOT exist (Parmenides, 450BC)

→ Nature abhors a vacuum

→ Torricelli vacuum (Torricelli, 1643)
→ Magdeburg hemispheres (Guericke, 1657)

(add)

Ether

The following are ether related nonexistences:

Affirmative | Ether DOES exist (Anaxagoras, 450BC)
Defirmative | Ether does NOT exist

→ Michelson and Morley experiment (1887)
→ Disabused (Einstein, 1905)
→ Social eclipse expedition (Eddington, 1919)
(Q)

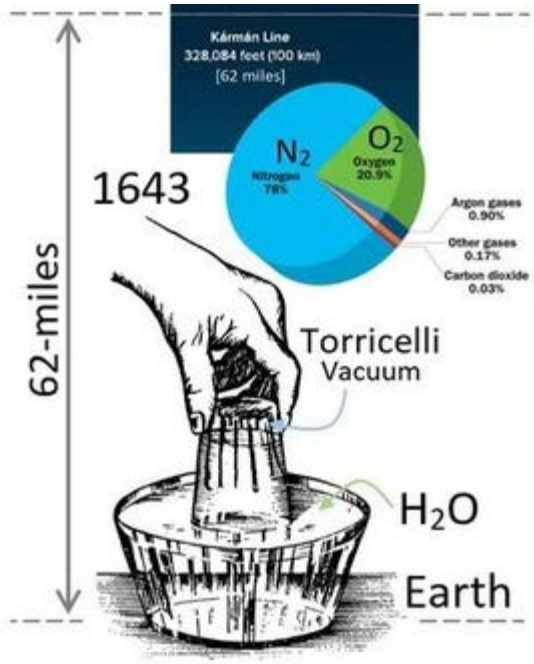

Torricelli vacuum experiment
(1643)

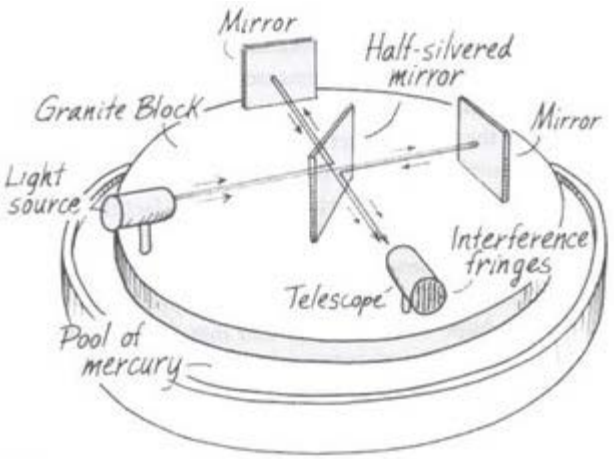

Michelson and Morley experiment
(1887)

Left: the Torricelli vacuum experiment, conducted by Evangelista Torricelli (1643), in efforts to solve the pump problem, which gave evidence, contrary to the long-standing postulate that vacuums **do not exist** (or nature abhors a vacuum), proved that vacuums can exist (at least in part). Right: the Michelson and Morley experiment, conducted by Albert Michelson and Edward Morley (1887), which gave evidence suggesting that ether **does not exist**.

(add discussion)

Force

The following are force related nonexistences:

Affirmative | Force DOES exist (Newton, 1686)
Defirmative | Force does not exist (Balfour Stewart and Peter Tait, 1875) [3]

Gravity

- Erik Verlinde (2011) (Q)(Q)
- Gravity does not exist (Seargent, 2014) [1]

(add discussion)

Atoms | Exist

The following are atom related nonexistences:

Affirmative | Atoms DO exist (Leucippus, 450BC)
Defirmative | Atoms do not exist (Mach, c.1890)

Proved to exist by Jean Perrin (c.1908) by calculating Avogadro's number using three different methods, all involving liquid phase systems: First, he used a gamboge soap-like emulsion, second by doing experimental work on Brownian motion, and third by confirming Einstein's theory of particle rotation in the liquid phase. In 1909, Wilhelm Ostwald, following Perrin's work, famously recanted his disbelief in atomic theory:'

> "I am now convinced that we have recently become possessed of experimental evidence of the discrete or grained nature of matter, which the atomic hypothesis sought in vain for hundreds and thousands of years. The isolation and counting of gaseous ions, on the one hand, which have crowned with success the long and brilliant researches of J.J. Thomson, and, on the other, agreement of the Brownian movement with the requirements of the kinetic hypothesis, established by many investigators and most conclusively by J. Perrin, justify the most cautious scientist in now speaking of the experimental proof of the atomic nature of matter, the atomic hypothesis is thus raised to the position of a scientifically well-founded theory, and can claim a place in a text-book intended for use as an introduction to the present state of our knowledge of general chemistry."

(add discussion)

Life

The following are life related nonexistences:

Affirmative | Afterlife DOES exist (Neanderthals, 70,000 YA) (Q)
Affirmative | Life DOES exist (clay creation myth, 3500BC)
Affirmative | Prelife DOES exist (Socrates, 400BC) (Q)
Deffirmative | Prelife does NOT exist (Plato, 350BC) (Q)
Affirmative | Life DOES exists (Lucilius, 120BC)

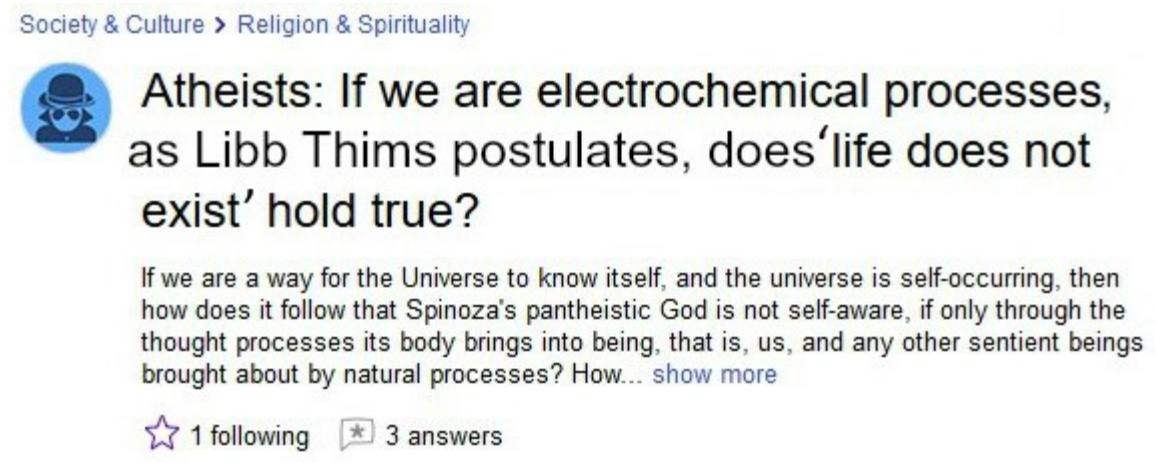

A 2015 Yahoo Answers query (Q) about **Thims**' version of the "**life does not exist**" view, intermixed with discussion of Spinoza's god; see: defunct theory of life (2009) + life terminology upgrades (2012); see also: Thims' "Lotka's Jabberwock" (2016) talk given at BPE 2016.

> "The poets, through the conjunction of fire and moisture, are indicating that the *vis*, 'force', which they have is that of Venus [Aphrodite]. Those born of *vis* have what is called *vita*, 'life', and that is what is meant by Lucilius (c.120BC) when he says: 'life is *force* you see: to do everything force doth compel us'."
>
> — Marcus Varro (c.50BC), *On the Latin Language*

Deffirmative | Afterlife does NOT exist (Meslier, 1729) (Q)

? Spark of life theory (Galvani | Shelley, 1771)

Affirmative | Vital force DOES exists (Medicus, 1774)

→ Seem so lifelike (Goethe, 1809)
→ Urea synthesis (Wohler, 1828)

Defirmative | Vital force does NOT exist (Berzelius, 1831)

→ Reymond-Brucke oath (Helmholtz school, 1842)
? Warm pond model (Darwin, 1871)
? Crystal model of life (Haeckel, 1882)

Defirmative | Vital energy does NOT exist (Landois, 1880) (Q)(Q)
● 19th century vitalism debates | Energy of life (1898) (Q)

→ No thing endowed with life (Tesla, 1915)
? Primordial soup (Oparin, 1924)

→ Regarding definitions (Lotka, 1925)
? Virus life debate (Stanley, 1935) (Q)(Q)(Q)
→ Life NOT recognized by physics and chemistry (Sherrington, 1938)
? Life feeds on negative entropy (Schrodinger, 1943)
→ Faculty of reaction (Lubicz , 1949)
? Miller-Urey experiment (1952)

● 20th century neovitalism debates (Crick vs Polanyi on scientific vitalism and Teilhard on religious vitalism) (1963)

→ Abandon the word alive (Crick, 1966)
? Clay substrate theory (Cairns-Smith, 1966)
? Thermodynamic origin of life theory (Gladyshev, 1978)
? RNA world hypothesis (Gilbert, 1986)
? Hydrothermal vent theory (Wachtershauser, 1988) (Q)
? More alive / less alive theory (Arnopoulos, 1993)
? Auto-catalytic closure theory (Kauffman, 1995)
→ Stem cell debate (1998) (Q)(Q)
→ Top 13 things that do NOT make sense (Brooks, 2005)

Defirmative | Defunct theory of life (Thims, 2009)
Defirmative | Life does **NOT** exist (Rogers, 2010) (Jabr, 2013)

→ To Have Done with Life (Brown, 2011)

→ Life terminology upgrades (Thims, 2012)

→ Abioism (Thims, 2015)

Spirit

The following are spirit related nonexistences:

Affirmative | Spirit exists in all thing (Bruno, 1590) (Q)
Defirmative | Spirit does not exist | view: "Matter exists; spirit does not exist" classified (1953) as "extreme materialism." (Q)

→ Aspiritism

(add discussion)

Soul

The following are soul related nonexistences:

Affirmative | Soul DOES exist (Imhotep, 2650BC)
Deffirmative | Pre-soul does NOT exist (Plato, 350BC) (Q)
Deffirmative | Immortal soul does not exist (Spinoza, 1656)
Deffirmative | Incorporeal soul does not exist (Person, date)
Deffirmative | Soul does not exist (la Mettrie, 1745) (Edison, 1910)

→ Prisoner in holed cask soul detection experiment (Frederick II, 1230)
→ Soul weighting experiments (MacDougall, 1902)

→ Asoulism (Weisman, 2010)

(add discussion)

God

The following are god related nonexistences:

Affirmative | God does exist (pre-Dynastic, before 3100BC)
Defirmative | God does not exist

→ Atheism (French etymology, c.1550) (Q)
→ Disproofs of the existence of god [2]

→ Aluminum disproof (Lotka, 1925)

Religion | Other

The following are religio-mythology rooted nonexistences:

- Adam and Eve never existed (56% of Americans believe that they existed)
- Noah never existed
- Abraham never existed (Ibn Warraq, 1995) (Q); (Thims, 2004)
- Moses never existed (Wittgenstein, 1953)
- Jesus never existed (Napoleon, 1817)
- Virgin Mary never existed
- Buddha never existed
- Muhammad never existed

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2. Treharne, Trevor. (2012). *How to Prove God Does Not Exist*. Universal Publishers.
3. Stewart, Balfour and Tait, Peter G. (1875). *The Unseen Universe: or Physical Speculations on a Future State* (pg. #). Macmillan.
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(b) Engl. Trans. by Frederick Soddy (London: Taylor and Francis, 1910) [Excerpt: sections 1-6 complete (from: David M. Knight, ed., Classical Scientific Papers: Chemistry (New York: American Elsevier, 1968) and the abridgment reprinted in Henry A. Boorse & Lloyd Motz, The World of the Atom, Vol. 1 (New York: Basic Books, 1966)].
5. Ostwald, Wilhelm. (c.1908). "Quote" (Q), in: *Grundriss der allgemeinen Chemie* (4th ed., 1909), Preface, as cited by Erwin N. Hiebert and Hans-Gunther Korber in article on Ostwald in Charles Coulston Gillespie (ed.), *Dictionary of Scientific Biography* Supplement 1, Vol 15-16, 464.

θΔics

In science, **Dollo's law** is the hypothesis, in short, that "evolution is irreversible", or in its original formulation that "an organism is unable to return, even partially, to a previous stage already realized in the ranks of its ancestors." [1]

French-born Belgian engineer and paleontologist Louis Dollo (1857-1931), the eponym of **Dollo's law**, the argument that evolution is irreversible.

Dollo's law, aka the theory of irreversibly changes in morphological nature, was first proposed in 1890 by French-born Belgian engineer and paleontologist Louis Dollo (1857-1931) and further elaborated into the status of a proposed law in his 1893 article "The Law of Evolution". [2]

Thermodynamics

Dollo's law is frequently said to be the equivalent or embodiment the second law in the description of the process of evolution. Americans Daniel Brooks and Edward Wiley, in their 1986 *Evolution as Entropy*, for example, state: [3]

> "**Dollo's law** and natural selection describe the thermodynamic process called biological evolution."

It remains to be tracked down, however, if Dollo was actually using thermodynamic arguments in his theory. Presently, it does not seem to be the case, but rather possibly a situation of name or term association and or historical synthesis?

In any event, into the 1910s, American historian Henry Adams was citing Dollo's evolution theories in the context of discussions of thermodynamics (e.g. *Degradation of the Democratic Dogma*, 1920); and into the 1950s Dollo was being mentioned in the context of the "irreversibility of entropy" with reference citations to Adams. [4] American historian William Jordy's gives detailed discussion on the possibility that Adams's use Dollo's anatomical irreversibility theory blended into thermodynamic arguments was done, likely, without completed dissection of Dollo's work, which as Dollo himself warned, was concerned with the irreversibility of anatomical structure and not function. [7]

French philosopher Pierre Teilhard (1881-1955) also began citing Dollo in his work, intermixed with entropy, energy, and evolution theory discussion. [5] Robert Ayres, in his 1994 *Information, Entropy, and Progress: A New Evolutionary Paradigm*, states that Dollo's law was reformulated by Julian Huxley (1956) and taken up again by Carl Sagan (1977). [6]

References

1. (a) Dollo, L. (1893). "The Law of Evolution" ("Les lois de l'evolution"), *Bulletin de la Societe beige de geologie, de plaentologie, et d'hydrologie*, 7:164-67.
(b) Dollo, quoted in "Evolution: Ammonites Indicate Reversal," in *Nature*, March 21, 1970.
2. Louis Dollo – Wikipedia.
3. Brooks, Daniel R. and Wilson, E.O. (1986). *Evolution as Entropy: Toward a Unified theory of Biology*. (1988, 2nd ed.). University of Chicago Press.
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6. Ayres, Robert. (1994). *Information, Entropy, and Progress: A New Evolutionary Paradigm* (Dollo, pgs. 155, 227). Springer.
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Further reading

● Cave, A.J.E. and Haines, R. Wheeler. (1944). "Dollo's Law of Irreversibility", *Nature*, Nov. pg. 579.
● Brooks, Daniel B., Cumming, David, and LeBlond, Paul H. (1988). "Dollo's Law and the Second Law of

Thermodynamics: Analogy or Extension?", in: *Entropy, Information and Evolution* (pgs. 189-226). MIT Press.
● Higgins, John P. (1995). *The Promise of Pragmatism: Modernims and the Crisiis of Knowledge and Authority* (§2: Who Bore the Failure of the Light: Henry Adams, pgs. 55-107; Dollo, pg. 85). University of Chicago Press.
● Thims, Libb. (2007). *Human Chemistry (Volume Two)* (§:Dollo's law, pgs. 678-79). Morrisville, NC: LuLu.

External links

● Dollo's law of irreversibility – Wikipedia.
● Dollo's law – Encyclopedia Britannica.

θΔics

In existographies, **Donald Campbell** (1916-1996) was an American social scientist, noted for []

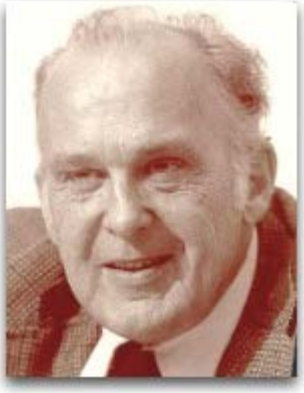

Overview

In 1975, Campbell, in his "On the Conflicts between Biological and Social Evolution and between Psychology and Moral Tradition", stated the following:

> "I do accept the limited emergentist principle that the laws of biology, psychology exist which are NOT described by the laws of physics and inorganic chemistry. These 'emergent laws' are compatible with the laws of physics and chemistry but not derivable from them."
>
> — Donald Campbell (1975), "On the Conflicts between Biological and Social Evolution and between Psychology and Moral Tradition" [1]

In 1988, Richard Adams, in commentary on this, stated that this view expresses a position common to "sophisticated social scientists". Adams also points out that Campbell never details what these "emergent" laws are, and also tells us that most "emergent" laws in the social sciences have never been made with regard to the operation of the physical laws; hence, each needs to be reexamined. [2]

References

1. (a) Campbell, Donald. (1975). "On the Conflicts between Biological and Social Evolution and between Psychology and Moral Tradition" (pg. 1104), *American Psychologist*, 30:1103-1126.
(b) Adams, Richard N. (1988). *The Eighth Day: Social Evolution as the Self-Organization of Energy* (pg. 8). University of Texas Press.

External links

â— Donald T. Campbell – Wikipedia.

θΔics

In existographies, **Donald Cardwell** (1919-1998) (IQ:145|#714) (CR:48) was an English physicist and science historian, focused in the area of the history of heat theory, history of steam engines, and history of thermodynamics, noted for for []

Overview

In 1963, Cardwell, in his *Steam Power in the Eighteenth Century: a Case Study in the Application of Science*, gave discussion of James Watt, and seemingly a history of eighteen-century steam engine development. [2]

In 1971, Cardwell, in his *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age*, gives a very-cogent and well-referenced history of thermodynamics, from basically the period of Joseph Black and the various theories of heat in that period, followed by a good amount of detail on the Watt engine, indicator, and indicator diagram, up through Sadi Carnot, Emile Clapeyron, William Thomson, and finally Rudolf Clausius. [1]

Tait

Cardwell, of very accurate discernment, devotes about the last eight pages of his *Watt to Clausius*, to highlight the damage done by the mis-represented and confused Angelo-Irish-biased historical writings of Peter Tait, particularly his *Sketch of the History of Thermodynamics* (1868), wherein he attacks Robert Mayer's work on the mechanical equivalent of heat as basically worthless, that Clausius is subordinate to Kelvin, presents an incorrect explanation of entropy, which later famously confused James Maxwell (he had to "correct" his later edition of *Theory of Heat*); his claim that "Newton is the true originator of the doctrine of energy" (1877); among numerous other issues; the following are a few quotes:

> "I would rather see you and Clausius friends than Zollner and myself. Trust me, Clausius is through and through **an honest, high-minded man**."
>
> — John Tyndall (1874), "Letter to Peter Tait" (in comment on an attack by Karl Zoller on some of Tyndall's work); cited by Donald Cardwell (1971) in *From Watt to Clausius* (pg. 288)

> "What Tait was doing, in fact, was perpetuating the Robinson-Playfair tradition (O) of writing history to suit one's [philosophical and religious] presuppositions of things ought to have happened."
>
> — Donald Cardwell (1871), *From Watt to Clausius* (pg. 282)

> "Tait's was seemingly indefatigable in his vendetta against the unfortunate and quite inoffensive Mayer. In 1876, he published, in the *Philosophical Magazine*, a translation Mohr's paper of 1837 explicitly to denigrate Mayer's work."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 286)

> "Tait's efforts can be seen to be fundamentally and deplorably obscurantist."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 285)

> "Tait was a very poor historian and an unreliable interpreter of science."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 286)

Cardwell even goes on to claim, in a very penetrating argument, using the fragmentation of knowledge problem (see: hydraism; doctrinary departmentalism, anti-interdepartmentalism, demise of the universal genius phenomena [see: last universal genius; last person to know everything, etc.), which he says began in 1851, and its effect on the education of young minds in the last century, that it is, in fact, directly because of Tait in his influence, namely Tait is why (a) Clausius is not taught in modern textbook, and (b) why no modern 20th century person understands entropy, which occurred because Tait washed over the second law with William Thomson's verbal purview on things.

It is almost, as though, Cardwell's *From Watt to Clausius*, which seems now to be the best and most coherent history of thermodynamics books to date (in fact, it seems, to be the ONLY English-written book that has ever given a cogent summary of origin of entropy in the theories of Clausius, as found in and based on his transformation content modes), was written in direct reaction to Tait's very-poor and country-man biased skewed *Sketch of the History of Thermodynamics*?

Education

Cardwell completed a degree in physics from King's College, London, in 1939. After serving in the Second World War, he took history of science courses at the University College London and sociology seminars at the London school of Economics. In 1964 he joined the University of Manchester Institute of Science and Technology. [3]

Quotes | By

The following are noted quotes by Cardwell:

> "The student is usually introduced to the concepts of thermodynamics—the Carnot cycle, the principle of reversibility, the idea of entropy—in a way which does some violence to credibility. After having been taught science in terms of the highly abstract systems of mechanics and optics, and a science of heat concerned with the exact measurements of such abstract quantities temperature and specific heat, he is suddenly asked to accept a mysterious and entirely unrealistic engine of an almost completely impracticable nature as a fundamental concept of science. The introduction of the idea of entropy is almost equally abrupt. How or why such a system of thought was invented is never explained: the student is asked to take it or leave it. The natural reaction on the part of all but the most remarkably able on the one hand and the most gullible on the other is, surely, to feel that if this represents scientific thought then it is something the student is entirely unfamiliar with; and this is a conviction that he may never lose."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. xiii)

References

1. Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age*. Cornell University Press.
2. Cardwell, Donald S.L. (1963). *Steam Power in the Eighteenth Century: a Case Study in the Application of Science*. Sheed and Ward.
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External links

● Cardwell, Donald Stephen Lowell 1919-1998 – WorldCat Identities.

θΔics

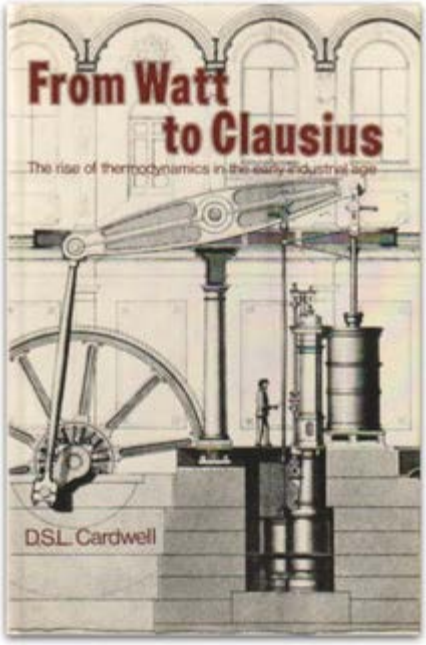

Cardwell's 1971 *From Watt to Clausius*, wherein he goes from early heat theories up to the 1865 work of Clausius. [1]

In thermodynamics, **Donald Haynie** (1964-) is an American biophysicist noted for his 2001 biochemical thermodynamics textbook *Biological Thermodynamics*, themed on the thermodynamics of protein folding (protein thermodynamics). [1] Haynie currently is working as the co-founder of Artificial Cell Technologies, Inc., a company focused on the commercialization of polypeptide multilayer nanofilm technologies. [2]

Education

Haynie completed his BS in physics, at the university in South Florida, and his PhD in 1993 in biophysics, on the thermodynamic properties of proteins and their conformational folding aspects, at Johns Hopkins University.

See also

- Rennie vs Thompson and Harrub creationism fiasco

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2. Donald T. Haynie (overview) – Nanosmat2008.org

Further reading

- Yang, J., Buck, M., Pitkeathly, M., Kotik, M., Haynie, D., Dobson, C. and Radford, S. (1995). "Conformational properties of four peptides spanning the sequence of hen lysozyme", *J. Mol. Biol.* 252:483-491.
- Haynie, D. and Freire, E. (1993). "Structural Energetics of the Molten Globule State", *Proteins* 16:115-140.

External links

- Biological Thermodynamics – BiologicalThermodynamics.com.
- Donald Haynie (about the author) – BiologicalThermodynamics.com.

External links

- Haynie, Donald T. (1964-) – WorldCat Identities.

θΔics

In engineering, **Donald Macy Liddell** (1879-1958) was an American mining and chemical-metallurgical engineer, economist, and chess historian notable for

Overview

In 1922, Liddell, as editor of McGraw-Hill *Handbook of Chemical Engineering*, in the preface, situated the following cogent statement: [1]

> "The matter of multiplicity of contributors needs no great explanation, for we are all used to this in the modern handbooks. I believe it is a common saying that Helmholtz was the last universal genius, and we are fast arriving at the point where even a single subject becomes too vast for one man. At any rate, whether or not any of my learned colleagues could write an entire chemical engineering handbook, I could not—hence the present form."

Namely, aptly classifying German physician-physicist Hermann Helmholtz as the last in the lineage of last universal geniuses. The only other possible near followup to Helmholtz would be John Neumann, who also completed a degree in chemical engineering.

Education

Liddell completed his AB in engineering from Johns Hopkins University in 1900, after which he began as an engineer for the Detroit Copper [2]

Donald Macy Liddell (1879–1958) is the subject of a recent publication: *The Donald M. Liddell Collection of Chess Books and Other Volumes in the Liddell Family Library* (privately printed, 2007); supposedly done by his grandson D. Roger B. Liddell. The introduction contains a biographical sketch of Roger's grandfather, a consulting engineer by profession, and a prominent collector of chessmen as well as author of a standard book on the subject (*Chessmen*, Harcourt, Brace and Company, 1937). The volume contains extensive genealogical background on the Liddell and allied families, and on the ancestry of Roger's mother, Jane Hawley Hawkes Liddell (Mrs. Donald M. Liddell, Jr.). (Ñº)

References

1. Liddell. Donald M. (1922). *Handbook of Chemical Engineering, Volume 1* (quote, pg. ix). McGraw-Hill Company.
2. Author. (1974). *Indiana Authors and Their Books, 1917-1966* (pg. 369). Wabash College.

External links

â— Liddell, Donald M. (Donald Macy) (b.1879) – WorldCat Identities.

θΔics

In animate thermodynamics, **Donald Mikulecky** (1936-) or Don Mikulecky, is an American physiologist noted for a number of publications in which he attempts to extend and synthesize the network thermodynamics theories of Israeli chemist Aharon Katchalsky, which he describes as a marriage of classical thermodynamics and nonequilibrium thermodynamics along with network theory, and kinetics, together with American theoretical biologist Robert Rosen's relational biology models, and complexity theory, so to explain biological phenomena. [1]

American ecologist Eric Schneider states that his discussions with Mikulecky were one of the inspirations for his "nature abhors a gradient" or gradient reduction interpretation of the second law of thermodynamics. [2]

Education

Mikulecky completed his PhD in 1963 in physiology, with a thesis on "Phospholipid-cholesterol Membrane Model. I. Correlation of Resistance and Ion Content. II. Cation Exchange Properties. III. Effect of Ca on Salt Permeability", at the University of Chicago. [3]

References

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θΔics

In hmolscience, **Donald Murray** (1865-1945) was a New Zealand engineer and philosopher noted, in religious thermodynamics, for his 1939 efforts to describe god in terms of the "growth and decay" laws of thermodynamics, as he refers to them, and therein outline a theory of human destiny, as he sees things.

Overview

In 1939, Murray, in his *The Philosophy of Power*, penned chapter sections such as “God and Thermodynamics”, among other topics, in which he he attempts the following:

> “In *The Philosophy of Power*, I am preaching on God and the Steam-engine, with many more familiar doctrines of the seers and sages of all ages.”

Murray, in this effort, touches on the conservation of energy, the laws of thermodynamics, Herbert Spencer, and the philosophy of power. [1] Other names he cites include Karl Marx, Max Planck, Wilhelm Ostwald, William Thomson, Rudolf Clausius, and James Jeans, among others.

Education

Murray completed his BA at Auckland, New Zealand, his MA in Sydney, Australia, and his MIEE in London. He was a journalist, an agricultural student, and inventor of high merit telegraph systems. [2] He, supposedly, is noted for having invented the duplex telegraph printer. [3]

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θΔics

In ecology, **Donald Worster** (1941-) is an American environmental historian noted for his 1977 book *Nature's Economy: A History of Ecological Ideas*, wherein, in his chapter fourteen, according to Eric Zencey (1983), he gives an account of the "thermodynamic revolution in biology". [1] This, however, seems to be an over-exaggeration, as Worster only uses the term thermodynamics 10 time times, with citations of Leon Brillouin, Harold Blum, Ludwig Bertalanffy, Lawrence Henderson, James Lovelock, in general, and in ecological thermodynamics, Raymond Lindeman, Charles Elton, and his so-called "pyramid of numbers" (see: Paul Colinvaux), and Eugene Odum. [2]

Tansley

Worster, in commentary on English botanist and ecology pioneer Arthur Tansley (1871-1955), states the following: [2]

> "Tansley's mechanist ecosystem had really nothing in common with the Romantic view of biology—the life-force idea of Goethe and Thoreau. Indeed, it owed nothing to any of its forebears in the history of the science, not even to the crudely mechanistic biology of the eighteenth century. It was born of entirely different parentage: that is, modern thermodynamic physics, not biology."

although, to note, he incorrectly labels Goethe as a life force theorist.

Zencey, in his 2013 "Energy as a Master Resource", supposedly citing Worster, likewise, comments the following: [4]

> "Biology was reconstructed on thermodynamic grounds in the 1920s through the work of A.G. Tansley, Edgar Transeau, Max Kleiber, and others who began …"

(add discussion)

Education

Worster completed his BA in 1963 at the University of Kansas, his PhD in 1971 at Yale and presently is professor emeritus of US history at Kansas University, his current research focuses on the application of evolutionary theory to human ecological adaptation and the role of natural resource abundance and scarcity in shaping and reshaping American history. [3]

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θΔics

In human thermodynamics, **Donna M. Riley** (c.1971-) is an American chemical engineer noted for her 2011 *Engineering Thermodynamics and 21st Century Energy Problems*, which contains twenty modules targeted toward meeting five often-neglected ABET outcomes: ethics, communication, existence-long learning, social context, and contemporary issues, with human thermodynamics education chapter sections such as "entropy as a social construct" (e.g. social thermodynamics), "entropy's philosophical implications" (e.g. philosophical thermodynamics), "thermo to life" (e.g. defunct theory of life), among others, each with a four-part engage/analyze/reflect/change reading program with what seem to be classic human thermodynamic stylized "homework problem" assignments. [1]

Human thermodynamics education

See main: Human thermodynamics education

Interestingly, Riley's book, which she describes as a "textbook companion" for engineering thermodynamics students and teachers, and two-cultures style teaching approach, e.g. her course EGR 205 (Science, Technology and Ethics), seems to be one of the first by an American chemical engineer to actually begin to attempt to bring about a "paradigm shift" in the standard American engineering school teaching framework. In her own words: [2]

> "I seek to revise engineering curricula to be relevant to a fuller range of student experiences and career destinations, integrating concerns related to public policy, professional ethics and social responsibility; de-centering Western civilization; and uncovering contributions of women and other underrepresented groups."

This effort seems to be along the lines of American electrochemical engineer Libb Thims nascent efforts to establish America's first two-cultures university teaching department, reminiscent of a combination of Henry Adams 1910 "A Letter to American Teachers of History" and Leon Winiarski's 1894-1900 social mechanics course at the University of Geneva.

Comparative efforts include: American chemical engineers Benjamin Kyle's 1999 *Chemical and Process Thermodynamics* CD-ROM attachment, Libb Thims' 2010-present human thermodynamics engineering lectures and chapter assignments, James Ferri's 2011 "thermodynamics of Wall Street" video assignments, and Indian-born American mechanical engineer Kalyan Annamalai's 2011 inclusion of human molecular theory in his *Advanced Thermodynamics Engineering*, aside,

Education

Riley completed her BS in chemical engineering at Princeton University in 1993, her MS in circa 1996 with a thesis "Optimization of Sulfur Removal in a Pressurized Fluid Bed Combustion Power Generation System" and PhD in 1998 with a dissertation "Human Factors in Exposure Analysis for Consumer Paint Stripper Use", both at Carnegie Mellon University. Since 2001, she has been an associate engineering professor at Smith College.

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θΔics

In neurochemistry, **dopamine**, $C_8H_{11}NO_2$, is the primary neurochemical responsible for drive, heightened motivation, heightened *preference* for a particular mate (mate selection), focused attention, and sustained energy levels associated with delayed reward. [1]

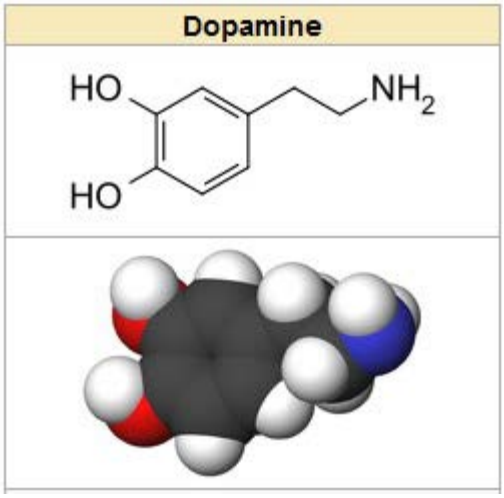

Overview

Dopamine, in colloquial speak, tends to be characterized as the "desire molecule" or neurotransmitter associated with desire: levels increase as passion levels increase; elevated levels are associated with romantic love.135 Is produced by specialized nerve cells located in the *arcuate nucleus* of the brain. Increased levels associated with sexual arousal and heightened motivation.136 Elevated levels directly associated with a *preference* for a particular mate.137 Mate favoritism is associated with a fifty percent increase in the nucleus accumbens, a part of the brain associated with craving and addiction.138 Reduced levels correlated to indiscriminate mate selection.139 Injected increases of cause females to prefer the male present at the time of the infusion, even if she had never mated with this individual.139 Levels spike as an estrus female looks at slides of a males face.140 Heightened levels associated with extremely focused attention.141 Heightened levels associated with unwavering motivation and goal-directed behaviors.142 All major addictions are associated with elevated levels of.143 Specific brain cells produce greater amounts when a reward is delayed, thus energizing, focusing, and driving the pursuer harder.144 All basic drives, and particularly sexual drive or motivation, are associated with elevated levels of.145 Stimulates the release of testosterone.146 Elevated levels are related to sexual arousal, frequency of intercourse, and positive sexual function.147 When injected into the blood stream it stimulates copulatory behaviors.148 When a male is near an estrous female, such that he can see or smell her, his levels rise.149 During copulation levels rise.150 Stimulates lust and erectile function.151 Drugs that elevate levels of in the brain cause sex drive to improve.152 Very high levels of are associated with intense motivation and goal-directed behaviors, as well as with anxiety and fear.133 Vigorous exercise drives up levels of dopamine in the nucleus accumbens, bestowing feelings of euphoria.153 Twice as many receptors for dopamine are found in the limbic systems of schizophrenics.154 Is responsible for the desire or pursuit of any pleasure [see: pleasure center]; without it, a person will feel no joy, anticipation, enthusiasm, excitement, or exuberance.128 It is the common denominator of most addictions, such as cocaine and alcohol, and may be with addicts people to each other.128 It is the neurotransmitter that moves people, drives them to go after what they want, reinforces that desire, and promotes the anticipation of pleasure.128 Is what makes a person smile as well as induces spontaneous activity and movement.128 (ref #s per [1])

Counters

People who have a tendency to count things, such as books, stair steps, or flower petals, according to Helen Fisher, who asks people this question in her Chemistry.com type matching questionnaire, tend to have higher levels of dopamine. [5]

> “I want ten chocolate chip cookies. Medium chips. None too close to the outside.”
>
> — Howard Hughes (2004), *The Aviator* (Ñº)

Risk tolerance and morality

A person’s thinking on moral issues is said to vary depending on one’s tolerance for risk; a factor which is, in turn, governed by a variety of genes, including genes for the D4 dopamine receptor and the protein stathmin, the latter of which is primary expressed in the amygdala. [2]

Religion vs. science

People who have inherited the most active form of the D4 receptor are more likely to believe in miracles and to be skeptical of science; whereas, conversely, those with the least active forms correlate with “rational materialism.” (materialism) [3]

Studies show that skeptics given the drug L-dopa, which increases dopamine levels, show an increased propensity to accept mystical explanations for novel phenomena. [4]

See also

â— Neuroeconomics

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θΔics

In hmolscience, **Dorion Sagan** (1959-) is an American science writer noted for being a popular scientific editorial co-author for a number of publications, 1995 to present, tending to surround the topic of the origin of life, thermodynamics, evolution, and purpose.

Overview

In 1995, Sagan co-authored *What is Life* with his mother Lynn Margulis, wherein the expound on endosymbiotic theory to explain the origin of life.

In 1997, Sagan and Margulis published *What is Sex*, and more simplified version of the former, on bacterial "sex", so to say.

In 2005, Sagan, together with American ecological thermodynamicist Eric Schneider, penned *Into the Cool: Energy Flow, Thermodynamics, and Life*, in which they outline a degrade-the-gradient thermodynamic meaning of life. [2]

In 2013, Sagan, in his *Cosmic Apprentice*, attempted to tackle evolution and entropy. [3]

Education

Sagan, the son of Carl Sagan and Lynn Margulis, seems to be mostly self-educated in the science. Sagan, in this end, has authored or co-authored numerous articles and 23 books translated into eleven languages.

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θΔics

In existographies, **Dorothy Murdock** (1960-2015) (IQ:160|#435) [RGM:1,452|1,500+] (FA:200) (RMS:109) (CR:62), aka “Acharya S” (pen name), D.M. Murdock, or "Dori" (to friends), was an American self-taught independent religio-mythology scholar, of sorts, noted for a number of Christianity and or Hinduism debunking publications, where she attempts to trace modern religions back to ancient mythologies, Egyptian mythology in particular, astro-theology in large part.

Overview

In 1999, Murdock published her first book *The Christ Conspiracy: The Greatest Story Ever Sold*, arguing the concept of Jesus Christ as myth and that the Christ story is a fabrication.

In 2009, Murdock, in comparative mythology and religion, in her *The Gospel According to Acharya S.*, penned a section entitled “Abraham is Brahma? Moses is Dionysus?”, wherein she makes the difficult Abraham = Brahma connection (see: Abraham and Brahma). [2]

Zeitgeist

In 2007, Murdock functioned as the main consulting author for the so-called “Christ myth theory” portion of the viral Internet documentary *Zeitgeist* (Q), by Peter Joseph, in a popular way. [1] In the decade to follow, the film, fortified with Bill Maher's Horus = Jesus connecting film 2008 *Religulous*, have been one of the most successful attacks on the core of Christianity since "new atheism" and Darwin.

In 2012, Christian apologeticist Mark Foreman, a professor of philosophy and religion at Liberty University, penned a chapter “Challenging the Zeitgeist Movie: Parallelomania on Steroids”, where he claims to have dismantled all the Christ myth claims of *Zeitgeist* film. Foreman, in his opening chapter, recalls that it was one of his students who had begun to question his Christian faith who approached him, after a class one day, that pointed the film out to him. The student commented:

> “They really backed up their claims with all sorts of evidence, Dr. Foreman. I don’t know what to believe anymore. Is it true? Is all this stuff I was taught in church just a big hoax?”

In 2013, Foreman followed this up with some type of video-recorded public lecture on his Zeitgeist debunking efforts. [6]

Education

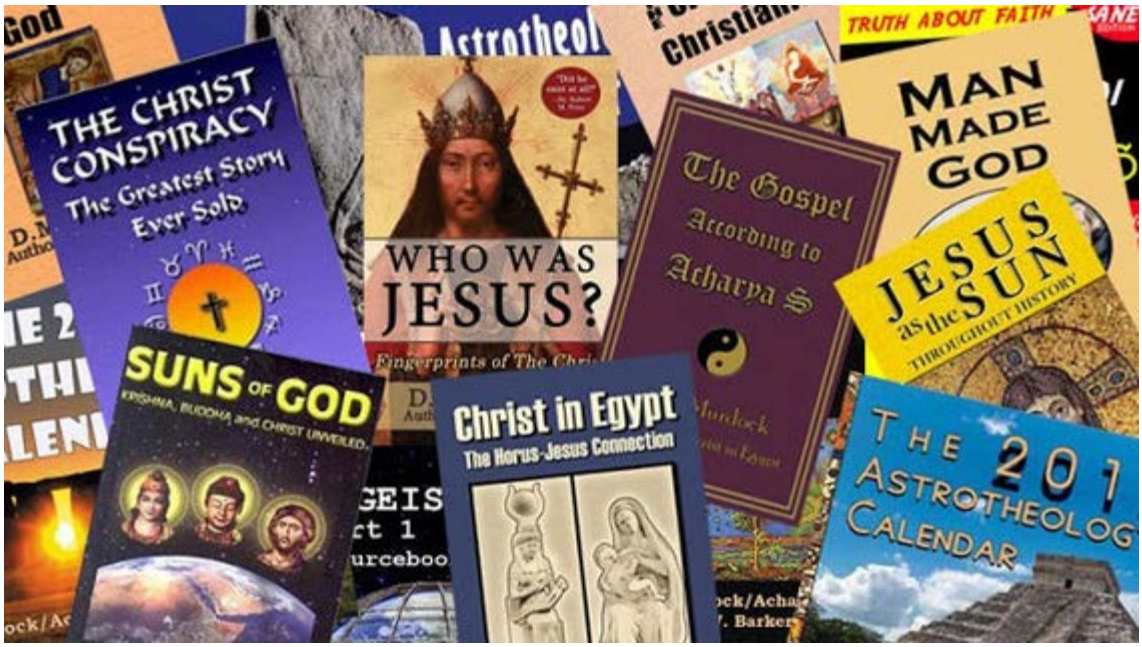

Murdock is an autodidactic, i.e. “self-taught”, and compares herself to Gerald Massey and Abraham Lincoln in this sense. At an early age, she had “developed a fascination for learning certain subjects at an early age”, that around age 3 she began to pour over comics, cartoons, *National Geographic* magazines, etc., in her family’s small library, on characters such as Zeus and Hercules, and books on mythologies in general. In second grade, or so, she was

An obituary tribute selection (Q) of Murdock publications, on the difficult deconstruction of religion backwards into their original myths.

put into some type of gifted program from high IQ children, stating that she was then reading at a rate of 600-words per minute. [3]

As a child, Murdock developed an interest in Greek mythology, which evolved into her life's work exploring, writing and teaching about the origins of religion, mythology and astrotheology. [8]

At age 11, Murdock developed a fascination with the work of British paleoanthropologist Louis Leakey, noted Christian human evolution in Africa archaeologist. [4] At age 14, Murdock relocated with her father, a psychology professor, assigned to an American battleship, to Greece, where she saw the Temple of Zeus in Athens, deciding thereafter to study this field in college.

In c.1983, Murdock completed a BA in "Classics and Greek Civilization" at Franklin & Marshall College, Pennsylvania. She then spent a year at the American School of Classical Studies, Athens, doing post-graduate work in Greek mythology.

In c.1984, Murdock, after returning from her study abroad, and being a "little bit pathless", as she said, was at the Bodhi Tree Book Store (Q), in Las Angeles, and came across Joseph Wheless' *Forgery in Christianity*, at which point it "all came together". [12]

Murdock then spent a number of years doing independent research in the areas of: Christian origins, archaeology, comparative religion, mythology, astrotheology, and archaeoastronomy.

In 1995, Murdock launched TruthBeKnown.com (Q), wherein she began to make her views public.

In c.2006, Murdock stated the following about herself: [3]

> "As concerns my credentials and continuing education, I would like to consider my book *Suns of God* [2004] in particular a PhD thesis in the subjects of comparative religion and **astrotheology**. In this regard, I sincerely hope that these important subjects become increasingly popular and taught in colleges and universities, and that others may be able to obtain relevant and appropriate credentials therein."

(add)

Atheism | Religion

Murdock, who was a member of Michael Murdock's Human Rights for Atheists, Agnostics and Secularists organization, is characterized as a sceptic, free thinker, and feminist. [7] Murdock, based on her work, seem to classify as some type of astro-spiritual philosopher, but not explicitly aligned with openly declared atheism, seemingly.

> "An atheist by the name of **Dorothy Murdock** (who often calls herself Acharya S.) has claimed to be able to demonstrate that the pagan gods Horus, Dionysius, Mithra and even Buddha were said to have been born of a virgin on December 25th (which she mistakenly presumes to be the Biblical position on Jesus' birth), laid in a manger, visited by shepherds and angels, a prodigy at age 12, to have walked on water, been crucified and risen."
>
> — Howie Gardner (2014), *The Middle East Crisis Can be Solved* (pg. 259)

Theists at TheRefinersFire.org, who claim to have done battle with her, likened her as "hopelessly entrenched in her atheistic convictions." (Q)

Reaction end

Of interesting note, Murdock met her reaction end on 25 Dec 2015, i.e. the sun rebirth day, aka Christmas Day, with her best friend and son by her side. [8] Here, it is not too difficult to conjecture that this day was chosen by Murdock, symbolically, per reason that most of her life's work was devoted to debunking the Christ rebirth myth associated with this day. English theist blogger Roger Pearse, in his "In Memoriam: Acharya S.", described the irony of her last day as such: [10]

Murdock tombstone, shown with anthropomorphized sun, showing also that she "died" (ceased to exist) on Dec 25 the sun-rebirth day. [9]

> "On Christmas Day 2015, she died. She was 55 years old, and died of cancer, leaving a 13-year old son. That she should die on 25 Dec [compare: July 4th and Thomas Jefferson and John Adams] was itself full of irony. Acharya S was certain, certain with a degree of certainty that would appall most of us, that Christmas Day was a fraud: that Jesus of Nazareth never lived, and that the day was in fact the birthday of a huge number of pagan deities – Attis, Mithras, Adonis, Osiris, Horus, and so on. So she wrote, and so she preached with a fierce fervor that contradiction only strengthened."

Her tombstone, shown adjacent, has a sun with a face in it, similar to Ra and or its later derivative Akhenaten's sun disc god Aten, in some sense. [9]

Quotes | By

The following are quotes by Murdock:

> "Older religio-mythology books, from longer ago, have the most interesting research, as compared to modern books, which are very sanitized and the products of fairly dull thinking. The older books, from before the WWII era, from the late 18th century until that era, in English, were extremely well-written, the English was very well thought out and taught. The education was obviously superior."
>
> — Dorothy Murdock (c.1998), interview (4:12-43) (Q)

> "Indeed, it is my contention, and that of others deemed 'Jesus mythicists', that the creators of the gospel tale picked various themes and motifs from the pre-Christian religions and myths, including and especially the Egyptian, and wove them together, using also the Jewish scriptures, to produce a unique version of the "mythos and ritual." In other words, the creators of the Christ myth did not simply take an already formed story, scratch out the name Osiris or Horus and replace it with Jesus. They chose their motifs carefully, out of the most popular religious symbols, myths and rituals, making sure they fit to some degree with the Jewish "messianic scriptures" as they are termed, and created a new story that hundreds of millions since have been led to believe really and truly took place in history. We are convinced, in other words, that 'Jesus Christ' is a fictional character created out of older myths, rituals and symbols."
>
> — Dorothy Murdock (c.2010), "The Companion Guide to Zeitgeist" (pg. 8) (Q); cited by Mark Foreman (2013) as a "poorly reasoned" argument that does not "hold up" under close scrutiny [11]

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θΔics

In cessation thermodynamics, **Dorothy D. Sherrill** (c.1940-) is an American nurse noted for her 2010 booklet *Thermodynamics: the Secret Life of Heat*, in which she attempts, through mostly autobiography, to explain subjects concerning extrasensory perception, such as death, ghosts, remote sensing, male energy, female energy, emotion, etc., using sparse bits of thermodynamics terminology, mostly concerning sensory perception as a form of heat radiation. [1] Sherrill seems to focus on the conservation of energy and sites Peter Tait and Balfour Stewart, mentioning their 1875 book *The Unseen Universe*, on immortality. [2]

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θΔics

In philosophy, **Dostoyevsky dilemma**, Karamazov conjecture, Dahmer experiment, or killing spree paradox, among other names, refers generally to the question of why, in a universe without god, meaning, according to logic of a certain type deduction, morals do not exist, and or have no substructure, it is wrong for a person to kill?

A deviant art rendition (Q) of the three brothers Karamazov, the middle brother Ivan Karamazov, a rationalist leaning towards atheism, who is concerned with the suffering he sees in the world, being the one who expresses the "if no god, all is permissible" conjecture.

Overview

In 1880, Russian realism philosopher Fyodor Dostoyevsky, in his *The Brothers Karamazov*, had the character Ivan Karamazov, an atheism-leaning rationalist, express the following supposed position:

> "If god does not exist, every thing is possible."

God, in other words, according to Ivan's proposed viewpoint, if he exists, is the lynchpin holding the universe together, dictating moral code, according to which so-deemed impermissible "wrong" actions are barred from occurring, in large part, owing to hypothetical punishment in the afterlife, either in averse resurrection (e.g. eternally burned in fire) and or averse reincarnation scenarios (e.g. reborn as a pig).

The "everything is permissible" assertion, for many, tends to equate to the logic that "no god = no immorality", which translates to the belief that in a godless world there is no virtue, or something along these lines. (Q)

In 2013, Canadian philosopher Jordan Peterson — a 2017 existence state agnostic (Q), and Sam Harris utopian morality critiquer (Q), who Harris "frustratingly" (Q) podcasted with, and talks about the "problem of atheism" (Q), in respect to Harris and Richard Dawkins, who ranked Trump's IQ as less than 160 (Q) — discussed, in lecture (Q), Dostoyevsky's "why don't I just kill her?" ruminations, in pro and con details.

Dahmer

In 1976, American Jeffrey Dahmer, then aged 16, had the following Karamazov-like atheism ideology ruminating in his mind, as he told his father Lionel Dahmer, a chemist by trade:

> "If it all happens naturalistically? What's the need for god? Can't I set my own rules? Who owns me? I own myself!"
>
> — Jeffrey Dahmer (c.1993), variant of atheism belief he tried (see: killing spree paradox); as told to his father (Q)

> "If a person doesn't think there is a god to be accountable to, then — then what's the point of trying to modify your behaviour to keep it within acceptable ranges? That's how I thought anyway. I always believed

> the theory of evolution as truth, that we all just came from the slime. When we died, you know, that was it, there is nothing ...”
>
> — Jeffrey Dahmer (1994), interview (Q) with Stone Phillips, *Dateline NBC*, Nov 29

and was fantasizing about rendering a male jogger unconscious and performing sexual acts on his unconscious body.

Two years later, in 1978, Dahmer began testing out the Karamazov conjecture, in actuality, and over the next 13 years committed the so-defined immoral acts of: rape, dismemberment, necrophilia, cannibalism, torture and murder of seventeen men and boys.

In 1991, Dahmer, 13 years after he began engaging in extreme immoral activity, was eventually caught, sentenced to imprisonment, and three years later, beaten to death by a fellow inmate.

Other

In 2013, American theological philosopher Joseph Milburn, in his talk “If God Does Not Exist (For All We Know): Everything is Permitted”, part of the "Must Morality Be Grounded in God?" Conference at Franciscan University of Steubenville, digressed on the Karamazov conjecture, in the context of new atheism.

Abioism

See also: Killing spree paradox

A 2016 Atheism Reviews video comment (Q), in reaction to the Francis Crick 1966 “we should abandon the world alive” suggestion, similar thematically to the Karamazov conjecture; which is also found in the David Bossens 2013 jump from abioism to the killing spree paradox. [5]

A newer variant of Karamazov conjecture, is seen as a repercussion of the human molecular and or abioism positions; the following 2013 view expressed by David Bossens, who jumps from abioism to the killing spree paradox, is one example: [5]

> “The morality Libb would propose, is never explicitly proposed. Rather, Libb, each time after he says ‘life does not exist’, goes on to claim that this should have something to do with morality. To me the most obvious moral principle that would follow from ‘life does not exist’ is that ‘it really doesn’t matter whether we would kill somebody’, since life does not exist. Clearly, such reasoning is highly *immoral* and I hope that Libb does not propose this?” (pg. 97) .... Can Libb be a **serial killer** if it doesn’t really matter since: one, life does not exist, so you cannot remove it, and two if the negativeness of dG tells me that killing many people is OK, then I must do so.” (pg. 104)
>
> — David Bossens (2013), *Debates of the Hmolpedians*

(add)

Euthyphro dilemma

In 375BC, Plato, in his dialogue *Euthyphro*, touched on the roots of the solution, to the Dostoyevsky dilemma, when he has the character Socrates ask the character Euthyphro the following approximate statement: [3]

> “Is what is moral or pious ‘good’ because it is commanded by god or is what is moral or pious ‘good’ in and of itself, independent of god?”

Is morality, in other words, written into the laws of nature, according to which god is but a scribe, dictating certain commandments to various prophets of history, or is what is moral in nature based on decrees from god?

The first to answer the Euthyphro dilemma, correctly, was Goethe who in 1809 stated that the moral symbols of nature are found in the equations, reactions, laws, and logic of physical chemistry, a field in which god was disabused in the 19th century, from physical position in 1802 by Pierre Laplace and disabused from the chemical position in 1885 by Johannes Wislicenus.

Existentialism

In 1945, Jean-Paul Sartre asserted that the Dostoyevsky dilemma is the starting point of existentialism. [2]

Quotes

The following are related quotes:

> "Try atheism, and do whatever the hell you want."
>
> — Banjo Bastion (2019), "Ad Pitch to Convince Christians to become Atheists" (Q), Oct 9

References

1. Dostoyevsky, Fyodor. (1880). *The Brothers Karamazov* (Part 4, Book 11, Chap 4) (Q). The Russian Messenger.
2. Sartre, Jean-Paul. (1945). "Existentialism is a Humanism" (pgs. 28-29), Lecture at Club Maintenant, Oct 29, Yale University Press, 2007.
3. Euthyphro dilemma – Wikipedia.
4. (a) Milburn, Joseph. (2013). "If God Does Not Exist (For All We Know): Everything is Permitted" (Q), part of the "Must Morality Be Grounded in God?" Conference (Q) at Franciscan University of Steubenville, Apr 5-6.
(b) Joseph Milburn (faculty) – University of Pittsburgh.
5. Bossens, David. (2013). *Debates of the Hmolpedians* (Amz) (Q) (§Morality, pgs. 103-04). Lulu.

θΔics

In chemistry, **double displacement reaction**, aka a "double elective affinity", as it was called in the 18th century, as can be contrasted with a "single displacement reaction", is a reaction in which there is a two-way exchange of chemical components or species between two reactants, which results in two new products.

The double displacement reaction, using Bergman letter notation, is the following generic reaction:

$$AB + CD \rightarrow AC + BD$$

Wherein species A detaches from species B, C detaches from species D, during the course of which, A bonds to C, and B bonds to D, thereby forming two new product species.

See also

â— Human reproduction reaction

External links

â— Double displacement reaction – Study.com.

θΔics

In chemistry, a **double elective affinity**, aka "double displacement reaction", in modern parlance, is a reaction or affinity reaction, involving four affinities, in which two compositions, each consisting of two ingredients, mutually decompose each other, being destroyed, and, by a double interchange of these principles, form two new compounds. [1]

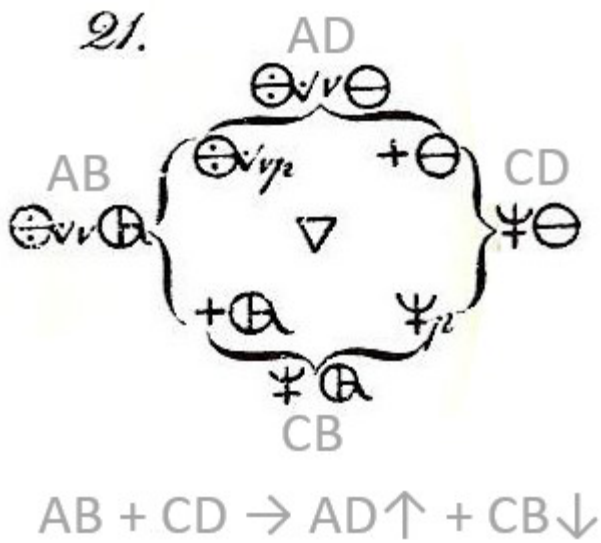

Swedish chemist Torbern Bergman's 1775 reaction diagram #21 (see: Bergman's reaction diagrams), showing a **double elective affinity** (i.e. double displacement reaction), occurring in the wet way, upside down triangle symbol, between two different two-element chemical species put in contact in water, the species AD going out of the reaction in gaseous form, the species CB precipitating in the solid form in the reaction system.

Goethe

See main: EA|IAD: Reaction decipherment; See also: Thims Apr 2013 lecture

The following shows the human elective affinity conceptualized "double elective affinity" reaction that German polyintellect Johann Goethe conceptualized as the basis behind the chemical reaction story of his 1809 physical chemistry based novella *Elective Affinities*, as described in his famous chapter four, according to which Charlotte (A) and Edward (B), a married couple residing on their country estate (retort), decide to invite their associates Captain (C) and Ottilie (D) to the estate, per various disclosed reasons of circumstance, through which, chapter by chapter, the following double elective affinity (double displacement) human chemical reaction accrues:

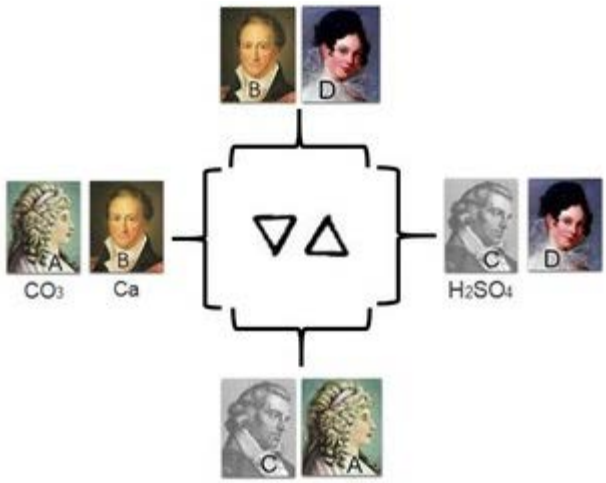

the inverted ∇ and upside Δ triangles indicating the reaction occurred in the dry way (heated) and in the wet way (in water), respectively, i.e. heated by the sun and near or in the various ponds and lakes on the estate; the upward pointing bonding bracket, signifying that Edward and Ottilie, in their BD union, evaporated out of the system of the estate, first Edward going off to war, and eventually the pair of them dying (dereacting) at the end of the novella; the downward pointing bracket signifying that the Captain and Charlotte, in their CA union, precipitating in the state as a semi-formed solidified couple, approximately.

The general model of which, Goethe attributes to Bergman's reaction diagrams, e.g. reaction #21 is shown above, which Goethe considered the "moral symbols" of nature; the reaction described in chapter four, specifically being the contact of limestone with sulfuric acid, shown below, which Goethe takes as the central reaction model for his novella:

which, in modern chemical equation notation, translates as follows:

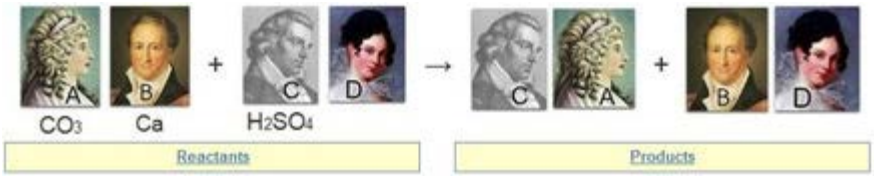

(add discussion)

References

1. Henry, William. (1831). *The Elements of Experimental Chemistry, Volume 1* (Single elective affinity, pgs. 183-85; Double elective affinity, pgs. 185-86; ch. 2: Of Chemical Affinity, pgs. 37-; section: IV: Of Elective Affinity, pgs. 61-; section VI: Of the Estimation of the Forces of Affinity, pgs. 68-; section VII: Of Complex Affinity, pgs. 70-). D. Desilver.
2. Bergman, Torbern. (1775). *A Dissertation on Elective Attractions*. London: Frank Cass & Co.

θΔics

In experiments, the **double-slit experiment** was a *circa* 1804 experiment, conducted by English physician-physicist Thomas Young, in which he passed a portion of light through two small apertures, and found that they produced light and dark stripes or fringes by their interference, proceeding in the form of hyperbolas, the middle ones becoming more and more dilated, as in section A, as shown adjacent. [1]

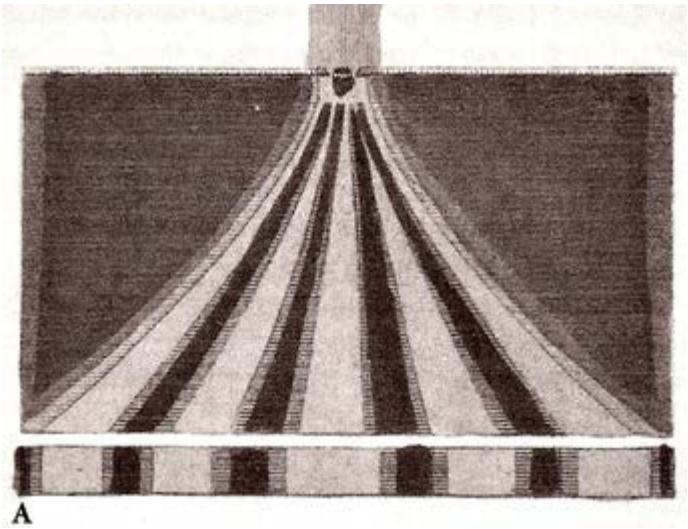

English physicist Thomas Young's *circa* 1804 **double-slit experiment** with light and the interference fringes produced, as diagrammed in his 1807 *Natural Philosophy*. [1]

History

Since ancient times, following the invention of glass, people had noticed that whenever broken glass was present the appearance of colors would appear where two refracting surfaces formed a sharp edge.

English natural philosopher Francis Bacon (1561-1626) contended that light was a disturbance in an invisible medium which could be detected by the eye; subsequently, color was caused by objects "staining" the light as it passed.

French natural philosopher Rene Descartes (1596-1650) famously looked through a prism in sunlight and seen a circle of colors. Descartes thought of light as a pressure in the ether and color an effect of the rotation of the ether particles.

English polymath Robert Hooke (1635-1703) objected to the Descartes's view, arguing instead that light was a type of pulse, a vibration of ether, or a wave, like sound.

English physicist Isaac Newton (1643-1727), notably viewing Hooke and Descartes as intellectual giants, objected to the theories of both. He commented, e.g., in the margins of his personal copy of Hooke's 1665 *Micrographia:*

> "Though Descartes may be mistaken so is Mr Hook."

Newton's general objection against the wave ether theory was that light, unlike sound, does not turn corners. He queried to himself: "why then may not light not deflect from straight lines as well as sounds, etc." In its place, in his personal notes during this period, Newton wrote of light as globules, traveling at finite speed, which impinged on the eye. [8]

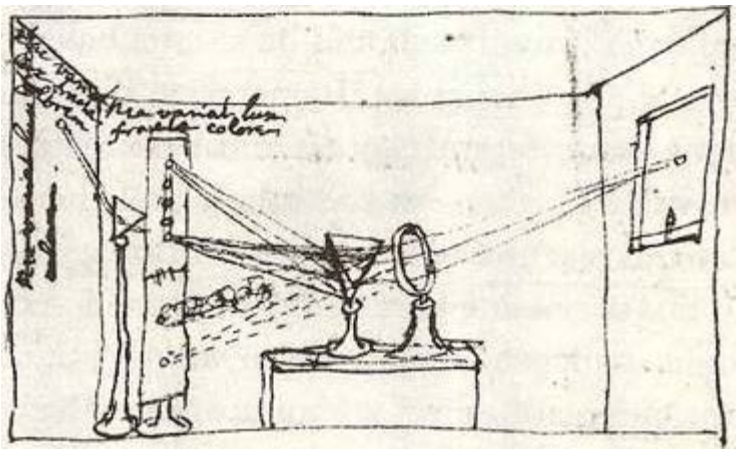

Sketch of English physicist Isaac Newton's circa 1666 double prism, double perforation experiment, from his notebook, in which he showed that an isolated beam of *colored* light shined through a prism did not create new colors, contrary to the prevailing theory that prisms somehow added color to white light. [8]

In *circa* 1666, English physicist Isaac Newton performed his famous double prism, double perforation experiment, as shown adjacent, in which pure white light (sunlight) enters a dark room through a whole in the window (right), then passes through a first prism (middle), which splits the light into its various colors; each individual colored beam is then sent through a second perforated hole, and into a second prism, after which it is found that the color is pure, meaning that it cannot be split anymore. [8]

Newton's revolutionary theory of light was made public in the 1672 readings of the *Philosophical Transactions*, which caused such an embroiled turmoil, Newton being embroiled greatly with Hooke, that Newton resigned from the Royal society.

In 1678, Dutch physicist-astronomer Christiaan Huygens had developed an undulatory theory of light, in which light was thought to be a wave spreading out in all directions from a light source, transmitted via a medium known as ether.

This view, however, was in conflict with Newton's corpuscular theory of light, in which light was imaged to be a stream of minute particles or corpuscles emitted by a light source. The final word on Newton's theory is found in his Query 17 to his *Opticks* (c.1718).

In 1799, English physician-physicist Thomas Young wrote his first paper, with a section on "The Analogy between Light and Sound", in which he addressed the issue of the uniform velocity of light not being consistent with the corpuscular theory, and went on to explain, in objection to the opinion of English mathematician Robert Smith, that waves of sound can interfere with each other, and thus increase and decrease their mutual effect. In this paper, Young had the idea in mind that the analogous phenomenon might explain light.

In May 1801, in a time when Newton's theory was the dominate view, Young was said to have gleaned his first insight into a newer version of the wave theory of light, while reflecting on Newton's experiments with light, particularly on the colors in Newton's rings.

In July 1801, in letter to *Nicholson's Journal*, Young stated: “light is probably the undulation of an elastic medium.” In a followup paper that year, Young stated his new theory:

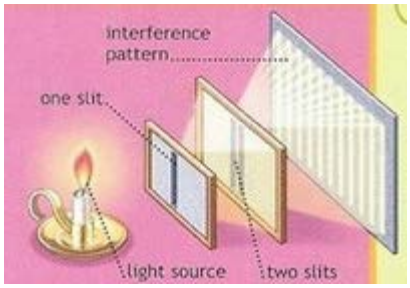

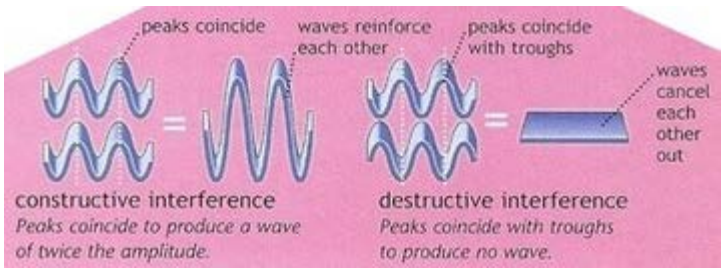

Depiction of Thomas Young's famous circa 1804 **double slit experiment**. [2] Depiction of two waves producing constructive interferences (left) and destructive interferences (right).

> “I maintain that when two portions of light are mixed, elevations or depressions in the undulations will result, similar to the way in which waves of colliding water combine in their effects, and I call this the general law of the interference of light.”

In 1802, to elaborate on his theory, by analogy with water waves, Young built a "ripple tank" (below), with a glass bottom and board for creating ripples on one end, arranged such that if light was allowed to illuminate the bottom of the tank, the interference of the ripple patterns could be observed on a board placed above the tank at an angle.

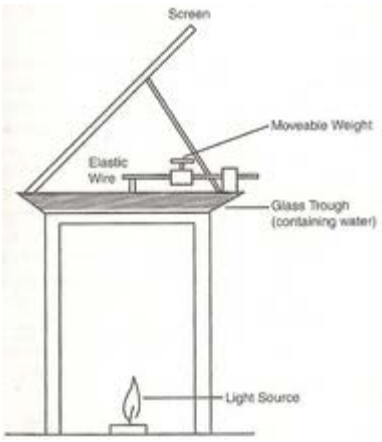

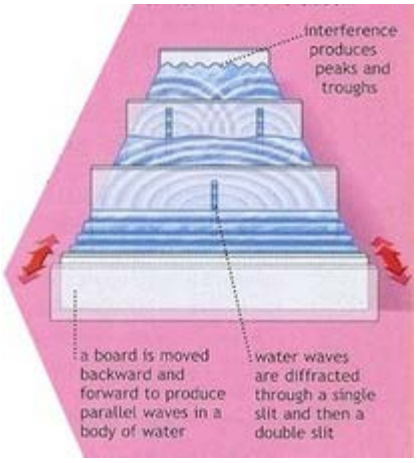

In November 1803, Young performed an experiment showing a single beam of light detracted by a narrow card, and the color fringe effects it produced. This experiment was soon attacked by English statesman Henry Brougham, a proponent of Newton's view, who called Young's law of interference "absurdity and one of the most incomprehensible suppositions that we remember to have met with in the history of human hypothesis". This attack was said to have been the main goad or drive behind Young later performing the the now-famous double-slit experiment, so as to prove his theory conclusively.

Single particle interference

The puzzle to the double slit experiment only became more complicated when in the 1980s an experiment was conducted in which single electrons were fired, one by one, through the equivalent of Young’s double-slit

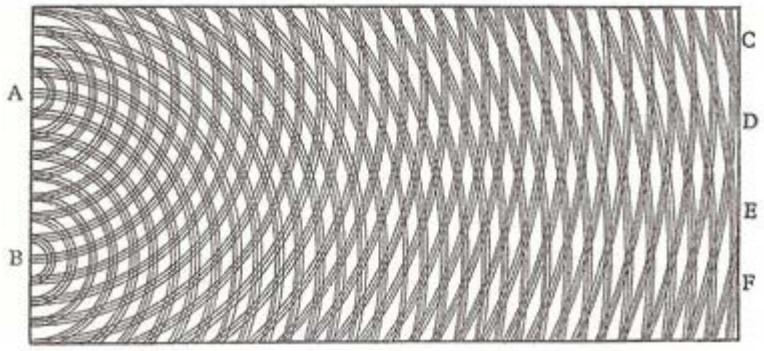

Ripple tank (top) and **interference** of two water waves (below) in the ripple tank, as diagrammed in Young's 1807 *Natural Philosophy*. [1]

apparatus, only to still show, curiously, interference patterns, as if the screen "remembered" the previous spot of impact. [2] Said another way, the previously-fired electron was found to be interfering somehow with the electron in movement through the slits?

This same phenomenon was soon observed for larger more massive particles, such as atoms, dimmers, small van der Walls clusters, and neutrons.

Many, such as American physicist Richard Feynman, have called this the most puzzling experimental finding in all of modern science, one that nobody understands.

In 1999, Viennese researchers, supposedly led by physicist Anton Zeilinger, reported interference in in the movement of Buckyball molecules, a 60 atom molecule, through the double slits, the largest objects to-date ever to show quantum phenomena. [7] In short, by passing Buckyball molecules, one at a time, through a double slit experimental apparatus, Zeilinger showed that single molecules possess wave particle duality. [5]

The implications of the finding that large molecules, such C_{60}, possess wave particle duality, are that single human molecules also possess wave particle duality.

Human chemistry

A loose outline of human particle-human wave behavior was first documented in circa 1885 by Ernst Mach and his noting of what he called "turning tendencies" in troops lost in a snow storm. [3]

A modern approach to the issue of wave particle duality behavior is the the concept of the human molecular orbital, as explained in human molecular orbital theory, in which a person as a bound state point-like molecule (or human particle) moves daily in probabilistic activity orbitals. [4]

Quotes

The following are related quotes:

> "It is daydreaming. What counts is what you see on the screen. Do not ask if the particle did follow some continuous path. We do not know about that. Forget about it.?"
>
> — Martinus Veltman (2003), *Facts and Mysteries in Elementary Particle Physics* [6]

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(b) Young, Thomas. (1807). *A Course of Lectures on Natural Philosophy and the Mechanical Arts: Volume Two*. Publisher.
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6. Veltman, Martinus. (2003). *Facts and Mysteries in Elementary Particle Physics*. World Scientific Press.
7. (a) Zeilinger, Anton. (2006). "I believe quantum physics requires us to abandon the distinction between information and reality", in: *What We Believe, But Cannot Prove* (pgs. 223-24). Harper-Perennial.
(b) Anton Zeilinger – Wikipedia.
8. Gleick, James. (2003). *Isaac Newton* (pg. 80). Vintage Books.

External links

â— Double-slit experiment – Wikipedia.

θΔics

In existographies, **Douglas Adams** (1952-2001) [RGM:541|1,260+] (FA:167) was an English author generally known for his 1978 radio comedy turned 15-million copy selling book *The Hitchhiker's Guide to the Galaxy*, wherein his fictional supercomputer computes the meaning of everything to be #42, which is the number of nomes of Ancient Egypt, which became the number of sins or negative confessions of the weight of the soul, the forerunner to the Ten Commandments and judgment day.

Puddle analogy

In c.1990, Adams, in video (Ñº), gave a "puddle analogy", the gist of which is that one day a "puddle", analogous to a human, wakes up, and looks around, and sees who perfectly it is "fit" to the shape around him; the analogy being a mockery of religious beliefs, e.g. intelligent design, fine tuning ideas, or something to this effect.

Atheism

Adams, a characterized "devout atheist", is a Brainz.org top 50 brilliant atheist (#43) (Ñº); a auto-described "radical atheist"; Richard Dawkins dedicated his *The God Delusion* to Adams.

Quotes | By

The following are noted quotes:

> "I am a 'radical atheist'. I use this term because if I say 'atheist', people will assume I mean 'agnostic', but I really do not believe that there is a god, in fact I am convinced that there is not a god (a subtle difference), I see not one shred of evidence to suggest that there is one."
>
> — Douglas Adams (1998) [1]

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 482). HarperOne.

External links

â— Douglas Adams – Wikipedia.

θΔics

In existographies, **Douglas Hofstadter** (1945-) is an American mathematical physicist turned ontic opening stylized “sense of self” philosopher, noted for []

Soul | Huneker number

See also: Number; Geniuses on the soul

In 2007, Hofstadter, in his *I am a Strange Loop*, having been mesmerized by video feedback experiments he did in graduate school, along with Godel's theorem, with its formulas that speak of themselves, Escher's drawings of hands drawing hands, Bach's involuted fugues, attempted to stylize the “I” of a person in terms of “loopiness” as follows: [1]

> "You make decisions, take actions, affect the world, receive feedback from the world, incorporate it into yourself, then the updated ‘you’ makes more decisions, and so forth, round and round; [what results is an] anatomically invisible, terribly murky thing called I.”

Hofstadter then attempts to argue that each thing’s looped structure is its “self” or “soul”, terms he, supposedly, uses interchangeably in his mind. [1]
Here, to note, there is something to be said about how existence involves “loops”, but rather it operates in the form of orbitals (see: human molecular orbital theory; turning tendencies) and atomic turnover (see: turnover rate), generally captured by how human existence, according to Charles Sherrington (1938), is an “eddy in the stream of energy, destined by the second law of thermodynamics.

When, however, the specifics of Hofstadter's looped soul-self theory are elaborated on, e.g. in comparing the soul or loop of a fly, to a lion, to a dog, to a human, a cartoonish anthropomorphism results; to site on example: [2]

> “This may merely be a lexical gap or a confusing semantic blur in these languages (the meaning on a literal level is "co-knowledge"), but even if that's the case, I nonetheless think of it as offering us an insight that might otherwise never occur to us: that the partial internalization of other creatures' interiority (conscience) is what most clearly marks off creatures who have large souls (much consciousness) from creatures that have small souls, and from yet others that have none or next to none. I think it's obvious, or nearly so, that mosquitoes have no conscience and likewise no consciousness, hence nothing meriting the word "soul". These flying, buzzing, blood-sucking automata are more like miniature heat-seeking missiles than like soulful beings. Can you imagine a mosquito experiencing mercy or pity or friendship? 'Nough said.”

On this sloppy basis, e.g. using derogation stylized language to argue that flies, in the unwritten context of the great chain of being, are soul-less automatons without friends while humans are soulful non-automatons with friends, Hofstadter suggests, based on the fact that James Huneker once wrote that a certain Chopin etude should not be attempted by “small-souled men”, that each thing in the universe, albeit only animate things above the size of a mosquito, should be assigned a “Huneker number” (Q)(Q)(Q), with mosquito being about 0.5, average human being 100, and Mahatma Gandhi being 200. [1]

Self

The following is a popular quote by Hofstadter on his views of what he is:

> “In the end, we are self-perceiving, self-inventing, locked-in mirages that are little miracles of self-reference.”
>
> — Douglas Hofstadter (2007), *I Am a Strange Loop*; see: Thims' 2017 “Dan Message” (Q),

Hmolpedia thread (#4) [3]

Here, Hofstadter, despite studying physics, is unaware that things which move themselves (see: self-motion), e.g. a thing that "invents" itself, as pointed out by Leonardo da Vinci and Karl Pearson, are violations of the principle of inertia and the first law of motion.

References

1. Johnson, George. (2007). “A New Journey into Hofstadter’s Mind: the Eternal Golden Braid Emerges as a Strange Loop” (Q), *Scientific American*, Mar 1.
2. Hofstadter, Douglas. (2007). *I Am a Strange Loop* (small soul, pg. #). Publisher.
3. (a) Hofstadter, Douglas. (2007). *I Am a Strange Loop* (pg. 363). Publisher.
(b) Thims, Libb. (2017). “Dan Message” (Q), Hmolpedia thread (#4), Sep 11.

External links

- Douglas Hofstadter – Wikipedia.

θΔics

In existographies, **Douglass Rushkoff** (1961-) is an American media theorist, writer, columnist, graphic novelist, and documentarian, noted for []

Lunar | Neurochemistry

In 2013, Rushkoff, in his *Present Shock: When Everything Happens Now*, summarized his interview with Mark Filippi, curator SomaSpace.org, on the neurochemical effects changes associated with lunar cycles, aka "chronobiology" as he refers to it, as follows: [1]

> "Building on his predecessors' work, Filippi has been analyzing the biochemical impact of seasonal and lunar phases in order to make sense of human rhythms and determine optimal times for both therapy and particular activities. Just as there are four solar seasons with rather obvious implications (winter is better for body repair; summer is better for exertion), there are also four corresponding moon phases, sections of the day, quarters of the hour, and even stages of breath, Filippi argues. By coordinating our internal four-part, or "four phase," rhythms with those of our greater environment, we can think, work, and interact with greater coherence. Integrating the research of Dardik, Goodman, and Robinson along with his own observations, Filippi concluded that in each moon phase the brain is dominated by a different neurotransmitter. According to Filippi, the prevalence of one chemical over the others during each week of the lunar cycle optimizes certain days for certain activities. At the beginning of the new moon, for example, one's acetylcholine rises along with the capacity to perform. Acetylcholine is traditionally associated with attention. "The mood it evokes in us is an Energizer Bunny—like pep. That vibe can be used to initiate social interactions, do chores and routines efficiently, and strive for balance in our activities." Nearer to the full moon, an uptick in serotonin increases self-awareness, generating both high focus and high energy. Serotonin, the chemical that gets boosted by drugs like Prozac, is thought to communicate the abundance or dearth of food resources to our brain. "When under its influence we can feel euphoric, spontaneous, and yet composed and sedate. Whereas acetylcholine worked to anchor us to our physical world, serotonin buoys us to the mental realm, allowing us to experience the physical world from an embodied, more lucid vantage point. We actually benefit from solitude at this time, as when an artist finds his muse."
>
> Over the next week, we can enjoy the benefits of increased dopamine. This chemical—responsible for the rush one gets on heroin or after performing a death-defying stunt—is responsible for reward-driven learning. "It allows us to expand our behaviors outside of our routines, decrease our intensity, and essentially blend with the energy of the moment. If acetylcholine is the ultimate memory neurotransmitter, dopamine is the ultimate experiential one. Functionally, it serves us best when we're doing social activities we enjoy." In other words, it's **party week**. Finally, in the last moon phase, we are dominated by norepinephrine, an arousal chemical that regulates processes like the fight-or-flight response, anxiety, and other instinctual behaviors. "We tend to be better off doing more structural tasks that don't involve a lot of reflection. Its binary nature lets us make decisions, act on them, and then recalibrate like a GPS with a hunting rifle. The key with norepinephrine is that if it's governed well, we experience a fluid coordination of thought and action so much so that we almost fail to feel. Everything becomes second nature." So instead of letting the natural rise of fight-or-flight impulses turn us into anxious paranoids, we can exploit the state of nonemotional, almost reptilian arousal it encourages. Further, within each day are four segments that correspond to each of these moon phases. In the new moon phase, people will be most effective during the early morning hours, while in the second phase leading up to the full moon, people do best in the afternoon.
>
> Admittedly, this is all a tough pill for many of us to swallow, but after my interviews with Filippi, I began working in this fashion on this book. I would use the first week of the moon to organize chapters, do interviews, and talk with friends and colleagues about the ideas I was working on. In the second, more intense week, I would lock myself in my office, set to task, and get the most writing done. In the third week, I would edit what I had written, read new material, jump ahead to whatever section I felt like working on, and try out new ideas. And in the final week, I would revisit structure, comb through difficult passages, and recode the nightmare that is my website. My own experience is that my productivity went up

> by maybe 40 percent, and my peace of mind about the whole process of writing was utterly transformed for the better. Though certainly anecdotal as far as anyone else is concerned, the exercise convinced me to stay aware of these cycles from now on."

(add)

Quotes | By

The following are quotes by Rushkoff:

> "New research suggests that our dominant neurotransmitters change with each of the four weeks of a lunar cycle. The first week of a new moon brings a surge of acetylcholine; the next brings serotonin; then comes dopamine, and finally norepinephrine. During a dopamine week, people would tend to be more social and relaxed, while norepinephrine would make people more analytic. A serotonin week might be good for work, and an acetylcholine week should be full of pep."
>
> — Douglass Rushkoff (2017), "Chronobiology" [2]

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External links

â— Douglas Rushkoff – Wikipedia.

θΔics

In hmolscience, **Douglas C. Spanner** (c.1920-) is an English biophysicist noted for his 1973 to 2004 efforts to give a middle ground digression on the choice between evolution theory meaning and Biblical meaning, in respect to questions like "who am I?" and "how did I get here?"

Overview

In 1964, Spanner, in his *An Introduction to Thermodynamics: Experimental Botany*, modeled a leaf as a heat engine, attempts to outline the criterion for spontaneity and thermodynamics in living systems, and of note includes an interesting section on the the graphical nature of the a total differential . [1]

In 1973, Spanner, being a life long reader of the Bible, as he says, was ordained to the non-stipendiary ministry of the Church of England.

In 1987, Spanner, in his *Biblical Creation and the Theory of Evolution*, stated that he considers his viewpoint a neutral stance between science and religion. [3]

In 2004, Spanner, in his online *Creation and Evolution*, which is sparse with reference to the second law, summarized his Christian-sided view, and took issue with the anti-theistic views of Richard Dawkins, Peter Atkins, and Daniel Dennett; the following of which seems to be his abstract: [4]

> "Two of the most important and serious questions people ever ask are surely, 'Who or what am I?' and, 'How did I come to be here, on earth?' In adulthood they tend to become snuffed-out by the pressures of everyday life; and for many, life ends at last like a tale which is told, with a sigh, and without any satisfactory answer having ever been found. Two sources which claim to give us such an answer are the Judaeo-Christian Scriptures, and evolutionary science; in other words, the Bible and the experts in Darwinism. The latter currently get very good publicity through the highly exciting and confident writings of biologists like Richard Dawkins and philosophers like Daniel Dennett, backed-up as they often are by secular cosmologists and the authors of science fiction. The answers they give invoke many ideas outside the stock-in-trade of the ordinary man or woman, and are usually at a specialist level above their ability to challenge; the listener is accordingly left with conclusions only half-believed because he is out of his depth and because they often run counter to deep intuitions."

Spanner argues, for instance, that passages from the Genesis sections of the Bible "fills the cosmic horizon with hope", "in spite of the second law of thermodynamics [which] predicts an ultimate heat death of the universe." [4]

Education

Spanner completed his undergraduate work in chemistry at Imperial College, London. He completed his PhD in 1951 in biology and a DSc in 1972. [2] He was the chair of the department of plant biophysics at the University of London, retiring from that position in 1978.

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2. Douglas Spanner – CreactionandEvolution.co.uk.
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Further reading

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53.

External links

- Spanner, D. C. – WorldCat Identities.

θΔics

In hmolscience, **Douglas R. White** (1942-) is an American anthropologist noted, in sociological thermodynamics, for his 2000 thermodynamics based sociology course taught at the University of California, Irvine.

Overview

In 2000, White, at the University of California, Irvine, via his online article "Thermodynamic Principles for the Social Sciences: an Introduction", was teaching an Arthur Iberall based sociology-anthropology course; the following being White's general view: [1]

> "Hierarchical systems are ubiquitous in nature and society. They require variably long time scales for the interactions among their diverse elements to unwind towards thermodynamic equilibrium. The unwinding of long-span (e.g. solar) systems fuels the wind-up of shorter-span (e.g. living) systems. Stacks of such complex systems comprise the universe—physical, biological, and social—as we know it."

In addition, "life", according to White, "is a special case of self-organizing systems where it is thermodynamic stacking that is doing the organization." In outlining human chemical bonding, White states: [2]

> "If we consider atomism as a system that is difficult to break up, an experimental observation equally applicable to social groups and social bonds, there is energy in the bonding of atomic constitution, and when that bonding is broken that energy is released."

In giving these statements, Whites references the 1977 thermodynamics of complex systems theories of American physicist-engineer Arthur Iberall and American nuclear physicist Harry Soodak. [3]

White is member of the Santa Fe Institute.

References

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â— Douglas White (faculty) – University of California, Irvine.

θΔics

In existographies, **Dr. Seuss** (1904-1991) (IQ:140|#719) [RGM:387|1,500+] (GLAE:#) (CR:4), aka **Theodore Seuss Geisel**, was American children's author, philosopher, and comedian, noted for []

Pen name

In 1930 to 1932, Geisel, in his *College Humor* series "Animals Every Student Loves", would sign his articles via the pen name: "Doctor Theodophilus Seuss, Ph.D., I.Q., H2SO4". [1] This, supposedly, was done in a way to poke fun at the long-standing pompous credentiality trick.

Things

In 1957, Seuss, in his *The Cat in the Hat*, introduced the characters "thing one" and "thing two", that were released from the box that the cat brought in to introduce to Conrad, Sally and the fish.

In 2018, Libb Thims, in his "Thing Philosophy" lecture, taught two kids a thing one to thing five stylized "thing philosophy" view of the world. [2]

Other

In 1985, Christopher Hirata, age 3, was reading the Dr. Seuss series to himself, able to recite the alphabet backwards, and had coded the alphabet sequence numerically, e.g. that the letter 'O' was 15th in the sequence.

Quotes | On

The following are quotes on Geisel:

> "My IQ is somewhere between **Dr. Seuss**, who in 1931 claimed an IQ of H_2SO_4, and Dr. Faustus, who in 1514 sold his soul to the devil for truth, knowledge, and power; the embodiment of the latter found in the mind of Goethe, who in 1809 professed that he and his wife were like $CaCO_3$ (limestone), who when put into contact with H_2SO_4 (Captain) have no "choice" but to debond, and who in 1926 became the first ever person ranked [Cox] with an IQ of 225."
>
> — Libb Thims (2013) YouTube post reply to query by Paul Rael, Aug [3]

Quotes | By

The following are quotes by Seuss:

> "My IQ is H_2SO_4."
>
> — Dr. Seuss (1931), *College Humor* (see: auto-estimated IQs) [1]

References

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2. Thims, Libb. (2018). "Thing Philosophy" (Q), HumanChemistry101, Jul 9.
3. (a) Thims, Libb. (2013). Query: "Who are you, a professor somewhere? And what is your IQ?"; asked (Q) by Paul Rael, Aug.
(b) Note: variations of this "what is your IQ query" have been asked reoccurring since circa 2009 (see: Libb Thims (genius ranking)); draft answers prior have been attempted, this is the first one that seems to hold in the mind.

Further reading

● Purcell, Alex. (2016). "Column: Dr. Seuss Wasn't Lucky, He was a Genius" (Q), *The Shorthorn*, Mar 2.

External links

- Dr. Seuss – Wikipedia.

θΔics

In thermodynamics schools, **Dresden school of thermodynamics** is circle of thermodynamics influence, at Dresden University of Technology (east Germany), associated with Germans physicist Gustav Zeuner, creator of “technical thermodynamics”, physicist Richard Moller, Zeuner’s successor, noted for his “Moller diagrams”, and Georg Helm, noted for his views on social energy and theories on money and entropy in economics.

Overview

In some circles, German physicist Gustav Zeuner, author of the two-volume *Technical Thermodynamics*, which went through five-editions, is considered as the founder of the "Dresden school of thermodynamics". Specifically, in 1873, Zeuner took on the post of director at the Royal Saxon Polytechnicum in Dresden (now Technische Universität Dresden) in east Germany, wherein, aside from thermodynamics, he led to the introduction of the humanities; the extension of the range of subjects taught resulted in the polytechnic's rise to a full-scale polytechnic university in 1890. In 1889, aged 61, Zeuner gave up his position as director of the polytechnic to work as a lecturer until his retirement in 1897.

Zeuner was succeeded at Dresden, in 1897, by German physicist Richard Mollier as professor of mechanical engineering. Mollier later became notable for his enthalpy-entropy diagrams for steam; publishing treatises such as *The Entropy of Heat* (1895) and *New Graphs for Technical Thermodynamics* (1904). At the 1923 Los Angeles Thermodynamics Conference, it was decided that any thermodynamic diagram having enthalpy as one of its coordinates should thereafter be called a "Mollier Diagram". [17]

German mathematical physicist Georg Helm studied mathematics at Dresden Polytechnic during the years 1867 and 1872. In 1881, he completed his PhD at the University of Leipzig and that same year married Elise Zeuner, the daughter of Gustav Zeuner. Helm then taught analytical geometry, mechanics, mathematics, and physics at the Dresden University of Technology and at the Royal Saxon Polytechnic from 1888 until 1922. He later becoming head of the office of rector at the Technical University of Dresden in 1910. [2]

References

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θΔics

A synopsis of the operation of the "**drinking bird**", a seeming perpetual motion machine, which, once put in contact with the water, will continue to bob up and down until it runs out of water, owing to a cooling effect of water (cold body) on the volatile methylene chloride CH_2Cl_2 vapor (working body), thereby turning the vapor back into liquid, and readjusting the gravitational balance of the bird, making it go into the vertical position, after which the head dries, more vapor evaporates into the head, the process starts over again

In thermodynamics, **drinking bird**, or "dipping bird", is a fluid filled vessel, hinged near its midpoint, with a bird's head at its top and feathers near its bottom, that will do work, i.e. bob up and down, for days on end, via heat differentials and evaporation effects.

History

The drinking bird was invented in the 1940s by American chemist Miles Sullivan, patented by him in 1945, after watching bubbles go up a colored tube on a jukebox machine, and thinking about how much energy was lost by that process. [1]

Overview

The famous thermodynamic toy the “drinking bird” is an amusing toy, the thermodynamical operation of which notoriously baffled German-born American physicist Albert Einstein in 1946.

The dipping bird is a loose example of “thermodynamic art”, being a sort of atmospheric heat engine, which will run for days operating on the principle of heat loss via evaporation conjoined with the conversion of heat into work in the working body (liquid-vapor mixture of methylene chloride CH_2Cl_2) of the engine via the mechanical equivalent of heat.

The operation of the drinking bird is similar, in a way, to Greek inventor Hero of Alexandria’s first century AD rotating toy steam engine the "aeolipile", a heat-driven spinning steam ball.

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θΔics

In science, **drive**, from the PIE *dhreibh-* “pushing from behind”, *push* meaning "to press against with force", is a cause to move by force or compulsion. [1]

Overview

In a psychological sense, drive is the motive force or motivational factor behind a person’s actions; or a basic compelling urge. [2] The opening quote to American psychologist Paul Young’s 1936 book *Motivation of Behavior*, chapter “The Energetics of Activity”, is by American gifted-children psychologist Florence Goodenough, which summarizes the his views on the word drive: [3]

> “The literal meaning of *motivation* (drive) is the process of induced movement.”

In terms of the modern understanding of this definition of drive, one must compare the mechanism or photon-induced movement of the 3-element retinal molecule to the photon-induced movement of the 26-element human molecule, a process colloquially known as “free will”. [4]

History

The word “drive”, which has been widely used in discussions of motivation, came into use in psychology via the publication of American psychologist Robert Woodworth’s 1918 publication *Dynamic Psychology*, and from this source it was taken up by the animal psychologists. [5] According to Woodworth:

> “Once the point of view of a dynamic psychology is gained, two general problems come into sight, which may be named the problem of ‘mechanism’ and the problem of **‘drive’**.”

He continues, “one is the problem, how we do a thing, and the other is the problem of what induces us to do it. Take the case of the pitcher in a baseball game. The problem of mechanism is the problem of how he aims, gauges distance and amount of curve, and coordinates his movements to produce the desired end. The problem of drive induces such questions as to why he is engaged in the exercise at all, why he pitches better one day than on another, why he rouses himself more against one than against another batter, and many similar questions.” Woodworth, according to American psychologist Paul Young, derived the term “drive” from mechanics; in that: [3]

> “A machine must be driven if it is to move, and the drive of a machine is the supply of energy that puts the mechanism in motion.”

In extrapolation, the same definition applies in the human case. The “supply of energy that puts the mechanism in motion” in the human scenario, however, is very complicated, depending on detailed description of valence shell photon-electron interactions in the periphery sensory system of a set of persons in a system owing to the influx of photons from the sun. [4] In terms of etymology of the term “drive”, in the mind of Woodworth, in a personal communication from Woodworth to Young, he states:

> “I believe you are right in supposing that the current use of ‘drive’ in animal psychology and other psychology springs from my use of the word in *Dynamic Psychology*, 1918. I am sure I did not derive the word from any previous psychologist. I got it from mechanics. A machine has a mechanism, such that if it is put in motion it operates in a certain way; but it must be driven in order to move. The ‘drive’ of a machine is the supply of energy that puts it in motion.”

Moss’ eight-principles of drives and resistances

The animal psychologists took up the word, according to Young, because “it carried no implications of conscious motive.” The first to use the term in animal psychology was American physician Fred Moss who published his 1924 PhD dissertation “A Study of Animal Drives”, in which he introduced his “resistance” apparatus for measuring the drive in terms of the amount of resistance (electric shock) which it would overcome. [6] This usage was taken up by others in the decade to follow. Moss wrote to Young that he was familiar with “dynamic psychology”, though he did not definitely recall adopting the word from Young. He used the term drive, according to Young: [3]

> “[drive (term use)] not to describe any instinct or necessary inborn condition in the animal, but to describe a certain set of chemical conditions that make the animal move in a definite direction in the same way that the explosion of gas in the chamber of the automobile makes the piston move up and down.”

The basic thesis of Moss’ 1924 paper is that: “the behavior of any animal is the result of his drives to action and the opposing resistances”. [3] Drives, according to Moss, are “impelling forces” in the situation that stimulate the animal to positive behavior, e.g., the hunger drive impels to food-seeking; the maternal drive impels the mother to go to the young, especially when they show distress. Resistances, according to Moss, are “repelling forces” that stimulate to negative behavior; e.g., the presence of cats repels rats; and again, if rats are placed in a maze the floor of which is covered with crushed ice, they avoid the cold and seek the relative warm, dry goal-box. On these outlines, and other experiments, Moss drew up a series of eight-principles of a dynamic theory of drives and resistances, which are in short:

> P1. Any animal *drive* may be measure in terms of resistances.
> P2. A successful *drive* is, by definition, stronger than the resistance overcome.
> P3. If two independent *drives* are opposed by the same resistance and one drive overcomes the resistance while the other fails, the one that overcomes the resistance is the stronger drive.
> P4. Given two *drives* both functioning at the same time, and so arranged that neither can succeed without neglecting the other, the one that succeeds is the stronger drive.
> P5. Given two antagonistic *resistances* both functioning at the same time and both so arranged that neither can cease to function without overcoming the other, the one that over comes is the stronger resistance.
> P6. When one *drive* by itself is not strong enough to overcome a resistance, it may be reinforced by other drives, until it is strong enough to overcome the resistance.
> P7. As a motive force is provoking the learning of such problems as a maze, the *drive* is strongest which causes the animal to learn the problem in the shortest time and with the fewest errors.
> P8. Other things being equal, every time a *resistance* is overcome, the strength of the resistance is weakened.

Following Woodworth and Moss, the term “drive” was employed by Dashiell, Tolman, Richter, Warden, Stone, and others, until, by 1936, the word had become common in animal psychology other elementary textbooks. In 1943, American behavioral physiologist Clifford Morgan defined drive or motivation as “a central neural state of an organism”. [7] Also that year, noted American psychologist Clark Hull, life’s work was to explain learning and motivation by scientific laws of behavior, arrived at the conclusion that: “fundamentally, drives energize behavior” [8]

Trieb

In his development of psychodynamics, Austrian psychoanalyst Sigmund Freud, in his writings about the "engines of human behavior", used the German word *Trieb*, a word that can be translated into English as either *instinct* or *drive*. [9] The German, prior to the 1930s, had used the word “Trieb” both for the drive of a machine and for animal impulse. [3]

Human chemistry

In chemistry and human chemistry, the driving force or affinity *A* of a reaction or human chemical reaction is the decrease in Gibbs free energy on going from the reactants to the products of a chemical reaction (-ΔG). [10]

Neurochemistry

In terms of a biochemical or neurochemical appoach to understanding "drive", in recent years, scientists have begun looking at a number of key internal motivators, in particular dopamine, often called the "drive" chemical. [11]

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θΔics

In paradoxes, **drive-thru paradox** is the difficult to reconcile flipsidedness of the, on one hand, vanity, i.e. something that is vain, empty, or valueless, and superficiality associated with educational and occupational climbing and social label prestige, e.g. doctor, lawyer, or engineer, etc., obtained thereby, and accompanying sexual value increased therein, and, on the other hand, the seeming contentment and happiness obtainable via remedial low-level jobs, e.g. drive-thru worker, dishwasher, janitor, brick-layer, auto mechanic, or ditch-digger, etc., and accompanying sexual value decreased therein, and the loss of individualism (or being) yet gain of social respect that comes with the former, and gain of individualism (or being) yet loss of social respect that comes with the later; and or something equivalent to this effect in respect to the bigger picture of the movement of the universe.

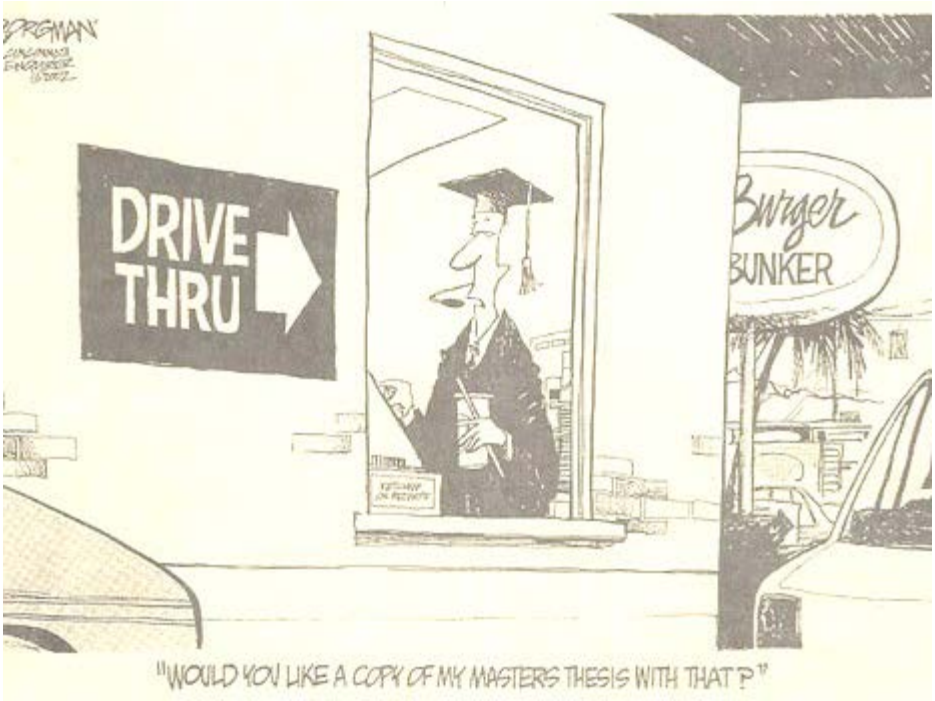

A famous c.1995 **drive-thru paradox** stylized cartoon, found and kept in the personal file notes of Libb Thims, sometime following or amid the completion of two engineering degrees, during which time the big picture mechanism "why" of doing any "thing" comes into immediate view, such as captured well in the Einstein-Pascal dialogue.

Goethe

In 1770, Goethe, in personal notes, in respect to the Faust play, ruminated the following about how whose who become "professionally" schooled or accredited in the various branches of knowledge, e.g. physician, lawyer, jurist, artist, scientist, philosopher, etc., were but things done in vain, i.e. for reasons of nothing but showy vanity:

> "The puppet-play [see: Faustian] echoed and vibrated in many tones through my mind. I, also, had gone from one branch of knowledge to another, and was early **enough convinced of the vanity of all**. I had tried life in many forms, and the experience had left me only the more unsatisfied and worried. I now carried these thoughts about with me, and indulged myself in them, in lonely hours, but without committing anything to writing. Most of all, I concealed from Herder my mystic-cabalistic chemistry, and everything connected with it."
>
> — Johann Goethe (1770), reflection on intercourse with Johann Herder, in Strasburg [1]

(add)

Thims

American Libb Thims, at age 15, got a work permit—thermodynamics being the governing science of the relation between **"heat"** (e.g. sexual heat) and **"work"** (e.g. occupation)—and began to be employed at a minimum wage summer job (paid work), and thereabouts began to date (feel relationship heat); during the course of which, he began to notice, in the lifestyles (states of existence) of some of the girls-turning-women (age 17-22) he began to chill with, who each worked (at or near minimum wage jobs) and thereby paid their own rent and seemed to be "happy" (friends, throwing parties, etc.), according to which, based on this observation, one could, theoretically, very easily (in theory), work a minimum wage (simple manual labor) job, exist and be happy.

In circa 1994, Libb Thims, as a new undergraduate chemical engineering student, had decided to switch form dating

multiple girls/women, at the same time, whom he had largely attracted via traits such as: fun factor, charm, personality, fitness, coolness, craziness, eccentricity, etc., to dating one particular female, a graduate school student, working on her master's degree in architecture, a semi-child prodigy, who had been high school valedictorian and completed here BS in architecture by age 20, who thought [possibly half-jokingly] that she was smarter than Thims, whose family, both maternally, heir to a multi-million dollar vacuum company, and paternally, president of a large engineering corporation, were in high social standing.

> "I told her you were a chemical engineer."
> — Anon (c.1994), "Comment to Thims"; made to her mother about Thims

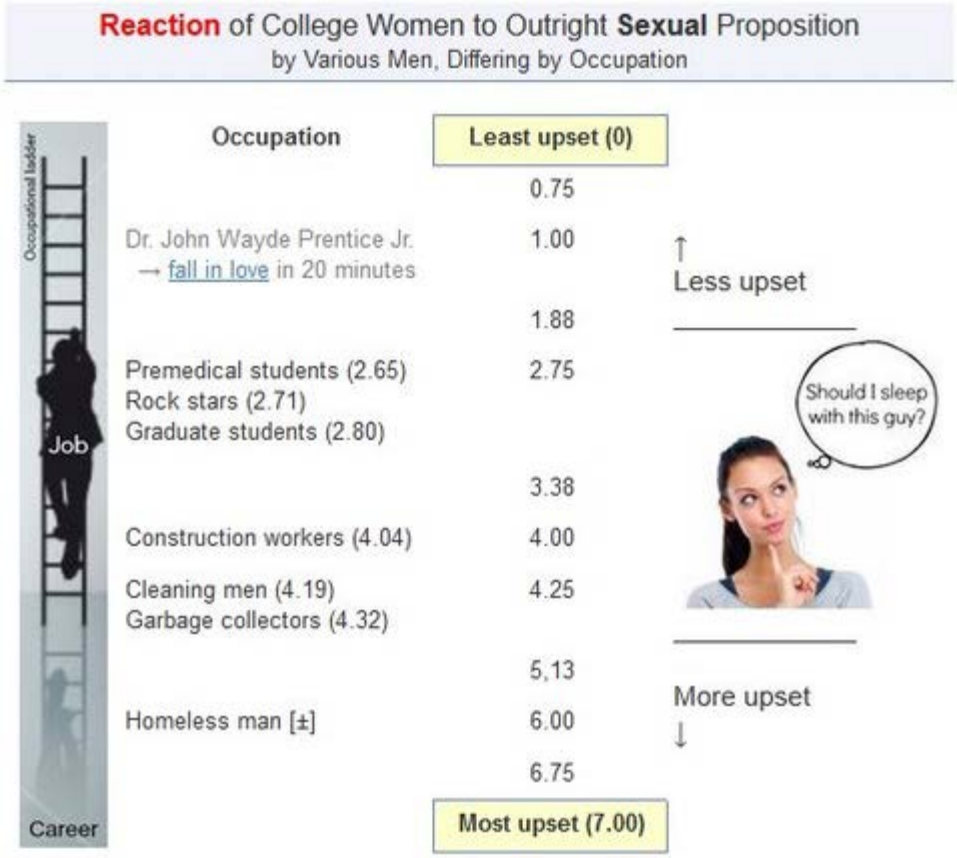

The 1994 "sexual proposition study" done by David Buss, which found sexual receptivity to be directly proportional to the social "status" and or prestige of occupation or "label" of the male.

This nearly floored Thims, mentally, at this moment, and for many years afterwords (still not yet fully remedied at 2015), according to which Thims was reduced, not to being a "fun person", "nice guy", "cool dude", or "super personality", but only to a social door opening parental pacification "label", according to which, seemingly, one's whole being is becomes meaningless, and one becomes but a vanity label in the mind of the opposite mate, her family, friends, and social network.

At about this time, or shortly thereafter, Thims was reading David Buss' *The Evolution of Desire*, where mate selection is broken down mechanistically; one dominate study, presented therein, being the Buss sexual proposition study, according to which women were found, via polled opinion, to be less and less upset by direct "sexual proposition" as a man's label status increased, the results of which are shown adjacent. The "occupationally" perfect fictional male of Dr. John Wayde Prentice Jr., of the 1967 film *Guess Whose Coming to Dinner?*, specifically scripted that way to highlight the issue of "race" in mate selection, is the epitome of the "label", as he movie tells, that will make a women fall in love in 20 minutes.

Here a grand confusion began to embed into Thims' mind, surrounding the nature of happiness, contentment, and or mental satiety, and its connection to "work" (see: principle of the transmission of work), work output (occupational ladder), and specifically "status level" of work, such as embodied in the defining first engagement query: "so what do you do?" [for a living], e.g. see: David Buss' 1993 "Occupation vs Sexual Receptivity" study, in respect to mate selection and existence, surrounding the question "why" a person was or has to do anything, past the point of minimum society mandated education level (high school), past the minimum demarcation point of paying for rent (below which is homelessness)? English-born American philosopher Alan Watts' circa 1955 "here kitty kitty" social indoctrination ideology or process (see: South Park annotated video (Ñº) at 5:54), idealized or rather carrot-sticked for the person age 0 to 40 to follow, captures some of this issue well.

Good Will Hunting | Bar scene

In 1997, Matt Damon, a Harvard

English major turned film writer, in his *Good Will Hunting*, co-written with Ben Affleck, pitted the fictional genius Will Hunting, supposedly based on William Sidis, who learned the equivalent of $150,000 dollars worth of Harvard education via trips to the public library and $1.50 in late charges, against the over-typical superficial label-monger Clark, described as "obnoxious graduate student thinks he can impress [women] with his academic browbeating" (Ñº), who replies to the library late charges jab, with the following resonating statement:

The famous "bar scene" from *Good Will Hunting* (1997), where Clark says pointedly that although Hunting may know more than him, from his library studies, he will have a Harvard degree, and will go on skiing trips, with his family, while Hunting will be working at a drive-thru, which pits vanity against knowledge and meaning, in a confusing manner, aka the **drive-thru paradox**.

> "Yeah, but I will have a **degree**, and you'll be serving my kids fries at a **drive-thru** on our way to a skiing trip."
>
> — Clark (1997), apex moment in "bar scene" of *Good Will Hunting*

In circa 2008, Thims began using (Ñº) the term "drive-thru paradox", themed on the *Good Will Hunting* bar scene, to describe this phenomena.

Good Will Hunting | Brick-layer dialogue

The following is the brick layer-dialogue scene:

> SEAN
> Do you think you're alone?
>
> WILL
> What?
>
> SEAN
> Do you have a soul-mate?
>
> WILL
> Define that.
>
> SEAN
> Someone who challenges you.
>
> WILL
> Chuckie.
>
> SEAN

Chuckie's family. He'd lie down in traffic for you. I'm talking about someone who opens up things for you. Touches your soul.

WILL
I got it. I got plenty.

SEAN
Well name them.

WILL
Shakespeare, Nietzsche, Frost, O'Connor, Kant, Pope, Locke, --

SEAN
That's great, they're all dead.

WILL
Not to me, they're not.

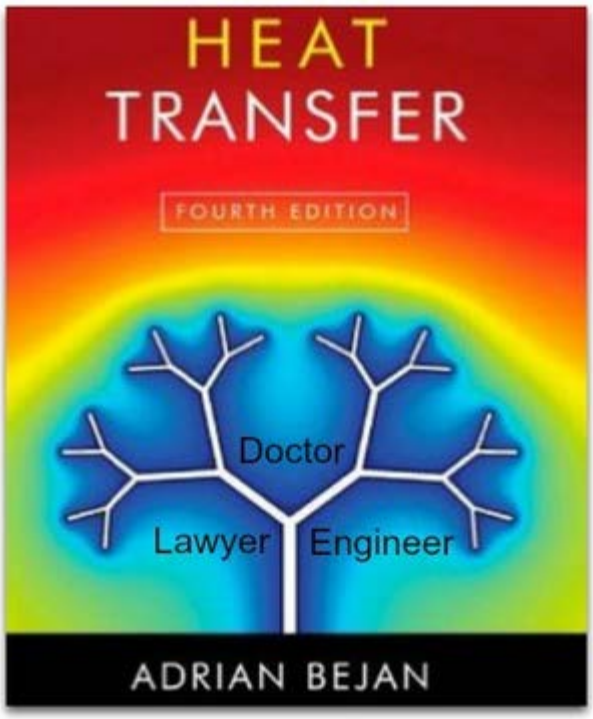

A Thims-labeled (Ñº) 2013 4th edition of Adrian Bejan's *Convection Heat Transfer*.

SEAN
You don't have a lot of dialogue with them. You can't give back to them, Will.

WILL
Not without some serious
smelling salts, and a heater, no...

SEAN
That's what I'm saying. You'll never have that kind of relationship in a world where you're afraid to take the first step because all you see is every negative thing ten miles down the road.

WILL
Oh, what? You're going to take the
professor's side on this?

SEAN
Don't give me your line of sh*t. No.

WILL
I didn't want the job.

SEAN
It's not about that job. I don't care if you work for the government. But, you could do anything you want. You are bound by nothing. What are you passionate about? What do you want? I mean there are guys who work their entire lives laying bricks so that there kids have a chance at the opportunities that you have here.

WILL
I didn't ask for this.

No. You were born with it. So don't cop out with this 'I didn't ask for this'.

WILL

Cop-out? I mean, what's wrong with laying brick? That's somebodies home I'm building.

SEAN
Right. My dad laid brick. Ok. Busted his ass so I could have an education.

WILL
Exactly. That's an honorable profession. What's wrong with fixing somebody's car? Somebody gets to work the next day because of me. There's honor in that.

SEAN
Yeah, there is. There's honor in that and there's in taking that 40-minute train ride so those college kids can come in, in the morning, and those floors are clean, and those waste baskets are empty. That's real work.

WILL
That's right.

SEAN
And that's honorable. That's why you took that job, for the 'honor' of it?

[A pause. Will says nothing]

SEAN
I just have a little question here: you could be a janitor anywhere. Why did you choose to work at the most prestigious technical college in the whole fu*king world? And why did you sneak around at night and finish other people's formulas, that only one or two people in the world could do, and then lie about it?

[A pause. Will says nothing]

SEAN
Because I don't see a lot of honor in that, Will?

SEAN
So what do you really want to do?

[A pause]

WILL
I want to be a shepherd. I want to move up to Nashwood, get some sheep, and tend to them.

SEAN
Maybe, you should go do that.

WILL
What?

SEAN
You know, if you're going to jerk-off, you should do it at home with a moist towel.

WILL
You're chucking me …?

SEAN
Yeah, get the fu*k out of here.

Slipping a few lines, the scene ends with:

SEAN
You and your bulls*t. You got an answer for everybody. But I asked you a straight question and you can't give me a straight answer. Because you don't know.

The famous "dishwasher scene" from the 1983 film *Scareface*, wherein being called a "dishwasher" is an grave insult.

(add discussion)

Other

The famous "don't be calling me no f$%king dishwasher" scene of the 1983 film *Scarface*, and the "the world needs ditch diggers too" scene, and Kuder Preference test discussion scene, espoused in the 1980 film *Caddyshack*, seem to be in the neighborhood of the drive-thru paradox.

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θΔics

In chemistry, **driving force** of a chemical reaction or "force of reaction" is the "chemical affinity" or affinity *A*, which is measured by negative change in the free energy (Gibbs free energy -ΔG or Helmholtz free energy -ΔH) on going from the reactants to the products. [1]

In 1922, English inorganic chemist Joseph Mellor stated the relationship as such: [7]

> "Chemical affinity can be regarded as the **driving force** of a chemical reaction."

This term 'driving force', in a colloquial sense, often goes by the shortened term "drive". A mathematical expression for driving force is found in the equation for the affinity of reaction. [6]

History

In affinity chemistry, the elusive quantity 'affinity' (or chemical affinity), a term dating to at least the 13th century (Magnus, 1250), has long been known as the 'driving force' of chemical reactions and processes. In 1882 and 1884, respectively, German physician and physicist Hermann Helmholtz and Dutch physical chemist Jacobus van't Hoff, independently, determined that free energy change was the true measure of affinity or the driving force of chemical reactions. [4]

In 1910, Joseph Klein, American mechanical engineer, stated that the "change of entropy (ΔS) constitutes the *driving motive* in all natural events"; and that "it has therefore a reach and universality which even transcends that of the first law or principle of the conservation of energy." [2]

In 1923, Gilbert Lewis, in his *Thermodynamics and the Free Energy of Chemical Substances*, specifically the section "The Driving Force of a Chemical Reaction and a New Test for Equilibrium", has since become the most referenced thermodynamics textbook of all-time. [3]

Overview

American physical chemist Ron Salzman explains the concept of 'driving force' by stating that for chemical reactive systems at constant *T* and *p*, the Gibbs free energy seeks a minimum; subsequently, one can use ΔG to tell whether or not a reaction will proceed spontaneously as written: [5]

> If $\Delta G > 0$ then the reaction will not go as written (the reverse reaction will go)
> if $\Delta G < 0$ then the reaction will go as written.

The quantity ΔG, according to Salzman, is a measure of the "driving force" of a chemical reaction; conveying the idea that ΔG tells whether or not a given reaction will really run spontaneously. The two components of the reaction "driving force", according to Salzman, are:

> ΔH is the drive toward stability. When $\Delta H < 0$ the products are more stable than the reactants (and vice versa).
> ΔS is the drive toward disorder. When $\Delta S > 0$ the products are more disordered than the reactants.

In the expression for Gibbs free energy change:

$$\Delta G = \Delta H - T\Delta S$$

the negative sign in front of the '*TΔS' product* shows that a positive Δ*S* makes a negative contribution to Δ*G* which tends to drive the reaction in the forward direction. One should note, according to Salzman, that increasing *T* increases the influence of Δ*S* on the reaction "driving force"; also, that for a chemical reaction, Δ*H* and Δ*S* are independent of each other; that is, one cannot be calculated from the other. Reactions can also have situations where both are positive, both are negative, or one is positive and the other negative. It should be noticed, according to Salzman, that if Δ*H* and Δ*S* have the same sign, it means crudely that they are energetically working against each other. A good rule, according to Salzman, is that one can make the entropy win by increasing the temperature or you can make the enthalpy win by decreasing the temperature.

Sociology

The above "driving force" logic scales up absolutely (i.e. there is no unbridgeable gap) to the sociological level, i.e. to the human-human reaction level or human chemical reaction level. As summarized by American physical chemist Thomas Wallace, from his 2009 appendix section "The Fundamentals of Thermodynamics Applied to Socioeconomics": [8]

> "The thermodynamic parameter free energy:
>
> $$\Delta G = \Delta H - T\Delta S$$
>
> [where] enthalpy H and entropy S represent the variables of heat content and probability, respectively, represents the fundamental **driving force** in nature and determines whether physical and chemical processes conducted by nature and society will take place."

This, according to the standard model, is what is called the correct point of view. This view, however, is in direct opposition to thinkers, such as Indian chemical engineer DMR Sekhar, who, in an attempt to maintain belief in free will, consciousness, choice, etc., promote theories such as self-drive (see: self-motion), which amount, in effect to perpetual motion, or specifically perpetual motion of the living kind, and are classified as ontic opening theories. [9]

See also

- Affinity of reaction

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Chemical Affinity, pgs. 291-93). Longmans.
8. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (Appendix: "The Fundamentals of Thermodynamics Applied to Socioeconomics", pgs. 469-90). AuthorHouse.
9. No attack (2012) - Hmolpedia threads.

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● Cavanagh, John and Akke, Mikael. (2000). "May the Driving Force be with You – Whatever it is", *Nature Structural & Molecular Biology*, 7: 11-13, Jan 01.
● Pross, Addy. (2003). "The Driving Force for Life's Emergence: Kinetic and Thermodynamic Considerations", *Journal of Theoretical Biology*, 220: 393-406.

θΔics

In thermodynamics, **drug-receptor thermodynamics** is the study of the entropy, enthalpy, free energy aspects of drug-receptor interactions. [1] Topics in this field include free energy maps, enthalpy-entropy compensation, heat capacity in ligand-receptor interactions, among other topics. [2] Pioneers in this newly developing field include Americans chemist Irvin Klotz, author of the 1997 *Ligand-Receptor Energetics*, and pharmacological engineer Robert Raffa, general editor of the first textbook on the subject, 2001 *Drug-Receptor Thermodynamics*, originally published as 1980 paperback. The subject of the thermodynamics or free energy aspects of drug-receptor interactions and dynamics began to arise in the late 1970s.

Human chemistry

See main: Human chemistry

Some of the concepts in Raffa's 2001 *Drug-Receptor Thermodynamics* were used by American chemical engineer Libb Thims as base models in the synthesis of the free energy interaction theories, e.g. "human molecular mechanisms", in the dynamics and life movements involved in human molecular interactions, i.e. interactions between people. [3]

References

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â— Ladbury, John E. and Connelly, Patrick R. (1997). *Structure-based Drug Design: Thermodynamics, Modeling, and Strategy.* Springer.
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θΔics

In molecules, **DTA** (TR:5), or "9,10-DiThioAnthracene", molecular formula $C_{14}H_{10}S_2$, is synthetic 3-element animate (see: animate molecule) bipedal (see: walking molecule) molecule, with the ability to move along a copper surface, specifically Cu(111), when cooled down to -223°C, and either powered with a little heat or induced to move by the lure of the tip of charged scanning tunneling microscope.

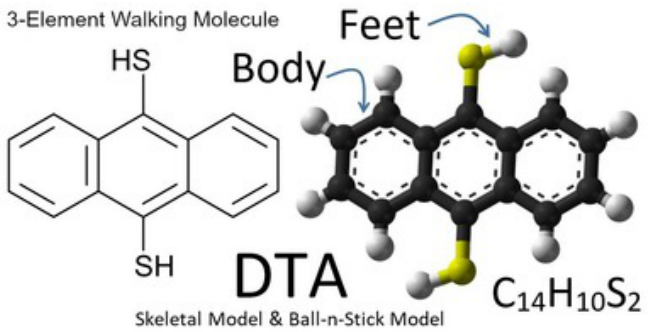

A depiction of **DTA** ($C_{14}H_{10}S_2$), a 3-element synthetic molecule that walks like a human, with a triple benzene ring body, and two sulfur-hydrogen legs, i.e. thiol (O) leg.

Overview

In 2004, Ludwig Bartels, and his University of California, Riverside research group, used a scanning tunneling microscope (STM) to investigate the diffusion of small molecules upon a CU(111) surface, during which 9,10-Dithioanthracene (DTA) was found to migrate linearly in fashion reminiscent of a bipedal 'passing leg' gait. [1]

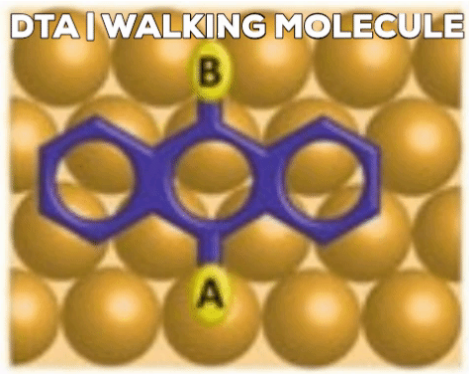

The following shows a one-dimensional non-directional diffusion migration mechanism of DTA upon a high symmetry Cu(111) surface at 50K, images based on DFT calculations: [1]

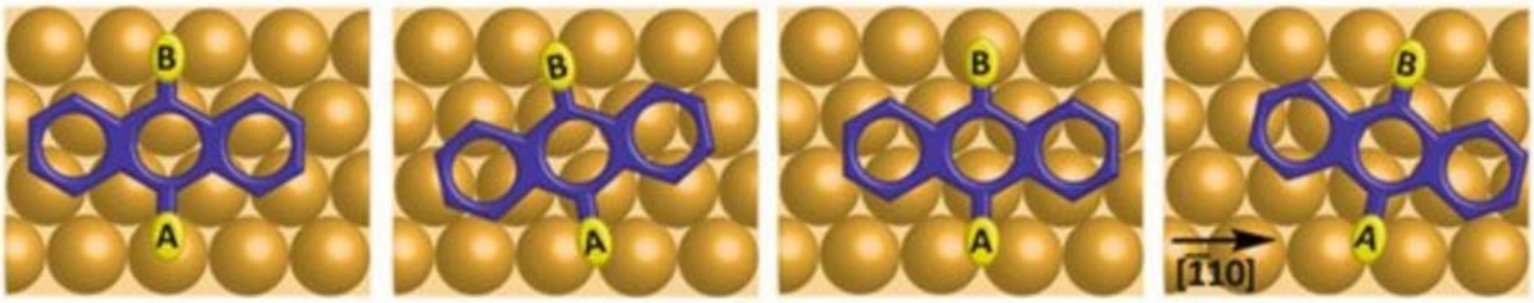

Rotation around a sulfur atom which occupies a low energy site, bridging two copper atoms, brings both feet into favorable positions. However, the aromatic core is forced out of alignment with the high symmetry direction. This orientation is only observed in experiments conducted at 10K, where thermal movement of DTA is not observed. [1]

AQ molecule | Molecular carrier

In 2007, Bartels, expanding on his DTA experiments, began investigating so-called "molecular carriers", specifically by doing STM studies on AnthraQuinone (AQ) (O), a DTA-like molecule, formula $C_{14}H_8O_2$, with two oxygen feet. The following shows an "AQ molecule" attaching to or carrying a CO_2 molecule (or two CO_2 molecules) during diffusion along the Cu(111) high-symmetry direction by means of individual steps: [1]

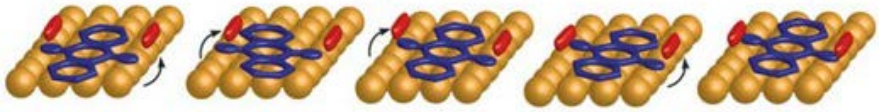

Bartels found that carrying more load, e.g. 2 or three CO2 molecule, slows the carrier down, just as a human is slowed down when carrying more bundles.

Philosophical implications

In 2010, Libb Thims was using DTA in "defunct theory of life" debates with Georgi

Gladyshev, among others; an example statement shown below:

> "We are NOT in agreement. The terms "life", "biological", "biosphere", are all meaningless. Science is very specific. According to your definition (life = structure with metabolism), then, one would conclude that a [synthetic] 'walking molecule' is alive. Is the walking molecule **DTA** (9,10-dithioanthracene) alive? Yes or No? What about the two-legged motile protein 'kinesin' (Q) that walks along microtubules carrying loads to destinations, being powered by ATP. (Q) Kinesin is a small 6-element molecule, with molecular formula of about $C_{400}H_{620}N_{100}O_{120}P_{50}S_{20}$, that walks, carries things, and has a metabolism. Kinesin is like a little human. Do you think that kinesin is alive? Certainly not. It is simply an animate molecule, just like you or I. The problem with the calling some "thing" alive is that it implies perpetual motion of both the first and second kind."
>
> — Libb Thims (2010). "Origin of Life Debate with Georgi Gladyshev" (post #9), Dec 6

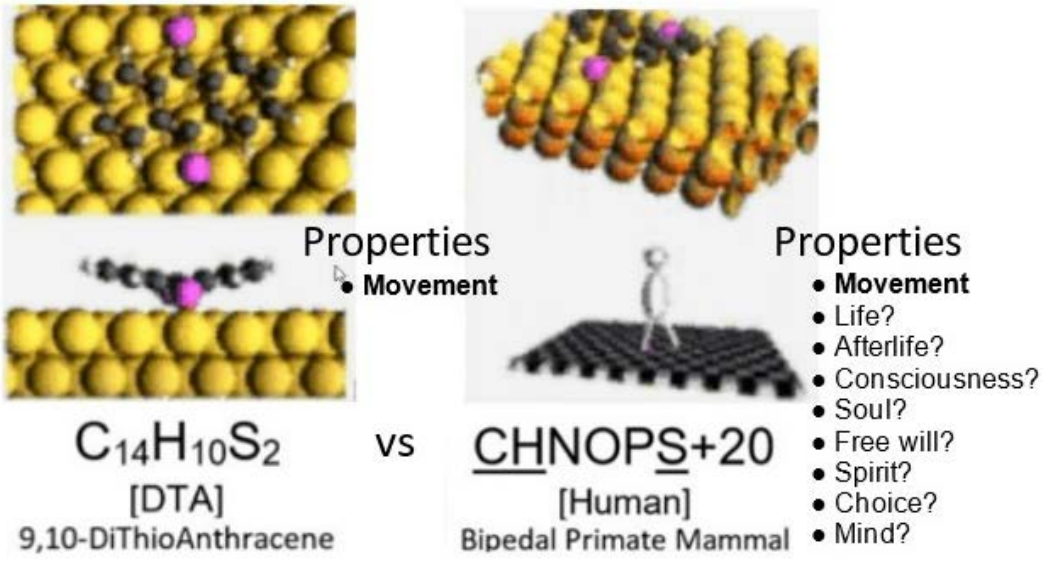

A screen shot from Libb Thims' 2016 video "Walking Molecules: Philosophical Implications", wherein he explains that to call **DTA**, a CHS-bipedal, as "not-alive", and to call a HUMAN, a CHNOPS+20-bipedal, "alive" is but a fallacious anthropism-rooted mythological dualism divide, buttressed by layers of ignorance.

The "life = structure with metabolism" model, to note, was debased by Michael Brooks (2008), who gave the counter argument (see: life criteria counterargument) that many other things not considered "alive", e.g. an automobile, rocket, the sun, etc., consume fuel and excrete waste. [5]

In 2016, Thims, in his "Walking Molecules: Philosophical Implications" video, discussed the philosophical implications of non-alive DTA, a synthetic CHS walking molecule, as opposed to a so-deemed "alive" human, a CHNOPS+20 walking molecule, in respect to Cartesian dualism (1637) as opposed to Goethean monism (1809). [2]

Quotes

The following are related quotes:

> "Effectively, **DTA** kind of rotates around each of the feet and wobbles forward or wobbles backward."
>
> — Ludwig Bartels (2005), interview with MIT Technology Reviews [3]

> "It is often a neglected fact that humans are molecules that walk, run, and sometimes fly, on or above a 'surface', which from a chemical-definitions sense can be defined as either substrate or catalyst, depending on the context of discussion, which varies depending on subject mode: surface chemistry, surface physics, or surface thermodynamics. In this perspective, an intuitive way to better come to understand human behavior (movement and reactions) is to use the conception or reality that humans are 'walking molecules' on a surface and, using this perspective, study the behaviors and operation of smaller nano-size 'walking molecules'. The first operational walking molecules were developed in 2004 by German-born American physical chemist Ludwig Bartels, at the University of California Riverside, who designed a molecule, called 9,10-dithioanthracene (**DTA**), that can walk in a straight line on a flat surface, like a little person."
>
> — Libb Thims (2010), opening paragraph from "Walking Molecule" section of the human molecule article; quoted (Q) by QuantumMystics (2015) at BellGab forums, Nov 11

See also

- ATP
- DNA
- Kinesin

- Myosin
- Retinal | Retinal molecule | ABC model
- RNA
- Virus | Virus molecule

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External links

- 9,10-DiThioAnthracene – Wikipedia.

θΔics

In philosophy, **dualism**, as compared to monism, is a theory which holds that the mind (or soul) is separate from the body; the argument or subject is sometimes called: mind-brain dualism, Cartesian dualism (after Rene Descartes), or mind-body problem, among other variants. The opposite of view to the dualism position, supposedly, is the materialism or physicalism position.

Economic dualism

Economics historian Lewis Haney (1920), as cited by Howard W. Odum (1929), outlined six pairs of contrasts, in early economic approaches, that seem to portray a dualism of sorts: [5]

Materialism | Idealism
Rationalism | Religious teleology
Hedonism | Reason
Individualism | Monarchical government
Laissez-faire | Protection to agriculture
Wealth is all-important | Well-being is not wealth

(add discussion)

Egyptian dualism

The original world-dominating dualism model originated in Egyptian and is very elaborate, to say the least—the primary or original version of it found in Anunian theology of the Heliopolis creation myth, according to which the original classical element was water (Nun) out of which life-giving principle, soul, animation, or first creator god (Ra) emerged, in short. On this basis, over the years 3100-500BC, variations of Egyptian religion-physics followed, according to which the human eventually came to be divided into about nine parts, depending on version: [3]

	Part	Description
1.	khat	physical body
2.	ib	heart
3.	ba	soul
4.	ka	spirit of life force
5.	akh	the soul and spirit reunited as a successful reincarnated afterlife entity
6.	ren	name of the person
7.		shadow of person
8.		
9.		

The residual aspects of this Egyptian theory, germane to the modern colloquial view, in short, is the body/soul (khat/ba) divide, body/spirit (khat/ka), or body/mind divide depending on perspective.

Greek-Egyptian dualism

Greek philosopher Thales (c.624-c.546), attributed by Aristotle to have been the first philosopher in the Greek tradition, was the first to initiate the study of Egyptian philosophy of nature, by himself traveling to Egypt as well as advising other Greek philosophers to go to Egypt in order to learn, such as Pythagoras: [4]

> "Thales advised Pythagoras to go to Egypt and to entertain himself as much as possible with the priests of Memphis and Diospolis: it was from them that he had drawn all the knowledge which made him a sage and a scientist in the eyes of the masses."

The claim Thales was the founder of Greek philosophy rests primarily on Aristotle, who wrote he was the first (Greek) to suggest a single material substratum for the universe, namely, water, or moisture—according to which, even though Thales renounced mythology, his choice of water as the fundamental building block of matter had its precedent in the Egyptian tradition (cf. "Nun", the undifferentiated primordial waters before time and space and its "Ba" or "soul", the autogenetor Atum). To Thales, the entire universe is a living organism, nourished by exhalations from water (cf. Egypt's organic, hylezoistic view on creation). [4]

Hence, Thales' significance for Greek philosophy, lies less in his choice of water as the essential substance, than in his attempt to explain nature by the simplification of phenomena. Indeed, Thales searched for causes within nature itself rather than in the caprices of the anthropomorphic gods.He was deemed the first Greek to give a purely natural explanation of the origin of the world, free from all mythological ingredients and unnecessary complexities (linearization and homogeneity). [4]

Aristotelian dualism

Greek philosopher Aristotle, in turn, absorbed all of this Thalean directive, and in his circa 330BC writings on psychology, seems to have been the first dominate thinker to initiate the debate surrounding dualism position, which invariably, as summarized above, seems to have been Egyptian in origin: body/ba divide. In this framework, Aristotle insists that the mind or intellect (nous) may not be enmeshed in the body in the same way as these sorts of states, and so denies that the study of soul falls in its entirety to the natural scientist—wherein he seems to employ the term soul (psuchê in Greek, or anima in Latin), psychologically, so it naturally investigates all ensouled or animate beings. [1] Aristotle states his position on the matter of body-soul dualism as follows: [2]

> "There is however one peculiar inconsistency which we may note as marking this and many other psychological theories. They place the soul in the body and attach it to the body without trying tin addition to determine the reason why or the conditions of the body under which such attachment is produced. This would seem however to be a real question calling for a solution."

(add discussion)

Renaissance dualism

French philosopher Rene Descartes initiated the renaissance dualism argument in circa 1620s, according to which a human is an automaton with a soul (located in the pineal gland, according to Descartes anatomical studies), in short.

Dutch philosopher Benedict Spinoza, in his discussions on the subject of "will", in his 1677 *Ethics*, was one of the first to criticize Descartes' dualism position.

German polymath Johann Goethe, beginning in 1796, built on Spinoza's position by adding affinity chemistry theory to the argument, resulting in human chemical theory.

Quotes

The following are related quotes:

> "Man, feeling within himself a concealed force that insensibly produced action, that imperceptibly gave direction to the motion of his machine, believed that all nature, of whose energies he is ignorant, with whose modes of action he is unacquainted, owed its motion to an agent analogous to his own soul, who

acted upon the great macrocosm in the same manner that his soul acted upon his body. Man, having supposed himself double, **made nature double also**: he invented it from its own peculiar energy; he separated it from its mover, which by degrees he made spiritual."

— Baron d'Holbach (1770), *The System of Nature* (pg. 117) [6]

"The chemists who uphold **dualism** are far from being agreed among themselves; nevertheless, all of them in maintaining their opinion, rely upon the phenomena of chemical reactions. For a long time the uncertainty of this method has been pointed out: it has been shown repeatedly, that the atoms put into movement during a reaction take at that time a new arrangement, and that it is impossible to deduce the old arrangement from the new one. It is as if, in the middle of a game of chess, after the disarrangement of all the pieces, one of the players should wish, from the inspection of the new place occupied by each piece, to determine that which it originally occupied."

— Auguste Laurent (1853), *Chemical Method, Notation, Classification, and Nomenclature* (pg. 18) (Ñº)

"Most people are **dualists**. Intuitively, we think of ourselves not as physical devices, but as immaterial minds or souls housed in physical bodies. Most experimental psychologists and neuroscientists disagree, at least officially. The modern science of mind proceeds on the assumption that the mind is simply what the brain does. We don't talk much about this, however. We scientists take the mind's physical basis for granted. Among the general public, it's a touchy subject."

— Joshua Greene (2011), "Social Neuroscience and the Soul's Last Stand" [7]

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7. (a) Greene, Joshua D. (2011). "Social Neuroscience and the Soul's Last Stand", in: *Social Neuroscience: Toward Understanding the underpinnings of the Social Mind* (editors: A. Dodorov, S. Fiske, and D. Prentice) (pgs. 263-73). Oxford University Press.
(b) Musolino, Julien. (2015). *The Soul Fallacy: What Science Shows we Gain from Letting Go of Our Soul Beliefs* (foreword: Victor Stenger) (pg. 21). Prometheus.

External links

â— Dualism (philosophy of mind) – Wikipedia.

θΔics

In atheism, **dumb atheism**, as compared to smart atheism, refers to modern popular brands of atheism (see: atheism types by denial and belief) that are intellectually slow, backwards, error ridden, incorrect, not in alignment with reality, conjecturally inept, boastful of false working models of universal operation, and or generally lacking in discernment and erudition. [N1] Dumb atheism, to note is a grade above theism (which, by definition, is dumb [per post Rosetta stone (1799) standards]) — brands of which are listed in creationism scientists ranked by idiocy, which if professed publicly, is a belief now held by fewer than 6% of scientifically literate intellectuals (see: belief in the existence of god by scientists) — but, nevertheless, a variety of professed creed (see: atheist's creed) lacking in discernment.

List | Ranked

The following is a work-in-progress ordered ranking of "dumb" brands of atheism:

	↓↓ Dumb atheism ↓↓	Reason
1.	William Provine (1942-2015)	"Let me summarize my views on what modern evolutionary biology tells us loud and clear — and these are basically Darwin's views. There are no gods, no purposes, no goal-directed forces of any kind. There is no life after death. When I die, I am absolutely certain that I am going to be dead. That's the end for me. There is no ultimate foundation for ethics, no ultimate meaning to life, and no free will for humans, either." — William Provine (1994), "Darwinism Science or Naturalistic Philosophy?
2.	Jeffrey Dahmer (1960-1994)	This atheism, a tested out brand of Dostoyevskian atheism, so to say, is the belief that in a universe without god there are No rules. The following is a dumbness example: "If it all happens naturalistically? What's the need for god? Can't I set my own rules? Who owns me? I own myself!" — Jeffrey Dahmer (c.1993), variant of atheism belief he tried (see: killing spree paradox); as told to his father (Ñº) Dahmer, in short, tested out the Dostoyevsky conjecture: "If god does not exist, everything is permissible." (Fyodor Dostoyevsky, 1880); finding, accordingly, that all "things" are not permissible, and that there are "rules" to godless nature. Ranked #6 of the 2010 ListVerse.com "Ten People Who Gave Atheism a Bad Name". (Ñº)
3.	Richard Dawkins (1941-)	The following is dumbness example: "In a universe of electrons and selfish genes [A], **blind** physical forces [B] and genetic replication, some people are going to get hurt, other people are going to get lucky [C], and you won't find any **rhyme or reason** [D] in it, nor any justice [E]. The universe that we observe has precisely the properties we should expect if there is, at bottom, no design [F], no purpose [G], no evil [H] no good [I], nothing but pitiless indifference." — Richard Dawkins (1995), *River Out of Eden*

DN:6.5
English
zoologist

A. Genes are selfish [*self*- is code for perpetual motion].
B. Forces aren't blind (Bejan, 2012).
C. Luck doesn't exist [nature is determined]
D. See: Adams creed.
E. See: Goethe on the juridical procedures of god (Friedrich Gundolf, 1916)
F. See: atheist Adrian Bejan's *Design in Nature* (2012).
G. See: chemical peneplanation (Bray, 1934) and Bruce Lindsay (1983).
H. The problem of evil was solved by coupling theory (Thims, 2011).
I. Good and evil are terminologically reformed as "natural" and "unnatural", which do exist, thermodynamically speaking.

4. Jean-Paul Sartre (1905-1980)

His existentialism brand of anti-materialism atheism is replete with errors.

5. Albert Camus (1913-1960)

His oft-touted "Sisyphean purpose" model (see: Camus model) (1942), adhered to by some, e.g. Randall Schweller (2014), is incorrect (compare: Gates model).

6. Steven Weinberg (1933-)

His 1977 "pointlessness universe" atheism conjecture is replete with errors.

7. Alexander Rosenberg (1949-)

His 2011 "when in doubt, take SSRIs" atheism motto coupled with his "nice atheism" brand, based on "blind variation", "dumb luck", "random chance", "accident" themed, "mindless" process, "entropy = disorder" thermodynamics-conceptualized model of evolution, is akin to happy-go-lucky ignorance-loaded implicitly.

8. Peter Atkins (1940-)

His 1998 "purposeless universe" model has inherent theoretical issues; his entropy models of humans are mis-aligned.

9. Adolf Hitler (1889-1945)

Supposedly added Darwin atheism + Nietzsche atheism to arrive at the view that in a godless universe, destroying all the weaker races was in alignment with "nature", according to survival of the fittest; resultantly killing some 8 million Jews between 1939 and 1945; see: Hitler atheism (see: atheism atrocity fallacy).

10. Joseph Stalin (1878-1953)

Used the faulty logic of Marxist atheism to justify the implementation of a sociological theory that resulted in some 50 million "unnatural deaths" between 1924 and 1953; see: Stalin atheism (see: Stalin chicken abuse parable).

Ranked #1 of the 2010 ListVerse.com "Ten People Who Gave Atheism a Bad Name". (Ñº)

12. Ayn Rand (1905-1982)

This brand of atheism, known as Randianism and or objectivism, while often adhered to by many intelligent people, e.g. many Mensa members, is misaligned with the systems view of nature (see: extreme atheism) and the bigger picture view

of the universe.

13. Sam Harris (1967-)

While his anti-religion arguments are highly intelligent and articulate; and his while his "moral landscape" utilitarianism ideas are readable; his end game sale of "spiritual atheism" stylized as some type of ecstasy-drug like meditative Buddhism, is an off-the-rails end show.

(add discussion)

Notes

N1. The labeling or category of "dumb atheism" was initiated in the 2015 drafting article "Zerotheism for Kids", by Libb Thims, in preparation for the Zerotheism for Kids lecture, with the general mindset of teaching kids that there are brands of "dumb atheism", such as Dawkins and Dahmer, promoting false views of the workings of the universe.

Quotes

The following are related quotes:

> "Nietzsche was no ordinary guy. He was a genius. In his 'Parable of the Madman', the idea was that if 'god is dead', we're going to have to come up with definitions of what it means to be human, and what it means to be good, or wicked, and so on. The incredible breadth of understanding, one has to at least give him the credit that at least he knew the ramifications of what he had done. **Modern day guys like Richard Dawkins, and the like, they are sort of playing at backyard stuff** compared to the philosophical sophistication of a person like Nietzsche, who knew he had to evaluate what these things involve."
>
> — Ravi Zacharias (2013), "The Incoherence of Atheism" (13:58-14:32) (Ñº)

> "Atheists weren't always as **intellectually lazy** as Dawkins and his ilk."
>
> — Michael Robbins (2014), "Know Nothing: the True History of Atheism" [1]

See also

â— Atheism types by denial and belief
â— Creationism scientists ranked by idiocy
â— Top 100 atheists

References

1. Robbins, Michael. (2014). "Know Nothing: the True History of Atheism" (Review of Nick Spencer's *The Origin of Species*" (Ñº), Slate.com, Jul.

Further reading

â— Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

θΔics

In hmolscience, the **Dunbar number** is 150 and represents the maximal number at which a social group, such as a small tribe, small company, thematically-bound communities, e.g. Hutterites, Amish, Mennonites, military units, etc., can remain stable solely via interpersonal peer view and community incentives. [1] The following is a representative Dunbar number diagram: [2]

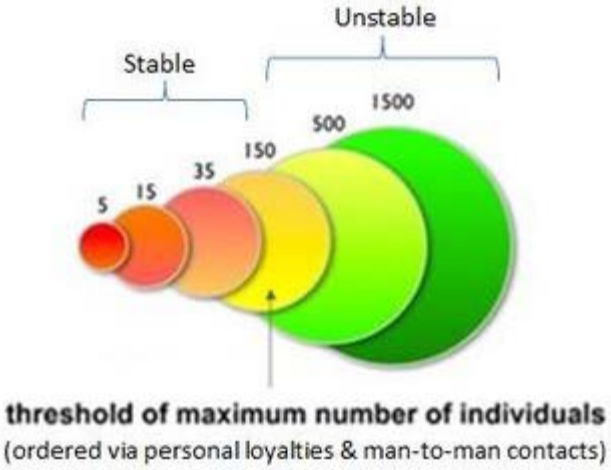

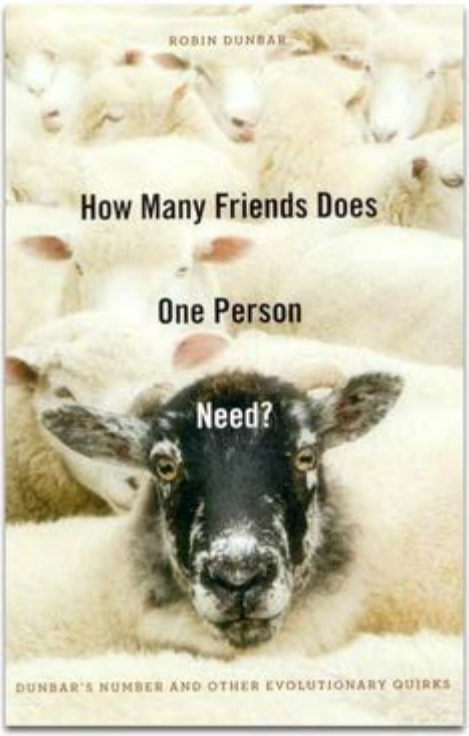

Robin Dunbar's 2010 book *How Many Friends Does One Person Need?: Dunbar's Number and Other Evolutionary Quarks*. [4]

In short, once group size grows beyond 150, a documented legal system is needed to maintain aggregation.

Overview

The Dunbar number is concisely defined as the cognitive limit to the number of individuals with whom any one person can maintain stable relationships. The term was proposed in 1992 by British anthropologist Robin Dunbar. [3] At or below the number 150, according to Dunbar:

> "Orders can be implemented and unruly behavior controlled on the basis of personal loyalties and direct main-to-man contacts. With larger groups, this is impossible."

To arrive at this number, Dunbar supposedly derived a generalized formula for any given species in which the input is the neocortex ratio (or the neocortex-to-brain size ratio), and the output is maximal size at which a group may retain stability. [5]

It has been discovered, via observation, that when a social group grows beyond the Dunbar number, it will naturally split apart into two smaller factions, where-after each molecular entity begins to grow in size, and each group tends towards a new Dunbar number. The phenomenon seems to have something to do with stability in connection with the surface law for groupings, or systems of human molecules in combination with the Muller stability ratio. The conception of the Dunbar number is one of the prime theoretical supports of Malcolm Gladwell's 2000 tipping point theory. [5]

It has been argued that, according to genetic evidence, a Dunbar size band of humans left Africa some 50,000 years ago, and that all modern humans are descended from this small, stable group of African hominids.

See also

â— Social Avogadro number
â— Buffett number

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4. Dunbar, Robin. (2010). *How Many Friends Does One Person Need?: Dunbar's Number and Other Evolutionary Quarks* (abs). Harvard University Press.
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6. Harris, Sam. (2010). *The Moral Landscape* (pg. 114). Free Press.

British anthropologist Robin Dunbar talking in 2010 about his **Dunbar number**, in particular why the typical person tends not to have more than 150 friends. [4].

External links

â— Dunbar's number – Wikipedia.

θΔics

In hmolscience, **Duncan Foley** (1942-) is an American economist noted for his efforts to bring thermodynamics logic, e.g. equilibrium, into bear in economics theory, in a semblance of Gibbsian themed economic thermodynamics.

Overview

In his 1994 "A Statistical Equilibrium Theory of Markets", he began discussing the thermodynamic notion of equilibrium as a conceptual tool in economics. [4]

In the late 1990s, Foley was the one who suggesting to American physicist Wayne Saslow that he write his 1999 article "An Economic Analogy to Thermodynamics". [1]

In the 2000s, Foley began collaborating with American physicist Eric Smith, to produce a number of papers. In 2002, they showed, supposedly, that theoretically one can create reversible economic transactions at the point which consumers are indifferent to trade and maintain constant utility. [3] This excursion, however, seems to have no relation to the manner in which reversibility is defined in thermodynamics.

Education

Foley completed his BA in mathematics in 1964 from Swarthmore College and PhD in economics from Yale in 1966 with a thesis on "Resource Allocation in the Public Sector". Foley is currently an economics professor at the New School for Social Research, New York, and also associated with the Santa Fe Institute.

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External links

● Duncan K. Foley – Wikipedia.
● Duncan Foley (faculty) – The New School.

θΔics

In hmolscience, **Duncan MacDougall** (c.1866-1920) was an American physician, one of the first experimental soul theorists, noted for his 1901 soul theory that if the soul exists it must have a mass that can be measured on a scale and be quantified scientifically.

Overview

In circa 1899, MacDougall expressed his soul theory views in a letter to a friend, as follows:

> "If personal identity, and consciousness and all the attributes of mind and personality, continue to exist after the death of a body, it must exist as a space occupying body."

In the years to follow, he then tested this theory by weighing dogs, horses, and people as they died, finding that on average that the soul weighs 3/4th of an ounce or about 21 grams. [1]

In 1901, MacDougall weighed six patients while they were in the process of dying from tuberculosis in an old age home. It was relatively easy to determine when death was only a few hours away, and at this point the entire bed was placed on an industrial sized scale which was reported to be sensitive to "two-tenths of an ounce". He took his results (a varying amount of unaccounted for mass loss in four of the six cases) to support his hypothesis that the 'soul' had mass, and when the 'soul' departed the body, so did this mass. The determination of the 'soul' weighing 21grams was based on the loss of mass in the first subject at the moment of death.

MacDougall later measured fifteen dogs in similar circumstances and reported the results as "uniformly negative," with no perceived change in mass. He took these results as confirmation that the 'soul' had weight, and that dogs did not have 'souls'.

This value then entered urban myth into the 20th century as the so-called "soul weight" of the average person; the 2003 film *21 Grams*, starring Sean Penn and Benicio del Toro, being one example of this.

References

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Further reading

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External links

â— Duncan MacDougall – Wikipedia.

θΔics

In hmolscience, **Duncan Watts** (1971-) is an Australian-born American sociophysicist noted for his 2011 *Everything is Obvious, Once You Know the Answer*, which, according to some reviews (Q), is supposed to give a good introduction to econo-socio-physics. [1]

Free will

Watt seems to be way off target in his ideas, as is evidenced by the following: [1]

> "The 'intellect' of Laplace's imagination eventually received a name—'Laplace's demon'—and it has been lurking around the edges of mankind's view of the future ever since. For philosophers, the demon was controversial because in reducing the prediction of the future to a mechanical exercise, it seemed to rob humanity of free will. As it turned out, though, they needn't have worried too much. Starting with the second law of thermodynamics, and continuing through quantum mechanics and finally chaos theory, Laplace's idea of a clockwork universe—and it's concerns about free will—has been receding for more than a century now."

This certainly is a mess. Watts would be well-advised to consult American physicist Steven Weinberg's 1992 Scrooge Tiny Tim dialogue, to get his bearings straight.

Education

Watts completed his BS in physics from the University of New South Wales and or the Australian Defense Force Academy and his PhD, with a thesis on "The Structure of Dynamics of Small-World Systems" (Q), in 1997 in theoretical and applied mechanics at Cornell University. From 2000 to 2007, Watt was a professor of sociology at Columbia University, then directed the Human Social Dynamics group at Yahoo! Research, then joined Microsoft as a research scientist, and served as an external faculty of the Santa Fe Institute.

References

1. Watts, Duncan. (2011). *Everything is Obvious, Once You Know the Answer* (physics, 14+ pgs; chemistry, 3+ pgs; thermodynamics, pg. 140). Crown Publishing.
2. Duncan Watts (about) – EverthingIsObvious.com.

External links

- Duncan J. Watts – Wikipedia.
- Watts, Duncan J. (1971-) – WorldCat Identities.

θΔics

In existographies, **Johannes Duns Scotus** (c.1266-1308) (IQ:150|#662) (Gottlieb 1000:635) (Stokes 100:23) was a Scottish philosopher and theologian, aka "medieval Kant" (Anar, 2019), noted for []

Overview

Scotus is oft-grouped with: Thomas Aquinas, William of Ockham (who he influenced), and Francisco Suarez as top four middle ages philosopher theologians.

Influenced

Scotus influenced: Rene Descartes, Martin Heidegger, Gilles Deleuze, Antonius Andreas

Quotes | On

The following are quotes on Scotus:

> "Read **Duns Scotus**'s *Ordinatio* of the Oxford Lectures (see the Critical Edition by Peter Simpson). Not the easiest of the medieval philosophers — I like to call him the 'medieval Kant' — this thinker is worth the time of a patient reader. A great synthesizer of positions, he sought a middle ground in the prevailing medieval disputes."
>
> — Ben Anar (2019), "Top 45 Western Philosophers" [1]

Quotes | By

The following are quotes by Scotus:

> "If all men by nature desire to know, then they desire most of all the greatest knowledge of science. And he immediately indicates what the greatest science is, namely the science which is about those things that are most knowable."
>
> — Duns Scotus (c. 1300), *Publication* (Ñº)

References

1. Anar, Ben. (2019). "A How-To-Guide, for Non-academic Philosophy Readers, to actually read the Primary Works of 45 Western Philosophers, With the Essential Order" (Ñº), Medium, May 3.

Further reading

â— Scotus, Duns. (1997). *Duns Scotus on the Will and Morality*. CUA Press.

External links

â— Duns Scotus – Wikipedia.

θΔics

In thermodynamics schools, the **Dutch school of thermodynamics** or “Dutch school”, a term dating to before 1903, is associated with the work of Dutch physical chemist Johannes van der Waals and Dutch chemist Bakhuis Roozeboom at the University of Amsterdam. [1] Others associated with the Dutch school include: Franciscus Schreinemakers (student of Roozeboom) and Jacobus van’t Hoff. [7]

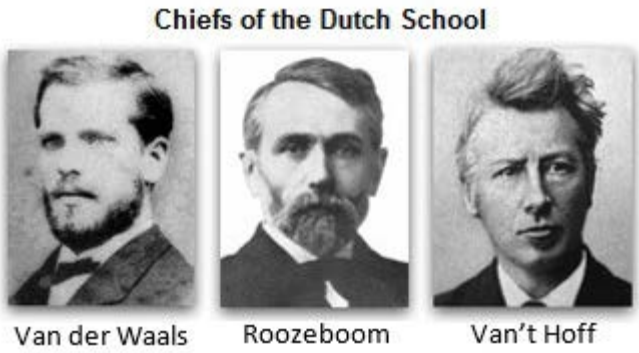

The three "chiefs" of the **Dutch school**, according to French physicist Pierre Duhem, which seems to have generally been launched in 1890 with the publication of Dutch physical chemist Johannes van der Waals' famous paper on the thermodynamic properties of fluid mixtures, wherein his van der waals equation, the equation of state for "ideal gas like" fluids, was derived.

The “chiefs of the Dutch school”, according to French physicist Pierre Duhem, are Van der Waals, Roozboom, and Van’t Hoff. Van't Hoff, however, is also said to have had his own school, the "Van't Hoff school". [6]

Overview

Van der Waals, who had been influenced significantly in his career path by German physicist Rudolf Clausius’ 1857 treatise *Über die Art der Bewegung welche wir Wärme nennen* (*On the Nature of Motion we Call Heat*), in 1876 became the first professor of physics at the newly established University of Amsterdam, where he stayed until his death in 1923. [2]

During these years, van der Waals introduced a newly developing Dutch chemist named Bakhuis Roozeboom to the theoretical works of American engineer Willard Gibbs on the phase rule which so far had little experimental verification in chemistry, prompting him to start a lifelong research program on phase equilibria. In 1896, Roozeboom became professor of chemistry in Amsterdam, where he died in 1907. [3] Roozeboom’s main work was main work was in the field of thermodynamics, he studied the equilibrium of multiple-phase systems.

The theoretical foundations for this were laid by Gibbs with his phase rule, but Roozeboom would be the one to apply the theory and demonstrate its usefulness. He is mainly remembered for his melting phase diagrams of metal alloys, i.e. studying how mixtures of metals melt depending on the relative amounts of the components, which is important for metallurgy. He also contributed to the science of chiral substances, he clarified how to distinguish the different types of crystalline racemates and predicted how mixtures of enantiomers behave in a heterogeneous system of solid and solution. [4]

A recent summary of the Dutch school is given by Dutch-American fluid thermodynamicist Johanna Sengers, in her 2002 book *How Fluids Unmix: Discoveries of the School of Van der Waals and Kamerling Onnes*, wherein she focuses on the Van der Waals equation, the law of corresponding states, liquid mixtures, theory of plaits on surface, fluid phase diagrams, criticality and critical exponents, and the impact of these on the subjects on the Dutch school. The book has back ground on Johannes van der Waals (1890), Heike Kamerling-Onnes, J.D. Korteweg (1891, 1903), the mathematical chemistry work or Johannes van Laar (1905), experimental physicist J.P. Kuenen, J.E. Verschaffelt, Willem Keesom, and Jacobus van’t Hoff. The book gives an inside look at the cooperative efforts of the members of the Dutch school in their effort to expand the knowledge of the thermodynamics of fluids (fluid thermodynamics), fluid mixtures, and the subject of the critical point. [8]

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2. Van der Waals, Johannes, D. (1910). "The Equation of State for Gases and Liquids." *Nobel Lecture*, December 12.
3. J. M. van Bemmelen, W. P. Jorissen, W. E. Ringer, (1907). *Berichte der Deutschen Chemischen Gesellschaft*, 40, 5141.
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(b) Johanna Levelt Sengers (faculty) – UCLA.

Further reading

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θΔics

In equations, the formula:

$$dW = PdV$$

is the differential expression for pressure volume work. If, to note, the equation for the pressure volume work becomes an inexact differential, which may occur as particle count approaches one, then it may become intuitive to use Neumann notation:

$$Ä‘W = PdV$$

where the d-crossbar Ä‘ derivative signifies that the work in this case is an inexact derivative.

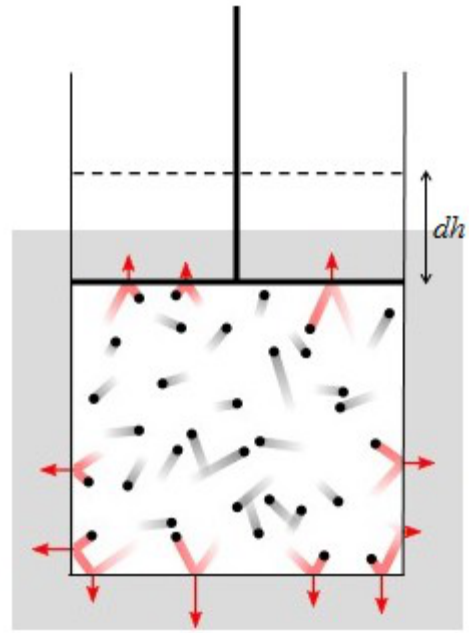

A system of moving particles exerting a pressure *P*, quantified as a force per unit area, on the walls of the containing vessel.

Derivation

When a body (working fluid, working body, working substance, or system) is enclosed inside of the volumetric boundaries (or boundary surface) of a piston and cylinder, at a pressure *P*, and undergoes some transformation, the change will tend to be accompanied by a volume change *dV*, in accordance with Boerhaave's law (1720), thus causing the piston to expand (expansion work) or contract (contraction work), by an amount of vertical height *dh*.

In this scenario, the standard definition of pressure, first given by Dutch-born Swiss physicist Daniel Bernoulli in his 1738 *Hydrodynamica*, will be defined as the force *F* the particles of the container exert on the walls of the boundary per unit area *A* or:

$$P = \frac{F}{A}$$

hence, the force will be given by:

$$F = PA$$

where *A* is the surface area of the face of the moving piston head. Then, according to Gustave Coriolis' 1829 principle of transmission of work, the work done by (or on) the body will be given by the product of the force and the distance of the piston head moved:

$$W = Fd$$

In this case the distance moved *d* will be *dh*:

$$W = Fdh$$

and the force *F* will be *PA*, hence the work will be given by the expression:

$$W = PAdh$$

where the work done by the body, being negative, with respect to the internal energy of the body, if the change of height *dh* of the piston is positive (piston moves up), or positive, with respect to the internal energy of the body, if the change of height *dh* of the piston is negative (piston moves down).

In this last expression, we note that the product of the surface are A and the change in height dh of the piston equates to volume change dV, or:

$$dV = Adh$$

Hence, with substitution into the previous to last expression:

$$dW = PdV$$

and the derivation is complete.

Irregular shapes

If the body or system is not of the standard piston and cylinder geometry, e.g. the territory of Rome, the same derivation applies, albeit with slight adjustment to the volume calculation.

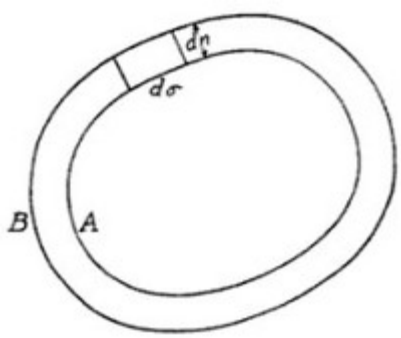

An **irregularly shaped system** at an initial state volume A and final state volume B, shown indicated with a small surface element *dσ* (d-sigma) and displacement element *dn*. [1]

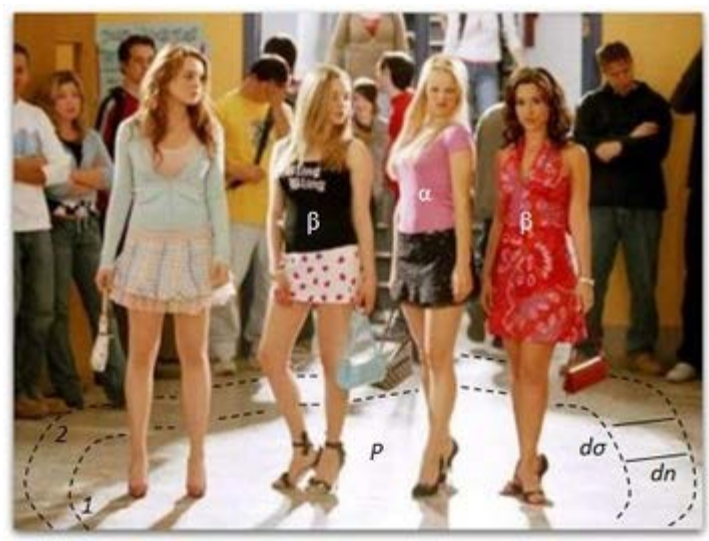

The adjacent diagram shows a body at a uniform pressure P enclosed in an irregularly shaped container, at an initial state, position, or volume A, which undergoes some transformation, e.g. territorial expansion or acquisition, heat addition, etc., and expands to a final state, position, or volume B.

An example of **human PV work** (above, right): the alpha female, flanked by two beta females, and a forth gamma-alpha female, enter a system, at an initial state 1 (volume one), which trigger reaction, resulting in a transformation of the system to state 2 (volume two), described by a human molecular pressure *P*, directed radially outward from the alpha female (a Johannes van der Waals theory), an amount of human work, which can be quantified by the product of the pressure into the integration of the surface element *dσ* (d-sigma) and the boundary element *dn*. [2]

$$W = P\int_{n_1}^{n_2} d\sigma dn$$

In this calculation, we let *dσ* (d-sigma), be a surface element of the container or boundary, and let *dn* be a displacement element, i.e. the displacement of the surface element in a direction normal to the surface of the container. The work performed on the surface element *dσ* by the pressure *P* during the displacement of the container from the situation A to situation B is:

$$dW = Pd\sigma dn$$

The total work performed during the infinitesimal transformation is obtained by integrating the above expression over all the surface σ of the boundary or container:

$$dW = \int P d\sigma dn$$

where, if the pressure is found to be constant (which may not always be assume true when dealing with human pressures and human volume changes of human systems and human boundaries, e.g. as during the volume change associated with the rise and fall of Rome, the so-called beauty expansion or height expansion phenomenon, associated with personal space, etc.), can come outside of the integral:

$$dW = P \int d\sigma dn$$

In this last expression, we note:

$$dV = \int d\sigma dn$$

and with substitution into the previous to last equation:

$$dW = PdV$$

and the derivation is complete.

Integration

If the integration can be written in the form of the a definite integral, having a definite measurable initial state volume V_1 and final state volume V_2, then:

$$W = \int_{V_1}^{V_2} PdV$$

The integral, and hence the work done, can be represented by the shaded area under the curve.

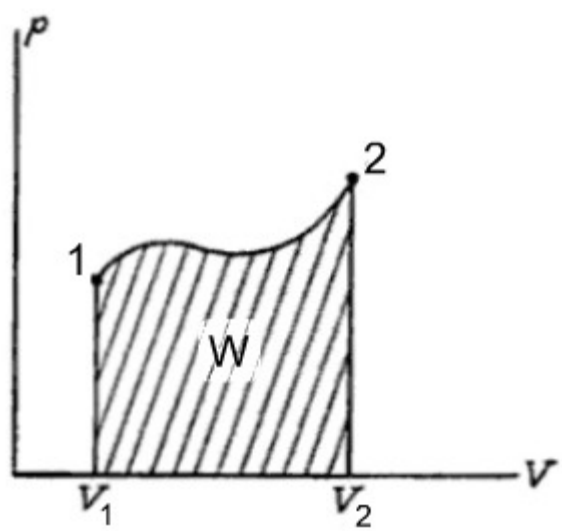

A PV diagram showing a body transforming from state 1 to state 2 and the representative work done indicated by the shaded area under the curve.

References

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2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (alpha molecules and Van der Waals force, pgs. 291-95). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (mean girls, pg. 550). Morrisville, NC: LuLu.

θΔics

In psychology, **dynamic psychology** is the study of the "drives" or mechanisms to arousal in animals and people. [1]

In 1918, American psychologist Robert Woodworth, in his *Dynamic Psychology*, defined dynamic psychology as a subject that "must utilize the observations of the 'workings of the mind'." Moreover, according to Woodworth, "once the point of view of a dynamic psychology is gained, two general problems come into sight, which may be named the problem of 'mechanism' and the problem of 'drive'." [1]

In 1954, American psychologist Calvin Hall, defined dynamic psychology as the subject that "that studies the transformations and exchanges of energy within the personality". [2]

Synonyms

The science of "dynamic psychology", a 1918 term, to a certain extent, is near synonym or precursor to the post 1920s theme of "psycho-dynamics", or the later, 1930s theme of "psychodynamics" as embodied in the writings of Austrian psychoanalyst Sigmund Freud, who considered the living organism as a dynamic system to which the laws of chemistry and physics apply. [2]

References

1. Woodworth, Robert Sessions. (1918). *Dynamic Psychology*, (ch. VII: "Drive and Mechanism in Abnormal Behavior", pg. 36, pg. 41-43; ch. VIII: "Drive and Mechanism in Social Behavior"). New York: Columbia University Press.
2. Hall, Calvin, S. (1954). *A Primer in Freudian Psychology*, (pg. 13). Meridian Book.

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θΔics

In science, **dynamics**, from the Greek δύναμις (Q) or *dunamis* “power” (Leibniz, 1689) (Q), the "D" letter possibly originating in the Greek-derived Egyptian-based Delta symbol Δ, is the science of "motion" (Sarpi, 1620), or of "accelerating or retarding forces, and of the varied motions which they must produce" (Lagrange, 1788), classified as a "new branch of mechanics" (Galileo, c.1630); generally, the study of the motion of bodies under the action of forces. [1] Dynamics, in short, is the science of force and motion. [2] The suffix -dynamic means concerning dynamics.

The founder of **dynamics**, the science of "motion" (Sarpi, 1620) or “accelerating or retarding forces, and of the varied motions which they must produce” (Lagrange, 1788), is Galileo, the physics of which being published in his *The Two New Sciences* (1632), most of which derived from experiments (Q) wherein balls were rolled down moderately-sloped inclined planes, such as shown above, wherein he used pendulums (Q) to time the rate of acceleration.

Overview

In 1543, Nicolaus Copernicus published *On the Revolutions of the Celestial Spheres* (*De revolutionibus orbium coelestium*), wherein the heliocentric theory was established, which marks the start of dynamics.

In 1602, Galileo began doing "demonstrations", and developing theorems therefrom, concerning falling bodies and projectiles.

In 1632, Galileo published *Dialogue Concerning the Two Chief World Systems* (*Dialogo sopra i due massimi sistemi del mondo*), which compared the then controversial Copernican system with the inconsistencies of the older earth-centric Ptolemaic system, and contains all Galileo had to say on physics; this is said to mark the point when dynamics, as a science, was founded. [3]

In 1687, Isaac Newton published *Principia*, which introduced the concepts of force and mass, the laws of motion, and the principle of universal gravitation. [4]

In 1689, the term “dynamica” was coined by German polymath Gottfried Leibniz, during his Italian journey, referring to his doctrine of forces; during which time he comprised an extensive then-unpublished work entitled *Dynamica*, some of which found publication outlet as “Specimen Dynamicum” in *Acta eruditorum* in 1695. Leibniz, in this latter publication, outlined four notions: [7]

> a) Active primitive force is purely a metaphysical entity expressing the activity of substances and is also called entelechy;
> b) Active derivative force is somehow the phenomenal manifestation of an aggregate of metaphysical substances and is measured by living force, or *vis viva*;
> c) Passive primitive force is purely metaphysical and expresses the imperfection of substances;
> d) Passive derivative force, which is also called *inertia*, is its phenomena manifestation.

In c.1700, Newton, in a manuscript, however, had the following to say about this:

> “Galileo began to consider the effect of gravity upon projectiles. Newton in his *Principia* improved that

> consideration into a larger science. Leibniz christened the child by a new name as if it had been his own, calling it **dynamica**. But his mark must be set upon all new inventions. And if one may judge by the multitude of new names and characters invented by him, he would go for a great inventor."
>
> — Isaac Newton (c.1700), manuscript (Q) note

In 1788, Joseph Lagrange, in his *Analytical Mechanics*, defined "dynamics" as the science of accelerative forces and the motions they produce; a subject founded by Galileo, perfected by Huygens, and revolutionized by Newton; specifically:

> "**Dynamics** is the science of accelerating or retarding forces, and of the varied motions which they must produce. This science is wholly due to the moderns, and Galileo is the one who threw or made the first foundations."
>
> — Joseph Lagrange (1788), *Analytical Mechanics* (Volume One, pg. 221) [8]

Lagrange showed that most varied consequences respecting the motions of systems of bodies may be derived from one radical formula. Namely, using a method of generalized co-ordinates, Lagrange showed that if one determines a system's configuration by a sufficient number of variables whose number is the same as that of the degrees of freedom possessed by the system, then the kinetic and potential energies of the system can be expressed in terms of those variables, and the differential equations of motion thence deduced by simple differentiation.

In 1835, William Hamilton, in his his two-part 1835 treatise "On a General Method in Dynamics", extended the work of Lagrange. [3]

In 1879, Hamilton's so-called "force function" was referenced by Rudolf Clausius' 1879 *Mechanical Theory of Heat*, the founding textbook of the newly emerging science of "thermo-dynamics". [5]

Hmolscience

The descriptive phrase "cultural dynamics", according to Thomas Wallace, is often employed in tracing cultural transitions, but with rare exceptions tends to be devoid of appropriate models that mention a driving force or an energy source necessary to energize such dynamics; thermodynamics, conversely, according to Wallace is what identifies the "dynamics" of a society: [6]

> "A thermodynamic-based economic model identifies the **dynamics** that drive all human existence including the economic, social, and political activities of a society."

Other two-cultures namesakes that employ the term "dynamics" include: Henry Adams' physico-chemical social dynamics (1908).

Quotes

The following are related quotes:

> "To give us the **science of motion**, god and nature have joined hands and created the intellect of Galileo."
>
> — Paolo Sarpi (c.1620) [8]

See also

- Dynamic psychology

- Physico-chemical social dynamics (Henry Adams, 1908)
- Psychodynamics
- Social dynamics
- Thermodynamics

References

1. Daintith, John. (2005). *Oxford Dictionary of Science.* Oxford University Press.
2. Earnshaw, Samuel. (1844). *Dynamics – or a Treatise on Motion* (title page "Quote" by John Herschel). J. & J. J. Deighton.
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5. Clausius, Rudolf. (1879). *The Mechanical Theory of Heat* (2nd ed). London: Macmillan & Co.
6. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (pg. 2). AuthorHouse.
7. Applebaum, Wilbur. (2000). *Encyclopedia of the Scientific Revolution: from Copernicus to Newton* (pg. #). Routledge.
8. Galileo. (1632). *Dialogues Concerning the Two New Sciences* (translators: Henry Crew and Alfonso Salvio) (Lagrange quote, pg. v; Sarpi quote, pg. ix). Macmillan, 1914.

Further reading

- Hamill, Patrick. (2013). *A Student's Guide to: Lagrangians and Hamiltonians*. Cambridge University Press.

External links

- Dynamics – Wikipedia.

θΔics

In terminology, **dynamis**, as compared to “energia”, refers to []

Overview

In c.570BC, Heraclitus, in his *Physics*, only fragments of which extant, introduced the term “energy” as en-ergon; the following are summaries of this:

> "**En-ergon**, is the father of every ‘thing’, king of all things and, out of it, all forms of contrast originate. Since ‘en-ergon’ is common to everything, it is vital for life itself.”
>
> — Heraclitus (c.570BC), *Physics*; fragment paraphrase by Gerrit Feekes (1986) in his *The Hierarchy of Energy Systems* (pg. 1) [2]

> “The term *energia* was first used by Heraclitus to connote fire as the primary source of action. Heraclitus, in his *Physics*, considered ‘**energon**’ the father of everything and the originator of all life on *Gaia*.”
>
> — Paris Arnopoulos (1993), *Sociophysics* (pg. 21) [3]

In c.350BC, Aristotle, in his *Physics*, *Metaphysics*, *Nicomachean Ethics*, and *De Anima*, building on Heraclitus, and the other physicists, such as Empedocles and Democritus, employed a pair of connected principles he called *energia*, meaning a “mode of being”, and dynamis, meaning “potentiality”. [4]

In 1689, Gottfried Leibniz, in his *Dynamica*, building on the earlier work of Galileo (1632), introduced the term “dynamics”.

Quotes

The following are related quotes:

> “Semen is potentially these sorts of things, either according to its own bulk or it has a certain ***dynamis*** in itself.”
>
> — Aristotle (c.350BC), *Publications* (726b17-19) [1]

References

1. Katayama, Errol G. (1999). *Aristotle on Artifacts: a Metaphysical Puzzle* (pg. 88). SUNY.
2. (a) Feekes, Gerrit B. (1986). *The Hierarchy of Energy Systems: from Atom to Society* (pg. 1). Pergamon Press.
(b) Lancaster, Justin. (1989). “The Theory of Radially Evolving Energy” (abs), *Int. J. General Systems*, 16: 43-73.
3. Arnopoulos, Paris. (1993). *Sociophysics: Cosmos and Chaos in Nature and Culture* (pg. 21). Nova Publishers, 2005.
4. (a) Anon. (c.2019). “Actuality vs Potentiality in Aristotle” (Ñº), The-Philosophy.com.
(b) Potentiality and actuality – Wikipedia.

External links

â— Dunamis (Dynamis) (disambiguation) – Wikipedia.

θΔics

In engineering, **dynamo** is a device or engine for turning rotative motion, powered generally via steam engines, into electricity; an electric generator. [1]

Overview

In 1876, the Centennial Exposition, in Philadelphia, was the world's first fair at which the practicability of generating electricity by steam was demonstrated. [1]

See also

- Dynamode

References

1. Kirby, Richard. (1956). *Engineering in History* (co-authors: Sidney Withington, Arthur Darling, Frederick Kilgour) (pg. 182). Courier, 1990.

External links

- Dynamo – Wikipedia.

θΔics

In science, **dynamode**, from the Greek roots in force and path, is a unit of work equal to the effect of a motor lifting 1000-kilograms one meter. [1]

Overview

The dynamode is a historical unit proposed in 1829 to be the unit of work by French mathematician and engineer Gustave Coriolis in his textbook *Calculation of the Effect of Machines*. [2] In this sense, one dynamode (D) is equal to:

$$1\ \mathrm{D} = 1000\ \mathrm{kg} \cdot \mathrm{m}$$

This unit may have its origins in French mathematician Jean Hachette's 1811 dynamic unit proposal of kg·m.

Sometime thereafter, French engineer and mathematician Jean-Victor Poncelet, the commandant general of the École Polytechnique, and also professor of mechanics applied to machines, built on the logic of Coriolis and lectured successfully on the topic of work done by machines, wherein he used the word travail, which is French for "work", to signify Coriolis dynamode effect.

Into the year 1899, the dynamode, in some publications, was considered as a unit of potential defined as work divided by 1000. [3] Although his term 'work' has become standard, the dynamode did not prove popular in the long run as the unit of work. Instead, the modern unit of work is the "joule" (J), named after English physicst James Joule, is equal to:

$$1\,\mathrm{J} = 1\,\mathrm{N} \cdot \mathrm{m}$$

$$1\,\mathrm{J} = 1\,\mathrm{kg} \cdot \frac{\mathrm{m}^2}{\mathrm{s}^2}$$

The use of the kilogram-meter, however, was used by German physicist Rudolf Clausius, in his *Mechanical Theory of Heat*, beginning in 1850, through 1875. [4]

References

1. Bennett, Joseph. (1858). *A Treatise on Hydraulics*, (pg. 316). London: D. Van nostrand.
2. (a) Coriolis Biography – MacTutor History of Mathematics Archive.
(b) O I Franksen, “The virtual work principle - a unifying systems concept”, in *Structures and operations in engineering and management systems, Trondheim, 1980* (Trondheim, 1981), 17-152.
(c) The contribution of Coriolis, Poncelet, and Navier to the the concept of “work” is examined in detail in: Grattan-Guinness, I. (1984). “Work for the workers : advances in engineering mechanics and instruction in France, 1800-1830, *Ann. of Sci.* 41 (1), 1-33.
3. Willcox, Cornélis De Witt. (1899). *A French-English Military Technical Dictionary*, (pg. 537). Govt. Print. Off.
4. Clausius, Rudolf. (1879). *The Mechanical Theory of Heat*, (pg. 1), (2nd ed). London: Macmillan & Co.

θΔics

In mechanics, **d'Alembert's principle** is a reformulated version of the second law of motion which gives an interpretation of the force of inertia, which allows one to extend the principle of virtual work from statics to dynamics, according to which one can extend the criteria of equilibrium—vanishing of a force in Newtonian mechanics means equilibrium—to a system which is in motion. [1]

History

The so-called d'Alembert's principle was formulated by French mathematician physicist Jean D'Alembert.

This vanishing of forces in dynamical system principle is often called d'Alembert's principle, but, according to Arnold Sommerfeld (1956), it was first written in this variational form by Joseph Lagrange. [5]

Physical economics

The principle of d'Alembert, according to physical economics historian Philip Mirowski, is said to have been influential and or thematically found in the 1801 economic formulations of French mathematician and engineering Nicholas-Francois Canard. [3]

In 1897, French engineer and physical socioeconomist Vilfredo Pareto penned a mechanical-to-social phenomena variables table, in a section of which he made the following comparison: [4]

The science of mechanics is divided into two others. If we consider inextensibly connected material points we obtain a pure science, rational mechanics, which studies in an abstract way the forces of equilibrium and movement. The easiest part of science is equilibrium. **D'Alembert's principle**, considering the forces of inertia, enables the reduction of the dynamic problem to a static one.	The science of political economy is divided into two others. If we consider the *homo economicus* who acts only as a result of economic forces, we obtain political economy, which studies in abstract terms ophelimity. The only part of this which is well known is static equilibrium. There may be a **principle** for economic systems analogous to **D'Alembert's**, but at present our knowledge is very poor. The theory of economic crisis offers an example of dynamic study.

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1. Lanczos, Cornelius. (1949). *The Variational Principles of Mechanics* (§4: D'Alembert's Principle, pgs. 88-). Dover, 1970.
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4. (a) Pareto, Vilfredo. (1896). *Course of Political Economics* (*Cours d'Economie Politique*), *Volume One*. University of Lausanne.
(b) Pareto, Vilfredo. (1897). *Course of Political Economics* (*Cours d'Economie Politique*), *Volume Two* (variables table, pgs. 12-13). University of Lausanne.
(c) Pareto, Vilfredo. (1964). *Cours d'Economie Politique* (variables table, pgs. 12-13). Librairie Droz.
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(e) Donzelli, Franco. (1997). "Pareto's Mechanical Dream" (pdf) (comparison table, pgs.2-4), *History of Economic Ideas*, 3:127-78.
5. Arnold Sommerfeld (1956), *Mechanics: Lectures on Theoretical Physics*, *Volume One* (p. 53). Academic Press, 1964.

External links

â— D'Alembert's principle – Wikipedia.
â— d'Alembert's principle – Britannica.

θΔics

In relativistic thermodynamics, **E = mc²** is an equation which defines the principle of mass-energy equivalence, which states that energy is proportional or "equivalent", according to the speed of light squared, to matter: [1]

Top: 3-meter-tall sculpture of Einstein's formula at the 2006 Walk of Ideas, Germany.

$$E = mc^2$$

Said another way, mass and energy are different manifestations of the same thing.

The now-famous expression was developed proposed 1905 by German-born American physicist Albert Einstein in his paper "Does the Inertia of a Body Depend upon its Energy-content?", wherein he argued that the equivalence of mass and energy is a general principle, which is a consequence of the symmetries of space and time: [2] In his own words, as voiced in the adjacent video:

> "It followed from the special theory of relativity that mass and energy are both different manifestations of the same thing. A somewhat unfamiliar conception for the average mind. Furthermore, the equation **E** is equal to **m c²**, in which energy is put equal to mass, multiplied by the square of the velocity of light, showed that very small amounts of mass may be converted into a very large amount of energy and vice versa. The mass and energy were in fact equivalent, according to the formula mentioned. This was demonstrated by Cockcroft and Walton in 1932, experimentally."

German physicist Ingo Muller argues that E = mc², defining energy, and S = k ln W, defining entropy, are the two most famous expressions in all of science. [2]

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Further reading

â— Flores, Franciso. (2007). "The Equivalence of Mass and Energy", *Stanford Encyclopedia of Philosophy*.

External links

â— Mass-energy equivalence – Wikipedia.

θΔics

In hmolscience, **E.B.** (c.1810-c.1880) was an English atheism philosopher noted for his 1851 religion and science debates contributions to the Jeremy Bentham themed periodical *The Reasoner: and Theological Examiner*, run by George Holyoake, wherein, in his discussions of English polymath William Whewell, he seems to have been the first to coin the term "human chemistry."

Mackintosh | Holyoake

In 1850, John Mackintosh, in his pamphlet *The Logic of Atheism: With Especial Reference to Mr. Holyoake's Pretended Refutation of Paley*, wherein, he states the following:

> "All Christians are knaves or fools."
>
> — George Holyoake (c.1845) (Ñº)

In 1851, E.B., in *The Reasoner* (Ñº), refuted Mackintosh on his anti-atheism; and Mackintosh refuted back, which seems to have runamuck into a debated about "name calling".

Human chemistry

In 1851, E.B. cited the following contentious quote by English polymath William Whewell, from his *Bridgewater Treatise* (1833):

> "We can no longer maintain the infinite past duration of the earth; for chemical forces as well as mechanical tend to equilibrium. If, for instance, a large portion of the earth's mass were originally pure potassium, we can imagine violent igneous action to go on so long as any part remained unoxidized; but when the oxidation of the whole has taken place, this action must be at an end; for there is no agency (physical) which can reproduce the de-oxidized metal. Thus a perpetual motion is incapable in chemistry, as it is in mechanics; and a theory of constant change, continued through infinite time, is untenable."

E.B. then, in semi-objection to the above, employed the term "human chemistry" as follows: [1]

> "Potassium is a compound of certain elements which exist abundantly in nature: the operations of nature can resolve potassium, or gold, or man, into their elements, and build up new gold, new potassium, and new men, by laws unknown indeed to human chemistry, but which we must (arrogantly or not) for the present hesitate to pronounce undiscoverable."

(add discussion)

Education

E.B. may have been possibly a mathematician or physicist of sorts, as he cites the first book of Euclid.

Quotes

The following are noted quotes:

> "Nature's operations, as far as we have yet observed them, proceed by inexorable atheistical laws, and every new discovery of natural laws is a new blow to the tottering dogma of a 'moral governor' and mechanical contriver, the offspring of dark and ignorant ages."
>
> — E.B. (1851), commentary on John Mackintosh's "The Logic of Atheism" [2]

References

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2. E.B. (1851). Pamphlets of the Opponents (III): Commentary on “The Logic of Atheism” by John Mackintosh (pgs. 410-12; quote, pg. 414), in: *The Reasoner: and Theological Examiner*, 10.

θΔics

“The greatest German novel before the 20th century.”

— Michael Dirda (2009) [5]

5. Dirda, Michael. (2009). “Essay: Elective Affinities”, Library Without Walls, BN.com, Mar. 30.

Bergman reaction (1775)
(add)

"reaction #2"

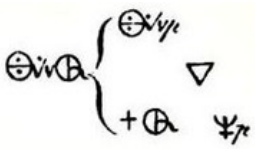

Chemical reaction (1969)

$$A + B \rightarrow AB$$

The first reaction, of Goethe's novella, according to Karl Fink (1999), is a "combination reaction", beginning with Charlotte (A) and Eduard (B) described as being bonded by marriage. [1] The attachment AB signifies a human chemical bond (A≡B), and the molecular or chemical unit "AB" is technically a dihumanide molecule, attached in one bound state existence. [2]

see American electrochemical engineer Libb Thims' 2007 *Human Chemistry* chapter ten "Goethe's Affinities", for details of this chapter's human chemical reaction, in Bergman-style (top) and modern-style (bottom) reactions. [2]

Discussion
The following is the discussion section for part one, chapter one:

Real: Edward & Charlotte
A depiction of the "real" **Eduard** (Goethe) and the "real" **Charlotte** (Charlotte von Stein) in their earlier years, reading or discussing with each other: [4]

The "real" Charlotte, German socialite Charlotte von Stein (1742-1827), depicted above, along her vast estate in Weimer, Germany, whose affections Goethe in 1775 tried to win, although already married with seven children and seven years his senior—she is the main person behind the character of **Charlotte**. The death of her husband Baron Gottlob von Stein (1735-1793) in 1793 (see: Goethe timeline), thus freeing Charlotte, then age 51, from her 29-year arranged marriage of necessity, opened up opportunity for Goethe's previous decade-long quest to wed or acquire Charlotte as his own. This "turning point" seems to give way to the "what might have been" scenario that plays out in *Elective Affinities*, in regards to the marriage formed between the characters Eduard and Charlotte (as introduced in this chapter).

Real: Captain
Below right: the famous 1857 Goethe-Schiller statue in Weimar (copies in San Francisco, Cleveland, Milwaukee, Syracuse, & Anting):

Above middle: the *circa* 1805 Goethe-Schiller bust, depicting Goethe looking into the skull of Schiller trying to figure out where his old friend had gone—the passing of Schiller, in 1805, thus gave way to the imagined role of the **Captain** (mixed in with the character of Wilhelm Buchholz, whose chemistry lectures Goethe listened to during the Friday Society at Weimar, from 1791 to 1798), with whom Eduard and Charlotte discusses the elective affinities; similar to how Goethe and Schiller discussed the elective and similar to how Schiller's wife, Charlotte von Schiller (1766-1826), would have discussed the elective affinities with the two of them. Charlotte von Schiller, for example, thought that Goethe's *Elective Affinities*, as summarized by Astrida Tantillo, "demonstrated Goethe's infinite understanding and genius as a writer and praised its realistic qualities." [6] Goethe is buried with Schiller at the Ducal Vault in Weimar, a fact that seems to very clearly indicate that Schiller was indeed the "Captain", or at least the inspiration for the dominant portion of his character. [7]

Notes

The above Bergman reaction #2, as assigned to this chapter, needs to be checked, to see if it is in fact a combination reaction; of to see if Goethe had a different reaction in mind.

Cut stuff

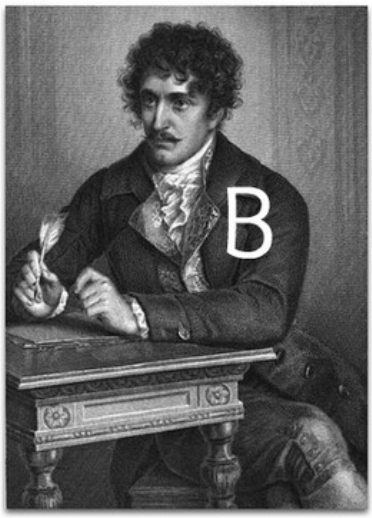

Left: A *circa* 1863 rendition of the character **Edward** (HB:230) by Friedrich Pecht and Arthur von Ramberg, who in large part is the character of Goethe himself. [3] **Right:** a painting of Goethe, aged 59-60, circa 1808-1809, supposedly by Franz Gerhard von Kügelgen, at the time when *Elective Affinities* was written. One should imagine the character "Edward" as a blend of the two. The story, however, takes place, in the mind of Goethe, in the year 1793, when Goethe was 44, see: Goethe timeline, during which time the existence of Baron Gottlob von Stein (1735-1793) ends, thus freeing Charlotte von Stein (1742-1827), then age 51, from her 29-year arranged marriage of necessity, and thus giving opportunity for Goethe's previous decade-long quest to wed or acquire Charlotte as his own.

d

Charlotte

Left: an artistic rendition of the "character" **Charlotte** (HB:264). **Right:** German baroness Charlotte

von Stein (1742-1827), Goethe's past great love interest, who, from 1774 to 1786, he attempted to court into the bonds of marriage, but who since the age of 19 had been betrothed into an arranged marriage; the character, to note, might also have some aspects of Charlotte von Schiller (1766-1826), Schiller's wife (Captain's wife), who discussed the elective affinities with Goethe and Schiller, just as did the character Charlotte discuss the elective affinities with Edward and the Captain in the famous "chapter four".

In acronyms, **EA:IAD** is an Hmolpedia-link facilitating term, short for *Elective Affinities: Illustrated, Annotated, and Decoded*, the work-in-progress, 2012-lauched, online deconstructed, illustrated, chapter-by-chapter, decoding and analyzed compendium on of Goethe's chemically-cryptic 1809 *Elective Affinities*, done using the 1854 English translation by James Froude and the 1885 illustrations orchestrated by Hjalmar Boyesen; a print version of which, when finalized, being sought. [1]

Overview

The following are the main pages of EA:IAD, ordered generally via the layers one encounters, when attacking the book:

- EA | IAD: **Main Project Page**
- Elective Affinities | IAD: Project background
- Elective Affinities | IAD: Goethe timeline
- Elective Affinities | IAD: Goethe's advertisement
- Elective Affinities | IAD: **Table of contents**
- Elective Affinities | IAD: List of characters
- Elective Affinities | IAD: Title decoding
- Elective Affinities | IAD: Cyphers | CHEM (see: CHEM cypher), OTT, TOT, Echo, EO (see: Hermes)
- Elective Affinities | IAD: Reaction decipherment
- Elective Affinities | IAD: **Equation decipherment** (hardest part)
- Elective Affinities | IAD: Commentary decoding | Puzzles
- Elective Affinities | IAD: Love theories
- Elective Affinities | IAD: Affinity table
- Elective Affinities | IAD: Admirers | Enemies
- Elective Affinities | IAD: Translations
- Elective Affinities | IAD: Robe of Nessus; Tableau vivant
- Elective Affinities | IAD: Artists

References

1. Thims, Libb. (2020). *Elective Affinities: Illustrated, Annotated, and Decoded*. Lulu.

θΔics

In EA:IAD, **EA:P1C1 discussion** refers to discussion, annotations, and decoding analysis of part one, chapter one (P1:C1) of Goethe's *Elective Affinities*.

Annotations

N1. [life]: the term "life", in the modern-days views of things, namely since Serbian-born electrical engineering Nikola Tesla famously and correctly stated in 1925 "there is no thing endowed with life", is a defunct term: a defunct scientific theory, to be precise; for the sake of readability, however, the original usage of the term "life" will be followed throughout, although correct it should be rendered as "reaction existence", "bound state existence", or existence, among other possiblities: an animate atomic geometry, as walking-talking-thinking human is, can "exist" and "react", but not be alive, by virtue of the fact that atoms and molecules are not alive, and by virtue of the fact that a human is a molecule (see: human molecular formula).

N2. [time]: English German-languages scholar Gerlinde Roder-Bolton, in his 1998 book *George Elliot and Goethe: an Elective Affinity*, comments that Goethe's chapter one opens with statements of time and space: "Edward has been spending the best hour of an April afternoon in his tree nursery." Bolton goes on to comment: [11]

A 2011 Penguin edition cover section of Die Wahlverwandtschaften (German) or Elective Affinities (English) showing some type of hot (passion) / cold (breakup) love/hate relationship schematic flow chart (top), above a chemical combination reaction (right), and the 1882 Goethe-Helmholtz equation (below left) the thermodynamic connection between chemical affinity (Goethe's "elective affinities") and free energy (modern). [16]

> "Although this denotes a single event, the dialogue which follows establishes it as an habitual occupation: Eduard spends certain hours of the day in his park. **The singulative beginning is also pseudo-iterative, and this results in a slow temporal movement**. In *Die Wahlverwandtschaften*, such a narrative strategy establishes at once the slow, generalized temporal movement of the novel, which is further emphasized by the character's preoccupation with trivial matters (which G.H. Lewes found 'somewhat tedious'). The strategy also introduces a sense of spatial enclosure and isolation: Eduard had been in the tree nursery, which lies within the confines of the estate. He talks to one of the his gardeners, who describes first a view which defines the spatial dimensions of the novel (park, mansion, village, church), and then a second view into an indefinite 'heitere Ferne', the outside world, with which the novel is not concerned."

Here we see a well-presented take on what scholars have come to define as the "retort" or the reaction vessel—namely the vast grounds of the estate on which the human chemical reactions take place.

Time is slowed down purposely to allow for a more readily discernible chemist-type or rather human chemist type "third person" (advanced perspective) take on the way in which, in Goethe's own 1799 words, people "attract and reply, neutralize each other, separate again, and reestablish themselves". The following 2007 section summary on the Gottman stability ratio, from Libb Thims' 2007 *Human Chemistry*, gives a decent synopsis on why "time" needs to be slowed down, in order to properly understand the step-by-step mechanistic nature of human interactions, namely of: "attractions", "repulsions", "neutralizations", "separations", and "reestablishments", as Goethe described things verbally in 1796 and storyline format in the *slowing down* of his first chapter: [1]

> "At the sub-microsecond speed, exchanges are mediated by photons. The rate at which human molecules absorb, process, and emit field particles, or emotional current, is 15-cycles per second. Therefore, if any 10-second video segment or interaction between two people in conversation is analyzed by slowing the video down to micro-frames of **1/45th of a second**, one will see, by watching the slowed-down version, frame by frame, what is called *interaction synchrony*, in which the conversation takes on a rhythmical structure. One will see, for instance, each person, within the space of one, two, or three 1/45th-of-a-second frames, move a shoulder or cheek or an eyebrow or a hand, sustain that movement, stop it, change direction, and start again. In other words, the timing of the stops and starts of each person's micromovements, i.e. the jumps and shifts of body and face, with respect to his or her bonded companion's response, are found to be in perfect harmony, having a frequency of 15-cycles per second.
>
> The sum process is akin to a champion ping-pong match of emotional exchange (thermalization); each catches the other's emotion, then rapid fire sends back the response. If,

Time, as noted by German-languages scholar

> however, the pair is in a state of *bonding dissolution*, meaning they are headed for a break-up, the exchange process will become disharmonious. The mental register of a mate's sour facial expression, for instance, will require time-extended neurological processing, thus slowing down the energy exchange rate involved in the evolution. This extra energy use quota constitutes entropy loss through what would be termed *mental friction* in the bond, meaning that the second law of thermodynamics is at work, dissipating energy *in* the relationship, and that less and less energy is being left available for purpose or functional external useful work, *outside* of the relationship"

Gerlinde Roder-Bolton (1998) is particularly "slowed" down in Goethe's novella, so to allow for proper digestion of reactions occurring between the characters of the novella, per chapter.

The best modern-day feel on how debonding occurs, to note, is described excellently in American sociologist Diane Vaughan's 1986 *Uncoupling: Turning Points in Intimate Relationships*, the results of detailed studies and interviews of people looking back and describing and thinking about the decisive or pivotal moments and or tipping points in which relationships began to break apart. [14]

Lastly, in sum, in modern chemical thermodynamics terminology, see here a visual of the "system" (estate), the "boundary" (within the confines), and "surroundings" (outside world), or environment, as it is sometimes called.

N3. [beauty]: (add)

Note: Jeremy Adler thinks (1990) that Eduard and Charlotte alone on the estate, as described in this opening chapter, was known at the time as "simple affinity". [15]

Reactions

Historically, the first person to do actual research into which chemical reactions or rather "affinity reactions" Goethe had in mind when he penned each chapter was English poet turned elective affinity chemistry historian Jeremy Adler who from 1969 to 1977 did his PhD dissertation on the chemists, chemical reactions, theory, and affinity tables that Goethe most-likely used in the construction of *Elective Affinities*.

In 1990, American Goethean scholar Alfred Steer, in his *Goethe's Elective Affinities: the Robe of Nessus*, attempted to outline, as shown in the caption box below, using the reactions described in the famous chapter four, how Goethe might have conceptualized his human-human reactions (human chemical reactions). [13]

American Germanic-literature professor Karl Fink, soon thereafter, learned of Adler's affinity reaction work, likely sometime during the writing and research for his 1991 book *Goethe's History of Science*, wherein he comments the following on Adler: [9]

> "To date, Jeremy Adler has provided the most detailed study of Goethe's research in the history of chemistry, particularly [his] *The History of Chemical Affinity* (*Zur Geschichte der chemischen 'Verwandtschaft*)."

In 1999, Fink, in his conference presentation turned book chapter "Goethe's Intensified Border", gives explication and discussion of nine of the thirty-six chemical reactions in German polymath Johann Goethe's 1809 *Elective Affinities*.

In the late 2000s, during the writing and research for the two-volume textbook *Human Chemistry* (2007), and follow up work in the construction of *Hmolpedia*, American electrochemical engineer Libb Thims discovered Adler's reaction theory work (via Astrida Tantillo, 2001), and later the work of Fink, both of whom Thims contacted and communicated with via email.

(fix)

Adler speculated on a number of various different reactions. Fink speculated on the first nine main reactions, as he sees things, up through the synthesis and conception of the child, towards the end using a rather peculiar +/- method of writing out reactants and products. The synthesis of these three points of view, mixed in with newer ideas and theories, in regards to human chemical reaction theory, will be the main line of argument in these per chapter "reaction" sections.

Fink describes the first reaction of the novella, which seems to be this opening chapter, as a combination reaction, of the following form:

$$A + B \rightarrow AB$$

The conversation began with the spherical droplets of oil, water and mercury, each of which tends to unite only with its own kind, refusing to unite with the others. This is really physics, rather than chemistry, but has some interesting ramifications, which will be dealt with in the chapter on symbols. Charlotte saw at once here the analogy to classes within a state (52:272). Then the men described the processes that take place when chalk is introduced into dilute sulfuric acid, producing gypsum and carbon dioxide: in modern terms[4];

$$CaCO_2 \text{ plus } H_2SO_4 \text{ gives } CaSO_4 \text{ plus } H_2CO_2$$

But this is really misleading, since it employs a set of symbols that were not yet developed and generally accepted until much later in the 19th century. If Goethe had thought in symbols here, he would have had to use the ones employed by his teacher Bergman (and most other chemists of the late 18th and early 19th centuries), and the result would have looked something like this:

$$(+\Theta)(\nabla) \text{ plus } (\div V) \text{ gives } (\nabla \Psi) \text{ plus } (\nabla + E)$$

There will be cause presently to return to this arcane set of symbols, since every chemist of the time, on looking at any of the then current symbols, would have been reminded of alchemy.

American Goethean scholar Alfred Steer's 1990 take on how Goethe might have interpreted his human-human reactions, possibly on scratch paper notes (although he destroyed all notes to this particular novella, contrary to his usual practice), as modeled, based or conceptualized on Bergman's affinity reactions. [13]

with Charlotte (A) and Eduard (B) being described as being "freed" from their previous sets of arraigned marriages, signifying an initial reactants state in time of being "single" individuals free to date who they like, who into the period of the first chapter, are described as being bonded by marriage.

Human chemical bonding | Energy rich bonds

In the above symbol notation of Charlotte (A) and Eduard (B), being symbolized in the "marriage state", via the conjoined symbol AB, we note that Fink nor Adler do not go into detail or speculate on the nature of the "bond" of this scenario, if, in the Goethean sense of the visualization, these entities (Charlotte and Edward) are indeed chemical entities. Fink in other words does not explicitly signify or define the union as being attached via a "human chemical bond". This is what is called a "glass wall" problem in the hmolsciences: something that is not seen until one runs into it at high speed and it stops one dead in their tracks.

Human chemical bonding theory, however, is a more advanced subject of human chemistry, first developed by Thims in 2003 (see: Thims history), and is a very complex subject requiring the digestion of a number of intricate and advanced fields of study, the first of which is German-born American biochemist Fritz Lipmann's 1941 chemical thermodynamics based models of bonds acting as "energy" carriers or routers of energy acting as fuel for processes, as defined in coupling theory: [10]

> "The recent recognition that in nature there occurs a widespread utilization of phosphate bonds as energy carriers, necessitates a still further revision of the earlier view concerning the biological significance of phosphate turn-over. During various metabolic processes phosphate is introduced into compounds not merely, or at least not solely, to facilitate their breakdown, but as a prospective carrier of energy. The outline of the metabolic generation and the circulation of this peculiar type of chemical energy is the primary purpose of this paper."

a subject that requires a mastery of American physical chemist Gilbert Lewis's 1923 *Thermodynamics and the Free Energy of Chemical Substances*, as a prerequisite. The second digestion, to understand "bonding" properly, in regards to human attachments, is that one educates oneself in on the subject of "exchange force" models of modern physics, which again is a deep subject to say the least going back to the discovery of the neutron and an attempt to formulate a new model of bonding at the quantum mechanical level, as discussed in the 1930s work of Weiner Heisenberg and Ettore Majorana, to name a few.

Overview

The model of two people, A and B, chemically reacting over the course of a number of months or years to form a couple AB, according to chemical reaction notation is defined as such:

$$A + B \rightarrow AB$$

wherein the reactants "A + B" are single unattached human molecules, and the product "AB" is a dihumanide molecule held together by a human chemical bond, the bond itself sometimes symbolized by the triple equals sign "≡" as in A≡B.

The concept or premise of the existence of "chemical bonds" (no analogy) existing between people is a bit of an anathema to many.

Objection
In 2005, American high school geology teacher V. Smith commented on this modeling of humans as molecules that undergo chemical reactions to form bonded molecular products:

> "The idea of 'human chemical reactions' occurring between 'human molecules' is good for a laugh, but not much else."

Likewise, in 2011, Irish biochemistry student Ryan Grannell commented on this logic:

> "A + B → AB is just a pretentious way of stating something we already know; it tells us absolutely nothing new."

Here we see examples of scientists new to the subject of human chemistry who do not yet see the big picture scheme of things. Smith and Grannell are over-common examples of scientists who have not yet seen the glass wall, cannot see the ships in the harbor, or are not able to discern the forest among the trees.

Methodology
From a human chemical thermodynamics point of view, human chemical bonding theory and human chemical reaction theory in general are integral part of human thermodynamics, particularly in regards to (a) the thermodynamic quantification of the initial state and final state of "big history" thermodynamic processes, as encapsulated in the description "twice married, once divorced", and (b) the nature of "coupling", free energy coupling, or thermodynamic coupling between human chemical reactions.

The origin of the notion of "energy-rich" and "energy-poor" bonds originated in 1941 article "Metabolic Generation and Utilization of Phosphate Bond Energy" by Fritz Lipmann, wherein he presented his Lewis thermodynamics framed model of how the release of energy from the break down of ATP to ADP is that drives the muscle contraction among a host of other biochemical processes; a theory that thus initiated the model of free energy coupling in the context of phosphate bond energy storage and use. As summarized in 1991 by National Academy of Sciences biographer Eugene Kennedy:

> "In his masterly and highly influential review in 1941 Lipmann was to emphasize the central role of adenosine triphosphate (ATP) as an 'energy-rich' phosphate ester, the breakdown of which to adenosine diphosphate (ADP) and inorganic phosphate (Pi) drives not only muscle contraction but also a host of other energy-requiring [endergonic] processes."

In his article, Lipmann introduced the "squiggle" notation "~P" and used the terms "bond energy" and "high-energy bonds" to represent the amount of potential energy that could be stored in these bonds:

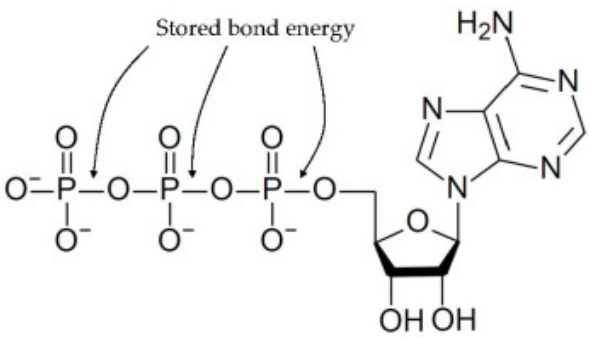

Table of Bond Energies	
Type	Bond energy (kJ/mol)
Ionic bond	700-4,000
Covalent triple bond	800-1,000
Covalent double bond	500-700
Covalent single bond	200-500
Dipole attractions	40-400
Hydrogen bond	10-40
Phosphate bonds (ATP)	25-60
Human chemical bond	7.6E8 (kJ per bond)

A 2D diagram of adenosine triphosphate (ATP) a five-element molecule ($C_{10}H_{16}N_5O_{13}P_3$) shown next to a table of representative bond energies.

In 1971 retrospect commentary, as explained in his *Wanderings of a Biochemist*, he explains the tension that this caused:

> "My paper caused a stir when it appeared, although at first it was given what one might call a mixed reception. The talk of *energy-rich bonds* aroused a forceful, sometimes virulent antagonism. Unwittingly, I had stepped into a hornet's nest by using 'bond energy' to express the potential energy derivable from a bond. Many organic chemists were outraged by what they felt was a **misuse of the term** *bond energy*. The situation brings to mind an observation made by a good friend and colleague of mine: 'you always have to see that your union card is in good order'."

Lipmann's mention of "potential energy derivable from a bond", can be graphically depicted on a reaction coordinate, as shown below, from the field of drug-receptor thermodynamics, depicting the generic bonding of a drug (D) with a receptor (R) in an initial heightened kinetic energy state (initial state) that transitions into a stable final state drug-receptor complex product (DR) with potential energy stored in the bond:

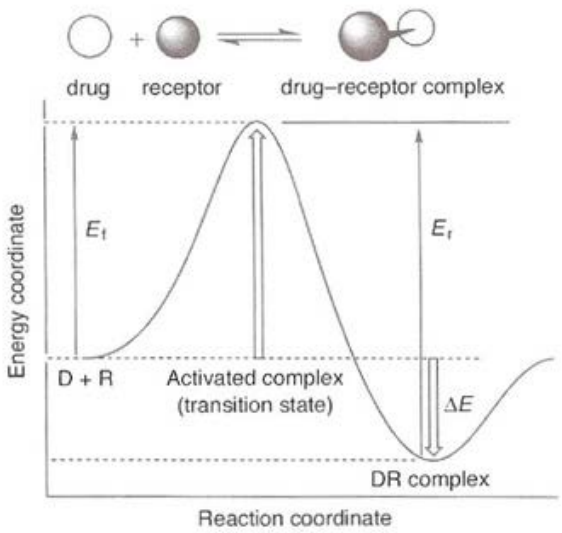

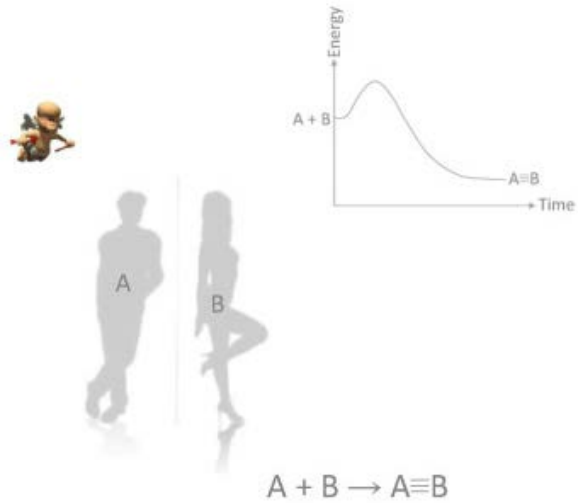

Drug-receptor reaction model of complex formation.	Human-human reaction model of complex formation.

These models can thus be scaled up to the human-human reaction level, such as shown above (right), such as found in the work of chemists David Hwang (2001), Libb Thims (2007), Surya Pati (2009), and Thomas Wallace (2009).

The notion of "energy-rich bonds" and "energy-poor bonds" are integral to the notion of "coupling" in human chemical thermodynamics processes, an example being the phenomenon of nepotism, according to which rich bonds drive the poor bonds, and the system as a whole works.

See also

â— Goethe's affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe's human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

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θΔics

In existographies, **Eann Alexander Patterson** (c.1955-) (DN:1) is an English mechanical engineer noted, in business thermodynamics, for his 2004 book *The Entropy Vector: Connecting Science and Business*, co-written with English engineer and business manager Robert Handscombe, in which, via citation to the dictionary-based ideas Nicholas Georgescu-Roegen, they apply entropy theory, e.g. low entropy, mental entropy, etc., to business operation to argue that managers should strive to find the "entropy vector" characterized by low entropy creation, low energy input, and high work output. [1]

Religion

In the about the authors section of their book, Patterson lists "working all hours god gives" among his interests, which would seem to classify him as Dawkins number of near to one.

Education

Patterson completed his PhD, dissertation: *Load and Stress Distributions in Axially Threaded Connections*, in 1985 at the University of Sheffield. [2] In 2004, Patterson was the head of the department of mechanical engineering at the University of Sheffield. [3] Currently, he is the chair of mechanical engineering at Michigan State University. [4]

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3. Ibid. (2004). About the authors (front matter).
4. Eann Patterson (about) – ExperimentalStress.com.

External links

â— Eann Patterson (faculty) – Michigan State University.

θΔics

In genius studies, **early parental death and genius**, aka EPD genius, or correctly, per life terminology upgrades, early parent de-existence, dereaction (death), or analysis "geniuses", is a salient anomaly, common to existographies (biographies) of geniuses, in particular double Nobel Prize Laureates (75% are EPD geniuses), heads of scientific revolutions, and thinkers at the top of the top 1000 geniuses listings.

The depiction of the burial scene (Q) of the parents of William Wallace (c.1270-1305) (IQ:155|#603) (Q), from the 1995 film *Braveheart*, who lost both his parents at a young age, owing to the conflicts between the "freedom" desired by Scotland and the unjust controlling nature of England, specifically the rules of Edward I of England (1239-1307) (Q), aka "Edward Longshanks" or the "Hammer of the Scots".

Works

The following is a ranking by famous publications in respect to EPD characterizers:

1542: *On the Revolution of the Heavenly Orbs* | **Copernicus** (**F**10)
1661: *The Skeptical Chemist* | **Boyle** (**M**3)
1677: *Ethics* | **Spinoza** (**M**7)
1687: *Principia* | **Newton** (**F**0)
1859: *Origin of Species* | **Darwin** (**M**8)
1865: *A Dynamical Theory of the Electromagnetic Field* | **Maxwell** (**M**8)
1876: *On the Equilibrium of Heterogeneous Substances* | **Gibbs** (**M**16)
1888: *The Will to Power* | **Nietzsche** (**F**5)
1910: *The Physical Significance of Entropy* | **Klein** (**F**2)
1937: *The Nature of the Chemical Bond* | **Pauling** (**F**9)
2007: *Human Chemistry* | **Thims** (**M**12)

In succinct detail, visual, i..e the exchange force observation, of the cessation of one or two of one's parents, e.g. watching a mother turn blue, imbibes or instills a sort of "sober cold" reality of the existence of things, that works to differentiate EPD children, accordingly, from normal or status quo upbringing of average children, in a way that what seems "cold" to normal adults, has been previous "accustomed" too by EPD children.

List

The following is a work-in-progress listing of geniuses, ordered chronologically by birth date (reaction inception), who were products of early parental death, i.e. early parental dereaction (analysis):

#	Person	IQ	RGM	Parents	Notes
1.	Aristotle (384-322 BC)	(IQ:195|#11)	[RGM:6|1,310+]	orphaned at tender age	
2.	Marcus Aurelius (121-180	(IQ:180|#122)	[RGM:103|1,260+]	F3	Stoicism

	AD)				
3.	Nicolaus Copernicus (1473-1543)	(IQ:185|#59)	[RGM:21|1,260+]	father age 10	
4.	Blaise Pascal (1623-1662)	(IQ:190|#51)	[RGM:44|1,250+]	mother age 3	
5.	Robert Boyle (1627-1691)	(IQ:185|#61)	[RGM:361|1,260+]	mother age 3	
6.	**Benedict Spinoza** (1632-1677)	(IQ:180|#90)	[RGM:361|1,260+]	M6	Atheism
7.	Robert Hooke (1635-1703)	(IQ:195|#20)	[RGM:161|1,260+]	father age 13	
8.	Isaac Newton (1642-1727)	(IQ:220|#2)	[RGM:2|1,260+]	father age 0	
9.	**Thomas Aikenhead** (1676-1697)			father and mother age 10	Atheism
10.	**Voltaire** (1694-1778)	(IQ:195|#18)	[RGM:33|1,250+]	mother age 7	Deism/Skepticism/Atheism
11.	David Hume (1711-1776)	(IQ:180|#106)	[RGM:111|1,250+]	father age 2	
12.	Jean Rousseau (1712-1778)	(IQ:175|#225)	[RGM:125|1,250+]	mother age 9 days	
13.	Adam Smith (1723-1790)	(IQ:170|#252)	[RGM:88|1,260+]	father age 0	
14.	Marquis Condorcet (1743-1794)	(IQ:180|#149)		father died shortly after his birth (O)	
15.	Joseph Jacquard (1752-1834)	(IQ:160|#392)		father age 10	
16.	Benjamin Thompson (1753-1814)			F2	
17.	Jacob Berzelius (1779-1848)	(IQ:180|#150)		F4; M9	
18.	Mary Shelley (1797-1851)	(IQ:175|#225		mother at 11 days	

19.	Charles Darwin (1809-1882)	(IQ:180|#162)	[RGM:13|1,260+]	mother age 8	
20.	**Karl Heinzen** (1809-1880)			M4	Atheism
19.	James Maxwell (1831-1879)	(IQ:210|#4)	[RGM:133|1,260+]	mother age 8	
21.	Willard Gibbs (1839-1903)	(IQ:210|#5)		mother age 16	
22.	**Friedrich Nietzsche** (1844-1900)	(IQ:190|#31)	[RGM:25|1,260+]	father age 5	Atheism
23.	Joseph Klein (1849-1918)			father age 1 or 2	
24.	Marie Curie (1867-1934)	(IQ:185|#76)	[RGM:12|1,260+]	mother age 10	(physics, 1903; chemistry, 1911)
25.	Fritz Haber (1868-1934)			mother age 3 weeks	(chemistry, 1919)
26.	**Bertrand Russell** (1872-1970)	(IQ:180|#103)	[RGM:113|1,260+]	mother age 2; father age 4	Atheism (literature, 1950)
27.	Arthur Eddington (1882-1944)			father age 2	[nominations: 6] (Q)
28.	Howard Lovecraft (1890-1937)		[RGM:379|1,290+]	father age 8	Atheism
29.	Linus Pauling (1901-1994)	(IQ:190|#29)	[RGM:176|1,260+]	father age 9	(chemistry, 1954; peace, 1962)
30.	**Jean-Paul Sartre** (1905-1980)	(IQ:165|#321)	[RGM:385|1,260+]	father age 2	Atheism
31.	John Bardeen (1908-1991)	(IQ:180|#127)		M12	(physics, 1956; physics, 1972)
32.	**Albert Camus** (1913-1960)	(IQ:155|#412)	[RGM:351|1,260+]	father age 1	Atheism (literature, 1957)
33.	**Libb Thims** (1972-) (222- AG)			M12	Atheism

Firstly, to note, three of the top five existentialism philosophers, namely: Nietzsche, Sartre, and Camus, were EPD

products.

Secondly, we note that three (Curie, Pauling, Bardeen) of the only four "dual" Nobel laureates (Sanger, Curie, Pauling, Bardeen), i.e. won the Nobel prize twice, from among 880+ laureate winners (Q) in total, are EPD products.

Thirdly, we note that the greatest atheists of the 17th century (Spinoza), 18th century (Voltaire), 19th century (Nietzsche), and the 20th century (Russell) are each EPD products.

Fourthly, we note that names of the biggest revolutions, namely: Copernican revolution, Newtonian revolution, Darwinian revolution, and Maxwellian revolution, are each the results of EPD products.

EPD genius battles

Of curiosity, among early parent death (EPD) geniuses, are the battles, between Newton and Hooke in the 17th century and Hume and Rousseau in the 18th century.

Mother | Father death

One study indicated that one-third of creative geniuses had lost their father early in life. (Q)

The 1981 IQ study by American learning and education scholar Herbert Walberg, et al, inclusive of a research team involving 76 scholars, found that "poets, novelists, and dramatists" tend to have an absence of father commonality, whereas scientists tend to have an absence of mother commonality. [10]

A 2019 photo during the monumental meeting of Mirza Beg (EPD:F11) and Libb Thims (EPD:M12), in Karachi, Pakistan, the two main existive human chemical thermodynamics pioneers, at the start (15 Sep) of their 5-day interview session, only to find out that they are both **EPD-products**.

Overview

One study of 699 eminent figures showed that 45% had lost a parent before age 21. A quarter of eminent mathematicians had lost a parent before age ten. Another study of British Prime Ministers found that 63% had lost a parent, a number much higher than a comparable control group of English peers. (Q)

American science and medicine historian William Woodward's 1974 article "Scientific Genius and Loss of a Parent" cites Anne Roe, in her 1952 book *The Making of a Scientist*, as being the first to cite the environmental factor of the death of a parent during the childhood of a scientist to one of most salient non-genetic or non-family relatedness factors behind the making of scientific genius. [3] Roe comments specifically: [4]

> "One of the first things that stands out is the frequency with which these subjects report the death (reaction end) of a parent during their childhood."

American genius and creativity theory psychologist Dean Simonton, from his 1991 chapter "When Giftedness Becomes Genius: How Does Talent Achieve Eminence?", summarizes the phenomenon as follows:

> "For both creators and leaders, the percentage of geniuses who lost one or both parents before reaching early adulthood is appreciably larger than what appears to hold in the general population or any other comparable group."

Simonton buttresses this statement by citing Walberg, Rasher, and Parkerson (1980); Berrington (1974); Silverman (1974); and Martindale (1972), which, he seems to indicate, are just a few examples. [2]

Scientific revolutions

A large percentage of the leaders of scientific revolutions have been the product of an early parental death childhood; namely: Copernican revolution (Nicolaus Copernicus, father age 10), Newtonian revolution (Isaac Newton, father age 0), Darwinian revolution (Charles Darwin, mother age 8), Maxwellian revolution (James Maxwell, mother age 8), Goethean revolution (Goethe, blue baby; Libb Thims, mother age 12), to name a few.

Dual Nobel Prize winners

Among individual to have one two Nobel Prizes, as depicted adjacent, namely Marie Curie, Linus Pauling, John Bardeen, and Frederick Sanger, 3 out of 4 have been the product of an early parental death childhood.

Marie Curie	Mother and sister died before she was 11
Linus Pauling	Father died when he was 9
John Bardeen	Mother died when he was 12
Frederick Sanger	No Early Parental Death [EPD]

LAUREATE:	NOBEL PRIZES:	CREDENTIALS:
Marie Curie [1867-1934]	Physics [1903]: Discovery of Radioactivity Chemistry [1911]: Isolation of Pure Radium	Ph.D. Physics & Radiochemistry
Linus Pauling [1901-1994]	Chemistry [1954]: Hybridized Orbital Theory Peace [1962]: Nuclear Test-Ban Treaty Activism	B.S. Chemical Engineering Ph.D. Physical Chemistry
John Bardeen [1908-1991]	Physics [1956]: Invention of Transistor Physics [1972]: Theory of Superconductivity	Grade-switched: 3rd to 7th B.S. Electrical Engineering M.S. Electrical Engineering Ph.D. Mathematical Physics
Frederick Sanger [1918-]	Chemistry [1958]: Structure of the Insulin Molecule Chemistry [1980]: Virus Nucleotide Sequencing	B.S. Natural Sciences Ph.D. Biochemistry

The Dual-Laureate Similarities section from American electrochemical engineer Libb Thims' 2005 IoHT profile page, where he lists Nicolaus Copernicus, Isaac Newton, Charles Darwin, James Maxwell, Willard Gibbs, Friedrich Nietzsche, Edger Allan Poe, Lucille Ball, James Dean, JFK, Marilyn Monroe, Madonna, and Julia Roberts, as examples. [7]

Discussion

American genius and creativity theory psychologist Dean Simonton argues, in his 1999 *Origins of Genius: Darwinian Perspectives on Creativity*, that parents who are more intelligent tend to delay reproduction until later in their existence, after their professional careers are established, stating that data shows that parents of eminent personalities were older than is the norm when their illustrious progeny were born—he gives the example of Darwin's mother being in her 50s when she ended—and argues that heightened education level in correlation with heightened age of the parent may be the explanation for the anomaly over that of traumatic experiences, meaning that geniuses' parents were older, older people have a higher death rate, and that this explains the anomaly. [5]

This argument, however, does not seem to align with way in which elite geniuses view their situation and the great intensity and voracity about which they conduct their remaining days. German philosopher Friedrich Nietzsche, founder of what might be called the atheism revolution, whose father (age 36) ended when he was five, would go on to hold to a philosophy centered around the the idea of "life-affirmation", involving an honest questioning of all doctrines that drain life's expansive energies, however socially prevalent those views might be. [8] In this sense, early parental death would seem to trigger a sort of non-status quo, culturally-unbounded, orthodox-questioning energy release reaction phenomenon, whereby those activities which drain creativity and progress toward solution are strictly avoided.

Likewise, Scottish physicist James Maxwell, one of the most intellectually deep and prolific of scientific geniuses, all through his days was acutely aware of his end, as exemplified by the fact that he penned his rare inner in his last and dying poem, "A Paradoxical Ode" (1878), written in his final year as he was in the final stages of stomach cancer, as he went into his 48th year, the same age his mother died previously from the same disease.

Terminology

Of note, in regards to terminology (see: life terminology upgrades) a person is a molecule (technically a powered animate chemical) and, technically speaking (see:

defunct theory of life), and molecules cannot "die" but only be formed (de-formed) or synthesized (or de-synthesized); hence, it is more scientifically accurate to speak of "end" or "termination" of a parent as compared to the defunct term "death" of a parent; a comparative example being someone speaking about the death of the water molecule H_2O in a water sodium reaction. For the sake of Internet search functionability, however, in this article, the older religio-mythology term "death" will be retained in the title, over that of either the politically-neutral term "loss", which implies that something has been lost (which is a blurry conception), or the scientifically-correct terms "termination" or "end", but which are less palatable.

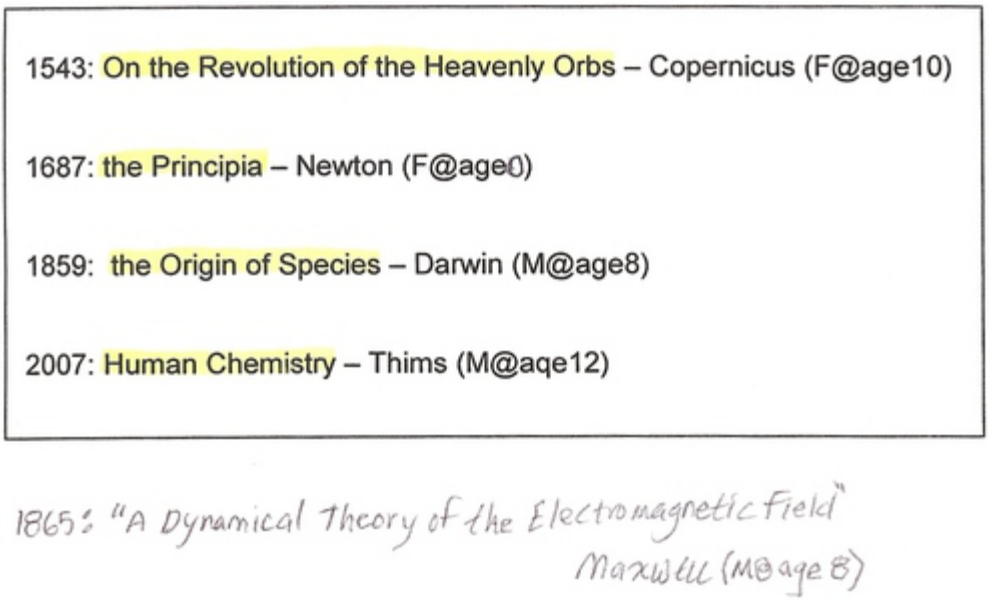

A noted selection of **early parental death geniuses**: the top three of which, Copernicus (Copernican revolution), Newton (Newtonian revolution), and Darwin (Darwinian revolution), each peculiarly being initiators of large scientific revolutions; image being a scan (24 Sep 2007) from page of American electrochemical engineer Libb Thims' personal copy of his newly published *Human Chemistry*, showing the age at which the mother or father died for each: Nicolaus Copernicus (father age 10); Isaac Newton (father age 0), Charles Darwin (mother age 8), and James Maxwell (mother age 12); a phenomena Thims has been curious about and keeping track of since the mid 1990s, since the phenomena is one common to himself, being that his mother analyzed (died) when he was age 12. [6]

Other

A partial list of scientists, philosophers, and psychologists, common to the phenomenon of early parental death, of related note, is given in Dean Simonton's 2002 book *Great Psychologists and Their Times*. [9]

Quotes | On

The following are quotes on Rumford:

"**Rumford** has informed us himself that he should probably have remained in the modest condition of his ancestors if the little fortune which they had to leave him had not been lost during his infancy. Thus, **like many other men of genius**, a misfortune in early life was the cause of his subsequent reputation. His **father died young** [age 2]. A second husband removed him from the care of his mother, and his grandfather, from whom he had everything to expect, had given all he possessed to a younger son, leaving his grandson almost penniless. Nothing could be more likely than such a destitute condition to induce a premature display of talent."
— Georges Cuvier (c.1815), *Publication* (pg. 9)

See also

- Founders of thermodynamics and suicide

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Further reading

● Eisenstadt, Marvin J. (1978). “Parental Loss and Genius”, *American Psychologist*, 33:21.
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θΔics

In science, the **Earth** is the third planet rotating about the sun, intermediate between the orbits of Venus and Mars. [1] The solar flux of energy received by the earth at its surface is 1370 watts per meters squared.

Thermodynamics

The Earth, according to the science of environmental physics, is defined as a thermodynamic entity: [2]

> "At the macroscopic level the **Earth** is a thermodynamic entity. Life is sustained on it because of the temperature gradient maintained by the net energy balance between the energy that comes from the Sun and the energy that leaves the Earth. At the microscopic level, i.e. the level of the individual person or animal, living organisms are also thermodynamic structures exhibiting energy exchanges between themselves and the environment."

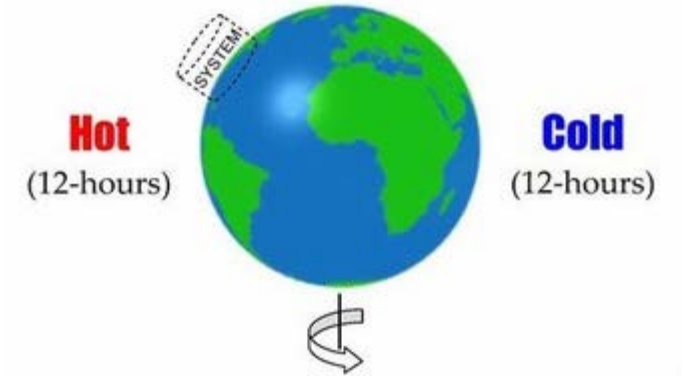

A circa 2010 Carnot cycle model (thermodynamic system) view of the surface section of the **earth**.

A surface section of earth is defined as an earth-bound thermodynamic system.

Solar chemistry

In human chemistry, the earth is defined as an "earth molecule", i.e. a large 92-element molecule. [3] In this view, animate atomic structures, such as "human molecules", are attached to the surface of the earth; in same manner as "bacteria molecules" are attached to the surface of humans; in the same manner that lipopolysaccharides, i.e. large endotoxin-type molecules, are attached to the outer surface of gram-negative bacteria.

Thermodynamic system models

See main: System, Thermodynamic system, Biological system, Social system, Economic system, etc.

There are a number of various ways to study the earth from the perspective of thermodynamic analysis, some more intuitive, others less so, depending upon where the boundary is drawn and what time periods or cycles (heat inputs, heat outputs) are studied. A few of these diagrammatic attempts are shown below:

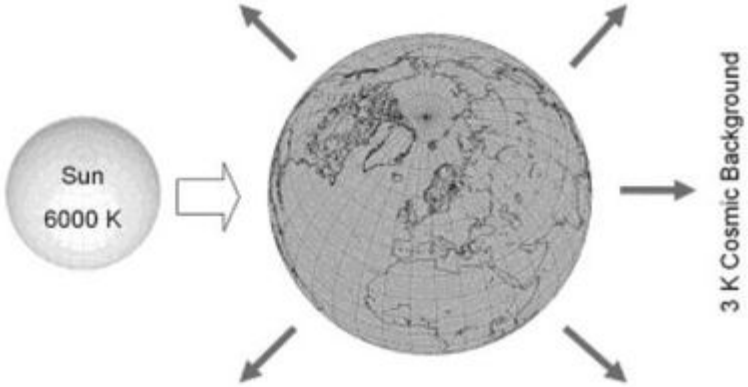

The original 1982 schematic of the earth or earth surface section acting as a **photon mill**, by German physical evolutionists Werner Ebeling and Rainer Feistel, depicting the estimation of the terrestrial entropy export, about which the earth is described as existing at mean surface temperature of about 300 K, located amid a radiative thermal gradient of 6000 K (the hot sun) and 3 K (the cold cosmic

background), through which the flow of photons (similar to the flow of water in a water mill), operate, as they describe in 2011, as such: "entropy production necessarily accompanies the multiple self-organization phenomena and sustained dissipative structures observed in our natural environment." [7]

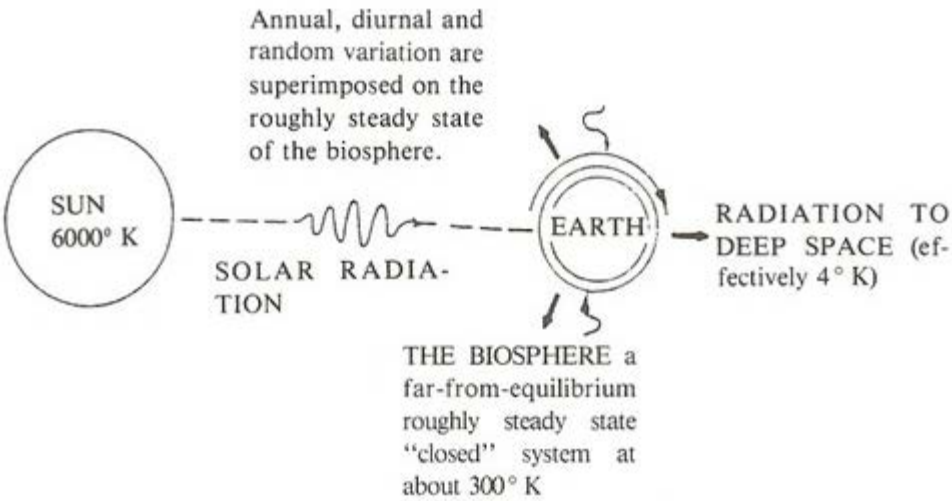

The 1985 sun-earth model by American physical organic chemist George Scott. [6]

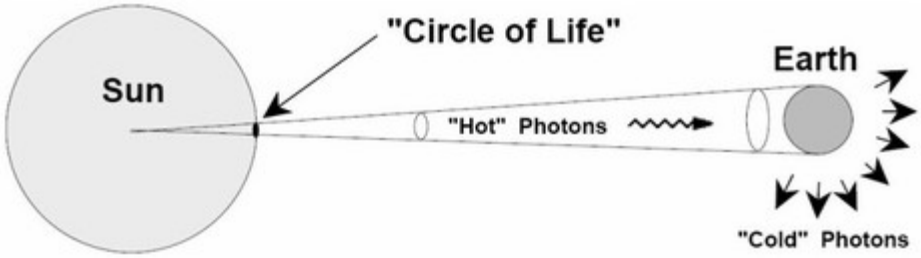

A 1992 thermodynamic view of the earth diagram made by Canadian biophysicist Marek Roland-Mieszkowski used to explain life in relation to entropy and energy. [4]

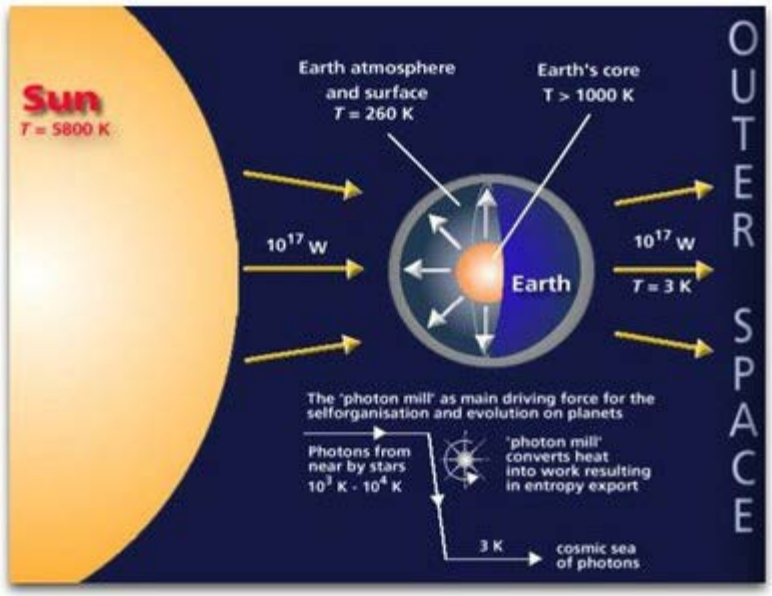

A circa 1999 rendition of a **photon mill** from Peter Strazewski's talk "A Pleading for Chemistry", based on the 1994 version by Werner Ebeling and Rainer Feistel, which describes a photon

mill as being the main driving force for the self-organization and evolution on planets. [9]

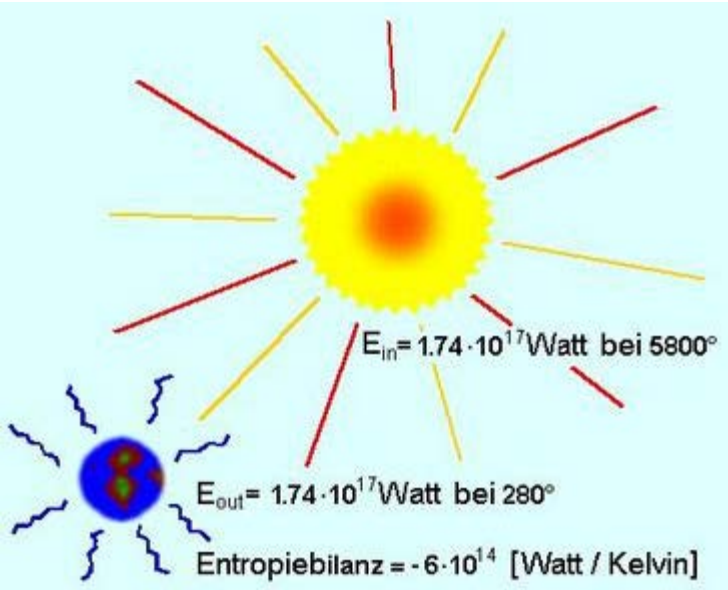

A 2004 online German animated gif version of a **"Photonenmühle"**, described as such: “the mill supplies the earth with photons or physical negative entropy and provides information for life processes”, or something along these lines. [10]

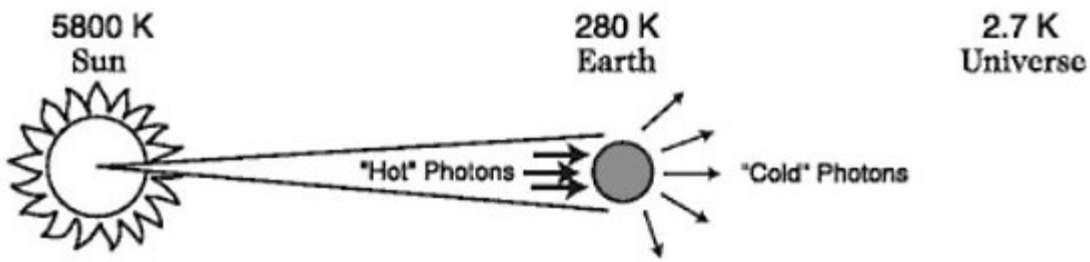

A modified 2005 version of Roland's sun earth system diagram Hawking temperature of outer space by American ecologist Eric Schneider and science writer Dorion Sagan. [5]

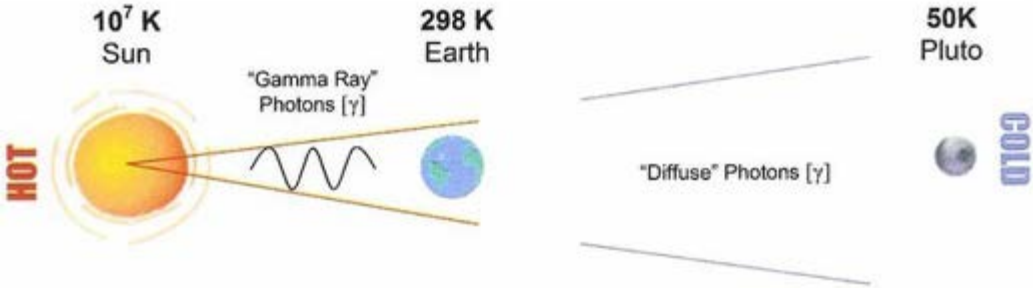

A 2005-2008 temperature difference view of the earth made by American chemical engineer Libb Thims, based on Schneider-Sagan version, with the "hot photon" and "cold photon" labels removed, as these were found to be objectionable terminologies by many. [3]

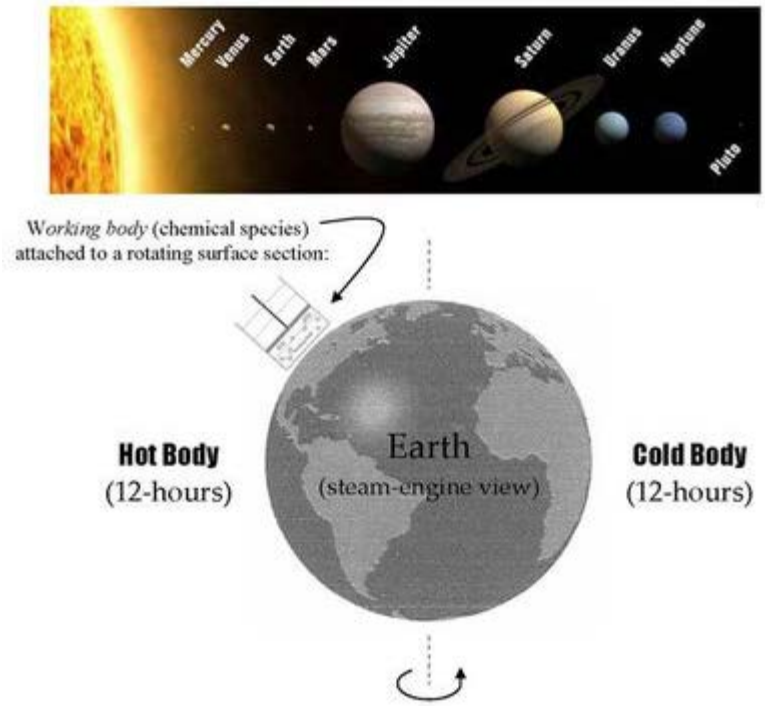

A 2007 Carnot cycle depiction of a given earth surface section, from American electrochemical engineer Libb Thims's *Human Chemistry*; an upgrade, so to speak, to the 1982 **photon mill** concept, taking into account (a) the rotative nature of the earth, and (b) the volume expansion and volume contraction aspects of each surface-attached system. [8]

(add discussion)

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10. Photon Mill (German → English) – Ernst-team.de.

θΔics

In science, **earth molecule** is the definition of the planet Earth from a chemical perspective, a view in which all motile structures are characterized as "molecules" defined by their atomic structure, formula, dynamics, and reactions with other like-sized structures. [1]

Earth molecule

$O_{E50}Fe_{E49}Si_{E49}Mg_{E49}S_{E48}Al_{E48}Ni_{E48}Ca_{E48}Cr_{E47}Na_{E46}K_{E46}H_{E46}Ti_{E46}F_{E45}$
$C_{E45}P_{E45}Mn_{E44}Sr_{E44}Ba_{E44}Cl_{E44}V_{E44}Li_{E44}Zr_{E43}Rb_{E43}Zn_{E44}Cu_{E43}N_{E43}B_{E43}$
$Ce_{E43}Co_{E43}Sc_{E43}Nd_{E43}Ga_{E43}Be_{E43}La_{E42}Nb_{E42}Pb_{E42}Pr_{E42}Sm_{E42}Th_{E42}$
$Gd_{E42}Dy_{E42}Y_{E42}Ge_{E42}Ar_{E42}Er_{E41}Cs_{E41}Ur_{E41}Hf_{E41}Yb_{E41}Sn_{E41}Eu_{E41}Ta_{E41}$
$As_{E41}Mo_{E41}Ho_{E41}W_{E41}Tb_{E41}Br_{E41}Tl_{E40}Lu_{E40}Tm_{E40}He_{E40}Sb_{E40}I_{E40}Cd_{E40}$
$In_{E40}Ag_{E40}Se_{E40}Hg_{E39}Bi_{E39}Te_{E39}Ru_{E38}Pd_{E38}Au_{E38}Pt_{E38}Ne_{E38}Re_{E38}Rh_{E37}$
$Os_{E37}Kr_{E36}Ir_{E35}Xe_{E35}Ra_{E35}Pa_{E32}Ac_{E30}At_{E30}Po_{E30}Rn_{E28}Tc_{E23}Pm_{E23}Fr_{E23}$

The general molecular formula for the earth, aka the "**earth molecule**" from the atomic/chemical point of view of "things".

Overview

In 2005, American chemical engineer Libb Thims calculated the following approximate molecular formula for the earth: [2]

$$O_{E50}Fe_{E49}Si_{E49}Mg_{E49}S_{E48}Al_{E48}Ni_{E48}Ca_{E48}Cr_{E47}Na_{E46}K_{E46}H_{E46}Ti_{E46}F_{E45}$$
$$C_{E45}P_{E45}Mn_{E44}Sr_{E44}Ba_{E44}Cl_{E44}V_{E44}Li_{E44}Zr_{E43}Rb_{E43}Zn_{E44}Cu_{E43}N_{E43}B_{E43}$$
$$Ce_{E43}Co_{E43}Sc_{E43}Nd_{E43}Ga_{E43}Be_{E43}La_{E42}Nb_{E42}Pb_{E42}Pr_{E42}Sm_{E42}Th_{E42}$$
$$Gd_{E42}Dy_{E42}Y_{E42}Ge_{E42}Ar_{E42}Er_{E41}Cs_{E41}Ur_{E41}Hf_{E41}Yb_{E41}Sn_{E41}Eu_{E41}Ta_{E41}$$
$$As_{E41}Mo_{E41}Ho_{E41}W_{E41}Tb_{E41}Br_{E41}Tl_{E40}Lu_{E40}Tm_{E40}He_{E40}Sb_{E40}I_{E40}Cd_{E40}$$
$$In_{E40}Ag_{E40}Se_{E40}Hg_{E39}Bi_{E39}Te_{E39}Ru_{E38}Pd_{E38}Au_{E38}Pt_{E38}Ne_{E38}Re_{E38}Rh_{E37}$$
$$Os_{E37}Kr_{E36}Ir_{E35}Xe_{E35}Ra_{E35}Pa_{E32}Ac_{E30}At_{E30}Po_{E30}Rn_{E28}Tc_{E23}Pm_{E23}Fr_{E23}$$

The "molecular" view of the earth shows, according to the mass composition of the 92 naturally-occurring elements in the structure of the earth, that the earth can be viewed as a type of reactive molecule, active in the solar system, attached to the sun via a type of yet undefined chemical-gravitation, composed primarily of the elements oxygen O, iron Fe, silicon Si, and magnesium Mg, among other elements in decreasing percentages.

See also

â— Sun molecule
â— Human molecule
â— Bacterial molecule
â— Walking molecule
â— Molecular evolution table

References

1. Thims, Libb. (2008). *The Human Molecule* (ch. 8: Modern Views, section: “Planetary-sized molecules”, pgs. 57-59) (preview). Morrisville, NC: LuLu.
2. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pgs. 20-21) (preview), (Google books). Morrisville, NC: LuLu.

External links

â— Earth molecule – IoHT Glossary.

θΔics

In science, **earth-bound** refers to processes or reactions that occur on or near the surface of the earth and under standard natural conditions, i.e. standard temperature and pressure (STP), can be approximated as being described as being a constant temperature (isothermal) constant pressure (isobaric process). [1]

Overview

In 1923, American physical chemist Gilbert Lewis described earth-bound reactions as such:

> "**Earth-bound** reactions are the more common cases of reactions which run freely, like the combustion of fuel, or the action of an acid upon a metal. Here we consider [isothermal] systems subject to no external forces except a constant pressure exerted by the atmosphere."

The no external forces criterion given by Lewis refers to systems coupled in some way to an external conjugate force factor, the prime example being those systems harnessed for the production of useful work, e.g. a galvanic cell reaction in a battery, the electrodes of which being connected to an external mechanical motor or other electrical system.

Lewis, to note, did not actually used the term 'earth-bound' but rather used the term 'isothermal constant pressure'. In modern parlance, the former, more intuitive term (earth-bound), is assumed equivalent to the latter, more cumbersome term (isothermal constant pressure). The term 'earth-bound' derives from the fact that reactions and processes that occur on the surface of the earth, e.g. people walking in a park, reactions in a beaker, etc., occur at constant pressure and temperature, which are reaction "conditions" that yield the the Lewis equality (dG = 0) condition for equilibrium, one of the eight standard types of conditions of the varieties of possible equilibrium states processes: [2]

Conditions	Name	Criterion for Equilibrium
Constant volume	Isochoric	dE – TdS = 0
Constant pressure	Isobaric	dH – TdS = 0
Constant temperature	Isothermal	d(E – TS) + PdV = 0
Constant entropy	Isentropic	dE + PdV = 0
Constant volume and entropy	Isochoric-isentropic	dE = 0
Constant pressure and entropy	Isobaric-isentropic	dH = 0
Constant volume and pressure	Isochoric-isobaric	d(E – TS) = 0
Constant pressure and temperature	Isobaric-isothermal (earth-bound)	d(E + PV – TS) = 0 d(H – TS) = 0 dG = 0

In sum, the term 'earth-bound' is short for 'constant temperature (isothermal) constant pressure (isobaric process)', which is a rather unwieldy term. In earth-bound processes and reactions, the Lewis inequality:

$$\Delta G < 0$$

becomes the criterion for spontaneity and the 'naturalness' of processes.

Notes

A few conditional factors should be studied or noted in more advanced analysis. Firstly, as has traditionally been the case, for earth-bound processes 'inside' of an animated entity, such as a bacteria or human, this criterion almost always holds, on the logic that body temperature is almost always maintained as uniform, 98°F for a human, and pressure is generally assumed to be that of the atmosphere. For earth-bound processes occurring 'between' animated entities, such as reactions between people, such as in love or war, this criterion can be approximated to hold, on the basis that atmospheric pressure is generally constant (1atm), implying that:

$$dP = 0$$

and temperature generally fluctuates ±10° F on any given day, which can be approximated to imply that:

$$dT = 0$$

These are the simplifications used in basic calculations. In more advanced calculations, wherein one is looking to quantify more subtle aspects of temperature and pressure, however, one would need to investigate what effects daily or hourly fluctuations in temperature and pressure would have in the calculations under study. An example might be how the differences in summer temperatures as compared to winter temperatures, affect free energy calculations, as well as how a daily variation in temperature would affect calculations. Beyond this, in very advanced calculations, one would need to investigate how such things as 'social pressure' or 'sexual temperature' play into the calculation.

See also

â— Earth-bound thermodynamic system

References

1. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pg. 160). McGraw-Hill Book Co., Inc.
2. Rossini, Frederick D. (1950). *Chemical Thermodynamics* (pg. 123). John Wiley & Sons, Inc.

External links

â— Standard conditions for temperature and pressure (STP) – Wikipedia.

θΔics

In thermodynamics, **earth-bound system** model is a heat engine view of any volumetric region near or on the surface of the earth, which being subjected to diurnal rotation (day and night), operate as idealized Carnot cycles. [1] The two views, i.e. Earth engine model vs. Carnot engine model, are contrasted adjacent. In general, in human systems, social systems, economic systems, ecosystems, etc., the determination and diagramming of the boundary of the thermodynamic system becomes a paramount issue.

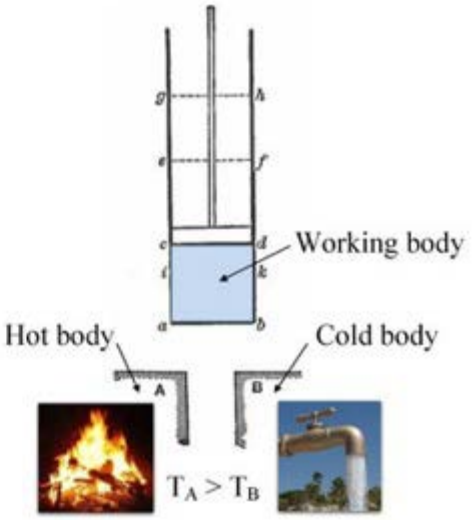

Left: diagram of a volumetric region of a system section of earth, delineated via an arbitrary dotted line boundary, acting as a Carnot engine working body or "thermodynamic system". Right: the "hot body", "working body", and "cold body" of the original 1824 Carnot engine as defined via the Carnot cycle.

Basic model

The basic model delineates a cylinder type (piston and cylinder) imaginary volumetric region on the surface (substrate) of the earth, viewed such, while remaining in contact with the surface of the earth, it rotates in a 24-hour, two-part heat cycle, being put in contact with a hot body (the sun) for approximately 12-hours, wherein heat (or entropy, TdS_{in}) enters the body in the expansion phase, and then put in contact with a cold body (the night sky) for approximately 12-hours, wherein heat (or entropy, TdS_{out}) leaves the body in the contraction phase, whereby after the "state" or atomic and molecular arrangement of the body, if it is considered to be reversible, returns to its original condition.

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1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (ch. 3: Carnot cycle, pgs. 37-71), (preview), (Google books). Morrisville, NC: LuLu.
2. Thims, Libb. (2008). "On the Mechanical Equivalent of Heat and Occupation", *Journal of Human Thermodynamics*, Vol. 3, Issue 1. pgs. 1-7, April.

θΔics

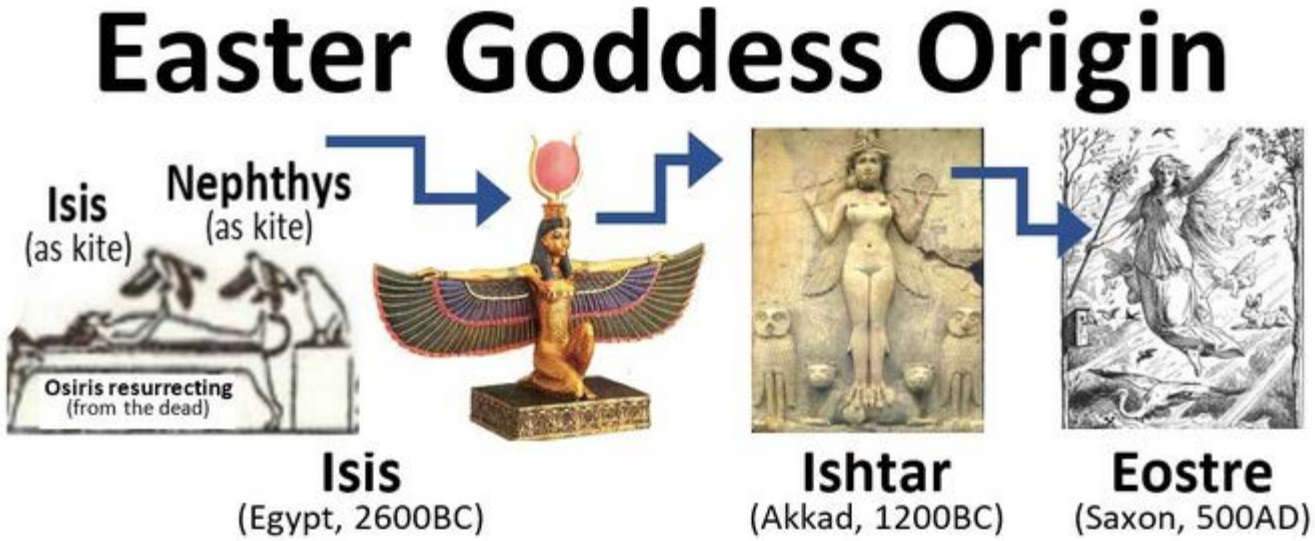

The day or month of **Easter**, aka 'Eostur-month', as it was called by the Anglo-Saxons (500AD) or month of Phamenot by the Egyptians (2800BC), is a celebratory act of the day in which Osiris, amid his brief resurrection from the dead, during the so-called black rite, "gave fecundity to Isis" (Kendrenos, 1050AD), therein seeding the child Horus. As this religious model passed into neighboring cultures, over time (see: god character rescripts), Isis became Ishtar, in Akkadian mythology (1200BC), who became Eostre, in Anglo-Saxon mythology, and hence the "Easter" festival in modern times, amid which, in Roman mythology, Osiris-Horus became Jesus.

In religio-mythology, **Easter**, from the Germanic spring goddess "Eostre" (aka "Ostara") (Bede, 725) (Ñº) or Saxon April goddess Easter (Chambers, 1728), both a cultural migration rescript of "Ishtar" (1600BC), which the Akkadian goddess rescript of Isis (aka "Sirius") (2500BC), the Old Testament equivalent of "Sarah", and is the name of the holiday symbolic of the spring celebration of the mass of "Christ's resurrection", originally Osiris as Christ (2800BC), then Osiris-Ra as Christ (1500BC), and eventually, following the Roman recension, Jesus, as an Osiris-Horus god man syncretism, as Christ, an event astro-theologically occurring, on a Sunday closest to the full moon of the fourth month of the year, nearest the vernal equinox.

Sirius | Isis | Ishtar | Eostre

The name "Easter", in a modern cultural sense, a term not found in the Bible, is symbolic of the period of the resurrection of Jesus, raised from the dead, with the help of two "Maries", Mary Magdalene and "another Mary" (aka Virgin Mary), who visit his tomb and climb "up onto" the sepulcher before he rises from the dead. How this "day" came to be called "Easter", occurred, over time, via a cultural religion migration transmission, involving a certain amount of yet clarified etymological complexity.

In the original version (2,500BC) of the myth, as told in Egypt, based on astro-theology, it was Osiris who rises from the dead with the help of the two Mert goddesses, Isis, representative of the star Sirius (aka Stella Maris) and Nephthys, who "fly over" his mummified body, as pictured (above, left), in the form of kites or birds, and use the spiritual power of wing flapping, along with the time stopping power of Thoth, in the "black rite", to raise him from the dead, let him get and erection, and impregnate the Isis, incarnate as a bird.

Over time, this motif was transferred to the Akkadians (1200BC), wherein, in Akkadian mythology, Isis was rescripted (see: god character rescripts) into the goddess Ishtar.

In 200AD, this Isis/Ishtar motif was carried by migrants into the north, into Nordic mythology, Ishtar was rescripted into the spring goddess Eostre (aka "Ostara"), and hence into the name of the spring holiday Easter; the following are synopsis quotes of this etymology:

> "The Angelo-Saxons called the fourth month 'Eosturmonath' [Eostur month], which is now translated 'Paschal month', and

which was once called after a goddess of theirs named Eostre, in whose honour feasts were celebrated in that month. Now they designate that Paschal season by her name, calling the joys of the new rite by the time-honored name of the old observance."

EASTER, a Feast of the Church, held in Memory of our Saviour's Resurrection. See FEAST, &c.

The *Latins*, &c. call it *Pascha*, A *Hebrew* Word, signifying *Passage*; applied to the Feast of the *Passover*, which is held among the *Jews*, much about the same Time. See PASSOVER.

In *English* it is called *Easter*, from the *Saxon* Ɛarrep, a Goddess, worship'd with peculiar Ceremony in the Month of *April*.

The article (Nº) on **Easter**, from the 2-volume 1728 English non-controversial *Cyclopaedia*, by Ephraim Chambers, stating that the term Easter comes from the "Saxon goddess Ɛarrep worshiped with peculiar ceremony in the month of April". [9]

— Bede (725), *The Reckoning of Time* [2]

"The English name Easter, and the German Ostern, are derived from the name of the Teutonic goddess Ostera (Anglo-Saxon *Eostre*), whose festival was celebrated by the ancient Saxons with peculiar solemnities in the month of April; and for which the first Roman missionaries substituted the paschal feast."

— George Tylor (1858), *Encyclopedia of Religious Knowledge* [5]

"**Ishtar was one of the most prominent of the deities of the Acadian and Assyrian pantheon**. She was the Assyrian goddess of love. She was the עשתרת, Ashtoreth of the Jews or Hebrews. She is the planetary Venus, and in general features corresponds with the classical goddess of love. Her name Ishtar is that by which she was known in Assyria, and the same name prevailed, with slight modifications, among the Semite nations generally. In Babylonia the goddess was known as Nana, which seems to be the Nanaea of the second book of Maccabees (2 Mac 1:13-15), and the Nani of the modern Syrians. She was the goddess of the moon, or moon-faced goddess. The crescent was supposed to have adorned her crown or diadem, hence she was called the moon-faced goddess' or the 'goddess with the horned face. She may be identified with Eostre of the Germans or Easter. **To this goddess our Saxon or German ancestors sacrificed in April, which was therefore by them styled 'Eostur-month', and from these arose our word Easter**, which the Saxons retained after their conversion to Christianity, so that our Easter day is nothing more nor less than Ishtar's day."

— Leonidas Hamilton (1888), *Ishtar and Izdubar* [5]

"The English word 'Easter' is distinctly derived from the Anglo-Saxon goddess of spring, Ostara; in the Saxon language, the month of April had the name Oestur-month."

— Karel Hujer (1946), "The Astronomical Significance of Easter" [6]

"This book is intended to fulfil a number of roles: a brief introduction to philological methods for historians, a (necessarily partial) analysis of the nature of pre-Christian religious life in Anglo-Saxon England, but also a rescue. Not only does it seek to rescue a pair of goddesses in distress, Eostre and Hreda, from being considered to be 'an etymological fancy' (Page, 1992) and relegated to a series of notes on the unlikelihood of their existence — it also seeks to rescue the Venerable Bede himself from the charge of having invented these pre-Christian deities."

— Philip Shaw (2011), *Pagan Goddess in the Early Germanic World: Eostre, Hreda and the Cult of Matrons* [3]

In 595AD, Pope Gregory sent a mission of 40 monks to England with instructions to convert the pagan inhabitants to Christianity, but in such a way to allow the outward forms of the old festivals to remain intact, but to superimpose Christian ceremonies and philosophy on them. [4] In this period, the then extant Anglo-Saxon "Eostre month" was merged with the then extant Roman April celebration of the resurrection of "Jesus", as it was known then, to become what we now refer to as "Easter".

In 1583 to 1664, of note, theologians had been keeping track (Ñº) of which day "Easter day" was being celebrated throughout the world, e.g. in Roman, England, France, Holland, New Zealand, Africa, and Asia, but were perplexed at how it fell on different days scattered throughout April, depending on country.

Astro-theology

In day of Easter, occurring on 21 Apr 2019, presently, or 25 Mar 19AD, two millinnea ago, falls on the date when the number of hours of sunlight begins to overtake the number of hours of night:

> "It is evident that the celebration of this resurrection is symbolic of the return of spring, conditioned by the position of the sun exactly as it crosses the celestial equator, which is on March 21; 2000 years ago, this apparently occurred on March 25."
>
> — Karel Hujer (1946), "The Astronomical Significance of Easter" [6]

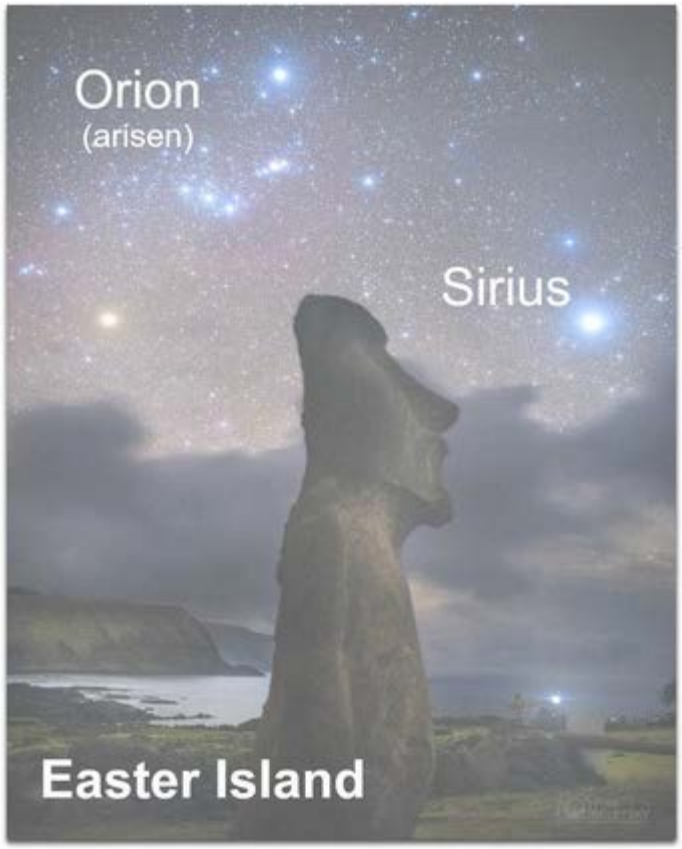

A photo of Orion "rising" followed by the star Sirius above Easter Island; though the exact astro-theological meaning of this, in its original Egyptian format is not precisely known, it is known that the god Osiris, representative of the Orion and the moon, and Isis, representative of the star Sirius and the moon, are the two key original gods behind the **Easter** holiday.

In Egyptian terms, this month of March, or "Phamenot" as they called it, was the month in which Osiris rose from the dead, during a ritual act called the "black rite", and gave his seed to the goddess Isis:

> "The first day of the first month is the first of the month Nisan; it corresponds to the **25th of March** of the Romans, and the Phamenot of the Egyptians. On that day Gabriel saluted Mary in order to make her conceive the savior. I observe that it **is the same month Phamenot, that Osiris gave fecundity to Isis**, according to Egyptian theology. On the very same day, our god savior — Christ, Jesus, after the termination of his career, arose from the dead; that is what our forefathers called Passover, or the passage of the Lord."
>
> — George Kendrenos (c.1050), *A Concise History of the World*; cited by Charles Dupuis [6]

As Osiris was associated with the moon (and the Orion constellation), Isis with the star Sirius, and Horus or Ra (as Osiris-Ra) with the sun, Geb, the father of the former, in the form of a goose who laid eggs, with the earth, there would seem to be an astro-theological significance of Easter or Phamenot occurring on the full moon of the vernal equinox when the sun crosses the celestial equator? Opinions on this, given the state of knowledge concerning Egyptian astro-theology, are undecided and vary; to cite one example:

> "We have either Temples of Osiris pointing to the sunset at equinox or Temples of Isis pointing to the

sunrise at equinox, but in either case in relation to the pyramids."

— Norman Lockyer (1894), *Dawn of Astronomy* (pg. 143) [6]

This description, supposedly, is based on the investigations of Jean Biot (c.1823) (Ñº) and Egyptian astronomy (Ñº) associated with the Ramesseum.

Full moon

Why does the celebration of the resurrection of Jesus from the dead have to occur on or near a full moon and on a Sunday? The celebration of resurrection on the day of the "sun", aka Sunday, according to Dan Brown (2003), was the result of emperor Constantine (272-337), who wanted to align the celebration with the then extant sun worship cult of Sol Invictus, or the Invincible Sun. Debate about which Sunday to use in respect to the "full moon" and the vernal equinox, began to erupt (Ñº) , supposedly, in the period 190 to 350AD.

The need to have the holiday of Easter on or near a full moon, however, can be explained with respect to the original myth. Specifically, in the original story of the resurrection of Osiris, the Egyptian moon god Thoth has to magically "stop time", during the ceremony of the black rite, in order for Isis, in the form of a kite, resurrect Osiris from the dead. In the Roman recension rescript of this story, a "full moon" has to be present when Jesus is resurrected. The same moon + sun motif, of note, can be seen the story when Horus was brought back to life by Isis, Thoth (moon), and Ra (sun), after being stung by a scorpion (see: Joshua 10:13).

Eggs

In Heliopolis, in the so-called Heliopolis creation myth (3100BC), the sun god Atum or Atum-Ra is created first, who then creates Shu (air) and Tefnut (moisture), who in turn create Geb (earth) and Nut (sky). Geb, aka the

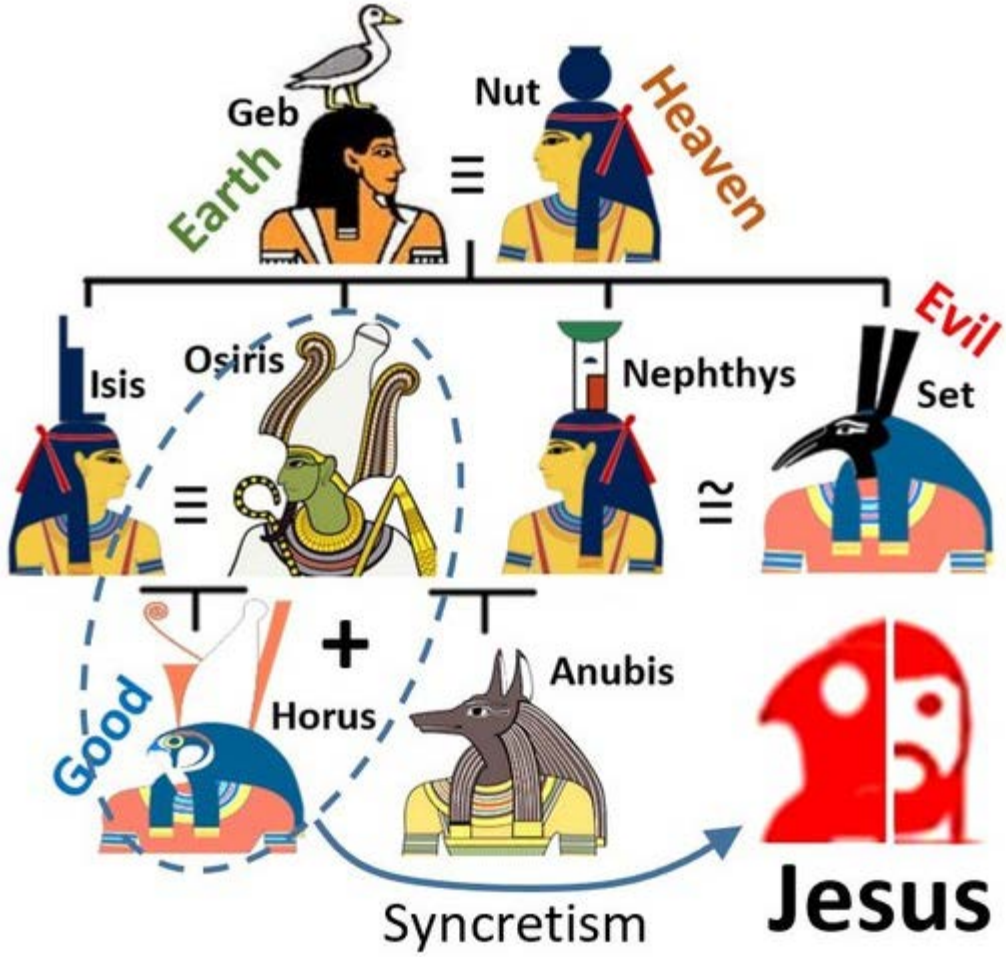

"Great Cackler", in characteristics, is frequently depicted as a goose or a man with a goose on his head. The name of Geb, in hieroglyphics, is shown with an goose: (goose + god symbol), egg: (egg + god symbol), or star , (astro-theology + god symbol). The following speaks about how the deceased, prior to his resurrection as a "person Osiris", e.g. "Osiris Ani", i.e. Ani resurrected as Osiris in the afterlife, must have a spell recited over their mummified body, stating that they guarded the sacred egg of Geb and that if the egg grows, so to will the deceased in the afterlife:

The gist of Heliopolis creation myth, according to which the **egg**-laying pair Geb and Nut father the dying and rising god Osiris, who rises from the dead in the ancient Egyptian vernal equinox month of Phamenot, which becomes 'Eostur-month' in Anglo-Saxon (500AD) times, and hence later Easter day (c.1500) celebration.

> "Oh Atum, give me the sweet breath which is in your nostril, for I am **this 'egg'** which is in the Great Cackler [Geb], I am the guardian of this great being [Shu] who separates the earth from the sky. If I live, she will live; I grow young, I live, I breath the air. I am he who splits iron, I go around the egg, tomorrow is min though the striking power of Horus and the strength of Seth."
>
> — Ani scribe (1250), *Egyptian Book of the Dead* (§:54: Chapter for giving breath to Ani in the god's domain) (pg. 65)

> "I have guarded **this egg** of the Great Cackler [Geb]. If it grows, I will grow; if it lives, I will live, if it breaths the air, I will breath the air."
>
> — Ani scribe (1250), *The Egyptian Book of the Dead* (§:59: Chapter for breathing air and having power over the water in god's domain) (pg. 66)

It was the egg-laying god Geb who fathered Osiris, the original dying and rising god, who in turn fathered Horus, himself later seen as a dying and rising god, the joint syncretism of which, as Osiris-Horus, becoming, amid the Roman recension, the god man Jesus, as shown adjacent. The following shows the "sacred egg of Heliopolis" and "Typhon's egg" (aka Set's egg, if the labeling is correct [?]): [8]

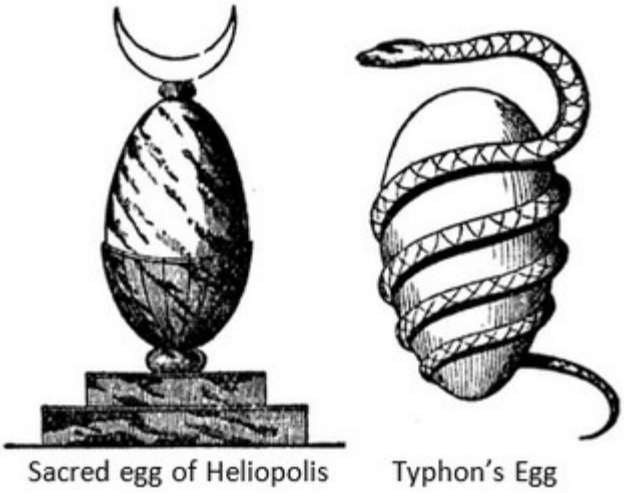

In other accounts (Ñº), Geb and Nut laid the cosmic egg that contained the sun.

In Memphis, according to Memphis creation myth (2800BC), alternatively, the creator god Ptah was said to have made a golden egg, on his potter's wheel, out of which the sun was born.

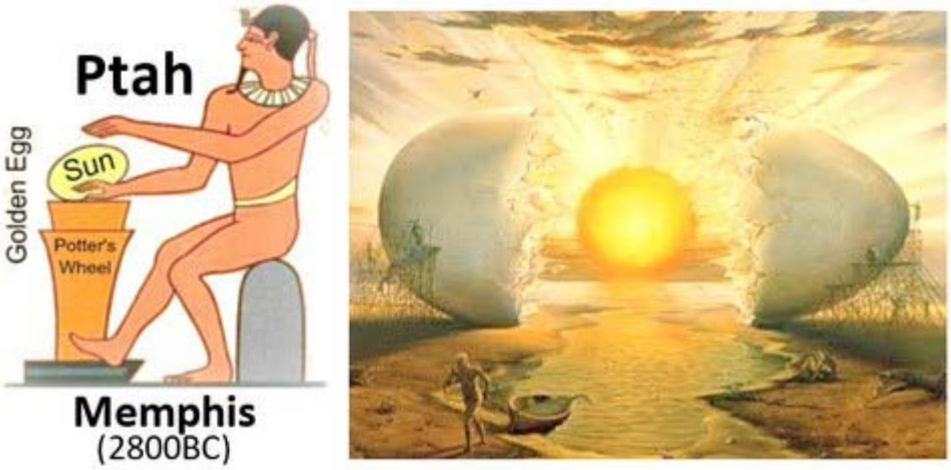

As people wanted to be "reborn" again, like the sun daily and yearly, so they believed, they put decorated eggs in their tombs and graves. Later the Sumerians, influenced by the Egyptians, followed later by the Ukrainians, adopted this practice. [4]

In 1900BC, during the so-called Theban recension (see: recension theory), the local Theban god Amen was made "supreme god" of Egypt, sold as a syncretism of the former four main supreme gods: Nun, Ra, Ptah, and Atum, such that Amen was conceived as being incarnate in those previous forms, hence the "egg" birth theory of the sun was carried over into the god Amen, which is now the "word" said at the end of modern Easter Sunday prayers, around which colored eggs are hidden, after which people eat eggs during Sunday brunch.

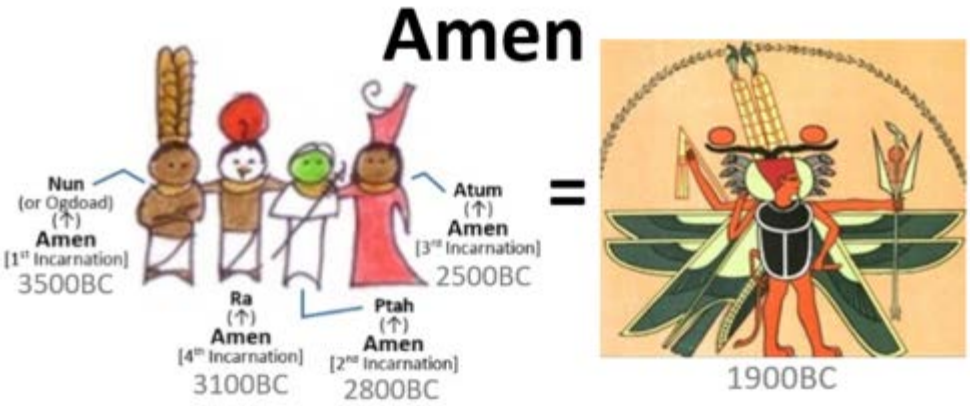

The practice of dying eggs, e.g. red to represent the blood of Christ, was introduce, supposedly, by early Mesopotamian Christians and officially adopted by Pope Paul V in 1610. [4]

Bunnies

The addition of bunnies and rabbit eggs, into the Easter holiday mix, seems to have been a late 19th century German addition; the following is an example quote:

> "The **Easter Hare** is inexplicable to me, but probably the hare was the sacred animal of Ostara; just as there is a hare on the statue of [the Celtic goddess] Abnoba."
>
> — Adolf Holtzmann (1874), *German Mythology* [7]

Likely, the rabbit motif was added on as being animals symbolic of spring and fecundity, particularly in the northern regions.

See also

â— Christmas | Khoiak festival
â— Atheist holidays

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(b) Sora, Steven. (2011). "Easter, the Rites of Spring: Tracking the Ancient and Universal Celebrations of Rebirth and Renewal" (Ñº), *Atlantis Rising Magazine*, 87, May/Jun.
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(b) The Reckoning of Time – Wikipedia.
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External links

â— Easter – Wikipedia.

θΔics

In cyphers, **ECHO** or the "echo cypher" refers to the hypothesis that Goethe embedded, in his *Elective Affinities* (1809), the hidden acronym "ECHO" in the names of the four main characters: **E**dward, **C**harlotte, **H**auptmann (Captain), **O**ttilie, to signify some type of meaning or connection to Roman poet Ovid's 8 AD mythological hexameter poem *Metamorphoses* (see: morphology), in particular the nymph Echo in the Narcissus myth. [1]

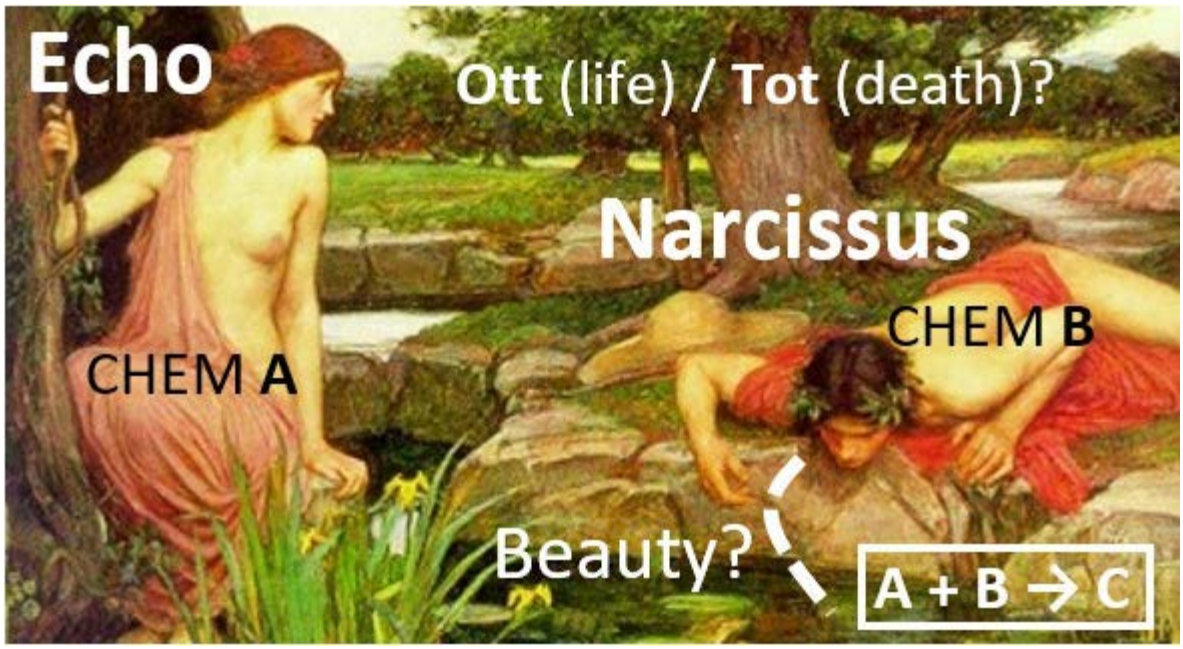

A depiction of **Echo** (left) and **Narcissus** (right) story, as told by Ovid (8AD), by English painter John Waterhouse (1902); shown with annotation by Thims (2020), the supposed way Goethe perceived the story, as alluded to in his *Elective Affinities*. [5]

History

A 1902 depiction of Echo (left) and Narcissus (right) by English painter John Waterhouse, the synopsis of which, in Ovid's version of the myth, is: [5]

"Narcissus was the son of the river god Cephissus and the nymph Liriope. His parents were told that he would live to an old age if he did not look at himself. He rejected all the nymphs and women who fell in love with him. One of these was the nymph Echo, who was so upset by her rejection that she withdrew from life and wasted away until all that was left was a whisper. Her prayers were heard by the goddess Nemesis who caused Narcissus to fall in love with his own reflection. He continued to look at his reflection until he died."

The extrapolation of this, to Goethe's Elective Affinities, is that Ovid's myth tells the story of fate of Ottilie (Echo) and Edward (Narcissus), who both meet their ends by similar fates.

The first to have made a connection between the Narcissus myth and *Elective Affinities* seems to have been English Germanic literature scholar Frederick Stopp (1911-1979) and his 1959 article "A True Narcissus: Reflections on the Eduard-Ottilie relationship in Goethe's *Wahlverwandtschaften*." [2]

Others to explore connections between Ovid's Narcissus myth and Goethe's *Elective Affinities*, according to Stefani Engelstein (2008), were German philologist Waltraud Wietholter (1982) and American literary critic J. Hillis Miller (1992). [3] Miller, who cites neither Stopp nor Wietholter, may have been the first to pick out the "hidden anagram", as he calls it, in the names of the four main characters: [4]

"The name 'Echo' may even be present in the novel as a hidden anagram of the names of the four main characters: *Edward*, *C*harlotte, the Captain (der *H*auptmann), and *O*ttilie."

Scottish biographer and German literature lecturer John Williams (1998) also discusses the hidden ECHO acronym anagram, along with several others. [1]

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External links

â— Metamorphoses – Wikipedia.
â— Echo (mythology) – Wikipedia.

θΔics

In thermodynamics, **eco-thermodynamics** is a synonym for the science of economic thermodynamics, coined in 1995 by American mathematical physicist Robert Ayres, referring to the study of economic systems according to the first and second law of thermodynamics. [1] The quantity of prominence, in this version of economic thermodynamics, is exergy. The quantity exergy is preferred over the entropy concept because the latter contains, in his Ayres' own words, too much "mystical baggage". [2]

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θΔics

In science, **ecodynamics** is the study of the dynamics and thermodynamics of ecosystems. The term is similar to ecological thermodynamics, which is the thermodynamical study of ecosystems.

History

The term “ecodynamics”, as used in ecology, dates back to at least before the early 1980s. French-born British economist and philosopher Edward Goldsmith used the term in his 1981 article "Thermodynamics or Ecodynamics". [1] The *International Journal of Ecodynamics*, launched in 2005, according to its founders, is based on the work of nonequilibrium thermodynamics works of Belgian chemist Ilya Prigogine. [2]

Goldsmith's two laws of ecodynamics

In ecodynamics, Goldsmith is known to have argued that thermodynamics does not apply to dynamics of ecosystems and on this logic positioned two “laws of ecodynamics”, that he wished to set up against the first two laws of thermodynamics. Goldsmith’s first law of ecodynamics states that: [3]

> “Living things seek to conserve their information, structure, and behavior”

Goldsmith's second law of ecodynamics states that:

> “Natural systems tend towards stability, not in the direction of entropy or disorder, but towards climax, which must correspond to ecological equilibrium, a point in which the system ceases to grow.”

(add discussion)

Notes

The term “ecodynamics”, to note, in other contexts is considered as the study of the dynamics and thermodynamics of economic systems.

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θΔics

In schools of thermodynamics, the **École Polytechnique** is a French engineering school, founded in 1794, associated with a number of connected scientists and founders of thermodynamics as well as various heat/force/work concepts, principles, and theories derived therefrom.

French school of thermodynamics

All-in-all, the the École Polytechnique is the original birthplace or seedling home of thermodynamics, having been founded, in part by, French engineer Lazare Carnot, father to thermodynamics pioneer Sadi Carnot, among numerous other pre-thermodynamics pioneers.

Those of significance to have graduated or taught at the École Polytechnique include Sadi Carnot, a student there in 1812, author of the 1824 *Reflections on the Motive Power of Fire* (*Réflexions sur la puissance motrice du feu*), Gustave Coriolis, a tutor there beginning in 1816, first to coin the term "work" as the product of force and distance, and Émile Clapeyron, graduate of the school in 1818, author of the 1834 *Motive Power of Heat* (*Puissance motrice de la chaleur*), among others.

The school, originally called the *École centrale des travaux publics*, was founded in 1794 by French engineer Lazare Carnot, the father of Sadi Carnot, and French mathematician Gaspard Monge, during the French Revolution, at the time of the National Convention.

Coriolis was the first to employ the name *work* for the quantity *fs* or force *f* multiplied by distance *s*. [2] This was sustained in usage by French engineer and mathematician Jean-Victor Poncelet, a former student (1808-10) and later commandant general (1848) of the École Polytechnique, who adopted the *kilogramme-metre* as the unit of work. [3]

In the late 1790s, French mathematician and physicist Joseph Fourier was appointed chair of the École Polytechnique. In 1822 he published his *Analytical Theory of Heat* (*Théorie analytique de la chaleur*), in which he basing his reasoning on Newton's law of cooling, namely, that the flow of heat between two adjacent molecules is proportional to the extremely small difference of their temperatures, outlined a mathematical model of heat movement in various directions. [5] In this work Fourier claims that any function of a variable, whether continuous or discontinuous, can be expanded in a series of sines of multiples of the variable.

French physicist Alexis Petit studied at the École Polytechnique, graduating in 1811, later becoming professor of physics from 1815 to 1819. He is known for his 1818 publication on the efficiencies of air-engines and steam-engines and for his discussions with Sadi Carnot on the same subject. One of Petit's noted students in physics, during the years 1815-16, was Auguste Comte, the French sociologist and philosopher who is generally credited with having coined the term sociology and who first outlined the subject of "social physics".

Thomson's search for Carnot's Reflections

See main: Thomson's search for Carnot's Reflections

In 1839, at the Royal Belfast Academical Institution of Northern Ireland, where a young 15-year-old student William Thomson (Lord Kelvin) was in attendance, Scottish educator John Nichol, a professor of astronomy, took the chair of natural philosophy. That year, Nichol updated the curriculum, introducing the new mathematical works of Fourier. The mathematical treatment much impressed young Thomson, who became intrigued with Fourier's *Théorie analytique de la chaleur* and committed himself to study the "Continental" mathematics resisted by a British establishment still working in the shadow of Isaac Newton.

Out of this stimulus, in 1841, at the age of 17, Thomson wrote his first scientific paper on Fourier's analysis of heat under the pseudonym *P.Q.R.*, which was submitted to the *Cambridge Mathematical Journal* by his father, titled "On Fourier's expansions of functions in trigonometric series". [4] Two more papers of similar theme soon followed. [6]

In 1845, after learning of Sadi Carnot's work through the 1834 paper of Clapeyron, Thomson went to Paris to work with French chemist and physicist Henri Regnault, a former student (1830) and later chair of chemistry (1840) at École

Polytechnique, and tried to find a copy of Carnot's *Reflections*. To his surprise and disappointment there was no copy in the library of the École Polytechnique, and no Paris bookseller had heard of it or its author. [7]

Mechanical Theory of Heat

By 1850, through Thomson, via Clapeyron, the work of Carnot reached the likes of German physicist Rudolf Clausius. In a footnote to his 1850 paper "On the Motive Power of Heat", Clausius states: [8]

> "I have not been able to obtain a copy of this book [Reflections], and am acquainted with it only through the work of Clapeyron and Thomson, from the latter of whom are quoted the extracts afterwards given."

The supposition, in Carnot's work, that caught Clausius' attention was the postulate, expressly stated, that "the quantity of heat remains unchanged" (in the process), which equates to the argument that "no change occurs in the condition of the working body" (during the work cycle). Conversely, according the view of Clausius, as developed in the mechanical equivalence of heat, a certain amount of heat would consumed in the working body during an irreversible passage of heat in the cyclical production of work. These corrections were employed and remolded in Clausius' famous *Mechanical Theory of Heat* (1850-1875).

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θΔics

In science, **ecological economics** is the study of the relationships between ecosystems and economic systems in the broadest sense. [7] Ecological economics, in more detail, is the study of economic systems confined by ecological awareness, constraints, and scarcities often centered around ways to promote sustainability. The subject of "ecological economics" is often found intertwined with thermodynamics logic; in the sense of being syncretism of ecological thermodynamics and economic thermodynamics. [1]

Overview

The 1971-76 work of Romanian mathematician Nicholas Georgescu, according to Japanese economist Kozo Mayumi, originated the field of ecological economics. [3] Others site American economist Herman Daly, a student of Georgescu-Roegen, as an originator in the field. [4] It is also argued that the 1975-17 work of English economist Kenneth Boulding helped to pioneer in the field, having also introduced the concept of entropy in ecological economics, particularly on the subject of waste material management. [5]

In 1989, the journal of *Ecological Economics* was launched under the direction of founding editor American ecological economist Robert Costanza.

The 1995 book *A Survey of Ecological Economics*, edited by Rajaram Krishnan, Johathan Harris, and Neva Goodwin, is a collection of 95 original essays, articles, and response letters written by a wide assortment of noted thinkers, that seems to be well representative of the field of "ecological economics". [6]

Difficulties

The use and understanding of thermodynamics in this field is often baseless, largely owing to the fact the central founder of this field is Romanian mathematician Nicholas Georgescu who confused the second law in such a way as to suppose that fossil fuels are a type of entropy (or material entropy as he put conceived it) that tend to be wasted in accordance with the mandates of the second law. This has led to many obscure and nearly incorrigible papers, most written by individuals with nearly no fundamental training or schooling in thermodynamics, on subjects such as the thermodynamics of recycling. As such, the concept of "entropy" is often found way out of context, e.g. citing the first law of thermodynamics as the "law of conservation of energy-mass". [2]

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External links

● Ecological economics – Wikipedia.

θΔics

In ecodynamics, **ecological equilibrium** is a point or period in time in which the state of an ecological system is at climax, wherein it ceases to grow. [1] This postulate was put forward in 1981 by French-born British economist and philosopher Edward Goldsmith, in his opposition to the logic of second law of thermodynamics, dictating that systems tend towards disorder. [2] In this formulation, Goldsmith equates thermodynamic equilibrium, in ecosystems, not necessarily as death, but as a climax state in which growth potential is lost.

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θΔics

In famous publications, ***Ecological Stoichiometry**: the Biology of the Elements from Molecules to the Biosphere*, is a 2002 book, by American limnologists Robert Sterner and James Elser, noted for being the first publication to contain the results of the first-ever calculation for the empirical molecular formula for one average human being, a calculation done, independently, the following year by American chemical engineer Libb Thims. [1] In outlining their subject, Sterner and Elser state:

> "The stoichiometric approach considers whole organisms as if they were single abstract molecules."

They were led to this by studying differences in carbon, nitrogen, and phosphorous levels in similar species. In their chapter one, as to the human being, they state that "from the information on the quantities of individual elements, we can calculate the stoichiometric formula for a living human being to be", taking cobalt (Co) as unity: [11]

$$H_{375,000}\ O_{132,000,000}\ C_{85,700,000}\ N_{6,430,000}\ Ca_{1,500,000}\ P_{1,020,000}\ S_{206,000}\ Na_{183,000}\ K_{177,000}$$
$$Cl_{127,000}\ Mg_{40,000}\ Si_{38,600}\ Fe_{2,680}\ Zn_{2,110}\ Cu_{76}\ I_{14}\ Mn_{13}\ F_{13}\ Cr_{7}\ Se_{4}\ Mo_{3}\ Co_{1}$$

This amounts to a 22-element human empirical molecular formula. They concludes "this formula combines all compounds in a human being into a single abstract 'molecule'". They continue, "our main purpose in introducing this formula for the 'human molecule' is to stimulate you to begin to think about how every human being represents the coming together of atoms in proportions that are, if not constant, at least bounded and obeying some rules".

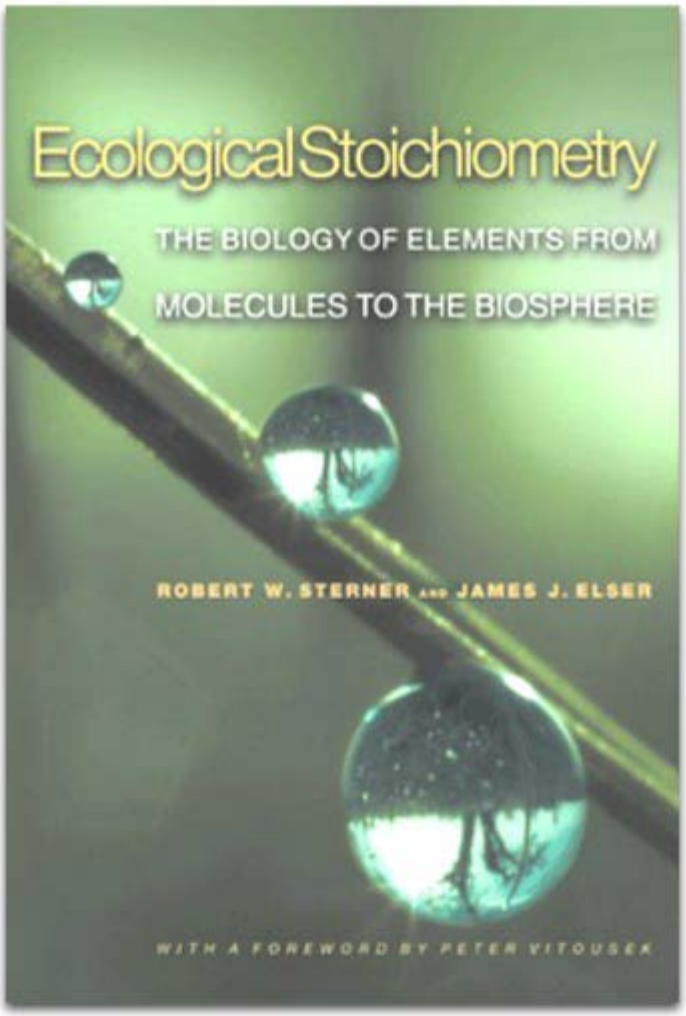

2002 book *Ecological Stoichiometry*, by American limnologists Robert Sterner and James Elser; first publication to contain a calculation of the human molecular formula.

Calculation history

The term "human molecule", used to describe a human being as an abstract molecule, dates back to 1869 in the works of French philosopher Hippolyte Taine. The use of this construct has since been discussed by dozens of thinks over the years in various fields, ranging from philosophy, to history, to economics. The subject of human thermodynamics, in fact, was defined, in 1952 by English physicist C.G. Darwin, as thermodynamic study of systems of human molecules.

Not until the turn of the 21st century, however, a period following the appearance of various human mass composition tables, was the calculation for the molecular formula for the human being done. Two different, independent, calculations were done, one on April 18, 2000 by Sterner and Elser, who determined the human being to be an 22-element molecule, using cobalt element found in the lowest amount in the average human, and one in September 2002 by Thims, who determined the human being to be an average 26-element molecule, taking vanadium as unity. [2]

Key sections:

The following are screenshots of the opening section of the book devoted to the 'human molecules' from the stoichiometric perspective:

SCOPE

To begin to define this book's scope, let us start by considering what portion of chemistry and physics we cover. Our focus is almost entirely on the elements. All of life requires the macroelements C, H, O, N, P, etc., as well as a set of trace elements including Fe, Mg, and others (Fig. 1.1). These provide for a diverse set of functions including structure (such as C, H, and O in cellulose fibers), oxidation-reduction (such as Fe as a cofactor in enzymes), and others (see Chapter 2). The patterns of abundance of elements in living things are major components of ecological stoichiometry. Take humans as an example. The concentrations of at least 22 elements in humans have been determined; these range in total amount in a typical live individual from 35 kg (O) to 1 mg (Co) (Heymsfield et al. 1991; Williams and Fraústo da Silva 1996). From information on the quantities of individual elements, we can calculate the stoichiometric formula for a living human being to be

$$H_{375,000,000}\ O_{132,000,000}\ C_{85,700,000}\ N_{6,430,000}\ Ca_{1,500,000}\ P_{1,020,000}\ S_{206,000}\ Na_{183,000}\ K_{177,000}\ Cl_{127,000} Mg_{40,000}\ Si_{38,600}\ Fe_{2,680}\ Zn_{2,110}\ Cu_{76} I_{14}\ Mn_{13}\ F_{13}\ Cr_{7}\ Se_{4}\ Mo_{3}\ Co_{1}$$

That is, there are about 375 million H atoms for every Co atom in your body (the formula is based on "wet weight"). This formula combines all compounds in a human being into a single abstract "molecule." This formula sets the value of the scarcest substance (cobalt, mass in humans ≈ 1 mg) equal to a stoichiometric coefficient of 1 and shows relative amounts, not absolute ones. Most stoichiometric analyses are in fact concerned with relative abundances. The large stoichiometric coefficients for H and O, the most numerous atoms in our bodies, arise partly from the fact that life is aqueous and partly from the fact that H and O are key components of many (or all, in the case of H) organic molecules. Our main purpose in introducing this formula for the "human molecule" is to stimulate you to begin to think about how every human being represents the coming together of atoms in proportions that are, if not constant, at least bounded and obeying some rules. Humans must obtain these elements in sufficient but not (for some) oversufficient quantities from an environment that may or may not have similar proportions of these elements. Human physiology must take complex chemical resources containing multiple elements arranged in myriad different molecules, absorb some, metabolize some, rearrange many, and excrete or otherwise release a great deal. This book is concerned both with the way that organisms do this and with its consequences for ecological dynamics.

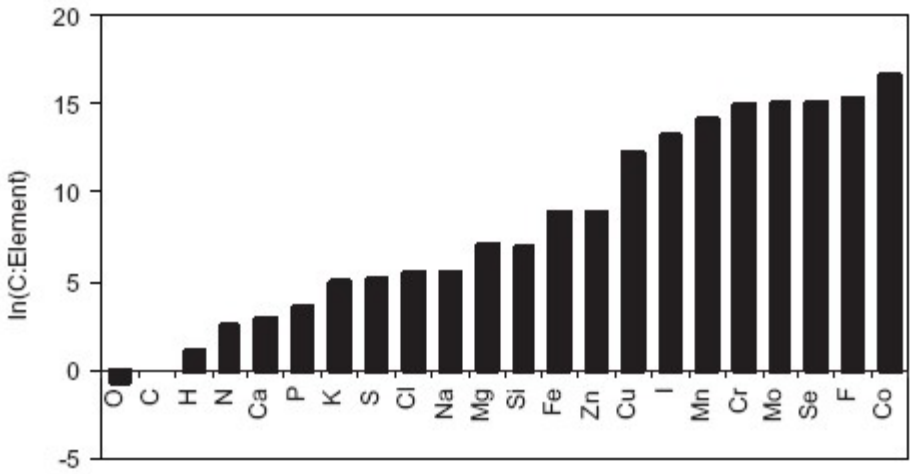

Fig. 1.2. Abundance of 22 elements in humans, expressed relative to carbon (mass:mass) and natural-log-transformed for clarity. High values indicate substances in low relative abundance. Data obtained from two sources, with averages taken when multiple values were available (Heymsfield et al. 1991; Williams and Fraústo da Silva 1996). For a historical presentation of similar information, see Fig. 2.1.

(add discussion)

References

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(b) Note: Thims only became aware of Sterner's calculation on February 17, 2008 after doing a Google book search on keywords "human molecule thermodynamics"; Thims then emailed Sterner within the hour.
(c) Source for Sterner date: "I have attached the spreadsheet used to construct that formula for a human molecule in our book. My copy of the spreadsheet is dated April 18, 2000. I cannot say exactly when we made the calculations. That date might have to do with some modification of the figure or some other edit. At any rate, it gives an indication." (email communicate from Robert Sterner to Libb Thims on February 20, 2008).

θΔics

In thermodynamics, **ecological thermodynamics** or “ecology thermodynamics” is the application of thermodynamics principles and laws, particularly exergy, emergy, energy flow, and entropy, to the study of the states and evolutions of ecosystems.

History

The use of the concept of energy in the study of ecology came into use in the early 1950s through the works of Americans ecologist Howard Odum and his brother zoologist Eugene Odum. [1] In 1953, the Odum brothers, particularly Eugene, wrote the world’s first textbook in ecology, *Fundamentals of Ecology*, in which they introduced the first two laws of thermodynamics for application in ecology. [2] Through their writings the Odums introduced a number of non-rigorous thermodynamic conjectures, such as emergy, embodied energy, the maximum power principle, energese or "energy systems language", among others. [3]

The more general application of thermodynamics to the study of ecosystems began to emerge in the early 1970s. Pioneers in this developing field include American ecologist Danish chemical engineer Sven Jorgenson, American chemical engineer Robert Ulanowicz, American ecologists James Kay and Eric Schneider, and Italian nuclear scientist Corrado Giannantoni, among others.

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External links

● About: Thermodynamics and Ecology – James Kay.

θΔics

In existographies, **Economakis Michael** (1967-) is a Greek self-characterized former child prodigy turned psychometric and differential psychology philosopher, business executive, chess player, and genius ranker, noted for his 2008 to 2012 IQ calculations, per some method of his own devise, of some 51 geniuses.

Overview

In 2008, Michael, at the online cite "FRCEC-Fischer Random Chess Email Club", began posting IQs of noted thinkers, calculated or estimated by some method of his own device.

In 2010, Michael, in review commentary on Ludwig Wittgenstein's *Philosophical Investigations*, posted the following messy blurb of his IQ estimations, after supposedly being "asked to do so" by Nietzschean philosopher and chess player Bobby Fischer (1943-2008) (O): [1]

> "According to my non-completely integrated yet concise theory (will be completed after enough years, due to lack of time!) for the: (Ultimate) philosophical bases of differential psychology & psychometry (or else: The "post"-quantum bases of philosophical psychometry),...Ludwig Wittgenstein was a "philosophical monster" of intelligence (with also a "tremendous" "mental vitality" & "(mental) creativity", very close to this of the absolutely unique global phenomenon/in these parameters: Friedrich Nietzsche).
>
> The Austrian Wittgenstein (1889-1951)/a son of an industrial magnate (and..."never" of an average person!...-physical law of the ultimate genius's "birth"-), as the greatest "analytic" philosopher/who had 170-i.q. (equal to this of Albert Einstein/-and Einstein wasn't the top history's physicist!-) stands as the number 4 ranked philosopher in world's history, after the three ultimate philosophers (all of them existed within 19th century): Ludwig Feuerbach-180 i.q. (1804-1872), John Stuart Mill (number 1/ranked)-190 i.q. (1806-1873), & Friedrich Nietzsche-also 180 i.q. (1844-1900).
>
> Within 20th century, these certain ~ top philosophical or epistemological personalities as: Edmund Husserl, Oswald Spengler, John Dewey, Lewis Althusser, Otto Neurath (Austrian sociologist member of "Vienna's circle"-for the expression and elaboration of "Neo-positivism"/with his main concept of "physicalismus"), Thomas Kuhn, Percy Bridgman, all of them also had 170-i.q. (but lesser! more or less "mental vitality" & " (final-mental) creativity" than Wittgenstein), above names as Bertrand Russell (168-i.q), Martin Heidegger (165-i.q.), Henry Bergson (160-i.q.), Jean Paul Sartre & Albert Camus (both with 155-i.q.). -In the history of philosophy & epistemology, particularly four other names have not to be forgotten: Arthur Schoppenhauer/170-i.q., David Hume & Soren Kirkegaard both with 168-i.q., and within 20th century's epistemology Paul Feyerabend/165-i.q., (above names as Herbert Spencer/165-i.q., Augumste Comte and Hegel both with 160-i.q., Leibniz/160-i.q., Ernst Mach/160-i.q., Richard Avenarious/~ 157-i.q., Spinoza, John Locke or Immanuel Kant the last three of them with 150-i.q., Karl Marx/150-i.q.,...and from the ancient world Heraclitus & Democritus both with 160-i.q. -Note: Socrates, Pythagoras & Epicurus all the three of them with 150-i.q., Aristotle/145-i.q., Plato/142-i.q. -Remark: Max Horkheimmer/of the school of Frankfurt (20th century) despite his...165-i.q! remains..."unacceptably utopian"!!!).
>
> Ludwig Wittgenstein offers the most "analytically critical, creative & intrinsic also indefinite" philosophy of "language" & "general communication"/in art, science, e.t.c., ever written. A "critically ultimate properly-"improper" " philosophy eventually. A very interesting/as a "critical methodology" philosophy for nowadays! (to be "evenmore elaborated & "developed" " -?!...-). -M-. -P.S.: ------- For the identity of this article's author & more info (and furthermore...a lot of history's "top" scientists', artists', businessmen', e.t.c.,...i.q.s!)/about my theory, visit: FRCEC-Fischer Random Chess Email Club, -here in internet- , browse it's: Guestbook, pages of May 2008.
>
> [Asked to publish in brief, a sort of an abstract/as regards my theory's estimations, e.t.c., from my late friend/from Pasadena-California (in 1987): myth of global chess & creator of FRC (or else chess960, or

> even..."quantum chess"! as I named it with his consent later in Buenos Aires (1996)) Robert James Fischer/a unique individual with ultimate non-systematic though philosophical education (on Nietzsche, e.t.c.) & i.q.-184]. "

In 2012, Michael, in Hmolpedia forum post, below the Hippolyte Taine article, elaborate on his genius IQ estimates, as follows: [2]

> "HIPPOLYTE TAINE...had 160-i.q. (as and the other classic genius historian: the British Arnold J. Toynbee), and his also mentally isolated "recluse" remote friend...FRIEDRICH NIETZSCHE.....:180! .....-starting point for the characterization: "universal genius"!-.
>
> {-For instance: The music composers: a). the Austrian Wolfgang Amadeus Mozart (1756-1791) had: 187-i.q., & b). the American John Cage (within 20th century) had: 180-i.q. The chess world champion of 1972 (&...of 1992, "in real", as well) Robert James Fischer (who was and the "final thorough originator" of FRC-Fischer Random Chess or Chess960 or..."quantum chess"!...) had 184-i.q.}. MOREOVER:
>
>> A). John Stuart Mill: 190-i.q., Ludwig Feuerbach: 180-i.q., Ludwig Wittgenstein*, & Arthur Schopenhauer, & Oswald Spengler, & John Dewey, & Edmund Husserl,...& only a few others (and in epistemology): all with 170-i.q.
>> - {*: A world phenomenon of "mental creativity" & "mental vitality", but after the unique "myth" Friedrich Nietzsche/in these features-factors} -.
>>
>> B). Bertrand Russell: 168-i.q., Herbert Spencer: 165-i.q., Henry Bergson: 160-i.q. as well as formerly Hegel (or and the composer Richard Wagner friend initially of Nietzsche),.....and eventually.....
>>
>> C). Jean Paul Sartre: 155-i.q. (as and Sigmund Freud),...furthermore.....Karl Marx (& Vladimir Ilits Lenin, Winston Churchill, and Juan Domingo Peron, or even John Fitzgerald Kennedy, and the Yugoslav Josef Tito, -in politics!-): all the last six personalities: were first-stage geniuses with 150-i.q."

The following is a work-in-progress ordered listing, from the above two blurbs, of Michael's genius IQ estimations:

1. John Mill | IQ:190
2. Ludwig Feuerbach | IQ:180
3. Ludwig Wittgenstein | IQ:170
4. Arthur Schopenhauer | IQ:170
5. Oswald Spengler | IQ:170
6. John Dewey | IQ:170
7. Edmund Husserl | IQ:170
8. Percy Bridgman | IQ:170
9. Jean-Paul Sartre | IQ:155
10. Albert Camus | IQ:155

as have been added as IQ estimates to the top 500 genius rankings; where, of note, we can compare John Platt's 1960 IQ estimation of Percy Bridgman at 180.

The other genius IQ estimations, from the above two blurts, not as of yet added to the top 500 rankings, are:

- Wolfgang Mozart | IQ:187

- Robert Fischer | IQ:184
- Friedrich Nietzsche | IQ:180
- John Gage | IQ:180
- Albert Einstein | IQ:170
- Thomas Kuhn | IQ:170
- Lewis Althusser | IQ:170
- Otto Neurath | IQ:170
- Bertrand Russell | IQ:168
- David Hume | IQ:168
- Soren Kierkegaard | IQ:168
- Herbert Spencer | IQ:165
- Martin Heidegger | IQ:165
- Paul Feyerabend | IQ:165
- Max Horkheimer | IQ:165
- Auguste Comte | IQ:160
- Ernst Mach | IQ:160
- Gottfried Leibniz | IQ:160
- Heraclitus | IQ:160
- Democritus | IQ:160
- Hippolyte Taine | IQ:160
- Henri Bergson | IQ:160
- Georg Hegel | IQ:160
- Richard Wagner | IQ:160
- Richard Avenarius | IQ:157
- Sigmund Freud | IQ:155
- Karl Marx | IQ: 150
- Vladimir Lenin | IQ:150
- John Locke | IQ:150
- Benedict Spinoza | IQ:150
- Immanuel Kant | IQ:150
- Socrates | IQ:150
- Pythagoras | IQ:150
- Epicurus | IQ:150
- Winston Churchill | IQ:150
- Juan Domingo Peron | IQ:150
- John Kennedy | IQ:150
- Yugo Josef Tito | IQ:150
- Aristotle | IQ:145
- Plato | IQ:142

(add)

Husserl | IQ

In 2010, Michael, per above, estimated of Edmund Husserl's IQ at 170 as follows: [1]

> "John Mill hand an IQ of 190, Ludwig Feuerbach had IQ of 180, and Ludwig Wittgenstein, Arthur Schopenhauer, Oswald Spengler, John Dewey, and Edmund Husserl all had IQ of 170."

In 2017, of note, Thims, while calculating the mean IQs of the top existentialism philosophers, situated Husserl at top 500 genius position #311 per the following established rankings [RGM:311|1,260+] (Stokes 100:74) (PGT:18) (GPE:#) and per his top 10 existentialism philosopher position, which corresponded to an IQ of 170 in Hmolpedia real IQ rankings, and THEN went internet searching to see if anyone else had estimated Husserl's IQ, and therein found that

Michael had previously calculated it at 170.

Education

Michael completed a diploma in marketing, in 1988, and a BA in economics in 2001, both at Greenwich College, London, then completed his MBA in 2003 at Kingston University, London. [3]

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External links

- Economakis Michael (profile) – British Hellenic Chamber of Commerce.

θΔics

In cycles, an **economic cycle** refers to a period of economic growth or expansion followed by a period of economic contraction or recession, which tend to last twelve years on average.

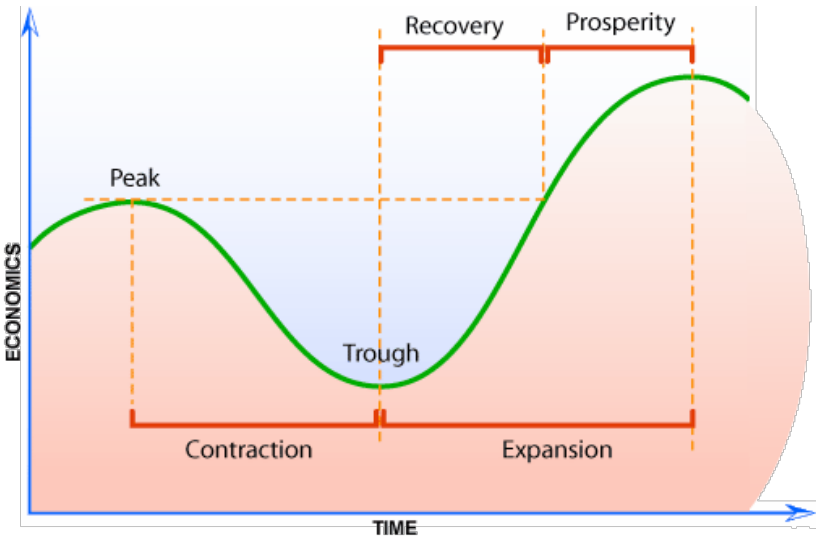

Generic diagram of an **economic cycle** (or business cycle). [4]

Overview

In 1946, Wesley Mitchell defined an economic cycle is as follows: [1]

> "Business **cycles** are a type of fluctuation found in the aggregate **economic** activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; in duration, business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar characteristics with amplitudes approximating their own."

In short, an economic cycle refers to one expansion stroke followed by one contraction stroke of one work cycle of an economic system.

Thermodynamics

In principle, economic cycles, being work cycles of system of economically bound human molecules, should be quantified via construction of indicator diagrams, in the framework of the James Watt and Emile Clapeyron graphical style of pressure-volume work calculation methodology of Carnot cycles.

In human thermodynamic terms, one day constitutes one heat cycle of an economic system of humans, wherein the working body of an economy is first put in contact with a hot body (day sky), which creates an expansion stroke, followed by contact with a cold body (night sky), which creates a contraction stroke.

Daily heat cycles are initiated by the coupling of the spin of the earth to the spin of the sun to the spin of the Milky Way; all of which is in trajectory to the great attractor at a speed of about 600 kilometers per second.

In some yet clarified way, daily heat cycles, which are integrated in the context of seasonal cycles (four seasons per year), give rise to economic cycles (12-years per cycle, on average), which in turn are connected to architectural cycles (architecture) (100-years per cycle, on average), all of which in turn give rise to the cycles of the rise and fall of civilizations (1,000-years per cycle, on average), which in turn are connected to the mass extinctions, which are known to occur cyclically ever 26-million years (sloughing hypothesis). [2]

A few writers, such as American philosopher Charles Dýke (1994) or Russian bioelectrochemist Octavian Ksenzhek (2007), to cite two examples, have touched on the topic of discussing economic cycles in the context of thermodynamic formalism. [3] Others to have touched on this topic include: Borisas Cimbleris, John Bryant, and Jurgen Mimkes.

References

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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two).* Morrisville, NC: LuLu.
3. (a) Dýke , Charles. (1994). "From Entropy to Economy: A Thorny Path", in: *Economic and Thermodynamics* (ch. 11:

207-38; economic cycles, pg. 231), edited by: Peter Burley and John Foster. Kluwer Academic Publishers.
(b) Ksenzhek, Octavian. (2007). *Money: Virtual Energy: Economy Through the Prism of Thermodynamics* (economic cycles, pg. 103). Universal Publishers.
4. Business cycle – TransTutors.com.

External links

â— Business cycle – Wikipedia.

θΔics

In economic thermodynamics, **economic energy** is a specific form of energy associated with wealth. [1]

Overview

In 1853, Hermann Gossen, as cited by Thomas Wallace (2009), theorized about economic energy, as follows: (Q)

> "The totality of commodities over which a person disposes constitutes his **economic energy**, his wealth, which devolves to the benefit of the social whole."

In circa 1870, Georg Helm conceived a theory of "economic energy", in a thermodynamic sense, in which, as summarized by Alfred Lotka (1921), money represents the most fluid form of economic energy. [3]

In 1908, Sidney Reeve, in his *The Thermodynamics of Heat Engines*, explained adiabatic lines on indicator diagrams via the following comparison: (Q)

> "The process may be perfectly paralleled by a man who goes down town with his pockets full of money. He may not have been robbed of a cent, yet he may return with his pockets empty; but the supposition is that his arms are full of bundles which he has purchased. Not a cent has been abstracted from him, yet he has ceased to possess his money; it has been transformed into another form of **economic energy**."

In 1910, Italian economist Emanuele Sella, in his *The Life of Wealth*, was employing the term "economic energy" [2] Sella's objective, according to Guido Erreygers (2001), in introducing this term, was to find a representative value correlative to the "energy", or possibly internal energy, in a basic thermodynamic system.

See also

- Economic entropy
- Economic temperature

References

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θΔics

In economic thermodynamics, **economic entropy** is conceptual term used in various ways to represent entropy in economic systems.

Overview

In 1910, Italian economist Emanuele Sella was outlining some type of idea of elementary economic entropy.

In 1914, American mathematical economist Harold Davis, in his 1941 book *The Theory of Econometrics*, conceptualized the term "economic entropy" as "relating to or representing the utility of money". [1] Earlier views, however, on the idea of elementary economic entropy were outlined in 1910 by [4]

In cross-over terminology to that of the phraseologies related to standard entropy, some will argue that each step in the reduction of economic entropy (in the economic system) is made at the expense of an increase in the entropy of nature (of the surroundings). [2] In other cases, which seem to have little connection to thermodynamics, completely unfounded definitions can be found. American mathematical economist Antal Fekete, for instance, states that *economic entropy* is defined as "the measure of the disappearance of uncertainty and risk". [5]

In modern terms, some have taken an organismic-view of society and have argued that according to the second law of thermodynamics, it can be deduced that inside of each organism the "economic temperature", a term coined by Emanuele Sella (1915), which can be read therefore as wealth and the capacity to absorb it, is distributed uniformly; but that between different organisms a thermoeconomic diversity (or temperature difference) exists. [3] Hence, according to author Guido Erreygers, for instance, when such supra-organisms associate, a thermoeconomic leveling process proceeds and that society has a total economic entropy or "a limit saturation to which the competition process tends as a result of the diffusion of the economic temperature through the organic series". [3]

In 1997, Russian-American business researcher Sergei Darda (Ñº), in his "Entropy and Economy", argued that a business may be considered as economic engine that produces a product or a service, according to which economic entropy can be calculated as: [6]

$$dS_{max} = \frac{NI_{max}}{C_e}$$

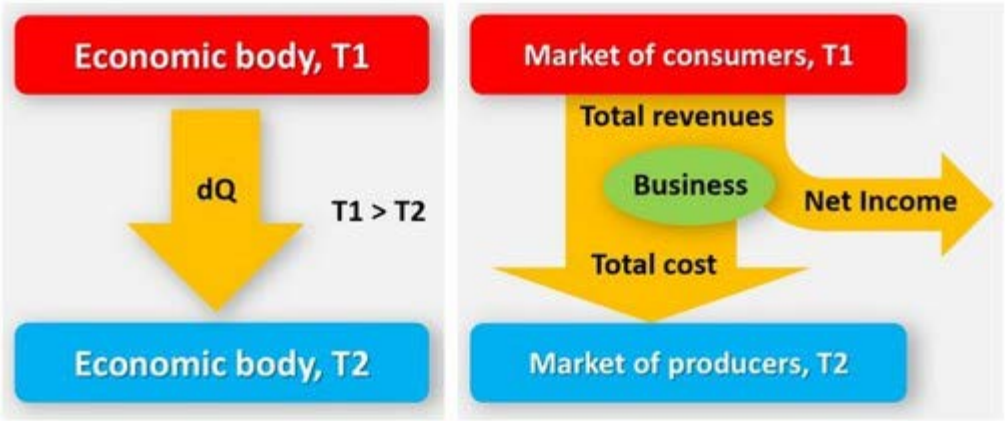

Two examples of 1997 economic engine models of Serge Darda. [6]

where NI_{max} is net income of the business and C_e is equilibrium cost to produce a unit of the product or service.

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θΔics

In hmolscience, **economic equilibrium** is an instantaneous Gibbs free energy minimum differential, on an energy landscape of a given economic system, per extent of reaction of that given system.

Thermodynamics

The use of thermodynamics applied to "economic equilibrium" modelling dates, predominately, to the 1858-1912 theories of Lausanne school of physical economics.

In 1932, Swiss-French economist Georges Guillaume 1932 PhD dissertation "On the Fundamentals of the Economy with Rational Forecasting Techniques", co-written with the "mathematical assistance" of his brother physicist Edouard Guillaume, in which, in critique of the Lausanne school, they employed thermodynamics, supposedly of the Percy Bridgman variety, to emphasized the possibility of the existence of "states of equilibrium in economics" (cf. pgs. 68-69), which, according to John Neumann's 1934 review, "seem entirely justified", is an oft-cited early usage of thermodynamics-based economic equilibrium theorizing. [1]

In 2003, American physicist and econophysicist Joseph McCauley comments the following: [2]

> "Attempts at neo-classical **equilibrium economic** analogies with thermodynamics go back to Guilluame and Samuelson. Von Neumann apparently believed that thermodynamic formalism could potentially be useful in computer theory, for formulating a description of intelligence, and was interested in the possibility of a thermodynamics of economics. But presented with Guillaume's work, he criticized it on the basis of the misidentification of a quantity as entropy."

The mention of Paul Samuelson here, is reference to his educational background being a product of the Lausanne school turned Harvard Pareto circle.

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(c) Mirowski, Philip. (2002). *Machine Dreams: Economics becomes a Cyborg Science* (pg. 104). Cambridge University Press.
2. McCauley, Joseph L. (2003). "Thermodynamic Analogies in Economics and Finance: Instability of Markets." *Physica A*, 329 (2003): pp. 199-212.

Further reading

● Sergee, V.M. (2003). "Thermodynamic Approach to the Problem of Economic Equilibrium" (abs), *Forma Description of Developing Systems*, NATO Science Series, 121:45-58.
● Smith, Eric and Foley, Duncan. (2008). "Classical Thermodynamics and Economic General Equilibrium Theory", *Journal of Economic Dynamics and Control*, 32:7-65, *Department of Economics* Graduate Faculty, New School University, 2005 manuscript.

External links

● Economic equilibrium – Wikipedia.
● List of types of equilibrium (economics) – Wikipedia.

θΔics

In hmolscience, **economic force** is a physical force, intermediate in complexity between that of the chemical force (affinity) and the gravitational force (gravity), of some type of electromagnetic force composition, i.e. involving the exchange of photons between valence shell electrons, related to economic matters or the descriptive operation of the economy; something that moves an economic agent through unit distance, according to which work is done.

Overview

In 1801, Nicholas-Francois Canard, in his essay-turned-book *Principles of Political Economy*, gave his view that supply and demand are ontologically like contradicting physical forces; as summarized by Philip Mirowski (2004): [1]

> "Canard wrote down an equation of forces which determined price under nonspecific circumstances. Here the sellers and buyers were accorded a single function each, which price as the shared variable; psychological need is identified as the ultimate source of each function; equilibrium is equated with the balance of forces. Unfortunately, all specification of the sequence of actions by which equilibrium is brought about is absent, in clear analogy with d'Alembert's principle in mechanics."

In the late 1850s, the Lausanne school of physical economics began to form, whose members include: Auguste Walras, Leon Walras, Vilfredo Pareto, Maffeo Pantaleoni, and Leon Winiarski, the general philosophical aim of which was to derive a rational mechanics like formulation of political economy; the following is one of the first dialogues in this direction:

> "To create a scientific theory of economics one would need to use differential calculus to derive a 'science of **economic forces**, analogous to the science of astronomical forces'."
>
> — Auguste Walras (1858), comment to son Leon Walras, then aged 24, during walk [2]

In 1897, Vilfredo Pareto gave the following mechanical-to-sociology comparison table (see: human thermodynamic variables table), wherein he showed the jump from force as defined by rational mechanics to a conception of force defined by economic mechanics: [3]

Mechanical phenomenon	Social phenomenon
Given a certain number of solids, we study their relations of equilibrium and movement abstracted from the other properties. We obtain thus a study of mechanics.	Given a society, we study the relations of production and wealth between men, abstracted from other circumstances. We obtain thus the study of political economy.
The science of mechanics is divided into two others. If we consider inextensibly connected material points we obtain a pure science, rational mechanics, which studies in an abstract way the forces of equilibrium and movement. The easiest part of science is equilibrium. D'Alembert's principle, considering the forces of inertia, enables the reduction of the dynamic problem to a static one.	The science of political economy is divided into two others. If we consider the *homo economicus* who acts only as a result of **economic forces**, we obtain political economy, which studies in abstract terms ophelimity. The only part of this which is well known is static equilibrium. There may be a principle for economic systems analogous to D'Alembert's, but at present our knowledge is very poor. The theory of economic crisis offers an example of dynamic study.
From rational mechanics comes applied mechanics, which is a little closer to reality, considering elasticity, friction, etc.	From pure political economy comes applied political economy, which does not consider solely *homo economicus*, but also other models of humankind closer to reality.
Real solids not only have mechanical properties of the phenomena caused by light, electricity and heat. Chemistry studies other properties. Thermodynamics, like other sciences, studies some of these properties in detail. All these sciences constitute the physical-chemical sciences.	Men and women have other characteristics which are studies by other particular sciences, such as law, religion, aesthetics, the organization of society, and so on. Some of these have quite a high level of development, others on the contrary, have not. As a whole they constitute the social sciences.

In 1898, Leon Winiarski published his *Essay on Social Mechanics*, wherein he described "forces" in a sociological, political economy, and economic sense, generally via an attraction and repulsion sense of the matter; although, to note, he used the Clausius inequality, which indirectly assumed the principle of the transmission of work via force in its formulation.

In 1912, Pareto published his four-volume *Treatise on General Sociology*, the social Newton term analysis of which, in respect to force, is as follows:

Scientific terms	Sciences	Elements
Matter [301] (O):78+; (O):59+; (O):89+; (O):75+ Force [271] (O):54+; (O):46+; (O):83+; (O):88+ Energy [27] (O):1+; (O):4+; (O):3+; (O):19+	Mechanics [42] (O):23+; (O):2+; (O):9+; (O):8+ Chemistry [40] (O):24+; (O):1+; (O):7+; (O):8+ Mathematics [32] (O):22+; (O):0+; (O):7+; (O):3+	Oxygen [5] (O):4+; (O):1+; (O):0+; (O):0+

Heat [19] (Q):2+; (Q):7+; (Q):3+; (Q):7+
Molecule [7] (Q):V4
Atom [5] (Q):1+; (O):0+; (Q):1+; (Q):3+
Affinity [2] (Q):1+; (O):0+; (Q):1+; (O):0+
Entropy [1] (Q):V4

Physics [26] (Q):15+; (O):0+; (Q):7+; (Q):4+
Thermodynamics [6] (Q):2+; (O):0+; (Q):2+; (Q):2+

Hydrogen [3] (Q):V1

In respect to the extent Pareto, in this publication, utilized "force" in an economic sense, that is a matter in need of investigation.

Quotes

The following are related quotes:

> "**Economic force** sets people in motion. We cannot observe this force. A human person's behaviour is a vector of different forces, of which the economic force is only one. A comparison with Newton's law of gravity is clarifying in this respect. Only if there is no counter-forces we can see an object fall to the ground. So, too, with the economic force; only if there are no other forces human behavior is fully determined by economic force. While in the physics laboratory experiments make the effect of a particular force observable, in economics there is no such thing as a laboratory."
>
> — Piet Keizer (2012), "Coordination and Communication"; an extension of Adam Smith like forces in an historical discussion (§3.2: From Moral Philosophy to Political Economy), according to which the "force" derives from the motivation of an economic subject to maximize their utility [4]

See also

- Economic pressure
- Social force
- Political force

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External links

- Economic forces – Wikipedia.

θΔics

In economic thermodynamics, an **economic molecule** is oft-used, metaphor-like, definition of a person in an atomic sense, as in a person viewed as a single "molecule", similar to the term human molecule. The term economics molecule tends to be used in economics or in discussing economic systems. At the level of economic molecules, a view often emerges that “life forces” are important in determining the functions and operations of an economy. [1]

Walrus

The term economic molecule or “economic molecules” was a term used in circa 1880 by French economist Léon Walras to refer to an individual person or to people, particularly in an economic sense. [2] In the 1981 words of English economist Hazel Henderson: [3]

> “[Walras] was an agrarian socialist and wanted to nationalize land, but he talked of humans as ‘**economic molecules**’ and gave concepts like scarcity scientific definitions analogous to heat in physics.”

The exact publication as to where Walras used this term "molécules économiques" (French) remains to be determined. In any event, the term is commonly attributed to Walras. In the 2000 words of authors Thomas Prugh, Robert Costanza, and Herman Daly: [9]

> “*Homo economicus* knows neither benevolence nor malevolence, only indifference. Human beings in this model are first, last, and always extreme individuals: **economic molecules**, in the conception of Leon Walras, one of the founders of modern economics.”

In another section, the state:

> “If it no longer makes sense—social, ecological, or political—for us to behave as the economic molecules that capitalism falsely claims is our instinctive fate, then we can be something else.”

The term economic molecules may have had influence on Walras’ student French-Italian economist Vilfredo Pareto, who in his social theories later came to speak of people as “human molecules”. [4]

Koopmans

In 1947, Dutch-born American mathematician, theoretical physicist, economist Tjalling Koopmans famous stated that time has come for us to stop denying the "human molecular hypothesis" and to begin using human molecular theory in economics:

> “While it was long possible and sometimes tempting for physicists to deny the usefulness of the molecular hypothesis, we economists have the good luck of being some of the ‘molecules’ of economic life ourselves, and of having the possibility through human contacts to study the behavior of other ‘molecules’.”

Koopmans grew up during a time when many still believed that molecules did not exist. Specifically, it was not until Koopmans turned sixteen, in 1926, that French chemist Jean Perrin received the Nobel Prize in physics for proving, conclusively, the existence of molecules, by calculating Avogadro's number using three different methods, all involving liquid phase systems. First, he used a gamboge soap-like emulsion, second by doing experimental work on Brownian motion, and third by confirming Einstein’s theory of particle rotation in the liquid phase. [7]

Nelson | Economic agent = Human molecule

In 1992, American philosopher Alan Nelson’s used Koopmans' famous quote at the opening to his 1992 chapter

"Human Molecules", after which the idea emerged that Koopmans coined the term "human molecule" in economics, which is only partially true. To exemplify, the 2009 *Oxford Handbook of Philosophical Economics* defines the term *human molecule* as an "ontologically distinct individual" and states specifically that the term "human molecule" is "Tjalling Koopmans' evocative coinage".

Other

In 1994, arguing that economics can be objective, American philosopher-economist Daniel Hausman stated: [5]

> "We have much information immediately at our disposal about our own behavior as **economic molecules**, if we would only examine the grounds of our beliefs."

Likewise, in 1996 American economics historian Thomas Rawski stated: [6]

> "The individual choices by rice buyers and factory owners in the economy are like the movement of air molecules in a balloon … economic molecules in the modern world huddle, of course, in markets, which gives another sense in which economics is bourgeois, the townsman's science."

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θΔics

In hmolscience, **economic pressure** refers to a physics or thermodynamic stylized reconception of pressure, defined as force per unit area, in economic terms.

A 2012 depiction of **economic pressure** used in a an article about the results of survey which found that over half of China's urban residents feel they are under "high economic pressure" (Ñº).

Overview

In 1996, Japanese ecological economist Kozo Mayumi together with Italian plant scientists Gianni Pastore and Mario Giampietro presented the paper on "Bio-Economic Pressure as Indicator of Standard of Living", at the fourth biennial meeting of the International Society for Ecological Economics, Boston University, wherein they proposed that bio-economic pressure was an indicator of development. [1] In 2013, Giampietro, Mayumi, together with Alevgul Sorman, in their *Energy Analysis for a Sustainable Future*, expand on their "bio-economic pressure" concept in terms of a jumble of layered acronym filled formulas. [2]

In 2006, German physicist Jurgen Mimkes, in his "A Thermodynamic Formulation of Economics" chapter, discusses "economic pressure" in thermodynamic formula terms. [3] In 2013, Mimkes together with physicists Peter Richmond and Stefan Hutzler formulated a version of "economic pressure" in a quasi-thermodynamic equation framework. [4]

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External links

â— Economic pressure – BusinessDictionary.com.

θΔics

In economic thermodynamics, an **economic system** is boundaried system comprised of producers, consumers, and markets, studied or modeled from an open, closed, or isolated perspective. [1] Economic systems tend to be studied from a statistical thermodynamics point of view, wherein the Boltzmann equation, $S = k \ln W$, tends to be employed, and efforts are made to find a type of "global energy" function, similar to internal energy. [2]

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Further reading

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θΔics

In economic thermodynamics, **economic temperature** is the extrapolation of the definition of temperature to economic systems and processes.

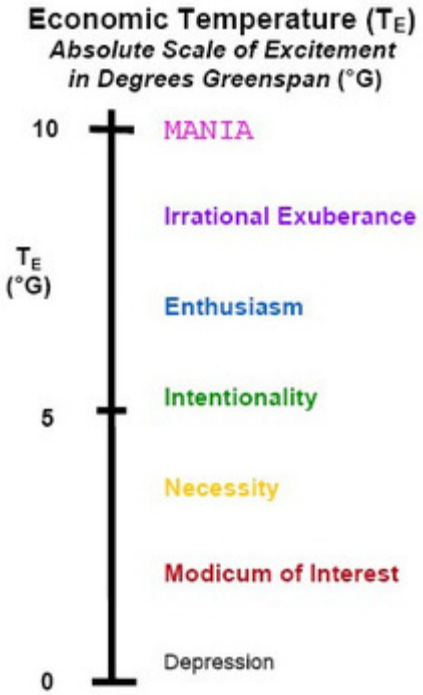

Economic temperature scale (in degrees Greenspan) as defined in 2009 by Americans engineer Arthur Jonath and psychologist Richard Goldwater.

Overview

In 1995, Italian economist Emanuele Sella was using the term "economic temperature". [1] In Sella's model, in his research on the effects of spreading of competition, he strove to find a generic measure of "economic conditions" and "value" in place of the standard economic units of money, work, grain, land, and utility, commonly used by economists. In this direction, Sella adopted what he called "an ideal measurement, in terms of *economic temperature*", using the following two postulates:

1. Each organism has its own thermoeconomic degree comparable to that of any other organism in time and space; this property of the organism is defined as economic temperature.
2. The economic temperature of an organism depends on the means which it possess (or, in a certain sense, its 'wealth'); on its capacity to absorb these means (that is to say, in a certain sense, on its 'need for wealth').

In using these postulates, Sella intends to supersede the problem of the measurement of value: "it is clear … that one can appreciate the economic temperature of an organism also as a specific value of this organism". He suggests, however, that "it is advisable not to utilize the term *value*, which is too closely linked to statics." [1]

In 1997, Sergei Darda, in his "Entropy and Economy", offered new definition of economic temperature, applying the concept to work of a business that generates income by producing and selling some products or services, wherein economic temperature defined as equilibrium cost and equilibrium price for producing and selling a product or a service. [3]

In 2009, Americans engineer Arthur Jonath and psychologist Richard Goldwater developed a crude economic temperature scale in what they called 'degrees Greenspan', named after former federal reserve chairman Alan Greenspan who described the dot com era as being in a state of 'irrational exuberance (or 7ËšG). [2] The reason that just as heat excites molecules, increasing pressure in a container, so to will desire heat up people, and put pressure on behavior.

See also

â— Financial temperature

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3. Sergei Darda. (1997). "Entropy and Economy", EconomicEntropy.com.

θΔics

In human thermodynamics, **economic thermodynamics** is the thermodynamic study of the process by which a country's money and goods are produced and used. [1]

Overview

In 1926, English radiochemist Frederick Soddy's published his famous *Virtual Wealth and Debt* on thermodynamics in the economic sense.

In the study of thermoeconomics economists use the laws of thermodynamics such as Clausius' entropy, or the principles of nonequilibrium thermodynamics, such as Prigogine's dissipative structures theory for the modeling of the activity and forcast of economies. Synonyms include eco-thermodynamics and thermoeconomics.

In a general sense, the argument exists that the science of economic thermodynamics began following the publication of English-born American economist Kenneth Boulding's famous 1966 article "The Economics of the Coming Spaceship Earth" in conjunction with Romanian mathematician Nicholas Georgescu-Roegen's 1971 book *The Entropy Law and the Economic Process*, after which economists became interested in the subject. [11]

In 1989, American economists Daniel Underwood and Paul King stated the connection between thermodynamics and economics as: [12]

> "The fact that there are no known exceptions to the laws of **thermodynamics** should be incorporated into the axiomatic foundation of **economics**."

In 1990, German theoretical ecologist Bengt Mansson wrote out a standard chapter on economic and thermodynamics in the seven-part textbook series on thermodynamics edited by American chemical thermodynamicist Ali Mansoori. [14]

Likewise, in 2008 by American physical chemist Thomas Wallace argues: [13]

> "If **economics** is to be considered as a science-based discipline, the principles of physical science, including the laws of **thermodynamics**, must be appropriately applied."

In 2011, German physicist Reiner Kummel, in his *The Second Law of Economics: Energy, Entropy, and the Origins of Wealth*, argued that we need to begin to incorporate energy and entropy thinking into economics; his general derivation and presentation was incorrigible, novice, and essentially baseless. [15]

Related terms

A related term is "biophysical economics" coined by Austrian-born American mathematician and physical chemist Alfred Lotka in 1925 used to signify the application of biological and physical principles to aid economic analysis. [4]

The related term "bioeconomics" refers to the study of how organisms of all kinds earn their living in nature's economy, with particular emphasis on co-operative interactions and the progressive elaboration of the division of labor. [6] Today, the term is used in various ways, from Georgescu-Roegen's thermodynamic analyses to the work in ecological economics on the problems of fisheries management. [7]

The term "econophysics", described as the use of statistical mechanics to solve problems in economics, was coined by H. E. Stanley in the mid 90's, to describe the large number of papers written by physicists in the problems of (stock) markets, and first appeared in a conference on statistical physics in Calcutta in 1995.

Objections

Although most scientists agree that all physical processes abide by the laws of thermodynamics, there are many

economists and physicists that maintain that the economy is exempt from these laws. In 1972, American economist Paul Samuelson, who earlier in his career was an avid user of thermodynamic analogies, asserted that: [10]

> "The sign of a half-baked speculator in the social sciences is his search for something in the social system that corresponds to the physicist's notion of entropy."

In 2003, American physicist Joseph McCauley argued that "real financial markets cannot behave thermodynamically" because "financial markets are unstable, they do not approach statistical equilibrium, nor are there any available topological invariants on which to base a purely formal statistical mechanics." [9]

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External links

● Thermodynamicsociety.org - a small discussion forum on the relation between physics and economics.
● Energy, Entropy, Economics, and Ecology (a list of related excerpts, articles, and books).
● Thermodynamics and Economic Activity – Eileen O. van Ravenswaay, Michigan State University, 1998.

θΔics

In HT pioneers, the **economic thermodynamics pioneers** page is a file-tree header for grouping individuals, some ordered in the dropbox to the left, in the category of pioneers of economic thermodynamics.

Economic thermodynamicists

The following are some of the noted individuals to have contributed either ideas, theories and concepts in economic thermodynamics or on connections between economics and thermodynamics:

1. Hermann Gossen (1853) - speculated on human energies in the context economic exchange.
2. Sergei Podolinsky (1880) - scrutinized the economic process from a thermodynamic perspective.
3. Friedrich Engels (1881) - argued that it is totally impossible to express economics in physical terms.
4. Carl Neumann (c.1880s) - argued that all economic life could be expressed by an exchange of energy.
5. Emanuele Sella (1910) - outlined "economic temperature", entropy, and specific heat of economic systems.
6. Frederick Soddy (1922) - outlined his views on wealth, energy, economics, and thermodynamics.
7. Jacques Rueff (1922) - argued that thermodynamics could be applied to economics.
8. Harold Davis (1941) - coined the term "economic entropy".
9. Kenneth Boulding (1966) - coined the term "material entropy".
10. Nicholas Georgescu-Roegen (1971) - developed a rudimentary second law theory of economic process.
11. Lev Rozonoer (1973) - discussed economics and resource allocation via thermodynamic analogies.
12. John Bryant (1974) – synthesized thermodynamic theories of economics.
13. Herman Daly (1977) - outlines a theory on laws of thermodynamics in relation to a steady-state economy.
14. George Gilder (1981) - argues that Shannon information theory reconciles evolution, economics, and growth.
15. Xenophon Zolotas (1981) - outlined his view that the entropy law governs economic growth.
16. Julian Simon (1981) - argued that the second law is irrelevant to long term continual growth of human welfare.
17. Malte Faber (1983) - began applying and using entropy in economics and sociology.
18. Thomas DeGregori (1986) - published “Technology and Negative Entropy” on resources and states of entropy.
19. Juan Martinez-Alier (1987) - wrote on thermodynamics and ecological economics.
20. Bela Lukacs (1989) - articles and lectures on using thermodynamics and economics.
21. Philip Mirowski (1989) - outlined a dismal view of the use of thermodynamics in economics.
22. Matthias Ruth (1992) - PhD dissertation on a synthesis of economics, ecology, and thermodynamics.
23. James Reiss (1994) - wrote a chapter on comparative thermodynamics in economics.
24. Jürgen Mimkes (1995) - formulated various economic and sociological thermodynamic theories.
25. Stefan Baumgärtner (1996) - furthered thermodynamic investigations in ecological economics.
26. Kozo Mayumi (1997) - applied entropy in ecological economics.
27. Michael Macrakis (1997) - developed a thermodynamic theory of capital.
28. Bernard Beaudreau (1998) - has views on physics and thermodynamics terms applied to economic theory.
29. Wayne Saslow (1999) - developed a analogy formulations of temperature, entropy, free energy, etc. of economic systems.
30. Philip Parker (2000) - situated the conception of "physioeconomics" to explain the equatorial paradox.
31. Jing Chen (2002) - outlined an analytical economic thermodynamic information theory.
32. Dimitris Keranis (2005) - outlined a Gibbs free energy economic theory.
33. Eric Beinhocker (2006) - outlined a Georgescu-Roegen based entropy-irreversbility-fitness theory of wealth.
34. Octavian Ksenzhek (2007) - proposed a economic thermodynamics energy-entropy view of virtual money.
35. Arthur Jonath (2009) - developed a thermoeconomic theory.

Note this is only a partial listing, tallied up until early 2010; after which newer finds have been added to the HT pioneers page, listed chronologically as indicated by the dollars sign icon.

θΔics

In science, **economics** is the study of they wealth as what is produced by humans in order to maintain their existences. [1]

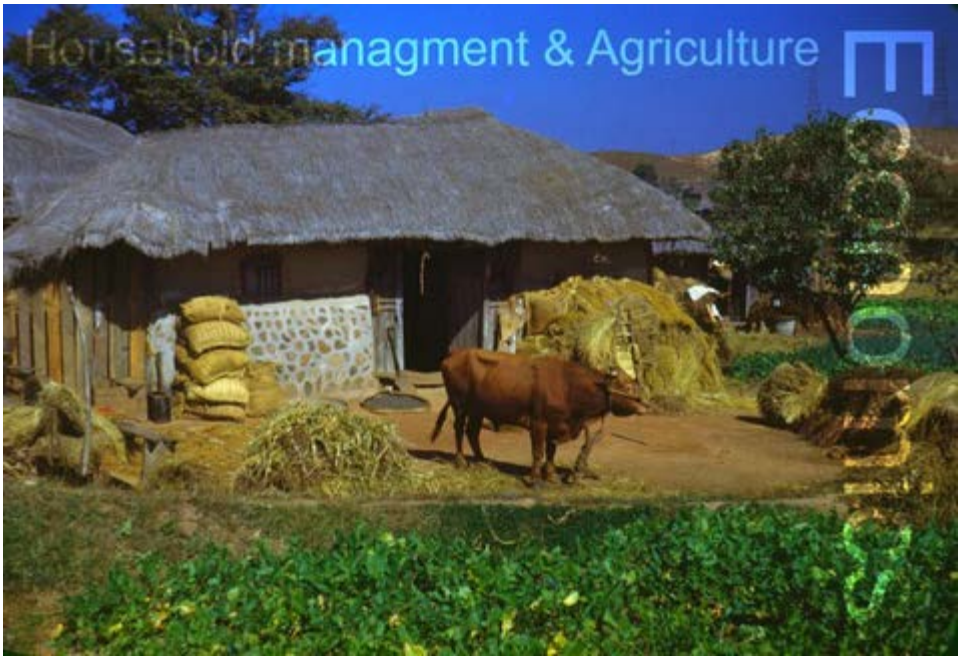

The original definition of "**economics**" meaning "household management and agriculture", from a 362BC book Xenophon, student Socrates; the modern meaning, supposedly, is the basic model, albeit scaled up to the city-state and or country level.

Overview

The term "economics" means “household management and agriculture”, deriving from the title of a 362BC book by that name by Xenophon, student of Socrates, becoming in 1792 synonymous with the “science of wealth”, some of which molded historically into the physiocracy ideas of Francois Quesnay.

The founders of "classical economics", according to Wassily Leontief (1982), are: Adam Smith, David Ricardo, Thomas Malthus, and John Mill.

The founders of "neoclassical economics" are: Leon Walrus and Vilfredo Pareto and their "general equilibrium theory", which, in the 1980s, according to Leontief, constituted the "core of undergraduate and graduate instruction" in America. [3]

Thermodynamics

The study of economics, in thermodynamics, is called "economic thermodynamics" or in some cases thermoeconomics.

Econophysics

See main: Econophysics

The use of physics in economics is called econophysics.

See also

â— Greatest economist ever

Quotes

The following are related quotes:

> “Laplace is reputed to have said: ‘give me the equations of motion and I will show you the future of the universe’. Likewise, economists studying the evolution of a large general equilibrium system ask only for the equation of motion in order to bring their work to completion.”
>
> — Edwin Burmeister and Rodney Dobell (1970), *Mathematical Theories of Economic Growth* [2]

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External links

â— Economics – Wikipedia.

θΔics

In economics, **econophysics**, which can be compared to: biophysical economics, physical economics, physico-economics, mathematical economics (or physicochemical economics), among other related near-synonyms (see: two cultures namesakes), is the subject of applying concepts of physics, such as statistical mechanics, power laws, ising models, etc., to problems in economics and markets.

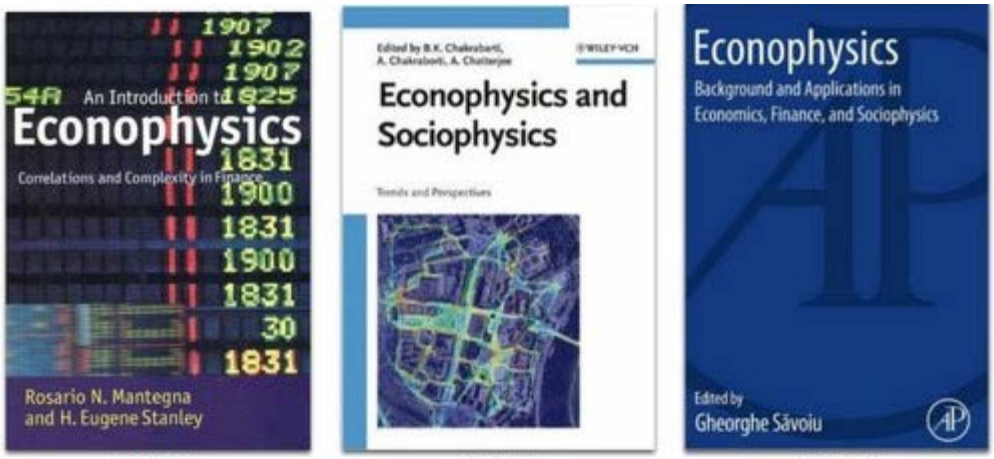

(2000) (2006) (2012)

Noted books in **econophysics**: the 2000 *Econophysics: Correlations and Complexity in Finance*, by Rosario Mantegna and Eugene Stanley, the 2006 *Econophysics and* Sociophysics, with chapters by German physicist Jurgen Mimkes, e.g. "A Thermodynamic Formulation of Social Science", and the 2012 *Econophysics*, with an end chapter by Romanians economist and econophysicist Gheorghe Savoiu and physicist and sociophysicist Ion Siman's entitled "Sociophysics: A New Science or a New Domain for Physicists in a Modern University", both outline the newly growing science of sociophysics. [8]

Etymology

Historically, physics-based economics models began to arise, predominately, in the late 19th century, particularly via the Lausanne school of physical economics, Leon Winiarski's social mechanics based political economics school, at the University of Geneva, among others (see: HP pioneers; schools).

In 1958, an American scientist (Ñº) was using the term econophysics as follows:

> "The author advances the theory termed '**econophysics**' in which the economy of a nation is based on the 'quantum unit' dollars."

In 1991, in Turkey, the first PhD dissertation in the field of econophysics was completed by Necip CakÄ±r at the University of Bogazici, Istanbul, as published in the 1998 book *Physics and Economics*. [4] Cakir currently is a professor of economics and deputy dean at the University of Bahcesehir. [5]

In 1995, American physicist Eugene Stanley, at the second Statphys-Kolkata conference in Kolkata (formerly Calcutta), India, was using term "econophysics" to describe the large number of papers written by physicists in the problems of stock markets. [1] In the paper presented at the meeting, Stanley argued that: [12]

> "Behavior of large numbers of humans (as measured, e.g. by economic indices) might conform to analogs of the scaling laws that have proved useful in describing systems composed of large numbers of inanimate objects."

In 2011, Taiwanese economists Shu-Heng Chen and Sai Ping Li, in their "Econophysics: Bridges over a Turbulent Current", argued that economics and physics were two shores of a turbulent river: [19]

> "Despite their very different ages, physics and economics have been developed and extended along the two sides of the same river for a long time. Crossing the river signifies the eï¬€orts made to connect the side of

physics with the side of economics, or more generally, the side of the natural sciences and the side of the social sciences."

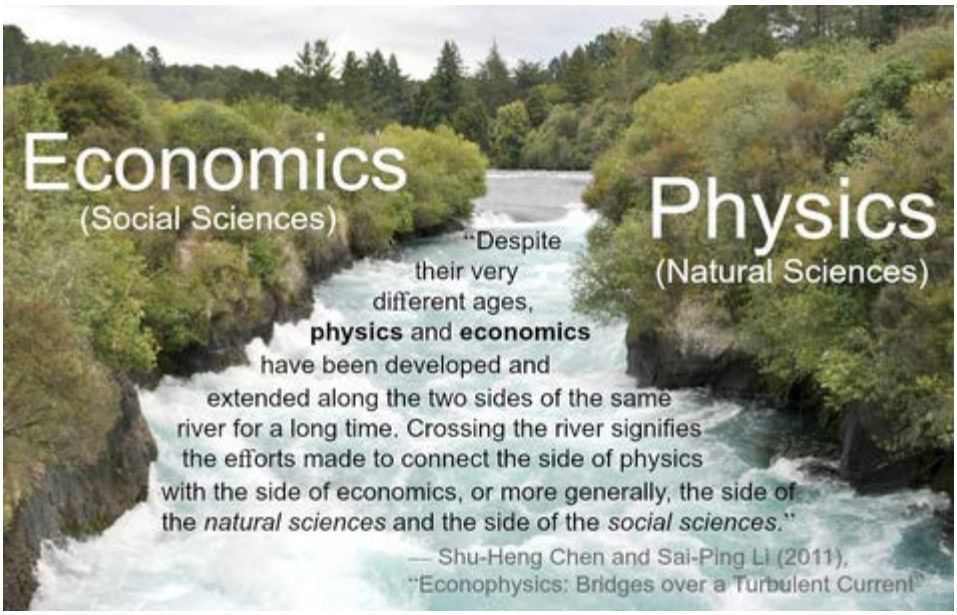

Taiwanese economists Shu-Heng Chen and Sai Ping Li's 2011 take on **econophysics** in modern and historical retrospect (see also: Map of Physics). [19]

More than one century ago, crossing the river had already started, but over the years, particularly in recent years, the scale and organization of the crossings have changed, from individuals to communities and from traveling to immigrating. To facilitate such a massive crossing, bridges have also been built over the river. The academic community currently known as econophysics can be regarded as an emerging society after these crossings and the ensuring immigration. All organized conferences and journals (publications) related to this community are bridges."

Here, we might like to compare the unbridgeable gap views.

They then attempting to differentiate, per citation to Bertrand Roehner (2002), between "classical econophysics", i.e. pre Eugene Stanley (1995) term usage, and "modern econophysics", 1996 to present; the division of which seems to be evidenced by the following 2013 econophysics histogram: (Ñº)

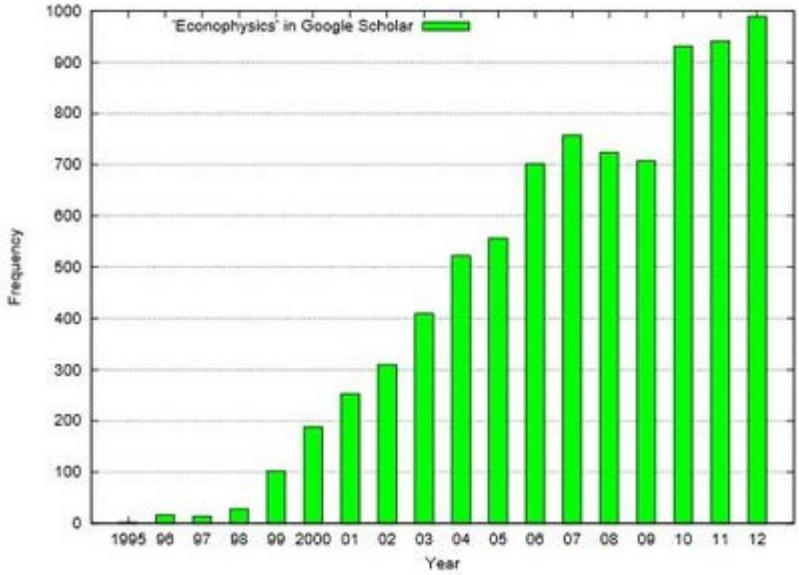

One of the modern problems, to note, is that approximately 95 percent of these thousands per year "econophysics" scholarly term usages, is that these are not physics of economics proper, e.g. of the type Paul Samuelson was taught, applications, but rather Sokalism-style mathematical toolism running on a thin veneer of physics paint, i.e. there is no F = ma involved in the majority of these newer formulations.

Capelin | Publishing house

Editor Simon Capelin, the physics section editor of Cambridge University Press was an early facilitator of econophysics; the following quotes attest to thos:

> "In 1995, Eugene Stanley coined the phrase 'econophysics' at a meeting in India. At about the same time, Yi-Cheng Zhang and his group introduced the econophysics webpage: unifr.ch/econophysics. **Simon Capelin** at Cambridge University Press led the charge by publishing Stanley's and other econophysics books. His program there is still strong. Sadly, econophysics, like nonlinear dynamics, was never recognized by the APS as part of physics. American physics prefers (nonfalsifiable) string theory to falsifiable approaches to social problems. My university offers one of the only econophysics PhD programs in the world."
>
> — Joseph McCauley (2008), "Emergence of Finance Theory and Econophysics" [16]

> "Through its physics publishing director, **Simon Capelin**, Cambridge University Press played a pioneering role in the development of econophysics."
>
> — Bernard Roehner (2007), *Driving Forces in Physical, Biological and Socio-Economic Phenomena* [17]

(add discussion)

Physics-less econophysics?

There is a blurry unspoken divide in papers and books categorized under the umbrella term "econophysics" between those authors who base their economic formulations and theories on physical principles, e.g. Emanuele Sella (1910), and those who base their economic formulations and theories NOT on physical principles, but simply use equations of physics, in a mathematical isomorphism sense, aka toolism, to solve problems or speculate on things, e.g. Eugene Stanley. The same problem, to note, resides in sociophysics, between those who use NO actual physics in their formulations, e.g. Serge Galam, and those who do, e.g. Jurgen Mimkes.

Nearly all post 1996 econophysics papers are in alignment with the comment that American physicist Eugene Stanley coined the term "econophysics" at the 1995 second Statphys-Kolkata conference. Beyond this, however, perspective seems to diverge into two schools of thought, the first group of which, representative of the what might be called the "Stanley school" applies statistical physics methods, tools, and equations to peripheral aspects and markers, such as finance and market indices, but NOT to humans themselves. This point of view is summarized by Victor Yakovenko and Barkley Rosser in 2009 as follows: [13]

> "**Econophysics** does NOT literally apply laws of physics, such as Newton's laws or quantum mechanics, to humans. It uses mathematical methods developed in statistic physics to study statistical properties of complex economic systems consisting of a large number of humans."

This might well be called the "conform to analogs" view, wherein one may study a peripheral aspect of humans such as "money" or a stock price using, for instance, the conservation of energy or statistical mechanics, but speculations laws of physics applied to humans themselves are skirted around.

In 2011, American physicist Joseph McCauley, noted for his 1999-present work in attempting to falsify invisible hand based stable equilibrium theory, head of UC Houston "econophysics department", one of the big three American schools of econophysics, gave his opinion that none of the following are econophysicists:

Thims' 2011 List of Greatest Econophysicists

1. Léon Winiarski (1894) – explains socioeconomics via Clausius and Lagrange.

2. Thomas Hobbes (1651) – uses mechanics to explain society.
3. Dimitris Keranis (2005) – argues that the Gibbs function governs economic activity.
4. Emanuele Sella (1910) – was one of the first to discuss economic temperature via Clausius.
5. Julius Davidson (1919) – argues that economics activity is an equilibrium adjusting reaction.
6. Frederick Soddy (1911) – gave Clausius-based Cartesian economics lectures.
7. Thomas Wallace (2009) – outlines a mechanistic-thermodynamics based socioeconomics.
8. Nicholas Georgescu (1966) – outlines a free energy/bound energy material resource theory.
9. Philip Mirowski (1984) – a very critical physical economics historian.
10. Philip Ball (2001) – is a modern citation linchpin of social physics and econophysics.

"There are no econophysicists in that list."

— Joseph McCauley (2011), Econophysics Forum thread comment [14]

(add discussion)

At this point there seems to be some terminology confusion? If someone who writes an article entitled "One of the Physical Foundations of Economics", such as American economist Julius Davidson, is not writing in the field of "econophysics", as McCauley sees things, than what field of science is he or she writing in? Possibly, we might well label Davidson as a "physical economist" working in the field of "physical economics", but whatever the case this seems to be a semantic issue in need of reconciliation. If McCauley defines econophysics as the physics of finance, then he should rename his department as "financial physics" in the same manner as the field of financial thermodynamics is defined as the thermodynamics of finance.

The alternative school of thought view, one which generally tends to cull from theorists that predate the 1995 Stanley usage of the term econophysics, is that wherein physics concepts and laws are applied to the study of the economic world AND to humans under the assumption that humans behave like particles, electrons, atoms, or molecules. Romanian socioeconomic physicists Gheorghe Savoiu and Ion Siman summarize their perspective of the econophysics as follows: [4]

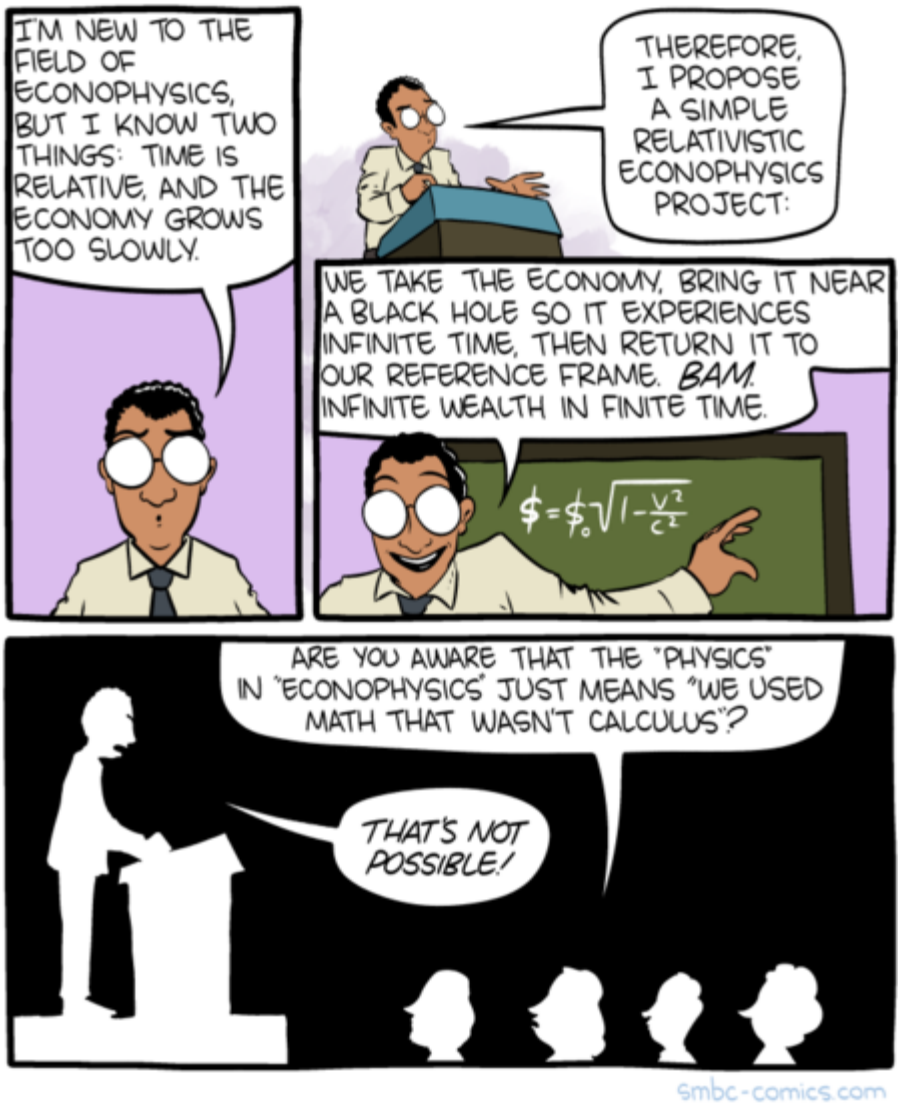

A 2017 econophysics cartoon. (Ñº)

"**Econophysics** was from the beginning the application of the principles of physics

to the study of financial markets, under the hypothesis that economic world behaves like a collection of electrons or a group of water molecules that interact with each other, and the econophysicists are always considered that, with new tools of statistical physics, and the recent breakthroughs in understanding chaotic systems, they are making a controversial start at tearing up some perplexing economics and reducing them to a few elegant general principles with the help of some serious mathematics borrowed from the study of disordered materials."

(add)

Econo-thermodynamics

The subject of econophysics, as defined by Stanley, in a 2000 article co-written with Italian econophysicist Rosario Mantegna, to note, seems to make little use of thermodynamics. [2]

In 2000, Russian-born American physicist Victor Yakovenko began promoting econophysics, using thermodynamics, in some sense, about America.

Others, such as Jurgen Minkes, incorporate a good deal of thermodynamics in their version of "econophysics". [3]

In 2006, German solid-state physicist Jurgen Mimkes presented at on of the first focus sessions hosted by the American Physical Society: [9]

> "Physicists often model economic interactions like collisions of atoms in gases: by interaction one agent gains, the other loses. This leads to a Boltzmann distribution of capital, which has been observed in wealth distributions of different countries. However, economists object: no economic agent will attend a market in which he gets robbed! This conflict may be resolved by writing basic laws of economics into terms of calculus. In these terms the daily struggle for survival of all economic systems turns out to be a Carnot cycle that is driven by energy: heat pumps and economic production depend on oil, GNP and oil consumption run parallel for all countries. Motors and markets are based on the same laws of calculus (macro-economics) and statistics (micro-economics). Economic interactions mean exploiting a third party (nature) and are indeed close to robbing! A baker sells bread to his customers, but the flour comes from nature. Banks sells loans to investors, but the money comes from savers. Econo-thermodynamics is a thrilling new interdisciplinary field."

In 2009, philosopher Michael Mannino, in his article "Econophysics: A New Paradigm", traces the subject of econophysics back to Adam Smith's view that Newtonian mechanics and classical physics are the model for all social and economic phenomena. [6]

American econophysics schools

See main: American school of econophysics

In the 2000s, fledgling econophysics schools and or groups began to emerge at the UC Davis (person, date), University of Maryland (Victor Yakovenko, c.2000),

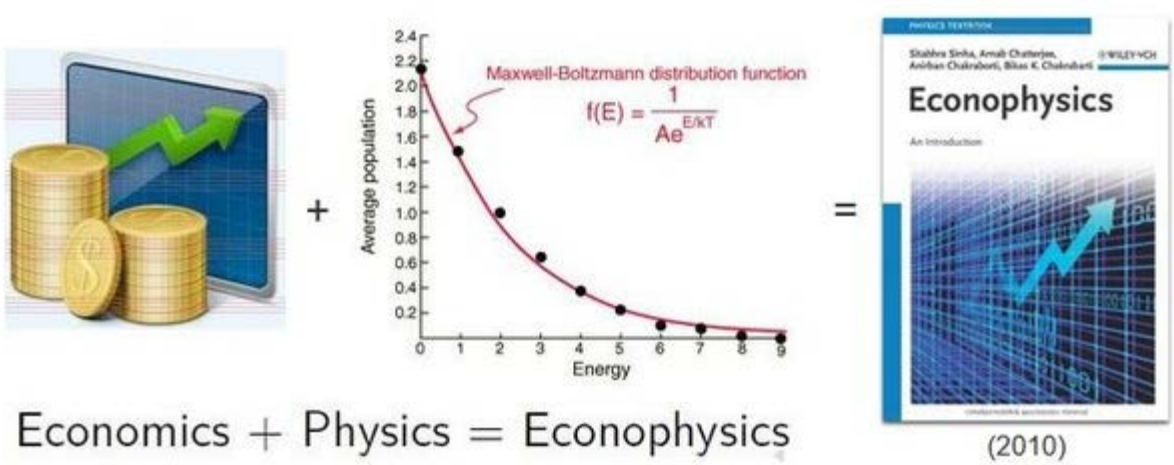

Above: German econophysics PhD German Lars Seemann's 2011 power point style definition of **econophysics**, a

where the Maxwell-Boltzmann distribution is used, and University of Houston (Joseph McCauley, c. 2005).

student at the University of Houston's econophysics program since 2007, which he defines economics plus physics. [7] Right: the 2010 *Econophysics: an Introduction* by Sitabhra Sinha, Arnab Chatterjee, Anirban Chakraborti, and Bikas Chakrabarti. [11]

A 2013 **econophysics** course (physics 250) at UC Davis entitled "Econophysics: the Statistical Physics of Financial Markets" taught by geophysicist John Rundle, based primarily on Rosario Mantegna and Eugene Stanley's 2001 An Introduction to Econophysics; along with some earlier work by German physicist Dietrich Stauffer [10]

Synonyms

In the Minkes' version of econophysics, synonyms would include: thermoeconomics and economic thermodynamics. Of these terms, only "economic thermodynamics" clearly embodies the specific meaning: the study of economic systems or economic processes using thermodynamics; whereas thermoeconomics can sometimes be found used in the sense of: the economics of specific industrial or factory processes, e.g. the monetary factors involved in methane production (i.e. a subject having nothing to do with people); and per above, econophysics, can often not employ thermodynamics logic at all. Another term is Philip Parker's 2000 term "physioeconomics", a mixture of physiology, neuroanatomy, physics, thermodynamics (a bit), and economics.

Quotes

The following are related quotes:

> “I seek general analogies between economics and physics.”
>
> — Ragnar Frisch (c.1930) (Ñº)

> “I believe that economic laws can be formulated similar to the laws in thermodynamics.”
>
> — Michael Kalecki (c.1950) (Ñº)

> “I believe that microscopic market simulations have an important role to play in economics and ï¬ nance. If it takes people from outside economics and ï¬ nance – perhaps physicists – to demonstrate this role it won’t be for the ï¬ rst time that outsiders have made substantial contribution to these ï¬ elds.”
>
> — Harry Markowitz (c.1998), comment on draft of chapter “Microscopic Market Simulations” by Dietrich Stauffer et al [18]

> “**Econophysics** is still unrecognized as science by the American Physical Society.”
>
> — Joseph McCauley (2009), *Dynamics of Markets* [8]

> “My background is physics and solid-state thermodynamics. My present field is ‘physical economics’, especially macro and microeconomics, and finance. My time invested in this interdisciplinary work is 100%. I have trouble calling my field ‘**econophysics**’, as this only covers finance.”
>
> — Jurgen Mimkes (2019), “Answer to Question #1”; cited by Kishore Dash (2019) in *The Story of Econophysics* (pg. 182)

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Further reading

â— Shea, Christopher. (2005). "Econophysics", *New York Times*, Dec 11.

External links

â— Econophysics – Wikipedia.
â— EconoPhysics Forum – University of Fribourg, Switzerland.

θΔics

In journals, ***Econophysics, Sociophysics, and Multidisciplinary Sciences Journal*** (ESMSJ) is a 2011-launched Romanian-based journal focused on the newly-developing sciences of: econophysics, sociophysics, and other multidisciplinarity and or interdisciplinarity amalgam fields, such as socio-thermodynamics, or econo-thermodynamics, among others.

Journal cover

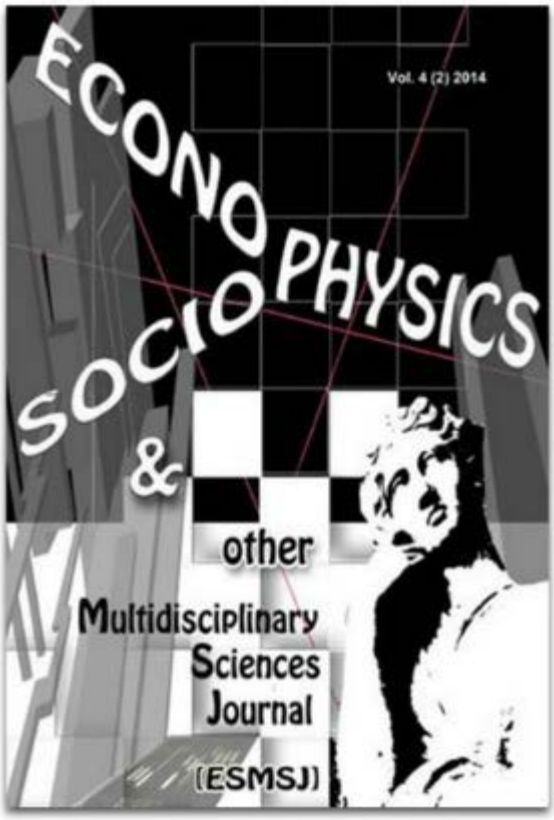

Journal details

Abbreviation	ESMSJ
Disciplines	Econophysics, sociophysics, econo-thermodynamics, socio-thermodynamics, physicochemical humanities, and interdisciplinarity
Language	English
Publisher	University of Pitesti, Romania
History	2011-present
Reviewers	Gheorghe Savoiu, Ion Siman (O)
Frequency	Yearly
Access	Open
ISSN	2247 - 2479
ISSN L	2247 - 2479
Format	PDF
Cost	Fee = $0, submission or access
Link	Homepage

See also

- Journal of Human Thermodynamics
- Romanian school of physical socioeconomics
- University of Pitesti Econophysics and Sociophysics Workshop 2013

References

1. ESMJS (home) – UPIT.ro.

θΔics

In existographies, **Ecphantus** (c.530-460BC) (IQ:175|#225) was a Greek physicist, astronomer, and philosopher, supposedly a Pythagorean, noted for his earth-as-wheel rotation theory (compare: Heraclides), for some type of early atomic theory, wherein he employed a motive force in addition to atoms and void, and declared that monads of Pythagoras were corporeal; first-slating: 175|#225 (Jan 2019).

Quotes | On

The following are quotes on Ecphantus:

> "Anaximander stated that the earth was like a column, Leucippus, a cylinder or war drum; Cleanthes, a cone or top; Heraclitus, a boat-shaped vessel; Democritus, a concave disc; Anaximenes and Empedocles, etc., a level table. Thereafter, Parmenides and Epicurus came nearer actual fact, as did Heraclitus, Ponticus, and **Ecphantus**. The former believed that the earth was round like a ball, while the latter not only attributed the shape of a sphere to the earth, but also some movement, albeit not such that it could move forward and change place, however, as a wheel does."
> — Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* [1]

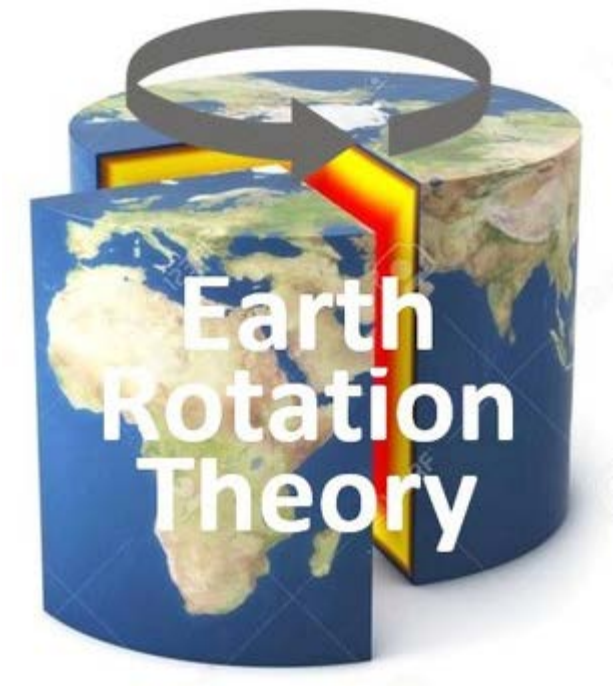

A mock diagram of **Ecphantus**' earth rotation theory, according to which the earth rotates like a wagon wheel, and this explains the apparent motion of the stars.

> "All authorities agree that Heraclides of Pontus affirmed the daily rotation of the earth about its own axis; but the *Doxographi* associate with this discovery another name, that of '**Ecphantus** the Pythagorean'. Thus, we are told of Ecphantus that he asserted that 'the earth, being in the centre of the universe, moves about its own centre in an eastward direction' (Hippolytus, c.210). Again, 'Heraclides of Pontus and Ecphantus the Pythagorean make the earth move, not in the sense of translation, but by way of turning as on an axle, like a wheel, from west to east, about its own centre' (Aetius, c.100). Who then is this Ecphantus, described in another place in Aetius as Ecphantus the Syracusan, one of the Pythagoreans? His personality is even more of a mystery than that of Hicetas. The *Doxographi*, however, tell us of other doctrines of his; Hippolytus devotes a short paragraph to him, between paragraphs about Xenophanes and Hippo, which shows that Theophrastus must have spoken of him at length. Some of his views were quite original, particularly on the subject of atoms. Holding that the universe was made up of indivisible bodies separated by void, he was the first to declare that the monads of Pythagoras were corporeal; he attributed to the atoms, besides size and shape, a 'motive force' (δνυαμις); the atoms were moved, not by their weight or by percussion, but by a divine force which he called mind and soul. The universe was a type of this, and accordingly the divine motive force created it spherical."
>
> — Thomas Hearth (1913), *Aristarchus of Samos, the Ancient Copernicus* (pg. 251)

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External links

â— Ecphantus – Wikipedia.

θΔics

In science, **ectropy** is an entropy antonym, conceptualized by some as a synonym or derivative of negative entropy or negentropy, loosely defined as the effect of ordering or a hypothetical organizing force. [1] The term was coined in 1910 by German physicist Felix Auerbach. [2] In modern terms, ectropy has come to be defined as the ability of living systems to use the environmental substances, rich in easily released energy, to maintain a given level of entropy and even to lower it. [3] In mathematical thermodynamics, ectropy has come to be defined as a measure of the tendency of large-scale dynamical systems to do useful work and grow more organized. [4]

Overview

The seed of the term 'ectropy' originated in the 1900 book *Entropie der Keimsysteme und erbliche Entlastung* (*Entropy of Germ Systems and Hereditary Discharge*) by German writer Georg Hirth. [7]

French philosopher Henri Bergson used the term ectropy, in *circa* 1906, believing that life-phenomena were exceptions to “ectropy”, a kind of anti-entropy or chaos-to-order principle. [8]

Influenced by Hirth, in the 1910 book *Ektropismus oder die physikalische Theorie des Lebens* (*Ectropy and Physical Theory of Life*), German physicist Felix Auerbach is said to have coined the term, in a dominant sense, when he compared the entropy of inert matter to what he called the “ectropy” of living form, linking it to the evolution and development of life. [2]

The the English version of the term “ectropy” was first used in the 1947 Brussels symposium *Problemes de Philosophie des Sciences* (Problems of the Philosophy of Science) where, following a mention of Austrian physicist Erwin Schrödinger’s 1944 theory that metabolism is fundamentally neither an exchange of matter now of energy but of entropy, one of the group stated that “let us use the term ectropy for minus entropy”. [5] The term was soon used in a similar sense by many others in the years to follow.

In 1972, author Edward Haskell argued that the term ectropy was suggested by American philsopher Willard Quine in the 1969 *Twenty-first Anniversary Symposium of the Council for Unified Research and Education*. Specifically, Haskell stated that "this term was suggested by W. V. Quine in discussions following this symposium: *Entropy*, he pointed out, is Greek for *turning in*; the opposite term should therefore be the Greek for *turning out*, namely *ectropy*." [5] Likewise, in 2005, authors Haddad, Chellaboina, and Nersesov suggest that the word "ectropy" comes from the Greek word εκτροπη (εκ and τροπη) for outward transformation and that it is the literal antonym of entropy (εν and τροπη) signifying an inward transformation. [6]

See also

â— Anti-entropy difficulties

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θΔics

In existographies, **Ed Stephan** (1939-2008) (CR:25) is an American sociologist noted, in sociological thermodynamics, for his 1977 to 1995 in attempt to formulate, with chemist George Gerhold and physicist Louis Barrett, a physics and chemistry based model of sociology and demographics.

Overview

In 1975, Stephen, on a one-page scratch paper, developed some type of logarithmic based "time-minimization explanation for the -2/3 size density slop" (O), for social populations; which was published in the Apr 1977 issue of *Science*. (O)

In 1977, Stephan began to make efforts to understand population distributions via physics, when after giving a talk about his research on size density to members of the science department of Western Washington University, the physics department chairman Louis Barrett began to discuss with him ideas on the physics behind the forces shaping populations, speculating on questions, such as: 'whether humans were fermions or bosons', later giving Stephan a copy of Arthur Beiser's textbook *Concepts of Modern Physics*, to pursue the study further.

In 1980, Stephen and American chemist George Gerhold began to ponder how the Gibbs fundamental equation, of the form: [1]

$$E = ST - pV + \mu N$$

where E is the energy, S the entropy, p the pressure, V the volume, μ the chemical potential, and N the number of particles of the system, applies to sociological systems of people. Some of the questions they speculated at include: [2]

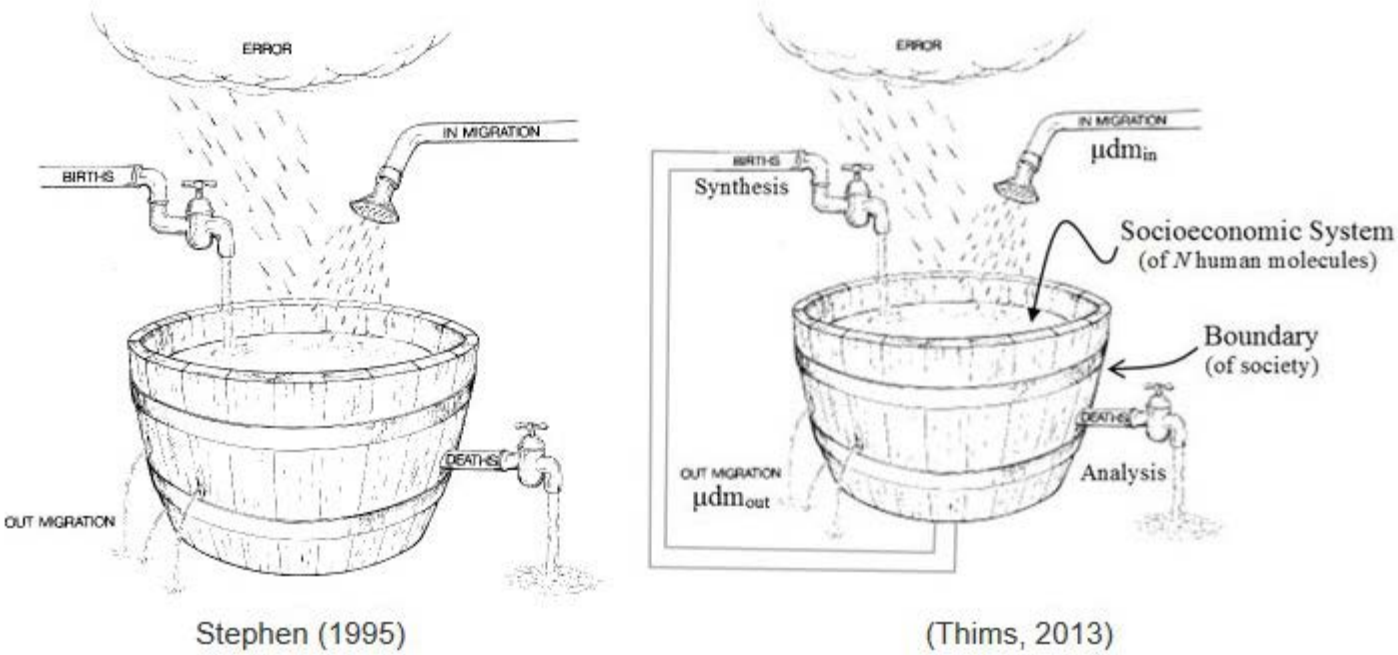

A depiction of Stephan social system (1995), drawn by Allan Parker; shown also with further annotation by Libb Thims (2013).

> "What is the total time in a social system? At the level of particles, temperature is just velocity of movement. I sense an analogy between temperature in physical systems and the technology of transportation and communication in social systems. Modern societies are 'hotter'. Big cities (high

interactance centers) are 'hot': People, commodities and ideas move around faster. 'Hot' regions subdivide territory more thoroughly than 'cool' ones.

And what is *entropy* — unpredictability? is that what we call freedom? What is the social equivalent of the product entropy-times-temperature? Freedom of movement? What do *pressure* and *volume* suggest, if anything?

Could the raw product kNT be given some sociological meaning? Do humans have something like *chemical potential*, some sort of (bonding) potential? Maybe the last two terms in could be combined into something with a meaning specific to sociology. Combining them into $-N(1 + \alpha)$, with N as a population — what would be the sociological significance of the factor $-(1 + \alpha)/\beta$? Could the value for β computed above in the case of urban population distributions ($\beta = 2v/x\mu$) have any application?"

In answer to some of these questions, he says that he didn't or doesn't know.

Shown adjacent, is Stephen's "DRL logo" drawn by Allan Parker, original drawing (left) also shown with added annotation by Libb Thims (2013), the barrel seeming to represent the "boundary" of Stephen's conceptualized social system: defined by births (synthesis), deaths (analysis), in migrations, and out migrations. [4]

In 1995, Stephan penned an online book *The Division of Territory in Society*, wherein he outlined the results of his sociophysics and physiochemical sociology investigations.

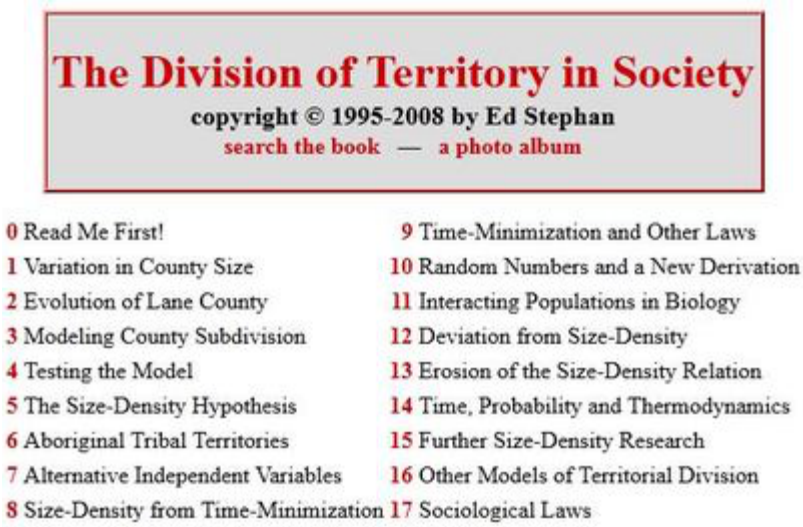

Contents of Stephen's 2008 "research opus" online book *The Division of Territory in Society*, the result of a prolonged research project that began with the initiation of his sociology doctoral dissertation work in 1968 at the University of Oregon, supposedly on some type of "time minimization" theory. [2]

Education

Stephan completed a certain amount of undergraduate work in chemistry at the University of San Francisco, California from 1957 to 1959, before switching over to political science, completing his BA in that subject in 1965 at San Francisco State University. Stephan completed his PhD in sociology at the University of Oregon in 1970. [2] He joined Western Washington University, during the course of which becoming chair of the sociology department, retired from the sociology department there in 2001.

See also

- Two cultures synergy

References

1. Desloge, Edward A. (1968). *Thermal Physics* (pg. 156). Holt, Rinehart and Winston.

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3. Ed Stephan – Curriculum Vitae.
4. (a) Photos – EdStephan.org.
(b) Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (video, 1:33-min) (article, 40-pgs) (PowerPoint, 36-slides), Key speaker talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29; in: *Econophysics, Sociophysics, and other Multidisciplinary Sciences Journal* (Q) (pdf), 3(2):5-25.

External links

- Stephan, Ed – WorldCat Identities.
- Ed Stephan (1939-2008) – Obituary, Western Washington University.

θΔics

In science, **Eddington rule** is the following logic:

> "If your theory does not conform to the second law, you will collapse in deepest humiliation."

This generally-accepted iron-clad guideline on how to classify pet theories and newly discovered experimental findings on whether the fledgling theory, observation, or finding is in agreement or not with the second law of thermodynamics. If the theory is not in agreement with the second law, it will have no choice but to collapse into the deepest of humiliation. This rule was stated by English astronomer Arthur Eddington in 1927 during his Gifford Lectures at the University of Edinburg as follows:

> "If someone points out to you that your pet theory of the universe is in disagreement with Maxwell's equations — then so much the worse for Maxwell's equations. If it is found to be contradicted by observation — well, these experimentalists do bungle things sometimes. But if your theory is found to be against the second law of thermodynamics I can give you no hope; there is nothing for it but to collapse in deepest humiliation."

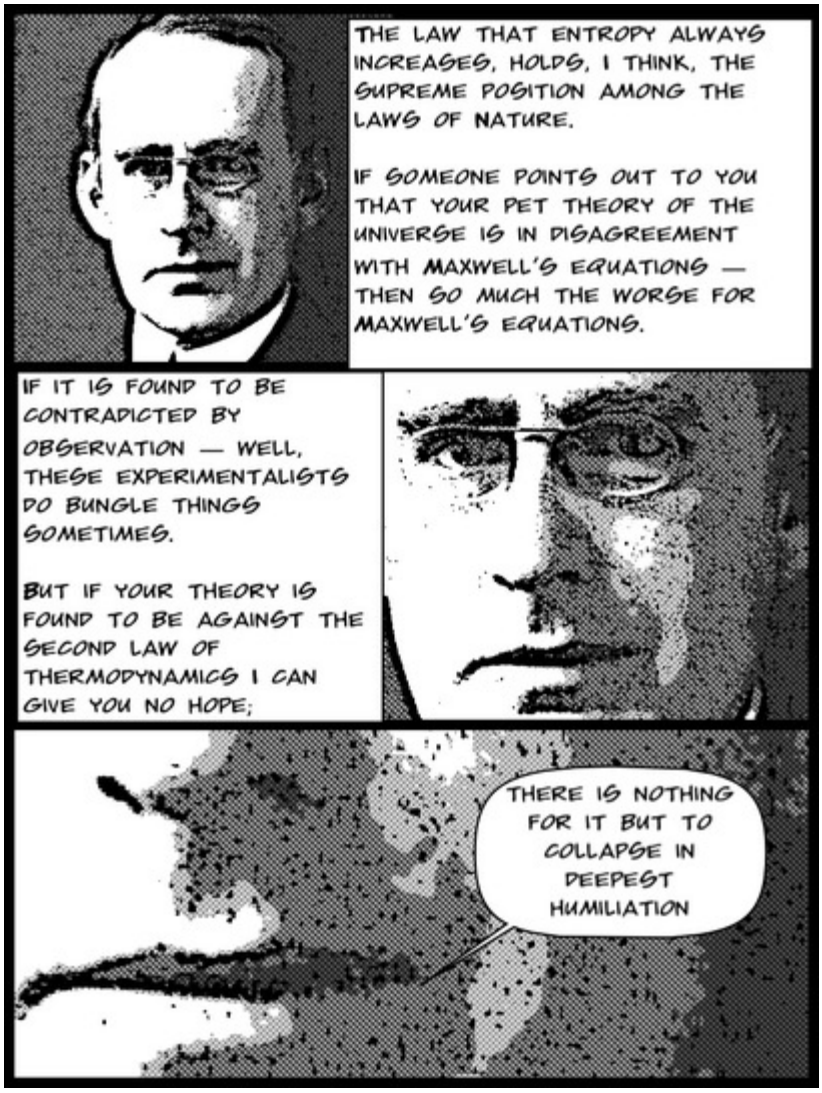

A 2012 image (O) of the **Eddington rule** of theories in science.

This quote was first published in Eddington's famous 1928 book *The Nature of the Physical World.* [1]

Black holes

One of the famous examples of the usages of this rule was the prediction of Hawking radiation by Stephen Hawking, when he found then-established experimental data and models of black holes that did not seem to agree with the second law. Sure enough, Hawking held-fast to an unwritten form of the Eddington rule, and sure-enough it paid off and radiation coming out of black holes was discovered.

Evolution

In grasping at attempt to reconcile evolution with entropy, there have been numerous attempts by lay-thermodynamicists, seemingly completely unaware of the Eddington rule, to formulate concepts that are said to be "counter to entropy" or run opposite to the second law, such as: anti-entropy, disentropic, ectropy, ektropy, entropy ethics, entropy reduction, entropy reversal, genetic entropy, gentropy, inverse entropy, local entropy decrease, entropy islands, low entropy, mental entropy, syntropy, syntropic, teleonomic entropy, genopsych, among others. To quote one example, representative of all of these, 'syntropic' is a term, conceived by Italian mathematician Luigi Fantappié, in the 1940s, is said to describe phenomena governed by a force, opposed to entropy, which attracts living systems towards higher levels of organization and order. All of these have resulted in humiliation and redicule.

References

1. (a) Eddington, Arthur S. (1928). *The Nature of the Physical World* (pg. 74). Cambridge: Cambridge University Press.

(b) Eddington, Arthur. (1927). *The Nature of the Physical World*: *Gifford Lectures of 1927, An Annotated Edition* (humiliation, pg. 84). Cambridge Scholars Publishing, 2014.

θΔics

In religio-mythology, **Eden**, the “Garden of Eden”, the four rivers of Eden, refers to the mythical location where, according to the Bible, as told in Genesis, god created Adam and Eve, man sinned, and where cast out of the garden.

“Therefore the Lord God sent him forth from the garden of Eden, to till the ground from whence he was taken.”
— Anon (c.500BC), *Bible* (Genesis 3:23)

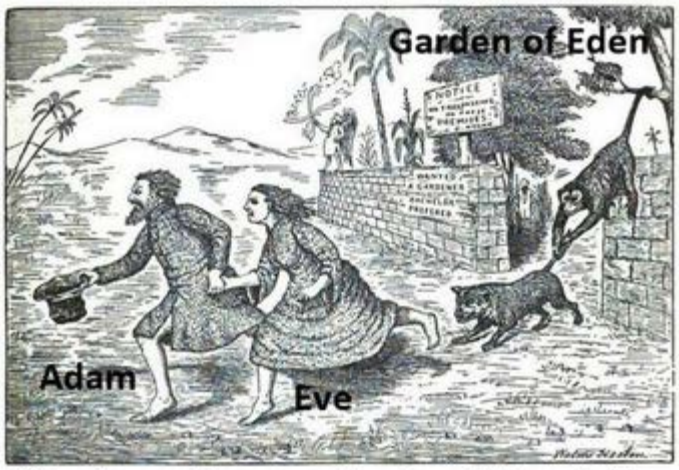

“So he drove out the man; and he placed at the east of the garden of Eden Cherubims, and a flaming sword which turned every way, to keep the way of the tree of life.”
— Anon (c.500BC), *Bible* (Genesis 3:24)

A depiction of **Eden**, Adam and Eve, and the "Garden of Eden" according to Watson Heston (1892).

Eating Knowledge

Gen 2.9 and 2.15-17, wherein we are told about Adam eating from the “tree of knowledge”, and therein becoming “like gods”, and therein knowing “good and evil”, is derived, in part, from the Unas Pyramid Texts (Q), the oldest known Pyramid Texts, the last king of the 5th dynasty (2498-2345BC) – which can be compared to the Teti Pyramid Texts (Q) (Q), the successor to Unas – wherein, according to the Gaston Maspero (1885) translation, cited and commented on by Wallis Budge (1904), who defines it as the "Heliopolitan recension", aka Heliopolis creation myth derivative, in the section titled “Unas: the Slayer and Eater of Gods”, we find the following: [1]

> “Unas, it is said, hath **eaten the "knowledge,"** 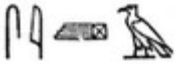 **of every god**, and the period of his life and his existence are merged into eternity and everlastingness, which he may pass in any way that pleaseth his spiritual body *(sdh)*, and during this existence he has no need whatsoever to do anything which is distasteful to him. Moreover, the soul[s] and spirits of the gods are in and with Unas, and their souls, and their shadows, and their divine forms are with him.”

(add discussion)

Four Rivers

In the four rives section, Genesis 2.10-14, we find reference to "four rivers" or a river going out of Eden with four heads.

In 2004, Ralph Ellis, in his *Eden in Egypt*, asserted (Q) that the river of Eden, described with four branches is the Nile River, with the Blue Nile and White Nile, being two branches, and two rivers of the Nile Delta being the other two branches. [2] Others (Q), similar to Ellis, have summarized this as follows:

> "The Nile starts its flow in the Ethiopian highlands. To many Ethiopians "Gihon" as they call the Nile is one of the **four rivers** that flowed out of **Eden** at the beginning of the World. It was the river mentioned in the Bible's Genesis. In ancient times, powerful Ethiopian kingdoms knew not where the river went exactly, just as the Egyptians knew not where it came from. There even was a great and powerful king named Gihon. The Ethiopians said the river had no resting place."

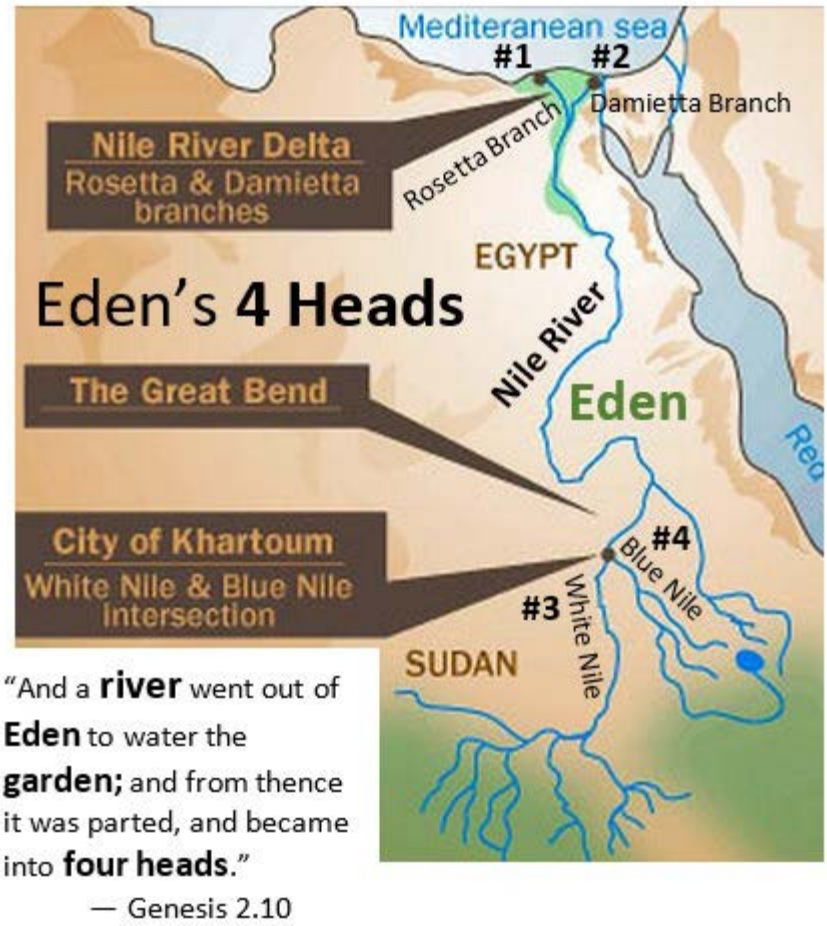

A visual showing the four river branches of the Nile River: 1. Rosetta Branch, 2. Damietta Branch, 3. White Nile, and 4. Blue Nile, which are the "four head" referred to in the Biblical story of the river coming out of the garden of Eden.

The Nile River, in short, is the famed "river" going out of Eden with four heads or branches.

Alternatively, we might see an attempt to morph or syncretize Heliopolis creation myth (3100BC), i.e. the flood myth of the Nile River, whose two major tributaries are the White Nile and Blue Nile, which discharges into the Nile Delta, and Sumerian creation myth (3,400BC), i.e. the flood myth of the Tigris river and Euphrates river, who merge to create the Shatt al-Arab river (Q), which discharges into the Persian Gulf; the gist of this four river, two myth syncretism is summarized as follows:

> "The Hebrew redactors used Egyptian myths to make the biblical stories; which, from time to time, had Babylonian myths grafted onto earlier texts or replaced portions of the original stories."
>
> — Gary Greenberg (2000), *101 Myths of the Bible* (pg. 7)

Or, as Thomas Paine, in his "Origin of Christianity" (1803), put things, Babylonian mythology was "fixed as a preface to the Bible after the Jews returned from captivity in Babylon".

Quotes | Related

The following are related quotes:

> "The Bible is not the 'word of god', but stolen from pagan sources. Its **Eden**, Adam and Eve were taken from the Babylonian account; its flood or deluge is but an epitome of some four hundred flood accounts; its

Ark and Ararat have their equivalents in a score of deluge myths; even the names of Noah's sons are copies, so also Isaac's sacrifice, Solomon's judgment, and Samson's pillar act; its Moses is fashioned after the Syrian Mises; its laws after Hammurabi's code. Its Messiah is derived from the Egyptian Mandi, Savior, certain verses are verbatim copies of Egyptian scriptures. Between Jesus and the Egyptian Horus, Gerald Massey found 137 similarities, and those between Christ and Krishna run into the hundreds. How then can the Bible be a revelation to the Jews?"

— Lloyd Graham (1975), *Deceptions and Myths of the Bible* (pg. 5)

"In a universe of electrons and selfish genes, blind physical forces and genetic replication, some people are going to get hurt, other people are going to get lucky, and you won't find any rhyme or reason in it, nor any justice. The universe that we observe has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil, no good, nothing but pitiless indifference."

— Richard Dawkins (1995), *River Out of Eden*

See also

- Advice of the Guardian of the Ragusa Capuchins

References

1. Robbins, Michael. (2014). "Know Nothing: the True History of Atheism" (Review of Nick Spencer's *The Origin of Species*" (O), Slate.com, Jul.
2. Ellis, Ralph. (2004). *Eden in Egypt: Adam and Eve were Pharaoh Akhenaton and Nefertiti*. Edfu Books, 2010.

Further reading

- Paulson, Steve. (2010). *Atoms and Eden: Conversations on Religion and Science.* Oxford University Press.

External links

- Eden – Wikipedia.

θΔics

In science, **Edgar Buckingham** (1867-1940) (CR:5) was an American physicist noted for []

Overview

In 1900, Buckingham published his noted *An Outline of the Theory of Thermodynamics*, a 200-page book, wherein he attempts to give a simplified synopsis of Willard Gibbs and Pierre Duhem, whom, in his preface, he acknowledges his "great indebtedness and influence", along the way discussing things such as Humphrey Davy's ice rubbing experiment, Helmholtz' free energy descriptions, thermodynamic potentials applied to simple chemical reactions, among others; and was using terms such as "Gibbs energy surface" (see: Gibbs energy).

In 1905, Buckingham stated that term 'classical thermodynamics' had been introduced by French physicist Pierre Duhem, a noted student of German physical chemist and energetics founder Wilhelm Ostwald; about which he explains as follows: [2]

> "Aside from these three difficulties [(a) the definition of temperature; (b) the definition of quantity of heat; and (c) the statement of the theorem of Clausius for irreversible processes], the rest of 'classical thermodynamics', as Pierre Duhem has named it, seems to be a fairly logical and satisfactory whole."

(add discussion)

Education

Buckingham completed his BS in physics in 1887 from Harvard, after which he studied at the University of Strasbourg and the University of Leipzig, where he studied under Wilhelm Ostwald, completed his PhD there in 1893, after which, in 1900, he was a professor of physics and physical chemistry at the Bryn Mawr College, Pennsylvania.

Quotes | On

The following are quotes on Buckingham:

> "For the person whose ambition is to go further, there is an excellent brief chapter on The Conditions of Thermodynamic Equilibrium, and another on Thermodynamic Potentials and Free Energy. These are preceded by the necessary disquisition on the relations and functions of the indefinitely large number of variables which may be involved, and they are followed by a chapter of applications in which are discussed the electromotive force of a reversible galvanic cell, the equilibrium of phases of a single substance (triple point, etc.), and the phase rule of Gibbs. The discussion of the last subject disclaims the intention of being 'either complete or rigorous'; but as an introduction ''tis enough, 'twill serve.' There is, probably, no other book so well suited as this to the needs of him who is making preparation for an attempt to explore those tremendous abysses of thought, where reigns that condition of supernal calm known as the *Equilibrium of Heterogeneous Substances*."
>
> — Edwin Hall (1902), "Review of Buckingham's *Thermodynamics*" [3]

References

1. Buckingham, Edgar. (1900). *An Outline of the Theory of Thermodynamics* (Ñº) (pdf) (ice-rubbing, pgs. 13-14). MacMillan Co.
2. Buckingham, Edgar. (1905). "On Certain Difficulties which are Encountered in the Study of Thermodynamics", (classical thermodynamics, pg. 208), *Philosophical Magazine: a Journal of Theoretical, Experimental, and Applied Physics*, pgs. 208-13. Taylor & Francis.
3. (a) Buckingham, Edgar. (1900). *An Outline of the Theory of Thermodynamics* (Ñº) (pdf) (ice-rubbing, pgs. 13-14). MacMillan Co.

(b) Hall, Edwin. (1902). “Review of Buckingham’s *Thermodynamics*” (pdf), *Bulletin of the American Mathematical Society*, 9:173-75.
(b) Edwin Hall – Wikipedia.

External links

â— Edgar Buckingham – Wikipedia.

θΔics

In hmolscience, **Edgar Morin** (1921-) is a French philosopher noted, in sociological thermodynamics, for being a Prigogine disciple who who in the 1970s outlined a melting pot theory of sociology, using complexity theory, second law, entropy, disorder and organization, cybernetics, among others.

Overview

In 1977, Morin, in his *The Nature of Nature*, used complex systems theory to theorize about philosophy of mind and epistemology.

Morin, according to Luis Fernández-Galiano, is one of "Prigogine's disciples". [1]

Morin, supposedly, describes the views of those as Harold Blum and Jeremy Rifkin as something extracted from the "thermodynamic vulgate". [1] The following is a representative quote of Morin's general view: [2]

> "There is, in time, and always will be, a dimension of degradation and dispersion. No organized thing, no organized being can escape degradation, disorganization, dispersion. No living thing can escape death. Perfumes evaporate, wines sour, mountains flatten, flowers wither, living things and suns return to dust. All creation, all generation, all development, and even all information must be paid for in entropy. No system, no being can regenerate itself in isolation."

Morin, known as the "sociologist of complexity theory", has argued, particularly in his 1981 work, that organization emerges out of disorder, and that the principle of organization works in direct opposition to entropy, in such a way that organization constantly absorbs more and more energy, in order to become more dense, dynamic and productive. [3]

References

1. Morin, Edgar. (1977). *The Nature of Nature* (*La Nature de la nature*) (pg. 73). Paris.
2. Fernández-Galiano, Luis and Carino, Gina (translator) (2000). *Fire and Memory: On Architecture and Energy* (pgs. 92, 113). MIT Press.
3. Korthals, Michiel and Bogers, R.J. (2005). *Ethics for Life Scientists* (pg. 23). Springer.

External links

â— Edgar Morin – Wikipedia.

θΔics

In hmolscience, **Edgar Poe** (1809-1849) (IQ:175|#190) [RGM:55|1,260+] [GLA:14], commonly cited as "Edgar Allan Poe", was American author, noted for []

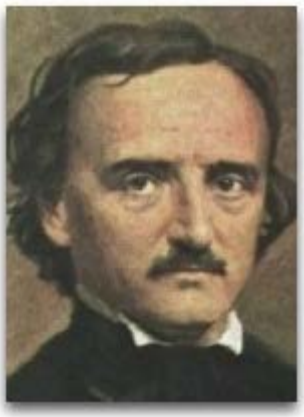

Life / Non-life

In 1844, Poe, in his short story "Mesmeric Revelation", in seeming discussion of Friedrich Wohler, gave a glimpse into the organic life (life) / inorganic life (non-life) mindset during this period. [1]

Literature chemistry

Poe, supposedly, is among the category of authors, in literature chemistry, who have explored the role of chemistry in literature. [1]

Olbers' paradox

In 1848, Poe, in his *Eureka*, solved Olbers' paradox, the paradox, pointed out by Edmund Halley, that if you add up all the light from all the stars in an infinite universe, the night sky would be infinitely bright. Poe pointed out that if the universe is of finite age then the sum of the light from all the stars if finite. [2]

Quotes | Insanity

See main: Insanity and genius

Poe, supposedly, went insane at one more more points:

> "I became insane, with long intervals of horrible sanity."
>
> — Edgar Poe (c.1840)

> "Men have called me mad; but the question is not settled, whether madness is or is not the loftiest of intelligence."
>
> — Edgar Poe (c.1845)

Quotes | By

The following are related quotes:

> "Humanity is divided into men, women, and Margaret Fuller."
>
> — Edgar Poe (c.1840) (Ñº)

> "Improvement makes straight roads, but the crooked roads, without improvement, are roads of genius."
>
> — Edgar Poe (c.1840) (Ñº)

> "All religion is simply evolved out of chicanery, fear, greed, imagination, and poetry."
>
> — Edgar Poe (c.1840) in FSM app

> “The true genius shudders at incompleteness — imperfection — and usually prefers silence to saying the something which is not everything that should be said.”
>
> — Edgar Allan Poe (c.1948), *Marginalia*

> “Marking a book is literally an experience of your differences or agreements with the author. It is the highest respect you can pay him.”
>
> — Edgar Poe (c.1840) (Ñº)(Ñº)

References

1. Poe, Edgar A. (1944). “Mesmeric Revelation”, *Columbian Magazine*, July.
2. Pratt-Smith, Stella. (2011). “Call for papers: Literature and Chemistry: Elective Affinities”, The British Society for Literature and Science, Interdisciplinary conference organized by the research group Literature and Science, Department of Foreign Languages and Literatures, The University of Bergen 27-28 October 2011.
3. (a) Rowan-Robinson, Michael. (1999). *The Nine Numbers of the Cosmos* (pg. 4). Oxford University Press.
(b) Olbers’ paradox – Wikipedia.

External links

â— Edgar Allan Poe – Wikipedia.

θΔics

In hmolscience, **edge of chaos** is a cellular automaton themed term, coined by Chris Langton (1990), but popularized by Stuart Kauffman (1995), referring to organizations, theoretical or not, that sustain themselves on the border or in region between stability (or equilibrium) and instability (chaos), a "bounded instability" as some call it. [1]

Overview

In the 1970s and 1980s, phase transition computer simulations like models of life or cellular automata began to be formulated in the minds of Chris Langton, studying under Steven Wolfram, and independently Stuart Kauffman, who joined Santa Fe Institute in 1991, all of whom attempted to build on the earlier 1950s cellular automaton theories of John Neumann, to extend Boolean network models plus chaos theory to make so-called "edge of chaos" computer simulations to explain biology and evolution.

In 1992, Roger Lewin, in his *Complexity: Life at the Edge of Chaos*, outlined the following view: [2]

> "Scientists from many disciplines have come together and begin to discover the underlying similarities in their fields. Briefly, complexity theory - which encompasses chaos - holds that at the root of all complex systems lies a few simple rules. It takes the notion of chaos (which states that within seemingly chaotic systems are elements of order) a step further by actually identifying these rules. For example - the rules which govern the behaviour of molecules will parallel those which guide human behaviour. The goal of complexity theory is a grand unification of the life sciences."

In 2009, Len Fisher, in his *The Perfect Swarm*, stated the following: [3]

> "Atoms and molecules experience forces of attraction and repulsion with nearby atoms and molecules, and these forces are sufficient in themselves to produce long-range order that can extend for billions of atomic diameters in all directions. Our society is made up of billions of individuals also, and the forces of attraction and repulsion between us can act to create social structures among us as well. These structures, however, are not nearly as regular as atoms (e.g. in a crystal) – to use the complexity scientist's picturesque but slightly misleading phrase, they are on the **edge of chaos**. Systems on the edge of chaos, including animal groups and human societies, have dynamic order, [which] lasts longer than the vortices in a cup of coffee."

In 2014, Randall Schweller, in his *Maxwell's Demon and the Golden Apple*, cites Christopher Langton (Ñº), noted for his 1984 self-reproducing loop computer iteration simulation (Ñº), to conclude, similar to Fisher (2009), that the entire international political system is always at the edge of chaos:

> "Principles developed in the natural sciences should apply to the international social and political system. We should recognize that the international system, like all complex systems composed of a large number of interacting parts—whether they be physical, biological, economic, political, or social systems—operates somewhere between order and randomness; it exists on 'the **edge of chaos**' in the phrase of computer scientist Christopher Langton."

(add discussion)

Difficulties

(add)

References

1. (a) Cheung-Judge, Mee-Yan and Holbeche, Linda. (2015). *Organization Development* (pg. 39). Kogan Page.

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2. Lewin, Roger. (1992). *Complexity: Life at the Edge of Chaos* (§3: Edge of Chaos Discovered, pgs. 44-). MacMillan Publishing Co.
3. Fisher, Len. (2009). *The Perfect Swarm: the Science of Complexity in Everyday Life* (edge of chaos, pgs. 2-3; Roy Henderson, pg. 24). Basic Books.

External links

â— Edge of chaos – Wikipedia.

θΔics

In thermodynamics schools, **Edinburgh school of thermodynamics** is the school of thermodynamics thought centered around the Edinburgh University, Scotland, and the Edinburgh Philosophical Society, through the particularly the synergy of James Maxwell and Peter Tait, from the late 1840s and into the 1860s. Also connected to this school of logic are William Hamilton and James Forbes, among others.

Maxwell-Tait

In 1841, at age 10, Irish physicist James Maxwell entered the Edinburgh Academy, the best school in Scotland, where he met mathematical physicist Peter Tait, who would become his life-long friend.

Thomson-Maxwell

During this period, Maxwell began friends with Irish physicist William Thomson, the central person of the Glasgow school of thermodynamics. Specifically, in circa 1846, Maxwell made visits to his cousin Jemima who was living in Glasgow. She had recently fell in love with and married Glasgow mathematics professor Hugh Blackburn and Blackburn, in turn, was friendly with the newly appointed Glasgow professor of natural philosophy, Scottish physicist William Thomson, recently appointed professor in 1846 at the age of 22. Thomson saw at once that the young fifteen-year-old Maxwell rare gift and the two struck up a friendship that lasted a life-time. [1]

In 1847, at age 16, Maxwell entered the University of Edinburgh.

In 1860, Maxwell published his “Illustrations on the Dynamical Theory of Gases”, an elaboration of Berlin school of thermodynamics founder German physicist Rudolf Clausius’ 1857 paper "On the Nature of the Motion we Call Heat", taking into account not only the average speeds of particles, but a graph of the distribution of speeds of the particles at any given temperature, which can be said to be representative of the core start date of the Edinburgh school.

Thomson-Tait

With Thomson, Tait co-authored the 1867 *Treatise on Natural Philosophy*, a seminal energy physics textbook. It was important for establishing energy within the structure of the theory of mechanics. [2] The following year, Tait wrote the short 128-page *A Sketch of Thermodynamics*, in which he expanded on his 1864 articles “Dynamical Theory of Heat” and “Energy” published in the *North British Review*. [4] This was one of the first publications to discuss, in large, the "history of thermodynamics". [3]

Maxwell-Gibbs

Gibbs had a mailing list of over 300 of the world’s greatest scientists, to which, it has been said, he sent his publications to. At some point during the years 1873-1878, Gibbs had sent Maxwell his three papers *On the Equilibrium of Heterogeneous Substances*, and it is said that Maxwell was the first to recognize the genius of Gibbs' work and thereafter became a promoter of his chemical thermodynamics theories in Europe. One of Gibbs’ biographers, J. G. Crowther, remarked that Maxwell became, in effect, Gibbs’ “intellectual publicity agent”.

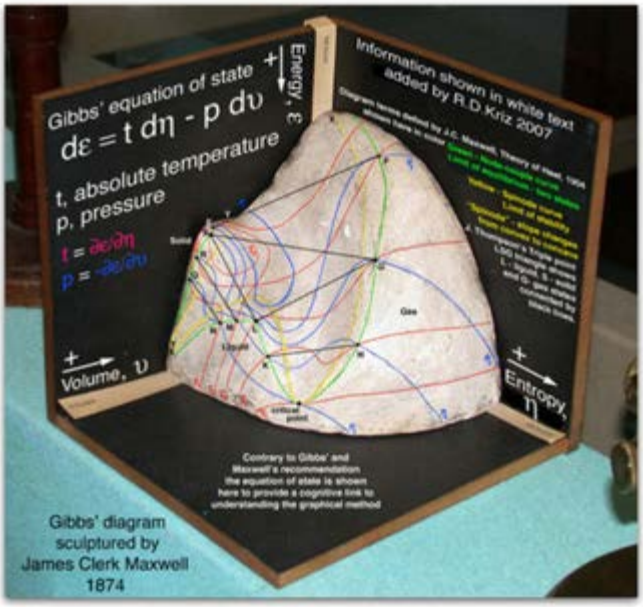

Plaster bust of the thermodynamics surface for water made by Maxwell in 1875, based on Gibbs 1873 graphical thermodynamics papers, and sent to Gibbs as a gift.

One interesting anecdote occurred during a visit to Cambridge University, where Maxwell was a professor, in the years *circa* 1873-78, the president of Yale (likely Reverend Noah Porter, president from 1871 to 1886) inquired about possible people to promote at Yale. [4] The famous Scottish physicist, James Maxwell immediately suggested Gibbs. At this time there was also a socially rather prominent individual, named Alan Gibbs, at Yale. Thus, the president replied with pleasure. "Oh, you mean *Alan* Gibbs." "No! No!" answered Maxwell; "Willard Gibbs." The president's reply was: [5]

> “Well, but he is a nobody. He just sits in his room and writes.”

This explains how Maxwell worked to connect Gibbsian school to both the Edinburgh school, the Glasgow school, England in general, via Cambridge, wherein his work reached the hands of Clausius, and the Berlin school, who began to cite Gibbs in the circa 1875.

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θΔics

In hmolscience, **Edison Bittencourt** (c.1941-) is an Brazilian-born American chemical engineer noted, in human thermodynamics, for his 1999 presentation advocating the teaching of the thermodynamic imperative to chemical engineering students, during which time he proposed to define living beings and ecosystems as "open, coherent, purposive, irreversible" systems or PICO systems, and for his 2011 paper "From Modern Thermodynamics to How Nature Works", in which he argues that societies, economies, and ecological aggregates are emergent ordered dissipative structures and that nonlinear irreversible thermodynamics is the key to understanding these structures, in particular the problem of sustainability. [1]

Beatty

Bittencourt, in his 2007 article "Thermodynamics of Irreversible Processes and the Teaching of Thermodynamics in Chemical Engineering", states that he spent "many hours of interesting discussion" in the early 1970s in talks with American chemical engineer James Beatty on problems discussed in this paper, which include the application of thermodynamics to problems including the creation of order and seeming purposive processes observed in biology (powered-chnopsology), sociology, and economics. The conclusion of their recommendations are as follows: [3]

> "Consolidation—of thermodynamics currently taught in physics, chemistry (general and physical), and chemical engineering (material and energy balances and a separate thermodynamics course), which often may involve a wide disparity in nomenclature, conventions and rigor—is recommended to be handled by the chemical engineering faculty ... with simultaneous and substantial incorporation of the thermodynamic [discussion] of the creation of order and complexity due to [seeming] purposive processes observed in biology, sociology, and economy."

This would include, according to Bittencourt and Beatty, the thermodynamics applied to the humanities works of Wilhelm Ostwald, on moral imperatives, Ilya Prigogine, on social bifurcation theory, Alfred Lotka, on physical biology, Nicholas Georgescu-Roegen, on economic thermodynamics, Herbert Spencer, on thermodynamics applied to evolution and sociology, Henri Bergson, on thermodynamics and creative forms, and Robert May, on dynamics, mathematics, and politics.

Education

Bittencourt completed his BS in textile chemistry in 1971 and PhD in chemical engineering in 1975, with a thesis on "The Preparation of Reverse Osmosis Membranes and Their Properties", at North Carolina State University, based on the thermodynamic work of Lars Onsager. [2] Bittencourt currently is a professor at the Universidade Estadual de Campinas, Brazil.

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External links

â— Edison Bittencourt (faculty) (Portuguese → English) – Faculdade de Engenharia Quimica.

θΔics

In hmolscience, **Edison on the soul** refers to American inventor Thomas Edison's statements, opinions, and or dialogues on the concept of the soul and or its residual theories.

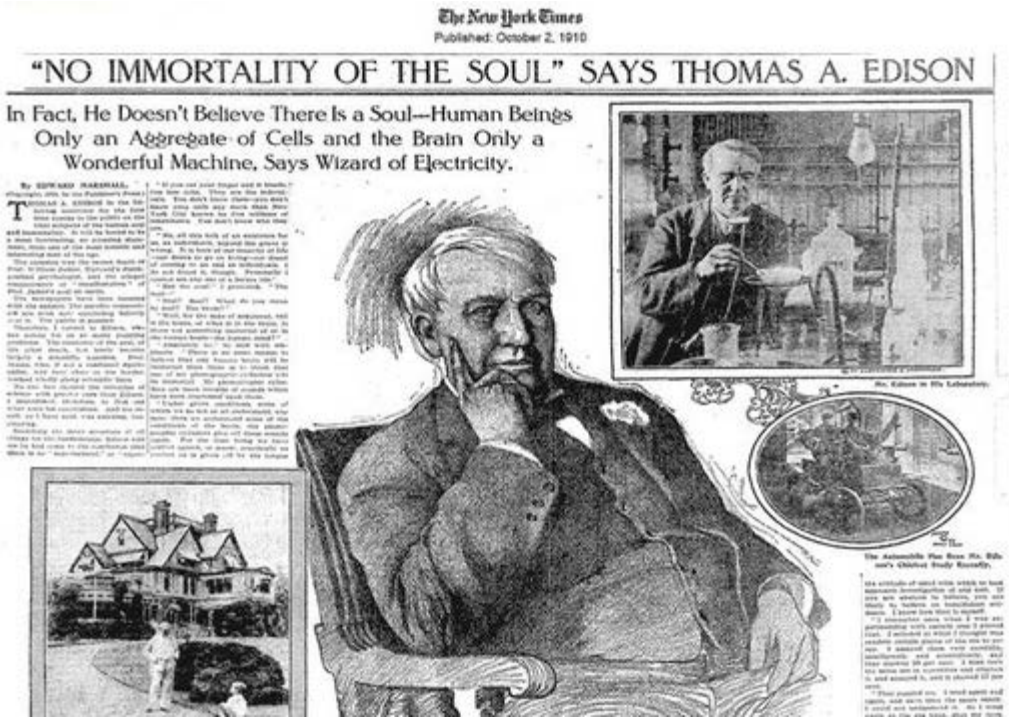
The New York Times
Published: October 2, 1910

"NO IMMORTALITY OF THE SOUL" SAYS THOMAS A. EDISON

In Fact, He Doesn't Believe There Is a Soul—Human Beings Only an Aggregate of Cells and the Brain Only a Wonderful Machine, Says Wizard of Electricity.

Top section from the 1910 *New York Times* interview of **Thomas Edison on the soul** and his views about religious matters and life and death, following the recent passing of William James and supposed whereabouts of his soul. [1]

1910 interview

On 26 Aug 1910, noted reserve energy theorist and *The Varieties of Religious Experience* (1902) author Harvard psychologist William James met his reaction end (died). Shortly thereafter, following alleged reports of the reappearance or 'manifestation' of James' soul on earth, *New York Times* journalist Edward Marshall sought out Edison, then aged 63, to clarify the matter, the aim of which he explains as follows: "The newspapers have been teaming with the subject. The psychic researchers are even now quarreling bitterly over it. The public is puzzled. Therefore, I turned to Edison, who has solved for us so many puzzling problems. The existence of the soul, of life after death, has lately become largely a scientific question. Professor James, who, if not a confessed spiritualist, was very close to the boarder, worked wholly along scientific lines. No one has studied the minutiae of science with greater care than Edison. I determined, therefore, to find out what were his conclusions. And the result , as I have said, was amazing, fascinating."

On 2 Oct 1910, the New York Times published the interview dialogue, between journalist Edward Marshall and Edison; the noted segments of the queries and comments are as follows:

> Edison: "I cannot believe in the immortality of the soul. Heaven? Shall I, if I am good and earn reward, go to heaven when I die? No – no. I am not 'I' – I am not an individual – I am an aggregate of cells."
>
> Edison: "No, all this talk of an existence for us, as individuals, beyond the grave is wrong. It is born of our tenacity of life—our desire to go on living—our dread of coming to an end as individuals. I do not dread it, though. Personally I cannot see any use of a future life."
>
> Marshall: "But the soul!" [I protested] "The soul—."
>
> Edison: "Soul? Soul? What do you mean by soul? The brain?"
>
> Marshall: "Well, for the sake of argument, call it the brain, or what is in the brain. Is there not something immortal of or in the human brain—the human mind?"
>
> Edison: "Absolutely no! There is no more reason to believe that any human brain will be immortal than there is to think that one of my phonographic cylinders—mere records of sounds which have been impressed upon them—will be immortal."

> Edison: “No one thinks of claiming immortality for the cylinders or the phonograph. Then why claim it for the brain mechanism or the power that drives it? Because we do not know what this power is, shall we call it immortal? As we call electricity immortal because we do not know what it is.
>
> Edison: “The brain, like the phonographic cylinder, is a mere record, not of sounds alone, but of other things which have been impressed upon it by the mysterious power which actuates it. Perhaps it would be better to call a recording office, where records are made and stored. But no matter what you call it, it is a mere machine, and even the most enthusiastic soul theorist will concede that machines are not immortal.”
>
> Edison: “If a man has a strong will he can force his brain to do this thing or that—make this effort, abstain from making that one. Is the will a part of the brain? I do not know. It may or it may not be. The will may be a form of electricity, or it may be a form of some other power of which we as yet know nothing. But whatever it is, it is material; on that we may depend.
>
> Edison: “After death the force, or power, we call ‘will’ undoubtedly endures; but it endures in this world, not in the next. And so with the thing we call life, or the soul—mere speculative terms for a material thing which, under given conditions, drives this way or that. It too endures in this world, not the other.”
>
> Edison: “Because we are as yet unable to understand it, we call it immortal. It is the ignorant, lazy man’s refute. There are plenty of savages, you know, who still call fire immortal. That is because they are underdeveloped, and are too lazy and ignorant to change their present state. This speculative idea of immortality needs but to be analyzed to fall whole to the ground.”
>
> “Mendeleev is dead”, looking at a personal signed photograph of the chemist, “Now where is his will? He was a very great man. His will has the greatest part of him. What has become of that will? I don’t know.”

Toward the end of the interview—following a rather interesting story, concerning the possible future development of "extra senses", e.g. like homing pigeons have, about a wandering Jew like mindreading visitor (though this may have been billet reading trickster Bert Reese (Q), see: second interview) who came to his laboratory, answering Edison’s secretly written question on paper: “Is there anything better for a storage battery than nickel-hydroxide?”, with the response: “No, there is nothing better”, and abruptly leaves—we find:

> Marshall: “Shall we, in the course of time, discover life’s actual source?”
>
> Edison: “Oh, I don’t know. Those things are pretty small. Too small to find , perhaps. The world, you know, and the universe, are full of the infinitely small as well as the infinitely great. We are, as I said early in this talk, all aggregates. To get us down to the ultimate division—to trace life down to its ultimate source —well—I don’t know—.”

Edison then mentions the “ultra-microscope”, Brownian motion, and how someday we might or might not see an actual molecule.

On 15 Oct 1910, in communication to H. Toyer, in a followup defense of this interview article, Edison stated: [2]

> “You have misunderstood the whole article, because you jumped to the conclusion that it denies the existence of God. There is no such denial, what you call God I call Nature, the Supreme intelligence that rules matter. All the article states is that it is doubtful in my opinion if our intelligence or soul or whatever one may call it lives hereafter as an entity or disperses back again from whence it came … scattered among the cells of which we are made.”

Likewise, in a Nov 9 communication to Joseph P. Smithers, Edison stated:

> "As far as my observations extend I am compelled to believe in the existence of a supreme intelligence and that while man is immortal through propagation of the species if not interfered with by a catastrophe I cannot see that his personality is immortal."

Thomson rebuttal | Response | 1911

In Jan 1911, a followup clarification interview, with Edward Marshall, published in *The Columbian Magazine*, following attacks by American physician and Christianity scholar William H. Thomson, along with those found in the statement that "hundreds of columns of newspaper comment have been printed, at least two books have, in the few weeks which have elapsed, been issued in pamphlet form upon the subject, the inventor's mail has reached a magnitude which quite appalls him; bitter criticism and enthusiastic praise have both been offered to him, the criticism sometimes joined with threats, the praise linked often with excited adulation", Edison stated: [3]

> Edison: "I have never seen the slightest scientific proof of the religious theories of heaven and hell, of future life for individuals, or of a personal god."

Edison does aver, to note, that he concedes his belief that Jesus Christ was a real person

(add discussion)

Quotes

The following are other related quotes:

> "My mind is incapable of conceiving such a thing as a soul. I may be in error, and man may have a soul; but I simply do not believe it."
>
> — Thomas Edison (1924), "Do We Live Again"? [4]

> "Religion is all bunk."
>
> — Thomas Edison (date) [4]

See also

- Do atoms have souls?
- Goethe on the soul
- Einstein on the soul
- Heisenberg on the soul | Heisenberg-Pauli dialogue

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θΔics

In existographies, **Edith Stern** (1952-) (SWE:22) is an American forced prodigy turned mathematician and telecommunications engineer, known famously for her involvement in the "Edith Project", an experimental effort by her father Aaron Stern to turn her from birth into a genius.

Overview

In 1952, when Edith was born, her father Aaron Stern, who was in the middle of being in and out of hospitals, related to cancer of the mouth and some WWII concentration camp issues, decided that he would devote his total energy into maximizing the education of his daughter; the following is an example synopsis:

> "Always a meticulous person, [Aaron] Stern says he had been hospitalized 170 times. He could not work. What he decided to do was raise and educate Edith. This was his job. He devoted full time to it. He calls his technique 'total educational immersion'. He says that intellectual growth begins at birth and ends with death. In between is nothing but promise. With Edith he wasted not a minute. There was no such thing as a simple walk. A building was a reason for a lesson in architecture; a picket line meant a lesson in civics. He demanded all of Edith's time. He saw her face when she was being nursed and he said this would be the perfect time for learning. So he took her from her mother's breast and fed the baby himself. It gave him more time to teach."
>
> — Richard Cohen (1977), "Creation of Genius Has Some Drawbacks" [1]

In fact, Two days after Edith was born, Aaron Stern, supposedly, held a press conference declaring in front of reporters that he would make her daughter into a genius.

In this end, before age one she was doing "calculations" (V) and speaking full sentences. Specifically, she could communicate with flash cards at eleven months old; and was able to use the cards to say how old she was. At age one, she was able to speak simple sentences and identify letters on flash cards. At age two, Edith knew the entire alphabet.

By age 3, Edith was playing chess and solving arithmetic problems; by age 4.5 four, she read straight through volume one of the Encyclopedia Britannica (Q), and by age 5 had read through the entire set. [2] She also, supposedly, had learned algebra by this age. At age 5, she was tested for her intelligence level, and she scored between 196 and 205 IQ.

Left: Edith Stern reading, next to her father Aaron Stern, and mother. (Q) Right: Edith, with her father, graduating from college.

Aaron Stern motivated his daughter by the use of colorful posters, flash, cards, and an abacus--which made math concrete and easier to grasp. Every moment was a learning opportunity—even a walk to the grocery store. (Q) At the earliest opportunity, he began using travel posters, classical music, ethnic dolls, counting and spelling blocks and many other things to engage the attention and interest of his daughter Edith Ann Stern when she was just a few weeks

old, and still in her play-pen. Using these as a focus, he would explain many concepts of life in very simple terms, teaching her ethics and compassion for all races, elementary mathematics, simple concepts of physics such as leverage, auto mechanics and a wide range of other mind-expanding experiences of everyday life. When they would go out for a walk, he would push her in her baby carriage and explain what different signs meant, and when they would pass a construction site, he would explain simple concepts of physics like leverage, and how it was being used there. When they passed a picket line, he would use this as an opportunity to explain labor-management relations concepts. EVERYTHING that caught her attention was used as an opportunity to further educate her, and expand her understanding of concepts and how her world worked.
By age 6, she was reading six books per day; by age 8, had read Plato, Freud, and Darwin.

In 1964, Edith, age 12, enrolled in college; by 14, she had obtained her associates degree at Miami-Dade Jr. College; by age 15, she completed a BS in mathematics at Florida Atlantic University; by 15, she was an assistant professor of mathematics at Michigan State University (MSU); by 18, she had competed her MS in mathematics at MSU.

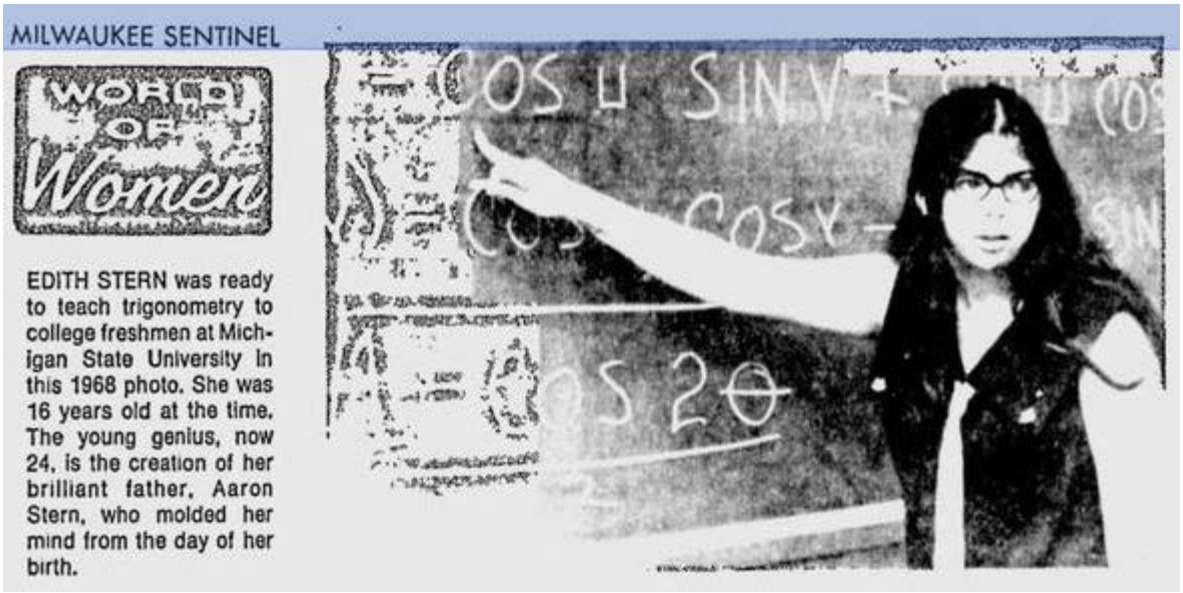

A 16-year-old Edith Stern teaching college trigonometry, in 1969, to students at Michigan State University.

As an adult, she went to work at nascent IBM family of real-time computing, enabling services such as direct dialing (1 + phone number) in areas where existing services were only handled by telephone operators; and custom calling features, such as *69 to return the last unanswered call received. Edith Stern eventually became a VP in the Research and Development Department of IBM. Stern, in 2012, in received the ASME Kate Gleason Award for lifetime in engineering, for her work at IBM, and her 128 US Patents. (Q)

Aaron Stern

Aaron Stern, to give some background, could write in six languages, was a teacher of some sorts after the war, for a period, and was associated with Einstein, who arranged for his Mayo Clinic treatments and came to visit him in the hospital. [1]

In 1973, Aaron Stern, in his *The Making of a Genius*, wrote about of how he spent time with his young daughter in NYC, teaching her to read in grocery stores. They made museum trips on Sunday and talked about everything they saw from the time they left home until they returned. He emphasized how he always asked open-ended questions and asked his daughter to do research.

Family | Strain

With Edith being in the public spotlight from age 12 (1964) to age 24 (1976), strains, supposedly, resulted in the structure of the family. In 1977, Edith told reporters that her mother apparently "doesn't understand" and that she was a "nasty little thing". [2] A South Florida newspaper reported that Aaron Stern and his daughter were not speaking toward the end of his life (reaction existence).

Other

In 2010, Edith Stern was one of the 40 people in Libb Thims' IQ:200+ online and video analysis of people, who, prior to 2009, were cited with an IQ of 200 or above.

Quotes | On

The following are quotes on Stern:

> "I can foster the same meteoric IQ in the children of the Tasaday tribe, a Stone Age people living in the Philippines."
>
> — Aaron Stern (1971), *The Making of a Genius*

See also

- Greatest female geniuses

Note

N1. On 25 Feb 2019, when this article was started, the top 5 eoht.info Alexa search key words were: 1. Catalyst, 2. Opposite of entropy [see: entropy antonyms], 3. Christopher Hirata, 4. Edith Stern, 5. Goethe pronunciation.

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External links

- Does Edith Stern really have an IQ of 200? (2018) – Quora.
- Jew of the Week: Edith Stern: the Woman with 100 Patents and a 200 IQ – JewOfTheWeek.net.

θΔics

In existographies, **Edme Mariotte** (1620-1684) (CR:14) was a French physicist noted for his 1673 elastic and inelastic experiments, cited later by Gottfried Leibniz, and for his 1679 *The Nature of Air*, wherein he reports on research that is said to have recognized Boyle's law (1669), in the statement that 'the volume of a gas varies inversely as the pressure' (see: Mariotte's law); and for at some point conducted an early version of the ball and clay experiment.

Elastic | Inelastic collisions

See main: Ball and clay experiment

In 1670, Mariotte had announced his intention to compose a major work on the impact of bodies, i.e. to conduct a number of experiments in order to discern possible laws of inelastic collisions; a modified extension, as seems to be the case of Rene Descartes earlier 1610s work on elastic collisions (of hard bodies), supposedly.

In 1671, Mariotte completed his experiments on collisions, which he read Paris Academy of Science.

In 1673, Mariotte, in his *Treatise on the Percussion or Impact of Bodies*, gave the first comprehensive treatment of the laws of inelastic and elastic impact and of their application to various physical problems.

Mariotte, in his *Treatise*, reported, firstly, on how he performed experiments using inelastic clay bobs, of varying sizes, some on pendulums, to confirm a series of propositions, most of which he termed "principles of experience", namely: [2]

(a) the additivity of motion (both directly and obliquely)
(b) the dependence of impact only on the relative velocity of the bodies (confirmed by the extent of flattening on impact)
(c) the quantity of motion (weight times speed) as the effective parameter of impact (also measured by flattening)
(d) the laws of inelastic collision linking initial and final speeds through the conservation of quantity of motion.

First, using simple pendulums with soft clay bobs—clay being an "inelastic" body, as contrasted with an "elastic" body, i.e. capable of recovering size and shape after deformation; wherein total kinetic energy during collision, between such bodies, remains unchanged—he measured the impact when the clay bobs collided by the extent of the flattening of the clay. With this data, he set up some laws of inelastic collisions.

He then linked these with the laws governing elastic collisions via the principle that a perfectly elastic body deformed by the impact of a hard inelastic one regains its original shape and, in doing so, imparts to the impacting body its original speed.

Mariotte then, supposedly, confirmed this new elastic-inelastic collision law, by bouncing a hard pendulum bob off a stretched string, and thereby showing something to the effect that apparently hard bodies deform on impact.

He did this, supposedly, by dropping glass and ivory balls from varying heights on to a steel anvil lightly coated with dust; the circles in the dust of various sizes enable him, he claimed to measure the degree of flattening of the balls.

Mariotte's impact treatise long served as the standard work on the subject and went through three editions in Mariotte's lifetime. [2]

Pressure and Volume | Boyle's law

See main: Mariotte's law

In 1679, Mariotte, in his *Discourse on the Nature of Air* (*Discours de la nature de l'air*), was the first to call the finding that pressure is inversely proportional to volume, a 'law of nature'. [4] The following are some takes on this:

> "Towneley was the person who first suggested [what is now called] 'Boyle's law'. Boyle, however, is generally credited with the discovery that the pressure exerted by a gas is inversely proportional to the volume of the space in which it is confined. From Boyle's point of view, that discovery by itself was insignificant, and though he had provided the experimental evidence for it, he readily admitted that he had not found any general quantitative relation between pressure and volume *before* Richard Towneley suggested his simple hypothesis. Hooke also provided further experimental confirmation of the hypothesis. This 'hypothesis' was long known, on the continent, as 'Mariotte's law', because **Edme Mariotte**, proposed it in his *Essay on the Nature of the Air* (1679. There are good reasons (James, 1928/1929) for believing that Mariotte was familiar with Boyle's work [see: Spring of the Air (1660)] even though he does not mention it, so that he does not even deserve the credit for independent, much less simultaneous, discovery."
>
> — Stephen Brush (2003), *Kinetic Theory of Gases* (pg. 3) [6]

> "In his *De la nature de l'air* (1679), **Edme Mariotte**, through a combination of experiment, namely to ascertain the thickness of the lowermost 'layer' of the atmosphere, simplifying assumptions, namely about the average thickness of an atmospheric Iayer depending on its altitude and the total number of such layers, and calculation, namely to determine the relationship between atmospheric pressure, and hence barometer readings, and elevation, had concluded that atmospheric pressure decreased arithmetically as elevation increases geometrically, which Mariotte himself could compute only by approximating the geometric progression with an arithmetic one. Mariotte and others referred to this relationship as a 'rule'; he employed the same term 'regle de la nature' (rule of nature), for what came to be known as the Boyle-Mariotte law relating the pressure, temperature, and volume of air, published in the same work. So, for example, Maraldi (1709) reported on how his experiments in tropical Batavia on the dilation of the air in a thermometer seemed to deviate from the 'rule of Mariotte'."
>
> — Lorraine Daston (2008), "Unruly Weather: Natural Law Confronts Natural Variability" (pg. 244) [5]

Mariotte, according to some reports (Ñº), is said, in this work, to have confirmed Boyle's law that pressure and volume vary inversely, but with the more detailed point that this only holds if the temperature is constant.

Heat

Mariotte, at some point, discovered that a sheet of glass cuts off the heat from a fire but has little effect on the heat from the sun. [3]

Other

Mariotte was a correspondent of Christiaan Huygens. [2]

Notes

The photo shown (Ñº) is tentative photo of Mariotte from a circa 1866 Paris Academy of Sciences group photo. Mariotte's date of birth and location, supposedly, are also unknown; the 1620 date possibly misattribution and or estimate. [2]

Quotes | On

The following are related quotes:

> "The new, best proven theories make little progress as long as they are based only on abstract principles; even the best minds, who are used to certain acquired in youth abstract ideas, reject all the ideas that do not easily combine with the former, and all speculative truths, for which one can give no sensible evidence, are therefore absolutely lost. Therefore, when a man of genius proposing new truths, he has just like him supporters and a number of young people who are educated away the prejudices of the public schools; the rest did not understand him or wrong, pursuing him or makes him ridiculous."
>
> — Condorcet (1773), "Praise of Mariotte"; cited by Ludwig Feuerbach in his 1850 "The Natural Sciences and the Revolution"

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External links

â— Edme Mariotte – Wikipedia.

θΔics

In quantum mechanics, **Edmond Bauer** (1880-1963) was a French physicist noted for []

Overview

In 1939, Bauer, in his "The Theory of Observation in Quantum Mechanics", co-written with German physical chemist Fritz London, discussed the role of consciousness in regards to the collapse of the wave function. [1] The following is a representative excerpt from the article: [2]

> "So far we have only coupled one apparatus with one object. But a coupling, even with a measuring device, is not yet a measurement. A measurement is achieved only when the position of the pointer has been *observed*. It is precisely this increase of knowledge, acquired by observation, that gives the observer the right to choose among the different components of the mixture predicted by theory, to reject those which are not observed, and to attribute thenceforth to the object a new wave function, that of the pure case which he has found. We note the essential role played by the consciousness of the observer in this transition from the mixture to the pure case. Without his effective intervention, one would never obtain a new function."

Their presentation here is said to be more concise that John Neumann's earlier 1932 work on the modification of information on the system by the act of observation, supposedly, as between the statistical meaning of representation of information by the wave function and the density matrix method. [2]

Information theory

The 1939 Bauer-London article, in some way, by 1975, got mixed up in information theory debates. [3]

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(b) Thims, Libb. (2012). "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair" (url), *Journal of Human Thermodynamics*, 8(1):1-##.

Further reading

â— Kuhn, T.S. and Kahan, T. (1963). "Interview with Dr. Edmond Bauer", at Ecole de Chimie ed Phys., Paris, France, Jan 8.
â— Darrow, Karl K. (1964). "Obituary: Edmond Bauer", *Physics Today*, 17(6):86, Jun.

External links

â— Measurement problem (§: The Role of a Conscious Observer) – InformationPhilosopher.com.

θΔics

In existographies, **Edmond Halley** (1656-1742) (IQ:175|#257) (Cattell 1000:594) [RGM:398|1,500+] (Murray 4000:8|A) (Eells 100:92) (CR:13) was an English physicist, astronomer, and mathematician, generally known for his prediction of Halley's comet, for having (Ñº) persuaded Newton into writing his *Principia*, and oft-cited as having worked on a primitive form of social physics in 1693.

Heat | Trade winds

In 1687, Halley, in his "An Historical Account of the Trade Winds", in opposition to the then-prevalent "Cartesian vortices" model of the trade winds, explained the origin and nature of the trade winds, to the heating effect of the sun. [4]

Social physics

In 1693, Halley made the first table of mortality figures, finding that half of men die (dereact) before age 17 (Ñº); work that was cited by Adolphe Quetelet in his social mechanics writing. [1] This date, thereafter, has sometimes been cited as proto-social physics, of the John Q. Stewart variety, i.e. for demonstrating the use of physical laws in the realm of the social sciences. [2]

Comet

In 1705, Halley determined the periodicity a comet, since famously named as "Haley's comet", namely 75-76 years, observed by astronomers since 250 BC, but whose reappearances were not recognized as the same object. Specifically, used Newton's new theory of gravitation to determine the orbits of comets from their recorded positions in the sky as a function of time. He found that the bright comets of 1531, 1607, and 1682 had almost the same orbits, and when he accounted for the gravitational perturbation on the cometary orbits from Jupiter and Saturn, he concluded that these were different appearances of the same comet. He then used his gravitational calculations to predict the return of this comet in 1758; which on Christmas night of that year reappeared in a spectacular vindication of his bold conjecture and of Newton's gravitational theory. (Ñº)

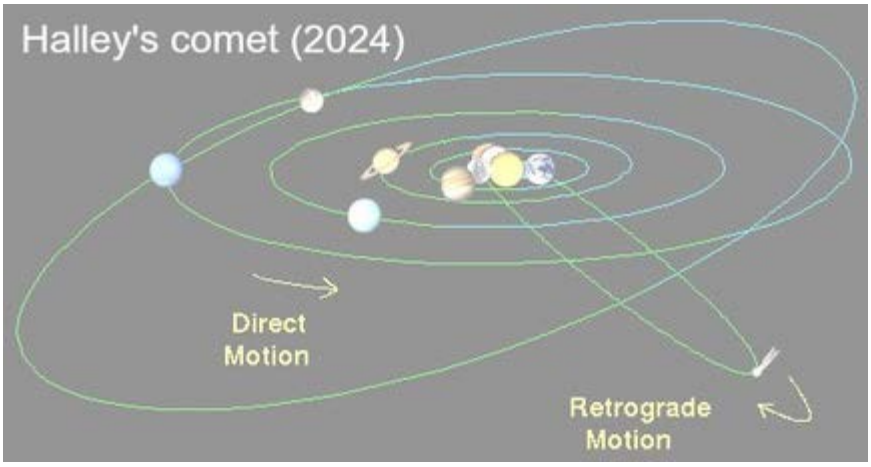

A diagram (Ñº) showing the location of Halley's comet in 2024.

Magnetism

In 1716, Halley penned some type of "circulating effluvia" magnetic terrella lines (see: magnetism), work that later influenced both the 1830s "lines of force" theory of Michael faraday and the electromagnetism work of James Maxwell.

Navigation

Halley is also noted for having solved the riddle of accurate navigation for all sea-going vessels. [3]

Quotes | On

The following are quotes on Halley:

> "**Halley**'s lasting contribution, in meteorology, was that he saw the atmosphere as a vast dynamical system, the 'go' of which resulted from the differential heating of the earth's surface."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 10)

> "Amontons seems to have been the first to realize the importance of actually measuring the thermal

expansion of elastic fluids, and the first to have studied the increase of pressure with temperature. Amontons also noticed, as **Halley** had done, that when water boils the temperature remains constant. Unlike Halley, he seems to have reconized the importance of this: boiling water provides an eminently suitable datum or fixed point for a thermometric scale."

— Donald Cardwell (1971), *From Watt to Clausius* (pgs. 18-19)

References

1. Ball, Philip. (2004). *Critical Mass: How One Thing Leads to Another* (pg. 59). New York: Farrar, Straus and Giroux.
2. John Q. Stewart Papers (1907-1979) – Princeton University Library.
3. Wakefield, Julie. (2005). *Halley's Quest: a Selfless Genius and his Troubled Paramore* (pg. 143). National Academy of Sciences.
4. (a) Halley, Edmond. (1687). "An Historical Account of the Trade Winds", *Philosophical Transactions of the Royal Society*, pg. 153.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 8). Cornell University Press.

External links

â— Edmond Halley – Wikipedia.

θΔics

In existographies, **Edmund Husserl** (1859-1938) (IQ:170|#311) [RGM:311|1,260+] (Stokes 100:74) (PGT:18) (GPE:#) was a German philosopher, a top existentialism philosopher, noted for []

Animate | Organisms

Husserl, according to Google Books search results, seems to have been a dominate advocate, similar to Henry Adams, of the term "animate organism". [1]

Quotes | On

The following are quotes on Husserl:

> "John Mill hand an IQ of 190, Ludwig Feuerbach had IQ of 180, and Ludwig Wittgenstein, Arthur Schopenhauer, Oswald Spengler, John Dewey, and **Edmund Husserl** all had IQ of 170."
>
> — Economakis Michael (2012), "Finally the Liberal Arts IQs!" (Ñº), Forum post, Apr 30

References

1. Husserl, Edmund, Welton, Donn. (1999). *The Essential Husserl: Basic Writings in Transcendental Phenomenology* (animate organism, 13+ pgs). Indiana University Press.

External links

â— Edmund Husserl – Wikipedia.
â— Edmund Husserl – BrainyQuote.com.

θΔics

In existographies, **Edmund Lippmann** (1857-1940) was a German chemist noted for []

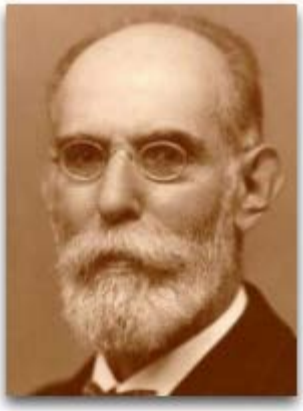

Overview

In 1933, Lippmann, in his *Spontaneous Generation and Life Force: the History of these Problem from the Earliest Times up to the Beginning of the 20th Century*, according to Alexander Oparin (1936), gave a fairly complete survey of all the theories of the origin of life, from ancient times to the early 20th century. [1]

References

1. (a) Lippmann, Edmund. (1933). *Spontaneous Generation and Life Force: the History of these Problem from the Earliest Times up to the Beginning of the 20th Century* (*Urzeugung und Lebenskraft : zur Geschichte dieser Probleme von altesten Zeiten An bis zu Anfangen des 20. Jahrhunderts*). Springer.
(b) Oparin, Alexander. (1936). *The Origin of Life* (introduction and translation: Serguis Morgulis) (three phases, pgs. 1-2). Dover, 1965.

External links

â— Edmund Oscar von Lippmann – Wikipedia.

θΔics

In hmolscience, **Edmund Noble** (1853-1937) was a Scottish-born American philosopher noted for his 1896 “Imitation Among Atoms and Organisms”, wherein he suggest that "imitation", can serve as a unifying principle, atoms to humans, in regards to likes attracting and opposites repelling and the conflict dynamics therein.

Overview

In 1896, Noble, in his “Imitation Among Atoms and Organisms”, attempted to outline, in what might be called a semi-modern Empedocles style of discussion, a unified theory of imitation and organization applicable to atoms as well as to humans, based in loose outline on speculations about chemical affinity and gravity, so to explain evolution. [1] Nobel, in opening of his article, wherein he aims to extend imitation, e.g. the way a child acquires characteristics by imitation of their parents, from humans to lower organisms to the inorganic, defines what he refers to as the “law of assimilation” as follows:

> “All things free to move, capable of becoming closely associated, and impelled to movement by the system to which they belong, tend to come together when they are likes, and to be separated when they are unlikes. If we regard this tendency from the point of view of the movement, we shall say that likeness of things involves association of them in the degree of their likeness, and that unlikeness of them involves dissociation of them in the degree of their unlikeness; while, if we regard the tendency from the point of view of the things themselves, we shall say that association of things involves likeness of them in the degree of the association, while dissociation of things involves or implies unlikeness of them in the degree of the dissociation. These truths may be expressed in a more general way by saying that in systems the association of likes involves the least degree of resistance among them, while the association of unlikes involves the utmost degree of resistance. It follows that where unlikes are associated, the resistance offered to their union will tend (1), where they are forcibly held in association, to make them likes; and (2) where they are free to move, to dissociate them.”

He says this model is of “universal character” and thereafter goes into examples of how likes attract, e.g. “Most people usually fall in love with those about their own age; deaf-mutes almost invariably marry deaf-mutes”, and opposites repel, e.g. opposite religious beliefs repel, differing wealth classes don’t fit, etc.

Noble then superficially touches on how certain atoms and molecules attract and repel, or who mercury, oil, and water won’t mix but will form, three layers if poured in a jar, etc.

He then concludes with the following:

> “Here, then, our treatment of the subject must draw to a close. While necessarily brief, it has been complete enough to reveal a process far reaching in its scope and of cosmical significance. We have seen how like units everywhere tend to be associated and unlikes dissociated; how unlikes, held in forcible association, tend to be more or less profoundly assimilated to one another; and how disturbances of prevailing uniformity tend to be equably distributed through the several media in which they occur. But we have also noted that the power impelling to these multifarious acts of assimilation, to these movements of association and dissociation, is not the power of the units themselves, but the power of the system to which they immediately belong; and we are thus warned of the important bearing which our law has upon two problems of the utmost generality in physics namely, the problems of chemical affinity and gravitation. It is true that we have as yet no formula for explaining these manifestations of power by a single principle; that we do not yet know the real structure of ether; and that there is still needed a definite account of gravitation as an intelligible mechanical process. Nevertheless, the causal connection of both gravitative and chemical actions with the ether system is already obvious to physicists. That the power which accomplishes these actions does not reside in matter alone, but resides also in the ether system is, in fact, a function of that system regarded as including both ether and matter seems to be increasingly pointed to by the trend of

recent physical research."

(add discussion)

In 1926, Noble published *Purposive Evolution: the Link Between Science and Religion*, in attempts to rectify the science and religion conflict. [2]

References

1. Noble, Edmund. (1896). "Imitation Among Atoms and Organisms" (Ñº), *Popular Science*, Feb, pgs. 462-510.
2. Noble, Edmund. (1926). *Purposive Evolution: the Link Between Science and Religion* (atoms, 41+ pgs; molecules, 46+ pgs). H. Holt and Co.

External links

â— Edmund Noble – Wikipedia.

θΔics

In economic thermodynamics, **Edouard Guillaume** (1881-1959) was a Swiss-French physicist noted for his work with his younger brother economist Georges Guillaume, first in giving mathematical assistance with Georges' 1932 PhD dissertation "On the Fundamentals of the Economy with Rational Forecasting Techniques", which applied the formalism of thermodynamics to the theory of value. [1]

Rational mechanics

In the years to following Georges' 1932 dissertation, the Guillaume brothers elaborated on what they called "rational economics" (see: two cultures namesakes), a term conceptualized as the economic version of "rational mechanics" or the mathematical theory about the motion of objects, based on and derived from Newton's laws on the relation between forces and motion. Though the term "rational mechanics" was used first by Leon Walras, then his first protégé Albert Aupetit, and later by François Divisia (1928), who credits Walras as introducing the term, the Guillaume brothers were said to have employed the term in an original sense.

Education

Edouard completed his PhD in physics at the University of Zurich in 1908, after which he worked at the Swiss Patent office at Bern, during the time when Albert Einstein was employed there. In the 1910s to 1920s, he did work on relativity theory (in an effort to "destroy" Einstein's theory as he put it), and did work on Henri Poincare. He then moved to the Federal Office for Insurance, then became director of the Swiss insurance firm *La Neuchateloise*, and in 1936 became privat-docent at the University of Neuchatel. [1]

References

1. Guillaume, Georges and Guillaume, Edouard. (1932). *Sur le Fundements de l'economique Rationelle: Avec une technique de la prevision* (*On the fundamentals of the economy with rational forecasting technique*) (thermodynamique, 4+ pgs). Paris: Gautier-Villars.

External links

â— Guillaume, Guillaume, and Einstein – MathPages.com.

θΔics

In existographies, **Edouard Naville** (1844-1926) was a Swiss archaeologist, Egyptologist, and Biblical scholar noted for []

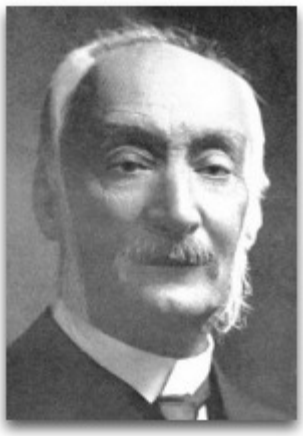

Recension theory

See main: Recension theory

In 1886, Naville published the so-called "Saite recension" (26th dynasty | 600BC) of the *Book of the Dead*, based upon a particularly complete papyrus in the Turin Museum. [3] Naville, supposedly, asserted that prior to this there was a "Theban recension" (18th-19th dynasties | 1550-1200BC), i.e. a revision made before the Late Period. [1]

In 1886, Naville published a history of the Theban recension. (Ñº)

Egyptology | Genesis

In 1915, Naville delivered a series of Schweich Lectures on the Old Testament in respect to Egyptology, wherein, in defense of newer radical views that the light of Egyptian mythology where shedding on previously held Old Testament scholarship, wherein he attacked the "documentary hypothesis", defending the traditional that Moses was the sole author of Genesis; the following being an example quote: [2]

> "Here as in my former works I have preserved for Jehovah or the Lord the name 'Yahveh', which is now in current use, although its accuracy has been contested since the discovery of the papyri of Elephantine and the potsherds of Samaria. Quite recently Cowley has shown that the ancient form of the word is 'Iaho' or 'Iahou', and that the tetragram is of post-exilic origin."

(add discussion)

Education

In 1891, Naville became a professor of Egyptology at the University of Geneva.

Quotes | Employed

The following are quotes employed by Naville:

> "If a sacred book is found to state what is not true, should it still be considered sacred?"
>
> — Voltaire (c.1750) [2]

References

1. Spence, Lewis. (1990). *Ancient Egyptian Myths and Legends* (pg. 114). Courier Corporation.
2. Naville, Edouard. (1920). *The Law of Moses* (translated under the author's revision) (Preface: Henry Wace); in: *Revue de Theologie et de Philosophie*, Aug, Oct, 1920. Chas. J. Thynne, 1922.
3. Faulkner, Raymond Goelet, Ogden, Andrews, Carol, and Wasserman, James. (2008). *The Egyptian Book of the Dead: The Book of Going Forth by Day - The Complete Papyrus of Ani Featuring Integrated Text and Full-Color Images* (recensions, pg. 144). Chronical Books.

External links

â— Edouard Naville – Wikipedia.

θΔics

In *Elective Affinities*, **Eduard** (R.J. Hollingdale, 1971; David Constantine, 1994 translations), or **Edward** (Hjalmar Boyesen, 1885; H.M Waidson 1960 translations), is the central character of the novel, is a wealthy baron reacting in a sort of dull-drum existence on his vast country estate, near to a local town, married to Charlotte, his love from earlier years, to whom he was unable to marry at the time as they were each formerly in arraigned marriages of circumstance or necessity.

An 1863 rendition of **Eduard** by Friedrich Pecht and Arthur von Ramberg. [1]

Background

The character Eduard is Goethe himself contemplating in his mind the running of a "what could have been situation" following the 1793 passing of Baron Gottlob von Stein (1735-1793), the husband of Charlotte von Stein (1742-1827), his longtime love interest (since 1774-75 when he came to Weimar), which thus frees Charlotte von Stein, then age 51, from her 29-year arranged marriage of necessity, and thus giving opportunity for Goethe's previous decade-long quest to wed or acquire Charlotte as his own, to see the light of day. The scenario of this possibility plays out in the novel, written at a time, 1808, when Goethe was 59 and Charlotte was 66, each on friendly, albeit mending a past broken relationship terms.

References

1. Pecht, Friedrich, and Ramberg, Arthur. (1870). *Goethe Gallery: Containing Characters from Goethe's Works, drawn by Friederick Pecht and Arthur von Ramberg, fifty illustrations engraved on steel, with descriptive text by Frederick Pecht* (The Councillor's Lady Goethe, pgs. 24-29; Corneila Goethe, 32-35; *Elective Affinities*, pgs. 289-306). Appleton & Co.

θΔics

In existographies, **Eduard Farber** (1892-1969) was an Austria-Hungarian born American chemist noted for []

Overview

See main: Farber 114

In 1961, Farber, in his 1,600+ page *Great Chemists*, lists existographies (biographies) of 114 selected "great chemists", each penned by leading historians and scientists and or via autobiography (auto-existography); the first selection of which are listed below: [1]

1. Babylonian chemists
2. Interlude I, philosophers and practitioners
3. Arabic chemists
4. Interlude II, philosophers and alchemists and practical metallurgists
5. Paracelsus
6. Libavius and Jean Beguin
7. Joan van Helmont
8. Rudolf Glauber
9. Robert Boyle
10. Nicolas Lemery
11. Herman Boerhaave
12. Duhamel du Monceau
13. Guillaume-Francois Rouelle
14. Andreas Sigismun Marggraf
15. Mikhail Lomonosov
16. Joseph Black
17. Henry Cavandish
18. Joseph Priestley
19. Carl Scheele
20. Antoine Lavoisier

The are listed in chronological order, some discussion of selection methods of which he discusses in his preface.

Education

Farber completed his PhD in organic chemistry, physics, and mineralogy at the University of Leipzig in 1916. [2]

Quotes | Employed

The following are quote employed by Farber:

> "Fate, show thy force; ourselves we do not owe;
> What is decreed must be, and be this so!"
>
> — William Shakespeare (1602), *Twelfth Night* (Act 1, Scene 5); cited by Edward Farber (1961), in respect to ranking greatest chemists [1]

Quotes | By

The following are noted quotes by Farber:

> “To observe how others behaved in their predicaments may help us in emergencies, even to foresee both their coming and the results of our reactions.”
>
> — Eduard Farber (1961), “Preface” to *Great Chemists*

References

1. Farber, Eduard. (1961). *Great Chemists*. Interscience Publishers.
2. Anon. (2006). “Eduard Farber (1892-1969)” (pdf), *American Chemical Society*.

θΔics

In science, **Eduard Pfluger** (1829-1910) was a German physiologist, a former assistant to Emil Reymond, noted for []

Overview

In 1875, Pfluger, in his "On the Physiological Combustion in the Living Organism", asserted his so-called heated cyanogen origin of life theory, amid which he makes a distinction between dead protein (storage protein) and live protein (protoplasmic protein), metabolism based on atomic rearrangement, and heat input.

Pfluger, in short, noticed the fact that cyanogen (CN) (Q) formation is associated with the absorption of a great amount of heat, and that calorimetric study of cyanogen shows that this radical contains a large amount of energy; cyanogen and its compounds, such as potassium cyanide, ammonium cyanide, hydrocyanic acid, cyanic acid, etc., arise only in an incandescent heat e.g., when the necessary nitrogenous compounds are brought in contact with burning coal, or when the mass is heated to a white heat. Pfluger, on this evidence, theorized that the atoms in CN, namely carbon and nitrogen, have a strong oscillatory movement.

Pfluger, on this basis, with contextual discussion of the Wohler synthesis (Q), discovered by Friedrich Wohler (1828), jumps to the following statement, using the Sergius Morgulis (1936) translation: [1]

> "If one considers the beginning of organic life, it is not necessary to pay attention first of all to carbon dioxide (CO_2) and ammonia (NH_3), because both represent the end and not the beginning of life. The beginning is found to a very much larger degree in cyanogen (CN).
>
> In this respect organic chemistry gives us the very important fact, namely, that cyanogen and its compounds are formed at a red glow when nitrogenous compounds come in contact with red hot coal; or when a mixture of the two is heated to a white glow. It is, therefore, obvious that cyanogen combinations were formed at a time when the earth was either entirely or partly in an incandescent state.
>
> From this it follows that life comes from fire and, in the last analysis, was formed at a time when the earth was a red hot mass. If one thinks of the immeasurably long period of time during which the earth's surface was cooling at an exceedingly slow rate, cyanogen and its compounds had plenty of time and opportunity to follow their great tendency to transformation and polymerization, and by the addition of oxygen and, later, also of water and salts to change to a labile protein, which constitutes living matter."

In 1909, J. Arthur Thomson, in his *The Science of Life: an Outline of the History of Biology*, cites the following alternative translation: [3]

> "Accordingly, nothing is clearer than the possibility of the formation of cyanogen compounds when the earth was wholly or partially in a fiery or heated state. It is seen how strongly and remarkably all facts of chemistry point to fire as the force that has produced by synthesis the constituents of proteid. In other words, life is derived from fire, and its fundamental conditions were laid down at a time when the earth was still an incandescent ball. If now we consider the immeasurably long time during which the cooling of the earth's surface dragged itself slowly along, cyanogen and the compounds that contain cyanogen and hydrocarbon substances had time and opportunity to indulge extensively their great tendency toward transformation and polymerization and to pass over with the aid of oxygen, and later of water and salts, into that self destructive proteid, living matter.
>
> Accordingly, I would say that the first proteid to arise was living matter, endowed in all its radicals with the property of vigorously attracting similar constituents, adding them chemically to its molecule, and thus

growing *ad infinitum*. According to this idea, living proteid does not need to have a constant molecular weight; it is a huge molecule undergoing constant, never ending formation and constant decomposition, and probably behaves toward the usual chemical molecules as the sun behaves toward small meteors.

In the plant, living proteid simply continues to do what it has always done since its origin i.e., regenerate or grow; wherefore I believe that all proteid existing in the world today was derived directly from the first proteid."

In 1936, Alexander Oparin, curiously citing some of the above passages, discards Pfluger theory as follows: [3]

"Modern biochemistry has completely discarded the fundamental conceptions of a labile autoxidizable live protein, such as Pfluger postulated."

(add discussion)

Half-living molecule | Thing

See main: Half-alive theory

In 1906, John Burke, in his *The Origin of Life: its Physical Basis and Definition*, cites a number of statements by Pfluger, including his assertion that CN is a half living thing; which he summarizes as follows: [4]

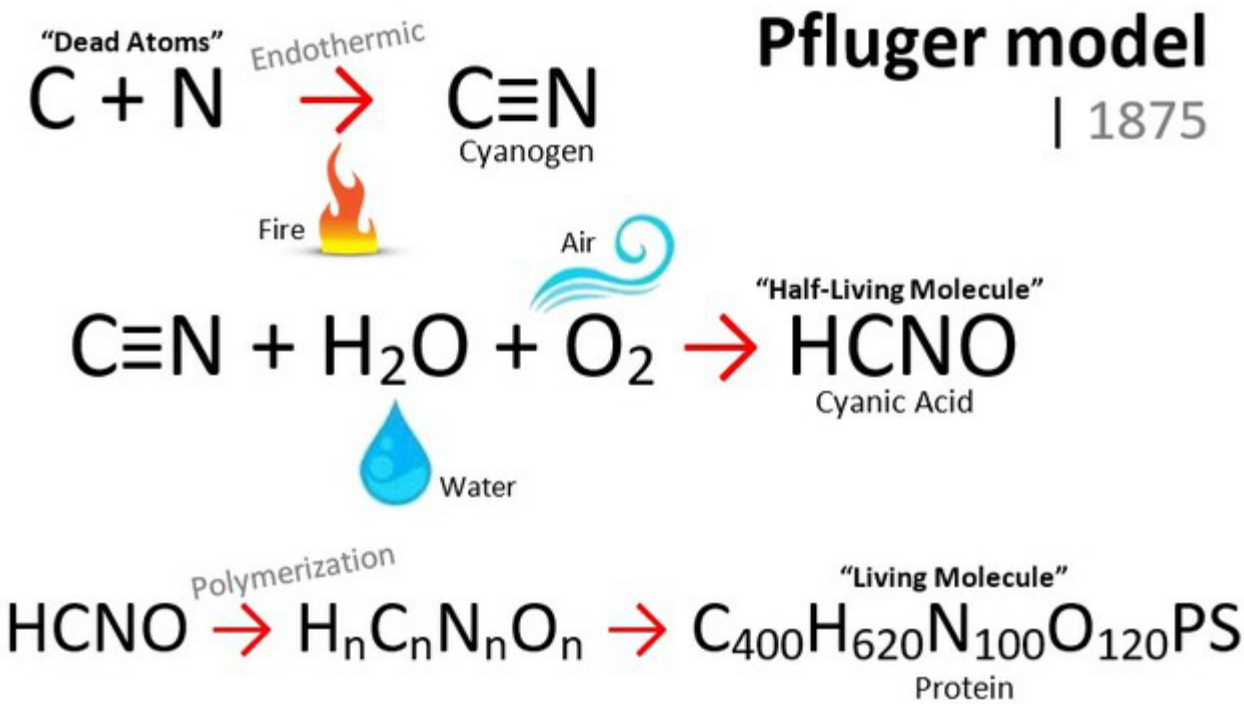

Pfluger calls attention to the following interesting points of comparison (quoting the following four points):

1. Both bodies grow by polymerization in combining chemically similar molecules like chains into masses; the growth of living substance takes place thus, and in this way also the polymeric HnCnNnOn comes from cyanic acid HCNO.
2. Further, both bodies in the presence of water are spontaneously decomposed into carbonic acid and ammonia.
3. Both afford urea by dissociation, i.e., by intra-molecular rearrangement, not by direct oxidation.
4. Finally, both are liquid and transparent at low temperatures and coagulate at higher ones; cyanic acid earlier, living proteid later. Their similarity is so great that I might term cyanic acid a half-living molecule.

Pfluger's analyses, to say the least of them, have not met with widespread recognition, further experimental confirmation being doubtless necessary before they could be ranked as theory.

The dynamical nature of the cyanogen molecule, however, together with the large store of potential energy which it contains, constitutes the resemblance, from a physical point of view, between it and radium compounds. Still it must be borne in mind that the internal energy thus manifested by the molecular disintegration is of an entirely different order of magnitude. Nevertheless there is a sufficient resemblance between the two from a physical point of view to utilize either of them for the purpose of the experiments we have in view. The molecule in either case might act as a nucleus that by catalysis, or some other means, should set up dynamically unstable groups, which, though not living in the sense that they possessed the n qualities of living proteid, might, as we have said, by possessing n-1 of those qualities be regarded as a mode of life in the sense in which many philosophers have used the word. If cyanogen is a half-living thing, as Pfluger supposed for the reasons given, it is only natural to try if it would form growths in culture media, and the use of bouillon in my experiments was merely the logical outcome of this conception."

(add discussion)

Sidis | Second law reversal

In 1920, William Sidis, in his *The Animate and Inanimate* (§11: Theories of the Origin of Life) (Q), was discussing Pfluger's theory as follows:

"How this proteid was formed remains a mystery. We have, however, a more detailed explanation in Pflüger's theory, which is to the general effect that the original combination was that between carbon and nitrogen, forming cyanogen, which in its turn united with other substance, especially the hydrogen and oxygen of water, to form more and more complex cyanogen or other similar carbon-nitrogen compounds, such combination forming as a final result proteid, the chemical basis of which would thus be the cyanogen radical, CN. Here we have a very likely explanation. In the first place, even many simple cyanogen compounds have many chemical reactions very similar to those of proteid; in the second place, whereas proteid has, in itself, been found to constitute a very great poison, it is also known that cyanogen is one of the most powerful poisons known, and that its compounds are, in general, extremely poisonous, though in certain combinations found in living bodies (e.g., almonds) such compounds seem to be quite harmless.

One difficulty with this is that this idea of spontaneous generation is somewhat contrary to observed facts; there is no instance observed of such a thing as spontaneous generation of life. But the main difficulty is to explain the formation of cyanogen and especially of its compounds from their elements. It is perfectly true, as alleged, that carbon and nitrogen being together at a high temperature will form a little cyanogen, but, with the large amount of oxygen present, this cyanogen could not last long, since cyanogen is a very endothermic substance, and under the second law of thermodynamics, it will reduce to the combination that has less chemical energy, losing the difference in the form of heat; resulting in carbon dioxide and nitrogen as a product. Accordingly we must suppose some peculiar sort of carbon and nitrogen that will not only unite into cyanogen, but which will form such a peculiar form of cyanogen that, instead of oxidizing on contact with oxygen (as ordinary cyanogen would), it not only holds itself aloof from oxidation but even forms more complex and more endothermic compounds. We must suppose some form of carbon and nitrogen which would reverse the ordinary chemical reactions under those circumstances; or, since those reactions are based ultimately on the second law of thermodynamics, we must suppose that there was at that period of the earth's history some carbon and nitrogen that possessed the ability to reverse the second law of thermodynamics. If we suppose that, our theory of life can easily harmonize with the Pflüger idea as to the origin of organic life from cyanogen compounds. In fact, as we have seen, our theory of life is such that we

> would theoretically suppose that living organisms would have a chemical construction based on the cyanogen radical, thus falling in exactly with Pfluger's idea that life on the earth originated in cyanogen and its compounds."

(add summary)

Allen

Pfluger's theory, according to Alexander Oparin, was followed by the 1899 nitrogen + energy origin of life theory of American physiologist Frank Allen, a modified variant of the former, so to say, as presented in his "What is Life?". [5]

Quotes | On

The following are quotes on Pfluger:

> "**Pfluger**'s theory deserves an exceptional place in the development of our ideas on the origin of life. Pfluger was the first to realize the possibility of a primary origin of organic substances which, because of their enormous content of chemical energy are also extensively endowed with capacity for further change and transformation. He was the first to point out that 'carbon dioxide is not the beginning but the end of life'."
>
> — Alexander Oparin (1936), *The Origin of Life* (pg. 51)

References

1. (a) Pfluger, Eduard. (1975). "On the Physiological Combustion in the Living Organism" ("Ueber die Physiologische Verbrennung in den ledendigen Organisme") (abs), *Archiv für die gesamte Physiologie des Menschen und der Tiere*, 10(1):641-44.
(b) Oparin, Alexander. (1936). *The Origin of Life* (introduction and translation: Serguis Morgulis) (pdf) (pgs. 47-50). Dover, 2003.
2. Thomson, J. Arthur. (1909). *The Science of Life: an Outline of the History of Biology* (Q). Publisher.
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5. (a) Allen, Frank J. (1899). "What is Life?" (Q), read before the Birmingham Natural History and Philosophical Society, Feb 21; in: *Proclamations of the Birmingham Natural History and Philosophical Society*, 11.
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θΔics

In hmolscience, **Eduard Sacher** (1834-1903) (SN:27) (CR=10) was an Austrian science teacher noted, in human thermodynamics, for his 1881 *Outline of a Mechanics of Society*, in which, utilizing the second law, kinetic energy, conservation of energy, he derives some type of Mayer-Clausius based social mechanics theory.

Contents

The following are the table of contents for Sacher's 1881 *Outline of a Mechanics of Society*:

Einband | Cover
Titleblatt | Titlepage
Vorrede | Preface (1-5)
Einleitung | Introduction (6-18)

1. Kraftevorrath der Gesellschaft | Reserve Forces of Society (19-30)
2. Der Kräfteverbrauch der Gesellschaft | The Every Needed Forces of Society (31-41)
3. Die Arbeit | The Work (41-52)
4. Vom Werthe der Dinge | From the Values of Things (52-63)
5. Geld | Money (63-)
6. Bewerthung der Arbeit | Job Evaluation (72-)
7. Der Reichthum | The Wealth (77-)
8. Des Capital | The Capital (83-)
9. Der Preis | The Price (95-)
10. Vertheilung des Arbeitsertrages | Distribution of Labor Income (107-)
11. Die Einzelarbeit | The Individual Work (121-)
12. Das Arbeitsprodukt und die Volksarbeit | The Work Product and the Workers (139-)
13. Der wirtschaftliche Druck | The Economic Pressure (155-)
14. Die Besteuerung | Taxation (213-246)

Inhaltsverzeichnis | Table of Contents (247)
Druckfehler | Misprints (248)

(add discussion)

Overview

In 1881, Sacher, in his *Outline of a Mechanics of Society*, in his opening pages, digs into citation of Robert Mayer (1840), and gives the following equation for what seems to be kinetic energy, although seems to define it as work:

$$W = \frac{1}{2}MV^2$$

intermixed, it seems (original is in German), with discussion of the mechanical equivalent of heat, and how heat is transformed into the a rise in one degree of temperature of water, conceptualized as an increase in the kinetic energy of the water molecules. From here, Sacher goes into further derivation and discussion of what seems to be potential energy, principle of the transmission of work, laws of motion, and then by page 18 he is citing Clausius and what seems to be kilogram-meter mechanical equivalent of version of what is now defined as the joule:

— 18 —

Es war die Aufgabe dieser Einleitung, zu zeigen, daß die physikalische Bedeutung des Wortes Energie nicht etwa einen unbestimmten Begriff bezeichnet, sondern daß die Energie etwas ganz Bestimmtes, Meßbares ist; meßbar auf 2 Arten, nämlich mittelst Wärmeeinheiten und mittelst Kilogrammmeter, wobei eine Wärmeeinheit (Calorie) gleich 424 Kilogrammeter ist.

$$1\ W = 424\ \text{Kgm.}$$

Nimmt man nach Clausius 424 Kgm. als eine höhere Maßeinheit für Arbeitsleistungen, und nennt dieselbe 1 Werk, so ist 1 Wärmeeinheit = 1 Werk.

*) Der Abkürzungsbuchstabe W kann in dem Folgenden nach Bedarf als Wärmeeinheit oder als Werk gedeutet werden.

Here, to give some humorous retrospect comparison, one would be hard-pressed to find one 21st century, if not a 20th century, sociology textbook that cites Clausius, in spite of the fact that his *The Mechanical Theory of Heat* (1865) contains the foundational basis for all socio-economic phenomena.

Sacher, according to Vaclav Smil, supposedly, viewed economies as systems for winning the greatest possible amount of energy from nature and tried to correlate stages of cultural progress with per capita access to fuels. [3]

Sacher seems to be making statements to the affect that individual work, of the more abstract varieties, can be quantified, such as in his statement: "the work of an inventor can almost priceless [measured in joules] have value."

Clausius

Sacher's book, according to Spanish applied mathematics historian Jose Pacheco, owes its inspiration to a talk given by German physicist Rudolf Clausius' on "The Energy Supplies of Nature" applied to humanity, which was said to be on the subject of humanity's profligate use of irreplaceable fossil fuel, a talk that was published in book form in 1885. [2]

Quotes

The following are representative quotes:

> "The author believes he has found in the natural sciences, the basis for a rational economy."
>
> — Eduard Sacher (1881), *Outline of a Mechanics of Society*

References

1. (a) Sacher, Eduard. (1881). *Grundzüge einer Mechanik der Gesellschaft, Theil I* (*Outlines of a Mechanics of Society*, Part I) (Q) (kinetic energy, pg. 8). Jena: Gustav Fischer.
(b) Note: part II was never published.

Grundzüge
einer
Mechanik
der
Gesellschaft.
Von
Eduard Sacher,
k. k. Professor.
I. Theoretischer Theil.
Jena,
Gustav Fischer
vorm. Friedrich Manke.
1881.

Title page of **Sacher**'s 1881 *Outline of a Mechanics of Society*, wherein he outlines some type of Mayer-Clausius based social mechanics theory. [1]

2. (a) Pacheco, Jose M. (2008). "Does More Abstraction Imply Better Understanding: *Ampuntes de Mecanica Social* by Antonio Porunondo). Max Planck Institute for the History of Science, *Preprint 351*.
(b) Clausius, Rudolf. (1885). *Über die* Energievorräthe der Natur *und ihre Verwerthung zun Nutzen der Menschheit (On the Energy Supplies of Nature and the Utilization of them for the Benefit of Mankind*). Bonn: Verlag von Max Cohen & Sohn.
(c) Krishnan, Rajaram, Harris, Johathan M., and Goodwin, Neva R. (1995). *A Survey of Ecological Economics* (pgs. 22, 24). Island Press.
3. Smil, Vaclav. (1991). *General Energetics: Energy in the Biosphere and in Civilization* (Sacher, pgs. 5, 348). Wiley.

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and Leipzig.
● Sacher, Eduard. (1901). "Die Massenarmut: ihre Ursache und Beseitigung" ("Mass Poverty: Their Causes and Eliminations"), Akademische Verlag für soziale Wissenschaften, Berlin.
● Zumerchik, John. (2001). *Macmillan Encyclopedia of Energy, Volume 2* (pg. 626). MacMillan Reference USA.
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External links

● Sacher, Eduard – WorldCat Identities.

In terminology, **education** is the method of teaching or instilling knowledge and learning, in schools or independently.

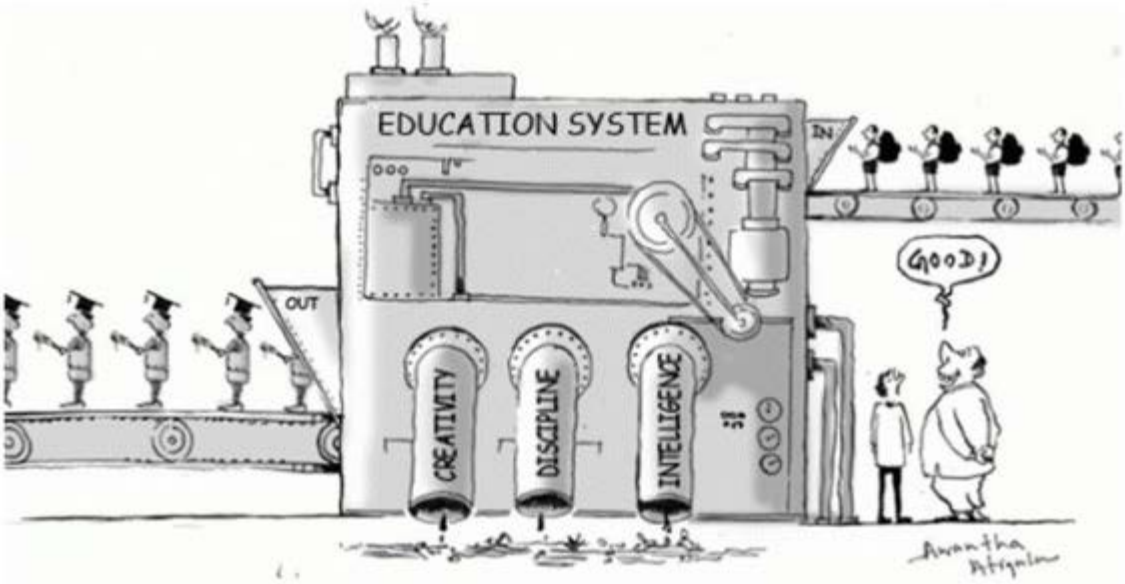

An **education system** cartoon, in what seems to be a Angelo Letizia (2014) article (Q), visually conceptualizing of what Alan Watts famous referred to as the "here kitty kitty" mentality of the education-career process of the atypical coming into being realization.

Information obesity

See also: Hydraism

In c.2004, the term "information obesity" began to be used in respect to having a fat unfit mind overloaded with wrong simplified versions of information (Q); it is a two cultures (Q) related problem. [7]

Original works | Reading

The following are admonitions about techniques to studying subjects:

> "You must acquire the best knowledge first, and without delay; it is the height of madness to learn what you will later have to unlearn."
>
> — Desiderius Erasmus (1497), "Letter to Christian Northoff" [5]

> "It is of great advantage to the student of any subject to **read the original memoirs** on that subject, for science is always most completely assimilated when it is in the nascent state."
>
> — James Maxwell (1873), *A Treatise on Electricity and Magnetism* (pg. xi)

> "Erasmus advises students to read only the best books on the subjects with which they are occupied. He cautions them against loading their memories with the errors of inferior writers which they will afterwards have to throw off and forget."
>
> — James Froude (1894), *Life and Letters of Erasmus* [6]

(add)

Ignorance

The following are education and ignorance quotes:

> "If one does not know what went on for the last three thousand years, he or she remains ignorant, merely surviving from day-to-day."
>
> — Johann Goethe (c.1820)

> “**Education** is the progressive realization of our ignorance.”
>
> — Will Durant (1965), variant of (Q) above, per extension of Socratic paradox; seemingly misattributed to Einstein

(add)

Socratic paradox | Know nothing

A famous saying, in respect to knowledge, attributed to Socrates by Plato, is that the wisest person is the one who knows that they “know nothing”, whereas the most ignorant person, conversely, is the one who boasts they know everything. Chaerephon, a friend of Socrates, as the dialogue goes, asked Pythia (the oracle of Delphi): "Is anyone wiser than Socrates?" The answer was: "No human is wiser", since Socrates denied any knowledge, and tried to find someone wiser than himself among politicians, poets, and craftsmen. It appeared that politicians claimed wisdom without knowledge; poets could touch people with their words, but did not know their meaning; and craftsmen could claim knowledge only in specific and narrow fields. The interpretation of the Oracle's answer might be Socrates's awareness of his own ignorance. [3]

Montaigne's medal | Evidence

In 1576, French thinker Michel Montaigne ordered a medallion to be struck with the words *Que sais-je?* or “what do I know?” in scribed on it, which he wore around for the rest of his existence to remind himself that nothing should be believed without evidence. [4]

Auto-education

The greater a genius is the more he or she tends to be self-educated (see: self terminology reform) and or autodidactic; he following reflective quote by Nietzsche is evidence to this:

Bio-Engineering	88.3
Electrical Engineering: Wave Propagation & Radiation	87.5
Science & Engineering	85.8
Mathematics	83.3
Chemistry	82.5
Energy Engineering	81.7
Thermal Science	81.7
Wave Propagation & Radiation	80
Aerospace Science	79.2
Physics	79.2

A ranking of hardest degrees, in intellectual difficulty, on a scale of 1-100 (100=harder, 0=easier), of the 90 attained degrees (see: full list) for female graduating students of the University of Illinois, Chicago, for the graduating classes of 1969 and 1970 combined, according to the polled opinion of American college students (N=14). [2]

> “If I am to describe what an event my first glance at Schopenhauer's writings was for me, I must dwell for a moment on an idea which used to come to me in my youth more pressingly, and more frequently, than perhaps any other. When in those days I roved as I pleased through wishes of all kinds, I always believed that sometime fate would take from me the terrible effort and duty of **educating** myself: I believed that, when the time came, I would discover a philosopher to educate me, a true philosopher whom one could follow without any misgiving because one would have more faith in him than one had in oneself ... Schopenhauer produced upon me, that magical outpouring of the inner strength of one natural creature on to another that follows the first and most fleeting encounter; and when I subsequently analyze that impression I discover it to be compounded of three elements, the elements of his honesty, his cheerfulness and his steadfastness. He is honest because he speaks and writes to himself and for himself, cheerful because he has conquered the hardest task by thinking, and steadfast because he has to be.”
>
> — Friedrich Nietzsche (1876), “Schopenhauer as Educator”

(add)

Adams

American Henry Adams, best known for his *The Education of Henry Adams*, about the failure of the typical American

educational system, Harvard in particular, to adequately educate the mind to the growing realities of the world, is known for a number of ripe quotes on education:

> "The object of **education** should be the teaching [of] how to react with vigor and economy. No doubt the world at large will always lag so far behind the active mind as to make a soft cushion of inertia to drop upon; but education should try to lessen the obstacles, diminish the friction, invigorate the energy, and should train minds to react, not at haphazard, but by choice, on the lines of force that attract their world."
>
> — Henry Adams (1907), *The Education of Henry Adams* [1]

> "Nothing is to be gained by preaching this lesson as a form of energy. It would act as a dissipator of energy. Therefore I have taught it, or tried teaching it, only to the few men who could profit by it to economise their scholar's energies,—to save them from wasting it on past processes. Economy is all I can see now, as true scientific object for education to pursue. Certain branches of **education** may soon be lopped off, to advantage."
>
> — Henry Adams (1910), "Letter to Barrett Wendell", May 18

Quotes | Religion conflict

The following are relevant quotes, particularly highlighting the belief system conflict issue:

> "Today's children are **taught** by our culture that we are a cosmic accident. Something slithered out of the primal slime and over billions of years evolved into a human being. We are cousins, ten times removed, to the ape at the zoo eating his own excrement."
>
> — Gary Bauer (1992/2013), Evangelical Christian centric politician; former domestic advisor to Ronald Reagan (Q) (Q) (Q)

> "To think that we just evolved from a bang, that we used to be monkeys, that seems unbelievable when you look at the complexity of the human body … If you **tell** children there is no purpose to their life—that they are just a chemical mutation—that doesn't build self-esteem."
>
> — Nigel McQuoid (2001), Headmaster Emmanuel College

Quotes

The following are general education quotes:

> "Spend a few thoughts sometimes on the puzzling inquiries concerning vacuums and atoms, the doctrine of infinites, indivisibles, and incommensurables in geometry, wherein there appear some insolvable difficulties: do this on purpose to give you a more sensible impression of the poverty of your understanding and the imperfection of your knowledge. This will teach you **what a vain thing it is to fancy that you know all things**, and will instruct you to think modestly of your present attainments."
>
> — Isaac Watts (1727), *The Improvement of the Mind* (pg. 22); read by Michael Faraday at age 14 [8]

> "By annihilating the desires, you annihilate the mind. Every man without passions has within him no

principle of action, nor motive to act."

— Helvetius (1773), *A Treatise on Man: His Intellectual Faculties and his Education* (Q)

"To be master of any branch of knowledge, you must master those which lie next to it; and thus, to know anything — you must know all."

— Oliver Homes (1886), American jurist

"Never let school get in the way of your **education**."

— Mark Twain (c.1890) (Q)

"**Education** is not the filling of a pail, but the lighting of a fire."

— William Yeats (c.1905) (Q)

"If I were in seventh grade now my mind would be rotting."

— Balamurali Ambati (1990), age 12 statement; got MD at age 17

See also

- Human thermodynamics education
- Hydraism
- Two cultures department

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(b) The Education of Henry Adams – Wikipedia.
2. Thims, Libb. (2003). *Human Thermodynamics, Volumes 1-3* (Research project #, pg. 221). IoHT Publications.
3. (a) I know that I know nothing – Wikipedia.
(b) Plato. (c.395). *The Socratic Dialogues* (abs). Kaplan.
4. Rowan-Robinson, Michael. (2001). *The Nine Numbers of the Cosmos* (pg. vii). Oxford University Press.
5. Erasmus, Desiderius. (1489). "Letter to unidentified friend" (Q); in: *Collected Works of Erasmus* (pg. 114). Publisher, 1974.
6. Froude, James. (1894). *Life and Letters of Erasmus: Lectures Delivered at Oxford 1893-94* (Q). Longmans, Green, 1899.
7. McCullough, Malcolm. (2015). "Distraction Reconsidered", in: *Ubiquitous Computing, Complexity, and Culture* (pg. 207). Publisher.
8. Watts, Isaac. (1727). *The Improvement of the Mind*. A.S. Barnes, 1885.

Further reading

- Groysman, Alec. (2011). "Use of Art Media in Engineering and Scientific Education" (§3.4: Human Chemistry), Generative Art Conference, XIV.

External links

- Education – Wikipedia.

θΔics

In *Elective Affinities*, **Edward**, the name used in the Hjalmar Boyesen (1885) and Herbert Waidson (1960) translations of Goethe's 1809 *Elective Affinities*.

An 1863 rendition of **Eduard** by Friedrich Pecht and Arthur von Ramberg. [1]

Spelling alternative

The name is an alternative spelling of **Eduard** (main article), as used in the more popular Reginald Hollingdale (1971) and David Constantine (1994) translations.

Comment on | by Goethe

Goethe's literary assistant German poet Johann Eckermann reported that on 21 Jan 1827 Goethe spoke of Edward in the following manner: [2]

> "I can't stand him myself, but I had to make him like that ... There is in any case much truth in his figure, for one finds enough people in the upper classes in whom, as in him, wilfulness takes the place of character."

(add)

Description | by Friedrich Pecht

The following is the 1863 description of the character Edward, in the depiction and emotion of the character shown adjacent, by German historical and portrait painter, lithographer, and art writer Friedrich Pecht: [1]

> "If Goethe generally treats the gentlemen very badly who take the part of lovers in his works, and not only gives them heavy crosses to bear, but makes them also perform their parts poorly, this is wholly justifiable on psychological grounds, since long experience testifies that love makes men more stupid and women brighter.
>
> Perhaps of all these afflicted gentlemen, none comes off so badly as the hero of the *Elective Affinities*, since the extraordinary power of the delineation leaves no doubt of its truth. The ground of this whole phenomenon is found here, that love-making, which with men is but a subordinate occupation, even if the most interesting, in romance and plays is made the chief work of the lover, and this affects us disagreeably. With men it is rather doing than being, with women it is rather being than doing.
>
> But the Baron Edward occupies himself, as we see him, only in love-making; only in this has he attained to mastery; in all other things is he a thorough *dilettante*, with all that disagreeable and unmanly flavor which dilettanteism gives to men. Even if it were not told us in the beginning, we should infer from his whole demeanor that he had not been sufficiently chastised by his father when a boy, and that his gracious mother had almost spoiled him. In his flute-playing, in his gardening, in his readings, everywhere, he is in danger of being ridiculous, or at least of awakening a little contempt, because he begins with such impatient haste, and is neither earnest nor persistent. How finely is the Captain contrasted with him | The Captain also loves, but he does many things of which Edward has no perception—he labors, and so neither he nor Faust, to whom love also is only a subordinate thing, is in danger of arousing in our hearts a feeling of barren pity.
>
> Only through two features has the poet preserved Edward from being perfectly despicable, as was Weislingen: with all his childish impatience, he is thoroughly amiable, and is, in every sense, brave. He seeks war and death when misfortune overtakes him.

This is the manly side of his character—only, alas ! do not clearly see it, but- merely hear of it incidentally; whereas the English poet takes good care, first of all, to make us accurately acquainted with this characteristic of his hero, so that no doubt respecting it can remain. But that our poet left it undecided what his intention was, is a highly-significant feature, not only in the portrait of Edward, but also in his own, and that of the period in which the book had its origin. It was written, as we know, in the years 1808-1809—the period of the deepest, most hopeless depression of Germany, and it makes upon us of today a very peculiar impression to see a man in a distinguished social position act without any discernible grounds for his action. All the personages of the story are German, the scene is laid in Germany, but the local characteristics are effaced with the utmost care. The whole plot could as well have been laid in the moon as in Germany. Every reference to an oppressed, betrayed, dishonored nation, and to the condition of public affairs, then most lamentable, which forms the invisible background of this painting, is wanting; and nevertheless it is simply this background which gives their justification to these figures of the poet. It was with the Germans of that time as with the Jews. Without a fatherland, and without any hope of obtaining one, all activity must limit itself to the family and to the intimate relations of friendship. In such a state of affairs all the emotions of the soul become sickly, as we find them described in Werther, in Wilhelm Meister, but especially in Edward.

Transferred to the year 1813, such a character as Edward is not imaginable. He goes out to serve under a leader “where death is probable, but victory is certain.” In these words Goethe could have thought only of Napoleon, and so gives to Edward the fortunate post of a soldier of the Confederation of the Rhine, but considerately avoids giving him the glory of a defender of the fatherland. Such high patriotism must necessarily have been a counteractive to that sickness of the soul under which he labored, and have greatly contributed to his mental recovery.

Nowhere does the extraordinary artistic superiority of Goethe more plainly show itself than in his description of the restless, hasty, hot-tempered, capricious, but nevertheless amiable Baron. We ever see the man of fine education, of fine culture, who, partly through his natural endowments, and partly through external influences from childhood, has learned to do not only the right thing but the wrong also, in an attractive way. He is, through and through, a cavalier, without a single plebeian feature, while the earnest Captain, contrasted with him, shows through his soldierly bearing the born citizen. We see in him a stiff and formal character; an active mind; a nature persistent, punctilious, and taking strict account both of time and money; while Edward is naturally prodigal of both, and has never learned to know rightly their worth. Generous even to excess, he is persistent only for a caprice which becomes indifferent to him so soon as he has attained it. In like manner, has he learned only to command, but never, like the Captain, to obey. He is full of courtesy, but it is of that distinguished kind which is not rooted in benevolence for those with whom he has to do, but in the wish to be considered very good-hearted and compassionate. It is certainly one of the finest touches in the delineation of his character that, learning that the Captain had spoken with Charlotte depreciatingly of his flute-playing, he should feel himself released form all obligations toward both. That he is full of caprices, but without determination; that he makes not the slightest attempt to control his unjustifiable passion; that the conception of duty seems wholly to be wanting; that he recognizes simple rights,—all this shows us certainly the spoiled son, but shows us also the nobleman of that time. In general, the whole romance, carefully as every trace of place and time is kept out of sight, depicts in an incomparable way the constitution of a portion of society at that period.

If we not accompany the impatient Baron without special sympathy in his progress through the whole book, so long as a gleam of hope remains to him, we cannot nevertheless deny him our sympathy when all hope has vanished. The manner in which he yields to slow decay, making no effort to live, but with a kind of joy gives himself to a lingering death, is powerfully described, and to the amiable man in his hopeless misery no one can deny a tear.

In the picture, he is represented writing to Charlotte of the country-seat, and impatience is manifest in his fingers, and breathing in every feature of this countenance. With raven locks, pale and embrowned, a form light and elastic, a brilliant and showy manner, he is nevertheless more cavalier than soldier. Although an elegant cavalry officer, he is deficient in that subjection to strict discipline which is as much due from

himself as others, and which extends to mind and heart as well as to things external. He is good only for attack, for defense he is wholly unprepared"

References

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2. Waidson, Herbert M. (1960). "Introduction", in: *Kindred by Choice*. John Calder.

θΔics

In existographies, **Edward Bulwer** (1803-1873) (IQ:165|#360) (Cattell 1000:247) , aka Baron Lytton, was an English writer noted, in literature thermodynamics, for []

Overview

In 1871, Bulwer, in his science fiction novel *Vril: the Power of the Coming Race*, in which he utilized English chemist-physicist Michael Faraday's version of the conservation of force; an example of which is as follows [1]

> "I have long held an opinion, almost amounting to a conviction, in common, I believe, with many other lovers of natural knowledge, that the various forms under which the forces of matter are made manifest have one common origin; or, in other words, are so directly related and mutually dependent, that they are convertible, as it were, into one another, and possess equivalents of power in their action."

to make a story around a subterranean species, called 'Vril-ya', that exist on a hypothetical type of energy called 'vril', according to which both the workings of the machinery in the new society and the government of the new species operate under the same laws of nature, or something along these lines.

The novel also digs into the question of the automaton the human and morality and motion; one passage explains:

> "[The automaton] is animated for the time being by the soul thus infused into it."

The logic of the book, according to American literature thermodynamicist Barri Gold, is that the "soul" operates as the natural force produced by harnessing the internal motion of matter. "Bulwer-Lytton's automata", as summarized by Gold, "seem to live and reason". [2]

See also

â— Isaac Asimov | *Foundation Series* (1942) | Psychohistory

References

1. Bulwer-Lytton, Edward. (1871). *Vril: the Power of the Coming Race* (pg. 53). Broadview Press.
2. Gold, Barri J. (2010). *ThermoPoetics: Energy in Victorian Literature and Science* (pgs. 80, 90-92). MIT Press.

External links

â— Vril – Wikipedia.
â— Edward Bulwer-Lytton, 1st Baron Lytton – Wikipedia.

θΔics

In thermodynamics, **Edward P. Culverwell** (1855-1931) was an Irish physicist noted for his 1890s objections to Austrian physicist Ludwig Boltzmann's 1872 H-theorem solution to derive irreversible consequences from reversible premises. [1]

Education

Culverwell completed his MA at Dublin College.

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● Lindley, David. (2001). *Boltzmann's Atom: the Great Debate that Launched a Revolution in Physics* (Culverwell, 5+ pgs.). The Free Press.

External links

● Edward P. Culverwell – InformationPhilospher.com.

θΔics

In thermodynamics, **Edward Eugene Daub** (1924-) is an American engineer noted for his 1960 PhD dissertation *The Second Law of Thermodynamics and Christian Thought*, on religious thermodynamics, and various articles on the history of thermodynamics in the 1960s.

Overview

In 1967, Daub, in his "Atomism and Thermodynamics", compares the thermodynamics of Rudolf Clausius with William Rankine. [1]

Daub's 1970 article "Entropy and Dissipation" discusses the history behind the entropy (misinterpretations) of James Maxwell in his *Theory of Heat* and later edition revision corrections, and how entropy relates to spontaneity whereas the notion of dissipation does not. [2]

In 1978, Daub published *Fire*, his most widely-held work, a children's book discussing fire, its usefulness to humans, and its destructive elements.

Education

In 1947, Daub completed his MS on "Thermal Diffusion in Liquid Mixtures" at the University of Wisconsin, Madison. [3] In 1960, Daub seems to have parlayed into the religious thermodynamics arena when he completed his PhD on *The Second Law of Thermodynamics and Christian Though* at the Union Theological Seminary, New York. [4] In 1967 to 1969, Daub was doing summer research on probability and thermodynamics, on a National Science Foundation grant, at the University of Kansas. [5] In 2003, Daub was professor emeritus of engineering at the University of Wisconsin, Madison.

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1. Daub, Edward E. (1967). "Atomism and Thermodynamics" (abs), *Isis*, 58: 293-303.
2. Daub, Edward E. (1970). "Entropy and Dissipation" (abs), *Historical Studies in the Physical Sciences*, 2: 321-54.
3. Daub, Edward E. (1947). "Thermal Diffusion in Liquid Mixtures", thesis, University of Wisconsin, Madison.
4. Daub, Edward E. (1960). *The Second Law of Thermodynamics and Christian Thought* (abs). Union Theological Seminary.
5. Daub, Edward E. (1969). "Probability and Thermodynamics: the Reduction of the Second Law" (abs), *Isis*, 60(3): 318-330.

Further reading

â— Daub, Edward E. (1966). *Rudolf Clausius and the Nineteenth Century Theory of Heat*. University of Wisconsin.

External links

â— Daub, Edward E. – WorldCat Identities.
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θΔics

In chemistry, **Edward Frankland** (1825-1899) was an English chemist noted for his 1852 valence theory, a pioneering idea in the history of chemical bonding theory, in which he combined the older theories of 'free radicals' and 'type theory' with thoughts on chemical affinity, he argued that atoms of each elementary substance have a definite saturation capacity or 'combining power', so that they can only combine with a certain limited number of the atoms of other elements. [1]

Valence theory

In his valence theory of atomic attachment, Frankland explained that certain elements have the tendency to combine with other elements to form compounds containing three, i.e. in the three atom groups (e.g. *NO3, NH3, NI3*, etc.) or five, i.e. in the five atom groups (e.g. *NO5, NH4O, PO5*, etc.), equivalents of the attached elements. It is in this manner, according to Frankland, that their affinities are best satisfied. As he stated:

> "A tendency or law prevails (here), and that, no matter what the characters of the uniting atoms may be, the **combining power** of the attracting element, if I may be allowed the term, is always satisfied by the same number of these atoms."

(add discussion)

References

1. Frankland, Edward. (1852). "On a New Series of Organic Bodies containing Metals", *Philosophical Transactions*, 417. Royal Society of London. pg. 417-.

Further reading

â— Frankland, Edward. (1877). *Experimental Researches in Pure, Applied and Physical Chemistry* (the use of brackets in chemical formulae, pg. 11). J. Van Voorst.
â— Partington, J.R. (1937). *A Short History of Chemistry* (Frankland, pgs. 273-78, 280, 286, 290, 294, 297-98, 317, 321). Dover.

External links

â— Edward Frankland – Wikipedia.

θΔics

In existographies, **Edward Gibbon** (1737-1794) (IQ:180|#170) (Cattell 1000:60) [RGM:495|1,400+] (GHE:2) [HD:12] (FA:76) (CR:18) was and English historian, noted for []

Overview

See: Rise and fall of civilization

In 1788, Gibbon finished his six-volume *The History of the Decline and Fall of the Roman Empire*, some of which he had peer reviewed by David Hume (1776), wherein he openly criticized organized religion; quote: "Religion is regarded by the common people as true, by the wise as false, and by the rulers as useful" (Q); and or a paraphrase of Seneca the Younger (Q), thereafter developing enlarged reputation for harboring "irreligion" or atheism. (Q)

Specifically, Gibbon told the story of the rise and fall of Roman, without the intervention of god, as was previously the standing explanation, but instead from the point of view of Rome's decline as due the "disease of Christianity" spreading through the Roman empire and rotting it. [1]

Influence

Gibbon's six-volume *The History of the Decline and Fall of the Roman* was influential to Isaac Asimov's seven-volume science fiction *Foundation Series* (1993), wherein psychohistory is outlined.

Quotes | By

The following are quotes by Gibbon:

> "The various modes of worship, which prevailed in the Roman world, were all considered by the people, as equally true; by the philosopher, as equally false; and by the magistrate, as equally useful."
>
> — Edward Gibbon (1788), *The History of the Decline and Fall of the Roman Empire* (§2); also attributed to Seneca (c.50AD) and Lucretius (c.55BC) [2]

> "The number of Protestants executed in a single province and single reign far exceeds that of the primitive martyrs in the space of three centuries of the Roman empire."
>
> — Edward Gibbon (1788), *Decline and Fall of the Roman Empire* [1]

> "Unprovided with original learning, unformed in the habits of thinking, unskilled in the arts of composition, I resolved-to write a book."
>
> — Edward Gibbon (c.1779), Ranker best quote #8 (Q)

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 354-55). HarperOne.
2. (a) Gibbon, Edward. (1776). *The History of the Decline and Fall of the Roman Empire* (§2). Publisher.
(b) Stephens, Mitchell. (2014). *Imagine There's No Heaven: How Atheism Helped Shape the Modern World* (pg. 37). St. Martin's Press.

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● Gibbon, Edward. (1883). *History of Christianity: Comprising All that Relates to the Progress of the Christian Religion in "The History of the Decline and Fall of the Roman Empire," and A Vindication of Some Passages in the 15th and 16th Chapters* (Serapis, pgs. 526-27). P. Eckler.

External links

● Edward Gibbon – Wikipedia.

θΔics

In ecological thermodynamics, **Edward Goldsmith** (1928-2009) is a French-born English economist, ecologist, and philosopher noted, particularly in the field of ecodynamics, for his 1981 article "Thermodynamics or Ecodynamics", for postulating two laws of ecodynamics, and for his theory of ecological equilibrium. [1]

Overview

Goldsmith, in a way, is anti-thermodynamic in his views. His writings are generally themed towards a paradigm shift away from the reductionist approach of science. In his 1992 magnum opus *The Way: An Ecological World-View*, for instance, Goldsmith argues, on the logic of the views of Belgian chemist Ilya Prigogine, that the laws of classical thermodynamics cannot be applied to living things. [2] Moreover, the appendix section of this book devotes ten-pages to a proof that "the entropy law does not apply to behavior within the ecosphere." Aside from Prigogine, Goldsmith has been influenced by the writings of English scientist James Lovelock and American ecologist Eugene Odum, among others.

References

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(b) Sale, Kirkpatrick. (2000). *Dwellers in the Land* (pgs. 67-68). University of Georgia Press.
(c) Edwin Goldsmith (curriculum vitae) – EdwinGoldsmith.com
2. Goldsmith, Edward. (1992). *The Way: An Ecological World-View*, (pgs. 13-14) (Appendix One: Does the Entropy Law Apply to the Real World?, pgs 439-48). University of Georgia Press.

External links

â— Edward Goldsmith – Wikipedia.

θΔics

In existographies, **Edward Grant** (1926-) (CR:5) an American science historian, specializing in medieval science, noted for []

Overview

In 1981, Grant, in his *Much Ado About Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution*, gave a sharp and detailed historical overview of the deeper history of nature abhors a vacuum debate, in the middle ages years (see: middle ages geniuses), comparable in many respects to Steven Shapin and Simon Schaffer's 1985 *Leviathan and the Air-Pump*.

In 2001, Grant, in his *God and Reason in the Middle Ages*, gave a listing of the 216+ condemnations of the famous Condemnation of 1277. [2]

Quotes | Employed

The following are quotes employed by Grant:

> "Nothingness [void / vacuum / empty space] contains all things; it is **more precious than gold**, free from birth and destruction, more pleasant than the sight of pure light, more noble than the blood of kings, comparable with the sky and higher than the stars, more powerful than a bolt of lightning, perfect and rich in all its parts."
>
> — Otto Guericke (1672), *The Magdeburg Experiments on the Vacuum of Space* (pg. 99); cited by Edward Grant (1981) in *Much Ado About Nothing* (pg. 216); cited by Helge Kragh (2014) in *The Weight of the Vacuum* (pg. 6) [1]

Quotes | By

The following are quotes by Grant:

> "In the medieval literature on nature's 'abhorrence of a vacuum', the two most popular demonstrations were the clepsydra and the separation of two plane surfaces."
>
> — Edward Grant (1981), *Much Ado About Nothing* [1]

References

1. Grant, Edward. (1981). *Much Ado About Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution* (gold, pg. 216; clepsydra, 7+ pgs, quote, pg. 83). Cambridge.
2. (a) Grant, Edward. (2001). *God and Reason in the Middle Ages* (pg. #) (Ñº). Cambridge University Press.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 258-61). HarperOne.

External links

â— Edward Grant – Wikipedia.
â— Edward Grant (about) – American Academy of Arts and Sciences.

θΔics

In existographies, **Edward Armand Guggenheim** (1901–1970) (CR:73) was an English physical chemist, physicist, and statistician known, through the publication of his 1933 textbook *Modern Thermodynamics by the Methods of Willard Gibbs*, as being one of the founders of modern chemical thermodynamics. [1]

Education

In his youth, Guggenheim excelled greatly in mathematics and chemistry; this may explain his attraction towards to exacting work of Gibbs. In circa 1924, Guggenheim came under the tutelage of English physicist Ralph Fowler, who together with they would go on the write the 1938 textbook *Statistical Thermodynamics*. [2]

See also

- Jeans, Donnen, Guggenheim debate

References

1. (a) Edward Guggenheim – Oxford Dictionary of National Biography
(b) Ott, Bevan J.; Boerio-Goates, Juliana (2000). *Chemical Thermodynamics – Principles and Applications*. Academic Press.
2. Tompkins, F. C. and Goodeve, Charles F. (1971). "Edward Armand Guggenheim. 1901-1970", *Biographical Memoirs of Fellows of the Royal Society*, Vol. 17, Nov., 1971 (Nov., 1971), pp. 303-326.

Publications

- Guggenheim, Eduard, A. (1933). *Modern Thermodynamics: by the Methods of Willard Gibbs.* London: Methuen & Co.
- Guggenheim, Eduard. (1959). *Thermodynamics - an Advanced Treatment for Chemists and Physicists, 4th Ed.* Amsterdam: North-Holland Publishing Co.
- Fowler, Ralph and Guggenheim, E. A. (1960). *Statistical Thermodynamics.* Cambridge University Press.

External links

- Edward A. Guggenheim – Wikipedia.

θΔics

In existographies, **Edward Hall** (1914-2009) (CR:11) was an American anthropologist noted for his 1966 *The Hidden Dimension: an Anthropologist Examines Man's Use of Space in Public in Private*, wherein he extends the 1955 animal personal space, flight or fight, trigger reaction, and territorial measurement work of German zoologist Heini Hediger, to develop theories on human social volumes.

Action chain | Chain reaction

In 1966, Hall, in his *The Hidden Dimension*, used the term "chain reaction", and or, supposedly, "action chain", as a type of automated reaction sequence of events or "dance", in the case of two-person action chain; noting that the common goal could be reached only after each link in the chain was forged. Hall gave the example of the fifteen ordered steps required in the matting of the sticklebacks. He then argued that humans, similarly, do *nothing* that is not part of an action chain. [8]

Molecules | Space

See: Social space; Personal space; Sidewalk study; Hallway study

In 1966, Hall, in his *The Hidden Dimension*, stated the following: [1]

> "As more and more is learned about both men and animals, it becomes clear that the skin itself is a very unsatisfactory boundary or measuring point for crowding. Like molecules that make up all matter, living things move and therefore require more or less fixed amounts of space (see: social space). Absolute zero, the bottom of the scale, is reached when people are so compressed that movement is no longer possible. Above this point, the containers in which man finds himself either allow him to move about freely or else cause him to jostle, push, and shove. How he responds to this jostling, and hence to the enclosed space, depends on how he feels about being touched by strangers."

Here, interestingly, he compares people to molecules and notes frankly that "skin" is not a good boundary measurement for humans, which is good rule of thumb guideline for beginner human thermodynamicists in respect to discernment of "boundaries" in human social thermodynamic terms.

Social gravity

The following is another noted quote by Hall: [5]

> "Like gravity, the influence of two bodies on each other is inversely proportional not only to the square of the distance but possibly even the cube of the distance between them."

> "Man, too, has territoriality and he has invented many ways of defending what he considers his own land, turf, or spread. The removal of boundary markers and trespass upon the property of another man are punishable acts in much of the Western world."

In equation form, Hall seems to be giving the following estimate of the measure of the force between humans and animals or what seems to be social gravity:

$$G_S \propto \frac{1}{d^n}$$

where G_S is the social gravity, d is the distance between the two people or animals, and n is a number between 2 and 3. Hall explains this logic in terms of his "invisible bubbles" theory and compressed social stress:

> "If one sees man surrounded by a series of invisible bubbles which have measurable dimensions, architecture can be seen in a new light. It is then possible to conceive that people can be cramped by the spaces in which they have to live and work. They may find themselves forced into behavior, relationships, or emotional outlets that are overly stressful. When stress increases, sensitivity to crowding rises—people get more on edge—so that more and more space is required as less and less is available."

The adjacent numbers give some example calculation of what Hall is saying here. In other words, if for example you get in someone's face, at a distance of 0.5 meters, the force may increase at a rate proportional to the inverse cube (8 newtons of force) of the distance rather than the inverse square (4 newtons of force) of the distance, according to Hall's intuitive estimates.

	$G_S \propto \frac{1}{d^2}$	$G_S \propto \frac{1}{d^3}$
d = 3 m	0.11 N	0.04 N
d = 0.5 m	4 N	8 N

To give a comparison example, magnetic field strength is often described as diminishing inversely proportional to the square of the distance; but one will often hear descriptions that the field strength is inversely proportional to the cube of the distance from the surface of the magnet. It depends on the source of the field and how close you are to it.

> A "monopole" field goes like $1/r^2$. Magnetic monopoles don't actually exist as far as we know to date, but some situations can produce a field which is approximately a monopole field over a limited region. For example, if you have a long bar magnet and you stay close to one pole.
>
> A "dipole" field goes like $1/r^3$. This is what you get from a current loop or a bar magnet, when you get far enough away that it appears "small."

Norway rat study

Hall, in his chapter three "Crowding and Social Behavior in Animals", gives a rather cogent analysis of American ethologist John Calhoun's famous Norway rat study, conducted over a period of 14-years in and about a barn, with an overhead glass walkway observation platform, in Rockville, Maryland, from 1947 to 1958, commenting for example how Callhoun discerned the Dunbar number, i.e. 150, of population stability:

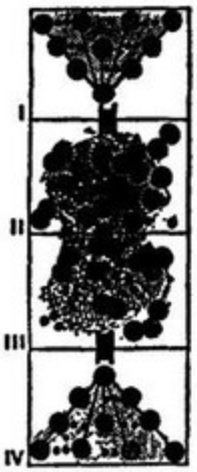

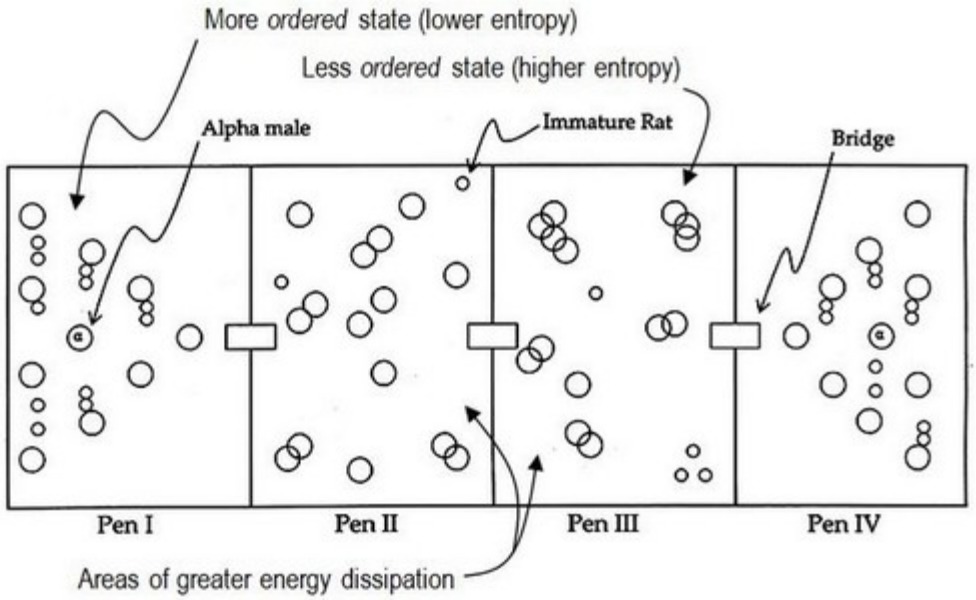

> “Even with plenty of food and no pressure from predation, the population never exceeded 200 individuals, and stabilized at 150.”

even before it was actually given the name "Dunbar number" in honor or Robin Dunbar. The following, below left, is Hall's reconstruction of the Calhoun's rat density study, shown adjacent to Libb Thims reconstruction of the same study based on Hall's description and illustration. [7]

Hmolscience

Hall’s work is frequently cited in efforts quantify and or formulate theories on social volume and or human volumes, in general, in physical, chemical, and or thermodynamical terms; examples found in the works Raddai Raikhlin (2003) and Libb Thims (2007). [2] Thims, in particular, employed the work of Hall and Hediger to develop aspects of human molecular orbital theory, such as explaining their so-called "attack reaction" theory: [3]

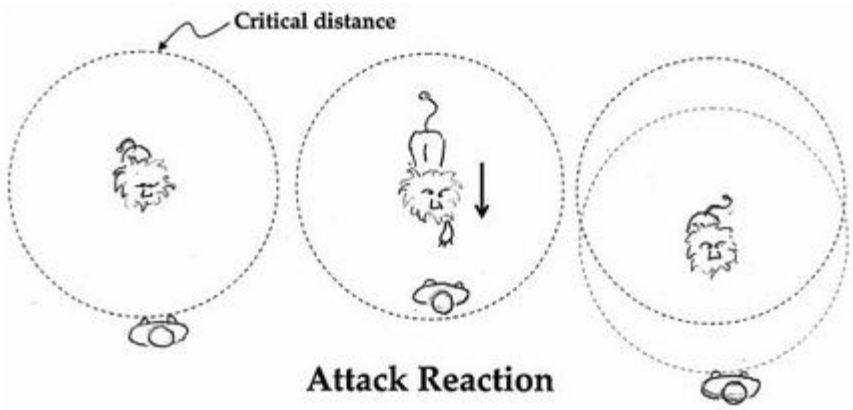

in chemical reaction terms.

Reaction bubbles

Hall also states:

> “Each animal is surrounded by a series of **bubbles** or irregularly shaped balloons that serve to maintain proper spacing between individuals.”

Thims, in turn, utilized this logic, in combination with *molecular orbital theory*, in the development of the theory of the human molecular orbital.

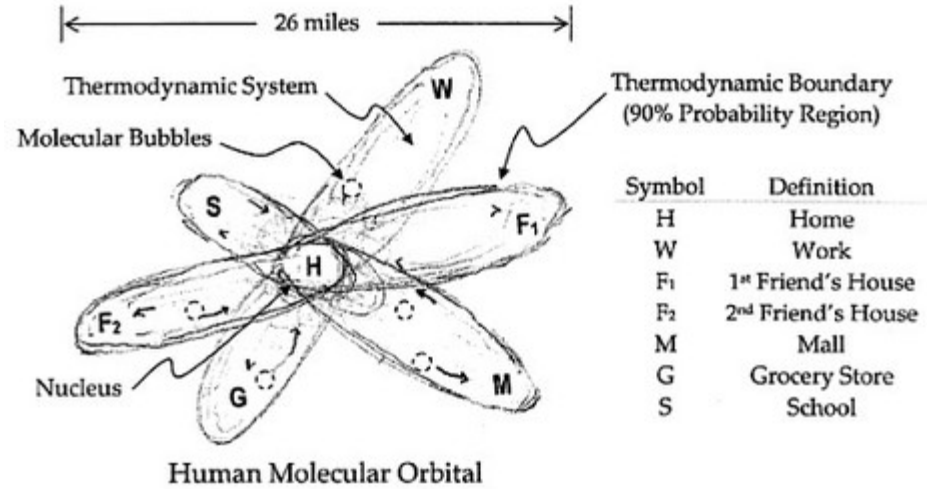

Depiction of a human molecular orbital showing of the 90 percent probability region of a person's location over the surface of the earth, the person considered as a human particle, shown inside of **Hall's** 1966 conception of 'reaction bubbles' (a type of personal space), according to which the probability region boundary is defined as one's thermodynamic boundary. [4]

Quotes | On

The following are quotes on Hall:

> “A captivating scholarly writing on how human beings react to and make use of spatial distance from a physical and psychological viewpoint, i.e. the study of proxemics. The book also deals with cultural differences in the use of space. **Hall** examines the French, German, English, Japanese, and Arab world comparing each with the American context and with one another.”

— Rana Sinha (2006), review of *The Hidden Dimension* (Ñº)

Quotes | By

The following are noted quotes by Hall:

> "Two points are very important to remember to ask: is it real and does it work?"
>
> — Edward Hall (c.1970), *Publication* (Ñº)

References

1. (a) Hall, Edward T. (1966). *The Hidden Dimension: an Anthropologist Examines Man's Use of Space in Public in Private* (chain, 3+ pgs). Doubleday Anchor Book.
(b) Hediger, Heini. (1955). *The Psychology of Animals in Zoos and Circuses*. Dover, 1968.
2. (a) Raikhlin, Raddai. (2003). *Civil War, Terrorism and Gangs: the Systematic of Sociology and Social Dynamics* (Hall, pg. 258; thermodynamics, 30+ pgs). BookSurge.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (Hall, pgs. 223-32; 264-65). Morrisville, NC: LuLu.
3. (a) Hall, Edward T. (1966). *The Hidden Dimension: an Anthropologist Examines Man's Use of Space in Public in Private* (attack reaction, pg. 12). Doubleday Anchor Book.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (attack reaction, pg. 226; Hall, pgs. 223-32; 264-65). Morrisville, NC: LuLu.
4. Thims, Libb. (2007). *Human Chemistry (Volume One)* (human molecular orbtal, pg. 265). Morrisville, NC: LuLu.
5. Hall, Edward T. (1966). *The Hidden Dimension: an Anthropologist Examines Man's Use of Space in Public in Private* (gravity, pg. 129). Doubleday Anchor Book.
6. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (Pens I-IV diagram, pg. 286). Morrisville, NC: LuLu.
(b) Hall, Edward T. (1966). *The Hidden Dimension: an Anthropologist Examines Man's Use of Space in Public in Private* (Pens I-IV diagram, pg. *27).* Doubleday Anchor Book.
7. Magnetic field strength diminishes proportion to inverse cube or inverse square? (22 Nov 201) – PhysicsFormums.com.
8. (a) Hall, Edward T. (1966). *The Hidden Dimension: an Anthropologist Examines Man's Use of Space in Public in Private* (chain, 3+ pgs). Doubleday Anchor Book.
(b) Hall, Edward T. (1977). *Beyond Culture*. Anchor Press.
(b) Hall, Edward T. (1983). *The Dance of Life and Other Dimensions of time*. Anchor Press.
(c) Hall, Edward T. and Hall, Mildred R. (1990). *Understanding Cultural Differences*. Intercultural Press.
(d) Bohannan, Paul. (1995). *How Culture Works* (pg. 51). Simon and Schuster.

External links

â— Edward T. Hall – Wikipedia.

θΔics

In existographies, **Edward Harrison** (1919-2007) (CR:4), aka "Ted Harrison", was a British astronomer and cosmologist, generally for his 1964 solution to Olber's paradox, retrospectively noted for his hydrogen to human, anti-chance, deism beliefs

Atomic deism

Harrison, of curious note, was a hydrogen-to-human believing Paleyan deist, i.e. he believed in atomic theory and a deism-designed universe, per reason that he objected with blind chance universal origin and sided with fine tuning arguments; the following is his noted quote:

> "Here is the cosmological proof of the existence of god - the design argument of Paley - updated and refurbished. The fine tuning of the universe provides *prima facie* evidence of deistic design. Take your choice: blind chance that requires multitudes of universes or design that requires only one.... Many scientists, when they admit their views, incline toward the teleological or design argument."
>
> — Edward Harrison (1985), *Masks of the Universe* [2]

> "Hydrogen is a light, odorless gas, which, given enough time, turns into people."
>
> — Edward Harrison (c.1990) *Publication* (Q); cited (Q) by John Wiley (1995) in "Phenomena, Comments and Notes" (Q); cited (Q) by David Christian (2004) in: *Maps of Time*

(add)

Quotes | By

The following are quotes by Harrison:

> "By convention there is color, by convention sweetness, by convention bitterness, but in reality, 'there are atoms and the void,' announced Democritus. The universe consists only of atoms and the void; all else is opinion and illusion. If the soul exists, it also consists of atoms."
>
> — Edward Harrison (1985), *Masks of the Universe* (pg. 54) [1]

> "Life exists on earth because protons are shy creatures. When brought face to face, they take a considerable time in deciding whether to like each other. Before their minds are made up they have moved apart and gone their separate ways. A similar thing happens to people in cities; they move about, encountering one another on the streets and in the subway, and sometimes a person meets another for a fleeting moment and feels a strong attraction. But in their movement and hurry they turn aside and go separate ways, perhaps never again to meet. An attitude of reserve between strangers prevents instant intimate friendship. Protons have an equivalent inhibition, and their shyness and inability to make instant friendships is due to what is called the weak interaction."
>
> — Edward Harrison (1985), *Masks of the Universe* (pg. 125) [1]

References

1. (a) Harrison, Edward. (1985). *Masks of the Universe: Changing Ideas on the Nature of the Cosmos* (blind chance, pgs. 252, 263; soul, pg. 54). Cambridge University Press, 2003.

(b) Zacharias, Ravi. (2010). *Beyond Opinion: Living the Faith We Defend* (pg. 123). Thomas Nelson.
(c) Edward Robert Harrison (quotes) – AZQuotes.com.

Further reading

● Harrison, Edward. (1987). *Darkness at Night: a Riddle of the Universe*. Harvard University Press.

External links

● Edward Robert Harrison – Wikipedia.
● Edward Robert Harrison (quotes) – AZQuotes.com.

θΔics

In existographies, **Edward H. Kerner** (1924-2002) was an American theoretical physicist noted, in ecological physics, for []

Overview

In 1957, Kerner, in his "A Statistical Mechanics of Interacting Biological Species", citing Gibbs' Elementary Principles in Statistical Mechanics (1902), Alfred Lotka's Elements of Physical Biology (1925), together with Italian mathematical physicist Vito Volterra's 1930s predator-prey dynamics models, to outline a statistical mechanics, e.g. Gibbs ensemble methods, applied to animal species based model of "statistical biophysics", as it seems to have been called; deriving concepts such as "species temperature" or the temperature measures of species; the following is the abstract: [1]

> "The system of differential equations proposed by Vito Volterra, describing the variation in time of the populations Nr of interacting species in a biological association, admits a Liouville's theorem (when log Nr are used as variables) and a universal integral of 'motion'. Gibbs' microcanonical and canonical ensembles can then provide a thermodynamic description of the association in the large. The 'temperature' measures in one number common to all species the mean-square deviations of the Nr from their average values. There are several equipartition theorems, susceptible of direct experimental test, a theorem on the flow of 'heat' (the conserved quantity in an isolated association) between two weakly coupled associations at different temperatures, a Dulong-Petit law for the heat capacity, and an analog of the second law of thermodynamics expressing the tendency of an association to decline into an equilibrium state of maximal entropy. The analog of the Maxwell-Boltzmann law is a distribution of intrinsic abundance for each species which has been successfully used by ecologists for interpreting experimental data. A true thermodynamics develops upon introducing the idea of work done on an association through a variation of the variables (such as physical temperature) defining the physical and chemical environment. An ergodic theorem is suggested by the agreement of ensemble and time averages in the one case where the latter may be found explicitly."

In 1962, Kerner, in his "Gibbs Ensemble and Biological Ensemble", elaborates on his previous work, by attempting to outline a "general theory of ecology", by firstly starting out with Vito Volterra's 1931 equation for population dynamics: [2]

$$\frac{dN_r}{dt} = \epsilon_r N_r + \frac{1}{\beta_r} \sum_s \alpha_{sr} N_s N_r$$

where N_r is the population of the r_{th} species, and α_{sr} is a "strength of interaction" constant.

Education

Kerner completed his BS in 1943 from Columbia College and PhD in physics in 1950 from Cornell University. During his post-undergraduate studies, he worked with American physicist Richard Feynman to better understand particle electrodynamics. In 1962, he became a physics professor at the University of Delaware, retiring from there in 1999. [2]

Kerner seems to have been a relatively clever and inquisitive fellow, e.g. he held to a view that "conviction that infinities do not occur in nature", despite Nobel prize awards to the contrary. (Ñº)

References

1. Kerner, Edward. (1957). "A Statistical Mechanics of Interacting Biological Species" (abs), *Bulletin of Mathematical Biology*, 19(2): 121-46.
2. Kerner, Edward. (1962). "Gibbs Ensemble and Biological Ensemble" (abs), *Mathematical Theories of Biological Phenomena*, 96: 975-84; in: *Towards a Theoretical Biology* (editor: C.H. Waddington) (contents) (pgs. 129-39).

Publisher.
3. Staff. (2002). “Paid Notice: Deaths of Kerner, Edward H.”, *The New York Times*, Mar. 03.

θΔics

In hmolscience, **Edward Ockham** (c.1975-) is an English anti-materialism philosopher noted for []

Overview

In 2012, Ockham, in his blog "The Human Molecule", labeled the Hmolpedia "human molecule" article as example of "crude materialism" (see: materialism) and, supposedly, bad sophomoric philosophy. The following is Ockham's blog post (indented) with discussion and commentary:

> "Yesterday I discussed arguments for the broadly materialistic principle that "we can characterize thought and understanding entirely without reference to any external object". But let's not confuse that with materialism itself, and certainly let's not confuse it with *crude* materialism. I am concerned with rejecting the sort of anti-materialist argument that we cannot characterize a thought unless we can specify what it is a thought *of*, and rejecting an argument *against* something is obviously not the same as an argument *for* something."

It is difficult to see exactly what Ockham here is conceptualizing as crude materialism, but according to philosopher Ronald Nash, crude materialism is defined as the theory that denies the existence of mind and mental events. [2] Regarding his second comment: "we can characterize thought and understanding entirely without reference to any external object", this is incorrect logic. To exemplify, adjacent is the animate 3-element retinal molecule, which in descent down the evolution timeline is but a smaller and less complex, version of the animate 26-element human molecule. The "thought process", if we are to anthropomorphize as such, in the retinal molecule involves an "external", or rather external force, photon that works to actuate the initiation of the thought process in the retinal molecule via an exchange force interaction with an electron, in one of the lower atomic orbitals of the C[11]C[12] bond, causing or rather forcing the electron to jump up in orbital position. The new orbital position in the structure of the so-called hydrocarbon brain, i.e. C[11]C[12] bond, acts to cause the molecule as a whole to change geometrically, i.e. bend its "limbs" (C[1]C[9] branch and C[13]C[15] branch), into the straightened position. This gives of a simplified, albeit less-evolved version, of how the thought process actuates in people, i.e. in human molecules.

In any event, Ockham continues:

> "As for 'crude' materialism, that is a perfect example of the kind of bad, sophomoric philosophy which it is the job of good philosophy to correct. There's a wonderful page full of it here [human

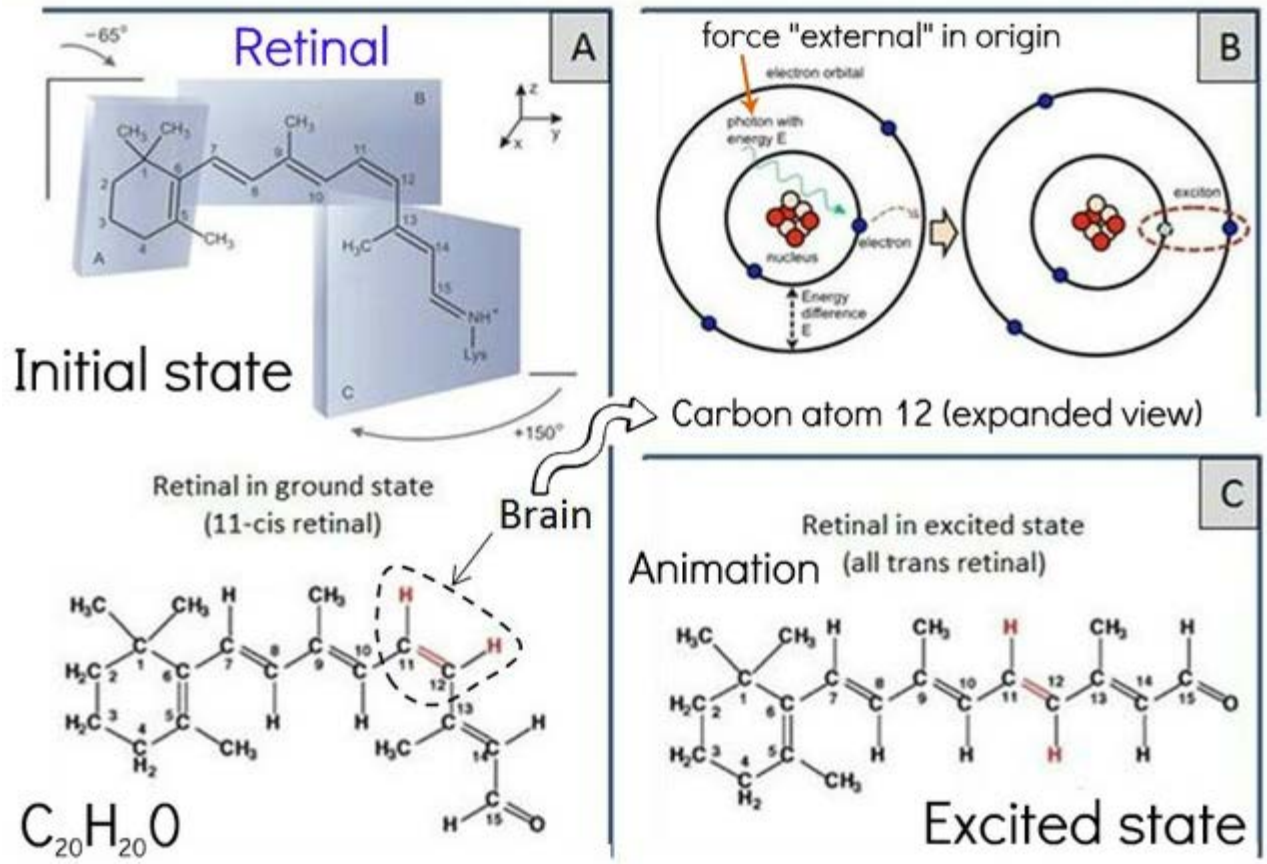

he "ABC model" of **free will**: (A) retinal molecule in ground state (normal state); (B) light (or one or more photons) with a frequency of 400 to 700 nm absorbs into the the carbon atom (note: atom shown is actually beryllium) at the 11 position, thus causing (exchange force) an electron to jump up in orbital position (excited state); (C) the retinal molecule reacts to this by "moving" to the straightened position, a short-lived heightened energy configuration. [3]

molecule]. Someone [Libb Thims], probably with an education entirely confined to the hard sciences [chemical engineering and electrical engineering], has the insight that people are made entirely of atoms. Molecules are made of entirely atoms, *ergo* humans are molecules. Materialism of the crudest sort. What's wrong with it? Well, I am not sure it is even scientifically correct. Molecules are arrangements of atoms in certain bonding relationships that hold only at the atomic level. So even DNA is not a molecule, but rather a pair of molecules held tightly together. The relationship that ties the heart to liver, and the liver to the brain is not an atomic one. Or is a molecule a set of atoms in any relationship whatsoever? Then a city is a molecule [social molecule], the Earth [earth molecule] and the Sun [sun molecule] are molecules, the Earth and the Sun *together* are a single molecule, *the whole universe* is a single molecule [universe molecule]. That is no help whatsoever."

To begin with, here Ockham, in his mention of good and bad philosophy, seems to think that "good" and "bad" (or evil) are scientifically defined terms, religious, utilitarianism, etc., views aside, in physical science. This, however, is not the case and as things currently stand it is a very large subject in great need of clarification, one that is to be explained, according to the 1809 views of German polymath Johann Goethe, by the "moral symbols" of physical chemistry, which, in modern chemical thermodynamics language, equates to free energy differentials acting to quantify what is "natural" (aka good) and "unnatural" (aka bad) in human affairs, albeit both, i.e. natural and unnatural, connected via coupling theory. [4] In this context, of explaining outdated, predominately religious based, notions of good and bad in thermodynamic equation and terminology upgrade, one begins to see why it was that in 1952 English physicist C.G. Darwin, in his *The Next Million Years*, specifically defined the science of "human thermodynamics" as the thermodynamical study of conservative dynamic systems of "human molecules", and through the study of which one might, in Darwin's view, be able to do some "good" in the world, and hence Ockham's conjecture that the human molecule point of view "is no help whatsoever" is an example of someone not seeing the ships in the harbor, being that Ockham is trained only in philosophy and not in the language, equations, and universal rule reality of the laws of the universe, aka the first law and second law of thermodynamics, which thus set limits to all varieties of movement in the

universe. Ockham continues:

> “Even if it is scientifically correct (I'm no expert), how does the insight *help*? We want to explain the nature of money, for example. Now money is an arrangement of atoms – either atoms of pound notes, or coins, or bond 'paper', or their electronic correlates in the general ledger of a payments system. But how does that help explain *money*? It is the job of the sciences of economics and finance to do that. How does the science of atoms and thermodynamics help us here? That's not to say that, once we have perfected those sciences, we could give a more complete, but vastly more complicated explanation in terms of atomic theory. My point is that the insight – that things are composed of atoms – does not help us explain economics, aesthetics, history, etc.”

At this point, Ockham is at least starting to ask intelligent questions. The way in which one begins to differentiate atomic geometries, e.g. humans as compared to money, depends on focus: the field of "paper chemistry" in the case of money, and the field of "human chemistry" in the case of people. In the relatively new science human chemistry, people are defined as the "reactants" and money is defined as a type of secondary field particle that operates in the mechanism of the exchange force in the dynamics of interpersonal interactions, bondings, and debondings. Regarding "it is the job of the sciences of economics and finance to do that. How does the science of atoms and thermodynamics help us here?", that would be the sciences of economic thermodynamics, wherein people are defined as molecules (e.g. Tjalling Koopmans, 1947) and financial thermodynamics, wherein people are also defined as molecules (e.g. Daedalus, 1970).

> “Sometimes a crude materialism of this sort is used to justify malicious actions. "OK I lied to you, but I am only a collection of atoms, and concepts like good and evil and being 'wrong' are not appropriate to collections of atoms. Therefore what I did was not *wrong*". Which reminds of the story (I can't remember where I read it), of the man who was about to be executed for murder the next day, and pleaded to the king for clemency. "I could not help my actions, I was determined by my nature and by the stars to commit these evil deed, it was all predestined". To which the king replied "I forgive you. I also forgive the man who is to execute you tomorrow".”

Here Ockham is referring to the *circa* 270BC slave stealing parable of Zeno of Citium. [6] Zeno, who did not believe in slavery but nevertheless had a slave, is reported to have caught him stealing and set about giving him a beating for punishment. Knowing Zeno’s creed, the slave is reported to have said: “But you should not punish me for stealing. The destiny of the ages, over which I have no control, has determined that I should steal.” To which Zeno is supposed to have answered: “The destiny of the ages, over which I have no control either, has also determined that I should beat you for it.” [7] This is what America physical organic chemist George Scott, who also uses the above retinal molecule model to discuss the human thought process and who is a human molecular philosopher (see: poem "Molecular People: Dedicated to Lucretius"), calls physical determinism. He cites this anecdote of Zeno as the best known ancient deterministic system of philosophy. [6]

Note

Ockham posts a lot on Ludwig Wittgenstein, meaning that Wittgensteinian philosophers (Ñº) are likely to also be anti-materialistic; Ockham removed the post to his blog "The Human Molecule" made by Libb Thims, per reasons of, no doubt, objection.

See also

â— HMS pioneers (objectors)

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1. Ockham, Edward. (2012). “The Human Molecule”, *Beyond Necessity: Philosophy, Medieval Logic and the London Plumbing Crisis*, Blogspot.com, May 13.
2. Nash, Ronald. (2010). *Life’s Ultimate Questions: An Introduction to Philosophy* (§:Crude Materialism, pg. #).

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5. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (392-pgs). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (436-pgs). Morrisville, NC: LuLu.
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θΔics

In human thermodynamics, **Edward Sanville** (1981-) is an American computational chemist noted for his 2005 objections to human thermodynamics as a science. In particular, in commentary to American chemical engineer Libb Thims, Sanville expressed the view that: [1]

> "I think human thermodynamics is pseudoscience. The interchanging of words with precise scientific meanings, i.e. bond, energy, reaction, hot, etc., with their everyday meanings is one of the cornerstones of pseudoscience. Of course human beings obey the laws of thermodynamics like everything else in the universe, but trying to apply equations which only describe larger systems of microscopic particles to analogous situations between human beings, just because the everyday and scientific words involved happen to correspond, [is a fallacious argument]."

Education

Sanville completed his BS in chemistry in 2001 at the University of New Hampshire, New Hampshire, and his PhD in computational chemistry in 2005 at Dartmouth College, Hanover, New Hampshire. He is currently a research assistant in neural networking and quantum molecular dynamics at mathematical sciences department of Loughborough University.

See also

- Human thermodynamics quotes

References

1. Sanville, Edward and Thims, Libb. (2005). "Human Thermodynamics: Science or Pseudoscience", conversation originating on Wikipedia talk pages (Sep–Oct). IoHT Publications.

External links

- Ed Sanville – Linkedin.com.
- Edward Sanville (WayBack) – EdSanville.com.
- Ed Sanville – MySpace.com.

θΔics

In existographies, **Edward Somerset** (1603-1667) (EP:16) (CR:5), aka "Marquis of Worcester" (CR:1), was an English inventor, politician, and nobleman, noted for []

Overview

In c.1658, Somerset observed the cover of his cooking vessel explode, pop off, or shoot up, which led him to ruminate on the potential power of steam; the following is one account of this:

> "It is said that the Marquis, while confined in the Tower of London, was preparing some food in his apartment, and the cover of the vessel, having been closely. fitted, was, by the expansion of the steam, suddenly forced off and driven up the chimney. This circumstance attracting his attention, led him to a train of thought, which terminated in the completion of his water-commanding engine."
>
> — Charles F. Partington (1825), note on the history of the steam engine [9]

This anecdotal lid-poping story, to note, has been attributed, in various form, to Denis Papin and James Watt.

In 1660, Somerset obtained a patient, from the king, for his so-named "water-commanding engine" invention. [8]

In 1663, Somerset, in his *The Century of Inventions*, detailing more than 100 inventions, number 68 (LXVIII) of which was a fire driving water raising devise, which he describes as follows: [1]

> "An admirable and most **forcible way to drive up water by fire**, not by drawing it or sucking it upwards, for that must be, as the philosopher calleth it, 'within the sphere of activity' [*intra sphaeram activitatis*], which is but at such a distance. But this way hath no bounder, if the vessels be strong enough: for I have taken a piece of a **whole cannon**, whereof the end was burst, and filled it three-quarters full of water, stopping and screwing up the broken end, and also the touch-hole, and making a constant fire under it, within twenty-four hours it burst, and made a great crack; so that having a way to make my vessels so that they are strengthened by the force within them, and the one to fill after the other, I have seen the water run like a constant **fountain-stream forty feet high**; one vessel of water rarefied by fire [hot body], driveth up forty of cold water. And a man that tends the work is but to turn **two cocks**, that one vessel of water being consumed, another begins to force and refill with cold water, and so successively the fire being tended and kept constant, which the self-same person may likewise abundantly perform in the interim between the necessity of turning the said cocks."

The following is a reconstruction of the Somerset water raising engine based on his verbal descriptions and the grooves the wall of the citadel of Raglan Castle (Ñº) , where he had one installed; the left device operating such that steam is generated in the boiler *a*, and thence is led into the vessel *e*, already nearly filled with water, and fitted up like the apparatus of de Caus (1615). It drives the water in a jet out through the pipe *f*. The vessel *e* is then shut off from the boiler *a*, is again filled through the pipe *h*, and the operation is repeated: [7]

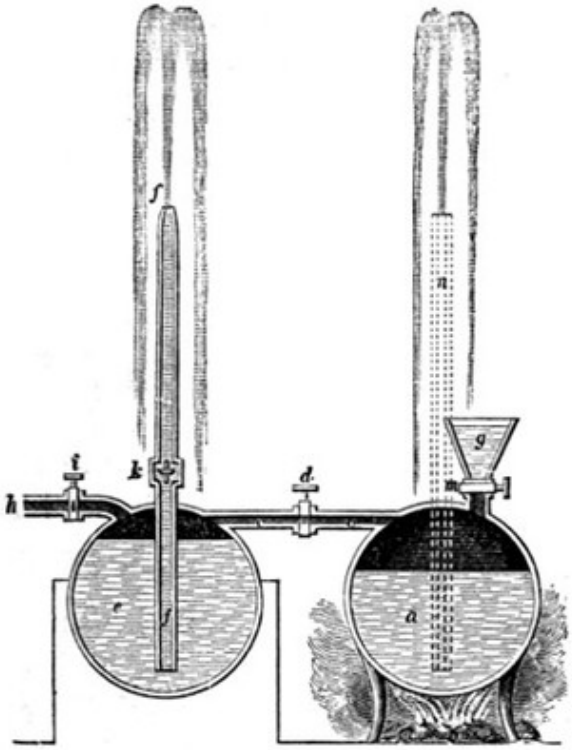

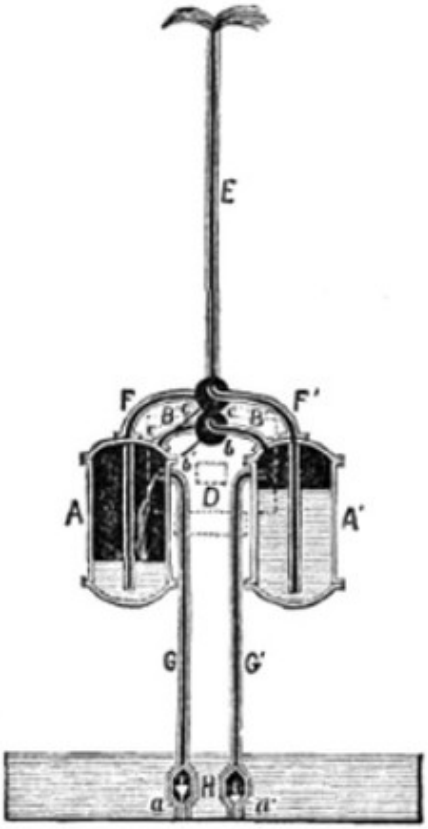

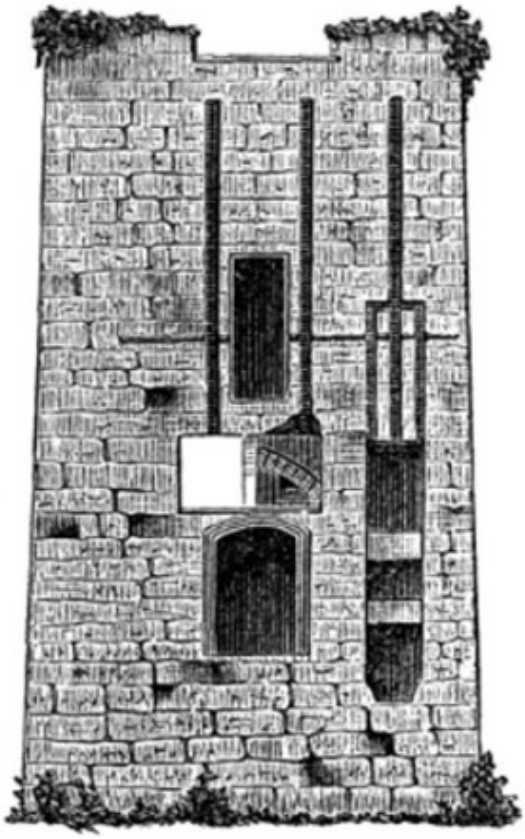

The following is Somerset's definition of his water commanding engine, made for a water company then about to be established: [8]

> "A stupendous, or a water-commanding engine, boundless for height, or quantity, requiring no external, nor even additional help or force to be set, or continued in motion, but what intrinsically is afforded from its own operation, nor yet the twentieth part thereof. And the engine consisteth of the following particulars:
>
> 1. A perfect counterpoise, for what quantity soever of water.
> 2. A perfect countervail, for what height soever it is to be brought unto.
> 3. A primum mobile, commanding both height and quantity, regulator-wise.
> 4. A vicegerent or countervail, supplying the place, and performing the full force of man, wind, beast, or mill.
> 5. A helm or stern, with bit and reins, wherewith any child may guide, order, and control the whole operation.
> 6. A particular magazine for water, according to the intended quantity, or height of water.
> 7. An aqueduct, capable of any intended quantity or height of water.
> 8. A place for the original fountain or river to run into, and naturally of its own accord incorporate itself with the rising water, and at the very bottom of the aqueduct, though never so big or high.
>
> By divine providence, and heavenly inspiration, this is my stupendous water-commanding engine, boundless for height and quantity. **Whosoever is master of weight, is master of force**; whosoever is master of water, is master of both: and consequently to him all forcible actions and achievements are easy."

The following is another retrospect reconstruction of this so-called "Worcester engine" (Thurston, 1878) or "Somerset engine" description, in a guesstimate sense of the manner, if such a machine actually existed: [2]

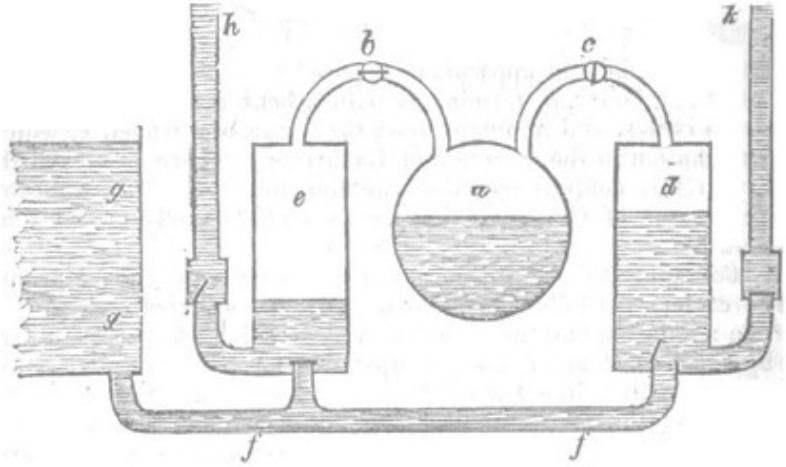

The operation of the device, referred to as a "water commanding engine", is described as follows:

> “Let *a* represent the boiler communicating by the pipes *b* and c, with the cold water vessels *d* and e, which latter communicate by the pipe *f, f,* with the water to he raised, *g*, g. The pipes hand k ascend to the reservoir, forty feet above, and their lower ends enter the cold water vessels e and *d*. The two cocks, *b* and c, are those which are described to be opened and shut alternately. The four valves in the pipes *f, h*, and *k*, are precisely such as had been used for nearly two thousand years in pumps. The vessels *d* and e are in fact forcing pumps, in which steam is substituted for a solid piston. The cock *b* is in the diagram open, the steam is therefore forcing the water out of e, and up the pipe *h*. The cock c is closed, and the vessel *d* is cooling; the water tends, therefore, to enter it both from the cistern g, *g*, and from the pipe *k;* the arrangement of the valves, exactly like those of a pump, prevents the latter and permits the former: therefore, the vessel *d*, as it cools, is filled from the cistern *g, g*. This action would, no doubt, go on alternately, by maintaining the fire, and alternately opening and shutting the cocks *b, c*, and it is quite certain that this proposal more nearly resembles the first steam engine known to have been made, than any prior invention.”

The engine, described as “an admirable and most forcible way to drive up water by fire”, purportedly could raise cold water to a height of 40 feet.

Somerset's devise has been supposed to have been a variant of Giovanni Porta’s 1606 device.

Savery

In 1819, Abraham Rees, in his “Steam-Engine” article, recounted various historical anecdotes on the conjecture that Thomas Savery, in building his “Savery engine” (1698) aka Miner’s friend, got the idea from Somerset, but that Savery denied this assertion. [3]

> “A practical mathematician, who has quickness to seize a hint, and sagacity to apply it, might avail himself greatly of these scantlings. It is extremely probable, that Savery took from the Marquis the hint of the Steam engine, for raising water with a power made by fire, which invention alone would entitle the author to immortality.”
>
> — James Granger. (1824). *A Biographical History of England, Volume Five* (pg. 278)

In 1878, Robert Thurston, in his *A History of the Growth of the Steam Engine*, likewise, was saying that the Somerset engine was almost substantially and precisely the form of the Savery engine. [7]

Most of this presumed connection between Savery and Somerset, however, supposedly, has debunked. [4]

Quotes | On

The following are quotes on Somerset:

> "One man, by the help of this machine, raised four large buckets full of water in an instant, forty feet high, and that through a pipe of about eight inches long."
>
> — Samuel Sorbiere (1709), *A Voyage to England* [1]

> "A hot-air engine, however, which is the subject of Hero's 37th proposition, is of real interest. Hero sketches and describes a method of opening temple-doors by the action of fire on an altar, which is an ingenious device, and contains all the elements of the machine of the **Marquis of Worcester**, which is generally considered the first real steam-engine, with the single and vital defect that the expanding fluid is air instead of steam."
>
> — Robert Thurston (1878), *A History of the Growth of the Steam Engine* (pg. 5)

> "The most notable of Worcester's devices, and that on which his claim as inventor of the steam engine rests, is his **'water-commanding engine.'** Before the civil war he made experiments in this direction on the walls of Raglan Castle, but the traces that still remain (see engraving in Dircks, p. 21) are insufficient to 'point distinctly to precise particulars of arrangement.' The experiments were, however, renewed at Vauxhall, and there in 1663 Samuel Sorbière saw and described the 'hydraulic machine which the Marquis of Worcester has invented.' It was designed for purposes of irrigation, and **would 'raise to the height of forty feet, by the strength of one man and in the space of one minute of time, four large buckets of water.'** Cosmo de' Medici, duke of Tuscany, visited it in 1669, when a similar description was given (Dircks, pp. 264, 302). Robert Hooke [q. v.], however, described it as 'one of the perpetual motion fallacies.' This is apparently the machine described in the 'Century,' No. 100, and in Addit. MS. 23115, f. 45, as 'a most admirable and stupendious invention.' Worcester set great store by it, and in 1663 obtained a monopoly of its profits by act of parliament, granting one tenth to the king. In the same year he issued a folio broadside (reprinted in 1858) containing a description of the engine, the act of parliament, and some verses. He hoped by its means to pay off his debts, and **the machine was actually working for seven years**. **Nothing, however, is really known of Worcester's 'water-commanding engine' beyond his own 'vague and somewhat bombastic description** (Mr. R. B. Prosser in *Engineer*, 19 May 1876). Henry Dircks [q. v.] spent much time and money in the endeavour to ascertain the precise mode of construction, and search was even made in the marquis's grave for a model which was said to have been buried there, but without result (*ib*.) There is, moreover, no mention of either steam or fire in the act of parliament or any of the descriptions, and Worcester's claim as inventor of the steam-engine rests upon the assumption that this machine is identical with that suggested in the 'Century,' No. 68, where an admirable and most forcible instrument of propulsion is described, and is credited with the power of 'driving up water by fire.' The idea is said to have occurred to him while watching in the Tower the lid of a saucepan rising from the pressure of steam from boiling water; but the supposed identity of the two 'inventions' is 'pure and unwarranted hypothesis' (Galloway, *The Steam-Engine and its Inventors*, 1881, p. 57), and there is no conclusive evidence to prove that Worcester ever constructed a steam-engine like that suggested in No. 68 of his 'Century.'"
>
> --- Albert Pollard (1898), "Somerset, Edward (1601-1667)" [5]

References

1. (a) Somerset, Edward. (1663). *The Century of Inventions* (notes: Charles Partington). Murray, 1825.
(b) Anon. (1829). "On the Early History of the Steam Engine" (Ñº), *Journal of the Franklin Institute*, 4(8):319-27.
2. Anon. (1829). "On the Early History of the Steam Engine" (Ñº), *Journal of the Franklin Institute*, 4(8):319-27.
3. Rees, Abraham. (1819). *The Cyclopedia, Volume 34* (§: Steam-Engine, pgs. #). Publisher.
4. Anon. (1829). "On the Early History of the Steam Engine" (Ñº), *Journal of the Franklin Institute*, 4(8):319-27.
5. Pollard, Albert. (1898). "Somerset, Edward (1601-1667)" (Ñº), *Dictionary of National Biography*, Volume 53.
6. (a) Sorbiere, Samuel. (1709), *A Voyage to England* (pg. 29). London: J. Woodward.
(b) Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 156). Courier, 1990.

7. Thurston, Robert. (1878). *A History of the Growth of the Steam-Engine* (pgs. 20-23). Appleton and Company.
8. Somerset, Edward (Marquis of Worcester). (1825). *The Century of Inventions: Original Manuscript with Historical and Explanatory Notes and a Biographical Memoir* (editor: Charles F. Partington) (definition, pgs. 102-03). Murray.
9. (a) Partington, Charles F. (1822). *An Historical and Descriptive Account of the Steam Engine* (pg. 6). Taylor.
(b) Somerset, Edward (Marquis of Worcester). (1825). *The Century of Inventions: Original Manuscript with Historical and Explanatory Notes and a Biographical Memoir* (editor: Charles F. Partington) (pgs. 106-07). Murray.

External links

â— Edward Somerset, 2nd Marquiess of Worcester – Wikipedia.
â— Anon. (1933). “The Marquis of Worcester at Vauxhall” (Ñº), *Nature*, 131(267).

θΔics

In animate thermodynamics, **Edward Orlando Wiley** (c.1950-), or E.O. Wiley, is an American systems ecologist noted for his collaboration with Canadian zoologist Daniel Brooks and their 1986 book *Evolution as Entropy: Towards a Unified Theory of Biology*. [1] Wiley and Brooks also collaborated with Canadian physical information theory philosopher John Collier.

References

1. (a) Brooks, Daniel R. and Wiley, E.O. (1986). *Evolution as Entropy: Toward a Unified theory of Biology*. (1988, 2nd ed.). University of Chicago Press.
(b) Brooks, Daniel R. and Wiley, E.O. (1984). "Evolution as an Entropic Phenomenon", in: *Evolutionary Theory: Paths to the Future*, ed. J.W. Pollard, 141-71. New York: Wiley.

Further reading

● Wiley, Edward. (1988). "Entropy and Evolution", in: *Entropy, Information, and Evolution* (pgs.173-88). Eds. Weber, Bruce H., Depew, David J., and Smith, James D. MIT Press.

External links

● Edward O. Wiley – Wikipedia.
● E.O. Wiley (faculty) – Department of Ecology and Evolutionary Biology, University of Kansas.
● Wiley, E.O. – WorldCat Identities.

θΔics

In existographies, **Edward O. Wilson** (1929-) (Simmons 100:83) (CR:10), aka "E.O. Wilson", is an American myrmecologist, generally known for his 1975 *Sociobiology*.

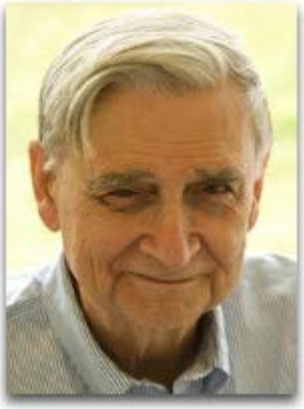

Quotes | By

The following are related quotes:

> "Above all, I am not suggesting that scientific naturalism be used as an alternative form of organized formal religion. My own reasoning follows in a direct line from the humanism of the Huxleys, Waddington, Monod, Pauli, Dobzhansky, Cattell, and others who have risked looking this Gorgon in the face. Each has achieved less than his purpose, I believe, for one or the other of two reasons. He has either rejected religious belief as animism or else recommended that it be sequestered in some gentle preserve of the mind where it can live out its culture-spawned existence apart from the mainstream of intellectual endeavor. Humanists show a touching faith in the power of knowledge and the idea of evolutionary progress over the minds of men. I am suggesting a modification of scientific humanism through the recognition that the mental processes of religious belief—consecration of personal and group identity, attention to charismatic leaders, mythopoeism, and others--represent programmed predispositions whose self-sufficient components were incorporated into the neural apparatus of the brain by thousands of generations of genetic evolution. As such **they are powerful, ineradicable, and at the center of human social existence**. They are also structured to a degree not previously appreciated by most philosophers. I suggest further that scientific materialism must accommodate them on two levels: as a scientific puzzle of great complexity and interest, and as a source of energies that can be shifted in new directions when scientific materialism itself is accepted as the more powerful mythology. That transition will proceed at an accelerating rate. Man's destiny is to know, if only because societies with knowledge culturally dominate societies that lack it. **Luddites and anti-intellectuals do not master the** [partial] **differential equations of thermodynamics** or the biochemical cures of illness. They stay in thatched huts and die young. Cultures with unifying goals will learn more rapidly than those that lack them, and an autocatalytic growth of learning will follow because scientific materialism is the only mythology that can manufacture great goals from the sustained pursuit of pure knowledge. I believe that a remarkable effect will be the increasingly precise specification of history. One of the great dreams of social theorists—Vico, Marx, Spencer, Spengler, Teggart, and Toynbee, among the most innovative—has been to devise laws of history that can foretell something of the future of mankind."
>
> — Edward Wilson (1978), *On Human Nature* (pgs. 206-07) [1]

> "If humankind evolved by Darwinian natural selection, genetic chance and environmental necessity, *not* god, made the species."
>
> — Edward Wilson (1978), *On Human Nature* [2]

References

1. (a) Wilson, Edward O. (1978). *On Human Nature* (Luddites, pgs. 206-07). Harvard, 2012.
(b) Dormer, Peter. (1997). *The Culture of Craft* (pg. 104). Manchester University Press.
(c) Thermodynamics – CafePress.com.
2. (a) Wilson, Edward. (1978). *On Human Nature* (pg. 1). Harvard University Press.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 27). Zondervan, 2009.

Further reading

â— Wilson, Edward O. (2004). *The Meaning of Human Existence*. W.W. Norton & Co.

External links

â— E.O. Wilson – Wikipedia.

θΔics

In

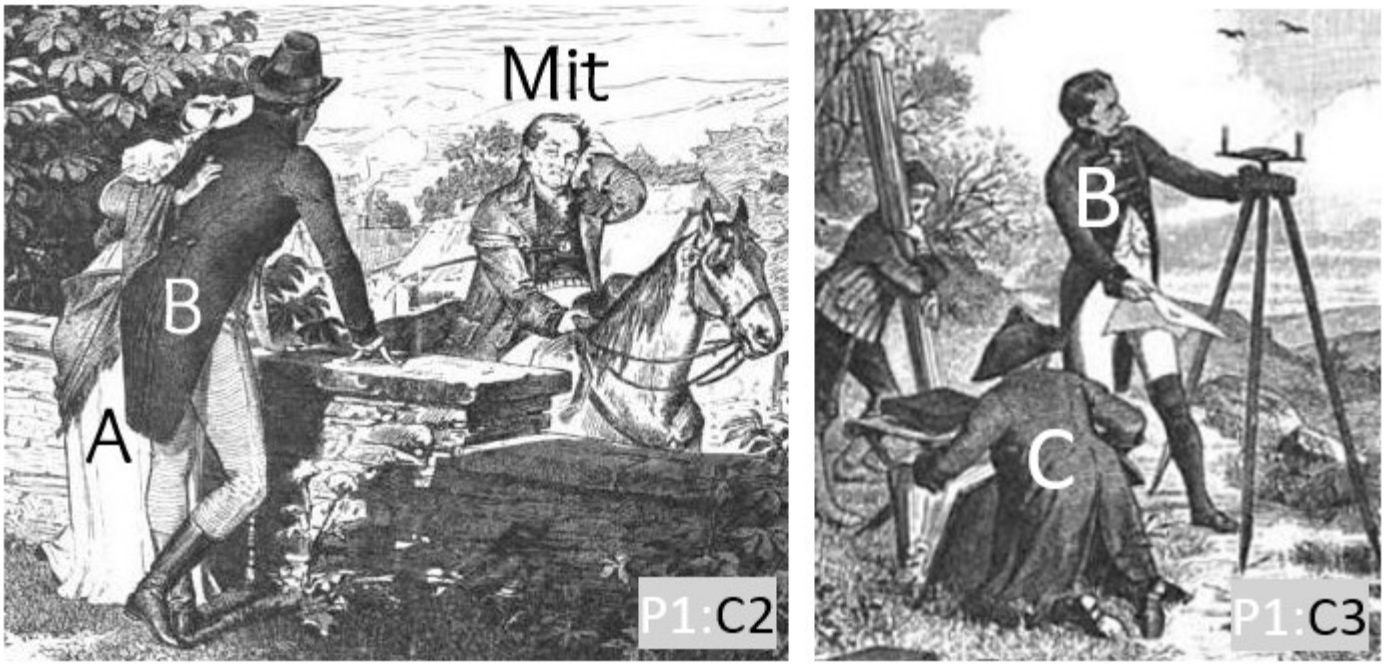

An illustration of the "change" from chapter two (P1:**C2**), when Edward (B) and Charlotte (A) are dullingly married, prior to the Captain's (C) arrival to the estate (chemical retort), to chapter three (P1:**C3**), in which Edward "detaches" (see: uncoupling; debond) from Charlotte, and begins spending time with his old friend the Captain, therein forming the BC attachment, i.e. **Edward≡Captain** bond, tie, union, or association; the symbols "≡" (stronger bond) and "=" (strong bond) employed, respectively, for the Edward=Charlotte bond vs the Edward≡Captain bond, quantitatively differentiated in Gibbs energy measurement terms.

hmolscience, **Edward≡Captain**, or BC in the original Bergman chemical letter notation (Bergman, 1775), is the chemical symbol for the bonded chemical species, or dihumanide molecule, of the character Edward and the Captain chemically "bonded", with a concordant measurable bond energy, into a new friendship union, which is a reaction formation that occurs in chapter three (see: P1:**C3**) of Goethe's 1809 *Elective Affinities* (see: contents).

Overview

See main: Human chemical reaction theory

In 1809, Goethe, in chapter three of his *Elective Affinities*, while he did say that Edward was equivalent, in a macroscopic physico-chemical sense, to the chemical species B and that the Captain was equivalent to the chemical species C and that Charlotte was equivalent to the chemical species A, he did not explicitly, in the text, affix the symbols AB or BC together, but rather had the bonding brackets of William Cullen in mind in the sense of the chemical force holding the two species together, as explained in Torbern Bergman's 1775 *A Dissertation on Elective Attractions*, wherein both letter symbols, A, B, C, etc. were employed, to represent species, and the bonding brackets were employed to represent chemical bonds.

In 1991, Karl Fink, in his *Goethe's History of Science*, after footnoting his knowledge of Jeremy Adler's 1987 depictions of Goethe's human chemical reactions, stating that he "Adler has provided the most detailed study of Goethe's research in the history of chemistry, particularly the history of chemical affinity." [1]

In 2001, Fink, in his article "Goethe's Intensified Border", as what seems to be a follow up to his earlier note, drew out nine of Goethe's reactions, including discussion, the way he sees them, among which, curiously, he considers the birth of the child to be a precipitate. [2] The first reaction of Goethe's novella, according to Fink, is a combination reaction, beginning with Charlotte (A) and Eduard (B) being described as being bonded by marriage, where the attachment AB signifies a human chemical bond:

$$A + B \rightarrow AB$$

This changes, according to Fink, with the arrival of the Captain (C), which triggers the second reaction, the Eduard detaching from Charlotte and bonding with his old friend the Captian:

$$AB + C \rightarrow A + BC$$

In c.2003, Libb Thims, having spent the previous eight-years working on the above problem, in terms of Gibbs energy changes and the human reproduction reaction, awoke to the realization, which he had been previously oblivious too (see: Thims history), that the quantitatively measurable "bond energy" in the "-", "=", or "≡" bond, is a key factor in the Gibbs energy change of human chemical reactions, particularly so with respect to mate selection mechanisms; such as follows:

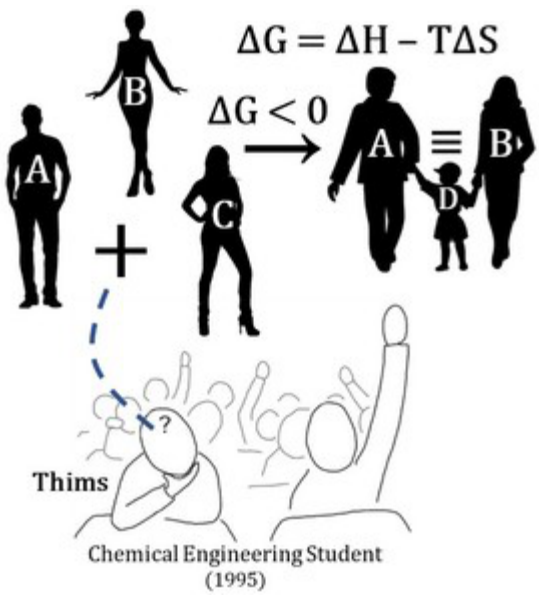

particularly in respect to initial state Gibbs energy and final state Gibbs energy, per reason that once you begin to think about initial state and final state entropies and enthalpies, one begins to the tunnel of a multi-decade rabbit hole of newly opened puzzles.

References

1. Fink, Karl J. (1991). *Goethe's History of Science* (elective affinities, pgs. 111, 195). Cambridge University Press.
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θΔics

In science, **Edwin Allston Hill** (1850-1929) was an American chemist noted for his 1900 system, the so-called "Hill order" (see: CHNOPS), for ordering elements in a molecular formula. Hill's molecular formula ordering system was first used by the classification division of the US Patent Office in 1907. [1]

Education

Hill completed his BA in 1875 at Yale University, followed by an MA, after which he served as a lawyer and civil engineer for various railroads prior to 1895. In 1901, he switched gears, and completed an MS in chemistry, with a thesis on "Properties of Compounds of Antimony", followed by a PhD in 1903, with a dissertation on "The Constitution of Certain Halogen Oxyacids as Inferred from Thermochemical Data", both at George Washington University, where after he became a professor of chemistry, remaining there until 1926. [3]

See also

â— Chnopsology
â— Chnopsologist

References

1. Hill, Edwin A. (1907). "The Chemical Card Index of the Patent Office", US Patent Office.
2. Staff. (1929). "Obituary: Edwin Allston Hill" (abs), *Chemical Engineering News*, 7(21):11.

External links

â— Edwin Allston Hill – WorldCat Identities.

θΔics

In existographies, **Edwin Hubble** (1889-1953) (IQ:170|#316) [RGM:85|1,500+] (Cropper 30:3|NP) (Murray 4000:12|A) was an American astronomer, noted for []

Overview

In 1922, Alexander Friedman, using general relativity equations, published a set of equations, aka Friedmann equations, showing that the universe might expand, and presenting the expansion speed if this was the case.

In 1927, Georges Lemaitre proposed the expansion of the universe and suggested an estimated value of the rate of expansion; on this he conjectured (1931) that an expanding universe could be traced back in time to an originating "single point" (see: big bang).

In 1929, Hubble calculated the recession velocity of objects far away from our universe from their redshifts, and therein showed that the universe is expanding; the concluding point of which is known known as Hubble's law.

Quotes | By

The following are quotes by Hubble:

> "We do not know why we were born into the world, but we can try to find out what sort of world it is, a least in its physical aspects."
>
> — Edwin Hubble (c.1940) (Ñº)

External links

â— Edwin Hubble – Wikipedia.

θΔics

In existographies, **Edwin Jaynes** (1922-1998) (CR:40) was an American physicist noted, in information thermodynamics, for his maximum entropy (MaxEnt) interpretation of thermodynamics, as found in his two part 1957 paper "Information Theory and Statistical Thermodynamics", in which he attempted to derive a statistical thermodynamics interpretation of information theory. [1] Jaynes' approach, in terms of schools of thermodynamics, soon came to be known as the MaxEnt school of thermodynamics also sometimes called the Jaynes school. Into the 2000s, Jaynes' MaxEnt formulation of nonequilibrium statistical thermodynamics, however, has generally failed to be accepted by the majority of scientists. [2] In about 1965, Jaynes wrote the outline of a thermodynamics textbook, that was never published. [4]

Tribus

Jayne's paper was of considerable influence to American engineer Myron Tribus who had spent the previous ten years attempting a similar derivation that when in 1948 he was told about Jaynes' paper he took an overnight train from LA to Stanford to visit Jaynes in his office. [5]

Economic thermodynamics

In 1991, Jaynes initiated a foray into economic thermodynamics with his article "How Should we Use Entropy in Economics: Some Half-baked Ideas in Need of Criticism", the subtitle a pun on Paul Samuelson's 1972 "half-baked" comment, in which is he introduces some tentative outlines of how an economic system can be modeled as a thermodynamic system, such as how Willard Gibbs' 1873 graphical thermodynamic ideas on entropy convexity can be mixed with logarithmic interpretations of economic entropy, which he defines as follows:

$$S(X, Y, Z...) = \log W(X, Y, Z...)$$

where (X,Y,Z ...) are some type of macroeconomic variables, which he doesn't really go into, and W is the multiplicity factor of the macroeconomic state, which he describes as the "number of different microeconomic ways in which it can be realized", whatever that means, and tries to connected in some way to French mathematician Rene Thom's 1960s catastrophe theory and the thermodynamics of a ferromagnet and Curie temperature. [6]

Education

Jaynes received his BA in physics from the University of Iowa in 1942 and PhD on ferroelectricity at Princeton in 1950 under the direction of Eugene Wigner. [3]

References

1. (a) Jaynes, E. T. (1957) "Information theory and statistical mechanics", (PDF), *Physical Review* 106:620.
(b) Jaynes, E. T. (1957) "Information theory and statistical mechanics II", (PDF), *Physical Review* 108:171.
2. Kleidon, Axel and Lorenz, Ralph D. (2004). *Non-equilibrium Thermodynamics and the Production of Entropy: Life, Earth, and Beyond* (pg. 42-43). Springer.
3. Edwin T. Jaynes, 1922-1998 – Obituary, Washington University Libraries.
4. Jaynes, Edwin T. (c.1965). *Thermodynamics*, (ch. I: Development of Thermodynamics, 49-pgs, ch. II: Use of Jacobians in Thermodynamics, 17-pgs, ch. V: Gibbs Formalism: Physical Derivation, 30-pgs). Unpublished Book, 9+ chapters.
5. Tribus, M. (1998). "A Tribute to Edwin T. Jaynes". In *Maximum Entropy and Bayesian Methods, Garching, Germany 1998: Proceedings of the 18th International Workshop on Maximum Entropy and Bayesian Methods of Statistical Analysis* (pgs. 11-20) by Wolfgang von der Linde, Volker Dose, Rainer Fischer, and Roland Preuss. 1999. Springer.
6. Jaynes, Edwin. (1991). "How Should we Use Entropy in Economics: Some Half-baked Ideas in Need of Criticism", Feb 01.

Further reading

● Jaynes, E.T. (1965). "Gibbs vs Boltzmann entropies." *American Journal of Physics*, 33: 391-8.
● Jaynes, E.T. (1988). "The Evolution of Carnot's Principle", in *Maximum-Entropy and Bayesian Methods in Science and Engineering*, 1, G.J. Erickson and C.R. Smith (eds.) Kluwer, Dordrecht.

External links

● Edwin Thompson Jaynes – Wikipedia.
● Edwin T. Jaynes (1922-1998) – Washington University Libraries.

θΔics

In hmolscience, **Edwin Slosson** (1865-1929) (CR:18) an American religion reconciling chemist noted for a number of publications on the application and integration of physics and chemistry into the humanities, such as: turnover rate (1902), his suggestion for a college department of humanized physics (1910), giving an in depth review of Wilhelm Ostwald's 1912 book *The Energetic Imperative* (energetic imperative), religion and chemistry reconciliation attempts (1925), among others.

Religion | Chemistry

Slosson is unusual, as far as chemists who write on religion go, in that his belief system consisted of the core belief that "God's willings are the immutable laws of nature". [7] Beyond this staple "god = nature" Spinozian like logic, some of his later religion + science writings are semi-cogent, as far as theistic scientists go.

His 1925 book *Sermons of a Chemist*, e.g., attempts to integrate atoms, relativity, with the Bible and ideas on God. [3] Slosson, for example, comments on the similar views of American biochemist Albert Mathews.

Two cultures university department

See main: Two cultures department

In 1910, Slosson, in his *Great American Universities*, analysis of the programs of the top universities in America, based on funding, in his chapter on the Princeton University, stated the following: [4]

> "Every university should have a Department of Applied Greek and a complementary **Department of Humanized Physics**, and the benefits of these departments also should be extended as freely as is practicable to those who need them most, that is, to those whose main work is in another field."

Interestingly, and somewhat prophetically or ironically, depending on one's view, Princeton turned out to be the first to produce such a department, namely the Princeton Department of Social Physics, which ran, under the direction of American physicist John Q. Stewart, for about a decade into the 1950s.

In 2013, American justice systems professor Curtis Blakely was citing the above Slosson quote as indication of need to begin initiate the teaching of sociophysics in America's universities. [5] Other similar departmental establishment efforts can be found in recent works, efforts, and symposiums meetings of Romanians economist Gheorghe Savoiu and physicist Ion Siman, as discussed in their 2012 chapter "Sociophysics: A New Science or a New Domain for Physicists in a Modern University. The recent ongoing efforts of American electrochemical engineer Libb Thims to establish America's first physical humanities department is another example.

Major prophets

In the summer of 1910, Slosson went to the homes of the following six men, each of whom he considered a prophet of his time:

- Maurice Maeterlinck | Interpreter of the animate and inanimate world
- Henri Bergson
- Henri Poincare
- Elie Metchnikoff | Optimistic philosophy theorist
- Wilhelm Ostwald | Author: *Natural Philosophy*
- Ernst Haeckel | Champion of Darwinism, Monism, author: *Riddle of the Universe*

> "Each age has its own prophets, men who bring to it distinctive messages and present them in such effective form as to sway the currents of contemporary thought."

Interestingly, in comparing the latter two, Oswald and Haeckel, he states that Haeckel was led to extreme mechanism by grounding his philosophy in the first law, whereas Ostwald, arrived at a more dynamic view by emphasizing the second law, as summarized by Cynthia Russett. [6] This, however, may be in need of fact checking, as Ostwald was primarily an energeticist, i.e. first law chemist.

Other

At one point, Slosson advocated an effort to interpret history in terms of its relation to the second law of thermodynamics. On this subject, Slosson lectured before learned groups and had hoped to bring his ideas together in systematic form on some future occasion; an effort, however, that was cut short by his early death (dereaction).

Reiser

In 1935, American philosopher Oliver Reiser, a correspondent of Slosson, commented in a footnote in his book *Philosophy and Concepts of Modern Science*, in his discussion section on the social energetics theorists, who brought physical chemistry methods to bear on social problems, such as Wilhelm Ostwald, Henry Adams, and Thomas Carver, that "I shall do my best to carry this view a step forward"; meaning that Reiser's aim was to continue the work on the thermodynamic application to history started by Slosson. [1]

Education

Slosson completed his BS (1890) and MS (1892) at the University of Kansas and his PhD in 1902 at the University of Chicago. From 1891 to 1903, Slosson was a chemistry professor at the University of Wyoming and working chemist at the Wyoming Agricultural Experimental Station. After this,

moved to New York to become literary editor of the Independent. He became head of the Science Serves in 1921. [2] Slosson also worked as a professor of journalism.

References

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2. Record Unit 8091 – SIArchives.Si.edu.
3. (a) Slosson, Edwin E. (1914). *Major Prophets of Today* (pgs. 199-207). Little, Brown.
(b) Slosson, Edwin E. (1925). *Sermons of a Chemist* (Goethe, pg. 73). Harcourt, Brace, and Co.
4. Slosson, Edwin E. (1910). *Great American Universities* (pg. 96). MacMillan.
5. Blakely, Curtis R. (2014). "Applying Humanized Physics to Penology: Parallels Between Natural and Social Realms", *JHT submission*, 12-pg draft preprint, received 6 Sep 2013.
6. Russett, Cynthia. (1966). *The Concept of Equilibrium in American Social Thought* (pg. 57). Yale College.
6. Slosson, Edwin E. (1903). "The Chemistry of the Greatest Miracle in the Bible", *The Independent*, 55:1454-61.

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- Slosson, Edwin E. (1919). *Creative Chemistry: Descriptive of Recent Achievements in the Chemical Industry* (Goethe, pg. 22). The Century Co.
- Slosson, Edwin E. (1924). *Keeping Up With Science*. Harcourt, Brace, and Co.

External links

- Edwin Emery Slosson – Wikipedia.

θΔics

In existographies, **Edwin Wilson** (1879-1964) (SN:9) (CR:71) was an American mathematician, physical economist, and general "polymath" (Weintraub, 1991), whose interests spanned mathematics, physics, statistics, economics, astronomy, and biology, as summarized by George Szpiro, notable for being the sole protégé of American engineer Willard Gibbs, for teaching a physical chemistry and thermodynamics based mathematical economics course at Harvard from 1934 to 1940, and later having mentored economic thermodynamicist Paul Samuelson about using equation 133 of Willard Gibbs' chemical thermodynamics treatise to model economic stability. [5]

Education

Wilson received his AB from Harvard College in 1899 and his PhD in 1901, dissertation "The Decomposition of the General Collineation in Space into Three Skew Reflections", at Yale with Gibbs as his advisor. In 1900 he became instructor in mathematics at Yale, but took leave during the year 1902-1903 to study mathematics at Paris, chiefly at the Ecole Normale Superieure; thereafter returning to teach at Yale. He became assistant professor of mathematics at Yale in 1906. In 1907, he when to MIT where he became an associate professor of mathematics; full professor in 1911, then professor of mathematical physics, and head of the department of physics in 1917. [1] In 1918, at the start of World War I, Wilson taught a course on aeronautics and or aeronautical engineering for Army and Navy officers, after which, in 1922, he moved to Harvard's school of public health, wherein he became professor of vital statistics, retiring from that position in 1945.

Mathematical economics | Physical chemistry based

In the 1930s, Wilson taught a physical chemistry, steam engine theory, thermodynamics based course or seminar on mathematical economics which Paul Samuelson and a few others attended. [3] Wilson discussed the details of of this course in 1934 to 1938 letters of communication with Harvard economics department head Harold Burbank; one example of which is as follows: [4]

> "Schumpeter has suggested that it would be particularly well for me to give as I gave last time a general theory of equilibrium such as this is understood by physical chemists including the phase systems of Willard Gibbs. Most of our equilibrium theory in economics really has for its background the notions of equilibrium which arise in mechanics. It is pretty high-brow stuff. Mathematically or physically it isn't any more high-brow than things which I long taught at Yale University and at the Institute of Technology. Although Pareto was certainly quite familiar with the types of equilibrium which arise in physical chemistry and are necessary in fact for the study of the steam engine he doesn't use this line of thought in economics."

This single paragraph, along with the amount of interaction discussed in the Harvard Pareto circle, along with the fact that in 1938 he told Paul Samuelson to use equation 133 of Willard Gibbs' 1876 700-equation thick *On the Equilibrium of Heterogeneous Substances* as the basis of a theory of economic stability, puts Wilson presently at the sixth position in social Newton rankings.

Vector analysis

Wilson's first major accomplishment was the preparation, in 1901, of Willard Gibbs lecture notes on vector analysis, as presented in the 1902 textbook *Vector Analysis.* [2] Prior to this time, various competing techniques for handling vector quantities were at hand: William Hamilton's 1843 quaternions, lavishly popularized by Peter Tait and the Quaternion Society, Hermann Grassman's 1844 *Ausdehnungslehre* (theory of extensive magnitudes), and the physical ideas of James Maxwell and Oliver Heaviside. In his lectures, Gibbs modified the techniques of Grassman to fit the ideas of Maxwell and Heaviside as well as his own work. His resulting "vector calculus" was presented in lecturers at Yale and in an unpublished brief set of lecture notes ("Elements of Vector Anslysis", 1881 and 1884). This work established the dominant use of the vector notation, over that of quaternion notation, whereby those, such as American physicists, use boldface notation for vectors, with a dot • for scalar products and X for vector products, exactly as initiated by Gibbs and presented in the Gibbs-Wilson textbook. [1]

References

1. Hunsaker, Jerome and Mac Lane, Saunders. (1973). “Edwin Bidwell Wilson (1879-1964)” (pdf), 38-pages. National Academy of Sciences.
2. (a) Gibbs, Josiah W. and Wilson, Edwin B. (1902). *Vector Analysis: a Text-book for the use of Students of Mathematics and Physics, Founded upon the Lectures of J. Willard Gibbs.* Charles Scribner’s and Sons.
(b) Vector Analysis (book) – Wikipedia.
3. Mooslechner, Peter, Schumerth, Helene, and Schurz, Martin. (2004). *Economic Policy Under Certainty* (pg. 146). Edward Elgar Publishing.
4. (a) Wilson, Edwin. (1938). “Letter to H.H. Burbank”, Dec 20; in *Wilson Correspondence*, HUG 4878.203.
(b) Mirowski, Philip. (1993). “The Goalkeeper’s Anxiety at the Penalty Kick”, in: *Non-natural Social Science: Reflecting on the Enterprise of More Heat Than Light, Annual Supplement to Volume 25, History of Political Economy* (editor: Neil De Marchi) (§5, pgs. 305-50; quote, pg. 339). Duke University Press.
(c) Weintraub, E. Roy. (1991). *Stabilizing Dynamics: Constructing Economic Knowledge* (Wilson letters, pg. 60; also 63-65). Cambridge University Press.
5. Szpiro, George. (2011). *Pricing the Future: Finance, Physics, and the 300-year Journey to the Black-Scholes Equation: a Story of Genius and Discovery* (pg. 183-85). Basic Books.

Further reading

â— Wilson, Edwin B. (1912). *Advanced Calculus: a Text upon Select parts of Differential Calculus*, differential equations, integral calculus, theory of functions; with numerous exercises (keyword: thermodynamics, pgs. 94, 106-107, 124, 294; section 91: Integrating factors, pgs. 207-08). Ginn and Co.

External links

â— Edwin Bidwell Wilson – Wikipedia.
â— Edwin Bidwell Wilson – Mathematics Genealogy Project.

θΔics

In genius rankings, **Eells 100** (TR:54) is a 1962 ranking of the greatest mathematicians of all time (see: greatest mathematician ever) according to American mathematician Walter Eells (1886-1963). [1]

List

The following is Eells' list of the 100 greatest mathematicians:

1. Isaac Newton
2. Gottfried Leibniz
3. Joseph Lagrange (Euler genealogy)
4. Leonhard Euler (Euler genealogy)
5. Pierre Laplace
6. Euclid
7. Carl Gauss
8. Archimedes
9. Rene Descartes
10. Gerolamo Cardano
11. Adrien-Marie Legendre
12. Pitagora
13. Gaspard Monge
14. Jean D'Alembert
15. Agustin Cauchy
16. Joseph Fourier
17. Pierre Fermat
18. John Napier
19. Blaise Pascal
20. Apollonius
21. Leonardo Fibonacci
22. François Viete
23. Ptolemy
24. Christiaan Huygens (Euler genealogy)
25. Regiomontanus
26. Diophantus
27. Colin Maclaurin
28. Jacob Bernoulli (Bernoulli family)
29. Pappus
30. Bonaventura Cavalieri
31. Carl Jacobi
32. Johann Bernoulli (Bernoulli family)
33. John Wallis
34. William Hamilton
35. Niccolò Tartaglia
36. Heron
37. Jean-Victor Poncelet
38. Bernhard Riemann
39. Siméon Poisson
40. Niels Abel
41. Michel Chasles
42. Luigi Cremona
43. Gilles Roberval
44. Roger Boscovich
45. Galileo Galilei
46. Alexis Clairaut
47. Johann Lambert
48. Isaac Barrow
49. Jacques Strum
50. Simon Stevin
51. Augustus de Morgan
52. Brook Taylor
53. Johannes Kepler
54. Daniel Bernoulli (Bernoulli family)
55. Girard Desargues
56. Henri Briggs
57. James Sylvester
58. Lazare Carnot
59. Pierre Maupertuis
60. Charles Babbage
61. Charles Hermite
62. Thales
63. Henry Smith
64. Sofia Kovalevskay
65. Luca Pacioli
66. Hippocrates (of Chois)
67. Gerbert
68. Alfred Clebsch
69. Julius Plucker
70. Hermann Grassmann
71. Peter Dirichlet
72. Arthur Cayley
73. Muhammed al-KhwÄ rizmi
74. Roger Cotes
75. Abraham De Moivre
76. George Boole
77. Karl Weierstrass
78. Sophus Lie
79. Nikolai Lobachevsky
80. Ahmes (the scribe)
81. Jean-Charles Borda
82. Eugenio Beltrami
83. Paolo Frisi
84. Évariste Galois
85. Evangelista Torricelli
86. Jean-Étienne Montucla
87. Otto Hesse
88. Jordanus de Nemore
89. Plato
90. Henri Poincare
91. Jakob Steiner
92. Edmond Halley
93. Andre Ampere
94. Guillaume L'Hospital
95. William Thomson
96. Boethius
97. Ehrenfried Tschirnhausen
98. Bhaskara II
99. Eratosthenes
100. Zeno of Elea

(add)

References

1. (a) Eells, Walter C. (1962). "100 Greatest Mathematicians of All Time" (Ñº), *Mathematics Teacher*, 7(55).
(b) Walter Crosby Eells Papers (1890-1963) – NWDA.OrbisCascade.org.

θΔics

In terminology, **effect**, as compared to cause, is something that inevitably follows from an antecedent. [1]

Quotes

The following are related quotes:

> "A physical object is something which stays put unless something else starts it going, whereas an animal is something which under any circumstances does what it pleases. Isn't a man a living creature and cannot he do pretty much as he pleases? … Heretofore, even if man entered somewhat into the matter, at least a given cause under a given set of conditions always produced the same effect. But along came Heisenberg with his principle of indeterminacy and apparently destroyed the pure and inevitable relations of cause and **effect**. On the analytical level of the laboratory, the mind sees things as determined. But in human behavior, in our daily lives, the decision is not simple. To his own mind, the behavior of a man seems to be free and of his own choosing, and all the accumulated moralities of the world exhort him to choose the good and to act righteously on the assumption that he is capable of free choice and action."
>
> — Selig Hecht (1935), "The Uncertainty Principle and Human Behavior" [2]

See also

- Aristotle-Mpemba effect
- Butterfly effect
- Catch up effect
- Cause and effect
- Genius hiatus effect
- Mechanical effect

References

1. Effect – Merriam-Webster Collegiate Dictionary, 2000.
2. (a) Hecht, Selig. (1935). "The Uncertainty Principle and Human Behavior" (pdf), *Harper's Magazine* (pgs. 237-49), Jan.
(b) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 37). Arnold-Howard Publishing Co.

θΔics

In thermodynamics, **efficiency**, symbol η (eta), is the ratio of work output to heat input of any heat engine: [1]

$$\eta = \frac{W_{out}}{Q_{in}}$$

The maximum theoretical efficiency that any heat engine can obtain is based on Carnot's theorem.

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics.* Oxford University Press.

External links

- Thermal efficiency – Wikipedia.

θΔics

Article
Entropy Generation, Brain Dynamics, and Thomas Aquinas | **Peer Review**
(a JHT submission)

Article | Review versions
â— Original article | Received: 12 Oct 2012 | Pages: 8
â— **Formatted article** | 7 May 2013 | Pages: 10 | Format: PDF

This is a new **JHT peer review stage article**, in the re-formatting and or re-construction stage of development, about which: comments, suggestions, and or criticism are welcome, which can be submitted via: (a) the threads below, (b) comments added into the "this" wiki page, via the EasyEdit button, (c) attachment added to this page, via EasyEdit tools, (d) review posted externally, e.g. in beta wiki, WordPress, Blogger, your own website, etc., or (e) email comments sent to JHT editor Libb Thims directly *via* libbthims@gmail.com, which will be made public.

Abstract
The formatted abstract of the working draft-article is as follows:

Entropy and entropy generation are fundamental quantities in the analysis of complex systems. Indeed, they have been proved to be the key in the understanding of many different phenomena and of practical applications in engineering and science. They represent the fundamentals of most modern formulations of both equilibrium and non-equilibrium thermodynamics. In the last twenty years, entropy and entropy generation have been better understood in fundamental aspects and a great number of applications have been developed in classical engineering and new scientific area problems. In this paper, starting from these results, the entropy generation approach is presented as a powerful method of analysis of the brain function, in looked at in the light of the moralistic and philosophical arguments of Italian philosopher and theologian Thomas Aquinas.

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Received: 12 Oct 2012; *Reviewed:* Dates; *Published:* Date

Review period

This article entered the review period on 7 May 2013 and will close prior to 27 Jun 2013, the date when JHT editor Libb Thims leaves for the University of Pitesti Econophysics and Sociophysics Workshop 2013, if not sooner as Thims will need to focus on completion of his key speaker talk. [1] Comments and review in between these two points will be appreciated.

Editorial issues

Formatting | Other

Libb Thims | 7 May 2013 | 2:43 PM CST | **Post**

Editorial note: Umberto, I am nearing to having your article finished. For future reference, I would suggest you consult the JHT formatting page, in particular the "names of people" section, the "inline citation" section, and the "citation" section in general (wherein we are missing first names of author citations), as it took me some time to correct all of this or rather to make your paper into standard JHT format. Also, your references, presently are not completely in JHT format:

JHT	Tribus, Myron and McIrvin, Edward C. (1971). "Energy and Information", *Scientific American*, 225(3):179-88.
MLA	Tribus, Myron, and Edward C. McIrvine. "Energy and information." *Scientific American* 225.3 (1971): 179-188.
APA	Tribus, M., & McIrvine, E. C. (1971). Energy and information. *Scientific American*, *225*(3), 179-188.
Chicago	Tribus, Myron, and Edward C. McIrvine. "Energy and information." *Scientific American* 225, no. 3 (1971): 179-188.

As, however, I did not actually write the "JHT formatting" page (24 Nov 2012) until after you submitted your article (12 Oct 2012), I'm not going to bother with this issue further at this point. Do be aware, however, that your extensive usage of upwards of 10 inline citations per sentence, such as the following:

> For the complex systems at the stationary states, the entropy generation has been proven to be always an extremum[17-25]. This result has been used in solid state physics[26,27], in two-phase flows[28,29], in the optimization of magnetic refrigeration[30], in economic analysis of production systems[31,32] and in biological systems[25,33] and in many other applications in chemistry and biochemistry[34].

have been editorially redacted into the following form:

> For the complex systems at the stationary states, the entropy generation has been proven to be always an extremum.[10] This result has been used in solid state physics, in two-phase flows, in the optimization of magnetic refrigeration, in economic analysis of production systems and in *bio*logical (*chnops*ological) systems and in many other applications in chemistry and *bio*chemistry (*chnops*chemistry).[11]

wherein (a) references are grouped into one (e.g. 26-34 regrouped into ref. #10) and also we see life terminology upgrade clarification.

Libb Thims | 7 May 2013 | 3:31 PM CST | **Post**

Editorial note: Comment: the following section (formatted version):

> These two results can explain some experimental facts, as, for example, the schizophrenia relation between the man behavior and the abnormal neurotransmission on brain neural network and the effects of a neurotransmitter on the chemical reaction cascade. [16]
>
> 16. Salerian, Alen J. (2012). "Thermodynamic Laws Apply to Brain Function", *Medical Hypothesis* 74: 270-274.

might not be a good reference as Alen Salerian's reputation seems to be in some form of legal and or credibility trouble and he is no longer able to practice as a physician/physiatrist:

http://www.salerianbrain.com/

I'll only skimmed his article, however, thus far:

http://www.salerianbrain.com/wp-content/Thermodynamic-laws-apply-to-brain-function-2009.pdf

Possibly, down the road I'll be able to write an Hmolpedia article on him to better discern the correctness of his logic?

In its place, I might recommend Italian psychiatrist Tullio Scrimali and his 2006 book *Entropy of Mind and Negative Entropy* in which he seems to use a mixture of complexity theory, Prigoginean thermodynamics, dissipative structures, information theory (although he doesn't mention Shannon), chaos theory, systems theory, cybernetics, among others, to explain schizophrenia.

Answer: I accept the suggestion of the reference.

Libb Thims | 7 May 2013 | 4:07 PM CST | **Post**

Editorial queries: The following as found in the newly-formatted article:

Q1. What is the author's definition of "entropy"?

> A1. Entropy is defined as:
>
> $$\Delta S = \left(\int \frac{\delta Q}{T} \right)_{rev} + S_g$$
>
> where Q is the heat exchanged, T is the temperature, *rev* means on an equivalent reversible path and S_g is the entropy generation which

represents the entropy variation due to irreversibility.

Q2. What is the author's definition of "entropy generation"?

A2. The entropy generation is defined by using the Gouy-Stodola theorem:

$$S_g = \frac{W_\lambda}{T_0}$$

where Sg is the entropy generation which represents the entropy variation due to irreversibility, W_l is the work (exergy) lost due to dissipation and T_0 is the environmental temperature.

Q3. What does the author mean by "theological approach"?

A3. Theological approach means a philosophical approach based on the research on God.

Q4. What is the author's position on the theory of the soul in terms of thermodynamics?

A4. In thermodynamic approach I think that soul is the source of life: without soul the exergy exchange cannot be used for life. The soul is the entity (mind) which can convert the exergy in thoughts, actions, emotions, etc.

Q5. What is the author's definition of 'exergy'?

A5. Exergy is the energy can be used for useful processes.

Q6. Please provide an example of a specific neurotransmitter variation, e.g. serotonin, dopamine, oxytocin, etc., that can be used determine entropy generation?

A6. Any exchange of neurotransmitter in any interaction between the brain and the environment.

Q7. What does the phrase: "From a theological point of view …" mean? From a God point of view? From a Christian point of view? From a soul theory point of view?

A7. From a philosophical point of view based on the research of the origin or motivation of life.

Q8. What exactly is "Thomas' philosophy" for those of us who don't know?

A8. What I mean for St. Thomas philosophy is the philosophical approach based on the thought that any action must follow its natural path, without any artificial human philosophical idea as conditioning of the development.

are in need of further clarification by the author (fixed ✓per A1-A8 via email from Lucia to Thims on 8 May 2013).

Peer review

Reviews | **Review board** | Other

Libb Thims | 7 May 2013 | **Post**

Comment: a general comment noticed is the rather bloated usage of references, on the last two of which, citations 39 (Walter Freeman, 2008) and 40 (Thomas Aquinas, 1272), in the original submission format, seem to have anything to do with the main argument of the article, as far as I can tell so far, which the proposal that entropy generation principles, applied to brain function, and ethical choice, might be able to rectify the theory of the soul (or soul weight theory) in quantitative thermodynamical terms (I would guess JHT review board member Gerard Nahum will have something to say about this, as this is his favorite topic?), if I'm not mistaken? To exemplify, Freeman, in his article, cites Aquinas' *Summa Theologica*, section: Treatise on Man (Q75-102), subsection: Q75: [2]

First Part, Q75
Of man, who is composed of a spiritual and a corporeal substance

A1: Whether the soul is a body? [It is not.] To seek the nature of the soul, we must lay down first that the soul is defined as the first principle of life in those things which in our judgment live; for we call living things "animate" and those things which have no life, "inanimate". Now life is shown principally by two actions, knowledge and movement. ...

Therefore the soul ... is not a body, but the act of a body; thus heat, which is the principle of making hot, is not a body, but an act of a body. (p. 378)

This last statement brings to mind the following Rene Descartes based video, and how certain things are illusional until dissected:

In any event, Aquinas continues:

A2: Whether the human soul is something subsistent? [It is.] It must necessarily be allowed that the principle of intellectual operation which we call the soul is a principle both incorporeal and subsistent. For it is clear that by means of the intellect man can know the natures of all corporeal things. Now whatever knows certain things cannot have any of them in its own nature, because that which is in it naturally would impede the knowledge of anything else. (p. 379)

Certainly, you are not the first so-called "soul theorist", as Mary Roach calls such theorists; on an aside note Napoleon Bonaparte was a prime example (with his brain probing queries and vegetable growing experiments in attempts to discern a soul), since Rene Descartes and his pineal gland theory of the soul.

To note: normally religious topics are not acceptable to JHT, being that the following three topics are generally not acceptable to JHT:

- â— God theories
- â— Life theories (perpetual motion theories; this includes origin of life theories; see: defunct theory of life)
- â— Information theory (information theory; see: Shannon bandwagon)

Thermodynamic discussions on soul theory/karma theory are in some sense tentatively allowable subjects for JHT articles, e.g. Ernst Haeckel's *circa* 1895 very humorous adiabatic liquefaction low-temperature thermodynamics "soul snow" theory being one topic worthy of discussion, being that these, in basic principle, are "movement theories", which for over 75 percent of the belief systems of the world and belief systems of children derived from the Egyptian *circa* 2,500 BC (3950 BP) so-called negative confessions based morality theory of right (good) and wrong (evil) movement and action in reaction existence (life), and thermodynamics does indeed recognize (a) movement and (b) also differentiates between natural and or unnatural movement, and in fact the understanding of the motion of a body, particle, human, or planet, it makes no difference, is the focus of the opening paragraph of the science of thermodynamics:

> “Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, work is performed.”
>
> — Rudolf Clausius (1875), “Mathematical Introduction” (*The Mechanical Theory of Heat*)

To clarify, we are not here attempting to argue here or promote the view that atomic, chemical, and or molecular entities, e.g. hydrogen, carbon dioxide molecule, DNA, protein molecule, bacteria molecule, cell-as-molecule, or human molecule, etc., the hydrogen atom in particular, have a "soul", or aggregate summations of good or evil movements, as one would say in the olden theologically-loaded terms, as this is but a a ‘recital that trips along simple as a fairy tale’, as English physiologist Charles Sherrington put it in his 1938/39 *Man on His Nature* lectures. To clarify further, however, a few Napoleon Bonaparte quotes seem apt here:

> “Great ambition is the passion of a great character. Those endowed with it may perform very good or very bad acts. All depends on the principles which direct them.”
>
> “Men are moved by two levers only: fear and self interest.”
>
> “Nothing is more difficult, and therefore more precious, than to be able to decide.”

> “Take time to deliberate, but when the time for action has arrived, stop thinking and go in.”
>
> “Lead the ideas of your time and they will accompany and support you; fall behind them and they drag you along with them; oppose them and they will overwhelm you.”

In short, men are indeed moved, and according to Clausius these movements accrue or rather result by the action of forces, and these movements, for men, depend on the principles (core belief systems) that guide men, and among these various movements, the most difficult thing, according to Napoleon, is "to be able to decide", and this difficulty in indecision, according to Goethe, and his four stages of existence model, shown below, become acute in the third stage of existence (skepticism):

Realism

“Every stage of life corresponds to a certain philosophy. A child appears a realist; for it is as certain of the existence of pears and apples as it is of its own being.

(age 9)

(age 15)

Idealism

A young man, caught up in the storm of his inner passions, has to pay attention to himself, look and feel ahead; he is transformed into an idealist.

(age 24)

(age 38)

Skepticism

A grown man, on the other hand, has every reason to be a skeptic; he is well advised to doubt whether the means he has chosen to achieve his purpose can really be right. Before action and in the course of action he has every reason to keep his mind flexible so that he will not have to grieve later on about a wrong choice.

(age 42)

(age 59)

Mysticism

An old man, however, will always avow mysticism. He sees that so much seems to depend on chance: unreason succeeds, reason fails, fortune and misfortune unexpectedly come to the same thing in the end; this is how things are, how they were, and old age comes to rest in him who is, who was and ever will be.”

(age 69)

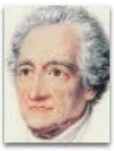
(age 81)

and that to remedy or rather facilitate this process of action following choice, one must, according to Goethe, turn to the "moral symbols" of physical science, which in Goethe's day was affinity chemistry, but in our day is chemical thermodynamics, of which "entropy", symbol S, function dQ/T, is one of these moral symbols (see also: moral movement); so indeed the submitting author is turning in the seemingly correct direction with digression on entropy and entropy generation as the new moral guiding principle for human kind, but also, to note, digressions on entropy alone in respect to morality is nothing new—a few historical examples include: energetic imperative, thermodynamic imperative, and entropy ethics, to name a few.

So, in short, soul theory digression is a tentative discussion path, but one that must be done with caution so that we do not "trip along in a fairy tale" (the recent 2012 book of Mark Janes, for some reason, comes to mind here?).

Jeff Tuhtan | 9 May 2013 | **Post**

Comment: This paper is one of the most interesting I have come across on JHT.

pg 55: Can you provide the canonical formula, including control parameters describing the equation mentioned?

>
>
> Umberto Lucia | 11 May 2013 | **Post**
>
> Answer: It is not possible to introduce a general formulation because the equation depends on the parameters we want to use and on the phenomena examined. Consequently, it depends on what we want to control.

pg 57: How is the fifth term of the entropy generation physically distinguished from the previous four?

> Answer by Umberto Lucia: It is different because it depends on external forces. For example magnetic or electric interaction, etc.

pg 57: Can you provide more behind the statement that "the entropy generation has been proven to always be an extremum?" My understanding is that extremal principles in irreversible thermodynamics are a hotly debated topic. For instance, there also exists a theory of entropy generation minimization.

Since 1995 I am developing this subject, obtaining a lot of results. The proof is as follows.

Starting from the approach of Gouy [Louis Gouy (1854-1926); see: exergy], from 1995, Lucia [35-39] is developing a theoretical and phenomenological approach to entropy generation in order both to introduce a principle of analysis for irreversibility in engineering and science and to obtain an approach related to the 'natural' behavior of the phenomena. The mathematical basis of this approach is the variational calculus, while the physical basis is the principle of least action (and the Noether's theorem too, and some phenomenological hypothesis as follows [39] that entropy generation has an upper limit which is the maximum at the stationary state.

[35] U. Lucia, Mathematical consequences and Gyarmati's principle in Rational Thermodynamics, Il Nuovo Cimento B110 (10) (1995) 1227-1235.
[36] G. Grazzini, U. Lucia, Global analysis of dissipations due to irreversibility, Revue Générale de Thermique 36 (1997) 605-609.
[37] U. Lucia, Irreversibility entropy variation and the problem of the trend to equilibrium, Physica A 376 (2007) 289-292.
[38] U. Lucia, Probability, ergodicity, irreversibility and dynamical systems, Proceedings of the Royal Society A 464 (2008) 1089-1184.
[39] U. Lucia, Maximum or minimum entropy generation for open systems?, Physica A 391 (12) (2012) 3392-3398.

My references on the subject, with all the proof are:

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pg 57: What is meant by stability in the physical sense?

Answer by Umberto Lucia: stability means that a stationary state is maintained for a long time without modifications.

pg 60: The concept of *participated being* as the partner to *form* is intriguing, especially as thermodynamics is traditionally a black-box approach which cannot easily account for the morphological characteristics of macroscopic systems. Can you elaborate a bit more on this connection, as well as on the *cooperation / network* concepts?

Yes, the black box approach is interesting, but the approach here used can link the external properties with the internal ones. Indeed, it is possible to link inside and outside of the system by means of the entropy generation and entropy production.

General comment: After reading the paper, it still remains unclear to me how the works of Aquinas are related to entropy generation in the human brain. If I understood correctly, Aquinas made the connection between brain and memory as matter and thermodynamic process? But how does this relate to ethical issues, or not remain just as relevant for any organism having a brain?

In the XIII Century St. Thomas Aquinas stated a philosophical consideration [1]: "It is impossible for an effect to be stronger than its cause". This statement can be considered as a first step, or a verbal expression, of the Second Law of thermodynamics. It isn't usually introduced, but it is the first author to explain irreversibility.

If I understood correctly, Aquinas made the connection between brain and memory as matter and thermodynamic process?

Yes

But how does this relate to ethical issues, or not remain just as relevant for any organism having a brain?

I think that St. Thomas is a "natural philosopher" in the sense that his philosophy and theology is related to Nature. Ethics means agreeing with the natural behavior of nature for the phenomenon considered.

Jeff Tuhtan | 12 May 2013 | **Post**

Comment: Thank you for your responses. I only have one remaining comment regarding the statement "the entropy generation has been proven to always be an extremum".

From your response, it appears that perhaps the statement should be reformulated to reflect the specific conditions under which it is strictly true: the entropy generation can be shown to be maximal at the stationary state, and otherwise has an upper limit for non-equilibrium states. Otherwise it may lead some readers to believe that the entropy variation due to irreversibility (entropy generation) is always an extremum. Furthermore, for cases in which the entropy generation occurs in systems which are free to change in space and over time, there is no general extremal principle for the entropy generation.That the entropy generation may serve as a general selection rule relating the initial and final conditions is also very interesting, especially for the post-mortem analysis of historical engineering designs.

It would be difficult to apply the steady state conditions to many natural systems, such as a human brain due to the spatial heterogeneity and instationarity of the gradients which drive the system. Indeed, it may be this heterogeneity itself which acts as the major obstacle to apply theoretical formulations from thermodynamics to complex natural systems.

Umberto Lucia | 12 May 2013 | **Post**

Answer: It is more simpler than it appears. Indeed, for example, a cell can live if there is a balance between inflow and outflow energy. This balance can be described by the energy balance of a stationary system. If the cell is not in a stationary state it increases or decreases its energy. If it increases energy it increases its temperature and the cell becomes a cancer cell. If desreases its temperature it cannot continue to live. All complex natural systems are in stationary states (non-equilibrium, but stationary) and they have transitions between their possible stationary states. If the system is not in a stationary state it is in transition, but at the end of a transition it reaches a stationary state. For me stationary means that there exists an balance equation of entropy and exergy like the ones used in engineering thermodynamics for open or closed systems.

Libb Thims | 12 May 2013 | **Post**

Note: I added Lucia's fuller 11 May 2013 response (with equations) to Tuhtan's review as an attachment to this page (below) for those interested.

Arto Annila | 17 May 2013 | **Email**

Comments: The study employs thermodynamics to make sense of the operational principle of brain. The bold approach as such attracts attention, and hence deserves further examination. I find the study well-motivated and its arguments are solid, although I do realize that some of are controversial. However, it would be only welcomed if the paper would generate debate on the operational principle of brain. Thus I recommend publication by JHT whose readers I expect to value the insights most. My comments below are intended to help the author to improve the paper further.

Page 55. “the small systems dissipates energy continuously, so they operates in non-equilibrium states.” I am worried how the concept *non-equilibrium state* is understood, because a continuous and constant dissipation implies a free-energy minimum state where input equals output. A non-stationary state is characterized by a changing dissipation as the system moves from one state to another. Therefore the word non-equilibrium implies for many as a non-stationary or meta-stable state, however, the continuous and constant dissipation does not imply vulnerability.

Page 56. The reference to the well-known paper [1994 (abs)] by Evans and Searles is formulated exceptionally accurately, because the fluctuation theorem about the probability of observing an entropy production opposite to that dictated by the second law of thermodynamics decreases exponentially, claims that entropy would have some probability to decrease which is in conflict with conservation of quanta.

Page 56. The concept of force would benefit from further identification to an energy difference or a gradient and to free energy and eventually also to affinity which all mean the same.

Page 57. A system is prone for instable behavior when the ratio of free energy over average energy is above unity, i.e. $A/kT > 1$, because then

trajectory changes so rapidly that it no longer appears as continuous.

Page 58. Only small fluctuations about the free energy minimum are approximately normal (symmetrical), however, in general and apparent in large fluctuations the distribution is not symmetrical but approximately log-normal.

Page 59. Quote of Hawking may be worth referring to, but would benefit from clarifying that entropy is not a measure of disorder, but logarithmic probability S = k ln P where probability P is a measure of relative free energy.

I agree that Thomas Aquinas saw the brain accurately not as a structure but a process, and hence the early insight can indeed be related to thermodynamics that describes both stationary and evolutionary processes as the maximum entropy states and maximal entropy generation, respectively. To draw inspiration from the early thinkers is well-motivated today when science has diversified to specialties, and lost the holistic view that is need to explain complex systems.

Umberto Lucia | 20 May 2013 | 5:11 PM EDT | **Post**

Response: My paper began after the reading of the Annila's paper: "Thoughts About Thinking" (pdf) (*Advanced Studies in Biology*, 2013 5, 135–149). It was so interesting that I decided to study the subject from an engineering thermodynamic point of view.

Libb Thims | 20 May 2013 | 10:18 EDT | **Post**

Comment: Re: "entropy is not a measure of disorder, but logarithmic probability S = k ln P where probability P is a measure of relative free energy", I do not recall immediately having read any works by "Annila", although I do note that I have *Hmolpedia*-cited him at least three times, for two of his articles:

http://www.eoht.info/search/everything/Annila?contains=Annila

â— Kaila, Ville R.I. and Annila, Arto. (2008). "Natural Selection for Least Action", *Proceedings of the Royal Society A.*
â— Annila, Arto and Salthe, Stanley. (2009). "Economies Evolve by Energy Dispersal" (abs), *Entropy*, 11(4): 606-33.

hence, I must have at least slimmed his abstracts previously, and from these returns, I note that his association with Stanley Salthe and Salthe's nearly bend-over-backwards incoherent "infodynamics" theory is a huge red flag. In any event, this last (Page 59) review comment by Annila, raises a lot of red flags:

â— Re: "entropy is not a measure of disorder", this conflicts with Rudolf Clausius, and his 1862 "disgregation" model of entropy, with Hermann Helmholtz and his 1882 unordered motion model of the magnitude of entropy |S|:

> "Unordered motion, in contrast, would be such that the motion of each individual particle need have no similarity to its neighbors. We have ample grounds to believe that heat-motion is of the latter kind, and one may in this sense characterize the magnitude of entropy as the measure of **disorder**."

and with the Boltzmann-Planck based principle of elementary disorder (1899) and with the followup Walther Nernst derived heat theorem (1907) model of entropy, according to which at absolute zero is characterized by perfect crystalline order and quantified by zero entropy.

the latter statement (Page 59) review comment by Annila, again raises a many red flags:

â— Re: "but [entropy where correctly is the] logarithmic probability S = k ln P where probability P is a measure of relative free energy", firstly (a) it amazes me as to the number of people who are gung-ho happy to jump into measures of entropy of non-ideal gas systems (such as the atoms and molecules of the brain) via using the Boltzmann-Planck entropy equation, in spite of the fine print that this equation uses the Boltzmann constant (gas constant/Avogadro number) and is only valid, supposedly, for particles having non-correlated velocity (axons, dendrites, and neurons are hardly ideal gas particles), and (b) the probability P, or correctly the W, from the German Wahrscheinlichkeit (var-SHINE-leash-kite), meaning probability, often referred to as multiplicity (in English)—the number of "states" (often modeled as quantum states), or "complexions", the particles or entities of the system can be found in according to the various energies with which they may each be assigned—supposedly, according to Annila, is the measure of the "relative free energy" of the brain, if I am not mistaken about his conjecture, is a proof I am surely awaiting to see.

Curtis Blakely | 20 May 2013 | **Email**

Comments: Here is my review of "Entropy Generation, Brain Dynamics and Thomas Aquinas."

It reads a bit harsh/negative - so feel free not to post it, to modify it, post it as is – just whatever you decide to do is fine with me.

Overall, I found it a bit weak – but again, that is just my opinion…..

I have read and reread this article several times – and not being a specialist in brain dynamics or even Thomas Aquinas, I have enjoyed it nonetheless. It has made me think about several interdisciplinary linkages that I have not previously considered. So for that reason, I applaud the efforts of the author.

However, I do have several comments about the article and I will present them in a constructive manner not just for the author's benefit but for all readers that are now composing their own scientific papers.

First, there are minor problems with the words that are occasionally used (i.e. making a word plural when it shouldn't be, forgetting to add an "ed" to the end of a word, etc.). While this is not a major issue, it can detract from the message being conveyed.

Secondly, in the author's human thermodynamics table, I would suggest that he add the terms *equilibrium*, *exergy*, *entropy generation*, etc. It appears that the author has a good grasp of these terms/processes, but perhaps he should operationalize them for his readers – this would eliminate/minimize confusion. For example, the author provides the following sentence that I find a bit confusing: *Consequently, when a new energy exchange occurs, the brain system follows the thermodynamic paths which allow the individual to rationalize the perception, consuming the exergy associated to the signal and growing its entropy generation* (and this is just one of several). I ascribe to the belief that an author's primary purpose is to make the reader's job as effortless as possible. The author should always keep his/her reader in mind.

I am not acquainted with Aquinas - so had the author provided a bit more background, it would have been welcomed. I also found the transition between the statements regarding the Protestant reformation and the distinction between matter and intellect a bit abrupt.

I am also not convinced by the statements that *the brain only learns what is useful*….or that *Aquinas understood the complex structure of the brain*. Statements like these will be assessed by each reader – and like me, they may find them unconvincing.

I don't want to sound too critical, but in a sense, this paper raised more question for me than it provided answers.

Umberto Lucia | 20 May 2013 | **Post**

Response: I agree that something can be added on St Thomas. I decided to study St Thomas because he developed his philosophy/theology before the Reformation. I think that the difficulties in some statement are the consequence of the English form written by a person who think in Italian and tries to write/speak English.

Reviewer | Date | **Via**

Comments:
(add)

Criticisms
(add)

Suggestions
(add)

Exercises | Problems

Exercises | **Homework problems** | Other

On the wise protocol of Swedish physical chemist Sture Nordholm's penning of eight homework problems to his 1997 *Journal of Chemical Education* article "In Defense of Thermodynamics: an Animate Analogy", the submitting author has provide (7 May 2013) two homework problems and or exercises, shown below, that will be added to the finial version of the submitted article, if published:

- â— Problem #1: Describe how the brain can obtain information from the environment by using the exergy.
- â— Problem #2: Describe how the entropy generation represents a fundamental quantity for obtaining cell information

from the brain.

JHT editor Libb Thims may, down the road, end up writing a *Chemical Thermodynamics: with Applications in the Humanities* textbook, built on Gilbert Lewis' famous 1923 *Thermodynamics and the Free Energy of Chemical Substances*, and some of these JHT homework problems may find their way into the end of chapter exercises.

References

1. Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (abs) (main), University of Pitesti Econophysics and Sociophysics Workshop (UPESW) 2013 / Exploratory Domains of Econophysics News (EDEN V) (organizer: Gheorghe Savoiu). University of Pitesti, Pitesti, Romania, Jun 29.
2. Freeman, Walter J. (2008). "Nonlinear Brain Dynamics and Intention According to Aquinas" (abs) (pdf), *Mind & Matter* 6(2): 207-234.

JHT

In psychological thermodynamics, the **ego** is a term representing a state of the mind associated with various energy levels or levels of conscious activity.

History

In 1872, English scientist Herbert Spencer, in his *Principles of Psychology* (first published in 1855), was one of the first to connect the principle of energy to the term ego, when he stated in his explanation of cognition that: [1]

> "Sets of manifestations [are] controllable by an energy every welling up within, are grouped together as an ***ego***, and that set of manifestations which, not being thus controllable, originate the consciousness of an outer energy or *non-ego*."

This type of logic was later introduced more elaborately by Austrian psychologist Sigmund Freud in his 1923, non-classic, *The Id and the Ego*, in which he divided the mind into the *id*, the unconscious source of drive and energy, the *ego*, the partly-conscious state of the active mind in its present plan, and the *super-ego*, a residue of the earliest object-choices of the id (stemming from the pleasure principle) representing an energetic-formation against those choices. [2]

Various aspects of Freud's three-part energy model of these various ego states or parts of the mind, were taken later by those as Carl Jung, Eric Berne, Mihály Csíkszentmihályi, and Francisco Tellez, among numerous others.

References

1. Spencer, Herbert. (1906). *Principles of Psychology*, Vol II, Installment No. 33 (pp. 481-560, esp. pgs. 501) Ed. 3. D. Appleton and Co.
2. Freud, Sigmund (1923). *The Ego and the Id* (pgs. 4-5). W.W. Norton & Company.

External links

â— Id, ego, and super-ego – Wikipedia.

θΔics

In locations, **Egypt** (CR:42) is a country in north east Africa, with a capital in Cairo, bordering on the Mediterranean and Red seas, generally divided into the Upper Nile and Lower Nile regions.

Overview

The the following diagram shows the main 42 nomes or cities of **Egypt**, shown divided into Lower Egypt, containing the delta region, and Upper Egypt. Historically, in religio-mythology, the 42 gods of the first dynasty of Egypt (3100BC) became united under the state worship of the sun god Ra (among other name), and with the rise of the Roman empire became integrated or rewritten into the 42 generations or descendants between Jesus Christ and God to form the basis of Christianity, the dominate belief system of 32 percent of the modern world.

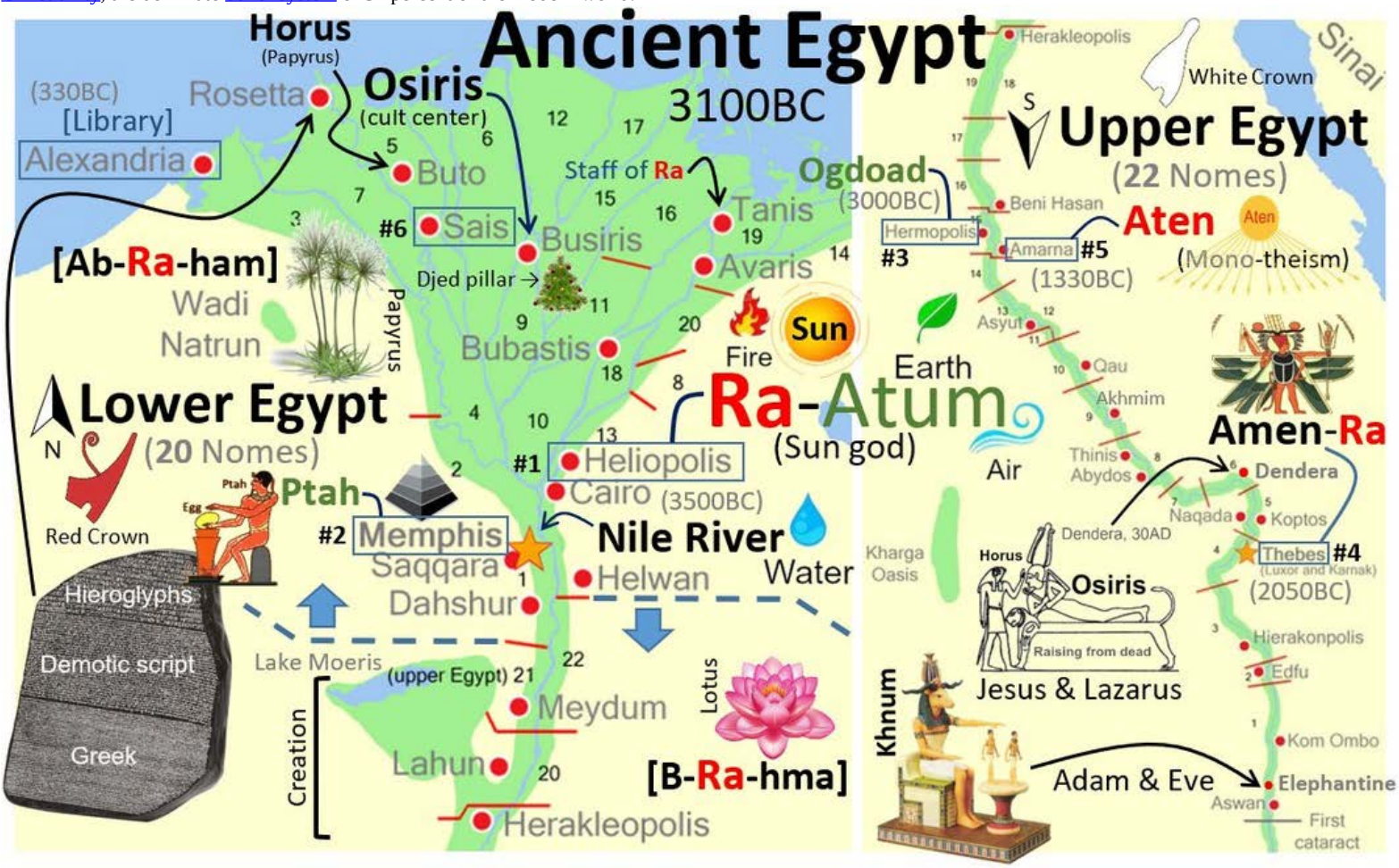

(add)

Egypt | Keme | Aigyptos | House of Ptah | Etymology

In 2500BC, Egypt, in the old kingdom, was referred to as "Kmt" (hieroglyph) or "Kemet" (with syllables inserted), based on the term "keme", pronounced: 'chem', as in *chem*istry, meaning black soil, in contrast to the "red soil" of the desert, which was considered the "land of Set".

In c.1150BC, Egypt, when Ptah became supreme god, came to be referred to as the "House of Ptah", a reference to the god Ptah, who had become supreme god of Egypt in the years [add]. In other cultures, as this religious model was cross-culturally transmitted (see: god character rescripts), the god Ptah came to be called: "Jiapheta" (India, c.900BC), "Hephaestus" (Greece, c.600BC), "Vulcan" (Rome, c.400BC), and finally "Japheth" (Judea, 300BC),

In 1050 to 656BC, during the so-called "Judaic recension" (see: recension theory; supreme god timeline), the supreme gods were, generally speak, the following entities:

- YHWH / Yahweh
- Abraham | Ab-Ra-ham
- **El** [see: Neter]
- **Ptah** = "the Lord" = El (O)
- Osiris-Ra | Moses + Abraham
- **Ptah**-Atum | Japheth + Adam

some, as shown above, being rescripted, via the god-to-prophet rescript method, so to affect a god reduction towards monotheism. In this period, the name of Egypt was changed from Kemet (Old Kingdom, 3100BC) to House of Ptah or Egypt; this etymological transition is summarized as follows:

> Ptah (Memphis, 2800BC) → Hikuptah (Amarna, 1300BC) → Hephaestus (Greek, 800BC) → Jiapheta (Indian, 800BC) → *Aigyptos* (Greek, 300BC) → AEgyptum (Latin, 500) → Egipte (Old English, 1150) → Egypt (English, c.1500)

The reference to the science of chemistry as the “black art” has the same root etymology, i.e. *kēme* as Egypt (see: chemistry (etymology)). [1]

The name of Abraham (and Brahma) also are based on the root *keme* (-chem), which transliterates as father (Ab-) Ra (sun god) born of the Nun (-ham), or primordial land mound arisen after the flood, the latter suffix pronounced ‘chem’ in Hebrew.

Greek philosophy

The c.600BC, Greek thinkers began to study abroad in Egypt:

> “A tradition says Solon, Thales, and Plato all visited the great college at Heliopolis, and that the last-named actually studied there, and that Manetho (c.300-250BC), the priest of Sebennytus, who wrote a history of Egypt in Greek for Ptolemy II, collected his materials in the library of the priesthood of Ra.”
>
> — Wallis Budge (1904), *The Gods of Egypt, Volume One* [9]

> “Greeks, thirsting for knowledge, sought the Egyptian priests for instruction. Thales, Pythagoras, Oenopides, Plato, Democritus, Eudoxus, all visited the land of the pyramids. Egyptian ideas were thus transplanted across the sea and there stimulated Greek thought, directed it into new lines, and gave to it a basis to work upon.”
>
> — Florian Cajori (1991), *A History of Mathematics* (pg. 15)

Solon, according to Plutarch, spent some time in Egypt and discussed philosophy with two Egyptian priests, Psenophis of Heliopolis and Sonchis of Sais. According to Plato's dialogues Timaeus and Critias, he visited Neith's temple at Sais (see: recension theory) and received from the priests there an account of the history of Atlantis. (O)

Greek philosopher Thales (c.624-c.546BC), who is attributed by Aristotle to have been the first philosopher in the Greek tradition, was the first to initiate the study of Egyptian philosophy, and or Egyptian mythology, of nature, by himself traveling to Egypt.

Thales, according to Aristotle, was the first Greek to suggest a single material substratum for the universe, namely, water, or moisture—according to which, even though Thales renounced mythology, his choice of water as the fundamental building block of matter had its precedent in the Egyptian tradition (cf. "Nun", the undifferentiated primordial waters before time and space and its "Ba" or "soul", the autogenetor Atum).

To Thales, the entire universe is a living organism, nourished by exhalations from water (cf. Egypt's organic, hylezoistic view on creation). Hence, Thales' significance for Greek philosophy, lies less in his choice of water as the essential substance, than in his attempt to explain nature by the simplification of phenomena. Indeed, Thales searched for causes within nature itself rather than in the caprices of the anthropomorphic gods. He was deemed the first Greek to give a purely natural explanation of the origin of the world, free from all mythological ingredients and unnecessary complexities (linearization and homogeneity). [8]

Thales also advised other Greek philosophers to go to Egypt in order to learn, such as Pythagoras: [8]

> “Thales advised Pythagoras to go to **Egypt** and to entertain himself as much as possible with the priests of Memphis and Diospolis: it was from them that he had drawn all the knowledge which made him a sage and a scientist in the eyes of the masses.”

Pythagoras, and after him Plato, see below, accordingly, both went to study in Heliopolis, the famous university town of ancient Egypt. [7] Pythagoras, according to Sudanese-born American philosopher Monydit Malieth, supposedly, spent over a decade in Egypt, studying Egyptian mathematics (O)(O), where he supposedly learned the so-called Pythagorean theorem, named after him, the mathematical laws of music harmony, and from these his famous dictum: [2]

> “The ultimate nature of reality is number.”
>
> — Pythagoras (c.500BC)

In 515BC, Greek thinker Heraclitus is assumed to have traveled to Egypt, being that his fire element centralized logic, amid earth and water element logic, aka three element theory, is conceptually similar to the main points of Heliopolis creation myth; Egyptian history scholar Karl Luckert (1991), e.g., argues that while it has largely been assumed that Heraclitus was a was a haughtily independent scholar, that his thinking stems from a direction of Egyptian ontological heritage. [4]

Pliny says that Democritus and Empedocles travelled in Egypt to “learn magic”. (O)

Greek atomic theorist Democritus (c.460-370BC) is reported to have traveled to Egypt, Persia, and India in search of knowledge, all along maintaining a sense of humor—sometimes referred to as the “laughing philosopher”, for his tendency to mock fellow citizens for their follies—an effort that is said to have resulted in the writing of some 60-70 books and or commentaries on diverse subjects including: ethics, logic, planets, colors, senses, air, earth’s surface, fire, geometry, geography, harmony, poetry, painting, military tactics, and diet. [5]

Greek philosopher Plato (427-348BC), of note, was said to have went, with Eudoxus (or Eudoxus when by himself), as a student to Heliopolis to study for over a decade, to learn what they could about Egyptian knowledge, likely e.g. Nun cosmology, Heliopolis creation myth, etc., therein translating some Egyptian books (or scrolls) to Greek, after which they came back to Greece to open academies for teaching. [2]

Malieth states that the following derives from Egyptian numbers theory: [2]

> "Let no one enter here who is ignorant of mathematics."
>
> — Plato (360BC), plaque over door to his academy

In 100AD, Plutarch, in his *On Isis and Osiris*, summarized the Greek study in Egypt historical precedence as following: [10

> "Witness to this also that the wisest of the Greeks: Solon, Thales, Plato, Eudoxus, Pythagoras, who came to Egypt and consorted with the priests; and in this number some would include Lycurgus also. Exodus, they say, received instruction from Chonuphis of Memphis, Solon from Sonchis of Sais, and Pythagoras from Oenuphis of Heliopolis. Pythagoras, as it seems, was greatly admired, and he also greatly admired the Egyptian priests, and, copying their symbolism and occult teachings, incorporated his doctrines and enigmas."

(add)

Greek | Study abroad scholars

The following is the table of Greek study abroad scholars:

	Scholar	Note
1.	Lycurgus (c.900-800BC)	"Travelled to Egypt, and consorted with their priests; got from the Egyptians the idea of separating the military from the menial workers, thus refining later Spartan society, in which Spartans were not allowed to practice manual crafts." (Plutarch, 100AD) (Q)
2.	Orpheus (c.725-675BC)	"Travelled from Thrace to Egypt, wherein he was initiated into the mysteries of an Egyptian "Dionysus", aka Osiris, which he brought back to Greece." (Diodorus, c.40BC)
3.	Solon (638-558BC)	"Visited Neith's temple at Sais (see: recension theory) and received from the priests there an account of the history of Atlantis." (Plato, in *Timaeus* and *Critias*) (Q) "Spent time in Egypt and discussed philosophy with two Egyptian priests, Psenophis of Heliopolis and Sonchis of Sais." (Plutarch, 100AD) "Visited the great college at Heliopolis." (Budge, 1904)
4.	Thales (c.624-c.546BC)	"Visited the great college at Heliopolis." (Budge, 1904)
5.	Pythagoras (c.570-490BC)	"Received instruction from Oenuphis of Heliopolis." (Plutarch, 100AD)
	Theodorus of Samos (c.550-500BC)	[11]
6.	Empedocles (495-435BC)	"Traveled in Egypt to 'learn magic'. (Pliny, c.77AD) (Q)
7.	Herodotus (484-425BC)	Spent a considerable amount of time throughout Egypt interviewing people for his book two of his *Histories*.
8.	Democritus (c.460-370BC)	"Traveled in Egypt to 'learn magic'. (Pliny, c.77AD) (Q)
9.	Plato (427-348BC)	"Visited (and studied at) the great college at Heliopolis." (Budge, 1904) "Stayed, as a student at Heliopolis, to study for over a decade, to learn what they could about Egyptian knowledge." (Malieth, 2013)
10.	Eudoxus (c.390-337BC)	"Exodus, they say, received instruction from Chonuphis of Memphis." (Plutarch, 100AD) As a youth (c.370BC), supposedly, travelled miles to listen to Plato lecture; then, having become un-enamored with Plato's lack of mathematical ability, travelled to Heliopolis to learn astronomy.
11.	Manetho (c.300-250BC)	"Manetho (c.300-250BC), the priest of Sebennytus, who wrote a history of Egypt in Greek for Ptolemy II, collected his materials in the library of the priesthood of Ra." (Budge, 1904)

(add)

Religo-mythology

The following are related quotes, in respect to religio-mythology studies:

> "Christianity was neither original nor unique, but that the roots of much of the Judeo/Christian tradition lay in the prevailing Kamite (ancient **Egyptian**) culture of the region. We are faced with the inescapable realization that if Jesus had been able to read the documents of old Egypt, he would have been amazed to find his own biography already substantially written some four or five thousand years previously."
>
> — Gerald Massey (1885), "The Mythical Christ" [3]

> "The theological dependency of Christendom on ancient **Egypt** is much stronger than its theological link with the Hebrew tradition."

— Karl Luckert (1991), *Egyptian Light and Hebrew Fire* [4]

Quotes

The following are other related quotes:

> "The philosophy of the **Egyptians** is described as follows so far as relates to the gods and to justice. They say that matter was the first principle, next the four elements were derived from matter, and thus living things of every species were produced. The sun and the moon are gods bearing the names of Osiris and *Isis* respectively; they make use of the beetle, the dragon, the hawk, and other creatures as symbols of divinity, according to Manetho in his *Epitome of Physical Doctrines*, and Hecataeus in the first book of his work *On the Egyptian Philosophy*. They also set up statues and temples to these sacred animals because they do not know the true form of the deity. They hold that the universe is created and perishable, and that it is spherical in shape. They say that the stars consist of fire, and that, according as the fire in them is mixed, so events happen upon earth; that the moon is eclipsed when it falls into the earth's shadow; that the soul survives death and passes into other bodies; that rain is caused by change in the atmosphere; of all other phenomena they give physical explanations, as related by Hecataeus and Aristagoras. They also laid down laws on the subject of justice, which they ascribed to Hermes; and they deified those animals which are serviceable to man. They also claimed to have invented geometry, astronomy, and arithmetic. Thus much concerning the invention of philosophy."
>
> — Diogenes Laertius (c.230BC), *The Lives and Opinions of Eminent Philosophers* (1:10-11) (Q)

> "The British and French invasion of **Egypt** in 1956 would never have occurred if the Eden government had properly appreciated the role of Newtonian mechanics in American history. Any student of social physics could have warned the British that the tradition of this Republic recognizes the existence of a principle separate from any given set of circumstances."
>
> — John Q. Stewart (1957) [6]

> "I remembered reading once in Plutarch (c.100AD) that all the ancient Greek wise man—Solon, Thales, Pythagoras, and Plato—had in their day gone to **Egypt** and been instructed by the priests in the ancient wisdom. But the full impact had escaped me at that time."
>
> — Tom Harpur (2004), *The Pagan Christ* (pg. 35)

> "It is a scene I won't forget in a hurry."
>
> — Jean-Marie Lehn (2006), on defending his atheism at a packed public conference at the new Alexandria Library in **Egypt**

References

1. (a) Plutarch. (100AD). *On Isis and Osiris*. Publisher.
(b) Partington, James. (1937). *A Short History of Chemistry* (pg. 20). Dover, 1989.
2. Malieth, Monydit (aka Tonnerre). (2013). *The Future Affects the Past: What Destination is Time Rushing To?* (pgs. 45-47). Red Lead Books.
3. Massey, Gerald. (1883). *The Natural Genesis* (§8). Publisher.
4. Luckert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective* (§:Heraclitus, pgs. 206-; quote, pg. #). SUNY Press.
5. Furley, David J. (1967). *Two Studies in the Greek Atomists: Study I – Indivisible Magnitudes, Study II – Aristotle and Epicurus on Voluntary Action*. Princeton University Press.
6. Lear, John. (1957). "American Newsletter: The Laws of Social Relationship", *New Scientist*, Jan 31.
7. Sladen, Douglas. (1911). *Oriental Cairo: the City of the Arabian Nights* (§33:Heliopolis, pgs. 341-). Publisher.
8. (a) Thales – Wikipedia.http://www.eoht.info/page/Egypt
(b) The Impact of Ancient Egypt on Greek philosophy – Maat.Sofiatopia.org.
9. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (pg. 332). Dover, 1969.
10. Plutarch. (c.100AD). *Isis and Osiris*; in: *Plutarch's Moralia, Volume Five* (pg. 25-27) (Introduction: Victor Hanson). Harvard University Press.
11. Hahn, Robert. (2012). "Prologue", in: *Anaximander in Context: New Studies in the Origins of Greek Philosophy* (pg. 73). SUNY.

Further reading

● Drummond, William. (1818-20). "On the Science of the Egyptians and Chaldeans", *The Classical Journal*; Part 4, 35:1-18; Part 5, 36:298-316; Part 6; 38:296-314; Part 8, 21:35-56.

External links

● Egypt – Wikipedia.

θΔics

In famous publications, **Egyptian Book of the Dead** (TR:21), or *Book of the Dead*, is an Egyptian story book telling the life and times of primarily the gods of the Heliopolis creation myth, e.g. Ra, Osiris, Horus, Isis, Set, etc., replete with 200 "chapters", depending on recension (see: recension theory), in which are found 125+ spells, e.g. Spell 125 is the original version of the Lord's Prayer, Spell 148 describes the original version of the virgin birth and the holy spirit, etc., guarantying that the possessor of the book will likely be granted access to the afterlife, if his or her "heart" is judged morally light in respect to the weight of the 42 negative confessions (forerunner to the ten commandments).

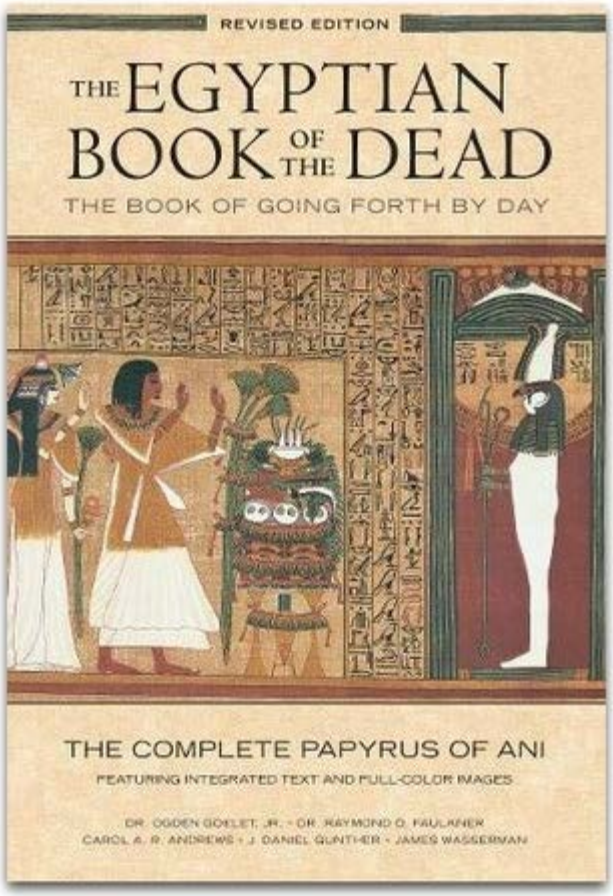

A 1972 printing of the ***Egyptian Book of the Dead***, by Raymond Faulkner, which is the immediate forerunner to the Bible and the Rig Vida. [3]

Overview

In c.2500BC, the pyramid texts were written, for the use of granting pharaohs access to the afterlife.

In c.2200-2000BC, the coffin texts began to be penned, in place of the older pyramid texts, made for rich scribes and other community leaders, which were costlier to make, consisting of about 1,200 spells. In 1957, a total of 787 coffin text spells, of the extant known mass of coffin texts, was published in a six-volume edition, edited by Adriaan de Buck. [4]

In c.1250BC, the Papyrus of Ani was made, for the scribe Ani, in the form of a 78-foot long by 1-foot 3-inches width scroll, which contains about 160 or so of the main or essential pyramid texts and coffin texts.

In 670BC, during the so-called “Saite recension” (see: recension theory), the book of the dead became canonized into a standard order format, all spells put into a standard order. [1]

Translations

In 1842, Richard Lepsius published the first “standard edition” attempt at an English rendering of the Egyptian *Book of the Dead*, one from the papyrus of a Ptolemaic official named Iuwefankh, during which time he divided this book into 165 chapters, assigning the numbers on the basis of the dividing lines and rubrics of that document. Additional chapters were added by Willem Pleyte, Edouard Naville, Wallis Budge, Thomas Allen, and others, raising the total number to 192 chapters, as of 2015. [3]

In 1888, the Papyrus of Ani was discovered by Wallis Budge at some antiquities dealership in Egypt, brought to the British Museum, and translated by him in 1895.

In 1972, Raymond Faulkner did a translation of the Ani-version of the *Book of the Dead*, which is considered by many to be the "finest to date". A modern read through of the Faulkner translation, however, leaves one with the impression that over 75 percent of the text and its meaning is NOT translated and or rendered correctly into English, as much of it is complete nonsense, as rendered by Faulkner. The following quote gives indication of this:

> “Much of the *Book of the Dead* is **frankly incomprehensible**, even for experts. No amount of exegesis can explain many passages. Images and allusions follow one another with bewildering force and frequency, **lacking thematic and logical connection**. The same can be said for much of the rest of Egyptian mortuary literature. Yet the endurance of the well-administered Egyptian state and its monumental undertakings are proof that the Egyptians were a fundamentally rational people. Their Greek contemporaries [Lycurgus, Orpheus, Solon, Thales, Pythagoras, Empedocles, Herodotus, Democritus, Plato, Eudoxus, Manetho] assure

us that the Egyptian's religion was deeply imbued with profound theological doctrines."

> — Ogden Goelet (1994), "Commentary on the Corpus of Literature and Tradition Which Constitutes the Egyptian Book of the Dead, the Book of Going Forth by Day" (pg. 163) [3]

In other words, the logic the Greeks derived from the Egyptian priests, as distilled in secular terms, and presented to us, e.g. by Aristotle, in English, is a solid and coherent system of logic, which does NOT match up with what Faulkner and others have attempted to render the hieroglyphics into? Even Roman accounts of Egyptian myths and religion, e.g. Herodotus account of the Phoenix or Cicero's account of the Isis and Osiris myth, don't match up fully or correctly with modern attempts at the Book of the Dead attempted translations?

Chapters | Spells

The following are notable or key chapters or spells to the *Book of the Dead*; the exact ordering of the "spell" or "chapter", to note, is a bit inexact, presently, as the spells or chapters don't exactly match up to which version of the Book of the Dead is cited::

#	Summary	Rescripts / Modern Version	Reference
	● Horus, born of mother Isis, is the avenger of god, who is his father. ● Thoth cured Horus' torn-out eye by spitting on it.		
Spell 17	"When Ra began to rule what he had made, when he began to appear as king, before the supporters of Shu had come into being, when he was upon the hill, which is in Hermopolis, when he destroyed the children of impotence [see: destruction of mankind] on the hill, which is in Hermopolis. I have seen this sun god [Ra] born yesterday from the buttocks of the celestial cow." — Anon Ani (c.1250BC), *Egyptian Book of the Dead* (§17)	● God the father; Jesus is god the son. ● Jesus cured the blind (Mark 8:23) and the deaf (Mark 7:32-3), by spitting in their eyes (Mark 8:23), and stuck his fingers in their ears, licking and spitting on his medical patients.	(Paulkovich, 2013)
Spell 19	Horus preaches a communion.		(Paulkovich, 2013)
Spell 42	Horus delivered himself from evil. Horus is the Prince of Eternity, Lord of mankind		(Paulkovich, 2013)
Spell 52-53	Describes the miracle of "seven loaves" supplied by the son of god.		(Paulkovich, 2013)
Chapter 54	Egg of Geb and resurrection (pg. 65)	Easter eggs	
Chapter 59	Egg of Geb and resurrection (pg. 66)	Easter eggs	
Spell 78	"All that liveth" are subject to Horus.		(Paulkovich, 2013)
Spell 92	Horus, born of mother Isis, is the avenger of god, who is his father. Promises to guide you to heaven.	God the father; Jesus is god the son.	(Paulkovich, 2013)
Chapter	Speaks about the "day of examining souls" at the		

92	"beginning of the reckoning of years" on the boat of Ra. (pg. 69)	Purgatory	
Spell 97	Horus purifying his soul with mikvah or baptism.		(Paulkovich, 2013)
Spell 112	Describes an an anti-pork diet.		(Paulkovich, 2013)
Spell 125		Lord's Prayer (Found (Q) in Matthew 6:9-13 and Luke 11:1-4 of the Bible).	
Spell 148		Virgin birth (Matthew 1:18-25 (Q); compare: Isaiah 7:14) description and the holy spirit.	
Spell 156	The blood of the mother of Horus is magical and holy.		(Paulkovich, 2013)

(add)

Quotes

The following are related quotes:

> "Hope for life after death is evidenced even in prehistoric times in Upper Egypt. The first written aids for attaining and supporting life in the hereafter were the Pyramid Texts inscribed within royal tombs toward the end of the Old Kingdom. In the Middle Kingdom, many texts were borrowed from the pyramid chambers and mingled with new spells; this new form, which today we call Coffin Texts, were usually written inside coffins. These eventually gave way to what we now know as the Book of the Dead. The collections of spells were usually written on [70+ foot] rolls of papyrus, that is, in the form of an **Egyptian book**."
>
> — Thomas Allen (1960), *The Egyptian Book of the Dead* [4]

> "Everything in the Bible is taken from the ***Book of the Dead***. Hellenistic, Roman religion, et al are copies of the Egyptian Book of Dead."
>
> — Calpurniso (2009), video (Q) at 4:42; an oft-classified (Q) extreme atheist (albeit abrasive)

> "Over 1,500-years before Christian times, an 'Egyptian Bible' was carved in stone and thousands of copies were hidden in scrolls, deep within mausoleums and pyramids. Judeo-Christian belief systems and Bible stories were clearly borrowed from Egyptians, whence came also, by no coincidence, the Hebrew alphabet. The exercise in proof that follows can be repeated by anybody able to read a valid translation of the Egyptian glyphs into his or her native tongue. Borrow from your library a translation of the Egyptian ***Book of the Dead***. I primarily cite interpretations by Peter Renouf (Q)(Q) (1904), Raymond Faulkner (Q) (1972), and Wallis Budge (1895). A direct and pellucid connection is evident: the tales and liturgies of the Tanakh —as well as those of the New Testament, were plagiarisms of mystical and supernatural conjecture, much borrowed from Egyptian belief. Fifteen centuries before Jesus, the Egyptians worshiped a saintly savior named Horus. The Egyptian missals present proofs of the origins of the Judeo-Christian mythologies, *res ipsa loquitur* [the thing speaks for itself]. The *Book of the Dead* consists of 'spells'. Consider these divine convictions: Born of mother Isis, Horus is the avenger of god, who is his father (Spells 17 and 92). "All that liveth" are subject to Horus (Spell 78). Horus delivered himself from evil (Spell 42), and Spell 92 promises

to guide you to heaven. In Spells 52 and 53 we learn a miracle of "seven loaves" supplied by the son of god. Horus was born of mother Isis (who transformed into Neith or Nephthys, Spell 17)—a virgin, like so many mothers of sun-gods: Attis, Buddha, Dionysus, Krishna, Perseus, Prometheus, Mithras, Hercules, and of course, Jesus. In Spell 112 we discover an anti-pork diet. As in the later Hebrew religion, pork was forbidden among ancient Egyptians. Horus is the Prince of Eternity, Lord of mankind (Spell 42). Spell 97 tells of Horus purifying his soul with mikvah or baptism. Horus preaches a communion (Spell 19), and the blood of his mother is magical and holy (Spell 156). Digging deeper into the Egyptian sands and spiritual beliefs, we find other suspicious connections. The Christian Bible claims Jesus cured the blind (Mark 8:23) and the deaf (Mark 7:32-3). How did Jesus cure them? Jesus spat in their eyes (Mark 8:23), and stuck his fingers in their ears, licking and spitting on his medical patients. Many centuries before Jesus, Egyptian god Thoth cured Horus' torn-out eye by spitting on it (Spell 17). From the Pyramid Texts we learn that Horus loves "those who love him." Centuries later Jesus expresses the same sentiment and "he that loveth me shall be loved of my Father, and I will love him" (John 14:21).”

— Michael Paulkovich (2013), *No Meek Messiah* (§: Egyptian Origins of Judeo-Christian Beliefs, pgs. 161-65)

“When Ogden Goelet and I first met to discuss the possibility of collaborating with each other in the mid-1980s, introduced by our colleague William Breeze, I was surprised to learn that the ***Egyptian Book of the Dead*** was considered ‘outside’ of the mainstream of then-modern Egyptian scholarship. However, as my friend, the Egyptian scholar Daniel Gunther, points out, true Egyptian scholarship is a comparatively young academic discipline. He makes clear that prior to the decipherment of the Rosetta Stone in the 1820s, absolutely everything that was posited about the meaning of these mysterious Egyptian texts was pure speculation.”

— James Wasserman (2014), “Thoughts on the Twentieth Anniversary Edition” [3]

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2. Paulkovich, Michael. (2013). *No Meek Messiah*: *Christianity’s Lies, Laws and Legacy* (§: Egyptian Origins of Judeo-Christian Beliefs, pgs. 161-65). Publisher.
3. Faulkner, Raymond. (1972). *The Egyptian Book of the Dead: the Book of Coming Forth by Day: Complete Papyrus of Ani, Featuring Integrated Text and Full-Color Images* (translator: Ogden Goelet; Preface: Carol Andrews; Introduction: Daniel Gunther; Foreword: James Wasserman) (Amz) (chapters, pg. 18; recensions, pg. 144). Chronicle Books, 2015.
4. Allen, Thomas. (1960). *The Egyptian Book of the Dead: Documents in the Oriental Institute Museum at the University of Chicago* (Q)(pdf). University of Chicago Press.

External links

- Book of the Dead – Wikipedia.

θΔics

In models, **Egyptian human**, or "Egyptian model of the human", refers to theory ancient Egyptians, in the dynastic eras, held about the component parts of a human, which numbered between around seven to ten parts, depending version described: Kaht (body), Ka (double or spirit), Ba (soul), Jb, ib, or Ab (heart), Khu (spirit or spiritual intelligence), Khaibt or Sheut (shadow), Akh (ghost or magical dead being), Ren or Rent (secret name), Sekhem (vital power), and Sah (mummy or astral body).

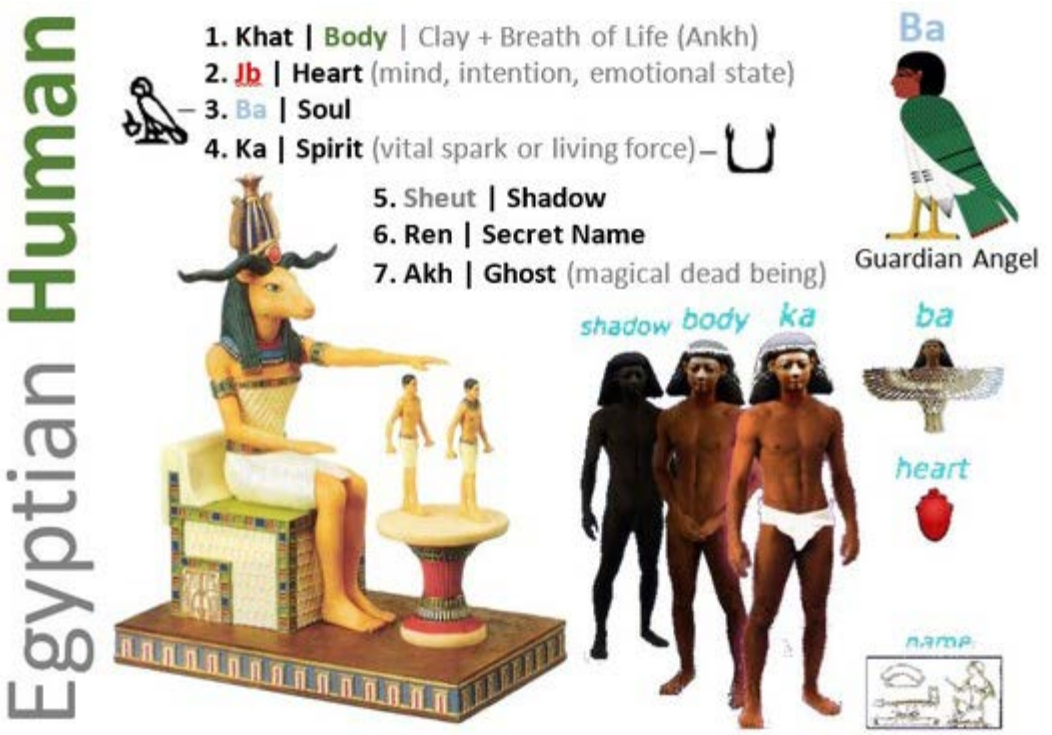

A visual of the slide of the seven-part "**Egyptian human**" model taught to the children of the 2015 Zerotheism for Kids class by Libb Thims.

Overview

In 1899, Wallis Budge, in his *Egyptian Religion*, summarized the eight-part Egyptian model of the human as follows:

"In the interval which elapsed between the period of the prehistoric burials and the IVth dynasty, the Egyptian formulated certain theories about the **component parts of his own body**, and we must consider these briefly before we can describe the form in which the dead were believed to rise.

1. The physical body of a man was called **Khat**, a word which indicates something in which decay is inherent; it was this which was buried in the tomb after mummification, and its preservation from destruction of every kind was the object of all amulets, magical ceremonies, prayers, and formulae, from the earliest to the latest times. The god Osiris even possessed such a body, and its various members were preserved as relics in several shrines in Egypt.

2. Attached to the body in some remarkable way was the **Ka**, or "double," of a man; it may be defined as an abstract individuality or personality which was endowed with all his characteristic attributes, and it possessed an absolutely independent existence. It was free to move from place to place upon earth at will, and it could enter heaven and hold converse with the gods. The offerings made in the tombs at all periods were intended for the nourishment of the Ka, and it was supposed to be able to eat and drink and to enjoy the odour of incense. In the earliest times a certain portion of the tomb was set apart for the use of the Ka, and the religious organization of the period ordered that a class of priests should perform ceremonies and recite prayers at stated seasons for the benefit of the Ka in the Ka chapel; these men were known as "ka priests." In the period when the pyramids were built it was firmly believed that the deceased, in some form, was able to be purified, and to sit down and to eat bread with it "unceasingly and for ever;" and the Ka who was not supplied with a sufficiency of food in the shape of offerings of bread, cakes, flowers, fruit, wine, ale, and the like, was in serious danger of starvation.

3. The soul was called **Ba**, and the ideas which the Egyptians held concerning it are somewhat difficult to reconcile; the meaning of the word seems to be something like "sublime," "noble," "mighty." The Ba dwelt in the Ka, and seems to have had the power of becoming corporeal or incorporeal at will; it had both substance and form, and is frequently depicted on the papyri and monuments as a human-headed hawk ; in nature and substance it is stated to be ethereal. It had the power to leave the tomb, and to pass up into

heaven where it was believed to enjoy an eternal existence in a state of glory; it could, however, and did, revisit the body in the tomb, and from certain texts it seems that it could re-animate it and hold converse with it.

4. Like the heart **Ab** it was, in some respects, the seat of life in man. The souls of the blessed dead dwelt in heaven with the gods, and they partook of all the celestial enjoyments for ever.

5. The spiritual intelligence, or spirit, of a man was called **Khu**, and it seems to have taken form as a shining, luminous, intangible shape of the body; the thus formed a class of celestial beings who lived with the gods, but their functions are not clear. The Khu, like the Ka, could be imprisoned in the tomb, and to obviate this catastrophe special formulae were composed and duly recited.

6. Besides the Khu another very important part of a man's entity went into heaven, namely, his **Sekhem**. The word literally means "to have the mastery over something," and, as used in the early texts, that which enables one to have the mastery over something, *i.e.*, "power." The Sekhem of a man was, apparently, his vital force or strength personified, and the Egyptians believed that it could and did, under certain conditions, follow him that possessed it upon earth into heaven.

7. Another part of a man was the **Khaibit** or "shadow," which is frequently mentioned in connexion with the soul and, in late times, was always thought to be near it;

8. Finally we may mention the **rent**, or "name" of a man, as one of his most important constituent parts. The Egyptians, in common with all Eastern nations, attached the greatest importance to the preservation of the name, and any person who effected the blotting out of a man's name was thought to have destroyed him also. Like the Ka it was a portion of a man's most special identity, and it is easy to see why so much importance grew to be attached to it; a nameless being could not be introduced to the gods, and as no created thing exists without a name the man who had no name was in a worse position before the divine powers than the feeblest inanimate object. To perpetuate the name of a father was a good son's duty, and to keep the tombs of the dead in good repair so that all might read the names of those who were buried in them was a most meritorious act. On the other hand, if the deceased knew the names of divine beings, whether friends or foes, and could pronounce them, he at once obtained power over them, and was able to make them perform his will.

We have seen that the entity of a man consisted of body, double, soul, heart, spiritual intelligence or spirit, power, shadow, and name. These eight parts may be reduced to three [body, soul, spirit] by leaving out of consideration the double, heart, power, shadow and name as representing beliefs which were produced by the Egyptian as he was slowly ascending the scale of civilization, and as being the peculiar product of his race; we may then say that a man consisted of body, soul, and spirit. But did all three rise, and live in the world beyond the grave? The Egyptian texts answer this question definitely; the soul and the spirit of the righteous passed from the body and lived with the beatified and the gods in heaven; but the physical body did not rise again, and it was believed never to leave the tomb. There were ignorant people in Egypt who, no doubt, believed in the resurrection of the corruptible body, and who imagined that the new life would be, after all, something very much like a continuation of that which they were living in this world; but the Egyptian who followed the teaching of his sacred writings knew that such beliefs were not consistent with the views of their priests and of educated people in general.

In 1904, Budge, in his *Gods of the Egyptians, Volume One*, elaborated on this “Egyptian model” of the human in more detail. [2]

In 1904, Budge, in his *Gods of the Egyptians, Volume Two*, described the nine components of man, in sum, as the Egyptians saw things, as follows: [6]

Men and gods were supposed to contain the same component parts. Man possessed:—1. A physical body (, *khat*). 2. A soul (, or , *ba*). 3. A heart (, *ab*). 4. A double (, *ka*). 5. An intelligence (, *khu*). 6. Power (, *sekhem*). 7. A shadow (, *khaibit*). 8. A spiritual body (, *sāḥ*). 9. A name (, *ren*); and the gods possessed divine counterparts of all these.

In 2015, Julien Musolino, citing Andre Dollinger (2003), summarizes that what modern people conceptualize as soul was for Egyptians divided into five parts: [7]

> "For the Egyptians, the soul was composed of five parts: the **ib** (or heart), the **ba** (personality), the **ka** (vital essence), the **sheut** (shadow), and the **ren** (secret name)."

(add)

Greek | Human

In c.850 to 350BC, Greek thinkers, such as Lycurgus, Orpheus, Solon, Thales, Pythagoras, Empedocles, Herodotus, Democritus, Plato, and Eudoxus, all travelled to Egypt to study, and therein learned the Egyptian model of the human and its components.

In c.530BC, Pherecydes, according to Cicero, as discussed in his *Tusculam Dispulat* (c.55BC), or another part of his works, as cited by Baron d'Holbach (1770), no doubt via absorption of Egyptian soul theory, is said to have "invented" the doctrine of the soul and or the model of the immortality of the soul. [11]

Roman-Christian | Human

In 100 to 800AD, during the Roman recension, the Greco-Egyptian model of the human was reduced or transformed into the Greco-Roman Christian model of the human and its soul and spirit, aka the Plato-Augustine-Descartes model of the soul.

Christian | Human

In Christianity, the Egyptian human models has morphed into the modern belief systems, in American in particular, in a sublimated peculiar way that children, such as those that attended the Zerotheism for Kids (2015) class, came to the class with belief in soul (see: geniuses on the soul), life, and guardian angels, to cited three examples; not to mention the predominate near-global belief in spirit or spirituality.

Philosopher Stephen Asma, in "Soul Talk" (2010) article, gives a fairly

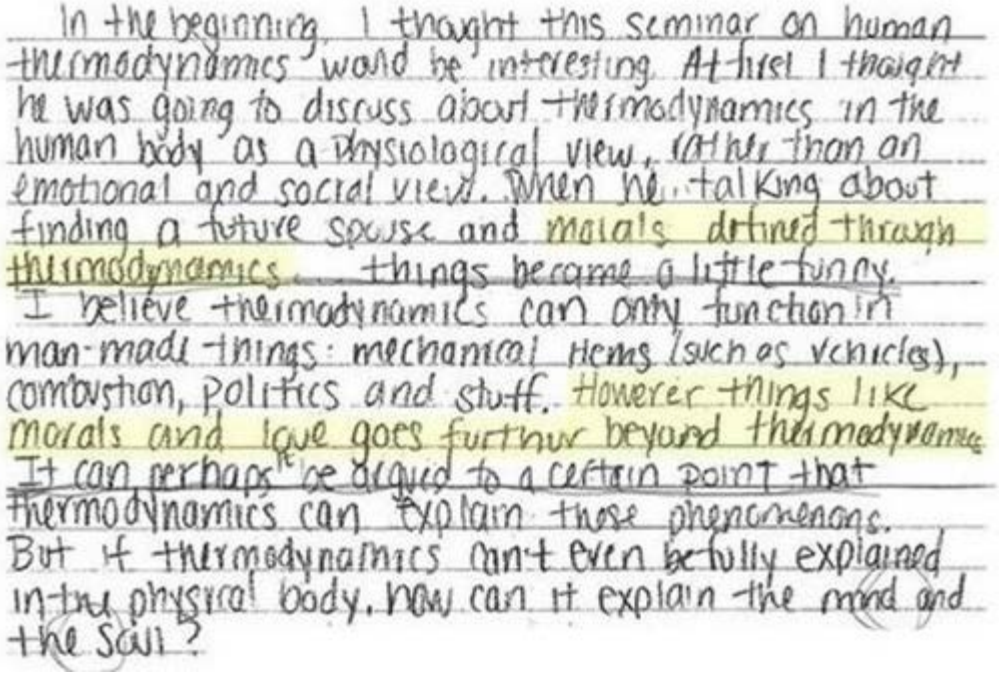

In the beginning, I thought this seminar on human thermodynamics would be interesting. At first I thought he was going to discuss about thermodynamics in the human body as a physiological view, rather than an emotional and social view. When he talking about finding a future spouse and morals defined through thermodynamics... things became a little funny. I believe thermodynamics can only function in man-made things: mechanical items (such as vehicles), combustion, politics and stuff. However things like morals and love goes further beyond thermodynamics. It can perhaps be argued to a certain point that thermodynamics can explain those phenomenons. But if thermodynamics can't even be fully explained in the physical body, how can it explain the mind and the soul?

An hand-written objection, by a UIC bioengineering thermodynamics student, to the premise, outlined in lecture by Libb Thims (2010), of chemical thermodynamics being applied to the explanation of the human social interactions, per reason that mind and "soul", the modern variant of the **Egyptian human** Ba, are outside of the domain of thermodynamics, or something to this effect. [5]

cogent synopsis of the state of the underground belief in some type of soul theory: [3]

> "No self-respecting professor of philosophy wants to discuss the **soul** in class. It reeks of old-time theology, or, worse, new age quantum treacle. The soul has been a dead end in philosophy ever since the positivists unmasked its empty referential center. Scientific philosophy has shown us that there's no there there. But make no mistake, our students are very interested in the soul. In fact, that is the main reason many of us won't raise the soul issue in our classes: The bizarre, speculative, spooky metaphysics that pours out of students, once the box has been opened, is truly chaotic and depressing. The class is a tinderbox of weird pet theories—divine vapors, god particles, reincarnation, astral projections, auras, ghosts—and mere mention of the soul is like a spark that sets off dozens of combustions. Trying to put out all these fires with calm, cool rationality is exhausting and unsuccessful."

In hmolscience, some of these "soul belief" ideologies (see: soul theory), likewise, are seen bubbling to the surface whenever either people are defined, from the atomic theory point of view, as a molecule (see: human molecule), such as detailed by Bruce Bathurst in his 2009 "why I'm not a molecule". [4] Likewise, objection is seen whenever chemical thermodynamics is applied to human movements and social dynamics (see: human chemical thermodynamics), such as expressed by some students to Libb Thims' 2010 UIC bioengineering thermodynamics lecture (see: Thims lectures), and example of which is shown above. [5]

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1. Budge. Wallis. (1899). *Egyptian Religion: Egyptian Ideas of a Future Life* (pgs. 163-67) (Ñº). Publisher.
2. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (pg. #). Dover, 1969.
3. Asma, Stephen. (2010). "Soul Talk", *The Chronicle Review*, May 2.
4. Bathurst, Bruce. (2009). "Why I'm Not a Molecule", Hmolpedia threads, Aug 24.
5. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs) (pg. 68). Publisher.
6. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pgs. 299-300). Dover, 1969.
7. (a) Dollinger, Andre. (2003). "Body and Soul" (Ñº), An Introduction to the History and Culture of Pharaonic Egypt", Sep.
(b) Musolino, Julien. (2015). *The Soul Fallacy: What Science Shows We Gain from Letting Go of Our Soul Beliefs* (foreword: Victor Stenger) (pg. 21). Prometheus.
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translator: H.D. Robinson) (pg. 118). J.P. Mendum, 1889.

θΔics

In mythology, **Egyptian mythology** is []

Overview

The basic Egyptian mythology genealogy diagram, from the draft chapter "Noah", for a new book *Smart Atheism: For Kids*, by Libb Thims, is shown adjacent, which shows how Egyptian mythology (3100BC) spawned: Hindu mythology (1300BC), Jewish mythology (500BC), Christian mythology (200AD), and Islamic mythology (800AD). [1]

The number 42, shown as the number of generations between Abraham and Jesus, according to Matthew's genealogy (Q), as mentioned five times (Q) in the Bible, is representative of the number of state gods, one for each nome (state), or territory, of 1st Dynasty Egypt, aka oversight gods, that presided over, along with the supreme god Ra, according to Anunian theology, the weighing of the soul in the Judgment Hall, judged by Osiris, whose son Horus functioned as the one who lead the dead person into the Judgment Hall to be judged, on the summation of their wrong doings, as determined by 42 Negative Confessions, each confession comprising one part of the weight of the soul.

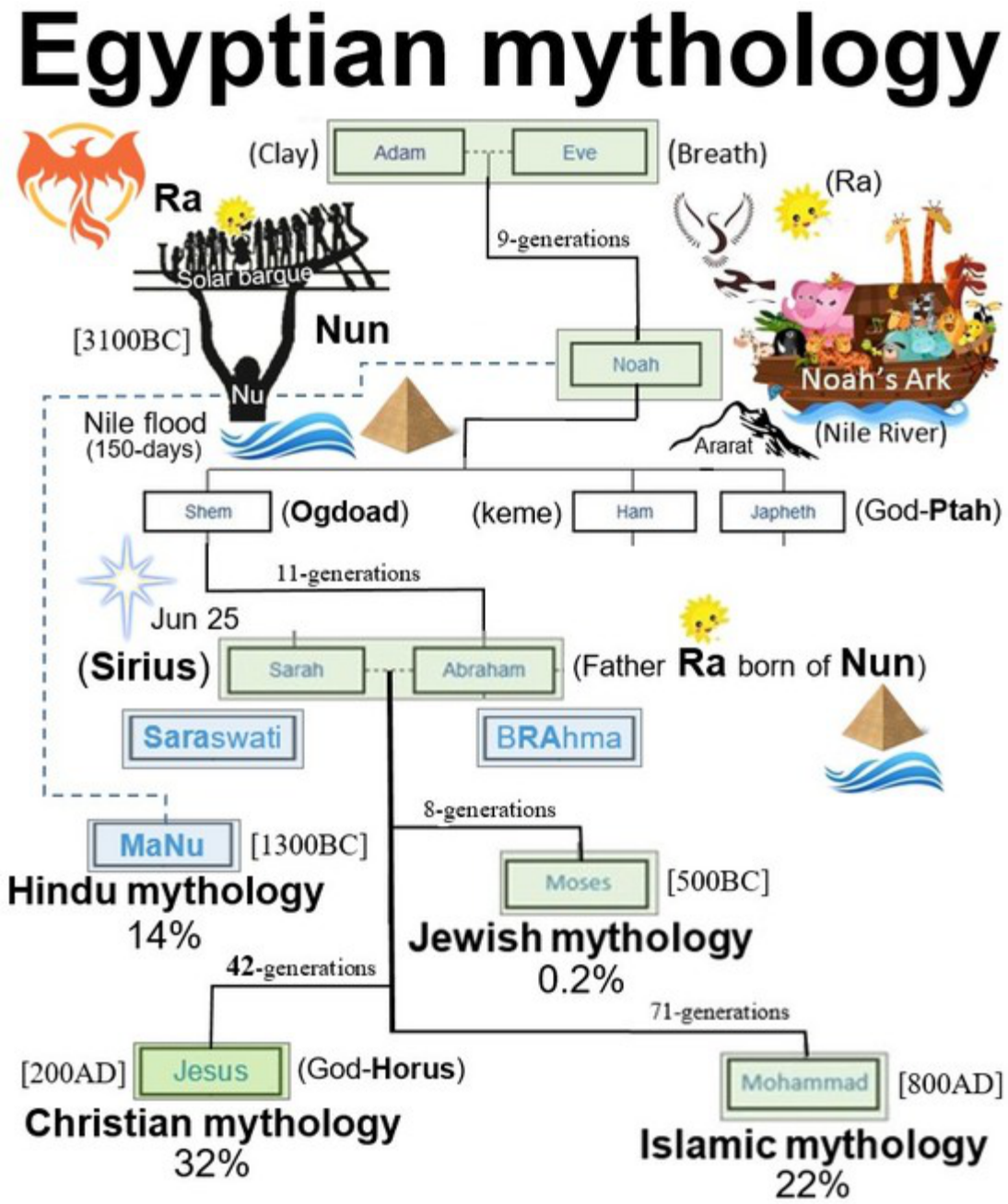

A basic diagram showing how **Egyptian mythology**, aka Anunian theology, over the course of 5,000-years, spawned one new polytheistic mythology, namely: Hindu mythology (1300BC), and three new monotheistic mythologies: Jewish mythology (500BC), Christian mythology (200AD), and Islamic mythology (800AD). [1]

Hence, in the Christian rewrite, Ra, Osiris, and 42 oversight gods, became monotheistically recast as a man named Abraham who is the ancestor, by 42 generations, to Jesus.

The number 42 famously became the number used by Douglas Adams, albeit arisen, as he claims (Q), out of free-thought memory, in his *Hitchhiker's Guide to the Galaxy* (1978), as the number his fictional supercomputer Deep Thought supplies to the query "What is the answer to life, the universe, and everything?"

References

1. (a) Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf). Publisher.
(b) Jabari, Angela. (2016). *Why I'm an Atheist*. Publisher.

Further reading

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Further reading

● Anon. (2018). "Egyptian Mythology: Osiris Myth Animated" (Q), Captivating History, YouTube, Jun 14.

External links

● Egyptian mythology – Wikipedia.

θΔics

In pantheons, **Egyptian pantheon** refers to the spectrum of gods, local gods, state gods, god groups (pauts), and supreme gods, categorized in an ordered scheme, prevalent in Egyptian mythology, generally grouped per recension.

Overview

The following shows the main outline of the Egyptian pantheon, in respect to its main gods, supreme gods, local gods, and god groups, dated according to the main pantheonic adjustments or recensions, in the years 3100BC to 1950BC, as religious cultural power shifted from **Heliopolis** (Heliopolis creation myth, 3100BC) to **Memphis** (Memphis creation myth, 2800BC), to **Hermopolis** (Hermopolis creation myth, 2150BC), to **Thebes** (Thebian creation myth, 1950BC):

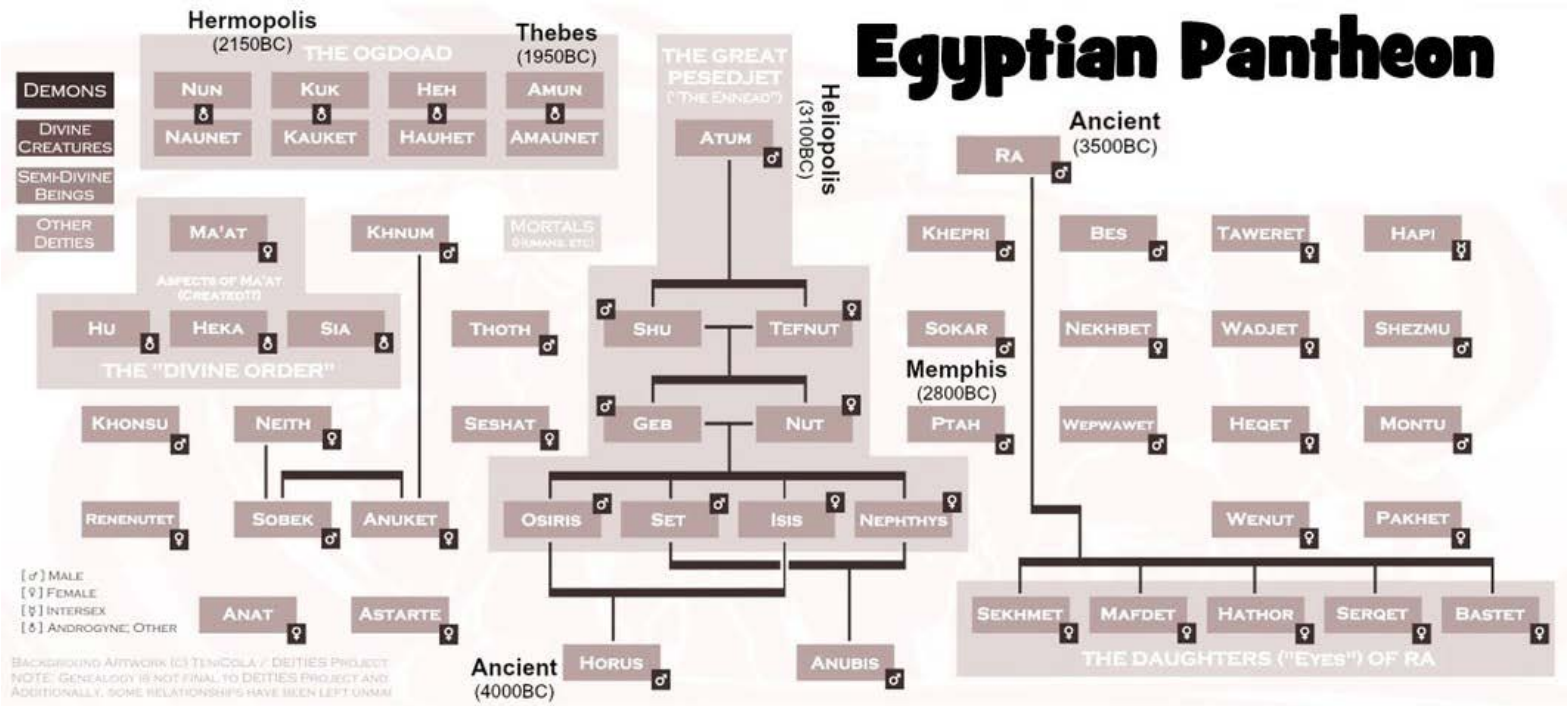

An alternative Egyptian pantheon, by UsefulCharts.com, shows the c.2500 Heliopolis version of the Ennead, when Ra was joined with Atum, as follows: [4]

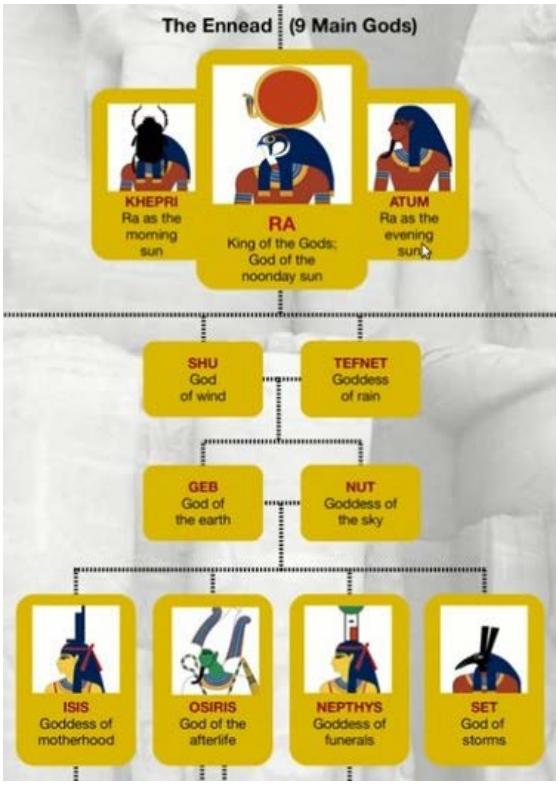

Showing the then-conceived three forms of the sun god, namely: morning sun (Ra-Khepri), noon sun (Ra), and evening sun (Atum), all three of which latter being syncretized into the form of Ra-Atum or Atum-Ra.

Greek pantheon

See main: Greek pantheon

In c.700BC, Hesiod, as described in his *Theogony*, followed by Solon (c.590BC), and others, e.g. Lycurgus (c.840BC), Homer (c.800BC), Orpheus (c.680BC) (Q), and Pherecydes (c.430BC), after studying in Egypt, in Heliopolis and Memphis, formalized their own state religion pantheon (See: Greek mythology) based, in outline, on the above Egyptian pantheon, then prevalent (see: **histomap**), with modifications and reductions; the gist of which, as outlined below [2], being that Ogdoad (see: Hermopolis creation myth, 2150BC) became "chaos", which gave birth to Gaea (or Geb) and Uranus (or Nut), from the Ennead; Amen-Ra became Zeus, the new supreme god; the model of there being two competing pauts or god groups, namely the Ogdoad and the Ennead, mixed with the eternal god camp battle, of good and evil (or light and darkness) between Horus and Set (or Ra and Apep, depending), became the model for the battle between the Titans and the Olympians; Osiris became Dionysus; Isis became Demeter; Nephthys became Persephone; Horus became Apollo; Shu became Atlas; Khnum became Prometheus; Thoth became Cronus and or Hermes, depending; Hathor became Aphrodite [3]; Neith (Q) became Athena [3]; Ptah became Hephaestus; Set became Typhon; among others (see: god character rescripts), and the gods took human forms (as opposed to human-animal forms, in the Egyptian scheme):

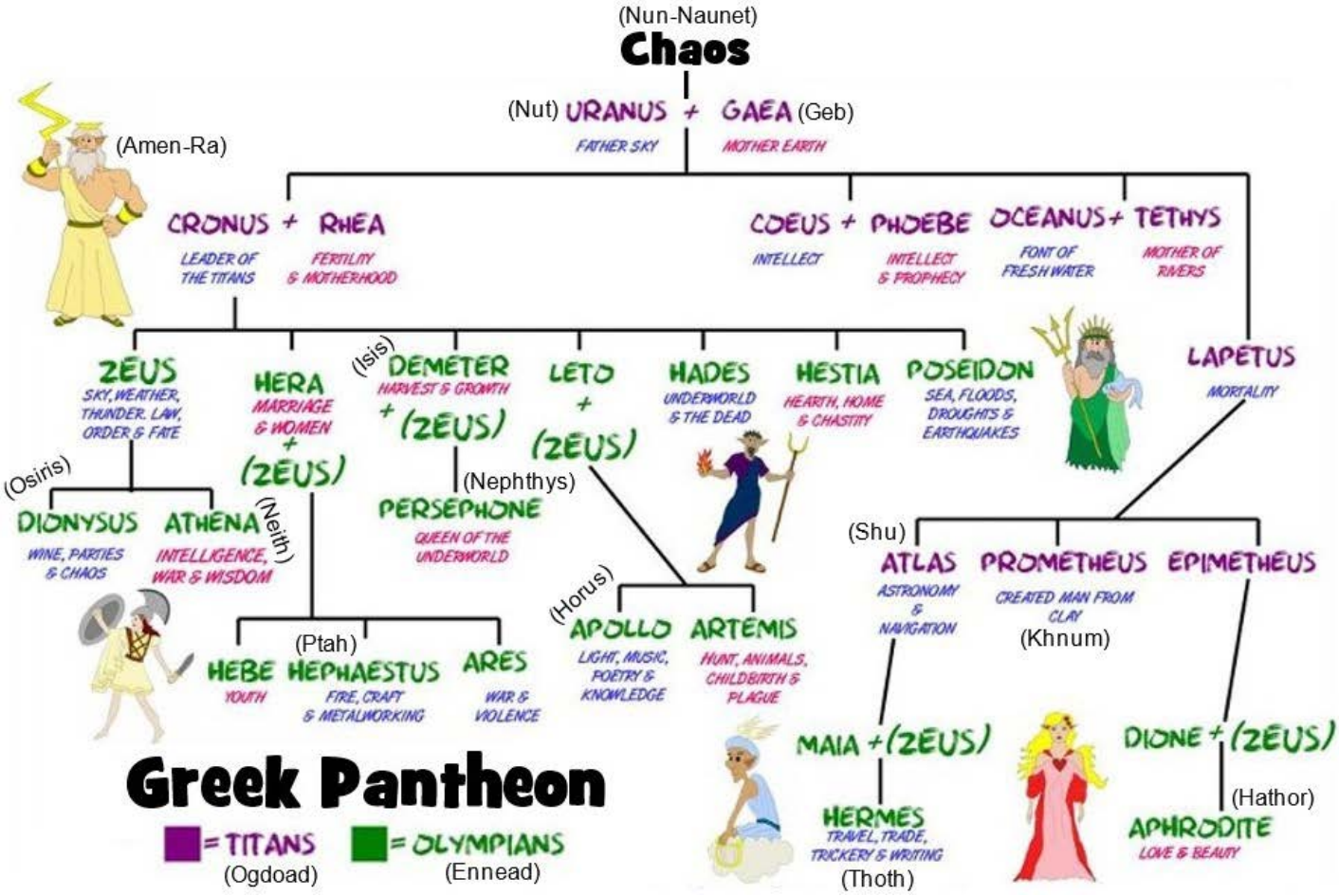

In 330BC, Empedocles, aged 12 or 14, depending, studied Hesiod's *Cosmogony* at school, and finding that everything was explained to arise from chaos, he cried out and asked: 'Whence, then, came chaos?' His teacher, likely being ignorant of the fact that Hesiod's model of chaos, was culled from the Nun and Naunet god pair, of the Hermopolis Ogdoad, however, had "no reply that would content him" (Lange, 1975), after which he began to develop his own philosophy (see: Epicureanism); thereafter coming in contact with atomic theory of Democritus, which expanded into the form of 300 scrolls, which eventually found there way into the hands of Lucretius, who transformed this logic into the now famous publication *On the Nature of Things*, which later, following the dark ages, seeded the enlightenment.

Judeo-Christian pantheon

See main: Judeo-Christian pantheon

In c.150AD, early Christian theologians, known as Matthew and Luke, in the Roman province, and or "Roman theologians" (see: Roman recension), building on the earlier c.300BC Judaic recension (see: Jewish mythology) of Egyptian mythology, elaborated on the Abrahamic lineage (see: religio-mythology genealogy), namely in continuation of the Judaic god reduction practice of "turning Egyptian gods into prophets", e.g. Atum became Adam; Nun became Noah; Ra became Abraham; Osiris (or Osiris-Dionysus), a new afterlife based monotheism was proposed, wherein: Joseph became Geb; Isis became Mary; the syncretistic god Horus-Osiris (or Osiris-Horus) became of "god the son" or divinely born man (or god-man), retrospectively named Jesus Christ; Osiris became Lazarus, among others; the gist of of which diagrammed (Q) as follows:

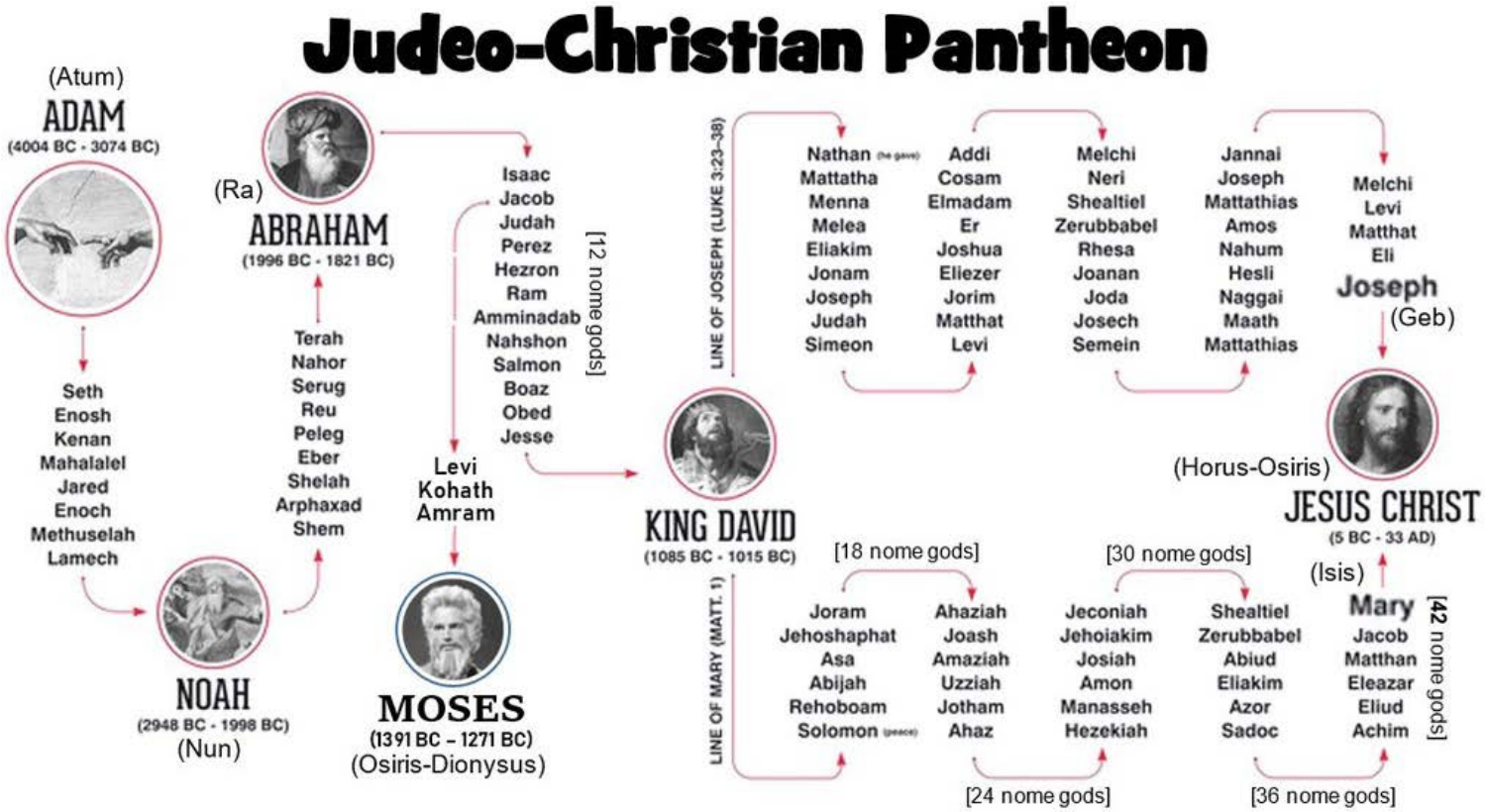

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Quotes

The following are related quotes:

> "The Greeks got the names of all their Olympian gods from the Egyptians except Poseidon and Hera."
>
> — Herodotus (450BC), *History* (book 2) (Q)

> "The initiatory rites of Demeter in Eleusis were transferred from Egypt (1.29.2). The rite of Osiris is the same as that of Dionysus and that of Isis very similar to that of Demeter; **the names alone having been interchanged**, and the punishments in Hades of the unrighteous, the Fields of the Righteous and the fantastic conceptions, current among the many - all these were introduced by Orpheus in imitation of the Egyptian funeral customs. (1.96.4-5). Isis, after having invented the practice of medicine, taught this art to her son Orus [Horus], named also Apollo, who was the last of the gods that reigned in Egypt."
>
> — Diodorus (40BC), *Historical Library*

> "The trumpets they conceal in Bacchic wands (see: thyrsus), as Socrates has stated in his treatise on *The Holy Ones*. Furthermore, the tales regarding the Titans and the rites celebrated by night agree with the accounts of the dismemberment of Osiris and his revivification and regenesis."
>
> — Plutarch (100AD), *On Isis and Osiris* (§35)

> "Herodotus upon this occasion says, that the whole romance of the soul and its transmigrations was **invented by** the Egyptians, and **propagated in Greece by men, who pretended to be its authors**. I know their names, adds he, but shall not mention them (lib. 2). Cicero, however, has positively informed us, that it was Pherecydes, master of Pythagoras. Tuscul. lib. 1, sect. 16. Now admitting that this system was at that period a novelty, it accounts for Solomon's treating it as a fable, who lived 130 years before Pherecydes."
>
> — Constantin Volney (1791), *The Ruins* (Q)

See also

- God reduction
- Mangnall's Abstract of Heathen Mythology
- Recension theory
- Supreme god timeline

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θΔics

In religion, **Egyptian religion** refers to the binding belief system, generally centered on belief in a variety of "supreme gods" (see: supreme god timeline) and "lesser gods" (see: Egyptian pantheon), a "bible" (see: Egyptian Book of the Dead), belief in an afterlife, a weighing of the soul (see: soul weight), a judgment hall, sins in the form of 42 negative confessions, an end of the year holiday season (see: khoiak festival), among other points (see: Egyptian human), as practiced in ancient Egypt, in the pre-dynastic period (3,500 to 3,100BC), to the dynastic period (3100 to 300BC), prior to the fall of Egypt as an empire (see: histomap), and its new rule first by the Greeks, the the Romans, then the Muslims.

Quotes

The following are related quotes:

> "The Egyptians lived in a world of allusions."
>
> — Helmut Brunner (c.1987), *Publication* [1]

References

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External links

â— Ancient Egyptian religion – Wikipedia.

θΔics

In religio-mythology, **Egyptian-to-Christian transliteration**, as compared to Christian to Egyptian transliteration, refers to []

Overview

In 1907, Gerald Massey, in his *The Natural Genesis*, devoted an appendix section, the first page of which is shown adjacent, to the first attempt an Egyptian to Christian transliteration of concepts and characters. [1]

Egyptian.		*Christian.*
The Mysteries	=	The miracles.
The Sem, or mythical representations	=	The parables.
The Ritual as the book of resurrection	=	The Book of Revelation.
The sayings of Iu or Iu-em-hetep	=	The sayings of Jesus.
Huhi the father in heaven as the eternal, a title of Atum-Ra	=	Ihuh, the father in heaven as the eternal.
Ra, the holy spirit	=	God the Holy Ghost.
Ra the father of Iu the Su, or son of God, with the hawk or dove as the bird of the holy spirit	=	God, the Father of Jesus, with the dove as the bird of the Holy Spirit.
Iu or Horus, the manifesting son of God	=	Jesus the manifesting Son of God.
The trinity of Atum (or Osiris) the father, Horus (or Iu) the son, and Ra the holy spirit	=	The Trinity of the Father, Son and Holy Spirit.
Iu-Su or Iusa, the coming son of Iusâas, who was great with Iusa or Iusu	=	Jesus.
The ever-coming Messu or Child as Egyptian	=	The Hebrew Messianic Child.
Horus (or Heru), the Lord by name, as a child	=	Child-Jesus as the Lord by name (Gospels of the Infancy).
Isis, the virgin mother of Iu, her Su or son	=	Mary the virgin mother of Jesus.

The first section of Gerald Massey's 1907 "**Egyptian to Christian**" appendix section. [1]

- The Mysteries = The miracles.
- The Sem, or mythical representations = The parables.
- The Ritual as the book of resurrection = The Book of Revelation.
- The sayings of Iu or Iu-em-hetep = The sayings of Jesus
- Huhi the father in heaven as the eternal, a title of Atum-Ra = Ihuh, the father in heaven as the eternal.
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- Ra the father of Iu the Su, or son of God, with the hawk or dove as the bird of the holy spirit = God, the Father of Jesus, with the dove as the bird of the Holy Spirit.
- Iu or Horus, the manifesting son of god = Jesus the manifesting Son of God.
- The trinity of Atum (or Osiris) the father, Horus (or Iu) the son, and Ra the holy spirit
- Iu-Su or Iusa, the coming son of Iusaaas, who was the grat with Isua or Iusu = Jesus
- The ever-coming Messu or Child as Egyptian = The Hebrew Messianic Child.
- Horus (or Heru), the Lord by name, as child = Child-Jesus as the Lord by name (Gospels of the Infancy)
- Isis, the virgin mother of Iu, her Su or sun = Mary the virgin mother of Jesus
- The first Horus as Child of the Virgin, the second as son of Ra, the father = Jesus as the Virgin's child, the Christ as the son of the father
- The first Horus as the founder, second as fulfiller for the father = Jesus as the founder, and the Christ as fulfiller for the father
- The two mothers of Child-Horus, Isis and Nephthys, who were two sisters = The two mothers of Child-Jesus, who were sisters
- Meri or Nut. the mother-heaven = Mary, as Regina Caeli

Some of these, more of which are listed in Massey's appendix, as we see are pretty crude, but nevertheless a decent first draft.

In 2010, Libb Thims, in dependent of Massey, for the mos part, was listing, in posts (Q), Egyptian to Christian transliteration as follows:

Flood (120 annual Nile flood) → 120 days of the Biblical flood
Nun (mound that arose out of the flood) → Noah
Ra (sun or god that burst forth out of the mound) → Abraham (Father - Ra - son on Nun)
Bennu bird (that carried Ra on its head) → Doves (the 3 birds that Noah released from the Ark to see if land has arose from the flood)
Osiris (great grandson of Ra) → God
Horus (sun of Osiris) → Jesus

Isis (Stella Maris) → Mary
Breath of Atum → Holy Spirit
Set → Devil
"Passion of Osiris" → "Passion of Christ"
42 Negative confessions → 10 Commandments
14 pieces of Osiris → 14 tribes of Israel
Akhenaten (or his priest) + Horus-the-child → Moses
Ba → Soul (of a person)
Ka → Spirit (of a person)

The "breath of Atum" equals "holy spirit" assertion made here, to note, seems to be incorrect, per gained view that if it is the "Holy Spirit" that impregnates the "Virgin Mary" than this is a god reduction morph of an aspect of the black rite resurrection sex creation of Horus enactment.

Christian-to-Egyptian transliteration

The following is an up-to-date Christian-to-Egyptian transliteration and transcription of the main characters of Christianity in their original form, ordered chronologically as they appear in the Bible:

Christianity	**Greek mythology**	**Hinduism**	**Islam**	**Egyptian Mythology**	**Physical Model**	**Scholar**
Adam	Prometheus (heat)		Adam		Clay	
Eve	Pandora (box)				Spirit / Breath	
Noah		MaNu	Nuh	God Nun	Nile River	
Abraham		Brahma	Ibrahim	God Ra	Sun	Charles King (1864) Karl Anderson (1892) Libb Thims (2003)
Sarah		Saraswati	Sara	Goddess Isis	Sirius	
Joseph | Jo-Seph				God Geb (Seb)	Earth	
Joshua | Jo-Shua				God Shu	Air	Libb Thims (2016) (Q)
Mary				Isis	Sirius	
Lazarus | The Osiris				Osiris	Orion	John Morris (1880) (Q) Gerald Massey (1883) Albert Parsons (1893) (Q)
Jesus | Je-Sus	Dionysus | Bacchus	Kirshna | Buddha		God Osiris-Horus		William Cooper (1877) [2] Gerald Massey (1907)
Christ				krst ("mummy")		Gerald Massey (1883)
Jesus Christ				Osiris the Mummy	Wheat / Sun / Dung Beetle	

John the Baptist	Anup the Baptist aka Anubis (Q)(Q)	Gerald Massey (1883) (Q)
Devil (Satan)	Set	
Mary Magdalene	Nephthys	

(add discussion)

Egyptian-to-Christian transliteration

The following is the Egyptian-to-Christian transliteration and transcription:

- Nun → Noah
- Ra → Abraham
- Osiris (the child) → Moses (the child)
- Osiris → God
- Breath of life (Ankh) → Holy Spirit

- Isis (or Stella Maris or "star of the sea") → Mary
- Nephthys (Isis' or Stella Maris' sister) → Mary Magdalene
- Horus → Jesus
- Set (Horus' evil brother; depicted with a red face and horns) → Devil
- Heliopolis Ennead (creation myth) → 5 Books of Moses (7 days of creation story)
- Ba → Soul
- Ka → Spirit

- Life (human origin of life) → Creation by breath / Creation by clay
- Lesser gods and goddesses → Angels and demons
- Bird wings → Angel wings
- Sun disc→ Halo
- Ankh (symbol of the breath of life) → Cross
- Judgment hall → door way to heaven

- Ammit standing over lake of fire → gateway to hell
- Holy Lake (underlying each temple) → John the Baptist (and baptism)
- 120 days of the annual Nile flood → 120 days of Noah's flood.
- Benu bird (which burst forth out of the primordial land mound that arose following the flood, which carried the sun on its head) → Noah's 3 doves (sent out at 40-day intervals to check for dry land; the third of which, sent out on day 120, didn't return, a sign that land had arose).
- Release of the soul ritual → Abraham killing Isaac parable
- Osiris the child (released onto the Nile) → Moses the child (released onto the Nile)
- Creation by incest genealogy (from Nun) → Thrice sister-wife parable of Abraham and Sarai
- 42 Negative confessions (modeled on the 42 predynastic nodes or kingdoms) → 10 commandments (truncated confessions)
- 42 gods of the Judgment Hall → 42 generations between God and Jesus
- Passion of Osiris → Passion of Christ
- Ripping apart of Osiris by his evil brother Set (break up of stars of Orion) → Crucifixion of Jesus
- 12 pieces of Osiris, scattered about the land, and the temple that grew in each spot → 12 tribes of Israel

● Pieces of Osiris collected back together by Isis and mummified → wrapping in linen of Jesus' body (Mathew 27:59)
● Rubbing of Osiris' dead phallus with oil → anointing of Jesus' body (Mathew 26:6-12)
● Burial of Osiris in a great primeval mound or pyramid → laying of Jesus in his own "rock hewn tomb", sealed with a great stone door (Mathew 27:60)
● 3 days of death of Osiris (modeled on the Dec 22-24 apparent stillness of the sun, before it's rebirth to longer days on December 25) → 3 days of death of Jesus
● 2 goddesses mounting the Osiris (Stella Maris and her Nephthys) to have resurrection sex → 2 Marys "sitting over" the sepulcher (Mathew 27:61)
● 3 wise men bringing gifts to the birth of Horus → 3 wise men bringing gifts to the birth of Jesus
● Acceptance of Horus the Savior → Acceptance of Jesus Christ as you Savior → Mary and Mary Magdalene mounting the sepulcher (Mathew 27:61)
● Khnum creating humans from clay (creation from clay) → Adam (Hebrew for "clay") and Eve
● Weighing of the soul (soul weight) → modern human morality system
● Ra having sex with the pharaoh's wife (from inscriptions the temple of Hatshepsut, the daughter of Thutmose I: "Ra gathered the lesser gods around his throne, and told them: 'I will create a queen to rule over Egypt'. Then accompanied by the messenger god Thoth, he went to the palace of King Thutmose I and taking the appearance of the pharaoh, appeared a the bed of his wife, Ahmose, who 'naturally rejoiced at his virility' and as 'the palace became inundated with the *sent of God*', he had his way with her.") → the Holy Spirit getting the Virgin Mary pregnant.

(add discussion)

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θΔics

In thermodynamics, **eigenenergie** is a term used significantly by German physicist Georg Helm in his 1887 *The Doctrine of Energy*, which directly translates as self-energy or intrinsic energy or the energy of the body, but in a modern thermodynamical sense seems to mean 'internal energy' in the original Clausius formulation. [1] Clausius, however, does never employs the term 'eigenenergie', but defines U as the energie des systems ('energy of the system').

Etymology

The prefix eigen- is said to be adopted from the German word "eigen" for "innate" or "own".

German thermodynamics historian Ingo Muller reasons that Helm used the term 'eigenenergie' in the same Clausius sense as 'internal energy'. [2]

As to the 1880s origin of the term, American German studies professor Karl Fink reasons that the source of "Eigenenergie" is most likely in the Latin-Greek "energia" (ultimately from Latin energia or Ancient á¼ νÎργεια (enérgeia)) picked up by Johann Herder in his term "Volkgeist' to unite mind-body-spirit in his theory of culture, which German physician Johann Blumenbach (1752-1840) re-cast in his concept of "bildungstrieb" (1781) or "formational drive" in human development, a term that united growth, maintenance, healing, regeneration, and reproduction as variations of the single goal of maintaining form. [4]

German philosopher Immanuel Kant, supposedly, admitted to be following Blumenbach in some respects, in distinguishing between a principle of primordial organization and a merely mechanicial formative force of impulse that resides in matter and body. [5]

By the end of the eighteenth-century this developmenal force became central to Johann Schiller's theory of aesthtetic education which also attempted to invest psychological develment in physiology, the topic of Schiller's medical dissertation from 1779. In a way, modern genetics continues to define the "Bildungstrieb" that links mind-body development. It would be fair to say that Timothy Lenoir's 1982 book *The Strategies of Life* has become a classic scholarly treatment of the "energia" concept as it became more and more a term for human biological development. Goethe of course knew and used the term, but found it too much of an abstraction to be a useful term for complexities of human development. [3]

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4. (a) Blumenbach, Johann. (1781). *On the Formative Drive of the Generation Process* (*Uber den Bildungstieb und das Zeugungsgeschafte*). Gottingen: Johann Dieterich.
(b) Engelstein, Stefani. (2008). *Anxious Anatomy: the Conception of the Human Form in Literary and Naturalist Discourse* (pg. 13). SUNY Press.
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θΔics

In science, **Einstein** [CR:198] is the surname of German physicist Albert Einstein.

See also

- Einstein on free will
- Einstein on god
- Einstein on good and evil
- Einstein on love
- Einstein on purpose
- Einstein on religion
- Einstein on the soul
- Einstein postulate
- Einstein-Pascal dialogue
- Einstein's personal library

θΔics

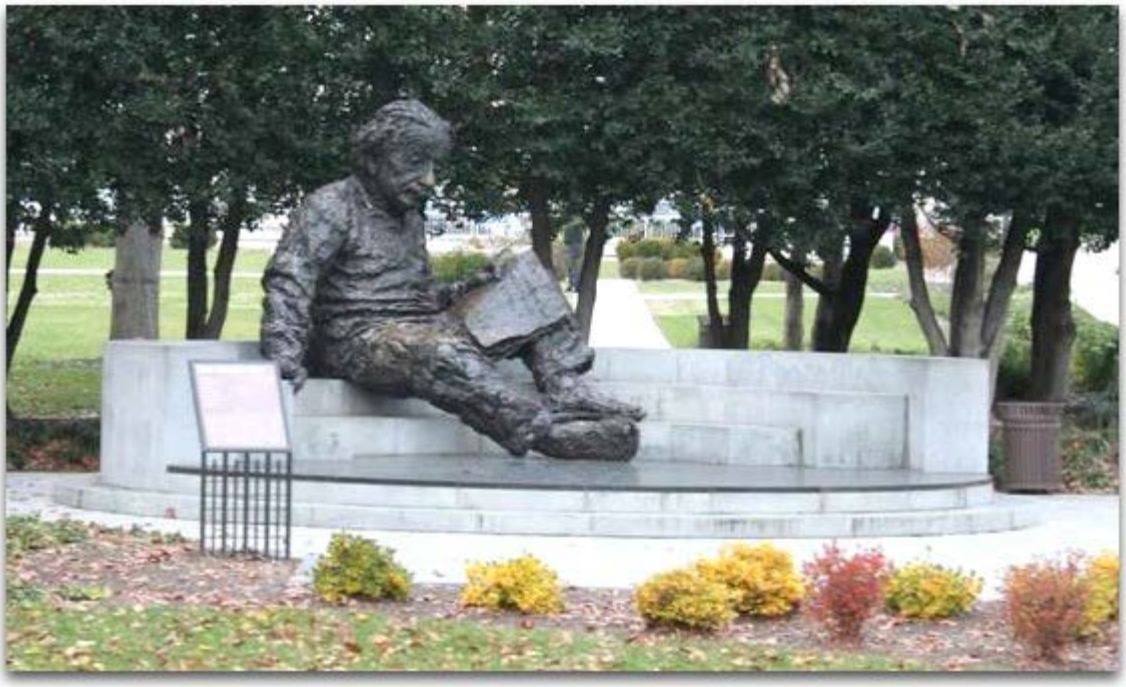

A statue of Einstein reading in Washington, D.C.

In genius queries, **Einstein on free will** refers to stated and or published opinions by German-born American physicist Albert Einstein on the question of the freedom of the will, i.e. whether people have such a thing as "free will", namely the ability to freely "choose" between one or more alternatives, in a way that is free or so-to-say above, beyond, or outside the laws of nature.

In 1931, when asked about "**free will**", **Einstein** replied that human's sense that their "will" is free is the same as the moon's belief, supposing it was a conscious thinking thing, that it is freely moving about the earth, by its own will (compare: Johannes Kepler's belief that the moon was pushed in its orbit by an angel flapping its wings), yet at the same laughing at the humans, seen from above, moving in predictable daily orbitals (see: human molecular orbital theory), on the earth's surface, falsely believing that they are moving by the freedom of the will or their own free will.

Moon | Free will

In 1931, Einstein, in response to questions about belief in free will, responded with the following comparison of the will of the moon:

> "If the moon, in the act of completing its eternal way around the earth, were gifted with self-consciousness, it would feel thoroughly convinced that it was traveling its way of its own accord…. So would a being, endowed with higher insight and more perfect intelligence, watching man and his doings, smile about man's illusion that he was acting according to his own free will."

This quote, according to British analytical philosopher Galen Strawson (2015), is said to be "at one" with Nietzsche's views on: being, becoming, power, law, force, will, energy, cause, necessity, and fate. [7]

In 2014, physicist George Ellis, in interview with John Horgan, was shown the Einstein moon quote (above), and then asked if he believed in believed in free will, to which he responded with: [6]

> "Yes. Einstein is perpetuating the belief that all causation is bottom up. This simply is not the case, as I can demonstrate with many examples from sociology, neuroscience, physiology, epigenetics, engineering, and physics. Furthermore if Einstein did not have free will in some meaningful sense, then he could not have been responsible for the theory of relativity – it would have been a product of lower level processes but not of an intelligent mind choosing between possible options. I find it very **hard to believe** this to be the case – indeed it does not seem to make any sense. Physicists should pay attention to Aristotle's four forms of causation – if they have the free will to decide what they are doing. If they don't, then why waste time talking to them? They are then not responsible for what they say."

Ellis, similar to Terrence Deacon (2011), who also reacts against American physicist Philip Anderson's 1972 "More is Different", here is trying to sell god in coded repackaged scientifically-sounding form via a mix Aristotelian causation and emergence talk, similar to what Deacon and others have attempted.

Murphy | Schopenhauer

See main: Einstein-Murphy dialogue

In circa 1932, Einstein, during an interview with Irish science translator James Murphy, digressed on questions of the of free will and freedom via recourse to Arthur Schopenhauer's 1840s human chemical theory based freedom of the will logic; the gist of which is as follows:

"Man can do what he will, but cannot will what he wills."

— Arthur Schopenhauer (1839), rendition recalled by Einstein, circa 1930 [4]

Einstein made this logic part of his 1932 credo, quoted below, and shown adjacent.

Quotes

The following are related quotes:

"In living through this 'great epoch', it is difficult to reconcile oneself to the fact that one belongs to that mad, degenerate species that boasts of its free will. How I wish that somewhere there existed an island for those who are wise and of good will! In such a place even I should be an ardent patriot!"

— Albert Einstein (1914), "Letter to Paul Ehrenfest", early Dec [1]

"I am a determinist. As such, I do not believe in free will. The Jews believe in free will. They believe that man shapes his own life. I reject that doctrine philosophically. In that respect I am not a Jew."

— Albert Einstein (1928), "Interview with George Viereck" [2]

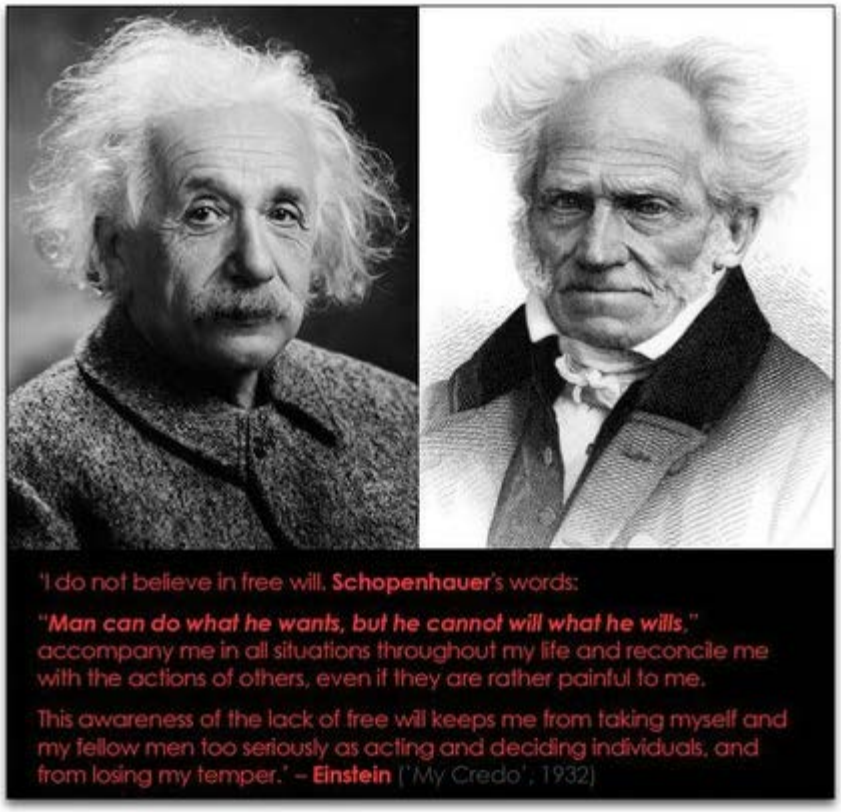

A Philosopher.eu text pic (Q) of Einstein's famous 1932 statement on free will, namely that of "will" defined by Arthur Schopenhauer.

"I do not believe in free will. Schopenhauer's words: 'Man can do what he wants, but he cannot will what he wills,' accompany me in all situations throughout my life and reconcile me with the actions of others, even if they are rather painful to me. This awareness of the lack of free will keeps me from taking myself and my fellow men too seriously as acting and deciding individuals, and from losing my temper."

— Albert Einstein (1932), "My Credo", Aug [5]

"Objectively, there is, after all, no free will."

— Albert Einstein (1946), "Letter to Otto Juliusburger", Apr 11

"I have never admired any system that encourages a herd nature in man by suppressing his free will to choose for himself. . . . I said that Marx sacrificed himself for the ideal of social justice, but I didn't say that his theories are right. As for Lenin, I don't believe he liked me. How can I be called a communist when I have fought so long for freedom of thought, of expression, freedom from the military boot, and freedom from automation?"

— Albert Einstein (1954), when queried if he had communist sympathies [3]

See also

- Einstein on god
- Einstein on love
- Einstein on purpose
- Einstein on religion
- Einstein on the soul

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(b) Galen Strawson – Wikipedia.

θΔics

In theories of love, **Einstein on love** refers German-born physicist Albert Einstein's jotted and or verbally stated views on the nature of love, falling in love, and first love, and or separation or divorce, one of which being his 1920s puzzled statement: "how on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?", the second being his 1933 personal note jotting "gravitation cannot be held responsible for people falling in love."

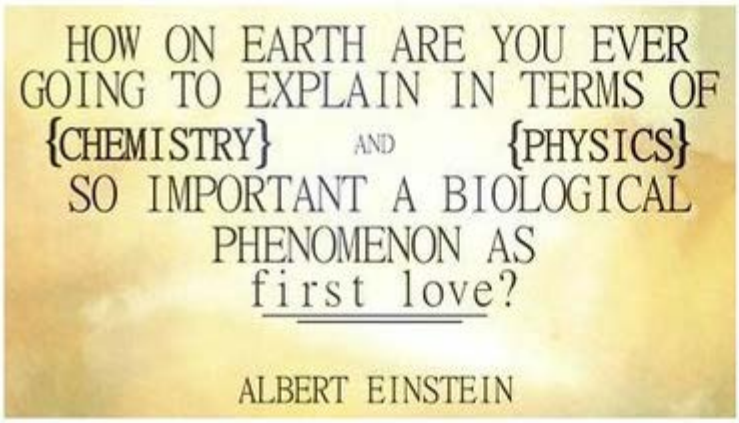

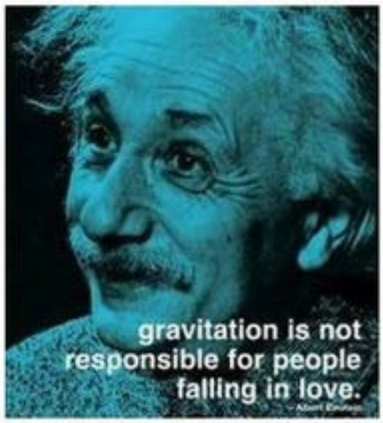

Einstein's 1933 letter question him as to whether being upside down was what caused people to fall in love, to which Einstein jotted the personal note: "Gravitation cannot be held responsible for people falling in love. [1] **Right:** An art.com picture frame of Einstein's famous 1933 personal scratch paper note about love and gravity. [3]

Morgan incident

In the late 1920s at the California Institute of Technology, as recorded by Henry Borsook (1956), physical chemist Edwin Cohn asked American geneticist Thomas Morgan (1866-1945) what is research plans were? Morgan answer was: "I am not doing any genetics. I am bored with genetics. But I am going out to Cal Tech where I hope it will be possible to bring physics and chemistry to bear on biology." Shortly after Morgan arrived at Cal Tech, Einstein visited the laboratory and posed almost the same question. Morgan answered similarly as before. In response, Einstein shook his head and said: [1]

> "No, this trick won't work. The same trick does not work twice. How on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?"

The end of this statement has gone on to become a popular poster quote, in recent years, such as shown above.

Standing on their heads letter

During a visit to England in 1933, after having left Germany for good and just before going to the United States to take up his position at the Institute for Advanced Study in Princeton, N.J., Einstein received a letter from a correspondent described, by Einstein's archives editors Helen Dukas and Banesh Hoffmann, as someone "whose knowledge of physics could hardly be sound". The correspondent said that according to his understanding, the world moves so fast that it seems to be stationary. He went on to say, in all seriousness, that because of gravity a person on the spherical earth is sometimes upright, sometimes standing on his head, sometimes sticking out at right angles to the earth, and sometimes, as he put it, "at left angles". He then asked if perhaps it was while upside down, standing on their heads, that people fell in love and did other foolish things? So far as is known, Einstein did not answer the man, but on it, in German, he scribbled the following words: [1]

> "Falling in love is not the most stupid thing that people do—but gravitation cannot be held responsible for it."

In respect to gravitation and love, Einstein seems to have been off in logic a bit. To cite a simple disproof example, it is well known that female sexual heat and ovulation, for instance, is mediated by the lunar

cycle: human females ovulate once per month in cycles; moreover, females who dorm together "cycle together", a phenomenon called the McClintock effect, named after American researcher Martha McClintock, who first described it in 1971) which is a gravitational phenomenon. In general, however, Einstein knew that human movement was controlled by "forces" an opinion he stated in 1929:

A depiction of the McClintock effect: that females who react together or dorm in the same housing, eventually end up having synchronized menstrual cycles—and likewise synchronized mate selection windows, wherein the activation second of "falling in love", possibly at first sight, becomes opportune.

"Everything is determined … by forces over which we have no control. It is determined for the insect as well as the star. Human beings, vegetables, or cosmic dust—we all dance to a mysterious tune, intoned in the distance by an invisible piper."

Commentary

What is strangely curious in discerning the above two anecdotes in unison is that it seems Einstein was toying around with, possibly, some unpublished, undocumented, or unspoken of ideas or thoughts or confusions about the nature of love, possibly that he grappling with or thought about in passing amusement. The strange part about this is that Einstein's biggest intellectual mentor was Goethe: he kept a bust of Goethe in his study, and Goethe's collected works, in a 52-volume set, took up the biggest portion of Einstein's personal library. Therefore putting two and two together, it would seem logical that Einstein read Goethe's self-defined best book: *Die Wahlverwandtschaften* (*The Elective Affinities*) or at least was aware of the concept of "wahlverwandtschaften", the German-version of the "chemistry of love", albeit described though a more complex theory taking into account interpersonal choices or elections being guided by forces "external to the system" as Goethe put it (1796).

It remains to be tracked down if Einstein read or was aware of Goethe's *Die Wahlverwandtschaften*. If so, it would seem likely that Einstein, who published his first 30 papers in thermodynamics, would have known about German physicist Hermann Helmholtz's 1882 paper "On the Thermodynamics of Chemical Processes" which proved, for the first time, that "affinities", human, chemical or otherwise, are quantified by free energy change. Hence, had Einstein been able to put two and two together, he would have likely said to Morgan:

> "No, you can't trick me. The same trick does not work twice. To explain, in terms of chemistry and physics, so important a biological phenomenon as first love, you need to turn the discussion towards free energy [see: Note to chapter 6]."

He, oddly, did not say this. The reason he did not say this may be attributed to a combination of "not seeing the ships in the harbor" + "not seeing the forest amid the trees", in the sense that his mind was solely focused on the thought experiment of attempting to run alongside a beam (tree) that he may have not seen the big picture, which amounts to connecting the different trees (Goethe + Helmholtz + Nernst + his own work) so to see the bigger forest and hence the elective affinities problem and hence may have not been aware of the chemical-version of Goethean philosophy, such as Arthur Schopenhauer was.

Lieserl love letter | Hoax

In circa 2015, a faked (Ñº)(Ñº) Einstein so-labeled newly unearthed (1980s) letter to his daughter Lieserl Einstein (1902-1903), began to surface (Ñº), reporting Einstein as saying things like "love is gravity", "love is god", "love is a force that gives meaning to life", etc.; none of which, however, are in accordance with his mindset or views. The hoaxer is someone trying to sell spirituality/new age ideas via artificial Einstein veneer.

See also

â— Equation of love

References

1. Source: Kang, Manjit. (2002). *Quantitative Genetics, Genomics, and Plant Breeding*, (pg. 12). CABI Publishing.
2. (a) Dukas, Helen and Hoffmann, Banesh. (1979). *Albert Einstein: the Human Side. New Glimpses into his Archives* (pg. 56). Princeton University Press.
(b) Isaacson, Walter. (2007). *Einstein* (pg. 423). Simon and Schuster.
3. Einstein: Love (16” x 16” art print) – Art.com.

θΔics

In philosophy, **Einstein on purpose** refers to the collected thoughts and reflections of German-born American physicist Albert Einstein on the topic of purpose.

Einstein-Pascal dialogue

See main: Einstein-Pascal dialogue

In 1950, Einstein engaged into a question and answer style dialogue with a nineteen-year-old American engineering student on the question of "What is the purpose of man on earth?", framed around French physicist-mathematician Blaise Pascal's *circa* 1642 jotting queries on the same question.

Quotes

The following are related quotes:

> "How strange is the lot of us mortals! Each of us is here for a brief sojourn; for what **purpose** he knows not, though he sometimes thinks he senses it. But without deeper reflection one [only] knows from daily life that one exists."
>
> — Albert Einstein (1930), Essay: "The World as I See It" [1]

> "Strange is our situation here on earth. Each of us comes for a short visit, not knowing why, yet sometimes seeming to divine a **purpose**."
>
> — Albert Einstein (1932), "My Credo" [2]

See also

â— Einstein on love
â— Einstein-Murphy dialogue

References

1. (a) Einstein, Albert. (1930). "The World as I See It", Essay, originally published in "Forum and Century," vol. 84, pp. 193-194, the thirteenth in the Forum series, *Living Philosophies*; In *Living Philosophies* (pp. 3-7) New York: Simon Schuster, 1931; In A. Einstein, *Ideas and Opinions, based on Mein Weltbild*, edited by Carl Seelig, New York: Bonzana Books, 1954 (pp. 8-11).
(b) The World as I See It (book) – Wikipedia.
2. Einstein, Albert. (1932). "Quote: divine a purpose", from "My Credo," [AEA 28-218]; in: *The God Delusion* (pg. 241) by Richard Dawkins, Mariner Books, 2006.

θΔics

In geniuses on, **Einstein on religion** refers to stated and or published opinions by German-born American physicist Albert Einstein on the question of the religion, religious belief, and or his personal religious beliefs.

Overview

In 1891, as reported by Max Jammer, as summarized by William Jensen, Einstein, at the age of 12 had a sudden and abrupt "deconversion" and thereafter rejected all traditional religion, Jewish or Christian; at age 22, he discovered Benedict Spinoza, and his last wish was not to be buried in the Jewish tradition but to be cremated. [2]

Quotes

The following are noted quotes:

> "It is a special blessing to belong among those who can and may devote their best energies to the contemplation and exploration of objective and timeless things. Although I am a typical loner in daily life, my consciousness of belonging to the invisible community of those who strive for truth, beauty, and justice keeps me from feeling isolated. The most beautiful and deepest experience a man can have is the sense of the mysterious. It is the underlying principle of religion as well as of all serious endeavor in art and science. He who never had this experience seems to me, if not dead, then at least blind. To sense that behind anything that can be experienced there is a something that our minds cannot grasp, whose beauty and sublimity reaches us only indirectly: this is religiousness. In this sense, I am religious. To me it suffices to wonder at these secrets and to attempt humbly to grasp with my mind a mere image of the lofty structure of all there is."
>
> — Albert Einstein (1932), "My Credo", Aug [1]

> "I am a deeply religious non-believer. This is a somewhat new kind of religion."
>
> — Albert Einstein (c.1935) (Q)(Q)

See also

- Einstein on free will
- Einstein on god
- Einstein on love
- Einstein on purpose
- Einstein on the soul

References

1. Einstein, Albert. (1932). "My Credo" (Q), Aug, for a recording by order and to benefit the German League of Human Rights.
2. Jensen, William B. (2010). "Was Einstein a Humanits?", VI, FIG meeting notes.

External links

- Religious views of Albert Einstein – Wikipedia.

θΔics

In geniuses on, **Einstein on the soul** refers to stated and or published opinions by German-born American physicist Albert Einstein on the question of the existence of the soul.

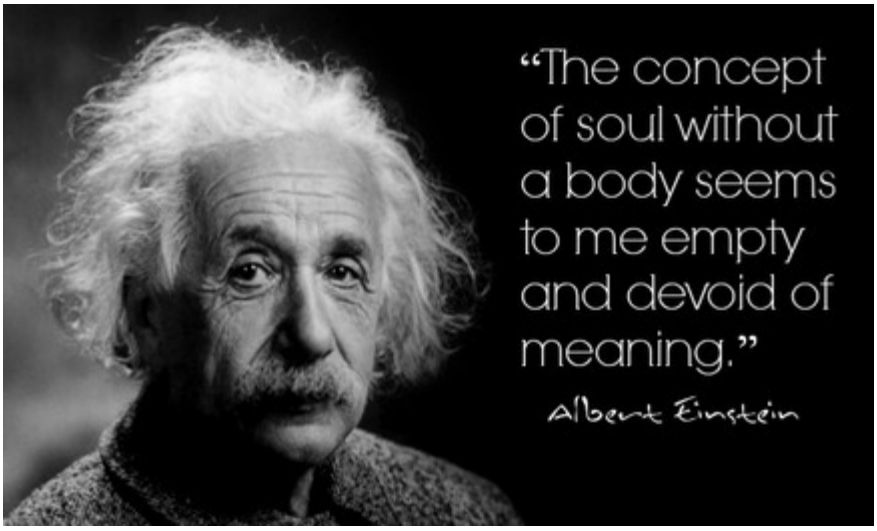

Albert Einstein (1921): commentary on the concept of "soul".

Overview

In 1921, Einstein received a letter from a woman in Vienna imploring him to tell her if he had formed an opinion as to whether the soul exists and with it personal, individual development after death; on 5 Feb 1921, Einstein answered the following: [1]

> "The mystical trend of our time, which shows itself particularly in the rampant growth of the so-called theosophy and spiritualism, is for me no more than a symptom of weakness and confusion. Since our inner experiences consist of reproductions and combinations of sensory impressions, the concept of soul without a body seems to me empty and devoid of meaning."

In 1929, Einstein stated the following about his views on the question of god and soul:

> "We followers of Spinoza see our God in the wonderful order and lawfulness of all that exists and in its soul ('Beseeltheit') as it reveals itself in man and animal. It is a different question whether belief in a personal God should be contested. Freud endorsed this view in his latest publication. I myself would never engage in such a task. For such a belief seems to me preferable to the lack of any transcendental outlook of life, and I wonder whether one can ever successfully render to the majority of mankind a more sublime means in order to satisfy its metaphysical needs."
>
> — Albert Einstein (1929), "Letter to Eduard Busching" (Oct 29); after Büsching sent Einstein a copy of his book *Es gibt keinen Gott* [*There Is no God*] [2]

In circa 1930, Einstein said the following about the soul:

> "Your question [about God] is the most difficult in the world. It is not a question I can answer simply with yes or no. I am not an Atheist. I do not know if I can define myself as a Pantheist. The problem involved is too vast for our limited minds. We see a universe marvelously arranged, obeying certain laws, but we understand the laws only dimly. Our limited minds cannot grasp the mysterious force that sways the constellations. I am fascinated by Spinoza's Pantheism. I admire even more his contributions to modern thought. Spinoza is the greatest of modern philosophers, because he is the first philosopher who deals with the soul and the body as one, not as two separate things."
>
> — Albert Einstein (1930), interview with George Viereck [3]

On 17 Jul 1953, in a response letter to a female Baptist pastor who queried him in regards to his views on soul, God, and everlasting life, Einstein replied: [1]

> "I do not believe in immortality of the individual, and I consider ethics to be an exclusively human concern with no superhuman authority behind it."

(add discussion)

Quotes

The following are related quotes:

> "I cannot—nor would I want to—conceive of an individual that survives his physical death. Let feeble souls, from fear or absurd egotism, cherish such thoughts."
>
> — Albert Einstein (1931), "The World As I See It" [4]

See also

Soul	Einstein
● Geniuses on the soul	● Einstein on free will ● Einstein on god ● Einstein on love ● Einstein on purpose ● Einstein on religion

References

1. Einstein, Albert. (1981). *Albert Einstein: the Human Side*. Princeton University Press.
2. (a) Einstein, Albert. (1929). "Letter to Eduard Busching", Oct 29; after Büsching sent Einstein a copy of his book *Es gibt keinen Gott* [*There Is no God*] (Q)
(b) Jammer, Max. (1999). *Einstein and Religion: Physics and Theology* (pg. 51). Publisher.
3. Viereck, George S. (1930). *Glimpses of the Great* (pgs. 372-73) (Q). Duckworth.
4. (a) Einstein, Albert. (1931). "The World As I See It", in: *Albert Einstein* (editor: Jim Green) (pgs. 24-27; quote, pg. 27). Ocean Press, 2003.
(b) Mitchell, Deborah. (2014). *Growing Up Godless: a Parent's Guide to Raising Kids Without Religion* (foreword: Dale McGowan) (vi). Sterling Publishing.

θΔics

In science, the **Einstein postulate** is the following statement:

> "Thermodynamics is only physical theory of universal content which I am convinced will never be overthrown, within the framework of applicability of its basic concepts."

German-born American physicist Albert Einstein (1879-1955), eponym of the **Einstein postulate** (c.1940) in his personal library.

This conclusion was famously surmised in the 1940s by German-born American physicist Albert Einstein, who in retrospect reasoned that among the various sciences, the science of thermodynamics is the one subject least likely in all of science to ever be overthrown. The exact statement made by Einstein is as follows: [1]

> "A theory is the more impressive the greater the simplicity of its premises, the more different kinds of things it relates, and the more extended its area of applicability. Therefore the deep impression that classical thermodynamics made upon me. It is the only physical theory of universal content which I am convinced will never be overthrown, within the framework of applicability of its basic concepts."

This is one of the most-famous quotes in thermodynamics and situates thermodynamics as the hardest of all sciences.

A version of the so-called Einstein postulate was stated in 1903 by American Henry Adams who in his research to see how modern physical science would apply to the humanities, particularly in the study of history, commented in a letter to a friend that: [2]

> "Mathematicians and physicists are almost epileptic in their convulsive assurances that the laws of thermodynamics have reached a generalization which will hold good."

In other words, by start of the 20th century, the first and second laws of thermodynamics had reached a point nearly uniform acceptance.

See also

â— Clausius postulate
â— Eddington rule

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(c) As quoted by Don Howard, John Stachel. *Einstein: The Formative Years, 1879-1909* (Einstein Studies, vol. 8). Birkhäuser Boston. 2000. (p. 1).
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θΔics

In dialogues, **Einstein-Murphy dialogue** is a *circa* 1932 Socratic dialog between Irish science translator James Murphy and German-born American physicist Albert Einstein on the question of free will and freedom in the vein of Arthur Schopenhauer's human chemical theory based freedom of the will logic.

James Murphy
(1880-1946)

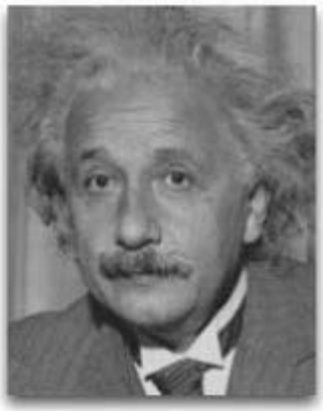

Albert Einstein
(1879-1955)

In c.1932, James Murphy interviewed Einstein on his opinion about "causation", the "freedom" of the human "will", in respect to some of the views of Max Planck.

Overview

In *circa* 1932, Irish science translator James Murphy queried German-born American physicist Albert Einstein on the question of free will and freedom: [1]

> "**Murphy:** I have been collaborating with our friend, Planck, on a book which deals principally with the problem of causation and the freedom of the human will.
>
> **Einstein:** Honestly, I cannot understand what people mean when they talk about the freedom of the human will. I have a feeling, for instance, that I will do something or other; but what relation this has with freedom I cannot understand at all. I feel that I will light up my pipe and I do it; but how can I connect this up with the idea of freedom? What is behind the act of willing to light the pipe? Another act of willing? Schopenhauer once said: Man can do what he wills, but cannot will what he wills.

The Schopenhauer quote here, to note, comes from German philosopher Arthur Schopenhauer's 1839 *Essay on the Freedom of the Will*, which in turn is based on his mentor German polyintellect Johann Goethe's 1809 human chemical theory of the affinity force theory behind the will, the gist of which was elaborated on further by Schopenhauer as follows:

> "The will of the copper, claimed and preoccupied by the electrical opposition to the iron, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive."

which comes from his 1844 second volume *The World as Will and Representation*, wherein he cites German chemist Justus Liebig's description of the reaction of damp copper Cu in air containing carbonic acid H_2CO_3, the balanced reaction of which is as follows:

$$2CuOH + H_2CO_3 \rightarrow Cu_2CO_3 + 2H_2O$$

To continue with the Murphy-Einstein dialog:

> **Murphy:** But it is now the fashion in physical science to attribute something like free will even to the routine processes of organic nature.
>
> **Einstein:** That nonsense is not merely nonsense. It is objectionable nonsense."

Related to this, Einstein, in his 1932 “My Credo”, also commented the following:

> “Strange is our situation here on earth. Each of us comes for a short visit, not knowing why, yet sometimes seeming to divine a purpose.”

Hence, in sum, it is "objectionable nonsense" to apply teleological causation theory to inorganic nature, i.e. non-carbon based nature (e.g. silicon reactions) as well as to organic nature, i.e. carbon-based nature (e.g. human reactions), and hence it would thus seem to be the case the idea of "purpose", that just like feeling of "free will", is something that needs to find reconciliation not in Aristotle's final cause, but rather in the nature of the force—specifically the exchange force—that mediates one's "seeming" sense of divine purpose, as Einstein put it. This is a large issue to grapple with, to say the least, but at least one stated in outline.

See also

â— Einstein-Pascal dialogue

References

1. (a) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (clouds, pg. 7; no duality, pg. 531). Arnold-Howard Publishing Co.
(b) Planck, Max. (1933). *Where is Science Going?* (pg. 201). Allen & Unwin.

θΔics

In dialogues, **Einstein-Pascal dialogue** (TR:10) is a 1950 Q&A style dialogue between German-born American physicist Albert Einstein and an anon nineteen-year-old American engineering student on the question of "What is the purpose of man on earth?", framed around French physicist-mathematician Blaise Pascal's *circa* 1642 jotting queries on the same question. [1]

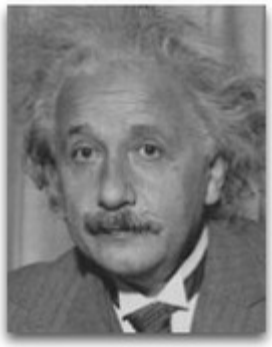

The **Einstein-Pascal dialogue on purpose** is a 1950 dialogue between a 19-year-old Rutgers University engineering student in query to German-born American physicist Albert Einstein (right) in regards to "what is the purpose of man on earth?", as framed around French mathematical physicist Blaise Pascal (left), and his circa 1642 personal jottings thoughts on purpose or rather the "why's of existence?". [1]

Overview

For much of his existence, French child prodigy and mathematical physicist Blaise Pascal (1623-1662) worked on a magnum opus which was never published in the form he intended as a philosophical treatise. Instead, Pascal left a mass of fragments, some of them meant as notes for the Apologie. These became known as the Pensées, or "Thoughts", first published posthumously in 1669, which are said to occupy a crucial place in Western philosophy and religious writing.

Pascal's general intention was to confound scepticism about metaphysical questions. Some of the Pensées are fully developed literary reflections on the human condition, some contradict others, and some remain jottings whose meaning will never be clear. The most important are among the most powerful aphorisms about human experience and behavior ever written, it is said, in any language. Pascal surveys several philosophical paradoxes: infinity and nothing, faith and reason, soul and matter, death and life, meaning and vanity—seemingly arriving at no definitive conclusions besides humility, ignorance, and grace.

In December 1950, German-born American physicist Albert Einstein received a long handwritten letter from a nineteen-year-old engineering student at Rutgers University, New Jersey, who said: “My problem is this, sir, ‘What is the purpose of man on earth?’” Dismissing such possible answers as to make money, to achieve fame, and to help others, the student said:

> “Frankly, sir, I don’t even know why I’m going to college and studying engineering.”

The student went on to express his opinion that man is here “for no purpose at all” and went on to quote from French mathematical physicist Blaise Pascal’s (IQ=190) *Pensees* (*Thoughts*) the following words, which he said aptly summed up his own feelings on the matter, of the following *circa* 1642 statement (assuming written at about age 19) about his uncertain views on the why’s of existence: [2]

> “I know not who put me into the world, nor what the world is, nor what I myself am. I am in terrible ignorance of everything. I know not what my body is, nor my senses, nor my soul, not ever that part of me which thinks what I say, which reflects on all and on itself, and knows itself no more than the rest. I see those frightful spaces of the universe which surround me, and I find myself tied to one corner of this vast expanse, without knowing why I am put in this place rather than another, nor why this short time which is given me to live is assigned to me at this point rather than at another of the whole eternity which was before me or which shall come after me. I see nothing but infinities on all sides, which surround me as an atom, and as a shadow which endures only for an instant and returns no more. All I know is that I must die, but what I know least is this very death which I cannot escape.”

Pascal, it is assumed, penned these remarks

at about the same age as the engineering student, as this question is a ripe one for physical science / engineering inclined mindsets at about this age. The student remarked that Pascal saw the answers to be in religion but that he himself did not. After elaborating on the cosmic insignificance of man, he nevertheless asked Einstein to tell him where the right course lay, and why, saying "Pull no punches. If you think I've gone off the track let me have it straight." On 3 Dec 1950, a few days after receiving the letter, Einstein replied (see: main) as follows: [1]

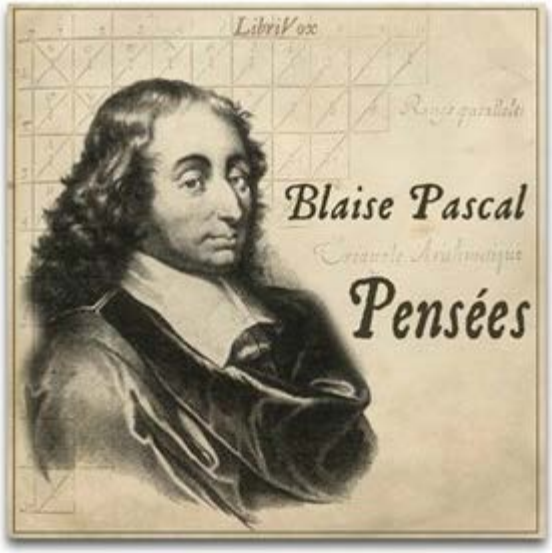

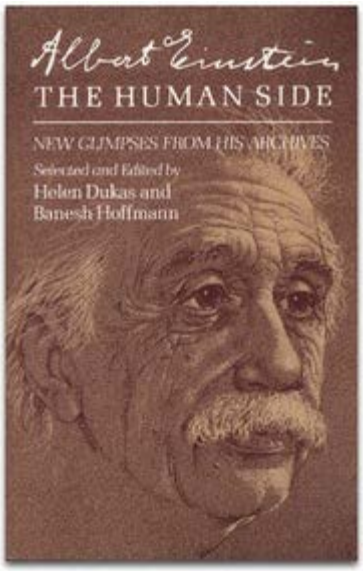

French child prodigy Blaise Pascal's penned his jottings on his struggle with questions on the "why's of existence" in circa 1642, as found in his posthumously published *Thoughts* (*Pensess*). [2] The 1979 *Albert Einstein: the Human Side*, contains the 1950 response letter on the question of purpose, to the 19-year-old engineering student. [1]

> "I was impressed by the earnestness of your struggle to find a purpose for the life of the individual and of mankind as a whole. In my opinion there can be no reasonable answer if the question is put this way. If we speak of purpose and goal of an action we mean simply the question: 'Which kind of desire should we fulfill by the action or its consequences or which undesired consequences should be prevented?'
>
> We can, of course, also speak in a clear way of the goal of an action form the standpoint of a community to which the individual belongs. In such cases the goal of the action has also to do at least indirectly with fulfillment of desires of the individuals which constitute a society.
>
> If you ask for the purpose or goal of a society as a whole or of an individual taken as a whole the question loses meaning. This, of course, even more so if you ask the purpose or meaning of nature in general. For in those cases it seems quite arbitrary if not unreasonable to assume somebody whose desires are connected with the happenings.
>
> Nevertheless we all feel that it is indeed very reasonable and important to ask ourselves how we should try to conduct our lives. The answer is, in my opinion: satisfaction [see: satiety] of the desires and needs of all, as far as this can be achieved, and achievement of harmony and beauty in the human relationships. This presupposes a good deal of conscious thought and of self-education. It is undeniable that the enlightened Greeks and the old Oriental sages had a achieved a higher level in this all-important field than what is alive in our schools and universities."

Similarly, in 1954/55, in a reply to a noted evolutionist concerning a query about the place of intelligence in the universe, Einstein commented: [1]

> "I have never imputed to nature a purpose or a goal, or anything that could be understood as anthropomorphic."

(add)

Thims

American electrochemical engineer Libb Thims' *circa* 2011-present manuscript:
Purpose? (in a Godless universe) (see: publications) is an upgraded hmolscience-based attempt at a modern physical science elaboration of the Einstein-Pascal dialogue on purpose. [3] Thims at the same age as the Rutgers engineering student, was nearly of the exact same mindset in regards the same questions (see: history), the question: "what is the point of everything?", in particular stood out at about age nineteen, the point at which Thims was interjecting into decision into college choices and what exactly a person was supposed to do with one's self after being "freed" from societal-defined high school graduation requirement minimums of so-called adulthood, after which, although still uncertain as to the answer, the decision was made to go after the most-difficult course of career choice, namely: chemical engineering, having never before even taken a chemistry class prior, so as to see if the answer the possible secret of existence arose in the course of the subsequent endeavor—the precipitate of six-volume *Hmolpedia*, being but one significant result of this path, the 2009 solution to the great problem of natural philosophy, being but another (see: progress report).

Quotes

The following are related quotes:

> "How strange is the lot of us mortals! Each of us is here for a brief sojourn; for what **purpose** he knows not, though he sometimes thinks he senses it. But without deeper reflection one [only] knows from daily life that one exists."
>
> — Albert Einstein (1930), Essay: "The World as I See It" [4]

> "Strange is our situation here on earth. Each of us comes for a short visit, not knowing why, yet sometimes seeming to divine a **purpose**."
>
> — Albert Einstein (1932), "My Credo" [5]

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1. Einstein, Albert. (1981). *Albert Einstein: the Human Side* (Pensees dialogue, pgs. 25-27; imputed to nature, pg. 39). Princeton University Press.
2. (a) Pascal, Blaise. (1662). *Thoughts* (*Pensees*) (pg. #). Publisher.
(b) Pensees – Wikipedia.
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(b) The World as I See It (book) – Wikipedia.
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θΔics

In genius studies, **Einstein's brain** refers to []

Overview

On 18 Apr 1955, at the Princeton Medical Center, New Jersey, Einstein ceased to exist.

Within eight hours, supposedly, his brain was removed by American pathologist Thomas Harvey who cut it into 240 blocks for study; the rest of the body was cremated and his ashes were scattered in the river.

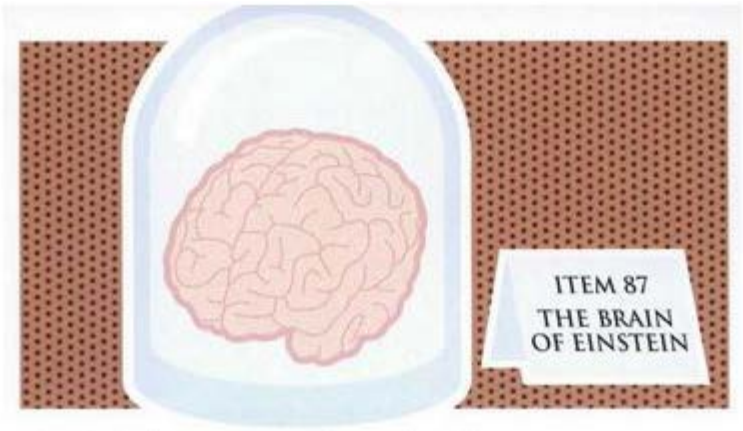

Who Was the Smartest Person Ever?

Einstein's IQ is unknown, but his brain was removed after he died to see whether it was different from anyone else's. Scientists discovered that one part—thought to be related to mathematical reasoning—*was* a bit bigger than most people's.

A chapter section, from the 2007 book *101 Things You Should Know*, on intelligence, IQ, smartness (brightness), and speculation on the query "**smartest person ever**", which talks about how some, supposedly, have found that the mathematical reasoning section of **Einstein's brain** was bigger on average. [3]

Harvey sent tissue slides to several neuropathologists, who reported nothing exotic. The remaining brain sections floated in two mason jars of formaldehyde, inside of a cardboard box marked Costa Cider, under a beer cooler in Harvey's office.

In the mid-1980s, Marian Diamond studied Einstein's brain, finding that, in the left inferior parietal lobe, there were more glia per neuron (73 percent) as compared to average brains. [1]

In 1999, his brain was examined by Sandra Witelson and colleagues at McMaster University, who found that it weighted 1,230 grams; had parietal lobes, essential for mathematical and spatial reasoning, that appeared 15 percent wider than normal (a phenomenon also, supposedly, found in Gauss and Siljestrom); and his Sylvian fissure, the fold running through the parietal lobes, was missing. [2]

Einstein's corpus callosum, supposedly, was also found to be highly myelinated and much thicker than average. (Ñº)

In 2001, American investigative journalist Michael Paterniti published *Driving Mr. Albert: a Trip Across America with Einstein's Brain*, wherein he details the so-called what had become "urban myth" of the Einstein's brain. (Ñº)

References

1. Jensen, Eric. (2009). *Enriching the Brain: How to Maximize Every Learner's Potential* (pgs. 155-56). John Wiley & Sons.
2. Ackerman, Diane. (2004). *An Alchemy of Mind: the Marvel and Mystery of the Brain* (pgs. 63-65). Simon and Schuester.
3. Horne, Richard and Turner, Tracey. (2007). *101 Things You Need to Know: and Some You Don't* (pgs. 86). Bloomsbury.

External links

â— Albert Einstein's brain – Wikipedia.

θΔics

In libraries, **Einstein's personal library** refers to the total set of books read, owned, and or collected by German physicist Albert Einstein from 1889 (age ten), the year in which he set out on a path of self-education, to his death in 1955 (age seventy-six). As twenty-eight of Einstein's first thirty published papers were in thermodynamics, we should expect to find a larger portion of Einstein's library to contain books written by the founders of thermodynamics. This page, subsequently, is a work-in-process listing and discussion of the science books, particularly those in thermodynamics, owned by Einstein. The following 2008 quote by German-born American physicist Gerald Holton, student of American thermodynamicist Percy Bridgman, gives an idea as to the theme of Einstein's library: [1]

Photo showing about **325 books** in part of Einstein's study.

> "Throughout his life **Einstein** was a man of the **book**, to a much higher degree than other scientists. The remarkably diverse collection of volumes in his library grew constantly. If we look only at the German-language books published before 1910 that survived Einstein's Princeton household, the list includes much of the cannon of the time: Boltzmann, Buchner, Friedrich Hebbel, the works of Heine in two editions, Helmholtz, von Humboldt, the many books of Kant, Gotthold Lessing, Mach, Nietzsche, and Schopenhauer. But what looms largest are the collected works of Johann von Goethe in a thirty-six volume edition and another of twelve volumes, plus two volumes on his *Optics*, the exchange of letters between Goethe and Schiller, and a separate volume of *Faust*."

This passage seems to identify German polymath Johann Goethe, the precursory pioneer to the science of human chemical thermodynamics, to be the vicarious intellectual mentor to Einstein, a founder of both radiation thermodynamics and relativistic thermodynamics, being that Goethe's 52-volume collected works (see: Goethe's collected works) is the dominate part of Einstein's library, along with the fact that Einstein kept a plaster bust of Goethe in his reading room.

Author (alphabetical)	**Books**
• Bernstein, Aaron	*People's Books on Natural Science* (5-6 volume set), which Einstein recalled having "read with breathless attention", supposedly introducing him to atomism. [3]
• Boltzmann, Ludwig	
• Buchner, Ludwig	
• Euclid	A text on Euclidean geometry, given to Einstein at age 12, which he called the "holy geometry book". [3]
• Goethe, Johann	Collected Works (36-volume edition)
	Collected Works (12-volume edition)
	Optics (2-volume edition)
	Volume of Letter Exchanged between Goethe and Schiller
	Faust
• Hebbel, Friedrich	
• Heine	(two editions) [1]
• Helmholtz, Hermann	
• Humboldt	
• Kant, Immanuel	(many books) [1]
	Critique of Pure Reason, read by Einstein at age 13. [3]
• Lessing, Gotthold	
• Nietzsche, Friedrich	
• Mach, Ernst	
• Schopenhauer, Arthur	

History

Einstein's personal library was transferred to the Hebrew University in 1987, where it is supposedly to be found in the Jewish National & University Library of that university, following the death of Einstein's step-daughter, Margot Einstein. Einstein's personal library is said to include books on science, European and American politics and society, literature and culture, religion and philosophy, Judaism and Isreal.

Photos

The following photos give an idea of parts of Einstein's library:

Einstein writing by his window, showing about **65 books**.

Einstein standing in his study, showing about **550 books**.

Einstein's office at The Institute for Advanced Study, Princeton, after his death in 1955, which shows about **30 books**.

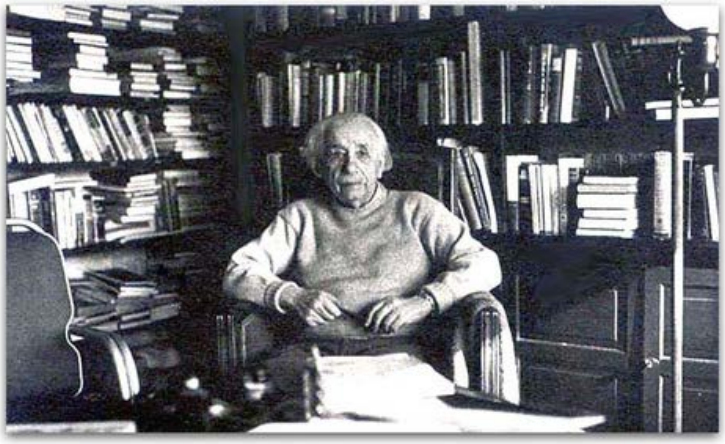

Einstein in study looking forward, showing close-up of his **books**.

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1: Who Was Einstein? Why is He Still so Alive?, pgs 3-15; quote: pg. 10). Princeton University Press.
2. Einstein Archives (History) - AlbertEinstein.info.
3. Miller, Arthur I. (2002). *Einstein, Picasso: Space, Time and the Beauty that Causes Havoc* (pg. 44). Basic Books.

External links

- Einstein Archives Online – AlbertEinstein.info.
- How many books did Einstein read during his lifetime? (2008) – Yahoo Answers.

θΔics

In physicological thermodynamics, **Ejnar Lundsgaard** (1899-1968) was a Danish physiologist noted for his work in 1930 which showed that "nonlactic" muscle contractions can be made at the expense of the dephosphorylation of creatine phosphate. This work was carried on to a higher degree by his protégé Herman Kalckar and by Kalckar's correspondent Fritz Lipmann who in 1941 introduced the theory of ATP as a universal biochemical energy currency.

Overview

In 1930, Lundsgaard made the important finding that frog muscles poisoned with iodoacetate and therefore unable to carry out glycolysis (the splitting of glucose to lactic acid) are nevertheless capable of carrying out a limited number of contractions. Lundsgaard later showed that these "nonlactic" contractions were at the expense of the dephosphorylation of creatine phosphate, which had been discovered and characterized only a few years earlier by American biochemist Cyrus Fiske at the Harvard Medical School. [1]

In 1934, newly-minted Danish physician Herman Kalckar became Lundsgaard's PhD student in the physiology department of the University of Copenhagen.

Education

Lundsgaard was professor of physiology at the University of Copenhagen from 1934 to 1967. [2]

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1. Kennedy, Eugene P. (1991). "Herman Moritz Kalckar (1908-1991)" – US National Academy of Sciences.
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Further reading

â— Lipmann, Fritz. (1969). "Einar Lundsgaard", *Science*, 164: 246-47.
â— Kruhoffer, Poul and Crone, Christian. (1972). *Reviews of Physiology, Biochemistry, and Pharmacology, Volume 65* (*Ergebnisse der Physiologie Biologischen Chemie und Experimentellen Pharmakologie*) (Ch: Einar Lundsgaard, 1899-1968). Springer.

External links

â— Lundsgaard, Einar (1899-1968) – WorldCat Identities.

θΔics

In hmolscience, **ektropy** refers to the energetics related to morphic order or generating order or form in ordinary space. [1] The term was introduced in 1900 by German writer Georg Hirth to be antonym to entropy in the case of living structures. [2] The English variant is ectropy.

See also

- Anti-entropy difficulties

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1. Wittbecker, Alan. (2006). *Good Forestry: From Good Theories and Good Practices* (keyword: ektropy). 3 Muses Books.
2. Hirth, George. (1900). *Entropie der Keimsysteme und erbliche Entlastung* (*Entropy of Germ Systems and Hereditary Discharge*). Munich: G. Hirth's Verlag.

θΔics

In religio-mythology, **El**, or “Il” (southern Arabia), is the god modeled on the creator god of the Canaanites, represented by the bull and revered by the Hebrew tribes who settled norther Palestine. [1]

The god El, according to some Ugaritic texts (e.g. Ras Samra), is not the original creator god, but the offspring of an older principle god El’eb, meaning “god of the father”.

In the Bible, the term ‘el’ tends to get translated as “lord”.

Allah

The Muslim god Allah, supposedly, is derived from a variant of El, namely the the western Semitic god Il, who began to be worshiped in c.300BC in Saudi Arabia. [1]

See also

- Is-Ra-El

References

1. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (Allah, pg. 11; El, pg. 74). Facts on File, Inc.

External links

- El (deity) – Wikipedia.

θΔics

In hmolscience, **elan vital** or *élan vital* (French), from Greek Vita, "goddess of life"+ Old French *eslan* “rush” or *elancer* “to throw forth or hurl”, a term which translates as “vital impetus”, is an anti-entropy type of concept, conceived by French philosopher Henri Bergson, as explained in his 1907 *Creative Evolution*, themed to embody a mixture of impulse, driving force, and life force, argued to be found existent in evolving animated organisms. The term is intimately connected with belief in the existence of God—an attempt be scientific, yet retain remote connection to religion.

Influence

The term has been very influential to those who wish to maintain beliefs in the metaphysical borderland of religion and science: Christian de Quincey, Marguerite Callaway, etc.; for Pierre Teilhard, *Creative Evolution* and its "élan vital" was the "catalyst of a fire which devoured already its heart and its spirit." The concept, in some way, was said to have “inspired” Ilya Prigogine.

Criticism

British biologist Julian Huxley (1887-1975) remarked that Bergson’s *élan vital* is no better an explanation of life than is explaining the operation of a railway engine by its *élan locomotif* ("locomotive driving force") or specifically: [1]

> “To say that biological progress is explained by the ***élan vital*** is to say that the movement of the train is ‘explained’ by an *élan locomotif* of the engine.”

The jibe here, of course, is true in its humor, in that, the driving force behind movements on the surface of the earth, whether a train or children making a play human choo-choo train, is Gibbs free energy. This concept, however, was not purified enough, by the time of Bergson.

Other

In 2012, Japanese genomics of photosynthetic organisms researcher Naoki Sato published his *Entropy* journal article “Scientific Elan Vital: Entropy Deficit or Inhomogeneity as a Unified Concept of Driving Forces of Life in Hierarchical Biosphere Driven by Photosynthesis”, wherein he positions to introduce the concept of “entropy deficit” to be the new unified driving force of the biosphere. [2] Sato’s theory (see his article), however, is an example of someone lost in the garden of thermodynamics.

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1. Gillies, Mary Ann. (1996). *Henri Bergson and British Modernism* (revision of author’s PhD thesis), (pg. 31). McGill-Queen’s Press.
2. Sato, Naoki. (2012). “Scientific Elan Vital: Entropy Deficit or Inhomogeneity as a Unified Concept of Driving Forces of Life in Hierarchical Biosphere Driven by Photosynthesis” (abs), *Entropy*, 14(2): 233-51.

External links

â— Elan vital – Wikipedia.

θΔics

In famous publications, ***Elective Affinities***, or *Die Wahlverwandtschaften* (*The Elective Affinities*) in German (audio pronunciation), is an 1809 scientific novella, published in October, by German polymath Johann von Goethe, in which the characters, considered as chemical species, interact, or rather chemically react, through passions governed by the reaction laws of 'elective' or chemical affinity. [1]

Goethe's 1809 novella ***Elective Affinities*** (*Die Wahlverwandtschaften*), original German cover, adjacent to an updated reprint of the H.M. Waidson translation (1960, *Kindred by Choice*), One World Classics edition.

Influence

Goethe's *Elective Affinities* was read by Arthur Schopenhauer, who based his *The World as Will and Representation on it* (1818; 1844), Friedrich Nietzsche, who based his aphorism #1 of his *Human, All Too Human* (1878) on it, Sigmund Freud (Ñº), who based his *A Project for Scientific Psychology* on it, and Thomas Mann, which influenced his *Death in Venice* (1912), to name a few.

American | Unawaredness

In American, the two cultures are largely unaware of "Goethe" and his physicochemical model of human existence, says as compared to Europe; the following are testament to this:

> "Romantic love, we still read in cosmopolitan, is a 'matter of chemistry', an image that has its support in the writings of the greatest poets, in Shakespeare, for instance, and in Goethe, whose novel *Elective Affinities* has been prime reading in Europe for almost two centuries."
>
> — Robert Solomon (1981), *Love: Emotion, Myth, Metaphor* (pg. 38)

> "Words like 'great' and 'genius' could aptly be used for but a select number of artists—for Michelangelo or say Shakespeare. In the United States, the works of these great artists have been incorporated into popular culture as the epitome of visual and linguistic beauty. By contrast, on these shores, Goethe's works remain largely unread and rarely discussed except among college students, most of whom develop a healthy dose of amnesia shortly after graduation."
>
> — Daniel Spiro (2005), "Remember to Live! The Philosophy of Johann Wolfgang von Goethe"

(add discussion)

Overview

In response to critics, Goethe commented, on 31 December 1809, to Karl Reinhard, to the effect that *Elective Affinities* would be a book for future generations to enjoy and in particular to understand:

> "How I look forward to the effect that this novel will have in a few years on many people upon rereading

it."

One of these "effects", although it actually took a few centuries, rather than a few years, was the 2006 discovery of Goethe's *Elective Affinities*, by American chemical engineer Libb Thims, resulted in the writing of the world's first textbook on human chemistry.

Elective Affinities is the greatest publication in this field since the time of Greek philosopher Empedocles' famous 450BC chemistry aphorisms, about friends mixing like wine and water and enemies separating like oil and water; a view to which Goethe pays tribute to in his novella.

Magnetism

See also: Animal magnetism; Mesmerism

At some point in the novella, Goethe, supposedly, explains human passion in the language of both magnetism and chemical attraction. [31]

This would seem to have likely been in the second part.

Left: a 2011 Albatros reprint cover of *Die Wahlverwandtschaften*. Right: a 2001 watercolor rendition of the estate (retort, reaction vessel, closed reaction system), by Colombian artist Nohra Barros, in which the the story or rather reactions (human chemical reactions) of *Elective Affinities* take place, chapter-by-chapter. [21]

Reviews

The 1859 *New American Cyclopedia*, edited by George Ripley and Charles Dana, describe Goethe's novella as follows: [27]

> "In 1809, Goethe printed the most exceptionable of his novels, the *Wahlverwandschaften* ("Elective Affinities"), in which the charms and graces of this style are employed in the description of the impulses which spring from the collision of passion and duty in the relations of marriage. By the title of the book, and in the whole spirit of it, he would represent that sexual affinities follow the same inevitable law as chemical affinities, and that humanity struggles impotently against the dictates of nature. Like all his productions, this was suggested by circumstances in his own experience. The work shocked the moral world, in spite of the beauty with which it was written, and to this day tasks the ingenuity of those of his admirers who seek to defend it from attack."

Interestingly, the attack still continues to this very day (e.g. Libb Thims (attack)) some two-hundred years later.

Spinoza

The exact date in which Goethe conceived the theory behind *Elective Affinities* is difficult to pin down. We do know, however, that by 1768, at age nineteen, he had already openly called chemistry is "secret love" and was conducting chemical experiments, scouring the chemistry literature, and studying the works of the great chemists looking for a unifying principle that permeates the entire universe.

German philosopher Herman Grimm, in his 1875 University of Berlin lectures on Goethe, argues that Dutch

philosopher Benedict Spinoza (1632-1677), in his manner of treating human relations, supposedly, had opened the way to the latter views of Goethe (and Schiller) who compared humans to elements that attract or repel one another without any exercise of "will" in the matter.

There may be some truth to this, possibly not in regards to treating humans as attracting and repelling chemical elements, but at least in regards to Spinoza's view of morality as explained in his 1677 post humorously book *Ethics*. [25] Of Spinoza, Goethe writes in his autobiography *Dichtung und Wahrheit*: [26]

> "After seeking through the world in vain, to find a means of cultivation for my unusual nature, I at last fell upon the *Ethics* of this philosopher. If would be impossible for me to render an account of how much I drew form my perusal of the work itself and how much I myself read into it. Enough that I found in it a sedative for my passions, and that it seemed to open out for me a free and boundless view of both the sensible and the moral world. But what especially riveted me to him, was the utter disinterestedness, which glowed in his every sentence."

In other words, Goethe, in Spinoza, may have intuited the some of the preliminaries of the physical chemistry morality system that he eventually comes to present in *Elective Affinities*.

Lectures on Anatomy

Goethe's first detailed presentation of affinity occurs in his third *Lecture on Anatomy* of 1796. [28] Specifically, in his lectures on comparative anatomy and zoology, under the heading 'On the Laws of Organization as Such, to the Extent That We Can Observe Them in the Structure of Types', Goethe stated the following view: [29]

> "To facilitate our comprehension of the concept of organic existence, let us first take a look at mineral structures. Minerals, whose varied components are so solid and unchanging, do not seem to hold to any limits or order when then combine, although laws do determine these conditions. Different components can be easily separated and recombined into new combinations. These combinations can again be taken apart, and the mineral we thought destroyed can soon be restored to its original perfection.
>
> The main characteristic of minerals that concerns us here is the indifference their components show toward the form of their combination, that is, their coordination or subordination. There are, by nature, stronger or weaker bonds between these components, and when they evidence themselves, they resemble attractions between human beings. This is why chemists speak of elective affinities [see: human elective affinity; human chemical affinity], even though the forces that move mineral components one way or another and create mineral structures are often purely external in origin, which by no means implies that we deny them the delicate portion of nature's vital inspiration that is their due."

Here we see, in excellent form, in 1796, Goethe discussing "human chemical bonding" in the context of the affinity forces, which he correctly says are "external in origin", that create or dissolve such combinations.

Schiller-Crebillon

The first definitive mention of Goethe's human elective affinities theory seems to have been made in an October 23, 1799 letter to his associate German author Friedrich Schiller, wherein Goethe criticizes the work of French author Prosper Crebillon (1674-1762) to the effect that Crebillion's writing is not realistic in the sense that it is not based on the reality that people react according to the principles and outcomes of chemistry. The specific comment by Goethe, in this letter, in which he first mentions the outlines of his soon-to-be theory-infused novella, is as follows: [13]

> "There is no trace of the delicate *verwandtschaft* (affinity) through which they (his characters) attract and repel, neutralize each other, separate again and re-establish themselves."

In other words, in 1799, Goethe viewed the forces of personal relationships to be chemical forces, just as is chemical affinity understood, in modern terms, to be the force or reaction. [13]

Grimm argues that Schiller's last unfinished drama "Demetrius", which was left lying on his table unfinished at the time of this reaction end (1805), was in some way a vicarious impetus or collisional momentum to the start of *Elective Affinities*, in some way or another, so to speak.

In love with four women?

Initially, according to Goethean scholar John Armstrong, in mid 1808, a few months before Goethe met Napoleon, he had started writing a story called "The Renouncers", and took it up again early the next year, after which the tale ballooned into a novel. Uncharacteristically, the work progressed quickly and before the end of the year it was in print under the enigmatic title *Elective Affinities*. During this period, according to one of Goethe's assistants, it is said that Goethe was contemplating a novel in which the hero is simultaneously in love with four women: [17]

> "Each in her own way is lovable; whichever one he is drawn to in the mood of the moment, she alone is lovable."

One of the stepping stones to the writing of the *Elective Affinities* was Goethe's 1808 unfinished draft *The Renouncers*, in which the hero is simultaneously in love with four women, and the "moral" implications and repercussions of this situation. [17]

Of considerable coincidence, this love thought experiment performed by Goethe in draft, is nearly verbatim to that in which American electrical chemical engineer Libb Thims was drawn into the formulation of the subjects of human chemistry and human thermodynamics, or in combined form human chemical thermodynamics. Specifically, in *circa* 1992-1993, in an attempt to figure out how to go about choosing who to marry, as a freshman pre-engineering student, Thims made an excel-style spread sheet table of the top nineteen girlfriends, whom he could potentially marry, listing each person on the horizontal and listing a range of point ranked attributes, qualities, or factors on the vertical, in an attempt to get a numerical "marriage quality value" for each girlfriend. The resulting solutions, however, did not seem to intuitively make any sense. In 1995, in he began to muse about how this would be done chemical thermodynamically; even nearing the point of asking the question in his chemical engineering thermodynamics class. It would be a full seven years (2001) before he could figure out the nuts and bolts of how this could be quantified via enthalpy and entropy determinants (see: Libb Thims (history)).

In sum, it is only through looking through the lens of the theoretical model of how, that one begins to see the chemical thermodynamic viewpoint, namely that there are real rules that determine how these bonding choices actuate.

Publication

A few have mentioned that *Elective Affinities* was first intended for insertion among the numerous short stories in the second part of 'Wilhelm Meister', but soon grew beyond the limits of availability for such use. [20]

Goethean biographer Havelock Ellis notes that the first mention of *Elective Affinities* by Goethe occurred on 11 April

1808 in a diary entry. The end of July of that year he had completed a version with 18 chapters. This, however, remained untouched until April of next year. [14]

On October 1809, he finally the whole novel, in two parts with 18 chapters, shortly before printing. Goethe, in retrospect, commented on this completion: [14]

> "No one can fail to recognize in it a deep passionate would which shrinks from being closed by healing, a heart which dreads to be cured … In it, as in a burial urn, I have deposited with deep emotion many a sad experience. The 3rd of October 1809 (when the publication was completed) set me free from the work: but the feelings it embodies can never quite depart from me."

In other words, the novella was finished on October 3rd, 1809.

Overview

See main: Goethe's human chemistry; Goethe's human affinity table; Human chemical reaction (history)

The central plot of the book is centered on a double elective affinity, through which the four main characters Eduard, Charlotte, Captain, and Ottilie go through as the novella proceeds:

AB + CD → AC + BD

Charlotte-Eduard + Captain-Ottilie → Charlotte-Captain + Eduard-Ottilie

Famous "chapter four" discussion of the affinity reactions occurring between the characters, from the 1996 French-Italian film adaptation.

With the following Bergman-style letter symbols assigned to each human reactant, by Goethe, in the famous chapter four:

A = Charlotte
B = Eduard
C = Captain
D = Ottilie

Goethe's *Elective Affinities* is considered the founding book of human chemistry. [2] Goethe's theory of human elective affinities, stimulated may writers in the years to follow. One such person was German sociologist Max Weber, who had begun reading Goethe at the age of 14, later constructing a theory of social human elective affinities. [3] English science historian Jeremy Adler did his 1969 PhD dissertation on the theoretical basis of Goethe's novella, in terms of what chemists and affinity reaction each chapter was based on. [4]

Advertisement

On March 23, 1810 Goethe put an advertisement for his novella in the *Morning Paper for the Educated Professional* stating the following: [6]

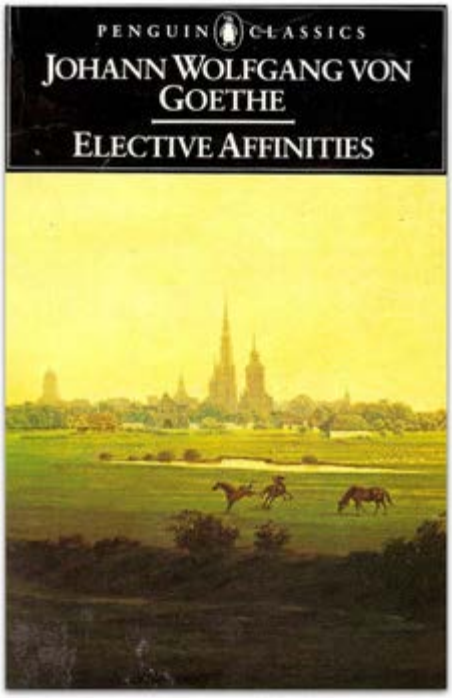

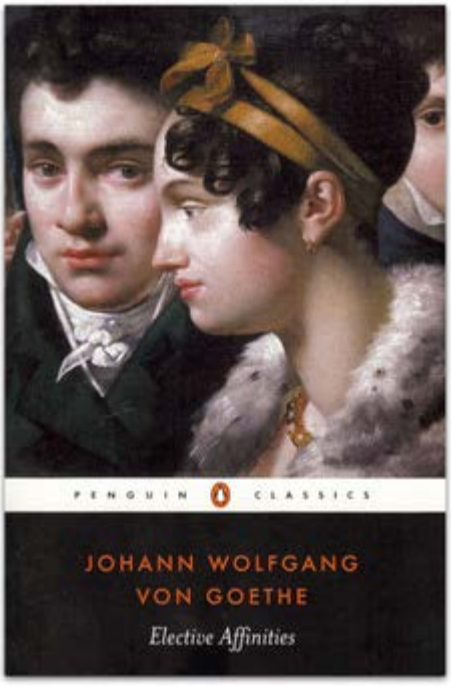

R.J. Hollingdale translation, Penguin Classics editions, 1971 (left) and 2005 (right); the latter with chronology and further reading by David Deissner, with the cover detail from *Family Portrait* (1813) by Merry Josph Blondell, in the Kunsthalle, Bremen, Germany (photo AKG Images).

> "It seems as if the author's continued natural studies have caused him to use this unusual title. He may have noticed that in the natural sciences one often uses ethical parables in order to bring closer what is quite distant from the circle of human knowledge; and so he also probably wanted, in a moral case, to bring a chemical figure of speech back to its spiritual origins, especially since there is only one nature overall, and also since throughout the realm of cheerful freedom of reason the traces of sad, passionate necessity irresistibly pull themselves and may only be erased by a higher hand, and perhaps even then not in this life."

Another shorter translation of this advertisement reads: [7]

> "It seems that his continued work in physics made the author choose this strange title. He may have noticed that often in natural science ethical similes are used to bring something nearer that is remote from the region of human knowledge, and so, presumably, he may have wanted to trace the parlance of a chemical simile back to its spiritual origin, all the more so since there is after all just one nature."

In other words, Goethe is attempting to smooth-over the grand implications of what he has done by saying to the undiscerning reader that the teachings of his novella may simply be thought of, if so be it, as ethical "similes" or parables, but not actual truth, if such a debate should erupt. Goethe, as we see, was well wise to the immensity of the underlying controversy to the science he had outlined, multiple times more controversial than is evolution. And yet another, 2005, translation reads this advertisement as: [12]

> "This strange title was one suggested to him by his continued work in the field of physics, that it was a metaphor in chemistry whose spiritual origins is demonstrated in the novella."

This may have been the September 4th, 1809 advert in *Morgenblatt*, stating that "elective affinities" is a metaphor in chemistry with a "spiritual origin". Goethean philosopher John Armstrong, argues that approach was used being that his publisher Johann Cotta feared or anticipated attack, and was thus introducing a neutralizing deflection. The adverts allude to the premise that Goethe viewed his theory is pure metaphor, which is far from the truth.

Title etymology

The name of the book is derived from

the the Latin translation of Swedish chemist Torbern Bergman's 1775 textbook *A Dissertation on Elective Attractions*, where the German *Die Wahlverwandtschaften* literally means "The Elective Affinities". [5] Goethe specifically stated that the theme of his book comes from Bergman's textbook on elective affinities, which was originally published in Latin as *De Attractionibus Electives* (*The Elective Attractions*). This was translated into German, in 1782 by Hein Tabor, under the title *Die Wahlverwnadtschafte* (*The Elective Affinities*)

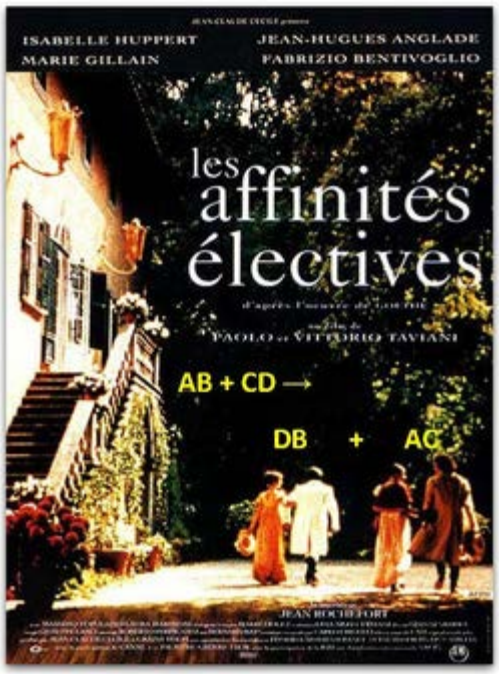

Left: The principle characters in Goethe's *Elective Affinities* (Eduard, Charlotte, Captain, and Ottilie) original drawing by Heinrich Dahling, engraved by Heinrich Schmidt for the 1811 German edition. [8] Right: 1996 French film adaptation of *Elective Affinities*.

German historian Jeremy Adler notes that Goethe mentions both Bergman and French chemist Claude Berthollet in connection with his studies on affinity. Specifically, in a conversation with his friend Riemer on 24 July 1809, Goethe specifically names Bergman as a source for his for the idea of "elective affinity", using the early German translation of that term, namely "*Wahlverwandtschaft*", which became an inspiration for his novel. [4]

Complexity | hidden secrets

A unifying theme in Goethe's statements surrounding his *Elective Affinities* is the novel's complexity.

From his earliest remarks to friends and later conversations with those, such as Johann Eckermann, Goethe stressed over and again the novel's intricate structure and veiled meaning. He told composer Karl Zelter that he had placed numerous different elements within the text, but that many of these were hidden; also that past the veiled quality of the work lays the "truly intended Gestalt."

Goethe's *Elective Affinities* can best be described as a mixture of (a) the Rosetta stone, in the sense that it is one of the most cryptic publications ever, as evidenced by Goethe's open comment that hidden in it are layers upon layers of gestalt; two of the keys to its

To his neighbor and author Christoph Wieland Goethe stated that the novel had to be read at least three times before it could be understood. To his publisher Johann Cotta, he wrote that there is much hidden within the novel.

To French diplomat Karl Reinhard, Goethe predicted that the novel's meaning might remain incomprehensible for a time, only to be rediscovered through multiple rereadings at a later date. [5]

Goethe commented that in his *Elective Affinities*, he had hidden numerous correlations and "offenbares Geheimnis," patent secrets or open secrets, like a work of

translation being Clausius' *Mechanical Theory of Heat* and Gibbs' *On the Equilibrium of Heterogeneous Substances*; and (b) Pandora's box, being that *Elective Affinities* has been described, as summarized by Herman Grimm, as "Goethe's most dangerous work", and example of this "danger" as can be glimpsed in the recent post 9/11 heated Rossini debate.

nature herself. [16] Beyond this, Goethe has frequently stated that withing the novella are hidden multiple layers of Gestalt and that the work must be read multiple times for proper understanding.

OTTO

See main: Otto (cryptography); See also: Anagram

It has frequently been pointed out that the four main characters as well as the child that is born share the same root name "Otto". [5] Both Eduard and the Captain were called OTTO in youth; the two women CharlOTTE and OTTilie, have related names; and the misfortune child born out of the "mental" double adultery (or double elective affinity) of the four main characters (reactants) is called Otto. [4] Opinions differ as to why Goethe used this naming riddle, but the modern chemical view would argue that Goethe intended the reader to grasp the logic that each person is a different type of "human chemical" in essence.

Scottish biographer and German literature lecturer John Williams gives one of the best summarizes of Goethe's intricate use of this anagram. [23]

Mittler

See main: Mittler

American chemist Roald Hoffmann argues that the character Mittler, "the mediator", whose central point was to never enter any house where there was not a dispute to settle or difficulties to put right, was the role model for a catalyst or human catalyst. [8] In Goethe's mind, however, Mittler more likely was modeled on the theory of "mediating affinity", a species or substance the brings about an action in or between two other chemical species. [2]

Wet Way and Dry Way

It has frequently been argued that Goethe intended the estate to be his retort, beaker, reaction vessel, or selectively closed reaction container. In this sense, it might be the case that Goethe intended the "land" of the estate to be representative of Bergman's listing or grouping of reactions, in his affinity table, in the "dry way" (without water) and the lake of the estate to be representative of Bergman's listing of reactions in the "wet way" (aqueous) or in the presence of water. In this sense, if this supposition is correct, the drowning of the child (Oto) would have been Goethe's secret method of describing a human chemical reaction in the "wet way" or in the presence of water.

Choice

Australian religious studies scholar Andrew Kania summarizes Goethe's *Elective Affinities*, in regards to choice and how changes in external circumstance affect choice, as such: [22]

> "The German poet, Goethe, in his novel *"Elective Affinities"*, describes a situation by which those who were once attracted toward one another, ("an affinity"), are torn apart by a change in circumstance; hence they "elect to be together" and "then elect to be apart". For Goethe, the theory is that we bind ourselves according to that which we are most passionate about, the more we yearn or love something or someone, the tighter we bind. To bind ourselves requires a degree of maturity and commitment. When faced with a decision to make, we choose on the basis of what would do our conscience best. Rather than vacillate in a grey world, we have the courage to elect an affinity; and each of us is required to elect an affinity of varying degrees of gravity throughout our lives. As mature adults we are required to commit."

Overall, this seems to be a fairly cogent description.

PhD dissertations

At least two PhD dissertations have been done in attempt to decipher the scientific framework to Goethe *Elective Affinities*. The first is American Robert David Gould's 1970 PhD thesis "Elective Affinities: an Investigation of the Influence of Goethe's Scientific Thinking on *Die Wahlverwandtschaften*". [18] Gould's take on Goethe's *Elective Affinities*, however, seems to have been a stab in the wrong direction. Gould, for instance, compares Eduard and Charlotte's development to plants. [19]

The second dissertation on Goethe's *Elective Affinities*, in what has turned out to be one of the most-valuable dissertations of the 20th century, is German science historian Jeremy Adler's 1977 PhD done on the chemistry theory used in Goethe's novella, which amounts to a historical mastery of 18th century chemistry, particularly affinity chemistry, and his followup chapters and articles in the decade to follow. [4]

Reception

In an 1827 conversation with Johann Eckermann, Goethe discusses a letter from Solger to Tieck in which kind words about the *Wahlverwandtschaften* (Elective Affinities) were spoken on the fine nature of the Architect's character. Goethe comments on this letter that:

> "These remarks were written as early as 1809. I should then have been much cheered to hear so kind a word about the *Wahlverwandtschaften*; for at that time, and afterwards, not many pleasant remarks were vouchsafed be about that novel."

We may conclude from these remarks that Goethe's novella / chemical theory presentation found a cold reception and likely rejection for many people, which of course was due to the fact that the logic of the book was many centuries ahead of its time.

Compensation

Goethe was paid 2,000 taler for his *Elective Affinities* by his publisher Johann Cotta (1761-1837). [30]

Reproductions, remakes, and renditions

Since its publication, Goethe's 1809 novella has been the stimulus for several reproductions:

â— The 1933 oil-on-canvas painting (*Elective Affinities*) by Belgian surrealist artist by René Magritte's themed on Goethe's *Elective Affinities*.
â— The 1950s novel *Pornographia* (and 2003 film adaptation) by Polish writer Witold Gombrowicz is said to be an attempted modern-day remake of *Elective Affinities*, utilizing chemical combination models as well as newer ideas such as Michael Faraday's 1830s lines of force models to explain lines of desire or passion.
â— The 1962 film *Jules et Jim* by director Francois Truffaut was filmed while reading *Elective Affinities*.
â— *Die Wahlverwandtschaften* , 1974, DDR , Regie Siegfried Kühn , ua mit

Left: René Magritte's 1993 *Elective Affinities* (top); 1999 model re-construction (bottom). Right: 1996 French-Italian film adaptation

Hilmar Thate als Eduard, Beata
Tyszkiewicz als Charlotte, Magda Vasary als Ottilie, Gerry Wolff als Hauptmann.
â— *Die Wahlverwandtschaften.* Frankreich, BR Deutschland 1981/1982, TV-Spielfilm, 118 Min., Regie: Claude Chabrol , Erstsendung: ARD , 4. April 1982, ua mit Helmut Griem als Eduard Otto, Stéphane Audran als Charlotte, Michael Degen als Hauptmann Otto, Pascale Reynaud als Ottilie.
â— John Banville's 1982 novel *The Newton Letter*, adopts aspects of Goethe's novella; the inhabitants of 'Fern House', of Banville's book, e.g., are Edward, the often drunk master of the house; Charlotte, his wife, a tall, middle-aged woman with an abstracted air and a penchant for gardening; Ottilie, the big, blonde, twenty-four year old niece of Charlotte; and Michael, the adopted son of Edward and Charlotte.
â— The 1993 play *Arcadia* by British playwright Tom Stoppard is a modern re-write of *Elective Affinities*, juxtaposed between the years 1809 and 1989.
â— The 1996 film *Le affinità elettive* by Paolo Taviani is the French-Italian version of the book (with English subtitles).

Thermodynamics

In 1882, German physicist Hermann Helmholtz proved, through derivation and based partially on the earlier work of Willard Gibbs (1876), in his *On the Thermodynamics of Chemical Processes*, that the measure of affinity *A* is free energy, Gibbs free energy *G* or Helmholtz free energy *F*, depending on the type of process; which for typical reactions occurring on the surface of the earth, is Gibbs free energy, whereby affinity is defined as a function of entropy *S*, temperature *T*, and enthalpy *H*:

$$A = T\Delta S - \Delta H$$

Modern writers, are thus forced into the puzzling picture of how entropy, the most elusive quantity in science, is to be understood in the context of human interactions. This is seen in the works of American writer Thomas Pynchon as well as playwright Tom Stoppard. The following quote, for instance, gives an incontext comparison of *Elective Affinities* to Pynchon's 1966 *The Crying of Lot 49*, in which entropy theory in employed: [10]

> "Pynchon's novel points outside itself: the act of reading, to use thermodynamic terminology, can either be adiabatic or irreversible, either locking in the unchanging garden of fiction, or open to the shifting and uncertain world of choice, emotion, and community. The achievement of *The Crying of Lot 49* is its ability to speak unwanted words without a hint of preaching or propaganda. The book's transformation of the impersonal language of science into a language of great emotional power is a breathtaking accomplishment, whose nearest rival is perhaps Goethe's *Elective Affinities*."

To clarify, although this quote makes a good comparison, as Goethe used the affinity ($A = T\Delta S - \Delta H$) as the theoretical construct of his story, whereas Pynchon used entropy change (ΔS) in his, we must point out that Goethe's presentation was many levels above that of Pynchon. Likewise, Stoppard's 1993 play *Arcadia*, a remake of Goethe's *Elective Affinities*, delves into open discussions on entropy and heat of sex occurring between different characters, but similar to Pynchon, or anyone else for that matter, fails to discuss enthalpy change.

The discussion of enthalpy change ΔH of human chemical reactions requires a minimum of a degree in either physical chemistry or chemical engineering, plus a basic reading of nearly every article in this encyclopedia, plus a basic desire to re-master and re-work the entire field of chemical thermodynamics, to even begin to be able to write cogent sentences about enthalpy of human reactions.

English translations | with introductions

See main: Elective Affinities (translations)

The 1872 D.W. Niles English translation (translator anonymous) has an introduction by American woman's rights activist Victoria Woodhull.

Praise

The modern view of Goethe's novella is summarized well by the 2009 view of American Pulitzer Prize-winning book critic Michael Dirda: “The greatest German novel before the 20th century is probably Goethe’s *Elective Affinities*.” [11]

Videos

The following are various related videos and images:

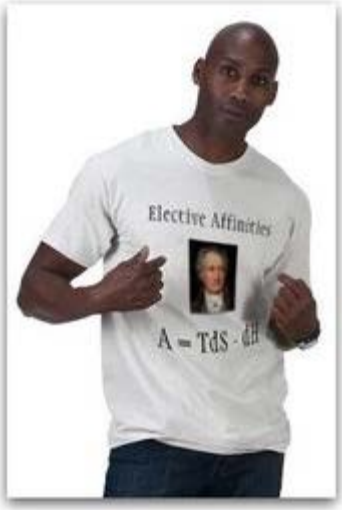

Left: Commemorative video on the 200th anniversary (October 2009) of the publication of Goethe's ***Elective Affinities***. Right: 200th *Elective Affinities* Anniversary T-shirt, designed by Libb Thims, displaying the modern formulaic understanding of affinity A, as a function of entropy S, temperature T, and enthalpy H. [15]

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External links

â— Elective Affinities – Wikipedia.
â— Elective Affinities (timeline) – Google.com.
â— Elective Affinities – Facebook.com.

θΔics

In art thermodynamics, **Elective Affinities** is a 1933 oil on canvas painting Belgian surrealist artist by Rene Magritte, based on aspects, particularly free will in relation to the laws of chemical affinity, of German polymath Johann von Goethe's 1809 scientific novella *Elective Affinities*. [1] The painting characterizes the reality that although we are born free or may, at times, feel free, we are always "caged" by forces or chemical affinities over which we have no control. [2] The following quote by Goethe summarizes the message of the painting:

> "None are more hopelessly enslaved than those who falsely believe they are free."

(add discussion)

Left: Belgian surrealist artist Rene Magritte's 1933 oil on canvas painting entitled "Elective Affinities" based on the human chemical theory of German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*, according to which the "will" is largely determined by forces external (1796).Right: some 2012 **free will** artwork, based on Margritte's painting, the idea that we are each hatched into a world caged by external forces. [5]

Logic of

In Goethe's time, his view was that each person was an evolved form of a chemical species and that the various reaction laws of chemical affinity, which number up to ten depending on which chemist is sourced, determine the fate and destiny of human relationships, intimate, social, and political. [3] Subsequently, in the novella, the characters compare the passions, friendships, and animosities of reactions between people in different combinations and discuss the nature of these in comparison to the reaction lives of the chemicals. The central chemical theory used in Goethe's novella stems from Swedish chemist Torbern Bergman's 1775 textbook *A Dissertation on Elective Attractions*. As such, for either a human or a chemical born or synthesized in a reactive system to assume that they are chemically "feel" is illogical.

Other

The picture is used on the cover of American philosopher Lydia Goehr's 2008 book *Elective Affinities* on the philosophy of music and aesthetics, the first chapter of which opens with a discussion of Geothe's *Elective Affinities.* [4]

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θΔics

In films, ***Elective Affinities*** (original title: *Le affinità elettive*) is a French-Italian rewrite of German polymath Johann von Goethe's 1809 novella *Elective Affinities* by the brothers Paolo Taviani and Vittorio Taviani. [1] The film stars Isabelle Huppert, as Charlotte, Jean-Hugues Anglade, as Edouard, and Marie Gillain, as Ottilia. [2] The film is 98-minutes long and in Italian.

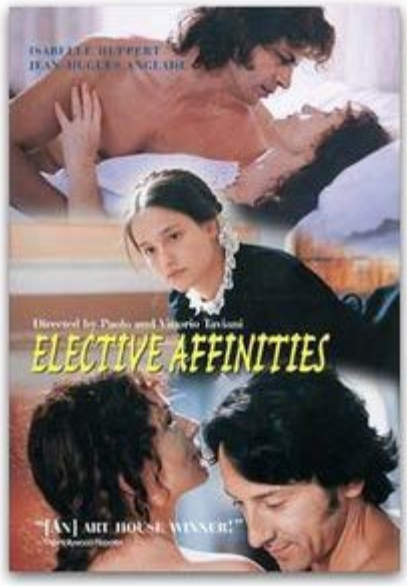

An English-subtitled version of the 1996 *Le affinità elettive*.

See also

â— Elective affinity (chemical term)
â— Elective Affinities (1933 painting)

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θΔics

In art chemistry, **Elective Affinities** was a 2004 art gallery exhibit by Brazilian artist Tunga. [1]

The gallery consisted of half-naked dancers, classical music, and a large display of curtain-divided partitions surrounded by chains and larger steel boulders with teeth embedded and detached, presented at the Christopher Grimes Gallery, Los Angeles, from May 22nd to July 3rd, themed on German polymath Johann Goethe's 1809 novella *Elective Affinities*. [2]

Display and live video clip of the 2004 gallery "Elective Affinities" by Brazilian artist Tunga. [1]

The meaning of the gallery seems to be something along the lines of that breaking free of (or being forcefully ripped from) strong sexual bonds is similar to the act of getting teeth pulled, often being a painful experience for many, or for others an innocuous, sometimes pleasant, experience, depending on if one is anesthetized during the process, or not.

The chains seem to be symbolic of the strength of the bond holding people in relationships, being akin to Belgian surrealist artist by René Magritte's 1933 oil on canvas work "Elective Affinities (painting)", which depicts an unhatched egg locked in cage, the cage being representative of the idea that we are all bound by the forces of elective affinity.

See also

â— Elective Affinities (1933 painting)
â— Elective Affinities (1996 film)

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θΔics

In cultural reactions, **Elective Affinities (admirers)**, as compared to its enemies, refers to admires, fans, or proselytes of German polymath Johann Goethe's 1809 physical chemistry based novel *Elective Affinities* (see: Goethe timeline) and or adherents or advocators of the great revolutionary doctrine embodied within.

> "In 1809, Goethe printed the most exceptionable of his novels, the *Wahlverwandschaften* ("Elective Affinities"), in which the charms and graces of this style are employed in the description of the impulses which spring from the collision of passion and duty in the relations of marriage. By the title of the book, and in the whole spirit of it, he would represent that sexual affinities follow the same inevitable law as chemical affinities, and that humanity struggles impotently against the dictates of nature. Like all his productions, this was suggested by circumstances in his own experience. The work shocked the moral world, in spite of the beauty with which it was written, and to this day tasks the ingenuity of those of his **admirers** who seek to defend it from attack [by] [**enemies**]."
>
> — *New American Cyclopedia* (1859), edited by George Ripley and Charles Dana

> "In 1809, Goethe published a book which was a **puzzle** both to his **admirers** and his **enemies**. This was *Elective Affinities.*"
>
> — Hjalmar Boyesen (1885), "The Life of Goethe"

List

The following is a listing of admirers, followers, and devotees of *Elective Affinities*:

Admirer	Date	Description
Germaine Stael (1766-1817) French-born Swiss writer	c.1810	In her publication *On Germany*, written following her 1803-date exile to Germany by Napoleon, for publishing her controversial novel *Delphine* (1802), during which time she entered into the Goethe-Schiller circle, she, supposedly, commented on Goethe's *Elective Affinities* "one cannot deny that there is in this book a profound understanding of the human heart, but it is a discouraging one. Life is presented as a thing of indifferent value, however one regards it—sad when one gets to the bottom of it, pleasant enough when one evades it, prone to moral ills, which one must cure if one can and of which one must die if one cannot." [3]
Heinrich Heine (1797-1856) German poet	c.1810	Claimed, supposedly that that Goethe was a corrupter of religion; that the novel overturns "everything holy" and is an attack against religion, morality, and the social forms. [2] In his later writings, he commented how beautiful was the explanation about the laws of reproduction by Goethe.
Arthur Schopenhauer (1788-1860) German philosopher (IQ=185)	1816	Goethe's sole direct human chemistry protégé; based his will to power theory, and a large amount of his monumental two-volume *The World as Will and Representation* (1818, 1844), on Goethe's human elective affinities theory, whom he talked to personally about (1816-1819), explaining, therein, how chemical phenomena and reactions scale up to the human-human interaction level.

George Eliot (1819-1880) English realism philosopher / novelist (IQ=190)	1854	In a debate with German literary historian Adolf Stahr (1805-1876), she defended the *dénouement* of Goethe's *Elective Affinities*, and in most of her works to follow—most notably her 1872 novel *Middlemarch* on *Elective Affinities*—employed Goethe's human chemical theory as the structural backbone of her realism views.
Victoria Woodhull (1838-1927) First female US presidential candidate	1871	Believes that a "subtle insinuation of a great revolutionary doctrine pervades the whole."
Max Weber (1864-1920) German sociologist	1878	At the age of 14, read *Elective Affinities* in the classroom, "hiding it behind his textbook", and went on to formulate a large amount of sociology theory, through the his reformulation or rather reinterpretation of the standard Goethean elective affinities into what has come to be known as Weberian elective affinities, proposing that there is an "elective affinity" between important ideological, economic, and social interests, conditions, forces, and processes constituting the development of rational capitalism; the 2013 University of Sao Paulo, Brazil, "Architectural Elective Affinities Conference", is themed on the subject of "architectural elective affinities", defined as a "complex borrowing of Weberian elective affinities". [1]
Joseph Cook (dates)	1879	In his collected lectures book *Scepticism and Rationalism: Elective Affinities and Hereditary*, gave a 15-point set of rules as to how Goethe's elective affinities regulate relationships. [2]
Wilhelm Bolsche (1861-1939) German natural scientist	1889	Is of the opinion that the novel is realistic due to its portrayal of natural forces and psychology, but that it should be seen as a predecessor to such realistic works such as George Eliot and Balzac, and is a pioneering work of literary realism.
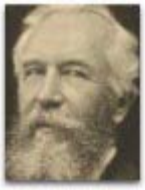 Ernst Haeckel (1834-1919) German physician and biologist	1899	Believes that "Goethe, in his classical romance, *Affinities*, compares the relations of pairs of loves with the phenomenon of the same name in the formation of chemical combinations. The irresistible passion that draws Edward to the sympathetic Ottilie, or Paris to Helen, and leaps over all bounds of reason and morality, is the same powerful unconscious attractive force which impels the living spermatozoon to force an entrance into the ovum in the fertilization of the egg of the animal or plant—the same impetuous movement which unities the two atoms of the hydrogen to one atom of the oxygen for the formation of the a molecule of water. This fundamental unity of affinity in the whole of nature was recognized by the great Greek scientist Empedocles in the fifth century BC in his theory of the love and hatred of the elements."
Leopoldo Alas (1852-1901) Spanish realism	1890	His novel *His Only Son*, supposedly, is a so-called successor to *Elective Affinities*.

novelist		
Fielding Garrison (1870-1935) American science historian	1901	Believes Goethe's "chemical anthropomorphisms" (see: anthropomorphism), as he calls them, "seem so plausible and fascinating", and are in some way related to American engineer Willard Gibbs' 1876 chemical thermodynamics.
René Magritte (1898-1967) Belgian surrealist artist	1933	Painted "Elective Affinities" of very large egg about to hatch in a very confined cage.
Witold Gombrowicz (1904-1969) Polish lawyer turned dramatic novelist	1955	His *Pornographia* (and 2003 film adaptation) is a remake, described by him as a "descent to the dark limits of the conscience and the body".
Jeremy Adler (1947-) English affinity chemistry historian and German-languages scholar	1969	Spent 1969 to 1977 doing research into the history, chemistry, and background to the reactions used to construct each chapter of the novella; published many expansions of this work in both English and German, in chapter and article form, into the 1990s.
Tom Stoppard (1937-) English playwright	1993	Did a remake of *Elective Affinities* in the form of the play *Arcadia*, albeit with a twist: the story is juxtaposed between the years 1809 (time of publication of original) and the modern day, and the storyline involves heat, the second law, the steam engine, the "attraction that Newton left out", chaos theory, among other modern day science aspects.
Kevin Yee (1970-) American Germanic-languages scholar	1997	His "The Captain as Catalyst in Goethe's *Wahlverwandtschaften*" attempts to argue that Captain acts as a catalyst (or human catalyst) who "propels, accelerates, and alters the reaction without being affected himself."
Karl Fink (c. 1960-) American Germanic-languages scholar	1999	His 1999 conference presentation turned 2001 book chapter "Goethe's Intensified Border" builds on the earlier human chemical reaction theory work of Jeremy Adler (1969), to present tentative formulations and gives discussion of nine of the supposed thirty-six Bergman-style chemical reactions that Goethe, supposedly, used as frameworks for each of his 36 chapters.
Astrida Tantillo (c.1963-)		

American Germanic-languages and Goethean scholar	2001	Published Goethe's *Elective Affinities* and the Critic.
Jurgen Mimkes (1939-) German metalurgist, thermodynamicist, and physical socio-economist	2000s	His *circa* 2000s articles and working manuscript *Chemistry of Social Bonds* (2010-present) open to quotes and discussions of Goethe and his elective affinities theories.
Libb Thims (1972-ACM) (222-AG) American electrochemical engineer (IQ=~190)	2006	Discovered Goethe and his affinity chemistry based human chemical reaction theory in 2006, via footnote 2.5 of Belgian chemical thermodynamicist Ilya Prigogine's 1984 *Order Out of Chaos*, after previous searching for the first theorizer of this topic and researching the same topic for a period of eleven years, following the supplanting of the question into his mind while sitting in his undergraduate chemical engineering thermodynamics class, but for whatever reason not raising his hand to ask the question openly in class (see: reverse engineering puzzle; love thought experiment; Thims history).
Wolfe von Lenkiewicz (1966-) British artist	2011	Painted an oil on canvas 210 x 160 centimeter artwork entitled “Elective Affinities”, depicting a mixture of the thematics of Lewis Carol’s 1865 fantasy novel *Alice and Wonderland* and Goethe’s *Elective Affinities*.

Discussion

To note, the distinction between those who are admirers as contrasted with those who are enemies, seems to fall within the framework or distinction of those who, in modern times, consider themselves to be giant molecules (human molecules), as contrasted with those who do not, such as indicated in the 2001-present polling numbers of English physicist Jim Eadon, the results of which show that about 43 percent of people do "not" believe that they are in fact a large animated molecule; this number should likely corroborate similarly with the percent of people who are enemies of Goethe's *Elective Affinities*.

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θΔics

In hmolscience, **Elective Affinities (confusion)** refers to a semi-prevalent ignorance seen in literature, and in cultural mindset, in respect to the scientific position of Goethe 1809 chemical affinity based human chemical theory; which tends to accrue either by discussion of how Goethe failed to account for "split affinity theory", aka Berthollet's affinity theory (1799), in his novella, or via a blanketed statement to the affect that Goethe used an "out dated" theory, or something along these lines; whereas correctly in 1882, via Helmholtz ("On the Thermodynamics of Chemical Processes") and the thermodynamic theory of affinity, the premise or model of the forces of affinity or the force of reaction, and affinity chemistry in general, were subsumed into the model of free energy, Gibbs energy in human chemical reactions, and chemical thermodynamics in generally, and that in the years following 1923, via Gilbert Lewis (*Thermodynamics and the Free Energy of Chemical Substances*), the word "affinity", according to Henry Leicester (1956), was replaced by the word "free energy" throughout the English speaking world; a cultural ignorance has fermented since.

Overview

In 2008, Stefani Engelstein, in her *Anxious Anatomy: the Conception of the Human Form in Literary and Naturalist Discourse*, devoted her chapter "Formative Drives", on Goethe's *Elective Affinities*, albeit done in such a way that she seems to give a classic example of a confused interpretation of Goethe's human chemical theory. Engelstein, not only says that the theory used by Goethe was an "outdated chemical concept", but goes on to attempt to marginalize and to discredit the human chemical theory used by Goethe, arguing that: the title is a "misleading allusion"; that the "characters do not mimic the behavior of the chemicals to which they are compared"; that Goethe's famous anonymous advertisement was him pointing out that he was "not trying to map human relations into chemical reactions or *vice versa*"; that Goethe, in his essay "Analysis and Synthesis", and his mention of the Danaids, was his admittance that his theory "cannot hold water", etc., etc., and uses the term "fail" repetitively, in regards to the chemical theory. [5]

Quotes

The following are representative quotes:

> "Lavoisier's triumph was sufficiently complete to make the language of sympathy, antipathy, affinity and attraction seem **utterly archaic** by about the time that Goethe's famous novel, *Elective Affinities*, was published in 1809. In that tour de force, in the context of learning about chemical combination and decomposition, human relationships are formed and broken: the result is tragic, inviting us to reflect upon the differences and similarities of people and things. Chemistry and its associated industry have since evoked all sorts of reactions, in the past often sublime, but nowadays often negative. Where would we be without catalysis or chain-reaction? – but the constant transfer back and forth of serious metaphors between chemistry and human life has ceased for the last two centuries."
>
> — David Knight (2003), "Sympathy, Attraction and Elective Affinity" [6]

> "Goethe's [*Elective Affinities*] did not add any scientific knowledge."
>
> — Tominaga Keii (2004), *Thermodynamics of Chemical Reactions* [1]

> "In the late 1700s, Goethe devised a theory of how colors work, to refute Isaac Newton's theory; except Goethe's relied as much on poetry as science, including his whimsical thesis that "colors are the deeds of light, deeds and sufferings." Not to huff like a positivist, but that statement has absolutely no meaning. He also laded his novel *Elective Affinities* with the spurious idea that marriages work like chemical reactions. That is, if you throw couple AB into contact with couple CD, they all might naturally commit chemical adultery and form new pairs: AB + CD → AD + BC. And this wasn't just implied or a metaphor. Characters actually discuss this algebraic rearrangement of their lives. Whatever the novel's other strengths especially its depiction of passion), Goethe would have been better off cutting out the science. Goethe would have been crushed after his death in 1832 to learn that its science and philosophy [See: Goethean philosophy]

would soon **disintegrate** and that people now read his work strictly for its literary value."

— Sam Kean (2010), *The Case of the Disappearing Spoon*; an example of secular delusion par excellence [2]

"The best example of such idle doings I the conversation in which the chemical 'elective affinities' are mentioned for the first time: Charlotte plays the role of the sensible, down-to-earth wife; Eduard, the *enfant terrible*; the *Hauptmann* (Captain), the well-informed man-of-the world. The irony here is, of course, that the theory expounded on and discussed is already **ten years out of date**."

— Roger Stephenson (2010), *Studies in Weimar Classicism* [4]

"In 19th century chemistry, the term 'elective affinities' was used to describe chemical compounds that only interacted with each other under determined circumstances. The writer Goethe employed this as a universal organizing [see: universal rule] agent running across human relationships and science. I was drawn to these ideas – which are now seen as **degenerated methods** in modern science – as relevant to language, and how we use it."

— Wolfe von Lenkiewicz (2011), interview commentary on his "Elective Affinities" painting [3]

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2. Kean, Sean. (2010). *The Disappearing Spoon: and Other True Tales of Madness, Love, and the History of the World from the Periodic Table of the Elements* (txt) (Goethe, pgs. 239-54, 367). Little, Brown and Company.
3. Pryor, John-Paul. (2011). "Interview: Wolfe von Lenkiewicz on his 'Elective Affinities'", AnotherMag.com, Apr 26.
4. (a) Stephenson, Roger. (2010). *Studies in Weimar Classicism: Writing as Symbolic Form* (pgs. 255-56). Peter Lang.
(b) Note: Stephenson footnotes that with: Jeremy Adler, in my view, errs here by following the scholarly consensus in taking this conversation too seriously. See his illuminating: *Goethe's Elective Affinity and the Chemistry of its Time* (*Ein fast magische Anziehungskraft: Goethe's Wahlverwandtschaften und die Chemie seiner Zeit*) (Munich: Bech, 1987), pgs. 88, 121, 205, 215. See also John Winkelman, *Goethe's Elective Affinities: an Interpretation* (New York: Peter Lang, 1987), pgs. 142, and Lesley Sharpe's review of Winkelman, *MLR*, 86, 1991, 785-87.
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θΔics

In cultural reactions, **Elective Affinities (enemies)**, as compared to its admirers, refers to enemies, objectors, or non-fans of German polymath Johann Goethe's 1809 physical chemistry based novel *Elective Affinities* (see: Goethe timeline) and or objectors or detractors of the great revolutionary doctrine embodied within.

> "In 1809, Goethe published a book which was a **puzzle** both to his admirers and his **enemies**. This was *Elective Affinities*."
>
> — Hjalmar Boyesen, "The Life of Goethe" (1885)

List

The following is a listing of enemies, detractors, or protestors of *Elective Affinities*:

Enemies	Date	Description
Anonymous woman (friend of Heinrich Laube)	1809	Commented to Goethe: 'I cannot approve of *Elective Affinities*, Herr von Goethe; it really is an immoral book!'
Friederike Helene Unger (1741-1813) German writer	c.1809	Wrote to German translator and critic August Schlegel (1767-1845) that the morality of the book is "atrocious". [2]
Ludwig Tieck (1773-1853) German poet and romantic movement novelist (IQ=165)	c.1809	Called Goethe's novella "torture affinities"; a fact that German writer and novelist Bettina Brentano (1785-1859) let Goethe know. [2]
Karl Knebel (1744-1834) German poet	1810	Commented to Goethe: "he could not stomach it" (Feb 7). [2]
Christoph Wieland (1733-1813) German poet and writer (IQ=170)	1810	Commented in a letter to German philologist and archeologist Karl Böttiger, which he suggested should be "burned" after it is read, that: "to all rational readers, the use of the chemical theory is nonsense and childish fooling around"; supposedly, objected owing to the "radicalness of its Christianity" (Jul 16); in another letter, whose addressee, a woman, is unknown, he stated: "I confess to you, my friend, that I have read this truly terrifying work not with out feeling or concern."
Tominaga Keii (1920-2009)		Stated in his chemical thermodynamics chapter, specifically in his mis-dated subsection "Chemical Affinity in 1806", of his *Heterogeneous Kinetics*, after nearly re-quoting the entire part of the famous "chapter four", that in his concluding

Japanese chemical engineer	2004	passing remark view the human chemical reaction theory and the publication "did not add any scientific value."
Sam Kean (c.1980-) American science writer	2010	In his laymanized chemistry history book *The Disappearing Spoon: and Other True Tales of Madness, Love, and the History of the World from the Periodic Table of Element*, he attempts to deride Goethe's *Elective Affinities*, commenting, for example: "Goethe would have been better off cutting out the science" and that "Goethe would have been crushed after his death in 1832 to learn that its science and philosophy would soon disintegrate and that people now read his work strictly for its literary value."
Ryan Grannell (c.1991-) Irish openly atheist biochemistry student	2011	Believes that Goethe's human chemistry theory is a "nutty theory" and that the modern chemical thermodynamics version of Goethe's human chemistry, as presented in the works of American electrochemical engineer Libb Thims, is "calculus coated woo" and "Goethe's *Elective Affinities* wrapped in a lab coat."
Erland Lagerroth (1925-) Swedish literary critic and humanism theorist	2013	"Today I started from scratch again [see: discussion] and when I got to your homepage, I understood. We have different interests and foci, and so we differ in research and results. Already before I quoted from Gladyshev: "History can be predicted with thermodynamics" and now I found another bon mot: "Love is in its ultimate analysis nothing but a chemical reaction" [Anon chemist, c.1922] [5]. You want to understand by reducing, Prigogine, Jantsch and I by comprehending the great connections = relations, processes, wholenesses, systems. Because it is in their world we live - and love and it is this world that is a wonder to be loved. I understand you have found something related to your interest in *Die Wahlverwandtschaften*, but I doubt that Goethe would have loved your reductions. But, maybe, as an experiment [see: love thought experiment]. But the four-five persons certainly are much more than their chemical formulas [see: human molelcular formula]. So I stay with Prigogine and Jantsch and myself. But I admire the tremendous work you have done on your interest, and I know there are many like you. But for me this passion for reduction of our wonderful world is a perversion." [see: anti-reductionism] [4]

Icons

The following icons given a quick-mark indication to the main or central reason for the objection:

Objection	Icon	Description
Religious		The cross icon signifies that the person objects for religious reasons.
Philosophical		The infinity symbol signifies that the person objects for philosophical reasons and or belief system conflict reasons.
Free will		The bird in a cage icon signifies that the person has a "free will" objection, that he or she believes in free will, and as such does not believe in determinism; as is the case in the novella, which itself is based on the experimental results of the 180 reaction experiments presented in Swedish physical chemist Torbern Bergman's 1775 *A Dissertation on Elective Attractions*, each of which are predetermined reactions, as is the case with all chemical bondings, debondings, and or

formation changes, all governed by the nature of affinity tables (Goethe's day) or free energy tables (modern day); the person, in other words, believes that his or her "choices" are under the control of their own mind, that he or she has a "self-drive", among other possible variants.

Discussion

To note, the distinction between those who are admirers as contrasted with those who are enemies, seems to fall within the framework or distinction of those who, in modern times, consider themselves to be giant molecules (human molecules), as contrasted with those who do not, such as indicated in the 2001-present polling numbers of English physicist Jim Eadon, the results of which show that about 43 percent of people do "not" believe that they are in fact a large animated molecule; this number should likely corroborate similarly with the percent of people who are enemies of Goethe's *Elective Affinities*.

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5. Bennett, Frederick M. (1922). “Is Spirit a Chemical Reaction?”, *The Personalist* (pgs. 106-11), *Vol. 3-4.* School of Philosophy, University of Southern California.

θΔics

In films, **Elective Affinities (film adaptations)** refers to film or television renditions or adaptations of Goethe's *Elective Affinities*.

Film | German

In 1974, director Siegfried Kühn (German → English) did a 103-minute German film rendition of the novel; the following being one scene:

(add discussion)

Coppola

In 1979, Francis Ford Coppola began to work on a script for an English mega film rendition of *Elective Affinities*, envisioned as a four-part 8-hour megafilm; the following is a 2003 statement, by Coppola, of this prolonged effort: [1]

> "After *Apocalypse Now* [1979], I had imagined that I was going do this great work, which was going be a series of four films loosely inspired by the Goethe novel *Elective Affinities*. Those of you who know *Elective Affinities* know it's one of the first modern novels and it's a very simple story about a man and his wife. They're living in an absolutely wonderful place, and the man suggests, "Oh, my friend the captain, he's an architect, and I thought it would be nice if he came and lived with us for a while, and he could plan the gardens and stuff." And the wife says, "Well, you know, I really… We're so perfect and happy here that, I was going to say, my niece is—her mother has died, and I was going to invite the niece to come live." And they said, "Well, let's have the captain and the niece." So you have the basic setting of the man, the woman, the other man, the other woman. In Goethe's mind, he was working on a chemical formula. A, B, A-prime, B-prime. And I had a concept to make an ambitious film on that theme."

(add discussion)

TV drama | French

See main: Die Wahlverwandtschaften (TV drama)

In 1982, an 118-minute France, West Germany television remake of *Elective Affinities*, directed by Claude Chabrol, first broadcast: ARD, 4 April 1982, including Helmut Griem as Edward Otto, Stéphane Audran as Charlotte, Michael Degen as Captain Otto, Pascale Reynaud as Ottilie, was done

(add discussion)

Film | French-Italian

See main: [Elective Affinities](#) (1996 film)

The following various covers of the 1996 French-Italian film adaptation —shown below left is *Les affinities electives* (*Elective Affinities*), written and directed by: Paolo Taviani and Vittorio Taviani; produced by: Jaen-Claude Volpi, language: Italian, with English subtitles; below right is a German VHS version:

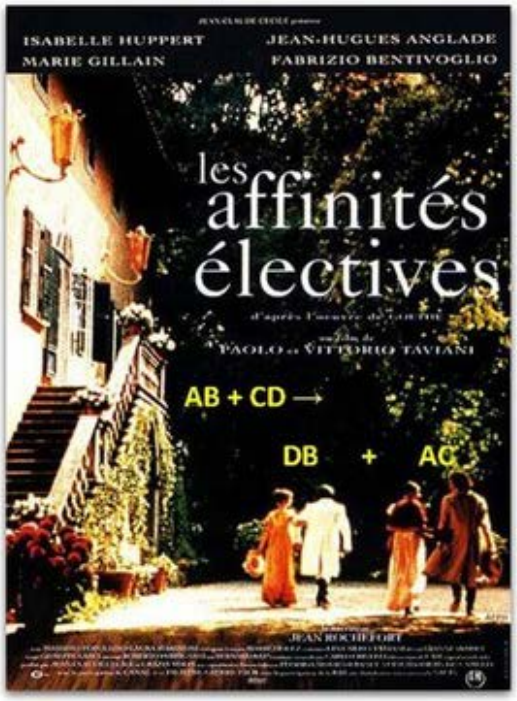

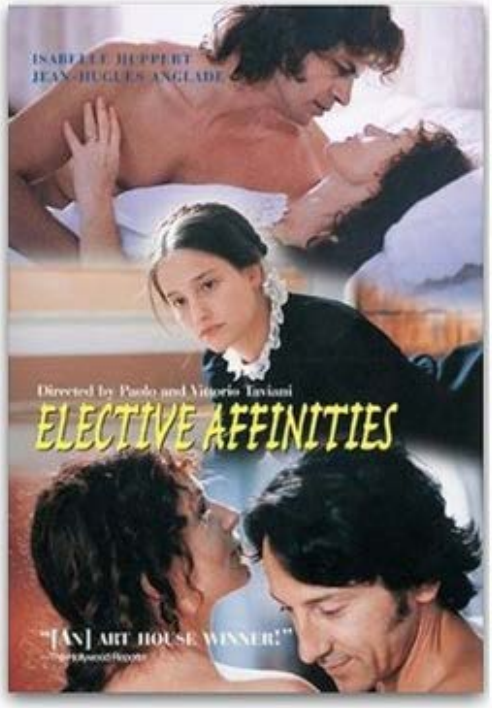

(add discussion)

Pornographia

In 2003, a film adaptation of Polish writer Witold Gombrowicz's 1950s novel *Pornographia*, which is said to be an attempted modern-day remake of *Elective Affinities*, utilizing chemical combination models as well as newer ideas such as Michael Faraday's 1830s lines of force models to explain lines of desire or passion, was made.

Afinidades | Affinities

In 2010, Spanish director Vladimir Cruz produced the film *Afinidades* (Q); the film script, written by Cruz, is based on the novel *Chamber Music* (Musical de Camara) by Reinaldo Montero, and "inspired" by Goethe's *Elective Affinities* or *The Selective Affinities* ("Las afinidades selectivas", as they call it in Cuba.

Cruz is Bruno, a theoretical physicist employee Nestor (Perugorría) who fears for the continuity of his job, married to Magda, a young and romantic woman, without much life experience, who plays the newcomer Gabriela Griffith. (Q)

Corey Nuffer gives the following review synopsis of the film: [2]

> "All films arise from scripts but not all scripts come from novels. After reading Chamber Music (Música de Cámara) by Cuban author Reinaldo Montero, Cuban actor Vladimir Cruz wrote the script for the feature film, Affinities (Afinidades). Along with fellow actor Jorge Perugorría, Cruz co-directed and starred in the film. Their efforts culminated in a film seething with the interstitial complexity that's easily encountered in a novel but less so on screen. Consequently, Affinities tells one story but emotes something as complicated as the human condition. It's a strange sensation to be intuiting such complexity from a film. Perhaps that's why it will keep you thinking long after the closing credits roll. Immediately, the film conveys the sort of tension leading you to believe this story will end in someone dying. Affinities is not a thriller, however, it is drama.
>
> The writing allows for even less breathing space as characters interact with each other with grandiose ideas and brutally short replies. Sometimes these exchanges seem truncated, as if Cruz purposefully withheld anything that would feel like resolution. The absence, then, makes for silence, something that is given fierce presence in the role of Magda (exquisitely portrayed by actress Gabriela Griffith). It is in these exchanges that your mind wanders in a gentle panic. Much like music, it is these spaces of silence or what goes unsaid that are more important than the music itself. And so you continue watching with baited breath and hope for some release.
>
> Cruz even gives to one of the characters, the wonderful Spanish actress Cuca Escribano, the habit of speaking in questions. Indeed, while much of what she has to say provides us with the levity so scarce in this film, she is literally discussed in the movie as speaking in questions. The effect is both cute and frustrating, for many of her questions go unanswered.
>
> With all that is happening under the surface, the plot of the film is somewhat simple: Two couples spend a

weekend together on a getaway. Arriving on a Friday and leaving on a Sunday, they dine together, go boating together, sun themselves at the pool together, watch a show together and in more ways that you can anticipate and imagine, have sex. And there it is: There is a lot of sex in this movie.

Affinities can certainly be considered a part of this genre of picture, but it is also much more. In a press conference for Affinity, Cruz explains that while this is a movie much ado about infidelity, it is also just as much about the individual. He states: "We are only trying to meditate about the human being and their complexities, facing emptiness and the lack of rational explanation for many of the problems of the contemporary world, sometimes appearing that the only way out is to take refuge in instincts." He goes on to say that the instinctual impulse ends up being sex.

No wonder why the movie carries with it such an overwhelming feeling; this is a lot to convey in 90-minutes of film, no matter how well made. Adding to everything is the political dimension: Cuba is still under US embargo. Whether intended or not, the feeling of claustrophobia in Affinities seems to carry with it room to at least ponder just how deep the complexity goes.

And if things weren't complicated enough, Goethe is brought up. For those interested in seeing how deep the rabbit hole goes, there is a nod to Goethe's *Elective Affinities*. While it will provide more place for traction, it will certainly be without solace for the questions brought up in Affinity, with or without Goethe, bear the mark of great art: They keep the conversation going."

(add discussion)

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See also

- Elective Affinities (plays)
- Elective Affinities (translations)

θΔics

In films, **Elective Affinities (plays)** refers to theatrical renditions or adaptations of Goethe's *Elective Affinities* in the form of plays.

Overview

In 1993, British playwright Tom Stoppard produced *Arcadia*, which is a spin on *Elective Affinities*.

In 2011, Claudia Meyers, at the Big House of the National Theatre Weimar, produced a play of the *Elective Affinities*; the following being a scene from the play: [1]

The following is a review of the play by writer Stefanie Grießbach: [1]

> A dubious and flat staging of Goethe's novel *Elective Affinities* by Claudia Meyer saw her performance on DNT Weimar. One child, big eyes, sailor suit comes out of the dark and runs gracefully through the gently rolling meadow, a child will die, a doll. And always floats down from above a gazebo, white, people with Ufobrillen go in and out, talking, screaming, silent to listen. It is anticipated: Who does not know the text of Goethe's *Elective Affinities*, is lost in Claudia Meyers Staging of the novel, on Saturday at the Big House of the National Theatre Weimar like only a debut applauded.
>
> What works in chemistry, is also good for human relationships. Whether love and passion based on reason, morality or pure sex, free will or living in a marriage, she collapses when travel between the laws of nature. Goethe, scientific researching, demonstrates cool and relentless in the fasting experiment, makes the hearts of Edward and Charlotte (Irina Wrona) Such as chemical elements crosswise fly on the Captain and Ottilie and nothing, no renunciation, waiver, not a dead child, stop the love, transcends the laws of nature.
>
> Meyers Staging searches from the beginning the futuristic image, which is conclusive, because the topic is universal. The stage (Alfons Flores), Modern ideal landscape with floating rooms, which come and go, arouses curiosity tingling. Meyer breaks the chronology of events to complete, focuses on the perspective and motivation of the four particles and as the events rolled over again on.
>
> The idea is not bad, it means the consequence of a tough but repeating text and scenes. But the implementation falls then questionable, if the selected text passages do not always appear plausible and if one of the key scenes of the play, the night in which the respective other have the couple making love in mind and in which the child is conceived, the provocative dance of three nudes is, with acrobatic lifts,

which is present at twice with varying participation. The feelings quietly and subtly developed by Goethe in his novel, to be in this production with duplication at the expense of depth not plastic, not understandable, not touching.

If fail then even the young actors of Goethe's language, the desperation is great. The only one who has internalized his text, he is the mediator-(Nico Delpy). The four lovers loud outbursts dominate the game, but no emotion is understandable, you see nothing, you hear only what you hear and Goethe's profound formulated phrases, memorized and sound tinny. No desire and no suffering is felt, not with Edward (Thomas Büchel), Not with Ottilie (Nina Mariel Kohler), Which does not show any character, not shy, not bold, not shattered, a smooth ironed Textaufsagerin that does not touch, decorated in yellow, as an indication of envy and falsehood, perhaps, as the captain (Hagen Ritschel) Comes in shades of red (costumes Ingo Krügler), But is so pale that it is hardly noticed.

During the three-hour evening so flattens the staging, in spite of live music and puppetry really moving (Nicola Reinmöller), Not least because of the lack of power mimic. The beautiful scene degenerates into a mere toy, the Regiemätzchen, sometimes surprising when Luciane Charlotte's daughter, neck plunges over head into the water, or just stupid, if fir needle and Lavendelgeplapper from off interfere with the dialogue, elicit the snap-frozen acting audience sporadically laugh or shocked, "Oh God" exclamation. The desire to read the novel in the original, which probably tickled out the production."

It's a near mockery America is blind to such productions.

The following is a scene from a 2013 German play of *Elective Affinities*: [2]

English: Discreetly holding hands under the tree: Charlotte (Bettina guy) and Otto (Rainer Galke) approach shyly. In the background (left) narrator (Marianne Hoika), niece Ottilie (Mareike Beykirch) and Edward (Andreas Patton).

German: Dezentes Händchenhalten unterm Baum: Charlotte (Bettina Kerl) und Otto (Rainer Galke) nähern sich schüchtern an. Im Hintergrund (v.l.) Erzählerin (Marianne Hoika), Nichte Ottilie (Mareike Beykirch) und Eduard (Andreas Patton).

(add discussion)

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See also

â— Elective Affinities (film adaptations)
â— Elective Affinities (translations)

θΔics

In translations, ***Elective Affinities* (translations)** refers to language translations of German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities* (published 3 Oct 1809, in German), his "best book" (of his 142+ collected works set), the founding book of human chemistry, and precursor book to the very complex subject of human chemical thermodynamics.

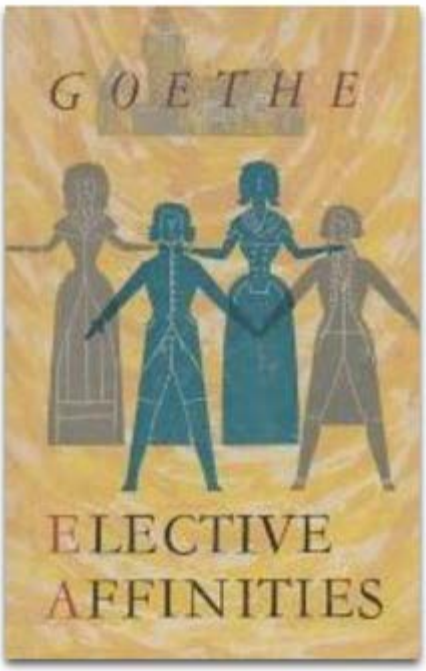

Left: A reprint cover design (date) for the H. Regnery (1963) edition (check). [3] Right: A 2011 Penguin edition (German) showing some type of hot (passion) / cold (breakup) love schematic flow chart. [1]

Translations history

British translator David Constantine, in his 1994 "Note on Translation" section to his Oxford University Press English translation edition of Goethe's novella, comments: [2]

> "Goethe's *Die Wahlverwandtschaften* was translated into French (twice) and into Danish in 1810, only a year after its publication in Germany, but there was no English version until 1854. The translator then was Carlyle's disciple and biographer J.A. Froude [although "anonymous" until 1901], and *Elective Affinities* appeared among other "Novels and Tales by Goethe" in a volume of Bohn's Standard Library. Mr Bohn himself introduced it with a warning:
>
> > 'Exceptions may be taken to some of the statements contained in this production of Goethe.'
>
> But, quoting Carlyle: 'Fidelity is all the merit a translator need aim at', he absolved Mr Froude at least of any blame. That version, several times reprinted, was the standard onoe until 1960 I know of four since then: by H.M. Waidson (1960, *Kindred by Choice*); by Elizabeth Mayer and Louise Bogan (1963); by R.J. Hollingdale for Penguin Classics in 1971; and by Judith Ryan in Volume XI of the American Suhrkamp edition of Goethe's works, in 1988."

In this chronology of translations, we note, quite humorously, how the first two English translators (1854; 1872) remained "anonymous", naturally, of course—this work being "Goethe's most dangerous work" (Herman Grimm, 1875) and the Robe of Nessus (Goethe, 1827) for many who read it.

Elective Affinities: Illustrated and Annotated

The 1885 translation by Norwegian-born, German educated, American European languages professor Hjalmar Boyesen (1848-1865), with its plethora of images, done by "the best German artists", has served as the basis for the 2012-

launched online chapter-by-chapter (wikipage-by-wiki page) *Hmolpedia*-turned 2013 print book *Elective Affinities: Illustrated, Annotated, and Decoded* by Libb Thims, using Goethean reaction theorists Jeremy Adler and Karl Fink's chapter reaction equation speculations as reference points; assigning a Bergman-based chemical reaction for each of the 36 chapters; among other decoding, annotation, and commentary.

English translations

The following are English translations:

Date	Cover/Title page	Reprint covers	Translator
1809	● Goethe, Johann. (1809). *Die Wahlverwandtschaften*. Cotta.		● Goethe, Johann. (1976). *Wahlverwandtschaften* (with Essay by Walter Benjamin and notes Hand J. Weitz). Frankfurt AM Main: Insel Verlag. Essay: Walter Benjamin (1892-1940). Notes: Hand J. Weitz ().
1854	● Goethe, Johann. (1854). *Novels and Tales: Elective Affinities; The Sorrows of Werther; German Emigrants; The Good Woman; and a Nouvelette* (translation chiefly by R.D. Boylan (*Elective Affinities*, pgs. 1-). London: Henry G. Bohn. ● Goethe, Johann. (1913). *The German Classics of the Nineteenth and Twentieth Centuries: Masterpieces of German Literature Translated Into English, in Twenty Volumes Illustrated, Volume II: Johann Wolfgang von Goethe* (List of Illustrations, pg. ii; Introduction to The Elective Affinities, pgs. 1-4, by Calvin Thomas; The Elective Affinities, pgs. 5-278, translated by James Froude and R. Dillon Boylan; edited by Kuno Francke and Isidore Singer). The German Publication Society.		The translator to this first English translation, London edition, remained "anonymous". As commented by the publisher Henry Bohn, in the preface to this collected works set: 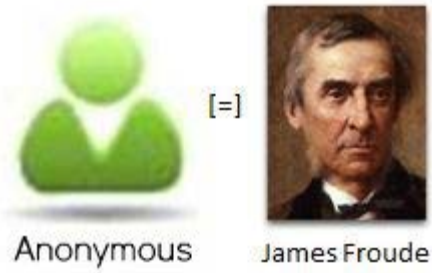 "The works of Goethe, comprised in the present volume, are entirely new translations, made expressly for the series of German Classical Works, which find their place from time to time in the "Standard Library." The *Elective Affinities* has been executed by a gentleman well known in the literary world, who does not wish his name to appear. It is possible that exceptions may be taken to some of the statements contained in this production of Goethe. But to use the language of Carlyle, "Fidelity is all the merit a translator need aim at, to convey the author's sentiments as he himself expressed them, and to follow the original in all its variations. … The entire volume, excepting the *Affinities*, has been translated by R. Dillon Boylan, Esq., who is favorably known to the readers of the "Standard Library," by his version of Schiller's *Don Carlos*."

A 1901 “Publisher’s Note” identified the translator as English writer James Froude (1818-1894). [5]

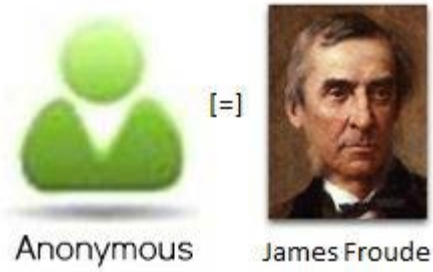

1872

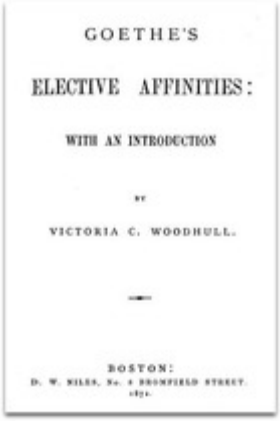

● Goethe, Johann. (1872). *Elective Affinities* (introduction by Victoria C. Woodhull; translator anonymous). D.W. Niles.

The "anonymous" translator here, based on text comparison, seems to be James Froude (1854).

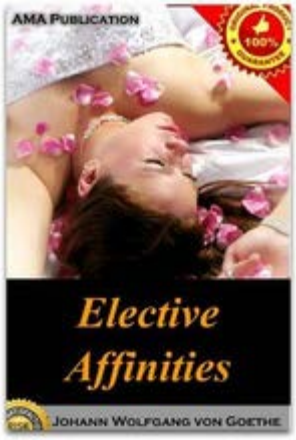

(2011 Kindle version, by AMA Publications).

The translator to this edition was listed as "anonymous".

Victoria Woodhull comments on this in her introduction:

> "Indeed, it strikes me almost ludicrous, that the translator has shrunk from appending his name to the work, if he has done so from any idea that its dangerous views might tend to impair his reputation."

1884

● Goethe, Johann. (1884). *The Sorrows of Werther; Elective Affinities; and a Nouvelette* (edited and revised by F.H. Hedge and L. Noa) (*Elective Affinities*, pgs. 111-362). S.E. Cassino and Co.

Translator: (add).

1885

● Goethe, Johann. (1885). *Goethe’s Works, Illustrated by the Best German artists*, 5 volumes (by Hjalmar Boyesen) (Volume 5: W. Meister’s Travels; Elective Affinities (Part I, pgs. 231-297; Part II, pgs. 298-369; Index, pg. 371; Index of engravings, pgs. 370-76)) (online). Philadelphia: George Barrie.

(online version, date)

Based on text comparison, the version used here seems to be the 1854 James Froude translation.

Translator (series): Hjalmar Boyesen (1848-1865): a Norwegian-born, German educated, American languages professor; a prolific writer, noted for works including: *Goethe and Schiller* (1879), *Essay on German Literature* (date), among others.

1902 ● Goethe, Johann. (1902). *Works: The Sorrows of Young Werther, Elective Affinities* (translation by R. Dillon Boylan [James Froude?]) (List of Illustrations, pg. front matter). F.A. Niccolls & Co.

1960 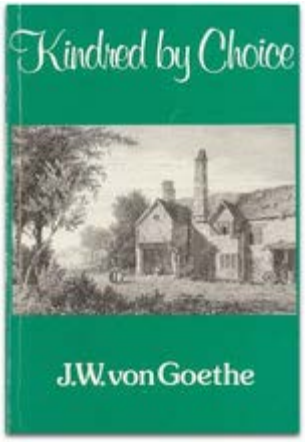

● Goethe, Johann. (1960). *Kindred by Choice* (translation by H.M Waidson). One World Classics.

(2009 reprint)

Translator: Herbert Waidson (1916-1988): a professor and head of the department of German at the University College of Swansea, Wales; he had previously translated Goethe as well as other German and Swiss authors.

photo needed

1963 ● Goethe, Johann. (1963). *Elective Affinities* (translated by Elizabeth Mayer and Louise Bogan with introduction by Victor Lange). H. Regnery Co.

Translators: Elizabeth Mayer and Louise Bogan.

Introduction: Victor Lange

photo needed

1971 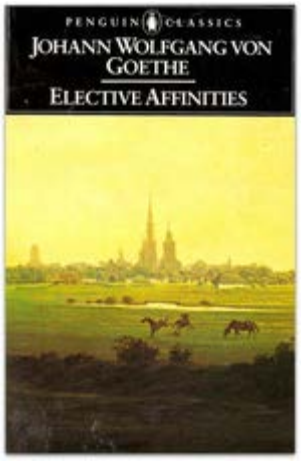

● Goethe, Johann. (1971). *Elective Affinities* (translation and introduction by R.J. Hollingdale; chronology and further reading by David Deissner, 2005). Penguin.

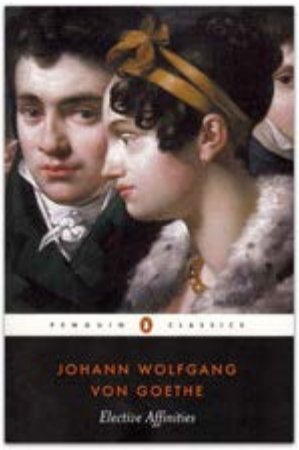

(2005 reprint)

Reginald Hollingdale (1930-2001): English translator and biographer of a number of German works, including: Goethe, Friedrich Nietzsche, Arthur Schopenhauer, among others; he was openly an atheist.

photo needed

David Markus Deissner (1796-) completed his 2007 PhD dissertation on *Moral and Motivation in the Work of Heinrich von Kleists* (*Moral Und Motivation Im Werk Heinrich von Kleists*) at Oxford University, in the medieval and modern languages and literature department.

● Goethe, Johann. (1988). *Elective Affinities* (translated by Judith Ryan); in

Translator: Judith Ryan (1943-).

1988 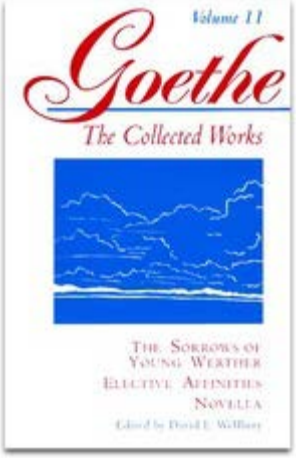

Volume XI of the American Suhrkamp edition of Goethe's works.

1994 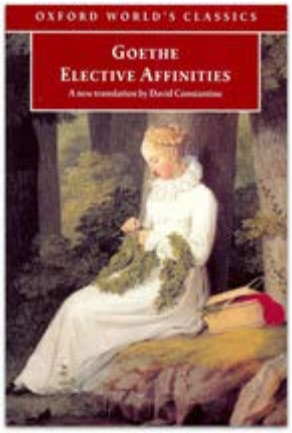

● Goethe, Johann. (1994). *Elective Affinities* (introduction, note on translation, selected bibliography, chronology, and explanatory notes by David Constantine). World Classics.

Translator: David Constantine (1944-): a British translator of German language and literature, poet, and freelance writer. [2]

2013

● Goethe, Johann. (2012-2013). *Elective Affinities: Illustrated, Annotated, and Decoded* (introduction, timeline, annotation, and decoding by Libb Thims). Publisher.

Translator: Hjalmar Boyesen (1848-1865).

Introduction, timeline, annotation, and decoding by Libb Thims (c.1975-)

(add discussion)

See also

● Elective Affinities (film adaptations)
● Elective Affinities (plays)

References

1. Goethe, Johann. (2011). *Die Wahlverwandtschaften*. Penguin.
2. Goethe, Johann. (1994). *Elective Affinities* (introduction, note on translation, selected bibliography, chronology, and explanatory notes by David Constantine). World Classics.
3. Elective Affinities – Amazon.
5. Glass, Derek, Bell, Matthew, and Jones, Martin H. (2005). *Goethe in English: a Bibliography of the Translations in the Twentieth Century* (pg. 233). MHRA.

θΔics

In modern queries, **elective affinities problem**, aka "love thought experiment", depending, similar to the great problem of chemical affinity, classificationally, the hardest intellectual genius puzzle of them all, is the quest to explain human passions, turmoils, and experience via the chemical affinities or free energies, such as depicted adjacent.

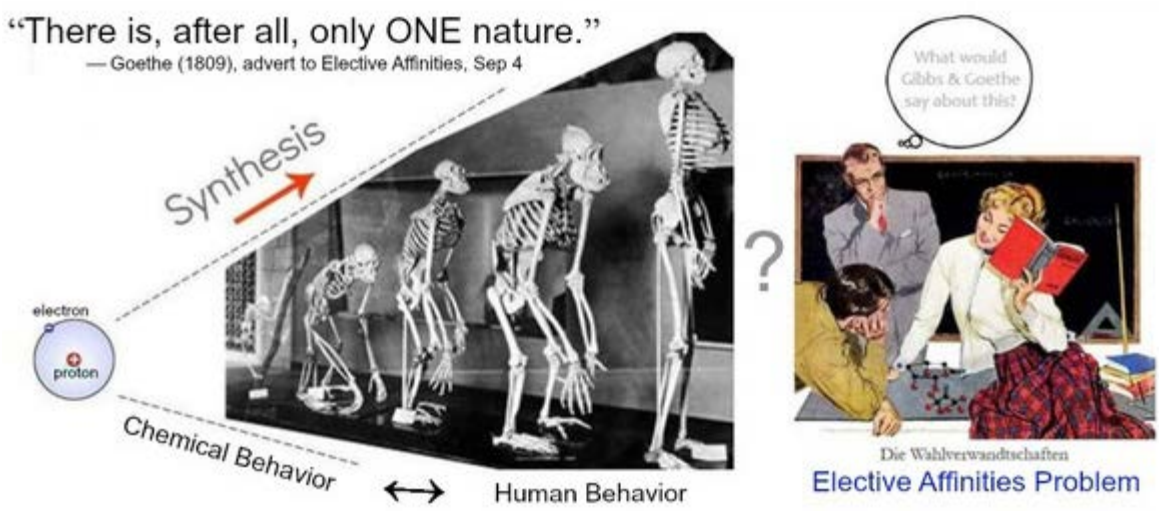

A Thomas Huxley (1871) / Goethe (1809) style depiction of the "**elective affinities problem**" namely: how to explain human behavior through the language of the physical sciences as it explains chemical behavior, according to the view, as expressed in Goethe's 1809 famous advertisement for his newly-published physical chemistry based novella *Elective Affinities*, that "there is, after all: only *one* nature"; mixed in with Huxley's 1863 evolution of man diagrams and his 1871 theories on social chemistry, the synopsis of which, in Goethe's day (pre: 1882-years), i.e. before Helmholtz's article "On the Thermodynamics of Chemical Processes", was that one had to explain how human behavior was regulated by the forces of chemical affinity, and in modern days (post: 1882-years), one has to explain human behavior in terms of both the chemical affinities at the interpersonal level and the human free energies, at the social system boundary level, the two being related via the Goethe-Helmholtz equation. Right: a 2011 depiction of the "elective affinities problem", by Peter Glaser, namely how to explain passions of existence in terms of Bergman's 1775 chemical affinities theories (Goethe's day) or in terms of Gibbs' 1876 free energies (modern day). [6]

Goethe

In 1768 to 1775, German polyintellect Johann Goethe began searching for a secret principle or universal rule to explain the hows and whys of the happenings of existence and experience: [7]

> "I perceived something in nature (whether living or lifeless, animate or inanimate) that manifested itself only in contradictions and therefore could not be expressed in any concept, much less any word. It was **not divine**, for it seemed irrational; not human, for it had no intelligence; not diabolical, for it was beneficent; and not angelic, for it often betrayed malice. It was like chance, for it laced continuity, and like providence, for it suggested context. Everything that limits us seemed penetrable by it, and it appeared to dispose at will over the elements necessary to our existence, to contract time and expand space. It seemed only to accept the impossible and scornfully to reject the possible."

In 1799, Goethe, in an Oct 23 letter (see: Goethe timeline) to his intellectual friend Friedrich Schiller, in comment on the lack of realism in the literary work of French author Prosper Crebillon, explicitly stated the elective affinities problem as follows:

> "Crebillon … treats the passions like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. **There is no trace** of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover."

In 1809, Goethe, ten years later, penned a draft outline attempt at solution to the problem, which he explained via hidden layers of coded gestalt in his 36 chapter physical chemistry based novella *Elective Affinities*, finished on Oct 3, after which, as he said, he was "set free" from the problem.

Faraday

In 1859, English electrochemist Michael Faraday, in his "On the Various Forces of Nature" lecture, stated what seems to be an outline of the elective affinities problem, in query self-reflective format, as follows: [8]

> “Let us now consider, for a little while, how wonderfully we stand upon this world. Here it is we are born, bred, and live, and yet we view these things with an almost entire absence of wonder to ourselves respecting the way in which all this happens. So small, indeed, is our wonder, that we are never taken by surprise; and I do think that, to a young person of ten, fifteen or twenty years of age, perhaps the first sight of a cataract or a mountain would occasion him more surprise than he had ever felt concerning the means of his own existence: How he came here; how he lives; by what means he stands upright; and through what means he moves about from place to place. We come into this world, we live, and depart from it, without our thoughts being called specifically to consider how all this takes place; and were it not for the exertions of some few inquiring minds, who have looked into these things, and ascertained the very beautiful laws and conditions by which we do live and stand upon the earth, we should hardly be aware that there was anything wonderful in it. These inquiries, which have occupied philosophers from the earliest days, when they first began to find out the laws by which we grow, and exist, and enjoy ourselves, up to the present time, have shown us that all this was effected in consequence of the existence of certain *forces*, or abilities to do things, or *powers*, that are so common that nothing can be more so; for nothing is commoner than the wonderful powers by which we are enabled to stand upright: they are essential to our existence every moment.”

(add discussion)

Adams

In 1863, Adams, writing to Charles Gaskell, seems to have begun searching for a universal theory of existence, applicable, in a one nature manner, atoms to humans:

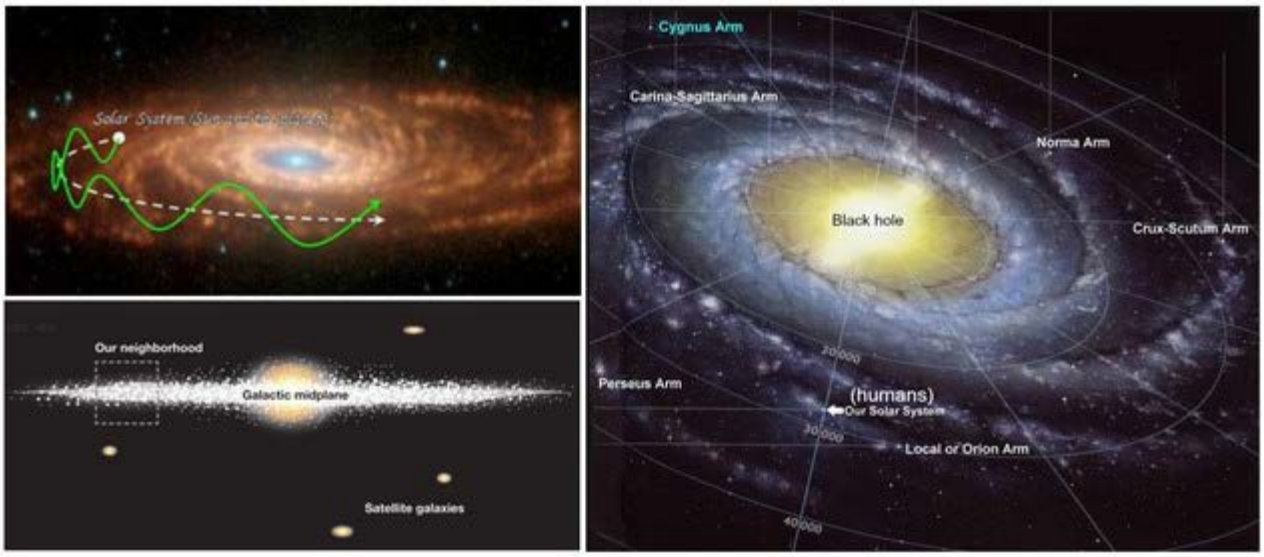

A three-view depiction of the Milky Way galaxy, showing the glimpse of the "waves and tides", which Henry Adams spoke of in 1863, amid his 5-decade search for a systematic conception of it all, humans viewed as chemically reactive "human molecules" (1885) or "social phases" (1908), the rise and fall of civilizations explained in terms of physico-chemical Gibbsian chemical thermodynamics framework; the modern version of the **elective affinities problem**.

> “Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday within this law. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a **systematic conception of it all**. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward.”

In 1885, Adams restated the problem in the following format, in an April 12th letter to his wife, written while at extended stay at work in Washington, in which Adams declares: [2]

> "I am not prepared to deny or assert any proposition which concerns myself; but certainly this solitary struggle with platitudinous atoms, called men and women by courtesy, leads me to wish for my wife again. How did I ever hit on the only women in the world who fits my cravings and never sounds hollow anywhere? Social chemistry—the mutual attraction of equivalent human molecules—is **a science yet to be created**, for the fact is my daily study and only satisfaction in life."

Adams, of course, would go on to spend a record five decades on the problem, culminating in his famous 1910 *A Letter to American Teachers of History*, among other publications on the subject prior to this, in which he lamented that American history teachers need to start teaching the second law to students to explain human history in a more uniform physical chemistry sense, and at the end of which surmised that complete solution to the problem would require the aid a new Newton:

> "Such a **complete solution** [socio-history human chemical thermodynamics] seems not impossible; but at present to call for the aid of another Newton."

Huxley

In 1871, English naturalist Thomas Huxley stated the elective affinities problem as such: [3]

> "Every society, great or small, resembles ... a complex molecule, in which the *atoms* are represented by *men*, possessed of all those multifarious attractions and repulsions which are manifested in their desires and volitions, the unlimited power of satisfying which we call freedom ... the social molecule exists in virtue of the renunciation of more or less of this freedom by every individual. It is decomposed, when the attraction of desire leads to the resumption of that freedom the expression of which is essential to the existence of the social molecule. The **great problem** of social chemistry we call politics, is to discover what desires of mankind may be gratified, and what must be suppressed, if the highly complex compound, society, is to avoid decomposition."

In 1962, in commentary on Huxley's call for the development of the field of social chemistry in order to attempt solution of the elective affinities problem, Austrian social economist Werner Stark stated the following: [4]

> "Why should no social chemistry ever been developed? Nobody would suggest that the social scientists should imitate meteorology, for this discipline does not appear to have got very far … but what about chemistry? A sociology based on chemistry [has] in fact **been called for**, but, significantly, [this call has] found no echo. It would have been easy to take up this suggestion and develop it further. An intending social chemist would have found it one whit more difficult to manufacture a sociological parallel to the Boyle-Charles law than Haret did to the Newtonian propositions. But the **experiment** appears never to have been tried. Why?"

Here, to comment quickly, regarding "sociological parallel to Boyle-Charles law", the experiment was tried ten years earlier in the introduction section chapter to English physicist C.G. Darwin's 1952 *The Next Million Years*, but, as summarized so rightly by Nicholas Georgescu (1971), quoted above, who attempted a similar solution in formulation of economic thermodynamics, "manifold avenues open up" almost as soon as one begins to work on the problem. [5]

The 2,500+ articles of *Hmolpedia*, the 824-page two-volume *Human Chemistry* (2007) textbook, and the assimilation of the history of the point of view of the 120+ human molecule pioneers, are only some of the examples of these "manifold avenues" that begin to open up when one attempts to tackle the great two-hundred-year-old elective affinities problem,

and that's not to mention the 700-equations of Willard Gibbs that one has to master to solve the problem.

New blue sky problem | IQ=225+

The elective affinities problem, in some sense, has become the new blue sky problem, as was formerly the only problem worked on by all IQ: 200+ range geniuses, prior to its early 20th century solution; the elective affinities problem, presently, is the only puzzle common to the rare ceiling geniuses cited in the IQ=225+ range, namely:

- â— Goethe (1796) (IQ_{Cit}=225; IQ=230), who called his solution to this problem his "greatest work" or "best book" (1809), of all his 142+ collected works publications, in which he embedded a secret principle which he said was "true" and which was "only production of greater extent" in which he was "conscious of having labored to set forth a pervading idea";
- â— Einstein (IQ_{Cit}=225; IQ=220), who commented on the problem (see: Einstein on love), in a somewhat irritated perplexment scribble note: "gravitation cannot be responsible for people falling in love" (1933) and previously in query to geneticist Thomas Morgan: "how on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?" (1920s);
- â— Thims (1995) (IQ_{Cit}=225+; IQ=190), who was led into the problem, similar to Goethe, via a mixture of the "love thought experiment" and the "reverse engineering puzzle";
- â— Hirata (2000) (IQ_{Cit}=225; IQ=190), who called his solution a "fun compilation of worthless applications of physics and mathematics to relationships";

An illustration of Jean Sales' 1777 satirical play "Reasonable Drama", aka Newton in Senegal, showing Newton, as "social Newton", a possible rendition of what "Another Newton", i.e. Henry Adams' 1910 term for the person who will solve the **elective affinities problem** (or the problem of "physico-chemical social dynamics" as he termed it), might like look like, above fictionally depicted as a vegetarian, eavesdropping on a conversation between a meat-eating Merman, a talking oyster, pleading for it's life, amid which an African, who believes in a scarab-conceptualized god, enters the scene; at the end of which Newton reasons that he should only attempt to explain morality to the African, since he alone, with his type of belief system, might obtain a soul, or something along these lines. [9]

Even the great child prodigy William Sidis (IQ_{Cit}=250-300; IQ=195) attempted solution, in a round-about-way, via his 1920 theories on animate matter and entropy.

Other

Romanian mathematician and economist Nicholas Georgescu, who spent several decades on the problem, stated the following, in 1971, on the problem:

> "Manifold avenues open up almost as soon as one begins to work on **the problem**."

In 1910, Henry Adams (IQ=190) surmised, after working on the problem for 45-years, through Gibbs (IQ=200), Clausius (IQ=205), and others, that the "complete solution" would require the "aid of another Newton".

See also

- â— Equation of love

Discussion

1. (a) Adams, Henry. (1863). “Letter to Charles Gaskell”, Oct.
(b) Adams, Henry. (1982). *The Letters of Henry Adams, Volume 1: 1858-1868* (editor: Jacob Levenson) (pgs. 395-96). Harvard University Press.
(c) Stevenson, Elizabeth. (1997). *Henry Adams: a Biography* (pg. 69). Transaction Publishers.
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7. (a) Goethe, Johann. (1814). *Poetry and Truth* (book 20). Publisher.
(b) Schwartz, Peter J. (2010). *After Jena: Goethe’s Elective Affinities and the End of the Old Regime* (pg. 19). Publisher. Bucknell University Press.
8. Faraday, Michael. (1859). *On the Various Forces of Matter: and their Relation to Each Other* (pgs. 2-3), six lectures delivered before a juvenile auditory at the Royal Institute, during the Christmas Holidays of 1859-60. Richard Griffin and Co, 1861.
9. (a) Sales, Jean. (1777). “Reasonable Drama” (“Drame Raisonnable”). Publisher.
(b) Sales, Jean. (1789). *The Philosophy of Nature: Treatise on Human Moral Nature, Volume 4* (*De la Philosophie de la Nature: Ou Traité de Morale Pour Le Genre Humain, Tiré de la Philosophie Et Fondé Sur la Nature, Volume 4*) (Drame Raisonnable, 7+ pgs; esp. pgs. 173-201, 205). Publisher.
(b) Darnton, Robert. (1996). *The Forbidden Best-Sellers of Pre-Revolutionary France* (Delisle de Sales, Jean-Babtiste-Claude Isoard, pgs. 48-49, 70-71, 397 n. 32). W.W. Norton.
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(d) Malandian, Pierre. (1982). *Delisle des Sales: Philosophe de la Nature (1741-1816), Volume 2*. Oxford: Voltaire Foundation.
(e) Fara, Patricia. (2002). *Newton: the Making of a Genius* (pg. 126; Newton in Senegal, figure 5.1). Columbia University Press.
(f) Shank, J.B. (2008). *The Newton Wars and the Beginning of the French Enlightenment* (pg. 9). University of Chicago Press.

θΔics

In scales, **elective affinities scale**, or "Elective Affinities Belief Scale", is a 1 to 10 scale of belief indicative of, in short and predominately, whether or not one believes that people are types of chemicals that react together according to the rules and regulations of the physicochemical laws; whether or not one believes Goethe's human chemical theory and that the principles illustrated in Goethe's *Elective Affinities* (1809) are true—as he famously said was the case, in his "best book" incident, where, in response to a woman who accosted him, following it's publication, stating that it was an "immoral book", he replied with the cryptic response: "the principle illustrated in the book is true and not immoral", the two visual images of people, shown below, being two recent film remakes, i.e. *Les affinities electives* (1996) and *Afinidades* (2010), theatrically showing this so-called "principle" at work.

Overview

On 30 Nov 2015, the following visual diagram, of the elective affinities belief scale, was made (Ñº) for the immediate purpose to query Preston MacDougall as to where he stood on the scale, being that he is one of the few people to make the discerning Gibbs and Goethe connection, historically speaking, i.e. whether Goethe's human chemical theory is a near-accurate model of reality (closer to 10), pure analogy (closer to 1), or somewhere between analogy and reality (closer to 5):

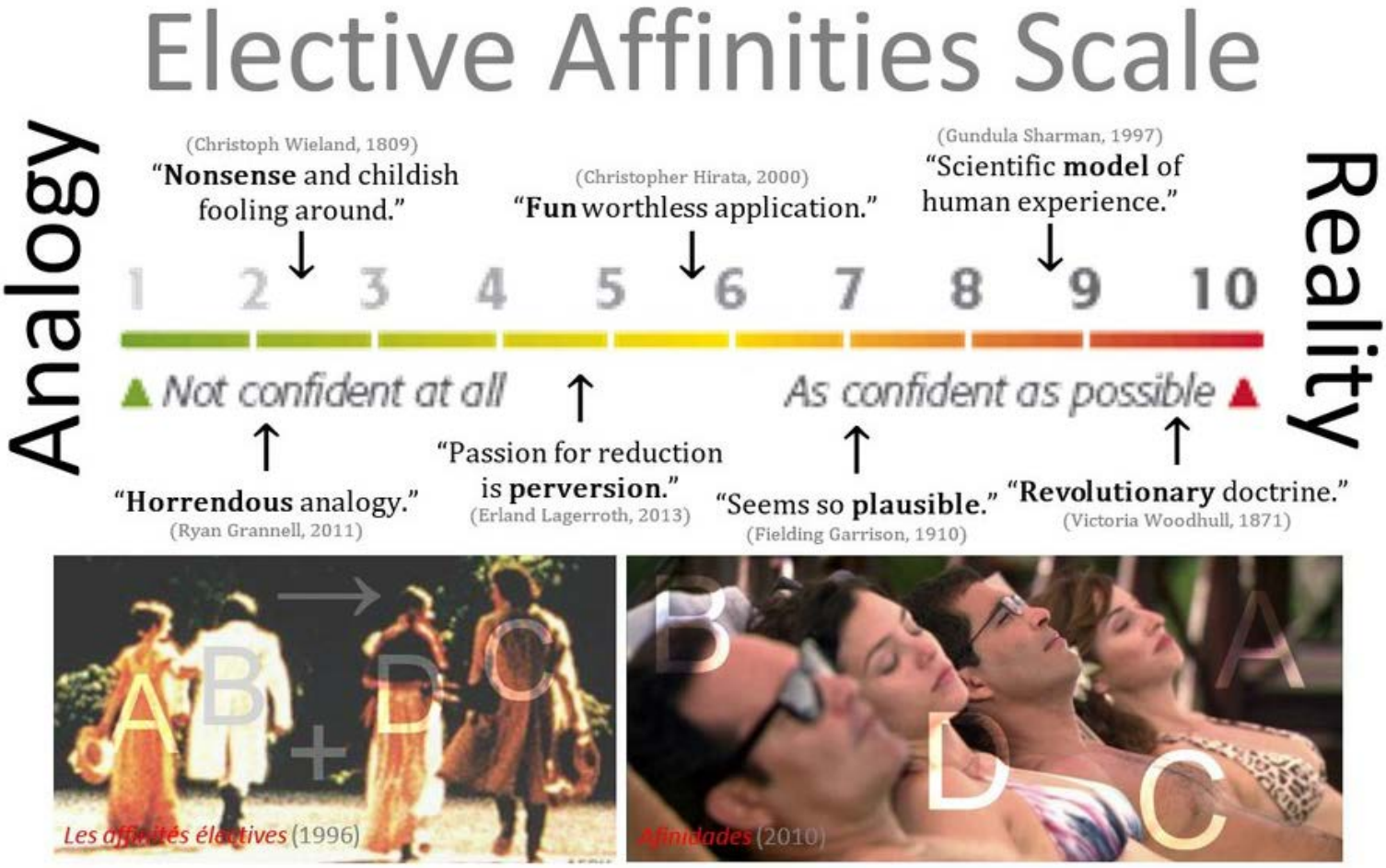

The "**elective affinities scale**", showing the number-estimated views of: Ryan Grannell (2011), Christoph Wieland (1809), Erland Lagerroth (2013), Christopher Hirata (2000), Fielding Garrison (1910), Gundula Sharman (1997), and Victoria Woodhull (1871) in respect to Goethe's 1796 human chemical theory and its expounding in his *Elective Affinities* (1809). Note one: Hirata's estimate is of his own theory, which is a modern equivalent human chemical thermodynamics version of Goethe's theory, albeit done without knowledge of Goethe. Note two: the Lagerroth statement is his holism-compatibilist view of Thims' extreme reductionism deconstruction of Goethe's human chemical theory.

The above belief scale, in more detail, is indicative of the range of beliefs expressed historically in the following three areas:

(a) the variety of views expressed on the Gibbs and Goethe page, namely people who understand, in some connective sense, the "free energy" work of Willard Gibbs, and how this connects, historically, via derivation, back through the "affinities" work of Goethe;
(b) the *Elective Affinities* "enemies" and "admirers" split, showing the dividing lines, over the last two centuries;
(c) the general split of beliefs in respect to modern human chemical thermodynamics, i.e. whether one is a supporter, detractor, or fence-sitter of the views expressed in, e.g. Christopher Hirata taking the non-confrontational middle-ground on his "The Physics of Relationships" (2000), stating that views expressed are but just "fun" kid stuff, albeit a worthless topic, or the heat (debate heat) inherent amid the ongoing: Rossini debate (2006), Moriarty-Thims debate (2009), or Beg-Thims dialogue (2014), etc.

The Bergman reaction symbols (A, B, C, D, +, →) equation overlay visual effect were added, and or possibly worked to stimulate the inception of the scale, following the discovery 2010 *Afinidades*, image shown above (right), a Spanish modern-remake of the film, which is shown next to the 1996 *Les affinities electives*, the French-Italian production of the film, image shown above (left); giving lead into the query: if various countries, e.g. Germany, France, Italy, Spain, and nearly America (see: Francis Ford Coppola), are make films depicting the dark "feeling" anchored philosophy espoused therein, particularly in the Spanish version, there where do others explicitly stand on this scale of beliefs (see: Elective Affinities (films)). In some sense, the scale is endemic of the free will vs love reaction paradox split in recent polled views. Note: the letter placement above

Afinidades | Characters

The following shows each character: Bruno/Captain (Vladimir Cruz), Magda/Ottilie (Gabriela Griffith), Christian/Charlotte (Cuca Escribano), and Nestor/Edward (Jorge Perugorria), each labeled (A,B,C,D), as a different heightened reactive state chemical species, according to the Goethe lettering scheme (itself based on the Bergman lettering scheme), from the 2010 *Afinidades* modern-remake of *Elective Affinities*, labeled according to which role each "new" character is filling, in respect to the original:

(add discussion)

Quotes

The following are related quotes:

> "Based on the **scale** captions, I would put myself at 8 on that scale. I think that the 'work of man' is just one of many types of work."
>
> — Jeff Tuhtan (2015), response to query (Ñº) about position on EA belief scale (image only), Dec 2

> "I read through the **scale** thoroughly, and must place myself at 10."
>
> — Peter Mander (2015), response (Ñº) to query of position on *Elective Affinities* scale (above page), Dec 5 [1]

> "Concerning your **EA-scale**, I would vote for 5, because much more empirical work is needed to prove human inter-action (e.g. genetic affinities, due to inherited traits/Soviet research was focusing on human temperament)."
>
> — Stephen Ternyik (2015), poll response (Ñº), Dec 7

References

1. Mander, Peter. (2013). "Ranking on Entropy, Love and Marriage" (Ñº), CarnotCycle blog, Feb 1.

θΔics

In Elective Affinities: IAD, the following is the **affinity table** page of online project:

Goethe's affinity table

See main: Goethe's affinity table; Affinity table

An image of three putti studying French physician-chemist Étienne Geoffroy's 1718 affinity table (see: Geoffroy's affinity table), as found on the second edition title page of French chemist Pierre Macquer's 1749 *Elements of the Theory of Chemistry*, the original affinity table upon which Swedish chemist Torbern Bergman's 1775 affinity table is based (see: Bergman's affinity table and Bergman's reaction diagrams), with which Goethe is argued (Duncan, 1970; Adler, 1977; Kim, 2003; Thims, 2007) to have used to make his own "human affinity table", at least in verbal concept, as his chapters tell, and as he claimed to have done in "symbols" or in "symbolic representation", but also in drawn "table format", such as shown below (Thims, 2007), although the fact that he destroyed all notes to his novella precludes certain verification.

In 1718, French physician-chemist Étienne Geoffroy, during a French-to-English translation of English physicist Isaac Newton's *Opticks*, took verbal descriptions of various reaction tendencies, preferences, and powers, as found in Newton's "Query 31", and made the world's first "affinity table" (see: Geoffroy's affinity table) entitled *Table Concerning the Different Affinities Observed in Chemistry between Different Substances* (*Tableau des différentes Rapports Observées entre Différentes Substances*), sometimes translated as "Table of the Different Relations Observed between Different Substances", a 16-column (9-row) affinity table made by which ordered chemical species according to the following rule, often categorized as Geoffroy's first law of affinity:

> "Whenever two substances are united that have a disposition to combine and a third is added that has a greater affinity with one of them, these two will unite, and drive out the other."

The set of all these bonding and debonding rules are known as the "laws of affinity", a methodology that traces back to Plato's notion of "likes attract; opposites repel", and before that to Empedocles' chemical aphorisms.

This pioneering table by Geoffroy, was followed by larger more expanded affinity tables: Grosse's affinity table (1730); Pierre Macquer's 1749 *Elements of the Theory of Chemistry*, with its cover page of three putti studying Geoffroy's affinity table (shown adjacent), and its chapter seventeen "Explanation of the Table of Affinities"; Gellert's affinity table (1750); Rudiger's affinity table (1756); Cullen's affinity reaction diagrams (1756); Limbourg's affinity table (1758); Marherr's affinity table (1762); Rouelle's affinity table (1763); Spielmann's affinity table (1763); Demachy's affinity table (1769); De Fourcy's affinity table (1773)—all of which culminating in the biggest and grandest affinity table of them all: Bergman's affinity table (1775), as found in his *Dissertation on Elective* Attractions, which was translated into German in 1785, by physician-chemist Heinrich Tabor (1751/57-1795), and read by Goethe, likely during the years 1791 (while attending the chemistry lectures (1791-1797) of German physician-chemist Wilhelm Buchholz) to 1801 (during his physical science studies with German author Friedrich Schiller and with the Gottingen school of history university professors (1798-1801)), the end product of which was his idea to explains human relations, conflicts, affairs, and interactions "symbolically" using Bergman's physical chemistry symbols, , as he states in his own words (28 Aug 1808 + 24 Aug 1809):

> "My idea in the new novel *Elective Affinities* is to show forth social relationships and the conflicts between them symbolically [using] the moral symbols of the natural sciences, namely those of the elective affinities invented and used by the great Bergman."

In sum, although Goethe does not explicitly state that he made an actual affinity table for the characters of his novella, each of which, as he states were based on actual people he knew and interacted with, it has been argued (Jeremy Adler, 1977; Libb Thims, 2007), that Goethe did in some way, in his mind or on paper, make an actual "human affinity table", i.e. an affinity table filled with people, each viewed as potential reactants and products, in place of the chemicals of standard affinity chemistry affinity tables, which he would have likely made in circa 1807-1808, prior to his May 1808 recounting of a large part of the (then) novella to his friend Swiss painter and art critic Heinrich Meyer (1760-1832), during their coach journey between Jena and Weimar.

	3	4	5	6	7	8	9	10	11	12
	Ott	Cap	Luc	Mit	Cou	Bar	Nan	Ass	Arc	Oto
	Edu	Edu		Edu	Bar	Cou	Oto	Ott	Ott	Ott
	Cha	Cha		Cha	Edu	Edu	Ott			
	Oto			Cap	Cha	Cha				
				Ott						
	Ass									
	Arc									
	Cap				Mit	Mit				
	Gar									
				Bar						

Luc

Ott

Cou

The first tentative reconstructed version of Goethe's likely-made affinity table, was done by American electrochemical engineer Libb Thims in 2007, as found in chapter ten "Goethe's Affinities" of his *Human Chemistry* textbook. An expanded color photograph filled version of this 2007 reconstruction version is shown adjacent, in which the reactants (top row), on the table, were the characters in the 1809 novella *Elective Affinities*, and where the new species (new reactants) introduced into the system (estate), chapter by chapter, are those listed *below* each header reactant (top row), per column, listed via descending affinity force preference (or human free energy measure, in modern terms; see: free energy table), according to the laws of affinity (laws of thermodynamics, in modern terms); those individuals with the weakest elective affinity to the header reactant (top row), listed at the bottom of the table.

Goethe readily admits that his novella was based on the Swedish chemist Torbern Bergman's 1775 affinity table, and accompanying textbook with its sixty-four affinity reaction diagrams; all affinity tables, themselves, being expanded versions of French chemist Etienne Geoffrey's original 1718 affinity table; a table which was itself based on verbal descriptions of affinity reactions in Query 31 to the 1718 edition of English physicist Isaac Newton's *Opticks.*

German science historian Jeremy Adler, who did his 1969 PhD dissertation on the chemists and affinity tables used by Goethe in the construction of his novella, argues that there were close to a dozen more chemists and various affinity tables used by Goethe developing the theoretical construct of his novella. [1]

The fact that Goethe, contrary to his usually practice, "destroyed all of his notes and manuscripts" to this novella, as well as all of his correspondences with Christiane Vulpius (1765-1816), during the tumoltuous war years, circa 1806, however, precludes certain verification of his table, but there is no doubt that he at least made one in his mind, if not surely on paper.

The human chemical symbols used, as originally done by Thims (2007) are: Eduard (Edu), Charlotte (Cha), Ottilie (Ott), the Captain (Cap), in addition to the symbol assignments: Luciane (Luc), Mittler (Mit), the Count (Cou), the Baroness (Bar), Otto (Oto), the Nanni (Nan), the Assistant (Ass), the Architect (Arc), the Elderly clerk (Eld), Homeless people (Hom), the Gardener (Gar), the Lawyer (Law), the Parson (Par), the Surgeon (Sur), the Englishman (Eng), the Traveling companion (Tra), among others.

The affinity table works, as described affinity table pioneer Etienne Geoffrey, such that at the head of each column is a header species with which all species below can combine or have a rapport with. The latter are so placed such that any higher species replaces all others lower in the column from their compounds with that at the head of the table. In other words, the species at the head of the table can potentially react with any species below it. All the species below the header species are ranked by chemical affinity preferences relative to the top species, with a higher rank corresponding to a higher affinity tendency. The species at the bottom of each column, for instance, have the least amount of affinity for the header species. If the bottom species is in a weakly bonded relationship with the header species, any species above it can potentially displace it from its attached partner. [2]

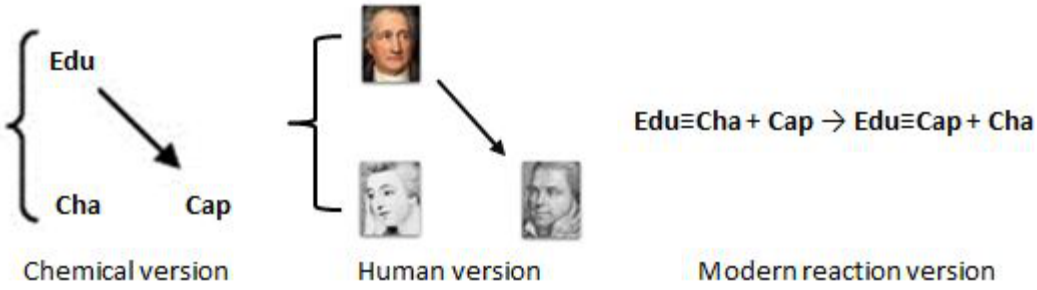

To go through one example, in the opening of the novella Eduard (Edu) is bonded in comfortable, but tending towards mundane, marriage to Charlotte (Cha), signified by the bonding Edu=Cha. When Eduard's old friend the Captain (Cap) arrives, however, they rekindle their friendship, and thus act to displace Charlotte from her bond with Eduard. This is described as a single elective affinity reaction (adjacent).

In other words, the Captain has a stronger chemical affinity for Eduard as compared to Charlotte, as represented by her lower position on the affinity table; thus when the Captain is introduced into the mixture (Estate viewed as a closed system, to other reactants) he acts to displace Charlotte from her attachment to Eduard.

References

1. Adler, Jeremy. (1990). "Goethe's Use of Chemical Theory in his *Elective Affinities*" (ch. 18, pgs. 263-79) in *Romanticism and the Sciences* - edited by Andrew Cunningham and Nicholas Jardine, New York: Cambridge University Press.
2. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (ch. 10: Goethe's Affinities) (description of Geoffroy's 1718 affinity table, pg. 382). Morrisville, NC: LuLu.

In Elective Affinities: IAD, the following is the **artists** section of the online project:

Description: Goethe's Works: Illustrated by the best German Artists.

Artists

The artists for the illustrated and annotated version include, if they are known, are listed below:

Artist	Illustrations
● Philipp Johann (1841-1892), noted *Grimm's Fairy Tales* illustrator.	Two Putti EA Title Page, Charlotte Glancing over Edward's Book (P#C#), Edward Assisting Ottilie (P#C#), The Captain Carrying Charlotte (P#C#), Luciana as Artmesia (P#C#), Ottilie as the Madonna (P#C#), Edward Looking at the Child (P#C#), Ottilie and Edward Meeting at the Inn (P#C#), the Architect at Ottilie's Bier (P#C#). Adjacent: Title page to Hjalmar Boyesen's 1885 illustrated English translation of Goethe's 1809 *Elective Affinities*, possibly depicting putti of Prometheus (with his fire of life) scaring Cupid (with his bow of love), amid doves (the Christian rewrite of Ra or the Phoenix, as Herodotus called him, or doves as the Noah (Nun) (Ma-Nu) version described it), alive and dead.
● Heinrich Dahling (1773-1850)	Original drawing of Eduard, Charlotte, Captain, and Ottilie sitting at the table under candle light (P#C#); engraved by Heinrich Schmidt in 1811 for the German edition. ● The Dead Ottilie (in glass casket), the Architect and Nanny (1811) – Engraving by H.A. Dahling, engraved by F.W. Meyer.
● Wilhelm von Kaulach (1802-1874) German painter and book illustrator noted for his "Goethe Gallery" consist of fifty paintings illustrating Goethe's poems, life and work.	"Ottilie on the Lake" (P#C#) (depiction of Ottilie and the dead child Otto), one of the paintings from his from his (see: Goethe timeline).
● Friedrich Pecht (1814-1903) a German historical and portrait painter, lithographer, art writer, and publisher.	A *circa* 1863 rendition of the character Edward (HB:230) (P1C1) (or done by Ramberg?)

● Arthur von Ramberg (1819-1875) Austrian-born painter who worked in Germany.

A *circa* 1863 rendition of the character Edward (HB:230) (P1C1) (or done by Pecht?)

● Arthur von Ramberg – Wikipedia.

● F. Simon ()

"The Chart was brought and Spread Out" (P1C6) (see: Goethe timeline).

● Nina Ilieva (c.1992-) American art student

(under-construction) (P#C#)

● Artist name ()

"Ottilie Reading and Walking on the Footpath" (P#C#) (see: Goethe timeline).

In Elective Affinities: IAD, the following is the **commentary decoding** section of the online project:

Overview

The subject of the "cryptic commentary" that Goethe made on his *Elective Affinities* is an involved subject in and of itself; in 2007, Libb Thims, in his *Human Chemistry (Volume Two)*, collected the following into a footnote: [8]

> (a) Note: Goethe's statement that he wrote *Elective Affinities*for 'young girls' (as reported by Varnhagen von Ense, pg. 321), is one of the many cryptic comments made by Goethe. It is highly likely, according to Thims' point of view, that Goethewrote *Elective Affinities*, for young girls, as he says, for the same reason that *Human Chemistry*(a modern day *Elective Affinities*) was written, i.e. 'for a young person 7-15 years of age'; namely that in Goethe's time, as is the case presently, no one teaches a young person how the world really is. Moreover, past a certain age, people, on average, will no longer be malleable to correct teachings. As such, Goetheinvariably wrote *Elective Affinities* so that young, un-biased, girls (persons) might know how the world really is, namely a chemical one.
> (b) Note: the 'little girls' comment comes after a stream of criticism following the publication of his novella, where many called it reprehensible; thus, when his old friend Knebel started making moralobjections to the novel Goetheexploded: 'But I didn't write it for you, I wrote it for little girls!' R.J. Hollingdale, translator of the 1971 Penguin Classics English edition, reasons that Goethemade this statement 'to assert that the book is altogether wholesome and romantic and that only a moralizing old man could find anything in it to object to' (pg. 14).
> (c) To his fellow author and neighbor Christoph Martin Wieland, Goetheindicated that the novel had to be read at least three times before it could be understood (source: Tantillo).
> (d) Nearly twenty years after its publication, Goethestressed to his friend Johann Peter Eckermann that the novel could never be comprehended in a single reading of it (source: Tantillo).
> (e) On June 01, 1809, Goethewrote to his friend, the composer Karl Friedrich Zelter, that he not only placed numerous different elements within the text, but that many of these were hidden with in it and that past the transparent or non-transparent veils in the novel one may be able to see the 'truly intended *Gestalt*' (source: Tantillo).
> (f) Tantillo, Astrida O. (2001). Goethe's *Elective Affinities*and the Critics. (pg. xx). New York: Camden House.
> (g) Varnhagen von Ense, Karl August. Diary Entry. 28 June 1843, Quoted here from *Karl August Varnhagen von Ense Werke*. 5 vols. Frankfurt: Keutscher Kalssiker verlag, 1994. 5:320-21. Also reprinted in: *Goethes Werke*. Ed. erich Trunz. 14 vols. Hamburg: Christian Wenger Verlag, 1949-71. Reissued 13th Ed., Munich: Verlag C. H. Beck., 6:641.

(add discussion)

Other puzzles

The following are general puzzles:

● The "Otto" ciphers puzzle | The four central characters: Eduard (OTTo), CharlOTTe, OTTilie, and the Captain (OTTo), have been famously said to have some type of hidden meaning; first commented on by German playwright Johann Rochlitz (1769-1842): "... very artfully contrasted with each other in groups," which occur in polar relationships (5 Nov 1809—letter to Goethe)

● ECHO (Eduard, Charlotte, Hauptmann, Ottilie) cypher: somee have argued that *Elective Affinities* is a retelling of Ovid's Narcissus myth, which establishes a relationship between humanity and nature that appeals to human vanity by reading the natural world as a projection of human passions; Eduard and Ottilie, supposedly, mimic or mirror the behavior of Narcissus and Echo. [3]

● CHEM cypher | As pointed out John Williams, the characters **CH**arlotte, **E**duard, **M**ittler, form the root CHEM,

which itself derives from the Egyptian *keme* meaning black soil (see: chemistry etymology)—a significant acronym for the main theme of the novella (chemistry), even if, according to Williams, “Mittler (the mediator) fails to catalyze or restore the relationship between Charlotte and Eduard." [7]

Resemblance puzzle

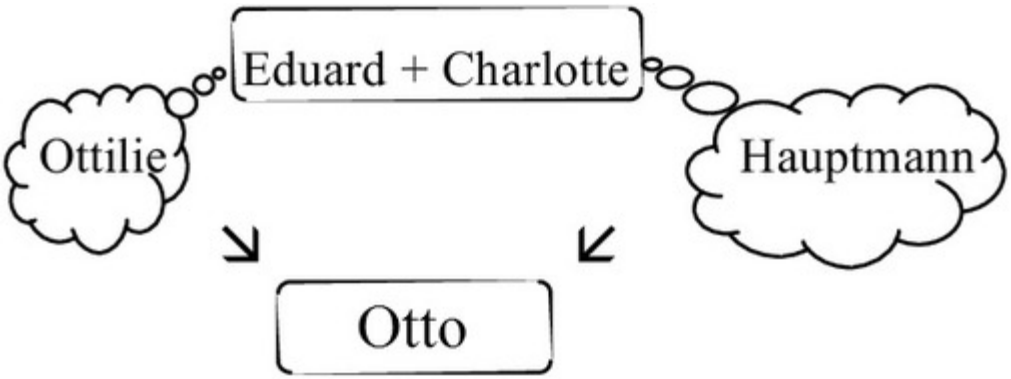

A diagram of the mental double adultery from Jinan Kauf’s 2008 thesis “Wolfgang Goethe’s ‘Elective Affinities’ and Dieter Welller Hoff’s ‘The Love of Desire’.” [7]

The part (P#:C#) where Edward and Charlotte engage in mental double adultery, having physical sex, but both thinking of alternative partners while in the act, Edward thinking of Ottilie and Charlotte thinking about the Captain, after which the child (Otto) is synthesized (conceived) having puzzling resemblance to neither of the parents, but to Ottilie and the Captain, is said to owe its origin to French natural philosopher Pierre Maupertuis’ chemical affinity theory of sex (*Venus Physics*, 1745), according to which the organic particles of the semen and egg have a type of memory in primitive form, wherein maternal imagination can be passed on to the fetus.

Maupertuis, in turn, seems to have developed his "chemical affinity" version of the theory from the older original version by Dutch physician Levinus Lemnius as explained in his 1559 *The Secret Miracles of Nature*. [6] The following is a popular truncated version of Lemnius' theory: [5]

> “If a woman (saith Lemnius) at the time of her conception, think of another man present or absent, the child will be like him.”

The Maupertuis version of the theory, in turn, was discussed by French naturalist Georges Buffon (1707-1788). [4]

Goethe could have gotten the theory from either Buffon, Maupertuis, or Lemnius. American romantic literature scholar Hermione de Almeida argues that Goethe got the theory from Buffon. [5]

Decipherment | Hidden elements

The following are comments by Goethe in regards to the many puzzles and hidden elements that the claimed to have put secretly into *Elective Affinities* (see: Goethe timeline):

> “There are many things put into [hidden in] it, with which I hope to invite the reader back for repeated viewing.” (1 Oct 1809—to Cotta)

> “I have hidden many correlations and ‘offenbares Geheimnis’ [patent secrets, open secrets, or evident secrets], in *Elective Affinities*, like a work of nature herself.” [1]

> “Goethe’s campaign to fashion the reception of *Die Wahlverwandtschaften* is further evidenced in his letters—he wrote to many people about the novel, informing them of the unified ‘Gestalt’, hidden meanings, and the necessity of multiple rereadings.” (Astrida Tantillo, 2001:29)

> “I have revealed much and concealed much in it.” [2]

Decipherment | Autobiographical elements

The following are comments by Goethe in regards to his claim that his *Elective Affinities* (see: Goethe timeline) was some type of autobiographical re-write or synthesis of his existence, to the extent that the events depicted in the novel actually occurred:

> "There is not a line in *Elective Affinities* that I have not lived, but none exactly as I have lived." (To Eckermann, 17 Feb 1830). [2]
>
> "I lived every word of my *Elective Affinities*."

as reported by David Constantine (1994), who also tells that Eckermann reported:

> "He said there was nothing in his *Elective Affinities* which had not been really lived, but nothing was there in the form *in which* it had been lived."

or as reported by Julie Reahard (1997):

> "There is not a line in *Elective Affinities* that I have not lived, but none exactly as I have lived."

or as reported by Astrida Tantillo (2001):

> "[Goethe] repeatedly asserted that there was not one line within the novel that he had not personally experienced."
>
> "No one can fail to recognize in it a deep passionate would which shrinks from being closed by healing, a heart which dreads to be cured … In it, as in a burial urn, I have deposited with deep emotion many a sad experience." (Date—Goethe to "someone")

Decipherment | Pervading idea

The following are comments by Goethe in regards to "pervading idea" that he claimed to have put secretly into *Elective Affinities* (see: Goethe timeline):

> "The only production of greater extent, in which I am conscious of having labored to set forth a pervading idea, is probably my *Elective Affinities.* This novel has thus become comprehensible to the understanding; but I will not say that it is therefore better. I am rather of the opinion, that the more incommensurable and the more incomprehensible to the understanding a poetic production is, so much the better it is." (06 Man 1827—to Eckermann) [9]
>
> "My idea in the new novel *The Elective Affinities* is to show forth social relationships and the conflicts between them symbolically [in symbolic concentration]" (28 Aug 1808—to Riemer) and "the moral symbols in the natural sciences, that of the elective affinities invented and used by the great Bergman, are more meaningful and permit themselves to be connected better with poetry and society" (24 Jul 1809—to Riemer).

● The reproach incident | “It is my best book, and don’t think that this is the mere whim of an aging man. I grant you that one loves most deeply the child of one’s last marriage, the product of one’s late power of generation. But you wrong me and the book. The principle illustrated in the book is true and not immoral. But you must regard it from a broader point of view and understand that the conventional moral norms can turn into sheer immorality when applied to situations of this character.” (Dec 1809—reported by Laube)

Decipherment | Passion and elective affinity

The following are comments by Goethe in regards to the way in which Goethe conceived of the "elective affinities" or chemical affinities, as presented in his novella and as he viewed them as related to his own interactions, as he began to use his theory in conversation in post-publication years (see: Goethe timeline):

“This is why chemists speak of elective affinities, even though the forces that move mineral components [or humans] one way or another and create mineral structures are often purely external in origin, which by no means implies that we deny them the delicate portion of nature’s vital inspiration that is their due.” (1796—*Third Lecture on Anatomy*)

"A little passion is the only thing which can render a watering place supportable; without it, one dies of *ennui*. I was almost always lucky enough to find there [Carlsbad] some little ‘elective affinity’ which entertained me during the few weeks.” (20 Jul 1831—to Eckermann) [N1]

“Crebillon … treats the passions like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. There is no trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover.” (23 Oct 1799—to Schiller)

“For decades I have been struggling with Berthollet in the matter of affinities.” (26 Sep 1826—to Person)

Decipherment | Morality

The following are comments by Goethe in regards to the "new morality" aspects of his novel and theory (see: Goethe timeline), which according to the insight of German poet Heinrich Heine, have the power to "overturn" modern religion and "everything holy":

“It seems that the author’s continued work in the physical sciences caused him to arrive at this strange title. He might have noticed that in the natural sciences very often ethical parables, far removed from the circle of human knowledge, are employed in order to bring about a closer match of the two—and in this sense, in the case of morality, he likely sought to drive the nature the chemical parable back to its mental origins—being that there is, after all, only *one* nature—and also since, within the serene realm of rational freedom, the cloudy tracks of passionate necessity move inexorably through their course, only to be wiped out by a higher hand, and perhaps not completely wiped out in this life.” (4 Sep 1809, advertisement for *Elective Affinities*, in *Morning Paper for the Educated Professional*)

“Following on what went before, let me tell you in fun, that in my *Elective Affinities*, I took care to round off the inward, true catharsis, with as much purity and finish as possible, but I do not therefore imagine that any handsome fellow could thereby be purged from the lust of looking after the wife of another. The sixth commandment, which seemed to the Elohim-Jehovab to be so necessary, even in the wilderness, that he engraved it on granite tables with his own finger,—this it will still be necessary to uphold in our blotting-

paper catechisms." (29 Jan 1830—to Zelter)

Decipherment | Rereadings

The following are comments by Goethe in regards to "other", more puzzling, and difficult to categorize aspects of his novel and theory (see: Goethe timeline):

> "How I look forward to the effect that this novel will have in a few years on many people upon **rereading** it." (31 Dec 1809—to Reinhard)
>
> "To be understood properly, it must be read **three times**" (date—to Wieland)

Decipherment | Other

The following are comments by Goethe in regards to "other", more puzzling, and difficult to categorize aspects of his novel and theory (see: Goethe timeline):

> "I did not write the book for you but for young girls". (7 Feb 1810—to Knebel)
>
> "They treated my *Elective Affinities* as though it had been the Robe of Nessus." (21 Nov 1827—to Zelter)
>
> "What man, what society dare express such sentiments? seeing that we cannot easily known anyone from his youth up, nor criticize the rise of his activity. How else does character finally prove itself, if it is not formed by the activity of the day, by reflective agencies which counteract each other? Who would venture to determine the value of contingencies, impulses, after-effects? Who dare to estimate the influence of elective affinities? At all events, he who would presume to estimate what man is, must take into consideration what he was, and how he became so. But such barefaced pretension are common, and we have often enough met with them; indeed they are always recurring, and they must be tolerated." (28 Jun 1831—to Zelter)

This last comment, "Who dare to estimate the influence of elective affinities?", is quite telling, being that it would not be until the circa 1907 heat theorem work of Walther Nernst, in regards to the measurement of "affinities" near absolute zero, work for which he won the 1920 Nobel Prize in chemistry, that we have been actually able to "measure" the "elective affinity" and hence now "dare estimate its influence", as we are now doing in this project.

Notes

N1. (a) Re: "ennui", both Emilie Chatelet and Voltaire viewed "ennui" as the enemy.
(b) Zinsser, Judith. (2006). *Emilie Du Chatelet: Daring Genius of the Enlightenment* (pg. 55). Penguin.
(c) Blaise Pascal, supposedly, linked ennui to the problem of desire (Q)

References

1. (a) Author (2010). "Article" (pg. 14). *Goethe Yearbook, Volume 17*. Goethe Society.
(b) ibid, footnote 49: HABr 3:104f.
2. Reahard, Julie A. (1997). "Aus Einem Unbekannten Zentrum, Zu Einer Nicht Erkennbaren Grenze" ("A stranger from the center, not discernible to the one line"): Chaos Theory, Hermeneutics, and Goethe's *Die Wahlverwandtschaften* (pgs. 8-9). Rodopi.
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4. Georges Louis Leclerc, Count of Buffon – Wikipedia.
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(b) Hermione de Almeida – Sites.Google.com.
6. (a) Levinus Lemnius – Wikipedia.
(b) Lemnius, Levinus. (1559).*The Secret Miracles of Nature* (pg. 11), Publisher, 1658. 7. Kauf, Jinan. (2008). “Wolfgang Goethes "Die Wahlverwandtschaften" und Dieter Wellershoffs "Der Liebeswunsch"” (German) “Wolfgang Goethe’s ‘Elective Affinities’ and Dieter Welller Hoff’s ‘The Love of Desire’” (English), thesis, comparative literature, Justus-Liebig University, Giessen.
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8. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (N8, pg. 704). Morrisville, NC: LuLu.
9. Emery, S.H. (1886). “The Elective Affinities”, Lecture at the Concord School of Philosophy; in: *The Life and Genius of Goethe* (§9:251-89; pg. 256) (editor: Franklin Sanborn). Ticknor.

In Elective Affinities: IAD, the following is the **equation decipherment** page of online project.

Equations of *Elective Affinities*

$\frac{dF}{dt} \leq 0$	$A = -\Delta U$	$A = -\Delta G$	$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$	$A^\circ = \sum_{i=1}^{k} -\nu_i \mu_i^\circ$
Helmholtz (1882)	Nernst (1906)	Lewis (1923)	De Donder (1936)	Perrot (1998)

Note: prerequisites to a proper understanding and reading of the "equations" section of the project are that the reader has previously taken courses in (a) partial differential equations, (b) chemical thermodynamics and (c) and is familiar with the subject of physical chemistry.

Decipherment | Equations

The most complex issue, that is in great need of addressing, is the discernment of the chemical thermodynamic "equations" that quantify each chapter of the novella. Famously, in 1882, German physicist Hermann Helmholtz, in his "On the Thermodynamics of Chemical Processes", proved that "free energy" is the true measure of chemical affinity and gave the following formulation for chemical affinity:

$$\frac{dF}{dt} \leq 0$$

meaning that the affinities *A* are "active" only in the sense in which the free energy differentials *dF* of the reacting system decrease with differentials of time *dt*. The century to follow saw purifications of this logic, significantly in the works of: Nernst (1906), Lewis (1923), De Donder (1936), and to some extent Perrot (1998) in his dictionary descriptions of the relations of affinities and free energies. In short, the human interactions of each chapter of Goethe's novella need to be explained in terms of partial differential equations of Gibbs free energy or human free energies per extent of reaction. Over 130 years have now passed since Helmholtz's famous free energy = affinity proof, but the literary world has not yet caught up to this fact, in short the world of both cultures has not yet received the memo or as Hjalmar Boyesen, in his *The Life of Goethe* (1885), put it:

> "It is difficult to overestimate the value of Goethe's work to humanity. The bequest which he left to the world in his writings, and in the whole intellectual result of his life, is not as yet appreciated at its full worth; because, intellectually, the world has not yet caught up to him."

The focus of the equation decipherment section of the project will be make sure the world receives the memo.

Human molecule perspective | 21st century

Another salient point that will be followed in the "equation decipherment" section of the EA:IAD project, will be that of the point of view presented with the 2002 publication and description of Sterner-Elser "human molecular formula", according to which humans are now defined as "abstract molecules" that react with each other and the surrounding animate and inanimate world in a way that resembles large scale surface-attached chemical reactions (see: human chemical reaction theory), which are governed by the laws, science, and principles of chemical thermodynamics, which thus defines the subject of human chemical thermodynamics.

In plain speak, (a) humans are now defined as "abstract molecules" (human molecules), which as of 2011 is a standard thermodynamics textbook definition (see: human molecular formula), and (b) the "elective affinities" (or chemical affinities) that Goethe speaks of in his novella and in his correspondences (see: Goethe timeline: 1809-1832), as governing the relationships, are now quantified by Gibbs free energy, which in the summary words of American-born Canadian biophysical chemist Julie Forman-Kay, from her 1999 article "The 'Dynamics' in the Thermodynamics of Binding" operate such that:

> “Whether two molecules [or human molecules] will bind [or debind] is determined [destiny] by the free energy change [human free energy] of the interaction, composed of both enthalpic and entropic terms.”

In short, this means that the interactions (bondings and debondings) in each of Goethe's chapter have to be deciphered in terms of "enthalpy" and "entropy" changes, a very complex task, to say the least. This is the objective that will occupy the equation decipherment section of the EA:IAD project.

Overview

Strangely, in spite of the fact that there are over 500+ human thermodynamic theorists, of which 40 are human free energy theorizers, the only known chemical thermodynamic "equation work" done on Goethe's great novella seems to have been that of American electrochemical engineer Libb Thims as discussed in his 2007 *Human Chemistry* chapter ten "Goethe's Affinities" and chapter eleven "Affinity and Free Energy". [1] Moreover, the above affinity-free energy equations, shown in various alternative formulations, seem to have been remained an "unnamed" equation, that is until its 2011 Hmolpedia coining as the "Goethe-Helmholtz equation".

Background	Count
Physical chemist/Chemical physicist	7
Chemical engineer	6
Thermodynamicist (Chemical/Statistical/Mechanical)	5
Chemist	4
Sociologist/Economist/Mathematician	4
Physicist	4
Physicist-Engineer	2
Physical biologist/Physiologist	2
Engineer (Materials science/Civil)	2
Philosopher	2
Psychologist	1

The **academic background** of each the above 39 human free energy theorists, which shows that 46 percent (or 13 individuals), the dominate portion of human free energy theorists are either: physical chemists, chemical physicists, or thermodynamicists.

The general reason for this dearth of activity on the chemical thermodynamics of *Elective Affinities*, is that, in large part, the modern physical scientist, i.e. chemical engineer, physical chemist, or chemical physicist, is only generally familiar with the term and concept of "free energy" and not with "affinity", which is a result of the fact that with the publication of Gilbert Lewis' 1923 *Thermodynamics and the Free Energy of Chemical Substances*, the word "affinity" was replaced, in the famous 1956 words of chemistry historian Henry Leicester, throughout the English-speaking world, with the term "free energy", as such the words: affinity, affinity chemistry, elective affinity, etc., are foreign terms to most modern physical scientists; resultantly, only those willing to dig into prolonged decade-long historical research into the subject will become aware of the deep and strong bridge that connects the two descriptions: affinities and free energies. To exemplify, it took Libb Thims exactly eleven years to track down Goethe and his *Elective Affinities* after becoming curious, in 1995, about the methodology of applying free energy prediction to human interactions (see: Thims history). Beyond this, the two cultures divide only further exasperates the situation.

Enthalpy | Heat content | Physical beauty

As far as is known, Libb Thims and German chemist Volker Wiskamp aside, almost no connection has been made, up to this point, between enthalpy and the chapters of Goethe's novella, a term, known formerly as "heat content" (Heike Kamerlingh-Onnes, 1909), that would best seem to be representative in Goethe's discussion of human "heats", e.g. sexual heat, social heat, frictional heat, etc., and human beauties that occur throughout the novella, one example of which are as follows: [11]

> “Beauty acts with far greater force on both inner and outer senses, so that he who beholds it is exempt from evil and feels in harmony with himself and with the world.”

To give a visual of what exactly we are talking about here, the following is 1 to 10 scale "Hot or Not" depiction of morphed photos (based on an original set of about 30 real photos), per each scale demarcation, created in 2005 by imaging researcher Pierre Tourigny: [4]

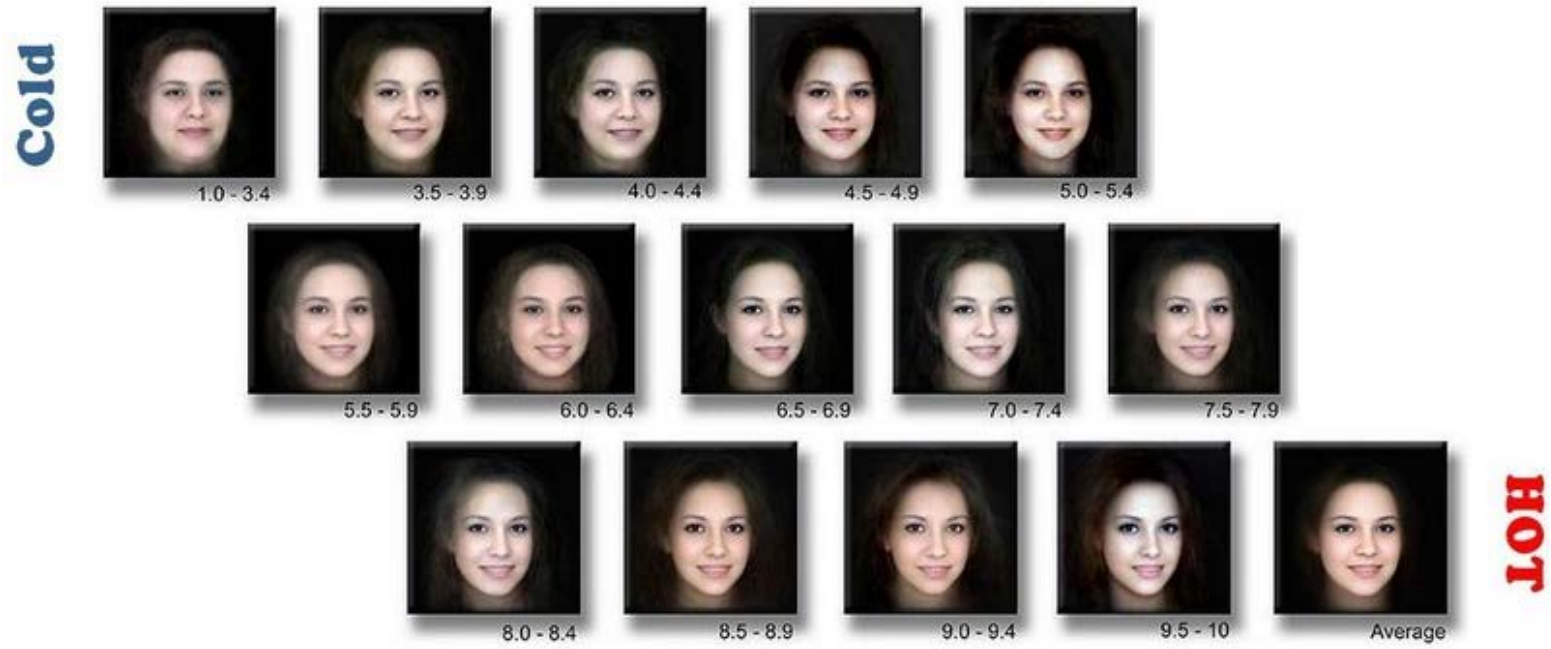

The lower end of the scale (1-range), according average ratings are, from the physical attractiveness (outer beauty) point of view, considered less-beautiful, whereas, conversely, the photos at the higher end of the scale (10-range) are considered the most-beautiful, in terms of outer beauty. The last female, a morph of all 30 women, is deemed very attractive, nearly in ranking to that of the perfect 10 female by virtue of the averageness effect, i.e. that people in possession of "average" to the mean physical traits tend to be well-represented in the current generation, and hence by logical extrapolations, into future generations as well.

Those near the 10-point range, no doubt, possibly in the character of Ottilie, is what Goethe meant when he states in the novella:

> "Beauty is everywhere a welcome guest."

The modern-day perspective on the nature of the relationship between physical attractiveness (outer beauty), neurological attractiveness (inner beauty), heat, and enthalpy (itself composed of internal energy and pressure volume work energy), is indeed a very complex subject, to say the least, some of which has only recently been touched on in the 2007 work of Libb Thims. [1] The equations decoding sections of the EA:IAD project will attempt to further elaborate and dissect this complex puzzle.

To corrobrate the above statement by Goethe, i.e. that "beauty is everywhere a welcome guest", a 2012 survey of 25 men, by Thims, who where shown the above photos, via a sliding ruler hot-to-cold smartphone scale (namely the continuous horizontal scale shown on the *Hmolpedia* hot article page), and asked to stop at the lowest female that they, while in an inhibition-lowered inebriated state, would have sex with, if approached by her, while at at a party, found that the average answer was the female at 6.04, below which sex would not occur, with a range of 3.4 to 9 of bottom-barrel female. [11] In short, every male stated that they would have sex with female 9.0 or above, thus lending credence to Goethe's statement that "beauty [at 9.0 or above] [in regards to willingness to have sex] is everywhere a welcome guest."

Historical thermodynamic connections

The following sections gives an outline of the known thinkers, Thims aside, to have made connections between Goethe's novella and thermodynamics, which seem to be mostly entropy connections, in a verbal sense.

Reahard

In 1991, American Goethean scholar Julie Reahard competed her PhD dissertation-turned-book *Chaos Theory, Hermeneutics, and Goethe's Die Wahlverwandtschaften* on the subject of analyzing Goethe's *Elective Affinities* in terms of chaos theory. She mentions entropy in passing on one page, in her discussion of the brain imaging chaos theories of American mathematical physicist Mitchell Feigenbaum and his studies of Goethe's color theory in relation to Newton's color theory: [7]

> "It seems only right, then, that, we turn the work of Feigenbaum and the other 'chaos' theoreticians like him, who see 'order in chaos', back upon Goethe in order to illuminate his meanings. I must emphasize these thinkers' common ability to see 'order in chaos' because Goethe's thought has much in common with this branch of chaos theory and little in common with the branch equating chaos with entropy and entropy with a complexity that is rich in information."

Here, Reahard, in her attempt to explain Goethe's *Elective Affinities* in terms of 1990s chaos theory models, gives way to the view that she is relatively a green theorist attempting to make sense of chaos theory and or complexity theory in the late 20th century, a field largely dominated by Prigoginean models of thermodynamics and of order being created past the bifurcation point. This, however, is a model, which to note has fallen out of flavor as of the 2010s, that has little to do with what Goethe had in mind in the writing of his *Elective Affinities*. Prigogine, although a citer of Goethe's *Elective Affinities* (see: footnote 2.5), was against human free energy models, commenting, for example, in his 1977 Nobel Lecture that Helmholtz free energy does not explain or apply to the structures, such as towns and trees, that we see around us. [8] In any event, it is interesting here to see someone from the humanities side of the two cultures attempting to discern Goethe's hidden "one idea", that he is said to have implanted into his novella, in terms of modern "comprehensive approaches", as she says.

Stoppard

British playwright Tom Stoppard, in his 1993 play *Arcadia*, a modern day remake attempt of *Elective Affinities*, that takes place via a juxtaposition of the years 1809 (the year of publication of *Elective Affinities*) and 1989, makes connection between entropy and affinity, through storyline, via his mentions of the second law, heat, and sexual energy, etc. To exemplify, the following is from act one scene one: [6]

> Thomasina: You can't stir things apart.
> Septimus: No more you can, time must needs run backward, and since it will not, we must stir our way onward mixing as we go, disorder out of disorder into disorder until pink is complete, unchanging and unchangeable, and we are done with it forever. This is known as free will or self-determination.
>
> Septimus: "if everything from the furthest planet to the smallest atom of our brain acts according to Newton's law of motion, what becomes of free will?"

Stoppard latter goes on to bring in the second law and heat death into the storyline:

> Valentine: "We are all doomed? It's called the second law of thermodynamics."

This is also mixed in with discussion of heat and sex; and to some extent, Stoppard attempts to explain sex via equations, but he chooses the equation of Fermat's last theorem, i.e. that no three positive integers *a*, *b*, and *c* can satisfy the equation:

$$a^n + b^n = c^n$$

for any integer value of *n* greater than two, for some reason. Stoppard's characters also discuss the Laplace's demon model of determinism.

Mimkes

In 1992, German solid state thermodynamicist and socio-economic physicist Jurgen Mimkes began working on a "society as a many particle system" model to explain various sociological economic phenomena, such as migrations, war, wealth, happiness. His first major publication was his 1995 "Binary Alloys as a Model for a Multicultural Society" *Journal of Thermal Analysis* article, in which he outlined a physics-based integration and segregation model.

In his 2000 article "Society as a Many Particle System", Mimkes begins to give some historical background, and comments how Goethe and his *Elective Affinities* was the first major thinker to use chemistry to explain human separations and coalitions. In his many articles, chapters, and talks, in the decade to follow, he frequently opened to an historical introduction of how Empedocles of Acragas (495-435BC) was the first to introduce the physical chemistry-based model of how aggression in countries at war, like Bosnia, could be explained in terms of how atoms and people like and attract each other, dislike or repel each other, or are indifferent; and comments how Goethe discussed this idea in his *Die Wahlverwandtschaften*, and supposedly how Wolfgang Weidlich (1971) is somehow the more recent advocator of this Empedocles-Goethe model, for his sociodynamics explanations using modern thermodynamics. [3]

This, however, is about as far as Mimkes goes, the rest of his rather statistical physics-based slanted derivation spent on an attempt to found socio-economic dynamics on a variant of the Lagrangian formulation. In his 2004 essay “Interactions of Heterogeneous Agents in Stochastic Socio-economic Systems”, to exemplify, Mimkes does, to his credit, discuss both free energy and entropy, although not enthalpy (as almost nobody, Thims aside discusses this), but his human thermodynamic variable assignments are very tenuous at best, almost guesses it would seem? The gist of his derivation is that firstly, he states that in circa 1780s Joseph Lagrange “formulated a principle that applies to stochastic systems with interactions (constraints)”, which Mimkes defines or rather introduces, without derivation, as follows: [3]

$$L = E + T \ln P \rightarrow \text{Max}$$

where L is the Lagrange function, E is the constraints of the system, i.e. the interactions of the agents, the function “ln P” the entropy of the system, according to the Boltzmann-Planck entropy formulation, T what Mimkes calls the Lagrange factor, according to which he states that the “stochastic system will be stable if the Lagrange function is a maximum.” He then states the following:

> “The meaning of the functions L, E, and T will depend on the type of systems investigated: in atomic systems E will be determined by the energy of atomic interactions, L will be the free energy, and T the mean energy (temperature).”

which seems to imply that Mimkes has the Helmholtz free energy, shown below, in mind?

$$H = E - TS$$

But in this case, the following form of the equatoin will be true, on spontaneous progression to the most stable state:

$$E - TS \rightarrow \min$$

which seems to contradict Mimkes’ formulation, which amounts to:

$$E + TS \rightarrow \max$$

In any event, Mimkes then jumps to the extrapolation:

> "In social systems, E will be given by the emotions of social interactions, L will be the common happiness and T the tolerance of disorder."

Moreover:

> "In economic systems, E will be the property value or price of goods, L the common profit, and T the average wealth or standard of living (Mimkes 2000)."

He then concludes with the following three axioms, which he seems to think are correct:

> "Atomic systems will be stable if the negative free energy L is at maximum."
> "Social systems will be stable if the common happiness L is at maximum."
> "Economic systems will be stable if the common profit is at maximum."

Here, although this is an interesting first stab at the elective affinities problem, there are numerous issues, too many to list at this point, the first of which however, is his usage of "negative free energy", which is a type of convoluted thermodynamics gone awry, similar to "negative entropy" and its tumultuous fall from grace.

Lehn

French supramolecular chemist Jean-Marie Lehn, in his 1995 *Supramolecular Chemistry* is well-aware of Goethe's *Elective Affinities*, on one hand, and also well-aware that enthalpy and entropy determinants are the factors of supramolecular bonding, but does not seem to be able to put the two pieces of the puzzle together. In fact, on the second page of his textbook (page 2) he opens to Goethe in the following way: [4]

> "Supramolecular chemistry is a sort of molecular sociology! Non-covalent bonds define the inter-component bond, the action and reaction, in brief, the behavior of the molecular individuals and populations: their social structure as an ensemble of individuals having its own organization; their stability and their fragility; their tendency to associate or to isolate themselves; their selectivity, their 'elective affinities' and class structure, their ability to recognize each other; their dynamics, fluidity or rigidity or arrangements and of castes, tensions, motions and reorientations; their mutual action and their transformations by each other."

Then, in his later chapter subsection (page 51) on supramolecular thermodynamics, he explains receptor-substrate bonding to form a supermolecule as such:

> "A receptor-substrate supermolecule is characterized by its geometric (structure, conformation), its thermodynamic (stability, enthalpy and entropy of formation) and its kinetic (rates of formation and of dissociation) features."

Here, we see an example of one "not able to see the forest amid the trees". Lehn clearly knows about tree one (Goethe and his *Elective Affinitie*s) and tree two (that entropy and enthalpy determines whether or not a receptor molecule and substrate molecule will bond to form a supermolecule), but is not able to place the two trees together at once so to see the forest (that entropy and enthalpy determinants are the factors in the formation of human molecular couples and social structures).

Keii

In 2004, Japanese chemical engineer Tominaga Keii, in his chemical thermodynamics chapter, devotes a section, entitled "Chemical Affinity in 1806", to Goethe's novel, as what seems to be an amusement diversion to himself, but does no equation derivation and comments it a somewhat odd turn of phrase that Goethe's *Elective Affinities* "added no scientific value"; very strange indeed?

Other

In 2004, writer Jang-Hyok An, in his *Goethe's Elective Affinities and the Other of Reason*, has a chapter section loosely translated as the "entropy of the thing", wherein the discusses elective affinities, entropy, and heat death, but the main citation seems to be Jeremy Rifkin, which is mostly garbage writing, intermixed with discussions on chaos theory. [12]

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (§10: Goethe's Affinities, pgs. 371-422; §11: Affinity and Free Energy, pgs. 423-468). Morrisville, NC: LuLu.
2. Stoppard, Tom. (1993). *Arcadia* (heat, 6+ pgs; sexual energy, pg. 33; atom, 2+ pgs; second law, pg. 65; quote: "Ah. The attraction that Newton left out. All the way back to the apple in the garden.", pg. 74). London: Faber and Faber.
3. Mimkes, Jurgen, Hillebrand, M., Frund, F, Denk, Ch., and Willis, G. (2004). "Interactions of Heterogeneous Agents in Stochastic Socio-economic Systems", in *The Complex Dynamics of Economic Interactions: Essays in Economics and Econophysics* (pg. 381-) (editors: Mauro Gallegati A.P. Kirman). Springer.
4. (a) Lehn, Jean-Marie. (1995). *Supramolecular Chemistry* (molecular sociology, pg. 2; §4.5: Supramolecular Dynamics, pgs. 51-53). New York: VCH.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (Lehn, pgs. 450-51). Morrisville, NC: LuLu.
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6. Stoppard, Tom. (1993). *Arcadia* (disorder, pg. 5; second law, pg. 65). Samuel French, Inc.
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(b) Mitchell Feigenbaum – Wikipedia.
8. Prigogine, Ilya. (1977). "Time, Structure and Fluctuations", *Nobel Lecture*, Dec. 08.
9. Hot or Not – Wikipedia.
10. Thims, Libb. (2012). "Lowest Female to Have Sex With" (N=25), IoHT research project, May 30-31.
11. Note: in 2011, following the posting of Libb Thims "Sexual Heat | Pop Quiz" video, some have vigorously objected to enthalpy = physical attractiveness model, including: Ryan Grannell and Lubos Motl to name a two.
12. (a) An, Jang-Hyok. (2004). *Goethe's Elective Affinities and the Other of Reason: the Micro and Macro of Constellation of Otherness as atopic Counter Instance for Identity Constraint* (Goethes"Wahlverwandtschaften" und das Andere der Vernunft: Die Mikro- und Makrokonstellation der Andersheit als atopische Gegeninstanz zum Identitätszwang) (§2.7: The order of discourse (as ordinal instance) or the entropy of the thing (Die Ordnung des Diskurses (als Ordnungsinstanz) oder die Entropie der Ding), pgs. 78-80). Königshausen & Neumann.
(b) Found via Google search: "Entropie, Goethe, Wahlverwandtschaften".

Further reading

â— Gladyshev, Georgi P. (2012). "Love: the State of Living Organism" (Russian → English), WordPress.com, Mar. 9.
â— Gladyshev, Georgi P. (2012). "On the Thermodynamics of Feelings and 'Goethe's Affinity'" (Russian → English), WordPress.com, Sep. 24.

In Elective Affinities: IAD, the following is the **artists** section of the online project:

> “Scarcely any literature is likely to offer a narrative of the length of *Elective Affinities* in which there are so few names.”
>
> — Walter Benjamin (1921), German literary critic

The the above quote, Benjamin attempts to explain this sparsity of characters by attributing it to "Goethe's penchant for typical characters". [1] This, however, seems quote off. Correctly, it would seem that the sparsity of characters has to do with the fact Goethe envisioned each character as a reactant whose total set of possible reactions had to fit on one affinity table; subsequently, as the number of characters increased, so to would the size of the affinity table, and hence the number of potential reactions, beyond which, at a certain point, fitting them all into the format of one novella, would become untenable.

Characters | Reactants

The following is a list of the characters [reactants] to Goethe's *Elective Affinities*, listed in order of appearance:

Original		Characters			Description	Chapters
Goethe (1809)	B	Edward (by Philipp Johann?, 1885)	Eduard (by Friedrich Pecht and Arthur von Ramberg, 1863)	Edward (Helmut Griem, 1982)	(add)	1:1, 1:2
		Gardener			He informs Edward, while at work in the garden, that Charlotte wishes to see him.	1:1
Charlotte von Stein (1793)	A	Charlotte (by Philipp Johann?, 1885)	Charlotte (by Friedrich Pecht and Arthur von Ramberg, 1863)	Charlotte (Stephane Audran, 1982)	(add)	1.1, 1:2

Luciana
(by Philipp Johann?, 1885)

Charlotte's daughter, who is away at boarding school; her name begins to be mentioned in 1:2, 1:4, and 1:13.

Servant

He runs out to tell Edward and Charlotte, who are walking around the cemetery, that Mittler has arrived to visit. 1:2

Mittler
(by Philipp Johann?, 1885)

1:2

(add)

Friedrich Schiller
(1805)

C

Captain
(by Philipp Johann?, 1885)

Captain
(Michael Degen, 1982)

He arrives in chapter three by invitation of Edward to begin work on surveying projects on the grounds of the Estate. 1:3

D

1.6?

(add)

Minna Herzlieb
(1803)

Ottilie
(by Friedrich Pecht and Arthur von Ramberg, 1863)

Ottilie
(by Wilhelm von Kaulach, c.1864)

Ottilie
(by Wilhelm von Kaulach, c.1864; check?)

Ottilie
(Pascale Reynaud, 1982)

References

1. Benjamin, Walter. (1921). "Goethe's *Elective Affinities*" (scribd), first published by Hugo von Hofmannsthal in the *Neue Deutsche Beitrage* (1924/25); in: *Selected Writings, Volume 1: 1913-1926* (Elective Affinities, pgs. 297-360). Harvard University Press, 1996.

In Elective Affinities: IAD, the following is the **love theories** page of online project.

Theories

As Goethe famously said that he has hidden many things (see: commentary decoding) in *Elective Affinities*, this page focuses on the various philosophical, mythological, and or scientific love theories that scholars have uncovered hidden in the novella. The following is the listing of known theories of love, relationships, and reproduction models that Goethe is argued to have incorporated into his novella:

Theory	Originator[s]	Description	Image	Scholars
Cupid	Imhotep (2635-2595BC) Hesiod (750-650BC)	The god of love (Eros), in the form of a putto, with his bow and arrow of love, with which a shot from, via the actions of its chemically-dipped arrow head, causes a person to fall in love; the nature of love, passion, and the rules and repercussions of desire is the central motif of the novella.		Philipp Johann Hjalmar Boyesen
Prometheus	Imhotep (2635-2595BC) Hesiod (750-650BC)	A Greek mythology figure who is credited with the creation of man from clay (Ñº), and who defies the gods and gives fire to humanity, i.e. theft of fire (Ñº), an act that enabled progress and civilization; Shakespeare, whom Goethe started reading at age 17 (see: timeline), famous commented, in his 1603 *Othello, the Moor of Venice*, in riddled form: "I know not where is that Promethean heat, that can thy life relum"; the term here is extrapolated to the nature of the heats of passion, and the life and death of relationships.		
Chemical	Empedocles	The theory that people who love each other mix like water and wine;		

aphorism	(495-435 BC)	whereas, conversely, those who hate each other separate like oil and water.		
Soul mate theory (or split human theory)	Aristophanes (446-386BC) Plato (427-347BC)	Human ancestors were hypothesized to once have had two heads, four arms [and supposedly one soul]. They did something to offend a god so that god punished them by splitting them down the middle, resulting in the creation of humans. As a punishment, we are condemned to spend our lives searching for the other half, our soulmates. (Ñº) The theory is described in a dialogue in Plato's *The Symposium*, in which he has Aristophanes present a story about soul mates; a theory that, supposedly, Goethe incorporated into the Edward/Ottilie paring via his alternate headache coincidence descriptions. In modern terms, about 75 percent of people, supposedly, believe in this theory, to the effect that when two soul mates find each other it will be love at first sight.	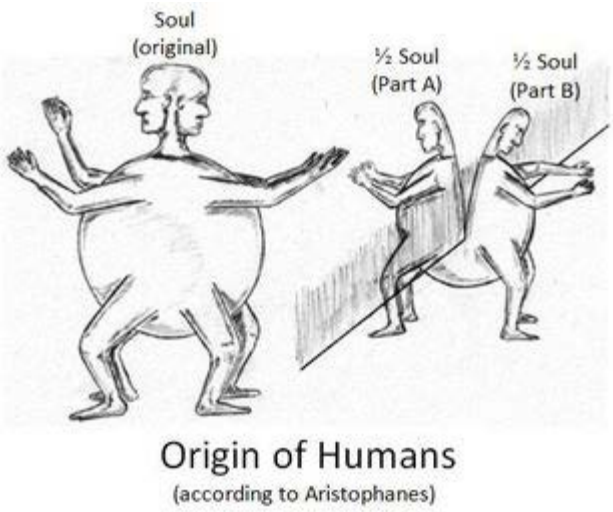	William Lillyman [1]
Narcissism	Ovid (43BC-c.17AD)			Stefani Engelstein [2]

Maternal imagination theory	Levinus Lemnius (1505-1568) Robert Burton (1577-1640) Pierre Maupertuis (1698-1758)	A physiology of reproduction theory which holds that whoever a woman (or in some versions the man) is thinking of at the time of conception those traits will be passed to the offspring.	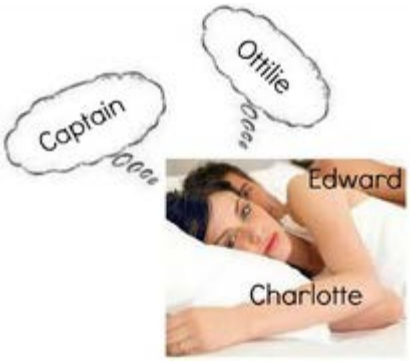	
Bildungstrieb	Johann Blumenbach (1752-1840)	A “formative drive” theory (see also: Freud-Schiller drive theory), which hypothesizes that an epigenetic driving force exists that directs form reproduction in plants, animals, and humans; such as observed in grafting shoots and plant growth.		Stefani Engelstein [2]
Human chemical theory	Johann Goethe (1749-1832) Friedrich Schiller (1759-1805)	A theory that humans "react" together like chemicals, forming and or breaking bonds, according to chemical reaction diagram (equation) logic, of the Bergman reaction diagram variety; the theory was originated by Goethe (1793-1796), as an extension of his early evolution of plants and animals theory (metamorphology), then developed in part via discussions with Schiller (1798-1805). The "Captain" to "Major" change, only after which Charlotte	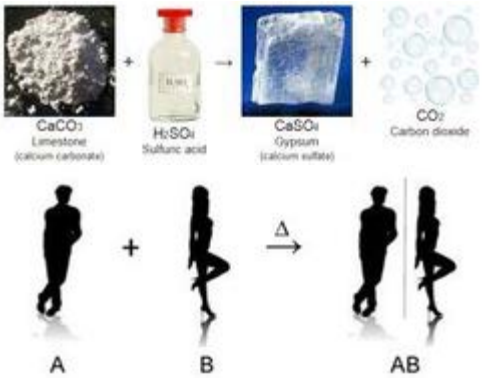	Jeremy Adler

Evolutionary psychology	agrees to marry the Captain, is situated in the novella, as some type of Alley equation factor.	Person [?]

References

1. (a) Lillyman, William J. (1982). "Analogies for Love: Goethe's *Die Wahlverwandtschaften* and Plato's *Symposium*" (quote, pg. 128). Goethe's Narrative Fiction: the Irvine Goethe Symposium. Walter de Gruyter.
(b) Plato. (c.380BC). "Aristophanes' speech", in: *Collected Works of Plato* (translator: Benjamin Jowett) (pgs. 520-25). Oxford University Press, 1953.
(c) Symposium (Plato) – Wikipedia.
(d) Burton, Neel. (2010). "Platonic Myths: the Myth of Aristophanes", Outre-Monde.com, Sep. 25.
2. Engelstein, Stefani. (2008). *Anxious Anatomy: the Conception of the Human Form in Literary and Naturalist Discourse* (§Goethe's Monstrous Otto, pgs. 26-30; Metamorphology, pgs. 48-54; Elective Affinities or Chosen Correspondences, pgs. 55-60). SUNY Press.

In Elective Affinities: IAD, the following is the **project background** page of online project. The earliest reactions to Goethe's novella seem to well find classification into Admirers | Enemies divide. Into the 1850s to modern times, however, a more slowed-down intellectual digestion of the work seems to have emerged, allowing for "commentators" to be classified as shown below:

Humanities scholar commentators | Content analyzers

The following is an historical listing of general content, hidden elements, and or embedded puzzles commentators on *Elective Affinities*:

- George Lewes (1855): together with George Elliot, supposedly, in his *Life of Goethe*, “analyzed” the novel.
- Victoria Woodhull (1871) [Introduction]
- Herman Grimm (1875)
- Hjalmar Boyesen (1885)
- S.H. Emery (1886) [3]
- Henry Finck (1887)
- Wilhelm Bolsche (1889)
- Ernst Haeckel (1895): gave an account of it in his *Riddle of the Universe*.
- Friedrich Gundolf (1916)
- Walter Benjamin (1921) [Essay]
- Georg Lukacs (1968): analyzed it in his *Goethe and His Age*.
- William Lillyman (1980-present)
- Judith Ryan (1983-present)
- John Winkelman (1987) [Book]
- David Constantine (1994) [Introduction]
- Alfred Steer (1990) [Book]
- Isher-Paul Sahni (1996) MA thesis: “The Will to Act: an Analysis of Max Weber’s Sociology in Light of Goethe’s Fiction.” [2]
- Gundula Sharman (1997) [Talk]
- Julie Reahard (1997) [Book]
- John Williams (1998)
- Gordan Burgess (1999) [Book]: first computer-assisted analysis of novella.
- Astrida Tantillo (2001) [Book]: first attempt to make a compilation and analysis book of the critics and commentators.
- Martin Swales (2002)
- Erika Swales (2002)
- Stanley Corngold (2003) [Lecture]
- Matthew Bell (2014) (Q)
- John Armstrong (2006)
- Bernard Joly (2006)
- Carl Krockel (2007) [PhD]
- Nicholas Boyle (2007), Goethe, *Die Wahlverwandtschaften*, Lecture at University of Cambridge (Q)
- Stefani Engelstein (2008)
- Karen Pinkus (2009)
- Helmut Huhn (2010) [Book]: first multi-collaborator compendium of analysis's on the novella.
- Takaoki Matsui (2010)
- Irina Strout (2011)
- Frode Pedersen (2011)
- Lucia Salvato (2014) (Q)
- Matthew Bell (2014)

Chemists | Physical scientists to have cited *Elective Affinities*

See main: Scientists who've cite *Elective Affinities*

The following is a list of chemists, chemical engineers, and chemistry historians and other scientists who have cited Goethe's 1809 human elective affinity theory:

1905 | Wilhelm Ostwald | Sixth Lecture: Affinity Lecture at MIT.
1910 | Fielding Garrison | comment: "seems so plausible and fascinating".
1969 | Jeremy Adler | *Goethe's* 'Elective Affinity' *and the Chemistry of his Time*
1978 | Pierre Laszlo | "All Kinds of Affinities"
1984 | Ilya Prigogine | *Order Out of Chaos* (pgs. 64, 319)
1995 | Jean-Marie Lehn | *Supramolecular Chemistry* (pg. 2)
1995 | Roald Hoffmann | *The Same and Not the Same* (pgs. 58, 88-89, 179-80, 256) [43]
1995 | Joel Janin | protein thermodynamics article "Elusive Affinities". [41]
1997 | Kevin Yee | The Captain as Catalyst in Goethe's *Wahlverwandtschaften*
2000 | Jurgen Mimkes | "Society as a Many Particle System" (pg. 2)
2003 | Mi Gyung Kim | *Affinity, That Elusive Dream* (pgs. 1-2)
2004 | Tominaga Keii | *Heterogeneous Kinetics* (section: Chemical Affinity in 1806, pgs. 16-17)
2007 | Libb Thims | *Human Chemistry* (ch. 10: Goethe's Affinities, pgs. 371-422)
2008 | Philip Ball | "Literary Reactions" in *Science World*
2010 | Sam Kean | *The Case of the Disappearing Spoon* (ch. 14: Artistic Elements)

Commentators | Chemical theory

The following is the listing of human chemical theory commentators:

- Fielding Garrison (1909)
- Betty Dobbs (1875)
- Ilya Prigogine (1984)
- Roald Hoffmann (1995)
- Kevin Yee (1997)
- Tominaga Keii (2004)
- Stefan Blechschmidt (2009)
- Sam Kean (2010)

Commentators | Reaction theory analyzers

The following is the listing of human chemical reaction theory commentators:

- Arthur Schopenhauer (1816)
- Jeremy Adler (1977) [PhD]: done on the reactions and chemists used.
- Alfred Steer (1990)
- Karl Fink (1999)
- Libb Thims (2007) [Textbook]
- Ryan Grannell (2011)
- Xavier Duran (2012)

Background

The "illustrated and annotated" reprinting idea came to Thims while making the Goethe timeline (27 Apr to 7 Mar 2012) and noting all of the diverse artwork, criticism, and commentary produced in regards to Goethe's greatest work, and coming to the view that a single-book collection of all of this information, and historical commentary, would well serve as a guide to the new reader of *Elective Affinities*, the physical science dissection, following German physicist Hermann Helmholtz's 1882 "On the Thermodynamics of Chemical Processes", mandating the requirements of a proficiency in the chemical thermodynamics language of partial differential equations dating back to at least the time of the Euler reciprocity relation and Leonhard Euler's formulation of the integrating factor method of the exact differential.

On 6 May 2012, Thims tentatively contracted American artist Nina Ilieva to add modern upgrade artistic renditions to the sections lacking depiction. On May 7th, in the early morning, prior to discovering the Boyesen illustrated reprint, Thims sent the following email to Goethean scholar Karl Fink, summarizing the project, in attempt to query him as to the best pre-1930s "public domain" English translations:

> "I've been making a Goethe timeline these last two weeks (you are at 1999). Please feel free to forward me important dates, in regards to the science, dates, criticism, and or followup of *Elective Affinities*, that you see that I am missing. I may make the timeline into a one-hour video; and may possibly do a 2013 book publication *Elective Affinities: Annotated and Illustrated*, with the representative Bergman reaction for each chapter, with footnoted commentary on each chapter, as scholars have seen and discussed the hidden coded elements of each chapter over the years, and as modern human chemical thermodynamics sees things. In

regards to this tentative project, I already have two book illustrator artists lined up; to make artwork for chapters that don't already have preexisting art historically, e.g. Wilhelm Kaulbach (e.g. Ottilie on the Lake); and as a first step, I will likely pick a public domain translation, upload each chapter online, into wiki format, and edit, illustrate, and annotate each chapter individually, and publicly."

Later in the day, May 7th, while making the "Elective Affinities (translations)" page, in an effort to catalog all known English translators, Thims discovered the Hjalmar Boyesen illustrated reprint *Elective Affinities*, via the *The Online Library of Liberty*, which in 2012 posted single-page semi-formatted online version Boyesen-version, with poor quality image scans, to the Internet, along with the *Wilhelm Meister's Travels*, all on one continuous 110-page long Internet page. [1] This finding launched the project (started: 7 May 2012).

Further reading

● Hodge, Joanna. (2005). "The Timing of Elective Affinity: Walter Benjamin's Strong Aesthetics", in: *Walter Benjamin and Art* (editor: Andrew Benjamin)(§2, pgs. 14-31; quote, pg. 21; note 13, pg. 252). Continuum International Publishing Group.

North American dissertations

(1886-2008) (link)

● Gould, Robert David. "Elective Affinities: An Investigation of the Influence of Goethe's Thinking on *Die Wahlverwandtschaften*." Diss. Princeton University 1970.
● O'Neill, Mary Jane. "'Zwiespalt im Gemüt': Ambiguity in Goethe's *Wahlverwandtschaften.*" Diss. Washington University 1974.
● Erickson, Susan Joan. "A Reading of Goethe's *Die Wahlverwandtschaften* and Musil's *Der Mann ohne Eigenschaften*." Diss. Yale University 1977.
● Nolan, Erika Johanna. "Anteil und Schicksal: Versuch über das Verhältnis von Charakter und Geschehen in Goethes Roman *Die Wahlverwandtschaften*." Diss. University of Chicago 1978.
● Leonhard, Sigrun Dagmar. "Verfehlte Vermittlung: Eine Interpretation von Goethes Roman *Die Wahlverwandtschaften*." Diss. Stanford University 1983.
● Puszkar, Norbert. "Symbolik, Bildlichkeit und Mimesis sozialer Verhältnisse in Goethes *Wahlverwandtschaften*." Diss. University of Southern California 1985.
● Reahard, Julie A. "'From an Unknown Center to an Unknowable Boundary': Chaos Theory, Hermeneutics, and Goethe's *Die Wahlverwandtschaften*." Diss. University of Colorado at Boulder 1991.
● Fry, Ingrid Elisabeth. "*Elective Affinities*: Johann Wolfgang von Goethe's Concept of Bildung and Its Influence on the American Transcendentalist Writers Emerson, Fuller and Thoreau." Diss. Washington University 1994.
● Sczyrba, Johannes D. "Illusionsbildung bei Landschaftsbeschreibungen in Goethes *Wahlverwandtschaften* und Flauberts *Madame Bovary*." Diss. University of Colorado at Boulder 1994.
●Trepanier, Michele. "Food, Flesh and Death: Anorexic Discourse in Goethe's Die Wahlverwandtschaften." M.A. McGill University (Canada) 1999.
● Schwartz, Peter Joseph. "After Jena: Historical Notes on Goethe's *Elective Affinities*." Diss. Columbia University 2002.
● Schreiber, Anne. "The Theatrical Construction of Identity in Goethe's *Wilhelm Meisters Lehrjahre* and *Die Wahlverwandtschaften*." Diss. The University of Iowa 2003.

References

1. (a) Goethe, Johann. (1885). *Goethe's Works, Illustrated by the Best German Artists*, 5 volumes (by Hjalmar Boyesen) (Volume 5: W. Meister's Travels; Elective Affinities (Part I, pgs. 231-297; Part II, pgs. 298-369; Index, pg. 371; Index of engravings, pgs. 370-76)). Philadelphia: George Barrie.
(b) Compare the 2012 version done (link) by the Online Library of Liberty.
2. Sahni, Isher-Paul. (1996). "The Will to Act: an Analysis of Max Weber's Sociology in Light of Goethe's Fiction" (pdf), MA thesis, Department of Sociology and Anthropology, Concordia University, Montreal, Quebec, Canada, Aug.
3. Emery, S.H. (1886). "The Elective Affinities", Lecture at the Concord School of Philosophy; in: *The Life and Genius*

of Goethe (§9:251-89) (editor: Franklin Sanborn). Ticknor.

In Elective Affinities: IAD, the following is the **reaction decipherment** page of online project:

Decipherment | Reactions

A main focus of the "decoding" aspect of this project will be to determine which specific chemical reactions, of Swedish chemist Torbern Bergman's 1775, 64-affinity reaction diagrams (chemical equations), Goethe used with which to model each of his 36 chapters. Historical precidents to this puzzle include the work of English Goethean scholar Jeremy Adler, who from 1969-1990 tentatively decoded about a half-a-dozen of the reactions Goethe likely used, American Germanic literature professor and Goethean science scholar Karl Fink who in 1999 tentatively approximated the first nine reactions used by Goethe, largely for Part One of the novella.

Bergman's Symbols | 1775
(Single elective attractions)

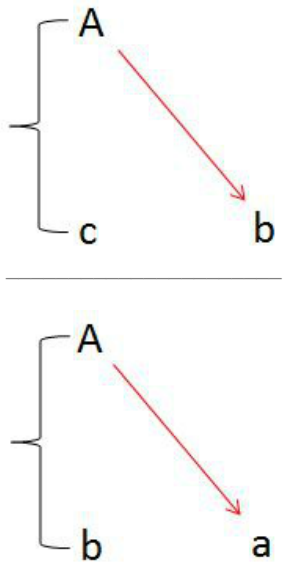

"Suppose *A* to be a substance for which other heterogeneous substances *a*, *b*, *c*, etc., have and attraction; suppose, further, *A*, combined with *c* to saturation—this union I shall call *Ac*—should, upon the addition of *b*, tend to unite with it to the exclusion of *c*, *A* is then said to attract *b* more strongly than *c*, or to have a stronger elective attraction for it;

lastly, let the union *Ab*, on the addition of *a*, be broken, let *b* be rejected, and *a* chosen in its place, it will follow, that *a* exceeds *b* in attractive power, and we shall have a series: *a*, *b*, *c*, in respect to efficacy. What I here call *attraction*, others call *denominate affinity*; I shall employ both terms promiscuously, though the latter, being more metaphorical, would seem less proper in philosophy."

In short, our objective, in regards to the discerning of the various human chemical reactions presented in Goethe's mind, via his coded novella, will be to show forth *what exactly* Goethe means by the following riddled statements concerning his "best book", of his 142-publications collected works set:

> "My idea in the new novel *The Elective Affinities* is to show forth social relationships and the conflicts between them symbolically [in symbolic concentration]" (28 Aug 1808) and "the moral symbols in the natural sciences, that of the elective affinities invented and used by the great Bergman, are more meaningful and permit themselves to be connected better with poetry and society" (24 Jul 1809).

"The great Bergman", who, according to Goethe, "invented and used the elective affinities—the moral symbols of the natural sciences."

Swedish chemist Torbern Bergman (1735-1784), author of the 1775 textbook *A Dissertation on Elective Attractions*, the backbone to science and reactions behind Goethe's 1809 *Elective Affinities*.

In plain speak, in this above statement, Goethe tells us that the entire structure of his *Elective Affinities*, all 36-chapters, if we are to take this statement at face value, is the explanation of "social relationships", i.e. friendship, marriage, affairs, sexual relationships, work relations, family interactions, community engagements, etc., through the language of the "theory of affinity" (affinity chemistry)—which, as English chemistry historian James Partington correctly explains, in his 1937 chapter "The History of Physical Chemistry"—is the foundation and starting point for the science of physical chemistry—of which, chemical thermodynamics is the centerpiece—and in which the measure of "affinity" has been determined (Helmholtz, 1882) to be that of the measure of the change in the "free energy" of the reacting system or social system, which in our novella scenario is the "estate", the reaction vessel, the type of free energy, in the case of earth-bound freely-going human reactions (human-human reactions), see: human chemical reaction theory, being: Gibbs free energy.

Subsequently, if we are to take Goethe's words at face value, each chapter of *Elective Affinities* is framed around one of Swedish chemist Torbern Bergman's 64 affinity reaction diagrams (see: affinity reaction) and 59-column 50-row affinity table (see: affinity table) as explained through the text of his 1775 chemistry textbook *A Dissertation on Elective Attractions*—at a minimum—Jeremy Adler, who did his 1977 well-researched PhD on this topic, for example, argues cogently that Goethe used over a dozen different affinity tables and affinity reaction theories in the construction of his novella. To get our feet wet into this matter, the following are the opening paragraphs of Bergman's textbook, upon which Goethe based his novella:

> "It is found by experience, that all substances in nature, when left to themselves, and placed at proper distances, have a mutual tendency to come into contact with one another. This tendency has been long distinguished by the name attraction. I do not suppose in this place to inquire into the cause of this phenomena; but, in order that we may consider it as a determinate power, it will be useful to know the laws to which it is subject in its operations though the mode of agency be as yet unknown.
>
> It has been shown by Newton, that the great bodies of the universe exert this power directly as their masses, and inversely as the squares of their distances. But the tendency to union which is observed in all neighboring bodies on the surface of the earth, and which may be called *contiguous attraction*, since it only affects small particles, and scarce reaches beyond contact, whereas *remote attraction* extends to the great masses of matter in the immensity of space, seems to be regulated by very different laws; it seems, I say, for the whole difference may perhaps depend on circumstances."

In short, Goethe's aim was to explain "contiguous attraction", occurring between bodies on the surface of the earth in close proximity, using the symbols of chemical reactions, namely of reactants transforming into products, using the letter notation (A, B, AB, c, etc.) invented by Bergman, such as, in modern (non bracket) chemical equation format, for example the combination reaction (marriage or relationship formation):

$$A + B \rightarrow AB$$

or, as described in the caption box (above, right), the single elective attraction (single elective affinity), which famously sets the stage for the first several chapters of Goethe's novella:

$$Ac + b \rightarrow Ab + c$$

and

$$Ab + a \rightarrow Aa + b$$

in which, as Goethe would have read it, in *circa* 1885, the time of the German translation of Bergman's textbook, the "should upon the addition of *b*" (Bergman) describes the invitation of the Captain to the estate (Part One, Chapter Two), and the "on the addition of *a*" (Bergman) describes the recall of Ottilie back to the estate (Part One, Chapter Five), each chapter, in turn, being expanded versions of Bergman's variously described chemical reactions scaled up as models of human interaction, a principle and methodology of which that Goethe famously said was "true". In the version Goethe presented, however, he switched the lettering around, to a certain extent, using the assignments of: Charlotte (A), Eduard (B), Captain (C), and Ottilie (D).

The original 64 reaction diagrams, "click here" for larger version, presented in Bergman's textbook, as based on 122 chemical experiments, with which Goethe used to base or model the various human chemical reactions to each of his 36 chapters, are shown below:

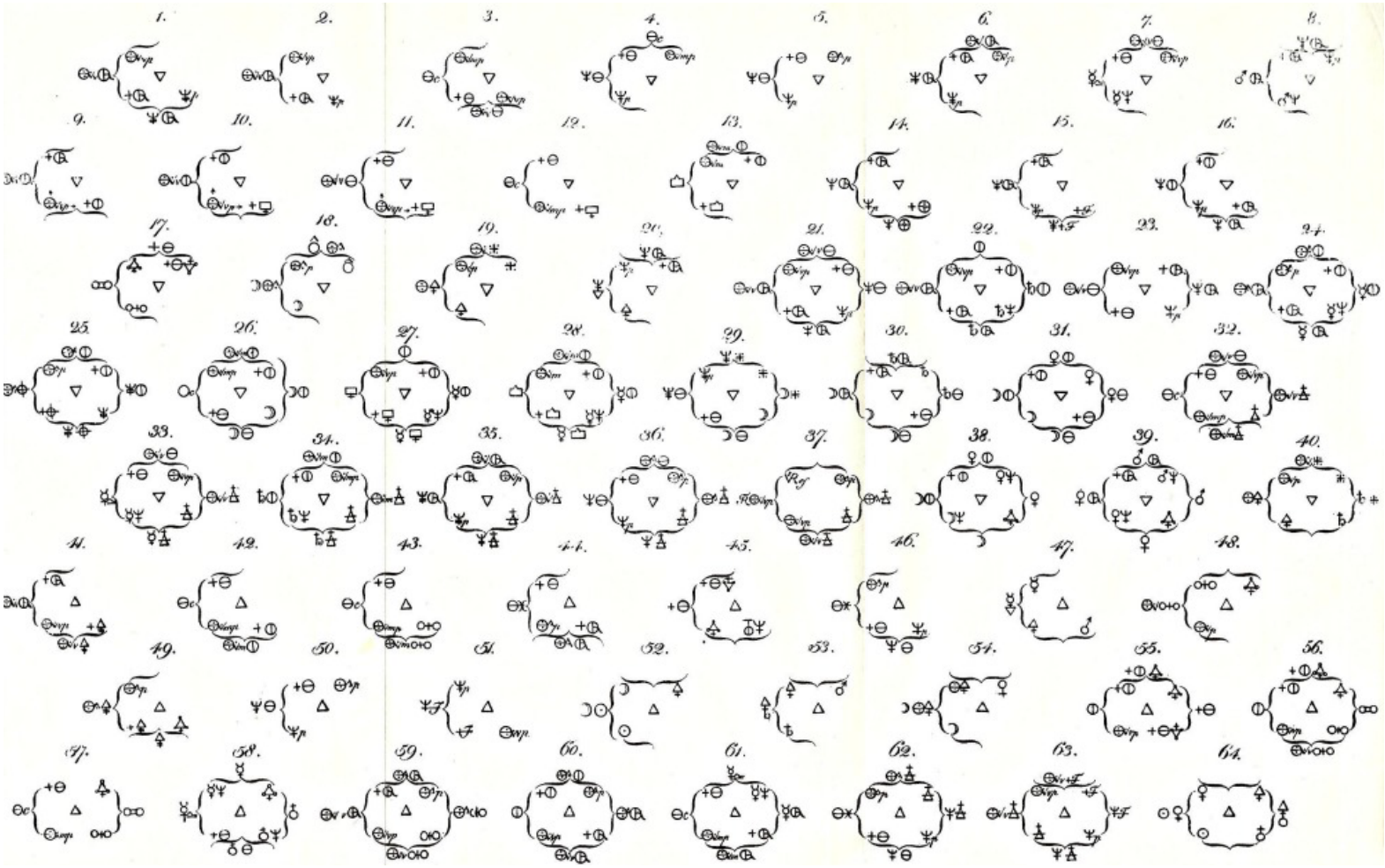

The following, to go through one example, is Bergman's reaction #20, the decomposition of calcareous hepar (calcium sulfide) by vitriolic acid (sulfuric acid): [10]

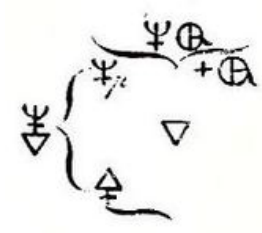

(or)

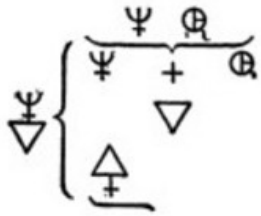

which has the following "symbol" assignments and meanings (see: Bergman's chemical signs explained):

Symbol	Bergman name	Modern name	Modern formula
	Calcareous hepar	Calcium sulfide	CaS
	Vitriolic acid	Sulfuric acid	H_2SO_4
	Sulphur	Sulfur	S
	Gypsum	Sulfate mineral	$CaSO_4 \cdot 2H_2O$
	Pure calcareous earth	Calcium oxide	CaO
	Water (reaction condition)	Aqueous reaction	$A + B \xrightarrow{H_20} C$
	Heated reaction (matter of heat)		$A + B \xrightarrow{\Delta} C$
	Chemical union (vertical crotchet)	Chemical bond	AB or A≡B
	Downward full-bracket (crotchet) A new united product "falling down"	Precipitate (bonded)	
	Downward half-bracket (half-crotchet) A single species "falling down"	Precipitate (single species)	
	Upward full-bracket (crotchet) "remains in solution"		

Letter notations:

(aq) = aqueous solution
(l) = liquid
(g) = gas
(s) = solid

Used such as:

A(aq) + B(aq) → C(s) + D(aq) + E(q)

In this chemical reaction, calcium sulfide *CaS* is decomposed by sulfuric acid H_2SO_4 in water to produce elemental sulfur *S* which precipitates (downward half-bracket) and calcium sulfate Cas_O4, which also precipitates (down full-bracket). In modern terms, neglecting intermediates, this reaction would be written as:

$$CaS + H_2SO_4 \xrightarrow{\mathbb{H}_2O} CaSO_4 + S$$

In the middle of these reaction diagrams, Bergmanuses the nabla symbol , the alchemical symbol for water, to indicate that the reaction occurs the wet way, i.e. in water, or according to Bergman:

> “Intimating that the three surrounding bodies freely exercise their attractive powers in it.”

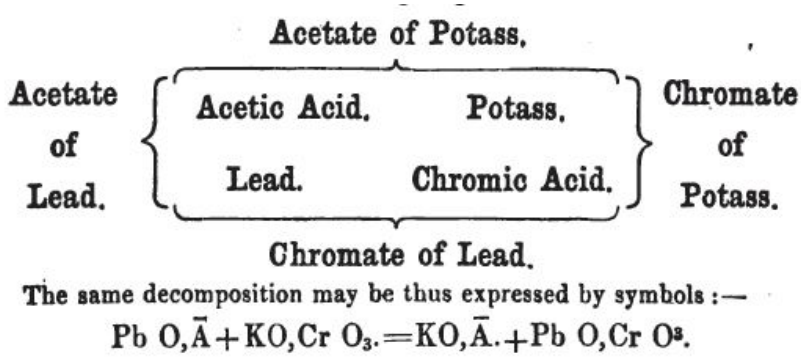

An 1858 depiction of the reaction of Acetate of Lead with Chromate of Potass, from English chemist John Bidlake's *Textbook of Elementary Chemistry*, chapter three: "Chemical Affinity", which shows the Bergman-style reaction notation (above) and the semi-modern products-going-to-reactants (before and after) reaction notation (bottom), a type of reaction that Bidlake defines as a "double decomposition" (or double elective affinity as Goethe would have called it). [2] The upgrade from the equal sign " = " symbol to the two-way reaction arrow "⇄" symbol (or ⇌), signifying a reversible reaction, to note, did not come about until 1884 through the work of Dutch physical chemist Jacobus van't Hoff. [3]

In other diagrams, Bergmanuses the delta symbol âˆ†, the alchemical symbol for fire, to indicate reactions which are performed in the dry way; which, in modern terms, these reaction condition details are typically listed over the reaction arrow, as H_2O or heat, respectively, as shown in the above table. Goethe would have viewed these "reaction condition" symbols, to the effect that the air, water, fire (day light and sun heat), landscape, housing, and food, etc., would create the reaction environment in which the characters in or entering into the grounds of the estate could "freely exercise their attractive powers in it". [10]

In more detail, Bergman's reaction #20 shows, in his own words, the "decomposition of *calcareous hepar* by *vitriolic acid*", as re-shown below:

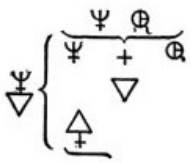

$$CaS + H_2SO_4 \rightarrow CaSO_4 + S$$

Bergman 1775 version Modern version

The "+" sign here seems to indicate "with the addition of" [species indicated]; a reaction which, in words, is such that the *calcareous hepar*,

(CaS)

described such that it has its "proximate principles [are] united", which are *calcareous earth* (calcium oxide, CaO) and sulphur (S):

(CaO) and
(S)

is decomposed [reacts with] *vitriolic acid* (sulfuric acid, H_2SO_4):

(H_2SO_4)

in water, (H_20), indicating that “the three surrounding bodies freely exercise their attractive powers in it”, to form gypsum and elemental sulphur:

($CaSO_4$) and
(S)

The separation of the signs of calcareous earth and hepar inside the vertical bracket { represents breaking of the combination of these two “proximate principles” by the action of the vitriolic acid, which “attracts calcareous earth more strongly than sulphur does.” The signs of the calcareous earth and vitriolic acid are placed side by side above a complete horizontal bracket—the indication that a new combination—the point of which is turned downwards to imitate that the new compound (vitriolated calcareous earth or gypsum) is precipitated. The fact that sulphur, which is the other product of the reaction, also precipitates, is indicated by turning downwards the point of the lower horizontal half bracket. [12] In modern terms, calcium sulfide *CaS* is decomposed by sulfuric acid H_2SO_4 in water calcium sulfate $CaSO_4$, which precipitates (down full-bracket) and to produce elemental sulfur *S* which precipitates (downward half-bracket); which, neglecting intermediates, would be written as:

$$CaS(s) + H_2SO_4(aq) \rightarrow CaSO_4(s) + S(s)$$

This reaction, of course, is an example of a single elective affinity (reaction), and in Bergman chemical species letter notation would be categorized as the

following "type" of reaction:

Historical Reaction Schematic Development Overview

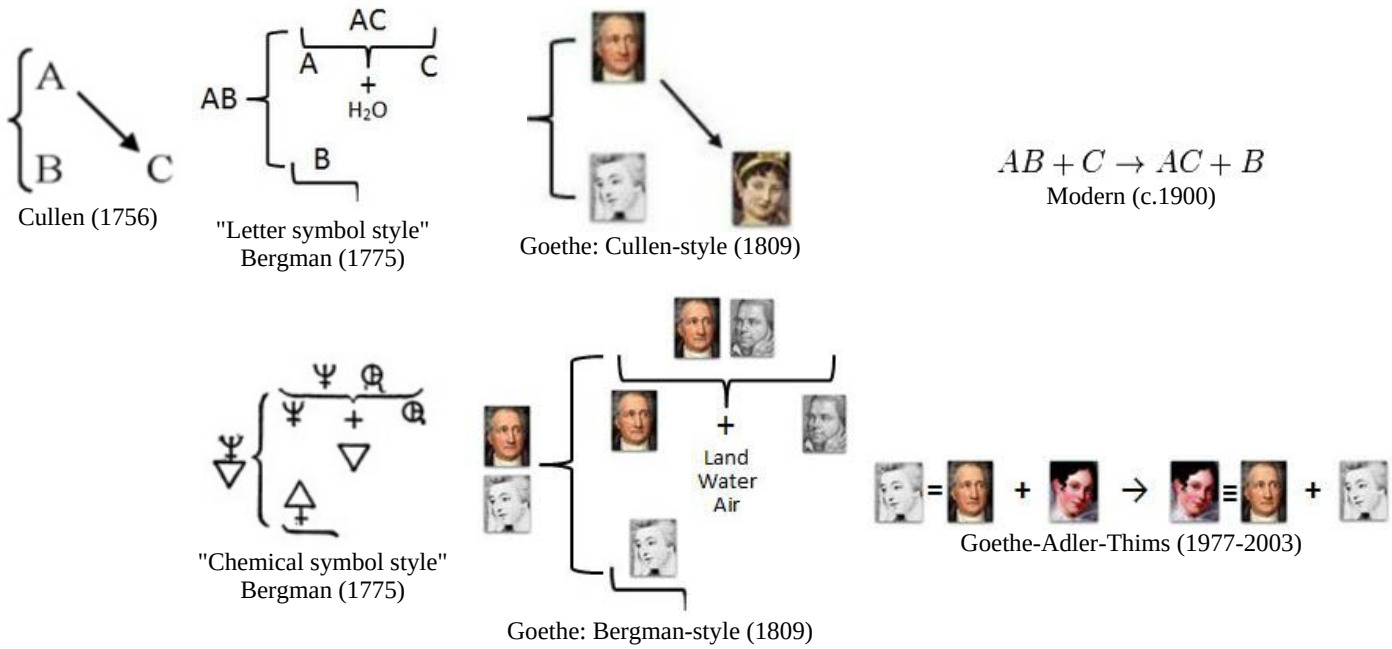

This outline thus explains the "symbols" Goethe had in mind in the writing of his greatest work.

Double elective affinity reaction

(add example)

Reaction force | Affinity arrow

The "dart" or reaction arrow (→), which, according to the pioneering reaction diagram methods of Scottish physician-chemist William Cullen, shows the dynamic joining of the substances between which the attractions are the strongest, and hence the forces acting between them, thus showing the result of the reaction, of significant note, were not used in Bergman's reactions, as seen above. As explained by English affinity chemistry historian Alistair Duncan from his introduction section to the 1970 English reprint edition of Bergman's *A Dissertation on Elective Attractions*: [1]

Force of reaction

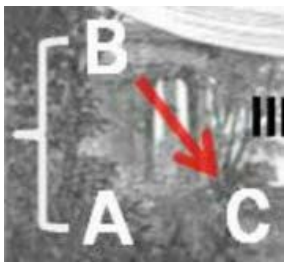

Chemical version

William Cullen (1757): "the **dart** → between them expresses the *elective attraction*; when I put a dart with the tail to one substance and the point to another, I mean that the substance to which the tail is directed unites with the one to which the point is directed more strongly than it does with the one united to it in the **crotchet** {."

> "Cullen's diagram closely resembles that used by Bergman except that Bergman uses no arrows or other symbols to show the forces acting, but merely shows which substances are combined at the start and finish of the reaction without any implications about cause."

Goethe, however, had integrated some the Cullen reaction arrow logic into his model in regards to the arrow representing the "forces acting" to cause the reaction. He gives indication of this in his 1796 *Third Lecture on Anatomy* (see: Goethe timeline), wherein he states:

> "To facilitate our comprehension of the concept of organic existence, let us first take a look at mineral structures. Minerals, whose varied components are so solid and unchanging, do not seem to hold to any limits or order when then combine, although laws do determine these conditions. Different components can be easily separated and recombined into new combinations. These combinations can again be taken apart, and the mineral we thought destroyed can soon be restored to its original perfection. The main characteristic of minerals that concerns us here is the indifference their components show toward the form of their combination, that is, their coordination or subordination. There are, by nature, stronger or weaker bonds between these components, and when they evidence themselves, they resemble attractions between human beings. This is why chemists speak of elective affinities, even though the forces that move mineral components [or humans] one way or another and create mineral structures are often purely external in origin, which by no means implies that we deny them the delicate portion of nature's vital inspiration that is their due."

Here, Goethe specifically states that he views elective affinities, i.e. those attractions and repulsions that move humans or chemical components one way

or the other, as being under the operation of "forces", that are often purely "external in origin", very ingenious, indeed—especially for such a time in history—a view nearly considered blasphemous in modern times (e.g. see crackpot, self-drive, Moriarty-Thims debate, etc.) owing to the engrained ignorance that is a result of the two cultures knowledge fanning effect.

References

1. Bergman, Torbern. (1785). *A Dissertation on Elective Attractions* (new introduction by Alistair Duncan, pgs. vii-xxxviii; arrow note, pg. xxiv; translation by Thomas Beddoes). Frank Cass & Co.
2. Bidlake, John P. (1858). *Bidlake's Elementary Chemistry: a Text-book of Elementary Chemistry for the Use of Schools and Junior Students* (§2: Chemical Affinity, pgs. 15-23, synthesis, pg. 6; number of elements, pg. 8). London: Allman and Son.
3. (a) Nernst, Walther. (1895). *Theoretical Chemistry: from the Standpoint of Avogadro's Rule & Thermodynamics* (⇆, pg. 358). MacMillan and Co.
(b) The exact publication of Van't Hoff likely being his 1884 *Studies in Chemical Dynamics.*

Further reading

â— Thims, Libb. (2007). *Human Chemistry (Volume Two)* (Bergman reactions explained, pgs. 390-94). Morrisville, NC: LuLu.
â— Greenberg, Arthur. (2000). *A Chemical History Tour: Picturing Chemistry from the World of Alchemy to Modern Molecular Science* (single elective attraction, pgs. 153-55; double elective attraction, pg.156). Wiley-Interscience.

In Elective Affinities: IAD, the following is the **table of contents** to the various online chapters of the project:

Part one

The following are the eighteen chapters to the online version, part one (finished Jul 1808):

> "In **Part I**, the aristocrat Eduard has finally been able to marry his first love, Charlotte, after both had been forced into socially advantageous marriages. Living at Eduard's country estate, they are joined by his friend, the Captain, and then by Charlotte's niece, Ottilie. The foolish Mittler—his name connotes that he will mediate between or even introduce previously separated individuals—plays a smaller role. While Charlotte and the Captain struggle against their growing attraction, first Eduard and then finally the innocent Ottilie acknowledge their love for each other. In a night of passion, Eduard and Charlotte embrace, while each longs intensely for a different partner. The next day, they openly declare their love, respectively, for Ottilie and the Captain. Charlotte, however, insists that they renounce these affinities and remain together. The Captain leaves the estate just as Eduard learns that Charlotte will bear the child conceived on that fateful night. Eduard, seeing himself deprived of Ottilie, throws himself into war, longing for death."
>
> — Michael Jennings (1996), End Notes to English translation of Walter Benjamin's "Goethe's Elective Affinities" (1922) [9]

Part One (Jul 1808)	**Description**	**Notes**
EA | P1:**C1**	Edward, the main character of the novella, is introduced: a wealthy baron reacting in a sort of dull-drum existence on his vast country estate, near to a local town, married to Charlotte, his love from earlier years, to whom he was unable to marry at the time as they were each formerly in arraigned marriages of circumstance or necessity. They discuss inviting Edward's old friend the Captain?	**Reaction:** combination reaction. Characters: Edward, Charlotte, and the Gardener.
EA | P1:**C2**	Edward dispatches a letter to send for the Captain; Edward and Charlotte discuss the state of affairs of her daughter Luciana, who is doing well at boarding school, and Ottilie, who, conversely, is doing poorly; the famous marriage mediator Mittler makes an appearance and gives his two-cents on things.	**Reaction:** Interaction reaction / collision. Characters: Edward, Charlotte, Mittler, and servants (castle).
EA | P1:**C3**	The Captain arrives.	
EA | P1:**C4**	Captain explains "elective affinity" !!!	**Reaction:** Double displacement reaction [?].
EA | P1:**C5**	They read the letters on Ottilie at school; and decide to send for her.	
EA | P1:**C6**	Ottilie arrives; they bring out the chart of the estate landscape to study.	
EA | P1:**C7**	With the Captain away with Charlotte, Edward and Ottilie begin to bond.	
EA | P1:**C8**	Suggest they lay the foundation stone on Ottilie's birthday.	
EA | P1:**C9**		The famous "good foundations" quote occurs.
EA |	The "five year marriage" dialogue proposal, via the Count, is	

P1:**C10**	discussed.	
EA | P1:**C11**	Features the notorious scene of 'mental double adultery': while they are making love, Charlotte imagines that she is with the Captain, and Eduard that he is with Ottilie.	See: maternal imagination theory.
EA | P1:**C12**		
EA | P1:**C13**		
EA | P1:**C14**	Offer for Captain to become a Major.	
EA | P1:**C15**		
EA | P1:**C16**		
EA | P1:**C17**		
EA | P1:**C18**		

Part two

The following are the eighteen chapters to the online version, part two (finished Oct 1809):

> "**Part II** is suffused with symbols of death. The action stagnates, as the narrator focuses on Ottilie's psychological processes, which are conveyed primarily by lengthy excerpts from her diary. The child is an ever-present reminder of infidelity: it resembles *not* its parents but Ottilie and the Captain. As Eduard returns from battle, he visits the Captain and proposes that each marry the person he truly loves; at the estate, he explains the child's origins to Ottilie and asks for her hand. Ottilie accepts, on the condition that Charlotte also accept the Captain. It is at this point that the passage so important to Benjamin's reading occurs: "Hope shot across the sky above their heads like a falling star." Yet the emotional turmoil produced in Ottilie by her love for Eduard brings on the catastrophe: as she returns across the lake, the child falls from the rocking boat and drowns. Eduard greets the loss as an act of providence that has removed the final obstacle to his desire; even Charlotte agrees to the new arrangement, acknowledging the extent to which her rigorous moralism precipitated the disaster. But Ottilie, now recognizing her complicity in the events, renounces Eduard and seeks shelter in a convent. Eduard's passionate intervention robs her of even this recourse, and she chooses total passivity, refusing to speak or eat, believing that this will help her achieve not merely absolution but a form of holiness. Shortly after her death—effectively a suicide—Eduard dies also, and they are buried together in the estate's funeral chapel."
>
> — Michael Jennings (1996), End Notes to English translation of Walter Benjamin's "Goethe's Elective Affinities" (1922) [9]

Part Two (Oct 1809)	**Description**	**Notes**
EA | P2:C1		
EA | P2:C2		

EA | P2:C3		See: Lorna McIntosh
EA | P2:**C4**	Contains Ottilie's aphorisms (from her diary)	
EA | P2:**C5**		famous "freedom" quote
EA | P2:C6		
EA | P2:C7		
EA | P2:C8		
EA | P2:C9		
EA | P2:C10		
EA | P2:C11		
EA | P2:C12		
EA | P2:**C13**	The child Otto drowns.	Charlotte agrees to a divorce, after this incident
EA | P2:**C14**		
EA | P2:C15		
EA | P2:C16		
EA | P2:C17		
EA | P2:**C18**	Mittler gives his Ten Commandments talk.	

Six section outline view

Literary commentator Joseph O'Leary argues in his 2005 discussion essay "Goethe in *The Golden Bowl*" that the 36 chapters of Goethe's *Elective Affinities* can be broken down or grouped into a 6x6=36 structure or six sections of six chapters each. In this model, the basic plot outline is as follows: [2]

Section 1: Formation of the foursome:

> Eduard and Charlotte, who wished to marry in youth and have finally done so in middle age (after the death of their respective spouses), are installed in their magnificent estate. They decide to invite his friend the Captain and her niece Ottilie, schoolmate of her daughter Luciane, to stay with them. The Captain helps Eduard beautify the estate and expounds the chemical topic of elective affinities. Charlotte feels rather neglected. But the arrival of the introverted, slightly anorexic Ottilie provides her with companionship.

Section 2: The double adultery:

The two couples, thrown together as in a laboratory vessel, form new attachments. Eduard's passion for Ottilie grows like wildfire. At a foundation-laying ceremony on Charlotte's birthday he throws a glass in the air but it is not smashed; it is inscribed with the letters E and O which he takes as an omen. The visit of an adulterous couple, the Count and the Baroness, creates a sense of moral disorder. Eduard and Charlotte make love while thinking of Ottilie and the Captain respectively; the next day Edward embraces Ottilie, Charlotte the Captain.

Section 3: Departure of the two men:

Charlotte tries to restore things to normal. On Ottilie's birthday the Captain saves a boy from drowning. Eduard ignores the general commotion and puts on the fireworks display for Ottilie alone. The Captain leaves. Promising Charlotte that he will try to cure his passion, Eduard retires to a smaller residence, having ensured that Ottilie will stay on, and then joins the army. Charlotte reassures the ex-clergyman Mittler that her marriage is not doomed, for she is pregnant.

Section 4: Intermezzo:

The two women are taken up with an architect who is devoted to Ottilie and with the vain and over-energetic Luciane. They enact various aesthetic fads of the period, culminating in tableaux vivants from which Luciane excludes Ottilie. When Luciane has left, the architect stages new tableaux in which Ottilie poses radiantly as the Blessed Virgin.

Section 5: The re-emergence of the fateful relationships:

After the visit of Ottilie's tutor, Charlotte gives birth to a boy who resembles Ottilie and the Captain. A visiting English Lord tells a story which may suggest that Charlotte and the Captain were lovers in the past. More Romantic fads: Ottilie reveals a capacity for water-divining; Charlotte refuses the Lord's offer to cure Ottilie's headache by magnetism. Eduard tells the Captain (now a Major) that his survival in battle means that Ottilie is his. He will divorce Charlotte and the Captain can marry her. This will restore all-round harmony.

Section 6: Tragedy and apotheosis:

Stealing back to his estate, Eduard finds Ottilie with his son by the lake and explains his plan. Her excitement causes a boating accident in which his child drowns. Charlotte agrees to the divorce. But Ottilie, stricken with guilt, renounces Eduard. Eduard meets her at an inn on her journey back to the boarding school; she gently declines his advances but returns with him to Charlotte. Charlotte, to soothe Edward, agrees to marry the Major, on condition that Ottilie first agrees to marry Eduard. Ottilie falls into anorexia and mutism, and explains in a written statement that her passion for Eduard has disoriented her and that she wants to recover herself. She hears Mittler speak of the sanctity of marriage, and faints. She dies shortly after, asking Eduard to promise to live. Seeing Ottilie's funeral, the servant-girl Nanny leaps down from her window, and is severely injured, but is miraculously healed when she touches Ottilie's body. A cult forms around Ottilie. Edward discovers that the glass inscribed with E and O has been broken, and he too becomes mute and anorexic, and dies.

O'Leary comments further: "the inserted novella points to a hidden story under the surface. The Captain would have married Charlotte but for his loyalty to Eduard; they try to have Eduard fall in love with Ottilie instead, but he is not

swayed. Charlotte knows the episodes in the Captain's life on which the novella is based (442), and we may gather, as James may have, that the girl was Charlotte herself (Winkelman, 80). In the story Charlotte rejects her boring fiance (Eduard) for the Captain; this happy ending, the opposite of what actually happened, moves her so much that she has to leave the room. When Eduard proposes inviting the Captain, Charlotte makes her consent contingent on his consent to the corresponding visit by Ottilie, hoping (at least subconsciously) that this will lead to Eduard falling in love with Ottilie after all and to a divorce that will free Charlotte to marry the Captain. The ethical shadiness of this and the necessity of squaring the Captain's high principles explain the inconsistencies in her later behaviour (Winkelman, 24-9, 79-83, 100-1). The division in her motivations makes Charlotte a 'fascinating woman' rather than the 'bland personification of virtue' critics have seen in her (103)." [2]

References

1. Benjamin, Walter. (1921). “Goethe’s *Elective Affinities*” (trans. Stanley Corngold; "writing the translation notes goes —I’m quite sure—to the Chief Editor, Michael W. Jennings", Corngold email to Thims) (scribd), first published by Hugo von Hofmannsthal in the *Neue Deutsche Beitrage* (1924/25); in: *Selected Writings, Volume 1: 1913-1926* (Elective Affinities, pgs. 297-360). Harvard University Press, 1996.
2. O’Leary, Joseph S. (2005). “Goethe in ‘The Golden Bowl’”, *Essays on Literary and Theological Themes*, Jun 22.

In Elective Affinities: IAD, the following is the **title decoding** page of online project, devoted to decoding of inherent meaning of the German title *Die Wahlverwandtschaften*, a compound word meaning: Die + Wahl + Verwandt + Schaften, where "Die" simply translates as "The", the other terms being more difficult to render exactly.

Overview

In 1854, the title *Die Wahlverwandtschaften* was first translated into English by James Froude as *Elective Affinities*, which renders the meaning possibly more cryptic and interpretive than the original German.

The following are the Google-translation options for the German term "**Wahl**":

Translations of Wahl

noun

choice	Wahl, Auswahl, Auslese
selection	Auswahl, Selektion, Wahl, Auslese, Auswählen, Tipp
option	Option, Möglichkeit, Wahl, Alternative, Bezugsrecht, Wahlfach
election	Wahl
vote	Abstimmung, Stimme, Wahl, Votum, Wahlrecht, Bewilligung
voting	Wählen, Abstimmung, Stimmabgabe, Wahl
ballot	Abstimmung, Wahl, geheime Abstimmung, Geheimwahl
polling	Wahl, Stimmabgabe, Wählen
poll	Umfrage, Abstimmung, Wahl, Wahlbeteiligung, Stimmabgabe, Schädel

The following are the Google-translation options for the German term "**verwandt**":

Translations of verwandt

adjective

related	verbunden, verwandt, zusammenhängend, zusammengehörig, stammverwandt
akin	verwandt
kindred	verwandt
allied	verbündet, verwandt, alliiert
cognate	verwandt, stammverwandt
consanguineous	verwandt
interrelated	zusammenhängend, verwandt

The following are the Google-translation options for the German term "**schaften**":

A 2017 Google translation, of note, also renders *Wahlverwandtschaften* as "electoral relations".

Title decoding

The following gives forward and backward gist synopsis of title etymology:

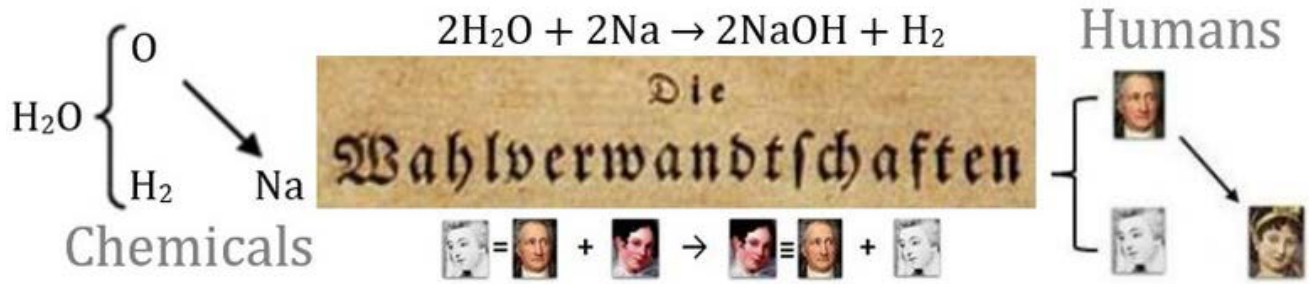

Title | Rendition	Source	Note
The **selection** (choice or election) by nature of **allied** (connatural, related, or interrelated) **unions** (ties, companions, companies, or communities)	Hmolpedia edit (23 Dec 2015)	Edit probed into action via difficulties on theory discussion of Henry Bray's 1910 "manifestation of choice" discussion of love and affinities at the atomic and human level; where, correctly, a one nature "mechanism of choice" in both scenarios is the requisite description.
The Selection [**wahl**] of Connatural [**verwandt**] Unions [**schaften**]	Jeff Tuhtan (2012)	Thread discussion [4]
The Choice of One's Elections or Attractions to Things or People	Hmolpedia edit (23 May 2012)	Bacon-style; see below
Selective Affinities	Afinidades (2010) translations	
The Choice of One's Chemical Affinities	Stanley Corngold (2003)	[2]; see page discussion below
Kindred by Choice	Herbert Waidson (1960)	
Elective Affinities	James Froude (1854)	First English translation
Die Wahlverwandtschaften	Johann Goethe (1809)	
Von der Attraction	Heinrich Tabor (1789)	
Disquisitio de Attractionibus Electivis	Torbern Bergman (1775)	
Inter Differentes Substantias: Non Fingendum Aut Exogit Andum, Sed Videndum Quid Natura Ferat; Aut Faciat [Affinities between Different Substances: Not Invented, or Thought Involved, but to be Seen What the Nature of the Issue Is, or Does]	Étienne Geoffroy (1718)	Geoffroy's affinity table (subtitle + description)
"Have not the small particles of bodies certain powers, virtues, or force, by which they act at a distance, not only upon the rays of light for reflecting, refracting, and		

inflecting them, but also upon one another for producing a great part of the phenomena of nature? ... We must learn from the phenomena of nature what bodies attract one another, and what are the laws and properties of attraction, before we enquire the cause which the attraction is performed. “Is it not for want of an attractive virtue between the parts of water ( ) and oil, of quick-silver ( )(Hg) and antimony ( )(Sb), of lead ( )(Pb) and iron (♂)(Fe), that these substances do not mix; and by a weak attraction, that quick-silver ( )(Hg) and copper (♀)(Cu) mix difficultly; and from a strong one, that quicksilver ( )(Hg) and tin ( )(Sn), antimony ( )(Sb) and iron (♂)(Fe), water ( ) and salts, mix readily?	Isaac Newton (1718)	"Query 31"

How chemicals 'elect' or 'choose' each other?	Isaac Newton (1678)
Election to Embrace and or Exclude	Francis Bacon (1620)
Attracting (*philia*)/repelling (*neikos*) forces	Empedocles (450BC)

The original title of the novel, published on October 3rd, 1809, was under the German title *Die Wahlverwandtschaften*, which has a rather complex meaning not easily rendered into the English language or for that matter completely embodying exactly many of the underlying fine print embedded under the original pure chemistry Latin title *Disquisitio de Attractionibus Electivis* (Bergman, 1775), but which, for reasons not clearly stated, as noted on the Elective Affinities (translations) page, were all rendered in the first German-to-English translations (1854, 1872), done anonymously, supposedly owing to the “dangerousness” of the novella, simply as *Elective Affinities*—a namesake which in and of itself carries little direct immediate recognition to the learned English-speaking person, even the chemistry-trained English speaking person, even to the English-speaking chemist trained or well-schooled in the history of affinity chemistry (see: affinity chemistry).

To give some quick introduction, Google translates “Die Wahlverwandtschaften” as *The Affinities*; “Wahlverwandtschaften” as *Elective Affinities*; and “verwandtschaften” as *affinities*—all of which is not very intuitive. In German wahlverwandtschaft, in more detail, is a complex term having the two part meaning:

> **wahl** [choice] **verwandtschaft** [affinity or election]

In the plural sense, wahlverwandtschaften, with the suffix *-en*, means “elective attractions” or elective affinities, in the following sense:

> **verwandtschaften** [affinities or elections]

which gives the over-typical English rendering of *Die Wahlverwandtschaften* as *The Elective Affinities*.

To exemplify, American literary critic Hillis Miller, devotes several pages to title dissection, commenting that:

> “The customary translation of the title, *Elective Affinities*, is the correct equivalent English idiom, but does not exactly match the play of metaphor in the German word. The German word says chosen (*Wahl*)—related (*verwandt*)—conditions (*schaften*): conditions of being related that are chosen. The English word *ship* is not far from the German *schaft*, as in ‘relationship’. The center of the word *Verwandten* is the ordinary German word for relations in the sense of those closely tied by blood or marriage.”

In conclusion, however, focusing on the grafting imagery that occur in various chapters, he describes the novella as “anastomosical”, consisting of constantly intersecting, intertwining, fusing and branching lines that cannot be reconciled—and specifically recasts the title of Goethe’s book as “chosen anastomoses.” [11]

Verwandt

Alternatively, as estimated by American-born German educated civil-ecological engineer Jeff Tuhtan, who suggests the German-to-English translations of verwandt → connatural and Wahl → selection, the title break up might render as follows: [4]

> **wahl** [selection] **verwandt** [connatural] **schaften** [unions]

Merriam-Webster defines connatural as:

1. "connected by nature"
2. "of the same nature"

which might render the English version of the title as:

Die Wahlverwandtschaften | The Selection of Connatural Unions

This latter usage might possibly have some connective connotation to what Goethe might have meant, in the sense that human nature and chemical nature are of "of the same nature", as embodied in Goethe's pre-publication advertisement statement "there is, after all, only one nature" or such as embodied in Goethe's human chemistry protégé Arthur Schopenhauer's 1816 retrospect synopsis:

> "As the title indicates [*Die Wahlverwandtschaften*], though Goethe was unaware of this, [it] has as its foundation the idea that the will, which constitutes the basis of our inner being, is the same will that manifests itself in the lowest, inorganic phenomena."

The weight of Schopenhauer's opinion on this matter should be taken very seriously, as he seems to have been the only direct elective affinities theories student of Goethe, who consulted with him on this subject personally during the years 1816 to 1819, the effect of which is evidenced in the numerous usages of Goethe's one nature elective affinities theory in his two-volume *The World as Will and Representation* (1818, 1844).

The term "verwandt" Google-translates as "related", but also gives the following alternatives:

adjective
related
akin
allied
kindred
cognate
interrelated
consanguineous

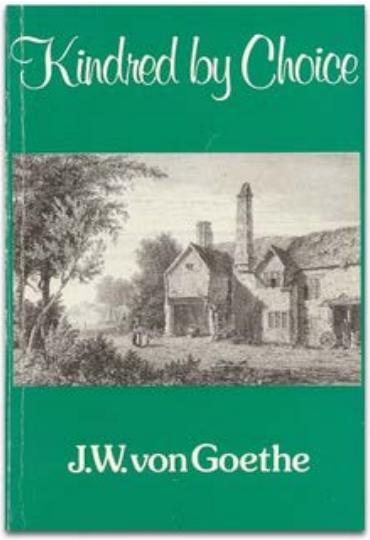

1960 Waidson title

1990 Waidson re-title

Left: Welsh Germanic-languages scholar Herbert Waidson's 1960 original John Calder English translation of Die Wahlverwandtschaften as *Kindred by Choice*. [6] **Right:** the 2009 One World Classics reprint edition of the Waidson-translation.

The fourth of these, "kindred", seems to be the sense in which Welsh Germanic-languages scholar Herbert Waidson entitled the 1960 English translation as *Kindred by Choice* in place of the German *Die Wahlverwandtschaften*. [6] The term "kindred", however, at least in American, is a very old-fashioned hillbilly type of term, not part of the modern vernacular—which likely explains why the Waidson's translation choice did not catch on, and, as shown adjacent, the publisher reverted to the more commonly-known English title *Elective Affinities*.

American Germanic literature scholar William Lillyman seems to think that the term "verwandt" stems from Friedrich Schleiermacher's 1807 translation of Plato's *Symposium*: [12]

> "I would suggest that it was Schleiermacher's translation of Plato, and especially the choice of the German word **'verwandt'** for what the halves are seeking (see: Aristophanes), that provided the connection between the contemporary chemical theory of elective affinities and Aristophanes' analogy, that this was, indeed, the catalyst for Goethe's novel."

While there does seem to be possibly be aspects of Aristophanes' speech in Edward/Ottilie paring, the notion that the title of the novel derives from Schleiermacher's translation seems a bit more tenuous of an assertion, being that the historians have already establish that the title stems from the 1785 German translation of Torbern Bergman's *A Dissertation on Elective Attractions*.

Schaften

The translation of latter term "schaften" as unions, as used above, is based, estimated, or rather modeled on the Dictionary.com redirect of "Schaften" to "Burschenschaft", a term referring to a student body organization formed in Jena, Germany, in 1815, inspired by liberal and patriotic ideas, whose purpose was to break down societal lines and to destroy rivalry in the student body; seeded from students who had taken

part in the previous German wars of liberation against the Napoleonic occupation of Germany—hence, Webster dictionary translated Burschenschaft as the “the organization formed by the affiliation of local bodies” or “any of various associations of university students formed”. [5] The term Burschenschaft thus Google-translates as “Fraternity”, but the hyphened term “Burschen-schaften”, of significance, Google-translates as “Fellow unions”.

Empedocles' attracting and repelling forces

The originator of the seed model behind the model of what would become elective affinities or affinity chemistry, that so dominated 18th century chemistry, was Greek philosopher Empedocles, who in circa 450BC originating the first standard model of physics, according to which the universe was hypothesized to be comprised of four elements: fire (△), earth (▽̸), air (△̸), water (▽), meaning, subsequently, that humans are entities made of four elements, whose interactions were governed by two forces: philia (●→|←●), i.e. attraction (or love) and neikos (←●|●→), i.e. repulsion (or hate). Two of Empedocles' noted chemical aphorisms on this standard model applied to humans are:

Top: **oil** aggregating into bubbles of like kind amid a system of surrounding **water**. Bottom: a poster for how people of polar opposite types, such as vegans and ranchers, tree huggers and loggers, and consumers and environmentalists, don’t mix like oil and water. [10]

“People who love each other mix like water and wine; people who hate each other segregate like **water** and **oil**.”

“Relatives mix like water and wine; enemies avoid each other like water and oil.”

This model was carried forward in the works of Greek philosopher Plato who specifically credits Empedocles as having created this list of elements, and went on to formulate his own versions of the laws of affinity. Goethe, in turn, indirectly, or rather directly, depending on one's point of view, specifically cites Empedocles's affinity models in part one: chapter four, in Edward's mention of oil and water, as follows:

> “I think,” interrupted Edward, “we can make the thing more clear to her, and to ourselves, with examples; conceive water, or oil, or quicksilver; among these you will see a certain oneness, a certain connection of their parts; and this oneness is never lost, except through force or some other determining cause. Let the cause cease to operate, and at once the parts unite again” [...] “And that,” interrupted Edward, “will be different according to the natural differences of the things themselves. Sometimes they will meet like friends and old acquaintances; they will come rapidly together, and unite without either having to alter itself at all—as wine mixes with water. Others, again, will remain as strangers side by side, and no amount of mechanical mixing or forcing will succeed in combining them. **Oil** and **water** may be shaken up together, and the next moment they are separate again, each by itself.”

Goethe, no doubt, was well aware of the Empedocles-model precedence.

Baconian elective affinities

In 1620, English physicist and natural philosopher Francis Bacon began to pioneer some of the first post-Empedocles, pre-Newtonian ideas on elective affinity to explain the inherent nature of motion and its causes. Bacon reasoned that: [7]

> "Dispute and friendship are the spurs to motion in nature, and the keys to her works."

The following definition by Bacon is one of the first 17th-century definitions of elective affinity: [8]

> “It is certain that all bodies whatsoever, though they have no sense, yet they have perception; for when one body is applied to another, there is a kind of election to embrace that which is agreeable, and to exclude or expel that which is ingrate; and whether the body be alterant or altered, evermore perception precedeth operation; for else all bodies would be like one to another.”

In this sense, the full original German title, as Goethe would have conceptualized it, in the original 1620 Baconian chemical affinity sense of

the term "election" of chemical bodies to embrace, might well be correctly rendered in English as:

> Die Wahlverwandtschaften | The Choice [of one's] Electives [or] Attractions [to things or people]

Newtonian elective affinities

The way in which the Baconian chemical model of "election to embrace or expel" was passed along, in a rather vicarious manner, to Goethe, was though the works English physicist Isaac Newton. In particular, as affinity chemistry historians, such as Mi Kim, among others, categorize things, the modern theory of affinity chemistry, i.e. the transition from alchemy to chemistry, arose in the works and theories of English physicist Isaac Newton. This is evidenced in his 1678/79 letter to Irish chemist Robert Boyle, which was preoccupied with the phenomenon of elective affinity among chemicals; he states, for example: [1]

> "There is a certain secret principle in nature by which liquors are sociable to some things and unsociable to others. Thus water will not mix with oil but readily with spirit of wine or with salts."

American science historian William Newman, in his 2003 summarized rewrite of Newton's letter, elaborates on this further: [1]

> "Just as water **'elects'** to mix with ethyl alcohol or with salts, so it **'chooses'** not to mix with oil, Similarly, water will sink into wood while quicksilver will not, but quicksilver will penetrate and amalgamate with metals, which water will not. Likewise aqua fortis (nitric acid) will dissolve silver and not gold, while aqua regis (mixed nitric and hydrochloric acid) will dissolve gold and not silver. Nonetheless these rules are not written in stone: 'but a liquor which is of itself unsociable to a body may by a mixture of a convenient mediator be made sociable. So molten lead which alone will not mix with copper or with Regulus of Mars, by the addition of tin is made to mix with either."

Newton goes on, in his writing of this period, to speak about how "particles of spirits floating in the water, will strike on metal, and will by their sociableness enter into its pores, and gather around the outside of its particles." The finalized version of Netwon's search, research, and experiments for this "secret principle", however, was presented some three decades later, following his successes in gravitational theory and optics and light, specifically in his famous appended Query 31 of the 1718 edition of his *Opticks*. That year, French chemist Étienne Geoffroy, while doing a translation into French of Newton's *Opticks*, famously took the "verbal descriptions" of affinity reaction preferences and powers of combination and decombination, as found in Query 31, and made the world's first "affinity table" (see: Geoffroy's affinity table), a tabulated listing of reaction bonding powers, so to speak, the first of many to follow over the next century. The biggest affinity table was Swedish chemist Torbern Bergman 1775 table (Bergman's affinity table) which took up a large eight-page fold out map-like sheet showing the results of some 160 different reactions. It was from this table that Goethe, in his own words, envisioned the idea for his new novella.

This quick etymological synopsis, of course, embodies the age-old "choice or free will"; "will" vs "determinism"; "fate or destiny" debate, which is a very complex issue to say the least—especially in the "human molecular formula", i.e. humans viewed as animated molecules attached to a surface, point of view era—which, no doubt, is what drew both Newton and Goethe to the subject: the search for the "secret principle" of human existence. In any event, to corroborate, American Goethean scholar and German languages translator Stanley Corngold, in his 2003 "Compulsive Affinities: Goethe, Kafka, Benjamin", translates "Wahlverwandtschaften" as "elective [chemical] affinities", his brackets, which in turn gives the title a rendering of: [2]

Die Wahlverwandtschaften | The Choice of One's Chemical Affinities

which, in the proper modern language sense of the matter, seems very cogent and likely what Goethe had in mind by his title choice, being that:

> (a) "chemical affinity" is the modern term used to defined the subject of discussion, as it is actually practiced (e.g. drug-receptor thermodynamics), whereas "elective affinity" is a rather outdated term (see: affinity, synonyms section);
> (b) the question of how one's choices are made, e.g. the choice of who to marry, or rather, in a different sense, whether or not two people will bind, in the words [3] of American-born Canadian biophysical chemist Julie Forman-Kay, "is [completely] determined by the free energy change (ΔG) of the interaction, composed of both enthalpic and entropic terms", which in Goethe's time would have rendered, in his mind, as: "whether two people [human chemicals] will bind [form a relationship] is [completely] determined by the elective affinities of the reactive system [estate]."

or as Goethe says in his 1796 *Third Lecture on Anatomy*: "there are, by nature, stronger or weaker bonds between these components, and when

they evidence themselves, they resemble attractions between human beings. This is why chemists speak of elective affinities, even though the forces that move mineral components [or humans] one way or another and create mineral structures are often purely external in origin, which by no means implies that we deny them the delicate portion of nature's vital inspiration that is their due."

Choices determined by external forces

The modern interpretation of "external" forces mediating choices in molecules is shown adjacent, exemplifying the way in which the 3-element molecule retinal "chooses" or "elects" to move.

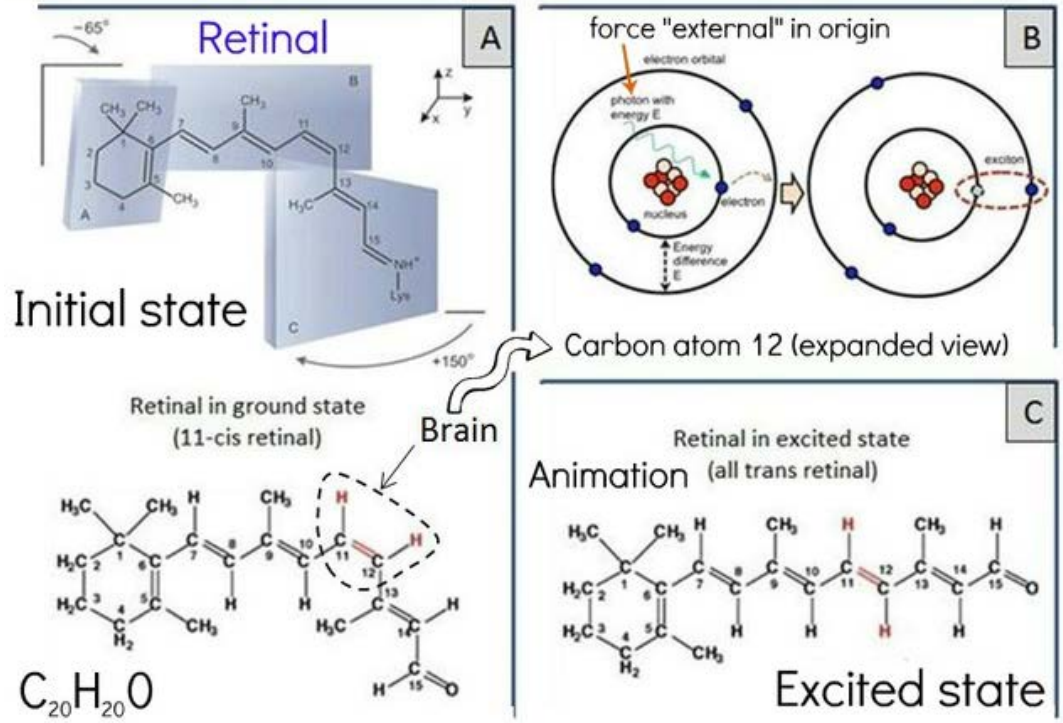

The "ABC model" of **free will**: (A) retinal molecule in ground state (normal state); (B) light (or one or more photons) with a frequency of 400 to 700 nm absorbs into the the carbon atom (note: atom shown is actually beryllium) at the 11 position, thus causing (exchange force) an electron to jump up in orbital position (excited state); (C) the retinal molecule reacts to this by "moving" to the straightened position, a short-lived heightened energy configuration.

This photon inducing, exchange force, retinal-bending mechanism, to note, was is an expansion of the 1913 Bohr model of the atom applied to the phenomenon of molecular movement and mechanism with light interaction as discovered in 1958 by the American biochemist George Wald and his co-workers; work for which Wald won a share of the 1967 Nobel Prize in Physiology or Medicine with Haldan Keffer Hartline and Ragnar Granit.

In short, the "choice" of one "chemical affinities" or "elections to embrace" or "expel that which is ingrate" is determined by "forces" "external in origin", as Goethe correctly says, and the modern way we measure these forces or thermodynamic forces (or force functions) as they are called is by via enthalpy and entropy determinants, variables that can be measured and quantified. [N1]

About 40-45 percent of people (similar to the "Are you a giant molecule?" poll, James Eadon, 2001), to note, will object to this model of "choice", because it in effect "undermines the entire structure of religion", as Heinrich Heine put it (c.1810), being that one's choices, according to the big three religions, Christianity, Islam, and Hinduism, all of which are Anunian theologies in origin, choices which are thought to come from one's mind and no where else, are what determine the weight of one's soul or karma, and hence determine whether one is allowed proper reincarnation or resurrection, depending on religion. This entire logic, now, however, is defunct theory. As of 2002, according to the Sterner-Elser molecular formula, a human is now defined as an abstract molecule, whose average molecular formula, for a typical 70-kg (154-lb) human, is shown below:

$$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}$$
$$Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$$

This atomic geometry, simply put, is an expanded, bigger, more dynamic, animated, complex (Thims), evolved (Darwin), or metamorphosized (Goethe) version of smaller animate molecules, such as, for example, the retinal molecule:

$$C_{20}H_{20}O$$

a simple 15-carbon chain light sensitive molecule, that "straightens" when in the presence of light of a certain wavelength.

Objection

The central objection, many will have, even in modern times (e.g. about 43 percent of people object that they are a giant molecule, James Eadon, 2001), is that human nature is different from chemical nature in that humans are capable of free actions and choices. German *Elective Affinities* analyzer Herman Grimm, who was one of German's leading late 18th century promoters of Goethe, and who seems to have been advocate or admirer of *Elective Affinities*, held this view. As summarized by Astrida Tantillo (2001): [9]

"Grimm differentiates human beings from the rest of nature: in addition to being subject to natural laws, they are also capable of free actions and choices."

This type of "having's own's cake and eating it to" mindset, i.e. the view that humans are subject to laws, but also free, is also exemplified in English physicist C.G. Darwin's 1952 famous "Introduction" section, to his *The Next Million Years*, wherein he states, similar to Grimm, that humans are molecules, "human molecules" as Darwin called us, that are governed by the laws of thermodynamics, just as are the lowly gas molecules, but also, because of their "unpredictability", as Darwin states, they also have free will. The two views, however, are not compatible: when a water molecule and sodium atom are placed in contact, the oxygen atom, of the water molecule, will "always"—no exceptions—bond with the sodium atom, to the displacement of the hydrogen atoms—the oxygen atom will never "choose" in an alternative manner and "decide" to stay bonded to the hydrogen atoms—it is an absolute predetermined decision. This is what Goethe was getting at in his novella and in his title choice. Actions are predetermined, and the quicker we, as intellectuals, become aware of this, the better off we will be in the long run.

Those, in modern 2010s times, who would like to object that there is a difference between the two natures, human and chemical, will argue, for example, that there are "emergent" or "holistic", etc., properties in the former, not found in the latter—this, however, is what is called the "ontic opening" argument, and is an example of what not to do, as it only leads down the path of incoherentness.

Those who believe that "choice" is different in the essential nature of the two atomic structures are in possession of either what Nicholas of Cusa calls "learned ignorance"—and would no doubt further go on to deny the existence of the bereitschaftspotential or "readiness potential" and likely the existence of the electromagnetic force—similar to those, in olden days, who *disbelieved* that the earth *could* move, because they had "learned" it that way, or are possibly in possessionof the mental condition of not being able to "seeing the ships" in the harbor, a phenomenon common to many new to the subject of human chemistry, as Goethe had envisioned it.

Annotations

N1. (a) On an aside, in 1990, American Goethean scholar Alfred Steer, in his *Goethe's Elective Affinities: the Robe of Nessus*, gave his opinion, based on the H.M. Waidson translation (*Kindred by Choice*, 1960) that "Wahlverwandtschaft" might translate as "choice relationship". This, however, is lacking and nonsensical in description; the above bolded in black translation "the choice of one's chemical affinities" is the preferred and most-cogent of translations.
(b) Likewise, American Germanic-languages scholar Calvin Thomas, in his 1913 "Introduction" section to Goethe's 1809 *Elective Affinities*, commented on the title: "The strange title, too, has served to divert attention from the real center of gravity. Had the tale been called, say, "Ottilie's Expiation," there would have been less room for misunderstanding and irrelevant criticism; there would have been less concern over the moral, and more over the artistic, aspect of the story."

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In Elective Affinities (IAD), **Part one: Chapter eight** (add synopsis)

Part one: Chapter eight

Early the following morning the captain examined the spot: he first threw off a sketch of what should be done, and afterwards, when the thing had been more completely decided on, he made a complete design, with accurate calculations and measurements. It cost him a good deal of labor, and the business connected with the sale of the farm had to be gone into, so that both the gentlemen now found a fresh impulse to activity.

Description: "Ottilie playing with Edward" (HB:260)

The captain made Edward observe that it would be proper, indeed that it would be a kind of duty, to celebrate Charlotte's birthday with laying the foundation-stone. Not much was wanted to overcome Edward's disinclination for such festivities—for he quickly recollected that a little later Ottilie's birthday would follow, and that he could have a magnificent celebration for that.

Charlotte, to whom all this work and what it would involve was a subject for much serious and almost anxious thought, busied herself in carefully going through the time and outlay which it was calculated would be expended on it. During the day they rarely saw each other, so that the evening meeting was looked forward to with all the more anxiety.

Ottilie meantime was complete mistress of the household—and how could it be otherwise, with her quick methodical ways of working? Indeed, her whole mode of thought was suited better to home-life than to the world, and to a more free existence. Edward soon observed that she only walked about with them out of a desire to please; that when she stayed out late with them in the evening it was because she thought it a sort of social duty, and that she would often find a pretext in some household matter for going in again—consequently he soon managed so to arrange the walks which they took together, that they should be at home before sunset; and he began again, what he had long left off, to read aloud poetry—particularly such as had for its subject the expression of a pure but passionate love.

They ordinarily sat in the evening in the same places round a small table—Charlotte on the sofa, Ottilie on a chair opposite to her, and the gentlemen on each side. Ottilie's place was on Edward's right, the side where he put the candle when he was reading—at such times she would draw her chair a little nearer to look over him, for Ottilie also trusted her own eyes better than another person's lips, and Edward would then always make a move towards her, that it might be as easy as possible for her—indeed he would frequently make longer stops than necessary, that he might not turn over before she had got to the bottom of the page.

Charlotte and the captain observed this, and exchanged many a quiet smile at it; but they were both taken by surprise at another symptom, in which Ottilie's latent feeling accidentally displayed itself.

One evening, which had been partly spoiled for them by a tedious visit, Edward proposed that they should not separate so early—he felt inclined for music—he would take his flute, which he had not done for many days past. Charlotte looked for the sonatas which they generally played together, and they were not to be found. Ottilie, with some hesitation, said that they were in her room—she had taken them there to copy them.

"And you can, you will, accompany me on the piano?" cried Edward, his eyes sparkling with pleasure. "I think perhaps

I can," Ottilie answered. She brought the music and sat down to the instrument. The others listened, and were sufficiently surprised to hear how perfectly Ottilie had taught herself the piece—but far more surprised were they at the way in which she contrived to adopt herself to Edward's style of playing. Adapt herself, is not the right expression—Charlotte's skill and power enabled her, in order to please her husband, to keep up with him when he went too fast, and hold in for him if he hesitated; but Ottilie, who had several times heard them play the sonata together, seemed to have learned it according to the idea in which they accompanied each other—she had so completely made his defects her own, that a kind of living whole resulted from it, which did not move indeed according to exact rule, but the effect of which was in the highest degree pleasant and delightful. The composer himself would have been pleased to hear his work disfigured in a manner so charming.

Charlotte and the captain watched this strange unexpected occurrence in silence, with the kind of feeling with which we often observe the actions of children—unable exactly to approve of them, from the serious consequences which may follow, and yet without being able to find fault, perhaps with a kind of envy. For, indeed, the regard of these two for one another was growing also, as well as that of the others—and it was perhaps only the more perilous because they were both stronger, more certain of themselves, and better able to restrain themselves.

The captain had already begun to feel that a habit which he could not resist was threatening to bind him to Charlotte. He forced himself to stay away at the hour when she commonly used to be at the works; by getting up very early in the morning he contrived to finish there whatever he had to do, and went back to the castle to his work in his own room. The first day or two Charlotte thought it was an accident—she looked for him in every place where she thought he could possibly be. Then she thought she understood him—and admired him all the more.

Avoiding, as the captain now did, being alone with Charlotte, the more industriously did he labor to hurry forward the preparations for keeping her rapidly-approaching birthday with all splendor. While he was bringing up the new road from below behind the village, he made the men, under pretence that he wanted stones, begin working at the top as well, and work down, to meet the others; and he had calculated his arrangements so that the two should exactly meet on the eve of the day. The excavations for the new house were already done; the rock was blown away with gunpowder; and a fair foundation-stone had been hewn, with a hollow chamber, and a flat slab adjusted to cover it.

This outward activity, these little mysterious purposes of friendship, prompted by feelings which more or less they were obliged to repress, rather prevented the little party when together from being as lively as usual. Edward, who felt that there was a sort of void, one evening called upon the captain to fetch his violin—Charlotte should play the piano, and he should accompany her. The captain was unable to refuse the general request, and they executed together one of the most difficult pieces of music with an ease and freedom and feeling, which could not but afford themselves, and the two who were listening to them, the greatest delight. They promised themselves a frequent repetition of it, as well as further practice together. "They do it better than we, Ottilie," said Edward; "we will admire them—but we can enjoy ourselves together too."

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● Elective Affinities | Part one: Chapter seven

Main
● Elective Affinities: Illustrated, Annotated, and Decoded

Elective Affinities

Discussion
(add)

See also
- Goethe’s affinity table | Used to make *Elective Affinities*.
- Goethe timeline | Historical overview of the construction of *Elective Affinities*.
- Goethe’s human chemistry | Goethe's version of human chemistry.
- Goethean philosophy | Goethe's philosophy.
- Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References
1. (add)

In Elective Affinities (IAD), **Part one: Chapter eighteen** (add synopsis)

Part one: Chapter eighteen

It may easily be supposed that the strange, busy gentleman, whose acquaintance we have already made—Mittler—as soon as he received information of the disorder which had broken out among his friends, felt desirous, though neither side had as yet called on him for assistance, to fulfill a friend's part towards them, and do what he could to help them in their misfortune. He thought it advisable, however, to wait first a little while; knowing too well, as he did, that it was more difficult to come to the aid of cultivated persons in their moral perplexities, than of the uncultivated. He left them, therefore, for some time to themselves; but at last he could withhold no longer, and he hastened to seek out Edward, on whose traces he had already lighted. His road led him to a pleasant, pretty valley, with a range of green, sweetly-wooded meadows, down the centre of which ran a never-failing stream, sometimes winding slowly along, then tumbling and rushing among rocks and stones. The hills sloped gently up on either side, covered with rich corn-fields and well-kept orchards. The villages were at proper distances from each other. The whole had a peaceful character about it, and the detached scenes seemed designed expressly, if not for painting, at least for life. At last a neatly-kept farm, with a clean, modest dwelling-house, situated in the middle of a garden, fell under his eye. He conjectured that this was Edward's present abode; and he was not mistaken.

Of this our friend in his solitude we have only thus much to say—that in his seclusion he was resigning himself utterly to the feeling of his passion, thinking out plan after plan, and feeding himself with innumerable hopes. He could not deny that he longed to see Ottilie there; that he would like to carry her off there, to tempt her there; and whatever else (putting, as he now did, no check upon his thoughts) pleased to suggest itself, whether permitted or unpermitted. Then his imagination wandered up and down, picturing every sort of possibility. If he could not have her there, if he could not lawfully possess her, he would secure to her the possession of the property for her own. There she should live for herself, silently, independently; she should be happy in that spot—sometimes his self-torturing mood would lead him further—be happy in it, perhaps, with another.

So days flowed away in increasing oscillation between hope and suffering, between tears and happiness—between purposes, preparations, and despair. The sight of Mittler did not surprise him; he had long expected that he would come; and now that he did, he was partly welcome to him. He believed that he had been sent by Charlotte. He had prepared himself with all manner of excuses and delays; and if these would not serve, with decided refusals; or else, perhaps, he might hope to learn something of Ottilie,—and then he would be dear to him as a messenger from heaven.

Not a little vexed and annoyed was Edward, therefore, when he understood that Mittler had not come from the castle at all, but of his own free accord. His heart closed up, and at first the conversation would not open itself. Mittler, however, knew very well that a heart that is occupied with love has an urgent necessity to express itself—to pour out to a friend what is passing within it; and he allowed himself, therefore, after a few speeches backwards and forwards, for this once to go out of his character, and play the confidant in place of the mediator. He had calculated justly. He had been finding fault in a good-natured way with Edward, for burying himself in that lonely place, upon which Edward replied:

"I do not know how I could spend my time more agreeably. I am always occupied with her; I am always close to her. I have the inestimable comfort of being able to think where Ottilie is at each moment—where she is going, where she is standing, where she is reposing. I see her moving and acting before me as usual; ever doing or designing something which is to give me pleasure. But this will not always answer; for how can I be happy away from her? And then my fancy begins to work; I think what Ottilie should do to come to me; I write sweet, loving letters in her name to myself, and then I answer them, and keep the sheets together. I have promised that I will take no steps to seek her; and that promise I will keep. But what binds her, that she should make no advances to me? Has Charlotte had the barbarity to exact a promise, to exact an oath from her, not to write to me, not to send me a word, a hint, about herself? Very likely she has. It is only natural; and yet to me it is monstrous, it is horrible. If she loves me—as I think, as I know that she does—why does she not resolve, why does she not venture to fly to me, and throw herself into my arms? I often think she ought to do it; and she could do it. If I ever hear a noise in the hall, I look towards the door. It must be her—she is coming—I look up to see her. Alas! because the possible is impossible, I let myself imagine that the impossible must become possible. At night, when I lie awake, and the lamp flings an uncertain light about the room, her form, her spirit, a sense of her presence, sweeps over me, approaches me, seizes me. It is but for a moment; it is that I may have an

assurance that she is thinking of me, that she is mine. Only one pleasure remains to me. When I was with her I never dreamed of her; now when I am far away, and, oddly enough, since I have made the acquaintance of other attractive persons in this neighborhood, for the first time, her figure appears to me in my dreams, as if she would say to me, ‘Look on them, and on me. You will find none more beautiful, more lovely than I.’ And so she is present in every dream I have. In whatever happens to me with her, we are woven in and in together. Now we are subscribing a contract together. There is her hand, and there is mine; there is her name, and there is mine; and they move one into the other, and seem to devour each other. Sometimes she does something which injures the pure idea which I have of her; and then I feel how intensely I love her, by the indescribable anguish which it causes me. Again, unlike herself, she will rally and vex me; and then at once the figure changes—her sweet, round, heavenly face draws out; it is not her, it is another; but I lie vexed, dissatisfied and wretched. Laugh not, dear Mittler, or laugh on as you will. I am not ashamed of this attachment, of this—if you please to call it so—foolish, frantic passion. No, I never loved before. It is only now that I know what to love means. Till now, what I have called life was nothing but its prelude—amusement, sport to kill the time with. I never lived till I knew her, till I loved her—entirely and only loved her. People have often said of me, not to my face, but behind my back, that in most things I was but a botcher and a bungler. It may be so; for I had not then found in what I could show myself a master. I should like to see the man who outdoes me in the talent of love. A miserable life it is, full of anguish and tears; but it is so natural, so dear to me, that I could hardly change it for another.”

Edward had relieved himself slightly by this violent unloading of his heart. But in doing so every feature of his strange condition had been brought out so clearly before his eyes, that, overpowered by the pain of the struggle, he burst into tears, which flowed all the more freely as his heart had been made weak by telling it all.

Mittler, who was the less disposed to put a check on his inexorable good sense and strong, vigorous feeling, because by this violent outbreak of passion on Edward’s part he saw himself driven far from the purpose of his coming, showed sufficiently decided marks of his disapprobation. Edward should act as a man, he said; he should remember what he owed to himself as a man. He should not forget that the highest honor was to command ourselves in misfortune; to bear pain, if it must be so, with equanimity and self-collectedness. That was what we should do, if we wished to be valued and looked up to as examples of what was right.

Stirred and penetrated as Edward was with the bitterest feelings, words like these could but have a hollow, worthless sound.

“It is well,” he cried, “for the man who is happy, who has all that he desires, to talk; but he would be ashamed of it if he could see how intolerable it was to the sufferer. Nothing short of an infinite endurance would be enough, and easy and contented as he was, what could he know of an infinite agony? There are cases,” he continued, “yes, there are, where comfort is a lie, and despair is a duty. Go, heap your scorn upon the noble Greek, who well knows how to delineate heroes, when in their anguish he lets those heroes weep. He has even a proverb, ‘Men who can weep are good.’ Leave me, all you with dry heart and dry eye. Curses on the happy, to whom the wretched serve but for a spectacle. When body and soul are torn in pieces with agony, they are to bear it—yes, to be noble and bear it, if they are to be allowed to go off the scene with applause. Like the gladiators, they must die gracefully before the eyes of the multitude. My dear Mittler, I thank you for your visit; but really you would oblige me much, if you would go out and look about you in the garden. We will meet again. I will try to compose myself, and become more like you.”

Mittler was unwilling to let a conversation drop which it might be difficult to begin again, and still persevered. Edward, too, was quite ready to go on with it; besides that of itself, it was tending towards the issue which he desired.

“Indeed,” said the latter, “this thinking and arguing backwards and forwards leads to nothing. In

Description: "Mittler Discoursing with Edward." (HB:295)

this very conversation I myself have first come to understand myself; I have first felt decided as to what I must make up my mind to do. My present and my future life I see before me; I have to choose only between misery and happiness. Do you, my best friend, bring about the separation which must take place, which, in fact, is already made; gain Charlotte's consent for me. I will not enter upon the reasons why I believe there will be the less difficulty in prevailing upon her. You, my dear friend, must go. Go, and give us all peace; make us all happy."

Mittler hesitated. Edward continued:

"My fate and Ottilie's cannot be divided, and shall not be shipwrecked. Look at this glass; our initials are engraved upon it. A gay reveler flung it into the air, that no one should drink of it more. It was to fall on the rock and be dashed to pieces; but it did not fall; it was caught. At a high price I bought it back, and now I drink out of it daily—to convince myself that the connection between us cannot be broken; that destiny has decided."

"Alas, alas!" cried Mittler, "what must I not endure with my friends? Here comes superstition, which of all things I hate the worst—the most mischievous and accursed of all the plagues of mankind. We trifle with prophecies, with forebodings and dreams, and give a seriousness to our every-day life with them; but when the seriousness of life itself begins to show, when everything around us is heaving and rolling, then come in these spectres to make the storm more terrible."

"In this uncertainty of life," cried Edward, "poised as it is between hope and fear, leave the poor heart its guiding-star. It may gaze towards it, if it cannot steer towards it."

"Yes, I might leave it; and it would be very well," replied Mittler, "if there were but one consequence to expect; but I have always found that nobody will attend to symptoms of warning. Man cares for nothing except what flatters him and promises him fair; and his faith is alive exclusively for the sunny side."

Mittler, finding himself carried off into the shadowy regions, in which the longer he remained in them, the more uncomfortable he always felt, was the more ready to assent to Edward's eager wish that he should go to Charlotte. Indeed, if he stayed, what was there further which at that moment he could urge on Edward? To gain time, to inquire in what state things were with the ladies, was the best thing which even he himself could suggest as at present possible.

He hastened to Charlotte, whom he found as usual, calm and in good spirits. She told him readily of everything which had occurred; for from what Edward had said he had only been able to gather the effects. On his own side, he felt his way with the utmost caution. He could not prevail upon himself even cursorily to mention the word separation. It was a surprise, indeed, to him, but from his point of view an unspeakably delightful one, when Charlotte, at the end of a number of unpleasant things, finished with saying:

“I must believe, I must hope, that things will all work round again, and that Edward will return to me. How can it be otherwise, as soon as I become a mother?”

“Do I understand you right?” returned Mittler.

“Perfectly,” Charlotte answered.

“A thousand times blessed be this news!” he cried, clasping his hands together. “I know the strength of this argument on the mind of a man. Many a marriage have I seen first cemented by it, and restored again when broken. Such a good hope as this is worth more than a thousand words. Now indeed it is the best hope which we can have. For myself though,” he continued, “I have all reason to be vexed about it. In this case I can see clearly no self-love of mine will be flattered. I shall earn no thanks from you by my services; I am in the same case as a certain medical friend of mine, who succeeds in all cures which he undertakes with the poor for the love of God; but can seldom do anything for the rich who will pay him. Here, thank God, the thing cures itself, after all my talking and trying had proved fruitless.”

Charlotte now asked him if he would carry the news to Edward: if he would take a letter to him from her, and then see what should be done. But he declined undertaking this. “All is done,” he cried; “do you write your letter—any messenger will do as well as I—I will come back to wish you joy. I will come to the christening!”

For this refusal she was vexed with him—as she frequently was. His eager impetuous character brought about much good; but his over-haste was the occasion of many a failure. No one was more dependent than he on the impressions which he formed on the moment.

Charlotte’s messenger came to Edward, who received him half in terror. The letter was to decide his fate, and it might as well contain No as Yes. He did not venture, for a long time, to open it. At last he tore off the cover, and stood petrified at the following passage, with which it concluded:

“Remember the night-adventure when you visited your wife as a lover—how you drew her to you, and clasped her as a well-beloved bride in your arms. In this strange accident let us revere the providence of heaven, which has woven a new link to bind us, at the moment when the happiness of our lives was threatening to fall asunder and to vanish.”

What passed from that moment in Edward’s soul it would be difficult to describe! Under the weight of such a stroke, old habits and fancies come out again to assist to kill the time and fill up the chasms of life. Hunting and fighting are an ever-ready resource of this kind for a nobleman; Edward longed for some outward peril, as a counterbalance to the storm within him. He craved for death, because the burden of life threatened to become too heavy for him to bear. It comforted him to think that he would soon cease to be, and so would make those whom he loved happy by his

Description: "Edward Departing to the War." (HB:297)

departure.

No one made any difficulty in his doing what he purposed—because he kept his intention a secret. He made his will with all due formalities. It gave him a very sweet feeling to secure Ottilie's fortune—provision was made for Charlotte, for the unborn child, for the captain, and for the servants. The war, which had again broken out, favored his wishes: he had disliked exceedingly the half-soldiering which had fallen to him in his youth, and that was the reason why he had left the service. Now it gave him a fine exhilarating feeling to be able to rejoin it, under a commander of whom it could be said, that under his conduct death was likely, and victory was sure.

Ottilie, when Charlotte's secret was made known to her, bewildered by it, like Edward, and more than he, retired into herself—she had nothing further to say: hope she could not, and wish she dared not. A glimpse into what was passing in her we can gather from her diary, some passages of which we think to communicate.

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Discussion

(add)

See also

â— Goethe’s affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe’s human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations

N1. (add)

References

1. (add)

In Elective Affinities (IAD), **Part one: Chapter eleven** (add synopsis)

Part one: Chapter eleven

Edward went with the count to his room. They continued talking, and he was easily prevailed upon to stay a little time longer there. The count lost himself in old times, spoke eagerly of Charlotte's beauty, which, as a critic, he dwelt upon with much warmth.

Description: "Edward Guiding the Count." (HB:272)

"A pretty foot is a great gift of nature," he said. "It is a grace which never perishes. I observed it to-day, as she was walking. I should almost have liked to have kissed her shoe, and repeat that somewhat barbarous but significant practice of the Sarmatians, who know no better way of showing reverence for any one they love or respect, than by using his shoe to drink his health out of."

The point of the foot did not remain the only subject of praise between two old acquaintances; they went from the person back upon old stories and adventures, and came on the hindrances which at that time people had thrown in the way of the lovers' meetings—what trouble they had taken, what arts they had been obliged to devise, only to be able to tell each other that they loved.

"Do you remember," continued the count, "an adventure in which I most unselfishly stood your friend when their high mightinesses were on a visit to your uncle, and were all together in that great, straggling castle. The day went in festivities and glitter of all sorts; and a part of the night at least in pleasant conversation."

"And you, in the meantime, had observed the back-way which led to the court ladies' quarter," said Edward, "and so managed to effect an interview for me with my beloved."

"And she," replied the count, "thinking more of propriety than of my enjoyment, had kept a frightful old duenna with her. So that, while you two, between looks and words, got on extremely well together, my lot, in the meanwhile, was far from pleasant."

"It was only yesterday," answered Edward, "when we heard that you were coming, that I was talking over the story with my wife, and describing our adventure on returning. We missed the road, and got into the entrance-hall from the garden. Knowing our way from thence so well as we did, we supposed we could get along easily enough. But you remember our surprise on opening the door. The floor was covered over with mattresses, on which the giants lay in rows stretched out and sleeping. The single sentinel at his post looked wonderingly at us; but we, in the cool way young men do things, strode quietly on over the outstretched boots, without disturbing a single one of the snoring children of Anak."

"I had the strongest inclination to stumble," the count said, "that there might be an alarm given. What a resurrection we should have witnessed."

At this moment the castle clock struck twelve.

"It is deep midnight," the count added, laughing, "and just the proper time; I must ask you, my dear baron, to show me a kindness. Do you guide me to-night, as I guided you then. I promised the baroness that I would see her before going to bed. We have had no opportunity of any private talk together the whole day. We have not seen each other for a long time, and it is only natural that we should wish for a confidential hour. If you will show me the way there, I will manage to get back again; and in any case, there will be no boots for me to stumble over."

“I shall be very glad to show you such a piece of hospitality,” answered Edward; “only the three ladies are together in the same wing. Who knows whether we shall not find them still with one another, or make some other mistake, which may have a strange appearance?”

“Do not be afraid,” said the count; “the baroness expects me. She is sure by this time to be in her own room, and alone.”

“Well, then, the thing is easy enough,” Edward answered.

He took a candle, and lighted the count down a private staircase leading into a long gallery. At the end of this he opened a small door. They mounted a winding flight of stairs, which brought them out upon a narrow landing-place; and then, putting the candle in the count’s hand, he pointed to a tapestried door on the right, which opened readily at the first trial, and admitted the count, leaving Edward outside in the dark.

Another door on the left led into Charlotte’s sleeping-room. He heard her voice, and listened. She was speaking to her maid. “Is Ottilie in bed?” she asked. “No,” was the answer; “she is sitting writing in the room below.” “You may light the night-lamp,” said Charlotte; “I shall not want you any more. It is late. I can put out the candle, and do whatever I may want else myself.”

It was a delight to Edward to hear that Ottilie was writing still. She is working for me, he thought triumphantly. Through the darkness, he fancied he could see her sitting all alone at her desk. He thought he would go to her, and see her; and how she would turn to receive him. He felt a longing, which he could not resist, to be near her once more. But, from where he was, there was no way to the apartments which she occupied. He now found himself immediately at his wife’s door. A singular change of feeling came over him. He tried the handle, but the bolts were shot. He knocked gently. Charlotte did not hear him. She was walking rapidly up and down in the large dressing-room adjoining. She was repeating over and over what, since the count’s unexpected proposal, she had often enough had to say to herself. The captain seemed to stand before her. At home, and everywhere, he had become her all in all. And now he was to go; and it was all to be desolate again. She repeated whatever wise things one can say to one’s self; she even anticipated, as people so often do, the wretched comfort, that time would come at last to her relief; and then she cursed the time which would have to pass before it could lighten her sufferings—she cursed the dead, cold time when they would be lightened. At last she burst into tears; they were the more welcome, since tears with her were rare. She flung herself on the sofa, and gave herself up unreservedly to her sufferings. Edward, meanwhile, could not take himself from the door. He knocked again; and a third time rather louder; so that Charlotte, in the stillness of the night, distinctly heard it, and started up in fright. Her first thought was,—it can only be, it must be the captain; her second, that it was impossible. She thought she must have been deceived. But surely she had heard it; and she wished, and she feared to have heard it. She went into her sleeping-room, and walked lightly up to the bolted tapestry-door. She blamed herself for her fears. “Possibly it may be the baroness wanting something,” she said to herself; and she called out quietly and calmly, “Is anybody there?” A light voice answered, “It is I.” “Who?” returned Charlotte, not being able to make out the voice. She thought she saw the captain’s figure standing at the door. In a rather louder tone, she heard the word “Edward!” She drew back the bolt, and her husband stood before her. He greeted her with some light jest. She was unable to reply in the same tone. He complicated the mysterious visit by his mysterious explanation of it.

“Well, then,” he said at last, “I will confess, the real reason why I am come is, that I have made a vow to kiss your shoe this evening.”

“It is long since you thought of such a thing as that,” said Charlotte.

“So much the worse,” he answered; “and so much the better.”

She had thrown herself back in an armchair, to prevent him from seeing the slightness of

Description: "Charlotte Listening for Edward." (HB:274)

her dress. He flung himself down before her, and she could not prevent him from giving her shoe a kiss. And when the shoe came off in his hand, he caught her foot and pressed it tenderly against his breast.

Charlotte was one of those women who, being of a naturally calm temperament, continue in marriage, without any purpose or any effort, the air and character of lovers. She was never expressive towards her husband; generally, indeed, she rather shrank from any warm demonstration on his part. It was not that she was cold, or at all hard and repulsive, but she remained always like a loving bride, who draws back with a kind of shyness even from what is permitted. And so Edward found her this evening, in a double sense. How sorely did she not long that her husband would go; the figure of his friend seemed to hover in the air and reproach her. But what should have had the effect of driving Edward away only attracted him the more. There were visible traces of emotion about her. She had been crying; and tears, which with weak persons detract from their graces, add immeasurably to the attractiveness of those whom we know commonly as strong and self-possessed.

Edward was so agreeable, so gentle, so pressing; he begged to be allowed to stay with her. He did not demand it, but half in fun, half in earnest, he tried to persuade her; he never thought of his rights. At last, as if in mischief, he blew out the candle.

In the dim lamplight, the inward affection, the imagination, maintained their rights over the real;—it was Ottilie that was resting in Edward’s arms; and the captain, now faintly, now clearly, hovered before Charlotte’s soul. And so, strangely intermingled, the absent and the present flowed in a sweet enchantment one into the other.

And yet the present would not let itself be robbed of its own unlovely right. They spent a part of the night talking and laughing at all sorts of things, the more freely, as the heart had no part in it. But when Edward awoke in the morning, on his wife’s breast, the day seemed to stare in with a sad, awful look, and the sun to be shining in upon a crime. He stole lightly from her side; and she found herself, with strange enough feelings, when she awoke, alone.

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Elective Affinities

Discussion

● Maternal imagination theory
● Engelstein, Stefani. (2008). *Anxious Anatomy: the Conception of the Human Form in Literary and Naturalist Discourse* (pg. 29). SUNY Press.

See also

● Goethe's affinity table | Used to make *Elective Affinities*.
● Goethe timeline | Historical overview of the construction of *Elective Affinities*.
● Goethe's human chemistry | Goethe's version of human chemistry.
● Goethean philosophy | Goethe's philosophy.
● Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations

N1. (add)

References

1. (add)

In Elective Affinities (IAD), **Part one: Chapter fifteen** (add synopsis)

Part one: Chapter fifteen

The long-wished-for morning dawned at last on Edward; and very soon a number of guests arrived. They had sent out a large number of invitations, and many who had missed the laying of the foundation-stone, which was reported to have been so charming, were the more careful not to be absent on the second festivity.

Before dinner the carpenter's people appeared, with music, in the court of the castle. They bore an immense garland of flowers, composed of a number of single wreaths, winding in and out, one above the other; saluting the company, they made request, according to custom, for silk handkerchiefs and ribbons, at the hands of the fair sex, with which to dress themselves out. When the castle party went into the dining-hall, they marched off singing and shouting, and after amusing themselves a while in the village, and coaxing many a ribbon out of the women there, old and young, they came at last, with crowds behind them and crowds expecting them, out upon the height where the park-house was now standing. After dinner, Charlotte rather held back her guests. She did not wish that there should be any solemn or formal procession, and they found their way in little parties, broken up, as they pleased, without rule or order, to the scene of action. Charlotte stayed behind with Ottilie, and did not improve matters by doing so. For Ottilie being really the last that appeared, it seemed as if the trumpets and the clarinets had only been waiting for her, and as if the gayeties had been ordered to commence directly on her arrival.

To take off the rough appearance of the house, it had been hung with green boughs and flowers. They had dressed it out in an architectural fashion, according to a design of the captain's; only that, without his knowledge, Edward had desired the architect to work in the date upon the cornice in flowers, and this was necessarily permitted to remain. The captain had only arrived on the scene in time to prevent Ottilie's name from figuring in splendor on the gable. The beginning, which had been made for this, he contrived to turn skillfully to some other use, and to get rid of such of the letters as had been already finished.

The garland was set up, and was to be seen far and wide about the country. The flags and the ribbons fluttered gayly in the air; and a short oration was, the greater part of it, dispersed by the wind. The solemnity was at an end. There was now to be a dance on the smooth lawn in front of the building, which had been enclosed with boughs and branches. A gayly-dressed working mason took Edward up to a smart-looking girl of the village, and called himself upon Ottilie, who stood out with him. These two couples speedily found others to follow them, and Edward contrived pretty soon to change partners, catching Ottilie, and making the round with her. The younger part of the company joined merrily in the dance with the people, while the elder among them stood and looked on.

Then, before they broke up and walked about, an order was given that they should all collect again at sunset under the plane trees. Edward was the first upon the spot, ordering everything, and making his arrangements with his valet, who was to be on the other side, in company with the firework-maker, managing his exhibition of the spectacle.

The captain was far from satisfied at some of the preparations which he saw made; and he endeavored to get a word with Edward about the crush of spectators which was to be expected. But the latter, somewhat hastily, begged that he might be allowed to manage this part of the day's amusements himself.

The upper end of the embankment having been recently raised, was still far from compact. It had been staked, but there was no grass upon it, and the earth was uneven and insecure. The crowd pressed on, however, in great numbers. The sun went down, and the castle party was served with refreshments under the plane trees, to pass the time till it should have become sufficiently dark. The place was approved of beyond measure, and they looked forward to frequently enjoying the view over so lovely a sheet of water, on future occasions.

A calm evening, a perfect absence of wind, promised everything in favor of the spectacle, when suddenly loud and violent shrieks were heard. Large masses of the earth had given way on the edge of the embankment, and a number of people were precipitated into the water. The pressure from the throng had gone on increasing till at last it had become more than the newly-laid soil would bear, and the bank had fallen in. Everybody wanted to obtain the best place, and now there was no getting either backwards or forwards.

People ran this and that way, more to see what was going on than to render assistance. What could be done when no one could reach the place?

Description: "Ottilie Dancing with the Mason." (HB:283)

The captain, with a few determined persons, hurried down and drove the crowd off the embankment back upon the shore; in order that those who were really of service might have free room to move. One way or another they contrived to seize hold of such as were sinking; and with or without assistance all who had been in the water were got out safe upon the bank, with the exception of one boy, whose struggles in his fright, instead of bringing him nearer to the embankment, had only carried him further from it. His strength seemed to be failing—now only a hand was seen above the surface, and now a foot. By an unlucky chance the boat was on the opposite shore filled with fireworks—it was a long business to unload it, and help was slow in coming. The captain's resolution was taken; he flung off his coat; all eyes were directed towards him, and his sturdy vigorous figure gave everyone hope and confidence: but a cry of surprise rose out of the crowd as they saw him fling himself into the water—every eye watched him as the strong swimmer swiftly reached the boy, and bore him, although to appearance dead, to the embankment.

Now came up the boat. The captain stepped in and examined whether there were any still missing, or whether they were all safe. The surgeon was speedily on the spot, and took charge of the inanimate boy. Charlotte joined them, and entreated the captain to go now and take care of himself, to hurry back to the castle and change his clothes. He would not go, however, till persons on whose sense he could rely, who had been close to the spot at the time of the accident, and who had assisted in saving those who had fallen in, assured him that all were safe.

Charlotte saw him on his way to the house, and then she remembered that the wine and the tea, and everything else which he could want, had been locked up, for fear any of the servants should take advantage of the disorder of the holiday, as on such occasions they are too apt to do. She hurried through the scattered groups of her company, which were loitering about the plane trees. Edward was there, talking to every one—beseeching everyone to stay. He would give the signal directly, and the fireworks should begin. Charlotte went up to him, and entreated him to put off an amusement which was no longer in place, and which at the present moment no one could enjoy. She reminded him of what ought to be done for the boy who had been saved, and for his preserver.

"The surgeon will do whatever is right, no doubt," replied Edward. "He is provided with everything which he can want,

and we should only be in the way if we crowded about him with our anxieties.”

Charlotte persisted in her opinion, and made a sign to Ottilie, who at once prepared to retire with her. Edward seized her hand, and cried, “We will not end this day in a lazaretto. She is too good for a sister of mercy. Without us, I should think, the half-dead may wake, and the living dry themselves.”

Charlotte did not answer, but went. Some followed her—others followed these: in the end, no one wished to be the last, and all followed. Edward and Ottilie found themselves alone under the plane trees. He insisted that stay he would, earnestly, passionately, as she entreated him to go back with her to the castle. “No, Ottilie!” he cried; “the extraordinary is not brought to pass in the smooth common way—the wonderful accident of this evening brings us more speedily together. You are mine—I have often said it to you, and sworn it to you. We will not say it and swear it any more—we will make it be.”

The boat came over from the other side. The valet was in it—he asked, with some embarrassment, what his master wished to have done with the fireworks?

“Let them off!” Edward cried to him: “let them off!—It was only for you that they were provided, Ottilie, and you shall be the only one to see them! Let me sit beside you, and enjoy them with you.” Tenderly, timidly, he sat down at her side, without touching her.

Rockets went hissing up—cannon thundered—Roman candles shot out their blazing balls—squibs flashed and darted—wheels spun round, first singly, then in pairs, then all at once, faster and faster, one after the other, and more and more together. Edward, whose bosom was on fire, watched the blazing spectacle with eyes gleaming with delight; but Ottilie, with her delicate and nervous feelings, in all this noise and fitful blazing and flashing, found more to distress her than to please. She leaned shrinking against Edward, and he, as she drew to him and clung to him, felt the delightful sense that she belonged entirely to him.

The night had scarcely reassumed its rights, when the moon rose and lighted their path as they walked back. A figure, with his hat in his hand, stepped across their way, and begged an alms of them—in the general holiday he said that he had been forgotten. The moon shone upon his face, and Edward recognized the features of the importunate beggar; but, happy as he then was, it was impossible for him to be angry with anyone. He could not recollect that, especially for that particular day, begging had been forbidden under the heaviest penalties—he thrust his hand into his pocket, took the first coin which he found, and gave the fellow a piece of gold. His own happiness was so unbounded that he would have liked to have shared it with everyone.

In the meantime all had gone

Description: "Ottilie Examinging the Birthday Gift." (HB:285)

well at the castle. The skill of the surgeon, everything which was required being ready at hand, Charlotte's assistance—all had worked together, and the boy was brought to life again. The guests dispersed, wishing to catch a glimpse or two of what was to be seen of the fireworks from the distance; and, after a scene of such confusion, were glad to get back to their own quiet homes.

The captain also, after having rapidly changed his dress, had taken an active part in what required to be done. It was now all quiet again, and he found himself alone with Charlotte—gently and affectionately he now told her that his time for leaving them approached. She had gone through so much that evening, that this discovery made but a slight impression upon her—she had seen how her friend could sacrifice himself; how he had saved another, and had himself been saved. These strange incidents seemed to foretell an important future to her—but not an unhappy one.

Edward, who now entered with Ottilie, was informed at once of the impending departure of the captain. He suspected that Charlotte had known longer how near it was; but he was far too much occupied with himself, and with his own plans, to take it amiss, or care about it.

On the contrary, he listened attentively, and with signs of pleasure, to the account of the excellent and honorable position in which the captain was to be placed. The course of the future was hurried impetuously forward by his own secret wishes. Already he saw the captain married to Charlotte, and himself married to Ottilie. It would have been the richest present which anyone could have made him, on the occasion of the day's festival!

But how surprised was Ottilie, when, on going to her room, she found upon the table the beautiful box! Instantly she

opened it; inside, all the things were so nicely packed and arranged, that she did not venture to take them out, she scarcely even ventured to lift them. There were muslin, cambric, silk, shawls and lace, all rivaling each other in delicacy, beauty and costliness—nor were ornaments forgotten. The intention had been, as she saw well, to furnish her with more than one complete suit of clothes: but it was all so costly, so little like what she had been accustomed to, that she scarcely dared, even in thought, to believe it could be really for her.

Next chapter
â— Elective Affinities | Part one: Chapter sixteen

Previous chapter
â— Elective Affinities | Part one: Chapter fourteen

â— Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

See also
â— Goethe’s affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe’s human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References

1. (add)

A = - dG

In Elective Affinities (IAD), **Part one: Chapter five** (add synopsis)

Part one: Chapter five

LETTER OF THE LADY SUPERIOR | Headmistress's Letter [N1]

"Your ladyship will forgive the brevity of my present letter. The public examinations are but just concluded, and I have to communicate to all the parents and guardians the progress which our pupils have made during the past year. To you I may well be brief, having to say much in few words. Your ladyship's daughter [Luciana] has proved herself first in every sense of the word. The testimonials which I enclose, and her own letter, in which she will detail to you the prizes which she has won, and the happiness which she feels in her success, will surely please, and I hope delight you. For myself, it is the less necessary that I should say much, because I see that there will soon be no more occasion to keep with us a young lady so far advanced. I send my respects to your ladyship, and in a short time I shall take the liberty of offering you my opinion as to what in future may be of most advantage to her.

"My good assistant will tell you about Ottilie."

LETTER OF THE ASSISTANT | The Schoolmaster's Letter [N2]

"Our reverend superior leaves it to me to write to you of Ottilie, partly because, with her ways of thinking about it, it would be painful to her to say what has to be said; partly, because she herself requires some excusing, which she would rather have done for her by me.

Description: "Luciana Showing her Prizes" (HB:251); possibly to Ottilie (?), who is doing poorly in school.

"Knowing, as I did too well, how little able the good Ottilie was to show out what lies in her, and what she is capable of, I was all along afraid of this public examination. I was the more uneasy, as it was to be of a kind which does not admit of any especial preparation; and even if it had been conducted as usual, Ottilie never can be prepared to make a display. The result has only too entirely justified my anxiety. She has gained no prize; she is not even amongst those whose names have been mentioned with approbation. I need not go into details. In writing, the letters of the other girls were not so well formed, but their strokes were far more free. In arithmetic, they were all quicker than she; and in the more difficult problems, which she does the best, there was no examination. In French, she was outshone and out-talked by many; and in history she was not ready with her names and dates. In geography, there was a want of attention to the political divisions; and for what she could do in music there was neither time nor quiet enough for her few modest melodies to gain attention. In drawing she certainly would have gained the prize; her outlines were clear, and the execution most careful and full of spirit; unhappily, she had chosen too large a subject, and it was incomplete.

"After the pupils were dismissed, the examiners consulted together, and we teachers were partially admitted into the council. I very soon observed that of Ottilie either nothing would be said at all, or if her name was mentioned, it would be with indifference, if not absolute disapproval. I hoped to obtain some favor for her by a candid description of what she was, and I ventured it with the greater earnestness, partly because I was only speaking my real convictions, and partly because I remembered in my own younger years finding myself in the same unfortunate case. I was listened to with attention, but as soon as I had ended, the presiding examiner said to me very kindly but laconically, 'We presume

capabilities: they are to be converted into accomplishments. This is the aim of all education. It is what is distinctly intended by all who have the care of children, and silently and indistinctly by the children themselves. This also is the object of examinations, where teachers and pupils are alike standing their trial. From what we learn of you, we may entertain good hopes of the young lady, and it is to your own credit also that you have paid so much attention to your pupil's capabilities. If in the coming year you can develop these into accomplishments, neither yourself nor your pupil shall fail to receive your due praise.'

"I had made up my mind to what must follow upon all this; but there was something worse that I had not anticipated, which had soon to be added to it. Our good superior, who like a trusty shepherdess could not bear to have one of her flock lost, or, as was the case here, to see it undistinguished, after the examiners were gone could not contain her displeasure, and said to Ottilie, who was standing quite quietly by the window, while the others were exulting over their prizes, 'Tell me, for heaven's sake, how can a person look so stupid if she is not so?' Ottilie replied, quite calmly, 'Forgive me, my dear mother, I have my headache again to-day, and it is very painful.' Kind and sympathizing as she generally is, the superior this time answered, 'No one can believe that,' and turned angrily away.

"Now it is true,—no one can believe it,—for Ottilie never alters the expression of her countenance. I have never even seen her move her hand to her head when she has been asleep.
"Nor was this all. Your ladyship's daughter, who is at all times sufficiently lively and impetuous, after her triumph to-day was overflowing with the violence of her spirits. She ran from room to room with her prizes and testimonials, and shook them in Ottilie's face. 'You have come badly off this morning,' she cried. Ottilie replied in her calm, quiet way, 'This is not the last day of trial.' 'But you will always remain the last,' cried the other, and ran away.

"No one except myself saw that Ottilie was disturbed. She has a way when she experiences any sharp unpleasant emotion which she wishes to resist, of showing it in the unequal color of her face; the left cheek becomes for a moment flushed, while the right turns pale. I perceived this symptom, and I could not prevent myself from saying something. I took our superior aside, and spoke seriously to her about it. The excellent lady acknowledged that she had been wrong. We considered the whole affair; we talked it over at great length together, and not to weary your ladyship, I will tell you at once the desire with which we concluded, namely, that you will for a while have Ottilie with yourself. Our reasons you will yourself readily perceive. If you consent, I will say more to you on the manner in which I think she should be treated. The young lady your daughter we may expect will soon leave us, and we shall then with pleasure welcome Ottilie back to us.

"One thing more, which another time I might forget to mention: I have never seen Ottilie eager for anything, or at least ask pressingly for anything. But there have been occasions, however rare, when on the other hand she has wished to decline things which have been pressed upon her, and she does it with a gesture which to those who have caught its meaning is irresistible. She raises her hands, presses the palms together, and draws them against her breast, leaning her body a little forward at the same time, and turns such a look upon the person who is urging her, that he will be glad enough to cease to ask or wish for anything of her. If your ladyship ever sees this attitude, as with your treatment of her it is not likely that you will, think of me, and spare Ottilie."

Edward read these letters aloud, not without smiles and shakes of the head. Naturally, too, there were observations made on the persons and on the position of the affair.

"Enough!" Edward cried at last, "it is decided. She comes. You, my love, are provided for, and now we can get forward with our work. It is becoming highly necessary for me to move over to the right wing to the captain; evenings and mornings are the time for us best to work together, and then you, on your side, will have admirable room for yourself and Ottilie."

Charlotte made no objection, and Edward sketched out the method in which they should live. Among other things, he cried, "It is really very polite in this niece to be subject to a slight pain on the left side of her head. I have it frequently on the right. If we happen to be afflicted together, and sit opposite one another,—I leaning on my right elbow, and she on her left, and our heads on the opposite sides, resting on our hands,—what a pretty pair of pictures we shall make." [N3]

The Captain thought that might be dangerous. “No, no!” cried out Edward. “Only do you, my dear friend, take care of the D, for what will become of B if poor C is taken away from it?”

“That, I should have thought, would have been evident enough,” replied Charlotte.

“And it is, indeed,” cried Edward; “he would turn back to his A, to his Alpha and Omega;” and he sprung up and taking Charlotte in his arms, pressed her to his breast.

Next chapter
● Elective Affinities | Part one: Chapter six

Previous chapter
● Elective Affinities | Part one: Chapter four

Main
● Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

See also
● Goethe’s affinity table | Used to make *Elective Affinities*.
● Goethe timeline | Historical overview of the construction of *Elective Affinities*.
● Goethe’s human chemistry | Goethe's version of human chemistry.
● Goethean philosophy | Goethe's philosophy.
● Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. The chapter subsection title “LETTER OF THE LADY SUPERIOR” is Hjalmar Boyesen’s 1885 translation; the subsection title “Headmistress’s Letter” is Reginald Hollingdale 1971 translation.
N2. The chapter subsection title “LETTER OF THE ASSISTANT” is Hjalmar Boyesen’s 1885 translation; the subsection title “The Schoolmaster’s Letter” is Reginald Hollingdale 1971 translation.
N3. Add discussion of how this is code for Plato's split soul theory, aka soul mate theory (see: Goethe on the soul and love theories).

References

1. (add)

A = - dG

In Elective Affinities (IAD), **Part one: Chapter four** (add synopsis).

â— Active characters:
â— Discussed characters:
â— Locations:

Part one: Chapter four

The topographical chart of the property and its environs was completed. It was executed on a considerable scale; the character of the particular localities was made intelligible by various colors; and by means of a trigonometrical survey, the captain had been able to arrive at a very fair exactness of measurement. He had been rapid in his work. There was scarcely ever anyone who could do with less sleep than this most laborious man; and, as his day was always devoted to an immediate purpose, every evening something had been done.

Description: "Edward and the Captain Arranging the Documents" (HB:244).

"Let us now," he said to his friend, "go on to what remains for us, to the statistics of the estate. We shall have a good deal of work to get through at the beginning, and afterwards we shall come to the farm estimates, and much else which will naturally arise out of them. Only we must have one thing distinctly settled and adhered to. Everything which is properly *business* we must keep carefully separate from *life.* Business requires earnestness and method; life must have a freer handling. Business demands the utmost stringency and sequence; in life, inconsecutiveness is frequently necessary, indeed, is charming and graceful. If you are firm in the first, you can afford yourself more liberty in the second; while if you mix them, you will find the free interfering with and breaking in upon the fixed."

In these sentiments Edward felt a slight reflection upon himself. Though not naturally disorderly, he could never bring himself to arrange his papers in their proper places. What he had to do in connection with others was not kept separate from what only depended on himself. Business got mixed up with amusement, and serious work with recreation. Now, however, it was easy for him, with the help of a friend, who would take the trouble upon himself; and a second "I" worked out the separation, to which the single "I" was always unequal.

In the captain's wing, they contrived a depositary for what concerned the present, and an archive for the past. Here they brought all the documents, papers, and notes from their various hiding-places, rooms, drawers, and boxes, with the utmost speed. Harmony and order were introduced into the wilderness, and the different packets were marked and registered in their several pigeon-holes. They found all they wanted in greater completeness even than they had expected; and here an old clerk was found of no slight service, who for the whole day and part of the night never left his desk, and with whom, till then, Edward had been always dissatisfied.

"I should not know him again," he said to his friend, "the man is so handy and useful."

"That," replied the captain, "is because we give him nothing fresh to do till he has finished, at his convenience, what he has already; and so, as you perceive, he gets through a great deal. If you disturb him, he becomes useless at once."

Spending their days together in this way, in the evenings they never neglected their regular visits to Charlotte. If there was no party from the neighborhood, as was often the case, they read and talked, principally on subjects connected with the improvement of the condition and comfort of social life.

Charlotte, always accustomed to make the most of opportunities, not only saw her husband pleased, but found personal

advantages for herself. Various domestic arrangements, which she had long wished to make, but which she did not know exactly how to set about, were managed for her through the contrivance of the captain. Her domestic medicine-chest, hitherto but poorly furnished, was enlarged and enriched, and Charlotte herself, with the help of good books and personal instruction, was put in the way of being able to exercise her disposition to be of practical assistance more frequently and more efficiently than before.

In providing against accidents, which, though common, yet only too often find us unprepared, they thought it especially necessary to have at hand whatever is required for the recovery of drowning men—accidents of this kind, from the number of canals, reservoirs, and waterworks in the neighborhood, being of frequent occurrence. This department the captain took expressly into his own hands; and the observation escaped Edward, that a case of this kind had made a very singular epoch in the life of his friend. The latter made no reply, but seemed to be trying to escape from a painful recollection. Edward immediately stopped; and Charlotte, who, as well as he, had a general knowledge of the story, took no notice of the expression.

“These preparations are all exceedingly valuable,” said the captain, one evening. “Now, however, we have not got the one thing which is most essential—a sensible man who understands how to manage it all. I know an army surgeon, whom I could exactly recommend for the place. You might get him at this moment, on easy terms. He is highly distinguished in his profession, and has frequently done more for me, in the treatment even of violent inward disorders, than celebrated physicians. Help upon the spot, is the thing you often most want in the country.”

He was written for at once; and Edward and Charlotte were rejoiced to have found so good and necessary an object, on which to expend so much of the money which they set apart for such accidental demands upon them.

Thus Charlotte, too, found means of making use, for her purposes, of the captain’s knowledge and practical skill; and she began to be quite reconciled to his presence, and to feel easy about any consequences which might ensue. She commonly prepared questions to ask him; among other things, it was one of her anxieties to provide against whatever was prejudicial to health and comfort, against poisons and such like. The lead-glazing on the china, the verdigris which formed about her copper and bronze vessels, etc., had long been a trouble to her. She got him to tell her about these, and, naturally, they often had to fall back on the first elements of medicine and chemistry.

An accidental, but welcome occasion for entertainment of this kind, was given by an inclination of Edward to read aloud. He had a particularly clear, deep voice, and earlier in life had earned himself a pleasant reputation for his feeling and lively recitations of works of poetry and oratory. At this time he was occupied with other subjects, and the books which, for some time past, he had been reading, were either chemical, or on some other branch of natural or technical science.

One of his especial peculiarities—which, by-the-by, he very likely shares with a number of his fellow-creatures—was, that he could not bear to have anyone looking over him when he was reading. In early life, when he used to read poems, plays or stories, this had been the natural consequence of the desire which the reader feels, like the poet, or the actor, or the story-teller, to make surprises, to pause, to excite expectation; and this sort of effect was naturally defeated when a third person’s eyes could run on before him, and see what was coming. On such occasions, therefore, he was accustomed to place himself in such a position that no one could get behind him. With a party of only three, this was unnecessary; and as with the present subject there was no opportunity for exciting feelings or giving the imagination a surprise, he did not take any particular pains to protect himself.

One evening he had placed himself carelessly, and Charlotte happened by accident to cast her eyes upon the page. His old impatience was aroused; he turned to her, and said, almost unkindly,

“I do wish, once for all, you would leave off doing a thing so out of taste and so disagreeable. When I read aloud to a person, is it not the same as if I was telling him something by word of mouth? The written, the printed word, is in the place of my own thoughts, of my own heart. If a window were broken into my brain or into my heart, and if the man to whom I am counting out my thoughts, or delivering my sentiments, one by one, knew already beforehand exactly what was to come out of me, should I take the trouble to put them into words? When anybody looks over my book, I always feel as if I were being torn in two.”

Charlotte's tact, in whatever circle she might be, large or small, was remarkable, and she was able to set aside disagreeable or excited expressions without appearing to notice them. When a conversation grew tedious, she knew how to interrupt it; when it halted, she could set it going. And this time her good gift did not forsake her.

"I am sure you will forgive me my fault," she said, "when I tell you what it was this moment which came over me. I heard you reading something about **affinities**, and I thought directly of some relations of mine, two of whom are just now occupying me a great deal. Then my attention went back to the book. I found it was not about living things at all, and I looked over to get the thread of it right again."

"It was the comparison which led you wrong and confused you," said Edward. "The subject is nothing but earths and minerals. But man is a true Narcissus (see: ECHO); he delights to see his own image everywhere; and he spreads himself underneath the universe, like the amalgam behind the glass."

"Quite true," continued the Captain. "That is the way in which he treats everything external to himself. His wisdom and his folly, his will and his caprice, he attributes alike to the animal, the plant, the elements, and the gods."

"Would you," said Charlotte, "if it is not taking you away too much from the immediate subject, tell me briefly what is meant here by Affinities?"

"I shall be very glad indeed," replied the captain, to whom Charlotte had addressed herself. "That is, I will tell you as well as I can. My ideas on the subject date ten years back; whether the scientific world continues to think the same about it, I cannot tell."

"It is most disagreeable," cried Edward, "that one cannot now-a-days learn a thing once for all, and have done with it. Our forefathers could keep to what they were taught when they were young; but we have, every five years, to make revolutions with them, if we do not wish to drop altogether out of fashion."

"We women need not be so particular," said Charlotte; "and, to speak the truth, I only want to know the meaning of the word. There is nothing more ridiculous in society than to misuse a strange technical word; and I only wish you to tell me in what sense the expression is made use of in connection with these things. What its scientific application is, I am quite contented to leave to the learned; who, by-the-by, as far as I have been able to observe, do not find it easy to agree among themselves."

"Whereabouts shall we begin," said Edward, after a pause, to the captain, "to come most quickly to the point?"

The latter, after thinking a little while, replied shortly,

"You must let me make what will seem a wide sweep; we shall be on our subject almost immediately."

Charlotte settled her work at her side, promising the fullest attention.

The captain began:

"In all natural objects with which we are acquainted, we observe immediately that they have a certain relation to themselves. It may sound ridiculous to be asserting what is obvious to everyone; but it is only by coming to a clear understanding together about what we know, that we can

Scene of **chapter four** from the 1996 French-Italian film version, *Les affinities electives*, of Goethe's *Elective Affinities*, written and directed by Paolo Taviani and Vittorio Taviani and produced by Jaen-Claude Volpi.

advance to what we do not know."

"I think," interrupted Edward, "we can make the thing more clear to her, and to ourselves, with examples; conceive water, or oil, or quicksilver; among these you will see a certain oneness, a certain connection of their parts; and this oneness is never lost, except through force or some other determining cause. Let the cause cease to operate, and at once the parts unite again."

"Unquestionably," said Charlotte, "that is plain; rain-drops readily unite and form streams; and when we were children it was our delight to play with quicksilver, and wonder at the little globules splitting and parting and running into one another."

"And here," said the captain, "let me just cursorily mention one remarkable thing, I mean that the full, complete correlation of parts which the fluid state makes possible, shows itself distinctly and universally in the globular form. The falling water-drop is round; you yourself spoke of the globules of quicksilver; and a drop of melted lead let fall, if it has time to harden before it reaches the ground, is found at the bottom in the shape of a ball."

"Let me try and see," said Charlotte, "whether I can understand where you are bringing me. As everything has a reference to itself, so it must have some relation to others."

"And that," interrupted Edward, "will be different according to the natural differences of the things themselves. Sometimes they will meet like friends and old acquaintances; they will come rapidly together, and unite without either having to alter itself at all—as wine mixes with water. Others, again, will remain as strangers side by side, and no amount of mechanical mixing or forcing will succeed in combining them. Oil and water may be shaken up together, and the next moment they are separate again, each by itself."

"One can almost fancy," said Charlotte, "that in these simple forms one sees people that one is acquainted with; one has met with just such things in the societies amongst which one has lived; and the strangest likenesses of all with these soulless creatures, are in the masses in which men stand divided one against the other, in their classes and professions; the nobility and the third estate, for instance, or soldiers and civilians."

"Then again," replied Edward, "as these are united together under common laws and customs, so there are intermediate members in our chemical world which will combine elements that are mutually repulsive."

"Oil, for instance," said the captain, "we make combine with water with the help of alkalies—"

"Do not go on too fast with your lesson," said Charlotte. "Let me see that I keep step with you. Are we not here arrived among the affinities?"

"Exactly," replied the captain; "we are on the point of apprehending them in all their power and distinctness; such natures as, when they come in contact, at once lay hold of each other, and mutually affect one another, we speak of as having an affinity one for the other. With the alkalies and acids, for instance, the affinities are strikingly marked. They are of opposite natures; very likely their being of opposite natures is the secret of their effect on one another—they seek one another eagerly out, lay hold of each other, modify each other's character, and form in connection an entirely new substance.

Key words: protein–protein interaction, protein–DNA interaction, microcalorimetry, heat capacity changes, entropy, accessible surface area

INTRODUCTION

Have we not already come to affinities?—We have indeed, and let us at once now get to know them in what they are and in what they do. We say of those natures which on meeting speedily connect and interact that they have an affinity for one another.

Goethe, *Elective Affinities*

The ability to form noncovalent complexes of high affinity and specificity is a fundamental property of biological macromolecules. It is through specific as-

French biophysicist (chnopsphysicist) Joel Janin's opening *Elective Affinities* "chapter four" quote (David Constantine translation, 1994) from his 1995 protein thermodynamics article "Elusive Affinities." [3]

There is lime, you remember, which shows the strongest inclination for all sorts of acids—a distinct desire of combining with them. As soon as our chemical chest arrives, we can show you a number of entertaining experiments, which will give you a clearer idea than words, and names, and technical expressions."

"It appears to me," said Charlotte, "that if you choose to call these strange creatures of yours related, the relationship is not so much a relationship of blood, as of soul or of spirit. It is the way in which we see all really deep friendships arise among men; opposite peculiarities of disposition being what best makes internal union possible. But I will wait to see what you can really show me of these mysterious proceedings; and for the present," she added, turning to Edward, "I will promise not to disturb you any more in your reading. You have taught me enough of what it is about to enable me to attend to it."

"No, no," replied Edward, "now that you have once stirred the thing, you shall not get off so easily. It is just the most complicated cases which are the most interesting. In these you come first to see the degrees of the affinities, to watch them as their power of attraction is weaker or stronger, nearer or more remote. Affinities only begin really to interest when they bring about separations."

"What!" cried Charlotte, "is that miserable word, which unhappily we hear so often now-a-days in the world, is that to be found in nature's lessons too?"

"Most certainly," answered Edward; "the title with which chemists were supposed to be most honorably distinguished was, artists of separation."

"It is not so any more," replied Charlotte; "and it is well that it is not. It is a higher art, and it is a higher merit, to unite. An artist of union, is what we should welcome in every province of the universe. However, as we are on the subject again, give me an instance or two of what you mean."

"We had better keep," said the captain, "to the same instances of which we have already been speaking. Thus, what we call limestone is a more or less pure calcareous earth in combination with a delicate acid, which is familiar to us in the form of a gas. Now, if we place a piece of this stone in diluted sulphuric acid, this will take possession of the lime, and appear with it in the form of gypsum, the gaseous acid at the same time going off in vapor. Here is a case of separation; a combination arises, and we believe ourselves now justified in applying to it the words, 'Elective Affinity;' it really looks as if one relation had been deliberately chosen in preference to another."

"Forgive me," said Charlotte, "as I forgive the natural philosopher. I cannot see any choice in this; I see a natural necessity rather, and scarcely that. After all, it is perhaps merely a case of opportunity. Opportunity makes relations as it makes thieves, and as long as the talk is only of natural substances, the choice to me appears to be altogether in the

hands of the chemist who brings the creatures together. Once, however, let them be brought together, and then God have mercy on them. In the present case, I cannot help being sorry for the poor acid gas, which is driven out up and down infinity again."

"The acid's business," answered the captain, "is now to get connected with water, and so serve as a mineral fountain for the refreshing of sound or disordered mankind."

"That is very well for the gypsum to say," said Charlotte. "The gypsum is all right, is a body, is provided for. The other poor, desolate creature may have trouble enough to go through before it can find a second home for itself."

"I am much mistaken," said Edward, smiling, "if there be not some little *arrière pensée* behind this. Confess your wickedness! You mean me by your lime; the lime is laid hold of by the captain, in the form of sulphuric acid, torn away from your agreeable society, and metamorphosed [metamorphosed|JF][transformed|HW][transformed|RH][transformed|DC] into a refractory gypsum."

"If your conscience prompts you to make such a reflection," replied Charlotte, "I certainly need not distress myself. These comparisons are pleasant and entertaining; and who is there that does not like playing with analogies? But man is raised very many steps above these elements; and if he has been somewhat liberal with such fine words as Election and Elective Affinities, he will do well to turn back again into himself, and take the opportunity of considering carefully the value and meaning of such expressions. Unhappily, we know cases enough where a connection apparently indissoluble between two persons, has, by the accidental introduction of a third, been utterly destroyed, and one or the other of the once happily united pair been driven out into the wilderness."

"Then you see how much more gallant the chemists are," said Edward. "They at once add a fourth, that neither may go away empty."

"Quite so," replied the captain. "And those are the cases which are really most important and remarkable—cases where this attraction, this affinity, this separating and combining, can be exhibited, the two pairs severally crossing each other; where four creatures, connected previously, as two and two, are brought into contact, and at once forsake their first combination to form into a second. In this forsaking and embracing, this seeking and flying, we believe that we are indeed observing the effects of some higher determination; we attribute a sort of will and choice to such creatures, and feel really justified in using technical words, and speaking of 'Elective Affinities.' "

"Give me an instance of this," said Charlotte.

"One should not spoil such things with words," replied the captain. "As I said before, as soon as I can show you the experiment, I can make it all intelligible and pleasant for you. For the present, I can give you nothing but horrible scientific expressions, which at the same time will give you no idea about the matter. You ought yourself to see these creatures, which seem

Description: “Charlotte glancing over Edward’s Book” (HB:248) (artist: Philipp Johann).

so dead, and which are yet so full of inward energy and force, at work before your eyes. You should observe them with a real personal interest. Now they seek each other out, attract each other, seize, crush, devour, destroy each other, and then suddenly reappear again out of their combinations, and come forward in fresh, renovated, unexpected form; thus you will comprehend how we attribute to them a sort of immortality—how we speak of them as having sense and understanding; because we feel our own senses to be insufficient to observe them adequately, and our reason too weak to follow them.”

“I quite agree,” said Edward, “that the strange scientific nomenclature, to persons who have not been reconciled to it by a direct acquaintance with or understanding of its object, must seem unpleasant, even ridiculous; but we can easily, just for once, contrive with symbols to illustrate what we are speaking of.”

“If you do not think it looks pedantic,” answered the captain, “I can put my meaning together with letters. Suppose an A connected so closely with a B, that all sorts of means, even violence, have been made use of to separate them, without effect. Then suppose a C in exactly the same position with respect to D. Bring the two pairs into contact; A will fling himself on D, C on B, without its being possible to say which had first left its first connection, or made the first move towards the second.”

“Now then,” interposed Edward, “till we see all this with our eyes, we will look upon the formula as an analogy, out of which we can devise a lesson for immediate use. You stand for A, Charlotte, and I am your B; really and truly I cling to you, I depend on you, and follow you, just as B does with A. C is obviously the captain, who at present is in some

degree withdrawing me from you. So now it is only just that if you are not to be left to solitude, a D should be found for you, and that is unquestionably the amiable little lady, Ottilie. You will not hesitate any longer to send and fetch her."

"Good," replied Charlotte; "although the example does not, in my opinion, exactly fit our case. However, we have been fortunate, at any rate, in today for once having met all together; and these natural or elective affinities have served to unite us more intimately. I will tell you, that since this afternoon I have made up my mind to send for Ottilie. My faithful housekeeper, on whom I have hitherto depended for everything, is going to leave me shortly, to be married. (It was done at my own suggestion, I believe, to please me.) What it is which has decided me about Ottilie, you shall read to me. I will not look over the pages again. Indeed, the contents of them are already known to me. Only read, read!"

With these words, she produced a letter, and handed it to Edward.

Next chapter
â— Elective Affinities | Part one: Chapter five

Previous chapter
â— Elective Affinities | Part one: Chapter three

Main â— Elective Affinities: Illustrated and Annotated

Plato and Aristophanes

American Germanic literature scholar William Lillyman argues, in his 1982 symposium article "Analogies for Love: Goethe's *Die Wahlverwandtschaften* and Plato's *Symposium*", that Greek comedy playwright Aristophanes' (446-386BC) speech, in Plato's circa 380BC *Symposium*, and Aristophane's explanation of love permeate Goethe's novel and that in particular the discussion between the Captain, Charlotte, and Edward, in the above famous chapter four, is a "Goethean equivalent of a Platonic dialogue". [1]

Berthollet |Ten years

Regarding the Captain's comment:

> "That is, I will tell you as well as I can. My ideas on the subject date **ten years** back; whether the scientific world continues to think the same about it, I cannot tell."

English *Elective Affinities* scholar Jeremy Adler (1987/1990) argues that this comment, by the Captain, signifies Goethe's attempt to explain that his understanding of the chemical affinities is based on his learnings of the subject in the years "just before Berthollet's main findings appeared", i.e. to the years 1796 to 1799. A variant translation of the above statement by the Captain, according to Adler, is: [4]

> "Whether it still fits the newer doctrines, I am unable to say."

The new doctrines on affinity, referred to here, would thus be the Claude Berthollet's 1799 *Researches into the Laws of Affinity* (see: Berthollet's affinity theory), in which, stimulated by Antoine Lavoisier's supposed inability to verify affinity theory in strictly empirical terms, in his *Elements of Chemistry* (1789), he set out to disprove the central law of affinity. [4] The following are Berthelot's findings: [5]

> "The very term *elective affinity* must lead into error, as it supposes the union of the whole of one substance with another, in preference to a third; whereas there is only a partition of action, which is itself subordinate to other chemical circumstances … care must be taken not to consider this affinity as a uniform force which produces compositions and decompositions … Such a conclusion would lead us to neglect all the modifications which it undergoes form the commencement of action to the term of equilibrium."

In short, Berthollet argued that the standard single elective affinity reaction, of the form:

$$AC + B \rightarrow AB + C$$

would actuate such that force of affinity of the leaving species A could possibly split into two parts: [4]

$$AC + B \rightarrow A_1B + A_2C$$

Berthollet elaborated on this further in 1801 as well as in his 1803 *Essai de Statique Chemique* (*Essay on Static Chemistry*). This "Berthollet = new doctrines" argument corroborates with Goethe's 26 Sep 1826 letter, in which he comments that: [4]

> "For decades [I have been struggling] with **Berthollet** in the matter of the affinities."

Adler states that Berthollet's refutation of the standard affinity theory appeared in Germany in 1801, and that Goethe could have learned about this from at least four sources.

Korean-born American affinity chemistry historian Mi Gyung Kim summarizes that the "whole text of *Researches* was directed to proving the inadequacy of elective affinity as it was conceived and measured by Torbern Bergman. [6]

See/add

See: Jacques Monod on "bond energy" in *in vivo* biochemical reactions (chnopsological reactions) and double displacement reactions. [2]

Integrate

â— Chapter four
â— Lorna McIntosh

See also

â— Goethe's affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe's human chemistry | Goethe's version of human chemistry.

â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

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(b) Nye, Mary Jo. (1993). *From Chemical Philosophy to Theoretical Chemistry: Dynamics of Matter and Dynamics of Disciplines, 1800-1950* (pg. 269). University of California Press.
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In Elective Affinities (IAD), **Part one: Chapter fourteen** (add synopsis)

Part one: Chapter fourteen

In the meantime a letter came from the count to the captain—two, indeed—one which he might produce, holding out fair, excellent prospects in the distance; the other containing a distinct offer of an immediate situation, a place of high importance and responsibility at the court, his rank as major, a very considerable salary, and other advantages. A number of circumstances, however, made it desirable that for the moment he should not speak of it, and consequently he only informed his friends of his distant expectations, and concealed what was so nearly impending.

He went warmly on, at the same time, with his present occupation, and quietly made arrangements to secure the works being all continued without interruption after his departure. He was now himself desirous that as much as possible should be finished off at once, and was ready to hasten things forward to prepare for Ottilie's birthday. And so, though without having come to any express understanding, the two friends worked side by side together Edward was now well pleased that the cash-box was filled by their having taken up money. The whole affair went forward at fullest speed.

The captain had done his best to oppose the plan of throwing the three ponds together into a single sheet of water. The lower embankment would have to be made much stronger, the two intermediate embankments to be taken away, and altogether, in more than one sense, it seemed a very questionable proceeding. However, both these schemes had been already undertaken; the soil which was removed above, being carried at once down to where it was wanted. And here there came opportunely on the scene a young architect, an old pupil of the captain, who partly by introducing workmen who understood work of this nature, and partly by himself, whenever it was possible, contracting for the work itself, advanced things not a little, while at the same time they could feel more confidence in their being securely and lastingly executed. In secret this was a great pleasure to the captain. He could now be confident that his absence would not be so severely felt. It was one of the points on which he was most resolute with himself, never to leave anything which he had taken in hand uncompleted, unless he could see his place satisfactorily supplied. And he could not but hold in small respect, persons who introduce confusion around themselves only to make their absence felt, and are ready to disturb in wanton selfishness what they will not be at hand to restore.

So they labored on, straining every nerve to make Ottilie's birthday splendid, without any open acknowledgment that this was what they were aiming at, or, indeed, without their directly acknowledging it to themselves. Charlotte, wholly free from jealousy as she was, could not think it right to keep it as a real festival. Ottilie's youth, the circumstances of her fortune, and her relationship to their family, were not at all such as made it fit that she should appear as the queen of the day; and Edward would not have it talked about, because everything was to spring out, as it were, of itself, with a natural and delightful surprise.

They, therefore, came all of them to a sort of tacit understanding that on this day, without further circumstance, the new house in the park was to be opened, and they might take the occasion to invite the neighborhood and give a holiday to their own people. Edward's passion, however, knew no bounds. Longing as he did to give himself to Ottilie, his presents and his promises must be infinite. The birthday gifts which on the great occasion he was to offer to her seemed, as Charlotte had arranged them, far too insignificant. He spoke to his valet, who had the care of his wardrobe, and who consequently had extensive acquaintance among the tailors and mercers and fashionable milliners; and he, who not only understood himself what valuable presents were, but also the most graceful way in which they should be offered, immediately ordered an elegant box, covered with red morocco and studded with steel nails, to be filled with presents worthy of such a shell. Another thing, too, he suggested to Edward. Among the stores at the castle was a small show of fireworks which had never been let off. It would be easy to get some more, and have something really fine. Edward caught the idea, and his servant promised to see to its being executed. This matter was to remain a secret.

While this was going on, the captain, as the day drew nearer, had been making arrangements for a body of police to be present—a precaution which he always thought desirable when large numbers of men are to be brought together. And, indeed, against beggars, and against all other inconveniences by which the pleasure of a festival can be disturbed, he had made effectual provision.

Edward and his confidant, on the contrary, were mainly occupied with their fireworks. They were to be let off on the

side of the middle water in front of the great ash tree. The party were to be collected on the opposite side, under the planes, that at a sufficient distance from the scene, in ease and safety, they might see them to the best effect, with the reflections on the water, the water-rockets, and floating-lights, and all the other designs.

Under some other pretext, Edward had the ground underneath the plane trees cleared of bushes and grass and moss. And now first could be seen the beauty of their forms, together with their full height and spread, right up from the earth. He was delighted with them. It was just this very time of the year that he had planted them. How long ago could it have been? he said to himself. As soon as he got home, he turned over the old diary books, which his father, especially when in the country, was very careful in keeping. He might not find an entry of this particular planting, but another important domestic matter, which Edward well remembered, and which had occurred on the same day, would surely be mentioned. He turned over a few volumes. The circumstance he was looking for was there. How amazed, how overjoyed he was, when he discovered the strangest coincidence! The day and the year on which he had planted those trees was the very day, the very year, when Ottilie was born.

Next chapter
● Elective Affinities | Part one: Chapter fifteen

Previous chapter
● Elective Affinities | Part one: Chapter thirteen

● Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

See also
● Goethe’s affinity table | Used to make *Elective Affinities*.
● Goethe timeline | Historical overview of the construction of *Elective Affinities*.
● Goethe’s human chemistry | Goethe's version of human chemistry.
● Goethean philosophy | Goethe's philosophy.
● Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References

1. (add)

A = - dG

In Elective Affinities (IAD), **Part one: Chapter nine** (add synopsis)

Part one: Chapter nine

The birthday was come, and everything was ready. The wall was all complete which protected the raised village road against the water, and so was the walk; passing the church, for short time it followed the path which had been laid out by Charlotte, and then winding upwards among the rocks, inclined first under the summer-house to the right, and then, after a wide sweep, passed back above it to the right again, and so by degrees out on to the summit.

A large party had assembled for the occasion. They went first to church, where they found the whole congregation collected together in their holiday dresses. After service, they filed out in order; first the boys, then the young men, then the old: after them came the party from the castle, with their visitors and retinue; and the village maidens, young girls and women, brought up the rear.

At the turn of the walk, a raised stone seat had been contrived, where the captain made Charlotte and the visitors stop and rest. From here they could see over the whole distance from the beginning to the end—the troops of men who had gone up before them, the file of women following, and now drawing up to where they were. It was lovely weather, and the whole effect was singularly beautiful. Charlotte was taken by surprise, she was touched, and she pressed the captain's hand warmly.

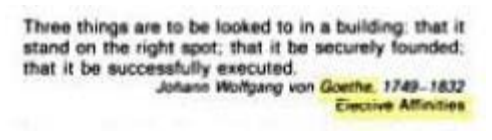

[2]

They followed the crowd who had slowly ascended, and were now forming a circle round the spot where the future house was to stand. The lord of the castle, his family and the principal strangers were now invited to descend into the vault, where the foundation-stone, supported on one side, lay ready to be let down. A well-dressed mason, a trowel in one hand and a hammer in the other, came forward, and with much grace spoke an address in verse, of which in prose we can give but an imperfect rendering. "Three things," he began, "are to be looked to in a building—that it stand on the right spot; that it be securely founded; that it be successfully executed. [Q] The first is the business of the master of the house—his and his only. As in the city the prince and the council alone determine where a building shall be, so in the country it is the right of the lord of the soil that he shall say, 'Here my dwelling shall stand; here, and nowhere else.' "

Edward and Ottilie were standing opposite one another, as these words were spoken; but they did not venture to look up and exchange glances.

"To the third, the execution, there is neither art nor handicraft which must not in some way contribute. But the second, the founding, is the province of the mason; and, boldly to speak it out, it is the head and front of all the undertaking—a solemn thing it is—and our bidding you descend hither is full of meaning. You are celebrating your festival in the deep of the earth. Here within this small hollow spot, you show us the honor of appearing as witnesses of our mysterious craft. Presently we shall lower down this carefully-hewn stone into its place; and soon these earth-walls, now ornamented with fair and worthy persons, will be no more accessible—but will be closed in forever!

"This foundation-stone, which with its angles typifies the just angles of the building, with the sharpness of its moulding, the regularity of it, and with the truth of its lines to the horizontal and perpendicular, the uprightness and equal height of all the walls, we might now without more ado let down—it would rest in its place with its own weight. But even here there shall not fail of lime and means to bind it. For as human beings who may be well inclined to each other by nature, yet hold more firmly together when the law cements them, so are stones also, whose forms may already fit together, united far better by these binding forces. It is not seemly to be idle among the working, and here you will not refuse to be our fellow-laborer,"—with these words he reached the trowel to Charlotte, who threw mortar with it under the stone—several of the others were then desired to do the same, and then it was at once let fall. Upon which the hammer was placed next in Charlotte's, and then in the others' hands, to strike three times with it, and conclude, in this expression, the wedlock of the stone with the earth.

“The work of the mason,” went on the speaker, “now under the free sky as we are, if it be not done in concealment, yet must pass into concealment—the soil will be laid smoothly in, and thrown over this stone, and with the walls which we rear into the daylight we in the end are seldom remembered. The works of the stone-cutter and the carver remain under the eyes; but for us it is not to complain when the plasterer blots out the last trace of our hands, and appropriates our work to himself; when he overlays it, and smooths it, and colors it.

“Not from regard for the opinion of others, but from respect for himself, the mason will be faithful in his calling. There is none who has more need to feel in himself the consciousness of what he is. When the house is finished, when the soil is smoothed, and the surface plastered over, and the outside all overwrought with ornament, he can even see in yet through all disguises, and still recognize those exact and careful adjustments, to which the whole is indebted for its being and for its persistence.

“But as the man who commits some evil deed has to fear, that, notwithstanding all precautions, it will one day come to light—so too must he expect who has done some good thing in secret, that it also, in spite of himself, will appear in the day; and therefore we make this foundation-stone at the same time a stone of memorial. Here, in these various hollows which have been hewn into it, many things are now to be buried, as a witness to some far-off world—these metal cases hermetically sealed contain documents in writing; matters of various note are engraved on these plates; in these fair glass bottles we bury the best old wine, with a note of the year of its vintage. We have coins too of many kinds, from the mint of the current year. All this we have received through the liberality of him for whom we build. There is space yet remaining, if guest or spectator desires to offer anything to the after-world!”

After a slight pause the speaker looked round; but, as is commonly the case on such occasions, no one was prepared; they were all taken by surprise. At last, a merry-looking young officer set the example, and said, “If I am to contribute anything which as yet is not to be found in this treasure-chamber, it shall be a pair of buttons from my uniform—I don’t see why they do not deserve to go down to posterity!” No sooner said than done, and then a number of persons found something of the same sort which they could do; the young ladies did not hesitate to throw in some of their side hair combs—smelling bottles and other trinkets were not spared. Only Ottilie hung back; till a kind word from Edward roused her from the abstraction in which she was watching the various things being heaped in. Then she unclasped from her neck the gold chain on which her father’s picture had hung, and with a light gentle hand laid it down on the other jewels. Edward rather disarranged the proceedings, by at once, in some haste, having the cover let fall, and fastened down.

Photo: "Charlotte Laying the Corner-stone" (HB:263).

The young mason who had been most active through all this again took his place as orator, and went on, “We lay down this stone forever, for the establishing the present and the future possessors of this house. But in that we bury this treasure together with it, we do it in the remembrance—in this most enduring of works—of the perishableness of all human things. We remember that a time may come when this cover so fast sealed shall again be lifted: and that can only be when all shall again be destroyed which as yet we have not brought into being.

“But now—now that at once it may begin to be, back with our thoughts out of the future—back into the present. At once, after the feast which we have this day kept together, let us on with our labor; let no one of all those trades which are to work on our foundation, through us keep unwilling holiday. Let the building rise swiftly to its height, and out of the windows, which as yet have no existence, may the master of the house, with his family and with his guests, look forth with a glad heart over his broad lands. To him and to all here present herewith be health and happiness.”

With these words he drained a richly cut tumbler at a draught, and flung it into the air, thereby to signify the excess of pleasure by destroying the vessel which had served for such a solemn occasion. This time, however, it fell out otherwise. The glass did not fall back to the earth, and indeed without a miracle.

In order to get forward with the buildings, they had already thrown out the whole of the soil at the opposite corner; indeed, they had begun to raise the wall, and for this purpose had reared a scaffold as high as was absolutely necessary. On the occasion of the festival, boards had been laid along the top of this, and a number of spectators were allowed to stand there. It had been meant principally for the advantage of the workmen themselves. The glass had flown up there, and had been caught by one of them, who took it as a sign of good luck for himself. He waved it round without letting it out of his hand, and the letters E and O were to be seen very richly cut upon it, running one into the other. It was one of the glasses which had been executed for Edward when he was a boy.

The scaffoldings were again deserted, and the most active among the party climbed up to look round them, and could not speak enough in praise of the beauty of the prospect on all sides. How many new discoveries does not a person make when on some high point he ascends but a single story higher. Inland many fresh villages came in sight. The line of the river could be traced like a thread of silver; indeed, one of the party thought that he distinguished the spires of the capital. On the other side, behind the wooded hill, the blue peaks of the far-off mountains were seen rising, and the country immediately about them was spread out like a map. “If the three ponds,” cried some one, “were but thrown together to make a single sheet of water, there would be everything here which is noblest and most excellent.” “That might easily be effected,” the captain said. “In early times they must have formed all one lake among the hills here.”

“Only I must beseech you to spare my clump of planes and poplars that stand so prettily by the centre pond,” said Edward. “See,”—he turned to Ottilie, bringing her a few steps forward, and pointing down,—“those trees I planted myself.”

“How long have they been standing there?” asked Ottilie.

“Just about as long as you have been in the world,” replied Edward. “Yes, my dear child, I planted them when you were still lying in your cradle.”

The party now betook themselves back to the castle. After dinner was over they were invited to walk through the village to take a glance at what had been done there as well. At a hint from the captain, the inhabitants had collected in front of the houses. They were not standing in rows, but formed in natural family groups, partly occupied at their evening work, part out enjoying themselves on the new benches. They had determined, as an agreeable duty which they imposed upon themselves, to have everything in its present order and cleanliness, at least every Sunday and holiday.

A little party, held together by such feelings as had grown up among our friends, is always unpleasantly interrupted by a large concourse of people. All four were delighted to find themselves again alone in the large drawing-room, but this sense of home was a little disturbed by a letter which was brought to Edward, giving notice of fresh guests who were to arrive the following day.

“It is as we supposed,” Edward cried to Charlotte. “The count will not stay away; he is coming to-morrow.”

“Then the baroness, too, is not far off,” answered Charlotte.

“Doubtless not,” said Edward. “She is coming, too, to-morrow, from another place. They only beg to be allowed to stay for a night; the next day they will go on together.”

“We must prepare for them in time, Ottilie,” said Charlotte.

“What arrangement shall I desire to be made?” Ottilie asked.

Charlotte gave a general direction, and Ottilie left the room.

The captain inquired into the relation in which these two persons stood towards one another, and with which he was only very generally acquainted. They had some time before, both being already married, fallen violently in love with one another; a double marriage was not to be interfered with without attracting attention. A divorce was proposed. On the baroness’ side it could be effected, on that of the count it could not. They were obliged seemingly to separate, but their position towards one another remained unchanged, and though in the winter at the residence they were unable to be together, they indemnified themselves in the summer, while making tours and staying at watering-places.

They were both slightly older than Edward and Charlotte, and had been intimate with them from early times at court. The connection had never been absolutely broken off, although it was impossible to approve of their proceedings. On the present occasion their coming was most unwelcome to Charlotte; and if she had looked closely into her reasons for feeling it so, she would have found it was on account of Ottilie. The poor innocent girl should not have been brought so early in contact with such an example.

“It would have been more convenient if they had not come till a couple of days later,” Edward was saying, as Ottilie re-entered; “till we had finished with this business of the farm. The deed of sale is complete. One copy of it I have here, but we want a second, and our old clerk has fallen ill.” The captain offered his services, and so did Charlotte, but there was something or other to object to both of them.

“Give it to me,” cried Ottilie, a little hastily.

“You will never be able to finish it,” said Charlotte.

“And really I must have it early the day after to-morrow, and it is long,” Edward added.

“It shall be ready,” Ottilie cried; and the paper was already in her hands.

The next morning, as they were looking out from their highest windows for their visitors, whom they intended to go some way and meet, Edward said, “Who is that yonder, riding slowly along the road?”

The captain described accurately the figure of the horseman.

“Then it is he,” said Edward; “the particulars, which you can see better than I, agree very well with the general figure, which I can see too. It is Mittler; but what is he doing, coming riding at such a pace as that?”

The figure came nearer, and Mittler it veritably was. They received him with warm greetings as he came slowly up the steps.

“Why did you not come yesterday?” Edward cried, as he approached.

“I do not like your grand festivities,” answered he; “but I am come to-day to keep my friend’s birthday with you quietly.”

“How are you able to find time enough?” asked Edward, with a laugh.

“My visit, if you can value it, you owe to an observation which I made yesterday. I was spending a right happy afternoon in a house where I had established peace, and then I heard that a birthday was being kept here. Now this is what I call selfish, after all, said I to myself: you will only enjoy yourself with those whose broken peace you have mended. Why cannot you for once go and be happy with friends who keep the peace for themselves? No sooner said

than done. Here I am, as I determined with myself that I would be."

"Yesterday you would have met a large party here; to-day you will find but a small one," said Charlotte; "you will meet the count and the baroness, with whom you have had enough to do already, I believe."

Image: "Mittler Saying Farewell" (HB:265).

Out of the middle of the party, who had all four come down to welcome him, the strange man dashed in the keenest disgust, seizing at the same time his hat and whip.

"Some unlucky star is always over me," he cried, "directly I try to rest and enjoy myself. What business have I going out of my proper character? I ought never to have come, and now I am persecuted away. Under one roof with those two I will not remain, and you take care of yourselves. They bring nothing but mischief; their nature is like leaven, and propagates its own contagion."

They tried to pacify him, but it was in vain. "Whoever strikes at marriage," he cried;—"whoever, either by word or act, undermines this, the foundation of all moral society, that man has to settle with me, and if I cannot become his master, I take care to settle myself out of his way. Marriage is the beginning and the end of all culture. It makes the savage mild; and the most cultivated has no better opportunity for displaying his gentleness. Indissoluble it must be, because it brings so much happiness that what small exceptional unhappiness it may bring counts for nothing in the balance. And what do men mean by talking of unhappiness? Impatience it is which from time to time comes over them, and then they fancy themselves unhappy. Let them wait till the moment is gone by, and then they will bless their good fortune that what has stood so long continues standing. There never can be any adequate ground for separation. The condition of man is pitched so high, in its joys and in its sorrows, that the sum which two married people owe to one another defies calculation. It is an infinite debt, which can only be discharged through all eternity [Q].

"Its annoyances marriage may often have; I can well believe that, and it is as it should be. We are all married to our consciences, and there are times when we should be glad to be divorced from them; mine gives me more annoyance than ever a man or a woman can give."

Basic Calculations

Johann Wolfgang Von Goethe [1749–1832]

The sum which two married people owe to one another defies calculation. It is an infinite debt, which can only be discharged through all eternity.

—*Elective Affinities [1808]. Book I, Chap. 9*

Quote found chapter one "Basic Calculations" of Louis Theodore, Francesco Ricci, and Timoth Vanvliet's 2009 *Thermodynamics for the Practicing Engineer*. [1]

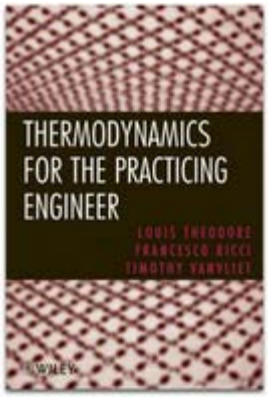

All this he poured out with the greatest vehemence: he would very likely have gone on speaking longer, had not the sound of the postilions' horns given notice of the arrival of the visitors, who, as if on a concerted arrangement, drove into the castle-court from opposite sides at the same moment. Mittler slipped away as their host hastened to receive them, and desiring that his horse might be brought out immediately, rode angrily off.

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â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
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References
1. Theodore, Louis, Ricci, Franceso, and Vanvliet, Timothy. (2009). *Thermodynamics for the Practicing Engineer* (“defies calculation”, pg. 3). Wiley.
2. Beakley, George, Evans, Donovan L. and Keats, John B. (1986). *Engineering: an Introduction to a Creative Profession* (pg. 141). MacMillan.

In Elective Affinities: IAD, **Part one: Chapter One** introduces Edward, the main character of the novella, is a wealthy baron reacting in a sort of dull-drum existence on his vast country estate, near to a local town, married to Charlotte, his love from earlier years, to whom he was unable to marry at the time as they were each formerly in arraigned marriages of circumstance or necessity.

â— Active characters: Edward, Charlotte, and the Gardener.
â— Discussed characters: Captain.
â— Locations: nursery garden, summer house (on the new grounds).

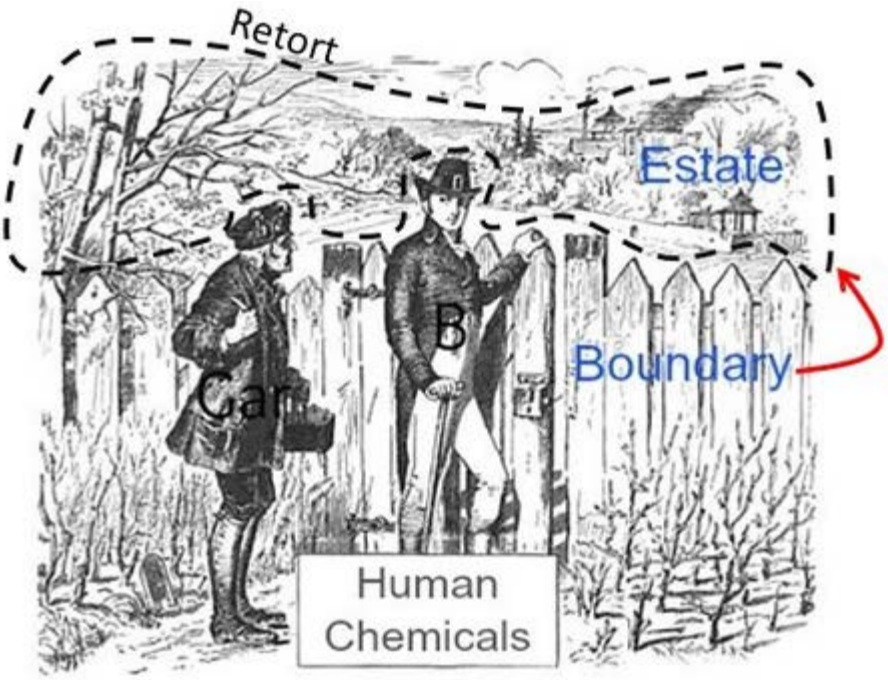

Description: "**the gardener directing Edward**" (HB:231) (by Philipp Johann?)

Part one: Chapter one

Edward [Eduard|RH]—so we shall call a wealthy nobleman [baron|RH] in the prime of life [N1]—had been spending several hours of a fine April morning in his nursery-garden [orchard nursery|RH] [orchard|HW] [N2], budding the stems of some young trees with cuttings which had been recently sent to him. He had finished what he was about, and having laid his tools together in their box, was complacently surveying his work, when the gardener came up and complimented his master on his industry.

"Have you seen my wife anywhere?" inquired Edward, as he moved to go away.

"My lady is alone yonder in the new grounds," said the man; "the summer-house [moss-hut|RH] [arbour|HW] which she has been making on the rock [cliff face|RH] over against the castle [mansion|DC] is finished to-day, and really it is beautiful [N3]. It cannot fail to please your grace. The view from it is perfect:—the village at your feet; a little to your right the church, with its tower, which you can just see over; and directly opposite you, the castle and the garden."

"Quite true," replied Edward; "I can see the people at work a few steps from where I am standing."

"And then, to the right of the church again," continued the gardener, "is the opening of the valley; and you look along over a range of wood and meadow far into the distance. The steps up the rock, too, are excellently arranged. My gracious lady understands these things; it is a pleasure to work under her."

"Go to her," said Edward, "and desire her to be so good as to wait for me there. Tell her I wish to see this new creation of hers, and enjoy it with her."

The gardener went rapidly off, and Edward soon followed. Descending the terrace, and stopping as he passed to look into the hothouses and the forcing-pits, he came presently to the stream, and thence, over a narrow bridge to a place where the walk

Based On **Artistic Representations**

Edward

Goethe

B

Edward

Eduard
(by Friedrich Pecht and Arthur

Edward

leading to the summer-house branched off in two directions One path led across the churchyard, immediately up the face of the rock. The other into which he struck, wound away to the left with a more gradual ascent, through a pretty shrubbery. Where the two paths joined again, a seat had been made, where he stopped a few moments to rest; and then, following the now single road, he found himself, after scrambling along among steps and slopes of all sorts and kinds, conducted at last through a narrow more or less steep outlet to the summer-house.

Historical and antecedent depictions of the three dominant characters of *Elective Affinities*.

Charlotte was standing at the door to receive her husband. She made him sit down where, without moving, he could command a view of the different landscapes through the door and window—these serving as frames, in which they were set like pictures. Spring was coming on; a rich, beautiful life would soon everywhere be bursting; and Edward spoke of it with delight.

"There is only one thing which I should observe," he added, "the summer-house itself is rather small."

"It is large enough for you and me, at any rate," answered Charlotte.

"Certainly," said Edward; "there is room for a third, too, easily."

"Of course; and for a fourth also," replied Charlotte. "For larger parties we can contrive other places."

"Now that we are here by ourselves, with no one to disturb us, and in such a pleasant mood," said Edward, "it is a good opportunity for me to tell you that I have for some time had something on my mind, about which I have wished to speak to you, but have never been able to muster up my courage."

"I have observed that there has been something of the sort," said Charlotte.

"And even now," Edward went on, "if it were not for a letter which the post brought me this morning, and which obliges me to come to some resolution to-day, I should very likely have still kept it to myself."

"What is it, then?" asked Charlotte, turning affectionately towards him.

"It concerns our friend the Captain," answered Edward; "you know the unfortunate position in which he, like many others, is placed. It is through no fault of his own; but you may imagine how painful it must be for a person with his

knowledge and talents and accomplishments, to find himself without employment. I—I will not hesitate any longer with what I am wishing for him. I should like to have him here with us for a time."

"We must think about that," replied Charlotte; "it should be considered on more sides than one."

"I am quite ready to tell you what I have in view," returned Edward. "Through his last letters there is a prevailing tone of despondency; not that he is really in any want. He knows thoroughly well how to limit his expenses; and I have taken care for everything absolutely necessary. It is no distress to him to accept obligations from me; all our lives we have been in the habit of borrowing from and lending to each other; and we could not tell, if we would, how our debtor and creditor account stands. It is being without occupation which is really fretting him. The many accomplishments which he has cultivated in himself, it is his only pleasure—indeed, it is his passion—to be daily and hourly exercising for the benefit of others. And now, to sit still, with his arms folded; or to go on studying, acquiring and acquiring, when he can make no use of what he already possesses;—my dear creature, it is a painful situation; and alone as he is, he feels it doubly and trebly."

"But I thought," said Charlotte, "that he had had offers from many different quarters. I myself wrote to numbers of my own friends, male and female, for him; and, as I have reason to believe, not without effect."

"It is true," replied Edward; "but these very offers — these various proposals — have only caused him fresh embarrassment. Not one of them is at all suitable to such a person as he is. He would have nothing to do; he would have to sacrifice himself, his time, his purposes, his whole method of life; and to that he cannot bring himself. The more I think of it all, the more I feel about it, and the more anxious I am to see him here with us."

"It is very beautiful and amiable in you," answered Charlotte, "to enter with so much sympathy into your friend's position; only you must allow me to ask you to think of yourself and of me, as well."

"I have done that," replied Edward. "For ourselves, we can have nothing to expect from his presence with us, except pleasure and advantage. I will say nothing of the expense. In any case, if he came to us, it would be but small; and you know he will be of no inconvenience to us at all. He can have his own rooms in the right wing of the castle, and everything else can be arranged as simply as possible. What shall we not be thus doing for him! and how agreeable and how profitable may not his society prove to us!

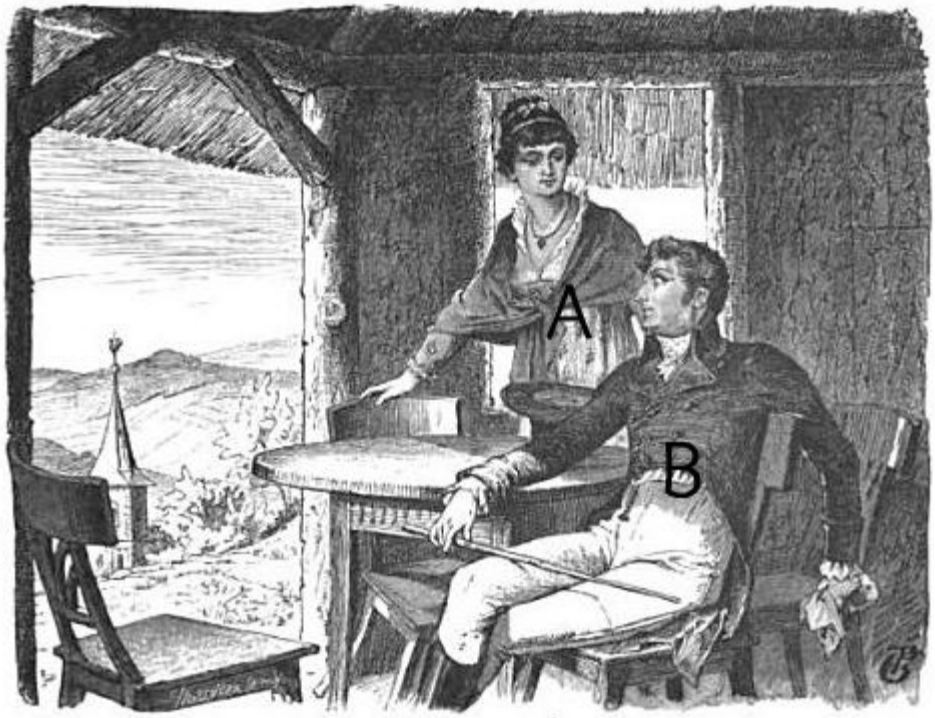

Description: "**Charlotte conversing with Edward**" (HB:233).

I have long been wishing for a plan of the property and the grounds. He will see to it, and get it made. You intend yourself to take the management of the estate, as soon as our present steward's term is expired; and that, you know, is a serious thing. His various information will be of immense benefit to us; I feel only too acutely how much I require a person of this kind. The country people have knowledge enough, but their way of imparting it is confused, and not always honest. The students from the towns and universities are sufficiently clever and orderly, but they are deficient in personal experience. From my friend, I can promise myself both knowledge and method, and hundreds of other circumstances I can easily conceive arising, affecting you as well as me, and from which I can foresee innumerable advantages. Thank you for so patiently listening to me. Now, do you say what you think, and say it

out freely and fully; I will not interrupt you."

"Very well," replied Charlotte; "I will begin at once with a general observation. Men think most of the immediate—the present; and rightly, their calling being to do and to work. Women, on the other hand, more of how things hang together in life; and that rightly too, because their destiny—the destiny of their families—is bound up in this interdependence, and it is exactly this which it is their mission to promote. So now let us cast a glance at our present and our past life; and you will acknowledge that the invitation of the captain does not fall in so entirely with our purposes, our plans, and our arrangements. I will go back to those happy days of our earliest intercourse. We loved each other, young as we then were, with all our hearts. We were parted: you from me— your father, from an insatiable desire of wealth, choosing to marry you to an elderly and rich lady; I from you, having to give my hand, without any especial motive, to an excellent man, whom I respected, if I did not love. We became again free—you first, your poor mother at the same time leaving you in possession of your large fortune;

I later, just at the time when you returned from abroad. So we met once more. We spoke of the past; we could enjoy and love the recollection of it; we might have been contented, in each other's society, to leave things as they were. You were urgent for our marriage. I at first hesitated. We were about the same age; but I as a woman had grown older than you as a man. At last I could not refuse you what you seemed to think the one thing you cared for. All the discomfort which you had ever experienced, at court, in the army, or in traveling, you were to recover from at my side; you would settle down and enjoy life; but only with me for your companion. I settled my daughter at a school, where she could be more completely educated than would be possible in the retirement of the country; and I placed my niece Ottilie there with her as well, who, perhaps, would have grown up better at home with me, under my own care. This was done with your consent, merely that we might have our own lives to ourselves—merely that we might enjoy undisturbed our so-long-wished for, so-long-delayed happiness. We came here and settled ourselves. I undertook the domestic part of the menage, you the out-of-doors, and the general control. My own principle has been to meet your wishes in everything, to live only for you. At least, let us give ourselves a fair trial how far in this way we can be enough for one another."

"Since the interdependence of things, as you call it, is your especial element," replied Edward, "one should either never listen to any of your trains of reasoning, or make up one's mind to allow you to be in the right; and, indeed, you have been in the right up to the present day. The foundation which we have hitherto been laying for ourselves, is of the true, sound sort; only, are we to build nothing upon it? is nothing to be developed out of it? All the work we have done—I in the garden, you in the park—is it all only for a pair of hermits?"

"Well, well," replied Charlotte, "very well. What we have to look to is, that we introduce no alien element, nothing which shall cross or obstruct us. Remember, our plans, even those which only concern our amusements, depend mainly on our being together. You were to read to me, in consecutive order, the journal which you made when you were abroad. You were to take the opportunity of arranging it, putting all the loose matter connected with it in its place; and with me to work with you and help you, out of these invaluable but chaotic leaves and sheets to put together a complete thing, which should give pleasure to ourselves and to others. I promised to assist you in transcribing; and we thought it would be so pleasant, so delightful, so charming, to travel over in recollection the world which we were unable to see together. The beginning is already made. Then, in the evenings, you have taken up your flute again, accompanying me on the piano, while of visits backwards and forwards among the neighborhood, there is abundance. For my part, I have been promising myself out of all this the first really happy summer I have ever thought to spend in my life."

"Only I cannot see," replied Edward, rubbing his forehead, "how, through every bit of this which you have been so sweetly and so sensibly laying before me, the captain's presence can be any interruption; I should rather have thought it would give it all fresh zest and life. He was my companion during a part of my travels. He made many observations from a different point of view from mine. We can put it all altogether, and so make a charmingly complete work of it."

"Well, then, I will acknowledge openly," answered Charlotte, with some impatience, "my feeling is against this plan. I have an instinct which tells me no good will come of it."

"You women are invincible in this way," replied Edward. "You are so sensible, that there is no answering you, then so affectionate, that one is glad to give way to you; full of feelings, which one cannot wound, and full of forebodings, which terrify one."

"I am not superstitious," said Charlotte; "and I care nothing for these dim sensations, merely as such; but in general they are the result of unconscious recollections of happy or unhappy consequences, which we have experienced as following on our own or others' actions. Nothing is of greater moment, in any state of things, than the intervention of a third person. I have seen friends, brothers and sisters, lovers, husbands and wives, whose relation to each other, through the accidental or intentional introduction of a third person, has been altogether changed—whose whole moral condition has been inverted by it."

"That may very well be," replied Edward, "with people who live on without looking where they are going; but not, surely, with persons whom experience has taught to understand themselves."

"That understanding ourselves, my dearest husband," insisted Charlotte, "is no such certain weapon. It is very often a most dangerous one for the person who bears it. And out of all this, at least so much seems to arise, that we should not be in too great a hurry. Let me have a few days to think; don't decide."

"As the matter stands," returned Edward, "wait as many days as we will, we shall still be in too great a hurry. The arguments for and against are all before us; all we want is the conclusion, and, as things are, I think the best thing we can do is to draw lots."

"I know," said Charlotte, "that in doubtful cases it is your way to leave them to chance. To me, in such a serious matter, this seems almost a crime."

"Then what am I to write to the captain?" cried Edward; "for write I must at once."

"Write him a kind, sensible, sympathizing letter," answered Charlotte.

"That is as good as none at all," replied Edward.

"And there are many cases," answered she, "in which we are obliged, and in which it is the real kindness, rather to write nothing than not to write."

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See also

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Key

The following are keys:
[translation|JF] = James Froude translation (1854)
[translation|HB] = Hjalmar Boyesen translation (1885)

[translation|HW] = Herbert Waidson translation (1960)
[translation|RH] = Reginald Hollingdale translation (1971)
[translation|DC] = David Constantine translation (1994)
Character [**new**] = new character introduced in that chapter.
Name [size 14pt] = first mention of new character in text

θΔics

In Elective Affinities (IAD), **Part one: Chapter five** (add synopsis)

Part one: Chapter six

It was a natural consequence now that Charlotte was occupied with the captain, that Edward should attach himself more to Ottilie. Independently of this, indeed, for some time past he had begun to feel a silent kind of attraction towards her. Obliging and attentive she was to everyone, but his self-love whispered that towards him she was particularly so. She had observed his little fancies about his food. She knew exactly what things he liked, and the way in which he liked them to be prepared; the quantity of sugar which he liked in his tea; and so on. Moreover, she was particularly careful to prevent draughts, about which he was excessively sensitive, and, indeed, about which, with his wife, who could never have air enough, he was often at variance. So, too, she had come to know about fruit-gardens and flower-gardens; whatever he liked, it was her constant effort to procure for him, and to keep away whatever annoyed him; so that very soon she grew indispensable to him—she became like his guardian angel, and he felt it keenly whenever she was absent. Besides all this, too, she appeared to grow more open and conversible as soon as they were alone together.

Description: "Edward Assisting Ottilie" (HB:256).

Edward, as he advanced in life, had retained something childish about himself, which corresponded singularly well with the youthfulness of Ottilie. They liked talking of early times, when they had first seen each other; and these reminiscences led them up to the first epoch of Edward's affection for Charlotte. Ottilie declared that she remembered them both as the handsomest pair about the court; and when Edward would question the possibility of this, when she must have been so exceedingly young, she insisted that she recollected one particular incident as clearly as possible. He had come into the room where her aunt was, and she had hid her face in Charlotte's lap—not from fear, but from a childish surprise. She might have added, because he had made so strong an impression upon her—because she had liked him so much.

While they were occupied in this way, much of the business which the two friends had undertaken together had come to a standstill; so that they found it necessary to inspect how things were going on—to work up a few designs and get letters written. For this purpose, they betook themselves to their office, where they found their old copyist at his desk. They set themselves to their work, and soon gave the old man enough to do, without observing that they were laying many things on his shoulders which at other times they had always done for themselves. At the same time, the first design the captain tried would not answer, and Edward was as unsuccessful with his first letter. They fretted for a while, planning and erasing, till at last Edward, who was getting on the worst, asked what o'clock it was. And then it appeared that the captain had forgotten, for the first time for many years, to wind up his chronometer; and they seemed, if not to feel, at least to have a dim perception, that time was beginning to be indifferent to them.

In the meanwhile, as the gentlemen were thus rather slackening in their energy, the activity of the ladies increased all

the more. The every-day life of a family, which is composed of given persons, and is shaped out of necessary circumstances, may easily receive into itself an extraordinary affection, an incipient passion—may receive it into itself as into a vessel; and a long time may elapse before the new ingredient produces a visible effervescence, and runs foaming over the edge.

With our friends, the feelings which were mutually arising had the most agreeable effects. Their dispositions opened out, and a general goodwill arose out of the several individual affections. Every member of the party was happy; and they each shared their happiness with the rest.

Such a temper elevates the spirit, while it enlarges the heart, and everything which, under the influence of it, people do and undertake, has a tendency towards the illimitable. The friends could not remain any more shut up at home; their walks extended themselves farther and farther. Edward would hurry on before with Ottilie, to choose the path or pioneer the way; and the captain and Charlotte would follow quietly on the track of their more hasty precursors, talking on some grave subject, or delighting themselves with some spot they had newly discovered, or some unexpected natural beauty.

One day their walk led them down from the gate at the right wing of the castle, in the direction of the hotel, and thence over the bridge towards the ponds, along the sides of which they proceeded as far as it was generally thought possible to follow the water; thickly wooded hills sloping directly up from the edge, and beyond these a wall of steep rocks, making further progress difficult, if not impossible. But Edward, whose hunting experience had made him thoroughly familiar with the spot, pushed forward along an overgrown path with Ottilie, knowing well that the old mill could not be far off, which was somewhere in the middle of the rocks there. The path was so little frequented, that they soon lost it; and for a short time they were wandering among mossy stones and thickets; it was not for long, however: the noise of the water-wheel speedily telling them that the place which they were looking for was close at hand. Stepping forward on a point of rock, they saw the strange old, dark wooden building in the hollow before them, quite shadowed over with precipitous crags and huge trees. They determined directly to climb down amidst the moss and the blocks of stone. Edward led the way; and when he looked back and saw Ottilie following, stepping lightly, without fear or nervousness, from stone to stone, so beautifully balancing herself, he fancied he was looking at some celestial creature floating above him; while if, as she often did, she caught the hand which in some difficult spot he would offer her, or if she supported herself on his shoulder, then he was left in no doubt that it was a very exquisite human creature who touched him. He almost wished that she might slip or stumble, that he might catch her in his arms and press her to his heart. This, however, he would under no circumstances have done, for more than one reason. He was afraid to wound her, and he was afraid to do her some bodily injury.

What the meaning of this could be, we shall immediately learn. When they had got down, and were seated opposite each other at a table under the trees, and when the miller’s wife had gone for milk, and the miller, who had come out to them, was sent to meet Charlotte and the captain, Edward, with a little embarrassment, began to speak:

“I have a request to make, dear Ottilie; you will forgive me for asking it, if you will not grant it. You make no secret (I am sure you need not make any), that you wear a miniature under your dress against your breast. It is the picture of your noble father. You could hardly have known him; but in every sense he deserves a place by your heart. Only, forgive me, the picture is exceedingly large, and the metal frame and the glass, if you take up a child in your arms, if you are carrying anything, if the carriage swings violently, if we are pushing through bushes, or just now, as we were coming down these rocks,—cause me a thousand anxieties for you. Any unforeseen blow, a fall, a touch, may be fatally injurious to you; and I am terrified at the possibility of it. For my sake do this: put away the picture, not out of your affections, not out of your room; let it have the brightest, the holiest place which you can give it; only do not wear upon your breast a thing, the presence of which seems to me, perhaps from an extravagant anxiety, so dangerous.”

Ottilie said nothing, and while he was speaking she kept her eyes fixed straight before her; then, without hesitation and without haste, with a look turned more towards heaven than on Edward, she unclasped the chain, drew out the picture, and pressed it against her forehead, and then reached it over to her friend, with the words:

“Do you keep it for me till we come home; I cannot give you a better proof how deeply I thank you for your affectionate care.”

He did not venture to press the picture to his lips; but he caught her hand and raised it to his eyes. They were, perhaps, two of the most beautiful hands which had ever been clasped together. He felt as if a stone had fallen from his heart, as if a partition-wall had been thrown down between him and Ottilie.

Under the miller's guidance, Charlotte and the captain came down by an easier path, and now joined them. There was the meeting, and a happy talk, and then they took some refreshments. They would not return by the same way as they came; and Edward struck into a rocky path on the other side of the stream, from which the ponds were again to be seen. They made their way along it, with some effort, and then had to cross a variety of wood and copse—getting glimpses, on the land side, of a number of villages and manor-houses, with their green lawns and fruit-gardens; while very near them, and sweetly situated on a rising ground, a farm lay in the middle of the wood. From a gentle ascent, they had a view, before and behind, which showed them the richness of the country to the greatest advantage; and then, entering a grove of trees, they found themselves, on again emerging from it, on the rock opposite the castle.

They came upon it rather unexpectedly, and were of course delighted. They had made the circuit of a little world; they were standing on the spot where the new building was to be erected, and were looking again at the windows of their own home.

They went down to the summer-house, and sat all four in it for the first time together; nothing was more natural than that with one voice it should be proposed to have the way they had been that day, and which, as it was, had taken them much time and trouble, properly laid out and graveled, so that people might loiter along it at their leisure. They each said what they thought; and they reckoned up that the circuit, over which they had taken many hours, might be traveled easily with a good road all the way round to the castle, in a single one.

Already a plan was being suggested for making the distance shorter, and adding a fresh beauty to the landscape, by throwing a bridge across the stream, below the mill, where it ran into the lake; when Charlotte brought their inventive imagination somewhat to a stand-still, by putting them in mind of the expense which such an undertaking would involve.

"There are ways of meeting that too," replied Edward; "we have only to dispose of that farm in the forest which is so pleasantly situated, and which brings in so little in the way of rent: the sum which will be set free will more than cover what we shall require, and thus, having gained an invaluable walk, we shall receive the interest of well-expended capital in substantial enjoyment—instead of, as now, in the summing up at the end of the year, vexing and fretting ourselves over the pitiful little income which is returned for it."

Even Charlotte, with all her prudence, had little to urge against this. There had been, indeed, a previous intention of selling the farm. The captain was ready immediately with a plan for breaking up the ground into small portions among the peasantry of the forest. Edward, however, had a simpler and shorter way of managing it. His present steward had already proposed to take it off his hands—he was to pay for it by installments—and so, gradually, as the money came in, they would get their work forward from point to point.
So reasonable and prudent a scheme was sure of universal approbation, and already, in prospect, they began to see their new walk winding along its way, and to imagine the many beautiful views and charming spots which they hoped to discover in its neighborhood.

To bring it all before themselves with greater fullness of detail, in the evening they produced the new chart. With the help of this they went over again the way that they had come, and found various places where the walk might take a rather different direction with advantage. Their other scheme was now once more talked through, and connected with the fresh design. The site for the new house in the park, opposite the castle, was a second time examined into and approved, and fixed upon for the termination of the intended circuit.

Ottilie had said nothing all this time. At length Edward pushed the chart, which had hitherto been lying before Charlotte, across to her, begging her to give her opinion; she still hesitated for a moment. Edward in his gentlest way again pressed her to let them know what she thought—nothing had as yet been settled—it was all as yet in embryo.

"I would have the house built here," she said, as she pointed with her finger to the highest point of the slope on the hill.

“It is true you cannot see the castle from thence, for it is hidden by the wood; but for that very reason you find yourselves in another quite new world; you lose village and houses and all at the same time. The view of the ponds with the mill, and the hills and mountains in the distance, is singularly beautiful—I have often observed it when I have been there.” “She is right,” Edward cried; “how could we have overlooked it. This is what you mean, Ottilie, is it not?” He took a lead pencil, and drew a great black rectangular figure on the summit of the hill.

It went through the captain’s soul to see his carefully and clearly-drawn chart disfigured in such a way. He collected himself, however, after a slight expression of his disapproval, and went into the idea. “Ottilie is right,” he said; “we are ready enough to walk any distance to drink tea or eat fish, because they would not have tasted as well at home—we require change of scene and change of objects. Your ancestors showed their judgment in the spot which they chose for the castle; for it is sheltered from the wind, with the conveniences of life close at hand. A place, on the contrary, which is more for pleasure parties than for a regular residence, may be very well yonder there, and in the fair time of year the most agreeable hours may be spent there.”

The more they talked it over, the more conclusive was their judgment in favor of Ottilie; and Edward could not conceal his triumph that the thought had been hers. He was as proud as if he had hit upon it himself.

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Discussion
(add)

See also
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â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe’s human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References

1. (add)

A = - dG

In Elective Affinities (IAD), **Part one: Chapter seventeen** (add synopsis)

Part one: Chapter seventeen

Description: "The Valet Thwarted by Charlotte." (HB:288)

Ottilie heard someone ride away, and went to the window in time just to catch a sight of Edward's back. It was strange, she thought, that he should have left the house without seeing her, without having even wished her good-morning. She grew uncomfortable, and her anxiety did not diminish when Charlotte took her out for a long walk, and talked of various other things; but not once, and apparently on purpose, mentioning her husband. When they returned she found the table laid only with two covers.

It is unpleasant to miss even the most trifling thing to which we have been accustomed. In serious things such a loss becomes miserably painful. Edward and the captain were not there. The first time for a long while Charlotte sat at the head of the table herself—and it seemed to Ottilie as if she was deposed. The two ladies sat opposite each other; Charlotte talked, without the least embarrassment, of the captain and his appointment, and of the little hope there was of seeing him again for a long time. The only comfort Ottilie could find for herself was in the idea that Edward had ridden after his friend, to accompany him a part of his journey.

On rising from table, however, they saw Edward's travelling carriage under the window. Charlotte, a little as if she was put out, asked who had had it brought round there. She was told it was the valet, who had some things there to pack up. It required all Ottilie's self-command to conceal her wonder and her distress.

The valet came in, and asked if they would be so good as to let him have a drinking cup of his master's, a pair of silver spoons, and a number of other things, which seemed to Ottilie to imply that he was gone some distance, and would be away for a long time.

Charlotte gave him a very cold dry answer. She did not know what he meant—he had everything belonging to his master under his own care. What the man wanted was to speak a word to Ottilie, and on some pretense or other to get her out of the room; he made some clever excuse, and persisted in his request so far that Ottilie asked if she should go to look for the things for him? But Charlotte quietly said that she had better not. The valet had to depart, and the carriage rolled away.

It was a dreadful moment for Ottilie. She understood nothing—comprehended nothing. She could only feel that Edward had been parted from her for a long time. Charlotte felt for her situation, and left her to herself.

We will not attempt to describe what she went through, or how she wept. She suffered infinitely. She prayed that God would help her only over this one day. The day passed, and the night, and when she came to herself again she felt herself a changed being.

She had not grown composed. She was not resigned, but after having lost what she had lost, she was still alive, and there

was still something for her to fear. Her anxiety, after returning to consciousness, was at once lest, now that the gentlemen were gone, she might be sent away too. She never guessed at Edward's threats, which had secured her remaining with her aunt. Yet Charlotte's manner served partially to reassure her. The latter exerted herself to find employment for the poor girl, and hardly ever,—never, if she could help it,—left her out of her sight; and although she knew well how little words can do against the power of passion, yet she knew, too, the sure though slow influence of thought and reflection, and therefore missed no opportunity of inducing Ottilie to talk with her on every variety of subject.

It was no little comfort to Ottilie when one day Charlotte took an opportunity of making (she did it on purpose) the wise observation, "How keenly grateful people were to us when we were able by stilling and calming them to help them out of the entanglements of passion! Let us set cheerfully to work," she said, "at what the men have left incomplete: we shall be preparing the most charming surprise for them when they return to us, and our temperate proceedings will have carried through and executed what their impatient natures would have spoiled."

"Speaking of temperance, my dear aunt, I cannot help saying how I am struck with the intemperance of men, particularly in respect of wine. It has often pained and distressed me, when I have observed how, for hours together, clearness of understanding, judgment, considerateness, and whatever is most amiable about them, will be utterly gone, and instead of the good which they might have done if they had been themselves, most disagreeable things sometimes threaten. How often may not wrong, rash determinations have arisen entirely from that one cause!"

Charlotte assented, but she did not go on with the subject. She saw only too clearly that it was Edward of whom Ottilie was thinking. It was not exactly habitual with him, but he allowed himself much more frequently than was at all desirable to stimulate his enjoyment and his power of talking and acting by such indulgence. If what Charlotte had just said had set Ottilie thinking again about men, and particularly about Edward, she was all the more struck and startled when her aunt began to speak of the impending marriage of the captain as of a thing quite settled and acknowledged. This gave a totally different aspect to affairs from what Edward had previously led her to entertain. It made her watch every expression of Charlotte's, every hint, every action, every step. Ottilie had become jealous, sharp-eyed and suspicious, without knowing it.

Meanwhile, Charlotte with her clear glance looked through the whole circumstances of their situation, and made arrangements which would provide, among other advantages, full employment for Ottilie. She contracted her household, not parsimoniously, but into narrower dimensions; and, indeed, in one point of view, these moral aberrations might be taken for a not unfortunate accident. For in the style in which they had been going on, they had fallen imperceptibly into extravagance; and from a want of seasonable reflection, from the rate at which they had been living, and from the variety of schemes into which they had been launching out, their fine fortune, which had been in excellent condition, had been shaken, if not seriously injured.

The improvements which were going on in the park she did not interfere with; she rather sought to advance whatever might form a basis for future operations. But here, too, she assigned herself a limit. Her husband on his return should still find abundance to amuse himself with.

In all this work she could not sufficiently value the assistance of the young architect. In a short time the lake lay stretched out under her eyes, its new shores turfed and planted with the most

Description: "Ottilie Conversing with the Gardener." (HB:290)

discriminating and excellent judgment. The rough work at the new house was all finished. Everything which was necessary to protect it from the weather she took care to see provided, and there for the present she allowed it to rest in a condition in which what remained to be done could hereafter be readily commenced again. Thus hour by hour she recovered her spirits and her cheerfulness. Ottilie only seemed to have done so. She was only forever watching, in all that was said and done, for symptoms which might show her whether Edward would be soon returning: and this one thought was the only one in which she felt any interest.

It was, therefore, a very welcome proposal to her when it was suggested that they should get together the boys of the peasants, and employ them in keeping the park clean and neat. Edward had long entertained the idea. A pleasant-looking sort of uniform was made for them, which they were to put on in the evenings, after they had been properly cleaned and washed. The wardrobe was kept in the castle; the more sensible and ready of the boys themselves were entrusted with the management of it—the architect acting as chief director. In a very short time, the children acquired a kind of character. It was found easy to mould them into what was desired; and they went through their work not without a sort of maneuver. As they marched along, with their garden shears, their long-handled pruning knives, their rakes, their little spades and hoes, and sweeping brooms; others following after these with baskets to carry off the stones and rubbish; and others, last of all, trailing along the heavy iron roller—it was a thoroughly pretty, delightful procession. The architect observed in it a beautiful series of situations and occupations to ornament the frieze of a garden-house. Ottilie, on the other hand, could see nothing in it but a kind of parade, to salute the master of the house on his near return.

And this stimulated her, and made her wish to begin something of the sort herself. They had before endeavored to encourage the girls of the village in knitting and sewing and spinning, and whatever else women could do; and since what had been done for the improvement of the village itself, there had been a perceptible advance in these descriptions of industry. Ottilie had given what assistance was in her power, but she had given it at random, as opportunity or inclination prompted her; now she thought she would go to work more satisfactorily and methodically. But a company is not to be formed out of a number of girls, as easily as out of a number of boys. She followed her own good sense, and, without being exactly conscious of it, her efforts were solely directed towards connecting every girl as closely as

possible each with her own home, her own parents, brothers and sisters: and she succeeded with many of them. One lively little creature only was incessantly complained of as showing no capacity for work, and as never likely to do anything if she were left at home.

Description: "Nanny." (HB:292/93)

Ottilie could not be angry with the girl, for to herself the little thing was especially attached—she clung to her, went after her, and ran about with her, whenever she was permitted—and then she would be active and cheerful and never tire. It appeared to be a necessity of the child's nature to hang about a beautiful mistress. At first, Ottilie allowed her to be her companion; then she herself began to feel a sort of affection for her; and, at last, they never parted at all, and Nanny attended her mistress wherever she went.

The latter's footsteps were often bent towards the garden, where she liked to watch the beautiful show of fruit. It was just the end of the raspberry and cherry season, the few remains of which were no little delight to Nanny. On the other trees there was a promise of a magnificent bearing for the autumn, and the gardener talked of nothing but his master; and how he wished that he might be at home to enjoy it. Ottilie could listen to the good old man forever! He thoroughly understood his business; and Edward—Edward—Edward—was forever the theme of his praise!

Ottilie observed, how well all the grafts which had been budded in the spring had taken. "I only wish," the gardener answered, "my good master may come to enjoy them. If he were here this autumn, he would see what beautiful sorts there are in the old castle garden, which the late lord, his honored father, put there. I think the fruit gardeners that are now don't succeed as well as the Carthusians used to do. We find many fine names in the catalog, and then we bud from them, and bring up the shoots, and, at last, when they come to bear, it is not worthwhile to have such trees standing in our garden."

Over and over again, whenever the faithful old servant saw Ottilie, he asked when his master might be expected home; and when Ottilie had nothing to tell him, he would look vexed, and let her see in his manner that he thought she did not care to tell him: the sense of uncertainty which was thus forced upon her became painful beyond measure, and yet she could never be absent from these beds and borders. What she and Edward had sown and planted together were now in full flower, requiring no further care from her, except that Nanny should be at hand with the watering-pot; and who shall say with what sensations she watched the later flowers, which were just beginning to show, and which were to be in the bloom of their beauty on Edward's birthday, the holiday to which she had looked forward with such eagerness, when these flowers were to have expressed her affection and her gratitude to him!—but the hopes which she had formed of that festival were dead now, and doubt and anxiety never ceased to haunt the soul of the poor girl.

Into real open, hearty understanding with Charlotte, there was no more a chance of her being able to return; for, indeed, the position of these two ladies was very different. If things could remain in their old state—if it were possible that they could return again into the smooth, even way of calm ordered life, Charlotte gained

Description: "Ottilie Mourning for Edward." (HB:292)

everything; she gained happiness for the present, and a happy future opened before her. On the other hand, for Ottilie all was lost—one may say, all; for she had first found in Edward what life and happiness meant; and, in her present position, she felt an infinite and dreary chasm of which before she could have formed no conception. A heart which seeks, feels well that it wants something; a heart which has lost, feels that something is gone—its yearning and its longing changes into uneasy impatience—and a woman's spirit, which is accustomed to waiting and to enduring, must now pass out from its proper sphere, become active, and attempt and do something to make its own happiness.

Ottilie had not given up Edward—how could she?—although Charlotte, wisely enough, in spite of her conviction to the contrary, assumed it as a thing of course, and resolutely took it as decided that a quiet rational regard was possible between her husband and Ottilie. How often, however, did not Ottilie remain at nights, after bolting herself into her room, on her knees before the open box, gazing at the birthday presents, of which as yet she had not touched a single thing—not cut out or made up a single dress! How often with the sunrise did the poor girl hurry out of the house, in which she once had found all her happiness, away into the free air, into the country which then had had no charms for her. Even on the solid earth she could not bear to stay; she would spring into the boat, and row out into the middle of the lake, and there, drawing out some book of travels, lie rocked by the motion of the waves, reading and dreaming that she was far away, where she would never fail to find her friend—she remaining ever nearest to his heart, and he to hers.

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â— Elective Affinities | Part one: Chapter eighteen

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Main
â— Elective Affinities: Illustrated, Annotated, and Decoded

Discussion

The discussions of the orphans Ottilie attached to Charlotte and Nanni attached to Ottilie, for example:

> "The child seemed to need to be attached to a beautiful mistress. At first Ottilie tolerated her company; then grew fond of her; finally they became inseparable, and Nanni went with her mistress everywhere."

are, in some way, supposedly, a comparison or model of some type of tree grafting. [1]

See also

â— Goethe's affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe's human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations

N1. (add)

References

1. Engelstein, Stefani. (2008). *Anxious Anatomy: the Conception of the Human Form in Literary and Naturalist Discourse* (pg. 45). SUNY Press.

In Elective Affinities (IAD) **Part one: Chapter five** (add synopsis)

Part one: Chapter six

The carriage which brought Ottilie drove up to the door. Charlotte went out to receive her. The dear girl ran to meet her, threw herself at her feet, and embraced her knees.

Description: "**Charlotte Receiving Ottilie**" (HB:252).

"Why such humility?" said Charlotte, a little embarrassed, and endeavoring to raise her from the ground.

"It is not meant for humility," Ottilie answered, without moving from the position in which she had placed herself; "I am only thinking of the time when I could not reach higher than to your knees, and when I had just learned to know how you loved me."

She stood up, and Charlotte embraced her warmly. She was introduced to the gentlemen, and was at once treated with especial courtesy as a visitor. Beauty is a welcome guest everywhere. She appeared attentive to the conversation, without taking a part in it.

The next morning Edward said to Charlotte, "What an agreeable, entertaining girl she is!"

"Entertaining!" answered Charlotte, with a smile; "why, she has not opened her lips yet!"

"Indeed!" said Edward, as he seemed to bethink himself; "that is very strange."

Charlotte had to give the new-comer but a very few hints on the management of the household. Ottilie saw rapidly all the arrangements, and what was more, she felt them. She comprehended easily what was to be provided for the whole party, and what for each particular member of it. Everything was done with the utmost punctuality; she knew how to direct, without appearing to be giving orders, and when anyone had left anything undone, she at once set it right herself.

As soon as she had found how much time she would have to spare, she begged Charlotte to divide her hours for her, and to these she adhered exactly. She worked at what was set before her in the way which the assistant had described to Charlotte. They let her alone. It was but seldom that Charlotte interfered. Sometimes she changed her pens for others which had been written with, to teach her to make bolder strokes in her handwriting, but these, she found, would be soon cut sharp and fine again.

The ladies had agreed with one another when they were alone to speak nothing but French, and Charlotte persisted in it the more, as she found Ottilie more ready to talk in a foreign language, when she was told it was her duty to exercise herself in it. In this way she often said more than she seemed to intend. Charlotte was particularly pleased with a description, most complete, but at the same time most charming and amiable, which she gave her one day, by accident, of the school. She soon felt her to be a delightful companion, and before long she hoped to find in her an attached friend.

At the same time she looked over again the more early accounts which had been sent her of Ottilie, to refresh her recollection with the opinion which the superior and the assistant had formed about her, and compare them with her in her own person. For Charlotte was of opinion that we cannot too quickly become acquainted with the character of those with whom we have to live, that we may know what to expect of them; where we may hope to do anything in the way of improvement with them, and what we must make up our minds, once for all, to tolerate and let alone.

This examination led her to nothing new, indeed; but much which she already knew became of greater meaning and importance. Ottilie's moderation in eating and drinking, for instance, became a real distress to her.

The next thing on which the ladies were employed was Ottilie's toilet. Charlotte wished her to appear in clothes of a richer and more *recherché* sort, and at once the clever active girl herself cut out the stuff which had been previously sent to her, and with a very little assistance from others was able, in a short time, to dress herself out most tastefully. The new fashionable dresses set off her figure. An agreeable person, it is true, will show through all disguises; but we always fancy it looks fresher and more graceful when its peculiarities appear under some new drapery. And thus, from the moment of her first appearance, she became more and more a delight to the eyes of all who beheld her. As the emerald refreshes the sight with its beautiful hues, and exerts, it is said, a beneficent influence on that noble sense, so does human beauty work with a far larger potency on the outward and on the inward sense; whoever looks upon it is charmed against the breath of evil, and feels in harmony with himself and with the world. [N#]

In many ways, therefore, the party had gained by Ottilie's arrival. The Captain and Edward kept regularly to the hours, even to the minutes, for their general meeting together. They never kept the others waiting for them either for dinner or tea, or for their walks; and they were in less haste, especially in the evenings, to leave the table. This did not escape Charlotte's observation; she watched them both, to see whether one more than the other was the occasion of it. But she could not perceive any difference. They had both become more companionable. In their conversation they seemed to consider what was best adapted to interest Ottilie, what was most on a level with her capacities and her general knowledge. If she left the room when they were reading or telling stories, they would wait till she returned. They had grown softer and altogether more united.

In return for this, Ottilie's anxiety to be of use increased every day; the more she came to understand the house, its inmates, and their circumstances, the more eagerly she entered into everything, caught every look and every motion; half a word, a sound, was enough for her. With her calm attentiveness, and her easy, unexcited activity, she was always the same. Sitting, rising up, going, coming, fetching, carrying, returning to her place again, it was all in the most perfect repose; a constant change, a constant agreeable movement; while, at the same time, she went about so lightly that her step was almost inaudible.

This cheerful obligingness in Ottilie gave Charlotte the greatest pleasure. There was one thing, however, which she did not exactly like, of which she had to speak to her. "It is very polite in you," she said one day to her, "when people let anything fall from their hand, to be so quick in stooping and picking it up for them; at the same time, it is a sort of confession that they have a right to require such attention, and in the world we are expected to be careful to whom we pay it. Towards women, I will not prescribe any rule as to how you should conduct yourself. You are young. To those above you, and older than you, services of this sort are a duty; towards your equals they are polite; to those younger than yourself and your inferiors you may show yourself kind and good-natured by such things,—only it is not becoming in a young lady to do them for men."

"I will try to forget the habit," replied Ottilie; "I think, however, you will in the meantime forgive me for my want of manners, when I tell you how I came by it. We were taught history at school; I have not gained as much out of it as I ought, for I never knew what use I was to make of it; a few little things, however, made a deep impression upon me, among which was the following:—When Charles the First of England was standing before his so-called judges, the gold top came off the stick which he had in his hand, and fell down. Accustomed as he had been on such occasions to have everything done for him, he seemed to look round and expect that this time too some one would do him this little service. No one stirred, and he stooped down for it himself. It struck me as so piteous, that from that moment I have never been able to see any one let a thing fall, without myself picking it up. But, of course, as it is not always proper, and as I cannot," she continued, smiling, "tell my story every time I do it, in future I will try and contain myself."

In the meantime the fine arrangements which the two friends had been led to make for themselves, went uninterruptedly forward. Every day they found something new to think about and undertake.

One day as they were walking together through the village, they had to remark with dissatisfaction how far behindhand it was in order and cleanliness, compared to villages where the inhabitants were compelled by the expense of building-ground to be careful about such things.

“You remember a wish we once expressed when we were travelling in Switzerland together,” said the Captain, “that we might have the laying out some country park, and how beautiful we would make it by introducing into some village situated like this, not the Swiss style of building, but the Swiss order and neatness which so much improve it.”

“And how well it would answer here! The hill on which the castle stands, slopes down to that projecting angle. The village, you see, is built in a semicircle, regularly enough, just opposite to it. The brook runs between. It is liable to floods; and do observe the way the people set about protecting themselves from them; one with stones, another with stakes; the next puts up a boarding, and a fourth tries beams and planks; no one, of course, doing any good to another with his arrangement, but only hurting himself and the rest too. And then there is the road going along just in the clumsiest way possible,—up hill and down, through the water, and over the stones. If the people would only lay their hands to the business together, it would cost them nothing but a little labor to run a semicircular wall along here, take the road in behind it, raising it to the level of the houses, and so give themselves a fair open space in front, making the whole place clean, and getting rid, once for all, in one good general work, of all their little trifling ineffectual makeshifts.”

“Let us try it,” said the Captain, as he ran his eyes over the lay of the ground, and saw quickly what was to be done.

“I can undertake nothing in company with peasants and shopkeepers,” replied Edward, “unless I may have unrestricted authority over them.”

“You are not so wrong in that,” returned the Captain; “I have experienced too much trouble myself in life in matters of that kind. How difficult it is to prevail on a man to venture boldly on making a sacrifice for an after-advantage! How hard to get him to desire an end, and not hesitate at the means! So many people confuse means with ends; they keep hanging over the first, without having the other before their eyes. Every evil is to be cured at the place where it comes to the surface, and they will not trouble themselves to look for the cause which produces it, or the remote effect which results from it. This is why it is so difficult to get advice listened to, especially among the many: they can see clearly enough from day to day, but their scope seldom reaches beyond the morrow; and if it comes to a point where with some general arrangement one person will gain while another will lose, there is no prevailing on them to strike a balance. Works of public advantage can only be carried through by an uncontrolled absolute authority.”

While they were standing and talking, a man came up and begged of them. He looked more impudent than really in want, and Edward, who was annoyed at being interrupted, after two or three fruitless attempts to get rid of him by a gentler refusal, spoke sharply to him. The fellow began to grumble and mutter abusively; he went off with short steps, talking about the right of beggars. It was all very well to refuse them an alms, but that was no reason why they should be insulted. A beggar, and everybody else too, was as much under God’s protection as a lord. It put Edward out of all patience. [N#]

The Captain, to pacify him, said, “Let us make use of this as an occasion for extending our rural police arrangements to such cases. We are bound to give away money, but we do better in not giving it in person, especially at home. We should be moderate and uniform in everything, in our charities as in all else; too great liberality attracts beggars instead of helping them on their way. At the same time there is no harm when one is on a journey, or passing through a strange place, in appearing to a poor man in the street in the form of a chance deity of fortune, and making him some present which shall surprise him. The position of the village and of the castle makes it easy for us to put our charities here on a proper footing. I have thought about it before. The public-house is at one end of the village, a respectable old couple live at the other. At each of these places deposit a small sum of money, and let every beggar, not as he comes in, but as he goes out, receive something. Both houses lie on the roads which lead to the castle, so that any one who goes there can be referred to one or the other.”

“Come,” said Edward, “we will settle that on the spot. The exact sum can be made up another time.”

They went to the innkeeper, and to the old couple, and the thing was done.

“I know very well,” Edward said, as they were walking up the hill to the castle together, “that everything in this world depends on distinctness of idea and firmness of purpose. Your judgment of what my wife has been doing in the park was entirely right; and you have already given me a hint how it might be improved. I will not deny that I told her of it.”

“So I have been led to suspect,” replied the Captain; “and I could not approve of your having done so. You have perplexed her. She has left off doing anything; and on this one subject she is vexed with us. She avoids speaking of it. She has never since invited us to go with her to the summer-house, although at odd hours she goes up there with Ottilie.”

Description: **“the chart … was brought and spread out”** (citation: "Photogravure after the drawing by F. Simon"). [1]

“We must not allow ourselves to be deterred by that,” answered Edward. “If I am once convinced about anything good, which could and should be done, I can never rest till I see it done. We are clever enough at other times in introducing what we want into the general conversation; suppose we have out some descriptions of English parks, with copper-plates, for our evening’s amusement. Then we can follow with your plan. We will treat it first problematically, and as if we were only in jest. There will be no difficulty in passing into earnest.”

The scheme was concerted, and the books were opened. In each group of designs they first saw a ground-plan of the spot, with the general character of the landscape, drawn in its rude, natural state. Then followed others, showing the changes which had been produced by art, to employ and set off the natural advantages of the locality. From these to their own property and their own grounds, the transition was easy.

Everybody was pleased. The chart which the Captain had sketched was brought and spread out. The only difficulty was, that they could not entirely free themselves of the plan in which Charlotte had begun. However, an easier way up the hill was found; a lodge was suggested to be built on the height at the edge of the cliff, which was to have an especial reference to the castle. It was to form a conspicuous object from the castle windows, and from it the spectator was to be able to overlook both the castle and the garden.

The Captain had thought it all carefully over, and taken his measurements; and now he brought up again the village road and the wall by the brook, and the ground which was to be raised behind it.

“Here you see,” said he, “while I make this charming walk up the height, I gain exactly the quantity of stone which I require for that wall. Let one piece of work help the other, and both will be carried out most satisfactorily and most rapidly.”

“But now,” said Charlotte, “comes my side of the business. A certain definite outlay of money will have to be made. We ought to know how much will be wanted for such a purpose, and then we can apportion it out—so much work, and so much money, if not by weeks, at least by months. The cash-box is under my charge. I pay the bills, and I keep the accounts.”

“You do not appear to have overmuch confidence in us,” said Edward.

“I have not much in arbitrary matters,” Charlotte answered. “Where it is a case of inclination, we women know better how to control ourselves than you.”

It was settled; the dispositions were made, and the work was begun at once.

The Captain being always on the spot, Charlotte was almost daily a witness to the strength and clearness of his understanding. He, too, learned to know her better; and it became easy for them both to work together, and thus bring something to completeness. It is with work as with dancing; persons who keep the same step must grow indispensable to one another. Out of this a mutual kindly feeling will necessarily arise; and that Charlotte had a real kind feeling towards the Captain, after she came to know him better, was sufficiently proved by her allowing him to destroy her pretty seat, which in her first plans she had taken such pains in ornamenting, because it was in the way of his own, without experiencing the slightest feeling about the matter.

Next chapter
â— Elective Affinities | Part one: Chapter seven

Previous chapter
â— Elective Affinities | Part one: Chapter five

â— Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
See: Matthew Bell (2014).

See also
â— Goethe’s affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe’s human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations

N1. (add)

References

1. (a) Goethe, Johann. (1902). *Works: The Sorrows of Young Werther, Elective Affinities* (*Werther* translation By R. Dillon Boylan, *Elective Affinities* translation by James Froude) (List of Illustrations, pg. front matter; “Ottilie’s Favorite Walk … was along a Pleasant Footpath”, cover and pg. 376; “the Chart … was brought and Spread out”, pg. 195; “She Sank Down Upon Her Knees”, pg. 412). F.A. Niccolls & Co.
(b) The chart was brought and spread out (by F. Simon) – Wikipedia Commons.

In Elective Affinities (IAD), **Part one: Chapter sixteen** (add synopsis)

Part one: Chapter sixteen

The next morning the captain had disappeared, having left a grateful, feeling letter addressed to his friends upon his table. He and Charlotte had already taken a half leave of each other the evening before—she felt that the parting was forever, and she resigned herself to it; for in the count's second letter, which the captain had at last shown to her, there was a hint of a prospect of an advantageous marriage, and, although he had paid no attention to it at all, she accepted it for as good as certain, and gave him up firmly and fully.

Now, therefore, she thought that she had a right to require of others the same control over themselves which she had exercised herself: it had not been impossible to her, and it ought not to be impossible to them. With this feeling she began the conversation with her husband; and she entered upon it the more openly and easily, from a sense that the question must now, once for all, be decisively set at rest.

"Our friend has left us," she said; "we are now once more together as we were—and it depends upon ourselves whether we choose to return altogether into our old position."

Edward, who heard nothing except what flattered his own passion, believed that Charlotte, in these words, was alluding to her previous widowed state, and, in a roundabout way, was making a suggestion for a separation; so that he answered, with a laugh, "Why not? all we want is to come to an understanding." But he found himself sorely enough undeceived, as Charlotte continued, "And we have now a choice of opportunities for placing Ottilie in another situation. Two openings have offered themselves for her, either of which will do very well. Either she can return to the school, as my daughter has left it and is with her great-aunt; or she can be received into a desirable family, where, as the companion of an only child, she will enjoy all the advantages of a solid education."

Edward, with a tolerably successful effort at commanding himself, replied, "Ottilie has been so much spoiled, by living so long with us here, that she will scarcely like to leave us now."

"We have all of us been too much spoiled," said Charlotte; "and yourself not least. This is an epoch which requires us seriously to bethink ourselves. It is a solemn warning to us to consider what is really for the good of all the members of our little circle—and we ourselves must not be afraid of making sacrifices."

"At any rate I cannot see that it is right that Ottilie should be made a sacrifice," replied Edward; "and that would be the case if we were now to allow her to be sent away among strangers. The captain's good genius has sought him out here—we can feel easy, we can feel happy, at seeing him leave us; but who can tell what may be before Ottilie? There is no occasion for haste."

"What is before us is sufficiently clear," Charlotte answered, with some emotion; and as she was determined to have it all out at once, she went on: "You love Ottilie; every day you are becoming more attached to her. A reciprocal feeling is rising on her side as well, and feeding itself in the same way. Why should we not acknowledge in words what every hour makes obvious? and are we not to have the common prudence to ask ourselves in what it is to end?"

"We may not be able to find an answer on the moment," replied Edward, collecting himself; "but so much may be said, that if we cannot exactly tell what will come of it, we may resign ourselves to wait and see what the future may tell us about it."

"No great wisdom is required to prophesy here," answered Charlotte; "and, at any rate, we ought to feel that you and I are past the age when people may walk blindly where they should not or ought not to go. There is no one else to take care of us—we must be our own friends, our own managers. No one expects us to commit ourselves in an outrage upon decency: no one expects that we are going to expose ourselves to censure or to ridicule."

"How can you so mistake me?" said Edward, unable to reply to his wife's clear, open words. "Can you find it a fault in me, if I am anxious about Ottilie's happiness? I do not mean future happiness—no one can count on that—but what is

present, palpable, immediate. Consider, don't deceive yourself; consider frankly Ottilie's case, torn away from us, and sent to live among strangers. I, at least, am not cruel enough to propose such a change for her!"

Charlotte saw too clearly into her husband's intentions, through this disguise. For the first time she felt how far he had estranged himself from her. Her voice shook a little—"Will Ottilie be happy if she divides us?" she said. "If she deprives me of a husband, and his children of a father!"

"Our children, I should have thought, were sufficiently provided for," said Edward, with a cold smile; adding, rather more kindly, "but why at once expect the very worst?"

"The very worst is too sure to follow this passion of yours," returned Charlotte: "do not refuse good advice while there is yet time; do not throw away the means which I propose to save us. In troubled cases those must work and help who see the clearest—this time it is I. Dear, dearest Edward! listen to me—can you propose to me, that now at once I shall renounce my happiness! renounce my fairest rights! renounce you!"

"Who says that?" replied Edward, with some embarrassment.

"You, yourself," answered Charlotte; "in determining to keep Ottilie here are you not acknowledging everything which must arise out of it? I will urge nothing on you—but if you cannot conquer yourself, at least you will not be able much longer to deceive yourself."

Edward felt how right she was. It is fearful to hear spoken out, in words, what the heart has gone on long permitting to itself in secret. To escape only for a moment, Edward answered, "It is not yet clear to me what you want."

"My intention," she replied, "was to talk over with you these two proposals—each of them has its advantages. The school would be best suited to her, as she now is; but the other situation is larger and wider, and promises more, when I think what she may become." She then detailed to her husband circumstantially what would lie before Ottilie in each position, and concluded with the words, "For my own part I should prefer the lady's house to the school, for more reasons than one; but particularly because I should not like the affection, the love indeed, of the young man there, which Ottilie has gained, to increase."

Edward appeared to approve; but it was only to find some means of delay. Charlotte, who desired to commit him to a definite step, seized the opportunity, as Edward made no immediate opposition, to settle Ottilie's departure, for which she had already privately made all preparations, for the next day.

Edward shuddered—he thought he was betrayed. His wife's affectionate speech he fancied was an artfully contrived trick to separate him forever from his happiness. He appeared to leave the thing entirely to her; but in his heart his resolution was already taken. To gain time to breathe, to put off the immediate intolerable misery of Ottilie's being sent away, he determined to leave his house. He told Charlotte he was going; but he had blinded her to his real reason, by telling her that he would not be present at Ottilie's departure; indeed, that, from that moment, he would see her no more. Charlotte, who believed that she had gained her point, approved most cordially. He ordered his horse, gave his valet the necessary directions what to pack up, and where he should follow him; and then, on the point of departure, he sat down and wrote:

EDWARD TO CHARLOTTE

"The misfortune, my love, which has befallen us, may or may not admit of remedy; only this I feel, that if I am not at once to be driven to despair, I must find some means of delay for myself, and for all of us. In making myself the sacrifice, I have a right to make a request. I am leaving my home, and I only return to it under happier and more peaceful auspices. While I am away you keep possession of it—*but with Ottilie.* I choose to know that she is with you, and not among strangers. Take care of her; treat her as you have treated her—only more lovingly, more kindly, more tenderly! I promise that I will not attempt any secret intercourse with her. Leave me, as long a time as you please, without knowing anything about you. I will not allow myself to be anxious—nor need you be uneasy about me: only, with all my heart and soul, I beseech you, make no attempt to send Ottilie away, or to introduce her into any other

situation. Beyond the circle of the castle and the park, placed in the hands of strangers, she belongs to me, and I will take possession of her! If you have any regard for my affection, for my wishes, for my sufferings, you will leave me alone to my madness: and if any hope of recovery from it should ever hereafter offer itself to me, I will not resist."

This last sentence ran off his pen—not out of his heart. Even when he saw it upon the paper, he began bitterly to weep. That he, under any circumstances, should renounce the happiness—even the wretchedness—of loving Ottilie! He only now began to feel what he was doing—he was going away without knowing what was to be the result. At any rate he was not to see her again *now*—with what certainty could he promise himself that he would ever see her again? But the letter was written—the horses were at the door; every moment he was afraid he might see Ottilie somewhere, and then his whole purpose would go to the winds. He collected himself—he remembered, that, at any rate, he would be able to return at any moment he pleased; and that, by his absence he would have advanced nearer to his wishes: on the other side, he pictured Ottilie to himself forced to leave the house if he stayed. He sealed the letter, ran down the steps, and sprang upon his horse.

As he rode past the hotel, he saw the beggar to whom he had given so much money the night before, sitting under the trees: the man was busy enjoying his dinner, and, as Edward passed, stood up, and made him the humblest obeisance. That figure had appeared to him yesterday, when Ottilie was on his arm; now it only served as a bitter reminiscence of the happiest hour of his life. His grief redoubled. The feeling of what he was leaving behind was intolerable. He looked again at the beggar. "Happy wretch!" he cried, "you can still feed upon the alms of yesterday—and I cannot any more on the happiness of yesterday!"

Next chapter
● Elective Affinities | Part one: Chapter seventeen

Previous chapter
● Elective Affinities | Part one: Chapter fifteen

Main
● Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

See also
● Goethe's affinity table | Used to make *Elective Affinities*.
● Goethe timeline | Historical overview of the construction of *Elective Affinities*.
● Goethe's human chemistry | Goethe's version of human chemistry.
● Goethean philosophy | Goethe's philosophy.
● Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References

1. (add)

In Elective Affinities (IAD), **Part one: Chapter ten** (add synopsis)

Part one: Chapter ten

The visitors were welcomed and brought in. They were delighted to find themselves again in the same house and in the same rooms where in early times they had passed many happy days, but which they had not seen for a long time. Their friends too were very glad to see them. The count and the baroness had both those tall fine figures which please in middle life almost better than in youth. If something of the first bloom had faded off them, yet there was an air in their appearance which was always irresistibly attractive. Their manners too were thoroughly charming. Their free way of taking hold of life and dealing with it, their happy humor, and apparent easy unembarrassment, communicated itself at once to the rest; and a lighter atmosphere hung about the whole party, without their having observed it stealing on them.

Description: "The Visitors Arriving" (HB:267)

The effect made itself felt immediately on the entrance of the new-comers. They were fresh from the fashionable world, as was to be seen at once, in their dress, in their equipment, and in everything about them; and they formed a contrast not a little striking with our friends, their country style, and the vehement feelings which were at work underneath among them. This, however, very soon disappeared in the stream of past recollection and present interests, and a rapid, lively conversation soon united them all. After a short time they again separated. The ladies withdrew to their own apartments, and there found amusement enough in the many things which they had to tell each other, and in setting to work at the same time to examine the new fashions, the spring dresses, bonnets, and such like; while the gentlemen were employing themselves looking at the new travelling chariots, trotting out the horses, and beginning at once to bargain and exchange.

They did not meet again till dinner; in the meantime they had changed their dress. And here, too, the newly-arrived pair showed to all advantage. Everything they wore was new, and in a style which their friends at the castle had never seen, and yet, being accustomed to it themselves, it appeared perfectly natural and graceful.

The conversation was brilliant and well sustained, as, indeed in the company of such persons everything and nothing appears to interest. They spoke in French that the attendants might not understand what they said, and swept in happiest humor over all that was passing in the great or the middle world. On one particular subject they remained, however, longer than was desirable. It was occasioned by Charlotte asking after one of her early friends, of whom she had to learn, with some distress, that she was on the point of being separated from her husband.

“It is a melancholy thing,” Charlotte said, “when we fancy our absent friends are finally settled, when we believe persons very dear to us to be provided for for life, suddenly to hear that their fortunes are cast loose once more; that they have to strike into a fresh path of life, and very likely a most insecure one.”

“Indeed, my dear friend,” the count answered, “it is our own fault if we allow ourselves to be surprised at such things. We please ourselves with imagining matters of this earth, and particularly matrimonial connections, as very enduring; and as concerns this last point, the plays which we see over and over again help to mislead us; being, as they are, so untrue to the course of the world. In a comedy we see a marriage as the last aim of a desire which is hindered and crossed through a number of acts, and at the instant when it is reached the curtain falls, and the momentary satisfaction continues to ring on in our ears. But in the world it is very different. The play goes on still behind the scenes, and when

the curtain rises again we may see and hear, perhaps, little enough of the marriage."

"It cannot be so very bad, however," said Charlotte, smiling. "We see people who have gone off the boards of the theatre, ready enough to undertake a part upon them again."

"There is nothing to say against that," said the count. "In a new character a man may readily venture on a second trial; and when we know the world we see clearly that it is only this positive eternal duration of marriage in a world where everything is in motion, which has anything unbecoming about it. A certain friend of mine, whose humor displays itself principally in suggestions for **new laws**, maintained that every marriage should be concluded only for five years. Five, he said, was a sacred number—pretty and uneven. Such a period would be long enough for people to learn one another's character, bring a child or two into the world, quarrel, separate, and what was best, get reconciled again. He would often exclaim, 'How happily the first part of the time would pass away!' Two or three years, at least, would be perfect bliss. On one side or other there would not fail to be a wish to have the relation continue longer, and the amiability would increase the nearer they got to the parting time. The indifferent, even the dissatisfied party, would be softened and gained over by such behavior; they would forget, as in pleasant company the hours pass always unobserved, how the time went by, and they would be delightfully surprised when, after the term had run out, they first observed that they had unknowingly prolonged it."

Charming and pleasant as all this sounded, and deep (Charlotte felt it to her soul) as was the moral significance which lay below it, expressions of this kind, on Ottilie's account, were most distasteful to her. She knew very well that nothing was more dangerous than the licentious conversation which treats culpable or semi-culpable actions as if they were common, ordinary, and even laudable, and of such undesirable kind assuredly were all which touched on the sacredness of marriage. She endeavored, therefore, in her skilful way, to give the conversation another turn, and when she found that she could not, it vexed her that Ottilie had managed everything so well that there was no occasion for her to leave the table. In her quiet observant way a nod or a look was enough for her to signify to the head-servant whatever was to be done, and everything went off perfectly, although there were a couple of strange men in livery in the way, who were rather a trouble than a convenience. And so the count, without feeling Charlotte's hints, went on giving his opinions on the same subject. Generally, he was little enough apt to be tedious in conversation; but this was a thing which weighed so heavily on his heart, and the difficulties which he found in getting separated from his wife were so great that it had made him bitter against everything which concerned the marriage bond,—that very bond which, notwithstanding, he was so anxiously desiring between himself and the baroness.

"The same friend," he went on, "has another law which he proposes. A marriage shall only be held indissoluble when either both parties, or at least one or the other, enter into it for the third time. Such persons must be supposed to acknowledge beyond a doubt that they find marriage indispensable for themselves; they have had opportunities of thoroughly knowing themselves; of knowing how they conducted themselves in their earlier unions; whether they have any peculiarities of temper, which are a more frequent cause of separation than bad dispositions. People would then observe one another more closely; they would pay as much attention to the married as to the unmarried, no one being able to tell how things may turn out."

"That would add no little to the interest of society," said Edward. "As things are now, when a man is married nobody cares any more either for his virtues or for his vices."

"Under this arrangement," the baroness struck in, laughing, "our good hosts have passed successfully over their two steps, and may make themselves ready for their third."

"Things have gone happily with them," said the count. "In their case death has done with a good will what in others the consistorial courts do with a very bad one."

"Let the dead rest," said Charlotte, with a half serious look.

"Why so," persevered the count, "when we can remember them with honor? They were generous enough to content themselves with less than their number of years for the sake of the larger good which they could leave behind them."

“Alas! that in such cases,” said the baroness, with a suppressed sigh, “happiness is only bought with the sacrifice of our fairest years.”

“Indeed, yes,” answered the count; “and it might drive us to despair, if it were not the same with everything in this world. Nothing goes as we hope. Children do not fulfil what they promise; young people very seldom;—and if they keep their word, the world does not keep its word with them.”

Charlotte, who was delighted that the conversation had taken a turn at last, replied cheerfully,

“Well, then, we must content ourselves with enjoying what good we are to have in fragments and pieces, as we can get it; and the sooner we can accustom ourselves to this the better.” “Certainly,” the count answered, “you two have had the enjoyment of very happy times. When I look back upon the years when you and Edward were the loveliest couple at the court, I see nothing now to be compared with those brilliant times, and such magnificent figures. When you two used to dance together, all eyes were turned upon you, fastened upon you, while you saw nothing but each other.”

“So much has changed since those days,” said Charlotte, “that we can listen to such pretty things about ourselves without our modesty being shocked at them.”

“I often privately found fault with Edward,” said the count, “for not being more firm. Those singular parents of his would certainly have given way at last; and ten fair years is no trifle to gain.”

“I must take Edward’s part,” struck in the baroness. “Charlotte was not altogether without fault—not altogether free from what we must call prudential considerations; and although she had a real, hearty love for Edward, and did in her secret soul intend to marry him, I can bear witness how sorely she often tried him; and it was through this that he was at last unluckily prevailed upon to leave her and go abroad, and try to forget her.”

Edward bowed to the baroness, and seemed grateful for her advocacy.

“And then I must add this,” she continued, “in excuse for Charlotte. The man who was at that time suing for her, had for a long time given proofs of his constant attachment to her; and, when one came to know him well, was a far more lovable person than the rest of you may like to acknowledge.”

“My dear friend,” the count replied, a little pointedly, “confess, now, that he was not altogether indifferent to yourself, and that Charlotte had more to fear from you than from any other rival. I find it one of the highest traits in women, that they continue so long in their regard for a man, and that absence of no duration will serve to disturb or remove it.” “This fine feature, men possess, perhaps, even more,” answered the baroness. “At any rate, I have observed with you, my dear count, that no one has more influence over you than a lady to whom you were once attached. I have seen you take more trouble to do things when a certain person has asked you, than the friend of this moment would have obtained of you, if she had tried.”

“Such a charge as that one must bear the best way one can,” replied the count. “But as to what concerns Charlotte’s first husband, I could not endure him, because he parted so sweet a pair from one another—a really predestined pair, who, once brought together, have no reason to fear the five years, or be thinking of a second or third marriage.”

“We must try,” Charlotte said, “to make up for what we then allowed to slip from us.”

“Aye, and you must keep to that,” said the count; “your first marriages,” he continued, with some vehemence, “were exactly marriages of the true detestable sort. And, unhappily, marriages generally, even the best, have (forgive me for using a strong expression) something awkward about them. They destroy the delicacy of the relation; everything is made to rest on the broad certainty out of which one side or other, at least, is too apt to make their own advantage. It is all a matter of course; and they seem only to have got themselves tied together, that one or the other, or both, may go their own way the more easily.”

At this moment, Charlotte, who was determined once for all that she would put an end to the conversation, made a bold

effort at turning it, and succeeded. It then became more general. She and her husband and the captain were able to take a part in it. Even Ottilie had to give her opinion; and the dessert was enjoyed in the happiest humor. It was particularly beautiful, being composed almost entirely of the rich summer fruits in elegant baskets, with epergnes of lovely flowers arranged in exquisite taste.

The new laying-out of the park came to be spoken of; and immediately after dinner they went to look at what was going on. Ottilie withdrew, under pretence of having household matters to look to; in reality, it was to set to work again at the transcribing. The count fell into conversation with the captain, and Charlotte afterwards joined them. When they were at the summit of the height, the captain good-naturedly ran back to fetch the plan, and in his absence the count said to Charlotte,

“He is an exceedingly pleasing person. He is very well informed, and his knowledge is always ready. His practical power, too, seems methodical and vigorous. What he is doing here would be of great importance in some higher sphere.”

Charlotte listened to the captain’s praises with an inward delight. She collected herself, however, and composedly and clearly confirmed what the count had said. But she was not a little startled when he continued:

“This acquaintance falls most opportunely for me. I know of a situation for which he is perfectly suited, and I shall be doing the greatest favor to a friend of mine, a man of high rank, by recommending to him a person who is so exactly everything which he desires.”

Charlotte felt as if a thunderstroke had fallen on her. The count did not observe it: women, being accustomed at all times to hold themselves in restraint, are always able, even in the most extraordinary cases, to maintain an apparent composure; but she heard not a word more of what the count said, though he went on speaking.

“When I have made up my mind upon a thing,” he added, “I am quick about it. I have put my letter together already in my head, and I shall write it immediately. You can find me some messenger, who can ride off with it this evening.”

Charlotte was suffering agonies. Startled with the proposal, and shocked at herself, she was unable to utter a word. Happily, the count continued talking of his plans for the captain, the desirableness of which was only too apparent to Charlotte.

It was time that the captain returned. He came up and unrolled his design before the count. But with what changed eyes Charlotte now looked at the friend whom she was to lose. In her necessity, she bowed and turned away, and hurried down to the summer-house. Before she was half way there the tears were streaming from her eyes, and she flung herself into the narrow room in the little hermitage, and gave herself up to an agony, a passion, a despair, of the possibility of which, but a few moments before, she had not had the slightest conception.

Edward had gone with the baroness in the other direction towards the ponds. This ready-witted lady, who liked to be in the secret about everything, soon observed, in a

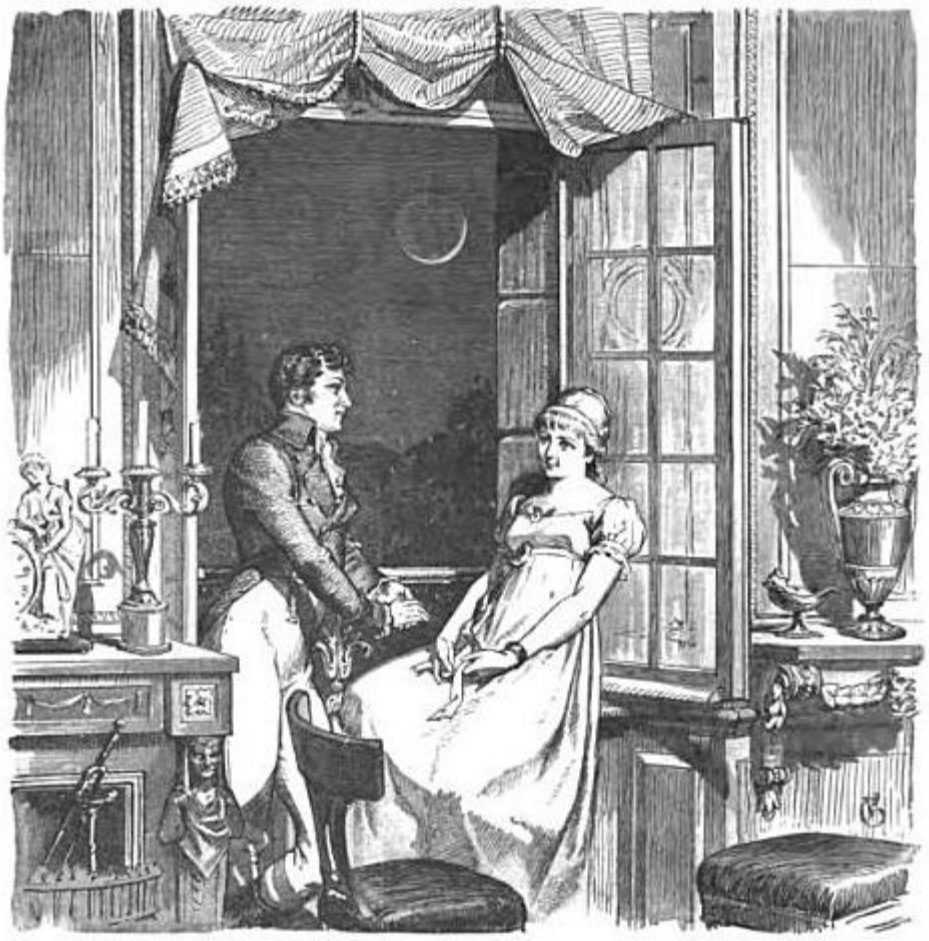

Description: "Edward Conversing with Ottilie". (HB:270)

few conversational feelers which she threw out, that Edward was very fluent and free-spoken in praise of Ottilie. She contrived in the most natural way to lead him out by degrees so completely, that at last she had not a doubt remaining that here was not merely an incipient fancy, but a veritable, full-grown passion.

Married women, if they have no particular love for one another, yet are silently in league together, especially against young girls. The consequences of such an inclination presented themselves only too quickly to her world-experienced spirit. Added to this, she had been already, in the course of the day, talking to Charlotte about Ottilie; she had disapproved of her remaining in the country, particularly being a girl of so retiring a character; and she had proposed to take Ottilie with her to the residence of a friend, who was just then bestowing great expense on the education of an only daughter, and who was only looking about to find some well-disposed companion for her,—to put her in the place of a second child, and let her share in every advantage. Charlotte had taken time to consider. But now this glimpse of the baroness into Edward's heart changed what had been but a suggestion at once into a settled determination; and the more rapidly she made up her mind about it, the more she outwardly seemed to flatter Edward's wishes. Never was there anyone more self-possessed than this lady; and to have mastered ourselves in extraordinary cases disposes us to treat even a common case with dissimulation—it makes us inclined, as we have had to do so much violence to ourselves, to extend our control over others, and hold ourselves in a degree compensated in what we outwardly gain for what we inwardly have been obliged to sacrifice. To this feeling there is often joined a kind of secret, spiteful pleasure in the blind, unconscious ignorance with which the victim walks on into the snare. It is not the immediately doing as we please which we enjoy, but the thought of the surprise and exposure which is to follow. And thus was the baroness malicious enough to invite Edward to come with Charlotte and pay her a visit at the grape-gathering; and, to his question whether they might bring Ottilie with them, to frame an answer which, if he pleased, he might interpret to his wishes.

Edward had already begun to pour out his delight at the beautiful scenery, the broad river, the hills, the rocks, the vineyard, the old castles, the water-parties, and the jubilee at the grape-gathering, the wine-pressing, etc., in all of which, in the innocence of his heart, he was only exuberating in the anticipation of the impression which these scenes were to make on the fresh spirit of Ottilie. At this moment they saw her approaching, and the baroness said quickly to

Edward, that he had better say nothing to her of this intended autumn expedition—things which we set our hearts upon so long before, so often failing to come to pass. Edward gave his promise; but he obliged his companion to move more quickly to meet her; and at last, when they came very close, he ran on several steps in advance. A heartfelt happiness expressed itself in his whole being. He kissed her hand as he pressed into it a nosegay of wild flowers, which he had gathered on his way.

The baroness felt bitter to her heart at the sight of it. At the same time that she was able to disapprove of what was really objectionable in this affection, she could not bear to see what was sweet and beautiful in it thrown away on such a poor paltry girl.

When they had collected again at the supper-table, an entirely different temper was spread over the party. The count, who had in the meantime written his letter and dispatched a messenger with it, occupied himself with the captain, whom he had been drawing out more and more—spending the whole evening at his side, talking of serious matters. The baroness, who sat on the count's right, found but small amusement in this; nor did Edward find any more. The latter, first because he was thirsty, and then because he was excited, did not spare the wine, and attached himself entirely to Ottilie, whom he had made sit by him. On the other side, next to the captain, sat Charlotte; for her it was hard, it was almost impossible, to conceal the emotion under which she was suffering.

The baroness had sufficient time to make her observations at leisure. She perceived Charlotte's uneasiness, and occupied as she was with Edward's passion for Ottilie, she easily satisfied herself that her abstraction and distress were owing to her husband's behavior; and she set herself to consider in what way she could best compass her ends.

Supper was over, and the party remained divided. The count, whose object was to probe the captain to the bottom, had to try many turns before he could arrive at what he wished with so quiet, so little vain, but so exceedingly laconic a person. They walked up and down together on one side of the saloon, while Edward, excited with wine and hope, was laughing with Ottilie at a window, and Charlotte and the baroness were walking backwards and forwards, without speaking, on the other side. Their being so silent, and their standing about in this uneasy, listless way, had its effect at last in breaking up the rest of the party. The ladies withdrew to their rooms, the gentlemen to the other wing of the castle; and so this day appeared to be concluded.

Next chapter
â— Elective Affinities | Part one: Chapter eleven

Previous chapter
â— Elective Affinities | Part one: Chapter nine

â— Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

See also

â— Goethe’s affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe’s human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations

N1. (add)

References

1. (add)

In Elective Affinities (IAD), **Part one: Chapter thirteen** (add synopsis)

Part one: Chapter thirteen

Edward, on his part, was in a very different temper. So little he thought of sleeping that it did not once occur to him even to undress himself. A thousand times he kissed the transcript of the document, but it was the beginning of it, in Ottilie's childish, timid hand; the end he scarcely dared to kiss, for he thought it was his own hand which he saw. Oh, that it were another document! he whispered to himself; and, as it was, he felt it was the sweetest assurance that his highest wish would be fulfilled. Thus it remained in his hands, thus he continued to press it to his heart, although disfigured by a third name subscribed to it. The waning moon rose up over the wood. The warmth of the night drew Edward out into the free air. He wandered this way and that way; he was at once the most restless and the happiest of mortals. He strayed through the gardens—they seemed too narrow for him; he hurried out into the park, and it was too wide. He was drawn back toward the castle; he stood under Ottilie's window. He threw himself down on the steps of the terrace below. "Walls and bolts," he said to himself, "may still divide us, but our hearts are not divided. If she were here before me, into my arms she would fall, and I into hers; and what can one desire but that sweet certainty!" All was stillness round him; not a breath was moving;—so still it was, that he could hear the unresting creatures underground at their work, to whom day or night are alike. He abandoned himself to his delicious dreams; at last he fell asleep, and did not wake till the sun with his royal beams was mounting up in the sky and scattering the early mists.

He found himself the first person awake on his domain. The laborers seemed to be staying away too long: they came, he thought they were too few, and the work set out for the day too slight for his desires. He inquired for more workmen; they were promised, and in the course of the day they came. But these, too, were not enough for him to carry his plans out as rapidly as he wished. To do the work gave him no pleasure any longer; it should all be done. And for whom? The paths should be graveled that Ottilie might walk pleasantly upon them; seats should be made at every spot and corner that Ottilie might rest on them. The new park-house was hurried forward. It should be finished for Ottilie's birthday. In all he thought and all he did, there was no more moderation. The sense of loving and of being loved, urged him out into the unlimited. How changed was now to him the look of all the rooms, their furniture, and their decorations! He did not feel as if he was in his own house any more. Ottilie's presence absorbed everything. He was utterly lost in her; no other thought ever rose before him; no conscience disturbed him; every restraint which had been laid upon his nature burst loose. His whole being centered upon Ottilie. This impetuosity of passion did not escape the captain, who longed, if he could, to prevent its evil consequences. All those plans which were now being hurried on with this immoderate speed, had been drawn out and calculated for a long, quiet, easy execution. The sale of the farm had been completed; the first instalment had been paid. Charlotte, according to the arrangement, had taken possession of it. But the very first week after, she found it more than usually necessary to exercise patience and resolution, and to keep her eye on what was being done. In the present hasty style of proceeding, the money which had been set apart for the purpose would not go far.

Much had been begun, and much yet remained to be done. How could the captain leave Charlotte in such a situation? They consulted together, and agreed that it would be better that they themselves should hurry on the works, and for this purpose employ money which could be made good again at the period fixed for the discharge of the second installment of what was to be paid for the farm. It could be done almost without loss. They would have a freer hand. Everything would progress simultaneously. There were laborers enough at hand, and they could get more accomplished at once, and arrive swiftly and surely at their aim. Edward gladly gave his consent to a plan which so entirely coincided with his own views. During this time Charlotte persisted with all her heart in what she had determined for herself, and her friend stood by her with a like purpose, manfully. This very circumstance, however, produced a greater intimacy between them. They spoke openly to one another of Edward's passion, and consulted what had better be done. Charlotte kept Ottilie more about herself, watching her narrowly; and the more she understood her own heart, the deeper she was able to penetrate into the heart of the poor girl. She saw no help for it, except in sending her away.

It now appeared a happy thing to her that Luciana had gained such high honors at the school; for her great aunt, as soon as she heard of it, desired to take her entirely to herself, to keep her with her, and bring her out into the world. Ottilie could, therefore, return thither. The captain would leave them well provided for, and everything would be as it had been a few months before; indeed, in many respects better. Her own position in Edward's affection, Charlotte thought she could soon recover; and she settled it all, and laid it all out before herself so sensibly that she only strengthened herself

more completely in her delusion, as if it were possible for them to return within their old limits,—as if a bond which had been violently broken could again be joined together as before.

In the meantime Edward felt very deeply the hindrances which were thrown in his way. He soon observed that they were keeping him and Ottilie separate; that they made it difficult for him to speak with her alone, or even to approach her, except in the presence of others. And while he was angry about this, he was angry at many things besides. If he caught an opportunity for a few hasty words with Ottilie, it was not only to assure her of his love, but to complain of his wife and of the captain. He never felt that with his own irrational haste he was on the way to exhaust the cash-box. He found bitter fault with them, because in the execution of the work they were not keeping to the first agreement, and yet he had been himself a consenting party to the second; indeed, it was he who had occasioned it and made it necessary.

Hatred is a partisan, but love is even more so. Ottilie also estranged herself from Charlotte and the captain. As Edward was complaining one day to Ottilie of the latter, saying that he was not treating him like a friend, or, under the circumstances, acting quite uprightly, she answered unthinkingly, “I have once or twice had a painful feeling that he was not quite honest with you. I heard him say once to Charlotte, ‘I Edward would but spare us that eternal flute of his! He can make nothing of it, and it is too disagreeable to listen to him.’ You may imagine how it hurt me, when I like accompanying you so much.”

She had scarcely uttered the words when her conscience whispered to her that she had much better have been silent. However, the thing was said. Edward’s features worked violently. Never had anything stung him more. He was touched on his tenderest point. It was his amusement; he followed it like a child. He never made the slightest pretensions; what gave him pleasure should be treated with forbearance by his friends. He never thought how intolerable it is for a third person to have his ears lacerated by an unsuccessful talent. He was indignant; he was hurt in a way which he could not forgive. He felt himself discharged from all obligations.

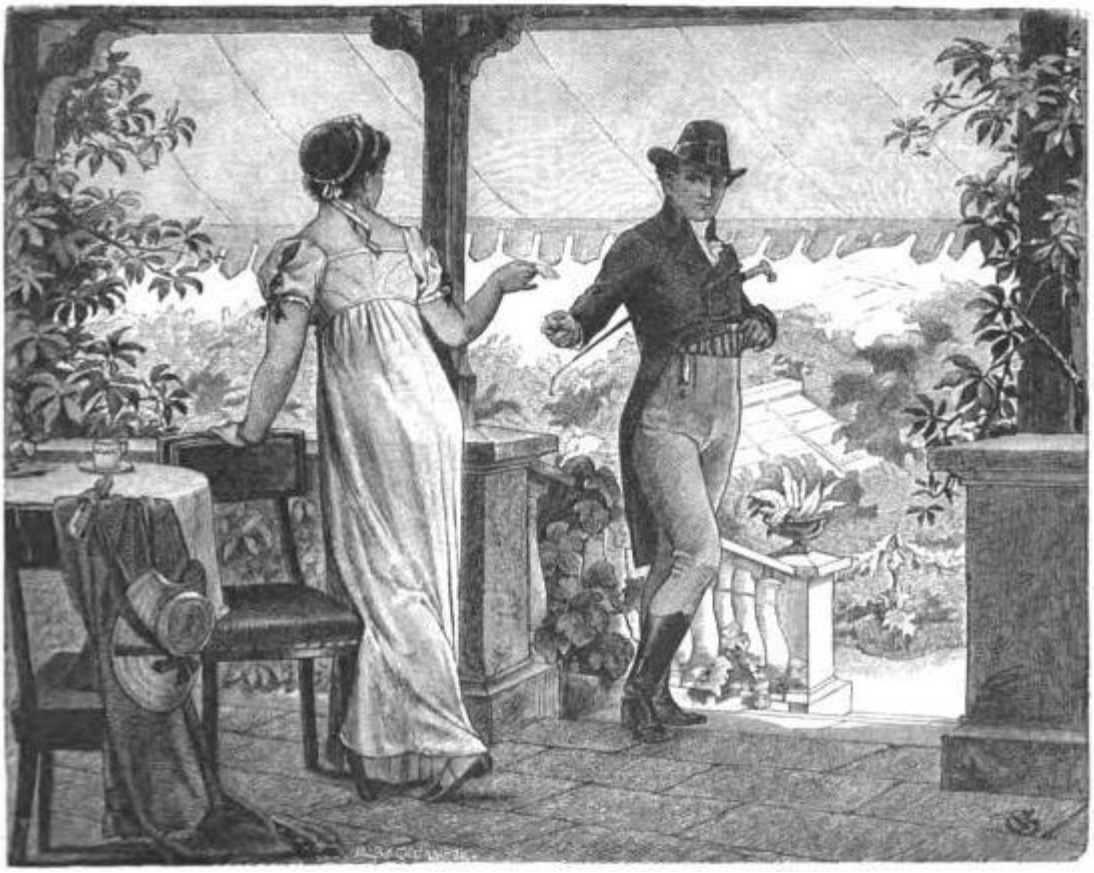

Description: "Charlotte Handing the Note to Edward." (HB: 279)

The necessity of being with Ottilie, of seeing her, whispering to her, exchanging his confidence with her, increased with every day. He determined to write to her, and ask her to carry on a secret correspondence with him. The strip of paper on which he had, laconically enough, made his request, lay on his writing-table, and was swept off by a draught of wind as his valet entered to dress his hair. The latter was in the habit of trying the heat of the iron by picking up any scraps of paper which might be lying about. This time his hand fell on the billet; he twisted it up hastily, and it was burnt. Edward observing the mistake snatched it out of his hand. After the man was gone, he sat himself down to write it over again. The second time it would not run so readily off his pen. It gave him a little uneasiness; he hesitated, but he got over it. He squeezed the paper into Ottilie’s hand the first moment he was able to approach her. Ottilie answered him immediately. He put the note unread in his waistcoat pocket, which, being made short in the fashion of the time, was shallow, and did not hold it as it ought. It worked out, and fell without

his observing it on the ground, Charlotte saw it, picked it up, and after giving a hasty glance at it, reached it to him.

“Here is something in your handwriting,” she said, “which you may be sorry to lose.”

He was confounded. Is she dissembling? he thought to himself. Does she know what is in the note, or is she deceived by the resemblance of the hand? He hoped, he believed the latter. He was warned—doubly warned; but those strange accidents, through which a higher intelligence seems to be speaking to us, his passion was not able to interpret. Rather, as he went further and further on, he felt the restraint under which his friend and his wife seemed to be holding him the more intolerable. His pleasure in their society was gone. His heart was closed against them, and though he was obliged to endure their society, he could not succeed in rediscovering or in reanimating within his heart anything of his old affection for them. The silent reproaches which he was forced to make to himself about it were disagreeable to him. He tried to help himself with a kind of humor which, however, being without love, was also without its usual grace.

Over all such trials, Charlotte found assistance to rise in her own inward feelings. She knew her own determination. Her own affection, fair and noble as it was, she would utterly renounce.

And sorely she longed to go to the assistance of the other two. Separation, she knew well, would not alone suffice to heal so deep a wound. She resolved that she would speak openly about it to Ottilie herself. But she could not do it. The recollection of her own weakness stood in her way. She thought she could talk generally to her about the sort of thing. But general expressions about “the sort of thing,” fitted her own case equally well, and she could not bear to touch it. Every hint which she would give Ottilie, recoiled back on her own heart. She would warn, and she was obliged to feel that she might herself still be in need of warning.

She contented herself, therefore, with silently keeping the lovers more apart, and by this gained nothing. The slight hints which frequently escaped her had no effect upon Ottilie; for Ottilie had been assured by Edward that Charlotte was devoted to the captain, that Charlotte herself wished for a separation, and that he was at this moment considering the readiest means by which it could be brought about.

Ottilie, led by the sense of her own innocence along the road to the happiness for which she longed, only lived for Edward. Strengthened by her love for him in all good, more light and happy in her work for his sake, and more frank and open towards others, she found herself in a heaven upon earth.

So all together, each in his or her own fashion, reflecting or unreflecting, they continued on the routine of their lives. All seemed to go its ordinary way, as, in monstrous cases, when everything is at stake, men will still live on, as if it were all nothing.

next
Next chapter
● Elective Affinities | Part one: Chapter fourteen

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● Elective Affinities | Part one: Chapter twelve

Main
● Elective Affinities: Illustrated, Annotated, and Decoded

Elective Affinities

Discussion
(add)

See also
- Goethe’s affinity table | Used to make *Elective Affinities*.
- Goethe timeline | Historical overview of the construction of *Elective Affinities*.
- Goethe’s human chemistry | Goethe's version of human chemistry.
- Goethean philosophy | Goethe's philosophy.
- Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References
1. (add)

In Elective Affinities (IAD), **Part one: Chapter three** (add synopsis).

Active characters:
Discussed characters:
Locations:

Reaction: Captain arrives at the Estate

(single elective affinity)

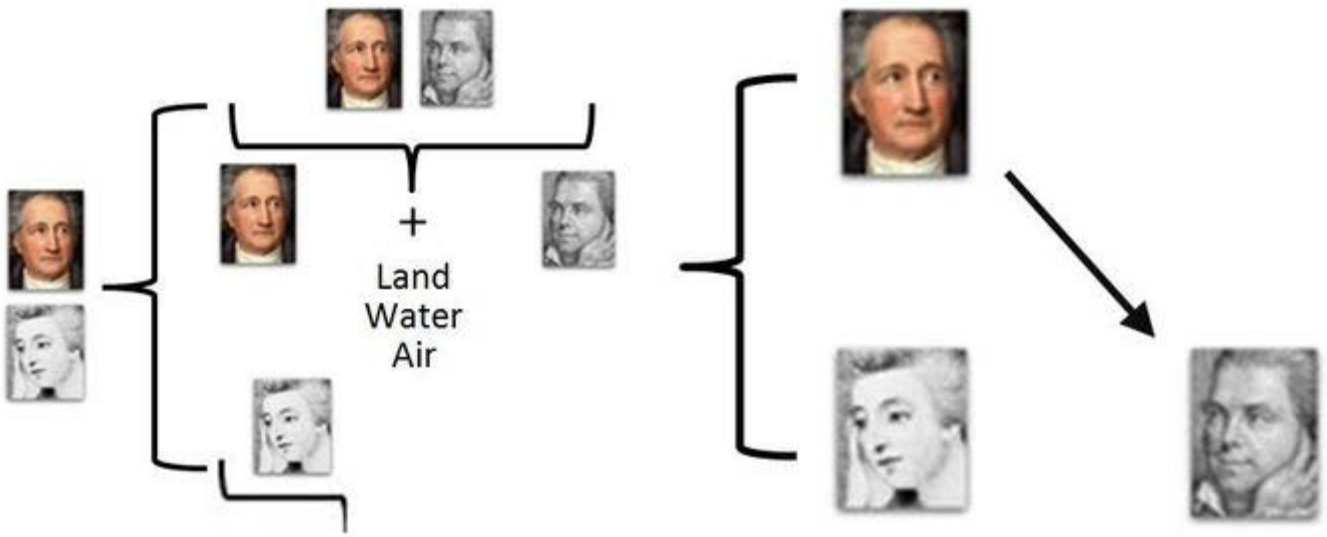

Left: **Reaction** | Bergman style: the Captain is introduced into the system (Edward and Charlotte existing on their estate).Right: **Reaction** | Cullen style: the Captain is introduced into the system (Edward and Charlotte existing on their estate); Cullen (1756): "the **dart** → between them expresses the *elective attraction*; when I put a dart with the tail to one substance and the point to another, I mean that the substance to which the tail is directed unites with the one to which the point is directed more strongly than it does with the one united to it in the **crotchet** {."

Part one: Chapter three

The captain came, having previously written a most sensible letter, which had entirely quieted Charlotte's apprehensions. So much clearness about himself, so just an understanding of his own position and the position of his friends, promised everything which was best and happiest.

The conversation of the first few hours, as is generally the case with friends who have not met for a long time, was eager, lively, almost exhausting. Towards evening, Charlotte proposed a walk to the new grounds. The captain was delighted with the spot, and observed every beauty which had been first brought into sight and made enjoyable by the new walks. He had a practised eye, and at the same time one easily satisfied; and although he knew very well what was really valuable, he never, as so many persons do, made people who were showing him things of their own uncomfortable, by requiring more than the circumstances admitted of, or by mentioning anything more perfect, which he remembered having seen elsewhere.

When they arrived at the summer-house, they found it dressed out for a holiday, only, indeed, with artificial flowers and evergreens, but with some pretty bunches of natural cornears among them, and other field and garden fruit, so as to do credit to the taste which had arranged them.

"Although my husband does not like in general to have his birthday or christening-day kept," Charlotte said, "he will not object to-day to these few ornaments being expended on a treble festival."

"Treble?" cried Edward.

"Yes, indeed," she replied. "Our friend's arrival here we are bound to keep as a festival; and have you never thought, either of you, that this is the day on which you were both christened? Are you not both named Otto?"

The two friends shook hands across the little table.

"You bring back to my mind," Edward said, "this little link of our boyish affection. As children, we were both called so; but when we came to be at school together it was the cause of much confusion, and I readily made over to him all my right to the pretty laconic name."

“Wherein you were not altogether so very high-minded,” said the captain; “for I well remember that the name of Edward had then begun to please you better, from its attractive sound when spoken by certain pretty lips.”

They were now sitting all three round the same table where Charlotte had spoken so vehemently against their guest’s coming to them. Edward, happy as he was, did not wish to remind his wife of that time; but he could not help saying,

“There is good room here for one more person.”

At this moment the notes of a bugle were heard across from the castle. Full of happy thoughts and feelings as the friends all were together, the sound fell in among them with a strong force of answering harmony. They listened silently, each for the moment withdrawing into himself, and feeling doubly happy in the fair circle of which he formed a part. The pause was first broken by Edward, who started up and walked out in front of the summer-house.

“Our friend must not think,” he said to Charlotte, “that this narrow little valley forms the whole of our domain and possessions. Let us take him up to the top of the hill, where he can see farther and breathe more freely.”

“For this once, then,” answered Charlotte, “we must climb up the old footpath, which is not too easy. By the next time, I hope my walks and steps will have been carried right up.”

And so, among rocks, and shrubs, and bushes, they made their way to the summit, where they found themselves, not on a level flat, but on a sloping grassy terrace, running along the ridge of the hill. The village, with the castle behind it, was out of sight. At the bottom of the valley, sheets of water were seen spreading out right and left, with wooded hills rising immediately from their opposite margin, and, at the end of the upper water, a wall of sharp, precipitous rocks directly overhanging it, their huge forms reflected in its level surface. In the hollow of the ravine, where a considerable brook ran into the lake, lay a mill, half hidden among the trees, a sweetly retired spot, most beautifully surrounded; and through the entire semicircle over which the view extended ran an endless variety of hills and valleys, copse and forest, the early green of which promised the near approach of a luxuriant clothing of foliage. In many places particular groups of trees caught the eye; and especially a cluster of planes and poplars directly at the spectator’s feet, close to the edge of the center lake. They were at their full growth, and they stood there, spreading out their boughs all around them, in fresh and luxuriant strength.

To these Edward called his friend’s attention.

“I myself planted them,” he cried, “when I was a boy. They were small trees which I rescued when my father was laying out the new part of the great castle garden, and in the middle of one summer had rooted them out. This year you will no doubt see them show their gratitude in a fresh set of shoots.”

They returned to the castle in high spirits, and mutually pleased with each other. To the guest was allotted an agreeable and roomy set of apartments in the right wing of the castle; and here he rapidly got his books and papers and instruments in order, to go on with his usual occupation. But Edward, for the first few days, gave him no

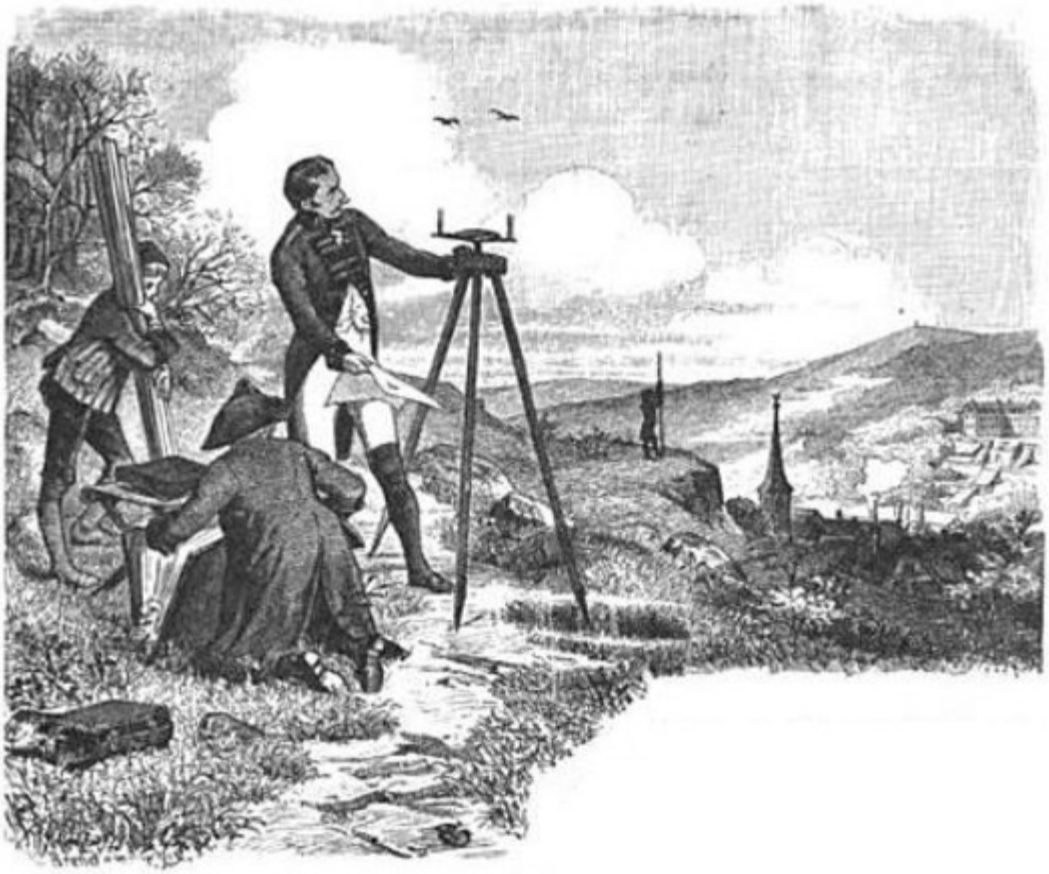

Description: "Edward and the Captain Surveying" (HB:241).

rest. He took him about everywhere, now on foot, now on horseback, making him acquainted with the country and with the estate; and he embraced the opportunity of imparting to him the wishes which he had been long entertaining, of getting at some better acquaintance with it, and learning to manage it more profitably.

“The first thing we have to do,” said the captain, “is to make a magnetic survey of the property. That is a pleasant and easy matter; and if it does not admit of entire exactness, it will be always useful, and will do, at any rate, for an agreeable beginning. It can be made, too, without any great staff of assistants, and one can be sure of getting it completed. If by-and-by you come to require anything more exact, it will be easy then to find some plan to have it made.”

The captain was exceedingly skillful at work of this kind. He had brought with him whatever instruments he required, and commenced immediately. Edward provided him with a number of foresters and peasants, who, with his instruction, were able to render him all necessary assistance. The weather was favorable. The evenings and the early mornings were devoted to the designing and drawing, and in a short time it was all filled in and colored. Edward saw his possessions grow out like a new creation upon the paper; and it seemed as if now for the first time he knew what they were, as if they now first were properly his own.

Thus there came occasion to speak of the park, and of the ways of laying it out; a far better disposition of things being made possible after a survey of this kind, than could be arrived at by experimenting on nature, on partial and accidental impressions.

“We must make my wife understand this,” said Edward.

“We must do nothing of the kind,” replied the captain, who did not like bringing his own notions in collision with those of others. He had learned by experience that the motives and purposes by which men are influenced are far too various to be made to coalesce upon a single point, even on the most solid representations. “We must not do it,” he cried; “she will be only confused. With her, as with all people who employ themselves on such matters merely as amateurs, the important thing is, rather that she shall do something, than that something shall be done. Such persons feel their way

with nature. They have fancies for this plan or that; they do not venture on removing obstacles. They are not bold enough to make a sacrifice. They do not know beforehand in what their work is to result. They try an experiment—it succeeds—it fails; they alter it; they alter, perhaps, what they ought to leave alone, and leave what they ought to alter; and so, at last, there always remains but a patchwork, which pleases and amuses, but never satisfies."

"Acknowledge candidly," said Edward, "that you do not like this new work of hers."

"The idea is excellent," he replied; "if the execution were equal to it there would be no fault to find. But she has tormented herself to find her way up that rock; and she now torments everyone, if you must have it, that she takes up after her. You cannot walk together—you cannot walk behind one another with any freedom. Every moment your step is interrupted one way or another. There is no end to the mistakes which she has made."

"Would it have been easy to have done it otherwise?" asked Edward.

"Perfectly," replied the captain. "She had only to break away a corner of the rock, which is now but an unsightly object, made up as it is of little pieces, and she would at once have a sweep for her walk and stone in abundance for the rough masonry work, to widen it in the bad places, and make it smooth. But this I tell you in strictest confidence. Her it would only confuse and annoy. What is done must remain as it is. If any more money and labor is to be spent there, there is abundance to do above the summer-house on the hill, which we can settle our own way."

If the two friends found in their occupation abundance of present employment, there was no lack either of entertaining reminiscences of early times, in which Charlotte took her part as well. They determined, moreover, that as soon as their immediate labors were finished, they would go to work upon the journal, and in this way, too, reproduce the past.

For the rest, when Edward and Charlotte were alone, there were fewer matters of private interest between them than formerly. This was especially the case since the fault-finding about the grounds, which Edward thought so just, and which he felt to the quick. He held his tongue about what the captain had said for a long time; but at last, when he saw his wife again preparing to go to work above the summer-house, with her paths and steps, he could not contain himself any longer, but, after a few circumlocutions, came out with his new views.

Charlotte was thoroughly disturbed. She was sensible enough to perceive at once that they were right, but there was the difficulty with what was already done,—and what was made was made. She had liked it; even what was wrong had become dear to her in its details. She fought against her convictions; she defended her little creations; she railed at men who were forever going to the broad and the great. They could not let a pastime, they could not let an amusement alone, she said, but they must go and make a work out of it, never thinking of the expense which their larger plans involved. She was provoked, annoyed and angry. Her old plans she could not give up, the new she would not quite throw from her; but, divided as she was, for the present she put a stop to the work, and gave herself time to think the thing over, and let it ripen by itself.

At the same time that she lost this source of active amusement, the others were more and more together over their own business. They took to occupying themselves, moreover, with the flower-garden and the hot-houses; and as they filled up the intervals with the ordinary gentlemen's amusements, hunting, riding, buying, selling, breaking horses, and such matters, she was every day left more and more to herself. She devoted herself more assiduously than ever to her correspondence on account of the captain; and yet she had many lonely hours; so that the information which she now received from the school became of more agreeable interest.

To a long-drawn letter of the superior of the establishment, filled with the usual expressions of delight at her daughter's progress, a brief postscript was attached, with a second from the hand of a gentleman in employment there as an assistant, both of which we here communicate.

Postscript of the Superior | The Headmistress's Postscript [N1]

"Of Ottilie, I can only repeat to your ladyship what I have already stated in my former letters. I do not know how to find

fault with her, yet I cannot say that I am satisfied. She is always unassuming, always ready to oblige others; but it is not pleasing to see her so timid, so almost servile.

“Your ladyship lately sent her some money, with several little matters for her wardrobe. The money she has never touched, the dresses lay unworn in their place. She keeps her things very nice and very clean; but this is all she seems to care about. Again, I cannot praise her excessive abstemiousness in eating and drinking. There is no extravagance at our table, but there is nothing that I like better than to see the children eat enough of good, wholesome food. What is carefully provided and set before them ought to be taken; and to this I never can succeed in bringing Ottilie. She is always making herself some occupation or other, always finding something which she must do, something which the servants have neglected, to escape the second course or the dessert; and now it has to be considered (which I cannot help connecting with all this) that she frequently suffers, I have lately learned, from pain in the left side of her head. It is only at times, but it is distressing, and may be of importance. So much upon this otherwise sweet and lovely girl.”

Second Postscript, by the Assistant | The Schoolmaster’s Letter [N2]

“Our excellent superior commonly permits me to read the letters in which she communicates her observations upon her pupils to their parents and friends. Such of them as are addressed to your ladyship I ever read with twofold attention and pleasure. We have to congratulate you upon a daughter who unites in herself every brilliant quality with which people distinguish themselves in the world; and I at least think you no less fortunate in having had bestowed upon you, in your step-daughter, a child who has been born for the good and happiness of others, and assuredly also for her own. Ottilie is almost our only pupil about whom there is a difference of opinion between myself and our reverend superior. I do not complain of the very natural desire in that good lady to see outward and definite fruits arising from her labors. But there are also fruits which are not outward, which are of the true germinal sort, and which develop themselves sooner or later in a beautiful life. And this I am certain is the case with your protégée. So long as she has been under my care, I have watched her moving with an even step, slowly, steadily forward—never back. As with a child it is necessary to begin everything at the beginning, so it is with her. She can comprehend nothing which does not follow from what precedes it; let a thing be as simple and easy as possible, she can make nothing of it if it is not in a recognizable connection; but find the intermediate links, and make them clear to her, and then nothing is too difficult for her.

“Progressing with such slow steps, she remains behind her companions, who, with capacities of quite a different kind, hurry on and on, learn everything readily, connected or unconnected, recollect it with ease, and apply it with correctness. And again, some of the lessons here are given by excellent, but somewhat hasty and impatient teachers, who pass from result to result, cutting short the process by which they are arrived at; and these are not of the slightest service to her; she learns nothing from them. There is a complaint of her handwriting. They say she will not, or cannot, understand how to form her letters. I have examined closely into this. It is true she writes slowly, stiffly, if you like; but the hand is neither timid nor without character. The French language is not my department, but I have taught her something of it, in the step-by-step fashion; and this she understands easily. Indeed, it is singular that she knows a great deal, and knows it well, too; and yet when she is asked a question, it seems as if she knew nothing.

“To conclude generally, I should say she learns nothing like a person who is being educated, but she learns like one who is to educate—not like a pupil, but like a future teacher. Your ladyship may think it strange that I, as an educator and a teacher, can find no higher praise to give to any one than by a comparison with myself. I may leave it to your own good sense, to your deep knowledge of the world and of mankind, to make the best of my most inadequate, but well-intended expressions. You may satisfy yourself that you have much happiness to promise yourself from this child. I commend myself to your ladyship, and I beseech you to permit me to write to you again as soon as I see reason to believe that I have anything important or agreeable to communicate.”

This letter gave Charlotte great pleasure. The contents of it coincided very closely with the notions which she had herself conceived of Ottilie. At the same time, she could not help smiling at the excessive interest of the assistant, which seemed greater than the insight into a pupil’s excellence usually calls forth. In her quiet, unprejudiced way of looking at things, this relation, among others, she was contented to permit to lie before her as a possibility; she could value the interest of so sensible a man in Ottilie, having learned, among the lessons of her life, to see how highly true regard is to be prized, in a world where indifference or dislike are the common natural residents.

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Annotations

N1. The chapter subsection title “POSTSCRIPT OF THE SUPERIOR”, is Hjalmar Boyesen’s 1885 rendition; the subsection title “The Headmistress’s Postscript” is David Constantine’s 1994 rendition, added in for clarity.
N2. The chapter subsection title “SECOND POSTSCRIPT, BY THE ASSISTANT”, is Hjalmar Boyesen’s 1885 rendition; the subsection title “The Schoolmaster’s Letter” is David Constantine’s 1994 rendition, added in for clarity.

See also

â— Goethe’s affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe’s human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

In Elective Affinities (IAD), **Part one: Chapter twelve** (add synopsis)

Part one: Chapter twelve

When the party assembled again at breakfast, an attentive observer might have read in the behavior of its various members the different things which were passing in their inner thoughts and feelings. The count and the baroness met with the air of happiness which a pair of lovers feel, who, after having been forced to endure a long separation, have mutually assured each other of their unaltered affection. On the other hand, Charlotte and Edward equally came into the presence of the captain and Ottilie with a sense of shame and remorse. For such is the nature of love that it believes in no rights except its own, and all other rights vanish away before it. Ottilie was in child-like spirits. For her—she was almost what might be called open. The captain appeared serious. His conversation with the count, which had roused in him feelings that for some time past had been at rest and dormant, had made him only too keenly conscious that here he was not fulfilling his work, and at bottom was but squandering himself in a half-activity of idleness.

Hardly had their guests departed, when fresh visitors were announced—to Charlotte most welcomely, all she wished for being to be taken out of herself, and to have her attention dissipated. They annoyed Edward, who was longing to devote himself to Ottilie; and Ottilie did not like them either; the copy which had to be finished the next morning early being still incomplete. They stayed a long time, and immediately that they were gone she hurried off to her room.

Description: "The Captain Carrying Charlotte" (by Philipp Johann) (HB:276/77)

It was now evening. Edward, Charlotte, and the captain had accompanied the strangers some little way on foot, before the latter got into their carriage, and previous to returning home they agreed to take a walk along the water-side.

A boat had come, which Edward had had fetched from a distance, at no little expense; and they decided that they would try whether it was easy to manage. It was made fast on the bank of the middle pond, not far from some old ash trees, on which they calculated to make an effect in their future improvements. There was to be a landing-place made there, and under the trees a seat was to be raised, with some wonderful architecture about it: it was to be the point for which people were to make when they went across the water.

“And where had we better have the landing-place on the other side?” said Edward. “I should think under my plane trees.”

“They stand a little too far to the right,” said the captain. “You are nearer the castle if you land further down. However, we must think about it.”

The captain was already standing in the stern of the boat, and had taken up an oar. Charlotte got in, and Edward with her

—he took the other oar; but as he was on the point of pushing off, he thought of Ottilie—he recollected that this water-party would keep him out late; who could tell when he would get back? He made up his mind shortly and promptly; sprang back to the bank, and reaching the other oar to the captain, hurried home—making excuses to himself as he ran.

Arriving there he learned that Ottilie had shut herself up—she was writing. In spite of the agreeable feeling that she was doing something for him, it was the keenest mortification to him not to be able to see her. His impatience increased every moment. He walked up and down the large drawing-room; he tried a thousand things, and could not fix his attention upon any. He was longing to see her alone, before Charlotte came back with the captain. It was dark by this time, and the candles were lighted.

At last she came in beaming with loveliness: the sense that she had done something for her friend had lifted all her being above itself. She put down the original and her transcript on the table before Edward.

“Shall we collate them?” she said, with a smile.

Edward did not know what to answer. He looked at her—he looked at the transcript. The first few sheets were written with the greatest carefulness in a delicate woman’s hand—then the strokes appeared to alter, to become more light and free—but who can describe his surprise as he ran his eyes over the concluding page? “For heaven’s sake,” he cried, “what is this? this is my hand?” He looked at Ottilie, and again at the paper; the conclusion, especially, was exactly as if he had written it himself. Ottilie said nothing, but she looked at him with her eyes full of the warmest delight. Edward stretched out his arms. “You love me!” he cried: “Ottilie, you love me!” They fell on each other’s breast—which had been the first to catch the other it would have been impossible to distinguish.

From that moment the world was all changed for Edward. He was no longer what he had been, and the world was no longer what it had been. They parted—he held her hands; they gazed in each other’s eyes. They were on the point of embracing each other again.

Charlotte entered with the captain. Edward inwardly smiled at their excuses for having stayed out so long. Oh! how far too soon you have returned, he said to himself.

They sat down to supper. They talked about the people who had been there that day. Edward, full of love and ecstasy, spoke well of every one—always sparing, often approving. Charlotte, who was not altogether of his opinion, remarked this temper in him, and jested with him about it—he who had always the sharpest thing to say on departed visitors, was this evening so gentle and tolerant.

With fervor and heartfelt conviction Edward cried, “One has only to love a single creature with all one’s heart, and the whole world at once looks lovely!”

Ottilie dropped her eyes on the ground, and Charlotte looked straight before her.

The captain took up the word, and said, “It is the same with deep feelings of respect and reverence: we first learn to recognize what there is that is to be valued in the world, when we find occasion to entertain such sentiments towards a particular object.”

Charlotte made an excuse to retire early to her room, where she could give herself up to thinking over what had passed in the course of the evening between herself and the captain. When Edward sprang on shore, and, pushing off the boat, had himself committed his wife and his friend to the uncertain element, Charlotte found herself face to face with the man on whose account she had been already secretly suffering so bitterly, sitting in the twilight before her, and sweeping along the boat with the sculls in easy motion. She felt a depth of sadness, very rare with her, weighing on her spirits. The undulating movement of the boat, the splash of the oars, the faint breeze playing over the watery mirror, the sighing of the reeds, the long flight of the birds, the fitful twinkling of the first stars—there was something spectral about it all in the universal stillness. She fancied her friend was bearing her away to set her on some far-off shore, and leave her there alone; strange emotions were passing through her, and she could not give way to them and weep.

The captain was describing to her the manner in which, in his opinion, the improvements should be continued. He praised the construction of the boat; it was so convenient, he said, because one person could so easily manage it with a pair of oars. She should herself learn how to do this; there was often a delicious feeling in floating along alone upon the water, one's own ferryman and steersman.

The parting which was impending, sank on Charlotte's heart as he was speaking. Is he saying this on purpose? she thought to herself. Does he know it yet? Does he suspect it? or is it only accident; and is he unconsciously foretelling me my fate?

A weary, impatient heaviness took hold of her; she begged him to make for land as soon as possible, and return with her to the castle.

It was the first time that the captain had been upon the water, and, though generally he had acquainted himself with its depth, he did not know accurately the particular spots. Dusk was coming on; he directed his course to a place where he thought it would be easy to get on shore, and from which he knew the footpath which led to the castle was not far distant. Charlotte, however, repeated her wish to get to land quickly, and the place which he thought of being at a short distance, he gave it up, and exerting himself as much as he possibly could, made straight for the bank. Unhappily the water was shallow, and he ran aground some way off from it. From the rate at which he was going the boat was fixed fast, and all his efforts to move it were in vain. What was to be done? There was no alternative but to get into the water and carry his companion ashore.

It was done without difficulty or danger. He was strong enough not to totter with her, or give her any cause for anxiety; but in her agitation she had thrown her arms about his neck. He held her fast, and pressed her to himself—and at last laid her down upon a grassy bank, not without emotion and confusion . . . she still lay upon his neck . . . he caught her up once more in his arms, and pressed a warm kiss upon her lips. The next moment he was at her feet: he took her hand, and held it to his mouth, and cried,

"Charlotte, will you forgive me?"

The kiss which he had ventured to give, and which she had all but returned to him, brought Charlotte to herself again—she pressed his hand—but she did not attempt to raise him up. She bent down over him, and laid her hand upon his shoulder, and said,

"We cannot now prevent this moment from forming an epoch in our lives; but it depends on us to bear ourselves in a manner which shall be worthy of us. You must go away, my dear friend; and you are going. The count has plans for you, to give you better prospects—I am glad, and I am sorry. I did not mean to speak of it till it was certain: but this moment obliges me to tell you my secret . . . Since it does not depend on ourselves to alter our feelings, I can only forgive you, I can only forgive myself, if we have the courage to alter our situation." She raised him up, took his arm to support herself, and they walked back to the castle without speaking.

But now she was standing in her own room, where she had to feel and to know that she was Edward's wife. Her strength and the various discipline in which through life she had trained herself, came to her assistance in the conflict. Accustomed as she had always been to look steadily into herself and to control herself, she did not now find it difficult, with an earnest effort, to come to the resolution which she desired. She could almost smile when she remembered the strange visit of the night before. Suddenly she was seized with a wonderful instinctive feeling, a thrill of fearful delight which changed into holy hope and longing. She knelt earnestly down, and repeated the oath which she had taken to Edward before the altar.

Friendship, affection, renunciation, floated in glad, happy images before her. She felt restored to health and to herself. A sweet weariness came over her. She lay down, and sunk into a calm, quiet sleep.

Next chapter
● Elective Affinities | Part one: Chapter thirteen

Previous chapter
● Elective Affinities | Part one: Chapter eleven

Main

● Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

See also
● Goethe's affinity table | Used to make *Elective Affinities*.
● Goethe timeline | Historical overview of the construction of *Elective Affinities*.
● Goethe's human chemistry | Goethe's version of human chemistry.
● Goethean philosophy | Goethe's philosophy.
● Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References
1. (add)

In Elective Affinities: IAD, **Part one: Chapter two** Edward dispatches a letter to send for the Captain; Edward and Charlotte discuss the state of affairs of her daughter Luciana, who is doing well at boarding school, and Ottilie, who, conversely, is doing poorly; the famous marriage mediator Mittler makes an appearance and gives his two-cents on things.

Active characters: Edward, Charlotte, Mittler [**new**], and several castle servants.
Discussed characters: Captain, Ottilie, Luciana, and Charlotte's aunt.
Locations: Edward's room, church yard, village, the saloon.

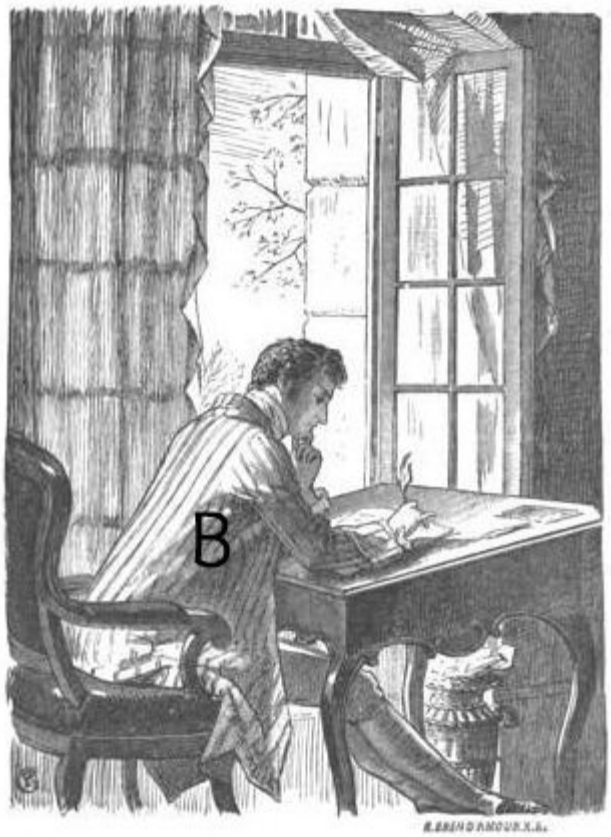

Description: "Edward Inditing the Letter" (HB:235).

Part one: Chapter two

Edward was alone in his room. The repetition of the incidents of his life from Charlotte's lips; the representation of their mutual situation, their mutual purposes; had worked him, sensitive as he was, into a very pleasant state of mind. While close to her—while in her presence—he had felt so happy, that he had thought out a warm, kind, but quiet and indefinite epistle which he would send to the captain. When, however, he had settled himself at his writing-table, and taken up his friend's letter to read it over once more, the sad condition of this excellent man rose again vividly before him. The feelings which had been all day distressing him again awoke, and it appeared impossible to him to leave one whom he called his friend in such painful embarrassment.

Edward was unaccustomed to deny himself anything. The only child, and consequently the spoiled child, of wealthy parents, who had persuaded him into a singular, but highly advantageous marriage with a lady far older than himself; and again by her petted and indulged in every possible way, she seeking to reward his kindness to her by the utmost liberality; after her early death his own master, traveling independently of every one, equal to all contingencies and all changes, with desires never excessive, but multiple and various—free-hearted, generous, brave, at times even noble—what was there in the world to cross or thwart him?

Hitherto, everything had gone as he desired! Charlotte had become his; he had won her at last, with an obstinate, a romantic fidelity; and now he felt himself, for the first time, contradicted, crossed in his wishes, when those wishes were to invite to his home the friend of his youth—just as he was longing, as it were, to throw open his whole heart to him. He felt annoyed, impatient; he took up his pen again and again, and as often threw it down again, because he could not make up his mind what to write. Against his wife's wishes he would not go; against her expressed desire he could not. Ill at ease as he was, it would have been impossible for him, even if he had wished, to write a quiet, easy letter. The most natural thing to do was to put it off. In a few words he begged his friend to forgive him for having left his letter unanswered; that day he was unable to write circumstantially; but shortly, he hoped to be able to tell him what he felt at greater length.

The next day, as they were walking to the same spot, Charlotte took the opportunity of bringing back the conversation to the subject, perhaps because she knew that there is no surer way of rooting out any plan or purpose, than by often talking it over.

It was what Edward was wishing. He expressed himself in his own way, kindly and sweetly. For although, sensitive as he was, he flamed up readily—although the vehemence with which he desired anything made him pressing, and his obstinacy made him impatient—his words were so softened by his wish to spare the feelings of those to whom he was speaking, that it was impossible not to be charmed, even when one most disagreed, with him.

This morning, he first contrived to bring Charlotte into the happiest humor, and then so disarmed her with the graceful

turn which he gave to the conversation, that she cried out at last:

“You are determined that what I refused to the husband you will make me grant to the lover. At least, my dearest,” she continued, “I will acknowledge that your wishes, and the warmth and sweetness with which you express them, have not left me untouched, have not left me unmoved. You drive me to make a confession;—till now, I too have had a concealment from you; I am in exactly the same position with you, and I have hitherto been putting the same restraint on my inclination which I have been exhorting you to put on yours.”

“Glad am I to hear that,” said Edward. “In the married state, a difference of opinion now and then, I see, is no bad thing; we learn something of one another by it.”

“You are to learn at present, then,” said Charlotte, “that it is with me about Ottilie as it is with you about the Captain. The dear child is most uncomfortable at the school, and I am thoroughly uneasy about her. Luciana, my daughter, born as she is for the world, is there training hourly for the world; languages, history, everything that is taught there, she acquires with so much ease that, as it were, she learns them off at sight. She has quick natural gifts, and an excellent memory, one may almost say she forgets everything, and in a moment calls it all back again. She distinguishes herself above everyone at the school with the freedom of her carriage, the grace of her movement, and the elegance of her address, and with the inborn royalty of nature makes herself the queen of the little circle there. The superior of the establishment regards her as a little divinity, who, under her hands, is shaping into excellence, and who will do her honor, gain her reputation, and bring her a large increase of pupils; the first pages of this good lady’s letters, and her monthly notices of progress, are forever hymns about the excellence of such a child, which I have to translate into my own prose; while her concluding sentences about Ottilie are nothing but excuse after excuse—attempts at explaining how it can be that a girl in other respects growing up so lovely seems coming to nothing, and shows neither capacity nor accomplishment. This, and the little she has to say besides, is no riddle to me, because I can see in this dear child the same character as that of her mother, who was my own dearest friend; who grew up with myself, and whose daughter, I am certain, if I had the care of her education, would form into an exquisite creature.

“This, however, has not fallen in with our plan, and as one ought not to be picking and pulling, or forever introducing new elements among the conditions of our life, I think it better to bear, and to conquer as I can, even the unpleasant impression that my daughter, who knows very well that poor Ottilie is entirely dependent upon us, does not refrain from flourishing her own successes in her face, and so, to a certain extent, destroys the little good which we have done for her. Who are well trained enough never to wound others by a parade of their own advantages? and who stands so high as not at times to suffer under such a slight? In trials like these, Ottilie’s character is growing in strength, but since I have clearly known the painfulness of her situation, I have been thinking over all possible ways to make some other arrangement. Every hour I am expecting an answer to my own last letter, and then I do not mean to hesitate any more. So, my dear Edward, it is with me. We have both, you see, the same sorrows to bear, touching both our hearts in the same point. Let us bear them together, since we neither of us can press our own against the other.”

“We are strange creatures,” said Edward, smiling. “If we can only put out of sight anything which troubles us, we fancy at once we have got rid of it. We can give up much in the large and general; but to make sacrifices in little things is a demand to which we are rarely equal. So it was with my mother,—as long as I lived with her, while a boy and a young man, she could not bear to let me be a moment out of her sight. If I was out later than usual in my ride, some misfortune must have happened to me. If I got wet through in a shower, a fever was inevitable. I traveled; I was absent from her altogether; and, at once, I scarcely seemed to belong to her. If we look at it closer,” he continued, “we are both acting very foolishly, very culpably. Two very noble natures, both of which have the closest claims on our affection, we are leaving exposed to pain and distress, merely to avoid exposing ourselves to a chance of danger. If this is not to be called selfish, what is? You take Ottilie. Let me have the Captain; and, for a short period, at least, let the trial be made.”

“We might venture it,” said Charlotte, thoughtfully, “if the danger were only to ourselves. But do you think it prudent to bring Ottilie and the Captain into a situation where they must necessarily be so closely intimate; the Captain, a man no older than yourself, of an age (I am not saying this to flatter you) when a man becomes first capable of love and first deserving of it, and a girl of Ottilie’s attractiveness?”

“I cannot conceive how you can rate Ottilie so high,” replied Edward. “I can only explain it to myself by supposing her

to have inherited your affection for her mother. Pretty she is, no doubt. I remember the Captain observing it to me, when we came back last year, and met her at your aunt's. Attractive she is,—she has particularly pretty eyes; but I do not know that she made the slightest impression upon me."

"That was quite proper in you," said Charlotte, "seeing that I was there; and, although she is much younger than I, the presence of your old friend had so many charms for you, that you overlooked the promise of the opening beauty. It is one of your ways; and that is one reason why it is so pleasant to live with you."

Charlotte, openly as she appeared to be speaking, was keeping back something, nevertheless; which was that at the time when Edward came first back from abroad, she had purposely thrown Ottilie in his way, to secure, if possible, so desirable a match for her protégée. For of herself, at that time, in connection with Edward, she never thought at all. The Captain, also, had a hint given to him to draw Edward's attention to her; but the latter, who was clinging determinately to his early affection for Charlotte, looked neither right nor left, and was only happy in the feeling that it was at last within his power to obtain for himself the one happiness which he so earnestly desired; and which a series of incidents had appeared to have placed forever beyond his reach

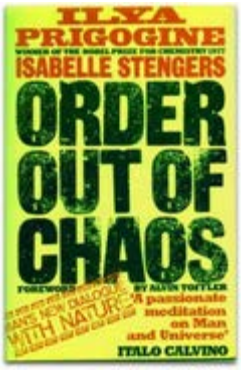

5. Dobbs, op. cit., also examined the role of the "mediator" by which two substances are made "sociable." We may recall here the importance of the mediator in Goethe's *Elective Affinities* (Engl. trans. Greenwood 1976). For what concerns chemistry, Goethe was not far from Newton.

Belgian chemist Ilya Prigogine's famous 1984 footnote 2.5, wherein, citing Betty Dobbs (1976), he explains how Goethe's Mittler (the mediator) has the ability to make two substances (chemical or human) sociable. [1]

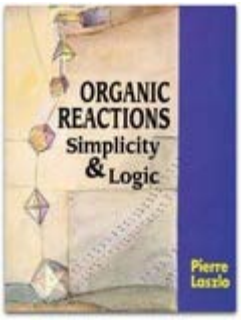

We will not develop further this topic in this chapter: the conversion from inert to labile—by lowering the transition state with an auxiliary molecule, a mediator (just like the character of a 'Mittler' in Goethe's *Elective Affinities*)—is by definition *catalysis*. Catalysis of organic reactions is a field in full expansion.

Mention of Mittler, by French organic chemist Pierre Laszlo (1995), as an auxiliary molecule (catalyst) that acts to lower the transition state, facilitating the process of catalysis of reactions. [2]

They were on the point of descending the new grounds, in order to return to the castle, when a servant came hastily to meet them, and, with a laugh on his face, called up from below, "Will your grace be pleased to come quickly to the castle? The Herr Mittler has just galloped into the court. He shouted to us, to go all of us in search of you, and we were to ask whether there was need, 'whether there is need,' he cried after us, 'do you hear? but be quick, be quick.' "

"The odd fellow," exclaimed Edward. "But has he not come at the right time, Charlotte? Tell him, there is need,—grievous need. He must alight. See his horse taken care of. Take him into the saloon, and let him have some luncheon. We shall be with him immediately."

"Let us take the nearest way," he said to his wife, and struck into the path across the churchyard, which he *usually avoided*. He was not a little surprised to find here, too, traces of Charlotte's delicate hand. Sparing, as far as possible, the old monuments, she had contrived to level it, and lay it carefully out, so as to make it appear a pleasant spot on which the eye and the imagination could equally repose with pleasure. The oldest stones had each their special honor assigned them. They were ranged according to their dates along the wall, either leaning against it, or let into it, or however it could be contrived; and the string-course of the church was thus variously ornamented. [N1]

Edward was singularly affected as he came in upon it through the little wicket: he pressed Charlotte's hand, and tears started into his eyes. But these were very soon put to flight by the appearance of their singular visitor.
This gentleman had declined sitting down in the castle; he had ridden straight through the village to the churchyard gate; and then, halting, he called out to his friends, "Are you not making a fool of me? Is there need, really? If there is, I can

stay till midday. But don't keep me. I have a great deal to do before night."

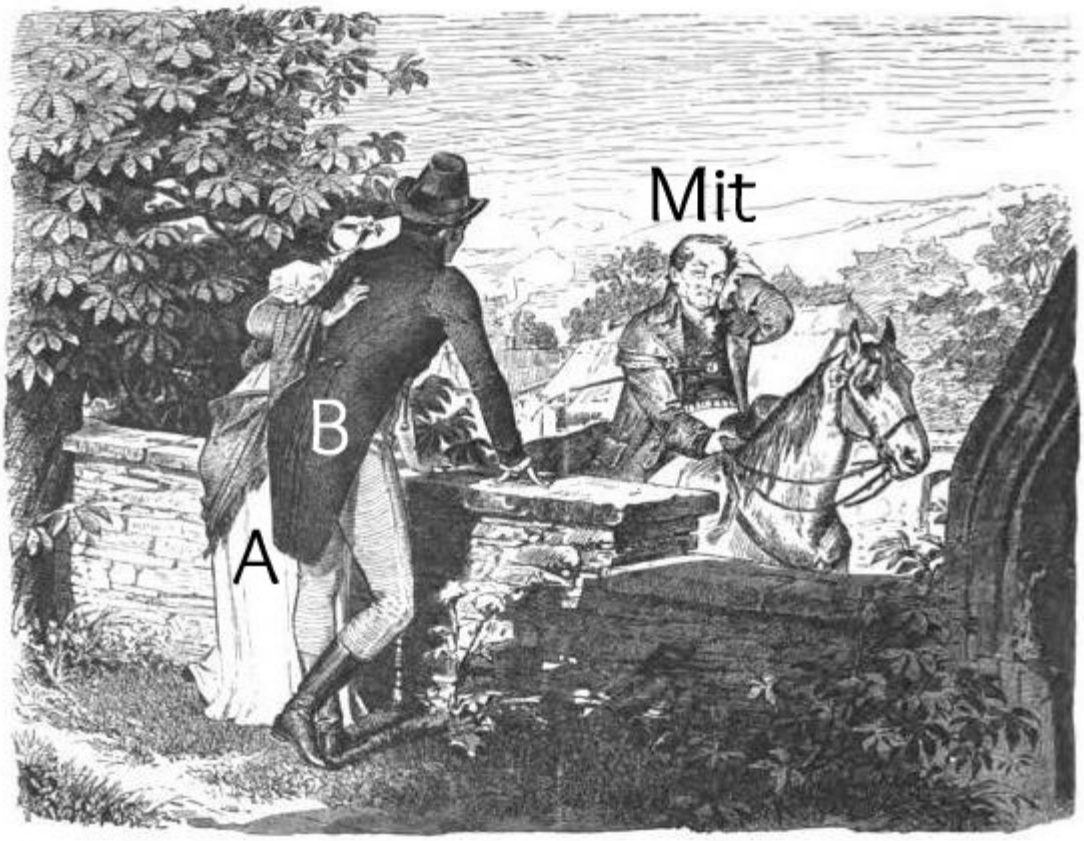

Description: "Mittler arriving at the Terrace" (HB:238).

"Since you have taken the trouble to come so far," cried Edward to him, in answer, "you had better come through the gate. We meet at a solemn spot. Come and see the variety which Charlotte has thrown over its sadness."

"Inside there," called out the rider, "come I neither on horseback, nor in carriage, nor on foot. These here rest in peace: with them I have nothing to do. One day I shall be carried in feet foremost. I must bear that as I can. Is it serious, I want to know?"

"Indeed it is," cried Charlotte, "right serious. For the first time in our married lives we are in a strait and difficulty, from which we do not know how to extricate ourselves."

"You do not look as if it were so," answered he. "But I will believe you. If you are deceiving me, for the future you shall help yourselves. Follow me quickly, my horse will be none the worse for a rest."

The three speedily found themselves in the saloon together. Luncheon was brought in, and Mittler told them what that day he had done, and was going to do. This eccentric person had in early life been a clergyman, and had distinguished himself in his office by the never-resting activity with which he contrived to make up and put an end to quarrels; quarrels in families, and quarrels between neighbors; first among the individuals immediately about him, and afterwards among whole congregations, and among the country gentlemen round. While he was in the ministry, no married couple were allowed to separate; and the district courts were untroubled with either cause or process. A knowledge of the law, he was well aware, was necessary to him. He gave himself with all his might to the study of it, and very soon felt himself a match for the best trained advocate. His circle of activity extended wonderfully, and people were on the point of inducing him to move to the residence, where he would find opportunities of exercising in the higher circles what he had begun in the lowest, when he won a considerable sum of money in a lottery. With this, he bought himself a small property. He let the ground to a tenant, and made it the center of his operations, with the fixed determination, or rather in accordance with his old customs and inclinations, *never to enter a house when there was no dispute to make up*, and no help to be given. People who were superstitious about names, and about what they imported, maintained that it was his being called Mittler which drove him to take upon himself this strange employment.

Luncheon was laid on the table, and the stranger then solemnly pressed his host not to wait any longer with the disclosure which he had to make. Immediately after refreshing himself he would be obliged to leave them.

Husband and wife made a circumstantial confession; but scarcely had he caught the substance of the matter, when he started angrily up from the table, rushed out of the saloon, and ordered his horse to be saddled instantly.

"Either you do not know me, you do not understand me," he cried, "or you are sorely mischievous. Do you call this a

quarrel? Is there any want of help here? Do you suppose that I am in the world to give *advice?* Of all occupations which man can pursue, that is the most foolish. Every man must be his own counselor, and do what he cannot let alone. If all go well, let him be happy, let him enjoy his wisdom and his fortune; if it go ill, I am at hand to do what I can for him. The man who desires to be rid of an evil knows what he wants; but the man who desires something better than he has got is stone blind. Yes, yes, laugh as you will, he is playing blindman's-buff; perhaps he gets hold of something, but the question is what he has got hold of. Do as you will, it is all one. Invite your friends to you, or let them be, it is all the same. The most prudent plans I have seen miscarry, and the most foolish succeed. Don't split your brains about it; and if, one way or the other, evil comes of what you settle, don't fret; send for me, and you shall be helped. Till which time, I am your humble servant."

So saying, he sprang on his horse, without waiting the arrival of the coffee.

"Here you see," said Charlotte, "the small service a third person can be, when things are off their balance between two persons closely connected; we are left, if possible, more confused and more uncertain than we were."

They would both, probably, have continued hesitating some time longer, had not a letter arrived from the Captain, in reply to Edward's last. He had made up his mind to accept one of the situations which had been offered him, although it was not in the least up to his mark. He was to share the ennui of certain wealthy persons of rank, who depended on his ability to dissipate it.

Edward's keen glance saw into the whole thing, and he picture it out in just, sharp lines.

"Can we endure to think of our friend in such a position?" he cried; "you cannot be so cruel, Charlotte."

"That strange Mittler is right after all," replied Charlotte; "all such undertakings are ventures; what will come of them it is impossible to foresee. New elements introduced among us may be fruitful in fortune or in misfortune, without our having to take credit to ourselves for one or the other. I do not feel myself firm enough to oppose you further. Let us make the experiment; only one thing I will entreat of you—that it be only for a short time. You must allow me to exert myself more than ever, to use all my influence among all my connections, to find him some position which will satisfy him in his own way."

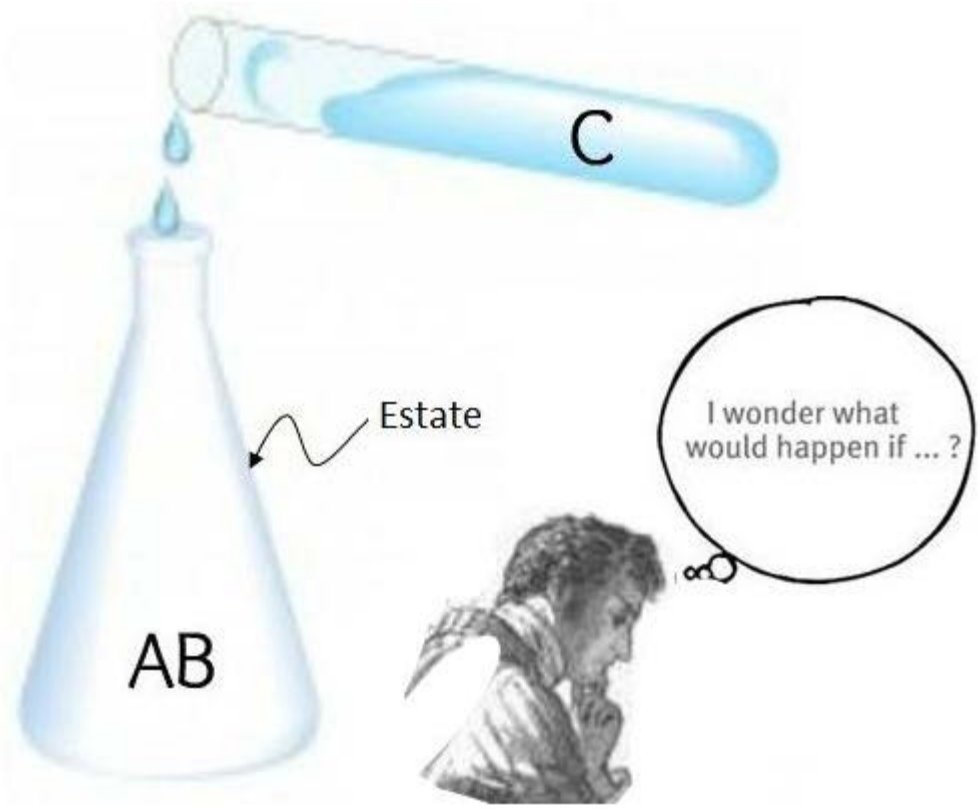

Description: "Let us make the experiment", Charlotte (**A**) proclaiming to Edward (**B**) in emphatic decision—Edward contemplating, via a thought experiment, the introduction of the Captain (**C**), into the "system" of the estate, as a chemical reaction in his mind, as he did as a youth—a human chemical reaction!

Edward poured out the warmest expressions of gratitude. He hastened, with a light, happy heart, to write off his proposals to his friend. Charlotte, in a postscript, was to signify her approbation with her own hand, and unite her own kind entreaties with his. She wrote, with a rapid pen, pleasantly and affectionately, but yet with a sort of haste which was not usual with her; and, most unlike herself, she disfigured the paper at last with a blot of ink, which put her out of temper, and which she only made worse with her attempts to wipe it away.

Edward laughed at her about it, and, as there was still room, added a second postscript, that his friend was to see from this symptom the impatience with which he was expected, and measure the speed at which he came to them by the haste in which the letter was written.

The messenger was gone; and Edward thought he could not give a more convincing evidence of his gratitude than by insisting again and again that Charlotte should at once send for Ottilie from the school. She said she would think about it; and, for that evening, induced Edward to join with her in the enjoyment of a little music. Charlotte played exceedingly well on the piano, Edward not quite so well on the flute. He had taken a great deal of pains with it at times; but he was without the patience, without the perseverance, which are requisite for the completely successful cultivation of such a talent; consequently, his part was done unequally, some pieces well, only perhaps too quickly—while with others he hesitated, not being quite familiar with them; so that, for anyone else, it would have been difficult to have gone through a duet with him. But Charlotte knew how to manage it. She held in, or let herself be run away with, and fulfilled in this way the double part of a skillful conductor and a prudent housewife, who are able always to keep right on the whole, although particular passages will now and then fall out of order.

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â— Goethe’s human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. Add commentary on the graveyard tombstone rearrangements, and path through the churchyard avoidance, deviation.

References

1. (a) Prigogine, Ilya. (1984). *Order Out of Chaos: Man’s New Dialogue with Nature* (footnote 2.5: “B.J. Dobbs [*The*

Foundations of Newton's Alchemy, 1975] also exampled the role of the 'mediator' by which two substances are made 'sociable'. We may recall here the importance of Goethe's *Elective Affinities.* For what concerns chemistry, Goethe was not far from Newton." pg. 319). New York: Bantam Books.
(b) Dobbs, Betty J. (1975). *The Foundations of Newton's Alchemy: or the Hunting of the Greene Lyon*. Cambridge University Press.
2. Laszlo, Pierre. (1995). *Organic Reactions: Simplicity and Logic* (Mittler, pg. 269). Wiley.

θΔics

In Elective Affinities (IAD), **Part two: Chapter eight** (add synopsis)

Part two: Chapter eight

There are but few men who care to occupy themselves with the immediate past. Either we are forcibly bound up in the present, or we lose ourselves in the long gone-by, and seek back for what is utterly lost, as if it were possible to summon it up again, and rehabilitate it. Even in great and wealthy families who are under large obligations to their ancestors, we commonly find men thinking more of their grandfathers than their fathers.

Description: "The Death of the Old Pastor" (HB:332).

Such reflections as these suggested themselves to our assistant, as, on one of those beautiful days in which the departing winter is accustomed to imitate the spring, he had been walking up and down the great old castle garden, and admiring the tall avenues of the lindens, and the formal walks and flower-beds which had been laid out by Edward's father. The trees had thriven admirably, according to the design of him who had planted them, and now when they ought to have begun to be valued and enjoyed, no one ever spoke of them. Hardly anyone even went near them, and the interest and the outlay was now directed to the other side, out into the free and the open.

He remarked upon it to Charlotte on his return; she did not take it unkindly. "While life is sweeping us forwards," she replied, "we fancy that we are acting out our own impulses; we believe that we choose ourselves what we will do, and what we will enjoy. But in fact, if we look at it closely, our actions are no more than the plans, and the desires of the time which we are compelled to carry out."

"No doubt," said the assistant. "And who is strong enough to withstand the stream of what is round him? Time passes on, and in it, opinions, thoughts, prejudices and interests. If the youth of the son falls in the era of revolution, we may feel assured that he will have nothing in common with his father. If the father lived at a time when the desire was to accumulate property, to secure the possession of it, to narrow and to gather one's self in, and to base one's enjoyment in separation from the world, the son will at once seek to extend himself, to communicate himself to others, to spread himself over a wide surface, and open out his closed stores."

"Entire periods," replied Charlotte, "resemble this father and son whom you have been describing. Of the state of things when every little town was obliged to have its walls and moats, when the castle of the nobleman was built in a swamp, and the smallest manor-houses were only accessible by a draw-bridge, we are scarcely able to form a conception. In our days, the largest cities take down their walls, the moats of the princes' castles are filled in; cities are no more than great *places*, and when one travels and sees all this, one might fancy that universal peace was just established, and the golden age was before the door. No one feels himself easy in a garden which does not look like the open country. There must

be nothing to remind him of form and constraint; we choose to be entirely free, and to draw our breath without sense of confinement. Do you conceive it possible, my friend, that we can ever return again out of this into another, into our former condition?”

“Why should we not?” replied the assistant. “Every condition has its own burden along with it, the most relaxed as well as the most constrained. The first presupposes abundance, and leads to extravagance. Let want reappear, and the spirit of moderation is at once with us again. Men who are obliged to make use of their space and their soil, will speedily enough raise walls up round their gardens to be sure of their crops and plants. Out of this will arise by degrees a new phase of things: the useful will again gain the upper hand; and even the man of large possessions will feel at last that he must make the most of all which belongs to him. Believe me, it is quite possible that your son may become indifferent to all which you have been doing in the park, and draw in again behind the solemn walls and the tall lindens of his grandfather.”

The secret pleasure which it gave Charlotte to have a son foretold to her, made her forgive the assistant his somewhat unfriendly prophecy of how it might one day fare with her lovely, beautiful park. She therefore answered without any discomposure: “You and I are not old enough yet to have lived through very much of these contradictions; and yet when I look back into my own early youth, when I remember the style of complaints which I used then to hear from older people, and when I think at the same time of what the country and the town then were, I have nothing to advance against what you say. But is there nothing which one can do to remedy this natural course of things? Are father and son, parents and children, to be always thus unable to understand each other? You have been so kind as to prophesy a boy to me. Is it necessary that he must stand in contradiction to his father? Must he destroy what his parents have erected, instead of completing it, instead of following on upon the same idea, and elevating it?”

“There is a rational remedy for it,” replied the assistant. “But it is one which will be but seldom put in practice by men. The father should raise his son to a joint ownership with himself. He should permit him to plant and to build; and allow him the same innocent liberty which he allows to himself. One form of activity may be woven into another, but it cannot be pieced on to it. A young shoot may be readily and easily grafted with an old stem, to which no grown branch admits of being fastened.”

The assistant was glad to have had the opportunity, at the moment when he saw himself obliged to take his leave, of saying something agreeable to Charlotte, and thus making himself a new link to secure her favor. He had been already too long absent from home, and yet he could not make up his mind to return there, until after a full conviction that he must allow the approaching epoch of Charlotte’s confinement first to pass by, before he could look for any decision from her in respect to Ottilie. He therefore accommodated himself to the circumstances, and returned with these prospects and hopes to the superior.

Charlotte’s confinement was now approaching; she kept more in her own room. The ladies who had gathered about her were her closest companions. Ottilie managed all domestic matters, hardly able, however, the while, to think what she was doing. She had indeed utterly resigned herself; she desired to continue to exert herself to the extent of her power for Charlotte, for the child, for Edward. But she could not see how it would be possible for her. Nothing could save her from utter distraction, except patiently to do the duty which each day brought with it.

A son was brought happily into the world, and the ladies declared, with one voice, it was the very image of its father. Only Ottilie, as she wished the new mother joy, and kissed the child with all her heart, was unable to see the likeness. Once already Charlotte had felt most painfully the absence of her husband, when she had to make preparations for her daughter’s marriage. And now the father could not be present at the birth of his son. He could not have the choosing of the name by which the child was hereafter to be called.

The first among all Charlotte’s friends who came to wish her joy was Mittler. He had placed expresses ready to bring him news the instant the event took place. He was admitted to see her, and, scarcely able to conceal his triumph even before Ottilie, when alone with Charlotte he broke fairly out with it; and was at once ready with means to remove all anxieties, and set aside all immediate difficulties. The baptism should not be delayed a day longer than necessary. The old clergyman, who had one foot already in the grave, should leave his blessing, to bind together the past and the future. The child should be called Otto; what name would he bear so fitly as that of his father and of his father’s friend?

It required the peremptory resolution of this man to set aside the innumerable considerations, arguments, hesitations, difficulties; what this person knew, and that person knew better; the opinions, up and down, and backwards and forwards, which every friend volunteered. It always happens on such occasions that when one inconvenience is removed, a fresh inconvenience seems to arise; and in wishing to spare all sides we inevitably go wrong on one side or the other.

The letters to friends and relations were all undertaken by Mittler, and they were to be written and sent off at once. It was highly necessary, he thought, that the good fortune which he considered so important for the family, should be known as widely as possible through the ill-natured and misinterpreting world. For indeed these late entanglements and perplexities had got abroad among the public, which at all times has a conviction that whatever happens, happens only in order that it may have something to talk about.

The ceremony of the baptism was to be observed with all due honor, but it was to be as brief and as private as possible. The people came together; Ottilie and Mittler were to hold the child as sponsors. The old pastor, supported by the servants of the church, came in with slow steps; the prayers were offered. The child lay in Ottilie's arms, and as she was looking affectionately down at it, it opened its eyes and she was not a little startled when she seemed to see her own eyes looking at her. The likeness would have surprised anyone. Mittler, who next had to receive the child, started as well; he fancying he saw in the little features a most striking likeness to the captain. He had never seen a resemblance so marked. The infirmity of the good old clergyman had not permitted him to accompany the ceremony with more than the usual liturgy.

Mittler, however, who was full of his subject, recollected his old performances when he had been in the ministry, and indeed it was one of his peculiarities that on every sort of occasion, he always thought what he would like to say, and how he would express himself about it.

At this time he was the less able to contain himself, as he was now in the midst of a circle consisting entirely of well-known friends. He began therefore towards the conclusion of the service, to put himself quietly into the place of the clergyman; to make cheerful speeches aloud, expressive of his duty and his hopes as godfather, and to dwell all the longer on the subject, as he thought he saw in Charlotte's gratified manner that she was pleased with his doing so.

It altogether escaped the eagerness of the orator, that the good old man would gladly have sat down; still less did he think that he was on the way to occasion a more serious evil. After he had described with all his power of impressiveness the relation in which every person present stood toward the child, thereby putting Ottilie's composure sorely to the proof, he turned at last to the old man with the words, "And you, my worthy father, you may now well say with Simeon, 'Lord, now lettest thou thy servant depart in peace, for mine eyes have seen the savior of this house.' "

He was now in full swing towards a brilliant peroration, when he perceived the old man, to whom he held out the child, first appear a little to incline towards it, and immediately after to totter and sink backwards. Hardly prevented from falling, he was lifted to a seat; but, notwithstanding the instant assistance which was rendered, he was found to be dead.

To see thus side by side birth and death, the coffin and the cradle, to see them and to realize them, to comprehend, not with the eye of imagination, but with the bodily eye, at one moment these fearful opposites, was a hard trial to the spectators; the harder, the more utterly it had taken them by surprise. Ottilie alone stood contemplating the slumberer, whose features still retained their gentle sweet expression, with a kind of envy. The life of her soul was killed; why should the bodily life any longer drag on in weariness?

But though Ottilie was frequently led by melancholy incidents which occurred in the day to thoughts of the past, of separation and of loss, at night she had strange visions given her to comfort her, which assured her of the existence of her beloved, and thus strengthened hers, and gave her life for her own. When she laid herself down at night to rest, and was floating among sweet sensations between sleep and waking, she seemed to be looking into a clear but softly illuminated space. In this she would see Edward with the greatest distinctness, and not in the dress in which she had been accustomed to see him, but in military uniform; never in the same position, but always in a natural one, and not the least with anything fantastic about him, either standing or walking, or lying down or riding. The figure, which was

painted with the utmost minuteness, moved readily before her without any effort of hers, without her willing it or exerting her imagination to produce it. Frequently she saw him surrounded with something in motion, which was darker than the bright ground; but the figures were shadowy, and she could scarcely distinguish them—sometimes they were like men, sometimes they were like horses, or like trees, or like mountains. She usually went to sleep in the midst of the apparition, and when, after a quiet night, she woke again in the morning, she felt refreshed and comforted; she could say to herself, Edward still lives, and she herself was still remaining in the closest relation towards him.

Next chapter
â— Elective Affinities | Part two: Chapter nine

Previous chapter
â— Elective Affinities | Part two: Chapter seven

â— Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

See also
â— Goethe’s affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe’s human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References

1. (add)

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In Elective Affinities (IAD),
Part two: Chapter eighteen
(add synopsis)

Part two: Chapter eighteen

Description: "Nanny Examining the Bridal Garments" (HB:364).

The most remarkable feature, however, which was observed about Ottilie was that, for the first time, she had now unpacked the box, and had selected a variety of things out of it, which she had cut up, and which were intended evidently to make one complete suit for her. The rest, with Nanny's assistance, she had endeavored to replace again, and she had been hardly able to get it done, the space being over full, although a portion had been taken out. The covetous little Nanny could never satisfy herself with looking at all the pretty things, especially as she found provision made there for every article of dress which could be wanted, even the smallest. Numbers of shoes and stockings, garters with devices on them, gloves, and various other things were left, and she begged Ottilie just to give her one or two of them. Ottilie refused to do that, but opened a drawer in her wardrobe, and told the girl to take what she liked. The latter hastily and awkwardly dashed in her hand and seized what she could, running off at once with her booty, to show it off and display her good fortune among the rest of the servants.

At last Ottilie succeeded in packing everything carefully into its place. She then opened a secret compartment, which was contrived in the lid, where she kept a number of notes and letters from Edward, many dried flowers, the mementos of their early walks together, a lock of his hair, and various other little matters. She now added one more to them, her father's portrait, and then locked it all up, and hung the delicate key by a gold chain about her neck, against her heart.

In the meantime, her friends had now in their hearts begun to entertain the best hopes for her. Charlotte was convinced that she would one day begin to speak again. She had latterly seen signs about her which implied that she was engaged in secret about something; a look of cheerful self-satisfaction, a smile like that which hangs about the face of persons who have something pleasant and delightful, which they are keeping concealed from those whom they love. No one knew that she spent many hours in extreme exhaustion, and that only at rare intervals, when she appeared in public through the power of her will, she was able to rouse herself. Mittler had latterly been a frequent visitor, and when he came he stayed longer than he usually did at other times. This strong-willed, resolute person was only too well aware that there is a certain moment in which alone it will answer to smite the iron. Ottilie's silence and reserve he interpreted according to his own wishes; no steps had as yet been taken towards a separation of the husband and wife. He hoped to be able to determine the fortunes of the poor girl in some not undesirable way. He listened, he allowed himself to seem convinced; he was discreet and unobtrusive, and conducted himself in his own way with sufficient prudence.

There was but one occasion on which he uniformly forgot himself—when he found an opportunity for giving his opinion upon subjects to which he attached a great importance. He lived much within himself, and when he was with others, his only relation to them generally was in active employment on their behalf; but if once, when among friends, his tongue broke fairly loose, as on more than one occasion we have already seen, he rolled out his words in utter recklessness, whether they wounded or whether they pleased, whether they did evil or whether they did good.

The evening before the birthday, the major and Charlotte were sitting together expecting Edward, who had gone out for a ride; Mittler was walking up and down the saloon; Ottilie was in her own room, laying out the dress which she was to wear on the morrow, and making signs to her maid about a number of things, which the girl, who perfectly understood her silent language, arranged as she was ordered.

Mittler had fallen exactly on his favorite subject. One of the points on which he used most to insist was, that in the education of children, as well as in the conduct of nations, there was nothing more worthless and barbarous than laws and commandments forbidding this and that action. "Man is naturally active," he said, "wherever he is; and if you know how to tell him what to do, he will do it immediately, and keep straight in the direction in which you set him. I myself, in my own circle, am far better pleased to endure faults and mistakes, till I know what the opposite virtue is that I am to enjoin, than to be rid of the faults and to have nothing good to put in their place. A man is really glad to do what is right and sensible, if he only knows how to get at it. It is no such great matter with him; he does it because he must have something to do, and he thinks no more about it afterwards than he does of the silliest freaks which he engaged in out of the purest idleness. I cannot tell you how it annoys me to hear people going over and over those Ten Commandments in teaching children. The fifth is a thoroughly beautiful, rational, preceptive precept. 'Thou shalt honor thy father and thy mother.' If the children will inscribe that well upon their hearts, they have the whole day before them to put it in practice. But the sixth now? What can we say to that? 'Thou shalt do no murder;' as if any man ever felt the slightest general inclination to strike another man dead. Men will hate sometimes: they will fly into passions and forget themselves; and as a consequence of this or other feelings, it may easily come now and then to a murder; but what a barbarous precaution it is to tell children that they are not to kill or murder! If the commandment ran, 'Have a regard for the life of another—put away whatever can do him hurt—save him though with peril to yourself—if you injure him, consider that you are injuring yourself;'—that is the form which should be in use among educated, reasonable people. And in our Catechism teaching we have only an awkward clumsy way of sliding into it, through a 'what do you mean by that?'

"And as for the seventh; that is utterly detestable. What! to stimulate the precocious curiosity of children to pry into dangerous mysteries; to obtrude violently upon their imaginations ideas and notions which beyond all things you should wish to keep from them! It were far better if such actions as that commandment speaks of were dealt with arbitrarily by some secret tribunal, than prated openly of before church and congregation—" At this moment Ottilie entered the room.

" 'Thou shalt not commit adultery,' "—Mittler went on—"How coarse! how brutal! What a different sound it has, if you let it run, 'Thou shalt hold in reverence the bond of marriage. When thou seest a husband and a wife between whom there is true love, thou shalt rejoice in it, and their happiness shall gladden thee like the cheerful light of a beautiful day. If there arise anything to make division between them, thou shalt use thy best endeavor to clear it away. Thou shalt labor to pacify them, and to soothe them; to show each of them the excellencies of the other. Thou shalt not think of thyself, but purely and disinterestedly thou shalt seek to further the well-being of others, and make them feel what a happiness is that which arises out of all duty done; and especially out of that duty which holds man and wife indissolubly bound together.' "

Charlotte felt as if she was sitting on hot coals. The situation was the more distressing, as she was convinced that Mittler was not thinking the least where he was or what he was saying; and before she was able to interrupt him, she saw Ottilie, after changing color painfully for a few seconds, rise and leave the room.

Charlotte constrained herself to seem unembarrassed: "You will leave us the eighth commandment," she said, with a faint smile.

"All the rest," replied Mittler, "if I may only insist first on the foundation of the whole of them."

At this moment Nanny rushed in, screaming and crying: "She is dying; the young lady is dying; come to her, come."

Ottilie had found her way back with extreme difficulty to her own room. The beautiful things which she was to wear the next day were laid out on a number of chairs; and the girl, who had been running from one to the other, staring at them and admiring them, called out in her ecstasy, "Look, dearest madam, only look! There is a bridal dress worthy of you."

Ottilie heard the word, and sank upon the sofa. Nanny saw her mistress turn pale, fall back, and faint. She ran for Charlotte, who came. The medical friend was on the spot in a moment. He thought it was nothing but exhaustion. He ordered some strong soup to be brought. Ottilie refused it with an expression of loathing: it almost threw her into convulsions, when they put the cup to her lips. A light seemed to break on the physician: he asked hastily and anxiously what Ottilie had taken that day. The little girl hesitated. He repeated his question, and she then acknowledged that Ottilie had taken nothing.

There was a nervousness of manner about Nanny which made him suspicious. He carried her with him into the adjoining room; Charlotte followed; and the girl threw herself on her knees, and confessed that for a long time past Ottilie had taken as good as nothing; at her mistress' urgent request, she had herself eaten the food which had been brought for her; she had said nothing about it, because Ottilie had by signs alternately begged her not to tell anyone, and threatened her if she did; and, as she innocently added, "because it was so nice."

The major and Mittler now came up as well. They found Charlotte busy with the physician. The pale, beautiful girl was sitting, apparently conscious, in the corner of the sofa. They had begged her to lie down; she had declined to do this; but she made signs to have her box brought, and resting her feet upon it, placed herself in an easy, half recumbent position. She seemed to be wishing to take leave; and by her gestures, was expressing to all about her the tenderest affection, love, gratitude, entreaties for forgiveness, and the most heartfelt farewell.

Edward, on alighting from his horse, was informed of what had happened; he rushed to the room; threw himself down at her side; and seizing her hand, deluged it with silent tears. In this position he remained a long time. At last he called out: "And am I never more to hear your voice? Will you not turn back toward life, to give me one single word? Well, then, very well. I will follow you yonder, and there we will speak in another language."

She pressed his hand with all the strength she had; she gazed at him with a glance full of life and full of love; and drawing a long breath, and for a little while moving her lips inarticulately, with a tender effort of affection she called out, "Promise me to live;" and then fell back immediately.

"I promise, I promise!" he cried to her; but he cried only after her; she was already gone.

After a miserable night, the care of providing for the loved remains fell upon Charlotte. The major and Mittler assisted her. Edward's condition was utterly pitiable. His first thought, when he was in any degree recovered from his despair, and able to collect himself, was, that Ottilie should not be carried out of the castle; she should be kept there, and attended upon as if she were alive: for she was not dead; it was impossible that she should be dead. They did what he desired; at least, so far as that they did not do what he had forbidden. He did not ask to see her.

There was now a second alarm, and a further cause for anxiety. Nanny, who had been spoken to sharply by the physician, had been compelled by threats to confess, and after her confession had been overwhelmed with reproaches, had now disappeared. After a long search she was found; but she appeared to be out of her mind. Her parents took her home; but the gentlest treatment had no effect upon her, and she had to be locked up for fear she should run away again.

They succeeded by degrees in recovering Edward from the extreme agony of despair; but only to make him more really wretched. He now saw clearly, he could not doubt how, that the happiness of his life was gone from him forever. It was suggested to him that if Ottilie was placed in the chapel, she would still remain among the living, and it would be a calm, quiet, peaceful home for her. There was much difficulty in obtaining his consent; he would only give it under condition that she should be taken there in an open coffin; that the vault in which she was laid, if covered at all, should be only covered with glass, and a lamp should be kept always burning there. It was arranged that this should be done, and then he seemed resigned.

They clothed the delicate body in the festal dress which she had herself prepared. A garland of asters was wreathed about her head, which shone sadly there like melancholy stars. To decorate the bier and the church and chapel, the gardens were robbed of their beauty; they lay desolate, as if a premature winter had blighted all their loveliness. In the earliest morning she was borne in an open coffin out of the castle, and the heavenly features were once more reddened

with the rising sun. The mourners crowded about her as she was being taken along. None would go before; none would follow; everyone would be where she was, everyone would enjoy her presence for the last time. Men and women, and little boys, there was not one unmoved; least of all to be consoled were the girls, who felt most immediately what they had lost.

Nanny was not present; it had been thought better not to allow it, and they had kept secret from her the day and the hour of the funeral. She was at her parents' house, closely watched, in a room looking towards the garden. But when she heard the bells tolling, she knew too well what they meant; and her attendant having left her out of curiosity to see the funeral, she escaped out of the window into a passage, and from thence, finding all the doors locked, into an upper open loft. At this moment the funeral was passing through the village, which had been all freshly strewed with leaves. Nanny saw her mistress plainly close below her, more plainly, more entirely, than anyone in the procession underneath; she appeared to be lifted above the earth, borne as it were on clouds or waves, and the girl fancied she was making signs to her; her senses swam, she tottered, swayed herself for a moment on the edge, and fell to the ground. The crowd fell asunder on all sides with a cry of horror. In the tumult and confusion, the bearers were obliged to set down the coffin; the girl lay close by it: it seemed as if every limb was broken. They lifted her up, and by accident or providentially she was allowed to lean over the body; she appeared, indeed, to be endeavoring with what remained to her of life to reach her beloved mistress. Scarcely, however, had the loosely hanging limbs touched Ottilie's robe, and the powerless finger rested on the folded hands, than the girl started up, and, first raising her arms and eyes towards heaven, flung herself down upon her knees before the coffin, and gazed with passionate devotion at her mistress.

At last she sprang, as if inspired, from off the ground, and cried with a voice of ecstasy: "Yes, she has forgiven me; what no man, what I myself could never have forgiven. God forgives me through her look, her motion, her lips. Now she is lying again so still and quiet, but you saw how she raised herself up, and unfolded her hands and blessed me, and how kindly she looked at me. You all heard, you can witness that she said to me: 'You are forgiven.' I am not a murderess any more. She has forgiven me. God has forgiven me, and no one may now say anything more against me.' "

The people stood crowding around her. They were amazed; they listened and looked this way and that, and no one knew what should next be done. "Bear her on to her rest," said the girl. "She has done her part; she has suffered, and cannot now remain any more among us." The bier moved on, Nanny now following it; and thus they reached the church and the chapel.

So now stood the coffin of Ottilie, with the child's coffin at her head, and her box at her feet, inclosed in a resting-place of massive oak. A woman had been provided to watch the body for the first part of the time, as it lay there so beautifully beneath its glass covering. But Nanny would not permit this duty to be taken from herself. She would remain alone without a companion, and attend to the lamp which was now kindled for the first time; and she begged to be allowed to do it with so much eagerness and perseverance, that they let her have her way, to prevent any greater evil that might ensue.

But she did not long remain alone. As night was falling, and the hanging lamp began to exercise its full right and shed abroad a larger lustre, the door opened and the architect entered the chapel. The chastely ornamented walls in the mild light looked more strange, more awful, more antique, than he was prepared to see them. Nanny was sitting on one side of the coffin. She recognized him immediately; but she pointed in silence to the pale form of her mistress. And there stood he on the other side, in the vigor of youth and of grace, with his arms drooping, and his hands clasped piteously together, motionless, with head and eye inclined over the inanimate body.

Once already he had stood thus before in the Belisarius; he had now involuntarily fallen into the same attitude. And this time how naturally! Here, too, was something of inestimable worth thrown down from its high estate. *There* were courage, prudence, power, rank and wealth in one single man, lost irrevocably; *there* were qualities which, in decisive moments, had been of indispensable service to the nation and the prince; but which, when the moment was passed, were no more valued, but flung aside and neglected, and cared for no longer. And *here* were many other silent virtues, which had been summoned but a little time before by nature out of the depths of her treasures, and now swept rapidly away again by her careless hand—rare, sweet, lovely virtues, whose peaceful workings the thirsty world had welcomed, while it had them, with gladness and joy; and now was sorrowing for them in unavailing desire.

Both the youth and the girl were silent for a long time. But when she saw the tears streaming fast down his cheeks, and he appeared to be sinking under the burden of his sorrow, she spoke to him with so much truthfulness and power, with such kindness and such confidence, that, astonished at the flow of her words, he was able to recover himself, and he saw his beautiful friend floating before him in the new life of a higher world. His tears ceased flowing; his sorrow grew lighter: on his knees he took leave of Ottilie, and with a warm pressure of the hand of Nanny, he rode away from the spot into the night without having seen a single other person.

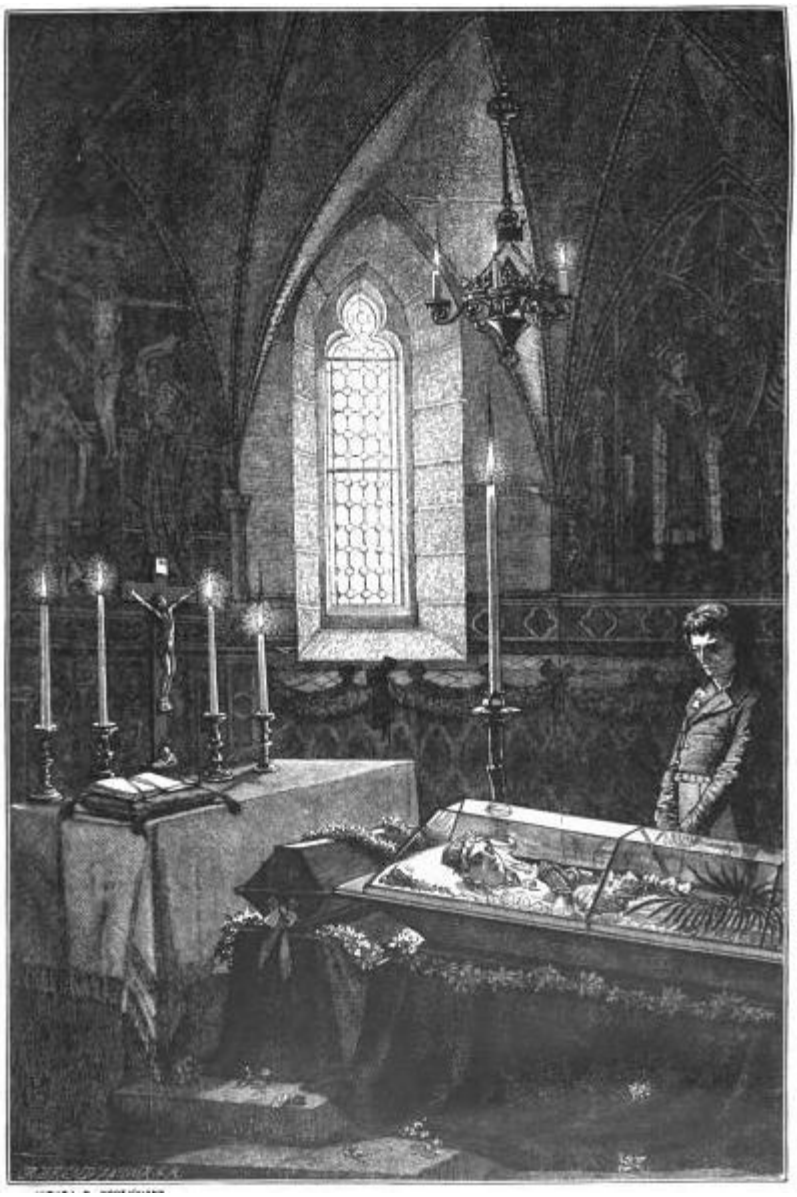

Description: "The Architect at Ottilie's Bier" (HB:368/69).

The surgeon had, without the girl being aware of it, remained all night in the church; and when he went in the morning to see her, he found her cheerful and tranquil. He was prepared for wild aberrations. He thought that she would be sure to speak to him of conversations which she had held in the night with Ottilie, and of other such apparitions. But she was natural, quiet and perfectly self-possessed. She remembered accurately what had happened in her previous life; she could describe the circumstances of it with the greatest exactness, and never in anything which she said stepped out of the course of what was real and natural, except in her account of what had passed with the body, which she delighted to repeat again and again, how Ottilie had raised herself up, had blessed her, had forgiven her, and thereby set her at rest forever.

Ottilie remained so long in her beautiful state, which more resembled sleep than death, that a number of persons were attracted there to look at her. The neighbors and the villagers wished to see her again, and everyone desired to hear Nanny’s incredible story from her own mouth. Many laughed at it, most doubted, and some few were found who were able to believe.

Difficulties, for which no real satisfaction is attainable, compel us to faith. Before the eyes of all the world, Nanny’s limbs had been broken, and by touching the sacred body she had been restored to strength again. Why should not others find similar good fortune? Delicate mothers first privately brought their children who were suffering from obstinate disorders, and they believed that they could trace an immediate improvement. The confidence of the people increased, and at last there was no one so old or so weak as not to have come to seek fresh life and health and strength at this place. The concourse became so great, that they were obliged, except at the hours of divine service, to keep the church and chapel closed.

Edward did not venture to look at her again; he lived on mechanically; he seemed to have no tears left, and to be incapable of any further suffering; his power of taking interest in what was going on diminished every day; his appetite gradually failed. The only refreshment which did him any good was what he drank out of the glass, which to him, indeed, had been but an untrue prophet. He continued to gaze at the intertwining initials, and the earnest cheerfulness of his expression seemed to signify that he still hoped to be united with her at last. And as every little circumstance combines to favor the fortunate, and every accident contributes to elate him; so do the most trifling occurrences love to unite to crush and overwhelm the unhappy. One day as Edward raised the beloved glass to his lips, he put it down and thrust it from him with a shudder. It was the same and not the same. He missed a little private mark upon it. The valet was questioned, and had to confess that the real glass had not long since been broken, and that one like it belonging to

the same set had been substituted in its place.

Edward could not be angry. His destiny had spoken out with sufficient clearness in the fact, and how should he be affected by the shadow? and yet it touched him deeply. He seemed now to dislike drinking, and thenceforward purposely to abstain from food and from speaking.

But from time to time a sort of restlessness came over him; he would desire to eat and drink something, and would begin again to speak. “Ah!” he said, one day to the major, who now seldom left his side, “how unhappy I am that all my efforts, are but imitations ever, and false and fruitless. What was blessedness to her, is pain to me; and yet for the sake of this blessedness I am forced to take this pain upon myself. I must go after her; follow her by the same road. But my nature and my promise hold me back. It is a terrible difficulty, indeed, to imitate the inimitable. I feel clearly, my dear friend, that genius is required for everything; for martyrdom as well as the rest.”

Description: "The Death of Edward" (HB:369).

What shall we say of the endeavors which in this hopeless condition were made for him? his wife, his friends, his physician, incessantly labored to do something for him. But it was all in vain: at last they found him dead. Mittler was the first to make the melancholy discovery; he called the physician, and examined closely, with his usual presence of mind, the circumstances under which he had been found. Charlotte rushed in to them; she was afraid that he had committed suicide, and accused herself and accused others of unpardonable carelessness. But the physician on natural, and Mittler on moral grounds, were soon able to satisfy her of the contrary. It was quite clear that Edward’s end had taken him by surprise. In a quiet moment he had taken out of his pocket-book and out of a casket everything which remained to him as memorials of Ottilie, and had spread them out before him; a lock of hair; flowers which had been gathered in some happy hour, and every letter which she had written to him from the first, which his wife had ominously happened to give him. It was impossible that he would intentionally have exposed these to the danger of being seen, by the first person who might happen to discover him.

But so lay the heart, which but a short time before had been so swift and eager, at rest now, where it could never be disturbed; and falling asleep, as he did, with his thoughts on one so saintly, he might well be called blessed. Charlotte gave him his place at Ottilie’s side, and arranged that thenceforth no other person should be placed with them in the same vault.

In order to secure this, she made it a condition under which she settled considerable sums of money on the church and the school.

So lie the lovers, sleeping side by side. Peace hovers above their resting-place. Fair angel faces gaze down upon them from the vaulted ceiling, and what a happy moment that will be when one day they awake again together! [N1]

prev Previous chapter
â— Elective Affinities | Part two: Chapter seventeen

Elective Affinities

Discussion
(add)

See also
â— Goethe’s affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe’s human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. American German-literature scholar William Lillyman (1982) thinks the last sentence has something to do with the last sentence in Aristophanes’ speech. [1]

References
1. Lillyman, William J. (1982). “Analogies for Love: Goethe’s *Die Wahlverwandtschaften* and Plato’s *Symposium*” (pg. 140). Goethe’s Narrative Fiction: the Irvine Goethe Symposium. Walter de Gruyter.

In Elective Affinities (IAD), **Part two: Chapter eleven** (add synopsis)

Description: "Ottilie Displaying her Skill to Earl's Friend" (HB:344).

Part two: Chapter eleven

The narrator made a pause, or rather he had already finished his story, before he observed the emotion into which Charlotte had been thrown by it. She got up, uttered some sort of an apology, and left the room. To her it was a well-known history. The principal incident in it had really taken place with the captain and a neighbor of her own; not exactly, indeed, as the Englishman had related it. But the main features of it were the same. It had only been more finished off and elaborated in its details, as stories of that kind always are, when they have passed first through the lips of the multitude, and then through the fancy of a clever and imaginative narrator; the result of the process being usually to leave everything and nothing as it was.

Ottilie followed Charlotte, as the two friends begged her to do; and then it was the earl's turn to remark, that perhaps they had made a second mistake, and that the subject of the story had been well known to or was in some way connected with the family. "We must take care," he added, "that we do no more mischief here; we seem to bring little good to our entertainers for all the kindness and hospitality which they have shown us; we will make some excuse for ourselves, and then take our leave."

"I must confess," answered his companion, "that there is something else which still holds me here, which I should be very sorry to leave the house without seeing cleared up or in some way explained. You were too busy yourself yesterday when we were in the park with the camera, in looking for spots where you could make your sketches, to have observed anything else which was passing. You left the broad walk, you remember, and went to a sequestered place on the side of the lake. There was a fine view of the opposite shore which you wished to take. Well, Ottilie, who was with us, got up to follow; and then proposed that she and I should find our way to you in the boat. I got in with her, and was delighted with the skill of my fair conductress. I assured her that never since I had been in Switzerland, where the young ladies so often fill the place of the boatmen, had I been so pleasantly ferried over the water. At the same time I could not help asking her why she had shown such an objection to going the way which you had gone, along the little by-path. I had observed her shrink from it with a sort of painful uneasiness. She was not at all offended. 'If you will promise not to laugh at me,' she answered, 'I will tell you as much as I know about it; but to myself it is a mystery which I cannot explain. There is a particular spot in that path which I never pass without a strange shiver passing over me, which I do not remember ever feeling anywhere else, and which I cannot the least understand. But I shrink from exposing myself to the sensation, because it is followed immediately after by a pain on the left side of my head, from which at other times I suffer severely.' We landed. Ottilie was engaged with you, and I took the opportunity of examining the spot, which she pointed out to me as we went by on the water. I was not a little surprised to find there distinct traces of coal, in sufficient quantities to convince me that at a short distance below the surface there must be a considerable bed of it.

"Pardon me, my lord; I see you smile; and I know very well that you have no faith in these things about which I am so

eager, and that it is only your sense and your kindness which enable you to tolerate me. However, it is impossible for me to leave this place without trying on that beautiful creature an experiment with the pendulum.”

The earl, whenever these matters came to be spoken of, never failed to repeat the same objections to them over and over again; and his friend endured them all quietly and patiently, remaining firm, nevertheless, to his own opinion, and holding to his own wishes. He, too, again repeated, that there was no reason, because the experiment did not succeed with everyone, that they should give them up, as if there was nothing in them but fancy. They should be examined into all the more earnestly and scrupulously; and there was no doubt that the result would be the discovery of a number of affinities of inorganic creatures for one another, and of organic creatures for them, and again for each other, which at present were unknown to us.

He had already spread out his apparatus of gold rings, markasites, and other metallic substances, a pretty little box of which he always carried about with himself; and he suspended a piece of metal by a string over another piece, which he placed upon the table. “Now, my lord,” he said, “you may take what pleasure you please (I can see in your face what you are feeling), at perceiving that nothing will set itself in motion with me, or for me. But my operation is no more than a pretense; when the ladies come back, they will be curious to know what strange work we are about.”

The ladies returned. Charlotte understood at once what was going on. “I have heard much of these things,” she said; “but I never saw the effect myself. You have everything ready there. Let me try whether I can succeed in producing anything.”

She took the thread in her hand, and as she was perfectly serious, she held it steady, and without any agitation. Not the slightest motion, however, could be detected. Ottilie was then called upon to try. She held the pendulum still more quietly and unconsciously over the plate on the table. But in a moment the swinging piece of metal began to stir with a distinct rotatory action, and turned as they moved the position of the plate, first to one side and then to the other; now in circles, now in ellipses; or else describing a series of straight lines; doing all the earl’s friend could expect, and far exceeding, indeed, all his expectations.

The earl himself was a little staggered; but the other could never be satisfied, from delight and curiosity, and begged for the experiment again and again with all sorts of variations. Ottilie was good-natured enough to gratify him; till at last she was obliged to desire to be allowed to go, as her headache had come on again. In further admiration and even rapture, he assured her with enthusiasm that he would cure her forever of her disorder, if she would only trust herself to his remedies. For a moment they did not know what he meant; but Charlotte, who comprehended immediately after, declined his well-meant offer, not liking to have introduced and practised about her a thing of which she had always had the strongest apprehensions.

The strangers were gone, and, notwithstanding their having been the inadvertent cause of strange and painful emotions, left the wish behind them, that this meeting might not be the last. Charlotte now made use of the beautiful weather to return visits in the neighborhood, which, indeed, gave her work enough to do, seeing that the whole country round, some from a real interest, some merely from custom, had been most attentive in calling to inquire after her. At home her delight was the sight of the child, and really it well deserved all love and interest. People saw in it a wonderful, indeed a miraculous child; the brightest, sunniest little face; a fine, well-proportioned body, strong and healthy; and what surprised them more, the double resemblance, which became more and more conspicuous. In figure and in the features of the face, it was like the captain; the eyes every day it was less easy to distinguish from the eyes of Ottilie.

Ottilie herself, partly from this remarkable affinity, perhaps still more under the influence of that sweet woman’s feeling which makes them regard with the most tender affection the offspring, even by another, of the man they love, was as good as a mother to the little creature as it grew, or rather, she was a second mother of another kind. If Charlotte was absent, Ottilie remained alone with the child and the nurse. Nanny had for some time past been jealous of the boy for monopolizing the entire affections of her mistress; she had left her in a fit of crossness, and gone back to her mother. Ottilie would carry the child about in the open air, and by degrees took longer and longer walks with it. She took her bottle of milk to give the child its food when it wanted any. Generally, too, she took a book with her; and so with the child in her arms, reading and wandering, she made a very pretty Penserosa.

Next chapter
● Elective Affinities | Part two: Chapter twelve

Previous chapter
● Elective Affinities | Part two: Chapter ten

Main
● Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

See also
● Goethe's affinity table | Used to make *Elective Affinities*.
● Goethe timeline | Historical overview of the construction of *Elective Affinities*.
● Goethe's human chemistry | Goethe's version of human chemistry.
● Goethean philosophy | Goethe's philosophy.
● Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References
1. (add)

In Elective Affinities (IAD), **Part two: Chapter fifteen** (add synopsis)

Part two: Chapter fifteen

Friends and relations, and all persons living in the same house together, are apt, when life is going smoothly and peacefully with them, to make what they are doing, or what they are going to do, even more than is right or necessary, a subject of constant conversation. They talk to each other of their plans and their occupations, and, without exactly taking one another's advice, consider and discuss together the entire progress of their lives. But this is far from being the case in serious moments; just when it would seem men most require the assistance and support of others, they all draw singly within themselves everyone to act for himself, everyone to work in his own fashion; they conceal from one another the particular means which they employ, and only the result, the object, the thing which they realize, is again made common property.

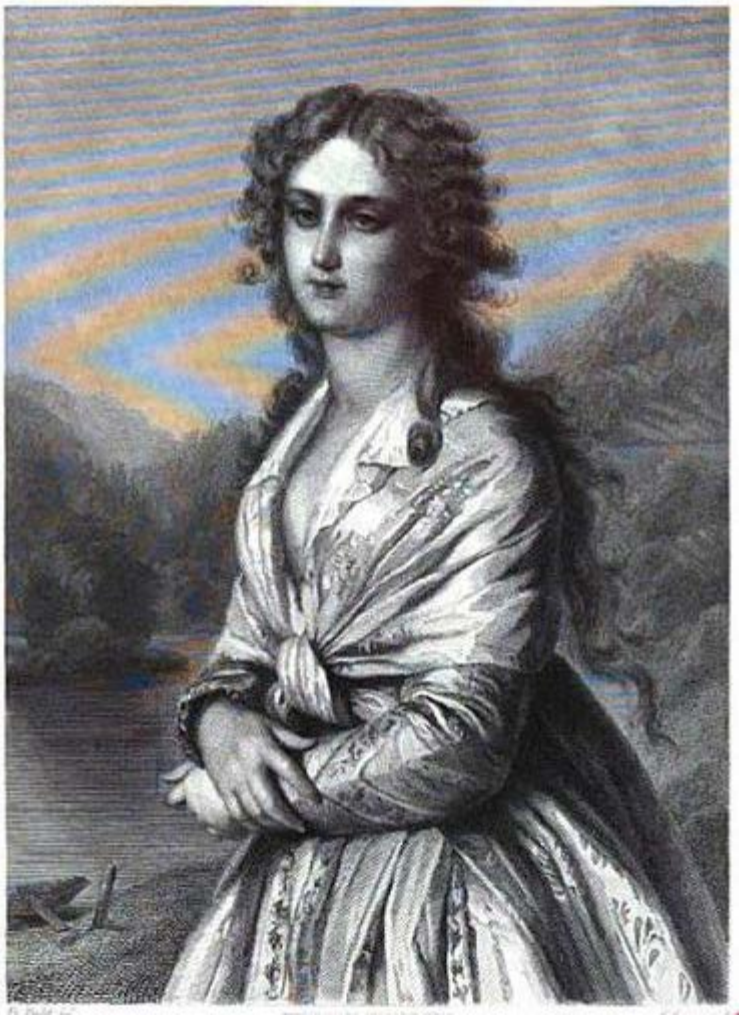

Description: "Ottilie" (HB:356/57).

After so many strange and unfortunate incidents, a sort of silent seriousness had passed over the two ladies, which showed itself in a sweet mutual effort to spare each other's feelings. The child had been buried privately in the chapel. It rested there as the first offering to a destiny full of ominous foreshadowings. Charlotte, as soon as ever she could, turned back to life and occupation, and here she first found Ottilie standing in need of her assistance. She occupied herself almost entirely with her, without letting it be observed. She knew how deeply the noble girl loved Edward. She had discovered by degrees the scene which had preceded the accident, and had gathered every circumstance of it, partly from Ottilie herself, partly from the letters of the major.

Ottilie, on her side, made Charlotte's immediate life much more easy for her. She was open, and even talkative, but she never spoke of the present, or of what had lately passed. She had been a close and thoughtful observer. She knew much, and now it all came to the surface. She entertained, she amused Charlotte, and the latter still nourished a hope in secret to see her married to Edward after all.

But something very different was passing in Ottilie. She had disclosed the secret of the course of her life to her friend, and she showed no more of her previous restraint and submissiveness. By her repentance and her resolution she felt herself freed from the burden of her fault and her misfortune. She had no more violence to do to herself. In the bottom of her heart she had forgiven herself solely under condition of the fullest renunciation, and it was a condition which would remain binding for all time to come.

So passed away some time, and Charlotte now felt how deeply house and park, and lake and rocks and trees, served to keep alive in them all their most painful reminiscences. They wanted change of scene, both of them, it was plain enough; but how it was to be effected was not so easy to decide.

Were the two ladies to remain together? Edward's previously-expressed will appeared to enjoin it,—his declarations and his threats appeared to make it necessary; only it could not be now mistaken that Charlotte and Ottilie, with all their goodwill, with all their sense, with all their efforts to conceal it, could not avoid finding themselves in a painful situation towards one another. In their conversation there was a constant endeavor to avoid doubtful subjects. They were often obliged only half to understand some allusion; more often, expressions were misinterpreted, if not by their

understandings, at any rate by their feelings. They were afraid to give pain to one another, and this very fear itself produced the evil which they were seeking to avoid.

If they were to try change of scene, and at the same time (at any rate for a while) to part, the old question came up again, where Ottilie was to go? There was the grand, rich family, who still wanted a desirable companion for their daughter, their attempts to find a person whom they could trust having hitherto proved ineffectual. The last time the baroness had been at the castle, she had urged Charlotte to send Ottilie there, and she had been lately pressing it again and again in her letters. Charlotte now a second time proposed it; but Ottilie expressly declined going anywhere, where she would be thrown into what is called the great world. “Do not think me foolish or self-willed, my dear aunt,” she said; “I had better tell you what I feel, for fear you should judge hardly of me; although in any other case it would be my duty to be silent. A person who has fallen into uncommon misfortunes, however guiltless he may be, carries a frightful mark upon him. His presence, in everyone who sees him and is aware of his history, excites a kind of horror. People see in him the terrible fate which has been laid upon him, and he is the object of a diseased and nervous curiosity. It is so with a house, it is so with a town, where any terrible action has been done; people enter them with awe; the light of day shines less brightly there, and the stars seem to lose their luster.

“Perhaps we ought to excuse it, but how extreme is the indiscretion with which people behave towards such unfortunates, with their foolish importunities and awkward kindness! You must forgive me for speaking in this way, but that poor girl whom Luciana tempted out of her retirement, and with such mistaken good nature tried to force into society and amusement, has haunted me and made me miserable. The poor creature, when she was so frightened and tried to escape, and then sank and swooned away, and I caught her in my arms, and the party came all crowding round in terror and curiosity! little did I think, then, that the same fate was in store for me. But my feeling for her is as deep and warm and fresh as ever it was; and now I may direct my compassion upon myself, and secure myself from being the object of any similar exposure.”

“But, my dear child,” answered Charlotte, “you will never be able to withdraw yourself where no one can see you; we have no cloisters now: otherwise, there, with your present feelings, would be your resource.”

“Solitude would not give me the resource for which I wish, my dear aunt,” answered Ottilie. “The one true and valuable resource is to be looked for where we can be active and useful; all the self-denials and all the penances on earth will fail to deliver us from an evil-omened destiny, if it be determined to persecute us. Let me sit still in idleness and serve as a spectacle for the world, and it will overpower me and crush me. But find me some peaceful employment, where I can go steadily and unweariedly on doing my duty, and I shall be able to bear the eyes of men, when I need not shrink under the eyes of God.”

“Unless I am much mistaken,” replied Charlotte, “your inclination is to return to the school.”

“Yes,” Ottilie answered; “I do not deny it. I think it a happy destination to train up others in the beaten way, after having been trained in the strangest myself. And do we not see the same great fact in history? some moral calamity drives men out into the wilderness; but they are not allowed to remain as they had hoped in their concealment there. They are summoned back into the world, to lead the wanderers into the right way; and who are fitter for such a service than those who have been initiated into the labyrinths of life? They are commanded to be the support of the unfortunate; and who can better fulfill that command than those who have no more misfortunes to fear upon earth?”

“You are selecting an uncommon profession for yourself,” replied Charlotte. “I shall not oppose you, however. Let it be as you wish; only I hope it will be but for a short time.”

“Most warmly I thank you,” said Ottilie, “for giving me leave at least to try to make the experiment. If I am not flattering myself too highly, I am sure I shall succeed: wherever I am, I shall remember the many trials which I went through myself, and how small, how infinitely small they were compared to those which I afterwards had to undergo. It will be my happiness to watch the embarrassments of the little creatures as they grow; to cheer them in their childish sorrows, and guide them back with a light hand out of their little aberrations. The fortunate is not the person to be of help to the fortunate; it is in the nature of man to require ever more and more of himself and others, the more he has received. The unfortunate who has himself recovered, knows best how to nourish, in himself and them, the feeling that

every moderate good ought to be enjoyed with rapture.”

“I have but one objection to make to what you propose,” said Charlotte, after some thought, “although that one seems to me of great importance. I am not thinking of you, but of another person: you are aware of the feelings towards you of that good, right-minded, excellent assistant. In the way in which you desire to proceed, you will become every day more valuable and more indispensable to him. Already he himself believes that he can never live happily without you, and hereafter, when he has become accustomed to have you to work with him, he will be unable to carry on his business if he loses you; you will have assisted him at the beginning only to injure him in the end.”

“Destiny has not dealt with me with too gentle a hand,” replied Ottilie; “and whoever loves me has perhaps not much better to expect. Our friend is so good and so sensible, that I hope he will be able to reconcile himself to remaining in a simple relation with me; he will learn to see in me a consecrated person, lying under the shadow of an awful calamity, and only able to support herself and bear up against it by devoting herself to that Holy Being who is invisibly around us, and alone is able to shield us from the dark powers which threaten to overwhelm us.”

All this, which the dear girl poured out so warmly, Charlotte privately reflected over; on many different occasions, although only in the gentlest manner, she had hinted at the possibility of Ottilie’s being brought again in contact with Edward; but the slightest mention of it, the faintest hope, the least suspicion, seemed to wound Ottilie to the quick. One day when she could not evade it, she expressed herself to Charlotte clearly and peremptorily on the subject.

“If your resolution to renounce Edward,” returned Charlotte, “is so firm and unalterable, then you had better avoid the danger of seeing him again. At a distance from the object of our love, the warmer our affection, the stronger is the control which we fancy that we can exercise on ourselves; because the whole force of the passion, diverted from its outward objects, turns inwards on ourselves. But how soon, how swiftly is our mistake made clear to us, when the thing which we thought that we could renounce stands again before our eyes as indispensable to us! You must now do what you consider best suited to your circumstances. Look well into yourself; change, if you prefer it, the resolution which you have just expressed. But do it of yourself, with a free consenting heart. Do not allow yourself to be drawn in by an accident; do not let yourself be surprised into your former position. It will place you at issue with yourself and will be intolerable to you. As I said, before you take this step, before you remove from me, and enter upon a new life, which will lead you no one knows in what direction, consider once more whether really, indeed, you can renounce Edward for the whole time to come. If you have faithfully made up your mind that you will do this, then will you enter into an engagement with me, that you will never admit him into your presence; and if he seeks you out and forces himself upon you, that you will not exchange words with him?”

Ottilie did not hesitate a moment; she gave Charlotte the promise, which she had already made to herself.

Now, however, Charlotte began to be haunted with Edward’s threat, that he would only consent to renounce Ottilie, as long as she was not parted from Charlotte. Since that time, indeed, circumstances were so altered, so many things had happened, that an engagement which was wrung from him in a moment of excitement might well be supposed to have been cancelled. She was unwilling, however, in the remotest sense to venture anything or to undertake anything which might displease him, and Mittler was therefore to find Edward, and inquire what, as things now were, he wished to be done.

Since the death of the child, Mittler had often been at the castle to see Charlotte, although only for a few moments at a time. The unhappy accident which had made her reconciliation with her husband in the highest degree improbable, had produced a most painful effect upon him. But ever, as his nature was, hoping and striving, he rejoiced secretly at the resolution of Ottilie. He trusted to the softening influence of passing time; he hoped that it might still be possible to keep the husband and the wife from separating; and he tried to regard these convulsions of passion only as trials of wedded love and fidelity.

Charlotte, at the very first, had informed the major by letter of Ottilie’s declaration. She had entreated him most earnestly to prevail on Edward to take no further steps for the present. They should keep quiet and wait, and see whether the poor girl’s spirits would recover. She had let him know from time to time whatever was necessary of what had more lately fallen from her. And now Mittler had to undertake the really difficult commission of preparing Edward for an

alteration in her situation. Mittler, however, well knowing that men can be brought more easily to submit to what is already done, than to give their consent to what is yet to be done, persuaded Charlotte that it would be better to send Ottilie off at once to the school.

Consequently, as soon as Mittler was gone, preparations were at once made for the journey. Ottilie put her things together; and Charlotte observed that neither the beautiful box, nor anything out of it, was to go with her. Ottilie had said nothing to her on the subject; and she took no notice, but let her alone. The day of the departure came; Charlotte's carriage was to take Ottilie the first day as far as a place where they were well known, where she was to pass the night, and on the second she would go on in it to the school. It was settled that Nanny was to accompany her, and remain as her attendant.

This capricious little creature had found her way back to her mistress after the death of the child, and now hung about her as warmly and passionately as ever; indeed she seemed, with her loquacity and attentiveness, as if she wished to make good her past neglect, and henceforth devote herself entirely to Ottilie's service. She was quite beside herself now for joy at the thought of travelling with her, and of seeing strange places, when she had hitherto never been away from the scene of her birth; and she ran from the castle to the village to carry the news of her good fortune to her parents and her relations, and to take leave. Unluckily for herself, she went among other places into a room where a person was who had the measles, and caught the infection, which came out upon her at once. The journey could not be postponed. Ottilie herself was urgent to go. She had travelled once already the same road. She knew the people of the hotel where she was to sleep. The coachman from the castle was going with her. There could be nothing to fear.

Charlotte made no opposition. She, too, in thought, was making haste to be clear of present embarrassments. The rooms which Ottilie had occupied at the castle she would have prepared for Edward as soon as possible, and restored to the old state in which they had been before the arrival of the captain. The hope of bringing back old happy days burns up again and again in us, as if it never could be extinguished. And Charlotte was quite right; there was nothing else for her except to hope as she did.

Next chapter
â— Elective Affinities | Part two: Chapter sixteen

Previous chapter
â— Elective Affinities | Part two: Chapter fourteen

â— Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

See also
â— Goethe's affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.

â— Goethe’s human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations

N1. (add)

References

1. (add)

In Elective Affinities (IAD), **Part two: Chapter five** (add)

- Active characters: (add)
- Discussed characters: (add)
- Locations: (add)

Description: A rendition of Luciana by Friedrich Pecht and Arthur von Ramberg (HB:312).

Part two: Chapter five

So swept on Luciana in the social whirlpool, driving the rush of life along before her. Her court multiplied daily, partly because her impetuosity roused and attracted so many, partly because she knew how to attach the rest to her by kindness and attention. Generous she was in the highest degree; her aunt's affection for her and her bridegroom's love, had heaped her, with beautiful and costly presents, but she seemed as if nothing which she had was her own, and as if she did not know the value of the things which had streamed in upon her. One day she saw a young lady looking rather poorly dressed by the side of the rest of the party, and she did not hesitate a moment to take off a rich shawl which she was wearing and hang it over her—doing it, at the same time, in such a humorous, graceful way that no one could refuse such a present so given. One of her courtiers always carried about a purse, with orders, whatever place they passed through, to inquire there for the most aged and most helpless persons, and give them relief, at least for the moment. In this way she gained for herself all round the country a reputation for charitableness which caused her not a little inconvenience, attracting about her far too many troublesome sufferers.

Nothing, however, so much added to her popularity as her steady and consistent kindness towards an unhappy young man, who shrank from society because, while otherwise handsome and well-formed, he had lost his right hand, although with high honor, in action. This mutilation weighed so heavily upon his spirits, it was so annoying to him that every new acquaintance he made had to be told the story of his misfortune, that he chose rather to shut himself up altogether, devoting himself to reading and other studious pursuits, and once for all would have nothing more to do with society.

She heard of the state of this young man. At once she contrived to prevail upon him to come to her, first to small parties, then to greater, and then out into the world with her. She showed more attention to him than to any other person; particularly she endeavored, by the services which she pressed upon him, to make him sensible of what he had lost in laboring herself to supply it. At dinner, she would make him sit next to her; she cut up his food for him, that he might only have to use his fork. If people older or of higher rank prevented her from being close to him, she would stretch her attention across the entire table, and the servants were hurried off to make up to him what distance threatened to deprive him of. At last she encouraged him to write with his left hand. All his attempts he was to address to her, and thus, whether far or near, she always kept herself in correspondence with him. The young man did not know what had happened to him, and from that moment a new life opened out before him.

Chemische Reactie Cadeaus (Chemical Reaction Gifts), Zazzle.nl (Q)

One may perhaps suppose that such behavior must have caused some uneasiness to her bridegroom. But, in fact, it was quite the reverse. He admired her exceedingly for her exertions, and he had the more reason for feeling entirely satisfied about her, as she had certain features in her character almost in excess, which kept anything in the slightest degree dangerous utterly at a distance. She would run about with anybody, just as she fancied; no one was free from danger of a push or a pull, or of being made the object of some sort of freak. But no person ever ventured to do the same to her; no person dared to touch her, or return, in the remotest degree, any liberty which she had taken herself. She kept everyone within the strictest barriers of propriety in their behavior to herself, while she, in her own behavior, was every moment overleaping them.

On the whole, one might have supposed it had been a maxim with her to expose herself indifferently to praise or blame, to regard or to dislike. If in many ways she took pains to gain people, she commonly herself spoiled all the good she had done, by an ill tongue, which spared no one. Not a visit was ever paid in the neighborhood, not a single piece of hospitality was ever shown to herself and her party among the surrounding castles or mansions, but what on her return her excessive recklessness let it appear that all men and all human things she was only inclined to see on the ridiculous side.

There were three brothers who, purely out of compliment to each other, which should marry first, had been overtaken by old age before they had got the question settled; here was a little young wife with a great old husband; there, on the other hand, was a dapper little man and an unwieldy giantess. In one house, every step one took one stumbled over a child; another, however many people were crammed into it, never would seem full, because there were no children there at all. Old husbands (supposing the estate was not entailed) should get themselves buried as quickly as possible, that such a thing as a laugh might be heard again in the house. Young married people should travel:

housekeeping did not sit well upon them. And as she treated the persons, so she treated what belonged to them; their houses, their furniture, their

dinner-services—everything. The ornaments of the walls of the rooms most particularly provoked her saucy remarks. From the oldest tapestry to the most modern printed paper; from the noblest family pictures to the most frivolous new copperplate: one as well as the other had to suffer—one as well as the other had to be pulled in pieces by her satirical tongue, so that, indeed, one had to wonder how, for twenty miles round, anything continued to exist.

It was not, perhaps, exactly malice which produced all this destructiveness; willfulness and selfishness were what ordinarily set her off upon it: but a genuine bitterness grew up in her feelings towards Ottilie.

She looked down with disdain on the calm, uninterrupted activity of the sweet girl, which everyone had observed and admired, and when something was said of the care which Ottilie took of the garden and of the hot-houses, she not only spoke scornfully of it, in affecting to be surprised, if it were so, at there being neither flowers nor fruit to be seen, not caring to consider that they were living in the depth of winter, but every faintest scrap of green, every leaf, every bud which showed, she chose to have picked every day and squandered on ornamenting the rooms and tables, and Ottilie and the gardener were not a little distressed to see their hopes for the next year, and perhaps for a longer time, destroyed in this wanton recklessness.

As little would she be content to leave Ottilie to her quiet work at home, in which she could live with so much comfort. Ottilie must go with them on their pleasure-parties and sledging-parties; she must be at the balls which were being got up all about the neighborhood. She was not to mind the snow, or the cold, or the night-air, or the storm; other people did not die of such things, and why should she? The delicate girl suffered not a little from it all, but Luciana gained nothing. For although Ottilie went about very simply dressed, she was always, at least so the men thought, the most beautiful person present. A soft attractiveness gathered them all about her; no matter whereabouts in the great rooms she was, first or last, it was always the same. Even Luciana's bridegroom was constantly occupied with her; the more so, indeed, because he desired her advice and assistance in a matter with which he was just then engaged. He had cultivated the acquaintance of the Architect. On seeing his collection of works of art, he had taken occasion to talk much with him on history and other matters, and especially from seeing the chapel had learned to appreciate his talent. The baron was young and wealthy. He was a collector; he wished to build. His love for the arts was keen, his knowledge small. In the architect he thought that he had found the man he wanted; that with his assistance there was more than one aim at which he could arrive at once. He had spoken to his bride of what he wished. She praised him for it, and was infinitely delighted with the proposal. But it was more, perhaps, that she might carry off this young man from Ottilie (for whom she fancied she saw in him a kind of inclination), than because she thought of applying his talents to any purpose. He had shown himself, indeed, very ready to help at any of her extemporized festivities, and had suggested various resources for this thing and that. But she always thought she understood better than he what should be done, and as her inventive genius was usually somewhat common, her designs could be as well executed with the help of a tolerably handy domestic as with that of the most finished artist. Further than to an altar on which something was to be offered, or to a crowning, whether of a living head or of one of plaster of Paris, the force of her imagination could not ascend, when a birthday, or other such occasion, made her wish to pay someone an especial compliment.

Ottilie was able to give the baron the most satisfactory answer to his inquiries as to the relation of the architect with their family. Charlotte had already, as she was aware, been exerting herself to find some situation for him; had it not been indeed for the arrival of the party, the young man would have left them immediately on the completion of the chapel; the winter having brought all building operations to a standstill; and it was, therefore, most fortunate if a new patron could be found to assist him, and to make use of his talents.

Ottilie's own personal position with the architect was as pure and unconscious as possible. His agreeable presence, and his industrious nature, had charmed and entertained her, as the presence of an elder brother might. Her feelings for him remained at the calm unimpassioned level of blood relationship. For in her heart there was no room for more; it was filled to overflowing with love for Edward; only God, who interpenetrates all things, could share with him the possession of that heart. Meantime the winter sank deeper; the weather grew wilder, the roads more impracticable, and therefore it seemed all the pleasanter to spend the waning days in agreeable society. With short intervals of ebb, the crowd from time to time flooded up over the house. Officers found their way there from distant garrison towns; the cultivated among them being a most welcome addition, the ruder the inconvenience of every one. Of civilians too there was no lack; and one day the count and the baroness quite unexpectedly came driving up together.

Their presence gave the castle the air of a thorough court. The men of rank and character formed a circle about the baron, and the ladies yielded precedence to the baroness. The surprise at seeing both together, and in such high spirits was not allowed to be of long continuance. It came out that the count's wife was dead, and the new marriage was to take place as soon as ever decency would allow it.

Well did Ottilie remember their first visit, and every word which was then uttered about marriage and separation, binding and dividing, hope, expectation, disappointment, renunciation. Here were these two persons, at that time without prospect for the future, now standing before her, so near their wished-for happiness, and an involuntary sigh escaped out of her heart.

No sooner did Luciana hear that the count was an amateur of music, than at once she must get up something of a concert. She herself would sing and accompany herself on the guitar. It was done. The instrument she did not play without skill; her voice was agreeable: as for the words one understood about as little of them as one commonly does when a German beauty sings to the guitar. However, everyone assured her that she had sung with exquisite expression, and she found quite enough approbation to

Description: "Luciana performing at the Concert" (HB:315); Luciana singing in front of the count.

satisfy her. A singular misfortune befell her, however, on this occasion. Among the party there happened to be a poet, whom she hoped particularly to attach to herself, wishing to induce him to write a song or two, and address them to her. This evening, therefore, she produced scarcely anything except songs of his composing. Like the rest of the party he was perfectly courteous to her, but she had looked for more. She spoke to him several times, going as near the subject as she dared, but nothing further could she get. At last, unable to bear it any longer, she sent one of her train to him, to sound him and find out whether he had not been delighted to hear his beautiful poems so beautifully executed.

"My poems?" he replied, with amazement; "pray excuse me, my dear sir," he added," I heard nothing but the vowels, and not all of those; however, I am in duty bound to express all gratitude for so amiable an intention." The dandy said nothing and kept his secret; the other endeavored to get himself out of the scrape by a few well-timed compliments. She did not conceal her desire to have something of his which should be written for herself.

If it would not have been too ill-natured, he might have handed her the alphabet, to imagine for herself, out of that, such laudatory poem as would please her, and set it to the first melody that came to hand; but she was not to escape out of this business without mortification. A short time after, she had to learn that the very same evening he had written, at the foot of one of Ottilie's favorite melodies, a most lovely poem, which was something more than complimentary.

Luciana, like all persons of her sort, who never can distinguish between where they show to advantage and where to disadvantage, now determined to try her fortune in reciting. Her memory was good, but, if the truth must be told, her execution was spiritless, and she was vehement without being passionate. She recited ballad stories, and whatever else is usually delivered in declamation. At the same time she had contracted an unhappy habit of accompanying what she delivered with gestures, by which, in a disagreeable way, what is purely epic and lyric is more confused than connected with the dramatic.

The count, a keen-sighted man, soon saw through the party, their inclinations, dispositions, wishes and capabilities, and by some means or other contrived to bring Luciana to a new kind of exhibition, which was perfectly suited to her.

"I see here," he said, "a number of persons with fine figures, who would surely be able to imitate pictorial emotions and postures. Suppose they were to try, if the thing is new to them, to represent some real and well-known picture. An imitation of this kind, if it requires some labor in arrangement, has an inconceivably charming effect."

Luciana was quick enough in perceiving that here she was on her own ground entirely. Her fine shape, her well-rounded form, the regularity and yet expressiveness of her features, her light-brown braided hair, her long neck—she ran them all over in her mind, and calculated on their pictorial effects, and if she had only known that her beauty showed to more advantage when she was still than when she was in motion, because in the last case certain ungracefulnesses continually escaped her, she would have entered even more eagerly than she did into this natural picture-making.

They looked out the engravings of celebrated pictures, and the first which they chose was Van Dyk's Belisarius. A large well-proportioned man, somewhat advanced in years, was to represent the seated blind general. The architect was to be the affectionate soldier standing sorrowing before him, there really being some resemblance between them. Luciana, half from modesty, had chosen the part of the young woman in the background, counting out some large alms into the palm of his hand, while an old woman beside her is trying to prevent her, and representing that she is giving too much. Another woman who is in the act of giving him something, was not forgotten. Into this and other pictures they threw themselves with all earnestness. The count gave the architect a few hints as to the best style of arrangement, and he at once set up a kind of theatre, all necessary pains being taken for the proper lighting of it. They were already deep in the midst of their preparations, before they observed how large an outlay what they were undertaking would require, and that in the country, in the middle of winter, many things which they

required it would be difficult to procure; consequently, to prevent a stoppage, Luciana had nearly her whole wardrobe cut in pieces, to supply the various costumes which the original artist had arbitrarily selected. The appointed evening came, and the exhibition was carried out in the presence of a large assemblage, and to the universal satisfaction. They had some good music to excite expectation, and the performance opened with the Belisarius. The figures were so successful, the colors were so happily distributed, and the lighting managed so skillfully, that they might really have fancied themselves in another world, only that the presence of the real instead of the apparent produced a kind of uncomfortable sensation.

The curtain fell, and was more than once raised again by general desire. A musical interlude kept the assembly amused while preparation was going forward, to surprise them with a picture of a higher stamp; it was the well-known design of Poussin, Ahasuerus and Esther. This time Luciana had done better for herself. As the fainting, sinking queen she had put out all her charms, and for the attendant maidens who were supporting her, she had cunningly selected pretty well-shaped figures, not one among whom, however, had the slightest pretension to be compared with herself. From this picture, as from all the rest, Ottilie remained excluded. To sit on the golden throne and represent the Zeus-like monarch, Luciana had picked out the finest and handsomest man of the party, so that this picture was really of inimitable perfection. For a third they had taken the so-called “Father's Admonition” of Terburg, and who does not know Wille's admirable engraving of this picture? One foot thrown over the other, sits a noble knightly-looking father; his daughter stands before him, to whose conscience he seems to be addressing himself. She, a fine striking figure, in a folding drapery of white satin, is only to be seen from behind, but her whole bearing appears to signify that she is collecting herself. That the admonition is not too severe, that she is not being utterly put to shame, is to be gathered from the air and attitude of the father, while the mother seems as if she were trying to conceal some slight embarrassment—she is looking into a glass of wine, which she is on the point of drinking.

Here was an opportunity for Luciana to appear in her highest splendor. Her back hair, the form of her head, neck and shoulders, were beyond all conception beautiful; and the waist, which in the modern antique of the ordinary dresses of young ladies is hardly visible, showed to the greatest advantage in all its graceful slender elegance in the really old costume. The architect had contrived to dispose the rich folds of the white satin with the most exquisite nature, and, without any question whatever, this living imitation far exceeded the original picture, and produced universal delight.

The spectators could never be satisfied with demanding a repetition of the performance, and the very natural wish to see the face and front of so lovely a creature, when they had done looking at her from behind, at last became so decided, that a merry impatient young wit cried out aloud the words one is accustomed to write at the bottom of a page, "Tournez, s'il vous plait," which was echoed all round the room.

The performers, however, understood their advantage too well, and had mastered too completely the idea of these works of art to yield to the most general clamor. The daughter remained standing in her shame, without favoring the spectators with the expression of her face. The father continued to sit in his attitude of admonition, and the mother did not lift nose or eyes out of the transparent glass, in which, although she seemed to be drinking, the wine did not diminish.

We need not describe the number of smaller after-pieces; for which had been chosen Flemish public-house scenes and fair and market days.

Description: "The count and baroness departing" (HB:317).

The count and the baroness departed, promising to return in the first happy weeks of their approaching union. And Charlotte now had hopes, after having endured two weary months of it, of ridding herself of the rest of the party at the same time. She was assured of her daughter's happiness, as soon as the first tumult of youth and betrothal should have subsided in her; for the bridegroom considered himself the most fortunate person in the world. His income was large, his disposition moderate and rational, and now he found himself further wonderfully favored in the happiness of becoming the possessor of a young lady with whom all the world must be charmed. He had so peculiar a way of referring everything to her, and only to himself through her, that it gave him an unpleasant feeling when any newly-arrived person did not devote himself heart and soul to her, and was far from flattered if, as occasionally happened, particularly with elderly men, he neglected her for a close intimacy with himself. Everything was settled about the architect. On New Year's day he was to follow him, and spend the Carnival at his house in the city, where Luciana was promising herself infinite happiness from a repetition of her charmingly successful pictures, as well as from a hundred other things; all the more as her aunt and her bridegroom seemed to make so light of the expense which was required for her amusements.

And now they were to break up. But this could not be managed in an ordinary way. They were one day making fun of Charlotte aloud, declaring that they would soon have eaten out her winter stores, when the nobleman who had represented Belisarius, being fortunately a man of some wealth, carried away by Luciana's charms, to which he had been so long devoting himself, cried out unthinkingly, "Why not manage then in the Polish fashion ? you come now and eat up me, and then we will go on round the circle." No sooner said than done. Luciana willed that it should be so. The next day they all packed up and the swarm alighted on a new property. There indeed they found room enough, but few conveniences and no preparations to receive them. Out of this arose many *contretemps*, which entirely enchanted Luciana; their life became ever wilder and

wilder. Huge hunting-parties were set on foot in the deep snow, attended with every sort of disagreeableness; women were not allowed to excuse themselves any more than men, and so they trooped on, hunting and riding, sledging and shouting, from one place to another, till at last they approached the residence, and there the news of the day and the scandals and what else forms the amusement of people at courts and cities gave the imagination another direction, and Luciana with her train of attendants (her aunt had gone on some time before) swept at once into a new sphere of life.

FROM OTTILIE'S DIARY.

"We accept every person in the world as that for which he gives himself out, only he must give himself out for something. We can put up with the unpleasant more easily than we can endure the insignificant.

"We venture upon anything in society except only what involves a consequence.

"We never learn to know people when they come to us: we must go to them to find out how things stand with them.

"I find it almost natural that we should see many faults in visitors, and that directly they are gone we should judge them not in the most amiable manner. For we have, so to say, a light to measure them by our own standard. Even cautious, sensible men can scarcely keep themselves in such cases from being sharp censors.

"When, on the contrary, we are staying at the houses of others, when we have seen them in the midst of all their habits and environments among those necessary conditions from which they cannot escape, when we have seen how they affect those about them, and how they adapt themselves to their circumstances, it is ignorance, it is worse, it is ill-will, to find ridiculous what in more than one sense has a claim on our respect.

"That which we call politeness and good breeding effects what otherwise can only be obtained by violence, or not even by that.

"Intercourse with women is the element of good manners.

"How can the character, the individuality of a man co-exist with polish of manner?

"The individuality can only be properly made prominent through good manners. Everyone likes what has something in it, only it must not be a disagreeable something.

"In life generally, and in society no one has such high advantages as a well-cultivated soldier.

"The rudest fighting people at least do not go out of their character, and generally behind the roughness there is a certain latent good humor, so that in difficulties it is possible to get on even with them.

"No one is more intolerable than an underbred civilian. From him one has a right to look for a delicacy, as he has no rough work to do.

"When we are living with people who have a delicate sense of propriety, we are in misery on their account when anything unbecoming is committed. So I always feel for and with Charlotte, when a person is tipping his chair. She cannot endure it.

"No one would ever come into a mixed party with spectacles on his nose, if he did but know that at once we women lose ail pleasure in looking at him or listening to what he has to say.

"Free-and-easiness, where there ought to be respect, is always ridiculous. No one would put his hat down when he had scarcely paid the ordinary compliments if he knew how comical it looks.

"There is no outward sign of courtesy that does not rest on a deep moral foundation. The proper education would be that which communicated the sign and the foundation of it at the same time.

"Behavior is a mirror in which everyone displays his own image.

"There is a courtesy of the heart. It is akin to love. Out of it arises the purest courtesy in the outward behavior.

"A freely offered homage is the most beautiful of all relations. And how were that possible without love?

"We are never further from our wishes than when we imagine that we possess what we have desired.

"No one is more a slave than the man who thinks himself free while he is not. [N1]

"A man has only to declare that he is free, and the next moment he feels the conditions to which he is subject. Let him venture to declare that he is under conditions, and then he will feel that he is free.

"Against great advantages in another, there are no means of defending ourselves except love.

"There is something terrible in the sight of a highly-gifted man lying under obligations to a fool.

"'No man is a hero to his valet,' the proverb says. But that is only because it requires a hero to recognize a hero. The valet will probably know how to value the valet-hero.
"Mediocrity has no greater consolation than in the thought that genius is not immortal.

"The greatest men are connected with their own century always through some weakness.

"One is apt to regard people as more dangerous than they are.

"Fools and modest people are alike innocuous. It is only your half-fools and your half-wise who are really and truly dangerous.

"There is no better deliverance from the world than through art; and a man can form no surer bond with it than through art.

"Alike in the moment of our highest fortune and our deepest necessity, we require the artist.

"The business of art is with the difficult and the good.

"To see the difficult easily handled, gives us the feeling of the impossible.

"Difficulties increase the nearer we are to our end.

"Sowing is not so difficult as reaping."

Next chapter
● Elective Affinities | Part two: Chapter six

Previous chapter
● Elective Affinities | Part two: Chapter four

Main

● Elective Affinities: Illustrated, Annotated, and Decoded

See also
● Goethe’s affinity table | Used to make *Elective Affinities*.
● Goethe timeline | Historical overview of the construction of *Elective Affinities*.
● Goethe’s human chemistry | Goethe's version of human chemistry.
● Goethean philosophy | Goethe's philosophy.
● Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

N1. Freedom quote
The 21st diary axiom, from Ottilie's diary section, above, shown depicted on the poster held by the woman adjacent, seems to have been a truncated paraphrasing of Dutch philosopher Benedict Spinoza's discussions on the subject of "will", from propositions 48 and 49 of his 1677 *Ethics*, wherein he criticized the Rene Descartes' dualism position, summarizing his views as follows: [3]

> “There is in the mind no absolute faculty of willing or not willing but only particular volitions like this or that

A woman holding up the famous Goethe quote on freedom, from *Elective Affinities* at the Occupy Wall Street protests (Zuccotti Park, New York, 28 Sep 2011, photo by: David Shankbone).

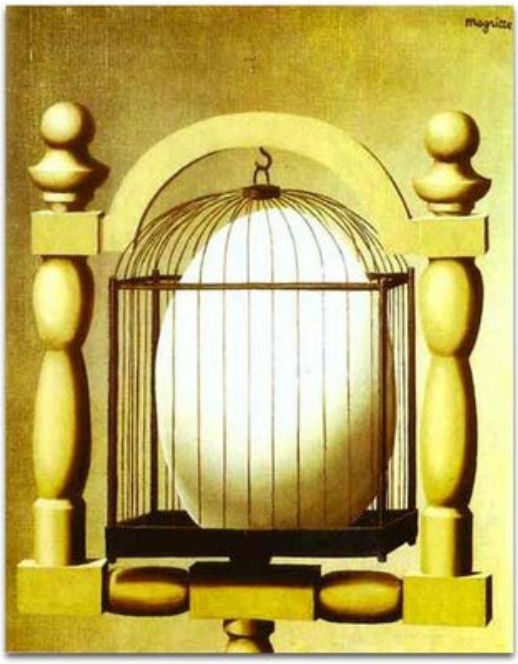

Belgian surrealist artist Rene Magritte's 1933 oil on canvas painting entitled "Elective Affinities" based on the human chemical theory of German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*, according to which the "will" is largely determined by forces external (1796).

> affirmation or this or that negation. Will and understanding are one and the same thing. Ideas are not dumb figures traced on a canvas; the assumption that they are is what prevents our seeing that every idea inasmuch as it is an idea contains affirmation or negation. There is not in the mind a will absolute and free; but the mind is so conditioned as to be caused to will this or that, by some cause which is determined by other cause, and this by another and so to infinity. So then the relation of the understanding and the will to this or that idea, to this or that volition, is that of stoniness to this or that stone, or that or humanness to Peter or to Paul. Will cannot be called 'free cause', but only 'necessary cause'. The will is nothing else than a manner of thinking just as is the understanding. **Men think themselves free**, because they are conscious of their volitions and of their desires and are oblivious to the causes which dispose them do desire and to will."

Spinoza's morality philosophy was said to have been very influential to Goethe. [4] According to German Goethean scholar Herman Grimm, Spinoza's manner of treating human relations, had opened the way to the latter views of Goethe and Friedrich Schiller who, in their *circa* 1796 correspondences, compared humans to elements that attract or repel one another without any exercise of "will" in the matter. [5] In regards to Spinoza's view of morality, and its possible influence on Goethe's physical chemistry morality theory, Goethe writes in his autobiography *Dichtung und Wahrheit*: [6]

> "After seeking through the world in vain, to find a means of cultivation for my unusual nature, I at last fell upon the *Ethics* of this philosopher. If would be impossible for me to render an account of how much I drew from my perusal of the work itself and how much I myself read into it. Enough that I found in it a sedative for my passions, and that it seemed to open out for me a free and boundless view of both the sensible and the moral world. But what especially riveted me to him, was the utter disinterestedness, which glowed in his every sentence."

In other words, Goethe, in Spinoza, may have intuited the some of the preliminaries of the physical chemistry morality system that he eventually comes to present in *Elective Affinities*.

The following 1853 Otto Wenckstern translation, seems to be the dominate version known in English: [2]

> "None are more hopelessly enslaved than those who falsely believe they are free."
>
> ("Niemand ist mehr Sklave, als der sich für frei hält, ohne es zu sein.")

The James Froude (1854) / Hjalmar Boyesen (1885) rendition, found above, reads as such:

> "No one is more a slave than the man who thinks himself free while he is not."

The Herbert Waidson (1960) version reads:

> "Nobody is more a slave than the man who imagines himself to be free without being so."

The Reginald Hollingdale (1971) rendition reads as such:

> "No one is more a slave than he who thinks he is free without being so."

The David Constantine (1994) version is:

> "No one is more enslaved than the man who believes himself to be free and is not."

Discussion

Japanese literary theorist Takaoki Matsui, noted for his 2010 chapter "Illuminations of *Elective Affinities:* Goethe's Criticism of Technology and Its Materialistic Transformation by Walter Benjamin" and 2011 Literature and Chemistry: Elective Affinities conference presentation: "From Lavoisier to Dalton and Davy: Towards the Complete Decipherment of Goethe's *Elective Affinities*", seems to think that some of the content of part two of Goethe's *Elective Affinities* has something to do with caloric theory and the kinetic theory of heat in some way, which seems to be a far-stretched hypothesis. On 6 May 2010, Matsui commented on this: [1]

> "The [following] pictures relate to Part II, Chap. 5 of the novel (the first of the three tableaux vivants which actually illustrate caloric theory and kinetic theory of heat). They were included in my slideshow for the conference (and not in my new article). Their subject (respiration experiment) is important for human chemistry, as you know."

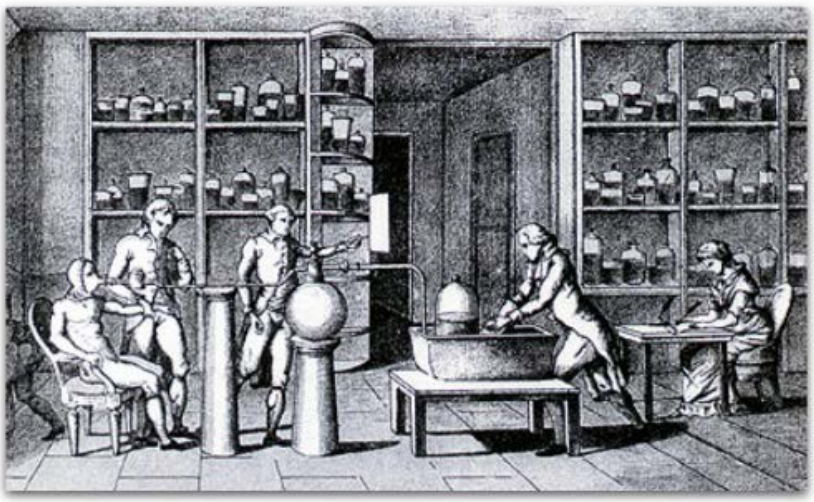

French chemist Antoine Lavoisier (center) shown conducting **animal heat combustion experiments** on his assistant, French chemist Armand Seguin; his wife chemist Marie-Anne Paulze (Madame Lavoisier) seated. [6]

Photo: ?

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In Elective Affinities (IAD), **Part two: Chapter four** (add synopsis)

Description: "Luciana Arriving at the House" (HB:308).

Part two: Chapter four

How strangely, after all this, with the sense so vividly impressed on her of mutability and perishableness, must Ottilie have been affected by the news which could not any longer be kept concealed from her, that Edward had exposed himself to the uncertain chances of war! Unhappily, none of the observations which she had occasion to make upon it escaped her. But it is well for us that man can only endure a certain degree of unhappiness; what is beyond that, either annihilates him, or passes by him, and leaves him apathetic. There are situations in which hope and fear run together, in which they mutually destroy one another, and lose themselves in a dull indifference. If it were not so, how could we bear to know of those who are most dear to us being in hourly peril, and yet go on as usual with our ordinary everyday life?

It was therefore as if some good genius was caring for Ottilie, that, all at once, this stillness, in which she seemed to be sinking from loneliness and want of occupation, was suddenly invaded by a wild army, which, while it gave her externally abundance of employment, and so took her out of herself, at the same time awoke in her the consciousness of her own power.

Charlotte's daughter, Luciana, had scarcely left the school and gone out into the great world; scarcely had she found herself at her aunt's house in the midst of a large society, than her anxiety to please produced its effect in really pleasing; and a young, very wealthy man, soon experienced a passionate desire to make her his own. His large property gave him a right to have the best of everything for his use, and nothing seemed to be wanting to him except a perfect wife, for whom, as for the rest of his good fortune, he should be the envy of the world.

This incident in her family had been for some time occupying Charlotte. It had engaged all her attention, and taken up her whole correspondence, except so far as this was directed to the obtaining news of Edward; so that latterly Ottilie had been left more than was usual to herself. She knew, indeed, of an intended visit from Luciana. She had been making various changes and arrangements in the house in preparation for it; but she had no notion that it was so near. Letters, she supposed, would first have to pass, settling the time, and then unsettling it; and then a final fixing: when the storm broke suddenly over the castle and over herself.

Description: "Luciana as Artemesia" (HB:308/09)

Up drove, first, lady's maids and men-servants, their carriage loaded with trunks and boxes. The household was already swelled to double or to treble its size, and then appeared the visitors themselves. There was the great aunt, with Luciana and some of her friends; and then the bridegroom with some of his friends. The entrance-hall was full of things—bags, portmanteaus, and leather articles of every sort. The boxes had to be got out of their covers, and that was infinite trouble; and of luggage and of rummage there was no end. At intervals, moreover, there were violent showers, giving rise to much inconvenience. Ottilie encountered all this confusion with the easiest equanimity, and her happy talent showed in its fairest light. In a very little time she had brought things to order, and disposed of them. Every one found his room,—everyone had his things exactly as he wished, and all thought themselves well attended to, because they were not prevented from attending on themselves.

The journey had been long and fatiguing, and they would all have been glad of a little rest after it. The bridegroom would have liked to pay his respects to his mother-in-law, express his pleasure, his gratitude, and so on. But Luciana could not rest. She had now arrived at the happiness of being able to mount a horse. The bridegroom had beautiful horses, and mount they must on the spot. Clouds and wind, rain and storm, they were nothing to Luciana, and now it was as if they only lived to get wet through, and to dry themselves again. If she took a fancy to go out walking, she never thought what sort of dress she had on, or what her shoes were like, she must go and see the grounds of which she had heard so much; what could not be done on horseback she ran through on foot. In a little while she had seen everything, and given her opinion about everything; and with such rapidity of character it was not easy to contradict or oppose her. The whole household had much to suffer, but most particularly the lady's maids, who were at work from morning to night, washing, and ironing, and stitching.

As soon as she had exhausted the house and the park, she thought it was her duty to pay visits all round the neighborhood. As they rode and drove very fast, all round the neighborhood was a considerable distance. The castle was flooded with return visits, and that they might not miss one another, it soon came to days being fixed for them.

Charlotte, in the meantime, with her aunt, and the man of business of the bridegroom, were occupied in determining about the settlements, and it was left to Ottilie, with those under her, to take care that all this crowd of people were properly provided for. Game-keepers and gardeners, fishermen and shop-dealers were set in motion, Luciana always showing herself like the blazing nucleus of a comet with its long tail trailing behind it. The ordinary amusements of the parties soon became too insipid for her taste. Hardly would she leave the old people in peace at the card-table. Whoever could by any means be set moving (and who could resist the charm of being pressed by her into service?) must up, if not to dance, then to play at forfeits, or some other game, where they were to be victimized and tormented. Notwithstanding all that, however, and although afterwards the redemption of the forfeits had to be settled with herself, yet of those who played with her, never anyone, especially never any man, let him be of what sort he would, went quite empty-handed away. Indeed, some old people of rank who were there she succeeded in completely winning over to herself, by having contrived to find out their birthdays or christening days, and marking them with some particular celebration. In all this she showed a skill not a little remarkable. Everyone saw himself favored, and each considered himself to be the one most favored, a weakness of which the oldest person of the party was the most notably guilty.

It seemed to be a sort of pride with her, that men who had anything remarkable about them—rank, character, or fame—she must and would gain for herself. Gravity and seriousness she made give way to her, and, wild strange creature as she was, she found favor even with discretion itself. Not that the young were at all cut short in consequence. Everybody had his share, his day, his hour, in which she contrived to charm and to enchain him. It was therefore natural enough that before long she should have had the architect in her eye, looking out so unconsciously as he did from under his long black hair, and standing so calm and quiet in the background. To all her questions she received short sensible answers; but he did not seem inclined to allow himself to be carried away further, and at last, half provoked, half in malice, she resolved that she would make him the hero of a day, and so gain him for her court.

It was not for nothing that she had brought that quantity of luggage with her. Much, indeed, had followed her afterwards. She had provided herself with an endless variety of dresses. When it took her fancy she would change her dress three or four times a day, usually wearing something of an ordinary kind, but making her appearance suddenly at intervals in a thorough masquerade dress, as a peasant girl or a fish maiden, as a fairy or a flower-girl; and this would go on from morning till night. Sometimes she would even disguise herself as an old woman, that her young face might peep out the fresher from under the cap; and so utterly in this way did she confuse and mix together the actual and the fantastic, that people thought they were living with a sort of drawing-room witch.

But the principal use which she had for these disguises were pantomimic tableaux and dances, in which she was skillful in expressing a variety of character. A cavalier in her suite had taught himself to accompany her action on the piano with the little music which was required; they needed only to exchange a few words and they at once understood one another.
One day, in a pause of a brilliant ball, they were called upon suddenly to extemporize (it was on a private hint from themselves) one of these exhibitions. Luciana seemed embarrassed, taken by surprise, and contrary to her custom let herself be asked more than once. She could not decide upon her character, desired the party to choose, and asked, like an improvisatore, for a subject. At last her piano-playing companion, with whom it had been all previously arranged, sat down at the instrument, and began to play a mourning march, calling on her to give them the Artemisia which she had been studying so admirably. She consented; and after a short absence reappeared, to the sad tender music of the dead march, in the form of the royal widow, with measured step, carrying an urn of ashes before her. A large black tablet was borne in after her, and a carefully cut piece of chalk in a gold pencil case.

One of her adorers and adjutants, into whose ear she whispered something, went directly to call the architect, to desire him, and if he would not come to drag him up, as master-builder, to draw the grave for the mausoleum, and to tell him at the same time that he was not to play the statist, but enter earnestly into his part as one of the performers.

Embarrassed as the architect outwardly appeared (for in his black, closefitting, modern civilian’s dress, he formed a wonderful contrast with the gauze crape fringes, tinsel tassels, and crown), he very soon composed himself internally, and the scene became all the more strange. With the greatest gravity he placed himself in front of the tablet, which was supported by a couple of pages, and drew carefully an elaborate tomb, which indeed would have suited better a Lombard than a Carian prince; but it was in such beautiful proportions, so solemn in its parts, so full of genius in its

decoration, that the spectators watched it growing with delight, and wondered at it when it was finished.

All this time he had not once turned towards the queen, but had given his whole attention to what he was doing. At last he inclined his head before her, and signified that he believed he had now fulfilled her commands. She held the urn out to him, expressing her desire to see it represented on the top of the monument. He complied, although unwillingly, as it would not suit the character of the rest of his design. Luciana was now at last released from her impatience. Her intention had been by no means to get a scientific drawing out of him. If he had only made a few strokes, sketched out something which should have looked like a monument, and devoted the rest of his time to her, it would have been far more what she had wished, and would have pleased her a great deal better. His manner of proceeding had thrown her into the greatest embarrassment. For although in her sorrow, in her directions, in her gestures, in her approbation of the work as it slowly rose before her, she had tried to manage some sort of change of expression, and although she had hung about close to him, only to place herself in some sort of relation to him, yet he had kept himself throughout too stiff, so that too often she had been driven to take refuge with her urn; she had to press it to her heart and look up to heaven, and at last, a situation of that kind having a necessary tendency to intensify, she made herself more like a widow of Ephesus than a Queen of Caria. The representation had to lengthen itself out and became tedious. The pianoforte player, who had usually patience enough, did not know into what tune he could escape. He thanked God when he saw the urn standing on the pyramid, and fell involuntarily as the queen was going to express her gratitude, into a merry air; by which the whole thing lost its character, the company however being thoroughly cheered up by it, who forthwith divided, some going up to express their delight and admiration of the lady for her excellent performance, and some praising the architect for his most artist-like and beautiful drawing.

The bridegroom especially paid marked attention to the architect. “I am vexed,” he said, “that the drawing should be so perishable; you will permit me however to have it taken to my room, where I should much like to talk to you about it.”

“If it would give you any pleasure,” said the architect, “I can lay before you a number of highly finished designs for buildings and monuments of this kind, of which this is but a mere hasty sketch.”

Ottilie was standing at no great distance, and went up to them. “Do not forget,” she said to the architect, “to take an opportunity of letting the baron see your collection. He is a friend of art and of antiquity. I should like you to become better acquainted.”

Luciana was passing at the moment. “What are they speaking of?” she asked.

“Of a collection of works of art,” replied the baron, “which this gentleman possesses, and which he is good enough to say that he will show us.”

“Oh, let him bring them immediately,” cried Luciana; “you will bring them, will you not?” she added, in a soft and sweet tone, taking both his hands in hers.

“The present is scarcely a fitting time,” the architect answered.

“What!” Luciana cried, in a tone of authority; “you will not obey the command of your queen!” and then she begged him again with some piece of absurdity.

“Do not be obstinate,” said Ottilie, in a scarcely audible voice.

The architect left them with a bow, which said neither yes nor no.

He was hardly gone, when Luciana was flying up and down the saloon with a greyhound. “Alas!” she exclaimed, as she ran accidentally against her mother, “am I not an unfortunate creature? I have not brought my monkey with me. They told me I had better not; but I am sure it was nothing but the laziness of my people, and it is such a delight to me. But I will have it brought after me; somebody shall go and fetch it. If I could only see a picture of the dear creature, it would be a comfort to me; I certainly will have his picture taken, and it shall never be out of my sight.”

“Perhaps I can comfort you,” replied Charlotte. “There is a whole volume full of the most wonderful ape faces in the library, which you can have fetched if you like.”

Luciana shrieked for joy. The great folio was produced instantly. The sight of these hideous creatures, so like to men, and with the resemblance even more caricatured by the artist, gave Luciana the greatest delight. Her amusement with each of the animals was to find some one of her acquaintance whom it resembled. “Is that not like my uncle?” she remorselessly exclaimed; “and here, look, here is my milliner M., and here is Parson S., and here the image of that creature — bodily! After all, these monkeys are the real *incroyables*, and it is inconceivable why they are not admitted into the best society.”

It was in the best society that she said this, and yet no one took it ill of her. People had become accustomed to allow her so many liberties in her prettinesses, that at last they came to allow them in what was unpretty.

During this time, Ottilie was talking to the bridegroom; she was looking anxiously for the return of the architect, whose serious and tasteful collection was to deliver the party from the apes; and in the expectation of it, she had made it the subject of her conversation with the baron, and directed his attention on various things which he was to see. But the architect stayed away, and when at last he made his appearance, he lost himself in the crowd, without having brought anything with him, and without seeming as if he had been asked for anything.

For a moment Ottilie became—what shall we call it?—annoyed, put out, perplexed. She had been saying so much about him—she had promised the bridegroom an hour of enjoyment after his own heart; and with all the depth of his love for Luciana, he was evidently suffering from her present behavior.

The monkeys had to give place to a collation. Round games followed, and then more dancing; at last, a general uneasy vacancy, with fruitless attempts at resuscitating exhausted amusements, which lasted this time, as indeed they usually did, far beyond midnight. It had already become a habit with Luciana to be never able to get out of bed in the morning or into it at night.

About this time, the incidents noticed in Ottilie’s diary become more rare, while we find a larger number of maxims and sentences drawn from life and relating to life. It is not conceivable that the larger proportion of these could have arisen from her own reflection, and most likely someone had shown her varieties of them, and she had written out what took her fancy. Many, however, with an internal bearing, can be easily recognized by the red thread.

FROM OTTILIE’S DIARY

A1. “We like to look into the future, because the undetermined in it, which may be affected this or that way, we feel as if we could guide by our silent wishes in our own favor.”

A2. “We seldom find ourselves in a large party without thinking, the accident which brings so many here together should bring our friends to us as well.”

A3. “Let us live in as small a circle as we will, we are either debtors or creditors before we have had time to look round.”

A4. “If we meet a person who is under an obligation to us, we remember it immediately. But how often may we meet people to whom we are ourselves under obligation without its even occurring to us!”

A5. “It is nature to communicate one’s self; it is culture to receive what is communicated as it is given.”

A6. “No one would talk much in society, if he only knew how often he misunderstands others.”

A7. “One alters so much what one has heard from others in repeating it, only because one has not understood it.”

A8. “Whoever indulges long in monologue in the presence of others, without flattering his listeners, provokes ill-will.”

A9. “Every word a man utters provokes the opposite opinion.”

A10. “Argument and flattery are but poor elements out of which to form a conversation.”

A11. “The pleasantest society is when the members of it have an easy and natural respect for one another.”

A12. “There is nothing in which people more betray their character than in what they find to laugh at.”

— Goethe (1809), James Froude (1854) translation

A12. “Human beings reveal their character most clearly by what they find ridiculous.”

— Goethe (1809), Reginald Hollingdale (1971) translation

A12. “Nothing so characterizes a man as what he finds ridiculous.”

— Goethe (1809), David Constantine (1994) translation

A13. “The ridiculous arises out of a moral contrast, in which two things are brought together before the mind in an innocent way.”

— Goethe (1809), James Froude (1854) translation

A13. “The sensual man often laughs when there is nothing to laugh at. His reaction to whatever stimulus he may receive never fails to reveal his inner complacency.”

— Goethe (1809), Reginald Hollingdale (1971) translation

A13. “We laugh when the elements of a moral discrepancy are brought home to our senses in a harmless way.”

— Goethe (1809), David Constantine (1994) translation

A14. “The foolish man often laughs where there is nothing to laugh at. Whatever touches him, his inner nature comes to the surface.”

— Goethe (1809), James Froude (1854) translation

A14. “The sensual man often laughs when there is nothing to laugh at. His reaction to whatever stimulus he may receive never fails to reveal his inner complacency.”

— Goethe (1809), Reginald Hollingdale (1971) translation

A14. “A sensual man often laughs when there is nothing to laugh at. Whatever provokes him, he expresses his inner well-being.”

— Goethe (1809), David Constantine (1994) translation

A15. “The man of understanding finds almost everything

A15. “The clever man finds almost everything ridiculous, the wise man almost nothing.”

— Goethe (1809), Reginald Hollingdale (1971) translation

ridiculous; the man of thought scarcely anything."

— Goethe (1809), James Froude (1854) translation

A15. "A commonsensical man finds almost everything ridiculous, a wise man almost nothing."

— Goethe (1809), David Constantine (1994) translation

A16. "Someone found fault with an elderly man for continuing to pay attention to young ladies. 'It is the only means,' he replied, 'of keeping one's self young, and everybody likes to do that.' "

A17. "People will allow their faults to be shown them; they will let themselves be punished for them; they will patiently endure many things because of them; they only become impatient when they have to lay them aside."

A18. "Certain defects are necessary for the existence of individuality. We should not be pleased, if old friends were to lay aside certain peculiarities."

A19. "There is a saying, 'He will die soon,' when a man acts unlike himself."

A20. "What kind of defects may we bear with and even cultivate in ourselves? Such as rather give pleasure to others than injure them."

A21. "The passions are defects or excellencies only in excess."

A22. "Our passions are true phoenixes: as the old burn out, the new straight rise up out of the ashes."

— Goethe (1809), James Froude (1854) translation

A22. "Our passions are phoenixes: as the old one burns away a new one immediately rises from the ashes."

— Goethe (1809), Reginald Hollingdale (1971) translation

A23. "Violent passions are incurable diseases; the means which will cure them are what first make them thoroughly dangerous."

A24. "Passion is both raised and softened by confession. In nothing, perhaps, were the middle way more desirable than in knowing what to say and what not to say to those we love."

— Goethe (1809), James Froude (1854) translation

A24. "Passion is both intensified and moderated by being confessed. Perhaps nowhere is a middle course more desirable than in what we say and do not say to those we love."

— Goethe (1809), David Constantine (1994) translation

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Elective Affinities

Discussion

Luciana's affinity to pictures of monkey's, mentioned in this chapter, in contrast to Ottilie's aversion to monkey photos, mentioned in later chapters, is the first mention in the apes in the novel.

In Goethe's 1784 essay "An Intermaxillary Bone is Present in the Upper Jaw of Man as Well as Animals", following his March 27th discovery of the human intermaxillary bone, Goethe commented the following:

> "Of the ape I will say nothing, for here the correspondence is all too striking."

See also:
â— Engelstein, Stefani. (2008). *Anxious Anatomy: the Conception of the Human Form in Literary and Naturalist Discourse* (pgs. 35-37). SUNY Press.

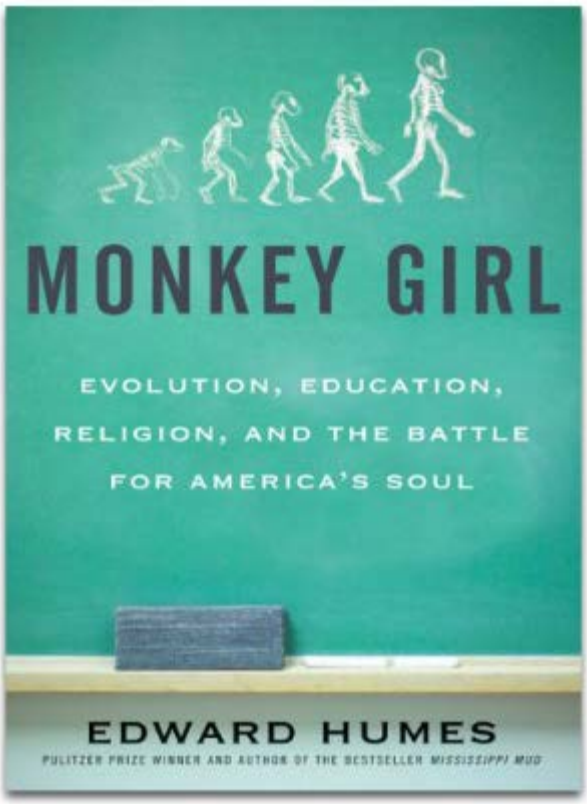

Edward Humes' 2007 *Monkey Girl* gives a well-rounded summary of how this monkey/human issue, 200-years later, is still with us. [1] See: monkey girl (11+ pgs)

See also

â— Goethe's affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe's human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations

N1. (add)

References

1. Humes, Edward. (2007). *Monkey Girl: Evolution, Education, Religion, and the Battle for America's Soul*. Harper Perennial.

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In Elective Affinities (IAD),
Part two: Chapter fourteen
(add synopsis)

Part two: Chapter fourteen

Description: "Charlotte Receiving the Major"(HB:352).

She hurried to the new house, and called the surgeon and gave the child into his hands. It was carried at once to Charlotte's sleeping-room. Cool and collected from a wide experience, he submitted the tender body to the usual process. Ottilie stood by him, through it all. She prepared everything, she fetched everything, but as if she were moving in another world; for the height of misfortune, like the height of happiness, alters the aspect of every object. And it was only when after every resource had been exhausted, the good man shook his head, and to her questions, whether there was hope, first was silent, and then answered with a gentle No! that she left the apartment, and had scarcely entered the sitting-room, when she fell fainting, with her face upon the carpet, unable to reach the sofa.

At that moment Charlotte was heard driving up. The surgeon implored the servants to keep back, and allow him to go to meet her and prepare her. But he was too late; while he was speaking she had entered the drawing-room. She found Ottilie on the ground, and one of the girls of the house came running and screaming to her open-mouthed. The surgeon entered at the same moment, and she was informed of everything. She could not at once, however, give up all hope. She was flying up-stairs to the child, but the physician besought her to remain where she was. He went himself, to deceive her with a show of fresh exertions, and she sat down upon the sofa. Ottilie was still lying on the ground; Charlotte raised her, and supported her against herself, and her beautiful head sank down upon her knee. The kind medical man went backwards and forwards; he appeared to be busy about the child; his real care was for the ladies; and so came on midnight, and the stillness grew more and more deathly. Charlotte did not try to conceal from herself any longer that her child would never return to life again. She desired to see it now. It had been wrapped up in warm woolen coverings. And it was brought down as it was, lying in its cot, which was placed at her side on the sofa. The little face was uncovered; and there it lay in its calm sweet beauty.

The report of the accident soon spread through the village; everyone was roused, and the story reached the hotel. The major hurried up the well-known road; he went round and round the house; at last he met a servant who was going to one of the out-buildings to fetch something. He learned from him in what state things were, and desired him to tell the surgeon that he was there. The latter came out, not a little surprised at the appearance of his old patron. He told him exactly what had happened, and undertook to prepare Charlotte to see him. He then went in, began some conversation to distract her attention, and led her imagination from one object to another, till at last he brought it to rest upon her friend, and the depth of feeling and of sympathy which would surely be called out in him. From the imaginative she was brought at once to the real. Enough! she was informed that he was at the door, that he knew everything and desired to be admitted.

The major entered. Charlotte received him with a miserable smile. He stood before her; she lifted off the green silk

covering under which the body was lying; and by the dim light of a taper, he saw before him, not without a secret shudder, the stiffened image of himself. Charlotte pointed to a chair, and there they sat opposite to one another, without speaking, through the night. Ottilie was still lying motionless on Charlotte's knee; she breathed softly, and slept or seemed to sleep.

The morning dawned, the lights went out; the two friends appeared to awake out of a heavy dream. Charlotte looked towards the major, and said quietly: "Tell me through what circumstances you have been brought hither, to take part in this mourning scene."

"The present is not a time," the major answered, in the same low tone as that in which Charlotte had spoken, for fear lest she might disturb Ottilie; "this is not a time, and this is not a place for reserve. The condition in which I find you is so fearful that even the earnest matter on which I am here, loses its importance by the side of it." He then informed her, quite calmly and simply, of the object of his mission, in so far as he was the ambassador of Edward: of the object of his coming, in so far as his own free will and his own interests were concerned in it. He laid both before her, delicately but uprightly; Charlotte listened quietly, and showed neither surprise nor unwillingness.

As soon as the major had finished, she replied, in a voice so light that to catch her words he was obliged to draw his chair closer to her: "In such a case as this I have never before found myself; but in similar cases I have always said to myself, how will it be to-morrow? I feel very clearly that the fate of many persons is now in my hands, and what I have to do is soon said without scruple or hesitation. I consent to the separation; I ought to have made up my mind to it before; by my unwillingness and reluctance I have destroyed my child. There are certain things on which destiny obstinately insists. In vain may reason, may virtue, may duty, may all holy feelings place themselves in its way. Something shall be done which to it seems good, and which to us seems not good; and it forces its own way through at last, let us conduct ourselves as we will.

"And, indeed, what am I saying? It is but my own desire, my own purpose, against which I acted so unthinkingly, which destiny is again bringing in my way? Did I not long ago, in my thoughts, design Edward and Ottilie for one another? Did I not myself labor to bring them together? And you, my friend, you yourself were an accomplice in my plot. Why, why, could I not distinguish mere man's obstinacy from real love? Why did I accept his hand, when I could have made him happy as a friend, and when another could have made him happy as a wife? And now, look here on this unhappy slumberer. I tremble for the moment when she will recover out of this half death sleep into consciousness. How can she endure to live? How shall she ever console herself, if she may not hope to make good that to Edward, of which, as the instrument of the most wonderful destiny, she has deprived him? And she can make it all good again by the passion, by the devotion with which she loves him. If love be able to bear all things, it is able to do yet more; it can restore all things: of myself at such a moment I may not think.

"Do you go quietly away, my dear major; say to Edward that I consent to the separation; that I leave it to him, to you, and to Mittler, to settle whatever is to be done. I have no anxiety for my own future condition; it may be what it will; it is nothing to me. I will subscribe whatever paper is submitted to me, only he must not require me to join actively. I cannot have to think about it, or give advice."

The major rose to go. She stretched out her hand to him across Ottilie. He pressed it to his lips, and whispered gently: "And for myself, may I hope anything?"

"Do not ask me now!" replied Charlotte. "I will tell you another time. We have not deserved to be miserable; but neither can we say that we have deserved to be happy together."

The major left her, and went, feeling for Charlotte to the bottom of his heart, but not being able to be sorry for the fate of the poor child. Such an offering seemed necessary to him for their general happiness. He pictured Ottilie to himself with a child of her own in her arms, as the most perfect compensation for the one of which she had deprived Edward. He pictured himself with his own son on his knee, who should have better right to resemble him than the one which was departed.

With such flattering hopes and fancies passing through his mind, he returned to the hotel, and on his way back he met

Edward, who had been waiting for him the whole night through in the open air, since neither rocket nor report of cannon would bring him news of the successful issue of his undertaking. He had already heard of the misfortune; and he too, instead of being sorry for the poor creature, regarded what had befallen it, without being exactly ready to confess it to himself, as a convenient accident, through which the only impediment in the way of his happiness was at once removed.

The major at once informed him of his wife's resolution, and he therefore easily allowed himself to be prevailed upon to return again with him to the village, and from thence to go for a while to the little town, where they would consider what was next to be done, and make their arrangements.

After the major had left her, Charlotte sat on, buried in her own reflections; but it was only for a few minutes. Ottilie suddenly raised herself from her lap, and looked full with her large eyes in her friend's face. Then she got up from off the ground, and stood upright before her.

"This is the second time," began the noble girl, with an irresistible solemnity of manner, "this is the second time that the same thing has happened to me. You once said to me that similar things often befall people more than once in their lives in a similar way, and if they do, it is always at important moments. I now find that what you said is true, and I have to make a confession to you. Shortly after my mother's death, when I was a very little child, I was sitting one day on a footstool close to you. You were on the sofa, as you are at this moment, and my head rested on your knees. I was not asleep, I was not awake: I was in a trance. I knew everything which was passing about me. I heard every word which was said with the greatest distinctness, and yet I could not stir, I could not speak; and if I had wished it, I could not have given a hint that I was conscious. On that occasion you were speaking about me to one of your friends; you were commiserating my fate, left as I was a poor orphan in the world. You described my dependent position, and how unfortunate a future was before me, unless some very happy star watched over me. I understood well what you said. I saw, perhaps too clearly, what you appeared to hope of me, and what you thought I ought to do. I made rules to myself, according to such limited insight as I had, and by these I have long lived; by these, at the time when you so kindly took charge of me, and had me with you in your house, I regulated whatever I did, and whatever I left undone. "But I have wandered out of my course; I have broken my rules; I have lost the very power of feeling them. And now, after a dreadful occurrence, you have again made clear to me my situation, which is more pitiable than the first. While lying in a half torpor on your lap, I have again, as if out of another world, heard every syllable which you uttered. I know from you how all is with me. I shudder at the thought of myself; but again, as I did then, in my half sleep of death, I have marked out my new path for myself.

"I am determined, as I was before, and what I have determined I must tell you at once. I will never be Edward's wife. In a terrible manner God has opened my eyes to see the sin in which I was entangled. I will atone for it, and let no one think to move me from my purpose. It is by this, my dearest, kindest friend, that you must govern your own conduct. Send for the major to come back to you. Write to him that no steps must be taken. It made me miserable that I could not stir or speak when he went;—I tried to rise,—I tried to cry out. Oh, why did you let him leave you with such unlawful hopes!"

Charlotte saw Ottilie's condition, and she felt for it; but she hoped that by time and persuasion she might be able to prevail upon her. On her uttering a few words, however, which pointed to a future,—to a time when her sufferings would be alleviated, and when there might be better room for hope, "No!" Ottilie cried, with vehemence, "do not endeavor to move me; do not seek to deceive me. At the moment at which I learn that you have consented to the separation, in that same lake I will expiate my errors and my crimes."

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Elective Affinities

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● Goethe timeline | Historical overview of the construction of *Elective Affinities*.
● Goethe’s human chemistry | Goethe's version of human chemistry.
● Goethean philosophy | Goethe's philosophy.
● Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References
1. (add)

In Elective Affinities (IAD), **Part two: Chapter nine** (add synopsis)

Part two: Chapter nine

The spring was come; it was late, but it therefore burst out more rapidly and more exhilaratingly than usual. Ottilie now found in the garden the fruits of her carefulness. Everything shot up and came out in leaf and flower at its proper time. A number of plants which she had been training up under glass frames and in hotbeds, now burst forward at once to meet, at last, the advances of nature; and whatever there was to do, and to take care of, it did not remain the mere labor of hope which it had been, but brought its reward in immediate and substantial enjoyment.

There was many a chasm however among the finest shoots produced by Luciana's wild ways, for which she had to console the gardener, and the symmetry of many a leafy coronet was destroyed. She tried to encourage him to hope that it would all be soon restored again, but he had too deep a feeling, and too pure an idea of the nature of his business, for such grounds of comfort to be of much service with him. Little as the gardener allowed himself to have his attention dissipated by other tastes and inclinations, he could the less bear to have the peaceful course interrupted which the plant follows towards its enduring or its transient perfection. A plant is like a self-willed man, out of whom we can obtain all which we desire, if we will only treat him his own way. A calm eye, a silent method, in all seasons of the year, and at every hour, to do exactly what has then to be done, is required of no one perhaps more than of a gardener. These qualities the good man possessed in an eminent degree, and it was on that account that Ottilie liked so well to work with him; but for some time past he had not found himself able to exercise his peculiar talent with any pleasure to himself. Whatever concerned the fruit-gardening or kitchen-gardening, as well as whatever had in time past been required in the ornamental gardens, he understood perfectly. One man succeeds in one thing, another in another; he succeeded in these. In his management of the orangery, of the bulbous flowers, in budding shoots and growing cuttings from the carnations and auriculas, he might challenge nature herself. But the new ornamental shrubs and fashionable flowers remained in a measure strange to him. He had a kind of shyness of the endless field of botany, which had been lately opening itself, and the strange names humming about his ears made him cross and ill-tempered. The orders for flowers which had been made by his lord and lady in the course of the past year, he considered so much useless waste and extravagance. All the more, as he saw many valuable plants disappear; and as he had ceased to stand on the best possible terms with the nursery gardeners, who he fancied had not been serving him honestly.

Consequently, after a number of attempts, he had formed a sort of a plan, in which Ottilie encouraged him the more readily, because its first essential condition was the return of Edward, whose absence in this, as in many other matters, every day had to be felt more and more seriously.

Now that the plants were ever striking new roots, and putting out their shoots, Ottilie felt herself even more fettered to this spot. It was just a year since she had come there as a stranger, as a mere insignificant creature. How much had she not gained for herself since that time! but, alas! how much had she not also since that time lost again! Never had she been so rich, and never so poor. The feelings of her loss and of her gain alternated momentarily one with another, chasing each other through her heart; and she could find no other means to help herself, except always to set to work again at what lay nearest to her, with such interest and eagerness as she could command.
That everything which she knew to be dear to Edward received especial care from her may be supposed. And why should she not hope that he himself would now soon come back again; and that when present, he would show himself grateful for all the care and pains which she had taken for him in his absence?

But there was also a far different employment which she took upon herself in his service; she had undertaken the principal charge of the child, whose immediate attendant it was all the easier for her to be, as they had determined not to put it into the hands of a nurse, but to bring it up themselves by hand with milk and water. In the beautiful season it was much out of doors, enjoying the free air, and Ottilie liked best to take it out herself, to carry the unconscious sleeping infant among the flowers and blossoms which should one day smile so brightly on its childhood,—among the young shrubs and plants, which, by their youth, seemed designed to grow up with the young lord to their after stature. When she looked about her, she did not hide from herself to what a high position that child was born: far and wide, wherever the eye could see, all would one day belong to him. How desirable, how necessary it must therefore be, that it should grow up under the eyes of its father and its mother, and renew and strengthen the union between them!

Ottilie saw all this so clearly, that she represented it to herself as conclusively decided, and for herself, as concerned with it, she never felt at all. Under this fair heaven, by this bright sunshine, at once it became clear to her, that her love, if it would perfect itself, must become altogether unselfish; and there were many moments in which she believed it was an elevation which she had already attained. She only desired the well-being of her friend. She fancied herself able to resign him, and never to see him any more, if she could only know that he was happy. The one only determination which she formed for herself was never to belong to another.

They had taken care that the autumn should be no less brilliant than the spring. Sunflowers were there, and all the other plants which are never tired of blossoming in autumn, and continue boldly on into the cold; asters especially were sown in the greatest abundance, and scattered about in all directions, to form a starry heaven upon the earth.

FROM OTTILIE'S DIARY

"Any good thought which we have read, anything striking which we have heard, we commonly enter in our diary; but if we would take the trouble, at the same time, to copy out of our friends' letters the remarkable observations, the original ideas, the hasty words so pregnant in meaning, which we might find in them, we should then be rich indeed. We lay aside letters never to read them again, and at last we destroy them out of discretion, and so disappears the most beautiful, the most immediate breath of life, irrecoverably for ourselves and for others. I intend to make amends in future for such neglect."

"So, then, once more the old story of the year is being repeated over again. We are come now, thank God, again to its most charming chapter. The violets and the mayflowers are as its superscriptions and its vignettes. It always makes a pleasant impression on us when we open again at these pages in the book of life."

"We find fault with the poor, particularly with the little ones among them, when they loiter about the streets and beg. Do we not observe, that they begin to work again, as soon as ever there is anything for them to do? Hardly has nature unfolded her smiling treasures, than the children are at once upon her track to open out a calling for themselves. None of them beg anymore; they have each a nosegay to offer you; they were out and gathering it before you had awakened out of your sleep, and the supplicating face looks as sweetly at you as the present which the hand is holding out. No person ever looks miserable who feels that he has a right to make a demand upon you."

"How is it that the year sometimes seems so short, and sometimes is so long? How is it that it is so short when it is passing, and so long as we look back over it? When I think of the past (and it never comes so powerfully over me as in the garden), I feel how the perishing and the enduring work one upon the other, and there is nothing whose endurance is so brief as not to leave behind it some trace of itself, something in its own likeness."

"We are able to tolerate the winter. We fancy that we can extend ourselves more freely when the trees are so spectral, so transparent. They are nothing, but they conceal nothing; but when once the germs and buds begin to show, then we become impatient for the full foliage to come out, for the landscape to put on its body, and the tree to stand before us as a form."

"Everything which is perfect in its kind, must pass out beyond and transcend its kind. It must be an inimitable something of another and a higher nature. In many of its tones the nightingale is only a bird; then it rises up above its class, and seems as if it would teach every feathered creature what singing really is."

"A life without love, without the presence of the beloved, is but poor *comédie à tiroir*. We draw out slide after slide, swiftly tiring of each, and pushing it back to make haste to the next. Even what we know to be good and important hangs but wearily together; every step is an end, and every step is a fresh beginning."

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● Goethe timeline | Historical overview of the construction of *Elective Affinities*.
● Goethe's human chemistry | Goethe's version of human chemistry.
● Goethean philosophy | Goethe's philosophy.
● Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References
1. (add)

In Elective Affinities (IAD), **Part two: Chapter one** (add synopsis)

Part two: Chapter one

There often happens to us in common life what, in an epic poem, we are accustomed to praise as a stroke of art in the poet; namely, that when the chief figures go off the scene, conceal themselves or retire into inactivity, some other or others, whom hitherto we have scarcely observed, come forward and fill their places. And these putting out all their force, at once fix our attention and sympathy on themselves, and earn our praise and admiration.

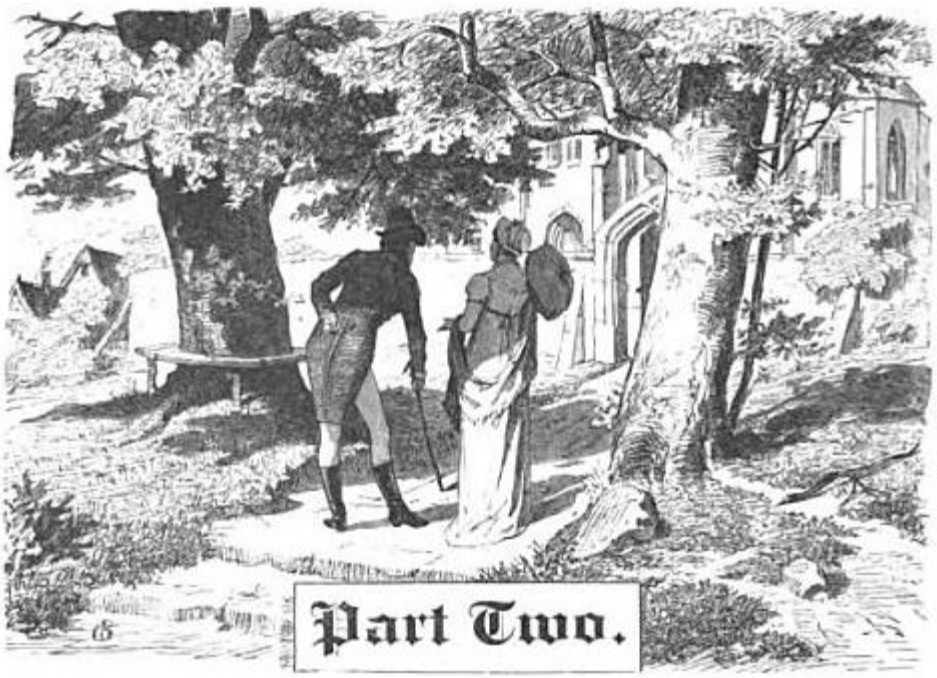

Description: "Charlotte Advising with the Architect." (HB:298)

Thus, after the captain and Edward were gone, the architect, of whom we have spoken, appeared every day a more important person. The ordering and executing of a number of undertakings depended entirely upon him, and he proved himself thoroughly understanding and businesslike in the style in which he went to work; while in a number of other ways he was able also to make himself of assistance to the ladies, and find amusement for their weary hours. His outward air and appearance were of the kind which win confidence and awake affection. A youth in the full sense of the word, well-formed, tall, perhaps a little too stout; modest without being timid, and easy without being obtrusive, there was no work and no trouble which he was not delighted to take upon himself; and as he could keep accounts with great facility, the whole economy of the household soon was no secret to him, and everywhere his salutary influence made itself felt. Any stranger who came he was commonly set to entertain, and he was skillful either at declining unexpected visits, or at least so far preparing the ladies for them as to spare them any disagreeableness.

Among others, he had one day no little trouble with a young lawyer, who had been sent by a neighboring nobleman to speak about a matter which, although of no particular moment, yet touched Charlotte to the quick. We have to mention this incident because it gave occasion for a number of things which otherwise might perhaps have remained long untouched. We remember certain alterations which Charlotte had made in the churchyard. The entire body of the monuments had been removed from their places, and had been ranged along the walls of the church, leaning against the string-course. The remaining space had been leveled, except a broad walk which led up to the church, and past it to the opposite gate; and it had been all sown with various kinds of trefoil, which had shot up and flowered most beautifully.

The new graves were to follow one after another in a regular order from the end, but the spot on each occasion was to be carefully smoothed over and again sown. No one could deny that on Sundays and holidays when the people went to church the change had given it a most cheerful and pleasant appearance. At the same time the clergyman, an old man and clinging to old customs, who at first had not been especially pleased with the alteration, had become thoroughly delighted with it, all the more because when he sat out like Philemon with his Baucis under the old linden trees at his back door, instead of the humps and mounds he had a beautiful clean lawn to look out upon; and which, moreover, Charlotte having secured the use of the spot to the parsonage, was no little convenience to his household.

Notwithstanding this, however, many members of the congregation had been displeased that the means of marking the spots where their forefathers rested had been removed, and all memorials of them thereby obliterated. However well preserved the monuments might be, they could only show who had been buried, but not where he had been buried, and the *where*, as many maintained, was everything.

Of this opinion was a family in the neighborhood, who for many years had been in possession of a considerable vault

for a general resting-place of themselves and their relations, and in consequence had settled a small annual sum for the use of the church. And now this young lawyer had been sent to cancel this settlement, and to show that his client did not intend to pay it any more, because the condition under which it had been hitherto made had not been observed by the other party, and no regard had been paid to objection and remonstrance. Charlotte, who was the originator of the alteration herself, chose to speak to the young man, who in a decided, though not a violent manner, laid down the grounds on which his client proceeded, and gave occasion in what he said for much serious reflection.

“You see,” he said, after a slight introduction, in which he sought to justify his peremptoriness; “you see, it is right for the lowest as well as for the highest to mark the spot which holds those who are dearest to him. The poorest peasant, who buries a child, finds it some consolation to plant a light wooden cross upon the grave, and hang a garland upon it, to keep alive the memorial, at least as long as the sorrow remains; although such a mark, like the mourning, will pass away with time. Those better off change the cross of wood into iron, and fix it down and guard it in various ways; and here we have endurance for many years. But because this too will sink at last, and become invisible, those who are able to bear the expense see nothing fitter than to raise a stone which shall promise to endure for generations, and which can be restored and made fresh again by posterity. Yet this stone it is not which attracts us; it is that which is contained beneath it, which is entrusted, where it stands, to the earth. It is not the memorial so much of which we speak, as of the person himself; not of what once was, but of what is. Far better, far more closely, can I embrace some dear departed one in the mound which rises over his bed, than in a monumental writing which only tells us that once he was. In itself, indeed, it is but little; but around it, as around a central mark, the wife, the husband, the kinsman, the friend, after their departure, shall gather in again; and the living shall have the right to keep far off all strangers and evil-wishers from the side of the dear one who is sleeping there.

“And, therefore, I hold it quite fair and fitting that my principal shall withdraw his grant to you. It is, indeed, but too reasonable that he should do it, for the members of his family are injured in a way for which no compensation could be even proposed. They are deprived of the sad sweet feelings of laying offerings on the remains of their dead, and of the one comfort in their sorrow of one day lying down at their side.”

“The matter is not of that importance,” Charlotte answered, “that we should disquiet ourselves about it with the vexation of a lawsuit. I regret so little what I have done, that I will gladly myself indemnify the church for what it loses through you. Only I must confess candidly to you, your arguments have not convinced me; the pure feeling of a universal equality at last, after death, seems to me more composing than this hard determined persistence in our personalities and in the conditions and circumstances of our lives. What do you say to it?” she added, turning to the architect.

“It is not for me,” replied he, “either to argue, or to attempt to judge in such a case. Let me venture, however, to say what my own art and my own habits of thinking suggest to me. Since we are no longer so happy as to be able to press to our breasts the in-urned remains of those we have loved, since we are neither wealthy enough, nor of cheerful heart enough to preserve them undecayed in large elaborate sarcophagi; since, indeed, we cannot even find place any more for ourselves and ours in the churches, and are banished out into the open air, we all, I think, ought to approve the method which you, my gracious lady, have introduced. If the members of a common congregation are laid out side by side, they are resting by the side of, and among their kindred; and, if the earth be once to receive us all, I can find nothing more natural or more desirable than that the mounds, which, if they are thrown up, are sure to sink slowly in again together, should be smoothed off at once, and the covering, which all bear alike, will press lighter upon each.”

“And is it all, is it all to pass away,” said Ottilie, “without one token of remembrance, without anything to call back the past?”

“By no means,” continued the architect; “it is not from remembrance, it is from *place* that men should be set free. The architect, the sculptor, are highly interested that men should look to their art—to their hand, for a continuance of their being; and, therefore, I should wish to see well-designed, well-executed monuments; not sown up and down by themselves at random, but erected all in a single spot, where they can promise themselves endurance. Inasmuch as even the good and the great are contented to surrender the privilege of resting in person in the churches, *we* may, at least, erect there or in some fair hall near the burying-place, either monuments or monumental writings. A thousand forms might be suggested for them, and a thousand ornaments with which they might be decorated.”

“If the artists are so rich,” replied Charlotte, “then tell me how it is that they are never able to escape from little obelisks, dwarf pillars, and urns for ashes? Instead of your thousand forms of which you boast, I have never seen anything but a thousand repetitions.”

“It is very generally so with us,” returned the architect, “but it is not universal; and very likely the right taste and the proper application of it may be a peculiar art. In this case especially we have this great difficulty, that the monument must be something cheerful and yet commemorate a solemn subject; while its matter is melancholy, it must not itself be melancholy. As regards designs for monuments of all kinds, I have collected numbers of them, and I will take some opportunity of showing them to you: but at all times the fairest memorial of a man remains some likeness of himself. This, better than anything else, will give a notion of what he was; it is the best text for many or for few notes, only it ought to be made when he is at his best age, and that is generally neglected; no one thinks of preserving forms while they are alive, and if it is done at all, it is done carelessly and incompletely: and then comes death; a cast is taken swiftly off the face; this mask is set upon a block of stone, and that is what is called a bust. How seldom is the artist in a position to put any real life into such things as these!”

“You have contrived,” said Charlotte, “without perhaps knowing it or wishing it, to lead the conversation altogether in my favor. The likeness of a man is quite independent; everywhere that it stands, it stands for itself, and we do not require it to mark the site of a particular grave. But I must acknowledge to you to having a strange feeling; even to likenesses I have a kind of disinclination. Whenever I see them they seem to be silently reproaching me. They point to something far away from us,—gone from us; and they remind me how difficult it is to pay right honor to the present. If we think how many people we have seen and known, and consider how little we have been to them and how little they have been to us, it is no very pleasant reflection. We have met a man of genius without having enjoyed much with him,—a learned man without having learned from him,—a traveler without having been instructed,—a man to love without having shown him any kindness.”

“And, unhappily, this is not the case only with accidental meetings. Societies and families behave in the same way towards their dearest members, towns towards their worthiest citizens, people towards their most admirable princes, nations towards their most distinguished men.”

“I have heard it asked why we heard nothing but good spoken of the dead, while of the living it is never without some exception. It should be answered, because from the former we have nothing any more to fear, while the latter may still, here or there, fall in our way. So unreal is our anxiety to preserve the memory of others,—generally no more than a mere selfish amusement; and the real, holy, earnest feeling, would be what should prompt us to be more diligent and assiduous in our attentions toward those who still are left to us.”

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- Goethe timeline | Historical overview of the construction of *Elective Affinities*.
- Goethe’s human chemistry | Goethe's version of human chemistry.
- Goethean philosophy | Goethe's philosophy.
- Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References
1. (add)

In Elective Affinities (IAD), **Part two: Chapter seven** (add synopsis)

Part two: Chapter seven

In so far as the architect desired the happiness of his kind patronesses, it was a pleasure to him, now that at last he was obliged to go, to know that he was leaving them in good society with the estimable assistant. At the same time, however, when he thought of their goodness in its relation to himself, he could not help feeling it a little painful to see his place so soon, and as it seemed to his modesty, so well, so completely supplied. He had lingered and lingered, but now he forced himself away; what, after he was gone, he must endure as he could, at least he could not stay to witness with his own eyes.

Description: "Ottilie as the Madonna" (HB:324/25).

To the great relief of this half-melancholy feeling, the ladies at his departure made him a present of a waistcoat, upon which he had watched them both for some time past at work, with a silent envy of the fortunate unknown, to whom it was by-and-by to belong. Such a present is the most agreeable which a true-hearted man can receive; for while he thinks of the unwearied play of the beautiful fingers at the making of it, he cannot help flattering himself that in so long-sustained a labor the feeling could not have remained utterly without an interest in its accomplishment.

The ladies had now a new visitor to entertain, for whom they felt a real regard, and whose stay with them it would be their endeavor to make as agreeable as they could. There is in all women a peculiar circle of inward interests, which remain always the same, and from which nothing in the world can divorce them. In outward social intercourse, on the other hand, they will gladly and easily allow themselves to take their tone from the person with whom at the moment they are occupied; and thus by a mixture of impassiveness and susceptibility, by persisting and by yielding, they continue to keep the government to themselves, and no man in the cultivated world can ever take it from them.

The architect, following at the same time his own fancy and his own inclination, had been exerting himself and putting out his talents for their gratification and for the purposes of his friends; and business and amusement, while he was with them, had been conducted in this spirit, and directed to the ends which most suited his taste. But now in a short time, through the presence of the assistant, quite another sort of life was commenced. His great gift was to talk well, and to treat in his conversation of men and human relations, particularly in reference to the cultivation of young people. Thus arose a very perceptible contrast to the life which had been going on hitherto, all the more as the assistant could not entirely approve of their having interested themselves in such subjects so exclusively.

Of the impersonated picture which received him on his arrival, he never said a single word. On the other hand, when they took him to see the church and the chapel with their new decorations, expecting to please him as much as they were pleased themselves, he did not hesitate to express a very contrary opinion about it.

“This mixing up of the holy with the sensuous,” he said, “is anything but pleasing to my taste; I cannot like men to set apart certain especial places, consecrate them, and deck them out, that by so doing they may nourish in themselves a temper of piety. No ornaments, not even the very simplest, should disturb in us that sense of the Divine Being which accompanies us wherever we are, and can consecrate every spot into a temple. What pleases me is to see a home-service

of God held in the saloon where people come together to eat, where they have their parties, and amuse themselves with games and dances. The highest, the most excellent in men, has no form; and one should be cautious how one gives it any form except noble action.”

Charlotte, who was already generally acquainted with his mode of thinking, and in the short time he had been at the castle had already probed it more deeply, found something also which he might do for her in his own department; and she had her garden children, whom the architect had reviewed shortly before his departure, marshaled up into the great saloon. In their bright, clean uniforms, with their regular orderly movement, and their own natural vivacity, they looked exceedingly well. The assistant examined them in his own way, and by a variety of questions, and by the turns which he gave them, soon brought to light the capacities and dispositions of the children; and without its seeming so, in the space of less than one hour he had really given them important instruction and assistance.

“How did you manage that?” said Charlotte, as the children marched away. “I listened with all my attention. Nothing was brought forward except things which were quite familiar, and yet I cannot tell the least how I should begin, to bring them to be discussed in so short a time so methodically, with all this questioning and answering.”

“Perhaps,” replied the assistant, “we ought to make a secret of the tricks of our own handicraft. However, I will not hide from you one very simple maxim, with the help of which you may do this, and a great deal more than this. Take any subject, a substance, an idea, whatever you like; keep fast hold of it; make yourself thoroughly acquainted with it in all its parts, and then it will be easy for you, in conversation, to find out, with a mass of children, how much about it has already developed itself in them; what requires to be stimulated, what to be directly communicated. The answers to your questions may be as unsatisfactory as they will, they may wander wide of the mark; if you only take care that your counter-question shall draw their thoughts and senses inwards again; if you do not allow yourself to be driven from your own position—the children will at last reflect, comprehend, learn only what the teacher desires them to learn, and the subject will be presented to them in the light in which he wishes them to see it. The greatest mistake which he can make is to allow himself to be run away with from the subject; not to know how to keep fast to the point with which he is engaged. Do you try this on your own account the next time the children come; you will find you will be greatly entertained by it yourself.”

“That is very good,” said Charlotte. “The right method of teaching is the reverse, I see, of what we must do in life. In society we must keep the attention long upon nothing, and in instruction the first commandment is to permit no dissipation of it.”

“Variety, without dissipation, were the best motto for both teaching and life, if this desirable equipoise were easy to be preserved,” said the assistant, and he was going on further with the subject, when Charlotte called out to him to look again at the children, whose merry troop were at the moment moving across the court. He expressed his satisfaction at seeing them wearing a uniform. “Men,” he said, “should wear a uniform from their childhood upwards. They have to accustom themselves to work together; to lose themselves among their equals; to obey in masses, and to work on a large scale. Every kind of uniform, moreover, generates a military habit of thought, and a smart, straightforward carriage. All boys are born soldiers, whatever you do with them. You have only to watch them at their mock fights and games, their storming parties and scaling parties.”

“On the other hand, you will not blame me,” replied Ottilie, “if I do not insist with my girls on such unity of costume. When I introduce them to you, I hope to gratify you by a party-colored mixture.”

“I approve of that entirely,” replied the other. “Women should go about in every sort of variety of dress; each following her own style and her own likings, that each may learn to feel what sits well upon her and becomes her. And for a more weighty reason as well—because it is appointed for them to stand alone all their lives, and work alone.”

“That seems to me to be a paradox,” answered Charlotte. “Are we then to be never anything for ourselves?”

“Oh, yes!” replied the assistant. “In respect of other women assuredly. But observe a young

Description: "The Assistant Instructing Charlotte and Ottilie" (HB:325).

lady as a lover, as a bride, as a housewife, as a mother. She always stands isolated. She is always alone, and will be alone. Even the most empty-headed woman is in the same case. Each one of them excludes all others. It is her nature to do so; because of each one of them is required everything which the entire sex have to do. With a man it is altogether different. He would make a second man if there were none. But a woman might live to an eternity, without even so much as thinking of producing a duplicate of herself."

"One has only to say the truth in a strange way," said Charlotte, "and at last the strangest thing will seem to be true. We will accept what is good for us out of your observations, and yet as women we will hold together with women, and do common work with them too; not to give the other sex too great an advantage over us. Indeed, you must not take it ill of us, if in future we come to feel a little malicious satisfaction when our lords and masters do not get on in the very best way together."

With much care, this wise, sensible person went on to examine more closely how Ottilie proceeded with her little pupils, and expressed his marked approbation of it. "You are entirely right," he said, "in directing these children only to what they can immediately and usefully put in practice. Cleanliness, for instance, will accustom them to wear their clothes with pleasure to themselves; and everything is gained if they can be induced to enter into what they do with cheerfulness and self-reflection."

In other ways he found to his great satisfaction, that nothing had been done for outward display; but all was inward, and designed to supply what was indispensably necessary. "In how few words," he cried, "might the whole business of education be summed up, if people had but ears to hear!"

"Will you try whether I have any ears?" said Ottilie, smiling.

"Indeed I will," answered he; "only you must not betray me. Educate the boys to be servants, and the girls to be mothers, and everything is as it should be."

"To be mothers?" replied Ottilie. "Women would scarcely think that sufficient. They have to look forward, without being mothers, to going out into service. And, indeed, our young men think themselves a great deal too good for servants. One can see easily, in every one of them, that he holds himself far fitter to be a master."

"And for that reason we should say nothing about it to them," said the assistant. "We flatter ourselves on into life; but life flatters not us. How many men would like to acknowledge at the outset, what at the end they must acknowledge whether they like it or not? But let us leave these considerations, which do not concern us here.

"I consider you very fortunate in having been able to go so methodically to work with your pupils. If your very little ones run about with their dolls, and stitch together a few petticoats for them; if the elder sisters will then take care of the younger, and the whole household know how to supply its own wants, and one member of it help the others, the further step into life will not then be great, and such a girl will find in her husband what she has lost in her parents.

“But among the higher ranks the problem is a sorely intricate one. We have to provide for higher, finer, more delicate relations; especially for such as arise out of society. We are, therefore, obliged to give our pupils an outward cultivation. It is indispensable, it is necessary, and it may be really valuable, if we do not overstep the proper measure in it. Only it is so easy, while one is proposing to cultivate the children for a wider circle, to drive them out into the indefinite, without keeping before our eyes the real requisites of the inner nature. Here lies the problem which more or less must be either solved or blundered over by all educators.

“Many things, with which we furnish our scholars at the school, do not please me; because experience tells me of how little service they are likely to be in after-life. How much is not at once stripped off; how much is not at once committed to oblivion, as soon as the young lady finds herself in the position of a housewife or a mother!

“In the meantime, since I have devoted myself to this occupation, I cannot but entertain a devout hope that one day, with the companionship of some faithful helpmate, I may succeed in cultivating purely in my pupils that, and that only, which they will require when they pass out into the field of independent activity and self-reliance; that I may be able to say to myself, in this sense is their education completed. Another education there is indeed which will again speedily recommence, and work on well-nigh through all the years of our life—the education which circumstances will give us, if we do not give it to ourselves.”

How true Ottilie felt were these words! What had not a passion, little dreamed of before, done to educate her in the past year! What trials did she not see hovering before her if she looked forward only to the next—to the very next, which was now so near!

It was not without a purpose that the young man had spoken of a helpmate—of a wife; for with all his diffidence, he could not refrain from thus remotely hinting at his own wishes. A number of circumstances and accidents, indeed, combined to induce him on this visit to approach a few steps towards his aim.

The lady superior of the school was advanced in years. She had been already for some time looking about among her fellow-laborers, male and female, for some person whom she could take into partnership with herself, and at last had made proposals to the assistant in whom she had the highest ground for feeling confidence. He was to conduct the business of the school with herself. He was to work with her in it, as if it was his own; and after her death, as her heir, to enter upon it as sole proprietor.

The principal thing now seemed to be, that he should find a wife who would co-operate with him. Ottilie was secretly before his eyes and before his heart. A number of difficulties suggested themselves, and yet again there were favorable circumstances on the other side to counterbalance them. Luciana had left the school; Ottilie could therefore return with the less difficulty. Of the affair with Edward, some little had transpired. It passed, however, as many such things do, as a matter of indifference, and this very circumstance might make it desirable that she should leave the castle. And yet, perhaps, no decision would have been arrived at, no step would have been taken, had not an unexpected visit given a special impulse to his hesitation. The appearance of remarkable people, in any and every circle, can never be without its effects.

The count and the baroness, who often found themselves asked for their opinion, almost everyone being in difficulty about the education of their children, as to the value of the various schools, had found it desirable to make themselves particularly acquainted with this one, which was generally so well spoken of; and under their present circumstances, they were more easily able to carry on these inquiries in company.

The baroness, however, had something else in view as well. While she was last at the castle, she had talked over with Charlotte the whole affair of Edward and Ottilie. She had insisted again and again that Ottilie must be sent away. She tried every means to encourage Charlotte to do it, and to keep her from being frightened by Edward’s threats. Several modes of escape from the difficulty were suggested. Accidentally the school was mentioned, and the assistant and his incipient passion, which made the baroness more resolved than ever to pay her intended visit there.

She went; she made acquaintance with the assistant; looked over the establishment, and spoke of Ottilie. The count also

spoke with much interest of her, having in his recent visit learned to know her better. She had been drawn towards him; indeed, she had felt attracted by him; believing that she could see, that she could perceive in his solid, substantial conversation, something to which hitherto she had been an entire stranger. In her intercourse with Edward, the world had been utterly forgotten; in the presence of the count, the world appeared first worth regarding. The attraction was mutual. The count conceived a liking for Ottilie; he would have been glad to have had her for a daughter. Thus a second time, and worse than the first time, she was in the way of the baroness. Who knows what, in times when passions ran hotter than they do now-a-days, this lady might not have devised against her? As things were, it was enough if she could get her married, and render her more innocuous for the future to the peace of mind of married women. She therefore artfully urged the assistant, in a delicate, but effective manner, to set out on a little excursion to the castle; where his plans and his wishes, of which he made no secret to the lady, he might forthwith take steps to realize.

With the fullest consent of the superior he started off on his expedition, and in his heart he nourished good hopes of success. He knew that Ottilie was not ill-disposed towards him; and although it was true there was some disproportion of rank between them, yet distinctions of this kind were fast disappearing in the temper of the time. Moreover, the baroness had made him perceive clearly that Ottilie must always remain a poor portionless maiden. To be related to a wealthy family, it was said, could be of service to nobody. For even with the largest property, men have a feeling that it is not right to deprive of any considerable sum, those who, as standing in a nearer degree of relationship, appear to have a fuller right to possession; and really it is a strange thing, that the immense privilege which a man has of disposing of his property after his death, he so very seldom uses for the benefit of those whom he loves, out of regard to established usage only appearing to consider those who would inherit his estate from him supposing he made no will at all.

Thus, while on his journey, he grew to feel himself entirely on a level with Ottilie. A favorable reception raised his hopes. He found Ottilie indeed not altogether so open with him as usual, but she was considerably matured, more developed, and, if you please, generally more conversible than he had known her. She was ready to give him the fullest insight into many things which were in any way connected with his profession; but when he attempted to approach his proper object, a certain inward shyness always held him back.

Once, however, Charlotte gave him an opportunity for saying something. In Ottilie’s presence she said to him, “Well now, you have looked closely enough into everything which is going forward in my circle. How do you find Ottilie? you had better say while she is here.”

Hereupon the assistant signified, with a clear perception and composed expression, how that, in respect of a freer carriage, of an easier manner in speaking, of a higher insight into the things of the world, which showed itself more in actions than in words, he found Ottilie altered much for the better; but that he still believed it might be of serious advantage to her if she would go back for some little time to the school, in order methodically and thoroughly to make her own forever what the world was only imparting to her in fragments and pieces, rather perplexing her than satisfying her, and often too late to be of service. He did not wish to be prolix about it. Ottilie herself knew best how much method and connection there was in the style of instruction out of which, in that case, she would be taken.

Ottilie had nothing to say against this; she could not acknowledge what it was which these words made her feel, because she was hardly able to explain it to herself. It seemed to her as if nothing in the world was disconnected so long as she thought of the one person whom she loved: and she could not conceive how, without him, anything could be connected at all.
Charlotte replied to the proposal with a wise kindness. She said that she herself, as well as Ottilie, had long desired her return to the school. At that time, however, the presence of so dear a companion and helper had become indispensable to herself; still she would offer no obstacle at some future period, if Ottilie continued to wish it, to her going back there for such a time as would enable her to complete what she had begun, and to make entirely her own what had been interrupted.

The assistant listened with delight to this qualified assent. Ottilie did not venture to say anything against it, although the very thought made her shudder. Charlotte, on her side, thought only how to gain time. She hoped that Edward would soon come back and find himself a happy father, then she was convinced all would go right; and one way or another they would be able to settle something for Ottilie.

After an important conversation which has furnished matter for after-reflection to all who have taken part in it, there commonly follows a sort of pause, which in appearance is like a general embarrassment. They walked up and down the saloon. The assistant turned over the leaves of various books, and came at last on the folio of engravings which had remained lying there since Luciana's time. As soon as he saw that it contained nothing but apes, he shut it up again.

It may have been this, however, which gave occasion to a conversation of which we find traces in Ottilie's diary.

FROM OTTILIE'S DIARY

"It is strange how men can have the heart to take such pains with the pictures of those hideous monkeys. One lowers one's self sufficiently when one looks at them merely as animals, but it is really wicked to give way to the inclination to look for people whom we know behind such masks."

"It is a sure mark of a certain obliquity, to take pleasure in caricatures and monstrous faces and pigmies. I have to thank our kind assistant that I have never been vexed with natural history; I could never make myself at home with worms and beetles."

"Just now he acknowledged to me, that it was the same with him. 'Of nature,' he said, 'we ought to know nothing except what is actually alive immediately around us. With the trees which blossom and put out leaves and bear fruit in our own neighborhood, with every shrub which we pass by, with every blade of grass on which we tread, we stand in a real relation. They are our genuine compatriots. The birds which hop up and down among our branches, which sing among our leaves, belong to us; they speak to us from our childhood upwards, and we learn to understand their language. But let a man ask himself whether or not every strange creature, torn out of its natural environment, does not at first sight make a sort of painful impression upon him, which is only deadened by custom. It is a mark of a motley, dissipated sort of life, to be able to endure monkeys and parrots and black people about one's self."

"Many times when a certain longing curiosity about these strange objects has come over me, I have envied the traveler who sees such marvels in living, every-day connection with other marvels. But he, too, must have become another man. Palm trees will not allow a man to wander among them with impunity; and doubtless his tone of thinking becomes very different in a land where elephants and tigers are at home."

"The only inquirers into nature whom we care to respect, are such as know how to describe and to represent to us the strange wonderful things which they have seen in their proper locality, each in its own especial element. How I should enjoy once hearing Humboldt talk!"

"A cabinet of natural curiosities we may regard like an Egyptian burying-place, where the various plant gods and animal gods stand about embalmed. It may be well enough for a priest-caste to busy itself with such things in a twilight of mystery. But in general instruction, they have no place or business; and we must beware of them all the more, because what is nearer to us, and more valuable, may be so easily thrust aside by them."

"A teacher who can arouse a feeling for one single good action, for one single good poem, accomplishes more than he who fills our memory with rows on rows of natural objects, classified with name and form. For what is the result of all these, except what we know as well without them, that the human figure pre-eminently and peculiarly is made in the image and likeness of God?"

"Individuals may be left to occupy themselves with whatever amuses them, with whatever gives them pleasure, whatever they find useful; but the proper study of mankind is man."

next Next chapter
â— Elective Affinities | Part two: Chapter eight

Previous chapter
â— Elective Affinities | Part two: Chapter six

â— Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
On monkey comment and evolution theory discussion, see Stefani Engelstein:

â— Engelstein, Stefani. (2008). *Anxious Anatomy: the Conception of the Human Form in Literary and Naturalist Discourse* (pgs. 36-37). SUNY Press.

See also
â— Goethe's affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe's human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References
1. (add)

In Elective Affinities (IAD), **Part two: Chapter seventeen** (add synopsis)

Part two: Chapter seventeen

It was with the utmost surprise that Charlotte saw the carriage drive up with Ottilie, and Edward at the same moment ride into the courtyard of the castle. She ran down to the hall. Ottilie alighted, and approached her and Edward. Violently and eagerly she caught the hands of the wife and husband, pressed them together, and hurried off to her own room. Edward threw himself on Charlotte's neck and burst into tears. He could not give her any explanation; he besought her to have patience with him, and to go at once to see Ottilie. Charlotte followed her to her room, and she could not enter it without a shudder. It had been all cleared out. There was nothing to be seen but the empty walls, which stood there looking cheerless, vacant and miserable. Everything had been carried away except the little box, which from an uncertainty what was to be done with it, had been left in the middle of the room. Ottilie was lying stretched upon the ground, her arm and head leaning across the cover. Charlotte bent anxiously over her, and asked what had happened; but she received no answer.

Description: "Edward and Ottilie Meeting at the Inn" (HB:360/61).

Her maid had come with restoratives. Charlotte left her with Ottilie, and herself hastened back to Edward. She found him in the saloon, but he could tell her nothing. He threw himself down before her; he bathed her hands with tears; he flew to his own room, and she was going to follow him thither, when she met his valet. From this man she gathered as much as he was able to tell. The rest she put together in her own thoughts as well as she could, and then at once set herself resolutely to do what the exigencies of the moment required. Ottilie's room was put to rights again as quickly as possible; Edward found his, to the last paper, exactly as he had left it.

The three appeared again to fall into some sort of relation with one another. But Ottilie persevered in her silence, and Edward could do nothing except entreat his wife to exert a patience which seemed wanting to himself. Charlotte sent messengers to Mittler and to the major. The first was absent from home and could not be found. The latter came. To him Edward poured out all his heart, confessing every most trifling circumstance to him, and thus Charlotte learned fully what had passed; what it had been which had produced such violent excitement, and how so strange an alteration of their mutual position had been brought about. She spoke with the utmost tenderness to her husband. She had nothing to ask of him, except that for the present he would leave the poor girl to herself. Edward was not insensible to the worth, the affection, the strong sense of his wife; but his passion absorbed him exclusively. Charlotte tried to cheer him with hopes. She promised that she herself would make no difficulties about the separation; but it had small effect with him. He was so much shaken that hope and faith alternately forsook him. A species of insanity appeared to have taken possession of him. He urged Charlotte to promise to give her hand to the major. To satisfy him and to humor him, she did what he required. She engaged to become herself the wife of the major, in the event of Ottilie consenting to the marriage with Edward; with this express condition, however, that for the present the two gentlemen should go abroad together. The major had a foreign appointment from the court, and it was settled that Edward should accompany him.

They arranged it all together, and in doing so found a sort of comfort for themselves in the sense that at least something was being done.

In the meantime they had to remark that Ottilie took scarcely anything to eat or drink. She still persisted in refusing to speak. They at first used to talk to her, but it appeared to distress her, and they left it off. We are not, universally at least, so weak as to persist in torturing people for their good. Charlotte thought over what could possibly be done. At last she fancied it might be well to ask the assistant of the school to come to them. He had much influence with Ottilie, and had been writing with much anxiety to inquire the cause of her not having arrived at the time he had been expecting her; but as yet she had not sent him any answer. In order not to take Ottilie by surprise, they spoke of their intention of sending this invitation in her presence. It did not seem to please her; she thought for some little time; at last she appeared to have formed some resolution. She retired to her own room, and before the evening sent the following letter to the assembled party:

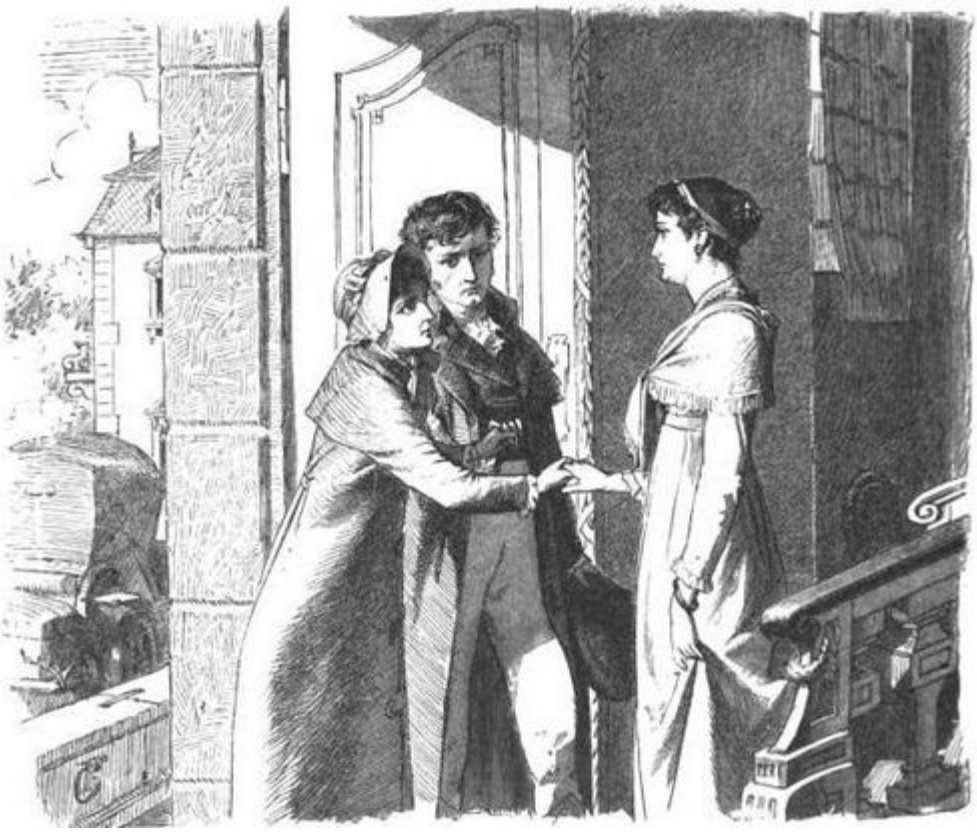

Description: "Charlotte Meeting Edward and Ottilie" (HB:361).

OTTILIE TO HER FRIENDS

“Why need I express in words, my dear friends, what is in itself so plain? I have stepped out of my course, and I cannot recover it again. A malignant spirit which has gained power over me seems to hinder me from without, even if within I could again become at peace with myself.

“My purpose was entirely firm to renounce Edward, and to separate myself from him forever. I had hoped that we might never meet again; it has turned out otherwise. Against his own will he stood before me. Too literally, perhaps, I have observed my promise never to admit him into conversation with me. My conscience and the feelings of the moment kept me silent towards him at the time, and now I have nothing more to say. I have taken upon myself, under the accidental impulse of the moment, a difficult vow, which if it had been formed deliberately, might perhaps be painful and distressing. Let me now persist in the observance of it so long as my heart shall enjoin it to me. Do not call in anyone to mediate; do not insist upon my speaking; do not urge me to eat or to drink more than I absolutely must. Bear with me and let me alone, and so help me on through the time; I am young, and youth has many unexpected means of restoring itself. Endure my presence among you; cheer me with your love; make me wiser and better with what you say to one another: but leave me to my own inward self.”

The two friends had made all preparation for their journey, but their departure was still delayed by the formalities of the foreign appointment of the major, a delay most welcome to Edward. Ottilie’s letter had roused all his eagerness again; he had gathered hope and comfort from her words, and now felt himself encouraged and justified in remaining and waiting. He declared, therefore, that he would not go; it would be folly, indeed, he cried, of his own accord, to throw away, by over-precipitateness, what was most valuable and most necessary to him, when although there was a danger of losing it, there was nevertheless a chance that it might be preserved. “What is the right name of conduct such as that?” he said. “It is only that we desire to show that we are able to will and to choose. I myself, under the influences of the same ridiculous folly, have torn myself away, days before there was any necessity for it, from my friends, merely that I might not be forced to go by the definite expiration of my term. This time I will stay: what reason is there for my going; is she not already removed far enough from me? I am not likely now to catch her hand or press her to my heart; I could not even think of it without a shudder. She has not separated herself from me; she has raised herself far above me.” And

so he remained as he desired, as he was obliged; but he was never easy except when he found himself with Ottilie. She, too, had the same feeling with him; she could not tear herself away from the same happy necessity. On all sides they exerted an indescribable, almost magical power of attraction over one another. Living, as they were, under one roof, without even so much as thinking of each other, although they might be occupied with other things, or diverted this way or that way by the other members of the party, they always drew together. If they were in the same room, in a short time they were sure to be either standing or sitting near each other; they were only easy when as close together as they could be, but they were then completely easy. To be near was enough; there was no need for them either to look or to speak: they did not seek to touch one another, or make sign or gesture, but merely to be together. Then there were not two persons, there was but one person in unconscious and perfect content, at peace with itself and with the world. So it was that if either of them had been imprisoned at the further end of the house, the other would by degrees, without intending it, have moved towards its fellow till it found it; life to them was a riddle, the solution of which they could only find in union.

Ottilie was throughout so cheerful and quiet that they were able to feel perfectly easy about her; she was seldom absent from the society of her friends: all that she had desired was that she might be allowed to eat alone, with no one to attend upon her but Nanny.

What habitually befalls any person repeats itself more often than one is apt to suppose, because his own nature gives the immediate occasion for it. Character, individuality, inclination, tendency, locality, circumstance and habits, form together a whole, in which every man moves as in an atmosphere, and where only he feels himself at ease in his proper element.

And so we find men, of whose changeableness so many complaints are made, after many years, to our surprise, unchanged, and in all their infinite tendencies, outward and inward, unchangeable.

Thus in the daily life of our friends, almost everything glided on again in its old smooth track. Ottilie still displayed by many silent attentions her obliging nature, and the others like her continued each themselves; and then the domestic circle exhibited an image of their former life, so like it, that they might be pardoned if at times they dreamed that it might all be again as it was.

The autumn days, which were of the same length with those old spring days, brought the party back into the house out of the air about the same hour. The gay fruits and flowers which belonged to the season, might have made them fancy it was now the autumn of that first spring, and the interval dropped out and forgotten; for the flowers which now were blowing, were the same as those which then they had sown, and the fruits which were now ripening on the trees, were those which at that time they had seen in blossom.

The major went backwards and forwards, and Mittler came frequently. The evenings were generally spent in exactly the same way. Edward usually read aloud, with more life and feeling than before; much better, and even it may be said with more cheerfulness. It appeared as if he was endeavoring, by light-heartedness as much as by devotion, to quicken Ottilie’s torpor into life, and dissolve her silence. He seated himself in the same position as he used to do, that she might look over his book; he was uneasy and distracted unless she was doing so, unless he was sure that she was following his words with her eyes.

Every trace had vanished of the unpleasant, ungracious feelings of the intervening time. No one had any secret complaint against another; there were no cross-purposes, no bitterness. The major accompanied Charlotte’s playing with his violin, and Edward’s flute sounded again, as formerly, in harmony with Ottilie’s piano. Thus they were now approaching Edward’s birthday, which the year before they had missed celebrating. This time they were to keep it without any outward festivities, in quiet enjoyment among themselves. They had so settled it together, half expressly, half from a tacit agreement. As they approached nearer to this epoch, however, an anxiety about it, which had hitherto been more felt than observed, became more noticeable in Ottilie’s manner. She was to be seen often in the garden examining the flowers: she had signified to the gardener that he was to save as many as he could of every sort, and she had been especially occupied with the asters, which this year were blowing in immense profusion.

Next chapter
● Elective Affinities | Part two: Chapter eighteen

Previous chapter
● Elective Affinities | Part two: Chapter sixteen

● Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

● Lillyman, William J. (1982). "Analogies for Love: Goethe's *Die Wahlverwandtschaften* and Plato's *Symposium*" (pg. 141). Goethe's Narrative Fiction: the Irvine Goethe Symposium. Walter de Gruyter.

See also
● Goethe's affinity table | Used to make *Elective Affinities*.
● Goethe timeline | Historical overview of the construction of *Elective Affinities*.
● Goethe's human chemistry | Goethe's version of human chemistry.
● Goethean philosophy | Goethe's philosophy.
● Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References
1. (add)

In Elective Affinities (IAD), **Part two: Chapter six** (add synopsis)

Part two: Chapter six

The very serious discomfort which this visit had caused to Charlotte was in some way compensated to her through the fuller insight which it had enabled her to gain into her daughter's character. In this, her knowledge of the world was of no slight service to her. It was not the first time that so singular a character had come across her, although she had never seen any in which the unusual features were so largely developed; and she had had experience enough to show her that such persons after having felt the discipline of life, after having gone through something of it, and been in intercourse with older people, may come out at last really charming and amiable; the selfishness may soften and eager restless activity find a definite direction for itself. And therefore, as a mother, Charlotte was able to endure the appearance of symptoms which for others might perhaps have been unpleasing, from a sense that where strangers only desire to enjoy, or at least not to have their taste offended, the business of parents is rather to hope.

Description: "Ottilie Calming the Invalid" (HB:320).

After her daughter's departure, however, she had to be pained in a singular and unlooked-for manner, in finding that, not so much through what there really was objectionable in her behavior, as through what was good and praiseworthy in it, she had left an ill report of herself behind her. Luciana seemed to have prescribed it as a rule to herself not only to be merry with the merry, but miserable with the miserable; and in order to give full swing to the spirit of contradiction in her, often to make the happy, uncomfortable, and the sad, cheerful. In every family among whom she came, she inquired after such members of it as were ill or infirm, and unable to appear in society. She would go to see them in their rooms, enact the physician, and insist on prescribing powerful doses for them out of her own travelling medicine-chest, which she constantly took with her in her carriage; her attempted cures, as may be supposed, either succeeding or failing as chance happened to direct.

In this sort of benevolence she was thoroughly cruel, and would listen to nothing that was said to her, because she was convinced that she was managing admirably. One of these attempts of hers on the moral side failed very disastrously, and this it was which gave Charlotte so much trouble, inasmuch as it involved consequences and everyone was talking about it. She never had heard of the story till Luciana was gone; Ottilie, who had made one of the party present at the time, had to give her a circumstantial account of it.

One of several daughters of a family of rank had the misfortune to have caused the death of one of her younger sisters; it had destroyed her peace of mind, and she had never been properly herself since. She lived in her own room, occupying herself and keeping quiet; and she could only bear to see the members of her own family when they came one by one. If there were several together, she suspected at once that they were making reflections upon her, and upon her condition. To each of them singly she would speak rationally enough, and talk freely for an hour at a time.

Luciana had heard of this, and had secretly determined with herself, as soon as she got into the house, that she would forthwith work a miracle, and restore the young lady to society. She conducted herself in the matter more prudently than usual, managed to introduce herself alone to the poor sick-souled girl, and, as far as people could understand, had wound her way into her confidence through music. At last came her fatal mistake; wishing to make a scene, and fancying that she had sufficiently prepared her for it, one evening she suddenly introduced the beautiful pale creature into the midst of the brilliant glittering assembly; and perhaps, even then, the attempt might not have so utterly failed, had not the crowd themselves, between curiosity and apprehension, conducted themselves so unwisely, first gathering about the invalid, and then shrinking from her again; and with their whispers and shaking their heads together, confusing and agitating her. Her delicate sensibility could not endure it. With a dreadful shriek, which expressed, as it seemed, a horror at some monster that was rushing upon her, she fainted. The crowd fell back in terror on every side, and Ottilie had been one of those who had carried back the sufferer utterly insensible to her room. Luciana meanwhile, just like herself, had been reading an angry lecture to the rest of the party, without reflecting for a moment that she herself was entirely to blame, and without letting herself be deterred by this and other failures, from going on with her experimentalizing.

The state of the invalid herself had since that time become more and more serious; indeed, the disorder had increased to such a degree, that the poor thing's parents were unable to keep her any longer at home, and had been forced to confide her to the care of a public institution. Nothing remained for Charlotte, except, by the delicacy of her own attention to the family, in some degree to alleviate the pain which had been occasioned by her daughter. On Ottilie, the thing had made a deep impression. She felt the more for the unhappy girl, as she was convinced, she did not attempt to deny it to Charlotte, that by a careful treatment the disorder might have been unquestionably removed.

So there came, too, as it often happens that we dwell more on past disagreeables than on past agreeables, a slight misunderstanding to be spoken of, which had led Ottilie to a wrong judgment of the architect, when he did not choose to produce his collection that evening, although she had so eagerly begged him to produce it. His practical refusal had remained ever since hanging about her heart, she herself could not tell why. Her feelings about the matter were undoubtedly just; what a young lady like Ottilie could desire, a young man like the architect ought not to have refused. The latter, however, when she took occasion to give him a gentle reproof for it, had a very valid excuse to offer for himself.

"If you knew," he said, "how roughly even cultivated people allow themselves to handle the most valuable works of art, you would forgive me for not producing mine among the crowd. No one will take the trouble to hold a medal by the rim. They will finger the most beautiful impressions, and the smoothest surfaces; they will take the rarest coins between the thumb and forefinger, and rub them up and down, as if they were testing the execution with the touch. Without remembering that a large sheet of paper ought to be held in two hands, they will lay hold, with one, of an invaluable proof-engraving of some drawing which cannot be replaced, like a conceited politician laying hold of a newspaper, and passing judgment by anticipation, as he is cutting the pages, on the occurrences of the world. Nobody cares to recollect that if twenty people, one after the other, treat a work of art in this way, the one-and-twentieth will not find much to see there."

"Have not I often vexed you in this way?" asked Ottilie. "Have not I, through my carelessness, many times injured your treasures?"

"Never once," answered the architect, "never. For you it would be impossible. In you the right thing is innate."

"In any case," replied Ottilie, "it would not be a bad plan, if in the next edition of the book of good manners, after the chapters which tell us how we ought to eat and drink in company, a good circumstantial chapter were inserted, how to behave among works of art and in museums."

"Undoubtedly," said the architect; "and then curiosity-collectors and amateurs would be better contented to show their valuable treasures to the world."

Ottilie had long, long forgiven him; but as he seemed to have taken her reproof sorely to heart, and assured her again and again that he would gladly produce everything—that he was delighted to do anything for his friends—she felt that

she had wounded his feelings, and that she owed him some compensation. It was not easy for her, therefore, to give an absolute refusal to a request which he made her in the conclusion of this conversation, although when she called her heart into counsel about it, she did not see how she could allow herself to do what he wished.

The circumstances of the matter were these: Ottilie's exclusion from the picture-exhibition by Luciana's jealousy had irritated him in the highest degree; and at the same time he had observed with regret, that at this, the most brilliant part of all the amusements at the castle, ill health had prevented Charlotte from being more than rarely present; and now he did not wish to go away, without some additional proof of his gratitude, and, for the honor of one and the entertainment of the other, preparing a far more beautiful exhibition than any of those which had preceded it. Perhaps, too, unknown to himself, another secret motive was working on him. It was so hard for him to leave the house, and to leave the family. It seemed impossible to him to go away from Ottilie's eyes, under the calm, sweet, gentle glance of which the latter part of the time he had been living almost entirely alone.

The Christmas holidays were approaching; and it became at once clear to him that the very thing which he wanted was a representation with real figures of one of those pictures of the scene in the stable,—a sacred exhibition such as at this holy season good Christians delight to offer to the divine Mother and her Child, of the manner in which she, in her seeming lowliness, was honored first by the shepherds and afterwards by kings.

He had thoroughly brought before himself how such a picture should be contrived. A fair, lovely child was found, and there would be no lack of shepherds and shepherdesses. But without Ottilie the thing could not be done. The young man had exalted her in his design to be the mother of God, and if she refused, there was no question but the undertaking must fall to the ground. Ottilie, half embarrassed at the proposal, referred him and his request to Charlotte. The latter gladly gave her permission, and lent her assistance in overcoming and overpersuading Ottilie's hesitation in assuming so sacred a personality. The architect worked day and night, that by Christmas-eve everything might be ready.

Day and night, indeed, in the literal sense. At all times he was a man who had but few necessities; and Ottilie's presence seemed to be to him in the place of all delicacies. When he was working for her, it was as if he required no sleep; when he was busy about her, as if he could do without food. Accordingly by the hour of the evening solemnity all was completed. He had found the means of collecting some well-toned wind instruments to form an introduction, and produce the desired temper of thought and feeling. But when the curtain rose, Charlotte was taken completely by surprise. The picture which presented itself to her had been repeated so often in the world, that one could scarcely have expected any new impression to be produced. But here, the reality as representing the picture had its especial advantages. The whole space was the color rather of night than of twilight, and there was nothing even of the details of the scene which was obscure. The inimitable idea that all the light should proceed from the child, the artist had contrived to carry out by an ingenious method of illumination which was concealed by the figures in the foreground, who were all in shadow. Bright looking boys and girls were standing round, their fresh faces sharply lighted from below; and there were angels too, whose own brilliancy grew pale before the divine, whose ethereal bodies showed dim and dense, and needing other light in the presence of the body of the divine humanity. By good fortune the infant had fallen asleep in the loveliest attitude, so that nothing disturbed the contemplation when the eye rested on the seeming mother, who with infinite grace had lifted off a veil to reveal her hidden treasure. At this moment the picture seemed to have been caught, and there to have remained fixed. Physically dazzled, mentally surprised, the people round appeared to have just moved to turn away their half-blinded eyes, to be glancing again towards the child with curious delight, and to be showing more wonder and pleasure than awe and reverence,—although these emotions were not forgotten, and were to be traced upon the features of some of the older spectators. But Ottilie's figure, expression, attitude, glance, excelled all which any painter has ever represented. A man who had true knowledge of art, and had seen this spectacle, would have been in fear lest any portion of it should move; he would have doubted whether anything could ever so much please him again Unluckily, there was no one present who could comprehend the whole of this effect. The architect alone, who, as a tall, slender shepherd, was looking in from the side over those who were kneeling, enjoyed, although he was not in the best position for seeing, the fullest pleasure. And who can describe the mien of the new-made queen of heaven? The purest humility, the most exquisite feeling of modesty, at the great honor which had undeservedly been bestowed upon her, with indescribable and immeasurable happiness, was displayed upon her features, expressing as much her own personal emotion as that of the character which she was endeavoring to represent.

Charlotte was delighted with the beautiful figures; but what had most effect on her was the child. Her eyes filled with

tears, and her imagination presented to her in the liveliest colors that she might soon hope to have such another darling creature on her own lap.

They had let down the curtain, partly to give the exhibitors some little rest, partly to make an alteration in the exhibition. The artist had proposed to himself to transmute the first scene of night and lowliness into a picture of splendor and glory; and for this purpose had prepared a blaze of light to fall in from every side, which this interval was required to kindle.

Ottilie, in the semi-theatrical position in which she found herself, had hitherto felt perfectly at her ease, because, with the exception of Charlotte and a few members of the household, no one had witnessed this devout piece of artistic display. She was, therefore, in some degree annoyed when in the interval she learned that a stranger had come into the saloon, and had been warmly received by Charlotte. Who it was no one was able to tell her. She therefore made up her mind not to produce a disturbance, and to go on with her character. Candles and lamps blazed out, and she was surrounded by splendor perfectly infinite. The curtain rose. It was a sight to startle the spectators. The whole picture was one blaze of light; and instead of the full depth of shadow, there now were only the colors left remaining, which, from the skill with which they had been selected, produced a gentle softening of tone. Looking out under her long eyelashes, Ottilie perceived the figure of a man sitting by Charlotte. She did not recognize him; but the voice she fancied was that of the assistant at the school. A singular emotion came over her. How many things had happened since she last heard the voice of that her kind instructor! Like a flash of forked lightning the stream of her joys and her sorrow rushed swiftly before her soul, and the question rose in her heart, Dare you confess, dare you acknowledge it all to him? If not, how little can you deserve to appear before him under this sainted form; and how strange must it not seem to him who has only known you as your natural self to see you now under this disguise? In an instant, swift as thought, feeling and reflection began to clash and gain within her. Her eyes filled with tears, while she forced herself to continue to appear as a motionless figure, and it was a relief, indeed, to her when the child began to stir,—and the artist saw himself compelled to give the sign that the curtain should fall again.

If the painful feeling of being unable to meet a valued friend had, during the last few moments, been distressing Ottilie in addition to her other emotions, she was now in still greater embarrassment. Was she to present herself to him in this strange disguise? or had she better change her dress? She did not hesitate—she did the last; and in the interval she endeavored to collect and to compose herself; nor did she properly recover her self-possession until at last, in her ordinary costume, she had welcomed the new visitor.

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Elective Affinities

Discussion

(add)

See also

â— Goethe’s affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe’s human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations

N1. (add)

References

1. (add)

In Elective Affinities (IAD), **Part two: Chapter sixteen** (add synopsis)

Part two: Chapter sixteen

When Mittler was come to talk the matter over with Edward, he found him sitting by himself, with his head supported on his right hand, and his arm resting on the table. He appeared in great suffering. “Is your headache troubling you again?” asked Mittler.

“It is troubling me,” answered he; “and yet I cannot wish it were not so, for it reminds me of Ottilie. She too, I say to myself, is also suffering in the same way at this same moment, and suffering more perhaps than I; and why cannot I bear it as well as she? These pains are good for me. I might almost say that they were welcome; for they serve to bring out before me with the greater vividness her patience and all her other graces. It is only when we suffer ourselves, that we feel really the true nature of all the high qualities which are required to bear suffering.”

Mittler, finding his friend so far resigned, did not hesitate to communicate the message with which he had been sent. He brought it out piecemeal, however; in order of time, as the idea had itself arisen between the ladies, and had gradually ripened into a purpose. Edward scarcely made an objection. From the little which he said, it appeared as if he was willing to leave everything to them; the pain which he was suffering at the moment making him indifferent to all besides.

Scarcely, however, was he again alone, than he got up, and walked rapidly up and down the room; he forgot his pain, his attention now turning to what was external to himself. Mittler’s story had stirred the embers of his love, and awakened his imagination in all its vividness. He saw Ottilie by herself, or as good as by herself, travelling on a road which was well known to him—in a hotel with every room of which he was familiar. He thought, he considered, or rather he neither thought nor considered; he only wished—he only desired. He would see her; he would speak to her. Why, or for what good end that was to come of it, he did not care to ask himself; but he made up his mind at once. He must do it.

He summoned his valet into his council, and through him he made himself acquainted with the day and hour when Ottilie was to set out. The morning broke. Without taking any person with him, Edward mounted his horse, and rode off to the place where she was to pass the night. He was there too soon. The hostess was overjoyed at the sight of him; she was under heavy obligations to him for a service which he had been able to do for her. Her son had been in the army, where he had conducted himself with remarkable gallantry. He had performed one particular action of which no one had been a witness but Edward; and the latter had spoken of it to the commander-in-chief in terms of such high praise, that notwithstanding the opposition of various ill-wishers, he had obtained a decoration for him. The mother, therefore, could never do enough for Edward. She got ready her best room for him, which indeed was her own wardrobe and store-room, with all possible speed. He informed her, however, that a young lady was coming to pass the night there, and he ordered an apartment for her at the back, at the end of the gallery. It sounded a mysterious sort of affair; but the hostess was ready to do anything to please her patron, who appeared so interested and so busy about it. And he, what were his sensations as he watched through the long, weary hours till evening? He examined the room round and round in which he was to see her; with all its strangeness and homeliness it seemed to him to be an abode for angels. He thought over and over what he had better do; whether he should take her by surprise, or whether he should prepare her for meeting him. At last the second course seemed the preferable one. He sat down and wrote a letter which she was to read:

EDWARD TO OTTILIE

“While you read this letter, my best beloved, I am close to you. Do not agitate yourself; do not be alarmed; you have nothing to fear from me. I will not force myself upon you. I will see you or not, as you yourself shall choose.

“Consider, oh! consider your condition and mine. How must I not thank you, that you have taken no decisive step! But the step which you have taken is significant enough. Do not persist in it. Here, as it were, at a parting of the ways, reflect once again. Can you be mine?—will you be mine? Oh, you will be showing mercy on us all if you will; and on me, infinite mercy.

“Let me see you again!—happily, joyfully see you once more! Let me make my request to you with my own lips; and

do you give me your answer your own beautiful self, on my breast, Ottilie! where you have so often rested, and which belongs to you forever!”

As he was writing, the feeling rushed over him that what he was longing for was coming—was close—would be there almost immediately. By that door she would come in; she would read that letter; she in her own person would stand there before him as she used to stand; she for whose appearance he had thirsted so long. Would she be the same as she was?—was her form, were her feelings changed? He still held the pen in his hand; he was going to write as he thought, when the carriage rolled into the court. With a few hurried strokes he added: “I hear you coming. For a moment, farewell!”

He folded the letter, and directed it. He had no time for sealing. He darted into the room through which there was a second outlet into the gallery, when the next moment he recollected that he had left his watch and seals lying on the table. She must not see these first. He ran back and brought them away with him. At the same instant he heard the hostess in the antechamber showing Ottilie the way to her apartments. He sprang to the bedroom door. It was shut. In his haste, as he had come back for his watch, he had forgotten to take out the key, which had fallen out, and lay the other side. The door had closed with a spring, and he could not open it. He pushed at it with all his might, but it would not yield. Oh, how gladly would he have been a spirit, to escape through its cracks! In vain. He hid his face against the panels. Ottilie entered, and the hostess, seeing him, retired. From Ottilie herself, too, he could not remain concealed for a moment. He turned towards her; and there stood the lovers once more, in such strange fashion, in one another’s presence. She looked at him calmly and earnestly, without advancing or retiring. He made a movement to approach her, and she withdrew a few steps towards the table. He stepped back again. “Ottilie!” he cried aloud, “Ottilie! let me break this frightful silence! Are we shadows, that we stand thus gazing at each other? Only listen to me; listen to this at least. It is an accident that you find me here thus. There is a letter on the table, at your side there, which was to have prepared you. Read it, I implore you—read it—and then determine as you will!”

She looked down at the letter; and after thinking a few seconds, she took it up, opened it, and read it: she finished it without a change of expression; and she laid it lightly down; then joining the palms of her hands together, turning them upwards, and drawing them against her breast, she leaned her body a little forward, and regarded Edward with such a look, that, eager as he was, he was compelled to renounce everything he wished or desired of her. Such an attitude cut him to the heart; he could not bear it. It seemed exactly as if she would fall upon her knees before him, if he persisted. He hurried in despair out of the room, and leaving her alone, sent the hostess in to her.

He walked up and down the antechamber. Night had come on, and there was no sound in the room. At last the hostess came out and drew the key out of the lock. The good woman was embarrassed and agitated, not knowing what it would be proper for her to do. At last as she turned to go, she offered the key to Edward, who refused it; and putting down the candle, she went away.

In misery and wretchedness. Edward flung himself down on the threshold of the door which divided him from Ottilie, moistening it with his tears as he lay. A more unhappy night had been seldom passed by two lovers in such close neighborhood!

Day came at last. The coachman brought round the carriage, and the hostess unlocked the door and went in. Ottilie was asleep in her clothes; she went back and beckoned to Edward with a significant smile. They both entered and stood before her as she lay; but the sight was too much for Edward. He could not bear it. She was sleeping so quietly that the hostess did not like to disturb her, but sat down opposite her, waiting till she woke. At last Ottilie opened her beautiful eyes, and raised herself on her feet. She declined taking any breakfast, and then Edward went in again and stood before her. He entreated her to speak but one word to him; to tell him what she desired. He would do it, be it what it would, he swore to her; but she remained silent. He asked her once more, passionately and tenderly, whether she would be his. With downcast eyes, and with the deepest tenderness of manner she shook her head to a gentle *No.* He asked if she still desired to go to the school. Without any show of feeling she declined. Would she then go back to Charlotte? She inclined her head in token of assent, with a look of comfort and relief. He went to the window to give directions to the coachman, and when his back was turned she darted like lightning out of the room, and was down the stairs and in the carriage in an instant. The coachman drove back along the road which he had come the day before, and Edward followed at some distance on horseback.

Next chapter
● Elective Affinities | Part two: Chapter seventeen

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● Elective Affinities | Part two: Chapter fifteen

● Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

See also
● Goethe’s affinity table | Used to make *Elective Affinities*.
● Goethe timeline | Historical overview of the construction of *Elective Affinities*.
● Goethe’s human chemistry | Goethe's version of human chemistry.
● Goethean philosophy | Goethe's philosophy.
● Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. (add)

References

1. (add)

In Elective Affinities (IAD), **Part two: Chapter ten** (add synopsis)

Part two: Chapter ten

Charlotte meanwhile was well and in good spirits. She was happy in her beautiful boy, whose fair promising little form every hour was a delight to both her eyes and heart. In him she found a new link to connect her with the world and with her property. Her old activity began anew to stir in her again.

Look which way she would, she saw how much had been done in the year that was past, and it was a pleasure to her to contemplate it. Enlivened by the strength of these feelings, she climbed up to the summer-house with Ottilie and the child, and as she laid the latter down on the little table, as on the altar of her house, and saw the two seats still vacant, she thought of gone-by times, and fresh hopes rose out before her for herself and for Ottilie.

Description: "Ottilie and Charlotte Amusing the Infant." (HB:336)

Young ladies, perhaps, look timidly round them at this or that young man, carrying on a silent examination, whether they would like to have him for a husband; but whoever has a daughter or a female ward to care for, takes a wider circle in her survey. And so it fared at this moment with Charlotte, to whom, as she thought of how they had once sat side by side in that summer-house, a union did not seem impossible between the captain and Ottilie. It had not remained unknown to her, that the plans for the advantageous marriage, which had been proposed to the captain, had come to nothing.

Charlotte went on up the cliff, and Ottilie carried the child. A number of reflections crowded upon the former. Even on the firm land there are frequent enough shipwrecks, and the true wise conduct is to recover ourselves, and refit our vessel as fast as possible. Is life to be calculated only by its gains and losses? Who has not made arrangement on arrangement, and has not seen them broken in pieces? How often does not a man strike into a road and lose it again! How often are we not turned aside from one point which we had sharply before our eye, but only to reach some higher stage! The traveler, to his greatest annoyance, breaks a wheel upon his journey, and through this unpleasant accident makes some charming acquaintance, and forms some new connection, which has an influence on all his life. Destiny grants us our wishes, but in its own way, in order to give us something beyond our wishes. Among these and similar reflections they reached the new building on the hill, where they intended to establish themselves for the summer. The view all round them was far more beautiful than could have been supposed; every little obstruction had been removed; all the loveliness of the landscape, whatever nature, whatever the season of the year had done for it, came out in its beauty before the eye; and already the young plantations, which had been made to fill up a few openings, were beginning to look green, and to form an agreeable connecting link between parts which before stood separate.

The house itself was nearly habitable; the views, particularly from the upper rooms, were of the richest variety. The longer you looked round you, the more beauties you discovered. What magnificent effects would not be produced here at the different hours of day—by sunlight and by moonlight? Nothing could be more delightful than to come and live there, and now that she found all the rough work finished, Charlotte longed to be busy again. An upholsterer, a tapestry-hanger, a painter, who could lay

A depiction of Ottilie reading and walking along her favorite pleasant footpath (P2:C10). [1]

on the colors with patterns, and a little gilding, were all which were required, and these were soon found, and in a short time the building was completed. Kitchen and cellar stores were quickly laid in; being so far from the castle, it was necessary to have all essentials provided; and the two ladies with the child went up and settled there. From this residence, as from a new center point, unknown walks opened out to them; and in these high regions the free fresh air and the beautiful weather were thoroughly delightful.

Ottilie's favorite walk, sometimes alone, sometimes with the child, was down below, towards the plane trees; along a pleasant footpath, leading directly to the point where one of the boats was kept chained in which people used to go across the water. She often indulged herself in an expedition on the water, only without the child, as Charlotte was a little uneasy about it. She never missed, however, paying a daily visit to the castle garden and the gardener, and going to look with him at his show of greenhouse plants, which were all out now, enjoying the free air.

At this beautiful season, Charlotte was much pleased to receive a visit from an English nobleman, who had made acquaintance with Edward abroad, having met him more than once, and who was now curious to see the laying out of his park, which he had heard so much admired. He brought with him a letter of introduction from the count, and introduced at the same time a quiet but most agreeable man as his traveling companion. He went about seeing everything, sometimes with Charlotte and Ottilie, sometimes with the gardeners and the foresters, often with his friend, and now and then alone; and they could perceive clearly from his observations that he took an interest in such matters, and understood them well; indeed, that he had himself probably executed many such.

Although he was now advanced in life, he entered warmly into everything which could serve for an ornament to life, or contribute anything to its importance.

In his presence, the ladies came first properly to enjoy what was round them. His practiced eye received every effect in its freshness, and he found all the more pleasure in what was before him, as he had not previously known the place, and was scarcely able to distinguish what man had done there from what nature had presented to him ready made.

We may even say that through his remarks the park grew and enriched itself; he was able to anticipate in their fulfillment the promises of the growing plantations. There was not a spot where there was any effect which could be either heightened or produced, but what he observed it.

In one place he pointed to a fountain which, if it was cleaned out, promised to be the most beautiful spot for a picnic party. In another, to a cave which had only to be enlarged and swept clear of rubbish to form a desirable seat. A few trees might be cut down, and a view would be opened from it of some grand masses of rock, towering magnificently against the sky. He wished the owners joy that so much was still remaining for them to do, and he besought them not to be in a hurry about it, but to keep for themselves for years to come the pleasures of shaping and improving.

At the hours which the ladies usually spent alone he was never in the way, for he was occupied the greatest part of the day in catching such views in the park as would make good paintings, in a portable camera obscura, and drawing from them, in order to secure some desirable fruits from his travels for himself and others. For many years past he had been in the habit of doing this in all remarkable places which he visited, and had provided himself by it with a most charming and interesting collection. He showed the ladies a large portfolio which he had brought with him, and entertained them with the pictures and with descriptions. And it was a real delight to them, here in their solitude, to travel so pleasantly over the world, and see sweep past them, shores and havens, mountains, lakes and rivers, cities, castles, and a hundred other localities which have a name in history.

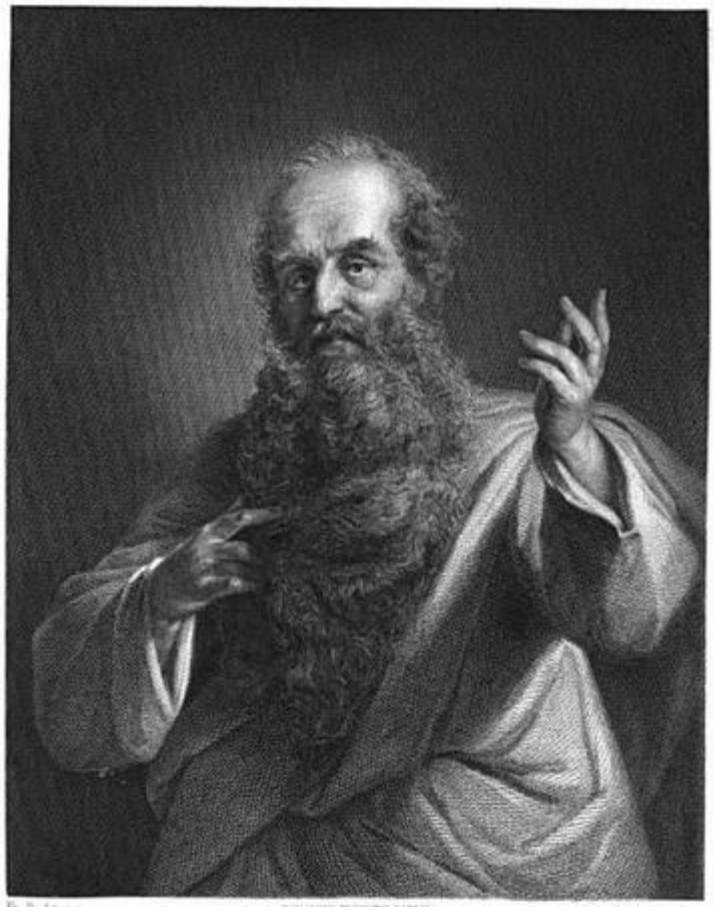

Description: "Herr Mittler" (HB:336/37).

Each of the two ladies had an especial interest in it—Charlotte the more general interest in whatever was historically remarkable; Ottilie dwelling in preference on the scenes of which Edward used most to talk,—where he liked best to stay, and which he would most often revisit. Every man has somewhere, far or near, his peculiar localities which attract him; scenes which, according to his character, either from first impressions, or from particular associations, or from habit, have a charm for him beyond all others.

She, therefore, asked the earl which, of all these places, pleased him best, where he would like to settle, and live for himself, if he might choose. There was more than one lovely spot which he pointed out, with what had happened to him there to make him love and value it; and the peculiar accentuated French in which he spoke, made it most pleasant to listen to him.

To the further question, which was his ordinary residence, which he properly considered his home; he replied, without any hesitation, in a manner quite unexpected by the ladies.

“I have accustomed myself by this time to be at home everywhere, and I find, after all, that it is much more agreeable to allow others to plant and build, and keep house for me. I have no desire to return to my own possessions, partly on political grounds, but principally because my son, for whose sake alone it was any pleasure to me to remain and work there,—who will, by-and-by, inherit it, and with whom I hoped to enjoy it,—took no interest in the place at all, but has gone out to India, where, like many other foolish fellows, he fancies he can make a higher use of his life. He is more likely to squander it.

“Assuredly we spend far too much labor and outlay in preparation for life. Instead of beginning at once to make ourselves happy in a moderate condition, we spread ourselves out wider and wider, only to make ourselves more and more uncomfortable. Who is there now to enjoy my mansion, my park, my gardens? Not I, nor any of mine,—strangers, visitors, or curious, restless travelers.

“Even with large means, we are ever but half and half at home, especially in the country, where we miss many things to which we have become accustomed in town. The book for which we are most anxious is not to be had, and just the thing which we most wanted is forgotten. We take to being domestic, only again to go out of ourselves; if we do not go astray of our own will and caprice, circumstances, passions, accidents, necessity, and one does not know what besides, manage it for us.”

Little did the earl imagine how deeply his friend would be touched by these random observations. It is a danger to which

we are all of us exposed when we venture on general remarks in a society the circumstances of which we might have supposed were well enough known to us. Such casual wounds, even from well-meaning, kindly-disposed people, were nothing new to Charlotte. She so clearly, so thoroughly knew and understood the world, that it gave her no particular pain if it did happen that through somebody's thoughtlessness or imprudence she had her attention forced into this or that unpleasant direction. But it was very different with Ottilie. At her half-conscious age, at which she rather felt than saw, and at which she was disposed, indeed was obliged, to turn her eyes away from what she should not or would not see, Ottilie was thrown by this melancholy conversation into the most pitiable state. It rudely tore away the pleasant veil from before her eyes, and it seemed to her as if everything which had been done all this time for house and court, for park and garden, for all their wide environs, were utterly in vain, because he to whom it all belonged could not enjoy it; because he, like their present visitor, had been driven out to wander up and down in the world—and, indeed, in the most perilous paths of it—by those who were nearest and dearest to him. She was accustomed to listen in silence, but on this occasion she sat on in the most painful condition; which, indeed, was made rather worse than better by what the stranger went on to say, as he continued with his peculiar, humorous gravity:

"I think I am now on the right way. I look upon myself steadily as a traveler, who renounces many things in order to enjoy more. I am accustomed to change; it has become, indeed, a necessity to me; just as in the opera, people are always looking out for new and new decorations, because there have already been so many. I know very well what I am to expect from the best hotels, and what from the worst. It may be as good or it may be as bad as it will, but I nowhere find anything to which I am accustomed, and in the end it comes to much the same thing whether we depend for our enjoyment entirely on the regular order of custom, or entirely on the caprices of accident. I have never to vex myself now, because this thing is mislaid, or that thing is lost; because the room in which I live is uninhabitable, and I must have it repaired; because somebody has broken my favorite cup, and for a long time nothing tastes well out of any other. All this I am happily raised above. If the house catches fire about my ears, my people quietly pack my things up, and we pass away out of the town in search of other quarters. And considering all these advantages, when I reckon carefully, I calculate that, by the end of the year, I have not sacrificed more than it would have cost me to be at home."

In this description Ottilie saw nothing but Edward before her; how he too was now amidst discomfort and hardship, marching along untrodden roads, lying out in the fields in danger and want, and in all this insecurity and hazard growing accustomed to be homeless and friendless, learning to fling away everything that he might have nothing to lose. Fortunately, the party separated for a short time. Ottilie escaped to her room, where she could give way to her tears. No weight of sorrow had ever pressed so heavily upon her as this clear perception (which she tried, as people usually do, to make still clearer to herself), that men love to dally with and exaggerate the evils which circumstances have once begun to inflict upon them.

The state in which Edward was, came before her in a light so piteous, so miserable, that she made up her mind, let it cost her what it would, that she would do everything in her power to unite him again with Charlotte, and she herself would go and hide her sorrow and her love in some silent scene, and beguile the time with such employment as she could find.

Meanwhile the earl's companion, a quiet, sensible man and a keen observer, had remarked the mistake in the conversation, and spoke to his friend about it. The latter knew nothing of the circumstances of the family; but the other being one of those persons whose principal interest in traveling lay in gathering up the strange occurrences which arose out of the natural or artificial relations of society, which were produced by the conflict of the restraint of law with the violence of the will, of the understanding with the reason, of passion with prejudice—had some time before made himself acquainted with the outline of the story, and since he had been in the family he had learned exactly all that had taken place, and the present position in which things were standing.

The earl, of course, was very sorry, but it was not a thing to make him uneasy. A man must hold his tongue altogether in society if he is never to find himself in such a position; for not only remarks with meaning in them, but the most trivial expressions, may happen to clash in an inharmonious key with the interest of somebody present.

"We will set things right this evening," said he, "and escape from any general conversation; you shall let them hear one of the many charming anecdotes with which your portfolio and your memory have enriched themselves while we have been abroad."

However, with the best intentions, the strangers did not, on this next occasion, succeed any better in gratifying their friends with unalloyed entertainment. The earl's friend told a number of singular stories—some serious, some amusing, some touching, some terrible—with which he had roused their attention and strained their interest to the highest tension, and he thought to conclude with a strange but softer incident, little dreaming how nearly it would touch his listeners.

Description: "two strange children" (HB:339).

THE TWO STRANGE CHILDREN | STRANGE NEIGHBORS: A NOVELLE [N1]

Two children of neighboring families, a boy and a girl, of an age which would suit well for them at some future time to marry, were brought up together with this agreeable prospect, and the parents on both sides, who were people of some position in the world, looked forward with pleasure to their future union.

"It was too soon observed, however, that the purpose seemed likely to fail; the dispositions of both children promised everything which was good, but there was an unaccountable antipathy between them. Perhaps they were too much like each other. Both were thoughtful, clear in their wills, and firm in their purposes. Each separately was beloved and respected by his or her companions, but whenever they were together they were always antagonists. Forming separate plans for themselves, they only met mutually to cross and thwart one another; never emulating each other in pursuit of one aim, but always fighting for a single object. Good-natured and amiable everywhere else, they were spiteful and even malicious whenever they came in contact.

"This singular relation first showed itself in their childish games, and it continued with their advancing years. The boys used to play at soldiers, divide into parties, and give each other battle, and the fierce haughty young lady set herself at once at the head of one of the armies, and fought against the other with such animosity and bitterness that the latter would have been put to a shameful flight, except for the desperate bravery of her own particular rival, who at last disarmed his antagonist and took her prisoner; and even then she defended herself with so much fury that to save his eyes from being torn out, and at the same time not to injure his enemy, he had been obliged to take off his silk handkerchief and tie her hands with it behind her back.

"This she never forgave him: she made so many attempts, she laid so many plans to injure him, that the parents, who had been long watching these singular passions, came to an understanding together and resolved to separate these two hostile creatures, and sacrifice their favorite hopes.

"The boy shot rapidly forward in the new situation in which he was placed. He mastered every subject which he was taught. His friends and his own inclination chose the army for his profession, and everywhere, let him be where he would, he was looked up to and beloved. His disposition seemed formed to labor for the well-being and the pleasure of others; and he himself, without being clearly conscious of it, was in himself happy at having got rid of the only antagonist which nature had assigned to him.

"The girl, on the other hand, became at once an altered creature. Her growing age, the progress of her education, above all, her own inward feelings, drew her away from the boisterous games with boys in which she had hitherto delighted. Altogether she seemed to want something; there was nothing anywhere about her which could deserve to excite her hatred, and she had never found anyone whom she could think worthy of her love.

“A young man, somewhat older than her previous neighbor-antagonist, of rank, property and consequence, beloved in society, and much sought after by women, bestowed his affections upon her. It was the first time that friend, lover, or servant had displayed any interest in her. The preference which he showed for her above others who were older, more cultivated, and of more brilliant pretensions than herself, was naturally gratifying; the constancy of his attention, which was never obtrusive, his standing by her faithfully through a number of unpleasant incidents, his quiet suit, which was declared indeed to her parents, but which as she was still very young he did not press, only asking to be allowed to hope; all this engaged him to her, and custom and the assumption in the world that the thing was already settled, carried her along with it. She had so often been called his bride that at last she began to consider herself so, and neither she nor anyone else ever thought any further trial could be necessary before she exchanged rings with the person who for so long a time had passed for her bridegroom.

“The peaceful course which the affair had all along followed was not at all precipitated by the betrothal. Things were allowed to go on both sides just as they were; they were happy in being together, and they could enjoy to the end the fair season of the year as the spring of their future more serious life.

“The absent youth had meanwhile grown up into everything which was most admirable. He had obtained a well-deserved rank in his profession, and came home on leave to visit his family. Towards his fair neighbor he found himself again in a natural but singular position. For some time past she had been nourishing in herself such affectionate family feelings as suited her position as a bride; she was in harmony with everything about her; she believed that she was happy, and in a certain sense she was so. Now first for a long time something again stood in her way. It was not to be hated—she had become incapable of hatred. Indeed the childish hatred, which had in fact been nothing more than an obscure recognition of inward worth, expressed itself now in a happy astonishment, in pleasure at meeting, in ready acknowledgments, in a half willing, half unwilling, and yet irresistible attraction; and all this was mutual. Their long separation gave occasion for longer conversations; even their old childish foolishness served, now that they had grown wiser, to amuse them as they looked back; and they felt as if at least they were bound to make good their petulant hatred by friendliness and attention to each other—as if their first violent injustice to each other ought not to be left without open acknowledgment.

“On his side it all remained in a sensible, desirable moderation. His position, his circumstances, his efforts, his ambition, found him so abundant an occupation, that the friendliness of this pretty bride he received as a very thankworthy present; but without, therefore, even so much as thinking of her in connection with himself, or entertaining the slightest jealousy of the bridegroom, with whom he stood on the best possible terms.

“With her, however, it was altogether different. She seemed to herself as if she had awakened out of a dream. Her fightings with her young neighbor had been the beginnings of an affection; and this violent antagonism was no more than an equally violent innate passion for him, first showing under the form of opposition. She could remember nothing else than that she had always loved him. She laughed over her martial encounter with him with weapons in her hand; she dwelt upon the delight of her feelings when he disarmed her. She imagined that it had given her the greatest happiness when he bound her; and whatever she had done afterwards to injure him, or to vex him, presented itself to her as only an innocent means of attracting his attention. She cursed their separation. She bewailed the sleepy state into which she had fallen. She execrated the insidious lazy routine which had betrayed her into accepting so insignificant a bridegroom. She was transformed—doubly transformed, forwards or backwards, whichever way we like to take it.

“She kept her feelings entirely to herself; but if anyone could have divined them and shared them with her, he could not have blamed her: for indeed the bridegroom could not sustain a comparison with the other as soon as they were seen together. If a sort of regard to the one could not be refused, the other excited the fullest trust and confidence. If one made an agreeable acquaintance, the other we should desire for a companion; and in extraordinary cases, where higher demands might have to be made on them, the bridegroom was a person to be utterly despaired of, while the other would give the feeling of perfect security.

“There is a peculiar innate tact in women which discovers to them differences of this kind; and they have cause as well as occasion to cultivate it.

“The more the fair bride was nourishing all these feelings in secret, the less opportunity there was for anyone to speak a

word which could tell in favor of her bridegroom, to remind her of what her duty and their relative position advised and commanded—indeed, what an unalterable necessity seemed now irrevocably to require; the poor heart gave itself up entirely to its passion.

“On one side she was bound inextricably to the bridegroom by the world, by her family, and by her own promise; on the other, the ambitious young man made no secret of what he was thinking and planning for himself, conducting himself towards her no more than a kind but not at all a tender brother, and speaking of his departure as immediately impending; and now it seemed as if her early childish spirit woke up again in her with all its spleen and violence, and was preparing itself in its distemper, on this higher stage of life, to work more effectively and destructively. She determined that she would die to punish the once hated, and now so passionately loved, youth for his want of interest in her; and as she could not possess himself, at least she would wed herself forever to his imagination and to his repentance. Her dead image should cling to him, and he should never be free from it. He should never cease to reproach himself for not having understood, not examined, not valued her feelings toward him.

“This singular insanity accompanied her wherever she went. She kept it concealed under all sorts of forms; and although people thought her very odd, no one was observant enough or clever enough to discover the real inward reason.

“In the meantime, friends, relations, acquaintances had exhausted themselves in contrivances for pleasure parties. Scarcely a day passed, but something new and unexpected was set on foot. There was hardly a pretty spot in the country round which had not been decked out and prepared for the reception of some merry party. And now our young visitor before departing wished to do his part as well, and invited the young couple, with a small family circle, to an expedition on the water. They went on board a large beautiful vessel dressed out in all its colors,—one of the yachts which had a small saloon and a cabin or two besides, and are intended to carry with them upon the water the comfort and conveniences of land.

“They set out upon the broad river with music playing. The party had collected in the cabin, below deck, during the heat of the day, and were amusing themselves with games. Their young host, who could never remain without doing something, had taken charge of the helm, to relieve the old master of the vessel, and the latter had lain down and was fast asleep. It was a moment when the steerer required all his circumspectness, as the vessel was nearing a spot where two islands narrowed the channel of the river, while shallow banks of shingle stretching off, first on one side and then on the other, made the navigation difficult and dangerous. Prudent and sharp-sighted as he was, he thought for a moment that it would be better to wake the master; but he felt confident in himself, and he thought he would venture and make straight for the narrows. At this moment his fair enemy appeared upon deck with a wreath of flowers in her hair. ‘Take this to remember me by,’ she cried out. She took it off and threw it to the steerer. ‘Don’t disturb me,’ he answered quickly, as he caught the wreath; ‘I require all my powers and all my attention now.’ ‘You will never be disturbed by me anymore,’ she cried; ‘you will never see me again.’ As she spoke, she rushed to the forward part of the vessel, and from thence she sprang into the water. Voice upon voice called out, ‘Save her, save her, she is sinking!’ He was in the most terrible difficulty. In the confusion the old shipmaster woke, and tried to catch the rudder, which the young man bid him take. But there was no time to change hands. The vessel stranded; and at the same moment, flinging off the heaviest of his upper garments, he sprang into the water and swam towards his beautiful enemy. The water is a friendly element to a man who is at home in it, and who knows how to deal with it; it buoyed him up, and acknowledged the strong swimmer as its master. He soon overtook the beautiful girl, who had been swept away before him; he caught hold of her, raised her and supported her, and both of them were carried violently down by the current, till the shoals and islands were left far behind, and the river was again open and running smoothly. He now began to collect himself; they had passed the first immediate danger, in which he had been obliged to act mechanically without time to think; he raised his head as high as he could to look about him; and then swam with all his might to a low bushy point, which ran out conveniently into the stream. There he brought his fair burden to dry land, but he could find no signs of life in her; he was in despair, when he caught sight of a trodden path leading among the bushes. Again he caught her up in his arms, hurried forward, and presently reached a solitary cottage. There he found kind, good people—a young married couple; the misfortunes and the dangers explained themselves instantly; every remedy he could think of was instantly applied; a bright fire blazed up: woollen blankets were spread on a bed, counterpane, cloaks, skins, whatever there was at hand which would serve for warmth, were heaped over her as fast as possible. The desire to save life overpowered, for the present, every other consideration. Nothing was left undone to bring back to life the beautiful half-torpid, naked body. It succeeded; she opened her eyes! her friend was before her; she threw her heavenly arms about his neck. In this position

she remained for a time; and then a stream of tears burst out and completed her recovery. ‘Will you forsake me,’ she cried, ‘now when I find you again thus?’ ‘Never,’ he answered, ‘never:’ hardly knowing what he said or did. ‘Only consider yourself,’ she added; ‘take care of yourself, for your sake and for mine.’

Description: "Rescuing the Drowning Girl" (HB:341).

“She now began to collect herself, and for the first time recollected the state in which she was; she could not be ashamed before her darling, before her preserver; but she gladly allowed him to go, that he might take care of himself; for the clothes which he still wore were wet and dripping.

“Their young hosts considered what could be done. The husband offered the young man, and the wife offered the fair lady, the dresses in which they had been married, which were hanging up in full perfection, and sufficient for a complete suit, inside and out, for two people. In a short time our pair of adventurers were not only equipped, but in full costume. They looked most charming, gazed at one another, when they met, with admiration, and then with infinite affection, half laughing at the same time at the quaintness of their appearance, they fell into each other’s arms.

“The power of youth and the quickening spirit of love in a few moments completely restored them; and there was nothing wanted but music to have set them both off dancing.

“To have found themselves brought from the water on dry land, from death into life, from the circle of their families into a wilderness, from despair into rapture, from indifference to affection and to love, all in a moment: the head was not strong enough to bear it; it must either burst, or go distracted: or if so distressing an alternative were to be escaped, the heart must put out all its efforts.

“Lost wholly in each other, it was long before they recollected the alarm and anxiety of those who had been left behind; and they themselves, indeed, could not well think, without alarm and anxiety, how they were again to encounter them. ‘Shall we run away? shall we hide ourselves?’ said the young man. ‘We will remain together,’ she said, as she clung about his neck.

“The peasant having heard them say that a party was aground on the shoal, had hurried down, without stopping to ask another question, to the shore. When he arrived there, he saw the vessel coming safely down the stream. After much labor it had been got off; and they were now going on in uncertainty, hoping to find their lost ones again somewhere. The peasant shouted and made signs to them, and at last caught the attention of those on board; then he ran to a spot where there was a convenient place for landing, and went on signaling and shouting till the vessel’s head was turned towards the shore; and what a scene there was for them when they landed. The parents of the two betrothed first pressed on the banks; the poor loving bridegroom had almost lost his senses. They had scarcely learned that their dear children had been saved, when in their strange disguise the latter came forward out of the bushes to meet them. No one recognized them till they were come quite close. ‘Who do I see?’ cried the mothers. ‘What do I see?’ cried the fathers. The preserved ones flung themselves on the ground before them. ‘Your children,’ they called out; ‘a pair.’ ‘Forgive us!’ cried the maiden. ‘Give us your blessing!’ cried the young man. ‘Give us your blessing!’ they cried both, as all the world stood still in wonder. ‘Your blessing!’ was repeated the third time; and who would have been able to refuse it?”

Next chapter
â— Elective Affinities | Part two: Chapter eleven

Previous chapter
â— Elective Affinities | Part two: Chapter nine

â— Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

See also
â— Goethe's affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe's human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations
N1. The German original of this so-called inserted novella is: *Die wunderlichen Nachbarskinder*, which Google-translates as "The Quaint Neighborhood Children". American German-literature scholar William Lillyman postulates that the inserted novella refers to Edward's and Ottilie's love. [2]

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1. Goethe, Johann. (1902). *Works: The Sorrows of Young Werther, Elective Affinities, tr. By R.D. Boylan* (List of Illustrations, pg. front matter). F.A. Niccolls & Co.
2. Lillyman, William J. (1982). "Analogies for Love: Goethe's *Die Wahlverwandtschaften* and Plato's *Symposium*" (pg. 129). Goethe's Narrative Fiction: the Irvine Goethe Symposium. Walter de Gruyter.

Further reading
â— Milfull, John. (1971). "The Function of the Novelle 'Die Wunderlichen Nachbarskinder' in Goethe's *die Wahlverwandtschaften*" (abs), *German Life and Letters*, 25(1):1-5.
â— Gurganus, Albert E. (2008). "Typologies of Repetition, Reflection, and Recurrence: Interpreting the Novella in Goethe's *Wahlverwandtschaften*" (abs), *Goethe Yearbook*, 15:99-114.

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In Elective Affinities (IAD), **Part two: Chapter thirteen** (add synopsis)

Part two: Chapter thirteen

Men who are complete strangers, and wholly indifferent to one another, if they live a long time together, are sure both of them to expose something of their inner nature, and thus a kind of intimacy will arise between them. All the more was it to be expected that there would soon be no secrets between our two friends, now that they were again under the same roof together, and in daily and hourly intercourse. They went over again the earlier stages of their history, and the major confessed to Edward that Charlotte had intended Ottilie for him at the time at which he returned from abroad, and hoped that some time or other he might marry her. Edward was in ecstasies at this discovery; he spoke without reserve of the mutual affection of Charlotte and the major, which, because it happened to fall in so conveniently with his own wishes, he painted in very lively colors.

Description: "Edward Looking at the Child" (HB:348/49).

Deny it altogether, the major could not; at the same time, he could not altogether acknowledge it. But Edward only insisted on it the more. He had pictured the whole thing to himself not as possible, but as already concluded; all parties had only to resolve on what they all wished; there would be no difficulty in obtaining a separation; the marriages should follow as soon after as possible, and Edward could travel with Ottilie.

Of all the pleasant things which imagination pictures to us, perhaps there is none more charming than when lovers and young married people look forward to enjoying their new relation to each other in a fresh, new world, and test the endurance of the bond between them in so many changing circumstances. The major and Charlotte were in the meantime to have unrestricted powers to settle all questions of money, property, and other such important worldly matters; and to do whatever was right and proper for the satisfaction of all parties. What Edward dwelt the most upon, however, what he seemed to promise himself the most advantage from was this:—as the child would have to remain with the mother, the major would charge himself with the education of it; he would train the boy according to his own views, and develop what capacities there might be in him. It was not for nothing that he had received in his baptism the name of Otto, which belonged to them both.

Edward had so completely arranged everything for himself, that he could not wait another day to carry it into execution. On their way to the castle, they arrived at a small town, where Edward had a house, and where he was to stay to await the return of the major. He could not, however, prevail upon himself to alight there at once, and accompanied his friend through the place. They were both on horseback, and falling into some interesting conversation, rode on further together.

On a sudden they saw, in the distance, the new house on the height, with its red tiles shining in the sun. An irresistible longing came over Edward; he would have it all settled that very evening; he would remain concealed in a village close by. The major was to urge the business on Charlotte with all his power; he would take her prudence by surprise; and oblige her by the unexpectedness of his proposal to make a free acknowledgment of her feelings. Edward had

transferred his own wishes to her; he felt certain that he was only meeting her half-way, and that her inclinations were as decided as his own; and he looked for an immediate consent from her, because he himself could think of nothing else.

Joyfully he saw the prosperous issue before his eyes; and that it might be communicated to him as swiftly as possible, a few cannon shots were to be fired off, and, if it was dark, a rocket or two sent up. The major rode to the castle. He did not find Charlotte there; he learned that for the present she was staying at the new house; at that particular time, however, she was paying a visit in the neighborhood, and she probably would not have returned till late that evening. He walked back to the hotel, to which he had previously sent his horse.

Edward, in the meantime, unable to sit still from restlessness and impatience, stole away out of his concealment along solitary paths only known to foresters and fishermen, into his park; and he found himself towards evening in the copse close to the lake, the broad mirror of which he now for the first time saw spread out in its perfectness before him.

Ottilie had gone out that afternoon for a walk along the shore. She had the child with her, and read as she usually did while she went along. She had gone as far as the oak tree by the ferry. The boy had fallen asleep; she sat down; laid it on the ground at her side, and continued reading. The book was one of those which attract persons of delicate feeling, and afterwards will not let them go again. She forgot the time and the hours; she never thought what a long way round it was by land to the new house; but she sat lost in her book and in herself, so beautiful to look at, that the trees and the bushes round her ought to have been alive, and to have had eyes given them to gaze upon her and admire her. The sun was sinking; a ruddy streak of light fell upon her from behind, tingeing with gold her cheek and shoulder. Edward, who had made his way to the lake without being seen, finding his park desolate, and no trace of human creature to be seen anywhere, went on and on. At last he broke through the copse behind the oak tree, and saw her. At the same moment she saw him. He flew to her, and threw himself at her feet. After a long, silent pause, in which they both endeavored to collect themselves, he explained in a few words why and how he had come there. He had sent the major to Charlotte; and perhaps at that moment their common destiny was being decided. Never had he doubted her affection, and she assuredly had never doubted his. He begged for her consent; she hesitated; he implored her. He offered to resume his old privilege, and throw his arms around her, and embrace her; she pointed down to the child.

Edward looked at it, and was amazed. “Great God!” he cried; “if I had cause to doubt my wife and my friend, this face would witness fearfully against them. Is not this the very image of the major? I never saw such a likeness.”

“Indeed!” replied Ottilie; “all the world say it is like me.”

“Is it possible?” Edward answered; and at the moment the child opened its eyes—two large, black, piercing eyes, deep and full of love; already the little face was full of intelligence. He seemed as if he knew both the figures which he saw standing before him. Edward threw himself down beside the child, and then knelt a second time before Ottilie. “It is you,” he cried; “the eyes are yours! ah, but let me look into yours; let me throw a veil over that ill-starred hour which gave its being to this little creature. Shall I shock your pure spirit with the fearful thought, that man and wife who are estranged from each other, can yet press each other to their heart, and profane the bonds by which the law unites them

Description: "Ottilie Hurring to the New House" (HB:350).

by other eager wishes? Oh, yes! As I have said so much; as my connection with Charlotte must now be severed; as you will be mine, why should I not speak out the words to you? This child is the offspring of a double adultery. It should have been a tie between my wife and myself, but it severs her from me, and me from her. Let it witness, then, against me. Let these fair eyes say to yours, that in the arms of another I belonged to you. You must feel, Ottilie, oh! you must feel, that my fault, my crime, I can only expiate in your arms.

“Hark!” he called out, as he sprang up and listened. He thought that he had heard a shot, and that it was the sign which the major was to give. It was the gun of a forester on the adjoining hill. Nothing followed. Edward grew impatient.

Ottilie now first observed that the sun was down behind the mountains; its last rays were shining on the windows of the house above. “Leave me, Edward,” she cried; “go. Long as we have been parted, much as we have borne, yet remember what we both owe to Charlotte. She must decide our fate; do not let us anticipate her judgment. I am yours if she will permit it to be so. If she will not, I must renounce you. As you think it is now so near an issue, let us wait. Go back to the village, where the major supposes you to be. Is it likely that a rude cannon-shot will inform you of the results of such an interview? Perhaps at this moment he is seeking for you. He will not have found Charlotte at home; of that I am certain. He may have gone to meet her; for they knew at the castle where she was. How many things may have happened! Leave me! she must be at home by this time; she is expecting me with the baby above.”

Ottilie spoke hurriedly; she called together all the possibilities. It was too delightful to be with Edward; but she felt that he must now leave her. “I beseech, I implore you, my beloved,” she cried out, “go back and wait for the major.”

“I obey your commands,” cried Edward. He gazed at her for a moment with rapturous love, and then caught her close in his arms. She wound her own about him, and pressed him tenderly to her breast. Hope streamed away, like a star shooting in the sky, above their heads. They thought then, they believed, that they did indeed belong to one another. For the first time they exchanged free, genuine kisses, and separated with pain and effort.

The sun had gone down. It was twilight, and a damp mist was rising about the lake. Ottilie stood confused and agitated. She looked across to the house on the hill, and she thought she saw Charlotte's white dress on the balcony. It was a long way round by the end of the lake; and she knew how impatiently Charlotte would be waiting for the child. She saw the plane trees just opposite her, and only a narrow interval of water divided her from the path which led straight up to the house. Her nervousness about venturing on the water with the child vanished in her present embarrassment. She hastened to the boat; she did not feel that her heart was beating; that her feet were tottering; that her senses were threatening to fail her.

She sprang in, seized the oar, and pushed off. She had to use force; she pushed again. The boat shot off, and glided, swaying and rocking, into the open water. With the child in her left arm, the book in her left hand, and the oar in her right, she lost her footing, and fell over the seat; the oar slipped from her on one side, and as she tried to recover herself, the child and the book slipped on the other, all into the water. She caught the floating dress, but lying entangled as she was herself, she was unable to rise. Her right hand was free, but she could not reach round to help herself up with it; at last she succeeded. She drew the child out of the water; but its eyes were closed, and it had ceased to breathe.

In a moment she recovered all her self-possession; but so much the greater was her agony; the boat was driving fast into the middle of the lake; the oar was swimming far away from her. She saw no one on the shore; and, indeed, if she had, it would have been of no service to her. Cut off from all assistance, she was floating on the faithless, unstable element.

Description: "She Sank Down Upon Her Knees" or "Ottilie on the Lake"; a circa 1864 depiction of Ottilie and the dead child Otto by German painter Wilhelm von Kaulbach (1802-1874); from his "Goethe Gallerie" consist of fifty paintings illustrating Goethe's poems and life, and took him five years to complete.[1]

She sought for help from herself; she had often heard of the recovery of the drowned; she had herself witnessed an instance of it on the evening of her birthday; she took off the child's clothes, and dried it with her muslin dress; she threw open her bosom, laying it bare for the first time to the free heaven. For the first time she pressed a living being to her pure, naked breast. Alas! and it was not a living being. The cold limbs of the ill-starred little creature chilled her to the heart. Streams of tears gushed from her eyes, and lent a show of life and warmth to the outside of the torpid limbs. She persevered with her efforts; she wrapped it in her shawl, she drew it close to herself, stroked it, breathed upon it, and with tears and kisses labored to supply the help which, cut off as she was, she was unable to find.

It was all in vain; the child lay motionless in her arms; motionless the boat floated on the glassy water. But even here her beautiful spirit did not leave her forsaken. She turned to the Power above. She sank down upon her knees in the boat, and with both arms raised the unmoving child above her innocent breast, like marble in its whiteness; alas, too like marble, cold; with moist eyes she looked up and cried for help, where a tender heart hopes to find it in its fullness, when all other help has failed.

The stars were beginning one by one to glimmer down upon her; she turned to them and not in vain; a soft air stole over

the surface, and wafted the boat under the plane trees.

Next chapter

â— Elective Affinities | Part two: Chapter fourteen

Previous chapter

â— Elective Affinities | Part two: Chapter twelve

â— Elective Affinities: Illustrated, Annotated, and Decoded

Discussion

The effect of the drowning, is to effect Charlotte into becoming "willing" to getting a "divorce"; the following is a synopsis of this:

> "Later, in a scene which reminds one of E. M. Forster, Ottilie upsets a boat, and the child is drowned. The effect of this on Charlotte is to make her willing for the first time to agree to Edouard's demand for a divorce, but now Ottilie, stricken with remorse, swears she will drown herself if a divorce takes place."
>
> — Author (1964), "Speaking of Books" (Ñº), New York Times, Oct 18

We also note, that the chapter number "13", symbolic of bad omens, is employed for this dark chapter.

See also

â— Goethe's affinity table | Used to make *Elective Affinities*.
â— Goethe timeline | Historical overview of the construction of *Elective Affinities*.
â— Goethe's human chemistry | Goethe's version of human chemistry.
â— Goethean philosophy | Goethe's philosophy.
â— Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations

N1. (add)

References

1. (a) Goethe timeline (elective affinities section)– GoetheZeitPortal.de.
(b) Wilhelm von Kaulbach – Wikipedia.
(c) Ottilie (c.1864) – PDMP Gallery.

A rendition of Ottilie with the drowned child of Edward by Friedrich Bury. [2]

(d) Kaulbach, Wilhelm. (1881). *The Goethe Gallery: from the Original Drawings of Wilhelm von Kaulbach, with Explanatory Text* (*Elective Affinities*, pgs. 49-50; *The Natural Daughter*, 59-60; Goethe in Frankfort: skating, 1773, pgs. 67-68 ; Goethe in Weimar, pgs. 71-73). J.R. Osgood and Co.

(e) Goethe, Johann. (1902). *Works: The Sorrows of Young Werther, Elective Affinities* (*Werther* translation By R. Dillon Boylan, *Elective Affinities* translation by James Froude) (List of Illustrations, pg. front matter; "Ottilie's Favorite Walk … was along a Pleasant Footpath", cover and pg. 376; "the Chart … was brought and Spread out", pg. 195; "She Sank Down Upon Her Knees", pg. 412). F.A. Niccolls & Co.

2. Ottilie (Friedrich Bury) – Goethe-Museum.com.

In Elective Affinities (IAD), **Part two: Chapter three** (add synopsis)

Part two: Chapter three

It causes us so agreeable a sensation to occupy ourselves with what we can only half do, that no person ought to find fault with the dilettante, when he is spending his time over an art which he can never learn; nor blame the artist if he chooses to pass out over the border of his own art, and amuse himself in some neighboring field. With such complacency of feeling we regard the preparation of the architect for the painting the chapel. The colors were got ready, the measurements taken; the cartoons designed. He had made no attempt at originality, but kept close to his outlines; his only care was to make a proper distribution of the sitting and floating figures, so as tastefully to ornament his space with them.

Description: "Ottilie Painting in the Chapel." (HB:304)

The scaffoldings were erected. The work went forward; and as soon as anything had been done on which the eye could rest, he could have no objection to Charlotte and Ottilie coming to see how he was getting on.

The life-like faces of the angels, their robes waving against the blue sky-ground, delighted the eye, while their still and holy air calmed and composed the spirit, and produced the most delicate effect.

The ladies ascended the scaffolding to him, and Ottilie had scarcely observed how easily and regularly the work was being done, than the power which had been fostered in her by her early education at once appeared to develop. She took a brush, and with a few words of direction, painted a richly folding robe, with as much delicacy as skill.

Charlotte, who was always glad when Ottilie would occupy or amuse herself with anything, left them both in the chapel, and went to follow the train of her own thoughts, and work her way for herself through her cares and anxieties which she was unable to communicate to a creature.

When ordinary men allow themselves to be worked up by common every-day difficulties into fever-fits of passion, we can give them nothing but a compassionate smile. But we look with a kind of awe on a spirit in which the seed of a great destiny has been sown, which must abide the unfolding of the germ, and neither dare nor can do anything to precipitate either the good or the ill, either the happiness or the misery, which is to arise out of it.

Edward had sent an answer by Charlotte’s messenger, who had come to him in his solitude. It was written with kindness and interest, but it was rather composed and serious than warm and affectionate. He had vanished almost immediately after, and Charlotte could learn no news about him; till at last she accidentally found his name in the newspaper, where he was mentioned with honor among those who had most distinguished themselves in a late important engagement. She now understood the method which he had taken; she perceived that he had escaped from great danger; only she was convinced at the same time that he would seek out greater; and it was all too clear to her that in every sense he would

hardly be withheld from any extremity.

She had to bear about this perpetual anxiety in her thoughts, and turn which way she would, there was no light in which she could look at it that would give her comfort.

Ottilie, never dreaming of anything of this, had taken to the work in the chapel with the greatest interest, and she had easily obtained Charlotte's permission to go on with it regularly. So now all went swiftly forward, and the azure heaven was soon peopled with worthy inhabitants. By continual practice both Ottilie and the architect had gained more freedom with the last figures; they became perceptibly better. The faces, too, which had been all left to the architect to paint, showed by degrees a very singular peculiarity. They began all of them to resemble Ottilie. The neighborhood of the beautiful girl had made so strong an impression on the soul of the young man, who had no variety of faces preconceived in his mind, that by degrees, on the way from the eye to the hand, nothing was lost, and both worked in exact harmony together. Enough; one of the last faces succeeded perfectly; so that it seemed as if Ottilie herself was looking down out of the spaces of the sky.

They had finished with the arching of the ceiling. The walls they proposed to leave plain, and only to cover them over with a bright brown color. The delicate pillars and the quaintly-moulded ornaments were to be distinguished from them by a dark shade. But as in such things one thing ever leads on to another, they determined at least on having festoons of flowers and fruit, which should as it were unite together heaven and earth. Here Ottilie was in her element. The gardens provided the most perfect patterns; and although the wreaths were as rich as they could make them, it was all finished sooner than they had supposed possible.

It was still looking rough and disorderly. The scaffolding poles had been run together, the planks thrown one on the top of the other; the uneven pavement was yet more disfigured by the particolored stains of the paint which had been spilled over it.

The architect begged that the ladies would give him a week to himself, and during that time would not enter the chapel; at the end of it, one fine evening, he came to them, and begged them both to go and see it. He did not wish to accompany them, he said, and at once took his leave.

"Whatever surprise he may have designed for us," said Charlotte, as soon as he was gone, "I cannot myself just now go down there. You can go by yourself, and tell me all about it. No doubt he has been doing something which we shall like. I will enjoy it first in your description, and afterwards it will be the more charming in the reality."

Ottilie, who knew well that in many cases Charlotte took care to avoid everything which could produce emotion, and particularly disliked to be surprised, set off down the walk by herself, and looked round involuntarily for the architect, who however was nowhere to be seen, and must have concealed himself somewhere. She walked into the church, which she found open. This had been finished before; it had been cleaned up, and service had been performed in it. She went on to the chapel door; its heavy mass, all overlaid with iron, yielded easily to her touch, and she found an unexpected sight in a familiar spot.

A solemn beautiful light streamed in through the one tall window. It was filled with stained glass, gracefully put together. The entire chapel had thus received a strange tone, and a peculiar genius was thrown over it. The beauty of the vaulted ceiling and the walls was set off by the elegance of the pavement, which was composed of peculiarly shaped tiles, fastened together with gypsum, and forming exquisite patterns as they lay. This and the colored glass for the windows the architect had prepared without their knowledge, and a short time was sufficient to have it put in its place.

Seats had been provided as well. Among the relics of the old church some finely carved chancel chairs had been discovered, which now were standing about at convenient places along the walls.

The parts which she knew so well now meeting her as an unfamiliar whole, delighted Ottilie. She stood still, walked up and down, looked and looked again; at last she seated herself in one of the chairs, and it seemed, as she gazed up and down, as if she was, and yet was not—as

Description: "Ottilie Lingering in the Chapel." (HB:306)

if she felt and did not feel—as if all this would vanish from before her, and she would vanish from herself; and it was only when the sun left the window, on which before it had been shining full, that she awoke to possession of herself, and hastened back to the castle.
She did not hide from herself the strange epoch at which this surprise had occurred to her. It was the evening of Edward's birthday. Very differently she had hoped to keep it. How was not everything to be dressed out for this festival? and now all the splendor of the autumn flowers remained ungathered. Those sunflowers still turned their faces to the sky; those asters still looked out with quiet, modest eye; and whatever of them all had been wound into wreaths had served as patterns for the decorating a spot which, if it was not to remain a mere artist's fancy, was only adapted as a general mausoleum.

And then she had to remember the impetuous eagerness with which Edward had kept her birthday-feast. She thought of the newly-erected lodge, under the roof of which they had promised themselves so much enjoyment. The fireworks flashed and hissed again before her eyes and ears; the more lonely she was, the more keenly her imagination brought it all before her. But she felt herself only the more alone. She no longer leaned upon his arm, and she had no hope ever any more to rest herself upon it.

FROM OTTILIE'S DIARY

"I have been struck with an observation of the young architect.

"In the case of the creative artist, as in that of the artisan, it is clear that man is least permitted to appropriate to himself what is most entirely his own. His works forsake him as the birds forsake the nest in which they were hatched.

"The fate of the architect is the strangest of all in this way. How often he expends his whole soul, his whole heart and passion, to produce buildings into which he himself may never enter. The halls of kings owe their magnificence to him; but he has no enjoyment of them in their splendor. In the temple he draws a partition line between himself and the Holy of Holies; he may never more set his foot upon the steps which he has laid down for the heart-thrilling ceremonial; as the goldsmith may only adore from far off the *monstrance* whose enamel and whose jewels he has himself set together. The builder surrenders to the rich man, with the key of his palace, all pleasure and all right there, and never shares with him in the enjoyment of it. And must not art in this way, step by step, draw off from the artist, when the work, like a child who is provided for, has no more to fall back upon its father? And what a power there must be in art itself, for its own self-advancing, when it has been obliged to shape itself almost solely out of what was open to all, only out of what was the property of everyone, and therefore also of the artist!"

"There is a conception among old nations which is awful, and may almost seem terrible. They pictured their forefathers to themselves sitting round on thrones, in enormous caverns, in silent converse; when a new-comer entered, if he were worthy enough, they rose up, and inclined their heads to welcome him. Yesterday, as I was sitting in the chapel, and other carved chairs stood round like that in which I was, the thought of this came over me with a soft, pleasant feeling. Why cannot you stay sitting here? I said to myself; stay here sitting meditating with yourself long, long, long, till at last your friends come, and you rise up to them, and with a gentle inclination direct them to their places. The colored window panes convert the day into a solemn twilight; and someone should set up for us an ever-burning lamp, that the night might not be utter darkness."

“We may imagine ourselves in what situation we please, we always conceive ourselves as *seeing*. I believe men only dream that they may not cease to see. Someday, perhaps, the inner light will come out from within us, and we shall not any more require another.

“The year dies away, the wind sweeps over the stubble, and there is nothing left to stir under its touch. But the red berries on yonder tall tree seem as if they would still remind us of brighter things; and the stroke of the thrasher’s flail awakes the thought how much of nourishment and life lies buried in the sickled ear.”

Next chapter
● Elective Affinities | Part two: Chapter four

Previous chapter
● Elective Affinities | Part two: Chapter two

● Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

See also
● Goethe’s affinity table | Used to make *Elective Affinities*.
● Goethe timeline | Historical overview of the construction of *Elective Affinities*.
● Goethe’s human chemistry | Goethe's version of human chemistry.
● Goethean philosophy | Goethe's philosophy.
● Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Quotes | Cited
The following are quotes cited from this chapter:

> “Someday perhaps the inner light will shine forth from us and then we shall need no other light.”
>
> — Goethe (1809), *Elective Affinities* (P2C3) (Q)

Annotations
N1. (add)

References

1. (add)

A = - dG

In Elective Affinities (IAD), **Part two: Chapter twelve** (add synopsis)

Part two: Chapter twelve

The object of the campaign was attained, and Edward, with crosses and decorations, was honorably dismissed. He betook himself at once to the same little estate, where he found exact accounts of his family waiting for him, on whom all this time, without their having observed it or known of it, a sharp watch had been kept under his orders. His quiet residence looked most sweet and pleasant when he reached it. In accordance with his orders, various improvements had been made in his absence, and what was wanting to the establishment in extent, was compensated by its internal comforts and conveniences. Edward, accustomed by his more active habits of life, to take decided steps, determined to execute a project which he long had sufficient time to think over. First of all, he invited the major to come to him. This pleasure in meeting again was very great to both of them. The friendships of boyhood, like relationship of blood, possess this important advantage, that mistakes and misunderstandings never produce irreparable injury; and the old regard after a time will always re-establish itself.

Edward began with inquiring about the situation of his friend, and learned that fortune had favored him exactly as he most could have wished. He then half-seriously asked whether there was not something going forward about a marriage; to which he received a most decided and positive denial.

“I cannot and will not have any reserve with you,” he proceeded. “I will tell you at once what my own feelings are, and what I intend to do. You know my passion for Ottilie; you must long have comprehended that it was this which drove me into the campaign. I do not deny that I desired to be rid of a life which, without her, would be of no further value to me. At the same time, however, I acknowledge that I could never bring myself utterly to despair. The prospect of happiness with her was so beautiful, so infinitely charming, that it was not possible for me entirely to renounce it. Feelings, too, which I cannot explain, and a number of happy omens, have combined to strengthen me in the belief, in the assurance, that Ottilie will one day be mine. The glass with our initials cut upon it, which was thrown into the air when the foundation-stone was laid, did not go to pieces; it was caught, and I have it again in my possession. After many miserable hours of uncertainty, spent in this place, I said to myself, ‘I will put myself in the place of this glass, and it shall be an omen whether our union be possible or not. I will go; I will seek for death; not like a madman, but like a man who still hopes that he may live. Ottilie shall be the prize for which I fight. Ottilie shall be behind the ranks of the enemy; in every entrenchment, in every beleaguered fortress, I shall hope to find her, and to win her. I will do wonders, with the wish to survive them; with the hope to gain Ottilie, not to lose her.’ These feelings have led me on; they have stood by me through all dangers; and now I find myself like one who has arrived at his goal, who has overcome every difficulty and who has nothing more left in his way. Ottilie is mine, and whatever lies between the thought and the execution of it, I can only regard as unimportant.”

“With a few strokes you blot out,” replied the major, “all the objections that we can or ought to urge upon you, and yet they must be repeated. I must leave it to yourself to recall the full value of your relation with your wife; but you owe it to her, and you owe it to yourself, not to close your eyes to it. How can I so much as recollect that you have had a son given to you, without acknowledging at once that you two belong to one another forever; that you are bound, for this little creature’s sake, to live united, that united you may educate it, and provide for its future welfare?”

“It is no more than the blindness of parents,” answered Edward, “when they imagine their existence to be of so much importance to their children. Whatever lives, finds nourishment and finds assistance; and if the son who has early lost his father does not spend so easy, so favored a youth, he profits, perhaps, for that very reason, in being trained sooner for the world, and comes to a timely knowledge that he must accommodate himself to others, a thing which sooner or later we are all forced to learn. Here, however, even these considerations are irrelevant; we are sufficiently well off to be able to provide for more children than one, and it is neither right nor kind to accumulate so large a property on a single head.”

The major attempted to say something of Charlotte’s worth, and Edward’s long-standing attachment to her; but the latter hastily interrupted him. “We committed ourselves to a foolish thing, that I see all too clearly. Whoever, in middle age, attempts to realize the wishes and hopes of his early youth, invariably deceives himself. Each ten years of a man’s life has its own fortunes, its own hopes, its own desires. Woe to him who, either by circumstances or by his own infatuation,

is induced to grasp at anything before him or behind him. We have done a foolish thing. Are we to abide by it all our lives? Are we, from some respect of prudence, to refuse to ourselves what the customs of the age do not forbid? In how many matters do men recall their intentions and their actions; and shall it not be allowed to them here, here, where the question is not of this thing or of that, but of everything; not of our single condition of life, but of the whole complex life itself?"

Again the major powerfully and impressively urged on Edward to consider what he owed to his wife, what was due to his family, to the world, and to his own position; but he could not succeed in producing the slightest impression.

"All these questions, my friend," he returned, "I have considered already again and again. They have passed before me in the storm of battle, when the earth was shaking with the thunder of the cannon, with the balls singing and whistling round me, with my comrades falling right and left, my horse shot under me, my hat pierced with bullets. They have floated before me by the still watch-fire under the starry vault of the sky. I have thought them all through, felt them all through. I have weighed them, and I have satisfied myself about them again and again, and now forever. At such moments why should I not acknowledge it to you? you too were in my thoughts, you too belonged to my circle; as, indeed, you and I have long belonged to one another. If I have ever been in your debt I am now in a position to repay it with interest; if you have been in mine you have now the means to make it good to me. I know that you love Charlotte, and she deserves it. I know that you are not indifferent to her, and why should she not feel your worth? Take her at my hand and give Ottilie to me, and we shall be the happiest beings upon the earth."

"If you choose to assign me so high a character," replied the major, "it is the more reason for me to be firm and prudent. Whatever there may be in this proposal to make it attractive to me, instead of simplifying the problem, it only increases the difficulty of it. The question is now of me as well as of you. The fortunes, the good name, the honor of two men, hitherto unsullied with a breath, will be exposed to hazard by so strange a proceeding, to call it by no harsher name, and we shall appear before the world in a highly questionable light."

"Our very characters being what they are," replied Edward, "give us a right to take this single liberty. A man who has borne himself honorably through a whole life, makes an action honorable which might appear ambiguous in others. As concerns myself, after these last trials which I have taken upon myself, after the difficult and dangerous actions which I have accomplished for others, I feel entitled now to do something for myself. For you and Charlotte, that part of the business may, if you like it, be given up; but neither you nor any one shall keep me from doing what I have determined. If I may look for help and furtherance, I shall be ready to do everything which can be wished; but if I am to be left to myself, or if obstacles are to be thrown in my way, some extremity or other is sure to follow."

The major thought it his duty to combat Edward's purposes as long as it was possible; and now he changed the mode of his attack and tried a diversion. He seemed to give way, and only spoke of the form of what they would have to do to bring about this separation, and these new unions; and so mentioned a number of ugly, undesirable matters, which threw Edward into the worst of tempers.

"I see plainly," he cried at last, "that what we desire can only be carried by storm, whether it be from our enemies or from our friends. I keep clearly before my own eyes what I demand, what, one way or another, I must have; and I will seize it promptly and surely. Connections like ours, I know very well, cannot be broken up and reconstructed again without much being thrown down which is standing, and much having to give way which would be glad enough to continue. We shall come to no conclusion by thinking about it. All rights are alike to the understanding, and it is always easy to throw extra weight into the ascending scale. Do you make up your mind, my friend, to act, and act promptly, for me and for yourself. Disentangle and untie the knots, and tie them up again. Do not be deterred from it by nice respects. We have already given the world something to say about us. It will talk about us once more; and when we have ceased to be a nine days' wonder, it will forget us as it forgets everything else, and allow us to follow our own way without further concern with us." The major had nothing further to say, and was at last obliged to sit silent; while Edward treated the affair as now conclusively settled, talked through in detail all that had to be done, and pictured the future in every most cheerful color, and then he went on again seriously and thoughtfully: "If we think to leave ourselves to the hope, to the expectation, that all will go right again of itself, that accident will lead us straight, and take care of us, it will be a most culpable self-deception. In such a way it would be impossible for us to save ourselves, or re-establish our peace again. I who have been the innocent cause of it all, how am I ever to console myself? By my own importunity I

prevailed on Charlotte to write to you to stay with us, and Ottilie followed in consequence. We have had no more control over what ensued out of this, but we have the power to make it innocuous; to guide the new circumstances to our own happiness. Can you turn away your eyes from the fair and beautiful prospects which I open to us? Can you insist to me, can you insist to us all, on a wretched renunciation of them? Do you think it possible? Is it possible? Will there be no vexations, no bitterness, no inconvenience to overcome, if we resolve to fall back into our old state? and will any good, any happiness whatever, arise out of it? Will your own rank, will the high position which you have earned, be any pleasure to you, if you are to be prevented from visiting me, or from living with me? And after what has passed, it would not be anything but painful. Charlotte and I, with all our property, would only find ourselves in a melancholy state. And if, like other men of the world, you can persuade yourself that years and separation will eradicate our feelings, will obliterate impressions so deeply engraved; why, then the question is of these very years, which it would be better to spend in happiness and comfort than in pain and misery. But the last and most important point of all which I have to urge is this: supposing that we, our outward and inward condition being what it is, could nevertheless make up our minds to wait at all hazards, and bear what is laid upon us, what is to become of Ottilie? She must leave our family; she must go into society where we shall not be to care for her, and she will be driven wretchedly to and fro in a hard, cold world. Describe to me any situation in which Ottilie, without me, without us, could be happy, and you will then have employed an argument which will be stronger than every other; and if I will not promise to yield to it, if I will not undertake at once to give up all my own hopes, I will at least reconsider the question, and see how what you have said will affect it."

This problem was not so easy to solve; at least, no satisfactory answer to it suggested itself to his friend, and nothing was left to him except to insist again and again, how grave and serious, and in many senses how dangerous, the whole undertaking was; and at least that they ought maturely to consider how they had better enter upon it. Edward agreed to this, and consented to wait before he took any steps; but only under the condition that his friend should not leave him until they had come to a perfect understanding about it, and until the first measures had been taken.

Next chapter
● Elective Affinities | Part two: Chapter thirteen

Previous chapter
● Elective Affinities | Part two: Chapter eleven

● Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

See also
● Goethe's affinity table | Used to make *Elective Affinities*.
● Goethe timeline | Historical overview of the construction of *Elective Affinities*.
● Goethe's human chemistry | Goethe's version of human chemistry.
● Goethean philosophy | Goethe's philosophy.

● Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations

N1. (add)

References

1. (add)

In Elective Affinities (IAD), **Part two: Chapter two** (add synopsis)

Part two: Chapter two

Description: "The Architect Exhibiting his Portfolio." (HB:301)

Under the stimulus of this accident, and of the conversations which arose out of it, they went the following day to look over the burying-place, for the ornamenting of which and relieving it in some degree of its somber look, the architect made many a happy proposal. His interest too had to extend itself to the church as well; a building which had caught his attention from the moment of his arrival.

It had been standing for many centuries, built in old German style, the proportions good, the decorating elaborate and excellent; and one might easily gather that the architect of the neighboring monastery had left the stamp of his art and of his love on this smaller building also; it worked on the beholder with a solemnity and a sweetness, although the change in its internal arrangements for the Protestant service, had taken from it something of its repose and majesty.

The architect found no great difficulty in prevailing on Charlotte to give him a considerable sum of money to restore it externally and internally, in the original spirit, and thus, as he thought, to bring it into harmony with the resurrection-field which lay in front of it. He had himself much practical skill, and a few laborers, who were still busy at the lodge, might easily be kept together, until this pious work too should be completed.

The building itself, therefore, with all its environs, and whatever was attached to it, was now carefully and thoroughly examined; and then showed itself, to the greatest surprise and delight of the architect, a little side chapel, which nobody had thought of, beautifully and delicately proportioned, and displaying still greater care and pains in its decoration. It contained at the same time many remnants, carved and painted, of the implements used in the old services, when the different festivals were distinguished by a variety of pictures and ceremonies, and each was celebrated in its own peculiar style.

It was impossible for him not at once to take this chapel into his plan; and he determined to bestow especial pains on the restoring of this little spot, as a memorial of old times, and of their taste. He saw exactly how he would like to have the vacant surfaces of the walls ornamented, and delighted himself with the prospect, of exercising his talent for painting upon them; but of this, at first, he made a secret to the rest of the party.

Before doing anything else, he fulfilled his promise of showing the ladies the various imitations of, and designs from, old monuments, vases and other such things which he had made; and when they came to speak of the simple barrow-sepulchers of the northern nations, he brought a collection of weapons and implements which had been found in them. He had got them exceedingly nicely and conveniently arranged in drawers and compartments, laid on boards cut to fit them, and covered over with cloth; so that these solemn old things, in the way he treated them, had a smart dressy appearance, and it was like looking into the box of a trinket merchant.

Having once begun to show his curiosities, and finding them prove serviceable to entertain our friends in their loneliness, every evening he would produce one or other of his treasures. They were most of them of German origin—pieces of metal, old coins, seals and such like. All these things directed the imagination back upon old times; and when

at last they came to amuse themselves with the first specimens of printing, woodcuts, and the earliest copper-plate engraving, and when the church, in the same spirit, was growing out, every day, more and more in form and color like the past, they had almost to ask themselves whether they really were living in a modern time, whether it were not a dream, that manners, customs, modes of life, and convictions were all really so changed.

After such preparation, a great portfolio, which at last he produced, had the best possible effect. It contained indeed principally only outlines and figures, but as these had been traced upon original pictures, they retained perfectly their ancient character, and most captivating indeed this character was to the spectators. All the figures breathed only the purest feeling; every one, if not noble, at any rate was good; cheerful composure, ready recognition of One above us, to whom all reverence is due; silent devotion, in love and tranquil expectation, was expressed on every face, on every gesture. The old bald-headed man, the curly-pated boy, the light-hearted youth, the earnest man, the glorified saint, the angel hovering in the air, all seemed happy in an innocent, satisfied, pious expectation. The commonest object had a trait of celestial life; and every nature seemed adapted to the service of God, and to be, in some way or other, employed upon it.

Towards such a region most of them gazed as towards a vanished golden age, or on some lost paradise; only perhaps Ottilie had a chance of finding herself among beings of her own nature. Who could offer any opposition when the architect asked to be allowed to paint the spaces between the arches and the walls of the chapel in the style of these old pictures, and thereby leave his own distinct memorial at a place where life had gone so pleasantly with him?

He spoke of it with some sadness, for he could see, in the state in which things were, that his sojourn in such delightful society could not last forever; indeed, that perhaps it would now soon be ended.

For the rest, these days were not rich in incidents; yet full of occasion for serious entertainment. We therefore take the opportunity of communicating something of the remarks which Ottilie noted down among her manuscripts, to which we cannot find a fitter transition than through a simile which suggested itself to us on contemplating her exquisite pages. There is, we are told, a curious contrivance in the service of the English marine. The ropes in use in the royal navy, from the largest to the smallest, are so twisted that a red thread runs through them from end to end, which cannot be extracted without undoing the whole; and by which the smallest pieces may be recognized as belonging to the crown.

Just so is there drawn through Ottilie's diary, a thread of attachment and affection which connects it all together, and characterizes the whole. And thus these remarks, these observations, these extracted sentences, and whatever else it may contain, were, to the writer, of peculiar meaning. Even the few separate pieces which we select and transcribe will sufficiently explain our meaning.

More Observations on Goethe's Elective Affinities

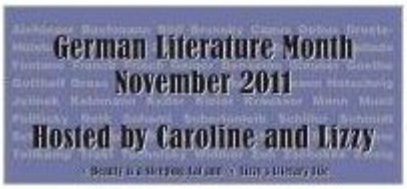

German Literature month co-hosted by Caroline and Lizzy continues, and after getting annoyed about one part of Goethe's ***Elective Affinities***, here's a post regarding a wonderful quote. This passage is spoken by Ottilie–a veritable saint of a girl.

(O)

FROM OTTILIE'S DIARY

"To rest hereafter at the side of those whom we love is the most delightful thought which man can have when once he looks out beyond the boundary of life. What a sweet expression is that —'He was gathered to his fathers!' "

"Of the various memorials and tokens which bring nearer to us the distant and the separated—none is so satisfactory as a picture. To sit and talk to a beloved picture, even though it be unlike, has a charm in it, like the charm which there sometimes is in quarrelling with a friend. We feel, in a strange sweet way, that we are divided and yet cannot separate."

"We entertain ourselves often with a present person as with a picture. He need not speak to us, he need not look at us, or take any notice of us; we look at him, we feel the relation in which we stand to him; such relation can even grow

without his doing anything towards it, without his having any feeling of it: he is to us exactly as a picture."

"One is never satisfied with a portrait of a person that one knows. I have always felt for the portrait-painter on this account. One so seldom requires of people what is impossible, and of them we do really require what is impossible; they must gather up into their picture the relation of everybody to its subject, all their likings and all dislikings; they must not only paint a man as they see him, but as everyone else sees him. It does not surprise me if such artists become by degrees stunted, indifferent, and of but one idea; and indeed it would not matter what came of it, if it were not that in consequence we have to go without the pictures of so many persons near and dear to us."

"It is too true, the architect's collection of weapons and old implements, which were found with the bodies of their owners, covered in with great hills of earth and rock, proves to us how useless is man's so great anxiety to preserve his personality after he is dead; and so inconsistent people are! the architect confesses to have himself opened these barrows of his forefathers, and yet goes on occupying himself with memorials for posterity."

"But after all why should we take it so much to heart? Is all that we do, done for eternity? Do we not put on our dress in the morning, to throw it off again at night? Do we not go abroad to return home again? And why should we not wish to rest by the side of our friends, though it were but for a century?"

"When we see the many grave-stones which have fallen in, which have been defaced by the footsteps of the congregation, which lie buried under the ruins of the churches, that have themselves crumbled together over them, we may fancy the life after death to be as a second life, into which a man enters in the figure, or the picture, or the inscription, and lives longer there than when he was really alive. But this figure also, this second existence, dies out too, sooner or later. Time will not allow himself to be cheated of his rights with the monuments of men or with themselves.

Next chapter
● Elective Affinities | Part two: Chapter three

Previous chapter
● Elective Affinities | Part two: Chapter one

Main
● Elective Affinities: Illustrated, Annotated, and Decoded

Discussion
(add)

See also
● Goethe's affinity table | Used to make *Elective Affinities*.
● Goethe timeline | Historical overview of the construction of *Elective Affinities*.
● Goethe's human chemistry | Goethe's version of human chemistry.
● Goethean philosophy | Goethe's philosophy.
● Goethe-Helmholtz equation | Connection between *Elective Affinities* and chemical thermodynamics.

Annotations

N1. (add)

References

1. (add)

In Elective Affinities (translations), ***Elective Affinities: Illustrated, Annotated, and Decoded*** (EA:IAD) is an online (2012-launched), possibly to be turned print book (date), annotated, illustrated, and puzzle-solving Hmolpedia-hyperlinked reconstructed and reaction-decoded reprinting of German polymath Johann Goethe's 1809 physical chemistry based masterpiece *Elective Affinities* (*Die Wahlverwandtschaften*), his self-defined "best book" (and most "dangerous" book).

The equation overlaid cover design to 2012-launched online, planned 2013-book published, ***Elective Affinities: Illustrated, Annotated, and Decoded*** by American electrochemical engineer Libb Thims, based the 1885 cover illustration by Philipp Johann and translation by James Froude (1854). [1]

> "In 1809, Goethe published a book which was a **puzzle** both to his admirers and his enemies. This was *Elective Affinities.*"
>
> — Hjalmar Boyesen (1885), Goethean scholar

The backbone of the project is the 1854 English translation by James Froude and the 1885 illustrated edition of this translation compiled by Norwegian-born, German-educated, American languages professor Hjalmar Boyesen, done by "the best German artists", predominately German artist Philipp Johann, noted *Grimm's Fairy Tales* illustrator, as a text-picture framework starting point; inter-spliced with text-section translation alternatives [in brackets] for controversial terms (e.g. see: Goethe's advertisement), using comparative translations: Herbert Waidson (1960), Reginald Hollingdale (1971), Judith Ryan (1988), and David Constantine (1994), etc.; with footnoted annotations, commentary, and modern insights into the "layered, hidden, gestalt" and "symbolic" or "moral symbol" Bergman affinity reactions, as Goethe put it, secretly buried as coded puzzles, in each chapter, by American electrochemical engineer by Libb Thims, using Jeremy Adler (1969-1990) and Karl Fink's (1999) per-chapter affinity reaction research hypotheses as reference points; thus, thematically, putting a "main" or central chemical reaction for each of the 36 chapters, which Goethe claimed or alluded to have done—and discussing, along the way, the modern human chemical thermodynamics upgrades to each scene scenario, via the 1882 Goethe-Helmholtz equation.

Project pages

The following are links to the separate project pages:

- Elective Affinities | IAD: Project background
- Elective Affinities | IAD: Goethe timeline
- Elective Affinities | IAD: Goethe's advertisement
- Elective Affinities | IAD: **Table of contents**
- Elective Affinities | IAD: List of characters
- Elective Affinities | IAD: Title decoding
- Elective Affinities | IAD: Reaction decipherment
- Elective Affinities | IAD: **Equation decipherment** (hardest part)
- Elective Affinities | IAD: Commentary decoding | Puzzles
- Elective Affinities | IAD: Love theories
- Elective Affinities | IAD: Affinity table
- Elective Affinities | IAD: Admirers | Enemies

- Elective Affinities | IAD: Translations
- Elective Affinities | IAD: Robe of Nessus; Tableau vivant
- Elective Affinities | IAD: Artists

Reviews

The following are historical reviews and commentary:

Back cover to 2013 hard cover version of *Elective Affinities: Illustrated, Annotated, and Decoded.* [4]

> "In 1809, Goethe printed the most exceptionable of his novels, the *Wahlverwandschaften* ("Elective Affinities"), in which the charms and graces of this style are employed in the description of the impulses which spring from the collision of passion and duty in the relations of marriage. By the title of the book, and in the whole spirit of it, he would represent that sexual affinities follow the same inevitable law as chemical affinities, and that humanity struggles impotently against the dictates of nature. Like all his productions, this was suggested by circumstances in his own experience. The work shocked the moral world, in spite of the beauty with which it was written, and to this day tasks the ingenuity of those of his admirers who seek to defend it from attack."
>
> — *New American Cyclopedia* (1859), edited by George Ripley and Charles Dana [2]

"A great revolutionary doctrine pervades the whole."

— Victoria Woodhull (1871), first female US presidential candidate

> "A novel remarkable for depth of feeling, wealth of penetrative knowledge of the world and of man, and artistic perfection; a masterpiece of its kind, though it has not escaped manifold misinterpretation."
>
> — Heinrich Duntzer, *Life of Goethe* (1880) [6]

> "Betty Dobbs [1975] also examined the role of the 'mediator' by which two substances are made 'sociable'. We may recall here the importance of the mediator [Mittler] in Goethe's *Elective Affinities*. For what concerns chemistry, Goethe was not far from Newton."
>
> — Ilya Prigogine (1984), *Order Out of Chaos*, footnote 2.5

> "*Elective Affinities*—the famous novel by Goethe—is often considered, along with *War and Peace* [Tolstoy], the best novel of the nineteenth century."
>
> — Francesca Santucci (2002) (Q)

> “The chemical theory is the structural backbone of Goethe.”
>
> — Carl Krockel, “D.H. Lawrence and Germany” (2007)

> “Wahlverwandtschaft – the natural affinity with which different elements adhere to but also repel one another, as if each were choosing its own particular arrangement. Eduard speaks of chemistry and physics; the Captain, too, of how cohesiveness can be seen in liquids with their tendency to form into round shapes—falling drops of water or little balls of quicksilver or molten lead. At the same time, they all hear descriptions of human relations. Elements and persons: each compelled to spring into activity to form novel and unexpected constellations, a lively movement that disturbs each along the way and of which the ending can’t be predicted in advance.”
>
> —Lydia Goehr, *Elective Affinities: Musical Essays on the History of Aesthetic Theory* (2008) [3]

Project | overview

A current main project of *Hmolpedia* is the undertaking of the 2012-launched online, slated 2013-book publication, *Elective Affinities: Illustrated, Annotated, and Decoded*, shown adjacent, the first full book (*Elective Affinities*, 1809) to be embedded and hyperlinked into the body and structure of *Hmolpedia*, consisting in structure of about 40+ individual wiki pages, listed above. The main objective of the newly-launched project is to: (a) collect all known nineteenth-century illustrations of German polymath Johann Goethe’s self-defined “best book” , albeit critically-defined most “dangerous” book, yet thinker-defined revolution-containing (see: Goethean revolution) book; to (b) annotate the two-centuries of critical review and commentary on the content of the monumental novella, and to (c) decode the “hidden secrets” Goethe claimed to have embedded in the book in multiple layers of gestalt, most importantly to extract the three-dozen plus Bergman reactions Goethe is said to have used to construct the various chapters of the novella, and lastly to give a modern human chemical thermodynamics upgrade to the entire affinity chemistry (1718-1881) theoretical backbone of the novel, a "principle" (e.g. moral symbols) that Goethe famously said was “true”, using the various versions of Goethe-Helmholtz equation (1882) as a starting point. Those new to hmolscience are encouraged to read the newly deciphered, decoded, and human chemical reaction explicated online version of Goethe’s greatest publication, chapter-by-chapter, a work that Goethe famous said must be read “three times” for proper understanding. New project contributors are welcome to join—especially Goethean scholars, chemical thermodynamicists and or physical chemists, and those proficient in the subtleties of German-to-English translation (e.g. see Goethe's “advertisement”); see also: Goethe timeline, Goethe's affinity table, and Goethean human chemistry. Special thanks to those who have contributed, in various ways, to the project thus far, including: Takaoki Matsui, Stanley Corngold, and Jeff Tuhtan.

Notes | Annotations

In the online chapter pages, the shorthand "HB:##", as in “a *circa* 1863 rendition of Eduard (HB:230) by Friederick Pecht and Arthur von Ramberg” (Part One: Chapter One), means that the reference or illustration is found in the Hjalmar Boyesen (HB) 1885 translation (volume five), on the page number indicated.

Cover depictions

The following explains the various portions of the cover design, as well-representative of the main thematic contents of the novella:

Cupid **Prometheus** **Doves**

Doves, the symbol of life and death; the etymology of which traces to

Cupid, in the form of a putto, and his bow and arrow of love, with which a shot from, via the actions of its chemically-dipped arrow head, causes a person to fall in love; the nature of love, passion, and the rules and repercussions of desire is the central motif of the novella.

Prometheus, in the form of a putto, and his fire of life, that he stole of the heavens to give humans life; Shakespeare, whom Goethe started reading at age 17 (see: timeline), famous commented, in his 1603 *Othello, the Moor of Venice*, in riddled form: “I know not where is that Promethean heat, that can thy life relum”; the term here is extrapolated to the nature of the heats of passion, and the life and death of relationships.

the the three doves that Noah released from ark, the non-return of the third of which, after 120-days of flood, meant that land had arose, after which the sun began to shine; which, in turn, is a retelling of the myth of Ra the sun-god being "born" out of the Nun (land mound) following the 120-day annual Nile flood.

Reactions

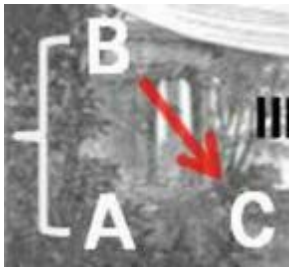

William Cullen (1757): “the **dart** → between them expresses the *elective attraction*; when I put a dart with the tail to one substance and the point to another, I mean that the substance to which the tail is directed unites with the one to which the point is directed more strongly than it does with the one united to it in the

Equations

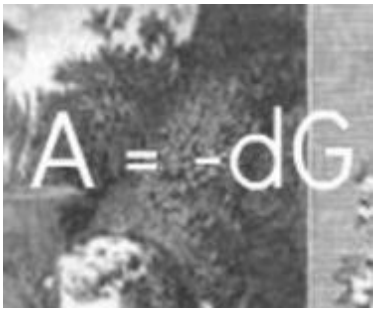

After 1885, following Hermann Helmholtz's "On the Thermodynamics of Chemical Processes", affinities, symbol A, of reactions were found to be measured by the negative of the change in the Gibbs free energy, symbol dG, of the boundaried system; which in the novella translates as the boundary of the estate—whereby the “free energy” or available energy, is that created or absorbed or put to work during the interactions and collisions of the characters (reactants), per each chapter (reaction) of the story.

crotchet {."

Annotation

The gist of the "annotation" portion will be to footnote in after-publication historical commentary, critique, discussion, debate and or commentary reaction to Goethe's "most dangerous" publication, as there is a lengthy two-centuries long ongoing debate on the content and meaning of this great novella.

Location

There is some commentary that not only are the tombs of Goethe and Schiller, as well as their archives, located in Weimar, Germany, but also that *Elective Affinities* is set around the city of Weimar (check). [5]

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Research

● Paternal Admonition (1655) – WGA.hu.

External links

● Elective Affinities (German Literature) – Google Sites.
● Project Muse (free pdfs of past Goethe Yearbook editions)
● Dual pair of Goethe (German → English) – Typen-und-mehr.com.

In chemistry, **elective affinity**, a variant of "affinity", was a term used, especially in the 18th century, to define a tendency of a chemical species to "elect" to unit with one chemical entity in preference to that of another. [1] The modern variation is "chemical affinity". In social psychology, elective affinity is defined as a force of mutual attraction involving the structure and contents of belief systems and the motives of their adherents and is argued to exist between epistemic motives to reduce uncertainty and political conservatism. [11]

Of Elective Affinity.

An important law of affinity, which is the basis of almost all chemical theory, is, that one body has not the same force of affinity towards a number of others, but attracts them unequally. Thus A will combine with B in preference to C, even when these two bodies are presented to it under equally favourable circumstances. Or, when A is united with C, the application of B will detach A from C, and we shall have a new compound consisting of A and B, C being set at liberty.

Opening section of English physician-chemist William Henry's 1818 twelve-page chapter section *Of Elective Affinity*, a textbook overview of **elective affinity**. [12]

Overview

In circa 1250, German philosopher Albertus Magnus introduced the term *affinitas*, in the sense of chemical relation, to qualify the combinations of bodies. [2] Magnus use the term affinity, for instance, to define the cause of combination of sulfur with silver and other metals. Magnus employed phrases such as 'sulphur destroys the metals because of its natural affinity to them'. [3] In his *Book of the Marvels of the World*, Magnus outlined four principles related to affinity. The first principle of affinity is that likes attract to likes, meaning that an attraction between things with similar qualities or virtues exists, stated in general terms, referring to the Aristotelian elements: earth, air, fire, and water. The second affinity principle is that all things have prime, or first, qualities, but can acquire second or third qualities by association. The third affinity principle is that qualities may be innate to a whole species or to individual things. The fourth affinity principle is antagonism where just as all things attract related things with like qualities, they also 'repel' things with opposite qualities. [4] Magnus' affinity theories and works were frequently reprinted well into the 16th century.

In 1620, English scientific philosopher Francis Bacon developed theories on chemical affinity to explain the inherent nature of motion and its causes. Bacon reasoned that 'dispute and friendship are the spurs to motion in nature, and the keys to her works.' [5] Bacon defined chemical affinity as such: [6]

> "It is certain that all bodies whatsoever, though they have no sense, yet they have perception; for when one body is applied to another, there is a kind of **election** to embrace that which is agreeable, and to exclude or expel that which is ingrate; and whether the body be alterant or altered, evermore perception precedeth operation; for else all bodies would be like one to another."

This logic, naturally, evolved into a conception of elective attraction or *elective affinity*, defined as 'a favorable inclination to one more than to another' or a process in which 'a substance tends to combine with certain substances in preference to others.' [7]

In 1718, during a translation into French of a later edition of Newton's *Opticks*, French physician and chemist Étienne Geoffroy made the world's first affinity table, containing 16-columns and 9-rows of chemical species, titled *Tableau des différentes Rapports Observées entre Différentes Substances* (Table of the Different Relations Observed between Different Substances), using data from Query 31 of the *Opticks*. [8] Soon other chemist started expanding on Geoffroy's table by adding more species.

In 1775, Swedish chemist Torbern Bergman, in his *A Dissertation on Elective Attractions*, published a large fold-out affinity table, containing 55-rows and 50-columns of chemical species. [9]

In 1785 to 1795, German polyintellect Johann von Goethe began to absorb the affinity reaction theory logic of Bergman; with which he used in the theoretical development and writing of his scientific novella *Elective Affinities* (1809), the world's first scientific treatise on the origin of love and the founding book of human chemistry. [10]

See also

â— Elective Affinities (novella)
â— Elective Affinities (1933 painting)
â— Elective Affinities (1996 film)

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12. Henry, William. (1818). *The Elements of Experimental Chemistry* (section IV: Of Elective Affinity, pgs. 38-50). Joy.

θΔics

In science, **electrical energy** is energy associated with the flow of charge, e.g. an electron or ion, in a conductor, such as copper or an axon.

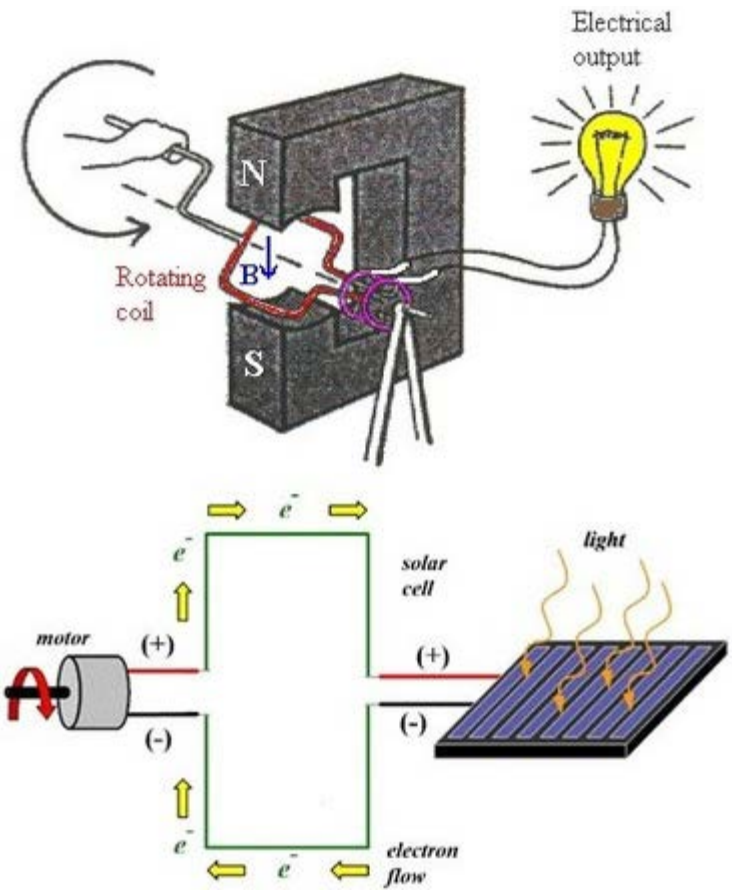

Two depictions of **electrical energy**: the top diagram showing mechanical work being converted into light via electromagnetic induction; the bottom diagram shows sun light being converted into the rotative movement of an electric motor.

History

In circa 580BC, Greek thinker Thales, noted that when amber was rubbed, straw attracted to it, and therein made the first type of observations on the properties of electricity.

In circa 1670, German engineer Otto Guericke and built his electrostatic generator (c.1670).

In 1744, the Leyden jar, a type of charge storage device, was invented in Leiden.

In 1776, Italian physician Luigi Galvani discovered the ability of circuit-induced dead twitching frog legs by led to the hypothesis of "animal electricity" to explain this phenomenon, a theory which led to the invention of the batter or voltaic pile by Italian physicist Alessandro Volta in 1800. [2]

In 1802, Humphry Davy passed the current of an extremely powerful battery through a thin strip of platinum, heating the filament enough to make incandescent light, wherein electrical energy was transformed into heat by passing an electric current though a resistance. [1]

In the 1840s, experimental mechanical equivalent of heat measurement of electrical energy was done by English scientist James Joule.

See also

â— Electricity

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External links

â— Electrical energy – theFreeDictionary.com.

θΔics

In engineering, **electrical engineering** is art of construction, design, and building of devices and machines tending to involve the flow of electric current through conductors, as in motors and generators, based on mathematical and scientific principles. [1]

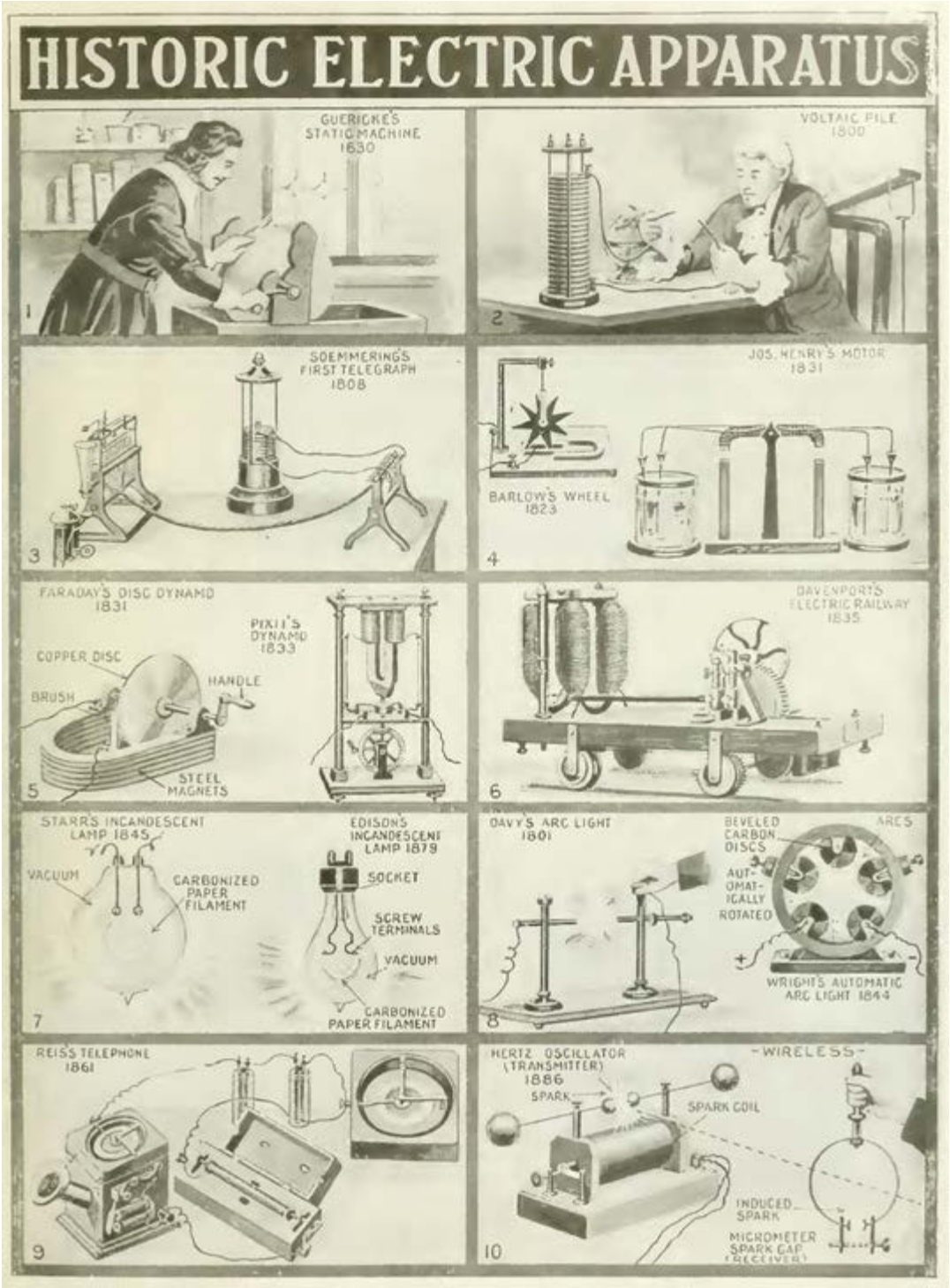

A short visual history of the invention of electronic devices in the field of **electrical engineering**. [2]

History

In 1600, English chemist-physicist and physician William Gilbert—sometimes called the "father of magnetic philosophy"—published his *De Magnete*, the earliest known work treating both magnetism and electricity, was the first to use the New Latin term *electricus* to mean "like amber in it is attractive properties", from the Greek word for amber, Î®λεκτρον (*Ä"lektron*). Based on Gilbert's usage, in 1646 term 'electricity' was introduced by Thomas Browne.

In 1630, German inventor Otto Guericke built a static machine generator.

In 1774, Swiss mathematical physicist Georges Le Sage invented the first electric telegraph consisting of 24 wires, each suitably spaced and insulated by means of glass partitions at frequent intervals, placed in a trough in the ground, according to which each wire represented a certain letter of the alphabet.

In 1776, Luigi Galvani made severed frog legs twitch via electric flow created via a dissimilar metal junction arch, after which he argued for an "animal electricity" theory to explain this phenomenon.

In 1800, Italian physicist Alessandro Volta, in aims to disprove Galvani's animal electricity theory, invented the battery otherwise known as the voltaic pile.

(add)

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External links

â— Electrical engineering – Wikipedia.

θΔics

In science, **electricity** is any effect resulting from the existence of stationary or moving electric charges, typically either (negative) electrons or (positive) protons. [1]

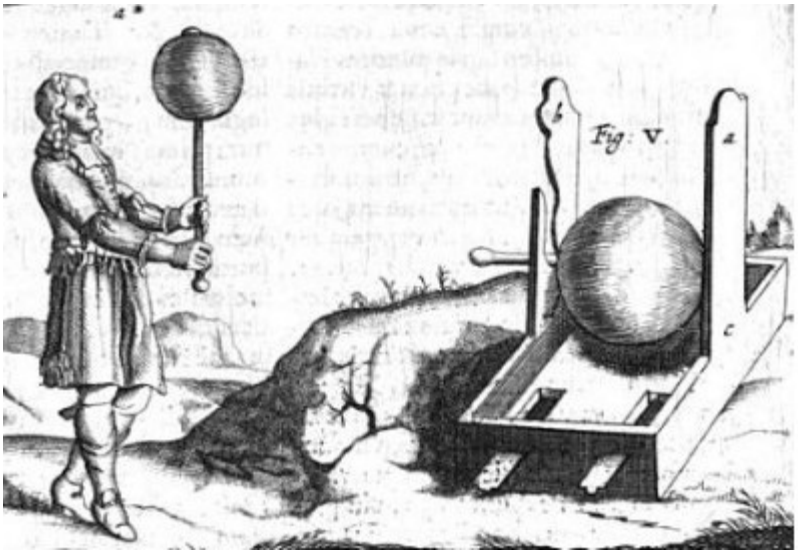

A depiction of William Gilbert's 1663 "electric machine", a type of electrostatic generator, made of metallic sulfur globe, that, when spun, produced a charge, or something along these lines.

Etymology

In 1550, Gerolamo Cardano, in his *On the Subtlety of Things*, was the first, supposedly, to differentiate between the attraction of amber and the attraction of lodestone. [9] The following is how he viewed attraction in amber:

> "Amber has a fatty and glutinous humor which, being emitted, the dry object desiring to absorb it is moved toward the source, that is the amber. For every dry thing, as soon as it begins to absorb moisture, is moved toward the moist source, like fire to its pasture; and since the amber is strongly rubbed, it draws the more because of its heat."
>
> — Gerolamo Cardano (1550), *On the Subtlety of Things* (Volume 5) [7]

In 1600, William Gilbert, in his *On Magnets*, employed Cardano's "fatty and glutinous humor" theory the basis or origin of his *ab humore effluvia* or "electric effluvia". [7] Gilbert Latin word "electrum", based on the Greek name "elektron" for amber, and for substances that behaved like amber he coined the term "electrica" which translates as electrics. [6]

In 1629, Niccolo Cabeo, in his *Magnetic Philosophy*, a book that attempted to refute the theories of William Gilbert (1600), from the Aristotelian view, made an important observation of electrical repulsion, reporting his observations that an electrically charged body can attract non-electrified objects, also that two charged objects repelled each other. [6]

In 1646, Thomas Browne, in his 1646 *Pseudodoxia Epidemica*, became the first English author to use the term "electricity". [2]

In 1663, Otto Guericke, in an effort to disprove William Gilbert's magnetic earth theory of gravity, invented the first electrostatic generator, a type of metallic globe or sulfur globe, that could be spun to produce charge. [8]

In 1675, Robert Boyle, in his "Mechanical Production of Electricity", was freely using the term in respect, supposedly, to the earlier experimental demonstrations of electricity done by William Gilbert. (Q)

In 1705, Francis Hauksbee, inspired by Jean Picard (Q), who discovered that if he shook a mercury-containing barometer, it would produce a glow (Q), placed mercury inside of a Guericke generator, which he built, shown below, which he then evacuated, with a vacuum pump, to make a mild vacuum inside, then rubbed the glass ball to build up a charge, and observed that a glow was visible when he placed his hand on the outside of the globe.

In 1729, Stephen Gray built an elongated Hauksbee generator, 3-feet long by 1.2-inch in diameter, and found that cork stuck in the end would alternately attract and repel a feather; after which he then began to test to see if he could conduct electricity through various things, such a silk cords. In later experiments with Granville Wheler, he was able to conduct electricity through up to many hundreds of feet.

Human chemistry

In human chemical terms, writers often use the metaphor of a feeling of "electricity" between people, particularly when

falling in love, or in reference to a state of excitement. [3] In music chemistry, for instance, the chorus to the popular 2007 song “Chemistry”, by Swedish pop-singer *Velvet*, is:

> I feel the chemistry
> Between you and me
> There's **electricity**
> when you're touching me
> I feel the chemistry
> feel the biogravity
> I want you touching me
> I feel you touching me

In positive psychology, the state of absorbed mental involvement called “flow”, for instance, was conceived in the 1970s by Croatian-born American psychologist Mihály Csíkszentmihályi and named as such due interviews of 173 subjects where people often described their 'flow' experiences using the metaphor of a current carrying them along. [4]

The metaphor of electricity between reacting human molecules is a difficult subject but may possibly be interpreted according to heightened or optimal states of neuro-electricity/neurotransmitter flow, thus instilling the sense of being alive. [5]

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Further reading

● Priestley, Joseph. (1767). *The History and Present State of Electricity, with Original Experiments*. Publisher.

External links

● Electricity – Wikipedia.

θΔics

In thermodynamics, **electrochemical thermodynamics** is the study of the thermodynamics of electrochemistry, of electrochemical systems, or electrochemical processes.

Further reading

● Kelly, R.G. (2003). (ch. 2: Electrochemical Thermodynamics and Kinetics of Relevance, pgs. 9-). CRC Press.
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θΔics

In forces, the **electromagnetic force** is a force that consists of an electric field oriented perpendicular to a magnetic field, that can be emitted or absorbed from certain types of fermions, such as a moving electron or a proton, which is described as being comprised of spin 1 field particles called photons, that are “on mass-shell” when in the form of light or “off mass-shell” when in the form of static fields, such as in the form of the electric field around the proton in a hydrogen atom. [1]

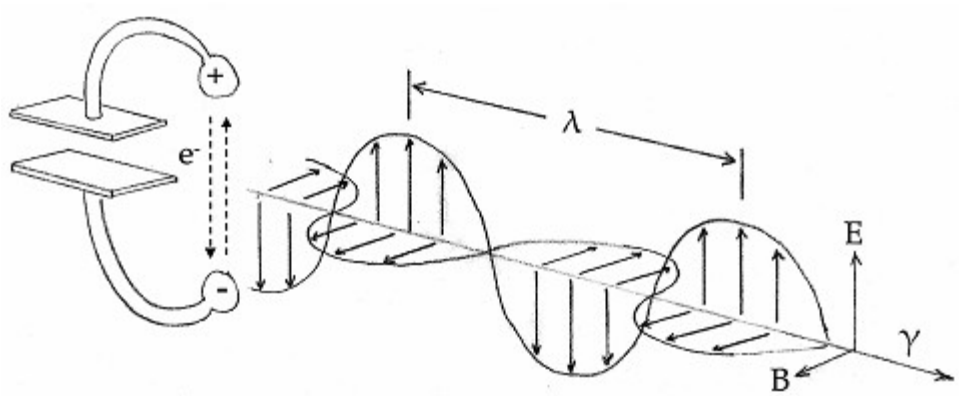

Depiction of the **electromagnetic force** (or electromagnetic wave), created by the movement of an electron e^- between a oppositely charged poles of conducting plates, showing an electric field E moving or oscillating perpendicular to a magnetic field B, with a characteristic wavelength of λ (lambda), described as being comprised of photons, symbol γ (gamma), "on mass-shell". [2]

Overview

In 1861, James Maxwell formulated the equations that defined the nature of the electromagnetic force, the original form of which contained 20 variables.

In 1873, Maxwell gave the following diagram of the spatial relationship between electromagnetic fields ‘at a given instant’ along a ray of ‘plane-polarized light’. [6]

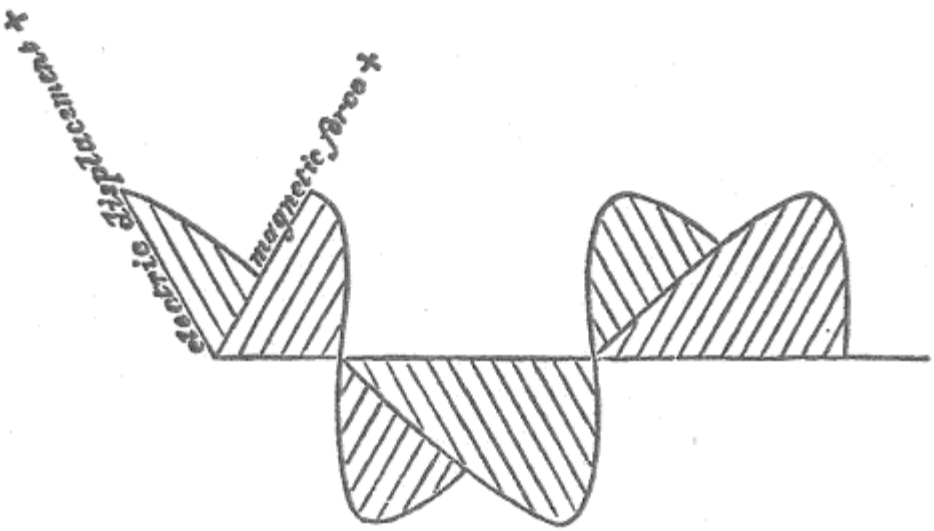

Later, Maxwell's 20 equations were reduced by Oliver Heaviside into a more reduced set of four equations and seven variables; the first two of which, building on the work of Carl Gauss, are shown below: [3]

$$\nabla \cdot \mathbf{D} = \rho$$

$$\nabla \cdot \mathbf{B} = 0$$

The third equation, building on the work of Michael Faraday, is as follows:

$$\nabla \times E = -\frac{\partial B}{\partial t}$$

The four so-called Maxwell equation, building on the work of Andre Ampere, is as follows:

$$\nabla \times \mathbf{H} = \frac{\partial \mathbf{D}}{\partial t} + \mathbf{J}$$

(add discussion)

Social force | Interactions

Historically, very little work has been done in attempts to say what the electromagnetic force has to say about the so-called "forces" that work in the operation of social interactions, such as have been labeled variously as "social forces" (Auguste Comte, 1854), economic forces, the forces of love and hate (Empedocles, 450BC), etc.

In circa 1950, German philosopher Ernst Junger (1895-1998), according to Helmut Lethen (1994), promulgated some type of "electromagnetic force fields" social theory, based on an electric circuit model of social analysis, admixture with iron filing movement theory; the following being an example Junger quote: [5]

> "The arrangement of atoms thus takes on the sort of nonambiguity that prevails in the electromagnetic force field."

People or users in an administrative state, according to Junger, get connected and integrated via current into an "energy association", according to which the individual automatically becomes an "organic construction".

In 1993, Canadian political scientist Paris Arnopoulos, in his *Sociophysics*, was grappling with this issue as follows: [4]

> "All entities, whether fermions or humans, need some mediating agency to interconnect them into systems. This indispensable interrelating and interacting role is ultimately played by different field particles named bosons. Unlike fermions, which are characterized by a significant mass and charge, bosons do not take partake of these to attributes. Rather, they only have spins and provide connections as they are exchanged among fermions. Such exchanges are of three kinds: weak or strong nuclear, electromagnetic, and gravitational. The first exist by sharing gluons and thus hold together the atomic nucleus. The second take place by exchanging photons and thus explain most of our ordinary phenomena. The third operate by the displacement of gravitons and thus provide the overall attraction between everything in the universe. Similar phenomena occur up the ontological ladder to describe social, as well as atomic and galactic bonding. Societies, like all systems, are held together by certain ties of varying strength and extent."

In 2007, American electrochemical engineer Libb Thims, independent of Arnopoulos, in his *Human Chemistry*, was outlining a similar formulation of the same, in regards to the exchange force nature of human bonding and human dynamics. [2]

References

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External links

â— Electromagnetism – Wikipedia.

θΔics

In science, **electron**, symbol e^-, is a lepton, one of the four types of fermions (quarks, leptons, antiquarks, and antileptons), with a rest mass of 9.11E-31 kg (0.511 MeV), an electric charge of -1.60E-19 coulombs, a spin of ½, is considered an elementary particle, and characterized as obeying Fermi-Dirac statistics. [1]

Etymology

The concept of electricity being divided up atomically into particles or quantities was introduced in 1874 by Irish physicist James Stoney, in his paper "On the Physical Units of Nature", wherein, based on earlier charge distribution theory of Swedish chemist Jacob Berzelius, he postulated that the exchange of a certain "quantity of electricity" between atoms and molecules is what accounts for the chemical bond:

> "For each chemical bond which is ruptured within an electrolyte a certain quantity of electricity traverses the electrolyte which is the same in all cases."

Later, in 1891, Stoney assigned the name "electron", based on the Greek word for amber, for the fundamental unit of negative electricity. [3]

Other

In circa 1963, Chinese-born English biophysicist (chnops-physicist) Mae-Wan Ho became intrigued by Hungarian physiologist Albert Szent Gyorgyi's idea that life is interposed between two energy levels of the electron, after which she spent the three decades searching for this idea, resulting in her 1993 book *The Rainbow and the Worm: the Physics of Organisms*. [2]

Quotes

The following are related quotes:

> "Perhaps our genius for unity will some time produce a science so broad as to include the behavior of a group of **electrons** and the behavior of a university faculty, but such a possibility seems now so remote that I for one would hesitate to guess whether this wonderful science would be more like mechanics or like a psychology."
>
> — Gilbert Lewis (1925), *Anatomy of Science*

References

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3. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 216). Morrisville, NC: LuLu.

External links

- Electron – Wikipedia.

θΔics

In chemistry, an **element** is an atom or pure chemical substance characterized by an atomic number Z, the number of protons its nucleus, numbering from 1 to 118, of which 92 are naturally occurring elements, at earth-bound conditions. [1]

Depiction of Greek philosopher Empedocles' 450BC "standard model" of physics, in which the universe consisting of four elements (earth, air, water, and fire), depicted above, and two forces (attraction and repulsion).

The big five elements that comprise 98 percent of the structural mass of a human are: oxygen O (61%), the central component of blood, carbon C (23%) and hydrogen H (10%), the central components of the brain, nitrogen N (2.6%), the central component of protein, and calcium Ca (1.4%), the central component of bone.

Earth

Vernadsky was one of the first to note that the elements of the periodic table do not distribute themselves uniformly, stating for instance that elements with even atomic numbers predominate in the earth's crust. [4]

Human mass composition tables

Mass composition tables for biological entities are difficult to come by. In 1899, English physiologist John Thornton stated that there were 72 elements known in chemistry and that 14 of these enter into the composition of the human body: oxygen, carbon, hydrogen, nitrogen, sulphur, phosphorus, chlorine, sodium, potassium, calcium, magnesium, iron, fluorine, and silicon; and noted that other elements, such as manganese and lead (anti-element: poison), have sometimes been found in small quantities. [7]

In 1968, American biochemist Harold Morowitz, in his *Energy Flow in Biology*, is said to have given a table that compares the element contents of twenty-three elements, namely C, H, N, O, P, S, Ca, Na, K, Mg, Cl, Fe, Si, Zn, Rb, Cu, Br, Sn, Mn, I, Al, and Pb, of man, alfalfa, copepod, and bacteria. [5]

One of the best books to given element counts in humans is English chemist John Emsley's 2001 *Nature's Building Blocks: an A-Z Guide to the Elements*, a book which functioned as one of the principle sources in the calculation of the formula for one human molecule by American chemical engineer Libb Thims, between 2002 and 2007. [6]

The following is a 2009 depiction of the "essential" elements in the human body, according to the University of Waikato: [3]

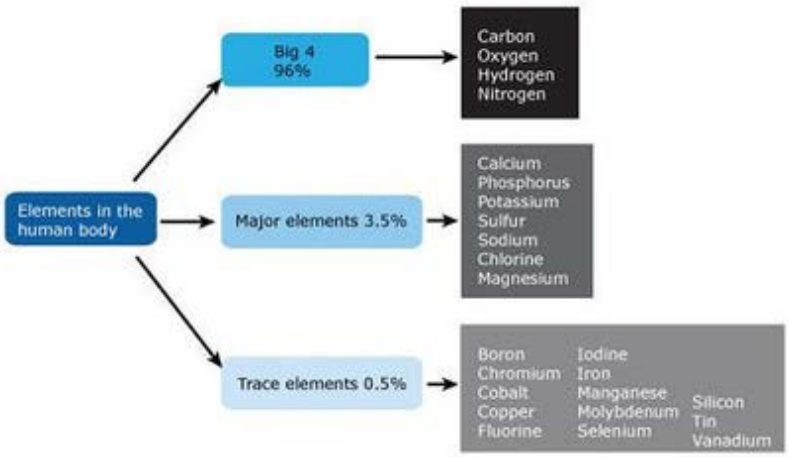

which lists 25 elements.

Human molecule

The following table lists the 26 functional elements that comprise one human molecule, according to the 2002 calculation of American chemical engineer Libb Thims. The less-accurate 22-element and 12-element empirical human molecular formulas for one human molecule by American limnologists James Elser and Robert Sterner (2000) and New Scientist

(2005), respectively, are shown below for comparison. [2]

$$H_{375,000,000}O_{132,000,000}C_{85,700,000}N_{6,430,000}Ca_{1,500,000}P_{1,020,000}S_{206,000}Na_{183,000}K_{177,000}Cl_{127,000}Mg_{40,000}Si_{38,600}Fe_{2,680}Zn_{2,110}Cu_{76}I_{14}Mn_{13}F_{13}Cr_{7}Se_{4}Mo_{3}Co_{1}$$ (Sterner and Elser, 2000)

$$H_{2.5E9}O_{9.7E8}C_{4.9E8}N_{4.7E7}P_{9.0E6}Ca_{8.9E6}K_{2.0E6}Na_{1.9E6}S_{1.6E6}Cl_{1.3E6}Mg_{3.0E5}Fe_{5.5E4}F_{5.4E4}Zn_{1.2E4}Si_{9.1E3}Cu_{1.2E3}B_{7.1E2}Cr_{98}Mn_{93}Ni_{87}Se_{65}Sn_{64}I_{60}Mo_{19}Co_{17}V$$ (Thims, 2002)

$$H_{15,750}N_{310}O_{6,500}C_{2,250}Ca_{63}P_{48}K_{15}S_{15}Na_{10}Cl_{6}Mg_{3}Fe_{1}$$ (New Scientist, 2005)

The four functional elements missing from Sterner and Elser's formula, i.e. Tin (Sn), Selenium (Se), Nickel (Ni), and Vanadium (V), as determined by Thims, are shown in bold below, listed adjacent to their known function:

#	Name	Symbol	CPK (jmol)	% Mass	Picture	Z	Function
1	Oxygen	O		61		8	Roughly 60% of the body is H_2O, which is essential for almost all chemical reactions within the body.
2	Carbon	C		23		6	Is a major elemental component of carbohydrates and fats.
3	Hydrogen	H		10		1	Is a major elemental component of proteins, carbohydrates, and fats.
4	Nitrogen	N		2.6		7	Is a major elemental component of proteins (comprised of N, H, C, and O).
							Used in the development and maintenance of bone

5	Calcium	Ca		1.4		20	structure and development. Functions in the clotting process, nerve transmission, muscle stimulation, parathyroid hormone function, and metabolism of vitamin D, etc.
6	Phosphorus	P		1.1		15	Plays a part in almost every chemical reaction within the body because it is present in every cell. Forms calcium phosphate with calcium in the bones and teeth in a 2-1 ratio. Is important in the utilization of carbohydrates, fats, and proteins for growth, maintenance, and repair, etc.
7	Potassium	K		0.3		19	Functions mainly in the intercellular fluid as the primary ion force. Potassium together with sodium helps regulate the water balance within the body. Potassium regulates the transfer of nutrients to the cell, transmits electrochemical impulses, and is necessary for normal growth enzymatic reactions, etc.
8	Sulfur	S		0.2		16	Keeps hair glossy and smooth and keeps the complexion clear and youthful. Sulfur is an important elemental constituent of thiamin, biotin, methionine, cystine, and cysteine. It disinfects the blood, resists bacteria, and stimulates bile production in the liver, etc.
9	Chlorine	Cl		0.18		17	Helps regulate acid alkali balance, stimulates production of hydrochloric acid, stimulates the liver to function as a filter for wastes, aids in keeping joints and tendons in youthful shape, and helps distribute hormones, etc.
10	Sodium	Na		0.17		11	Is found in every cell in the body. Sodium functions with potassium to equalize the acid-alkali factor in the blood. Along with potassium, it helps regulate water balance within the body. Sodium keeps blood minerals soluble, so they will not build up as deposits in the bloodstream, etc.
11	Magnesium	Mg		0.029		12	70% of the bodies magnesium supply is located in the bones together with calcium and phosphorus, while 30% is found in cellular fluids and some soft tissue. Is involved with energy production of glucose, protein and nucleic acid synthesis, the formation of urea, vascular tone, muscle impulse transmission, electrical stability of the cells, and neurotransmission, etc.

The major function of iron is to combine with protein and copper in making hemoglobin. Iron

12	Iron	Fe		0.012		26	builds up the quality of the blood and increases resistance to stress, the immune system, energy production, growth in children, and resistance to disease.
13	Fluorine	F		0.004		9	Research indicates that fluorine increases the deposition of calcium, thereby strengthening the bones. Helps reduce the formation of acid in the mouth caused by carbohydrates, thereby reducing the likelihood of tooth decay.
14	Zinc	Zn		0.003		30	Helps fight disease, protect the immune system, involved in the Krebs cycle, has been found to increase the male sex drive, is a constituent of more that 2,000 enzymes involved in digestion and metabolism, etc.
15	Silicon	Si		0.001		14	Is needed for the connective tissues of the body such as the tendons, cartilage, blood vessels, nails, skin, and hair, and is essential for their integrity. Silicon works with calcium to make strong bones, proper levels are essential during growth periods, and it is helpful in the prevention of cardiovascular disease, etc.
16	Copper	Cu		0.0003		29	Involved in the synthesis of hemoglobin, collagen, and the neurotransmitter noradrenalin. Is an important blood antioxidant, prevents the rancidity of polyunsaturated fatty acids, and helps cell membranes remain healthy.
17	Iodine	I		0.00003		53	Aids in the development and functioning of the thyroid gland, and is an integral part of thyroxine. Iodine plays an important role in regulating cellular oxidation, promotes growth and development, and stimulates the basal metabolic rate—helping the body burn excess fat.
18	Tin	Sn		0.00003		50	Deficiency results in poor growth and diminished hemoglobin synthesis.
19	Boron	B		0.00003		5	A trace mineral essential for healthy bones.

20	Selenium	Se		0.00002		34	Is a natural antioxidant that protects against free radicals and appears to preserve elasticity of tissue that become less elastic with aging. Is necessary for the production of prostaglandins, and pancreatic function depends upon selenium, etc.
21	Chromium	Cr		0.00002	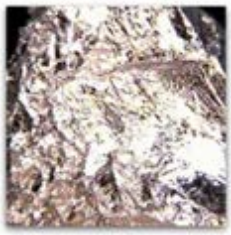	24	Stimulates the activity of enzymes involved in the metabolism of glucose for energy and the synthesis of fatty acids and cholesterol. It appears to increase the effectiveness of insulin and its ability to handle glucose, preventing hypoglycemia or diabetes. The mineral may also be involved in the synthesis of protein through its binding action with RNA molecules.
22	Manganese	Mn		0.0002		25	Functions as an important antioxidant in the prevention of toxic oxygen forms. It plays a role in activating numerous enzymes that are necessary for utilization of choline, biotin, thiamine, and ascorbic acid. Is a catalyst in the synthesis of fatty acids, cholesterol, and mucopolysaccharides, etc.
23	Nickel	Ni		0.0002		28	May be a factor in hormone, lipid, and membrane metabolism and cell integrity. Significant amounts are found in DNA and RNA. May be involved in glucose metabolism, etc.
24	Molybdenum	Mo		0.000007		42	Is an essential part of two enzymes: xanthine oxidase—which aids in the mobilization of iron from the liver reserves and helps change iron from ferrous to ferric, and aldehyde oxidase—which is necessary for the oxidation of fats. It is also a factor in copper metabolism, nitrogen metabolism, and the final stages of urine production, ect.
25	Cobalt	Co		0.000004		27	Necessary for the normal functioning and maintenance of red blood cells as well as all other body cells; and is a constituent of vitamin B12.
							Has been shown to reverse diabetes. Inhibits cholesterol synthesis. Bones, cartilage, and teeth

26	Vanadium	V		0.0000002		23	require it for proper development. It has been shown to have a function in cellular metabolism, iron metabolism, and red blood cell growth, etc.

(add discussion)

Quotes

The following are related quotes:

> "When you look at the ingredients of the universe (Ñº), the number one ingredient is hydrogen. Next is helium. Next is oxygen. Then nitrogen. Then, when you look at earth, because we like to think of ourselves as 'special', the number one element in the human body (Ñº): hydrogen [No: #3], matches the universe. Number two is oxygen [No: #1]. Matches the universe. Number three: carbon [No" #2]. Matches the universe. Number four: nitrogen [Correct]. Matches the universe. And for each of us, the fifth element – "other" [No] – is the same in both places."
>
> — Neil Tyson (c.2014), "Dialogue on Origin of Life" (1:14-2:35) (Ñº)

See also

â— Human element
â— Human chemical element
â— Chocolate (element) diagram
â— Lavoisier's list of the elements (1789)

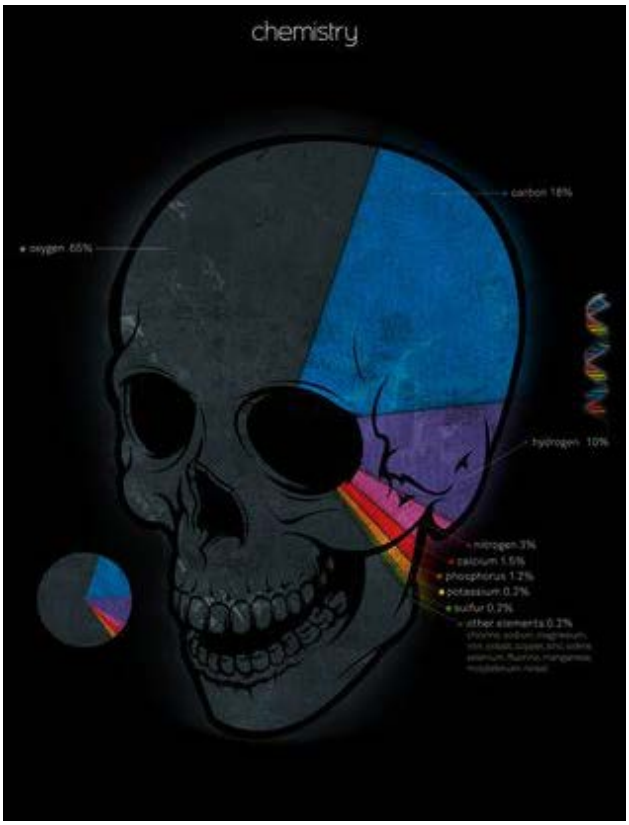

A 2012 "human chemistry" artwork: a pie chart style human element composition overlaid on a skull, by designer Mathieu Michaux. [9]

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External links

â— Chemical element – Wikipedia.

θΔics

In famous publications, ***Elements of Physical Biology*** is a 1925 highly-cited book, by Austrian-born American physical chemist Alfred Lotka, which was the first book to make an attempt at a rigorous application of the logic of thermodynamics, e.g. irreversibility, chemical equilibrium, transformations, etc., to the energy interactions and dynamics of animals and plants in whole ecosystems, rather than by studying them individually (or internally), concluding with chapters on the origins and energy relations of consciousness. The following is a representative quote: [1]

> "Evolution being a slow process, it takes a certain time, when equilibrium or near-equilibrium is disturbed, for a new equilibrium or near-equilibrium to become established."

This view, to note, is in stark contrast to the post-1970s idiom that evolution exists continuously in a far-from-equilibrium state of existence, as advocated by Belgian chemist Ilya Prigogine; a view that only recently has come to be questioned, in the mid 2000s.

Lotka's book is divided into four parts: general principles, kinetics, statics, and dynamics, the latter of which is devoted to thermodynamics. Lotka states that the outline of the book has appeared in various article publications beginning in 1907 and that, in origin, the first plan of the work was laid out in about 1902 during his student days in Leipzig. A precursor to Lotka's book is the earlier work of English biologist James Johnstone, particularly his 1921 *The Mechanism of Life in Relation to Modern Physical Theory*, which Lotka cites.

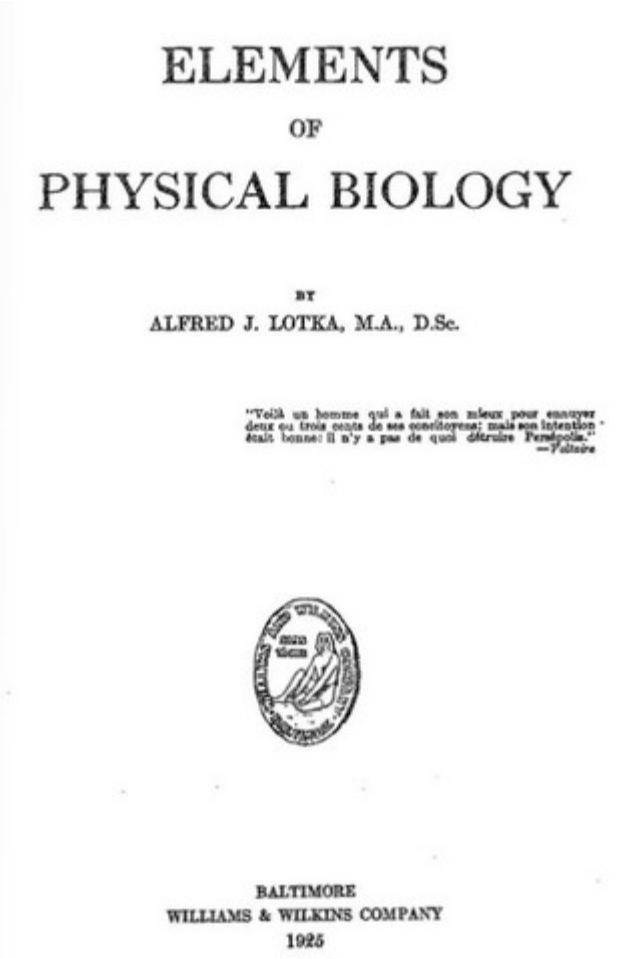
ELEMENTS

OF

PHYSICAL BIOLOGY

BY

ALFRED J. LOTKA, M.A., D.Sc.

"Voilà un homme qui a fait son mieux pour ennuyer deux ou trois cents de ses concitoyens; mais son intention était bonne: il n'y a pas de quoi détruire Persépolis."
—Voltaire

BALTIMORE
WILLIAMS & WILKINS COMPANY
1925

Title page to Alfred Lotka's 1925 book *Elements of Physical Biology*, the first book to apply thermodynamics to interspecies interactions.

Concepts developed in the book include defining biological entities as 'energy transformers' and the logic that visual inputs can act to produce a 'trigger action', such as when prey sights predator and flees, which amounts in the act of huge release of energy. [2]

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θΔics

In economic thermodynamics, **Elias Khalil** (1957-) is an American economist noted for several commentary publications on theorists, such as Julius Davidson and Nicholas Georgescu, to have employed thermodynamic logic in the economic theory.

In 2004, Khalil published his "The Three Laws of Thermodynamics and the Theory of Production", which he had reviewed by: Jeffrey Wicken, Reiner Kummel, Kozo Mayumi, among others, wherein he argues the following position: [1]

> "This paper concurs with experts on thermodynamics that Georgescu-Roegen has committed a major error. Georgescu-Roegen's notion of 'material entropy', which he christened as the 'fourth law of thermodynamics', is unfounded."

(add discussion)

Education

Khalil completed his BA in economics in 1979 at Ohio State University, and his MA in 1987 and PhD in 1990 both in economics at New School University, and currently is an economics professor at Monash University, Australia.

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External links

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● Elias Khalil (faculty) – Monash University.
● Khalil, Elias L. (1957-) – WorldCat Identities.
● Elias Khalil – LinkedIn.

θΔics

In hmolscience, **Elihu Herman Fein** (c.1916-c.1996) was an American physicist noted, in human thermodynamics, for his 1970 article “Demography and Thermodynamics”, wherein building on the earlier population potential work of John Q. Stewart and William Warntz, he outlines, what Daedalus refers to as, a "molecular sociology". [1]

Overview

In 1970, Fein, in his “Demography and Thermodynamics”, gave the following abstract: [2]

> “The use of physics for demographic analyses is not a form of alchemy. A brief reflection on the use of abstract structures to organize knowledge suggests a commonness to both social and physical science. Population distribution is examined using the structure of thermodynamics.”

Fein, on this abstract, earlier 1958 population potential work of John Q. Stewart and William Warntz, first derives a social ideal gas law, implicitly treating people as gas molecules; then on Warntz' suggestion that per capita income may be used as a measure of social activity, defines the total "social energy" of a demographic area as the per capita income multiplied by the population of the group.

Then, in final section "Demographic States as Points on an Adiabatic", attempts to do a first law and second law based derivation of society, defining entropy as the "molecular order of a system", i.e. the measure of social order, entropy change as resulting from the flow of wealth into our out of a system; concepts such as "social temperature", during which he attempts to assert that some demographic regions can be "economically cold" (as compared to "economically hot"), examples of which he seems to give as the southern states, as being economically colder.

In 1971, *New Scientist* published a review article on Fein, entitled “Molecular Sociology Arrives at Last”, in which he explains how social activity is analogous to molecular activity; uses concepts such as adiabatic and entropy in social systems; but cautions his readers, in that although his analogies seem to have validity, he emphatically states that “the conclusion is not that people act like molecules”, but that the goal is to understand ourselves and the world through abstract concepts. [3]

Difficulties on theory

(add)

Education

Fein completed his MS, with a thesis on “A Comparison of the Stopping Power of Lead, Aluminum, and Carbon for High Speed Mesotrons”, at the University of Chicago in 1946. [4] In 1970 was associated with the Northeast Utilities Service Company in Hartford, Connecticut.

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External links

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In existographies, **Elihu Palmer** (1764-1806) (FA:100) was an American Presbyterian minister turned deistic freethinking irreligionist, noted for []

Overview

In 1801, Palmer published *Principles of Nature: Development of the Moral Causes of Happiness and Misery among the Human Species*, wherein, in a manner similar to Thomas Paine's *Age of Reason* (1794), he attacked religion, e.g. he argued that the flawed teachings of Jesus were responsible for Christianity's sordid history, that he preferred "the correct, the elegant, the useful maxims of Confucius, Antoninus, Seneca, Price, and Volney". [1]

In 1802, Thomas Paine began to correspond to Palmer, dating his letters as follows: [2]

> "Paris, February 21st, 1802, since the fable of Christ"

This is one of the first attempts at a secular dating system, on record.

Quotes | Employed

The following are quotes employed by Palmer:

> "I'll not be made a soft and dull eyed fool, to shake the head, relent, and sigh, and yield to Christian intercessors."
>
> — William Shakespeare (c.1598), *The Merchant of Venice* (Act 3, Scene 3); cited by Elihu Palmer (1801) in *Principles of Nature* (title page)

> "Prove all things."
>
> — Anon (c.100AD), Bible, New Testament (1 Thessalonians 5:21); cited by Elihu Palmer (1801) in *Principles of Nature* (title page)

Quotes | By

The following are quotes by Palmer:

> "Reason, which is the glory of our nature, is destined eventually, in the progress of future ages, to overturn the empire of superstition."
>
> — Elihu Palmer (1801), *Principles of Nature: Development of the Moral Causes of Happiness and Misery among the Human Species* (Ñº)

> "Another important doctrine of the Christian religion, is the atonement supposed to have been made by the death and sufferings of the pretended Saviour of the world; and this is grounded upon principles as regardless of justice as the doctrine of original sin. It exhibits a spectacle truly distressing to the feelings of the benevolent mind, it calls innocence and virtue into a scene of suffering, and reputed guilt, in order to destroy the injurious effects of real vice. It pretends to free the world from the fatal effects of a primary apostacy, by the sacrifice of an innocent being. Evil has already been introduced into the world, and in order to remove it, a fresh accumulation of crimes becomes necessary. In plain terms, to destroy one evil, another must be committed."

— Elihu Palmer (1801), *Principles of Nature: Development of the Moral Causes of Happiness and Misery among the Human Species* [1]

References

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External links

â— Elihu Palmer – Wikipedia.
â— Principles of Nature – Wikipedia.

θΔics

In religio-mythology, **Elijah**, not to be confused with his understudy "Elisha", described as a hairy man who wore a garment of hair, is the Hebrew recension god-to-prophet rescript (see: 2 Kings 2:24), of the Egyptian god El Sah, i.e. "god Sah", the deity personification of the Orion constellation, later syncretized with the god Osiris (Sah-Osiris), admixtured with physical attributes of Set, e.g. hair-covered, or Set-Baal (see: supreme god timeline).

An artistic rendition of **Elijah** as a hair man; which is code for the fact that he was a rescript of a previous fur-covered human-like animal god, e.g. Set (or Set-Baal).

Elijah | Hairy

Elijah is described as "a hairy man that lived in solitude and wore camel skin for his clothes with a leather belt with a bag attached", said to have resided in Israel (see: Is-Ra-El) from about 874 to 847 BC, whose days, ministry, miracles in the Bible from 1 Kings 17 to 2 Kings 2. (Ñº)

The biblical prophet **Elijah**, was depicted, in other contexts, as a hairy giant, such as shown adjacent; just as others were too, namely: Mary Magdalene (Nephthys), John the Baptist, Enoch, Esau, king Nebuchadnezzar, and Enkidu [Gilgamesh], i.e. the Babylonian hero. (Ñº)

World end

In 1540, Georg Rheticus, in his *First Report*, on the heliocentric theory of Nicolaus Copernicus, stated the following: [1]

> "We look forward to the coming of our lord Jesus Christ when the center of the eccentric reaches the other boundary of mean value, for it was in that position at the creation of the world. This calculation dos not differ much from the saying of **Elijah**, who prophesied under divine inspiration that the world would endure only 6,000 years, during which time nearly two revolutions ore competed."

In 1541, Martin Luther, influenced by this astronomic statement [as conjectured by Jack Repcheck (2007), e.g. this passage was read by Philipp Melanchthon, Luther's close associate], prepared a chronology of the world in which he predicted the end of the earth after 6,000-years and cited the same prophesy by Elijah. [2]

In 1776, Edward Gibbon, in his *Decline and Fall of the Roman Empire*, stated the following: [3]

> "The ancient and popular doctrine of the Millennium was intimately connected with the second coming of Christ. As the works of the creation had been finished in six days, their duration in their present state, according to a tradition which was attributed to the prophet **Elijah**, was fixed to six thousand years. By the same analogy it was inferred that this long period of labor and contention, which was now almost elapsed, would be succeeded by a joyful Sabbath of a thousand years; and that Christ, with the triumphant band of the saints and the elect who had escaped death, or who had been miraculously revived, would reign upon earth till the time appointed for the last and general resurrection."

(add)

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External links

â— Elijah – Wikipedia.

θΔics

In philosophy, **eliminative materialism** is a type of materialism that denies the existence of specific types of folklore-based mental states or rather is a materialism philosophy that aims to "eliminate" or displace baseless common sense psychology conceptions.

Etymology

The term “eliminative materialism” was introduced in American philosopher James Cornman’s 1968 article “On the Elimination of ‘Sensations’ and Sensations”—written as a response to American philosopher Richard Rorty’s 1965 article “Mind-Body Identity, Privacy, and Categories”—the truncated abstract gist of which is as follows: [1]

> “It seems that science is advancing towards a state where physics will be not only the basic science upon which all other sciences are erected, but also the one science to which all other sciences are reducible. This is the view, then, that in the millennium physics will be sufficient for the purposes of explaining and predicting the behavior of everything including persons.”

This seems to be a statement of physical reductionism or in some sense one of the basic tenets of hmolscience.

Cornman, further on in his article, after introducing the term eliminative materialism, goes on, supposedly, to criticize the concept. [2] The response 1970 article “In Defense of Eliminative Materialism”, by Rorty, supposedly, is a convincing rebuttal to Cornman. [3]

History

American philosopher Paul Churchland is a noted advocate of the eliminative materialism position. In his 1981 “Eliminative Materialism and the Propositional Attitudes”, he stated that the traditional roadblocks to the so-called materialist program, namely emotions, qualia, and raw feelings, were beginning to dissolve as compared to previous decades, and went on to argue that neuroscience needs to be more substantially integrated into physical science. [5]

In short, folk psychology based concepts such as beliefs, feelings, and desires, according to according to Paul Churchland, are theoretical constructs without coherent definition, destined to be obviated by a thoroughly scientific understanding of human nature.

Canadian-born American philosopher Patricia Churchland's provocative 1986 *Neurophilosophy* is also said to advocate the eliminative materialism positions, suggesting that developments in neuroscience point to a bleak future for commonsense mental states. [6]

Criticisms

In the 2011 Juarrero-Deacon affair, American neurological anthropologist Terrence Deacon stated that the one thing that he and Cuban-born American philosopher Alicia Juarrero have in common is that they both “share a criticism of simple eliminative materialism.” [4]

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External links

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θΔics

In hmolscience, **Elizabeth Cameron** (1857/60-1944), or “Lizzie Sherman”, prior to her 1878 arranged marriage, to senator J. Donald Cameron, and “Elizabeth ‘Lizzie’ Sherman Cameron”, thereafter, was, supposedly, American physical humanities historian Henry Adams' side relationship love affair in whom, via some 100s of letters, written over the years 1883 to 1912, he confided in a number of telling things, e.g. "No one shall persuade me that I am not a phase" (1908), in respect to his physicochemical belief that he was some type of chemical "equilibrium" atomic arrangement, defined by the chemical thermodynamics of American engineer Willard Gibbs.

Overview | Pre Clover

In Jan 1881, Adams met Cameron for the first time in the drawing room of the house of John Hay can Clara Hay. [1]

On 19 May 1883, when Cameron and her husband departed for Europe, Adams initiated a correspondence with Cameron, expressing unhappiness with her departure and his longing for her return.

On 7 Dec 1884, *exactly* one year before the suicide of Clover Adams, Henry Adams' wife, Adams wrote to Cameron:

> “I shall dedicate my next poem to you. I shall have you carved over the arch of my stone doorway. I shall publish your volume of extracts with your portrait on the title page. None of these methods can fully express the extent to which I am yours.”

On 12 Apr 1885, Adams, while on an extended work stay-over in Washington, wrote Clover the following:

> “Social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life.”

It would seem, here, to be the case, speculatively speaking, that the three human molecules Adams had in mind in this statement, subsequently, would have been himself, his side love affair Elizabeth Cameron, and his wife Clover Adams.

On 4 Dec 1885, two days before her suicide by cyanide (Dec 6 or 7), Clover Adams, visited Elizabeth Cameron, who was then three-months pregnant. [1]

(add discussion)

Overview | Post Clover

On 15 Sep 1908, Adams, at the age (reaction extent) of 70, wrote Cameron about his Jul 1908 mental paralysis incident, confiding in her that he might have two more years left before his mind goes: [3]

> “If I can get two more years, without a breakdown, I shall do well enough, but I doubt it. The margin is wide.”

On 29 Sep 1908, Adams wrote Cameron the following telling insight about his encounter with the chemical thermodynamics equations of Willard Gibbs: [4]

> “I have run my head hard up against a form of mathematics that grinds my brains out. I flounder like a sculpin in the mud. It is called the ‘law of phases’, and was invented at Yale. No one shall persuade me that

> I am not a phase."

On 24 Jan 1910, in his letter to Cameron, Adams, supposedly, according to American social energetics historian Eric Zencey (1983), "smirked", or something to this effect, that the terms he employed in his entire physicochemical dynamic theory of history were but metaphor. [2] This, however, may be a distortion of facts (check), as Zencey frequently gets his facts wrong or misaligned. Moreover, this does not at all conform to Adams five decade long modus operandi.

Other

The following is another noted correspondence in need of fact checking:

> "The solution of mind is certainly in the magnet."
>
> — Henry Adams (1908), "Letter to Charles Gaskell (or Cameron (check))" (Sep)

Birth date

There seems to be some inconsistency in respect to Cameron's birth date.

Biographer Arline Tehan states that on the time of her marriage on 9 May 1878, Cameron was 20-years old, which situates her birth date at 1858. [1]

FindAGrave.com lists her as born 10 Nov 1860 died 1944. [5]

Adams family biographer Paul Nagel states that she was born 10 Nov 1857. [6]

References

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θΔics

In energy psychology, **Elizabeth Duffy** (1904-1970) was an American psycho-physiologist noted for her theoretical writings on motivation and emotion (see: emotional thermodynamics) as viewed in terms of energy mobilization, arousal, tension, and activation (see: activation energy). [1]

Her publications on emotion and energy started with her 1930 PhD thesis "Tensions and Emotional Factors in Reaction", completed at the physiological laboratories of Johns Hopkins University, which seems to have been inspired by the previous 1920s experimental work of Walter Cannon, who showed that certain emotions possess the function of the mobilization of energy of the organism for greater activity, argued that if the energy representative of emotion is not released in overt activity, it will result in tension in the skeletal muscles, and hence in the state of the organism. [2]

In 1962, Duffy, in her *Activation and Behavior*, digs more into the physiological and neuroanatomical aspects of energy, e.g. by discussing the relation of lactic acid levels to emotion or the hypothalamus as being interpreted as a center for regulation of energy exchange than a center for "emotion" *per se*, among other similar factors. [3]

Education

Duffy completed her MA at Columbia University, her PhD at Johns Hopkins University, thesis "Tensions and Emotional Factors in Reaction" (1930), after which she served on the psychology faculty at the University of North Carolina, Greensboro, for thirty years. [1]

References

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θΔics

In existographies, **Elizabeth Dole Porteus** (1911-2010) (CR:10) was an American writer and philosopher noted, in philosophical thermodynamics, for her "impulse theory" of happiness, on the relationship between thermodynamics and happiness. [1] Her generalized philosophy about life is that since, according to the generalized colloquial point of view of the second law as a “law of disintegration”, meaning that “complicated arrangements always break down into less complicated ones”, a state of happiness in life will ensue when one follows the "impulse of integration". [2]

Overview

Porteus obtained her bachelors degree in child study at Vassar College and a masters degree in social work at the Smith College School. In college, a Vassar Professor challenged her to come up with her own philosophy. This stimulus drove Porteus, over the next sixty years, to develop a thermodynamic-based view of child-raising, working, and living as described by her theory of happiness.

Other

Porteus, of curiosity, being the daughter of American self-made industrialist James Dole (1877-1958), aka the “Pineapple King”, the founder of Dole Food Company, was as a child known as the “pineapple princess” of Hawaii, having a bit of American royalty upbringing. (Ñº)

References

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External links

â— Elizabeth Porteus Dole - Porteus.com

θΔics

In existographies, **Elizabeth Stanton** (1815-1902) [HD:28] (FA:105) was an American social activist, noted for being one of the pioneers of "atheist feminism". (O)

Overview

In 1848, Stanton, taking up the vocal doubting role of Ernestine Rose's public atheism, began to engage in the conflicts between the Bible and women's rights (O).

Woman's Bible

See also: Atheist's bible

In 1895, Stanton published *The Woman's Bible*, wherein her and a committee of woman did the following to a standard Bible: [4]

> "Those who have been engaged this summer have adopted the following plan, which may be suggestive to new members of the committee. Each person purchased two Bibles, ran through them from Genesis to Revelations, marking all the texts that concerned women. The passages were cut out, and pasted in a blank book, and the commentaries then written underneath."

Here, of note, we recall a similar manner of cut and paste editing as was done by Thomas Jefferson and his Jefferson Bible.

Quotes | Employed

The following are quotes employed by Stanton:

> "Still, it moves."
>
> — Galileo (c.1633), punchline to the Galileo story as told by Stanton (1869) in "The Universal Creed" [1]

Quotes | By

The following are quotes by Stanton:

> "Harriet Martineau said that the happiest day of her life was the 'day she gave up charge of her soul'. The happiest period of my life, similarly, has been since the emerging from the shadows and superstitions of the old theologies."
>
> — Elizabeth Stanton (1885), "The Pleasure of the Ages" [2]

> "Clergyman are still preaching sermons on the 'rib origin' [of women]!"
>
> — Elizabeth Stanton (1895), speech at 80th birthday celebration, New York Opera House [3]

> "I decline to accept Hebrew mythology as a guide to twentieth-century science."
>
> — Elizabeth Stanton (1902), reply, a few days before her death (O), to a Bishop who had quoted the Genesis chapter on the rib origin of women to her

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(b) Gaylor, Annie. (1997). *Women Without Superstition, No Gods, No Masters: The Collected Writings of Women Freethinkers of the Nineteenth and Twentieth Centuries* (pg. 137). Freedom From Religion Foundation.
(c) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 391). HarperOne.
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3. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 392). HarperOne.
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External links

- Elizabeth Cady Stanton – Wikipedia.
- The Woman’s Bible – Wikipedia.

θΔics

In existographies, **Elizabeth Stuart** (1596-1662), aka Elizabeth of Bohemia, was a Bohemian queen, philosopher, and an auto-characterized an "ignorant and indocile" person (1643), noted for her correspondence with Rene Descartes.

Descartes | Soul

On 6 May 1643, Stuart wrote the following to Rene Descartes: [1]

> "I beseech you to tell how the soul of man (since it is but a thinking substance) can determine the spirits of the body to produce voluntary action. For it seems **every determination of movement happens from an impulsion of the thing moved**, according to the manner in which it is pushed by that which moves it, or else, depending on the qualification and figure of the superficies of this latter. Contact is required for the first two conditions, and extension for the third. You entirely exclude extension from your notion of the soul, and contact seems to be incompatible with an immaterial thing."

On 21 May 1643, Descartes responded with the following discussion, wherein he says he believes the soul moves the body: [1]

> "I can in all honesty say that the question Your Highness proposes seems to me that which can be asked with the greatest justification in sequel to the writings I have published. For, there being two things in the human soul (compare: animal soul) on which depends all the knowledge we can have of its nature—the first, that it thinks, and the second, that being united to the body, it can act and suffer with it—I have said nearly nothing of this latter, and have studied only to understand well the first, since my principal design was to prove the distinction that exists between the soul and the body, for which the first alone could suffice, while the other would have been an impediment. But since Your Highness is so discerning that one cannot hide anything from her, I shall try here to explain the manner in which I conceive the union of the soul with the body, and how it has the force to move the body.
>
> Firstly, I consider that in us are certain primitive notions that are like originals on whose model we form all our other knowledge. And there are but very few such notions; for, after the most general ones—of being, number, duration, etc.—which refer to everything we can conceive, we have, as regards body in particular, only the notion of extension, from which follow those of figure and movement; and, as regards the soul alone, we have only that of thought, in which are comprised the perceptions of the understanding and the inclinations of the will; finally, for the soul and the body together, we have only that of their union, on which depends that of the **force of the soul for moving the body**, and of the body for acting upon the soul by causing its feelings and passions.

This, to pause, in retrospect, is hilarious: humans are moved by the force of the soul. We note, curiously, that 84% of modern college students still believe this tenet. It is keen to note that Newton, in his later formulation of the laws of motion, questioned this self-motion premise. Descartes continues:

> I consider also that all human knowledge consists only in carefully distinguishing these notions, and in attributing each of them only to the things to which they pertain. For when we wish to explain some difficulty by means of a notion that does not pertain to it, we cannot fail to make a mistake. And that occurs whenever we wish to explain one of these notions by another—for since they are primitive, each of them cannot be understood except through itself. And inasmuch as the use of the senses has rendered the notions of extension, figures, and movements very much more familiar to us than the others, the principal cause of our errors consists in that we ordinarily wish to employ them to explain things to which they do not pertain, as when one wishes to employ the imagination to conceive the nature of the soul, or else, when one wishes

to conceive the manner in which the soul moves the body after the fashion in which a body is moved by another body.

That is why, having tried to clarify in the *Meditations* Your Highness has deigned to read, the notions that pertain to the soul alone and distinguish them from those that pertain to the body alone, the first thing I should in sequel explain is the manner of conceiving whatever pertains to the union of the soul with the body, leaving aside things that pertain to the body alone or to the soul alone. In this regard it seems to me that what I wrote at the end of my Response to the sixth objections can be of use; for we cannot seek these simple notions other than in our soul—in our soul which, although it has all of them in it by its nature, does not always sufficiently distinguish them one from another, or else fails to attribute them to the objects to which they should be attributed.

Thus I believe that we hitherto confused the notion of the force by which the soul acts on the body with that by which one body acts upon another; and that we have attributed both, not to the soul, for as yet we did not recognize it, but to different qualities of bodies, such as weight, heat, and so forth which we imagined as being real—or, as having an existence distinct from that of body, and consequently as being substances, although we called them qualities. And in order to conceive them, we have sometimes used the notions that are in us for knowing body, and sometimes those that are for knowing the soul, according as what we attributed to them has been material or immaterial. For example, in supposing weight a real quality, of which we possess no other knowledge save that it has the force of moving the body in which it exists toward the center of the earth, we have no difficulty conceiving how it moves this body, nor how it is joined to it; and we do not think that happens by means of an actual touching of one surface against another, for we experience in our own selves that we have a particular notion for conceiving it; yet I believe that in applying this notion to weight—which, as I hope to show in physics, is nothing really distinct from body—we are abusing what has been given us for conceiving the manner in which the soul moves the body.

I would show myself insufficiently aware of the incomparable wit of Your Highness if I employed more words in ex-plaining myself, and I would be too presumptuous if I dared think my response ought satisfy her entirely; but I shall try to avoid both by adding nothing further here save that, if I am capable of writing or saying anything that can be agreeable to her, I will always consider it a very great favor to take up my pen or to go to the Hague on such account; and that there is nothing in the world so dear to me as to obey her commands. But I can find no room here for observing the oath of Hippocrates as she enjoins me; for she has communicated nothing to me that does not merit being seen and admired by all. I can only say, regarding this matter, that infinitely esteeming your letter, I shall treat it as misers do their treasures—which they stash away all the more they esteem them, and, by begrudging everyone else the sight of them, take their sovereign contentment in looking upon them. And thus I shall be very willing to enjoy all to myself the good of looking upon it; and my greatest ambition is to be able to say, and truly to be, . . . etc."

(add)

References

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External links

â— Elizabeth Stuart, Queen of Bohemia – Wikipedia.

θΔics

In human physics, **Elliott Montroll** (1916-1983) was an American chemist, mathematician, physicist, and statistical mechanicist noted for his 1974 *Introduction to Quantitative Aspects of Social Phenomena*, coauthored with Wade Badger, which tends to get cited in econophysics histories as being on the first books to apply statistical physics methods to sociology, or something along these lines. [1] Montroll and Badger, in their book, discuss the application of probability to traffic flow, income distributions, floods, and the stock market. [3]

Molecular comparisons

Montroll seems to employ a certain number of humans to molecules comparisons (see: human molecular formula), and in one section of this book give the following formula for the total kinetic energy of the ith molecule in a system, being supposedly a socioeconomic system:

$$\epsilon_i(x) = \frac{1}{2} m u_i^2$$

where m is mass and u_i the velocity of the molecule, respectively, then comments:

> "The [acts of a human] individual [occurs] in a manner to that in which energy is transferred from gas molecule to gas molecule by collisions. Through transfer of goods or services (or welfare), every family has someone with an annual income. One might argue that through many transactions money tends to get randomly distributed but, through some unclear constraints which are due to training, motivation, risk-taking, inheritance, intimidation etc., some people obtain [more money]."

This is pretty decent logic. Here, Montroll seems to be making a reference to the Pareto principle of wealth distribution.

Other

Montroll has also commented on the Vienna school of statistical thermodynamics. [2]

References

1. (a) Montroll, Elliott and Badger, Wade W. (1974). *Introduction to Quantitative Aspects of Social Phenomena* (molecule, 5+ pgs; quote, pg. 158; entropy, 11+ pgs). Gordon and Breach.
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(c) Savoiu, Gheorghe. (2012). *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (pg. 8). Academic Press.
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Academy of Science USA, 78(12);7839-43.
● Montroll, Elliott W. (1987). “On the Dynamics and Evolution of Some Sociotechnical Systems” (abs) (pdf), *Bulletin of the American Mathematical Society*, 16:1-46.

External links

● Elliott Montroll – Wikipedia.

θΔics

In existographies, **Robert Ellis Dye** (c.1938-), cited as Ellis Dye, is an American German literature scholar noted for his work Goethe's *Elective Affinities*, the logic of which he considers "romantic metafiction" and "chemical analogy".

Religion

Dye seems to have some type of religious affiliation, being that he tweets (Q) on Mormon activities.

Education

Dye completed his BA in 1960 at the University of Utah, and his MA in 1963 and PhD in 1966 at Rutgers University. Presently, he is professor emeritus of German at Macalester College, Minnesota. (Q)

Further reading

● Dye, Ellis. (1996). "Goethe's *Die Wahlverwandtschaften*: Romantic Metafiction", *Goethe Yearbook 8* (editors: Thomas Saine, Ellis Dye) (pgs. 66-92). Camden House.
● Dye, Ellis. (2004). *Love and Death in Goethe: One and Double* (chemical analogy, pg. 213). Boydell & Brewer.

θΔics

In hmolscience, **Elmar Altvater** (1938-) is a German political scientist noted, human thermodynamics, for his 1987 article turned chapter "Ecological and Economic Modalities of Time and Space", in which he outlines how social, economic, and ecological processes unfold historically through the dimensions of space and time, both framed in the context of thermodynamic irreversibility. [1]

References

1. (a) Elmar Altvater (1987). "Ecological and Economic Modalities of Time and Space", *Prokia*, 67, Jun; trans. Michael Schatzschneider, *Capitalism, Nature, Socialism*, Fall, 1989, 1(3)3:59-70.
(b) Elmar Altvater (1994). "Ecological and Economic Modalities of Time and Space", in: *Is Capitalism Sustainable?* (ch. 4, pgs. 76-90). Ed. Martin O'Connor. Guilford Press.
(c) Brennan, Teresa. (1993). *History after Lacan* (pg. 147). New York: Routledge.

External links

â— Elmar Altvater – Wikipedia.

θΔics

In existographies, **Emanuel Swedenborg** (1688-1772) (IQ:185|#79) (Cattell 1000:84) [RGM:127|1,500+] [LPKE:#] (CR:32) was a Swedish scientist, philosopher, theologian, revelator, mystic, and general polymath, one of the oft-cited "last persons to know everything", noted for his 1721 atomic theory, a type of atomic geometry, in which geometric groupings of small, concrete atoms explain the properties of different substances, for his 1734 nebular hypothesis theory of the origin of the solar system, and for his later 1758 speculations on religion and the afterlife.

Overview

In 1758, Swedenborg, in his *Heaven and Hell* (§183), commented that he who discourses of life and death, putting aside all erudite notions concerning the soul and its mode of union with the body, believes that after death he shall live in a glorious joy and vision, as a man among angels; but when he begins to reflect upon the doctrine of the union of the soul with the body, or upon the hypothetical opinion concerning the soul, doubts arise in him as to whether the soul is thus or otherwise, and when these doubts arise, his former idea is dissipated. [2]

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(c) Swedenborg, Emanuel. (1734). *On the Principles of Natural Things* (*Prodromus Principiorum Rerum Naturalium*) (Figure: "De Chao Universali Solis" [formation of solar system], Plate 26, Volume 1). Publisher.
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2. (a) Unamuno, Miguel de. (1912). *The Tragic Sense of Life* (pgs. 221-22). Dover, 1954.
(b) Heaven and Hell (Swedenborg) – Wikipedia.

External links

â— Emanuel Swedenborg – Wikipedia.

θΔics

In hmolscience, **Emanuele Sella** (1879-1946) (SN:19) was an Italian lawyer, political economist, with a remarkable "encyclopedic knowledge", oft-classified as part of the Lausanne school of physical economics, noted, in economic thermodynamics, for his 1910s work on applying the first law and second law to the study of the mechanical investigation of economic activity and the cycle of wealth. [1]

Overview

In 1910, Sella published his *La Vita della Ricchezza* [*The Life of Wealth*] in which he emphasized not only a mechanical investigation of economic life, which studies the production, exchanges, savings, and speculation, but also suggested the possibility of conducting an energetic investigation by studying the psychological and physiological forces that cause economic phenomena. In this work, Sella uses the concept of entropy for the analogy between the process of hereditary transmission and the mechanism of production, where as he states: [2]

> "If we consider men as generators of wealth who absorb and radiate, and if we consider wealth as a specific form of energy which we could call *economic energy*, we can see here also a corollary of the law of Clausius, which is the synthesis of human knowledge of a recent phase in the history of science: the energy of the universe is constant, entropy tends to its maximum. Heat moves from bodies having a higher temperature to those having a lower temperature. Therefore entropy tends to grow: the universe, according to Clausius, tends toward a *heat equilibrium*."

On this logic, Sella formulates a concept of *elementary economic entropy* ('oicoentropia'), arguing that with within each organism of which a society is composed, wealth is distributed to benefit all of its elements. He argues for the existence of *specific economicity*, wherein technical progress is viewed as a transformation of material which causes variations in the specific heat of bodies, that corresponds to the capacity which an organism has to use the things which surround it. [1]

In his 1915 *Competition: Systems and Criticism of Systems*, he becomes one of the first to discuss "economic temperature" and economic entropy. [1] In 1899, Sella wrote his first economic treatise: *L'Emigrazione Italiana in Svizzerra* (The Emigration Italiana in Svizzerra).

Sella's core economic theory, in which he outlined his ideas on "economic energetics" or the relation between competition and entropy, was published in two volumes between 1915 and 1916 titled *La Concorrenza: Sistema e Critica dei Sistemi* [Competition: Systems and Criticism of Systems].

Education

Sella studied at the University of Geneva for three semesters in 1898, attending courses of Italian economist Maffeo Pantaleoni (supposed mentor to Vilfredo Pareto); he obtained his law degree at the University of Turin in 1902 with the thesis "Free Trade is favorable to the Economy of a Nation, to its Industrial Development and, in this case, to the Progress of the Wool Industry"; from 1901 to 1902, Sella attended the Economic School and Royal Statistical Society in London. In 1903, he became an assistant lecturer at the Laboratorio di Economia Politica of Turin; he taught statistics and political economy at the Universita Commerciale of Turin from 1901 to 1903, becoming a professor there in 1905. In 1911, he became the chair of political economy at the University of Perugia.

Sella's books were extensive in their citations, meaning that a reading of one of his books, according to Claudia Rotondi, required a reading of his long and important notes, almost preponderant with respect to the text, amounting to hundreds and hundreds of bibliographical references, which seems to imply that Sella was a erudite well-read person, especially outside of his given field, being that he was aware of the work of Rudolf Clausius.

References

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External links

â— Emanuele Sella (economist) (Italian → English) – Wikipedia.
â— Emanuele Sella (Italian → English) – Treccani.it, *The Italian Encyclopedia.*

θΔics

In atheism, **embarrassed to be an atheist** refers, generally, to non-believers, who classify loosely as atheists, embarrassed to be associated with new atheism, in some way or another.

Atran

In Nov 5-6 2006, anthropologist Scott Atran, author of *In Gods We Trust: the Evolutionary Landscape of Religion* (2002), a speaker, along with with Richard Dawkins and Sam Harris, at the Salk Institute Beyond Belief conference, objected to new atheism; his main objection (Q)(Q) is as follows:

> "I find it fascinating that among the brilliant scientists and philosophers at the [Salk Institute] conference, there was no convincing evidence presented that they knew how to deal with the basic irrationality of human life other than to insist against all reason and evidence that thing ought to be rational and evidence based. It makes me **embarrassed to be a scientist and atheist**. There is no historical evidence whatsoever that scientists have a keener or deeper appreciation than religious people of how to deal with personal or moral problems."

(add discussion)

Ruse

In Jan 2007, Michael Ruse commented the following about Richard Dawkins' *The God Delusion* (2006)

> "The *God Delusion* makes me **embarrassed to be an atheist**."

In 2009, Ruse, in his "Dawkins et al Bring us Into Disrepute" (Q) blog, responded to the backlash from this now-popular apologetics quote, e.g. as cited by: Alister McGrath (2007), Ravi Zacharias (2008), Frank Turek (2014).

References

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(b) Beyond Belief: Science, Religion, Reason and Survival
(c) Zacharias, Ravi. (2008). *The End of Reason: a Response to the New Atheists* (§: Atheists Divided on the This New Atheism, pg. 23). Zondervan
2. (a) Ruse, Michael. (c.2007). *Source*, Jan
(b) McGrath, Alister. (2007). "The Dawkins Delusion" (Q), AlterNet.org, Jan 25.
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External links

- Aren't Atheists Embarrassed by P.Z. Myers? (2011) – TheThinkingAtheist.com.
- Embarrassed to be an Atheist? (2014) – Quora.

θΔics

In hmolscience, **embodied energy** is an “energy theory of value”, promoted in ecological economics, generally the brainchild of Howard T. Odum (1983) and Robert Costanza (1980), conceptualized as the total direct energy and indirect energy required to produce an economic or environmental good; the energy “embodied” in an automobile, e.g., is the energy consumed directly in the manufacturing plant, plus all the energy consumed indirectly to produce other inputs to the manufacturing process. [1]

References

1. Adams, Richard N. (1988). *The Eighth Day: Social Evolution as the Self-Organization of Energy* (pg. 95). University of Texas Press.

External links

â— Embodied energy – Wikipedia.

θΔics

In science, **emergence** is a theory that meaningful order can "emerge" all on its own, spontaneously, in complex systems made of many interacting parts. [1]

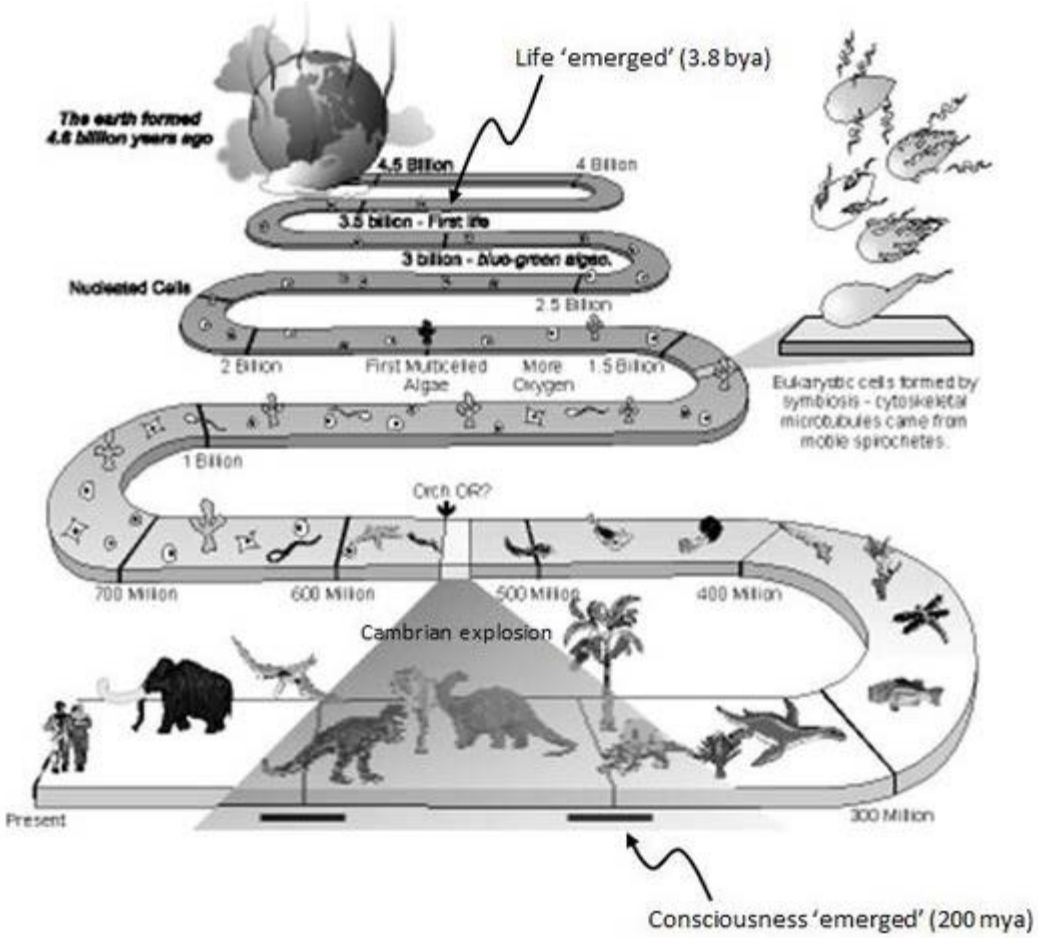

A typical **emergence** stylized diagram, showing the model that "life" emerged 3.8 billion years ago, via some unstated mechanism, per citation of dating bacteria fossils, and that "consciousness" emerged, as an emergent property, some 200 million years ago, per citation of John Eccles (1992). [16]

> "We chemists perceive the origin of life as a chemical process. How did that chemistry begin? I believe the answer will be found in the realm of physics, and more specifically biophysics, defined as the physical processes associated with the living state. The chemistry of life only became possible after certain physical processes permitted specific chemical reactions to occur. Life can **emerge** where physics and chemistry intersect. I used the word 'emerge', [here] which increasingly influences how scientists think about the origin of life. In common usage, 'emergence' is an unexpected happening, as in an emergency. 'Emergence' is not being used in science to connote the process by which a physical or chemical process becomes more complex under the influence of energy. There is a certain mysterious quality to the word's use in this regard because the emergent property is typically unexpected and cannot be predicted. Emergence is the opposite of reductionism, in which everything is believed to be explainable by understanding ever simpler components of a system."
>
> — David Deamer (2011), *First Life* [17]

(add discussion)

Anti-emergence

The following 1992 statement by Steven Weinberg is good example of the anti-emergence position: [18]

> "The question of **emergence**: is it really true that there are new kinds of laws that govern complex systems? Yes, of course, in the sense that different levels of experience call for description and analysis in different terms. The same is just as true for chemistry as for chaos. But *fundamental* new kinds of laws? Gleick's lynch mob provides a counterexample."

(add discussion)

Early History

The history of the usage of the term emergence or emergent seems isolated to discussions concerning the origin of the mind in the evolution sense of the matter.

English philosopher John Mill, in his 1843 *A System of Logic*, according to American anthropological neuroscientist Terrence Deacon, is said to give the first proto-outline of the emergence argument that the "neutral" properties of acid-base reacted compounds, table salt in particular, differ substantially from the acidic/basic toxic nature of the individual compounds; though Mills, to note, did not use the term emergence or emergent. [12]

English philosopher George Lewes, in his 1875 *Problems of Life and Mind*, used the term emergent: [7]

> "Every resultant is either a sum or a difference of the co-operant forces; their sum, when their directions are the same—their difference, when their directions are contrary. Further, every resultant is clearly traceable in its components, because these are homogeneous and commensurable. It is otherwise with **emergents**, when, instead of adding measurable motion to measurable motion, or things of one kind to other individuals of their kind, there is a co-operation of things of unlike kinds. The emergent is unlike its components insofar as these are incommensurable, and it cannot be reduced to their sum or their difference."

Lewes, in his views here, supposedly, was influenced by Mill. [11]

Likewise, English science philosopher Charlie Broad (1887–1971), described as "arguably the most astute of British emergentists", in his 1925 *The Mind and its Place in Nature*, spoke of the characteristic properties of silver chloride as being emergent properties:

> "No doubt the properties of silver chloride are completely determined by those of silver and of chlorine; in the sense that whenever you have a whole composed of these two elements in certain proportions and relations you have something which the characteristic properties of silver chloride."

Moreover, one of the top key terms in Broad's book is "emergent materialism". [8] This bonded atoms have new properties point of view, however, is nothing but a superficial ontic opening pass at an attempt to explain the mind in the context of the periodic table and the laws of hard physical science.

Lewis

We might be quick to dismiss Broad as being ignorant of the physical sciences, being that he was not well-schooled in physical chemistry and thermodynamics, but then we would be hard-pressed to dismiss American physical chemist Gilbert Lewis who that very same year, in his 1925 *Anatomy of Science* (§7: Non-Mathematical Sciences), in defense of his self-query as to whether him writing a book is nothing but a chemical reaction or conversely if crystals thinks, defends the absurdity of both positions by taking recourse in autocatalysis (perpetual motion) the second emergence: [9]

> "Suppose that this hypothetical experiment could be realized, which seems not unlikely, and suppose we could discover a whole chain of phenomena [evolution timeline], leading by imperceptible gradations form the simplest chemical molecule to the most highly developed organism

An overview of **emergence**, from the dissipative structures perspective, written by Belgium pharmaceutical toxicologist Jacques de Gerlache. [6]

[human molecule]. Would we then say that my preparation of this volume [*Anatomy of Science*] is only a chemical reaction [extrapolate up approach], or, conversely that a crystal is thinking [extrapolate down approach] about the concepts of science?"

This is all a very excellent Hegelian dialectic juxtaposition of the issues: how do we defining "thinking" if all phenomena is only variations of atomic structures? Is Lewis himself nothing but an "complex chemical molecule" that has evolved from imperceptible gradations form "simple chemical molecules"? Lewis then answers his own questions (similar to the way, in modern times, many jump to the label of human chemistry or human thermodynamics as "crackpot") by commenting:

> "**Nothing could be more absurd**, and I once more express the hope that in attacking the infallibility of categories I have not seemed to intimate that they are the less to be respected because they are not absolute. The interaction between two bodies is treated by methods of mechanics; the interaction of a billion such bodies must be treated by the statistical methods of thermodynamics."

He then jumps to the "emergence" point of view solution to the origin of life (his italics):

> "They are the same bodies and presumably follow the same behavior, but a great group of new phenomena ***emerges*** when we study an immense number, and by this we must mean merely that phenomena appear that never would have been recognized of dreamed of if the two bodies alone had been studied."

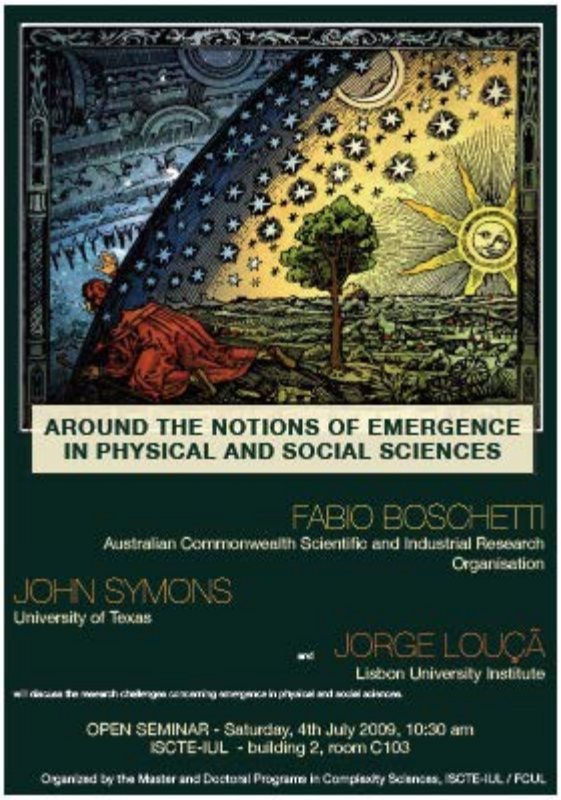

A 2009 "emergence" seminar poster.

Emergence, according to another definition, is the process of what happens when an interconnected system or relatively simple elements self-organizes to form more intelligent, more adaptive higher-level behavior. [2] This version of emergence is captured well by American philosopher Christian de Quincey: [5]

> "Whenever we encounter a clash of ontologies attempting to explain the mind-body relationship, the issue of emergence is always in the background, if not actually the central issue of the debate. Materialists claim, for example, that consciousness emerges through evolution from insentient matter; emanationists idealists say that multiplicity of forms emerge from the onvolution of spirit; the panexperientialists say that different qualities of experience and consciousness evolve and emerge at different levels of complexity; whereas only dualists avoid the issue of emergence altogether because for them the mind belongs in a completely different ontological domain."

In other words, the term emergence, similar to complexity, is loosely used as a subtle way of saying 'I don't know', generally speaking.

Recent history

American physicist Philip Anderson's 1972 article "More is Different", wherein he addressed the controversy surrounding the reductionist hypothesis, is often cited as certain physical properties, e.g. solid state forms of matter, emerge at higher levels of organization. [13]

In 2000, American physicist Robert Laughlin, in his “The Theory of Everything”, elaborates on Anderson's views, and promots a “protected states” theory of emergence, according to which there is a certain insulation between levels of physical dynamics. [14] In 2005, Laughlin published *A Different Universe: Reinventing Physics from the Bottom Down*, wherein he argues for emergence as a replacement for reductionism, but a book that is not much expanded beyond his 2000 article. [15]

In 2002, American biochemist (powered chnops-chemist) Harold Morowitz, in his *The Emergence of Everything*, outlines over twenty "emergences". [10]

Thermodynamics

The subject of emergence is often found interwoven with thermodynamics, being that the latter studies order and disorder in terms of energy and entropy. In 2003, American mathematician Steven Strogatz gave his summary of the understanding of connection of the two, emergence and thermodynamics, in modern science: [3]

> “Scientists have long been baffled by the existence of spontaneous order in the universe. The laws of thermodynamics seem to dictate the opposite, that nature should inexorably degenerate toward a state of disorder, greater entropy. Yet all around us we see magnificent structures—galaxies, cells, ecosystems, human beings—that have somehow managed to assemble themselves. This enigma bedevils all of science today. The key to unlocking the mysteries of self-organization, according to Belgian chemist Ilya Prigogine and his colleagues, lies in a deeper understanding of thermodynamics, where **emergence** of order is a victorious uphill battle against entropy, as a complex system feeds itself on energy flowing in from the environment.”

In 2008, Swiss mathematician Claes Johnson argued that computational thermodynamics, based on his own Euler equation type formulation of the first two laws, could explain emergence. [4]

See also

â— Self-organizaton

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External links

â— Emergence – Wikipedia.

θΔics

In science, **emergent property** refers to a property, often hypothetical, e.g. "consciousness" or "life", of system that appears, i.e. "emerges", as a result of the interaction or combination of the subcomponents of the system, typically atoms, but is not a property of the individual components themselves. [1]

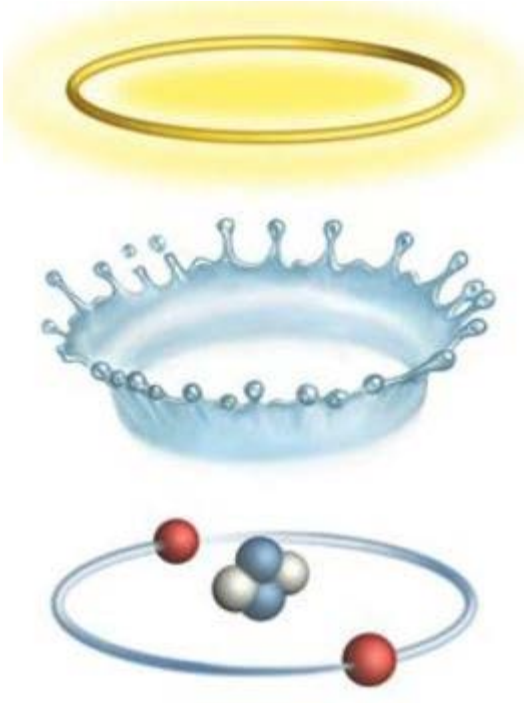

> "A benzene molecule is made of six carbon atoms arranged symmetrically in a ring, to each carbon atom. Apart from its mass, the **properties** of a benzene molecule are not in any sense the simple arithmetical sum of the properties of its twelve constituent atoms. Nevertheless, the behavior of benzene, such as its chemical reactivity and its absorption of light, can be calculated if we know how these parts interact, although we need quantum mechanics to tell us how to do this. It is curious that nobody derives some kind of mystical satisfaction by saying 'the benzene molecule is more than the sum of its parts', whereas too many people are happy to make such statements about the brain and nod their head wisely as they do so."
>
> — Francis Crick (1994), *The Astonishing Hypothesis: the Scientific Search for the Soul* [11]

An image of emergence—i.e. that **emergent properties**, wetness, "emerge" at the holism or system level, that cannot be explained by looking at reductive atomic methods—often used as a tool, along with self-organization, by anti-reductionists to bring, using evasive and subtle methods, spirituality and religion back into science or nature. [6]

The concept of "emergence", i.e. the view of nature as a series of "emergent levels" rather than a succession of rearrangements of the same elements", arose sometime in the late 20th-century; though, said to have existed in earlier forms, e.g. Aristotle's "coming-to-be of what is not." (Ñº)

Early usages

The argument that "liquidity" is an emergent property of water, not found in the individual hydrogen and oxygen atoms, has become a classic example in consciousness research circles; who tend to argue that, on this basis, consciousness is an "emergent property" of the brain, not found in the neuroanatomy and or neurochemicals of the brain, or something along these lines. [3] The person who originated this liquid emergence theory, however, is a bit difficult to track down? The following are a few noted historical precursory "emergent property" types of arguments:

In 1843, English philosopher John Mill, in his *A System of Logic*, according to American anthropological neuroscientist Terrence Deacon, is said to give the first proto-outline of the emergence argument that the "neutral" properties of acid-base reacted compounds, table salt in particular, differ substantially from the acidic/basic toxic nature of the individual compounds. [7]

In *circa* 1869, French engineer Francois Massieu, in his effort to explain or understand the perceived dualism issue, in his day, of soul vs body or living vs non-living, discussed the idea of splitting apart the water molecule H_20 into oxygen O_2 and hydrogen H_2 to see if this answers anything.

In the 1920s, according to Austrian-born American physicist Fritjof Capra, the term "emergent properties", referring to those properties that emerge at a certain level of complexity but do not exist at lower levels, was coined by English science philosopher Charlie Broad (1887–1971). [9] To exemplify, Broad, in his 1925 *The Mind and its Place in Nature*, spoke of the characteristic properties of silver chloride as being emergent properties:

> "No doubt the properties of silver chloride $AgCl$ are completely determined by those of silver Ag and of chlorine Cl; in the sense that whenever you have a whole composed of these two elements in certain proportions and relations you have something which the characteristic properties of silver chloride."

In 1930, English physicist Oliver Lodge, in his *Beyond Physics*, of the emergent property argument, which he employed as follows: [10]

> "It is proved that neither an atom of hydrogen nor an atom of oxygen has any of the properties of water. The separate atoms acquire those properties in combination. Hence a molecule has properties denied to an atom, and so also an organized assemblage of a large number of molecules; and if the molecular compounds are sufficiently complicated and sufficiently numerous so as to be organized into a portion of protoplasm, then further properties makes it appearance."

Here, Lodge seems to be alluding to the premise that life (and or spirit) is an emergent property found in or past the protoplasm level of molecular complexity.

Soul | Emergent property

Nearly all emergent properties arguments are attempts to substantiate metaphysical religio-mythology concepts such as: life, soul, consciousness, etc., in semi-scientific sounding guise.

A 2013 depiction of the soul as an **emergent property**, i.e. a property emerging in the embryo at some day or second in development, according to American priest Nate Bostian and his agnostic science teacher friend. (Ñº)

Liquidness as an emergent property of atoms

In 1980, German-born American psychologist Karl Pribram stated: [5]

> "Mind so defined, is an **emergent property** of information processing by the brain much as wetness is an emergent property of the appropriate organization of hydrogen and oxygen into water, and gravity is an emergent property of the organization of matter into interacting masses."

This statement is somewhat cogent, but one that gives way to the view that "emergent property" is nothing but a plug term, used in place of a more discerning explanation.

American psychologist Richard Lerner, in his 2001 *Concepts and Theories of Human Development*, gives the over-typical regurgitated method in which the liquid property emergence theory is used to explain various anthropocentric ideologies: [4]

> "Knowledge of the functioning of the various subsystems that make up an organism does not lead to an understanding of the whole organism. Water, for example, has an emergent quality (its liquidness) that cannot be understood by reducing water to its constitute (and gaseous) elements (hydrogen and oxygen). Similarly, human beings have unique characteristics (or qualities), such as being able to love, being governed by abstract principles of moral and ethnical conduct, or showing high levels of 'need achievement', that emerge as ontogenetically distinct (qualitatively discontinuous) features and cannot be understood by mere reduction to underlying neural, hormonal, and muscular processes."

The idiocy of this sesquipedalian statement is tremendous, yet one over-typical of those who are anti-reductionists (see: debate). The inane notion that the liquidness of water cannot be understood by studying atoms typically comes from

people who have never studies chemistry or physics.

Life as an emergent property of atoms

In 1872, English physiologist Henry Bastian, in his *The Beginnings of Life*, outlined a mixture of conservation of energy, vitalism, and emergence of living matter arising from atoms and molecules as follows: [2]

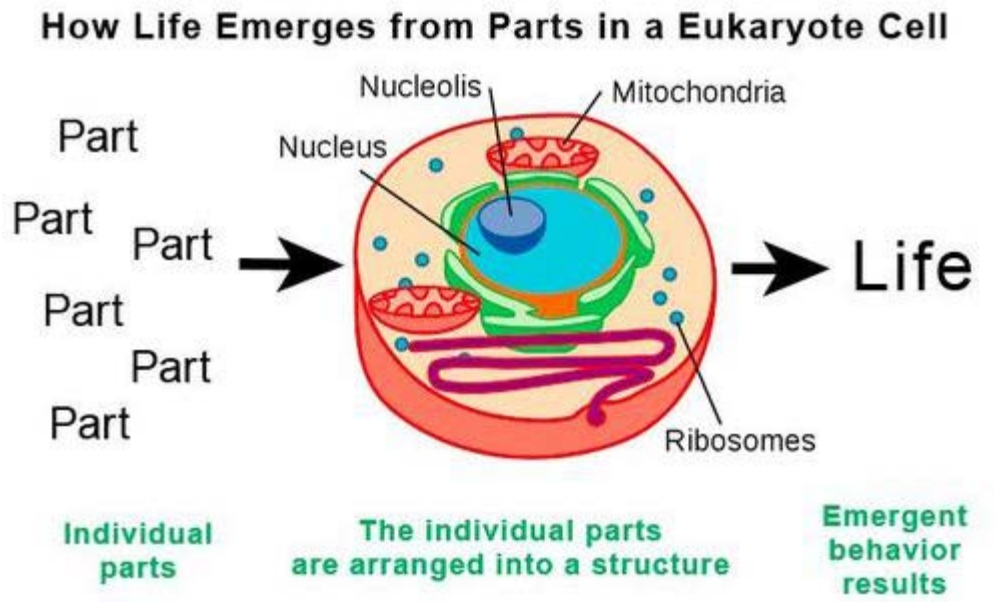

A rather hilarious—nearly childlike attempt, from thwink.org (Ñº), to render a visualization of "life" as an **emergent property** of the parts of a cell. The opposite of this being the cell-as-molecule model, which jettisons life as a defunct concept.

> "We know that the molecules of elementary or mineral substances combine to form acids and bases by virtue of their own 'inherent' tendencies; that these acids and bases unite so as to produce salts, which, in their turn, will often again combine and give rise to 'double salts.' And at each stage in this series of ascending molecular complexities, we find the products endowed with properties wholly different from those of their constituents. Similarly, amongst the carbon compounds there is abundance of evidence to prove the existence of internal tendencies or molecular properties, which may and do lead to the evolution of more and more complex chemical compounds. And it is such synthetic processes, occurring amongst the molecules of colloidal and allied substances, which seem so often to engender or give 'origin' to a kind of matter possessing that subtle combination of properties to which we are accustomed to apply the epithet 'living'."

This, however, is no different that the famous incorrigible molecular "liquidness" is an emergent property of the atoms hydrogen and oxygen combined in the molecular form as H_20, which does not exist in the atoms singly, but only "emerges" in the upper level molecular state argument, such as summarized above.

Temperature as an emergent property

> *See also: Single particle thermodynamics (emergent concepts)*

The so-called "temperature" is an "emergent" property premise, i.e. something conceptualized as arising from the holism action of large number of moving particles (or atoms), but not something existing in the individual particle (atom), stems from ideas of Austrian-born English philosopher Karl Popper and his so-called anti-reductionist "disciples", namely: Agassi Joseph (1966, 1976), in particular, along with Paul Feyerabend (1970) and Imre Lakatos (1968), in residual effect. [14]

In 1966, Popper, in his *Objective Knowledge*, chapter section: "Realism and Pluralism: Reduction versus Emergence", attempted to solve the seeming "life from non-life puzzle" by positing that life is an emergent property of matter, as follows—with a seeming, to note, indirect assertion that chemistry emerges out of physics, with a certain "temperature" range: [13]

> "Man produces not only scientific theories but many other ideas—for example, religious or poetical myths or, say, plots for stories. Take physics and chemistry for example; sciences which make assertions about all physical things and physical states, including living organisms. Physics and chemistry are not very

different, and there seems to be no great difference in the kind of things to which they apply, except that chemistry, as it is usually understood, becomes inapplicable at very high temperatures and also, perhaps, at very low ones. It therefore would not be very surprising if the hopes, held for a long time, that chemistry can be reduced to physics, were to come true, as indeed they seem to be doing.

Here we have a real paradigm case of a 'reduction'; by a reduction I mean, of course, that all the findings of chemistry can be fully explained by (that is to say, deduced from) the principles of physics. Although such a reduction would not be very surprising, it would be a very great scientific success. It would not only be an exercise in unification, but a real advance in understanding the world. Let us assume that this reduction has been carried out completely. This might give us some hope that we may also reduce one day all the biological sciences to physics. Now this would be a spectacular success, far greater than the reduction of chemistry to physics. Why? Because the kind of things to which physics and chemistry apply are really very similar from the start. Only think how difficult it would be to say whether the atomic theory is a physical or a chemical theory. In fact, for a long time it was both; and it is this common bond which provides the link which may lead, or perhaps has led, to their unification.

With living organisms the situation is different. They are, no doubt, subject to all kinds of physical and biological laws. Yet there appears to be some prima facie difference [see: unbridgeable gap] between living organisms and non-living things. Admittedly, we learn from science that there are transitory or intermediate stages, and also intermediate systems; and this gives us hope that a reduction might be achieved one day. Moreover, it seems not at all improbable that recent tentative theories about the origin of life on earth might be successfully put to the test, and that we might be able to create primitive living organisms artificially. But even this would not necessarily mean a complete reduction. This is shown by the fact that chemists were able to create all sorts of chemicals, inorganic and organic, before understanding even their chemical composition, to say nothing about their physical structure. Thus even the control of chemical processes by purely physical means is not as such equivalent to a reduction of chemistry to physics. Reduction means much more. It means theoretical understanding: the theoretical penetration of the new field by the old field.

Thus we might find a recipe for creating some primitive forms of life from non-living matter without understanding, theoretically, what we were doing. Admittedly, this would be a tremendous encouragement to all those who seek for a reduction, and rightly so. But the way to a reduction might still be long; and we could not know whether it was not even impassable: there may be no theoretical reduction of biology to physics, just as there seems to be neither a theoretical reduction of mechanics to electrodynamics, nor a theoretical reduction the other way round.

If the situation is such that, on the one hand, living organisms may originate by a natural process from non-living systems, and that, on the other hand, there is no complete theoretical understanding of life possible in physical terms, then we might speak of **life as an emergent property of physical bodies**, or of matter. Now I want to make it quite clear that as a rationalist I wish and hope to understand the world and that I wish and hope for a reduction. At the same time, I think it quite likely that there may be no reduction possible; it is conceivable that life is an **emergent property** of physical bodies."

In 1975, e.g., in the Popper-cited essay collection *Analysis and Metaphysics*, written by students of American metaphysics philosopher Roderick Chisholm, we find: [15]

"For example, it seems reasonable to postulate temperature as a property that groups of basic particles have, but no individual particles have. Similarly, sensing redly might be postulated as an emergent property that a group of basic particles..."

Prior to this, to note, there is NO published discussion of "temperature"—technically a "tension associated with entropy, following from the zeroth law of thermodynamics" (Pierre Perrot, 1998); understood to be a quantity measureable, on

the absolute temperature scale, for every body and or system in the universe.

In 1975, Popper's graduate student Israeli philosopher Agassi Joseph, in his “On the Philosophy of Technology”, directly asks the following: [12]

> “**Is temperature an emergent property?** The movement of molecules in a gas is related to the temperature of a gas. It would seem impossible to predict that a change in velocity of a set of individuals could result in a temperature change of a population made up of those individuals.”

In 1976, James Franklin, in his *General Systems*, was citing Popper’s “life is an emergent property” in conjunction temperature described as an emergent property, to give the argument seeming support: (Ñº)

> “… dynamics is not able to explain even thermodynamics, for which the emergent properties described ‘temperature’ and ... it is conceivable that life is an emergent property property of physical bodies. And later in the same article adds: So I would ..”

On this basis, in the years 1976-1999, the same argument kept getting repeated *ad nauseum*, as a platform to justify whatever “agenda” one was arguing, e.g. complexity theory (Yaneer Bar-Yam, 1997), machine biology theory (Kevin Kelly, 1994), neurophilosophy (Paul Churchland, 1989), linguistic rules (Susan Lima,1994), etc. (Ñº) A rather humorous spinoff of this is the assertion that “gravity is an emergent property of matter” in order to lend seeming scientific support for an altruism theory of consciousness. (Ñº)

In 1996, Austrian-born American physicist Fritjof Capra, cites the Charles Broad (1925) silver chloride example, but then goes on to inanely claim that temperature is an emergent property that does not exist at the atomic level: [8]

> “There exist different levels of complexity with different kinds of laws operating at each level. At each level of complexity the observed phenomena exhibit properties that do not exist at the lower level. For example, the concept of temperature, which is central to thermodynamics, is meaningless at the level of individual atoms, where the laws of quantum theory operate.”

This is incorrect logic. Temperature exists everywhere. In fact, the third law of thermodynamics explains that it is impossible to reach absolute zero of temperature, even for a one atom system, because it would take an infinite amount of energy to reach that point, hence the concept of temperature never becomes “meaningless” as Capra would seem to believe.

Sweetness as an emergent property of atoms

Likewise, in his 1996 book *The Web of Life*, and again in his 2002 book *The Hidden Connections*, he employs the classic emergent property argument to make his point to argue that sweetness is an "emergent" property of the synthesized sugar molecule not found in the individual atoms: [8]

> “When carbon (C), oxygen (O) and hydrogen (H) atoms bond in a certain way to form sugar [e.g. glucose $C_6H_{12}O_6$], the resulting compound has a sweet taste. The sweetness resides neither in the C, nor in the O, nor in the H; it resides in the pattern that emerges from their interaction. It is an **emergent property**. Moreover, strictly speaking, is not a property of the chemical bonds. It is a sensory experience that arises when the sugar molecules interact with the chemistry of our taste buds, which in turns causes a set of neurons to fire in a certain way. The experience of sweetness emerges from that neural activity.”

This, of course, is but a smoke and mirrors argument, generally done to give a scientific appearance to various arguments of the proposed existence of things, such as: mind, consciousness, life, mysticism (one of Capra's favorite terms), among others.

Reductionist holism | Atheism

The following is a 2006 "reduced" holism statement by American atheism advocate and philosopher Alexander Rosenberg: [16]

> "The whole has properties which no individual part has: the property of wetness that water has is not a property that any H_20 molecule has. But this is no reason to deny that reducibility of wetness to properties of H_20 molecules. Wetness is identical to the weak adhesion of these molecules tone another, owing to the polar bonds between the molecules; and these bonds are the result of the distribution of electrons in the outer shell of the constituent atoms of the H_20 molecules."

The above but goes to show that nearly all "emergent property" pro arguments are religious-based in underlying nature. American physicist Victor Stenger elaborates on Rosenberg's derision as follows: [17]

> "The whole, in other words, still results from the interaction of the parts. Try as they might, the anti-reductionists have been unable to find any evidence to support their distaste for atomism. Now special holistic forces have been shown to come into play with the aggregation of large numbers of parts; just new properties develop, or, in the common parlance of today, 'emerge' from the interaction of the parts."

(add)

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External links

â— Emergent properties – Stanford Encyclopedia of Philosophy.

θΔics

In ecological economics, **emergy**, short for “embodied energy” or “energy memory”, is a term which is posited to represent the sum of all energy inputs, and or matter, in the form of energy, inputs required to make a resource, good, or service. [1]

The concept of emergy seems to be a type of verbal energy flow concept, similar to the concept of transformations of energy in the steps of the food chain, albeit with an ecological-economic focus.

emergy An expression of all the energy and material resources used in the work processes that generate a product or service, calculated in units of one form of energy. In the early 1970s Howard T. Odum recognized that traditional methods of measuring energy did not account for the "quality" of different forms of energy (e.g., sunlight, versus fossil fuels or electricity). As a systems scientist with expertise in many fields including: biogeochemistry, ecology, meteorology, and open systems thermodynamics, Odum reasoned that a measure of a product's quality could be obtained from evaluating the total energy and matter directly and indirectly required to make it. Odum and his colleagues began using sunlight as the base to evaluate all other forms of energy, reasoning that, all other forms are nothing more than concentrated sunlight. As the concept matured evaluations were conducted on many processes of the biosphere (ecological and technological) calculating the energy required to transform energy and materials from one form into another. David Scienceman, an Australian colleague of Odum's, coined the term emergy. Odum believed that emergy was a universal measure of the work of nature and society made on a common basis and therefore a measure of the environmental support to any process in the biosphere. The ratio of the total emergy input to the available energy of the product was named *transformity*. Since all energy transformations of the geo-biosphere can be arranged in an ordered series to form an energy hierarchy reinforced and stabilized by web-like and feedback interactions, transformities can be used as indicators of hierarchical position and role of a component in the thermodynamic hierarchy of the whole system.

Mark T. Brown,
University of Florida
Sergio Ulgiati, University of Siena

The 2009 *Dictionary of Energy* definition of **emergy** by Mark Brown. [2]

Thermodynamics

There isn't really anything that is "thermodynamic" about the concept of emergy; although the term is often found mixed up in thermodynamics discussions, such as terms including "available energy" (a Willard Gibbs' term for free energy), exergy, among others. The term seems to be a type of verbal thermodynamics.

Etymology

The term “emergy” was coined in the late 1980s by Australian David Scienceman, while working as a visiting scientist at Howard Odum’s research group at the University of Florida, and supposedly was introduced to be a replacement to Odum’s term “embodied energy”, which had been used to refer to energy quality differences in terms of their costs of generation, and a ratio called a “quality factor” for the calories (or joules) of one kind of energy required to make those of another. [3]

In these years a terminology overlap resulted since the term embodied energy was being used by other groups who were evaluating the fossil fuel energy required to generate products and were not including all energies or using the concept to imply quality, embodied energy was dropped in favor of “embodied solar calories” and the quality factors became known as "transformation ratios".

The term "embodied energy", supposedly, was abandoned altogether in 1986 when David Scienceman, a visiting scholar at the University of Florida from Australia, suggested the term “emergy” and "emjoule" or "emcalorie" as the unit of measure to distinguish emergy units from units of available energy.

The term transformation ratio was shortened to transformity in about the same time; and is said to be defined as the ratio of total emergy input to the available energy of the product. [2]

The term "emergy" was employed by Odum and later used theoretically, in ecological thermodynamics, by those including: Eugene Odum, Sven Jorgensen, and Marlan Blissett.

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Further reading

â— Wayburn, Thomas L. (1993). “Thermodynamics, Availability, and Emergy”, Dematerialism.net.

External links

â— Emergy – Wikipedia.

θΔics

In existographies, **Emil Du Bois-Reymond** (1818-1896) (CR:4) was a German physiologist noted for []

Goethe vs Darwin

In 1882, Reymond, aged 64, in his "Goethe ad Infinitum", an address given on the occasion of his installation as Rector, attacked and belittled Goethe's theory of evolution as metamorphosis, saying in effect Goethe would have been better off had he not ventured into science, and instead touted Darwin as the intellectual hero; this is summarized by Gabriel Finkelstein (2013) as follows: [5]

> "Goethe contributed far more to natural history. The metamorphosis of plants, the discovery of the intermaxillary bone in human beings, and the vertebral theory of the skull gave proof of the poet's talent and industry; still, **du Bois-Reymond** wondered whether he might better have spent his time writing. Goethe's work in biology had little effect on his contemporaries, and later investigators replicated his achievements. "Science therefore progressed not through Goethe," du Bois-Reymond declared, "but rather with him and around him. —"Voltaire offered an illuminating contrast: instead of cursing Newton, he popularized the English genius and paved the way for the triumph of French physics?'
>
> Du Bois-Reymond ended his lecture with a set of contemporary reflections. Four weeks earlier, at a plenary session of the Congress of German Scientists and Physicians, Ernst Haeckel had named **Goethe one of the most important forerunners to Darwin**. Du Bois-Reymond disagreed, arguing that Haeckel's pronouncement held only for the idea of descent. However, there was nothing remarkable in Goethe's belief in common ancestry. "Anyone with even a moderate familiarity with paleontology," du Bois-Reymond explained, "will immediately be led to the idea that life has evolved sequentially to greater perfection. Were he to deny this, he would have to conclude that life either arose out of nothing or appeared in its current stage of development."
>
> Pressing his point further, du Bois-Reymond argued that Goethe's contemporaries must have been aware of the concept of evolution or else they would not have opposed it. "The difference between them and the pre-Darwinian adherents of descent lies in the fact that they did not overlook the apparently insurmountable difficulties of the theory?' In contrast, Goethe simply posited the doctrine of transformation, never refuting the "grounds of the older zoological school for the invariability of species" and never discussing the "problems for the theory of descent arising front the imperfection of the geological archive.' Goethe viewed the world as a "great, beautiful, unified cosmos?' Such an attitude tied him to the past. The central tenet of Darwinism, du Bois-Reymond reminded his audience, was not descent but natural selection, a mechanism that would have left the poet aghast. Little matter—modern society had learned to face the consequences of Darwinian evolution as dispassionately as it had the horrors of a train-wreck. Goethe's science was antiquated; what counted was his literature?'"

Here, we see a huge intellectual downgrade ↓ for Reymond, from his illustrious beginnings as Lucretius-siding atomist. His "rector promotion" must have went to his head?

Overview

In 1840s, Reymond was a key player in the formation of the so-called Helmholtz school, a philosophy centered on the notion of a purely physical science based physiology and psychology.

In 1842, Reymon made the following pact (see: Reymond-Brucke oath) with Ernst Brücke: [1]

> "[We pledge] to put in power this truth: no other forces than the common physical chemical ones are active within the organism. In those cases which cannot at the time be explained by these forces one has either to

find a specific way or form of their action by means of physical mathematical method, or to assume new forces equal in dignity to the chemical physical forces inherent in matter, reducible to the force of attraction and repulsion."

Meaning, in their view, that only the principles of physics and chemistry operate inside of organisms.

World enigmas

In 1880, Reymond, in Leibnitz session of the Berlin Academy of Sciences, distinguished seven world enigmas, enumerated as follows: [2]

1. The nature of matter and force.
2. The origin of motion.

3. The origin of life.
4. The (apparently preordained) orderly arrangement of nature.

5. The origin of simple sensation and consciousness.

6. Rational thought, and the origin of the cognate faculty, speech.
7. The question of the freedom of the will.

Numbers: 1, 2, and 5, Reymond, as discussed by Ernst Haeckel (1899), deemed entirely transcendental and insoluble; numbers 3, 4, and 6 were deemed soluble, through extremely difficult; on #7, Reymond was undecided.

Education

In 1838, Reymond, aged 20, read Lucretius' *On the Nature of Things*, which converted him to a positivist view of biology (powered chnopsology), meaning that he dispensed with teleology, vitalism, and other romantic notions. [3]

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External links

â— Emil Du Bois-Reymond – Wikipedia.

θΔics

In existographies, **Emile Borel** (1871-1956) (Siegfried 10:2) was a French mathematician noted for his 1913 article "Statistical Mechanics and Irreversibility", followed by his 1914 book *Chance*, in which he introduced the typing monkeys explanation of the statistical view of the second law. In short, Borel argued that that if a million monkeys typed ten hours a day, it was extremely unlikely that their output would exactly equal all the books of the richest libraries of the world; and yet, in comparison, it was even more unlikely that the laws of statistical mechanics would ever be violated, even briefly. [1]

American physical chemist Gilbert Lewis cites Borel's *Le Hasard Elements of the Theory of Probability* as being the source of the typing monkeys thought experiment. [2]

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External links

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θΔics

In existographies, **Emile Clapeyron** (1799-1864) (IQ:#|#) (CR:63) was a French mining engineer and physicist, noted for []

Overview

In 1834, Clapeyron, in his "Memoir on the Motive Power of Heat", brought Sadi Carnot's 1824 paper *Reflections on the Motive Power of Fire* into the public light, and with the very important use of the Watt indicator diagram (1796), employed to update graphically Carnot's arguments. [1]

Indicator diagram

Clapeyron, is credited as being the first person to use the graph of an indicator, thermodynamically. How he learned about the indicator diagram, however, is a bit of a mystery; the following is one take on this:

> "**Clapeyron** represented the Carnot cycle in terms of a Watt indicator diagram; the familiar form that it assumes in the introductory pages of all modern textbooks on thermodynamics. How Clapeyron came to know about the indicator diagram is an intriguing and, at present, unsolved problem in the history of science. The secret was very closely guarded by Boulton and Watt; so well in fact that was not until 1826 that a well-informed engineer like John Farey first saw an indicator diagram being taken in Russia, and in this way learned of the principle."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 220) [3]

While historians, like Caldwell above, categorize this as an "unsolved" problem in the history of thermodynamics.

In 1822, Scottish engineer H.H., in his "Account of a Steam-Engine Indicator", published in the *Quarterly Journal of Science, Literature and the Arts* (Q), detailed the operation of the indicator, with indicator graph illustration, below left. The indicator diagram made by Clapeyron, by comparison, is shown above right.

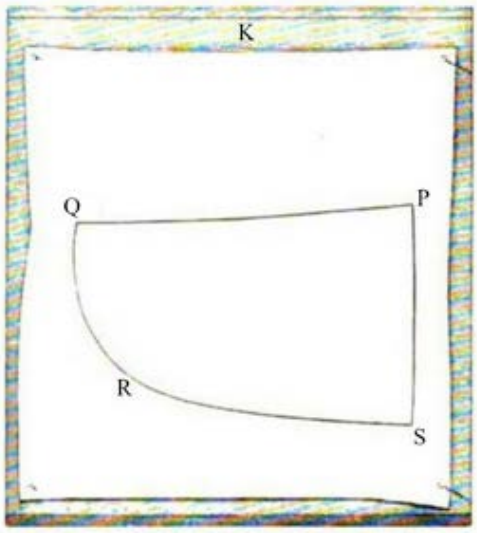

H.H. indicator diagram (1822)

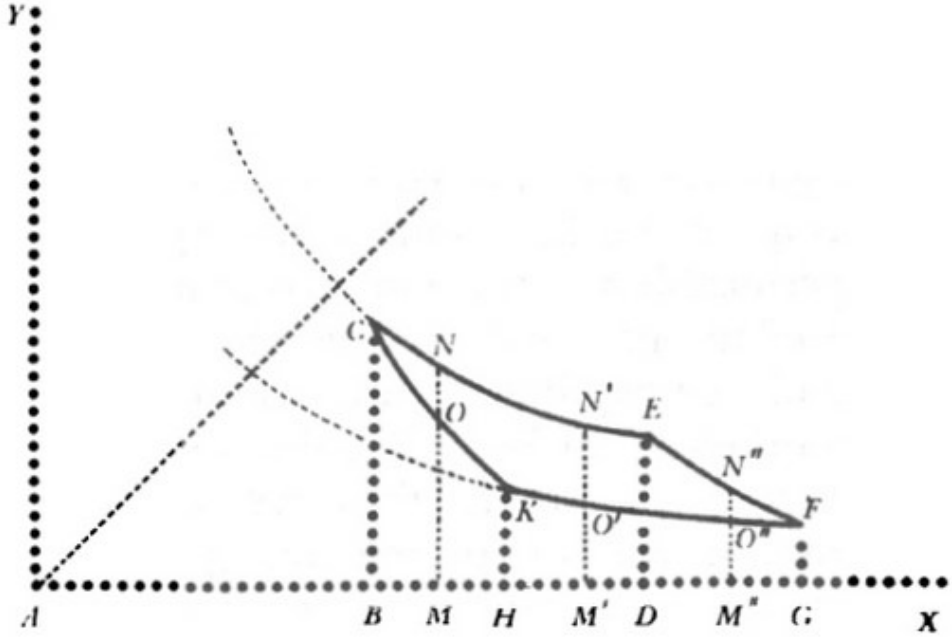

Clapeyron indicator diagram (1834)

In 1834, Francois Pambour, in his *Treatise on the Steam Locomotive*, of note mentions the Watt "indicator", but only in respect to give a description of the spring-coiled pressure measuring device, but not the indicator diagram. [5]

Influenced

In 1837, Clapeyron's memoir was translated into English and formed one of the papers presented in Volume I of William

Taylor's *Scientific Memoirs*. [6]

In 1844, James Joule, having read and digested the Taylor translation of Clapeyron, began to attack the "conservation of caloric" aspects of the theory, as follows:

> "The principles I have adopted lead to a theory of the steam-engine very different from the one generally received, but at the same time much more accordant with facts. It is the opinion of many philosophers that the mechanical power of the steam-engine arises simply from the passage of heat from a hot to a cold body, no heat being necessarily lost during the transfer. This view has been adopted by Clapeyron in a very able theoretical paper, of which there is a translation in the Third part of Taylor's Scientific Memoirs. This philosopher agrees with Carnot in referring the power to vis viva developed by the caloric contained by the vapor in its passage from the temperature of the boiler to that of the condenser. I conceive that this theory, however ingenious, is opposed to the recognized principles of philosophy, because it leads to the conclusion that vis viva may be destroyed by an improper disposition of the apparatus."
>
> — James Joule (1844), "On the Changes of Temperature produced by the Rarefaction and Condensation of Air" (pg. 188)

In 1845, Carl Holtzmann, as described in his "On the Heat and Elasticity of Gases and Vapors", had obtained a copy of Clapeyron, but was unable to find a copy of Carnot.

In 1848, William Thomson, in his "On an Absolute Thermometric Scale", said the following in respect to how he learned of Carnot via the 1837 English translation of Clapeyron's work:

> "Carnot's Theory of the Motive Power of Heat – Published in 1824 in a work entitled Réflexions sur la Puissance Motrice du Feu, by M. S. Carnot. Having never met with the original work, it is only through a paper by M. Clapeyron, on the same subject, published in the Journal de l'École Polytechnique, Vol. XIV, 1834, and translated in the first volume of Taylor's Scientific Memoirs, that the Author has become acquainted with Carnot's Theory."
>
> — William Thomson (1848), "On an Absolute Thermometric Scale" [4]

Thomson, before or after this point (see: Thomson's search for Carnot's Reflections), travelled around the Paris bookstores looking for a copy of Carnot's reflections, without success. Eventually, in Sep 1848, Thomson received a copy of Carnot's Reflections from colleague Professor Lewis Gordon.

On 2 Jan 1849, Thomson, having read Carnot's Reflections, published, in ub Royal Society of Edinburgh, "An Account of Carnot's Theory of the Motive Power of Heat", in which the term "thermo-dynamic" was coined.

The discussions of Carnot, and the graphical summary of his work by Clapeyron, eventually reached the attention of German physicist Rudolf Clausius, in whose work thermodynamics was founded. [2]

Education

Clapeyron was a a former student of the École Polytechnique, whose interests were in the theory of structures and in civil engineering, generally.

Quotes | By

The following are quotes by Clapeyron:

> "Dulong, in in his 'Researches on the Specific Heats of Elastic Fluids', established, by experiments, which are free from all objections, that equal volumes of all elastic fluids at a given temperature and pressure, compressed or expanded suddenly by a given fraction of their volumes, release or absorb the same absolute quantity of heat."
>
> — Emile Clapeyron (1834), "Memoir on the Motive Power of Heat" (pg. 73)

> “It has been known for a long time that heat can develop ‘motive power’ [work] and, conversely, that by means of ‘motive power’ [work] heat can be produced.”
>
> — Emile Clapeyron (1834), “Memoir on the Motive Power of Heat” (pg. 74); see: mechanical equivalent of heat

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External links

- Benoît Paul Émile Clapeyron – Wikipedia.
- Emile Clapeyron – MaxTutor Biographies, University of Saint Andrews, Scotland.

θΔics

In existographies, **Emile Durkheim** (1858-1917) (IQ:170|#351) [RGM:333|1,500+] (Scott 50:9) (HCR:22) (CR:36) was a French sociologist notable for his 1893 initiative to define a social system using some type of systems theory and or general systems theory, for providing, supposedly, the first solution to the Spencerian dilemma, and for his physical sociology like descriptions of human phenomena, such as suicides, religion, etc., in physics terms such as: forces, currents, heat, or electricity. [1]

Chemistry | Social compounds

In 1893, Durkheim, in his *Division of Labor in Society*, according to Daniel Rigney, employed the language of chemistry when he spoke of social cohesion and or bonding, or the formation of, supposedly, stable "social compounds"; see also: John Boodin, on similar Durkheim discussions. [12]

Overview

In 1953, English social anthropologist Jean Peristiany summarized Durkheim's overall theory as follows: [11]

> "**Durkheim** puts forward the thesis that society is a dynamic system and the seat of moral life. It is neither a mechanical robot not an organism limited by the structure and function of its organs and the possibilities of its environment. The Durkheimian individual is a *homo duplex*, both *I* and *We*. This is a polarity, not an antithesis, which is deeply rooted in his conception of society and of its moving forces."

(add discussion)

Forces | Currents

Durkheim is said to have borrowed terminology from the electrical sciences, such as 'collective forces' and 'currents', and thermodynamics. [3] He argued, for instance, that religions influence a 'dynamogeneic influence' on people; this term modeled, it seems, on the dynamo, a device that converts the mechanical motion, specifically of a rotating magnet located in a coil of wire, into electric current. [4]

In 1893, Durkehim, in his *The Division of Labour*, employed an organic analogy throughout, in which he used the language of 'collective forces' and 'social currents' and in general the analogy of thermodynamics and electricity. [7]

His 1897 monograph *Suicide* is said to be full of such language: for each people there was 'a collective force of a determinate amount of energy, impelling men to self-destruction' and such forces 'determine behavior from without, just like physico-chemical forces' and their strength can be measured 'as one does the strength of electric currents.' [7]

In a 1898 letter to the *American Journal of Sociology*, Durkheim argued that 'suicidogenic currents' of the way in which individuals are associated in the 'social organism' is chemical in the manner in which those individuals are transformed. To cite another example, at one point he reasoned to the effect that: [5]

> "Religious forces spread out and diffuse with extreme facility in the same way in which heat or electricity which a body has received from some external source may be transmitted to the surrounding medium."

It remains to be tracked down exactly what physical scientist Durkheim culled these extrapolation idea from?

Unbridgeable gap?

The following is a 1895 unbridgeable gap like statement by Durkheim, which stirred a certain amount of re-quoting and discussion: [8]

> "If we begin with the individual, we shall be able to understand nothing of what takes place in the group. In a word, there is between psychology and sociology the same break in continuity as between biology and the physico-chemical sciences. Consequently, every time that a social phenomenon is directly explained by a psychological phenomenon, we may be sure that the explanation is false."

by those including: Werner Stark (1962), Edward Wilson (1977), others (Ñº). [9]

Notes

It remains to be seen if Durkheim ever actually used the term 'thermodynamique' in his writings? The connection of Durkheim to thermodynamics may be a secondary interpretation by other authors, such as Steven Lukes (1982). [5] Durkheim, however, did, in general, seem to conceive of society as a system of forces. Durkheim, to note, was the general editor of the 1900 *Year in Sociology*, in which a one-page review of French sociologist Maurice Hauriou's 1899 book *Lessons on Social Movement*, by French sociologist Celestin Bougle, was found, describing Hauriou's attempt to explain social movement in terms of thermodynamics. [6]

Quotes | By

The following are notable quotes:

> "This obligation is the proof that these ways of acting and thinking are not the work of the individual but come from a moral power above him, that which the mystic calls 'god' but which can be more scientifically explained."
>
> — Emile Durkheim (1898), "Individual and Collective Representations"; in *Sociology et Philosophie* (1924) (pgs. 32-35); cited by Jennifer Hecht (2003) in *Doubt* (pg. 411)

> "Religious forces spread out and diffuse with extreme facility in the same way in which heat or electricity which a body has received from some external source may be transmitted to the surrounding medium."
>
> — Emile Durkheim (1912), *The Elementary Forms of Religious Life* (pg. 322)

> "This obligation is the proof that these ways of acting and thinking are not the work of the individual but come from a moral power above him, that which the mystic calls 'god' but which can be more scientifically explained."
>
> — Emile Durkheim (1898), "Essay" [13]

> "If the science *morals* and *law*, as we are trying to make it, were sufficiently advanced, it would be able to play in relation to moral facts the same role that astronomy plays in relation to astronomical facts. One would go to it in order to discover in what moral life consists. But this science of morality is only now being born, and the theories of philosophers coincide so little with our intentions, so little do they set themselves the object that we have in view, that they are unanimously opposed to our way of looking at and studying moral facts. They cannot, then, serve us as authorities in the same way. It would be very wrong, however, to suppose that I exclude them completely. I only deny them the prerogative and primacy that has too often been accorded to them. They also are instructive as facts. They teach us what passes in the public mind of one particular epoch and they must therefore be accounted for. What I refuse to admit is that they express moral truth in a particular eminent manner, in the same way that physics or chemistry expresses the truth about the order of things coming under the head of physico-chemical."

— Emile Durkheim (c.1900), “Replies to Objections: Philosophy and Moral Facts” [10]

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External links

â— Emile Durkheim – Wikipedia.

θΔics

In doubles, **Emile Durkheim 2** is []

→ **Emile Durkheim** (mobile; readable; NON-editable)
→ **Emile Durkheim** (online; readable) – WayBack (2016)
→ Emile Durkheim (hacked; Non-readable)

Emile Durkheim (1858-1917) (IQ:170|#351) [RGM:333|1,350+] (Scott 50:9) (HCR:22) (CR:17) was a French sociologist;

References

1.

In hmolscience, **Émile Meyerson** (1859-1933) was a Polish-born French chemist and philosopher noted, in philosophical thermodynamics, for his 1908 *Identity and Reality*, a Heraclitus vs Parmenides reconciliation aiming work.

Overview

In 1908, Meyerson, in his *Identity and Reality*, penned chapters such as mechanism, conservation of energy, Carnot's principle, etc., in which he attempted to show how science is the progressive rationalization of reality. [1]

The synopsis of Meyerson's *Identity and Reality*, according to American economics historian Philip Mirowski, is that he manages to update the age-old philosophical conflict between the sphere of Parmenides, representative of a search for identity and invariance, and the sphere of Heraclitus, representative of the flux, fire, diversity, and change philosophy.

Meyerson's thesis and book was an influential thematic springboard to Mirowski's 1989 book *More Heat than Light*. [2]

References

1. Meyerson, Émile. (1908). *Identity and Reality* (*Identité et Réalite*) (ch. 8: Carnot's principle, pgs. 259-90). Routledge.
2. Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics.* Cambridge University Press.

External links

- Émile Meyerson – Wikipedia.
- Identity and Reality (French → English) – Wikipedia.

θΔics

In existographies, **Emile Zuckerkandl** (1922-2013) was an Austrian-born American molecular evolutionist noted, for []

Overview

In 1976, Zuckerkandl, in chnopsology, posited an chemical affinity based genetic-evolution theory according to which evolution might consist of stabilizing labile characters by fixing new concentration ratios or new relations in affinity constants between activators and repressors, such that each new stabilization leads to some degree of labilization or other activator-repressor equilibria and where mutations result from decays in old affinity constants or increases in new ones. [1] The gist of his genetic evolution model, supposedly, is that: [2]

> Increases in affinity = increases in determinism
> Decreases in affinity = decreases in determinism

and that these two tendencies, when actuated between regulatory molecules and receptor genes, gives rise to genetic-based evolution, or something along these lines. In 1957, Zuckerkandl met American chemical engineer Linus Pauling, who he began to work with in the years to follow, which may be from whom he learned affinity chemistry.

Quotes | On

The following are quotes on Zuckerkandl:

> "The order of the battle is no different. It has been the *scientists*—Richard Dawkins, Victor Stenger, Taner Edis, **Emile Zuckerkandl**, Peter Atkins, Steven Weinberg (*vast mole superbus*)—who have undertaken a wide-ranging attack on religious belief and sentiment."
>
> — David Berlinski (2008), *The Devil's Delusion* (pg. 3) [3]

References

1. Zuckerkandl, Emile. (1976). "Programs of Gene Action and Progressive Evolution", in: *Molecular Anthropology: Genes and Proteins in the Evolutionary Ascent of the Primates* (pgs. 387-447) (editors: M. Goodman, R.E. Tashian, and J.E. Tashian). Plenum Press.
2. Brooks, Daniel R. and Wilson, Edward O. (1988). *Evolution as Entropy: Toward a Unified theory of Biology* (pgs. 157-60). University of Chicago Press.
3. Berlinski, David. (2008). *The Devil's Delusion: Atheism and Its Scientific Pretensions*. Publisher, 2010.

External links

â— Emile Zuckerlandly – Wikipedia.

θΔics

In existographies, **Emilie Chatelet** (1706-1749) (IQ:180|#45) [RGM:649|1,500+] (CR:20) was a French mathematician and physicist noted for her circa 1740 postulate that living force or *vis viva* (kinetic energy) could be converted into dead essence or *vis mortua* (potential energy) and that the sum of the two quantities, being interconvertable, would remain constant, a conclusion she supposedly derived during her translation into French of Isaac Newton's *Principia*.

Chatelet's theory of the interconversion of vis viva and vis mortua is said to be a forerunner to the conservation of energy; as well as to the Lagrangian and Hamiltonian. [1]

Education

In 1722, before age 16, Chatelet had begun beading Descartes' analytic geometry.

In 1733, Chatelet began to take lessons advanced geometry and algebra with Pierre Maupertuis. [2]

Romance

Chatelet was not only romantically linked to Voltaire, and Pierre Maupertuis, who was her tutor, but also, interestingly, to extreme atheist thinker Julien la Mettrie. [3]

Gravesande

In 1720, Dutch physicist Willem Gravesande conducted an experiment in which brass balls were dropped with varying velocity onto a soft clay surface; the possible experimental apparatus (see: Leiden University) of which shown below:

Built and ran her own research lab at Chateau de Cirey, pictured, from 1734-1749, said to have a library comparable to the Paris academy of sciences; scientist such as Samuel Koenig and Johann Bernoulli would stay for weeks or months at a time.

Gravesande found in his experiments that a ball with twice the velocity of another would leave an indentation four times as deep, that three times the velocity yielded nine times the depth, and so on. He shared these results with Chatelet, and with Voltaire (Chatelet's companion), after which she subsequently corrected Newton's formula $E = mv$ to $E = mv^2$.

In her 1740 *Lessons in Physics*, Chatelet, supposedly, combined the theories of Gottfried Leibniz and the practical observations of Dutch physicist Willem Gravesande to show that the energy of a moving object is proportional not to its velocity, as had previously been believed by Newton, Voltaire and others, but to the *square* of its

velocity. Hence it is said that where as Gravesande provided the experimental data for the formula of kinetic energy, Chatelet provided the formulaic explanation.

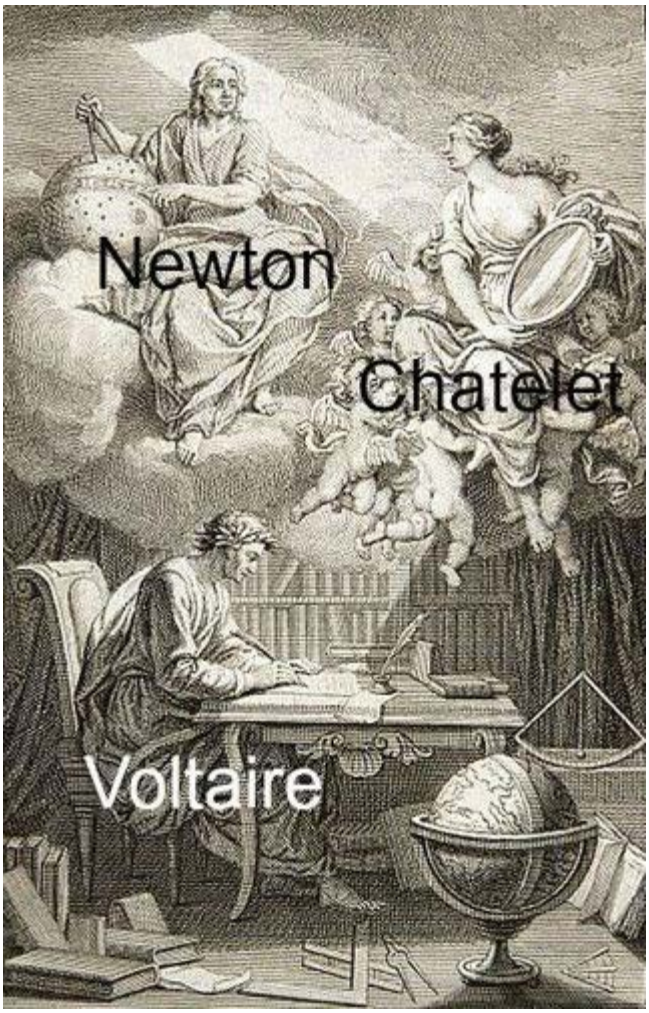

The frontispiece to Voltaire's interpretation of Isaac Newton's work, *Elémens de la philosophie de Newton* (1738), the philosophe sits translating the inspired work of Newton. Voltaire's manuscript is illuminated by seemingly divine light coming from Newton himself, reflected down to Voltaire by a muse, representing Voltaire's lover Émilie du Châtelet—who actually translated Newton and collaborated with Voltaire to make sense of Newton's work. (Q)

Quotes | On

The following are related about quotes:

> "My youngest flaunts her mind and frightens away the suitors."
>
> — Louis Breteuil (c.1724)

> "She speaks with great rapidity ... her words are like an angel."
>
> — Anon (1726), early lover

> "In 1733, I met a young lady who happen to think nearly as I did."
>
> — Voltaire (c.1740)

> "Mme **Du Chatelet**, at the height of her career, [was] a self-proclaimed mathematician and physicist, acknowledge in her own lifetime as a genius, [and] accorded the title of philosopher by her contemporaries."
>
> — Judith Zinsser (2006), *Emile Du Chatelet: Darling Genius of the Enlightenment* [2]

Quotes | By

The following are noted quotes:

> "God behaves like a strange king who wanted to test the obedience of his subjects on ridiculous things, and who punished them afterward well beyond their crimes. If only Adam and Eve had been punished, one could strive to save the conduct of God from the reproach of malignity and injustice. But it is claimed that the entire race of men was cursed for this mistake, and that we all carry the burden of Adam's sin, a burden that is no less than our eternal damnation."
>
> — Emile du Chatelet (c.1740) (Q)

> “If I were king, I would redress an abuse which cuts back, as it were, one half of human kind. I would have women participate in all human rights, especially those of the mind.”
>
> — Emile du Chatelet (c.1740), *Selected Philosophical and Scientific Writings*

References

1. Bodanis, David. (2000). *E = mc² : A Biography of the World's Most Famous Equation* (Emile du Chatelet, pgs. 19+; esp. x, 58-67). Berkley Books.
2. Zinsser, Judith. (2006). *Emilie Du Chatelet: Daring Genius of the Enlightenment* (pg. 6; Maupertuis, pg. 61). Penguin.
3. Israel, Jonathan I. (2006). *Enlightenment Contested* (pg. 795-96). Oxford University Press.

Further reading

- Bodanis, David. (2009). *Passionate Minds: Emile du Chatelet, Voltaire, and the Great Love Affair of the Enlightenment*. Random House.
- Du Chatelet, Emilie. (2009). *Selected Philosophical and Scientific Writings* (editor: Judith Zinsser). University of Chicago Press.
- Arianrhod, Robyn. (2012). *Seduced by Logic: Emile Du Chatelet, Mary Somerville and the Newtonian Revolution*. Oxford University Press.

External links

- Emilie du Chatelet – Wikipedia.

θΔics

In existographies, **Emmanuel Maignan** (1601-1776) was a French physicist and theologian, noted for []

Overview

In 1653, Maignan, in his four-volume *Course on Natural Philosophy*, gave the most detailed account, of four known accounts, including those by: Magiotti, Zucchi, and Kircher, of the 1639 Berti vacuum experiment. [1]

Maignan, in his Berti vacuum discussion, offers (Q) the argument that the reason the bell can be heard in the vacuum is that vibratory motion of the bell is conducted through the solid mounting and into the air.

Quotes | On

The following are quotes on Maignan:

> "In the 1640s, Berti's experiment appears to have remained entirely unknown except to the people actually involved, until Magiotti wrote to Mersenne in 1648 and Zucchi published his anonymous pamphlet in the same year. Who actually saw it, besides Berti? Certainly, Kircher, Magiotti, and Zucchi (Q); and as we have seen, **Maignan** knew all about it. De Waard (1936) thinks Michelangelo Ricci (Q) may have been there, but there is really no direct evidence for this assumption; nor is there any reason to believe that Torricelli witnessed the experiment. If Ricci was there, it would be strange if Torricelli did not hear of it from him, as Ricci was his mathematical executor. But Magiotti, near the end of the letter from which we have already quoted, specifically states that he wrote to Torricelli about the experiment, with the suggestion that if the water had been sea water, it would have stood lower in the tube. 'They', presumably Torricelli and Viviani (Q), he tells Mersenne, 'made experiments and finally came to the use of quicksilver'."
>
> — William Middleton (1964), *The History of the Barometer* (pg. 19) [1]

Quotes | By

The following are quotes by Maignan:

> "At length, when the tap R was opened the water flowed, contrary to the hope of many (e.g. Athanasius Kircher and Nicolo Zucchi), out of the pipe into the cask EF, to an easily observable height; but not all of it flowed out, and it soon stood quite still. This was clear, because a *mark was made in the cask* at the surface of the water, and next day it was found that the water in it had remained exactly at the mark although the tap R had been open all the time. Then, when this tap R had been carefully closed again, the screw D was taken out above. And as soon as it was taken out, **behold [!] the air rushed in with a loud noise, filling the space** previously abandoned by the water. Then by lowering a sounding-line, it was determined how much water was inside, or rather to what height the water stood in the tube, and it was found to stand about 18 cubits above the level of the water in the cask, at mark L."
>
> — Emmanuel Maignan (1653), *Course on Natural Philosophy*

References

1. (a) Maignan, Emmanuel. (1653). *Course on Natural Philosophy: physical things from the embers of this harmoniously formed by the best known from the law of nature in particular with regard to each one principles and experiments in various places demonstrated, and the data of the senses* (*Cursus philosophicus: concinnatus ex notissimis cuique principiis - ac praesertim quod res physicas instauratas ex lege Naturae sensatis experiments passim comprobata*, *Volume One*; *Volume Two*; *Volume Three*, *Volume Four*). Publisher.

(b) Waard, Cornelis. (1936). *The barometric experience: its antecedents and explanations; historical study* (*L'expérience barométrique: ses antécédents et ses explications; étude historique*). Publisher.
(c) Middleton, William. (1963). "The Place of Torricelli in the History of the Barometer" (abs), *Isis*, 54(1):11-28.
(d) Middleton, William E. (1964). *The History of the Barometer* (pg. 19) (Amz). Publisher.

External links

- Emmanuel Maignan – Wikipedia.
- Emanual Maignan – Galileo Project.
- Emmanuel Maignan (Spanish → English) – EstudiosMinimos.eu.

θΔics

In existographies, **Emmett L. Williams** (c.1935-) is an American materials scientists, metallurgical engineer, and creationism scientist noted for []

Overview

In 1974, Williams published *Physical Science for Christian Schools*, co-authored with George Mulfinger, the abstract of which is as follows: [1]

> "This book is not just another textbook. It has been designed by Christians "from the ground up" for use specifically in Christian schools. For some time we have felt that it was simply not enough to put a child in a Christian school where he took a course using humanistic books, with hopefully some supplementary material from a Christian viewpoint. We have attempted to put science in its proper historical and biblical perspective: it is the work of men and is thus imperfect and changing. As scientists, we have found that true science always reaffirms the inerrancy of the Scriptures."

Here we are reminded of Mirza Beg, who, with similar educational background to Williams, similarly attempted, in the 1980s, to present physical science in alignment with scriptures, albeit Quranic scriptures.

In 1978, Williams, in his *Chemistry for Christian Schools: Expansion Text and Lab Manual for Use with Physical Science for Christian Schools*, supposedly outlined a version of chemistry compatible with Christianity. [2]

In 1981, Williams edited *Thermodynamics and the Development of the Order*, which included a chapter by Duane Gish entitled "The Origin of Biological Order and the Second Law", and a chapter by Williams entitled "Resistance of Living Organisms to the Second Law", both cited by Martin Goldstein (1995). [3]

Education

Williams completed his BS and MS in metallurgical engineering and his PhD in materials science at Clemson University, after which he taught thermodynamics, modern physics, solid state physics, physical chemistry and metallurgy, supposedly, at a Christian university. He was on the board of directors of Creation Research Society for 30 years. [4]

References

1. Williams, Emmett L. and Mulfinger, George. (1974). *Physical Science for Christian School* (abs). Bob Jones University Press.
2. Williams, Emmett L. (1978). *Chemistry for Christian Schools: Expansion Text and Lab Manual for Use with Physical Science for Christian Schools*. Bob Jones University Press.
3. (a) Williams, Emmett L. (1981). *Thermodynamics and the Development of Order* (S: "The Origin of Biological Order and the Second Law", pgs. 67-90; §:"Resistance of Living Organisms to the Second Law", pgs. 91-110). Creation Research Society.
(b) Goldstein, Martin and Goldstein, Inge F. (1993). *The Refrigerator and the Universe: Understanding the Laws of Energy* (pg. 418). Harvard University Press.
4. Emmett L. Williams – Creation.com.

Further reading

â— Reed, John K. and Williams, Emmett L. (2011). "Battlegrounds of Natural History: Naturalism" (pdf), Creation Research Science Quarterly, Fall.

External links

â— Emmett L. Williams, Jr. (about) – ChristianAnswers.net.

θΔics

In existographies, **Emmy Noether** (1882-1935) (IQ:170|#416) [RGM:542|1,500+] (Siegfried 10:1) (CR:7) was German mathematical physicist noted for []

Overview

In 1907, when Einstein was asked to write a review of relativity, and while working with David Hilbert to extend special relativity to form general relativity, they decided to bring on Noether as a consultant to help solve the problem of how the conservation of energy integrates into relativity. (Ñº)

In 1918, Noether used group theory to show that to every invariance or symmetry property of a physical law corresponds a conservation principle, and vice versa, aka Noether's theorem. Her theorem, supposedly, reconceptualized energy as an algebraic property in a system of operators, on invariance condition among many. [1] Noether's theorem is said to have implications for the definition of energy as a substance and have some type of relationship to the conservation of energy.

David Hilbert, her teacher, and Albert Einstein, and others, have characterized her as the most important woman in the history of mathematics.

Quotes | On

The following are quotes on Noether:

> "In the judgement of the most competent living mathematicians, Fraulein **Noether** was the most significant creative mathematical genius thus far produced since the higher education of women began."
>
> — Albert Einstein (1935), "Letter to New York Times" (Ñº)

> "**Noether** was the greatest female mathematician ever. Noether's theorem is a profound statement, perhaps running as deeply into the fabric of our psyche as the famous theorem of Pythagoras. Noether's theorem directly connects symmetry to physics, and vice versa. It frames our modern concepts about nature and rules modern scientific methodology. For scientists it is the guiding light to unraveling nature's mysteries, as they delve into the innermost fabric of matter."
>
> — Leon Lederman (2004), *Symmetry and the Beautiful Universe* (Ñº)

References

1. Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (pg. 71, 74). Cambridge University Press.

External links

â— Emmy Noether – Wikipedia.

θΔics

In terminology, **emotion** (TR=120), from the Latin *e-* 'away' + *-movere* 'to move', is a state or psycho-physical reaction, subjectively experienced as a strong feeling, physiologically involving changes that prepare the body for immediate vigorous action; used first in the 1570s in the sense of 'a (social) moving, stirring, agitation'. [1]

A rendition of near-equilibrium, "hot and cold", up and down, relationships as **emotional** roller coasters. [4]

The rate (Ñº) at which people (human molecules), according to video recorded studies, absorb, process, and emit field particles, or emotional current, is 15-cycles per second. [6]

In 2011, American literature science scholar Richard Sha gave a talk on "The Chemistry and Physics of Romantic Emotion", the opening abstract of which is as follows: [2]

> "This essay considers what it means to think of the **emotions** in terms of physical force and chemical affinity and the role that romantic science played in making the emotions manageable. Emotion of course is etymologically connected to motion, and is derived from the Latin to move and to move out. I turn to physics and chemistry, the two disciplines that had the most to say about movement, to challenge the popular view that emotions embody subjectivity, and consequently to resist the narrow framing of emotions as a site of psychological intensity."

Quotes

The following are related quotes:

> All great movements are popular movements. They are the volcanic eruptions of human passions and **emotions**, stirred into activity by the ruthless goddess of distress or by the torch of the spoken word cast into the midst of the people."
>
> — Adolf Hitler (1925), *Mein Kampf* [5]

> "In such accounts, mathematicians feature prominently as exemplars of the dehumanization process. This is comically expressed in William Rankine's poem 'The Mathematician in Love' (1874). The mathematician is mocked for his inability to related emotionally to the young lady, and his obsession with formulas is duly punished in the living world, where **emotions** rather than abstractions are the accepted currency."
>
> — Roslynn Haynes (1994), *From Faust to Strangelove* [3]

See also

â— Emotional thermodynamics

References

1. (a) Emotion – Merriam-Webster Collegiate Dictionary, 2000.
(b) Emotion – Online Etymology Dictionary.
2. Sha, Richard C. (2011). "The Chemistry and Physics of Romantic Emotion" (abs), Given at the "Mastering Emotions" Conference at Queen Mary, University of London in June.
3. Haynes, Roslynn. (1994). *From Faust to Strangelove: Representations of the Scientist in Western Literature* (pg. 85). John Hopkins University Press.
4. Thims, Libb. (2009). "Hot N Cold: Relationships | Katy Perry" (5:43-min; rollercoaster at 4:30), Human Chemistry

101, YouTube, Mar 4.
5. Hitler, Adolf. (1925). *Mein Kampf, Volume 1* (ch. 3) (Ñº). Publisher.
6. Thims, Libb. (2007). *Human Chemistry (Volume One)* (Gottman stability ratio, pgs. 179-82). Morrisville, NC: LuLu.

External link

â— Emotion – Wikipedia.

θΔics

In psychological thermodynamics, **emotional thermodynamics** is the thermodynamical study of emotions, particularly in regards to viewing emotion as a type of energy that acts, in the mind, according to the conservation of energy or the conservation of force.

Etymology

The concept of emotional thermodynamics, according to emotion theorist James Hillman, originated in the 1943 theories of American psychologist Helen Dunbar, based on the foundational energy psychology theories of Austrian psychologist Sigmund Freud, considers emotion as energy analogous to the way in which heat is generated chemically and electrically. Her oft-quoted enunciation of this logic is as follows: [1]

> "The basic law of Freud's work, which now is a basic law of general psychiatry as well, may thus be called the 'first law of **emotional thermodynamics**' or conservation of vital energy."

In this passage, to note, which seems to have caused a certain amount of stir in psychology community, is a misattribution, in the sense that Freud, a student of the anti-vitalism Helmholtz school, did not believe in the concept of "vital energy", and thus this although he did believe in the concept of the conservation of emotional energy, as explained in his id, ego, super ego theory, the above passage seems to have been a slanted version of Freud's theory suitable to Dunbar's agenda, which seems to have been religious in underlying matter, as evidenced by the fact that her undergraduate work was in theology, and what have been called her later "interests in integrating religion and science". [2]

Interestingly, vital issues aside, Dunbar devotes about six pages of discussion to her concept of "emotional thermodynamics", discussing the likes of Sadi Carnot, James Joule, and William Thomson, and postulating how somatic short circuits may occur when certain "quantums of energy" get discharged in the wrong directions or are blocked.

In a 1945 book review of Dunbar's emotional thermodynamics theory, psychologist Franz Alexander, supposedly, "challenges the application of the laws of thermodynamics in this way to the theory of emotion. [3]

References

1. (a) Dunbar, Helen Flanders. (1943). *Psychosomatic Diagnosis* (thermodynamics, 7+ pgs; emotional thermodynamics, pgs. 650-57). New York.
(b) Hillman, James. (1999). *Emotion* (emotional thermodynamics, pg. 70-71, 78). Psychology Press.
2. (a) Helen Flanders Dunbar – Psych.YorkU.ca.
(b) McGovern, Constance M. (2000). "Helen Flanders Dunbar", Webster.edu.
3. (a) Alexander, F. (1945). "Book Review of *Psychosomatic Diagnosis*", in *Psychosomatic Medicine*, pg. 46.
(b) Hillman, James. (1999). *Emotion* (pg. 71). Psychology Press.

θΔics

In terminology, **Empedoclean** (TR:6) refers to the work, philosophy, theories, ideas, and or models of Greek philosopher Empedocles (490-430BC), who espoused a four element (earth, air, water, fire) and two force (attraction, repulsion) model of existence and universal operation; and who is also known for his chemical aphorisms of human behavior.

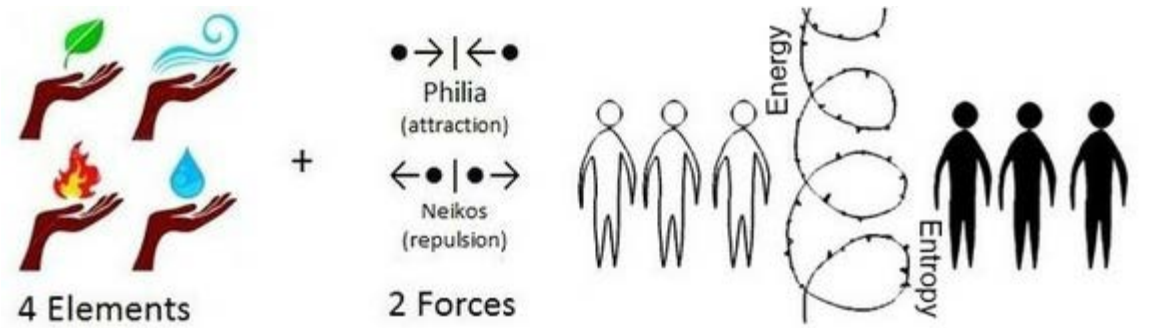

A generic model of an **Empedoclean** belief system, which adheres to the view that the universe is comprised of elements and forces and that people, made of these elements, depending on likes and dislikes, will attract or repel, depending, similar to the way oil and water will separate, in dislike-situations, or the way water and wine will mix, in like-situations; the right side shows a racial thermodynamics conception, according to which separations, mixings, bondings, and or aggregations, will depend on energy and entropy differentials.

The term or phrase Empedocleanism, is an example of one of the dominate godless belief systems (Q); a belief system comparable to, a contrast to, or of the stature of: Heracliteanism, materialism, Epicureanism, Cartesian atheism, Spinozism, Newtonian atheism, Epicurean materialism, Darwinism, Nihilism, existentialism, among others. (Q)

Quotes

The following are example quotes:

> "We are but atomic geometries, moving about cyclically on a surface, via the action of forces, powered by the heating of the sun, embedded in a partially understood spin coupled Leucippean-**Empedoclean** universe."
>
> — Libb Thims (2014), mental note (Q)(Q), Jan 27 @ 1:05PM CST

> "I must be a Democritean, **Empedoclean**, Epicurean, Goethean, Maxwellian, Adamsian, Paretian, Hendersonian, Rossinian infused thinker?"
>
> — Libb Thims (2014), mental documentation note (Q), per discovery and ordering of Bruce Hunt's 1994 *The Maxwellians* (Q) 3:52 PM CST, Sep 22

External links

- Empedoclean – Wikionary.
- Empedoclean – Merriam-Webster.com.

θΔics

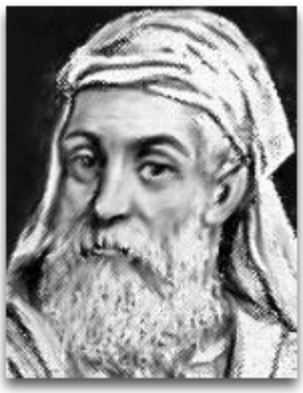

In existographies, **Empedocles** (495-435 BCM) (2245-2185 BG) (IQ:190|#24) (Cattell 1000:896) [RGM:401|1,500+] (ACR:11) (FA:8) (EvT:5|21+) [CR:276] was a Greek philosopher, born (reaction start): Acragas, Sicily (then: Greece | now: Italy); died (reaction end): Peloponnese (Greece), noted for his circa 450BC treatise *On Nature*, of which there are about 450 lines of poem extant, including 70 lines which have been reconstructed from some papyrus scraps known as the *Strasbourg Papyrus*. The poem outlines his philosophical system, explaining not only the nature and history of the universe, including his theory of the four classical elements, but he describes theories on causation, perception, and thought, as well as explanations of terrestrial phenomena and biological processes.

Living things | Other things

Empedocles, supposedly, makes a distinction between "living things" and "other things"; some example quotes of which are as follows:

> "Empedocles, then, thinks that sense-perception and thinking occur thus; but from what he says one might wonder first of all how 'living things' differ from 'other things' with respect to sense-perception. For things fit into the pores of 'lifeless things' too; for in general he says that mixture occurs by a symmetry of pores. That is why oil and water do not mix [N1], but other fluids do, as indeed do other substances whose proper blends he lists. Consequently, everything will perceive and mixture, sense-perception, and growth will be the same process. For he makes them all [occur] by the symmetry of pores, unless he add some differentiating feature."
>
> — Author (c.300BC), "Testimonia #12", in: *The Poem of Empedocles* (pg. 198) [14]

> "In living things themselves why will the fire inside the animal do the perceiving rather than the fire outside, if indeed they fit into each other? For they possess both symmetry and likeness. Moreover; there has to be a difference [between them] if it itself [i.e. internal fire] cannot fill up the pores but the external fire does so as it enters. Consequently, if it was like in all respects and in all circumstances, there would be no perception. Moreover, are the pores full or empty? For if they are empty, he would turn out to be contradicting himself — for he says that there is absolutely no void. [N1] But if [the pores] are full, animals would always perceive. For if it is so obvious that, as he says, what is like fits into them."
>
> — Author (c.300BC), "Testimonia #13", in: *The Poem of Empedocles* (pg. 198) [14]

The "internal fire" (found inside of a living thing) vs "external fire" (e.g. camp fire) distinction, here, would seem to be similar to the attempts at a "bio-Gibbs energy" (driving humans, animals, plants, etc.) vs "Gibbs energy" distinction attempt made by Mark Janes.

Atheism | Polytheism

Empedocles is oft-classified as an early atheist; the following quote is representative of this view:

> "If horses could draw, god would have four limbs and run very fast."
>
> — Empedocles (c.450), attributed aphorism (Ñº); most (Walsh, 1997), however, attribute saying to Xenophanes

Theophilus (c.120-184) (Ñº) believed that Empedocles "taught atheism", about which he says as follows: [12]

> "For it was fit that they who wrote should themselves have been eye-witnesses of those things concerning

> which they made assertions, or should accurately have ascertained them from those who had seen them; for they who write of things unascertained beat the air. For what did it profit Homer to have compose the Trojan war, and to have deceived many; or Hesiod, the register of the theogony of those whom he calls gods; or Orpheus, the three hundred and sixty-five gods, whom in the end of his life he rejects, maintaining in his precepts that there is one god? What profit did the sphaerography of the world's circle confer on Aratus, or those who held the same doctrine as he, except glory among men? And not even that did they reap as they deserved. And what truth did they utter? Or what good did their tragedies do to Euripides and Sophocles, or the other tragedians? Or their comedies to Menander and Aristophanes, and the other comedians? Or their histories to Herodotus and Thucydides? Or the shrines and the pillars of Hercules to Pythagoras, or the Cynic philosophy to Diogenes? What good did it do Epicurus to maintain that there is no providence; or **Empedocles** to teach atheism (see: atheism professor); or Socrates to swear by the dog, and the goose, and the plane-tree, and AEsculapius struck by lightning, and the demons whom he invoked? And why did he willingly die? What reward, or of what kind, did he expect to receive after death? What did Plato's system of culture profit him? Or what benefit did the rest of the philosophers derive from their doctrines, not to enumerate the whole of them, since they are numerous? But these things we say, for the purpose of exhibiting their useless and godless opinions."

Irenaeus (130-202AD) viewed most of the pre-Socratics as "atheists" in their materialist explanations of the origin of the world, including: Homer, Thales, Anaximander, Empedocles, and Anaxagoras. Clement of Alexandria (150-215), likewise, saw Thales, Anximenes, Diogenes of Apollonia, Parmenides, Heraclitus, Empedocles, and all of the atomists as such. [13]

God

In 45BC, Cicero, in his *On the Nature of the Gods*, describes Empedocles' concept of god as follows: [15]

> "Empedocles notion of god is the most distasteful lapse. He would have it that the four elements, from which he maintains that all things originate, are divine, though it is obvious that the elements come into existence and are destroyed, and lack all sensation."

(add)

Life / Synthesis | Death / Analysis

> *See main: Death does not exist*

The following quote statement by Empedocles on the falsity of belief in life and death is renowned:

> "There is neither birth nor death for any mortal, but only a combination and separation of that which was

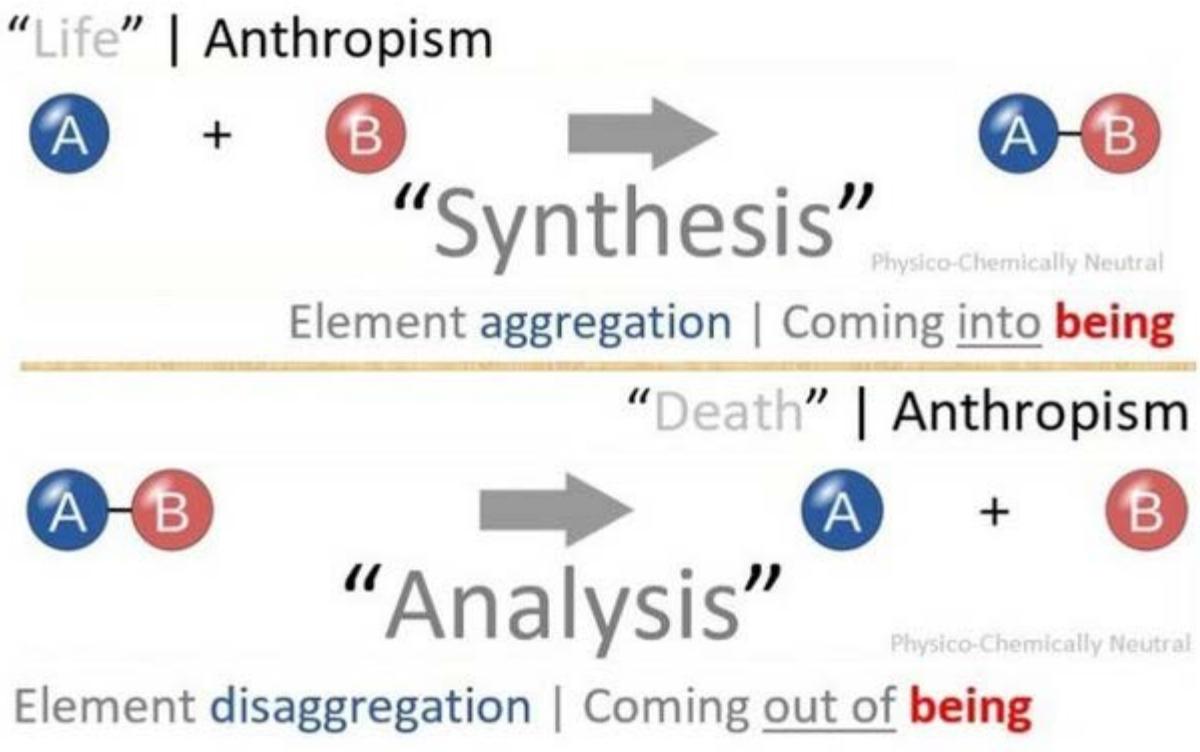

combined, and this is what amongst laymen they call 'birth' and 'death'. **Only infants or short-sighted persons imagine** any thing is 'born' which did not exist before, or that any thing can 'die' or parish totally."

The models of re-interpretation of "life" and "death", of **Empedocles**, according to which "coming into being" (aka LIFE in layspeak) is but the "co-mingling" of the elements and "coming out of being" (aka DEATH in layspeak) is but the "separation" of the elements. This view is corroborated by Charles Sherrington (1938) who sees life and death as but anthropisms that disappear from the scene when chemistry and physics enter.

— Empedocles (c.450BC), Fragment I21 / DK8 + Fragment I23 / DK11; cited by Baron d'Holbach in *The System of Nature* (pg. 27); cited by cited by Alfred Lotka (1925) in *Elements of Physical Biology* (pg. 185, 246)

"When the elements have been 'mingled' in the fashion of a man, and come to the light of day, or in the fashion of the race of wild beasts or plants or birds, then men say that these 'come into being', and when they are 'separated', they call that in common parlance, death .... let not the error prevail over the mind that there is any other source of all the perishable creatures that appear in countless numbers."

— Empedocles (c.450BC), cited by Alfred Lotka (1925) in *Elements of Physical Biology* (pg. 185) [11]

"There is no coming into being of aught that perishes, nor any end for it .... but only mingling, and separation of what has been mingled."

— Empedocles (c.450BC), cited by Alfred Lotka (1925) in *Elements of Physical Biology* (pg. 246) [11]

In other words, in modern parlance, using the adjacent diagram for illustration, when an atomic aggregate or "being" comes into existence, e.g. carbon monoxide CO, we do not say that it gains "life" or conversely that when it is separated, and goes out of being, into its components, that it "dies", because chemistry and physics to not see things this way. This logic, according to Empedocles, applies to other larger atomic formations, such as plants, animals, or humans.

There general non-death and non-birth ideology, to note, is also found, sometimes, attributed to the sayings of **Leucippus** (c.500-450BC) or Anaxagoras (500-428BC) two contemporaries of Empedocles, albeit of different branches

of the tree of Greek philosophy.

> "Birth is the aggregation of atoms, death is their disaggregation or destruction of atomic composite, without anything being derived from nothing and nothing going into anything in the process."
>
> — Leucippus (c.460BC), and or the analogous views of **Empedocles** and Anaxagoras [7]

Greek philosopher Anaxagoras (500-428BC), like Empedocles, was also said to have held the atomic theory view that "birth is the aggregation of atoms, and death is their disaggregation or the destruction of the atomic composite, without anything being derived from nothing and nothing going into anything in the process. [7]

Empedocles, according to James Forlong (1906), believed in transmigrations of souls and that life and death are mere questions of mixture and separation. [6]

Works

It is thought that he left almost 5,000-lines of poetry, of which a few hundred have come down to us. (Ñº) Traditionally, Empedocles extant works, in the form of two separate poems, are usually called "Physics" and "Purifications". [9]

Education

Empedocles was a disciple of Parmenides (ACR:11) (Ñº); his work also is said to show signs of Pythagoreanism (see: Pythagoras); the two great scholars of southern Italian philosophical movement; a place Empedocles is said to have visited. [9] Empedocles, according to another view, student of Pythagoras and his teachings and that he was afterwards convicted of having divulged his doctrines, as reported by Timaeus the Pythagorean (Ñº), who of note many have been a fictional character of Plato. (Ñº) He is said to have also embraced the atomic theory of Democritus. [6]

Overview

In 1907, Scottish engineer and comparative religions scholar James Forlong penned the following entry on Empedocles: [6]

> **Empedokles**: a native of Sicily, about 450BC. He was a man of wealth and learning, who embraced the atomic theory of Demokritos (see: that heading), and affirmed that all nature evolved under

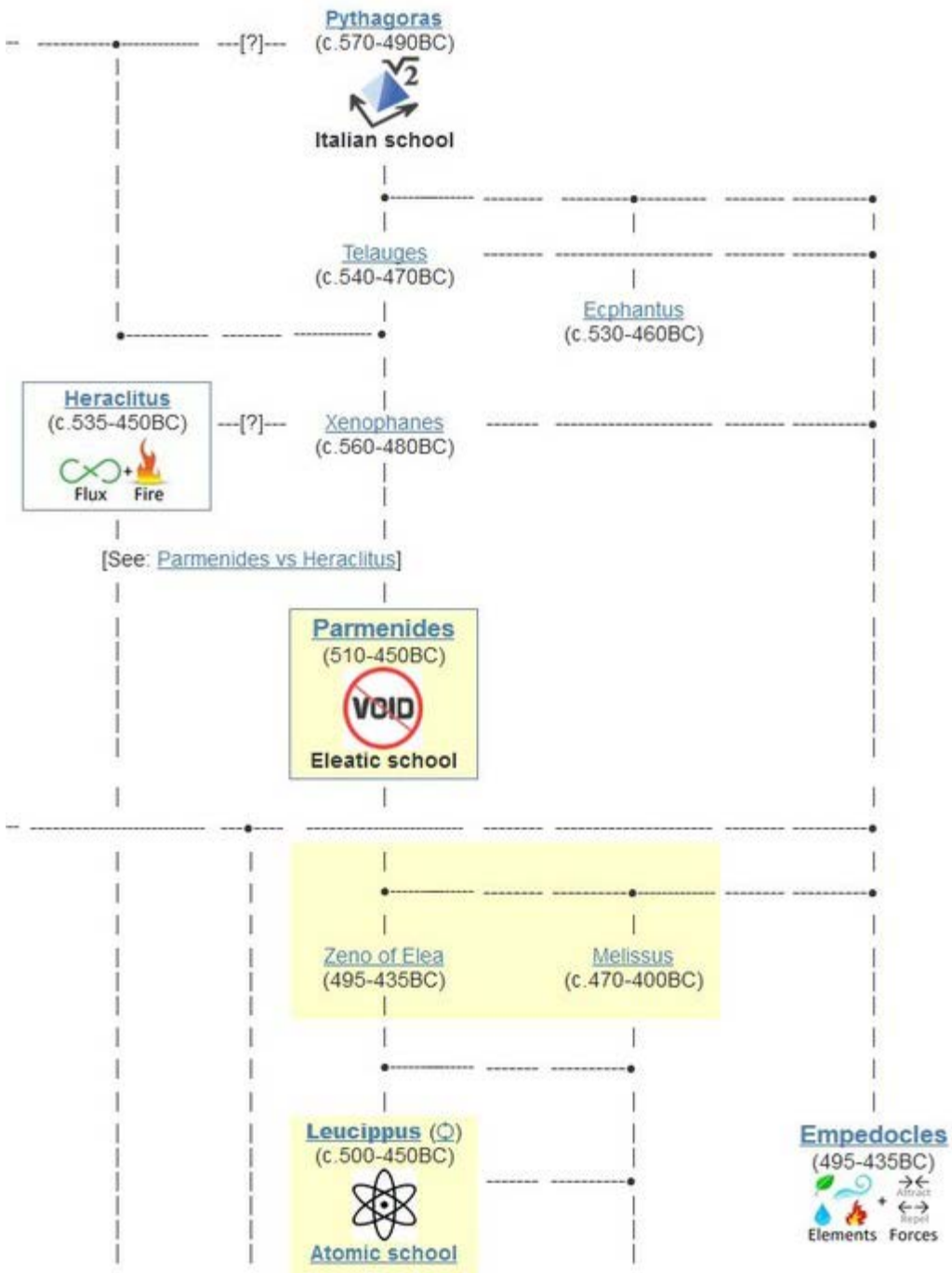

A general diagram, from the Greek philosophy tree, of the intellectual influence on **Empedocles**, specifically that of: Pythagoras, Telauges, Xenophanes, Anaxagoras, and Parmenides.

fixed laws, without the interference of the gods. With poetic fancy he spoke of atoms combined or separated through love and hate. He thus anticipated our modern theory, and our discoveries as to attractions and repulsions. He said that unfit combinations endured only for a time, to be succeeded by others, and that matter was but the combination of unalterable and substantial atoms, which he called "the roots of things." He distinguished four elements, fire, air, water, and earth, deified, he said, as Zeus, Hera, Nestis, and Aidoneus. These he supposed to be simple elementary substances, eternal and unalterable, which united mechanically according to properties of attraction and repulsion. He conceived them to be constituted by spheres of pure existence, offering equal resistance in every direction, and embodying the ideas of pure divinity, united by Love. Like the Eleatiks he spoke of a "holy and infinite Spirit passing through the world with rapid thoughts ... an eternal power of Necessity " (see Prof. Brandis. Smith's *Dicty. Gr. and Rom. Biogr.).*

Empedokles insists on good moral conduct, as the best preventive of disease, since all things so follow their natural course. He was extolled as an "averter of evils," and even as a "controller of storms," his disciples saying that he accomplished this miraculously: that he drained marshes, and quelled noxious winds, and

epidemics: that he cured strange malignant diseases, and prolonged lives. He was supposed to desire that men should regard him as being an incarnate god. It was an age of varied movements; and Empedokles was acquainted with Anaxagoras, Parmenides, Pausanias, and the Pythagoreans; he was also said to have visited Magi. He believed in transmigrations of souls; and Aristotle places him among the "lonik" physiologists, holding that an existence could as little be supposed to pass into non-existence as that the non-existent could pass into existence, since "from nothing nothing comes." Thus a complete final annihilation (of the universe), is, he said, impossible; and life and death are mere questions of mixture and separation.

In 1910, English-born American philosopher Henry Bray said the following on Empedocles: [10]

> "**Empedocles** (500BC) held that in the beginning all matter existed undifferentiated as one universal sphere; that all matter is really one; that all the various forms possible are but the result of mixture and change."

In 1987, American philosopher Eugene Bales gave the following summary of Empedocles' philosophical system: [5]

> "**Empedocles** accepted Parmenides' notion of being as uncreated and indestructible. However, he held that motion was real. His explanation of motion is of some interest. Being is made up of four chief kinds of atoms: earth, air, fire, and water. Each object in sense-perception is constituted of different arrangements or combinations of these four kinds of atoms. The movement of these atoms occurs because of the universal principles of love and hate, that is, of attraction and repulsion. Thus the atoms, like Parmenides' being, are eternal and unchangeable by nature; but, like the logos of Heraclitus, they do move according to principles which are forever in conflict."

In 2000, ancient Greek philosophy scholars Mar Cohen, Patricia Curd and C. Reeve gave the following synopsis of Empedocles, after having examined the 1990s discovered newly-discovered 74-lines of papyrus fragment poetry: [9]

> "**Empedocles** claimed that the numerous basic realities of the cosmos are entities with the features of basic reality for which Parmenides had argued. Although these basic entities are eternally real and unchanging in their natures, their mixture and separation cause the world of the senses.
>
> Empedocles says that there are six such basic things in the cosmos, each a genuine being in the Parmenidean sense: the 'roots' (as Empedocles refers to them) earth, water, air, and fire (later called 'elements' by Aristotle), and two forces, love [attraction] and strife [repulsion]. The roots are mixed and separated (by love and strive) to produce the world that we sense and are made part of this mixture and separation take the place of coming-to-be and passing-away, since the ingredients remain all though the changes.
>
> In selections 87 (B96) and 88 (B98) Empedocles provides 'recipes' for such phenomenal things as bone and blood. At the same time, under the waxing and waning of the comparative strengths of the forces of love and strife the cosmos undergoes cycles from complete mixture of the roots to their complete separation: how many cycles there are, and the events within those cycles are subjects of controversy among commentators.
>
> Within these cycles, living things come to be and pass away; Empedocles' system includes 'daimones' (singular, daimon) [see: Goethe's daimonic] which are divinities of some sort. These *daimones* undergo many lives, apparently because of some transgression. Although they, like the gods, are called 'long-lived' by Empedocles, they are not immortal, for they, like the roots of which they are made, are all absorbed into

the complete mixture of the roots at the height of love's power. Only the roots and love and strife are genuinely immortal, subject neither to coming-to-be or passing-away. The destiny of the daimones is connected with the sorts of lives they lead, and it is the nature, behavior, and fates of the daimones that Empedocles' natural and religious views come together."

(add discussion)

Empedocles + Goethe | Water, wine, and oil

See main: Goethe + Empedocles

The following are a historical selection of the development over time of Empedocles' most famous water, wine, oil, friends, and enemies quotes, wherein, to note, the full quote fragment containing all five key points (water, wine, oil, friends, and enemies) is not extant, but seems to be aggregate over time :

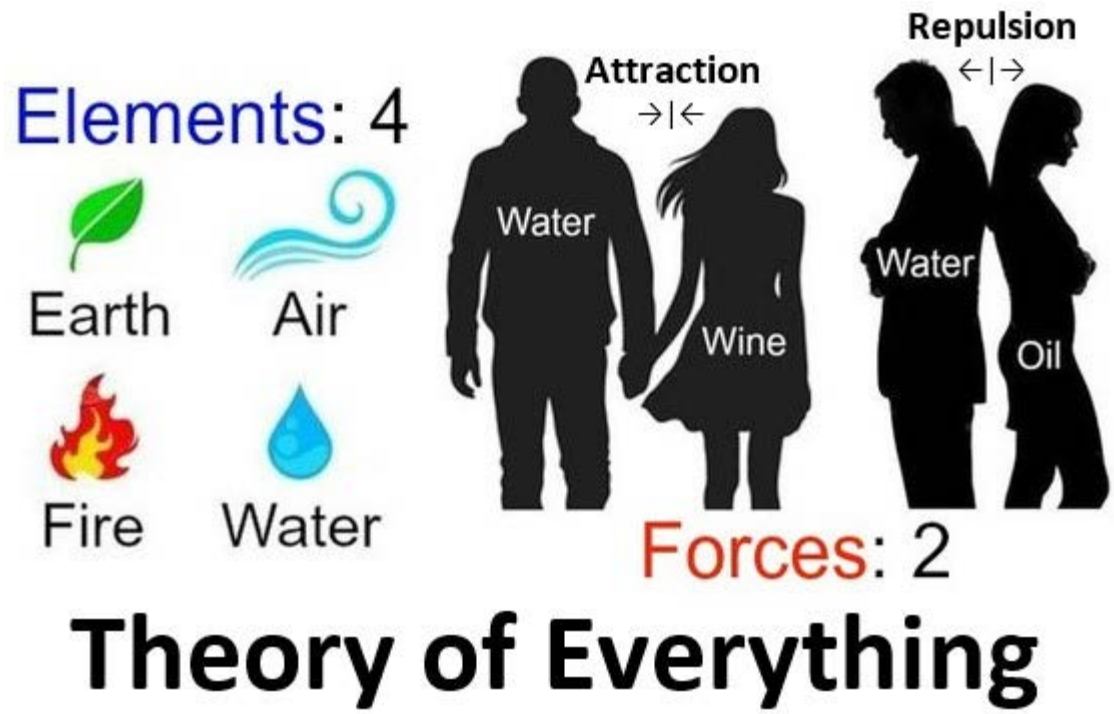

The basic Empedoclean model, according to which everything (humans included) is comprised of four elements (earth, air, fire, and water), or "roots" as he called them, and two forces, namely "philia" (love/attraction) and "neikos" (hate/repulsion), as he called them.

"Water mixes easily with wine, but with oil it does not want to mix."

— Empedocles (c.455BC), Fragment I89 / DK 91

"For all these things—shining sun and earth and heaven and sea—are united with their own parts, all that are split off and have come to be in mortal things. In the same way, all that are more fitted for mixture are made alike by Aphrodite [force of love] and have come to love one another. But **greatest enemies are those furthest separated** from one another in birth and mixture and molded forms, in every way unaccustomed to be together and very mournful through their birth in strife, because their births were in anger."

— Empedocles (c.455BC), Fragment B22 (Ñº); cited by Simplicius (c.540AD) in *Commentary on Aristotle's Physics* (160.26)

"Water has a greater affinity with wine, but with olive oil it is unwilling to mix."

— Empedocles (c.450BC), fragment 56 (B91); cited by Philoponus (c.550AD) in *Commentary on Aristotle's Generation of Animals* (123.19-20) [9]

"And that," interrupted Edward, "will be different according to the natural differences of the things

themselves. Sometimes they will meet like friends and old acquaintances; they will come rapidly together, and unite without either having to alter itself at all—as **wine mixes with water**. Others, again, will remain as strangers side by side, and no amount of mechanical mixing or forcing will succeed in combining them. **Oil and water** may be shaken up together, and the next moment they are separate again, each by itself."

— Johann Goethe (1809), *Elective Affinities* (P1:C4)

"Has not Goethe, following **Empedocles**, told us how carbon and oxygen love each other, how passionately they fly, lover-like, into each other's arms? The union is extremely firm, as is testified by the quantity of heat evolved by a fire during the process of combination, and by the chemist's great difficulty when he seeks artificially to undo it."

— Caleb Saleeby (1904), "The Green Leaf" [8]

"These elements are equal, all of them, and of like ancient race; and one holds one office and another and each has his own nature"—some being predominantly warm, others cold. They were coeval and eternal—for if they perish whither should they go? (Fragment 87.) "From these arose blood and various kinds of flesh" (203), "and if your faith be at all lacking in regard to these (elements), how from water and earth and air and sun (fire) when they are mixed arose such colors and forms of mortal things," the attraction and repulsion of modern physical chemistry, symbolized under the conception of love and hate accomplished it, a simile carried out in the meaning of Empedocles by Goethe in his wonderful novel (*Die Wahlverwandtschaften*—*Elective Affinities*). Combinations of the elements arose under "the uniting power of Aphrodite" (210). He seems to have thrown much, if not all, of his written work into the form of poetry and his other physical ideas as well, are full of poetical conceptions even in the reports and traditions of later writers. So Goethe made poetry of the *Metamorphosis of Animals and Plants*."

— Jonathan Wright (1920), "Empedocles the Primitive Physiologist" (pg. 143-44)

"The idea [of society as a many particle system] goes back to **Empedocles** who in his *On Nature* explains the solubility of wine in water by the attraction of love of relatives, the segregation of water and oil by the hate of enemies. Goethe used this idea in his *Elective Affinities* to demonstrate that human relations depend on the chemical laws of society."

— Jurgen Mimkes (1997), "Society as a Many Particle System" [4]

"Relatives mix like water and wine; enemies avoid each other like water and oil."

— Jurgen Mimkes (2005), "Chemistry of the Social Bond" [2]

"People who love each other mix like water and wine; people who hate each other segregate like water and oil."

— Libb Thims (2007), *Human Chemistry* [1]

Others to have cited and or discussed the Goethe + Empedocles connection, include: Ernst Haeckel (1899) and Michel

Chaouli (2002) (Ñº).

Standard model of physics

See main: Standard model (classical); Standard model (particle physics); Standard model (human existence)

Empedocles also originating the first standard model of physics, according to which the universe was comprised of four elements: fire (△), earth (▽), air (△), water (▽), meaning that humans are entities made of four elements, whose interactions were governed by two forces: philia (â— →|←â—), i.e. attraction (or love) and neikos (←â— |â— →), i.e. repulsion (or hate).

Greek philosopher Plato specifically credits Empedocles as having created this list of elements. Empedocles insisted that the two ruling passions of human life, love and hate, were the two ruling principles which pervade and rule the whole universe. Plato later built Empedocles' conception of *philia* and *neikos* by postulating the first law of affinity that "likes tend toward likes" (likes attract), e.g. earth to earth or water to water, etc., the forerunner to many other laws of affinity to following.

Human formation | Evolution theory

The following is a synopsis of Empedocles' evolution theory, as summarized by American anthropological neuroscientist Terrence Deacon: [3]

> "Empedocles claimed that event the orderliness of living bodies might be able to arise spontaneously, simply by preserved accident. From these sparse beginnings all the more complex features of the world, like living bodies, could arise by combinations of more basic parts which themselves arose and combined by accident.
>
> Empedocles argues that even aimless mechanical processes could produce functionally useful complexity. Initially, all that would be produced would be incongruous combinations and monstrosities. For example a man-faced ox, that might willy-nilly be products of such a wild natural shuffling of materials and form. But, he notes, most such combinations would be awkward and inappropriate to the world, and would quickly perish. Only those combinations that exhibited both an appropriate balance of component features and fittedness to the surroundings would be likely to persist in the world (and presumably, if living, would produce progeny).
>
> Further, he suggested that these creatures would sort themselves out into different environments, with those suited to water more likely to spend time there and those more suited to air more likely to spend time there, where each would then, by the same logic, get honed by elimination into progressively more specialized and distinguishable types. So, he claimed, without prior design, a blind and promiscuous process of mixing of elements could by dint of the elimination of the less coherent, less elegant, less appropriate variations, after the fact, result in forms that were both internally and relationally well designed and well suited to their contexts."

(add)

Aristotle

Greek science-philosopher Aristotle (384-322BC), supposedly, took Empedocles' ideas to be worthy exemplars of a way of thinking about the natural world that was deeply flawed and is said to have devoted a considerable effort to refuting Empedocles' model of accident-based mechanical evolution or formation of animate form. [3]

Lucretius

Greek philosopher Lucretius (99-55BC), who wrote his own *On the Nature of Things*, extolling the basics of atomic

theory, speaks of him with enthusiasm, and evidently viewed him as his model.

Quotes | On

The following are quotes on Empedocles:

> "Now though this great country is seen to deserve, in many ways, the wonder of mankind, and is held to be well worth visiting, rich in all good things, guarded by large force of men, yet seems it to have held within it nothing more glorious than this man [Empedocles], and nothing more holy, marvelous, and dear. The verses, too, of his **godlike genius** cry with a loud voice, and set forth in such wise his glorious discoveries, that **he hardly seems born of a mortal stock**."
>
> — Lucretius (60BC), *On the Nature of Things*; cited by Friedrich Lange (1875) in *The History of Materialism, Volume One* (pg. 136)

> "If Aristotle does not misrepresent **Empedocles**, as he often doth Plato, then it must be granted, that he being a mechanical physiologer, as well as theologer, did something too much indulge to fortuitous mechanism; which seems to be an extravagancy, that mechanical philosophers and atomists have been always more or less subject to. But Aristotle doth not charge Empedocles with resolving all things into fortuitous mechanism, as some philosophers have done of late, who yet pretend to be theists and incorporealists, but only that he would explain some things in that way. Nay, he clearly puts a difference betwixt Empedocles and the Democritic atheists, in these words subjoined: [Greek], etc. which is as if he should have said, 'Empedocles resolved some things in the fabric and structure of animals into fortuitous mechanism; but there are certain other philosophers, namely, Leucippus and Democritus, who would have all things whatsoever in the whole world, heaven, and earth, and animals, to be made by chance and the fortuitous motion of atoms, without a deity.' **It seems very plain, that Empedocles's Philia and Neikos, his friendship and discord, which he makes to be the [Greek], the active cause,—and principle of motion in the universe, was a certain plastic power, superior to fortuitous mechanism; and Aristotle himself acknowledges somewhere as much**. And Plutarch tells us, that, according to Empedocles, the order and system of the world is not the result of material causes and fortuitous mechanism, but of a divine wisdom, assigning to everything [Greek] not such a place as nature would give it, but such as is most convenient for the good of the whole."
>
> — Ralph Cudworth (1678), *True Intellectual System of the Universe*

> "**Empedocles** believed in the transmigration of souls, and forbade the offering of sacrifices as well as the eating of flesh."
>
> — Friedrich Lange (1875), *The History of Materialism, Volume One* (pg. 36)

> "**Empedocles** is the most multi-faceted figure of all ancient Greek philosophy."
>
> — Friedrich Nietzsche (c.1880) (Ñº)

Quotes | By

The following are quotes by Empedocles:

> “Hear first [of] the four roots of all things: bright Zeus (fire), life-giving Hera (air), and Aidoneus (earth), and Nestis (water) who moistens the springs of men with her tears. And a second thing I will tell thee: there is no origination of anything that is mortal, nor yet any end in baneful death; but only mixture and separation of what is mixed, but men call this ‘origination’.”
>
> — Empedocles (c.455BC), *On Nature* and *Purifications* (Fragments 33-34); cited by Karl Luckert (1991) in *Egyptian Light and Hebrew Fire* (pg. 219) [16]

> “All things have thought and share of understanding.”
>
> — Empedocles (c.455BC), *On Nature* and *Purifications* (Fragment I16 / DK110) [17]

> “All things, including animals and plants, are rational.”
>
> — Empedocles (c.455BC), *On Nature* and *Purifications* (Fragment #); cited by Sextus Empiricus (c.200) in *Against the Mathematicians* (8.286) [17]

See also

â— Goethe + Empedocles
â— Gibbs, Goethe, and Empedocles
â— Gibbs and Goethe

Notes

N1. Cf. 19/13 [14]

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Further reading

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â— Empedocles. (435BC). *The Poem of Empedocles: a Text and Translation with an Introduction* (editor: Brad Inwood). University of Toronto Press, 1992.

External links

â— Empedocles – Wikipedia.

θΔics

In chemistry, **empirical formula** expresses the relative number of atoms of the different elements present in a compound or structure, using the simplest whole number ratio. [1] The molecular formula, by comparison, expresses the actual number of atoms present in a structure or compound. Thus, for instance, the empirical formula of acetic acid is CH_20, whereas its molecular formula is $C_2H_4O_2$ or twice CH_2O.

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External links

â— Empirical formula – Wikipedia.

θΔics

In science, **empty space**, aka nothingness, void, or vacuum, refers to a "space" that has no "things" in it or within its boundary.

Quotes

The following are related quotes:

> "This [separation of two plane surfaces] experiment shows the aversion of nature for '**empty space**', even during the brief moment required for the outside air to rush in and fill up the region between the two plates."
>
> — Galileo (1638), *Dialogues Concerning the Two New Sciences* (pg. 11) [1]

> "Nothingness [void / vacuum / **empty space**] contains all things; it is **more precious than gold**, free from birth and destruction, more pleasant than the sight of pure light, more noble than the blood of kings, comparable with the sky and higher than the stars, more powerful than a bolt of lightning, perfect and rich in all its parts."
>
> — Otto Guericke (1672), *The Magdeburg Experiments on the Vacuum of Space* (pg. 99); cited by Edward Grant (1981) in *Much Ado About Nothing* (pg. 216); cited by Helge Kragh (2014) in *The Weight of the Vacuum* (pg. 6) [1]

References

1. Galileo. (1632). *Dialogues Concerning the Two New Sciences* (translators: Henry Crew; Alfonso Salvio) (pg. 11). Macmillan, 1914.
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θΔics

In hmolscience, **Emyr Alun Moelwyn-Hughes** (1905-1978), oft-cited as E.A. Moelwyn-Hughes, was a Welsh physical chemist noted for 1947 frequently requoted (e.g. Philip Ball, 2004) aphorism that "energy among molecules is like money among men. The rich are few, the poor numerous".

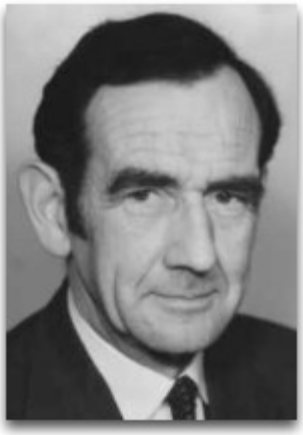

Overview

In 1947, Moelwyn-Hughes, in his *The Kinetics of Reactions in Solution*, employed a proto-econophysics logic, when he compared money to energy and men to molecules: [1]

> "Energy among molecules is like money among men. The rich are few, the poor numerous."

This saying is known in modern terms as the Pareto principle, named after Vilfredo Pareto. [2]

Education

Hughes, the son of a minister, completed his BS in 1926, PhD in 1928, and DSc in 1933 at the University of Liverpool, much of which was focused around an interest in chemical reaction kinetics; after which he became a physical chemist at the University of Cambridge, focusing on the kinetics of reactions in solution. His magnum opus was his 1957 *Physical Chemistry* textbook. [3]

Quotes

The following are related quotes:

> "The complete physical chemist blows his own apparatus and solves his own equations."
>
> — Emry Hughes (1957), *Physical Chemistry* (pg. 1) [3]

References

1. (a) Moelwyn-Huges, Emyr A. (1947). *The Kinetics of Reactions in Solution* (quote, pg. 390). Claredon Press.
(b) Moelwyn-Huges, Emyr A. (1961). *Physical Chemistry* (pg. 343). Pergamon Press.
(c) Moelwyn-Huges, Emyr A. (1967). *A Short Course on Physical Chemistry* (pg. 136). Amerian Elsevier Pub. Co.
(d) Quoted by J.M. Thomas (1986). "Lecture" (pg. 3). *Royal Institute Proceedings*, Royal Institute Inaugural Lecture.
(e) Ball, Philip. (2004). *Critical Mass - How One Thing Leads to Another* (quote, pgs. 41-42). Farrar, Straus and Giroux.
2. Pareto principle – Wikipedia.
3. Spencer, Michael. (2012). "A Lost Intellectual?" (pdf), *Friend's Newsletter and Magazine* (pg. 9-10), Oct 9.

External links

â— Moelwyn-Hughes, E.A. (Emyr Alun) – WorldCat Identities.

θΔics

In science, **en** can refer to the prefix *en*- (Greek) meaning "in" or "within" or or alternatively "to go into" or "cause to be", depending, as in *en*-ergon (work), *en*-tropy (entropy), or *en*-ergy (energy); or the abbreviation EN (technical) maning exponent E to the power of some number N.

Exponent

The term EN is sometimes found as an old-fashioned short notation scheme for exponent E to the power of some number N, which is written formulaically as follows:

$$\mathrm{EN} = 10^N$$

where N is a positive number. If N equals 22, for example:

$$\mathrm{E22} = 10^{22}$$

This notation scheme is useful in expressing shorthand notation for numbers of atoms in a human molecule which can reach upwards E27, depending on atom, such as hydrogen or oxygen. Hence, for instance, the notation:

$$Zn_{10,000,000,000,000,000,000,000}$$

become shortened to:

$$\mathrm{Zn}_{\mathrm{E22}}$$

or in subscript notation:

$$Z_{E22}$$

or in Latex notation:

$$Z_{10^{22}}$$

all of which are equivalent, which signify that there are 10 sextillion Zinc atoms in the average human molecule.

See also

- Number of atoms in

θΔics

In encyclopedias, **Encyclopedia of Human Thermodynamics** (EoHT.info) is the 2007 to 2011 name for Hmolpedia, thereafter, at about the 2,000-article mark, renamed: *Hmolpedia: Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, representative of the grown encompassing nature of the site. [1]

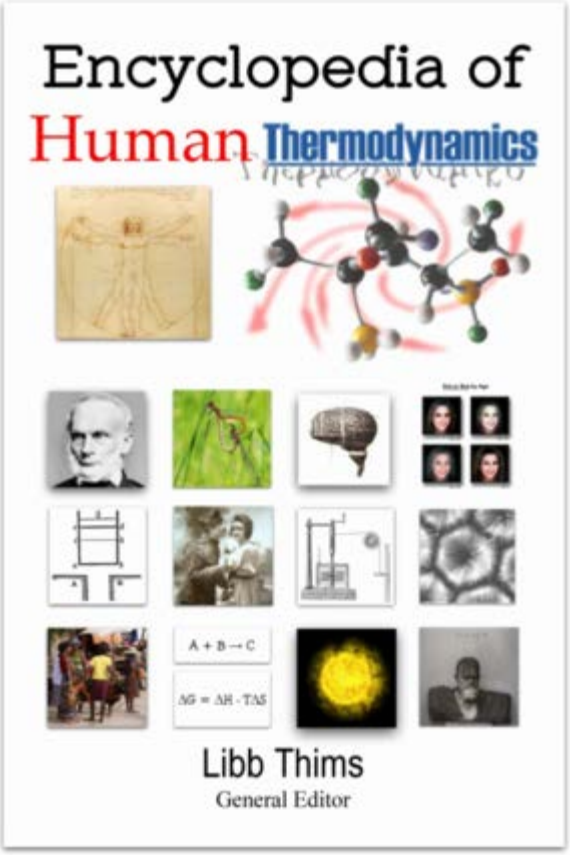

July 2010 draft-cover for the printed 5-volume set of the Encyclopedia of Human Thermodynamics

Overview

The articles on subjects in the encyclopedia are arranged in groups, as shown in the adjacent navigation box, such as by sub-branches, by pioneers of human thermodynamics, by topics in human thermodynamics, by new articles, etc., and listed either alphabetically or by importance, and are contained in the set of freely-available online Wetpaint wiki pages (eoht.info), that anyone can edit.

Name | EoHT → Hmolpedia

The general written-in-text name, for lengthy "online Encyclopedia of Human Thermodynamics", as used in discussions, since the sites 2007-launch, seems to have traditionally been either: EoHT, EoHT wiki, or EoHT.info.

In 2011, the acronym term EoHT seems to have become unwieldy in the case of repeated use, e.g. used three or more times in one paragraph, and a newer lower case alternative seems to be needed, similar to Wikipedia, which is easier to type that EoHT, which requires increased keyboard dexterity (one shift-key type, one type, followed by two shift-key types). Some of the alternatives (a subject still in limbo), in descending order of preference, are listed below:

● Hmolpedia (signifying that the encyclopedia covers (a) human thermodynamics, (b) human chemistry, (c) human physics, and (d) human molecule; albeit with general focus on the thermodynamics.)

● EoHT
● EoHT.info

● Htpedia
● Humanthermopedia
● HTpedia

● Eohtpedia (seems redundant?)
● Thermopedia (taken, see below)
● Eoht
● EHT

Encyclopedia

The purpose of an encyclopedia, in the words of French philosopher and writer Denis Diderot, editor-in-chief of the famous *Encyclopédie*, is: [3]

> "An encyclopedia's aim is to collect knowledge, disseminated around the globe; to set forth its general system to the men with whom we live, and transmit it to those who will come after us, so that the work of preceding centuries will not become useless to the centuries to come; and so that our offspring, becoming better instructed, will at the same time become more virtuous and happy, and that we should not die without

> having rendered a service to the human race."

The aim herein is the same, namely to collect knowledge, in a systematic way; albeit with focus on the subject of human thermodynamics, thermodynamics, and topics periphery to these.

Wiki encyclopedias

The aim of a free online wiki-based encyclopedia, as expressed by Wikipedia (launched 2001) founder Jimmy Wales, is that: [10]

> "Wikipedia [compared to Britannica] begins with a very radical idea, and that's for all of us to imagine a world where every single person on the planet is given free access to the sum of all human knowledge."

The purpose of the

Left: advertisement for the 11th edition 1911 *Encyclopedia Britannica* (a reaction to the French *Encyclopédie*), which is still praised for its excellence, used as reference for some articles of the EoHT. [11] Right a 2010 screenshot of Wikipedia, launched in 2001, the prototype model for wiki-style encyclopedia construction.

Encyclopedia of Human Thermodynamics is the same, but with specific focus on the multifarious theories, postulates, ideas, conceptions, and people connected to the two-century long study of the thermodynamic understanding of the place of the human being in the universe. In the words of American historian Henry Adams, "Man as a form of energy, is in most need of getting a footing on the law of thermodynamics." [4]

History

See main: EoHT (history)

The *Encyclopedia of Human Thermodynamics* was started in December of 2007 (see: progress report) by American chemical engineer Libb Thims in association with Russian physical chemist Georgi Gladyshev in efforts to organize thermodynamics. [8] The core of the EoHT is being built using Thims' thermodynamic book collection, that he began collecting in 1995, along with his vast file of articles, facts, and notes to organize the set of known information on the thermodynamic understanding of human life, in conjunction with tools such as Google Book Search, Google Scholar, JSTOR, Amazon, etc., and local and university libraries and book stores in or around Chicago.

By December of 2008, the EoHT had 19 members and over 620+ articles. At the start of 2009, seeing that the topics connected to the thermodynamics of human existence seem to connect to all other branches and topics in thermodynamics, like a spider web, the following 1886 quote, by Oliver Holmes Jr., is beginning to summarize the direction that the EoHT is taking: [9]

> "To be master of any branch of knowledge, you must master those which lie next to it; and thus, to know anything — you must know all."

The cover page (above) shows the draft-version of the hardcover printed EoHT, which may be available in late 2010-2011.

Comparison sites:

The main comparison thermodynamics-related online encyclopedia is the 2006-launched Thermopedia.com or

● Thermopedia.com (site) or "A-to-Z Guide to Thermodynamics, Heat & Mass Transfer, and Fluids Engineering Online" (trademarked: THERMOPEDIA™ in *circa* 2006); based on:
● Hewitt, Geoffrey and Shires, G.L. (1997). *International Encyclopedia of Heat and Mass Transfer* (abs). CRC Press.

The best comparison example of a good online science encyclopedia is *MathWorld* created by American physicist and astronomer Eric Weisstein, the biggest math site on the Internet, which currently has more than 13,000 entries, the majority of which were authored by Weisstein. [6] As to the origins of *MathWorld*, beginning in 1995 Weisstein took the vast collection of mathematical facts that he had been accumulating since his teenage years and began to deploy them on the early Internet.

A newly developing thermodynamics wiki is the SklogWiki, started on February 15th, 2007 by Spanish physicist Carl McBride, in association with the *Complutense University of Madrid*, for people interested in thermodynamics, statistical mechanics, and computer simulations, with particular focus on simple fluids, complex fluids, and soft condensed matter. The site, as of 2009, however, seems to consist of 950+ mostly-empty stub pages, linked to lists of either related topic articles or related journal articles. It now seems to be a journal article organization website. A now-inactive ThermoWiki, having been an active wiki for a few months (May 27 – July 26) in 2007, was started by American chemical engineer J.M. Haile, which produced 47 articles.

A comparitive example of an active collaborative wiki science the *Encyclopedia of Earth* (EoE), launched 2006, with approximately 1,000 articles, which uses a one-person peer review sign-off process. As of April 2008, they had a listing of 700+ authors and 2,000+ articles. [5] The thermodynamics articles in the EoE, however, are notoriously filled with obvious errors, particularly when it comes to thermodynamics. [7]

See also

● Science wikis

References

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2. See: the progress report for the origin and development of the encyclopedia.
3. Diderot, Denis and d'Alembert, Jean le Rond *Encyclopédie.* University of Michigan Library: Scholarly Publishing Office and DLXS.
4. Adams, Henry. (1910). *A Letter to American Teachers of History*. Google Books, Scanned PDF. Washington.
5. EoE: FAQs - Encyclopedia of Earth.
6. About Eric Weisstein, Creator of *MathWorld*.
7. (a) The EoE "History of Thermodynamics" article states that a G. Black (a Joseph Black typo) coined the term thermodynamics in 1770 (very incorrect).
(b) The EoE "Thermodynamics" article has a picture of Lazare Carnot (Sadi Carnot's father) in the caption box listed as Sadi Carnot and states that thermodynamics was founded, between 1850-60, by Irish pneumatic tire inventor Robert William Thomson (whereas the correct name is William Thomson (a co-founder) or Lord Kelvin; and the founder is Rudolf Clausius).
8. (a) The wiki encyclopedia was spurred into existence, in a general sense, out of the two-year experience of Thims as

an editor at Wikipedia, between 2005-2007, having authored about 180+ articles with over 8,500+ edits while there, and the resultant view or understanding that niche topics, such as human thermodynamics, human chemistry, and human molecule, etc., do not fit in well in a encyclopedia designed for general readers. (b) The concept of entropy is so corrupted in Wikipedia, to cite one example, that one cannot even cite Clausius in the definition of entropy. (c) In addition, during this period, Thims had been contemplating the idea of starting a new wiki to make the adding of terms in the IoHT Glossary easier and themed to a more community style of construction. Subsequently, the Wetpaint wiki was chosen as a platform for the new wiki. (d) Hence the EoHT wiki was born.
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(b) Oliver Wendell Holmes, Jr. – Wikipedia.
10. Wales, Jimmy. (2007). "Jimmy Wales: How a Ragtag Band Created Wikipedia." TED Talks, Jan 16.
11. (a) Encyclopedia Britannica (1911) - LoveToKnow1911.
(b) from the May 1913 issue of *National Geographic Magazine*

External links

- Encyclopedia Britannica (current)
- Encarta
- Colombia Encyclopedia
- High Beam Encyclopedia - Encyclopedia.com
- BookRages
- Chemistry, Physics, Mathematics, Scientific Biography - Eric Weisstein's Worlds.
- Thermopedia - (limited free search; $3,500 cost: full search)
- Encyclopedia of Thermodynamics - Department of Geosciences, University of Basil.

θΔics

In terminology, **encyclopedist** is someone who writes collective treatises on subjects of knowledge, specific or general, or contributes articles to encyclopedias.

Advert for the classic 1911 *Encyclopedia Britannica* (11th edition), originally said to be a reaction to the French *Encyclopédie* (1751-1772), the height of the single collected set encyclopedia, written by the **encyclopedist**, a set still praised for its excellence. [5]

Overview

The first so-called encyclopedist, supposedly, was Roman natural philosopher Pliny the Elder and his circa 77 *Naturalis Historia*, which purports to cover the entire field of ancient knowledge, based on the best authorities available. [10]

In 1710, English writer, scientist, and priest John Harris published the two-volume *Lexicon Technicum, or A Universal English Dictionary of Arts and Sciences*, which contained articles by such contributors as Isaac Newton.

In 1728, English globe maker apprentice Ephraim Chambers wrote a very popular two-volume *Cyclopedia*, which went through multiple editions and awakened publishers to the enormous profit potential of encyclopedias.

In 1732, German bookseller and publisher Johann Zedler published the 64-volume *Grosses Universal-Lexicon* (published 1732–1759), the first encyclopedia to include biographies of reactive people.

In 1751, editors Denis Diderot (IQ=165) (5394 articles) and Jean D'Alembert (IQ=185) (1309 articles) headed the writing of the *Encyclopedie* (1751-1772), which contained articles written by a group of about 100 French authors, including Jean Rousseau (IQ=150) (344 articles), Voltaire (IQ=195) (26 articles), etc., who latter came to be called "encyclopedists". [1] The D'Alembert-Didertot *Encyclopedie* (1751-1772) is said, according to French collective intelligence theorist Pierre Levy, to mark "end of an area in which a single human being was able to comprehend the totality of knowledge" (see: "last persons to know everything"). [2]

In 1768, the *Encyclopedia Britannica* was launched by Irishmen bookseller and printer Colin Macfarquhar and engraver Andrew Bell, conceived as a conservative reaction to Diderot's *Encyclopédie*, which was widely viewed as heretical.

In 1807, English polymath Thomas Young (IQ=200), under the direction and encouragement of Benjamin Thompson, finished compiling his famous two-volume *Lectures on Natural Philosophy and the Mechanical Arts*, wherein famously the modern definition of "energy" was first introduced. [3]

In 1917, the *World Book Encyclopedia* was launched (conceived by whom?), with an eight volume first edition.

In 1995, American mathematician, physicist, and astronomer (turned mathematics and science encyclopedist) Eric Weisstein (BA (1990) physics (Cornell); MS (1993) and PhD (1996) in planetary astronomy (CalTech)), starting from a 200-page Microsoft Word document (a collection of mathematical facts that he had been accumulating since his teenage years), uploaded it to his webspace at Caltech, under the title *Eric's Treasure Trove of Sciences*, has gone on to write over 17,000+ articles on science and mathematics in his *MathWorld* (13,000+) and *ScienceWorld* (4,000+) sites; some of which has been published by CRC Press in book format titled, the *CRC Concise Encyclopedia of Mathematics*. [4] His *MathWorld* is equivalent to more than 4,000 printed pages of encyclopedic material; *ScienceWorld* current stands at the equivalent of about 1,000 printed pages. [9]

In 2001, American internet entrepreneur (turned encyclopedia project head) Jimmy Wales, having previous making a learned attempted at launching *Nupedia* (2000-2003), a so-called expert written encyclopedia, famously launched the community-written *Wikipedia*, which has gone on to revolutionize the way encyclopedias are written.

In 2004, American hedge fund manager (turned video tutorial encyclopedist) Salman Kahn (BS mathematics, BS electrical engineering, MS electrical engineering (MIT), MBA (Harvard Business School)), starting from a tutoring

request from his cousin, Nadia, working from a small office in his home, via video upload (using using Yahoo!'s Doodle notepad), founded the intuitive Khan Academy, from which he has personally produced over 2600 tutorial videos elucidating a wide spectrum of academic subjects, tending to focus on mathematics and the sciences. Bill Gates (IQ=175), notable himself for having read the entire *World Book Encyclopedia* by age nine, who funds Kahn's project, commented on him: "I'd say we've moved about 160 IQ points from the hedge fund category to the teaching-many-people-in-a-leveraged-way category. It was a good day his wife let him quit his job." (a hedge fund manager position he quit in 2009 to devoted more time to his project).

In 2005, *Google Books* was launched, which, when combined with open wiki writing and key word search technology, significantly impacted the methodology of knowledge acquisition, documentation, and re-organization employed by the encyclopedist, in the sense that in summarizing a topic in an encyclopedia manner, one must thoroughly pick through the supposed 130 million unique books in the world, in order to adequately cover a topic. [7]

In 2006, Thermopedia.com (site) or an "A-to-Z Guide to Thermodynamics, Heat & Mass Transfer, and Fluids Engineering Online" (trademarked: THERMOPEDIA™ in *circa* 2006) was launched, based on Geoffrey Hewitt and G.L. Shires 1997 *International Encyclopedia of Heat and Mass Transfer*. [6]

In 2006, American geologist and encyclopedist Cutler Cleveland, author of a number of book print energy dictionaries and encyclopedias, headed the launch of online *Encyclopedia of Earth*, with approximately 1,000 articles, which uses a one-person peer review sign-off process; which as of April 2008 had a listing of 700+ authors and 2,000+ articles.

In 2007, American electrochemical engineer and thermodynamicist Libb Thims, having previously tested the water as a writer at Wikipedia (2005-2007), penning some 180 articles, launched *Hmolpedia*, the result of the need to organize the extensive amount of material related to the three, essentially underground, interrelated fields of human chemistry, human physics, and human thermodynamics (and to some extent human mathematics); which as of 2011 had over 2,300 articles (nearly all written by Thims) and about 200+ members providing thread discussion feedback.

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2. Levy, Pierre. (1997). *Collective Intelligence: Mankind's Emerging World in Cyberspace* (totality of knowledge, pg. 213). Basic Books.
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(b) Young, Thomas. (1807). *A Course of Lectures on Natural Philosophy and the Mechanical Arts: Volume Two*. Publisher.
4. (a) Eric Weisstein (about) - *MathWorld*.
(b) Weisstein, Eric W. (2003). *CRC Concise Encyclopedia of Mathematics*. CRC Press.
(c) Eric W. Weisstein – Wikipedia.
5. (a) Encyclopedia Britannica (1911) - LoveToKnow1911.
(b) Image: from the May 1913 issue of *National Geographic Magazine*.
6. Hewitt, Geoffrey and Shires, G.L. (1997). *International Encyclopedia of Heat and Mass Transfer* (abs). CRC Press.
7. Google Books - Wikipedia.
8. (a) Salman Khan (educator) – Wikipedia.
(b) Salman Khan (2011 talk) – TED.com.
9. Eric Weisstein (about) – EricWeisstein.com.
10. (a) Encyclopedia – Wikipedia.
(b) Natural History (Pliny) – Wikipedia.

θΔics

In thermodynamics, **endergonic**, as contrasted with exergonic, refers to a free energy or available energy absorbing process or reaction, one in which work energy is consumed, defined by the criterion: $\Delta G > 0$ (isothermal, isobaric process) or $\Delta F > 0$ (isothermal, isochoric process).

In short, an endergonic reaction (or process) requires energy to proceed. [1]

References

1. Purves, William K, Sadava, David, and Orians, Gordon H. (2004). *Life: the Science of Biology* (section: ATP couples exergonic and endergonic reactions, pgs. 112-13). MacMillian.

External links

â— Endergonic – Wikipedia.

θΔics

In human chemistry, **endorphin theory of love**, as can be contrasted with the "chocolate theory of love" (Liebowitz, 1983), is a view that when two people fall in love the body will release a plethora of endorphins, the body's natural morphine (a heroine like substance), and that this accounts for the pleasurable feelings of being in love. The relationship between brain endorphin release and love, or particularly sex, stems from the 1976 research of Americans Candace Pert and Nancy Ostrowski.

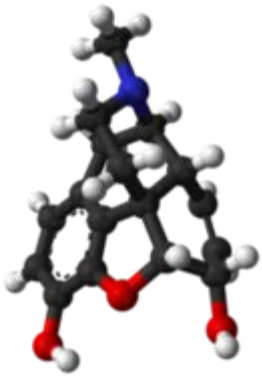

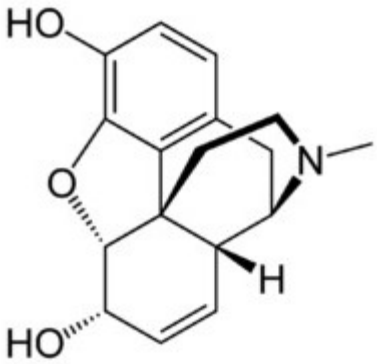

Structure of morphine ($C_{17}H_{19}NO_3$), an **endorphin**-like chemical substance.

Etymology

The etymology of the word *endorphin* is a combination of the prefix *endo-* and the sufix *-orphin*; or a shorted formation of the words *endogenous* and *morphine*, intended to mean "a morphine-like substance originating from within the body." [1]

History

In 1975, endorphin receptors were discovered by two independent teams of researchers, John Hughes and Hans Kosterlitz in Scottland and Rabi Samantov and Solomon Snyder in the U.S. In 1976, American neuroscientist Candace Pert, who had played a role in the discovery of the opiate receptor while completing her PhD in pharmacology in the laboratory of Synder, along with American researcher Nancy Ostrowski, together built a small sex guillotine. With this device, they encouraged mice to have sex and then decapitated them while they were in the act. They then quickly then blenderized the brains and found that the brain cells had been pouring out endorphins. [2]

In particular, Ostrowski, who was a relative expert on brain mechanisms of animal sex, would inject the animals with a radioactive opiate before copulation, and then, at various points in the cycle, decapitate them and remove their brains. Using autoradiographic visualization of the animal's brains, the two of them were able to see where the endorphins were released during orgasm. The found that blood endorphin levels increased by about 200 percent from the beginning to the end of the act. [3]

Runner's high

They then tested how exercise affected the release of endorphins by recruiting twelve young psychiatrists who were serious runners and taking blood samples before and after their daily runs. [3] The results showed that levels increased significantly after a run. A later paper, written by Pert and exercise physiologist Peter Farell, popularized and substantiated the physiological validation of the phenomenon now known as "runner's high".

Human orgasm

Later, under the guidance of Pert, a number of data collections were made of saliva at various moments during human sexual intercourse. These results, although suggestive and presented at some early neuroscience meets, however, were never published as they "lacked sufficient clarity to be written up and accepted by a medical journal." [3]

Chemistry of love

Into the late 1970s, the understanding of the function of endorphins in the body was improving. In the 1983 book *The Chemistry of Love* American psychiatrist Michael Liebowitz broke the mold when he outlined the relationship between endorphins and love. Prior to this year, no one had ever serious investigated the underlying biochemical or neurochemical basis of love. Liebowitz, for instance, states that, prior to the writing of his book,

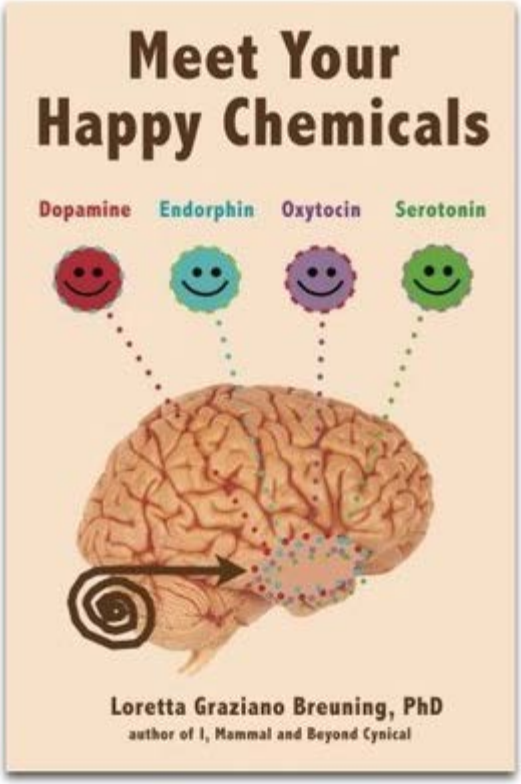

Loretta Breuning's 2012 *Meet Your Happy*

when “looking into the matter more closely I began to realize that no one had ever seriously tried to examine the biochemical basis for our romantic drives”. [4]

Chemicals: Dopamine, Endorphin, Oxytocin, Serotonin (Ñº), talks about endorphin and love, in overview.

In the 1996 book *The Alchemy of Love*, by American physician Theresa Crenshaw, a former pupil of famed human-sexuality researchers William Masters and Virginia Johnson, arrived at the same point of view. Crenshaw stated that "when it was discovered in the 1980s that nerve cells have specific receptor sites for chemicals such as endorphins, a flood of research followed ... we soon learned that the vast tributaries of the brain are awash in hormones (such as testosterone and estrogen)." [5] This research soon led to the "hormone theory of love".

In regards to endorphin, however, Liebowitz noted that endorphins are more effective than morphine in reducing separation-induced crying in guinea pigs and chicks. [4] Subsequently, Liebowitz reasons, animals and likely humans are genetically programmed to secrete endorphins in situations of social comfort (such as sex), which would help them to feel both less anxious and also give them a sense of well-being. Moreover, Liebowitz notes that when people feel socially isolated or cut off from familiar figures, the brain shuts off endorphin production. Thus, according to Liebowitz, “as most adults feel some anxiety when separated from important figures in their lives, and some sense of increased security when their closest relationships seem stable”, attachment, as in the form of a human chemical bond, is mediated internally by the release of endorphins in the brain.

Fear

See main: Fear

In 2001, American neurobiologist Donald Pfaff and associates showed that genetically modified mice made to be incapable of producing endogenous opiates (lacking endorphins), behaved such that the smallest fright made the animals freeze. [6] In large rooms, they stayed close to walls and showed other typical signs of fear. [7]

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External links

â— Endorphin – Wikipedia.

θΔics

In

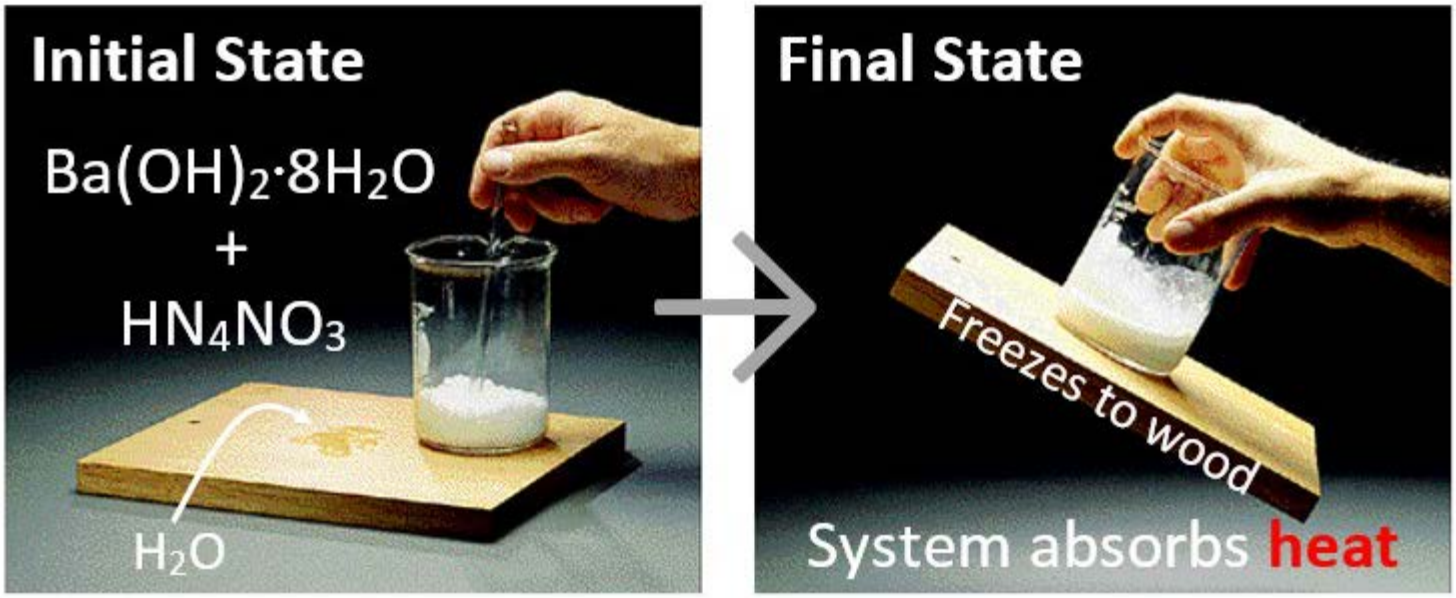

The figure below illustrates a demonstration for a spontaneous **endothermic** reaction. Left: When crystalline solid barium hydroxide octahydrate $Ba(OH)_2 \cdot 8H_2O$ and crystalline solid ammonium nitrate HN_4NO_3 are mixed, a liquid slurry soon forms as the water of hydration are released. Right: The system absorbs heat so quickly that it cools, the beaker becomes covered with frost, and a moistened block of wood freezes to it. This reaction has a positive value for the enthalpy change ΔH. The entropy of the system, supposedly, is increasing (Q) with a positive value for ΔS.

chemistry, **endothermic**, from the Greek *endo-* "inside" + *-therme* "heat, warm", as contrasted with exothermic, refers to a transformation, i.e. process, reaction, or change of state, wherein heat is absorbed from the surroundings into the system; formulaically:

$$Q < 0$$

When the transformation occurs at constant pressure, the enthalpy change in greater than zero: $\Delta H > 0$; at constant volume, the internal energy change is greater than zero: $\Delta U > 0$. If the surroundings do not supply heat, an endothermic transformation leads to a drop in the temperature of the system. [1]

An example of an endothermic reaction is the heating of calcium carbonate $CaCO_3$ to a temperature above 840°C, where, at which point, the reactant decomposes to form calcium oxide CaO, commonly called quicklime, and carbon dioxide CO_2:

$$CaCO_3 \rightarrow CaO + CO_2$$

The reaction has an enthalpy change ΔH of + 178 kJ / mole.

Etymology

The term “endothermic” was coined, as most references indicate, by French chemist Marcellin Berthelot, supposedly in 1866, to describe a reaction in which heat was absorbed. [2]

See also

- Endergonic
- Thermal words

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External links

- Endothermic – Wikipedia.
- Endothermic reaction – Wikipedia.

θΔics

In hmolscience, **energetic imperative** refers to Wilhelm Ostwald's energy-themed categorical imperative about how one should utilize their own personal energies, as a form of an ethical principle; the gist of which is "waste energy not", but one that tends to be found in may overly read-into mis-translations.

Overview

In circa 1906, Wilhelm Ostwald conceptualized an energy-themed reformulation of German philosopher Immanuel Kant's 1785 categorical imperative, which he states as follows:

German original	English translations
"Vergeude keine Energie: verwerte sie."	"Do not waste energy; exploit/recycle it." (Google translate, 2015)
	"Waste not free energy; treasure it and make the best use of it." (William Bayliss, 1915)
	"Waste no (free) energy; use it well." (John Edsall, 1974) [3]
	"Do not waste energy, but convert it into a more useful form." (Thomas Hapke, 1998) [2]
	"Waste no energy; turn it all to account." (Helge Kragh, 2008) [1]

In the above William Bayliss (1915) and John Edsall (1974) translations we see a mis-translation of "free energy" being read into Ostwald's imperative, which is not correct, being that Ostwald was not a free energy theorist.

In 1912, Ostwald published *Die Energetische imperativ*, a book of essays. [1]

In 1959, American physicist Robert Lindsay's extened Ostwald's ideas into the form of what he called a thermodynamic imperative.

In 1997, Robert Clark outlined some type of entropy-based global imperative.

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θΔics

In science, **energetics** is the study of energy. Energetics, in its original sense, was a branch of mechanics or thermodynamics that dealt primarily with energy and its transformations. [1] In a modern terms, energetics is often, incorrectly, considered as the study of the total energy relations and transformations of a physical, chemical, or biological system as understood according to particularly the conservation of energy. [2] Correctly, energetics, as science, fell out of fashion, as incorrect, in the 1910s.

Energetics | Thermodynamics

There are some, in modern times, who assume that energetics is synonymous with thermodynamics. This, however, is not the case: energetics was invented as a proposed second law free and atomic theory free version of thermodynamics, that was found to be defunct into the 1910s. Planck summarized the distinction between the two as follows:

> "Certain physicists actually regarded Clausius' reasoning as unnecessarily complicated and even confused; and they refused, in particular, to admit the concept of irreversibility, and thereby to assign to heat a special position among the forms of energy. The created in opposition to Clausius' theory of thermodynamics, the so-called science of 'energetics'. The first fundamental proposition of energetics, exactly like that of Clausius' theory, expresses the principle of the conservation of energy; but its second proposition, which is supposed to formulate the direction of all occurrences, postulates a perfect analogy between the passing of heat from a higher to a lower temperature and the sinking of a weight form a greater to a smaller height. A consequence of this point of view was that the assumption of irreversibility for proving the second law of thermodynamics was declared to be unessential; furthermore, the existence of an absolute zero of temperature was disputed, on the ground that for temperature, just as for height, only differences can be measured."
>
> — Max Planck (1949), *Scientific Autobiography* (pgs. 29-30)

(add)

History

In 1728, the term *energetic* was in use. [3]

In 1855, Scottish engineer-physicist William Rankine, in his "Outlines of the Science of Energetics", defined energetics as a new branch of science, specifically "a science whose subjects are, material bodies and physical phenomena in general", according to which *energy* is "every state of a substance which constitutes a capacity for performing work."

The outline of the science of energetics, proposed by Rankine, is parallel in theme, but far less rigorous in its mathematical generality, to the science of thermodynamics or "mechanical theory of heat" developed by German physicist Rudolf Clausius between 1850-65. As such, the term "energetics" is often found as an older synonym for thermodynamics. In the 1890s, for instance, German physical chemist Wilhelm Ostwald, after recently translating American mathematical physicist Willard Gibbs' *On the Equilibrium of Heterogeneous Substances* into French, styled Gibbs as the "founder of *chemical energetics*", whereas, in modern terms, Gibbs is known as the "founder of chemical thermodynamics". [5]

In 1890 to 1908, the so-called school of energetics arose around the work of German chemist Wilhelm Ostwald (the founder) and Austrian physicist Ernst Mach, who both rejected the atomic hypothesis focusing instead on the law of conservation of energy and a belief that macroscopic energy levels were the only reality. [10] With the discovery of the atom, between 1897 and 1909, this school, however, soon became

defunct. Ostwald eventually recanted; Mach did not.

Bioenergetics

In 1911, Jules Le Fevre published *Animal Heat and Bioenergetics*, a general treatise on animal physiology, calorimetry, heat balance, and thermoregulation. [11]

In 1941, German-born American biochemist Fritz Lipmann, in his "Metabolic Generation and Utilization of Phosphate Bond Energy", building on the chemical thermodynamics of Gilbert Lewis, established the model that that the chemical energy set free in the breakdown of foodstuff (unless it generates heat) is transformed into a special kind of bond energy, that is stored in the pyrophosphate bonds of ATP, before it is converted into other forms of energy, such as mechanical work in muscle or osmotic work in secreting glands. [8]

The name "bioenergetics", as compared to the circa 1970s term biothermodynamics, in their period, began to be associated with fundamental principles only sparsely using a language that often does not correspond to that used in standard thermodynamics textbooks. This has led to a difficulty in communications between biologists and the traditional thermodynamicists, physicists and engineers. [9] In this sense, bioenergetics often refers to a simplified (first law or second law) version or synonym of biochemical thermodynamics or the thermodynamics of biochemistry. [6]

In 2009 to 2014, the prefix "bio-", Greek for "life", was shown to be a defunct, not recognizable by chemical thermodynamics, being that "life" is something non-existent, as Charles Sherrington (1938) discerned. Reform terminology upgrades include: chnops-ological thermodynamics (or powered chnopsological thermodynamics).

Other uses

In recent years, the term "energetics" has come to be associated with combinations of folk quantum mechanics, new age theories, energy medicines, acupuncture, and other well-being publications, having little relation to its original formulations. [7]

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External links

â— Energetics – Wikipedia.

θΔics

In debates, **energetics debate**, or "energetics controversy" (Deltete, 1983), was a famous and very heated debate, which erupted at the 1895 meeting of the German Society of Scientists and Physicians, on the validity of new energetics movement, which opposed the newly derived atomic theory based statistical mechanics version of thermodynamics. The debate, in overview, was a debate between two near similar, but subtly different schools of thought: the energetics school and the Berlin school, with Austrian physicist Ludwig Boltzmann (Vienna school) caught in the middle.

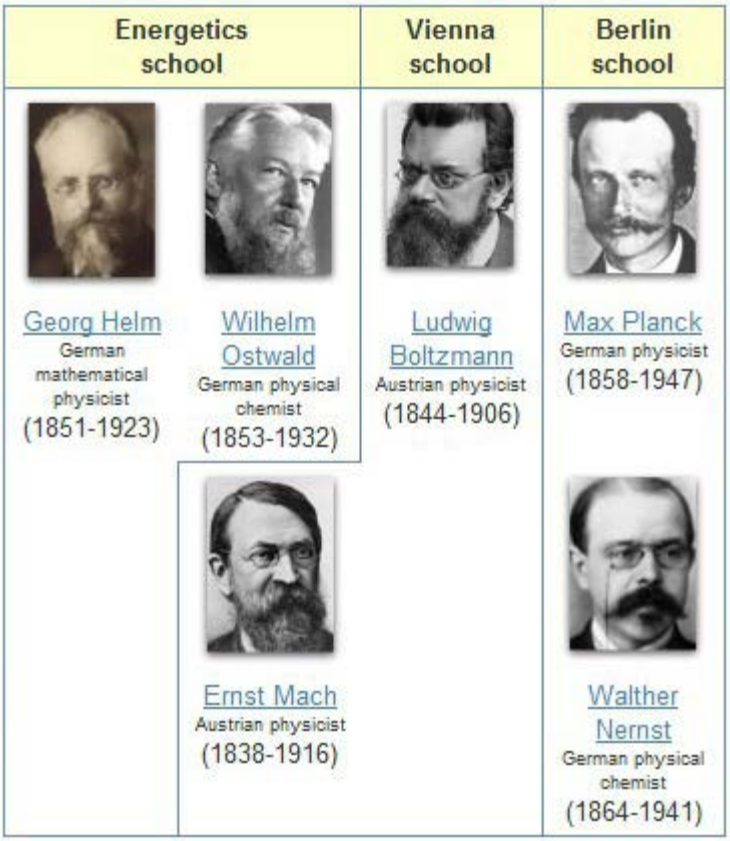

An overview of the players, schools, and sides taken in the famous 1895 **energetics debate**.

Preliminaries

The roots of the energetics debate seem to have originated in what is sometimes called the “Mach-Boltzmann controversy”. In 1873, Austrian physicist Ludwig Boltzmann joined the University of Vienna as professor of mathematics and there he stayed until 1876. In 1893, Boltzmann succeeded his teacher Joseph Stefan as professor of theoretical physics at the University of Vienna. Boltzmann, however, did not get along with some of his colleagues in Vienna, particularly Ernst Mach, a strong objector to the molecular hypothesis (used by Boltzmann in his statistical derivation of the second law), who became a professor of philosophy and history of sciences in 1895. Thus, in 1900, owing to the tension, Boltzmann went to the University of Leipzig, on the invitation of German physical chemist Wilhelm Ostwald. After the retirement of Mach due to bad health, Boltzmann came back to Vienna in 1902.

On a second front, Ostwald, having read American engineer Willard Gibbs papers on thermodynamics, was convinced, being influenced by Gibbs’ work, that he could outline a program of energetics, advancing it as an alternative to the program of atomism—a model which he outlined in his inaugural lecture at the University of Leipzig in 1887. [3] The stakes in this preliminaries to this debate were quite high indeed, involving deep roots.

Lübeck meeting

The debate was launched at the September 1895 meeting of the German Society of Scientists and Physicians, Lubeck, Germany, during a special symposium on the new energetics movement. The topic of the 1895 Lübeck meeting was chosen by a commission consisting of Boltzmann, Lang, Quincke, and Eilhard Wiedemann, at the previous year's meeting the year prior; no doubt guided by Boltzmann’s growing irritations with Mach and with the premise of the energetics school as a whole. In the physics section of the meeting, German mathematical physicist Georg Helm was invited to give a report on the current state of energetics, and following the example of the British Association, Boltzmann asked Helm to prepare it for publication before the meeting.

Following Helm’s report, in his own words, there was a “stiff fight”, where he, and his only supporter in the debate, Ostwald, battled Boltzmann, the Gottingen mathematician Felix Klein, Walther Nernst, Ostwald’s Leipzig colleague Arthur Oettingen, Arnold Sommerfeld, among others. What actually occurred in the debate, as summarized by American science historian Philip Mirowski, was that: [1]

> “Ostwald was violently attacked by Boltzmann and raked over the coals by Klein and Nernst”.

The attack was led off by Boltzmann, accusing the energeticists of being nothing more than a classification, a mere

"natural history" of the various types of energies. The well-attended debate on energetics was sufficiently lively that it was continued after a two-day interruption.

The debate concluded with an ovation for Helm, but the real debate, it might be said, carried out in the journals to follow, with Boltzmann and Planck (who never took part in the actual Lubeck debate) publishing in the *Annalen der Physick*; Ostwald publishing rebuttals; and Helm publishing a second treatise *Die Energetik nach ihrer Geschichtlichen Entwickelung* (*The Energetics of their Historical Development*), conceived in the strife of the great debate. [3]

German physical chemist Walther Nernst, as mentioned here, seems to have thus sided with his close associate German physicist Max Planck.

In their followup critiques, the two, Boltzmann and Planck, were said to have derided errors in Ostwald's mathematics, of which, according to Mirowski, there were many to choose from. [1] In what Planck considered to be the coup de grace, he complained: [2]

> "Energetics achieves the apparent and surprising simplicity of its proofs by the simple process of pushing the content of the laws back to be demonstrated (which must always be shown in advance) backwards to their definitions."

(discussion)

Results

Boltzmann would eventually sink into a great unrecoverable depression and committed suicide (September, 1906) and Ostwald, in 1909, would latter recant his denial of the existence of atom, one of the main objections in his original argument, in the fourth edition of his *Grundriss der Allgemeinen Chemie* (*Fundamentals of General Chemistry*), supposedly following new empirical demonstrations of the existence of the atom (Jean Perrin, Ernest Rutherford, Frederick Soddy, and J.J. Thomson, in the period 1902-1906). The energetics movement, as a subject, was, in one part, relegated to a peculiar area of thermodynamics history, as a sort of peculiar appendage, and, in a second part, the cogent aspects of the energetics argument were incorporated or rather integrated into the newly forming subject of physical chemistry, in unwritten subtle ways.

Discussion | Analysis

In 1983, American philosopher and energetics historian Robert Delete dis his PhD dissertation *The Energetics Controversy in the Late 19th Century Germany: Helmholtz, Ostwald, and Their Critics*, which according to American physical economics historian Philip Mirowski, is said to be the best source in English on the energetics movement, which focuses particularly on the works of Georg Helm, Willard Gibbs, Wilhelm Ostwald, and Ernst Mach, among others. [1]

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θΔics

In thermodynamics schools, the **energetics school** or "school of energetics" was a school of thermodynamics logic focused on energy as the sole principle of universal operation. The energetics school used primarily energetics-based theories, publications, and logic, promoted from about 1890 to 1908, attributed to German chemist Wilhelm Ostwald (the founder), at the University of Leipzig, and Austrian physicist Ernst Mach, at the University of Vienna, that rejected the atomic hypothesis focusing instead on the law of conservation of energy and a belief that macroscopic energy levels were the only reality. [1]

With the discovery of the atom, between 1897 and 1909, this school of logic, however, soon became defunct. It does, to note, require a reading of the actual material being referred to as "energetics" to discern which parts are actual pure thermodynamics, i.e. using entropy concepts, and which are not, as much of what one calls "energetics" is actually Clausius-Gibbs based teachings.

Overview

in 1885, Ostwald published *Lehrbuh der Allgemeinen Chemie* (*Textbook of General Chemistry*), the first textbook on physical chemistry and

In 1887, Ostwald became professor of physical chemistry at the University of Leipzig, remaining there until 1906. [5]

in 1887, Ostwald, together with Dutch chemist Jacobus van't Hoff, founded *Zeitschrift fur Physikalische Chemie* (*Journal of Physical Chemistry*) the first periodical in physical chemistry. [2]

Austrian physicist Gustav Jaumann, a student of Mach, seems to also be associated with this school, although he is classified by Ilya Prigogine as being the leader of the Vienna school.

In 1900, Ludwig Boltzmann went to the University of Leipzig, owing to his dislike of Mach, on the invitation of Wilhelm Ostwald. After the retirement of Mach due to bad health, Boltzmann came back to Vienna in 1902.

The work of French physicist Pierre Duhem, likely his 1911 *Treatise on Energetics* (*Traite d'Energetique*), was said to have been given appreciation years later among German 'energeticists', such Ostwald and Georg Helm. [1]

In the 1890s, Ostwald, who had recently translated American mathematical engineer Willard Gibbs' 1876 *On the Equilibrium of Heterogeneous Substances* into French, styled Gibbs as the "founder of chemical energetics". [3] The term 'human energetics', a near synonym to 'human thermodynamics', seems to have been attributed to Ostwald's 1909 book *Gross Manner*. [4]

The seed the "energetics credo" of belief, possibly, may trace to the 1887 book *The Doctrine of Energy* by German physicist Georg Helm, a work read by Ostwald; but, to note, Helm's work is largely a thermodynamics treatise. With the discovery of the atom, between 1897 and 1909, this school, however, soon became defunct.

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θΔics

In thermodynamics journals, **Energies** is an open-access publication devoted to articles on a variety of energy topics; the focus, however, seems directed presently towards the energy/fuel shortage problems and the sustainability issue. [1] The journal was launched in 2008 in through the initiatives of Chinese chemist Shu-Kun Lin, creator of the 1999 journal *Entropy*. [2]

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In thermodynamics, **energy**, from the Greek *ενÎργειας* (en-ergon), meaning "at work", is that which quantifies the effect of "force in action", as well as that which can exist in various forms, such as internal, kinetic, or potential, and that which characterizes the ability of a system to modify the state of its surroundings. [1]

The focused study of energy is called energetics, which has limited application, or thermodynamics, when, in addition to energy, entropy is taken into account, which has universal application.

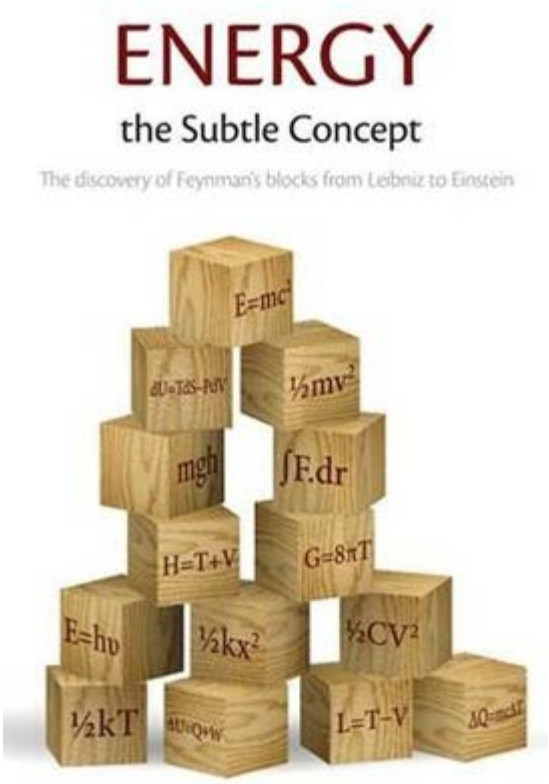

The energy equation building blocks that Richard Feynman played with as a child, on the cover of the 2010 book *Energy, the Subtle Concept*, by nuclear physicist Jennifer Coopersmith. [15]

Etymology

There does not seem to be a unified and exact etymology to the word "energy", aside from the general agreement that the term originated in ancient Greek science, particularly in the works of Heraclitus and Aristotle, in its primordial concept wording and description.

Beyond this, there is the famous Thomas Young 1802 equation definition of energy described as kinetic energy, as we now understand kinetic energy; there is the super-famous Rudolf Clausius 1850-1875 thermodynamic definition of energy as internal energy or energy of the body as a function of various differential quantities or state variables, at which point "energy" became the universal entity; and lastly there is the superstar status of energy as being equivalent to mass as formulated by Albert Einstein in 1905.

Heraclitus: The the earliest etymological reference to the use of the term "energy" is found in the *circa* 500BC writings of Greek philosopher Heraclitus (c.535-450BC), the so-called "flux and fire philosopher", who used the term en-ergon, meaning "the source of activity". Heraclitus, in his book about nature, according to American science writer Gerrit Feekes (1986), wrote: [17]

> "**En-ergon** is the father of everything, king of all things and, out of it, all forms of contrast originate. Since 'en-ergon' is common to everything, it is vital for life itself."

Likewise, Canadian sociophysicist Paris Arnopoulos (1993) attributes the coining of energy to Heraclitus, as follows: [23]

> "The term *energia* was first used by Heraclitus to connote fire as the primary source of action. Heraclitus, in his *Physics*, considered *Energon* the father of everything and the originator of all life on *Gaia*."

Arnopoulos also states that Empedocles was the first to distinguish between "matter", which he conceptualized as earth, water and air, and "energy", which he conceptualized as fire or heat.

Aristotle: The most widely cited etymological origin of "energy", however, is that it derives from the works of Greek philosopher Aristotle particularly his circa 350 BC *Metaphysics* in which he used the term Greek term á¼ νÎ-ργεια (taken over into Latin as *energia*) with the meaning, "according to scholars", as discussed in American physicist Robert Lindsay's respected 1975 book *Energy: Historical Development of the Concept*, of the "realized state of potentialities", presumably having to do with that which has the ability to bring about something else. [18]

Likewise, American physical economics historian Philip Mirowski, who spent over six years doing research in on the used of physicist notion of energy and the conservation of energy being employed in economic theory, cites Lindsay, and explains that Aristotle used the word in several senses: in his *Ethics*, in the sense of "activity" as opposed to mere disposition; in his *Rhetoric*, for a vigorous style. Aristotle also employs it to distinguish activity from potentiality, and to imply the ceaseless transformation of the potential into the actual. [19]

Recent etymology dictionaries, similarly, give an Aristotle etymological origin to the "energy", citing his circa 350 *Metaphysics*, describing the term *enérgeia* to mean act or 'activity', 'actuality', or in a literal sense '(a state of) functioning'; but itself deriving from, what seems to be the earlier Heraclitus use of the Greek term "ergon" or *energos* meaning "active, working," from *en-* "at" + *ergon* "work". [4]

In sum, Aristotle used the term *enérgeia* to clarify, in one sense, the definition of "being" as potency (*dýnamis*) and act (*enérgeia*).

The modern spelling of the term "energy" is said to have came into use in 1599. [5]

Papin: In 1690, French physician and physicist Denis Papin, in his famed memoir "A New Way to Obtain Very Great Motive Powers at Small Cost", used the term energy in a somewhat modern sense. Specifically, according to Papin, the forceful downward movement of a piston, by the pressure of the atmosphere, in an evacuate cylinder, having been evacuated by the quick condensation of steam, which thus created a partial vacuum, was said to be proportional to an amount of energy. In his own words: [14]

> "[The quick condensation of steam] [in the vacuum engine] [gives the] intended movement; which is of an **energy** great in proportion to the size of the tube."

In the 1728 *Cyclopedia - or Universal Dictionary of Arts and Sciences*, one of the first general encyclopedias to be produced in English, energy is defined as "an uncommon force, or strength, in a discourse, a sentence, or a word." [6] In 1775, energy was defined as "there is in a body in movement an effort of *energy* which is not at all in a body at rest". [7]

Young: The modernly defined usage of the term energy, as pointed out by James Maxwell (among others), was made by English physicist and physician Thomas Young. In 1802, Young began to write a series of lectures on natural philosophy for the Royal Society, by the request of American-born English physicist Benjamin Thomson, which were finished in 1807 and amounted essentially to a treatise on everything that was known in modern science in that day. In his lecture "On Confined Motion", Young states:

> "Since the height, to which a body will rise perpendicularly, is as the square of its velocity, it will preserve a tendency to rise to a height which is as the square of its velocity, whatever may be the path into which it is directed, provided that it meets which no abrupt angle. The same idea is somewhat more concisely expressed by the term **energy**, which indicates the tendency of a body to ascend or to penetrate to a certain distance, in opposition to a retarding force."

In his lecture "On Collision", the most cited of his definitions of energy, Young states:

> "The term **energy** may be applied, with great propriety, to the product of mass or weight of a body, into the square of the number expressing its velocity. Thus, if the weight of one ounce moves with a velocity of a foot in a second, we call its energy 1; if a second body of two ounces has a velocity of three feet in a second, its energy will be twice the square of three, or 18."

This usage, according to Ingo Muller, supposedly, is based on the Greek word Îνεργεια meaning *efficacy* or *effective force*, as an abbreviation for the sum of kinetic energy and gravitational potential energy of a mass and the elastic energy of a spring to which the mass may be attached. [8] In this sense, Young defined energy as:

$$E = mv^2$$

To clarify that Young was the first to have mathematically coined the term "energy", years later Scottish mathematical physicist William Thomson stated before an audience, for instance, that "the very name *energy*, though first used in its present sense by Thomas Young about the beginning of this century, has only come into use practically after the doctrine which defines it had ... been raised from mere formula of mathematical dynamics to the position it now holds of a principle pervading all nature and guiding the investigator in the field of science." [10]

Lagrange: Four years later, supposedly in 1811, in partial correction to Young's expression, Italian mathematician Joseph Lagrange used calculus to show that a factor of two is involved in the relationship "potential" (potential energy) and "vis viva" (kinetic energy), and thereby defined energy as: [13]

$$T = \frac{1}{2}mv^2$$

To note, the exact publication and derivation of this half factor still needs to be tracked down; although it seems to have its origin in Lagrange's 1788 *Analytical Mechanics*, of which the second edition was published in 1811-1815.

To note, according to a second reference (Max Jammer), it was French physicist Gustave Coriolis who in 1829 introduced the factor ½ in Leibniz's *vis viva* for the sake of mathematical convenience. [20]

To note, according to a third reference (Philip Mirowski), it was Swiss mathematician Leonhard Euler who introduced the ½ factor in 1752. [21] This latter citation, which is based on American physicist Robert Lindsay's 1976 *Energy: Historical Development of the Concept*, however, may be a misinterpretation.

Clausius: In 1864, German physicist Rudolf Clausius, in his "On Terminology" section, Appendix A to his Sixth Memoir, adopted the term "energy", semi-based on William Thomson's earlier usage, for his new thermodynamic quantity U, otherwise known as "internal energy" in modern parlance, as follows: [24]

> "Of the expressions mentioned above—namely: 'the mechanical energy of a body in a given state' (Thomson), 'wirkungsfunction' (Kirchhoff), and 'interior heat of body' (Zeuner)—the term ***energy*** employed by Thomson appears to me to be very appropriate; it has in its favor, too, the circumstance that it corresponds to the proposition of Rankine to include under the common name energy, both heat and everything that heat can replace. I have no hesitation, therefore, in adopting, for the quantity U, the expression *energy of the body*."

Clausius, in short, building on the earlier work of Irish mathematician William Hamilton (1833), who showed that for a system of particles the sum of the kinetic energy and potential energy in the system can be represented by a set of differential equations known as the *Hamilton equations* for that system, showed that the energy *U* of a system, equates to the sum of the "vis viva" (kinetic energy), symbol *T*, and the "ergal" (potential energy), symbol *J*, of the three-dimensional movements of the particles of the system, such that:

$$U = T + J$$

and the "energy remains constant during the motion" (conservation of energy). [9]

Planck: The best modern-day general definition of "energy" was given by German physicist Max Planck, the noted PhD student of the work of Clausius, who gave the following (Clausius-based) definition of energy, supposedly, in argumentative correspondence with German physical chemist Wilhelm Ostwald in the period of the great "energetics debate" (c.1895): [22]

> "[A]n energy is a quantity which depends only on the instantaneous state of the system, not on the manner in which the system reached this state or on the manner in which it later changes its state. The whole importance of the concept of energy rests on this property; without it the principle of the conservation of energy would be illusory."

The reason this definition is the most cogent of all energy definitions is that once the appropriate reference frame is chosen, the "states" of all of the various energies of bodies or systems in the universe can be measured, quantified, and tabulated in thermodynamic tables, such as are found in free energy tables.

Einstein: In 1905, with respect to the development of "relativistic thermodynamics", German-born American physicist Albert Einstein showed that energy is proportional, according to the speed of light squared, to matter, in what has come to be called in word format as "mass-energy equivalence" relation or in equation format famously as $E = mc^2$. [11] Specifically, in his paper "Does the inertia of a body depend upon its energy-content?", Einstein proposed that the equivalence of mass and energy is a general principle, which is a consequence of the symmetries of space and time: [12]

$$E = mc^2$$

This has since come to be known as the most famous equation in all of science.

Particle physics

Into the late 20th century, in the perspective of particle physics, energy, in contrast to matter, began to be defined structurally as bosons or Gauge bosons.

Human chemistry

See also: human energy, social energy

In human chemistry, energy can be released or absorbed through the transformations of human chemical bonds. [2] The mathematical connection between the bulk measurements or "state" measurements of energies of human thermodynamic systems, such as a country, to the individual working energy actions of people (human molecules), as mediated through working human bonds, is new area of research. [3]

Clean

See also

â— Potential energy
â— Kinetic energy

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External links

â— Energy – Visuwords.com.
â— Energy – Wikipedia.

θΔics

In economics, **energy accounting** is a theory which holds that the "value" of any good or service should be determined by the amount of "energy" that goes into making it. [1] The energy accounting model can be contrasted with the "labor theory of value" (Marx, c.1885) of the theory that "value should be determined by prices" (Simon, 1991). [1]

Overview

In 1881, Sergei Podolinsky, in some article, supposedly, according to Juan Alier (1979), strove to reconcile the work-based theory of value with some type of proto "energy accounting" theory by integrating economic cycles with natural cycles, amid the skepticism of German political theorist Friedrich Engels who deemed it "totally impossible to try to express economic relationships in physical terms." [2]

In the late 20th century, economists, such as Nicholas Roegen and Herman Daly, the thinkers behind the "Roegen-Daly school" of economics, energy economics, ecological economics, and or biophysical economics, among other contrived namesakes, concerned about the loss of natural resources actuated by economies, sought to attempt to use loosely conceived ideas about energy and entropy, e.g. Roegen's "material entropy" theory, to formulate moral imperative based models to save natural resources, and began to lobby politically to get these models implemented into national energy policy guidelines and regulations, or something along these lines.

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Further reading

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External links

â— Energy accounting – Wikipedia.

θΔics

In thermodynamics, an **energy carrier** is a structure, such as a chemical bond, that carriers stored energy, e.g. bond energy. The term is rather ill-defined and used in similar but different contexts.

Overview

In 1941, German-born American chemist Fritz Lipmann described phosphate bonds as a type of motile energy carrier, used inside of biological bodies in various locations to drive endergonic reactions or processes: [1]

> "The recent recognition that in nature there occurs a widespread utilization of phosphate bonds as **energy carriers**, necessitates a still further revision of the earlier view concerning the biological significance of phosphate turn-over."

In 2006, Hungarian-born American economist Peter Pogany described condensed matter, such as coal, as energy carriers. [2]

In 2007, Russian bioelectrochemist Octavian Ksenzhek argued that money can be considered as a virtual form of energy, as in "energy currency", and that energy coupling in social systems is mediated by materialized forms of energy, such as money. Ksenzhek argues that the role of money in social systems may be compared with that of ATP (adenosine triphosphate) in biochemical systems, both of which act as energy carriers. [3]

See also

- Force carrier
- Field particle
- Primary field particle
- Secondary field particle

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θΔics

In hmolscience, **energy certificate** is a theoretical unit of value, in ergs or joules, proposed to be a replacement for the dollar and money in North America. [1]

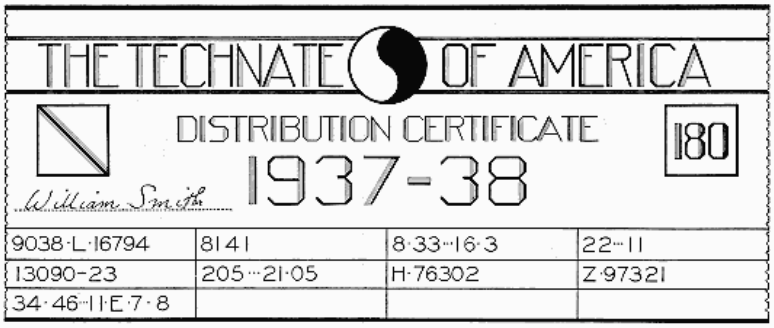

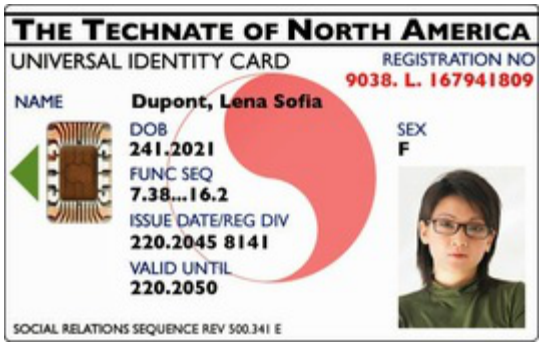

Left: a 1938 **energy certificate**. (Q) Right: a mock futuristic technate ID (Q), supposedly, embodying some type of energy certificate idea.

Overview

The energy certificate was conceived by the Technocracy group under the leadership of American engineer Howard Scott in *circa* 1930, following the stock market crash of 1929.

In 1933, Scott presented the argument in the following form: [2]

> "It is the fact that all forms of energy, of whatever sort, may be measured in units of ergs, joules, or calories that is of the utmost importance. The solution of the social problems of our time depends upon the recognition of this fact. A dollar may be worth—in buying power—so much today and more or less tomorrow, but a unit of work or heat is the same in 1900, 1929, 1933 or the year 2000."

By introducing energy certificates, the technocrats argued that "apolitically", rational engineers should be vested with authority to guide the nation's economic machine into a thermodynamically balanced load of production and consumption, thereby doing away with unemployment. [1]

In 1934, in their *Technocracy Study Course*, energy certificates were described as follows: [3]

> "Energy Certificates are issued individually to every adult of the entire population. The record of one's income and its rate of expenditure is kept by the Distribution Sequence, so that it is a simple matter at any time for the Distribution Sequence to ascertain the state of a given customer's balance… When making purchases of either goods or services an individual surrenders the Energy Certificates properly identified and signed. The significance of this, from the point of view of knowledge of what is going on in the social system, and of social control, can best be appreciated when one surveys the whole system in perspective. First, one single organization is manning and operating the whole social mechanism. The same organization not only produces but also distributes all goods and services. With this information clearing continuously to a central headquarters we have a case exactly analogous to the control panel of a power plant, or the bridge of an ocean liner." [Technocracy Study Course, Hubbert & Scott, p. 238 – 239]

Two key differences between price-based money and energy certificates are that a) money is generic to the holder while certificates are individually registered to each citizen and b) money persists while certificates expire. The latter facet would greatly hinder, if not altogether prevent, the accumulation of wealth and property. (Q)

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θΔics

In physicology, **energy currency** is a popular metaphor term used to describe the analogy of ATP, it particular its high-energy phosphate bonds (bond energy) seen as energy carriers, modeled as a type of universal biochemical "currency" or money able to pay for energetically unfavored reactions and processes in the cell and in the body.

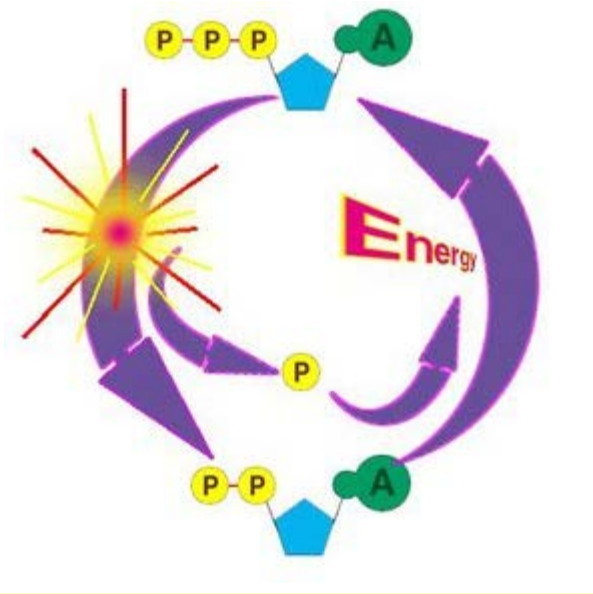

Simplistic diagram of ATP as **energy currency** showing how the breaking of one phosphate bond can release energy (left arrow); whereas it takes energy to make ATP (right arrow).

Overview

In 1941, German-born American biochemist Fritz Lipmann, in his "Metabolic Generation and Utilization of Phosphate Bond Energy", although he did not use the term "money" or "currency", began to outline the view how the bond energy stored in ATP could be used to pay for or run the energetics of (endergonic) reactions, that wouldn't normally go on their own. [2]

Beyond this, it is difficult to say who coined the term "energy currency". The term commonly began to be used in 1970s in reference to English biochemist Peter Mitchell's 1961 chemiosmotic theory of membrane energy transduction, which showed that ATP synthesis was coupled to electrochemical gradients.

In 1989, American biochemist Bruce Alberts stated the following: [1]

> "Just as energy stored in an elevated bucket of water can be dispensed in small doses to drive a wide variety of different hydraulic machines, ATP serves as a convenient and versatile store, or **currency**, of **energy** to drive many different chemical reactions that the cell needs."

This rule is has become a ubiquitous sort of biological linchpin of energy teaching in biology. Into the 1990s, it became dogma in nearly all biology textbooks.

In 2001, American biophysicist Donald Haynie, in his *Biological Thermodynamics* textbook, employed a bold face type is assigned to the opening (page four) statement that: "ATP plays the role of the main energy 'currency' of biochemical processes in all known organisms." [7]

Human thermodynamics

In economic thermodynamics, there have been attempts to develop a type of global currency based on units of joules. The most significant attempt was the 1920s effort by American engineer Howard Scott to introduce the notion of "energy certificates" to replace money as a unit of value in the economy.

In recent years, on the ATP energy currency model, there have been attempts to model money as a type of human molecular energy currency, used to couple reactions between people or in society. One example is Russian bioelectrochemist Octavian Ksenzhek argument that money can be considered as a virtual form of energy, i.e. "virtual energy", and that energy coupling in social systems is mediated by materialized forms of energy, such as money; whereby the role of money in social systems may be compared with that of ATP in biochemical systems, both of which act as energy carriers. [4] Another example is American chemical engineer Libb Thims' assignment of anthropomorphic molecular forms of value, such as money, gold, diamonds, etc., as types of secondary field particles, i.e. entities that act to transmit the electromagnetic force of movement to human chemical reactions. [5]

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External links

â— Energy currency – Appropedia.
â— The Cell’s Energy Currency – CliffNotes.com.

θΔics

In thermodynamics, **energy dispersal**, or energy dispersion (energy randomization), is a mis-contrived view used to describe entropy, in a nonmathematical way, such that entropy increase is described to mean that energy of systems is becoming more spread out or more dispersed among microstates. [1]

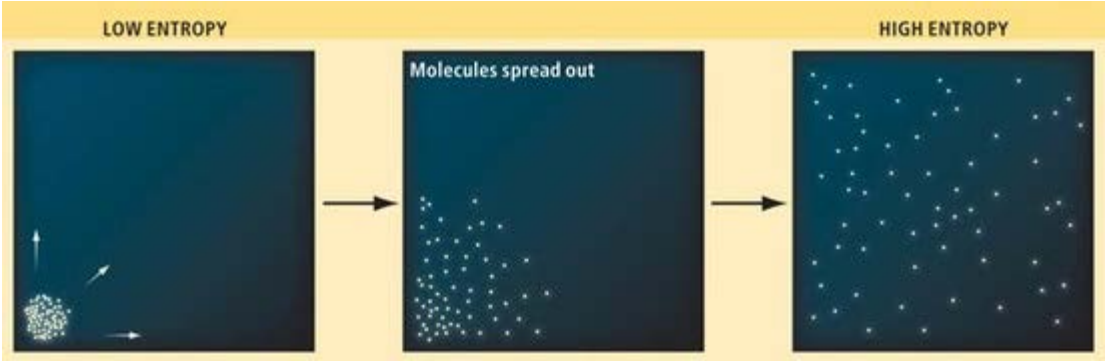

Typical depiction of the **energy dispersal** view of entropy, wherein it is argued that the second law of thermodynamics states that concentrated forms of energy, such as a packed ordered grouping of atoms or molecules (low entropy state), tend to spread out over time, towards that of the most probable or uniform state, often towards the most disordered state (high entropy state).

Etymology

The origin of the "energy dispersal view" of the entropy and the second law is difficult to pin down. It seems to be a modern-day spin-off of the William Thomson 1852 dissipation view of the second law, albeit not exactly as Thomson saw things in terms of a dissipation of mechanical work. The term may also have origins in the 1874 *Nature* article “Kinetic Theory of the Dissipation of Energy” by Scottish physicist James Maxwell. [3]

In 1921, English biologist James Johnstone was explaining entropy and the second law as the tendency for available energy to transform into inavailable energy or for energy to be first concentrated somewhere and then when a phenomenon occurs for the energy to become "dissipated or spread out", at which point it is said to loose its capacity for doing work. [12]

English chemist Kenneth Denbigh was also using a variant of the the entropy as energy dispersal view description in the 1980s.

A significant promoter of the "dispersal of energy" view of the second law is English physical chemist Peter Atkins, as presented in his 1984 *The Second Law* and his 1992 *Creation Revisited*, all of which seem to be the result of an effort to over-laymanize the entropy and the second law.

The major change in use of the term 'energy dispersal' came about through the efforts of American organic chemist Frank Lambert who from 1999 to 2009 made a 'Jihad' (as some have described it) against the Boltzmann-Planck order-disorder view of entropy, by mass mailing out requests to dozens of American chemistry textbook writers to have the word 'disorder' removed from chemistry textbooks and replaced by the work 'dispersal'. The result of this effort was that at least two dozen textbooks were changed or reworded to this effect, although there was no actual experimental or mathematical justification for this change, other than "its easier concept for beginners to understand".

Lambert

This energy dispersal view of entropy stems from the efforts, during the years 1999-2009, of American chemist Frank Lambert to have the word ‘disorder’ removed from American chemistry textbooks. In 2009, one anonymous person humorously commented on the issue of growing prevalence of Lambert’s view of entropy in chemistry textbooks (such as pictured adjacent): [10]

> “Finding grossly erroneous incorrect information in introductory chemistry texts is like finding sand at the beach.”

In origins, as discussed below, in 1939 as an undergraduate chemistry student, Lambert essentially

flunked out of (or had great difficulty with) his senior year thermodynamics course, and was forced to change majors from physical chemistry to organic chemistry, thus leaving a likely void of insecurity in his mind. Sixty years later, at the age of eighty, in retirement, having unresolved issues with the disorder view of entropy, Lambert went searching for the true meaning of entropy, supposedly finding it in 2002, and thus going on to supposedly educate America and its chemistry textbook authors about what entropy really is.

The thrust of this particular view of entropy, in larger part, comes from the views of American chemist Frank Lambert, who for several decades (1948-1981) taught a course on entropy for humanity students at Occidental College, California. The following are Lambert's explanation of the origins of this course: [2]

> "Here's a brief of my sad story: Never liking thermo, except for the power of the Gibbs free energy relationship, and never having to teach it, I was asked to develop a chem course for non-science majors that would have more meaningful content and interest than any watered-down general chem. I came up with 'Enfolding Entropy', essentially a **baby thermo** course with minimal math. Marvelous fun for years. Good kids. In a very thorough 'entropy via order-disorder' that led to its (mis)application to human affairs in the last week or even two. I felt a bit uncomfortable. But not much. I put that aside because the students really could grasp why it required energy to produce hydrogen from water, and the problems in ammonia synthesis, etc., etc."

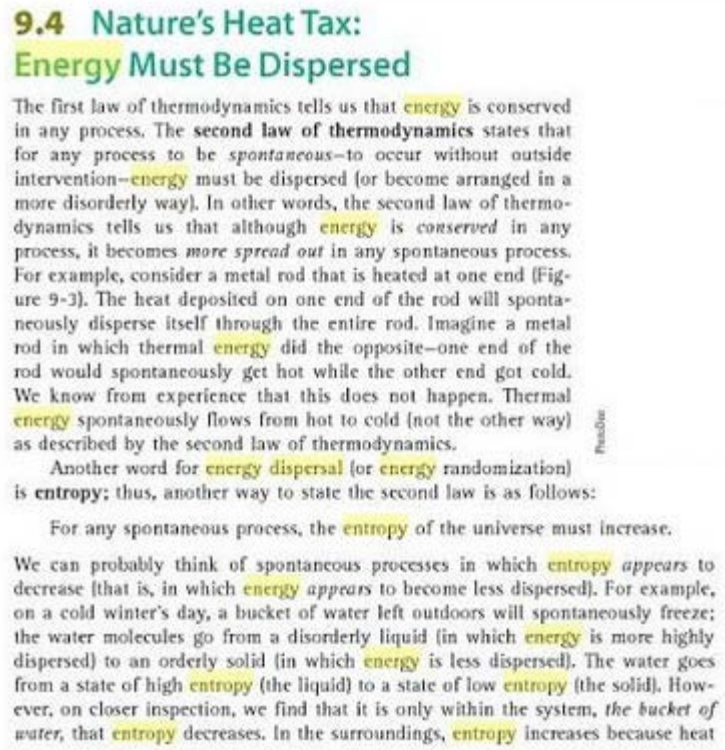

9.4 Nature's Heat Tax: Energy Must Be Dispersed

The first law of thermodynamics tells us that energy is conserved in any process. The **second law of thermodynamics** states that for any process to be *spontaneous*—to occur without outside intervention—energy must be dispersed (or become arranged in a more disorderly way). In other words, the second law of thermodynamics tells us that although energy is *conserved* in any process, it becomes *more spread out* in any spontaneous process. For example, consider a metal rod that is heated at one end (Figure 9-3). The heat deposited on one end of the rod will spontaneously disperse itself through the entire rod. Imagine a metal rod in which thermal energy did the opposite—one end of the rod would spontaneously get hot while the other end got cold. We know from experience that this does not happen. Thermal energy spontaneously flows from hot to cold (not the other way) as described by the second law of thermodynamics.

Another word for energy dispersal (or energy randomization) is **entropy;** thus, another way to state the second law is as follows:

For any spontaneous process, the entropy of the universe must increase.

We can probably think of spontaneous processes in which entropy *appears* to decrease (that is, in which energy *appears* to become less dispersed). For example, on a cold winter's day, a bucket of water left outdoors will spontaneously freeze; the water molecules go from a disorderly liquid (in which energy is more highly dispersed) to an orderly solid (in which energy is less dispersed). The water goes from a state of high entropy (the liquid) to a state of low entropy (the solid). However, on closer inspection, we find that it is only within the system, *the bucket of water,* that entropy decreases. In the surroundings, entropy increases because heat

Excerpt of a Lambert-influenced description of entropy and the second law from the fourth edition 2008 college chemistry textbook *Chemistry in Focus* by American chemist Nivaldo Tro, in which the second law is defined, incorrectly, as the tendency for "energy to become more spread out in any spontaneous process" and that another word for entropy is "**energy dispersal**" (or energy randomization). [9]

In retrospect, while teaching this "baby thermo" course in a subject that he "never liked", Lambert has admitted in retrospect that during these years he had no idea what entropy was. In particular, in communication with American chemical engineer Libb Thims, in 2006, Lambert commented that while teaching this course that he never understood what entropy was, that he had never had read any of German physicist Rudolf Clausius' work (from where the definition of entropy comes), and that he only came to understand entropy in his retirement years, in *circa* 1998, through a reading of Scottish physicist James Maxwell's four-page 1874 *Nature* article "Kinetic Theory of the Dissipation of Energy". [3] This seed prompted his seven-year "jihad against the word 'disorder'", as several people have commented, starting in 1999, in the chemistry community, to have disorder removed from all American chemistry textbooks and replaced with the word energy dispersion. [4] In his own words: [2]

> "After my second retirement, from a fascinating non-academic career [advisor for the J. Paul Getty Museum, 1981-2002], I had time to think. I began to wonder why Clausius' q/T had begun to be applied to shuffled cards and, to start, I checked some history. Clausius, Boltzmann, Planck, and Gibbs, then Shannon and Jaynes – and things began to clear. My first paper on shuffled cards as unrelated to entropy change caused the deletion of this silly example – my point of view (POV) of 1999 is now the shared wisdom of all but one chemistry textbooks published since 2004 , whereas in 1999, it was the principal illustration of entropy increase in most general chemistry textbooks. In 2002, my POV discovery was that 'disorder' was a valiant try by Boltzmann but an untenable view because of his limitation to 1898 knowledge (prior to the Third Law, quantum mechanics, and full understanding of the energetic behavior of molecules)."

Lambert published his new-view 'discovery' of entropy in an article titled "Disorder: A Cracked Crutch for Supporting Entropy Discussions" in the *Journal of Chemical Education.* [5] He then began aggressively emailing various US chemistry textbook authors petitioning them to change their descriptions of entropy from disorder to dispersion. Lambert explains the results of this effort as such:

> "That seemingly personal POV of 2002 has, by 2006, resulted in the deletion of "entropy is related to disorder" from the great majority of new chemistry texts – including those in physical chemistry (although I can claim my direct influence in only two physical chemistry texts). This is perhaps an unprecedented rate of change in an 'accepted' concept in texts. It is not my famous name or power in the establishment that caused a total of 25 or so authors and hundreds of text reviewers to change their views! I am just the lucky guy who belled a giant cat that most chemist-authors had known was dead but wanted somebody else to say so."

In 1999, Lambert claims that "all U.S. general chemistry texts described entropy as *disorder*. By 2007, 16 first-year textbooks and two physical chemistry texts had adopted the spontaneous dispersal of molecular motional energy in space or in occupancy of an increased number of accessible microstates as their definition of entropy increase." In 2009, supposedly, according to Lambert, 21 texts had changed to his view. He lists these revision updates as sorts of online trophies on his entropy is simple websites. [6]

Difficulties on theory

The fact that a good portion of America is being currently educated about entropy by someone who switched majors because thermodynamics was too difficult, requires a bit of discussion on the backwardness of this situation.

It seems to be the case that this decade long effort by Lambert, between his 81st and 91st birthdate, seems to be an end-life attempt to exorcise his demons in regards to his lack of understanding of thermodynamics. In particular, he was forced to switch majors, at Harvard University, from the harder physical chemistry to the easier organic chemistry, after having difficulty, in his senior year, with Ukrainian-born American chemist George Kistiakowsky's thermodynamics course. [7] In Lambert's own words: [8]

> "Mistakenly thinking that [I] could shorten [my] grad school work, [I] was admitted to Kistiakowsky's thermodynamics course for graduate students. Its difficulty sealed [my] decision to become an organic chemist rather than a physical chemist."

This quote, together with the facts that: (a) Lambert has never read Clausius; (b) that he never knew what entropy was until *circa* 1999 (at the age of 81), (c) that he derived his view of entropy from a three-page paper by Thomson discussing Joule's work on the dissipation of energy (mechanical equivalent of heat) and Maxwell's demon, (d) that he has no academic background in physical chemistry, (e) that his only experience with entropy was teaching a 'baby thermodynamics' class, with minimal math, to humanities students (that was marvelous fun for years), parts of which he felt uncomfortable with, leads to the conclusion that: when these six facts combined with the fact that currently near to two-dozen chemistry textbooks are teaching Lambert's uneducated view of entropy as energy dispersal to tens of thousands of students, one can only shake their head at the dismal state of the American chemistry departments, in regards to thermodynamics? [11] In clearer words, as one Wikipedian commented to Lambert in 2006: [4]

> "I think you are doing untold (but hopefully minor) damage to the teaching of entropy with your jihad against the word 'disorder' and insistent on relating everything to **energy dispersal**."

The only thing worse than this situation, to note, is the gross proliferation of American electrical engineer Claude

Shannon's 1948 equating of entropy to "information, choice, and uncertainty", which over the last sixty-years has led thousands of researchers down endless highways of incorrect knowledge and further incorrect publication and research; in a sense, leading possibly millions of people to think that currents and voltages in wires and telephone lines have something to do with thermodynamic entropy.

See also

â— Entropy (misinterpretations)

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1. (a) Zhang, Wei and Shmulevich, Ilya. (2006). *Computational and Statistical Approaches to Genomics* (pg. 154). Springer.
(b) Kozliak, Evguenii I. and Lambert, Frank L. (2005). "Order-to-Disorder for Entropy Change? Consider the Numbers!" *Chem. Educator.* 10: 24-25.
2. Introduction (Jul 01, 2006) – en.Wikipedia.org/Talk:Entropy/Archive2.
3. (a) Email commentary (and talk page discussions) from Lambert to Libb Thims in connection to Wikipedia Talk Page discussions on entropy, c. 2006-2007.
(b) Thomson, William (1874). "Kinetic Theory of the Dissipation of Energy", *Nature, IX. pp 441-444* (April 9).
4. (a) Entropy Sites (Jun 27, 2006) – en.Wikipedia.org/Talk:Entropy/Archive2.
(b) Removed Confusing Text (Jun 29, 2006) – en.Wikipedia.org/Talk:Entropy/Archive2.
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7. George Kistiakowski – Wikipedia.
8. Frank L. Lambert (biography) – EntropySite.oxy.edu.
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11. (a) Koltz, John C., Treichel, Paul, Townsend, John R. (2008). *Chemistry and Chemical Reactivity*, 7th ed. (9.2: Dispersal of Energy: Entropy, pgs. 863-). Cengage Learning.
(b) Ebbing, Darrell D. and Gammon, Steven D. (2007). *General Chemistry*, 9th ed. (18.2: Entropy and the Second Law of Thermodynamics, pgs. 736). Cengage Learning.
(c) Whitten, Kenneth W., Davis, Raymond, Davis E., Peck, M. Larry, Stanley, George G. (2009). *Chemistry*, 9th ed. (pg. 582-). Cengage Learning.
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Further reading

â— Annila, Arto and Salthe, Stanley. (2009). "Economies Evolve by Energy Dispersal", *Entropy*, 11(4): 606-33.

External links

â— Entropy (energy dispersal) - Wikipedia.

θΔics

In science, an **energy element** ε is the base energy unit of the total internal energy *U* of an irradiated, monochromatic, vibrating resonator, i.e. blackbody, defined to be proportional to the frequency ν of the emitted or absorbed radiation: [1]

$$\varepsilon = h \nu$$

where *h* is Planck's constant. The energy element postulate was developed, during the years 1889-1901, by German physicist Max Planck.

Overview

In 1894, German physicist Max Planck turned his attention to the problem of black-body radiation. He had been commissioned by electric companies to create maximum light from lightbulbs with minimum energy. The problem had been stated by Kirchhoff in 1859: how does the intensity of the electromagnetic radiation emitted by a black body (a perfect absorber, also known as a cavity radiator) depend on the frequency of the radiation (e.g., the color of the light) and the temperature of the body? The question had been explored experimentally, but no theoretical treatment agreed with experimental values. Wilhelm Wien proposed Wien's law, which correctly predicted the behavior at high frequencies, but failed at low frequencies. The Rayleigh-Jeans law, another approach to the problem, created what was later known as the "ultraviolet catastrophe", but contrary to many textbooks this was not a motivation for Planck.

Planck's first proposed solution to the problem in 1899 followed from what Planck called the "principle of elementary disorder", which allowed him to derive Wien's law from a number of assumptions about the entropy of an ideal oscillator, creating what was referred to as the Wien-Planck law. Soon it was found that experimental evidence did not confirm the new law at all, to Planck's frustration. Planck revised his approach, deriving the first version of the famous Planck black-body radiation law, which described the experimentally observed black-body spectrum well. It was first proposed in a meeting of the German Physical Society (Deutsche Physikalische Gesellschaft, DPG) on 19 October 1900 and published in 1901. This first derivation did not include energy quantization, and did not use statistical mechanics, to which he held an aversion.

In November 1900, Planck revised this first approach, relying on Austrian physicist Ludwig Boltzmann's statistical interpretation of the second law of thermodynamics as a way of gaining a more fundamental understanding of the principles behind his radiation law (Boltzmann had been discussing in a theoretical paper in 1877 the possibility that the energy states of a physical system could be discrete). As Planck was deeply suspicious of the philosophical and physical implications of such an interpretation of Boltzmann's approach, his recourse to them was, as he later put it, "an act of despair ... I was ready to sacrifice any of my previous convictions about physics."

The central assumption behind his new derivation, presented to the DPG on 14 December 1900, was the supposition that the electromagnetic energy could be emitted only in quantized form, in other words, the energy could only be a multiple of an elementary unit $\varepsilon = h\nu$, where *h* is Planck's constant, also known as Planck's action quantum (introduced already in 1899), and ν is the frequency of the radiation.

In 1901, in reference to the total internal energy U of a resonating blackbody, Planck stated: [2]

> "It is necessary to interpret U not as a continuous, indivisible quantity, but as a discrete quantity composed of an integral number of finite equal parts … let us call each such part the **energy element** ε."

Here, Planck was explaining the view that the internal energy *U* of a black body (resonator) could be divided into a discrete number of "energy elements" ε by the expression:

$$U = \varepsilon P$$

where *P* is large integer. [1]

Einstein | Quantums

In 1905, German-born American physicist Albert Einstein, influenced by Planck, proposed that light itself was composed of quantums of energy, i.e. light quantums. These light quantums later came to be called “photons”, a term introduced in 1926 by American physical chemist Gilbert Lewis. These beginnings launched the later development of quantum thermodynamics.

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1. Kuhn, Thomas S. (1987). *Black-body Theory and the Quantum Discontinuity, 1894-12*, (section: "Energy elements and energy discontinuity", pgs. 125-30). University of Chicago Press.
2. Planck, Max. (1901). "On the Law of Distribution of Energy in the Normal Spectrum". *Annalen der Physik*, vol. 4, p. 553 ff.

θΔics

In thermodynamics, **energy flow** is an oft-used, albeit ill-defined, term referring to the movement of one type of energy, e.g. bond energy, potential energy, into that of another type, e.g. kinetic energy, diffusion mechanisms. The term is frequently used in biology and ecology to the effect that various “energy flows” mediate life or an ecosystem. The typical example being a verbal description of how "energy" enters the biosphere via photosynthesis then flows through the various food chains.

In 1988, American physicist Ronald Fox used the 1941 Fritz Lipmann ATP energy currency model to argue that “energy flow” is key to the existence to life’s dynamic molecular state. [1] Americans ecologist Eric Schneider and biophysicist Harold Morowitz also use the concept of energy flow to a significant extent. [2]

See also

- Csíkszentmihályi flow
- Entropy flow
- Gibbs energy flow
- Thermodynamic flow

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1. Fox, Ronald F. (1988). *Energy and the Evolution of Life* (pg. 5). New York: W.H. Freeman and Co.
2. (a) Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Life*. Chicago: The University of Chicago Press.
(b) Morowitz, Harold J. (1968). *Energy Flow in Biology: Biological Organization as a Problem in Thermal Physics.* Academic Press.

External links

- Energy flow – Wikipedia.

θΔics

Slides

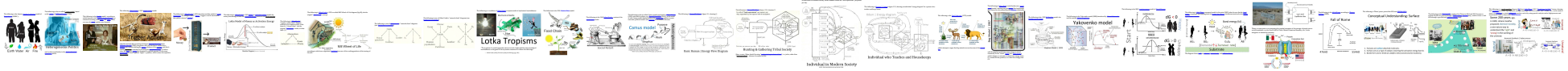
Earth Water Air Fire
Lotka Tropisms
Food Chain
Cornus model
Individual in Modern Society
Individual who Teaches and Housekeeps
Yakovenko model
Subsidies
Fall of Rome
Conceptual Understanding: Surface

In hmolscience, **energy form** is a crude scientific term, introduced in 1988 by Richard Adams, as a replacement to the earlier confounded term "matter-energy" (Miller, 1978), conceptualized to mean "any form of potential energy or kinetic energy", generally employed in sociological discussions. [1]

Overview

In 1988, Richard Adams, in his *The Eighth Day*, via citation to James Miller's earlier usage of "matter-energy", introduced the term "energy form" as follows:

> "The term **'energy form'** will refer to any form of potential or kinetic energy; that is, for those things we ordinarily call matter and those we call energy. The choice of the term energy form is, of course, arbitrary. Miller (*Living* Systems,1978), in his treatise on general systems, uses the term matter-energy. I prefer *energy form* because form implies matter and in***form***ation."
>
> — Richard Adams (1988), *The Eight Day* [1]

Here, to clarify, we see incoherence, in that "information" is not a form of energy; this false assertion is what is called the "thermodynamic information fallacy".

Quotes

The following are related quotes:

> "While most readers would have no problem in conceiving of coal or petroleum as **energy forms**, the present argument requires that we also regard human beings, human behavior, social groups, and assemblages of social interactions as energy forms. Similarly, mental processes located in the brain, writing on paper, and soundwaves in the air are also energy forms. The inclusion of all these different kinds of things as energy forms is legitimate because all of them meet the definition."
>
> — Richard Adams (1988), *The Eighth Day* (pgs. 15-16); cited by Ralph Anderson (2019) in *Human Behavior as Social Environment* (pg. 9); cited by Libb Thims (2019) in Reddit (Ñº) post

References

1. (a) Miller, James G. (1978). *Living Systems* (pg. 11). McGraw-Hill.
(b) Adams, Richard N. (1988). *The Eighth Day: Social Evolution as the Self-Organization of Energy* (pg. 15). University of Texas Press.

θΔics

In thermodynamics, **energy landscape**, as they are referred to in protein thermodynamics, or "free energy map", as they are called in drug-receptor thermodynamics, is a computer-generated map that shows the three-dimensional regions or landscapes of local free energy minimums in systems of particles (atoms, ions, molecules, chemical species, proteins, human molecules, etc.). [1] Free energy maps often show that the most populated cluster of entities often occur around regions of the lowest free energy local minimums. [2]

An energy landscape, in simple terms, is a mapping of all possible conformations of a molecular entity (or the spatial positions of interacting molecules in a system) and their corresponding energy levels, typically Gibbs free energy, on a two- or three-dimensional Cartesian system.

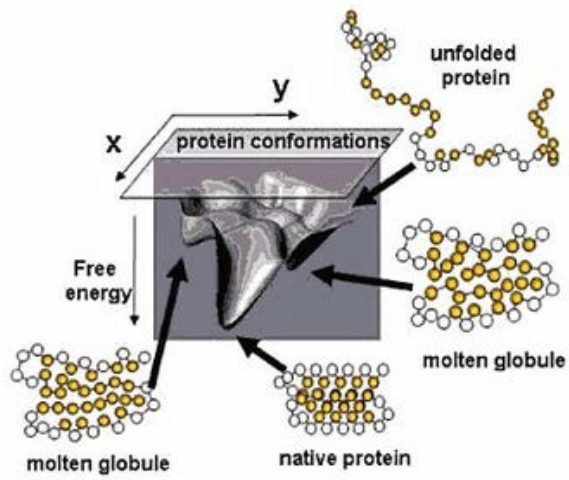

A hypothetical **energy landscape**, the x,y-plane serves to locate the various conformational states of the folding protein, with the Gibbs free energy shown on the vertical z-axis, a decrease in free energy indicative of increased stability, the native protein being the normal state or most stable configuration. [4]

History

It seems likely that the free energy map (landscape) concept arose following the 1931 development of the "potential energy surface", developed during the work of hydrogen atom - hydrogen atom interactions, by Mexican-born American theoretical chemist Henry Eyring and Hungarian-born English physical chemist Michael Polanyi.

In this sense, the energy landscape conception was originally proposed to study potential energy in physical systems and had its first rigorous development in the context of Hamiltonian systems (such as possibly summarized in the work of Vladimir Arnold). [9]

In the mid 1980s, energy landscape models were being employed in the study of protein folding. The theory of RNA free energy landscapes was being utilized as early as 1993.

Potential energy surface vs free energy surface

The first unified textbook on the subject of energy landscapes was the 2003 *Energy Landscapes: Applications to Clusters, Biomolecules, and Glasses* by David Wales. In it Wales explains the difference between a potential energy surface and a free energy surface: [13]

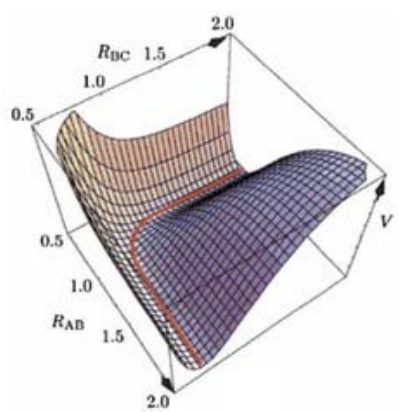

The **potential energy surface**, where V, the potential energy, is an explicit function of just two internal coordinates for the linear hydrogen atom exchange reaction, shown above, namely the internuclear distances RAB and RBC, in Angstroms. A trajectory that runs close to the valley bottom is marked in red.

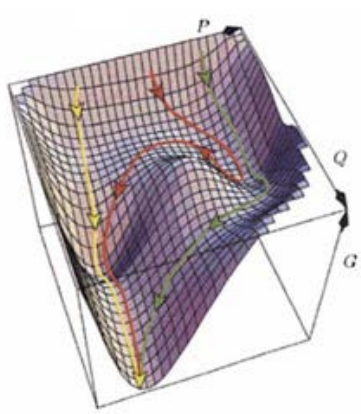

The **free energy surface** schematic for lysozyme, shown above, is constructed to match experimental observations by averaging over all the solvent and protein coordinates except for Q and P. G is the Gibbs free energy, Q is the fraction of native contacts present, and P represents some measure of compactness. The three folding pathways are superimposed on the surface: the yellow trajectory represents the fast folding, the green represents a slower path involving a higher free energy barrier, and for the red pathway the system first explorers a partly folded state before escaping to the route for fast folding.

Protein folding

In protein thermodynamics, the free energy landscape model was employed beginning in the late 1980s to understand protein folding through the work of Ken Dill (1985), followed by Byrngelson and Wolynes (1987), among others. [5]

Construction

To construct an energy landscape protein conformations are sampled by iteratively perturbing existing conformations, starting typically with a confirmation of the known native state or “target conformation” (below left), and then sampling neighboring conformations (middle two), of which resultantly there tends to be a denser coverage near the target. These samples yield a three dimensional free energy graph of the different geometries of the molecular structure of the protein (below right): [7]

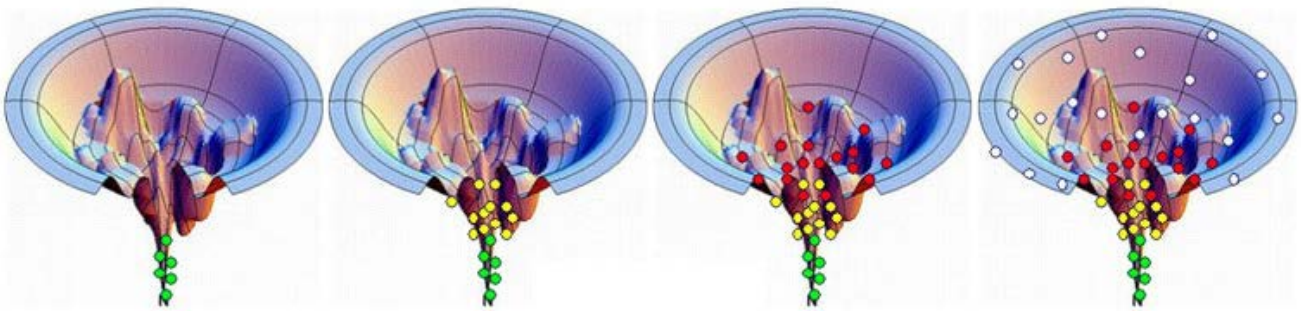

Landscape types

The following are various landscapes made by Danny Heap of the University of California, at San Francisco, for the 1998 article “Protein Folding in the Landscape Perspective” by Hue Chan and Ken Dill: [5]

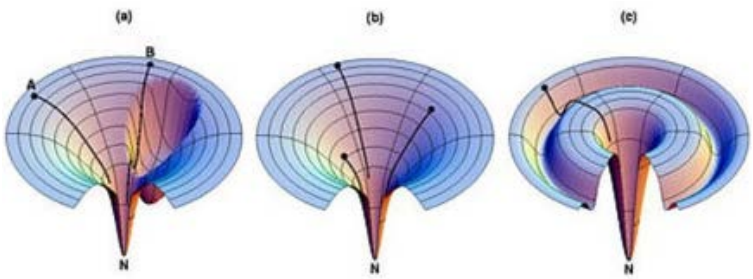

General shapes of landscapes: (a) The HP landscape is shown pictorially as having a kinetic trap, A is a throughway folding trajectory whereas path B passes through the trap; (b) the HP+ landscape is smooth, unfolding paths are simply the reverses of the folding paths shown; (c) shows a landscape on which all folding molecules must pass through an obligatory folding intermediate, represented by the "moat" in the figure.

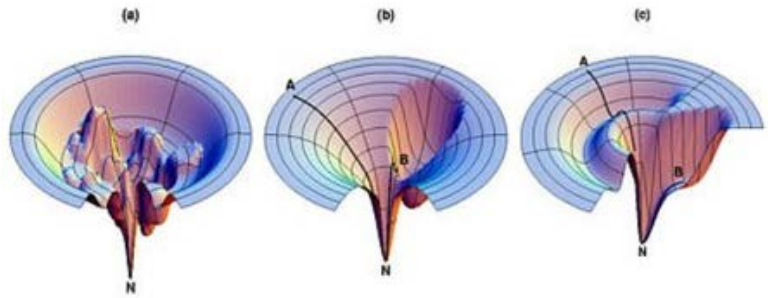

Different folding scenarios: The vertical axis is internal free energy. Each conformation is represented as a point on the landscape. The two horizontal axes represent the many chain degrees of freedom. (a) shows a rugged landscape with hills and traps, folding kinetics is likely multi-exponential. (b) shows a landscape in which folding is faster than unfolding. A is a throughway folding path, whereas unfolding chains (path B) must surmount a barrier in order to reach the most stable denatured conformations. (c) shows a landscape in which folding is slower than unfolding. Most folding paths (path A) pass through a kinetic trap, whereas some low-lying denatured conformations are readily accessible from the native state during unfolding (path B).

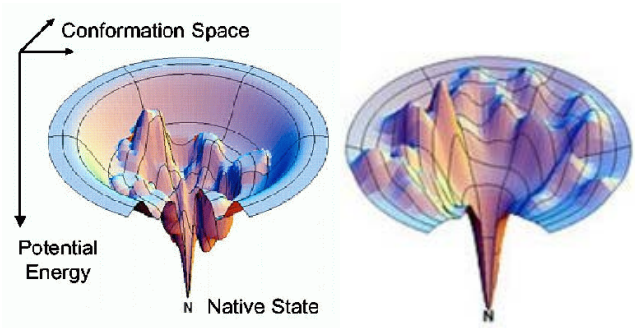

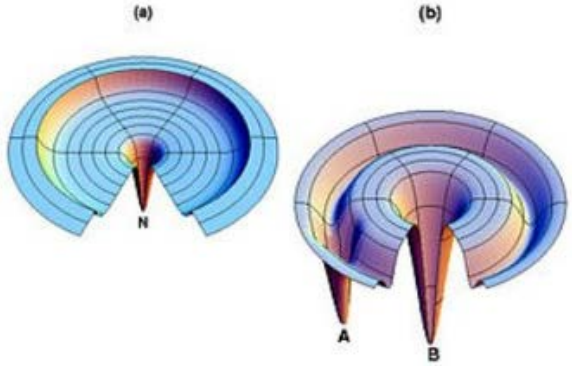

Champagne glass landscape: Illustrates how conformational entropy can cause "free energy barriers" to folding. The "bottleneck" or rate limit to folding is the aimless wandering on the flat plateau as the chain tries to find its way downhill (b) Serpin scenario shows a

Funnelscape for a fast folding protein: Folding is limited by the rate of meandering downhill.

landscape with a deep kinetic trap on the left (A), which is easily accessible from the open conformations. Chain trapped in this deep local minima anneal to the global minimum (B, in the middle) only very slowly. This corresponds to the folding of some serpins such as PAI-1.

Drug-receptor encounter complexs

In drug-receptor thermodynamics, free energy maps are employed to map the free energy changes or values involved in an encounter complex between to molecules, such as a drug and a receptor. The relative orientation of two molecules in an encounter complex can be specified, it is said, by five Euler angles, whereby the free energy map or landscape is a continuous function in space of these fiver variables, obtained by smoothing the discrete free energy values on a grid of on the surface of the receptor. [1]

Fitness landscapes

Some, such as Hungarian biochemist Peter Csermely (and possibly Stuart Kauffman), have argued that the concept of an 'energy landscape' was introduced, underlying, in the 1932 work of American geneticist Sewell Wright, who viewed evolution as an optimization process on a "fitness landscape". [3] This, however, seems to be a retrospect appropriation. There doesn't seem to be an actual formal proof or article equating free energy with fitness, but by 1997 statements can be found, in discussions of Wright's fitness landscape models, to the effect that: [11]

> "In physics, **fitness** is analogous to free energy, the minimum of which determines the configuration of a system."

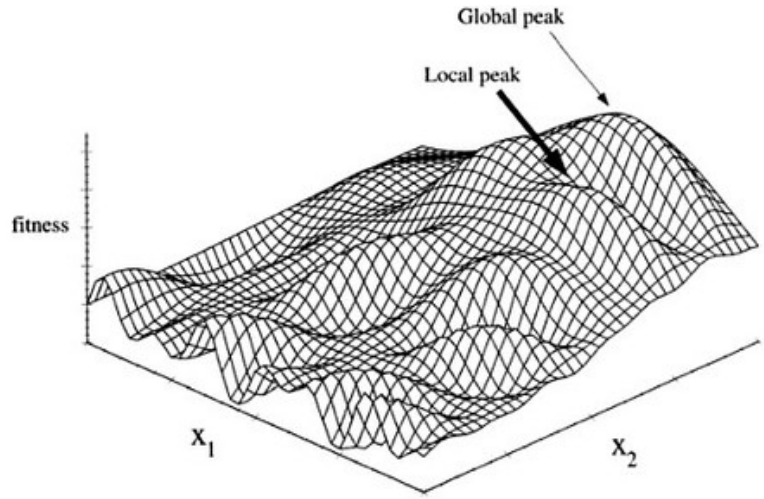

Two-dimensional **fitness landscape**, where X_1 and X_2 are coordinates in a space; the global peak is the highest fitness in the space; a local peak is a point of all whose neighbors, defined by some neighbor relationship, are of lower fitness. [11]

Wright introduced the metaphorical concept of adaptive landscapes, visualizing evolution as a hill-climbing (local optimization) process. With the development of formal thermodynamic methods, in the years to follow, such as finding the minimum free energy in spin glasses, some began to develop evolutionary dynamic models using a mix of both theories (adaptive landscapes + energy landscapes = fitness landscapes), to the logic that an analogy can be employed whereby just as a physical system minimizes its free energy as it climbs down a an energy surface, so to does an evolving population maximize its fitness as it climbs a "landscape" to an adaptive peak. In the latter model, a fitness landscape or fitness function is defined by assigning a reproduction rate to every point in genotype space. [10]

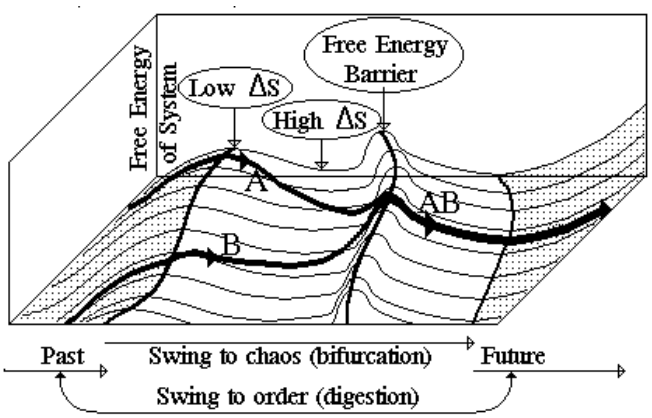

Figure 2: Free Energy Landscape

South African physical chemist Adriaan De Lange's 2001 free energy landscape of evolution, employing a mixture of chaos theory, Prigoginean bifurcation theory, order-disorder logic, time (past vs future), free energy barrier, path functions, and discussions of high and low values of entropy change.

Human chemistry | thermodynamics

See main: Human chemistry

In 2001, South African physical chemist Adriaan de Lange developed a Gibbs free energy theory of human evolution (with, to note, underlying spirituality implications) and drew out various free energy landscape diagrams (possibly culling logic from Stuart Kauffman, whom de Lange often cites), such as the one pictured adjacent, which he says is "a simplified version of the image in my mind", wherein the vertical axis represents free energy, the 'Urphaenomen' or prototype of all functions having limits. In explaining his plot, de Lange states:

> "All fitness functions, how imaginative we may create them, depend on free energy as the mother of them all. No change is possible without free energy changing somewhere in the universe, whether in the system S_Y or in the surroundings S_U. The free energy F is not merely a theoretical concept of the imagination. It is a quantity based on innumerous measurements and calculations in the realm of physical chemistry. It is a quantity of bewildering consequences, the nemesis of many a student in physical chemistry."

In describing his graph further he explains:

> "Please notice the two shaded regions, designated past and future digestions. (Forget for a moment the thickest lines called A, B and AB as well as the strange barrier in the unshaded region where the two lines join.) The free energy in both shaded regions increases (the landscape bulges upwards to a summit). The difference is that the "hill of the past" is often lower than the "hill of the future". (I have actually drawn the future hill much higher than the past hill so that you can easily observe it.) Looking towards all the free energy hills of the future, there is a gradual elevation along the future hills. It is as if the system is gradually climbing the rugged landscape called free energy F from sea level towards a high mountain "Everest" beyond the horizon. "Steigerung" (staggering) is necessary to do so. Specialization, on the other hand, will cause the system to stay meandering within in a "patch" (region) containing only some hills this side of the horizon."

In 2007, American chemical engineer Libb Thims argued that the logic of free energy maps can be employed in the study of encounter complexes between humans, such as in the male-female reaction. It can be shown, for instance, that the map of the estate that the Captain makes in Goethe's celebrated novella *Elective Affinities*, is in fact a prototype free energy map or energy landscape. [8]

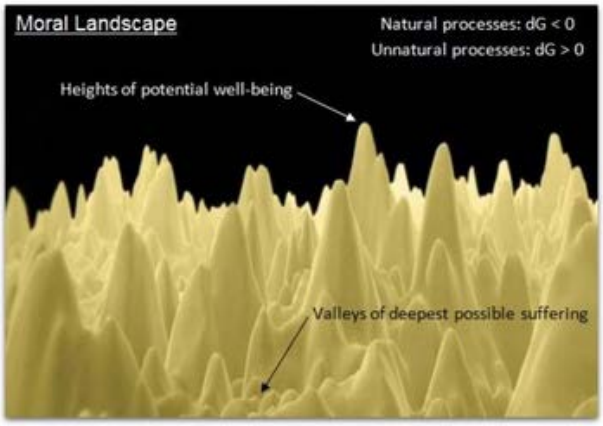

American neuroscience philosopher Sam Harris's 2010 visual conception of "moral landscapes" posited to be explainable by science, shown with the standard criterion for constitutes "natural" and "unnatural" for earth-bound reactions and processes. [15]

Further reading

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13. Wales, David. (2003). *Energy Landscapes: Applications to Clusters, Biomolecules, and Glasses.* Cambridge University Press.
14. (a) Harris, Sam. (2010). *The Moral Landscape* (pg. moral landscape definition, pg. 7). Free Press.
(b) Moral landscape (video image) - SamHarris.org.
(c) Guggenheim, Eduard, A. (1933). *Modern Thermodynamics by the Methods of Willard Gibbs* (pgs. 5, 17). London: Methuen & Co.

Further reading

â— Dill, Ken A. and Chan, Hue S. (1997). "The New View of Folding: from Levinthal to Pathwas to Funnels" (abstract), *Nature Structural Biology*, 4(1).

External links

â— Energy landscapes – Wikipedia.

θΔics

In science, **energy level** refers to an allowed state of a quantum system corresponding to a particular amount of stored energy. [1] The term “energy level”, in basic definition, typically refers to the position of an electron in one of the layered “levels” of shells in the orbital structure of the atom, where each step higher (distally away) from the nucleus corresponds to a higher energy level or less stable position for the electron.

Molecules

Supposedly, not just electrons, but all nuclei and molecules have well-defined energy levels, such that molecules and molecular systems can only pass from one energy level to another, with no in-between state. [1] This is often referred to as the quantum leap. This would seem to have huge implications to that of the energy levels of human molecules.

History

The energy level model seems to stem from the 1913 article “On the Constitution of Atoms and Molecules” by Niels Bohr. [2] This was expanded on more American physical chemist Gilbert Lewis’ 1916 article “The Atom and the Molecule”, in which he discussed how “electrons may pass with readiness from one position in the outer shell to another”, also discussing this in the context of thermodynamic stability and chemical bonding. [3]

American physicist William Sidis, in 1920, stated that “the idea of the energy-level, of unavailable energy (or entropy)” was brought in by the second law of thermodynamics. [4]

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External links

â— Energy level – Wikipedia.

θΔics

In human thermodynamics, **energy psychology**, or Freud's "psychical energy model" as the subject was described by English child psychologist John Bowlby, is the study of how energy, particularly in its stored latent mental forms, relates to human behavior and psychological phenomenon. [1]

The term "energy psychology" is a near-synonym for psychodynamics, dynamic psychology, and psychological thermodynamics, in a modern sense.

To note, only those writings that model the mind as a thermodynamic system, as typified by the theories of Austrian psychologist Sigmund Freud are true versions of what one would correctly define as energy psychology. The 2001 *How to Manage Your Dick*, by American psychology-philosopher Sean O'Reilly might be a representative modern example of energy psychology, in a general sense. [2]

Often is the case, however, that one will come across many new age types of "energy psychologies, often mixed with Eastern philosophies, that have little to do with actual physics or thermodynamics.

See also

â— Evolutionary psychology

References

1. Bowlby, John (1969). *Attachment and Loss: Volume I* (pgs. 13-23). Basic Books.
2. O'Reilly, Sean. (2001). *How to Manage Your Dick: Destructive Impulses with Cyber-kinetics: Redirect Sexual Energy and Discover your More Spiritually Enlightened, Evolved Self* (ch. 7: Entropy and Your Dong, pgs. 47-56). Travelers' Tales.

θΔics

In terminology, **energy slave** is an abstract conception referring to the technologic-mechanical energy equivalent that a healthy human youth could do. [1] The lifestyle of any person, in this logic, can be equated with a certain number of “energy slaves” equivalent to the number of human laborers required, measured in human labor power energy units, to mediate that person’s way of life.

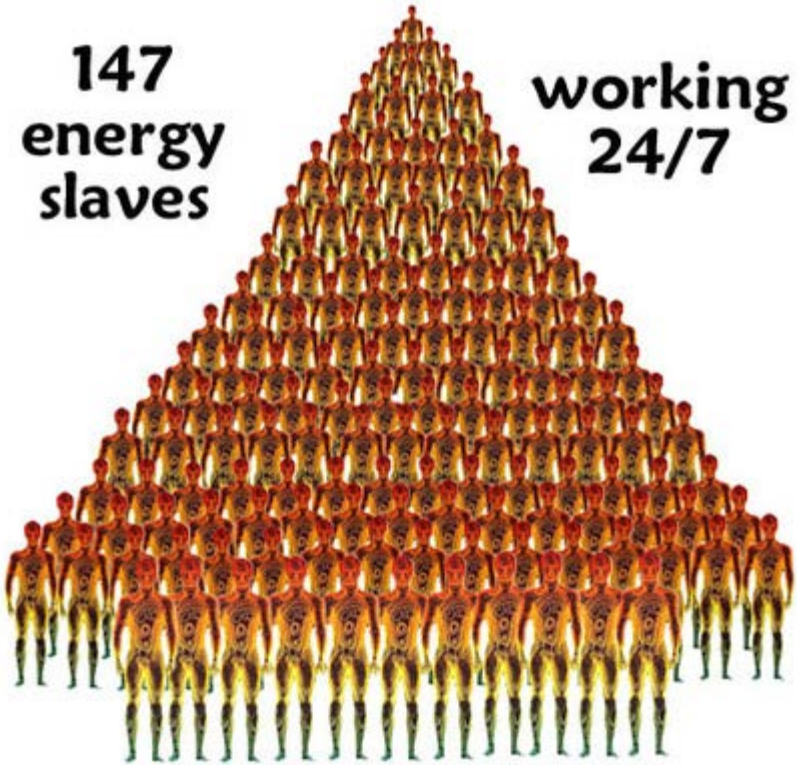

A diagram (Q) by Jennifer Barker (2006) who estimates that the average person sues 129,000 horse-power hours of electricity, which translates to 147 **energy slaves** working continuously, 24-hours a day.

Etymology

In circa 1944, American philosopher Buckminster Fuller introduced the term "energy slave". [2] Fuller proposed the term based on the average output of a hard-working man doing 150,000 foot-pounds of work per day and working 250-days per year. [9]

In 1954 English thermodynamicist Alfred Ubbelohde, in his book *Man and Energy*, was using the term, it seems, independent of Fuller. [10]

It has been estimated, for instance, that a middle-class American lives a style of life that is equivalent to the work produced by 200 human slaves. [3] Fuller, who believed that in the future human societies would come to rely mainly on renewable sources of energy, such as solar-power and wind-derived electricity, referred to Americans as possessing two-hundred “energy slaves” that run on nonrenewable resources. [4] One energy slave, according to Fuller, equals “each unit of one trillion foot pound equivalents per annum consumed annually by respective economies from both import and domestic sources, computed at 100% of potential content.” [5]

Derivation

Fuller used data gathered by the U.S., German, and Swiss armies to arrive at an estimate for the average amount of (mechanical) work a person could do in a year. This is in addition to the energy spent in metabolic self-maintenance. The net work done constitutes a net "advantage" in dealing with the environment. A figure of 37.5 million foot-pounds was arrived at. [6]

Using this logic, one can calculate the ratio of work done by a system to the energy intake, to obtain a measure of efficiency. Since many machines and appliances inefficient, Fuller posited a figure of 4% overall efficiency for total energy consumption. He then calculated world energy consumption for the year 1950 as being 80.17 quintillion foot-pounds (plus or minus 10%). Given only 4% efficiency the net work obtained equaled 3.2 quintillion ft-lbs. One can divide this figure by the net annual energy output per man of 37.2 million ft-lbs. This gives a result of 85.5 billion man-year equivalents done by machines. These man-year equivalents are energy slaves. [6]

If the number of energy slaves is divided by the world population total of 2.25 billion (1950) a figure of 38 energy slaves per person is arrived at. Fuller plotted the geographical concentrations of energy slaves on what he called his *World Energy Map*. [7]

In 1987 commentary on Fullers energy slave theory, author Stephen Boyden commented that "in the USA, the daily use per capita of energy is around 1000 MJ; that is, each person has the equivalent of 100 energy slaves working 24 hours a day for him or for her.... In some developing countries, the rate of energy use is less than the equivalent of one energy slave per person." [8]

References

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6. Energy Slave – Nous.org.uk.
7. World Energy Map – Nous.org.uk.
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10. Ubbelohde, Alfred René. (1954). *Man and Energy: Illustrated* (pg. 92-100). Hutchinson's Scientific & Technical Publications.

External links

- Energy slave – Wikipedia.

θΔics

In famous publications, ***Energy Transformations in Living Matter*** is an 85-page booklet on the thermodynamics or "energy transformations" of living matter by physician and biochemist Hans Krebs and biochemist Hans Kornberg, with an appendix by Keith Burton, notable for being the first major publication on the thermodynamics of biochemical reactions. [1]

The appendix by Burton, according to American biophysical chemist Robert Alberty, is the highlight of the booklet, which contains the first thermodynamic table for biochemical reactions, containing Gibbs free energy of formation $\Delta G f^{o}$ values for about 100 species of biochemical reactions, able to make predictions on reactions that had not yet occurred. [2]

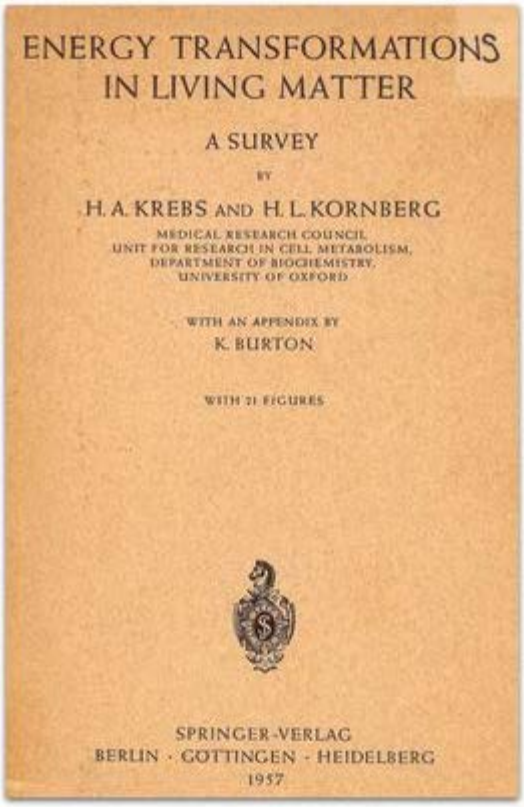

Cover to the 1957 booklet *Energy Transformations in Living Matter* by Hans Krebs, Hans Kornberg, and Keith Burton. [1]

History

The booklet is a reprint of pages 213 to 298 of the *Results of Physiology, Organic Chemistry, and Experimental Pharmacology* (Ergebnisse Der Physiologie, Biologischen Chemie Und Experimentellen Pharmakologie) published by Neundundvierzigster Band in 1957.

References

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θΔics

In fringe science, **enformy** is a hypothetical new age type of immaterial essence, akin to the olden days theory of the soul, that is said to 'enform' matter, or create enformed systems, prior to the formation of the physical body, that transcends space and time. [1] The idea of enformy, supposedly, is something similar or akin to English sixth sense research Rupert Sheldrake's theory of morphogenetic fields. [2]

Etymology

In lay terms, the concept of "enformed energies", or energized forms, etymologically, supposedly, is a blend of the terms *form* and *energy*, and somehow framed as dualism or opposite to entropy, which is seen as the tendency to deform ordered units. [3]

The "theory of enformed systems", supposedly, was introduced by Don Watson and Berney Williams in 1993 or 1997, which seems to be the precursor to the truncated term 'enformy'. [4]

References

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2. Altmann, Gabriel, Grzybek, Peter, Kohler, Reinhard. (2007). *Exact Methods in the Study of Language and Text* (enformy, pg. 300). Walter de Gruyter.
3. Wade, David. (1993). *Crystal & Dragon: the Cosmic Dance of Symmetry and Chaos in Nature, Art, and Consciousness* (pg. 41). Inner Traditions.
4. (a) Watson, Don and Williams, Berney. (date). "Introduction to the Theory of Enformed Systems", Enformy.com.
(b) Qazi, M.H. (2008). *Iqbal on Inner Religious Experience* (pg. 171). Iqbal Academy.

θΔics

In science, **engine**, etymologically, a "mechanical device" (c.1300), from the Old French *engine* "skill, wit, cleverness", from Latin *ingenium* ("inborn qualities, talent"), similar to "ingenius"; a machine for making or doing something (Boyle's pneumatical engine, 1658; Papin's engine for softening bones, 1678); a device that converts energy into mechanical power (18th century); in modern terms, a machine in which power is applied to do work by the conversion of various forms of energy into mechanical force and motion. [1]

Left: the Papin engine (1690), the prototype of all steam engines. Right: a Corliss steam engine at the 1876 Philadelphia Centennial Exposition. [2]

Quotes

The following are related quotes:

> "About 6 or 8 years ago my ingenious friend Mr. John Robinson having [contrived] conceived that a fire **engine** might be made without a lever—by inverting the cylinder and placing it above the mouth of the pit proposed to me to make a model of it which was set about by having never completed and I [being] having at the time ignorant little knowledge of the machine however I always thought the machine might be applied to [more] other as valuable purposes [than] as drawing water."
>
> — James Watt (1765), entry in notebook [5]

> "A perfect thermo-dynamic **engine** is such that, whatever amount of mechanical effect derived from a certain thermal agency; if an equal amount be spent in working backwards, an equal reverse thermal effect will be produced."
>
> — William Thomson (1849), "An Account of Carnot's Theory of the Motive Power of Heat" [4]

> "The whole of developments and operations of analysis are now capable of being executed by machinery. As soon as an analytical **engine** exists, it will necessarily guide the future course of science."
>
> — Charles Babbage (1864), *Life of a Philosopher* [3]

See also

â— Engine development timeline

References

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2. Corliss steam engine – Wikipedia.
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(b) Bynum, W.F. and Porter, Roy. (2005). *Oxford Dictionary of Scientific Quotations* (pg. 34). Oxford University Press.
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Publisher.
(b) Bynum, W.F. and Porter, Roy. (2005). *Oxford Dictionary of Scientific Quotations* (pg. 579). Oxford University Press.
5. (a) Watt, James. (1765). “Entry in Notebook” (words in bracket crossed out by Watt); in: *Eric Robinson and Douglas McKie* (editors), Partners in Science; *Letters of James Watt and Joseph Black* (1970) (pg. 434). Publisher.
(b) Bynum, W.F. and Porter, Roy. (2005). *Oxford Dictionary of Scientific Quotations* (pg. 609). Oxford University Press.

Further reading

â— Ripper, William. (1913). *Heat Engines: Being a New Edition of Steam.* Longmans, Green, and Co.

External links

â— Engine – Wikipedia.

θΔics

In science, **engine development timeline** traces the chronological development of the modern engine, from the early vacuum lifting devices (Guericke engine, 1850), to the construction of the first gunpowder engine (1678), to the design of the first steam engine (Papin engine, 1690), to the construction of the first operational steam engine (Miner's friend, 1698), to the description of the first theoretical heat engine (Carnot engine 1824).

The following is a chronological listing of the development and invention of engines, the name "steam engine" being a generic name for the the engines built by Papin to Watt, using water as the working body, and the name "heat engine" referring to any body, whatsoever, that produces work by the alternating action of contact with a and a hot body and a cold body.

(make sideways scrolling):

Date	Type	Picture	Description
1647	Suction pump Inventor: Otto Guericke (others before?)		
1650	Piston and cylinder Inventor: Otto Guericke (others before?)	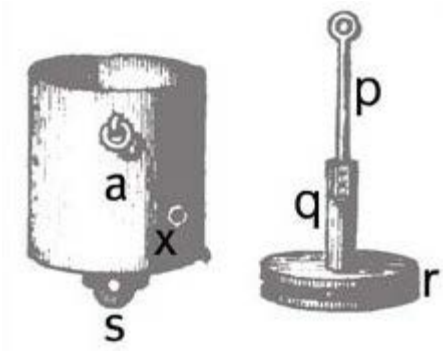	
1650	Vacuum pump Inventor: Otto Guericke		[5]

Guericke engine

1654 Inventor:
Otto Guericke

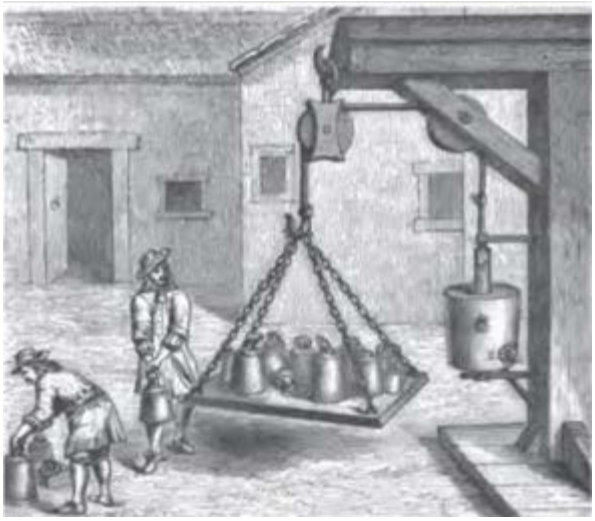

Pneumatical engine

1658 Inventor:
Robert Hooke
(under direction of
Robert Boyle)

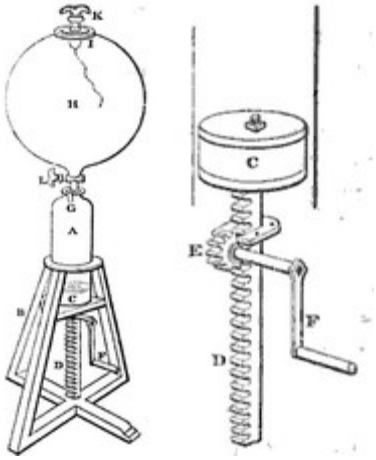

[4]

Gunpowder engine

1678 Inventor:
Christiaan Huygens

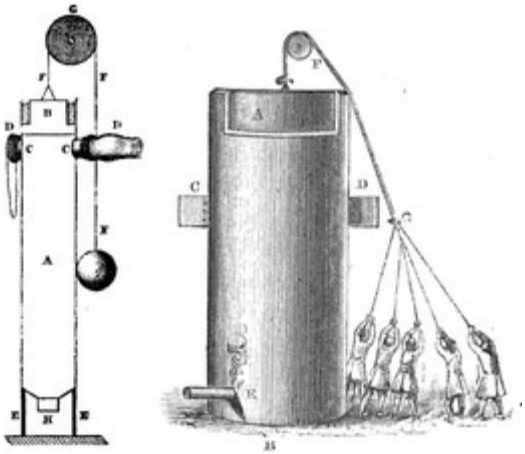

[6]

Boiling engine
(Papin's digester)

1679 Inventor:
Denis Papin

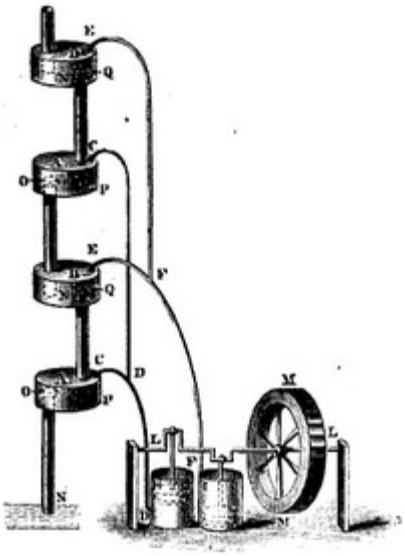

Papin's pneumatic engine for raising water

1685

Inventor:
Denis Papin

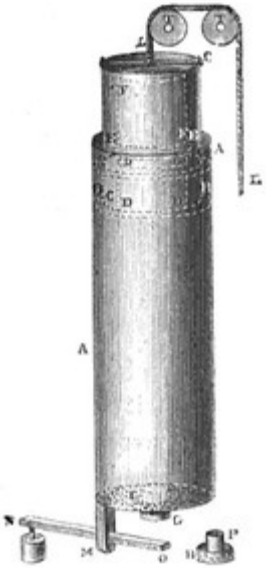

Papin’s gunpowder and air engine

1687

Inventor:
Denis Papin

Papin engine

1690 Inventor:
Denis Papin

Savery engine
(Miner's friend)
(Savery sump
1698 pump)

Inventor:
Thomas Savery

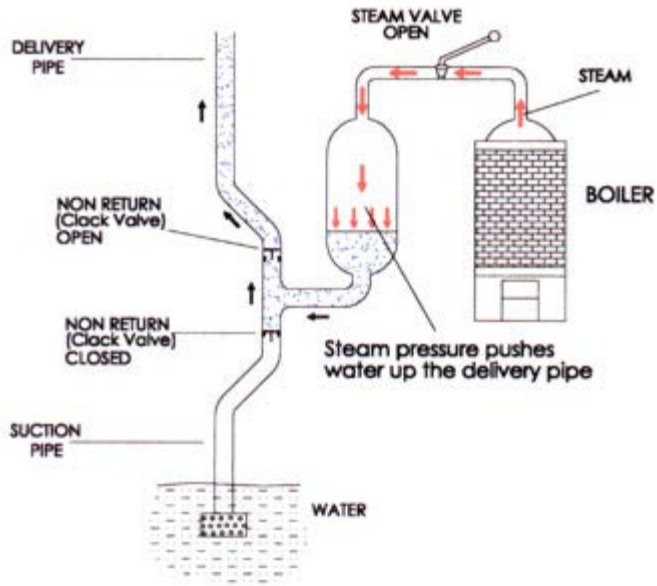

[3]

Newcomen engine
(Atmospheric
Engine)
1712 (improved Savery
engine)

Inventor:
Thomas Newcomen

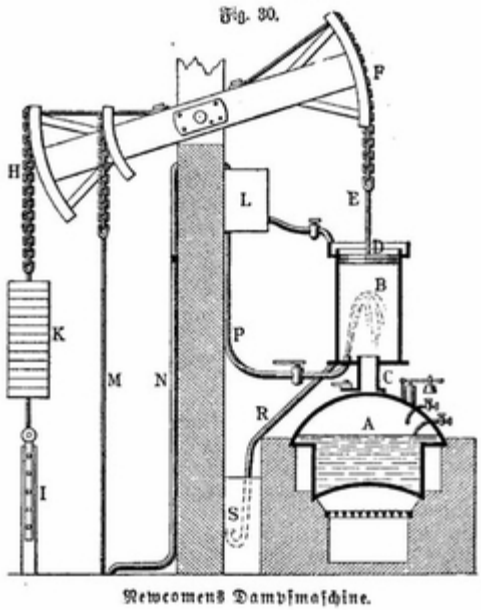

1741 Smeaton engine (improved Newcomen engine)

Inventor: John Smeaton

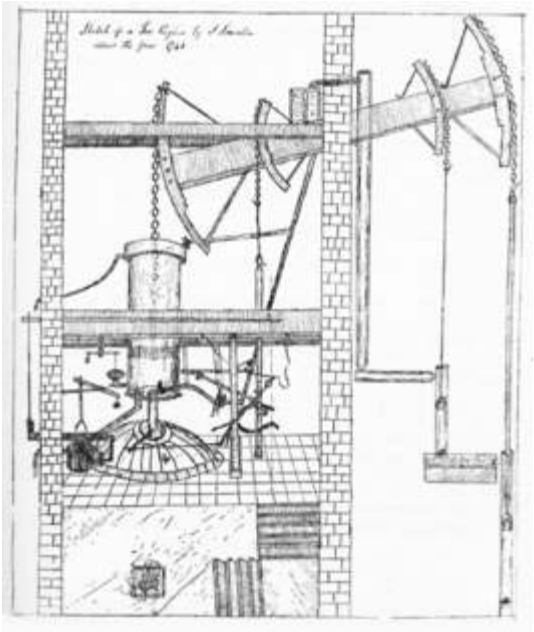

1765 to 1796 Watt engine (improved Newcomen engine)

Inventor: James Watt

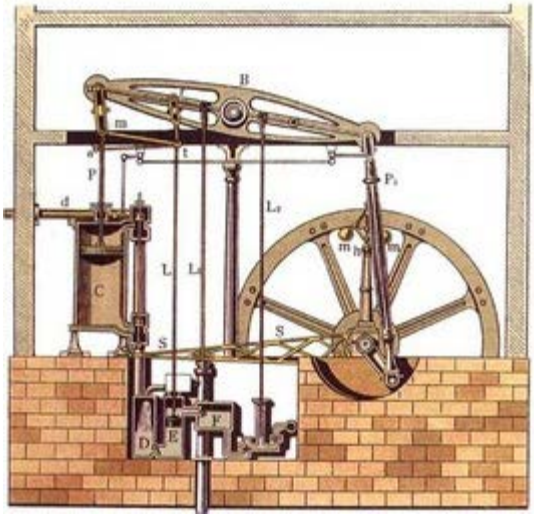

Added separate condenser (1765), sun and planet gear (1781), centrifugal governor (1788), and indicator diagram (1796).

1801 Trevithick engine

Inventor: Richard Trevithick

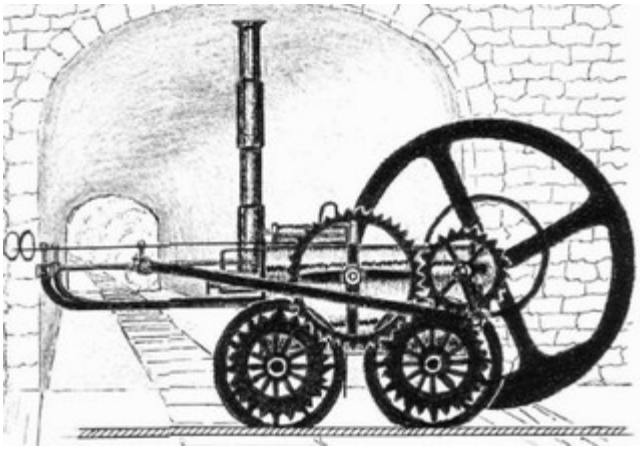

Built the first steam engine automobiles.

Woolf engine

Designed an improved boiler for producing high pressure steam

1803 Inventor:
Arthur Woolf

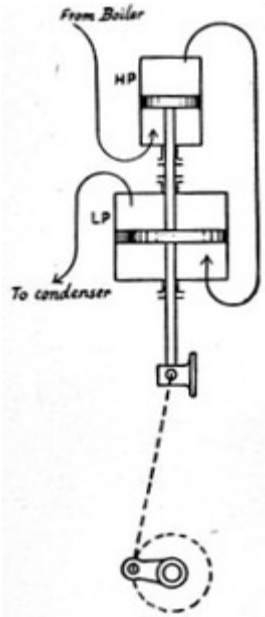

(1803) and invented a compound steam engine (1805).

Killingworth locomotive
1814
Inventor:
George Stephenson

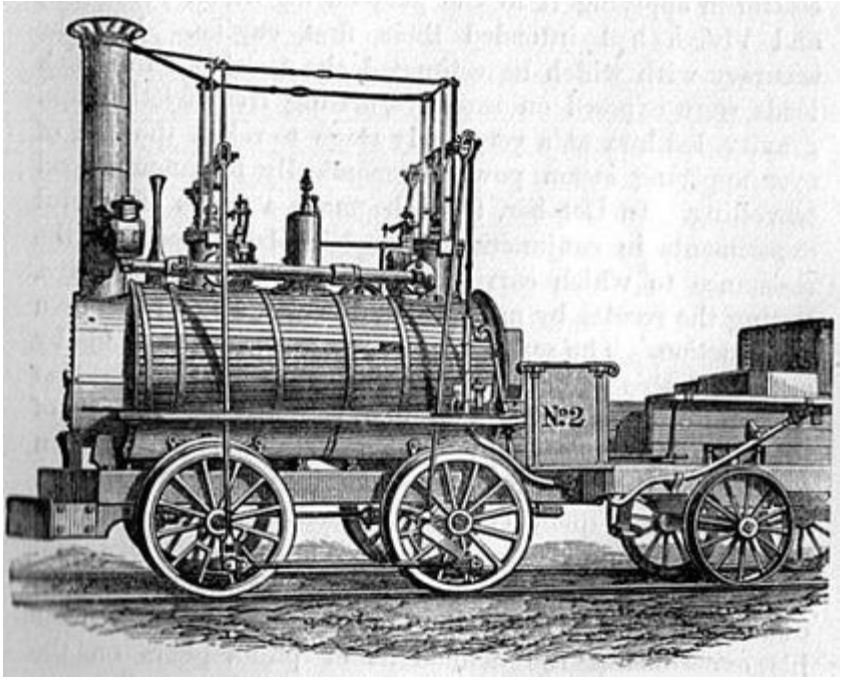

Carnot engine
(heat engine)
1824
Inventor:
Sadi Carnot

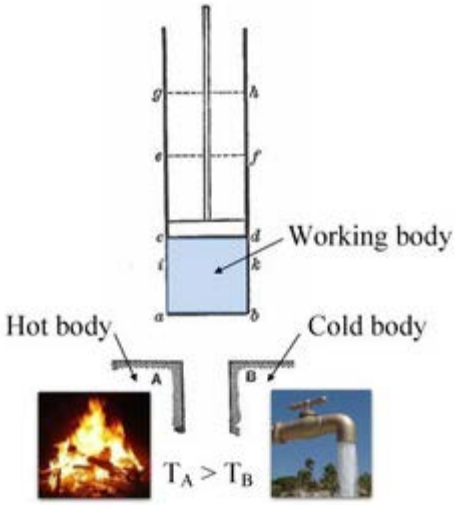

[2]

Heat engine

1969	(generic) Author: Hendrick Van Ness	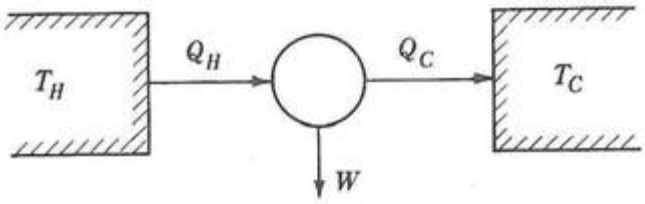	
2005	Human engine (dihumanid molecular engine) Author: Libb Thims (2005) Barri Gold (2011)	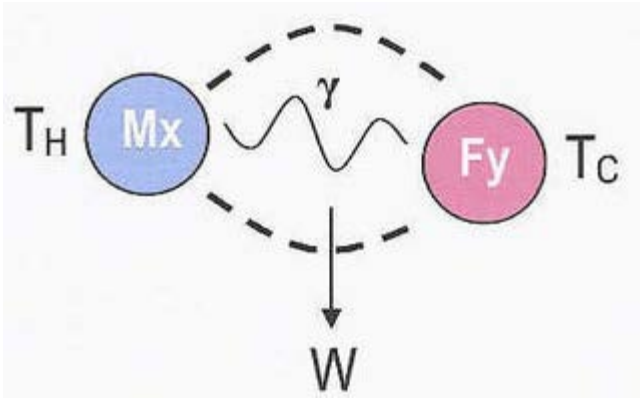	Two human molecules, one male Mx, one female Fy, in a bonded "working" relationship. [7]
2007	Earth surface engines Author: Add Libb Thims (2007)	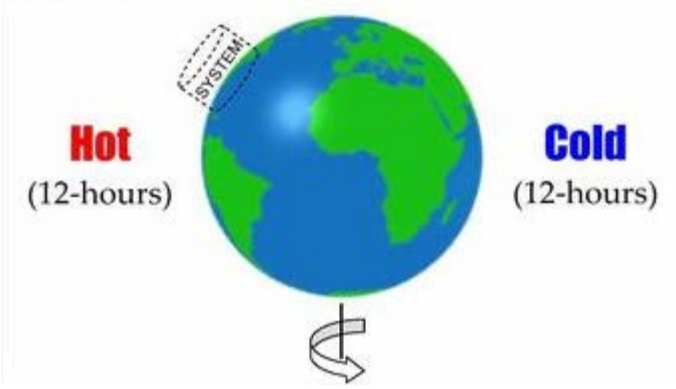	[8]

See also

- Timeline of thermodynamics

References

2. Carnot, Sadi. (1824). "Reflections on the Motive Power of Fire and on Machines Fitted to Develop that Power." Paris: Chez Bachelier, Libraire, Quai Des Augustins, No. 55.
3. Savery, Thomas. (1702). *The Miner's Friend – or an Engine to Raise Water by Fire*. London.
4. Boyle, Robert. (1660). *New Experiments: Physico-Mechanical, Touching the Spring of the Air, and its Effects: Made, for the most part, in a New Pneumatical Engine*. Publisher.
5. Schott, Gaspar. (1657). *Mechanical Hydraulic Pneumatics* (*Mechanicahydraulica-pneumatica*). Würtzburg.
6. Galloway, Robert L. (1881). *The Steam Engine and its Inventors*. London: MacMillan and Co.
7. History – HumanThermodynamics.com.
8. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (esp. ch. 3). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.

Further reading

- Thurston, Robert H. (1886). *A History of The Growth of the Steam-Engine* (PG). Publisher.

θΔics

In thermodynamics, **engine pioneers** refers to innovators in the area of the development of engines, enabled by heat, combustion, or vacuum creation (e.g. vacuum pump, attached to vacuum bulb, attached to piston and cylinder), able to lift a weight though unit height and or turn a crank arm so to do work.

Overview

The following is a work-in-progress chronological listing of engineers behind vacuum engines, generally, e.g. gunpowder engine, or heat engines, e.g. steam engines, air engines, etc., specifically, and or theoretical engines, e.g. Carnot engine, in overall design; the code EP:#, e.g. Hero (EP:3), is shorthand notation for that person's engine pioneer ranking:

		Person	Date	Engine	Type	Description
1.	190 | 39	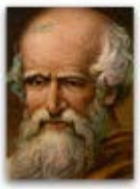 Archimedes (287-212BC)	c.235BC	Architronito (steam cannon)		Invented, according to da Vinci (c.1500), a so-called architronito, or steam-powered cannon that throws 70lb iron balls, via the action of "great noise and fury", at the enemy, by the action of heat derived from burning coals; diagrams of which are found in da Vinci's notebooks.
2.	185 | 73	Ctesibius (c.285-222BC)	c.230BC	Aeolipile		
3.	185 | 63	Hero (c.10-70AD)	c.50AD	Aeolipile		
4.	200 | 7	Leonardo da Vinci (1452-1519)	1508	Da Vinci engine [s]	Gunpowder engine Steam cannon Steam turbine	Da Vinci, according to the arguments of Ladislao Reti (1969), was the first to: state that condensed steam makes a vacuum, before Gerolamo Cardano (1550) is blurrily-cited to have done so; first to make a gunpowder engine, before Christiaan Huygens (1673), Denis Papin (1674), and Jean Hautefeuille (1678); was the "unknown author" cited by Giovanni Branca (1629), in respect to his Hero-like steam turbine; and that he was the true inventor of the steam-powered cannon (Architronito), not Archimedes, per argument that Archimedes only invented an ordinary gunpowder cannon.
5.	175 | 297	Gerolamo Cardano (1501-1576)	1550			

5.		Lazarus Ercker (c.1530-c.1594)	1574			
6.		Giovanni Porta (1535-1615)	c.1601	Porta engine (improved Hero fountain)		In his *Spiritali*, following or amid a French translation of Hero's steam machine work, reproduced Hero's aeolipile and his solar boiler device, after which, he added an illustrated modified variant of his own, similar to a combination of the above two devices; as shown below, wherein, a fire is put under flask a, filled with water, which makes steam, that enters closed container b, filled with cold water, which forces the water to shoot out of tube c, into the external air.
7.	170 | 410	Cornelis Drebbel (1572-1634)	1609			
8.		Salomon de Caus (1576-1626)	1615	Caus engine		
9.		Giovanni Branca (1571-1645)	1629		Steam turbine (modified aeolipile)	
10.		David Ramsay (c.1590-1653)	1630	Ramsay engine (aka fire engine)		Under the idea influence of de Caus, applied for a patent for a device "To Raise Water from Lowe Pitts by Fire"; supposedly, however, there is no information concerning what he had in mind or what he did with it.
11.	195 | 11	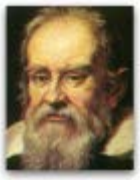 Galileo Galilei (1564-1642)	1632	Galileo engine (vacuum measuring device)		
12.	190 | 37	Otto Guericke (1602-1686)	c.1647	Guericke engine (aka vacuum pump)	Vacuum engine	
13.		John Wilkins (1614-1672)	1648			His *Mathematical Magic* (1648) presented a chapter on the history of heat engines of various sorts, e.g. aeolipile, Giovanni Branca's device (1629), and Cardano's smoke jack, and Cornelis Drebbel's sun-powered clavichord

						(1609).
14.	195 | 18	Robert Hooke (1635-1703) | **#1**	1658	Pneumatical engine (aka machine Boyleana)		An improved re-construction of the Guericke engine, built per order of Robert Boyle.
15.		Samuel Morland (1625-1695) | **#1**	1661			Was granted a 'monopoly', according to a warrant of Charles II, for an engine for raising water out of mines by means of 'air and powder conjointly'."
16.		Edward Somerset (1603-1667)	1663	Worcester engine (Thurston, 1878) (aka Somerset engine)		
17.	170 | 415	Ferdinand Verbiest (1623-1688)	c.1670	Verbiest auto-mobile		
18.	190 | 33	Christiaan Huygens (1629-1695)	1673	Huygens engine	Gunpowder engine; Piston and cylinder	
19.	195 | 18	Robert Hooke (1635-1703) | **#2**	1675	Hooke engine	Theoretical	
20.	180 | 185	Denis Papin (1647-1712) | **#1**	1674			A few years subsequent to Boyle's discoveries [1662], Papin was installed in the laboratory at the Parts Academy of Sciences, and under the directions of Christiaan Huygens, was employed in experiments with the pneumatic engine, after the model of Boyle and Hooke's, and the examination of the force of gunpowder, and also of the force of water rarefied by fire. An account of these experiments was published in 1674, and in the following year Papin left Paris, and proceeded to London. [2]

21.		Jean Hautefeuille (1647-1724)	1678	Hautefeuille engine	Gunpowder engine	
22.	180 | 185	Denis Papin (1647-1712) | **#2**	1679	Papin digester		invented what he called a "digester or engine for softning bones", aka "bone digester", or Papin's digester as it later came to be called
23.		Samuel Morland (1625-1695) | **#2**	1683	Morland engine		Submitted a project to Louis XIV for raising water by means of steam, accompanying it with ingenious calculations and tables.
		Denis Papin (1647-1712) | **#3**	1688	Papin engine (gunpowder)		
24.	180 | 185	Denis Papin (1647-1712) | **#3**	1690	Papin engine (steam)	Theoretical; Piston and cylinder	
25.	170 | 332	Thomas Savery (c.1650-1715)	1698	Savery engine (aka Miner's friend)	Working	
26.		Thomas Newcomen (1664-1729)	1705	Newcomen engine (improved Savery engine)		
26.		Henry Beighton (1687-1743)	1717			In two entries of the Royal Society (1717), he made an improved Newcomen engine (Ñº); sometime thereafter he began to associate with John Desaguliers. (Ñº)
27.		John Desaguliers (1683-1744)	1718			
		James				Made a number of inventions and design

28.	175 | 218		Watt (1736-1819)	1765	Watt engine (improved Newcomen engine)	improvements to the functionality of the steam engine, including: separate condenser (1765), the fly-ball governor (1788), and the definition of "pony power" (or horse power).
29.			Joshua Rigley (c.1710-1785)	c.1768		
30.			John Smeaton (1724-1792)	1769	Smeaton engine (improved Newcomen engine)	
31.			Nicolas Cugnot (1725-1804)	1769	Cugnot auto-mobile	
32.			James Pickard (c.1735-1800)	1780	Pickard engine	
33.			Jonathan Hornblower (1753-1815)	1781	Hornblower engine (compound engine)	
34.			Arthur Woolf (1766-1837)	1803		Designed an improved boiler for producing high pressure steam (1803) and invented a compound steam engine (1804) generally using the expired patent of Hornblower.
35.	165 | 499		Richard Trevithick (1771-1833)	1804	Trevithick locomotive	
36.			George Stephenson (1781-1848)	1814		
37.	190 | 25		Sadi Carnot (1796-1832)	1824	Carnot engine	Abstract

(add)

Quotes

The following are related quotes:

> "When a comparison is made between **Savery's engine** [1698] and those of his predecessors, the result will be in every respect favorable to his character as an inventor, and as a practical engineer; all the details of his invention are made out in a masterly style, and accidents and contingencies are provided for, so as to render it a real working engine; whereas De Caus [**Caus engine**, 1615], the Marquis of Worcester [Worcester engine, 1663], Sir Samuel Morland [**Morland engine**, 1683], and Papin [**Papin engine**, 1690], though

ingenious philosophers, only produced mere outlines, which required great labor and skill of subsequent inventors to fill up, and make them sufficiently complete to be put in execution."

— John Farey (1827), *Treatise on the Steam Engine*; cited by Dionysius Larder (1840) in *The Steam Engine* (pg. 58) [1]

"James Watt is rightly enough described as the 'father of the modern steam engine'. The story of his life has been so frequently told that no one would have thanked Galloway for repeating it; he has accordingly preferred to trace the history of the modern prime-mover from the time when modern philosophy rendered it possible for the genius of Papin, Savery, Newcomen, and, lastly, Watt, to turn to account the facts discovered in the laboratory. The aeolipile of Hero, who flourished about 150 BC, may have been, in the estimation of some rather imaginative minds, the precursor of the steam-engine, just as the projects of De Caus, Branca, Ramsey, and the Marquis of Worcester were steps in the evolution of the genus steam-engine, but **between Hero and Watt there are a great many missing links**. It is rather in the scientific discoveries of the 17th century that we must look for the germ of the steam-engine, and such men as Galileo, Torricelli, Pascal, and Otto von Guericke take a place in the list."

— Anon (1881), "The History of the Steam Engine: Overview of Galloway's *The Steam Engine and its Inventors*" [2]

See also

â— Engine development timeline
â— Timeline of thermodynamics

References

1. (a) Farey, John. (1827). *A Treatise on the Steam Engine: Historical, Practical, and Descriptive*. Longman.
(b) Lardner, Dionysius. (1840). *The Steam Engine: Explained and Illustrated – With an Account of its Invention and Progressive Improvement and its Application to Navigation and Railways; also Including a Memoir of Watt*. Taylor and Walton.
2. (a) Galloway, Elijah. (1826). *History of the Steam Engine: From its First Invention to the Present Time*. Cowie.
(b) Anon. (1881). "The History of the Steam Engine: Overview of Galloway's *The Steam Engine and its Inventors*" (Ñº), *English Mechanics and the World of Science*, 32:507-08, Feb 4.

θΔics

In science, an **engineer** is an individual who specializes in one of the branches of engineering. [1]

History

The first PhD engineer in American was Willard Gibbs.

See also

- Greatest engineer ever

References

1. Licker, Mark D. (2003). *Dictionary of Engineering*. McGraw-Hill.

External links

- Engineer – Wikipedia.

θΔics

In science, **engineering** is the art of construction, design, and building based on mathematical and scientific principles.

History

(add)

The following is a depiction of mining engineering in 1580 showing mining capstans water jug art, which seems to give a depiction of the classic "how to get water out of mines problem", the classic genius puzzle that eventually spurred the invention of the steam engine, and hence the science of thermodynamics (1850), a problem that would not be solved until the 1690 invention design of the Papin engine by French physicist Denis Papin. [1]

The following is a depiction of the 1705 second reciprocating steam pump of Denis Papin: [1]

A depiction of mining engineering in 1580 showing mining capstans water jug art, which seems to give a depiction of the classic "how to get water out of mines problem", the classic genius puzzle that eventually spurred the invention of the steam engine, and hence the science of thermodynamics (1850), a problem that would not be solved until the 1690 invention design of the Papin engine by French physicist Denis Papin. [1]

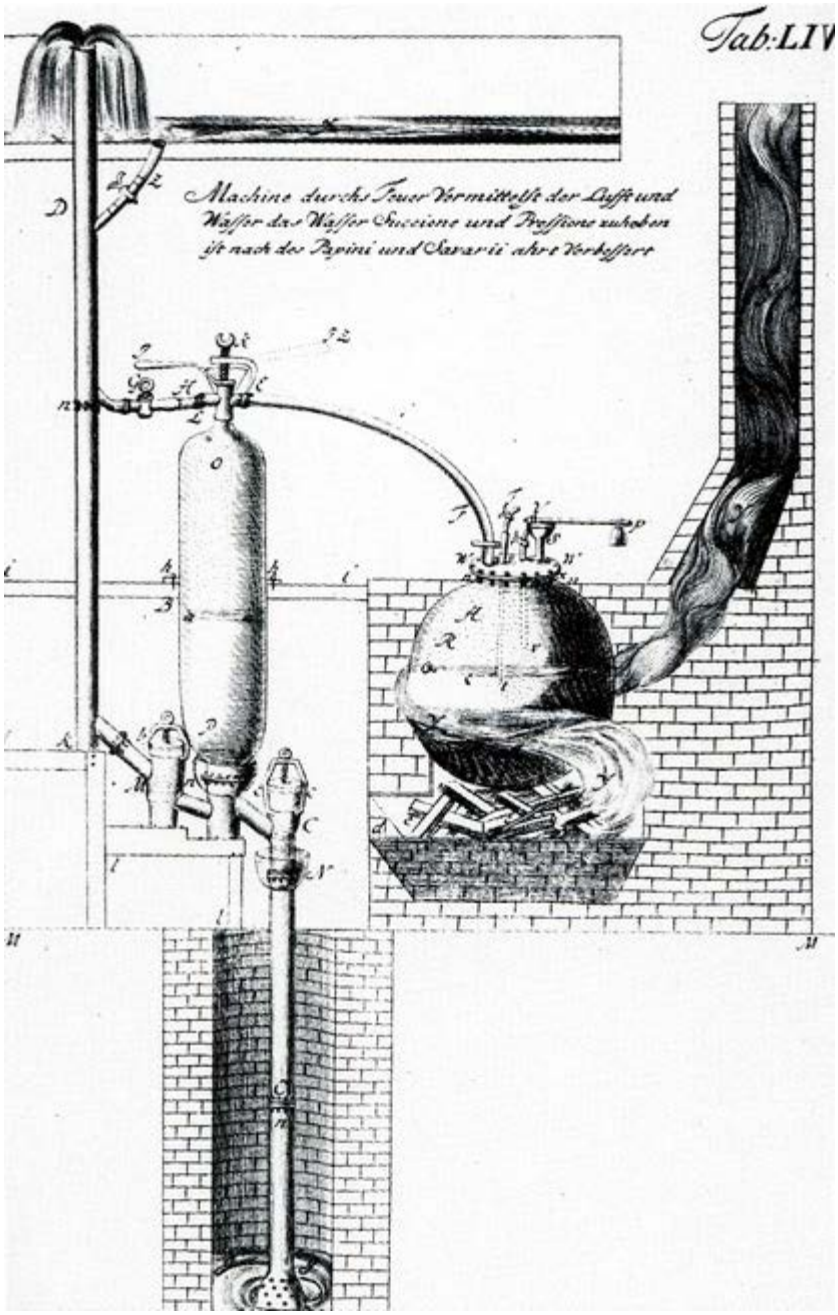

The following is a depiction of the Newcomen engine in the Upper Silesia in 1786 (Friedrchsgrube Tarnowtiz): [1]

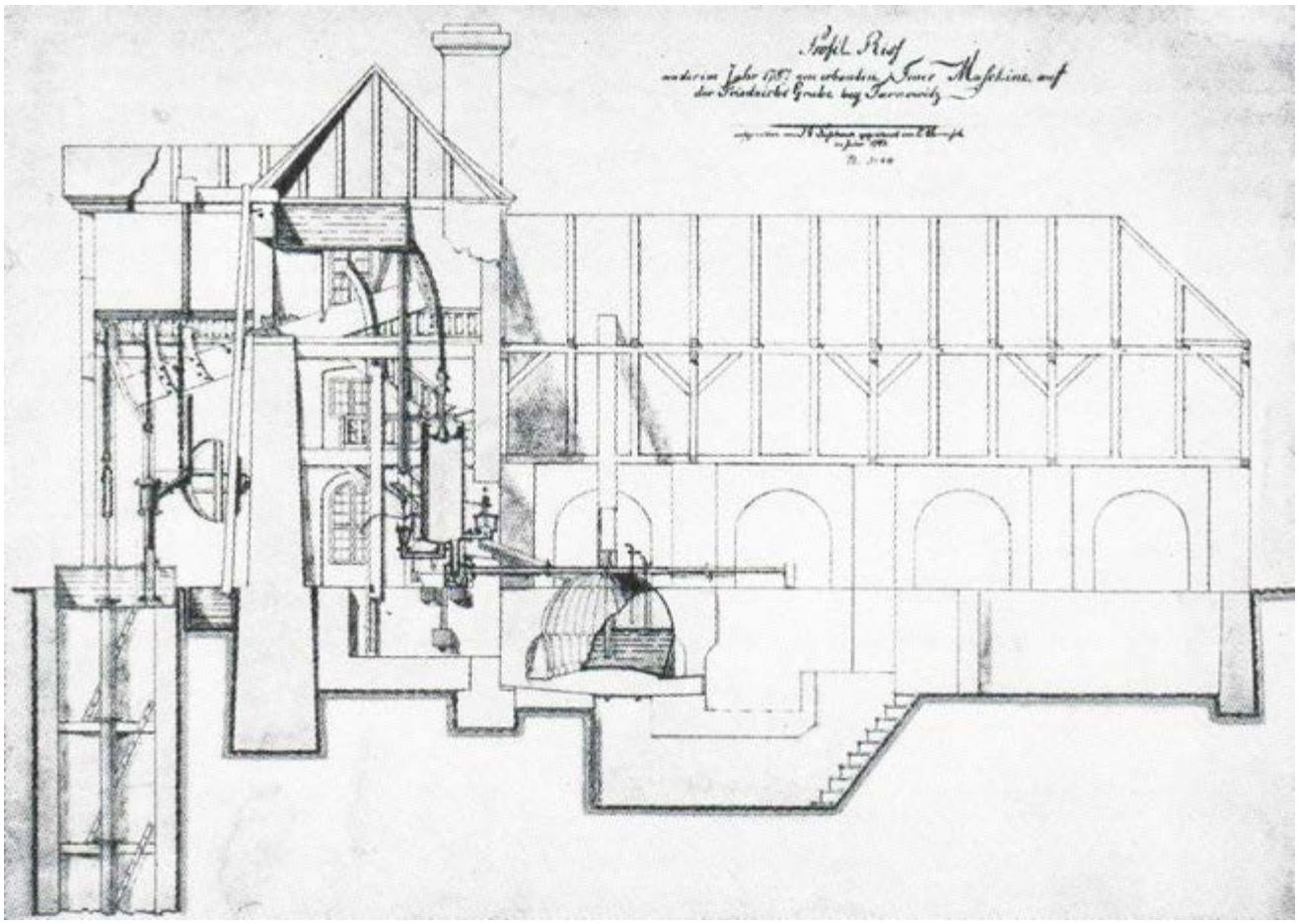

The following is a depiction of a single-acting steam engine by James Watt in 1793 at the Brine pumping station: [1]

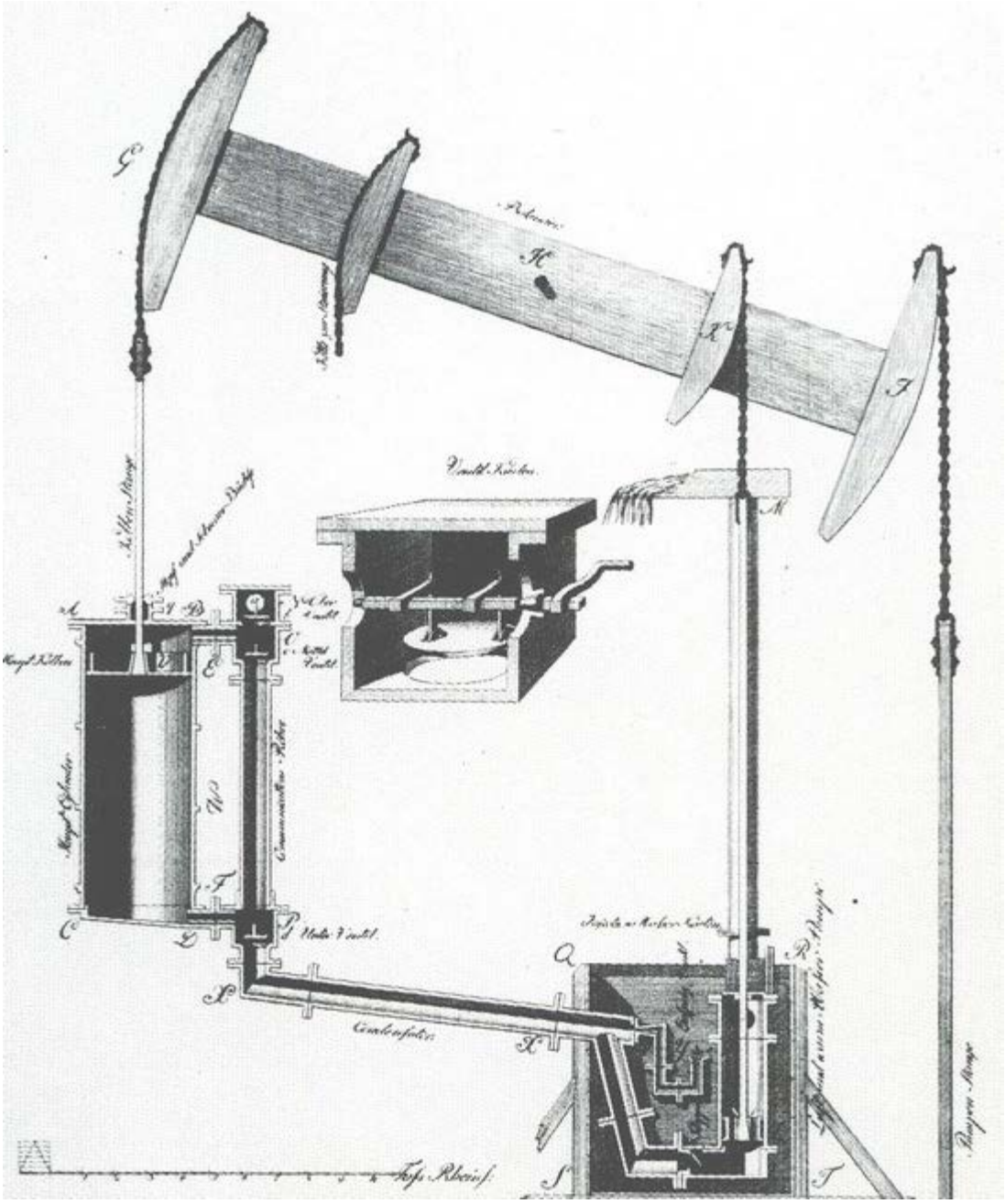

(add)

See also

- Chemical engineering thermodynamics
- Chemical engineering
- Electrical engineering
- Engine development timeline
- Engineering thermodynamics
- Human molecular engineering (see: two cultures department, 2013)
- Human engineering thermodynamics (see: Thims lectures, 2012)

References

1. Mining engineering in 1580 (German → English) – Pictokon.net.

Further reading

- Kirby, Richard. (1956). *Engineering in History* (co-authors: Sidney Withington, Arthur Darling, Frederick Kilgour)

(pg. 42). Courier, 1990.

External links

- Engineering – Wikipedia.
- Top 50 engineering & technology universities (2012) – TimesHigherEducation.co.uk.

θΔics

In education, **engineering (humanities education)** refers to the conflicting subject of teaching humanities courses, subjects, or topics to engineering students, generally speaking.

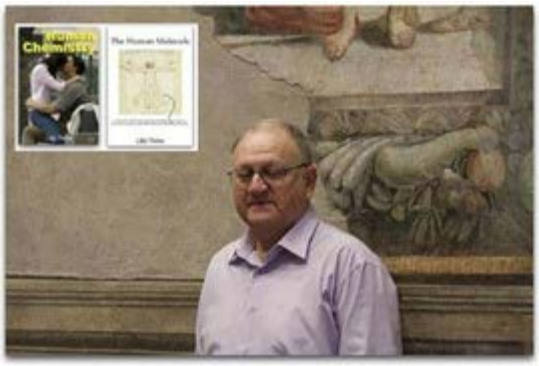

Russian-born Israeli chemical engineer Alec Groysman (2011) suggesting that the chemical engineering curriculum begin incorporate a Goethe-Gibbs stylized human chemical reaction theory approach to teaching the humanities to engineers, so to better allow students, as they go into the work field, to have a better grasp of Shakespeare's "to be or not to be" query. [1]

Overview

In 1998, Indian-born American mechanical engineer Satish Boregowda, completed a NASA-funded PhD dissertation "Thermodynamic Modeling and Analysis of Stress Responses", supposedly, was first foreign student at that time to get a direct funding scholarship for work in human thermodynamics

In 2008, Boregowda, while a professor at Purdue University, found that his colleagues and his tenure reviewers were not in favor of his work in thermodynamics applied to the humanities, i.e. on the "human thermodynamics" of stress, being that it was not ABET (Accreditation Board for Engineering and Technology) certification relevant; as a result of which he left academia and went into industry.

In 2011, Russian-born Israeli chemical engineer Alec Groysman, in his generative art conference presentation "Use of Art Media in Engineering and Scientific Education", Rome, Italy, suggested that the chemical engineering and humanities be integrated as follows: [1]

> "Dobereiner helped in refining Russian platinum, discovered catalysis, and reported his work to Goethe. We can only suspect that Dobereiner read the tragedy *Faust* and the novella *Elective Affinities*. The latter work of art gave impulse to a **new scientific field** named 'human chemistry'. In the exact sciences there are quantitative measures of estimation of each value: mass, length, force, energy. In the humanistic disciplines (history, philosophy, psychology) as well as art there are no quantitative criteria. This is similar to the question of how to measure beauty, love, friendship, democracy? The function named Gibbs energy defines 'love' between substances [and] people ... and is similar to Hamlet's 'to be or not to be?' of William Shakespeare."

Groysman, in short, discussed German polyintellect Johann Goethe's physical chemistry based *Elective Affinities* up through modern free energy theory, the two connected via the affinity-free energy equation, cites the work of Thims, classifies human chemistry-based thermodynamics as a new scientific field, and advocates its use in engineering and scientific education.

In 2011, Indian-born American mechanical engineer Kalyan Annamalai and Venezuelan-born American mechanical engineer Carlos Silva, in their 2011 "Human Body: Formula" chapter subsection, of *Advanced Engineering Thermodynamics*, wherein, via citation of Thims human molecular formula (2002), they define a human, from a thermodynamic point of view, as "a 26-element energy/heat driven dynamic atomic structure." [4]

In 2012, Satish Boregowda, in discussion with American electrochemical engineer Libb Thims on advice on attempts to found America's first chemical engineering centric two cultures university department, Boregowda commented the following: [2]

> "Regarding Purdue, it is nothing personal but a lack of awareness among mechanical engineering faculty to

> see thermodynamics beyond application of first law and steam engines. I used to teach second law (entropy generation minimization) and exergy analysis in my class. The ABET does not require these topics and the faculty were not interested in covering it in the class. Most importantly, it was related to funding: as federal agencies do not fund directly any research activity related to thermodynamics. They were of the impression that I was wasting my time on a "lost cause"….. which is not true by any means. I have decided to work on this during my spare time as my current job does not require me to bring any grant money. I admire your tenacity to promote thermodynamics at this time in history. If you need any help in starting the department of thermodynamics [see: two cultures synergy], please let me know. I will check out the Lewis school of thermodynamics."

In 2013, American chemical engineer John Prausnitz, one of the University of California, Berkeley professor emeritus chemical and biomolecular engineering department founding heads, noted for pioneering work in protein thermodynamics and the history of chemical thermodynamics, commented the following to Thims about the potential fit of a two cultures department at UC Berkeley, with the central hub located within the chemical and biomolecular engineering department, and the humanities integrated into this hub: [3]

> "I don't know what the Rossini debate is but I hope to find out. No, your idea for a department for teaching two cultures would not be appreciated at Berkeley. In the social sciences and in some humanities, thermodynamics may be useful as an analogy, as a suggestion for looking at a problem (e.g., information theory) but beyond that, I see little use of thermodynamics outside science."

(add discussion)

See also

â— Human thermodynamics education
â— Physicochemical sociology

References

1. (a) Groysman, Alec. (2011). "Use of Art Media in Engineering and Scientific Education" (§3.4: Human Chemistry), Generative Art Conference, XIV (papers) (photos), Dec 5-7, Roma, Italy, at CRUI Frescos Hall, Angelica Library Gallery. and Cervantes Institute Gallery.
(b) Note: the end sentence fragment "to be or not to be", added above for lecture cogency, is from his earlier 2004 article (c).
(c) Groysman, Alec. (2004). "Aesthetic, Philosophical and Historical aspects in the Physical Chemistry education", in: *Trends in Electrochemistry and Corrosion at the Beginning of the 21st Century* (pgs. 1203-1226). Edicions Universitat Barcelona.
2. Boregowda, Satish. (2012). "Email communication to Libb Thims", Jan 25.
3. Prausnitz, John. (2013). "Email communication to Libb Thims", Mar 28.
4. Annamalia, Kalyan and Silvia, Carlos. (2011). "Thermodynamics and Biological Systems", in: *Advanced Thermodynamics Engineering*, *Second Edition* (Kalyan Annamalai, Ishwar K. Puri, and Milind A Jog) (§14; §§14.4.1: Human body | Formulae, pgs. 726-27; Thims, ref. 88). CRC Press.

θΔics

In thermodynamics, **engineering thermodynamics** is the study of thermodynamics with focus on practical applications often encountered in engineering, such as using data, together with basic ideas on energy conservation and entropy production, to analyze the behaviors of complex technological systems (e.g. power stations) or systems through which matter is flowing, to optimize desired objectives, such as energy conversion efficiency. [1] Engineering thermodynamics is one of the core subjects in the field of mechanical engineering.

See also

- Chemical engineering thermodynamics

References

1. Reynolds, William, C. and Perkins, Henry, C. (1977). *Engineering Thermodynamics* (2nd ed.). New York: McGraw-Hill Book Co., Inc.

Further reading

- Lucke, Charles E. (1912). *Engineering Thermodynamics* (preface). McGraw-Hill.
- Moran, Michael J. and Shapiro, Howard N. (1992). *Fundamentals of Engineering Thermodynamics* (2nd ed.). New York: John Wiley & Sons, Inc.
- Howell, John R. and Buckius Richard O. (1992). *Fundamentals of Engineering Thermodynamics* (2nd ed.). New York: McGraw-Hill, Inc.
- Cengel, Yunus A. and Boles, Michael A. (2002). *Thermodynamics: an Engineering Approach* (4th ed.). New York: McGraw-Hill.

External links

- Engineering Thermodynamics - Wikibooks

θΔics

In famous publications, **English translations needed** refers to books or articles on applications of thermodynamics to humanity in great need of English translation (some of which is being done in articles of the eoht). Some of these are shown below:

Original (Language)	**Date**	**Translation** (English)	**Author**	**Ref**
Conséquences Philosophiques et Métaphysiques de la Thermodynamique: Analyse élémentaire de l'univers (French)	1868	*Metaphysics and Philosophical Implications of Thermodynamics: Basic Analysis of the Universe* (trans)	Gustave Hirn	1
Die Lehre von der Energie: Historisch-kritisch entwickelt: Nebst Beitragen zu einer allgemeinen Energetik	1887	*The Doctrine of Energy*: *Historical-Critical Development, Along with contributions to an Overall Energetics* (trans)	Georg Helm	2
Essai sur la Mecanique Sociale (Italian)	1898	*Essay on Social Mechanics* (trans)	Leon Winiarski	3
Leçons sur le Mouvement Social (French)	1899	*Lessons on Social Movement* (trans)	Maurice Hauriou	4
(Farsi/Arabic: *Termodynamik-e Ensan*) (ترمودينام يك انسان)	1956	*Thermodynamics of Humans* (or *Human Thermodynamics)* (trans)	Mehdi Bazargan	5

References

1. Hirn, Gustave A. (1868). *Conséquences Philosophiques et Métaphysiques de la Thermodynamique*: *Analyse élémentaire de l'univers* (*Metaphysics and Philosophical Implications of Thermodynamics: Basic Analysis of the Universe*). Gauthier-Villars.
2. Helm, Georg F. (1887). *Die Lehre von der Energie*: *Historisch-kritisch entwickelt: Nebst Beitragen zu einer allgemeinen Energetik* (*The Doctrine of Energy: historical-critical development: in addition to contributing to an overall energetics*) (thermodynamik, 7+ pgs). Leibzig: Verlag von Arthur Felix.
3. Winiarski, Leon. (1898). "Theory of Property and Family: Essay on Social Mechanics" (Italian → English) (pgs. 572-76, 577-81, 582-86, 587-92) ("La Teoria Della Proprieta E Della Famiclia: Saggi Sulla Meccanica Sociale Pura") (pgs. 572-594) In: *Rivista Italiana di Sociologia* (Italian Journal of Sociology), Volume 3. Fratelli Bocca, 1899.
4. (a) Hauriou, Maurice. (1899). *Leçons sur le Mouvement Social* (*Lessons on Social Movement*) (thermodynamique, 23+ pgs; entropie, 19+ pgs; quote, pg. 79). Paris: Larose.
(b) Bougle, Celestin. (1900). "M. HAURIOU: *Leçons sur le Mouvement Social*" (Book Review: *Lessons on Social Movement* by Maurice Hauriou, 176-pages, 1899), in: *L'Annee Sociologique, Volume 3*. P.U.F.
5. Bazargan, Mahdi. (1956). *Love and Worship or Thermodynamics of Humans*, 216-pgs. (Farsi: *Eshq va Parastesh ya Thermodynamic-e Ensan*) (Persian: عشق و پرستش ي ا ترمودينام يك انسان). Tehran: Enteshar Publications.

In Egyptian mythology, **Ennead**, from the Greek ἐννεάς, meaning "group of nine", refers to the group, company, "paut" (Egyptian), or family of nine gods, of Heliopolis creation myth, from which all creation proceeded.

Overview

The following, from the Judgment Hall illustration of the Egyptian Book of the Dead, is an ordered seating of the Ennead, less Osiris and Set: [2]

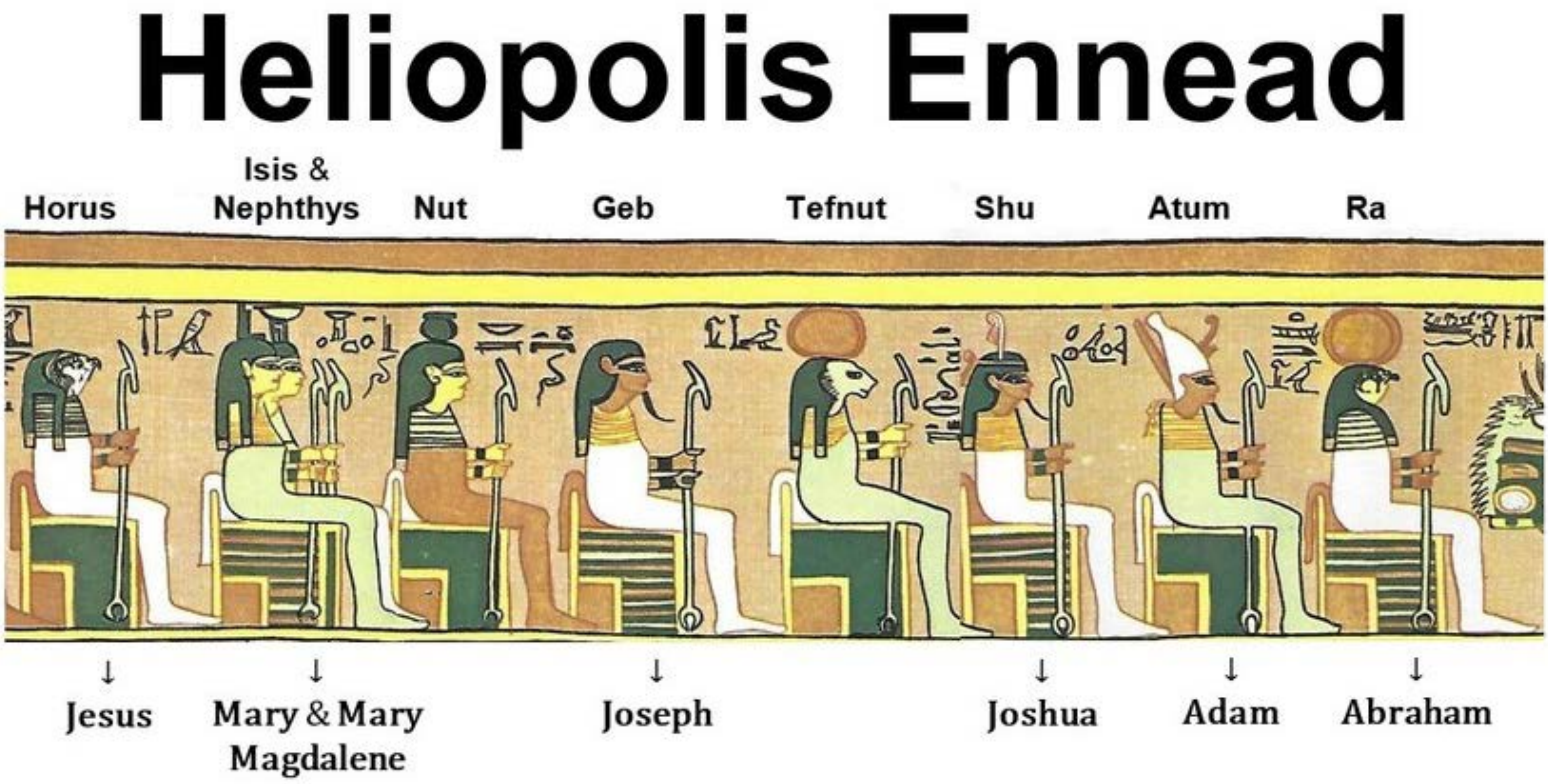

The characters or passengers in a "Bible Bus" (O) sense of things:

Bus driver: **Ra** (Abraham)

Seat 1: **Atum** (Adam)
Seat 2: **Shu** (Joshua)
Seat 3: **Tefnut**
Seat 4: **Geb** (Joseph)
Seat 5: **Nut**
Seat 6: **Isis** (Virgin Mary) and Nephthys (Mary Magdalene)
Seat 7: **Horus** (Jesus)

The following table is the birth order god family tree of the Heliopolis Ennead: [1]

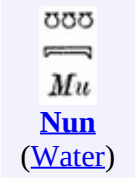

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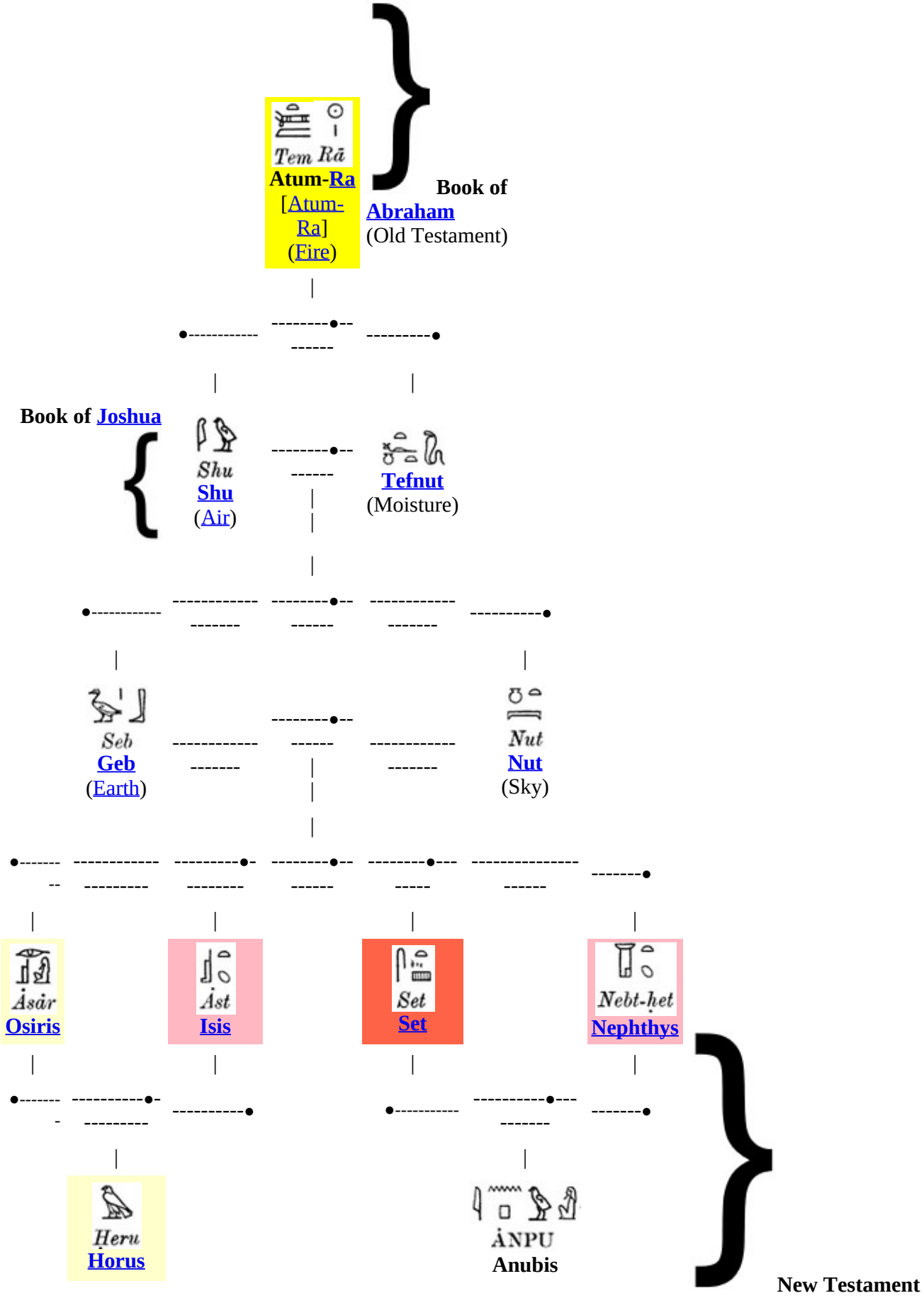
Tem Rā
Atum-Ra
[Atum-Ra]
(Fire)
Book of Abraham
(Old Testament)
Book of Joshua
Shu
Shu
(Air)
Tefnut
(Moisture)
Seb
Geb
(Earth)
Nut
Nut
(Sky)
Āsār
Osiris
Āst
Isis
Set
Set
Nebt-ḥet
Nephthys
Ḥeru
Horus
ĀNPU
Anubis
New Testament

(add)

See also

- Egyptian-to-Christian transliteration
- Ogdoad

References

1. (a) Golenischeff, Vladimir. (1877). *Die Metternichstele* (pl. 3. L. 48, ff). Leipzig: W. Engelmann.
(b) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (§:14: The Sorrows of Isis, pgs. 222-40). Dover, 1969.
2. Faulkner, Raymond. (1972). *The Egyptian Book of the Dead: the Book of Coming Forth by Day: Complete Papyrus of Ani, Featuring Integrated Text and Full-Color Images* (translator: Ogden Goelet; Preface: Carol Andrews; Introduction: Daniel Gunther; Foreword: James Wasserman) (Amz) (pgs. 40-41, 165). Chronicle Books, 2015.

External links

- Ennead – Wikipedia.

θΔics

In existographies, **Ennius** (239-169BC) (IQ:165|#430) (Cattell 1000:855) [RGM:N/A|1,500+] (CR:4) was a Roman epic poet, aka "father of Latin poetry", dramatist, and satirist, noted for []

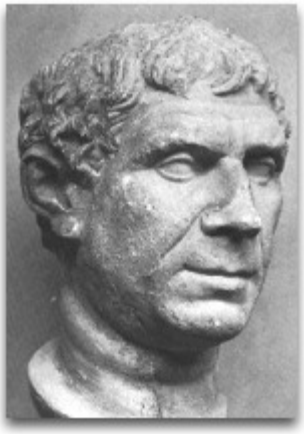

Annals

In c.180BC, Ennius penned *Annals*, comprised of eighteen books of Roman history in hexameters, which become the authoritative version of Rome's rise from the fall of Troy (and thus the Trojan migration to Italy) up to the censorship of Cato; popularity and authority of the Annales led to hexameters replacing Saturnian verse as the preferred meter of epic (and epic-like) poems. (Ñº)

Quotes | On

The following are quotes on Ennius:

> "They do not know the nature of the soul: if it is born or at birth slipped into us; whether, destroyed by death, it dies with us, or goes to see hell's broad and lightless pools, or by some miracle passes to other creatures [see: transmigration], as our loved Ennius sang, who first brought down from lovely Helicon garlands evergreen to grow in fame wherever Italians live. Yet Ennius claimed the underworld exists, and told his tale in deathless verse, a place where neither soul nor flesh lives on but a sort of 'images', pale and eerie things."
>
> — Lucretius (55BC), *On the Nature of Things* (translator: Frank Copley) (pg. 3) (1:112-23)

> "Is it not a wonder that anyone can bring himself to believe that a number of solid and separate particles by their chance collisions and moved only by the force of their own weight could bring into being so marvelous and beautiful a world. If one believes such a thing possible, I cannot conceive why one would not believe as well that by haphazardly throwing a vast quantity of the twenty-one letters onto the ground, the result could be **Ennius**' *Annals*, such that they could then be read. I doubt if chance could by itself complete even a single line."
>
> — Cicero (45BC), voice of Balbus in *On The Nature of the Gods* [1]

Quotes | By

The following are quotes by Ennius:

> "An ugly brute the ape may be, but how he resembles you and me!"
>
> — Ennius (c.180BC), from a lost satire [2]

References

1. (a) Cicero. (45BC). *On the Nature of the Gods* (translator: Horace McGregor) (chance, pg. 166). Penguin, 1972.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (§:Cicero, pgs. 131-46; chance, pg. 140). HarperOne.
(c) Pullman, Bernard. (1995). *The Atom in the History of Human Thought* (translator: Axel Reisinger) (pg. 70). Oxford University Press, 2001.
(d) Stenger, Victor J. (2013). *God and the Atom: from Democritus to the Higgs Boson: the Story of a Triumphant Idea* (pg. 45). Prometheus Books.
2. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (pg. 37, 168). Oxford University Press, 1998.

External links

â— Ennius – Wikipedia.

θΔics

In thermodynamics, **Enrico Di Cera** (c. 1960-) is an American biochemist noted for several books on the thermodynamics of binding between macromolecules and between macromolecules and receptor sites.

Di Cera is a notable expert on "linkage thermodynamics", founded in 1948 by American biochemical thermodynamicist Jeffries Wyman, who developed the theory of linkage functions and brought the rigor of Gibbsian thermodynamics to biochemistry. [1]

Education

In 1985, Di Cera completed his MD at Catholic University School of Medicine, Rome, Italy. Currently, he is professor and chair of biochemistry and molecular biology at Saint Louis University School of Medicine. (Q)

References

1. (a) Di Cera, Enrico and Richards, Frederic M. (1998). *Linkage Thermodynamics of Macromolecular Interactions, Volume 51 of Advances in Protein Chemistry.* Academic Press.
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Further reading

● Di-Cera, Enrio. (1995). *Thermodynamic Theory of Site-Specific Binding in Biological Macromolecules.* Cambridge: Cambridge University Press.
● Alberty, Robert A. and Di Cera, Enrico. (1996). "Jeffries Wyman: June 21, 1901-November 4, 1995", *Biographical Memoirs*, National Academies Press.
● Di-Cera, Enrico. (2000). *Thermodynamics in Biology.* Oxford: Oxford University Press.

External links

● Di Cera, Enrico – WorldCat Identies.
● Enrico Di Cera (faculty) – Washington University, in St. Louis, School of Medicine.

θΔics

In existographies, **Enrico Fermi** (1901-1954) (IQ:190|#46) [RGM:35|1,310+] (CR:52) was an Italian-born American physicist, a high-ranked greatest physicist ever, contender for last universal physicist, eponym of the "fermion", noted for his 1936 booklet on thermodynamics, which resulted from a course of lectures held during the summer session at Columbia University, New York. The entire booklet is 160-pages, including the index, making it one of the shortest books on thermodynamics. [1]

While writing the appendix for the Italian edition of German astronomer August Kopff's book *Foundation of Einstein's Relativity*, Fermi, supposedly, pointed out, or discerned, for the first time, the fact that hidden inside the famous Albert Einstein's 1905 mass-energy equivalence equation ($E = mc^2$), there was a enormous amount of energy (nuclear energy) to be exploited.

Fermi won the 1938 Nobel Prize in physics for his discovery of new radioactive elements produced by neutron irradiation, and for his related discovery of nuclear reactions brought about by slow neutrons.

Students

Six of Fermi's students won the Nobel Prize; although, to note, the brightest and most prolific of his group, Italian theoretical physicist Ettore Majorana (who did not win) would eventually burn out (1933).

Exchange force

Fermi is noted for having brought out the exchange force theory synthesized by his associate Italian theoretical physicist Ettore Majorana (1932) into the global scientific community, a few months after which Werner Heisenberg, learning of this view, would go on to pen out the fuller implications of this model in regards to nuclear bonding.

Quotes | On

The following are notes of praise and or tribute:

> "Fermi was the last universal physicist in the tradition of great men of the 19th century. He was the last person who knew all of physics of his day."
>
> — Emilio Segrè (c.1970) [4]

Quotes | By

The following are noted quotes:

> "Never underestimate the pleasure we feel from hearing something we already know."
>
> — Enrico Fermi (c.1935), cited by Steven Weinberg on whether or not to "repeat material" already familiar to historians or scientists [3]

References

1. Fermi, Enrico. (1936). *Thermodynamics*. Prentice Hall.
2. (a) Majorana, Ettore. (c.1935). "The Value of Statistical Laws in Physics and Social Sciences" (online reprint, with biography by Carlos Allones Pérez); Spanish version in: C. Aallones. (2004): "El valor de las leyes estadísticas en la Física y en las Ciencias Sociales", Empiria, núm. 7: 183-209. Madrid.
(b) Amaldi, Edoardo. (1966). "Ettore Majorana: Man and Scientist: Commemoration Speech" (pgs. 25-95; quote: 57-8); "La Vita e l'Opera di E. Majorana" (Accademia dei Lincei, Rome, 1966); "Ettore Majorana: Man and scientist," in *Strong and Weak Interactions* (pgs. 10-77). Present problems, A. Zichichi, ed. (Academic, New York, 1966).
3. Weinberg, Steven. (1992). *Dreams of a Final Theory: the Scientist's Search for the Ultimate Laws of Nature* (pg. x).

Random House.
4. Holton, James G. (1978). *The Scientific Imagination* (pg. 157). CUP Archive.

Further reading

â— Schwartz, David N. (2017). *The Last Man Who Knew Everything: the Life and Times of Enrico Fermi, Father of the Nuclear Age*. Hachette.

External links

â— Enrico Fermi – Wikipedia.
â— Enrico Fermi – NobelPrize.org.

θΔics

In hmolscience, **Enrique Serrano Fatigati** (1845-1918) (CR:9) (SN:28), Enrique Serrano, Enrique Fatigati (most common), Enrique Serrano-Fatigati, or Enrique Serrano y Fatigati (Spanish), referred to as "Serrano" by Stefan Pohl-Valero (2009), was Spanish physicist, chemist, and thermodynamicist noted, in human thermodynamics, for his 1870s publications that attempted to outline a unified theory of nature and society centered on the first and second laws of thermodynamics, particularly: William Thomson's "On a Universal Tendency to the Dissipation of Mechanical Energy" (1852), William Rankine's versions as described in his "Outlines of the Science of Energetics" (1855), mixed with a blend of ideas about Pierre Laplace's nebular hypothesis, Lamarckian evolution theory, and Friedrich Schelling's 1798 "world soul" theory, concluding that the universe as a whole is in a sort of organic evolution, while along the way replacing God and the soul with a type of transformative "natural energy" or "activity".

Name | Enrique Serrano or Enrique Fatigati

In the Hispanic tradition, people usually have two last names. So in the case of Serrano, "Enrique" is his first name, and "Serrano" and "Fatigati" are his two last names. According to protocol, when used in context, referring to a person the first time, usually one is encouraged to write down the whole name (with the two last names) and subsequently use only the first last name.

Students

A modern student of Fatigati's work is Spanish mechanical engineer and social thermodynamic historian Stefan Pohl-Valero, who devoted much of his 2007 PhD dissertation to bring out some of Serrano-Fatigati's theories into modern daylight.

Life | Non-life issue

In 1870, Serrano began publishing his view on the origin of life that all material forms, from stars to man, are organized and based on the same chemical and dynamical grounds, in which there exists a "unity of constitution, phenomena, and a common origin, in the general progress of matter" and a "necessity law" that orders the series from simplest to more complicated forms. In 1874, these views were expanded into a booklet and from 1874 to 1881 he conducted some types of experiments, with light, temperature, and composition of culture media, to verify his views. Shown adjacent are the main works by Fatigati on his unified theory of natural evolution. (Q)

1870 *Estudios de filosofía natural. Total organización de la materia.* Madrid, M. Tello. 70 p. (co-authored with S. Calderón)

1873 "El progreso de la materia" *Revista de la Universidad de Madrid* **2**, 69-98

1874 *La evolución en la Naturaleza.* Madrid, Aribau y Cia. 46 p.

1876 "On Saccharomyces cerevisiae" *Annals and Magazine of Natural History* (London) **18**, 187-189 (co-authored with Francisco Quiroga Rodríguez)

1877 "Note sur les bactéries et les générations spontanées" *Archives of Sciences Physiques et Naturelles* (Géneve) **59**, 383-384

1879a "Influence des diverses couleurs sur le développement et la respiration des infusoires" *Comtes Rendues de l'Académie des Sciences* (Paris) **89**, 959-960

1879b "Influencia de los distintos colores del espectro solar sobre la nutrición y desarrollo de los infusorios" *Anales de la Sociedad Española de Historia Natural* **8** (Actas de la sesión de 2 de julio), 42-43

1881a "Influencias físicas en el desarrollo de los seres inferiores" *Boletín de la Institución Libre de Enseñanza* (Madrid) **5**, 135

1881b "Orígenes de la vida: último aspecto del problema experimental" *Revista Ilustrada*, no. 18, 207-209

The main works by Fatigati on his unified theory of natural evolution. (Q)

Serrano, in his "The Activities of Nature" ("Las Actividades de la Naturaleza"), cited the ideas of Friedrich Schelling, his 1798 *From the World Soul* (*Von der Weltseele*), in particular, wherein nature is regarded as an organism, supposedly employing the ancient Stoic doctrine of a single soul pervading all of nature, upon which Serrano espoused a monistic world view that unified organic and non-organic, a theory that Stefan Pohl-Valero labels as a "thermodynamic evolution of the universe" theory. (Q)

According to Serrano, there was no difference between inorganic and organic nature, life differentiated from the inorganic only in its higher organization. Thus, in Serrano's view, all matter was organic and all matter had a soul or an internal, active force, conscious of itself, which directed its transformation.

Education

Serrano's version of physics (organic energetics) was said to have been a bit at odds with both Catholic teachings and main stream physics based on the mechanical hypothesis, i.e. that heat was a form of motion. This was the reason, it is said, that his first submission in 1872 of his doctoral thesis in physics on calculating the specific heats of solids and liquids was rejected by the viva jury at the University of Madrid. After a revision, his second thesis in 1874 was accepted and he obtained his doctorate. [1]

Free Institution of Education

In 1875, the outset of the Bourbon Restoration began, all state teaching staff received instructions to follow Catholic dogma in their work, after which many including Serrano protested, some being stripped of their posts.

The following year, those who rebelled grouped together and founded the Free Institution of Education (Institucion Libre de Ensenana), a private educational institution, in Madrid, where freedom and secularization of scientific education was highlighted. The works of Serrano and British chemist Edmund Mills, who both were of the view that there should be no divide between living matter and inert matter, that the laws of energy were the starting point for both, and that this was the unifying model applicable for social values, became the standard physics taught at this new school. [2] Serrano's energetics program, containing scientific and moral lessons, was taught at the institution.

In the 1880s, the energetics conception of nature was used by Serrano's advocates, especially chemists Laureano Calderon and Jose Rodriquez Mourelo, to characterize society and the way it should be organized. [1]

Quotes

The following are representative quotes:

> "Organic character means that all matter has a soul—internal, active force conscious of itself—which directs its transformation. Some philosophers call this active principle 'God', I prefer to call it 'natural energy' or activity. The two laws of thermodynamics are the fundamental laws governing the universe."
>
> — Enrique Fatagati (1873), "The Progression of Matter"; translated and paraphrased by Stefan Pohl-Valero [3]

References

1. Pohl-Valero, Stefan. (2009). "The Circulation of Energy: Thermodynamics, National Culture, and Social Progress in Spain, 1868-1890", in: *Popularizing Science and Technology in European Periphery, 1800-2000* (editors: Papanelopoulou, Faidra, Nieto-Galan, Agusti, and Perdiguero, Enrique) (ch. 6, pgs. 115-34). Ashgate Publishing.
2. Mills, Edmund J. (1876). "On the First Principles of Chemistry" (review), *Philosophical Magazine*, January.
3. (a) Fatagati, Enrique. (1873). "The Progression of Matter" ("El Progreso de la Materia") (pg. 97), *Revista de la Universidad de Madrid*, 2:69-98.
(b) Pohl-Valero, Stefan. (2009). "The Circulation of Energy: Thermodynamics, National Culture, and Social Progress in Spain, 1868-1890", in: *Popularizing Science and Technology in European Periphery, 1800-2000* (editors: Papanelopoulou, Faidra, Nieto-Galan, Agusti, and Perdiguero, Enrique) (ch. 6, pgs. 115-34; quote, pg. 118). Ashgate Publishing.

External links

- Enrique Serrano Fatigati (Spanish → English) – Wikipedia.
- Free Teaching Institution (Spanish → English) – Wikipedia.

θΔics

In terminology, **entelechy** (TR:19) is a technical term, coined by Aristotle, from the Greek *ἐντελής* (entelḗs), meaning "complete, finished, perfect", from *τέλος* (telos), meaning "end, fruition, accomplishment", + *ἔχω* (ékhō), meaning "to have", referring to something that makes things actual; the quality of having become complete, of being perfected, or having attained its purpose, and is used in contrast to 'dynamis', i.e. potential existence, which is the idea of a thing, its possibility, its mere potentiality; the principle or factor which renders things actual. [1]

Aristotle

(add overview)

Leibnitz

In 1689, German polymath Gottfried Leibniz coined the term "dynamica" (see: dynamics), during his Italian journey, referring to his doctrine of forces; during which time he comprised an extensive then-unpublished work entitled *Dynamica*, some of which found publication outlet as "Specimen Dynamicum" in *Acta eruditorum* in 1695; in this latter publication, he outlined the following four notions: [2]

> a) Active primitive force is purely a metaphysical entity expressing the activity of substances and is also called **entelechy**;
> b) Active derivative force is somehow the phenomenal manifestation of an aggregate of metaphysical substances and is measured by living force, or *vis viva*;
> c) Passive primitive force is purely metaphysical and expresses the imperfection of substances;
> d) Passive derivative force, which is also called *inertia*, is its phenomena manifestation.

(add)

Newton

Newton, in a manuscript, had the following to say about Leibnitz's entelechy-based dynamics theory:

> "Galileo began to consider the effect of gravity upon projectiles. Newton in his *Principia* improved that consideration into a large science. Leibniz christened the child by a new name as if it had been his own, calling it *Dynamica* … But his mark must be set upon all new inventions."

(add)

Goethe

> *See: Goethe on the soul*

(add summary)

Driesch

In the 1890s, German zoologist Hans Driesch, a student of Ernst Haeckel, outlined some type of entelechy theory, the operation of which required the occasional suspension of the second law of thermodynamics. [5] American physiologist Lawrence Henderson had the following to say about Driesch's entelechy theory: [6]

> "Driesch's theory is ingenious, but I believe untenable. In fact it involves a reduction to the sphere of molecules of the old fallacy of Descartes. For to suspend the operation of the second law of thermodynamics would be precisely equivalent to an alteration, without the expenditure of energy, of the direction of motion of the particles of a material body. Under these conditions an object which had fallen to

> the ground might, by cooling itself, rise again into the air. Nothing could be more radically inconsistent with the fundamental principles of physical science, as now generally admitted, than this assumption or the theory which it is designed to support."

(add)

Neo-vitalism

Into the early 20th century, entelechy theories began to be classified as types of neo-vitalism; English biologist James Johnstone (1921) states the following on this: [3]

> "Into the last generation there has been a recrudescence of vitalism—'neo-vitalism' it is now called—being obviously something that seems to be different from the Cartesian speculations about the sensitive soul. At its best this is seen in the 'psychoids' and '**entelechies**' of Driesch and others, concepts which are applicable to living things only, and not to chemical and physical phenomena. At its worst modern vitalism is exhibited in the crude and even grotesque 'spiritualism' which has attained such a vogue with the less resolute thinkers of our own generation. This, then, is the modern impasse to which biology has come. Purely physico-chemical explanations of life are not satisfactory, and the immaterial and non-energetic agencies that are being invoked in their place have no interest for science, since they cannot be the objects of investigations."

American neurological anthropologist Terrence Deacon (2011), likewise, surmises Aristotle's concept of "entelechy", or active principle intrinsic to the material substance of an organism, was a precursor or forerunner so to say of vitalism. [4]

References

1. (a) Carus, Paul. (1907). "Goethe's Soul-Conception", *The Open Court*, 21:745-51.
(b) Entelechy – Wikitionary.
2. Applebaum, Wilbur. (2000). *Encyclopedia of the Scientific Revolution: from Copernicus to Newton* (pg. #). Routledge.
3. Johnstone, James. (1921). *The Mechanism of Life in Relation to Modern Physical Theory* (pg. 159, 193). Longmans, Green & Co.
4. Deacon, Terrence W. (2011). *Incomplete Nature: How Mind Emerged from Matter* (pg. 55). W.W. Norton & Co.
5. (a) Mitchell, Robert. (2013). *Experimental Life: Vitalism in Romantic Science and Literature*. JHU Press.
(b) Monod, Jacques. (1970). *Chance and Necessity: Essay on the Natural Philosophy of Modern Biology* (*Le Hasard et la Nécessité: Essai sur la philosophie naturelle de la biologie moderne*) (English translator: Austryan Wainhouse) (pgs. 34-35). Vintage, 1971.
2. Henderson, Lawrence J. (1917). *The Order of Nature* (pg. 91). Harvard University Press.

External links

- Potentiality and actuality (entelechy redirect) – Wikipedia.

θΔics

In thermodynamics, **enthalpic** is a term referring to properties of enthalpy.

Overview

In 2006, David Baker, gave the following use, as an example: [1]

> "For covalent bonds, entropic effects are often of secondary interest because the **enthalpic** bond energy contributes to free energy for outweigh the entropic contributions under ambient thermal conditions. For H-bonding, this is not the case. H-bonding principles must therefore be formulated with due regard for the importance of both enthalpic and entropic factors, judiciously balanced in a *T*-dependent manner."

The term "enthalpic force" is another variant. On the logic that affinity is the driving force of a chemical reaction or process, the thermodynamic theory of affinity, situates the view that affinity is comprised of an entropic force (TΔS) and an "enthalpic force" (– ΔH), whose influence varies as temperature varies. This gives rise to concepts such as enthalpy-entropy compensation effects, among others.

Transition state

The classic model of reaction mechanism between two reactants *A* and *B* is as follows :

$A + B$	$\leftrightarrow$	A â^™â^™â^™ B	$\leftrightarrow$	$A - B$	$\leftrightarrow$	AB
close proximity		encounter complex		transition state		bound state

The two middle steps are often characterized by enthalpic energy barriers

The last step of the binding process is the latter stage transition from the favorable intermediates to the bound state unit *AB*, being a process of induced fit, limited by a rate constant, which requires structural rearrangements, which is assumed to be a process of "overcoming mostly enthalpic energy barriers".

References

1. Baker, David. (2006). *Peptide Solvation and H-bonds* (section V: General Enthalpic and Entropy Principles of H-Bonding, pgs. 141-). Academic Press.

θΔics

In thermodynamics, **enthalpy**, symbolized by *H*, summarized as 'heat content', is defined as the sum of the internal energy of a thermodynamic system plus the energy associated with work done by the system on the atmosphere, i.e. the product of the pressure times the volume. Enthalpy reflects the number and kinds of chemical bonds in the reactants and products. [1] In equation form, enthalpy is defined as follows:

$$H = U + PV$$

The quantity *H*, equal to the internal energy plus the pressure volume energy, was first recognized by American engineer Willard Gibbs as playing an important role for processes occurring at constant pressure, and was called by him 'heat content'.

Etymology

Italian physical chemist Salvatore Califano states that the term was introduced by Dutch physicist Heike Kamerlingh-Onnes at the first meeting of the Institute of Refrigeration in Paris in 1908. [5]

Alternatively, Canadian physical chemist Keith Laidler stated that Onnes introduced the term "enthalpy" in 1909, symbol *H*, from the Greek εν (*en*) 'in' and θαλπος (*thalpos*) 'to heat', which combined define the word *enthalpos*, to warm within. [4]

American protein thermodynamicist Donald Haynie, defines enthalpy, in the context of biological thermodynamics (chnops-thermodynamics), as a 'thermodynamic state function usually measured as heat transferred to or from a system at constant pressure.' [2] With the constraints of constant pressure and amount of substance, the differential change in enthalphy *dH*, of a system evolving in such conditions, equals the amount of heat dQ_P exchanged with the surroundings.' [3]

See also

â— Enthalpy-entropy compensation

References

1. Lehninger, A.L., Nelson, D.L., & Cox, M.M. (1993). *Principles of Biochemistry, 2nd ed*. New York: Worth Publishers.
2. Haynie, Donald T. (2001). *Biological Thermodynamics.* Cambridge: Cambridge University Press.
3. Perrot, P. (1998). *A to Z of Thermodynamics.* Oxford: Oxford University Press.
4. Laidler, Keith J. (1993). *The World of Physical Chemistry* (pg. 110). Oxford University Press.
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Further reading

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θΔics

In thermodynamics, **enthalpy-entropy compensation** is a process, reaction, or interaction in which increases in decreases in standard enthalpy and entropy sum to make zero contribution to the standard Gibbs free energy. [1]

In a 2010 study entitled “Thermodynamics of RNA melting, One Base Pare at a Time”, researchers Evgenia Nikolova and Hashim Al-Hashimi claimed to have observed ‘microscopic’ enthalpy-entropy compensations across base pairs within the same RNA. [2]

Etymology

The etymology the theory of 'enthalpy-entropy compensation' is difficult to track down. In 1981, however, it was being reported that the phenomenon called “enthalpy-entropy compensation” had been observed in a wide variety of chemical reactions and is said to be manifested in and diagnosed by the use of linear plots of enthalpy change verses entropy change, where by the slope has dimensions of temperature, and is called the compensation temperature. [3]

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● Enthalpy-entropy compensation – Wikipedia.

θΔics

In science, **entropic** is a term that refers to phenomena that are like, related to, or connected to entropy, such as in an entropic process.

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θΔics

In thermodynamics, **entropic force** or "force of entropy" is oft-used, albeit ill-defined, term used to describe the thermodynamic force aspects of the entropy in a system.

Etymology

In 1923, American physicists Gilbert Lewis and Merle Randall were describing free energy as the driving force of chemical reactions. In particular, according to the equation:

$$\Delta F = \Delta H - T\Delta S$$

They state that "we may think of the quantity $-\Delta F$ as the driving force for a reaction." This view traces back to the 1882 proof by German physicist Hermann Helmholtz that free energy is the true measure of the affinity (or driving force) of the reaction.

In this view, one may then see the two driving forces of an isothermal isobaric chemical reaction as composed of two parts:

$$\text{Driving force} = -\Delta F = T\Delta S - \Delta H = \text{“entropic force” } (T\Delta S) + \text{“enthalpic force” } (-\Delta H)$$

Hence the term "entropic force" has come to be a common phrase, but is not specifically defined in most cases.

Social entropic force

In the context of sociological thermodynamics, in the 1994 book *The Trouble with Canada*, which has sold over 50,000 copies, Canadian English professor William Gairdner uses the concept of entropic force and social entropy to a good extent. Gairdner postulates that societies are created like galaxies, by a certain initial force, and that over time they dissipate heat, or energy, moving toward a cooler state, culminating in heat death. [1]

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θΔics

In entropology, **entropism** is a marginal term referring loosely to acts, processes, states or philosophies related to neo-cultural aspects of entropy. [1] In political thermodynamics and economic thermodynamics entropism is considered as the antonym of synergism or the energetic parts of a leveling off process in the design of an economy. [2] In sociological thermodynamics, entropism is associated with decadence and degeneration. [3] In philosophical thermodynamics, entropism is associated with the study of evil. [4] In this latter sense, as found in several of the publications of Keith Ferreira, the opposite of entropism, antientropism is considered as the philosophical study of good or acts of goodness. [5]

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θΔics

In religious thermodynamics, **entropological proof** or 'entropy proof of God's existence' or 'entropic proof' is an entropy-based argument for the existence of god.

History

In 1274, Italian priest and philosopher Thomas Aquinas, in his *Summa Theologica*, gave his proof *ex motu*, which is said to be a forerunner to the entropological proof. [1]

In 1869, German physicist Adolf Fick, in his lecture series "The Forces of Nature in their Relationship", gave the first outline of the entropy proof, in which he extrapolated German physicist Rudolf Clausius' heat death theory of universal end to give what is said to be the first contour of the 'entropy proof of God's existence', to argue that God must exist, because of the second law of thermodynamics; though, to note, he only stated the argument, remaining agnostic about the validity of the proof, stating something along the lines that more evidence, work, or data was needed. [4]

In 1910, German physicist Caspar Isenkrahe published his *Energy, Entropy, and the Beginning and End of the Universe* discussing his views on the possible relationship between God and entropy. [6]

In 1920, German philosopher Josef Schnippenkotter completed his PhD dissertation, entitled *The Entropological Proof of God*, in which he discussed over 320 papers (200 of which, supposedly, on entropy and god speculations) to draw the conclusion that entropy does not necessarily imply the existence of a Deity, a view summarized as follows: [5]

> "There is no scientifically certain **proof** that the end and the beginning of the world, and then the existence of God, can be derived from the entropy law."

The phrase "entropological proof" in reference to a proof for the existence based on energy dispersion dates back to at least 1898. [2] The points in the proof, according to English statistical thermodynamicist Peter Landsberg, is as follows: [3]

> (a) the universe is an isolated system.
> (b) isolated systems reach internal thermal equilibrium given time, after which fluctuations about this equilibrium state can take place.
> (c) the universe is presently in a far-from-equilibrium state.
> (d) if the universe is in a far-from-equilibrium state, it must have had a finite age and hence a beginning.
> (e) this beginning must be a state of minimum entropy at which the cosmos was born.
> (f) this original state was brought about by God, who also created the initial values of parameters such as initial internal energy, matter, entropy, etc., such that the initial universe was wound up, i.e. "the spring was set", and the universe is now running down to an eventual heat death.

One of the obvious contradictions in this proof, at least according to Landsberg version, is that point (c) contradicts point (a). In other words, far-from-equilibrium systems, such as Benard cells, can only maintain such a state if they are continuously being driven by an external flux of energy or matter, and as such are open and cannot be isolated.

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θΔics

In human thermodynamics, an **entropologist** is an anthropologist whose studies and theories rest on the prediction of the ultimate thermodynamic leveling of all culture. [1] The term is a derivative of French anthropologist and philosopher Claude Lévi-Strauss' 1960s concept of entropology. In some scenarios, an entropologist is considered as any literary writer who uses the verbal ideas of entropy and disintegration. [2]

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θΔics

In human thermodynamics, **entropology** refers to the thermodynamic study of processes, particularly anthropological ones, without the use of differential equations. [1]

Overview

In 1955, French anthropologist and philosopher Claude Lévi-Strauss, in his *Sad Tropics*, coined the term "entropology".

In 1961, Levi-Strauss, in his *A World on Wane*, by Lévi-Strauss, defined things as follows: [3]

> "**Entropology**, not anthropology, should be the word for the discipline that devotes itself to the study of this process of disintegration in its most highly evolved forms."

The term can loosely be thought of as subjects interjecting on verbal discussion of entropy. Entropology, according to another definition, is the science of analyzing the decline of vitality and energy. [2]

An "entropologist", a Lévi-Strauss term, is defined as an anthropologist whose studies and theories rest on the prediction of the ultimate thermodynamic leveling of all culture. [4] Some have come to refer to the work of American writer Thomas Pynchon as entropology. [5]

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External links

â— *Entropology* - Matchless Recordings.

θΔics

In thermodynamics, **entropy**, symbol *S*, is the energy measure of the heat-transforming-into-work or work-transforming-into-heat equivalence-value (Clausius, 1862) of the transformation (or transformation content) of a working body, specifically "any" physical body in the universe, typically a volume of matter, during a change of state, due to the action of the passage of heat into or out of the body, across its boundary, quantified by the Euler reciprocity relation based value of the ratio of the unit if heat Q by the absolute temperature T of the body, where *Q* is an inexact differential quantity of heat that is produced from work due to the forces exerted by the constituent molecules of the body upon each other: [1]

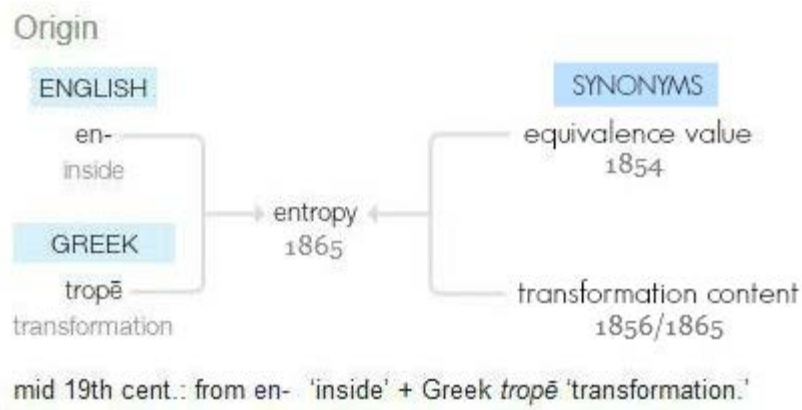

The etymology of the term **entropy** (see: entropy (etymology)), comprised of or embodying the terms: en- (inside) + -trope (transformation) + equivalence-value (1854) + transformation content (1856/1865).

$$S = \frac{Q}{T}$$

In 1865, Clausius, using differential notation, redefined entropy dS as follows:

$$dS = \frac{dQ}{T}$$

or in modern Greek delta δQ notation (Neumann, 1875), to explicitly defined the differential unit of heat as an inexact differential, we have:

$$dS = \frac{\delta Q}{T}$$

Clausius, accordingly, made the unit of heat the derivative of heat a complete differential or path independent state function, the logic of which became embodied in what Clausius defined as the "second main principle" of the mechanical theory of heat. The mathematical expression of entropy was conceived by Clausius to quantify the effect of irreversibility (or the irreversible change of state of a body), in the working body, e.g. a body of steam in a steam engine, during an engine cycle; an effect that French physicist Sadi Carnot assumed, in 1824, did not occur due to his view that heat was form of caloric particles.

Overview

In general, according to Clausius, when a body (working body) changes its state, work is performed *externally* and *internally* at the same time, the exterior work having reference to the forces which extraneous bodies exert upon the body under consideration, and the interior work to the forces exerted by the constituent molecules of the body in question upon each other. The interior work is for the most part so little known, and connected with another

equally unknown quantity (in fact with the increase of heat actually present in the body) in such a way, that in treating of it we are obliged in some measure to trust to probabilities; whereas the exterior work is immediately accessible to the observation and measurement, and thus admits of more strict treatment.

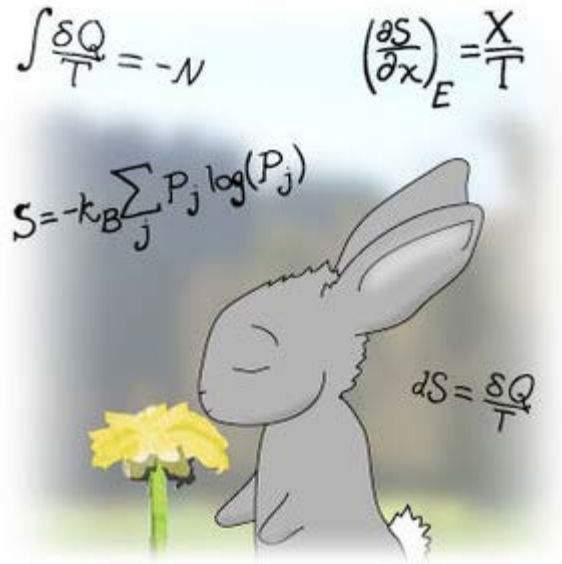

A depiction of the different equation formulations of entropy (using an equation overlay method), shown over a rabbit smelling a flower (indicative of natural governing nature of the second law); the function (δQ/T) on the right hand side of the equation in lower right hand corner being the 1854 "equivalence-value" formulation of heat; the equation in the upper left hand corner being the 1856 "equivalence-value of all uncompensated transformations" formulation of entropy; the second row equation a version of the probability-based Boltzmann entropy (1872) / Planck entropy (1901) / Gibbs entropy (1902); the equation in upper right hand corner being the partial of entropy with respect to some variable X at constant energy. [6]

As such, to avoid everything hypothetical, we can exclude the interior work, by confining heat operations to the consideration of cyclical process— that is to say, operations in which the modifications that the body undergoes are so arranged that the body finally returns to its original condition. In such operations the interior work which is performed during the several modifications, partly in a positive sense and partly in a negative sense, neutralizes itself, so that nothing but exterior work remains, for which the theorem of the equivalence of transformations can then be demonstrated with mathematical strictness.

The theorem of the equivalence of transformations argues that when a body goes through a cyclical process, a certain amount of exterior work may be produced, in which case a certain quantity of heat must be simultaneously expended; or, conversely, work my be expended and a corresponding quantity of heat may by gained. This may be expressed by saying: *Heat can be transformed into work, or work into heat, by a cyclical process*.

There may also be another effect of a cyclical process: heat may be transferred form one body to another, by the body which is undergoing modification absorbing heat form the one body and giving it out again to the other. In this case the bodies between which the transfer of heat takes place are to be viewed merely as heat reservoirs, of which we are not concerned to know anything except the temperatures. If the temperatures of the two bodies differ, heat passes, either from a warmer to a colder body, or from a colder to a warmer body, according to the direction in which the transference of heat takes place. Such a transfer of heat may also be designated, for the sake of uniformity, a *transformation*, inasmuch as it may be said that *heat of one temperature is transformed into heat of another temperature*.

The two kinds of transformations that have been mentioned are related in such a way that one presupposes the other, and that they can mutually replace each other. If we call transformations which can replace each other *equivalent*, and seek the mathematical expressions which determine the amount of the transformations in such a manner that the equivalent transformations become equal in magnitude, we arrive at the following expression: If the quantity of heat Q of the temperature t is produced from work, the equivalence-value of this transformation is:

$$\frac{Q}{T}$$

In addition, if the quantity of heat *Q* passes from a body whose temperature is T*1* into another whose temperature is T*2*,

the equivalence-value of this transformation is:

$$Q\left(\frac{1}{T_2}-\frac{1}{T_1}\right)$$

A tattoo of the principle of the equivalence of transformations (1856), using the 1875 inexact differential notation δ of German physicist Carl Neumann, on the forearm of Ivanka, a newly graduated philosophy student. [6]

here *T* is a function of the temperature which is independent of the kind of process by means of which the transformation is effected, and *T1* and *T2* denote the values of this function which correspond to the temperatures of bodies one and two. By separate considerations, according to Clausius, *T* is in all probability the absolute temperature. These two expressions further enable us to recognize the positive or negative sense of the transformations. In the first, *Q* is taken as positive when work is transformed into heat, and as negative when heat is transformed into work. In the second, we may always take *Q* as positive, since the opposite senses of the transformations are indicated by the possibility of the difference:

$$\frac{1}{T_2}-\frac{1}{T_1}$$

being either positive or negative. It will thus be seen that the passage of heat from a higher to a lower temperature is to be looked upon as a "positive transformation", and its passage form a lower to a higher temperature as a "negative transformation".

If we represent the transformations which occur in a cyclical process by these expressions, the relation existing between them can be stated in a simple and definite manner. If the cyclical process is reversible, the transformations which occur therein must be partly positive and partly negative, and the equivalence-values of the positive transformations must be together equal to those of the negative transformations, so that the algebraic sum of all the equivalence-values become = 0. If the cyclical process is *not reversible*, the equivalence values of the positive and negative transformations are not necessarily equal, but they can only differ in such a way that the positive transformations predominate.

The theorem respecting the equivalence-values of the transformations may accordingly be stated thus: *The algebraic sum of all the transformations occurring in a cyclical process can only be positive, or, as an extreme case, equal to nothing*. The mathematical expression for this theorem is as follows. Let *dQ* be an element of the heat given up by the body to any reservoir of heat during its own changes, heat which it may absorb from a reservoir being here reckoned as negative, and *T* the absolute temperature of the body at the moment of giving up this heat, then the equation:

$$\int \frac{dQ}{T} = 0$$

must be true for every reversible cyclical process, and the relation:

$$\int \frac{dQ}{T} \geq 0$$

must hold good for every cyclical process which is in any way possible. The value of *dQ/T* is called entropy. [1]

Etymology

See main: Entropy (etymology)

Between 1850 and 1865, Clausius published a series of nine memoirs, which in 1865 were collected in the textbook *Mechanical Theory of Heat.* The outline of the theoretical development of the concept and terminology of entropy, went through a number of name changes: "an expression was needed" (1850), equivalence-value (1854), "equivalence-value of all uncompensated transformations" (1856), "disgregation" (1862), "transformation-content" and then finally arriving at the word entropy (1865). [3]

Entropy of the universe tends to a maximum

American physicist Michael Guillen argues that the following formulation of the second law:

$$\Delta S_{universe} > 0$$

which states that the entropy of the final state of the universe will be greater than or 'maximal' as compared to the initial state entropy of the universe, is one the of the five equations that most changed the world; along with Isaac Newton's law of universal gravitation, Daniel bernoulli's law of hydrostatic pressure, Michael Faraday's law of electromagnetic induction, and Albert Einstein's mass-energy equivalence relation. [5]

Entropy of a human molecule

See main: Human entropy

The conception of the possession of an entropy value of individual person or human molecule or species of human molecules at a specific reference point in time is what is referred to as "human entropy".

Species	Formula	$S°$(J/K·mol)
Methane (g)	CH_4	186.19
Acetylene (g)	C_2H_2	200.80
Ethylene (g)	C_2H_4	219.45
Ethane (g)	C_2H_6	229.49
Human	$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$	?

A basic thermodynamic data table, alluding to the methodology according to which one would measure and list the entropy of a given human or rather human molecule, the human molecular formula of which is shown in the bottom row (next to an unknown value of positive entropy).

The first person, historically, to make the suggestion that each person has a different value of entropy was American engineer William Fairburn in mentioned in his 1914 book *Human Chemistry*.

In theory, each individual person can be assigned an entropy value, in reference to a base value, similar to smaller molecules. Shown adjacent, for instance, are standard measures of entropy for four different molecules.

A table such as this is similar to the "material entropy" postulate, but with reference on the measure of entropy per species.

Human system entropy

See main: Economic entropy, Social entropy, etc.

In human systems, the definition of entropy is the same with the translation that the "working body" is defined such that instead of water molecules, confined to the internal regions of a steam engine, put in alternating contact with a hot body (a fire) and a cold body (cool water), driven to do mechanical work (push a piston), we have human molecules, confined to the internal regions of various regions of social systems, put in alternating contact with a hot body (the day sun) and a

cold body (the cool night sky), driven to do the daily work of life, e.g. economic work, social work, volunteer work, household work, parenting work, territorial expansion work, interpersonal work, relationship work, etc. [2]

From a reaction point of view, i.e. human chemistry point of view, boundaries to "working bodies" of human systems, i.e. interactive collections of human molecules confined to economic systems, are defined as being the the 90 percent probability regions in which a specific number of socially interactive or energetically-coupled humans are found. In this point of view, entropy is defined as the internal system energy (internal work) dissipated as humans act on each other, energy that does not find conversion into system external work.

Entropy misinterpretations

See main: Entropy misinterpretations

Historically, entropy has been subject to much confusion, misinterpretation, misapplication, a subject about which is prolonged and involved.

The first dominant person to confuse entropy was Peter Tait who in his 1868 *Sketch of Thermodynamics* presented an incorrect view of entropy. Tait's book was read by his associate James Maxwell, who included this incorrect view of entropy in his 1871 *Theory of Heat.* The error went unnoticed until the fourth edition, during which time it was corrected.

Other famous misinterpretations of entropy were dug out during the great 1902 to 1904 "what is entropy debate", such as are listed adjacent 1903 letter by Syndney Evershed. [4]

"In despair, I offer your readers their choice of the following definitions of entropy. My authorities are such books and journals as I have by me at the moment.

"(*a*) Entropy is that portion of the intrinsic energy of a system which *cannot* be converted into work by even a perfect heat engine. — *Clausius.*

"(*b*) Entropy is that portion of the intrinsic energy which *can* be converted into work by a perfect engine. — *Maxwell, following Tait.*

"(*c*) Entropy is that portion of the intrinsic energy which *is not* converted into work by our imperfect engines. — *Swinburne.*

"(*d*) Entropy (in a volume of gas) is that which remains constant when heat neither enters nor leaves the gas. — *W. Robinson.*

"(*e*) Entropy may be called 'thermal weight,' temperature being called 'thermal height.' — *Ibid.*

"(*f*) Entropy is one of the factors of heat, temperature being the other. — *Engineering.*

. . . . . .

"I set up these bald statements as so many Aunt Sallys, for any one to shy at.

A listing of mostly incorrect misinterpretation **definitions of entropy** in a letter to *The Electrician* (London) from Sydney Evershed, January 09, 1903, supposedly in connection to the great "what is entropy debate" (1902-1904) started by British electrical engineer James Swinburne. [4]

See also

â— Entropy (quotes)

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External links

â— Entropy – Wikipedia.

θΔics

In thermodynamics, **entropy (child's playroom)** refers to a popular way of describing entropy as a tendency of systems to move towards disorder (or chaos), just as a child left alone in an initially organized room, given time, will move the room to state of disorder. This is sometimes referred to as the entropy messy room model.

A typical depiction of a disordered **child's playroom**, often said to, supposedly, give a visually depict the second law of thermodynamics, that a system left to itself will tend towards disorder or that entropy will tend to increase in an isolated system.

American mathematician turned journalist Charles Seife claims that nine out of ten high school physics teachers, when asked, will describe entropy as the measure of the messiness of one's room or how poorly one has arranged books on one's shelf. [6]

History

The child's playroom model of entropy seems to have originated in the 1961 lecture "Entropy and the Unity of Knowledge" by American physicist Peter Landsberg, where he states: [1]

> "Tidy way all your **children**'s toys in a toy cupboard, and the probability of finding part of a toy in a cubic centimeter is highly peaked in the region of the cupboard. Release a randomized influence in the form of an untidy child, and the distribution for the system will soon spread."

In 1971, American art theorist Rudolf Arnheim referred to this as the "child's playroom" explanation of the principle of disorder as advocated by German physicist Max Planck, who in his 1915 lectures seems to have given the impression that the end state of certain material systems is one of maximal disorder, as advocated previously in his principle of elementary disorder. [2] The following definition of entropy, to cite one example, comes from the chemistry department of Boise State University: [3]

> "Entropy is the measure of disorder or randomness in a system. It is a little like a child's playroom. It takes a lot of energy to put the toys away…ordered. It takes a child a millisecond to achieve total randomness… entropy at work!"

(add discussion)

Difficulties

There are some who argue that this model has nothing to do with entropy or entropy increase. This may or may not be true.

In American chemist Frank Lambert's 1999 article "Shuffled Cards, Messy Desks, and Disorderly Dorm Rooms", he argues that the shuffling cards model of entropy and the messy room model of entropy are nonsense examples of entropy increase. [4]

It is true, according to German physicist Rudolf Clausius, that entropy change in a cycle has to do with the energy associated with the work the molecules of the system do on each other during the

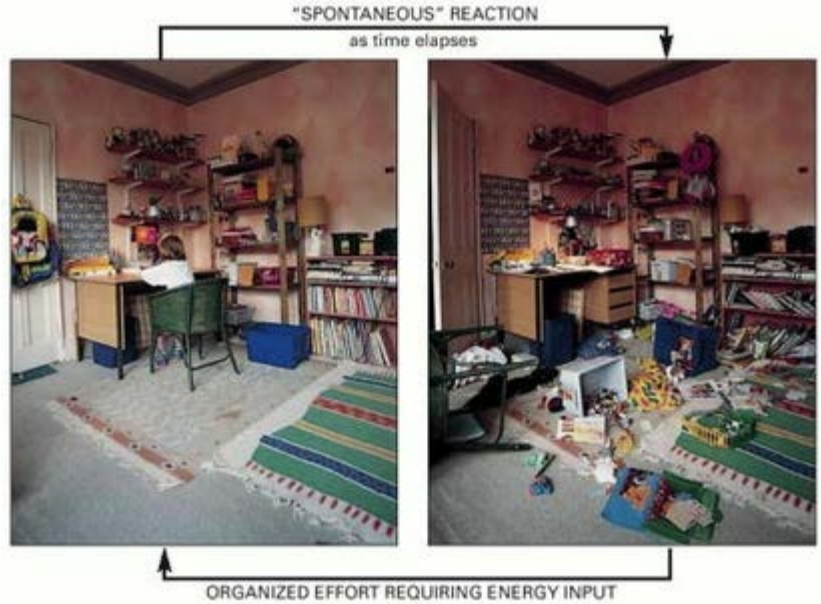

Figure 2-37, entitled "An Everyday Illustration of the Spontaneous Drive Towards Disorder", from the 1994 *Molecular Biology of the Cell*, captioned as "Reversing this tendency toward disorder requires an intentional effort and an input of energy: it is not spontaneous. In fact, from the second law of thermodynamics, we can be certain that the human intervention required will release enough heat to the environment to more than compensate for the reordering of the items in this room." [5]

course of time between which the system returns to its near original state. In this sense, the work that two human molecules, the child and parent, do on each other in playing in the room and later cleaning up the room can is related to entropy change. The loss of energy involved in re-tidying the room would thus be considered an uncompensated transformation. This, however, is an involved analysis. The original Landsberg definition, to note, seems to be based on the Boltzmann-Planck, $S = k \log W$, interpretation of entropy as a function of quantum states, and not precisely that defined originally by Clausius.

See also

â— Typing monkeys

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External links

â— Entropy messy room (discussion thread) – TheStudentRoom.co.uk.

θΔics

In thermodynamics, the **etymology** of term **entropy**, symbol S, derives from the Greek word τροπη (*tropos*), meaning "transformation", coined by German physicist Rudolf Clausius in 1865. [1]

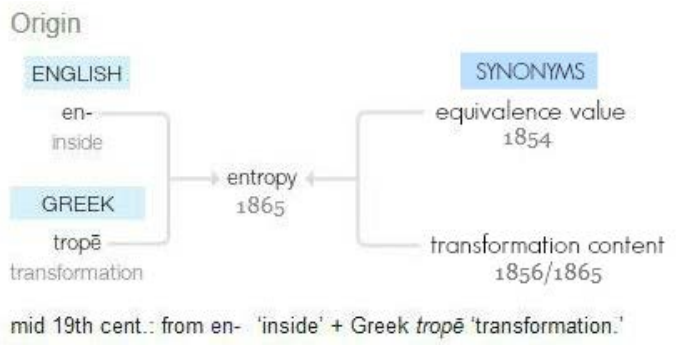

A term meaning flow chart for the etymology of the 1865 term entropy.

> "Clausius coined the term *entropy*, from the Greek *tropos*, or transformation."
>
> — Eric Zencey (1983), "Entropy as Root Metaphor" [10]

The above quote by American scholar Eric Zencey, who did his PhD dissertation on entropy as a root metaphor, in the social sciences, gives a well-representative synopsis of the etymology of entropy; the Greek term "τροπη", however, to clarify, has the following alternative meanings, namely "turn" or "change": [11]

τροπή - *noun*	
turn	σειρά, στροφή, τροπή, στρίψιμο, γύρος
change	αλλαγή, μεταβολή, ρέστα, μετασχηματισμός, ψιλά, τροπή
trope	αλληγορία, τροπή

The exact meaning behind Clausius' use of the term "transformation" is in the sense of:

Heat ↔ Work

or the transformation of heat into work or work into heat as defined by the mechanical equivalent of heat.

There were, however, a number of precursory terms and phrases used by Clausius in the preceding fifteen years, such as diagrammed above, to define this quantity. In addition, there are to be found propagated in the literature a number synonyms and false etymologies. Both topic areas are discussed below.

Heat | History

The roots of the mathematical concept of entropy have its roots in the various historical models of heat: caloric, matter of fire, phlogiston, terra pinguis, sulphur model of heat, among others. To construct the quantity entropy, conceived as a state function, i.e. to transform the conception of a quantity of heat—conceived by Antoine Lavoisier previously as an indestructible fluid like particle called "caloric" (a theory disproved via Benjamin Thompson's 1798 cannon boring experiment)—Clausius employed the Euler reciprocity relation, whereby he used William Thomson's absolute temperature (1854) scale T as the integrating factor for the differential (inexact differential) of a unit or quantity of heat Q, to make a new state variable function for heat: dQ/T (exact differential) which he came to call entropy.

Precursory etymologies

German physicist Rudolf Clausius, between 1850 and 1865, used the following phrasings and terminologies to define his heat divided by absolute temperature quantity in development:

Date	Conceptual Development of Entropy
1780	The matter of fire (indestructible) is called "caloric" (Antoine Lavoisier) and is disengaged from bodies during combustion.
1798	The synopsis conclusions of the famous caloric-questioning "cannon boring experiment" (Benjamin Thompson): "What is heat? Is there anything as igneous fluid? Is there anything that can with propriety be called caloric? That heat generated by friction [in the boring experiments] appeared, evidently, to be *inexhaustible*, [it] cannot possibly be *a material substance*; … it appears to me to me to be extremely difficult, if not quite impossible, to form any distinct idea of anything capable of being excited and communicated in the manner heat was excited and communicated in these experiments, except it be MOTION."
1850	Clausius: stated that: an expression was needed to account for the experimental fact that "loss of heat occurs when work is done." (as Carnot had assumed did not occur).

1854 (Jan 19)	**Rankine**: introduced his so-called "thermodynamic function" of heat; which he later (Sep 1865) says is equivalent to Clausius' entropy function.
1854 (Dec)	**Clausius**: defined the ratio: Q/T and calls it "equivalence-value" (so to have relation to Joule's 1843 paper "Mechanical equivalent of heat").
1856	Clausius: uses the phrase: "equivalence-value of all uncompensated transformations" (so as to have relation to Carnot's postulate: "we shall assume that the quantities of heat absorbed and emitted in these different transformations compensate each other exactly" involved in a cyclical process" (and gives it the symbol -*N*).
1862	Clausius: relates the integral of dQ/T to something he calls "disgregation" of the body having relation to arrangement of the molecules of the working body (to have relation to Carnot's 1824 paper *On the Motive Power of Fire* that characterized the "transformations" of "working substances" of an engine cycle, namely "mode of aggregation").
1865 (Apr 24)	Clausius: lets dS = dQ/T and first calls *S* the "transformational content" of the working body, but then settles on entropy, so to have similarity to the word energy.
1877	Clausius: explains the origin of the term 'entropie' to James Maxwell in a Nov 8th letter (see below).

1865 coining

On April 24th, 1865, during a reading to the *Philosophical Society of Zurich*, Clausius gave the following statement, in what was his first mention of the term "entropy", shown below, left in the original German and right in the first 1867 English translation by mathematical physicist Thomas Hirst: [1]

Original German

"Sucht man für *S* einen bezeichnenden Namen, so könnte man, ähnlich wie von der Grosse *U* gesagt ist, sie sei der *Wärmennd Werkinhalt* des Körpers, von der Grosse *S* sagen , sie sei der *Verwandlungsinhalt* des Körpers. Da ich es aber für besser halte, die Namen derartiger für die Wissenschaft wichtiger Grossen aus den alten Sprachen zu entnehmen, damit sie unverändert in allen neuen Sprachen angewandt werden können, so schlage ich vor, die Grosse *S* nach dem griechischen Worte η *τροπÎ®*, die Verwandlung, die ***Entropie*** des Körpers zu nennen. Das Wort *Entropie* habe ich absichtlich dem Worte *Energie* möglichst ähnlich gebildet, denn die beiden Grossen, welche durch diese Worte benannt werden sollen, sind ihren physikalischen Bedeutungen nach einander so nahe verwandt, dass eine gewisse Gleichartigkeit in der Benennung mir zweckmnssig zu sein scheint."

Hirst 1867 English translation

"We might call *S* the *transformation content* of the body, just as we termed the magnitude *U* its *thermal* and *ergonal content*. But as I hold it to be better terms for important magnitudes from the ancient languages, so that they may be adopted unchanged in all modern languages, I propose to call the magnitude S the **entropy** of the body, from the Greek word *τροπÎ®*, *transformation*. I have intentionally formed the word *entropy* so as to be as similar as possible to the word *energy*; for the two magnitudes to be denoted by these words are so nearly allied their physical meanings, that a certain similarity in designation appears to be desirable."

Google German → English translation

"If you are looking for specifically, *S* has a distinctive name, it might be similar to the size of *U*, it is the work Wärmennd content of the body, from the size of *S* say it is the transformation content of the body. Since I believe but for the better, such is the name for the science major in the Great found in ancient languages, so they can be used unchanged in all new languages, I propose that the size *S* of the Greek words η τροπÎ® that Transformation to call the **entropy** of the body. The word entropy I have intentionally formed the word energy as similar as possible, because the two quantities, which are named by these words are related to their physical meanings to each other so close that a certain uniformity in the designation seems to me zweckmnssig."

Rankine | thermodynamic function

In 1854, Scottish engineer-physicist William Rankine introduced what he called a "thermodynamic function", symbol Phi Φ, whose increase or diminution of which indicates whether heat is entering or leaving a system. [1] In 1873, Willard Gibbs, in two places, stated that Rankine's thermodynamic function was the same and or synonymous with Clausius' entropy; firstly, in his first thermodynamics article: [8]

> "The term *entropy*, it will be observed, is here used in accordance with the original suggestion of Clausius, and not in the sense in which it has been employed by Professor Tait and others [Maxwell] after his suggestion. The same quantity has been called by Professor Rankine the *thermo-dynamic function*."

Next, in his second 1873 thermodynamics article, Gibbs stated: [9]

> “The entropy as defined by Clausius is synonymous with the thermodynamic function as defined by Rankine.”

Maxwell

Scottish physicist James Maxwell had a number of stumbling blocks in respect to his understanding of entropy, owing to his first rendering discerned from his reading of Peter Tait's 1868 *Sketch of Thermodynamics*, wherein the sign for entropy was "incorrectly" reversed, as follows (as explained (Ñº) by Gibbs in 1873):

$$dS = -\frac{dQ}{T}$$

In a 1 Dec 1873 letter to Tait, after reading Gibbs clarifications, Maxwell stated the following: (Ñº)

> “It is only lately, under the conduct of Professor Willard Gibbs that I have been led to recant an error with I had imbibed from your θΔcs [thermodynamics] namely that the entropy of Clausius is *unavailable* energy while that of T' [Thomson's] is available energy. The entropy of Clausius is neither one nor the other it is only Rankine’s thermodynamic function.”

In 1877, Clausius, in a letter to Maxwell (Nov 8), explained the origin of the term ‘entropie’ (Ñº), the letter, in the original German, from Maxwell’s collected scientific letters (Ñº), is shown below:

In a letter of 8 November 1877 (ULC Add. MSS 7655, II/146), written in response to Maxwell's recent inquiry (not extant), Clausius had explained the origin of the term 'entropy'. 'Bonn, 8 Nov. 1877 / Hochgeehrter Herr, / Ich beeile mich, Ihre Anfrage wegen des Namens Entropie zu beantworten, indem ich das grosste Gewicht darauf lege, mit Ihnen nicht nur in Bezug auf die Benennungen in Uebereinstimmung zu sein. / Den Namen Entropie habe ich eingefuhrt in einer Abhandlung von 1865, welche ich Ihnen beifolgend unter Kreuzband ubersende. Die Stelle befindet sich auf Seite 390; es ist aber zweckmassig, zum besseren Verstandnisse auch die vorkehrgehenden Seiten, etwa von S.387 an, zu lesen. Die frühere Abhandlung von 1862, welche dort erwahnt ist, fuge ich ebenfalls bei. / Beide Abhandlungen sind auch in meiner Abhandlungen-Sammlung als Abhandlung VI und IX abgedruckt und befinden sich auch in der von Hirst herausgegebenen englischen Uebersetzung, wo die Stelle uber den Namen Entropie sich auf p.357 befindet. / Mit der Versicherung der aus gezeichnetsten Hochachtung verbleibe ich / ganz der Ihrige / R. Clausius.' In explaining the origin of the term 'Entropie' Clausius made reference to his paper 'Ueber verschiedene fur die Anwendung bequeme Formen der Hauptgleichungen der mechanischen Warmetheorie', *Ann. Phys.*, **125** (1865): 353–400, esp. 390: 'nach dem griechischen Worte *ἡ τροπή*, die Verwandlung, die *Entropie* des Korpers zu nennen'; in Clausius, *The Mechanical Theory of Heat*, (trans.) T. A. Hirst (London, 1867): 327–65, esp. 357; and see note (5). He also referred to his paper 'Ueber die Anwendung des Satzes von der Aequivalenz der Verwandlung auf die innere Arbeit', *Ann. Phys.*, **116** (1862): 73–112 (in *The Mechanical Theory of Heat*: 215–50); see Number 675. Clausius cited publication of these papers in his *Abhandlungen uber die mechanische Wärmetheorie*, 2 vols. (Braunschweig, 1864–7).

In 1878, Maxwell, in discussion of Clausius' description of entropy in terms of "equivalence of transformations", referred to the theory of entropy as the theory of transformation-equivalents. [3]

Clausius | 1875 restatement

In the updated 1875 second edition to his *Mechanical Theory of Heat* textbook, Clausius reaffirmed his etymology as follows: [2]

> “In another paper, after introducing a further development of the equivalence of transformations, the author proposed to call this quantity, after the Greek word *τροπÎ®*, transformation, the **entropy** of the body [S].”

False etymologies

In the 1955 work *Thermodynamics of Irreversible Processes*, Belgian chemist Ilya Prigogine gave the following incorrect etymology: “The second principle of thermodynamics postulates the existence of a function of state, called entropy, from the Greek *ενρωπη* meaning “evolution”. [4] In any event, whatever his agenda was at this point, Prigogine and his co-author Dilip Kondepudi give the correct etymology in their 1998 textbook *Modern Thermodynamics*. [5] In the 1998 thermodynamics dictionary *A to Z of Thermodynamics*, French thermodynamicist Pierre

Perrot gives the following incorrect etymology and incorrect date of coining: “[Entropy] a term proposed by Clausius in 1868, from the Greek root εντροπη, the act of turning round (τροπη, change of direction), implying the idea of reversibility.” [6] The *Online Etymology Dictionary*, since at least 2008, has been correctly claiming that entropy was conceived in the mind of Clausius it on the Greek term entropia, or "a turning toward," from en- "in" + trope "a turning"; whereas the correct sense Clausius uses the Greek term *τροπÎ®* in the sense of 'transformation' or 'transformation content.' [7]

See also

â— Entropy formualtions

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11. τροπη – Google Translate.

θΔics

In entropy models, a **ghostly quantity** is a view of entropy utilized and discussed by a number of scientists towards the end of the 19th century, in which entropy was viewed as a "mathematical spook" or "ghostly" type of thermodynamic quantity.

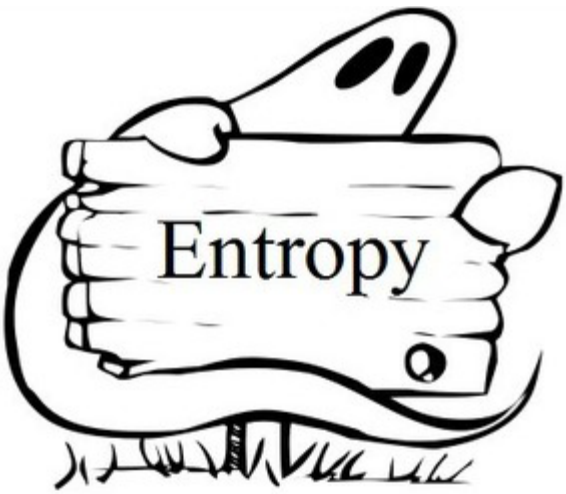

Entropy: the "mathematical spook" and "**ghostly quantity**" of physics and thermodynamics.

Overview

German physicist Max Planck has commented in his retrospect memoirs that the entropy was being viewed by some as early as 1889 as a mathematical spook. [1]

In 1899, Irish mechanical engineer John Perry was calling bodies by the name 'stuff' and a entropy as a 'ghostly quantity', as follows: [2]

> "If stuff is at the absolute temperature T and we give the small amount of heat δH to it, we say that we give it the entropy $\frac{\delta H}{T}$. Engineers seem to have great difficulty in understand why we introduce the notion of this **ghostly quantity**, but they must get accustomed to it."

In his 1902 *The Temperature-Entropy Diagram*, American thermodynamicist Charles Berry opened his introduction sentence with: [7]

> "It seems necessary in a book dealing with the application of the temperature-entropy diagram to discuss briefly that **'ghostly quantity'**, entropy, although I do not intend to give any new definition of a function already too variously defined, but rather to pick out such of the present ones as are correct."

In his 1902 *The Steam Turbine*, English mechanical engineer Robert Neilson states: [10]

> "This **'ghostly quantity'**, as Professor Perry calls it, is not perceptible by the senses, and cannot be measured directly by any gauge or meter. It is, nevertheless, a very convenient term of expression, and entropy-temperature diagrams are very instructive and very useful."

In 1903, Planck, in commentary on English electrical instrument maker James Swinburne's articles, stated that: "Swinburne has written one of the best and clearest expositions of the subject that has ever been written, especially when he points out that nature never undertakes any change unless her interests are served by an increase in entropy." [3] This metaphysical-sounding statement caught the eye of English self-taught electrical engineer, mathematician and physicist Oliver Heaviside, and prompted a letter which tells us, explicitly, something about his thermodynamic ideas, and of energy: [4]

> "I should like to ask Professor Max Planck whether the view he expresses that 'nature never undertakes any change unless her interests are served by an increase of entropy' is to be taken with or without any particular reservation or with any special interpretation of 'her interests'. My thermodynamic ideas are somewhat old-fashioned—viz., that there is invariably a dissipation of energy or loss of availability of energy due to imperfect or total want of reversibility in natural processes. This entirely agrees in effect with the way of expressing things in terms of increase of 'entropy', although that subtle quantity is certainly **'ghostly'**, and is somewhat too evasive to be regarded as a physical state even though it be a function of the

> physical state referred to a standard state. But the question is how the interests of Nature are served by imperfect reversibility? Professor Planck's words suggest a choice on Nature's part, as if Nature had any choice. Goethe said god himself could not alter the course of Nature. That was truly scientific. Then, again, what are to be considered the interests of Nature? Are we to take exactly things exactly as we find them, and define the interests in that way? If so, it carries us no further. Or is there a theorem of greatest entropy, showing how any variation from the proper course of Nature would tend to reduce the rate of increase of the entropy?"

Planck replied promptly with a sharp rejection of Heaviside, at first dismissing the 'ghostly' business: [5]

> "Whether entropy has any **'ghostly'** attributes, is a question I will not open, but I am for the present quite content to know that it is a quantity which can be measured without ambiguity."

In 1903, Perry wrote a review of James Swinburne's new book *Entropy: The Thermodynamics of Heat-Engines*, a review that he copied to Heaviside, in which he stated that experimentation removes the ghostly effect: [9]

> "We have found that practice with blackboards leads to the most exact quantitative and practical knowledge of what goes on in heat engines. But the student must really state the answers as to heat and work exactly, the scales to which energies are represented being familiarly known. After a little practice, the **ghostly quantity** entropy gets to be as well known as electrical potential now is to experimenters—in 1868 it was merely a mathematical expression to most students, just as entropy now must remain to anybody who will not experiment."

By 1910, the entropy as a "ghostly quantity" had entered unattributed engineering folklore, such as described in an engineering digest article "The Definition of Entropy" [8]

> "Entropy is what someone has called a **'ghostly quantity'**, and it is so intimately connected with mathematics that it cannot be divorced from it."

In 1914, English biologist James Johnstone commented that entropy is 'shadowy': [6]

> "Entropy is a **shadowy kind of concept**, difficult to grasp … but again, we may point out that, the reader who would extend the notion of mechanism into life *simply must* grasp it."

Likewise, in 1921 Johnstone argued that "we do not know about things, but only about relations—which are differential equations between, dx, dy, dz, and dt, which symbols, after all, 'ghosts' of space and time." [11]

In circa 1940, German physicist Max Planck famously commented in retrospect on joining the local Physical Society at the University of Berlin in 1889: [1]

> "In those days I was essentially the only theoretical physicist there, whence things were not so easy for me, because I started mentioning entropy, but this was not quite fashionable, since it was regarded as a **mathematical spook**."

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θΔics

In science, **entropy (information)** refers to the term "entropy", related to the coding and transmission of binary digits (0s, 1s) in information theory; a concept not related to thermodynamics.

See also

- Information
- Information entropy
- Shannon entropy
- Information theory
- Information thermodynamics
- Information TPs
- Informed energy

θΔics

In thermodynamics journals, **Entropy** is an open access, online journal devoted to publications on entropy, including thermodynamic, informational, and mathematical varieties of entropy. [1] In addition, in connection to human thermodynamic topics, the Entropy journal caters to publications in economics and philosophy, among others.

In 1999, the *Entropy* journal was launched primarily through the efforts of Chinese chemist Shu-Kun Lin who says he was confused about the "two main kinds of entropy", i.e. Clausius-based and Shannon-based, figuring that a journal would help sort the matter out.

As of 2015, the journal has diversified into five main sections, each with a “section” editor in chief:

- Thermodynamics | Milivoje Kostic
- Statistical mechanics | Antonio Scarfone
- Information theory | Raul Martinez
- Quantum information | Jay Lawrence
- Complexity | Tenreiro Machado

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(b) Entropy (journal) – Wikipedia.

θΔics

In thermodynamics, **entropy (misinterpretations)** are a number of cases where scientists have gone on a false or misunderstood interpretation of German physicist Rudolf Clausius' 1865 definition of the quantity entropy. There are many instances in which scientists who have never read any of Clausius' papers or his textbook *The Mechanical Theory of Heat*, have spent years developing and promoting various interpretations of entropy, verbal and mathematical; often going on residual second or third, far-removed, interpretations, having little connection to the original meaning. The first to point out the difficulties involved in the understanding of entropy was American engineer Willard Gibbs, who in 1873 stated:

> "The different sense in which the word *entropy* has been used by different writers is liable to cause misunderstanding."

"In despair, I offer your readers their choice of the following definitions of entropy. My authorities are such books and journals as I have by me at the moment.

"(*a*) Entropy is that portion of the intrinsic energy of a system which *cannot* be converted into work by even a perfect heat engine. — *Clausius.*

"(*b*) Entropy is that portion of the intrinsic energy which *can* be converted into work by a perfect engine. — *Maxwell, following Tait.*

"(*c*) Entropy is that portion of the intrinsic energy which *is not* converted into work by our imperfect engines. — *Swinburne.*

"(*d*) Entropy (in a volume of gas) is that which remains constant when heat neither enters nor leaves the gas. — *W. Robinson.*

"(*e*) Entropy may be called 'thermal weight,' temperature being called 'thermal height.' — *Ibid.*

"(*f*) Entropy is one of the factors of heat, temperature being the other. — *Engineering.*

. . . . . .

"I set up these bald statements as so many Aunt Sallys, for any one to shy at.

A listing of mostly incorrect **misinterpretations** of entropy, in a letter to *The Electrician* (London) from Sydney Evershed, January 09, 1903, in connection to the great "what is entropy debate" (1902-1904) launched by British electrical engineer James Swinburne. [11]

On this view, Gibbs, in his 1873 "A Method of Geometrical Representation of the Thermodynamic Properties of Substances by Means of Surfaces", devoted a section to discuss to the historical terminology of the subject of "entropy", as the term and mathematical expression had been used differently by those as Clausius, Peter Tait, James Maxwell, and William Rankine. [1]

Maxwell-Tait debacle

The classic example of entropy misinterpretation is that Scottish mathematical physicist Peter Tait who conceived entropy as "available energy" (whereas correctly "free energy", Gibbs free energy, or Helmholtz free energy, is what constitutes available energy, not entropy). Tait, in turn, communicated this interpretation of entropy to his associate Scottish physicist James Maxwell and used this interpretation in his 1868 *Sketch of Thermodynamics*. Maxwell, in turn, adopted Tait's mis-interpretation of entropy and used this interpretative version in his famous 1871 *Theory of Heat.*

In 1873, however, after reading American engineer Willard Gibbs' 1873 paper "Graphical Methods in the Thermodynamics of Fluids", Maxwell found that he was in error and was forced to make a recant (publically in the 1875 fourth edition of his *Theory of Heat*).

In commentary in a letter to Tait on 01 December 1873, Maxwell states: [2][3]

> "It is only lately, under the conduct of professor Willard Gibbs that I have been led to recant an error which I had imbibed from your θΔcs namely that the entropy of Clausius is *unavailable* energy while that of T' [Tait] is available energy. The entropy of Clausius is neither the one nor the other it is only Rankine's thermodynamic function."

In a 27 March 1875 letter to Scottish engineer James Thomson, Maxwell says: [2]

> "I shall be very much obliged to you if you will let me know any suggestions, corrections, or amendments to my book on heat. A new edition is about to come out soon and several things must be modified, e.g. all

> about entropy and about the conditions of evaporation now solved by Gibbs."

In the fourth edition of the text, to which he was referring, Maxwell made additions and revisions, correcting the erroneous discussion of "entropy" given in the earlier editions; see: *Theory of Heat* (London, 1875): 162-5 ("On Entropy"), 186-7, 187-93 ("Available energy"). He noted that in using the concept of "entropy" he was now following the meaning Clausius had attached to the term, and admitted that his earlier usage had introduced "great confusion into the language of thermodynamics" (*Theory of Heat*, 189n). [4]

The Tait-Maxwell "entropy = available energy" mis-interpretation, however, was not easily erased from history. To exemplify, in 1985, American engineering physicist turned writer Thomas Pynchon, commented in retrospect about his learning about entropy in 1958 stating to the effect that after first becoming acquainted with entropy from Henry Adams (as "power out of control") and Norbert Wiener ("universal heat death and mathematical stillness"), he states: [10]

> "Further, it turns out that not everyone has taken such a dim view of entropy. Again according to OED, Clerk Maxwell and P.G. Tait used it, for a while at least, in a sense opposite to that of Clausius: as a measure of energy available, not unavailable, for work."

Thus, we see that even into the late 20th century, the mis-notion of entropy as available energy was still being bandied about in discussion.

Shannon

Another classic example is the story of how American chemical engineer John von Neumann, in the 1940s, suggestion to American engineer Claude Shannon to call phone line information signals, or loss thereof, "entropy" and thus gave birth to the grandly confused idea of "information entropy", often naively seen to have a thermodynamic basis.

Lambert

In decade surrounding 2002, with the publication of "Disorder: A Cracked Crutch for Supporting Entropy Discussions", American chemist Frank Lambert is known to have made an uneducated push to get the word "disorder", of the Boltzmann-Planck quantum mechanical origin, removed from America's college chemistry textbooks and replaced with his simplified theory of "energy dispersion", even though he has never, admittedly, read the works of Clausius, but rather derived his interpretation of entropy based on papers from William Thomson. [6]

His ubiquitous websites, such as SecondLaw.com (1998), 2ndLaw.com (1999), Shakespeare2ndLaw.com (2000), EntropySimple.com (2001), EntropySite.com (2002), etc., have supposedly educated millions of students to the correct view of what entropy is. In addition, as of 2007, Lambert has aggressively petitioned a larger number of American chemistry textbook authors to replace the word disorder from their entropy chapters and to replace it with an energy dispersal view of entropy. Lambert claims to have convinced over a dozen different chemistry textbook authors to remove the word "disorder" from their chapters on entropy and thermodynamics, which as Google books shows (search: entropy, energy dispersal), is rather accurate estimate. All-in-all, this situation of reverse education seems to exemplify a case of the blind leading the blind.

Kennedy

Another example of entropy misinterpretation is Austrian environmental chemist Ivan Kennedy, who having never read the works of Clausius has developed a unit-less variation of entropy, on what seems to have no foundation, in a theory of what he calls action thermodynamics. [5] Kennedy, for instance, uses a large amount of standard thermodynaics terminology, e.g. free energy, internal energy, systems, etc., in discussion, but defines entropy as "a dimensionless capacity factor, the ratio of the cumulative heat needed to raise the temperature to *T*, divided by the absolute temperature, the latter being considered an energy intentsity factor." [7] On this logic, things become even more convoluted. The change in enthalpy ΔH, for instance, is defined by Kennedy as "changes in internal molecular entropy." [8]

References

1. Gibbs, J. Willard. (1873). "A Method of Geometrical Representation of the Thermodynamic Properties of Substances by Means of Surfaces" (pgs. 51-52), *Transactions of the Connecticut Academy*, II. pp.382-404, Dec.
2. Maxwell, James, (Harman, Peter (editor)). (1990). *The Scientific Letters and Papers of James Clerk Maxwell: 1874-1879* (Numbers 557 Letter to James Thomson, 27 March 1875, note (2) (pg. 205), 587 Draft of 'On the Equilibrium of Heterogeneous Substances, circa February 1876, note (7) (pg. 283), and 623 Letter to Peter Guthrie Tait, note (4) (pg. 397)). Cambridge University Press.
3. See: J. Willard Gibbs, "Graphical Methods in the Thermodynamics of Fluids", (Gibbs quote: "the term *entropy*, it will be observed, is here used in accordance with the original suggestion of Clausius, and not in the sense in which it has been employed by Professor Tait and others after his suggestion. The same quantity has been called by Professor Rankine the *Thermo-dynamic function.*") *Transactions of the Connecticut Academy of Arts and Sciences*, 2 (1873): 309-42, esp. 310n.
4. (a) On his clarification of "entropy" see his letter to Tait of 01 December 1873 (Volume II: 945-6, and see Number 529 note (6)).
(b) On these revisions to the *Theory of Heat* see Edward Daub, "Entropy and Dissipation", *Historical Studies in the Physical Sciences*, 2 (197): 321-54, esp. 330-3.
5. Kennedy, Ivan R. (2001). *Action in Ecosystems: Biothermodynamics for Sustainability* (ch. 4: Action Thermodynamics, pgs. 65-98). Research Studies Press.
6. (a) Email commentary from Lambert to Libb Thims in connection to Wikipedia Talk Page discussions, c. 2006-2007.
(b) Entropy (energy dispersal) - Wikipedia.
7. Rose, M.T., Crossan, A.N. and Kennedy, I.R. (2008). " Sustaining Action and Optimising Entropy: Coupling Efficiency for Energy and the Sustainability of Global Ecosystems". *Bulletin of Science, Technology and Society*, 28, 260-272.
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θΔics

In thermodynamics, **shuffling cards model of entropy** is popular, albeit incorrect, teaching tool in which the shuffling of a new pack of cards is used to explain the nature of entropy, a logic that is supposedly based on the work of Austrian physicist Ludwig Boltzmann, in the sense that order tends to disorder.

New **deck of cards** verses shuffled deck of cards over time diagram as described Arthur Eddington in 1928 to describe entropy. [1]

Overview

In 1925, Gilbert Lewis, in his *The Anatomy of Science*, seems to have been the first to discuss entropy in terms of a deck of cards.

In 1928, Arthur Eddington, in his *The Nature of the Physical World*, specifically chapter four "The Running-Down of the Universe", subsection "Shuffling", endeavored to explain the nature of time, order, and the universe in terms of the entropy views of Boltzmann; a condensed version of this is as follows: [1]

> "If you take a **pack of cards** as it comes from the maker and **shuffle** it for a few minutes, all traces of the original systematic order disappears. The order will never come back however long you shuffle. There is only one law of nature—the second law of thermodynamics—which recognizes a distinction between the past and the future. Its subject is the random element in a crowd. A practical measure of the random element which can increase in the universe but never decrease is called ***entropy***."

Eddington goes on to explain how the second law is the study of organization and how out of this study a direction of time-flow emerges, distinguishing between doing and undoing, and concludes with a section on a thermodynamic explanation of time's arrow, with further discussion on the shuffling of a pack of cards.

In 1964, David Hawkins, in his *The Language of Nature*, as cited by Randall Schweller (2014), was using the shuffling card model of entropy ; in footnotes, e.g., we find: [3]

> "These statements, like those I made about the free energy of information in an ordered deck of cards, will trouble my critics. When two systems, A and B with independent histories are considered as a single system, AB, their entropies are additive …"

In 1999, American chemistry teacher Frank Lambert was a strong advocate against the use of playing cards to explain entropy. [2]

Difficulties on theory

The deck of card model has many issues with it. Firstly, there is no mention of a deck of cards in German physicist Rudolf Clausius' 1865 *The Mechanical Theory of Heat*. Secondly, a card does not serve as a good model of an atom or molecule, which have specific attachment and reactivity tendencies and preferences. This was expressed by Goethe, in an Oct 23, 1799 letter (see: Goethe timeline) to his intellectual friend Friedrich Schiller, in comment on the lack of realism in the literary work of French author Prosper Crebillon, explicitly stated the elective affinities problem as follows:

> "Crebillon … treats the passions like **playing cards**, that one can **shuffle**, play, reshuffle, and play again, without their changing at all. There is no trace of the delicate, chemical affinity, through which they attract

and repel each other, reunite, neutralize [each other], separate again and recover."

Entropy, in short, is one of the components of chemical affinity, via Gibbs energy, therefore it is something not described correctly in terms of card shuffling.

References

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2. Lambert, Frank. (1999). "Shuffled Cards, Messy Desks, and Disorderly Dorm Rooms: Examples of Entropy Increase? Nonsense (Abstract)", *J. Chem. Educ*.76: 1385-87.
3. (a) Hawkins, David. (1964). *The Language of Entropy: an Essay in the Philosophy of Science* (free energy, 19+ pgs; pgs. 206, 216-18). W.H. Freeman.
(b) Schweller, Randall L. (2014). *Maxwell's Demon and the Golden Apple: Global Discord in the New Millennium* (pg. 39). JHU Press.

Further reading

● Goldstein, Martin and Goldstein, Inge F. (1993). *The Refrigerator and the Universe: Understanding the Laws of Energy* (ch. 7: The Molecular View of Entropy, pgs. 150-92, subsections: Probability Applied to Coins, Dice, and Cards, pgs. 151-56; The Shuffling Paradox, pgs. 156-59; Shuffling Simpler Decks, pgs. 159-63; Moleclar Probability, pgs. 163-68, etc.). Harvard University Press.

External links

● Quantifying entropy (discussion on shuffling cards) – Physics Forums.
● Entropy and Poker (entropy and Boltzmann) – Dave's Physics Shack, My.Morningside.Edu.
● Poker, Shuffling, and Entropy – CrystalPoker.net.
● Entropy for Shuffling Cards (information theory, bits, and algorithms) – Forums.Sun.com.

θΔics

In music thermodynamics, ***Entropy*** is a late 1990s rap song by nerdcore hip hop artist MC Hawking, aka Ken Leavitt-Lawrence, an American web-developer, a parody of the 1991 song O.P.P. (En-tro-py) by Naughty by Nature, a song that made to to the US Top Ten.

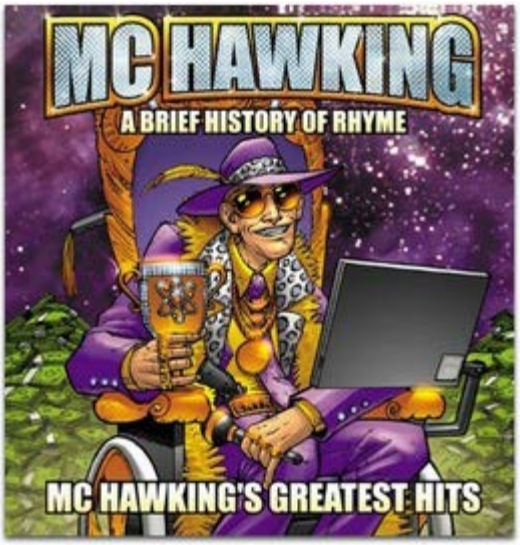

Video and album cover to MC Hawking's late 1990s "**Entropy**" a parody on Stephen Hawking's black hole entropy theories and the early 1990s song O.P.P. by Naughty by Nature.

The O.P.P version song's declaration [you] "Down Wit' OPP" was a popular catchphrase in the U.S. in the early 1990s and the play in Hawking's version is [you] "Down Wit' Entropy". The rap is synthesized by the now defunct commercial text-to-speech program WillowTalk. The song was released in the 2004 album *A Brief History of Rhyme: MC Hawking's Greatest Hits*. [1]

Lyrics

Trash Talk
Harm me with harmony.
Doomsday, drop a load on 'em.

Verse 1
Entropy, how can I explain it? I'll take it frame by frame it,
to have you all jumping, shouting saying it.
Let's just say that it's a measure of disorder,
in a system that is closed, like with a border.
It's sorta, like a, well a measurement of randomness,
proposed in 1850 by a German, but wait I digress.
"What the **** is entropy?", I here the people still exclaiming,
it seems I gotta start the explaining.

You ever drop an egg and on the floor
you see it break?
You go and get a mop so you can clean
up your mistake.
But did you ever stop to ponder why we

Verse 2
Defining entropy as disorder's not complete,
'cause disorder as a definition doesn't cover heat.
So my first definition I would now like to withdraw,
and offer one that fits thermodynamics second law.
First we need to understand that entropy is energy,
energy that can't be used to state it more specifically.
In a closed system entropy always goes up,

know it's true,
if you drop a broken egg you will not get an egg that's new.

That's entropy or E-N-T-R-O to the P to the Y,
the reason why the sun will one day all burn out and die.
Order from disorder is a scientific rarity,
allow me to explain it with a little bit more clarity.
Did I say rarity? I meant impossibility,
at least in a closed system there will always be more entropy.
That's entropy and I hope that you're all down with it,
if you are here's your membership.

Chorus
You down with entropy?
Yeah, you know me! (x3)
Who's down with entropy?
Every last homey!

that's the second law, now you know what's up.

You can't win, you can't break even, you can't leave the game,
'cause entropy will take it all 'though it seems a shame.
The second law, as we now know, is quite clear to state,
that entropy must increase and not dissipate.

Creationists always try to use the second law,
to disprove evolution, but their theory has a flaw.
The second law is quite precise about where it applies,
only in a closed system must the entropy count rise.
The earth's not a closed system' it's powered by the sun,
so **** the damn creationists, Doomsday get my gun!
That, in a nutshell, is what entropy's about,
you're now down with a discount.

Chorus
Trash Talk
Hit it!
Doomsday, kick it in!

References

1. *A Brief History of Rhyme: MC Hawking's Greatest Hits* (2004), Brash Music.
2. Lyrics - Entropy

External links

â— MC Hawking's Crib – MCHawking.com

θΔics

In thermodynamics, **you can't unscramble an egg** or a "broken egg can't unite back into a whole egg" are oft-used layperson's descriptions of the either entropy, the second law of thermodynamics, or the arrow of time.

Typical depiction of a **new egg** (low entropy state) and a **cracked egg** (high entropy state), intermixed with discussion on "spontaneity" and the "arrow of time", terms and concepts often used to describe what entropy or the second law means. [3]

An common logic to this teaching method is that it is said that a fresh new egg is in a "low entropy state" or ordered state and that a cracked or scrambled egg is in a "high entropy state" or disordered state. Then it is said that the second law mandates that systems tend to increase in their entropy, or systems tend towards maximal entropy, or something to this effect.

History

In 1954, English thermodynamicist Alfred Ubbelohde was discussing entropy and irreversibility as embodiment in the examples of Humpty Dumpty, broken eggs, spilt milk, and burnt boats. [5]

In 1955, American physicist Walter Albersheim, in his on "Entropy and Evil", was using what he called the old saying "one cannot unscramble an egg". [4]

In 1974, the "drop an egg on the floor", described as being synonymous with "dropping an ice cube into a glass of water" was being discussed. [2]

It is difficult to say, however, who originated either model (dropping or unscrambling), although some references seem to point to the circa 1950s lectures or statements of English physicist Charles Snow, who supposedly commented on unscrambled eggs and entropy, although a source is difficult to locate. It also may have connection to someone who famously used eggs to describe the arrow of time.

Entropy song

The popularity of the 'drop an egg description' of entropy is evidenced by the fact that it is found in the late 1990s parody song entropy by MC Hawking. The specific part of the lyrics explaining entropy is:

> You ever **drop an egg** and on the floor you see it break?
> You go and get a mop so you can clean up your mistake.
> But did you ever stop to ponder why we know it's true,
> if you drop a broken egg you will not get an egg that's new.
>
> That's entropy or E-N-T-R-O to the P to the Y,
> the reason why the sun will one day all burn out and die.

The egg model is some time described in term of it "being extremely improbable that all the yoke molecules will wind up finding themselves located in the original location of the yoke." [1] This statement embodies: the original Rudolf Clausius view that the entropy increase means that particles of the working body will never return to their original state or atomic position (c.1850) plus the Loschmidt's paradox (1876) + Poincare recurrence theorem (1890).

Difficulty on model

A basic difficulty of this model is that it is largely based on Boltzmann-type gas theory models, where as an egg is not something synthesized via gas particle interactions, but rather chemical reactions. In other words, statistical thermodynamics or statistical mechanics models are used, whereas chemical thermodynamics models are the correct way to explain egg formation. Secondly, the concept that a system has an increase in the value of its entropy, in the original Rudolf Clausius scheme, is a mathematical way of saying that either heat entered the boundary surface or that in one cycle more heat entered the boundary surface than left, in once complete cycle, meaning that some of the heat was converted into internal mechanical work (internal work), according to the principle of the transmission of work and the mechanical equivalent of heat, specifically the relocation of the positions of the particles of the system.

References

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θΔics

In hmolscience, **entropy antonyms** are terms conceived as being opposite to that of entropy, particularly in the Boltzmann-Planck sense of entropy as a measure of system disorder. Entropy antonyms come in a variety of terms, all conceived by different people (each with their own following), that all have the same general meaning, generally conceptualized as that of an ordering parameter; the majority of which being classified as a type of ontic opening:

	Term	Definition	Originator
	Sorting demon (1867)	A hypothetical intelligence able to sort random disordered gas molecules into two groups: fast and slow, and therein reverse the second law, and effect a decrease in entropy; not specifically an antonym, but in the same general category.	**James Maxwell** (1831-1879) Scottish mathematical physicist
1.	Ektropy (1900)	The energetics related to morphic order or generating order or form in ordinary space.	Georg Hirth (1841-1916) German writer
2.	Ectropy (1910)	A hypothetical organizing force of life.	Felix Auerbach (1856-1933) German physicist
3.	Syntropy | Syntropic (1941)	A "negative entropy" synonym; a force which causes living things to reach "higher and higher levels of organization, order and dynamic harmony."	Luigi Fantappie (1901-1956) → Albert Szent-Györgyi (1974)
4.	**Negative entropy** (1943)	States that life is anything that "feeds" on this; not specifically an "antonym" *per se*.	**Erwin Schrodinger** (1887-1961) Austrian physicist
5.	Disentropic (1947)	The “happenings which turn against the trend towards increasing entropy”.	Alfred Ubbelohde (1907-1988) Belgian thermodynamicist
6.	**Negentropy** (1950)	A contraction of Schrodinger's "negative entropy" principle of life argument.	Leon Brillouin (1889-1969) French-born American physicist
7.	Anti-entropy (1951)	An "effect of changes that are seized, draws a portion of matter in the direction of continually higher forms of structurization and centration."	Pierre Teilhard (1881-1955) French science religion philosopher
8.	Extropy (1967)	A counter-entropy quantity, involving truth and beauty and goodness, would be expected to lead inevitably to god.	Harry Overstreet (1875-1970) American philosopher → Tom Bell (1988)
9.	Ordiny (1975)	Defined as the opposite of entropy (disorder), i.e. "ordiny (order)", like negentropy.	**Norman Dolloff** (1907-1984) American metallurgical engineer
10.	Centropy (c.1975)	A type of centration opposite to entropy (disgregation); where things come together; a pooling of human energies.	Joseph Bois (1892-1978) French priest-psychologist → Irving Simon (1980)
11.	Exentropic (1978)	A term meant to capture the logic that since living systems are "open" they evade the second law.	Rupert Riedl | Austrian zoologist (1925-2005)
12.	Neguentropy (1979)	Tendency towards order.	Joel de Rosnay | French biochemist (1937-)
	Teleonomic	A teleological-conceptualized entropy; which the	

13.	entropy (1982)	conceive as "related to, but not identical to, physicochemical entropy."	Dimitri Katakis and Charis Katakis
14.	Psychic negentropy (1986)	A syncretism of psychic entropy (1928) + negentropy (1942), meaning “negative psychic entropy”, referring to mental states of positive emotions such as happiness, strength, or alertness.	Mihály Csíkszentmihályi | Hungarian-born American psychologist
15.	Orgatropy (1992)		Gilbert Chauvet | French mathematical physicist (1942-)
16.	Antientropism (2003)	The opposite of entropism is associated with the study of good	Keith Ferreira (c.1970-)
17.	Genopsych (2007)	A hypothetical extensive psychological-thermodynamic property, operating counter to entropy, reasoned to give directionality to the process of evolution.	DMR Sekhar | Indian chemical engineer (1952-)

Others include: Entropy reduction, Entropy reversal, Inverse entropy, Local entropy decrease, Entropy islands, and Low entropy. Each are a verbal way to argue out of the Planck-Boltzmann view of the second law as "systems tend towards disorder", such as is captured in the principle of elementary disorder, so as to explain topics such as evolution, the ordering effect of humanity, purpose, etc.

Confusion | Discussion

The general confusion, in respect to the proliferation of entropy antonyms coinings, as listed above, has to do with firstly a misreading of the specifics of the meaning of the second law, which is NOT that the disorder of the universe (or given system) will tend to a maximum, but correctly that the “equivalence value N of all uncompensated transformations”, aka entropy, in a given cycle integral number of heat cycles, of a given process, will tend to a maximum numerical value in magnitude |N]; which in the case of an “isolated system” (condition: quantities of extensity constant), the thermodynamic potential will be entropy (negative), according to which, at equilibrium, the following two conditions will accrue: dS = 0 and S = maximum; but for human social systems, where temperature and pressure are constant, the thermodynamic potential is Gibbs energy (negative), and at equilibrium, the following two conditions will accrue: dG = 0 and G = min, according to which measurements of order and disorder of structures are quantified on free energy tables, i.e. a given human or social system or order in a given state of existence will have a given free energy of formation, and moreover that transformations into the future, state to state, do not accrue towards greater states of disorder, but rather that the sum state-to-state transformations accrue in the direction that will show a decrease in the thermodynamic potential, i.e. the accrue in the direction of the condition: dG < 0, i.e. actuate along reaction coordinate of a free energy decrease, and will involved coupling.

This is similar to the laws behind a rock falling off a cliff. The rock will go in the direction that shows a decrease in the gravitational potential, i.e. toward the earth; and the process will not accrue towards a greater increase in disorder, but rather accrue in the direction of the given potential. The above dozen+ entropy antonyms proliferations, in short, are the result of a general ignorance among scientists about chemical thermodynamics, the nature of the free energy of formation of structures, in particular.

Aluminum chloride | Aluminum oxide

See also: Human free energy table; Human free energy of formation

To go through one example, supposed we put aluminum Al in contact with firstly chlorine Cl in one reaction system, and then in a separate chlorine in contact with oxygen O, and then see whether the rule "nature tends towards" disorder will prevail as the governing paradigm:

Species	Image	Phase	Formula	Entropy $S_f°$ J/(mol K)	Formation Free Energy $\Delta G_f°$ (kJ/mol)
Aluminum chloride		Solid	$AlCl_3$	109.29	-628.9
Aluminum oxide	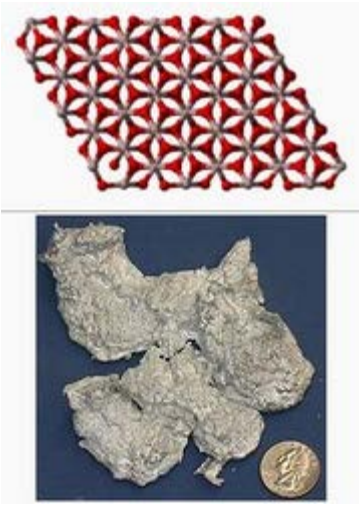	Solid	Al_2O_3	50.92	-1582.3

Here, just by looking at the resulting products, aluminum chloride $AlCl_3$ (top) and aluminum oxide Al_2O_3 (bottom) it is not simple a matter to point one's finger and say "ha, disorder has prevailed!", because the top pile of granules seems to be more "ordered" than the bottom chunky looking metal, and it has a higher entropy (109.29) value. Correctly, we look at the formation free energy, which in this example is greater in (negative) magnitude for the formation of aluminum oxide (1582.3) than for the aluminum chloride (628.9), therefore nature will favor the formation of the aluminum oxide over that of aluminum chloride, given the two alternative reaction directions, and this is the way it is throughout the natural world seen around us, i.e. this is how "nature selects" between different "species" as Darwin would say, NOT "survival of the fittest" but "selection of the most exergonic".

Quotes

The following are related quotes:

> “It has sometimes been maintained that the second law of thermodynamics does not hold in living nature. Remember the sorting demon, invented by Maxwell, and Auerbach’s doctrine of ectropy, stating that life is an organization created to avert the menacing entropy-death of the universe. Ectropy does not exist. However, thermodynamics was concerned only with closed systems, and its extension to open systems leads to very unexpected results.”
>
> — Ludwig Bertalanffy (1950), “The Theory of Open Systems in Physics and Biology” [1]

> “Many biologists have taken to speaking in terms of the **entropy** of an organism, or about its **antonym** ‘negentropy’, as a measure of the structural order within an organism.”
>
> — Robert Ulanowicz (1986), *Growth and Development* [2]

See also

â— Entropy (portmanteaus)

References

1. Bertalanffy, Ludwig. (1950). “The Theory of Open Systems in Physics and Biology” (pdf) (pg. 25-26), *Science*, 111:23-29.
2. Ulanowicz, Robert E. (1986). *Growth and Development: Ecosystems Phenomenology* (pg. 21). Springer, 2012.

θΔics

In hmolscience, **entropy applies to everything** (or second law applies to everything), as compared to the "entropy only applies" (or second law only applies), a secondary principle to the "everything is energy" motto, is the view that entropy applies to every "thing", process, system, or body in the universe.

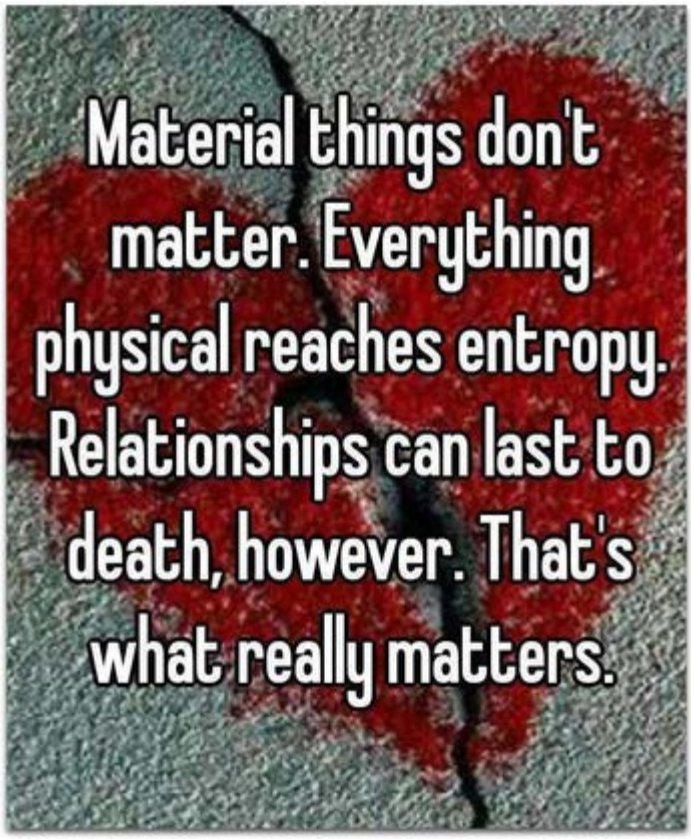

An **entropy applies to everything** like image (Q), stating that "everything physical reaches entropy"; alluding to the idea that relationships are beyond material or physical things, and exempt for the second law, or something to this effect.

Overview

In 1914, James Johnstone stated that "energy applies to everything" as follows: [1]

> "The law of conservation applies to some things and not to others, and the things which it does not apply are unreal."

In 1936, Boris Pavolvich stated, indirectly, that entropy applies to everything" as follows: [2]

> "Every question or effect has the right to exist if it does not contradict the second law of thermodynamics."

In other words, in this period, according to the Johnstone-Pavlovich rule, the only "things" which exist or are real, according to modern views, are those in which energy and entropy apply.

In 1996, compatibilist theologian Alan Padgett, in his "The Mutuality of Theology and Science: An Example from Time and Thermodynamics", stated things thusly: [3]

> "The end and beginning of time. I begin with the assumption that the universe, or better the 'material universe', since I do hold to non-material objects, is an isolated system. Physical energy and matter are not being exchanged between our material universe and some other dimension or universe. The material universe, then, contains all the known matter and energy. In such a system, entropy will always increase. This means that the material universe, left to its own devices, will come to an end. The material universe will some day reach thermal equilibrium: all free energy will be used-up, and no more 'work' will take place. Whether we predict another singularity at the end of 'measured time' (a 'big crunch') or continual expanse of lifeless particles into empty space (a 'heat death') is not of any significance. The basic point remains the same, from a thermodynamic perspective: entropy must increase (even if it never reaches an absolute maximum in an ever-expanding universe). The universe will come to an end.
>
> Some scientists are uneasy with this conclusion. There are three objections to applying thermodynamics to the material universe of which I am aware. First, some have suggested that thermodynamics is questionable when applied to such large entities as an entire universe. After all, this science was developed on small steam engines, not huge galactic clusters. In response I would argue that all physical cosmological laws were developed on earth, in the study of small, simple systems. It is an axiom of astronomy and cosmology that the laws of physics apply throughout all time and space in the material universe. To try and exempt thermodynamics from such universality is simply an attempt to wiggle out of the problem. According to all we know of physics and astronomy, every single astronomical object will eventually decay, and the resultant matter and energy left over will not have the same capacity for work (free energy) as the original

system. **Entropy applies to everything** in the material universe.

Secondly, William Drees has argued against the universal increase of entropy in the material universe by suggesting that it is not a 'closed' (he no doubt means 'isolated') system, in the sense necessary to apply the second law. The expansion of the material universe, he suggest, works as if there were an 'environment' into which entropy was carried away, even though there is no environment for the universe. Here I find Drees' argument rather unclear. Even the radiation given off by the universe, at the edge of its expansion, is also part of the Material Universe. The expansion itself is a form of thermodynamic exchange, increasing always the entropy of the whole (radiation, energy, and matter) and decreasing the free energy in the material universe. Empty space is not an 'environment' in the thermodynamic sense, i.e., something from which energy can be brought into the system, to decrease the (local) entropy of that system. There is, I believe, no philosophical or scientific grounds for doubting the fact that the material universe, after billions of years, will come to an end (I count a ceaseless drifting apart of lifeless particles as an 'end').
Thirdly, Drees also states that the second law is a purely statistical law. As such, perhaps this universe of low entropy is a (low probability) fluctuation in an otherwise eternal universe in thermal equilibrium. Such a 'fluctuation' would be very, very unlikely, but if the second law is merely statistical, still possible. This would allow for the material universe to be eternal, while not running counter to the second law. Ludwig Boltzmann suggested such a model in the 19th Century, and Hawking's cosmology, perhaps, is of a similar kind. The problem here lies in interpreting the second law in a purely statistical manner. There are real forces at work in the world, which are the ground of the statistics in the second law. In a merely statistical interpretation, there is no answer given as to why some states are more probable (act as 'attractors') than others: the fact that some are is merely asserted, rather than explained. As Prigogine explained:

> 'Dissipation produces entropy. But what then is the meaning of entropy? Over a century ago, Boltzmann came up with a most original idea: entropy is related to probability. . . . It is because the probability increases that entropy increases. Let me immediately emphasize that in this perspective the second law would have great practical importance but would be of no fundamental significance. . . . By improving our abilities to measure less and less unlikely events, we could reach a situation in which the second law would play as small a role as we want. This is the point of view that is often taken today, but it is difficult to maintain in the presence of the important constructive role of dissipative systems.'

In other words, while the merely statistical interpretation of entropy is useful and important, it is not metaphysically significant or fundamental. Dissipation, not statistics, produces entropy. "Unlikely" states of affairs, such as "fluctuations" of the age and extent of our Material Universe in an otherwise eternal thermal equilibrium, are not merely unlikely but practically impossible from a thermodynamic perspective."

(add discussion)

Quotes

The following are related quotes:

> "All systems, even closed ones, are subject to the second law of thermodynamics. **Entropy applies to everything** in nature."
>
> — John MacArthur (2005), *The Battle for the Beginning* (pg. 152)

> "The principle of **entropy applies to everything** in the universe. Science fiction movies are no different. There is a big trickle-down from the heights of Avatar. And most of that trickle happens in Vancouver."

— Stephen Tobolowsky (2013), *The Dangerous Animals Club* (pg. 110)

See also

- Not applicable view
- Moriarty-Thims debate

References

1. Johnstone, James. (1914). *The Philosophy of Biology* (pg. #). Cambridge: University Press.
2. (a) Sunyaev, R.A. (2004). *Zeldovich: Reminiscences* (pg. 16). CRC Press.
(b) Boris Pavlovich Belousov – Wikipedia.
3. (a) Padgett, Alan G. (1996). "The Mutuality of Theology and Science: An Example from Time and Thermodynamics" (pdf), *Christian Scholars' Review* (Q), 26:12-35, Fall; in: *Science and the Study of God* (pg. 113). Wm. B. Eerdmans Publishing Co.
(b) Alan G. Padgett (faculty) – Luther Seminary.

θΔics

In thermodynamics, **entropy as disorder confusions** refers to []

Quotes

The following are related quotes:

> "Even in the domain of situations which would be unanimously described as primarily 'thermodynamic', it would appear that there is a rather large verbal element in the coupling of 'disorder' with entropy, and that this coupling **is NOT always felicitous**. Consider, e.g., a quantity of sub-cooled liquid, which presently solidifies irreversibly, which increase of entropy and temperature, into a crystal with perhaps a regular external crystal form and certainly a regular internal arrangement as disclosed by X-rays. Statistically, of course, the extra 'disorder' associated with higher temperature of the crystal more than compensates for the effect of the regularity of the crystal lattice. But I think, nevertheless, we do not feel altogether comfortable at being forced to say that the crystal is the seat of greater disorder that the parent liquid."
>
> — Percy Bridgman (1941), *The Nature of Thermodynamics* (pg. 174); cited by Roderick Seidenberg (1950) in *Post-Historic Man* (pg. 158)

See also

â— Entropy (misunderstandings)
â— Order, Disorder, and Entropy
â— Norman Dolloff

References

1.

θΔics

In human thermodynamics and thermodynamics humor, an entropy **clock** is a hypthetical device that measures the one-way flow of time. [1] In 1925 English astronomer Arthur Eddington suggested that there might be an *entropy-clock* in brain that coordinates or mediates the conscious feeling of time's arrow via an entropy-gradient. [2]

Design of

A typical entropy clock, according to Eddington, could be designed by an electric circuit composed of two different metals with their two junctions embedded respectively in a hot and cold body in contact. The circuit would contain a galvanometer which constitutes the dial of the entropy clock. The thermoelectric current in the circuit is proportional to the difference of temperature of the two bodies. As such, according Eddington, the shuffling of energy between the two bodies would proceed, the temperature difference would then decrease, and the galvanometer reading would continually decrease. This clock, as Eddington argues, would infallibly tell an observer from another world which of two events is the later. [2]

References

1. Staff Writer. (1925). *Proceedings of the American Catholic Philosophical Association*, (pg. 105). National Office of the American Catholic Philosophical Association.
2. (a) Eddington, Arthur. (1928). *The Nature of the Physical World*, (section: "entropy-clock", pg. 101). Michigan: The University of Michigan Press.
(b) Bradley, John. (1971). *Mach's Philosophy of Science*, (pg. 87). Athlone Press.

θΔics

In human thermodynamics, **entropy consumption** refers to the transition from disorder-to-order, loosely a decrease in entropy, typically associated with the ordering tendency in the reproduction or formation of life. [1] In another sense, life is said to correspond with entropy consumption. [2]

Overview

In 1959, American physicist Robert Lindsay, in his "Entropy Consumption and Values in Physical Science", building on Erwin Schrödinger's 1944 argument that life "feeds on negative entropy" assertion, introduced the model of entropy consumption. [3] Linday states: [4]

> "The principle natural **entropy consumption** in human experience is exhibited by the living organism, which in a fashion only imperfectly understood as yet transforms disorder into order by building out of a few chemical elements compounds of great complexity but well-defined order; these form the constituents of the living cell, out of which in turn the various parts of the organism are created … in other words, life is a natural *consumer of entropy* on a local scale."

Moreover, according to Lindsay: [4]

> "Local consumption of entropy is not to be considered as a violation of the second law, for it seems altogether likely that entropy consumption of living beings is compensated for by the corresponding **entropy production** elsewhere in the universe."

On this premise, Lindsay argues that, in a general sense, people act or have an obligation to act deliberately as an "entropy consumer". In more detail: [4]

> "Man's whole struggle to introduce order into a chaotic environment may be seen as a kind of intuitive recognition of this obligation: he builds dwellings rather than live in the open; he develops means of transportation; he cultivates the soil rather than rely on what nature provides without his efforts; he develops language to put regularity into communication with his fellow man … practically every element in man's developed civilization may be interpreted either as an instinctive or conscious and deliberate attempt to replace disorder with order, in other words to **consume entropy**."

Conversely, in Lindsay's view, giving examples of arsonists and murderers as entropy producers, he states "destructive tendencies are exhibited by many human beings, and to this extent they are entropy producers rather than consumers." To cite another example, in Lindsay's disccussion of entropy consumption in his theory of the "thermodynamic imperative" or basis for an ethical code of human conduct: [4]

> "All men should fight always as vigorously as possible to increase the degree of order in their environment, i.e. **consume as much entropy** as possible, in order to combat the natural tendency for entropy to increase and for order in the universe to be transformed into disorder, in accordance with the second law of thermodynamics."

(add discussion)

Difficulties

The term "entropy consumption", however, is not a rigorous one, in a thermodynamic sense, i.e. as defined by German physicist Rudolf Clausius in 1865. In particular, Lindsay built his outline on a mixture of information theory ideas

blended with the negative entropy views of Austrian physicist Erwin Schrödinger's , which have been highly critized from the moment of inception. In this view, Lindsay's entropy consumption theory seems rather to be an entropology-like argument for a thermodynamic explanation of evolution.

References

1. (a) Name. (1961). *The American Journal of Psychiatry*, vol. 117, Jul-Dec, (pgs. 9-10). American Psychiatric Association, HighWire Press.
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2. Niele, Frank. (2005). *Energy: the Engine of Evolution*, (pg. 153). Elsevier.
3. Lindsay, Robert B. (1959). "Entropy Consumption and Values in Physical Science", *American Scientist*, Vol. 47, No. 3. Sept., pgs 376-85.
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θΔics

In thermodynamics, **entropy decrease**, as contrasted with entropy increase, refers generally to a process in which entropy was removed from a body.

Overview

The term “entropy decrease”, according to the Helmholtz-Planck-Nernst-Boltzmann model of entropy, tends to equate, in the mind of many, the premise that the “order” of the body has increased. To exemplify, German physicist Hermann Helmholtz, in his 1882 “On the Thermodynamics of Chemical Processes”, defined the magnitude of entropy |S| as the measure of atomic-molecular disorganization. [1] In this sense, many extrapolate the generalized notion that entropy decrease correlates to a decrease in atomic-molecular disorganization in the given body or system.

There is, however, much fine print to this assertion. When isothermal-isobaric state reaction-formed chemical species, are quantified in a given state of existence, on a thermodynamic database table (free energy table), the free energy become the measure of importance, entropy reconciled to a second place position. A so-called entropy-enthalpy compensation becomes a factor, which is step above the older gas theory based models of the magnitude of entropy = magnitude of disorder of system.

Local entropy decrease

During the course of the century plus long schism between evolution theory and the second law mandate of entropy always tending to a maximum, someone (add) proposed the notion that ordered structures form, within the confines of the overarching governance of the second law, as types of “local entropy decrease” structures, at the expense of the increase in the entropy in the surroundings. This catch phrase has been repeated *ad nauseam* ever since as the so-called solution to the second law (disordering) evolution (ordering) paradox.

References

1. (a) Helmholtz, Hermann. (1882). “On the Thermodynamics of Chemical Processes”, in: *Physical Memoirs Selected and Translated from Foreign Sources*, 1: 43-97. Physical Society of London, Taylor and Francis, 1888.
(b) Koenigsberger, Leo. (1902). *Hermann von Helmholtz* ("The Thermodynamics of Chemical Processes", pgs. 335-39; 1883: Note on an Introduction to Thermodynamics, pgs 340-43) trans. Frances A. Welby, preface by Lord Kelvin. Oxford at the Clarendon Press.

External links

â— Entropy decrease – PhysicsForums.com.

θΔics

In hmolscience, **entropy ethics** is any of a number of views on how to live ethically based on entropy or the second law of thermodynamics.

Overview

In 1909, German physical chemist and radical atheist Wilhelm Ostwald, in his "Monistic Sunday Sermons", and related writings, was outlining an energetic imperative, with possible hues of entropy argument.

In 1971, George Miller, in his *Energetics, Kinetics, and Life*, devoted a section to entropy and ethics, on what seems to be American physicist Robert Lindsay's logic of the thermodynamic imperative. [1]

In 1977, American chemist Henry Bent discussed a second law based type of ethics, reasoning that instead of national energy policy advice urging people to conserve energy (whereas in Bent's view energy is always conserved, according to the first law), what people do need is a "personal entropy ethic". [2] In addition, over the course of the year, Bent went around American conducting entropy ethics workshops, discussing with students the commandment "thou shalt not unnecessarily create entropy", among other topics. [3]

In 1985, American educator Dick Hammond published *The Human System: from Entropy to Ethics*, a book on the teaching of ethics in public schools based on the second law. In the 2005 fourth printing, Hammond states that the book arose from a wish by his mentor Belgian chemist Ilya Prigogine who wanted entropy ethics to be taught to children all over the planet. [4] In short, Hammond argues that in the past religion functioned as an unquestionable guide for how to live ethically. In Christianity, for instance, the simplified rule was: act good and go to heaven, act bad and go to hell. In short, religions, according Hammond, "tell people how they ought to feel about each other, and offer some right and wrong behaviors in the realm of interpersonal relationships." Yet, after religion was expelled from public school teaching, a trend that began in the early 19th century, tracing generally to the 1802 views on the separation of church and state by Thomas Jefferson, the third president of the United States, a void on the teaching of ethics was created. On this matter, Hammond states:

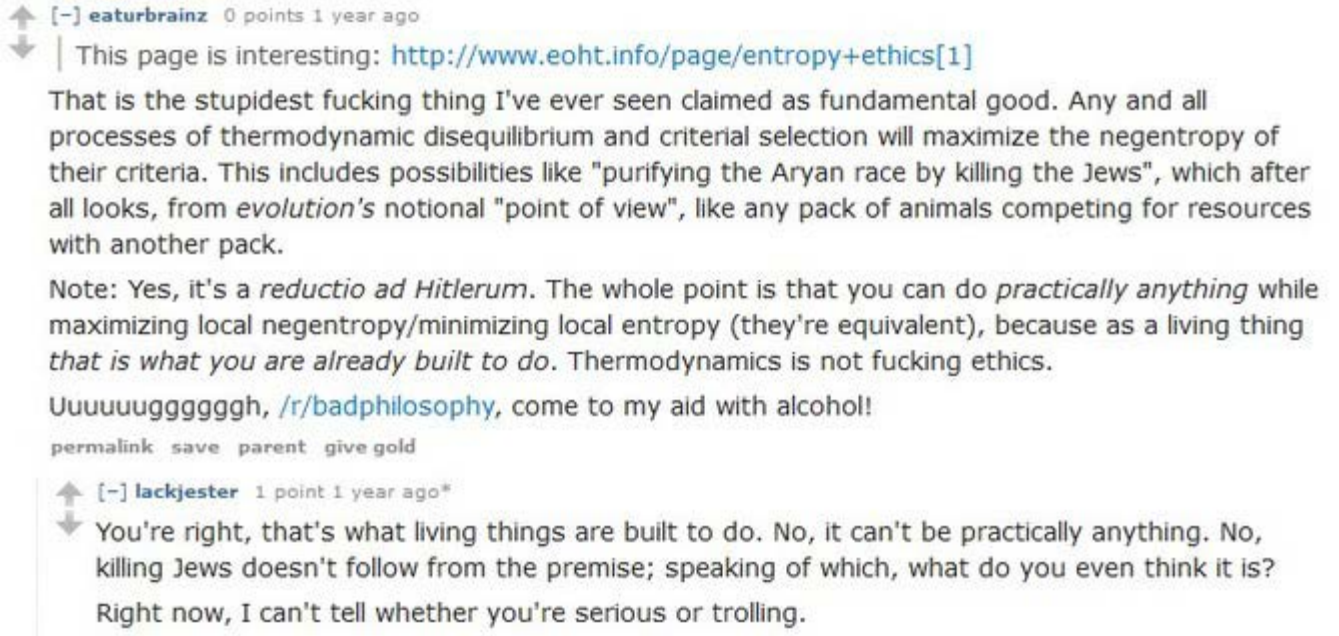
[–] eaturbrainz 0 points 1 year ago

This page is interesting: http://www.eoht.info/page/entropy+ethics[1]

That is the stupidest fucking thing I've ever seen claimed as fundamental good. Any and all processes of thermodynamic disequilibrium and criterial selection will maximize the negentropy of their criteria. This includes possibilities like "purifying the Aryan race by killing the Jews", which after all looks, from *evolution's* notional "point of view", like any pack of animals competing for resources with another pack.

Note: Yes, it's a *reductio ad Hitlerum*. The whole point is that you can do *practically anything* while maximizing local negentropy/minimizing local entropy (they're equivalent), because as a living thing *that is what you are already built to do*. Thermodynamics is not fucking ethics.

Uuuuuuggggggh, /r/badphilosophy, come to my aid with alcohol!

permalink save parent give gold

[–] lackjester 1 point 1 year ago*

You're right, that's what living things are built to do. No, it can't be practically anything. No, killing Jews doesn't follow from the premise; speaking of which, what do you even think it is?

Right now, I can't tell whether you're serious or trolling.

A 2015 Reddit philosophy thread (Q), citing this article, on a discussion of Jim Holt's *Why Does the World Exist?* (Q), citing and debating "**entropy ethics**" (this *Hmolpedia* article) and employing the "entropy only applies" argument, alongside one of Piero Scaruffi's (Q) webpages (Q) on biology, i.e. a "self-organizing life as negative entropy" double ontic opening argument; wherein one poster sees entropy ethics as "reduction ad Hitlerum" (see also: atheism atrocities fallacy).

> "[After] religions [were expelled] form public schools, out went instructions in ethics too, creating a void that we now have: what the **entropy ethic** can do for education is help fill that void."

Whereas, in the past, according to Hammond, teenage students would "blindly follow the supernatural dogmatic system of belief", the issue now is to find a modern foundational basis of ethics. Hammond belives that such a foundation can

be found in the nonequilibrium thermodynamics works of Prigogine.

In 2007, Angelo Letizia argued that ethics are used by humanity as a “bulwark against entropy.” [5]

References

1. Miller, George T. (1971). *Energetics, Kinetics, and Life: an Ecological Approach* (section 12-4: Entropy and Ethics: The Thermodynamic Imperative, pg. 328). Wadsworth Pub. Co.
2. Bent, Henry A. (1977). “Entropy and the Energy Crisis”, *The Science Teacher*, May, pgs 25-30.
3. NSF Chautaugua-Type Short Courses for College Teachers (Washington, D.C.: Office of Science Education, American Association for the Advancement of Science, Fall, 1977.
4. Hammond, Dick K. (2005). *The Human System from Entropy to Ethics*. (pg. vii). Publisher: Dick Hammond.
5. Letizia, Angelo. (2007). *The Battle for Existence* (pg. 68). LuLu.com.

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Further reading

● Massoudi, Mehrdad. (2016). “A Possible Ethical Imperative Based on the Entropy Law” (Q), *Entropy*, Nov 3.

θΔics

In thermodynamics, **entropy flow**, symbol d_eS, is flow of entropy across the boundary of a system due the exchanges of matter and or energy with the exterior. [1] The term, as developed by Belgian chemist Ilya Prigogine in 1947, is commonly used in open chemical systems that exchange matter and energy with the exterior of the system, such that "energy flows" and "entropy flows" can be identified with the exchanges of matter and energy with the surroudings, external to the boundary. [2]

Etymology

The concept and phraseology of an “entropy flow”, in large part, is peculiar to the work of Belgian chemist Ilya Prigogine who divides entropy into two parts:

dS	=	d_eS	+	d_iS
"entropy"		"entropy flow"		"entropy production"

where, in other contexts, he also refers to d_iS as internal entropy. Historically, although Prigogine seems to be the dominate promoter of the phrase entropy flow, he attributes the origination of the notions of entropy flow and entropy production to the Viennese school led by G. Jaumann and Polish researcher L. Natanson. [2] In other situations, to note, Prigogine implicitly refers to entropy flow as the derivative of d_eS with respect to time:

$$\frac{d_eS}{dt}$$

Prigogine also uses the logic of entropy flow in his explanation of evolution. [3]

References

1. Prigogine, Ilya. (1955). *Introduction to Thermodynamics of Irreversible Processes* (pgs. 16). Charles C. Thomas.
2. Kondepudi, Dilip and Prigogine, Ilya. (1998). *Modern Thermodynamics – from Heat Engines to Dissipative Structures* (pg. 87, 387-89). New York: John Wiley & Sons.
3. Prigogine, Ilya, Nicolis, Gregoire, and Babloyants, Agnes. (1972). "Thermodynamics of Evolution," (part I & II). *Physics Today*, Vol. 25, November, pgs. 23-28.

θΔics

In thermodynamics, **entropy formulations** refers to various mathematical formulas employed to quantify heat, heat multiplied by a thermodynamic function (e.g. the inverse of the absolute temperature), or entropy.

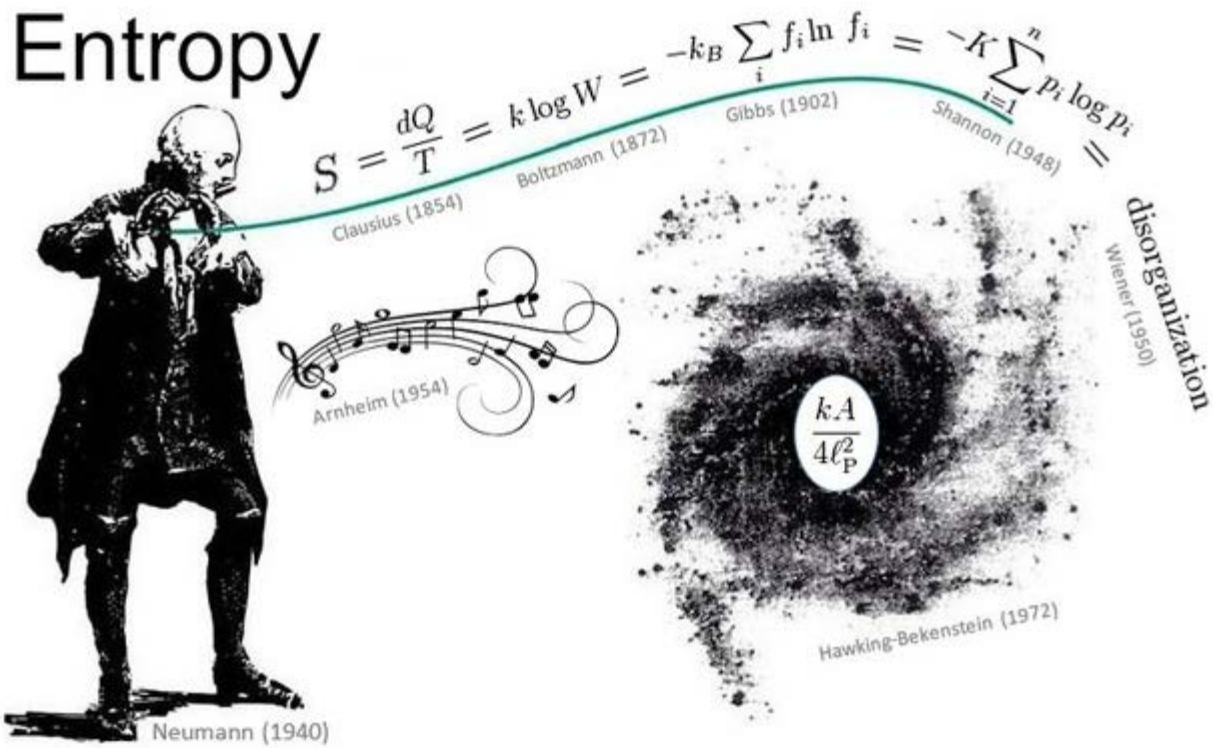

An extra-labeled "entropy pied piper", original from cover of Harold Morowitz' 1992 book *Entropy and the Magic Flute*, showing various **entropy formulations**.

Overview

Historically, a number of equations have been used to quantify the 1850 statement, by German physicist Rudolf Clausius, that "an expression was needed" to account for the experimental fact that "loss of heat occurs when work is done", in the working body, during one heat engine cycle, in that the forward expansion and reverse contraction of the body is not reversible; an action that French physicist Sadi Carnot, in 1824, had assumed did not occur, being that he assumed heat consisted of indestructible caloric particles. [1] A chronological tabulation of some of these various entropy formulations are listed below.

The fact that there are so many formulations of entropy, which are often said to be equivalent, is exemplified by the cover of American biophysicist Harold Morowitz' 1992 book *Entropy and the Magic Flute*, cropped cover section shown adjacent, which shows a pied piper playing a magic flute to the "tune of entropy", with the notes or chords of:

$$S = k \ln W = \frac{dQ}{T} = -k \sum f_i \ln f_i$$

signifying Boltzmann entropy (1906), Clausius entropy (1854), and Gibbs entropy (1901), a tune that supposedly is leading all the scientists down a swirling black hole.

#	Name	Date	Formula	Description
	Fire	350BC	Δ	Aristotle: there are four elements out of which all is made: earth, air, water, fire. Each of the four earthly elements has its natural place; the earth at the center of the universe, then water, then air, then fire. When they are out of their natural place they have

		natural motion, requiring no external cause, which is towards that place; so bodies sink in water, air bubbles rise up, rain falls, flame rises in air. [15]
Sulphur	c.790	Geber: to further explain the phenomena of combustion and metallic properties, metals (copper, iron, gold, etc.) were said to be formed out of two elements: *sulphur*, 'the stone which burns', which characterized the principle of combustibility, and *mercury*, which contained the idealized principle of metallic properties. This evolved into the Arabic three principles: *sulphur* giving flammability or combustion, *mercury* giving volatility and its opposite, and *salt* giving solidity.
Sulphur	1524	Paracelsus: in an attempt at a unification of Aristotle's four element theory and Geber's three principles, reasoning that the latter appeared in the former's bodies, justifying this by recourse to a description of how wood burns in fire: Mercury included the cohesive principle, so that when it left in smoke the wood fell apart. Smoke represented the volatility (the mercury principle), the heat-giving flames represented flammability (sulphur), and the remnant ash represented solidity (salt).
		Johann Becher: in modification on Paracelsus' theory, it was argued that the constituents of bodies are air, water, and three types of earth: *terra fluida*, the mercurial element, which contributes fluidity and volatility; *terra lapida*, the solidifying element, which produces fusibility or the binding quality; and *terra*

Terra pinguis	1669		*pinguis*, the fatty element, which gives material substance its oily and combustible qualities. These three earths correspond with Geber's three principles. A piece of wood, for instance, is composed of ash and terra pinguis; when the wood is burnt, the terra pinguis is released, leaving the ash. In other words, in combustion the fatty earth burns away. Georg Stahl: on a modification of Becher's three earths theory, terra pinguis was renamedas *phlogiston*, from the Ancient Greek *phlogios* for 'fiery', which was said to be the "matter and principle of fire, and not fire itself" that escapes from burning bodies with a rapid whirling motion, and is contained in all combustible bodies and also in metals, which can be burnt to "calces".
Phlogiston	1703	Ï•	In phlogiston theory, calx is a residual substance, sometimes in the form of a fine powder, that is left when a metal or mineral combusts or is calcinated due to heat. Calx, especially of a metal, is now properly defined as an 'oxide', i.e. a chemical compound containing an oxygen atom and other elements. In the phlogiston theory, the calx was the true elemental substance, having lost its phlogiston in the process of combustion. The phlogiston was said to have the property that it could be restored to the original substance by supplying a replacement phlogiston from any material containing it, such as oil, wax, charcoal, or soot, which was thought to be nearly pure phlogiston. Phlogiston was thought of as a material entity, sometimes

		considered as the matter of fire, sometimes as a dry earthy substance (soot), sometimes as a fatty principle, such as in sulphur, oils, fats, and resins, and sometimes as invisible particles emitted by a burning candle; contained in animal, vegetable, and mineral bodies. It could be *transferred from one body to another*. Antoine Lavoisier: a difficulty in Stahl's theory was that calx becomes lighter when reduced to a metal by taking up phlogiston. If the phlogiston had mass, then when added to something, it should make it heavier. To remedy this issue, an experiment (Lavoisier 1786) proved that the matter of heat is weightless. Specifically, phosphorus burnt in air in a closed flask, with no appreciable change in weight.
Caloric	1787	A new particle was proposed, called "caloric", replacing phlogiston, defined as 'the repulsive cause, whatever that may be, which separated the particles of matter from each other.' In this sense, heat was said to be an elastic, fluid-like, substance (called caloric), whereby the sensation of warmth was the accumulation of this substance in the interstices of the particles of matter and that, to explain Boerhaave's law (1720), the more caloric particles a body had in its pores the more it would expand in volume; and conversely when caloric particles were taken out of a body, the body would contract. Benjamin Thomson: heat produced, via friction, in the boring of a cannon, which was used to make water boil in 2.5

				hours time, gave “farther insight into the *hidden nature of heat*; and to enable us to form some reasonable conjectures respecting the existence, or non- existence, of an igneous fluid.”
	Motion	1798		“What is heat? Is there anything as igneous fluid? Is there anything that can with propriety be called caloric? That heat generated by friction [in the boring experiments] appeared, evidently, to be *inexhaustible*, [it] cannot possibly be *a material substance*; … it appears to me to me to be extremely difficult, if not quite impossible, to form any distinct idea of anything capable of being excited and communicated in the manner heat was excited and communicated in these experiments, except it be MOTION.” [17]
	Caloric	1824		Carnot: “we shall assume that the quantities of caloric absorbed and emitted in these different transformations compensate each other exactly.” [2]
	Mechanical equivalent of heat	1843		Joule: showed that heat Q and work W were inter-convertible according to a formulaic expression: “the grand agents of nature are … *indestructible*; and that wherever mechanical force is expended, an exact equivalent of heat is *always* obtained.” [18]
	?	1850		Clausius: stated an "expression needed" to amend Carnot's view (above) that "no permanent change occurs in the condition of the working body." [1]
1.	Equivalence-value	1854	$\frac{Q}{T}$	Clausius:
2.	Thermodynamic function	1854	Φ	Rankine:

3.	Equivalence-value of all uncompensated transformations	1856	$-N$	Clausius:
4.	Disgregation	1862		Clausius:
5.	Entropy	1865	$dS = \frac{dQ}{T}$	Clausius: the symbol *S* is the "transformation-content" of the working body, but termed "entropy", so to have similarity to the word energy.
6.			$S = S_{trans} + S_{rot} + S_{vib} + S_{elec}$	Clausius (?): entropy of an ideal gas. [8]
7.		1872	E	Boltzmann: [7]
8.	Entropy	1873	$d\eta = \frac{dH}{t}$	Gibbs: the quantity η is the entropy, $d\eta$ is the differential of entropy, *H* is the heat received by the body in passing from one state to another, and *t* the absolute temperature of a body in a given state. [5]
9.		1875	$dS = \frac{\delta Q}{T}$	Carl Gottfried Neumann: [10]
10.				
11.	Boltzmann entropy		$S_B = -Nk_B \sum_i p_i \log p_i$	[9]
12.	Gibbs entropy	1901	$S = -k_B \sum_i f_i \ln f_i$	Gibbs: [14]
13.		c.1906	$S = k \ln W$	The expression S = k ln W is said to have been introduced by Planck.
14.				
15.				
16.		c.1935	$S = k \log W$	Chiseled onto Boltzmann's tombstone in *circa* 1935 (as pictured adjacent).
17.	Prigogine entropy	1945	$dS = d_eS + d_iS$	Prigogine: (a) The entropy of a system is an extensive property: if the system consists of several parts, the total entropy is equal to the sum of the entropies of each part. (b) The change in entropy can

				be split into two parts: denoting *deS* as the flow of entropy, due to interactions with the exterior, and *diS* the contributions due to changes inside the system. [3]
18	Shannon entropy	1948	$H = -K \sum_{i=1}^{n} p_i \log p_i$	Shannon: "we shall call $H = -\Sigma p_i \log p_i$ the entropy of a set of probabilities $p_1, ..., p_n$." [4]
19.	Von Neumann entropy	1955	$S(\rho) = -\mathrm{Tr}(\rho \ln \rho),$	John Neumann: [11]
20.				
21.	Black hole entropy	1972	$S_{BH} = \frac{kA}{4\ell_{\mathrm{P}}^2}$	Jacob Bekenstein and Stephen Hawking: [13]
22.				
23.	Tsallis entropy	1988	$S_q(p) = \frac{1}{q-1}\left(1 - \int p^q(x)\,dx\right)$	Constantino Tsallis: [12]
24.				
25.				
26.				
27.				
28.	Human entropy	2007	$S = S_P + S_O + S_I + S_S + S_N$	Thims: entropy of a system of ideal human molecules. [6]
29.				

(add discussion)

See also

â— Entropy (etymology)

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θΔics

In cosmological thermodynamics, **entropy gap** is gap between actual entropy and the maximum possible entropy, or universal thermodynamic equilibrium, created by the gravitational contraction of gas clouds into stars, in the process of universal expansion from the point of the big bang. [1]

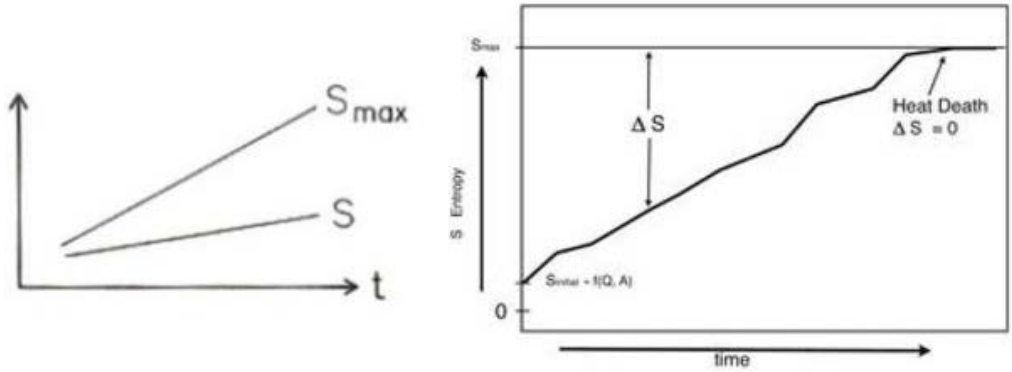

Left: a 1988 (possibly 1982) David Layzer-based **entropy gap** diagram, by American theoretical physicist Steven Frautschi, described as a: "schematic dependence of entropy S and maximum (equilibrium) energy Smax in the expanding universe"; such that the "gap" between the two line, $S_{max} - S$, represents the room for order in the universe, and that this is how life or intelligent order emerged in the context of the second law. [3] Right: a 2008 model version of the so-called **entropy gap** in the context of heat death theory, from the article "Life, Gravity and the Second Law of Thermodynamics" (figure 9), by Charles Linweaver and Chas Egan, captioned as: "The universe starts off at low entropy (not zero) due to the low level of density perturbations in the early universe—low Q and low A (e.g., [50])—where "low" means less than the maximum value Smax. At Smax all the energy density of the universe is in massless particles in equilibrium at a common temperature. Thus the universe starts off with a large entropy gap ΔS. The parameters Q and A are the observable normalizations of the primordial density fluctuations and set the initial gravitational entropy of the universe. There is no general agreement on the curve shown here. See for example Fig. 7.3 in [14] and Fig. 1.2 in [21]." [4]

Frautschi-Layzer diagrams

Entropy-time diagrams that show entropy gaps, in attempts to argue some point, are called Frautschi-Layzer diagrams.

In the 1988 book *Evolution as Entropy*, Canadian zoologist Daniel Brooks and American system ecologist Edward Wiley, employ 25 different information theory modified types of Frautschi-Layzer diagrams. [10]

Theory origin?

The "entropy gap" theory or argument seems to have originated in certain arguments in the 1975 "The Arrow of Time" by American astrophysicist David Layzer, although he does not use the actual term "entropy gap". Rather, following a near backwards convolution of information theory, statistical mechanics, arrow of time models, and big bang theory, he concludes: [7]

> "The quantity of macroscopic information generated by the expansion [of the universe] is the difference between the actual value of the entropy and the theoretical maximum entropy at the mean temperature and density."

In 1982, American theoretical physicist Steven Frautschi cites the Layzer and gives a entropy gap type graph, shown adjacent, which seems to bee modeled on the above argument. American physicist Robert Doyle, likewise, in his 2003-launched InformationPhilosopher.com site, attributes the entropy gap graphical model to Layzer. [5]

The term "entropy gap" seems to have been first used in 1983 and promoted by those as physicists such as Roger Penrose, Paul Davies, and Brian Greene. Greene, for example, argues that the arrow of time points in the direction in which the entropy gap is being lessened. [2]

The following shows three entropy gap modes. Left: A 2011 summary of Layzer's 1975 entropy gap model of the universe, according to American physicist Robert Doyle. [9] Center: American physicist Victor Stenger's 2007 (possibly 2003) **entropy gap** model: Plot of the total entropy of the universe and the maximum entropy of the universe as a function of the radius of the universe, according to Stenger's calculations. [6] Right: A information theory modified types of **Frautschi-Layzer diagram** from the 1988 book *Evolution as Entropy*, by Canadian zoologist Daniel Brooks and American system ecologist Edward Wiley, one of 25 different ones found in their book. [10]

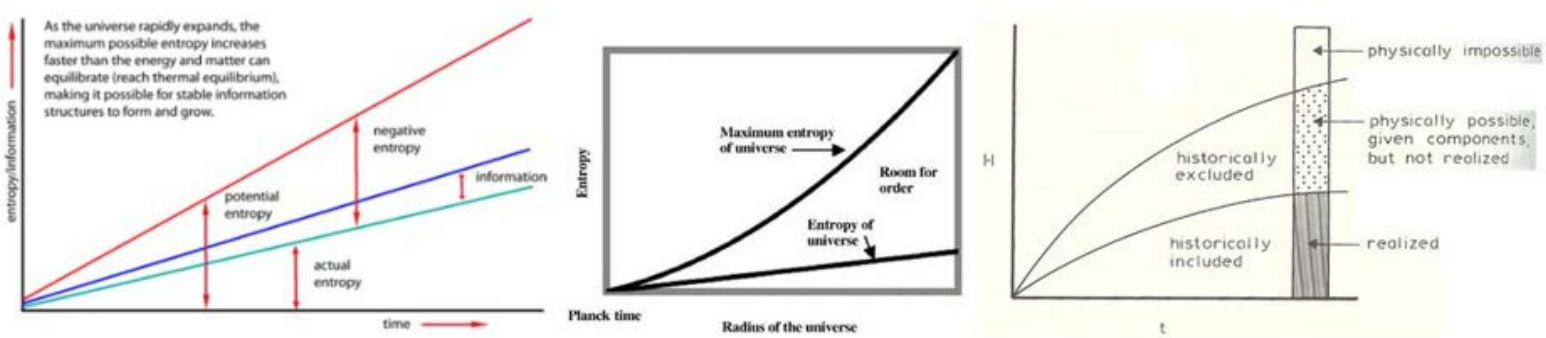

In his 1983 book *God and the New Physics*, American physicist Paul Davies seems to clearly dig into his gravity-driven entropy-order theory. [8] In his 1999 origin and meaning of life book *The 5th Miracle*, Davies devotes the second chapter to thermodynamics, concluding that:

> "All life feeds off the **entropy gap** that gravitation has created. The ultimate source of biological information and order is gravitation."

(add discussion)

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Further reading

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θΔics

In thermodynamics, **entropy increase**, as contrasted with entropy decrease, can be interpreted in two ways: one the result of a process in which entropy was added to a body; two the result of an irreversible cyclical process, during which time there are "uncompensated transformations", which are quantified by the value *N*, the "equivalence value of all uncompensated transformations".

History

The concept of "entropy increase" was formulated in 1854 by Rudolf Clausius, as presented in full in his 1865 textbook *The Mechanical Theory of Heat*, and is meant to take into account the view that a differential quantity heat, symbol Q, dQ, $\bar{d}Q$, or đQ, depending on notation assignment, or rather "caloric", as it was called in Guyton de Morveau's 1787 parlance (or *igneous fluid* or *matter of heat*, as it was called in Antoine Lavoisier's 1777 parlance) (or phlogiston, symbol ϕ (phi), as it was called in Georg Stahl's 1703 parlance) (or *terrra pinguis* as it was called in Johann Becher's 1669 parlance), is not a type of fluid-like massive or massless indestructible particle (as was believed at the time of the launch the science of thermodynamics, by Sadi Carnot in 1824) acting to cause repulsion (or the force of repulsion) in side of bodies, according to Boerhaave's law (1720), but rather a state of "movement", so to speak, a phenomenon discovered by Benjamin Thompson and his famous Cannon boring experiment (1798) (who curiously and simultaneously not only disproved Lavoisier's caloric theory, the one utilized by Carnot in scripting thermodynamics, but also married Lavoisier's wife) a combination of light (photons) interacting with the atoms (electrons), as quantified in Clausius' day, as best he could, by the measured phenomenon of the mechanical equivalent of heat and the postulate that the mathematical conception of the exact differential for a cycle integral can be formulated for units of heat, such that the phenomenon that heat can be converted into work and work into heat, both inside of bodies in transformation and as a body as a whole, according to a fixed ratio, now known as the "joule" the unit of energy.

Lambert | Energy dispersal

Laymanized views of what exactly constitute "entropy increase" abound.

A noted mistaken view of what "entropy increase" means is the 2000s work American organic chemist Frank Lambert, author of the various dumbed-down entropy for dummies websites (SecondLaw.com, 2ndLaw.com, Shakespeare2ndLaw.com, EntropySimple.com, EntropySite.com, etc.), centered around a 2002 article he published in the *Journal of Chemical Education*, in which he argued that portraying entropy as disorder is misleading or confusing and should be abandoned and instead replaced with his model of equating "entropy increase" as the being the "spontaneous dispersal of energy" or equating it to the "spreading out of energy", or something along these lines. [1]

Lambert mass emailed dozens of American college textbook authors, from 2000 to 2010, imploring them to change the term “disorder” to “energy dispersal” in their chemical thermodynamics chapter, which, supposedly about three dozen of them did. Hence, there are about 30 different college chemistry textbooks floating about the book market with Lambert’s fallacious definition of entropy increase as energy dispersal.

This view, however, fly's in the face of German physicist Rudolf Clausius’ original 1854 theorem of the equivalence of transformations definition of entropy increase, which itself is derived or rather based on the 1840s mechanical equivalent of heat and justified by Clausius’ proof of impossibility of perpetual motion of the second kind, the idea that if entropy did not increase it would be possible to couple to heat engines together and make a perpetual motion machine.

Lambert, however, admits that he nearly failed his senior year of college thermodynamics, finding the subject so difficult that he was forced to switch majors from physical chemistry to organic chemistry. This lack of foundational understanding of thermodynamics shows through in his attempt to define “entropy increase” simply as “energy dispersal”, which is a fallacious view, and moreover to pass this deficient definition off to American students is nearly a crime against humanity, akin to John Neumann telling Claude Shannon in circa 1948 to call his telegraph wire coding math logarithm formula by the name entropy, because, in Neumann's own words, "no one really knows what entropy really is, so in a debate you will always have the advantage."

Lambert admits that in formulating this model he never read the original Clausius, but culled from his “energy dispersal” model from an article of William Thomson, and his verbalized thermodynamics models of a universal

tendency in nature to the dissipation of mechanical energy, both of which lack in the mathematical rigor and foundation of Clausius, which is rooted in the foundations of mathematics, down to William Hamilton, Joseph Lagrange, Leonard Euler, down to Isaac Newton and Gottfried Leibniz, all of which Lambert says should be tossed by the wayaside all because he doesn't like the word disorder and thinks that the deeper underlying of entropy might be "too difficult" for college chemistry students to comprehend.

This judging entropy to be "too difficult" view, by no coincidence, resulted in the Erwin Schrodinger's ridiculous 1944 concept of "negative entropy" (or negentropy), which is akin to calling a the variable X by the name "negative X" or negX, which never occurs in mathematics, but has been taken up like candy to laymanized thermodynamicists, the world over, all because he judged that free energy might be too "difficult" a term to explain to his lay audience in his lectures, and followup now-famous book *What is Life?*, all of which he had to recant in his infamous "Note to Chapter 6", where he explains how he was attacked by his fellow physicists for promoting the nonsensical idea of "negative entropy" as a measure of order.

See also

- Surroundings entropy increase
- Local entropy decrease
- Law of increasing entropy
- Maximum entropy
- MaxEnt school
- Entropy of mixing

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(b) Thermodynamic entropy (2010) – Hmolpedia treads.
(c) Entropy (energy dispersion) – Wikipedia.

θΔics

In animate thermodynamics, **entropy islands**, or "islands of entropy", are hypothetical regions of ordered life (powered CHNOPS+ matter), defined such that life is representative of localized islands of order in a universe of ever-increasing entropy (disorder); a cybernetics-conceptualized type of energy eddy model of order, in short.

Etymology

In 1950, Norbert Wiener stated: [1]

> "There are local and temporary **islands** of decreasing **entropy** in a world in which the entropy as a whole tends to increase, and the existence of these islands enables some of us to assert the existence of progress."

This logic, however, may have been inspired by the earlier 1947 logic of Belgian-born English thermodynamicist Alfred Ubbelohde who stated that living organisms represent regions of local entropy decrease. [2]

In 1961, Czechoslovakian scientist E. Kollman expressed the following similar view: [3]

> "The machine and the living organism seem **islands** in an ocean of increasing entropy of all macroprocesses on those parts of the universe inhabitable by us, islands where entropy decreases because information is accumulated."

In 1985, American economist Thomas DeGregory stated: [4]

> "Life as a whole is definable as an **island** of negative entropy."

In 1989, the view had emerged that Erwin Schrodinger had asserted that: [5]

> "Living beings are decreasing **entropy islands**".

This view, however, is not a word-for-word translation, as Schrodinger never used the term 'island', but instead focused on digestion and his concept of negative entropy being equal to order.

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θΔics

In human thermodynamics, **entropy law** is a entropology-like synonym for the second law of thermodynamics. The term was introduced significantly by Romanian mathematical economist Nicholas Georgescu-Roegen in a 1970 pamphlet in which he discussed what he called the “important role of the *entropy law* for the existence of our species”. [1]

In this pamphlet, he argued, using a non-logical interpretation of the material entropy conception, that “the entropy law is the root of economic scarcity: it states that the natural resources on which our existence depends are continuously and irrevocably turned into waste.” This publication was followed up by his 1971 book *The Entropy Law and the Economic Process*, which worked to stimulate the use of the term “entropy law” in the decades to follow, especially in economics and economic thermodynamics, such as in the publications of Jeremy Rifkin, Jing Chen, and others. [3]

Etymology

Georgescu-Roegen’s use of the shorthand term “entropy law”, stems from English astronomer Arthur Eddington, whom he references in the first paragraph of his 1971 book, that in 1928 stated the famous quote: "the ***law that entropy*** always increases—the second law of thermodynamics—holds, I think, the supreme position among the laws of Nature.” [4]

References

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External links

â— EntropyLaw.com

θΔics

In thermodynamics, **entropy models** are any of various verbal, visual, heuristic, or statistical teaching models used to describe the 1865 quantity 'entropy', defined in various ways by German physicist Rudolf Clausius during the years 1850 to 1875. Some of the various oft-cited entropy models are as follows:

Model		Picture	Notes
Four element theory Aristotle	350BC		Denser elements tend to rise; lighter elements fall; earth is the heaviest element; fire the lightest. “For any two portions of fire, small or great, will exhibit the same ratio of solid to void; but the upward movement of the greater is quicker than that of the less.”
Three principles theory Geber	790		Metals are formed of two elements: *sulphur*, ‘the stone which burns’, the principle of combustibility, and *mercury*, the principle of metallic properties. Salt gives solidity.
Sulphur combustion model Paracelsus	1524	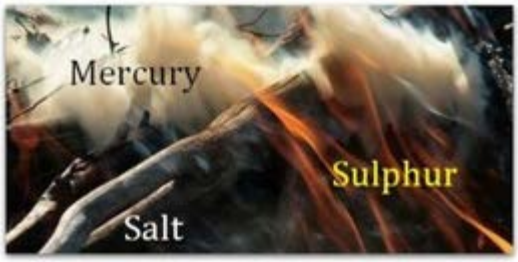	
Terra pinguis model Johann Becher	1699		
Phlogiston model	1703		

Georg Stahl

Caloric model

Antoine Lavoisier (1789)

1789

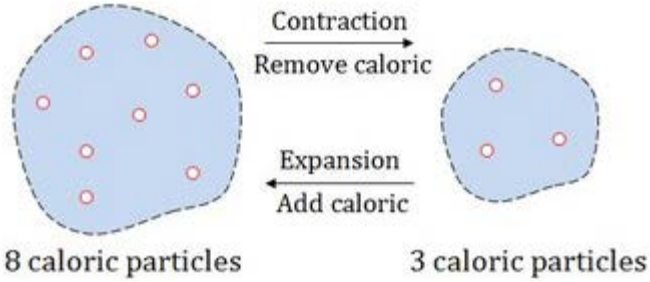

Re-establishment of equilibrium in the caloric

Sadi Carnot

1824

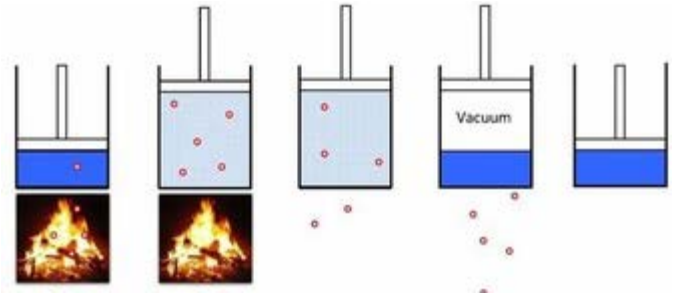

A Lavoisier-base view that heat consisted of indestructible caloric particles and that a body returned to its original position (state) at the end of one heat cycle.

Transformation content

Rudolf Clausius

1850

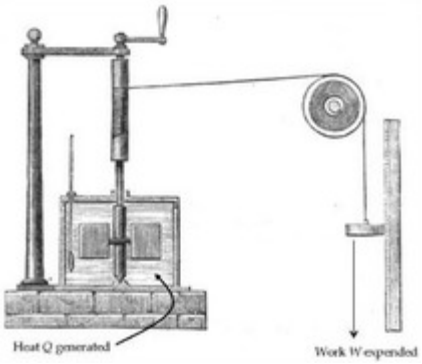

Dissipation (law of dissipation)

William Thomson

1852

Disgregation

Rudolf Clausius

1862

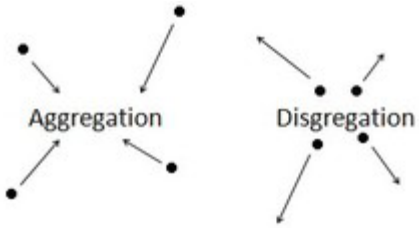

[3]

Entropy (melting ice)

Rudolf Clausius

1862

[1]

1870

"The second law of thermodynamics has the same degree of truth as the statement that if you throw a tumblerful into the sea, you cannot get the same tumblerful out again."

— James Maxwell (1870), "Letter to John Strutt", Dec 6; the "moral" of his Maxwell's demon argument [21]

Velocity distribution model (H-theorem)

Ludwig Boltzmann

1872

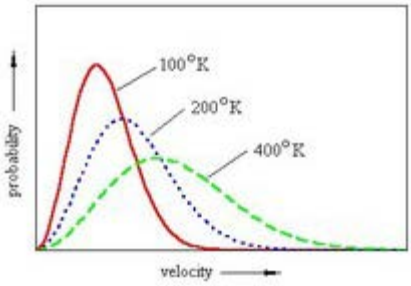

Entropy of mixing

Willard Gibbs

1876

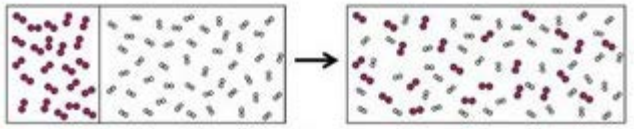

The spontaneous mixing of gases is driven by an increase in entropy

Note: this could have been Gibbs' 1902 work; see: Gilbert Lewis' 1925 *The Anatomy of Science* (pg. 148).

Disorder

1882

Hermann Helmholtz

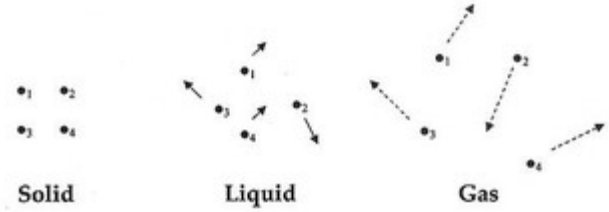

Ghostly quantity

1899

John Perry

S = k ln W

1901

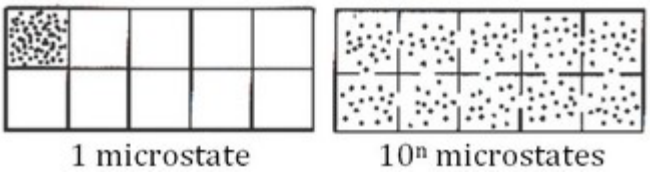

Max Planck

Mixed-up-ness

1903

Note: ditto to previous note.

Willard Gibbs

Elementary disorder

1906

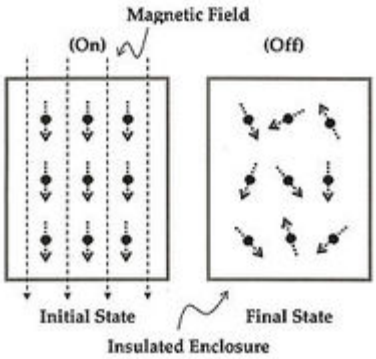

Max Planck

Typing monkeys

1913

Emile Borel (1913)

Entropies of

bodies

Gilbert Lewis

1923

Entropy (shuffling cards)

Gilbert Lewis
Arthur Eddington

1925

Seems to have been first described in Lewis' *The Anatomy of Science* (1925); then expanded be Eddington in his *The Nature of the Physical World* (1928).

Arrow of time

Arthur Eddington

1928

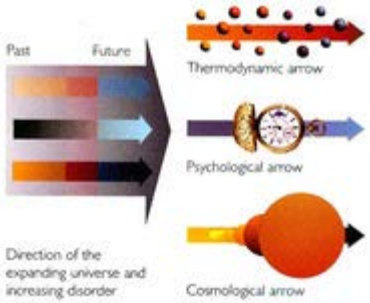

Entropy (information)

Leo Szilard
(1929)

1929

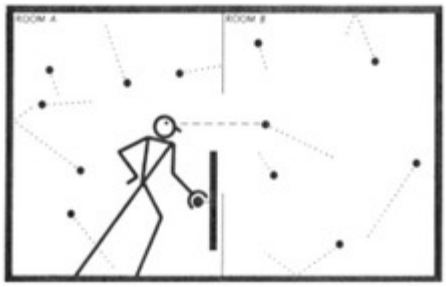

Information theory

Claude Shannon

Unscrambled

1948

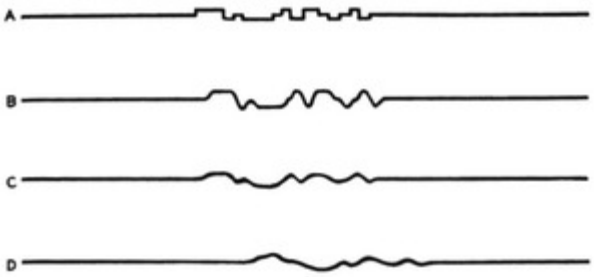

Note: this has nothing to do with thermodynamics; contrary to popular opinion; but rather is a mis-informed urban myth existing in ignorant science.

eggs
(Broken eggs)

Walter Albersheim?

1955

Entropy (child's playroom)

Peter Landsberg

1961

Energy dispersal

Peter Atkins

1984

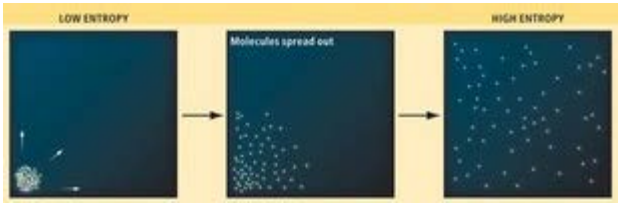

(spreading out of energy)

Frank Lambert

1999

Entropy ≠ Disorder

In a view of entropy as "energy spreading out"; a misinformed view promoted by American organic chemist Frank Lambert; based on a reading of one of William Thomson's articles.

See also

â— Entropy formulations
â— Entropy (misinterpretations)

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2. Lindberg, David C., Porter, Roy, Jo Nye, Mary, and Numbers, Ronald. (2003). *The Cambridge History of Science: the Modern Physical and Mathematical Sciences* (pgs. 494-95). Cambridge University Press.
3. Disgregation – Wikipedia.

θΔics

In thermodynamics, **entropy of mixing** is a term referring to the entropy changes resultant when two or more non-identical gas particles or chemical species are mixed. This aspect of entropy, supposedly, is attributed to the work of American engineer Willard Gibbs and based on Gibbs' theorem. [2]

Hmolscience

In 2002, American physicist Jack Hokikian speculated that an entropy of mixing effect occurs when two neighboring countries, such as the United States and Mexico, have a sudden increase in border permeability. In his own words: [1]

> "Consider a thermodynamic system consisting of two nations sharing a common border. The border exists to keep the inhabitants of each nation from intermixing freely, thus preventing entropy increase through the process of mixing. However, when the border fails to act as a barrier and allows free movement between nations, the entropy of the system increases accordingly."

(add discussion)

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Further reading

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- Muller, Ingo. (2007). *A History of Thermodynamics - the Doctrine of Energy and Entropy* (Entropy of mixing, pgs. 129-31). New York: Springer.
- Iribarne, Julio I. and Godson, W.L. (1981). *Atmospheric Thermodynamics* (Entropy of mixing, pgs. 48-49). Springer.

External links

- Entropy of mixing – Wikipedia.
- Entropy of mixing (ideal gases) – Chem.Arizona.edu.

θΔics

In hmolscience, **entropy only applies** (or second law only applies), as compared to "entropy applies to everything" (or second law applies to everything) view, is an overly-common argument from ignorance, generally made by people to don't read Clausius, i.e. the original source definition of entropy and the second law, according to which it is fallaciously asserted that entropy and or the second law, depending on the level of confusion of the asserter, does apply to "isolated" and or "closed" systems (the asserter often convolutes and confuses these two system types likewise) , but does NOT apply to "open" systems.

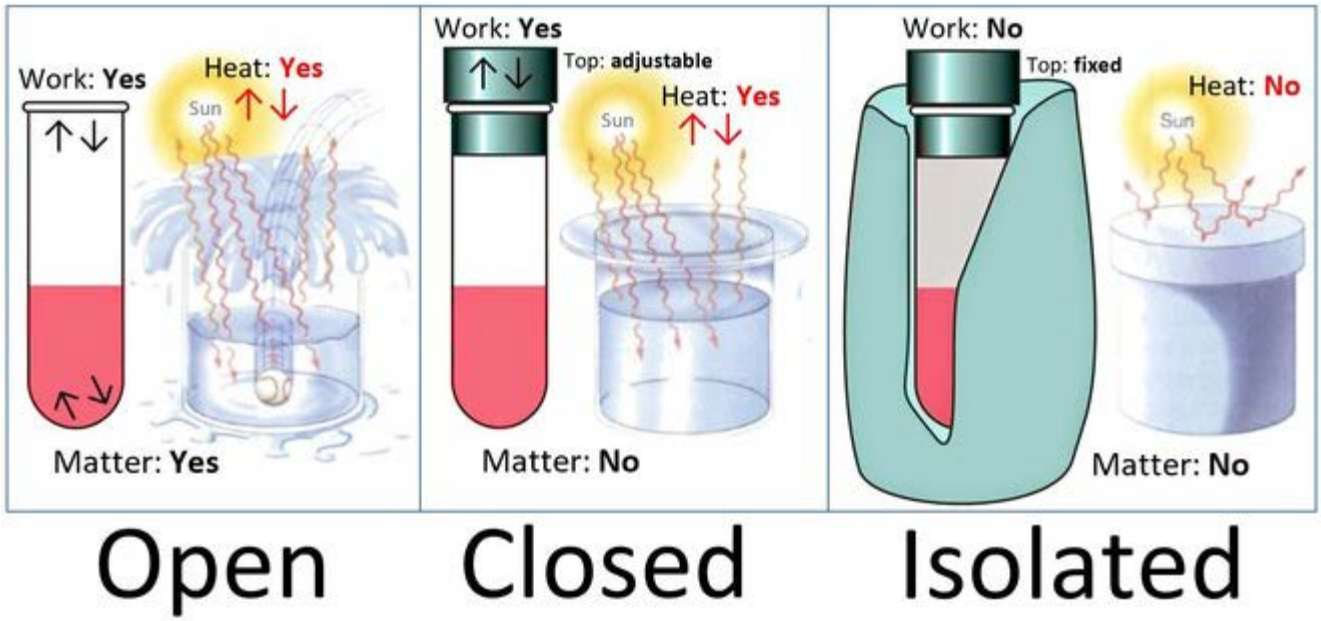

Examples of open, closed, and isolated systems; the ignorant person, in respect to Clausius, will incorrectly often assert that the first law applies to ALL three systems, but that the second law and or entropy "**only applies**" to isolated and or closed systems.

Overview

The "entropy only applies" dictum, which is equivalent to the synonymously ignorant statement "heat only applies", arises in the uneducated mind, generally in publications dealing with "life", i.e. powered CHNOPS+# existence states, or "evolution", owing to the assumed belief that entropy means disorder; in equation form:

$$|entropy| = \text{disorder}$$

a variant of which Helmholtz (1882) was the first (Ñº) to state, albeit "in context"; the "in context" aspect, however, is the crucial part the naive expositor tends to unaware of. Correctly, energy and entropy apply to EVERY body or system in the universe. This, in short, is a more exact and detailed statement of Boerhaave's law, namely: ALL bodies expand when heated. Those in the know, e.g. Gibbs, as shown below, understand this as a matter of fact.

> "The comprehension of the laws which govern ANY material system is greatly facilitated by considering the energy and entropy of the system in the various states of which it is capable. As the difference of the values of the energy for any two states represents the combined amount of work and heat received or yielded by the system when it is brought from one state to the other, and the difference of entropy is the limit of all the possible values of the integral ∫ dQ/T, dQ denoting the element of the heat received from external sources, and T the temperature of the part of the system receiving it, the varying values of the energy and entropy characterize in all that is essential the effects producible by the system in passing from one state to another."
>
> — Willard Gibbs (1876), *On the Equilibrium of Heterogeneous Substances*

The general root of the confusion

is that people see themselves as an ordered structure, aka a "low entropy state" in thermodynamic speak, hence the blanketed Clausius statement "entropy of the universe tends to a maximum" means to the uneducated person that "disorder of the system tends to a maximum"; according, to resolve this seeming mental confusion, the person will exclaim or assert, BUT "this ONLY applies to isolated systems" or "this ONLY applies to closed systems". This ignorance results from people who don't read Clausius, but yet who tend to speak officially for him, in regards to the operation of the universe. The only person, to note, who has remotely carried the "magnitude of entropy is the measure of order of a thing" ideology forward into a semi-cogent readable manner or discourse has been Norman Dolloff (1975); Dolloff, however, is apex mindset wherein it becomes apparent that "Gibbs energy of formation measure of the state of existence of a thing" is the newer correct way to go about explaining order and disorder in the context of evolving or heat-driven morphing systems governed by energy and entropy.

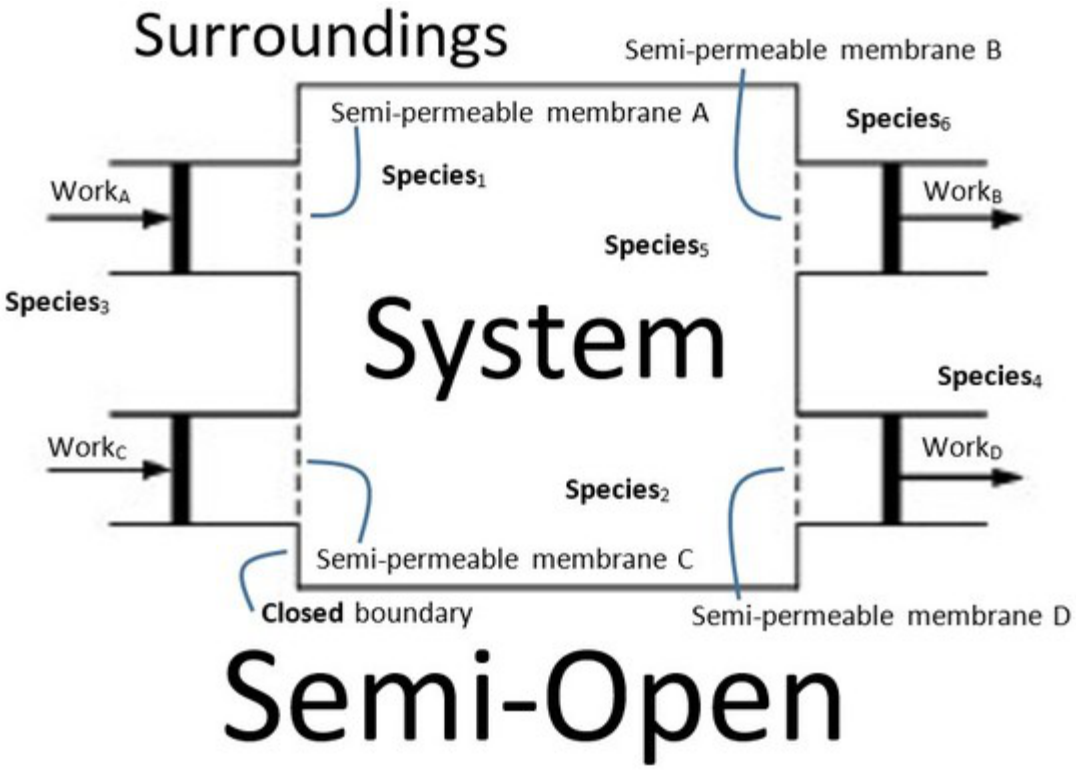

An example of a van't Hoff equilibrium box style semi-open system, with boundaries semi-permeable to certain chemical species, but impermeable to other species; which is the general type of system, e.g. social systems, of interest when humans are subject of discussion, in regards to energy and entropy.

Beyond this basic issue, earth-surface systems, e.g. a society or ecosystem, are semi-open systems, such as shown adjacent, a blend of the open + closed, such as experimented with in the van't Hoff equilibrium box models of Jacobus van't Hoff, wherein some boundaries are closed, e.g. like the walls of jail cell, whereas others are semi-open, like the guard-controlled door to a multi-person prison cell, wherein new inmates may enter or old inmates leave; or on a larger scale, the territories of gangs, or social troops (see: chimpanzee war), or the borders of countries, to name a few examples.

Quotes

The following are related quotes:

> "The definition of **entropy only applies** when every body of the system is in a state of equilibrium. Thus, for example, we cannot speak of the entropy of the solar system."
>
> — John Parker (1894), *Thermo-dynamics Treated with Elementary Mathematics* [1]

> "The second law of thermodynamics is a rather special case in that it **applies only to** closed systems. It does not define the steady state as this is exhibited in vital processes. Entropy may decrease in open systems. Therefore, such systems may spontaneously develop toward states of greater heterogeneity."
>
> — Judson Herrick (1956), *The Evolution of Human Nature* (pg. 51)

“The other possible escape from the evolutionist's dilemma is to say that the **second law only applies** to so-called ‘isolated systems’. There may well be an increase of order in an ‘open system.’ Thus, a baby grows into an adult, two animals may multiply into a population of thousands, man’s store of acquired knowledge accumulates to tremendous proportions. Even in the inorganic realm, simple elements may combine naturally to form complex compounds, and molecules may grow into crystals of beautiful complexity. All of these are open systems and their increased organization is derived from a source outside themselves.”

— Henry Morris (1976), *The Bible Has the Answer* (Ñº)

“The main point is that the law of increasing **entropy only applies** to systems that are isolated from the rest of the universe, so that neither matter nor energy can enter or leave. In these cases, and these cases alone, the law of increasing entropy holds. The surface of the earth, however, is not a closed system. Energy enters the biosphere all the time, primarily in the form of light from the sun. It leaves primarily in the form of heat, which is radiated into space. It is this constant flow of energy that makes life possible.”

— Lee Smolin (1997), *The Life of the Cosmos* [2]

“It must be strongly emphasized that the principle of increasing **entropy only applies** to the ‘total entropy’, i.e. the entropy of the system AND the surroundings. The entropy of the system itself may increase or decrease depending on the depending on the circumstances. For an ‘isolated system’, i.e. a system that cannot exchange energy or particles with the surroundings, the principle of increasing entropy applies to the system itself (the entropy of the surroundings will not change due to the process in this case).”

— Roland Kjellander (2002), *Thermodynamics Kept Simple* [3]

“Strictly speaking, the principle of increasing **entropy only applies** to systems of conserved total energy. The universe itself is such a system, so the universe appears to be headed for a state of thermal equilibrium, after which nothing else will happen.”

— Steven Frautschi, et al (2008), *The Mechanical Universe* (Ñº)

“Whether entropy's indefinable quality—its inherently ambiguous nature—is the source of its greatest strength or greatest weakness or both, it probably explains why the concept has proven to be such a seductive and persistent metaphor (I say *metaphor* because **entropy only applies** to closed or isolated systems).”

— Randall Schweller (2014), *Maxwell’s Demon and the Golden Apple* [4]

“The use of entropy as a metaphor has much to offer, but it is not without problems. **Entropy only applies** to isolated (or closed) systems, and there are no observable isolated systems. The earth itself is part of the solar system, which receives energy from—and radiates it back out to the rest of—the universe. Only the universe as a whole quantifies as a truly closed system.”

— Randall Schweller (2014), *Maxwell’s Demon and the Golden Apple* (pg. 35)

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2. Smolin, Lee. (1997). *The Life of the Cosmos* (pg. 152). Oxford University Press.

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θΔics

In hmolscience, **entropy pied piper** refers to anyone, e.g. John Neumann (1940), who attempts to baselessly re-sell the original Clausius standard definition of entropy of δQ/T in a new formulaic guise (Morowitz, 1996), as are commonly seen in many un-grounded entropy formulations. [1]

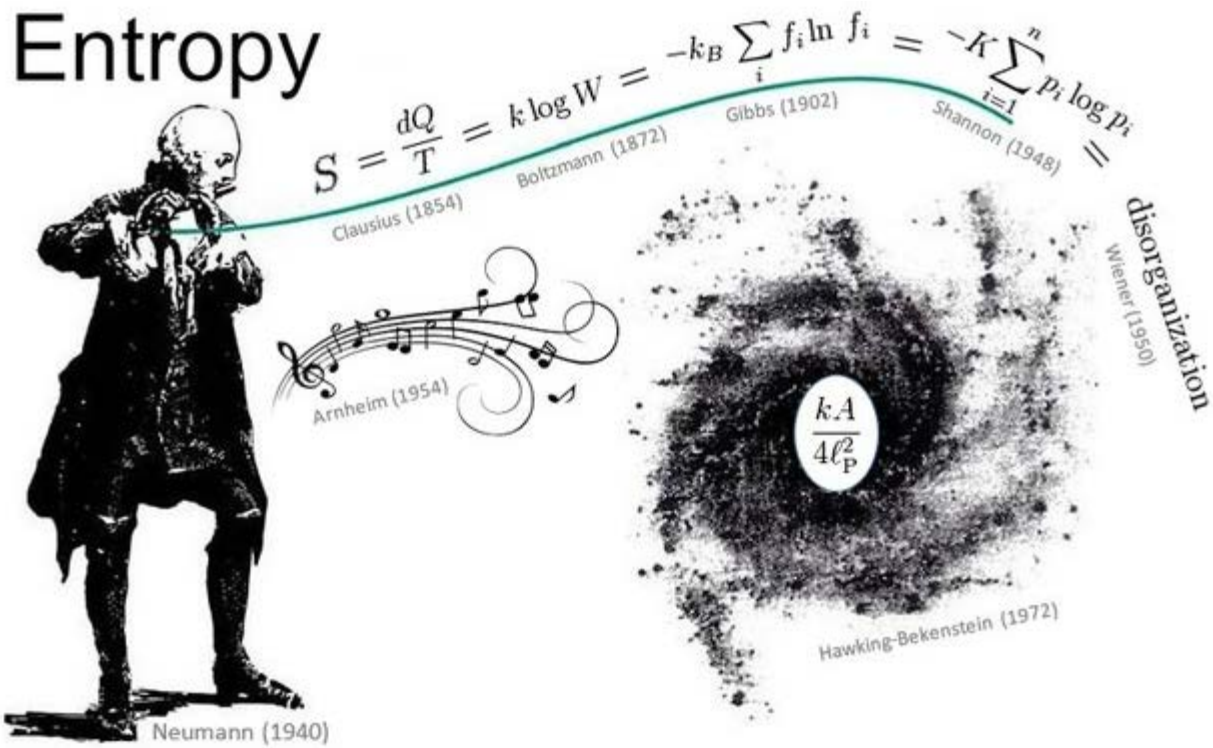

An extra-labeled "**entropy pied piper**", original from cover of Harold Morowitz' 1992 book *Entropy and the Magic Flute*, showing various abused entropy formulations, such as music as entropy (Arnheim, 1954), bits as entropy (Shannon, 1948), disorganization as entropy (Wiener, 1950).

Overview

In 1940, John Neumann told Claude Shannon that you can use "entropy" in ANY argument and win, using the power of the bluff, per the backwards reasoning that "no one", according to Neumann, really knows what entropy is. [2]

In 1996, Harold Morowitz published *Entropy and the Magic Flute: S = k ln W = dQ/T = - kΣfi ln fi*, an illustrated version of the the cover shown adjacent, the first equation being the Planck-version (1901) S = k ln W of Boltzmann entropy (1872), wherein he used humor to make a realistic joke that any one who begins speaking about entropy in an ignorant or disingenuous manner can quickly sound like magical music that can lead people, like mice, down roads of confusion. [1]

See also

- Information entropy (quotes)
- Open sesame
- Thermodynamic information fallacy
- Weed theory

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θΔics

In animate thermodynamics, an **entropy portmanteau** is an invented "word combo" or "word blend" of entropy with another word, term, prefix, or suffix, introduced or hypothesized for a number of various reasons, often introduced to be the long sought “tendency to order” principle of thermodynamics, proposed to explain evolution, human civilization growth, consciousness, etc., in contrast or opposition to the standard disorder model of entropy or tendency to disorder model of the second law.

An over-typical example is the term:

> Orgatropy = organization + entropy

as was introduced in 1992 by French mathematical physicist and physiologist Gilbert Chauvet to account for the origin of life from non-life and human consciousness.

Another example is the term phrentropy:

> Phrenentropy = phren- + entropy = entropy of the mind

As employed in the schizophrenic work of Italian psychiatrist Tullio Scrimali.

Entropy portmanteau antonyms

Entropy portmanteaus often tend to be entropy antonyms. The following list are some of the various known entropy portmanteaus antonyms: orgatropy, anti-entropy, disentropic, ectropy, ektropy, entropy ethics, entropy reduction, entropy reversal, genetic entropy, gentropy, inverse entropy, local entropy decrease, entropy islands, low entropy, mental entropy, syntropy, syntropic, teleonomic entropy, genopsych, among others.

θΔics

In thermodynamics, **entropy production** is a rather ambiguous term referring generally to the internal entropy differential diS of a system, as contrasted to the entropy crossing the exterior of system's boundary d_eS. [1] Others may use the term 'entropy generation' to refer to the rate of increase of internal entropy d_iS per unit time dt, expressed by the equation: [2]

$$\frac{d_i S}{dt}$$

In the context of attempting to explain the great order exemplified by human life, a common catch phrase to say that life represents a local entropy decrease at the expense of greater entropy production elsewhere in the surroundings or universe.

Difficulty on term

The general difficult with the use of this term is that, by definition, change in the entropy of a body is quantified numerically by the logic that increase in the entropy of a body is positive (+) and decrease in entropy of a body is negative (-). The idea of 'production' is not necessarily corroborative with this.

See also

- Principle of maximum entropy production
- Societal entropy production

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θΔics

In quotes, **entropy quotes** are noted statements on the nature of German physicist Rudolf Clausius' 1865 conception of the mathematical-physical quantity entropy. These quotes are listed below, chronologically:

> "If for the entire universe we conceive the same magnitude to be determined, consistently and with due regard to all circumstances, which for a single body I have called '**entropy**', and if at the same time we introduce the other and simpler conception of energy, we may express in the following manner the fundamental laws of the universe which correspond to the two fundamental theorems of the mechanical theory of heat: *the energy of the universe is constant; the entropy of the universe tends to a maximum*."
>
> — Rudolf Clausius (1865) *Mechanical Theory of Heat* (1865) [1]

> "Any method involving the notion of **entropy**, the very existence of which depends on the second law of thermodynamics, will doubtless seem to many far-fetched, and may repel beginners as obscure and difficult of comprehension."
>
> — Willard Gibbs (1873) *Graphical Methods in the Thermodynamics of Fluids* (1873) [2]

> "By the introduction of the expression, "without compensation" (verses "of itself"), combined with a full interpretation of this phrase, the statement of the second principle ("that heat cannot *without compensation* pass from a colder to a warmer body") becomes complete and exact; but in order to understand it we must have a previous knowledge of the theory of transformation-equivalents, or in other words **entropy**, and it is to be feared that we shall have to be taught thermodynamics for several generations before we can expect beginners to receive as axiomatic the theory of entropy."
>
> — James Maxwell (1873) "Tait's 'Thermodynamics" (1878) [3]

> "In those days I was essentially the only theoretical physicist there, whence things were not so easy for me, because I started mentioning **entropy**, but this was not quite fashionable, since it was regarded as a mathematical spook."
>
> — Max Planck (1889), "Commentary on joining the local *Physical Society*, University of Berlin" (c. 1940s) [4]

> "Only entropy comes easy."
>
> — Anton Chekhov (c.1900); also stated by Lewis Mumford (1970) (Ñº) [18]

> "Nature never undertakes any change unless her interests are served by an increase in entropy."
>
> — Max Planck (1903), "Commentary on James Swinburne's 1902 entropy debate views" (1903) [13]

> "As a young man I tried to read thermodynamics, but I always came up against **entropy** as a brick wall that stopped my further progress. If found the ordinary mathematical explanation, of course, but no sort of physical idea underlying it. No author seemed even to try to give any physical idea. Having in those days great respect for textbooks, I concluded that the physical meaning must be so obvious that it needs no

explanation, and that I was especially stupid on the particular subject."

— James Swinburne (1904), *Entropy: or Thermodynamics from an Engineer's Standpoint and the Reversibility of Thermodynamics*

"**Entropy** is a shadowy kind of concept, difficult to grasp … but again, we may point out that, the reader who would extend the notion of mechanism into life simply *must* grasp it."

— James Johnstone (1914), *The Philosophy of Biology* [5]

"Heretics are the only bitter remedy against the entropy of human thought."

— Yevgeny Zamyatin (c.1923) [16]

"You should call it **entropy**, because nobody knows what entropy really is, so in a debate you will always have the advantage."

— John Neumann (c.1939), suggestion to Claude Shannon on what to call his new formula for information [6]

"There is no concept in the whole field of physics which is more difficult to understand than is the concept of **entropy**, nor is there one which is more fundamental."

— Francis Sears (1950), *Principles of Physics I: Mechanics, Heat, and Sound* [8]

"The minute those two little particles inside a woman's womb have joined together, billions of decisions have been made. A thing like that has to come from **entropy**."

— Rex Stout (c.1960), American crime writer [11]

"If we knew exactly what animal life was like before the fall into sin and knew what nature was like before the law of entropy invaded it, we would already be living in heaven."

— Walter Lang (c.1967) [16]

"We could not, for example, arrive at a principle like that of entropy without introducing some additional principle, such as randomness, to this topography."

— Michael Polanyi (c.1970) [16]

"Few physical concepts have caused as much confusion and misunderstanding as has that of **entropy**."

— James Lovelock (1979), *Gaia: a New Look at Life on Earth* [7]

"If we will be more forthcoming with explanations of our cherished terms, our science colleagues may be more inclined to help us with **'entropy'**, which to me is a more difficult concept than anything economics has to offer."

— Tjalling Koopmans (1979) [10]

"Since I wrote this story ["Entropy"] I have kept trying to understand **entropy**, but my grasp becomes less sure the more I read. I've been able to follow the OED definitions, and the way Isaac Asimov explains it, and even some of the math. By the qualities and quantities will not come together to form a unified notion in my head. It is cold comfort to find that Gibbs himself described entropy in written form as 'far-fetched … obscure and difficult of comprehension'."

— Thomas Pynchon (1985), *Slow Learner* [14]

"Just as the constant increase of **entropy** is the basic law of the universe, so it is the basic law of life to be ever more highly structured and to struggle against entropy."

— Vaclav Havel (1986), Czech playwright [12]

"Software is like entropy. It is difficult to grasp, weighs nothing, and obeys the second law of thermodynamics; i.e. it always increases."

— Norman Augustine (1986) [17]

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(b) Maxwell, James C. (1878). "Tait's 'Thermodynamics' (II)", (pgs. 278-81). *Nature,* Feb. 07.
4. [citation needed]
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(b) Jeremy Campbell (1982): "Shannon does not remember von Neumann giving him such advice. However, Myron Tribus has a clear recollection of hearing Shannon tell him this story during a conversation in Shannon's office at MIT on April, 1961."
(c) See: Information theory.
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θΔics

In human thermodynamics, **entropy reduction** is a newer synonym, or spinoff term, to the older 1947 concept of local entropy decrease, referring to a hypothetical process wherein an activity or transformation is said to lower entropy and thus increase order.

Overview

In his 1975, American political scientist Stephen Coleman, devoted an entire chapter to entropy reduction and politics; Coleman's work, however, is clogged up with Shannon bandwagon suppositions about information theory. [1]

The term entropy reduction, according to the 2005 view of American educator Dick Hammond, who claims to have researched this term, states that it is used by many authors to indicate "the movement away from randomness and thus the irretrievable loss of energy and information." [2] In 2006, building on the 1971 entropy law logic of Romanian mathematician Nicholas Georgescu-Roegen, American economist Eric Beinhocker stated what he calls the second G-R condition, which is: [3]

> "All value-creating economic transformations and transactions **reduce entropy** locally within the economic system, while increasing entropy globally."

(add discussion)

Synonyms

Entropy reduction in life: plants, animals, humans, and their behaviors, according to Hammond, means that they must decrease or minimize the amount of entropy production, thrive on negative entropy or negentropy, retard entropy, absorb entropy, diminish entropy, consume entropy, decrease entropy, lessen entropy, cut down entropy, lower entropy, curtail entropy, be anti-entropic, or stop wasting free energy, all of which Hammond claims are synonyms with the same meaning. Entropy reduction, for people, according to Hammond, refers to how humans, as open systems, use energy to manipulate other energy, matter, or information outside themselves. [2]

See also

â— Entropy reversal

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θΔics

In thermodynamics, **entropy reversal**, "reversals of entropy", or reversals of the second law, is an oft-used, albeit convoluted, verbal argument to explain or reconcile English naturalist Charles Darwin's 1859 law of elevation (or evolution) of life with Scottish physicist William Thomson's 1852 interpretation of the second law as a law of degradation.

Overview

In 1921, English experimental biologist James Johnstone stated that "we are convinced that an evolutionary process that has occurred", and that "we cannot think of a time in the past when the universe did not exist". On this basis, to account for the existence of "human and animal minds" (which he associates with a retardation in the increase of entropy), Johnstone reasons: [1]

> "We are compelled to postulate that somewhere or other, or some time or other, the second law of thermodynamics must **reverse** itself, that is, some time or somewhere entropy must decrease, or have decreased, otherwise we shall be compelled (as Sir William Thomson was) to postulate a beginning, or creation."

Johnstone went so far as to give an elaborate so-called "proof" that a body of gas at a uniform temperature, may, of itself, separate into two temperature system, creating an entropy decrease, supposedly if the molecules collide in a certain way, essentially arguing that the second law is not always true.

In 1922, American physical chemist and mathematician Alfred Lotka cited Johnstone's work, but argued that entropy is only "retarded" not reverse. Specifically, as Lotka states: [2]

> "In living processes, the increase in entropy is **retarded** ... [Johnstone] points out that this is true, primarily, of plants; but that among animals also natural selection must work toward the weeding out of unnecessary and wasteful activities, and thus toward the conservation of free energy, or, what amounts to the same thing, toward **retarding** energy dissipation."

In 1925, American mathematical prodigy William Sidis began writting his thermodynamics of life treatise *The Animate and the Inanimate*, written in 1920-24, where it is argued, similarly on the logic of Thomson, that: [3]

> "**Reversals** of the second law are a regular phenomenon, and [they are identified] with what is generally known as life."

In his 1941 lecture "The Weight of Glory", in his series of lectures on Christianity, Irish-born British writer C.S. Lewis (1898-1963) stated: [6]

> "Lest your longing for the transtemporal should awake and spoil the whole affair, they use any rhetoric that comes to hand to keep out of your mind the recollection that even if all the happiness they promised could come to man on earth, yet still each generation would lose it by death, including the last generation of all, and the whole story would be nothing, not even a story, for ever and ever. Hence all the nonsense that Mr. Shaw puts into the final speech of Lilith, and Bergson's remark that the élan vital [vital impetus of evolution] is capable of surmounting all obstacles, perhaps even death—as if we could believe that any social or biological development on this planet will delay the senility of the sun or **reverse** the second law of thermodynamics."

In 1981, British neuropsychologist Richard Gregory stated: [4]

> "Time's arrow given by entropy—the loss of organization, or loss of temperature differences—is statistical and it is subject to local small-scale reversals. Most strikingly: life is a systematic **reversal of entropy**, and intelligence creates structures and energy differences against the supposed 'death' through entropy of the physical universe."

The 2001 book *The Ingenious Mind of Nature* by American engineer George Hall devotes a considerable amount of text to argue that growth and configuration is a form of "reversing entropy". Hall states for instance, that "a catastrophe is the result of configuration reversing entropy by virtue of its own mechanics and configuration." In his preface, however, Hall acknowledges that he learned about entropy from his West Point thermodynamics professor who told him that it had shells piled neatly (low entropy) and helter-skelter (high entropy). [5]

Difficulties on term

The idea of "reversing" or retarding entropy is mis-used or mis-understood attempt at an interpretation and application of entropy as defined by German physicist Rudolf Clausius, which he defines, with mathematical rigor, as a type of internal energy book-keeping factor or quantity.

See also

â— Local entropy decrease

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θΔics

In human thermodynamics, **entropy waste** is a metaphoric, entropology, type of term referring generally to material entropy turned into waste or entropy turned into a disordered state of energy or waste heat. The term is commonly used in economic thermodynamics and ecological thermodynamics; often distinguishing between "high entropy waste", the prime example being waste heat, and "low entropy waste", the example being waste material; although neither of these make any thermodynamic sense. [1]

Overview

The idea of entropy waste seems to trace to the ideas of Romanian mathematician Nicholas Georgescu-Roegen who, in his 1971 book *The Entropy Law*, uses a non-logical interpretation of the material entropy conception to outline a crude theory of a matter-energy entropy and waste. [2] In particular, Georgescu-Roegen stated that: [3]

> "The **entropy** law is the root of economic scarcity: it states that the natural resources on which our existence depends are continuously and irrevocably turned into **waste**."

By 1998, according to Americans biologist Peter Corning and engineer Stephen Kline, the following view of entropy had solidified in the public mind: [4]

> "**Entropy** is now a household word for any kind of disorder, disorganization, uncertainty, **waste**, confusion, inefficiency, and most flagrantly, willful sabotage."

In an aside to this comment, we note that this is an oversimplification. Correctly, according to 2008 polls, only 17 percent of households know what entropy is and can give a loose definition of it, and of this percentage none cited "waste" as a description of entropy. [5] In any event, into the 2000s, the concept of "entropy waste" has since been lost in translation, particularly in ecological economics, as a way to crudly quantify the end products of production processes.

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θΔics

In economic thermodynamics, an **entropy watershed** is a hypothetical point in time when, supposedly, nonrenewable fossil fuels or the established energy source run out, disorder increases to a maximum, and a society collapses. [1]

Overview

In 1989, American economist Jeremy Rifkin was speaking of entropy watersheds, as follows: [2]

> "[a point in time in which] the particular matter-energy *base* that a society is using becomes depleted, as a result of natural forces at work or as a result of people consuming resources faster than nature can reproduce them."

The term has little substantial justification and was conceived, using a great deal of backwards logic, by American economist Jeremy Rifkin in 1980. [3] The term is based on the "material entropy" hypothesis, which argues that available fossil fuels represent low-entropy states of matter and that society, in accordance with Romanian-born American mathematician and economist Nicholas Georgescu-Roegen's fourth law of thermodynamics, will tend to use up all the fuel leaving a state of high-entropy waste and disorder.

In the correct light, "entropy" as defined by German physicist Rudolf Clausius, is the measure of the irreversible work energy that the molecules of a system due on each other in a heat engine cycle. [5] When this model is translated into the human sphere, the "matter-energy base", Rifkin refers to is the substrate on which human molecules react. [6] In this sense, the matter-energy base only effects the "activation energy" barrier to human chemical reactions, thus having an effect on the speed of human progress and evolution. In a second sense, the attraction of human molecules to different regions of the matter-energy base, can be studied using the science of surface thermodynamics, in which interactions mediate to the effect that the free energy of the system lowers.

In short, Rifkin uses the phrase entropy watershed to divide one energy era from another, such as the wood-energy era to coal-energy era transition or the oil energy era to the nuclear-energy era transition, etc. Phrased another way, an *entropy watershed* is a negatively determined transition in which a scarce resource becomes unavailable and a society is forced to switch to a different form of energy use and thus a new economic structure with corresponding social forms and values. [4] Rifkin argues that, supposedly, the "industrialized nations, and the United States in particular, are coming up against an entropy watershed" and that "we stand today at the edge of a historic entropy watershed ... as we transition from the age of nonrenewable resources to the solar age." [1]

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θΔics

In terminology, **environment** is a oft-used term synonymous with the more technical terms surroundings or thermostat, in the sense of that which is immediately outside of the boundary of the system. The term is common in ecological thermodynamics and in ecological economics. [1]

References

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θΔics

In hmolscience, **Enzo Tiezzi** (1938-) is an Italian physical chemist noted, in sociological thermodynamics, for his 1983 to 2009 publications on Prigoginean thermodynamics to ecology, evolution, and society.

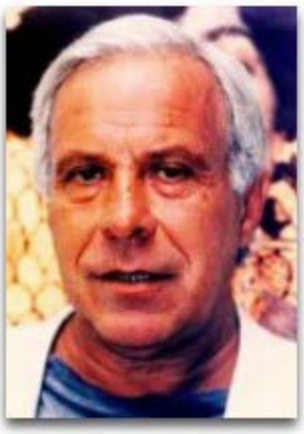

Overview

In 1983, Tiezzi, in his *The End of Time*, discussed sustainability in the context of entropy, thermodynamics, and unsustainable human behaviors, with mentions of Herman Daly and Charles Snow, it seems, as the primary references. [1]

In 1995, Tiezzi gave a talk on "Thermodynamic Analysis of Urban Systems" and "Energy Flows, Entropy, and Dissipative Structures", the latter with Nadia Marchettini. [2]

In 2005, Tiezzi one the Prigogine Medal.

In 2006, Tiezzi, in his *Steps Towards an Evolutionary Physics*, prefaced by Sven Jorgensen, applied Prigoginean thermodynamics to the study of biological evolution and society. [3]

In 2009, Tiezzi published *City Out of Chaos*, which, likewise, seems to be both themed and titled on Belgian chemist Ilya Prigogine's 1984 book *Order Out of Chaos.* [4]

Education

As an undergraduate, Tiezzi studied chemistry at Florence University. He taught at Cagliari University for four years. He worked Washington University, from 1966 to 1967, in the fields of physics and biology. Tiezzi currently is the PhD program coordinator of chemical science at the University of Siena.

References

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Further reading

â— Tiezzi, Enzo. (2003). *The Essence of Time: Volume 2* (thermodynamics, 35+ pgs). WIT Press.

External links

â— Tiezzi, Enzo – WorldCat Identies.
â— Enzo Tiezzi (faculty) – University of Siena.

θΔics

In hmolscience, **eobiont**, from the Greek *eo-* “earliest; oldest” + *-bion* “to live”, is a obsolete term (see: defunct theory of life), supposedly coined by John Bernal (c.1953) (O), meaning precursor of living things in the chemical evolution ‘preceding’ the occurrence of life. [1]

sketchy. Nevertheless it will probably seem a cocksure over-estimate of the relevance of present knowledge to anyone who reads it in thirty years' time.

* Eobiont = 'dawn organism'. Made by using the prefix *eo-*, as in the geological epoch Eocene.

A 1953 article (O), possibly written by John Bernal, wherein the term “**eobiont**” as “dawn organism”, in reference to the geological epoch “Eocene” (56 to 33.9 million years ago), was defined in footnote.

Overview

In 1953, the term “eobiont”, in connection with the views of John Bernal, was being used as follows: (O)

> “In early systems, which may be called **eobionts**,' functions may have been performed by other materials, inefficiently no doubt but well enough to get things started. ... Bernal proposes a similar role for clay. ... Eobiont = ‘dawn organism’. Made by...”

(add)

Other

Some, to note, credit the coining of “eobiont” to British biochemist and “dogmatic atheist” Norman Pirie (1907-1997); supposedly, and equivalent to Soviet biochemist Alexander Oparin’s protobiont. [2] Pirie’s coining of the term was such that he used it to designate the entire process of development from the evolution of organic out of inorganic compounds, including the production of the first protoliving creature or "eobiont”. (O)

Quotes

The following are example usage quotes:

> “One is compelled, for many reasons, to regard contemporary metabolic sequences which produce APT as derived from a common ancestor. Most authors are unanimous in maintaining that **eobionts** and primitive cells produced AT in the course of fermentation reactions.”
>
> — Ernest Schoffeniels (1973), *Anti-Chance* (pg. 37)

References

1. Eobiont – CollinsDictionary.com.
2. Anon. (1992). *The New Encyclopedia Britannica, Volume 4* (pg. 513)

θΔics

In acronyms, **EoHT**, the URL for his wiki (eoht.info), is the acronym of Encyclopedia of Human Thermodynamics, the original 2008 name for the content of works surrounding chemical thermodynamics applied to human chemical reaction theory.

Wiki

Encyclopedia of Human Thermodynamics

The **EoHT.info** website, short for "encyclopedia of human thermodynamics", is a community-style, free wiki encyclopedia of topics on human thermodynamics, the century-long study of the thermodynamical operation of human life and life in general. The wiki encyclopedia was started in December of 2007 by American chemical engineer Libb Thims and Russian physical chemist Georgi Gladyshev . As of April 2008, there were 260+ articles.

A 2008 AboutUs.org summary overview of **EoHT**.info (aka Hmolpedia). [1]

Overview

The following is a circa 2011 AllAcronyms.com image for EoHT: [2]

See also

â— Hmolpedia (reviews)

References

1. Hmolpedia (2008) – AboutUs.org.
2. EoHT (2011) – AllAcronyms.com.

θΔics

In science wikis, **EoHT (history)** refers to the pre-history, origin, and ongoing development of the encyclopedia of human thermodynamics (eoht) wiki. A short overview is outlined below.

Overview

In circa 1995, undergraduate chemical student Libb Thims, at the University of Michigan, began to wonder how the spontaneity criterion ($\Delta G < 0$) applies to the central process of society, that in which a man meets a women, they fall in love, produce a child; and entity which then begins to detach from the family household at about the fifteen-year mark; a process that 85 percent of people will go through. In the years to follow, Thims began to read up on mate section books as theorized in evolutionary psychology, in search to find a framework of understanding. The issue, however, remained a puzzle.

15-Year Puzzle

$M + F \rightarrow C$	$\Delta G < 0$
Male ***M*** and female ***F*** react yielding the product of a 15-year old child ***C***	The spontaneity criterion can be used to determines if a reaction if feasible

On the 2010 occasion of the completion of fifteen-hundredth EoHT article (John Herapath, Jul 7th), it is interesting to note, in retrospect, that this entire encyclopedia, along with the 824-page, two-volume 2007 *Human Chemistry* textbook, and the 120-page, 2008 book *The Human Molecule*, a detailed history of the concept of the 'human molecule', have purely been a product of the curious question as to how the above reaction can be explained using the above criterion, which arose as a puzzle in the mind of American chemical engineer Libb Thims, while sitting in one of his *circa* 1995 chemical engineer thermodynamics classes, at the University of Michigan, but for whatever reason, contrary to his regular practice, failing to raise his hand in class to ask the question.

On 15 Nov 2001, at 3:00 AM, while up memorizing anatomy for several hours, during a short mental break, a reading of some of British physicist Stephen Hawking's 1996 *Illustrated A Brief History of Time*, chanced Thims on the view that the entropy S of one's central nervous system will decrease during the process of eduction. With this clue, along with ideas that enthalpy H, described by Dutch physicist Heike Kamerlingh-Onnes in 1909 as 'heat content', may related to physical beauty, and that free energy G, described by American engineer Willard Gibbs in 1873 an 'available energy' to do work, the three variables related by the equation $G = H – TS$, Thims began to glimpse the view that the phenomenon of chemical reaction spontaneity may be able to explain the 'beauty-brains paradox', the observed phenomenon that beauty tends to be associated with decreased mental ability where conversely brains tend to be associated with decreased physical appearance, and that the entire average eighteen-year, on average, child production reaction, can be defined, entirely, by a free energy of the reactants in their initial state G_i, the day the two fall in love at first sight, and a free energy of the products in their final state G_f, the day the precipitate of the child detaches from the family.

At that moment, and in the weeks to follow, Thims was content that he had obtained a partial solution to the puzzle. This glimpse into the nature of the second-by-second changes in Gibbs free energy involved in the course of the process of ubiquitous conception of "love the chemical reaction", however, only opened up the door to more puzzles and various "glass walls" of conceptual difficulty, during continued investigations in the decade to follow.

Two months after this 3:00-AM insight, Thims arrived upon the view that it would be in his own interest (objective funding) as well as the public's interest (scientific revolution) if he wrote out a short presentation (article or even a short booklet) on the explication of this logic. In the four years to follow, Thims began to read-up on others to have approached this problem, such as Alfred Lotka, Erwin Schrodinger, Ilya Prigogine, Georgi Gladyshev, and Jing Chen, etc. (a group that would eventual amount to over 300+ thinkers), and to conduct research of his own to find data on various parameters involved in the problem.

In 2005, Thims began to go public with a preliminary presentation, with the launching of the website HumanThermodynamics.com and to contact, interact with, and link up with,

via email, phone calls, and meetings, the various dozens of authors, professors, and researchers on the bulk topic of applying thermodynamics to the explication of human activity.

In the course of the writing of the various webpages of HT.com site, various terms, such as 'human molecule' or 'Gibbs free energy', needed either Java script mouse-over pop-up definitions (as some sites used at the time) or hyperlink-to-page definitions. Initially, Thims mainly used the newly launched Wikipedia (2001) to fill this gap, eventually joining on as Wikipedian, owing to the fact that during the course of key-term-hyperlinking to Wikipedia articles, he was forced to join so as to correct the numerous errors he found in those articles; during which period (2005-2007), as a Wikipedia editor, he started over 180 articles and uploaded over 42 images.

The **index** to the A-Z pages of the HumanThermodynamics.com glossary of terms (click picture), which culminated in the writing of 87 terms (shown above). [1] The HT Glossary + Wikipedia experience was a precursor to the launching of the EoHT wiki.

Articles for key terms that he could not find in Wikipedia, however, were anchor-linked to paragraph definitions listed the A-Z pages of small glossary of terms, found on the HumanThermodynamics.com website, which culminated in the writing of 87 terms (adjacent). [8] During the writing of these Glossary terms, wherein the slow inefficiency of the of the process setting up each webpage, adding anchor links, linking each anchor link to a second index hyperlink, etc., compared to the ease of use of page creation at Wikipedia, led to the view that a wiki-style human thermodynamics glossary would be needed.

The transition from the idea stage to the startup stage resulted, following a period of several months of difficulty at Wikipedia in attempts to start three articles there: human thermodynamics, human chemistry, and human molecule (still topics not permissible at Wikipedia); owing to numerous community 'consensus' objections, too many to list; after which this site was launched, on 24 Dec 2007 with the writing of three articles: Sadi Carnot, human thermodynamics, and human chemistry.

The essential problem is that Wikipedia is a geared towards articles primarily on only mainstream topics. Attempts to write articles on rare terms and concepts will quickly be deleted at Wikipedia. This wiki was launched, essentially, to fill in that gap, by actively writing on rare terms, such as inverse entropy, or obscure people such as Andre Lalande, or bulk subjects, such as the twelve schools of thermodynamics, without having regard to whether the term, person, or subject is "notable" (meaning requisite to having its own article page) according to Wikipedia standards or if there is some sort of "conflict of interest" in regards to having an expert write on the topic of their expertise. [2] Each topic is thus given a detailed in-depth examination.

American engineer Libb Thims and Russian physical chemist Georgi Gladyshev during a 16 Dec 2007 meeting in Chicago.

Since its launching, the EoHT wiki has been used, essentially, as an online niche encyclopedia, a referenced file cabinet of sorts, for the mental storage of the key terms, topics, biographies, anecdotes, and equations, etc., germane to the subject of human thermodynamics in particular, thermodynamics in general, and those subjects being connective to the former, namely human chemistry and human physics, acting sort of like a niche topic Wikipedia. The main purpose of the encyclopedia, tentatively speaking, is to serve as a general framework of connective terms, topics, and people for the backbone of a possible future college teaching textbook on the subject of human thermodynamics. A prerequisite to this attempt, however, is a completed mastery of the works of Clausius, Gibbs, and Lewis, which has not yet been done by anyone. In the mean time, step-by-step additions to this site serve as growing template towards the completion of this potential task, by someone in the future.

The site's first member (joined: Dec 31) was Russian physical chemist Georgi Gladyshev, author of the famous 1978 article "On the Thermodynamics of Biological Evolution" and the follow-up 1997 book *Thermodynamic Theory of the Evolution of Living Beings*, whom Thims had been in weekly-monthly discussion with since 2005 in consultation and exchange of ideas in the peer-review of the writing of Thims various books and manuscripts.

Many notable people (and nearly two dozen college professors and teachers) have since joined, including: French physicist Pierre Perrot author of the 1998 *A to Z of Thermodynamics*, Chinese-born Canadian mathematician Jing Chen, author of the 2005 *The Physical Foundation of Economics: an Analytical Thermodynamic Theory*, and German physicist Ingo Muller, author of the 2007 *A History of Thermodynamics*, the first attempt at a full history of thermodynamics, among numerous other authors and intellectuals. The 100th member of the site, user:å·©æ–¹å»º, joined on July 19th, 2010, and the 1,500th article, John Herapath, was written on July 07th 2010. The site has since been used as a lecture teaching tool in various college engineering classes.

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1. Glossary – HumanThermodynamics.com.
2. (a) Wikipedia:Notability – Wikipedia.
(b) Wikipedia:Conflict of interest – Wikipedia.

θΔics

In the **EoHT wiki** this **Cover** page discusses the possibility of printing of the EoHT as a 5-volume set (~2,500-pages). The first draft cover, for the possible hardcover casewrap printing of the encyclopedia, in *circa* 2010 or later, is pictured adjacent. The first draft cover was made on 04 April 2008 by Libb Thims. The article pages are being written one at a time online via the wiki. Please post comments or suggestions below the photo or in the bottom threads.

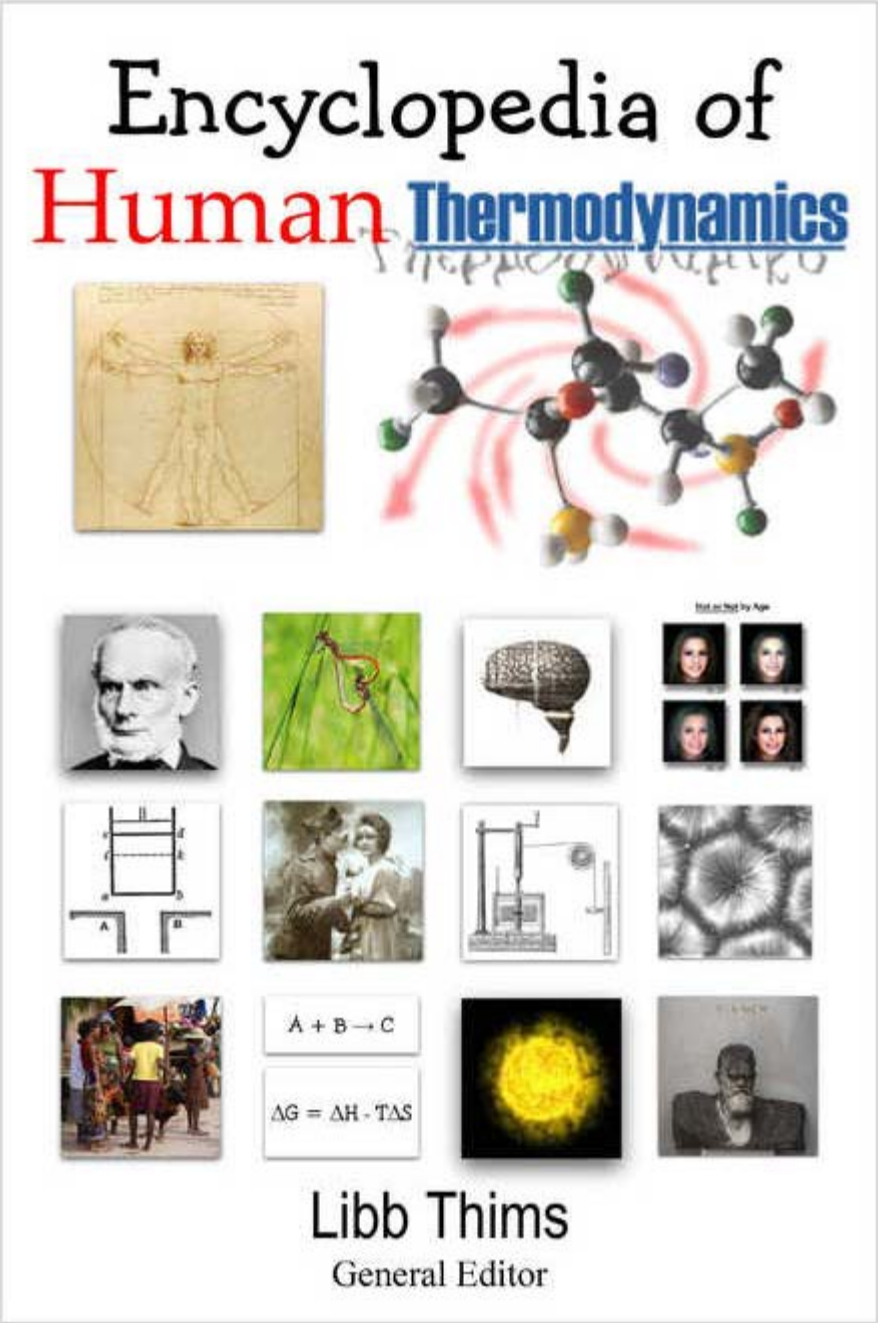

Need to print the encyclopedia

The general drive or force to print the encyclopedia results according to the following logic:

(a) Their exists the general urge or intuition to have a backup stored copy of the EoHT wiki website (in case of system crash).
(b) The Wetpaint site allows site creators to "back up" the contents of this wiki by exporting the pages as HTML into a zip file (to down load to a computer), but it doesn't back up the images.
(c) With this in mind, a stored file of HTML code, seems good but messy if it were to be reloaded somewhere?
(d) Hence, the next logical step would be for Thims to copy the site, page-by-page, onto a word document, for safety's sake.
(e) If this were to be done, it then wouldn't be that much more work to edit the file, make a PDF file of it, and then print it with an ISBN for Amazon and global distribution (or at least so to have one hardcover copy on Thims' bookshelf).
(f) Beyond this, knowing the volatility of webpages, so the knowledge will be preserved for future generations, i.e. the books will be in circulation for others to read, study, and build on, in 100-years or more from now.

Publisher

The publisher at present will be LuLu, as they are quick, affordable, simple to use, and have excellent quality text-book style hardcovers (no dust-jacket). A second choice might be to find a seasoned science encyclopedia publisher, e.g. McGraw-Hill.

Costs

The costs for the the ISBN fees, printing costs, advertising, etc., will be paid by Libb Thims.

Price

As to retail price, most scientific encyclopedias cost between $500 to the $12,000 dollar range (examples below). To note, there seems to be only two other "thermodynamics" type encyclopedias published (or available):

A few other comparative examples are below:

- The 620-page, 1-volume 2002 *Encyclopedia of Thermodynamics and Electrified Interfaces* is $505 dollars (or $0.81/page).
- The 1,744-page, 2-volume, 2004 *Encyclopedia of Supramolecular Chemistry* is $540 dollars (or $0.32/page).
- The 3,000-page, 4-volume, 2004 *Encyclopedia of Biological Chemistry* is $1,385 (or $0.46/page).
- The 5,373-page, 6-volume, 2004 *Encyclopedia of Energy* is $2,395 dollars (or $0.45/page).
- The 10,370-page, 11-volume, 2009 *Encyclopedia of Complexity and Systems Science* is $5,699 dollars (or $0.55/page) print or $7,124 (or $0.69/page) print + eReference.
- The 14,344-page, 15-volume, 2001 *Encyclopedia of Analytical Chemistry* is $11,860 dollars (or $0.82/page).

Page length

Possibly the EoHT will fall in 1,000-3,000 page range (being that the wiki is near to passing the 1,000 mark). An idea would be to print the first edition after the biographies, theories, terms, etc., of the top-200 human thermodynamic pioneers are found and written or after the first 1,000 wiki pages are written?

Proceeds

As to potential proceeds, the basic goal will be to (a) pay for the cost of the EoHT wiki, (b) buy more human thermodynamics books, to further the growth of the EoHT wiki, and (c) pay for printing costs. A possibly residual idea, assuming funds are available, would be to donate a number of copies to libraries and schools.

θΔics

In geniuses, **epicenter genius** (IQ_{avg}:210) is a thinker whose intellectual output is so bright that he or she attracts a circle of surrounding geniuses, and the effect of the aggregation acts to increase the brightness, and in this sense, in analogy to the description of earthquakes, becomes an "epicenter" or the part of the earth's surface directly above the focus of an earthquake.

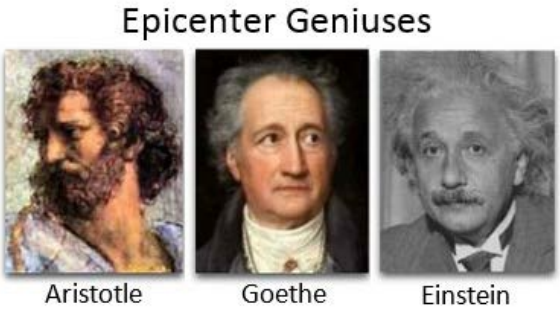

The three main **epicenter geniuses**, each depicted below surrounded by a large group of geniuses: Aristotle at the School of Athens (c.350BC), Goethe at Weimar (1803), and Einstein at the Solvay Conference (1927).

> "At the 1927 Solvay conference—which was to become a landmark in physics—Einstein was the uncrowned king of physics. At the **epicentre**, of the debates about quantum theory, were Bohr and Einstein's disagreements about Heisenberg's uncertainty principle, which Bohr defended successfully against Einstein's repeated onslaughts."
>
> — Graham Farmelo (2009) [9]

The following "genius epochs" statement by American reserve energy theory psychologist William James, from his 1880 lecture "Great Men and their Environment", given to the Harvard Natural History Society, might well capture the idea of the epicenter genius: [1]

> "Sporadic great men come everywhere. But for a community to get vibrating through and through with intensely active life, many geniuses coming together and in rapid succession are required. This is why great epochs are so rare, - why the sudden bloom of a Greece [Aristotle], an early Rome [Cicero], a Renaissance [Goethe], is such a mystery. Blow must follow blow so fast that no cooling can occur in the intervals. Then the mass of the nation glows incandescent, and may continue to glow by pure inertia long after the originators of its internal movement have passed away. We often hear surprise expressed that in these high tides of human affairs not only the people should be filled with stronger life, but that individual geniuses should seem so exceptionally abundant. This mystery is just about as deep as the time-honored conundrum as to why great rivers flow by great towns. It is true that great public fermentations awaken and adopt many geniuses who in more torpid times would have had no chance to work. But over and above this there must be an exceptional **concourse of genius** about a time, to make the fermentation begin at all. The unlikeliness of the concourse is far greater than the unlikeliness of any particular genius; hence the rarity of these periods and the exceptional aspect which they always wear."

An epoch genius, or epicenter genius, is a hammered genius, one that depends on concourse, forged into hardened shape by concourse other geniuses.

Historically, as represented in classical artistic depiction, as shown below, there have been three dominate epicenter geniuses: Aristotle (IQ=195), Goethe (IQ=230), and Einstein (IQ=220). With the inclusion of Voltaire (IQ=195), shown below, Café Procope (circa 1750), at a genius center, this yields and IQ_{avg} of 210 for an epicenter genius.

Aristotle's circle

The following is a depiction of epicenter genius Greek physicist-philosopher Aristotle (#15) and his circle in circa 350BC:

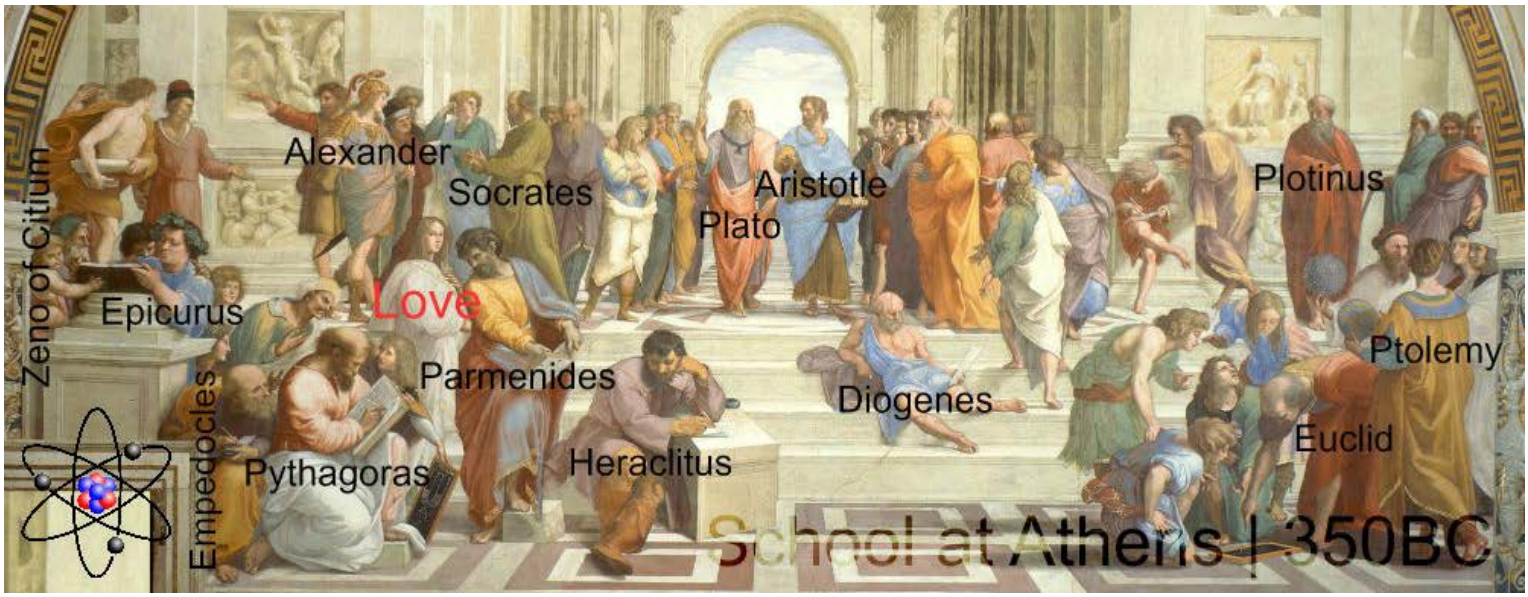

A vivid depiction of the School in Athens, Greece, circa 350BC, drawn by Italian painter Raphael (1510) (IQ=170), giving a well-imaged viewing of Aristotle's erudite intellectual circle: 1: Zeno of Citium 2: Epicurus 3: unknown 4: Boethius or Anaximander or Empedocles? 5: Averroes 6: Pythagoras 7: Alcibiades or Alexander the Great (IQ=180)? 8: Antisthenes or Xenophon or Timon? 9: unknown or the Fornarina as a personification of Love or (Francesco Maria della Rovere?) 10: Aeschines or Xenophon? 11: Parmenides? 12: Socrates (IQ=160) 13: Heraclitus (Michelangelo (IQ=180)) 14: Plato (IQ=180) (Leonardo da Vinci (IQ=205)) 15: Aristotle (**IQ=190**) 16: Diogenes 17: Plotinus (Donatello?) 18: Euclid (IQ=185) or Archimedes (IQ=190) with students (Bramante?) 19: Zoroaster 20: Ptolemy? R: Apelles (Raphael) 21: Protogenes (Il Sodoma, Perugino, or Timoteo Viti).

The following is closeup the of the lower left section, depicting the Heraclitus vs Parmenides debate, showing: Epicurus, representative of the atomic theory

view, Pythagoras, representative of the mathematical geometrical view, Parmenides, representative of the immovable being view, Heraclitus, representative of the flux, fire, and eternal change view of nature, amid an unnamed woman, said to be representative of "love", who glares out of the scene, in a strikingly peculiar way, that draws one's attention::

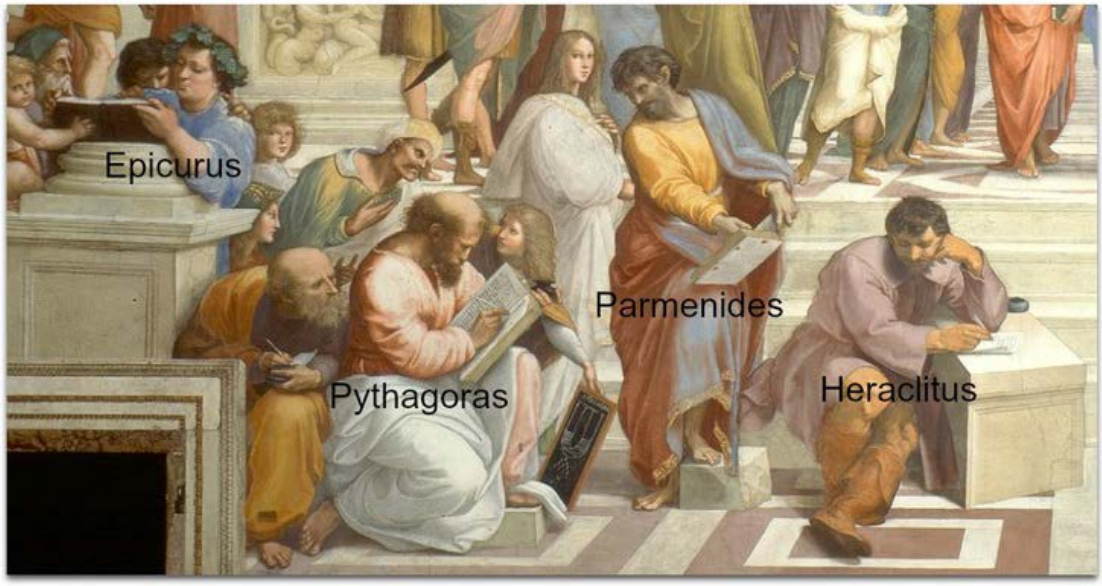

Galileo's circle

Italian physicist Galileo Galilei (IQ=200) might well be classified as an epicenter genius, who had in his immediate communication circle and number of thinkers, such as: Francesco Sagredo, Giovanni Baliani, Evangelista Torricelli, and an aftermath of a number of people affected by his experiments and influence, Blaise Pascal along with Pierre Petit, to name two.

Italian physicist Galileo Galilei, who might be classified as an **epicenter genius**, shown giving physics and astronomy lessons to the senate of Venice.

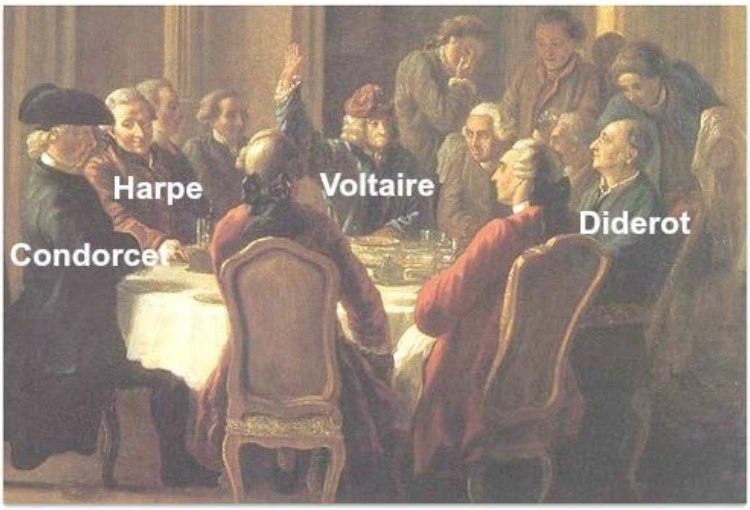

At Café Procope (circa 1750): at rear, from left to right: Marquis Condorcet (IQ=180), Jean-Francois de La Harpe, Voltaire (IQ=195), with his arm raised, and Denis Diderot (IQ=165). [4]

Voltaire's circle

As to whether or not French philosopher, scientist, and writer Voltaire (1694-1778) (IQ=195) can be classified as an "epicenter genius", he was ranked by Catherine Cox with an IQ of 200 and he did have a rather large and impressive circle, as what some have classified as "Voltaire's circle", such as depicted adjacent, at the famous Café Procope (circa 1750): at rear, from left to right: Marquis Condorcet (IQ=180), Jean-Francois de La Harpe, Voltaire (IQ=195), with his arm raised, and Denis Diderot (IQ=165)—one of the locations of the "age of enlightenment" beginnings, at which Voltaire is said to have drank forty cups of coffee a day, mixing it with chocolate. [5]

Voltaire's circle had connections and homes in France, from which he was banished from in 1726 (and again in 1834), England, where he occupied himself mainly with mathematics and made himself familiar with the philosophy of Newton, and Leiden University, Netherlands, the home to the original heat experiments school of thermodynamics, where he studied the experimental works of Boerhaave and Gravesande.

Other encyclopedists met at Café Procope, including: did Benjamin Franklin, John Paul Jones, and Thomas Jefferson. [5]

French mathematician Marquis de Condorcet (IQ=180) is described as "one of the philosophers of Voltaire's circle." [2]

In 1734, following his second banishment from France, at the invitation of a highly-intelligent woman friend, Emilie Chatelet (IQ=190), the so-called "smartest woman ever", Voltaire moved into her "Chateau de Cirey" near Luneville in eastern France. They studied the natural sciences together for several years. She became the mistress of Voltaire, who commented on her in retrospect: "in 1733, I met a young lady who happen to think nearly as I did."

Voltaire began a correspondence with Frederick the Great in August 1736. Frederick greatly admired Voltaire and invited him to come to Prussia many times; the invitation did not include Emilie. Frederick and Emilie did not like each other—both were competing for Voltaire. After Emilie's end, Frederick offered Voltaire the position of Chamberlain and 20,000 francs a year if he would come to Prussia. Voltaire accepted and spent three years at Frederick's court from

1750 to 1753. The materialist philosopher Baron d'Holbach was defined as being "one member of Voltaire's circle". [3]

In 1777, a year before his end, he visited French philosopher Jean Sales (IQ=190), the initiator of the human molecular hypothesis, and gave 500 pounds to towards his release.

Franklin | Madison

The following shows the depiction of the famous 1789 signing of the Constitution of the United States, centered around Benjamin Franklin and James Madison, the father of the constitution, said to have used his Princeton social physics training and ideas to formulate a Newtonian government:

Goethe's circle

See main: Goethe's circle

The following is a depiction of epicenter genius German polymath Johann Goethe (read dinner jacket, standing center) and his circle in 1803:

A vivid depiction of Weimar, Germany, in 1803, drawn by German painter Otto Knille (1884), giving a well-imaged viewing of Goethe's erudite intellectual circle: Johann Schlosser, Georg Hegel, Johann Fichte, Jean Paul, Ludwig Tieck, Wilhelm Humboldt, Alexander Humboldt, Friedrich Schleiermacher, Carl Gauss, who knew all of Goethe's poetry works, August Schlegel, Friedrich Klinger (KUnger), Peter Cornelius, Heinrich Kleist, Johann Pestalozzi seated left red jacket hunched over, who affixed Goethe with the title "prince of the mind", Barthold Niebuhr, Johann Herder, in whom in 1784 Goethe first confided his discovery of evidence for human evolution from lower animals, Johann Gleim, Lorenz Oken, Johann Voss, Johann Blumenbach, Friedrich Klopstock — and Goethe —the big dog, standing at the center of attention—followed by Christoph Wieland, seated right front, who in 1810 called Goethe's self-defined greatest theory "childish nonsense and fooling around", August Iffland—and last but not least Friedrich Schiller — Goethe's closest intellectual friend — in whom, in 1796, he first confided his newly-forming human elective affinities theory—and a bench mark for the launching of the science of human chemistry and in effect the seeds to the newly-forming overly-complex 21st century science of human chemical thermodynamics (see: human free energy theorists).

(add discussion)

Clausius circle | Boltzmann circle

Shown below is the connectivity diagram of the twelve founding schools of thermodynamics, showing that Rudolf Clausius, having the most nodal connections (nine), might be an **epicenter genius**:

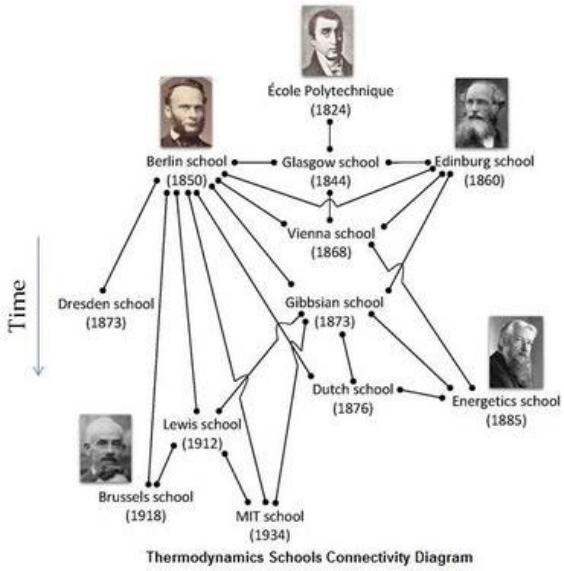

An 1887 group photo (Ñº), showing (standing, from the left): Walther Nernst, Heinrich Streintz, Svante Arrhenius, Hiecke, and (sitting, from the left): Aulinger, Albert von Ettingshausen, Ludwig Boltzmann (seated at middle), head of the Vienna school, who can be considered a type of **epicenter genius** (though Clausius, not shown, is the main genius of the thermodynamics network), Ignacij Klemencic, Hausmanninger.

It may also be cogently argued that both Maxwell (IQ=210), leader of the Edinburg school of thermodynamics (four nodal points) and Clausius (IQ=205), central founder of the Berlin school of thermodynamics—the biggest of the thermodynamic schools (nine nodal points), were epicenter geniuses, but artistic representation of this view, nodal diagram aside, seems to be lacking.

Einstein's circle

The start of German-born American physicist Albert Einstein's rise to "epicenter genius" seems to have found its seed in his 1902 two-person, turned three-person "Olympia Academy". Specifically, sometime in 1902, Einstein, having recently graduated (1900) from the Ecole Polytechnique of Zurich, with a degree in mathematical physics, and working for a minimal wage at the Berne Patent Office, put an advertisement in the paper offering to teach physics as a private tutor at so much an hour.

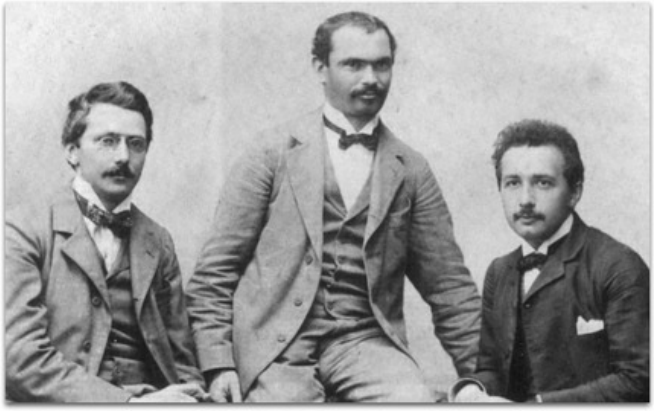

Conrad Habicht (left), Maurice Solovine (center), and Albert Einstein (right), *circa* 1902-1903, at one of their Olympia Academy meetings, during which time they read Karl Pearson's 1900 *The Grammar of Science*, with its superluminal Filon-Pearson demon note. [6]

Shortly thereafter, Rumanian college student Maurice Solovine (1875-1958), shown seated center, adjacent photo, who was studying a mixture of subjects at Berne University, including literature, philosophy, Greek, mathematics, and geology, became Einstein's first tutor pupil. The two men struck up a close relationship and Einstein was to say to Solovine a few days after meeting him:

"It is not necessary to give you lessons in physics, the discussion about the problems which we face in physics today is much more interesting; simply come to me when you wish, I am pleased to be able to talk to you."

On the third visit, Solovine suggested that they should read some of the standard works and discuss the problems they presented. Einstein then proposed they start with Karl Pearson's 1900 *The Grammar of Science*.

This was followed by John Stuart Mill's (IQ=185) *A System of Logic*, David Hume's (IQ=180) *Treatise on Human Nature*, Benedict Spinoza's (IQ=175) *Ethics*, Ernst Mach's (IQ=?) *Analysis of Sensations*, Henri Poincare's (IQ=195) *Science and Hypothesis*, the work of Bernhard Riemann (IQ=?), whose non-Euclidean geometry was utilized in Einstein's development of his 1916 general theory of relativity, along with literary works, such as Miguel de Cervantes's (IQ=155) *Don Quixote*. At some point along the line, Conrad Habicht (1876-1958), Einstein's old friend from Zurich, who had recently arrived in Berne to continue his mathematical studies, joined the study group. [7] The three formed a weekly discussion group that eventually came to be known as the Olympia Academy. [7]

Twenty-five years later, Einstein's three person intellectual social club, amassed into the following expanded global circle of intellectuals, showing Einstein seated center front at the 1927 Solvay conference, giving a well-earned depiction of him as an "epicenter genius":

The iconic group photograph of the 1927 Solvay conference, in Brussels, Belgium, giving a well-imaged viewing of Einstein's erudite intellectual circle: back row: Auguste Piccard, Emile Henriot, Paul Ehrenfest, Edouard Herzen, Theophile de Donder, Erwin Schrödinger (IQ=190), Jules Verschaffelt, Wolfgang Pauli, Werner Heisenberg (IQ=180), Ralph Fowler, Leon Brillouin; middle row: Peter Debye, Martin Knudsen, William Bragg, Hendrik Kramers, Paul Dirac, Arthur Compton, Louis de Broglie, Max Born, Niels Bohr (IQ=185); front row: Irving Langmuir, Max Planck (IQ=190), Marie Curie (IQ=185), Hendrik Lorentz—and at center front, Albert Einstein (**IQ=220**), intellectual protégé of Goethe—seated next to Paul Langevin, Charles Guye, Charles Wilson, and Owen Richardson.

Thims circle

In 2012, Belgian philosopher David Bossens, suggestively joked, in a thread post, after reading the above page, whether jokingly or not, that American electrochemical engineer Libb Thims be ranked as an "epicenter genius" (see: Libb Thims (genius ranking)), with him in the center, surrounded by other hmolpedias; the following photo, from the 2013 University of Pitesti Econophysics and Sociophysics Workshop, might give a glimpse into the future:

An after workshop group photo of some of the speakers at UPESW 5 (29 Jun 2013): Libb Thims (center), wearing Hu element golf shirt, Constantin Bratianu (Thims' right), Daniel Pele (Thims' back right), Mircea Gligor (Thims' back left), and seated in front left to right: Ion Siman and Gheorghe Savoiu, all noted members of the Romanian school of physical socioeconomics.

(add discussion)

Quotes

The following are related quotes:

> “People behave as if Einstein is the sun around which all wisdom revolves around like planets.”
>
> — Monydit Malieth (2013), *The Future Affects the Past* [10]

References

1. (a) James, William. (1880). “Great Men and Their Environment”, Lecture before the Harvard Natural History Society; in: *Atlantic Monthly*, 1880, Oct.; in *The Will to Believe and Other Essays in Popular Philosophy, and Human Immortality* (§: Great Men and their Environment, pgs. 105-22; quote, pg. 118). Digireads.com Publishing, 2010.
(b) Quotations on Genius – TheAbsolute.net.
2. Schaeffer, Francis A. (2005). *How Should We Then Live?: the Rise and Decline of Western Thought and Culture* (pg. 121). Crossway.
3. Baron d’Holbach – Wikipedia.
4. Age of Enlightenment – Wikipedia.
5. Café Procope – Wikipedia.
6. Maurice Solovine – Wikipedia.
7. Clark, Ronald W. (1984). *Einstein: the Life and Times* (pgs. 78-79). Harper Collins.
8. Olympia Academy – Wikipedia.
9. Farmelo, Graham. (2009). *The Strangest Man: the Hidden Life of Paul Dirac, Mystic of the Atom* (pg. 136-37). Basic Books.
10. Malieth, Monydit (aka Tonnerre). (2013). *The Future Affects the Past: What Destination is Time Rushing To?* (pg. 60). Red Lead Books.

θΔics

In existographies, **Epictetus** (55-135AD) (IQ:170|#349) (Cattell 1000:856) [RGM:411|1,320+] was a Greek stoicism philosopher, noted for []

Stoicism

Epictetus is often read in parallel with Marcus Aurelius' *Meditations*, to get the best synopsis of stoicism. [1]

Silent historian problem | Jesus?

> *See main: Silent historians problem*

Epicetetus, a noted intellectual influence to Origen and Godfrey Higgins, who was a secretary to Nero, from circa 54 to 68AD, is someone who should have known the famed "Jesus", if he had existed, but did not. The main resurrected god of Nero, such as famously depicted at the Dendera Temple (c.68AD), however, was Osiris (not Jesus), on the walls of which Nero is seen placating Osiris and Isis, in the presence of child god Ihy, son of Hathor and Horus. [2] Epictetus doesn't write about any Jesus Christ or any Jesus of Nazareth; latter commentators, e.g. Elizabeth Carter in her "The Moral Discourses of Epictetus" (1910) (Ñº) , argue that much of what we now call the moral philosophy of Jesus was stylize on that of Epictetus; Thomas Jefferson, who thinks Jesus thinks was real, also puts the teaching of Epictetus in the same category of Jesus.

Quotes | On

The following are quotes on Epictetus:

> "As you say of yourself, I too am an Epicurian. I consider the genuine (not the imputed) doctrines of Epicurus as containing everything rational in moral philosophy which Greece and Rome have left us. **Epictetus** indeed, has given us what was good of the stoics; all beyond, of their dogmas, being hypocrisy and grimace. Their great crime was in their calumnies of Epicurus and misrepresentations of his doctrines; in which we lament to see the candid character of Cicero engaging as an accomplice. Diffuse, vapid, rhetorical, but enchanting. His prototype Plato, eloquent as himself, dealing out mysticisms incomprehensible to the human mind, has been deified by certain sects usurping the name of Christians; because, in his foggy conceptions, they found a basis of impenetrable darkness whereon to rear fabrications as delirious, of their own invention. These they fathered blasphemously on him whom they claimed as their founder, but who would disclaim them with the indignation which their caricatures of his religion so justly excite.
>
> **Epictetus** and Epicurus give laws for governing ourselves, Jesus a supplement of the duties and charities we owe to others. The establishment of the innocent and genuine character of this benevolent moralist, and the rescuing it from the imputation of imposture, which has resulted from artificial systems [N1], invented by ultra-Christian sects, unauthorized by a single word ever uttered by him, is a most desirable object, and one to which Priestley has successfully devoted his labors and learning. It would in time, it is to be hoped, effect a quiet euthanasia of the heresies of bigotry and fanaticism which have so long triumphed over human reason, and so generally and deeply afflicted mankind; but this work is to be begun by winnowing the grain from the chaff of the historians of his life.
>
> I have sometimes thought of translating Epictetus (for he has never been tolerable translated into English) by adding the genuine doctrines of Epicurus from the *Syntagma* of Gassendi, and an abstract from the Evangelists of whatever has the stamp of the eloquence and fine imagination of Jesus. The last I attempted too hastily some twelve or fifteen years ago. It was the work of two or three nights only, at Washington, after getting through the evening task of reading the letters and papers of the day. But with one foot in the grave, these are now idle projects for me. My business is to beguile the wearisomeness of declining life, as I endeavor to do, by the delights of classical reading and of mathematical truths, and by the consolations of a sound philosophy, equally indifferent to hope and fear."

— Thomas Jefferson (1819), “Letter to William Short”, Oct 31 [3]

Quotes | By

The following are quotes by Epictetus:

> “But where are you going? It cannot be to a place of suffering: you will only return to the place from whence you came; **you are about to be again peaceably associated with the elements from whence you are derived**. That which in your composition is of the nature of fire, will return to the element of fire; that which is of the nature of earth, will rejoin itself to the earth; that which is air, will reunite itself with air; that which is water, will resolve itself into water; there is no Hell, no Acheron, no Cocytus, no Phlegethon.”
>
> — Epictetus (c.120AD), *Publication*; cited by Baron d’Holbach (1770) in *The System of Nature* [4]

> “The hour of death approaches; but do not aggravate your evil, nor render things worse than they are: represent them to yourself under their true point of view. The time is come when the materials of which you are composed, go, to resolve themselves into the elements from whence they were originally borrowed. What is there that is terrible or grievous in that? Is there any thing in the world, that perishes totally?”
>
> — Epictetus (c.120AD), *Publication*; cited by Baron d’Holbach (1770) in *The System of Nature* [5]

> “It's not what happens to you, but how you react to it that matters.”
>
> — Epictetus (c.120AD)

-

> “As a mark is not set up for the purpose of missing, so neither does the nature of evil exist in the universe.”
>
> — Epictetus (c.120AD), cited by Alice Zimmern (1887) in “Introduction” to Marcus Aurelius’ *Mediations* (pgs. 14-15) in the context to Aurelius’ views on the evil [6]

-

> “Epicurus was a foul-mouth bastard.”
>
> — Epictetus (c.120AD), *Publication*; cited by Diogenes Laertius (c.230AD) in *Lives and Opinions of Eminent Philosophers* (§10.6); as translated (1963) by George Strodach [7]; note: seems to be a more aggressive translation as, say, compare to Robert Hicks (1925) translation

References

1. Epictetus. (c.120AD). *The Manual: a Philosopher’s Guide to Life* (translator: Sam Torode). Publisher, 2017.
2. (a) Paulkovich, Michael. (2013). *No Meek Messiah*. Publisher.
(b) Paulkovich, Michael B. (2014). “God on Trial: The Fable of the Christ” (Ñº), *Free Inquiry*, 34(5).
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4. (a) Epictetus. (c.120AD). *Publication; See Arrian. in Epictet.* (*lib.* iii. *cap.* 13). Publisher.
(b) Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (pg. 130). J.P. Mendum, 1889.
5. (a) Epictetus. (c.120AD). *Publication; See Arrian* (*lib.* Iv cap 7 §1). Publisher.
(b) Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot;

translator: H.D. Robinson) (pg. 130). J.P. Mendum, 1889.
6. Aurelius, Marcus. (167AD). *Meditations* (translator: George Long; Introduction: Alice Zimmern). Publisher, 1887; DigiReads, 2015.
7. Strodach, George. (1963). *Epicurus: the Art of Happiness* (pg. 81). Penguin.

External links

â— Epictetus – Wikipedia.

θΔics

In hmolscience, **Epicurean atheism**, aka Epicureanism, is belief system, devoid of belief in god, buy instead based on the atomic theory centric teachings of Epicurus, generally the belief that all that exists is atoms moving in a void, whereby god is replaced by chance, free will is allowed per belief that atoms of the soul have a special swerving property called "clinamen" (Q), and wherein purpose is aimed at satisfying pleasures while avoiding pain, generally speaking. I1]

See also

- Atheism terminology
- Atheism types by denial and belief
- Atheism types

References

1. (a) Spizelius, Theophilus. (1666). *Radical Atheism* (1666) (Q)(Q). Publisher.
(b) Kors, Alan C. (2014). *Atheism in France, 1650-1729, Volume I: the Orthodox Sources of Disbelief* (pg. 162). Princeton University Press.

θΔics

In hmolscience, **Epicurean swerve** (257 GB hits), ‘Lucretian swerve’ (215 GB hits) or clinamen from the Latin *clīnāre* ‘to incline’, is an atomic theory based logic, espoused by Epicurus (307BC), in his Epicurean philosophy, or "Epicureanism", a choice flow chart of which is shown below: [5]

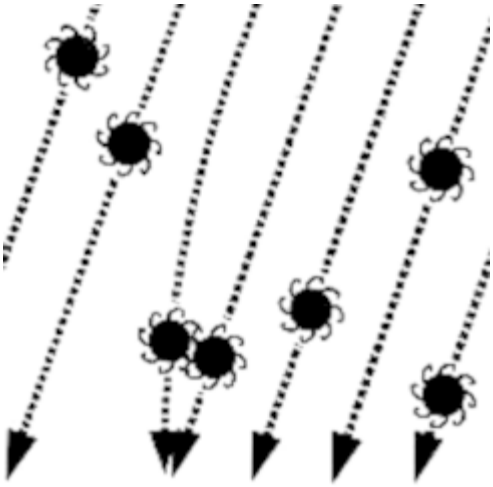

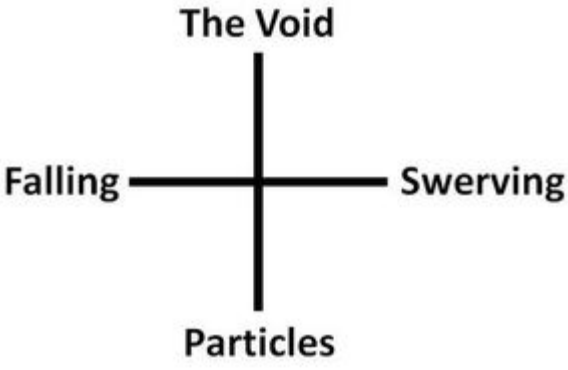

Left: an artistic reconstruction (Q) of clinamen or **‘atomic swerve’**, which Epicurus used as an ontic opening loophole to insert free will choice theory into Democritean determinism. Right: another take (Q) on Epicurean swerve theory.

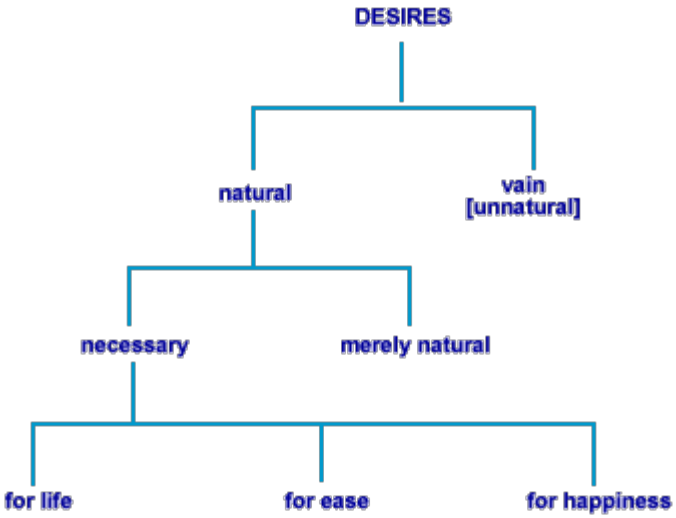

as told by Lucretius (55BC), that "pleasure" is the greatest good, and that the way to attain such pleasure is to “choose” to live modestly and to gain knowledge of the workings of the world and the limits of one's desires, but that in order for humans, as atomic-void structures, to have the so-called ability to freely ‘choose’ the greatest good, in a physically predetermined atomic motion universe, the atoms of the soul (or mind), yielding the property of *animus* or *anima*, are ‘tiny bodies, round and quick to roll’, with the peculiar property that they ‘swerve’ unpredictably, which gives people the property of freedom of the will or the power (see also: will to power) to wrest with fate in forward movement. [1] As explained by Lucretius, gist of the explanation, written in poetical-like philosophy terms, is as follows: (Q)

> “Again, if ev'r all motions are co-linked,
> And from the old ever arise the new
> In fixed order, and primordial seeds [atoms]
> Produce not by their **swerving** some new start
> Of motion to sunder the covenants of fate,
> That cause succeed not cause from everlasting,
> Whence this free will for creatures o'er the lands,
> Whence is it wrested from the fates,—this will
> Whereby we step right forward where desire
> Leads each man on, whereby the same we **swerve**

In motions, not as at some fixed time,
Nor at some fixed line of space, but where
The mind itself has urged? For out of doubt
In these affairs 'tis each man's will itself
That gives the start, and hence throughout our limbs
Incipient motions are diffused"

American organic chemist George Scott explains the Epicurean swerve theory as follows: [2]

> "Lucretius had two similar words, 'animus' and 'anima' which he identified with mind and soul and they sometimes create confusion. However, since Epicureans are materialists, they believe that for animus or anima to be real, they must be made of atoms and they must be located somewhere. Lucretius believed they form a union centered, not in the brain, but in the breast, though part of the soul moves throughout the body. Because thoughts and feelings move quickly, and because no change in form or weight is observed upon death, atoms of the soul and mind must be 'tiny bodies, round and quick to roll'.
>
> This is all well and good so far as the speed and location of thought, feeling, and life itself are concerned. However, if no thing is real but atoms in a void, what difference does the mind or soul make to free will and what do they contribute to survival? How can an Epicurean choose the correct Epicurean way of life if the atomic motions of the mind and soul are mathematically predestined from the eternal past?"

Said another way: [3]

> "Epicurus for the most part follows Democritean atomism but differs in proclaiming the *clinamen* (swerve or declination). Imagining atoms to be moving under an external force, Epicurus conceives an occasional atom 'swerving' for reasons peculiar to itself i.e. not by external compulsion but by 'free will'. In this his view absolutely opposes Democritean determinism as well as developed Stoicism. Otherwise he conceives of atoms as does Democritus – in that they have position, number and shape. To Democritus' differentiating criteria Epicurus adds 'weight' but maintains Democritus' view that atoms are necessarily indivisible and hence possess no demonstrable *internal* space."

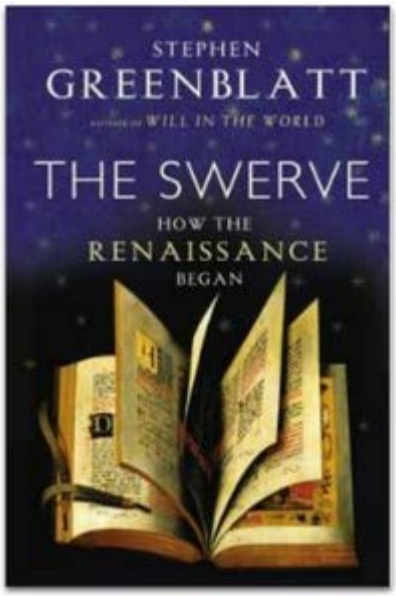

American historian Stephen Greenblatt, in his 2011 *The Swerve*, wherein he argues that Epicurus' **swerve theory** revival launched the renaissance. [4]

Discussion

American historian Stephen Greenblatt, in his 2011 *The Swerve: How the Renaissance Began*, seems to credit the start of the renaissance to the discovery of Epicurean swerve theory, via discovery Lucretius' *On the Nature of Things*, the abstract of which is as follows: [4]

> "One of the world's most celebrated scholars, Stephen Greenblatt has crafted both an innovative work of history and a thrilling story of discovery, in which one manuscript, plucked from a thousand years of neglect, changed the course of human thought and made possible the world as we know it. Nearly six hundred years ago, a short, genial, cannily alert man [Poggio Bracciolini] in his late thirties took a very old manuscript off a library shelf, saw with excitement what he had discovered, and ordered that it be copied. That book was [known at that time] the last surviving manuscript of an ancient Roman philosophical epic, *On the Nature of Things*, by Lucretius a beautiful poem of the most dangerous ideas: that the universe functioned without the aid of gods, that religious fear was damaging to human life, and that matter was made up of very small particles in eternal motion, colliding and swerving in new

directions. The copying and translation of this ancient book-the greatest discovery of the greatest book-hunter of his age-fueled the Renaissance, inspiring artists such as Botticelli and thinkers such as Giordano Bruno; shaped the thought of Galileo and Freud, Darwin and Einstein; and had a revolutionary influence on writers such as Montaigne and Shakespeare and even Thomas Jefferson."

(add discussion)

Goethean-Epicureanism

The following is the flow choice model of standard Epicureanism, according to Irish humanities scholar Damian Gordon: [5]

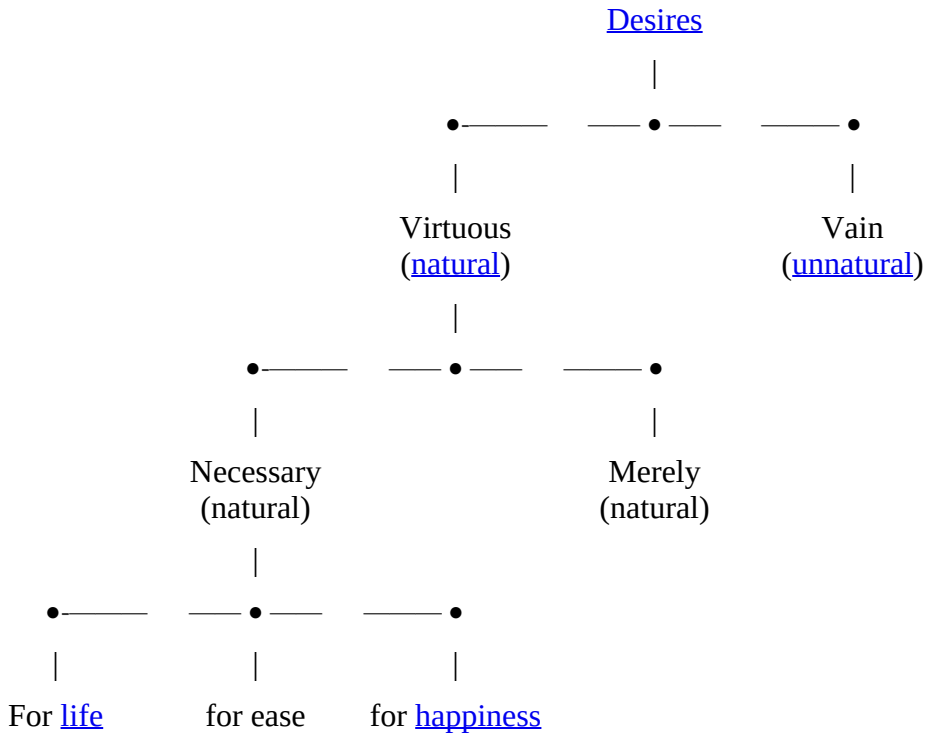

Here, of course, we see the so-called "problem of evil", first addressed by Epicurus, not being clearly addressed. In modern chemical thermodynamically neutral terms, we can indeed divide choice resulting from desires resulting from an external force/internal force interaction combination into "natural" ($dG < 0$) and "unnatural" ($dG > 0$), but, as Goethe pointed out (1809), there is no "free will" involved when, e.g. the molecule H_2 reacts with the molecule 0_2, hence the same applies to human molecules (people), which are but evolved (metamorphized) versions of the former, whereby subsequently, as defined by modern coupling theory (1941), both natural and unnatural processes will always exist within a system (society), the former driving the latter (see: human free energy theory), example outlines of which can be found Freud-Schiller drive theory and or Schopenhauer-Nietzsche will to power theory, and hence the so-called Epicurean dilemma, of conceptually how one "chooses" the correct way or path in a deterministic universe, is resolved, with recourse to ontic openings, according to cybernetic-like action of the feedback affect knowledge assimilation (reading) and knowledge production (writing) has on one's nervous system in going from the knowledge store centers of the brain (see: walking encyclopedia) to the belief system center storage areas of the brain, modifications to the latter resulting in evolved reactionary "decision" adjustments towards more accurate or natural choice, as one might say, given the present and or evolving state of the system. [6]

This upgrade logic, might seemingly be called Goethe-modified Epicureanism or "Goethean-Epicureanism" for short, a predominate mixture of Goethean philosophy and Epicureanism.

→

2700 BC **Modern**

A depiction of the Anunian theology (2700) judgment system according to which judgment comes in the afterlife, according the weighing (see: soul weight) of the soul theory; which Epicurus objected to, in its place formulating his ideal good of pleasure attraction pain avoidance natural morality, within which the mechanism of "choice" between good (natural) or evil (unnatural) desires, in his view, accrues via the "swerving" atoms that comprise the *anima* (soul or mind) of the person, i.e. the animation principle; which, as depicted right, serves as the backbone principle of the modern judicial system which assigns innocence and or guilt to the free will theory based "choice" of a person's action, whereas correctly, in the post animate thermodynamics logic based era, the guilt (unnaturalness) and or innocence (naturalness), e.g. as discussed in Goethean philosophy terms, should be assigned to an external force/internal force coupling interaction logic theory, guilt assigned per consensus + educated ruling, which will vary per accordance with the given state of dynamics of the universe, which changes per decade and or century.

Judicial system | Reform

In 1995, Belgian cytologist and biochemist Christian de Duve pointed out that: [7]

> "If neuronal events in the brain determine behavior, irrespective of whether they are conscious or unconscious, it is hard to find room for free will. But if free will does not exist, there can be no responsibility, and the structure of human societies must be revised."

One of these structural revisions that must inevitably accrue is revision to the criminal justice system. In America, as American biologist Anthony Cashmore, in his 2010 article "The Lucretian Swerve", points out: [8]

> "The [American] judicial system is based on a belief in the notion of free will."

Cashmore, from here, goes on to argue that this is "nothing other than continuing belief in vitalism", or neovitalisms as it would be classified, which is about right, neglecting the sideline fact that Cashmore, a "professor of biology" (see: defunct theory of life), calling the "judicial system professors of free will" as vitalism practitioners is but an example of the the pot calling the kettle black.

Zeno | Stealing slave parable

In any event, the question punishment in a deterministic universe was first addressed in the so-called "stealing slave parable" of Zeno of Citium. [2] A 1942 rendition of the parable is as follows: (O)

> "Long, long ago, before we were governed by Christian morality, the Eleatic Zeno, preached fatalism, which is very much like determinism. One day he caught his slave stealing and thrashed him for it. *Eimasto moi klephai* ("It was destined that I steal from you"), said the slave, "and also to be trashed" was the laconic

answer of Zeno.

In other words, unnatural process are by definition "exergonic" which means that the absorb energy from the surroundings in order to make them work and processes of this, by classification, are non-spontaneous, which means they won't go on their own, but have to be driven into existence via coupling; in short, unnatural processes tend to be destroyed, short-lived (short reaction extent), or "trashed" as Zeno put it, in the course of the reactions or destines of the universe, because they are actions that move upwards on the potential energy scale, and hence are inherently and increasingly unstable.

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(b) Cashmore, Antony. (2010). "The Lucretian Swerve: the Biological Basis of Human Behavior and the Criminal Justice System" (O), *Proceedings of the National Academy of Sciences*, 107(10):4499-4504.
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2. Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (§3: Atoms of the Soul: the Epicurean Swerve, pgs. 33-69). University Press of America.
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(b) Clinamen – Wikipedia.
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8. (a) Cashmore, Anthony. (2010). "The Lucretian Swerve: the Biological Basis of Human Behavior and the Criminal Justice System" (O), *Proceedings of the National Academy of Sciences*, 107(10):4499-4504.
(b) Anthony Cashmore – InformationPhilosopher.com.
(c) Anthony R. Cashmore (profile) – PNAS.org.

External links

- Atomic swerve – Epicurus wiki.
- Epicurus on Freedom – Georgia State University.

θΔics

In isms, **Epicureanism** is a physics-based ethical philosophy, developed by Greek philosopher Epicurus (c.307BC), as expounded on by his student Lucretius (55BC), according to which "pleasure", i.e. "peace and harmony of mind and body" (Close, 1977), is the only good and the end of all morality, thought to be achieved through an actuated existence of simplicity, prudence, honor, and justice, according to which "peace, quite, and contentment" (Close, 1977) were, supposedly, the idea state; it was the second most-popular philosophy below stoicism, in its period. [1]

Ep·i·cu·re·an·ism
/ˌepəkyəˈrēəˌnizəm,-ˈkyo͝orēə-/

noun

an ancient school of philosophy founded in Athens by Epicurus. The school rejected determinism and advocated hedonism (pleasure as the highest good), but of a restrained kind: mental pleasure was regarded more highly than physical, and the ultimate pleasure was held to be freedom from anxiety and mental pain, especially that arising from needless fear of death and of the gods.

A Google definition of **Epicureanism** as an anti-deterministic restrained-hedonism god-free happiness-aiming philosophy, based on the logic that all "things" can be explained on the principle of atoms moving, bonding, forming structures therein, and debonding, in a void, eternally.

Jefferson | Synopsis

In circa 1799, Thomas Jefferson, who owned at least five Latin editions of Lucretius' 55BC *On the Nature of Things*, penned per his own personal use the following "Syllabus of the doctrines of Epicurus", which in 1819 attached as a note in a letter to fellow Epicurean William Short: [2]

Syllabus of the Doctrines of Epicurus

- **Physical**: The universe eternal.

  Its parts, great and small, interchangeable.
  Matter and void alone.
  Motion inherent in matter which is weighty and declining.
  Eternal circulation of the elements of bodies.

- **Gods**: an order of beings next superior to man, enjoying in their sphere, their own felicities; but not meddling with the concerns of the scale of beings below them.
- **Moral**: Happiness the aim of life.
- **Virtue**: the foundation of happiness.
- Utility the test of virtue.
- **Pleasure**: active and In-do-lent.

  In-do-lence – is the absence of pain, the true felicity.

  Active – consists in agreeable motion; it is not happiness, but the means to produce it.

Thus the absence of hunger is an article of felicity; eating the means to obtain it. The *summum Annum* [default greatest, highest, or most elevated] is to be not pained in body, nor troubled in mind. i.e. In-do-lence of body, tranquility of mind. To procure tranquility of mind we must avoid desire and fear, the two principal diseases of the mind. Man is a free agent. Virtue consists in 1. Prudence. 2. Temperance. 3. Fortitude. 4. Justice. To which are opposed, 1. Folly. 2. Desire. 3. Fear. 4. Deceit.

In 1820, Jefferson had come to characterize himself, in discourse with others, in sum, as an "Epicurean materialist".

Copley | Synopsis

In 1977, Frank Copley, in his "Introduction" to *On the Nature of Things*, gave the following synopsis: [3]

> "**Epicureanism** was a philosophy that brought peace and quiet rather than inspiration and exhilaration; based on a theory of the exclusive validity of sense perception and on an ethical doctrine that 'pleasure was the criterion of good', it lent itself not only to a dull and flat dialectic but also to gross misinterpretation. Although, in the Hellenistic period and later in the Roman, it was second of the two great philosophies (the first was stoicism), yet it trailed far behind its rival and gained relatively few adherents, these chiefly among poets, philosophers, and others of a contemplative rather than an active disposition.
>
> Starting with the question 'how do we get our knowledge?', Epicurus concludes that we get it through the sense; sensation, he declared, is the only reliable source of knowledge, and consequently the only source of truth. From this starting point, the philosophy proceeds with nearly relentless logic to explain ever phenomenon—and the correct word is 'every'—of which the ancient world was aware."

(add discussion)

Misinterpretation | Food & Drink

Of note, the term "Epicurean", in modern times, is sometimes mistakenly presented or parlayed as a synonym for some someone with "an appreciation for fine food and drink" (Q), namely someone whose existence revolves around being a drunk glutton, or something to this effect; which does not seem to be representative of the original "physics-based philosophy of ethics".

Quotes

The following are related quotes:

> "**Epicureanism** held that pleasure is the goal of well-being and that neither god nor providence directs human affairs."
>
> — Epiphanius (378), *The Panarion* [4]

> "The **Epicureans** were neither determinists nor atheists [see: functional atheist], although they were commonly accused of being both."
>
> — Frank Copley (1977), "Introduction" to *On the Nature of Things* (pg. xv)

See also

- Epicurean swerve

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(b) Copley, Frank O. (1977). "Introduction", in: *Lucretius: On the Nature of Things* (§1:vii-xx, pg. vii). W.W. Norton, 2011.
2. Jefferson, Thomas. (1819). "Letter to William Short" (Q), Oct 31.
3. Copley, Frank O. (1977). "Introduction", in: *Lucretius: On the Nature of Things* (§1:vii-xx, pg. vii). W.W. Norton, 2011.
4. (a) Epiphanius. (378). *The Panarion of Epiphanius of Salamis, Volume One* (pg. 10). Brill, 1987.
(b) Stephens, Mitchell. (2014). *Imagine There's No Heaven: How Atheism Helped Shape the Modern World* (pg. 47). St.

Martin's Press.

External links

- Epicureanism – Wikipedia.
- Nature of Things – NewEpicurean.com.

θΔics

In existographies, **Epicurus** (341-270BC) (IQ:185|#50) (Cattell 1000:240) [RGM:72|1,500+] (FA:22) (GAE:3) (GPhE:#) [CR:356], aka "Epikuros" (Thomas, 1875), was a Greek philosopher, noted for having built on the atomic theories of Leucippus and Democritus in the formulation of his "Epicurean philosophy", centered around his ontic opening-like "Epicurean swerve" hypothesis, that the aim of existence is the satisfaction on one's desires. Epicurus left his teachings in the form of three-hundred scrolls, which eventually found their way into the hands of Lucretius.

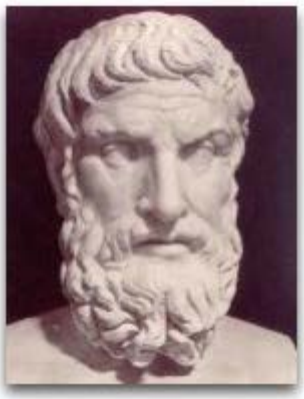

Good

Epicurus, supposedly, said the following about good:

> "I know not how to conceive the 'good', apart from the pleasures of taste, sexual pleasures, the pleasures of sound and the pleasures of beautiful form."
>
> — Epicurus (c.300BC), *On the Ethical End*; cited by Diogenes Laertius (c.230) in *Lives and Opinions of Eminent Philosophers* (§10.6)

Epicurus, in his *Health Ends* (*Peri Telous*), supposedly, laid down emphasis on "physical pleasures", which caused Cicero among other Epicureans to have strong antipathy to Epicurean ethics.

> "Epicurus attests that he cannot envisage any good which is detached from luxurious and lewd pleasures."
>
> — Cicero (45BC), *On the Nature of the Gods* [9]

The scholar Athenaeus (7.280a), supposedly, discusses this further. [9]

Chance

In 1997, Patrick Walsh, in his commentary on Cicero's discussions of Metrodorus and Hermarchus, gives the following synopsis of the Epicurean chance model: [9]

> "Metrodorus and Hermarchus: it is said that Metrodorus would have followed his friend **Epicurus** as head of the Garden had he not died first; Hermarchus succeeded instead. They joined with Epicurus in attacking Pythagoras for equating all things with number, Plato for his notion of the demiurge initiating motion in the universe, and Empedocles for positing that love and strife combine and separate the four elements. All these views of purposive creation are at odds with the Epicurean doctrine of the fusion and separation of atoms by chance."

(add)

Works

Epicurus' works included a 37 book treatise *On Nature*, of which only fragments survive; book 14, according to Patrick Walsh (1997), appears to have been an attack against Platonic physics, and may have included disparagement of Pamphilus. [9]

Alexander

The Epicureans were Alexander's greatest enemies, while the followers of Plato, Chrysippus, and Pythagoras were his friends. (Ñº)

Education

At age 12, Epicurus was frustrated with his teacher's inability to explain to him the meaning of chaos; after which, through study, he found Democritus' idea about the atom seemed to him the most promising clue. Epicurus, of note, once boasted in his writings, according to Cicero, in his *On the Nature of the Gods* (45BC), that he never had a teacher: [9]

> "You **Epicureans** repeat these doctrines like parrots, as though they have been dictated to you. Epicurus dreamt them up when half-asleep, for as we not from his writings, he boasted that he never had a teacher. Even if he had not proclaimed this, I myself could readily have believed it of him. He reminds me of the owner of a badly constructed house, who boasts of not having employed an architect. There is not a whiff of the Academy or the Lyceum in him, nor even a hint of basic lessons learnt at school. He could have attended the lectures of Xenocrates (c.396-314BC) (Ñº), an impressive enough teacher, heavens knows, and some believe that he did so. But he himself disavowed it, and I prefer his own testimony to that of others.
>
> He says that he attended the school of a certain Pamphilus, one of Plato's disciples, on the island of Samos, where he lived as a young man with his father and brothers. (His father Neocles had gone there as a settler, but he turned schoolmaster, I believe, when his little farm provided too precarious a living.) But Epicurus shows extraordinary contempt for this Platonist, so fearful is he of appearing ever to have been taught anything. But he is caught red-handed in the case of Nausiphanes, a follower of Democritus; he does not deny that he heard him lecture, but he harries him with all manner of abuse. Yet if we assume that he had not attended these teachings of Democritus, what others could he have attended? What is there in the natural philosophy of Epicurus which does not stem from Democritus? It is true that he changed a few things, as for example the swerve of the atoms which I mentioned a moment ago, but the main lines are the same: atoms and void, images, infinity of space, countless worlds, their emergence and extinction—in fact, almost the entire range of natural philosophy."

In 1875, Friedrich Lange, in his *The History of Materialism*, recounts Epicurus' educational path as follows: [10]

> "The father of Epicurus is said to have been a poor schoolmaster of Athens, who became a *kleruchos*, or colonist, at Samos. There Epicurus was born towards the end of the year 342, or at the beginning of 341. In his fourteenth year, it is said, he studied Hesiod's *Cosmogony* at school, and finding that everything was explained to arise from chaos, he cried out and asked: 'Whence, then, came chaos?' To this his teacher had no reply that would content him, and from that hour the young Epicurus began to philosophise for himself.
>
> Epicurus must, in fact, be regarded as self-taught, although the most important ideas which he incorporated in his system were individually already commonly known. His general education is said to have been deficient. He joined himself to none of the then prevailing schools, but studied the more industriously the writings of Democritus, which supplied him with the corner-stone of his cosmology, the doctrine of atoms. Nausiphanes (c.375BC-300BC) (Ñº), a somewhat skeptical follower of Democritus, is said to have first introduced this doctrine to him at Samos.
>
> Nevertheless, we cannot assume that it was through ignorance of other systems that Epicurus took his own course; for already as a youth of eighteen he had been to Athens, and heard probably Xenocrates, the pupil of Plato, whilst Aristotle, accused of atheism, was at Chalcis, looking towards his end."

At age 32, Epicurus founded a school in the garden in Athens, in which he constructed a whole account of the universe and a philosophy of existence. [5]

Epicureanism

Epicurus was an atomic materialist (see: atomic theory), who, following in the steps of Democritus, was an advocate of

materialism, led him to a general attack on superstition and divine intervention, and, following Aristippus — about whom very little is known — believed that pleasure is the greatest good, but the way to attain pleasure was to live modestly and to gain knowledge of the workings of the world and the limits of one's desires; the following are two alternative translations of this view:

> "When we say that **pleasure** is the end, we do not mean the pleasure of the profligate or that which depends on the physical enjoyment – as some think who do not understand our teachings, disagree with them, or give them an evil interpretation – but by pleasure we mean the state wherein the body is free from pain and the mind from anxiety."
>
> — Epicurus (c.280BC), "Letter to Menoeceus"; cited by Erik Wielenberg (2005) [7]

The following is an alternative translation, with additional text, wherein we see "state of anxiety in the mind" replaced with "trouble in the soul" (see: soul terminology upgrades):

> "When we say, then, that pleasure is the end and aim, we do not mean the pleasures of the prodigal or the pleasures of sensuality, as we are understood to do by some through ignorance, prejudice, or willful misrepresentation. By pleasure we mean the absence of pain in the body and of trouble in the soul. It is not an unbroken succession of drinking-bouts and of revelry, not sexual lust, not the enjoyment of the fish and other delicacies of a luxurious table, which produce a pleasant life; it is sober reasoning, searching out the grounds of every choice and avoidance, and banishing those beliefs through which the greatest tumults take possession of the soul. Of all this the beginning and the greatest good is wisdom. Therefore wisdom is a more precious thing even than philosophy; from it spring all the other virtues, for it teaches that we cannot live pleasantly without living wisely, honorably, and justly; nor live wisely, honorably, and justly without living pleasantly. For the virtues have grown into one with a pleasant life, and a pleasant life is inseparable from them."
>
> — Epicurus (c.280BC), "Letter to Menoeceus" (Ñº)

This led one to attain a state of tranquility (*ataraxia*) and freedom from fear, as well as absence of bodily pain (*aponia*). The combination of these two states is supposed to constitute happiness in its highest form. [6]

Death

On death, Epicurus reasoned that: [1]

> "Death, the most dreaded of all evils, is of no concern for us; for while we exist death is not present, and when death is present we no longer exist."

(add)

Marx | Historical materialism | Scientific socialism

In 1841, German thinker Karl Marx finished his dissertation entitled "Difference Between the Democritean and Epicurean Philosophy of Nature," from which his conception of historical materialism, and its near synonym description "scientific socialism", coined by Friedrich Engels, supposedly, arose based on research on the materialism philosophy of Epicurus, as well as his reading of Adam Smith, and other writers in classical political economy. [4]

Molecule

The life and atomic theory views of Epicurus were most-significantly revived by French philosopher Pierre Gassendi, as

found in his 1647 book *De vita, moribus, et doctrina Epicuri libri octo* (*On the Life and Death of Epicurus Book Eight*) and followup 1649 book *Syntagma philosophiae Epicuri* (*Arrangement of the Philosophy of Epicurus*), in the latter of which the term "molecule" was first coined.

Problem of evil

Epicurus is often seen as the champion of atheism owing to his queried view, often classified as the "problem of evil", that:

> "Is god willing to prevent evil, but not able? Then he is not omnipotent. Is he able, but not willing? Then he is malevolent. Is he both able and willing? Then whence cometh evil? Is he neither able nor willing? Then why call him god?"

which is one of the better known logic disproofs of the existence of god.

Swerve of the atoms | Free will

Epicurus, contrary to the views of Democritus, argued that humans have free will owing to the "swerve" of the atoms (see: ontic openings). [2]

Quotes | On

The following are quotes on Epicurus:

> "Democritus, when at ripe old age warned him that mind and memory were failing, went freely to place his person in death's path. **Epicurus** himself died when life's light ran out, **he who in mind surpassed all men**—eclipsed them all, as the sun hung high in heaven, the stars."
>
> — Lucretius (55BC), *On the Nature of Things* (pg. 81; 3:1039-44)

> "**Epicurus** was a foul-mouth bastard."
>
> — Epictetus (c.120AD), *Publication*; cited by Diogenes Laertius (c.230AD) in *Lives and Opinions of Eminent Philosophers* (§10.6); as translated (1963) by George Strodach [12]; note: seems to be a more aggressive translation as, say, compare to Robert Hicks (1925) translation

> "Apollodorus, the Epicurean, in the first book of his *Life of Epicurus*, says that **Epicurus** turned to philosophy in disgust at the schoolmasters who could not tell him the meaning of 'chaos' in Hesiod. According to Hermippus, however, he started as a schoolmaster, but on coming across the works of Democritus turned eagerly to philosophy."
>
> — Diogenes Laertius (c.230AD), *Lives and Opinions of Eminent Philosophers* (§:X.1)

> "Among the early philosophers, says Diocles (c.150BC) (Ñº), **Epicurus**' favorite was Anaxagoras, although he occasionally disagreed with him, and Archelaus the teacher of Socrates."
>
> — Diogenes Laertius (c.230), *Lives and Opinions of Eminent Philosophers* (§10.12)

"**Epicurus** was a most prolific author and eclipsed all before him in the number of his writings: for they amount to about three hundred rolls, and contain not a single citation from other authors; it is Epicurus himself who speaks throughout. Chrysippus tried to outdo him in authorship according to Carneades, who therefore calls him the literary parasite of Epicurus. 'For every subject treated by Epicurus, Chrysippus in his contentiousness must treat at equal length; hence he has frequently repeated himself and set down the first thought that occurred to him, and in his haste has left things unrevised, and he has so many citations that they alone fill his books: nor is this unexampled in Zeno and Aristotle'."

— Diogenes Laertius (c.230), *Lives and Opinions of Eminent Philosophers* (§10.26-27)

"There is no known Epicurean theory of life which does not assign to the pleasures of the intellect, of the feelings and imagination, and of the moral sentiments a much higher value as pleasures than to those of mere sensation."

— John Mill (1861), *Utilitarianism* [8]

"Although all of **Epicurus**' original writing has long since disappeared, we have much of his philosophy via Lucretius' *On The Nature Of Things* (50BC), three letters, including his 40 principle doctrines (Ñº), and the ruins of wall summarizing his philosophy, created by Diogenes of Oenoanda in Turkey."

— Anon (c.2015), English 257 (Ñº), University of Idaho

Quotes | Myth

The following are statements by Epicurus on myths and mythology:

"When someone admits one and rejects another which is equally in accordance with the appearances, it is clear that he has quitted all physical explanation and descended into myth."

— Epicurus (c.280BC), "Letter to Pythocles" (Ñº)

"It is impossible for anyone to dispel his fear over the most important matters, if he does not know what is the nature of the universe, but instead suspects something that happens in myth. Therefore, it is impossible to obtain unmitigated pleasure without natural science."

— Epicurus (c.280BC), opening quote to Victor Stenger's *God and the Atom* [6]

Quotes | By

The following are other noted quotes attributed to Epicurus:

"The wealth required by nature is limited and is easy to procure; but the wealth required by vain ideals extends to infinity."

— Epicurus (c.280BC) (Ñº)

"It is folly for a man to pray to the gods for that which he has the power to obtain by himself."

— Epicurus (c.280BC) (Ñº)

> “Those who gave an adequate account of causes from the beginning, far surpassing not only their predecessors but their successors too in many ways, though they alleviated many great evils, failed to see what they were doing in making necessity and chance the cause of everything. The very thesis which asserts this broke down and involved the man [i.e., Democritus] unawares in a conflict between his actions and his opinion, so that, had he not in his actions forgotten his opinion, he would have been in a continual state of self-induced confusion, succumbing to the most extreme consequences when his opinion prevailed, and full of conflict when it did not, through the opposition of his actions and his opinion.”

— Epicurus (c.320BC), Fragment #34.30 Arrighetti [11]

Works

Epicurus, as summarized by Diogenes Laertius (c.230AD), wrote on a total of 41 topics, all penned without citation, penned in 41 “books” (or volumes), totaling 300-scrolls:

â— Epicurus (c.300BC). *Of Nature, thirty-seven books*. Publisher.
â— Epicurus (c.300BC). *Of Atoms and Void*.
â— Epicurus (c.300BC). *Of Love*.
â— Epicurus (c.300BC). *Epitome of Objections to the Physicists*.
â— Epicurus (c.300BC). Against the Megarians.
â— Epicurus (c.300BC). Problems.
â— Epicurus (c.300BC). Sovran Maxims.
â— Epicurus (c.300BC). Of Choice and Avoidance.
â— Epicurus (c.300BC). Of the End.
â— Epicurus (c.300BC). Of the Standard, a work entitled Canon.
â— Epicurus (c.300BC). Chaeredemus.
â— Epicurus (c.300BC). Of the Gods.
â— Epicurus (c.300BC). Of Piety.
â— Epicurus (c.300BC). Hegesianax.
â— Epicurus (c.300BC). Of Human Life, four books.
â— Epicurus (c.300BC). Of Just Dealing.
â— Epicurus (c.300BC). Of the Angle in the Atom.
â— Epicurus (c.300BC). Of Fate.
â— Epicurus (c.300BC). Theories of the Feelings – against Timocrates.
â— Epicurus (c.300BC). Introduction to Philosophy.
â— Epicurus (c.300BC). Of Justice and the other Virtues.
â— Epicurus (c.300BC). Anaximenes.
â— Epicurus (c.300BC). Correspondence.

Along with:

> Of Touch.
> Of Images.
> Of Presentation.
> Aristobulus.
> Of Music.
> Of Benefits and Gratitude.
> Polymedes.
> Timocrates, three books.

Metrodorus, five books.
Antidorus, two books.
Theories about Diseases (and Death) – to Mithras.[41]
Callistolas.
Of Kingship.
Neocles: dedicated to Themista.
Symposium.
Eurylochus: dedicated to Metrodorus.
Of Vision.
Discovery of the Future.

(add)

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1. Harrison, Guy P. (2008). *50 Reasons People Give for Believing in a God* (pg. 175). Prometheus Books.
2. (a) Doyle, Bob. (2011). *Free Will: the Scandal in Philosophy* (pg. xvii). I-Phi Press.
(b) Epicurus – InformationPhilosopher.com.
3. Epicureanism – Wikipedia.
4. (a) Foster, John B. (1999). *Marx's Ecology: Materialism and Nature* (pg. #). San Val.
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6. Stenger, Victor J. (2013). *God and the Atom: From Democritus to the Higgs Boson: the Story of a Triumphant Idea* (pg. 11). Prometheus Books.
7. (a) Epicurus. (c.280BC), "Letter to Menoeceus" (Ñº), in: *Letters, Principle Doctrines, and Vatican Sayings* (pgs. 57, 131b). Macmillan, 1964.
(b) Wielenberg, Erik J. (2005). *Value and Virtue in a Godless Universe* (pg. 26). Cambridge University Press.
8. (a) Mill, John. (1861). *Utilitarianism* (pg. 8). Hackett, 1979.
(b) Wielenberg, Erik J. (2005). *Value and Virtue in a Godless Universe* (pg. 27). Cambridge University Press.
9. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (pgs. 27-28; *On Nature*, pg. 163; chance, pg. 167;(lewd ethics, pgs. 42, 170). Oxford University Press, 1998.
10. Lange, Friedrich A. (1875). *The History of Materialism: and Criticism of its Present Importance, Volume 1: Materialism in Antiquity. The Period of Transition* (translator: Ernst Thomas). *The Seventeenth Century* (translator: Ernest Thomas) (pgs. 98-99). Houghton, Osgood, and Co, 1879.
11. Taylor, C.C.W. (1999). *The Atomists: Leucippus and Democritus: Fragments: a Text and Translation with a Commentary by C.C.W. Taylor* (pg. 153). University of Toronto Press.
12. Strodach, George. (1963). *Epicurus: the Art of Happiness* (pg. 81). Penguin.

External links

â— Epicurus – Wikipedia.
â— Epicureanism – Wikipedia.
â— Epicurus wiki – Wiki.Epicurus.info.
â— Epicurus (fragments) – Attalus.org.

θΔics

In terminology, **epistemology** (TR:33), from the Greek *episteme* (knowledge) + -logy (doctrine; theory; science), is the study or a theory of the nature and grounds of knowledge especially with reference to its limits and validity. [1]

e·pis·te·mol·o·gy

/iˌpistəˈmäləjē/

noun PHILOSOPHY

the theory of knowledge, especially with regard to its methods, validity, and scope. Epistemology is the investigation of what distinguishes justified belief from opinion.

A Google-generated definition of **epistemology**.

In 1854, Scottish German-idealism philosopher James Ferrier (1808-1864) coined the term "epistemology", referring, supposedly, to the study of knowledge, in explicit contrast to the common-sense tradition of how one knows about something. (Ñº)

The following is a reductionism take on the nature of the so-called epistemological philosopher, in respect to the so-called epistemological status of sociology, psychology, biology, chemistry, physics, and mathematics:

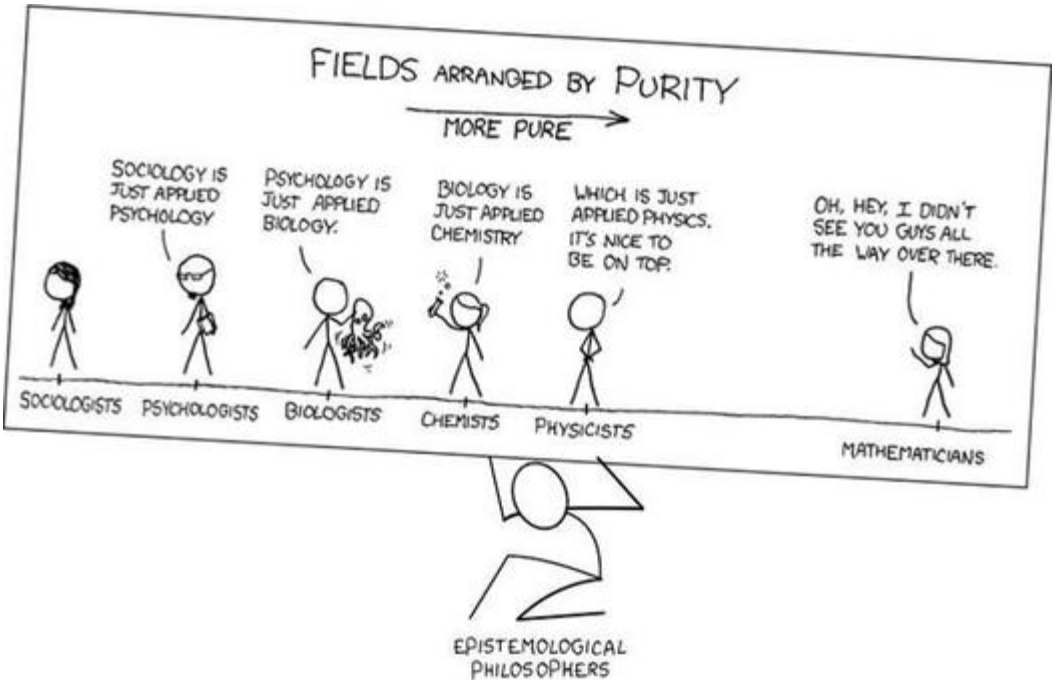

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1. Merriam-Webster Collegiate Dictionary, 2000.

External links

â— Epistemology – Wikipedia.

θΔics

In history, **epoch** marks a significant change in thinking in human conceptual understanding of the universe.

Epicenter geniuses

The following is a epoch quote in respect to epicenter geniuses mixed in with a good amount of thermal word vocabulary:

> "Sporadic great men come everywhere. But for a community to get vibrating through and through with intensely active life, many geniuses coming together and in rapid succession are required. This is why great **epochs** are so rare, — why the sudden bloom of a Greece [Aristotle], an early Rome [Cicero], a Renaissance [Goethe], is such a mystery. Blow must follow blow so fast that no cooling can occur in the intervals. Then the mass of the nation glows incandescent, and may continue to glow by pure inertia long after the originators of its internal movement have passed away. We often hear surprise expressed that in these high tides of human affairs not only the people should be filled with stronger life, but that individual geniuses should seem so exceptionally abundant. This mystery is just about as deep as the time-honored conundrum as to why great rivers flow by great towns. It is true that great public fermentations awaken and adopt many geniuses who in more torpid times would have had no chance to work. But over and above this there must be an exceptional concourse of genius about a time, to make the fermentation begin at all. The unlikeliness of the concourse is far greater than the unlikeliness of any particular genius; hence the rarity of these periods and the exceptional aspect which they always wear."
>
> — William James (1880), "Great Men and their Environment" [4]

Quotes

The following are related quotes:

> "Clausius' 'On the Moving Force of Heat and the Laws of Heat which may be Deduced Therefrom' marks an **epoch** in the history of physics."
>
> — Willard Gibbs (1889), "Rudolf Julius Emanuel Clausius" [1]

> "Gibbs ranks with men like Newton, Lagrange and Hamilton, who by the sheer force and power of their minds have produced those generalized statements of scientific law which mark **epochs** in the advance of exact knowledge."
>
> — Frederick Donnan (1924), "The Influence of J. Willard Gibbs on the Science of Physical Chemistry" [2]

> "Thims' brilliant book [*Human Chemistry*] symbolizes the beginning of a new era (**epoch**) in human history."
>
> — Georgi Gladyshev (2006), Russian physical chemist [3]

References

1. Gibbs, Willard. (1889). "Rudolf Julius Emanuel Clausius," *Proceedings of the American Academy*, new series, vol. XVI, pgs. 458-65. In *The Scientific Papers of J. Willard Gibbs* (Volume II).
2. (a) Donnan, Frederick G. (1924). "The Influence of J. Willard Gibbs on the Science of Physical Chemistry" (pg. 4), an address by F. G. Donnan, on the occasion of the centenary celebration of the founding of the Franklin institute and

the inauguration exercises of the Bartol research foundation, September 17, 18, 19. Franklin Institute.
(b) Fisher, Irving. (1930). "The Applications of Mathematics to the Social Sciences" (abs) (pdf), *Bulletin of the American Mathematical Society*, 36(4): 225-243.
3. Peer-review commentary on Thims' *Human Chemistry*, as found in the "Praise for" section of *Human Chemistry* (pages ix-x).
4. (a) James, William. (1880). "Great Men and Their Environment", Lecture before the Harvard Natural History Society; in: *Atlantic Monthly*, 1880, Oct.; in *The Will to Believe and Other Essays in Popular Philosophy, and Human Immortality* (§: Great Men and their Environment, pgs. 105-22; quote, pg. 118). Digireads.com Publishing, 2010.
(b) Quotations on Genius – TheAbsolute.net.

External links

â— Epoch – Wikipedia.

θΔics

In equations, **equation 133** (CR:8) is equation number 133 of Willard Gibbs' 1876 700-equation numbered *On the Equilibrium of Heterogeneous Substances*, subsection "Internal Stability of Homogeneous Fluids as indicated by Fundamental Equations", defined as follows:

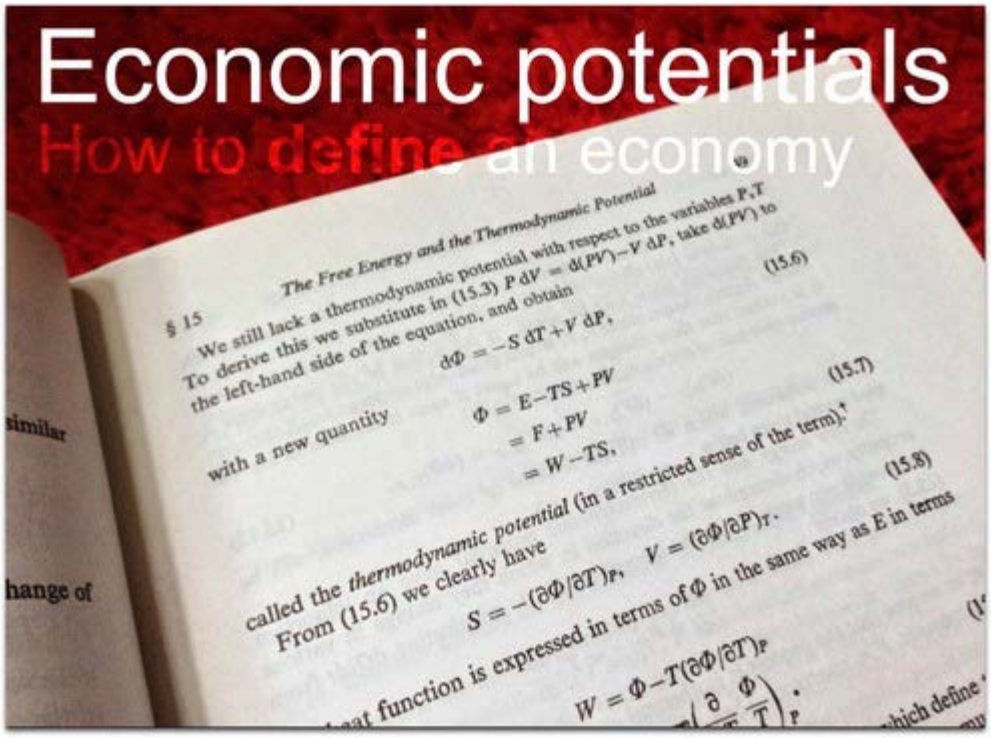

Annotated image, page from Lev Landau and Evgeny Lifschitz' 1959 *Course of Theoretical Physics* (Ñº), from **Smith**'s 2015 blog "Economic Potentials: How to Define an Economy", wherein he attempts, as she says, to "construct the thermodynamic potential of an economy by elaborate analogy", wherein eq. 15.7 is a variant of Willard Gibbs' 1876 **equation 133**, which Edwin Wilson (1938) told Paul Samuelson could be used to formulate the equilibrium of an economy. [3]

$$U - TS + PV - M_1m_1 - M_2m_2... - M_nm_n$$

where U is energy, T temperature, S entropy, P pressure, V volume, m_n the quantities of substances in a "fluid enclosed in a rigid envelop which is nonconducting to heat and impermeable to all the components of the fluid", and M_n the potentials (check) of the nth substance.

Mathematical economics

In 1938, American polymath Edwin Wilson, the last protege of Willard Gibbs, who was also Paul Samuelson' economics PhD adviser, wrote the following to Samuelson, in commentary on one of Samuelson's papers, wherein, in the context of his mathematical economics course, suggested that he use Gibbs equation 133 to formulate a new foundational version of economics; specifically: [2]

> "Moreover, general as the treatment is I think that there is the possibility that it is not so general in some respects as Willard Gibbs would have desired. [In] discussing equilibrium and displacements from one position of equilibrium to another position [Gibbs] laid great stress on the fact that one had to remain within the limits of stability. Now if one wishes to postulate the derivatives including the second derivatives in an absolutely definite quadratic form one doesn't need to talk about the limits of stability because the definiteness of the quadratic form means that one has stability. I wonder whether you can't make it clearer or can't come nearer following the general line of ideas [that] Gibbs has given in his *Equilibrium of Heterogeneous Substances*, **equation 133**."

The very impressive mention of "equation 133", from Gibbs' subsection "Internal Stability of Homogeneous Fluids as indicated by Fundamental Equations", is the following:

$$U - TS + PV - M_1m_1 - M_2m_2... - M_nm_n$$

Wilson, in other words, is suggested that Samuelson use the Gibbs fundamental equation to formulate a theory of economic stability. Samuelson, however, not being intellectually capable (i.e. he lacked education in pure physics, chemistry, and engineering, of the Gibbs mentality) of doing what Wilson suggested; accordingly, nine years later, in 1947, Samuelson, taking Wilson's advice, in part, as best he could, used some of this logic, via "mathematical isomorphisms", as Samuelson called them, in outline (e.g. Le Chatelier's principle), to pen his magnum opus *Foundations of Economic Analysis*, which invariably put economics into a new form of a more rigorous, semi-physical science conceptualized or analogized, mathematics-based science; in short, he used Gibbs' models of minima and maxima, not thermodynamically, but generally, and argued that such could be found amid various economic variables.

References

1. 1. (a) Gibbs, Willard. (1876). "On the Equilibrium of Heterogeneous Substances" (§: "Internal Stability of Homogeneous Fluids as indicated by Fundamental Equations", pgs. 156-62; eq. 133, pg. 157), *Transactions of the Connecticut Academy*, III. pp. 108-248, Oct., 1875-May, 1876, and pp. 343-524, may, 1877-July, 1878.
(b) Gibbs, Willard. (1906). *The Scientific Papers of J. Willard Gibbs, Volume One* (§: "Internal Stability of Homogeneous Fluids as indicated by Fundamental Equations", pgs. 156-62; eq. 133, pg. 157(§: "Internal Stability of Homogeneous Fluids as indicated by Fundamental Equations", pgs. 100-05; eq. 133, pg. 100). Longmans, Green, and Co.
2. (a) Wilson, Edwin. (1938). “Letter to Paul Samuelson”, Dec 30.
(b) Weintraub, E. Roy. (1991). *Stabilizing Dynamics: Constructing Economic Knowledge* (pdf) (equation 133, pgs. 61-62). Cambridge University Press.
3. Smith, Jason. (2015). “Economic Potentials: How to Define an Economy” (Ñº), Information Transfer Economics, BlogSpot, Apr 25.

Further reading

â— Anon. (2015). “More on Samuelson and the Damage he has Done to Economic Theory” (Ñº), LawofMarkets.com, Sep 12

θΔics

In science, **equation of love** (LR:1) refers to either a formulaic reaction describing instances of love the chemical reaction, such as depicted in the following alchemical symbol stylized chemical equation:

♂ + ♀ → ♂≡♀

wherein a single man ♂ meets a single women ♀ and fall in love into a stable relationship ♂≡♀, attached via a chemical bond '≡', or to an actual mathematical or thermodynamic formulation, equation quantifying the affinity (Goethe, 1809), potential (Rankine, 1853), or the free energy change (Hwang, 2001) of a reaction, describing the process of love, quantitatively or qualitatively.

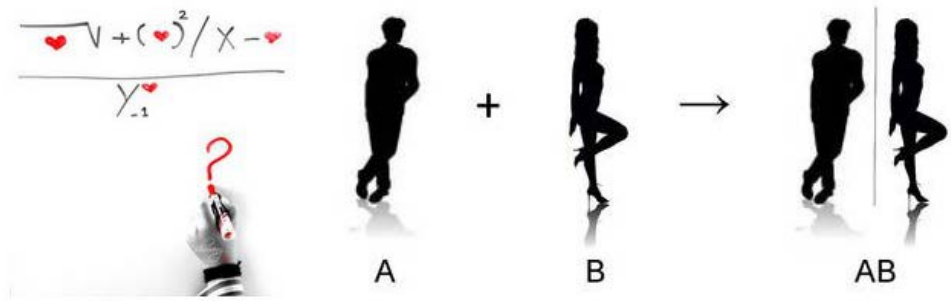

Left: a 2009 Flickr-style, heart icon depiction of a mathematical formulation attempt at an **equation of love**. [6] Right: a modern day Bergman-Goethe-Adler reaction style **equation of love**: that of a human combination reaction, i.e. a time-accelerated depiction of act of falling in love (relationship formation) as a chemical equation, specifically a male-female reaction (see: human chemical reaction theory).

Overview | Modern view

In modern 21st century physical science terms, an individual moving animate human, according to the 1789 Sales human molecular hypothesis and the 2000 Sterner-Elser human molecular formula, is an individual reactive "molecule", and reactive molecules moving freely about on the surface of the earth, according to 1923 Lewis inequality for natural processes, which governs the nature of earth-bound chemical reactions, will tend to react in a direction that results in a free energy decrease, indicative of system stability, thus qualifying the "spontaneity" (via the spontaneity criterion) or uncontrollableness of the heightened energetic process of falling in love.

A two demons equals one angel **love equation**, representative of the good (natural) and evil (unnatural) aspects of relationships, viewed as types of neutralizing reactions.

Hence, a reaction between a single male human molecule, symbol Mx, and a single female human molecule, symbol Fy, on going from an initial state (day one) Gibbs free energy G_i to a final state Gibbs free energy state G_f, over the extent of reaction, of say 2-3 years (typical transition state time period), is defined according to the following human chemical reaction equation: [5]

$$Mx + Fy \rightarrow MxFy$$

and is a process quantified by the following chemical thermodynamic formula:

$$\Delta G = G_f - G_i$$

or in expanded form:

$$\Delta G = G_{MxFy} - (G_{Mx} + G_{Fy})$$

in which G_{MxFy} is the Gibbs free energy of the couple in their bonded relationship state, in the form of a dihumanide molecule (two attached humans viewed as one single molecule), G_{Mx} is the measure of the Gibbs free energy of the male as a single unattached human molecule, and G_{Fy} is the measure of the Gibbs free energy of the male as a single unattached human molecule, variable which can be determined by measure of the individual enthalpies and entropies of each of those states of existence. This logic is summarized well by the following 1999 definition of molecular bonding by American-born Canadian biophysical chemist Julie Forman-Kay: [31]

A 2011 rustic algebra-style **equation of love**. [33]

"Whether two molecules will bind is determined by the free energy change of the interaction, composed of both enthalpic and entropic terms."

The calculated value of this so-called "marriage reaction", in human terms, Gibbs free energy change ΔG will determine the naturalness or feasibility of the potential marriage as follows:

Differential change	State change	Name
dG < 0	ΔG < 0	Lewis inequality for a natural process (or spontaneous process), one in which the change will occur naturally or spontaneously and in which useful energy is obtainable from the system.

dG > 0	ΔG > 0	Lewis inequality for an unnatural process (or non-spontaneous process), one in which useful energy is required to be supplied to the given system to bring about the desired change.

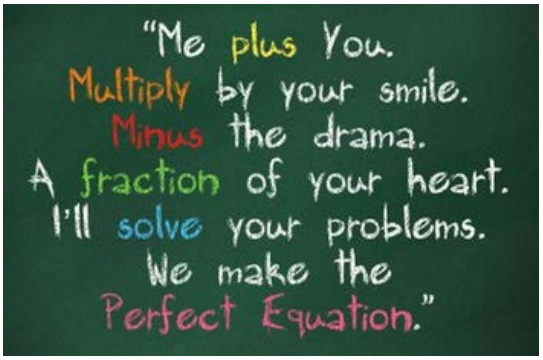

The first of these criterion's, i.e. the Lewis inequality for a natural process, will energetically quantify so-called "natural marriages" and the magnitude of the Gibbs free energy change, when less than zero, will determine the so-called measure of "love" or rather Gottman stability ratio of love to hate in the structure of the stability of the bond, according to the following rules (spontaneity criterion):

State change	Name
ΔG < 0	Lewis inequality for a *natural process* (or spontaneous process), one in which the change will occur naturally or spontaneously and in which useful energy is obtainable from the system.
ΔG 0	Lewis inequality for a "very" *natural process* (or "very" spontaneous process), one in which the change will occur naturally or spontaneously and in which useful energy is obtainable from the system and in which the final state (bonded couple) will be greatly favored over that of the initial state (unattached couple) and the existence of the so-called strongly "loving" marriage will ensue.

This last equation is the "actual" modern physical science equation of love, according to the science of chemical thermodynamics.

Algarotti | 1737

In 1737, Italian natural philosopher Francesco Algarotti, in his *Newtonianism for the Ladies*, employed the inverse square law to calculate the power of attraction between a pair of separated lovers", as follows:

$$\text{Love} \propto \frac{1}{d^2}$$

meaning that the force of love decreases with distance of separation.

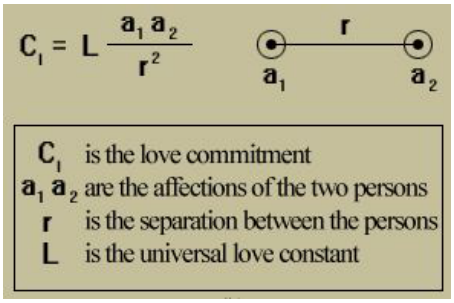

In 2004, someone made a Algarotti-style social gravity like equation of love (O), shown adjacent, with accompanying description "Every person in the universe attracts every other person with a commitment directed along the line of social centers for the two persons that is proportional to the product of their affections and inversely proportional to the square of the separation between the two persons".

Goethe | Affinity equation | 1809

See main: Reaction decipherment; Equation decipherment

In 1796, German polyintellect Johann Goethe began to pioneer human chemical reaction theory, in terms of the forces of chemical affinities A operating on and between people, affinity being the precursor concept to free energy, who used the chemical equations of Swedish chemist Torbern Bergman's 1775 physical chemistry textbook *A Dissertation on Elective Attractions*, to show, through thirty-six chapters of a novella, that human relationships are purely and simply "chemical reactions", or affinity reactions (as they were called in Goethe's day), whereby the actions and processes involved in the state (initial state and final state) of love and human actions revolving about this powerful notion are quantified by measures of the force of affinity. [2] The following is are screenshots from the 1996 film adaptation of the famous chapter four, of his his 1809 novella *Elective Affinities*, wherein the gist of this theory is explained:

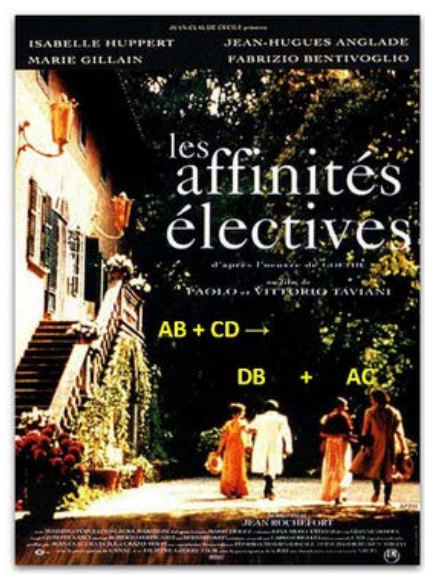

Left: the 1996 film adaption of German polymath Johann Goethe's 1809 *Elective Affinities*, which uses the equations of Swedish chemist Torbern Bergman's 1775 physical chemistry *A Dissertation on Elective Attractions*, to explain love and relationships.

In short, to actuate the above scene, and each human chemical reaction per chapter, in his mind, Goethe made a human affinity table, and thus gave his readers the following equation for love:

> Love = f{human elective affinities}

or in words, in 1799 comment (see: Goethe timeline) on the lack of realism in the work of French author Prosper Crebillon:

> "Crebillon … treats the passions like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. There is no trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover."

which states that love is a function of human elective affinities or "chemical affinity" preferences between reactive people, which Goethe viewed as being chemical species. Thus, according to Goethe, for instance, in the situation in which a man ♂ in a relationship with woman ♀$_1$ falls out of love with her and into love with a new women ♀$_2$, as diagrammed below:

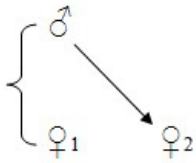

the changes in love, for this chemical reaction, are quantified by sum forces of elective affinity preferences, or chemical affinity (modern sense), of the three people involved in the reaction. In modern terms, this 'single elective affinity reaction' is written as such:

$$♂♀_1 + ♀_2 \rightarrow ♂♀_2 + ♀_1$$

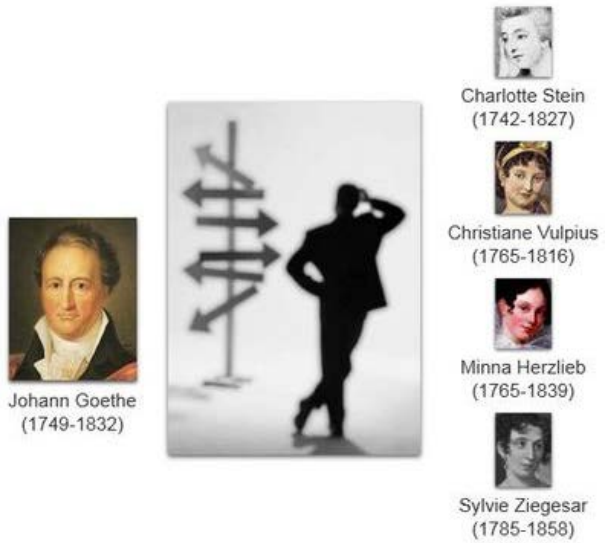

The 1808 Goethe "love thought experiment" according to which German polymath Johann Goethe contemplated the story of a hero simultaneously in love with four women, and had to turn to the equations of physical chemistry, affinity chemistry in particular, to explain the situation. See also: Thims thought experiment (1995).

To go through one example, the following is Bergman reaction #20 scaled up to the human-human reaction level, as explained in *Elective Affinities*. In modern terms, calcium sulfide *CaS* is decomposed by sulfuric acid H_2SO_4 in water calcium sulfate $CaSO_4$, which precipitates (down full-bracket) and to produce elemental sulfur *S* which precipitates (downward half-bracket); which, neglecting intermediates, would be written as:

$$CaS(s) + H_2SO_4(aq) \rightarrow CaSO_4(s) + S(s)$$

This reaction is an example of what is called a single elective affinity or single displacement reaction and in Bergman chemical species letter notation would be categorized as the following "type" of reaction:

Goethean chemical equation of love

(historical human chemical equation reaction schematic development overview)

18th century		19th century	20th century
A, B → C Cullen (1756)	AB + A + C → AC + B (H_2O) "Letter symbol style" Bergman (1775)	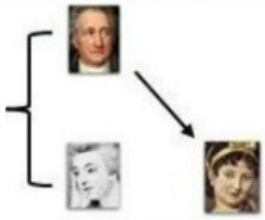 Goethe: Cullen-style (1809)	$AB + C \rightarrow AC + B$ Modern (c.1900)
	"Chemical symbol style" Bergman (1775)	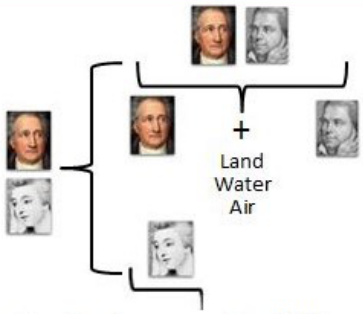 Goethe: Bergman-style (1809)	 Goethe-Adler-Thims (1977-2003)

This outline thus explains the "symbols" and "chemical equations" Goethe had in mind in the writing of his self-defined greatest work.

Others, in the decades to follow, such as Henry Carey (1854), George Elliot (1872), and Max Weber (1878), Otto Weininger, (1903), etc., would go on to utilize similar types of chemical affinity theory in explaining various aspects of love in the wider context of embedded societal interactions.

Balzac

See main: Balzac feelings and affinity dialogue

In 1834, French realism novelist Honore Balzac, in his *The Quest of the Absolute* (*La Recherche de l'Absolu*), has Balthazar Claes, a chemist, debate with Josephine, his wife, about the underlying moral of the romantic belief that preoccupation with science atrophies the normal emotions that sustain personal relations and social responsibilities; the main dialogue of which is as follows:

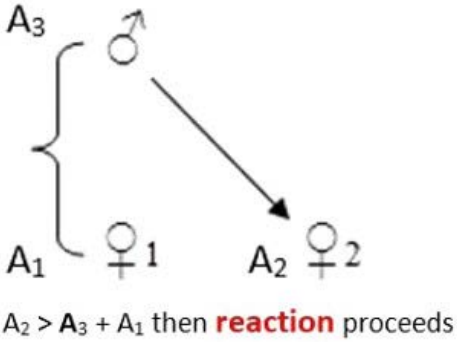

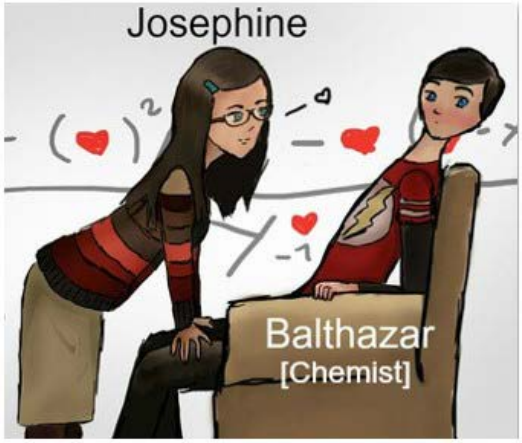

An 1834 rendition of Honore Balzac explaining to his fictional wife why the chemist, who has an understanding of human chemical theory, has a deeper sense and "feeling" of love then the general romantic person.

Josephine: "Believe me, Balthazar, nature made us to feel; and though you will have it that we are nothing but an electrical mechanism, your gases and etherealized matter will never account for our power of foreseeing the future.

Balthazar: "Yes, by means of affinities. The power of vision which makes the poet and the deductive power of the man of science are both based on visible affinities, though they are impalpable and imponderable, so that ordinary minds look on them 'moral phenomena', but in reality they are purely physical. Every dreamer of dreams sees and draws deductions from what he sees. Unluckily, such affinities as these are too rare, and the indications are too slight to be submitted to analysis and observation."

Josephine: "And this", she said, coming closer for a kiss, to put chemistry, which had returned so inopportunely at her question, to flight again, "is to be an affinity?"

(add discussion)

Rankine | Love potential function

In circa 1845, Scottish mathematical physicist and engineer William Rankine wrote his "The Mathematician in Love" poem love song, wherein he quantified love as follows, namely as a type of potential, i.e. "potential energy" (a term he would coin in 1853) and or thermodynamic potential, as we now define things:

Let x denote beauty, y manners well-bred,
z fortune (this last is essential),
Let L stand for love—our philosopher said—
Then L is a function of x, y and z
Of the kind that is known as potential.

Now integrate L with respect to dt
(t standing for time and persuasion)
Then, between proper limits, 'tis easy to see
The definite integral Marriage must be
(A very concise demonstration).*

$$L = \phi(x, y, z) = \iiint \frac{f(x, y, z)}{\sqrt{(\xi - x)^2 + (\eta - y)^2 + (\zeta - z)^2}}\, d\xi\, d\eta\, d\zeta.$$

(add)

Free energy and affinity | 1882

In the 1882 paper "On the Thermodynamics of Chemical Processes", German physicist Hermann Helmholtz showed that the measure of affinity A in a reaction system is equal to the negative of the free energy change ΔG for the process of reactants going to products:

$$A = -\Delta G$$

In the years to follow, others such as Walther Nernst, Theophile de Donder, and Gilbert Lewis, expanded on this view to prove unequivocally that the measure of affinity of a reaction is that of the free energy, or specifically Gibbs free energy in the case of isothermal-isobaric reactions, as are human chemical reactions.

A variant of this Helmholtz-based formula, connecting chemical affinity and free energy, is found in the 1936 booklet *Thermodynamic Theory of Affinity*, by Theophile de Donder, in which he gives the following expression for isothermal-isobaric affinity A: [3]

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

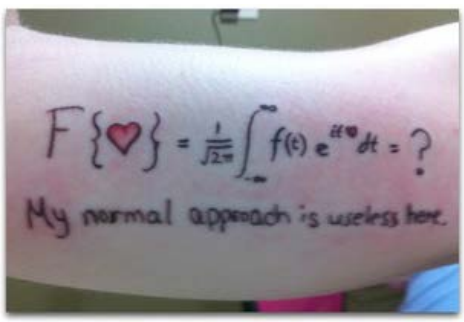

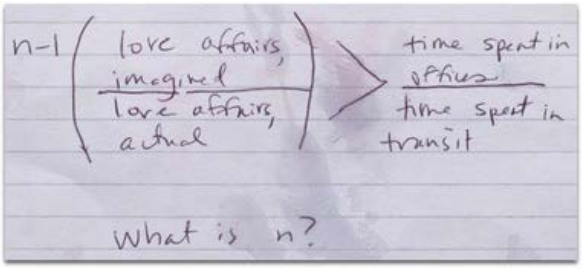

Left: a 2011 **equation of love** tattoo on the inner bicep of a Tumblr user woman named Chrissy. [32] Right: a 2009 index card "solve for n" style **equation of love**, entitled "The Equation of Love Perception", indicating that both "time", spent working, in transit, and in affairs, and "imagination" are factors. [35]

where the affinity of the reaction is equal to the negative of the partial of the Gibbs free energy ∂G with respect to a change in the partial of the extent of the reaction $\partial \xi$, for a process at constant pressure P and temperature T.

Ellis' equation | 1900

One of the first "equations" of love was put forward in the *circa* 1900 works of British physician Havelock Ellis, who postulated the following ball-park formula to love: [1]

Love = Sex + Friendship

which states that love is a combination of finding both hot sex and close friendship in another person.

Bazargan's equation of love

In these early years, however, the crossover to human application, with focus on love, had not yet begun; thus would be a late 20th century insurgence (below).

Bazargan's equation | 1956

Iranian mechanical engineer, thermodynamicist, and 75th prime minister of Iran Mehdi

W	=	U	-	T.S
↓		↓		↓
تقاضا	=	استعداد مصرف	–	موجودی جنسی
یا احتیاج		یا احتیاج کلی		
Demand or need		The capacity of consumption or total need		Available assets [items] (Sexual inventory?)

Bazargan outlined a “mathematical formula for the thermodynamic expression of love and life” in his 1956 book *Thermodynamics of Humans* (chapter five: Life Force). Although the Persian-to-English translation of this text is only partially complete (such as adjacent), the equation he seems to use for his equation of love and life is the Helmholtz free energy:

$$W = U - TS$$

where W is "demand or need", U is the "capacity of consumption or total need", and TS, the bound energy in Helmholtz terms, according to Bazargan, are the "available assets or sexual inventory". He then expands on this in his work employing various chemical thermodynamics derivatives of the free energy, such as dA =-d (U-TS), among others. The correct type of "free energy", however, as would come into view towards the end of the 20th century is the Gibbs free energy, the isothermal-isobaric free energy, as these are the general daily conditions on the surface of the earth, not the isochoric-isochoric free energy (Helmholtz free energy), as discussed further below. Nevertheless, this is not a simple discernment, as evidenced by the fact the the great Ilya Prigogine got this fact wrong in his 1977 Nobel Lecture.

-

Guyon | Prigogine

In 1975, Etienne Guyon sent the following letter to Ilya Prigogine where, supposedly, he discussed the premise of explaining the love affairs and relationships based on thermodynamics: [40]

-

Phénoménologie du couple. Compléments. Etienne GUYON
Université Paris Sud Orsay

La formulation mathématique ne devrait pas être une cause d'incommunicabilité ni la barrière derrière laquelle se protègent les mystificateurs ou simplement les faibles - ceux qui ont peur de la rencontre. Dans la clarté et l'universalité de son écriture elle doit, à condition d'être explicitée, avoir un rôle véhiculaire de l'information au même titre, et de façon plus incisive sans doute que le mot.

Dans cet esprit je formule le problème énoncé dans les pages précédentes

$$\begin{cases} \dfrac{dv_A}{dt} + \dfrac{v_A}{T_A} + \mathcal{A} v_B = 0 \\ \dfrac{dv_B}{dt} + \dfrac{v_B}{T_B} + \mathcal{A} v_A = 0 . \end{cases}$$

Ceci représente deux équations couplées reliant entre elle la valeur de A, v_A et celle de B, v_B.

Regardons d'abord les 2 premiers termes de la première équation, c'est à dire supposons que la valeur d'échange, d'amour, $\mathcal{A}$, soit nulle. On a

$$\frac{dv_A}{dt} + \frac{v_A}{T_A} = 0 \quad \text{ou} \quad \frac{dv_A}{dt} = -\frac{v_A}{T_A} .$$

$\frac{dv_A}{dt}$ représente la vitesse avec laquelle la valeur v_A varie dans le temps. Cette vitesse est d'autant plus grande que T_A, le temps de relaxation de A est court. Cette équation traduit le phénomène d'amortissement dans le temps T_A de A

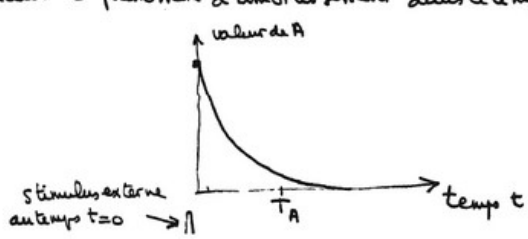

-

This idea interaction, however, never resulted in a published paper.

-

Partial differential equations | 1988

See main: Mathematics of love

One of the first to begin to describe love in mathematical terms was American mathematician Steven Strogatz who in his 1988 article "Love Affairs and Differential Equations" discussed his unusual teaching approach to introducing students to the subject of systems of coupled ordinary differential equations, by formulating hypothetical differential equations to describe the love/hate ratio functions (see: Gottman stability ratio) for the interactions between William Shakespeare's Romeo and Juliet. [16]

Strogatz's formulations, however, seem to be only a fun superficial application aimed at teaching mathematics.

The correct mathematical formulation of love and hate and relationships invariable involves partial differential equations that describe that describe either changes in chemical affinity or changes in Gibbs free energy with temperature and pressure held constant.

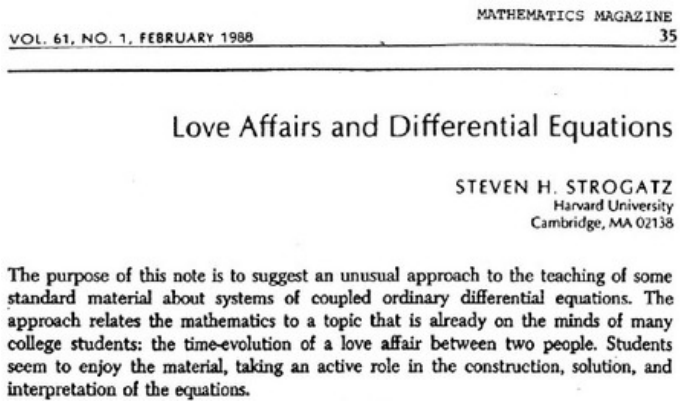

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Love Affairs and Differential Equations

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The purpose of this note is to suggest an unusual approach to the teaching of some standard material about systems of coupled ordinary differential equations. The approach relates the mathematics to a topic that is already on the minds of many college students: the time-evolution of a love affair between two people. Students seem to enjoy the material, taking an active role in the construction, solution, and interpretation of the equations.

American applied mathematician Steven Strogatz's 1988 article on differential equations and love. [1]

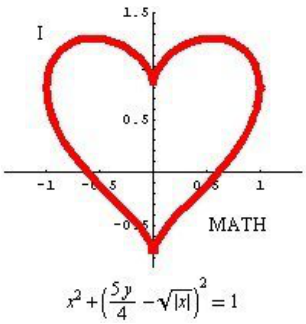

Left: a graphical way of depicting love as an equation. [7] Right: 2008 integral of love tattoo, said to mean: "all values, from zero to infinity, are less than love." [11]

Gibbs free energy | love & relationships

The first to state that human love is quantified by Gibbs free energy, in a formulaic manner was astrophysicist Christopher Hirata (IQ=225), in his circa 2000 relationship physics article "The Physics of Relationships".

This was followed by the 2001 relationship chemistry article "The Thermodynamics of Love" by American computational chemist David Hwang. Hwang states, without references and what seems to be on intuition, that for the process of a man *M* and women *F* falling in love:

$$M + F \rightarrow M\text{-}F$$

that, the measure of the spontaneity or favorability of this falling in love process is determined by the following equation:

$$sG = sH - TsS$$

where the "s" seems to refer to the specific value of Gibbs free energy *G*, enthalpy *H*, entropy *S*, and *T* for temperature.

Hwang then states that "a reaction in which G decreases (-sG) favors formation of product because the products have less free energy than the starting compounds and are more stable. In a reaction in which G increases (+sG), reactants are not likely to make much chemical progress." [4] On February 17, 2009, a video entitled "Chemical Romance", by Cacao Productions, was posted on YouTube declaring that:

> "Science today *cannot* give us an exact chemical **equation** to what is **love**, or even tell us if one exists."

In response to this, on March 03, 2009, American chemical engineer Libb Thims posted up a response video to correct this erroneous statement.

A 2007 T-shirt love as type of mathematical / chemical equation: [9]

$$M(e) + Y(o)^u = L^o(v)e$$

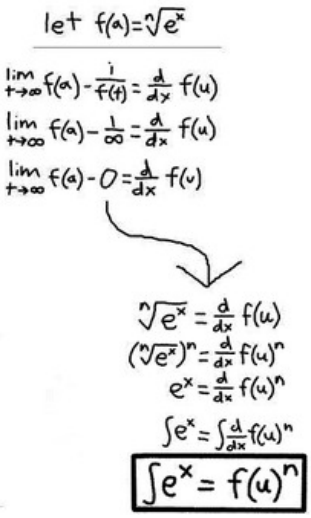

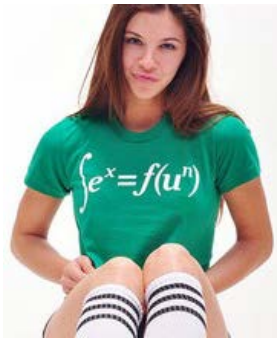

A mathematics humor "sex equal fun" derivation and T-shirt.

These are shown below, respectively. Thims, to

note, had previously written up a full textbook on this issue, *Human Chemistry* (2007), outlining the logic behind the view that human love and the activities surrounding this phenomenon are governed by the following simple expression:

$$A = -\Delta G$$

where, with substitution, knowing that the change in Gibbs free energy *ΔG* in closed system chemical reaction is equal enthalpy change *ΔH* less the product of the entropy change and the temperature, *TΔS*, we have:

"Chemical Romance" by Cacao Productions (17 Feb 09)	"Love | Equation of" by HumanChemistry101 (03 Mar 09)

$$A = -(\Delta H - T\Delta S)$$

or

$$A = T\Delta S - \Delta H$$

meaning that differences in love between potential mates can be determined by entropy and enthalpy changes involved in the process, and thus be able to predict, in theory, whether any given relationship is going to work; thus finding modern chemical thermodynamic corroboration with Goethe's 1809 *Elective Affinities*. [5]

Leachman | Equation

In 2017, Jacob Leachman, in "Social Thermodynamics: Chapter on Love", stating things as follows: (O)

> **When you'll fall in love**
> Falling in love is likely a form of phase change (see: social phase). You're entering into a (hopefully) synergistic bond with another that adds to you on many levels. The Gibbs energy analysis in other chapters shows that phase change spontaneously occurs when the Gibbs energy after the event is less than the Gibbs energy before:
>
> G = U + Pv – TS
>
> This is promoted by:
>
> U: simplification of values or descending to primal/familial values as a pair compared to individuals.
> P: reduced stress after the change.
> v: reduced volume, or increased density analogous to living together.
> T: likelihood of increased resources after the event. (Dowry?)
> S: becoming more empathic and understanding more things, including your partner, in more ways.

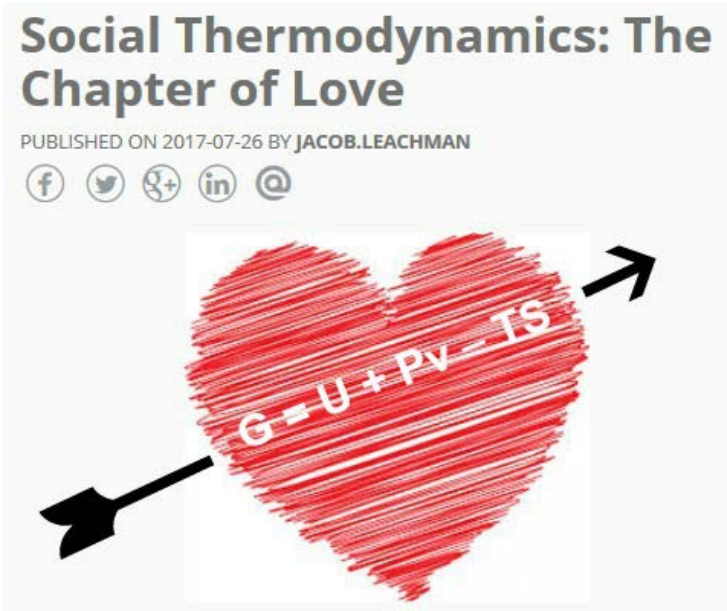

Image from Jacob Leachman's 2017 blog (O) on the thermodynamics of love, wherein he gives Gibbs energy as the defining **equation of love**.

> So if you find yourself only wanting to do one thing with someone, but are connecting with them on many levels, you run a chance of falling in love. But beware, empathy like entropy is irreversible, it'll be tough to forget someone if it doesn't work out. What's also comforting is that we can fall in love again and again. At the higher v-Memes there is a multitude of ways to synergize and hook up. Remember too that these properties are all connected by a complex surface of state and it is possible for phase change to happen despite some of the properties moving in opposite directions. But it generally holds, and vice versa should you ever want to prevent love.

(add)

An Abundance of Katherines | 2006

In 2006, American young adult fiction author John Green published the award-winning book *An Abundance of Katherines*, which tells the story of Colin Singleton, a child prodigy who tries to turn his 19 failed encounters with girls named Katherine into a formula that will predict the outcome of all relationships and elevate him into genius status. The book was a 2007 Michael L. Printz Award Honor Book, a finalist for the Los Angeles Times Book Prize, and may also, it is said, be in the works to be made into a movie in the future. The synopsis is:

"When it comes to relationships, Colin Singleton's type is girls named Katherine. And when it comes to girls named Katherine, Colin is always getting dumped. Nineteen times, to be exact. On a road trip miles from home, this anagram-happy, washedup child prodigy has ten thousand dollars in his pocket, a bloodthirsty feral hog on his trail, and an overweight, Judge Judy–loving best friend riding shotgun—but no Katherines. Colin is on a mission to prove The Theorem of Underlying Katherine Predictability, which he hopes will predict the future of any relationship, avenge Dumpees everywhere, and finally win him the girl. Love, friendship, and a dead Austro-Hungarian archduke add up to surprising and heart-changing conclusions in this ingeniously layered comic novel about reinventing oneself."

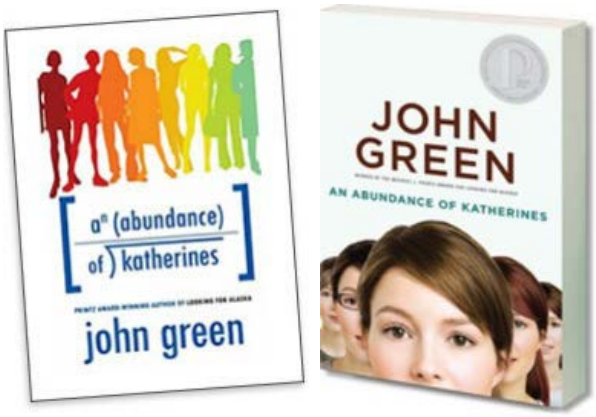

American young adult fiction author John Green's 2006 award-winning book *An Abundance of Katherines* (left), and followup 2008 edition (right), which tells the story of Colin Singleton, a child prodigy who tries to turn his 19 failed encounters with girls named Katherine into a formula that will predict the outcome of all relationships.

The book contains an appendix, written by American mathematician Daniel Biss, a close friend of Green, explaining some of the more complex equations Colin uses throughout the story. [21] The so-called "Theorem of Underlying Katherine Predictability", is outlined below: [23]

$$-D^7x^8 + D^2x^3 - \frac{x^2}{A^3} - Cx^2 - Px + \frac{1}{A} + 13P + \frac{\sin(2x)}{2}\left[1 + (-1)^{H+1}\frac{\left(x + \frac{11\pi}{2}\right)^H}{\left|x + \frac{11\pi}{2}\right|^H}\right]$$

- **Age** (A) – Average age of the two partners minus five.
- **Popularity Differential** (C) – The popularity difference between Person A and Person B on a scale of 1 to 1,000 (you can approximated) and then dividing by 75 – positive numbers if Person A is more popular; negative if Person B is. *(Or, as the website version of the formula calculates it, Person A's popularity score (on a scale of 1-15) minus person B's score.)*
- **Attractiveness Differential** (H) – Person A's attractiveness score (0-5) minus person B's score.
- **Dumper/Dumpee Differential** (D) – Person A's dumper score (0-1, where 0 is an extreme dumpee and 1 is an extreme dumper) minus person B's score. A positive number if Person A is more of a Dumper; negative if Person B is.
- **Introvert/Extrovert Differential** (P) – Person A's extrovert score (0-5, 0 for extreme introvert, 5 for extreme extrovert) minus person B's score. Positive numbers if Person A is more outgoing; negative if Person B is.

If the graph looks more like a frown (goes up then down), then **Person A** will be the dumper.
If the graph looks more like a smile (goes down then up), then **Person B** will be the dumper.
The formula also argues that the steeper the curve, the shorter the relationship in question will be.

A synopsis of the Green equation of love.

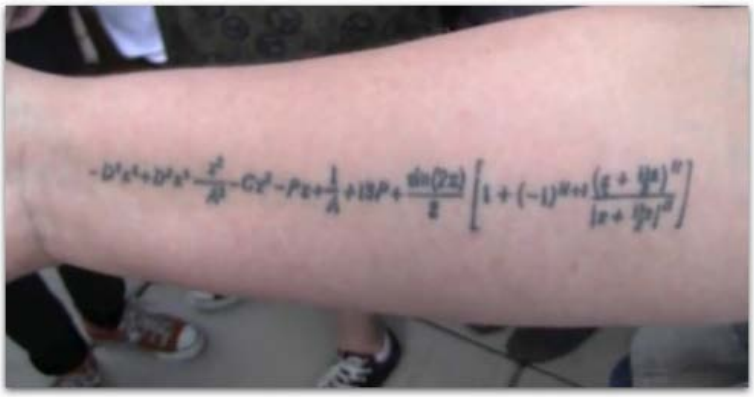

A *circa* 2010 tattoo of the Green equation of love on someone's forearm.

To solve this formula, supposedly, one is only to plug the variables into the equation shown and calculate. At one point, to note, Green had a java applet running to make quick calculations for people at SparksFlyUp.com, but the now-archived site was only active for a few years (c.2006-2008). [25] A Q&A synopsis of the book's writing origin, according to Green (2008), is as follows: [24]

Q. Is this book like Looking for Alaska?
A. Well, yes and no. Katherines is more of a comic novel (for instance, no one dies), but I still like writing about smart kids and friendship and figuring out what if anything matters.

Q. This book has a lot of anagrams and footnotes and also some math. What's up with that?
A. The only way I can answer that question is to say that I don't think you have to like footnotes or anagrams to like Katherines. And I SWEAR you don't have to like math.

Q. It's not just cleverness for the sake of cleverness, is it?
A. I hope not. Certainly I've never taken a lot of stock in being clever.

Q. Colin believes that there are two kinds of people in this world: Dumpers and dumpees. Which kind are you?
A. I am a dumpee. In fact, before I got married, I was dumped 53 times. But never by a girl named Katherine.

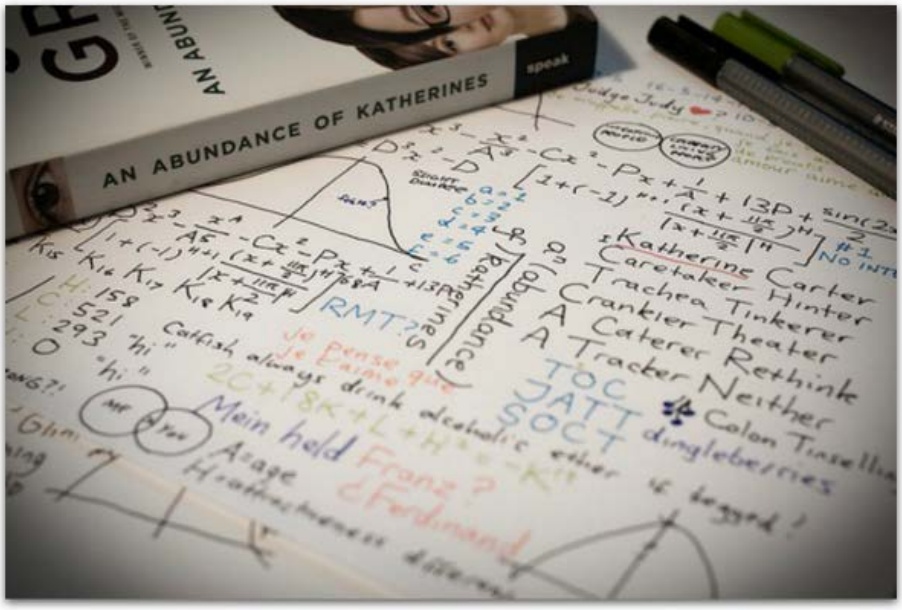

A 2008 artistic recreation of the themes and content, e.g. anagrams, mathematics, orbitals, some type of min-max graphical method, etc., of *An Abundance of Katherines*. [26]

Q. Is what why you picked the name Katherine?
A. Well, that had something to do with it. Also because Katherines is a great word for anagramming (it contains, after all, both heart and tear), and because it is a very common name.

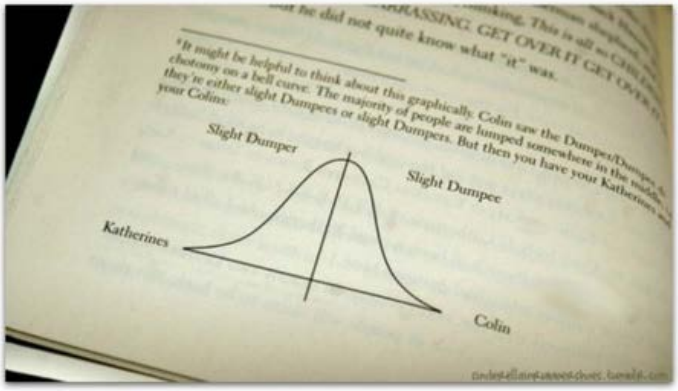

Green's "dumber/dumpee dichotomy" shown on a bell curve, according to which he says the majority of people are lumped somewhere in the middle.

Q. Yeah I have a question about that, actually. How could Colin have been dumped by 19 Katherines? Are there even 19 Katherines in all of Chicago?

A. When I was writing the book I actually decided to sit down and figure out approximately how many Katherines there are currently living in Chicago between the ages of 16 and 18 (which I figured to be the basic pool from which Colin could draw girlfriends).

It's a very inexact science, but if you look at the frequency with which kids in America were named Katherine between 1988 and 1990, and then you look at the percentage of Cook County residents who are between the ages of 16 and 18, the numbers indicate that there are something like 275 16-18-year-old Katherines living in or very near the city of Chicago, and that's not even counting the 3 million people who live in the suburbs. So the real question is: How did Colin manage to date ONLY 19 of them?

Curiously, although only in numerical similarity, 19 was the number of girlfriends of marriage potential that American electrochemical engineering student Libb Thims, in *circa* 1992-1993 (see: Thims thought experiment) , plugged into an excel spreadsheet style formula to attempt to discern numerically whom he should potentially choose to marry; listing each person on the horizontal and listing a range of point ranked attributes, qualities, or factors on the vertical, in an attempt to get a numerical "marriage quality value" for each girlfriend.

Of note, Green has been running an ongoing Penguin publishers "An Abundance of Covers" contest (ending November 21, 2011) for reprint editions of his book; all of the many submitted designs of which can be viewed online (at Tumblr). [27]

The Attraction Equation | 2007

A spin-off of Green's *An Abundance of Katherines* was the fictional 2007 book *The Attraction Equation* described as being written the character Charles Eppes of the popular TV show Numb3rs, described as being about the "the mathematics of friendship". [22] A summary of the episode is as follows: [23]

> "Dr. Finch tells him to publish, and so he has renewed interest in old research, having decided to publish one of his eleventh-grade papers he started at nine years old, "The Mathematics of Friendship," with an addendum. A publishing company has turned his work into a classic book for those not mathematically inclined, while opting for a title with more pizazz, "Friendship, As Easy as Pi." Charlie takes joy in the belief that this book will allow his thoughts to reach a much wider audience than before.

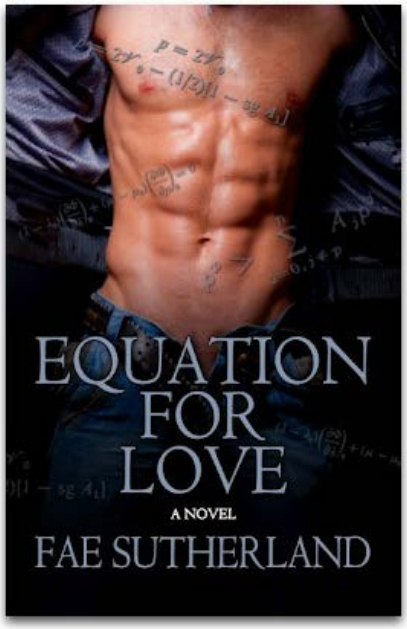

Left: a John Green fan 2011 "equation overlay style" book cover submission, showing Green's **equation of love** in the background. [27] Right: a 2012 novel entitled *Equation for Love* by Fae Sutherland the blurb of which is:

> Sex + money (shouldn't) = love

with the tagline: "but since when does the heart follow any laws but its own?" [36]

By the episode "In Security," the published book appears with the title "The Attraction Equation" and a dapper photo on the back cover of him holding a sculpture of a stellated icosidodecahedron with bevelled edges [William Sidis lectured on something similar to this as a child]. A decision theoretic approach to relationships is covered in the book. His proud father hands copies to friends and Larry sells signed copies on eBay. He apparently has some fans and gives into a televised interview."

To note, the first to actually write such a mathematical paper was Russian-born American thermodynamicist, theoretical biologist, and sociologist Nicolas Rashevsky who in his 1935 article turned chapter "Mathematical Theory of Human Relations" builds on the work of Alfred Lotka to attempt to derive mathematical equations for things such as 'desire' and 'will', in terms of concepts such as intensities and physical forces.

Likewise, as reality mirrors fiction and fiction reality, the character of Eppes, is similar to a number of actual prodigies. Eppes, it is said, could multiply

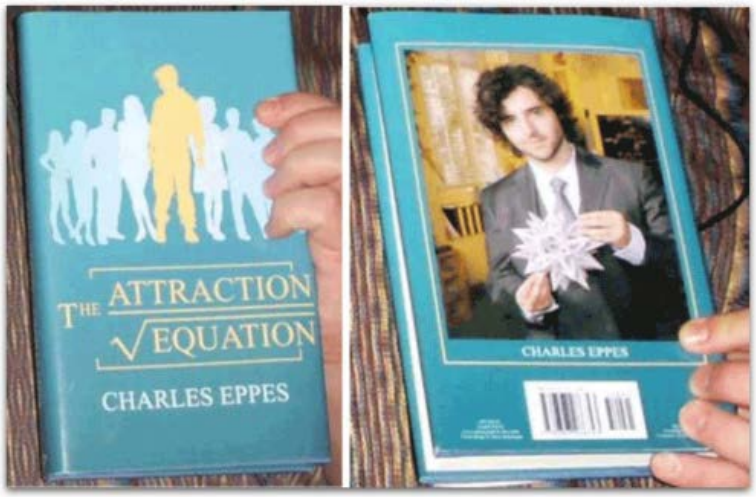

The cover of the fictional 2007 TV-land book *The Attraction Equation*, for an episode of the popular TV show Numb3rs, described as being about the "the mathematics of friendship", written by child prodigy Charles Eppes. [22]

four-digit numbers mentally at age three and at the age of four required special teachers [similar to Kim Ung-Yong (IQ=200-210)].

In the second grade, he attempted to find a 70-digit narcissistic number in base 12 [William Sidis (IQ=200-300) invented his own base 12 logarithm table] — Eppes has described himself as "quixotic" in elementary school.

A prodigy, he attended Princeton University at the age of 13 after graduating from high school [Christopher Hirata (IQ=225) won the IPO at age 13 and completed his BS in physics at Caltech and PhD at Princeton at age 23; likewise, Hirata actually did publish an actual physical chemistry based formula for love and relationships, in his 2000 article "The Physics of Relationships" written at age 20] at the same time as his brother who is five years his senior ("Soft Target"), and took Professor Lawrence Fleinhardt's quantum physics course in his first year.

They became fast friends, with Fleinhardt establishing his academic connections. Eppes published his first mathematical treatise at the age of 14 (in the *American Journal of Mathematics*) [similar to William Thomson (IQ=170-190) who published his first papers in the *Cambridge Mathematical Journal* as a teenager under the pseudonym P.Q.R.] and graduated at the age of 16. In fact, he was the youngest person to ever write a paper of importance. [23]

Extent of love

Modeling the process of love viewed as a purely chemical reaction, which is what it is, one arrives at the finding that each type of reaction between individuals in a relationship is characterized by a specific measure of "extent of reaction" or time-frame at which the reaction or relationship reaches thermodynamic equilibrium, meaning that the transformation content of the relationship, otherwise known as entropy or entropy change has reached maximum value.

Mathematically, the equilibrium point or divorce point for a relationship is quantified by Theophile de Donder's extent equation:

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

where at equilibrium the affinity *A*, chemical affinity, elective affinity, or driving force of the reaction between the couple will equal zero, A = 0, and thus with substitution:

$$\left(\frac{\partial G}{\partial \xi}\right)_{T,P} = 0$$

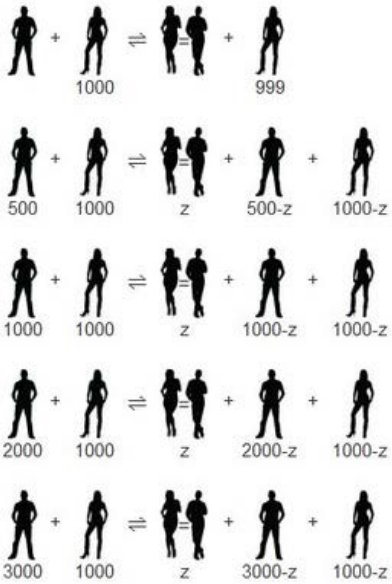

Left: with marriage viewed as a human chemical reaction, the factoid of 43% of marriages ending at 15-years, i.e. divorce rate, is a measure of the **extent** of reaction. Right: a Julius Davidson (1919) and or Christopher Hirata (2000) type depiction of human pairings as Le Chatelier type equilibrium reactions that adjust depending on reaction conditions.

which means that the variation of the Gibbs free energy (available energy) of the relationship with respect to the variation of extent (time) is zero or has a near negligible change. Some relationships, however, owing to thermodynamic coupling, will be driven past the equilibrium point, meaning that not only is there no available energy, but that the relationship becomes "energy absorbing" (endergonic) or energy draining, meaning that not only is the relationship not working any more, but it is work absorbing.

Statistically, it is known that about 90% of people will enter into a marriage reaction and that of these reactions 43% will reach thermodynamic equilibrium at the 15-year mark and file for divorce.

Homosexual equation of love

See main: Queer chemistry

The first to outline and discuss chemical reaction reaction or chemical equation formulations for homosexual relationships was American astrophysicist

Christopher Hirata ("The Physics of Relationships", 2000) and the first textbook section on subject homosexuality in the context of chemistry and thermodynamics was the "LGBT/Queer chemistry" chapter section of American electrochemical engineer Libb Thims' 2007 textbook *Human Chemistry*. [19]

On average, about 3-4 percent of the general male population and about 1-2 percent of the female population are homosexual in mating behavior and orientation. In these types of reactions, for the male-male pairing scenario, two male human molecules will form a mated union:

$$Mx + Mx \rightarrow MxMx$$

Similarly, about 1 percent of the general female population are homosexual in mating behavior. In these types of reactions, two female human molecules will form a mated union:

$$Fy + Fy \rightarrow FyFy$$

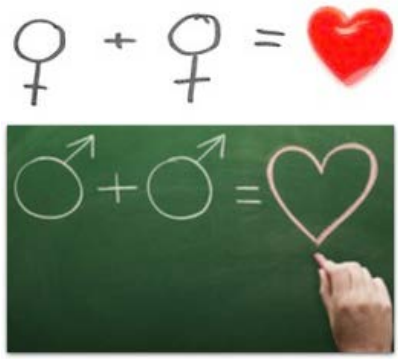

Left: an alchemy symbol stylized chemical equations for homosexual love. Right: the 2000 song "U + Me = Us" by the boy band 2ge+her.

Other variations of reactions and chemical equations exist beyond these two examples.

Mathematical equation

See also: Thermodynamics humor

Related to the subject of the "equation of love" is the popular so-called 'mathematical proof' that a woman equals problems, which is often given as a joke-answer to the premise that, supposedly, one can reduce love to a mathematical equation. It is difficult to track down the origin of this; online versions date several years, and the actual joke seems to have originated several decades back, but it amounts to a five step proof, with alternative variations in step four:

Step	Axiom	Origin	Equation
1.	Women are a product of time and money		$\text{women} = \text{time} \times \text{money}$
2.	Time is money		$\text{time} = \text{money}$
3.	(substitution of step 1 eq. into step 1 eq.)		$\text{women} = \text{money}^2$
4.	Money is the root of all evil	Bible (Timothy, 6:10)	$\text{money} = \sqrt{\text{evil}}$
	Money is the root of all problems		$\text{money} = \sqrt{\text{problems}}$
5.	(substitution of step 4 eq. into step 3 eq.)		$\text{women} = (\sqrt{\text{evil}})^2$
			$\text{women} = (\sqrt{\text{problems}})^2$

A "$\text{love} > \text{money}$" equation spray painted onto a public wall (22 July 2010): Love equation, graffiti artist (and place) unknown; alluding to the intimate and generally unwritten relation that exists between money (wealth) and love. [29]

Therefore, by the mathematical rule that $(\sqrt{x})^2 = x$, depending on one's prerogative, one can concluded to have proved that either all woman equal problems:

$$\text{women} = \text{problems}$$

or that women are evil:

$$\text{women} = \text{evil}$$

An alternative spin on this might start out by arguing that love is a product of time and energy:

Step	Axiom	Origin	Equation
1.	Love is a product of time and energy	Libb Thims (2007)	$\text{love} = \text{time} \times \text{energy}$
2.	Energy and mass are equivalent	Albert Einstein (1905)	$\text{energy} = mc^2$
3.	Love is a force	Empedocles (400BC)	$\text{love} = \text{force}_L$
4.	(substitution of step 3 eq. and step 2 eq. into step 1 eq.)		$\text{time} = \frac{\text{force}_L}{mc^2}$

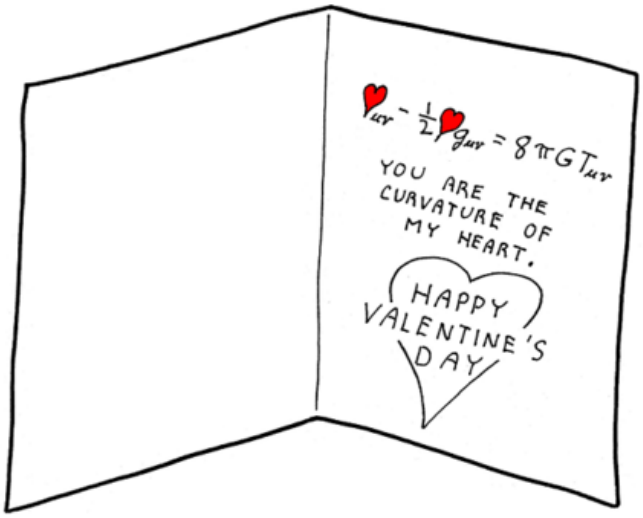

which leads one to the humorously conclusion that time is a function of the force of love divided by the product of the change in the mass of one's connected relationships and the speed of light squared. Another popular math-themed joke about love goes something along the lines of: [18]

"Sex is a matter of math: Add a woman. Subtract her clothes. Divide her legs. And Multiply."

Physics of love

See main: Physics of love; Thermodynamics of love

A humorous particle physics of love poem is:

Bosons are red
Mesons are blue
I like to classify
Hadrons with you

Shown adjacent, is a humorous relativity-themed Valentine's Day card equation of love, themed on the premise of explaining love via physics. [28]

Emotional imaging

In science-based matching sites, in circa 2009, building on Sigmund Freud and Carl Jung's psychodynamic theories and Libb Thims' 2007 human chemistry and human thermodynamics theories, the Russian biometrist Viktor Minkin launched a prototype emotional recognition compatibility program designed to test for love based on thermodynamic principles. The site, Psymaker.com (see: video matching example), supposedly tests couples in politics via vibraimage matching algorithms, giving a free test on which to give three politics view agreements with the best "energy compatibility" percentage with potential match. This logic is found at PsyMaker.com, which uses a fingerprint compatibility test.

Two swans forming a **heart shape**, both a common historical symbol of love. Modern symbols, however, involve chemical symbols: bonding brackets "{", reaction arrows "→", reaction conditions, i.e. in water " " or heated "Δ", individual chemical species, *A*, *B*, c., etc., attached species, *Ab*, *Ac*, etc., and movements and reactions of species due to affinity tendencies (affinity reactions), depicted diagrammatically.

Fiancée formula

In 2010, in what seems to have been a Valentine's day math joke that gained a significant amount press following, Australian mathematics professor Tony Dooley sent out a press release of the School of Mathematics and Statistics of the University of New South Wales, for a so-called newly discovered 'fiancée formula', as shown below, said to be an equation helpful in determining the right moment to get serious: [12]

$$\sum_{r=2}^{n-k+1} \frac{(n-k)}{n} \frac{(n-k-1)}{(n-1)} \frac{(n-k-2)}{(n-2)} \cdots \frac{(n-k-r+2)}{(n-r+2)} \times \frac{k}{(n-r+1)} \times \left(\frac{1}{r-1}\right)$$

As to what the variables of this equation stand for, however, the explanation seems to be lacking, as the press release seems to have retracted as of 2011, possibly being a joke? In any event, all that remains in the derivative news clippings is a three step handout, by the UNSW School of Mathematics and Statistics, for the process for determining

whether to ask someone to marry you, which amounts to the following:

1. Set out the last possible age by which you want to get married (e.g. age 39). Call this number 'n' for age at which marriage is a *necessity*.
2. Decide the earliest age at which you'll start to consider women as potential wife material (e.g. age 20 onwards). This age becomes 'p' or age at marriage becomes a *possibility*.

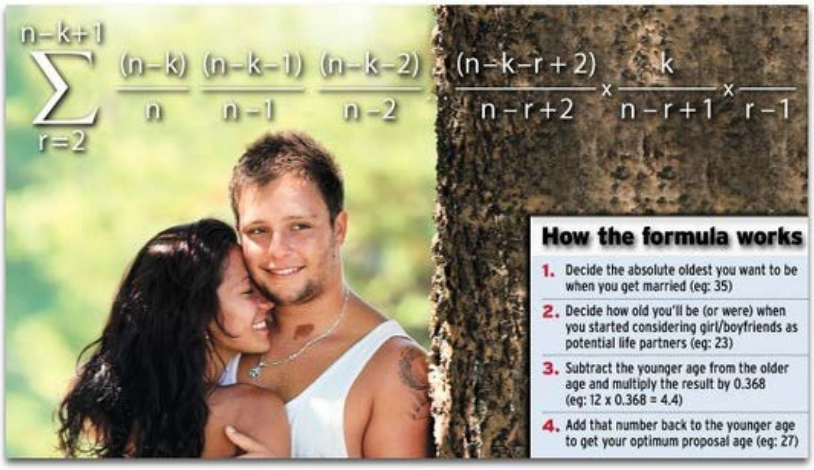

A 2010 equation overlay depiction of Australian mathematician Tony Dooley's so-called 'fiancée formula' **equation of love**. [34]

Then plug these numbers, *n* and *p*, into the following formula to get your age of optimal proposal:

$$A_o = p + 0.368(n - p)$$

The result A_o is your "optimal" proposal age. Using the example number, n = 39, p = 20, gives Ao = 27, which essentially yields the age of the average world man at first marriage. [13] Ideally, according to Dooley, you should not propose to anyone before you hit this age, but afterwards you should prepare to pop the question to the very next girl you date – as long as she's the best of the bunch so far.

$$\text{Joy} = \text{Love} - \text{Fear}$$

American well-being theorist Chip Conley's 2012 emotional equation of love. [30]

Emotional equations

In the 2012 book *Emotional Equations*, American Hotelier turned well-being theorist Chip Conley built on Abraham Maslow's theory of needs, following his emotional roller-coaster on how he was going to pay his thousand plus hotel employees following the dot com bust, to pen out a number of various "emotional equations", as he calls them, from topics such as flow to fear, among which his chapter sixteen gives the following equation for love: [30]

Joy = Love – Fear

or reordered algebraically:

Love = Joy + Fear

the latter of which becomes a bit tenuous, as far as equations of love go, boiling love down to a summation of joy and fear.

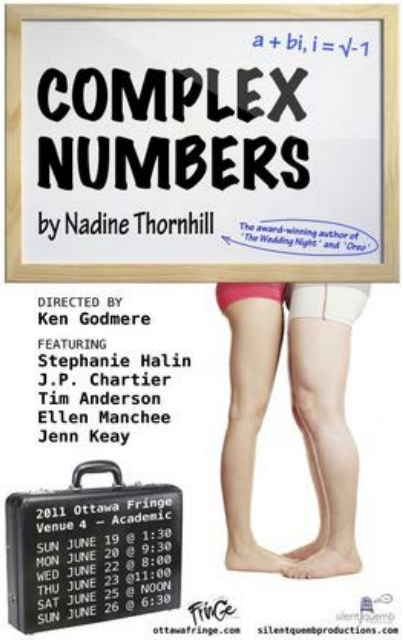

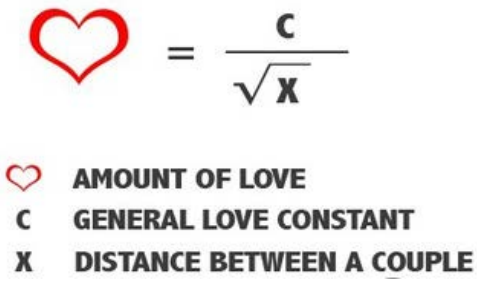

Left: poster for the 2011 play *Complex Numbers* written by Canadian playwright Nadine Thornhill and her husband mathematician Phil Eisen, in which the main character attempts to derive **equations for love**. [17] Right: a 2010 "Love vs. Distance" theory equation of love, where the love symbol represents the amount of love between the couple at an instantaneous time, X represents the distance between the couple, and C is a constant; according to which at a high value of X, the couple is far apart and love decreases, whereas at a low value of X, couples are nearer and love increases. [38]

Plays

The 2011 play *Complex Numbers*, written by Canadian playwright Nadine Thornhill, tells the story of a main character Fiona, a mathematician, tries to navigate the complexities of an office romance. "She tries to solve the equation of first dates, kinky sex, and long-term commitment," said Thornhill.

The inspiration for the play came in the way of Thornhill's husband, mathematician Phil Eisen, who works for Kanata-based security company Irdeto. "The main character is a mathematician and I'm married to a mathematician," said Thornhill. "I wanted to explore the idea of the office romance and do it in a way that is different then the way you see in romantic comedies. "I wanted to explore what would happen if you had a relationship where people did the exact opposite…I would call it radical communication." Eisen helped Thornhill write certain parts of the script, throwing in technical jargon that lends credibility to the characters but that's also easy for the public to understand. [17]

Thornhill's *Complex Numbers* might remind us of British playwright Tom Stoppard's 1993 *Arcadia*, an attempt at a modern rewrite of Goethe's famed physical chemistry of love based novella, the 1809 *Elective Affinities*.

Quotes

The following is a noted quote from the 2001 film *A Beautiful Mind* based on the life of American mathematician John Nash:

> "I've always believed in numbers. In the equations and logics that lead to reason; but after a lifetime of such pursuits I ask, what truly is logic? Who decides reason? My quest has take me through the physical, the metaphysical, the delusional and back, and I have made the most important discovery of my career... the most important discovery of my life. It is only in the mysterious **equations of love** that any logical reasons can be found. I'm only here tonight because of you. You are the only reason I am... you are all my reasons."

This is a quote from John Nash's fictional Nobel Prize speech. In actual fact, Nash was never asked to speak upon his acceptance of the 1994 Nobel Prize in Economics.

Other quotes are as listed:

> "I've made the most important discovery of my life. It's only in the mysterious **equation of love** that any logical reasons can be found."
>
> – Erich Fromm, German-born American social psychologist

Left: a short 2007 film entitled "Kirby and the Love Equation", about a 13-year-old boy genius named Kirby who spends five minutes each day attempting to derive an equation that will predict the odds the older girl he likes will go for him, Written by Brandon Goodwin, Nate Black and Grant Heugel. Right: the scene from the 2001 film *A Beautiful Mind*, wherein John Nash (starring Russell Crowe) gives his fictional Nobel Prize acceptance speech and mentions the "mysterious **equation of love**", something he never seems to have done in reality.

Notes

A related film by title, albeit only in namesake, is the 2008 movie *The Equation of Love and Death*, which is described as a pompous English re-title of the original Chinese: "Li Mi's guesses", a suspense-thriller film about why the boyfriend of Li Mi, an undistinguished taxi driver, left her. The film has no equations in it, nor it seems anything to do with a scientific explanation of love.

Other

The following are a few recently-found equations of love stylized images. The following, e.g., is a DreamsTime.com (Q) " equation of love" wedding symbol, which shows a mixture of math (love + love) equals marriage, and possibly human bonding (M=F) theory, couple tightly bound:

The following, below left, is 2013 *The Times* "equation of love" like image, showing: heart overlap, which may be representative of human molecular orbital theory, a martini squared, representative of alcohol's ability to lower inhibitions, thus giving wiggle room at the activation energy barrier, a reaction arrow, representative of transition state, an inequality sign (≥), which in the direction shown, would seem to be quantitatively indicative of the premise that good (natural) loves have greater Gibbs free energy in the initial state (left side of inequality sign) than final state (right side of inequality sign), some type of neurochemical, etc., for a book review article on Graeme Simsion's new book *The Rosie Project*, about a guy with Asperger's syndrome named Don Tillman who wants to find the "Perfect Wife" via questionnaires and DNA samples, a fictional spinoff, it seems, of recent non-fictional "Sweaty T-shirt study" based science-based dating sites: (Q) (Q)

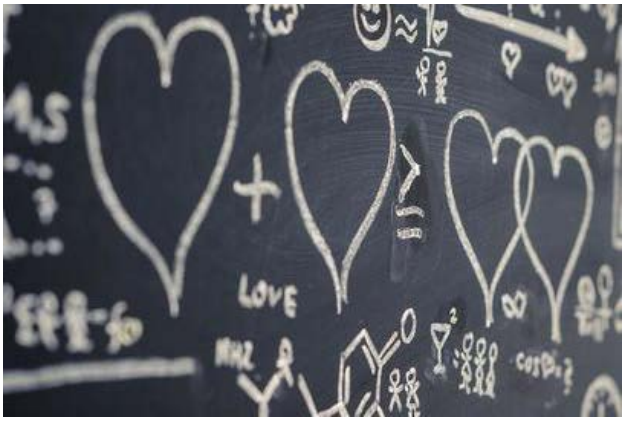

A 2013 *The Times* “equation of love” like image showing: heart overlap.

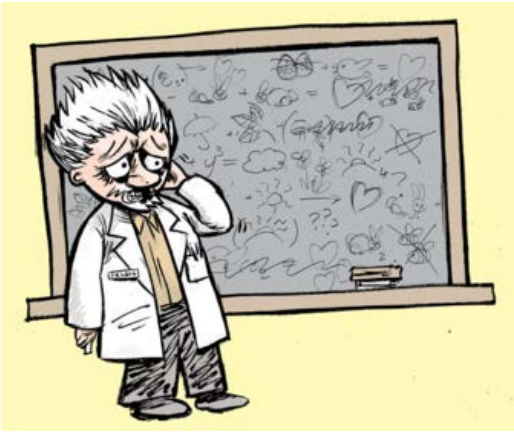

A circa 2011 Dr. Love cartoon, by artist Jaime Huxtable (O), trying to find the formula or equation for love. (O)

The following are other examples:

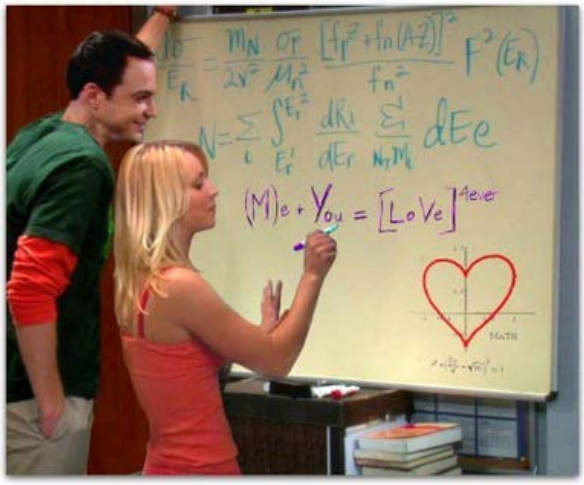

The following is a recent 2013 math, history, chemistry, art tale on the: what is love? query:

Right: A 2010 DeviantArt.com (computer modified) rendition of two people discussing a mathematical-like poetic style love equation. [15] In realty, to note, by virtue of tendencies of Beckhap's law, the probability of a physically "hot" blond being able to write such an equation on a dry erase board would be very rare.

Others include:

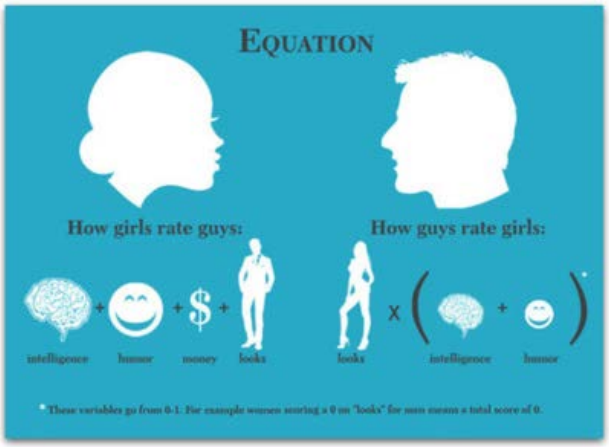

A 2010, Beckhap's law themed, equation infographic of love created by Audrey Fukuman, representing the differences in how men and women rate each other when looking for a potential mate. [8]

Throw pillow

The following is a circa 2014 "Chemical Thermodynamic Equation for Love" fine art design, by artist Paulette Wright, based on the circa 2003 Gibbs energy male-female reaction formulations of American electrochemical engineer Libb Thims, such as outlined above, available in the formats of: canvas print, framed print, iphone case, throw pillow, among others: (Q)

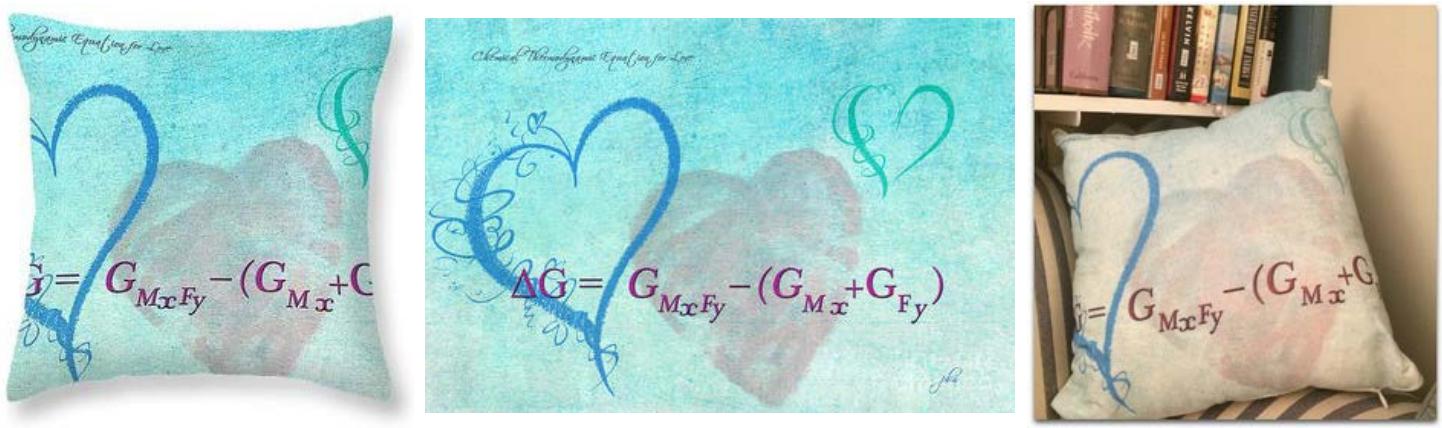

The 2015 photo (right) shows the equation of love pillow on the Thims' couch below biographical books on Hermann Helmholtz, Willard Gibbs, and William Thomson, by Helge Kragh, Muriel Rukeyser, Lynde Wheeler, David Lindley, among others, some of the thinkers behind the shown equation of love.

Quotes

The following are related quotes:

> "No poet, ancient or modern, not even Shakespeare or Dante, has more clearly divined or expressed with more profound utterance the nature of love than Emerson, though the poems in which he has expressly dealt with that passion are few. To be a poet is to be a lover, and the feminine Muse is but the unknown quantity in the poet's algebra, by which he expresses now this element, now that, in the indeterminate **equation of love**. Or, as Emerson better announces this mystery: 'The sense of the world is short; Long and various the report — To love and be beloved'."
>
> — Franklin Sanborn (1879), "The Homes and Haunts of Emerson" [39]

> "Polymerization + Love = You"
>
> — Clifford Pickover (2016), Great Chain of Being Image Tweet (Q), Nov 26

See also

- Elective Affinities | IAD: Love theories
- Equation overlay method
- Gottman stability ratio

● Ostwald happiness formula

2009 humorous take on a love equation: in which a man plus a woman times five beers equals love. [10]

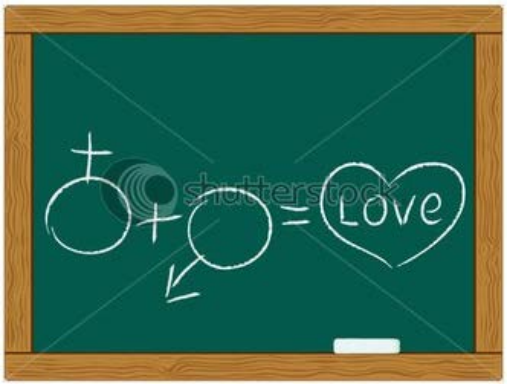

A 2011 ShutterStock.com rendition of a male plus female equals love chalkboard **equation of love**. [14]

A man plus woman plus coffee equals love equation, alluding to the underlying chemical-amphetamine nature of love.

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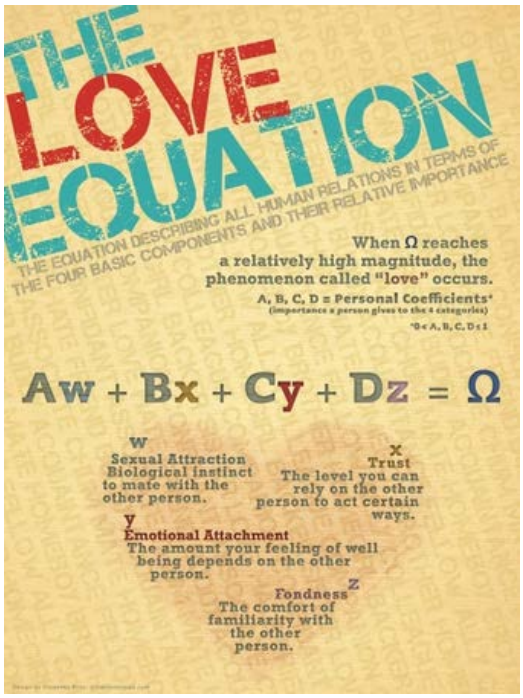

A 2010 love equation poster. [37]

(b) Photo (description): “Timing ... Ben Devonshire, 20, and girlfriend Cathy Clarke, 20 / Pic: Liam Driver Source: The Daily Telegraph”.
35. The Equation of Love Perception (2009) – Flickr.com.
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40. Rinaldi, Sergio, et al (2015). *Modeling Love Dynamics* (pg. 20-21). World Scientific.
-

Further reading

● Bryner, Jeanna. (2008). “Wanted: The Equation of Love”, *LiveScience.com*, Jan 30th.

External links

● Formula of Love (1984 film) – Wikipedia.
● Is there a mathematical equation for love? (2009) – Yahoo! Answers.
● What is the chemical formula for love? (2009) – Yahoo! Answers.

θΔics

In thermodynamics, **equation of state** or state equation is a mathematical expression that defines the state of a given system. State equations, if the variables are independent quantities, are generally of the following format: [1]

$$f(P, V, T) = 0$$

This form applies particularly for systems comprised of homogenous fluids. In this scenario, the state of the system is completely determined by any two of the three state variables. In more complicated systems, state functions come into play.

The ideal gas equation (1662-1893), which describes the state of an ideal gas, is the simplest type of state equation.

The van der Waals equation (c.1690), which describes the ideal gas system as the vapor-liquid state begins to be approached, wherein intermolecular interactions and particle volume effects need to be taken into account, is the next simplest equation of state.

References

1. Fermi, Enrico. (1936). *Thermodynamics* (pg. 2). Prentice-Hall.

External links

â— Equation of state – Wikipedia.
â— Equation of state (cosmology) – Wikipedia.

θΔics

In

A few example of the "**equation overlay method**", namely the placement of scientific notation, symbols, equations, chemical formulas, etc., above a given human phenomenon, in aims to visually capture the science of underlying the phenomena. Left: a circa 2004 draft cover for Libb Thims' *Human Thermodynamics, Volume One* manuscript. Center: the 2008 *Time* article "Why We Love?" [1] Right: A chemical symbol **overlay depiction** of an strong A≡B type human chemical bond actuating between two people (human molecules) newly in love during war times.

hmolscience, **equation overlay method** is type of problem solving methodology, used with intricately-dense problems, wherein the supposed scientific equations, formulas, concepts, or symbols, deemed likely to explain or govern a particular phenomenon, are overlaid on top of the representative-picture of the phenomenon of investigation.

Once the overlay is made, the problem will tend to be solved using the Feynman problem solving algorithm, or some variation of this.

The adjacent overlay, from the 2008 *Time* magazine article "Why We Love?", by written by Jeffrey Kluger with illustrations by Serge Bloch, depicts a scene from the 1939 epic-film *Gone With the Wind*, the highest adjusted-grossing film of all-time (having sold more tickets than any other film in US history), between Rhett Butler (Clark Gable) and Scarlett O'Hara (Vivien Leigh), with five equation-concept overlay, in descending order: [1]

- A top equation (name: maybe from electromagnetics?)
- Electromagnetic (or magnetic) field lines, over the head of Butler: indicative of some type of orbital theory?
- An atom (or atomic theory) symbol: possibly aiming to depict a type of atomic-mental bond?
- A chemical formula (2D formula for testosterone: the principle male sex hormone) overlaid on Butler
- A bottom equation (name: some type of kinetic energy formula?)

The article really doesn't expand much beyond this, but simply goes on to quote views from researchers such as Helen Fisher, David Buss, and Arthur Aron.

The manuscript cover to the unpublished 2002 *Human Chemistry (Volume One)*, pictured

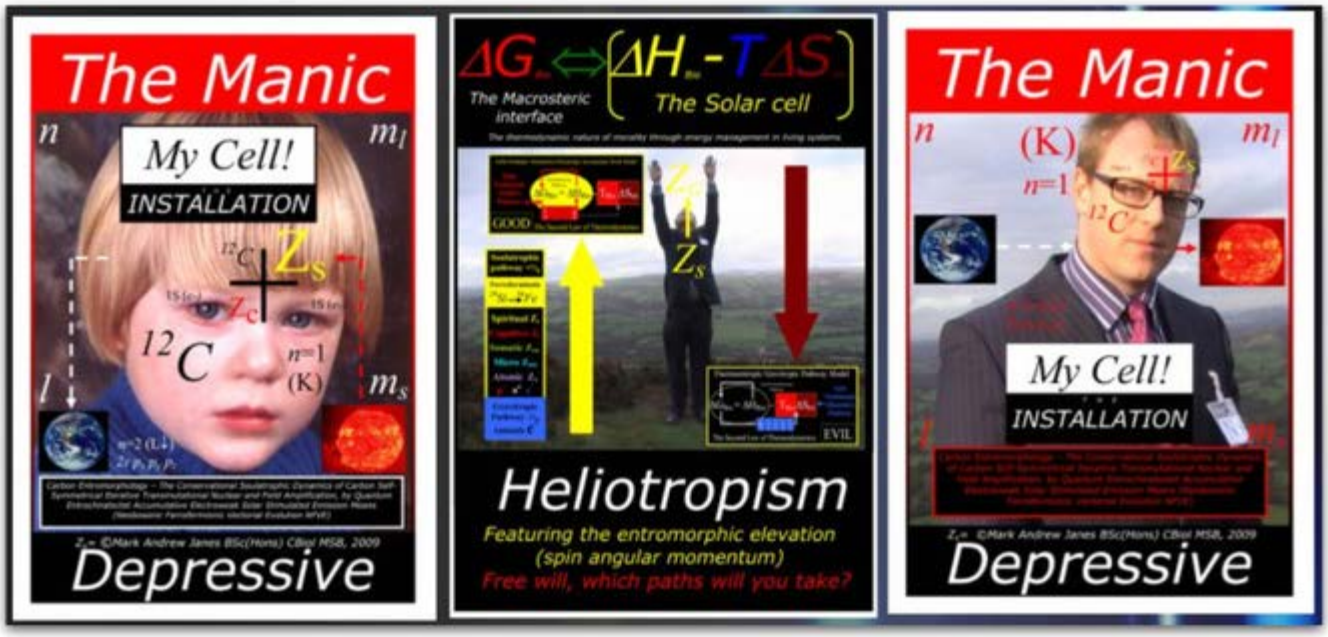

Mark Janes, the author of this overlay, wants to understand topics such as depression, free will, human occupation, good and evil, etc., in terms of chemistry and thermodynamics (add caption).

adjacent, by American chemical engineer Libb Thims, depicts another example of equation overlay method. Shown is a photo of two people approaching the embrace of kiss, on top of which each person is labeled with the Bergman-style chemical element letter notations of Mx = male human molecule, Fy = female human molecule, below which the male-female combination reaction is shown.

The "amount" of equation overlay sometimes tends to be indicative of the "greenness" of the hmol-theorist; one example, of this type, is the 2006 carbon entromorphology theory of English biologist Mark Janes, as shown below. [2] Janes' methodology is his belief that he is an amplified version of carbon atom and that atomic logic, and atomic orbital theory, must explain his existence; also that, being a type of atomic logic, the Gibbs equation, $\Delta G = \Delta H - T\Delta S$, of chemical thermodynamics, must explain topics such as free will, reaction paths, good and evil, and depression:

References

1. Biography – Carbon-Entropmorphology.com.
2. Harrell, Eben, Kloberdanz, Kristin, and Stinchfield, Kate. (2008). “Why We Love”, *Time* (pgs. 54-60), Jan 28.

θΔics

In science, an **equation** is a formula that sets one or more numbers or mathematical symbols equal or unequal to another set of set of one or more numbers or mathematical symbols whose operation is governed by specific rules.

Table of equations

The table to the right lists hmolscience relevant equations, in text (some linked) and LaTex format, although a few of the latter are in jpg format, indicated by (jpg) bracket, due to some kind of wiki page save error issue (seems to have something to do with "<" in LaTex), and each equation shown in modern symbol notation with main theorist behind the formulation of each: [2]

Equation name	Formulator	Date	Text	.jpg	LaTex
Equal signs	Robert Recorde	1557			$=$
Inequality signs	Thomas Harriot	c.1600			$>$(jpg) $<$(jpg) $>$
Momentum	René Descartes	c.1640			$\mathrm{p} = mv$
Boyle's law Mariotte's law	Robert Boyle	1662			$PV = k$
Gravity	Robert Hooke	1679			$\text{gravity} \propto \frac{1}{\text{distance}^2}$
Second law of motion	Isaac Newton	1686	F = ma		$F = ma$
Pressure	Daniel Bernoulli	1738			$P = \frac{F}{A}$
Reciprocity relation Euler reciprocity relation	Leonhard Euler	c.1739			$\left(\frac{\partial M}{\partial y}\right)_x = \left(\frac{\partial N}{\partial x}\right)_y$
Chemical equation	William Cullen	1757		$\begin{cases} A \searrow \\ B \quad C \end{cases}$	
Combination reaction	Torbern Bergman	1775			$A + B \rightarrow AB$
Legendre transform	Adrien-Marie Legendre	c.1786		$\begin{array}{ccccc} U(S,V) & \leftarrow & PV & \rightarrow & H(S,P) \\ \uparrow & & & & \uparrow \\ TS & & & & TS \\ \downarrow & & & & \downarrow \\ F(T,V) & \leftarrow & PV & \rightarrow & G(T,P) \end{array}$	
Charles' law	Jacques Charles	c.1787			$V = kT$
Gay-Lussac's law	Joseph Gay-Lussac	1802			$P = kT$

Truncated Pfaffian	Johann Pfaff	c.1805		$dW = Y dZ$
Pfaffian form	Johann Pfaff	c.1805		$dU = \sum_{i=1}^{k} X_i dx_i$
Vis viva	Joseph Lagrange	1811		$T = \frac{1}{2}mv^2$
Principle of the transmission of work	Gustave Coriolis	1821	W = Fd	$W = Fd$
Gravitational work Potential energy	Sadi Carnot	1824	W = mgh W = mgh	$W = mgh$
Pressure-volume work	Emile Clapeyron	1834		$W = \int_{V_1}^{V_2} PdV$
Mechanical equivalent of heat	James Joule	1843		$J = \frac{W}{Q}$
	Rudolf Clausius	1850		$A = \frac{\text{heat consumed}}{\text{work done}}$
Equivalence value of all uncompensated transformations	Rudolf Clausius	1856		$N = -\int \frac{dQ}{T}$
Entropy	Rudolf Clausius	1862		$S = \frac{Q}{T}$
First main principle First law of thermodynamics	Rudolf Clausius	1865		$dU = dQ - dW$
Clausius inequality	Rudolf Clausius	1865		$\oint \frac{dQ}{T} \leq 0$
Energy of the system Internal energy	Rudolf Clausius	1875		$U = T_v + J_e$
Maxwell internal energy relation See: Maxwell's relations	James Maxwell	c.1871		$dU = TdS - PdV$ $\Updownarrow$ $\left(\frac{\partial T}{\partial V}\right)_S = -\left(\frac{\partial P}{\partial S}\right)_V$
Maxwell				$dH = TdS + VdP$ $\Updownarrow$

enthalpy relation See: Maxwell's relations	James Maxwell	c.1871		$\left(\frac{\partial T}{\partial P}\right)_S = \left(\frac{\partial V}{\partial S}\right)_P$
Maxwell-Helmholtz energy relation See: Maxwell's relations	James Maxwell	c.1871		$dF = -PdV - SdT$ $\Updownarrow$ $\left(\frac{\partial P}{\partial T}\right)_V = \left(\frac{\partial S}{\partial V}\right)_T$
Maxwell-Gibbs energy relation See: Maxwell's relations	James Maxwell	c.1871		$dG = dH - SdT$ $\Updownarrow$ $\left(\frac{\partial V}{\partial T}\right)_P = -\left(\frac{\partial S}{\partial P}\right)_T$
Affinity-free energy equation	Hermann Helmholtz	1882		$\frac{dF}{dt} \leq 0$
Reversible reaction Equilibrium reaction	Jacobus van't Hoff	1884		$xA + yB \rightleftharpoons zC + wD$
Equilibrium constant	Jacobus van't Hoff	1884		$K = \frac{[C]^z[D]^w}{[A]^x[B]^y}$
	Jacobus van't Hoff	1884		$\Delta G^\circ = -RT \ln K$
Ideal gas law	Walther Nernst	1893	PV = nRT PV = nRT	$PV = nRT$
	Max Planck	1899		$k_B = \frac{R}{N_A}$
Lewis dot structure	Gilbert Lewis	1900		H:H $\rightleftharpoons H + H$
	Max Planck [?]	c.1900		$PV = Nk_BT$
Boltzmann entropy Boltzmann-Planck entropy	Max Planck	1903	S = k ln W S = k ln W	$S = k \ln W$
Heat theorem Third law of thermodynamics		1906		$\lim_{T \to 0} \Delta S = 0$
	Walther		A =	

	Nernst	1906	–ΔU	$A = -\Delta U$
Mass-energy equivalence	Albert Einstein	1905	E = mc² E = mc²	$E = mc^2$
New work done by chemical reaction	Gilbert Lewis			$\Delta G > w'$
Lewis inequality for natural processes	Gilbert Lewis	1923	ΔG < 0 ΔG < 0 $\Delta G < 0$ $dG < 0$	(Latex errors page code)
Lewis inequality for unnatural processes	Gilbert Lewis		ΔG > 0 $\Delta G > 0$	(Latex errors page code)
Driving force of chemical reaction	Gilbert Lewis		A = –ΔG	$A = -\Delta G$
			ΔG = ΔU + PΔV – TΔS ΔG = ΔU + PΔV – TΔS	$\Delta G = \Delta U + P\Delta V - T\Delta S$
	Gilbert Lewis	1923		$\Delta G = \Delta H - T\Delta S$
			ΔH – TΔS ΔH – TΔS	$\Delta H - T\Delta S$
Standard free energy of formation	Gilbert Lewis	1923	ΔG° = –RT ln K ΔG° = –RT ln K	
Electric work Galvanic free energy change	Gilbert Lewis	1923	ΔG = –nFE ΔG = –nFE	
	Gilbert Lewis	1923	A = –ΔG A = –ΔG	
		?		$A = \frac{1}{J}$
	James Partington	1924		$J = \frac{A}{Q}$

Affinity-free energy equation per extent of reaction	Theophile de Donder	1936		$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$
	Pierre Perrot	1998		$A^\circ = \sum_{i=1}^{k} -\nu_i \mu_i^\circ$
	Libb Thims	c.2010	A = TΔS – ΔH A = TΔS – ΔH	$A = T\Delta S - \Delta H$
Alley equation	The Alley	c.2012		no job = no sex
	Ben Biddle	2013	heat = passion	$\text{heat} = \text{passion}$
Lipmann coupling inequality				$\sum_{i=1}^{j} \Delta G_{N_i} + \sum_{i=1}^{k} \Delta G_{\tilde{N}_i} < 0$

Latex issues

Some LaTex equations, e.g. ΔG < 0, particularly when put into tables, on in some cases pasted into page, the code won't hold for some reason, and the page will not save.

Discussion

In 1918, American historian William Thayer, in commentary on the previous work of American physical historian Henry Adams, posited the future would see the arrival of a “common formula” that would unite history and thermodynamics: [1]

> “The time may come when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry … then it may be possible to invent a **common formula** for thermodynamics and history.”

The best candidate for this common formula, to note, as things currently stand, is the 1882 affinity-free energy equation (Goethe-Helmholtz equation), such as elaborated on in American chemical thermodynamicist Frederick Rossini's 1971 "Chemical Thermodynamics in the Real World" Priestly Medal address, the the full ramifications of this, as Adams concluded after nearly working on the problem for 50-years, will require the aid of "another Newton".

See also

â— Equation of love
â— Equation of state
â— Equation overlay method
â— Bridgman’s thermodynamic equations

References

1. Thayer, William R. (1921). “Vagaries of Historians”. *Annual Report of the American Historical Association* (pgs. 77-88, esp. pgs. 80-84). G.P.O.

External links

â— Equation – Wikipedia.
â— Pv=nrt calculator – EngineeringUnits.com.

θΔics

In science, **equilibration** refers to an interaction type of state or process between a system and its surroundings, such that there is a progression of equilibrium states. The term is similar to thermalization, the exchange of energy between two systems.

Etymology

The term "equilibration" seems to have been introduced by English philosopher scientist Herbert Spencer, employed greatly in his noted treatise *First Principles* (where he outlined four types of equilibration), to account for evolution in relation to society and changes in its surroundings. [1]

In circa 1858, Spencer was confounded when he was told by Irish physicist John Tyndall that his ideas on equilibration in relation to the end states of processes was incongruous with the second law and the logic of heat death. In a letter to Tyndall, Spencer declares: [2]

> "Regarding, as I had done, **equilibration** as the ultimate and highest state of society, I had assumed it to be not only the ultimate but also the highest state of the universe … and your assertion that when equilibrium was reached life must cease, staggered me. Indeed, not seeing my way out of the conclusion, I remember being out of spirits for some days afterwards."

The issue of what then happens to a society after equilibration is reached stayed on Spencer's mind for the next forty years. In his 1899 autobiographical "The Filliation of Ideas", Spencer concludes that when equilibration is completed, "dissolution" occurs. [3]

References

1. Spencer, Herbert (1897). *First Principles* (ch XXII: Equilibration, pgs. 496-530). D. Appleton & Co.
2. Duncan, David. (1908). *Life and Letters of Herbert Spencer* (vol I, pg. 136). Two volumes. New York: Appleton.
3. Bailey, Kenneth D. *Social Entropy Theory* (pg. 58). State University of New York Press.

θΔics

In thermodynamics, **equilibrium**, from the Latin *aequi-* meaning “equal, even” + *-libra* meaning “weight”, is an evolution condition in accordance with time of the “state” of a system and its surroundings where a system is said to be *in equilibrium* when neither its state nor that of the surroundings evolves with time. [1] In earth-bound systems, daily heat input from the sun punctuates the state of each thermodynamic system away from equilibrium, thus forcing chemical species to evolve. [8]

Thermodynamic equilibrium exists, said another way, when the properties of a system are assumed constant from point to point and when there is no tendency for change with time. [10]

History

The first to use the term "equilibrium" in thermodynamics was French engineer Sadi Carnot who spoke of "equilibrium in the caloric", referring to a state of arrangement in which no heat would flow between bodies and no work could be done. In thermodynamics, jumping from Carnot to German physicist Rudolf Clausius, origin of most equilibrium theories, trace their origin to the work of American engineer Willard Gibbs, particularly his 1876 publication “On the Equilibrium of Heterogeneous Substances” [2] In the 1930s, the branch of nonequilibrium thermodynamics began to emerge as researchers began to apply the concepts of energy and entropy to heat transfers in fluid systems, such as in the formation of Benard cells, taking the "system" to be a small differential region of substance in the medium subjected to continuous flows of matter and energy.

Overview

In simple terms, chemical species evolve according to the logic of chemical reactions. In general, for earth-bound systems, being isothermal-isobaric systems, changes in the Gibbs free energy are useful in indicating the conditions under which a chemical reaction will occur. The spontaneity rule for reactions is that if ΔG is positive a reaction will only occur if energy is supplied to force it away from the "equilibrium" position (i.e. when $\Delta G = 0$). If ΔG is negative the reaction will proceed spontaneously to equilibrium. [9] The combined set of reactions in a system characterize the equilibrium state of the system at any given time.

Equilibriums, in general, can be punctuated, stable, meta-stable, undifferentiated, unstable, near-equilibrium, far-from equilibrium, quasi-equilibrium, or non-equilibrium, among other terms. [7]

Difficulty on application in human systems

In human thermodynamics, there currently is great debate and confusion as to how the thermodynamic concept of equilibrium applies to systems of evolving human molecules. In the early 20th century, economists and sociologists, such as Vilfredo Pareto, began to apply Gibbs’ equilibrium criterion to the modeling of economic systems and social systems.

The general difficulty in applying the conception of equilibrium, as defined in thermodynamics, traces to the confusions between the “thermodynamic system” being defined using the standard, diurnal-time, heat contact, piston-and-cylinder, “Carnot cycle model”, verses the continuous-time, heat transfer, fluid mechanics, Bénard cells type, “hot plate model”. In loose term, the issue comes down to a debate on whether to use Gibbsian thermodynamics (1870s) or Prigoginean thermodynamics (1950s) to study the evolution of the biosphere.

In 1977, in contrast to the logic of classical thermodynamics, Belgian chemist Ilya Prigogine expressly stated that that the Gibbs' equilibrium method is not applicable to life and that evolving living systems, such as communities of people, are “far-from-equilibrium” systems. [3] In 1978, in opposition to Prigogine, Russian physical chemist Georgi Gladyshev proposed that evolving living systems are “quasi-equilibrium” systems. [4] Beyond this, others, culling from a mix of ecological thermodynamics and fluid mechanics (i.e. Bénard cells), model human systems in terms of distance from equilibrium: (a) *the equilibrium state*, (b) *slightly away from equilibrium*, (c) *near-equilibrium*, and (d) *far-from-equilibrium*. [5]

In modern terms, the confusion existent between most biochemistry textbooks, which model (internal bodily) biochemical reactions as Gibbs-like equilibrium reactions, and many recent physics models of human social systems (reactions between humans), which model evolution as a far-from-equilibrium Prigogine-like fluid dynamics system,

has caused much mishap. Some, in recent years, being caught up in this mix of theories, have summarized the matter by stating that “life is made up of reactions in the near equilibrium realm and may not be so *far* from equilibrium as has been suggested.”

Economic thermodynamics

In terms of thermodynamic approach to equilibrium in economics, some define equilibrium such that the system, instead of evolving in time, simply changes it position in the space of macroscopic parameters, remaining on certain surface, the *surface of state*, singled out by the “equation of state”. [6]

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics*, Oxford: Oxford University Press.
2. Gibbs, Willard. (1876). "On the Equilibrium of Heterogeneous Substances", *Transactions of the Connecticut Academy*, III. pp. 108-248, Oct., 1875-May, 1876, and pp. 343-524, may, 1877-July, 1878.
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5. Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Life*. Chicago: The University of Chicago Press.
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External links

â— Thermodynamic equilibrium – Wikipedia.

θΔics

In chemistry, the **equilibrium constant** *K* is a value defining the ratio of the concentrations of the products to the concentrations of the reactants in a reversible chemical reaction, at the point when the reactants and products reach steady-state values, a point otherwise known as equilibrium. [1] Given a reversible reaction of the form:

$$xA + yB \rightleftharpoons zC + wD$$

where x, y, z, and w are the stoichiometric coefficients, the equilibrium constant is defined by follow equation:

$$K = \frac{[C]^z [D]^w}{[A]^x [B]^y}$$

where [A], [B], [C], and [D] are the concentrations of the various reactants and products at the equilibrium.

Thermodynamics

The driving force of any reaction are the various chemical affinities of the reactants and products, in relation to each other. The affinity *A* for an isothermal-isobaric reaction, is defined by the variation of the Gibbs free energy per change in the extent or progress of the reaction:

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

ΔG° and Equilibrium

ΔG°	Reaction	K_{eq}
+	nonspontaneous	<< 1
−	spontaneous	>> 1
0	at equilibrium	= 1

An equilibrium constant spontaneity table showing the relationship between free energy change and the equilibrium constant. [6]

or, in terms of Gibbs free energy change:

$$A = -\Delta G$$

at equilibrium the affinities will be satisfied, as quantified by the condition ΔG=0. This condition can be expressed in terms of the equilibrium constant as:

$$\Delta G^\circ = -RT \ln K$$

where by solving for K the one arrives at an expression:

$$K = e^{(-\Delta G^\circ / RT)}$$

relating the equilibrium constant to Gibbs free energy and temperature: [2]

History

In 1868, in order to ascertain molecular weights via a vapor density method, German chemist August Horstmann began to investigate the effect of temperature on the equilibrium constant for a dissociation process, beginning with the Clausius-Clapeyron equation, but extending it to apply to a substance that is dissociating. In 1872-73, Horstmann applied the entropy principle to the problems of chemical dissociation. [3] In October 1973, Horstmann announced the condition for chemical equilibrium to be that of maximum entropy. [4]

In the 1880s, work on the relation between, affinity, the equilibrium constant, and thermodynamics was further established by Dutch physical chemist Jacobus van't Hoff. The above derivation, in particular, seems to stem from van't Hoff's 1884 *Studies in Chemical Dynamics*. [5]

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External links

â— Equilibrium constant – Wikipedia.

θΔics

In thermodynamics, **equilibrium state** or *state of equilibrium* is a conjunction term describing the state of a system that is in equilibrium, meaning that neither it nor its surroundings are evolving with time. The process of changing a system from one equilibrium state to another generally centers on the meaning or effect of the entropy change ΔS for the process. [1]

Overview

The detailed understanding of the “state of equilibrium” and the various "criterions" for this condition, as system influences change, such as with particle (chemical species) movements in and out of the system, gravitational effects, osmotic effects, electromotive force effects, etc., were laid out in the 1876 publication *On the Equilibrium of Heterogeneous Substances* by American engineer Willard Gibbs. The term “state of equilibrium” was first mentioned in the opening paragraph to his abstract, where he notes: [2]

> “It is an inference naturally suggested by the general increase of entropy which accompanies the changes occurring in any isolated material system that when the entropy of the system has reached a maximum, the system will be in a **state of equilibrium**.”

On this logic, in his dense treatise, Gibbs extends the results of this principle, i.e. the second law of thermodynamics as defined by German physicist Rudolf Clausius, to all varieties of systems.

References

1. Anderson, Greg, M. and Crerar, David A. (1993). *Thermodynamics in Geochemistry - the Equilibrium Model* (pg. 90). New York: Oxford University Press.
2. Gibbs, Willard. (1876). "On the Equilibrium of Heterogeneous Substances", *Transactions of the Connecticut Academy*, III. pp. 108-248, Oct., 1875-May, 1876, and pp. 343-524, may, 1877-July, 1878.

θΔics

In thermodynamics, **equilibrium thermodynamics** is the study of systems that are at equilibrium (equilibrium state), near-equilibrium, or approaching equilibrium.

The term equilibrium thermodynamics is often used so as to distinguish between assumed continuous equilibrium states, e.g. as in geological thermodynamic studies of rock formations, verses nonequilibrium thermodynamics, where continuous inputs of energy or matter to systems acts to keep such systems in nonequilibrium states, e.g. as in Benard's cell formation. The criterion of "local equilibrium" is often used to justify the use of equilibrium thermodynamic type equations.

Terminology

In his 1983 textbook *Equilibrium Thermodynamics*, English physicist Clement Adkins defines his book as a standard treatise on "classical thermodynamics", which implies that the term "equilibrium thermodynamics" simply means standard thermodynamics applied to a particular subject, in larger part. [1] In short, equilibrium thermodynamics is a rather ill-defined term, similar to classical thermodynamics, but is essentially a synonym for basic thermodynamics.

References

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Further reading

â— Denbigh, Kenneth. (1981). *The Principles of Chemical Equilibrium.* Cambridge University Press.
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External links

â— Equilibrium thermodynamics – Wikipedia.

θΔics

In thermodynamics, **equivalence-value**, from the German *Aequivalenzwerth*, is the mathematical value of a transformation, of heat into work or work into heat, defined by the ratio of the quantity of heat Q, interring or leaving a system, and the absolute temperature T of the surface of system, where the heat enters or leaves: [1]

$$\frac{Q}{T}$$

The term and logic behind the term were developed in 1854 by German physicist Rudolf Clausius, which is a precursory synonym for the 1865 quantity of entropy, being built on the phenomenon of the mechanical equivalent of heat in relation to its effect inside of working body during a cycle. [2]

See also

- Transformation-equivalents

References

1. Clausius, R. (1865). *The Mechanical Theory of Heat – with its Applications to the Steam Engine and to Physical Properties of Bodies*, (pgs. 121-27) (Forth Memoir). London: John van Voorst, 1 Paternoster Row. MDCCCLXVII.
2. Clausius, R. (1854). "On a Modified form of the Second Fundamental Theorem in the Mechanical Theory of Heat", Poggendoff's *Annalen*, December. Vol. xciii. p. 481; translated in the *Journal de Mathematiques*, vol. xx. Paris, 1855, and in the *Philosophical Magazine*, August 1856, S. 4. Vol. xii. p. 81.

θΔics

In thermodynamics, **equivalence-value of all uncompensated transformations**, symbol *N*, is defined by the following expression:

$$N = -\int \frac{dQ}{T}$$

which is the quantitative measure of the "equivalence-values", or mechanical equivalent of heat changes associated with internal irreversible work process that exist at the end of one cyclical process or what are called "uncompensated transformations". This name "equivalence-value of all uncompensated transformations" was an early extended synonym for what would famously become termed as "entropy" in 1865.

The nature of this variable *N* was addressed in Rudolf Clausius in his 1854-56 "principle of the equivalence of transformations".

See also

- Clausius inequality
- Transformation equivalents
- Transformational content
- Entropy (etymology)

References

1. Clausius, Rudolf. (1865). *The Mechanical Theory of Heat: with its Applications to the Steam Engine and to Physical Properties of Bodies* (pg. 141). John van Voorst.

θΔics

In science, **equivalent human molecules** refers to two or human molecules 'equivalent', in some way or another, in the sense of the possibility for human chemical reaction of human chemical bonding.

Overview

In 1885, American scientist Henry Adams, in a letter to his wife, introduced the term 'equivalent human molecules', as follows: [1]

> "I am not prepared to deny or assert any proposition which concerns myself; but certainly this solitary struggle with platitudinous atoms, called men and women by courtesy, leads me to wish for my wife again. How did I ever hit on the only women in the world who fits my cravings and never sounds hollow anywhere? Social chemistry—the mutual attraction of **equivalent human molecules**—is a science yet to be created, for the fact is my daily study and only satisfaction in life."

In modern terms, it would seem that what Adams means by "equivalent", in this context, alluding to the attraction he has to his wife, would translated to discussions of entropic and enthalpic equivalents in the thermodynamics of human bonding.

References

1. (a) Adams, Henry. (1885). "Letter to Marian Adams", April 12. (Letters, II: 608).
(b) Adams, Henry. (1988). *The Letters of Henry Adams: 1892-1899, Volume 4* (equivalent human molecules, pg. xxviii). Harvard University Press.
(c) O'Toole, Patricia. (2006). *The Five Hearts: an Intimate Portrait of Henry Adams and his Friends* (equivalent human molecules, pg. 148). Simon and Schuster.
(d) Rowe, John C. (1996). *New Essays on the Education of Henry Adams* (pg. 81). Cambridge University Press.

θΔics

In existographies, **Erasmus Darwin** (1731-1802) (IQ:175|#235) (EvT:9|21+) (CR:41) was an English physician, poet, philosopher, botanist and naturalist, stylized "singular genius" (Thurston, 1878), patriarch of the great "Darwin family", grandfather of naturalist Charles Darwin and great-great grandfather of physicist C.G. Darwin, noted for his 1791 evolution theories, preceding those of Saint-Hilaire (1833) and following those of Goethe (1784), and for his 1794 *Zoonomia: the Laws of Organic Life*, in which he argued that organic matter may be the matrix of new life. [1]

Overview

His 1789, Erasmus, in his poem *The Love of Plants*, offered a long footnote glimpse of his theory of evolution; his 1794/96 *Zoonomia* contains a chapter on "Generation", which outline a foreshadow of modern evolution theory.

Origin of life

In 1794, Erasmus, in his *Zoonomia: the Laws of Organic Life*, on the subject of the origin of life, gave the following opinion:

> "Would it be too bold to imagine, that in the great length of time, since the earth began to exist, perhaps millions of ages before the commencement of the history of mankind, would it be too bold to imagine, that **all warm-blooded animals have arisen from one living filament**, which the great first cause endued with animality, with the power of acquiring new parts, attended with new propensities, directed by irritations, sensations, volitions, and associations; and thus possessing the faculty of continuing to improve by its own inherent activity, and of delivering down those improvements by generation to its posterity, world without end!"
>
> — Erasmus Darwin (1794), *Zoonomia: the Laws of Organic Life* (pg. 397) [2]

This, no doubt, was a precursor idea to Charles Darwin's later "warm pond model" (1871).

Quotes | By

The following are quotes by Erasmus:

> "I was led to suspect, that elastic fluids, when they were mechanically expanded, would attract or absorb heat from the bodies in their vicinity; and that, when they were mechanically condensed, the fluid matter of heat would be pressed out of them, and disused among the adjacent bodies."
>
> — Erasmus Darwin (1788), "Frigorific Experiments on the Mechanical Expansion of Air" [1]

> A fool, Mr, Edgeworth, is one who has never made an experiment.
>
> — Erasmus Darwin (c.1795), "Remark to Richard Edgeworth (Q)"; as quoted by Stanley Jevons in 'Experimental Legislation' [4]

See also

- Desiderius Erasmus

References

1. Ball, Philip. (2011). *Unnatural: the Heretical Idea of Making People* (pg. 123). Vintage Books.
2. (a) Darwin, Erasmus. (1794). *Zoonomia* (XXXIX: On Generation, pgs. 373-442). Publisher.

(b) Darwin, Erasmus in Venn, J. & J. A., *Alumni Cantabrigienses*, Cambridge University Press, 10 vols, 1922–1958.
3. (a) Erasmus, Darwin. (1788). “Frigorific Experiments on the Mechanical Expansion of Air” (abs) (pg. 43), *Philosophical Transactions of the Royal Society*, 78:43-42, Jan 01.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 58). Cornell University Press.
4. Jevons, Stanley. (1880). “Experimental Legislation” (Q), *Popular Science*, 16:754, Apr.

Further reading

● King-Hele, Desmond. (1977). *Doctor of Revolution: the Life and Genius of Erasmus Darwin*. Faber.
● Smith, Cristopher and Arnott, Robert. (2005). *The Genius of Erasmus Darwin*. Ashgate.

External links

● Erasmus Darwin – Wikipedia.

θΔics

In thermodynamics, **Erasto Mpemba** (1950-) is a Tanzanian, African amateur scientist noted for his circa 1962 observation that "warm-freezes-faster" in respect to ice cream making, about which he began to query people for an answer, eventually finding physics professor Denis Osborne, who published an article in 1969 with him on this phenomenon.

Overview

See main: Mpemba effect

In 1961 (age 7) (Q) or 1963 (age 9) (Q), Mpemba, while making ice cream, noted the phenomenon — also commented on by Aristotle, Roger Bacon, Francis Bacon, and Rene Descartes — that "warm-freezes-faster", meaning that if he heated his water (or cream) before freezing, he could make ice cream faster. Mpemba told his teachers about this, who at the time, supposedly, laughed at him.

In 1966, Mpemba entered into Magamba Secondary (High) School, where he had a chance meeting with noted physics professor Denis Osborne from the University College in Dar Es Salaam. After an Osborne lecture, Mpemba boldly asked the physicist:

> "If you take two similar containers with equal volumes of water, one at 95°F and the other at 212°F and put them into a freezer, the one that started at 212°F freezes first. Why?"

In 1969, Osborn co-authored with Mpemba this experimental phenomena, which thereafter became dubbed the Mpemba effect, i.e. the hot-begets-cold-quicker phenomenon, that lays question to Newton's law of cooling, one of the supposed big seven paradoxes of thermodynamics. [1]

By 1972, Mpemba was considered a noted expert, so to speak, on rate of cooling theories. [2]

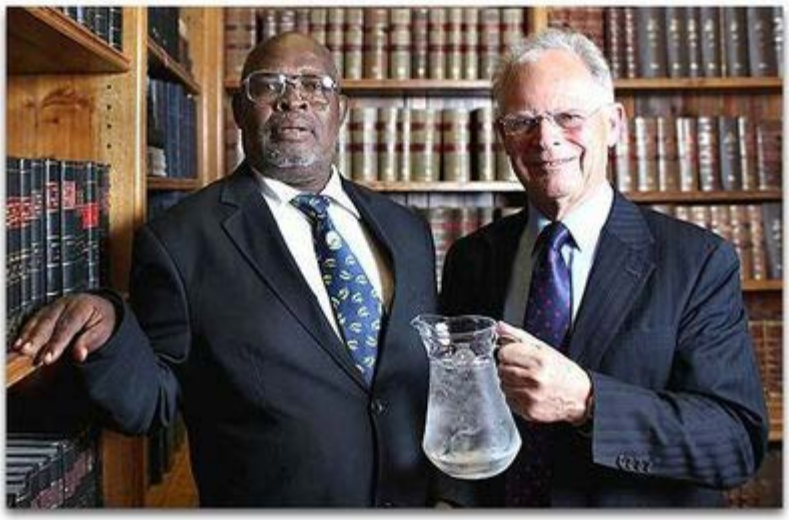

Erasto Mpemba (left) and Denis Osborne (right) in London (2013). [4]

Education

In 1979, Mpemba was associated with the College of African Wildlife management, Moshi, Tanzania. [3]

See also

- Social Mpemba effect

References

1. (a) Cucic, Dragoljub. (2009). "Paradoxes of Thermodynamics and Statistical Physics" (abs), Arxiv.org, Dec 09.
(b) Mpemba, Erasto B.; Osborne, Denis G. (1969). "Cool?". *Physics Education* (Institute of Physics) 4: 172–175.
2. Mpemba, Erasto B. (1972). "Rate of Cooling"; in: *Teaching School Physics* (pgs. 71-) by John Lewis, Penguin.
3. Mpemba, E. B.; Osborne, D. G. (1979). "The Mpemba effect." *Physics Education* (Institute of Physics) 14: 410–412.
4. Whipple, Tom. (2013). "22,000 scientists still can't explain the boy who kept his cool" (Q), *The Times*, Jan 11.

Videos

- Anon. (2013). "The Mpemba effect: Erasto Mpemba and Denis Osborne" (Q), Royal Society of Chemistry, Jan 10.

External links

- Erasto Mpemba (Spanish → English) – Wikipedia.
- Erasto Mpemba – AfricaOurAfrica.com.
- Who was Erasto B. Mpemba? (chemistry) – Wiki.Answers.com.

θΔics

In existographies, **Eratosthenes** (276-194BC) (IQ:175|#225) [RGM:201|1,350+] (Eells 100:99) was a Greek mathematician, geographer, poet, astronomer, music theorist, and chief librarian of the Library of Alexandria, noted for []

Overview

In c.220BC, Eratosthenes did work on the antipode earth model, a heated topic that, to note, Virgil of Salzburg was later condemned to be burned for having taught this.

Eratosthenes also is the inventor of the science of geography, from Egyptian *Geb*- "earth god" + Greek *-graphia* "description of" or "to scrape, scratch" (on clay tablets with a stylus) (Ñº), including the terminology used today, and popularly known for his measurement of the circumference of the earth, which was accurate to about 1-16% of modern value (40,000 km).

Quotes | On

The following are quotes on Eratosthenes:

> "The first to concern themselves with geography were people of that sort, namely philosophers, specifically: Homer, Anaximander, and Hecataeus of Miletus (c.550-476BC), as we learn from **Eratosthenes**; also Democritus."
>
> — Strabo (7BC), *Geography* (I.1) [1]

References

1. Taylor, C.C.W. (1999). *The Atomists: Leucippus and Democritus: Fragments: a Text and Translation with a Commentary by C.C.W. Taylor* (pg. 100). University of Toronto Press.

External links

â— Eratosthenes – Wikipedia.

θΔics

In thermodynamics, **ergal**, symbol *J*, is defined by the following expression:

$$J = J_0 - \int_{t_0}^{t} \sum (X dx + Y dy + Z dz)$$

which quantifies the system as a summation function of Cartesian coordinates, x,y, and z, for the work *W* done by the component forces, X, Y, and Z, acting on the particles of the system, where J_0 is the ergal of the system at some initial state. The generalized expression for the ergal of a single particle acted on by a force is:

$$W = F(xyz) + c$$

(add discussion)

Etymology

In 1875, German physicist Rudolf Clausius, in his second edition "Mathematical Introduction" section, explicitly introduced the term "ergal", as the negative value of Irish mathematician William Hamilton's "force function", deemed to represent a quantity the subtraction of which gives the work performed, a quantity which had been also given the name "potential energy" by Scottish physicist William Rankine. [1]

Ergon

Clausius' use of the term ergal seems, although he does not say this explicitly, to have its roots in the classical Greek term "ergon", such as used by Aristotle, e.g. in *Nicomachean Ethics*, as "function, task, or work". [2] Heraclitus, likewise, prior to Aristotle, used the term "en-ergon" as representative of fire, the primary source of activity, or the father of everything, according to his three element theory, which is the modern root of the term "energy". [3] Clausius, e.g., defines internal energy or its magnitude U as the sum of the "thermal and ergonal content" of a body.

Internal energy

The ergal, as explained in Clausius' 1875 "Mathematical Introduction", along with the vis viva T, is one of the components of the internal energy U of the body:

$$U = T + J$$

which quantifies the law of conservation of energy in nature.

Internal work

In reference to internal work, according to Clausius, the "internal forces", i.e. those forces which the atoms and molecules of a body exert among themselves when undergoing a change, "have an ergal". [1]

References

1. Clausius, Rudolf. (1875). *The Mechanical Theory of Heat* (§: Mathematical Introduction, pgs. 11-20; §§6: On the Ergal, pgs. 11-13; pg. 28). London: Macmillan & Co, 1879.
2. Ergon (disambiguation) – Wikipedia.
3. (a) Feekes, Gerrit B. (1986). *The Hierarchy of Energy Systems: from Atom to Society* (pg. 1). Pergamon Press.
(b) Lancaster, Justin. (1989). "The Theory of Radially Evolving Energy" (abs), *Int. J. General Systems*, 16: 43-73.
(c) Arnopoulos, Paris. (1993). *Sociophysics: Cosmos and Chaos in Nature and Culture* (pg. 21). Nova Publishers, 2005.

4. Clausius, Rudolf. (1865). *The Mechanical Theory of Heat: with its Applications to the Steam Engine and to Physical Properties of Bodies* (Ñº) (translator: Thomas Hirst) (pg. 357). John van Voorst, 1867.

Further reading

â— Clausius, Rudolf. (1874). "On the Theorem of the Mean Ergal, and its Application to the Molecular Motions of Gases", Translated from a separate impression, communicated by the Author, read at the Meeting of the *Niederrheinische Gesellschaft fur Natur-und Heilkunde*, Nov 09; in: *Philosophical Magazine*, Vol. L., 4th Series, Jul-Dec, 1875.

θΔics

In science, **ergon** (TR=9), from the Greek εργον, meaning work. [1]

Etymology

Greek philosopher Heraclitus was the first to introduce the term ergon, in the form of “en-ergon”, related to heat or fire as the primordial source of activity or “energy” in modern parlance.

Greek philosopher Aristotle, in his *Nicomachean Ethics*, was using the term “ergon” in the sense of function, task, or work. [2]

In 1864, German physicist Rudolf Clausius, in his "On Terminology" section, Appendix A to his Sixth Memoir, adopted the term "ergon", to mean "work measured according to the thermal unit", as a parallel to the more standard definition of work measured according to the mechanical unit. [3]

References

1. Kestin, Joseph. (1979). *A Course in Thermodynamics, Volume 1* (pg. 462). CRC.
2. Ergon (disambiguation) – Wikipedia.
3. Clausius, Rudolf. (1865). *The Mechanical Theory of Heat: with its Applications to the Steam Engine and to Physical Properties of Bodies* (Ñº) (translator: Thomas Hirst) (§: Proposed introduction of the term “Ergon” to denote work measured by a thermal unit, pg. 253; ergon, 15+ pgs). John van Voorst, 1867.

θΔics

In hmolscience, **Eric Beinhocker** (c. 1968-) is an American-born English business economist noted, in economic thermodynamics, for his 2006 Georgescu-Roegen conceptualized theory of value-creating economics.

Overview

In 2006, Beinhocker, in his *The Origin of Wealth: Evolution, Complexity, and the Radical Remaking of Economics*, builded on Romanian mathematician Nicholas Georgescu-Roegen's 1971 economic entropy law theories to formulate a new definition of wealth. [1] In his own words: [2]

> "I go a step beyond Georgescu-Roegen's claims and propose that taken together, these three observations [irreversibility, entropy, and fitness] tell us exactly what conditions have to be met for economic value to be created, which leads to a new definition of wealth itself."

He goes on to restate Georgescu-Roegen's three central arguments in terms of what Beinhocker calls G-R Conditions. Beinhocker is known for complexity economics, a term he claims to have coined in his book, which supposedly incorporates the second law of thermodynamics, albeit via Shannon information theory, and a mixture of Georgescu-Roegen's misapplied entropy law theories and Sante Fe Institute complexity theory. [3]

#	Condition	Description
1.	Irreversibility	All value-creating economic transformations and transactions are thermodynamically irreversible.
2.	Entropy	All value-creating economic transformations and transactions reduce entropy locally within the economic system, while increasing entropy globally.
3.	Fitness	All value-creating economic transformations and transactions produce artifacts and or actions that are fit for human purposes.

The three G-R conditions, according to Beinhocker, are such that a pattern of matter, energy, and or information has economic value if the following three conditions are met jointly: [2]

References

1. Eric D. Beinhocker (biography) – Economic Research Council.
2. Beinhocker, Eric, D. (2006). *The Origin of Wealth – Evolution, Complexity, and the Radical Remaking of Economics.* (ch. 14: A New Definition of Wealth: Fit Order, pgs. 299-319, subject: economic thermodynamics). Boston, Mass.: Harvard Business School Press.
3. Complexity economics – Wikipedia.

External links

â— Eric Beinhocker – Wikipedia.
â— Eric Beinhocker (Senior Fellow) – McKinsey Global Institute.

θΔics

In psychological thermodynamics, **Eric Berne** (1910-1970) was Canadian-born American psychiatrist noted for his best-selling 1964 book *Games People Play: the Psychology of Human Relationships*, in which, building on the psychodynamic work of Sigmund Freud, particularly his theory of ego states, he outlined a theory of social psychodynamics in which each players motives depends on aspects of the mental states of the other players in the game. [1] The following is noted passage:

> "The eternal problem of the human being is how to structure his waking hours. In this existential sense, the function of all social living is to lend mutual assistance for this project."

On this view, Berne focuses on the notion that stimulus-hunger through social interaction is parallel to that of the hunger for food and that in the modern world, with an over-abundance of food available to the average person, the former hunger takes precedence in one's waking hours.

Schiller | Love and hunger

Here, in Berne's keen discernment that in a world of abundant food, we are reminded of Friedrich Schiller's 1795 "The World Ways" poem about how love and hunger rule the world—a few oft-quoted versions of which shown below—according to which, in a food-sated world, love is the sole thing that rules and hence we come to seek solution to Berne's eternal problem of how to solve the nature of his so-called "ego games" in terms of the driving forces of love and hate:

> "Love and hunger rule the world."
>
> — Friedrich Schiller (1795), "The Philosophers" (Die Welteisen) (Q); StatusMind.com (Q)

> "Love and hunger rule the world. Ergo, to rule the world, one must master love and hunger."
>
> — Yevgeny Zamyatin (1920), *We*

> "The quantity '–ΔG' [is] the driving force of a [human chemical] reaction."
>
> — Gilbert Lewis (1923), *Thermodynamics and the Free Energy of Chemical Substances*

> "Hunger and love are what moves the world."
>
> — Schiller (1795), quoted by Sigmund Freud, in *Civilization and its Discontents* (1930) (Q), as basis if his drive theory (Q)

or equivalently the quantity '–ΔG', as Lewis describes things, which naturally leads into a modern human chemical thermodynamics based "ego states" reconceptualization.

References

1. (a) Berne, Eric. (1964). *Games People Play: The Psychology of Human Relationships*. Ballantine Books.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (pgs. 535, 6665, 677, 731). Morrisville, NC: LuLu.

External links

- Eric Berne – Wikipedia.
- Berne, Eric – WorldCat Identities.
- Photos of Eric Berne – EricBerne.com.

θΔics

In existographies, **Eric Chaisson** (1946-) (CR:5) is an American astrophysicist, noted for []

Overview

In 2001, Chaisson, in his *Cosmic Evolution: the Rise of Complexity in Nature*, outlined a "lightly quantitative, thermodynamics-oriented treatment" of radiation, matter, and 'life' (powered CHNOPS+ things), using what he calls "energy flow-rate density", in units of ergs per second per gram, as a complexity measure for phenomena of all kinds and scales. (Ñº)

Influenced

Chaisson has influenced: Alexander Wissner-Gross, David Christian, Paul Chefurka, and Georgi Georgiev (Ñº).

Quotes | By

The following are quotes by Chaisson:

> "No demonstrably new science likely need be invented to understand cosmic evolution and its attendant rise in complexity — we prefer to return to a steadfast concept of fundamental thermodynamics and to characterize that complexity by using quantifiably straightforward terms. In short, energy and energy flow seem to be more accessible, explicit, and primary quantities, and not just because this is a worldview espoused from an admittedly physical perspective. What is more, the concept of energy remains meaningful for any macroscopic state, obviating the difficulties noted above for entropy or information. More than any other term, energy has a central role to play in each of the physical, biological, and cultural evolutionary parts of the inclusive scenario of cosmic evolution; in short, energy is a common, underlying factor like no other — a 'DC baseline' in physicists' lingo — in our search for unity among all material things."
>
> — Eric Chaisson (2001), *Cosmic Evolution* (pg. 133); commentary on information theory

References

1. Chaisson, Eric. (2001). *Cosmic Evolution: the Rise of Complexity in Nature*. Harvard, 2002.

External links

â— Eric Chaisson – Wikipedia.
â— Eric Chaisson – InformationPhilosopher.com.

θΔics

In thermodynamics, **Eric Mendoza** (1919-2007), commonly cited as E. Mendoza, was a British physicist notable for being the editor of the popular 1960 Dover edition of *Reflections on the Motive Power of Fire and other Papers on the Second Law of Thermodynamics by E. Clapeyron and R. Clausius*, in which he penned an introduction to the subject. [1] Mendoza also collaborated with Robert Fox in the 1986 more exhaustive critical edition of the surviving manuscripts surrounding Sadi Carnot's famous 1824 memoir *Reflections on the Motive Power of Fire* (*Réflexions sur la Puissance Motrice du Feu*). [2]

Education

Mendoza graduated from Trinity College, Cambridge in 1940 with a degree in natural sciences tripos. In the early 1960s, Mendoza was a professor at Manchester University involved in low temperature physics work. [3]

References

1. Mendoza, Eric. (1960). "Introduction" (section) in Carnot, Sadi. (1824). "Reflections on the Motive Power of Fire and on Machines Fitted to Develop that Power." Paris: Chez Bachelier, Libraire, Quai Des Augustins, No. 55. (1960, Dover edition).
2. Fox, Robert. (1986). *Reflections on the Motive Power of Fire: a Critical Edition with the Surviving Scientific Manuscripts* (Eric Mendoza, 8+ pgs.). Manchester University Press.
3. Anon. (2007). "Professor Eric Mendoza (1919-2007): Physicist involved in low-temperature physics and later develoing aids for the Israeli Army", *Times Online Obituary*, Mar 19.

Further reading

â— Mendoza, Eric. (1981). "The Life and Work of Sadi Carnot", *The British Journal for the History of Science*, 14: 75-78.

θΔics

In existographies, **Eric D. Schneider** (c.1938-) (CR:45) is an American marine geologist and ecological thermodynamicist noted for the development of his gradient-based evolution thermodynamics theory, co-developed with Canadian ecological systems engineer James Kay, from 1992-2004, which a Prigoginean-like version of ecosystem change in which life is said to develop as a result of energy flow through the biosphere mediated by the postulated second law tendency of material systems to "degrade the gradient". [1] Schneider argues, similar to Prigogine, that life systems are like Bénard cells, but formed due to the tendency of systems, with energy flow through them, to degrade or equilize the hot to cold energy gradient.

Gradient reduction theory

The gist of so-called "gradient reduction theory", or Schneider-Kay theory, as summarized by Dorian Sagan and Jessica Whiteside, is the following statement:

> "Nature abhors a gradient."

Although Schneider claims that most of his work was inspired by Jeffrey Wicken, see below, the above statement seems to be a combination of the ancient "nature abhors a vacuum" dictum, plus the following 1988 argument by Canadian zoologist Daniel Brooks and American systems theorist Edward Wiley, who Schneider cites (2005): [8]

> "The products of genealogical processes exist by exploiting 'entropy gradients' in the surroundings, which we view as the ecological hierarchy, and associated with the exchange term *deS* (see: Prigogine entropy). The nature of these gradients, and thus of ecological hierarchy, is determined partly by abiotic factors and partly by biotic factors."

(add)

Influence

Schneider was greatly influenced in his thermodynamics theory development by the writings of American biochemist Jeffrey Wicken, particularly his 1987 book *Evolution, Thermodynamics, and Information*; possibly taking Wicken's 1978 article "The Entropy Gradient: A Heuristic Approach to Chemical Equilibrium". [2]

Religious thermodynamics

Their latest book is the 2010 *The Purpose of Life*, in which they attempt to tackle god and answer many of religion's more profound questions on the basis that life's natural purpose is defined in the context of being a function in an energy-driven cosmos, having had a certain direction in the last 3.5-billion years. [6]

Thermodynamics and life

> *See main: what is life? (theories of existence)*

Between 1993 and 2005, Schneider worked as a research scientist focused on the study of the intersection of thermodynamics and life, particularly its development and causality especially in ecosystems and evolution. [3] Beginning in 1992, Schneider co-wrote a number of articles, such as "Life as a Manifestation of the Second Law of Thermodynamics" (1994), with American systems design engineer James Kay, on the thermodynamical nature of ecosystems, biology, and life. [4]

Together, during the mid 1990s, Schneider and Kay worked to develop an ecological nonequilibrium thermodynamics theory. [5] With the passing of Kay, in 2004, Schneider teamed with American science writer Dorian Sagan to finish the publication of *Into the Cool: Energy Flow, Thermodynamics, and Life*, originally started with Kay.

Bénard cells

See main: Bénard cells

A central feature of Schneider's theory, originally developed with Kay in the early 1990s, is an nonequilibrium extension of the second law, of the William Thomson / Ilya Prigogine energy dissipation variety, to graphical calculations of theirs done on heat flow through silicon oil in turbulent flow regime. In short, they argue that spontaneous organizations appear in the fluid, which act to degrade the heat flow gradient across a fluid layer. The define this in terms of entropy production and exergy consumption. They then extend this postulate to be a pervading regulatory behavior in the whole of the biosphere.

Thermodynamics and sex

See main: Sex

In their 2005 book *Into the Cool*, Schneider and Sagan argue, on their degrade the gradient second law hypothesis, that "sex is the way living dissipative systems propagate into the future" and that "sex maintains our form of thermodynamic disequilibrium by reproducing physiological systems much like us but newer and sometimes improved." [5]

Education

Schneider completed his BS in geology in 1962 at University of Delaware, a MS (1965) and PhD (1969) in marine geology at Columbia University. [3]

References

1. (a) Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Life*. Chicago: The University of Chicago Press.
(b) Eric D. Schneider (About the Authors) – IntoTheCool.com
2. (a) Schneider, Eric. (2005). "Email to Libb Thims".
(b) Wicken, Jeffrey. (1978). "Entropy Gradient: a Heuristic Approach to Chemical Equilibrium" (abs), *Journal of Chemical Education*, 55(11):701.
(c) Wicken, Jeffrey S. (1987). *Evolution, Thermodynamics, and Information: Extending the Darwinian Program*. Oxford University Press.
3. Eric Schneider – Curriculum Vitae (PDF).
4. (a) Kay, J.J., Schneider, E.D. (1992). "Thermodynamics and Measures of Ecosystem Integrity" in Ecological Indicators, Volume 1, D.H. McKenzie, D.E. Hyatt, V.J. Mc Donald (eds.), *Proceedings of the International Symposium on Ecological Indicators*, Fort Lauderdale, Florida, Elsevier, pp.159-182.
(b) Schneider, E.D, Kay, J.J. (1993). "Exergy Degradation, Thermodynamics, and the Development of Ecosystems" in Tsatsaronis G., Szargut, J., Kolenda, Z., Ziebik, Z., (eds) Energy, Systems, and Ecology, Volume 1, Proceedings of ENSEC' 93, July 5-9 Cracow, Poland., pp. 33-42.
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External links

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θΔics

In hmolscience, **D. Eric Smith** (c.1965-) is an American physicist noted, in economic thermodynamics, for a number of publications and lectures on the thermodynamics of life and economics, such as his 2005 article "Classical Thermodynamics and Economic General Equilibrium", co-written with economist Duncan Foley, in which they explore concepts such as "economic Helmholtz potential", the economic version of Helmholtz free energy, entropy, the entropies of economic agents, and seem to build significantly on the Lausanne school of logic, particularly Leon Walras and Vilfredo Pareto. [1]

Overview

In 2002, Smith, together with Duncan Foley, in their "Is Utility Theory so Different from Thermodynamics?", were trying to extrapolate and or reformulate Leon Walras' notions of economic potentials into a mixture of Gibbs potentials and Helmholtz potentials, arguing that price/quantity was a conjugate variable pair of economics like pressure/volume is of thermodynamics, among other assertions; the abstract of which is as follows: [5]

> "Careful examination of the axioms, and interpretation conventions, of utility theory and thermodynamics reveals that the two domains are more similar mathematically than their divergent approaches to problem solving would suggest. Their differences inhere primarily in the economic assignment of importance to initial endowments, versus the physical choice to emphasize reversible transformations. Using an analysis based on reversible transformations in economics, it is shown that utility theory can be represented as a theory of additive price potentials, and nondecrease of an additive entropy in closed systems. The standard money-metric utility is identified as a Gibbs potential for demands, and a new "contour money-metric utility" is introduced as the conjugate Helmholtz potential for prices. Examples show how the central problem-solving tools of thermodynamics apply in detail to conventional utility models, with emphasis on the concepts of reversible transformation, the equation of state, and engines."

Smith and Foley define economic Helmholtz potential as being an "implementation of a Walrasian potential", a type of economic free energy, but one that does not correspond exactly to an actual physical energy. They defined economic Helmholtz potential as "an intrinsic money-metric welfare measure of the allocation of an economy in contact with a reservoir, equal to its potential to deliver money wealth to an external market through voluntary trade." A significant error in this derivation is that they are using the wrong potential. The Helmholtz free energy is the isothermal isochoric potential, and does not apply to economies, being that economic systems are not "isochoric", i.e. at a constant volume, as is evidenced classically by the rise and fall of empires, a process which correlates with the large volumetric expansions (rise), and later contractions (fall), of economic systems. The correct economic free energy is the Gibbs potential.

American physicist economics theorist Jason Smith (2014) commented that "there is nothing incorrect about about Smith and Foley's reformulation of economics as thermodynamics", which is incorrect. [4]

In 2008, Smith, in his "Chemical Carnot Cycles, Landauer's Principle, and the Thermodynamics of Natural Selection", building on the work of Sadi Carnot, Leon Brillouin, Erwin Schrodinger, Rolf Landauer (Landauer's principle), Claude Shannon, among others, argues that "life should be understood as a chemical system in which the flow of energy and storage of energy are related to the flow of and storage of information. [3]

Education

Smith completed his BS in physics and mathematics in 1987 at the California Institute of Technology, and his PhD in 1993, with a dissertation on problems in string theory and high-temperature superconductivity, at the University of Texas, Austin. Since 2000, Smith has been a professor at the Santa Fe Institute, working on problems of self-organization in thermal, chemical, biological, and social systems.

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- Smith, Eric. (2007). "Classical Thermodynamics and Neoclassical Economics", Santa Fe Complex Systems Summer School.

Videos

- Smith, Eric D. (2007). "Inevitable Life?" (V), Santa Fe Institute, Apr 18.

External links

- Eric Smith (homepage) – Santa Fe Institute.
- Eric Smith (about) – Santa Fe Institute.
- Eric Smith – ResearchGate.net.

θΔics

In hmolscience, **Eric Steinhart** (c.1961-) is an American philosopher noted for his 1999 to present work on Friedrich Nietzsche, Henry Adams, and Pierre Teilhard.

Nietzsche

In 1999, Steinhart, in his two-page subsection "From Thermodynamic to Philology: the Thermodynamic Conception of the Will to Power", attempted to outline a synthesis of Nietzsche's 1067 *The Will to Power* [WP] fragments, in thermodynamics terms. Steinhart, e.g., opens to the statement that WP:1067 describes will to power in thermodynamic terms:

> "And do you know what 'the world' is to me? Shall I show it to you in my mirror? This world: a monster of energy, without beginning, without end; a firm, iron magnitude of force that does not grow bigger or smaller, that does not expend itself but only transforms itself; as a whole, of unalterable size, a household without expenses or losses, but likewise without increase or income; enclosed by "nothingness" as by a boundary; not something blurry or wasted, not something endlessly extended, but set in a definite space as a definite force, and not a sphere that might be "empty" here or there, but rather as force throughout, as a play of forces and waves of forces, at the same time one and many, increasing here and at the same time decreasing there; a sea of forces flowing and rushing together, eternally changing, eternally flooding back, with tremendous years of recurrence, with an ebb and a flood of its forms; out of the simplest forms striving toward the most complex, out of the stillest, most rigid, coldest forms toward the hottest, most turbulent, most self-contradictory, and then again returning home to the simple out, of this abundance, out of the play of contradictions back to the joy of, concord, still affirming itself in this uniformity of its courses and, its years, blessing itself as that which must return eternally, as a, becoming that knows no satiety, no disgust, no weariness: this, my, Dionysian world of the eternally self - creating, the eternally self-destroying, this mystery world of the twofold voluptuous delight, my "beyond good and evil," without goal, unless the joy of the circle is itself a goal; without will, unless a ring feels good will toward itself—do you want a name for this world? A solution for all its riddles? A light for you, too, you best-concealed, strongest, most intrepid, most midnightly men?—This world is the will to power—and nothing besides! And you yourselves are also this will to power—and nothing besides!"
>
> — Friedrich Nietzsche (1885), WP:1067

Steinhart attempts to connect WP:619 to geo-thermal cycles:

> "The victorious concept of 'force', by means of which our physicists have created god and the world, still needs to be completed: an inner will must be ascribed to it, which I designate as 'will to power', i.e. as an insatiable desire to manifest power; or as the employment and exercise of power, as a creative drive, etc. Physicists cannot eradicate 'action at a distance' from their principles; nor can they eradicate a repellent force (or an attracting one). There is nothing for it: one is obliged to understand all motion, all 'appearances', all 'laws', only as symptoms of an inner event and to employ man as an analogy to this end. In the case of an animal, it is possible to trace all its drives to the will to power; likewise all the functions of organic life to this one source."
>
> — Friedrich Nietzsche (1885), WP:619

A deeper analysis of all the Nietzsche fragments, however, will be needed before we can corroborate or refute Steinhart's analysis assertions.

Adams | Teilhard

Steinhart, also, to note, in his work, touches on the work on Henry Adams and his phase rule theory of history, Friedrich Nietzsche and his will to power theory, and Pierre Teilhard and his omega point theory, all generally focused on the

borderland crossings of religion, science, and atheism. [1]

Education

Steinhart completed his BS in computer science in 1983 at Penn State, his MA in philosophy in 1988 at Boston College, his PhD in 1996 with a dissertation on "Formal Semantics for Metaphors: an Essay in the Computational Philosophy of Language" at the University of Stony Brook, and presently is a philosophy professor at William Paterson University, New Jersey.

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- Eric Steinhart (faculty) – William Paterson University.
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- Philosophical writings – EricSteinhart.com.

θΔics

In human thermodynamics, **Eric Zencey** (1953-) (CR=12) (GS=52) is an American political philosopher, ecological economist, and social historian noted for his 1985 PhD dissertation "Entropy as Root Metaphor", in which he discusses the use of entropy as a metaphor (or not), or specifically "root metaphor" in the categorical framework of Stephen Pepper (Thomas Kuhn's advisor) such as found in the works of Henry Adams, Brooks Adams, Wilhelm Ostwald, Frederick Soddy, Jeremy Rifkin, Lawrence Henderson, Leon Brillouin, Paul Colinvaux, Sigmund Freud, Anatol Rapoport, and Nicholas Georgescu, among others.

Biology | Thermodynamics

In 2013, Zencey, citing American ecology historian David Worster (1994), gave the following summary of the incursion or reconstruction of powered chnopsology (biology) via thermodynamics: [4]

> "Biology was reconstructed on thermodynamic grounds in the 1920s through the work of A.G. Tansley, Edgar Transeau, Max Kleiber, and others who began conceiving of organisms as energy fixers or consumers and of natural systems as complex webs of energy flows and transformations, thereby developing the modern science of ecology. Alfred Lotka and Howard Odum extended the approach, pointing to the role that energy appropriation plays in evolution: individuals and species that have the largest net energy surplus can dedicated more of their life energy to reproduction, outcompeting their rivals."

(add discussion)

Education

In the early 1980s, Zencey read American science historian Thomas Kuhn's *Structure of Scientific Revolutions* his senior year in college and was so excited by it that "he talked about it endlessly"; which is from where he likely began to engage in questions about entropy or at least energy.

In 1983, Zencey gave a talk on "Entropy as Root Metaphor" at the Conference on Science, Technology, and Literature, Long Island University, Brooklyn NY, and in 1985 made this the titled of his PhD dissertation, completed at Claremont Graduate University, which included a chapter calling for the development of a thermodynamically enlightened economics. Some of his dissertation re-appears as the second chapter "Some Brief Speculations on the Popularity of Entropy as Metaphor" in his 2000 book *Virgin Forest*. In this chapter, Zencey gives retrospect commentary on his dissertation, as follows: [1]

> "I began collecting references to the second law, and eventually my idle curiosity became an academically enforced obsession as I made the social history of the second law the topic of my doctoral dissertation."

In 1990, Zencey was a professor of history and social inquiry at Goddard College, after which he was a professor of historical and political studies at Empire State College, New York.

Zencey currently "ecological economics", a human thermodynamics education stylized school of economic thought "rooted in the perception that economic processes are at the bottom thermodynamic processes", as he says, at the University of Vermont (main) and as a visiting scholar (2014, spring) at Washington University, St. Louis. [3]

Quotes

The following are notable quotes:

“The second law of thermodynamics is one of the bedrock truths that physics offers to the world.”

— Eric Zencey (1983), “Entropy as Root Metaphor” [2]

“Mechanism, which counts among its progenitors and partisans Democritus, Descartes, Hobbes, Locke, Berkeley, and Hume, has at its root the engineer’s model or machine, with its atomistic and manipulatable parts.”

— Eric Zencey (1983), “Entropy as Root Metaphor” [2]

Zancey in a 2011 interview talking about how he wrote an op-ed piece on Frederick Soddy's economic theories (see: adjacent 1983 quote on Soddy) for the *New York Times*.

Zancey giving his “Energy as Master Resource” talk at Fourth Annual Biophysical Economics Conference, University of Vermont in Burlington, Vermont, Oct 26, wherein he opens to Sadi Carnot and the second law. [4]

“Frederick Soddy’s experience in the 1920s and 1930s offers a clear example of Kuhn’s dicta on the reception afforded those who are untutored in the prevailing paradigm; a Nobel laureate in chemistry, he was dismissed as a crank for his economic writings, because he presumed to take thermodynamics seriously and to argue that the practice of charging compound interest was an attempt to violate the second law.”

— Eric Zencey (1983), “Entropy as Root Metaphor” [2]

“It is unlikely that the generating substance hypothesis – energy or entropy discoverable in human social relations and groupings – will achieve any great precision in its application to psychological or social and political affairs in its entropist formulation. This has to do with the shortcomings of the terms and categories of entropism as they are applied in these realms: the term ‘entropy’ is used metaphorically when it is applied to any form of energy that cannot be denominated in calories, and there are insurmountable difficulties involved in discovering a quantifiable, determinate, caloric content for such terms as ‘psychic energy’, ‘cultural energy’ or the energy of a community, an institution, or an idea.”

— Eric Zencey (1983), “Entropy as Root Metaphor” [2]

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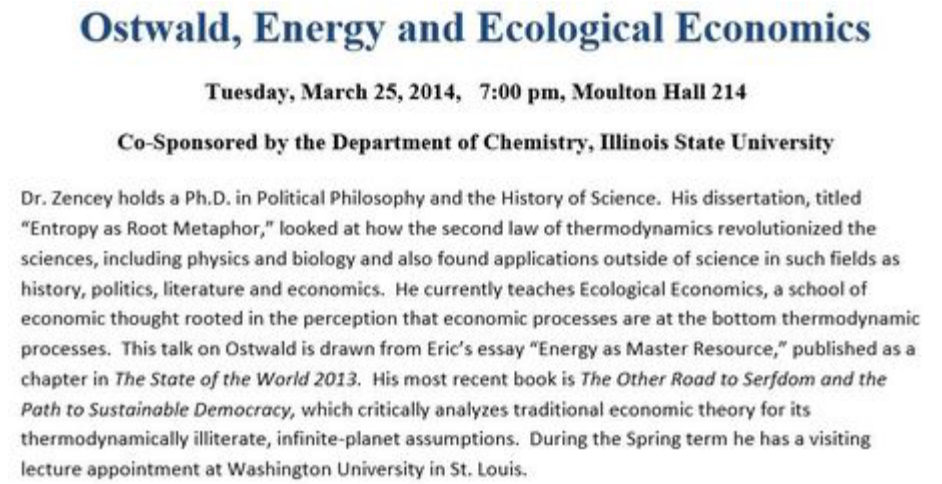

Ostwald, Energy and Ecological Economics

Tuesday, March 25, 2014, 7:00 pm, Moulton Hall 214

Co-Sponsored by the Department of Chemistry, Illinois State University

Dr. Zencey holds a Ph.D. in Political Philosophy and the History of Science. His dissertation, titled "Entropy as Root Metaphor," looked at how the second law of thermodynamics revolutionized the sciences, including physics and biology and also found applications outside of science in such fields as history, politics, literature and economics. He currently teaches Ecological Economics, a school of economic thought rooted in the perception that economic processes are at the bottom thermodynamic processes. This talk on Ostwald is drawn from Eric's essay "Energy as Master Resource," published as a chapter in *The State of the World 2013*. His most recent book is *The Other Road to Serfdom and the Path to Sustainable Democracy*, which critically analyzes traditional economic theory for its thermodynamically illiterate, infinite-planet assumptions. During the Spring term he has a visiting lecture appointment at Washington University in St. Louis.

A flyer for **Zencey's** recent 2014 talk on "Ostwald, Energy, and Ecological Economics" at Illinois State University (see also: Thomas Wallace), interestingly sponsored by the department of chemistry, the Wilhelm Ostwald social energetics parts based on his 2013 chapter "Energy as a Master Resource". [3]

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External links

● Eric Zencey – Wikipedia.
● Zencey, Eric (1953-) – WorldCat Identities.
● Eric Zencey (faculty) – Empire State College, New York.
● Eric Zencey (fellow) – Gund Institute for Ecological Economics, University of Vermont.

θΔics

In existographies, **Erich Fromm** (1900-1980) (IQ:160|#550) [RGM:661|1,500+] (CR:16) was a German-born American social psychologist noted, in hmolscience, for his 1956 *The Art of Loving*, wherein he extols on his theory of meaning amid prison camp existence.

Overview

In 1956, Fromm published his *The Art of Loving*, wherein he theorizes about people, via human physics and human chemistry metaphors, e.g. individuals as human atoms; discusses concepts such as how human energy and skill are without 'exchange value' if there is no demand for them; how, at times, the social machine can operate without friction; models love on chemical-style metaphors including fusion, explosion, orgiastic union, among others.

Human atoms

Fromm models of people as "atoms" as follows:

> "Contemporary society preaches the ideal of unindividualized equality because it needs human atoms, each one the same, to make them function in mass aggregation, smoothly, without friction; all obeying the same commands, yet everybody being convinced they he is following his own desires."

(add)

Quotes | Employed

The following are quotes employed by Fromm:

> "He who knows nothing, loves nothing. He who can do nothing understands nothing. He who understands nothing is worthless. But he who understands also love, notices, sees. The more knowledge is inherent in a thing, the greater the love. Anyone who imagines that all fruit ripen at the same time as the strawberries knows nothing about grapes."
>
> — Paracelsus (c.1530), quoted by Erich Fromm in *The Art of Loving* (pg. ix)

Quotes | By

The following are noted quotes:

> "The deepest need of man is the need to overcome his separateness, to leave the prison of his aloneness. The absolute failure to achieve this aim means insanity."
>
> — Erich Fromm (1956), *The Art of Loving* (pg. 9)

> "I've made the most important discovery of my life. It's only in the mysterious equation of love that any logical reasons can be found."
>
> — Erich Fromm (1959), *The Art of Loving*

> "Fortitude is the capacity to say no when the world wants to hear yes."

— Erich Fromm (c.1960) (Ñº)

See also

â— Toralf Zschau

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External links

â— Erich Fromm – Wikipedia.

θΔics

In existographies, **Erich Jantsch** (1929-1980) (CR:26) was an Austrian-born American astrophysicist noted, in hmolscience, for his 1980 *Self-Organizing Universe*, wherein he attempts to scaffold on the dissipative structure theory work of Ilya Prigogine to outline melting pot like unifying model of evolution, cosmology, biology, sociology, psychology, and consciousness.

Overview

In 1972, Belgian chemist Ilya Prigogine was giving a seminar at the University of California, Berkeley on dissipative structures or what he equivalently referred to as "self-organization through irreversible processes", during the course of which Jantsch—who was also directing a eclectic business management group at Berkeley, comprised of members interested in topics such as shamanism, psychology economics, or Buddhism—sent one of his students to scout Prigogine's seminar, after which Prigogine was invited to address Jantsch's group, following which Jantsch began to see Prigogine's work as the "missing link" that would help him centralize his own theory of "self-realization through self-transcendence", as Jantsch put, into the form of a universal model. [6]

In 1975, Jantsch published *Design for Evolution: Self-organization and Planning in the Life of Human Systems*, discusses the second law of thermodynamics in the context of the Brownian motion of human molecules; an excerpt of which is as follows: [1]

> "… dream of a pressure-free end state of maximum entropy in physical and social energy, in which action is neither possible nor necessary in any direction, only a kind of thermal (so-called Brownian) motion of the human "molecules" **...**"

In 1979, Jantsch gave his Gauthier lectures in "system science" at Berkeley,

In 1980, Jantsch, building on his Gauthier lectures, published his *The Self-Organizing Universe: Scientific and Human Implications of the Emerging Paradigm of Evolution*, wherein he attempts to unify cosmology, biology, sociology, psychology, and consciousness, around a mixture of evolution theory and dissipative structures theory. In short, he promulgated a melting pot ontic opening philosophy in regards to being and becoming within the confines of a physics-governed universe, which he exemplifies by the following:

> "It becomes possible to view evolution as a complex, but holistic dynamic phenomenon of a universal unfolding or order which becomes manifest in many ways, as matter and energy, information and complexity, consciousness and self-reflexion. It is no longer necessary to assume a special life force—such as Bergson's elan vital or prana of Hinduism—separate from the physical forces."

Jantsch's *Self-organizing Universe* is said to present a large exposition of the form of existence, common to life and non-life, structured around energy, entropy, dissipative structures; the gist views of which he summarized as follows: [3]

> "I stress that neither physicalism nor vitalism play a role in [my theory]. For the life of me only the paradigm of self-organization is appropriate. I am committed to open. Despite the largely scientific content of [my theory] is humanistic in his outlook, because it is time to end the senseless separation of science and humanism. The relationships that I point out in my book are characterizable with slogans such as self-organization, coevolution, self-transcendence and creativity. From them, the image of an open, non-teleological (and not even teleonomic) evolution, the conditions at all levels is openness, and imbalance are autocatalytic self-reinforcing."

(add)

Influences

In 1985, after coming across Jantsch's *Self-organizing Universe*, Swedish literature and science critic and humanism theorist Erland Lagerroth wound go on to write over ten books expanding on Jantsch's viewpoint, including: *Toward a New Science* (1986), *Beyond Darwin and DNA: A Non-mechanistic Biology* (2004), *Between Atoms and the Universe: or to Try to Understand the World We Live In* (2010), among others. [4]

In 1995, American philosopher Ken Wilber published his *Sex, Ecology, Spirituality: the Spirit of Evolution*, which heavily cites Jantsch.

Education

In 1951, Jantsch completed his PhD at the University of Vienna, working thereafter, at various times, as an astronomer, physicist, engineer, management consultant, forecaster, conservationist, general systems theorist, evolutionary theorist, humanist, and philosopher.

Jantsch's original training was in astrophysics, but somewhere along the line he began to delve into the bigger problems of existence and therein began to build on the self-organization work of Ilya Prigogine and Hermann Haken in attempt to bridge the gap between science and humanism. Jantsch is often classified as belonging to the Prigogine school of thermodynamics, and was described as "Prigogine's most famous disciple and interpreter." [2]

Quotes | On

The following are quotes on Jantsch:

> "**Jantsch** (1975) and Capra (1982) find some stimulation in the pattern fit between the model of nature that is now emerging and that derived from mystical religions. Such correspondences may stimulate theory building, but I find them of little help in the present exercise."
>
> — Richard Adams (1988), *The Eighth Day* (pg. 7)

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External links

● Erich Jantsch – Wikipedia.

θΔics

In existographies, **Erich A. Müller** (1963-) (SNE:9) (CR:48) is a Venezuelan-born English chemical engineering thermodynamicist noted, in human thermodynamics, for his 1998 "Human Societies: a Curious Application of Thermodynamics", where in he explains society, its bondings and interactions, using chemical thermodynamics arguments.

Overview

In 1998, Muller, in his *Chemical Engineering Education* article "Human Societies: a Curious Application of Thermodynamics", defined humans to be analogous to molecules (human molecules), then quantified inter human molecular love and hate in terms of basic thermodynamic pair bonds, and the lastly quantified social forces as a type of van der Waals dispersion force. [1]

Muller, in his "Human Societies", uses six citations: R.M. Bevesee (1993), Edwin Jaynes (1957), Alexander Zotin and I. Lmprecht (1996), Erwin Schrodinger (1944), Klaus Jaffe and C. Fonck (1994), and Benjamin Kyle (1988). [5]

In 2005, Libb Thims launched the *Journal of Human Thermodynamics*, conceptualized thematically on the presentation and philosophical insight of Muller's "Human Societies: a Curious Application of Thermodynamics".

In 2006, Müller was interviewed by journalist Laura Gallagher, with *Reporter magazine,* for his popularity for his invigorating thermodynamic lectures in which he draws analogies between molecules and people. In the resulting article titled 'A Thermodynamic Personality', Müller states 'I make lectures a little more light-hearted to get everyone interested. Thermodynamics can be very close to everyday things but some of the textbooks can make it seem abstract. There is no need for it always to look that scary.' Likewise, according to Gallagher, Müller compares people with molecules to help his students understand interactions between molecules and visualize how they behave. 'Liquids come together because their molecules attract each other, just like human beings, who like to get close together at parties. However, molecules repel each other when they are too close in the same way that no-one wants to be approached by a close-talker.' [3]

In 2007, Libb Thims named Müller dispersion force and Müller stability ratio are after Muller and his 1998 article.

Education

Muller completed his BS (1985) and MS (1986) in chemical engineering at the Universidad Simon Bolivar, Venezuela, his PhD in chemical engineering, with a thesis "Molecular Simulation of Homogeneous and Inhomogeneous Associated Fluids", in 1995 at Cornell University. Müller currently is a reader in thermodynamics at the Imperial College London. [2]

See also

- Integration and segregation thermodynamics

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(f) Kyle, Benjamin J. (1988). "The Mystique of Entropy," *Chemical Engineering Education*, 18(2), 92.

Videos

- Muller, Erich. (2011). “Make Ice Cream the Thermodynamicists Way” (V), Imperial College London, Sep 13.

External links

- Erich A. Muller (unofficial webpage) – Google Cached Page.
- Muller, Erich A. (1963-) – WorldCat Identities.

θΔics

In existographies, **Erik Aslaksen** (c.1938-) is an Australian electrical engineer and physicist, noted for []

Overview

In 2017, Aslaksen, in his *The Social Bond: How the Interaction Between Individuals Drives the Evolution of Society*, argued from analogy on the subject of the social bond, as follows: [1]

> "The simplest social structure is the relationship between two persons, corresponding to a diatomic molecule (see: dihumanide molecule), such as, e.g. HCI, in our analogy between social and atomic structures. This binary interaction is what forms the social bond, and we shall see that all changes to the collective identity and to society can be represented by combinations of such binary interactions. The relationship we are concerned with consists not of what we might characterize as surface interactions, interactions that only have an effect at the time of occurrence, but of interactions that have a lasting and binding effect. These interactions are in the form of exchanges (see: exchange force) of information that leads to a change in the individual identities, and, as we noted above, we are primarily interested in interactions that where one partner is engaged in persuading the other partner.
>
> The claim of a similarity between society and a chemical structure (gas, liquid, molecule, crystal, etc.) is based on mapping individuals to atoms and noting the ability of both to form structures through interactions. A structure-less society, as could possibly have existed in small, primitive groups, would correspond to a gas of atoms, and the interactions between the individuals in the group correspond to the random collisions (see: collision theory) between atoms. In a society made up of families the family would correspond to a molecule (see: family molecule; nuclear family) made up of different atoms, with each type of atom corresponding to a type of family member (father, mother, etc.), and here we come to the first illustration of the difference between the dynamic social structure and the fixed molecular structure. In a given family, members enter and exit, and the strength of interaction varies over time, so, in order to use the correspondence between social structures and chemical structures, we have to abstract from this detailed description and say: 'We can identify a social structure called a family, to which we may be able to assign some useful characteristics, and we should think of it as an average over all actual families in the society. The correspondence is between this family and a (small) molecule, to which we may also assign some useful characteristics. This is not different to talking about a member of society as a concept, even though all members are different, and to characterize this average member by per capita quantities. It is this member that corresponds to an atom."

Here, of note, we see similarity to Robert Nisbet (m) and his 1970 *The Social Bond*. [2]

Education

Aslaksen completed his MS in electrical engineering in 1962 at the Swiss Federal Institute of Technology and his PhD in physics at Lehigh University, and presently is the dean of engineering at University of Technology, Sydney.

Quotes | By

The following are quotes by Aslaksen:

> "This is the equivalent of a phase transition in thermodynamics, the 'temperature' of society reaches the 'melting point'. The second analogy is the one reflected in the title of the book—the analogy between a society and a molecule, with individuals as atoms and the social bond representing the energy that forms them into a society. It is generally true that the dissociation temperature of a …."
>
> — Erik Aslaksen (2017), *The Social Bond* (pg. 134)

References

1. Aslaksen, Erik W. (2017). *The Social Bond: How the Interaction Between Individuals Drives the Evolution of Society* (HCl, pg. 78; thermodynamics, 8+ pgs). Springer.
2. Nisbet, Robert A. (1970). *The Social Bond: an Introduction to Society* ("modern chemistry", pg. 38; pg. 55, ch. 10: Social Entropy, pgs. 260-300). Alfred A. Knopf.

Further reading

â— Aslaksen, Erik W. (1966). “Belief and Reason: Complementary, Not Contradictory” (pdf), Gumbooya.com.

External links

â— Erik Aslaksen (faculty) – UTS.edu.
â— Erik W. Aslaksen (about) – TheConversation.com.

θΔics

In existographies, **Erik Hornung** (1933-) is a German-born Swiss Egyptologist noted for []

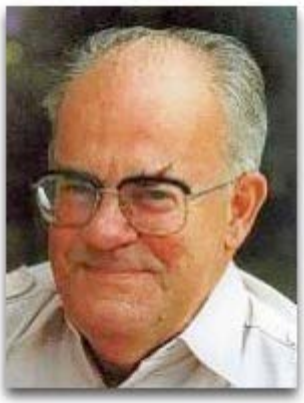

Overview

In 1982, Hornung, in his *Conceptions of God in Ancient Egypt*, distinguished between what he called "Egyptology", which appeared in 1822 with the translation of the Rosetta stone, i.e. the subject of decipherment of hieroglyphics and the translation of the Egyptian stories into modern language, and "Egyptosophy", the study of the wisdom inherent in the ancient Egyptian esoteric traditions, lore, and the its "continuation down into modern esoteric movements"; the latter of which, he says, is a "troubled" subject and in inverse proportion to the former, which he evidences by the fact that in 1982 there was only one professorship of esoteric lore, at Sorbonne in Paris, in all the world, as compared to universal professorships in Egyptology, worldwide. [1]

Quotes

The following are related quotes:

> "There was an obvious analogy between the Horus child and the baby Jesus and the care they received from their sacred mothers; long before Christianity, Isis had borne the epithet 'mother of the god'."
>
> — Erik Hornung (2001), *The Secret Lore of Egypt* (pg. 60); cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 5) [2]

> "There was a smooth from the image of the nursing Isis, Isis lactans, to that of Maria lactans. The miraculous birth of Jesus could be viewed as analogous to that of Horus, whom Isis conceived posthumously from Osiris, and Mary was closely connected with Isis by many other characteristics."
>
> — Erik Hornung (2001), *The Secret Lore of Egypt* (pg. 72); cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 72) [2]

References

1. Harpur, Tom. (2004). *The Pagan Christ* (pg. 231). Thomas Allan Publishers.
2. (a) Hornung, Erik. (2001). *The Secret Lore of Egypt: Its Impact on the West* (analogy, pg. 60; analogous, pg. 75) (Ñº) . Cornell University Press.
(b) Harpur, Tom. (2004). *The Pagan Christ* (pg. 72). Thomas Allan Publishers.

Further reading

â— Hornung, Erik. (1982). *Conceptions of God in Ancient Egypt*. Publisher, 1996.

External links

â— Erik Hornung – Wikipedia.

θΔics

In existographies, **Erik Wielenberg** (c.1972-) (FA:171) is an American atheist moral philosopher noted for []

Overview

In 2005, Wielenberg, in his *Value and Virtue in a Godless Universe*, touched on famous atheists, e.g. Epicurus, apologists, e.g. Alvin Plantinga, William Craig, and theists, e.g. Rene Descartes, to expound on secular morality and or atheistic morality ideas, such as Kant's categorical imperative. [1]

Value | Free energy

In 1934, John Neumann, of note, equated the analogon of energy to value and free energy to cash value; likewise, in 1994, James Reiss equated value to Gibbs free energy, in socio-economic terms. (see: HTV table).

Education

Wielenberg completed his BS in philosophy (1994) at Lawrence University, his MA in philosophy (1998) and his PhD, dissertation "The Nature of Moral Virtue" (2000) both at University of Massachusetts, Amherst; since 2000, he has been a professor at DePauw University, Indiana.

References

1. Wielenberg, Erik J. (2005). *Value and Virtue in a Godless Universe*. Cambridge University Press.

Further reading

● Wielenberg, Erick. (2008). *God and the Reach of Reason: C.S. Lewis, David Hume, and Bertrand Russell*. Cambridge University Press.

Audio

● Finlay, Reginald (moderator). (2005). "Absolute Morality Without God? Erik Wielenberg vs Robert Morey" (Q), sponsored, by InfidelGuide.com, Sep 23; at: Matthew Robinson, YouTube, 2014.

External links

● Erik J. Wielenberg – Wikipedia.
● Erik Wielenberg (faculty) – DePauw University.

θΔics

In hmolscience, **Erland Lagerroth** (1925-) is a Swedish literary critic and humanism theorist noted for his 1985 to present work aimed at ferreting out connections between the various popular physicalism ontic opening scholars and the field of literature humanities.

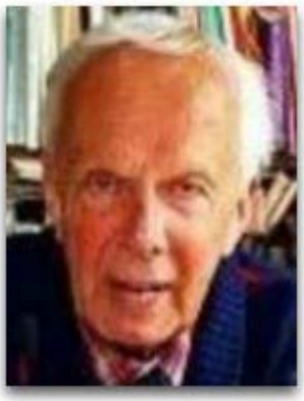

Overview

Lagerroth spent five decades aiming to unify the views of the literary humanistic outlook with modern empirical science, with focus on the work of Austrian-born American physicist Erich Jantsch, a topic about which he would go on to write over ten books (all in Swedish) on, including: *Toward a New Science* (1986), *Beyond Darwin and DNA: A Non-mechanistic Biology* (2004), *Between Atoms and the Universe: or to Try to Understand the World We Live In* (2010), among others. Lagerroth's biggest book on Prigogine and Jantsch is the 1994 *The Re-enchantment of the World and Science* (*Världen och Vetandet Sjunger på Nytt*). [2]

Lagerroth's overall effort has has been to formulate a more holistic description, from atoms to humans, of human existence. Much of Lagerroth's theory, seems to crouch on emergence, holism, and self-organization. [1]

Education

Lagerroth completed his PhD in 1958 with a dissertation on "Landscape and Nature [Selma Lagerlof's] Gosta Berling's saga and Nils Holgersson", after which he became a professor of literary criticism, teaching at various universities.

After coming across the work of Jantsch (*The Self Organizing Universe*, 1979) in 1985, Lagerroth delves into a course of research on the works of: Ilya Prigogine (the mentor to Erich Jantsch), Gregory Bateson, Karel Kosïk, Fritjof Capra, Ken Wilber, Henryk Skolimowski, Erwin Laszlo, Edward Goldsmith, Theodore Roszak, Elisabet Sahtouris, Susan Oyama, Anthony Wilden, Nicholas Maxwell, E F Schumacher, Amit Goswami, Lynn Margulis, Rupert Sheldrake, Henri Bortoft on Goethe, Robert Laughlin, Harold Morowitz, Steven Johnson, Steven Strogatz, Stephen Wolfram, Stephan Harding, David Abram, Mary Midgley, Brian Goodwin, Stuart Kauffman, Robert Ulanowicz, Sven Jørgensen, and Enzo Tiezzi.

Presently, Lagerroth is senior lecturer emeritus in literary criticism at the University of Lund, Sweden.

References

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Further reading

- Lagerroth, Erland. (2009). "In the Beginning was the Process", Aug. 11. Amazon.com Reviews.
- Erland Lagerroth (overview) – EoHT Beta.

External links

- Erland Lagerroth (Swedish → English) – Wikipedia.
- Erland Lagerroth (overview) (Swedish → English) – Lagerroth.com.

θΔics

In hmolscience, **Ernest Barnes** (1874-1953) was an English mathematical scientist turned theologian noted, in religious thermodynamics, for his 1927 to 1929 Gifford Lectures on "Scientific Theory and Religion", wherein he touches on thermodynamics, quantum mechanics, relativity and god, as he sees things.

Overview

In 1927 to 1929, Barnes gave a series of twenty lectures on "Scientific Theory and Religion: the World Described by Science and Its Spiritual Interpretation", as part of the Gifford Lectures, in lecture eight of which he covers the first law of thermodynamics and radiation, introduces quantum theory and Röntgen rays, and the consequences for theories of matter, light and energy are suggested and assessed; and concludes by pondering the notions of determinism and spirit in this context. [3] Barnes later touches on the second law. [1]

He also argues that "we are driven to the belief that God lies behind [the] phenomenon" of the cosmological consequences of thermodynamics. [1]

In 1934, Barnes published a revised version of his lectures, entitled *Relativity, Thermodynamics, and Cosmology*, in which warned cosmologists against making unjustified philosophical preferences. [2]

References

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2. (a) Barnes, Ernest W. (1934). *Relativity, Thermodynamics, and Cosmology*. (the book, prefaced November 1932, was an extensively revised version of Barnes' Gifford Lectures of 1927-29).
(b) Kragh, Helge S. (2008). *Entropic Creation: Religious Contexts of Thermodynamics and Cosmology* (pgs. 207-08). Ashgate Publishing, Ltd.
3. Barnes, Ernest. (1929). "Scientific Theory and Religion: the World Described by Science and Its Spiritual Interpretation" (abs), GiffordLectures.org.

External links

â— Ernest William Barnes – Wikipedia.

θΔics

In molecular thermodynamics, **Ernest Grunwald** (1923-2002) was a German-born American physical organic chemist noted for his 1997 textbook *Thermodynamics of Molecular Species*, a coherent theoretical overview of his life's work, being essentially the application of thermodynamics to organic reaction mechanisms. [1]

Education

Grunwald completed a BS in chemistry and BA in physics in 1944 at the University of California, Los Angeles. He completed his PhD in 1947, with a dissertation on "Solvolytic Substitution in the Presence of Neighboring Groups", under Saul Winstein at UCLA. [2] From 1941 to 1961, at Florida State University, Grunwald used electrochemistry, solution thermodynamics, and acid-base chemistry to demonstrate quantitatively how the free energies of neutral molecules and ions respond to solvent change across a variety of water-organic binary mixtures and water-salt solutions. In 1965, he became the chair of the chemistry department at Brandeis University, retiring in 1989.

References

1. Grunwald, Ernest. (1997). *Thermodynamics of Molecular Species.* New York: John Wiley & Sons, Inc.
2. Arnett, Edward M. (2004). "Ernest Grunwald: November 2, 1923-March 28, 2002" [URL], *Biographical Memoirs* (pgs. 165-82), Vol. 84, The National Academies Press.

External links

â— Grunwald, Ernest (1923-) – WorldCat Identities.

θΔics

In existographies, **Ernest Hemingway** (1899-1961) (IQ:170|#408) (RGM:317|1,500+) (WorldCat 100:11) [GLAE|#] (FA:165) (CR:5) was an American journalist, novelist, and short-story writer, who wrote standing up, characterized (Q) as the contemporary nemesis of Scott Fitzgerald, noted for []

Other

In 1974, during the Kanawha County textbook controversy, Hemingway's *The Old Man and the Sea*, along with books including: *Paradise Lost* (John Milton), *The Great Gatsby* (Scott Fitzgerald), and *The Republic* (Plato), were books banned and removed from the teaching curriculum of schools in Kanawha County, West Virginia.

Quotes | By

The following are quotes by Hemingway:

> "All thinking men are atheists."
>
> — Ernest Hemingway (1929), *A Farewell to Arms*

> "The world breaks everyone and afterwards many are stronger at the broken places."
>
> — Ernest Hemingway (c.1940)

> "There are only three sports: mountain climbing, bull fighting, and motor racing. All the rest are merely games."
>
> — Ernest Hemingway (c.1940)

External links

- Ernest Hemingway – Wikipedia.

θΔics

In science, **Ernest Nagel** (1901-1985) (CR:6), not to be confused with American atheist anti-reductionist philosopher Thomas Nagel (1937-), was an American positivist philosopher noted for his 1961 pro-reductionism descriptions and discussions, for his social teleology theories, and for his mentoring of James Coleman.

Social teleology

Nagel, according to Stephen Turner (2008), is said to have promoted some type of "social teleology" argument, similar to that of Max Weber and Pierre Bourdieu, among others. (Ñº)

Reductionism

In 1961, Nagel, in his *The Structure of Science*, according to Steven Weinberg (1961), also cited by Michael Simon (1971), gives the "paradigmatic example of the reduction of one theory to another". [1]

Influences

American chemical engineer turned sociologist James Coleman, after completing his BS in chemical engineering in 1949, entered sociology following a job as a chemist at Eastman Kodak, with a self-described 'positivist orientation … carried over from the physical sciences', an orientation he was able to polish in courses on the philosophy of science taken under Nagel. [2]

References

1. (a) Nagel, Ernest. (1961). *The Structure of Science: Problems in the Logic of Scientific Explanation.* (§:The Reduction of Theories, pgs. 338-45). Harcourt, Brace & World.
(b) Weinberg, Steven. (1992). *Dreams of a Final Theory: the Scientist's Search for the Ultimate Laws of Nature* (pgs. 40, 286) Random House.
(c) Simon, Michael A. (1971). *The Matter of Life: Philosophical Problems of Biology* (pg. 23). Yale University Press.
2. Steinmetz, George. (2008). "American Sociology Before and After World War II", in: *Sociology in America: A History* (editor: Craig Calhoun) (pg. 340). University of Chicago Press.

External links

â— Ernest Nagel – Wikipedia.

θΔics

In existographies, **Ernest Rutherford** (1871-1937) (IQ:180|#160) [RGM:151|1,360+] (Murray 4000:3|P / 15|CS) (CR:40) was a New Zealand-born British physicist noted for his discovery/identification of the alpha particle (1899), nucleus (1909/1911), proton (1919), and for predicting/proposing the "neutron" (1920).

Students

A noted student of Rutherford is: C.G. Darwin.

Quotes | By

The following are quotes by Rutherford:

> "When we have found how the nucleus of atoms is built up we shall have found the greatest secret of all — except life."
>
> — Ernst Rutherford (c.1898)

External links

â— Ernest Rutherford – Wikipedia.

θΔics

In hmolscience, **Ernest Samuels** (1903-1996) was an American lawyer and English professor noted for his detailed three-volume biography of American physical science historian Henry Adams, in which are found a number of very ripe unpublished personal communication statements made by by Adams, in his letters and communication notes, such as found in his efforts to find a physico-chemical proofreader (see: Henry Bumstead) and his 1907 to 1909 efforts to formulate a physico-chemical based dynamic theory of history, based on the works of Willard Gibbs, according to which he began to conceptualized himself as a "phase" or equilibrium state. [1]

Adams | Biography

Samuels' biography of Henry Adams, a precipitate or outgrowth of his 1942 PhD dissertation, was published in three volumes: *The Young Henry Adams* (1948), *Henry Adams: the Middle Years* (1958), and *Henry Adams: the Major Phase* (1964), the last of which won a Pulitzer Prize, all of which were truncated into a one volume abridged edition (1989). Samuels was a great connoisseur of Adams personal correspondences: in 1956, e.g. Samuels traveled to Italy to meet with the art connoisseur Bernard Berenson, who owned letters written by Adams.

Samuels also wrote prefaces and introductions works by Adams, including: *Mont-St.-Michel and Chartres* (1961), *Democracy* (1961) and *The Education of Henry Adams* (1974); he also served on the advisory committee for the publication of the Henry Adams papers and helped edit the collected letters in three volumes. A one-volume abridgement of the letters was published in 1992. [2]

Education

Samuels completed a bachelor's degree in 1923 followed by a law degree in 1926 at the University of Chicago, after which he practiced law in El Paso, Texas, from 1928 to 1930. He then completed a MA in English in 1931, then practiced law in Chicago from 1933 to 1937, and from 1937 to 1939 was an English instructor at Washington State University. [2] In 1942, Samuels completed a PhD in English with a dissertation on "The Early Career of Henry Adams" at the University of Chicago, after which he began teaching English at Northwestern University, becoming department chair in 1964 and retiring in 1971. [2]

Quotes

The following are noted quotes:

> "Man must jump, as Adams liked to say, if he would save himself; a moral and intellectual elite must be recruited. If nothing else would serve to make moral philosophers out of historians, the fear of imminent annihilation might. University education must be revolutionized by the physicist-historian."
>
> — Ernst Samuels (1989), *Henry Adams* [1]

References

1. Samuels, Ernest. (1989). *Henry Adams* (physico-chemical, pgs. 401; Jameson, pg. 411; physicist-historian, pg. 411). Harvard University Press.
2. Grimes, William. (1996). "Ernest Samuels, 92, Author of Henry Adams Biography" (Q), *The New York Times*, Feb 15.
3. Heise, Kenan. (1996). "Professor Ernest Samuels, Pulitzer Winning Author" (Q), *Chicago Tribune*, Feb 14.

Further reading

- Samuels, Ernest. (1948). *The Young Henry Adams*. Harvard University Press.
- Samuels, Ernest. (1958). *Henry Adams: the Middle Years*. Harvard University Press.
- Samuels, Ernest. (1964). *Henry Adams: the Major Phase*. Harvard University Press.
- Adams, Henry. (1982). *The Letters of Henry Adams, Volume 1-3* (editors: J.C. Levenson, Ernest Samuels, Charles Vandersee, Viola Winner) (abs). Belknap Press.

● Adams, Henry. (1992). *Henry Adams: Selected Letters* (editor: Ernest Samuels). Harvard University Press.

External links

● Ernest Samuels – Wikipedia.
● Samuels, Ernest – WorldCat Identities.

θΔics

In existographies, **Ernest Schoffeniels** (1927-1992) was a Belgian biochemist (CHNOPS+ chemist), noted for []

Overview

In 1973, Schoffeniels, in his *Anti-Chance: a Reply to Monad's Chance and Necessity*, penned in reaction to Jacques Monod's 1970 *Chance and Necessity*, presented a deterministic, i.e. anti-chance, view of things; the abstract of which is:

> "This book is an answer to Monad's *Chance and Necessity*. The origin of life and the evolution of biological systems is explained in the light of a deterministic approach in which 'chance' has no place. All physico-chemical processes are determined, and biological systems are no exception to this general rule. This inadequacy of classical thermodynamics to explain biological systems is stressed, and information theory is used to describe these systems in a more satisfactory manner. The book is written at the level suitable for students and research workers in biology, biochemistry, philosophy and human affairs."

(add)

Zoological | Teleology

Schoffeniels, to illustrate the errors of the use of teleological descriptions in zoological behavior, gives the following multiple choice question:

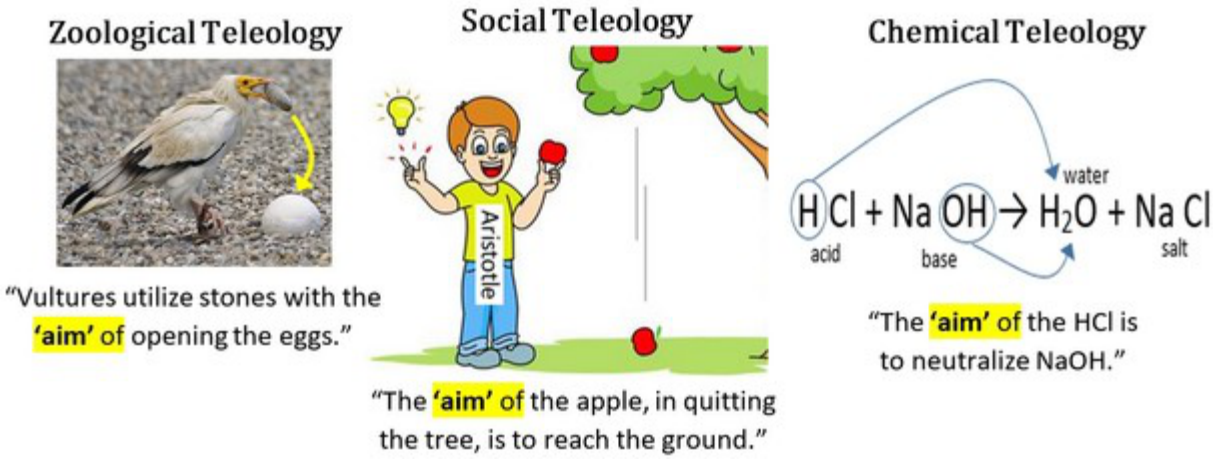

Nothing further is gained, says **Schoffeniels**, in employing teleology, e.g. biological teleology, chemical teleology, social teleology, etc., in describing an apple falling or an acid reacting with a base.

The Egyptian vulture (*Neophron percnopterus*) (Q) uses a stone to break the eggs upon which it feeds. This observation can be phrase in different ways:

1. Vultures open eggs by means of stones
2. Vultures utilize stones to open eggs
3. Vultures utilize stones with the aim of opening eggs

Schoffeniels then asks which of the above statements, from a physico-chemical point of view, is incorrect? To give us a hint in this subtle language correctness matter, Schoffeniels states the following:

> "Although very difficult to escape concepts and a vocabulary dedicated by usage, i.e. the 'epistemological obstacle' (Q) of Bachelard (1938), the effort is certainly worthwhile. Biology can only enrich itself by abandoning a teleological or 'finalist' mode of thought. Elimination of finalist language is no loss for science because that which can be described in teleological terms can also be described effectively in other

terms. The universal law of gravitation whose objective description (compare: subjective description) is sufficient in itself. Nothing is further gained by adding that the **aim of** the apple in quitting the tree is to reach the round or that the **aim of** HCl is to neutralize NaOH. Moreover, the elimination of 'finalist language' avoids the importation into biology of unverifiable theological or metaphysical doctrines not acceptable by the scientific method and the use of explanatory concepts not current in physics or chemistry. "

— Ernest Schoffeniels (1973), *Anti-Chance* (pg. 4)

(add)

Education

Schoffeniels stated (pg. 33) that his "master" was Marcel Florkin, author of *Introduction to General Biochemistry* (1944).

Quotes | Employed

The following are quotes employed by Schoffeniels:

"The word 'chance' expresses only our ignorance of the causes of the phenomena we see happen and succeed each other without any apparent order."

— Pierre Laplace (1782), *Publication*; cited by Ernest Schoffeniels in *Anti-Chance* (pg. v)

"We do not know, moreover, that the word 'chance' expresses only our ignorance of causes."

— Jean Lamarck (c.1800), *Publication*; cited by Ernest Schoffeniels in *Anti-Chance* (pg. v)

Quotes | By

The following are quotes by Schoffeniels:

"We must relegate the panoply of classic concepts as accessories and re-think biological facts from the viewpoint of thermodynamics."

— Ernest Schoffeniels (1973), *Anti-Chance* (pg. xi)

"We must, most urgently, cease feeding ourselves on an obsolete vocabulary by casting aside the concepts of function, finality, teleonomy, gratuity, organ, finalized mechanism, and, most importantly, 'chance' – because we know today that chance does NOT occur in biology."

— Ernest Schoffeniels (1973), *Anti-Chance* (pg. xii)

"Our mind is poorly prepared for a scientific approach to human behavior."

— Ernest Schoffeniels (1973), *Anti-Chance* (pg. xii)

"One should only speak of things which one can measure."

— Ernest Schoffeniels (1973), *Anti-Chance* (pg. xiii)

"The problem of 'choice' can only be approached in a reasonable and effective manner by the introduction of the most fundamental biological facts about human behaviour which, we must recognize, represent constants which are difficult to modify by religious, moral or social constraints. Many behavioral and personality problems find their origin in a strict observance of taboos founded on fancies. At the group level they find their expressions in violence, in racial conflict, in emotional dissatisfaction of young generations and in women's liberation movements."

— Ernest Schoffeniels (1973), *Anti-Chance* (pg. xiii)

"The attentive perusal of the little red book *Biochemical Evolution* (1949) (O) of Marcel Florkin (O), has persuaded me that, to be valid, all attempts at solution to the problem of the evolution of man must be looked for at the molecular level."

— Ernest Schoffeniels (1973), *Anti-Chance* (pg. xiii)

"It is my profound conviction that all progress realized in our comprehension of biological phenomena can only improve relations between humans. I entirely share the hope very briefly formulated by Monod and before him by Boris Rybak (O) that the future of our societies exists only within an ethic whose roots are firmly embedded in scientific knowledge."

— Ernest Schoffeniels (1973), *Anti-Chance* (pg. xvii)

"Fundamental 'chance' in the microscopic world of physics is abolished at the level of the living world. Invoking chance, as Monod does, to explain the transformation of species by the interplay of [spontaneous] mutation, which obey the laws of physics and chemistry, and natural selection is certainly a classic viewpoint but one which is far from satisfactory for numerous biologists."

— Ernest Schoffeniels (1973), *Anti-Chance* (pg. xvii)

"The determinism of human behavior, the absence of 'choice' and 'freedom' are NOT synonymous with the outdated 'fatalism' according to which nothing should be done since all is written and all that is to be will be. This is a simplistic view which neglects the profound meaning of physio-chemical determinism and the most elementary rules of structuration of biological systems."

— Ernest Schoffeniels (1975), *Anti-Chance* (2nd edition preface, pg. xix)

"An increasingly organized structure results which, if it is determined, represents nevertheless a progressive modification of the 'initial state'. My deep conviction is that we act in relation to and are determined by the informational flow which traverses and structures us. We finalize, in retrospect, the content of our actions by the exercise of consciousness [i.e. a mind (hydrocarbon structure) "with" (*con*-) "knowledge" (-*scire*)]."

— Ernest Schoffeniels (1975), *Anti-Chance* (2nd edition preface, pg. xix)

Education

In 1973, Schoffeniels was a professor of biochemistry at the University of Liege.

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θΔics

In hmolscience, **Ernest Solvay** (1838-1922) was Belgian industrial chemist noted, in sociological thermodynamics, his 1894 to 1910s philanthropist efforts to promote and establish a positivism sociology based on energetics.

Overview

In 1861, Solvay came into wealth, for the invention of the sodium carbonate synthesis (Solvay process); money that he later use for the promotion the science social energetics, i.e. the use of the science of energetics in sociology.

In 1894, Solvay founded the *Institute of Social Sciences* (*Institut des Sciences Sociales*), which assembled many like-minded researchers, publishing tracts on aspects of energetics, e.g. social energetics, the use of the science of energetics in sociology, well into the 1930s. [2]

In 1904, Solvay, in his *Energetics Considered as the Guiding Principle for Rational Sociology* (*L'Energetique Consideree Comme Principe d'orientation Rationelle pour la Sociologie*), gave his outlined view on he topic of social energetics; this was followed by his 1910 *Social Energetics Issues* (*Questions d'Energetiques Sociales*). Solvay's 1904 and 1910 books, according to John Scott, supposedly, are similar to Spiru Haret (1910), both arguing something akin to the logic that equilibrium processes, following thermodynamic principles, reflect the flow of energy though a social system. [6]

Solvay was also a man of progressive social ideals, which he implemented within his factories. He voluntarily establisheda social security system, pensions for the workers in 1878, an 8-hour workday in 1897, and paid vacations in 1913, long before it was introduced by the most socially advances nations. [3]

Solvay Conferences

In 1911, Solvay started the Solvay Conferences on Physics, in part as a way to interest the most respected physicists of his day in his energetic ideas. [2] The first conference was attended by several thermodynamics founders: Walther Nernst, Wilhelm Wien, Henri Poincare, Max Planck, Heike Kamerlingh-Onnes, and Albert Einstein, among other notable scientists. [4] The 1927 conference resulted in one of the most notable group photographs (see: epicenter genius) in science history; which included the likes of thermodynamicists: Theophile de Donder, Ralph Fowler, Leon Brillouin, Max Planck, Albert Einstein, among others. [5]

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θΔics

In existographies, **Ernestine Rose** (1810-1892) was Polish-born English freethinker, atheism and women's rights activist noted for []

Overview

On 29 Jan 1850, Rose was part of a "Thomas Paine Holiday", a celebration of the 113th anniversary of his birth, part of a movement to create nonreligious holidays. [1]

In c.1855, Rose interacted with a preacher that he claimed the existence of rivers near large cities "proved" the existence of god.

In 1860, Rose, in her "A Defense of Atheism" lecture, opened to the following creed:

> "I believe that truth only is beneficial, and error, from whatever source, and under whatever name, is pernicious to man, I consider no place too holy, no subject too sacred, for man's earnest investigation."

She discusses god gap like mechanism ignorance as follows:

> "The savage, ignorant of the mechanism of a watch, attributes the ticking to a spirit. The so-called civilized man, equally ignorant of the mechanism of the universe, and the laws which govern it, ascribes it to the same erroneous cause."

(add)

Quotes

The following are noted quotes:

> "Do you tell me that the Bible is against our rights? Then I say that our claims do not rest upon a book written no one knows when, or by whom. Books and opinions, no matter from whom they came, if they are in opposition to human rights, are nothing but dead letters."
>
> — Ernestine Rose (1856), reply to audience member, at Seventh National Women's Rights Convention, that the Bible submitted women to men [1]

> "The universe is one vast chemical laboratory, in constant operation, by her internal forces. The laws or principles of attraction, cohesion, and repulsion, produce in never-ending succession the phenomena of composition, decomposition, and recomposition. The *how*, we are too ignorant to understand, to modest to presume, and too honest to profess. Had man been a patient and impartial inquirer, and not with childish presumption attributed everything he could not understand, to supernatural causes, given names to hide his ignorance, but observed the operations of nature, he would undoubtedly have know more, been wiser, and happier."
>
> — Ernestine Rose (1861), "A Defense of Atheism", Apr 10 [2]

> "The atheist says to the honest conscientious believer, though I cannot believe in your god whom you have failed to demonstrate, I believe in man; if I have no faith in your religion I have faith, unbounded, unshaken faith in the principle of right, of justice, and humanity. Whatever good you are willing to do for the sake of

your god, I am full as willing to do for the sake of man."

— Ernestine Rose (1861), "A Defense of Atheism", Apr 10 [2]

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External links

â— Ernestine Rose – Wikipedia.

θΔics

In existographies, **Ernesto Sabato** (1911-2011) was an Argentine writer, painter, and physicist noted for []

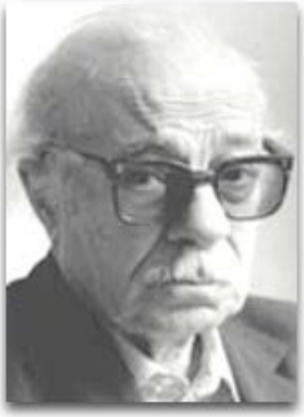

Sabato bible

In 1961, Sabato, in his *On Heroes and Tombs*, presented a story amid the tumult of Buenos Aires in the 1950s, which "leads its reader into a world of passion, philosophy and paranoia" (Q); the following quote references the so-called Sabato bible:

> "On the shelves there was also to be found, naturally, Ostwald's *Energetics*, that sort of thermodynamic bible in which god is replaced by a lay entity called energy."
>
> — Ernesto Sabato (1961), *On Heroes and Tombs*; compare: Mirza Beg (1987) and Frederick Rossini (1971) who replace god with free energy

This can be compared to Goethe *Elective Affinities* + Rasputin based Grass bible (see: Gunter Grass, 1959):

> "After rejecting the public school system Oskar undertakes his own education by close reading of two books whose pages, for simplicity's sake, he has torn out and shuffled to make a single new volume, Goethe's *Elective Affinities* and a volume promisingly entitled *Rasputin and Women*."
>
> — Gunter Grass (1959), *The Tin Drum*

As affinity and free energy are equivalent, in the sense of free energy being the measure of affinity, as proved by Hermann Helmholtz (1882), both Sabato and Grass are seen grasping here at the same thing.

Quotes

The following are related quotes:

> "At the Curie Institute [1938], one of the highest goals for a physicist, I found myself empty. Beaten up by disbelief, I kept going because of inertia, which my soul rejected."
>
> — Ernesto Sabato (1998), *Before the End* (*Antes del Fin*) (Q)

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External links

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θΔics

In existographies, **Ernst Brucke** (1819-1892) (CR:26) was a German physician and physiologist noted for his 1874 publication of *Lectures on Physiology*, in which it is argued that living organisms are energy systems governed by the conservation of energy (later to be known as the first law of thermodynamics), as defined particularly by German physicist Hermann Helmholtz, Brücke's former lab partner and friend from medical school. Brücke is said to have founded the Helmholtz school.

Overview

In 1838 to 1842, Brucke worked with Hermann Helmholtz, along with German physician Emil Du Bois-Reymond, the founder of experimental neurophysiology, in the laboratory of the German physiologist Johannes Muller. In opposition to Muller's adherence to the principle of vitalism, a doctrine that the functions of a living organism are due to a vital principle distinct from physiochemical forces, the three of them, in the words of Du Bois-Reymond, formulated a desire to validate the basic truth that: [1]

> "In an organism no other forces have effect than the common physio-chemical ones."

This is the short version of the Reymond-Brucke oath.

In 1874, Brucke, in his *Lectures on Physiology*, supposed that all living organisms are energy-systems governed by the first law of thermodynamics, which states, in effect, that the total amount of energy in any given physical system is always constant, that energy quanta can be changed but not annihilated, and consequently that when energy is moved from one part of the system it must reappear in another part. In his *Lectures*, Brücke set forth the radical view that the living organism is a dynamic system to which the laws of chemistry and physics apply. [2] This publication was the seed for the later formation of the science of psychodynamics or psychological thermodynamics.

Freud

In 1873, a young Sigmund Freud started medical school at the University of Vienna. His first-year adviser was Brücke, who was then director of the director of the Physiology Laboratory at the University. Over the next six years, initially concentrating on biology, Freud did research under Brücke. This was the starting point for Freud's dynamic psychology of the mind and its relation to the unconscious. Freud, who had great admiration and respect for Brücke, quickly adopted Brücke's new 'dynamic physiology' with enthusiasm. [2]

From there it was but a short conceptual step - but one which Freud was the first to take, and on which his claim to fame is largely grounded - to the view that there is such a thing as psychic energy, that the *human personality* is also an energy-system, and that it is the function of psychology to investigate the modifications, transmissions, and conversions of 'psychic energy' within the personality which shape and determine it. This latter conception is the very cornerstone of Freud's psychoanalytic theory. [3] The first mention of the issue of "energy" in relation to conservation, or the first law of thermodynamics, in the mind of Freud seems to be in an April 1875 letter where he is having issues about the question of the existence of God in regard to science. In particular, he states: [4]

> "The principle of the conservation of energy, of the interaction of natural forces, which we consider as the best fruits of scientific research, seem to involve the end no less than the beginning of the world."

Freud, however, was very subtle in referencing or citing the origins of his later ideas. Most, however, agree that his use of energy or force in the explanation of psychological dynamics trace to his experience with Brücke. As British developmental psychologist John Bowlby points out in 1973:

> "The psychical energy model that Freud brought to psychoanalysis came, not form his clinical work with patients, but from ideas he had learned many years earlier, especially when he was working in the laboratory of his admired professor of physiology, **Brücke**. During the 1840s, Brücke had been one of a group of dedicated young scientists, of whom Helmholtz was the leader, who were determined to show that all real causes are symbolized in science by the word 'force'. Since the achievements of the Helmholtz school soon became famous, it was natural that Freud, working under one of their number, should have adopted their assumptions."

In addition, to confirm his opinion, Bowlby cites Jones (1953) who points out that the style and content of Brücke's *Lectures* correspond closely to the words Freud always used to characterize psychoanalysis in its dynamic aspect, such as "…psycho-analysis derives all mental processes (apart from the reception of external stimuli) form the interplay of forces, which assist or inhibit one another, combine with one another, enter into compromises with one another, etc. [6] All-in-all, Brücke's 1874 *Lectures* had a lasting life-long influence on Freud, instilling the radical proposition that the living organism is characterized by dynamism. Freud, in turn, whet on to apply this idea to the levels and structures of the unconscious mind and to examine the role that dynamism plays in human development. [7]

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θΔics

In human chemistry, **Ernst Georg Friederich Gryzanowski** (1824-1888), cited as E. Gryzanowski, was a German physician and diplomat, of Polish extraction, of primarily Italian residency, or "versatile German scholar" (Ernest Samuels, 1989), a Henry Adams (O) associate, knowledgeable about Hegelian metaphysics, noted for his 1875 article "Comtism", wherein he seems to be pro-sociophysics in philosophy, i.e. an advocate of Adams-conceptualized physicochemical sociology ideas.

Overview

In 1875, Gryzanowski published his *North American Review* article "Comtism", wherein, during his discussion of the social physics proposals of French sociologist Auguste Comte, he refers to people as both 'social molecules' and 'human molecules', and concludes that: [1]

> "Civil law, commerce, political economy, and international ethics are all based on the assumption that the social body consists of such human molecules, and there is no reason why the methods of physical science should not be applied to the statics and dynamics of that society, the passions and rights of the individual man corresponding exactly to the chemical and physical forces inherent in the material molecule."

Gryzanowski ridiculed Comte for his distancing himself from the origin of life question:

> "We maintain, that as long as we are unable not only to bridge over the gulf that separates organic from inorganic nature, but even to see the bottom of it, the *onus probandi* must lie on those who deny its width and its depth. Comte himself holds curious opinions on this point. He deprecates the inquiry into the origin of organic life as a useless speculation (thus admitting the partly speculative nature of biology). He believes in the immutability of species, and separates, in his pedigree of sciences, biology from physics by a twofold division, making them agnates rather than cognates. It would therefore have been easy for him to admit the *specific* difference between man and atom, and to find this difference in self-consciousness, and in the moral freedom of man's will."

(add discussion)

Adams | James

It seems to be that Gryzanowski may have adopted this 'human molecule' logic from American historian Henry Adams, who himself had previously became acquainted with French philosopher Hippolyte Taine's 1869 'human molecule' point-of-view of history, at least as early as 1873, where as editor of the *North American Review*, Adams had accepted an article on "Taine's Philosophy" by James Bixby, wherein the human molecule concept is discussed. Adams and Gryzanowski were associates. Adams and his wife, for instance, had visited Gryzanowski at his house in Florence, Italy, during their 1872 European honeymoon, where the three discussed Hegelian metaphysics. [2] Adams commented that he esteemed Gryzanowski as his best contributor to the *North American Review*. [3]

Gryzanowski also exchanged letters with William James. (O)

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External links

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θΔics

In existographies, **Ernst Haeckel** (1834-1919) (IQ:180|#202) (Murray 4000:16|B) (FA:74) (GPhE:11) [CR:127] was a German physician, turned Goethe-promoting, Darwin-promoting zoologist, an "unabashed atheist" (Brix, 1992), noted, in hmolscience, for, among things, his "physico-chemical monism" philosophical conception "of the world" (1892) as he put things.

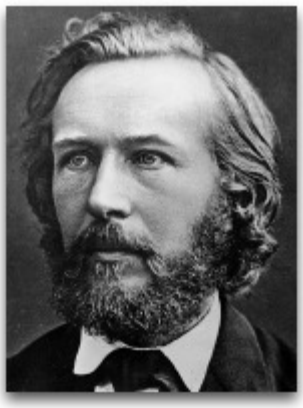

Overview

In 1862, Haeckel, in his *The Natural History of Creation*, employed Darwin to state that the divide between inanimate and animate does not exist.

In 1875, Haeckel expounded on an elective affinities based theory of evolution.

In 1899, Haeckel, in his *The Riddle of the Universe*, argues for a very ripe logic; in overview, the following: [1]

> "The fundamental unit of affinity in the whole of nature, from the simplest chemical process to the most complicated love story, [as] was recognized by Empedocles [and] Goethe, [can be] reduced, on logical analysis, to matter (space filling substance) and energy (moving force), [which] are but two inseparable attributes of one underlying substance."

Herein, among other things, aside from a few difficulties on theory, e.g. reliance on "ether" theory, Haeckel coins the term anthropism, discusses Goethe's *Elective Affinities*, applies thermodynamics logic to questions of existence, such in the borderland where science begins to overtake religion, e.g. his conception of 'soul snow', the nature as to how chemical affinity applied to human passions, among others. [1]

Lodge

In 1905, Oliver Lodge penned *Life and Matter: a Criticism of Professor Haeckel's Riddle of the Universe*, wherein he attempted to do battle with Haeckel and his Goethe-based monism, by attempting to "ride the fence" with an ontic opening like "incomplete nature" model of physics-based "mechanism and morals".

Plant souls

Haeckel, in his *The Riddle of the Universe* (pg. 157), via his elaborate soul plasm to cell soul to nervous system theory of soul evolution, came to the conclusion that plants have souls; some of which he comments on as follows:

> "The plant-soul (phytopsyche) is, in our view, the summary of the entire psychic activity of the tissueforming, multicellular plant (the *metaphyton*, as distinct from the unicellular *protophyton)*; it is, however, the subject of the most diverse opinions even at the present day. It was once customary to draw an essential distinction between the plant and the animal, on the ground that the latter had a "soul" and the plant had none. However, an unprejudiced comparison of the irritability and movements of various higher plants and lower animals convinced many observers, even at the beginning of the century, that there must be a "soul" on both sides. At a later date Fechner, Leitgeb (Q) , and others strongly contended for the plant-soul. But a profounder knowledge of the subject was obtained when the similarity of the elementary structure of the plant and of the animal was proved by the cellular theory, and especially when the similarity of conduct of the active, living protoplasm in both was shown in the plasma theory of Max Schultze (1859)."

Here, we might compare Scottish moral philosopher Francis Macnab's 1818 assertion that plants are neither alive nor dead, an intermediate view to the defunct theory of life, resulting from his attempt to reconcile religious theory (Biblical views) with modern science (fossil evidence, Copernican system, law of gravitation, atomic theory, chemistry, etc.). This nearly begs the nearly similar question: 'do rocks have souls?', a query people seem to be have reasoned answers

on, depending on if one is a Raramuri Indian (Q), Aristotle (Q), the Ik (Q), African tribesmen of Uganda, or general Yahoo Answers (Q)(Q)(Q) variety, etc.

Law of substance

Haeckel frequently refers to a "law of substance", e.g. in discussions of his theory of a non-supernatural soul, by which he means, as stated in his *The Riddle of the Universe* (pg. 78), the "formulation of Robert Mayer [conservation of energy] and Helmholtz [conservation of force]". This, to note, seems to have, in its unstated meaning, the "all substances are reducible to energy" theories of Wilhelm Ostwald as conceptualized in his pre-1920s energetics.

Denial | Beliefs

See main: Atheism types by denial and belief

Haeckel, according to James Birx (1992), believed Darwin (believed: evolution) and denied seven main things, namely he rejected: god (was an “unabashed atheist”), vitalism, teleology, mysticism, anthropocentrism, anthropomorphism, and western dualism, of two varieties: (a) that matter and spirit were two separate aspects of existence and (b) that mind-body dualism was unsound. [14]

Origin of life | Plastidule theory

See main: Plastidue theory

Haeckelm, after reading Darwin in 1860, first began to lecture on the origin of species in 1862.

In 1866, Haeckel, in his *General Morphology* (*Generelle Morphologie*), introduced the terms: ‘Plastide’, ‘Plasson’, and ‘Plastidul’, from the Greek *plastikos*, from *plassein* to mold or form, as his designation of the first single-celled organisms, creatures of the lowest morphological order of ‘individual’, as his solution to the origin of life problem (which Darwin had patched, in 1871, using a warm pond model).

The creatures or entities themselves Haeckel called ‘Plastiden’, which he considered to be the building blocks from which all life is made, were hypothesized to be filled with a homogeneous substance called ‘Plasson’, which in turn was composed of molecules called ‘Plastidule’ (plural) or ‘Plastidul’ (singular), which were special types of molecules that had the ability to reproduce through a sort of molecular ‘memory’; a conception vaguely said to be similar to or precursory in conception to the way in which the modern view of chromosomes and DNA (molecules) facilitate or rather transmit traits in the process of reproduction. [7]

The term ‘plastidule’ tends to be rendered in the modern as the "first living molecules"—although this may not exactly be a correct translation, as Haeckel seems to have held a monism viewpoint in his mind.

Goethe | Elective Affinities

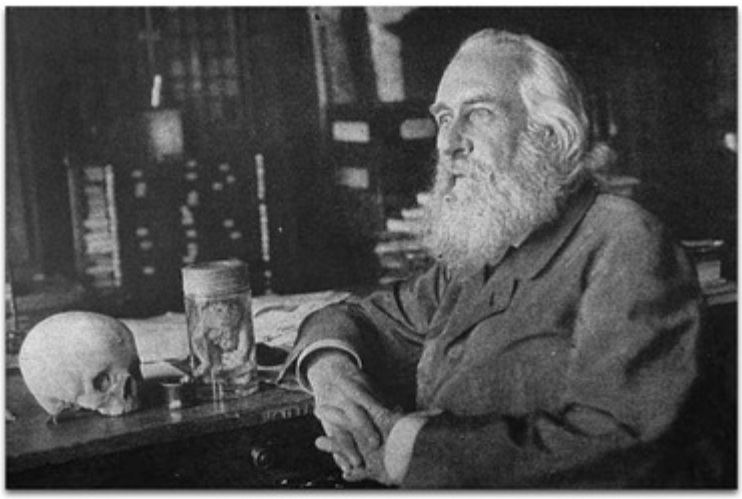

In his November 1875 lecture “On the Procreation of Life-Particles or Perigenesis of Plastidule” (“Über die Wellenzeugung der Lebensteilchen oder die Perigenesis der Plastidule”), wherein "perigenesis", supposedly, means: “inheritance transmission via a type of growth force possessed by one generation to another”, Haeckel elaborated on his plastidule theory to explain generational transmission. He opened to the straight-forward view that: [4]

> “Every atom has an inherent amount of force and is animated in this sense.”

A circa 1910 photo (Q) of **Haeckel** in his studio.

> "Jedes Atom besitzt eine inharente Summe von Kraft und ist in diesem Sinne beseelt."

He then went on to embraced Goethe's conception of elective affinities, anthropomorphizing atoms using what seems to be the extrapolate down approach: [5]

> "Without the adoption of an 'atomic soul' the most common and general phenomena of chemistry are inexplicable. Pleasure and pain, desire and aversion, attraction and repulsion must be all atomic-masses together, the movements of the atoms, which must take place in formation and release of each chemical compound, are only explicable only if we instill in them sensation and volition. What else is due to basically the generally accepted chemical study of the elective affinity of the body than on the unconscious assumption that in fact the attracting and repelling atoms are inspired by certain tendencies, and that they, these feelings or impulses, following too have the will and the ability to move towards each other and away from each other? What Goethe transmits in his 'Elective Affinities' on the highest composite soul life of man, which has full truth."
>
> "Ohne die Annahme einer 'Atomseele' sind die gewöhnlichsten und allgemeinsten Erscheinungen der Chemie unerklärlich. Lust und Unlust, Begierde und Abneigung, Anziehung und Abstoßung müssen allen Massen-Atomen gemeinsam sein; den die Bewegungen der Atome, die bei Bildung und Auflösung einer jeden chemischen Verbindung stattfinden müssen, sind nur erklärbar, wenn wir ihnen *Empfindung* und *Willen* beilegen. Worauf anders beruht den im Grunde die allgemein angenommene chemische Lehre von der *Wahlverwandtschaft* der Körper, als auf der unbewussten Voraussetzung, dass in der Tat die sich anziehenden und abstoßenden Atome von bestimmten Neigungen beseelt sind, und dass sie, diesen Empfindungen oder Trieben folgend, auch den Willen und die Fähigkeit besitzen, sich zu einander hin und von einander fort zu bewegen? Was *Goethe* in seinen 'Wahlverwandtschaften' über das höchst zusammengesetzte Seelenleben des Menschen überträgt, das besitzt volle Wahrheit …"

Here, to note, in Haeckel's comment on the "will and the ability of atoms to move towards and away from each other", we are reminded of German philosopher and Goethean protege Arthur Schopenhauer's 1818-1844 elective affinity theory of the will of atoms (will to power). It would not be until the development of exchange force theory that this "ability of atoms and molecules to move towards and away from each other" would be reconciled or rather upgraded, in the 1930s, to the model that atoms and molecules of themselves do not have the ability to towards or away from each other, but rather that the transmittal or exchange of field particles is what produced the motion or as it is sometimes explained changes the behavior of the bound state entity ("Massen-Atomen" or atomic mass, as Haeckel seems to define things) that emits or receives the field particle. [6]

In a 26 May 1876 letter to Haeckel, Bartholomaus von Carneri (1821-1909), in commentary on one of Haeckel's recent publications, stated: [9]

> "I was full of jubilation at the clarity with which you pass from chemical elective affinity one side into the realm of life and on the other into the realm of mechanics; and I am more than ever convinced that in its unremitting progress, science will offer explanations of all the more important points that do not stand in contradiction to the requirements of an austere philosophy, or to put it more correctly, that it makes it possible for an austere philosophy to progress without losing contact with the ground under it's feet."

(add)

Memory of atoms

Haeckel commented, at some point, that he got his idea of the "memory of atoms" (whatever he means by this?) from

Goethe's 1809 *Elective Affinities*. [4]

Elective affinity | Review

The following is Haeckel's 1899 summary of Goethe's novella-version theory of human chemical affinities: [1]

> "Goethe, in his classical romance, *Elective Affinities*, compares the relations of pairs of loves with the phenomenon of the same name in the formation of chemical combinations. The irresistible passion that draws Edward to the sympathetic Ottilie, or Paris to Helen, and leaps over all bounds of reason and morality, is the same powerful unconscious attractive force which impels the living spermatozoon to force an entrance into the ovum in the fertilization of the egg of the animal or plant—the same impetuous movement which unities the two atoms of the hydrogen to one atom of the oxygen for the formation of the a molecule of water. This fundamental unity of affinity in the whole of nature was recognized by the great Greek scientist Empedocles in the fifth century BC in his theory of the love and hatred of the elements."

(add)

Elective affinity | Psychological chemotropism

In 1893 to 1903, Haeckel, in his love letters, mentions the concept of elective affinity at least three times in respect to his own romantic relationships. In one letter to a Franziska von Altenhausen, Haeckel defines elective affinity as a strange psychological chemotropism: [8]

> "… seductive women—why should I, despite all scruples and obstacles, cast myself into the dust before you? Dearst Franziska, herein lies the enigma of 'elective affinity', of that strange **psychological 'chemotropism'**, of whose power I have spoken repeatedly in my books—little dreaming that I myself should fall a victim to it in my old age!"

(add)

Soul theory

Haeckel was a rather unique soul theorist, as soul theorists go, attributed "souls", eventually, to all entities: organism, cells, tissues, nerves, crystals, atoms, and light-bearing ether. [2] In his 1874 *Anthropogeny* (*The Origin of Humans*), Haeckel began to use a mechanical explanation of nature, albeit in panpsychism sort of way, so to speak, that energy and soul are synonymously denoted by the term "energy" (or possibly kraft). [4]

One peculiar example of his material soul theory is his temperature-based "soul snow" conception, one of the more forced religion-melded-to-science contrivances known to science, thermodynamics or rather religious thermodynamics in particular.

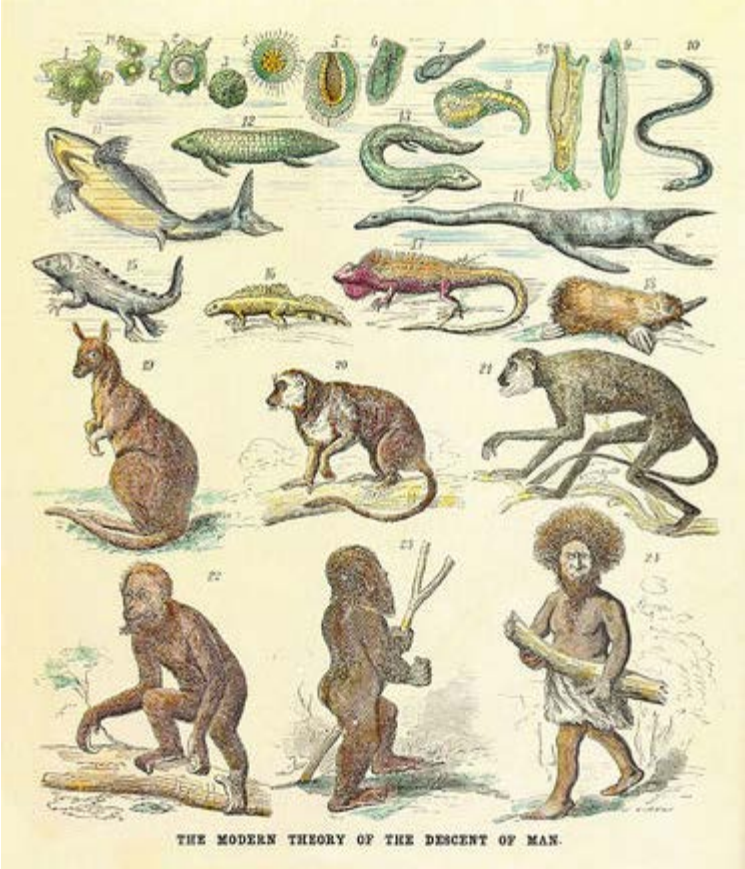

Haeckel's 1874 "evolution of man" diagram, showing: 1 Amoeba; 1a Asexual reproduction (amoeba dividing); 2 Sexual reproduction (cell with spore); 3 Multi-cellular organism (early embryonic stage); 4 Muliticellular organism with three germ layers (blastula); 5 Organism with primitive mouth (gastrula); 6 Planaria; 7 Worm (leech); 8 Primitive chordate (tunicate larva); 8a Adult tunicate; 9 Lancelet; 10 Jawless fish (lamprey); 11 Cartilaginous fishes (shark); 12 Australian lungfish; 13 South American lungfish; 14 Aquatic reptile (plesiosaur); 15 Early amphibian (labytinthodont); 16 Modern amphibian (newt); 17 Reptile (iguana); 18 Monotreme (platypus); 19 Marsupial (kangaroo); 20 Prosimian (lemur); 21 Monkey (langur); 22 Ape (orangutan); 23 Ape-man (*Pithecanthropus*); 24 Modern human (a Papuan).

His last book, the 1917 *Crystal Souls: Studies on Inorganic Life*, was devoted to extolling his views on souls in liquid

crystals. [3]

Descent of man | 1874

In 1874, Haeckel gave what seems to be one of the first "evolution of man", diagrams (adjacent), from amoeba to modern human, "great chain of being" like diagram, illustrated by modern and fossil species: [10] Of note here we see the prototype of a the organic | inorganic origin of life divide forming, namely the amoeba (first form of life) | inorganic matter (parts of amoeba) conceptual demarcation. A fuller reading of Haeckel's works, however, are in order here, to see what he conceptualized before or at step one (amoeba)?

Education

Haeckel grew up listening to his mother recite Schiller's poetry and discussing Goethe's nature philosophy with his father. [15] Haeckel, in his *General Morphology* (1866), commented in regard to his earlier educational years:

> "In our most impressionable years, we are given very defective, perverse, and often really mischievous instruction, by which we are filled with absurd errors, instead of natural truths."

In 1858, Haeckel completed his MD in Berlin in under Johannes Muller, among others, in biological sciences, wherein he adopted the Helmholtz school of thought, that of the mechanical theory of life over that of the vitalism theory of life. Haeckel then completed a DSc in biology and PhD in zoology, the latter at the University of Jena, where at he became a professor of comparative anatomy, remaining there for 47 years, until 1909.

Quotes | By

The following are noted quotes:

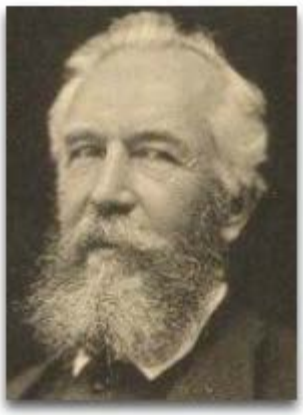

> "We thus arrive at the extremely important conviction that all natural bodies which are known to us, are equally animated, that the distinction which has been made between animate and inanimate bodies does not exist."
>
> — Ernst Haeckel (1868), *The History of Creation*, key-citation from above [11]

> "Darwin is the 'new Newton' who has explained the origin of organisms strictly via mechanical causes."
>
> — Ernst Haeckel (1868), *History of Creation* [13]

> "Judeo-Christian beliefs are 'those dogmatic doctrines of anthropism'."
>
> — Ernst Haeckel (c.1868) [14]

> "Wolfgang Goethe: Germany's greatest genius."
>
> — Ernst Haeckel (1892), *Monism* [16]

> "The immortal merit of establishing the doctrine on an empirical basis, and pointing out its world-wide application, belongs to the great scientist Charles Darwin; he it was who, in 1859, supplied a solid

foundation foi the theory of descent, which the able French naturalist Jean Lamarck had already sketched in its broad outlines in 1809, and the fundamental idea of which had been almost prophetically enunciated in 1799 by Germany's greatest poet and thinker, Wolfgang Goethe. These three distinguished naturalists shine as three stars of the first magnitude amid all the great men of the century."

— Ernst Haeckel (1899), *The Riddle of the Universe* (pgs. 4-5)

"The fundamental unit of affinity in the whole of nature, from the simplest chemical process to **the most complicated love story**, [as] was recognized by Empedocles [and] Goethe, **[can be] reduced,** on logical analysis, **to matter** (space filling substance) **and energy** (moving force)**,** [which] are but two inseparable attributes of one underlying substance."

— Ernest Haeckel (1899), *The Riddle of the Universe* (pg. #)

"During the Middle Ages—especially during the domination of the papacy—scientific work in this direction entirely ceased. The torture and the stake of the Inquisition insured that an unconditional belief in the Hebrew mythology should be the final answer to all the questions of creation."

— Ernst Haeckel (1899), *The Riddle of the Universe* (pg. 238)

"As the coach pulled up to Darwin's ivy-covered country house, shaded by elms, out of the shadows of the vine-covered entrance came the great scientist himself to meet me. He had a tall, worthy form with the broad shoulders of Atlas, who carries a world of thought. He had a Jupiter-like forehead, high and broadly domed, similar to Goethe's, and with deep furrows from the habit of mental work."

— Ernst Haeckel (c.1900), retrospect on first meeting Charles Darwin [15]

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θΔics

In existographies, **Ernst Mach** (1838-1916) (IQ:175|#235) [RGM:198|1,350+] was an Austrian physicist and philosopher note for his 1896 book *Principles of the Theory of Heat: Historically and Critically Elucidated* and for his harsh attack on fellow Austrian Ludwig Boltzmann's statistical thermodynamics work, sometimes called the "Mach-Boltzmann controversy", being in direct opposition to Boltzmann's supposition of the existence of atoms. [1] Mach was one of the founders of the school of energetics.

Mach-Boltzmann controversy

See main: Energetics debate

In 1873, Austrian physicist Ludwig Boltzmann joined the University of Vienna as Professor of Mathematics and there he stayed until 1876. In 1893, Boltzmann succeeded his teacher Joseph Stefan as Professor of Theoretical Physics at the University of Vienna. Boltzmann, however, did not get along with some of his colleagues in Vienna, particularly Mach, strong objector to the molecular hypothesis (used by Boltzmann in his statistical derivation of the second law), who became a professor of philosophy and history of sciences in 1895. Thus in 1900 Boltzmann went to the University of Leipzig, on the invitation of German physical chemist Wilhelm Ostwald. After the retirement of Mach due to bad health, Boltzmann came back to Vienna in 1902.

Turning tendencies

In precursor to the concept of "human molecular spin", in 1885 Mach used the term "turning tendencies" when discussing the circular movements of troops on dark nights, and how one will tend to walk in circles if lost in the woods. [2]

Quotes | By

The following are noted quotes:

> "I don't believe that atoms exist."
>
> — Ernst Mach (1897), "statement at meeting in Vienna" [1]

> "The task of the early investigators who lay the foundation is quite a different one from that of their successors. The former have to seek out and establish the weightiest facts only, and to do this, as history teaches, calls for more intelligence that is generally believed."
>
> — Ernst Mach (1897), *The Mechanics in Their Historical-Critical Development* [4]

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External links

● Ernst Mach – Wikipedia.

θΔics

In existographies, **Ernst Mayr** (1904-2005) (CR:6) was a German-born American evolutionary biologist noted, in hmolscience, for his antireductionism stance, a line of argument that seems to have started amid 1985 public debates, in *Nature*, with reductionist Steven Weinberg.

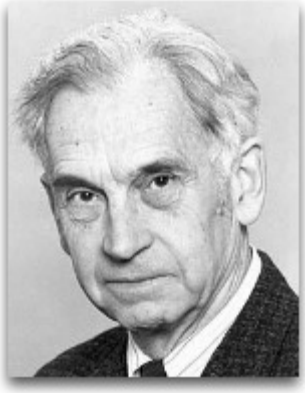

Evolution | Teleological drives

In 1982, Mayr, in his *The Growth of Biological Thought*, outlined the so-called "drive toward perfection" religion-reconciling evolution theories. [4] In circa 1985, Mayr penned a similar article in *Scientific American*, as cited by Robert Pirsig in his famous 1991 chemistry professor paradox discourse, in which he says the following: [5]

> "Those who rejected natural selection on religious grounds or philosophical grounds or simply because it seemed too random a process to explain evolution continued for many years to put forward alternative schemes with such names as: orthogenesis [Chambers, Nageli, Eimer], nomogensis, aristogenesis [Osborn], or the 'omega principle' of Teilhard de Chardin, each scheme relying on some built-in tendency or drive toward perfection or progress. All these theories were finalistic; they postulated some form of cosmic teleology or purpose or program.
>
> The proponents of teleological theories, for all their efforts, have been unable to find any mechanism (except supernatural ones) that can account for their postulated finalism. The possibility that any such mechanism can exist has now been virtually ruled out by the findings of molecular biology.
>
> Evolution is recklessly opportunistic: it favors any variation that provides a competitive advantage over the other members of an organism's own population or over individuals of different species. For billions of years this process has automatically fueled what we call evolutionary progress. No program controlled or directed this progression. It was the result of spur of the moment decisions of natural selection."

(add)

Entropy

Mayr argued that entropy does not apply to biological systems. In his 2004 *What Makes Biology Unique?*, to exemplify, he states: [1]

> "Biological systems are open systems; the principles of entropy therefore are not applicable. Owing to their complexity, biological systems are richly endowed with capacities such as reproduction, metabolism, replication, regulation, adaptedness, growth, and hierarchical organization. Nothing of the sort exists in the inanimate world."

The logic of this perspective, for course, is incorrect: but is classified as the "unbridgeable gap" model. Whatever the case, Mayr's general motto, which he appends to some of his chapter subsections, is: "physicalist ides not applicable to biology".

Discussion

Mayr, supposedly, was openly an atheist, stating "there is nothing that supports the idea of a personal God". [2] Though, to note, the blurry term "personal God", leaves a certain amount of dis-clarity in the Dawkins scale, possibly putting Mayr at the Dawkins number 6 range. This, of course, makes his objection all the more puzzling; possibly he held in his view some type of god = nature view, and held a special place for humans in the big scheme of the universe, according to which, somehow, humans are exempt from the laws of the universe, the laws of physical science, the laws of thermodynamics, etc. There would seem to be a "categorical name" for people of this mindset, but one that does not yet

seem to be coined or labeled?

Quotes | By

The following are quotes by Mayr:

> "Descartes's grossly mechanistic interpretation of life, and the logical extreme to which his ideas were carried by Holbach and de la Mettrie, inevitably provoked a reaction leading to vitalistic theories which have been in vogue, off and on, to the present day. I have only to mention names like Driesch (entelechy), Bergson (elan vital), and Lecomte du Nouy, among the more prominent authors of the recent past. Though these authors may differ in particulars, they all agree in claiming that living beings and life processes cannot be causally explained in terms of physical and chemical phenomena. It is our task to ask whether this assertion is justified, and if we answer this question with 'no', to determine the source of the misunderstanding."
>
> — Ernst Mayr (1961), "Cause and Effect in Biology" [6]

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θΔics

In existographies, **Ernst Sellin** (1867-1947) was German theologian noted for pioneering the field of archeology-based Old Testament scholarship.

Overview

In 1922, Sellin, in his *Moses and its Significance for the Israeli-Jewish religious History*, as summarized by Sigmund Freud (1939), asserted, based on some interpretation of the Book of Hosea (Ñº), that Moses met a violent end in a rebellion of his stubborn and refractory people, and that the religion he instituted was abandoned. [1]

Freud

In 1939, Austrian psychologist Sigmund Freud took this Sellin conjecture to mean that Moses was the Egyptian pharaoh Akhenaten or one if his priests; specifically: [2]

> "Let us adopt from **Sellin** the surmise that the Egyptian Moses was killed by the Jews, and the religion he instituted abandoned. It allows us to spin our thread further without contradicting the trust-worthy results of historical research. If Moses was an Egyptian and if he transmitted to the Jews his own religion then it was that of Ikhnaton, the Aton religion [Atenism]."

(add discussion)

Quotes

The following are noted quotes:

> "Therefore we have to picture the true religion of Moses, the belief he proclaimed in one, ethical god, as being from now on, as a matter of course, the possession of a small circle within the people. We cannot expect to find it from the start in the official cult, the priests religion, in the general belief of the people. All we can expect is that here and there a spark flies up from the spiritual fire [see: spirit terminology upgrades] he had kindled, that his ideas have not died out, but have quietly influenced beliefs and customs until, sooner or later, under the influence of special events, or through some personality particularly immersed in this belief, they broke forth again more strongly and gained dominance with the broad mass of the people. It is from this point of view that we have to regard the early religious history of the old Israelites. Were we to reconstruct the Mosaic religion after the pattern laid down in the historical documents that describe the religion of the first five centuries in Canaan we should fall into the worst methodical error."
>
> — Ernst Sellin (1922), *Moses and its Significance for the Israeli-Jewish religious History* [3]

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External links

â— Ernst Sellin – Wikipedia.

θΔics

In thermodynamics, **Ernst Zermelo** (1871-1953) was a German mathematician, an assistant to German physicist Max Planck, who is noted for his 1894 article "On a Theorem of Dynamics and the Mechanical Theory of Heat" in which he used the 1890 Poincaré recurrence theorem to argue that there was inconsistence between the dynamics of classical mechanics (William Hamilton), and the dynamics of the mechanical theory of heat (thermodynamics), in which processes are said to not be reversible; where in the middle was the kinetic theory of heat trying to reconcile the two. [1] This sparked a bit of a debate with Austrian physicist Ludwig Boltzmann in the *Annalen der Physik* in the years to follow. [2]

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θΔics

In science, **Erving Goffman** (1922-1982) was a Canadian-born American sociologist, high-cited humanities citation ranking, noted for []

Overview

In 1971, Goffman, in his *Relations in Public: Microstudies of the Public Order*, described how complex rules govern human behavior in apparently simple situations, such as passing by a stranger on a sidewalk; a 2009 rendition of this book is as follows:

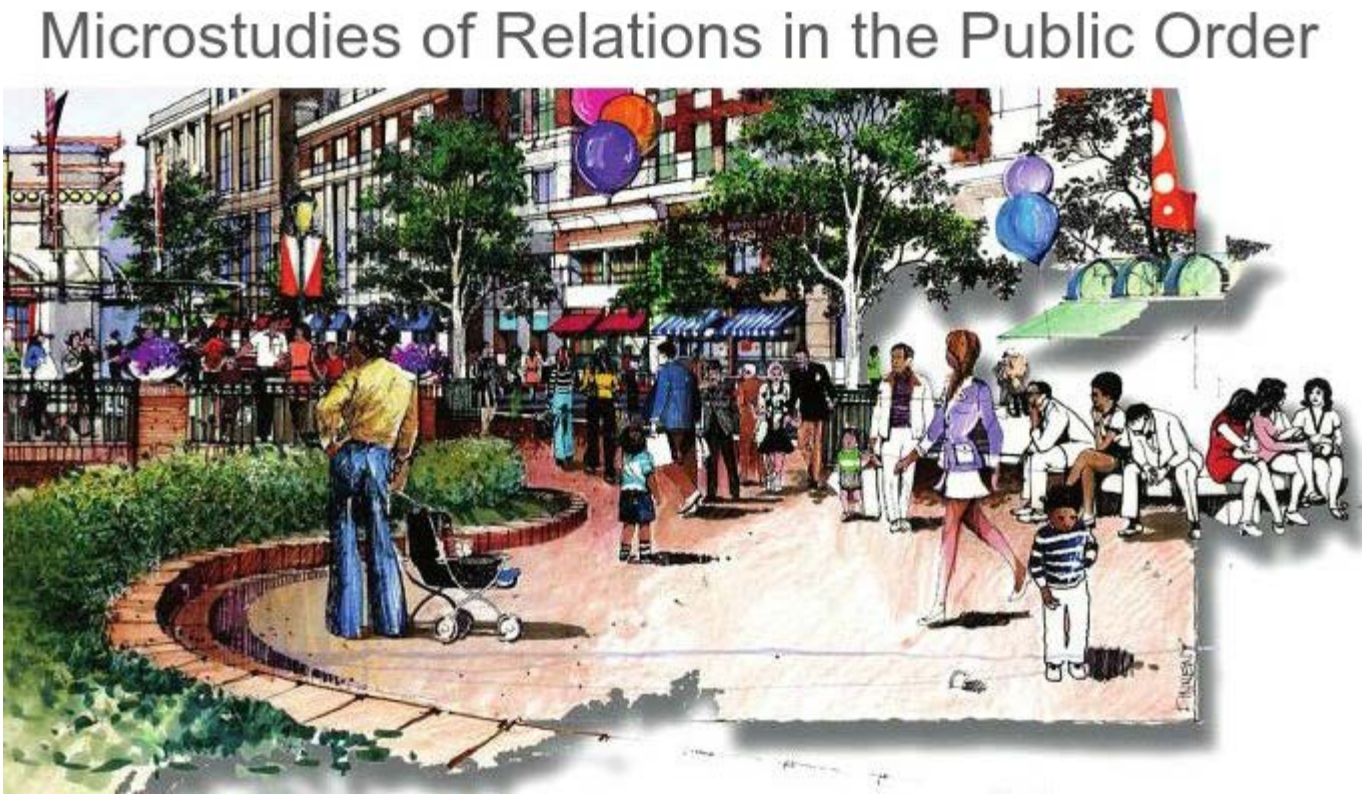

In 1975, American sociologists James Dabbs and Neil Stokes, seemingly influenced by Goffman, in their "Beauty is Power: the Use of Space on the Sidewalk", reported the results of a study wherein they quantified volume or rather personal space changes via time lapsed video recordings of 470 pedestrians observed from above walking on a side walk, which found that sex, number, attractiveness (beauty) caused volume expansion, results about which Dabbs and Stokes concluded to the effect that these can be "regarded as aspects of power." [1]

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θΔics

In hmolscience, **Erwin Simonovich Bauer** (1890-1938), or Ervin Bauer, was a Hungarian-born Russian physician, pathologist, and physical biologist noted, in animate thermodynamics, for for his free energy based so-called "principle of the permanent inequilibrium of living matter", aka Bauer principle, aimed at explaining life in physical terms.

Overview

In 1918, Bauer was "deep in work, constantly thinking about biology", as he told his wife Margit Kaffka in letter. [8]

In 1920, Bauer published his *The Fundamental Principles of Biological Science*, in which he introduces the so-called so-called "principle of the permanent inequilibrium of living matter", or what has come to be known as the Bauer principle, which states that: [1]

> "The living and only the living systems are never in equilibrium, and, on the debit of their free energy, they continuously invest work against the realization of the equilibrium which should occur within the given outer conditions on the basis of the physical and chemical laws."

A shortened version of the Bauer principle, according to Russian biophysicist Mikhail Volkenstein, is: [2]

> "Living systems are never in equilibrium and at the expense of their free energy …"

In 1930, Bauer published and updated second edition more aggressively entitled *Physical Principles in Biology*.

In 1935, Bauer published a third version of his treatise entitled *Theoretical Biology*, in Leningrad, in the form of 5,200 copies, which quickly sold out, which is the most-cited version of his work.

Russian biophysicist Alexander Zotin describes Bauer's entire theory, on the general problems in biology: metabolism, irritability, excitability, ontogenesis, and evolution, as proceeding from one thermodynamic principle, namely the principle of stable nonequilibrium. [3]

Translations | Rarity

Bauer's works, currently, are only in Russian or Hungarian, and copies are rare; in particular, in 1938, during the great Soviet purge, Bauer, accused of being a spy, was shot by the KGB, and nearly all copies of his works, deemed an "enemy of the people", were pulped. In 1967, a Hungarian translation of the 1935 edition was published as Elméleti *Biológia*. In 1982, a Russian preprint was issued with an extended summary in English. [5]

Influence

Promoters of Bauer's work include: Russian biochemist Sergey E. Severin (1901-c.1980) (Q) and his student Simon Shnol (1920-) (Q)—mentor to Anatol Zhabotinski, eponym of the famous Belousov-Zhabotinsky reaction (Q)—who were both discussing Bauer and his work when it was forbidden to even mention his name. In the 1960s, Soviet embryologist Tokin Boris (1900-1984) (Q), a friend and superior to Bauer, began to promote his work in Hungary, resulting in a 1967 translation of Bauer's work, in Hungarian, by the Hungarian Academy of Sciences. In 2003, Hungarian chemical engineer Tibor Ganti, in his so-called chemoton theory of living systems, began to build on and discuss Bauer's work; which thus seems to the only readily available English presentation of Bauer's views, some of which is outlined below.

Marx | Dialectic materialism

Bauer, supposedly, has some type of Marx-Stalin influenced dialectic materialism aspect of biology in his work. [5]

Animate vs inanimate

Bauer, supposedly, evoked our outlines some type of "life principle" in his work to the effect that living beings follow a deeper organizing principle than inanimate objects, namely that organisms have inner motivations, which dominate over outer conditions, which machines do not have. [6]

Free energy

Hungarian chemical engineer Tibor Ganti, noted for his 1971 theory that living organisms are chemotons, or chemical automatons, gives a fairly good overview section of Bauer's theories as they concern free energy, with accompanying equations. Bauer's so-called "principle of constant non-equilibrium" of living systems, according to Ganti, states that: [4]

> "The free energy of an isothermally closed living system is smaller in equilibrium than that of a nonliving system if the sum of the potential differences measured in absolute units has been initially identical in them. Under such conditions, the free energy of the living system is smaller in equilibrium than that of the non-living system just by the work done by the living system against the equilibration process.
>
> Thus if the free energy of the living system is in equilibrium equal to *F*, the sum of the work factors—differences in pressure, concentration, electrical potential, etc., is equal to the changes caused by them in a time interval of *t* equal to *X*, the corresponding data for nonliving system are denoted by *F'*, *x'*, and Δx', then:

$$F' - F = \sum_{i=0}^{n} X_i \frac{\Delta x_i}{\Delta t} \Delta t - \sum_{i=0}^{n} X_i' \frac{\Delta x_i'}{\Delta t} \Delta t$$

A full reading of the original work, to note, will be needed to discern what exactly Bauer is getting at in this passage, as there seem to be mathematical typos in the translation given by Ganti, among other factors; although the argument seems to be an extrapolation of the work of Willard Gibbs, in some way or another.

Biography

Bauer was born in Hungary in 1890 and died in 1938. He was married twice, first to writer and poet Margit Kaffka, who died of the Spanish flu on December 1, 1918. Bauer later married Stefania Szilard, sister of physicist Leo Szilard. The Bauers were arrested by the KGB on August 4, 1937 accused and convicted of spying for a foreign country, and were condemned to death. They were shot on January 11, 1938 by Senior Lieutenant A.R. Polikarpov of the Leningrad NKVD and interred in a mass grave. The reason for the incorrect date of death commonly cited as 1942 is that the original documents surrouding Bauer's death were not given to the family until 1992. [5] Boris Tokin, Bauer's friend and superior, gave a short biography of Bauer in the 1982 Hungarian reprint of *Theoretical Biology*.

Quotes | About

The following are praise, tribute, and or summary quotes:

> "**Bauer**'s dream of theoretical biology was similar to Einstein's goal in physics to create a single equation that encompasses the 'essence of nature', from which all physical phenomena can be derived."
>
> — Boris Tokin (1988), "Notes on the Work of E.S. Bauer" [7]

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● Bauer, Erwin (1890-1942) – WorldCat Identities.

θΔics

In science, **Erwin Nick Hiebert** (1919-2012) was a Canadian-born American science historian noted, in religious thermodynamics, for his 1966 article "The Uses and Abuses of Thermodynamics in Religion". [1] The following is oft-repeated quote from this work: [2]

> "All kinds of private metaphysics and theology have grown like weeds in the garden of thermodynamics."

Hiebert also published a shorter history of thermodynamics and religion. [3]

Hiebert also wrote on the great 1895 energetics debate. [4]

Education

Hiebert completed his PhD at the University of Wisconsin, Madison in 1954 in the history of science and physical chemistry, after which he was professor of history of science at UW-Madison, from 1957 to 1970, thereafter becoming professor of the history of science at Harvard University from 1970 to 1989, becoming professor emeritus thereafter. [5]

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θΔics

In existographies, **Erwin Schrödinger** (1887-1961) (IQ:190|#26) [RGM:424|1,500+] (Becker 160:44) (GPE:7) [CR:224] was an Austrian physicist, noted for his 1925 Schrodinger equation, a Lagrangian-based state equation for the wave movement of an electron about an atom, for his 1935 book *Science and the Human Temperament*, wherein he stated his opinion that the rise of cultures is governed by the second law of thermodynamics, for his ultra-famous 1943 "What is Life?, wherein he attempted, in laymanized terms, to explain "life" in terms of physics and chemistry, a lecture-turned-book, wherein he postulated that "life feeds on negative entropy", and followup retraction "Note to Chapter 6", wherein he had to admit to error, commenting that he he should have discussed life in terms of "free energy" in stead of entropy, in regards to the theory of life; also noted for his 1946 *Statistical Mechanics* book. [1] Schrodinger won the 1933 Nobel Prize for his development of the Schrodinger equation.

Do Electrons Think?

In 1949, Schrodinger, in his "Do Electrons Think?" BBC talk, stated the following: [9]

> "Twice within two and a half thousand years there was a notable departure from the belief in the strict necessity of physical events. The first time this happened only about 150 years after Leucippus. We gather this from the didactic poem of Lucretius, who was the posthumous mouth-piece of Epicurus, who lived in the fourth century B.C. Their suggestion had no consequences, it was all but forgotten. The second time the strictly causal linkage in the chain of physical happenings was thrown into doubt was only 30 years ago by Franz Exner in Vienna. About ten years later (that is, about twenty years ago, from today [1949]) the disbelief in strict causation became part and parcel of you might call the 'new creed' now adopted by most physicists and called 'quantum mechanics'.
>
> Both times, the alleged break-down of strict causality in the domain of physics was hailed for removing the obstacle in our understanding the spontaneity of the movements of the animals and of man—in understanding free will, as one usually calls it. Let us see whether this claim is justified.
>
> The hypothesis, as reported by Lucretius, was very simple indeed. He just states that the atoms do swerve in a very small but entirely undetermined and unforeseeable way from the courses you would expect them to take from supposed strict physical laws. No theory of the swerves is offered. This amounts to saying that the strict laws are only figments. The actual path of a particle is to a small extent arbitrary in the neighborhood of the fictitiously prescribed path. It is not illogical to surmise that the several little arbitrarinesses of the single atoms collaborate to bring about the apparent arbitrariness in the behavior of the animals and of man. What Lucretius forgets is that he has explained nothing, he has solved no problem. He has only referred the problem back to the ultimate particles, where it has become much more difficult to grapple with. The simplest, spontaneous bodily movement, say lifting of my arm, would require the planned collaboration of billions of single atoms in their undetermined swerves, if they should bring about the integrated action.
>
> In modern physics, the denial of strict causation is of entirely different nature, in two respects. First, there is no question of only small departures from a fictitious exact law of motion. The behavior of primal particles, as electrons for instance, or of small atomic systems composed of only a few of them, is now supposed to be undetermined and unforeseeable within a wide margin of uncertainty. It is thought that in times we have to allow a particle the choice between several entirely different courses to take. Let this for the moment be figurative speech, meaning only that nothing in the observed situation determines the course the particle actually takes. But on the other hand the situation is supposed to determine with rigorous precision the statistics of the various possible "choices." Given the same situation over and over again, the particle will, for instance, in exactly two thirds of the cases follow one course, in one third of cases the other one; and similarly when there are more than two courses to follow.
>
> Again, the same as 2,000 years ago, it has been suggested that this breach of strict causation leaves room

> for the display of the spontaneous movements in the animals and in man. Is this claim justified? **I think not**."

Here, of note, we recall Gilbert Lewis' 1925 *The Anatomy of Science*, wherein he discusses the "behavior of a group of electrons and the behavior of a university faculty":

Human thermodynamics

In 1935, in the context of human thermodynamics, Schrodinger, in his *Science and the Human Temperament*, stated the following in regards to the second law and rise of human cultures, as cited by Leslie White (1959): [3]

> "We are convinced that [the second law of thermodynamics] governs all physical and chemical processes, even if they result in the most intricate and tangled phenomena, such as organic life, the genesis of a complicate world of organisms from primitive beginnings, [and] the rise and growth of human cultures."

(add)

Life feeds on negative entropy

In popular or colloquial use, Schrodinger's cryptic "life feeds on negative entropy" postulate, might be considered as one of the most oft-quoted passages culled from the publications of thermodynamics. In extrapolation to human life, this would imply that people, in some way, feed on negative entropy (or a negative value of entropy *S*). In linguistic form, Schrödinger's postulate is similar to Austrian physicist Ludwig Boltzmann's 1886 postulate that "the general struggle for existence of animate beings is … a struggle for entropy". [2]

Negative entropy and order

In terms of entropy and order, in somewhat riddled form, Schrödinger reasoned that living organisms feed on negative entropy. To begin, he states that he will "try to sketch the bearing of the entropy principle (the second law of thermodynamics) on the large-scale behavior of a living organism". Second, he equates thermodynamic equilibrium, or what he calls "maximum entropy", as a state in which chemical potentials are equalized, wherein systems become dead, in which no observable changes occur. To avoid decay to this hypothetical death state, Schrödinger reasons that it is not energy that living beings feed on that keeps them at bay from decay but "negative entropy". In rephrasing this statement, he says "the essential thing in metabolism is that the organism succeeds in freeing itself from all the entropy it cannot help producing while alive." In making these ball-park statements, Schrödinger calls on the statistical concept of order and disorder, connections that were revealed, as he says, by the investigations of Boltzmann and Gibbs in statistical physics. On this basis, he situates the following definition:

$$\text{entropy} = k \log D$$

where *k* is the Boltzmann constant and *D* is a "quantitative measure of the atomistic disorder of the body in question". Here, to note, he fails to mention that this expression is generally valid only for ideal gases. In any event, Schrödinger reasons that this statistical expression applies to living organisms. Moreover, to make his verbal argument mathematical, he states that "if *D* is a measure of disorder, its reciprocal, 1/*D*, can be regarded as a direct measure of order." In addition, "since the logarithm of 1/*D* is just the minus of the logarithm of *D*, we can write can write Boltzmann's equation thus:

$$-\text{entropy} = k \log \frac{1}{D}$$

Hence, as Schrödinger states, “the awkward expression *negative entropy* can be replaced by a better one: entropy, taken with the negative sign, is itself a measure of order.” Thus, he concludes “the device by which an organism maintains itself stationary at a fairly high level of orderliness”, a state he equates with a low level of entropy, consists in “sucking orderliness from its environment”.

Difficulties on theory

See main: Note to Chapter 6

The basic difficulty in Schrödinger’s negative entropy theory is that he equates sustenance (metabolism) with measures of entropy. In the correct sense, sustenance is a function of substrate interactions, as studied in the field of surface chemistry. In an appended note to his thermodynamics-life chapter, however, Schrödinger states that:

> “The remarks on *negative entropy* have met with doubt and opposition from physicist colleagues. Let me say first, that if I had been law catering for them alone I should have let the discussion turn on free energy instead. It is the more familiar notion in this context. But this highly technical term seemed linguistically too near to energy for making the average reader alive to the contrast between the two things.”

In other words, in terms of entropy as defined by Clausius, as the “amount of work the molecules of the system do on each other" (that cannot be compensated), this outline by Schrödinger makes little sense. If he had let the discussion turn on free energy, he would have been confronted with the various postulates of energy interactions between people, such as was done by Goethe in his 1809 *Elective Affinities* (see: Goethe's human chemistry); where before 1882, free energy was called "chemical affinity" or elective affinity.

In 1987 commentary on Schrödinger’s *What is Life?*, American chemical engineer Linus Pauling noted that Schrödinger was discussing a change in the entropy of the "system", he never defined the system. Pauling wrote, "Sometimes he seems to consider that the system is a living organism with no interaction whatever with the environment; sometimes it is a living organism in thermal equilibrium with the environment; and sometimes it is the living organism plus the environment, that is, the universe as a whole." Pauling wrote that Schrödinger failed to recognize the most important question: "How biological specificity is achieved; that is, how the amino-acid residues are ordered into the well-defined sequence characteristic of the specific organism." [4] Similarly, Austrian-born English molecular biologist Max Perutz argued that we live on free energy and that there was no necessity to postulate negative entropy. [5]

God

In 1944, Schrodinger, in his *What is Life?*, made a blurry comment about the “Lord’s quantum mechanics”, when discussing chromosomes, clocks, and organisms. The following are some of his other religious-tinged comments:

> “Whence came I, whither go I? Science cannot tell us a word about why music delights us, of why and how an old song can move us to tears. Science is reticent too when it is a question of the great Unity – the One of Parmenides – of which we all somehow form part, to which we belong. The most popular name for it in our time is God – with a capital ‘G’. Whence come I and whither go I? That is the great unfathomable question, the same for every one of us. Science has no answer to it.”

In 1954, in his *Nature and the Greeks*, he states:

> “I am very astonished that the scientific picture of the real world around me is deficient. It gives a lot of factual information, puts all our experience in a magnificently consistent order, but it is ghastly silent about all and sundry that is really near to our heart, that really matters to us. It cannot tell us a word about red and blue, bitter and sweet, physical pain and physical delight; it knows nothing of beautiful and ugly, good or

> bad, God and eternity. Science sometimes pretends to answer questions in these domains, but the answers are very often so silly that we are not inclined to take them seriously."

> "In particular, and most importantly, this is the reason why the scientific worldview contains of itself no ethical values, no esthetical values, not a word about our own ultimate scope or destination, and no God, if you please. Whence came I and whither go I?"

Other comments in his collected quotes fall along these lines. [8] One example of which is: [7]

> "I shall quite briefly mention here the notorious atheism of science. The theists reproach it for this again and again. Unjustly. A personal God can not be encountered in a world picture that becomes accessible only at the price that everything personal is excluded from it. We know that whenever God is experienced, it is an experience exactly as real as a direct sense impression, as real as one's own personality. As such He must be missing from the space-time picture. 'I do not meet with God in space and time', so says the honest scientific thinker, and for that reason he is reproached by those in whose catechism it is nevertheless stated: 'God is Spirit'."

He would seem to fall somewhere in the gray area between Dawkins number 5 and 13.

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θΔics

In famous publications, **"Essay on Social Mechanics"** or *Essai sur la Mécanique Sociale* is a collection of twelve-articles, published in various journals, culminating in 1898, with a four-part essay on social mechanics, latter compiled into a book, by Polish economist Leon Winiarski. [1] The main essay, according to Winiarski, is divided into three parts: one on economic equilibrium and social equilibrium, a second on transformations of social energy, and the third on social dynamics, all defined in the context of Rudolf Clausius' thermodynamics and Joseph Lagrange's mechanics. [1] Partial (and full) English translations are underway below.

Cover of 1967 (315-pg) edition of Leon Winiarski's 1898 ***Essay on Social Mechanics*** (collected works) compiled by Swiss sociologist Giovanni Busino. [6]

In 1967, a 315-page collected works of Winiarski, in French, entitled *Essais Sur la Mecanique Sociale*, was compiled (with an introduction) by Swiss sociologist Giovanni Busino. [1] This edition indicates that Winiarski's theory is dominated by the terms: energy, potential energy, biological energy, sexual selection, social evolution, partial equilibriums, division of work, anthropology, Karl Marx, Leon Walras, and constant capital, amongs. [5] There also exists a 1898, 38-page, book *Essai sur la Mécanique Social* by the University of France Press. [1] An Italian-to-English translation of an 1899 Italian reprint (or variant) of the article "Theory of Property and Family: Essay on Social Mechanics" (chapter 9 collected works), found in the *Italian Journal of Sociology*, is shown below. [2] Other parts of the essays comprising Winiarski's *Social Mechanics*, as they are found, are being linked to below (and translated).

Overview

In this essay, Winiarski supposedly applied the principle of equivalence of transformation (transformation equivalents) to argue that, since the transformation of hunger and love into the higher wants of means the conversion of potential energy into kinetic energy, the evolution of a civilization involves a lowering of the potential of a people and its eventual replacement by a fresh, unexhausted race. [3] In terms of personal energies, Winiarski argues that things such as examples, ideas, and commands radiate from people of greater energy to those of lesser energy, and that this radiation takes the form of authority and influence of the social superior over that of the social inferior. In this logic, it is reasoned that this passage of energy tends to terminate in an equalizing of intensities and a state of equilibrium. [3] On the interesting topic of prediction, in the context of Winiarski's view of desire as a form of energy, American sociologist Edward Ross states:

> "Desire may or may not be a form of energy. In any case it is certain that a mechanical interpretation cannot help to predict the choices of people."

Ross seems to base this argument in the view that prediction can be made on the lower animals, whose behaviors are simply stimulus and reaction processes, but that in higher organisms, factors such as memory, psychic energy, consciousness, spontaneous sportive or festive activities, etc., except humans from mechanical simplicity. [3]

Collected works

English translations of this essay are difficult to find. The following table of contents, comes from the collected works of Winiarski, which seem to be grouped under the heading of *Essai sur la Mécanique Sociale*, as compiled by Swiss sociologist Giovanni Busino in 1967. It seems to be that all of the articles are were published originally published in French, except the one shown in chapter 9, on family property, which is in Italian. It also seems that chapter 7 (and the three chapters to follow) is the core of the group of essays.

Contents (French/Italian)	Ch	Contents (English)

Preface par G. Busino		Preface by G. Busino
La method mathematique dans la sociologie et dans la sociologie et dans l'economie politique (pgs. 1-14)		The mathematical method in sociology and the sociology and political economy (pgs. 1-14)
Le materialism economique et la psychologie sociale (pgs. 15-35)	1	The economic materialism and social psychology (pgs. 15-35)
Essai d'une nouvelle interpretation de phenomenes sociologiques. Introducion a la sociologie (pgs. 36-75)	2	Testing a new interpretation of sociological phenomena. Introduction has sociology (pgs. 36-75)
Deux theories d'equilibre economique (pgs. 76-97)	3	Two theories of economic equilibrium (pgs. 76-97)
Etude critique sur le troisieme volume du *Capital* de Karl Marx (pgs. 98-129)	4	Critical study on the third volume of Capital by Karl Marx (pgs. 98-129)
L'anthropo-sociologie (pgs. 130-161)	5	Anthropo-Sociology (pgs. 130-161)
Essai sur la mecanique sociale: I (pgs. 162-192)	6	**Essay on the social mechanics: I** (pgs. 162-192)
Essai sur la mecanique sociale: II. L'equilibre Esthetique (pgs. 193-225)	7	**Essay on the social mechanics: II**. The equilibrium Aesthetics (pgs. 193-225)
Saggi sulle meccanica sociale pura: III. L'equilibrio sociale, la teoria della proprieta e della famiglia (pgs. 226-243)	8	**Essays on pure social mechanics: III**. The balance of social, family and property theory (pgs. 226-243)
Essai sur la mecanique sociale: IV. L'energie sociale et ses mensurations (pgs. 244-290)	9	**Essay on the social mechanics: IV**. Social energy measurements (pgs. 244-290)
L'enseignement de l'economie politique pure et de la mecanique sociale en Suisse (pgs. 291-295)	10	The teaching of pure political economy and social mechanics in Switzerland (pgs. 291-295)
Le principle economique et la classification des sciences socials (pgs. 296-306)	11	The economic principle "and the classification of sciences socials (pgs. 296-306)
Index (pg. 307)	12	Index (pg. 307)

1898: Gaultier's review

The following is a 1898 two-page review of Winiarski's *Essay* by French philosopher Jules de Gaultier: [7]

> In a booklet whose text was first published in the *Philosophical Review*, Winiarski proposes a methodology to provide sociology with a guiding principle and give it a scientific rigor. The various factors - geographical, intellectual, moral or ethnicity - which in turn was attributed significant importance to the point of view of social evolution, not exclusive to the author's eyes, but they are only the partial elements of a more general phenomenon, as well as cosmic phenomena or organic, is subject to the laws of mechanics. Already, the pure economics, seeking action of mechanical laws to the facts it studies has built a system a satisfactory cohesion. It belongs to the sociology of engaging in a similar way.
>
> Individuals, identified as the molecules of a social aggregate, are sought, and the atoms of a material system, by forces of attraction and repulsion. The biological energy, which is in each of them tends to achieve maximum pleasure, and competition between individuals, to obtain the maximum each for himself,

sets the price of property, both tangible and intangible. The setting of this course of values, that the pleasure has achieved a measure, certify that bioenergy has a quantitative value as well as cosmic energy from which it derives. But this quantitative value, which science may one day no doubt determine the exact equivalent can now be applied to social facts the general principles of mechanics.

I am tempted to send Mr. Winiarski criticism. Why he called selfish and altruistic one hand on the other hand the forces of competition tends to be the balance of the moral world? Selfishness is it not by itself a principle sufficient to reconstruct the moral world the forces of attraction and repulsion that occur in any cosmic system? If these forces must be given a new name when carried out in this moral field, the words love and hate, or sympathy and antipathy, does not correspond with a more precise symmetry in attraction and repulsion, are not they not to each other more closely balances?

It does not appear in fact that altruism can be contrasted with selfishness as if the concepts contained in these words applied to two equal states, and antagonists of the same fore earlier. Selfishness is itself an anterior force. It is the only possible act of principle, because we cannot think of an act which originates outside the individual who runs it. Altruism is a more complex form of egoism, selfishness, taking the name of altruism when the person requires as a condition of his happiness, the support of the happiness of others. Because of this complexity, it presents a number of different cases, and although they all show their roots immersed in the ego, their genesis lends to different interpretations: it seems they can in turn be derived from a surplus of ego strength, manifested in feelings of protection, or rather a failure of me retires fun things they contain. Altruism is when a loan has the power to remove the others happy things, hidden and borrowing that accompanies the logical desire to provide others, taken as a necessary intermediary, opportunities for fun. Such is the case of the ambition of the fathers achieved by the son. This is idealized in the field of fiction, by the genius of Halzac, the meaning of the pact reached between Vautrin and Rubempre. But in one as in the other cases, altruism appears a direct manifestation of selfishness, leading, as selfishness luimême form of hatred of what opposes it and love for the favors, the forces of repulsion and attraction. It is not itself inherently one of those forces. '

This criticism, which deals only with the terminology, support also seems to me rather than contradicts the general theory of Winiarski. It aiiisi in Chapter II on the island social energy transformations, the author specifically a reconstruction of psychological tendencies and moral complex, on the one linse mobile selfish as basic: hunger. It is impossible in this limited space to list a series of ideas presented in their already low volume in the shortcut substantial pamphlet. I'll post at least to readers of Celtic magazine they find, among the developments of this begs a framework in which to return the ideological curious essay on the genius they enjoyed here the original value.

In de Gaultier's review, we note his issues with Winiarski's formulation of how love and hate act in human dynamics; this topic, to note, has only recently been resolved in the discovery of the Gottman stability ratio.

8: Aesthetic Equilibrium | L'Equilibre Esthetique

The following is one paragraph of page 221, from chapter eight, in the paragraph to follow the term thermodynamics is used:

Du reste le sentiment de la beaute de la natural inanimee it de la beaute en general a des souce beaucoup plus profondes dans l'attraction universelle, don't l'attraction sexualle n'est qu'une des manifestations. Le sentiment de beaute n'est ainsi qu'une des manifestations de l'unite de toute la nature. Helmholtz se demande, dand sa *Physiologie de la musique*, d'ou il resulte que certains tons qui representent une quantite de vibrations donnee,

Besides the feeling of the beauty of the natural beauty of the inanimate it generally has an essential source of much deeper into the universal attraction wherein sexual attraction is only one manifestation. The sense of beauty and is one manifestation of the unity of all nature. Helmholtz requires, in his *Physiology of Music*, it follows

mathematiqueuement determine, nous paraissent beaux, cependant que d' autres, non, et il cherche une reponse possible dans l'affirmation des philosophes que la beaute consiste dans ce que nous retrouvons dans le monde les lois de notre esprit. Pour nous, nous dirions justement le contraire. L'univers est plus ancient que **l'homme**. Nous ne sommes, au foud, que des atoms soumis aux lois de l'attraction universelle. Et puisque dans un system tout est lie, tout changement qui se fait dans l'univers, de meme que la totalite de ces changements reguliers embrasseee par le nom de lous, se reflete dans tous les atoms de matiere animee ou inanimee. Notre sentiment de beaute est une des preuves que nous nous trouvons dand le rytheme des lous generals de la nature, que nous sommes des atoms qui se balancent en harmone avec les mouvements du systeme solaire, et avec le rythem de l'evolution de choses naturelles, des arbres et des vents, des nuages et de la mer.

that certain shades that represent a given amount of vibration, mathematical measurement is determined, we look good, while others, no, and he is looking for a possible answer in assertion of the philosophers that beauty is in what we find in the world the laws of our mind. For us, we would say just the opposite. The universe is more ancient than humans. We are at Fouda, that atoms subject to the laws of universal gravitation. And since everything is in a bound system, any change that takes place in the universe, even as all of such changes by regular embrasseee name lous, is reflected in all atoms of animate or inanimate matter. Our sense of beauty is an evidence that we are the Rhythm of Dand lous generals of nature, atoms that we are swaying in harmony with the movements of the solar system, and with the Rhythm of the natural evolution of things , trees and wind, clouds and sea

9: Theory of family property | L'equilibrio sociale, la teoria della proprieta e della famiglia

No English translation, as yet, seems to exist. Shown below is the partial start of a straight Italian → English Google translation of it seems one of Winiarski's collected essays (Essay on Social Mechanics: Theory of Property and Family), on property and family, found in the *Italian Journal of Sociology* (likely chapter 9 of his collected works): [2]

(572-576)

Since the theory of energy is fundamental to the social mechanism, I begin by summarizing the state of studies on energy in general and in particular biological energy. [4] The mechanical theory of the universe reduces the social order, the order of life and the physical order to a single order, in which all phenomena can be reduced to transformations of matter or motion. The molecular mechanics is complete in all exactness in the energy theory, which is not only a basis of modern physics, but also penetrates into the biology and sociology. Mechanics, including energy, claims to embrace and unite all the sciences, since only precariously they are independent from each other, but everything in the universe has a related scheme, science, reflecting the ideal of the universe, must also submit such a system.

The law of indestructibility of matter was proposed by Lavoisier, that of the indestructibility of energy by Robert Mayer. So we must get used to this truth, namely, that there are no isolated phenomena in the world, they are linked to each other in constant transformation from a state of things to another. Heat, electricity, light, etc., no longer considered as independent phenomena. There is an exact relationship between the state and physical characterization of a system.

In each phenomenon, this exact ratio depends on a constant and eternal passing from one state to another, changing only the outward form of this conversion. This conversion element is the energy, and can manifest as mechanical chemical, thermal, and electrical, etc. These forms go into each other with certain quantitative relations closely. Energy might have, generally speaking, two states: kinetic and potential, a body raised to a certain height, spread, falling, work equal to that which is used to lift the body. Work as well developed in the fall can be used in different ways, e.g. to set in motion a clock. When the weights have not yet begun to fall, we say that they have some ability to do the work, a certain potential energy, which subsequently, by the measure of their descent, is transformed into kinetic energy which manifests itself in motion clock.

The daily experience convinces us that the mechanical work is transformed into heat and science has already measured accurately the quantitative relation of this transformation. The chemical energy may give rise to all other forms of energy: heat, electricity, mechanical work, etc. The physical world presents to us that the transformation of one kind of energy into another. Similarly, the living world shows us only mutations of matter and energy changes. The activity of living beings corresponds to transformations of energy, to change from one species into another, according to fixed rules

of equivalence.

Already R. Mayer, CI. Mayer, CI. Bernard and Helmholtz observed phenomena of life from the viewpoint of energy, and in this organic energetics has made great progress the work of Chauveau mercy of Loeb, the Lalaunié and several others. Indeed it has come to make some more very interesting. These law are:

1. The biological energy comes from energy food chemistry and ends in the energy heat. The phenomena of life there thus appears as a movement of energy, which, starting from a point in the physical world, returns to this world after a run through the animal organism. The circle is a circle of energy matters, nutrition, i.e. a stream of material that draws from outside the body through food and rejects coli'escrezione.

2. Maintaining vital not consume any power that is characteristic of life, rather it takes from the outer world that puts all that energy into work and takes the form of chemical energy potential. This principle shows us the source of that energy, which, at a stage of its transformations, will be biological energy. That source is the chemical energy of the elements stored in body tissues. "When the movement has produced", says C.I. Bernard, "the contraction of a muscle, when the will and awareness arise, when the thought is exercised, when the gland secretes the substance of the muscles, nerves, brain, glandular tissue is disorganized, it destroys and consumes." Energetics explains the biological reason for this coincidence between the operation and the destruction of organic chemistry: a portion of organic material decomposes, it simplifies chemically, descends to a lower potential in this defense and leaves the chemical energy that transformed into biological energy, which is the essence of all vital phenomena. The energy expenditure should be reconstituted because the body is kept in balance: the power supply provides the necessary materials for this purpose, digestion incorporates them into the body to the state reserve.

3. The energy emanating from the chemical potential of food, after going through the body and produced the phenomena of vitality, he returns to the physical world in the form of heat. The biological energy has therefore a very specific place, lies between the chemical and thermal energy and can also say that it is a chemical thermal energy conversion. We do not know what is the biological energy in its core, but even we know what it is electricity or heat; know them only at the escort of the phenomena in which they arise, how do we know the energy only organic form of vital phenomena, which are all our movements, our feelings, our thoughts, etc. This being totally science in either case. Energy belonging to organic acts silent and invisible even if you do not recognize their effects, it is all that happens, e.g. in preparing its muscle contraction, the nerve that leads to the influence nervous. And that is what we must now consider how mutual equivalence hill energies because of the physical world, as these are among them. Biological energy is repeated in the case of ordinary physical energy, known apparently not knowing what is reality.

The three principles listed show that takes place throughout the life of the universe. Since the chemical energy of food is prepared from plants, we can say that the animal spends the energy the plant world has accumulated. The same plant world takes its activity by the energy radiated by the sun. Eventually the animals return to the heat dissipated: in this way the whole universe is a concatenated system. Must still add something important: bio energy, although drawn from the chemical energy of food, must be regarded as existing in the substance of the organs and tissues active in food, not brutes. These must first be digested, modified, processed and incorporated as integral parts of the fabrics that you spend. This observation clearly applies not only to individuals but also to aggregations of individuals: the food are not a part of their biological energy are treated as if they had no body.

As to energy in biological it is necessary to distinguish, as in every other, two states: potential and kinetic. Potential, when it's been a reserve in the tissue, as they instinctively unconscious, while each event instead of movement by the body, or, in other words, every action and every conscience, a movement nervous in the case of feelings, ideas or the will, belongs biological kinetic energy. Now, in our opinion, social energy that is not composed of these two kinds of energy. And that becomes the physical energy of the natural or artificial? If you must have some social value, must first cause a biological reaction energy. Thus X-rays had no social value before Roentgen had discovered them, that is, before they had caused a nervous reaction, before him, back in all of us, as awareness of their existence, as a form of biological energy kinetic. Food assimilated by the body become a source of biological energy potential. But all that does not take any of these forms of biological energy is not part of social energy, which undergoes constant change. What are these changes?

Hunger and love are the two main forms of biological energy: hunger and love are two fundamental forces that reign in the living world, are the primary source of all phenomena, mental and social. Not suffer a single direction, that of seeking the maximum of pleasure. Of these two forces hunger has also broader and more general importance. Seize food, assimilate, digest, here is the phenomenon that is grounds to life. The increase and multiply the percentage is not a continuation of the process of digestion. Take *the amoeba*, one of the lowest living beings. Man mano che assimila il cibo, il suo corpo cresce, ma sino a un dato limite. As we assimilate food, your body grows, but up to a specified limit.

When he reached certain definite proportions, is divided into two parts: the multiplication is therefore not a result of digestion. Beings higher organisms multiply glue fertilization, but even in this case, procreation does not begin only when the individuals have added their full development, that is when they can no longer grow by assimilation of food. The seizing of food and the assimilation process is a purely selfish, which puts the individual in relations of enmity with the outside world. Is the domain of hatred and struggle for existence. In contrast, proliferation is the source of a different kind of feeling, that is. Feelings of sympathy, which is not extended, moreover, that self-interest, in the same manner that procreation is but the extent of digestion. The son is but a part of parents and separates from it when they touch the limit extremes of their Crescenzi.

(577-581)

Loving children, parents love themselves: it is therefore not surprising that protect them and try to make them like himself through education. The feelings of sympathy have been the main source for the bonds of blood and were expanded over time to people outside. *The amoeba* is divided into two parts, each of these in two others and so on ad infinitum; elementary cells so appeared or group together in colonies or in complex organisms, and they naturally tend to unite, because so may make it easier for their struggle with the outside world, their struggle for nutrition. At the heart of union sympathy reigns based on blood ties, but towards the outer world it is dominated by hate and leaning on hunger. The same occurs at the superior organizations: the union with the child's biological mother becomes longer, lasting several months, after which appears the care of parents, especially her mother, her children, the influence of education on young generations, etc.. The biological constraints and claims is complicated by sociological constraints, but these are only the continuation and development of those. The new generation assimilates the qualities of the old by another way, as well as heredity. The descendant is in the living conditions and environment are similar to those of their ancestors. For this you can see the transition from generation to generation, to create habits for a long time, and this fact forms the origin of 'tradition in the series of generations. On the other hand education in the common youth and his giuoclii are the source of solidarity among members of the same generation. It is therefore easy to see how all these social sentiments the following procreation: the union between parents and children or between brothers and sisters can be regarded as a union between members of that body, a union may not exceed certain limits. So the association itself-is divided into groups, but the affection between them always exists. These are the simplest manifestations of tilt procreative love. The manifestations of hunger then are: hatred, cruelty, which knows no limit and devoured in origin living thing that is weak or is beyond the limits of the social union. Let's see how these two needs brutality, hunger and love, more and more subtleties, physical and social phenomena have produced very complicated.

(582-###)

10: The Social Energy | L'Energie Sociale

The following is from page 257:

> ...primitive, he moved over automatically have a certain order, or some power, some right and some moral: just because the energy spent to up and down and not vice versa. But precisely because of the energy Raymone is so, there is a tendency toward the equalization of its different intensities, until a state of indifferent equilibrium or all changes have drawn up. This is called the dissipation of *entropy*, a new function of thermodynamics, so called by Clausius.

...primitive, il s'etablit déjà automatique ment un certain ordre, ou certain pouvoir, un certain droit et une certaine morale : tout simplement parce que l'energie passé d'en haut en bas et non inversement. Mais justement parce que le raymonnement de l'energie se fait ainsi, il y a tendance vers l'egalisation de ses intensites differentes, jusqu'a un etat d'equilibre indifferent ou toutes les transformations s'arretent. C'est ce qu'on appelle dissipation de l'entropie, une nouvelle function de la thermodynamique, appelee ainsi par Clausius.

Le caractere imperative de la morale, du droit, etc., ne presente rien de special et de mysterieux; il entre tres bien sous l'action des lois de la mecanique et veut seulement dire que certaines transformation d'energie, qui leur correspondent, sout irreversibiles. Mais comme tous les cycles irreversible tendent dans leur evolution vers un etat de reversibilite complete qui seule assure un maximum, le caractere obligatoire et imperative des institutions socials s'affaiblit avec le cours de tempt. [19]

[19] Avec les conditions d'une réversibilité complète le 2e principe, $\int \frac{dQ}{T} = 0$, est, en effet, le point de départ d'un autre raisonnement. Si l'expérience nous amène à établir l'équation $\int_{\circ}^{\circ} \frac{dQ}{T} = 0$, pour un cycle fermé et réversible, il devra exister une fonction des variables indépendantes dont la différentielle sera une différentielle exacte. En d'autres termes,

$$\frac{dQ}{T} = df$$

où f est une fonction de x et y, telle que df, en sera une différentielle exacte par rapport à x et y. C'est cette fonction f que Clausius a appelée du nom d'*entropie*, fonction qui présente une certaine analogie avec celle de l'énergie (U). En effet, comme l'énergie, l'entropie est une propriété des corps entièrement déterminée par les valeurs momentanées des variabes et il s'ensuit qu'elle peut toujours être traduite par une formule qui l'exprime en fonction de ces variables indépendantes. Comme pour l'énergie encore, sa valeur ne doit pas dépendre du trajet suivi par un corps pour arriver à son état actuel, dans le cas où il ne s'agit pas d'un cycle fermé d'opérations. On peut toujours exprimer l'entropie par l'équation $\frac{dQ}{T} = df$, mais seulement, bien entendu, pour un cycle réversible.

The imperative nature of morality, law, etc., does nothing special and mysterious it very well in between the action of the laws of mechanics and just means that some transformation of energy, which correspond to irreversibilities. But like all irreversible cycles tend to their evolution towards a state of full reversibility ensures that only a maximum, the binding nature and imperative of social institutions weakens over the course of time. [19]

Note 19:
With the conditions of complete reversibility in the second principle:

$$\int \frac{dQ}{T} = 0$$

is in fact the starting point for another reason. If experience leads us to establishing the equation:

$$\int_{\circ}^{\circ} \frac{dQ}{T} = 0$$ [or $$\oint \frac{dQ}{T} = 0$$ meaning closed line or path integral?]

for a closed cycle and reversible, it should be a function of independent variables do not sear the differential an exact differential. In other words:

$$\frac{dQ}{T} = dS$$

or *S* is a function of x and y, such that *dS*, will be an exact differential on a plot of x and y. It is this function that *S* that Clausius has called the name of *entropy*, a function which presents some analogy with that of the energy (U). Indeed, the like energy, entropy is a property of the body completely determined by the current values of variables and it follows that pet always be translated by a formula which expresses the function of these independent variables. As for energy incurs, its value should not depend of the path followed by a body to reach its current state, in case this is not a full cycle of operations. One can always express

entropy by the equation:

$$\frac{dQ}{T} = dS$$

but only, of course, for a reversible cycle.

The following is a bit from page 259:

Comme, en thermodynamique, la chaleur uniformement repandue et qui pour cela ne peute plus passer en travial utile n’est qu’un etat ideal que l’universene realisera jamais peut-etre, de meme dans l’univer social, l’egalisation complete des egoism des classes et individus qui rendrait tout travial utile impossible n’est qu’un etat purement theorique.

As in thermodynamics, heat uniformly spread and for that reason can not go into a state travial useful is ideal universene will realize that may never be, the same in the university office, complete equalization egoism of classes and individuals which would make that impossible is useful travial state purely theoretical.

11: The teaching of political economics and social mechanics in Switzerland | 1894-1900

The following is the translation of Winarski's article "L’enseignement de l’economie politique pure et de la mecanique sociale en Suisse", from a reprint in a collection of memoirs by various authors published in 1901 by the Commission permanent International Education office. [8]

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L'ENSEIGNEMENTDE L'ÉCONOMIE POLITIQUE PUREET DE LA MÉCANIQUE SOCIALE

Toute science a deux parties : une partie rationnelle, pure, qui étudie la forme la plus générale et abstraite des phénomènes respectifs et une partie appliquée qui étudie leur forme concrète et détaillée. La distinction rigoureuse entre ces deux parties, acceptée dans les sciences physiques, tend de plus en plus à s'introduire dans le domaine des sciences sociales.
Pour l'enseignement, cette distinction est de première importance en habituant pratiquement les étudiants aux nécessités logiques d'une méthode vraiment scientifique et -en leur facilitant la conception claire et méthodique des faits. Elle les prépare en même temps au travail indépendant et personnel en leur fournissant des procédés d'investigation sûrs et nécessaires pour toute recherche productive.

Des logiciens de premier ordre comme MM. les professeurs Ad. Naville, Goblot et d'autres, nous montrent avec raison qu'il est désormais impossible

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EDUCATION of POLITICAL ECONOMICS and SOCIAL MECHANICS

All science has two parts: a wise, pure, which studies the most general and abstract phenomena and respective applied part that examines their concrete and detailed. The strict distinction between these two parties accepted in the physical sciences, tends more and more to enter the field of social sciences.
For education, this distinction is of paramount importance in virtually accustoming students to the logical necessities of a truly scientific method, and by facilitating the design of the facts clearly and methodically. She prepares the same time self-employed and employees by providing safe and investigative procedures necessary for any productive research.

d'opposer la méthode de la physique, de la psychologie ou de la sociologie à celle des mathématiques aussi absolument qu'on le faisait autrefois. Les procédés du physicien, du psychologiste ou du sociologiste ressemblent toujours plus à ceux du mathématicien, à mesure qu'ils se perfectionnent.

Logicians of the first order as MM. teachers Ad Naville Goblot and others, show us with reason it is now impossible to oppose the method of physics, psychology or sociology to that of mathematics as they did formerly absolutely . The processes of the physicist, the psychologist or sociologist increasingly resemble those of the mathematician, as they develop.

Toutes les sciences ont une partie abstraite qui étudie les rapports entre des concepts. Ces sciences de lois ont du reste un point de départ expérimental. Les mathématiques ont eu au début une phase tout empirique ; ce n'est qu'avec le développement ultérieur qu'elles ont pris une apparence de plus en plus aprioristique : les constructions rationnelles refoulent dans l'ombre les données d'observation, qui n'en existent pas moinsDès maintenant, dans certaines parties de la physique, la construction rationnelle a un rôle non moins grand que l'observation. Le développement de la psychologie et de la sociologie va du même côté. De telle façon que sans diminuer l'importance de la partie historique et descriptive qui se base principalement sur l'observation, il faut reconnaître le rôle de premier ordre de la partie abstraite et rationnelle. Il est d'une bonne méthode logique et en même temps d'une bonne méthode d'enseignement d'introduire et de maintenir strictement cette distinction.

All sciences have some abstract studies the relationship between concepts. These laws have the science remains an experimental starting point. Mathematics has been an early phase, while empirical only with further development they have become increasingly apparent aprioristic: rational constructions repress the shadow of observational data, which does 'not exist in moinsDès now in some parts of physics, the rational construction has a role no less great than observation. The development of psychology and sociology is the same side. So that without diminishing the importance of the historical and descriptive based mainly on observation, we must recognize the leading role of rational and abstract part. It is a good logical method and yet a good teaching method to introduce and to strictly maintain this distinction.

Parmi les sciences sociales, c'est l'économie politique qui, la première, a introduit cette distinction de la façon la plus rigoureuse, en acceptant pour la partie rationnelle la forme mathématique.
Cournot en fut le vrai fondateur, pour avoir dans ses *Recherches sur les principes ?nathématiques de la théorie des richesses* (1838) nettement indiqué en quoi consistait l'application des mathématiques à l'économie politique, pour avoir posé la courbe de *demande* d'une marchandise en fonction décroissante du *prix* et pour en avoir déduit la théorie mathématique du monopole.

Among the social sciences, economics is that, first, introduced this distinction as the most rigorous in accepting the rational for the mathematical form.
Cournot was the real founder, to have in his *Researches into the Mathematical Principles of the Theory of Wealth* (1838) clearly stated in what was the application of mathematics to political economy, to have raised the demand curve of goods according to declining prices and have deduced the mathematical theory of monopoly.

En 1854, Gossen, dans son*Die Entwicklung der Gesetze des menschlichen Verkehrs*, pose une autre courbe, celle de *l'intensité du dernier besoin satisfait* en fonction décroissante de la *quantité consommée* de marchandise et il en tire la formule du partage autoritaire de deux marchandises entre deux individus en vue du maximum absolu d'utilité, par l'égalité des intensités des derniers besoins satisfaits de chaque marchandise chez les deux individus (partage communiste).

In 1854, Hermann Gossen, in his *The Development of the Laws of Human Interactions*, poses another curve, the intensity of the last want satisfied according to the decreasing quantity of goods consumed and it takes the form of sharing of two authoritarian goods between two individuals for the absolute maximum value, with equal intensities of the last wants satisfied with every commodity in the two individuals (sharing communist).

En 1862, Jevons pose la même courbe que Gossen et il en tire la formule du troc libre de deux marchandises entre deux individus impliquant la proportionnalité

In 1862, Jevons, raises the same curve as Gossen and takes the form of barter free two commodities between two

inverse chez chaque échangeur des intensités des derniers besoins satisfaits *(final degree of v'.ility)* aux quantités troquées des marchandises (partage individualiste).

individuals involving the inverse proportionality of intensities in each of the last exchanger needs met (final degree of v '. Ility) quantities bartered goods (share individualistic).

Enfin, en 1873, M. Walras expose, dans un mémoire intitulé Principe *d'une théorie mathématique de l'échange,* la théorie de l'échange économique de deux marchandises entre un nombre quelconque d'échangeurs. Pour cela il introduit dans le problème, en qualité d'inconnues à déterminer, les *prix* des deux marchandises (que Jevons avait remplacés par les rapports inverses des quantités échangées). Puis, de la courbe d'utilité de Gossen, il déduit les courbes de demande et d'offre, en vertu de la condition de satisfaction maxima des besoins, exprimée dans une formule identique à celle de Jevons.

Finally, in 1873, Mr. Walras explains in a paper entitled *Principle of a mathematical theory of exchange,* the theory of economic exchange of two commodities between any number of exchangers. To do this he introduces the problem, as unknowns to be determined, the prices of both goods (that Jevons was replaced by the inverse relationships of quantities traded). Then, the utility curve of Goshen, he deduces the curves of demand and supply, under the condition of maximum satisfaction of needs, expressed in a form identical to that of Jevons.

De telle façon, M. Wairas trouve rationnellement la courbe de demande, posée empiriquement par Cournot, et aussi la courbe d'offre. Et enfin il détermine les prix courants d'équilibre, en vertu de la condition d'égalité, de l'offre et de la demande effectives, par l'intersection de deux courbes de demande et d'offre.

So, Mr. Walras is rationally demand curve, empirically raised by Cournot, and also the supply curve. And finally it determines the current price equilibrium, under the condition of equality of supply and effective demand, by the intersection of two curves of demand and supply.

Dans ses « Éléments d'économie politique pure », M. Wairas a tiré successivement des principes mathématiques ci-dessus indiqués : 1° la *théorie de l'échange* d'un nombre quelconque des marchandises entre elles; 2° la *théorie, de la production* de ces marchandises considérées comme *produits* résultant de la combinaison de services de capitaux producteurs entre eux ; 3° la *théorie de !a capitalisation* ou de la production des capitaux neufs et, enfin, 4° la *théorie de la monnaie,* soit la théorie de la détermination des prix des produits, services et capitaux en une marchandise servant non seulement d'étalon pour la mesure de valeurs, mais aussi d'intermédiaire d'échange. Enfin, de toutes ces théories prises ensemble, M. Wairas tire une théorie d'équilibre économique général.

In his "Elements of pure economics," Mr. Walras fired successively mathematical principles listed above: 1, the theory of trade of any number of goods between them, 2 the theory, production of these goods considered as products resulting from the combination of capital services producing them; 3 theory "has funded or production of new capital and, finally, 4 the theory of money, the theory of pricing of products, services and capital goods used not only standard for measuring values, but also through trade. Finally, all these theories taken together, Mr. Waira derives a theory of general economic equilibrium.

Ainsi la statique économique fut définitivement constituée. Il reste encore à faire la dynamique économique. C'est dans cette voie que se sont engagés quelques économistes, comme M. Petten en Amérique.

Thus the static economy was constituted. It remains to economic dynamics. This is the road that have committed some economists, like Mr. Petten in America.

D'autre part, quelques écrivains comme MM. Wicksteed, Barone, Clark, Montemartini, complètent la théorie de l'utilité marginale par une théorie de la productivité marginale qui constitue en même temps le point de départ d'une théorie de la distribution des richesses. Une grande activité règne dans ce domaine de la science, comme le prouve la liste des

On the other hand, some writers like MM. Wicksteed, Barone, Clark Montemartini complete theory of marginal utility theory of marginal productivity, which is also the starting point for a theory of wealth distribution. A great activity prevails in this area of science, as evidenced by the list of economists, mathematicians: Marshall, Edgeworth, Launhardt, Lehr, Auspitz, Lieben, Wicksell, Rossi, Giddings, Fisher, etc.. Added to the representatives of the economy that

économistes-mathématiciens : Marshall, Edgeworth, Launhardt, Lehr, Auspitz, Lieben, Wicksell, Rossi, Giddings, Fisher, etc. Il faut y ajouter les représentants de l'économie pure qui s'appuient sur la déduction sans recourir aux mathématiques, comme Menger, Wieser, Sax, Bôhm-Bawerk, etc.

rely on pure deduction without using mathematics, as Menger, Wieser, Sax, Bohm-Bawerk, etc..

Suivre pas à pas tout ce mouvement, en exposer le progrès dans les phases successives et les résultats acquis, c'est le problème que nous nous sommes posé dans un cours que nous faisons depuis six ans à l'Université de Genève.

Follow this step by step movement, exposing the progress in the successive phases and the results obtained, that is the problem we posed in a course that we have been doing for **six-years** at the University of Geneva.

De plus, entraînés par l'exemple de l'économie politique pure, et convaincus que c'est dans cette voie que la science sociale devra nécessairement s'engager pour aboutir à une constitution définitive, nous avons tenté d'appliquer les mêmes méthodes d'investigation et de raisonnement dans tous les autres domaines de la sociologie générale et abstraite.

In addition, trained by example of pure economics, and convinced that this is the way that social science will necessarily have to commit to reaching a permanent constitution, we tried to apply the same methods investigation and reasoning in all other areas of sociology in general and abstract.

C'est ainsi que nous sommes arrivés à la conception que la théorie de l'équilibre peut être étendue des phénomènes économiques à tous les phénomènes sociaux : politiques, juridiques, moraux, esthétiques, religieux et scientifiques, les deux modes de partage Gossenien et Jevonien s'adaptant très bien au régime communiste des sociétés primitives et au régime individualiste des sociétés historiques.

Thus we arrived at the conception that the equilibrium theory can be extended to all economic phenomena of social phenomena: political, legal, moral, aesthetic, religious and scientific, both ways of sharing Gossenien and Jevonien adapting very well to the communist regime of primitive societies and historical societies individualistic regime.

En étendant les résultats acquis par l'économie politique pure à la science sociale, nous sommes arrivés à la constatation que le» équations fondamentales de M. Wairas — exprimant, pour un échangeur, l'équivalence des quantités offertes et des quantités demandées des diverses marchandises à certains prix et la proportionnalité des intensités des derniers besoins satisfaits à ces prix — peuvent être déduites des équations générales du mouvement de Lagrange et nous avons montré analytiquement de quelle façon cette déduction peut être faite. Ayant fourni les équations de l'équilibre social, nous avons fondé les bases de la mécanique sociale — dans sa partie statique — sur le principe de Lagrange, celui du minimal effort ou de l'énergie maximale, c'est-à-dire sur le principe qui sert de base à la mécanique cosmique.

By extending the results obtained by pure economics to social science, we have come to the realization that "the fundamental equations of Mr. Walras - expressing for an interchange, the equivalence of quantities supplied and quantities required for various goods at certain prices and the proportionality of the intensities of the last wants satisfied at these prices - can be deducted from the general equations of motion of Lagrange and we have shown analytically how this deduction may be made. Having provided the social balance equations, we have laid the foundations of the social mechanics - in its static part - the Lagrange principle, that of minimum effort and maximum energy, that is to say the principle is the basis for the mechanical universe.

Passant ensuite à la partie dynamique du problème, nous avons donné une définition de l'énergie sociale-biologique dans ces deux formes : potentielle (faim et amour) et kinétique (économique, politique, juridique, morale, esthétique, religieuse et scientifique). Ceci nous amena à l'application des principes de la

Turning to the dynamic part of the problem, we gave a definition of social-biological energy in two forms: potential (hunger and love) and kinetic (economic, political, legal, moral, aesthetic, religious, and scientific). This led us to the principles of thermodynamics, including the third, the Clausius same time explains the progressive spiritualization any closed social aggregate to show a decrease in potential.

thermodynamique, dont le troisième, celui de Clausius, explique en même temps la spiritualisation progressive de tout agrégat social fermé et la baisse de son potentiel. C'est la dissipation de l'eutropie qui s'effectue dans le monde social, comme dans le monde physique.

This dissipation of entropy that occurs is the same in the social world as in the physical world.

Enfin, nous avons montré de quelle façon le principe du moindre effort et de l'accélération de vitesse explique la différenciation et l'intégration progressive des agrégats sociaux par leur adaptation toujours plus parfaite au milieu naturel et artificiel. Tout ceci fait l'objet d'un cours de mécanique sociale que nous faisons sous le titre de : « Bases économiques de la science sociale », parallèlement à notre cours d'économie politique pure. — En effet, le point de départ de nos recherches fut, comme nous l'avons montré, l'économie politique pure, à laquelle nous ramenons toute la science sociale, en la ramenant elle-même à la mécanique.

Finally, we show how the principle of least effort and explains the acceleration of speed differentiation and the gradual integration of social aggregates by ever more perfect adaptation to natural and artificial. All this is subject to a social mechanics course that we have fashioned by the title: "Economic Foundations of Social Science", parallel to our course of pure economics. - Indeed, the starting point for our research was, as we have seen, pure economics, to which we bring all social science, taking it herself mechanics.

Dans notre cours, nous ne nous contentons pas de la partie abstraite et pure, mais nous la faisons suivre des applications aux sociétés primitives et historiques par une étude détaillée des faits.

In our course, we're not just part of the abstract and pure, but we do take applications in primitive societies and by a detailed historical facts.

Les résultats de nos recherches en mécanique sociale pure ont été publiés dans la *Revue philosophique* (mars 1898) sous le 'titre : « Essai sur la mécanique sociale », qui contient trois parties : 1° *L'équilibre économique et social; 2" les transformations de l'énergie sociale,* et 3° *la dynamique sociale.*

The results of our research in pure social mechanics were published in the *Philosophical Review* (March 1898) under the 'title: "Essay on the social Mechanics", which contains three parts: 1 The economic and social balance; 2 "the transformations of social energy, and 3 social dynamics.

Une année *après* la publication de notre travail, nous avons été heureux de constater l'apparition de deux livres de grande valeur, celui de M. le professeur Haurion : *Leçons sur le mouvement social,* et celui de M. le professeur A. Lalande : *La Dissolution opposée à révolution dans les sciences physiques et morales.* Ces travaux, tout en différant sur certains points de nos conclusions formulées dans la *Revue philosophique* (mars 1898), *s'inspirent des mêmes principes* et tendent dans la même direction, vers une application de la mécanique et de la thermodynamique à la science sociale.

A year after the publication of our work, we were pleased to note the appearance of two books of great value, that of Professor Maurce Haurion: *Lessons Social Movement* (1899) and that of Professor Andre Lalande: *The Dissolution Opposed to Revolution in the Physical and Moral* (1899). These studies, while differing on some points of our findings in the philosophical journal (March 1898), based on the same principles and tend in the same direction, toward an application of mechanics and thermodynamics to social science.

En 1899, nous avons appliqué ces principes à la théorie de la famille et de la propriété, publiée dans la *Rivista italiana di Sociologia* (novembre 1899). Nous avons montré que c'est la famille et la propriété qui se trouvent à la base de la société et que toutes les autres institutions en constituent la superstructure. Enfin, au

In 1899, we applied these principles to the theory of the family and property, published in the *Rivista Italiana di Sociologia* (November 1899). We have shown that the family and property located at the base of society and all other institutions that constitute the superstructure. Finally, later this year, we analyze more deeply (in the philosophical journal, February-March 1900) some points of our theory and show how one can apply quantitative methods to the social mechanism, for creating a sociometric.

courant de cette année, nous analysons plus profondément (dans la *Revue philosophique*, février-mars 1900) certains points de notre théorie et nous montrons de quelle façon on peut appliquer des méthodes quantitatives à la mécanique sociale, en vue de la création d'une sociométrie.

Certains de ces travaux ont suscité l'intérêt à l'étranger et ont été traduits en polonais *(Athenaeum* de Varsovie), en allemand *(Soc. Monatshefte* de Berlin) et en russe (Revue Scientifique de SaintPétersbourg). Ils ont été analysés, entre autres, dans la *Rivista Italiana di Filosofla*1 par M. le professeur Groppoli qui, tout en reconnaissant la nécessité d'une science générale et abstraite de la société, voudrait lui conserver le titre de sociologie pure. Mais je préférerai le titre de mécanique sociale, que j'ai donné à cette science, d'autant plus que M. le professeur Lester Ward, de l'Université de Columbia, l'auteur de *Dynamic Sociology*, suit maintenant la même voie et présente au Congrès International de Sociologie de cette année un mémoire intitulé : *Social Mecanics.*

Telles sont les étapes de la carrière parcourue jusqu'ici par la « mécanique sociale ». En l'enseignant depuis six ans à l'Université de Genève, je ne pense pas qu'elle puisse remplacer la sociologie descriptive et comparée, représentée chez nous avec tant d'autorité et de maîtrise par M. le professeur L. Wuarin, mais je pense qu'elle peut devenir une discipline indépendante et complémentaire, se rattachant en même temps aux mathématiques, à l'économie politique et à la sociologie.

J'ai tenu à renseigner Je Congrès sur cette tentative isolée et Ja première dans son genre. Quant à l'économie pure, elle est déjà enseignée dans une vingtaine d'universités (en Angleterre, Amérique, Allemagne, Autriche et Suisse) et il serait désirable que cet exemple fût suivi par celles de la France. Je suis heureux d'ajouter que l'enseignement de ces sciences, qui pourraient paraître arides, intéresse les auditeurs, dont le nombre va en croissant.

1. March-April 1900.D

Some of this work has attracted interest from abroad and have been translated into Polish (Athenaeum Warsaw), German (Soc. Monatshefte Berlin) and Russian (Saint Petersburg Scientific Review). The samples were analyzed, among others, in the *Rivista Italiana di Filosofla*1 by Professor Groppoli which, while recognizing the need for a general science of society and abstract, it would retain the title of pure sociology. But I prefer title social mechanism, which I gave to this science, especially since Professor Lester Ward, Columbia University, author of *Dynamic Sociology*, now follows the same path in memoir presented at The International Congress of Sociology of this year a entitled: *"*Social Mechanics". [2]

Such are the stages in the career thus far pursued by social mechanics. Though teaching it for six years at the University of Geneva, I do not think it can replace descriptive and comparative sociology represented with us with so great authority and mastery by Prof. L. Vuarin, but I do think that it may become an independent and complementary discipline, allying itself at the same time to mathematics, political economy, and sociology.

I have ventured to inform the congress of this isolated experiment, and the first of its kind. As to pure economics, it is already taught in a score of universities in England, America, Germany, Austria, and Switzerland, and it would be desirable that this example be followed by those of France. I am happy to add that the teaching of these sciences, which might appear dry, interests its hearers, whose number is constantly increasing.

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θΔics

In thermodynamics, **essergy**, short for ‘essence of energy’, is a hypothetical information theory stylized type of free energy, so to say.

Overview

In 1968, American engineer Robert Evans introduced essergy, a rather blurry, Shannon bandwagon riding, concept, posited to be a replacement for all measures of potential work, such as availability, exergy, available work, Gibbs free energy, Gibbs chemical potential, Helmholtz free energy, negentropy and other common energy expressions. [1] The idea of essergy is best expressed in Evens own words: [2]

> “An attempt is made to prove that all of the many seemingly independent measures of potential work, such as availability, exergy, available work, Gibbs free energy, Gibbs chemical potential, Helmholtz free energy, and other common energy expressions are necessarily all special cases of a unique quantity that is called **essergy**, a contraction of the term *essence of energy*. The proof is attempted rigorously for chemical systems, and then is extended. If correct, the proof will be of consequence to the design of any engineering system in which potential work is a significant factor, since it will show that by evaluating the one quantity, essergy, the designer will have taken account of the other seemingly independent considerations. A possible consequence of the proof may be a more general formulation for the concept of information based on Brillouin's principle of the equivalence of thermodynamic information and potential work. The proof indicates that negentropy is not as general a measure of potential work as is the quantity, essergy. This result could imply that essergy is a more general measure of thermodynamic information than negentropy, an implication that might lead to a broader formulation about information and, thus, new insight into the foundations of information theory.”

It is difficult to even describe what a mess this entire statement is.

In 1974, James Lovelock and Lynn Margulis cite Evans' publication to conclude that it has been proved "the classical properties of entropy and free energy have exact information theoretic equivalents", where information *I* is defined as:

$$I = S_0 - S$$

where S_0 is the entropy of the components of the system at thermodynamic equilibrium and *S* the entropy of the system assembled. They then state that this relation can be transferred directly from information theoretic to classical thermodynamic terms as follows:

$$I = \frac{E + PV - TS - \Sigma N, N_i}{T}$$

where E is the energy, P the pressure, V the volume, S the entropy, and N the chemical potential (and likely Ni the particle count) of the molecules present. It is difficult to even see how they made the jump from the first equation to the second equation, although it looks to have involved the Gibbs fundamental equation in some way? In any event, the pair naively conclude that "it follows that information is a measure of disequilibrium in the classic sense and recognizable in the information theoretic sense." This is the gist of their barely tenable derivation and they even go on to cite Lewis and Randall (1923), among others, to allude to the idea that Evans has proved that chemical thermodynamics is can be entirely re-written on information. [3]

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θΔics

In *Elective Affinities*, **estate** is the retort (or social retort), reaction vessel, closed or semi-closed, depending, reactive system, beaker, test tube, among other namesakes:

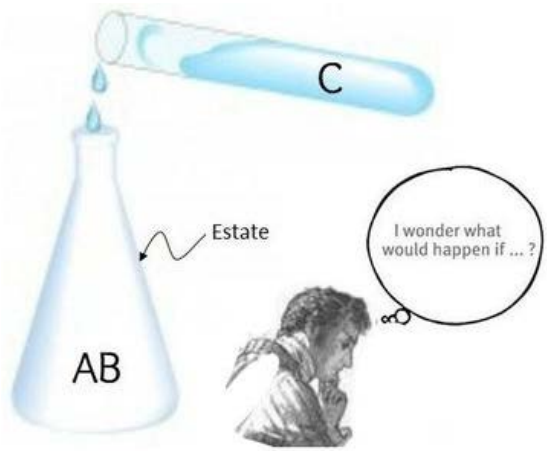

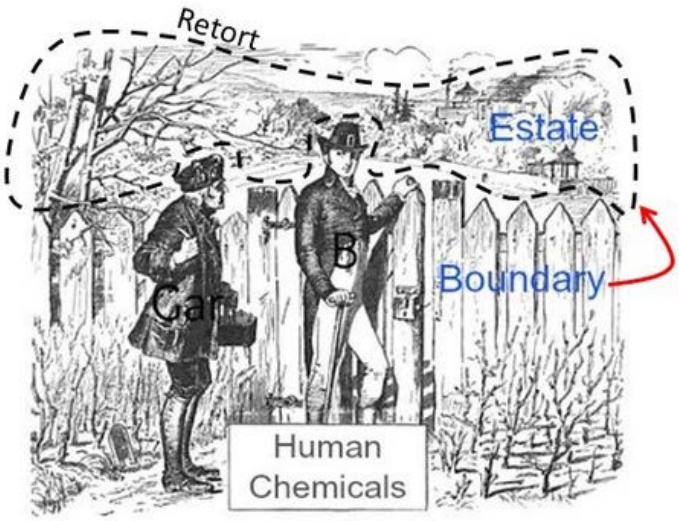

Description (P1:C1): "the gardener directing Edward" (HB:231) (by Philipp Johann?). The beaker, retort, test tube view of the **estate**, wherein Edward is beginning to contemplating his thought experiment of the reactions that could occur if he were to invited the Captain to the estate.

wherein the story and human chemical reactions of German polymath Johann Goethe's 1809 physical chemistry based novella takes place. The following discussion from P1:C2 gives a well-honed gist of the concept of the estate as the reaction vessel for the various human chemical reaction experiments played out in each chapter:

> "That strange Mittler is right after all," replied Charlotte; "all such undertakings are ventures; what will come of them it is impossible to foresee. New elements introduced among us may be fruitful in fortune or in misfortune, without our having to take credit to ourselves for one or the other. I do not feel myself firm enough to oppose you further. Let us make the experiment; only one thing I will entreat of you—that it be only for a short time. You must allow me to exert myself more than ever, to use all my influence among all my connections, to find him some position which will satisfy him in his own way."

(add)

Overview

English Germanic-literature scholar Gerlinde Röder-Bolton, in his 1998 book *George Elliot and Goethe: an Elective Affinity*, which discusses how George Elliot adopted aspects of *Elective Affinities* into two of her works, describes the estate as a vessel for the chemical reactions as such:

> "Spatial enclosure and narrative compactness are part of the *Novelle's* economy. In *Die Wahlverwandtschaften*, this is also implicit in the novel's central metaphor of the chemical reaction. Just as chemical experiments are conducted under controlled laboratory conditions, so Goethe provided specific narrative conditions—the isolation of his four main characters—in order to observe the operation of natural laws."

Estate | System view

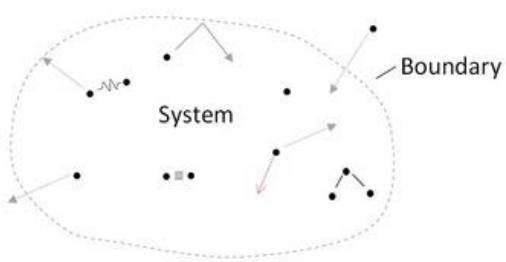

Estate | Human chemist view

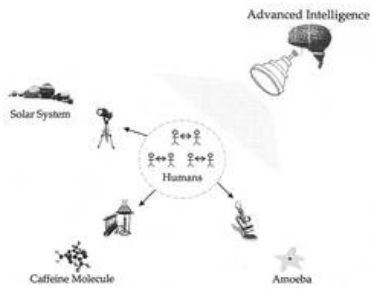

Left: the thermodynamic system view of the **estate** with its boundaried enclosure, through which reactants are selectively introduced, mediated via a certain boundary regulation (servants). Right: the "human chemist" or rather advanced perspective view of the estate, according to which time, both slowed down and accelerated perspectives, come into play.

Eliot, in some way, is said to present her modified version of this in her "Laws of Attraction" book section, among other places. A noted section about the surveying of the estate that occurs is as follows:

> "… the property and its surroundings; at the same time he expressed his long-cherished desire to become more familiar with his **estate ...**" The first thing we should do," said the Captain, "is to survey the whole property with a compass …"

The estate is replete with a mansion [RH] or castle [HB], depending on translation, summer house [HB] or moss hut [RH], some type of rock formation [HB] or cliff face [RH], lake, orchard, graveyard, paths, among other natural amenities, such as ponds a mill, all within the confines of the estate.

Architectural surveying | Analysis

Wolfgang Staroste, in his 1961 "Raumgestaltung und Raumsymbolik in Goethes *Wahlverwandtschaften*", according to Gerlinde Röder-Bolton, supposedly, is said to give an extended analysis of the spatial organization of the estate. [3]

In 2007, American electrochemical engineer Libb Thims, argued that the land and water descriptions are representative of Swedish chemist Torbern Bergman's 1775 division of his reactions into the "wet way" (aqueous) and "dry way" (heated), such as can be depicted in scale model of the lakes (wet) and land (dry) regions of the estate, adjacent. [1]

The "reaction" of Ottilie with the child Otto occurring in the "wet way" of rowing across the lake in a distraught state of mind results in the drowning death (reaction end) of the child (P2:C13).

In P1:C3, the Captain draws out a map of the estate. Adjacent, for example, is a screen shot of Charlotte and Edward, from the 1996 film version, viewing the scale size model of the estate in front of them, with what seems to be a map of the estate behind them.

Screen shot of Charlotte and Edward, from the 1996 film version, viewing the scale size model of the estate in front of them, with what seems to be a map of the estate behind them.

The following are a few noted depictions of the new geological undertakings the characters make in changing the land of the estate, the focus of which are said be based on a certain philosophical point of view Goethe was outlining in regards to the relationship between land, housing, travel ways, and his human chemical theory:

Edward and the Captain surveying the land (P1:C3).

Description: “the chart [of the landscape of the estate] … was brought and spread out” (P1:C6).

Description: "Charlotte Laying the Corner-stone" (P1:C9).

Description: "Charlotte Advising with the Architect." (P2:C1)

Description: "The Architect Exhibiting his Portfolio." (P2:C2)

Mansion | Castle

The following, below left, is a recent artistic rendition of the mansion of the estate, which may have taken its cues the Charlotte von Stein mansion in Thuringia, sections of which are shown below right and bottom. [5]

The following circa 1782 silhouette, to exemplify, is Goethe in front of his house (given to him by the Duke) in Weimar. In the background, to the left, is the house of the Duke and Duchess, next to it is the house of Charlotte von Stein, and the structure to the right is the house of Goethe. [6]

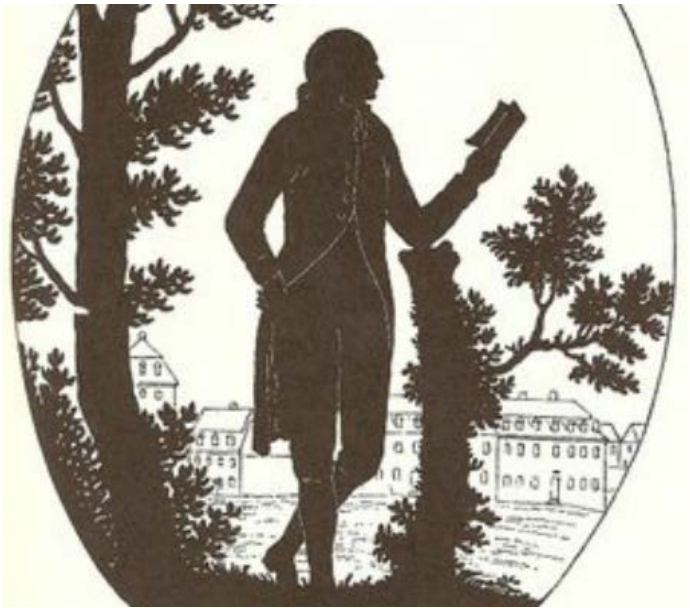

This would date the silhouette to later than 1782, the year he moved in. Goethe's house is still standing today, with his own original carriage in the garage. It is now a museum. A lovely garden graces the back of the house.

Renditions

The following are various artistic renditions of the estate:

The 1986 cover art to the Penguin Classics edition of *Elective Affinities*. The image possibly depicts the church with its tower that is described in P1:C1.

A 2001 watercolor rendition of the estate—retort, reaction vessel, closed reaction system, beaker—by Colombian artist Nohra Barros. [2]

The image from 1960 *Kindred by Choice* cover version of *Elective Affinities*. Possibly a depiction of the summer house or moss hut?

Summer house | Moss hut

The opening P1:C1 discussion of Eduard in his nursery-garden or orchard and the mention of the summer house, seems to imply that the story, in some way, is in recollection, of Goethe's garden house (as shown), at which a large part of Goethe's existence took place, which was was the first home acquired by Goethe in Weimar in 1776, a few months after his arrival in Weimar, together with the surrounding garden. The purchase was financed by Duke Carl August of Saxe-Weimar-Eisenach. The garden house was Goethe’s main residence and workplace until he moved to Frauenplan in June 1782. [4]

Goethe's Garden House | Reconstruction

Goethe's Garden House | Original

After buying the house, Goethe began to repair it and redesign the garden immediately (similar to as occurs in *Elective Affinities*). He divided it into three parts which are still recognizable today: the park-like slope behind the house, the sunny orchard and the lower part of the garden where the vegetable beds can be found. [4] The architectural landscape reconstruction and surveying that occurs in the novella seems to revolved around recollection of his garden house years.

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3. Bolton-Roder, Gerlinde. (1998). *George Elliot and Goethe: an Elective Affinity* (estate, pg. 22-23; chemical reaction, pgs. 36, 40). Rodopi.
4. (a) Goethe garden house (modern reconstruction) – IM-Weimarer-Land.de.
(b) Goethe garden house (history) – Klassik-Stifung.de.
5. Charlotte von Stein mansion (in Großkochberg/Thuringia) – TrekEarth.com.
6. Gilbert Stuart Blog: February 5, 2009 – GilbertStuart.Blogspot.com.

θΔics

In existographies, **Ethan Allen** (1737-1789) [HD:16] (FA:77) (RMS:30) (CR:4) was an American military leader, founding father (see: founding fathers fallacy), and philosopher, noted for []

Overview

In 1784, Allen, in his *Reason: the Only Oracle of Man*, penned a harsh denunciation of Christianity; the following is his take on the Moses pens his own death problem: [1]

> "This [Moses] is the only historian in the circle of my reading, who has ever given [Deuteronomy 34:5-8] the public a peculiar account of his own death, and how old he was at the decisive period, where he died, who buried him, and where he was buried, and withal of the number of days his friends and acquaintances mourned and wept for him. I must confess I do not expect to be able to advise the public of the term of my life, nor the circumstances of my death and burial, nor the days of the weeping or laughing of my survivors."

This death inconsistency was also pointed out by Noel Journet (1582).

Quotes | By

The following are quotes by Allen:

> "In the circle of my acquaintance, which has not been small, I have generally been denominated a deist, the reality of which I never disputed, being conscious I am no Christian, except mere infant baptism make me one ; and as to being a deist, I know not, strictly speaking, whether I am one or not, for I have never read their writings; mine will therefore determine the matter ; for I have not in the least disguised my sentiments, but have written freely without any conscious knowledge of prejudice for, or against any man, sectary *or* party whatever; but wish that good sense, truth and virtue may be promoted and flourish in the world, to the detection of delusion, superstition, and false religion; and therefore my errors in the succeeding treatise, which may be rationally pointed out, will be readily rescinded."
>
> — Ethan Allen (1784), *Reason, the Only Oracle of Man* [3]

> "There is not any thing, which has contributed so much to delude mankind in religious matters, as mistaken apprehensions concerning supernatural inspiration or revelation; not considering that all true religion originates from reason, and can not otherwise be understood, but by the exercise and improvement of it."
>
> — Ethan Allen (c.1780) (Ñº)

> "While we are under the tyranny of priests, it will ever be in their interest to invalidate the law of nature and reason in order to establish systems incompatible therewith."
>
> — Ethan Allen (1784), *Reason: the Only Oracle of Man* [2]

References

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2. (a) Allen, Ethan. (1784). *Reason: the Only Oracle of Man* (pg. 475). Publisher, 1940.
(b) Jacob, Susan. (2004). *Freethinkers: a History of American Secularism* (rev) (pg. 18). Publisher.

3. Allen, Ethan. (1784). *Reason, the Only Oracle of Man: a Compenduous System of Natural Religion* (deist, preface). J.P. Mendum, 1854.

External links

â— Ethan Allen – Wikipedia.

θΔics

In science, **ether** or aether, ἀιθήρ (Greek) (Q), from the Greek *αἴθω* (aíthō) meaning "to burn or light" (Q), is a hypothetical medium, thought to exist, prior to Einstein (1905), that was supposed to fill all space; originally conceptualized as that which carried the celestial bodies in rotation about the earth and later conceived as being the medium (luminiferous ether) that carried light waves. [1]

THE WORLD (NATURE, OR THE COSMOS)

ETHER—Imponderable.	MASS—Ponderable.
1. *Consistency:* Etheric (*i.e.*, neither gaseous, nor fluid nor solid).	1. *Consistency:* Not etheric (but gaseous, fluid, or solid).
2. *Structure:* Not atomistic, not made up of separate particles (atoms), but continuous.	2. *Structure:* Atomistic, made up of infinitesimal, distinct particles (atoms) discontinuous.
3. *Chief Functions:* Light, radiant heat, electricity, and magnetism.	3. *Chief Functions:* Gravity, inertia, molecular heat, and chemical affinity.

German zoologist-philosopher Ernst Haeckel's 1899 composition table defining what he then believed to be the composition of the universe: mass and **ether**. [2]

Overview

In c.460BC, Greek philosopher Anaxagoras said to have postulated the existence of the element "aether", which he conceived of as being in constant rotation and carried with it the celestial bodies. [3]

In c.455BC, Empedocles, under the supposed influence of Anaxagoras, was employing the term "ἀιθήρ" (Fragment DK38), which some translated as "ether" (Leonard, 1908), "air" (Burnet, 1920), or "aither" (Inwood, 1992) as a seeming unstated fifth element in his fragments, such as:

> "Come then! I shall tell you first the source from which the sun in the beginning and all other things which we now see became clear: earth and billowy sea and fluid air and the Titan **aither** squeezing all the them around in a circle."
>
> — Empedocles (c.455BC), Fragment I39 / DK38

> "For when **aither** separated and flew off from air and fire, and evolved into a heaven revolving in a very wide orbit, then fire - which had remained a little apart from the heaven - itself also grew into the rays of the sun. Earth withdrew into one place and when solidified by necessity it emerged and settled in the middle. Moreover, aither, being much lighter, moves all around it without diversion."
>
> — Empedocles (c.455BC), Fragment I40 / A49a; cited by Philo of Alexandria (c.20AD) in *On Providence*

Empedocles, of note, commonly is not typically attributed to be an ether theorist, but rather only a four element and two force theorist. There may be some sort of translation issue here? Clara Millerd, in her *On the Interpretation of Empedocles* (1908) dissertation (§:The Elements) (Q), e.g., gives a rather decent discussion how Empedocles refers (Fragment I12 / DK6) to the four roots or elements as: Zeus, Hera, Aidoneus, and Nestis, but in a confusing way in respect to which god represents which element, and also how he used the term ἀιθήρ to characterize the "bright sky".

In 1637, Rene Descartes, in his *Discourse on Method* (section: What Do Heat and Light of Fire Consist In?), and his 1641 *Meditations* (primarily the Third), argues that cold is merely the absence of heat, that darkness is the absence or recess of ethereal substance of the heat of fire (or stars), discusses good and evil, and intertwines these in with discussion on the possible existence a deity. Descartes thought of light as a pressure in the ether and color an effect of the rotation of the ether particles.

In 1842, Scottish chemistry Thomas Graham published *Elements of Chemistry*, wherein he discussed the 'material theory of heat' (an adaption of the caloric theory), in which heat was considered as indestructible particles, and the

‘undulatory theory of heat’ (an adaption of the undulatory of light), in which undulations in imponderable medium of space or ether are propagated that produce the impression of heat. [4] This may have been a precursor to Scottish engineering physicist William Rankine’s 1849 theory of “molecular vortices”, and possibly, in turn, William Thomson's later theory of quasi-labile ether of light propagation.

In 1887, Albert Michelson and Edward Morley, at Case Western Reserve University, Cleveland, Oh, performed their now-famous “Michelson-Morley experiment” (Q), in which they used mirrors mounted on a stone slab that floated in a annual trough of mercury, in an attempt to measure “luminous ether”; they did not detect the presumed to exist “ether”.

In 1889, Willard Gibbs published an article comparing the electromagnetic wave theory of light with William Thomson’s ether theory. [5]

In 1898, Russian psychologist Nicolas von Grot postulated the concept of “psychic energy” and reasoned that the conscious processes take place not in nervous matter, but in the ether of the mind, or something along these lines. [6]

In 1899, German zoologist-philosopher Ernst Haeckel intermixed his affinity theory of everything with ether theory logic. [2]

In 1905, Einstein disabused the notion of 'ether', the medium in which electromagnetic waves were *thought* to be propagating, from physics.

Other

Not to be confused with “ether” defined in chemistry as an oxygen atom connected to two alkyl or aryl groups, of general formula R–O–R'

Quotes

The following are related quotes:

> “Light waves were, after all, nothing more than undulatory states of empty space, and [thus] space gave up its passive role as a mere stage for physical events. The **ether** was invented and was admitted as a new kind of matter. It was over looked that by this procedure space itself had been brought to life.”
>
> — Albert Einstein (1929), “Field Theories, Old and New” [7]

> “If the Michelson–Morley experiment had not brought us into serious embarrassment, no one would have regarded the relativity theory as a (halfway) redemption.”
>
> — Albert Einstein (c.1940), *Publication* [8]

References

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2. Haeckel, Ernst. (1899). *The Riddle of the Universe: at the Close of the Nineteenth Century* (translator: Joseph McCabe) (ether table, pg. 229). Harper & Brother, 1900.
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of the Soul and the Psychic Energy in the Psychology"), *Archiv fur systematische Philosophie*, IV.
(b) Anon. (1898). *Mind*, Vol. 7, (pg. 591). B. Blackwell.
7. (a) Einstein, Albert. (1929). "Field Theories, Old and New", *New York Times*, Feb 3.
(b) Swenson, Loyd S. (1972). *The Ethereal Aether* (pg. 223). University of Texas Press, 2013.
8. Folsing, Albrecht. (1998). *Albert Einstein: a Biography* (pg. 219). Penguin Group.

Further reading

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External links

● Aether (classical element) – Wikipedia.
● Aether theories – Wikipedia.

θΔics

In sociology, **ethics**, from the Greek *ethos* meaning "character of a culture or person; underlying sentiments that informs the beliefs, customs, or practices of a group; moral element that determines a character's actions" (Q), refers to the principles of conduct governing an individual or group. Ethics, said another way, refers a system of moral values or to a guiding philosophy. It is often said to be the discipline dealing with what is good and bad and with moral duty and obligation. [1]

A Google etymological tree for the term "**ethics**", deriving from the Greek term "ethos", which means habit, custom, or character; and having some connection to Aristotle's "Ta Ethika"; equivalent to Latin *mores* (see: Mor).

Etymology

In 320BC, Aristotle, in his "Rhetoric" (Q)(Q), outlined the first systematic ideas on "ethos". (Q)

Overview

In 1922, English physical chemist Frederick Soddy stated very clearly that one can understand what is ethical by studying the operation of the steam engine: [2]

> "[The phenomenon of life] derives the whole of its physical energy or power not from anything self-contained in living matter, but solely from the inanimate world. It is dependent for all necessities of its physical continuance upon the principles of the steam engine. The principles of **ethics** of all human conventions must not run counter to those thermodynamics."

In 1985, American educator Dick Hammond promoted an conceptual form of ethics based on entropy; the gist of which is as follows: [3]

> "[After] religions [were expelled] form public schools, out went instructions in ethics too, creating a void that we now have: what the entropy ethic can do for education is help fill that void."

Another example of this type of second law ethics logic is the work of American science educator Fred Fox. [4] The 1999 work of Italian philosopher Luciano Floridi argues along the same theme, albeit in the framework of information theory.

See also

- Bioethics

References

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5. Floridi, Luciano and Sanders, J.W. (1999). "Entropy as Evil in Information Ethics", *Etica & Politica*, special issue on *Computer Ethics*, 1.2. Oxford University, Computing Laboratory, Programming Research Group Technical Report TR-5-00.

Further reading

● Miller, Alan S. (1991). *Gaia Connections: an Introduction to Ecology, Ecoethics, and Economics* (section: Biological Ethics and Thermodynamics, pgs. 86-89). Rowman and Littlefield.

External links

● Ethics – Wikipedia.

θΔics

In hmolscience, **ethnoenergetics**, from the Greek prefix *ethno-*, a combining form meaning race, culture, or people, is the energetic study of races, cultures, and people; a near-synonym of human thermodynamics.

Overview

In 1973, American anthropologist Eugene Ruyle, in his “Slavery, Surplus, and Stratification on the Northwest Coast: the Ethnoenergetics of an Incipient Stratification System”, introduced the term ethnoenergetics. [1] In ethnoenergetics, according to Ruyle, labor, value, money, and capital are all forms of “ethnoenergy”, defined as “somatic energy expended by the members of a population”, that property is an “ethnoenergetic field”, and that money is “a symbol for energy, a claim on the energy of other people.” [2]

See also

â— Bioenergetics
â— Human energetics
â— Social energetics

References

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(b) The paper itself was an outgrowth of term papers written in circa 1970 for Andrew P. Vayda and Morton H. Fried while Ruyle was a graduate student at Columbia University. Subsequent drafts were read and criticized by Theodore Caplow and Frank J.F. Wordick of the University of Virginia (note 1, ibid, 1973).
2. Hornborg, Alf. (2001). *The Power of the Machine: Global Inequalities of Economy, Technology, and Environment* (section: Energy, Value, and Society: Some Pervasive Problems in Earlier Theory, pgs. 95-101). Rowman Altamira.

θΔics

In existographies, **Etienne Condillac** (1714-1780) (Cattell 1000:151) (CR:5) was a French philosopher, epistemologist, psychologist, and mind philosopher, noted for []

Overview

In 1749, Condillac published *Treatise on Nature*; a section of this was later utilize in Baron d'Holbach's 1770 *System of Nature*. [1]

> "In 1754, a work appeared in France, which, though displaying greater ability, and possessing a higher influence than that of Helvetius, did, nevertheless, point in exactly the same direction. I allude to the great metaphysical treatise [*A Treatise on Sensations*] by **Condillac**, in many respects one of the most remarkable productions of the eighteenth century; and the authority of which, during two generations, was so irresistible, that, without some acquaintance with it, we cannot possibly understand the nature of those complicated movements by which the French Revolution was brought about. in it he peremptorily asserts, that every thing we know is the result of sensation; by which he means the effect produced on us by the action of the external world."
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 624-25)

> "The materials from which the philosophy of Condillac was originally drawn, were contained in the great work published by Locke about sixty years before this time. Locke, with some looseness of expression, and possibly with some looseness of thought, had asserted the separate existence of a power of reflection, and had maintained that by means of that power the products of sensation became available. Condillac, moved by the prevailing temper of his own time, would not hear of such a distinction. He, like most of his contemporaries, was jealous of any claim which increased the authority of the internal, and weakened that of the external."
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 625)

> "**The judgments which we form are, says Condillac, often ascribed to the hand of the deity; a convenient mode of reasoning, which has only arisen from the difficulty of analyzing them**. By considering how our judgments actually arise, we can alone remove these obscurities. The fact is, that the attention we give to an object is nothing but the sensation which that object excites; and what we call abstract ideas are merely different ways of being attentive. Ideas being thus generated, the subsequent process is very simple. To attend to two ideas at the same time, is to compare them; so that comparison is not a result of attention, but is rather the attention itself. This at once gives us the faculty of judging, because directly we institute a comparison, we do of necessity form a judgment. Thus, too, memory is a transformed sensation ; while the imagination is nothing but memory, which, being carried to its highest possible vivacity, makes what is absent appear to be present. The impressions we receive from the external world being, therefore, not the cause of our faculties, but being the faculties themselves, the conclusion to which we are driven is inevitable."
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 626)

(add)

Quotes | On

The following are quotes on Condillac:

> "Sales' [writings] are a morass of long-winded and conventional hodgepodge of ideas. Delisle de Sales is basically a Voltairian. But in natural philosophy he often inclines to Robinet, and his idolization of nature

frequently brings him alongside Rousseau. He approves of **Condillac**, Helvetius, and with some hesitation of d'Holbach. As a convinced theist, however, he fulminates against the atheist La Mettrie; believing firmly in the immortality of the soul, he 'demonstrates' it with the story of Richardson's Clarissa, and by way of further proof with a doleful tale of his own, 'the pathetic history of Jenny Lille'."

— Antonello Gerbi (2010), *The Dispute of the New World* [2]

Quotes | By

The following are quotes by Condillac:

"The Chaldeans and the Egyptians each had their principles; the Greeks, who inherited this absurd art from them, made some changes in it, as they did everything they borrowed from other people."

— Etienne Condillac (1749), "On the Origin and Progress of Divination" [1]

References

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2. Gerbi, Antonello. (2010). *The Dispute of the New World* (§IX: Delisle de Sales, De Pauw's Admiring Adversary, pgs. 111-17). University of Pittsburgh Press.

External links

â— Etienne Bonnot de Condillac – Wikipedia.

In existographies, **Etienne Dolet** (1509-1546) (FA:33) was a French humanist, materialist, scholar, translator, printer, and rumored atheist, noted for []

Overview

Dolet frequented the intellectual salon of Margaret of Navarre. [1]

In the 1535, Dolet rumored to be a "materialist" and to deny the immortality of the soul (Ñº).

In the years to follow, after being imprisoned several times, he was eventually convicted of heresy and burned with his books due to the combined efforts of the parliament of Paris, the Inquisition, and the theological faculty of the Sorbonne. Alternatively, as some have reported, he was convicted of the "crime" of atheism, tortured, strangled, and then **burned**, with his books:

Dolet has been classified as one of the first martyrs of the renaissance. [2]

Quotes | On

The following are quotes on Dolet:

> "Sneer away, you ape of Lucian. To deny the existence of god in heaven who wished his son to die for the salvation of men, to deny the last judgment and punishment of hell—this is madness."
>
> — Anon (c.1535), a contemporary of Dolet [1]

An engraving of **Dolet** (1546) being burned with his books.

Quotes | By

The following are quotes by Dolet:

> "Death? Let us not fear its blows. It will either grant us to be without feeling or it will allow us to enter a better world and a happy state—unless our hope of Elysium is entirely groundless."
>
> — Etienne Dolet (c.1535) [1]

References

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External links

â— Etienne Dolet – Wikipedia.

θΔics

In existographies, **Etienne Geoffroy** (1672-1731) (IQ:180|#170) (CR:73) was a French physician and chemist noted for the construction of the world's first affinity table, 1718. [1] This is often considered to have been the seed of the chemical revolution. [2] He was stimulated to make his affinity table during a translation into French of a later edition English physicist Isaac Newton's *Opticks*, particularly in reference to "Query 31". [3]

Human chemistry

In the decades to follow Geoffroy's table, many larger, more elaborate affinity tables were made by other chemists The largest was Swedish chemist Torbern Bergman's 1775 table containing 55-rows and 50 columns of chemical species as found in his textbook *A Dissertation on Elective Attractions*. [4] In 1809, German polymath Johann von Goethe published his *Elective Affinities* in which he used Bergman's textbook, and its implicit theory of elective affinity reactions between chemical species, to outline the first-ever human chemistry theory in which work interactions, human friendships, marriage, and love affairs were governed by the laws of affinity just as is the case between small chemical species. [5]

Quotes | On

The following are quotes on Geoffroy:

> "The suggestion by Mayow and by Newton, that the phenomena of chemical combination depend upon peculiar attractions, which exist between the minute particles of different bodies, ought perhaps to be regarded as the first successful attempt to lay the foundation of chemistry as a science, and to distinguish it from the other branches of natural philosophy. The attention given to chemistry by some of the more distinguished members of the Academy of Sciences at Paris, the delivery of lectures on this subject in the French language by the elder Lemery; the curious experiments of Homberg on phosphorus, metals and salts; the discovery of the remarkable effects produced upon various bodies by the burning glass; and the **ingenious method** conceived by **Geoffroy** of framing tables, which should exhibit the relative degrees of chemical affinity between different substances,—had all contributed to render the pursuits of chemistry more generally popular in France than they appear to have been at the same period in any other country of Europe."
>
> — John Thomson (1832), *An Account of the Life, Lectures and Writings of William Cullen, Volume One* (pg. 36) [6]

References

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3. Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (ch. 10, pgs. 371-421). Morrisville, NC: LuLu.
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5. Goethe, Johann. (1809). *Elective Affinities*. New York: Penguin Classics (reprint).
6. Thomson, John. (1832). *An Account of the Life, Lectures and Writings of William Cullen, Volume One* (chemistry lectures, pg. 35-; double elective affinities, pg. 5##-). Blackwood.

External links

â— Étienne François Geoffroy – Wikipedia.

θΔics

In existographies, **Etienne Guyon** (1935-) is a French physicist, noted for

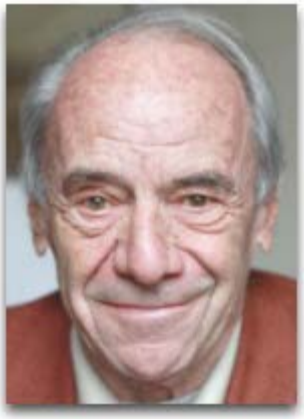

Thermodynamics of couples

See also: Equation of love; Thermodynamics of love

In 1975, Guyon had developed a draft theory the thermodynamics of couple formation; the following is a section of a letter, outlining his theory, which he sent to Ilya Prigogine: [1]

Phénoménologie du couple. Compléments. Etienne GUYON
Université Paris Sud Orsay

La formulation mathématique ne devrait pas être une cause d'incommunicabilité ni la barrière derrière laquelle se protègent les mystiphicateurs ou simplement les faibles - ceux qui ont peur de la rencontre. Dans la clarté et l'universalité de son écriture elle doit, à condition d'être explicitée, avoir un rôle véhiculaire de l'information au même titre, et de façon plus incisive sans que le mot.

Dans cet esprit je formule le problème énoncé dans les pages précédentes

$$\begin{cases} \dfrac{dv_A}{dt} + \dfrac{v_A}{T_A} + A v_B = 0 \\ \dfrac{dv_B}{dt} + \dfrac{v_B}{T_B} + A v_A = 0 . \end{cases}$$

Ceci représente deux equations couplées reliant entre elle la valeur de A, v_A et celle de B, v_B.

Regardons d'abord les 2 premiers termes de la première équation, c'est à dire supposons que la valeur d'échange, d'amour, A, soit nulle. On a

$$\frac{dv_A}{dt} + \frac{v_A}{T_A} = 0 \quad \text{ou} \quad \frac{dv_A}{dt} = -\frac{v_A}{T_A} .$$

$\frac{dv_A}{dt}$ représente la vitesse avec laquelle la valeur v_A varie dans le temps. Cette vitesse est d'autant plus grande que T_A, le temps de relaxation de A est court. Cette équation traduit le phénomène d'amortissement dans le temps T_A de A

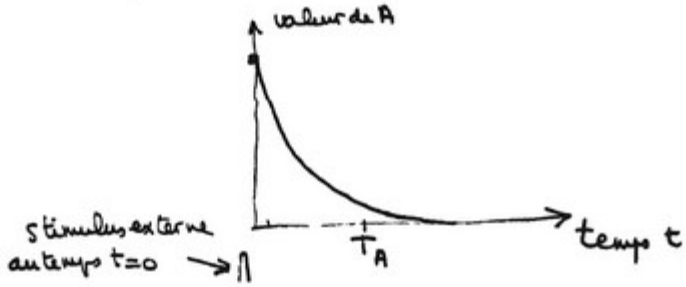

The ideas outlined here, however, never resulted in a published paper.

Education

In 1975, Guyon was the director of the Ecole Normale Superieure, Paris. Since 2000, Guyon has been a professor at the Graduate School of Physical and Industrial Chemistry of the city of Paris.

References

1. Rinaldi, Sergio, et al (2015). *Modeling Love Dynamics* (pg. 20-21). World Scientific.

External links

â— Etienne Guyon (French → English) – Wikipedia.
â— Etienne Guyon (Faculty) – ESPCI.Fr.

θΔics

In hmolscience, **Etienne-Jules Marey** (1830-1904), oft-cited "E.J. Marey", was a French physiologist-anatomist, noted for his 1873 *Animal Mechanism*, replete with chapters on "Forces in the Inorganic World and among Organized Beings" (§1), "Transformation of Physical Forces" (§2), "On Animal Heat" (§3), wherein he touches on Antoine Lavoisier's work on animal heat, "On Electricity in Animals" (§6), "Animal Mechanism" (§7), wherein he discusses animal mechanism, e.g. the "dynamical energy of animated motors", among others, amid which he employs the term "thermo-dynamics" 7+ times (e.g. "animal thermodynamics").

Unbridgeable gap

In 1873, Marey published his *Animal Mechanism*, of which the following is the bold opening paragraph:

> "Living beings have been frequently and in every age compared to machines, but it is only in the present day that the bearing and the justice of this comparison are fully comprehensible. No doubt, the physiologists of old discerned levers, pulleys, cordage, pumps, and valves in the animal organism, as in the machine. The working of all this machinery is called "animal mechanics" in a great number of standard treatises. But these passive organs have need of a motor; it is "life", it was said, which set all these mechanisms going, and it was believed that thus there was authoritatively established an **inviolable barrier** between inanimate and animate machines."

Marey, here, is touching on the so-called "unbridgeable gap". He goes on to say that because modern engineers have created machines, which via combustion, and the animation of various mechanical organs, thereby, we are now more legitimately able to compare animals to animate motors, we now need to "seek another basis for such distinctions".

Animal thermodynamics

Marey devotes a section to a discussion of "thermo-dynamics applied to living beings", discussed what he referred to as animal thermodynamics, wherein (add)

Quotes

The following are representative quotes:

> "The complications in the measure of force among organized beings shows what difficulties await those who are endeavoring to verify the principles of thermodynamics *in* animals; yet, nevertheless, it would be illogical to admit without proof that, in living beings, the physical forces do not obey natural laws. Several savants [Jules Beclard; Gustave Hirn], firmly convinced of the generality of the laws of thermodynamics, have attempted to demonstrate them upon the animal organism."
>
> — Etienne Marey (1873), *Animal Mechanism* [1]

References

1. Marey, Étienne-Jules. (1873). *Animal Mechanism: a Treatise on Terrestrial and Aerial Locomotion* (*La Machine animale. Locomotion terrestre et aérienne*) (thermo-dynamics, 7+ pgs; proof, pg. 13-18). D. Appleton and Co.

External links

â— Etienne-Jules Marey – Wikipedia.

θΔics

In existographies, **Ettore Majorana** (1906-1938) (IQ:185|#87) (RE:32) (CR:56) was an Italian engineer and theoretical physicist noted for his prediction of the neutrino (1932), for his synthesis of the exchange force theory of nuclear bonding, and for his *circa* 1935 sociophysics article "The Value of Statistical Laws in Physics and Social Sciences", in which he suggested the application of quantum statistical physics to social sciences. [1]

Majorana is described as "an original personality, who seemed as if he studied physics more as a hobby than as a profession." [6]

Neutron and exchange force

Majorana's discovery of the neutron and followup formulation of the exchange force is recounted by his close friend, Italian physicist Edoardo Amaldi (1966), as summarized by Carlos Perez (2004), as follows: [6]

> "Towards the end of January, 1932, we began to receive the issues of the "Comptes rendues" containing the famous notes by F. Joliot and I. Curie on the penetrating radiation discovered by Bothe and Becker. In the first of these notes it was shown that the penetrating radiation emitted by Be under bombardment with polonium alfa particles could transfer kinetic energies of about 5 millions electron volts to the proton present in small layers of various hydrogenated materials (such as water or cellophane). In order to interpret these observations the Joliot-Curies (1923) at first put forward the hypothesis that the phenomenon was similar to the Compton effect, namely that the incident photon undergoes an elastic collision with a proton; they had calculated, by applying the laws of energy and momentum conservation, that the incident photons should have had an energy of about 50 million electron volts in order to be able to transfer such high energy to a proton. However, they had very soon realized that when Klein and Nishina's formula was applied to the protons, the cross-section was too small by many orders of magnitude, and had suggested that the effect observed was due to a new type of interaction between gamma rays and protons, different from that responsible for the Compton effect. When Ettore read these notes he said, shaking his head:
>
> > "They haven't understood a thing. They are probably recoil protons produced by a heavy neutral particle".
>
> A few days later we got, in Rome, the issue of *Nature* containing the letter to the editor from Chadwick dated 17 February, 1932, entitled "Possible existence of a neutron", in which he demonstrated the existence of the neutron on the basis of a classical series of experiments, in which recoil nuclei of some light elements (such as nitrogen, for instance), were observed in addition to recoil protons. Amaldi continues: "Soon after Chadwick's discovery, various authors understood that the neutron must be one of the components of the nucleus and began to propose various models which included alfa particles, protons, electrons and neutrons.
>
> The first to publish the idea that the nucleus consists solely of protons and neutrons was probably Iwanenko (1932). Neither I nor his other friends questioned remember whether Ettore Majorana came to this conclusion independently. What is certain is that before Easter (18 Apr) of that year (1932):
>
> > "[Majorana] worked out a theory on light nuclei, assuming that they consisted solely of protons and neutrons (or neutral protons as he then said) and that the former interacted with the latter through exchange forces. He also reached the conclusion that these exchange forces must act only on the space co-ordinates (and not on the spin) if one wanted the alfa particle, and not the deuteron, to be the system saturated with respect to binding energy".
>
> He talked about this outline of a theory to his friends at the Institute, and Fermi, who had at once realized its

interest, advised him to publish his results as soon as possible, even though they were partial. However, Ettore would not hear of this, because he considered his work to be incomplete. Thereupon, Fermi, who had been invited to participate in the Physics conference which was to take place in July of that year in Paris in the wider framework of the Fifth International Conference on Electricity, and who had chosen as his subject the properties of the atomic nucleus, asked Majorana for permission to mention his ideas on nuclear forces. Majorana forbade Fermi to mention them but added that if he really must he should say they were the ideas of a well-known professor of electrical engineering who, among others, was to be present at the Paris conference and whom Majorana considered to be a living example of how not to carry out scientific research.

Thus, on 7 July, Fermi presented his report in Paris on "The Present State of the Physics of the Atomic Nucleus" (1932) without mentioning the type of force which was subsequently called "Majorana force" and which had actually been thought of, although in a crude form, some months earlier. The issue of the "Zeitschirft für Physick" dated 19 July, 1932, contained Heisenberg's first paper on "Heisenberg's exchange forces", namely forces involving the exchange of both the space and spin coordinates.

This paper made a great impression in the scientific world; it was the first attempt to put forward a theory of the nucleus which, although incomplete and imperfect, succeeded in overcoming some theoretical difficulties which had so far seemed insurmountable. Everyone at the Physics Institute of the University of Rome was extremely interested and full of admiration for Heisenberg's results, but at the same time disappointed that Majorana had neither published nor even allowed Fermi to mention his ideas at an international conference. Heisenberg's paper tackled the problem from a wider and fuller point of view but Ettore Majorana had completely understood, or so at least it appeared to us, the consequences of the action of the exchange forces in so far as the binding energy of light nuclei was concerned.

Fermi again tried to persuade Majorana to publish something, but all his efforts and those of his friends and colleagues were in vain. Ettore replied that Heisenberg had now said all there was to be said and that, in fact, ha had probably even said too much. Finally, however, Fermi succeeded in persuading him to go abroad, first to Leipzig and then to Copenhagen, and obtained a grant from the National Research Council for his journey, which began at the end of January, 1933 and lasted six or seven months."

(add)

Disappearance

In 1933 (age 27), Majorana seems to have burned out, likely from his intense proliferation of seven dense scientific articles all penned within the period of three years (1931-33), possibly having something to do with both James Chadwick and Werner Heisenberg stealing the show for his earlier discovery of the neutron and exchange force, respectively, and thereafter gone into a period of prolonged intellectual withdrawal, in a style of self-imposed isolation or exile, similar to other great minds such as William Sidis and Howard Hughes. As summarized by his close friend, Italian physicist Edoardo Amaldi in his retrospect 1966 commemoration speech "Ettore Majorana: Man and Scientist" on Majorana: [6]

"When he returned to Rome in the autumn of 1933, Ettore was not in good health, because of gastritis which he had developed in Germany. It is not clear what caused this, but the family doctors attributed it to nervous exhaustion.

He began to attend the Institute in the Via Panisperna only at intervals, and after some months no longer came at all: he tended more and more to spend his days at home immerse in study for a quite extraordinary number of hours.

At that time he was more interested in political economy, politics, the fleets of various countries and their respective power, and the constructional characteristics of the ships than in physics. At the same time his

> interest in philosophy, which had always been great, increased and prompted him to reflect deeply on the works of various philosophers, particularly Schopenhauer. It was probably at this time that he wrote the paper on “The Value of Statistical Laws in Physics and Social Sciences”, which was found among his papers by his brother Luciano, and was published after his disappearance by Giovanni Gentile junior.
>
> A considerable number of attempts by Giovanni Gentile junior, Emilio Segré and myself to bring him back to living a normal life met with no success. I remember that in 1936 he rarely left the house, not even to go to the barber’s, and his hair was therefore abnormally long; during this period some of his friends who had been to see him sent him a barber, in spite of his protests. However, non of us succeeded in finding out whether he was still doing theoretical physics research; I believe he was, but I have no proof.”

On 26 March 1938, at the age of 32, a week after withdrawing his savings from his bank, Majorana disappeared. Conjectural hypotheses, from various sources, speculate that he: (a) had a mystical crisis, and retired to a monastery (doubtful), (b) foresaw the invention of the nuclear bomb, and decided to withdraw from society (doubtful), (c) when off to committed suicide or eventual termination, or (e) or some variation of social exile and eventual deterioration induced termination. On this matter Enrico Fermi (who tried to get Mussolini to help in the search) commented on the disappearance: [4]

> “Ettore was too intelligent. If he has decided to disappear, no one will be able to find him. Nevertheless, we have to consider all possibilities.”

The last that was known of Majorana, was his passage on a ship connecting Palermo to Naples. This is recounted as follows: [6]

> "Half-way through 1937 public examinations held for various professorships, Majorana enters the field, said to have been motivated by Fermi’s international recognition; likewise his friends at the Institute of Physics put "pressure" [social pressure] [peer pressure] on him to apply, but Majorana had doubts. However, they do persuade him to publish an article he has kept in a drawer for five years. He wrote this article in 1932 and in it he qualifies some aspects of Paul Dirac’s well-known thesis on anti-particles, which continues to be (even today) a work of reference. In the end, without consulting or saying anything to anyone, he makes his decision and applies for the professorship in Palermo. This forced the intervention of senator Gentile, however, alarmed by the formidable competition which Majorana represented for his son, Giovanni Gentile junior. In order to avoid such competition, senator Gentile gets Mussolini to appoint Majorana Professor of Theoretical Physics at the University of Naples in November 1937, supposedly, for his outstanding reputation, without even passing an exam?
>
> Majorana takes up his [diverted] professorship on the 13th January, 1938, and carries out his duties punctually, leading a complete normal life, at least in appearance. But on the 25th March of this same year he sends, from Palermo, a letter to Antonio Carrelli, the director of the Naples Institute of Physics, where he works, in which he says “I have taken a decision which after everything is inevitable”, and that he will give up his classes, and that he will keep fond memories of the professors and students of the Institute “at least until eleven o’clock tonight, and possibly even later”… And the next day, 26th March, Majorana sends a telegram, asking him to ignore the letter, and yet another letter (was it sent at the same time as the telegram?) in which he tells Carrelli that “the sea has rejected me”, but that he does not wish to return to the classes."

All of this, i.e. five year depression (1933-1937), withdraw of bank assets, canceling of classes, "the sea has rejected me", etc., would seem to imply that he attempted to drawn himself, possibly an act that took two tries.

Prominence

In 1938, Italian physicist Enrico Fermi, who took him in his group when he was a student, ranked Majorana with Galileo Galilei (IQ=183-200) and Isaac Newton (IQ=190-200): [2][4]

> "There are several categories of scientists in the world; those of second or third rank do their best but never get very far. Then there is the first rank, those who make important discoveries, fundamental to scientific progress. But then there are the geniuses, like Galilei and Newton. Majorana was one of these."

This would corroborate Majorana with an extrapolated IQ of 183-200, which seem probable based on the a reading of his 10 published papers, his quantum social physics paper, his discovery of the neutron, use of the exchange force, and his two papers on the chemical bonds of molecules (age 25). In a 1938 letter to Mussolini, asking the government to intensify the search for Majorana, Fermi commented further: [5]

> "I have no hesitation to state to you, and I am not saying this as an hyperbolic statement, that of all Italian and foreign scholars that I have met, Majorana is among all of them the one that has most struck me for his **deep sharpness**."

This comment would seem to situate Majorana at a higher intellectual rank than thinkers such as Werner Heisenberg (Buzan IQ = 173). The penetrating mind aspect of Majorana is corroborated by the views of Dutch-American theoretical physicist George Uhlenbeck, as recalled by Edoardo Amaldi (1966): [6]

> "Feenberg remembers attending one of Heisenberg's seminars on nuclear forces, in which Heisenberg also mentioned the contribution made by Majorana to this subject; he said that he author was present and invited him to say something about his ideas, but Ettore refused. When he left the seminar, Uhlenbeck told Feenberg how much he admired Majorana's **penetrating ideas** which had been mentioned by Heisenberg."

This inside view, as recalled by American physicist Eugene Feenberg, further corroborates Majorana as having been a deep thinker.

Majorana's nine physics papers

The following are Majorana's nine known pure physics papers:

â— p1. Majorana, Ettore. (1928). "Sullo Sdoppiamento dei Termini Roentgen Ottici a Causa dell'eletrone Rotante e Sulla Intensita delle Righe de Cesio" ("Doubling of Terms on the Roentgen Optics Cause of electrons and rotating on the Intensity of the Lines of Cesium"), *Rendiconti Accademica Lincei*, 8: 229-33; (in collaboration with Giovanni Gentile Jr).
â— p2. Majorana, Ettore. (1931). "Sulla Formazione dello ione Molecolare di He" ("On the Formation of the Molecular Ion of He"), *Nuovo Cimento*, 8: 22-28.
â— p3. Majorana, Ettore. (1931). "I Presunti Termini Anomali dell'Elio" ("The Alleged Anomalous helium Terms"), *Nuovo Cimento*, 8: 78-83.
â— p4. Majorana, Ettore. (1931). "Reazione Pseudopolare fra Atomi di Idrogeno" ("Pseudopolar reaction between hydrogen atoms"), *Rendiconti Accademia Linceri*, 13: 58-61.
â— p5. Majorana, Ettore. (1931). "Teoria dei Triplitti *P'* Incomplelti" ("Theory of the Triplet P' Incomplete"), *Nuovo Cimento*, 8: 107-12.
â— p6. Majorana, Ettore. (1932). "Atomi Orientati in Campo magnetic Variable" ("Oriented Atoms in Variable Magnetic Field"), *Nuovo Cimento*, 9: 43-50.
â— p7. Majorana, Ettore. (1932). "Theoria relativistica di Particelle con Momento Intrinseco Arbitrario"

("Theory of Relativistic Particles with Arbitrary Intrinsic Moment"), *Nuovo Cimento*, 9: 335-44.
â— p8. Majorana, Ettore. (1933). "Uber die Kerntheorie" ("On Nuclear Theory"), *Zeitschrift fur Physik*, 82: 137-45; "Sulla Theoria dei Nuclei" ("On the Theory of the Nucei"), *La ricerca Scientifica*, 4(1): 559-65.
â— p9. Majorana, Ettore. (1937). "Teoria Simmetrica Dell'elettrone e del Positrone" ("Symmetric Theory of the Electron and Positron"), *Nuovo Cimento*, 14: 171-1984.

Majorana's first paper (p1), published at age 22 (1928), written while still and undergraduate, calculated the splitting of certain spectroscopic terms in gadolinium, uranium, and cesium, owing to the spin of the electron. That year he was invited by Enrico Fermi to give a talk at the Italian Physical Society on some applications of the Thomas-Fermi model.

In 1931, at the age of 25, Majorana published two papers (p2 and p4) on the chemical bonds of molecule, and two (p3 and p5) on spectroscopy.

In 1932, Majorana realized an independent discovery of the "neutral proton" (neutron) and had concluded that protons and neutrons (indistinguishable with respect to their nuclear interactions) were bound by the "exchange forces" originating from the exchange of their spatial positions alone (and also of their spins, as Weiner Heisenberg would propose), so as to produce the α particle (and not the deuteron) as saturated with respect to the binding energy. [3]

Social sciences

In his 10th and last article "The Value of Statistical Laws in Physics and Social Sciences", according to a synopsis by Italian econophysicist Rosario Mantegna, the 2006 English translator of Majorana's work: [2]

> "Majorana explicitly considers quantum mechanics as an irreducible statistical theory because the theory is not able to describe the time evolution of a single particle or atom in a precise environment at a deterministic level. This lack of determinism at the level of an elementary physical system motivated him to suggest a formal analogy between statistical laws observed in physics and in the social sciences."

(add)

Education

Majorana, born in to the bosom of a family of lawyers, physicists (Italian experimental physicist Quirino Majorana, for example, was his uncle), engineers, and politicians, who was said to have been a bit of a mathematics prodigy. [7] Majorana starting engineering (electrical engineering?) studies at the age of 17 at the school of engineering, University of Rome La Sapienza, where he would eventually complete his BS in engineering; in 1929 (age 23), he completed his MS in physics with a dissertation on "The Quantum Theory of Radioactive Nuclei" at the Institute of Physics, University of Rome La Sapienza, under Italian theoretical physicist Enrico Fermi (then 28), who had recently been appointed to the position of full professorship; in 1938 he took part in a national examination to obtain a position of professor of theoretical physics at Palermo University. He obtained the position, becoming a professor of theoretical physics at Naples University, where he taught a quantum mechanics course during the academic year 1937-38.

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(b) Majorana, Ettore. (c.1935). "The Value of Statistical Laws in Physics and Social Sciences" (online reprint, with biography by Carlos Pérez); Spanish version in: C. ALLONES (2004): "El valor de las leyes estadísticas en la Física y en las Ciencias Sociales", Empiria, núm. 7: 183-209 Madrid.

2. Mantegna, Rosario N. (2006). “The Tenth Article of Ettore Majorana” (abs), Arxiv.org, Aug 29; in: Bassani G.F (ed) (2006) *Ettore Majorana Scientific Papers: on the Occasion of the Centenary of the Birth* (pgs. 250-26). Springer.
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Further reading

â— Amaldi, Edoardo. (1984). “From Discovery of the Neutron to the Discovery of Nuclear Fission”, *Phys. Rep.* 111: 1-322.; in: *From Discovery of the Neutron to the Discovery of Nuclear Fission* (book). Amsterdam : North-Holland (book).
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â— Meyers, Robert A. (2010). *Complex Systems in Finance and Economemtrics* (Majorana, pgs. 249, 269). Springer.

External links

â— Ettore Majorana – Wikipedia.

θΔics

In science, **etymology** is the study of word origins and meanings.

Overview

In many cases of new scientific words, the etymologies are very precise, the date of introduction and precise meaning of the word given in public proclamation, an example being "entropy" (Rudolf Clausius, 1865), in other cases word origins are elusive, often buried in personal discussions, jokes, hidden stories, or destroyed texts, and or humor, among other barriers to understanding, an example being Americans John Neumann telling Claude Shannon, sometime in the early to late 1940s, to call his new logarithmic formulations of telegraph wire coding transmissions, which can be sent according to an agreed upon coding system to convey information, by the name "entropy" (i.e. Shannon entropy, as we have been forced to use), supposedly on the logic that "no one really knows what this word means, so in any debate you will always have the advantage". This latter example is most likely the most tarnished and misapprehensible etymologies in all of science.

See also

- Hmolpedia (etymology)
- Thermodynamics (etymology)
- Chemistry (etymology)
- Entropy (etymology)
- Human thermodynamics (etymology)

External links

- Etymology – Wikipedia.

θΔics

In existographies, **Euclid** (c.340-280BC) (IQ:185|#55) (Cattell 1000:501) [RGM:50|1,500+] (Murray 4000:19|CS / 3|M) (GME:4) (CR:65) was a Greek mathematician noted for his circa 300BC *Elements*, in which he deduced a set of principles of what is now called Euclidean geometry from a small set of axioms.

Influence

Euclid's *Elements* was influential to noted thinkers and thermodynamicists, including: Nicolaus Copernicus, whose two main personal library books were Euclid's *Elements* and Regiomontanus' *Tables of Directions*, Robert Hooke, who mastered Euclid at age 15, James Watt studied Euclid's *Elements* and Isaac Newton's natural philosophy as a youth; James Thomson (mathematician), father to noted child prodigy William Thomson, who edited a version of Euclid's *Elements* (1834); Scottish physicist James Maxwell, who mentions Euclid in his last-dying poem "A Paradoxical Ode", to German-born American Albert Einstein, who at age 12 was given a text on Euclidean geometry, which he called the "holy geometry book"; to Sarah Sidis (tutored by Boris Sidis; mother to William Sidis) who in 1891 (age 17) "propped Euclid up above the sink, and studied while she washed the dishes"; and to Russian engineer Yevgeny Zamyatin, who intersperses his 1923 literature thermodynamics work with mentions of Euclid. [1]

Non-Euclidean geometries

Euclid's fifth postulate, from the beginning, was regarded with suspicion by his contemporaries. German mathematical physicist Carl Gauss (1777-1855), in an unpublished manuscript shared with friends, starting from statements that contradicted the permanently "inculpated" postulate, underlined the fact that one could develop a compatible geometries. [3] One example of such later came from Bernhard Riemann (1826-1866).

Hobbes

In 1629, English philosopher, social physicist, and political theorist Thomas Hobbes (1588-1679), noted secretary to Francis Bacon, and student, of sorts, of Galileo Galilei (1636), one day, while walking through a library, as the story goes, as told by Philip Ball, happened to glance at a copy of Euclid's *Elements* that was laying open, and became transfixed, following each proposition, which at first he saw as being impossible, but soon thereafter became demonstratively convinced of the truth; and into the 1630s, amid the "unstable society" tensions erupting between the Crown and the Commons led by Charles I, namely to dissolve the Parliament and embark on an eleven-year period of personal rule, Hobbes sought to find a theory of governance with credentials as unimpeachable as those of Euclid's geometry. [5]

Spinoza

Dutch philosopher Benedict Spinoza (1632-1677) famously attempted write or rather derive his *Ethics: Demonstrated in Geometrical Order*, a treatise on morality written in the style of Euclid's *Elements*, as a series of geometrical proofs of numerous philosophical points, accompanied by definitions, axioms, demonstrations, and corollaries, as well as intervening stretches of friendlier prose (*scholia*); following is a representative quote from *Ethics* part three: [4]

> "I shall consider human actions and desires in exactly the same manner, as though I were concerned with lines, planes, and solids."

(add discussion)

Praise | Tributes

The following noted aspects of praise or tribute:

> "**Euclid**'s *Elements*, in thirteen books, is said to have exercised an influence on the human mind greater than that of any other work except the *Bible*."

— Dana Densmore [?] (2002), [2]

Quotes

The following are noted quotes:

> "There is no royal road to geometry."
>
> — Euclid (c.290BC), Reply given when the ruler Ptolemy I Soter asked Euclid if there was a shorter road to learning geometry than through his *Elements* (Ñº)

See also

â— Euler genealogy

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(b) Smith, Christian. (2010). *What is a Person?: Rethinking Humanity, Social Life, and the Moral Good from the Person Up* (Amz) (N33, pg.110). University of Chicago Press.
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External links

â— Euclid – Wikipedia.

θΔics

In existographies, **Eudoxus** (c.390-337BC) (IQ:170|#295) [Allen 100:52] was a Greek mathematician, astrophysicist, and philosopher, noted for []

Education

In c.370BC, Eudoxus, as a youth, supposedly, travelled miles to listen to Plato lecture; then, having become un-enamored with Plato's lack of mathematical ability, travelled to Heliopolis to learn astronomy.

Ethics

In 322BC, Aristotle, in his *Nicomachean Ethics*, states that Eudoxus had the following five points to say about ethics:

> 1. All things, rational and irrational, aim at pleasure; things aim at what they believe to be good; a good indication of what the chief good is would be the thing that most things aim at.
> 2. Similarly, pleasure's opposite − pain − is universally avoided, which provides additional support for the idea that pleasure is universally considered good.
> 3. People don't seek pleasure as a means to something else, but as an end in its own right.
> 4. Any other good that you can think of would be better if pleasure were added to it, and it is only by good that good can be increased.
> 5. Of all of the things that are good, happiness is peculiar for not being praised, which may show that it is the crowning good

(add)

Astronomy

The following, supposedly, is the geocentric model of Exodus: [4]

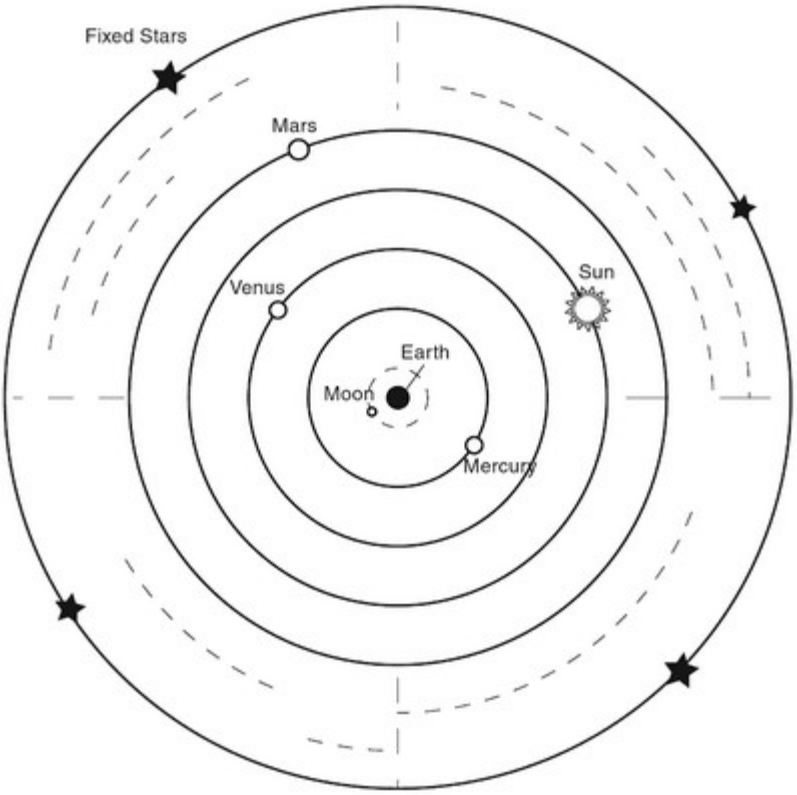

Exodus, via citations of him in Aristotle, supposedly, calculated that it takes 30 years for Saturn to complete its journey; Jupiter 12 years; Mars: 24 months (minus six days); Mercury: one year; Venus: one year. [1] He also made a sundial and, supposedly, discovered the leap year. [2]

Mathematics

He also, supposedly, developed the idea of real numbers, contributed to the theory of ratios, and invented an early form of calculus, called "method of exhaustion". [2]

Other

Some say he taught Aristotle, and rank him second only to Archimedes in all antiquity (Calinger, 1982).

Quotes | On

The following are quotes on Eudoxus:

> "Eudoxus says that the Egyptians have a mythical tradition in regard to Zeus that, because his legs were grown together, he was not able to walk, and so, for shame, tarried in the wilderness; but Isis, by severing and separating those parts of his body, provided him with means of rapid progress. This fable teaches by its legend that the mind and reason of the god, fixed amid the unseen and invisible, advanced to generation by means of motion."
>
> — Cicero (c.55BC), *Publication* (Ñº)

> "Thales [and others] and Democritus of Abdera handed on their discoveries of the laws according to which natural events are ordered and have their effects. Relying on their discoveries **Eudoxus**, Aratus and others devised the method of calendars to show the rising and setting of the stars and the significance of the seasons and handed it on to their successors."
>
> — Marcus Vitruvius (c.25BC), *Publication* (IX.6.3) [3]

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θΔics

In existographies, **Eugen Duhring** (1833-1921) was a German philosopher, positivist, economist, and socialist, noted for []

Overview

In 1873, Duhring, in his *Course of National and Social Studies*, inspired by Henry Carey, saw 'force' as the basis of all social activity, equating violent and coercive force with the forces of physics. [1]

Engels

In 1878, Friedrich Engels, in his *Anti-Duhring: Mr. Eugen Duhring's Revolution in Science*, penned in opposition to the ideas of Duhring, invoked water metaphors when he likened the revolutionary transformation of a society (see: social phase) to the qualitative phase transformation of ice into water and water into steam. [2]

Quotes | On

The following are quotes on Duhring:

> "**Duhring** was almost Lucretian in his anger against religion."
>
> — Carlton Hayes (1941), *A Generation of Materialism* (pg. 128)

> "Engels, in his *Duhring's Revolution in Science*, draws a sharp distinction between the sciences concerned with inanimate nature (mathematics, astronomy, mechanics, physics, chemistry) and those concerned with living organisms. The former group of sciences, according to Engels, are susceptible to mathematical treatment 'to a greater or less degree'. No such precision is possible in the sciences concerned with living organisms. 'In this field there is such a multitude of reciprocal relations and casualties that not only does the solution of each question give rise to a host of other questions, but each separate problem can usually only be solved piecemeal, through a series of investigations which often requires centuries to complete; and even then the need for a systematic presentation of the interrelations makes it necessary again and again to surround the final and ultimate truths with a luxuriant growth of hypotheses'."
>
> — Nathan Rosenberg (1976), *Perspectives on Technology* (pg. 315)

> "**Eugen Duhring** (1873) took his inspiration from Carey and saw force as the basis of all social activity, equating violent and coercive force with the forces of physics. The central institution of force in any society is its state, which establishes the conditions under which other social institutions must exist. Institutions such as slavery, wage labor, and property, as 'constitutional forms, are the infrastructure or 'frame' within which 'secondary' economic laws operate. Economic activity, then, is embedded in a framework of institutions sustained by the force of the state."
>
> — John Scott (2008), *Social Theory* (pg. 60)

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θΔics

In hmolscience, **Eugene Pleasants Odum** (1917-2002) was an American zoologist noted, in ecological thermodynamics, for his 1953 *Fundamentals of Ecology*, wherein he incorporated first law and second law models and ideas.

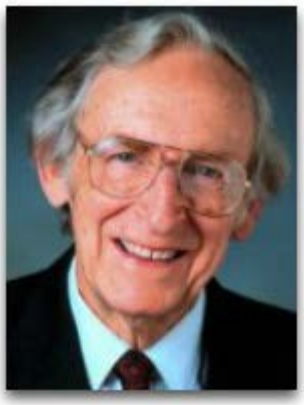

Overview

In 1953, Odum, in his textbook *Fundamentals of Ecology*, was the first to incorporate the first two laws of thermodynamics into ecology. [1]

Odum worked on his textbook in partial collaboration with his brother Howard Odum and through their joint writings the Odum's introduced a number of non-rigorous thermodynamic conjectures, such as emergy, embodied energy, the maximum power principle, energese (energy systems language), among others. [2]

Students

American chemical engineering professor Robert Ulanowicz states that he was inspired to switch careers, from chemical engineering to ecology, and to study theoretical ecology during a reading of American zoologist Eugene Odum's *Fundamentals of Ecology* (1959 second edition). [2] Specifically, in 1970, after teaching chemical engineering for two years at the Catholic University of America, Ulanowicz switched careers and became a professor of theoretical ecology at the University of Maryland's Chesapeake Biological Laboratory, where he is currently professor emeritus. Ulanowicz won the 2007 Prigogine medal for his efforts in ecolology.

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External links

â— Eugene Odum – Wikipedia.
â— Odum, Eugene Pleasants – Encyclopedia of Earth.

θΔics

In hmolscience, **Eugene Pelletan** (1813-1884) was a French writer, journalist, and politician noted for his 1863 “Address to the Cotton King” wherein he gives a fairly cogent usage of the term “social chemistry” (“la chimie sociale”).

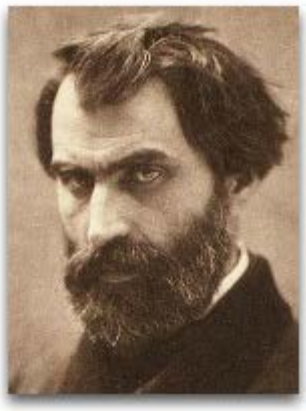

Overview
(add)

Religion
Pelletan was a deist freethinker, spiritualist; a progressive follower, supposedly, of the views of Marquis de Condorcet.

Social chemistry | La chimie sociale
In 1863, Pelletan, in his “Address to the Cotton King”, section three, stated the following:

La liberté seule a le don de création ; grâce à la liberté, la république américaine fera explosion dans l'espace. L'homme y gagnera le temps de vitesse. A peine le douzième ou le quinzième fils d'un même père aura-t-il touché l'âge de raison, qu'il attellera une charrette et la chargera du bagage laconique d'un émigrant ; il embrassera ensuite sa famille et il fouettera son cheval. -

Où ira-t-il ? Au grand Ouest. Quand il aura trouvé une propriéte convenable sur le domaine commun, il attaquera la forêt à coups de hache, il ensemencera la clairière de maïs et y bâtira une cabane à la lisière. Le jour où il aura un toit pour reposer sa tête, il pensera que deux têtes y reposeront encore mieux ; sur cette réflexion, il allumera sa pipe et retournera sur son bidet au village de son enfance.

Il y viendra chercher une compagne ; il épousera la première venue. Il pourra mettre au hasard la main à la loterie. Il y puisera toujours l'esprit d'ordre et de travail. La vertu, voilà la dot de la jeune fille américaine. Quant à l'autre dot, il n'en sera pas question. Comment vivront les enfants ? Ils émigreront à leur tour

Sitôt que le pionnier aura reçu la bénédiction nuptiale, il reprendra en compagnie de sa femme le chemin de sa cabane ; mais il emmènera cette fois un mobilier et un troupeau. Quelque temps après, le prédicant à cheval, chargé de distribuer Dieu dans le désert, passera devant une nouvelle ferme improvisée, et il verra un essaim de marmots jouer au seuil de la porte sous l'arche embaumée d'un rosier.

L'homme attire l'homme dans la chimie sociale, comme la molécule dans un autre ordre de composition. Une nouvelle cabane viendra chercher le voisinage de la cabane déjà construite, par raison de sympathie en même temps que de sécurité. Bientôt l'industrie apportera son

The only freedom is the gift of creation; through freedom, the American Republic will blast into space. The man will gain the speed of time. Hardly the twelfth or fifteenth son of the same father will he hit the age of reason, he attellera a cart load of terse and baggage of an emigrant; then he will embrace his family and he will whip his horse.

Where will he go? Much to the west. When he has found a suitable propriéte on the common domain, he will attack the forest with an ax, it will seed corn clearing it and build a shack on the edge. The day he will have a roof to lay his head, he will think that two heads are better lie down; this reflection, he lit his pipe and return on his pony to the village of his childhood.

There will pick a mate; he married the first coming. It will randomly put his hand in the lottery. There will always draw the spirit of order and work. Virtue, that the dowry of the American girl. As for the other dot, the fact will not matter. How children will live? They migrate in their turn

As soon as the pioneer receives the nuptial blessing, it will resume in the company of his wife the way to his cabin; but this time take furniture and a flock. Some time later, the preacher on horseback, responsible for distributing god in the wilderness, will pass before a new improvised farm, and he will see a swarm of brats playing threshold under the arch of a fragrant rose bush.

The man attracts man in the **social chemistry**, as the molecule to another order of composition. A new hut will pick the vicinity of the already built cabin by reason of sympathy along safety. Soon the industry will support agriculture; the blacksmith turn his forge next to the farm

concours à l'agriculture ; le forgeron allumera sa forge à côté de la ferme pour battre le soc de la charrue, le charron suivra le forgeron et le menuisier le charron, et ainsi de suite jusqu'au tailleur. L'agriculture disperse, l'industrie concentre. Le village naîtra de l'industrie. Ai je besoin de prédire le premier monument public qu'on y élèvera sur l'épargne de la commune ? Ce sera toujours la maison d'école.

Et pourquoi non ? Le culte du pionnier protestant n'est-il pas la Bible ? Sa piété n'est-elle pas la lecture ? La première condition d'un citoyen libre d'un p ys libre n'est-elle pas de savoir lire au moins son journal ? La reli- gion remisera d'abord dans la salle de l'école ; mais, avec le temps, elle aura sa demeure à part, une église surmontée d'un campanille, et la cloche célébrera dans le vent la naissance d'une nouvelle commune.

Pour peu que la commune trouve une circonstance locale sympathique à son développement, elle grandira en quelque sorte à la baguette. Ce - n'était qu'un village, la voilà petite ville, puis ville ordinaire, grande ville enfin, métropole de cent mille âmes, que disje ? de quatre cent mille âmes, et tout cela en une vie d'homme, sur un sol où la veille encore le buffalo broutait en luberté.

Que sera-ce donc lorsque la vapeur aura donné à la civilisation américaine une âme à la taille de son audace ? Tout ce qu'elle fera désormais, . agriculture ou industrie, elle voudra le faire à la mécanique, labourer à la " , unécanique, moissonner à la mécanique. La surface du sol tout entière ne - sera plus qu'une immense machine haletante toujours au travail. L'Amérique du Nord, armée de la puissance de la vapeur, mettra l'impossible au défi et ira jusqu'à contrefaire le miracle. Elle jettera, par exemple, un chemin de fer de mille lieues en reconnaissance, et la locomotive, emportée à travers l'immensité du vide, appellera éperdûment d'un coup de sifflet le fantôme encore enfoui des villes futures, et ces villes sortiront de terre à ' l'appel de la vapeur et prendront place au soleil.

to beat the Ploughshares, the wheelwright and blacksmith will follow the carpenter the wheelwright, and so on to the tailor. Agricultural dispersed, the industry focuses. The village will be born of the industry. Do I need to predict the first public monument that will rise on the savings of the town? It will always be the school house.

And why not? Is not the worship of the Protestant pioneer not the Bible? His piety is it not reading? The first condition of a free citizen of a free p-ys is it not at least be able to read her diary? Religion remisera first in the school hall; but over time it will dwell apart, surmounted a campanille church and the bell in the wind celebrating the birth of a new town.

As long as the town is a friendly local circumstances to its development, it will grow in some way to the stick. It - was a village, here a small town, and ordinary city, big city finally metropolis hundred thousand souls, that disje? four hundred thousand souls, and all that in a man's life, on a floor where the day before the buffalo grazed in luberté.

What will it be when the steam has given to American civilization soul to the size of its audacity? All she will do now,. agriculture or industry, it will want to do the mechanics, the plow, "unécanique, mechanical harvesting The surface of the whole soil. - will be a huge machine panting still working North America. Army of steam power, will not go up to the challenge and forge the miracle. She lay, for example, a thousand miles of railway in recognition, and the locomotive, carried through the immensity of empty, desperately called a whistle ghost still buried future cities, and these cities will come out of earth appeal of steam and take place in the sun.

(add discussion)

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â— Eugene Pelletan (French → English) – Wikipedia.

θΔics

In hmolscience, **Eugene Roberty** (1843-1915) (SN:34) (CR:10), Евгений Валентинович Де Роберти (Russian), De Robertis Castro de la Cerda, or "Eugene V. de Rebertis", among other variants, was a Russian positivism sociologist, of Spanish descent, noted, in sociological thermodynamics, for his 1910 *Energy and Sociology*, according to which he is credited as having been one of the first to introduce mechanistic theories in sociology, particularly using an energetics platform of reasoning. [1]

Overview

Roberty, over the years, published a number of works on scholars such as: Friedrich Nietzsche, Auguste Comte, and Herbert Spencer.

In 1910, Roberty published *Energy and Sociology*, based on what seems to be the work of Wilhelm Ostwald, and in 1914 he published *The Concept of Reason and the Laws of the Universe*. [5]

Russian-born American sociologist Pitirim Sorokin is said to have been the last and greatest promoter of Roberty's work. [2]

Roberty's main first publication, it seems, was the 1880 book *Sociology*, the first ten chapters of which were previously published in the *Review of Positive Philosophy* (*Revue La philosophie Positive*), March-April 1876 and July-August 1878. [3]

Roberty's basic theory, according to the 1929 views of American sociologist Howard W. Odum, was that he had an energetic theory wherein he considered there to be three fundamental forms of energy as composing the world as we know it, the physico-chemical or inorganic with the molecule as the unit; the vital or organic whose essence is the cell; and the social or superorganic centered in the brain and nervous system. These merge together into the other in an almost imperceptible way, with the superorganic elements constituting the highest forms of psychical phenomena with thought and abstract knowledge as fundamentals. [1]

Roberty seems to have culled his energetics views from German physical chemist Wilhelm Ostwald, whose theories he reviews in an article. [4]

Later works

Roberty seems to have produced a number of works, beyond this first 1880 *Sociology* publication, such as: *Agnosticism* (Agnosticisme), *What is progress?: Lecture at the Institute of Advanced Studies The University News* (Qu'Est-Ce Que Le Progres?: Leçon Donnée À L'Institut Des Hautes Études De L'Université Nouvelle), *Sociology of Action: The Social Genesis Of Reason And The Origins Of Rational Action* (Sociologie De L'action: La Genèse Sociale De La Raison Et Les Origines Rationnelles De L'action), *Friedrich Nietzsche: Contribution to the history of philosophical ideas and socially at the end of the nineteenth century* (Frédéric Nietzsche: Contribution À L'histoire Des Idées Philosophiques Et Sociales À La Fin Du Xixe Siècle), *Sociology: An Essay in Philosophy sociology* (La Sociologie: Essai De Philosophie Sociologique), Old and the New Philosophy: An Essay on the general laws of development of philosophy (L'ancienne Et La Nouvelle Philosophie: Essai Sur Les Lois Générales Du Développement De La Philosophie), *Ethics: the Social Psyche* (L'éthique: Le Psychisme Social), *Second Essay on the Morality Considered as Elementary Sociology* (Deuxième Essai Sur La Morale Considérée Comme Sociologie Élémentaire), *Auguste Comte and Herbert Spencer: Contribution to the History of Philosophical Ideas In the nineteenth century* (Auguste Comte Et Herbert Spencer: Contribution À L'histoire Des Idées Philosophiques Au Xixe Siècle), and *Ethics. Good And Evil: An Essay On Morals As Seen First Sociology* (L'éthique. Le Bien Et Le Mal: Essai Sur La Morale Considérée Comme Sociologie Première), among possible others.

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External links

● Eugene de Roberty (Russian → English) – Wikipedia.

θΔics

In hmolscience, **Eugene Roeber** (1867-1917) (SN:10±) was a German-born American electrochemical engineer noted for []

WWI | Social reaction

In Sep 1914, Roeber, in his "The European War", the opening editorial of *Metallurgical and Chemical Engineering*, expounded on his views that WWI (28 Jul 1914 – 11 Nov 1918) was a large social chemical reaction, comparing individuals to free ions, without free will, of dissociation theory, among other assertions; the following is the text of this editorial:

> "War is hell. Our knowledge of what is happening on the other side of the Atlantic comes to us through a rapid sequence of extra-editions of newspapers and while this highly excitable moving picture show of glaring headlines, more or less contradictory, passes before our eyes, we see only one thing clearly—that a gigantic calamity has come over Europe—and we pause quietly to ask why this whole terrible thing is going on.
>
> Have men whom we have known intimately for years and have admired for their peaceful achievements in arts and sciences, suddenly gone crazy? Have practically all Europeans suddenly gone crazy? If we want to avoid this conclusion, nothing is left but the inference that the psychology of nations is different from the psychology of individuals.
>
> Nor is this inference unwarranted. We know that an individual acts differently in a crowd than when left to himself. We know that we may be impressed quite differently by a silver-tongued orator if we hear him in the midst of a sympathetic crowd than when we read his sophisms in the quiet of our home. And when in the past the Devil wanted to try a particularly interesting human reaction, he created a boom in a mining camp. Mark Twain has sketched vividly how the actions of otherwise perfectly sensible and normal men become abnormal in a mining boom. The fact is that when crowd psychology of which national psychology is a variety, gets the best of individual psychology, the "free will" of the individual is gone; there remains not much more of it than the "mean free path" of an atom. Crowds and nations then act under the blind forces of nature. In the gigantic human reaction which the European war represents, the most celebrated individualities do not seem to have much more freedom of will than the "free" ions of the dissociation theory. And this is the most terrible thing in the situation, because if it is so, it means that the thing must go on to its most brutally complete conclusion.
>
> There are clear-cut reversible chemical reactions [see: reversible chemical reaction]. The European war is nothing of the kind. It is irreversible in all its phases and it is a horrid melee of half a dozen or more human reactions so that we cannot say which are primary or secondary—the hatred [negative affinity] of race against race or commercial rivalry and envy or a revenge idea or an excess of militaristic autocracy or what else. We only know with absolute certainty that because it is an irreversible reaction its outcome is determined by the second principle of thermodynamics. Whatever may be the detailed result of the war for this or that country or nation, in the whole there must be a frightful increase of entropy. That is, European civilization as a whole must be reduced from a place in the sun to a temperature much nearer absolute zero.

(add discussion)

Chemical Engineering | Journal

In 1902, Roeber became the founding editor of the *Electrochemical Industry*, which in 1905 became *Electrochemical and Metallurgical Industry*, which absorbed the *Iron and Steel Magazine* in 1906, thereafter becoming *Metallurgical and Chemical Engineering*, which became *Chemical Engineering*, its present title, in 1946. [2]

Education

Roeber completed his undergraduate work at the universities of Jena, Halle, and Berlin, completing his PhD at the latter

in 1892. [3]

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2. (a) Eugene F. Roeber (about) – Electrochemical Society.
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θΔics

In existographies, **Eugene Edward Ruyle** (1936-) (CR:11) is American anthropologist noted, in sociological thermodynamics, for his 1973 to 1980s work on the subject he refers to as "ethnoenergetics" a type of thermodynamics of ethology.

Overview

In 1973 to 1977, Ruyle pioneered the science of what he termed ethnoenergetics, a precursory themed subject to human thermodynamics, arguing that labor, value, money, and capital are all forms of “ethnoenergy”, defined as “somatic energy expended by the members of a population”, that property is an “ethnoenergetic field”, and that money is “a symbol for energy, a claim on the energy of other people.” [6]

In the late 1970s, Rule began formulating a thermodynamics and or energy based sociological theory based a combination of ecological energetics in conjunction with Karl Marx's labor theory of value. [1] Ruyle defines his theory as a thermodynamic approach to social stratification. [2] Human societies, according to Ruyle, may be usefully be thought of in ecological and thermodynamic terms, as parts of larger ecosystems composed of matter, energy, and information. [4]

Ruyle, in his In his view of life, states that “all life may be viewed as a continuous expenditure of energy in the pursuit of need-satisfaction.” That “the basic need of all living forms is the continual harnessing of free energy, in the form of food … but all organisms have additional needs which they satisfy through their behavior. Life may be viewed, then, as the continuous outpouring of energy, in various forms of behavior, in pursuit of the satisfaction of the needs of the living organism.” On this logic, Ruyle outlines a theory of social “thermodynamic flows”: [5]

> “The ensemble of social relations in any population may be viewed as a system of **thermodynamic flows** and blockages.”

Namely that need-based expenditures of energy may be either facilitated or hindered by other members of the population.

Ruyle, in comparing the older primitive commune days with the newer establishment of patriarchy and class rule, sees a cultural transformation that may be understood in thermodynamic terms. [3] Humans, according to Ruyle, are interdependent in a way that sets them off from all other primates, where as such we may speak of a "thermodynamic substratum" underlying human society. People pump energy into this substratum when they produce values; whereas they withdraw energy from it when they consume those values. [5]

Ruyle argues that it is possible to measure this energy, however rough and approximate such measurement may be. If one spends four hours digging up, cleaning, and cooking yams, for instance, there are four hours of labor energy embodied in those yams. When another person eats them, they are consuming, in addition to the caloric energy of the yams, four hours of labor energy. If someone else eats the yams, they are consuming four hours the labor energy; hence, one can speak of energy flowing from producer to consumer. The energy flows between members of a population, between groups, and between classes, are an indispensable element of human social life. In measuring and analyzing the “social thermodynamics of a human population”, Ruyle states, we are analyzing "the real foundation, on which rises a legal and political superstructure and to which correspond definite forms of social consciousness."

Education

Ruyle completed his BA in 1963 at Berkeley, his MA in 1965 at Yale, and his PhD in 1971 at Columbia University. In 1973 he was an assistant professor of anthropology at the University of Virginia.

See also

â— Anthropology thermodynamics

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θΔics

In human physics, **Harry Eugene Stanley** (1941-), commonly cited as "H. Eugene Stanley", is an American physicist noted for having coined the term "econophysics" in 1995, to denote the field of physics dealing with economic phenomenon, and for research and various publications in this field.

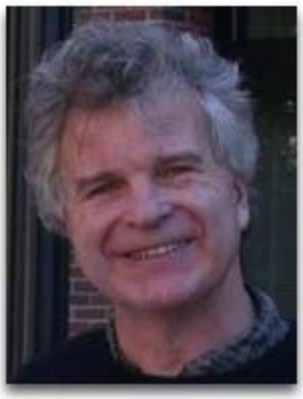

His group supposedly found empirical laws governing economic fluctuations, and proposed statistical mechanics models to explain their origins.

Stanley is said to have introduced the term "econophysics" at the 1995 second Statphys-Kolkata conference in Kolkata (formerly Calcutta), India, to describe the large number of papers written by physicists in the problems of stock markets. [1]

Stanley co-authored the 2000 *Introduction to Econophysics* with Italian econophysicist Rosario Mantegna. [2]

Random walks

In 2011, Stanley co-authored *The Physics of Foraging*, together with Gandhimohan Viswanathan, Marcos Luz, and Ernesto Raposo, on random walk theory applied to insects with implication to humans, which has the following abstract:

> "Do the movements of animals, including humans, follow patterns that can be described quantitatively by simple laws of motion? If so, then why? These questions have attracted the attention of scientists in many disciplines, and stimulated debates ranging from ecological matters to queries such as 'how can there be free will if one follows a law of motion?' This is the first book on this rapidly evolving subject, introducing random searches and foraging in a way that can be understood by readers without a previous background on the subject. It reviews theory as well as experiment, addresses open problems and perspectives, and discusses applications ranging from the colonization of Madagascar by Austronesians to the diffusion of genetically modified crops. The book will interest physicists working in the field of anomalous diffusion and movement ecology as well as ecologists already familiar with the concepts and methods of statistical physics."

The book has interesting sections such as "Power Laws and Pareto's principle" (4.3), "GPS tracking of humans" (7.3), "Energy and Entropy" (10.4), "Determinism, Randomness, and Free Will" (14.4), among others.

Influence

Stanley's work in econophysics was one of the stimulators for German theoretical physicist Dietrich Stauffer to enter into the field of econophysics.

Quotes

The following are noted quotes by Stanley:

> "Obviously, you can't predict the future, but, such research reveals how physicists and economists should compare notes in the future."
>
> — Eugene Stanley (2000), Dallas Morning News [4]

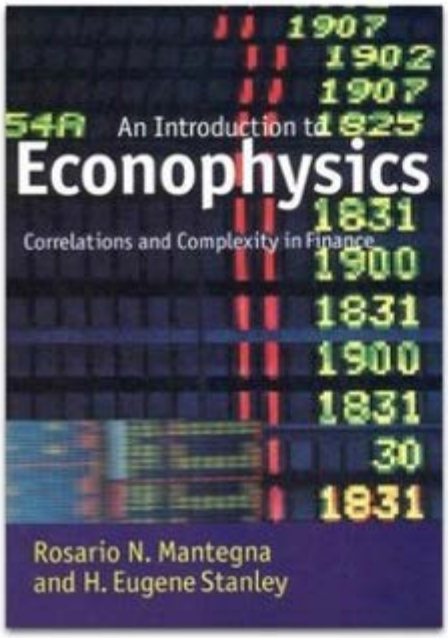

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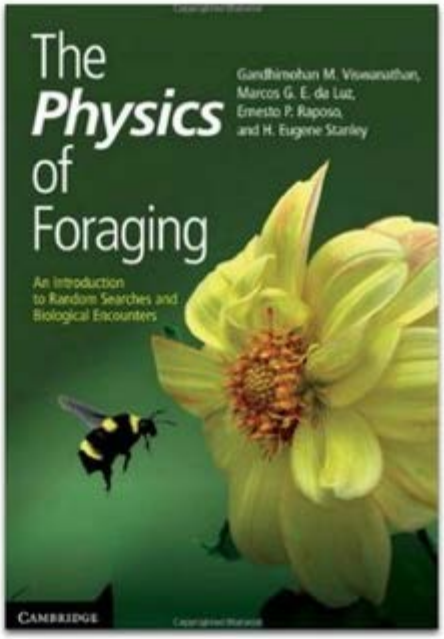

(2011)

Left: Stanley's co-authored 2000 *An Introduction to Econophysics*, one of the first books in econophysics. [2] Right: Stanley's co-authored 2011 book *The Physics of Foraging*, which applies random walk theory to explain searching and exploration behavior of humans. [3]

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External links

â— H. Eugene Stanley – Wikipedia.

θΔics

In human physics, **Eugene Wigner** (1902-1995) was a Hungarian-born American physicist noted for his views on the non-application of physics and quantum mechanics in explanations of life (animate matter) (powered chnops matter).

Overview

In 1961, Wigner, in his essay "The Probability of the Existence of a Self-Reproducing Unit", wherein purported to prove that a physical system can not make a transition from a nonliving state to a living state without contravening the laws of quantum physics, arguing to the effect, according to Paul Davies, that 'something funny must have gone on when life started.'

In 1967, Wigner published *Symmetries and Reflections*, is an oft-cited book, particularly in reductionist anti-reductionist debates, which is representative of the anti-reductionism view. [1]

In 1971, Wigner, in his *Foundations of Quantum Mechanics*, expressed his opinion that quantum mechanics is not applicable to humans, owing to their consciousness: [2]

> "The state of a 'friend' is a linear combination of several states, indicating different contents of his mind, seems very unnatural. This leads me to the opinion that quantum mechanics, in its present form, is not applicable to living systems, whose consciousness is a decisive characteristic."

This is an earlier statement in human quantum mechanics.

In 1976, American physical organic chemist George Scott exchanged letters with Wigner on the subject of quantum mechanics and consciousness. [3]

Davies

In the mid 1960s, Paul Davies, as an undergraduate physics student, read English astronomer Fred Hoyle's 1957 science fiction novel *The Black Cloud*, in which a large cloud of gas from interstellar space arrived in the solar system, which was said to be 'alive' (see: nebular hypothesis). Davies was intrigued by this idea, in his own retrospect words: [4]

> "How can a cloud be alive? I puzzled over this at length. Surely gas clouds just obey the laws of physics? How could they exhibit autonomous behavior, have thoughts, make choices? But, then, it occurred to me, all living things supposedly obey the laws of physics."

Hoyle's living cloud left Davies 'baffled and vaguely disturbed', leaving him questioning the 'what exactly is life question' and 'when did it start?' issue. Next, Davies' PhD advisor (Michael Seaton or Sigurd Zienau) then gave him a copy of Wigner's 1961 essay "The Probability of the Existence of a Self-Reproducing Unit" which purported to prove that a physical system can not make a transition from a nonliving state to a living state without contravening the laws of quantum physics, arguing to the effect, according to Davies, that 'something funny must have gone on when life started.' [5]

Quotes

The following are noted quotes:

> "I have known a great many intelligent people in my life. I knew Planck, von Laue and Heisenberg. Paul Dirac was my brother in law; Leo Szilard and Edward Teller have been among my closest friends; and Albert Einstein was a good friend, too. But none of them had a mind as quick and acute as Jansci [John] von Neumann. I have often remarked this in the presence of those men and no one ever disputed. But

Einstein's understanding was deeper even than von Neumann's. His mind was both more penetrating and more original than von Neumann's. And that is a very remarkable statement. Einstein took an extraordinary pleasure in invention. Two of his greatest inventions are the special and general theories of relativity; and for all of Jansci's brilliance, he never produced anything as original."

— Eugene Wigner (c.1980) (Ñº)

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2. Wigner, Eugene P. (1971). *Foundations of Quantum Mechanics* (pg. 17). Academic Press.
3. Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pgs. 282-83). University Press of America.
4. Davies, Paul. (1999). *The 5th Miracle: the Search for the Origin and Meaning of Life* (preface, pgs. 11-22; ch. 2: Against the Tide, pgs. 49-68; algorithmic entropy, pg. 276-77 and ch. 4). Orion Productions.
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Further reading

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External links

â— Eugene Wigner – Wikipedia.

θΔics

In hmolscience, **Eugenie Scott** (1945-) is American physical anthropologist turned NCSE director (1987-2014), noted for her efforts to combat teaching of creationism in the American educational system.

In 2005, Scott was one of the organizers (Q), expert witnesses (Q), behind the win at the Kitzmiller vs Dover lawsuit. [3]

In 2006, Scott co-authored the article "Public Acceptance of Evolution", which shows (Q) ranking second to lowest ahead of Turkey in respect to public acceptance of evolution. [2]

Beliefs

In 2003, Scott described herself as an atheist who "does not discount the importance of spirituality." (Q)

Debates

In 1974, Scott was drawn into the science vs creationism debates sphere when she attended a debate between physical anthropologist James Gaven, he PhD mentor, and biochemistry creationist Duane Gish, wherein she learned the intricacies of audience reception. [3]

Scott has since debated philosopher physicist creationist Stephen Mayer, among others.

Education

Scott completed her BS and MS at the University of Wisconsin-Milwaukee and her PhD at the University of Missouri with a dissertation on the dental evolution in pre-Columbian Peru. (Q)

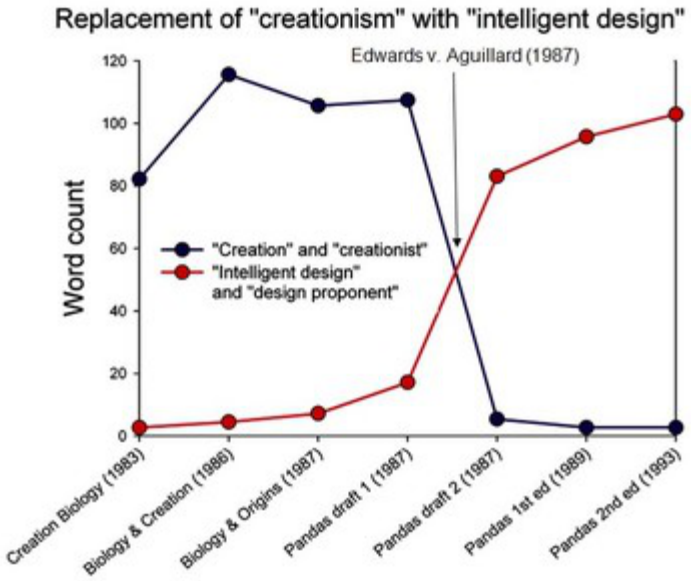

One of Scott-directed NCSE discovered changed on how "creationism" was switched to "intelligent design" in 1987 following the Edwards vs Aguillard decision; similar to who the term "intelligent design" has been replaced by the code word "sudden emergence", following the Kitzmiller vs Dover (2005) ruling. [4]

Quotes

The following are noted quotes:

> "You can't put an omnipotent deity in a test tube."
>
> — Eugenie Scott (1994), "Keep Science Free From Creationism"; cited by Lee Strobel, 2004 [1]

References

1. (a) Scott, Eugenie. (1994). "Keep Science Free From Creationism", *Insight*, Feb 21.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 21). Zondervan, 2009.
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3. Dean, Cornelia. (2013). "Standard-Bearer in Evolution Fight: Eugenie C. Scott Fights the Teaching of Creationism in Schools" (Q), New York Times, Sep 2.
4. Lebo, Lauri. (2008). *The Devil in Dover: an Insider's Story of Dogma v. Darwin in Small-Town America* (pg. 210). The New Press, 2013.

Further reading

● Scott, Eugenie. (2003). *Evolution vs Creationism: an Introduction*. University of California Press, 2005.

External links

- Eugenie Scott – Wikipedia.

θΔics

In existographies, **Euhemerus** (c.340BC-260BC) (FA:20), aka "Euhemerus of Messina", was a Greek philosopher and mythographer, noted for []

Atheism

Euhemerus was considered an atheist in the ancient world (Q); his god theory, according to (Empiricus, 200AD), was that gods were men of power, deified in memory after their deaths. He is an AskMen.com Top 10 Unknown Atheist (Q) (#10); his variety of atheism was discussed by the Anon Theophrastus (c.1659).

Quotes

The following are noted quotes:

> "**Euhemerus** of Messenê, who of himself drew up copies of an incredible and non-existent mythology, and spread atheism over the whole inhabited earth by obliterating the gods of our belief and converting them all alike into names of generals, admirals, and kings, who, forsooth, lived in very ancient times and are recorded in inscriptions written in golden letters at Panchon, which no foreigner and no Greek had ever happened to meet with, save only Euhemerus."
>
> — Plutarch (100AD), *On Isis and Osiris* (pg. 57)

> "In the list given by Drachmann [1922], others designated *atheoi* in the period up to the 3rd century BC are Diogenes of Apollonia, Hippo of Rhegium, Diagoras of Melos, Prodicus of Keos, the aristocrat Critias of Athens, Theodorus of Cyrene, Bion of Borysthenes, and **Euhemerus** of Messina."
>
> — Michael Palmer (2013), *Atheism for Beginners* [1]

References

1. (a) Drachmann, A.B. (1922). *Atheism in Pagan Antiquity* (pg. 13). Gyldendal.
(b) Palmer, Michael. (2013). *Atheism for Beginners: a Coursebook for Schools and Colleges* (pg. 15). Lutterworth Press.

Further reading

● Bullivant, Stephen and Ruse, Michael. (2013). *The Oxford Dictionary of Atheism* (§:Theodorus and Euhemerus, pg. #). Oxford University Press.

External links

● Euhemerus – Wikipedia.
● Euhemerus (German → English) – Wikipedia.

θΔics

In mathematics, **Euler genealogy** shows the advisor/student relationship, generally PhD advisor / graduate student relation, for the historical mentor-student lineage of Swiss mathematician Leonhard Euler and his descendants. The main points of the Euler genealogy are mapped adjacent.

Second to the Euler genealogy is the Johann Pfaff (advisor) Carl Gauss (student) genealogy.

Current director of the Mathematics Genealogy project and Mitchel T. Keller explains, in the following video, how over over one-third of all modern 150,000 known (mapped) mathematicians can trace their genealogy back to ether Euler or Gauss.

Discussion

To note, the mathematical linage from Gottfried Leibniz-Christiaan Huygens on back is not necessarily one of a PhD

Euler genealogy

Denied the void →

Parmenides
(510-450BC)

|

Aristotle
(384-322BC)

Denied the void ←
IQ=190

|

Piston and cylinder
Vacuum pump
Vacuum bulb
Magdeburg hemispheres
Vacuum engine

Otto Guericke (1602-1686)

| ← (Non-mathematical mentorship)

Gunpowder engine →
IQ=175

Christiaan Huygens
(1629-1695)

|

Differential equations →
IQ=182-205

Gottfried Leibniz
(1646-1716)

|

"Bernoulli brothers"
(differential equations)

student / PhD advisor connection, nor is the Leibniz-Jacob Bernoulli connection exactly a PhD student / PhD advisor connection; although Mitchel Keller, Mathematics Genealogy Project head, lists the three (Christiaan Huygens → Gottfried Leibniz → Jacob Bernoulli) as such. [2]

The so-called "Bernoulli brothers" (Jacob Bernoulli → Johann Bernoulli) (see: Bernoulli family) certainly were among the first to promote Leibniz's version of calculus, and the older Bernoulli (Jacob) seems to have been the advisor to the younger Bernoulli (Johann), but the connection between Huygens and Leibniz needs to be studied a bit more, as regards to mathematical influences.

In addition, the Otto Guericke → Christian Huygens linkage is not necessarily one of mathematical knowledge genealogy, but

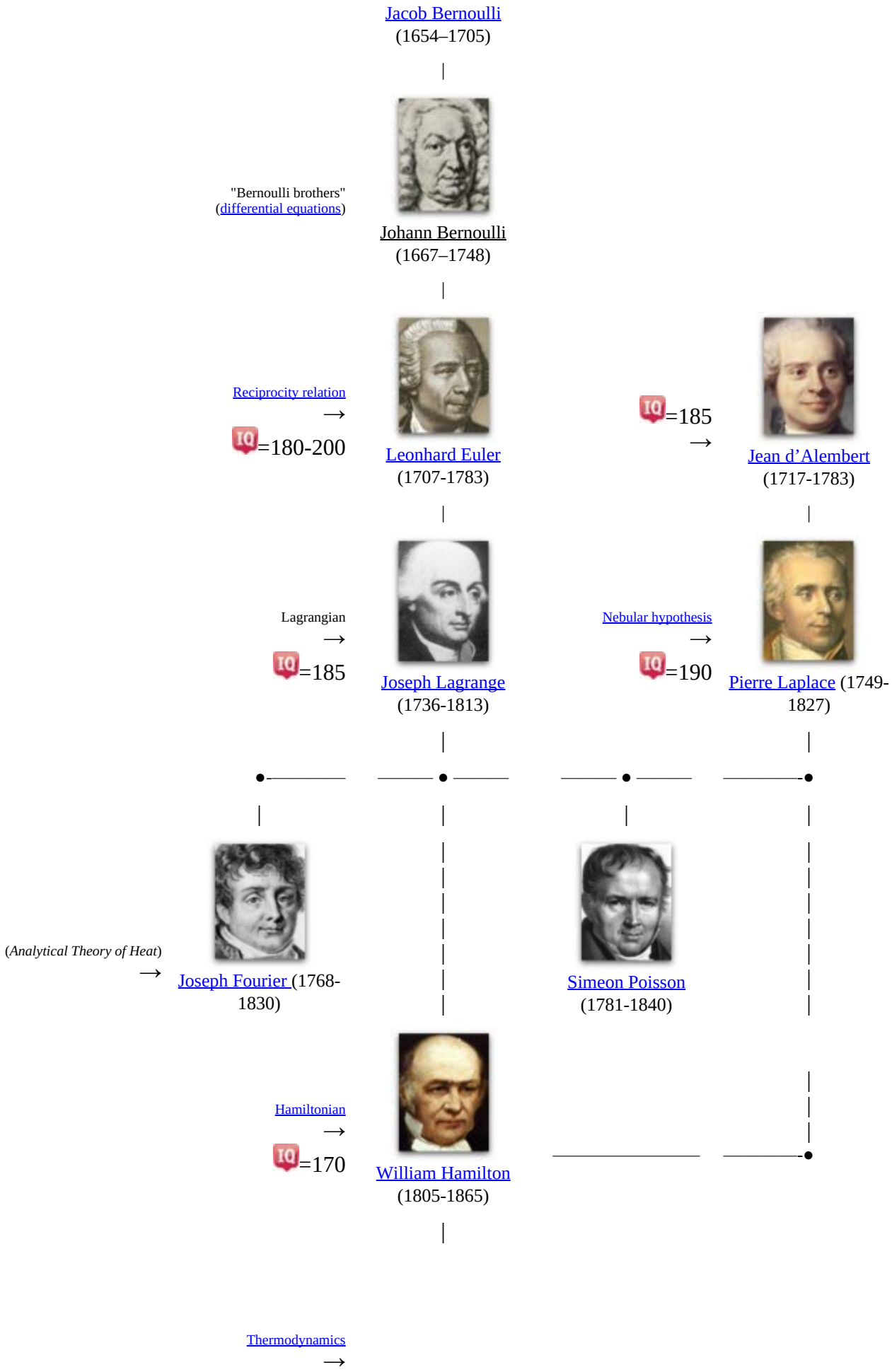

rather one of influence, especially in regards to Huygens prolonged effort, in coordinated synergy with Robert Boyle, Denis Papin, and Robert Hooke, to make a working gunpowder engine, and in general study the properties of the vacuum.

Furthermore, it remains to be tracked down how some of the other great mathematical thinkers, such as, in particular, Euclid, fit into the picture as well, being that both James Maxwell and Albert Einstein were greatly influenced by Euclid's *Elements*.

Quotes | On

The following are related quotes:

> "Descartes took up almost without change what this anonymous

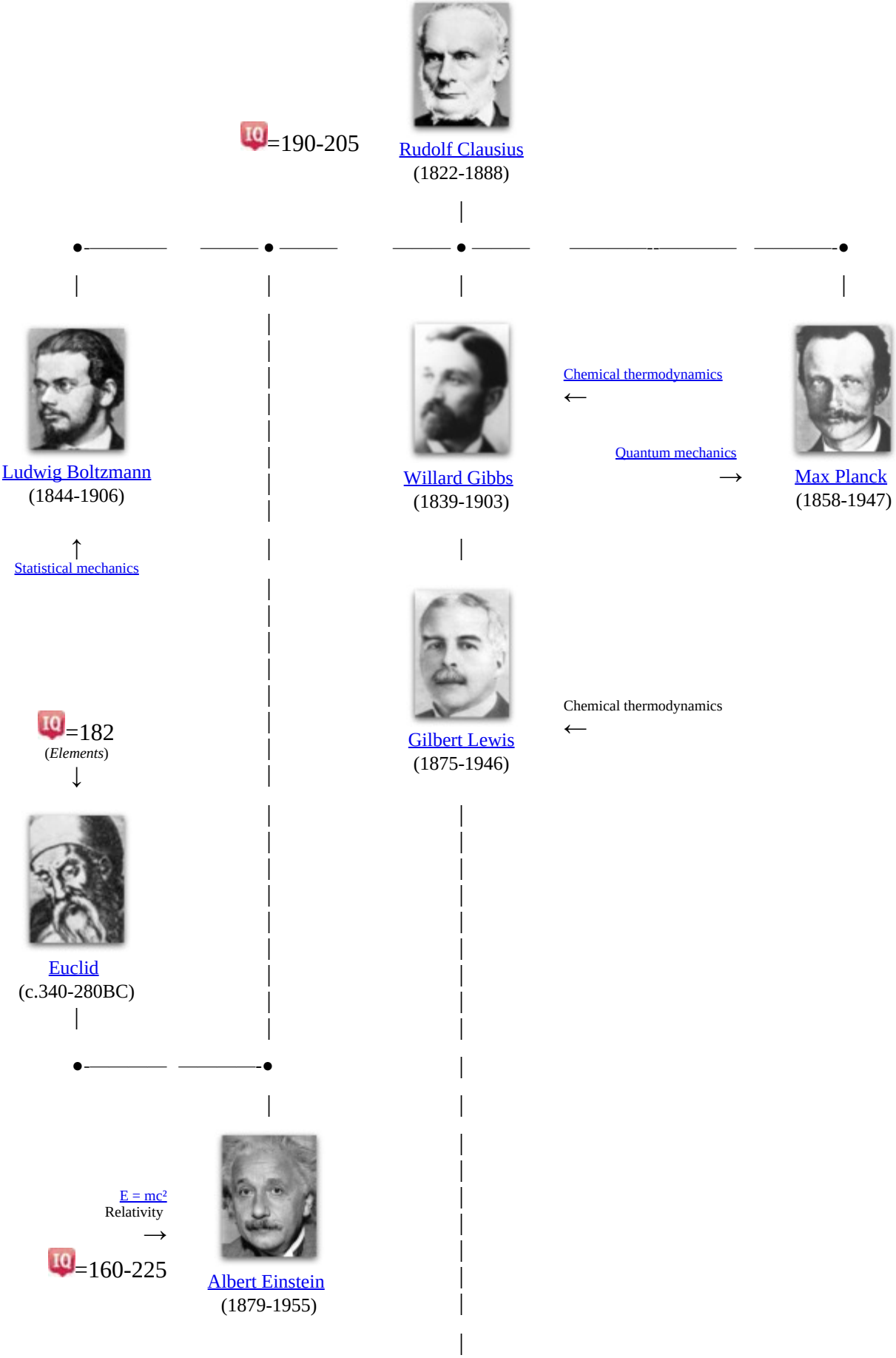

Rossini debate
Political thermodynamics
Chemical thermodynamics
→

Frederick Rossini
(1899-1990)

Stanley Sandler
(1940-)

Human thermodynamics
Human chemical thermodynamics
Human chemistry
Human physics
→

Libb Thims
(c.1975-)

mathematician of the thirteenth century had written; and henceforth, from Descartes to Wallis, from Wallis to Bernoulli, and from the former to Lagrange, then to Gibbs, the principle of virtual displacements continued to be extended."

— Pierre Duhem (1913), "Research on the History of Physical Theories", in: *Essays in the History and Philosophy of Science* (pg. 242)

See also

- Thomson genealogy
- Gauss genealogy

References

1. Leonhard Euler – Mathematics Genealogy Project.
2. Keller, Mitchel T. (2011). "Interview: on Mathematics Genealogy Project", London School of Economics website, Feb. 23.

Further reading

- Struik, D.J. (1969). *A Source Book in Mathematics, 1200-1800* (Euler, 69+ pgs). Harvard University Press.

External links

- Gauss and Euler genealogy (pdf) – 3.bp.blogspot.com.

θΔics

In mathematical thermodynamics, **Euler reciprocity relation** or "reciprocity relation" is the following relational criterion; namely:

If this holds:

$$\left(\frac{\partial M}{\partial y}\right)_x = \left(\frac{\partial N}{\partial x}\right)_y$$

for the following two dimensional function:

$$dF = M dx + N dy$$

If F is a state function, then $dF = \left(\frac{\partial F}{\partial x}\right)_y dx + \left(\frac{\partial F}{\partial y}\right)_x dy$

where x and y are variables of state of the system.

The Euler reciprocity relation (for F a state function):

If $dF = Mdx + Ndy$, then $\left(\frac{\partial M}{\partial y}\right)_x = \left(\frac{\partial N}{\partial x}\right)_y$

A snapshot summary of the **Euler reciprocity relation** or what Rudolf Clausius synonymously referred to as the "condition for an exact differential", both varieties of which seem to have originated by Swiss mathematician Leonhard Euler. [2]

then F is an **exact differential** (i.e. state function).

This, however, is for two dimensions (as can be extended to three dimensions), that applies to any a function of any number of independent variables, where x and y are any two of the independent variables, M is $\partial f / \partial x$, N is $\partial f / \partial y$, and each partial derivative has all independent variables held constant except the variable shown in the denominator. [1] In plain speak, the reciprocity relation, which is difficult to explain fully in words, is a type of symmetry differentiation criterion that determines whether or not a function is immediately Integrable.

Synonyms

Synonyms include: condition for an exact differential, condition for a complete differential, or condition of immediate integrability (Rudolf Clausius, 1858-1875), Euler's criterion (James Partington, 1911), integrability condition (Philip Mirowski, 1989), or Euler's reciprocity relation.

History

See also: History of differential equations

The first to begin studying reciprocity questions, supposedly, was French mathematician Pierre Fermat (1601-1665), discussed in correspondence letters to other mathematicians or written as notes in the margins of his books.

In 1729, Swiss mathematician Leonhard Euler began to read Fermat's work seriously following correspondence with German mathematician Christian Goldbach (1690-1764) on some of Fermat's observations; which thus acted to launch the long drawn-out study of "reciprocity laws", upward through the works of Adrien-Marie Legendre, Carl Gauss (1777-1855), Johann Dirichlet (1805-1859), Carl Jacobi (1804-1851), and Sergei Eisenstein (1898-1948). [4]

Euler's exact publication remains to be tracked down among his collected works of 60 to 80 quarto volumes (900 books).

It is known, however, that in 1739, in correspondence with Swiss mathematician Johann Bernoulli (1667–1748), and into the following year (1740), Euler began using the integrating factor as an aid to derive differential equations that were integrable in finite form. [3]

Thermodynamics | Entropy

In 1854, within the framework of launching the science of thermodynamics, German physicist Rudolf Clausius, in his fourth memoir "On a Modified Form of the Second Fundamental Theorem in the Mechanical Theory of Heat", began to employ, in an uncited manner, Euler's reciprocity relation (although he never called it by this name, not cited Euler explicitly has having introduced this proof) to develop the physical concept of a "path-independent" state function (one

that meets the reciprocity relation) as compared to a “path-dependent” state function (one that does not meet the reciprocity relation).

Clausius expanded on the underlying mathematics of this in his 1858 "Mathematical Introduction: on the Treatment of Differential Equations Which Are Not Directly Integrable", wherein he cites both Euler and Jacobi.

The foremost example of Clausius’ use of Euler’s reciprocity relation is in the derivation of the mathematical function of entropy (S), on the logic that the integrating factor of the inverse of the absolute temperature of the body (1/T) makes the inexact differential of a quantity of heat (dQ) an exact differential (dQ/T). This is the one aspect of thermodynamics that makes the subject notoriously difficult and its roots deep.

Maxwell’s relations

Euler’s reciprocity relation is used to derive the Maxwell relations.

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2. The Terrible Beauty of Thermodynamics (2010) – ScribD.com.
3. Sasser, John E. (1992). “History of Ordinary Differential Equations: the First Hundred Years”, Proceedings of the Midwest Mathematics History Society.
4. Lemmermeyer, Franz. (2000). *Reciprocity Laws: From Euler to Eisenstein*. Springer.

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● Blinder, S.M. (1966). “Mathematical Methods in Elementary Thermodynamics”, *Journal of Chemical Education*, 43(2): 85-92; adapted from Chapter 1 of a to be published physical chemistry textbook (MacMillan).
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External links

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θΔics

In existographies, **Euripides** (c.480-406BC) (IQ:180|#175) (Cattell 1000:99) [RGM:81|1,500+] (FA:10) (ACR:7) (CR:19) was a Greek philosopher and tragedian playwright noted for introducing the term "bios", the etymological root of the modern "bio-" prefix, for his general "question everything" philosophy, for his view that god was was an invention of a wise man, and for his views on the natural admixture of good and evil.

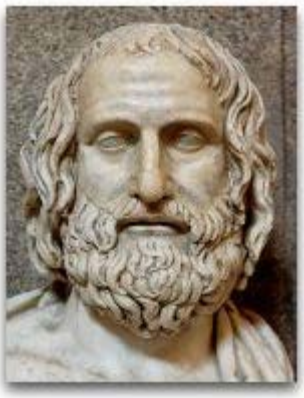

Bios | Life

The prefix *bio-*, supposedly, meaning "life" in Greek, according to Georg Misch (1950), originated in one of the works of Euripides. [1]

Euripides scholars E.H. Blakeney (1904) gives the following footnoted discussion on Euripides' *bio-* usage: [2]

664. Note here the distinction between ζωή and βιοτή[2] (=βίοτος). Roughly we may say that ζωή denotes the animal side of existence, the mere living (κατθανεῖν, while βίος denotes the activities of life; βίοτος indicating the *enjoyment* of life in contradistinction to its *duration* (the word is never found in Attic prose). We find βίος sometimes used for the life after death (*e.g.*, in Pindar). In later (Hellenistic) Greek, the meanings of the words got shuffled: thus, while ζωή is occasionally used in *N. T.* for physical existence, in the great majority of instances it means life in union with God (*e.g.*, 1 John v. 20); βίος is found=βίοτος, *victus*, in 1 John iii. 17.

[2] βιοτάν is the reading of L G here. It is, perhaps, a gloss on στάδιον (the metaph. of διαύλους in l. 662 being followed up). In any case the MSS. have διπλοῦν, which cannot go with the fem. βιοτάν.

Here we see the etymology of "bio" intertwined with theology (i.e. meaning "union with god") and afterlife ideas (e.g. meaning "life after death"), among other issues.

The c.495BC fragment 48 (Q) of Heraclitus, however, also uses the term "βίος" in the sense of life.

Quotes | By

The following are related quotes:

> "It was a wise man that invented god."
>
> — Euripides (c.450BC), "Concerning God" (Q); oft-attributed, incorrectly, in 20th century (Q), to Plato, in the form "He was a wise man that invented god"; James Haught (pg. 21), e.g., cites Plato's attributed dialogue (Q) *Sisyphus* (Q) dialogue as the source

> "Question everything."
>
> — Euripides (c.440BC) (Q)

> "A man's most valuable trait is a judicious sense of what not to believe."

— Euripides (c.430BC) (O)

"The good and bad cannot be kept apart; but there is some commingling, which is well."

— Euripides (c.420BC), *Source*; cited by Plutarch (100AD) in his *Moralia* as an early variant of the good and evil commingling principle

References

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2. Blakeney, E.H. (1904). *Euripides: Hercules Furens* (note #664, pgs. 99-100). William Blackwood and Sons.
3. Plutarch. (c.100AD). *Isis and Osiris*; in: *Plutarch's Moralia, Volume Five*: Isis and Osiris. The E at Delphi. The oracles at Delphi no longer given in verse (§44) . The obsolescence of oracles (Introduction: Victor Hanson). Harvard University Press.

External links

- Euripides – Wikipedia.

θΔics

In existographies, **Eusebius** (c.263-340) (Cattell 1000:508) (CR:4) was Greco-Roman Christianity historian, noted for []

Overview

In 300AD, Eusebius, in his *Ecclesiastical History*, stated that there was an alleged persecution (Q) of a "Christian" (see: silent historians problem) at Lyon in Gaul (177AD) during the reign of Marcus Aurelius; this purported persecution, however, is debatable (Q), e.g. it is not mentioned in Irenaeus 5-volume *Adversus Haereses* (180AD), and it is out his Stoic character. [2]

Quotes | By

The following are quotes by Eusebius:

> "The first man, according to the Egyptians, was Hephaestus [Ptah], who was the inventor of fire. From him descended the sun. After whom Agathodaemon (Q) . After whom Cronus [Saturn]. Then Osiris. And then Typhon [Set], the brother of Osiris. After whom was Orus [Horus], the son of Osiris and Isis. These were the first Egyptian kings. After them, the empire descended by a long succession to Bites, through a lapse of 13,900 years [months]; reckoned, I say, in lunar years of thirty days to each: for even now, they call the month a year. After the gods, a race of demi-gods reigned 1,255 years. Then reigned other kings 1,817 years. After them, thirty Memphite kings, 1,790 years. Then ten Thynite kings, 330 years. Then came the kingdom of the manes and demi-gods. 5,813. The number of years altogether amounts to 11,000; which also are lunar years, that is to say, months. All the lunar years which the Egyptians allow to the reigns of the gods, the demi-gods, and the Manes, are 24,900."
>
> — Eusebius (300AD), *Publication* (Q)

> "It is called the 'atom' not because it is the smallest thing, but because it *cannot be cut*, since it cannot be affected and contains no void."
>
> — Eusebius (c.313), *Praeparatio Evangelica* (XIV.14.5) [1]

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2. (a) Paulkovich, Michael. (2013). *No Meek Messiah*. Publisher.
(b) Paulkovich, Michael B. (2014). "God on Trial: The Fable of the Christ" (Q), *Free Inquiry*, 34(5).

External links

- Eusebius – Wikipedia.
- Praeparatio evangelica – Wikipedia.

θΔics

In existographies, **Evangelista Torricelli** (1608-1647) (IQ:175|#241) [Kanowitz 50:46] (GPE:89) (Eells 100:85) (CR:59), pronounced "Toor-a-chelli" (Q), was an Italian mathematical physicist noted for his 1644 investigation of the pump problem, suggested to him by his mentor Italian physicist Galileo Galilei, wherein he invented the world's first barometer, therein proved that atmospheric pressure exists, and experimentally demonstrated the vacuum (see: Torricelli vacuum); this later put the idea into the head of Blaise Pascal (1648) to climb a mountain with the barometer, to see if it's height went down as one climbed.

Mercury

In 1638, Galileo, in the Leiden edition of his *Discourse on the Two New Sciences*, added a note to his Galileo engine (1632) discussion, stating that if, in stead of water, other liquids such as mercury, oil, or wine were used, that the so-called "rupture of the vacuum" would occur at a higher or lower height:

> "And it is my belief that the same result will follow in other liquids, such as quicksilver, wine, oil, etc., in which the rupture will take place at a lesser or greater height than 18 braccia, according to greater or less specific gravity of these liquids in relation to that of water, reciprocally; always measuring such heights perpendicularly, however."
>
> — Galileo (1638), corrections made by Vincenzo Viviani, with the approval of Galileo, to the Leiden edition of *Discorsi*; cited by William Middleton (1964) in *The History of the Barometer* (pg. 20)

This text addition, supposedly, was made by Galileo's student Vincenzo Viviani, with the approval of Galileo. Viviani, also, later became the pupil of Torricelli. Thus, no doubt, Torricelli would have had this mercury idea in mind.

In 1639 to 1643, Rafael Magiotti told Torricelli about the Berti vacuum experiment; Magiotti also mentioned that if salt water was used instead of ordinary water, that the column would not stand so high. [3]

In 1642, Evangelista Torricelli succeed Galileo as philosopher and mathematician to the Grand Duke of Tuscany. [3]

On 11 Jun 1644, Torricelli, in a letter to Michelangelo Ricci, stated that "some sort of philosophical experiment was being done" related to the vacuum:

> "Some weeks ago, I asked signor Antonio Nardi (Q) for some of my demonstrations on the area of the cycloid, requesting him to direct them to you, or rather to signor Magiotti, after he had seen them. I have already hinted to you that **some sort of philosophical experiment was being done concerning the**

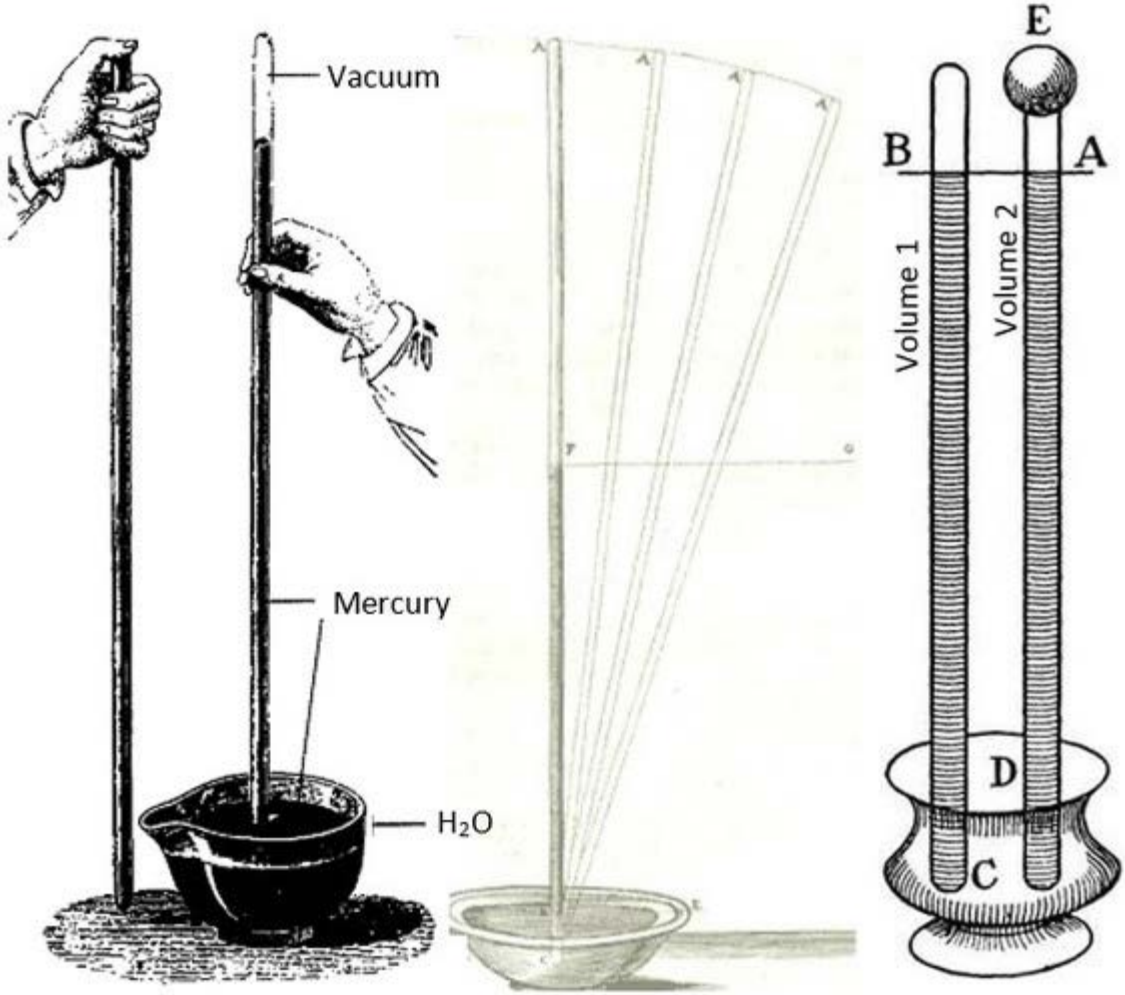

Left (and middle): images (Q) showing how Torricelli used his thump to upend a filled tube of mercury into a dish of mercury, and then released his thumb, and observed the drop in the column of mercury, thereby making, conclusively, a vacuum in the empty section in the top of the tube. Right: Torricelli's mercury column device, illustrated by him in a Jun 1644 letter to Michelangelo Ricci, which he used to make a vacuum, showing how he used two tubes of different volumes, yet the height of the mercury remained the same, therein disproving the conjecture that there was some "rarefied stuff" (e.g. Cartesian subtle matter) in the top volume (that the level BA remained the same, despite the two volumes, disproved the rarefied stuff objection); he also explained how he floated a top layer of water above the mercury, such as shown above left, and that when he raised the tube to the water/mercury divide, that water rushed in, with great violence, and filled the voided region, therein "proving" that the top was, in fact, empty, i.e. a vacuum. [1]

vacuum; not simply to produce a vacuum, but to make an instrument which might show the changes of the air, now heavier and coarser, now lighter and more subtle. Many have said that the vacuum cannot happen; others that it happens, but with repugnance of nature, and with difficulty. I really do not remember that anyone has said that it may occur with no difficulty, and with no resistance from nature?"

Here we see Torricelli, of note, speaking about the experiment in the plural sense, namely that some sort of philosophical experiment "was being done", as though he was not doing the experiment himself, but rather was directing the experiment, guiding the experiment, or had assigned it to a student as a project, or something along these lines?

We also note that in c.1663, Carlo Dati (1619-1676) (Q), a disciple of Galileo, and either acquaintance or student of Torricelli, reported, in a letter, that it was not Torricelli that performed the experiment, but rather it was Vincenzo Viviani who made the apparatus, procured the mercury, and did the experiment. [4]

Torricelli continues:

> "I reasoned thus: if I found a very obvious cause, from which resulted this resistance that is felt in trying to produce a vacuum, it would seem vain to try to attribute that resistance to the vacuum itself, as it would

clearly derive from the other cause. On the contrary, making some very easy calculations, I find that the cause I adopted, i.e. the weight of the air, ought by itself to produce a greater resistance than it does when we attempt to make a vacuum. I say this because some philosopher, seeing that he could not escape confessing that the gravity of the air is the cause of the resistance that is felt in producing a vacuum, would not say that he conceded the operation of the weight of the air, but would persist in his assertion that nature also helps by her repugnance to the vacuum.

We live submerged at the bottom of an ocean of elementary air, which is known by incontestable experiments to have weight, and so much weight, that the heaviest part near the surface of the earth weighs about one four-hundredth as much as water. Then writers have observed regarding the twilight that the vaporous air is visible above us for about fifty or fifty-four miles. But I do not think it as much as this, because I should then admit that the vacuum ought to produce a much greater resistance than it does, even if there is this escape for these writers, that this weight, given by Galileo, refers to the lowest air, frequented by man and animals, but above the peaks of high mountains the air begins to be very pure, and of much less weight than the four-hundredth part of the weight of water.

We have made many glass vessels such as those shown at A and B, wide, and with necks two ells long (see: adjacent figure). When these were filled with quicksilver, their mouths stopped with the finger, and then turned upside-down in a vase C which had some quicksilver in it, they were seen to empty themselves, and nothing took the place of the quicksilver in the vase which was being emptied.

Nevertheless, the neck AD always remained full to the height of an ell and a quarter and a finger more. To show hat the vessel was perfectly empty, the basin was filled up to D with water; and on raising the vessel little by little, it was observed that when the mouth of the vessel reached the water, the quicksilver in the neck came down, and the water rushed in with horrible violence and filled the vessel completely up to E.

While the vessel AE was empty, and the quicksilver, though very heavy, was sustained in the neck AC, we discussed this force that held up the quicksilver against its natural tendency to fall down. It was believed until now, that it was something inside the vessel AE, either from the vacuum, or from that extremely rarefied stuff; but **I assert that it is external, and that the force domes from outside**. On the surface of the liquid in the basin presses a height of fifty miles of air; yet what a marvel it is, if the quicksilver enters the glass CE, to being in which it has neither inclination nor repugnance, and rises there to the point at which it is in balance with the weight of the external air that is pushing it!

Water, then, in a similar vessel but very much longer, will rise to about eighteen ells, that is to say, as much higher than the quicksilver as quicksilver is heaver than water, in order to come into equilibrium with the same cause, which pushes the one and the other.

This reasoning was confirmed by making the experiment at the same time with the vessel A and with the tube B, in which the quicksilver always stopped at the same level AB; an almost certain sign that the force was not within; because the vase AE would have had more force, there being more rarefied and attracting stuff, and this much more vigorous by virtue of it greater rarefaction than that in the very small space B.

With this principle, I then tried to preserve all the kinds of repugnance which are felt to be in the various effects attributed to the vacuum, and up to this moment I have not met one of them that does not go well with it. I know that may objections will occur to you, but I hope also that think about the matter will appease them.

I have not been able to succeed in my chief intention, to find out with the instrument EC when the air is coarser and heaver and when more subtle and light; because the level AB changes from another cause (which I never thought of), that is, it is very sensitive to heat and cold, exactly as if the vase AE were full of air." ."

— Evangelista Torricelli (1644), "Letter to Michelangelo Ricci", Jun 11 [1]

The following is an alternative synopsis of how Torricelli (or Vincenzo Viviani) made his barometer:

> "Torricelli took a glass tube 2 cubits (110–120 cm) long and filled it with mercury. He then placed a finger over the end and inverted the tube in a basin containing mercury. He saw that the mercury fell until its height above the surface in the trough was a 'cubit and a quarter and an inch besides'. A cubit and a quarter is probably 73 cm, so he reported the height as in the region of 76 cm of mercury."
>
> — John West (2013), "Torricelli and the Ocean of the Air" [1]

(add)

Influenced

Torricelli influenced Blaise Pascal, who in 1648 repeated Torricelli's experiment by taking a mercury dish up a mountain.

Quotes | On

The following are quotes on Torricelli:

> "To us his incredible genius seems almost miraculous."
>
> — Marin Mersenne (c.1647), comment (Q) on Torricelli

> "It may seem strange that the Tuscan philosopher [Galileo], after advancing so far, should have stopped on the verge of a great discovery. He had already weighed the air, and it was only another small step thence to inter the effect of its incumbent mass. But the atmosphere was still believed to reach to the moon, and the pressure of columns of such enormous altitude seemed to mock all calculation, and overwhelm the imagination, Yet, on reconsidering the subject, Galileo began to suspect the solidity of the explanation which he had given; but it was now too late for him, in his advanced age, loaded with bodily infirmities, and dispirited by clerical persecution, to attempt any farther innovation in science. **Recommending it earnestly to bis friend and pupil Torricelli** to resume the investigation, this illustrious precursor of Newton expired in 1642. Torricelli now conceived the happy idea of exhibiting the action of a pump [?] on a contracted scale, by means of a column of mercury, width is nearly fourteen times heavier that of water. This experiment he first communicated to his friend Viviani, **who performed it** with success in 1643; and he afterwards repeated and varied it himself."
>
> — Anon (1853), *Encyclopedia Britannica, Volume Four* (pg. 449-50)

Quotes | By

The following are noted quotes by Torricelli:

> "I feel very fortunate to have been born in a century which was able to know and to write the praises of a Galileo, and oracle of nature."
>
> — Evangelista Torricelli (1632), "Letter to [Person]"; cited by William Middleton (1964) in *The History of the Barometer* (pg. 20)

> “Many have argued that a vacuum does not exist, others claim it exists only with difficulty in spite of the repugnance of nature; I know of no one who claims it easily exists without any resistance from nature.”
>
> — Evangelista Torricelli (c.1640) (Q)

See also

- Torricellian vacuum

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(b) Shea, William R. (2003). *Designing Experiments and Games of Chance: the Unconventional Science of Blaise Pascal* (pg. 32). Science History Publication.
4. (a) Dati, Carlo. (1663). Lettere a Filateli di Timauro antiate, Della Veera Storia della Cicloide, e della Famosissima Experienza dell;Argento Vico, Florence, pg. 20.
(b) Shea, William R. (2003). *Designing Experiments and Games of Chance: the Unconventional Science of Blaise Pascal* (pg. 32). Science History Publication.

External links

- Evangelista Torricelli – Wikipedia.
- Evangelista Torricelli – RobertNowlan.com.

θΔics

In existographies, **Evariste Galois** (1811-1832) (IQ:165|#442) [RGM:517|1,500+] [GME:16] (Glenn 20:11) was French mathematician, noted for []

Overview

Galois, prior to age 12, was educated by his mother, Adélaïde-Marie Galois, daughter of a jurist, fluent in Latin and classical literature.

At age 14, Galois read Adrien Legendre's *Elements of Geometry* "like a novel", as he says, mastering it at first reading; at 15, he read Joseph Lagrange's *Reflections on the Algebraic Solutions of Equations*, which motivated his later work on equation theory.

Politics

In 1828, Galois, after he entered the Ecole Preparatoire, became friends with the brothers Auguste Chevalier and Michel Chevalier, who were interested in the "Saint-Simonianism" (Ñº), i.e. the science as religion like utopian views of Henri Saint-Simon, who believed that the best direction for the economics of a society consisted in the elimination of poverty and ignorance, which could be achieved by turning Christianity into a secular religion, and granting power to the scientists rather than the priests. [1]

In 1826, the year after Saint-Simon de-existed (died), meetings of an association to continue the spread of his ideas were held in the Paris apartment of Hippolyte Carnot and Sadi Carnot, which resulted in the newspaper called *Le Producteure*, which lasted only one year, but had as its most frequent contributors being Auguste Comte.

This movement absorbed Galois, to some extent taking away energy from mathematics, to the extent that in 1830, in his first year final exams, on differential and integral calculus, he scored fourth out of eight candidates, as judged by Augustin Cauchy, and

Quotes | By

The following are quotes by Galois:

> "Unfortunately, what is little recognized is that the most worthwhile scientific books are those in which the author clearly indicates what he does not know; for an author most hurts his readers by concealing difficulties."
>
> — Evariste Galois (c.1831) (Ñº)

References

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External links

â— Evariste Galois – Wikipedia.

θΔics

In religio-mythology, **Eve** (TR:18), from the Hebrew "breath" or "spirit", is the fictional female character (Egyptian prescript: Hathor), in the story of Adam and Eve, namely wife of Adam (Egyptian prescript: Atum), as told in the Bible (section: Genesis) the purported first woman of humankind, who was said to have been created by god out of one of Adam's ribs.

An depiction of the supernatural act, described in Genesis 2:21-22, of god making **Eve** from Adam's rib.

Myth | Origin

The origin of the puzzling story of god making a woman from the rib of a man, as summarized well by Gary Greenberg (2000), is an admixture of the Heliopolis creation myth story of the god Shu, son of Atum, pulling Nut (heaven) from Geb's (earth) body, thereby separating heaven and earth, PLUS the Egyptian mythology story of how the god Khnum made the first two humans out of clay on his potter's wheel (supposedly by separating one original ball of magical clay), PLUS the Sumerian mythology story of the goddess Ninti, meaning "lady of the rib", who had the power to make humans out of a mixture of blood and clay, healing Enki's rib; the gist of this is summarized below: [1]

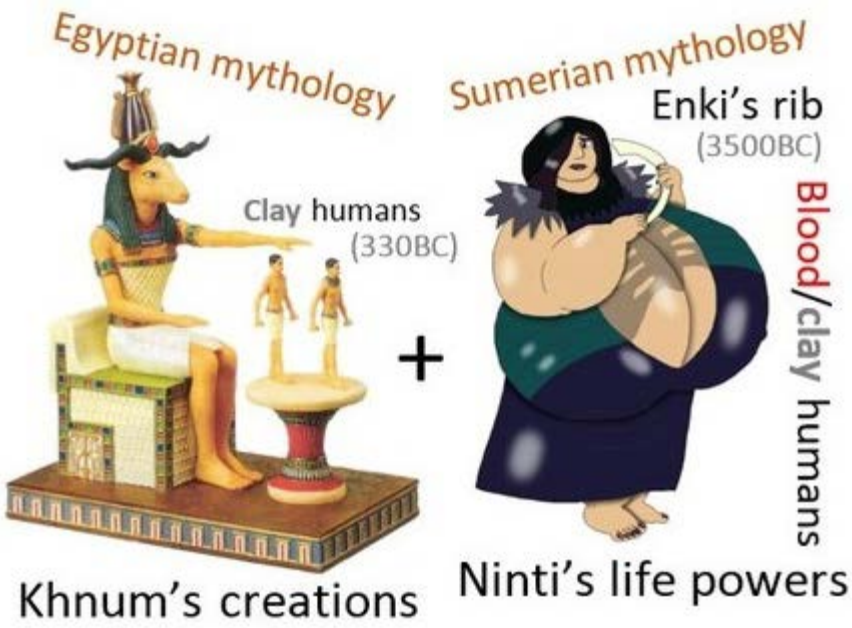

In the Hebrew redaction (1200-500BC), of Egyptian religion, according to recension theory, the Sumerian myth and the two Egyptian myths were synretized into a new more palatable monotheized story, aka the story of Adam and Eve.

Other

In c.1770, Albrecht Haller, on the "scatulation theory", which assumed that the outline of the entire organism, with all its parts, was present in the egg, according to which the ovary of the embryo had to supposed to contain the ova of the following generation (and, these, again, the ova of the next generation; and so on), calculated that god, 6,000-years ago, on the sixth day of creation, packed the germs of 200-billion men into the ovary of Eve (see: Adam and Eve). [2]

Quotes

The following are related quotes:

> "The story of **Eve** and the serpent, and of Noah and his ark, drops to a level with the Arabian Tales, without the merit of being entertaining, and the account of men living to eight and nine hundred years becomes as fabulous as the immortality of the giants of the mythology."
>
> — Thomas Paine (1794), *The Age of Reason* (Ñº)

> "How could god create **Eve** from Adam's rib?"
>
> — Ricky (2015), one of three written down questions, brought by an aged 11 boy to Libb Thims' Zerotheism for Kids: Smart Atheism for Children "Monday School" class, Aug 10

> "Why was there a first man, instead of a woman?"
>
> — Temple (2015), one of six written down questions, brought by an aged 10 girl to Libb Thims' Zerotheism for Kids: Smart Atheism for Children "Monday School" class, Aug 10

> "The drafting book *Smart Atheism: for Kids* is a follow up to an actual 'smart atheism' stylized 'Sunday School' for kids class I taught in Aug 2015 to five kids, who came with Noah's ark and Adam's rib questions and left (Ñº) with Big Bang and molecular evolution answers."
>
> — Libb Thims (2017), "Email to Gary Greenberg", Jun 10

References

1. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (Eve, pgs. 44, 54-55). Source Books.
2. Haeckel, Ernst. (1899). *The Riddle of the Universe: at the Close of the Nineteenth Century* (translator: Joseph McCabe) (pgs. 42, 55). Harper & Brother, 1900.

External links

â— Eve – Wikipedia.

θΔics

In terminology, **event** (TR=300) is an instance or happening in time within a given reference frame. An 'event', defined by Albert Einstein, and his theory of relativity, is the fundamental entity of observed physical reality represented by a point designated by three coordinates of place and one of time in space-time continuum. [1]

Quotes

The following are related quotes:

> "When we say that there is a causal connection between two consecutive **events**, we mean that there is some kind of law connecting them, the earlier event being called the cause, and the latter the effect."
>
> — Max Planck (1936), *The Philosophy of Physics* [1]

> "Whether or not historical **events** are causality connected or are the result of chance, accident or mathematical probability are much more than abstract speculations. Their answer goes to the very root of the historian's method of procedure. Of what would it avail us, if after all our labor, the reader were to agree that while strict causality has been proved in all past history, the future must be shrouded in darkness, or is controlled by chance? One may be convinced that historical laws are controlled by laws, but conclude that these laws are not causal, but indeterminate in nature."
>
> — Morris Zucker (1945), *A Field Theory of History* [2]

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External links

â— Event (disambiguation) – Wikipedia.

θΔics

In science, **Everett Mendelsohn** (c.1932-) is an American science historian noted for his 1964 book *Heat and Life: the Development of the Theory of Animal Heat*, in which a rather through-going history of the theory of animal heat, from the time of ancient Greek science, into the 18th century theories, e.g. John Hunter, to the modern French-German-English era of modern 19th century science, into 20th century animal thermodynamics.

In Greek science, to give a few examples, Mendelsohn gives overviews of physician Galen's discussions of the vital flame as well as Hippocrates doctrine of internal heat, which stated that "heat, a quantity which functions to animate, derives from an internal fire located in the left ventricle".

In French science, Mendelsohn overviews physiologist Claude Bernard's discussions of how the term 'life' is nothing but a word which means ignorance, but a term nevertheless closely associated with heat, as well as chemist Antoine Lavoisier's combustion theory of heat (animal heat).

Mendelsohn history of the theory of animal heat ends with the mid-to-late 19th century displacement of the animal heat or vital heat theory with the more abstract concepts such as 'vitalism', the idea that there is some type of living force inside of animals and people which explains life, as well as the upgrade to the more modern thermodynamic concept of the measure the mechanical equivalent of heat of animals, such as was done by Benjamin Thompson, or the mechanical equivalent of heat of humans, as done by Gustave Hern. [1]

Notes

A noted downside of Mendelsohn's historical presentation is that he dates the start of the theory of animal heat to the era of the invention of the Greek classical element theory (c.500BC), that everything is made of earth, air, water, or fire; whereas, there seems to exist a large uncharted Egyptian proto-science period (3500-300BC) of pre-history to the theory of animal heat, generally centered around theory that the sun was a god called Ra (or other variants, such as Amun-Ra) that was the "living flame", that came from the Nun, who created both men and animals. [2] Further research in this area might show an influential connection of the Greek animal heat theory to the Egyptian clay creation myth of men and animals created or rather given life in some way from the living flame. Mendelsohn also seems to precariously leave out mention of the "Promethean heat" myth.

Education

Mendelsohn was a professor of the history of science at Harvard University from 1960 to 2007, thereafter becoming professor emeritus. [3]

References

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External links

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θΔics

In science, **everything is energy**, or "alles ist energie" (German), or "all is energy", is a motto or ideology, defended scientifically in the late 19th century by the energetics school, and seen growingly in the new age schools thereafter, that all "things" in the universe can be reduced down to or explained as energy, and or variations of energy.

Overview

The “everything is energy” motto, historically, seems to be a simplified truncation of the first law of thermodynamics (Clausius, 1865), which itself is synthesis of: the conservation of energy (Joule, 1843), the mechanical equivalent of heat (1635, Baliani), and the conservation of force (Mohr, 1837).

In 1887, German physicist Georg Helm published his influential *The Doctrine of Energy*, which was read by many, such as Wilhelm Ostwald (below).

Ostwald | All is energy

In 1887, Wilhelm Ostwald, in a lecture at Leipzig, outlined his new “energism” (see: energetics) view, as American historian Niles Holt refers to it, according to which all natural processes are essentially transformations of energy, and most-contentiously that: [1]

> “Matter is only a mirage, which the mind creates to comprehend the workings of energy.”

In 1890, Ostwald entered into the universal theory of everything arena of the “all is energy” philosophical motto, following a spring physics conference in Berlin, wherein Ostwald attempted to convince a group of physicists to adhere to the following new outlook: [2]

> “From now on the whole of physics has to be represented as a theory of energies.”

This incident has been documented by American energetics historian Robert Deltete in a series of articles. The group found the idea “so absurd that they refused to take it seriously at all” and offered only “ridicule and abuse”. The next morning, Ostwald awoke early and went for a walk in the *Tiergarten*, and had a “personal Pentecost”, as he described it, seeing clearly the view that “all is energy”. Ostwald’s revelatory moment of insight is detailed in his *Autobiography*, and is quoted in Eduard Farber’s *Great Chemists*. [3]

Of note, in order for Ostwald to accept this "all is energy view", he had to reject atomic theory; he only later recanted on this disbelief in 1909.

In 1910, Ostwald, together with Ernst Haeckel, began promoting and giving their Monistic Sunday Sermons, wherein they preached their energy-based monism ideology. This, in large part, was the apex of the "all is energy" or "everything is energy" ideology.

Einstein | Mass-energy equivalence

In 1905, Albert Einstein, in his "Does the Inertia of a Body Depend upon its Energy-Content?", proved or showed that matter and energy are incontrovertible, i.e that a mass-energy equivalence exists, the two matter *m* and energy *E* related by the following formula:

$$E = mc^2$$

where c is the speed of light. This formula: **$E = mc^2$**, supposedly, is evidenced in the Einstein-Szilard letter (1939) (Ñº), the Hiroshima and Nagasaki bombings (1949), and other nuclear fission reactions (Ñº) to follow.

Dirac | Fermions + Bosons

In 1945, Paul Dirac, in his "Developments in Atomic Theory" lecture, referring to quantum particles that obey the laws that he and Enrico Fermi had set out in 1926, declared, in a roundabout way, that everything reduces to fermions (matter particles) and bosons (force particles).

Everything | Theories

Into the late 20th century, after Ostwald, specifically, and Dirac, in particular, energy-based theories of everything, were superseded, or supplanted, so to say, by thermodynamics-based theories of everything, as evidenced by the so-called Einstein postulate; albeit more difficult to state explicitly.

New age

In the 20th century and going into the early 21st century, the "everything is energy" motto seems to have been hijacked by the new age movement, as evidenced by the smattering of books (Ñº) proliferating and promulgating on this platform, e.g. law of attraction ideologies, "choose your own energy", power of prayer, etc., among other anthropomorphic and or religio-mythology ingrained ideologies.

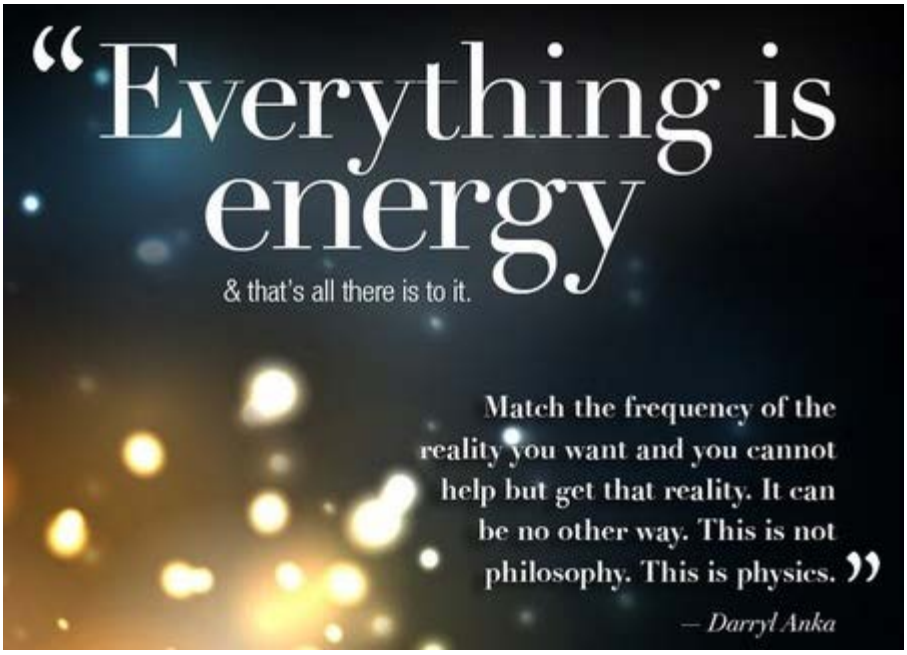

A new age stylized "**everything is energy**" image, attributed to Darryl Anka.

Quotes

The following are related quotes:

> "The time will be when this will be accomplished, and the time has come when one may utter such words before an enlightened audience without being considered visionary. We are whirling through the endless space with an inconceivable speed; all around us everything is spinning, everything is moving, **everything is energy**. There must be some way of availing ourselves of this energy more directly. Then, with the light obtained from the medium, with the power derived from it, with every form of energy obtained without effort, from the store forever inexhaustible, humanity will advance with giant strides. The mere contemplation of these magnificent possibilities expands our minds, strengthens our hopes and fills our hearts with supreme delight."
>
> — Nikola Tesla (1891), "Talk given to the American Institute of Electrical Engineers" at Columbia University; in *The New Nation* (pg. 440), Aug 8

> "Today it is believed to bring something new when we say: **everything is energy**. As far as they were formerly."
>
> — Paul Mobius (1898), "Zum Andenken an J. Ch. A. Heinroth" (Ñº), commentary on the views of force views of psychosomatic theorist Johann Heinroth (1773-1843) and soul, spirit, body views of Friedrich Jacobi (1743-1819)

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External links

â— Everything is energy (section) – RationalWiki.

θΔics

In hmolscience, **Evgeni Vasilevich Spektorsky** (1875-1951) was a noted Polish-born Russian sociologist noted for his two volume 1910/17 *The Problem of Social Physics in the 17th Century*, which is referred to by Pitirim Sorokin (1927) as "an outstanding contribution to 'mechanistic sociology'." [1]

In 1979, Polish scholar Antoni Krawczyk, in his "Evgeni Spektorsky: a Student of the History of Science", published in English, did a critique of Spektorsky's *Problem of Social Physics* and his "Nominalism and Realism in Social Sciences", discussing Spektorsky's views on physics, chemistry, and energy in sociology in respect to realism. [2]

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External links

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θΔics

In existographies, **Evguenii Kozliak** (c.1961-) (SNE:18) (CR:7) is a Russian-born American physical chemist noted, in human thermodynamics, for 2002 "Energy and Money, Chemical Bonding as Business, and Negative ΔH and ΔG as Investment", wherein, citing the earlier cash flow as heat flow models of American chemist Charles Wynn (1994), he attempts to correlated people to molecules, enthalpy to money, entropy to internal investment, and free energy to profit.

Overview

In 2002, Kozliak, in his "Energy and Money, Chemical Bonding as Business, and Negative ΔH and ΔG as Investment", building on the work of Charles Wynn (1997), outlined a type of human thermodynamics education style of teaching, defining people as human atoms or human molecules and applies chemical thermodynamics, namely the Gibbs equation, to business (see: business thermodynamics), specifically as a way to facilitate the teaching of physical chemistry; possibly also outlining some variant of a human chemical bond theory. Kozliak abstracts his interesting article as follows: [1]

> "A simple analogy is suggested illustrating the thermodynamic sign convention and the significance of the negative sign of ΔH and ΔG on spontaneity for general or introductory chemistry students. Enthalpy or energy is associated with money, and atoms or molecules are referred to as people. The suggested metaphor for ΔH is net profit or investment into the surroundings; positive ΔS is viewed as internal investment into the system. Hence, ΔG is similar to gross profit in business; its dependence on temperature is illustrated by the reversal of the market trends for high-tech companies in 2000. The analogy is further expanded to illustrate the significance of ionic lattice enthalpy, the positive sign of atomic ionization energies, and chemical bond enthalpies."

The one salient deficit in this teaching method is the conditional note that this is a "simple analogy" or neat metaphor, which leaves the student ambiguous as to what is in the realm of fact and what is not. Of note, the mention of "atoms or molecules referred to as people", as of the third millennium, is no longer an analogy, because the stoichiometric approach now "considers whole organisms as single abstract molecules", each with a measureable and characteristic molecular formula, in particular being that the human molecular formula has been calculated three independent times within the last decade (*Ecological Stoichiometry*, 2002; *New Scientist*, 2005; *Human Chemistry*, 2007), and that the "human as molecule" point-of-view is no longer analogy nor metaphor but a measureable reality, albeit a debatable one (see: HMS pioneers).

Wynn's analogies

Kozliak, to note, was led into his analogy via the previous 1994 article "Heat Flow vs Cash Flow: A Banking Analogy" by American chemist Charles Wynn, whose abstract is as follows: [6]

> "An analogy is drawn between the withdrawal of money from an automated teller machine (ATM) and an exothermic chemical reaction. In the analogy the amount in an individual's account is regarded as the system and the money withdrawn is regarded as part of the surroundings. Diagrams are used to present the analogy. An analogy can be drawn also between a deposit into an account and an endothermic chemical reaction."

Here we see the money as energy model being used, which is common (tracing back to at least the 1911-1926 work of Frederick Soddy), but also see the interesting usage of the exothermic/endothermic distinction, which may give way, in students minds, to the rather intricate notion of human chemical reaction theory.

Nordholm's analogies

An alternative abstract, entitled "Chemical Bonding as Business and Electrons as Humans: Two Metaphoric Illustrative Models", by the *American Chemical Society*, highlighting in that Kozliak also compares people to electrons (using the human electron or free electron model) is as follows: [2]

> "Two novel metaphoric illustrative models (systems of analogies, metaphors, and illustrations) are suggested designed to 'animate' the first-semester general/introductory chemistry lecture. The first model views energy as money, chemical bonding as business, and the change of free energy as investment. The second model …"

Here, by use of the accentuated brackets around the term 'animate', we are reminded of the similar 1997 JCE article "In Defense of Thermodynamics: an Animate Analogy", by Swedish physical chemist Sture Nordholm, wherein he introduces the subject the subject name "animate thermodynamics" as the thermodynamics of human behavior, and argues that thermodynamic formulation can be applied to explain human behavior, on the logic that the basic elements of the description of atoms, molecules, and matter can be "scaled up" to the realm of living organisms without changes other than in complexity of the systems and their behavior; equates energy to wealth, kinetic energy to cash, potential energy to property, and entropy to freedom; states that nature's goal is to minimize the free energy of the subsystem; and ends with the assignment of eight example homework problems (with clues). [3] The difference between the two teaching methods: Kozliak (pure analogy) vs. Nordholm (scalable results), might well highlight the cultural embeddedness or rather religiously-constrained conservativeness of each college (see: belief in existence of god), namely Sweden (open) as compared to America (conservative): [4]

> **23%** answered that "they do not believe there is any sort of spirit, god, or life force" (Sweden, 2005)
> **2%** answered that "they do not believe there is any sort of spirit, god, or life force" (North America, 2000)

which is why, in short, Nordholm can state as a matter of fact that humans are molecules and that chemical thermodynamics scales up to the human level, whereas Kozliak is forced to maintain that his models is only metaphor or analogy introduced for lively teaching purposes.

Entropy

In general chemistry, Evguenii also has interest in the teaching of entropy, and in 2005 co-wrote an "energy dispersal" model of entropy with American organic chemist Frank Lambert, in an effort to discourage the dominate order-disorder view of entropy. [5]

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External links

â— Evguenii Kozliak (faculty) – University of North Dakota.

â— Kozliak, Evguenii – WorldCat Identities.

θΔics

In knowledge, **evidence** is []

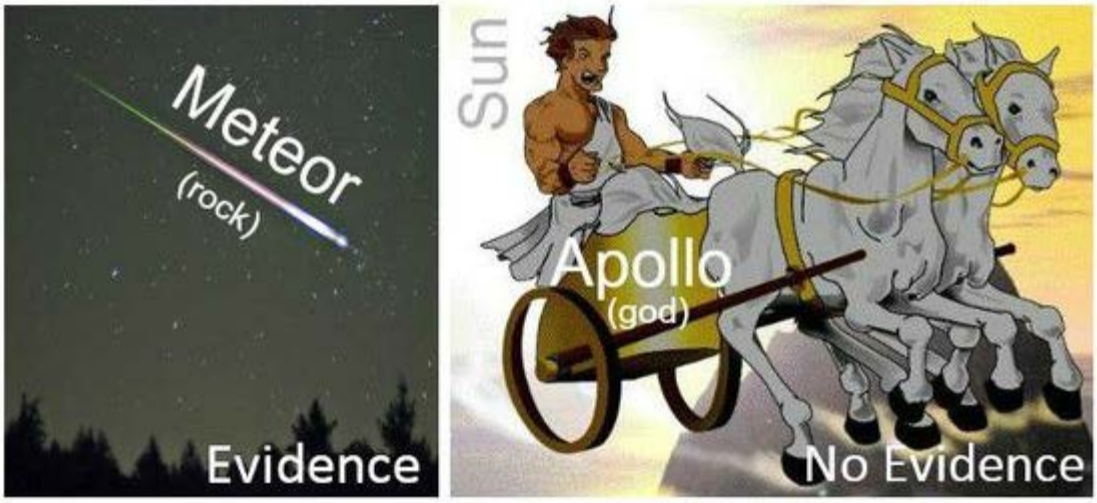

Left: the 2009 Leonid meteor, a type of measureable **evidence**, i.e. something that can be seen, studied, and quantified. Right: a depiction of the god Apollo pulling the sun on his flying chariot; an un-evidenced assertion about which Anaxagoras in 450BC said did not occur, being that he employed the evidence of observed fiery meteors to assert that the sun was a fiery rock moving in a rotating aether.

Anaxagoras | Apollo

In 450BC, when, according to Voltaire (1764), Greek philosopher Anaxagoras claimed that the sun was not driven by Apollo, mounted on a chariot, but rather, based on the "evidence" of examined fallen meteors, and the reasoned postulate that moon light was reflected sunlight, that it was a hot or fiery stone, moving in a fifth element, in addition to the standard four elements, he called "aether", which he conceived of as being in constant rotation and carried with it the celestial bodies, he was called an atheist, and had to flee. [1]

Other

In 2004, American deconversion philosopher American Christopher Redford, aka "evid3nc3", via his YouTube channel name, engaged into the deconversion, from a devout Pentecostal Christian (2001) to that of an "evidence-based secular humanist" (2013), all of which is documented in his 2009 to 2012 "Why I Am No Longer a Christian" video series (see: Redford deconversion model); after which he self-identified as an "evidentialist".

Quotes

The following are example quotes:

> "A wise man proportions his belief to the **evidence**."
>
> — David Hume (c.1760)

> "Facts are stubborn things; and whatever may be our wishes, our inclinations, or the dictates of our passions, they cannot alter the state of facts and **evidence**."
>
> — John Adams (1770), cited by Bertrand Roehner in *Driving Forces* [3]

-

> "Trust a witness in all matters in which neither his self-interest, his passions, his prejudices, nor the love of the marvelous is strongly concerned. When they are involved, require corroborative **evidence** in exact proportion to the contravention of probability by the thing testified."
>
> — Thomas Huxley (c.1870), *Essays Upon Some Controverted Questions* [4]

-

> "There is no **evidence** of a special life force, all of life on earth, including ourselves, is based on chemical processes and the four most common elements involved in the chemistry of life are hydrogen, carbon,

oxygen and nitrogen, collectively known by the acronym CHON. We are made out of exactly the raw materials which are most easily available in the universe. The implication is that the earth is not a special place, and that life forms based on CHON are likely to be found across the universe, not just in our galaxy but in others. It is the ultimate removal of humankind from any special place in the cosmos, the completion of the process that began with Copernicus and *De Revolutionibus*."

— John Gribbin (2002), "CHON and Humankind's Place in the Universe" [2]

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External links

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θΔics

In humanities, **evil** is a term, with negative connotation, historically relating to a state, force, feeling, or act deemed as pernicious, morally reprehensible, or repulsive or something that brings about great sorrow, distress, calamity, suffering, or misfortune; often encompassed as an effect opposite to the progress of life. [1]

Left: Mark Janes (2009), in his video "Morality and Thermodynamics", on good and **evil** in thermodynamic terms.

In human thermodynamics, writers, beginning in about the 1980s, have begun to speculate on the relationship of the concept of evil to the universal laws of thermodynamics. Due to the etymology of the term evil in the history of religion, the term often has biased overlap for many writers, especially in the field of religious thermodynamics. The opposite of evil is termed good.

Thermodynamics

The study of the thermodynamic underpinnings of evil is a difficult subject. By virtue of its implicit connection to a definition of morality, which is itself connected to purpose and meaning, the topic of "evil" invariably digs into the greater issues concerned with the definition of life.

In 1969, American organic chemist Frank Lambert proposed a way of looking at evil in terms of the ordering or disordering effects of thermodynamics. [6]

American physicist-theologian Robert Russell, since 1982, although biased by religious platforms, has argued that as both entropy and evil are often compared to their effect or measure of disorder, then they must be related if they both exist. [2] In 2008, building on thermodynamics of Belgian chemist Ilya Prigogine, Russell states:

> "Thermodynamics help[s] drive evolution and [shape] the phenomenon of both natural **evil** and natural goodness."

Furthermore, according to Russell, "thermodynamics provides the physical possibilities for the actions that we consider both virtuous and immoral." [5] American writer Lyall Watson reasons that evil has a relation to thermodynamic and that, somehow, "creative energies" on earth counter the effects of entropy as defined by the second law of thermodynamics thus keeping earth bound full of life. [3]

In terms of viewing human activity as governed by the combined law of thermodynamics, which states that isothermal, isobaric systems tend towards free energy minimums, within each evolution window, evil can be considered as the neurological effects of human molecular movements, activities, or behaviors running counter to the overall trend. [4]

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Right: a remake of Rene Descartes proving to his professor that evil does not exist, using concepts from physics.

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External links

● Evil – Wikipedia.

θΔics

In science, **evolution** is the Darwinian name (compare: metamorphosis) for the mechanistic process of carbon-based chnopsological form change.

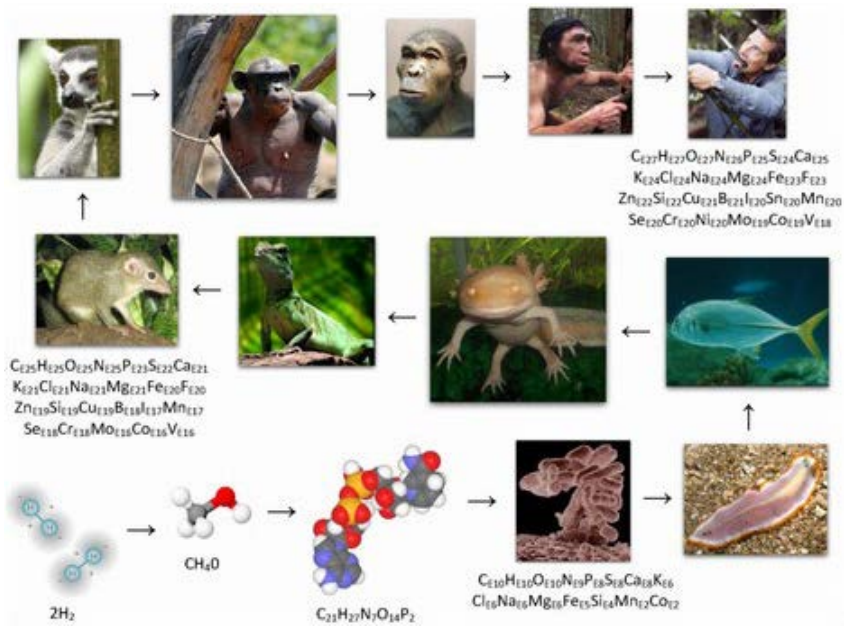

A molecular-based depiction of **evolution**: from the formation of the hydrogen molecule, bottom left, 13.7-billion-years ago, to the formation of the human molecule, top right, 150,000-years ago.

Free energy minimization | Principle

In the early 20th century, the number of scholars who began to glean the view that evolution operates macroscopically in terms of a free energy and or thermodynamic potential minimization principle include: Lawrence Henderson (1917-1935), Alfred Lotka (1925), and Harold Blum (1934), the latter two each progressively citing the former.

Etymology

The term "évolution" (French) was coined in by Swiss naturalist Charles Bonnet in *circa* 1760 used at the same time with his synonyms of "révolution" and "métamorphose", in the context of understanding development, nascent ideas on extinctions, and construction of a classification scheme in the great unbroken chain of being, as he saw things. [1] In this original linguistic sense, evolution seems to have the following underlying etymological meaning:

> **évolution** = [révolution + métamorphose]

Bonnet's usage, over the next century, supposedly, was passed along through the works of French naturalist Jean Lamarck, whose work influenced English natural philosopher Herbert Spencer, whose terminology usage later was adopted by English naturalist Charles Darwin. [1]

The first dominate usage of the term "evolution" in English is found in the works of English natural philosopher Herbert Spencer, who came to adopt some of Lamarck's evolution theories, after becoming curious about exposed fossils he observed while working as a civil engineer from 1837 to 1841. In 1852, he published an article that proposed a conception of natural evolution, albeit one lacking in underlying mechanism. In 1857, he planned a system of "synthetic philosophy", covering biology (chnopsology), psychology, sociology, and ethics, wherein the central evolutionary idea was the progressive transformation of the homogeneous into the heterogeneous, to which he added in the conservation of energy among other ideas from the physics of that decade (see also: Spencerian dilemma). [15]

In 1866, Charles Darwin was persuaded by Alfred Wallace to begin using Spencer's phrase "survival of the fittest" rather than "natural selection" in key passages of his *On the Origin of Species*. In the 1872 sixth edition, Darwin began to use the term "evolution", albeit only sparingly. [15]

Metamorphosis | Transmutation | Synthesis

> *See main: Metamorphosis*

The modern hmolscience technically correct term for the Darwinian-connotative term "evolution", is chemical "synthesis". In the human case, one says that over the last 14-billion years, the universe has synthesized "human molecules" products from hydrogen atoms reactants, through a sequenced step-by-step chemical mechanism.

According to Gallop.com, the percentages of people in the U.S. who believe that humans developed from other life forms are:

39% (high school or less)
46% (some college)
60% (college graduate)
75% (post-graduate education)

Circa 2005 Gallop polls (Ñº) of belief in **evolution**—or development from earlier life forms—by education level, indicating that 40 percent of US college graduates don't believe in evolution.

Theories

> *See main: Evolution theorists*

The following timeline gives a short historical overview of pre-Darwin, Darwin, and post-Darwin "origin of species" (evolution)

theorists. Charles Darwin, his in his 'Historical Sketch', on those who advocated variations on a theory of origin of species, prior to 1859, gives thirty-four authors who believe in the modification of species, or at least disbelieve in separate acts of creation, of which twenty-seven have written on special branches of natural history or geology, in which the two foremost of these, according to Darwin, are Goethe and Geoffroy.

Thermodynamics

See main: Evolution thermodynamics; Thermodynamic evolution

In a thermodynamics perspective, one can analyze the "process of change from one form to another" from a thermodynamic systems point of view, in which daily solar heat input actuates Carnot engine cycles according to which systems dynamically migrate or transform subtly, within each cycle, in structure, in the direction of free energy minimums due to the regulatory actions of the combined law of thermodynamics. From a sub-atomic or chemical point of view, one can study the process of form change through the logic of coupled chemical reactions, such as are evident in molecular evolution tables. [3]

In the 2008 book *The Chemistry of Evolution: the Development of our Ecosystem*, authors R.J.P. Williams and J.J.R. da Silva argue that a biological evolution is inadequate and should be accompanied with the thermodynamics universal views; that species evolution is a thermodynamics necessity to form energy efficient capturing and degradation systems, in which efficiency is rated as the system fitness. [12]

Since nearly the initiation of thermodynamics, it has been argued that the laws of thermodynamics violate evolution. The following 2010 satire comment of Canadian writer Paul DesOrmmeaux is a humorous spin on this: [7]

> "**Evolution** violates the second, third, fourth, and any future laws of thermodynamics that science types can dream up."

The 1999 chapter "Does the Second Law of Thermodynamics Refute the New-Darwinian Synthesis?", by Bruce Weber and David Depew, is one example of this perspective. [8]

A few examples of scientists, who are also creationism advocates, oo have publicly deprecated evolution as the violation of the second law include: Andrew McIntosh, Christopher Jordan, and Stuart Burgess. [11]

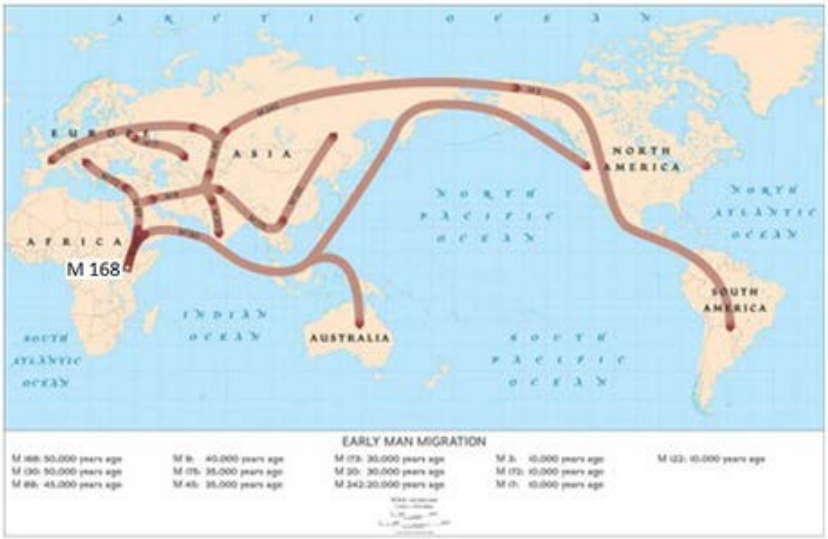

The last common ancestor, dubbed M 168, of all existing humans, according to genetic tracking.

M168

According to genetic tracking of the the Y-chromosome, every single person alive today is descendant from a single man, known as "M168" who lived in and migrated out of the East African Rift Valley some 59,000 years ago. In other words, M168 is the last common human ancestor to all currently existing humans.

Public acceptance | Religion

This doctrine of evolution, that humans evolved from lower forms of life, as of 2005, has an average sixty-two percent public acceptance. [5] In the United States, the theory of creationism is believed over that of evolution (by a 60/40 difference).

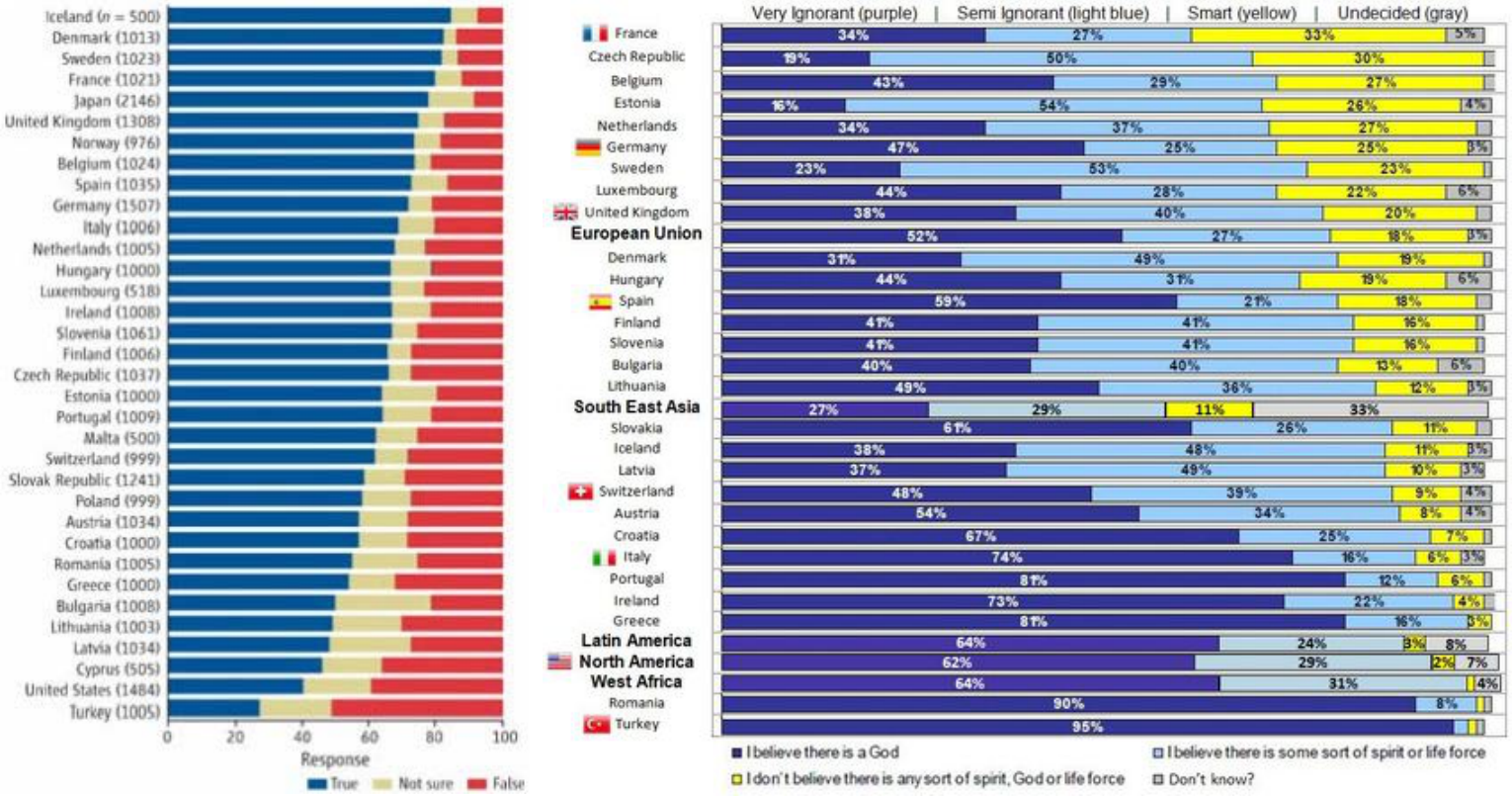

Left: Public acceptance of evolution (2005). [5] Right: a 2005 world belief, or non-belief (yellow), view on: God (purple), spirit or life force (light blue).

In this group of 40 percent of Americans who believe evolution to be true, as cited by Sam Harris (2006) only 12 percent believe that life (animate things) on earth evolved through natural processes, without the interference of a deity. [20]

In 2016, Pew Research polls found that 51% of Americans, under the age of 30, believe in secular evolution, i.e. evolution not directed by any divine power; a jump from 40 percent in 2009. (Ñº)

Evolution timeline

The following evolution timeline video shows evolution lineage from the hydrogen atom to the human molecule, a modern-day take on the earlier "great chain of being" model of existence.

Evolution | Pakistan

The following is the chapter section on "evolution" from a biology textbook in Pakistan: [21]

Facts about Creation of living organisms
The theory of **evolution** as proposed by Charles Darwin in the 19th century, is one of the most unbelievable and irrational claims in history. Despite this, over its 150-year history the people who have accepted it have failed to produce any scientific evidence, supporting the theory. The theory puts forth the irrational claim that all living organisms, plants, animals and human beings are the result of blind, unconscious, accidental events.

Evolutionists believe that millions of years ago, in the primal soup of the oceans or pools of water, mindless atoms with no knowledge, powers of reason, came together in certain proportions and later, by chance [C#1], formed

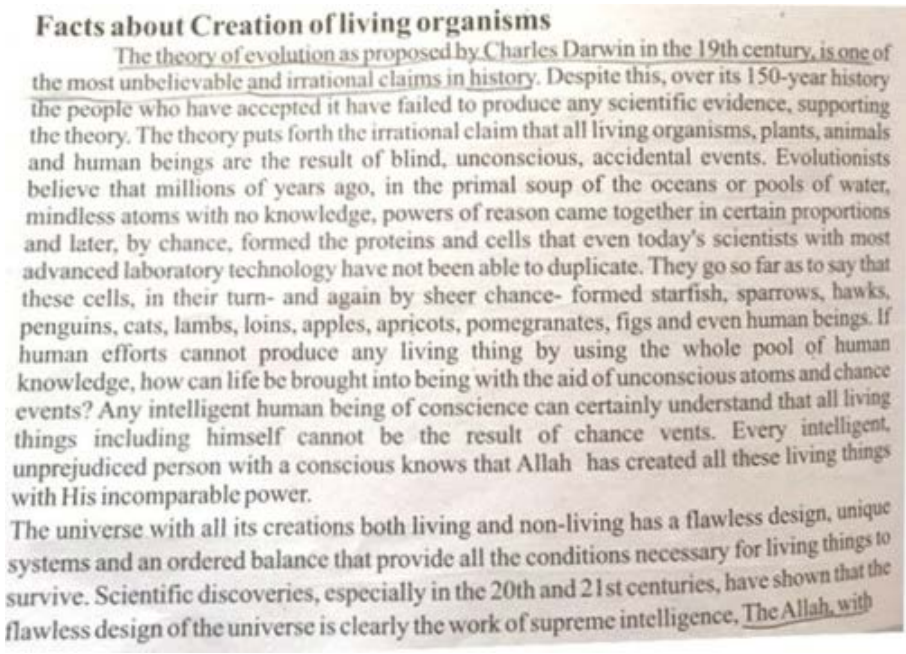

Facts about Creation of living organisms

The theory of evolution as proposed by Charles Darwin in the 19th century, is one of the most unbelievable and irrational claims in history. Despite this, over its 150-year history the people who have accepted it have failed to produce any scientific evidence, supporting the theory. The theory puts forth the irrational claim that all living organisms, plants, animals and human beings are the result of blind, unconscious, accidental events. Evolutionists believe that millions of years ago, in the primal soup of the oceans or pools of water, mindless atoms with no knowledge, powers of reason came together in certain proportions and later, by chance, formed the proteins and cells that even today's scientists with most advanced laboratory technology have not been able to duplicate. They go so far as to say that these cells, in their turn- and again by sheer chance- formed starfish, sparrows, hawks, penguins, cats, lambs, loins, apples, apricots, pomegranates, figs and even human beings. If human efforts cannot produce any living thing by using the whole pool of human knowledge, how can life be brought into being with the aid of unconscious atoms and chance events? Any intelligent human being of conscience can certainly understand that all living things including himself cannot be the result of chance vents. Every intelligent, unprejudiced person with a conscious knows that Allah has created all these living things with His incomparable power.

The universe with all its creations both living and non-living has a flawless design, unique systems and an ordered balance that provide all the conditions necessary for living things to survive. Scientific discoveries, especially in the 20th and 21st centuries, have shown that the flawless design of the universe is clearly the work of supreme intelligence. The Allah, with

Section on "**evolution**" from a Pakistani biology textbook, crouched in the back drop of god

> the proteins and cells that even today's scientists talk (Allah) and anti-chance objection. [21] with most advanced laboratory technology have not been able to duplicate. They go so far as to say that these cells, in their turn—and again by sheer chance [C#2]—formed starfish, sparrows, hawks, penguins, cats, lambs, loins, apples, apricots, pomegranates, figs and even human beings. If human efforts cannot produce any living thing by using the whole pool of human knowledge, how can life be brought into being with the aid of unconscious atoms and chance [C#3] events? Any intelligent human being of conscience can certainly understand that all living things including himself cannot be the result of chance [C#4] events. Every intelligent [I#1], unprejudiced person with a conscious knows that Allah has created all these living things with His incomparable power.

Here, firstly, we note that the "blind accidental chance" model described here seems to be Richard Dawkins model, which is a brand of dumb atheism, as compared to someone like Benedict Spinoza:

> “Nothing in nature is by **chance**. Something appears to be chance only because of our lack of knowledge.”
>
> — Benedict Spinoza (c.1675); *Publication* (Ñº); cited (Ñº) by Heinz-Otto Pietgen in *Baustein des Chaos* (1992)

and his vicarious followers, e.g. Goethe, Schopenhauer, Nietzsche, Henderson, i.e. smart atheism, who do not subscribe to chance-based evolution or form change. Secondly, in respect to "mindless atoms" and "unconscious atoms" were are reminded of Voltaire's discussion of "thinking atoms" and "tormented atoms", in his Poem on the Lisbon disaster (1755), and also of Christian apologeticist Ravi Zacharias' objections, in his *The End of Reason: a Response to the New Atheists* (2008), to these atomic terms. [22] To continue:

> The universe with all its creations both living and non-living has a flawless design, unique systems and an ordered balance that provide all the conditions necessary for living things to survive. Scientific discoveries, especially in the 20th and 21st centuries, have shown that the flawless design of the universe is clearly the work of supreme intelligence [I#2], The Allah, with His supreme intelligence [I#3], limitless knowledge and eternal power created the universe. How is it possible to think the balance in the ecosystem and the universe as a whole came about my mere coincidence when the extraordinary harmony of nature is observable even with the naked eye?
>
> It is the most unreasonable claim to say that the universe, each point of which suggests the existence of its creator, has come into being on its own. The fact about the creation is that there is a mighty force in the universe that has created all different types of living things once by special creation and in them have put the ability to reproduce their next generations. This mighty force is Allah the Almighty Who is the Creator and Who sustains life on earth.
>
> The hypothesis that two prokaryote cells invaded another prokaryote cell resulting in the evolution of a eukaryote cell is as baseless as someone’s claim that two rickshaws invaded a third one and in this way a motor car was evolved. The above hypothesis suggests that one of the invading prokaryote cells was changed into mitochondria and another invading prokaryote cell was modified into chloroplast.
>
> Thousands of questions arise from the above hypothesis:
>
> 1. How did prokaryote cells came into being?
> 2. How it started division?
> 3. How proteins, the most complicated organic compounds formed of units called amino acids, were formed?
> 4 How nucleic acids, which are also complicated organic compounds formed of units formed of units called nucleotides, were formed?
> 5. What is the probability [P#1] of formation of these two essential organic compounds together? As for the synthesis of one, the other is required. If, for example, both of the above organic compounds were formed by chance [C#5] factor, which is practically impossible, at different places then the evolution of a cell and its further division would not have been possible.
> 6. How autotrophic cyanobacteria developed chlorophyll?
> 7. The chromosome of prokaryotes is circular in shape while the chromosomes of eukaryotes are of different shapes and sizes. How these differences developed?
> 8. How other membranous structures such as Golgi bodies, endoplasmic reticulum, lysosomes, peroxisomes, etc. were evolved?
> 9. If billions of prokaryotes are cultured together for hundred years what will be the probability [P#2] of

evolution of a eukaryotic cell like the one claimed at the beginning?
10. What is the probability [P#3] of developing a living cell from the material (components) of cell putting together?
11. The most important question is what is life? How it originated?
12. If evolution is a blind process, for example, why is it stopped on human beings? If not what type of organisms will evolve from humans and when will it start?
13. What about the universe? Who created it?
14. How the high degree of discipline present in the universe can be explained?
15. What kind of forces are responsible for the movements of earth in its axis and orbit?

Firstly, in respect to term analysis of this section, we note that the term "chance" (5 mentions) is rebutted with the terms "intelligence" (3 mentions) and "probability" (3 mentions).

Secondly, to note, we can compare this to Pakistani organometallic chemist Mirza Beg's *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (1987) and Beg-Thims dialogue (2014) wherein this same Allah-siding issue collide with the extreme atheism purview of Libb Thims.

Dover | Fiasco

On 18 Oct 2004, the religiously-minded school board of Dover Area High School, passed, by 6-3 vote, the following resolution, in regards to the teaching of evolution to grade nine (age 14-15) biology class students: [19]

> "Students will be made aware of gaps/problems in Darwin's theory and of other theories of evolution including, but not limited to, intelligent design. **Note**: Origins of life is not taught."

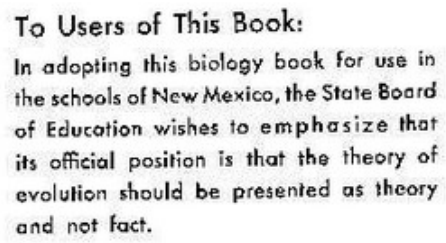
To Users of This Book:
In adopting this biology book for use in the schools of New Mexico, the State Board of Education wishes to emphasize that its official position is that the theory of evolution should be presented as theory and not fact.

On 19 Oct 2004, the school board passed a resolution, announced by press release, that science teachers be required to read the following statement in classes that teach evolution: (Ñº)

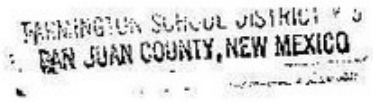

Left: a 2009 "Big Bang to Humans" evolution timeline video (Ñº) by Libb Thims, based on Hmolpedia's evolution timeline. Right: a circa 2000 New Mexico biology textbook book stamp (Ñº) as a way to warn students about the dangers of believing that evolution is a fact.

> "The Pennsylvania Academic Standards require students to learn about Darwin's theory of **evolution** and eventually to take a standardized test of which evolution is a part. Because Darwin's theory is a theory, it continues to be tested as new evidence is discovered. The theory is not a fact. Gaps in the theory exist for which there is no evidence. A theory is defined as a well-tested explanation that unifies a broad range of observations. Intelligent design is an explanation of the origin of life that differs from Darwin's view. The reference book, *Of Pandas and People*, is available for students who might be interested in gaining an understanding of what intelligent design actually involves. With respect to any theory, students are encouraged to keep an open mind. The school leaves the discussion of the 'origins of life' to individual students and their families. As a standards-driven district, class instruction focuses upon preparing students to achieve proficiency on standards-based assessments."

(add)

Quotes

The following are related quotes:

> "But the great principle of organic development through the struggle for existence, involving descent with modification, was distinctly enunciated by both Goethe and Erasmus Darwin before the close of the 18th century."
>
> — Lester Ward (1907), *Pure Sociology* (pg. 537)

> "It is true that the controversy over **evolution** which flared up, I suppose for the last time, in the early 1920s, frequently

went to considerable lengths in its denunciation of science. But the storm soon died down. It was already too late to campaign successfully against science."

— George Lundberg (1947), *Can Science Save Us?* (pg. 93)

"American science teachers, fearing religious backlash, have become timid about teaching **evolution** theory to their students."

— Lauri Lebo (2008), *The Devil in Dover*; see: evolution vs creationism in education [17]

"**Evolution** without the direct intervening hand of god removes the fear of eternal damnation, eliminating the consequences of sin. If children learn we come from animals, they'll behave like animals."

— Richard Thompson (2005), frequently stated argument during the Kitzmiller vs Dover trial [18]

See also

â— Thermodynamic evolution
â— Thermodynamics of Evolution

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External links

â— Evolution – Wikipedia.

θΔics

In hmolscience, **evolution objections** refers to one or more reasons as person has for objecting to the theory that humans have evolved over time (Darwin, 1959); metamorphosized from early chemical forms (Goethe, 1809); and or been synthesized, thermodynamically, over the last 13.8 billion years, via mechanism, from the atoms and forces, or fermions and bosons, of the universe.

1. Atomic | Objection

The following being the main seven compounded or aggregate non-theistic colloquial objections to evolution theory:

	Term	Date	Model | Non-theological
1.	Fortuitous concourse of atoms	450BC	Empedocles (see also: Thomson on religion)
2.	Blind	1800	Friedrich Schiller (see: blind force)
3.	Chance	1859	Charles Darwin (see: chance variation)
4.	Mutation	1901	Hugo de Vries
5.	Random	1922	Roy Sellars [1] (see also: random chance)
6.	Accident	1923	Bertrand Russell (Ñº) Kurt Vonnegut
7.	Lucky	1963	Richard Dawkins | 1995

A modern synopsis of the above position might well be called the "Dawkins view" being that Richard Dawkins has been the most vocal proponent, in recent years, of such views:

> "In a universe of electrons and selfish genes, blind physical forces and genetic replication, some people are going to get hurt, other people are going to get **lucky**, and you won't find any rhyme or reason [see: Adams creed; Newton in Senegal] in it, nor any justice. The universe that we observe has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil, no good, nothing but pitiless indifference."
>
> — Richard Dawkins (1995), *River Out of Eden* (pg. 133); cited by Bo Jinn (2013) in *Illogical Atheism* (loc. 954)

In short, according to the above general model, humans, according to the Dawkins view, are a "lucky | accidental | random | chance | mutation | blind | fortuitous | concourse of atoms" derived entity; the following are example statements:

> "To think that we just evolved from a bang, that we used to be monkeys, that seems unbelievable when you look at the complexity of the human body …. If you tell children there is *no purpose* to their life—that they are just a chemical mutation—that doesn't build self-esteem."
>
> — Nigel McQuoid (2001), Headmaster of Emmanuel College

> “The evolution of plants and animals? Perhaps other geologists also have questions about the mechanism of mutation (which varied its rate of effectiveness greatly in rocks), whether the ability to propagate is the difference between a fossil and its ancestor, how many such evolutions must occur before 'bad luck' is overcome and the newer variety replaces the older, which evolved features are not for propagation but just 'ride along' on the genetic material by a coincidental juxtaposition of genes, and - most importantly - whether 'good luck mutations' can occur fast enough to account for the fossil record.”
>
> — Bruce Bathurst (2009), “Why I am not a molecule?” [2]

The term "mutation" seems to crop up in purpose vs purposeless models of the universe debates and discussions. David Foster, e.g., has argues against “blind random chance mutation interpretations” of mutation-based Darwinism. Those who have theorized about mutation and entropy include: Pierre Levy, John Sanford, and the 1997 gentropy authors V. K. Savchennko and U. K. Sauchanka.

2. Life | Objection

The second main objection (Ñº), made by the theistic-holding mindset, is how do you get life from non-life. This objection has been resolved (see: defunct theory of life → life does not exist → life terminology upgrades).

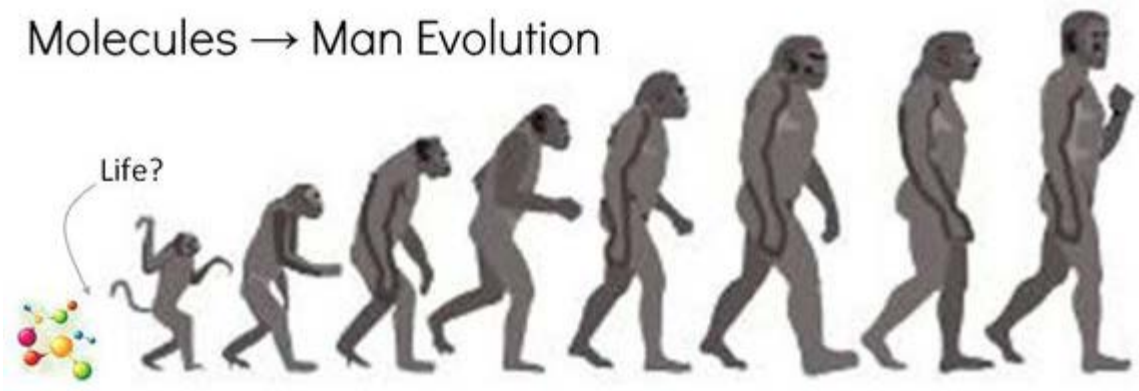

The Ken Ham (1975) version of the "life objection" to the theory of evolution (see: molecules-to-man evolution).

Quotes

The following are related quotes:

> “A wonder it must be that there should be any man found **so stupid** as to persuade himself that this most beautiful world could be produced by the fortuitous concourse of atoms.”
>
> — John Ray (c.1700) (Ñº)

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External links

â— Objections to evolution – Wikipedia.

θΔics

In hmolscience, **evolution theorists**, as opposed to creationism theorists, refers to []

Overview

The following timeline gives a short chronological overview of pre-Darwin, Darwin, and post-Darwin "origin of species" (evolution) theorists. Charles Darwin, his in his 'Historical Sketch', on those who advocated variations on a theory of origin of species, prior to 1859, gives thirty-four authors who believe in the modification of species, or at least disbelieve in separate acts of creation, of which twenty-seven have written on special branches of natural history or geology, in which the two foremost of these, according to Darwin, are Goethe and Geoffroy; the shorthand (EvT:#|21+), e.g. Anaximander (EvT:2|21+), signifies a thinkers chronological ranking among evolution theorists.

#	IQ	Person	Date	Theory

1.	180 | 92	Thales (c.624-546 BC)	585BC	“Many of the philosophers of the **Ionian school** believed that living organisms originated in sea slime by the action of heat, sun and air. Thus, for instance, Thales, the oldest philosopher of this Greek school, taught that living things developed from the amorphous slime under the influence of heat.” — Alexander Oparin (1936), *Origin of Life* (pg. 3)
2.	180 | 117	Anaximander (c.610-c.564 BC)	575BC	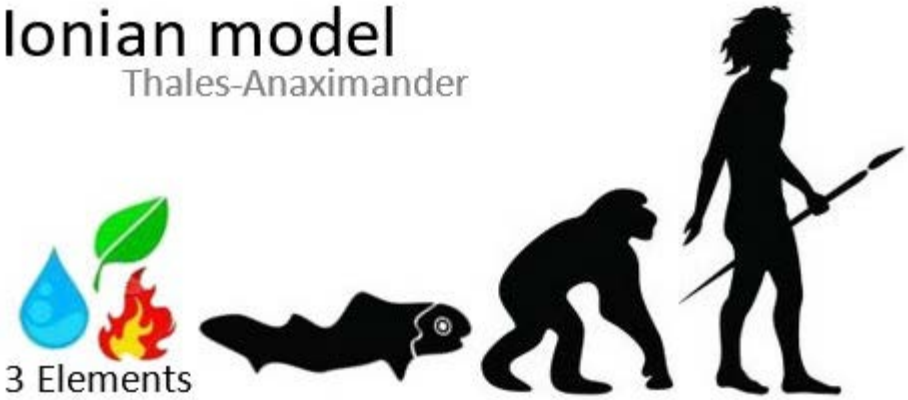 “Animals [based on Thales' water origin model] come into being from moisture evaporated by the sun. Humans originally resembled another type of animal, namely fish.” — Hippolytus (c.220), *Refutation of All Heresies* (Ñº)
				“Claimed that ever thing living arises in sea ooze and goes through a succession of stages in its development.” — Alexander Oparin (1936), *Origin of Life* (pg. 3)
				Argued that fish grew from warm mud, and that humans evolved from fish. [14]
3.	175 | 230		510BC	Taught that all organisms originate from earth and water and used fossil evidence as proof of his argument.

Xenophanes
(560-480BC)

4. | 180 | 132

Anaxagoras
(500-428 BC)

455BC

“The role of the hands in the evolution of man's intelligence seems to have been clearly recognized by the Greek philosopher Anaxagoras (500-428 BC). He explained, as cited by Will Durant, that ‘man's intelligence by the power of manipulation that came when the forelimbs were freed from the tasks of locomotion’.”

— Alfred Lotka (1925), *Elements of Physical Chemistry* (pg. 440)

5. | 190 | 24

Empedocles
(495-435 BC)

450BC

Quote: “Empedocles was the first evolutionist.” (Jonathan Wright, 1920) [16]

The following statement, according to John Haldane, is the "principle of evolution in its crudest form", as cited in *The Cause of Evolution* (1936) (pg. 112):

> “Multaque tum interisse animantum saecla necesse est, Nec potuisse propagando producer problem. Nam quaecomque uides uesci uitalibus aureis, Aut dolus, aut uirtus, aut denique mobilitas est Ex ineunte aeuo genus id tutata, reseruans.”
>
> — Lucretius (55BC), Latin original, per Haldane (1936) citation

6. | 180 | 87

Lucretius
(99-55BC)

55BC

“And many lines of organism must have perished then, and been unable to propagate their kind. For whatever you see feeding on the vital air, either craft, strength, or finally mobility has been protected and preserving that race from its earliest times.”

— Lucretius (55BC), Latin original, per Haldane (1936) citation

“Many kinds of animals have disappeared and it is not possible propaganda producer problem. For quaecomque see ourselves vital gold, or deceit, or power, or even from an early age this kind of mobility is protected, reserving. ”

— Lucretius (55BC), Latin original, per Google (2016) translation

7. | 175 | 270

Lucilio Vanini
(1585-1619)

1616

In his *De Admirandis Naturae Reginae Deaeque Mortalium Arcanis*, argued that humans, particularly Africans, owing to their skin color, descended from apes; he was accused of atheism and after a long trial was condemned to have his tongue cut out, to be strangled at the stake, and thereafter burned to ashes, an ending which occurred in 1619.

8.	225 — 1	Johann Goethe (1749-1832) See: Goethe on evolution	1784	In 1784, he discovered the human intermaxillary bone, thought to be unique to animals only, thus yielding anatomical proof of common origin; in his 1790 *Metamorphosis of Plants* (see: metamorphosis), he outlined a theory of form change in plants; he outlined his newly discovered principle further in his 1795 “Sketch of a General Introduction to Comparative Anatomy”; from 1796 to 1809, with the publication of his *Elective Affinities*, he explained his principle of “moving order” (bewegliche ordnung) at the chemical level for humans and chemicals, in terms of affinity chemistry and the force of elective affinity (forerunner to the modern free energy view of evolution).
9.	175 — 235	Erasmus Darwin (1731-1802)	1791	His 1789 poem *The Love of Plants* offers long footnote glimpse of his theory of evolution; his 1794/96 *Zoonomia* contains a chapter on “Generation”, which outline a foreshadow of modern evolution theory.
10.	170 — 329	Jean Lamarck (1744-1829)	1801	Advocated the usage theory of evolution, e.g. that giraffes grew longer necks by reaching for leaves, and that this trait could be passed on to offspring; he the doctrine that all species, including man, are descended from other species. [4]
11.	170 — 397	Georges Cuvier (1769-1832)	1813	in his *Essay on the Theory of the Earth* (1813), hypothesized a periodic catastrophic flood theory, conceptualized on Biblical flood theory (see: Noah's flood), according to which new species were "created", not by a processes of evolution, such as espoused by Jean-Baptiste Lamarck and Geoffroy Saint-Hilaire, but by the power of god, such that each species was "fixed" in its god-given place, after each successive flood period. Cuvier’s theories drew the attention of those including: Saint-Hilaire (in opposition), who advocated a "deism-based materialistic evolutionary determinism" (Hecht, 2003) theory, Johann Goethe (in opposition), John Hunter (in comparison), Francis Macnab (in supportive usage), and Honore Balzac (in praised status citation usage).
12.		Robert Grant (1793-1874)	1826	Publicly announced his speculation that 'transformation' might affect all organisms; noted that successive strata seemed to show a progressive, natural succession of fossil animals; that these forms "have evolved from a primitive model" by "external circumstances"; he accepted a common origin for plants and animals, and the basic units of life ('monads'), he proposed, were spontaneously generated. Was a supporter of Goethe's organic patterns views and the German "natural philosophy" view; in the late 1820s, Grant shared his views on unity of plan and corresponded with him while working on marine invertebrates; in 1830, Geoffroy proceeded to apply to the *invertebrata* his views as to the unity of animal composition, contending, in accordance with his theory of unity of plan in organic composition, that all animals are formed of the same elements, in the same number; and with the same connections: homologous parts, however they differ in form and size, must remain associated in the same invariable order, and

13.	Etienne Hilaire (1772-1884)	1830	with Goethe held that there is in nature a law of compensation or balancing of growth, so that if one organ take on an excess of development, it is at the expense of some other part; and he maintained that, since nature takes no sudden leaps, even organs which are superfluous in any given species, if they have played an important part in other species of the same family, are retained as rudiments, which testify to the permanence of the general plan of creation; it was his conviction that, owing to the conditions of life, the same forms had not been perpetuated since the origin of all things, although it was not his belief that existing species are becoming modified; Goethe's last writings were devoted to defending Saint-Hilaire.
14.	Richard Owen (1804-1892)	1836	In 1836, work on giant fossil bones (e.g. he coined the term dinosaur), recently collected in South America, instilled the revelation that that there were exceptional similarities, particularly as evidenced by similar limb design (wings, flippers, or hands) among certain lineages; and, being influenced by Johannes Muller, believed that a special life force like "organizing energy" directed the growth of tissues, that there were six types of evolution mechanisms; his 1841 anti-transmutation discussions with Darwin forced Darwin to keep quiet about his own theory; in his 1849 *Nature of the Limbs*, suggested that humans ultimately evolved from fish as the result of natural laws; believed the overall design was the plan of a creator (god).
15. 180 | 106	Charles Darwin (1809-1882)	1842	Sent out a tentative sketch of his "transmutation of species" ideas in a letter to Charles Lyell; in 1844, expanded ideas into a essay, which he sent to his wife (in case of his early termination), which he had Joseph Hooker read in 1847; this eventually resulted in his 1859 *Origins of Species*, which outlined the view that evolutionary change is the process of natural selection acting on randomly occurring variations. [2]
16.	Robert Chambers (1802-1871)	1844	in his *Vestiges of the Natural History of Creation*, published anonymously for fear of charges of atheism and materialism, attempted to champion the idea of evolution directed by god.
17. 175 | 245	Alfred Wallace (1823-1913)	1858	Sent Darwin a copy of his transmutation of species theory; Darwin suggested they both publish.
18.	Hugo de Vries (1948-1935)	1901	Introduced the "mutation" based model of Darwinism-modified evolution.
19. 180	Lawrence	1913	"Matter and energy have an original property, assuredly not by chance, which organizes the universe in space and time." — Lawrence Henderson (1913), *The Fitness of the Environment*

102 Henderson
(1878-1942)

20.
Harold Blum
(1899-1980)

1934

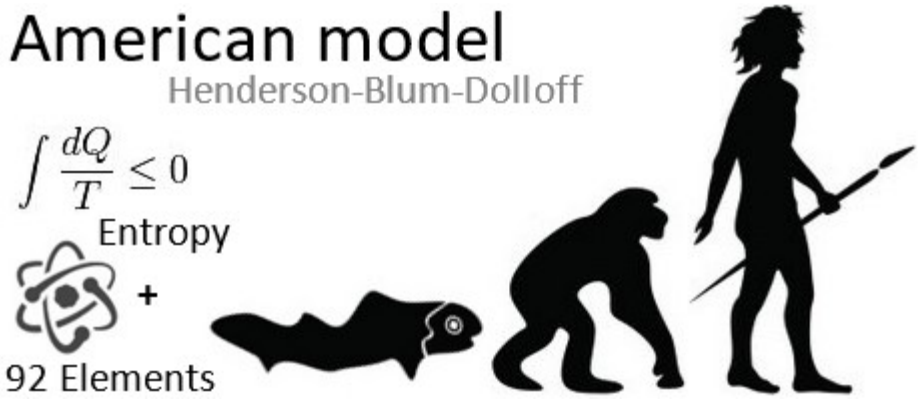

Introduced the "chemical peneplanation" model of evolution.

Building on Blum (1934) and Henderson (1913), he comes closest to outlining a entropy measure and Gibbs energy measure state of formation for each organism from the elements; in his *Heat Death and the Phoenix* (1975), he gives the following what might be called "organism synthesis equation":

21. 185 | 59
Norman Dolloff
(1907-1984)

1975

$$\sum n_i \rightarrow \text{organism}; \Delta G_R^\circ = +; \Delta S_R^\circ = -$$

He might be classified as the transition point mindset of someone grappling to switch from the entropy "order/disorder" model of everything transitioning into the "free energy" model of everything; all done in the framework of explicit atheism.

(add)

References

1.

θΔics

In thermodynamics, **evolution thermodynamics**, or thermodynamic evolution or "thermodynamics of evolution", is the study of the process of evolution, either ecological, chemical, geological, human, social, cosmic, etc., according to the laws of thermodynamics.

Publications

The following table gives a chronological listing of the some of the main publications on this subject; shown with 2010 citation count:

Date	Publication	Author(s)	Citations
1922	“Contribution to the Energetics of Evolution”	Alfred Lotka	329
1922	“Natural Selection as a Physical Principle”	Alfred Lotka	77
1935	"A Consideration of Evolution from a Thermodynamic View-Point"	Harold Blum	14
1965	“Thermodynamics of Terrestrial Evolution”	Jack Kirkaldy	2
1972	“Thermodynamics of Evolution”	Ilya Prigogine, Gregoire Nicolis, and Agnes Babloyantz	224
1977	“On the Thermodynamics of Biological Evolution”	Georgi Gladyshev	20
1987	*Evolution, Thermodynamics, and Information: Extending the Darwinian Program*	Jeffrey Wicken	186
1988	*Energy and the Evolution of Life*	Ronald Fox	51
1989	"Theory of Radially Evolving Energy"	Justin Lancaster	2
1997	*Thermodynamic Theory of the Evolution of Living Beings*	Georgi Gladyshev	17
1997	“Thermodynamics, Evolution, and Behavior”	Rod Swenson	22
2008	*Evolutionary Essays: a Thermodynamic Interpretation of Evolution*	Sven Jorgenson	

In science, thermodynamic evolution is the process of evolution from the thermodynamic point of view. The term is often used in ecological thermodynamics. [1] There may exist some overlap in this field with evolutionary psychology.

Thermodynamics and evolution

Over the last century and half, one of the biggest conceptual puzzles has been the seeming opposite, but necessarily connected, relation between the second law of thermodynamics, as popularized by William Thomson in 1852 as the "universal tendency in nature to the dissipation of mechanical energy", combined with Rudolf Clausius' 1865 dictate that in the universe the "entropy tends to a maximum", compounded with Ludwig von Boltzmann's 1877 suggestion that entropy could be equated with the measure of the "ordered or disordered" distribution of particles in a system, as this set of logic relates to the definition of evolution as, according to fossil records, the progressive increase in order or biological structure with time as outlined by Charles Darwin in his 1859 *Origin of Species*. In the 1914 book *Problems in Science*, for instance, Italian mathematician Federigo Enriques assigned the issue of the reconciliation of

thermodynamics and the phenomenon of life as one of the six main problems in science. [2]

The 1996 book *Darwinism Evolving* by David Depew and Bruce Weber, according to a review by blogger Jeremy Lent, is said to use a good amount of physics concepts and thermodynamics in an attempt to update the Darwin-view of evolution theory, citing the works of those as Karl Marx, Ronald Fisher, Alfred Lotka, Erwin Schrodinger, Ilya Prigogine, among others. [3]

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1. Author. (2004). "Professor Jorgensen wins the 1st Prigogine Prize" in *International Lake Environment Committee News Letter*, No. 45, March.
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3. (a) Depew, David J. and Weber, Bruce H. (1996). *Darwinism Evolving: Systems Dynamics and the Genealogy of Natural Selection.* MIT Press.
(b) Lent, Jeremy. (2010). "Crossing the Complexity Barrier: Book Review: *Darwinism Evolving*", *Finding the Li.*

θΔics

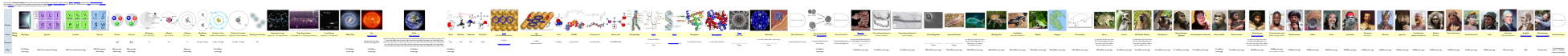

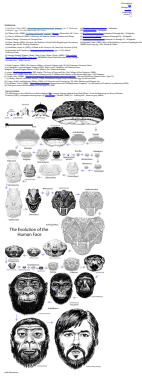
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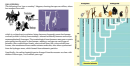

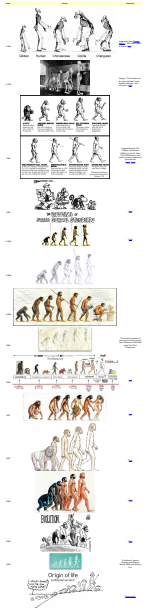
EVOLUTION
Origin of life

[Source]

Author: **Tracy Ann Kosa**

Date: 2010-10-06

Source: Tracy Ann Kosa, Jan Lauwers, Elective affinities problem, Photo: Chris Van Dorpe, Courtesy Theater Gent

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Keywords: **Elective affinities**, **Theater**, **Tracy Ann Kosa**, **Jan Lauwers**, **Chris Van Dorpe**, **Theater Gent**

Type: **Photographs**

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Hide

In social tensions, **evolution vs creationism in education** refers to "collision" that occurs between the beliefs of children, predominantly raised parentally according to one or another creationism belief systems, and evolutionary teachings professed by biology teachers in high school.

A 2008 clip of Richard Dawkins, from his Channel-4 documentary "The Genius of Darwin" (Q), part one "God Strikes Back" (Q), interviewing (2:20-3:50) four London high school biology teachers about why they don't address the religious conflict when they teach evolution.

Dawkins | Biology teacher interview

In 2008, English biologist Richard Dawkins, in his channel-4 documentary "God Strikes Back", interviews four biology teachers, at Park High School (Q), North London, video segment shown adjacent (2:20-3:50) about tensioned difficulties of teaching evolution to kids:

> "I worry that high school biology teachers are tiptoeing too respectfully around traditional beliefs."
>
> — Richard Dawkins (2008), Park High School teacher interview

> "We can't get into the business of knocking down kid's religions and the religions of families."
>
> — Chris Scott (2008), head of science at Park High School queried by Dawkins about why the conflict isn't addressed

> "Because we teach science, and I would not feel comfortable talking about anything but science."
>
> — Rachel Hughes (2008), Park High School biology teacher interviewed by Dawkins about why the conflict isn't addressed

The teaching of evolution, in short, inherently puts kids religious beliefs into question; hence the teachers avoid this tenuous issue, because, as they repeatedly say, in interview with Dawkins, "it is not their place".

High school biology | Evolution

The following infographic shows the results of a 2007 poll of 939 US high school biology teachers, which shows that 58 percent of teachers spend between 1 to 5 hours covering the evolution of humans and some 17 percent do not cover the topic at all: [1]

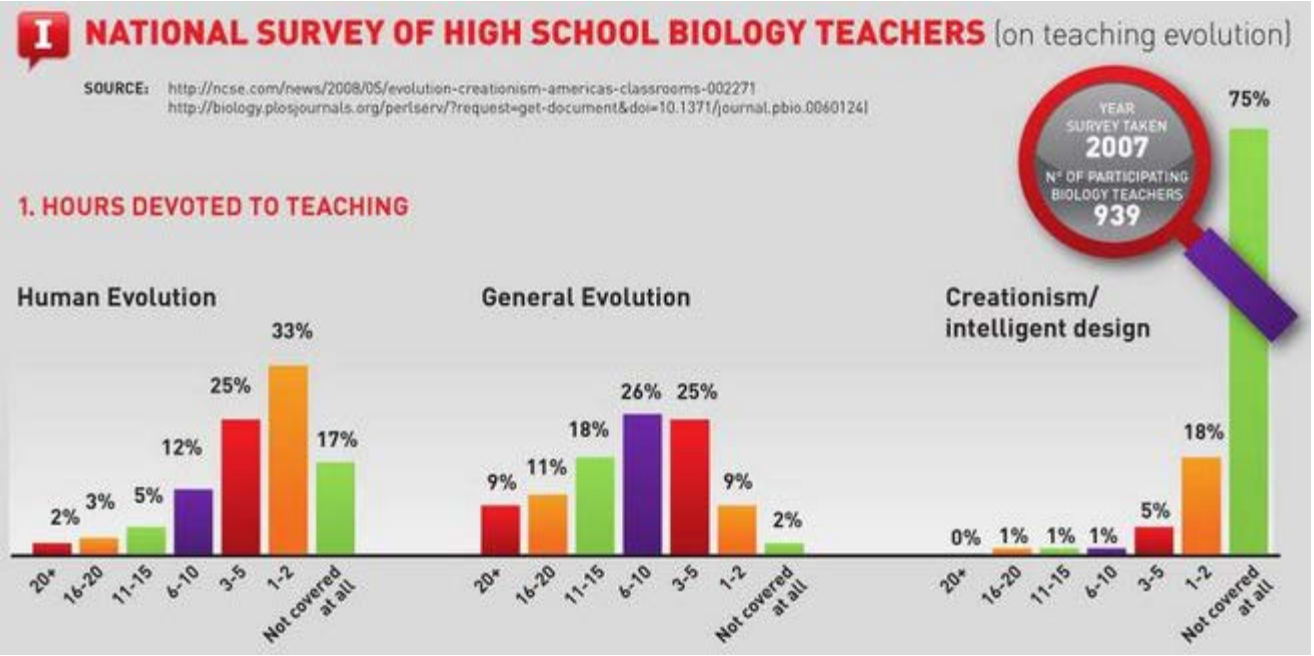

(add discussion)

High school biology teachers | Beliefs

The following infographic shows the personal beliefs reported by polled high school biology teachers of the 2007 survey, showing that 47 percent believe in god-guided evolution, 16 percent believe in some type of Biblical creationism version of human origins, according to which humans were created by the power of god within the last 10,000 years, whereas only 28 percent believe in godless evolution theory: [1]

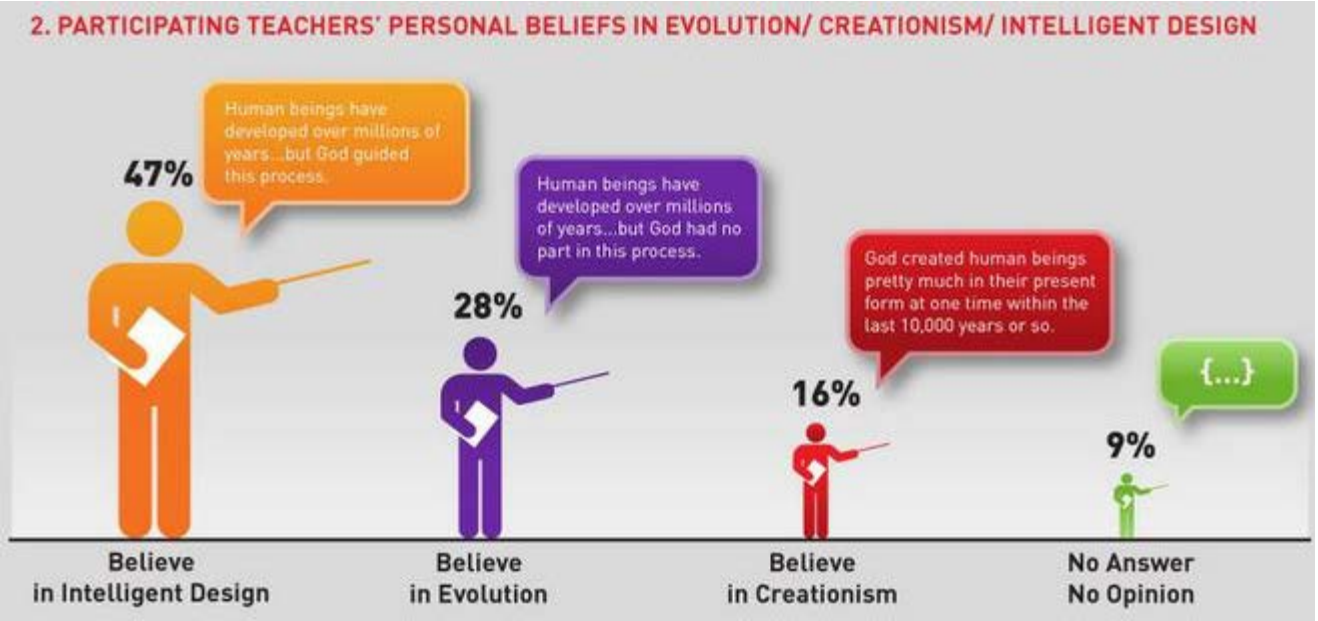

(add discussion)

Discussion

Creationism writer Jerry Bergman, in his *The Dark Side of Charles Darwin* (2011), citing Edward Humes' *The Monkey Girl* (2007), and the ongoing parents vs school board law suits about creationism teaching vs evolution teaching, gives

his opinion that evolution is a teaching that is hardly neutral, but rather one that "openly teaches a religion, the religion of atheism and ultimate nihilism." [2]

Quotes

The following are related quotes:

> "I teach evolution not as a unit, but by introducing the concept here and there throughout the year. I put out my little bits and pieces wherever I can. While some students have college educated parents, other students come from families that may not accept the idea, and that holds me back."
>
> — Ron Bier (2005), "Interview on teaching evolution at Oberlin High School, Ohio" [3]

> "American science teachers, fearing religious backlash, have become timid about teaching **evolution** theory to their students."
>
> — Lauri Lebo (2008), *The Devil in Dover* [4]

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θΔics

In science, **evolutionary psychology** is the study of the mind and motives from the point of view of evolution; being a synthesis of psychology and evolutionary biology. [1] Dylan Evans defines evolutionary psychology as the combination of evolutionary biology and cognitive psychology. [15]

Evolutionary psychology can also be defined as the study of the human psyche in the context of evolutionary anthropology, as many of its topics often delve into anthropological subjects. A claim often made by detractors is that evolutionary psychology is simply sociobiology renamed in efforts to escape opprobrium. [2]

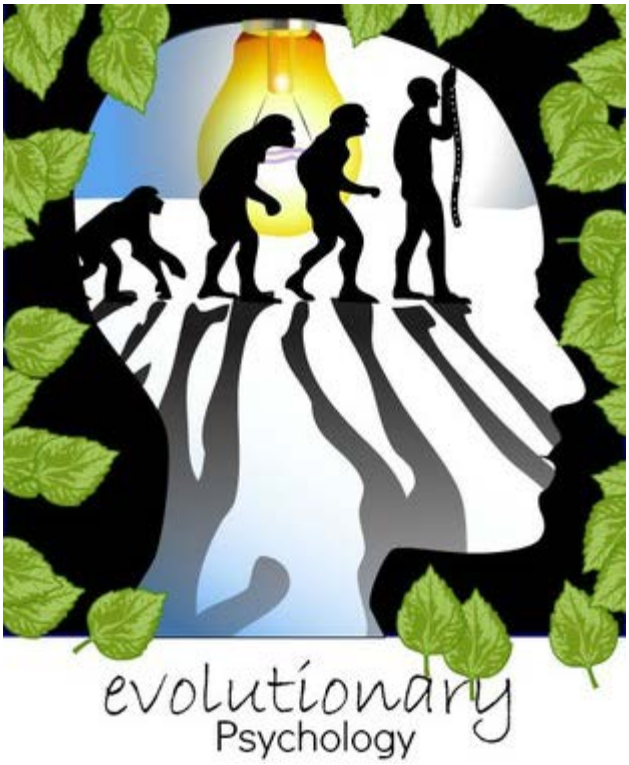

A depiction **evolutionary psychology**, the explanation of mind and ideas through the lens of Darwin-based evolutionary theory. (Ñº)

History

The first mentioning of a new branch of psychology based on evolution principles came from English naturalist Charles Darwin who at the end of his classic 1859 treatise *On the Origin of Species* stated:

> "In the distant future I see open fields for far more important researchers. **Psychology** will be based on a **new foundation**, that of the necessary acquirement of each mental power and capacity by gradation. Light will be thrown on the origin of man and his history."

The term "evolutionary psychology" was coined in 1890 by American psychologist William James in his *The Principles of Psychology*. From his section "Evolutionary Psychology Demands a Mind-Dust", to give a representative example, he states: [16]

> "As evolutionists we are bound to hold fast to is that all the new forms of being that make their appearance are really nothing more than results of the redistribution of the original and unchanging materials. The self-same atoms which, chaotically dispersed, made the nebula, now, jammed and temporarily caught in peculiar positions, form our brains' and the 'evolution' of the brain, if understood, would be simply the account of who the atoms came to be so caught and jammed. In this story now new *natures*, no factors not present at the beginning, are introduced at any later stage."

The founders of evolutionary psychology are American psychologist David Buss, along with Leda Cosmides, John Tooby, Don Symons, Martin Daly, and Margo Wilson. [12] Key among this group is Buss who in 1975 published the first outlines of this subject in a term paper, modeled on primate comparisons, which argued that main reason men have evolved a status striving motive is because higher status produces increased sexual opportunities. The first modern treatise on human evolutionary psychology, according to Buss, was American anthropologist Donald Symons' 1979 book *The Evolution of Human Sexuality*. [3] Buss and Symons soon thereafter began to collaborate. Soon thereafter, Buss conducted a 1982 cross-cultural study of 10,047 participants on human mating. Buss published and promoted his findings in the excellent 1994 book *The Evolution of Desire*. [4]

During this period, Buss began to influence, interact, and debate with graduate student Leda Cosmides and her husband John Tooby. The 1987 essay "From Evolution to Behavior: Evolutionary Psychology as the Missing Link", by Cosmides and Tooby, seems to be the first dominant coining of *evolutionary psychology* as a

A depiction of the some of the tenets of evolutionary psychology, those of measurements: waist-to-hip ratio, the golden ratio, symmetry, among others.

subject. [6] This synergy resulted in the noted 1992 book *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*, by Cosmides and Tooby (edited by Canadian anthropologist Jerome Barkow). [5]

The first textbook on evolutionary psychology was Buss' 1999 *Evolutionary Psychology*. [1] The first graduate program in evolutionary psychology was established about this time at the University of Texas at Austin, under the direction of Buss. The *Evolutionary Psychology* journal was launched in 2003. [7]

Entropy

The 1992 book *The Adapted Mind* gives one of the first speculations on entropy in relation to evolution and psychology: [13]

> "Entropic effects of many types act to introduce functional disorder into the design of organisms. They are recognizable by the lack of coordination that they produced within the architecture or between it and the environment, as well as by the fact that they frequently vary between individuals. Classes of entropic processes include mutation, evolutionarily unprecedented environmental change, individual exposure to unusual circumstances, and developmental accidents. Of course, one can decompose organisms into properties (or holistic relations) according to any of an infinite set of alterative systems. But, unless one applies a categorization system designed to capture their functional designs or adaptations, organisms will seem to be nothing but spandrels, chemistry, and entropy."

Although this statement is unreferenced, it would seem logical that this logic was culled, indirectly, from English evolutionary biologist Ronald Fisher's 1930 entropy-fitness theories. [14]

Thermodynamics

The first publication in evolutionary psychology to incorporate thermodynamics logic was the 2002 book *The Origin of Minds* by American neuroscientists Peggy La Cerra and Roger Bingham, which supposedly is said to have "explained how entropy drove the design of the human mind". [8] The book, however, is very elementary, mentioning the word entropy only twice, describing it as "disorder and randomness", and arguing that "life forms owe their temporary victory against entropy to an evolved capacity to acquire energy and to use it to survive and reproduce."

This premise later evolved into a set of articles in 2003 attempting to formulate psychological laws based on the second law of thermodynamics. [9] The attempt, however, seems to be very rudimentary. Tooby and Cosmides, for instance, in 2005, follow the "degradation force" view of entropy in stating that with regard to genes and design: "self-reproducing systems could not exist unless there were adaptations that conserved the functional design against entropy from one generation to the next." [10]

Human chemistry

Much of the development of American chemical engineer Libb Thims' *Human Chemistry* textbook, particularly regarding the thermodynamical nature, structure, and composition of the human chemical bond, was based on findings from evolutionary psychology.

Symmetry, in face and body, for instance, is universally viewed as attractive. Stable long-term marriage bonds are found

to have a ratio of attraction-to-repulsion of 5-to-1 (Gottman stability ratio). The formation of stable chemical bondings are those typically characterized by a decrease in the Gibbs free energy of the system evolution over time or a negative in the change in the Gibbs energy ΔG over the extent of the reaction. Subsequently, the recognition of symmetry in the psyche must have an evolutionary psychology explanation, and this explanation must find quantification in the bonds of the family (or relationships), extended family, and those of social life. [11]

Hmolscience

A 2012 pearltree, made by user jazzpanda, showing one take on how human chemistry, human thermodynamics, human molecular theory, and evolutionary psychology overlap and intertwine, so to speak, in regards to the science of interpersonal relationships. [16]

See also

â— Evolutionary thermodynamics
â— Thims' mate selection book collection – Dating Sites Wiki

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External links

â— Evolutionary psychology – Wikipedia.

θΔics

In science, **Ewald Hering** (1834-1918) was a German physiologist noted for his 1870 memory theory of living matter.

Overview

In 1870, Hering, in his “On Memory as a Universal Function of Organized Matter”, as translated by Samuel Butler (1880), following a Wundtian position (i.e. Wilhelm Wundt), is permanently altered by sense impressions, by a biochemical process that leaves “material vestiges”, via changes in the atomic and molecular disposition of the nervous system, that produces, what Wilhelm Ostwald (1906) summarizes as, “memory as universal function of living matter”. [1]

Ostwald argues, in outline, that Hering's sense impression matter memory theory, allows man to "learn to distinguish between good and evil by memory".

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External links

â— Ewald Hering – Wikipedia.

θΔics

In thermodynamics, **exact differential** is a type of differential such that integration depends only on the end points and satisfies the condition on integrability (Euler reciprocity relation). [1] Differentials that do not fit this criteria are called inexact diffferentials.

Terminology

Synonyms of exact differential include “full differential” or “complete differential”, such as used in the 1865 and 1875 English editions of Clausius' *The Mechanical Theory of Heat*, but not “total differential”, which has a different meaning in mathematics.

History

The concept of the exact differential, supposedly, originated in the work of Leonhard Euler, in particular his Euler reciprocity relation.

The subject of the exact and inexact differential has a peculiar usage in thermodynamics as was first introduced in the 1858 article “On the Treatment of Differential Equations which are not Directly Integrable” by German physicist Rudolf Clausius; an article that formed the basis of the chapter Mathematical Introduction to the first (1865) and second (1875) editions of Clausius' textbook *The Mechanical Theory of Heat*. [2]

The symbol Ä‘ (d-crossbar) or δ (in the modern sense) originated from the work of German mathematician Carl Neumann, specifically in his 1875 *Lectures on the Mechanical Theory of Heat*, indicating, as Clausius did, that δQ and δW are path dependent (inexact differentials), whereas internal energy *dU* is not (exact differential). [3]

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External links

â— Exact differential – Wikipedia.
â— Exact Differential – from Wolfram MathWorld

θΔics

In science, **exact science**, as contrasted with inexact science, is a branch of knowledge tending towards the use of quantitative treatment, nearing precision, in respect to measurement, explanation, and prediction; generally described in the language of mathematics.

Thermodynamics

In 1809, American science historian Fielding Garrison, in his "Gibbs and his Relation to Modern Science", correctly defined thermodynamics as an exact science: [5]

> "In this sentence ["heat is motion"] from *New Instruments* [1620] it is clear that Bacon, like Descartes, Count Rumford, Sir Humphry Davy and Young, had a more or less definite notion of the dynamic nature of heat and its convertibility into work. But the **exact science** which treats of heat as a mode of energy begins with the publication, in 1824, of the *Reflections on Motive Power of Fire* of Sadi Carnot, who Lord Kelvin calls the 'profoundest thinker in thermodynamic philosophy'."

(add discussion)

1.1 Thermodynamics — A Preeminent Example of an Exact Science

In 1830, Auguste Comte, a French philosopher who is generally recognized as the founder of sociology and positivism, wrote the following:[1]

> *Every attempt to employ mathematical methods in the study of chemical questions must be considered profoundly irrational and contrary to the spirit of chemistry ... If mathematical analysis should ever hold a prominent place in chemistry — an aberration which is happily almost impossible — it would occasion a rapid and widespread degeneration of that science.*

If Comte had lived long enough to see the development of thermodynamics and its applications, he might have retracted these words. However, he died well before the work of Black, Rumford, Hess, Carnot, Joule, Clausius, Kelvin, Helmholtz, and Nernst that established different aspects of the sciences, followed by the contributions of Gibbs, Lewis, and Guggenheim that unified the science into a coherent whole.[a]

The importance of mathematics to the study of thermodynamics was well understood by Guggenheim, however. We quote him:[2]

> *Thermodynamics, like classical Mechanics and classical Electromagnetism, is an exact mathematical science. Each such science may be based on a small finite number of premises or laws from which all the remaining laws of the science are deductible by purely logical reasoning.*

Americans physical chemist Juliana Goates and chemist and thermodynamicist Bevan Ott's 2000 classification of thermodynamics as the preeminent example of **exact science**, per historical citation of Edward Guggenheim's 1933 definition of thermodynamics as an "exact mathematical science", like classical mechanics and electromagnetism. [6]

Objection

Some would claim that there is no such thing as exact science; the following being one example:

> "The physical sciences claim that they are **exact sciences** but they are at best correlation with observations."
>
> — Mirza Beg (2014), "Beg-Thims dialogue" (post #4), Jul 6.

Beg, to clarify, here, who employs physicochemical methods as the basis of his sociology theory, is attempting to say that physical sciences are inexact so that he can leave margin or fudge-factor room in his position, as an ontic opening, so that he can sneak in Islamic argument into the basis of his theory at any point.

In short, in most cases, however, statements, such as above, are made owing to an inherent and underlying religious-siding objection and or bias.

See also

- Hard science
- Pseudoscience
- Real science
- Soft science

Quotes

The following are related quotes:

"Life is not an **exact science**, it is an art."

— Samuel Butler (c.1870) (Q)

"Many persons indeed seem to entertain a prejudice against mathematical language, arising out of a confusion between a mathematical science and an **exact science**. They think that we must not pretend to calculate unless we have the precise data, which will give a precise answer to our calculations; but, in reality, there is no such thing as an exact science, except in a comparative sense."

— Stanley Jevons (1871), *Theory of Political Economy* (pg. 6)

"It is a common observation that a science first begins to be 'exact' when it is quantitatively treated. What are called the **exact sciences** are no others than the mathematical ones."

— Charles Peirce (1878), *On the Doctrine of Chances* [3]

"Although this may seem a paradox, all **exact science** is dominated by the idea of approximation."

— Bertrand Russell (1966) [4]

"Dobereiner helped in refining Russian platinum, discovered catalysis, and reported his work to Goethe. We can only suspect that Dobereiner read the tragedy *Faust* and the novella *Elective Affinities*. The latter work of art gave impulse to a new scientific field named 'human chemistry'. In the **exact sciences** there are quantitative measures of estimation of each value: mass, length, force, energy. In the humanistic disciplines (history, philosophy, psychology) as well as art there are no quantitative criteria. This is similar to the question of how to measure beauty, love, friendship, democracy? The function named Gibbs energy defines 'love' between substances [and][possibly] people ... and is similar to Hamlet's 'to be or not to be?' of William Shakespeare."

— Alec Groysman (2011), "Use of Art Media in Engineering and Scientific Education" (Q) [2]

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External links

● Exact science – Wikipedia.

θΔics

In science, **exchange force** is a force whose apparent character lies in the assumption of a continuous exchange of particles, which accompanies the interaction and transmits the force, resulting from the continued interaction of particles in a manner that bonds their hosts together. [1]

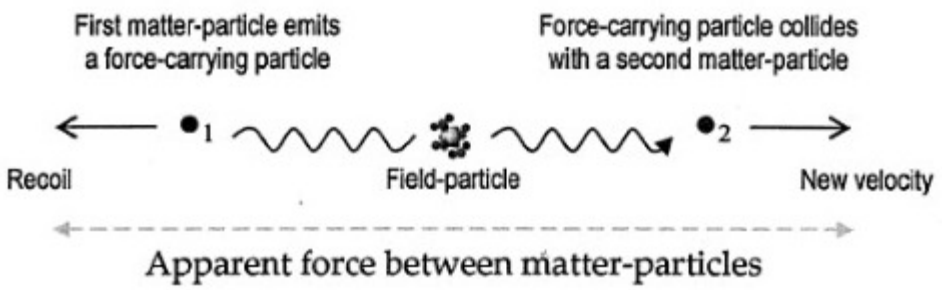

Generic diagram of the **exchange force**, wherein the exchange of field particles, namely primary field particles, e.g. photons, or secondary field particles, e.g. pheromones, acts as a force carrier to transmit the force between the interacting matter particles (e.g. electrons, atoms, insects, animals, or human molecules), creating or mediating either attraction or repulsion movement, in such a manner that an apparent force exists between the interacting entities. [4]

Overview

In 1927, Walter Heitler, after awaking from a series of naps, conceived the basic model of the exchange force or "perturbation theory" operating between two hydrogen atoms, the outline of which was first published in “Interaction of Neutral Atoms and Homopolar Bonding according to Quantum Mechanics”, co-authored with Fritz London (1900-1954); the theory was given in more detail in Heitler's 1945 *Elementary Wave Mechanics: with Applications to Quantum Chemistry*.

In 1932, Italian physicist Ettore Majorana (part of Enrico Fermi’s group) independently worked out his own version of the exchange force, and the following year, through suggestion via Fermi, when to Germany to work with Werner Heisenberg, who was working out a similar exchange force model. Heisenberg eventually convinced Majorana to publish his theory, which he did in the 1933 article “On Nuclear Theory”. [8] Their finalized joint model later came to be referred to as the “Heisenberg-Majorana” exchange forces. [9]

In circa 1993, Enrico Fermi and German Hans Bethe summarized the core model by suggesting that interactions between charged particles could be described in terms of photons being exchanged between particles. [3]

In 1992, English physical chemist Peter Atkins explained exchange force in the context of spacetime as such: [2]

> “All forces that bind atoms, nuclei, and the deepest components of particles, can be regarded as arising from the interchange of particles. Force is only the codeword for this behavior being played out on the arena of spacetime. Spacetime, with its curvature forms the stage; particles distributed as waves pursue straight lines; but particles detach from particles and travel (straight) to others and impress on them their motion. Force is the name of this **interchange** of particles.”

Whether or not forces act attractively or repulsively, supposedly, depends on the spin of the particles being exchanged: even-integral spin particles are attractive, odd-integral spin particles are repulsive between like particles. [2]

The most readable account of the interpretation of forces in terms of the exchange of particles, according to English physical chemist Peter Atkins, is the 1977 book *The Key to the Universe* by British science writer Nigel Calder. [4]

Human physics

In 1975, American physicist Arthur Iberall, in his paper “On Nature, Man, and Society: A Basis for Scientific Modeling”, outlined a basis for social dynamics in terms of exchange forces. [6] The interesting abstract for this paper by Iberall is as follows: [7]

> “A physical basis for the modeling of autonomous systems is presented. Namely the thesis is unfolded that irreversible thermodynamics is presently capable of describing nature, man, and society. Four fragments of the theme are presented. The first is a description of how thermodynamics orders all of nature. The second

illustrates how the dynamics of fluid fields (mobile atomisms) is developed. The third begins the formulation of a social physics. The fourth provides a primitive notion why all autonomous systems are described by the same formal set of equations of state and change."

In summary of Iberall's social physics exchange force model, according to a 2008 review by American physical anthropologist Douglas White, two major types of bonds are pertinent: "ionic" sexual force and "van der Waal" covalent exchange force (which provides internal "cohesive group" associations in the likely range of 10-200 empathetically shared views). These bondings take place through sensory contact, within a nominally 20-mile radius of a person's movement "territory". [6]

In 2007, independent of Iberall, American electrochemical engineer Libb Thims extrapolated the exchange force model up to the human-human interaction level (human molecule - human molecule interactions), in the formulation of the one of the aspects of the human chemical bond, as well as in formulation of the mechanism of the force of attraction and repulsion, wherein the notion of "primary field particles" (e.g. a photon) and "secondary field particles" (e.g. a diamond) was introduced to describe and explain the large scale operation of forces at the human level. [5]

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External links

â— Exchange interaction – Wikipedia.

θΔics

In thermodynamics, **exergonic**, from the Greek *exo*- "turning out" + -*ergon* "work", as contrasted with endergonic, refers to a free energy or available energy releasing process or reaction, one in which work energy is produced, so to speak, defined by the criterion: $\Delta G < 0$ (isothermal, isobaric process) or $\Delta F < 0$ (isothermal, isochoric process). In short, an exergonic reaction (or process) requires no energy to proceed. [1]

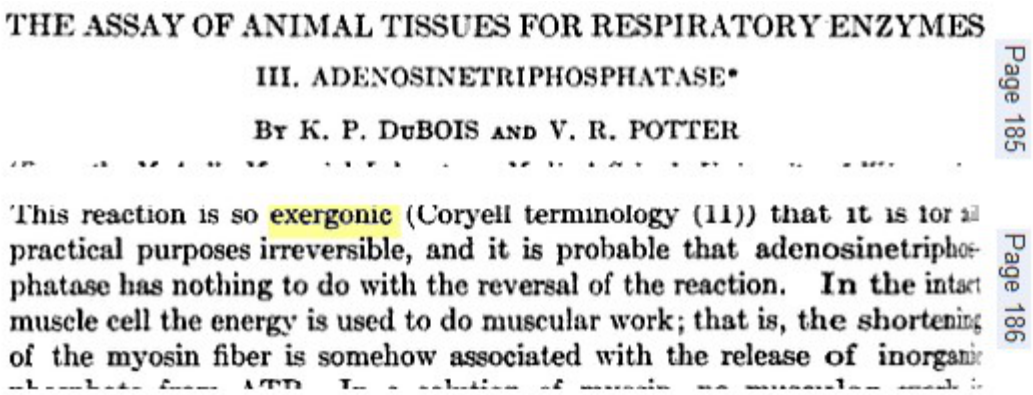

THE ASSAY OF ANIMAL TISSUES FOR RESPIRATORY ENZYMES

III. ADENOSINETRIPHOSPHATASE*

By K. P. DuBOIS and V. R. POTTER

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This reaction is so exergonic (Coryell terminology (11)) that it is for all practical purposes irreversible, and it is probable that adenosinetriphosphatase has nothing to do with the reversal of the reaction. In the intact muscle cell the energy is used to do muscular work; that is, the shortening of the myosin fiber is somehow associated with the release of inorganic

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A circa 1940 article (Q) using "**exergonic**" per so-called "Coryell terminology", i.e. that of American chemist Charles Coryell, as reactions that yield energy that can be used to do work, e.g. muscular work, i.e. the shortening of the myosin fiber.

Etymology

In 1940, American chemist Charles Coryell, in his *Science* letter "The Proposed Terms 'Exergonic' and Endergonic' for Thermodynamics", introduced the terms 'exergonic' (energy-yielding) and 'endergonic' (energy-requiring), as definitive of reactions that provide free energy, and so can produce work, as opposed to reactions which work must be expended to cause the reactions to go. [1]

Coryell, in short, proposed (Q) the terms "exergonic", for spontaneous (ΔG negative) processes or reactions, i.e. those which can produce work (Q), and "endergonic", for non-spontaneous (ΔG positive) processes or reactions, i.e. those which cannot produce work, on "analogy", according to John Edsall and Jeffries Wyman (1958), with "exothermic" and "endothermic", introduced in the 19th century by Marcellin Berthelot. Edsall and Wyman summarize this logic as follows: [3]

> "For a *total* process it is impossible to escape the rigorous requirement that the *total* free energy change, at constant pressure and temperature, must be negative if the process is to go. Such spontaneous processes (ΔG negative) have been termed '**exergonic**' by Charles Coryell, in analogy to the term exothermic for processes in which ΔH is negative. A process which taken alone would be endergonic (ΔG positive), and therefore thermodynamically forbidden, may nevertheless proceed if it is coupled with another process which is so highly exergonic that the total value of ΔG for the combined reaction is negative. Such coupled reactions are of profound importance in biochemistry. The supply of free energy in many coupled biochemical reactions is provided by the hydrolysis of adenosine triphosphate (ATP to adenosine diphosphate (ADP) and inorganic phosphate."

(add discussion)

Quotes

The following are related quotes:

> "Other [non-photosynthesizing] living forms must obtain energy from living forms must obtain energy from **exergonic** chemical reactions."
>
> — Author (1950), "Article" (Q)

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External links

- Exergonic – Wikipedia.

θΔics

In thermodynamics, **exergy**, symbol Ξ or B, is the maximum work done by a system during a transformation which brings it into equilibrium with a reservoir. [1] Exergy, by convention, is positive when putting the system into equilibrium with the reservoir results in doing work on the surroundings.

[2] Throughout this paper, either "free energy" or "available energy" will mean energy that is available to do work. Gibbs free energy, a special case, will always be specifically indicated. I also will not use the term "exergy", for two reasons. First, it is not a standard term, at least in the English-language literature; Chemical Abstracts merely cross-references "exergy" to "free energy". The second is that it does not seem to be used consistently as a synonym for free energy.

A cogent 2002 footnote definition, by American geologist Stephen Gillett, of **exergy** as a term *not* to be used, particularly in a chemical thermodynamic sense, from his article "Entropy and its misuse: Energy, free and otherwise". [8]

Synonyms?

It its often claimed that exergy is synonymous with: "available energy" (Gibbs, 1876), "free energy" (Helmholtz, 1882), or "available work", among others. [2] The term exergy, however, is used predominately in ecology, economics, and branches of mechanical engineering; often merely presented as a simplified or verbalized and equationless version of the free energy as used in the chemical-physical sciences.

Etymology

The term *exergy* was coined by Slovene mechanical engineer Zoran Rant, in his 1953 PhD thesis "Exergy: a Useful Concept" completed at Chalmers University of Technology, Goteborg, as follows: [6]

> "These claims show that aie will be the most appropriate suffix. Since the concept of a work is examined, it is necessary as the root syllable (as genus proximum) the Greek word *erg* (appear on) [see also: ergal] for this. Well, the correct prefix is to be selected, which highlights the specific nature, the specific difference. It is necessary that the requirement that the new term to describe the work that can be extracted from a system. AAUs is called in Greek AEK 'before consonants and AEX "before vowels.
>
> This is the new concept of **exergy**, has met practically all the demands made and the letter 'x' distinguishes it clearly from the related concept of energy, so that ruled out despite the analogy in word formation, any confusion remains. The expression can be imported into any Germanic, Romance or Slavic languages, it is, e.g. German to *exergy*, in English *exergy*, *exergy* in French, in Spanish *exergia*, in Italian and Slavic *essergia* [and] *eksergija*."

In 1956, Rant was using the term exergy to denote "technical working capacity" or "technical available energy"; soon thereafter becoming very popular. [3] The concept of exergy or maximal work, however, as introduced by Rant, supposedly, is a redressing of earlier works, in particular: American engineer Willard Gibbs ("available energy of the body and medium", 1873), German physicist Hermann Helmholtz ("free energy", 1882), and French physicist Louis Gouy ("possibility of obtaining work", 1889), among other variants. [4]

A significant promoter of the concept is Swedish physical engineer Goran Wall who completed his 1986 PhD on "Exergy as a Useful Concept". [6] Wall argues that the concept of exergy applies to society and aspects such as morality. [7]

Gouy-Stodola theorem

A folk theorem attributed independently to Gouy, in 1889, and Slovak mechanical engineer Aurel Stodola, in 1910, called the Gouy-Stodola theorem or the "Law of Gouy and Stodola", states that the entropy production is the exergy loss divided by the temperature of the surroundings; thus minimizing loss of exergy is equivalent to minimizing entropy production. In equation form, this theorem reads:

$$B_{lost} = T_o S_{gen}$$

where B_{lost} denotes the potential work or exergy lost by the system in a transformation process, T_o denotes the temperature of the system's surroundings, and S_{gen} is the entropy generated in the transformation. [2]

Notes

There was a short-lived *Exergy: an International Journal* (2001-2002), but which became incorporated into the journal *Energy*.

Quotes

The following are related quotes:

> "Living systems thrive on **exergy**."
>
> — Goran Wall (1997), *Publication* [9]

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External links

â— Exergy – Encyclopedia of Earth.

θΔics

In terminology, **exist** (CR:1516), from Latin *existere* "to come into being" (Merriam) or "to step out, stand forth, emerge, appear; be" (OED), from *ex-* + *-sistere* "to stand, stop", refers to something that has physically measureable form; is real or has reality; as opposed to something imaginary, fictional, or mythological (e.g. god, caloric, ether, life, or unicorns, etc.). [1]

Quotes

The following are noted quotes:

> "Believe me, dear Sir: there is not in the British Empire a man who more cordially loves a union with Great Britain than I do. But, by the God that made me, I will cease to **exist** before I yield to a connection on such terms as the British Parliament propose; and in this, I think I speak the sentiments of America."
>
> — Thomas Jefferson (1775), "Letter to John Randolph", Nov 29 [2]

See also

- Existence
- Existence of god
- Existive
- Existographies
- Reaction existence
- Stages of existence

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θΔics

In science, **existence**, or to "exist", as compared to non-existence (or "does not exist"), refers to something that has physical presence; an entity that has reality in the universe; something that has measurable properties; anything comprised of matter and or energy (see: mass-energy equivalence), fermions (matter) and or bosons (force), and vacuum or space—although, to note, there is still some debate, in the particle physics arena, as to whether or not a "true" or perfect vacuum can exist (see: nature abhors a vacuum).

Physical science

In physical science, there is a long history of assertion, proof, and or disproof of what exists and what does not exist.

In 1643, Italian physicist Evangelista Torricelli showed that 'vacuums' do exist, to a measurable degree, in contrast to the age old 'nature abhors a vacuum' dictum.

In 1798, Benjamin Thompson, via his cannon boring experiment, proved that 'caloric' or rather caloric particles—heat as a type of indestructible matter as espoused in the caloric theory or material theory of heat)—does not exist.

In 1875, Balfour Stewart and Peter Tait speculatively argued that 'force' is something that does not exist. [5]

In *circa* 1900, the energetics school, led by Wilhelm Ostwald, famously argues that 'atoms' do not exist; though Ostwald notably recanted his position in his last years.

In 1905, Albert Einstein famously proved that 'either' does not exist.

In 2013, Mexican-born American chemist Vicente Talanquer, in his critique of the use chemical teleology in US chemistry textbooks, asserted his view, in respect to the Le Chatelier's principle, that there is no 'drive' involved in chemical reactions—that drive, supposedly, is something that does not exist in nature: [6]

> "The same type of thinking can be applied to the chemical processes in equilibrium. For example, when pressure is applied on a reacting system in chemical equilibrium, the system does not shift towards reactants or products "so that" or "in order to" counterbalance the effect of the change. What happens is that the change in pressure affects the probability of the forward and backward chemical processes going on in the system. The change in pressure affects the probability of collisions for the backward and forward processes in different ways. As a result, the likelihood of one process becomes higher than the other. There is NO DRIVE to attain a new equilibrium state. There is only particles randomly moving and interacting, involved in competing processes with different probabilities."

(add discussion)

Human existence

French philosopher Rene Descartes, in his 1637 *Discourse on Method*, has given, invariably, the most-famous one-liner on the question of existence, specifically the subject of human existence, namely 'I think therefore I am', or in full: [1]

> "Finally, since I thought that we could have all the same thoughts, while asleep, as we have while awake, although none of them is true at that time, I decided to pretend that nothing that ever entered my was any more true than the illusions of my dreams. But I noticed, immediately afterwards, that while I thus wished to think that everything was false, it was necessarily the case that I, who was thinking this, was something. When I noticed that this truth 'I think, therefore I am' was so firmly and certain that all the most extravagant assumptions of the skeptics were unable to shake it, I judged that I could accept it without scruple as the first principle of the philosophy for which I was searching. Then, when I was examining what I was, I realized that I could pretend that I had no body, and that there was no world nor any place in which I was present, but I could not pretend in the same way that I did not **exist**. On the contrary, from the very

> fact that I was thinking of doubting the truth of things, it followed very evidently and very certainly that I existed; whereas if I merely ceased to think, even if all the rest of what I had ever imagined were true, I would have no reason to believe that I existed. I knew from this that I was a substance, the whole essence or nature of which was to think and to which, in order to exist, has no need of any place and does not depend on anything material. Thus this self—that is, the soul by which I am what I am—is completely distinct from the body and is even easier to know that it, and even if the body did not exist the soul would be everything that it is."

(add discussion)

Reason

The following is a noted 1976 quote on existence by English zoologist Richard Dawkins, from is his popular *The Selfish Gene*: "Intelligent life on a planet comes of age when it first works out the reason for its own **existence**." Dawkins's point of view, here, to note, is near to the truth, but correctly, however, in the modern 21st century hmolscience + defunct theory of life perspective, according to life terminology upgrades, the statement should read:

> "Intelligent [matter] on a planet comes of age when it first [calculates it own molecular formula] [and then] works out the reason [nature, or meaning] for its own **existence**."

In other words, firstly, a human is a type of bound state intelligent matter (see: human molecule), so-to-speak, and not dead nor alive, as Dawkins would presume, i.e. in the famous 1915 words of Serbian-born American electrical engineer Nikola Tesla "there is no thing endowed with life"; secondly, that a hydrogen atom or a human molecule has a so-called "reason for existence" is a puzzling subject, to say the least, one that has not yet been worked out, as Dawkins seems to presume.

Quotes | Evolution

The following are other related scientific quotes on 'exist' or 'existence', specifically in the context of pre-evolution theories (e.g. metamorphosis), evolution theories (natural selection), or post-evolution theories (e.g. synthesis/analysis):

> "Let us investigate more closely this property common to animal and plant, this power of producing its likeness, this chain of successive **existences** of individuals, which constitute the real existence of the species."
>
> — Buffon, "De la Reproduction en Generale et particuliere" (1749) [4]

> "The primal plant is going to be the strangest creature in the world, which nature herself must envy me. With this model and the key to it, it will be possible to go on forever inventing plants and know that their **existence** is logical; that is to say, if they do not actually **exist**, they could, for they are not the shadowy phantoms of a vain imagination, but possess an inner necessity and truth. The same law will be applicable to all other living organism."
>
> — Johann Goethe, to Herder, 17 May 1787 [2]

> "The struggle for existence amongst all organic beings throughout the world, which inevitably follows from their high geometrical powers of increase, will be treated of. This is the doctrine of Malthus, applied to the whole animal and vegetable kingdoms. As many more individuals of each species are born than can possibly survive; and as, consequently, there is frequently recurring struggle for **existence**, it follows that any being, if it vary however, slightly in any manner profitable to itself, under the complex and sometimes

varying conditions of life, will have a better chance of surviving, and thus be naturally selected. From the strong principle of inheritance, any selected variety will tend to propagate its new and modified form."

— Charles Darwin, *The Origin of Species* (1859)

Quotes | Other

The following are other related scientific quotes on 'exist' or 'existence':

"Being engaged lately in superintending the boring of cannon in the workshops of the military arsenal at Munich, I was struck with the very considerable degree of heat which a brass gun acquires in a short time in being bored, and with the still more intense heat (much greater than that of boiling water, as I found by experiment) of the metallic chips separated from it by the borer. The more I meditated on these phenomena, the more they appeared to me to be curious and interesting. A thorough investigation of them seemed even to bid fair to give a farther insight into the hidden nature of heat; and to enable us to form some reasonable conjectures respecting the **existence**, or **non-existence**, of an *igneous fluid*— a subject on which the opinions of philosophers have in all ages been much divided."

— Benjamin Thompson, *An Inquiry Concerning the Source of Heat which is Excited by Friction* (1798)

"I moved swiftly, and rather superficially, from Feuerbach, to Darwin, to Nietzsche, to outline the process through which modern Western civilization came to define the meaning of existence in more humane terms than the unenlightened Chinese tradition had."

— Fu Sinian (1919), reflection on Chen Duxiu's "what is the point of human existence at all?" in the context of Confucian ideal of social service (Ñº); cited by Jennifer Hecht (2003) in *Doubt: a History* (pg. 434)

"It has become a cheap intellectual pastime to contrast the infinitesimal pettiness of man with the vastnesses of the stellar universes. Yet all such comparisons are illicit. We cannot compare **existence** and meaning; they are disparate. The characteristic life of a man is itself the meaning of vast stretches of existences, and without it the latter have no value or significance. There is no common measure of physical existence and conscious experience because the latter is the only measure there is of the former. The significance of being, though not its existence, is the emotion it stirs, the thought it sustains."

— John Dewey, *Philosophy and Civilization* (1931) [3]

See also

â— What is life? (theories of existence)
â— Existence of god

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External links

â— Existence – Wikipedia.

θΔics

In culture, the **existence of god**, or belief in the existence of god, is an age old philosophical question that remains germane to modern scientific discussion.

Approximately 5.0% of American scientists (2011) believe in the **existence of God**, down from a 27% belief a century ago (1916); whereas, conversely, 62% of the lay public believes in a personal God (2000).

Recent polls, of North American citizens, show that fewer than 5.0% of scientists believe in god; whereas, conversely, 62% of the public believes in god or a personal god.

This large discrepancy, especially prevalent in the US, seems to the be the result of the dictum that there should exist a “wall of separation between church and state” in matters of funding, which is a sort of unwritten constitutional law first stated by America’s third president Thomas Jefferson, in 1802.

A result of this, is that the subject of the overlaps of science and religion, e.g. discussion of human origins, are sort of unwritten "taboo topics" of discussion in the minds of US high school and college teachers, avoided like the plague, for fear of job loss, funding loss, reputation derision, among other repercussions.

As the second following table shows, of the 27.2% of US citizens (in 1998) who obtained a bachelors degree (or higher), only 6.4% complete a degree in engineering or the physical sciences, subjects where thermodynamics tends to be a core requisite, which translates to the conclusion that fewer than 1.7% of modern day Americans have fundamental understanding of the physical science that governs the universe. [10]

Scientist's belief

The following are the 1998 polled views of America's so-called leading or "greater" scientists, the members of the National Academy of Sciences, on personal belief or disbelief on God and immortality: [8]

American National Academy of Sciences (1998)	**Disbelief in God**	**Disbelief in immortality**	**Doubt** (or agnosticism) **of belief in God**	**Doubt** (or agnosticism) **of belief in Immortality**	**Belief in God**	**Belief in Immortality**
Physical scientists (physicists and astronomers)	79%	76.3%	13.5%		7.5%	7.5%
Biological scientists	65.2%	69%	32.3%		5.5%	7.1%
Mathematicians					14.3%	15%
Overall:	72.2%	76.7%	20.8%	23.3%	7.0%	7.9%

The official opinion of the NAS, according to a 1998 booklet published under the direction of NAS president Bruce Alberts: [9]

> “Whether God exists or not is a question about which science is neutral.”

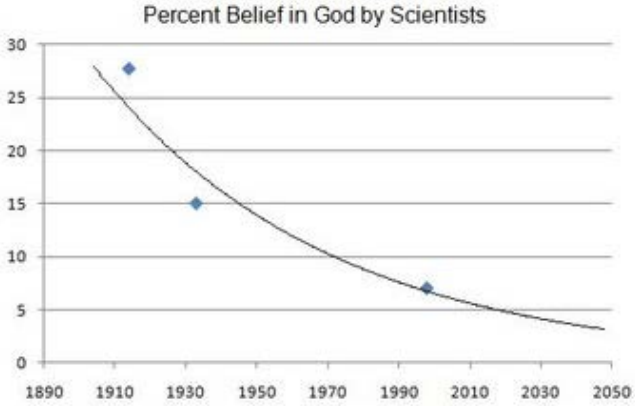

Rank	Science (1998)	%
1	Social Sciences	9.2
2	Biological/Agricultural Sciences	7.1
3	Psychology	6.2
4	Engineering	5.1
5	Mathematical/Computer Sciences	3.3
6	Physical Sciences	1.3
7	Non-S&E fields	67.4

Left: Percentage of American scientists who believe in God based on the combined studies of Leuba (1916/33) and Larson and Witham (1998). [8] Right: Percentage of US bachelors degrees obtained in 1998. [10]

This statement, supposedly meant to appease conservative religious adherents, however, is in direct conflict with the Clausius postulate, which states that the entire universe is governed by the two laws of thermodynamics, which is the actual official opinion of modern hard science.

Science

The topic of god, although purely a defunct scientific theory to the learned person, is intertwined with science to the effect that various branches of science are slowly replacing religious belief.

Key scientific books have played a role in this, particularly Polish astronomer Nicolaus Copernicus' 1543 *On the Revolution of the Heavenly Orbs* (established that the earth is not at the center of the universe), English physicist Isaac Newton's 1687 *Principia* (established the mechanical equations of the universal movement), English naturalist Charles Darwin's 1859 *Origin of Species* (established that humans were not created by god, but by evolution), German physicist Rudolf Clausius' 1865 *The Mechanical Theory of Heat* (established the two laws of the universe), American chemical engineer Libb Thims' 2007 *Human Chemistry* (established that humans are molecules whose actions are governed by the laws of chemistry and physics), etc., have been slowly eroding at public belief in the existence of god, but that however, there remains to be complete replacement for core tenets of religions, e.g. life after death, by scientific theory.

Global beliefs

The following chart shows the 2005 global beliefs on God, spirit or life force: [11]

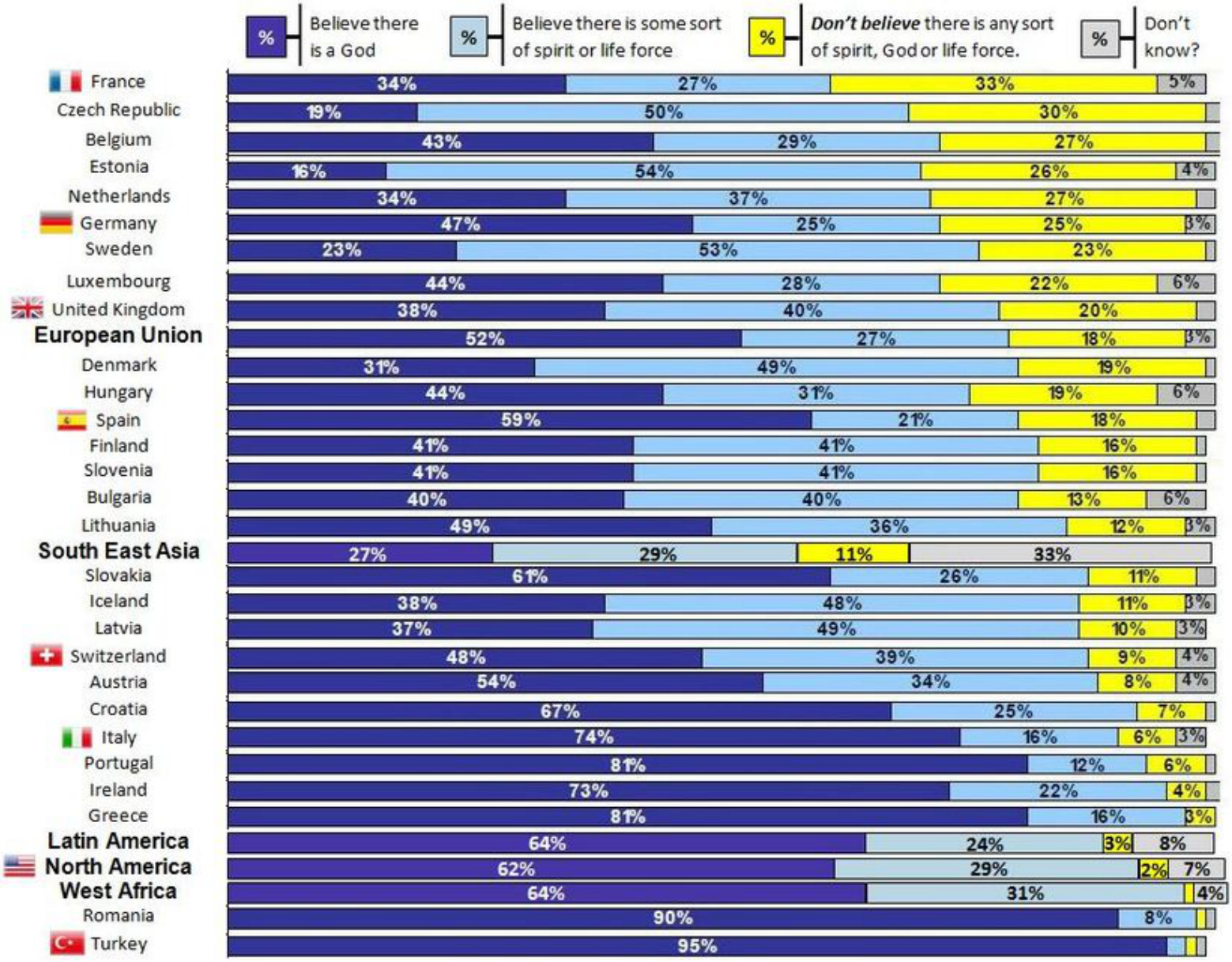

Dawkins levels

See main: Dawkins scale

In modern age, circa 2010, curious, a large percentage (84%) still people believe in god or some variation of this, and the question of 'is there a god?' is one of the big philosophical conundrums on the mind of the average person. One popular god belief scale (level 1-7), shown below, was put forward recently by English evolutionary biologist Richard Dawkins, in his popular 2006 book *The God Delusion*. [1]

Level	**Belief in the Existence of God** (Dawkins categories)
1	Strong theist. 100 percent probability of God. In the words of C.G. Jung, 'I do not believe, I know.'
2	Very high probability but short of 100 percent. De facto theist. 'I cannot know for certain, but strongly believe in God and live my life on the assumption that he is there.'
3	Higher than 50 percent but not very high. Technically agnostic but leaning towards theism. 'I am very certain, but I am inclined

	to believe in God.'
4	Exactly 50 percent. Completely impartial agnostic. 'God's existence and non-existence are exactly equiprobable.'
5	Lower than 50 percent but not very low. Technically agnostic but leaning towards atheism. ''I don't know whether God exists but I'm inclined to be skeptical.'
6	Very low probability, but short of zero. *De facto* atheist. 'I cannot know for certain but I think God is very improbable, and I live my life on the assumption that he is not there.'
6-7	"I count myself in category 6, but leaning towards 7. I am agnostic only to the extent that I am agnostic about fairies at the bottom of the garden." (Richard Dawkins, 2006)
7	Strong atheist. 'I know there is no God, with the same conviction as Jung 'knows' there is one.'
8	Do not prefer to be associated with term 'a-theist' to the same extent that I do not prefer to be associated with the term 'a-fairyist' in the sense that I am an adherent to a disbelief in tooth fairies.
9	(add view)
10	"Know there is no god (or spirits or life forces) with such certainty and conviction that I would be willing to stake my life on it"

To note, range of level 10 was added on by American chemical engineer Libb Thims in a 2009 discussion with a YouTube physicist Philip Moriarty. In Thims' view, the situation is summarized as follows:

> "Consider the entire discussion to be something akin to a flat earth theory debate; albeit a topic that irritatively seems to rear its head, recurrently, in modern scientific discussions concerning human activity. A human being is molecule, whose synthesis, movements, and future are governed by scientific laws. God is a defunct theory of olden days, used to reconcile questions that were then unanswerable; whose current following or belief, for 72 percent of the world's populous (religions), is nothing but reformulated Egyptian mythology, centered around the 5,000 BC story of the birth of the sun god Ra out of the land mound Nun."

In the discussion, Thims queried Moriarty as to his possible underlying religious motives, regarding his objections to human chemistry and human thermodynamics, commented: "I am what Richard Dawkins would classify as a **level 6 'agnostic'** - agnostic in the sense that although I cannot prove that there is or isn't a god, there are an infinite number of possibilities I can't definitively disprove.".

Thims commented back, after reading the Dawkins scale: "In the Dawkins scheme, I would be **level 10**, but I don't like the word atheist (I like the word scientist better). I've read over 50 books on religion (currently practiced, and active (about 18 main varieties), mythology, Egyptology, etc., and I know very clearly as to the background of most of the 10,000+ gods to have come and gone as well as the active ones. In the future, I might do some modern clarification videos on these topics (e.g. is there a god, what happens when you die, good vs evil, etc.), but I am somewhat hesitant, as these get very emotional for many." [3]

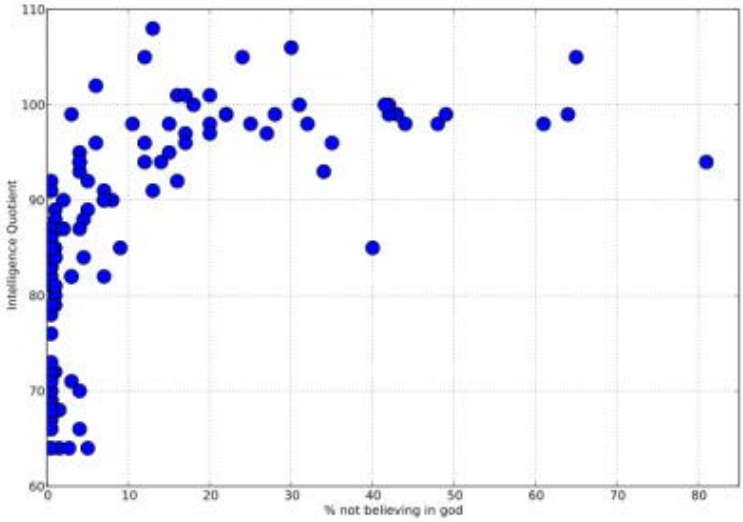

2008 study of 137 countries shows that those with an IQ < 90 have a 97% probability of believing in god; whereas if those with an IQ > 100 have a 77% probability of believing in god; and those with IQ > 105 have a 71% probability of believing in god. [4]

In 2010 Russian physical chemist Georgi Gladyshev commented to Thims on this scale: “I believe, like you, I am closer to the 10 point range.” [5]

To exemplify that this topic rears its head in origin of life discussions, Gladyshev includes a two-page discussion on the role of divine initiation in his chapter on the evolution of living systems, in which he builds his theory “without the concept of God”, instead putting his "belief in "the general laws and exact theories created by Rudolf Clausius, Willard Gibbs, and other classics of modern science.” [6]

IQ, education, and religiosity

Several studies have shown a statistical relationship between religiosity and education level, or religiosity and IQ. American skeptic aficionado Michael Shermer, in *How We Believe: the Search for God in an Age of Science*, describes a large survey of randomly chosen Americans that he and his colleague Frank Sulloway carried out, who found that religiosity is negatively correlated with education (more highly educated people are less likely to be religious) and that religiosity is negatively correlated with interest in science. [1] In this context of IQ vs belief in god, the following opinions on the theory of god, are expressed by the listed 200+ IQ group, ranked with a score of pass/fail if this question were on an IQ test:

Person	IQ	Religious Beliefs	Score
William Sidis (1898-1944)	200-300	â— At age 6, was a confirmed atheist. â— At age 21, when asked in court if he believed in god, he replied “No” and clarified that evolution was his god; when pressed further about this he stated that he did not believe in the “big boss of the Christians”, but that he did believe in something “that is in a way apart from a human being” (*The Prodigy*, pg. 144).	pass
Albert Einstein (1879-1965)	160-225	â— At age 75, gave his opinion that “the word of God is nothing more than an expression of human weakness"; described the Bible as “pretty childish”; and stated that “all religions are incarnations of the most childish superstitions.” [56]	pass
Michael Kearney (1982-)	200-325	â— Quote: “You have to be focused on the things that make you a human and not a golden god. You have to focus on just living.” (link)	?
Marnen Laibow-Koser (1975-)	268	â— At age 4, engaged in “mystical behavior”; saw his recently deceased Aunt Bessie being carried up an a flight of stairs, assisted by two old ladies, while at the funeral reception (although no one else could see these invisible stairs or invisible ladies), but supposedly described Bessie’s funeral dress and arrangement exactly and communicated with her, even though he had never really met here (*Nature’s Gambit*, pgs. 187-203). â— At age 34, stated "once again, God / the universe / whatever has reminded me that you get what you want (or what you think you want) when you're not really looking for it." (link)	fail
		â— Began to question god as a child; later returned to god, and is currently writing a treatise called the cognitive theoretic model of the universe, a type of intelligent	

	Christopher Langan (1952-)	174-210	design themed argument for the existence of god. â— At age 48, commented “Regarding evolution and creationism, the linkage is simple: Biblical accounts of the genesis of our world and species are true but metaphorical, our task is to correctly decipher the metaphor in light of scientific evidence also given to us by God.” (link)	fail
	Sho Yano (1990-)	200	â— Name means “happiness with god” (link). â— At age 14, commented that “I’m gifted. I got my gift from God, and I think I better not waste it” (link).	fail
	Michael Grost (1954-)	200	â— Grost mostly likely believes in god. In the biographical book of him (*Genius in Residence*, 1970) written by his mother, when he was 16 (and old enough to object), the first page opens to a description of describing Michael as a “miracle of God”, and the last page concludes with “may we offer those successes my son has experienced in the past, and God willing, those successes he may experience in the future …”	fail
	Marilyn vos Savant (1946-)	186-228	â— Quote: “Suppose you have bet on horse number 1 in a 3 horse race in which there is no favorite. After you have placed your bet, omniscient god, who, of course, knows the horse destined to win and how you have bet tells you, ‘It’s not going to be horse number 3’. Depending on God’s other attributes, e.g. whether God seeks to guide people towards the right decisions, you should probably switch to horse 2 if you have the opportunity.” (link) â— Quote: “Religions cannot be proved true intellectually. They come from the heart—and your parents—not the mind.” (link)	fail
	Rick Rosner (1960-)	140-250	â— At age 7, in his own words, “when my parents returned, they found me spinning clockwise (so that I wouldn't accidentally travel backwards in time) and chanting to God. I was taken to a child psychiatrist and given more IQ tests, including parts of a Stanford-Binet.”[59]	fail

References

1. Dawkins, Richard. (2006). *The God Delusion* (pgs. 50-51, pg. 102). Houghton Mifflin Harcout.
3. (a) YouTube messaging (Sep 04 2009): Libb Thims to English thermal physics professor P.M: “In the Dawkins scheme, I would be level 10, but I don’t like the word atheist (I like the word scientist better). I've read over 50 books on religion (currently practiced, and active (about 18 main varieties), mythology, Egyptology, etc., and I know very clearly as to the background of most of the 10,000+ gods to have come and gone as well as the active ones. In the future, I might do some modern clarification videos on these topics (e.g. is there a god, what happens when you die, good vs evil, etc.), but I am somewhat hesitant, as these get very emotional for many.”
(b) YouTube messaging (Sep 07 2009): P.M. to Libb Thims: “Re. YouTube message - there is no ‘Level 10’ in the Dawkins scheme. I was brought up in a very devout Catholic family and ‘kicked against’ religion from the age of nine (when I began to ask questions about the ludicrous concept of transubstantiation in Catholicism). You may therefore understand my irritation at the inference that my arguments are religiously driven. Please try not to throw around accusations of that type in the future when there is no evidence to support them.”
4. (a) Lynn, Richard, Harvey, John, and Nyborg, Helmuth. (2009). “Average Intelligence Predicts Atheism Rates Across 137 Nations” (abstract), *Intelligence*, 37(1): 11-15.
(b) Religiosity and intelligence – Wikipedia.
5. Email communicate from Georgi Gladyshev to Libb Thims on 22 Mar 2010.
6. Gladyshev, Georgi. (1997). *Thermodynamic Theory of the Evolution of Living Beings* (section: 1.3: The Origin of Life and the Role of Divine Initiation, pgs. 7-8). Nova Science Publishers.
7. Religion in the World (2000) – Gallup International Millennium Survey.
8. Larson, Edward J. and Witham, Larry. (1998). “Leading Scientists Still Reject God”, Nature, 394:313, Jul 23.
9. Alberts, Bruce. (1998). *Teaching About Evolution and the Nature of Science*. NAS Press. Washington, DC.
10. (a) National Science Foundation, Division of Science Resources Studies, *Science and Engineering Degrees: 1966-98*, NSF 01-325.
(b) In March 2000, 25.6% of US citizens graduated from college. Source: Digest of Education Statistics, 2001.
(c) In 2004, 27.2% of US citizens graduated from college: Source: US Census bureau (bachelor’s degree or higher: by state) – StateMaster.com.
11. (a) Anon. (2005). “Social Values, Science & Technology” (pdf), *Special Eurobarometer 225* (pg. 11). Report.

(b) Country abbreviations – SustainableSources.com.

External links

â— Existence in God – Wikipedia.

θΔics

In terminology, **existent**, as compared to a non-existent, is a thing having reality or existence. [1]

Quotes

The following are related quotes:

> "A similar inquiry is made by those who inquire into the 'number of **existents**'; for they inquire whether the ultimate constituents of 'existing things' are on or many, and if many whether a finite or an infinite plurality. So they are inquiring whether the principle or element is one or many."
>
> — Aristotle (350BC), *Physics* (§1.2:315-16) [2]

> "The law of sufficient reason, applied to actual **existents**, reduces itself to the assertion of final causes."
>
> — Bertrand Russell (c.1920), volume on Gottfried Leibniz; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 146) [2]

See also

â— Existive
â— Reaction existence
â— Cease to exist

References

1. (a) Existent – Merriam-Webster.com.
(b) Google Dictionary (2019).
2. Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea*. Harvard University Press, 1936.
2. Aristotle. (322BC). *The Complete Works of Aristotle, Volume One* (editor: Jonathan Barnes). Princeton University Press, 1995.

θΔics

In philosophy, **existentialism**, from *exist*-, referring to a thing that "existences" + *-al*, meaning "of, related to, or characterized by", + *-ism*, meaning "gray area subject", is the study of the meaning, purpose, point (or points), of existence, generally from the agnostic-leaning-towards-atheism, material universe purview.

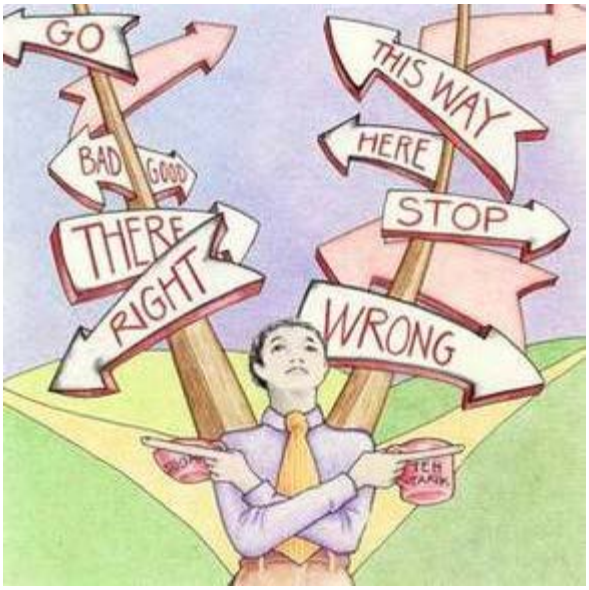

Left: an **existentialism** puzzle pieces (Ñº) cartoon, where each piece is part of the big picture of the solar system (or universe). Right: an existentialism image (Ñº) from Joe Pellegrino's webpage on an "Introduction to Existentialism".

Overview

The works of Blaise Pascal and later Soren Kierkegaard, according to Jennifer Hecht (2003), considered as forerunners of existentialism. [1]

In c.1642, Pascal, in his *Thoughts* notebook, circa aged 19, penned the following views on the uncertainties of existence:

> "**I know not** who put me into the world, nor what the world is, nor **what I myself am**. I am in terrible ignorance of everything. I know not what my body is, nor my senses, nor my soul, not ever that part of me which thinks what I say, which reflects on all and on itself, and knows itself no more than the rest. I see those frightful spaces of the universe which surround me, and I find myself tied to one corner of this vast expanse, without knowing why I am put in this place rather than another, nor why this short time which is given me to live is assigned to me at this point rather than at another of the whole eternity which was before me or which shall come after me. I see nothing but infinities on all sides, which surround me as an atom, and as a shadow which endures only for an instant and returns no more. All I know is that I must die, but what I know least is this very death which I cannot escape."

In c.1830, Kierkegaard stated the following "why of existence" very-humorous stylized query:

> "**Where am I? Who am I? How did I come to be here?** What is this thing called the world? How did I come into the world? **Why was I not consulted?** And if I am compelled to take part in it: Where is the director? I want to see him."

Later oft-classified early period existentialists include: Leo Tolstoy, Fyodor Dostoyevsky, Friedrich Nietzsche, and Jean-Paul Sartre.

In c.1950, Albert Einstein engaged into a Q&A style dialogue (see: Einstein-Pascal dialogue), with an anon 19-year-old American engineering student, on the topic of:

> "**What is the purpose of man on earth**?"

platformed on Pascal's earlier *Thoughts* notes.

In 1977, American physicist and open atheist Steven Weinberg, in his *The First Three Minutes*, outlined the generally-accepted scientific model of the early minutes of the start of the universe, according to big bang theory, at the end of which he concluded:

> "The more **the universe** seems comprehensible, the more it also **seems pointless**."

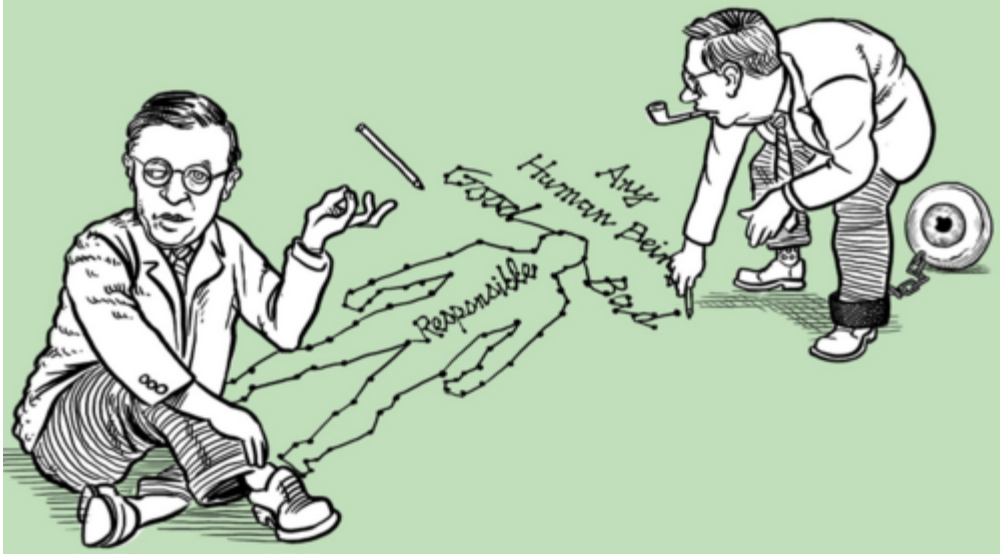

A screenshot from a 2015 video (Ñº) on Jean-Paul Sartre and **existentialism**.

Here, reading between the lines, or elaborating on this "chilling effect" stylized message, it would seem, according to the Weinberg model (compare: Camus model; Gates model), that existence, in an atheistic universe, is "pointless". This assertion, naturally enough, generated much debate and reaction in the decades to follow (see: pointlessness).

In 2002, Philip Stokes, in his *Philosophy 100: Essential Thinkers* (see: Stokes 100), listed the following seven top existentialism philosophers: [4]

1. Soren Kierkegaard
2. Friedrich Nietzsche
3. Edmund Husserl
4. Martin Heidegger
5. Jean-Paul Sartre
6. Albert Camus
7. Simone de Beauvoir

The following are top 20 greatest existentialism philosophers, per 2017 Google search return, per order of rowed photos returned:

1. Jean-Paul Sartre
2. Soren Kierkegaard
3. Albert Camus
4. Martin Heidegger
5. Friedrich Nietzsche

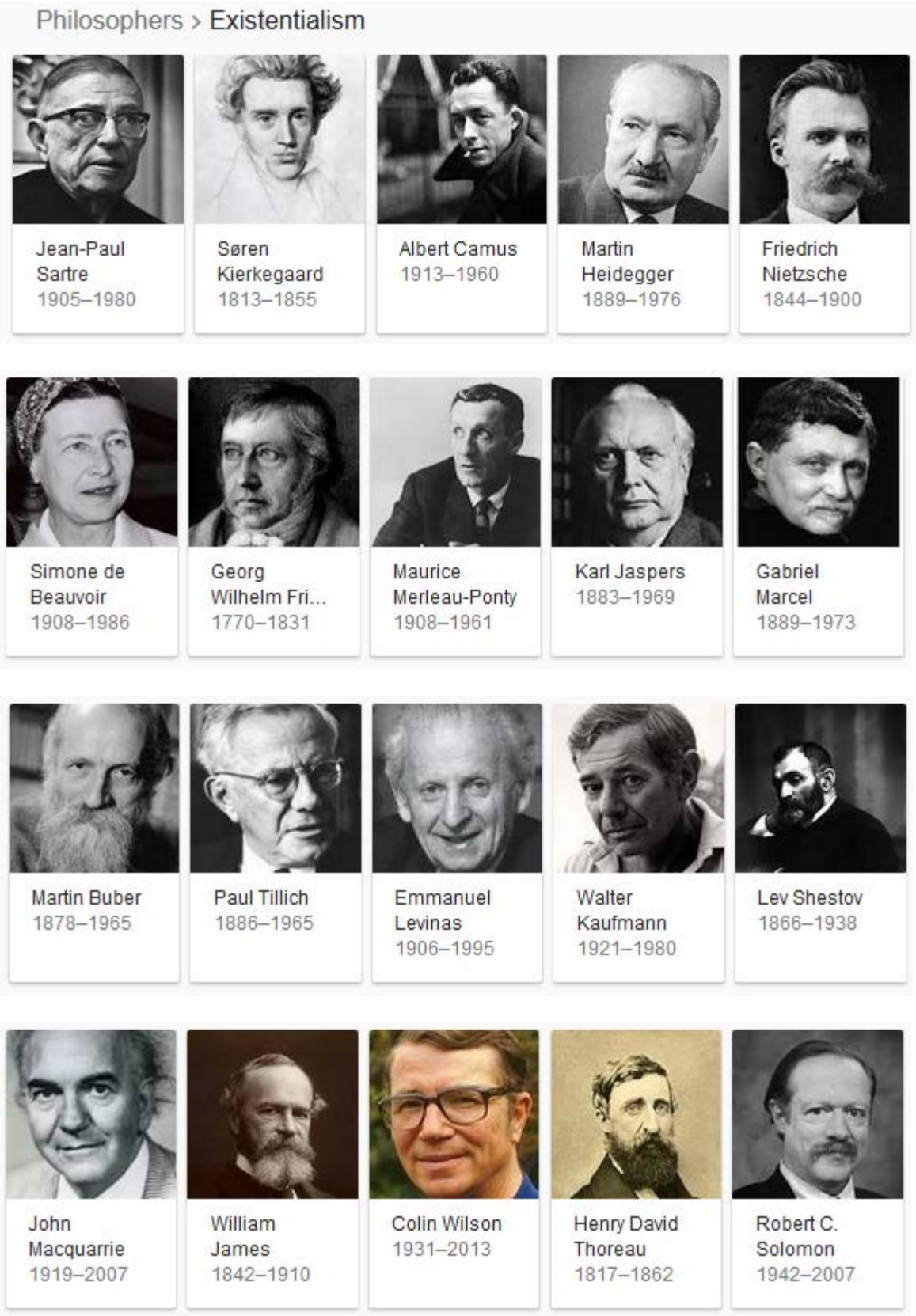

6. Simone de Beauvoir
7. Georg Hegel
8. Maurice Merleau-Ponty
9. Karl Jaspers
10. Gabriel Marcel

11. Martin Buber
12. Paul Tillich
13. Emmanuel Levinas
14. Walter Kaufmann
15. Lev Shestov

16. John Macquarrie
17. William James
18. Colin Wilson
19. Henry Thoreau
20. Robert Solomon.

Karl Jaspers, to note, argued for belief in god, akin to what Kierkegaard had discussed, namely thought "absurdist

irrationalism", which is what Jennifer Hecht calls "a leap". [1]

Goethean model

In modern terms, in a big bang based, god-less, spirit-less, soul-less, karma-less universe, a human comes into existence, as does any other "thing" in the universe, in the form of a "bound state" temporally-existive entity, the description of which being dependent on the state of the environment of the thing, e.g. higher temperatures tend to yield sub-atomic particle physics descriptions, whereas cooler temperatures tend to yield atomic-range descriptions.

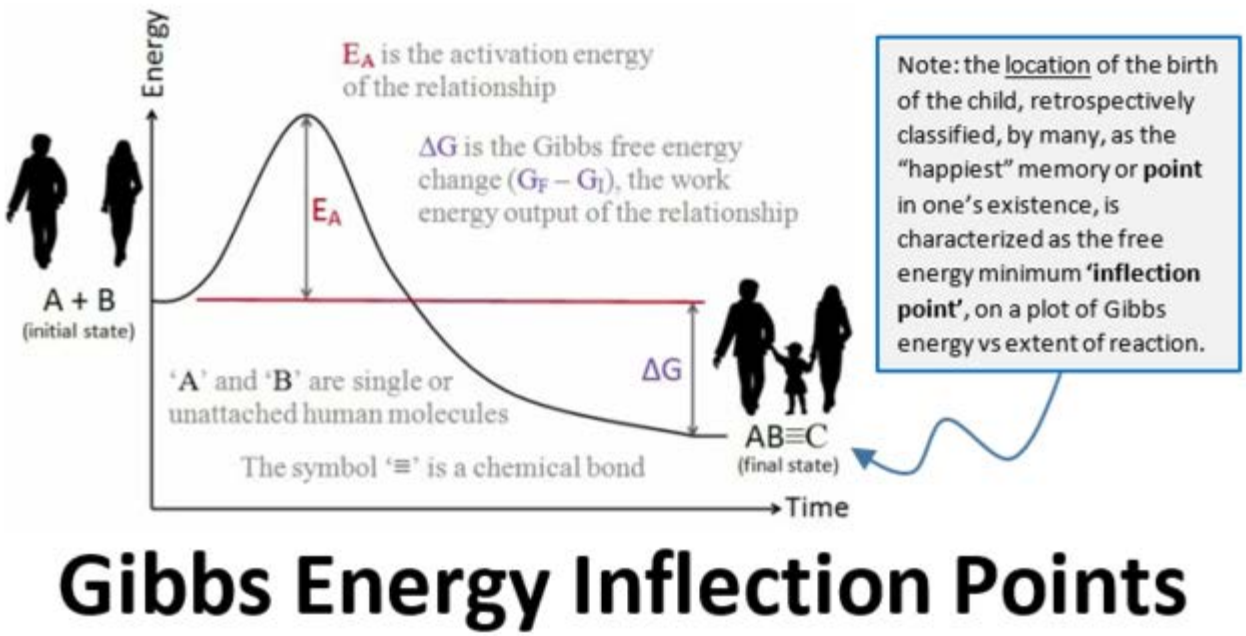

A plot of a typical human reproduction reaction, wherein an initial newly formed (collided) couple, in an initial state, progress, over time (or reaction extent), over the activation energy barrier, into the final state of a tri-human-ide molecule (see: trihumanide molecule) formation, barring discussion of irregular product formations (e.g. single mothers, single fathers, parentless children, etc.)

The existence of humans, being atomic-range description things, yield to a description wherein a new human (baby), as a newly synthesized product of the universe, comes into existence at the location of a free energy minimum (see: free energy), on a plot of Gibbs energy vs extent of reaction, in the purview of a human reproduction reaction equation.

In this "sense" (see: Pascal), one's individual existence in the universe, contrary to Weinberg model, is not "pointless", but described by states of existences (existence states) quantified Gibbs energy inflection points (compare: Gates model vs Camus model).

Quotes

The following are related quotes:

> "**Existentialism** is a chiefly 20th century philosophical movement embracing diverse doctrines but centering on analysis of individual existence (see: individualism) in an unfathomable universe and the plight of the individual who must assume ultimate responsibility for his acts of free will without any certain knowledge of what is right or wrong or good or bad."
>
> — Anon (2000), *Meriam-Webster Collegiate Dictionary*

> "**Existentialism** is a philosophical theory or approach that emphasizes the existence of the individual person as a free and responsible agent determining their own development through acts of the will."
>
> — Anon (2017), *Google Search Definition*

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 457). HarperOne.
2. (a) Pascal, Blaise. (1662). *Thoughts* (*Pensees*) (pg. #). Publisher.
(b) Pensees – Wikipedia.
3. Weinberg, Steven. (1977). *The First Three Minutes: a Modern View of the Origin of the Universe* (pointless, pg. 154). Basic Books.
4. Stokes, Philip. (2002). *Philosophy 100: Essential Thinkers*. Enchanted Lion Books.

External links

â— Existentialism – Wikipedia.

θΔics

In hmolscience, **existive**, a portmanteau-truncation of “react-**ive** **exist**-ence” (or reaction existence), a bio-defunct, life terminology upgrade functional term—employed as an upgrade to the religio-mythology rooted etymologically scientifically-defunct term “alive”, deemed scientifically irreparable and obsolete, in circa 2009 to 2013—referring to a powered animate CHNOPS+ structure, that at one time, past or present, had a time-demarcated state of reaction existence, as a bound state structure, semi-aware of its own movement.

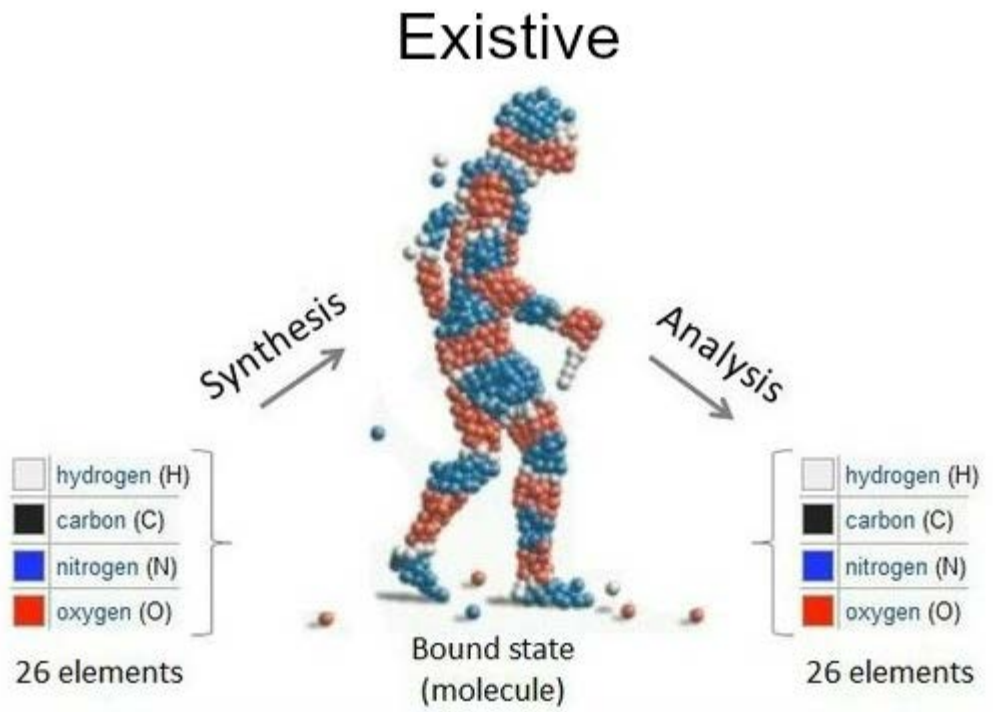

A atomic-geometry (molecular) depiction of a human as a powered animate CHNOPS+26 element bound state motile entity, in possession of a time-delineated state of “reaction existence”, NOT alive, but “**existive**”; no different, complexity aside, than any other animate carbon-based geometry, such as light-sensitive bending molecules (e.g. retinal) or fueled walking molecules (e.g. DTA or kinesin).

The term “existive” is a kind of “I react, therefore I am” Cartesian-upgrade, from defunct-dualism to modern non-defunct Goethean "one nature" envisioned monism.

The element “carbon” C, in short—or, in general, the column 14 of the periodic table (see: hmolscience periodic table)—possesses the proton-electron geometrical configuration property of photon-exchange meditated “animation”; hence to differentiate certain classes of carbon atoms to be “alive”, e.g. the 26-element bending and walking human molecule, and others to be “non-alive” (or types of non-life), e.g. the 3-element bending retinal molecule, is but vacuous religio-mythology division absorbed into science, in the 18th century, via the now-obsolete and defunct tripartite Linnaean classification scheme; thus the terminology reform.

Etymology

The introduction of the Hmolpedia-introduced term “existive”, as a life terminology upgrade for the scientifically defunct term “alive”, arose as a precipitate of the working term “reactively existive”, a water-testing derivative of the 2012-introduced terms: reaction start, reaction existence, reaction end, employed as delineation markers on Goethe timeline; loosely depicted as adjacent.

The title page (article and video) use of "existive" seem to have come about predominately in the construction and drafting of the 2013-initiated smartest person alive | existive page, somewhere amid versions 15 (Ñº) to version 25 (Ñº), approximately. Shown below, is a screenshot of parts 4 and 5 of the five-part “25 Smartest People Alive | Existive” video countdown by Libb Thims, where, both in online draft form (Ñº) and in video discussion (Ñº), parts one and five,

in particular, a significant focus was put on the peculiar and pointed issue that if a modern post-Crickean aged person was a so-called “smartest person alive”, he or she would know, paradoxically, that they were NOT alive; hence the video title term-dualism employed, namely “Alive | **Existive**”, the former employed for the purposes of colloquial recognition, the latter employed as the functionally operation working term upgrade.

This specific stand-alone article was started on 29 Jul 2015 to make operational a term link on the "existographies" article, started previously on the same day.

Quotes

The following are related quotes:

> “Believe me, dear Sir: there is not in the British Empire a man who more cordially loves a union with Great Britain than I do. But, by the God that made me, I will **cease to exist** before I yield to a connection on such terms as the British Parliament propose; and in this, I think I speak the sentiments of America.”
>
> — Thomas Jefferson (1775), “Letter to John Randolph”, Nov 29 [2]

> “Religion. Your reason is now mature enough [age 17] to examine this object. In examining this subject, divest yourself of all bias, in favor of novelty and singularity of opinion, shake off all fears and servile prejudices, under which weak minds are servilely crouched: fix reason in her seat firmly; question with boldness even the **existence** of God; because if there is one, he must approve more of the homage of reason than that of blindfolded faith. Read the Bible as you would Tacitus or Livy. Those facts in the Bible which contradict the laws of nature must be examined with care.”
>
> — Thomas Jefferson (1787), “Letter to [nephew] Peter Carr” [3]

> “**I feel: therefore I exist**. I feel bodies which are not myself: there are other existences then. I call them *matter*. I feel them changing place. This gives me *motion*. Where there is an absence of matter, I call it *void*, or *nothing*, or *immaterial space*. On the basis of sensation, of matter and motion, we may erect the fabric of all the certainties we can have or need.”
>
> — Thomas Jefferson (1820), “Letter to John Adams”, Aug 15 [4]

> “Exact knowledge is the enemy of vitalism. Let us **abandon** the word ‘alive’.”

— Francis Crick (1966), *Of Molecules and Men* [1]

References

1 Crick, Francis. (1966). *Of Molecules and Men* (pg. 5). Prometheus Books, 2004.
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3. (a) Jefferson, Thomas. (1787). “Letter to nephew Peter Carr”; in *Letters of Thomas Jefferson* (Ñº), Sanbornton Bridge, 1948.
(b) Holyoake, George J. (1871). *The Principles of Secularism Illustrated* (pgs. 40-42). Book Store.
(c) Peikoff, Leonard. (1982). *The Ominous Parallels* (pg. 106) (Ñº). Penguin-Meridian.
(d) Cox, John. (2008). *Googling God* (pg. 38). Harvest House Publishers.
4. Greenblatt, Stephen. (2011). *The Swerve: How the Renaissance Began* (pg. 263). Random House.

θΔics

In genius studies, **existive IQ** is an IQ (see: IQ key) assignment made, discerned, or determined, e.g. based on test results (see: IQ test), auto-estimation, or peer gauge, on an existive person, e.g. see smartest person existive, at a given "state" of existence, e.g. on a given day, a certain year, season, month, or time period.

θΔics

In hmolscience, **existographies**, a portmanteau of "*existive*-" (suffix) + (prefix) "-*graphies*", is a 2015-introduced file-tree header term, first used on the Top 500 geniuses, Robert Ingersoll, Thomas Paine, and David Darling page, employed as a neo-modern life terminology upgrade working synonym for the now bio-defunct term "biographies".

Quotes

The following are related quotes:

> "Thermodynamically, one cannot technically say that there is such a thing as a 'bio'. Correctly, one can say, thermodynamically speaking, that there exist such things as 'powered CHNOPS+' things, using Henry Swan's 1974 terminology."
>
> — Libb Thims (2017), mental note arisen via dialogue (Q) with Philoepisteme, Dec 5

See also

- Abioism
- Life does not exist
- Defunct theory of life

θΔics

See side navigation menu.

θΔics

In existographies, **existographies (anti-atomic theorists)** refers to hmolscience related thinkers who were against atomic theory; some of which are listed in the adjacent dropmenu.

In existographies, **existographies (anti-reductionism)** refers to articles of individuals that are anti-reductionist (see: anti-reductionism) in argument and or anti-materialistic (see: anti-materialism); some of which are listed in the adjacent dropmenu.

θΔics

In existographies, **existographies (artists)** refers to artists who have made hmolscience related art work; some of which are listed in the adjacent dropmenu.

θΔics

In existographies, **existographies (atheists)**, as compared to theists, are individuals who have identified as people not having belief in the existence of god and or deny that god exists; some noted atheists, famous atheists, and or top 100 atheists; along with atheism-related individuals are listed in the adjacent drop menu.

θΔics

In existographies, **existographies (chemists)** refers to noted or hmolscience-related chemists; names of which are listed in the adjacent drop menu.

θΔics

In Hmolpedia, **existographies (connected)** refers to existographies of individuals not directly pioneers in one of the hmolscience related fields, e.g. human chemistry, or subfields, e.g. thermodynamics, but a person in the backdrop framework of noted graphies.

θΔics

See side navigation menu.

In existographies, **existographies (ecology)** refers to hmolscience related thinkers who focus on ecology or related, e.g. ecological economics, etc.; some of which are listed in the adjacent dropmenu.

θΔics

In existographies, **existographies (economists)** refers articles on hmolscience-related economists; some of which are listed in the adjacent dropmenu.

θΔics

See side navigation bar.

In existographies, **existographies (Goethe)** refers to individuals associated with Goethe, Goethe-related scholars, *Elective Affinities* analyzers (Q), among related individuals; some of which are listed in adjacent dropmenu.

θΔics

In existographies, **existographies (Greek philosophers)** refers to the grouping of famous philosophers of ancient Greece, generally surrounding Aristotle (384-322 BC) (2134-2072 BG) in time period, minus several centuries, up to about the Hypatia (350-415) time period, prior to entry into the dark ages.

See also

â— Existographies (philosophers)

θΔics

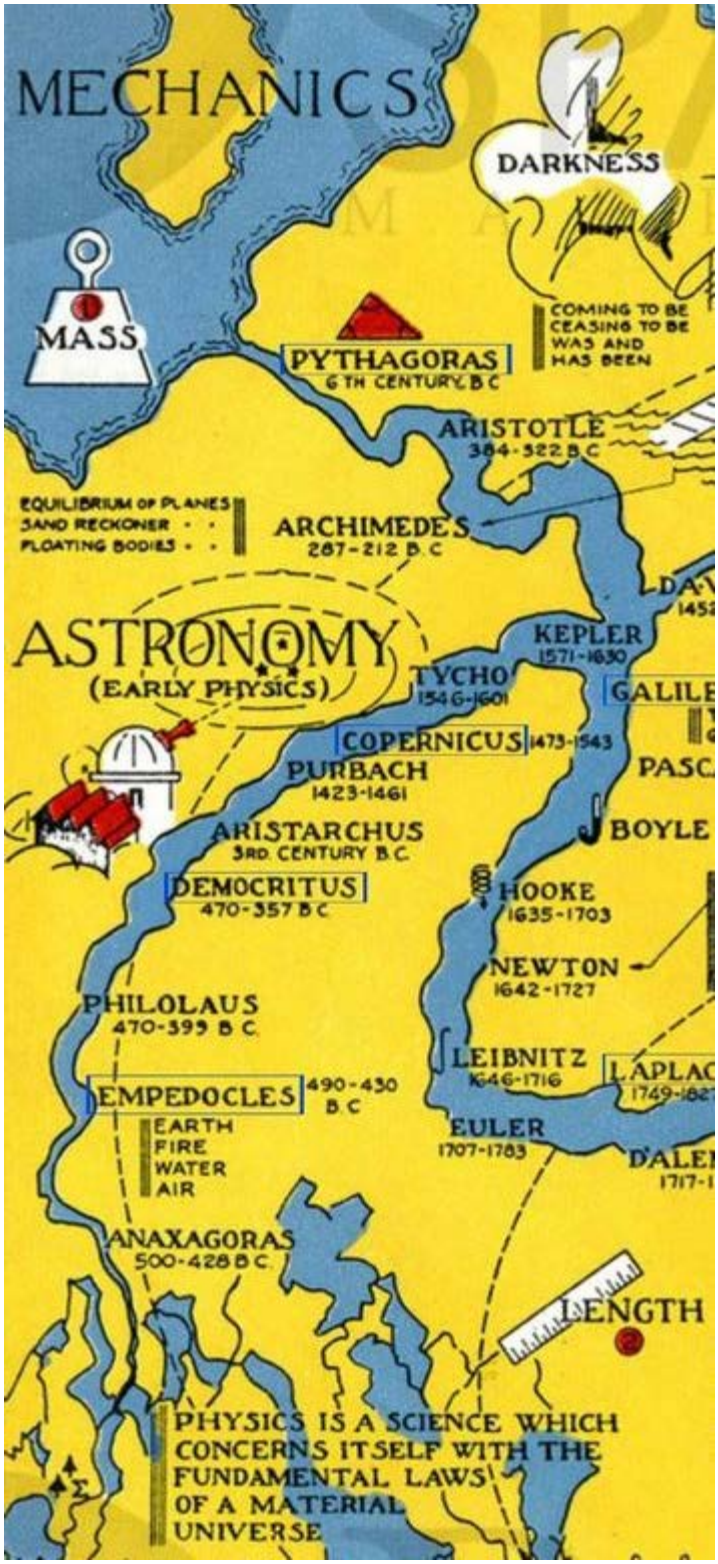

Noted "physicist" **Greek philosophers** from Bernard Porter's 1939 Map of Physics.

In existographies, **existographies (information theory)** refers to Hmolpedia articles of information theory minded thinkers; some of which are listed adjacent.

θΔics

In existographies, **existographies (Islam-related)** refers to hmolscience-related thinkers of Middle Eastern or Islam connectiveness or Muslim-related; some of which are listed in the adjacent dropmenu.

θΔics

See side navigation menu.

In existographies, **existographies (life/non-life theorists)** refers to thinkers digressing, historically, or in a related sense, on the life/non-life topic, e.g. Lionel Beale (1870) on the "physical life theorists", Richard Owen (magnetic life) or William Grove (battery life), etc., or related topics, e.g. half-alive theory (John Haldane).

θΔics

In existographies, **existographies (literature)** refers to hmolscience-related writers or literature related individuals, not necessarily HT, HC, or HP pioneers, but related or in the neighborhood, in some way; some of which are listed in the adjacent dropmenu.

θΔics

See names in adjacent drop menu.

In existographies, **existographies (new age)** refers to thinkers in in the meta-side of theoretical ideas, i.e. new age or fringe concepts; some of which are listed adjacent.

θΔics

In existographies, **existographies (ontic opening)** are thinkers who attempt to employ ontic openings in attempts to mend their dualism, religious, and or anthropomorphic conceptions and beliefs; some of which are listed in the adjacent dropmenu.

θΔics

See side navigation bar.

In existographies, **existographies (panbioists)** refers to existographies of thinkers who promote and or adhered to a panbioism view, or the related; panpsychism, panexperientialism; some of which are listed in the adjacent dropmenu.

θΔics

In existographies, **existographies (panpsychists)** refers to hmolscience-related panpsychists, i.e. those promoting panpsychism-like views; some of which are listed in the adjacent dropmenu.

θΔics

In existographies, **existographies (philosophers)** refers to noted or hmolscience-related philosophers; names of which are listed in the adjacent drop menu.

θΔics

In existographies, **existographies (physicists)** are physicists connected in some way to hmolscience; as listed in the adjacent dropmenu.

θΔics

In existographies, **existographies (physiologists)** refers to noted hmolscience connected thinkers who by trade were physiologists, i.e. studied physiology, in part or in full; some of which are listed in the adjacent drop menu.

θΔics

In existographies, **(existographies (poets)** refers to hmolscience-related scholars known notably for having produced poetry, often with some type of physics, chemistry, or thermodynamics themes employed.

θΔics

In existographies, **existographies (processing)** is a file tree header page for individuals who were previously in the "unfiled" pages header tree, for some period of digestion, but were processed up into Hmolpedia (print set) file, but are in need of more processing, digestion, or investigation of work, prior to more apt file tree header classification.

θΔics

In existographies, **existographies (psychologists)** refers to hmolscience-related psychologists, and the related, e.g. psychoanalysts; some of which are listed in the adjacent dropmenu.

θΔics

In existographies, **existographies (reductionists)** refers to hmolscience-related reductionists; some of which are listed adjacent.

θΔics

In existographies, **existographies (sociologists)** refers to hmolscience-related sociologists; some of which are listed in the adjacent dropmenu.

θΔics

In existographies, **existographies (theists)** refers to hmolscience-related or connected theist or creationist thinkers of a theological bent or siding; some of which are listed in the adjacent dropmenu.

θΔics

In existographies, **existographies (theologians)** refers to hmolscience related theologians, e.g. bishops, popes, preachers, etc., who digress on theology and science; some of which are listed adjacent.

θΔics

See side navigation menu.

In hmolscience, **exosomatic energy**, as contrasted with endosomatic energy (bodily metabolism), is a hypothetical concept, conceptualized as useful energy throughput outside human bodies. [1]

Overview

In 1945, American physical chemist Alfred Lotka, supposedly, was using the term “endosomatic instruments” (internal organs) in some type of energetics sense.

In 1971, Romanian mathematical economist Nicholas Georgescu-Roegen, expanded on Lotka's ideas, albeit applied or used as synonym for capital equipment (things people use around them to enjoy life). [2] Georgescu-Roegen argued that, e.g., the beak of a bird that kills its prey is an endosomatic instrument, and the energy of the organs and muscles that power the movement of the beak are classified as endosomatic metabolism, then by extrapolation of this model the bow and arrow (or large boat, etc.) that early humans used to kill their prey are thus classified as exosomatic instruments and the structures, such as boat engines or gun powder, that power the movement of the human exosomatic instruments are thus classified as having an abstract type of exosomatic metabolism with an associated "exosomatic energy"; in Georgescu-Roegen’s own words: [3]

> “Exosomatic instruments enable man to obtain the same amount of low entropy with less expenditure of his own free energy than if he used only his endosomatic organs.”

In 1980, Spanish ecologist Ramon Margalef, in his *Biosphere Between Thermodynamics and Game*, defines exosomatic energy as: [4]

> “[Exosomatic energy]: that which helps maintain life and the organization of ecosystems, but which neither flows though nor gets debased in the changes of somatic metabolism, and endosomatic energy, as energy that feeds the internal metabolism of organisms.”

Margalef adds, supposedly, that this term applies to all energy used in heating, transport, food preparation, air conditioning, the building and maintenance of dwellings, and information dissemination. [5] In these various contexts, it seems that the term exosomatic energy, as used in economics and ecology, is very ill-defined.

Human chemistry

In the modern formulation of human molecules reacting on surface, similar to the Haber process, it would seem that a good deal of what is referred to as an exosomatic instrument, e.g. a car or screw driver, is technically classified, from a chemical reaction point of view, as either substrate material or catalyst (e.g. iron in the Haber process), thus having an effect on the activation energy. In addition, in the sense of human chemical bonding, some of the energy aspects of this “exosomatic metabolism”, e.g. the energy of money being similar in properties to ATP as molecular currency, are classified as secondary field particles acting to mediate the force or exchange force between human molecules. [6]

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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (Google books). Morrisville, NC: LuLu.

Further reading

â— Ramos-Martin, J. (2005): *Complex Systems And Exosomatic Energy Metabolism Of Human Societies*, PhD, Autonomous university of Barcelona.

θΔics

In science, **exothermic**, from the Greek –*exo* "outside" + -*therme* "heat, warm", as compared to endothermic, refers to a transformation, i.e. process, reaction, or change of state, wherein heat is released out of the system into the surroundings; formulaically:

$$Q > 0$$

If the reaction occurs at constant pressure (isobaric), then $\Delta H < 0$; if the reaction occurs at constant volume (isochoric), then: $\Delta U < 0$. If the system undergoes a transformation which is both exothermic and adiabatic, then its temperature increases.

Etymology

The term "exothermic", in French as *exothermique*, was in use as early as 1851 (Ñº); it is oft-cited that Marcellin Berthelot coined both "exothermic" and "endothermic". [2]

Quotes

The following are related quotes:

> "Is hell **exothermic** or endothermic?"
>
> — Anon (c.1990), said to have been asked on a chemistry mid-term exam; related to Paul Foote's circa 1920 article "The Temperature of Heaven and Hell" (see: thermodynamics of hell)

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics* (pg. 108). Oxford University Press.
2. (a) Anon. (1985). *Academic American Encyclopedia, Volume 4* (pg. 327). Grolier.
(b) Luck, Steve. (1998). *The American Desk Encyclopedia* (pg. 96). Oxford University Press.

External links

â— Exothermic – TheFreeDictionary.com.

θΔics

In terminology, **experience** refers to the various reaction states of the mind according to which sensory input is processed into mental imagery, views, thoughts, memories, and actions, etc., that come to constitute time differentials of one's reaction existence.

Overview

In 1997, Gundula Sharman aptly described Goethe's *Elective Affinities* and its embedded human chemical theory as the "scientific model of human experience". [1]

Quotes

The following are related quotes:

> "There is an insatiable desire in the human breast to resume in some short formula, some brief statement, the facts of human **experience**."
>
> — Karl Pearson (1892), *The Grammar of Science* [2]

> "Snow is the spokesperson for the technologico-Benthamite reduction of human experience to the quantifiable, the measurable, the manageable."
>
> — Frank Leavis (1962), "The Significance of C.P. Snow" [1]

Die Wahlverwandtschaften - *Scientific Model for Human Experience*

The husband and wife of *The Newton Letter* are called Edward and Charlotte, which may be common enough, but the niece bears the unusual name of Ottilie. There is a similar, well-known constellation of an Eduard, married to a Charlotte, and a niece called Ottilie in literature: it can be found in Goethe's novel *Die Wahlverwandtschaften.*[11] Much has been written about that enigmatic novel which seems to remain forever out of the reach of the interpreter. Goethe himself invites our close attention when he writes to Johann Friedrich Cotta: "Es ist manches hineingelegt, das, wie ich hoffe, den Leser zu wiederholter Betrachtung auffordern wird."[12] Here, I will only concentrate on those aspects of the work which have a bearing on *The Newton Letter*.

Goethe himself advertised his novel, published in 1809, under the following description:

> Es scheint, daß den Verfasser seine fortgesetzten physikalischen Arbeiten zu diesem seltsamen Titel veranlaßten […] und so hat er auch wohl *in einem sittlichen Falle eine chemische Gleichnisrede* zu ihrem geistigen Ursprung zurückführen mögen, um so mehr, als doch überall nur *eine* Natur ist und auch durch das Reich der heiteren Vernunftfreiheit die Spuren trüber, leidenschaftlicher Notwendigkeit sich unaufhaltsam hindurchziehen, die nur durch eine höhere Hand und vielleicht auch nicht in diesem Leben völlig auszulöschen sind.[13]

Starting from his holistic view of the world, of there being only *one* nature which is at work in the whole of creation, Goethe justifies his attempt to apply a law from the natural sciences, the phenomenon of the so-called elective affinities, to the human realm. In the experiment, focusing on the power of the natural forces which underlie human action, Goethe explores the realm of free will. To what degree are our lives determined by natural laws, and how can their force be broken? Subjects of the experiment are the characters in the novel, the setting is an isolated country estate, relatively free from external influences, and the narrator can be seen as conducting and describing the proceedings:

> Die metaphorische Sprache […] legt nahe, daß die Romanhandlung selbst das versprochene Experiment ersetzt und die Romanfiguren Versuchsobjekte sind, an denen das soziale Urphänomen der Wahlverwandtschaften in Raum und Zeit darstellbar wird.[14]

Scottish German-languages scholar Gundula Sharman's 1997 lecture section header, from her conference presentation "Elective Affinities with Ireland: John Banville's *The Newton Letter* and Goethe's *Die Wahlverwandtschaften*", on the relation between the work of John Banville and German polymath Johann Goethe's 1809 physical chemistry base masterpiece *Elective Affinities* (*Die Wahlverwandtschaften*), the latter of which contains principles, about which Goethe famously defended in the street saying they were "true" and not immoral (Dec 1809), that, according to Sharman, define the "scientific model for human **experience**." [1]

See also

â— Existence
â— Being

References

1. Sharman, Gundula. (1997). "Elective Affinities with Ireland: John Banville's *The Newton Letter* and Goethe's *Die Wahlverwandtschaften*", in: *The Novel in Anglo-German Context: Cultural Cross Currents and Affinities*: *Papers from the Conference Held at the University of Leeds from 15 to 17 September 1997* (pgs. 369-84; image, pgs. 372-73) (edited by Susan Stark). Rodopi, 2000.
2. Pearson, Karl. (1900). *The Grammar of Science* (pg. 36). Publisher.

External links

â— Experience – Wikipedia.

θΔics

In science, an **experiment** is a process or trail designed to test a scientific theory. [1]

1768 rendition of English physicist and chemist Robert Boyle's *circa* 1660 bird in a vacuum **experiment**, by English artist Joseph Wright, somewhat incorrectly entitled "An Experiment on a Bird in an Air Pump" (incorrect on the fact that the bird as depicted is in a vacuum bulb, and not in the air pump); a noted thermodynamics anecdote: the odd experiment done so to test and hence disprove English scientist Thomas Hobbes' "wind theory of cold". [2]

Overview

In thermodynamics, and the connected fields of chemistry and physics, a number of decisive and epoch changing experiments have been famously conducted: these include: English physical chemist Robert Boyle's circa 1660 bird in vacuum experiment (see main: animal in vacuum experiment); Benjamin Thompson's 1798 cannon boring experiment; Humphry Davy's 1799 ice-rubbing experiment; Thomas Young's 1804 double-slit experiment; James Joule's 1843 paddle wheel experiment and 1847 Niagara Falls experiment; Alfred Mayer's 1878 floating magnets experiment; the 1952 Miller-Urey experiment, conducted by Stanley Miller and Harold Urey; Claus Wedekind's 1995 sweaty T-shirt experiment; among others.

Thought experiments

Another type of experiment is called the "thought experiment", examples of which James Maxwell's 1867 heat demon thought experiment, Albert Einstein's 1895 musing idea of what would happen if one were to run alongside a beam of light, among others.

Quotes

The following are related quotes:

> "It follows from this that all science is empty, deceptive, and pointless unless it is supported by **experiment**. What inconsistencies otherwise successful and perceptive scholars bring forth without its help! It is experimentation that dissolves all doubts, reconciles difficulties, is a unique teacher of the truth, furnishes a torch in darkness and instructs us how to determine the true causes of things by disentangling knotty problems."
>
> — Athanasius Kircher (1631), *Ars Magnetica* (pg. 570); cited by Otto Guericke (1672) in *New Magdeburg Experiments* (pg. xvii)

> "A thousand Demosthenes, a thousand Aristotles can be laid prostrate by a single man of mediocre talent who has seized upon a better way [experimental method] to find the truth. Such a hope, therefore, must be removed: for indeed, men, more learned and superior to us in book-learning, will be found who, to the same of nature itself, can make that which is, in fact, false, true."
>
> — Galileo (1632), *Dialogue on the Two Chief World Systems*; cited by Guericke in "Preface" to *Magdeburg Experiments*

> "Theories which are demonstrated by **experiment** and visual perception must be preferred to those derived from reasoning, however probable and plausible, for many things seem true in speculation and discussion, which in actual fact defy reality."
>
> — Otto Guericke (1672), "Preface" to *New So-Called Magdeburg Experiments on the Vacuum of Space*

See also

Sciences	Humanities
● Ball and clay experiment	
● Ball and ring experiment	
● Beer keg vacuum experiment	
● Cannon boring experiment	● Lazy ant experiment
● Double-slit experiment	● Libet experiment
● Floating magnets experiment	● Love thought experiment
● Ice rubbing experiment	● Miller-Urey experiment
● Magdeburg hemispheres	
● Niagara Falls	
● Paddle wheel experiment	

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1. Daintith, John. (2005). *Oxford Dictionary of Science.* Oxford University Press.
2. (a) Shachtman, Tom. (1999). *Absolute Zero and the Conquest of Cold* (pg. 31-34). Mariner Books.
(b) Shapin, Steven and Schaffer, Simon. (1985). *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton University Press.
(c) An Experiment on a Bird in the Air Pump – Wikipedia.
(d) Leviathan and the Air-Pump – Wikipedia.

External links

● Experiment – Wikipedia.

θΔics

In atheism terminology, **explicit atheism**, as compared to **implicit atheism** (e.g. Alfred Lotka), **indirect atheism**, i.e. “those who hold ideas that, in some way or another, imply atheism” (Ñº), which can be of a practical or theoretical variety (Ñº), or **crypto-atheism** (e.g. Thomas Hobbes) is a type of open and frank statement of one’s disbelief in the existence of god, and or denial of the existence of god, e.g. by proof via religio-mythology and or other proofs god does not exist, concordant with direct and open discussion, of traditionally **carpet swept** taboo topics, e.g. whether god is involved when hydrogen reacts with oxygen or man reacts with woman, in publications, presentations, and daily interactions.

Overview

In science, to go through one example, so to direct distinguish "implicit" as compared to "explicit" atheism, in the context of chemistry, when in 1885 Johannes Wislicenus took down the Wisdom of Solomon (11:21) quote: “god as arranged all things by measure and number and weight”, from the University of Leipzig chemistry classroom wall, then above the periodic table, when he succeeded Hermann Kolbe, via the subtle comment to his tour guide “that must go”, chemistry thereafter became “atheism implicit”.

A photo of implicit atheism and **explicit atheism** as compared to implicit theism and explicit theism in the Beg-Thims dialogue (2015).

Atheism | **Implicit**

> “Just as man and woman attract one another, so oxygen attracts hydrogen, and, in loving union with it, forms water, that mighty omnipresent element, without which no life nor thought would be possible.”
>
> — Ludwig Buchner (c.1855); cited by Henry Finck (1887) as an example of "gross materialism"

Atheism | **Explicit**

> “Just as there is no god involved when oxygen reacts with hydrogen, so to is there no god involved when man reacts with woman.”
>
> — Libb Thims (2014), mental synopsis personal note of the Goethe 1809 point on the atheism timeline; an atheism explicit variant of the c.1855 Ludwig Buchner quote: "Just as man and woman attract one another, so oxygen attracts hydrogen", Sep 10; cited (Ñº) by Inderjit Singh (2015) as favorite philosophical quote

In other words, in the Buchner quote, standalone, someone reading it in the following century, e.g. Henry Bray (1910) or Mirza Beg (1987), might intuit, imbibe, read, think, or interpret that Buchner was giving a theism-implicit statement, i.e. that "god" could be read into the reaction of oxygen with hydrogen or man with women, regardless of the fact that Ludwig Buchner is one of German's most-famous atheists. In the Thims' statement, however, it is EXPLICITLY stated that god is NOT involved when man reacts with woman. The statement is atheism "explicit".

If, however, when the students came into the class, and Wislicenus opened his introduction to the periodic table by stating that the "The laws of nature have arranged all elements by column (property) and row (external shell configuration)" AND "there is no god involved in any of this process", this would have been an example of "explicit atheism". The world's chemistry classrooms, however, have been implicit ever since.

In 1979, George Smith, supposedly, defined "implicit atheism" as the absence of theistic belief without a conscious rejection of it and "explicit atheism" as the absence of theistic belief due to a conscious rejection of it." (Ñº)

In 2013, Stephen Bullivant, via citation to a "contentious but intriguing" claim by Jesse Bering (2010), commented that, supposedly, changes in explicit atheism do not translate to higher levels of implicit atheism. [1] This Bering assertion, however, seems doubtful in respect to conscious implicit atheism as compared to conscious explicit atheism, the latter of which resulting in a rewiring of the mind in respect to the public discourse the switch in atheism type brings about.

Quotes

The following are related quotes:

> "The first atheist of whom we know is one Diagoras, who lived in the late fifth century BCE. It is typical that nothing of this works aside from random fragments survives and that he was forced to flee Athens because he declared that there were no gods. Even in the ages preceding Christianity, the enunciation of **explicit atheistic**, or even agnostic, views carried with it the threat of both legal punishment and social obloquy."
>
> — Sunand Joshi (2014), *The Original Atheists* [2]

> "I was an 'implicit atheist' prior to 2014 (see: Beg-Thims dialogue) and an **'explicit atheist'** thereafter."
>
> — Libb Thims (2017), mental note, Aug 26

References

1. Bullivant, Stephen. (2013). *The Oxford Handbook of Atheism* (editors: Stephen Bullivant and Michael Ruse) (explicit atheism, pgs 429, 639). OUP Press.
2. Joshi, SunandT. (2014). *The Original Atheists: First Thoughts on Nonbelief* (pg. 7). Prometheus Books.

θΔics

In thermodynamics, **extensity** *x* is shorthand term for an "extensive quantity", a quantity proportional to a system's dimensions, having the conjugate variable tension *X*. [1] Internal energy *U* is the thermodynamic potential for systems when quantities of extensity are constant.

Tension

A tension is a partial derivative of the internal energy *U* with respect to an extensity, other extensive quantities being kept constant. Subsequently, with any extensity x_i it is always possible to associate a tension variable X_i:

$$X_i = \frac{\partial U}{\partial x_i}$$

which is called the conjugate. As such, according to the first law, the change in internal energy of a system is given by:

$$dU = \sum_{i=1}^{k} X_i dx_i$$

Stated verbially, extensity is an energy "transfer variable", defined such that when two systems A and B are brought into contact or interact, the assembly (A + B) being isolated, with each system having different tensions, an exchange of energy results via a transfer of an extensity, such that the transfer ends when the tensions have equalized. [2] Extensity is conserved for reversible transformation. [1]

Psychological thermodynamics

See main: Psychological thermodynamics

At some point, the term extensity of thermodynamics seems to have crossed over into the field of psychodynamics, possibly through the writings of Swiss psychiatrist Carl Jung or a terminology borrowed from Belgian chemist Ilya Prigogine. In this sense, extensity, according to one definition, is an ordering parameter of a complex system, associated with energy, defined as the area of consciousness in phase space; where phase space for the ego is a two-dimensional chart showing the relationships between consciousness, the personal unconsciousness, and the collective unconsciousness over time. [3]

References

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2. Richet, Pascal. (2001). *The Physical Basis of Thermodynamics: with Applications to Chemistry*, (pg. 11). Springer.
3. Schueler, Gerald J. and Schueler, Betty J. (2006). *The Chaos of Jung's Psyche*, (Glossary) (T.O.C.). Online book: Schuelers.com.

θΔics

In thermodynamics, **extensive**, as contrasted with "intensive", is a quantity, property, variable or parameter, sometimes referred to as *extensity*, is a quantity proportional to the dimension of the system. [1]

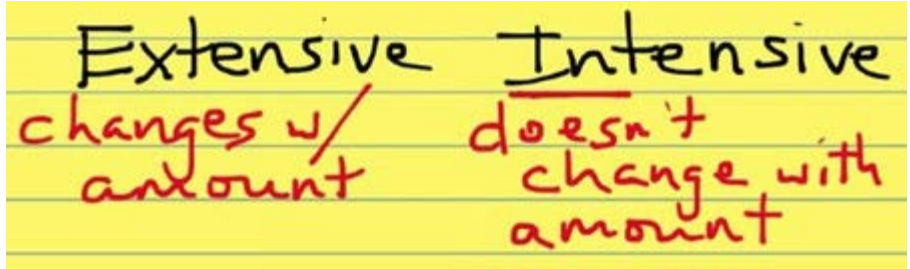

A simplified video (Q) definition of **extensive**, as something that changes with amount (e.g. length, surface, V, S, U, H, F, G, momentum, or kinetic energy), vs intensive, as something that doesn't change with amount (e.g. T, P, B, or μ).

The dimension may be, generally, of: a length, *l*, a surface, *A*, or a volume, *V*, amount of electricity, of substance, an entropy S, the functions internal energy *U*, enthalpy *H*, or free energy, *F* or *G*, as well as momentum and kinetic energy. [2]

Heat and inertia, according to Norman Dolloff (1975), supposedly, also are extensive properties. [3]

An extensive variable or property, defined another way, is one that depends on the mass of the system. If two systems are brought together the extensive properties of the new system is the sum of the extensive properties of the original two systems. [2]

Specific properties

If an extensive variable is divided by the mass, symbol m, what is called a "specific property" results, an example being the specific volume: [2]

$$v = \frac{V}{m}$$

As is sometimes customary, although not necessarily uniform (see: characteristic function notation table), uppercase letters are used to represent an extensive property [exception: *m* for mass] and lower case letters are used to denote the associated intensive property. [2]

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics.* Oxford: Oxford University Press.
2. Potter, Merle C. and Somerton, Craig W. (2009). *Schaum's Outlines: Thermodynamics for Engineers* (pg. 4). McGraw-Hill.
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External links

- Intensive and extensive properties – Wikipedia.

θΔics

In thermodynamics, **extensive vs intensive** refers to the differentiation of quantities according to whether they are "extensive", i.e. change with amount, or "intensive", do not change with amount.

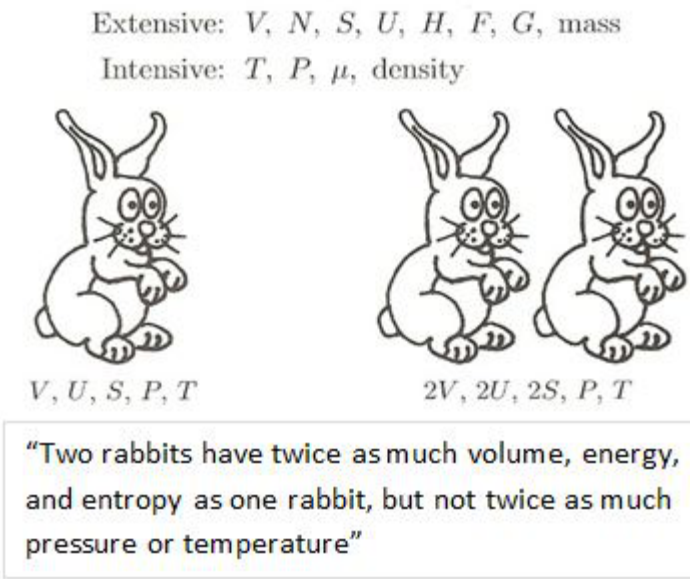

A rendition of **extensive vs intensive** variables explained via rabbits, drawn by Karen Thurber, from Daniel Schroeder's *Thermal Physics* (2000), according to which temperature, pressure, chemical potential, and density are "intensive variables", because they do not change with amount, whereas volume, particle count, entropy, enthalpy, free energy, and mass are "extensive" variables, because they change with amount. [1]

Small systems | Single particle systems

Shown adjacent is American physicist Daniel Schroeder's rendition of extensive and intensive variables in respect to a one-rabbit system as compared to a two-rabbit system, according to which volume V, internal energy U, and entropy S are said to double in going from the former to the latter, whereas pressure P and temperature T stay the same.

Schroeder's single rabbit model, to note, has issues with it, in particular being that in the range of single particle thermodynamics or single molecule thermodynamics (each rabbit considered as an animate molecule, e.g. fish molecule), the issue of what becomes of "extensity" or "intensity" of thermodynamic variables, in the small system thermodynamics range, becomes a subject of discussion and further investigation; one point of view of which, as advocated by American chemical engineering thermodynamicist Ali Mansoori, being that the roles are reversed. [2] More mathematical thermodynamics investigation is needed in this area (particularly in the work of Leonhard Euler, possibly via modification to the Euler reciprocity relation).

References

1. Schroeder, Daniel V. (2000). *An Introduction to Thermal Physics* (one rabbit, two rabbit diagram, pg. 163). Addison Wesley Longman.
2. Mohazzabri, Pirooz, and Mansoori, Ali G. (2005). "Nonextensivity and Nonintensivity in Nanosystems: A Molecular Dynamics Simulation" (abs), *Journal of Computational and Theoretical Nanoscience*, 2(1): 138-47(10).

External links

â— Extensive and intensive properties – Wikipedia.

θΔics

In chemistry, **extent of reaction**, or "reaction extent", symbol ξ, or Greek letter xi, or sometimes *x*, is an extensive quantity describing the progress of a chemical reaction equal to the number of chemical transformations, as indicated by the reaction equation on a molecular scale. [1]

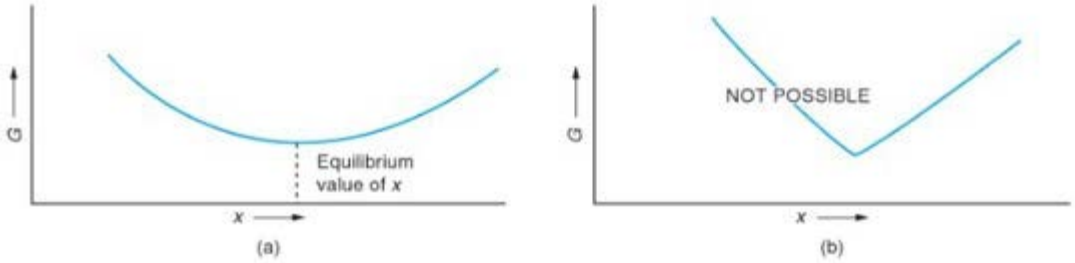

An example of Gibbs free energy *G* as a function of the **extent** *x* of a process or reaction with plot (a) showing a generic reaction as it is assumed to occur and (b) showing a hypothetical reaction that is not possible or assumed not to ever occur. [4]

Mathematically, extent of reaction or 'extent of process' refers to the partial differential of a thermodynamic potential, predominantly Gibbs free energy change ∂G, with respect to the partial differential of an extent variable ∂*x*, such as concentration or time, with specified variables assumed to be held constant, generally temperature *T* and pressure *P*, meaning loosely a non-heated open atmospheric reaction:

$$\left(\frac{\partial G}{\partial x}\right)_{T,P}$$

When this expression is equal to zero the reaction or process is said to be at the equilibrium position at the bottom of potential energy well curve.

The extent of reaction is essentially the amount of chemical transformations. The extent of reaction also goes by various other names such as *reaction coordinate* ε or degree of advancement, degree of reaction, and progress variable, all of which characterize the extent or degree to which a reaction has taken place. [2]

With marriage viewed as a human chemical reaction, the factoid of 43% of marriages ending at 15 years, is a measure of the **extent** of reaction.

History

The variable 'extent' , symbol ξ, was introduced by Belgian mathematical physicist Théophile de Donder in 1920. [3]

See also

â— Affinity of reaction

References

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3. (a) De Donder, Théophile. (1920). *Lecons de Thermodynamique et de Chemie Physique* (Lessons of Thermodynamics and Physical Chemistry), (pg. 117, formula 318). Paris: Gauthier-Villars.
(b) De Donder, T. (1936). *Thermodynamic Theory of Affinity: A Book of Principles*, (pg. 2). Oxford: Oxford University Press.
4. Mortimer, Robert G. (2008). *Physical Chemistry* (pg. 155). Academic Press.

θΔics

In business thermodynamics, **external entropy** is a hypothetical term associated with disorder and chaos in the market place.

Overview

In 1998, American revenue optimization theorist Robert Cross was referring to external entropy as follows:

> "**External entropy** is the disorder caused by outside forces that affect companies but cannot be directly controlled, such as consumer attitudes, new competition, competitive actions, technological advances, geopolitical factors, economic gyrations, and cataclysmic events."

In particular, external entropy, in contrast with internal entropy, is defined as some type of uncontrolled external force that causes disorder.

Difficulties

To note, the idea of a type of entropy "external" to a system, generally, makes little sense as entropy was originally defined by German physicist Rudolf Clausius, as the equivalence value of all uncompensated transformations in the system. It does, however, seem to have relation to the oft-used postulate that the order created (decrease in entropy) in the formation of a living organism is compensated by the increase in the entropy of the surroundings; although this makes little logical sense as well.

References

1. Cross, Robert G. (1998). *Revenue Management: Hard-core Tactics for Market Domination* (pgs. 10-11, etc.). Broadway Books.

θΔics

In chnopsology, **external force** or “forces external in origin” refers to the discussion as to whether or not animate movement, such as chemicals, plants, or humans occurs or is a result, completely, in large part, or partially, of external forces or forces external to the bodies that are moved—or, conversely, if the movement is solely or even partially the result of an internal force.

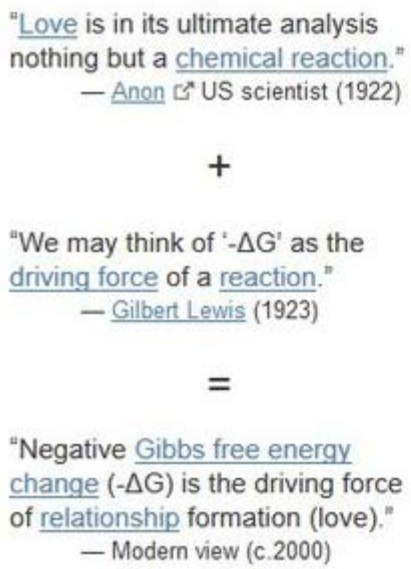

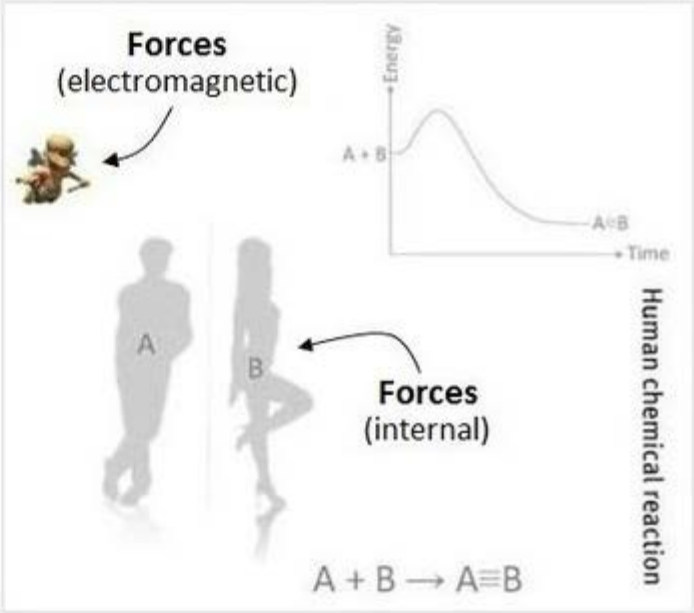

A visual of the human movement "driven" by **external forces**, and or possibly internal forces, in mechanism connectivity, according to 1796 human chemical theory of German polymath Johann Goethe, showing a human chemical reaction occurring via the action of the electromagnetic force; using the exchange force model of mediated or induced movement interactions.

Buckle

The gist of English historian Henry Buckle’s model of history, according to Morris Zucker, is that he relegates the individual to function as a register of the external material forces. [7]

Thermodynamics

The science of thermodynamics has a very clear position on the question of forces and movement. The definitive answer to the question is found in the opening paragraph of German physicist Rudolf Clausius' 1875 chapter “Mathematical Introduction: on Mechanical Work, on Energy, and on the Treatment of Non-Integrable Differential Equations”, which states the following:

> “Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, work is performed.”

This is the definitive underlying definition to all of thermodynamics—and in this sense, the movement of any body in the universe, such as a atom, molecule, chemical, animal, human, planet, etc., seem to be absolutely and definitively to be "under the influence of the force", as Clausius puts it, of two varieties: moving forces (or motive forces) and opposing forces.

Overview

Although the definitive Clausius definition of how bodies move, is very clear and straight forward the application of this model to the subject of how humans move is a bit involved, to say the least. To exemplify, English chemist-physicist Isaac Newton, the main founder of the model that things, i.e. particles or bodies (with mass) move only under the influence of forces, commented the following possible exemption of humans and animals from the laws of motion: [1]

> “God who gave animals self motion beyond our understanding is without a doubt able to implant other principles of motion in bodies which we may understand as little. Some would readily grant this may be a spiritual one; yet a mechanical one might be shown.”

This “animals have self motion” model, a power given to them by the hand of God, to give some historical review, is the creation by breath model passed along through the ages, in the format of the Anunian theologies: Christianity, Islam, and Hinduism, to Newton and the culture of his time and, of course, is an example of perpetual motion of the living kind, and as is the case with all perpetual motion theories, is something that is untenable. Two other alternative or differing points of view on this matter are shown below.

Spontaneity | Largely governed by external forces

In 1796, German polymath Johann Goethe, in his *Third Lecture on Anatomy* (see: Goethe timeline), stated the following logic in regards to his view that the forces that move humans and chemicals one way or another are often purely external in origin: [2]

> “There are, by nature, stronger or weaker bonds between chemical components, and when they evidence themselves, they resemble attractions between humans. This is why chemists speak of elective affinities [A = -ΔG], even though the forces that move chemicals [or humans] one way or another and create chemical structures are often purely **external in origin**.”

This is what Goethe defines as the concept of “organic existence”, and in modern post 1923 terms is representative of the “driving force” model of chemical processes, in which the quantitative measure of the driving force is free energy, Gibbs free energy for human movements and interactions.

A similar point of view can be found in American physician George Carey's 1919 *Chemistry of Human Life*, wherein he states: [5]

> “The human organism is an intelligent entity that works under the guidance which man has designated as chemical affinity.”

Carey, to note, utilized a bit of a blurry religious tinge to his chemistry writings, but, nevertheless, this one statement, whether or not by "guidance" he means "hand of God", or something along these lines, is cogent, religious issues aside.

Spontaneity | Not governed by external forces

English-born American philosopher Alan Watts, in his circa 1971 lecture “Works and Play” (14:30-15:00), shown adjacent, explains his views on nature in relation to external forces as follows: [3]

> “Living, you see, like this plant, is something spontaneous. In Chinese, the word for nature is dàzìrán (大自然), which means that which happens with itself, *not under any control* of an **outside force**, and they feel that all of the world is happening in and of itself—it’s spontaneous.”

Watts model, here, is a bit of a poetic or rather he presents a hued distortion of reality; whereas, correctly, the first cogent cold hard physical science explanation of "spontaneity" was outlined by German physical chemist Walther Nernst in 1893 in terms of free energy minimization. [4]

A more recent example is that given by American philosopher Christian de Quincey who in his 2002 book *Radical Nature*, uses the extrapolate downward approach to argue, in short, that since people are perceived to be self-moving that so to must fermions and bosons be sentient and and self-moving: [6]

> “If the universe is not ‘dead’, if it is not simply a huge mechanical system running according to a handful of laws at work in a vast ocean of chaos then it is in some sense ‘alive’. A more accurate term would be

> ‘sentient’—an inherent capacity for feeling or experience. In other words, to make explicit the main argument of the book: the matter of the universe, its raw stuff or ingredients, has within itself the essence of what we call ‘consciousness.’ There is something about matter itself, some quality or property, some intrinsic principle, that *moves matter from within*, an automotive urge toward self-organization, evolution, and complexity. In short, matter feels and moves itself. It *doesn’t require* **external forces** pushing and pulling it.”

To summarize, correctly, according to the defunct theory of life, in unison with Nernst's definition of things, a plant is not alive, as Watts' supposes, but rather is a periodic table structure type of a surface-attached cyclically-heated chemical process or animate growth reaction, and as is the case with all processes and reactions, will only advance in the "sense of a diminution of free energy, i.e. only in the sense of the affinity". In short, the free energy is the overarching "universal rule" that overrides or rather is the summation deciding factor in whether or not the process of the system as a whole will ensue.

See also

- Driving force
- Exchange force
- Social force
- Thermodynamic force
- Motive force
- Living force
- Fall-force
- Entropic force
- Force function
- Self drive | see: "self drive" (threads)

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1. Gleick, James. (2003). *Isaac Newton* (self motion, pg. 105). Vintage.
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(b) Eigen, Manfred, and Winkler, Ruthild. (1993). *Laws of the Game: How the Principles of Nature Govern Chance* (pg. 74-77). Princeton University Press.
3. (a) Watts, Alan. (c.1971). “Work as Play”, Video publisher.
(b) Chinese word for nature – BrightHub.com.
4. (a) Nernst, Walther. (1893). *Theoretical Chemistry from the standpoint of Avogadro's rule and Thermodynamics* (Theoretische *Chemie vom Standpunkte der Avogadroschen Regel und der Thermodynamik*). Stuttgart, F. Enke, 1893 [5th edition, 1923].
(b) Nernst, Walther. (1895). *Theoretical Chemistry: from the Standpoint of Avogadro’s Rule & Thermodynamics* (697-pages) (section: The Measure of Affinity, pgs. 586-88). MacMillan and Co.
(c) Nernst, Walther. (1904). *Theoretical Chemistry: from the Standpoint of Avogadro’s Rule & Thermodynamics* (771-pages). MacMillan and Co.
5. Carey, George W. (1919). *The Chemistry of Human Life*. Los Angeles: The Chemistry of Life Co.
6. De Quincey, Christian. (2002). *Radical Nature: Rediscovering the Soul of Matter* (quote, pg. 41). Invisible Cities Press.
7. Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pgs. 55-56). Arnold-Howard Publishing Co.

θΔics

In science, **extinction periodicity hypothesis**, or "Fischer-Arthur hypothesis", is the hypothesis that mass extinctions, of the majority of existing earth-bound marine vertebrates, invertebrates, and protozoans, aka "life forms" in defunct layspeak, vary cynically, via causes unknown, possibly related to extraterrestrial forces (solar, solar system, or galactic), at a rate, according to fossil records of the last 250 million years, of 26-million years, among with there have been five big extinction events. [1]

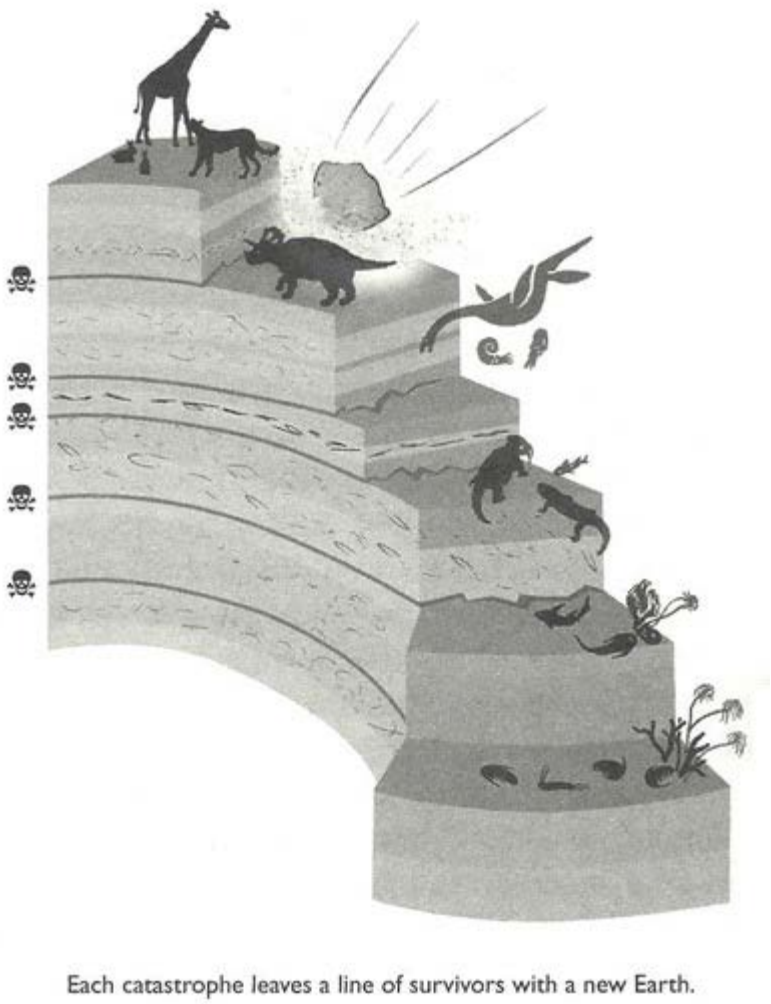

An artistic rendition of mass extinction, of the five big mass extinction, according to Neil Shubin, each leaving a layer of fossil clues in layers of earth. [3]

Overview

In 1977, Americans Alfred Fischer and Michael Arthur posited, without rigorous statistical testing, that mass extinctions occur cyclically ever 32-million years. [2]

In 1982, Jack Sepkoski finished a 10-year fossil data compilation project (1972-1982) of transforming the mass of known fossil data in *Treatise on Invertebrate Paleontology*, and other data bases, per suggestion of his PhD advisor Stephen Gould, into a computer database, in aims to discern possible patterns in the "history of life" (Neil Shubin, 2013), found that the data suggested five mass extinctions, and building on the so-called "extinction periodicity hypothesis" (or Fischer-Arthur hypothesis), introduced in 1977 by A.G. Fischer and M.A. Arthur, together with David Raup, hypothesized in 1984 (Ñº) that mass extinctions occur, not randomly, but cyclically every 26-million years. [4]

See also

â— Sloughing hypothesis

References

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(b) Raup, D.M. and Sepkoski, Jack. (1984). "Periodicity of Extinctions in Geological Past" (abs), *Proceedings of the National Academy of Science of the United States of America*, 81(3):801-05.
2. (a) Fischer, Alfred G. and Arthur, Michael A. (1977). "Secular Variations in the Pelagic Realm", in: *Deep-Water Carbonate Environments* (editors: H.E. Cook and P. Enos) (pgs. 19-50). Special Publication of the Society of Economic Paleontologists and Mineralogists. No. 25.
(b) Raup, D.M. and Sepkoski. (1984). "Periodicity of Extinctions in Geological Past" (abs), *Proceedings of the National Academy of Science of the United States of America*, 81(3):801-05.
3. Shubin, Neil. (2013). *The Universe Within: Discovering the Common History of Rocks, Planets, and People* (pgs. 130-39; photo, pg. 138). Random House.

External links

â— Extinction event – Wikipedia.

θΔics

In science, **extrapolate** or “extrapolation”, as compared to interpolate, or or “interpolation”, refers to the technique for finding the value of a function or measurement beyond values already known; more generally, to project, extend, or expand (known data or experience) into any area not know or experienced so as to arrive at conjectural knowledge of the unknown area, the exactness of the conjectural knowledge depending on how close the extension meets the scalability criterion (e.g. thermodynamics' first law, according to Clausius (1865), is scalable to any “material system” in the universe (Gibbs, 1876), whereas, by comparison, Joule’s first law is not); to predict by projecting past experience or known data; in hmolscience, two methods historically have tended to be employed, namely the extrapolate up approach (de-anthropomorphization) and the extrapolate down approach (anthropomorphization). [1]

Quotes

The following are related quotes:

> “The consideration [of] the nature of the forces involved in [human] relationships is not an easy subject. There are numerous pitfalls in applying what we know about ordinary human behavior to love, or even to sexual desires; and so to reinforce this fact I provide you with the following to consider: these processes occur on human time [human time] and length scales which are well known to us, and yet **extrapolating** (or interpolating?) from the known into the unknown may be dangerous. So one asks, what is the nature of sex and love and so on, and their relation to the other everyday experiences around us? And the answer, of course, follows only from an observation of this world and the processes that occur in it. It must be noted, if it is not obvious, that I have never experienced any sort of romance. It is also true that I [likely] never will, and yet my curiosity drives me to inquire as to the nature of the experience. And it is true that physical theory is the only way in which to answer this question, other than direct experience. While direct experience is undeniably a more reliable way to answer such questions, a few major problems with direct experience must be addressed: first, that it is [probably] not going to happen; and second, that various other people whom I know have been involved in romances, and in some cases they have been involved in many consecutive romances, but have failed to take data during those treasured minutes of sex. Love lasts longer but they don't want to analyze their relationships for fear of destroying them. More seriously, they do not take time to step back and make objective and scientific observations. Thus, for all practical purposes, the mysteries of sex and love can for the time being only be revealed by theory.”
>
> — Christopher Hirata (2000), “The Physics of Relationships” (§4:Neutron Scattering: a Cautionary Tale) [2]

References

1. (a) Daintith, John. (2005). *Oxford Dictionary of Science* (pg. 311). Oxford University Press.
(b) Extrapolate – Merriam-Webster Collegiate Dictionary, 2000.
2. (a) Hirata, Christopher M. (c.2000). “The Physics of Relationships” (§4:Neutron Scattering: a Cautionary Tale) (Ñº) (section: Fun), Tapir.Caltech.edu; (WayBack Machine).
(b) Hirata, Christopher M. (2010). "The Physics of Relationships", *Journal of Human Thermodynamics*, 6(5): 62-76.

External links

â— Extrapolation – Wikipedia.

θΔics

In hmol science, the **extrapolate downward approach**, as contrasted with the extrapolate up approach, is the methodology of applying anthropomorphic logic to explain physics and chemistry behavior, in regard to concepts such as life, death, consciousness, free will, choice, morality, etc. An example of the downward approach is used by American philosopher Christian de Quincey, who in his 2002 book *Radical Nature*, argues: [1]

> "The only way we can coherently explain the existence of choice at our macro level is to assume that it must go **'all the way down'** to the lowest-level micro entities. Choice—the exercise of free will and self-agency—must exist to some degree at the micro level if it exists at the macro level. Otherwise, the emergence of choice from the utter absence of choice would require a miracle."

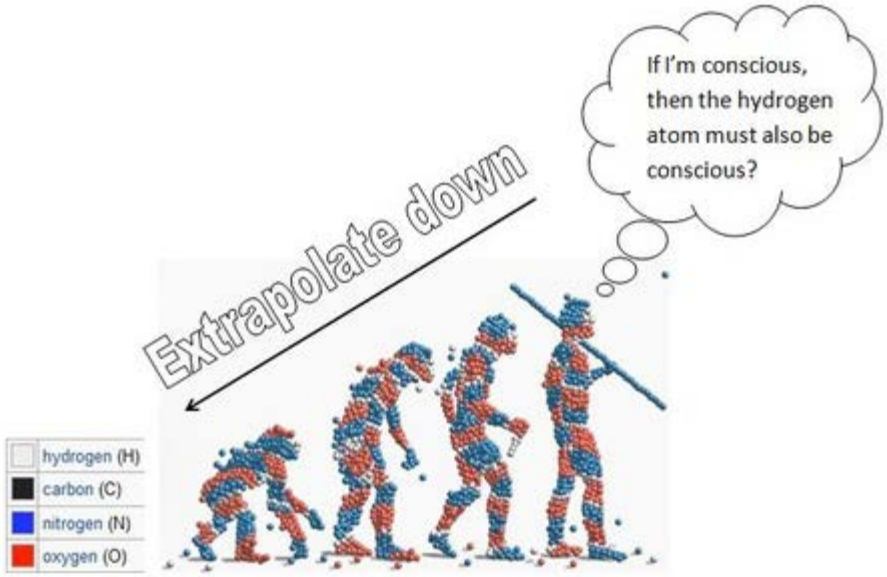

Basic model of the **extrapolate down approach**, wherein anthropocentric models of existence, e.g. life, consciousness, free will, etc., are assumed to exist at the atomic or subatomic level, because they are assumed to exist at the human level, and theories are developed to substantiate this view.

The macro level, for de Quincey, is the human mind and the micro level is the mind of particles such as the photon or electron, which he argues must have consciousness, owing to the perceived 'fact', in de Quincey's view, that humans have consciousness. The extrapolate down approach is exemplified as solution as to where to stop defining entities as conscious, as stated in 1987 by philosopher Thomas Nagel: [2]

> "Ordinarily we believe that other human beings are conscious, and almost everyone believes that other mammals and birds are conscious too. But people differ over whether fish are conscious, or insects, worms, and jellyfish. They are still more doubtful about whether one-celled animals like amoebae and paramecia have conscious experiences, even though such creatures react conspicuously to stimuli of various kinds. Most people believe that plants aren't conscious; and almost no one believes that rocks are conscious, or Kleenex, or automobiles, or mountain lakes, or cigarettes. And to take another biological example, most of us would say if we thought about it, that the individual cells of which our bodies are composed do not have conscious experiences."

On this passage, de Quincey states the central issue to solve is to find exactly how far down the evolutionary scale consciousness goes? His answer is that it must go all the way down (and supposedly up, i.e. extend to the universe as a whole), if humans are indeed conscious entities.

In sum, one is faced with these two alternative approaches, i.e. up or down, when attempting to reconcile the view that humans evolved, or were synthesized over time through chemical reaction mechanism, from smaller molecules (and before that from hydrogen atom precursors 13.7-billion years ago) when tracing the evolution timeline downward.

Thinkers representative of the extrapolate downward approach include Pierre Teilhard, Arthur Young, and Ted Erikson. The subjects of panpsychism or panexperientialism is a near synonym for this line of thinking.

Difficulties on theory

The central difficulty with this model is that it presupposes certain facts as proven truths that have no proof, such as that

"humans are alive" (no one has ever been able to define "life"), that humans have consciousnesses, etc., and extends these models down to the periodic table atomic level as the new governing principle of chemistry, all of which inevitability lead to the final conclusion that the hydrogen atom is alive. This finalized conclusion, however, does not sit well in the stomach. Hence, one is lead to the more cogent "extrapolate up approach", which leads to the new view that "life" is something that does not exist.

Middle grounder

A representative of the middle ground approach might be the *circa* 1869 discussions of French engineer Francois Massieu, and his effort to explain or understand the perceived dualism issue, in his day, of soul vs body or living vs non-living, by splitting apart the water molecule H_20 into oxygenO_2 and hydrogenH_2 to see if this answers anything.

Other

Alternatives to the up or down approach, used by many, is to use either (a) the emergence approach (b) the unbridgeable gap approach, the latter of which might be representative of the warm pond model.

References

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θΔics

In hmol science, the **extrapolate upward approach**, as contrasted with the extrapolate down approach, is the methodology of applying the logic of chemistry and physics to explain human behavior. The extrapolate up approach, in terms of thermodynamics, is explained well by Swedish physical chemist Sture Nordholm who in 1997 stated the following: [2]

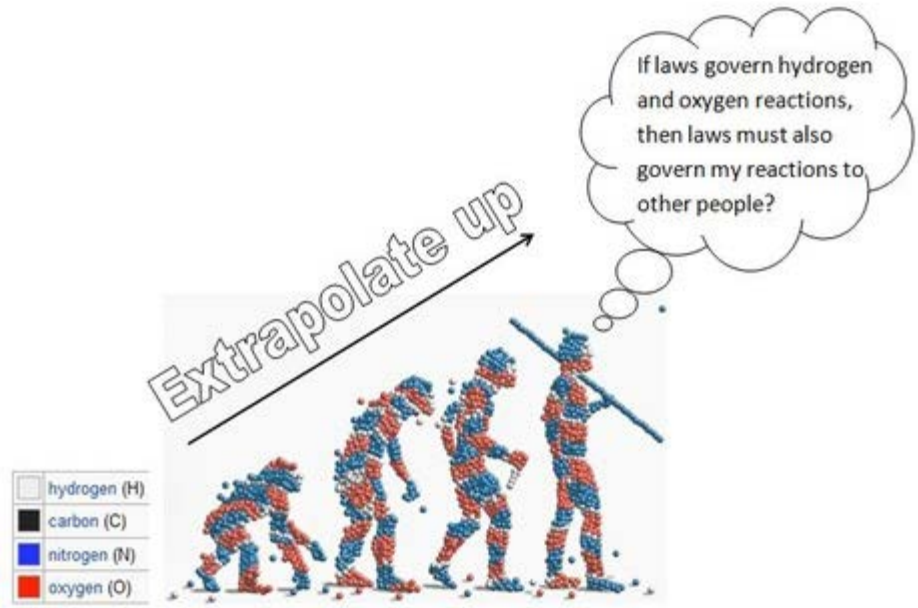

Basic model of the **extrapolate upward approach**, wherein one applies the laws and principles of chemistry and physics to explain human behavior.

> "The thought that the dry and forbidding discipline of thermodynamics could be applied to that most theory-defying of all applications, human behavior, may be staggering, and perhaps heresy to some. After all, the purity and precision of thermodynamics has been maintained on the strength of its validity only as a collection of limiting laws for infinitely large systems undergoing infinitely slow changes. However, the interest in thermodynamics has always been based on the great relevance for finite real systems undergoing changes that are fast on our everyday time scale and slow only on the microscopic time scale of atomic motion. Thus we are merely extending the beam of insight from the lifeless behaviors of inanimate matter to the vivid complexities of human behavior. In the final analysis this far-reaching analogy rests on the fact that the basic elements of the description of atoms, molecules, and matter **can be scaled up** to the realm of living organisms without changes other than in the complexity of the systems and their behavior."

Likewise, the extrapolate up approach, in terms of physical chemistry, is well-defined in the following 1808 statement of German polymath Johann Goethe: [1]

> "The moral symbols used in the natural sciences are the elective affinities discovered and employed by the great Bergman."

In his 1809 *Elective Affinities*, Goethe concluded that since humans have evolved or 'metamorphosized' over time from smaller chemicals that the very same laws and principles that govern the behaviors and reactions of smaller chemicals, namely affinity chemistry, must also govern the behaviors and reactions of humans, which he viewed simply as larger chemicals

One his faced with these two alternative approaches, i.e. up or down, when attempting to reconcile the view that humans evolved or were synthesized over time through chemical reaction mechanism from smaller molecules (and before that from hydrogen atom precursors 13.7-billion years ago) when tracing the evolution timeline downward.

The school of thinkers who use the extrapolate upward approach include Philip Ball, Sture Nordholm, Libb Thims, David Hwang, Christopher Hirata, to name a few. The simplest example is that employed by Thims, who reasons that since the spontaneity criterion, i.e. the equation $\Delta G < 0$ quantifying a spontaneous reaction, which governs the nature of chemical reactions, is a universal principle, that it must also apply to the human universe; which is the same mode of logic used by Goethe, albeit in terms of chemical affinity A, which equates to the spontaneity criterion via the formula $A = - \Delta G$.

A tool used in the extrapolate upward approach is reverse engineering.

A representative of the middle ground approach might be the circa 1869 discussions of French engineer Francois Massieu, and his effort to explain or understand the dualism issue or soul / body or living / non-living split by splitting apart the water molecule into oxygen and water to see if these answers anything.

Other

Alternatives to the up or down approach, used by many, is to use either (a) the emergence approach (b) the unbridgeable gap approach.

References

1. Tantillo, Astrida O. (2001). Goethe's *Elective Affinities* and the Critics. New York: Camden House.
2. Nordholm, Sture. (1997). "In Defense of Thermodynamics: an Animate Analogy" (Google Books), *Journal of Chemical Education*, 74: 273.

θΔics

In hmolscience, **extreme** tends to refer to the subjects of: reality (extreme realism), materialism (extreme materialism), and atheism (extreme atheism) "extremely" reduced to physical and chemical reality; reductionism (extreme reductionism); taken to or existing in a high degree of intellectual focus, analysis, description, or purview; radical; exceeding the ordinary, usually, or expected; the most advanced or thoroughgoing.

Reduction

The following are extreme reductionism themed quotes:

> "Physical science will not stop short of a **reduction of** the universe and **all** it contains to the basis of mechanics; in more concrete terms, to the working of a machine."
>
> — Carl Snyder (1903), *New Conceptions in Science* (Ñº)

> "There is nothing but the difficulty of the task to hinder the **reduction of all** [socio-] physiological processes to physical and chemical phenomena."
>
> — Lawrence Henderson (1927), "The Process of Scientific Discovery" [2]; note: the "*socio*-" insert, making the statement indicative of **"extreme" reductionism**, is a retrospect addition, per his later Gibbs-based ventures into sociology (see: "Sociology 23" + Harvard Pareto circle)

These two, to note, are both, independently, Gibbs, Goethe, and Empedocles scholars; namely each viewed the universe and all in it as being reducible to forces and elements, as did Empedocles, via his two force, four element model. The modern scholar builds on all of this, seeing the universe, and everything in it, particularly human affairs, completely reducible to fermion and boson interactions, governed and quantified by thermodynamics.

Atheism

The subject of "extreme atheism", of which there are five main scholars, namely: Jean Meslier, Julien la Mettrie, Baron d'Holbach, Ludwig Feuerbach, and Ludwig Buchner, tends to be classified in rank, or higher in level of extremeness, in respect to the number top 12 atheism types by denial and belief categories each promulgates a view or opinion on.

Realism

The subject of "extreme realism" tends to be exemplified by fields such as literary realism, realism philosophy, among others.

References

1. Extreme – Merriam-Webster Collegiate Dictionary, 2000.
2. (a) Henderson, Lawrence. (1927). "The Process of Scientific Discovery", in: *An Introduction to the Study of Experimental Medicine* (translator: H.C. Greene) (introduction, pgs. v-xii). Henry Schuman, 1949.
(b) Barber, Bernard. (1970). *L.J. Henderson on the Social System* (§2:149-58; quote, pg. 151). University of Chicago Press.

θΔics

In terminology, **extreme atheism** refers to one who has a belief system or belief state "extremely" nullified, devoid, and on the far right hand side of the Dawkins scale, of belief in the existence of god—something closely related to being an extreme materialist (e.g. Ludwig Buchner) and or extreme mechanist (e.g. Henry Carey) in Stark classification — which, in the 19th century terms, would refer to someone who only believes in the existence matter and energy in various states of vacuum, or in 20th century terms, would refer to someone who only believes in the existence of fermions and bosons and the interactions and bound states they produce, or something to this effect, e.g. Henry Adams believed, after deriving his own model of the universe, he was a physico-chemical phase (see: social phase), as defined by the chemical thermodynamics of Willard Gibbs (see: Adams creed).

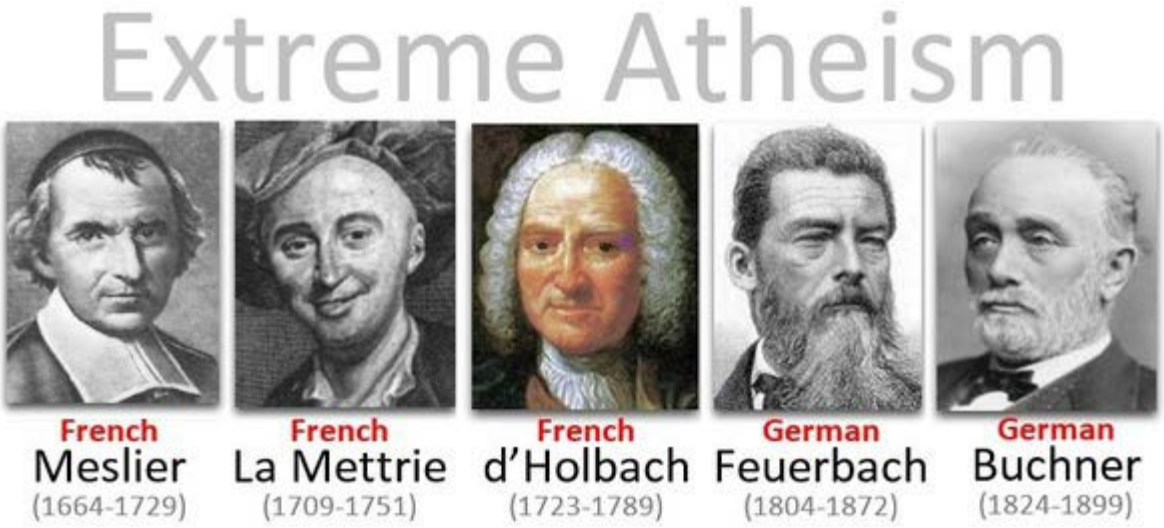

Famous atheists, known historically, as **"extreme atheists"**, along with, for some, akin clarifications of "extreme materialists" and or "extreme mechanists"; namely: Jean Meslier, Julien la Mettrie, Baron d'Holbach, Ludwig Feuerbach, in latter years, and Ludwig Buchner.

Historically, there have been only five individuals whose brand of atheism has been labeled in print as extreme, namely: Jean Meslier, Julien la Mettrie, Baron d'Holbach, Ludwig Feuerbach, in latter years, and Ludwig Buchner; Meslier being the most ferocious of the group, Holbach and Buchner being the most forwardly intellectual in thinking. The following is their general ranking stats, respectively:

1. Jean Meslier (1664-1729) (IQ:#|#) (FA:63) (GA:2)
3. Julien la Mettrie (1770-1751) (IQ:#|#) (FA:67) (GA:11)
3. Baron d'Holbach (1723-1789) (IQ:185#|56) (FA:74) (GA:4) [**SN:21**]
4. Ludwig Feuerbach (1804-1872) (IQ:180|#148) (FA:101) (GA:8)
5. Ludwig Buchner (1824-1899) (IQ:190|#40) (FA:110) (GA:6) **[SN:11]**

(add)

Meslier

The French Catholic priest Jean Meslier (1664-1729), who was notably discovered, upon his death, to have written a book-length philosophical essay promoting atheism, has been referred to as an "extreme atheist" who, supposedly, was too extreme for Voltaire (Ñº), and whose *Testament* against religions written is in a "frenzied anger" that makes Richard Dawkins' *The God Delusion* look tame (Nick Spencer, 2014). [6]

> "Matter and energy moves itself. It has no exterior mover."
>
> — Jean Meslier (c.1720) (Ñº)

(add)

La Mettrie

French physician-philosopher Julien la Mettrie (1770-1751), a student of Herman Boerhaave, translator of Seneca's

essay on happiness, who went on to become classified as “extreme materialist” (Minois, 2009) (Carol, 2013), who advocated “open atheism” and variously credited as the “first truly modern materialist” (Leiber, 1994), noted for his *The Natural History of the Soul* (1745), wherein he argued for a mechanist materialistic position, according to which there was no need of the soul to animate matter, that life was a property of matter, not something breathed into, and *Man a Machine* (1747), one of the first noted early atheists on the atheism timeline. [7] To quote:

> “What is the soul, but an empty word to which no idea corresponds?”

His books were burned in public. [8]

Newton of the atheists | Holbach

> *See also: Hume-Holbach dinner party*

French materialist philosopher Baron d’Holbach (1723-1789), and his *The System of Nature: the Laws of Moral and Physical World*, itself known as the “Atheist’s Bible”, is widely known as the “Newton of the atheists” (Ñº) even cited so in history of atheism documentaries. (V|1:45) Thought difficult to find a specific citation of him as an “extreme atheist”, the following is a 2006 summary European historian Nathan Barber: [9]

> “d’Holbach took Newton’s ideas about the universe operating as a clock or machine to the **extreme**, arguing that humans have no free will, and that forces and laws of nature governed the lives of humans, not humans themselves and certainly not god. He aggressively argued against the existence of God and even against the existence of human souls. After all, why would human machines have need for souls?”

(add discussion)

Feuerbach

German anthropologist and philosopher Ludwig Feuerbach (1804-1872), noted for his advocacy of liberalism, atheism, and materialism, known as a "legendary atheist" (Ñº) (Ñº), whose “extreme atheism” (Ñº) was sometimes tempered with “divine humanism”, whose work is a forerunner to Marx-based Soviet atheism, who was said to have become more of an extreme atheist in later years, a labeling summarized by philosophy historian Samuel Bergman, as follows: [3]

> “Feuerbach replaces theology with anthropology, he also replaces the concept of god with the concept of cooperation between people. He became an **extreme atheist** in his later years, as can been seen in his works.”

To elaborate, the following is the effect he had on Vladimir Lenin: [4]

> “The materialists Helvetius, Diderot, Lammet, then Comte, and especially Feuerbach, drove the idea of god and the notion of immortality of the soul completely out of his brain. The image of a ‘kind and graceful Christ’ disappeared.”

(add discussion)

Extreme	More Extreme

Buchner

German physician and physicist Ludwig Buchner (1824-1899) has been

characterized as a "gross materialist" (Finck, 1877), "extreme materialism" (Britannica, 1911), the "father of German atheistic evangelism"; and self-defined himself as an "atheist", per terminology dialogue with Darwin (Ñº), philosopher—compare also: Stark classification (1962) on "extreme form" of social mechanism. The following are quotes representative of these epitaphs:

Ludwig Buchner
(1824-1899)

vs.

Libb Thims
(c.1975-)

A comparison of German physician-physicist Ludwig Buchner and American electrochemical engineer Libb Thims, both labeled "**extreme atheists**" and [gross] "materialists" and both theorists of force-matter based morality systems, shows the latter to be MORE extreme than the former, in that he not only denies god, but he also denies life and love as being defunct terms in need of terminology and concept reform.

> "The universe, that is the all, is made neither of gods nor of men, but ever has been and ever will be an eternal living fire, kindling and extinguishing in destined measure."
>
> — Heraclitus (500BC), opening quote to Buchner's 1884 *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon*

> "Where there are three students of nature, there are two atheists."
>
> — Anon (c.1850), opening quote to Buchner's 1884 *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon*

> "Just as man and woman attract one another, so oxygen attracts hydrogen, and, in loving union with it, forms water, that mighty omnipresent element, without which no life nor thought would be possible."
>
> — Ludwig Buchner (c.1870), cited by Henry Finck (1887) as representative of "gross materialism"

> "Potassium and phosphorous entertain such a violent passion for oxygen that even under water they burn—i.e. unite themselves with the beloved object."
>
> — Ludwig Buchner (c.1870), cited by Henry Finck (1887) as representative of "gross materialism"

Buchner, by the time of the publication of 1884 4th English edition, based on the 15th German edition, of his *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon*, opens to quotes of extremes to have come before him, including: Feuerbach, La Mettrie, and Goethe.

American electrochemical engineer Libb Thims, to note, similar to Buchner, e.g. in advocating chemical and heat based modeling of human interactions, such as above, and for promoting ideologies said to be "laced with **extreme atheism** and materialism" (Sekhar, 2011), is in agreement with Buchner, albeit *more* extreme, in that Thims (a) also denies the existence of life (see: defunct theory of life), namely there is no such thing as "living" fire nor life, in the Francis Crick "we should abandon the word alive" (1966) sense of the matter, and (b) denies the existence of love, i.e. while agreeing, with Buchner, that man and woman attract just as oxygen and hydrogen attract, namely both processes actuating according to the same one nature overarching physicochemical principles, does not believe, in opposition to Buchner, that love nor passion can be attributed to these processes, in the Ninotchka "Love is a romantic designation for a most ordinary biological—or, shall we say, chemical—process … a lot of nonsense is talked and written about it" (1939) sense of the matter (see: It's a Chemical Reaction, That's All). They both, in short, are religio-mythology and metaphysical terms, respectively, in need of deanthropomorphized terminology reform, in the Otto Weininger "If iron sulphate and caustic potash are brought together, the SO_4 ions leave the iron to unite with the potassium. When in nature an adjustment of such differences of potential is about to take place, he who would approve or disapprove of the process form the moral point of view would appear to most to play a ridiculous part" (1903) sense of the matter. In other words, just as it is "ridiculous" to say that oxygen and hydrogen "love" or have "passion" for each other, or that it is "immoral"

for SO_4 to leave iron and to unite with potassium, so it is with humans. This is something akin to having, in the past, had to fix the mind into the correct belief that the earth moves, is not flat, and that the sun goes around the earth, not the other way around.

Rand

Russian-born American philosopher Ayn Rand (1905-1982) has been referred to in a number of places (Ñº) (Ñº) (Ñº) as an extreme atheist and or having an "extreme atheism" (Ñº) stance; the following is one example quote:

> "In 2005, Paul Ryan professed to be a believer in the teachings of Ayn Rand, a Russian-born writer, philosopher, and **extreme atheist**. He stated: 'I grew up on Ayn Rand, that's what I tell people. You know, everybody does their soul searching, and trying to found out who they are and what they believe. You learn about yourself. I grew up reading Ayn Rand and it taught me quite a bit about who I am and what my value systems are, and what my beliefs are."
>
> — Ron Peeples (2012), *Crap: the Dirty Dozen of the Republican Party* (Ñº)

Extreme		Aligned-Extreme
	vs.	
Ayn Rand (1905-1982)		**Libb Thims** (c.1975-)

Russian-born American philosopher Ayn Rand and American electrochemical engineer Libb Thims, both labeled as **extreme atheists**, seem to be aligned on most points, except on the on the question of purpose and societal organization, Rand siding with self-interest and the rights of the individual, Thims siding with reality defined by chemical thermodynamics, according to which freedom and security are governed by the competing tendencies of entropy and enthalpy.

Rand's personal philosophy is what is called objectivism, whose central tenets are: (a) god does not exist, (b) reality exists independent of consciousness, that humans have direct contact with reality through sense perception, that one can attain objective knowledge from perception through the process of concept formation and inductive logic, (c) proper moral purpose of one's life is the pursuit of one's own happiness (rational self-interest), that the only social system consistent with this morality is one that displays full respect for individual rights embodied in *laissez-faire* capitalism, and (d) that the role of art in human life is to transform humans' metaphysical ideas by selective reproduction of reality into a physical form—a work of art—that one can comprehend and to which one can respond emotionally.

Thims and Rand are aligned in their extremism, except on point (c) in that whereas Rand's objectivism seems to put more weight on individual rights and one's own happiness, Thims sides with the Rossini chemical thermodynamics real world model, according to which in any system, social or otherwise, there exists a compromise between freedom and security, as quantified by entropy and enthalpy change variables, behind which is the driving force of free energy, which actuates senses of purpose, "some seemingly divine, some not", as Einstein would say, respectively; also "proper moral purpose of one's life" is greatly loaded.

Thims

American electrochemical engineer Libb Thims, in 2009 self-classified himself as Dawkins number 10, and since at least 2011, has been classified or characterized in print by others an extreme atheist and or strong atheist:

> "Arrogants like Eddington, despite his achievements, are the cause as to why people like Libb Thims fall from one position to another lower position. First Libb argued that life is a defunct theory to justify the application of classical version of the second law of thermodynamics to living systems, ignoring statistical thermodynamics. Then to justify 'life is a defunct theory' he argues that his actions and behavior or not 'self-controlled' or 'self-driven' [see: self-motion] but are governed by external electromagnetic forces. Arrogance leads to ignorance and scientific blindness as we noted from the example of Eddington and Nobel laureate Chandra Sekhar. Libb Thims' science is laced with **extreme atheism** and materialism and hence his precarious position. Science needs to be kept at equal distance and away from both atheism and theism. I can't stop but laugh at myself when I think that I am not alive or I am not moving myself."

— DMR Sekhar (2011), “Eddington’s Psycho-Syndrome” [1]

“Libb Thims is a **strong atheist**, adheres to a physics-based morality, and considers himself a Goethean revolutionist.”

— David Bossens (2013), *Debates of the Hmolpedians* [2]

Quotes

The following are related quotes:

“The amoral nurse might reject that he or she has a moral duty to uphold a patient’s rights. The amoral nurse would also probably claim that it does not make any sense even to speak of things like a patient’s ‘rights’ since moral language itself has no meaning. The amoralist’s position in this respect is analogous to the atheist’s rejection of certain religious terms. The **extreme atheist**, for example, would argue against uttering the word 'god', since it refers to nothing and therefore has no meaning. Such an atheist might also claim that there is no point in engaging in a religious debate on the existence of god, since there is just nothing there to debate. To try and debate the existence of god would be like trying to debate the existence of a ‘black cat in a darkened room when there isn’t one’ [see: black cat analogy]. The amoralist may argue in a similar way in relation to the issue of morality.”

— Megan-Jan Johnston (2011), *Bioethics: a Nursing Perspective* [10]

References

1. Sekhar, DMR. (2011). “Eddington’s Psycho-Syndrome” (Ñº), Sulekhu.com.
2. Bossens, David. (2013). *Debates of the Hmolpedians* (Ñº). LuLu.
3. Bergman, Samuel H. (2012). *Dialogical Philosophy from Kierkegaard to Buber* (pg. 149). SUNY Press.
4. Valentinov, Nikolai. (1969). *The Early Years of Lenin* (pg. 266). University of Michigan Press.
5. Objectivism (Ayn Rand) – Wikipedia.
6. Spencer, Nick. (2014). “Why Aren’t More Americans Atheists? Turns out it has nothing to do with Science. And everything to do with Politics” (Ñº), *The Big Idea*, Aug 05.
7. (a) Minois, Georges. (2009). *The Atheist’s Bible: the Most Dangerous Book that Never Existed* (translator: Lys Weiss). University of Chicago Press, 2012.
(b) King, Carol. (2013). “The Man-Machine: Julien Offray de La Mettrie: An Extreme Materialist View of Human Beings as Having Only a Body and No Soul”, in: *1001 Ideas That Have Changed the Way We Think* (editor: Robert Arp) (pg. 405). Atria Books.
(c) Leiber, Justin. (1994). “Introduction”, in: *Man a Machine: and Man a Plant* (“open atheism”, pg. 3). Hackett Publishing.
8. King, Carol. (2013). “The Man-Machine: Julien Offray de La Mettrie: An Extreme Materialist View of Human Beings as Having Only a Body and No Soul”, in: *1001 Ideas That Have Changed the Way We Think* (editor: Robert Arp) (pg. 405). Atria Books.
9. Durkin, Aubrey. (2006). *The Complete Idiot’s Guide to European History* (pg. 199). Alpha.
10. Johnstone, Megan-Jane. (2011). *Bioethics: a Nursing Perspective* (pg. 103). Elsevier Health Sciences.

θΔics

In science, **extreme materialism**, or "gross materialism", refers to a materialism position that jettisons all supernatural and anthropomorphic beliefs, except that in belief in matter, as physics and chemistry define matter.

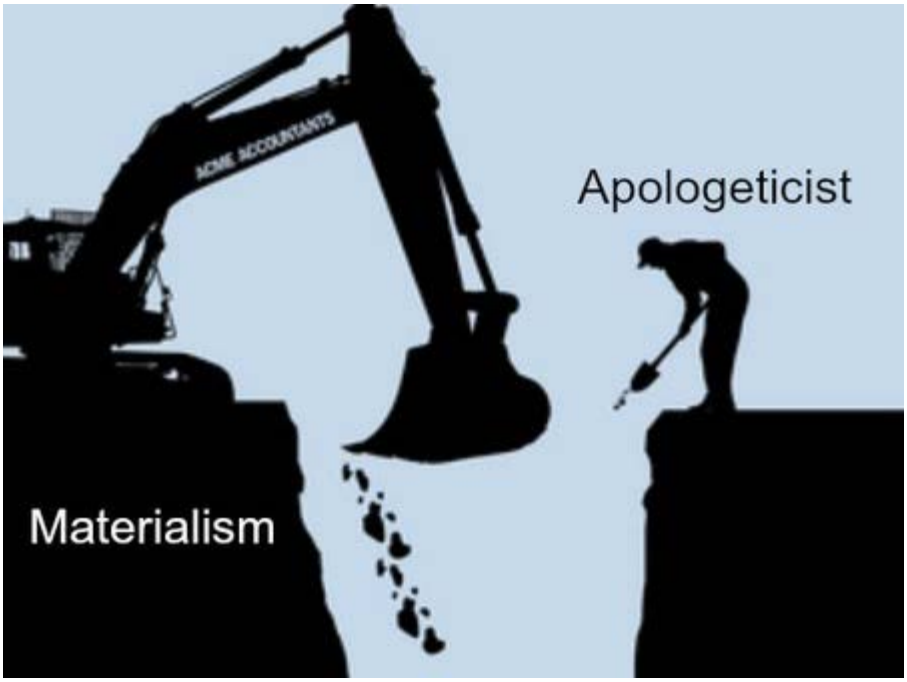

A god of the gaps (god void) depiction of scientific materialism and or **extreme materialism**; showing the religious apologeticist weakling trying to patch up the gaping holes carved away by the juggernaut of scientific progress and discovery.

Overview

In 1875, Balfour Stewart and Peter Tait classified extreme materialism, seemingly, as a deism-spirit-soul theory free version of materialism, which adheres to the following position: [1]

> "When a certain number of material particles consisting of phosphorus, carbon, oxygen, hydrogen, nitrogen, and perhaps some other elements, are, in consequence of the operations of their mutual forces, in certain positions with respect to each other, and in certain states of motion, consciousness is the result, but whenever this relative state is brought to an end, there is also an end of consciousness and the sense of individual existence, while however the particles of phosphorus, carbon, etc., remain as truly as ever."

Irish physicist John Tyndall, as the protagonist of this view in the Tyndall-Stewart-Tait debate (1874), supposedly, is a 19th century example archetype of the extreme materialist.

American philosopher Henry Finck, in his 1887 *Romantic Love and Personal Beauty*, section "Cosmic Attraction and Chemical Affinities", classifies German physicist and extreme atheist Ludwig Buchner as a "gross materialist" as follows: [2]

> "But the inclination to confound gravitation and other natural forces with Love is not to be found among ancient and mediaeval authors alone. Paradoxical as it may seem, it is the "**gross materialist**," Dr. Ludwig Buchner, who exclaims rapturously: "For it is love, in the form of *attraction*, which chains stone to stone, earth to earth, star to star, and which *Cosmic Attraction and Chemical Affinities* holds together the mighty edifice on which we stand, and on the surface of which, like parasites, we carry on our existence, barely noticeable in the infinite universe; and on which we shall continue to exist till that distant period when its component parts will again be resolved into that primal chaos from which it laboriously severed itself millions of years ago, and became a separate planet."
>
> Buchner carries on this anthropopathic process a step farther, by including all the chemical affinities of atoms and molecules as manifestations of love: "Just as man and woman attract one another, so oxygen attracts hydrogen, and, in loving union with it, forms water, that mighty omnipresent element, without which no life nor thought would be possible." And again: "Potassium and phosphorus entertain such a violent passion for oxygen that even under water they burn-—*i.e.* unite themselves with the beloved object"."

(add discussion)

See also

â— Extreme atheism
â— Extreme mechanism | Stark classification

References

1. Stewart, Balfour and Tait, Peter G. (1875). *The Unseen Universe: or Physical Speculations on a Future State* (pgs. 48-49). Macmillan.
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θΔics

In hmolscience, **extreme reductionism**, similar to ultra-reductionism, as compared to moderate reductionism or weak reductionism, refers to reductionism taken to the extreme.

Overview

The work of Alfred Lotka has been classified as extreme reductionism. [1] Steven Weinberg, likewise, has been classified (Q) as a champion of "extreme reductionism".

Antonym

The opposite of extreme reductionism tends to called holism. (Q)

Quotes

The following are related quotes:

> "Physical science will not stop short of a **reduction of** the universe and **all** it contains to the basis of mechanics; in more concrete terms, to the working of a machine."
>
> — Carl Snyder (1903), *New Conceptions in Science* (Q)

> "There is nothing but the difficulty of the task to hinder the **reduction of all** [socio-] physiological processes to physical and chemical phenomena."
>
> — Lawrence Henderson (1927), "The Process of Scientific Discovery" [2]; note: the "*socio*-" insert, making the statement indicative of **"extreme" reductionism**, is a retrospect addition, per his later Gibbs-based ventures into sociology (see: "Sociology 23" + Harvard Pareto circle)

> "Perhaps there is reluctance [in not employing Lotka's theories] to resort to such an apparently **extreme reductionism**."
>
> — Richard Adams (1988), *The Eight Day* (pg. 37) [1]

References

1. Adams, Richard N. (1988). *The Eighth Day: Social Evolution as the Self-Organization of Energy* (extreme reductionism, pg. 37). University of Texas Press.

θΔics

In philosophical thermodynamics, **extropianism** refers to an extropy-type mindset of futurist thinkers and activists who promote an optimistic future signified by behaviors, practices, and technologies that act intuitively as the opposite of entropy, to create a type of progress-directed self-transformation. Supposedly, extropianism is a particular form of transhumanism, concerned with the quest for the continuation and acceleration of the evolution of intelligent life beyond its current human form by means of science and technology, guided by life-promoting principles and values, while avoiding religion and dogma. [1]

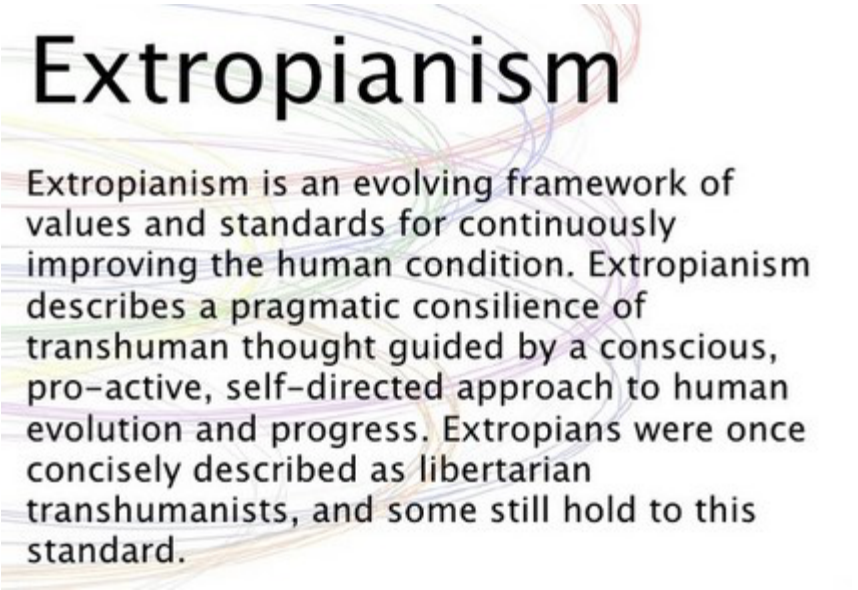

A 2009 SlideShare.com (Q) summary of "**extropianism**" as one of the 70+ "isms" of philosophy.

The philosophy seems to have originated in *circa* 1988 discussions between English-born American humanities philosopher Max More and American lawyer philosopher Tom Bell.

Luminaries of the extropian movement and philosophy of extropianism include American science writer Kevin Kelly, Marvin Minsky, and nanotechnologist Eric Drexler.

References

1. Goertzel, Ben and Bugaj, Stephan V. (1996). *The Path to Posthumanity: 21st Century Technology and its Radical Implications for Mind, Society and Reality* (ch. 12: Extropian Elitism and Humanist Posthumanism, pgs. 391-432). Academica Press, LLC.

External links

- Extropianism – Wikipedia.

θΔics

In hmolscience, **extropy** is a metaphorical entropy antonym term, conceived as the opposite of entropy, signifying progressive movements into the future; which has somewhat trickled into new age discussions.

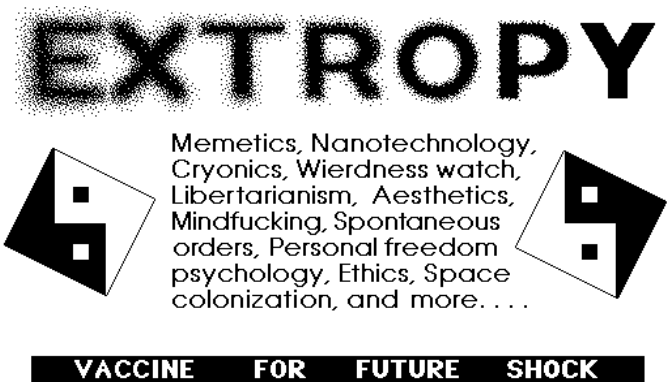

The first **extropy** advertisement, used by Tom Bell and Max More in the Fall of 1988 to promote the first few issues of their journal. [5]

Etymology

In 1967, or before Harry Overstreet, American naturalist humanist philosopher, introduced the term "extropy" as a counter-entropy quantity (see: entropy antonyms), which he defined as involving truth and beauty and goodness, would be expected to lead inevitably to god. [9]

One of the first mentions of the term extropy as a book title is the 1984 book *Mythematics and Extropy*, a work that seems to be associated with Polish poet Boleslaw Lesmian, who is noted for a number of neologisms.

Independently, it seems the term was coined, originating via analogy, by American lawyer-philosopher Tom Bell in 1988. [1] Max More, Bell's accociate, defines extropy as a "metaphor, loosely related to the idea of negentropy, that refers to basic attitudes and values shared by those who want to overcome human limits". [6] In 2010, when queried as to “the history behind adopting the term extropy, particularly in relation to either entropy or thermodynamics, as a type of philosophy?”, Tom Bell suggested the web archive Extropian FAQ page gave the best overview.

People considered to be adherents of the principles of extropy is called an "extropian" and the ideology or philosophy study of the subject is called "extropianism"

Extropy magazine

In August, of 1988, Bell together with English-American philosopher Max More started the printed journal *Extropy*, in which the term “extropy” was coined to define “the opposite of entropy or of thermodynamic decay”. [2] In the years to follow the term, both with and without thermodynamic qualifiers, slowly trickled into public use.

Other

In 1999, American physican Karlis Ullis, within his theory of *exercise physiology human thermodynamics*, defined *extropy* as a state of antientropy, which leads to the building of organized biological structures, the ultimate blueprint that calls for sexual maturation and reproduction. [3]

New age

In recent years, the term has come be associated with a creative force or élan vital, which is regarded by the new age and techno-utopian communities as generating novelty, breeding complexity, producing insights, and countering the forces of entropy. In this ideology, extropy is associated with the set of natural health products or ways of life, which mediate a type of force of extropy, that promote holistic well-being as they act to counter the entropic threat or degeneration. [4] These types of analogy uses, however, seem to have no rigorous connection to fundamental thermodynamics.

Novelty theory

A recent popular search term is novelty vs extropy, which seems to be a revival of something called “novelty theory”, supposedly, developed by American new age philosopher Terence McKenna, which proposes that the universe is an engine designed for the production and conservation of novelty. Novelty, in this context, can be thought of as newness, or extropy (supposedly borrowed from Max More’s meaning of the opposite of entropy). Some kind of laymanized view holds that, in a nutshell, novelty theory involves ontology, extropy, and eschatology. According to McKenna, when novelty is graphed over time, a fractal waveform known as "timewave zero" or simply the "timewave" results. The graph shows at what time periods, but never at what locations, novelty increases or decreases and is supposed to represent a model of history's most important events. The original publication for his view remains to be tracked down. [8]

Quotes

The following are related quotes:

> "The five base economic units are: energy, **extropy**, space, time and sentience."
>
> — Matt Frohlich (2015), on transhumanism (O), Jul 16

See also

- Anti-entropy difficulties

References

1. (a) Extropy - Journal of Transhumanism Solutions (see: History section) - Extropy Institute.
(b) T.O. Morrow (Tom Bell) - Articles and c.v. (AOL Members Page)
2. (a) Foster, Thomas. (2005). *The Souls of Cyberfolk: Posthumanism as a Vernacular Theory*, (pg. 15). University of Minnesota Press.
(b) *Extropy* journal history: the printed journal *Extropy: Vaccine For Future Shock*, started by Max More and Tom Bell, debuted in August 1988 with only fifty copies of the first issue. The title later became *Extropy: Journal of Transhumanist Thought*, and a total of seventeen issues were published. In November 1997, the journal moved to the Internet as *Extropy Online*, where it continued to publish articles for three years. After a year of dormancy, it returned to the Web in February 2002 as its current form, *Extropy: Journal of Transhumanist Solutions*.
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4. Ekström, Karin M. and Brembeck, Helene. (2004). *Elusive Consumption* (pg. 190). Berg Publisher.
5. First *Extropy* ad - (*T.0. Morrow, '89-'99)*
6. What is Extropy? - MaxMore.com.
7. (a) What is Extropy? (Extropians FAQs) – Web.Archive.org.
(b) Email communicate from Libb Thims to Tom Bell, 4 May 2010.
8. Terence McKenna – Wikipedia.
9. (a) Author. (1967). "Article" (Overstreet, pg. 229; extropy, pg. 229), *Physis*, Vol. 9-10.
(b) Kragh, Helge and Weininger, Stephen J. (1996). "Sooner Science than Confusion: the Tortuous Entry of Entropy into Chemist" (abs), *Historical Studies in the Physical and Biological Sciences*, 27(1): 91-130.

External links

- Extropy - Wikipedia.
- Max More's (philosophical) principles of extropy - Extropy Institute.

θΔics

In Egyptian mythology, **Eye of Horus** refers to model that the sky is the "face" of the god Horus, the Egyptian word for face being “Her” or “Hra”, and that the sun and the moon are his two eyes, the sun being the right eye and the moon being the left eye.

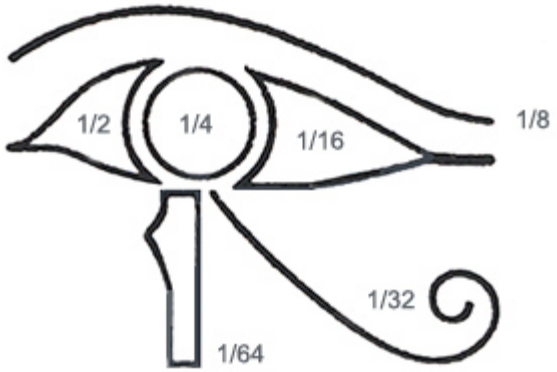

The Rhind Mathematical Papyrus (c.1550BC), by Ahmes (Q), the oldest known mathematician, and or the Akhmin wooden tablets (c.1950), supposedly give the above fractions of the eye of Horus.

Eye of Ra

In other contexts, e.g. of god syncretism, the right eye of Horus is convoluted with or seen as synonymous with the “eye of Ra” (Q), or something to this effect.

Quotes

The following are related quotes:

> “That the heavens, or the skies, were considered to be a face is evident from many allusions. Thus, the sun is frequently called the ‘eye of Horus’, and the moon is also and ‘eye of Horus’, the sun being the right eye, and the moon the left.”
>
> — Wallis Budge (1904), *The Gods of the Egyptians, Volume One* (pg. 467) [1]

See also

- Horus opening the mouth and two eyes of Osiris (Q)

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One*. Dover, 1969.

Videos

- Thims, Libb. (2018). “Eye of Thor (Horus) and Odin (Atum-Ra)” (Q), Atheism Reviews, Mar 22.

θΔics

In existographies, **Ezra Pound** (1885-1972) (Gottlieb 1000:367) (CR:2) was an American poet and critic, noted for []

Quotes | By

The following are quotes by Pound:

> "Genius is the capacity to see ten things where the ordinary man sees one"
>
> — Ezra Pound (c.1950), *Publication* (Q)

> "The arts are kept up by a very few people; they always have been kept up, when kept up at all, by a very few people. A great art patron is a man who keeps up great artists. A good art patron is a man who keeps up good artists. His reputation is coterminous with the work he has patronized. He cannot be an imbecile."
>
> — Ezra Pound (1958), *Pavannes and divagations* (Q)(Q)

External links

- Ezra Pound – Wikipedia.

θΔics

In terminology, **fact** (TR:311) is []

Quotes

The following are related quotes:

> "We must trust to nothing but **fact**: these are presented to us by nature, and cannot deceive. We ought, in every instance, to submit our reasoning to the test of experiment, and never to search for truth but by the natural road of experiment and observation."
>
> — Antoine Lavoisier (1789), *Elements of Chemistry* (pg. xiii-xxxvii) (Ñº)

> "It is a strange **fact**, incidentally, that religious apologists love the anthropic principle. For some reason that makes no sense at all, they think it supports their case. Precisely the opposite is true. The anthropic principle, like natural selection, is an alternative to the design hypothesis. It provides a rational, design-free explanation for the fact that we find ourselves in a situation propitious to our existence."
>
> — Richard Dawkins (2006), *The God Delusion*

Further reading

â— Veltman, Martinus. (2003). *Facts and Mysteries in Elementary Particle Physics*. World Scientific.

External links

â— Fact – Wikipedia.

θΔics

In terminology, **faith** (CR:286) is believing in things without evidence. [1]

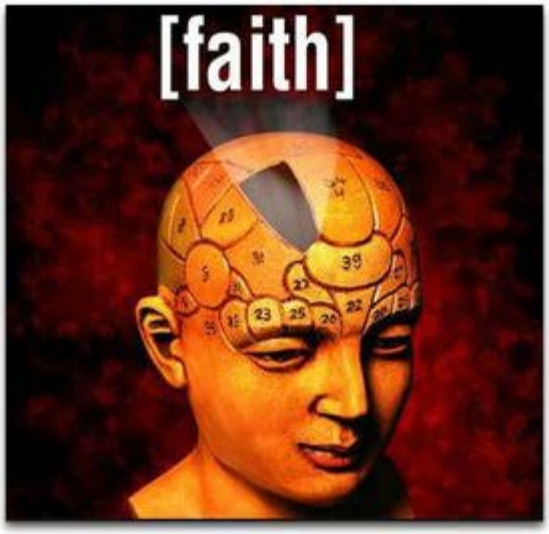

An imaging (O) conceptualizing the postulate that "**faith**" resides in a brain location.

Religion | Science

The term "faith" is often a precarious tool used by creationist scientists amid conflicts between science and religion.

Indian-born Pakistani organometallic chemist Mirza Beg, is a prime example of one whom had severe difficult in his attempts to reconcile "faith" amid his physiochemical sociology work (see: thread post: #62, #158, etc.).

Quotes

The following are relevant quote:

> "If god fimself were to say to me, "Thought is of an olive color"; "the square of a certain number is bitter"; I should certainly understand nothing at all from these words. I could not adopt them either as true or false. But I will repeat them, if He commands me to do it; and I will make others repeat them at the risk of my life. This is not **faith**; it is nothing more than obedience."
>
> — Voltaire (1764), *Philosophical Dictionary* (§:Faith) [6]

> "I have found no confession of **faith** to which I could ally myself without reservation."
>
> — Johann Goethe (1831) [3]

> "If faith begins where knowledge ends, then as the empire of knowledge thus always increases in extent, that of faith decreases as constantly."
>
> — Carl Nageli (1877), "The Limits of Natural Knowledge" [1]

> "A casual stroll through the lunatic asylum shows that **faith** does not prove anything."
>
> — Friedrich Nietzsche (c.1880) (O)

> "The failure of the reformation to capture France had left for the Frenchmen no half-way house between infallibility and infidelity; and while the intellect of Germany and England moved leisurely in the lines of religious evolution, the mind of France leaped from the hot **faith** which had massacred the Huguenots to cold hostility with which La Mettrie, Helvetius, Holbach, and Diderot turned upon the religion of the fathers."
>
> — Will Durant (1926), *the Story of Philosophy* [4]

> "If devotion to truth is the hallmark of morality, then there is no greater, nobler, more heroic form of

devotion than the act of a man who assumes the responsibility of thinking .... the alleged short-cut to knowledge, which is **faith**, is only a short-circuit destroying the mind."

— Ayn Rand (1957), *Atlas Shrugged* (Q)

"Faith is the license religious people give themselves to keep believing when reasons fail."

— Sam Harris (c.2012) [5]

"Nietzsche says that 'the struggle between science and religion is like the primordial struggle between bird and gravity. Religion is like gravity, it wants to pull science down, but science invents the mechanical bird, and airplane because it wants to fly. Science and religion have intense animosity. **Faith** suppresses thought. Faith is not wanting to question, think or know. 'Faith is a veto against science' said Nietzsche."

— Monydit Malieth (2013), *The Future Affects the Past* [2]

References

1. Smurthwaite, Kate. (2011). "Commentary on Abortion and Heaven" (Q), YouTube, Nov 16.
2. Malieth, Monydit (aka Tonnerre). (2013). *The Future Affects the Past* (pg. 15). Red Lead Books.
3. Goethe, Johann. (1831). "Letter to Sulpiz Boisseree", 22 March 1831; quoted in Peter Boerner, *Johann Wolfgang von Goethe 1832/1982: A Biographical Essay* (pg. 82). Bonn: Inter Nationes, 1981
4. (a) Durant, Will. (1926). *The Story of Philosophy* (pg. 175). Simon & Schuster, 1953.
(b) Hsieh, Ching-Yao, and Ye, Meng-Hua. (1991). *Economics, Philosophy, and Physics* (pgs. 13-14). M.E. Sharpe.
5. Meis, Morgan. (2013). "The First New Atheist", The Smart Set, May 8.
6. (a) Voltaire. (1764). *Philosophical Dictionary* (§:Faith) (txt). Publisher.
(b) Joshi, Sunand T. (2014). *The Original Atheists: First Thoughts on Nonbelief* (pg. 57). Prometheus Books.

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● Frode, James. (1849). *The Nemesis of Faith*. Publisher.
● Hiebert, Erwin N. (1986). "Modern Physics and Christian Faith" (pgs. 424-47) in: *God and Nature: Historical Essays on the Encounter between Christianity and Science* (pg. 427), by: Lindberg, David C. and Numbers, Ronald L. University of California Press.
● Graves, Dan. (1996). *Scientists of Faith: Forty-Eight Scientists and Their Christian Faiths* (pg. 168). Kregel Resources.
Strobel, Lee. (2009). *The Case for Faith*. Zondervan

External links

● Faith – Wikipedia.

θΔics

In existographies, **Mirza Faizan Baig** (c.1980-) (EPD:13), aka “Faizan Baig”, is a Pakistani human resources management scholar and career counselor, nephew of Mirza Beg, noted for []

Beg-Thims interview

In 15 to 19 Sep 2019, Faizan helped in the process of the Beg-Thims interview, by being a camera operator, as well as participating in the dialogue of the interview by asking questions, and interjecting at certain points, in regards to clarifications. At the end of the interview, Baig also used his own camera to make a three-person video of himself, with Thims and Mirza Beg, having each person say a few concluding words. [1]

New Dimensions | Conference

Baig stated, in 2019, that he was involved in helping Mirza Beg with publication of a slated second edition of his *New Dimensions*; also that he would be helping facilitate a video conference presentation by Mirza Beg at the 2020/2021 Two Cultures Conference.

Social potential | Realization

Baig, in his dialogues with Thims, expressed frustration about how, he as a career counselor, working in Pakistan, has observed that there is so much potential in the youth but little realization of that potential. On this question, Thims mentioned of physicochemical sociology and or human chemical thermodynamics, to which Thims mentioned the: social cannon ball model (1868), speech of Henry Pritchett (1906), and the Buss sexual receptivity study (1993), the drive-thru paradox (1995), and also the individualism speech of Ibrhim al-Buleihi, in respect to Faizan's puzzle as to why Pakistan has so much potential in its young people but little will towards realization:

> “The individualism of the Arab has been erased in this society.”
>
> — Ibrahim al-Buleihi (2010), Interview (Ñº) dialogue, Feb 26

This situation is similar to that in China, where communism or socialism has erased "individualism", instead situating the "good of the party" above that of the individual, at all costs. In this respect, the Pakistani realization situation is comparable to the "submission to Islam" in Pakistan dominating over that of individualism.

References

1. Baig, Faizan. (2019). “Human Thermodynamics” (Ñº), Mirza Faizan Baig, YouTube, Sep 24.

External links

â— Beg-Thims interview (playlist) – YouTube.

θΔics

In genius studies, **fake IQ**, aka "paper IQ" (Asimov, 1961), as compared to a real IQ or true IQ, is an intelligent quotient, generally claimed or calculated in the 140 or above range, that is not genuine; an IQ that is contrived, baseless or flawed in its method of calculation, resulting in the production of a "fake genius" or non-genuine geniuse. A fake IQ, in short, is akin to a fake diamond, fool's gold, and or a Sokal affair of the mind, so to say, combined, a thing impressive or seemingly genuine on the surface, but lacking in substance or truth.

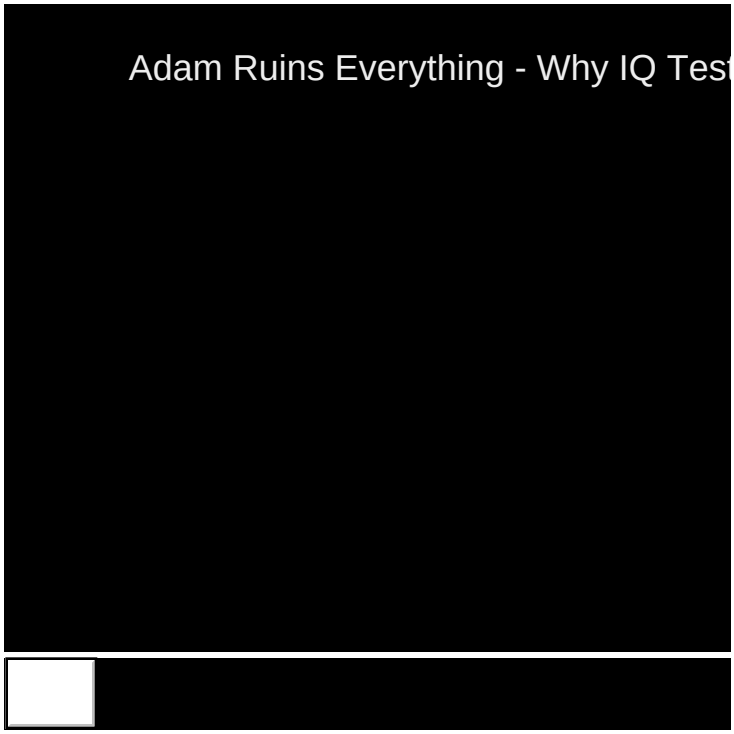

A 2017 TruTV clip on why "IQ tests are bunk", wherein they explain, via citation to various publications, that it is wrong to "think that IQ tests are objective evaluations of one's mental abilities, because in reality they are deeply biased, controversial tools, that might not predict intelligence at all" (Connor, 2012); that the first IQ test, invented in 1904 by Alfred Binet, was never intended to measure intelligence, but rather as a tool to decide what grade to put French kids in (Cautin, 2015); but that in 1908, Henry Goddard brought the Binet test to America, after which the practically swept the nation, allowing one to claim, based on test scores, that they "were a regular Marie Curie", and so on, i.e. to begin to produce so-called genius level "**fake IQs**". [1]

Overview

In 1946, Roland Berrill and Lancelot Ware founded Mensa, a high IQ society, purported to be society of geniuses (140+) or near geniuses (132+), whose current membership claims to host 130,000 plus geniuses, yet in all its years of operation the only two names (Q) of top 1000 geniuses level note produced are: Isaac Asimov and Buckminster Fuller. Asimov explained his reluctant joining and later quitting of the society as follows:

> "I have been a lifelong beneficiary of intelligence tests, I don't think much of them. I believe they test only one facet of intelligence—the ability to answer the kind of questions other people with the same facet of intelligence are likely to ask. My IQ rating has always been out of sight, but I am perfectly aware that in many respects I am remarkably stupid. Second, it seemed to me to be beneath my dignity to take an intelligence test. Surely, my life and work were ample testimony to my intelligence (such as it was).
>
> I took the test, scored high, and became a member of Mensa. **It was not on the whole, a happy experience**. I met a number of wonderful Mensans, but there were other Mensans who were brain-proud and aggressive about their IQs, who, one got the impression, would like, on being introduced, to be able to say, 'I'm Joe Doakes, and my IQ is 172,' or, perhaps, have the figure tattooed on their forehead. They were, as I had been in my youth, forcing their intelligence on unwilling victims. In general, too, **they felt underappreciated and undersuccessful**. As a result, they had soured on the universe and tended to be disagreeable.
>
> What's more, they were constantly jousting with each other, testing their intelligence on each other, and that sort of thing becomes wearing after awhile. Furthermore, I became uncomfortably aware that Mensans, however high their **'paper IQ'** might be, were likely to be as irrational as anyone else. Many of them believed themselves to be part of a 'superior' group that ought to rule the world, and despised non-Mensans as inferiors. Naturally, they tended to be right-wing conservatives, and I generally feel terribly out of sympathy with such views.
>
> Worse yet, there were groups among them, I found out eventually, who accepted astrology and many other pseudoscientific beliefs, and who formed 'SIGs' ('special interest groups') devoted to different varieties of intellectual trash. Where was the credit of being associated with that sort of thing, even tangentially?... I stayed on in Mensa for years, getting more and more tired of it. ... Eventually, after both Marvin and Margot [two of the New York Mensans he acknowledged as "delightful and intelligent"] had died, I did

resign."

— Isaac Asimov (1990), *I, Asimov: a Memoir*; reflection on his 1961 Mensa experience

Here we see many claimed-to-be-geniuses, yet no noticeable genius-level fruit?

In 1982, Ronald Hoeflin, disenfranchised with the Mensa Society, created the Mega Society, who members are purported to have an IQ of 177 or above, based on the ability to answer correctly 43 or more questions of his 48 question test (see: Mega Test IQ), first published a 1985 issue of Omni Magazine. This society has produced a number of publicly-famous fake geniuses, including: Rick Rosner, Marilyn Savant, and Christopher Langan. A quick rule of thumb to differentiate a fake genius from a real genius is to compare what real geniuses actually say on the big questions, namely: soul, religion, love, will and free will, purpose, good, evil, god, afterlife, chance, morality, life, and chance, as compared to what fake genius says, e.g. compare Langan's 2018 views on god and afterlife as compared to the views as listed in the "geniuses on" page.

In 1983, Andrew Egendorf, a lawyer who was in the middle of writing a book on high IQ societies, Marilyn Savant, a then unknown puzzle column writer for Omni magazine, and Ronald Hoeflin, the creator of the Mega Test (1982), which claims to measure the IQs of adults at the 145 or above range, concocted a publicity stunt plan to get Savant listed in the Guinness Book of World Records under the category of highest IQ by using her age 11 Stanford Binet test score as a basis to claim that she has an IQ of 228, via incorrectly claiming that she took the test at age 10, and to use the ratio IQ formula, to fake an genius ceiling range IQ.

In 2000, a hoax "fake IQ" chart (Q), went viral around the internet claiming that "states with higher IQ vote democratic".

In 2002, Elizabeth Chapman was fabricating the intelligence score of her son, Chris (or Justin) Chapman (1996-), to be IQ at 298 to the media; her child was removed after he attempted suicide a year latter.

Quotes

The following are related quotes:

"Actually, Adrian Seng is Terence Tao (Q). A book about gifted kids written by Miraca Gross (Q) included biographies of real-life gifted children but she changed their names. Terence Tao's name was changed to Adrian Seng. I disagree with your inclusion [actually not included] of chess champions, Go champions, and idiots who supposedly did well on those **fake 'Ultra-High IQ Tests'** (e.g. Widsten [IQclaim: 175+] (Q), Lygeros [IQclaim:189] (Q), Gunnarsson [IQclaim: 235] (Q), Schuessler [IQclaim: 185] (Q), etc.). These **idiots** haven't achieved anything that matches their **inflated IQs**. One person I suggest you include is Michael Grost. He was a true genius who achieved honorable mention on the incredibly difficult Putnam exam (the same one that Reid Barton won 4 times) at the age of 13. Also, include Gabriel Carroll. This guy probably has a > 200 IQ. Lastly, I'm pleasantly surprised that you know Wei-Hwa Huang. We really should talk because I know a lot of the people on your list."

— American Anon (2011), "Top 50" (Q), IQ:200+ thread (post #11), poster from Richmond Virginia, Mar 14.

See also

- Inflated IQ
- IQ miscalculation

References

1. (a) Anon. (2017). "Adam Ruins Everything: Why IQ Tests are Bunk" (Q), TruTV, YouTube, Aug 23.
(b) Connor, Steve. (2012). "Article", *The independent*, Dec 21.

(c) Cautin, Robin L. and Lilienfeld, Scott O. (2015). *Encyclopedia of Clinical Psychology*, *Volumes 1-5*. Wiley.

θΔics

In science, **fall in love** is a colloquial term used to refer to the action in which two people meet in time and fall into the confines of a relationship. About 20% of people will fall in love at first sight and marry that person. [2]

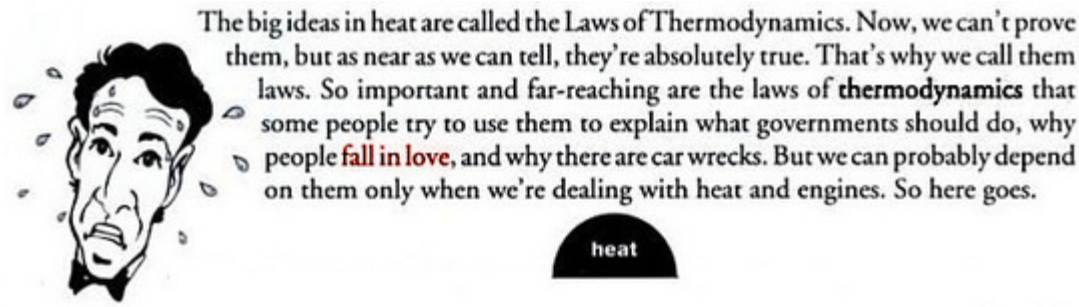

American mechanical engineer Bill Nye explaining, in his 1993 Disney science education book *Bill Nye the Science Guy's Big Blast of Science*, that people have used the laws of thermodynamics to explain why people **fall in love**. [1]

Human chemistry

In technical language, the state of behavior characterized by the term "falling in love" refers the process in which two previously unattached people, collide in time, surmount the activation energy barrier to reaction, and slide down into the free energy stability range on the potential energy surface (below relationship equilibrium level), and fall into the confines of a paired human molecular bond, in the unified structure of a dihumanide molecule.

Human thermodynamics

Scientists, according to the views of American mechanical engineer Bill Nye, have been using thermodynamics to explain how people fall in love since before 1993. [1] It is puzzling, however, as to who Nye is referring to?

In the 1993 book *Bill Nye the Science Guy's Big Blast of Science*, a Disney-version science book, in the section on thermodynamics, American mechanical engineer Bill Nye comments that someone previous to him has used thermodynamics to explain why people fall in love.

A pre-1993 reference to someone who used thermodynamics to explain "why people fall in love" is puzzling? He could be making a reference to German polymath Johann Goethe, and his 1809 human elective affinity work, but this was not pure thermodynamics, but rather pre-thermodynamics (in the sense that affinity was precursor to free energy); and it is doubtful that Nye knew at this time that affinity equates to free energy change, a fact that only people with a chemistry background or interest know about this factoid.

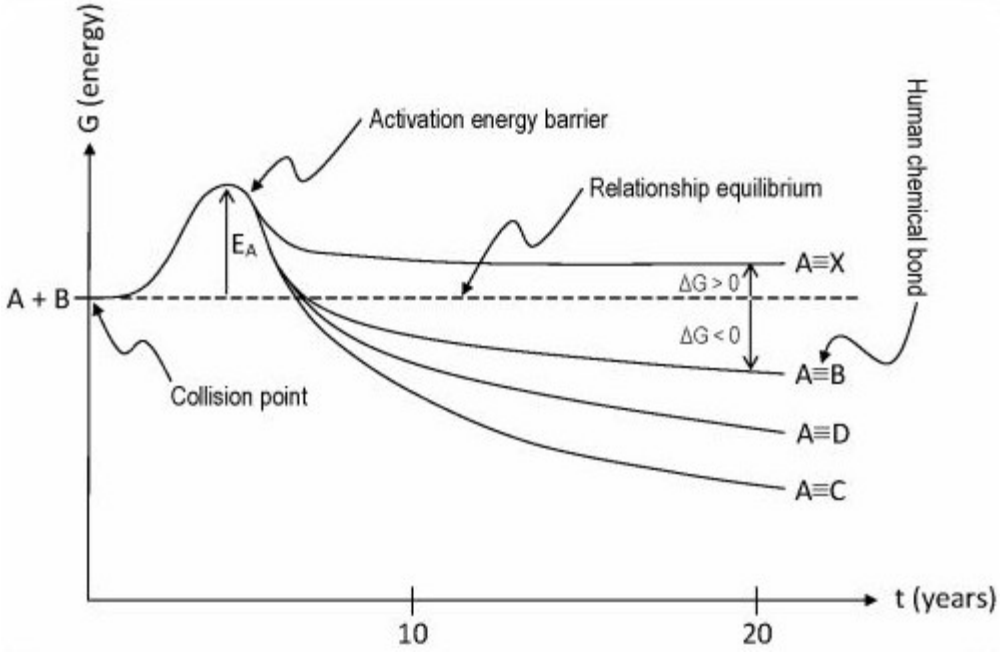

The process of **falling in love** is best visualized by plot of the potential energy surface of the reactants (unpaired individuals) on going to reactants (relationship). The plot above shows the free energy versus extent of reaction, showing various hypothetical final states, in various stabilities (A≡B, A≡D, A≡C, begin stable products; A≡X being an unstable product) above and below thermodynamic equilibrium.

It is possible, however, that Nye is making reference to Tom Stoppard's play *Arcadia*, a modern-day remake or twist on Goethe's *Elective Affinities*, in which Stoppard uses the second law concepts, such as heat death and sexual heat, in discussions of human passions and love. Arcadia premiered on April 13th, 1993, and Nye's book was published on Sep 21, 1993, so it is possible Nye could have either saw the play or read a review.

To give an example summary of Stoppard's use of thermodynamics in his play, writer Katherine Kelly summarizes in her 2001 *Cambridge Companion to Tom Stoppard* that the part in the play when Septimus quotes the tomb inscription 'Et in Ardccadia Ego', in Poussin's celebrated seventeenth-century painting, to mean 'even in paradise there is death',

that Thomasina knows about the second law and how the "entire universe is dying, inevitably heading towards an entropic dead end", expressed as "heat goes to cold" as Valentine explains to Hanna. In another instance "It's a one-way street … It'll take a while but we're all going to end up at room temperature". In this scene, Kelly explains that: [3]

> "Thomasina refuses to give in into despair. She is thinking of heat in more than one sense: not just the heat of **thermodynamics** but the heat of Eros. For she is **falling in love** with Septimus, and begs him to teach her to waltz."

(add discussion)

References

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2. Naumann, Earl. (2001). *Love at First Sight – the Stories and Science Behind Instant Attraction*, (ch. 2: "The Chemistry of Love", pgs. 23-42 [35]). Naperville, IL: Casablanca Press.
3. Kelly, Katherine E. (2001). *Cambridge Companion to Tom Stoppard* (pg. 189). Cambridge University Press.

θΔics

In physics, **fall-force** or fall-kraft, is a force that results from the spatial separation of bodies. [1] The term was conceived in 1842 by German physicist Robert Mayer, introduced as a replacement for gravity, that accounts for the mechanical equivalent of heat, namely that heat can produce motion, and that motion can produce heat, and that the two are interconvertable and transformable.

References

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● Helm, Georg. (2000). *The Historical Development of Energetics* (fall-force, 5+ pgs.). Kluwer.
● Coopersmith, Jennifer. (2010). *Energy, the Subtle Concept* (fall force, pgs. 248-49). MIT Press.

θΔics

In science, **falsifiability** refers to any proposed theory that meets the "criterion" that it has a correlatively proposed "test" that can be done to prove, without doubt, e.g. experimentally, whether or not said theory is "true" or "false". Overview In 1919, Karl Popper, age 17, was reflecting on how there were many "theories" in the air, the three dominating his mind being: Albert Einstein's relativity, Karl Marx's theory of history (historical materialism), Sigmund Freud's psycho-analysis (psychodynamics), and Alfred Adler's individual psychology, and that the problem that troubled him was the following: [1]

> "'When should a theory be ranked as scientific?' or 'Is there **a criterion** for the scientific character or status of a theory?' The problem which troubled me at the time was neither, 'When is a theory true?' nor, 'When is a theory acceptable?' My problem was different. I wished to distinguish between science and pseudo-science; knowing very well that science often errs, and that pseudo-science may happen to stumble on the truth."

Popper states that he began to grapple with this problem in the "since the autumn of 1919", after becoming impressed with recent May 1919 confirmation of Einstein's light bending prediction of his relativity theory via Arthur Eddington's solar eclipse expedition: [2]

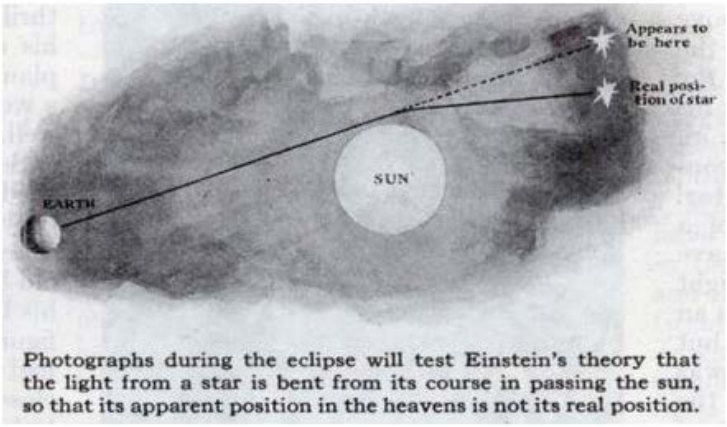

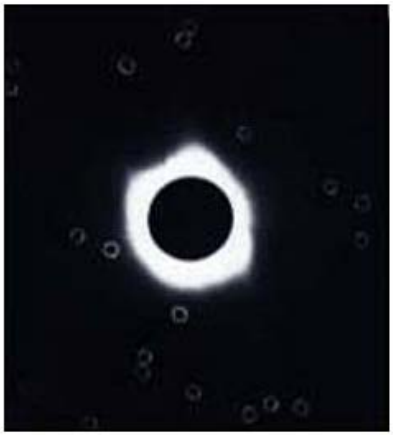

Left: a photo of Cambridge Observatory director Arthur Eddington who led an expedition to observe the total solar eclipse of May 29, 1919. During an eclipse, the sky gets dark enough that you can see stars, even close to the Sun. So Eddington set out to map the position of the stars when they were close to the Sun (right image), and see how the Sun bent the light (middle image) and to see if his measurements matched up with Einstein's prediction, Newton's prediction, or would light not bend at all? [3]

Popper used this Einstein-Eddington based "theories which can be confronted with observations or experimental results" model as his "falsifiability" test, which separates science from pseudoscience; according to which bad, nonscientific theories could not be falsified. [4]

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4. Dear, Peter. (2001). "Science Studies as Epistemography", in: *The One Culture? A Conversation about Science* (editors: Jay Labinger and Harry Collins) (§10:128-41). University of Chicago Press.

External links â— Falsifiability – Wikipedia.

θΔics

In culture, **family** is an association of three or more humans by blood or marriage. In human chemistry, families are defined as combinations of "human molecules". [1]

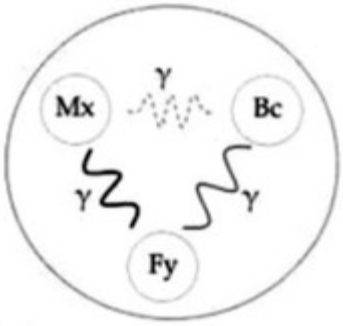

Left: Basic family: mother, father, and daughter (in a pool). Right: Bound state representation of a **family**: MxFyBc (father Mx, mother Fy, child Bc), connected by human chemical bonds (photon bonds γ). [1]

Human chemistry

In human chemistry, the first to refer to a a family as a type of combined "chemical", via human chemical theory or human molecular theory, was Thomas Dreier:

> "Every **family** is a combination of human chemicals."
>
> — Thomas Dreier (1948), *We Human Chemicals*

Dreier elaborated further on this basis in his chapter on the human chemistry of family life. [2]

In the 2001 book *Leaving and Clinging*, American writer Paul Peachey used the concept of the "family molecule", being the attachment of two or more human molecules, to argue that the family is the core molecule of society. Peachey seems to cull many of his ideas on human bonding and human molecules from American sociologist Robert Nisbet, whom he quotes often, for example: [3]

> "It should be obvious that **family**, not the individual, is the real molecule of society, the key link of the social chain of being. The family [is] the societal germ or 'molecule' that Nisbet proclaims."

In another instance, he states: "The family is the social molecule, it is not the first instance because it produces and socializes the young, but because it is the cradle of covenanting freedom. The often life-long trauma experienced by children of divorces testifies to the germinal (or molecular) significance of pair-bonding in the creation of the human." Most of his reasoning seems, however, to be used in loose metaphor. Below is one example:

> "To put the matter metaphorically, only when the family molecule begins to dissolve into individual atoms can the rational reconstruction or resynthesis that we call modernization be undertaken."

In 2007, American electrochemical engineer Libb Thims began to describe families, chemically, using three points of view: as "bound states" of human molecules; as di-humanide or tri-humanide molecules, etc., depending on geometry and molecule count; or using human molecular orbital theory as overlaps of probability orbitals. [1]

Family therapy

In the 1940s and 1950s, supposedly, concepts from systems theory, cybernetics, and psychodynamics began to filter over into family therapy books, carrying over concepts of boundaries, entropy, negentropy, openness and closedness, etc., to develop theories on family issues. [4]

In 2007, Herbert and Irene Goldenberg, in their *Family Therapy*, state: [5]

> "**Families** vary in the extent to which they are open systems; relatively closed systems run the risk of

entropy or decay and disorganization."

The term 'relatively closed system', however, is Carl Jung psychodynamics term, not being proper thermodynamics.

See also

- Family molecule
- Nuclear family

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1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (pg. 183-86). (preview), (Google books). Morrisville, NC: LuLu.
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Further reading

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- Zuk, Gerald H. and Boszormenyi-Nagy, Ivan. (1967). *Family Therapy and Disturbed Families* (Entropy and Family Therapy: Speculations on Psychic Energy, Thermodynamics, and Family Interpsychic Communication, pgs. 85-92). Science and Behavior Books.

External links

- Family – Wikipedia.

θΔics

In hmolscience, **family bond** is an adhesion or adhesion structure, between two or more family members, e.g. parents and child (trihumanide molecule), quantified by a determinate range of bond energy. [1]

An advert banner for Great Wolf Lodge water park, showing the statement: "some bonds only become stronger in the water, next to a picture of a family going down a water slide, thereby alluding to the idea that **family bonds**, akin to ionic bonds, become strengthened or gain power or activity during vacations.

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (pdf). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.

θΔics

In human chemistry, **family molecule** is a term that defines the family as a bonded association of two or more human molecules. [1]

Overview

In 2001, American writer Paul Peachey, in his *Leaving and Clinging*, was using the term "family molecule", in a metaphorical sense, as follows:

> "To put the matter metaphorically, only when the **family molecule** begins to dissolve into individual atoms can the rational reconstruction or resynthesis that we call modernization be undertaken."

The term seems to have been first used, albeit in a metaphorical sense, in the 2001 book *Leaving and Clinging*, by American writer Paul Peachey, to argue that the family is the core molecule of society: [2]

In 2007, American electrochemical engineer Libb Thims was explicitly definition the basic nuclear family, e.g. couple with one baby, as a tri-human-ide molecule. [1]

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (preview), (Google books). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (preview), (Google books). Morrisville, NC: LuLu.
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θΔics

In existographies, **famous atheists** refers to historical thinkers, past or present, who have gained a certain notoriety, fame or infamy, depending, for either being labeled an atheist, declared non-believer in the existence of god, and or contribute explicitly to atheism, anti-theism, and dissolution of religio-mythology based ideologies; below is chronological listing of famous atheists, past and present.

The hyperlink acronym FA:#, e.g. Marcus Aurelius (FA:#24), indicates an individuals famous atheist rankings, chronologically.

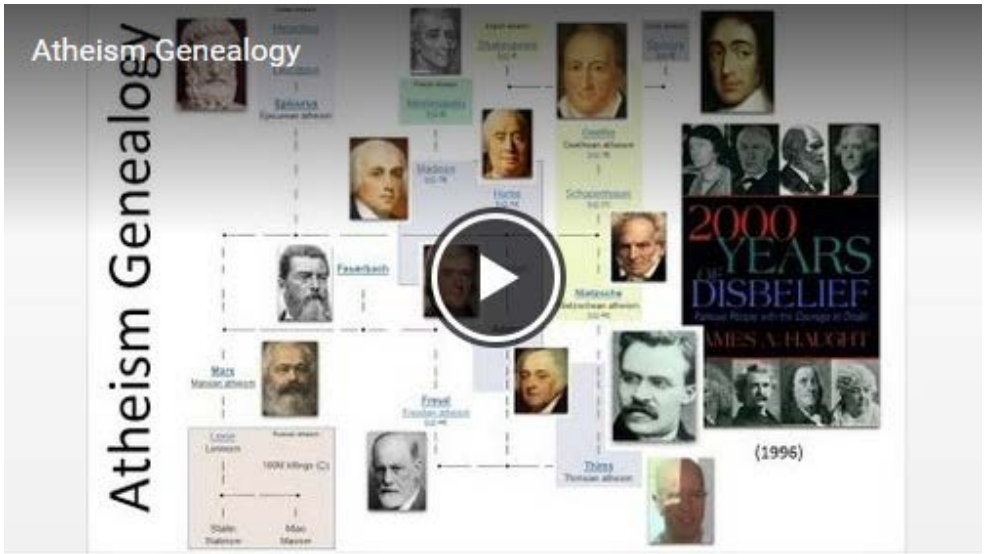

A screenshot of an atheism genealogy video (Q), showing the core **famous atheists** and branches, such as: atomic theory branch (Epicurean atheism), the Feuerbach branch (Freudian atheism and Marxian atheism), and the Goethe branch (Schopenhauer-Nietzsche atheism).

Overview

The following are example quotes of famous atheists grouped into association:

> "**Nietzsche** launched a new building project that represents an advance for atheism. **Meslier** denied all divinity, **Holbach** dismantled Christianity, **Feuerbach** deconstructed god. Then Nietzsche introduced transvaluation: atheism is not an end in itself. Do away with god, yes, but then what? Another morality, a new ethic, values never before thought of because unthinkable, this innovation is what makes it possible to arrive at atheism and to surpass it. A formidable task, and one still to be brought to fruition."
>
> — Michel Onfray (2005), *Atheist Manifesto* [11]

(add)

Atheists | 1-100

*See also: **Greatest atheist ever** (ranked)*

The following are noted atheists "1 to 100" — assumed, attributed, categorical, labeled, famous, extreme, and or legendary — chronological ordered, by either birth (reaction start) or event significance (next: **101-200**, 201-300, 310-400); those colored light pink are noted female atheists:

Atheists 1 to 100			
#	**Person**	**Date**	**Significance**
1.	Akhenaten (c.1380-1335BC)	c.1320BC	"Akhenaten's fascination for the sun disc Aten is akin to constituting atheism." — Donald Redford (1984), *Akhenaten: the Heretic King*; cited by Karl Luckert (1991) in *Egyptian Light and Hebrew Fire* (pg. 109)

2.	Thales (c.624-546 BC)	600BC	The first crypto "god doubter" in history, according to Jennifer Hecht (2003); like for his belief that "all is water", out of which earth and fire are second principles.
3.	Charvaka [c.650-550BC]	600BC	A sect of Indian materialism-based atheists; a reaction to the difficulties of Hinduism.
#.	Anaximander (c.610-564BC)	580BC	"Anaximander was the chief of the old atheistic philosophers." — Ralph Cudworth (1678), *The True Intellectual System of the Universe* (pg. #)
4.	Xenophanes (c.560-480BC)	530BC	"There has been a considerable number of those whom history calls 'atheists'. Leucippus, Democritus, Xenophanes, and others of the atomistic and Eleatic schools (Q), are said to have been such. In his *Intellectual System*, Cudworth puts into this category Seneca and the younger Pliny among the Romans. Since the reformation, such men as: Rabelais, Machiavel, Bruno, Vanini, D'Alembert, Diderot, Buffon, Condorcet, Mirabeau, La Place, Frederic II, and even Pope Leo X, have been charged with atheism." — Willis Lord (1875), *Christian Theology for the People* (pg. 67)
5.	Heraclitus (c.535-450BC)	475BC	"The universe, that is the all, is made neither of gods nor of men, but ever has been and ever will be an eternal-living fire, kindling and extinguishing in destined measure." — Heraclitus (c.470BC) [3] His fragments (Q) indicate a difficult-to-pin-down exact belief system, but approximately the following type of pantheism logic: "god = fire/lightening [principle] + reason/cause [λόγος]" Generally, a type of agnosticism-to-atheism of the Olympian gods, amid a search for a universal principle, rooted in fire, electricity, flux, and eternal change.
6.	Leucippus (c.500-450 BC)	450BC	Often called the 'father of atomic theory', he was the first to conceive of the theory of atoms, arguing that the universe consisted entirely of atoms and void, a theory purposely contrived so to contradict Greek philosopher Parmenides' earlier view that voids are impossible; called by Francis Bacon, in his "On Atheism" (1597), the chief or head of the school "most accused" of atheism.
	Hippo		Held water to be the first principle, out of which fire arise; believed the soul to be made of

7. (c.500-440BC) 450BC

water (not blood); classified as a materialist and atheist.

#. Anaxagoras (500-428 BC) 467BC

Was the first person to be legally "indicted for atheism", per his assertion that the sun was not a god (Helios), but rather a fallen meteorite (467BC); in 438BC, a law was passed against Anaxagoras-like atheism: "society must denounce those who do not believe in the divine beings or who teach doctrines about things in the sky" (Hecht, 2003; pg. 10).

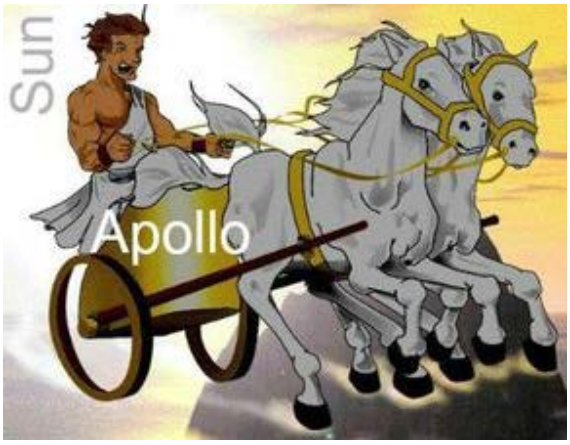

When, according to Voltaire (1764), he claimed that the sun was not driven by Apollo, mounted on a chariot, but rather, based on the "evidence" of examined fallen meteors, and the reasoned postulate that moon light was reflected sunlight, that it was a hot or fiery stone, moving in a fifth element, in addition to the standard four elements, he called "aether", which he conceived of as being in constant rotation and carried with it the celestial bodies, he was called an atheist, and had to flee.

Empedocles is oft-classified as an early atheist; the following quote is representative of this view:

> "If horses could draw, god would have four limbs and run very fast."
>
> — Empedocles (c.450), aphorisms (Q)

Theophilus (c.120-184) (Q) believed that Empedocles "taught atheism", about which he says as follows:

8. Empedocles (495-435BC) 450BC

> "What good did it do Epicurus to maintain that there is no providence; or **Empedocles** to teach atheism; or Socrates to swear by the dog, and the goose, and the plane-tree, and AEsculapius struck by lightning, and the demons whom he invoked? And why did he willingly die? What reward, or of what kind, did he expect to receive after death? What did Plato's system of culture profit him? Or what benefit did the rest of the philosophers derive from their doctrines, not to enumerate the whole of them, since they are numerous? But these things we say, for the purpose of exhibiting their useless and godless opinions."

Irenaeus (130-202AD) viewed most of the pre-Socratics as "atheists" in their materialist explanations of the origin of the world, including: Homer, Thales, Anaximander, Empedocles, and Anaxagoras. Clement of Alexandria (150-215), likewise, saw Thales, Anximenes, Diogenes of Apollonia, Parmenides, Heraclitus, Empedocles, and all of the atomists as such.

The first person to be "labeled" an atheist, for the following views:

9.

> "Concerning the gods, I am unable to discover whether they exist or not, or what they are like in form; for there are many hindrances to knowledge, the

	Protagoras (c.490-420BC)		obscurity of the subject and the brevity of the human mind." Technically, these views are what we now characterize as "agnostic", a term coined in 1869 by Thomas Huxley.
10.	 **Euripides** (c.480-406BC)	c.440BC	"He was a wise man who invented god." — Euripides (c.450BC), "Concerning God" (Q); oft-attributed, incorrectly, in 20th century (Q), to Plato, in the form "He was a wise man that invented god" Was threatened with an indictment for atheism (Lange, 1865; pg. 7).
11.	 Socrates (c.469-399BC)		Was "indicted for atheism" (Hecht, 2003; pg. 11).
12.	Prodicus (465-395BC)		God theory: Gods were what the ancients invented to equate the sun, rivers, and other beneficial things with. (Empiricus, 200AD). Tried for figure out, from a secular linguistic point of view, how humans learn the names of their gods; latter classified as an atheist by early contemporaries (Hecht, 2003; pg. 8) He also advanced an account of Demeter (Isis) and Dionysus (Osiris) as mortals who taught agriculture and viticulture, and who were accorded divine honors after their deaths in recognition of their gifts to humanity. The argument that the gods familiar to the Greeks were once mortals was a key element in the suspicion that sophists like Prodicus were atheists
13.	Diogenes of Apollonia (c.460-400BC)		Labeled, by Irenaeus (130-202AD), an atheist per his materialistic account of the world.
14.	 Thucydides (460-395BC)		Retrospectively characterized a secular historian, in his god free account of things; Thomas Hobbes (1629) defended him against the charge of atheism.
15.	 Democritus (c.460-370BC)		"Some men said something stretched out their hands tither, where we Greeks now speak of 'air' and thus they call the whole 'Zeus' and say: he knows everything, he gives and takes, he is king of everything." [14] "Critias seems to be from the ranks of the atheists when he says that the lawgivers of ancient times invented god as a kind of overseer of the right and wrong actions of men.

16.	Critias (c.460-403BC)		Their purpose was to prevent anyone from wronging his neighbors secretly, as he would incur the risk of vengeance at the hands of the gods." — Sextus Empiricus (c.200AD) (Q)
17.	Hippocrates (c.460-370BC)		Quote: "Men think epilepsy divine, merely because they do not understand it. We will one day understand what causes it, and then cease to call it divine. And so it is with everything in the universe." Note: while often deemed atheist, the Hippocratic oath (Q) speaks of "gods and goddesses" being witness to oath.
18.	Diagoras (c.448-388BC)		"With reason did the Athenians adjudge Diagoras guilty of atheism, in that he not only divulged the Orphic doctrine, and published the mysteries of Eleusis and of the Cabiri, and chopped up the wooden statue of Hercules to boil his turnips, but openly declared that there was no god at all." — Athenagoras (200AD), *A Plea for the Christians* Semi-labeled as the "**first true atheist**"; known as "Diagoras 'the Atheist' of Melos", a disciple of Democritus (Q), cited by Cicero, among others, sometimes referred to, in the history of atheism (Q), as the "first atheist" or history's earliest known "confirmed atheist", as some (Q) describe him.
19.	Aristophanes (c.446-386BC)		In his satirical play *The Clouds* (Q), tells a dialogue about the nature of rain (natural or Zeus caused), between a fictional atheist character Socrates and a lay character Strepsaides, who thinks rain is caused by "Zeus pissing into a sieve" (Hecht, 2013; pg. 12).
20.	Theophrastus (c.371-287BC)	c.290BC	Penned an essay, now lost, entitled "On Gods" (Περὶ ὦεῶν), wherein, supposedly, he debunks religion and proves gods non-existent.
21.	Strato (c.335-269BC)	287BC	Successor to Theophrastus; David Hume declared his brand of atheism to be: "the most dangerous of the ancients."

22.	Euhemerus (c.340BC-260BC)	c.270BC	Was considered an atheist in the ancient world (Q); his atheism was discussed by the Anon Theophrastus (c.1659).
23.	Theodorus (c.340-250BC)	c.260BC	"The Theodoreans derived their name from Theodorus, known as 'the atheist', and adopted his doctrines. Theodorus was a man who utterly rejected the current belief in the gods. And I have come across a book of his entitled *Of the Gods* which is not contemptible. From that book, they say, Epicurus borrowed most of what he wrote on the subject." — Diogenes Laertius (c.225), *Lives and Opinions of Eminent Philosophers* [9] "Diagoras and Theodorus flatly deny that there were ever gods at all." — Michel Montaigne (c.1580)
24.	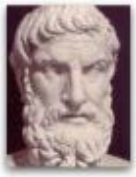 Epicurus (341-270BC)	c.300BC	Classified, along with Diagoras of Melos, as one of the first two "outright atheists". [7] Studied the lectures of determinism philosopher Zeno of Citium. [8] Epitaphs: "head of school most-accused of atheism" (Francis Bacon, 1597); "chief father of atheism" (Jonathan Edwards, c.1750) (Q); "father of atheism" (Monydit Malieth, 2013); eponyms: Epicureanism; Epicurean atheism; is the main conduit of atheism, throughout history, in atheism genealogy; e.g. Marxian atheism, Freudian atheism, and Jeffersonian atheism (American atheism) all stem from him, along with all the other big atheist, e.g. Giordano Bruno, Pierre Gassendi, Walter Charleton, among unlistable others; in his "Letter to Herodotus" (Q), he, supposedly, relegates the gods to the role of non-interfering material entities, in capable of controlling human affairs. [2] Diogenes Laertius (c.225) asserts, to note, that he borrowed most what he wrote from "outright atheist" Theodorus and his *On the Gods*.
25.	Leontion (c.330-280BC)	c.310BC	Epicurus' first female disciple; argued against Theophrastus.
26.	Bion (325-250BC)		A follower of atheists Theodorus and Theophrastus; would "often vehemently assail belief in the gods" (Laertius, 230AD). "The term **ἄθεος** [atheist] = **ἀ-** [without] + **θεός** [god]; meaning *godless*." — Cicero (45BC), *On the Nature of the Gods* Supposedly, was first to transliterate the Greek word ἄθεος, from the privative ἀ- + θεός "god", meaning "godless", into the Latin *átheos* (Q), i.e. to introduce the "atheism" to the modern western world.
2#.	Cicero (106-43BC)	45BC	"There are many questions in philosophy to which no satisfactory answer has yet been given. But the question of the nature of the gods is the darkest and most difficult of all …. So various and so contradictory are the opinions of the most learned men on this matter as to persuade one of the truth of the saying that philosophy is the child of ignorance." — Cicero (45BC), *On the Nature of the Gods* (Q) One of the first neutral commentators on atheism, specifically atomic atheism, namely differences on free will of Democritus vs Epicurus/Lucretius (describing him as a "brilliant genius", and atheists, e.g. Diagoras; also the person credited with coining the term "moral"

and moral science; the originator of the "anti-chance argument" (aka typing monkeys argument); technically: an atheism-curious skeptical agnostic, approximately.

In his *On the Nature of Things*, a summary of the main points of the atomic theory of Leucippus, Democritus, Epicurus, in poetic form, on “gods” his aim is the following:

> “My object is to dispel the fear of the gods, which arises simply from the fact that there are so many things which men do not yet understand, and therefore imagine to be effected by divine power.”

27.
Lucretius (99-55BC)

On where everything came from, without a "creator", he has the following to say:

> “For surely the atoms did not hold council, assigning order to each, flexing their keen minds with questions of place and motion and who goes where. But shuffled and jumbled in many ways, in the course of endless time they are buffeted, driven along, chancing upon all motions, combinations. At last they fall into such an arrangement as would create this universe.”

Lucretius' aim, according to American chemist-theologian Edwin Slosson, was to abolish belief in all gods from the mind of mankind.

28.
Seneca (4BC-65AD) — 55AD

“Religion is regarded by the common people as true, by the wise as false, and by the rulers as useful.”

— Seneca (c.50AD), attributed; paraphrase of Lucretius; rephrased by Edward Gibbon (O)

29.
Pliny the elder (23-79AD) — 77AD

“The enlightened and benevolent Pliny [in his *Natural History*] thus publicly professes himself an atheist.”

— Percy Shelley (1811), *The Necessity of Atheism*

30. Wang Chung (c.27-100AD) — c.80AD

A Chinese rational materialist who debunked most aspects of Chinese folk religion and magical thinking, via logic and natural thinking.

3#.
Plutarch (c.46-120)

Supposedly a “secret atheist” like Cicero (O).

31.
Pliny the Younger (61-c.113)

A retrospectively categorized Roman atheist, along with Seneca (Cudworth, 1678).

32.	Lucian (c.120-190AD)		In the renaissance, theists used the label "slave of Lucian" or "student of Lucian" as code for atheist.
33.	Marcus Aurelius (121-180)		An adherent of stoicism, an oft-classified “anti-theist” (Q) or "philosophical agnostic and practical atheist" (Hecht, 2004); representative quote: “Live a good life. If there are gods and they are just, then they will not care how devout you have been, but will welcome you based on the virtues you have lived by. If there are gods, but unjust, then you should not want to worship them. If there are no gods, then you will be gone, but will have lived a noble life that will live on in the memories of your loved ones.” — Marcus Aurelius (c.170AD), *Meditations, Book II* (Q)(Q)
34.	Aetius (c.300-367AD)		Surnamed the “atheist” by his trinitarian enemies (Q); listed by Jean Meslier (1729) in his *Testament* (pg. 343) as a famous atheist; generally cited (Q) atheist.
35.	Hypatia (350-415)	c.400	“All formal religions are delusive and must never be accepted by self-respecting persons as final.” — Hypatia (c.400) “Fables should be taught as fables, myths as myths, and miracles as poetic fancies. To teach superstitions as truth is a most terrible thing. The child mind accepts and believes them, and only through great pain and perhaps tragedy can he or she be in after years relieved of them. The reason for this is that a superstition is so intangible a thing that you cannot get at it to refute it.” — Hypatia (c.400) She was stripped, stoned, and burned for her anti-Christian, anti-religious, pro-science views.
36.	Tribonian (c.485-542)		Classified by Jean Meslier (1729) in *The Testament* (pg. 344) as an atheist.
37.	Ibn al-Rawandi (827-c.880)	c.870	
38.		c.900	Characterized as an "outspoken deist" and a "full-time freethinker" (Q); some of his

	 Zakariya Razi (854-925)		religion-debunking quotes are very-ripe (see: Middle ages geniuses).
39.	 Al-Marri (973-1057)	c.1030	Ranked (Q), by Luke Meuhlauser (2009), alongside: Epicurus, Jean Meslier, Robert Ingersoll, and Noam Chomsky, as a top classical nonbeliever; categorized (Q) as an Arab atheist.
40.	 Averroes (1126-1198)		Classified by Jean Meslier (1729) in *The Testament* (pg. 343) as an atheist.
41.	 Omar Khayyam (1048-1131)	c.1120	[HD:1]; Jabari (Q) 2016 top 20 smartest atheist; described by Christopher Hitchens (2007) as a skeptic, whose poetry was satirizing the claims and practices of religion. [5]
42.	 Frederick II (1194-1250)	1239	Frederick II not only published some treatise that denied the divinity of Jesus, Moses, and Muhammad, declaring each of them imposters, but conducted experiments to test the truths of various religious models, e.g. that Adam and Eve were the first two humans (language deprivation experiments) and soul detection experiments. “Frederick II, this pestilent king, a scorpion spitting out poison from the stinger of his tail, has notably and openly stated that—in his own words—the whole world has been fooled by three impostors, Jesus Christ, Moses, and Muhammad, two of whom died honorably, while Jesus himself died on the cross. Moreover, he has dared to affirm, or rather, he has fraudulently claimed, that all those who believe that a virgin could give birth to the god who created nature, and all the rest, were fools. And Fredrick has aggravated the heresy by this insane assertion, according to which no one can be born without having been conceived by the prior intercourse of a man and woman; he also claims that people ought to believe nothing that cannot be proven by the strength and reason of nature.” — Pope Gregory IX (1239), address to monarchs This resulted in the anonymous *Treatise on the Three Impostors* (aka *The Atheist’s Bible*), either written by Frederick II or Simon of Tournai (1130-1201) or Bernardino Ochino (1487-1564), which began to circulate (Q) in the centuries to follow; in 1770, the great

			Enlightenment satirist Voltaire, published a response to the hoax treatise entitled *Epistle to the Author of the Book of the Three Impostors* (Épître à l'Auteur du Livre des Trois Imposteurs) (Q), which contains one of his best-known quotations, "If god didn't exist, it would be necessary to invent Him."
43.	Pietro Pomponazzi (1462-1524)		Associated with the three impostors theory; categorized as having been charged with atheism and or a “secret atheist”, along with Machiavelli, Bodin, Arentino, Montaingne, Charron, and Gassendi. (Q)
44.	Niccolo Machiavelli (1469-1527)		
45.	Thomas Tailour (c.1461-1500)	1491	
4#.	Pope Leo X (1475-1521)	1514	Famously gave a Good Friday Vatican toast (1514), wherein he referred to the story of Jesus as a profitable fable: “How well we know what a profitable superstition this fable of Christ has been for us and our predecessors.” Also categorized as having been charged with atheism and or a “secret atheist”, along with Machiavelli, Bodin, Arentino, Pomponazzi, Montaingne, Chrarron, and Gassendi. (Q)
46.	Francois Rabelais (c.1489-1553)	1532	His *The Life of Gargantua and Pantagruel* tells the story of two giants who make fun of religion.
47.	Etienne Dolet (1509-1546)	1535	In 1535, was rumored to be a “materialist” and to deny the immortality of the soul (Q), and eventually was convicted of the “crime” of atheism, tortured, strangled, and then **burned**, with his books.
48.	Bonaventure des Periers (c.1500-1544)	1537	Published, in the protection of Marguerite of Navarre, *Cymbalum Mundi*, said to be (Q) one of the first humanist-like and or crypto-atheist books on “unbelief”; Lucien Febvre, supposedly, labels him as the first “real atheist” (Hecht, *Doubt: a History* [pg. 280] 2004); after being “charged with atheism”, supposedly, he committed suicide by running himself though his sword. (Q)
49.	Piero Strozzi (c.1510-1558)	1558	On his deathbed, after being wounded in battle, plainly renounced god, denied immortality, and asserted that the scriptures were fiction (Hecht, 2004, pg. 286).

50.	Helvetius (1715-1771)	1758	His *Essay on Mind*, which was burned a Paris, espoused atheistic, utilitarian, and egalitarian doctrines; was materialistic in its conception of the universe; and argued that a "nonreligious morality" is what really guided most people's virtues.
51.	Geoffroy Vallee (1535-1574)	1574	Burned at the stake for heresy and or atheism; he cited the unbelief evident in Ecclesiastes and Psalm 1. He claimed that believers were “like parrots” reciting the irrational views they had memorized before they left the cradle. He asserted that one should only believe that which could be learned by the senses and those ideas for which one could show rational proof.
52.	Alvise Capuano (c.1525-1580)	1577	
53.	Jean Bodin (1530-1596)	c.1580	A famous "secret atheist"; his *Colloquium of the Seven about Secrets of the Sublime* (c.1580), supposedly, became and “underground classic” of 17th century atheism.
54.	Michel Montaigne (1533-1592)	c.1580	“Man is certainly stark mad: he cannot make a worm, yet ye will make gods by the dozen.” — Michel Montaigne (c.1570) (Q) [HD:2] Many commentators assert that he was an atheist or skeptic who hid is true beliefs for his own protection or for the sake of social stability; evidence for the claim he was an atheists rests on his reply to the second objection against Raymond Sebond’s circa 1425 *Natural Theology: the Book of Creatures*. (Q)
55.	Girolamo Garzoni (c.1540-1590)	1586	During his inquisition trial, in Venice, states that he was an atheist, that he believes there is no god, and that the world was created by chance or “the world is made at random” (“ch'el mondo sia fatto a caso”) (Q) (Hecht, 2003; pg. 292).
56.	Pomponio Rustico (c.1550-1587)	1587	Was executed (Q) and or burned in Rome for his “libertine materialistic tendencies” (Q) and for stating thing such as “the stories on the Bible are worthy only of derision”. (Hecht, 2003; pg. 292).
57.	Giordano Bruno (1548-1600)	1600	A debatably-labeled (Q) (Q) “atheist” and or “courageous thinker who lay under the stigma of atheism” (Q), in opposition to Thomas Aquinas’ causality argument, added Lucretius’ atomic theory together with Copernican heliocentrism to argue for an infinite world’s hypothesis, and for these views, which he would not recant, was burned at the stake. Bruno's burning, in the history of atheism (Q), is said to mark a

			transition point for the re-emergence of atheism; though, to note, his works remained on the Index of Prohibited Books until 1965, and it was not until 2000 that he received a public apology from the Catholic Church. [2]
58.	Pierre Charron (1541-1603)	1601	His *Of Wisdom* (*De la sagesse*), a system of moral philosophy that develops ideas of Michel Montaigne, was characterized, for centuries, as a “seminary of atheism” (Hecht, 2004; pg. 307); he was listed in Marin Mersenne’s c.1640 “catalog of atheists”.
59.	Christopher Marlowe (1564-1593)		[HD:3] England’s most-famous “alleged atheist” of the time; in his The Jew of Malta, the Italian political thinker Niccolo Machiavelli (anglicized to “Machevil”) declares, “I count religion but a childish toy … ”; his Doctor Faustus, Marlowe’s most important play, was even more dangerous: Faustus declares, “I think hell’s a fable”, which some have attributed as his view. (Q)
60.	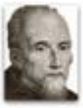 Paolo Sarpi (1552-1623)	1607	Characterized as the “first philosopher to develop systematic arguments for atheism”. (Q)
61.	William Shakespeare (1564-1616)		[HD:4]
62.	Lucilio Vanini (1585-1619)	1619	Italian philosopher, physician and free-thinker, who was one of the first significant representatives of intellectual libertinism; among the first modern thinkers who viewed the universe as an entity governed by natural laws (nomological determinism); was the first literate proponent of the thesis that humans evolved from apes; was executed for the "crime of atheism".
6#.	Thomas Hobbes (1588-1679)	1651	[HD:5] His *Leviathan: or the Matter, Form, and Power, of a Common Wealth Ecclesiastical and Civil*, an attempt to develop a political theory out of the mechanical view, sometimes associated with the term “atheist’s bible” (Q), is described by British atheism historian David Berman, as a “crypto-atheistic work”. [4]
64.	Ralph Cudworth	1678	His *True Intellectual System of the Universe: Wherein All the Reason and Philosophy of Atheism is Confuted, and Its Impossibility Demonstrated, with a Treatise Concerning Eternal and Immutable Morality* (1678) attempted to refute the atheism of Pierre Gassendi; his materialistic hylozoism model, however, later brought the charge of “atheism” to his

	(1617-1688)		name (Anthony Collins, 1713).
65.	Walter Charleton (1619-1707)	1652	The so-called "main conduit for the transmission of Epicurean ideas to England", and friend of Thomas Hobbes and reader of Pierre Gassendi, published his *The Darkness of Atheism Dispelled by the Light of Nature*, followed by *Physiologia Epicuro-Gassendo-Charletoniana: or a fabrick of science natural, upon the hypothesis of atoms* (1654), largely based Gassendi's *Animadversiones* (1649), *Epicurus's Morals* (1656), and *Natural History of the Passions* (1674).
66.	Anon Theophrastus (c.1609-1665)	c.1659	French materialistic atheism free thinking author of *Theophrastus Redivivus*, an aggressive history of atheism and religion disproof, Greek philosophy to present.
67.	Benedict Spinoza (1632-1677)	1656	[HD:6] Excommunicated from Judaism for asserting that there was no "immortal soul", among other things such as that the Torah was not the literal world of god, and the Jews were not the chosen people Debatably labeled a pantheist, atheist (or secret atheist), or polite pantheist, per his "god OR nature" (nature = god) style of argument; was a springboard for a number of atheists to follow: Goethe, Shelley, Einstein, among others.
68.	Mahomet Effendi (c.1625-1665)	c.1665	"Although there is no recompense to be looked for, yet truth is truth, and the love of it constrains me to die in its defense." — Mahomet Effendi (c.1665), Turkish atheist (Q)(Q) for his atheism; as reported (Q) by Pierre Bayle and Bernard Mandeville
69.	John Locke (1632-1704)		[HD:7] Note: possibly not an atheist, but rather an anti-atheist theist (Q).
69.	Kazimierz Lyszczynski (1634-1689)	1689	Known as the "first Polish atheist" (Q); executed for the crime of atheism.
70.	Daniel Scargill (1647-c.1690)	1668	
71.	Charles Blount (1654-1693)	1679	A "practical atheist" (Q) whose *Anima Mundi: an Historical Narration of the Opinions of the Ancients Concerning Man's Soul after this Life according to Unenlightened Nature* (1679), aimed at comparing Christianity with paganism, was deemed an "atheistical, heretical pamphlet" (Q)
72.	Pierre Bayle (1647-1706)	1682	In his *Various Thoughts on the Occasion of the Comet*, in commentary on the famous comet of 1680, argued that comets were a natural phenomenon, that comets did not presage disaster, and presented the "first-ever all-out defense of the morals of an atheist (see: atheistic morality)", as Jennifer Hecht (2003) summarizes things.

73. John Toland (1670-1722) — 1696 — The self-proclaimed atheist and first person called a "free thinker".

74. Thomas Aikenhead (c.1676-1697) — 1697

75. Nicolas Freret (1688-1749) — c.1725

7#. Jean Meslier (1664-1729) — 1729

|→ **Extreme atheist**

“Meslier’s *Testament* is the most singular phenomenon ever seen among all the meteors fatal to the Christian religion.”

— Voltaire (1766) [2]

Oft-said to mark the start of "**true atheism**"; overtly, a French Catholic priest (abbe) who was discovered, upon his death (dereaction), to have written an atheism advocating essay like book entitled *Testament*, that denied the existence of the soul, dismissed the notion of free will, denounced all belief in God, and all religion, with a “frenzied anger that makes Richard Dawkins’ *The God Delusion* (2006) seem like a work of reasoned scholarship”, as atheism historian Nick Spencer characterizes (Q) him.

76. Anthony Collins (1676-1729)

Although not a proclaimed atheist himself, he held certain views of opposition to church and theological teachings; Baron d’Holbach, e.g., quotes (Q) from Bolingbroke’s *Good Sense*.

77. Lord Bolingbroke (1678-1751)

“The church of the country is not only indifferent to the wrongs of the slave, it actually takes sides with the oppressors. For my part, I would say, ‘welcome infidelity!’, ‘Welcome atheists!’, ‘Welcome anything!’, in preference to the gospel, as preached by these divines. They convert the very name of religion into an engine of tyranny and barbarous cruelty, and serve to confirm more infidels, in this age, than all the infidel writings of Thomas Paine, Voltaire, and **Bolingbroke** (1678-1751) (Q) have together done.”

— Frederick Douglass (1852), cited by Jennifer Hecht (2003) in *Doubt: a History* (pg. 418)

78. Charles Montesquieu (1689-1755)

[HD:8]

79. David Hume (1711-1776) — 1740

[HD:10] Described by John Adams [HD:14] as an "atheist, deist, and libertine"; denounced by John Q. Adams as the "atheist Jacobite" (Q); known as the "great infidel"; oft-classified as an agnostic atheist; his first work *A Treatise on Human Nature* (1740), which includes considerations against an immortal soul, develops a system of morality independent of a deity, attempts to refute occasionalism, and argues against a necessary being, led to the charge of atheism. (Q)

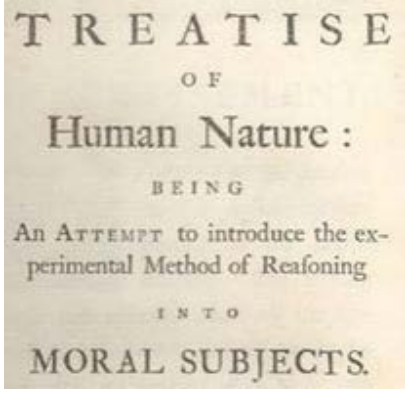
TREATISE
OF
Human Nature:
BEING
An ATTEMPT to introduce the experimental Method of Reasoning
INTO
MORAL SUBJECTS.

80. Julien la Mettrie (1709-1751) — 1745

|→ **Extreme atheist**

Was said to have held, according to Voltaire, as rumored by Maupertuis, to have held the post of the "royal atheist" (or "court atheist") of Frederick the Great (1712-1786); an "extreme materialist" (Q) philosopher Julien la Mettrie—a translator of Seneca's essay on happiness—in his *The Natural History of the Soul* (1745), argued for a mechanist materialistic position, according to which there was no need of the soul to animate matter, that life was a property of matter, not something breathed into; to quote: "What is the soul, but an empty word to which no idea corresponds?" Likewise, his 1747 *Man a Machine*, dubbed a "materialist manifesto" (Q), rooted in quasi-atheistic principles, caused a scandal because it denied Cartesian dualism, i.e. it denied that there was a distinction between humans, who alone had souls (in the pineal gland), and animals who, like machines, had none. He rejected immortality, arguing that humans, like all other beings in the entire universe, consist of nothing but matter. He attacked the monadism proposed by Gottfried Leibniz and his supporters as "incomprehensible" writing that: "They have *spiritualized* matter rather than 'materializing' the soul." He was known throughout Europe as an advocate of godlessness and vice, was eventually condemned, his books were **burned**, after which he fled to Prussia, where he was granted a safe haven by King Frederick II, where he was asked to be the King's personal physician. (Q)

81. Pierre Maupertuis (1698-1758) — 1745

Is described as "an atheist friend of La Mettrie" (Q); Voltaire, in his article "Atheism", in his *Philosophical Dictionary* (1764), makes Maupertuis an interlocutor in his fictional dialogue between god worshippers and modern atheists (Q); in his debate with Denis Diderot (see: Maupertuis-Diderot debate) is described as an "exchange or polemic of two authors trading accusations of atheism". (Q)

82. Jean-Francois de la Barre (1745-1766) — 1766

Was tortured, beheaded, and his body burned for alleged vandalism of a crucifix; a case that became celebrated because Voltaire tried unsuccessfully to have the sentence reversed (Q);

adjacent (right): is a circa monument to Barre at Sacré-Cœur de Montmartre (1906); adjacent (left): interrogation of the chevalier de La Barre as depicted on the monument to him in Abbeville (1907)

83.	Voltaire (1694-1778)	1768	[HD:9] Translated (watered down version of): Jean Meslier; known as the most “influential atheist of Europe in his day” (Q); technically: an "atheism-curious agnostic deist" (see: Voltaire on religion); one of the rocks to avoid in the Christian captain anecdote;
84.	Georg Lichtenberg (1742-1799)	c.1768	
8#.	Jacques-Andre Naigeon (1738-1810)	1769	The so-called “monk of atheism” (Q), a friend of Baron d’Holbach (Q), who in circa 1869 had begun to increasingly politicize d’Holbach and his views; and who assisted d’Holbach in the classic atheist works, such as Jean Meslier.
85.	Benjamin Franklin (1706-1790)		[HD:13] AskMen.com Top 10 Unknown Atheist (Q) (#10)
86.	Denis Diderot (1713-1784)		[HD:11] Read: Jean Meslier; sometimes incorrectly labeled as the "first true atheist"; some label him an "explicit atheist" [4]
87.	Baron d’Holbach (1723-1789) **|→ Extreme atheist**	1770	Read: Jean Meslier; explicit atheist; wrote volumes against religion, the most famous being *The System of Nature* (1770), itself known as the “Atheist’s Bible”; for thirty years (1750-1780), at his second mansion Le Château de Grand-Val, outside of Paris, he ran a bi-weekly intellectual salon, with the entice of excellent food, expensive wine, and a library of over 3000 volumes, he attracted many notable visitors, including: Diderot, Grimm, Condillac, Condorcet, D'Alembert, Marmontel, Turgot, La Condamine, Helvétius, Jean-Jacques Rousseau, Adam Smith, David Hume, and Benjamin Franklin. “All children are born **atheists**; they have no idea of god.” — Baron d’Holbach (1772), *Freethoughts Opposed to Supernatural Ideas* [5] He is widely known as the “Newton of the atheists” (Q) even cited so in history of atheism documentaries. (V|1:45); the famous: Hume-Holbach dinner party (1763) has been

			characterized as "atheist's greatest coming out party" (Hecht, 2003).
88.	John Adams (1735-1826)		[HD:14]
89.	Edward Gibbon (1737-1794)	1776	[HD:12] Has an enlarged reputation for harboring "irreligion" or atheism (O); his 1776-1788 six-volume *The History of the Decline and Fall of the Roman Empire*, noted for its open criticism of organized religion; quote: "Religion is regarded by the common people as true, by the wise as false, and by the rulers as useful" (O); and or a paraphrase of Seneca the Younger. (O)
90.	Ethan Allen (1737-1789)		[HD:16] (O)
91.	Matthew Turner (c.1720-1788)	1782	The supposed scholar (O), or possibly two authors combined, of *Answer to Dr. Priestley's Letters to a Philosophical Unbeliever* (O), in response to Joseph Priestley's book against atheism (*Institutes of Natural and Revealed Religion*, 1772), published by an anonymous "Mr. Hammon", by stating the following, becomes the first overt or avowed atheist in Britain: "As to the question whether there is such an existent being as an atheist, to put that out of all manner of doubt, I do declare upon my honor that I am one."
92.	Marquis Condorcet (1743-1794)		Charged with atheism.
93.	John Stewart (1749-1822)	1789	Author of the godless "moral motion" (or moral movement) theory.
94.	William Godwin (1756-1836)	1792	"I became in my 36th year an atheist." — William Godwin (c.1810), "Autobiography"; one the best example of an avowed in print Enlightenment atheist [12]
95.	Thomas Paine (1737-1809)	1794	[HD:15] Known as the "leading atheistic writer in the American colonies" (O); his *The Age of Reason* (1794) is the most-widely cited "atheist's bible", historically (O)(O); one of the rocks to avoid in the Christian captain anecdote; An Epicurean atheist with

focus on the aim to define living bodies within a sensuous order of matter 'naturally' seeking the maximization of pleasure and the minimization of pain. (O)

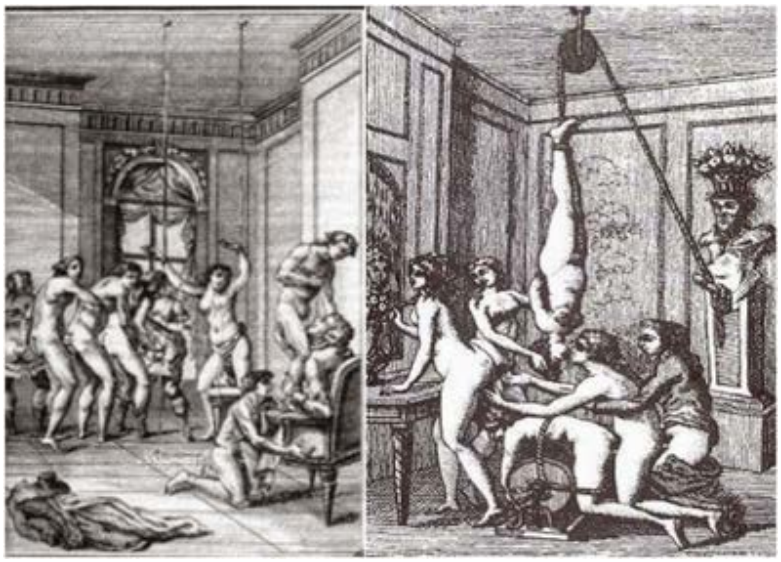

96.
Marquis de Sade
(1740-1814)

1795

"Religion — as noted by Marquis de Sade (1797), Novalis (1798), Marx (1843), and Dirac (1927) — is but an opiate or opium for the mind; and like all drugs, it can be replaced, upgraded, or in some cases treated, with a better or less symptomatic one."

— Libb Thims (2014), personal note, Sep 17

Described as the "most shocking of French atheists"; his *The Philosophy in the Bedroom* (1795) argued for speculative and also 'practical' atheism, supposedly in some type of "immoralism" terms. [12]

97.
Joseph Lagrange
(1736-1813)

Quote: "How comes it, then, that Laplace was an atheist? At the Institute neither he nor Monge, nor Berthollet, nor Lagrange believed in God. But they do not like to say so." (Napoleon to Gaspard Gourgaud, c.1814)

98.
Gaspard Monge
(1746-1818)

Quote: "How comes it, then, that Laplace was an atheist? At the Institute neither he nor Monge, nor Berthollet, nor Lagrange believed in God. But they do not like to say so." (Napoleon to Gaspard Gourgaud, c.1814)

99.
Claude Berthollet
(1748-1822)

Quote: "Bah! Laplace was an atheist, and Berthollet too. At the Institute they all were atheists, and yet Newton and Leibnitz were believers. Atheists compare man to a clock; but the clock-maker is a being of superior intelligence. They grant that creation is the result of matter, as warmth is the effect of fire." (Napoleon to Gaspard Gourgaud, c.1814)

100.
Elihu Palmer
(1764-1806)

1801

[HD:17] In 1800, during his presidential campaign, he was said to be unfit to hold office

10#.	Thomas Jefferson (1743-1826)	1802	because he did not have orthodox religious beliefs and called a “howling atheist”; in 1802, he added the separation of church and state clause to the Constitution; in the years to follow he became reticent, vacillated in belief system labels over time; in private letters, variously refers to himself as "Christian" (1803), "a sect by myself" (1819), an "Epicurean" (1819), a "materialist" (1820), and a "Unitarian by myself" (1825). (Q)

(add)

Next | Previous

- Famous atheists: 101-200 | 1840 to 2009
- Famous atheists: 201-300 | 2010 to present

Quotes

The following are related quotes:

> “In the list given by Drachmann [1922], others designated *atheoi* in the period up to the 3rd century BC are Diogenes of Apollonia, Hippo of Rhegium, Diagoras of Melos, Prodicus of Keos, the aristocrat Critias of Athens, Theodorus of Cyrene, Bion of Borysthenes, and Euhemerus of Messina.”
>
> — Michael Palmer (2013), *Atheism for Beginners* [3]

> “Michel Foucault, Ludwig **Feuerbach**, Friedrich **Nietzsche**, George Santayana, Denis Diderot, John Mill, Richard **Dawkins**, Noam Chomsky, Bertrand Russell, Bertolt Brecht, Ayn Rand, **Democritus**, David Hume, Albert Camus, Sigmund Freud.”
>
> — Cary Solomon (2014), *God’s Not Dead* (film); the “what do these individuals have in common?” scene [1]

See also

- Atheism timeline
- Famous publications
- Famous publications by age

References

1. (a) God’s Not Dead (film) – Wikipedia.
(b) Broocks, Rice. (2012). *God's Not Dead: Evidence for God in an Age of Uncertainty*. Thomas Nelson.
2. Palmer, Michael. (2013). *Atheism for Beginners: a Coursebook for Schools and Colleges* (Protagoras, pg. 15; Epicurus, pg. 16; Bruno, pg. 22 Bradlaugh, pgs. 202-03). Lutterworth Press.
3. (a) Palmer, Michael. (2013). *Atheism for Beginners: a Coursebook for Schools and Colleges* (pg. 15). Lutterworth Press.
(b) Drachmann, A.B. (1922). *Atheism in Pagan Antiquity* (pg. 13). Gyldendal.
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11. (a) Onfray, Michael. (2005). *Atheist Manifesto: the Case Against Christianity, Judaism, and Islam* (*Traite d'Atheologie*) (translator: Jeremy Leggatt) (pg. 34). Arcade Publishing, 2007.
(b) Atheist Manifesto – Wikipedia.
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14. (a) Burkert, Walter. (1985). *Greek Religion* (pg. 314). Harvard University Press.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 8). HarperOne.

External links

- The 50 Most Brilliant Atheists of All Time – Brainz.org.
- Category:Atheists (127+) – RationalWiki.org.
- List of atheist authors – Wikipedia.
- A to Z of Famous Atheists – MachinesLikeUs.com.

θΔics

In existographies, **famous atheists** refers to historical thinkers, past or present, who have gained a certain notoriety, fame or infamy, depending, for either being labeled an atheist, declared non-believer in the existence of god, and or contribute explicitly to atheism, anti-theism, and dissolution of religio-mythology based ideologies; below is chronological listing of famous atheists, past and present.

Atheists | 101-200

See also: Top 100 atheists (ranked)

The following are noted atheists "101 to 200" — assumed, attributed, categorical, labeled, famous, extreme, and or legendary — chronological ordered, by either birth (reaction start) or event significance (previous: 1-100, next: 201-300):

Atheists 101 to 200			
#	**Person**	**Date**	**Significance**
101	Jeremy Bentham (1748-1832)		Listed (Ñº) as "atheist philosopher". "Meslier, d'Holbach, Diderot, Hume, and Bentham can, with fair certainly, be called atheists." — Sunand Joshi (2014), *The Original Atheists*
102	Pierre Laplace (1749-1827)	1802	"I had no need of that [god] hypothesis." — Pierre Laplace (1802), response to Napoleon why the divine was not found in his new celestial mechanics book (see: Napoleon Laplace anecdote)
103	Johann Goethe (1749-1832)		"Crebillon … treats the passions like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. There is no trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover." — Johann Goethe (1799), comment to Friedrich Schiller on the lack of realism in the works of Prosper Crebillon, Oct 23

			“The **moral symbols** of nature are the elective affinities discovered and employed by the great Bergman.” — Johann Goethe (1809), comment to Friedrich Riemer, Jul 24 [HD:19] His *Elective Affinities*, showed that physical chemistry invalidates the logic of the sixth commandment; the "trainer of assassins of god", namely: Arthur Schopenhauer, Friedrich Nietzsche, and Libb Thims; among which, Nietzsche, who went beyond good (right) and evil (wrong) declaring "God is dead!" (1882) and venturing into thermodynamics (1888) in his last penned notes, before going insane, according to Albert Camus (1942), is “the most famous of God's assassins.” See: Goethe on religion; Goethe on the soul.
104.	Honore Mirabeau (1749-1791)		
105.	James Madison (1751-1836)		[HD:18]
106.	Johann Fichte (1762-1814)		Semi-labeled as the “first true atheist”. (Ñº)
107.	Napoleon Bonaparte (1769-1821)	1802	[HD:20] Noted for Napoleon Laplace anecdote (1802), wherein Laplace declared he no longer had need for the “hypothesis of god” in celestial mechanics; noted for his famous French scientific elite atheism queries (see: Napoleon on the soul) .
108.	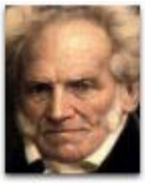 Arthur Schopenhauer (1788-1860)	1806	[HD:21] Trained by Goethe, at age 18, to become the first "god assassin"; himself later training Friedrich Nietzsche in the art of god assassination. “Schopenhauer was the first admitted and inexorable atheist among us Germans.” — Friedrich Nietzsche (1882), *The Gay Science* (Ñº) “Schopenhauer prided himself on being the **first true atheist** in German philosophy, and scorned his contemporaries’ attempts to substitute a world spirit for a bankrupt deity. Yet he never abandoned a notion of cosmic justice.” — Susan Neiman (2004), *Evil in Modern Thought: an Alternative History of Philosophy* (Ñº)
109.	Percy Shelley (1792-1822)	1811	“If ignorance of nature gave birth to gods, knowledge of nature is made for their destruction.” — Percy Shelley (1811), *The Necessity of Atheism* (inspired by Spinoza) “Every time we say that god is the author of some phenomenon, that signifies that we are ignorant of how such a phenomenon was able to operate by the aid of forces or causes that we know in nature.”

			— Percy Shelley (1811), *The Necessity of Atheism* (inspired by Spinoza)
110.	Stendhal (1783-1842)	c.1820	Described as the "most famous of all British atheists"; his: *The Necessity of Atheism*, got him expelled from Oxford. "Gods only excuse is that he does not exist." — Stendhal (c.1820), cited by Nietzsche, in *Ecce Homo*, as "best atheist joke", saying he was jealous of for not having said it first
111.	Robert Taylor (1784-1844)	c.1827	
112.	Virginia Woolf (1882-1941)		"The names of individuals who surrendered their belief in a universe governed by a supernatural being include: Percy Shelley, Charles Darwin, Karl Marx, Sigmund Freud, **Virginia Woolf**, Albert Camus, Simone Beauvoir, Salmon Rushdie, and Marquis Sade. Others who choose to live without religion—Ernestine Rose and Charles Bradlaugh are examples—should be better known, given their historical import and former notoriety." — Mitchell Stephens (2014), *Imagine There's No Heaven*
11#.	Anne Newport Royall (1769-1854)	1828	She knew Thomas Jefferson and George Washington; admired Voltaire and Thomas Paine (Ñº); she was characterized cross between Voltaire, Carry Nation, Joan of Arc, and Henry Mencken; noted for the irreligion book *Black Book* (1828) (Ñº), e.g. "all priests are dangerous when clothed with power" (Hecht, 2003).
113.	Robert Owen (1771-1858)	1829	Characterized a "practical atheist" (Wright, 1850).
114.	Richard Carlile (1790-1843)	1829	
115.	Heinrich Heine (1797-1856)	c.1830	
11#.	Ralph Emerson (1803-1882)	1836	In 1836, he proclaimed "make your own Bible" (Ñº); in 1841, in his *Essays*, his second book, is found his essay "Self-Reliance", described by his aunt as "strange medley of atheism and false independence" (Ñº); listed in CelebAtheists.com (Ñº); one of the promulgators of the godless Goethean calendar.
116.	Bruno Bauer (1809-1882)	1837	A "fiery atheist" (Hecht, 2003) who argued that Jesus was a myth (see: Christ myth theory) per silent historians problem reasons; founded the Doctor's Club (aka the Free Society) (1837) a group of intellectuals who wrote (Ñº) the most anti-Christian pamphlets in Germany at the time; met and influenced a young Karl Marx.
117.	Auguste Comte	c.1840	Was "avowedly atheistic" (Ñº); stated: "while the Protestants and deists have always attacked religion in the name of god, we must discard god, once and for all, in the name of religion" (Ñº); ran one of the first "atheist churches", namely a

(1798-1857)

movement of unbelieving congregations, which lasted for one generation .

“There is no god, and Harriet Martineau is her prophet.”

— Douglass Jerrold (c.1852), see: Paul Dirac and *The Strangest Man* (pg. 456)

118. Harriet Martineau (1802-1876) c.1840

Publicly declared her atheism with the publication of her *The Atkinson Letters* (Ñº); thereafter embracing atheism, as a philosophy. (Ñº)

119. Ludwig Feuerbach (1804-1872) 1840

|→ **Extreme atheist**

Known for this *Essence of Christianity*; known as a "legendary atheist" (Ñº) (Ñº), whose “extreme atheism” (Ñº) was sometimes tempered with “divine humanism”, whose work is a forerunner to Marx-based Soviet atheism, who was said to have become more of an extreme atheist in later years.

“Someday the scientific revolution, chemistry in particular, will dissolve Christianity in vat of nitric acid.”

— Ludwig Feuerbach (1850), *The Natural Sciences and the Revolution*

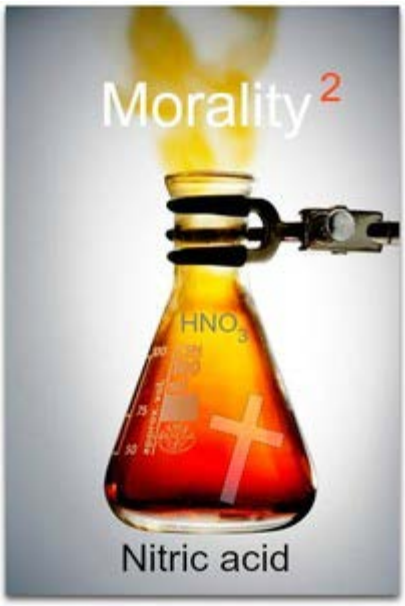

“Whenever morality is based on theology, whenever the right is made dependent on divine authority, the most immoral, unjust, infamous things can be justified and established. Morality is then surrendered to the groundless arbitrariness of religion.”
— Ludwig Feuerbach (c.1860) (Ñº)

120. Karl Marx (1818-1883) 1841

After meeting “fiery atheist” Bruno Bauer (1837), in 1841, the pair began to edit a journal called *Atheist Archives*, that didn’t pan out; they then wrote an atheist pamphlet, that got Bauer fired and made it impossible for Marx to find employment in academia; later became the eponym of “Marxian atheism”, a derivative of Epicurean atheism, Ludwig Feuerbach, and new scientific ideas, the result of which was dialectical materialism.

121. Charles Southwell (1814-1860) 1841

Together with George Holyoake, they dissented from the official policy of Owenism, that lecturers should take a religious oath, to enable them to take collections on Sunday; founded the atheist publication *Oracle of Reason*, because of which he was soon imprisoned because of its content; Holyoake took over as editor, and was moved to an atheist position as a result of his experiences.

122. Karl 1846

His *Six Letters to a Pious Man*, presented a series of letters, in the form of a pamphlet, which contain the confession of the belief of

Heinzen
(1809-1880)

an ‘atheist’ in concise form; involved in an atheism dispute in Zurich of some sort.

Zurich **Atheism Dispute** of 1846

123.	Friedrich Engels (1820-1895)	1848	Came to his own atheism via Ludwig Feuerbach, Bruno Bauer, the “Young Hegelians”, and the works of Robert Owen (Hecht, 2003); he co-authored, with Karl Marx, the *Communist Manifesto* (1848), and later supported Marx financially to write *On Capital*.
123.	Elizabeth Stanton (1815-1902)	1848	[HD:28] In 1848, she began to engage in the conflicts between the Bible and women’s rights (Ñº); in 1895, she penned *The Women’s Bible*; therein becoming one of the pioneers of “atheist feminism”. (Ñº)
124.	Jacob Moleschott (1822-1893)	1850	“Force is no impelling god, no entity separate from the material substratum; it is inseparable from matter, is one of its eternal indwelling properties. A force unconnected with matter, hovering loose over matter, is an utterly empty conception. In nitrogen, carbon, hydrogen, oxygen, in sulphur and phosphorus, their several properties have dwelt from all eternity.” [3]
125.	Charles Bradlaugh (1833-1891)	1850	As a youth, was kicked out of his family for questioning things in Sunday school, such as discrepancies between the 39 articles of the Anglican Church and the Bible; at 17, gave his first public lecture on atheism and published *A Few Words on the Christian Creed* (1850), *Who Was Jesus Christ, and What Did He Teach* (1860), *A Plea for Atheism* (1864), and in 1880 after being elected to a seat in Parliament, was kicked out for refusing to take the Oath of Allegiance, which invoked God: [2] > “I, (*Insert full name*), do swear that I will be faithful and bear true allegiance to Her Majesty Queen Victoria, her heirs and successors, according to law. So help me God.” Legal battle ensued over the next five years, culminating in the Oaths Act of 1888. (Ñº)
	George		A disbeliever who in 1851 coined the term “secularism” because he regarded

126.	Holyoake (1871-1906)	1851	“atheism” as a negative word (Ñº)(Ñº); his *The Principles of Secularism Illustrated* (1871) discusses Thomas Jefferson’s god questionings. (Ñº)
127.	E.B. (c.1810-c.1880)	1851	Defended George Holyoake from the attacks by John Mackintosh, in his pamphlet *The Logic of Atheism: With Especial Reference to Mr. Holyoake's Pretended Refutation of Paley*, during which he coined the term "human chemistry."
128.	Thomas Huxley (1825-1895)	1854	A freethinking “agnostic” (term he coined); in 1854, began attacking the Bible, because Moses was getting in the way of science; portrayed theology and science as “mortal enemies” (1859); etc., etc. (Ñº)
129.	George Eliot (1819-1880)	1854	[HD:30] In 1854, in the house of Adolf Stahr (1805-1876) she defended Goethe’s “everything holy overturning” (Heinrich Heine, 1810) physicochemical morality based *Elective Affinities*, the “sixth commandment” overthrowing end chapter (P2:C18) dénouement, which Stahr faulted; her nonbeliever efforts comprise chapter 10 of Christopher Hitchens’ *The Portable Atheist: Essential Readings for the Nonbeliever* (2007).
130.	Ludwig Buchner (1824-1899) |→ **Extreme atheist**	1855	Modern Christian apologists consider Büchner the father of atheistic evangelism, or antitheism, in Germany, a counterpart to Thomas Huxley, who some consider to be the first atheistic evangelist—though Huxley himself denied, supposedly, that he was an atheist, preferring the term agnostic, which he coined in 1868—the ‘atheistic evangelism’ standard, as some have categorized, since then has been carried by Bertrand Russell, Henry Mencken, Richard Dawkins, and Sam Harris.
131.	Karl Vogt (1817-1895)	c.1860	Was an "atheist preacher" of sorts for Darwinism, materialism based.
132.	Ernst Haeckel (1834-1919)	1868	An "unabashed atheist" (James Birx, 1992); after reading Darwin in 1860 he ventured into a bold consideration of the philosophical implications and theological consequences of taking organic evolution seriously, and through about eight main published works, e.g. *The Natural History of Creation* (1868), to *The Riddle of the Universe* (1999), to *Eternity* (1916), engaged in a "scathing attack on religious dogma", referring to Judaeo-Christian traditions as "those dogmatic doctrines of anthropism", and produced philosophical work beyond "crude materialism" and "crude mechanism". [6] “All that is good and commendable now existing would continue to exist if all marriage laws were repealed tomorrow.” — Victoria Woodhull (c.1872) (Ñº)

133.	Victoria Woodhull (1838-1927)	1871	In 1871, at age 33, after arising from sexually-abuse and financially exploited by her father, as a child, and, at age 15, forced via escape method into an 11-year "nightmare" marriage, prior to obtaining of very-difficult to obtain "divorce", penned the Introduction to the first English translation—done by "anonymously" by James Froude (whose *Nemesis of Faith* was publicly burned in 1849, during reverend William Sewells' moral philosophy class at Oxford)—of Goethe's "everything holy overturning" (Heinrich Heine, 1810), sixth commandment usurping, physicochemical morality based *Elective Affinities*, during which he outlined the Goethe revolution; in 1871, she became the first female presidential candidate; in 1872, she was derisively characterized by Thomas Nast as "Mrs Satan" (Ñº) for her "divorce rights" advocation; in 1885, William Patton (1821-1889), a minister turned (1877) Howard University president, in his "Women and Skepticism" sermon, named Woodhull as "representative of the movement in America that gave evidence of atheism and immorality." (Ñº)
134.	John Blackie (1809-1895)	1871	Authored: *Four Phases of Morals: Socrates, Aristotle, Christianity, Utilitarianism* (1871) and *The Natural History of Atheism* (1877).
135	William Reade (1838-1875)	1872	His *The Martyrdom of Man: From Nebula to Nation* (1872), in the 19th century, was conceptualized as an "atheist's bible". (Ñº)
136.	John Mill (1806-1873)	1873	[HD:24]; declared his atheism, and that of his father, in a famous essay published posthumously. [6]
137.	DeRobigne Bennett (1818-1882)	1873	
138.	John Tyndall (1820-1893)	1874	In the famous four-year Tyndall-Stewart-Tait debate, Tyndall stood on the side of science and god-free education, whereas John Stewart and Peter Tait stood on the side of a god and possible afterlife; in the wake of the debate, both Tyndall and Thomas Huxley were charged with "material atheism".
13#.	Robert	1880	[HD:34] Nicknamed the "great agnostic"; image shown is the frontispiece from his 1879 *The Gods and Other Lectures* (Ñº); by 1888, known as a "great American atheist" (Ñº); his *Some Mistakes of Moses* (1880), is one of the books cited in the

Ingersoll
(1833-1899)

Redford deconversion model; is one of the most-prolific atheism quotesmiths; one of the rocks to avoid in the Christian captain anecdote;

138.

Friedrich Nietzsche
(1844-1900)

1882

[HD:40] Quote: "God is dead. God remains dead. And we have killed him. Yet his shadow still looms. How shall we comfort ourselves, the murderers of all murderers? What was holiest and mightiest of all that the world has yet owned has bled to death under our knives: who will wipe this blood off us? What water is there for us to clean ourselves? What festivals of atonement, what sacred games shall we have to invent? Is not the greatness of this deed too great for us? Must we ourselves not become gods simply to appear worthy of it?"

Left: the 23 Dec 2010 pro-Christian "God is" billboard (Ñº), on the New Jersey side of the Lincoln Tunnel , which replaced the American Atheists 26 Nov 2010 "Christmas is a myth" billboard (Ñº) , graffiti bombed with the word "Dead" (Ñº), in reference to Nietzsche's famous proclamation.

139.

Annie Besant
(1847-1933)

1883

13#.

Johannes Wislicenus
(1935-1902)

1885

"That must disappear!"

— Johannes Wislicenus (1885), order to his guide, during his orientation tour of the University of Leipzig, as the new chemistry professor successor to Hermann Kolbe, in reference to Kolbe's Biblical quotation "God has arranged all things by measure and number and weight" (Wisdom of Solomon 11:20) in large letters, such as depicted adjacent, above the periodic table chart of the chemical elements at the front of his lecture theater (Ñº)

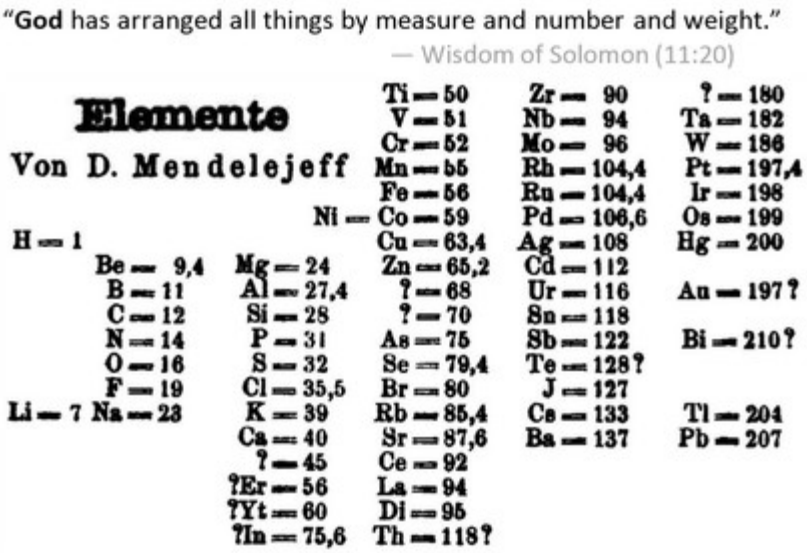

140. John Burroughs (1837-1921) 1885

14#. Watson Heston (1846-1905) 1890

After making illustrations in the free thinker journal *Truth Seeker* (Ñº), he went on to published *The Old Testament Comically Illustrated* (1890), *The New Testament Comically Illustrated* (1898), and *The Bible Comically Illustrated* (1900), the latter of which being 800 pages in length containing 400 pictures. (Ñº)

141. Sigmund Freud (1856-1939) 1895

[HD:51] [L50:15] (Ñº) In his "A Project for Scientific Psychology", he sought to base all of mental phenomena on the logic of free energy (Gibbs energy) and bound energy (entropy), an atheism-implicit (implicit atheism) program; eponym of **Freudian atheism**, a synthesis of Feuerbach, **Epicurean atheism** (Epicureanism), and German atheism; noted Moses religio-mythology debunker (*Moses and Monotheism*, 1939).

142. Jack London (1876-1916) 1895

"Everything we sensually experience can be reduced to energy relationships between our sense organs and the world around us."

> — Wilhelm Ostwald (1809), autobiographical reflection of his spring "pentecostal inspiration"; as recounted in his *Lifelines: an Autobiography*, 1926

"Research workers were, at one time, obliged to endeavor to ensure that their theories did not contradict those of the church; nowadays, in contrast the church is at pains to prove that its teachings are compatible with those of science. In other words, the church acknowledges science as the higher authority."

> — Wilhelm Ostwald (1909). "On Catalysis", Nobel Lectures

"I am made from the C-H-N-O-S-P combination from which a Bunsen, Helmholtz, Kirchhoff came."

> — Wilhelm Ostwald (1926), *Lifelines: an Autobiography*

14#. Wilhelm Ostwald (1853-1932) 1901

"Ostwald, who was the most 'radical atheist' among these scholars [Marx, Buchner, Fourier, Weber, Riehl], used the instrument of the 'Monistic Sunday Sermons' to spread his ideas on rationality."

> — Gird Spittler (2010), "Beginnings of Anthropology" [10]

In 1901, gave a seven part lecture series on "natural philosophy", wherein he sought to upgrade, in his own words, the classical atheistic "matter-and-motion theory (or scientific materialism)" with the new replacement theory named of

			energetics; in 1905, he was relieved of his lecture duties owing to “religious questions” issues, as biographer Eduard Farber puts it, at the time of the official obsequies for freethinker Johannes Wislicenus (1935-1902); after retiring in 1906, with Ernst Haeckel, he founded the “Monisten Bund” or German Monist League (Ñº), in Jena, a free-thinking organization; in 1910, Haeckel elected Ostwald as the president of the Monist League, after which he began giving his famous “Monistic Sunday Sermons”, at the center of which was his energy or energetics based universal belief, which usurped god and religion; in 1912, his *The Energetic Imperative*, outlined a thermodynamic imperative to Kant’s “categorical imperative”.
143.	Ambrose Bierce (1842-1914)	1906	[HD:43] Author of the hilarious *The Devils Dictionary*.
14#.	Mangasar Mangasarian (1859-1943)	1909	
144.	Thomas Edison (1847-1931)	1910	[HD:41] His 1910 *New York Times* interview (see: the Edison on the soul) on whereabouts of William James [HD:38], following is passing, is a fairly cogent and frank religion-ripping piece of work.
145.	George Shaw (1856-1950)	1912	[HD:45]; Jabari (Ñº) 2016 top 20 smartest atheist
146.	Emma Goldman (1869-1940)	1916	“I am not interested in the theological Christ. Brilliant minds like Bauer, Strauss, Renan, Thomas Paine, and others, refuted that myth long ago. The theological Christ, however, is less dangerous than the ethical and social one. But the ethical and poetical Christ myth has so thoroughly saturated our lives that even some of the most advanced minds find it difficult to emancipate themselves from its yoke.” — Emma Goldman (1916), “The Philosophy of Atheism”; cited by Jennifer Hecht (2003) in *Doubt: a History* (pg. 440)
147.	Howard Lovecraft (1890-1937)		
148.	Chapman Cohen (1868-1954)	c.1920	“Gods are fragile things; they can be killed by a whiff of science or a dose of common sense.” — Chapman Cohen (c.1920), *The Devil* (Ñº); in FSM atheism app
149.	Hubert	c.1920	Known as the "black atheist" or "black Socrates".

	Harrison (1883-1927)		
150.	Charles Steinmetz (1865-1923)	1922	
15#.	Fritz Mauthner (1849-1923)	c.1923	Penned a four-volume history of atheism in the early 1920s. (Ñº)
151..	Clarence Darrow (1857-1938)	1925	[HD:46] Son of an atheist father who famously defended high school biology teacher John Scopes, in the Scopes Monkey Trail, accused of teaching evolution to high school students.
152.	Henry Mencken (1880-1956)	1925	[HD:53] The witty reporter, on the atheist's side, of the "Scopes Monkey trial"; a self-classified agnostic, technically.
153.	Luther Burbank (1849-1926)	1926	
15#.	George Santayana (1863-1952)		[HD:49] “My atheism, like that of Spinoza, is true piety towards the universe and denies only gods fashioned by men in their own image, to be servants of their human interests.” — George Santayana (1922), “On My Friendly Critics”, *Soliloquies in England* (Ñº) (Ñº) “Faith in the supernatural is a desperate wager made by man at the lowest ebb of his fortunes.” (Ñº)
154.	Bertrand Russell (1872-1970)	1927	[HD:51] Oft-ranked as the greatest atheist of the 20th century, for his *Why I Am Not a Christian* (1927)—itself sometimes referred to as an “atheist’s bible”—among later television appearances; quote: “I see no reason, [owing to the universal nature of] the second law of thermodynamics, to believe in any sort of god, however vague and however attenuated.”
155.	Margaret Sanger (1879-1966)		[HD:54] Leading birth control activist; founder of Planned Parenthood; declared “no god; no masters”; braved the opposition of the Roman Catholic church. (Ñº)
	Bhagat Singh		While in prison, in 1930, he penned the resonating essay “Why I Am an Atheist”

156.	(1907-1931)	1930	(Ñº), response to a deeply religious inmate who thought he became an atheist because of his vanity. (Ñº)
157.	Abdullah al-Qasemi (1907-1996)	c.1930	A so-labeled “godfather of Arab atheism” (Ñº); his *The Lie In Order to See God* (ÙŠÙƒØ°Ø¨Ù^Ù† Ùƒ ÙŠ ÙŠØ±Ù^Ø§ Ø§Ù„Ù‡Ù‡ Ø¬Ù…ÙŠÙ„Ø§) (c.1930), supposedly, is a good ex-Muslim book (Ñº); another is *The Universe Judges the God* (c.1940) (Ñº)
158.	John Jackson (1907-1993)		(RMS:91)
159.	Max Otto (1876-1968)	1932	Author of author of *Is There a God?* (1932); associate of John Dewey.
160.	David Brooks (1902-1994)	1933	
161.	Albert Einstein (1879-1955)		[HD:52] A self-defined atheism-leaning agnostic of the Spinozan atheism variety, who repeatedly denied the existence of a "personal god", but not explicitly god, per se. See: Einstein on religion; Einstein on the soul; Einstein on free will
162.	Bertolt Brecht (1898-1956)		“Nowadays, anyone who wishes to combat lies and ignorance and to write the truth must overcome at least five difficulties. He must have the courage to write the truth when truth is everywhere opposed; the keenness to recognize it, although it is everywhere concealed; the skill to manipulate it as a weapon; the judgment to select those in whose hands it will be effective; and the cunning to spread the truth among such persons.” — Bertolt Brecht (1935) “Writing the Truth: Five Difficulties” (Ñº) Quote: “Brecht was an atheist who believed not in the truth, but in probability. In contrast to the agnostic, he did not doubt for the sake of doubting; he weighed alternative courses of action for the sake of choosing one, and he chose Communism not because it struck him as infallible, but because he saw it as the most likely instrument of anti-Fascism and social justice” (Ñº); listed in PositiveAtheism.org (Ñº); quoted in AtheistNexus.org (Ñº)
163.		1927	“Any further assumption implied by belief in a god which one may have in one’s faith is inadmissible from the point of view of modern science, and should not be needed in a well-organized society.” — Paul Dirac (1933), hand-written note to self

	Paul Dirac (1902-1984)		In 1927, during the fifth Solvay Conference, famously, during smoky hotel lounge conversation, began to rip on Einstein, and his “god talk”, to Werner Heisenberg and Wolfgang Pauli.
164.	Walter Lippmann (1889-1974)	1929	
16#.	Ernest Hemingway (1899-1961)	1929	“All thinking men are atheists.” — Ernest Hemingway (1929), *A Farewell to Arms*
166.	Richard Feynman (1918-1988)	1930	
165.	John Dewey (1859-1952)	1935	“I feel the gods are pretty dead, though I suppose I ought to know that || however, to be somewhat more philosophical in the matter, if atheism means simply not being a theist, then of course I'm an atheist. But the popular if not the etymological significance of the word is much wider. It has come to signify it seems to me a denial of all ideal values as having the right to control material ones. An in that sense I’m not an atheist and don’t want to be labelled as one.” — John Dewey (1935), letter to atheist friend Max Otto
166.	Albert Camus (1913-1960)	1942	Oft-cited as someone "born Christian; died atheist"; noted for Camus model; quote (1942): “Nietzsche was the most famous of God’s assassins.”
167.	Jean-Paul Sartre (1905-1980)	1943	French atheist existentialist philosopher, predominately noted for his 1943 *Being and Nothingness*, who promoted an anti-deterministic variety, i.e. science not based on causality, of individual “freedom as the foundation of all values” type of existentialism, according to the logic of “existence precedes essence”, meaning that man first materializes into the world, encounters himself, and only afterwards defines himself.
168.	Richard Feynman (1918-1988)	1946	In 1946, at his father’s funeral, know that his father was atheist, and that he was, refused to take part in a mourner’s prayer in praise of God. In his 1963 Danz lecture turned book *The Meaning of It All*, was self-classifying himself as an atheist, in a beat around the bush manner (see: Feynman on religion).
169.	Antony Flew (1923-2010)	1949	Concluded, at age 15, that there was no god (Ñº); in the 1949, engaged with C.S. Lewis, in his Socratic Club, in debates about god; thereafter spent the next 70 years engaging in atheist philosophy; in 1998, debated William Craig; described by Ravi Zacharias (2013) as, in the 1980s, the “best known atheist in the western world” (Ñº); in his last years, famously recanted (Ñº) his atheism and came out as a believer, per reasons he calls "integrated complexity", i.e. new discoveries in biology and chemistry, as he put it.

170.	Rand (1905-1982) |→ **Extreme atheist**	1957	
171.	Harlow Shapley (1885-1972)	1958	
17#.	Martin Heidegger (1889-1976)		"Philosophy will not be able to bring about a direct change of the present state of the world. This is true not only of philosophy but of all merely human meditations and endeavors. Only a god can still save us. I think the only possibility of salvation left to us is to prepare readiness, through thinking and poetry, for the appearance of the god or for the absence of the god during the decline; so that we do not, simply put, die meaningless deaths, but that when we decline, we decline in the face of the absent god." — Martin Heidegger (1966), interview with *Spiegel* (Ñº) See also: "The Basis of Heidegger's Atheism" (Ñº)
172.	Barack Obama, Sr. (1936-)	1961	"My father was almost entirely absent from my childhood, having been divorced from my mother when I was 2 years old; in any event, although my father had been raised a Muslim, by the time he met my mother [1960] he was a confirmed atheist, thinking religion to be so much superstition." — Barack Obama (2006), "My Spiritual Journey" (Ñº), *Time*, Oct 16 Born Muslim, turned Christian (age 6), turned atheist (age 24); AskMen.com Top 10 Unknown Atheist (Ñº) (#4)
173.	Joseph Lewis (1889-1968)	1960	Characterized as an "American freethinker and atheist activist" (Ñº); gave a 1960 address, delivered over Radio Station WIME, Miami, Florida, on "The Philosophy of Atheism" (Ñº); noted for his 1954 *An Atheist Manifesto* (Ñº), the first (Ñº) of a series of books titled as such, namely: Herman Philipse (1995), Michel Onfray (2005), and Sam Harris (2005).
174.	Madalyn O'Hair (1919-1995)	1963	Her Murray vs Curlett (1963) landmark Supreme Court ruling ended official Bible-reading in American public schools; that year she founded American Atheists; she published: *Why I'm an Atheist; Including a History of Materialism* (1980). Right: O'Hair (1983) in

			front of the Robert Ingersoll statue in Glen Oak Park, Peoria, Illinois.
175.	Richard Robinson (1902-1996)	1964	
17#.	Francis Crick (1916-2004)	1966	
176.	Reginald Hollingdale (1930-2001),	1971	"I admit that the generation which produced Stalin, Auschwitz and Hiroshima will take some beating, but the radical and universal consciousness of the death of god is still ahead of us. Perhaps we shall have to colonize the stars before it is finally borne in upon us that god is not out there." — Reginald Hollingdale (c.1980) Characterized as: "Grimly atheist, he appreciated Nietzsche's attempt to establish a philosophy that was simultaneously nihilist and life-affirming"; a self-educated scholar; paid to have German tutoring so that he could rehabilitate the work of Friedrich Nietzsche, in terms of English translation promotion; whom he had been led to via Richard Wagner and Arthur Schopenhauer.
177.	George Smith (1949-)	1974	In 1972, at age 23, building on Ayn Rand and her objectivism (Randianism), drafted an atheism book (Ñº); published in 1974 as *Atheism: the Case against God*; later published two other atheism books.
178.	John Patterson (1936-)	1975	Beginning in 1975, up to the present, e.g. Bill Nye vs Ken Ham (2014) commentary, began to publicly counter, in debates, radio, newspaper, lectures, etc., all creationism, religion-pushing views, in the area of science; in his engineering clashes, he famously have out creationism publications as homework assignments to check for errors and incorrectness.
180.	Steven Weinberg (1933-)	1977	Brainz.org top 50 brilliant atheist (#24) (Ñº); an "avowed atheist" (Lee Strobel, 2004); in his 1977 *The First Three Minutes*, he argues that according to the second law the universe is godless, albeit questionably pointless; his 1992 *Dreams of a Final Theory*, gives a number of noted atheism positions are stated.

181. Annie Laurie Gaylor (1955-) 1978

A third-generation free thinker (on her mother's side); debating believers as an atheist in 6th grade (Ñº); together with her mother Annie Nicole Gaylor (1926-2015) and John Sontarck (Ñº), in their kitchen (1976) started the Freedom From Religion Foundation (incorporated in 1978), after deducing that deduced that the root cause of much of the opposition to her pro-abortion and women's rights efforts came from organized religion; did battle on national television with Oprah (1984); author: *Women Without Superstition* (1984); wife of noted preacher turned atheist Dan Barker. [1]

In 1980, Sagan, became famous for his PBS series *Cosmos*, co-written with his wife Ann Duryan, wherein he defines a human as "star-stuff" (Ñº); used the term "cosmic perspective" for the advanced perspective; and seemed to conjecture for a universe that is god-free, though, it seems, not stated so explicitly.

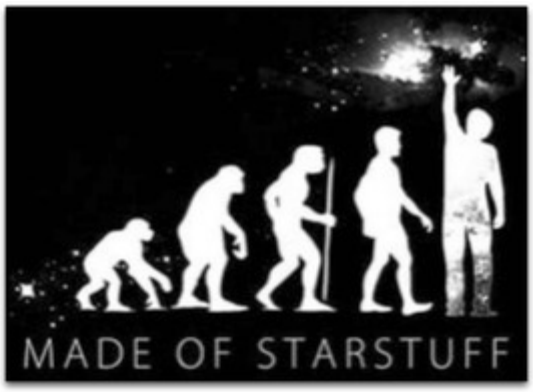

182. Carl Sagan (1934-1996) 1980

> "I am not an atheist. An atheist is someone who has compelling evidence that there is no Judeo-Christian-Islamic God. I am not that wise, but neither do I consider there to be anything approaching adequate evidence for such a god. Why are you in such a hurry to make up your mind? Why not simply wait until there is compelling evidence?"
>
> — Carl Sagan (1996), "To Robert Pope", Oct 2

> "Raised Muslim, wore a head scarf, prayed 5-times a day. Thanks to Bertrand Russell and Carl Sagan, am now an atheist."
>
> — Annisa Ihsani (2012), "I'm an atheist because …" tweet (Ñº), Nov 22

> "Regarding myself, atheist at 11, thanks to Carl Sagan's *Cosmos*, who showed how marvelous is the universe without a god!"
>
> — Alexandre Costa (2012), "I'm an atheist because …" tweet (Ñº), Nov 24

Technically, was a "near-atheist", "agnostoatheist", or "DN: 6" or "DN:6-" on the Dawkins scale. The adjacent image shows him as the poster-boy for the most-viewed "atheist" video, by term search on YouTube.

183. Simone de Beauvoir (1908-1986)

184. Michel Foucault (1926-1984)

185.	Dave Allen (1936-2005)	1971	His *Dave Allen at Large* BBC comedy skit show (1971-1979) ridiculed Catholic ritual via humor (Ñº); known for his atheist vs theist black cat analogy, aka his "The Leap of Faith" joke (Ñº)(Ñº); raised Catholic by nuns; later came to describe himself a "practicing atheist". (Ñº)
186.	Peter Atkins (1940-)	1981	An "implicit atheist" (of the chemical atheist variety); his 1981, his *Creation*, outlined a Darwinism + physical chemistry view that humans are emergent types of unimportant "molecules equipped for competition, survival, and reproduction" amid a purposeless universe; has debated William Craig (1998), John Lennox, among others, up the present; ranked by Bo Jinn (2013) as one of the "lower and more moderate figures in this new atheist priesthood", along with "Krauss, Stenger, Shermer [and all the rest] *e bella compagnia*."
187.	Isaac Asimov (1920-1992)	1982	"I am an atheist, out and out. It took me a long time to say it. I've been an atheist for years and years, but somehow I felt it was intellectually unrespectable to say one was an atheist, because it assumed knowledge that one didn't have. Somehow, it was better to say one was a humanist or an agnostic. I finally decided that I'm a creature of emotion as well as of reason. Emotionally, I am an atheist. I don't have the evidence to prove that god doesn't exist, but I so strongly suspect he doesn't that I don't want to waste my time." — Isaac Asimov (1882), *Free Inquiry* (Ñº), Spring
188.	Dan Barker (1949-)	1984	A preacher of 19-years, who, in 1984, came out as an atheist, going on a number of talk shows, e.g. Oprah (Ñº); publications: *Losing Faith in Faith: From Preacher to Atheist* (1992), *Godless: How an Evangelical Preacher Became One of America's Leading Atheists* (2008), and *The Good Atheist: Living a Purpose-Filled Life Without God* (2011). (Ñº)
189.	Richard Dawkins (1941-) DN:6.5	1986	In 1986, in his *The Blind Watchmaker*, he argued for the view that humans were not created by god, but by blind random purposeless chance; his 2006 *The God Delusion*, takes aim at the theory of god, arguing that god does not exist, that religion is a delusion, and in which he introduced the 1-7 Dawkins scale of belief in the existence of God, on which he says he is about a 6.5 or "6 leaning towards 7" whatever that means; a 2015 dubbed "king of atheism" (Ñº)(Ñº). "I'm a hardline atheist, I have to say." — Salman Rushdie (2006), "Interview with Bill Moyers" (Ñº)
190.	Salman Rushdie (1947-)	1988	AskMen.com Top 10 Unknown Atheist (Ñº) (#10; Note: as a teenager, he demonstrated his rejection of religion by eating a ham sandwich, and waited in vain for the thunderbolt from heaven; his *The Satanic Verses* (1988), in the Muslim world, drew accusations of blasphemy and unbelief; the Ayatollah of Iran issued a fatwa ordering Muslims to kill him, which was backed by the Iranian government until 1998. (Ñº)
191.	Douglas Adams (1952-2001)	1990	Brainz.org top 50 brilliant atheist (#43) (Ñº); a self-described "radical atheist"; Richard Dawkins dedicated his *The God Delusion* to Adams.
	Taslima		

192.	Nasrin (1962-)	1992	
193.	Michael Shermer (1954-)	1992	An former fundamentalist evangelistic Christian turned circa 1991 “agnostic-nontheist atheist” scientific skeptic, who in 1992 found the Skeptic Society (Ñº), which began as a hobby in his garage; came into notoriety with his *Why People Believe Weird Things* (1997); in the 2000s, began to engage in many atheism vs theism debates, on the atheism side (e.g. with Sam Harris).
194.	Leon Lederman (1922-)	1993	a “confirmed atheist of Jewish descent” (Ñº); in his *The God Particle* (1993), coined the term “god particle” for the then-hypothetical Higgs boson, per the reasoning that: > “This boson is so central to the state of physics today, so crucial to our final understanding of the structure of matter, yet so elusive, that I have given it a nickname: the God Particle. Why God Particle? Two reasons. One, the publisher wouldn't let us call it the Goddamn Particle, though that might be a more appropriate title, given its villainous nature and the expense it is causing. And two, there is a connection, of sorts, to another book, a *much* older [Genesis] one...” — Leon Lederman (1993), *The God Particle* (pg. 22) In other words: (a) the publishers wouldn’t let him call it the “goddamn particle”, being that it was costing $2 billion particle accelerator funding to find, and (b) confusion of language and understanding in particle physics is comparable to the Biblical story of the Tower of Babel and the quest for on language of nature to uniform physics; which he explains as follows:
195.	Ibn Warraq (1946-)		
196.	James Haught (1932-)	1996	Eponym of the Haught disbeliever, the top 64 atheists or disbelieving near-atheists, of the last two-millennia, as found in his *2000 Years of Disbelief: Famous People with the Courage to Doubt*; technically, he self-classifies as a “skeptic” (2012), when confronted with god-talking Unitarian preachers. (Ñº)
197.	Stephen Gould (1941-2002)	1997	A conceptualized “atheist”, e.g. a Brainz.org top 50 brilliant atheist (#33) (Ñº); technically, was a Clarence Darrow fan agnostic who “if forced” would bet on atheism (Ñº), but an agnostic, nonetheless; noted for his “Non-Overlapping Magisteria” (1997) dualism ideology often bandied about in atheism/religion discussions.
198.	Harlan Ellison (1934-)		
199.	George Carlin (1937-2008)	1999	“I’m an atheist because George Carlin explained it all.” — Mark Law (2012), “I’m an atheist because …” tweet (Ñº), Nov 25 Carlin, notably, did a Mad TV “Touched by an Atheist” (Ñº) skit on Pascal’s wager

			Her first book *The Christ Conspiracy: The Greatest Story Ever Sold*, argued that the concept of Jesus Christ is myth and that the Christ story is a fabrication;
200	Dorothy Murdock (1960-2015)	1999	"An atheist by the name of **Dorothy Murdock** (who often calls herself Acharya S.) has claimed to be able to demonstrate that the pagan gods Horus, Dionysius, Mithra and even Buddha were said to have been born of a virgin on December 25th (which she mistakenly presumes to be the Biblical position on Jesus' birth), laid in a manger, visited by shepherds and angels, a prodigy at age 12, to have walked on water, been crucified and risen." — Howie Gardner (2014), *The Middle East Crisis Can be Solved* (pg. 259)
20#.	Neil Tyson (1958-)	1999	(add) His "Holy Wars" (1999) article gives frank commentary on how if his lectures on the universe are "in America" the end questions "eventually reaches god"; oft-perceived atheist, albeit self-aligned (2012) agnostic, who frequently has to correct his Wikipedia page to clarify this (Ñº), known for being outspoken against intelligent design (Ñº), how faith and reason are irreconcilable, how the Bible is bunk, etc.; his 2014 interview with Bill Moyer (Ñº)(Ñº)(Ñº) seems to give the impression that he is a "hard core atheist, but reluctant to commit to such a label.

(add)

Next | Previous

â— Famous atheists: 1-100 | 600BC to 1840
â— Famous atheists: 201-300 | 2009 to present

Quotes

The following are related quotes:

> "After Harris came high pope Dawkins, then cardinal Hitchens, the bishop Dennett, and then the lower and more moderate figures in this new atheist priesthood: Krauss, Stenger, Atkins, Shermer [and all the rest] *e bella compagnia*."
>
> — Bo Jinn (2013), *Illogical Atheism* (loc. 286)

See also

â— Atheism timeline
â— Famous publications
â— Famous publications by age

References

1. (a) Atheist Annie Gaylor vs. Oprah | Religion as addition (1984) (Ñº) | IJ1(1:40): opium of the masses
(b) Gaylor, Annie L. (1997). *Women Without Superstition: No Gods—No Masters: The Collected Writings of Women Freethinkers of the Nineteenth and Twentieth Centuries*. Freedom From Religion Foundation.
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4. (a) McGrath, Alister, Dennett, Daniel. (2008). *The Future of Atheism: Alister McGrath & Daniel Dennett in Dialogue*

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6. (a) Birx, H. James. (1992). "Introduction", in: *The Riddle of the Universe* (by: Ernst Haeckel, translator: Joseph McCabe) (pgs. ix-xiv). Prometheus Books, 1992.
(b) H. James Birx – Wikipedia.

External links

- The 50 Most Brilliant Atheists of All Time – Brainz.org.
- Category:Atheists (127+) – RationalWiki.org.
- List of atheist authors – Wikipedia.

θΔics

In existographies, **famous atheists** refers to historical thinkers, past or present, who have gained a certain notoriety, fame or infamy, depending, for either being labeled an atheist, declared non-believer in the existence of god, and or contribute explicitly to atheism, anti-theism, and dissolution of religio-mythology based ideologies; below is chronological listing of famous atheists, past and present.

Atheists | 201-300

See also: Top 100 atheists (ranked)

The following are noted atheists "101 to 200" — assumed, attributed, categorical, labeled, famous, extreme, and or legendary — chronological ordered, by either birth (reaction start) or event significance (previous: 1-100, 101-200; next: 301-400):

Atheists 201 to 300

#	Person	Date	Significance
201	Sunand Joshi (1958-)	2000	
202.	Thomas Nagel (1937-)	2000	"I want atheism to be true and am made uneasy by the fact that some of the most intelligent and well-informed people I know are religious believers." — Thomas Nagel (c.2000) (Q) His *Mind and Cosmos* (2012) turned him into the "atheist who dared to question materialism" (Q) and the atheist who doubted Darwin, etc.
203.	Julia Sweeney (1959-)	2001	A Johnson 100 atheists (Q); in 2001, began working on her autobiographical "Letting Go of God" (Q) deconversion comedy routine, on how she dug herself mentally out of her entrenched Catholic upbringing into Deepak Chopra (Q) pseudoscientific quantum spirituality transition stage to intelligent design and then into rational sober atheism; available in DVD form in 2008; some of which was referenced in Dawkins' *The God Delusion*.
204.	Lewis Wolpert (1929-)	2002	Noted atheist who has spoken out against the argument for evil (Bo Jinn, 2013).
205.	Sean Carroll (1966-)	2003	Prefers the self-label "naturalist" (2014), over atheist, although he doesn't deny the latter, but considers the former a more positive term (Q); Brainz.org top 50 brilliant atheist (#49) (Q); in 2003, penned: "Why (Almost All) Cosmologists are Atheists" (Q); in 2004, with Shadi Hartsch, taught a course on the history of atheism at the University of Chicago; in 2012, organized a workshop entitled "Moving Naturalism Forward"; in 2013, blogged "Why I Won't Take Money from the Templeton Foundation" (Q) (Q); in 2014, received the "Emperor Has No Clothes" award from the Freedom From Religion Foundation".
206.	Jennifer Hecht	2003	

(1965-)

207.
Aron Nelson (1962-) 2003

One of the six atheists interviewed (Q) in the 2004 BBC documentary *The Atheism Tapes* (Q), along with Steven Weinberg, Arthur Miller, Richard Dawkins, Denys Turner, and Daniel Dennett; in which he draws an important distinction between atheism (lack of belief in a deity) and antitheism (active opposition to theism), identifies himself as both an atheist and an antitheist, and speculates about a post-theistic society; in 2009, dialogued at CUNY with Denys Turner "Does Morality Need God?" (Q), during which he states:

> "Some people often think that if you're an atheist, you don't believe in god, then you can't have a morality. There's no foundation to morality and morality's in question and so forth. [...] It's amazing to me that people in the current world still think that way, because that view was refuted 2.5 thousand years ago by Socrates, in the Euthyphro argument, where Socrates made the point that you can't define goodness or rightness as what god commands, because the reason god commands it is that it's right, it's not right because god commands it. [...] So, god cannot be the foundation of morality in that sense."

208.
Colin McGinn (1950-) 2004

In 2010, blogged "Why I'm an Atheist" (Q), wherein he described himself as an "atheist in the strong sense";

In 22 May was a reviewer (2013) of JDNM; in Jun 2013, parodied by FirstThings.com (Q), after being forced to resign from University of Miami, for sexually explicit emails to graduate student, as the an atheist hypocrite, namely for blaming faith for sexual abuse, and stating that atheists have better morals:

> "[Atheists] make up in morality what they lack in belief; whereas believers have to do so much work to believe that they have no energy left over for morality. The depravity of the Catholic Church is a nice illustration."

but then succumbing to a variant of the same immorality to which he was pointing the finger at.

209.
Michael Martin (1932-)

Cited by Michael Palmer (2013) as atheism battler on the side of Victor Stenger and Daniel Dennett, attacking for all they are worth, believers like: William Craig and Alister McGrath [4]; books include: *The Case Against Christianity* (1991), *Theism vs. Atheism: the Internet Debate* (2000), *Atheism, Morality and Meaning* (2002), among others. (Q)(Q)(Q)

210.	William Provine (1942-2015)	1994	
211.	Herman Philipse (1954-)	1995	His 1995 *The Atheist Manifesto*, converted Ayaan Ali into an atheist, after the first four pages.
212.	Richard Carrier (1969-)		Penned *Goodness Without God*; debated William Craig (2009).
213.	Jean-Marie Lehn (1939-)		Quote: “It is a scene I won’t forget in a hurry”, in commentary in defending (2006) his atheism at a packed public conference at the new Alexandria Library in Egypt. (O)
214.	Michael Palmer (1945-)		Noted for his 2010 atheist’s creed statement; publications include: *The Question of God* (2001), *The Atheist’s Primer* (2012), *Atheism for Beginners* (2013), among others.
215.	Michel Onfray (1959-)		“I am a sworn atheist and therefore from my point of view the Talmud or the Koran don't constitute works of political philosophy but rather writings that stand in utter contradiction to concepts like logic, freedom, feminism, secularism, brotherhood - which are my ideals.” — Michel Onfray (c.2005) (O) Noted epicurean (O); did preface to first English translation of Jean Meslier’s *Testament*; his 2005 *Atheist Manifesto: the Case Against Christianity, Judaism, and Islam*, has sold over 200,000 copies (O); cited as one of the big three modern atheists, behind Dawkins and Hitchens; backs his work by: Epicurus, Nietzsche, Georges Bataille, Jean Meslier, Baron d’Holbach, Michel Foucault, Jeremy Bentham and Freud. (O)
216.	Ayaan Ali (1969-)	2004	In 2002, became an atheist, in May, following 9/11, when she looked at herself in the mirror and asked “do I really believe in God?” (V); on 29 Aug 2004, her film *Submission* (V) — done while working with writer and director Theo van Gogh (who was shot 8 times, semi-decapitated, and stabbed in the chest, on 2 Nov 2004, at 9AM while biking to work), wherein she wrote the script and provided the voiceover — was aired on the Dutch public broadcasting network, which criticized the treatment of women in Islamic society, which was juxtaposed with passages from the Qur'an, were scenes of actresses portraying Muslim women suffering abuse, and an apparently nude actress dressed in a semi-transparent *burqa* was shown with texts from the Qur'an, written on her skin, interpreted as justifying the subjugation of Muslim women.

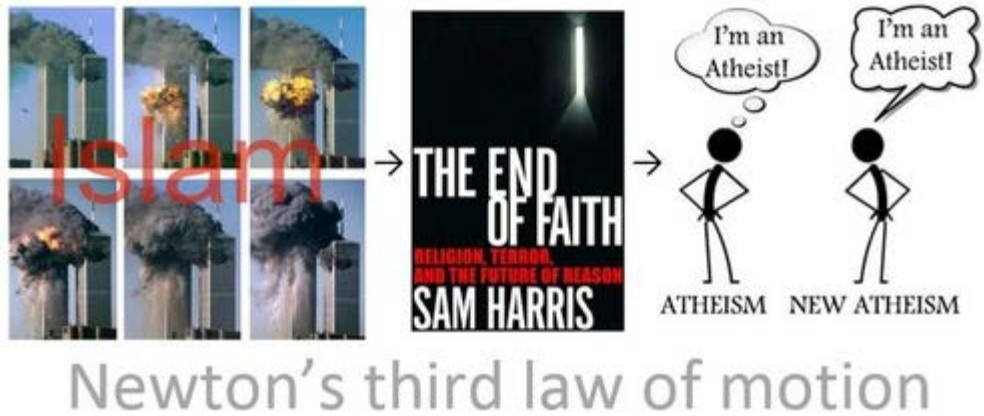

217.	Harris (1967-)	2004	Launching the "new atheism" movement, something he began to initiate the day after 9/11, as he described in his 2004 *The End of Faith*: > "I began writing this book on September 12, 2001. Many friends read and commented on a long essay that I produced in those first weeks of collective grief and stupefaction, and that text became the basis for this book." which would go on to sell over 250,000 copies within three years alone. (Q) Has been atheist quoted since at least 2005 (Q)
218.	Ricky Gervais (1961-)		"Science is constantly proved over time. You see, if we take any fiction or any holy book and destroy it, in a thousand years' time that wouldn't come back just as it was. Whereas, if we took ever science book and ever fact and destroyed them all, in a thousand years' time, they would all be back, because all the same tests would give all the same results." > — Rick Gervais (2017), reply (Q) to Stephen Colbert who said you just believe those science books because somebody, e.g. Hawking, told you they were true, Feb 2
219.	Michael Shermer (1954-)	2005	
220.	Erik Wielenberg (c.1972-)	2005	
221.	Libb Thims (c.1975-) DN:10	2005	Launched the *Journal of Human Thermodynamics* (2005) with the explicit footnote that "god theory" was not permissible; began to be ranked as an "extreme atheist" (2011) and or "strong atheist" (2014) per his human molecular theory and defunct theory of life views [see: Thimsian atheism]; Jabari (Q) 2016 top 20 smartest atheist (#13)
222.	Bobby	2005	Person (Q) behind the flying spaghetti monster; considered the founder of Pastafarian faith, which he outlined in his *The Gospel of the Flying Spaghetti Monster* (2006); shown

	Henderson (c.1980-)		adjacent is a Reddit atheism forum "in pasta we trust" parody of the 1956 "in god we trust" motto of the one dollar bill.
223.	Brian Flemming (c.1967-)	2005	In 2005, wrote and produced the documentary *The God Who Wasn't There* (Q), wherein, via interviews with Richard Carrier, Sam Harris, among others (Q), he argues that it is likely that Jesus Christ never existed; at the end of which he returns to confront the principal of the fundamentalist Christian school he attended as a child; in 2006, ranked by *Newsweek*, as one of America's ten most influential atheists. (Q)
224.	Paul Myers (1957-)	2005	In 2005, began atheist blogging at Pharyngula, as PZ Myers, a top-ranked science blog, according to *Nature* (2006); published his Atheist's creed (2008); visited (Q) the Creation Museum; was one of the ten famous atheists at the 2012 American Atheists Conference (Q), etc.
225.	Lawrence Krauss (1954-)	2005	"I view myself as an anti-theist rather than an atheist" (Q); engaged in public debate with Michel Behe (Q); "Every atom in your body came from a star that exploded. And, the atoms in your left hand probably came from a different star than your right hand. It really is the most poetic thing I know about physics: You are all stardust. You couldn't be here if stars hadn't exploded, because the elements - the carbon, nitrogen, oxygen, iron, all the things that matter for evolution and for life - weren't created at the beginning of time. They were created in the nuclear furnaces of stars, and the only way for them to get into your body is if those stars were kind enough to explode. So, forget Jesus. The stars died so that you could be here today." — Lawrence Krauss (2012), *A Universe from Nothing: Why There is Something Rather Than Nothing* (pg. #) (Q) (3:50)
226.	Noam Chomsky (1928-)	2006	An label-avoiding agnostic, oft-classified as an atheist; quote (2006): "When people ask me if I'm an atheist, I have to ask them what they mean. What is it that I'm supposed to not believe in? Until you can answer that question I can't tell you whether I'm an atheist. I don't see anything logical in being agnostic about the Greek gods. There's no agnosticism about ectoplasm. I don't see how one can be an agnostic when one doesn't know what it is that one is supposed to believe in, or reject" (Q); in 2012, claimed to be an atheist, while at the same time deriding the "new atheists" as an embarrassment and as narrow-minded and ill-informed bigots. (Q)
227.	Daniel Dennett (1942-)	2006	His *Breaking the Spell: Religion as a Natural Phenomenon* (2006), supposedly is a top 5 atheism book. (Q)
228.	Christopher Hitchens (1949-2011)	2007	His *God is Not Great* (2007) launched him into new atheism stardom and into many debates to follow; one of the new four horsemen of atheism.
	Victor		

229.	Stenger (1935-2014)	2007	Penned: *God: the Failed Hypothesis* (2007), *God: and the Follow of Faith* (2012), *God: and the Atom* (2013).
230.	Hemant Mehta (1983-)	2007	In 2007, penned his *I Sold My Soul on eBay: Viewing Faith Through an Atheist's Eyes* (Q), then *The Young Atheist's Survival Guide* (2012) (Q), which in 2014 was distributed (Q) alongside the Bible to students of Boon County, Kentucky; in 2013, launched the YouTube channel "The Atheist's Voice" (Q), where he promotes "friendly atheism"; also blogs about "friendly atheism" at Patheos.com.
231.	Greydon Square (1981-)		A noted (Q) physics major, Iraq war veteran turned, turned (2007) atheist rapper (O); noted for his "spoon fed" quote (Q); supposedly able to "make an atheist come out of the closet faster than Ted Haggard" (Q).
232.	Bill Maher (1956-)	2008	Technically an agnostic-atheist, who in 2011 self-defined as a "apatheist", or "apathetic atheist" (Q), born to a Catholic father and Jewish mother; noted for his 2008 documentary *Religulous* (Q), a humorous look at religious silliness; in 2008, on his Bill Maher show, he interviewed Richard Dawkins who said he "might be a 6.9" on his Dawkins scale; in 2012, Maher was being parodied in respect to Jesus myth and Gerald Massey connections.
233.	Christopher Redford (c.1982-)	2009	
234.	Stephen Hawking (1942-)	2010	"Cosmology is a kind of religion for intelligent atheists." — Stephen Hawking (c.1962), description (Q) to his wife, when they first met, about himself Other quotes: "the universe was not created by god" (2010); "there is no heaven or afterlife; that is a fairy story for people afraid of the dark" (2011). (Q)
235.	David Silverman (1966-)	2010	After becoming president of the American Atheists, has done a number of notable public awareness accomplishments: atheism billboards (2010); atheism bench (2013); launched 24/7 AtheismTV (2014) on television available vis Roku (Q); political conservatism atheism (2015), etc.
236.	Bahram Moshiri (c.1940-)	c.2010	Promotes atheism to Persians; Jabari (Q) 2016 top 20 smartest atheis.
	Sikivu		Her *Moral Combat: Black Atheists, Gender Politics, and the Values Wars* (2011), has

237.	Hutchinson (c.1969-)	2011	been dubbed (Q) the first book on atheism to be published by an African-American woman.
237.	David Noise (1962-)	2011	Penned the *Nonbeliever Nation: the Rise of Secular Americans* (2011) (Q); has been a humanism promoter since.
23#.	Armin Navabi (1984-)	2011	In 2011, he launched Iranian Atheists on a social networking site called Orkut, out of loneliness he says, before being transferring it to Facebook, under the moniker Atheist Republic, which has 1M+ likes, sometime therein launching WhyThereIsNoGod.com, and publishing the 2014 book *Why There Is No God: Simple Responses to 20 Common Arguments for the Existence of God* (Q); discusses (2017) (Q) Facebook atheism pages takedown problem.
239.	Alexander Rosenberg (1949-)	2011	Published *An Atheist's Guide to Reality*; mostly a weak book, promoting: promotes what he refers to as "nice atheism", a "blind variation", "dumb luck", "random chance", "accident" themed, "mindless" process, "entropy = disorder" thermodynamics-conceptualized model of evolution.
240.	Horus Gilgamesh (c.1965-)	2011	Started the Awkward Moments Children's Bible Facebook pages as a joke, which attracted enough followers that by 2013 it resulted in a book series, a proto-type children's atheist bible, so to say.
241.	Kurt Bell (c.1966-)	2011	An open and direct atheist who published a deemed controversial to some blog and vlog about how he considers his wife and children to be soulless bags of chemicals.
242.	Howard Bloom (1943-)	2012	Published *The Lucifer Principle* (1997) and *The God Problem* (2012) and gave talk on "Sex and the Second Law of Thermodynamics: How Sex Breaks the Law of Physics" (2013), towards the end of which he comes out as an anti-new atheism "pluralistic atheist" who uses numerous "Freudian god slips" in his supposedly atheism talks, e.g. "thank god", "oh god", "god knows", "lord knows", etc., arguing for free will a the particle physics level, "emergent properties", that "humans can't come out of the second law", and teleological purpose; his *The Mohammed Code* (2014) seems to be going after Islam.
243.	William Jensen (1948-) DN:7	2012	Science humor cartoonist of Gilbert Lewis as the new prophet of chemical thermodynamics based scientific religion; Dawkins number polled by Libb Thims (c.2012); gave his atheist's creed in 2014.
244.	Peter Higgs (1929-)	2012	Brainz.org top 50 brilliant atheist (#24) (Q); a labeled "inoffensive atheist" who publicly derides Richard Dawkins, the self-described "militant atheist" dubbed "Darwin's Rottweiler", for being too much of a "fundamentalist" (Q); received the 2013 Nobel Prize in physics for his work on the Higgs mechanism, which predicted a new particle, the Higgs boson, later (1993) ironically dubbed the "God particle" by Leon Lederman in conversation with Dick Teresi as a sort of joke (Q).
245	Chris Johnson (c.1989-)	2012	Made 2012 video "What Do You Think About Atheists?" (Q) In 2014, published *A Better Life: 100 Atheists Speak Out on Joy & Meaning in a World Without God* (Q) (Q), a result of two-years of in-person interviews, funded by a $100K pledge via KickStarter (Q), to make a photo-interview book of 100 famous atheists, Including: A.C. Grayling, Daniel Dennett, Derren Brown, Donald Johanson, James Randi, James Watson, Janet Asimov, Julia Sweeney, Lawrence Krauss, Michael Shermer, Patricia Churchland, Penn & Teller, Richard Dawkins, Sean Carroll, and Steven Pinker. a

follow-up video seems to have resulted as well.

246.	Peter Boghossian (1966-)	2012	Noted (Q) for his *A Manual For Creating Atheist* (2013); work on morality of inmates; lecture “Jesus, The Easter Bunny and Other Delusions: Just Say No!” (2012) (Q)
247.	Alain de Botton (1969-)	2012	Noted for his *Religion for Atheists* (Q), wherein he expressly reimagines Comte’s religion of humanity for contemporary nonbelievers. (Q)
248.	Sarah Haider (c.1988-)	2013	A Pakistani-born American ex-Muslim who at the circa age of 13 began to lose her faith when a “militant atheist”, as she says (Q), in 2015 discussion with atheist Dave Rubin, gave her printed pages from the Quran, of some horrible passages, and said “look, this is what you believe”, after which, in order to prove the militant atheist wrong, she began to investigate things, became an atheist; and in 2013 co-founded Ex-Muslims of North America, where she advocates for the acceptance of religious dissent and works to create local support communities for those who have left Islam; in 2015 gave a decent icebreaker “Islam and the Necessity of Liberal Critique” (Q) speech at the American Humanist Association.
249.	Heina Dadabhoy (1988-)		A devout California Muslim who in 2007 (age 19) starting becoming active in atheist organizations and events (Q) around Orange County, CA and in 2012 started a Kickstarter (Q) effort for a book entitled *Skeptic’s Guide to Islam*, raising about 10K, (supposedly due out Dec 2015); in 2014 interviewed (Q) with Matt Dillahunty. (Q)(Q)
250.	Patrick Fergus (1985-2015) (DN:9.5)	2014	“I believe in energy. You have sex, there’s friction … that’s heat. Then a baby shoots out. It’s all energy. The sun's a giant orgasm. Like if you see a hot girl ... and she's soo hot, you can't even touch that sh*t. You're like daaammn!”

— Pat Fergus (2014), when queried on Easter (Apr 20) about what—as an atheist—he believes in?

A hard-core "no-god", "no-soul", "no-spirit", physics-based energy-believing atheist.

In Nov 2014, became the launching co-host, with Libb Thims, of the Atheism Reviews channel; in Apr 2015, a memorial park (Q) bench was installed in his honor in Morton Grove, IL; shown adjacent is Thims, Art the god believer, and Yoni the agnostic, doing a Mar 2015 mid-night Bacardi 151 fire circle toast to the atheist who believed in energy.

“This is a satirical paper produced by left-

251.	Stephane Charbonnier (1967-2015)	2015	wingers and when I say left-wingers that goes all the way from anarchists to communists to Greens, Socialists and the rest. Above all it is a secular and atheist newspaper." — Stephane Charbonnier (2011), comment to Reuters amid office firebombings, the day after it named Mohammed as its 'editor-in-chief' for the week's issue, Nov 02 (Q) "I prefer to die standing rather than living on my knees." — Stephane Charbonnier (2013), said (Q) after being placed on Al-Qaeda's most-wanted list (Q)
252.	Michael Ruse (1940-)	2015	Published *Atheism: What Everyone Needs to Know*.
253.	Stephen Fry (1957-)	2015	His 2015 viral video (Q) (7M+) remarks on god, the most viewed video for key word atheism in YouTube (2017), got him near to being tried for the crime of atheism, under Ireland's blasphemy laws.
	Mohammed Alkhadra (c.1987-)		Jordanian ex-Muslim atheist; founder of Jordanian Atheists Group; became atheist (c.2015) after watching a video of Richard Dawkins. (Q)
254.	Ali Rizvi (c.1980-)	2016	
255	Mohamed Hisham (c.2001)	2018	

(add)

Next | Previous
- Famous atheists: 1-100 | 600BC to 1840
- Famous atheists: 101-200 | 1840 to 2009

See also

- Atheism timeline
- Famous publications
- Famous publications by age

References

1.

External links

- The 50 Most Brilliant Atheists of All Time – Brainz.org.
- Category:Atheists (127+) – RationalWiki.org.
- List of atheist authors – Wikipedia.

θΔics

In science, **famous publications** are a number of memoirs, books, and textbook that have been instrumental in the development of chemistry and thermodynamics. The following table lists famous core publications particularly germane to the subjects of human chemistry and human thermodynamics. Short articles on selections of these publications are listed in the “Wiki pages” file subsection (adjacent) to this header page; others are listed below.

List

The following is the work-in-progress list of famous hmolscience-related publications. Highlighted publications indicate pure classic works on human thermodynamics:

Date	Famous Publication	Significance
450BC	*Fragments of Aphorisms* by: Empedocles	Introduced the four elements and two force model of everything; wherein, in his chemical aphorisms, friends were said to mix like water and wine, and enemies separate like oil and water.
280BC	Letter To Herodotus by: Epicurus	Gives a nutshell synopsis of his matter + void theory of everything (Ñº); a staple publication of Thomas Jefferson's philosophy.
75BC	*On the Nature of Things* (*De Rerum Natura*) **by:** Lucretius	Outlined the basics of the atomic theory as developed by Leucippus, Democritus, and Epicurus in which the universe, and humans, are comprised of and worked by the operation of atoms and voids. The version shown is a 1947 three-volume set comprised of prolegomena, text, translation, and commentary by Cyril Bailey. (Ñº) 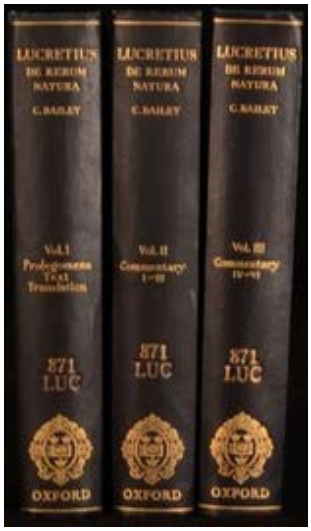
	Dark Ages	
1616	*Chemical Wedding* **by:** Johannes Andreae	
1620	*Elements of Chemistry* **by:** Herman Boerhaave	Established Boerhaave's law; later used by Lavoisier.
	New Experiments: Physico-Mechanical, Touching the	

1660	*Spring of the Air, and its Effects: Made, for the most part, in a New Pneumatical Engine* **by:** Robert Boyle	In defense of this publication, found in the 1662 second edition, contains Boyle's law, a forerunner to the ideal gas law.
1686	*Principia: the Mathematical Principles of Natural Philosophy* **by:** Isaac Newton	Established the laws of motion: first law of motion, second law of motion, and third law of motion. 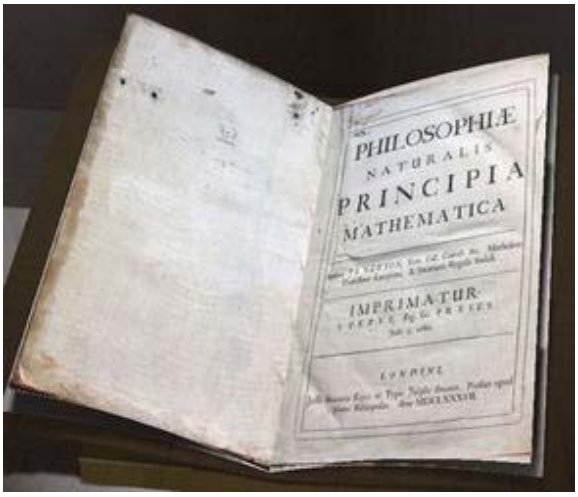
1690	*A New Method of Obtaining Very Great Motive Powers at Small Cost* **by:** Denis Papin	Laid out the designs for the steam engine and described the outline of the Carnot cycle.
1718	"Query 31" **by:** Isaac Newton	Seeded the logic of affinity chemistry; used by French chemist Étienne Geoffroy to make the world's first affinity table.
1718	*Table of Affinities Between Different Substances* **By:** Étienne Geoffroy	Put the verbal chemical hierarchy reaction power logic of Newton's Query 31 into the form of the world's first affinity table (see: Geoffroy's affinity table). 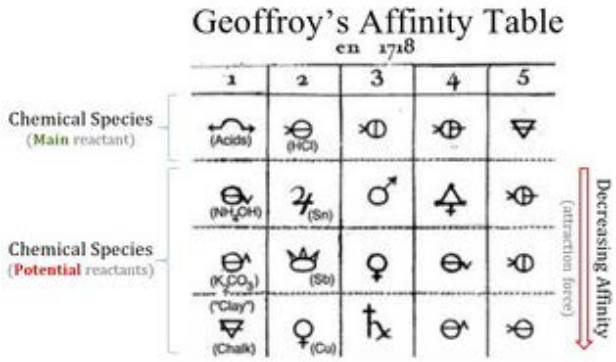
1738	*Hydrodynamica* **by:** Daniel Bernoulli	Defined pressure and verbally stated the precepts of the ideal gas law.
	A Dissertation on Elective Attractions	The founding textbook of chemical affinity; used by Goethe in his human elective afffinity theory.

1775	**by:** Torbern Bergman	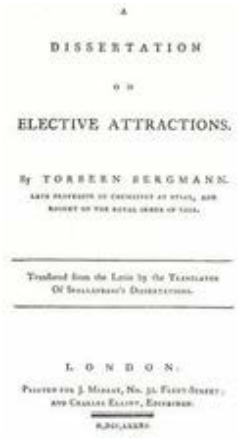 A DISSERTATION ON ELECTIVE ATTRACTIONS. By TORBERN BERGMANN. Translated from the Latin by the Translator Of Spallanzani's Dissertations. LONDON: Printed for J. Murray, No. 32, Fleet-Street; and Charles Elliot, Edinburgh. 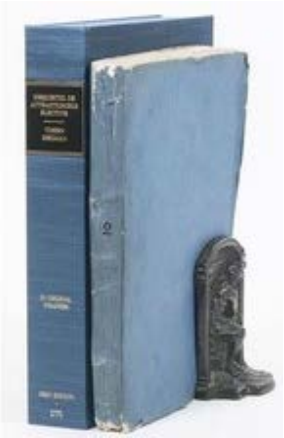
1777	"Newton in Senegal" **by:** Jean Sales	A ridicule of soul-based morality via social Newton logic.
1782	"On Friendship" **by:** William Cowper	Described the mixing of courtier and patriot to that of salts with lemon juice, both resulting in an effervescence; one of the first reaction-stylized Empedocles chemical aphorism.
1787	*Elements of Chemistry* **by:** Antoine Lavoisier	Introduced the world, and particularly Sadi Carnot, to caloric theory.
1796	"Third Lecture on Anatomy" **by:** Johann Goethe	Discusses chemical affinity for the first time.
1798	"An Enquiry Concerning the Source of the Heat which is Excited by Friction" **by:** Benjamin Thomson	Laid question to Lavoisier's caloric theory; thus initiating the postulate of the mechanical equivalent of heat.
1809	*Elective Affinities* **by:** Johann Goethe	Founded the science of human chemistry by explaining the mechanisms of human relationships, e.g. marriage, friendships, daily work, occupation, and society, etc., in terms the logic of elective affinity (or chemical affinity A) and affinity reactions (chemical reactions).

1824	*Reflections on the Motive Power of Fire* **by:** Sadi Carnot	Initiated the science of thermodynamics with its description of the Carnot cycle.	
1829	*Calculation of the Effect of Machines* **by:** Gustave Coriolis	Mathematically defined work and kinetic energy.	
1834	"Memoir on the Motive Power of Fire" **by:** Émile Clapeyron	Introduced physicists (particularly Thomson and Clausius) to Carnot's *Reflections.*	
1840	"The Establishment and Development of the Idea of Chemical Affinity" **by:** William Whewell		
c.1845	"The Mathematician in Love" **by:** William Rankine	Gives the first ever equation of love in proto-thermodynamic terms.	Let x denote beauty, y manners well-bred, z fortune (this last is essential), Let L stand for love—our philosopher said— Then L is a function of x, y and z Of the kind that is known as potential. Now integrate L with respect to dt (t standing for time and persuasion) Then, between proper limits, 'tis easy to see The definite integral Marriage must be (A very concise demonstration).*

1845	"On the Mechanical Equivalent of Heat" **by:** James Joule	Established the mechanical equivalent of heat.
1848	"On an Absolute Thermometric Scale founded on Carnot's Theory of the Motive Power of Heat, and Calculated from Regnault's Observations." **by:** William Thomson	Introduced the absolute temperature scale.
1849	"An Account of Carnot's Theory of the Motive Power of Heat; with Numerical Results Deduced from Regnault's Experiments on Steam" **by:** William Thomson	Introduced Clausius to the difficulties inherent in Carnot's principle.
1850	"On the Moving Force of Heat and the Laws of Heat which may be Deduced Therefrom" **by:** Rudolf Clausius	Began to lay the foundations for the science of thermodynamics (mechanical theory of heat).
1851	"On the Dynamical Theory of Heat" **by:** William Thomson	Contains the Kelvin-statement of the second law.
1852	"On a Universal Tendency in Nature to the Dissipation of Mechanical Energy" **by:** William	Introduced dissipation and energy to the lay public; and established the law of dissipation.

	Thomson	
1855	*Force and Matter* by: Ludwig Buchner	
1857	"On the Nature of the Motion which we call Heat" by: Rudolf Clausius	Initiated kinetic theory of gases and later the development of the Maxwell-Boltzmann distribution.
1859	*A Manual of the Steam Engine and Other Prime Movers* **by:** William Rankine	First textbook on thermodynamics.
1859	*On the Origin of Species* **by:** Charles Darwin	Situated the theory of evolution as an upward process. 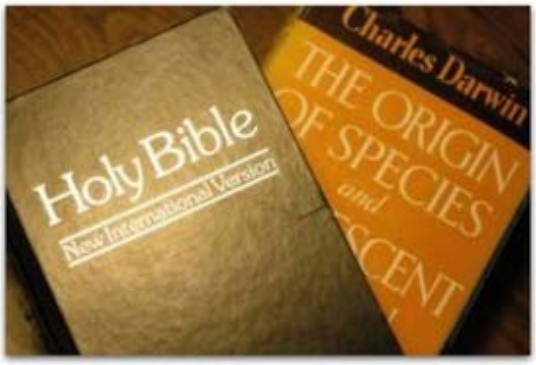
1865	*The Mechanical Theory of Heat* **by:** Rudolf Clausius	Founded the science of thermodynamics.
1868	*Philosophical Implications of Thermodynamics* **by:** Gustave Hirn	First book to address the philosophical ramifications of the newly-formed universal science of thermodynamics; Hirn's work is that to which the term 'human thermodynamics' was first used (1893).
1872	"Further Studies on the Thermal Equilibrium of Gas Molecules"	Contained the first explicit probabilistic expression, the H-theorem, for the entropy of an ideal

		gas.
	by: Ludwig Boltzmann	
1874	"The Mathematician in Love" **by:** William Rankine	A equation of love containing poem about love being a type of thermodynamic potential.
1876	*On the Equilibrium of Heterogeneous Substances* **by:** Willard Gibbs	Founded the science of chemical thermodynamics. 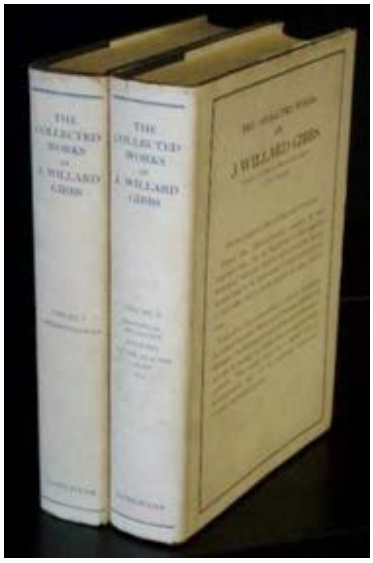
1877	"On a Relation between the Second Law of Thermodynamics and Probabilities" **by:** Ludwig Boltzmann	Contains the origins of proportionality equation between S and log W (S = k ln W).
1878	"A Paradoxical Ode" by: James Maxwell	Maxwell's final private thoughts about the relationship of science and religion, choice and chance, death and eternity.
1881	*Outline of a Mechanics of Society* **by:** Eduard Sacher	One of the first explicit "social mechanics" treatises, wherein, based on the work of Robert Mayer and Rudolf Clausius, physics and thermodynamics concepts, such as kinetic energy, the mechanical equivalent of heat, principle of the transmission of work, are used to outline a theory of "rational economics".

1882	"The Thermodynamics of Chemical Processes" **by:** Hermann Helmholtz	Showed that free energy is the measure of affinity.
1884	*Studies in Chemical Dynamics* **by:** Jacobus van't Hoff	Defined affinity as the maximum external work done by the chemical reaction at constant temperature and volume
1886	"The Second Law of Thermodynamics" **by:** Ludwig Boltzmann	Introduced the life is a struggle for entropy riddle.
1887	*The Doctrine of Energy* **by:** Georg Helm	First book to contain a chapter devoted to the application of energetics (and thermodynamics) in sociology and economics.
1888	*The Will to Power: An Attempt at a Revaluation of All Values* **by:** Friedrich Nietzsche	A collection of 1067 draft notes aimed, supposedly, at a thermodynamics based reformulation of all values; claimed by some to be the prolegomenon outline of his ideas to his envisioned magnum opus.
1893	"The Scientific Work of Gustav Adolph Hirn"	The term "human thermodynamics" was coined in it.

	by: Bryan Donkin	
1894	"Among the Bards" **by:** John Spollon	
1895	"A Project for Scientific Psychology" **by:** Sigmund Freud	Outlined of a chemical thermodynamics based psychology; the Helmholtz terms 'bound energy' and 'unbound energy' were first employed in a psychological sense.
1898	*Essay on Social Mechanics* **by:** Leon Winiarski	The first paper on human chemical thermodynamics; based sociology on the Clausius inequality, according to which "a social aggregate is nothing but a system of points, i.e. individuals, who are in perpetual movement of approaching or withdrawing from one another." 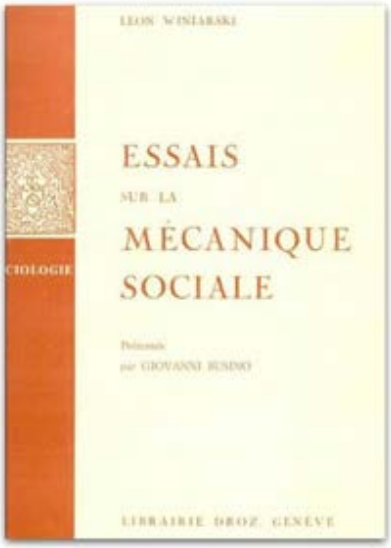
1899	*Lessons on Social Movement* **by:** Maurice Hauriou	Explains large scale social movements, i.e. gross aspects of business, social events, states of a society, etc., in terms of pure thermodynamics, using Carnot efficiency, Mayer's conservation of energy, and Clausius' entropy, etc., discussed in the guise of mechanism and reaction.
1900	"The Teaching of Pure Political Economics and Social Mechanics in Switzerland" **by:** Leon Winiarski	The first article to outline (and advocate) the teaching of a course on applied thermodynamics in sociology, politics, and economics at the University of Geneva (1894-1900).
1901	"On the Law of Distribution of Energy in the Normal Spectrum" **by:** Max Planck	Introduced the "energy element", launching quantum mechanics, solved the ultraviolet catastrophe, applied Boltzmann's 1872 H-theorem version of entropy, in the form of $S = k \log W$, to black body radiation, situated the principle of elementary disorder.
1905	"Affinity Lecture" **by:** Wilhelm Ostwald	Did a Goethe to Gibbs affinity history lecture.
	"Monistic Sunday	

1910	Sermons” **by:** Wilhelm Ostwald	A series of 60 plus sermons or lectures on how energy-based monism replaces god-based theism, and the repercussions and details of this view; a type of natural science based atheism Sunday school, so to say, devoid of any supernatural suppositions.
1910	*A Letter to American Teachers of History* **by:** Henry Adams	Argued that the teaching of the second law in history courses (history thermodynamics) should be mandatory.
1912	*The Energetic Imperative* **by:** Wilhelm Ostwald	Introduced the subject he called "anthropic physics", based on the energetic imperative, translated later into the thermodynamic imperative and the translated rule-of-thumb "waste not free energy" (William Bayliss, 1915)
1912	*Treatise on General Sociology* **by:** Vilfredo Pareto	A "construction of a system of sociology on the model of celestial mechanics, physics, and chemistry." 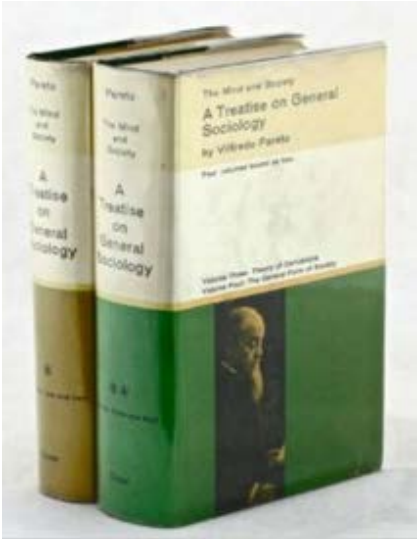
1914	*Human Chemistry* **by:** William Fairburn	First booklet on the science of human chemistry; viewing people as "human chemical elements" with ideas on human entropy, affinities, reactions of individuals, etc.
1914	“The European War” **by:** Eugene Roeber	Gives a chemical engineering view of WWI (28 Jul 1914 – 11 Nov 1918), wherein he stated that WWI was a gigantic chemical reaction governed by the second law, wherein people’s free will becomes like that of the will of “free” ions of dissociation theory; that entropy will increase as the war goes; that the end result will be a new Europe closer to absolute zero of temperature. 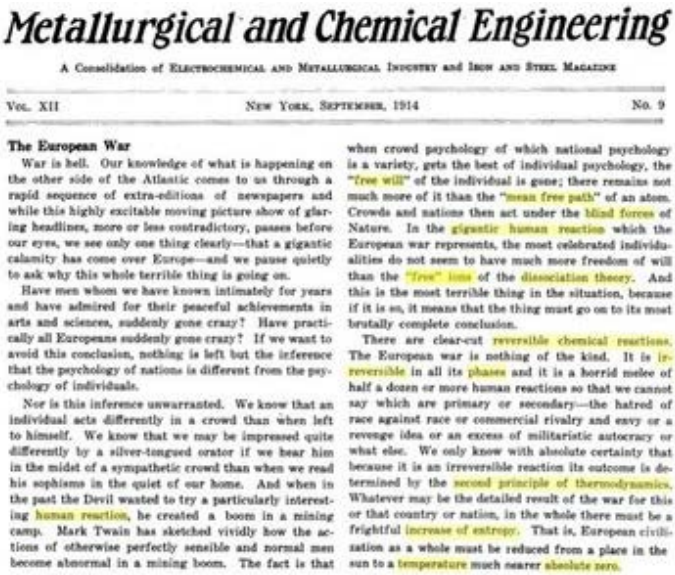 Metallurgical and Chemical Engineering A Consolidation of Electrochemical and Metallurgical Industry and Iron and Steel Magazine Vol. XII New York, September, 1914 No. 9 **The European War** War is hell. Our knowledge of what is happening on the other side of the Atlantic comes to us through a rapid sequence of extra-editions of newspapers and while this highly excitable moving picture show of glaring headlines, more or less contradictory, passes before our eyes, we see only one thing clearly—that a gigantic calamity has come over Europe—and we pause quietly to ask why this whole terrible thing is going on. Have men whom we have known intimately for years and have admired for their peaceful achievements in arts and sciences, suddenly gone crazy? Have practically all Europeans suddenly gone crazy? If we want to avoid this conclusion, nothing is left but the inference that the psychology of nations is different from the psychology of individuals. Nor is this inference unwarranted. We know that an individual acts differently in a crowd than when left to himself. We know that we may be impressed quite differently by a silver-tongued orator if we hear him in the midst of a sympathetic crowd than when we read his sophisms in the quiet of our home. And when in the past the Devil wanted to try a particularly interesting human reaction, he created a boom in a mining camp. Mark Twain has sketched vividly how the actions of otherwise perfectly sensible and normal men become abnormal in a mining boom. The fact is that when crowd psychology of which national psychology is a variety, gets the best of individual psychology, the "free will" of the individual is gone; there remains not much more of it than the "mean free path" of an atom. Crowds and nations then act under the blind forces of Nature. In the gigantic human reaction which the European war represents, the most celebrated individualities do not seem to have much more freedom of will than the "free" ions of the dissociation theory. And this is the most terrible thing in the situation, because if it is so, it means that the thing must go on to its most brutally complete conclusion. There are clear-cut reversible chemical reactions. The European war is nothing of the kind. It is irreversible in all its phases and it is a horrid melee of half a dozen or more human reactions so that we cannot say which are primary or secondary—the hatred of race against race or commercial rivalry and envy or a revenge idea or an excess of militaristic autocracy or what else. We only know with absolute certainty that because it is an irreversible reaction its outcome is determined by the second principle of thermodynamics. Whatever may be the detailed result of the war for this or that country or nation, in the whole there must be a frightful increase of entropy. That is, European civilization as a whole must be reduced from a place in the sun to a temperature much nearer absolute zero.
		Made the obtuse concepts of Gibbs'

1923	*Thermodynamics and the Free Energy of Chemical Substances* **by:** Gilbert Lewis	*Equilibrium* readily available to the chemists.
1925	*The Animate and the Inanimate* **by:** William Sidis	An attempt at a reconciliation of the second law with animated life on the premise of entropy reversal.
1925	*Elements of Physical Biology* **by:** Alfred Lotka	Attempted a reversible heat engine deconstruct of systems of interacting evolving biological species.
1927	"Transmission of Information" **by:** Ralph Hartley	Introduced the logarithmic model $H = n \log s$ for information, where *H* is the amount of information associated with *n* selections of *s* possible signals (0s or 1s).
1929	"On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings" **by:** Leo Szilard	Disposed of Maxwell's demon via showing that the information collection abilities of the demon would require energy.
1933	*Modern Thermodynamics by the Methods of Willard Gibbs* **by:** Edward Guggenheim	The second book to distill Gibbs' *Equilibrium*.
1938	*Man on His Nature* **by:** Charles Sherrington	Parlay into the defunct theory of life position.

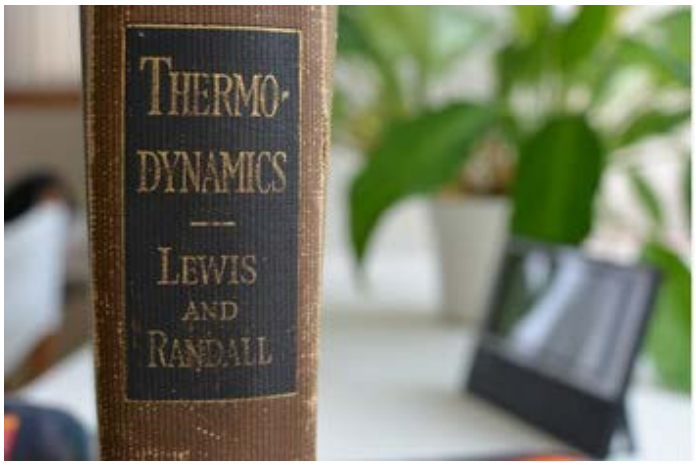

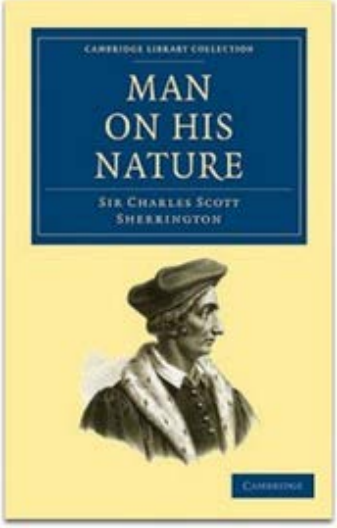

1938	*The Phenomenon of Man* **by:** Pierre Teilhard	Attempts a reconciliation synthesis of evolution, the second law, consciousness, and religion.
1941	"Metabolic Generation and Utilization of Phosphate Bond Energy" **by:** Fritz Lipmann	Presented the theory of free energy coupling in the context of phosphate bond energy use.
1941	"The Story of the Contented Molecule" **by:** Quaker State Motor Oil	Empedocles-style children's parable.
1944	*What is Life?* **by:** Erwin Schrödinger	Introduced the lay world to the simplified postulate that life is something that "feeds on negative entropy".
1948	*We Human Chemicals* **by:** Thomas Dreier	A "soft" storyteller like version human chemistry and how people are chemicals who react together in various ways.
1952	*The Next Million Years* **by:** C.G. Darwin	The first book to use the terms "human molecule" and "human thermodynamics" in one theory
		A song, based on the "love is a chemical reaction" scene from the 1939 film *Ninotchka*, turned Broadway musical, turned MGM film *Silk Stockings*, themed on during the lead female character states that a leading Russian scientist has "proved that physical attraction is purely

1955	"It's a Chemical Reaction, That's All" **By:** Cole Porter	electrochemical", that she has worked for 30-years on this proof, concluding in the end that this is a fact of science and "facts are facts", after which the following song ensues: When the electromagnetic of the he-male Meets the electromagnetic of the female, If right away she should say, "This is the male!" It's a chemical reaction, that's all.
1956	*Thermodynamics of Humans* **by:** Mehdi Bazargan	One of the first books to describe human existence and function using thermodynamics formulations.
1956	"The Thermodynamic Activity of the Male Housefly" by: Kaj Lang	A spoof article on anyone who cited Schrodinger's *What is Life*, scaled up to the fly level, and or Alfred Lotka stylized physical chemistry methods applied at the insect to animal interaction scale.
1957	"Free Energies of Formation from the Elements" in: *Energy Transformations in Living Matter* (by: Hans Krebs and Hans Kornberg) **by:** Keith Burton	Lists free energy of formation values ΔG_f^o for about 100 bioorganic species of biochemical reactions, able to make predictions on reactions that had not yet occurred.
1971	"Chemical Thermodynamics in the Real World" **by:** Frederick Rossini	Argued, using the combined law and equilibrium constant, that the interplay between enthalpy and entropy explains the paradox between freedom and security in society. 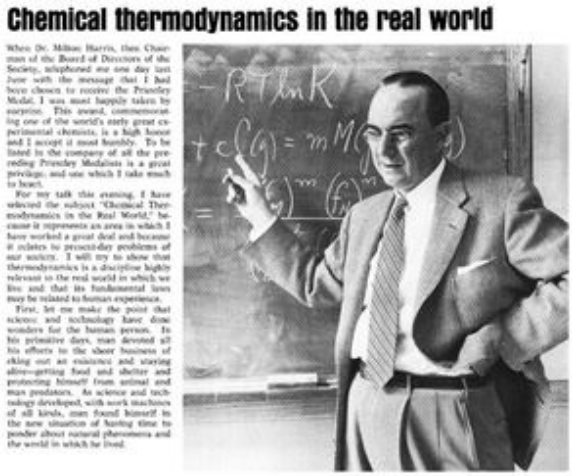 Chemical thermodynamics in the real world
1971	*The Entropy Law* **by:** Nicholas Georgescu "Thermodynamics of Evolution"	Introduced entropy to the economists.

1972	**by:** Ilya Prigogine, Gregoire Nicolis, Agnes Babloyantz	An attempt at a nonequilibrium thermodynamics explanation of evolution.
1977	*Self-Organization in Non-Equilibrium Systems: From Dissipative Structures to Order Through Fluctuations* by: by: Ilya Prigogine and Gregoire Nicolis,	Introduced the world to the view that life is a far-from-equilibrium dissipative structure.
1978	"On the Thermodynamics of Biological Evolution" by: Georgi Gladyshev	Outlined a Gibbsian thermodynamics view of evolution.
1979	"The Social Thermodynamics of Ilya Prigogine" by: Wil Lepkowski	One of the first articles devoted to the prospect of using thermodynamics to understand social processes.
1984	*Order Out of Chaos* by: Ilya Prigogine and Isabelle Stengers	Introduced the lay world to the "dissipative structure" theory of bifurcations and fluctuations.
1987	*New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* by: Mirza Beg	The first basic textbook on explicit physicochemical sociology; albeit corrupted to some extent via the implicit assumption that Gibbs energy, the driving force of change, is the will of Allah.

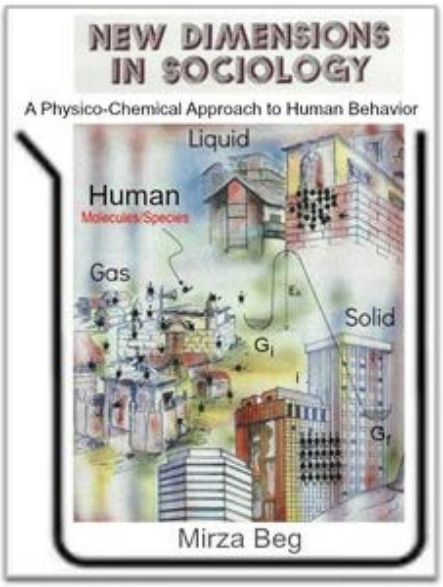

1987	*Goethe's Elective Affinity and the Chemistry of its Time* by: Jeremy Adler	The first book to attempt to unravel the chemists and affinity chemistry behind human chemical reaction theory of Goethe's *Elective Affinities*.
1992	"Human Molecules" by: Alan Nelson	Established the postulate that "economic agents" should be considered as "human molecules", according to which concepts from thermodynamics should apply.
1997	*Thermodynamic Theory of the Evolution of Living Beings* by: Georgi Gladyshev	The first book to explain evolution via changes in Gibbs free energy.
1997	"In Defense of Thermodynamics: an Animate Analogy" by: Sture Nordholm	Outlined the subject of "animate thermodynamics", the thermodynamics of animate matter and the animate world.
1998	"Human Societies: a Curious Application of Thermodynamics" by: Erich Muller	Prototype article for the 2005 launching of the *Journal of Human Thermodynamics*; the Muller dispersion force and Muller stability ratio are based on this paper.
2000	"The Physics of Relationships" by: Christopher Hirata	
2001	"The Thermodynamics of Love" by: David Hwang	A lighthearted discussion on the Gibbsian thermodynamics of human relationships from a human chemical reaction point of view.

HUMAN SOCIETIES

A Curious Application of Thermodynamics

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There is a loose analogy between the intermolecular forces that govern the observable behavior of fluid systems and the social forces that drive human behavior. Based on this premise, at least in principle, we can use thermodynamics to describe social systems. This paper will put forth some ideas, basically similes, that will help understanding of some common social situations, such as divorce and racism, through thermodynamic reasoning.

The origins of classical equilibrium thermodynamics as we now know it rest on the early findings of Watt, Clausius, Carnot, Joule, and Gibbs, along with many others. The results obtained by these early thermodynamicists were based on careful and systematic study of idealized thermal systems. Curiously, some of these "founding fathers of thermodynamics" had an appreciable comprehension of the exact constitution of matter. As an extreme example, one can point out how Sadi Carnot established the second law of thermodynamics without knowing the law of conservation of energy or the molecular nature of matter. In fact, he had an erroneous idea of what heat was, even though that quantity was the basis of his analysis. The relations and results obtained in this early classical thermodynamic period are independent of the actual nature of the systems studied and are, indeed, very general. This happy occurrence is the reason we can extrapolate the fundamental concepts of thermodynamics to other modern disciplines (e.g., geology,[7] information science,[8] and medicine[9]) if the analogies are carefully made.

Nowadays, we have elucidated many secrets of the nature of matter. Statistical thermodynamics faces the challenge of predicting macroscopic behavior of systems through knowledge of intermolecular interactions and appropriate averaging among the large number of molecules that constitute a system. It is fascinating to see how the statistical mechanical predictions line up perfectly with the earlier classical results. For example, for early scientists pressure was simply a property that described a system and could be related to work or energy. Today, we understand pressure as a result of forces between molecules in a fluid. In other words, today we can somehow understand the collective behavior of the system if we comprehend the interactions on an individual level.

THE INTERMOLECULAR POTENTIAL

In nature, molecules interact among themselves by means of forces that translate into the observable behavior of common substances. A few examples are the existence of a particular temperature at which liquid boils, the reason that two substances mix while others do not, and peculiar behavior such as ice floating on water—all of which can all be explained once we understand the molecular forces.

Even the most insignificant molecule of the simplest compound interacts with its neighbors by means of specific forces. The underlying cause for the presence of these forces is the physical separation of positive and negative charges in the atoms. The fundamental electrostatics and quantum mechanics needed to fully explain the nature and form of intermolecular forces are beyond the scope of this discussion. It will suffice to understand that if two atoms attempt to come too close to each other there will be an electrostatic repulsion between them. A macroscopic manifestation of this is the fact that matter cannot occupy the same space; in a simpler fashion, we witness this repulsion when two billiard balls collide. On the other hand, in atoms and molecules the electrons are not fixed in their orbits but rather move around in average locations. These fluctuations in position lead to fluctuating molecular dipoles, and they account for a weak type of attraction among molecules (sometimes called dispersion, or van der Waals forces). It is this attraction that accounts for the existence of condensed phases in which

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2001	"Humans, All Too Chemical" by: Kaspar Bott	
2002	"Chemistry in the Work of Goethe" by: Volker Wiskamp	
2002	*Ecological Stoichiometry*: *the Biology of the Elements from Molecules to the Biosphere* by: Robert Sterner and James Elser	Contains first published calculation for the human molecular formula for a human molecule; i.e. the Sterner-Elser human molecular formula: $H_{375,000,000}O_{132,000,000}C_{85,700,000}N_{6,430,000}Ca_{1,500,000}P_{1,020,000}S_{206,000}Na_{183,000}K_{177,000}Cl_{127,000}Mg_{40,000}Si_{38,600}Fe_{2,680}Zn_{2,110}Cu_{76}I_{14}Mn_{13}F_{13}Cr_{7}Se_{4}Mo_{3}Co_{1}$
2004	"Chemical Affinity in 1806" by: Tominaga Keii	Chapter sub-section which discusses Goethe's human elective affinities in the context of modern chemical thermodynamics.
2007	*Human Chemistry* (ch. 16: Human Thermodynamics) by: Libb Thims	The first textbook on human chemistry (ch. 16: human thermodynamics); expounding on the view of systems of humans as Carnot cycle driven thermodynamic systems of chemically reactive human molecules. 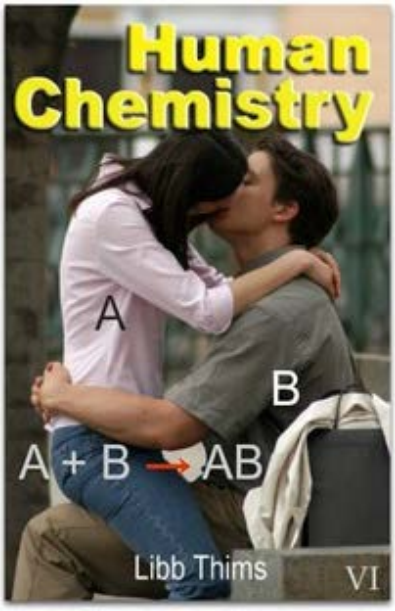
2008	*The Human Molecule* by: Libb Thims	The first book on the history of the concept of the "human molecule" the central component of a human thermodynamic system. The photo shown is a screenshot of an Issuu.com stack of books on "reality" in which Thims' *The Human*

Molecule is one of the top 39 books on the subject of what is real.

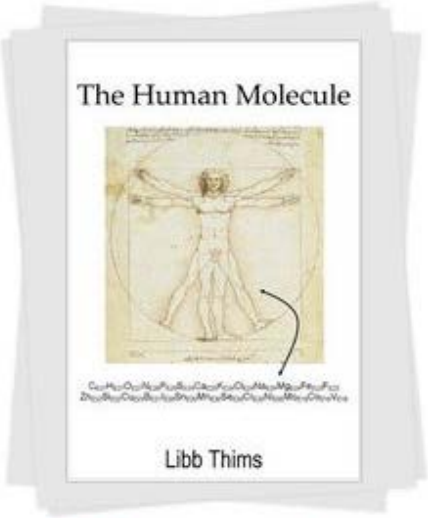

Reality
39 publications 0 followers
Craig Zimmermann

Well done! The Human Molecule was added to a stack
issuu

2009	*Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* by: Thomas Wallace	Applies physical chemistry logic, i.e. reactions, dynamics, mechanisms, transition states, etc., to the explanation of the historical growth and decline of civilizations, using concepts such as reaction equations, A + B → C + D, Le Chatelier's principle, and most importantly the Gibbs equation, $\Delta G = \Delta H - T\Delta S$, which, as he says, 'determines whether processes conducted by society will take place'.

Discussion

Among these, the 1923 textbook *Thermodynamics and the Free Energy of Chemical Substances*, by American physical chemists Gilbert Lewis and Merle Randall, has been called "the world's most quoted scientific book" and among schools of thermodynamics it is the core book of the Lewis school. In the reference section to thermodynamics books and textbooks it is the certainly the most referenced [1]

In mechanical engineering community, it is the view of the MIT school of thermodynamics, particularly according to Italian engineer Gian Beretta, that the 1965 *Principles of General Thermodynamics* by George Hatsopoulos and Joseph Keenan is *more* referenced than that of Lewis and Randall. [2]

In the physics community, the 1985 textbook *Thermodynamics and an Introduction to Thermostatistics* by American physicist Herbert Callen is very popular and is likely the most-referenced modern statistical thermodynamics book. [3] Other famous publications having a direct bearing or influence on human thermodynamics are listed below. Of these, Austrian physicist Erwin Schrödinger's 1944 book *What is Life?* is one of the most references thermodynamics book in the non-thermodynamics community.

See also

â— Famous publications by age
â— Most-referenced thermodynamics publication

References

1. (a) Angrist, Stanley W. and Helper, Loren G. (1967). *Order and Chaos – Laws of Energy and Entropy*, (pg. 27: "most quoted"). New York: Basic Books.
(b) The "most-referenced" book in the reference sections of all of the books in American chemical engineer Libb Thims' 200+ thermodynamics book collection is Lewis and Randall's *Thermodynamics*.
2. Email communication between Gian Beretta and Libb Thims in circa 2006.
3. (a) Note: the popularity of the 1985 Herbert Callen textbook *Thermodynamics and an Introduction to Thermostatistics*, the second edition to the 1960 textbook *Thermodynamics: an Introduction to the Physical Theories of Equilibrium Thermostatics and Irreversible Thermodynamics*, is due in large part to the popularity of Callen's 1951 paper "Irreversibility and Generalized Noise", written with Ted A. Welton, which by 1955 had become a "citation classic", having been cited in over 370 publications.
(b) Staff writer. (1985). "This Week's Citation Classic", Current Contents, No. 1, Jan. 07.

θΔics

In science, **famous publications by age** are a ranking of famous publications, hmolscience (or physicochemical humanities) publications in particular, by the age of the thinker per both inception of conceptual idea and age of publication of finished product, i.e. when the publication was finished, published, and or presented.

Idea Inception (age)	± →	**Finished Product** (age)	**Thinker**	**Publication**	**Date**
9/47	13	60	Johann Goethe	*Elective Affinities*	1809
25/47	25	**72**	Henry Adams	*A Letter to American Teachers of History* / *Phase Rule Applied to History*	1910
		64	Vilfredo Pareto	*Treatise on General Sociology*	1912
		72	Frederick Rossini	"Chemical Thermodynamics in the Real World"	1971
42	13	**55**	Mirza Beg	*New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*	1987
		19	Christopher Hirata	"The Physics of Relationships"	2000
		74	Thomas Wallace	*Wealth, Energy, and Human Values*	2009

Quotes

The following are related quotes:

> "You are now past 30 and you are no longer a physicist."
>
> — Paul Dirac (1931), comment to Heisenberg shortly after his 30th birthday (Dec 5) [1]

See also

â— Hmolscience (youngest thinkers)
â— RE | reaction extent

References

1. (a) Dirac, Paul. (1963). "Interview with von Weizsacher", Archives for the History of Quantum Physics (pg. 19), Jun 9.
(b) Farmelo, Graham. (2009). *The Strangest Man: the Hidden Life of Paul Dirac, Mystic of the Atom* (pg. 230). Basic Books.

θΔics

In thermodynamics, **far-from-equilibrium** is a type of dynamic equilibrium in which the state of a system is constantly changing with time due to an external energy (or matter) input. The term was coined in the 1970s by Belgian chemist Ilya Prigogine and modeled on the phenomenon of Bénard cell formation. [1]

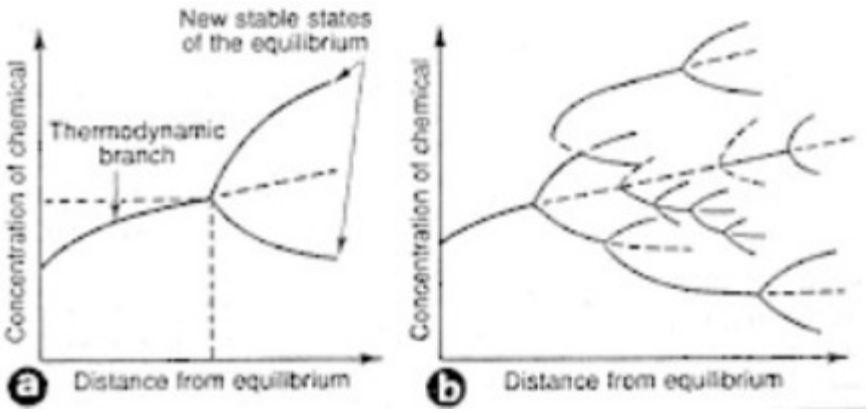

A Prigogine-style bifurcation diagram depiction of systems **far from equilibrium**, which in (a) split into two stable states, at a certain distance from equilibrium, and where in (b) the slightest tremor triggers many splittings. [10]

History

The general term far-from-equilibrium stems from the 1970s work of Belgian chemist Ilya Prigogine and is primarily based on the phenomenon of Bénard cell formation, where hexagonal convection cells spontaneously form in viscous mediums, such as silicon oil, when placed on a hot plate and heated past a bifurcation point into the turbulent flow regime. In a loose sense, according to Prigogine, far-from-equilibrium states of systems, are those subjected to flows of matter and or energy, in the non-linear (i.e. turbulent) regime, wherein the system can lose its stability and evolve, being driven by internal fluctuations, into one of the many states available to the system. [2]

Humans | Pro-view

In the 1970s and 80s, through the publications of Prigogine and his associates, the term “far-from-equilibrium” was parlayed over into the social sciences as the supposed type of equilibrium in which human life exists. In the 1989 book *Exploring Complexity*, Prigogine and Greek-born Belgian physicist Grégoire Nicolis, for instance, state as a matter of assumed fact that: [3]

> “Our everyday experience teaches us that adaptability and plasticity of behavior, two basic features of nonlinear dynamical systems capable of performing transitions in **far-from-equilibrium** conditions, rank among the most conspicuous characteristics of human societies.”

Through the very popular spreading of this assumed equivalence of life being in the far-from-equilibrium range, in spite of the fact that the majority of biospheric life exists in Carnot cycle like heat engine state of solar diurnal contact, rather than continuous heat contact (as with Bénard cells), the view of human life in the far-from-equilibrium range is common. In the 2008 book *Far from Equilibrium: Essays on Technology and Design Culture*, authors Sanford Kwinter and Cynthia Davidson tell us: [4]

> “Life is a case of maintaining a very delicate structure—ourselves—a significant distance from equilibrium at nearly all times, and at others—in order to evolve, grow and invent—very **far from equilibrium** indeed.”

These types of statements, however, make little sense from the point of view of Gibbs free energy transformations, which is the dominant term in biochemical thermodynamics, in which, during each daily heat cycle, separated biological systems evolve unto configurations typified of minimal Gibbs free energy. [5] The term is even used in economic thermodynamics and war thermodynamics. In the 2007 book *Age of Fallibility*, author George Soros states, for instance, states that the expression "far-from-equilibrium conditions" can be applied to political and social situations. Soros argues that “in financial markets, far-from equilibrium conditions prevail often, but by no means all the time.” In respect to World War Two, Soros states that Jews during the 1944 Nazi Germany occupation of Hungary, faced with daily extermination, were in a far-from-equilibrium condition. As another example, the collapse of the Soviet empire, according to Soros, was a “far-from-equilibrium process *par excellence*.” [6]

Objections

The term “far-from-equilibrium”, being generally ill-defined concept and, in biological and human spheres, a huge extrapolation away from Bénard cell fluid dynamics, has met with questionable objection in recent years.

American sociologist Thomas Fararo, in his 1992 book *The Meaning of General Theoretical Sociology*, for example, warns his readers not to mix up the far-from-equilibrium Prigoginean thermodynamics interpretation of equilibrium and structure formation with the standard sociological one.

In 1977, the year of Prigogine’s win of the Nobel Prize for his work in thermodynamics, particularly in reference to his far-from-equilibrium theory in biological evolution, Russian physical chemist Georgi Gladyshev outlined his own thermodynamic evolution theory (hierarchical thermodynamics), in opposition to Prigogine’s, in which life processes are said to evolve in the “quasi-equilibrium” range. [7] In 2005 commentary on Prigogine’s far-from-equilibrium second law of thermodynamics logic for use in modeling biological evolution, Gladyshev stated: [8]

> “Many works on nonequilibrium thermodynamics, especially the thermodynamics of systems that are **far from equilibrium**, remain a faint future hope ... some of these works, we daresay, are near ‘mathematically trimmed’ fantasies useless for real life.”

In 2005, authors Eric Schneider and Dorion Sagan ask, in question of the term far-from-equilibrium: [9]

> “Is life a **far-from-equilibrium** system? If so, how far are organisms from equilibrium? And what does this phrase mean? In fact, the term *far-from-equilibrium* may be more applicable to backfiring engines than smoothly running life-forms.”

They note that “far-from-equilibrium systems, a phrase that was, to the best of our knowledge, never defined by Prigogine and the Brussels school, seem to occur when sufficient but not excessive energy materially cycles.” In addition, according to Schneider and Sagan, “the tradition in nonequilibrium thermodynamics has been to define *far-from-equilibrium* events after the first bifurcation.” In respect to life, however, they note that many biological liquid systems operate under equilibrium thermodynamic conditions and that although “life itself seems to be a far-from-equilibrium phenomenon” it is, in reality, a collection of processes and structure, made of constitutive chemical reactions, requiring low activation energies, and that: [9]

> “Life is made up of [so] many reactions in the near equilibrium range [that it] may not be so **‘far’ from equilibrium** as has been suggested.”

In 2012, American cybernetics theorist David Abel commented: [11]

> “Chaos theory deals with many self-ordering phenomena that spontaneously move events **far from equilibrium**. But candle flames, vortices at bathtub drains, sand piles, and hurricanes have absolutely nothing to do with life. If anything, the ‘dissipative structures’ of chaos theory (e.g. tornadoes) tend to destroy life and any other form of formal organization that they encounter. The bottom line is that merely ‘moving far from equilibrium’ is not the key to the life-origin problem as supposed.”

Choas

Some, even in the modern day, however, are still so enamored with the unwieldy term ‘far-from-equilibrium’ that arrive at outlandish conclusions; one example being Len Fisher, and his 2009 book *The Perfect Swarm*, where he happily

concludes that humans and societies are so far far away from equilibrium that they are continuously at the edge of chaos. Societies, on average, aside from revolution and war, are not continuously at the edge of chaos as Fisher posits (based on his pied piper adoption of the Prigogine view).

Correct view

Correctly, humans and social systems are not far from equilibrium systems. Although equilibrium is a tricky subject, in overview, correctly, there are many varieties: (a) there are daily equilibrium variations (day heating vs night cooling), (b) the equilibrium = death version, e.g. a dead relationship, such as a marriage or company at the end of its reaction, (c) societal equilibrium variations, e.g. the rise and fall of Rome, and so on.

References

1. (a) Pacault, A., and Vidal, Christian. (1978). *Synergetics, Far from Equilibrium: Proceedings of the Conference Far from Equilibrium: Instabilities and Structures*, Bordeaux, France: Springer.
(b) Kondepudi, Dilip and Prigogine, Ilya. (1998). *Modern Thermodynamics – from Heat Engines to Dissipative Structures*, (section: Far-From-Equilibrium Systems, pg. 409). New York: John Wiley & Sons.
(c) Kondepudi, Dilip. (2008). *Introduction to Modern Thermodynamics*, (section: Biological Systems, pg. 379). John Wiley and Sons.
2. Prigogine, Ilya (1984). *Order Out of Chaos – Man's New Dialogue With Nature*. New York: Bantam Books, Inc.
3. Nicolis, Grégoire and Prigogine, Ilya. (1989). *Exploring Complexity - an Introduction*, (esp. sect. "Self-Organization in Human Systems", pgs. 238-42). New York: Freeman and Co.
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5. (a) Haynie, Donald. (2001). *Biological Thermodynamics.* Cambridge: Cambridge University Press.
(b) Gladyshev, Georgi, P. (1997). *Thermodynamic Theory of the Evolution of Living Beings.* Commack, New York: Nova Science Publishers.
6. Soros, George. (2007). *The Age of Fallibility: Consequences of the War on Terror* (pg. 8). PublicAffairs.
7. (a) Gladyshev, Georgi, P. (1978). "On the Thermodynamics of Biological Evolution", *Journal of Theoretical Biology*, Vol. 75, Issue 4, Dec 21, pp. 425-441 (Preprint, Chernogolovka, Institute of Chem. Phys. Academy of Science of USSR, May, 1977, p. 46). (b) Gladyshev, Georgi, P. (1997). *Thermodynamic Theory of the Evolution of Living Beings.* Commack, New York: Nova Science Publishers.
8. Gladyshev, Georgi P. (2005). "The Second Law of Thermodynamics and the Evolution of Living Systems", (section: Phenomenological vs. Nonequilibrium). *Journal of Human Thermodynamics*, Vol. 1, Issue 7, (pgs. 68-81). Dec.
9. Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Life*, (pgs. 86-87). Chicago: The University of Chicago Press.
10. Coveney, Peter. (1990). "Chaos, Entropy, and the Arrow of Time", *New Scientist*, Sep. 29.
11. Abel, David L. (2012). "Moving 'Far From Equilibrium' in a Prebiotic Environment: the Role of Maxwell's Demon in Life Origin" (§: 'Far from Equilibrium' Is Not Unique to Life or the Key to Life, pg. 225, in: *Genesis – in the Beginning: Precursors of Life, Chemical Models and Early* (editor: Joseph Seckbach) (pgs. 231-36). Springer.

Further reading

â— Ross, John. (2008). *Thermodynamics and Fluctuations Far from Equilibrium*. Springer.

θΔics

In human thermodynamics, **Fardin Khalili** (1988-) is an Iranian-born American mechanical engineer noted for being the 2013 Institute of Human Thermodynamics funded English translator of Iranian mechanical engineer, thermodynamicist, and 75th prime minister Mehdi Bazargan's 1956 book *Thermodynamics of Humans*, the first actual book devoted to the subject of "human thermodynamics", written, independently, only three years after English physicist C.G. Darwin, in his 1952 *The Next Million Years*, Introduction chapter, defined the science of "human thermodynamics" as the statistical mechanical study of systems of human molecules. [1]

Education

Khalili completed his BS in mechanical engineering in 2012 at Islamic Azad University of Mashhad, Iran, and currently is working on his MS in mechanical engineering at Northern Illinois University, where he is teaching assistant in engineering thermodynamics (MEE350) and heat and mass transfer (MEE352).

In spring 2014, Khalili completed his MS, with a thesis on "Three-Dimensional CFD Simulation and Aeroacoustics Analysis of Wind Turbines".

Khalili will continue his education in the PhD program at the University of South Florida in Fall 2014.

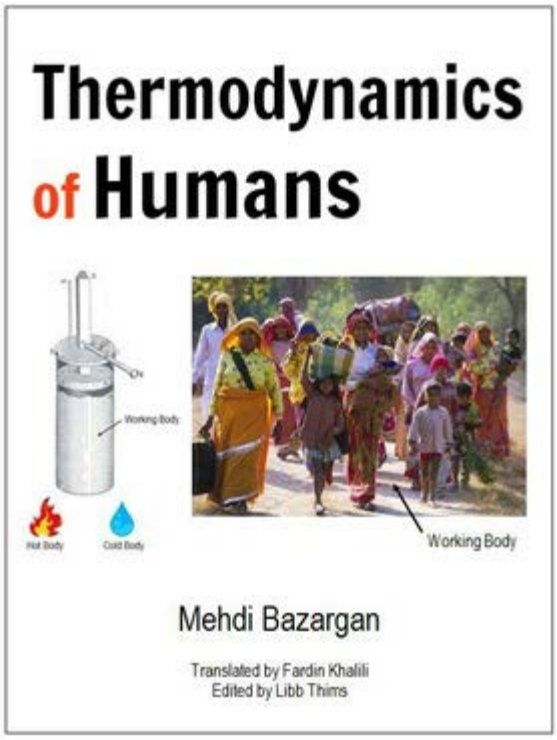

Current working draft cover (18 Apr 2013) to Bazargan translation project.

Bazargan | Translation project

In 2013, Libb Thims met Khalili will lecturing on human thermodynamics at Northern Illinois University, and inquired if he would be willing to do the Farsi-to-English translation of Bazargan's book? Khalili agreed to the project and began some of the translation at that time.

In May 2014, Khalili re-entered into a continuation of the Bazargan translation, previously started; estimating to finish the translation by the end of summer. [2]

References

1. Bazargan, Mahdi. (1956). *Love and Worship or Thermodynamics of Humans*, 216-pgs. (Farsi: *Eshq va Parastesh ya Thermodynamic-e Ensan*) (Persian (pdf): عشق و پرستش ي ا ترموديناميك انسان). Tehran: Enteshar Publications.
2. Email communication from Fardin Khalili to Libb Thims (16 Mar 2014).

External links

- Fardin Khalili – LinkedIn.

θΔics

In hmolscience, **fate** (TR:67) is []

Lucretius

In 55BC, Greek atomic theory philosopher by Lucretius employed the term fate, in the context of Epicurean swerve theory, as follows: (Q)

> "Again, if ev'r all motions are co-linked,
> And from the old ever arise the new
> In fixed order, and primordial seeds [atoms]
> Produce not by their swerving some new start
> Of motion to sunder the covenants of **fate**,
> That cause succeed not cause from everlasting,
> Whence this free will for creatures o'er the lands,
> Whence is it wrested from the **fates**,—this will
> Whereby we step right forward where desire
> Leads each man on, whereby the same we swerve
> In motions, not as at some fixed time,
> Nor at some fixed line of space, but where
> The mind itself has urged? For out of doubt
> In these affairs 'tis each man's will itself
> That gives the start, and hence throughout our limbs
> Incipient motions are diffused"

(add)

Shakespeare

The following are the discerning views of Shakespeare on fate:

> "Fate, show thy force; ourselves we do not owe;
> What is decreed must be, and be this so!"
>
> — William Shakespeare (1602), *Twelfth Night* (Act 1, Scene 5); cited by Edward Farber (1961), in respect to ranking greatest chemists [2]

(add)

Rankine

Scottish mathematical physicist and engineer William Rankine employs the term fate, in the fifth stanza of his 1845 poem "The Mathematician in Love", in the context of third law of motion (see: laws of motion), as follows:

> No doubts of the **fate** of his suit made him pause,
> For he proved, to his own satisfaction,
> That the fair one returned his affection; — "because,
> "As every one knows, by mechanical laws,
> "Re-action is equal to action."

(add)

Bray | No Fate / No Chance

The following are Bray quotes on fate and or chance:

> "The scientist does not behold in nature what the poet does. He sees no blind chance, no miracles, no **fate**, unless you call perfection by that name."
>
> — Henry Bray (1910), *The Living Universe* (pg. 216)

> "Neither **fate** nor chance is found, but everywhere law and harmony, that make the mighty cosmos one."
>
> — Henry Bray (1910), *The Living Universe* (pg. 226)

(add)

Other

The 2007 film *No Country for Old Men*, by the Coen brothers, employs "flipism" (Q) as a vicarious arbiter of fate; the character Chigurh occasionally gives his victims a second chance by flipping a coin and letting fate decide if he should spare them or not: (Q)

> **Chigurh:** "Call it."
> **Carla Jean:** "The coin don't have no say. It's just you."
> **Chigurh:** "I got here the same way the coin did."

(add)

Quotes

The following are noted quotes:

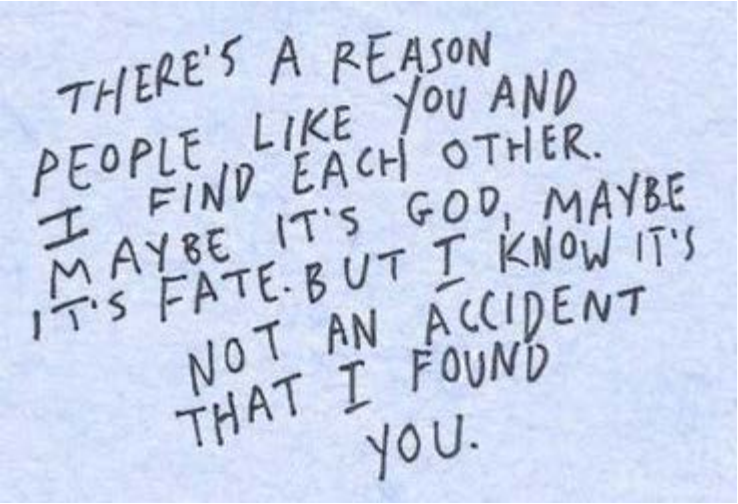

A typical or popular "**fate**" quote (Q) showing the interplay and or contrast with akin terms: accident or god.

> "A man's character is his **fate**."
>
> — Heraclitus (475BC)

> "The human species is but one of many. Viewed from a sort of universal microscope, we appear as but a vast collection of molecules in motion. In our current state we are firmly attached to an earthly substrate, feeding off the energy gradient of the sun. The **fate** of our chemical species is undeniably tied to the affinities and energies of interaction required to maintain our evolving earth ecosystem. We live in a closed system. In order to understand the nature of things, we must learn more about both our reactions and our products."
>
> — Jeff Tuhtan (2012), PhD "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality" [1]

See also

- Destiny
- Chance
- Determinism

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θΔics

In films, **Father Merrin**, or Lankester Merrin, played by Swedish actor Max von Sydow, in the 1973 film *The Exorcist* (9th highest adjusted grossing movie), a film-version adaptation of the 1971, 11-million copy selling book by American writer William Blatty, was based on French philosopher Pierre Teilhard, and his life-long efforts to reconcile religion (good and evil), evolution, consciousness, chemistry, and thermodynamics into one unified theory. [1] A specific referenced explanation remains to be found to detail how exactly and how much Blatty was influenced by Teilard, but, in any event, as filmographer Colleen McDannell points out: [2]

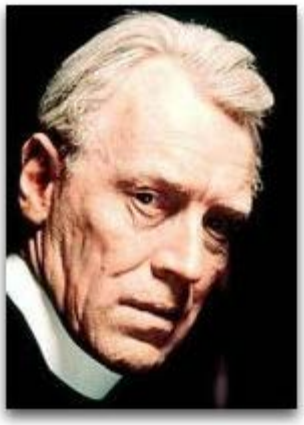

Father Merrin (1973) **Pierre Teilhard** (1881-1955)

Left: paleontologist-priest, played by Swedish actors Max Sydow (1929-); and later by Stellan Skarsgard (1951-). Right: Pierre Teilhard the French philosopher, Jesuit priest and paleontologist, who notably took part in the discovery of the 500,000-year old Peking man, a corroboration of evolution theory, who attempted throughout his prodigious number of publications to reconcile religion with modern science.

> "Blatty has frequently explained that he thought about Jesuit priest-philosopher-paleontologist Pierre Teilhard when creating the character **Father Merrin**, who besides spending years in China on archaeological digs, taught physics and chemistry at a Jesuit college in Egypt."

It is said that parts of the plot were themed on Teilhard's theory of evil (or the existence of Satan) in the world possibly being Lucifer [or matter-energy spirit] working out his [or its] salvation through the process of physical evolution ending in Teilhard's omega point. This, supposedly, is captured in the use of "psychic energy" and the "unity of minds" or "world mind" (noosphere) theories of Teilhard. [3]

Theory

The following opening quote from the book version of *The Exorcist* is said to capture the theoretical aspects of Blatty's mindset: [5]

> "Matter is Lucifer crawling itself back to God"
>
> (Matter [is] Lucifer upward groping back to his God)

This means, supposedly, that matter (humans being an evolved incarnation of matter) must work its way through the permutations of entropy, chaos, and generally things that make humanity unhappy in order to know about good and evil. The following is a quote from Blatty (about the novel Legion) which explain his theory: [4]

> 'In the novel, the coda was needed to put a button on what the novel was all about -- Kinderman's rescue of God's goodness via his theory of "The Angel," which hypothesized that the fall of man was premundane; that before the Big Bang, mankind was a single angelic being who fell from grace and was given his transformation into the material universe as a means of salvation wherein his legion of fragmented personalities would spiritually evolve ("Can there be a moral act without at least the possibility of pain?") back into the original single angelic being, back into himself, a process foreshadowed on the opening page of The Exorcist ("that matter was Lucifer upward groping back to his God").'

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External links

â— Lankester Merrin – Wikipedia.
â— The Exorcist – Wikipedia.
â— Father Merrin – Imdb.com.

θΔics

In famous publications, ***Faust*** is a epic drama, written in two-parts (1808,1832) by German polymath Johann Goethe, which retells the story of the legend of Faust, about a man who is striving to learn everything that can be known so to gain control over the physical world.

In the drama, the first use of Faust's power after literally signing a contract with the devil is to fall in love with and impregnate a teenage girl. [2]

Goethe puts into the mouth of Mephistopheles: "all that has achieved existence deserves to be destroyed." [5]

Title: "Mephiltopheles and the Pupil" (1828) by Eugene Delacroix, a depiction of **Faust** and Mephistopheles.A 1918 poster for Goethe's ***Faust*** by Richard Roland Holst, the story of a main who strives to learn everything that can be known so to gain power over the physical world.

Origin

The origin of the legend of Faust traces to a Dr. John Faust, Johann Faust, or Faustus (b. Knittlignen, Saubia-d. Staufen, 1538).

The etymology of Faust was first put forward in a 1587 literary work by Johann Spies who professes to narrate the “History of Dr. John Faust, the Far-famed Enchanter, and Professor of the Black Art”. [7]

The Faust legend, according to Philip Ball, initially a folk tale about an itinerant charlatan with roots that stretch back to the Bible, the Faust story was later blended with the myth of Prometheus, who paid a harsh price for daring to challenge the gods because of his thirst for knowledge. Goethe’s Faust embodied this fusion, and Mary Shelley popularized it in Frankenstein, which she explicitly subtitled ‘Or The Modern Prometheus’. Roslynn Haynes, a professor of English literature, has explored how the Faust myth shaped a common view of the scientist as an arrogant seeker of dangerous and powerful knowledge. [6]

The Faust story as some comparison to Clive Barker's 1987 *Hellraiser* film, albeit without the intellectual aspects.

Goethe | Overview

From the age of 4½, in 1753, wherein he learned the story of *Faust*, through his puppet stage, till the last two months of his reaction existence, in 1832, when he finished the second part to his epic drama version of the *Faust* legend—the subject of a man striving to learn everything that can be learned—seemed to occupy a large part of his thoughts. As summarized by Jaroslav Pelikan, in his 1997 *Faust the Theologian*: [1]

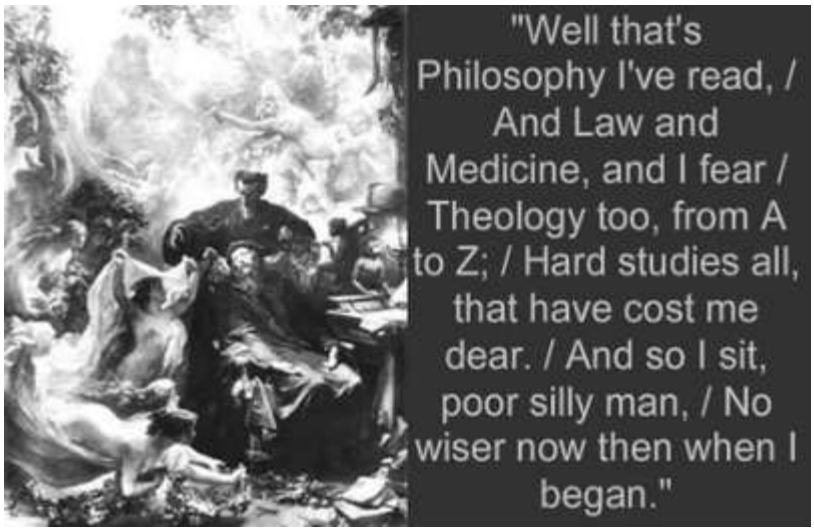

> "Doctor **Faust** the polymath is — as was Goethe the polymath — a man of "a hundred scholarly disciplines" [and] also a natural scientist."

Goethe's epic closet drama*Faust*, was to be completed in stages, and only published in its entirety after his death. The first part was published in 1808 and created a sensation.

The first operatic version, by Spohr, appeared in 1814, and was subsequently the inspiration for operas and oratorios by Schumann, Berlioz, Gounod, Boito, Busoni, and Schnittke as well as symphonic works by Liszt, Wagner, and Mahler.*Faust*became the ur-myth of many figures in the 19th century. Later, a facet of its plot, i.e., of selling one's soul to the devil for power over the physical world, took on increasing literary importance. [2] As far as authors go, according to WorldCat Identities, Shakespeare is #1 and Goethe is #2, based predominately on the following two main works of each author:

> Hamlet (by Shakespeare)
> 3,641 editions published between 1603 and 2009 in 72 languages and held by 6,941 libraries worldwide
>
> Faust (by Goethe)
> 4,422 editions published between 1787 and 2008 in 55 languages and held by 5,204 libraries worldwide

As far as minds go, regarding density of knowledge base and vocabulary variety, however, Goethe far excelled Shakespeare, in that, language ability aside, Goethe mastered every field of knowledge; mathematics and astronomy, aside—although he did eventually write a short treatise on mathematics. The references state that Goethe had three-times the vocabulary of Shakespeare.

Homunculus | Laboratory produced life

The adjacent depiction shows Wagner, a famed sorcerer's former student, creating Homunculus in the chemical laboratory using fire (or heat) and some type of chemical apparatus, as described in Goethe's 1832 *Faust part II* (see: laboratory produced life).

In his talk with Johann Eckermann, Goethe is supposed to have said that Homunculus is virtually the same as the Leibnizian entelechy or monad, according to John

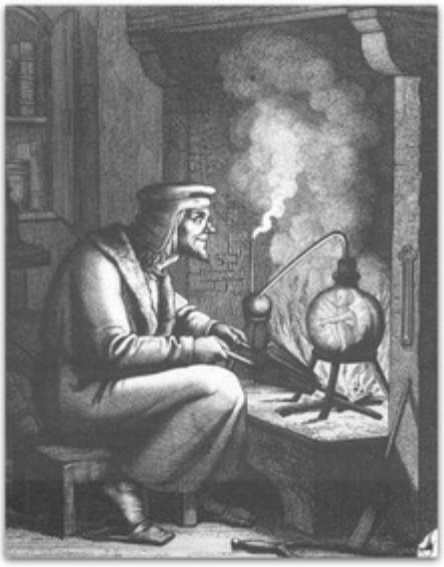

Williams. [3]

Wagner, a famed sorcerer's former student, creating **Homunculus** (life) in the chemical laboratory.A statue of **Faust** and Mephistopheles.

These thoughts, Goethe was toying with here, in literary voice, seem to be, in a way, a precursor to the defunct theory of life, the view that when one goes searching for the so-called "origin of life", from the evolutionary point of view, or the exact second of the "start of life", from the conception and creation point of view, that, in the chemical scheme of things, all things being made of atoms, and hence all things being molecular structures, the concept of an atom, chemical, or molecule "coming alive" becomes a very blurry, and eventually untenable, notion. One may thus conclude that Goethe was digging around in very complex issues here.

Thermodynamics

See main: Thermodynamics of Goethe's Faust

In an 1892 lecture, titled "Goethe's Presentiments of Coming Scientific Ideas", held in the General Assembly of the Goethe Society in Weimar, German physician and physicist Hermann Helmholtz attempted to explain Goethe's *Faust* through the lens of thermodynamics. [1] In this speech, Helmholtz postulates that Goethe was aware of the basics of the conservation of energy and argues that the ebb and flow of life, and its relation to death, has an explanation in the total constancy of energy or active force, for both animate and inanimate life.

Other

A volume of *Faust* comprised part of German-born American physicist Albert Einstein's (IQ=220) personal library collection 52-volume set of Goethe’s works.

Serbian-born American electrical engineer Nikola Tesla (IQ=195) memorized *Faust* in entirety. The idea for a self-starting AC electric motor came to Tesla one evening as he was reciting a poem of Goethe, specifically a passage from Faust, and watching a sunset, at which point he imagined a magnetic field rapidly rotating inside a circle of electo-magnets. [4]

A scene of Faust from the 1865 edition. [6](link)

On his deathbed, John Neumann (IQ=190) entertained his brother with word-for-word recitations of the first few lines of each page of Goethe's *Faust*. [8]

Quotes | Faust

The following are noted quotes from Faust:

> "To grant me a vision of nature's forces that bind the world, all its seeds and sources and innermost life... all this I shall see... and stop peddling in words that mean nothing to me."
>
> (Daß ich erkenne was die Welt im Innersten zusammenhält... Schau alle Wirkenskraft und Samen... und tu nicht mehr in Worten kramen.)
>
> — *Faust*, lines 382-5 (link)

> "Until one is committed there is always hesitancy, a chance to draw back. Always ineffectiveness concerning all acts of initiative and creation. There is one elementary truth—the ignorance of which kills countless ideas and splendid plans—that the moment one definitely commits oneself, then providence moves too. All sorts of things occur to help one, that would never otherwise have occurred. A whole stream of events issues from the decision, raising in one's favor all manner of unforeseen incidents and material assistance, which no man could have dreamed would have come this way. Whatever you can do or dream you can do, begin it. Boldness has genius, power and magic in it, begin it now."
>
> — *Faust*

This quote, in particular, embodies what genius studies expert Tony Buzan calls the Goethendipity principle.

Quotes | Related

The following are related quotes:

> "I regard my work on alchemy as a sign of my inner relationship to Goethe. Goethe's secret was that he was in the grip of that process of archetypal transformation that has gone on through the centuries. He regarded his ***Faust*** as an *opus magnum* or *divinum*. He called it his 'main business', and his whole life was enacted with the framework of this drama."
>
> — Carl Jung (c.1940), Swiss psychologist

> "For myself, the pleasure of the work had always provided justification enough for doing it. Sitting at my desk or at some café table, I manipulate mathematical expressions and feel like **Faust** playing with his pentagrams before Mephistopheles arrives."
>
> — Steven Weinberg (1992), *Dreams of a Final Theory*[9]

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External links

â— Goethe's Faust – Wikipedia.

θΔics

In terminology, **Faustian** refers to legends surrounding the unsated "mind" archetype of Johann Faust (c.1485-1541), the story of someone—extremely tired and bored with mundane worldly existence, unsatisfied with its explanations—who sold their soul to the devil in return for knowledge, the secrets of nature, power, according to some accounts, and a truthful explanation of the meaning of it all; the gist of which seems to be captured well by the following: [1]

A depiction of Faust in his study, by Georg Kersting (1829), a depiction of the so-called **Faustian** mind, an unsated desire to find truth. (Ñº)

> "I, too, have long investigated, have gone through all arts and sciences. I became a theologian, consulted authorities, weighed all, tested all,—polemics, exegesis, dogmatism. All was babble: nothing breathed of divinity! I became a jurist, endeavored to become acquainted with justice, and learned how to distort justice. I found an idol, shaped by the hands of self-interest and self-conceit, a bastard of justice, not herself. I became a physician, intending to learn the human structure, and the methods of supporting it when it gives way; but I found not what I sought, — I only found the art of methodically murdering men. I became a philosopher, desiring to know the soul of man, to catch truth by the wings and wisdom by the forelock; and I found shadows, vapors, follies, bound into a system!"
>
> — Faust (c.1770), Augsburg puppet-play version [2]

(add discussion)

Machiavellian encyclopedia

Faustian, according to some accounts, refers to someone who is Machiavellian (see: Niccolo Machiavelli) in his or her quest to understand the true nature of the meaning of the Prometheus myth in the context of the big riddle of the universe; a Machiavellian mind + Galilean mind in one person, so to say. Someone who is Faustian, in this context, is a "scholar of encyclopedia ambitions and Machiavellian dispositions", as American sociologist Steve Fuller (2000) described Vilfredo Pareto, in the context of the Harvard Pareto circle, who, by no coincidence, is the third ranked social Newton behind Goethe (#1), who is aptly described by Jaroslav Pelikan (1997) as: "Doctor Faust the polymath is — as was Goethe the polymath — a man of "a hundred scholarly disciplines" [and] also a natural scientist." [5]

Opening soliloquy

The main subject of the play, according to James Froude (1848), is the opening soliloquy, which varies per interpretation, but generally yielding to the same general theme; the following being the typical form:

> At last so far in learning I have gone,
> That I'm the laughing-stock of ev'ry one;
> All books, from first to last, I have turn'd over,
> The stone of wisdom I cannot discover.
>
> Med'cine and jurisprudence come to nought,
> In magic some assistance must be sought;
> My studies in theology were vain,
> My sleepless nights yet unrepaid remain.

Not one whole garment have I left to wear,
My load of debts is more than I can bear'
To pow'rs infernal I myself will bind,
That nature's deepest secrets I may find.

— Faust (1846), "Opening soliloquy", Simrock's version [9]

Typically, the play opens to a scene of Faust seated at a table overturning the leaves of a book:

"With all my learning, I, Johannes Faust, have accomplished just so much, that I must blush with self-shame. I am ridiculed everywhere, no one reads my books, all despise me. How fain am I to become more perfect! Therefore I am rigidly resolved to instruct myself in necromancy."

— Faust (c.1805), performance by Schutz [2]

"I seek for learning in this book and cannot find it. Though I study all books from end to end, I cannot discover the touchstone of wisdom. O, how unfortunate art thou, Faust! The sleepless nights I have spent in fathoming the mysteries of theology! But, no! By heaven, I will no longer delay, I will take upon myself all labor, so that I may penetrate into that which is concealed, and fathom the mysteries of nature!"

— Faust (date), Geisselbrecht's puppet-play [2]

(add)

Goethean Faust

In 1753-55, German thinker Johann Goethe, aged 4½-6½, and his sister are given, by their grandmother, a puppet theater for Christmas (see: Goethe timeline). Goethe learns the story of Faust through the puppet theater; by he 6½ was arranging and conducting plays on the miniature stage. [6] By age 21, Goethe had seen the so-called "Strasburg puppet-play version" of Faust, which, supposedly, opened to a brief prologue in hell, in which Pluto order the temptation of Faust. Goethe, in his autobiography *Poetry and Truth*, reflected on his intercourse with German philosopher Johann Herder, in Strasburg, as follows: [7]

Goethe learned the story of Faust through the puppet theater; by 6½ was arranging and conducting plays on the miniature stage.

"The puppet-play echoed and vibrated in many tones through my mind. I, also, had gone from one branch of knowledge to another, and was early **enough convinced of the vanity of all**. I had tried life in many forms, and the experience had left me only the more unsatisfied and worried. I now carried these thoughts about with me, and indulged myself in them, in lonely hours, but without committing anything to writing. Most of all, I concealed from Herder my mystic-cabalistic chemistry, and everything connected with it."

— Johann Goethe (1770), reflection on intercourse with Johann Herder, in Strasburg [7]

Here, in this conviction of the "vanity of it all", we are reminded of the so-called drive-thru paradox, as depicted in the 1997 film *Good Will Hunting*, a semi-fictionalized elaboration on the life and times of William Sidis, about the

paradoxical relation between the seeming purity of love and the apparent vanity inherent in the occupational ladder, as Faust says "how fain am I to become more perfect!", or as captured in the so-called alley equation, and the David Buss sexual receptiveness studies.

Faustian quest

The phrase “Faustian quest” tends to refer to a quest for knowledge, of truth of the universal genius variety. (Ñº)

Faustian insight

The following quote, from Goethe’s 1832 *Faust*, seems to capture the notion of Faustian insight:

> “To grant me a vision of nature's forces that bind the world, all its seeds and sources and innermost life ... all this I shall see... and stop peddling in words that mean nothing to me.”

In 2013, to cite usage, in the context of economic thermodynamics, during the JDNM review, Stephen Ternyik stated the following:

> “The Pareto-optimum closed the scientific gap to marginal benefit (= statistical social science / 2 research articles send to you via e-mail); while working on the political economics of American Independence, I could apply his theory of elite circulation = history as cemetery of elites. Also of methodical interest is his dynamic view of speculation/speculators as drivers of socio-economic change, i.e. of '**Faustian**' insight into our current monetary transition period.”

Faustian bargain

The phrase “Faustian bargain” tends to refer to refer to something made or done for present gain without regard for future cost or consequences. [3]

Faustian moment

The phrase “Faustian moment” seems to refer to a particular turning point or time at which one either has a moment of Faustian insight and or becomes Faustian. In 2005, American chemical engineer and ecologist Robert Ulanowicz, e.g., recalled when, several decades back, he had a “Faustian moment” in which he made a pact with the devil, so-to-speak, i.e. he gave up his worldly pursuits as formal chemical engineer, and switched careers to understand how the energy and matter interactions of the total set of organisms in Chesapeake Bay function. [4]

Faust-like | Modern Fausts

Roger Bacon has been categorized as “Faust-like” in legend. [10] Fritz Haber has been called a “modern Faust”, in regards to his willingness to serve any master who could further his passion for knowledge and progress. [11]

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External links

â— Faustian – Dictionary.com.

θΔics

In science, **fear** is a state of reduced activity or immobility characterized by the presence or imminence of danger. [1] Neuro-biologically, fear has been shown to be associated with a hyperactivity in the amygdala, one of the four parts of the limbic system.

Fear, and correlative immobility, has been shown to be associated with reduced levels of endorphins in mice, who in such a condition or state tend to freeze and remain close to the walls (above), unable to explore their surroundings. [1]

Endorphins

In 2001, American neurobiologist Donald Pfaff showed that fear is correlative to a reduced level of endorphins. Conversely, a high endorphin level is associated with fearlessness.

Pfaff and associates showed that that genetically modified mice made to be incapable of producing endogenous opiates (lacking endorphins), behaved such that the smallest fright made the animals freeze, and while in large rooms they tended to say close to the walls, showing typical signs of fear. [2]

In 1930, Subrahmanyan Chandrasekhar noted the following about Paul Dirac: [3]

> "[Dirac is a] lean, meek shy young fellow [FRS] who goes slyly along the streets. He walks quite close to walls, and is not at all healthy. A contrast to Mr Fowler […] Dirac is pale, thing, and looks terribly overworked."

(add discussion)

Quotes

The following are related quotes:

> "We **fear** what we don't understand."
>
> — Aesop (c.550BC); *Batman Begins* (2005)

> "My object is to dispel the **fear** of the gods, which arises simply from the fact that there are so many things which men do not yet understand, and therefore imagine to be effected by divine power."
>
> — Lucretius (55BC), *On the Nature of Things*

> "Courage is resistance to **fear**, mastery of fear—not absence of fear."
>
> — Mark Twain (c.1880)

> "The cave you **fear** to enter holds the treasure you seek."

— Joseph Campbell (c.1960), paraphrase (Ñº) of his ideology, recorded by associate

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â— Pfaff, Donald W. (1999). *Drive: Neurobiological and Molecular Mechanisms of Sexual Motivation* (fear, pg. 163). MIT Press.

External links

â— Fear – Wikipedia.

θΔics

In terminology, **feeling** or "feelings" refers to any number of various states of emotion, such as warmth (thermal word), anger, hate, envy, happiness, kindness, guilt, despise, disgust, fear, depression, etc.

A depiction of 30 types of **feelings** made by Jim Borgman. [4]

Hmolscience

In hmolscience, in the context of pure materialism and reductionism, when one follows the descendency of evolution downward to the pure atomic, chemical, molecular level, the equation of how "feelings" are explained within this framework often comes to the fore.

In 1874, English physical economist Stanley Jevons gave the following view of "feelings" in the context of the scientific method, reductionism, materialism, evolution, heat death, heat birth, thermodynamics, in relation to the human heart: [2]

> "By degrees it is found that the chemistry of organized substances is not widely separated from, but is rather continuous with, that of earth and stones. Life itself seems to be nothing but a special form of that energy which is manifested in heat and electricity and mechanical force. The time may come, it almost seems, when the tender mechanism of the brain will be traced out, and every thought reduced to the expenditure of a determinate weight of nitrogen and phosphorus."

> "No apparent limit exists to the success of scientific method in weighing and measuring, and reducing beneath the sway of law, the phenomena both of matter and of mind [mind brain duality]. And if mental phenomena be thus capable of treatment by the balance and the micrometer, can we any longer hold that mind is distinct from matter? Must not the same inexorable reign of law, which is apparent in the motions of brute matter, be extended to the most subtle **feelings** of the human heart [love]? Are not plants and animals and ultimately man himself, merely crystals, as it were, of a complicated form? If so, our boasted free will becomes a delusion, moral responsibility a fiction, spirit a mere name for the more curious manifestations of material energy. All that happens, whether right or wrong, pleasurable or painful, is but the outcome of the necessary relations of time and space and force, and of the laws of matter emerging from them, which are fixed in the very nature of things.
>
> Materialism seems, then, to be the coming religion, and resignation to the nonenity of human will the only duty. Such may not generally be the reflections of men of science, but I believe that we may thus describe the secret feelings of fear which the constant advance of scientific investigation excites in the minds of many who view it from a distance. Is science, then, essentially atheistic and materialistic in its tendency? Does the uniform action of material causes, which we learn with an ever increasing approach to certainty, preclude the hypothesis of an intelligent and benevolent creator, who has not only designed the existing universe, but who still retains the power to alter its course from time to time?"

He concludes this excellent tract, being already well past the 400-page mark of his treatise, by commenting "to enter

actually upon theological discussions would be evidently beyond the scope of this work."

In 1878, Scottish physicist James Maxwell, in commentary on Carl von Nageli, speculating about the "**feelings**" (or not) of molecules in relation to each other's proximity. [2]

In 2011, American biophysical chemist Mala Radhakrishnan, published her collected poems book *Atomic Romances, Molecular Dances*, written over a period of ten years, she frequently incorporates notions who atoms and molecules "feel" into her work: [3]

> "When I think of chemistry, I always think of what are the atoms **feeling** on a molecular and atomic level and in a lot of ways, the reactions that they experience are similar to the relationships that people experience."

(add discussion)

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(b) Radhakrishnan, Mala. (2011). *Atomic Romances, Molecular Dances* (abs). LuLu.com.
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External links

â— Feeling – Wikipedia.

θΔics

In hmolscience, **feelings and affinity dialogue** is an 1834 dialogue on love vs chemistry and physics, by French realism novelist Honore Balzac (see: Honore Balzac 2), as told in his *The Quest of the Absolute*, as dialoged between the characters "Balthazar" (note: possibly the precursor to the 1970s TV show character chemist Professor Balthazar (Ñº)), a chemist, who has a Goethe-Shelley like human chemical theory view of things and relationships, and Josephine, his wife, who has a romantic view of things.

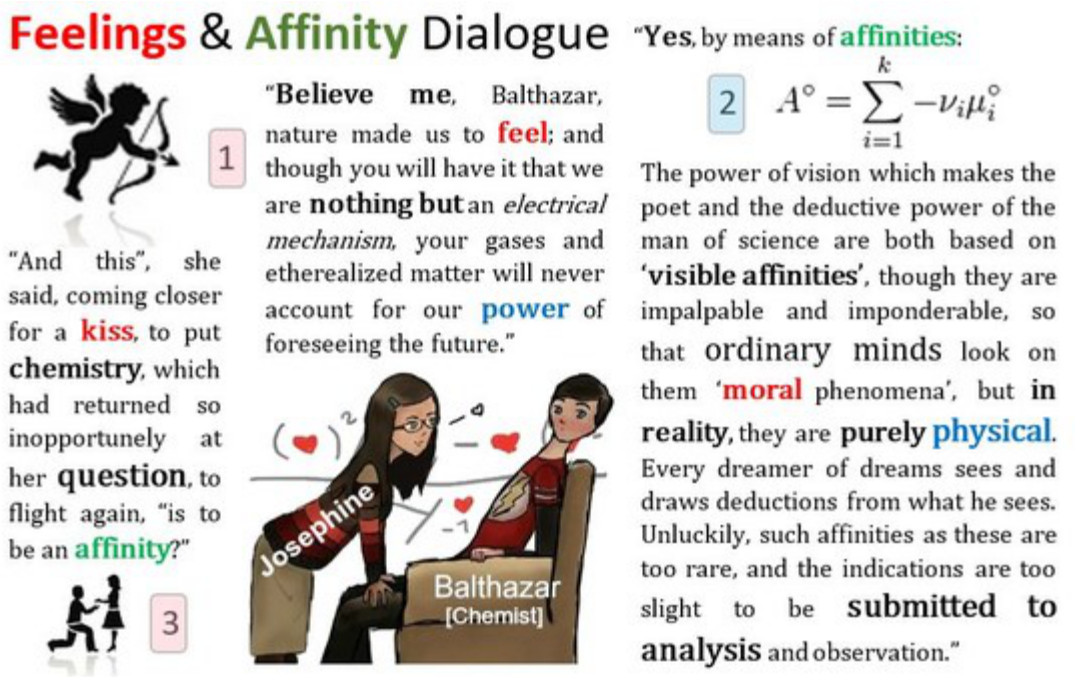

A rendition of the dialogue on love, feelings, and affinities, in the context of physico-chemical materialism, between the characters Josephine, a romantic, and her husband Balthazar, a chemist, of the Honore Balzac's 1834 novel *The Quest for the Absolute*.

Overview

In 1834, French realism novelist Honore Balzac, in his *The Quest of the Absolute* (*La Recherche de l'Absolu*), has Balthazar Claes, a chemist, debate with Josephine, his wife, about the underlying moral of the romantic belief that preoccupation with science atrophies the normal emotions that sustain personal relations and social responsibilities; the main dialogue of which is as follows:

> **Josephine**: "Believe me, Balthazar, nature made us to feel; and though you will have it that we are nothing but an electrical mechanism, your gases and etherealized matter will never account for our power of foreseeing the future.
>
> **Balthazar**: "Yes, by means of affinities. The power of vision which makes the poet and the deductive power of the man of science are both based on visible affinities, though they are impalpable and imponderable, so that ordinary minds look on them 'moral phenomena', but in reality they are purely physical. Every dreamer of dreams sees and draws deductions from what he sees. Unluckily, such affinities as these are too rare, and the indications are too slight to be submitted to analysis and observation."
>
> **Josephine**: "And this", she said, coming closer for a kiss, to put chemistry, which had returned so inopportunely at her question, to flight again, "is to be an affinity?"

Given the date of the dialogue, Balzac could have gleaned the above insight from either Goethe, his most likely source, or from Percy Shelley; he may, alternatively, have arrived at the above view on his own.

Other

Of note, some Iranians jokingly refer to Libb Thims as "Professor Balthazar" per similarity in views of Thims to Balthazar, owing to a Balthazar cartoon that played in Iran in the 1990s.

References

1. (a) Balzac, Honore. (1834). *The Quest of the Absolute* (*La Recherche de l'Absolu*) (pg. 85). Publisher.
(b) Haynes, Roslynn. (2007). "The Alchemist in Fiction: the Master Narrative" (Ñº), in: *The Public Image of Chemistry* (editors: Joachim Schummer, Bernadette Bensaude-Vincent, and Brigitte van Tiggelen) (§1:7-37). World Scientific.

θΔics

In hmolscience, **Felix Auerbach** (1856-1933) was a German physicist noted for his 1910 book *Ectropy and the Physical Theory of Life*, wherein he introduced the notion of "ectropy" as a type of biological anti-entropy. [1]

Overview

In this work, Auerbach compared the entropy of inert matter to what he called the "ectropy" of living form, linking it to the evolution and development of life. [2] Auerbach was known as an "ardent proponent of biological entropy decrease". [3] Supposedly, Auerbach had adopted the notion of ectropy, as the biological antithesis of entropy, from the 1900 work of German writer Georg Hirth. [4]

Education

Auerbach studied under German physicist Gustav Kirchhoff, at the University of Breslau, in Heidelberg, and later with German physicist Hermann Helmholtz, in Berlin, completing his doctorate in 1875 under him with a dissertation on *The Nature of Vowel Sounds*. In 1879, Auerbach worked at the physical institute of the University of Wroclaw as an assistant to German physicist Oscar Meyer (noted for his 1877 *Kinetic Theory of Gases*), becoming a lecturer in 1880. In 1889, he became professor of theoretical physics at the University of Jena.

References

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2. McMenamin, Mark A. S. (2000). *The Garden of Ediacara: Discovering the First Complex Life*, (pg. 276). Columbia University Press.
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External links

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â— Felix Auerbach (Jena: 1850 to 1950) (German → English).

θΔics

In existographies, **Felix Klein** (1849-1925) (IQ:170|#386) (GME:15) was a German mathematician, noted for []

Quotes | On

The following are quotes on Kline:

> "You will see it written that Hadamard was the last of the universal mathematicians (see: last person to know everything) —the last, that is, to encompass the whole of the subject, before it became so large that this was impossible. However, you will also see this said of Hilbert, Poincare, **Klein**, and perhaps of one or two other mathematicians of the period. I don't know to whom the title most properly belongs, though I suspect the answer is actually Gauss."
>
> — John Derbyshire (2003), *Prime Obsession: Bernhard Riemann and the Greatest Unsolved Problem in Mathematics* [1]

Quotes | By

The following are quotes by Klein:

> "The greatest mathematicians, as Archimedes, Newton, and Gauss, always united theory and applications in equal measure."
>
> — Felix Klein (c.1900) (Ñº)

References

1. Derbyshire, John. (2003). *Prime Obsession: Bernhard Riemann and the Greatest Unsolved Problem in Mathematics* (pg. 159) (Ñº). Joseph Henry Press.

External links

â— Felix Kline – Wikipedia.

θΔics

In existographies, **Ferdinand Magellan** (c.1480-1521) (IQ:145|#538) (Cattell 1000:635) [RGM:335|1,310+] was a Portuguese explorer, generally known for being the first person to nearly complete a circumnavigation of the globe.

Quotes | By

The following are quotes by Magellan:

> "The church says the earth is flat, but I know that it is round, for I have seen the shadow on the moon, and I have more faith in a shadow than in the church."
>
> — Ferdinand Magellan (c.1510), Portuguese explorer

External links

â— Ferdinand Magellan – Wikipedia.

θΔics

In existographies, **Ferdinand Verbiest** (1623-1688) (IQ:170|#404) (EP:15) (CR:3) was a Flemish mathematician, astronomer, engineer, theologian, and translator, characterized a "veritable universal genius" (Delumeau, 1977), noted for his c.1670 Verbiest engine, a small two-foot sized aeolipile-powered wagon, the world's first working automobile; not be succeeded (Q) until Denis Papin's c.1698 piston and cylinder based steam-powered cart.

Overview

In c.1670, or between 1665 to 1681, Verbiest connected the turning mechanism of a Hero-style aeolipile to the axle of the front wheels of a small two-feet long wooden cart, such as shown below, from an 18th century reconstruction, and got his small vehicle to move in a circle for more than an hour.

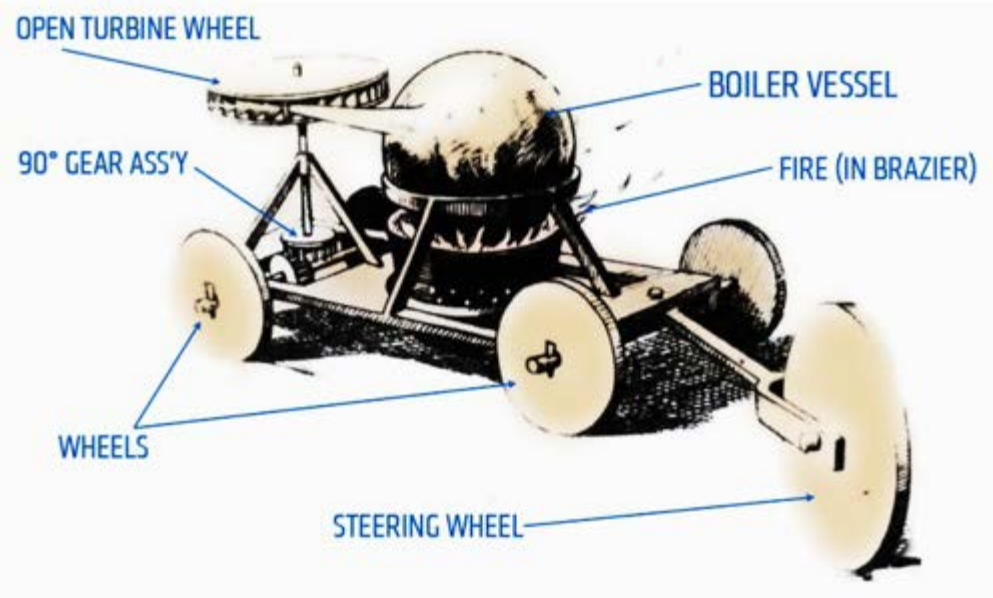

Verbiest summarized the following on his engine:

> "The [cart] moved in a circle with a motion and not slow for an hour or more, for as long a time, be it understood, as the steam continued to be forcefully expelled from the aeolipile."
>
> — Ferdinand Verbiest (1687), *Astronomica Europaea* (§: Pneumatics, pg. 88) [1]

Verbiest is said to have built this as but one of his many "scientific toys" (Q) for the young emperor of China.

This, in engineering history, is said to be the first working auto-mobile or "model of a self-propelled vehicle".

Verbiest's toy auto-mobile would not be succeeded (Q) until Denis Papin's c.1698 piston and cylinder based steam-powered cart, which was superseded by Nicolas Cugnot's 1769 three-wheeled steam-powered automobile. [2]

References

1. (a) Verbiest, Ferdinand. (1687). *Astronomica Europaea* (pg. 88). Dillingen.
(b) Kirby, Richard. (1956). *Engineering in History* (co-authors: Sidney Withington, Arthur Darling, Frederick Kilgour) (pg. 267). Courier, 1990.
2. Kirby, Richard. (1956). *Engineering in History* (co-authors: Sidney Withington, Arthur Darling, Frederick Kilgour) (pg. 267). Courier, 1990.

Further reading

● Delumeau, Jean. (1977). *Catholicism between Luther and Voltaire: a New View of Couter-Revolution* (pg. 65). Burns & Oates.

External links

● Ferdinand Verbiest – Wikipedia.

θΔics

In existographies, **Ferenc Mora** (1879-1934) was a Hungarian novelist, journalist, and museum and library director, noted for []

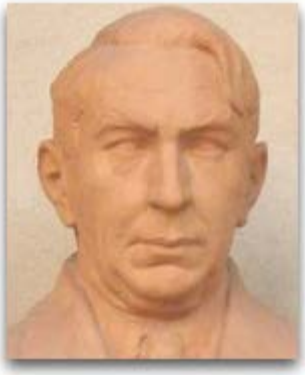

Overview

In 1914, Mora wrote an article in a newspaper about the first law of thermodynamics, with focus on Robert Mayer, in which he concluded something to the effect that he will not believe in the conservation of energy into someone can explain to him where his the "energy" of is "childhood" is; the following, translated by Katalin Martinas, is the main quote:

> "If I say that I do NOT believe in the conservation of energy then the professors of physics will say that I am asinine, as I am a layman. If I say that I DO believe in the conservation of energy then the reader of this journal will say that I am asinine, as I am a scientist. **Where is that Robert Mayer who can tell me where my childhood's energy is?** This is why I do not believe in the conservation of energy."
>
> — Ferenc Mora (1914), "The Conservation of Energy" [1]

(add)

References

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External links

â— Ferenc Mora – Wikipedia.

θΔics

In particles, **fermion**, as contrasted with boson, is an elementary particle, or bound state of an elementary particle, e.g. an atomic nucleus or an atom, with half integer spin (½, 3/2, etc.), which conforms to Fermi-Dirac statistics. [1]

Fermions

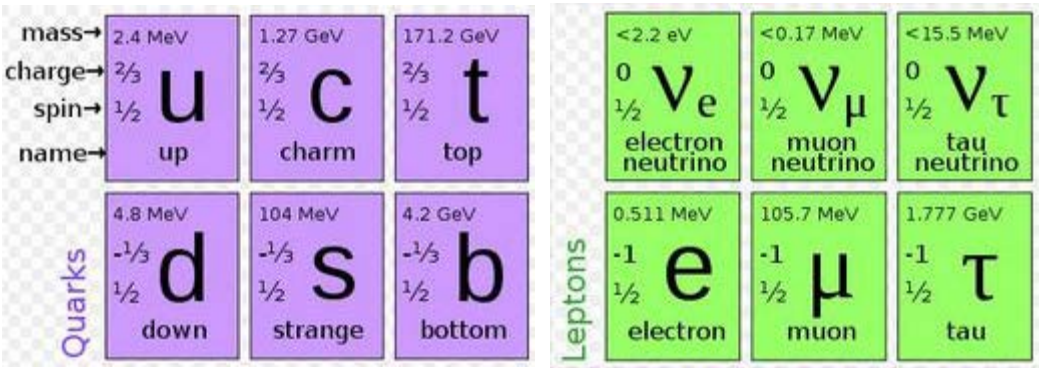

Quarks and leptons are examples of types of **fermions**.

Fermions are the particles that make up what is usually conceptualized as the material world (matter), e.g. the electron and proton. Fermions are conserved, such that the total number of each kind of fermion stays the same, provided that in any interaction an antiparticle is counted as "minus one" particle. [2]

Etymology

The term "fermion", named in honor of Enrico Fermi, was coined by English theoretical physicist Paul Dirac, during his 6 Dec 1945 lecture "Developments in Atomic Theory", referring to quantum particles that obey the laws that he and Fermi had set out in 1926. [3]

Humans | Fermions or Bosons?

See main: Social fermion

In the late 1970s, people began to ruminate on what humans were in terms of the new fermionic bosonic classification of the universe; the following are the two dominate examples:

> "Are humans **fermions** or bosons?"
>
> — Ed Stephan (1977), speculative discussions with physicist Louis Barrett [4]

> "All entities, whether **fermions** or humans, need some mediating agency to interconnect them into systems. This indispensable interrelating and interacting role is ultimately played by different field particles named bosons. Unlike fermions, which are characterized by a significant mass and charge, bosons do not take partake of these to attributes. Rather, they only have spins and provide connections as they are exchanged among fermions."
>
> — Paris Arnopoulos (2005), *Sociophysics* [5]

(add summary)

References

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(b) Farmelo, Graham. (2009). *The Strangest Man: the Hidden Life of Paul Dirac, Mystic of the Atom* (pg. 331). Basic Books.
4. Stephan, Ed. (1995). *The Division of Territory in Society*. EdStephan.org.

5. Arnopoulos, Paris. (2005). *Sociophysics: Cosmos and Chaos in Nature and Culture* (fermions or humans, pg. xIviii). Nova Publishers, 1993 first edition.

Further reading

â— Dirac, Paul. (1995). *The Collected Works of P.A.M. Dirac: Volume 1: 1924-1948* (editor: R.H. Dalitz) (fermion, 2+ pgs). Cambridge University Press.

External links

â— Fermion – Wikipedia.

θΔics

In existographies, **Fernando Sanford** (1854-1948) (CR:8) was an American physicist, the founding physical science professor of Stanford University, noted for []

Overview

In 1899, Sanford, in his address "The Scientific Method and its Limitations", gave the following telling statement: [1]

> "It is not only in those departments of science where the uniformity of natural law would seem to be a legitimate deduction that the scientific method has found favor with investigators, for at the present time many of the writers on ethics and sociology and theology are attempting to apply the methods and the laws of physical science in their fields of investigation. It is noticeable, however, that it is not the new physics of energy, but the old physics of forces, which is being thus applied. The physics which has been rendered obsolete by the investigation of the century has been taken up by the sociologist, and we have this mighty organism, man, still struggling with as many forces as were formerly supposed to battle for the control of the physical bodies of his individual members. ... If there is any spiritual universe, the phenomena of ethics are spiritual phenomena. The assumption of natural law, that is, physical law, in the spiritual universe means that there is no spiritual universe.
>
> A universe governed by the laws of physics is a universe in which there is no right or wrong, justice or injustice, reward or punishment: nothing but inevitable consequences. . . . This much, at least, is certain: if there is not a uniformity of nature in social phenomena so that effects follow causes with the same certainty as they do in the physical universe, then is there no science of sociology, and no such thing as a moral or social law. In so far as man is a free, moral agent, capable of determining his own conduct, all attempts at predicting what he will do under given circumstances must fail. Only in so far as man is *governed*, not merely influenced, by laws as unalterable and unvarying as are the laws of the physical universe, can his actions furnish the materials of scientific study. If, on the other hand, there are such laws, then all attempts of man at influencing the social order will be as successful as would attempts at revising the law of gravitation."
>
> — Fernando Sanford (1890), "The Scientific Method and its Limitations" (pgs. 19-21)

In 1903, Lester Ward, in his social mechanics chapter, of his *Pure Sociology*, cites this quote in full. [2]

Here we are reminded of Alexander Pope's famously discussed 1734 "Shall gravity cease when I go by?" quip.

Education

Sanford completed his BS in 1879 at Carthage College, Wisconsin, after which he taught physics for three years at Mt. Morris College, Illinois, then became superintendent of schools for Olge County, Illinois. Then he traveled to Germany to study for two years, studying under German physicist Hermann Helmholtz. He then became professor of physical science, at Lake Forest University, Illinois, where he worked for a few years. Sanford was then approached by American university administrator David Jordan (1851-1931)—who himself had been approached in Mar 1891 by American railroad tycoons Leland Stanford and Jane Stanford to become the founding president of their soon-to-be launched egalitarian Stanford University, scheduled to open in September first professor of physical science, one of the 22 original faculty members, a position he accepted and held until his retirement in 1919. During his career, Sanford wrote many books and papers on the subject of physics, especially on electricity and the mechanism of electrification. [3]

Quotes | By

The following are quotes by Sanford:

> “It is plain from the above quotation, that Cabeus did not recognize repulsion as a true property of electrification. Nor was it so recognized by others until the publication by Otto von Guericke of his paper ‘De Virtutibus Mundanis’ in 1672. Von Guericke recognized what he regarded as a true repulsion of his electrified sulphur globe for light bodies in its vicinity, but his explanation of the phenomenon was rather metaphysical than physical.”
>
> — Fernando Sanford (1921), “Some Early Theories Regarding Electrical Forces” [4]

References

1. Sanford, Fernando. (1899). “The Scientific Method and its Limitations” (pg. 19-21), Address at the eight Annual Commencement, Leland Stanford Junior University, May 24.
2. Ward, Lester F. (1903). *Pure Sociology: a Treatise on the Origin and Spontaneous Development of Society* (pgs. 166-67). MacMillan, 1907.
3. (a) Fernando Sanford (about) – Carthage.edu.
(b) David Starr Jordan – Wikipedia.
4. Sanford, Fernando. (1921). “Some Early Theories Regarding Electrical Forces: the Electrical Emanation Theory” (pg. 546), *The Scientific Monthly*, 12:544-.

External links

â— Fernando Sanford – Wikipedia.

θΔics

In hmolscience, **Ferris Jabr** (c.1986-) is an American science journalist noted for his 2013 arrival of the defunct theory of life position, as outlined in his *Scientific American* blog article "Why Life Does Not Really Exist" (see: life does not exist), wherein he explains how he recently came to the conclusion, after musing on the comparison between his cat and a K'Nex roller-coaster, each conceptualized as but two different types of animate machines, that "life does not actually exist", but rather is an "invented concept" rooted in anthropomorphism; the sharpest section of his argument being the following: [1]

> "Why is defining life so frustratingly difficult? Why have scientists and philosophers failed for centuries to find a specific physical property or set of properties that clearly separates the living from the inanimate? Because such a property **does not exist. Life** is a concept that we invented. On the most fundamental level, all matter that exists is an arrangement of atoms and their constituent particles. These arrangements fall onto an immense spectrum of complexity, from a single hydrogen atom to something as intricate as a brain. In trying to define life, we have drawn a line at an arbitrary level of complexity and declared that everything above that border is alive and everything below it is not. In truth, this division does not exist outside the mind. There is no threshold at which a collection of atoms suddenly becomes alive, no categorical distinction between the living and inanimate, no Frankensteinian spark. We have failed to define life because there was never anything to define in the first place."

Here we see fairly sharp discernment. The above "such a property does not exist", to note, brings to the mid-20th century life principle attempts, and the mention of Frankenstein brings to mind the Mary Shelley, Alessandro Volta, Luigi Galvani, and laboratory produced life debates of the 19th century.

Descartes | La Mattrie

Jabr's "cat = animate machine" reasoning is in the neighborhood of how Julien la Mettrie in 1748 published his *The Human Machine*, after becoming impressed by the androids and automatons of French inventor Jacques Vaucanson, and is also similar to how Rene Descartes, a century before did similar conceptual "human vs automaton" (see: Cartesian automaton) difference battle; therein developing his famous Cartesian dualism (which la Mettrie ridiculed).

Thims

Jabr's "there is no threshold at which a collection of atoms suddenly becomes alive" is strikingly similar to the same conclusion independently arrived at in 2009 by American electrochemical engineer Libb Thims and his atoms "suddenly come alive" objections to Russian physical chemist Georgi Gladyshev and his untenable view that "thermodynamics mandates life". [4] Jabr's "life is a concept that we invented" is parallel to Thims' view that life is a concept invented primarily by the Egyptians, prior to the first dynasty (3100BC), modeled on the conceptualization that the sun is "born" each day, i.e. comes "alive", then dies each night, only to be reborn daily and yearly; the logic of which, for 72 percent of people on the planet, is the basis of religious belief passed along through the generations over the last 5,000-years (see: religio-mythology transcription and syncretism).

Life | Non-existence

> *See main: Life does not exist*

Jabr, in his blog article "Why Life Does Not Really Exist", begins his argument as follows:

> "Recently, however, I had an epiphany that has forced me

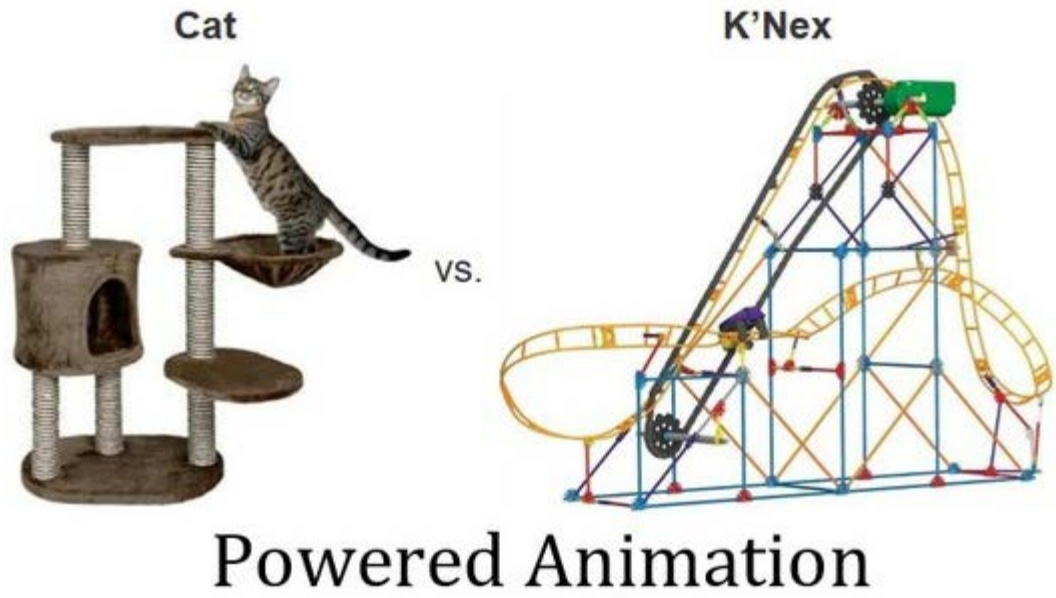

Jabr's 2013 musings on the animate nature between his cat and his brother's K'Nex roller coaster led him to the 2013 conclusion that "life" is something that does not exist; a view independently arrived at in 2009 by American electrochemical engineer Libb Thims, per similar reasons; and also concurred, in part, by those including: Francis Crick (1966) and Charles Sherrington (1938).

to rethink why I love living things so much and reexamine what life is, really. For as long as people have studied life they have struggled to define it. Even today, scientists have no satisfactory or universally accepted definition of life. While pondering this problem, I remembered my brother's devotion to K'Nex roller coasters and my curiosity about the family cat.

Why do we think of the former as inanimate and the latter as alive? In the end, aren't they both machines? Granted, a cat is an incredibly complex machine capable of amazing behaviors that a K'Nex set could probably never mimic. But on the most fundamental level, what is the difference between an inanimate machine and a living one? Do people, cats, plants and other creatures belong in one category and K'Nex, computers, stars and rocks in another? My conclusion: No. In fact, I decided, **life does not actually exist**."

Here, to note, we see the classic rock vs. human comparison. Jabr then goes into a short historical, starting with Aristotle, and his three souls theory, Galen, on vital spirits, Georg Stahl, on vitalism, then the organic from inorganic objection (solved by Friedrich Wohler via his 1828 synthesis of urea). Then he goes into the "bloated lists" issue of how biology textbooks, nowadays, have elaborate listings of criteria that supposedly, together, define life; albeit, as Jabr points out, ones that are each disprovable by giving a counter example, e.g. if one criterion of life is "something that grows", then pointing out that crystals grow, but are not considered alive, defuncts the criterion.

He then cites Gerald Joyce's NASA-based exobiology germane so-called "working definition of life", as a "self-sustained system capable of Darwinian evolution", which he discredits with citation to the field of "digital organisms" and computer viruses. He then discusses the RNA world to DNA world hypothesis; noting that Joyce "hesitates to say that ribozymes are truly alive". Jabr then jumps to his ripest paragraph, shown below right (also quoted above), which is compared, for the sake of curiosity, to Libb Thims' 2009 nearly equivalent stance on the same issue: [4]

Thims
(2009)

"You agree with me that the single atom is not alive. What about two atoms? What about three? Does a bound state of atoms have to have a certain movement to be considered alive? What if we heat

Jabr
(2013)

"Why is defining life so frustratingly difficult? Why have scientists and philosophers failed for centuries to find a specific physical property or set of properties that clearly separates the living from the inanimate? Because such a property

a system of four atoms, do they **suddenly become alive**? What if we subject a system of atoms to both gravitational and electromagnetic forces, does that suddenly make them alive? What if the two forces act to move smaller atoms through the cavities of larger atoms [molecules] on a cyclical basis, thus activating reactions [metabolism] in the process, does that make them alive? What if the two forces begin to arrange the atoms into hierarchies, and that smaller atoms and bundles of atoms begin to more between the hierarchies, does that make them alive? What if a structure of atoms, begin to turnover their internal atoms, with those of the surrounding space, on a cyclical basis, does that make it alive? It should be very obvious that no matter how many atoms one adds to the argument that an atom or a structure made of two or more atoms cannot be alive.

does not exist. Life is a concept that we invented. On the most fundamental level, all matter that exists is an arrangement of atoms and their constituent particles. These arrangements fall onto an immense spectrum of complexity, from a single hydrogen atom to something as intricate as a brain. In trying to define life, we have drawn a line at an arbitrary level of complexity and declared that everything above that border is alive and everything below it is not. In truth, this division does not exist outside the mind. There is no threshold at which a collection of atoms **suddenly becomes alive**, no categorical distinction between the living and inanimate, no Frankensteinian spark. We have failed to define life because there was never anything to define in the first place."

Here we see the seedlings of Thomas Kuhn multiple independent arrival of view pretext to scientific evolution model. Jabr then explains how he communicated these tentative life doesn't exist ideas to Joyce:

> "I nervously explained these ideas to Joyce on the phone, anticipating that he would laugh and tell me they were absurd. After all, this is someone who helped NASA define life. But Joyce said the argument that life is a concept is 'perfect'. He agrees that the mission to define life is, in some ways, futile. The working definition was really just a linguistic convenience. "We were trying to help NASA find extraterrestrial life," he says. "We couldn't use the word 'life' in every paragraph and not define it"."

Jabr continues:

> "What differentiates molecules of water, rocks, and silverware from cats, people and other living things is not "life," but complexity. Scientists already have sufficient knowledge to explain why what we have dubbed organisms can in general do things that most of what we call inanimate cannot—to explain how bacteria make new copies of themselves and quickly adapt to their environment, and why rocks do not—without proclaiming that life is this and non-life that and never the twain shall meet."

Here, in Jabr's statement that "complexity" is what differentiates water, rocks, and silverware from cats and people, is a good start, but way of target, nevertheless. The historical listing of physicochemical based definitions of a person (as listed in the "human" article) is a good place to start, as are the historical suggestions listed in the life terminology upgrade page. Jabr concludes:

> "We will never find some clean dividing line between the two [living and inanimate] because the notion of life and non-life as distinct categories is just that—a notion, not a reality."

(add discussion)

Strandbeest | Virus debate

In 2014, Jabr, in his “Why Nothing is Truly Alive” opinion page article, elaborated on his 2013 article, via launching his discussion off a video of Dutch artist Theo Jansen’s 1990 wooden wind-propelled beach automaton mobiles, which he calls strandbeests (Ñº), incorrectly asserts that the so-called life or non-life “virus debate” has been going on “for centuries”.

Correctly, although viruses were originally called *contagium vivum fluidum* or “soluble living germ”, by Dutch microbiologist Martinus Beijerinck (1898), and although there may have been some discussion of whether or not viruses “think” (Gilbert Lewis, 1925), the so-called debate about whether or not viruses are alive, did not start until 1935 when American biochemist Wendell Stanley (1904-1971) showed that viruses were particulate, existing as needlelike crystals, a finding that appeared in *Science* that year with the following statement: (Ñº)

Dutch artist Theo Jansen’s 1990 wooden wind-propelled beach automaton mobiles, called strandbeests (Ñº), a life-like thing, or new "form of life" as Jansen asserts, but, in reality, "not alive", according to Jabr, because nothing is truly alive.

> “The self-propagating crystals of mosaic virus prepared by Dr. Stanley are not alive. In his own words, ‘Tobacco-mosaic virus is regarded as an autocatalytic protein which, for the present, may be assumed to require the presence of living cells’ to grow.”

This controversial news soon made the front page of *New York Times*, for its sensational aspect that it was the missing link between the living and nonliving, after which the virus debate was officially launched, not centuries ago, as Jabr incorrectly asserts. [6]

Education

Jabr’s early educational queries were answered by his physicist father, which he describes as follows: [2]

> “When I was younger, my father the physicist regularly entertained endless questions about how the world works, which my brothers and I flung toward him like boomerangs — we always had another question; he always had another answer (until, you know, we got to stuff like what happened before the Big Bang and why existence exists in the first place). Our house had a lot of books, too, and I took a strong liking to written language.”

Jabr, in circa 2008, completed his BS as a double major in psychology and English at Tufts University; a process he explains as follows:

> “In high school, my favorite subjects were biology and English, hands down. I assumed I would pursue a career as a research biologist, but I soon realized that my mind was far more suited to learning about and explaining science, rather than designing ingenious experiments. I ended up double majoring in psychology and English in college, working in a social psych lab, writing for the student newspaper, and completing a couple science media internships at *Psychology Today* magazine and the PBS show *NOVA*.”

Jabr then went on to complete his MA in science, health, and environmental reporting at New York University, graduating in circa 2011, after which then worked as a staff editor at *Scientific American*, and now is a freelance science

journalist. [3]

Key

Jabr was found via the search keys: "life from non-life debate", following start of Lionel Beale article.

Quotes

The following are noted quotes by Jabr:

> "Why so much ambivalence? Why is it so difficult for scientists to cleanly separate the living and nonliving and make a final decision about ambiguously animate viruses? Because they have been trying to define something that never existed in the first place. Here is my conclusion: Life is a concept, not a reality. Not only is defining life futile, but it is also unnecessary to understanding how living things work. All observable matter is, at its most fundamental level, an arrangement of atoms and their constituent particles. These associations range in complexity from something as simple as, say, a single molecule of water to something as astonishingly intricate as an ant colony. All the proposed features of life — metabolism, reproduction, evolution — are in fact processes that appear at many different regions of this great spectrum of matter. There is no precise threshold."
>
> — Ferris Jabr (2014), "Why Nothing is Truly Alive" [5]

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(b) Thims, Libb. (2009). "Letter: Life a Defunct Scientific Theory", *Journal of Human Thermodynamics*, Vol. 5, pgs. 20-21.
(c) Sekhar, DMR. (2010). "Thread: An-att: On Self and Non-self (defunct life theory discussions), Aug 7, Ssubbanna.Sulekha.com.
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(e) Stamatopoulos, Vangelis. (2010). "It's Life Jim, but not as we Know it!", *AtheistNexus.org*, Nov. 15.
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6. James, Laylin K. (1993). *Nobel Laureates 1901-1992* (pg. 302). Chemical Heritage Foundation.

Further reading

â— Wilkins, John. (2014). "Does Life Exist?", *EvolvingThoughts.net*, Jan 11.
â— Jabr, Ferris. (2014). "Why Nothing is Truly Alive" (Ñº), Twitter, Mar 12.

External links

â— Ferris Jabr – Twitter.com.

θΔics

In terminology, **few super-Einsteins**, similar to "another Newton" (Henry Adams, 1910) or "new Aristotle" (Raymond Fosdick, 1924), refers to American entomologist William Wheeler's circa 1935 reference to future great intellect able to rectify the physicochemical, organismal, mental, social, and biological into one unifying framework; someone able to wield the intellect equivalent to 6 to 8 degrees, according to the polymathy degree problem benchmark; aspects of which he seemed to have sensed in the mind of Vilfredo Pareto (1912) and in the synthesis work of Lawrence Henderson's 1932 efforts to unify evolution, sociology, economics, business, physiology all under the guise of Gibbs-based physical chemistry and thermodynamics, intermixed with the historical precursory work of Pareto.

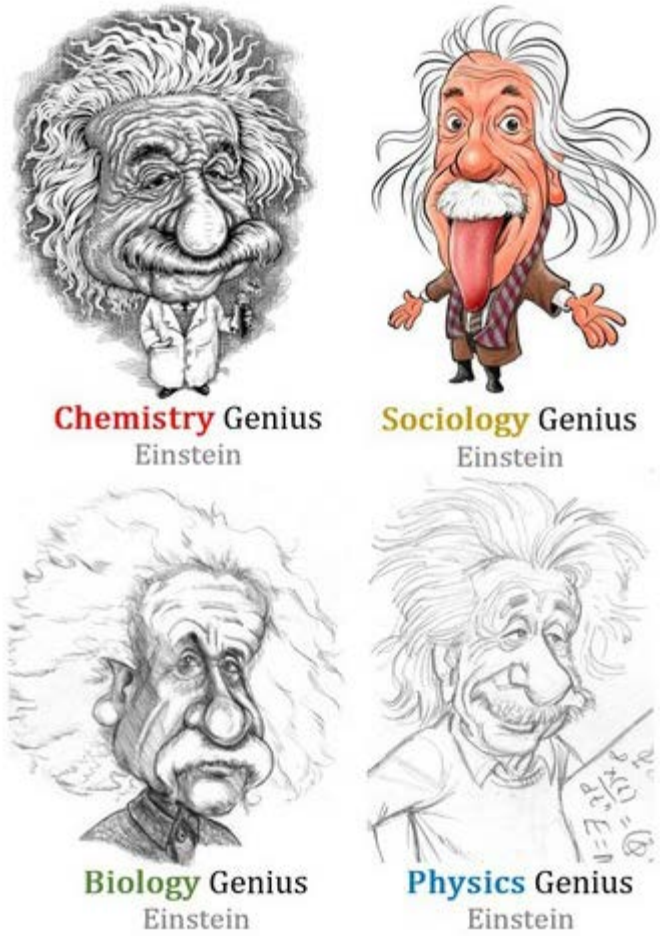

A rendition of William Wheeler's circa 1935 view that a "**few super-Einsteins**" will be needed to unify the main branches of knowledge: chemistry, physics, biology, and sociology, as it is presently diversified; someone able to wield the intellect equivalent to 6 to 8 degrees, according to the polymathy degree problem standard.

See also

- Existive social Newton
- Polymathy degree problem
- Social Newton

Quotes

The following are related quotes:

> "… emergence, the physicochemical, the organismal, the mental and the social. Hence, it till the advent of a **few super-Einsteins**, theoretical biology must stand as a combination of oppositions—a *compositio oppositorum*."
>
> — William Wheeler (c.1935), "Essay" [1]

> "Where will the **next Einstein** lead scientific thinking?"
>
> — Chris Quigg (2004), "Physics of the Large Hadron Collider Workshop" (Q)

> "The physics of the point that existed 13.7 billion years ago is mostly beyond our imaginations, not to mention our conceptual tools. Gravity, electromagnetism—all the forces at work around us did not have an independent existence. Matter as we know it didn't exist. With everything that would become the universe packed so tightly in one spot, there was an enormous amount of energy. In such a universe, the physics of small particles, quantum mechanics, and that of large bodies, general relativity, were somehow part of a single, overarching, and still unknown theory. Just what that theory is awaits the **next Einstein**."
>
> — Neil Shubin (2013), *The Universe Within* [2]

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(b) Smocovitis, Vassiliki B. (1997). *Unifying Biology* (pg. 109). Princeton University Press.
(c) Smocovitis, Vassiliki B. (2001). "The Unifying Vision: Julian Huxley, Evolutionary Humanism, and the Evolutionary Synthesis" (Q), read at the Unifying Nature, Past and Present conference, Gainesville, Florida.
2. Shubin, Neil. (2013). *The Universe Within: Discovering the Common History of Rocks, Planets, and People* (pg. 25).

Random House.

External links

● Zwillich, Todd, Green, Brian (guest). (2015). “Will There Ever Be Another Einstein?” (Q), Aug 17.

θΔics

In science, **Feynman on religion** refers to the

Left: the 1973 Feynman interview, by Nova, wherein he compares beliefs in witches to belief in brushing teeth. Right: the 1983 Feynman interview, second one by Christopher Sykes (Ñº), entitled "The Fun to Imagine", wherein Feynman is probed on his religious beliefs.

discussions, lectures, and or publications on the topic of God, existence of god, morality, life, meaning, death, i.e. religion in general, of American physicist Richard Feynman.

Overview

American physicist Richard Feynman (1918-1988) and his younger sister Joan Feynman (1927-) were siblings of American Lucille Feynman, a homemaker, and Belarus-born American Melville Feynman, a businessman, albeit one with a inkling to be a cultured scientist, both of whom were Ashkenazi Jews, according to census. His father, as his Richard reports, was a non-believing Jew. [1] His mother, however, seems to have had some religious conviction, as per her reaction responses tell; namely, in 1979, Omni Magazine named Feynman "The Smartest Man in the World", following their interview with him. When his mother Lucille heard about this, her response was: "Our Richie? The world's smartest man? God help us!" (Ñº)

In Jun 1945, Feynman's school sweetheart turned wife, Arline Feynman (Arline Greenbaum), passed away at age 25, from tuberculosis, in their fourth year of marriage.

On 8 Oct 1946, Feynman's father Melville Feynman died (dereacted) from a stroke.

During his father's interment, at Bayside Cemetery, nearby Queens, Feynman, then age 29, was asked by Rabbi Cahn to say the Kaddish, i.e. a hymn of praises to God found in the Jewish prayer service, with him. Feynman refused. His sister Joan, according to interviews with his sister by biographer James Gleick, "watched in anguish as her brother's face froze. He wanted no part in a mourner's prayer in praise of God." Gleick comments on this: [2]

> "Feynman did not believe in God; he knew that is father had not believed in God; and the hypocrisy seemed unbearable. His disbelief had nothing of indifference in it. It was determined, coolly rational disbelief, a conviction that the myths of religion cheated knowledge. He stood there surrounded by stone and grass near the undersized sepulchral vaults, assembled on atop another, that held the bones of his grandparents. One shelf, too held the remains of his infant brother, Henry, memorialized now for twenty-two years after his life of one month. One Feynman's face was a look of tension and determination and also, it seemed to Joan at that moment, utter isolation. Leaving his father's coffin, he exploded in a rage. Their mother broke down and wept."

Shortly after his father's funeral, that Oct, Feynman wrote a curious letter, addressed to his deceased wife, one that

remained sealed until after his own reaction end, in 1988, in which he states, among other things, the following: [3]

> "I find it hard to understand in my mind what it means to love you after you are dead. You, dead, are so much better than anyone else alive."

at the end of which he writes that he needs to be excused for not mailing the letter, because, as he says: "I don't know your new address."

In 1956, Feynman, during a lunchtime talk at Caltech, stated the following: [4]

> "A young man, brought up in a religious family, studies a science, and as a result he comes to doubt — and perhaps later to disbelieve in — his father's God. Now, this is not an isolated example; it happens time and time again. Although I have no statistics on this, I believe that many scientists — in fact, I actually believe that more than half of the scientists — really disbelieve in their father's God; that is, they don't believe in a God in a conventional sense. Now, since the belief in a God is a central feature of religion, this problem that I have selected points up most strongly the problem of the relation of science and religion. Why does this young man come to disbelieve? The first answer we might hear is very simple: You see, he is taught by scientists, and—as I have just pointed out—they are all atheists at heart, so the evil is spread from one to another. But if you can entertain this view, I think you know less of science than I know of religion."

In 1963, Feynman, in his John Danz lecture "A Scientist Looks at Society", stated the following: [5]

> "Throughout the ages, men have tried to fathom the meaning of life. They realize that if some direction or some meaning could be given to the whole thing, to our actions, then great human forces would be unleased. Very many answers have been given to the question of the meaning of it all. But they have all been of different sorts. I may say that we do not know what is the meaning of life and what are the right moral values, that we have no way to choose them and so on. No discussion can be made of moral values, of the meaning of life and so on, without coming to the great source of systems of morality and descriptions of meaning, which is in the field of religion. I do believe there is a conflict between science and religion."

Feynman then goes on to re-tell the "young man" parable.

Purpose | Meaning

The following seems to be Feynman's final states on meaning and purpose:

> "I can live with doubt and uncertainty and not knowing. I think it's much more interesting 'not knowing' than to have answers that might be wrong. I have approximate answers and possible beliefs and different degrees of certainty about different things, but I'm not absolutely sure of anything, and there are many things I don't know anything about such as whether it means anything to ask 'why we're here?' and what the question might mean; I might think about it a little bit, and if I can't figure it out, I'll move on to something else, but I don't have to know an answer, I don't feel frightened by not knowing things, by being lost in a mysterious universe without having any purpose, which is the way it is, as far as I can tell, possibly. It doesn't frighten me."
>
> — Richard Feynman (1981), Christopher Sykes "The Pleasure of Finding Things Out" interview (Ñº) documentary, age 63

Atheist's creed

The following seems to be Feynman's atheist's creed, so to say:

> "Believe in the fact that all things are made of atoms."
>
> — Richard Feynman (1964), on which sentence (Ñº) should be passed on to the next generation of creatures, should a cataclysm occur

Quotes

The following are related quotes:

> "Religion is a culture of faith; science is a culture of doubt."
>
> — Richard Feynman (c.1960) (Ñº)

References

1. (a) Richard Phillips Feynman – MacHistory.
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2. Gleick, James. (1992). *Genius: the Life and Science of Richard Feynman* (pg. #). Open Road Media, 2011.
3. (a) Feynman, Richard. (1946). "Letter to Arline Feynman" (Ñº), Oct.
(b) Gleick, James. (1992). *Genius: the Life and Science of Richard Feynman* (pg. #). Open Road Media, 2011.

θΔics

In science, **Feynman problem solving algorithm** is a basic problem solving technique, used by many scientists, consisting of three steps, first write down the problem, second think very hard, third write down the answer. [1]

The Feynman problem solving algorithm is used frequently by American electrochemical engineer Libb Thims.

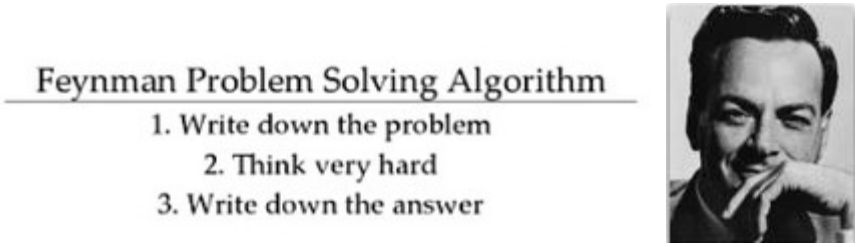

The three steps of Richard Feynman's so-called **solving algorithm**.

Often is the case, however, that step one involves the unconscious writing down of the problem in their head, two, many partial stabs at solution, followed by retraction, withdraw, and storage of the problem, followed by three writing down the solution.

Etymology

The technique was said to be common to American physicist Richard Feynman, as facetiously observed by his colleague Murray Gell-Mann, as reported in the *New York Times*.

Other

Feynman also, supposedly, had a standing bet that he could solve any problem to within 10% within 60 seconds. (Q)

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (Feynman problem solving algorithm, pg. 118). Morrisville, NC: LuLu.

Videos

- Anon. (2015). “The Feynman Technique” (Q), Sprouts, YouTube, Oct 12.

External links

- Feynman Problem Solving Algorithm – Solveare.net.
- Lal, Rajesh. (2008). “Feynman Problem-Solving Algorithm”, *Irajejsh.com*, Sep 03.

θΔics

In science, **Feynman time capsule wisdom** refers to the one sentence humanity should most want to pass on to the next generation of evolution should the world come to an end today, which is:

> "Believe in the atomic hypothesis."

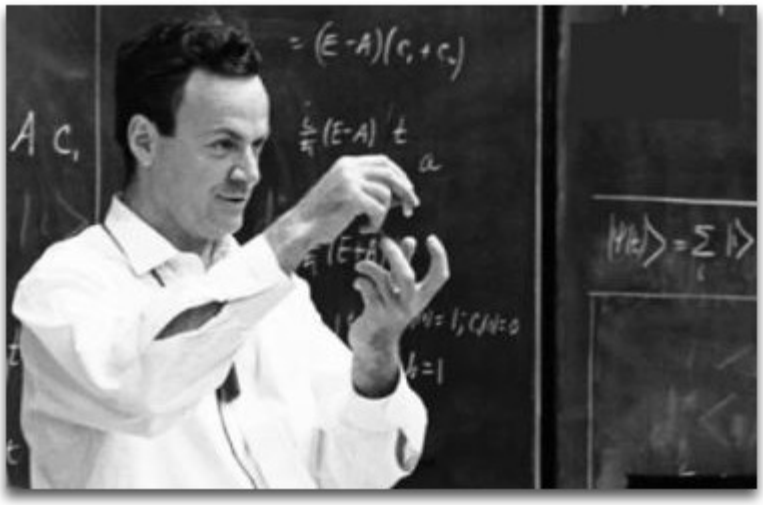

American physicist Richard Feynman (1918-1988), the eponym of the term **Feynman time capsule wisdom**, explaining the physics of quantum electrodynamics.

This thought experiment postulate was conceived by American physicist Richard Feynman in his famous 1964 *Lectures on Physics* and represents his opinion as to what bit of knowledge a person should most want to believe in to the exclusion of all else.

The original full statement is as follows:

> "If, in some cataclysm, all scientific knowledge were to be destroyed, and only one sentence passed on to the next generation of creatures, what statement would contain the most information in the fewest words? I **believe** it is the atomic hypothesis (or atomic fact, or whatever you wish to call it) that all things are made of atoms — little particles that move around in perpetual motion, attracting each other when they are a little distance apart, but repelling upon being squeezed into one another. In that one sentence you will see an enormous amount of information about the world, if just a little imagination and thinking are applied."

In other words, according to Feynman, the fundamental piece of knowledge to human existence is belief in the existence of the "atom".

Thims time capsule wisdom

In extrapolation on this model, in the 2010 views of American electrochemical engineer Libb Thims, an inclusioned footnote to Feynman's one sentence, if the time capsule were to allow such a thing, supposing the capsule to be opened in the year 4500 (approximately double the span of time since Leucippus first introduced the atomic theory (450BC)), would be:

> "Believe in the human molecular hypothesis."

It has been over 210-years not since French philosopher Jean Sales first introduced the human molecular hypothesis (1798), a subject for which he was jailed for, and in modern times hardly more than a handful people have belief in this doctrine.

See also

- Belief system
- Feynman problem solving algorithm
- Eddington rule
- Clausius postulate
- Einstein postulate

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(b) Richard Feynman – Wikiquote.
(c) The Feynman Lectures on Physics – Wikipedia.

θΔics

In science, **field** is a region in which a body experiences a force as the result of the presence of some other body or bodies. [1]

See also

- Electromagnetic force
- Field particle
- Force field | Social physics
- Morris Zucker
- Primary field particle
- Secondary field particle
- Social field

References

1. Daintith, John. (2004). *Oxford Dictionary of Science*. Oxford University Press.
2. Bazargan, Mehdi. (c.1980). "Religion and Liberty" (Section: Opposition: the Cause of Movement and Life, pgs. 81-82, note 23: Thermodynamics of Humanity); originally in *Rediscovery of Values* (*Bazyabi-e Arzeshha*); reprinted in *Liberal Islam: a Source Book* (chapter 7, pgs. 73-84) edited by Charles Kurzman, Oxford University Press, 1998.

A 7 Oct 2012 MinutePhysics video on the history of the theory of the **field** starting from the work of Michael Faraday up through James Maxwell by Neil Turok.

External links

- Field (physics) – Wikipedia.

θΔics

In physics, a **field particle**, messenger particle, force mediator, or force carrier, is what transmits each of the forces of the universe, by acting to change the behavior of the entity that it interacts with. [1] A field particle, technically known as a boson, comes in four varieties: gluons, photons, intermediate vector bosons (W and Z varieties), and a fifth hypothetical particle called the graviton which is believed to transmit the force of gravity.

Human chemistry

In respect to the forces that bind people (human molecules) into associations, the distinction of primary and secondary field particles facilitates dissection and examination of the operational aspects of the human chemical bond. [2]

References

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θΔics

In science, **Fielding Garrison** (1870-1935) was an American physician, librarian, and science historian noted 1909 four-part series article “Josiah Willard Gibbs and his Relation to Modern Science”, wherein he gives a very cogent and condensed history of thermodynamics up through chemical thermodynamics, centered around the work of American engineer Willard Gibbs, along the way giving many telling details, e.g. Garrison seems to coin the term “van’t Hoff school”, among many other interesting details and discerning insights. [1] In 1910, Garrison discusses Gibbs in relation to Goethe, the connection of which, as he says, which "seems so plausible and fascinating". [2]

Chemical thermodynamics | History

In 1909, Garrison, in his four part article “Josiah Willard Gibbs and his Relation to Modern Science”, gives one of the best short histories of early chemical thermodynamics; a truncated statement of "1873" with the independent publications of Horstmann and Gibbs being stated as follows:

> “In October, 1873, Horstmann announced the condition for chemical equilibrium to be that of maximum entropy, and in December of the same year Gibbs, in a modest footnote, stated that the condition for thermodynamic equilibrium in a chemical system at constant temperature and pressure is that the function now universally known as the thermodynamic potential should be a minimum.”
>
> — Fielding Garrison (1909), “Josiah Willard Gibbs and his Relation to Modern Science” [3]

The following, from Garrison’s part IV (Ñº) on Gibbs, is informative:

> “The naturalist Haeckel has explicitly denied the doctrine of universal increase of entropy142 because, pointing as it does to the ultimate thermal death of different worlds, it conflicts with his monistic conception of the universe as a *perpetuum mobile*, consisting of infinite substance in eternal motion, without beginning and without end. Yet the cosmogony of Kant and Laplace, which Haeckel accepts, points to the same conclusion as well as to formative periods in the history of the solar and sidereal systems, in which entropy decreases, and energy, instead of dissipating, tends, after a maximum of degradation, to concentrate. Even possibilities of this kind put the second law on a lower plane of probability than the first as far as man is concerned, unless it be that the irreversible processes of nature are in reality cyclic, in which case we should have Nietzsche's "eternal return" of all things. But as Bumstead has so admirably said, " It is nearer the truth to base the doctrine of entropy upon the finite character of our perceptions than upon infinity of time."
>
> In connection with the validity of the second law arises the important question of the extent of its application to animate nature and whether it is capable of reversal in vital processes. "The first law (conservation of energy) has been proven," says Otwald, "with an exactness of 1:1,000 even for physiological combustion (including mechanical and psychical work performed)." The second law, whether in the Clausius form of increase of entropy, the Kelvin form of dissi\Vc have formulas and tables; we make use of thermodynamics and the differential calculus; but this is for the most part a vain show. Long before we reach the point where the formula is to be tested experimentally we slip in a simplifying assumption: that the concentration of one component may be considered as a constant; that the heat of dilution is zero; that the solute may be treated in all cases as though it were an indifferent gas; that the concentration of the dissociated portion of a salt may be substituted for the total concentraIion; etc., eIc. The result is that our calculations apply at best only to limiting or ideal cases, where an error in deducing the formula may be masked by errors in observation. Helmholtz did not do this, but Ilelmholtz is considered old-fashionod." W. D. Bancroft, ./. *Phys. Chem.*, 1899, III., 604.
>
> pation of available energy, or the Gibbs-Helmholtz form of decrease of free energy, is assumed by recent physiologists to be characteristic of all spontaneous or metabolic processes, but both Helmholtz143 and

Kelvin144 have doubted whether it is either necessary or sufficient for their production, while Maxwell145 and Boltzmann140 have asserted, what Gibbs's statistical researches seem to prove, that it is sometimes possible for entropy to decrease, that is for small isolated temporary violations of the second law to occur in any real body. Has animal or vegetable protoplasm ever the power ascribed to Maxwell's demon of reversing the thermodynamic order of nature, and directing physicochemical forces? Such a demon, according to Lord Kelvin, might, through his superior intelligence or motor activity, render one half of a bar of metal glowing hot, while the other half remained icy cold. We have something analogous to this in certain diseases, as gangrene, aphasia, various forms of paralysis, the curious vasomotor and trophic disorders of the nervous system. Are these phenomena then of a thermodynamic nature? The animal body, Lord Kelvin thought, does not act like a thermodynamic engine, but "in a manner more nearly analogous to that of an electric motor working in virtue of energy supplied to it by a voltaic battery." Here, as Gibbs has shown in his theory of the chemical cells, the electromotive force would be identical with the free energy upon which the surface energies of the body must ultimately depend. Beyond these speculations we know nothing. Gibbs himself avowed his express disinclination to "explain the mysteries of nature," while Lord Kelvin, although affirming that physicists are bound "by the everlasting law of honor," to explain everything material upon physical principles, mystified friends and opponents alike by falling back upon a "vital principle" with "creative power" behind it as the *causa causans* of biological happenings. But the business of physics is with the material facts of the universe, and the invocation of creative power explains nothing and is subversive of determinism, or the relation of cause and effect in science. It may be that "man was born too late to ascertain final causes": he can only interpret the physical facts of his experience as he finds them and with the means at his disposal. An interesting attempt to explain the relation of life and mind to matter is found in the *energciiscllc Weltanschauung*.

or energetic philosophy of Ostwald, which confessedly derives147 from the thermodynamic argument of Gibbs, but should not be confused with the latter. Gibbs was concerned only with applying the laws of mechanics to physical chemistry. Compared with the case of nature, he says, thermodynamic systems are "of an ideal simplicity." To Ostwald, however, mind and matter are but forms of energy, which is the only thing eternal and immortal. "We can deal with measurable things, never with the unknown heart of nature," says Ostwald, yet his basic principle, energy, is to all intents and purposes identical with the eternal infinite substance of Spinoza, Goethe and Haeckel, "sive Deus, sive Natura naturans, sive Anima mundi appelletur." Matter, in Ostwald's scheme, is a group of energies in space; thought becomes a mode of energy involving evolution of heat, and "the problem of the connection between body and spirit belongs to the same series as the connection between chemical and electrical energy, which is treated in the theory of voltaic chains."148 **Falling in love, listening to a Beethoven symphony, identifying oneself with nature, are to Ostwald instances of dissipation of energy like any other**.149 Philosophy of this kind does not clear up the mystery of the relation of mind and matter. Descartes assumed that mind and matter exist apart as parallels, having no causal connection with each other. Spinoza held that neither can exist apart; indeed, he sometimes asserts their practical identity as different modes of the same eternal substance. But however intimately they may be associated, no scientist or philosopher has yet proven, whether in the body of man or in the origin of the universe, that one is either the cause or the effect of the other.

Assuming matter in mass to be ultimately made up of rotational, vortical or gyrostatic stresses or of energies, whether kinetic or potential, we encounter the formidable objection of Boltzmann, that it seems illogical, not to say unmechanical, to postulate motion as the primary idea with the moving thing as the derived one. Motion of what? we have a right to ask, since Ostwald disdains the ether of the physicist?.150 Matter, in the words of Sir Oliver Lodge, may be physically resolved "perhaps, into electricity, and that into some hitherto unimagined mode of motion of the ether," but no dynamic theory of the ether can resolve the ether into nothing. Assuming thought to be a mode of energy, the metaphysical argument that mind is at the bottom of motion seems more likely, in the last analysis, than that motion should be the cause of mind, for we can not conceive of a thing moving unless something moves it. Mind seems almost like an assemblage or complex of causes in itself, and is probably related to the brain as music to the violin. Destroy the violin and there will be an end of its music, but it needs other coefficients than the violin itself to get music out of it. Ostwald has himself admitted the force of Leibnitz's argument, that no mechanical explanation of cerebral action will ever account for the genesis of thought or the nature of consciousness: "Nihil in

intellectu quod non prius in sensu, nisi intellectus ipse." Individual thinking may be the result of physico-chemical differences of structure or substance in the brain, but apart from the evidence of mind in the evolution and structure of the universe, different aspects of mind, as ideas, sensations and sentiments, seem to have an individual life of their own so far as man is concerned, and are "things" in the sense that, like external forces, they have profoundly influenced and determined the actions of individuals and of entire races. Human thought as a function of the human brain may disappear with man himself, but this does not annul the possibility of mind existing in manifold ways elsewhere in the universe. The electric waves of wireless telegraphy undoubtedly existed as motions in the air before man discovered and labeled them and may continue to exist and be apprehended in other spheres of thought when man is gone."

(add)

Goethe

See main: Gibbs and Goethe

In 1910, Garrison, "A Note on Traube's Theory of Osmosis and 'Attraction-Pressure'", on German thinker Johann Goethe's 1809 novella *Elective Affinities*, comments that Goethe's theory of human elective affinities seems so "plausible and fascinating": [2]

> "Suppose chemical substances to be represented by a number of men and women of varying degrees of strength of character and 'attractiveness', and suppose the marital combinations or what Goethe called the 'elective affinities' between these men and women to be determined by certain mysterious 'laws'. If a man strong in character should mate with a woman, weaker but otherwise 'attractive', or *vice versa*, one set of observers might affirm that the union was due to the man's superior potentiality or masculinity, others might maintain that the real strength in the combination or 'affinity' lay in the woman's 'attractiveness'; or *vice versa*. Curiously enough, these anthropomorphisms, which seem so plausible and fascinating in Goethe's novel, are daily and hourly employed to explain the facts of chemical combination."

Human Chemical Thermodynamics

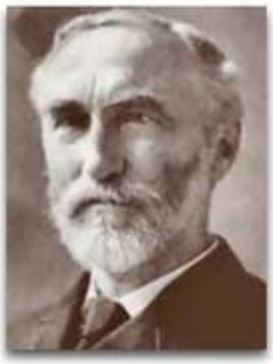

+

Gibbs (1839-1903) | Goethe (1749-1832)

Fielding Garrison (1910) is one of three known people to have ever made a connection between Gibbs and Goethe—a subject otherwise known as "human chemical thermodynamics"—the other two being Japanese chemical engineer Tominaga Keii (2004), who states bend-over-backwards incorrectly that Goethe's *Elective Affinities* "did not add any scientific value", and American electrochemical engineer Libb Thims (2006), who after discovering Goethe spent the next 18-months and 14-days writing out the worlds first textbook on "human chemistry". [4]

Garrison, interestingly, goes on to discuss this in relation to Gibbs' version of physical chemistry.

Thermodynamic surface

Garrison, in regards to the history of development of "thermodynamic surfaces", indicates that there may have been up to six possible plaster surfaces made by James Maxwell, sent out to various associates, including Gibbs, in a riddled style of correspondence. [5]

Education

Garrison completed his AB in 1890 at Johns Hopkins University and his MD in 1893 at Georgetown University, after which worked as a librarian at the Army Medical Library, Washington, D.C., and in 1930 become the supervisor of the Institute of the History of Medicine at Johns Hopkins University.

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1. (a) Garrison, Fielding H. (1909). "Josiah Willard Gibbs and his Relation to Modern Science, Parts I-IV" (pdf), *Popular Science Monthly*, Part I: 74(27):470-84, May; Part II: 74:551-61, Jun; Part III: 75:41-48, Jul; Part IV: 75:191-

203, Aug.
(b) Josiah Willard Gibbs and his Relation to Modern Science: I, II, III, IV – Wikisource.
2. Garrison, Fielding H. (1910). “A Note on Traube’s Theory of Osmosis and ‘Attraction-Pressure’”, *Science* (elective affinities, pg. 285), 32: 281-86.
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4. (a) Garrison, Fielding H. (1910). “A Note on Traube’s Theory of Osmosis and ‘Attraction-Pressure’”, *Science* (elective affinities, pg. 285), 32: 281-86.
(b) Keii, Tominaga. (2004). *Heterogeneous Kinetics: Theory of Ziegler-Natta-Kaminsky* (ch. 2: Thermodynamics of Chemical Reactions, pgs. 11-20; section: Chemical Affinity in 1806, pgs. 16-17). Springer.
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5. Garrison, Fielding H. (1909). “Josiah Willard Gibbs and his Relation to Modern Science, Parts I-IV” (pdf), *Popular Science Monthly* (thermodynamic surface, §1:pg. 481), Part I: 74(27):470-84, May; Part II: 74:551-61, Jun; Part III: 75:41-48, Jul; Part IV: 75:191-203, Aug.

Further reading

â— Garrison, Fielding H. (1909). “Physiology and the Second Law of Thermodynamics”, *International Record of Medicine and General Practice Clinics*, 90: 492-98; 551-56; 594-600. MD Publications.

External links

â— Fielding Hudson Garrison – Wikipedia.
â— Fielding H. Garrison – MedicalArchives.jhmi.edu.

θΔics

In the laws of thermodynamics, the **fifth law of thermodynamics** is any of a number of various, yet unsubstantiated, postulates, theories or (sometimes) humorous statements positioned to explain facets of physical phenomenon or existence; often stated on the assumption that the vacancy of the fourth law of already clearly filled by those such as the Onsager reciprocal relations (1931) or Odum's maximum power principle (1955), etc. [1] A 1961 reference gives the following example of a common fifth law: [2]

> "That no experiment gives quite the expected numerical result is sometimes called the **fifth law of thermodynamics**."

In 2004, to cite another interpretation of a fifth law of thermodynamics, authors David Bailin and Alexander Love stated: "The man who discovers a *fifth law of thermodynamics* will have a great difficulty in finding a suitable name." [3]

Discussion

It is sometimes argued that American physical chemist Alfred Lotka was the first to postulate the need for additional laws of thermodynamics, when in 1922 he stated: [4]

> "The principle of natural selection reveals itself as capable of yielding information which the first and second laws of thermodynamics *are not* competent to furnish. The two fundamental laws of thermodynamics are, of course, insufficient to determine the course of events in a physical system. They tell us that certain things cannot happen, but they do not tell us what does happen."

In this statement, to note, we see that Lotka is off-logic in his view. If, for instance, he would have read the works of those such as Hermann Helmholtz (1882) or Walther Nernst (1893) he would have learned that the measure of affinity *A* in a physial system, being a function of the first and second law via the equation:

$$A = T\Delta S - \Delta H$$

where, *T* is the temperature of the system, *ΔS* is the change in entropy for the process, and *ΔH* is the change in enthalpy for the process, does tells what happens in a physical system, in that movements, evolutions, reactions, etc., will proceed in the direction of the affinity satiety or, in modern terms, in a direction such that individual chemical species are said to move along paths of minimal free energy. [5]

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2. Anon. (1961). *ISIS* (pg. 165), Vol. 52.
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5. Nernst, Walther. (1895). *Theoretical Chemistry: from the Standpoint of Avogadro's Rule & Thermodynamics* (section: The Measure of Affinity, pgs. 586-88). MacMillan and Co.

External links

â— Carr, Philip. (2008). "A Proposed Fifth Law of Thermodynamics." Canada Connects.

θΔics

In existographies, **Filippo Carli** (1876-1938) was an Italian sociologist noted, in hmolscience, for works, e.g. *Sociological Theories* (*Le teorie sociologiche*) (1925), which, according to Pitirim Sorokin's 1928 "mechanistic school" classification, make him one of the chief representatives of "mathematical sociology" division, along with Vilfredo Pareto. [1]

Quotes | By

The following are quotes by Carli:

> "Social equilibrium is a totality of the internal rhythms, between elements of a social system, and the internal-external, which develop in a non-contradictory manner. In other words, it is a totality of the correlated internal and internal-external variations which go on either being constant or varying in a uniform manner."
>
> — Filippo Carli (1920), *L'Equilibrio delle Nazioni* [1]

References

1. Sorokin, Pitirim. (1928). *Contemporary Sociological Theories* (pdf) (§1: The Mechanistic School [pdf]). Harper & Brothers.
2. (a) (a) Carli, Filippo. (1920). *The Equilibrium of Nations: Applied Demographics* (*L'Equilibrio delle Nazioni secnodo la demographia applicata*) (pg. 34). Bologna: Zanichelli.
(b) Sorokin, Pitirim. (1928). *Contemporary Sociological Theories* (pdf) (§1: The Mechanistic School [pdf]; pg. 46). Harper & Brothers.

External links

â— Filippo Carli – Wikipedia.

θΔics

In publications, **films** are segments of events or processes of time, tending to be human related, presented in the form of motion pictures or moving images shown accompanied by corresponding recorded sound.

Ninotchka | 1939

See main: It's a Chemical Reaction, That's All

In 1939, in the film *Ninotchka* (Q), by Hungarian writer Melchior Lengyel (1880-1974) (Q), is centered around the Russian scientific ideology of love, as professed by Swedish-born American actress Greta Garbo, as compared to the American romantic model of love, embodied by Melvyn Douglas, the former telling the latter:

> "Love is a romantic designation for a most ordinary biological—or, shall we say, chemical—process … a lot of nonsense is talked and written about it."

The famous "chapter four" scene from the 1996 French-Italian film version of Goethe's 1809 physical chemistry based novella *Elective Affinities*.

(add discussion)

Thermodynamics

See main: Human thermodynamic films

(add)

Thermodynamics | Relationships

See main: *The Laws of Thermodynamics (film)*

In 2018, Gill wrote and directed the film *The Laws of Thermodynamics* (*Las leyes de la termodinámica*), an English-subtitled Spanish film, set in Barcelona, filmed in a seven-week shoot (Q) starting in 4 Oct 2016, purporting to be about the laws of thermodynamics and physics generally applied to explain relationships (see: relationship physics), specifically between actor Vito Sanz, playing the role of an astrophysics graduate student, and actress Berta Vazquez, playing the role of a model turned actress

Chemistry

An avid collector of films wherein "chemical" scenes are employed is American chemist Mark Griep, who, along with his wife, since 2001, have researched into and watched some 400+ chemistry-infused films. Griep uses many 3-min "chemical" scenes, in his classroom, to connect to material being taught; he also bundles clips for high school and college students. [1]

In 2009, Griep, together with Marjorie Mikasen, published *ReAction! Chemistry in the Movies*, wherein the present 110 films in outline, in respect the chemistry used. [2]

See also

- Literature chemistry
- Literature thermodynamics

References

1. (a) Griep, Mark. (2011). “The Fastest Way to a Chemistry Student’s Brain is Through Hollywood Movies” (Q), NSF Workshop Science: Becoming the Messmenger, Lincoln, Nebraska, Mar 9; in: Discover Magazine, Blog: The Intersection, Mar 23.
(b) Mark Griep (faculty) – University of Nebraska-Lincoln.
2. (a) Griep, Mark and Mikasen, Marjorie. (2009). *ReAction! Chemistry in the Movies*. Oxford University Press.
(b) Griep, Mark. (2014). “Using Movie Clips to Teach Chemistry Formally and Informally”, in: *Hollywood Chemistry: When Science Met Entertainment* (editors: Donna Nelson, Kevin Crazier, Jaime Paglia, and Sidney Perkowitz) (pgs. 199-213). ACS.

External links

- Film – Wikipedia.

θΔics

In scientific demons, the **Filon-Pearson demon** is a superluminal relativistic colleague of Maxwell's demon.

An artistic rendition of the **Filon-Pearson demon**, a colleague of Maxwell's demon, with "intensified acuteness", that is able to run both at the speed of light and faster than the speed of light, conceived in large part by French-born English applied mathematician Louis Filon in *circa* 1898; and elaborated on by his mentor Karl Pearson in 1900; a thought experiment read by Albert Einstein in 1902, who states that he had contemplated a similar "running along side a beam of light" thought experiment in 1895. [2]

Overview

In circa 1843 to 1853, an anonymous pamphlet, entitled "The Stars and the Earth: Thoughts on Space, Time, and Eternity", appeared, that, according to John Poynting (1883), digressed on the physical possibility of the idea of "magnifying or reducing time".

In 1898, Einstein contemplated his famous "running along side a beam of light" though experiment.

In circa 1898, the Filon-Pearson version of the demon was conceived by Louis Filon and described or rather elaborated on in more detail by Filon's mentor Karl Pearson in 1900 as follows: [1]

> "Irreversibility of natural processes is purely a relative conception. History goes forward or backward according to the relative motion of events and their observer. Conceive a colleague of Clerk Maxwell's demon, gifted with an immensely intensified acuteness of sight so that he could watch from enormous distances the events of our earth. Now suppose him to travel away from our earth with a velocity greater than that of light. Clearly all natural processes and all of history would for him be reversed. Men would enter life by death, would grow younger and grow simpler, evolution would be reversed, and the earth, growing hotter and hotter, would at last become nebulous. Shortly, by motion to or form the earth, our **demon** could go forward or backward in history, or with one speed—that of light—live in an eternal *now*."

Pearson concludes this footnote, by commenting that: "this conception of historical change and of time as a problem in relative motion was suggested to me by Louis Filon, and is, I think, of much interest from the standpoint of pure relativity of all phenomena."

Of note, the above footnote comes from the expanded 1900 second edition. It could be remotely possible, that the above footnote is also found in the 1892 edition. This, however, seems doubtful, being that Filon completed his BA in 1896, meaning that he would have entered college in *circa* 1892, or thereabout, *after* which time he is said to have come into connect with Pearson.

Related

Possibly related, or possibly completely independent, to the above, in 1916, American prodigy William Sidis, in his *The Animate and the Inanimate*, penned a similar second law themed reversibility theory of nature.

See also

â— Olympia Academy

References

1. Pearson, Karl. (1900). *The Grammar of Science* (§Note VII: On the Reversibility of Natural Processes, pg. 540). Publisher.
2. Faster than the speed of light (2011) – Planet-Science.com.

θΔics

In philosophy, **final cause** is the conception that everything has a teleological purpose or final location in the structural composition of the world or universe.

Aristotle

In c.322BC, Aristotle introduced the concept of “final cause”, amid his four-part cause theory of motion.

Bacon

In 1605, English philosopher Francis Bacon, in his *Advancement of Learning*, demolished the "final cause" theory of Aristotle, siding with Democritus in his place; the following be a representation: [1]

> “The handling of **final causes**, mixed with the rest in physical inquiries, hath intercepted the severe and diligent inquiry of all real and physical causes, and given men the occasion to stay upon these satisfactory and specious causes, to the great arrest and prejudice of further discovery. For this I find done not only by Plato, who ever anchoreth upon that shore, but by Aristotle, Galen, and others which do usually likewise fall upon these flats of discoursing causes. For to say that “the hairs of the eyelids are for a quickset and fence about the sight;” or that “the firmness of the skins and hides of living creatures is to defend them from the extremities of heat or cold;” or that “the bones are for the columns or beams, whereupon the frames of the bodies of living creatures are built;” or that “the leaves of trees are for protecting of the fruit;” or that “the clouds are for watering of the earth;” or that “the solidness of the earth is for the station and mansion of living creatures;” and the like, is well inquired and collected in metaphysic, but in physic they are impertinent. Nay, they are, indeed, but *remoras* and hindrances to stay and slug the ship from further sailing; and have brought this to pass, that the search of the physical causes hath been neglected and passed in silence. And, therefore, the natural philosophy of Democritus and some others, who did not suppose a mind or reason in the frame of things, but attributed the form thereof able to maintain itself to infinite essays or proofs of nature, which they term fortune, seemeth to me (as far as I can judge by the recital and fragments which remain unto us) in particularities of physical causes more real and better inquired than that of Aristotle and Plato.”

In 1917, American physicochemical physiologist Lawrence Henderson summarized the following about Bacon’s battle with Aristotle’s final cause theory: [2]

> “Bacon—while admitting that Aristotelian principle that mechanism and teleology appear to be two complementary aspects of things and that the latter may be conceived as real—discovered the peculiar feature of physical science that it must proceed as if **final causes** did not exist, i.e. that physical science can recognize only one kind of causation, which is physical causation, which is a return to Democritus and Empedocles.”

(add)

Juarrero-Deacon affair

The seeming dispute, in the 2012 so-called Juarrero-Deacon affair, on alleged plagiarism charges, is that both Cuban-born American philosopher Alicia Juarrero (*Dynamics in Action*, 1999) and American anthropologist Terrence Deacon (*Incomplete Nature*, 2011) independently employ the same formula of argument in their work, which was summarized (Ñº) by Juarrero as follows:

> *Dynamics in Action* (1999) & *Incomplete Nature* (2011) = Final cause (Aristotle) + Far-from-equilibrium thermodynamics (Prigogine)

(add)

Quotes

The following are noted quotes:

> "Nature has not fixed aim in view and all **final causes** are merely fabrications of men."
>
> — Benedict Spinoza (c.1650)

> "For Descartes, by founding a philosophy which rejected all authority except that of the human reason, was, of course, led to abandon the study of **final causes**,—an old and natural superstition, by which, as we shall hereafter see, the German philosophers were long impeded, and which still hangs, though somewhat loosely, about the minds of men. Whewell, for instance, says, that **we must reject final causes in the inorganic sciences, but must recognize them in the organic ones**; which, in other words, simply means, that we know less of the organic world than of the inorganic, and that because we know less, we are to believe more; for here, as everywhere else, the smaller the science the greater the superstition. *Whewell's Philosophy of the Inductive Sciences, Volume One* (pgs. 620, 627, 628); and his *History of the Inductive Sciences, Volume Three* (pgs. 430, 431). If the question were to be decided by authority, it would be enough to appeal to Bacon and Descartes, the two greatest writers on the philosophy of method in the seventeenth century, and to Auguste Comte, who is admitted by the few persons who have mastered his *Philosophie Positive*, to be the greatest in our own time. **These profound and comprehensive thinkers have all rejected the study of final causes**, which, as they have clearly seen, is a theological invasion of scientific rights."
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 427)

> "Purpose pertains to man, not to nature, and man's purposes are often shrouded in mystery, even to himself. We will leave out all theological or eschatological considerations, since they germinate from theories steeped in religion, destiny or **final cause** or purpose of existence."
>
> — Morris Zucker (1945), commentary on some who have ascribed purpose to history [3]

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3. Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 638). Arnold-Howard Publishing Co.

External links

â— Final cause (section) – Wikipedia.

θΔics

In thermodynamics, **final state**, as compared to an initial state, refers, generally, to the measurement of the free energy or the reactants, graphically shown on the reaction coordinate, at the end or final second at the last stage of the reaction sequence. The two different states, are often explained in terms of differences in the bonding geometries, bonding changes, and bond energies of the products as compared to the reactants.

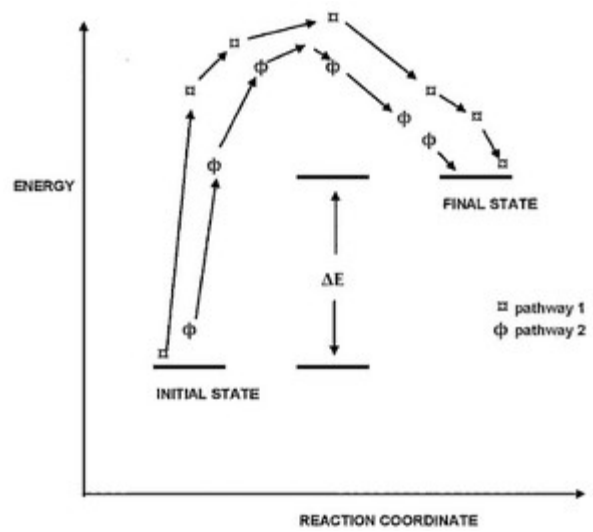

Generic depiction of an "initial state" of a reaction system, at a specific value of energy, which may proceed through any of various reaction pathways, in its course of action towards a "**final state**", signified by a specific value of energy, at a later point in time (or concentration) on the reaction coordinate. [1]

Overview

In 1993, American chemist Martin Goldstein gave the following example of what is meant by initial versus final in the context of "states", specifically in regards to how one would go about calculating the Gibbs free energy of formation of a mouse (or by extrapolation a human): [2]

> "To apply thermodynamics to the problem of how life got started, we must ask what net energy and entropy changes would have been is simple chemical substances, present when the earth was young, were converted into living matter [as in the formation of a mouse] … to answer this question [for each process], we must determine the energies and entropies of everything in the initial state and **final state**."

In other words, the initial state is one point in time in the course of the reaction, typically the beginning, or point at which reactant collision occurs, millisecond in which the reaction becomes activated, or time at which the reactants are introduced into the reacting system. The final state is some amount of time (seconds, minutes, days, or years, etc.) following the start of the reaction.

References

1. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (Appendix A: The Fundamentals of Thermodynamics Applied to Socioeconomics, pgs. 469-89; Graph, pg. 474.). AuthorHouse.
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θΔics

In human physics, **financial physics**, a subject sometimes taken as a synonym of econophysics, is the subject of physicists studying financial market, using the tools and techniques of physics.

History

In 1863, French economist Jules Regnault (1834-1894) published his “Calculations of Chances and Philosophy of Trading”, said to have been strongly influenced by the social physics of Adolphe Quetelet, and in doing so developed a version of what has been called “financial physics”

In 1900 French mathematician Louis Bachelier, in his *The Theory of Speculation*, built on the work of Regnault, to use a random hypothesis to treat securities prices similar to gas molecules, moving independently of each other, with future movements being independent of past movements, hence starting the field of econophysics, according to some classifications.

In 2008, University of Houston initiated their "econophysics" department (see: American school of econophysics), under the leadership of American physicist Joseph McCauley, which in large part seems to be focused on applications of physics in finance.

In 2012, *New Scientist*, per citation to Bikas Chakrabarti, published following financial physics stylized info box: [3]

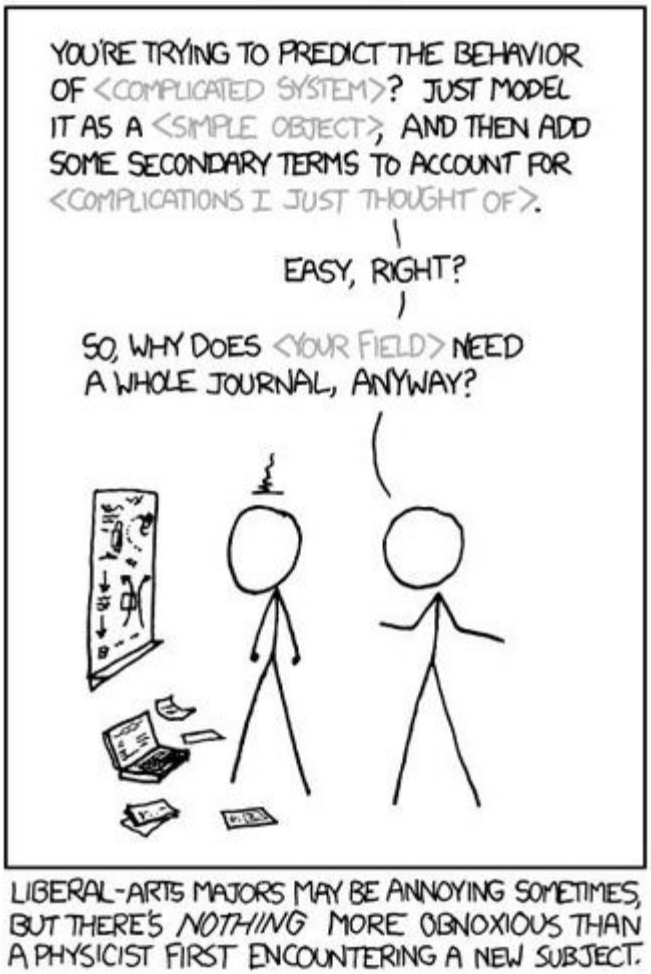

A **financial physics** themed cartoon by physicist and cartoonist Randall Munroe, used to mock the 2013 *The Physics of Wall Street* by James Weatherall. [1]

The physics of our finances

"The 1 per cent" may be a catchy phrase, but when it comes to understanding how wealth is distributed within society, we should focus on the top 5 or 10 per cent. Those who study income distribution have discovered that there is one rule for the rich and one rule for everybody else. For the masses, income follows a broad curve; for the wealthiest 5 to 10 per cent, the pattern is different, forming the so-called Pareto tail (see graph). The statistical pattern seems to be ubiquitous and unchanging – "from ancient Egypt up to today", says Juan Ferrero, a physicist at the University of Córdoba in Argentina. That implies that there may be a universal mechanism at work. More than 100 years ago, physicists pointed out that the broad income curve for the majority resembles the distribution of energy among molecules in a gas, a pattern called the Maxwell-Boltzmann distribution. This prompted the idea that the distribution arises because people exchange wealth when they meet, much as gas molecules exchange energy when they collide. That idea has since been tested using mathematical models that liken human beings to molecules bouncing around in a gas. In the simplest model, people risk surrendering all their wealth at each encounter.

That produces a wealth curve that has far more ultra-poor people than we find in the real world. So in 2000, Bikas Chakrabarti's team at the Saha Institute of Nuclear Physics in Kolkata, India, allowed people to retain some of their wealth in each exchange. The result was a wealth curve similar to the broad hump of the Maxwell-Boltzmann distribution. The next refinement was to allow different people to hold back different percentages of their wealth – effectively setting money aside as savings. With this tweak, the model correctly reproduced the whole wealth distribution curve, including the Pareto tail, which was made up largely of people who saved the most. This finding has been backed up by other similar models, including one developed by Ferrero, in which the richest 10 per cent are once again those most inclined to save. If these simple models do capture something of the essence of real-world economics, then they offer some good news. It turns out that the main part of the wealth distribution gets narrower, more equal, the more people choose to save. In other words, inequality can't be abolished, but it can be reduced if we all put more money aside for a rainy day. Stephen Battersby

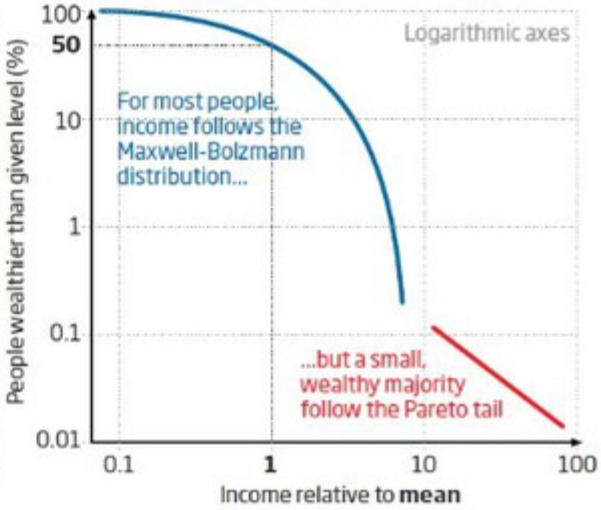

In all societies, the division of income follows a pattern similar to the distribution of energy of molecules in a gas – at least for the vast majority of people. But among the very richest, a pattern called the Pareto tail applies

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In 2013, James Weatherall, in his *The Physics of Wall Street*, supposedly, outlined some type of financial physics. [1]

See also

â— Financial thermodynamics
â— Financial temperature

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2. (a) Brown, Aaron. (2012). "*The Physics of Wall Street*: the Most Arrogant Book in the World?, Dec 17, MinyAnville.com.
(b) Weatherall, James O. (2013). *The Physics of Wall Street: a Brief History of Predicting the Unpredictable*. Houghton Mifflin Harcourt.
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θΔics

In hmolscience, **financial temperature**, in financial thermodynamics, is the measurement of the temperature of a house, body, business or system proportional to the number of expensive states, seats, or positions occupied by the people or human molecules of each system, such that more expensive positions, such as front row seats at a show, correspond with states of greater molecular energy.

Overview

In 1946, English thermodynamicist Alfred Ubbelohde gave a "cinema example" to explain equilibrium, statistical mechanics, microstates, and molecular energy, and temperature is the variations in the cost of seats at a city movie theater. To quote: [1]

> "Another aspect of city life, which bears an even closer relation to the rather abstruse calculations of statistical mechanics, is presented by a cinema giving a continuous show of a fairly popular film, so that the theatre is never quite full.
>
> At any there will be certain number of people in the one-and-threepennies, and the two-and-threepennies, and even in the four-and sixpennies. The way in which the number of people, and their distribution in the different price categories, maintains itself without over-riding instructions from anyone, is usually far too complex to work out scientifically in terms of the life-histories of individuals. Brown might be treating himself to an expensive seat, because he is a bachelor and has been successful in his business. Jones might take his girl to the same category of seats at the early stages of their courtship to impress her, and might move into cheaper seats later on.
>
> Yet in spite of individual variations of great complexity, with a given number of people in the house their distribution amongst the seats will show only small fluctuations about an average occupation of seats, and this average distribution must in fact be known with fair accuracy by enterprising managers. This average distribution of patrons in a cinema not quite full might be called the most probable distribution, and since it is not much affected by individual comings and goings, the state or degree of occupation of the cinema can be described as in statistical equilibrium. As more people occupy the more expensive seats the **financial temperature** of the house may be said to rise; actually this parallel gives quite a good idea of the effect of increasing the temperature of an assemblage of molecules. The more expensive seats correspond with states of greater molecular energy."

The question we must ask, in modern 21st century parlance, knowing that humans are indeed molecules, is does this model give an accurate depiction of molecular energy of the various human molecules involved, such that the distribution of filled seats gives a reading of temperature or rather financial temperature?

In 1972 issue of *New Scientist* the anonymous writer Daedalus outlined some basics of a theory of financial temperature: [2]

> "This week my fiscothermal friend Daedalus continues his exposition of the thermodynamics of money, regarding it as a heat-like entity whose concentration determines a financial temperature."

Here, in summary, financial temperature is posited to be measured by money or the concentration of money, in some way, in which money is to be viewed as a heat-like entity or secondary field particle in modern physics parlance. [3]

In 2001, Lowell Getz argues that there are ways to check a firm's financial temperature and that this gives a reading of the health of the firm, so to speak. [4]

In his 2006 book *The Psychology of Selling*, Brian Tracy argues that each person has a income thermostat that

determines each person's financial temperature. [5]

In 2009, Fred Steingold argued that the financial temperature of a small business can be gauged by factors such as debt-to-equity ratio or rate of collection on receivables. [6]

See also

â— Economic temperature
â— Social temperature
â— Sexual temperature

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θΔics

In human thermodynamics, **financial thermodynamics** is the study of the thermodynamics of money.

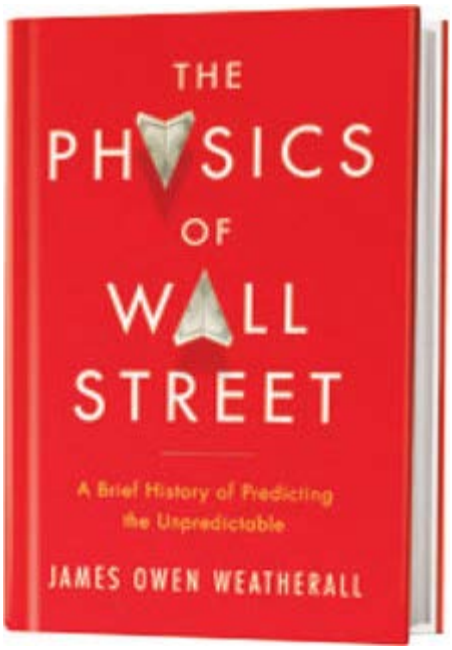

The 2013 book *The Physics of Wall Street*, by American physicist, philosopher, and mathematician James Weatherall, touches on thermodynamics, and may well represent some aspects of **financial thermodynamics**, specifically Paul Samuelson's usage in economics. [4]

Overview

In 1926, English radiochemist Frederick Soddy, in his 1926 *Virtual Wealth and Debt*, attempted to explain the difference between wealth and debt, thermodynamically. [1]

In 1972, American science writer Daedalus described money as a heat-like entity whose concentration determines a financial temperature, and the interactions of people as a type of molecular sociology. [1]

> "Some while back Daedalus developed a 'molecular sociology' an analogy between people and molecules. In particular he identified wealth in people with energy in molecules; he is now developing a **financial thermodynamics** or thermodynamics of money."

A 1970s example would be American science writer Daedalus

The 2003 "Thermodynamic Analogies in Economics and Finance: Instability of Markets" by American physicist Joseph McCauley might be a more recent example of an attempt at theorizing on financial thermodynamics. [3]

See also

â— Economic thermodynamics

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2. (a) Staff. (1972). "Ariadne", *New Scientist* (pg. 165), Apr 20.
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3. McCauley, Joseph l. (2003). "Thermodynamic Analogies in Economics and Finance: Instability of Markets", *Physica A* 329 (2003): pp.199-212.
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θΔics

In religio-mythology, **finger of god** refers to the metamorphosis, over about a thousand years, of the model of Aten's finger into the "finger" of the god of Moses, who famously writes on stone tablets, with his finger, to give modern man the 10 laws of morality (see: Ten Commandments).

A general diagram showing the how the closed-fingered hand of the monotheistic sun god Aten, which were conceptualized as sun rays, became the finger of god that penned the Ten Commandments and the "stretched out arm" that brought the Israelites out of Egypt.

Quotes

The following are related quotes:

> "And he gave unto Moses, when he had made an end of communing with him upon mount Sinai, two tables of testimony, tables of stone, written with the **finger of god**."
>
> — Anon (c.200BC), Exodus 31:18

> "He brought Israel out from their midst, with a **strong hand and stretched out arm**."
>
> — Anon (c.200BC), Psalms 136:11-12

> "Modern criticism rightly regards Thucydides as the model of the rational and objective historian who made it his first duty to leave the **finger of god** out of history and to tidy up the mundane events of the human drama. The contrast between his work with respect to the gods and the histories of his predecessor Herodotus and his successor Xenophon is plain; it is a contrast so great, in fact, as to provoke the observation from some (e.g. K. J. Dover) that Thucydides may well have been an atheist."
>
> — Borimir Jordan (1986), "Religion in Thucydides"

> "Aaron struck the dust: the mosquitoes attacked men and beasts throughout the land. So Moses in his mildness is not even capable of striking the ground—it is Aaron who must do it. Egyptian magic couldn't do this because clearly it was not magic; instead, it was a natural sign from YHWH that he is the creator—as if he were **Aten**, the singular creator-god of Akhenaten returned again. And yet: 'This is the **finger of god**', say Pharaoh's minions. The plagues are as if YHWH is writing in the landscape with natural signs. It is his 'finger' doing the writing, just as it may also aid Moses on Mount Sinai [writing the Ten Commandments]

—and, ‘as YHWH had foretold, Pharaoh refused to listen’. We can only imagine that Pharaoh had all the doors and windows sealed and was content to remain indoors until the mosquitoes died.”

— David Rosenberg (2010), *An Educated Man: a Dual Biography of Moses and Jesus* (pg. 103)

External links

â— Finger of god – Wikipedia.
â— Finger of god – Bible.Knowing-Jesus.com.

θΔics

In anatomy, **fingerprint** is a trace, print, or scan of the friction ridges of the skin of any finger that serve as unique identification markers. [1]

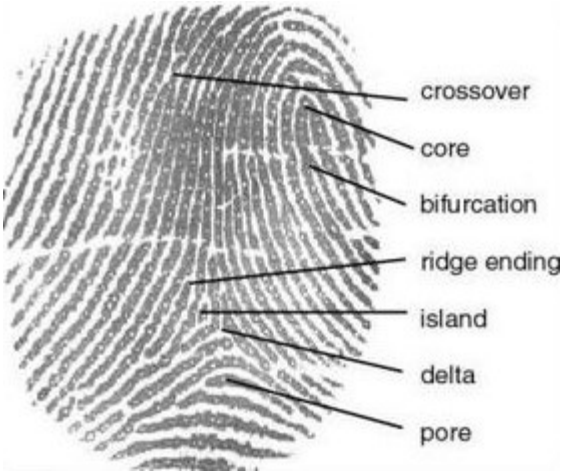

Overview

In 2007, it was noted by American chemical engineer Libb Thims, in reference to the concept of human molecules, that "just as each person has his or her own unique and specific *fingerprint*, retinal-scan, or genomic-map, so too does each individual person have his or her own unique twenty-six element molecular formula." [2] Similarly, that same year, it was hypothesized by Russian biometrist Viktor Minkin that the newly developing science of human thermodynamics provided a link between fingerprints, which reflect the character and health of a person, and DNA. [3] The first article on this topic was the 2008 "Fingerprints and the Thermodynamics of Human Development" by Minkin." [4]

References

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2. Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (pg. 18). Morrisville, NC: LuLu.
3. (a) email communication between Minkin and Thims (Friday, February 09, 2007) in commentary on a review of the first five chapters of manuscript of Thims' *Human Chemistry*.
(b) Comment as found on *pg. x* of Thims' *Human Chemistry (Volume One)*.
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θΔics

In science, **fire** (TR:451) is the phenomenon of light, heat, and flames produced during the combustion of hydrocarbon structures (e.g. wood), wherein carbon and oxygen react exergonically to produce carbon dioxide, water, heat, and light.

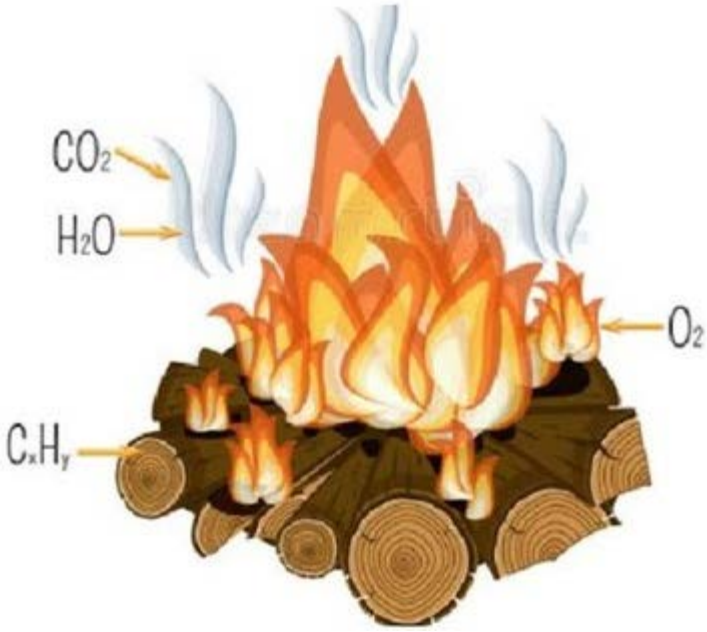

A generalized image of the combustion of wood (CxHy) reacting with oxygen (O2) in the air to produce CO2, H2O, and heat or fire.

Overview

The first so-called "flux and fire" philosopher was Heraclitus, who theorized that fire was the primary element and that change was the underlying mechanism of all.

Theories behind the operation or mechanisms that occur in fire, specifically fire seen as one of the four classical elements (350BC), sulphur (1524), terra pinguis (1669), phlogiston (1703), caloric (1787), entropy (1865), led to the development of the science of thermodynamics. The traditional alchemical symbol for fire was the capital delta Δ.

Quotes

The following are related quotes:

"The mind is not a vessel to be filled but a **fire** to be kindled."

— Plutarch (c.100) (Q); oft-misattributed to Socrates (Q); paraphrased by Yeats (Q)

"Doubt the stars are **fire**. Doubt that the sun moves. Doubt truth be a liar. But never doubt I love."

— William Shakespeare (c.1600) (Q)

"Genius is talent set on **fire** by courage."

— Henry van **** (c.1900) (Q)

"Education is not the filling of a pail, but the lighting of a **fire**."

— William Yeats (c.1905) (Q)

"The most powerful weapon on earth is the human soul on **fire**."

— Ferdinand Foch (c.1910) (Q)

"Someday, after mastering winds, the waves, the tides and gravity, we shall harness the energies of love, and then, for a second time in the history of the world, man will have discovered **fire**."

— Pierre Teilhard (c.1932), *Toward the Future* (pdf) (Q); his mist widely-quoted statement, supposedly (Q)

> “When, as I have done on many occasions, one asks educated persons and even eminent scientists, ‘What is **fire**?’, one receives vague or tautological answers which unconsciously repeat the most ancient and fanciful philosophical theories.”
>
> — Gaston Bachelard (1938), *The Psychoanalysis of Fire* [1]

> “In everyone’s life, at some time, our inner **fire** goes out. It is ithen burst into flame by an encounter with another human.”
>
> — Albert Schweitzer (c.1940) (O)

See also

● Reflections on the Motive Power of Fire

References

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Further reading

● Sestak, J. and Mackenzie, R.C. (2001). “The Fire/Heat Concept and its Journey from Prehistoric Time into the Third Millennium” (abs), *Journal of Thermal Analysis and Calorimetry*, 64: 129-47.
● Newton, David E. (2002). *Encyclopedia of Fire*. Oryx Press.

External links

● Fire – Wikipedia.

θΔics

In engineering, **fire engine** is an 18th century synonym for steam engine, meaning an engine for “raising water by fire”, generally referring to Savery engine, Newcomen engine, or Somerset engine; not to be confused with the modern sense of the term, as in a fire truck for putting out fires. [1]

Quotes

The following are related quotes:

> “No contrivance for raising water is more justly surprising than the ‘**fire engine**’, the particular contrivance, and sole invention of a gentleman with whom I had the honour long since to be well acquainted. I mean the ingenious Captain Savery, some time since deceased, but then a most noted engineer, and one of the commissioners of sick and wounded. This gentleman's thoughts were always employed in hydrostatics, or hydraulics, or in the improvement of water-works; and the first hint from which it is said he took this engine was from a tobacco-pipe, which he immersed to wash or cool it, as is sometimes done. He discovered by the rarefaction of the air in the tube, by the heat or steam of the water, and the gravitation or impulse of the exterior air, that the water was made to spring through the tube of the pipe in a wonderful, surprising manner; though others say, that the learned Marquis of Worcester, in his *Century of Inventions* (which book I have not seen) gave the first hint for this raising water by fire. It was a considerable time before this ingenious person (Savery), who has been so great an honour to his country, could, as he himself tells us, bring this his design to perfection, on account of the awkwardness of the workmen, who were necessarily to be employed about the affair; and I have heard him say myself that the very first time he played it was in a porter's house at Lambeth; where, though it was a small engine, yet it forced its way through the roof and struck up the tiles, in a manner that surprised all the spectators.”
>
> — Stephen Switzer (1729), *Introduction to a System of Hydrostatics and Hydraulics* [2]

References

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External links

â— Fire engine – Wikipedia.

θΔics

In heat engines, a **fire wheel** was a theoretical device, operated by the alternate dilation and contraction of air, by means of fire, that created circular motion for the purposes of raising water.

The “fire wheel”, or *moulin à feu* (mill of fire), was a theoretical device conceived by French physicist Guillaume Amontons and first documented in a memoir of 1699 entitled “A Commodious Way of Substituting the Action of Fire Instead of Men and Horses to Move Machines” delivered in June, the same month of Thomas Savery’s demonstration of his Miner’s friend to the Royal Society, to the Royal Academy of Sciences in Paris. [1]

The original memoir details the construction of Amontons’ machine; also Martin and Chambers's *Abridgment of the Philosophical History and Memoirs of the Royal Academy of Sciences* at Paris, volume i, gives a full account of it, with a figure (which may or may not be the one depicted, adjacent).

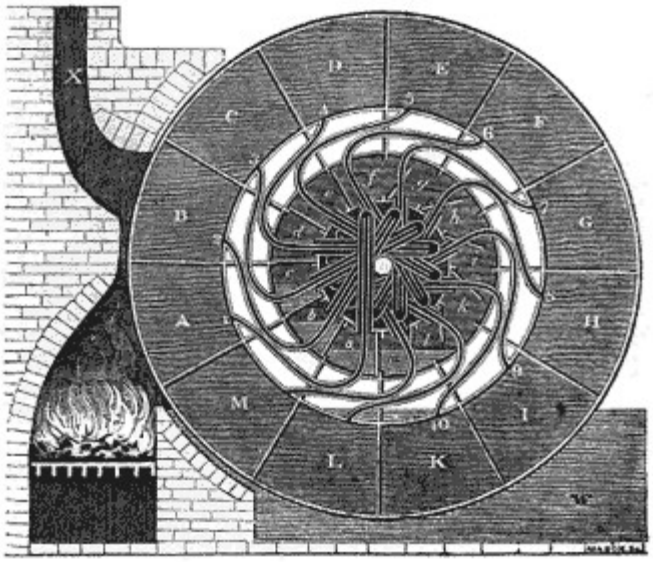

A supposed diagram of French physicist Guillaume Amontons 1699 **fire wheel**, wherein a fire sequentially heated air in the outer chambers, which then forced water to move between the inner segmented wheel's cavities. [3]

Steam engines

The Papin engine (1690) and the fire wheel (1699) are generally considered to be the two main theoretical forerunners to the working steam engine, i.e. the Savery engine (Miner's friend), Newcomen engine, and others to follow. [2]

Circular motion

Amonton’s fire wheel is said to have been the first attempt for producing “circular motion” by means of fire, otherwise than by the aeolipile (250BC) or the fly of a smoke-jack, prior, and the Watt sun and planet gear (1871) to follow.

Overview

Amontons' fire-wheel, as he called it, consists of a number of close buckets, or chambers, placed in the circumference of a hollow wheel, and communicating with each other by valves opening in one direction; and a sufficient quantity of water is put into these buckets to fill about one half of the number: another circle of similar buckets, but of larger dimensions, are placed on the outside of the circle of the former buckets; these large buckets contain air, and each one has a pipe conducted from it to one of the waterbuckets which are nearer to the center: a part of the circumference of the wheel, which is about the level of the center, is exposed to the fire of a furnace, so that each air-bucket that passes will be heated; and also the lower part of the wheel is immersed in a cistern of cold water, so as to cool the fame bucket again. [2]

The action of the machine may easily be understood. The air contained in the large bucket which is opposite the fire becomes heated and expanded, and by the pipe of communication it enters into that waterbucket which is at the lower side of the wheel, and pressing upon the surface of the water therein, causes it to mount up through the other chambers, in the direction in which the valves open from one chamber to the next; the water, being thus accumulated in the chambers at one side of the wheel, will give it a preponderating power to turn round upon its axis.

This motion brings another air-bucket opposite to the fire, and the air therein expands in its turn, and again elevates the water in the interior chambers as much as it had descended by the motion of the wheel; a continual succession is thus kept up, and the air-buckets which have pasted the fire descend into the cold water, and the air is thereby cooled and reduced to its former bulk. By the communication with the water-buckets, the pressure of the expanded air is removed from within them, and puts them in a situation to repeat their action.

This machine is ingenious, and if a better application of fire, by rarefying water into steam, had not been discovered, it is possible that the invention of Amontons might have been further prosecuted. From his computations it would appear, that the machine he proposed would act with a considerable power; but as he exhibited no working model, or actual trial, it was never proved that the machine, if put into practice, would be capable of producing anything near the effect

promised by his calculations.

Other fire wheels

Leupold, in his "Theatrum Hydraulicarum," 1724, proposed an improved form of this fire-wheel; and steam-engines have been since made with mercury, or fluid metal, contained within a hollow wheel, which is to be always kept on one side with the mercury by the force of the steam: they have not been found to equal other modes of applying the force of steam. [2]

Thermometers

Some of the fortuitous repercussions of Amontons' failed attempt to create a 'fire wheel', that used the heat of a fire to expand air and make it move a wheel, are said to have been some of his experimental work in thermometry and on the development of the ideal gas laws and research into the nature of cold, some of used to create better thermometers.

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2. Rees, Abraham. (1819). "Section: M. Amonton's Fire-Wheel", *The Cyclopedia*, pg. 40. Longman, Hurst, Rees, Orme & Brown.
3. Amonton Firewheel of 1698 – GenuineIdeas.com.

θΔics

In terminology, **first cause** refers to the first domino, event, or trigger in the chain of causality.

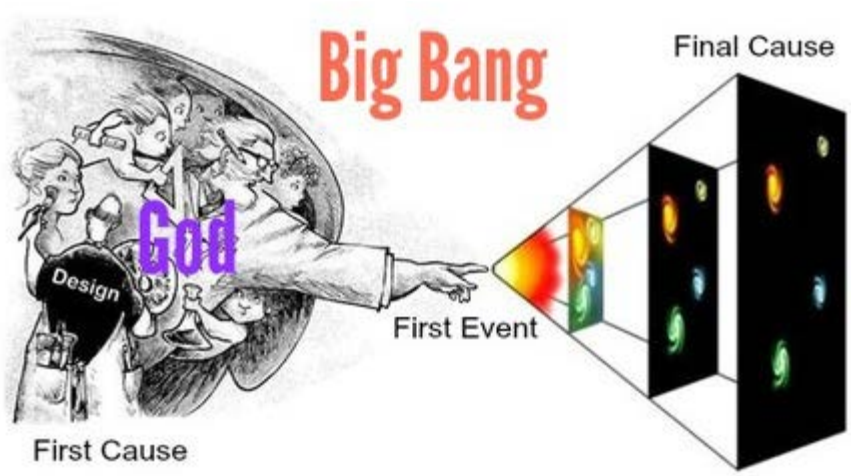

The "**first cause**" according to the 1985 views of American astronomer Allan Sandage, as that which precedes the big bang, aka the "first event". [2]

Overview

In 1647, French thinker Pierre Gassendi revives atomic theory, with the publication of *On the Life and Death of Epicurus*, followed by *Arrangement of the Philosophy of Epicurus* (1649), wherein he coins the term "molecule", but avoids the "charges of atheism" by locating the physical "causal" agency in atoms, albeit connected back to the creator, i.e. first cause, as follows: (Ñº)

> "The **first moving cause** in physical things is atoms; while they move through themselves and through the force which is continually received from the author from the beginning, they give motion to all things. And therefore, the atoms are the origin, principal, and cause of all motions that are in nature."

In 1794, Erasmus Darwin, in his *Zoonomia*, explained the following, in the context of his origin of life theory: [3]

> "Would it be too bold to imagine, that in the great length of time, since the earth began to exist, perhaps millions of ages before the commencement of the history of mankind, would it be too bold to imagine, that all warm-blooded animals have arisen from one living filament, which the great **first cause** endued with animality, with the power of acquiring new parts, attended with new propensities, directed by irritations, sensations, volitions, and associations; and thus possessing the faculty of continuing to improve by its own inherent activity, and of delivering down those improvements by generation to its posterity, world without end!"

In *circa* 1870, James Maxwell stated the following about first cause: [1]

> "**First causes** are not known to us, but they are subjected to simple and constant laws that can be studied by observation and whose study is the goal of natural philosophy … Heat penetrates, as does gravity, all the substances of the universe; its rays occupy all regions of space. The aim of our work is to expose the mathematical laws that this element follows … The differential equations for the propagation of heat express the most general conditions and reduce physical questions to problems in pure analysis that is properly the object of the theory."

In 1985, American astronomer Allan Sandage, during a conference on science and religion, as a Christian, telling the audience that the big bang was a supernatural event, that science had taking us to the "first event", but it could not take us further to the "first cause", i.e. the sudden emergence of matter, space, time, and energy, which pointed the need for some kind of transcendence. [2]

Quotes

The following are related quotes:

> "By predicating a **first cause**, the theist removes the mystery a stage further back. Such a belief is a logical

absurdity, and is an example of the ancient custom of creating a mystery to explain a mystery. Moreover, if it is reasonable to assume a first cause as having always existed, why is it unreasonable to assume that the materials of the universe always existed? If everything must have a cause, then the first cause must be caused and therefore: who made god? To say that this first cause always existed is to deny the basic assumption of this theory. To explain the unknown by the known is a logical procedure; to explain the known by the unknown is a form of theological lunacy."

— David Brooks (1933), *The Necessity of Atheism* [4]

"I think only an idiot can be an atheist. We must admit that there exists an incomprehensible power or force with limitless foresight and knowledge that started the whole universe going in the first place."

— Christian Anfinsen (c.1989) (Ñº)

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3. (a) Darwin, Erasmus. (1794). *Zoonomia* (XXXIX: On Generation, pgs. 373-442). Publisher.
(b) Darwin, Erasmus in Venn, J. & J. A., *Alumni Cantabrigienses*, Cambridge University Press, 10 vols, 1922–1958.
4. (a) Huberman, Jack. (2007). *The Quotable Atheist: Ammunition for Nonbelievers, Political Junkies, Gadflies, and those Generally Hell-Bound* (pg. 52-53). Nation Books.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 133). Zondervan.

Videos

â— Muslim vs Confused Theist | First Cause (Ñº) (Ñº)

θΔics

In thermodynamics, **first law** is shorthand for the first law of thermodynamics along with other synonyms, including: the first main principle as well as, loosely speaking, the conservation of energy; although, technically speaking, this is more of a step in the derivation of the first law.

See also

- Zeroth law
- Second law
- Third law
- Forth law
- Joule's first law
- Newton's first law

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θΔics

In laws of motion, **first law of motion**, aka inertia or "law of inertia" (see: principle of inertia), is []

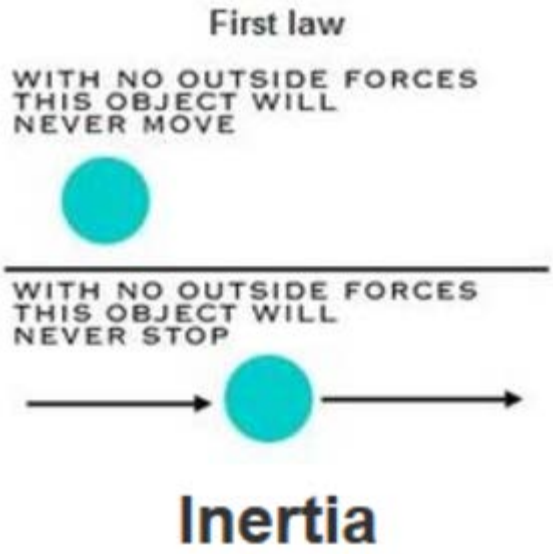

The gist of the **first law of motion**, namely that with no outside forces a body will never move, or if moving, will never stop.

Overview

In c.300BC, Aristotle, supposedly, was one of the first to grapple with the outlines of the first law; discussions of which resulting from his investigations into the nature abhors a vacuum query, which he was an advocator of; Aristotle's proto-version version of the first law was: [1]

> "Nobody can give a reason why a body that has been put into motion in empty space should stop on its own account. Why should it stop in one place rather than in another? Thus it will remain at rest, or it will of necessity keep moving ad infinitum unless it is hindered from doing so."

In 60AD, Hero stated the following on the matter: [1]

> "Bodies will have a rapid motion through a vacuum where there is nothing to obstruct or repel them, until they are in contact."

In 1490, Leonardo Da Vinci, in his notebooks, moved from simply describing inventions to a more intense search for underlying principles, the laws of motion, in particular; Da Vinci wrote: [2]

> "Nothing whatever can be moved by itself, but its motion is effected through another. There is no other force."
>
> "All movement tends to maintenance, or rather that all moved bodies continue to move along as the impression of the force of their motors (original impulse) remains in them."

In c.1600, Galileo Galilei outlined a proto-version of the first law of motion in the form of the principle of inertia, or Galileo's principle, refined, namely there are two states: being at rest and moving uniformly, which are to be treated as being the same. [3]

In 1687, Newton codified the first law of motion as follows:

> "Every body perseveres in its state of being at rest or of moving uniformly straight forward, except insofar as it is compelled to change its state by forces impressed."

(add discussion)

Social first law of motion

See main: Social first law of motion

The subject of the first law of motion applied socially, i.e. to human movement, seems to be quite involved, to say the least; the following three quotes, combined, seem to capture the gist of the application:

"Those which cannot act on any of our organs, either immediately and by themselves, or mediately, by the intervention of other bodies, exist not for us; since they can neither move us, nor consequently furnish us with ideas: they can neither be known to us, nor of course be judged of by us. **To know an object, is to have felt it; to feel it, it is requisite to have been moved by it**."

— Baron d'Holbach (1770), *The System of Nature* (pg. 16)

"The **only thing which can be directly perceived by the senses is force**, to which may be reduced light, heat, electricity, sound and all the other things which can be perceived by the senses."

— James Maxwell (1847), age 16 answer to homework exercise for Scottish philosopher William Hamilton (1788-1856) on the properties of matter [6]

"Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But **as soon as the body moves under the influence of the force, work is performed**."

— Rudolf Clausius (1875), "Mathematical Introduction"

(add)

References

1. Genz, Henning. (1994). *Nothingness: the Science of Empty Space* (pgs. 73, 108). Perseus Publishing.
2. Shlain, Leonard. (2009). *Leonardo's Brain: Understanding da Vinci's Creative Genius* (manuscripts, pg. 6; spurge, pg. 9; Machiavelli, pg. 27; desire to know, pg. 75; laws of motion, pgs. 111-14). Lyons Press, 2014.
3. Gleick, James. (2003). *Isaac Newton* (pgs. 129-30). Vintage Books.

External links

â— Newton's first law (section) – Wikipedia.

θΔics

In thermodynamics, the **first law of thermodynamics** is the principle of the conservation of energy applied to any thermodynamic system. [1] In short, the first law defines the equivalent relationship, between the heat input Q to a thermodynamics system to that of the change in internal energy U of that system and the work output W produced by the system.

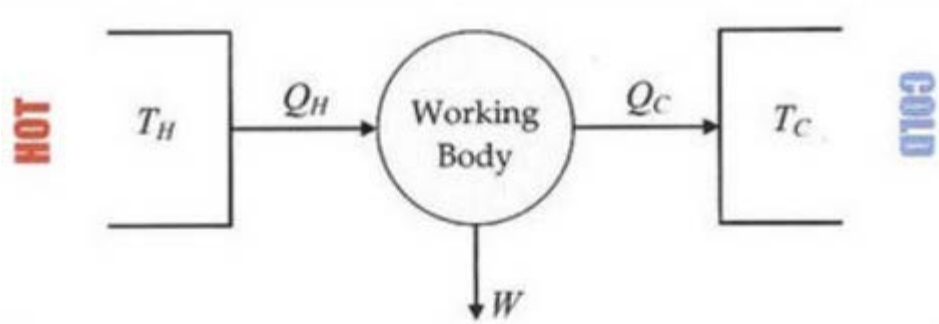

The basic model of the heat engine (Carnot engine), upon which the **first law** (or first main principle) is based.

History

The first mention of what eventually became the famed "first law" of thermodynamics was German physicist Rudolf Clausius' 1850 equation (IIa), as described in his first memoir, as shown below:

$$dQ = dU + AR\frac{a+t}{v}dv$$

where dQ is a differential unit of heat, dU is the internal energy of the body, A is the mechanical equivalent of heat, R is the gas constant, at is an arbitrary constant related to nature of the gas used in his derivation, t is temperature of the body, v is volume, and dv is a differential unit of volume. [4] The next version of what would eventually become the first law, was the following equation:

$$dQ = AW$$

described in detail in both his forth memoir (1854) and fifth memoir (1856), in the latter of which he classifies it along side the following expression:

$$\int \frac{dQ}{T} = -N$$

where T is the absolute temperature and N is the equivalence value of all uncompensated transformations, as the "two fundamental theorems". The finalized and now commonly-known version of the first law was presented in Clausius' ninth memoir (1865), wherein he introduces what he labels as the "first fundamental equation, as follows:

$$dQ = dU + AdW$$

Then he references the reader to his Appendix A to his sixth memoir, wherein he defined the quantity AW as being the exterior ergon. He then states that, for the sake of brevity, we can denote the exterior ergon by a simple letter:

$$w = AW$$

A cool sterling silver first law of thermodynamics handstamped necklace, for sale at Etsy.com, to show your people devotion to the first law. [5]

which which the former version of the first fundamental equation can be re-written as:

$$dQ = dU + dw$$

which he eventually goes on to re-write as:

$$dQ = dU - dw$$

signifying that "dw" in this version is the work done by the body on the surroundings. All of these would again be polished off and revised to some extent when Clausius re-wrote his nine memoirs into the 1875 second edition textbook version of his *Mechanical Theory of Heat*.

In overview, the basic outline of the first law states that, according to Boerhaave's law, a unit of heat is added to a body, it will cause the body to expand, where the expansion can be quantified as the body pushing out a region of new volume *V* against the weight or pressure *P* of the atoms and molecules of the surrounding atmosphere of the earth, and that the change in the energy of the body *dU* will be amount of heat added less the work one:

$$dU = dQ - dW$$

This is always the basic starting point of the first law. Other terms are added on as system analysis becomes more detailed or involved. Knowing, for instance, that *W* is pressure-volume work *PdV*, with substitution we have:

$$dU = dQ - PdV$$

To note, after *circa* 1875, through the work of German mathematician Carl Neumann, differentials which are inexact, or path-dependent, such as heat *Q* or work *W*, began to be signified using the small Greek delta δ or the d-hat Ä‘ symbol, among others.

Carnot cycle model of Earth

Each day, due to the configuration of the solar system, biospheric portions of the earth's surface, during its rotation, are put in contact diurnally with a hot body (the sun) and cold body (the night sky) on an alternating basis, according to which heat *Q* flows through various partitioned off human social systems, e.g. one small city, that each function as "working bodies", i.e. any partitioned off system through which heat may flow, of molecular species (e.g. a set of human species). In the human point of view, during each cycle, work-output is produced cyclically through the operation of economic, socially-mediated, substrate-attached, human molecular interactions in the form of multiple coupled social heat engines. [2]

Clausius notes

In the words of German physicist Rudolf Clausius, "whenever an indefinitely small quantity of heat *dQ* is imparted to this body, the question arises what becomes of it, and what effect it produces?" [3] It may serve in part, according to Clausius, "to increase the amount of heat actually existing in the body; in part also, if in consequence of the imparting of this heat the body changes its condition, and that change includes the overcoming of some force, it may be absorbed in the work done thereby." If we denote, according to Clausius, "the total heat existing in the body, or more briefly the quantity of heat in the body, by *H*, and the indefinitely small increment of this quantity by *dH*, and if we put *dL* for the indefinitely small quantity of work done (by the body)", then we can write:

$$dQ = dH + dL$$

The forces against which the work is done by the working body (e.g. a system of people, who each may be considered as individual human molecules), according to Clausius, "may be divided into two classes: (1) those which the molecules of the body exert among themselves, and which are therefore dependent on the nature of the body itself, and (2) those which arise from external influences, to which the body is subjected. According to these two classes of forces, which have to be overcome, the work is divided into internal and external work." If we denote these two quantities by *dJ* and *dW*, we may put:

$$dL = dJ + dW$$

and the foregoing equation becomes:

$$dQ = dH + dJ + dW$$

This outlines the essential first law analysis for any working body, in the words of Clausius, which thus serves as the starting basis for the thermodynamic analysis of human life.

References

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4. Clausius, Rudolf. (1865). *The Mechanical Theory of Heat – with its Applications to the Steam Engine and to Physical Properties of Bodies* ("first fundamental principle", 4+ pgs). trans. Thomas Hirst, 1867. London: John van Voorst.
5. (a) First law of thermodynamics handstamped necklace (sterling silver) – Etsy.com.
(b) First law handstamped necklace –Blog.NewsArama.com.

External links

â— First law of thermodynamics – Wikipedia.

θΔics

In science, **first life**, sometimes referred to as "origin of life" (or protoplasm), is a conceptualized hypothetical point in time, in the now-defunct theory of life (see: defunct theory of life), said to have occurred 3.5 to 3.85 billion years ago, based on isotope dating of fossilized bacteria, wherein "life" is said to have began or emerged, on or near the surface of the earth, following about one billion years of earth daily axis rotation and yearly rotation around the sun, wherein a period of no-life existence conceptually occurred, after the point at which the sun ignited, releasing photons, 4.6 billion years ago, according to the nebular hypothesis, and the earth formed in rotation, shortly thereafter.

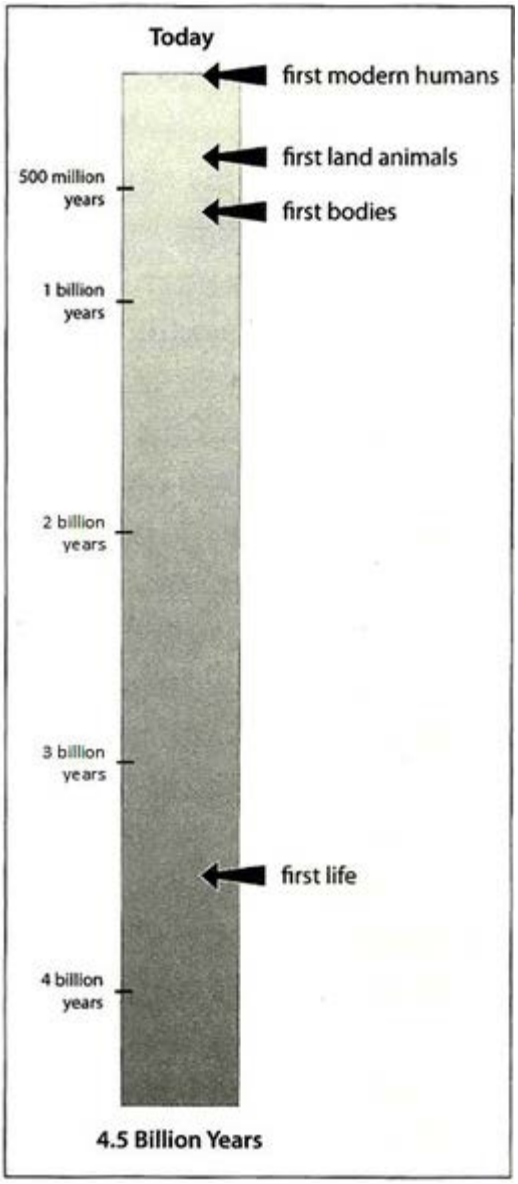

American paleontologist Neil Shubin's 2008 so-called "**first life**" diagram, from his *Your Inner Fish*, a point in time which he situates at 3.5 billion years ago. [1]

Overview

The following is a “first life” diagram, from American anesthesiologist Stuart Hameroff’s 1998 chapter “Did Consciousness Cause the Cambrian Evolutionary Explosion?”, artwork by Dave Cantrell and Cindi Laukes, based on organisms in Gould (1989) and adapted from a diagram by Joe Lertola, *Time Magazine*, December 4, 1995, subtitled with the generic "according to fossil records life on earth originated about 4 billion years ago" assertion, per citation of Lynn Margulis (1995), and consciousness "emerged" 200 million years ago, per citation of John Eccles (1992): [3]

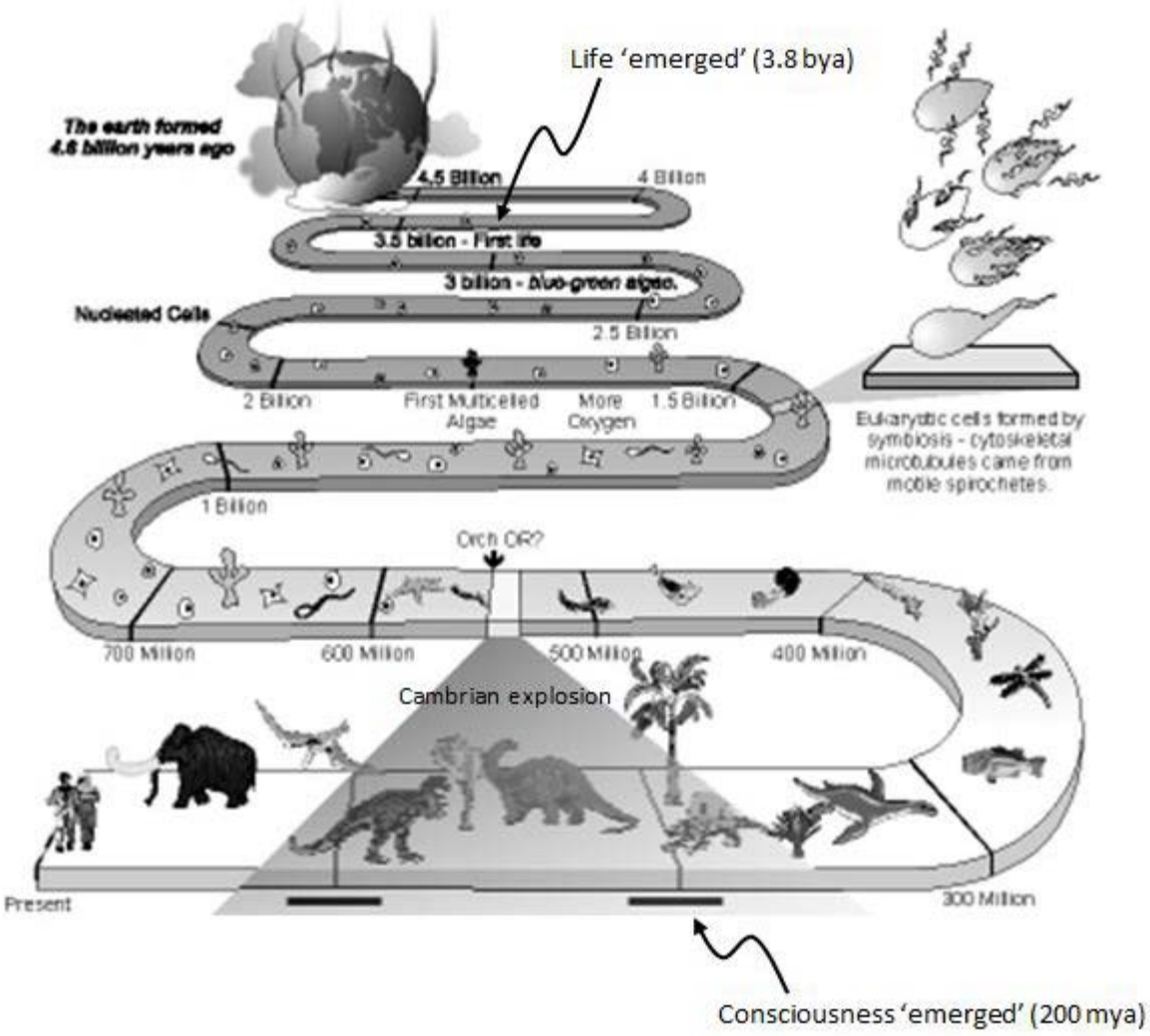

In 2008, American paleontologist Neil Shubin, in his *Your Inner Fish*, gave the adjacent "first life" diagram, with a first life arrow pointing to about 3.5 billion years ago, following which he later states that human lineage continues back to "3.8-billion-year-old pond scum, and beyond?" [1]

In 2008, American geologists Joseph Graham, William Newman, and John Stacy published the following diagram positioning the origin of organic structures spiral diagram, stating that "buried within rocks are the remains of life—the plants and animals that evolved from organic structures that existed 3 billion years ago": [2]

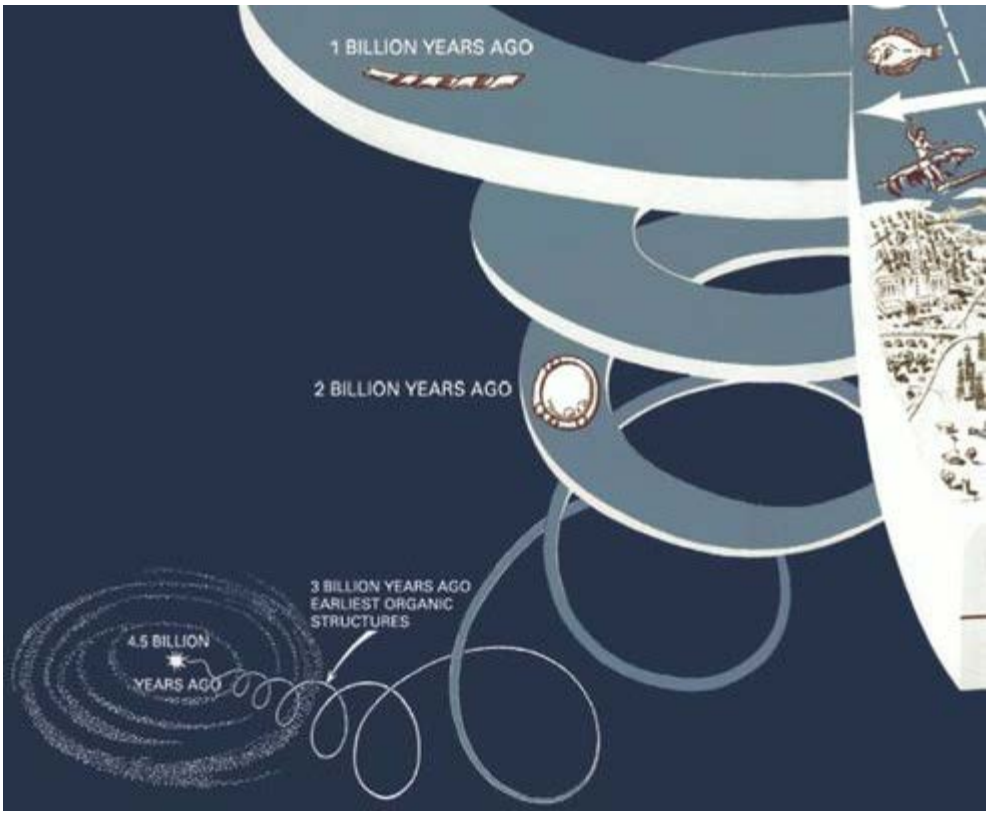

(add discussion)

See also

- Evolution timeline
- Great chain of being
- Half-alive theory
- Life terminology upgrades
- Molecular evolution table

References

1. Shubin, Neil. (2008). *Your Inner Fish: a Journey into the 3.5-Billion-Year History of the Human Body* (first life, pg. 121; pond scum, pg. 178). Random House.
2. Graham, Joseph, Newman, William and Stacy, John. (2008). "The Geologic Time Spiral" (Q) (Q), USGS.gov.
3. (a) Hamermoff, Stuart R. (1998). "Did Consciousness Cause the Cambrian Evolutionary Explosion?", in: *Toward a Science of Consciousness II* (§37:421-37) (Q). MIT Press.
(b) Margulis, Lynn and Sagan, Dorion. (1995). *What is Life?* University of California Press.
(c) Eccles, John C. (1992). "Evolution and Consciousness", *Proceedings of the National Academy of Science, USA*, 89(16):7320-24.

Further reading

- Dreamer, David. (2011). *First Life: Discovering the Connections between Stars, Cells, and How Life Began* (emerge, pg. 2). University of California Press.

External links

- Timeline of the evolutionary history of life – Wikipedia.

θΔics

In thermodynamics, **first main principle**, in contrast to the second main principle, of the mechanical theory of heat is defined by the following expression:

$$dQ = dU + dW$$

which is the general form, showing how an amount of heat *dQ* can change the energy *dU* of a body and force the body to do work *dW*. [1] In the case of the work being of the pressure-volume type *PdV* of work (pressure-volume work):

$$dQ = dU + PdV$$

such as in the body of water in a steam engine, where *dQ* is an amount of heat imparted to the body, *dU* is the change in the energy (or internal energy) of the body, *P* is the pressure of the body, and *dV* is the change in volume of the body. [2]

This terminology and expression was used by German physicist Rudolf Clausius, later coming to be known as the first law of thermodynamics. Clausius also called this the "principle of equivalence of heat and work", on the logic that heat can be transformed into work and work into heat according to the mechanical equivalent of heat.

References

1. Clausius, Rudolf. (1879). *The Mechanical Theory of Heat* (§:First Main Principle of the Mechanical Theory of Heat, or Principle of the Equivalence of Heat and Work, pgs. 21-38; pg. 110). Macmillan & Co.

θΔics

In atheism, **first true atheist** is an epitaph, affixed to a few people, referring to someone explicitly and openly a "true atheist".

> Being pessimism is sure to follow. Any astronomer of the soul worth his salt could have predicted to the day and hour the advent of Arthur Schopenhauer (1788–1860), the first true atheist. All of Europe, largely via the victory of scientific atheism, has contributed to the decay of the belief in the Christian God. This is now a universal European event in which all nations are to have their share of service and honor.

A 1991 citation (Q) by F.F. Centore, referring to Arthur Schopenhauer, the Goethe-trained assassin of god (Q), intellectual mentor to "god is dead" declarer Friedrich Nietzsche, as "**first true atheist**" of the world.

Diagoras

Greek thinker Diagoras (c.448-388BC), aka "Diagoras 'the Atheist' of Melos", a disciple of Democritus (Q), cited by Cicero, among others, sometimes referred to, in the history of atheism (Q), as the "first atheist" or history's earliest known "confirmed atheist", as some (Q) describe him, or the "first true atheist" in Greece. [5] Athenagoras, in his *A Plea for the Christians* (200AD), refers to Diagoras as follows:

> "With reason did the Athenians adjudge Diagoras guilty of atheism, in that he not only divulged the Orphic doctrine, and published the mysteries of Eleusis and of the Cabiri, and chopped up the wooden statue of Hercules to boil his turnips, but openly declared that there was **no God at all**."

The reason, supposedly, that Diagoras, was led to the supposition that god does not exist, was the result of frustration by the fact that a perjurer was not punished by the gods. [5]

Meslier

French closet extreme atheist priest Jean Meslier (1664-1729) is described by Michel Onfray (2005) as the start of true atheism: [6]

> "Meslier's *Testament* appeared in 1729, after his death. He had spent the greater part of his life working on it. The history of **true atheism** had begun."

Onfray (2009) elaborated rather cogently on this distinction as follows: [1]

> "Meslier's war cry [*Testament*, 1729], never before heard in the history of western thought, offers one of the **first true atheist** moments, if not the first. Prior to him, they call the *agnostic* an atheist who, as Protagoras, concludes that when it comes to god one can conclude nothing; the *pantheist* who, such as Spinoza, affirms its existence consubstantial with nature; the *polytheist*, like Epicurus, who teaches its multiplicity; the *deist*, in the way of Voltaire, for whom god creates the world en bloc, but does not care about the details; or whoever's idol does not correspond to the strict criteria established by the church. Now, the *atheist* clearly says that 'god does not exist'. This is what Meslier clearly writes: 'there is no god' (chapters 59, 74, 93, 94)—that is clear and distinct, blunt, and straightforward."

There seems to be some validity to this statement, being that Meslier was very influential to firstly Voltaire (1694-1778) (see: Voltaire on religion), who charged the French enlightenment with his work; secondly to Denis Diderot (1713-1784), who viewed the *Testament* as a kind of "underground bible", moving about in the literary underground, and who in his *The Promenade of the Skeptic* (1747), likened Meslier to an "intellectual guerrilla fighter" (Q); and thirdly to Baron d'Holbach (1723-1789), a top extreme atheists, known widely known as the "Newton of the atheists" (Q), whose 1770 *The System of Nature: the Laws of Moral and Physical World*, became known as the "Atheist's Bible".

Diderot

French encyclopedist Denis Diderot (1713-1784), a Haught disbeliever (#11), is referred to by Michael Buckley (1987),

among others, as having been history's "first true atheist"; others have labeled him as "France's first true atheist" (Q). Diderot's claim to atheism fame, according to Buckley, is his 1749 *Letters of the Blind*, wherein we find:

> "If you want me to believe in god, you must make me touch him."
>
> — Denis Diderot (1749), portrayal of fictional conversation of Nicholas Saunderson with a priest, in *Letters of the Blind* (Q)

Buckley asserts that this publication "introduces a critical transition in Western thought with its dismissal of transcendence and assertion of the virtualities of dynamic matter." [2] In response to Voltaire, who wrote to Diderot to comment upon *Letter on the Blind*, Voltaire defended the concept of god, to which Diderot replied that he was a believer: [4]

> "I believe in god, although I live very happily with atheists. It is very important not to mistake hemlock for parsley; but not at all so to believe or not in god."

and hence not an atheist, let alone a true atheist.

Fichte

Some refer to Johann Fichte (1762-1814) as the "first true atheist". (Q)

Schopenhauer

German thinker Arthur Schopenhauer (1788-1860), a Haught disbeliever (#21), was famously referred to by Friedrich Nietzsche, in his *Gay Science* (1882), as Germany's "first true atheist", as his view (Q) has been retrospectively summarized. The specific statement by Nietzsche is as follows: [3]

> "Schopenhauer was the first admitted and inexorable atheist among us Germans."

Other related views are as follows:

> "Schopenhauer prided himself on being the **first true atheist** in German philosophy, and scorned his contemporaries' attempts to substitute a world spirit for a bankrupt deity. Yet he never abandoned a notion of cosmic justice."
>
> — Susan Neiman (2004), *Evil in Modern Thought: an Alternative History of Philosophy* (Q)

See also

- Atheism timeline

References

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(b) King, Mike. (2007). *Secularism: the Hidden Origins of Disbelief* (pg. 142). Casemate Publishers.
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θΔics

In terminology, **fish** (TR:109), according to molecular evolution table classification, is an aquatic-habitat residing powered CHNOPS+16 molecular form.

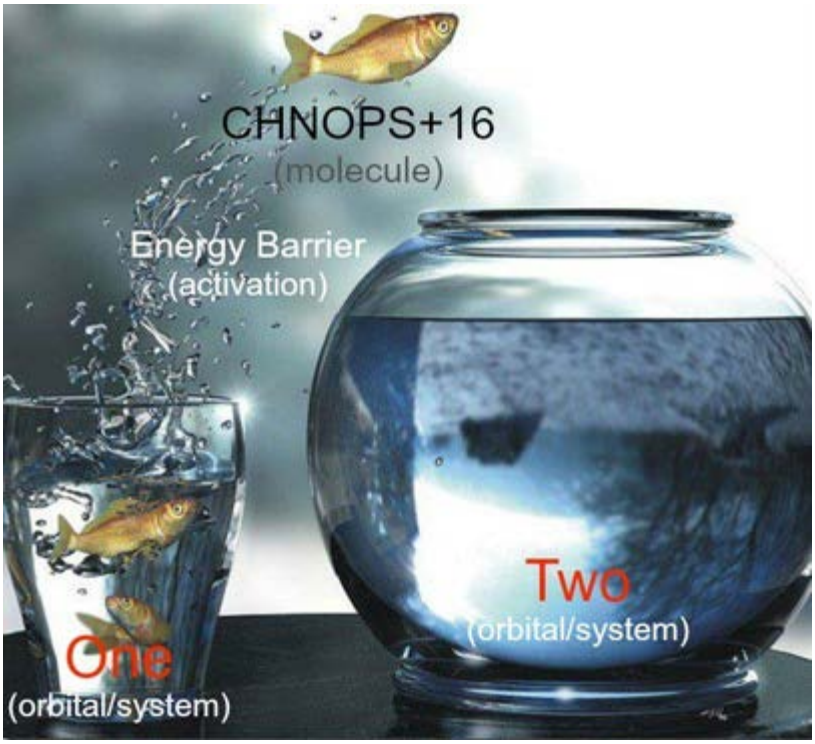

An "agitated" **fish**, in the language of Vilfredo Pareto, conceptualized as a molecule (or fish molecule), jumping to a new system.

Quotes

The following are related quotes:

> "Animals [according to Anaximander, pupil of Thales] come into being from moisture evaporated by the sun. Humans originally resembled another type of animal, namely **fish**."
>
> — Hippolytus (c.220), *Refutation of All Heresies* (O)

See also

- Fish molecule

Further reading

- Shubin, Neil. (2008). *Your Inner Fish: a Journey into the 3.5-Billion-Year History of the Human Body* (Lucy, pgs. 26-27; first life, pg. 121). Random House.

External links

- Fish – Wikipedia.

θΔics

In animate molecules, **fish molecule** is the name for a fish viewed as a single abstract reactive molecule. The molecular formula for a average fish was first calculated in 2005 by American electrochemical engineer Libb Thims, as shown below: [1]

$$\text{Molecular formula}_{fish} = \begin{array}{l} C_{E22}H_{E22}O_{E22}N_{E21}P_{E20}S_{E19}Ca_{E20}K_{E18}Cl_{E18}Na_{E18}Mg_{E18} \\ Fe_{E17}F_{E17}Zn_{E16}Si_{E16}Cu_{E15}I_{E14}Mn_{E14}Se_{E14}Mo_{E13}Co_{E13}V_{E12} \end{array}$$

This is a molecule according to which the standard laws and principles of chemistry, physics, and thermodynamics apply. [2] The fish molecule formed through a process of chemical synthesis, the first version of which was formed, according to fossil record, 0.7 billion years ago. [3]

American civil-ecological engineer Jeff Tuhtan, began in 2010 to develop a thermodynamic model of fish in rivers which was loosely based on the concept of a fish from the molecular formula point of view, an idea originating in English animal psychologist Lloyd Morgan's 1929 "biocule" model of a rabbit. [4] In this combined perspective, a fish can be defined as a CHNOPS-based animated organism.

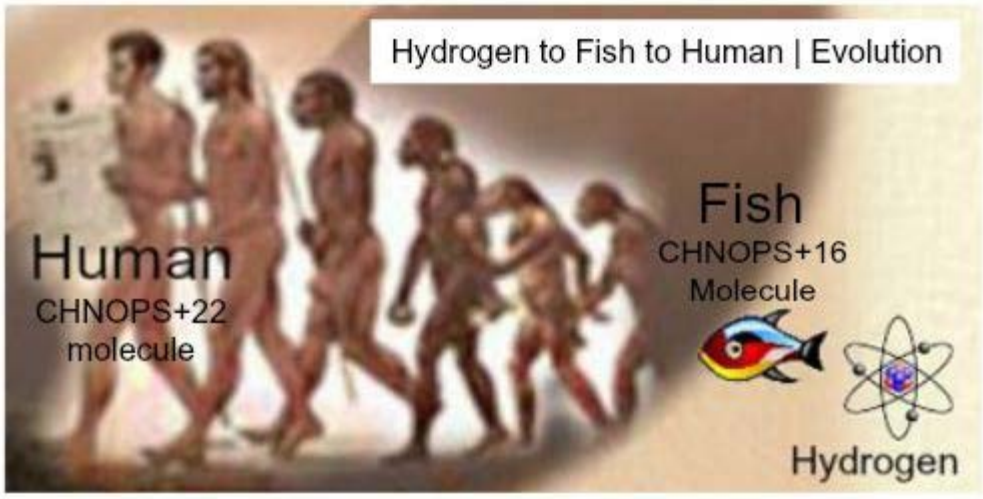

A hydrogen (H) to fish (CHNOPS+16) to human (CHNOPS+22) evolution diagram.

See also

- Bacteria molecule
- Walking molecule
- Retinal molecule
- Human molecule

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(b) Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc) (fish molecular formula, pg. 70). LuLu.
3. Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (ch. 5: "Molecular Evolution", 121-46; fish molecular formula, pg. 122). Morrisville, NC: LuLu.
4. (a) Morgan, C. Lloyd. (1929). *Mind at the Crossways* (pg. 6; biocule, pgs. 16-17). Williams & Norgate.
(b) Tuhtan, Jeff. (2012). “A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality”, PhD dissertation, Stuttgart University, Germany.

θΔics

Fiziksel ekonomi, ekonomik sistemler ve olayların açıklanmasında fiziksel yöntemler ve araçlar kullanır.
fiziksel ekonomi, disiplinlerarası ya da multidispliner bir çalışma alanıdır, amaç, ekonomik süreçlerin fiziksel süreçlerle olası bağlantılarını kurmak ve ekonomik sistemin fiziksel bir modelini geliştirmektir. fiziksel ekonomi, ya da fiziksel iktisat, fizikle iktisat arasında bir ilişki, bir paralellik olduğu varsayımıyla hareket eder.
ekonomik sistemler, toplumsal sistemler ve doğal ekolojik sistemler bir bütündür ve bu sistemler birbirlerinden soyutlanamaz, yalıtılamazlar.

Türkçede iktisat ve fizik arası ilişkiler konusunda yapılmış ilk doktora tezi 1991 yılında Boğaziçi üniversitesinde Prof. Dr. Necip Çakır tarafından yapıldı, tez daha sonra Physics and Economics adıyla ingilizce kitap olarak yayınlanmıştır.

θΔics

In hmolscience, **Fleeming Jenkin** (1833-1885) was an English engineer, a school friend of Peter Tait and James Maxwell, at Edinburgh Academy, predominately known as the inventor of the cable car, noted particularly for his 1868 article "The Atomic Theory of Lucretius", wherein he argues, if one believes in both atoms and free will, that free will is consistent with the conservation of energy, according to his argument that the Lucretian "swerve" free will model is replaced with a right angle deflecting force model of free will, on the following ontic opening stylized logic that:

> "A force acting at right angles to the direction in which a body moves does no work, although it may continually and continuously alter the direction in which the body moves."

In 1875, Balfour Stewart and Peter Tait cite Jenkin's paper in support of their religion + science reconciliation treatise. [2]

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External links

â— Fleeming Jenkin – Wikipedia.

θΔics

In experiments, **floating magnets experiment** is an experiment, done originally by English chemist-physicist William Gilbert in circa 1590, using loadstones floated on little wooden boats, and then by American physicist Alfred Mayer in 1878, using magnetized needles floating inserted into cork, wherein, in the latter version, geometric pattern distributions of floating positively charged needles (little magnets) were put in the vicinity of the positive end of a powerful magnet, then documented and studied, in efforts to discern a possible theoretical basis for atomic or molecular structure. [1]

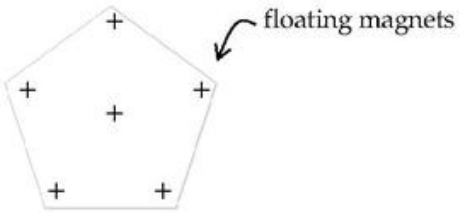

The distribution arrangement when six **floating** positively charged needles are put in the vicinity of the negatively-charged side of a large overhead hovering **magnet**, an experiment done in 1878 by American physicist Alfred Mayer. [3]

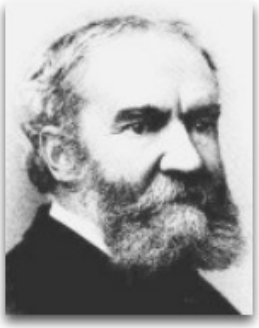

Gilbert | Loadstones

In circa 1590, English chemist-physicist William Gilbert conducted a "floating loadstones experiment", in which spherical lodestones were floated on water in small wooden boats, something akin to the following toy version of the experiment: [7]

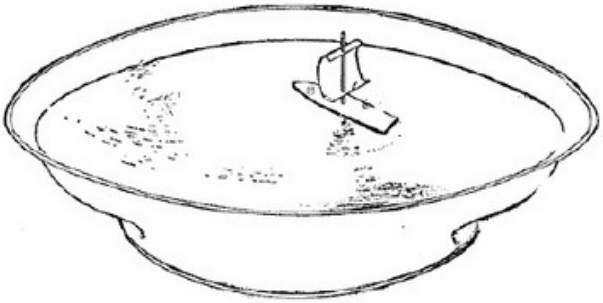

according to which he found that magnetic forces often produce circular motion (see also: turning tendencies). [1]

American physicist Alfred Mayer at some point came to learn of Gilbert's work and experiments. It is known, for example, that Mayer is cited by P. Fleury Mottelay as being one of the people who aiding in the 1892 English translation of Gilbert's *De Magente*. Whether Mayer, in 1878, was inspired to do his "floating magnetized needles on cork" experiment based on Gilbert's floating loadstones experiment is an open question, but the inference seems plausible.

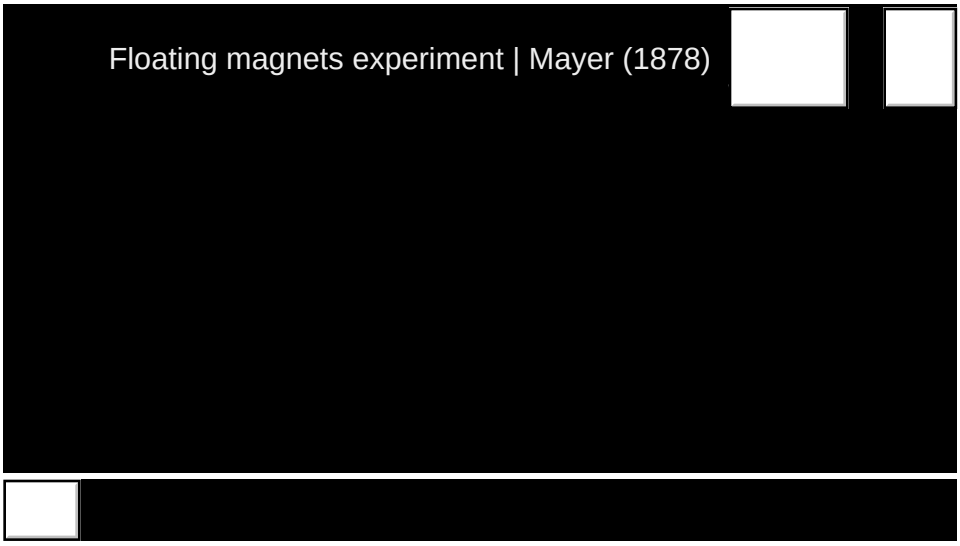

A video of Libb Thims (2015) performing the Mayer "**floating magnets experiment**" to a group of kids.

Mayer | Magnetized needles

In this experiment, Mayer took an assorted number of magnetized needles and stuck them through corks, floating in water, such that their *north poles*, i.e. positive ends, were all facing upwards at the same height above the water, all repelling each other equally. Mayer then held the *south pole* or negative end of a more powerful magnet some distance above the surface of the water to attract the needles simultaneously towards this center. The idea was to see what geometric equilibrium stability patterns formed for different numbers of needles under the influence of the similar attraction for the opposite pole as this attraction conflicted with the effects of mutual inter-magnet repulsion between the like (positive) poles.

Mayer found an interesting pattern: the like positive-poled needles liked to arrange themselves into concentric rings of stability. Three magnets formed a triangle, four a square, and a five a pentagon. When six magnets were used, however, one went to the center leaving the others to form a ringed pentagon. With eight magnets, two went to the center and six remained in an outer ring. As more magnets were added, up to eighteen, a separate inner system formed distinct from that of an outer ringed system. Beyond this, three systems formed an inner system, a middle ring, and an outer ring; and for a still larger number of magnets a four system ring pattern would emerge, and so on. Mayer's original diagrams for arrangements of 1-20 needles are shown below: [2]

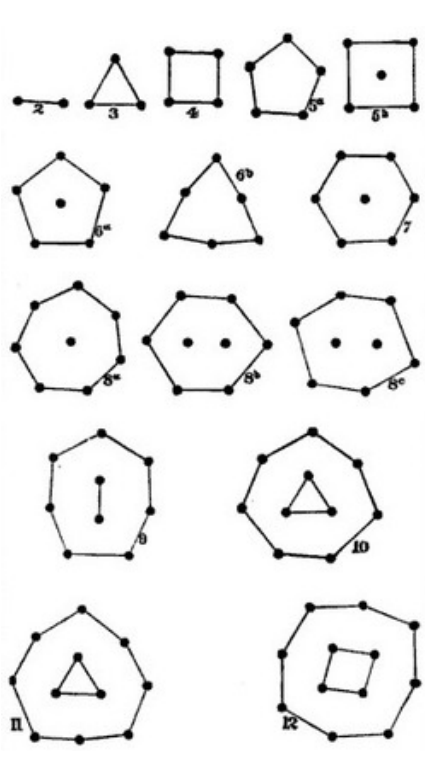

Geometric arrangements of 1-12 floating positively-changed needles; above which is held the positive end of a larger magnet.

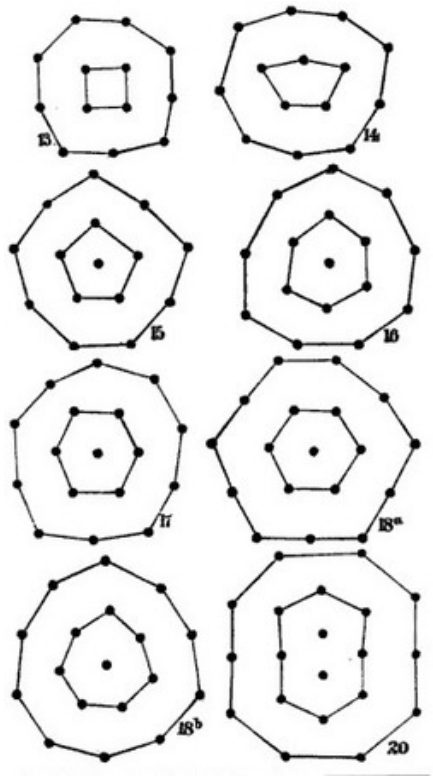

Geometric arrangements of 13-20 floating positively-changed needles; above which is held the positive end of a larger magnet.

To explain these curious equilibrium stability patterns, Mayer reasoned that the competing attracting and repulsing tendencies, between the like poles and oppositely charged central pole, respectively, resulted in the formation of geometric stability patterns, according to which the size of each pattern was determined by the relative strengths of the individual attractions and repulsions. The number of magnets, subsequently, determined the different stability patterns, in which each arrangement was the result of a local minimum energy configuration.

Thomson | Atomic structure

In 1897, English physicist Joseph Thomson (1856-1940) was aware of Mayer's experiment and in his "Cathode Rays" article began to cite him as follows: [3]

In 1897, English physicist Joseph Thomson began to use the results of American physicist Alfred Mayer's floating magnets experiment to develop one of the first experimentally-based structural model of the atom.

> "If we regard the chemical atom as an aggregation of a number of primordial atoms, the problem of finding the configurations of stable equilibrium for a number of equal particles acting on each other according to some law of force—whether that of Boscovich, where the force between them is a repulsion when they are separated by less than a certain critical distance, and an attraction when they are separated by less than a certain critical distance, and an attraction when they are separated by a greater distance, or even the simpler case of a number of mutually repellent particles held together by a central force—is of great interest in connexion with the relation between the properties of an element and its atomic weight. Unfortunately the equations which determine the stability of such a collection of particles increase so rapidly in complexity with the number of particles that a general mathematical investigation is scarcely possible. We can, however, obtain a good deal of insight into the general laws which govern such configurations by the use of models, the simplest of which is the **floating magnets** of Professor Mayer. In this model the magnets arrange themselves in equilibrium under the mutual repulsions and a central attraction caused by the pole of a large magnet placed above the floating magnets."

Thomson gives the following truncation of Mayer's results:

1.	2.	3.	4.	5.
1.5	2.6	3.7	4.8	5.9
1.6	2.7	3.8	4.9	
1.7				
1.5.9	2.7.10	3.7.10	4.8.12	5.9.12
1.6.9	2.8.10	3.7.11	4.8.13	5.9.13
1.6.10	2.7.11	3.8.10	4.9.12	
1.6.11		3.8.11	4.9.13	
		3.8.12		
		3.8.13		
1.5.9.12	2.7.10.15	3.7.12.13	4.9.13.14	
1.5.9.13	2.7.12.14	3.7.12.14	4.9.13.15	
1.6.9.12		3.7.13.14	4.9.14.15	
1.6.10.12		3.7.13.15		
1.6.10.13				
1.6.11.12				
1.6.11.13				
1.6.11.14				
1.6.11.15				
1.7.12.14				

where, for example, 1.6.10.12 means an arrangement with one magnet in the middle, then a ring of six, then a ring of ten, and a ring of twelve outside, which corresponds to diagram #17 above.

In 1904, Thomson would go on to use this structural ordering insight, in his more famous “On the Structure of the Atom” article, to develop what soon came to be dubbed the "plum pudding model" of atomic theory, the key sentence of which is shown below, next to conceptual images of this atomic model: [4]

“The atoms of the elements consist of a number of negatively electrified corpuscles enclosed in a sphere of uniform positive electrification.”

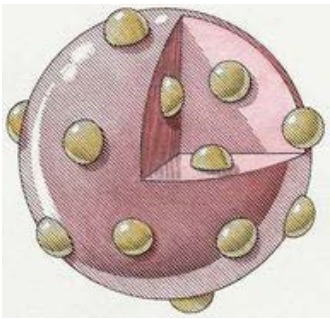

This model was later superseded by the Rutherford model (1911), developed by Ernest Rutherford, and then the Bohr model (1913), developed by Niels Bohr, as outlined below: [5]

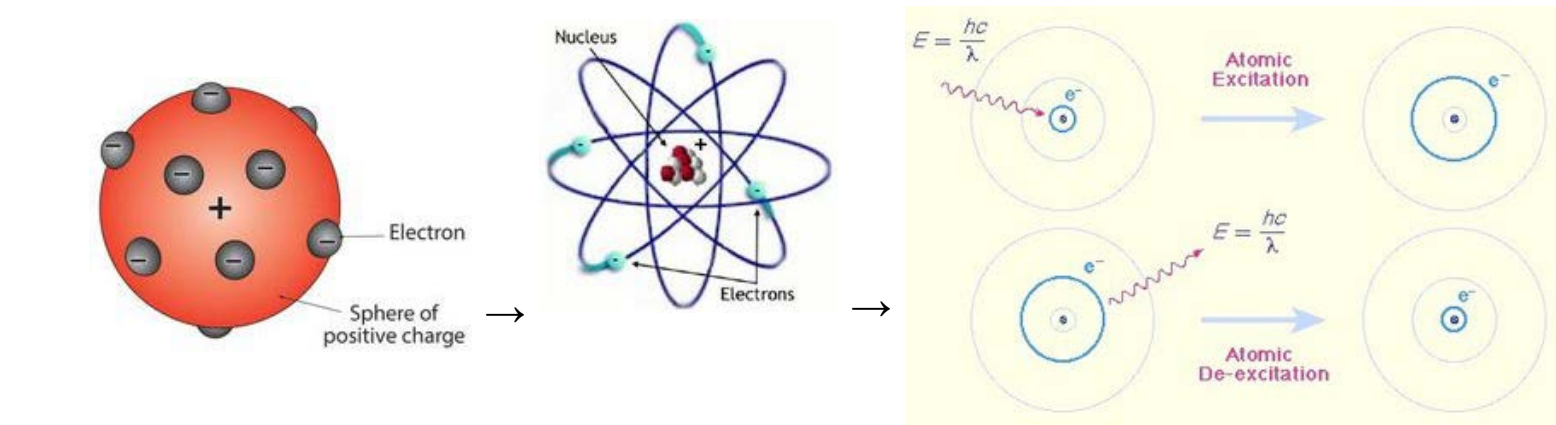

Plum pudding model (1904) Rutherford model (1911) Bohr model (1913)

Thims | Quantum electrodynamic evolution

In 2014, American electrochemical engineer Libb Thims redid the Gilbert-Mayer experiment using neodymium magnets on floating cork, according to which, to explain the turnover rate paradox, the electromagnetic field is what "holds" shapes of the positive and negative charges in regions of space, and that the geometric shape—like a person—will hold in form, if one charge is pushed into the pattern while another is removed:

5 magnets 6 magnets 7 magnets

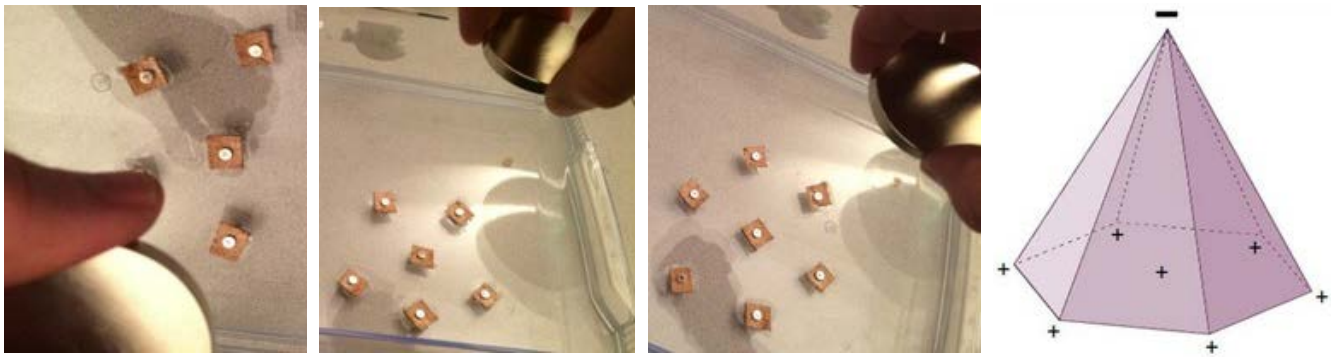

As magnets are added, as Mayer famously diagrammed (up to 20 magnets), the 3D pyramidal structure will grow geometrically: a triangle base at 3 magnets, a square base at 4 magnets, a hexagon base at 5 magnets, a two ringed structure base at 10 magnets, a center magnetic surrounded by two ringed base at 15 magnets, and so on. In this sense, one could conceptually understand the "structure holding" paradox if one were to add a base magnet to a given geometry while simultaneous removing one, and do this for all the magnets of the structure, similar to the ship, river, or carriage variants of the paradox, and then ask if the resulting turned over or magnetic replaced 3D geometric structure is the same growing "thing" or a different growing thing?

This model, naturally enough, can be scaled up to the people viewed as powered atomic geometries or human molecules, whereby the positively charged (floating) magnets and positively (hovering) magnets become atoms (elements), with varying amounts of positive or negative charged electron valency, albeit the description becomes more complicated owing to the effect that quantum electrodynamic changes are involved owing to cyclical sunlight photon input (cause) and resulting electron orbital transitioning (effect), whereby molecular animation results, something that does not occur in the magnet, ship, carriage, or river water scenarios.

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(b) Mayer, Alfred Marshall. "A Note on Experiments with Floating Magnets; Showing the Motions and Arrangements in a Plane of Freely Moving Bodies, Acted on by Forces of Attraction and Repulsion; and Serving in the Study of the Directions and Motions of the Lines of Magnetic Force." *American Journal of Science*, 3rd ser., 15 (1878): 276-277.
(c) Also: "Note on Floating Magnets [letter]." Ibid. 15 (1878): 477-478;
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3. Thomson, Joseph, J. (1897). "Cathode Rays." *Philosophical Magazine*, *44*, 293.
4. Thomson, Joseph, J. (1904). "On the Structure of the Atom: an Investigation of the Stability and Periods of Oscillation of a number of Corpuscles arranged at equal intervals around the Circumference of a circle; with application of the results to the Theory of Atomic Structure." *Philosophical Magazine*, Series 6, Vol. 7, No. 39. March, pgs. 237-65.
5. Plum pudding model – Wikipedia.
6. Pumfrey, Stephen and Tilley, David. (2003). "William Gilbert: Forgotten Genius", *Physics World*, Nov.
7. Magnetic fun and facts – EliWhitney.org.

Further reading

â— Thims, Libb. (2007). *Human Chemistry (Volume One)* (floating magnets experiment, pgs. 217-18, 248) (preview), (Google books). Morrisville, NC: LuLu.

Videos

â— Thims, Libb. (2015). “Floating Magnets Experiment | Mayer (1878)” (Ñº), Human Chemistry 101, YouTube, Mar 10.

External links

â— Fowler, Michael. (c.2010). “Models of the Atom”, Lectures, University of Virginia.

θΔics

In hmolscience, **Florence Nightingale** (1820-1910) [RGM:269|1,250+] was an Italian-born English social theorist—colloquially known as the founder of modern nursing—noted for her studies and usages (O) (O) of Belgian mathematical astronomer Adolphe Quetelet's 1830s social physics and social mechanics theories, recast the applied form of what she called "social or moral economy" (O), a two cultures namesakes variant, and for her physical humanities like proposal that Quetelet's social mechanics be taught at Oxford. [1]

Quetelet

Nightingale, at some point, was tutored or at least in the circle of Belgian statistical mathematician, astronomer, and social physics pioneer Adolphe Quetelet (1796-1874). Sometime, in his last years (1871-74), Quetelet gave Nightingale copies of his *Social Physics* (1835) and *Anthropometry* (1871), telling her, via culling from Newton's "I seem to have been only like a boy playing on the sea-shore" quote (O), that these two books were only two pebbles in front of the great sea of truth—a story reported by Nightingale, in her 7 Feb 1891 letter to Francis Galton on the social physics chair proposal (below), as follows: [3]

> "Quetelet gave me his *Physique Sociale* and his *Anthropometrie*. He said, almost like Sir Isaac Newton: 'These are only a few pebbles picked up on the vast seashore of the ocean to be explored. Let the exploration be carried out'."

Nightingale, thereafter, seems to have taken Quetelet's suggestion to heart.

Oxford | Chair of Social Physics

In 1874, on the passing Belgian social physics pioneer Adolphe Quetelet, Italian-born English social theorist Florence Nightingale, in her "In Memorandum", proposed that social physics should be taught at the University of Oxford; in 1876, she discussed the idea with Oxford administrative reformer Benjamin Jowett (1817-1893), who offered to leave money in his will for the chair, suggesting that it be named after her father (i.e. Nightingale Chair of Social Physics); in 1890-91, she spent a year-and-a-half lobbying to see the chair established, including discussion with Francis Galton, among others, the following being an example statement:

> "I think the [following] needs doing: [we need] a scheme from someone of high authority as to what should be the work and subjects in teaching 'social physics' and their practical application, in the event of our being able to obtain a statistical professorship or readership at the University of Oxford."
>
> — Florence Nightingale (1891), "Letter to Francis Galton", Feb 7

Jowett, e.g., in 1891, discussed the proposal with Alfred Marshall who gave his opinion that the "government ought to do it". [2] The chair, dispite Nightingale's efforts, was never realized.

Froude

Nightingale was an associate of Goethean human chemistry promoter James Froude, who published some of her work when he was editor of *Fraser's Magazine*. [4]

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(b) Nightingale, Florence. (2003). *Florence Nightingale on Society and Politics, Philosophy, Science, Education and Literature: Collected Works of Florence Nightingale* (editor: Lynn McDonald) (§: Proposal for a Chair in Social Physics, pgs. 105-28; quote, pg. 113). Wilfrid Laurier University Press.
4. Nightingale, Florence. (1994). *Suggestions for Thought by Florence Nightingale: Selections and Commentaries* (editors: Michael Calabria and Janet Macrae) (pg. xxx). University of Pennsylvania Press.

External links

- Florence Nightingale – Wikipedia.

θΔics

In existographies, **Florin Perier** (1605-1672) (CR:3) was a French lawyer, and the husband of Blaise Pascal's elder sister Gilberte, who Pascal in 1648 convinced to clime Puy de Dome, France, altitude 4,803 feet, to test his hypothesis that the Torricelli barometer would go down in height, indicating lower atmospheric pressure at the top of the mountain.

Quotes | On

The following are quotes on Towneley:

> "The association of physical science with mountains goes back, as far as we need to be concerned, to the seventeenth century; to **Perier**'s ascent of the Puy de Dome, in order to demonstrate that the height of the barometer fell as the altitude increased, and Richard Towneley's ascent of Pendle Hill when he was discovering his 'hypothesis', still wrongly called 'Boyle's law'."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 91) [1]

References

1. Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 91). Cornell University Press.

External links

â— Florin Perier (French → English) – Wikipedia.

θΔics

In science, **flow** is the movement of matter or energy per unit time per unit area.

Hmolscience

In hmolscience, flow can refer to a number of movement or energy characterizations; including: "psychological" flow, Gibbs energy flow, thermodynamic flow, or even the flow of human molecules in bulk, such as on a busy expressway, as studied in human chemistry. [1]

Mental flow

> *See main: Csíkszentmihályi flow*

In psychodynamics, Csíkszentmihályi flow or simply "flow" is a state of focused, engaged, and optimal mental activity, quantified by energy and entropy measures, in which a sense of timelessness and outputs of great productivity emerge. [2]

Quote

The following are related quotes:

> "All energy **flows** according to the whims of the great magnet. What a fool I was to defy him."
>
> — Hunter Thompson (1971), *Fear and Loathing in Las Vegas* (Ñº); favorite author Patrick Fergus

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (Google books). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (Google books). Morrisville, NC: LuLu.
2. (a) Csíkszentmihályi, Mihály. (1990). *Flow - the Psychology of Optimal Experience.* Harper Perennial.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview). (pg. 173). Morrisville, NC: LuLu.

θΔics

In psychodynamics, **flow state**, aka **Csíkszentmihályi** (pronounced Chicksent-me-high) **flow**, or simply "flow", is a state of focused, engaged, and optimal mental activity, quantified by energy and entropy measures, in which a sense of timelessness and outputs of great work productivity emerge. [1]

Seven Main Aspects of Flow
1. Completely involved in what one is doing – focused.
2. A sense of ecstasy—of being outside everyday reality.
3. Great inner clarity—knowing what needs to be done, and how well one is doing.
4. Knowing that the activity is doable—that one's skills are adequate to the task.
5. A sense of serenity—no worries about oneself, and a feeling of growing beyond the boundaries of the ego.
6. Timelessness—thoroughly focused on the present, hours seem to go by in minutes.
7. Intrinsic motivation—whatever produces flow becomes its own reward.

Left: the seven essential mental feelings, thoughts, or states associated with flow, according to the 2008 views of Csíkszentmihályi. [3]

Overview

In the 1970s, the flow model was developed by Croatian-born American psychologist Mihály Csíkszentmihályi in his studies of the behaviors of exceptional people, particularly artists and scientists. The state of "flow", as the following digram shows, according to Csíkszentmihályi, arises when both the level of challenge is high and the level of a one's skill sets are high.

To give a prime example of the mental flow state, as Csíkszentmihályi has quantified it, American engineer Willard Gibbs commented about the writing of his famous 300-page *Equilibrium* paper, otherwise known as the principia of thermodynamics, written over a period of three years, 1875-78, that: [2]

> "[I had no] sense of the value of time, of my own or others, when I wrote it."

The theory or state of "flow", as it is now viewed in positive psychology, is a state of mind or life where there is no disorder to straighten out, or threat to the self to defend against, such that the release of liberated psychic energy is used or invested successfully in chosen goals. In short, flow is a state of concentration or consciousness so focused that it amounts to absolute absorption in an activity.

The energy-entropy modeling of the flow theory, loosely described as the psychodynamics of happiness, was developed beginning in the 1970s by Croatian-born American psychologist Mihály Csíkszentmihályi and popularized by his 1990 book *Flow: the Psychology of Optimal Experience*.

The term "flow" was named as such due to interviews of 173 subjects, in the 1970s, where people often described their 'flow' experiences using the metaphor of a current carrying them along. [4] States of flowing activity are described as a condition of "optimal experience", where a one is in top form, and a feeling of timelessness results. States of flow experience are considered as the opposite of psychic entropy or negentropy.

As Csíkszentmihályi notes in the following 2008 TED talks lecture "Creativity, Fulfillment and Flow", he was pulled into the study of the psychology mental states, particularly those states in relation to the effect that the Second World War had on those who lost their jobs, security, and homes, etc., by accident during a weekend ski-trip in Zurich.

In particular, Csíkszentmihályi says that, by chance, the snow melted and that, being without spending money for other forms of entertainment, he was forced into the option of attending a free lecture on the mental projections of flying saucers, explained in the lecture as a residual effect of war traumatization, by Swiss psychologist Carl Jung. Jung, in turn, passed on his ideas on the energy and entropy of mental function to Csíkszentmihályi.

Csíkszentmihályi soon decided to devote his researches to the study of the aspects of activities that make people happy. In one of his early interviews of a famous music composer, Csíkszentmihályi

made particular note of the following of the state of ecstasy described by the composer in his most productive state:

> "You are in an ecstatic state to such a point that you feel as though you don't exist … my hand seems devoid of myself, and I have nothing to do with what is happening. I just sit there watching it in a state of awe and wonderment. And [the music] just **flows** out of itself."

In reference to flow in the workplace, Csíkszentmihályi cites the following quote by Sony founder electronics inventor Masaru Ibuka, in explaining the purpose of incorporation of Sony:

> "To establish a place of work where engineers can feel the joy of technological innovation, be aware of their mission to society, and work to their heart's content."

(add)

Quotes

The following are related quotes:

> "The calm prosperity of your reign has given us the **leisure to follow** these studies of quiet and retirement."
>
> — Robert Hooke (1665), "Epistle to the King" of *Micrographia* [5]

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3. Csíkszentmihályi, Mihály. (2008). "Creativity, Fulfillment and Flow" (18:56 video), TED talks, October.
4. (a) Csíkszentmihályi, Mihály. (1990). *Flow - the Psychology of Optimal Experience*. Harper Perennial.
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External links

- Mental state called flow – c2.com
- FlowTheory.com – 2005 MSc dissertation by Kay McMahon.

θΔics

In science, a **flow system** is a, generally cylindrical-like, system through which matter flows. Romanian-born American mechanical engineer Adrian Bejan employs the term significantly in his constructal theory, in which flow systems include: river basin, vascularized tissue, as well as flow configurations in social systems, such as city traffic, among others. [1]

References

1. Bejan, Adrian and Merkx, Gilbert W. (2007). *Constructal Theory of Social Dynamics* (pg. xi). Springer.

θΔics

In hmolscience, **flower stealing vs flower picking model** refers to morality explained, atheistically (see: atheistic morality), to children, via thermodynamics, in terms of the difference between when a child "picks" a flower, from a field, and gives it to her mother, and when a child "steals" a flower, from a flower shop, and gives it to her mother. [N1]

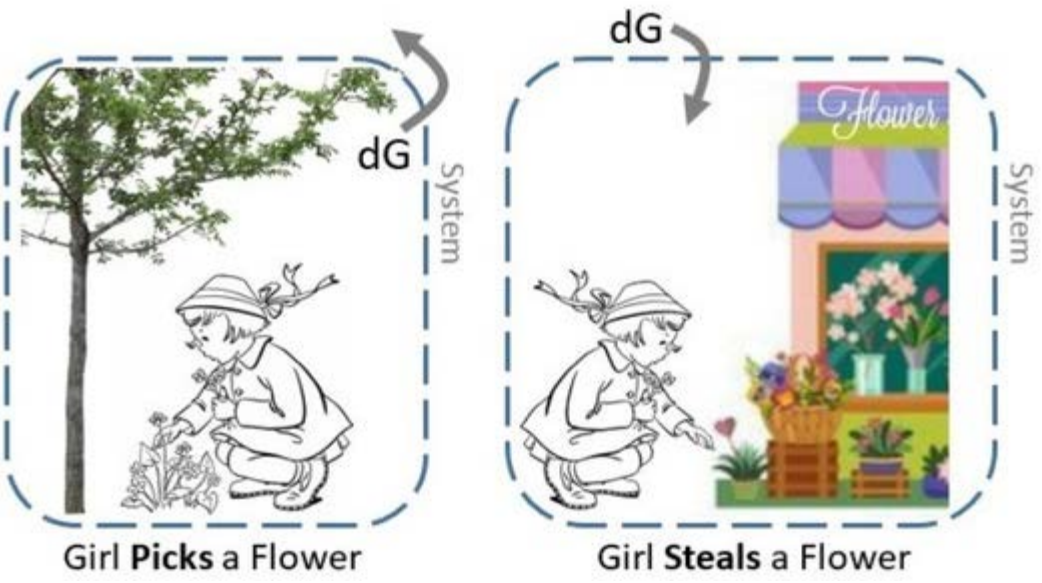

A diagram of the **"flower stealing" vs "flower picking" morality model**, as explained to A.G., an ex-Muslim, ex-Christian mother, so to explain to her questioning 10-year old confused daughter, how modern atheistic morality is explained by Gibbs energy differentials, as invented by Libb Thims (2016), as a method to explain thermodynamic morality to children, in simple understandable terms. [3]

History

In 1809, Goethe, in his *Elective Affinities*, outlined his physical chemistry based "moral symbols" model of social reactions.

In 1877, Ralph Emerson, in his "Perpetual Forces", among other publications, building on Goethe, outlined his "moral power" model of acting in accordance with the forces that be.

In 1909, Wilhelm Ostwald outlined his new-Kantian stylized "energetic imperative" of atheist moral action according to the laws of energetics, as he saw things.

In 1987, Mirza Beg, in his *New Dimensions in Society*, was discussing morality, in loose general terms, in the context of the Gibbs energies of social chemical reactions and social mixing; much of the discussion, however, was clogged up with references to Muhammad, Allah, and the Quran. [4]

In 2009, Mark Janes, in his "Morality and Thermodynamics" video, once available on his YouTube channel (Q), a screen shot of which is shown below, was discussing good and evil in terms of Gibbs energy, albeit in very crude theory form:

In 2011, Libb Thims, in his "Thermodynamic Proof that Good Always Triumphs Over Evil", building on Goethe and

Ostwald, and thematic to Emerson's logic, outlined a semblance of the modern that right, good, or what is "natural" is quantified by *decreasing* Gibbs energy differentials, i.e. exergonic acts or processes (dG < 0), per unit of existence (dt), i.e. time (in layspeak):

$$\frac{dG}{dt} < 0$$

that wrong, evil, or what is "unnatural" is quantified by *increasing* Gibbs energy differentials, i.e. endergonic acts or processes (dG > 0), per unit of existence (dt):

$$\frac{dG}{dt} > 0$$

and that both of these, according to the logic of Fritz Lipmann (1941), are "coupled" together in nature, such that the exergonic drives endergonic. [1]

In Aug 2015, Thims, together with co-host Thor, taught a 3.5-hour "Zerotheism for Kids" class to six kids (aged: 2, 6, 7, 9, 10, 11), a sort of "Sunday School for Atheists", which was thereafter edited into a 14-part lectures series, and uploaded to YouTube (Sep 2015), during which the kids were taught why certain things, e.g. "stealing", "arranged marriages", where right or wrong, depending on system constraints, according to either exergonic or endergonic Gibbs energy differential measurements. [2]

In 2018, Thims was semi-frequently referring back to the "flower stealing vs flower picking model", e.g. in threads (Q), and in conversations, e.g. when in Oct 2018 and friend named Lovely asked him about spirituality and the soul, during which he explained that these terms were but obsolete defunct metaphors for what is yet to be quantified scientifically, via thermodynamics.

See also

- Epicurus model
- Camus model
- Gates model
- Weinberg model

Notes

N1. Note: the "flower stealing model" arose, during discussion between Libb Thims, while drafting his *Smart Atheism: for Kids* (see: smart atheism), a draft book based on the "Zerotheism for Kids" class, and a mother named A.J. as a way to explain atheistic morality, in a simple manner, to her 10-year-old daughter. A.J., an ex-Muslim, ex-Christian atheist women that was residing with Thims that year, but her daughter was residing with the Muslim aunt of A.J.'s ex-husband, and was being fed theism as a belief system, and who would frequently interrogate her mother, over the phone, with statements such as "prove to me there is no god" and "atheists are immoral", etc., which was being fed back to Thims; the gist of which came out in verbal explanation, thereafter incorporated into the basis of chapter 14 "Right and Wrong". [3]

References

1. Thims, Libb. (2011). "Thermodynamic Proof that Good Always Triumphs over Evil", *Journal of Human Thermodynamics*, 7: 1-4.
2. Thims, Libb. (2015). "Zerotheism for Kids" (co-host: Thor) (main), 14-part [4:41-hr] lecture playlist (Q), 5-intro sides (Q), 56-main sides (Q), 11AM-3PM, Chicago, Aug 10 (recorded), Sep 7 (published).
3. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs) (A.J., pg. 17; §14: Right and Wrong, pgs. 241-53).

Publisher.
4. Beg, Mirza Arshad Ali. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (intro) (pdf, annotations by Libb Thims, 2014) (moral, pgs. 55, 104, 124, 131, 201). Karachi: The Hamdard Foundation.

θΔics

In thermodynamics, a **fluctuation** refers to the cyclical deviation of some parameter above or below the mean.

Overview

The term "fluctuation" is difficult to give a precise meaning to and is significantly intertwined with Belgian chemist Ilya Prigogine's theory of far-from-equilibrium dissipative structures and bifurcation points, as the following summary quote indicates: [1]

> "All systems contain subsystems, which are continually '**fluctuating**'. At times, a single fluctuation or a combination of them may become so powerful, as a result of feedback, that it shatters the preexisting organization. At this revolutionary moment, called a 'singular moment' or 'bifurcation point', it is inherently impossible to determine in advance which direction change will take: whether the system will disintegrate into 'chaos' or leap to a new, more differentiated, higher level of 'order' or organization, called a 'dissipative structure'."

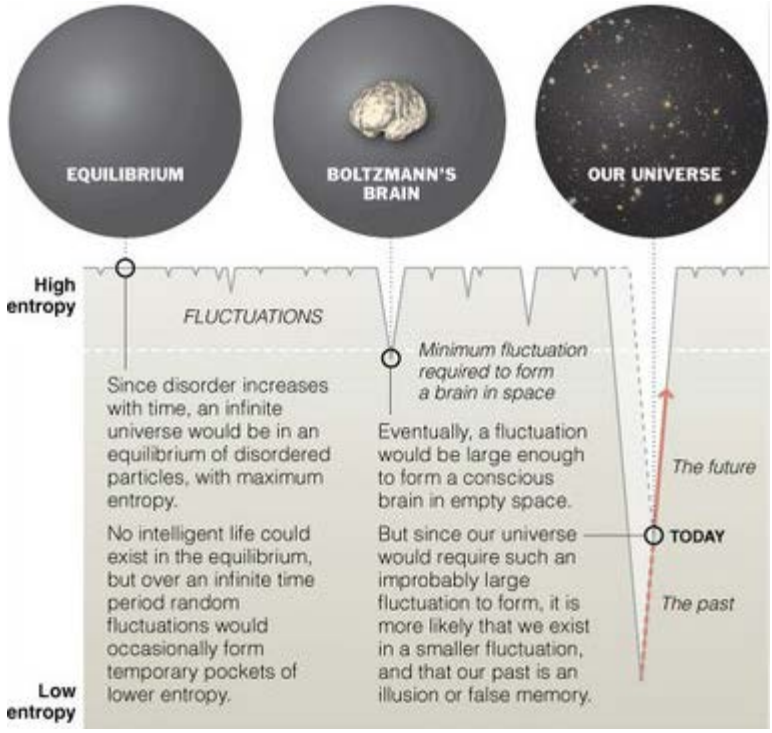

Boltzmann brain **fluctuation diagram**, used in discussions of the Boltzmann brain problem.

The essential phenomenon Prigogine seems to be attempting to capture in the use of the term "fluctuation", in all probability, is the instantaneous moment before a before a structural homogeneous fluid system (whale oil or silicon oil) spontaneously transforms into "Benard cell" structure when enough heat is added to the fluid.

More research, however, needs to be done on this term, to find its older usage in statistical mechanics.

References

1. Prigogine, Ilya. (1984). *Order Out of Chaos – Man's New Dialogue with Nature.* New York: Bantam Books.

Further reading

● Glansdorff, P. and Prigogine, Ilya. (1971). *Thermodynamic Theory of Structure, Stability and Fluctuations.* John Wiley and Sons.
● Nicolis, G. and Prigogine, Ilya. (1977). *Self-Organization in Non-Equilibrium Systems: From Dissipative Structures to Order Through Fluctuations.* Wiley.
● Prigogine, Ilya. (1977). "Time, Structure and Fluctuations", *Nobel Lecture*, Dec. 08.

External links

● Fluctuation theorem – Wikipedia.

θΔics

In science, **fluid theory of heat**, heat-fluid theory, "substance theory of heat" (Planck, 1949), "material theory of heat" (Caldwell, 1971), or "matter theory of heat", which can be contrasted with the "kinetic theory of heat", is a now-defunct theory, which argued that heat is a type of conserved elastic fluid, being either weightless (caloric) or with weight (e.g. phlogiston or terra pinguis), that was able to insinuate the interstices or pores of bodes causing volumetric expansion.

Massive or massless

The views on whether or not heat had mass were varied: [2]

> Herman Boerhaave (c.1724) found no change in the weight of a mass of iron when heated.
> Georges Leclerc (c.1774) found in increase in weight of iron when heated.
> John Roebuck (1775) found an increase in weight when iron was cooled.
> John Whitehurst (1776) found an increase in weight when iron was cooled.

The work of Roebuck and Whitehurst indicated that heat had "levity", a property attributed to "element of fire" by Aristotle.

In 1786, French chemist Antoine Lavoisier proved, via experiment, that the "matter of heat" is weightless by showing that phosphorous burned in air in a closed flask, with no appreciable change in weight. [4] Lavoisier then introduced the "caloric theory of heat".

Upgrades

English scientist Henry Cavendish, beginning in the mid to late 18th century, did a number of experiments on heat, publishing a number of articles and papers, in which he, supposedly, rejected the fluid theory of heat, and in its place, attempted to formulate a so-called "mechanical theory of heat". [5] This, however, was not likely the name used by Cavendish to describe his theory, being that the term mechanical theory of heat was first introduced by German physicist Rudolf Clausius, in his 1850s German term *mechanische wärmetheorie.*

The fluid theory of heat, during the years 1798 to circa 1849, was supplanted by the "atomic motion theory of heat" (1798, Benjamin Thompson), and then eventually by the "mechanical equivalent of heat" (Robert Mayer, 1842; James Joule, 1844), then the mechanical theory of heat (Rudolf Clausius, 1850, and thereafter). [1] Into the late 19th century, the study of radiation, and radiant heat, led to the "wave theory of heat", so to speak, and eventually to radiation thermodynamics. [2]

The fluid theory of heat was used by French physicist Sadi Carnot in 1824 when he initiated the science of thermodynamics. [3] In the decade to follow, however, Carnot, in his personal notes, recanted on his adherence to the fluid theory of heat.

Quotes

The following are related quotes:

> "I was led to suspect, that elastic fluids, when they were mechanically expanded, would attract or absorb heat from the bodies in their vicinity; and that, when they were mechanically condensed, the **fluid matter of heat** would be pressed out of them, and disused among the adjacent bodies."
>
> — Erasmus Darwin (1788), "Frigorific Experiments on the Mechanical Expansion of Air" [6]

> "One day, I happened to come across the treatises of Rudolf Clausius, whose lucid style and enlightening clarity of reasoning made an enormous impression on me, and I became deeply absorbed in his articles,

with an ever increasing enthusiasm. I appreciated especially his exact formulation of the two laws of thermodynamics, and the sharp distinction which he was the first to establish between them. Up to that time, as a consequence of the **theory that heat is a substance**, the universally accepted view had been that the passing of heat from a higher to a lower temperature was analogous to the sinking of a weight from a higher to a lower position, and it was not easy to overcome this mistaken opinion."

— Max Planck (1949), *Scientific Autobiography* (pg. 16)

See also

â— Kinetic theory of heat

References

1. Asimov, Isaac. (1988). *Understanding Physics, Volumes 1-3* (atomic motion theory of heat, pg. 235). Barnes & Noble.
2. Hankins, Thomas L. (1985). *Science and the Enlightenment* (wave theory of heat, pg. 80). Cambridge University Press.
3. Fermi, Enrico. (1936). *Thermodynamics.* Prentice-Hall.
4. Lavoisier, Antoine. (1786). Euvres, ii, 618.
5. (a) McCormmach, Russell. (2004). *Speculative Truth: Henry Cavendish, Natural Philosophy, and the Rise of Modern Theoretical Science* (pgs. 123-24). Oxford University Press.
(b) Cavendish, Henry. (2011). *The Scientific Papers of the Honourable Henry Cavendish, F.R.S.* (Cavendish Papers on Heat, pgs. 326-89). Cambridge University Press.
(c) McCormmach, Russell. (1988). "Henry Cavendish on the Theory of Heat" (abs), *Isis*, 79(1): 37-67.
6. (a) Erasmus, Darwin. (1788). "Frigorific Experiments on the Mechanical Expansion of Air" (abs) (pg. 43), *Philosophical Transactions of the Royal Society*, 78:43-42, Jan 01.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 58). Cornell University Press.

θΔics

Lecture: “Floating Magnets Experiment and Humans as Powered Atomic Geometries”

FME | P1: Big questions kids ask?

Synopsis: overview of big questions kids before age 9 ask

Chris Anderson | Big questions

The following are Pakistani-born British philosopher-journalist and TED curator Chris Anderson's "big questions" he asked as child from his 2012 “Questions No One Knows the Answers To” model (see: video (0:00-3:45).:

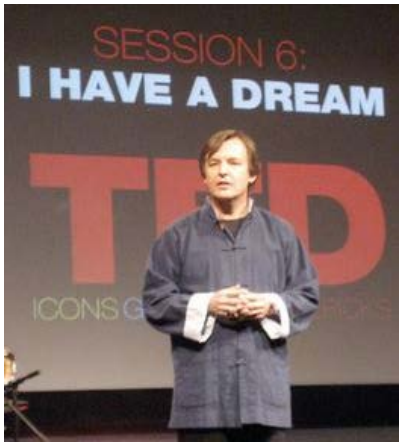

Q1: Anderson: “Was the big bang just an accident? Is there a god?” (0:40)

The above model supposes the following:

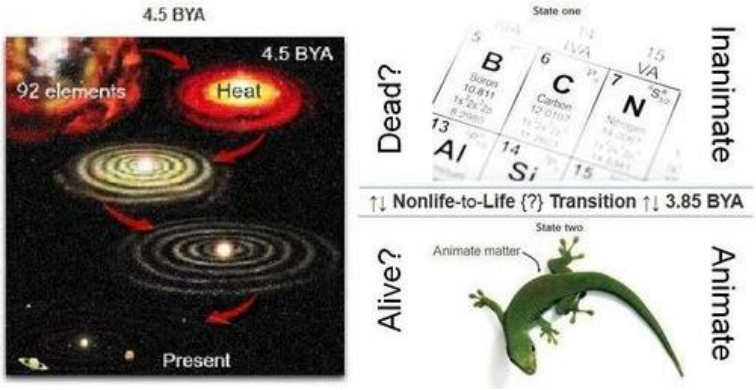

The formation of people, according to this model is explained as follows:

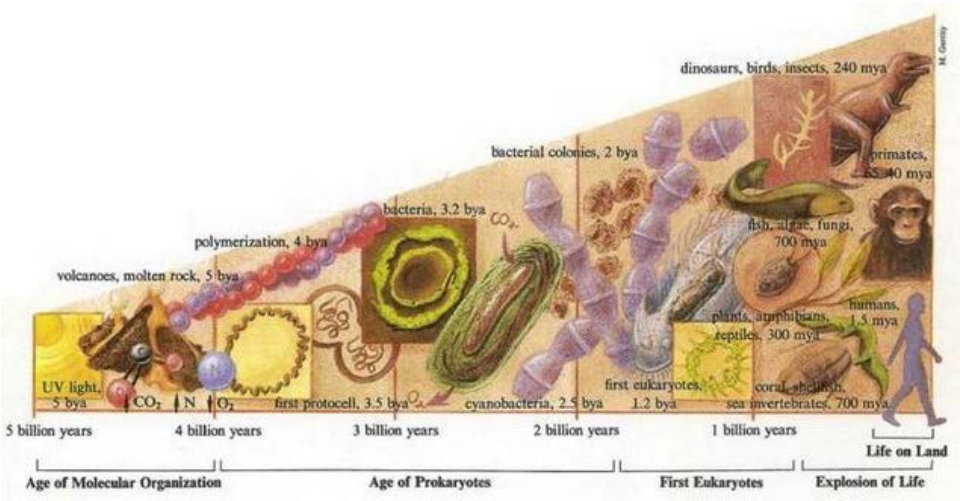

The way "heat" functions, according to this model is explained as follows:

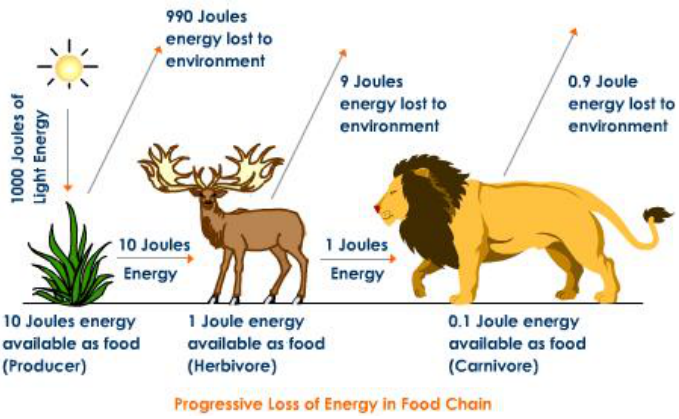

Q2: Anderson: "Is there really a plan for my life? (1:00)

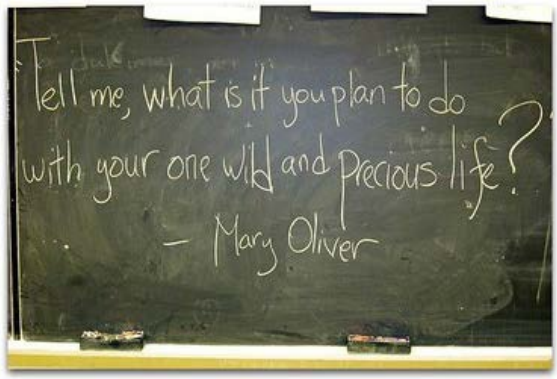

A popular 1992 quote (Ñº) by American poet Mary Oliver, from her *The Summer Day*, which well-encapsulates age 9 questions about purpose, destiny, and meaning. Seeking answers to this query can tend to lean on either religious models or going after what one is passionate about. (Ñº)

American inner voice philosopher Howard Thurman suggests the following guiding rule as to what a person is suggested to do with their time spent moving on this earth:

"Don't ask yourself what the world needs; ask yourself what makes you come **alive**. And then go and do that. Because what the world needs is people who have come alive."
— Howard Thurman (c.1970)

Q3: How do you know when you come alive? Technically, reactions that actuate as though they are, in a sense, "coming alive" are those that are exothermic. The following shows the main reactants and products of a basic human chemical reaction:

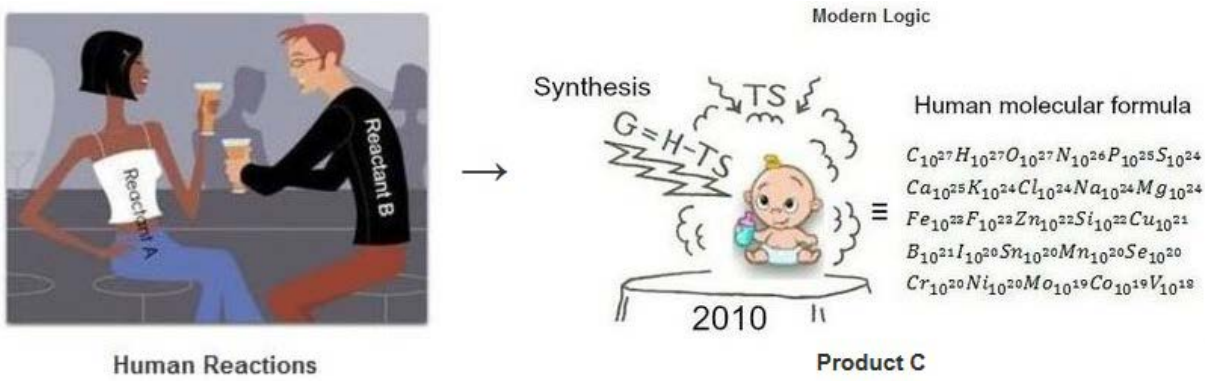

This "modern logic" model, however, conflicts with the older "religious logic" model we are taught in Sunday school:

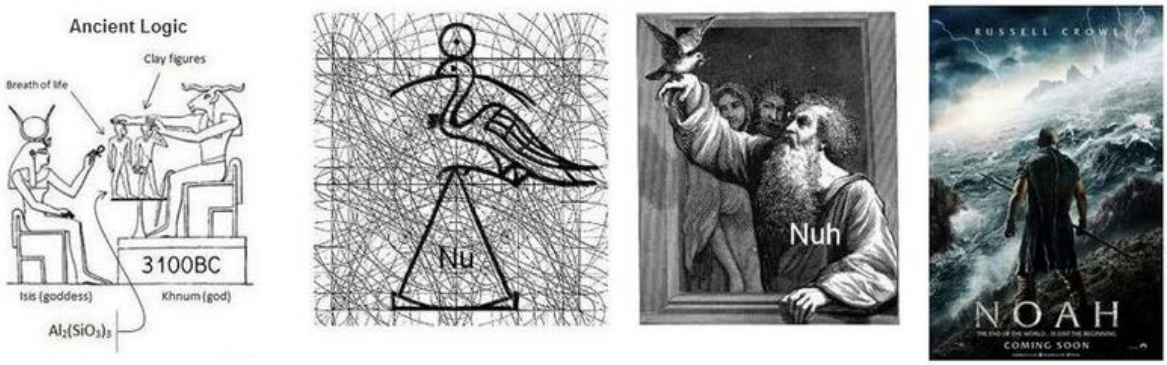

Discussion: according to the above, we, as adults, are left with mixed views, e.g. Anderson (above) with visual of God sneezing out the big bang, or Thomas Edison in 1910, when asked about the whereabouts of the "will" (or soul) of William James, said that he didn't know?

Hot | Cold reactions

To explain "coming alive" as a guiding rule to one's path or purpose, we will explain hot and cold reactions via experimental demonstration.

Demonstration (**cold** reaction): via thermometer (measurement), endothermic reaction (heat-absorbing), specifically the baking soda ($NaHCO_3$) and vinegar (CH_3COOH) reaction:

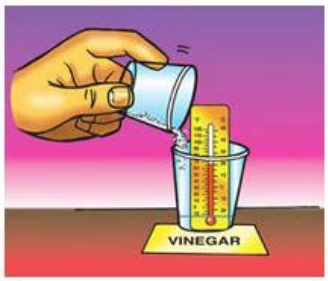

Endo/Exo-thermic Reactions

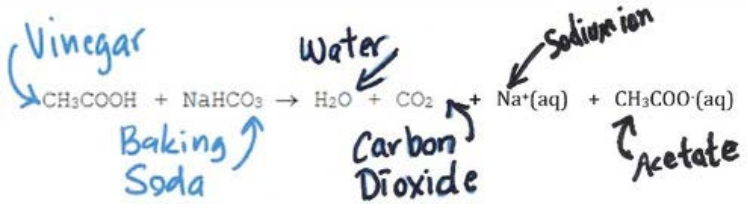

This as model explains the concept of cold reactions between people, or technically endergonic reactions (work-absorbing) reactions between people, defined as powered chemicals, as typified by the phrase: “It’s NOT working between us any more, I’m sick of you” (endergonic). [1]

Demonstration (**hot** reaction): an exothermic reaction (heat-releasing), will be demonstrated, specifically the baking soda solution ($NaHCO_3$) and calcium chloride ($CaCl_2$) reaction, which functions to explain hot reactions between people, or technically exergonic (work-releasing) reactions between people, defined as powered chemicals, as typified by the phrase: “Are relationship WORKS great—we love each other!” (exergonic). [1]

Jeremy Rifkin | Big questions

The following are American socio-political philosopher Jeremy Rifkin's "big questions" he summarizes that people ask as children from his 2010 “Emphatic Civilization” animated sketch (see: video (0:10-5:00):

Rifkin, in summary, gives the following "big questions" of children overview:

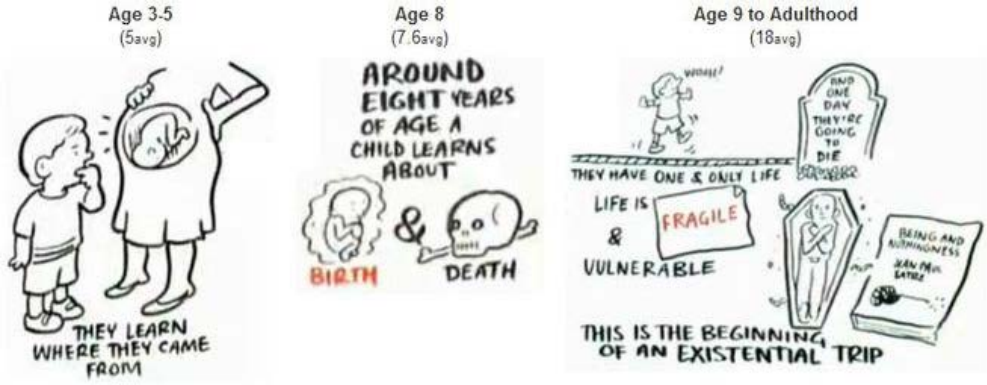

Stock answers | Thinker answers

Children, when pondering the above big questions, will tend to ask either people around them or the great thinkers of the past.

Q4: Anderson: “Do I have free **will**? Who am I anyway? Am I just a biological machine? Why am I conscious? (1:06-1:13)

Discussion: if we ask the people around us: mum, dad, teacher, the police, etc., we will tend to get stock answers.

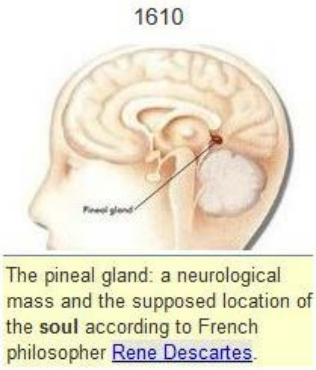

Q5: Anderson: "I just assumed that someday I would be told the answers to these questions? Someone must know?"

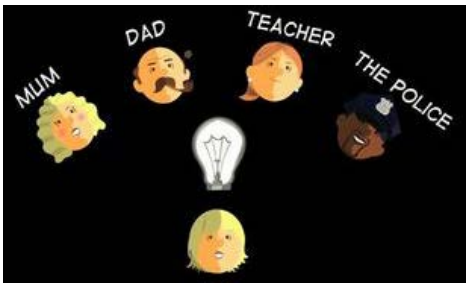

Discussion: the problem here is one needs to ask NOT people around them, but the great thinkers of the past (see: genius IQs). The following is German polymath Johann Goethe's 1796 human chemical theory, as explained via Platonic-Hegelian dialectic narration, in the above video, in which reaction between limestone, i.e. calcium carbonate ($CaCO_3$), and sulfuric acid (H_2SO_4) which upon contact yields gypsum ($CaSO_4 \cdot 2H_2O$), in the form an aqueous crystal, and carbon dioxide (CO_2) gas:

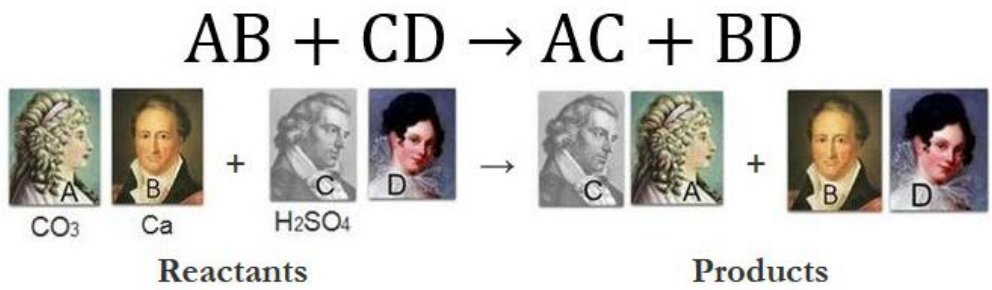

Shown below is the human periodic table:

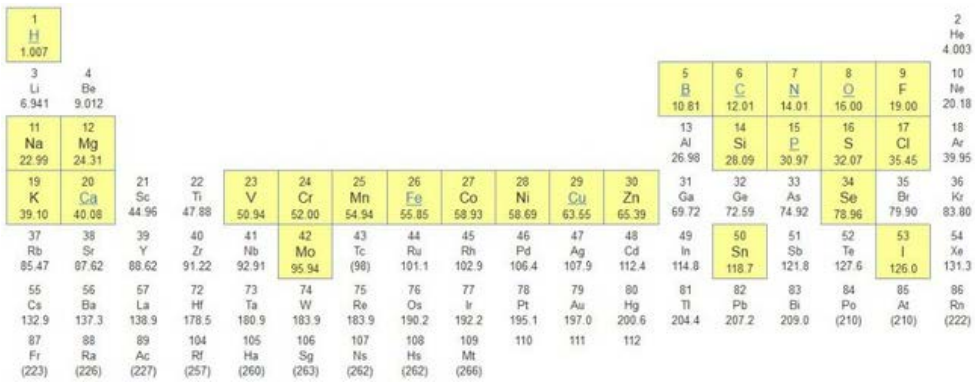

Shown below is American physicist Alfred Mayer's 1878 floating magnets experiment:

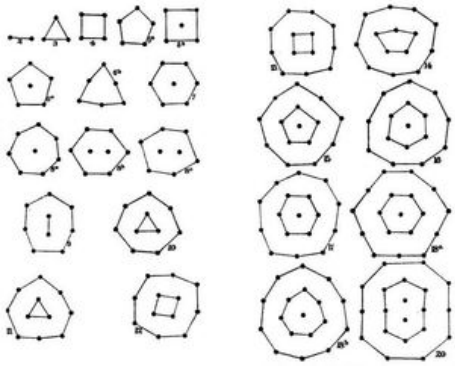

Floating magnets

The following floating magnets experiment demonstrations will help to explain the nature of "will" in respect to sense of purpose or "what should I do with my one wild and precious life?" In circa 1590, English chemist-physicist William Gilbert conducted a “floating loadstones experiment”, shown below, and in 1878 American physicist Alfred Mayer used magnetized needles floating inserted into cork, wherein, in the latter version, geometric pattern distributions, shown above right:

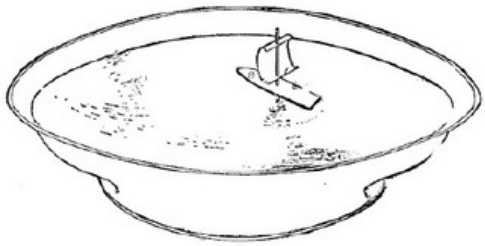

In 1904, Thomson would go on to use this structural ordering insight, in his more famous “On the Structure of the Atom” article, to develop what soon came to be dubbed the "plum pudding model" of atomic theory, the key sentence of which is shown below, next to conceptual images of this atomic model: [4]

"The atoms of the elements consist of a number of negatively electrified corpuscles enclosed in a sphere of uniform positive electrification."

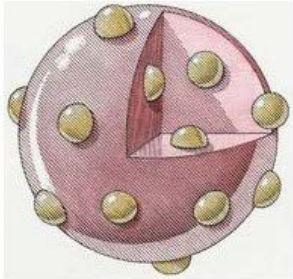

This model was later superseded by the Rutherford model (1911), developed by Ernest Rutherford, and then the Bohr model (1913), developed by Niels Bohr, as outlined below: [5]

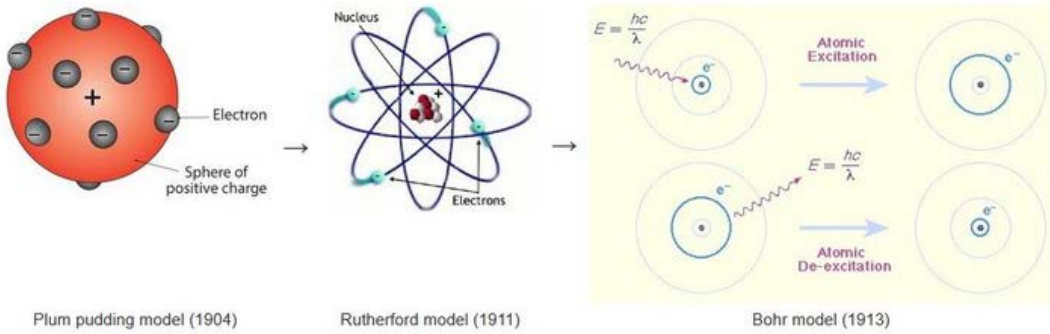

Atoms | Molecules | Forces

The following shows different types of molecules:

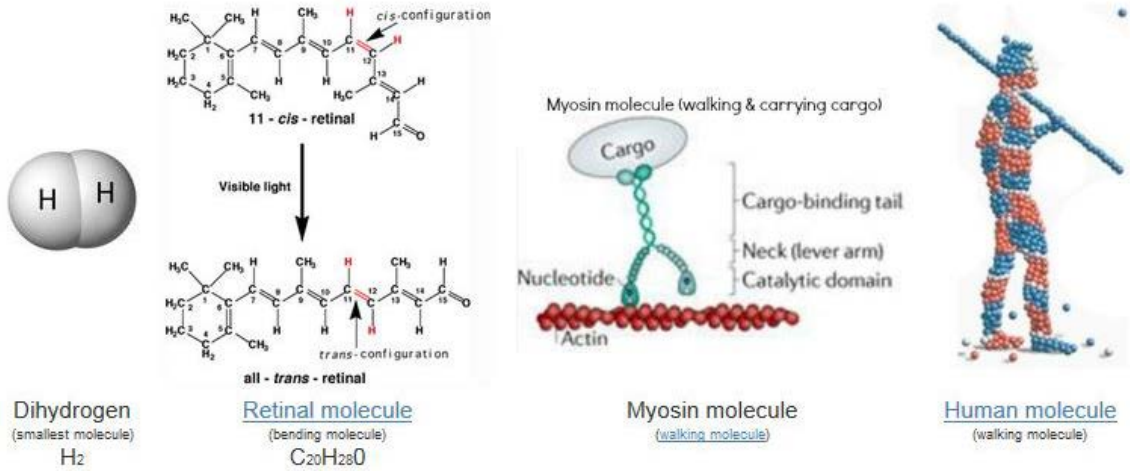

Definition: a "molecule" is a structure built of atoms bound together by chemical forces; a structure in which two or more nuclei are maintained in some geometrical configuration by attractive forces from a surrounding swarm of negative electrons. [1]

Floating Magnets

The following shows the right hand rule:

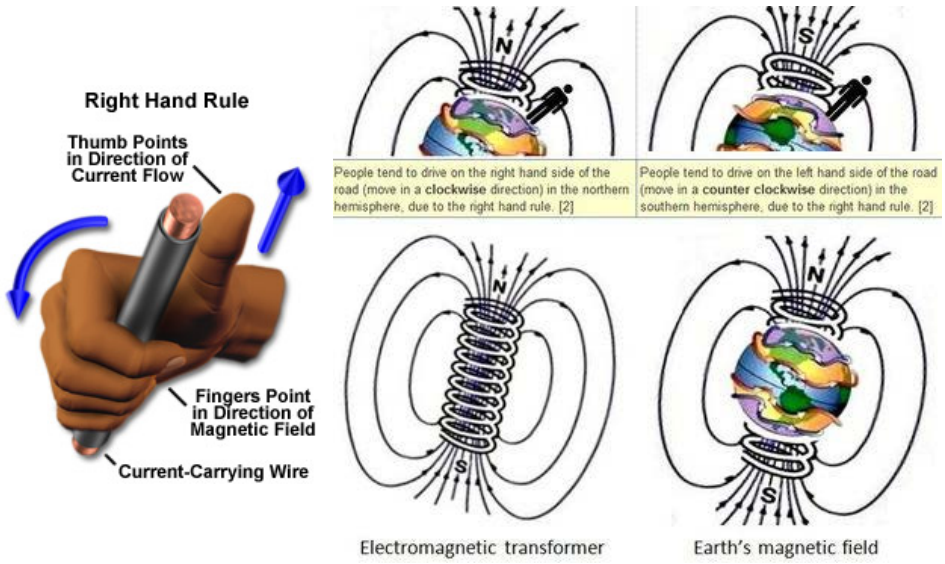

The following are the known forces of the universe:

FORCE	PARTICLE	STRENGTH	SPIN
Strong Nuclear	Gluons: g_{ab}	Strongest	1
Electromagnetic	Photons: γ	10^2 times weaker	1
Weak Nuclear	Bosons: W^+, W^-, Z^0	10^5 times weaker	0, 1, or 2
Gravity	Gravitons: G	10^{39} times weaker	2

The following shows the mechanism of force, i.e. operation via the exchange of bosons:

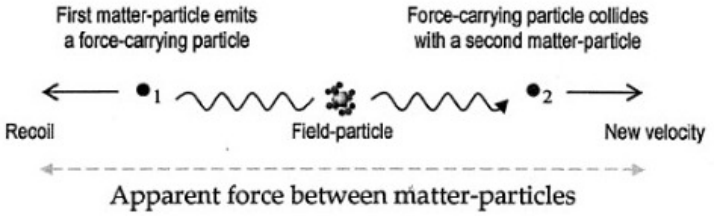

The following shows a visual of the forces of nature:

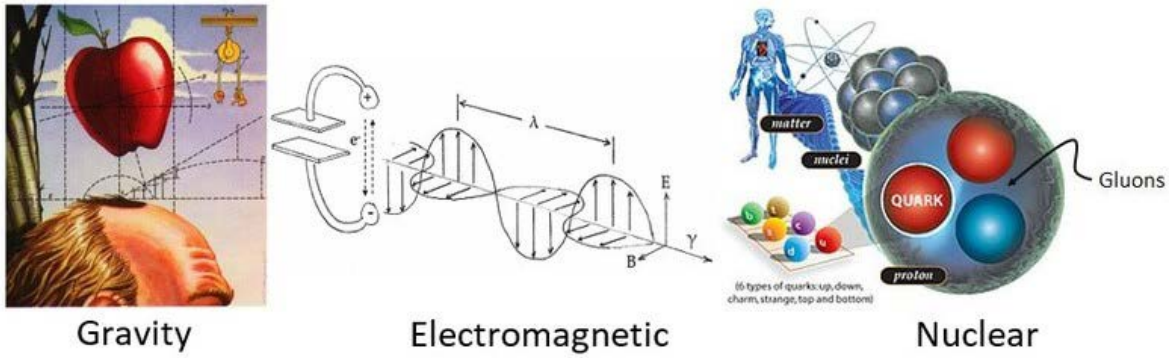

The following shows reactions started by light:

Hydrocarbon molecules

"Statistically, about 2/3 of people **believe** in love at first sight and 20% fall in love at first sight and marry that person."
— Earl Neumann (2001), *Love at First Sight*

"The stoichiometric approach considers whole organisms as if they were single abstract molecules; thought of as complex evolved chemical substances that interact with each other and the abiotic world in a way that resembles a complex, composite, chemical reaction. This formula for the **'human molecule'** [allows one] to think about how every human represents the coming together of atoms in proportions that are, if not constant, at least bounded and obeying some rules."
— Robert Sterner and James Elser (2002), *Ecological Stoichiometry*

Human molecules

The following combustion reactions of methane gas reacting with oxygen:

$$CH_4 + 2O_2 \rightarrow CO_2 + H_2O$$

may be comparable to a very hot and intense relationship:

$$Mx + Fy \rightarrow MxFy$$

in which a male human and female human molecule, Mx and Fy, react to form an intense passionate relationship, but one that is too hot, exploding into chaos, and eventual quick to end termination; or to short-lived human reproduction reaction (double displacement reaction) wherein sparks fly, passion bubbles, and a child Bc is produced:

1991 song *Summertime* (see: 1:00-1:19)

$$Mx + Fy \rightarrow MxFy + Bc$$

but one where either long term passion can continue to ignite the reaction to a golden wedding anniversary or alternatively the heat and friction of argument result in divorce, the result of which the reaction burns out and grows cold to the state of non-existence.

The following shows the activation energy barrier, wherein heat as light acts to trigger reactions:

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

$$\downarrow$$

$$\Delta G = \Delta H - T\Delta S$$

$$\downarrow$$

$$\Delta H = \Delta U + P\Delta V$$

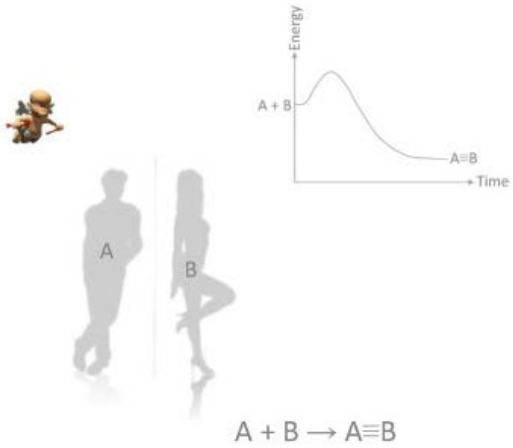

(add summary)

References

1. (a) Rifkin, Jeremy. (2009). *The Empathic Civilization: the Race to Global Consciousness in a World of Crisis.* Polity Press.
(b) See also: Belief system (children).
2. (a) Energy Changes in Chemical Reactions – MiddleSchoolChemistry.com (a K-8 themed ACS.org site).
(b) See: Thims' Apr 2013 lecture (section: human chemical reaction theory) for more on this.
3. Licker, Mark D. (2002). *McGraw-Hill Concise Encyclopedia of Chemistry*. New York: McGraw-Hill.

Next section

â— Lecture: FME | P2: Add

Previous section

â— Lecture: FME | Main

Lecture: "Floating Magnets Experiment and Humans as Powered Atomic Geometries"
FME | **Timeline**

Synopsis: a sideways scrolling flow chart of the overview of the lecture.

Overview
The following is a work-in-progress drafting of the lecture timeline:

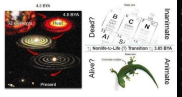

Standard Periodic Table

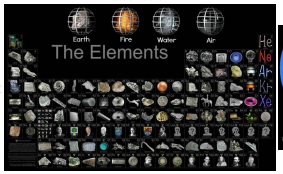

(G)

What the Earth is Made of

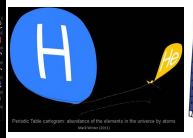

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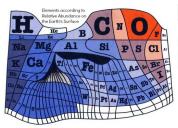

(see: William Sheehan)

What Humans are Made of

(see: Introscience periodic table)

Elements by Size

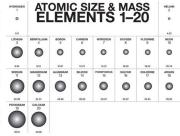

(G)

One (G) of the 16 types (G) of cartograms by Mark Winters (G).

Darwinian evolution

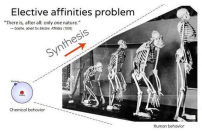

(see: elective affinities problem)

Molecular evolution

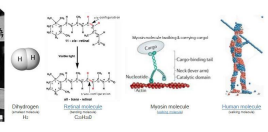

(see: molecule)

(add discussion)

Next section

- Lecture: FME | Main

In thermodynamics, **folklore thermodynamics** refers to versions of thermodynamics, particularly in regard to memorized argument rebuttals, which exist in the corpus of general public knowledge, but do not have an actual established reference or proof and in some cases are in fact types of scientific myth.

Disorder

One loose version of folklore is what is called "tendency to disorder in all systems" view of entropy, which is a blend or mixture of contrived thermodynamics, laymanized thermodynamics, folklore thermodynamics, statistical mechanics, the disgregation view of entropy of Rudolf Clausius, comments by Herman Helmholtz on how the magnitude of entropy is a measure of disorder, Boltzmann' principle of elementary disorder, aspect of Walther Nernst's third law, and the version of radiation thermodynamics and quantum mechanics developed by Max Planck.

Closed system

A 2009, a videotaped Penn State University "street debate" on whether or not entropy applies to humankind and evolution, wherein the one of the students uses the "closed system argument" and the man uses a mixture of contrived thermodynamics and laymanized thermodynamics to conclude that the evolution process should go towards disorder according to the second law and the fact that it's not is evidence of the work of God, of something to this effect. [1]

Open system

Another variation folklore thermodynamics is the oft-heard assertion that humans are open systems and thus not a violation of the second law.

Local entropy decrease

Another variety of folklore thermodynamics is the so-called argument that the order seen in evolution and in humans is what is called the phenomenon of "local entropy decrease", which is offset by the greater increase in entropy in the surroundings. This argument, however, seems to trace to the publications of English thermodynamicist Alfred Ubbelohde, particular his 1946 *Time and Thermodynamics*.

Far from equilibrium

An oft adopted view, is that human existence and in particular human society is a state of existence "far from equilibrium", very near the edge of chaos, and close to bifurcation points, which humans supposedly pass through periodically. This is all an alluded to view given by Ilya Prigogine who attempted to pass of the the phenomenon of Benard cell formation as the prototype model for evolution.

References

1. Anons. (2009). "Debate: Entropy Applies to Humankind?" (V), Penn State University.

θΔics

In religio-mythology, **follower of Horus**, or Heru-Khet (Budge, 1909), refers to, depending on period, either as the pharaoh or "god king", in pre-dynastic times (c.6000-3150BC), as the follower of Horus; the ruler or pharaoh, in early dynasty times (c.3000BC), in “Horus in life” and “Osiris in death”; the high priest, e.g. Sem priest (high priest of Ptah), in 2nd dynasty times (2890-2686 BC), as the follower of Horus; to a blurry notion that the “followers of Horus”, in 19th dynasty times (1292-1189BC), that the deceased, if their soul is light, will be forever like “followers of Horus”, seated at the right hand of Osiris, and be given bread and beer; to the Roman recension (c.50BC-500AD) model that the “followers of Jesus” will be given eternal life, and passage to the afterlife, or something along these lines.

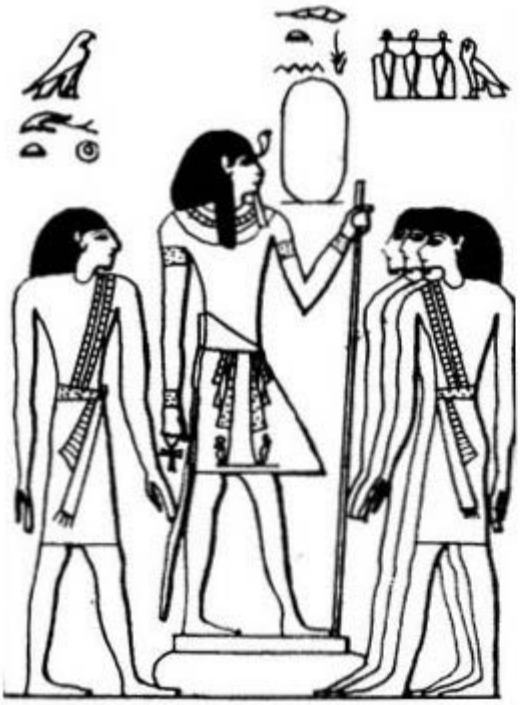

The ‘**follower of Horus**’, who is the Sem priest, addressing the three ministrants in the tomb

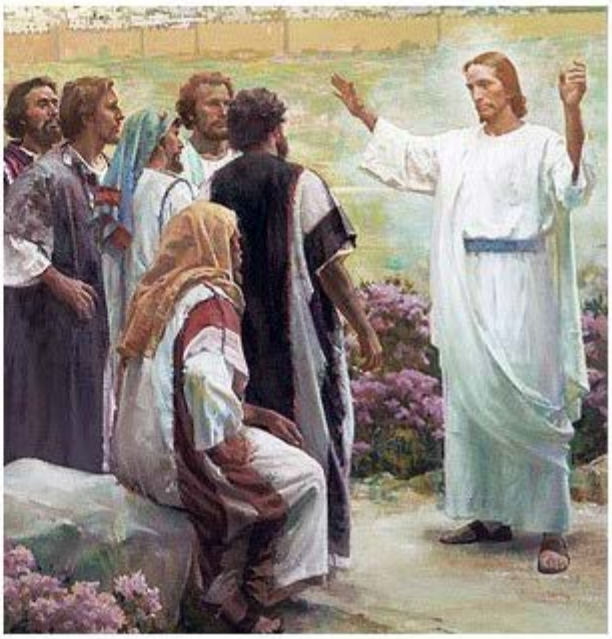

The ‘**followers of Jesus**’, listening to Jesus, the son of god, speaking about the "new" testament

Left: a description, by Wallis Budge (1909), showing the "**follower of Horus**", as the Sem priest (middle), addressing, three men. [2] Right: a Google Image (2019) search return for "followers of Jesus".

Overview

In Egypt, in early dynastic times (c.6000-3150BC), the ruler was considered a “follower of Horus”.

In 3000BC, the ruler or pharaoh became “Horus in life” and “Osiris in death”. [1]

In c.2500, the “Sem priest”, who presided over mortuary rituals, conducted the funeral services, and were the embalmers of the mummified corpse, recognized by the fact that he wore a short wig with a side-lock and was dressed in a panther skin, were known as the “followers of Horus”. [2]

In 1250BC, in the Papyrus of Ani version of the *Egyptian Book of the Dead*, the followers of Horus were being referred to as follows:

> “May there be given to me loaves in the ‘presence’ like the ‘**followers of Horus**’, may a place be made for me in the solar bark on the day when the god ferries across, and may I be received into the presence of Osiris in the ‘land of vindication’.”
>
> — Anon (1250), *Egyptian Book of the Dead* (§: Introduction Hymn to the sun god Ra) (Plate 1-B, pg. 37) [3]

> “Let there be given to him the offerings which are issued in the presence of Osiris, and may a grant of land be established in the ‘field of offerings’ as for the ‘**followers of Horus**’. Thus, says Horus son of Isis: I have come to you, O Wennefer [high priest of Osiris] (Ñº), and bring Ani to you. His heart is true, having

> gone forth from the balance, and he has not sinned against any god or any goddess. Thoth has judged him in writing which has been told to the Ennead, and Maat the great has witnessed. Let there be given to him bread and beer which have been issued in the presence of Osiris, and he will be forever like the 'follower of Horus'."
>
> — Anon (1250), *Egyptian Book of the Dead* (§:30B Chapter for not letting Ani's heart create opposition against him in the god's domain) (Plate 3-B to 4-A, pgs. 41-42) [3]

In c.100AD, amid the Roman recension (50BC-500AD), following the Greek recension (330BC), and the pre-dynastic model of "god kings" as "followers of Horus" (c.3200BC) model, which in 3000BC became pharaohs as "Horus in life" and "Osiris in afterlife" model, which in 1300BC became high priests as "followers of Horus" and people, e.g. Ani, who could afford for an *Egyptian Book of the Dead* to be made for them, a "follower of Horus", supposedly, in life and an "Osiris-person", e.g. Osiris-Ani, in the afterlife, became or was rescripted into the model of believers as "followers of Jesus" in life and people reborn at the right hand of "god the father", aka god Osiris, in the afterlife.

References

1. Jordan, Michael. (2014). *Dictionary of Gods and Goddesses* (pg. 128). Infobase Publishing.
2. Budge, Wallis. (1909). *The Book of Opening the Mouth: The Egyptian Texts with English Translations, Volume 1* (follower of Horus, 6+ pages). Trubner & Co.
3. Faulkner, Raymond. (1972). *The Egyptian Book of the Dead: the Book of Coming Forth by Day: Complete Papyrus of Ani, Featuring Integrated Text and Full-Color Images* (translator: Ogden Goelet; Preface: Carol Andrews; Introduction: Daniel Gunther; Foreword: James Wasserman) (Amz) (chapters, pg. 18; recensions, pg. 144). Chronicle Books, 2015.
4. Joshua, Mark. (2016). "Horus" (Ñº), Ancient History Encyclopedia, Mar 16.

θΔics

In terminology, **food chain** refers to the model through which carbon cycles via a "closed chain" (Lotka, 1925) between the atmosphere, plants, and animals, or "chains of animals linked together by food" (Elton, 1926) who at the bottom chain are linked to plants, who via the action of "raw sunlight and chemicals" become a form edible to animals.

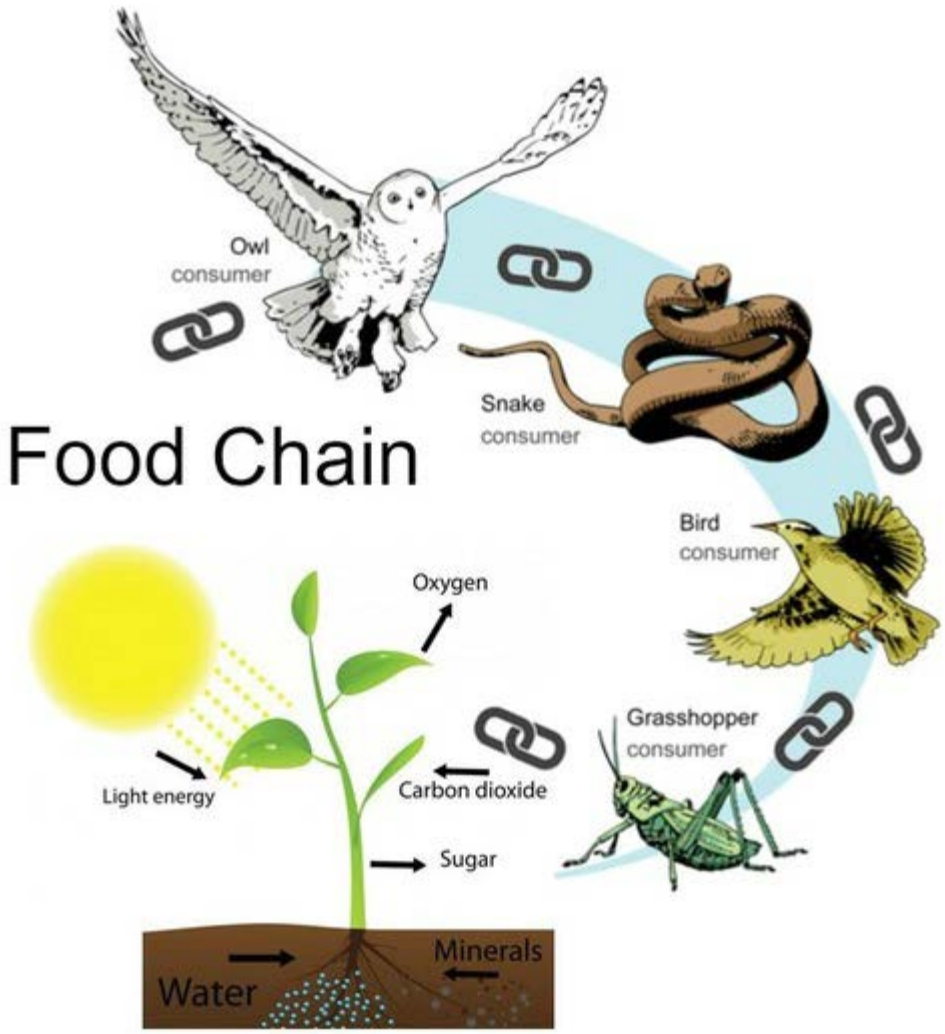

A basic **food chain** diagram, shown sunlight working on minerals and water to produce plants, which are eaten by plant consumers (herbivores), which are eating by carnivores, which are eaten by larger carnivores, birds, snakes, or owls, higher up on the food chain, so to say.

Overview

In 1925, Alfred Lotka, in his §:Carbon Dioxide Cycle, stated that the organic carbon cycle, reduced to its simplest terms, is a “closed chain of three links”, which he diagrammed as follows: [1]

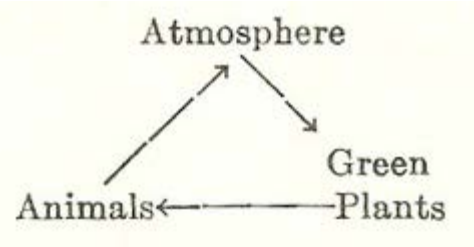

In 1926, English zoologist Charles Elton, citing Lotka, introduced the energy-based “food chain” model, a term he coined, stylized supposedly on Lotka's earlier "closed chain" usage, as follows: [2]

> “Animals are not always struggling for existence, but when they do begin, they spend the greater part of their lives eating. Feeding is such a universal and commonplace business that we are inclined to forget its importance. The primary driving force of all animals is the necessity of finding the right kind of food and enough of it. Food is the burning question in animal society, and the whole structure and activities of the community are dependent upon questions of food-supply. We are not concerned here with the various devices employed by animals to enable them to obtain their food, or with the physiological processes which enable them to utilize in their tissues the energy derived from it. It is sufficient to bear in mind that animals

> have to depend ultimately upon plants for their supplies of energy, since plants alone are able to turn raw sunlight and chemicals into a form edible to animals. Consequently herbivores are the basic class in animal society. Another difference between animals and plants is that while plants are all competing for much the same class of food, animals have the most varied diets, and there is a great divergence in their food habits. The herbivores are usually preyed upon by carnivores, which get the energy of the sunlight at third-hand, and these again may be preyed upon by other carnivores, and so on, until we reach an animal which has no enemies, and which forms, as it were, a terminus on this food-cycle. There are, in fact, chains of animals linked together by food, and all dependent in the long run upon plants. We refer to these as '**food-chains**', and to all the food-chains in a community as the 'food-cycle'."

This simple outline, of course, is but a foray into the more advanced chemical thermodynamic energy coupling theory, developed by Fritz Lipmann in the 1940s.

Other authors to have employed "food chain thermodynamics" models include: Vladimir Stanchinsky (1930), Raymond Lindeman (1942), Paul Colinvaux (1979), Paul Ehrlich, and in a unique way Vladimir Vernadsky (1926) who outlined a blurry type of food chain picture of free energy, so to speak.

In 1988, Americans Daniel Brooks and Edward Wiley, in their *Evolution as Entropy*, seems to give a energetics and or thermodynamics synopsis of food chain models, as follows: [3]

> "Beginning with Lotka (1924) and **Elton** (1927), continuing with Lindeman (1942) through today —Ulanowicz (1986), Wicken (1987), etc.—ecological processes have been characterized fruitfully in thermodynamic terms."

(add discussion)

Atheism | Meaning

See main: Zerotheism Bible (Ñº)

Of note, in regards to the non-religious and or atheist group of believers, there are many 21st century parents who take the above description as the model of godless existence to which they teach to their children; something along the lines of answering the young child query 'what happens when you die?' or 'what is the point of existence' with the answer: 'you become part of the food chain' or the 'lion eats you', among other variants; the following are examples:

An energy transformation model of the **food chain**, according to which energy is modeled to flow from sunlight to plant matter to herbivores to carnivores.

> "The lion eats you."
>
> — Anon (c.2005), answer to child's query, on what happens when you die, by European-born American female atheist parent [4]

> "We're the highest on the **food chain**."
>
> — Hudson (2016), comment of seven-year-old, while watching the introduction video of "Zerotheism for Kids", after

looking at the Darwin tree vs cross, Jan 30

References

1. Lotka, Alfred J. (1925). *Elements of Physical Biology* (republished (Ñº) as: *Elements of Mathematical Biology*, which includes: corrections from Lotka's notes and a completed list of his publications) (pdf) (Ñº) (txt) (pgs. 155-56). Dover, 1956.
2. Elton, Charles S. (1927). *Animal Ecology* (energy, 10+ pgs; food-chains, pg. 56). Sedgewick and Jackson.
3. Brooks, Daniel R. and Wilson, Edward O. (1988). *Evolution as Entropy: Toward a Unified theory of Biology* (pg. 31). University of Chicago Press.
4. Thims, Libb. (c.2005). "Personal Interview with Atheist Female Parent on What She Tells Her Children About What Happens When They Die", Chicago.

External links

â— Food chain – Wikipedia.

θΔics

In terminology, **fool** (TR:52), similar to "crackpot", refers to a person lacking in judgment or prudence; a harmless deranged person or one lacking in common powers of understanding; one with a marked propensity or fondness for something; a retainer formerly kept in great households to provide casual entertainment and commonly dressed in motely with cap, bells, and bauble. [1]

Frederick II (1194-1250) and Johann Goethe (1749-1832) both labeled as "**fools**" for challenging Christian doctrine; Frederick for asserting that virgin birth was impossible and that Jesus, Moses, and Muhammad were impostures; Goethe for asserting that Bergman-based morality usurps Christian-based morality.

Quotes

The following are related quotes:

"The **fool** saith in his heart: there is no god."

— David (c.100AD), Bible (Psalm 14:1) (Ñº)

"Frederick II (1194-1250), this pestilent king, a scorpion spitting out poison from the stinger of his tail, has notably and openly stated that—in his own words—the whole world has been **fooled** by three imposters, Jesus Christ, Moses, and Muhammad, two of whom died honorably, while Jesus himself died on the cross. Moreover, he has dared to affirm, or rather, he has fraudulently claimed, that all those who believe that a virgin could give birth to the god who created nature, and all the rest, were **fools**. And Fredrick has aggravated the heresy by this insane assertion, according to which no one can be born without having been conceived by the prior intercourse of a man and woman; he also claims that people ought to believe nothing that cannot be proven by the strength and reason of nature."

— Pope Gregory IX (1239), address to monarchs

"Astrology is that deceptive opinion by means of which a living is made from **fools**."

— Leonardo da Vinci (1490) [11]

A **fool**, Mr, Edgeworth, is one who has never made an experiment.

— Erasmus Darwin (c.1795), "Remark to Richard Edgeworth (Ñº)"; as quoted by Stanley Jevons in 'Experimental Legislation' [7]

"To all rational readers, the use of the chemical theory [in Goethe's *Elective Affinities*] is nonsense and childish **fooling** around."

— Christoph Wieland (1810), "Letter to Karl Bottiger" (with instructions to burn after reading), Jul 16 [2]

"Thus we can reconcile the philosophical position of our time with the words of the apostle; for the 'higher pantheism' [Tennyson] agrees with him in asserting the existence of the eternal 'in whom we live and move and have our being.' Science, conceiving of the universe as the manifestation of an immanent god, can only endorse these words. Goethe's name for the cosmos, which the **fool** in his folly was pleased to call a 'fortuitous concourse of atoms,' is this—'the living garment of god'."

— Caleb Saleeby (1904), "The Living Garment of God" [3]

> “I have already told you that I got my first warning. With me, as with many other **fools** and some geniuses, the weak spot is what is known as Brocas convolution of the brain, which contains the shelves of memory. Suddenly or slowly the shelves close and can’t be opened. Mine have been closing normally and slowly, but one day in July I happened to go into Audrain’s place to ask a question, and, to my consternation, my French tumbled out all in a heap. The words came without connection. The man looked at me queerly; I mumbled something, and got out into the street; by the time I got back to my rooms, the paralysis had passed; but I knew quite well what it meant.”
>
> — Henry Adams (1908), “Letter to letter to Elizabeth Cameron”, Sep 15; commentary on his forewarned descent into stroke land (1912 to 1918) reaction end [4]

> “A science is any discipline in which the **fool** of this generation can go beyond the point reached by the genius of the last generation.”
>
> — Max Gluckman (1965), *Politics, Law and Ritual in Tribal Society* [5]

References

1. Fool – Merriam-Webster Collegiate Dictionary, 2000.
2. (a) Wieland, Christoph Martin. (1810). "Letter to Karl August Böttiger" July 16. Weimar.
(b) Tantillo, Astrida O. (2001). Goethe's *Elective Affinities* and the Critics (pg. 9-10). Camden House.
3. Saleeby, Caleb. (1904). “The Living Garment of God”, in: *The Cycle of Life According to Modern Science: Being a Series of Essays Designed to Bring Science Home to Men’s Business and Bosoms* (pg. 343). Harper & Brothers.
4. (a) Adams, Henry. (1908). “Letter to Elizabeth Cameron”, Sep 15.
(b) Adams, Henry. (1992). *Henry Adams: Selected Letters* (editor: Ernest Samuels) (pg. 503). Harvard University Press.
5. Gluckman, Max. (1965). *Politics, Law and Ritual in Tribal Society* (pg. 16) (Ñº) . Transaction Publishers.
6. Shlain, Leonard. (2009). *Leonardo’s Brain: Understanding da Vinci’s Creative Genius* (manuscripts, pg. 6; spurge, pg. 9). Publisher.
7. Jevons, Stanley. (1880). “Experimental Legislation” (Ñº), *Popular Science*, 16:754, Apr.

θΔics

In science, **foot-pound** is the amount of work necessary to raise a pound weight a foot high. [1]

References

1. Anon (1890), “Horse-power” in *Encyclopedia Britannica, Volume 12* (pg. 207). Publisher.

External links

- Foot-pound (energy) – Wikipedia.

θΔics

In footnotes, **footnote 2.5** refers to footnote number five of chapter two "The Identification of the Real" of Belgian chemist Ilya Prigogine's 1984 book *Order Out of Chaos.* [1]

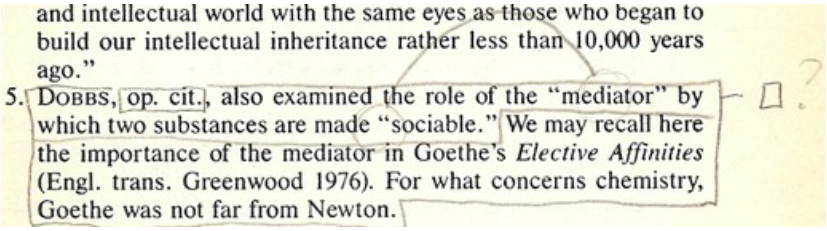
and intellectual world with the same eyes as those who began to build our intellectual inheritance rather less than 10,000 years ago."

5. Dobbs, op. cit., also examined the role of the "mediator" by which two substances are made "sociable." We may recall here the importance of the mediator in Goethe's *Elective Affinities* (Engl. trans. Greenwood 1976). For what concerns chemistry, Goethe was not far from Newton.

Footnote #5 (pgs. 64, 319), chapter II: The Identification of the Real, section 2: Motion and Change, *Order Out of Chaos* (1984) by Ilya Prigogine, with Thims hand-written markings as made when he first read the passage.

Overview

In Fall 1994, amid the course: Chemical Engineering Thermodynamics I [ChE 230], Winter 1995, amid the course: Chemical Engineering Thermodynamics II [ChE 330], or at the very latest, Spring 199, amid the course: Physical Chemistry [CHEM 468], see: Libb Thims (history), Thims' gleaned the patently-obvious "idea" (see: this idea), in his mind, that these equations, reactions, and principles, he was learning, in these courses, wherein he received straight A's, being near the top of his graduating class, of about 128 student, in each course, to predict and understand the nature of molecular formations, reactions, and dissolutions, applied to human reactions at the macro-social level; something along the lines of the following logic or view, i.e. that columns 1-3 are "translatable" to the phenomena described in columns 5-6:

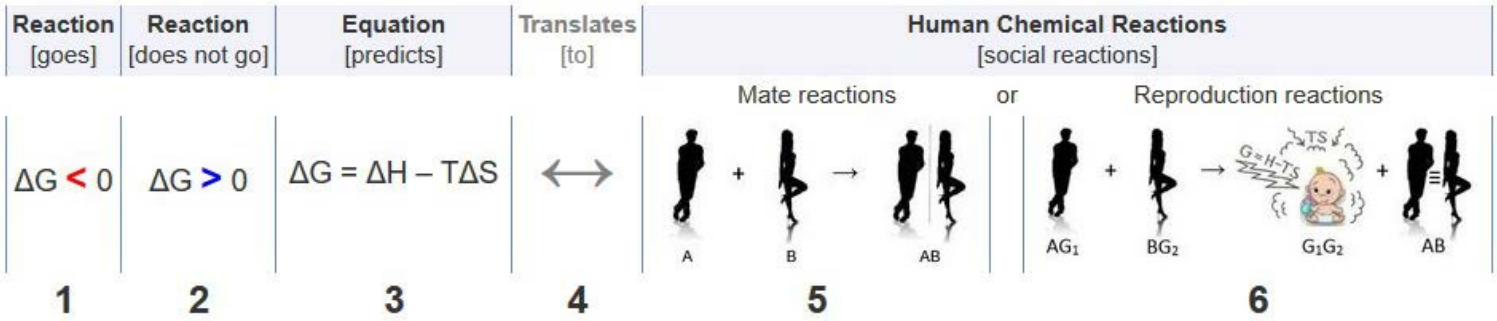

The question Thims had, in his mind, at this point, was "who" exactly, historically, or "how" exactly, in modern terms, was this explained, in detail? Thims, for whatever reason, did not ask the question OPENLY in class, despite of the fact, that he routinely sat in the front of every class, raised his hand to as the most questions in class, or thereabouts, and was the student that did some of the most teacher office visits, to get specifics answer, on various questions, that he couldn't solve on his own.

On 15 Nov 2001 at 3:00AM CST, Thims solved, in basic social mechanism outline, the intricately difficult puzzling as to how the differential variables of **column #3**, i.e. G, H, T, and S, were translatable, per unit state of existence, into social mate selection factors, such as character, occupation (see: Buss sexual proposition study), personality, family social structure, physical fitness, physical appearance, age, etc.; shortly thereafter, in the following weeks (or months), the vision began to arise in his mind that Thims might devote two months to "public" article presentation of this model, backed by the loose idea that such a model expanded into book form might pay for medical school [Thims, specifically, was memorizing neuroanatomy from 1AM to 2AM, when he took a "mental break" to work on his 7-year previous mental plaything puzzle [column #3], which at 3AM, see: Libb Thims (history), he began to glean the solution to.

Research | Book buying

Thims then began to do some historical research to see who else had worked on this problem, prior to him; the following shows Thims Amazon.com book order history; books listed chronologically per date of ordered placed, within each year (e.g. Prigogine and Goethe dates shown); some of the more influential books are shown in large text:

The inventions of Amazon (1994), Wikipedia (2004), Google Books (2004), and Wetpaint (2007), allowing one to find rare information, obtain copies of this rare information, and collate this flow of information into a wiki, were a polyintellect's dream come true.

2001 | 0 books

No account set up yet. Thims largely bought books from retail book stores. e.g. Borders, Barnes & Noble, university book stores, local small book stores, etc.

2002 | 3 books

● *Green Eyes, the Greenest Fields*
Andre Crump
● *Quantum Mechanics: Two Volumes Bound As One*
Albert Messiah
● *The Elegant Universe: Superstrings, Hidden Dimensions, and the Quest for the Ultimate Theory*
Brian Greene

2003 | 0 books

Thims, per recollection, was deep into penning a 1,000-page draft for a 3-volume *Human Thermodynamics* manuscript. In particular, Thims, during this

year, as he recalls was purchasing dozens of books, weekly or monthly, from Barnes & Noble (O), at Webster Place, Chicago; some from the philosophy section, some from the science section, and many from the religion and mythology section (see: Thims religion, mythology, and atheism book collection).

2004 | 6 books

● *Biocosm: The New Scientific Theory of Evolution: Intelligent Life Is the...*
James Gardner, Seth Shostak
● *Information Theory and Evolution*
John Avery | Ordered: May 11
● *Facts and Mysteries in Elementary Particle Physics*
Martinus Veltman | Ordered: May 11
● *The Origins of Order: Self-Organization and Selection in Evolution*
Stuart Kauffman
● *Linked: How Everything Is Connected to Everything Else and What It Means...*
Albert-Laszlo Barabasi, Albert-Laszlo Barbasi
● *Emergence: The Connected Lives of Ants, Brains, Cities, and Software*
Steven Johnson
● Survival of the Prettiest: The Science of Beauty
Nancy Etcoff

2005 | 34 books

● *The Sex Contract: The Evolution of Human Behavior*
Helen Fisher | Placed: Feb 25
● Thermodynamics
William Z. Black, James G. Hartley
● *A to Z of Thermodynamics*
Pierre Perrot
● *Particle Physics : A Comprehensive Introduction*
Abraham Seiden
● *Symmetry and the Beautiful Universe*
Leon M. Lederman, Christopher T. Hill
● *Down Things: The Breathtaking Beauty Of Particle Physics*
Bruce A. Schumm
● *Sperm Wars: The Science of Sex*
Robin Baker
● *Non-Equilibrium Thermodynamics*
S. R. De Groot, P. Mazur
● *Modern Thermodynamics : From Heat Engines to Dissipative Structures*
Dilip Kondepudi, Ilya Prigogine
● *The Origins of Virtue: Human Instincts and the Evolution of Cooperation*
Matt Ridley
● *Self-Organization in Biological Systems (Princeton Studies in Complexity...*
Scott Camazine, et al
● *Is Future Given?*
Ilya Prigogine
● *Nexus: Small Worlds and the Groundbreaking Science of Networks*
Mark Buchanan
● *Sync: The Emerging Science of Spontaneous Order*
Steven Strogatz
● *At Home in the Universe: The Search for Laws of Self-Organization and...*
Stuart Kauffman
● *Exploring Complexity: An Introduction*
Gregoire Nicolis, Ilya Prigogine
● *Order out of Chaos: Man's New Dialogue with Nature* [see: **footnote 2.5**]
Ilya Prigogine | Placed: Aug 6
● *Thermodynamic Theory of the Evolution of Living Beings*
Georgi Gladyshev | Placed: Sep 29
● *From Being to Becoming: Time and Complexity in the Physical Sciences*
Ilya Prigogine
● *Bioenergetics: The Molecular Basis of Biological Energy Transformations by...*
Albert Lehninger
● *Bioenergetics*
Alexander Lowen

● *Thermodynamics and the Kinetic Theory of Gases (Pauli Lectures on Physics)*
Wolfgang Pauli
● *Flow: The Psychology of Optimal Experience*
Mihaly Csikszentmihalyi
● *Statistical Thermodynamics*
Erwin Schrodinger

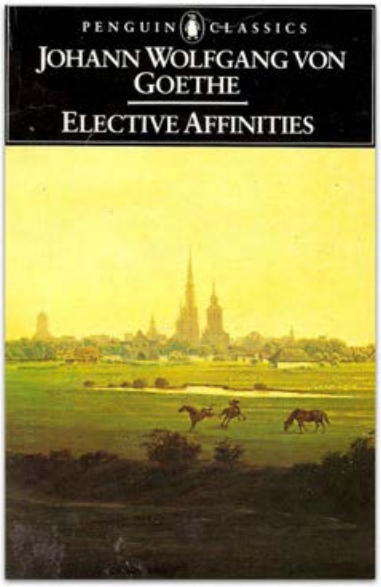

On 10 Oct 2006, Thims ordered Goethe's *Elective Affinities*, the Reginald Hollingdale (1971) translation (see: translations) with chronology and further reading by David Deissner (2005), and thereafter discovered the riddled meaning of Prigogine's **footnote 2.5**.

- *Elective Affinities* *(Penguin Classics)* [see: **chapter four**]
  Johann Goethe (translator: Reginald Hollingdale) | Ordered: **Oct 10**

● *My Twentieth Century Philosophy*
Elizabeth Porteus
● *The Second Law*
Peter Atkins
● *Astonishing Hypothesis: the Scientific Search for the Soul*
Francis Crick
● *Evolutionary Psychology: The New Science of the Mind*
David Buss
● *The Chemistry of Love*
Michael Liebowitz
● *The Principles of Chemical Equilibrium : With Applications in Chemistry and...*
Kenneth Denbigh
● *The Alchemy of Love and Lust*
Theresa Crenshaw
● *Chemistry of Human Life*
George Carey
- *Human chemistry*
William Fairburn
● *Entropy Demystified: Potential Order, Life and Money*
Valery Chalidze
- *Reflections on the Motive Power of Fire*: *And other Papers on the Second Law of Thermodynamics*
Sadi Carnot
● *The Science of Love: Understanding Love and It's Effects on Mind and Body by...*
Anthony Walsh
● *Theory of Heat*
James Maxwell
● *Screen Couple Chemistry : The Power of 2*
Martha Nochimson
● *The New Couple: Why the Old Rules Don't Work and What Does*
Maurice Taylor, Seana McGee

2006 | 217 orders
(add)

2007 | 127 orders
(add)

2008 | 53 orders
(add)

2009 | 38 orders
(add)

2010 | 51 orders
(add)

2011 | 89 orders
(add)

2012 | 90 orders (some not books, e.g. ink cartridges, face masque [cold weather], etc.)
(add)

2013 | 100 orders (some not books)
(add)

2014 | 85 orders (some not books)
(add)

2015 | 52 orders (some not books)
(add)

2016 | 6 orders (some not books)
● *Energy and Structure: A Theory of Social Power*
Richard Adams | Ordered: Jan 18
● *The End of Reason: A Response to the New Atheists*
Ravi Zacharias | Ordered: Mar 1
● *The Real Face of Atheism*
Ravi Zacharias | Ordered: Feb 10
● *The Excitement of Science*
John Platt | Ordered: Mar 13

Non-book orders: Garmin Vivoactive GPS run/bike/swim watch, Phaiser BHS-530 Bluetooth runner head phones, Ravi
[As of Mar 16]

Note 2.5

On 10 Aug 2005, Thims, as the above order history shows, ordered Belgian chemist Ilya Prigogine's 1984 book *Order Out of Chaos*, §2: The Identification of the Real (§§2: Motion and Change), after which, in the week to follow book arrival, discovered footnote number 2.5, which alluringly reads as follows:

> "Dobbs, op. cit., also examined the role of the 'mediator' by which two substances are made 'sociable'. We may recall here the importance of the mediator in Goethe's *Elective Affinities* (Engl. Trans. Greenwood 1976). For what concerns chemistry, Goethe was not far from Newton."
>
> — Ilya Prigogine (1984), **footnote 2.5**, in: *Order Out of Chaos* (§2: The Identification of the Real [§§2: Motion and Change (pgs. 64, 319)])

This, in turn, led Thims into searching out this peculiar book, of this person "Goethe", which Thims had never heard of before, despite having worked on the very same problem for the past 10-years.

On 10 Oct 2005, Thims ordered Goethe's *Elective Affinities*; thereafter, in the week or so to follow, upon book arrival, absorbing the mind-blending "chapter four".

On Feb-Mar 2006, Thims began writing *Human Chemistry*, a conceptualized-to-be intellectual "duty", to Goethe, namely to write a basic textbook on chemistry, at the human level, the way Goethe outlined hereabove in literary form, as best as newly minted top chemical engineer could do..

In Sep 2007, Thims finished this two-volume 824-page textbook, following 18-months and 14-days of focused writing.

In short, Thims had discovery that Goethe basically worked out nearly the same theory (as had Thims), albeit framed in the logic of affinity tables, i.e. human affinity tables (see: Goethe affinity table), the antecedent or rather forerunner to free energy tables, or in Thims' view human free energy table (see: Thims free energy table), over two hundred years ago (1796-1809), and wrote out the entire solution in coded format in his 1809 novella *Elective Affinities*, a treatise filled with 36-chapters of various types of human chemical reactions or human elective affinity reactions, as Goethe would have viewed them. [1]

At this point, strangely enough, even though Thims is 50% German, and had at that time over 750 science books in his home library collection, he had never heard of Goethe. In any event, after finally reading *Elective Affinities*, specifically the famous chapter four, it has since become the most influential book he has ever read and was what instilled in Thims the duty, obligation, or rather "moral imperative" to write the world's first ever textbook on the subject of human chemistry (basically the modern view of what Goethe was theorizing about 200 years ago).

Dobbs

The "Dobbs, op. cit." reference refers to the 1975 work of American chemistry historian Betty Dobbs. [2]

References

1. Prigogine, Ilya. (1984). *Order Out of Chaos – Man's New Dialogue with Nature* (footnote 2.5: "B.J. Dobbs [*The Foundations of Newton's Alchemy*, 1975] also exampled the role of the 'mediator' by which two substances are made 'sociable'. We may recall here the importance of Goethe's *Elective Affinities*. For what concerns chemistry, Goethe was not far from Newton." pg. 319). New York: Bantam Books.
2. Dobbs, Betty J. (1975). *The Foundations of Newton's Alchemy: or the Hunting of the Greene Lyon*. Cambridge University Press.

θΔics

In hmolscience, **Forbes Allan** (c.1960-) is an American writer noted, in literature thermodynamics, for his 1999 novel *Milton's Progress*, wherein he uses dialogue method to discuss Prigogine-based human molecular theory philosophy.

Overview

In 1999, Allan, in his novel *Milton's Progress*, presented themes on people as molecules, i.e. human molecules, employed the rare pre-21st century term use of the term "human thermodynamics", discussioned of a fourth law of thermodynamics, much of which is thematically or philosophically based on references to the ideas of Belgian chemist Ilya Prigogine, among other interesting themes; the following being a noted passage: [1]

> "People are like particles, they behave in groups as if they were molecules in a test-tube."

In chapter 21, we find a conversation between a character named John and a Dr. Snipe, along with references to a "Ilya Meiliakin" (a play on Belgian thermodynamicist Ilya Prigogine) concerning human life, which is described as "the most effective multiplier of *entropic decay* in the universe", and man's quest to understand his function in the scheme of things: [2]

> "It's just human thermodynamics, my friend," John said stiffly, "you're inside the jaws of laws beyond your ken." That's an acer poem, he decided, which nicely sums up the plight of humankind and the worthlessness of being. "Maybe I've stumbled upon a new law of physics!" it flashed on him suddenly: "—that life-driven anti-entropic processes are an integral component of all the second law activities and provide an engine with which to accelerate the overall degradation of energy into heat! … Or would that be a 'fourth' law of thermodynamics? …"

(add discussion)

Notes

Allan's book, to note, seems never to have been published with an ISBN and seems to have been available only as a mail order self-published book through a now defunct Rowanlea Grove Press. Several sample chapters were online, via Rowanlea.com (now defunct), between 2003 and 2005, and now only can be found though Internet Archive. [3]

References

1. (a) Forbes, Allan. (1999). *Milton's Progress*. Rowanlea Grove Press.
(b) Thims, Libb. (2008). *The Human Molecule*, (preview) (Google Books). Morrisville, NC: LuLu.
2. ibid (Chapter 21, human particle / molecule / thermodynamics references).
3. (a) ibid (Chapters: 20, **21**, 22, 23, 24, 25, 26, 27, etc.) - Web.Archive.org.
(b) ibid (Chapter 21, years online) - Web.Archive.org.

θΔics

In science, a **force** is any influence that tends to change the state of rest of a body or its uniform motion in a straight line. [1]

FORCE	PARTICLE	STRENGTH	SPIN
Strong Nuclear	Gluons: g_{ab}	Strongest	1
Electromagnetic	Photons: γ	10^2 times weaker	1
Weak Nuclear	Bosons: W^+, W^-, Z^0	10^5 times weaker	0, 1, or 2
Gravity	Gravitons: G	10^{39} times weaker	2

The so-called "standard model" of the the definition of **force**, in modern terms, of which four varieties of forces, strong nuclear force, electromagnetic force, weak nuclear force, and the gravitational force, are said to account for all movements in the universe, and in which the mechanism of the force is said to operate via the exchange of field particles, messenger particles, or force carriers which come in four varieties: gluons, photons, bosons, and gravitons, which carry and transmit the force. [6]

History

In 1686, English physicist Isaac Newton, in his famed *Principia*, introduced the standard model of "force", as defined by his three laws of motion.

In 1834, Irish mathematical physicist William Hamilton, one of the founders of dynamics, the study of the motion of bodies under the action of forces, defines force or rather what he called the *science of force* as follows: [3]

> "Force is power acting by law in space in time."

Standard model

The so-called standard model of science is that there are four types of fundamental forces:

1. Strong nuclear force – mediates subatomic interactions.
2. Electromagnetic force – mediates atomic and molecular interactions.
3. Weak nuclear force – mediates radioactive decay processes.
4. Gravitational force – mediates interactions between objects with mass.

The forth of these, namely gravity, however, can be shown to but a version of the electromagnetic force; hence, it can be argued that there are only three fundamental forces of the universe, as things currently stand.

Exchange force

See main: Exchange force

In modern terms, forces are said to be mediated by particles or entities called "force carriers" or field particles. [2]

Pioneer anomalies

In 1998, American NASA scientist John Anderson famously pointed out the "pioneer anomaly", namely that the Pioneer 10 and Pioneer 11 space probes that where launched in the early 1970s, but now powered-out are "decelerating" in a manner that cannot be accounted for by standard models of gravity. [4]

Chemical gravitation

The 2007-2008 work of American electrochemical engineer Libb Thims, on the nature of the relation of the "chemical bond" existent between "human molecules" in relationships and the so-called "bond" that holds "human molecules" to the "earth molecule" and in turn the "earth molecule" to the "sun molecule" seems to indicate that the so-called gravitational force is a sort of large scale derivative of the electromagnetic force, although the details of this theory need to be worked out. [6]

Z' boson

In 2011, researchers at Fermilab, studying data on particle accelerator collisions from 2001 to 2009, announced the possibility of the data showing that a new force of nature exists, a hypothetical particle known as the Z' boson, a heavier cousin of the Z boson, with a proposed mass of 150 billion electron volts, posited to be a new subset of the weak nuclear force set of exchange particles. [5]

Quotes

The following are related quotes:

> "Sometimes I think the **force** is stronger in the dead than in the living."
>
> — Steve Berry (c.2000) (Q) (Q)

See also

- Thermodynamic force
- Driving force
- Entropic force
- Kraft
- Fall-force
- Conservation of force
- Biogravity
- Gravitate
- Social gravitation
- Primary field particle
- Secondary field particle
- Motive force

References

1. Clark, John O.E. (2004). *The Essential Dictionary of Science*. New York: Barnes & Noble Books.
2. Ford, Kenneth W. (2004). *The Quantum World*, (pg. 46). Cambridge, Mass.: Harvard University Press.
3. Hamilton, W.R. (1834). "On a general method in dynamics by which the study of the motions of all free systems of attracting or repelling points is reduced to the search and differentiation of one central relation, or characteristic function." *Philos. Trans. R. Soc. London*, 124:247-308.
4. (a) Cowen, Ron. (2011). "Pioneer Puzzle Pinned on Thermodynamics: New Study Declares Long-standing Mystery Solved, but Experts are Skeptical", April 7th, ScienceNew.org.
(b) Cowen, Ron. (2008). "Pioneer 10's Puzzling Motion: a Lot of Hot Air", Science News Online, Apr 24.
(c) Cowen, Ron. (2008). "Too Speedy for Gravity? *Science News*. Vol. 173, Mar. 15, pg. 173.
5. Cowen, Ron. (2011). "Fermilab Data Hint at Possible New Particle: Powerful Collisions of Protons and Antiprotons Produced Unexplained Result." April 6th, ScienceNews.org.
6. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (fundamental forces, pg. 195-96). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
(c) Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc). LuLu.

External links

- Force – Wikipedia.

θΔics

In famous publications, ***Force and Matter**: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon*, or *Kraft und Stoff* (German), is an book, originally published in 1855, with substantial additions by the 1884 15th edition, written by German physicist Ludwig Buchner, ranked as a top atheist's bible, wherein, building on atheist thinkers such as Lucretius, Jean Meslier, and Baron d'Holbach, a cogent attempt is made to outline and atheism-explicit force, matter, and energy view of everything.

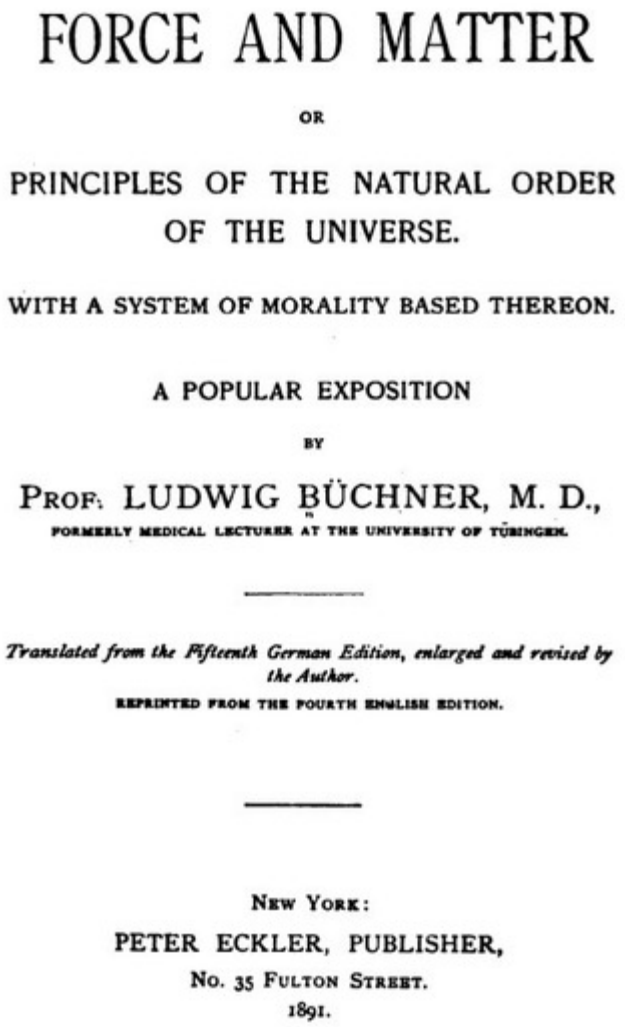

FORCE AND MATTER

OR

PRINCIPLES OF THE NATURAL ORDER OF THE UNIVERSE.

WITH A SYSTEM OF MORALITY BASED THEREON.

A POPULAR EXPOSITION

BY

PROF. LUDWIG BÜCHNER, M. D.,

FORMERLY MEDICAL LECTURER AT THE UNIVERSITY OF TÜBINGEN.

Translated from the Fifteenth German Edition, enlarged and revised by the Author.

REPRINTED FROM THE FOURTH ENGLISH EDITION.

NEW YORK:

PETER ECKLER, PUBLISHER,

No. 35 FULTON STREET.

1891.

The title page of German 1894 edition Ludwig Buchner's ***Force and Matter*** (1855), or *Kraft and Stoff* (German), oft-classified as the Bible of the free thinkers of the 19th century.

Overview

In 1855, Buchner published *Force and Matter*, which went through many editions, wherein he argued, as summarized by Jennifer Hecht (2003), that all there is are force and matter; that the universe is eternal, infinite, self-propelled; that thought is entirely dependent upon matter; and most-contentiously that the universe has no purpose (check). [1]

Other

Of note, the surname of the character "Hermann Stoffkraft", the fictitious German materialist of Balfour Stewart and Peter Tait's 1878 novel *Paradoxical Philosopher*, according to Daniel Silver (2007), is a portmantua play on Buchner's *Kraft und Stoff*; the first name, supposedly, being a reference to Hermann Helmholtz, the so-called last of the last universal geniuses, and main person behind the conservation of force model. [2]

Einstein

In the 1890s, at the house of a young Albert Einstein, the Einsteins would often invite Max Talmey (1869-1941) (Q), a medical student, to the house, during which time he and Albert became friends and Einstein's mentor, during the course of which Talmey brought books to show Albert, two of which being: Buchner's *Force and Matter* and Aaron Bernstein's *Popular books of Physical Science*, which talked about following an electric current inside a telegraphy wire, both which Albert "read with zest", thereby turning him from religion to science in his search to understand nature (Q);

> "At the age of 13, I read with enthusiasm Ludwig Buchner's ***Force and Matter***, a book which I later found to be rather childish in its ingenuous realism."
>
> — Albert Einstein (c.1950), "comment to biographer Carl Seelig" [3]

Other quotes on this transformation are as follows:

> "Max Talmey recommended that Einstein read Ludwig Buchner's ***Force and Matter***, wherein he propagates a materialistic-natural scientific worldview and, along with Aaron Bernstein's literature, prompts the young Einstein to renounce religious enthusiasm and turn toward free thought."
>
> — Author (c.2010), "Sides on Einstein" (Q), Max Planck Institute

> “The sensitive period related to reading popular science books was a significant one for the development of Albert's scientific genius. Such intellectual experiences — as, for example, reading Buchner's ***Force and Matter*** — transformed Einstein, who as a child was slow, almost pathologically modest, and seemed likely to become an introspective dreamer, into an independent scholar. The impact of this sensitive period can be seen in Albert's developing directness and readiness to question everything that others took for granted.”
>
> — Larisa Shavinina (2016) “On the Cognitive-Development Theory of the Child Prodigy Phenomenon” (Q)

(add)

Term | Analysis

See main: Social Newton term analysis

The following, noting Buchner’s pre 1923 Lewis-mediated free energy supplantation of affinity terminology switch position, shows the key term usage count:

Scientific terms	Religious terms	Elements	Metaphysical
Force (Q) | 100+ Matter (Q) | 100+ Work (Q) | 88+ Motion (Q) | 61+ Chemical (Q) | 54+ Heat (Q) | 40+ Mechanical (Q) | 39+ Atom (Q) | 33+ Energy (Q) | 30+ Molecule (Q) | 20+ Electricity (Q) | 19+ Affinity (Q) | 9+ Affinities (Q) | 3+ Bond (O) | 0+	Life (Q) | 100+ Soul (Q) | 75+ God (Q) | 65+ Death (Q) | 50+ Spirit (Q) | 45+	Hydrogen (Q) | 16+ Oxygen (Q) | 16+ Carbon (Q) | 15+ Iron (Q) | 12+ Phosphorus (Q) | 3+ Sulphur (Q) | 2+ Nitrogen (Q) | 7+ Calcium (Q) | 3+ etc.	Love (Q) | 21+ Ether (Q) | 13+ Hate (O) | 0+

(add)

Title

In 1855, Buchner first published the book entitled as *Force and Matter: Empirical Studies on Natural Philosophy*; the title 28-years later, following years of experiment and evolution of thought, the title was changed, as he notes (pg. x), to *Force and Mater: Principles of the Natural Order of the Universe, with a System of Morality Built In*, the latter subtitle added per reason that he added a chapter on morality. He also notes (pg. 3) the following:

> “We are learning more and more to regard ‘chemistry’, or the science which deals with **matter**, as a branch or subdivision of ‘physics’, the science which deals with **force**.”

Hence, in retrospect, Buchner could have retitled the book as *Physics and Chemistry: Principles of the Natural Order of the Universe, with a System of Morality Built In*, had he been progressive.

Quotes | Employed

The following are quotes employed by Buchner:

> "Strife is the parent of things."
>
> — Heraclitus (c.560BC), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 172)

> "It appears to mortals that the gods are like them in form, apparel and language. The negroes serve black gods with flat noses; the Thracians, gods with blue eyes and red hair. If the oxen and lions had hands to fashion images, they would give the gods a bovine or leonine shape."
>
> — Xenophanes (c.490BC), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 313)

> "They are children or persons of narrow views who imagine that anything originates which before was non-existent, or that anything can wholly die or perish."
>
> — Empedocles (c.450BC), *Fragment*; cited by Ludwig Buchner (1855) in *Force and Matter* (pg. 20)

> "None of the gods have formed the world, nor has any man it has always been."
>
> — Empedocles (c.450BC), *Fragment*; cited by Ludwig Buchner (1855) in *Force and Matter* (pg. 128)

> "Out of nothing arises nothing: nothing that is can be annihilated. All change is only the union and separation of particles. The varieties of all things depend on the varieties of the atoms in number, size, form, and arrangement."
>
> — Democritus (c.400BC), *Fragment*; cited by Ludwig Buchner (1855) in *Force and Matter* (pg. 20)

> "The gods dwell in the interspaces of our knowledge of the world."
>
> — Epicurus (c.280BC), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 116)

> "Never can no thing become something, nor something nothing."
>
> — Lucretius (55BC), *On the Nature of Things*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 8)

> "If thou wilt comprehend and hold fast these things, then will it be clear to thee that nature, set free and relieved from her haughty lords, does all things by intuition and without the interference of the gods."
>
> — Lucretius (55BC), *On the Nature of Things*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 145)

“For truly the origin of things has neither been led up to the present order by wise pre-ordainment, nor have its motions been regulated by the compulsory force of law; but shaken by countless impulses, constantly changing, endless in numbers it drove through the universe, and at length, after attempting every form of motion and of composition, it finally arrived at the present order of things.”

— Lucretius (55BC), *On the Nature of Things*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 174)

“If we assume the continued existence of the individual, we must first of all prove that the soul can live without requiring the body as subject or object of its activity. We cannot think without sensations; but these depend on corporeality of its organs. Thought is in itself eternal and immaterial, but human thought is bound up with the senses; it can recognize the general only in the special, it is never free from the rule of space and time, for its ideas come and go one after the other. Our soul is therefore really mortal, since neither consciousness nor memory can endure. Virtue is far purer when practiced for its own sake, than for a reward. Yet must those politicians not be blamed who desire that the immortality of the soul should be taught for the sake of the public good, in order that the weak and the bad might at least go the right way under the impulse of hope or fear, while noble free spirits choose that path of their own accord. For it is utterly untrue that only base scholars have denied immortality, and that all noble sages have adopted it. Homer, Pliny, Simonides and Seneca, who did not cherish this hope, were not vile on that account; they only managed to get along without mercenary servility.”

— Pietro Pomponazzi (c.1520), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pgs. 335-36)

“Give me matter and motion, and out of them I will build the universe.”

— Rene Descartes (c.1620), *Publication*; cited by Ludwig Buchner (1855) in *Force and Matter* (pg. 64)

“I am of opinion that we should try every other method of explanation first, before we take refuge in the admission of creation (that is, in miracle) for when once miracles are admitted, every scientific explanation is out of the question.”

— Johannes Kepler (c.1620), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 85)

“The human freedom, of which all boast, consists in nought but that men are conscious of their own will, while ignorant of the causes which have induced it.”

— Benedict Spinoza (c.1675), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pgs. 366-67)

“The value of a man does not depend on the truth he possesses or believes he possesses, but on the sincere labor he has bestowed upon getting at the truth; for it is not the possession of, but the search for truth, that increases his strength and thereby makes him more perfect.”

— Gotthold Lessing (c.1770), *Source*; cited by Ludwig Buchner (1884) in Preface to 15th edition of *Force and Matter* (pg. xiii)

“Narrow is the world, wide is the brain.”

— Friedrich Schiller (c.1790), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 255)

“If matter can fall to the ground then it can also think.”

— Arthur Schopenhauer (c.1844), *Publication*; cited by Ludwig Buchner (1855) in *Force and Matter* (pg. 52)

“I believe neither in chance nor miracle, but only in phenomena regulated by laws.”

— Jouvencel (c.1850), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 80)

“Man’s body is dust, but his soul lives in his works [W = Fd].”

— R. Voss (c.1850), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 316)

“All the substances in nature, even when they appear to be perfectly at rest, are engaged in the most rapid internal movement, and these movements in the bodies are transmitted to the surrounding ether, so that all space is continually traversed in every possible direction by wavelike vibrations, and the perception of the vibrations is what we term ‘heat’.”

— Rudolf Clausius (c.1850), *Publications*; cited by Ludwig Buchner (1855) in *Matter and Motion* (pg. 62)

“The doctrine which follows from the materialistic theory of the universe is: let us eat and drink, for tomorrow we shall be dead. All great and earnest thoughts are idle dreams, phantasms, games of mechanical contrivances running about on two legs and with two arms, which are dissolved into chemical atoms, and get joined together again like the dance of madmen in a lunatic asylum, without a moral basis.”

— Rudolf Wagner (1854), Stated, amid his siding with Christianity over physiology, at a meeting of German naturalists and physicians held at Gottingen; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 398)

“The necessary laws of thought and of matter are one and the same. Thought is a condensed motion, and since the human organism is but an involution of physical forces, thought must also be regarded as merely the condensed action of physical forces.”

— Paul von Lilienfeld (c.1870), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 102)

“Thought is a motion of matter.”

— Jacob Moleschott (c.1880), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 241)

"There is no such thing as a free will or voluntary act, independent of the totality of the influences which in each individual moment guide men and keep even the strongest within bounds."

— Jacob Moleschott (c.1880), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 266)

"Capacity of consciousness mast lie dormant in the existence of the atoms; otherwise our brain, which is a group of atoms, could not possess consciousness."

— Theodor Meynert (c.1880), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 247); note: this was Freud's teacher in psychiatry

"Whenever knowledge takes a step forward, god recedes a step backwards."

— Gustave Naquet (c.1880), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 301)

"Everywhere we observe only immutable natural laws and blindly working causes. Hence the ghost of a personal, universal spirit, interfering in natural processes, has long been banished from astronomy, physics, and chemistry; **no chemist now thinks of ascribing the union of two elements to the will of god**, and no scientist now sees the manifestation of the divine will in any phenomenon of attraction or repulsion."

— George Schneider (1883), *The Animal Will*; cited by Ludwig Buchner (1884) in *Force and Matter* (pg. 76); see: Mirza Beg, Frederick Rossini, etc.

(add)

Quotes | On

The following are general quotes on Buchner's *Force and Matter*:

"Buchner's ***Force and Matter*** also became the Bible of a new movement, 'free thinking', otherwise known as atheism."

— Howard Bloom (2012), *The God Problem* (pg. #)

Quotes | By

The following are quotes by Buchner:

"The ocean of mankind moves according to the same laws as the sea that covers the great part of the earth's surface. It is in the innermost nature of both to ebb and to flow."

— Ludwig Buchner (1884), Preface to 15th Edition of *Force and Matter* (pg. ix); compare Henry Adams' 1863 "waves and tides" quote

"The universe, as we see it, is the result of regularly working forces, having a causal connection with each other and therefore capable of being understood by human reason."

— Ludwig Buchner (1884), *Force and Matter* (preface, pg. x)

"One of the objections most frequently urged against my views, is that I was destroying the old faith and putting no new one in its place."

— Ludwig Buchner (1884), *Force and Matter* (preface, pg. xii)

"A creative force that either creates itself or arises from nothing, and which is a *causa sui* (its own cause), exactly resembles Baron Munchhausen, who drew himself out of the bog by taking hold of his own hair."

— Ludwig Buchner (1884), *Force and Matter* (pg. 10)

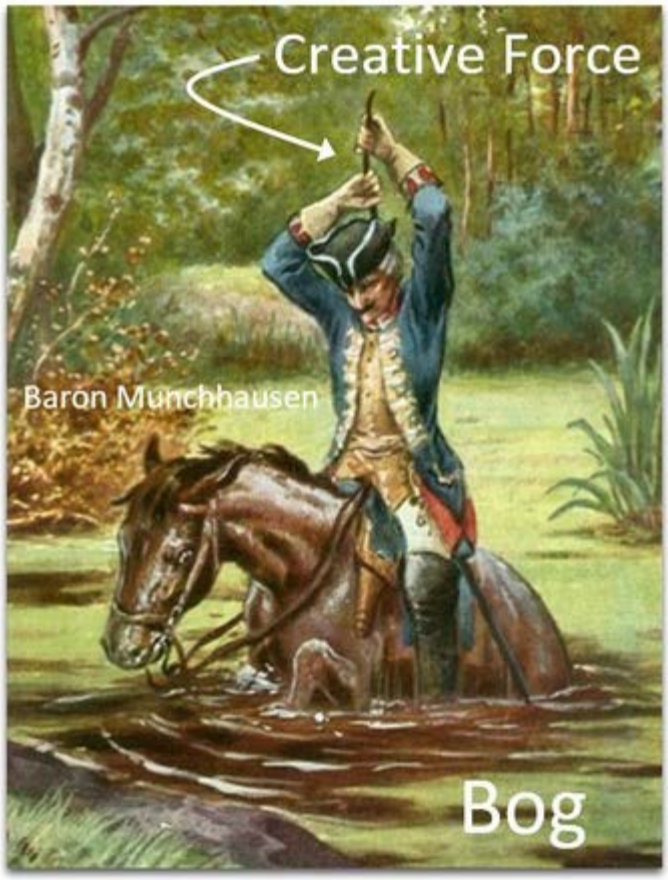

Buchner's opinion of "creative force" or models of self-caused things, e.g. god, as akin to the tale of Baron Munchhausen (Q) pulling himself out of a bog by his hair, i.e. a fiction; this is akin to "higher power" seen used in the 21st century.

"The useless search of philosophers for a cause of the universe is a *regressus in infinitum* (a stepping backwards into the infinite) and resembles climbing up an endless ladder, the recurring question as to the cause of the cause rendering the attainment of a final goal impossible."

— Ludwig Buchner (1884), *Force and Matter* (pg. 10) (compare: Lawrence Henderson on causality)

"We are sorry to confess that biological hypotheses have not yet completely got out of the second phase, and that ghost of 'vital force' still haunts many wise heads."

— Ludwig Bucher (1884), *Force and Matter* (15th ed) (pg. 13)

"The force which urges forward the locomotive, is a ray of sunshine converted into work by a machine, just the same as the work which creates thoughts in the brain of the thinker, or forges nails by the arm of the smith."

— Ludwig Buchner (1884), *Force and Matter* (pg. 27)

"They can, however, console themselves with the example of the great Greek philosopher *Anaxagoras*, who was compelled to leave Athens because, with a knowledge of nature or a foresight marvellous for his time, he declared that the sun was not a god, but a fiery ball, a glowing mass of stone. His great contemporary, the spiritualistic philosopher *Socrates*, spoke of him on account of this theory as an " impious man " — an epithet which, if well-merited, must now be applied to the whole educated human race."

— Ludwig Buchner (1884), *Force and Matter* (pg. 56)

"For the rest, the whole struggle yet proceeding between Materialism and Spiritualism, still more that

between Materialism and Idealism, must appear futile and groundless to him who has once attained to the knowledge of the untenability of the *dualisitc* theory which always underlies it. All philosophical systems up to the present time have almost without exception been more or less dualistic, that is they have made a definite severance between matter and force, substance and form, being and becoming, movement and mover, nature and spirit, world and god, body and soul, earth and heaven, death and life, time and eternity, finite and infinite,—and all these things or conceptions have been placed in opposition to each other and been treated as antitheses, whereas modern science has shown that these oppositions do not exist in reality, and that the separation can only take place in thought."

— Ludwig Buchner (1884), *Force and Matter* (pg. 56)

"Motion is everywhere in the universe, in the small as in the great. The conception of dead or motionless matter is utterly untenable; it exists only theoretically or as an abstraction, and not in reality, like that of forceless matter."

— Ludwig Buchner (1884), *Force and Matter* (pg. 59)

"Rest is not the absence of motion, but the resistance between two motions."

— Ludwig Buchner (1884), *Force and Matter* (pg. 64)

"The conception of dead matter is a mere abstraction, answering to nothing real, for matter, as we know experimentally, is everywhere full of life and motion and bears within itself its formative energies. Just the same view relating to matter was maintained by the materialistic philosophers of the eighteenth century. According to *Holbach* (*The System of Nature*) the world is nothing more than matter and motion and an endless concatenation of causes and effect. Everything in the universe is in constant flow and change, and all rest is but apparent. Matter and motion are eternal. *Diderot* and his successors held the same opinions."

— Ludwig Buchner (1884), *Force and Matter* (pg. 66)

"We are constrained to agree with Nageli when, basing his opinion on such facts, he declares that the difference between organic and inorganic is no other than that which exists between the simple and the complex."

— Ludwig Buchner (1884), *Force and Matter* (pg. 71)

"How easily has the torch of investigation shown what previously seemed incomprehensible, miraculous, caused by a supernatural power, to be the outcome of hitherto unknown or imperfectly estimated natural forces; how swiftly did the might of the spirits and the gods melt away beneath the hands of science."

— Ludwig Buchner (1884), *Force and Matter* (pg. 75)

"There exists in nature a tendency to form, which is the outcome of a definite formula."

— Ludwig Buchner (1884), *Force and Matter* (pg. 84)

“It is no part of the object of this work to take much notice of those who seek and find in the province of religious faith an explanation of the problem of existence and a satisfaction of their moral wants. We are only busying ourselves with that world which is accessible to our means of intelligence, and can find no scientific reasons compelling us to believe that behind this world there is another, a higher one, independent of the influence of the laws of nature and perhaps arranged in an entirely different fashion.”

— Ludwig Buchner (1884), *Force and Matter* (pgs. 85-86)

“Nor is truth arid or disconsolate; for it is in the very nature of true knowledge to restore more with one hand than what it seems to take away or destroy with the other.”

— Ludwig Buchner (1884), *Force and Matter* (pg. 86)

“What we still designate as ‘chance’, merely depends on a concatenation of circumstances, the internal connection and final causes of which we have as yet been unable to unravel. " To chance," says the famous *System of Nature,"* we ascribe those effects of which we cannot trace the connection with their causes.— Order and disorder are not in nature." Therefore, the alternative "God or Chance" which is so often presented to us by teleologists, has no real existence.”

— Ludwig Buchner (1884), *Force and Matter* (pg. 179)

“The largest known brains (excepting those enlarged by disease) have belonged to men who distinguished themselves in their lifetime by remarkable mental ability. While the average normal weight of the human brain is three pounds, the brain of *Cuvier,* the famous and ingenious naturalist, weighed nearly four. One of the largest known brains, according to the statement of Prof. Broca, who made an exact measurement of the skull, belonged to our great poet *Schiller,* Next to his, if the statements relating to them are accurate, come the crania or brains of *Byron, Cromwell, Napoleon* I, etc. Tiedemann weighed the brains of three full-grown idiots, and found the weight in all three varying between one and two pounds”

— Ludwig Buchner (1884), *Force and Matter* (pg. 220)

“What we still designate as ‘chance’, merely depends on a concatenation of circumstances, the internal connection and final causes of which we have as yet been unable to unravel.”

— Ludwig Buchner (1884), *Force and Matter* (15th ed) (pg. 226) (O) (see: anti-chance)

“The researches and discoveries of modern times can no longer allow to doubt that man, with all he has and possesses, be it mental or corporeal, is a *natural product* like all other organic beings. Man is a product of nature, in body and mind. Hence not merely what he is, but also what he does, wills, feels, and thinks, depends upon the same natural necessity of the whole structure of the world.”

— Ludwig Buchner (1884), *Force and Matter* (pgs. lxxviii + 239) [8]

“Philosophers are wonderful people. The less they understand of a thing, the more words they make over it. They have as many opinions as they have heads, and as Bacon very forcibly says, they become through their speculations "like owls that only see their dreams in the darkness, but become blind in the light of

experience, and are least able to perceive that which is clearest."”

— Ludwig Buchner (1884), *Force and Matter* (pg. 257)

“The *Stoics* considered that the child only received a soul when it first began to breathe.”

— Ludwig Buchner (1884), *Force and Matter* (pg. 278)

“This is true in such a measure that it always seems an impossibility, and will continue to be impossible, to obtain anywhere an absolute and specific definition of what is meant by ‘good’.”

— Ludwig Buchner (1884), *Force and Matter* (pg. 292)

“The whole deep-seated difference between the ideas of "juridical" and "moral" springs but from outward conditions, which is the best proof of the fact that the idea of good has no absolute standard.”

— Ludwig Buchner (1884), *Force and Matter* (pg. 294)

“While force and matter as such manifest their indestructibility in an incontrovertible manner, which rests upon experiments, the same cannot be said of the soul, which is only the effect or product of a definite combination of materials and forces subject to disassociation.”

— Ludwig Buchner (1884), *Force and Matter* (pg. 319)

“None but a superficial and ignorant contemplation of man and of human existence, superadded to spiritualistic and metaphysical prejudices, could ever induce the idea that the actions either of an individual or of nations are the outcome and expression of a perfectly free and self-conscious will.”

— Ludwig Buchner (1884), *Force and Matter* (pg. 366)

“The same conclusion has been arrived at by Dr. Bordier of Paris. Having examined the brains of thirty-six executed criminals, he found that in almost all of them the parietal lobes were excessively developed at the cost of the frontal, a fact which points to a low grade of intelligence together with a stronger tendency to violence.”

— Ludwig Buchner (1884), *Force and Matter* (pg. 377)

“What we call "moral feeling" has it origin in the social instincts or habits which each human (or animal) society develops, and must develop within itself, if it is not to perish by its own incapacity. Morality, therefore, is evolved from sociability, or the faculty for living in a community, and it changes according as the particular ideas or necessities of any given society change. Thus, the nomadic savage thinks it is a very praiseworthy action to kill his father when effete with age, whereas in the eyes of the cultured European, parricide is the most horrible of all crimes.”

— Ludwig Buchner (1884), *Force and Matter* (pg. 382)

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Further reading

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θΔics

In physics, **force carrier** is a particle whose creation, annihilation, and exchange gives rise to one of the forces of the universe. [1] It is believed that the force carriers, like the leptons and quarks, are fundamental particles with no substructure. The term force carrier is synonymous with field particle, messenger particle, and force mediator.

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θΔics

In science, **force field** is array of forces, i.e. influences that tends to change the state of rest of a body or its uniform motion in a straight line, acting in a given field, i.e. array, either surrounding a body or in a given area.

Social physics

In 1952, English physicist Vera Daniel, in his section on the "Patterns of Behavior", extrapolated the models of fields around compass needles and atoms in two element arrays to theorize how people exert forces, in their respective spheres, similarly: [1]

> "How does the mutual influence of the members of a group lead to a pattern of behavior? In physics, each member of an assembly has a **force-field**. In other words, it exerts well defined forces in different directions. For instance, if two compass needles are brought near to each other, the forces they exert on each other can be calculated if their mutual position is known. With an assembly of such units, these force fields are best satisfied for certain ordered arrangements. In social groups, people also 'exert forces' on one another; they have a vast number of needs and desires, and it seems reasonable to consider these as the origin of their mutual influence. However, these needs and desires are not fixed as are the force-fields of molecules."

In circa 1980, Iranian mechanical engineer and thermodynamicist Mehdi Bazargan, in his section on the "Cause of Movement and Life", theorized about human movement in terms of force fields: [2]

> "In general, an object in a given **force field** will, of necessity, behave in a calculable and predictable way. For any object, whether a stone, a plant, or a human society, force means movement."

(add discussion)

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1. Daniel, Vera V. (1952). "Physical Principles in Human Cooperation" (abs), *Sociological Review*, 44(1):107-34.
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External links

â— Force field – Wikipedia.

θΔics

forcIn thermodynamics, **force function**, or force-function, is the negative of the potential energy of a given system or body.

History

In 1788, Italian mathematician Joseph Lagrange introduced a ‘central function’ in his *Analytical Mechanics*. [4]

In 1835, supposedly building on Lagrange, Irish mathematician William Hamilton, in his *General Method in Dynamics*, introduced what he called a "force function" of a system, a function U of the masses and mutual distances of the material points of a given system. [3]

In circa 1841, German mathematician Carl Jacobi introduced a “force function”, which according to the retrospect 1882 view of Hermann Helmholtz, is said to be equal to the negative of the potential energy (a William Rankine term, 1853) of the system. [1]

In the work of German physicist Rudolf Clausius (1850-1865), Hamilton's version of the force function was cited in the formulation of the thermodynamic concept of internal energy, symbol U. [6]

In 1876, American engineer Willard Gibbs was defining giving the following two definitions: [2]

Characteristic function notation	Modern notation	Description	Name assigned by Gibbs (modern shorthand name)
$-\epsilon$	$-U$	Negative of the internal energy of a system	‘force-function for constant entropy’ (isentropic force function)
$-\psi$	$-H$	negative of the Helmholtz free energy of the system	‘force function for constant temperature’ (isothermal force function)

In 1882, German physicist Hermann Helmholtz stated that his “quantity of tension force” was essentially the same as Jacobi’s force function as well as Rudolf Clausius’ ergal. [1]

In 1923, American physical chemist Gilbert Lewis stated: [5]

> “We may think of the quantity ‘– ΔG ’ as the driving force of a reaction; where, in a thermodynamic sense, a system is stable when no process can occur with a diminution in free energy.”

Which seems to be in alignment with Helmholtz 1882 article section "Idea of Free Energy", wherein he states that the force function is the negative of the potential energy, in the sense that Gibbs free energy is often defined as the isothermal-isobaric thermodynamic potential and also the driving force for earth-bound natural processes.

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4. (a) Lagrange, Joseph. (1853). *Mecanique Analytique* (Vol. 1). Paris.
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5. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pgs. 160-61). McGraw-Hill Book Co., Inc.
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θΔics

In genius studies, **forced prodigy**, or parentally-created genius, as contrasted with an "innate prodigy", e.g. Jeremy Bentham, found as a toddler sitting at his father's desk reading a multi-volume history of England, who, at age 3, began studying Latin, Carl Gauss, at age 3, correcting errors in his father's wage payroll calculations, or Christopher Hirata, at age 3, entertained himself, at the grocery story, by calculating the total bill of items in his parent's shopping cart, item-by-item, by weight, quantity, discounts, and sales tax, refers to a child prodigy, whose accelerated talents are built into them or rather "forced" into and in turn out of the mind via highly-driven and pressurized instruction and educational conditions, typically, but not always, carried out by the father.

William Sidis
(1898-1944)

Margaret Fuller
(1810-1850)

Two famous **forced prodigies**: William Sidis and Margaret Fuller made genius via intense childhood instruction and education pressurization by their father.

List | Discussion

The following is a work-in-progress listing of "forced prodigies", shown in descending order of resulting successfullness of either genius output, going into adulthood or in adulthood, or resulting genius-target finding effect, e.g. how John Mill found or was drawn to Alexander Pope or how Margaret Fuller found or was drawn to Johann Goethe.

Among "forced prodigies", to note, there seems to a noticeable division between those who seemingly are "too-forced" (e.g. Sidis), not able generally to discern new insights, as contrast with those who are "forced in controllable balance" (e.g. Hypatia), and able to discern new insights.

Hypatia

Greek thinker Hypatia (360-415), was the daughter of Theon, the last head of the great Library of Alexandria, before it burned—which at its zenith had two libraries, filled with 500,000 book scrolls, a laboratory, and a research facility—and as part of his plan, he established a regimen of physical training for Hypatia, such as rowing, swimming, and horseback riding, to ensure that her body would be as healthy as her well-trained mind. As a teenager, she was educated at the Neoplatonist Academy in Athens, learning mathematics, astronomy, and philosophy. Resultantly, her intelligence and knowledge surpassed her father's at an early age. People would come from other cities to hear her talk and learn from her. She was eventually stoned and murdered for her beliefs. IQ unknown, but often cited in the 180-200 range, and considered the only known female universal genius. She was said to have had a superior intelligence, said to have surpassed that of all other philosophers of her time and her accomplishments in music and science paled all others. The following are noted accomplishments:

- Is rumored that to explain the seasonal variations of the apparent size of the sun, she conceived of elliptical orbit heliocentrism, over a thousand years before German astronomer Johannes Kepler, formulated this into a law in 1609.
- She authored: *Commentary on Diophantus*, *The Astronomical Canon*, and a commentary on *The Conics of Apollonius*.

The following Hypatia quotes attest to the genius of her resulting mind:

> "Fables should be taught as fables, myths as myths, and miracles as poetic fancies. To teach superstitions as truths is a most terrible thing. The child mind accepts and believes them, and only through great pain and perhaps tragedy can he be in after years relieved of them. In fact, men will fight for a superstition quite as quickly as for a living truth—often more so, since a superstition is so intangible you cannot get at it to refute it, but truth is a point of view, and so is changeable."

> "Life is an unfoldment, and the further we travel the more truth we can comprehend. To understand the things that are at our door is the best preparation for understanding those that lie beyond."

> "All formal dogmatic religions are fallacious and must never be accepted by self-respecting persons as final."

> "Reserve your right to think, for even to think wrongly is better than not to think at all."

(add discussion)

Montaigne

French statesman, philosopher, and realism writer Michel Montaigne (1533-1592) (IQ=165) was raised, from birth, via a very elaborate meticulously-arranged education process; similar it seems to Hypatia and John Mill.

Witte

The intense program of learning (Q) of Karl Witte (1880-1883), who currently holds the record for youngest PhD (age 13), is the subject of a book written by his father: *The Education of Karl Witte: Or, The Training of the Child* (Q), and may possibly be an example of a "forced prodigy" or accelerated learner via the father's methods. (Q)

Fuller

American Margaret Fuller (1810-1850), who fell somewhere between 2F and N2F, albeit closer to the latter, described her rather intense education-raising, carried out via the direction of her father Timothy Fuller, a scholarly man, Harvard graduate, congressman, and lawyer, process as follows: [1]

> "Thus I had tasks given me, as many and various as the hours would allow, and on subjects beyond my age; with the disadvantage of reciting to him in the evening, after he returned from his office…. I was often kept up till very late; and as he was a severe teacher, both from his habits of mind and his ambition for me, my feelings were kept on the stretch till the recitations were over. Thus frequently, I was sent to bed several hours too late, with nerves unnaturally stimulated. The consequence was a premature development of the brain, that made me a "youthful prodigy" by day, and by night a victim of spectral illusions, nightmare and somnambulism, which at the time prevented the harmonious development of my bodily powers and checked my growth, while, later, they induced continual headache, weakness, and nervous affections, of all kinds. As these again re-acted on the brain, giving undue force to every thought and every feeling, there was finally produced a state of being both too active and too intense, which wasted my constitution, and will bring me,—even although I have learned to understand and regulate my now morbid temperament,—to a premature grave."

The following is a Fuller quote that attests to the genius of her resulting mind:

> "I now know all the people worth knowing in America, and I find no intellect comparable to my own."

Not to mention that she somehow found Goethe, who like all other great geniuses, became her intellectual mentor.

Mill

Englishman John Mill (1806-1873) is the classical example of the successful N2F "parentally-created genius" prodigy. He was the eldest son of the Scottish philosopher, historian, and economist James Mill and Harriet Burrow, and was educated by his father, with the advice and assistance of Jeremy Bentham (also a former child prodigy) and Francis Place. He was given an extremely rigorous upbringing, and was deliberately shielded from association with children his own age other than his siblings. His father, a follower of Bentham and an adherent of associationism, had as his explicit aim to create a genius intellect that would carry on the cause of utilitarianism and its implementation after he and Bentham had died. He learned Greek at 3; wrote a treatise on the history of Rome at 6; reading Plato, etc. at 7; Latin, geometry, and algebra at 8; conic sections, spherical section, and Newtonian arithmetic; chemistry age 13 at the Royal Military College; at 14, chemistry, zoology, metaphysics, and logic at Montpellier University; law at 16 under John Austin. Mill is a top six Cox-Buzan genius; he is one of the fabled "last persons to know everything"; he is also, supposedly, a split-brainer who “could write Greek with his left hand while writing Latin with his right.” [2]

Sidis

American William Sidis (1898-1944) is the classic example of the 2F child prodigy. His father Boris Sidis, a student of Harvard psychologist William James, theorist behind the so-called "reserve energy" theory of the mind, i.e. the hypothesis or premise that if you keep pushing the mind, you will get second and third winds, similar to a runner hitting the wall, or a hiker getting his "second wind" during a long hike up a mountain. Boris Sidis tested this theory out on his son. The rest is well-documented history. Sidis the younger, e.g., is the person behind the now famous 10 percent myth. William Sidis did, of note, produced his thermodynamics based *The Animate and the Inanimate* and had discarded belief in the existence of god by age seven; hence, some fruit resulted.

Stern | Edith experiment

Edith Stern reading, next to her father Aaron Stern, who supposedly was doing calculations before age one and read an entire encyclopedia before age 4, and finished her BS in mathematics (age 15) and MS in mathematics, focusing on numbers theory, by age 18, then went to work in applied mathematics at IBM, in the area of telecommunications. (Q)

One of the most famous forced prodigies is American Edith Stern (1952-), cited as having had an IQ=200-203, whose father Aaron Stern dubbed her daughter the “Edith experiment” (or Edith Project), a genius rearing program that he carried out on his daughter, a premise that by using the certain type of progressive education, he could turn even a tribal child into a genius.

> “I can foster the same meteoric IQ in the children of the Tasaday tribe, a Stone Age people living in the Philippines.”
>
> — Aaron Stern (1971), *The Making of a Genius*

Aaron Stern is a Jewish survivor of WWII, although he suffered from lung and heart conditions from his time living in the forests. He was a professor of language (knew 7 languages) who taught children in displaced persons camps using

travel posters - the only things available. In this book he writes of how he spent time with his young daughter in NYC, teaching her to read in grocery stores. They made museum trips on Sunday and talked about everything they saw from the time they left home until they returned. He emphasized how he always asked open-ended questions and asked his daughter to do research.

She could communicate with flash cards at eleven months old; and was able to use the cards to say how old she was. At age one, she was able to speak simple sentences and identify letters on flash cards. At age two, Edith knew the entire alphabet. By age 4.5 four, she read straight through volume one of the Encyclopedia Britannica (Q), and by age 5 had read through the entire set. [3] Aaron Stern motivated his daughter by the use of colorful posters, flash, cards, and an abacus--which made math concrete and easier to grasp. Every moment was a learning opportunity--even a walk to the grocery store. (Q)

In 1973, Aaron Stern, in his *The Making of a Genius*, explained his so-called “total education submersion method”, which is the term he used for the method he used to make everything that caught the interest of his children into an opportunity for learning and developing their minds. At the earliest opportunity, he began using travel posters, classical music, ethnic dolls, counting and spelling blocks and many other things to engage the attention and interest of his daughter Edith Ann Stern when she was just a few weeks old, and still in her play-pen. Using these as a focus, he would explain many concepts of life in very simple terms, teaching her ethics and compassion for all races, elementary mathematics, simple concepts of physics such as leverage, auto mechanics and a wide range of other mind expanding experiences of everyday life. When they would go out for a walk, he would push her in her baby carriage and explain what different signs meant, and when they would pass a construction site, he would explain simple concepts of physics like leverage, and how it was being used there. When they passed a picket line, he would use this as an opportunity to explain labor-management relations concepts. EVERYTHING that caught her attention was used as an opportunity to further educate her, and expand her understanding of concepts and how her world worked.

At age 5, she was tested for her intelligence level. She tested at between 196 and 205 I.Q. At age 16 she was given the position of Assistant Professor of Abstract Mathematics at Michigan State University. Later she went to work for IBM as a computer consultant, and eventually became a V.P. in the Research and Development Dept. of IBM, according to her father. She married, and I had one child. Her mother, who had been filled with fear by her husband's methods because the pediatric "experts" were all telling her that he would ruin the mind and social life of her daughter, later acknowledged that far from ruining her daughter, he had turned her into a very mature, compassionate, kind, intelligent and wise young woman of whom she was very proud. (Q)

Aaron Stern was a survivor of concentration camps. Was hospitalized 170 times due to cancer. His cancer treatment, at the Mayo Clinic, was paid for, for some reason, by Albert Einstein. [3] Wanted to make his daughter a genius. Took her away from her mother from the day she was born. Designed the ‘total educational immersion’ technique. Played only classical music. Made flash cards for Edith with pictures, letters, and animals.

He demanded all of Edith's time. (Q) His total focus on his daughter apparently strained the relationship between Edith and her mother. In 1977, she told reporters that her mother apparently "doesn't understand" and that she was a "nasty little thing". [3] A South Florida newspaper reported that Aaron Stern and his daughter were not speaking toward the end of his life (reaction existence).

Others

Other forced prodigies, albeit without notable fruit or who are generally non-notable, but nevertheless interesting case studies, include:

-

The 1996 film *Shine*, starring Jeffrey Rush, is on forced prodigy David Helfgott (1947-), who cracked after performing Rachmaninoff’s *Piano Concerto No. 3*, thereafter remaining in a manic schizophrenic state, tells the story of a father pushing a child into child into near stardom, albeit via unhealthy means.

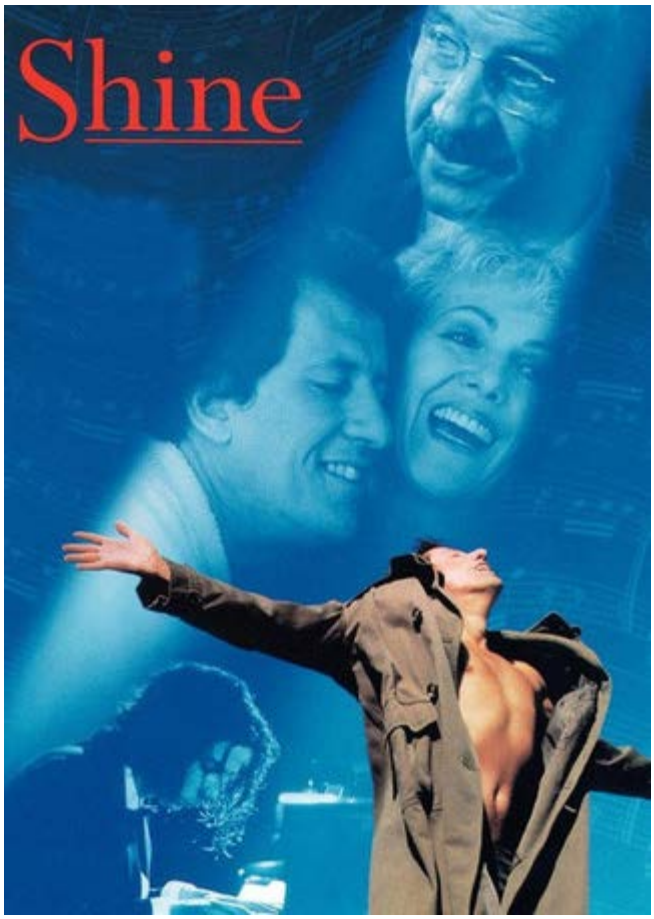

● Adragon De Mello (1976-), cited by his father to have had an IQ=400, is the extreme example of a paternal-driven genius child. Adragon seems to have had the same relationship to his father as Beethoven had to his. Beethoven's father wanted to create the next Mozart and drove him relentlessly from birth to adulthood, beating him along the way, to achieve perfection. Before Adragon was born, Agustin De Mello, Adragon's father, had written a book about a child prodigy that was born that went on to save the world, so to speak, with his great intellect. Cathy Gunn, Adragon's mother, said she was horrified by the father's obsessive pressure on their son but there was nothing she could do about it, she says. She eventually had to leave the family, fearing for her life. Agustin De Mello would go to any lengths to get his way, according to Gunn. "He threatened to kill himself in front of me. He did that in front of A.D. in order to get him to do things," she recalls. Adragon's father would yell at the top of his voice and scolding the child to no end to achieve his vision. After Adragon began to burnout, his father threatened to come into the college with a hammer and bash the teacher's heads in if they did not give Adragon his degree. Adragon eventually was put into foster care.

● Susan Polgar, Judith Polgar, and Sofia Polgar, cited with IQs in the 170 to 180 range, were part of an "educational experiment" carried out by their father László Polgár, who sought to prove that children could make exceptional achievements if trained in a specialist subject from a very early age. "Geniuses are made, not born," was László's thesis. He and his wife Klara educated their three daughters at home, with chess as the specialist subject.

● Sufiah Yusuf (1984-), a child math prodigy who entered Oxford at age 13, but eventually ran away and become a $400 per date ($95,000 annually) escort. Her domineering father Farooq Yusuf, early on subjected her to his "accelerated learning technique", in which her days revolved around stretching and breathing exercises in freezing-temperature rooms so as "to keep her brain attentive"; Sufiah would then study hard and be forced to play tennis with just as much intensity as fanatical Farooq drove her on. The routine was so effective, that Sufiah was seeded number eight in the country for under 21s (link). After three years at Oxford (age 15), Sufiah ran away, sparking a massive police hunt. In 2008, she commented that "she is still haunted by her hellish childhood-subjected to her father Farooq's accelerated learning technique, where she studied math day in day out in rooms kept freezing cold to improve her concentration. "As I grew older I began to clash with my father," she says. "He was violent on occasions. Because he pushed me so far academically, I became more confident for a girl of my age. I grew up too quickly. From 11, I was studying maths all the time. I didn't have any friends. I wasn't in the Brownies. My father said they didn't teach Muslim values. I hardly ever played with other children" (link). She passed her maths A level aged 12 and started at St Hilda's College, Oxford. "It was an amazing place but I was too young. By the time I was 15, I wanted to be in control of my life. I fought back." Sufiah sparked a two week nationwide police hunt when she ran away instead of going home at the end of term, saying she'd "had enough of 15 years of physical and emotional abuse".

● Asia Carrera (1973-), cited with an IQ=156, is similar to Yusuf's story is the story; Carnegie Hall pianist (age 13); studying Japanese and economics at Rutgers University; homeless by age 17, after running away from home because of

the pressure her demanding parents put on her; after which she turned to stripping, and then to porn, so to never be homeless again, in her own words.

Others who might well fall in the parentally created category include: Michael Kearney (1982-), college graduate by age 10, cited by his parents to have had an IQ=325, whose father had absenteeism regrets (away at sea in the Navy when he was born) and Ainan Cawley (1999-), cited by his father to have an IQ of 349, whose father Valentine Cawley, aka "Mr. True Genius" as he goes by in his online handles, such as at YouTube, seems to have missed or failed prodigy regrets in himself.

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θΔics

In hmolscience, **forest blind**, or "not seeing the forest", to someone who, owing to a two natures mindset bias—one set of laws governing animate nature (life) another governing inanimate nature (nonlife), or an unbridgeable gap mentality—is not able to see the forest amid the trees or synonymously does not see ships in the harbor, and is thus strongly averse to any and all types of one nature theorists and their theories. The following quote by German philosopher Arthur Schopenhauer:

> "Talent hits a target no one else can hit; genius hits a target **no one else** can see."

on his mentor German polymath Johann Goethe's ability of being able to hit the realism philosophy target of human chemical theory is one example of how many are forest blind to reality or the "real world" as American chemical thermodynamicist Frederick Rossini liked to say (see: Rossini debate).

Two Nature Mind		One Nature Mind
Non-child 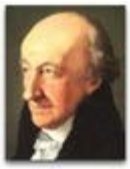 Christoph Wieland (1733-1813)	1810	**Childlike or Genius?** Johann Goethe (1749-1832)
Non-Lunatic Werner Stark	1962	**Lunatic or Newton?** Henry Carey (1793-1879)
Non-crank John Diggins (1935-2009)	1995	**Crank or Prophet?** Henry Adams (1838-1918)
Non-deranged Philip Moriarty (c.1968-)	2009	**Deranged or Genius?** Libb Thims (c.1975-)

Classic examples of two nature mindets, being **forest blind** to reality, referring to one nature mindsets as: fools, childish, lunatic, crank, crackpot, and or deranged, respective.

Two natures theorist

The prime example of a two natures theorist is Czechoslovakian-born English sociologist Werner Stark (1962), noted social mechanism historian, who considers the following statement, made in 1858 by American sociologist Henry Carey:

> "In the inorganic world, every act of combination is an act of motion. So it is in the social one. If it is true that there is but one system of laws for the government of all matter, then those which govern the movements of the various inorganic bodies should be the same with those by which is regulated the motion of society; and that such is the case can readily be shown."

as being someone in **"back in his strait-jacket"**, as Stark put it. More recent examples include John Diggins (1995) classifying one nature theorist Henry Adams as "more of a crank than a prophet" or Irish physicist Philip Moriarty (2009) classifying Libb Thims as having "derange imagination" for believing that the Carnot cycle governs chemical systems as it does human social systems (see: Moriarty-Thims debate).

One nature theorist

The prime example of a "one nature" theorist being German polymath Johann Goethe a view which he explains in his famous 4 Sep 1809 anonymous advertisement, shown below, to his soon-to-be published "most dangerous work" *Elective Affinities*:

> "The author must have been led to his strange title by his continuing work in the physical sciences where we often make use of comparisons drawn from the world of human behavior so that things which are essentially remote from us may be brought a little nearer; and in the novel, in a case concerning morality,

> doubtless the author was seeking to trace an expression used as an analogy in chemistry back to its origin in the life of the human spirit. [The advertisement concludes with a general remark, the essence of which is] there is after all only **one nature**, and that even in our human zone of it, the cheerful zone of reason and freedom of choice, still there are traces, in the passions, of bleak and irresistible necessity."

A philosophy which produced its many divided "forest blind" enemies and "forest awake" admirers (and or followers) to emerge in centuries to follow.

Quotes

The following are related quotes:

> "Originally I assumed or believed that everybody thought like I did [or like we do]; I soon, however, found this not to be the case."
>
> — Josip Stepanic (c.2009), comment to American electrochemical engineer Libb Thims [1]

See also

â— Glass wall
â— Ships not seen
â— Not seeing the forest | Trees amid the forest | Forest amid the trees

References

1. Email communication with Libb Thims (c.2009); quote from memory by Thims (original email not yet located).

θΔics

In genius studies, **forgotten genius** tends to refer to a genius that is either underappreciated, whose name may not be a household name, but whose intellect was penetrating and pioneering, a behind-the-scenes genius, a genius whose work a bigger genius built and improved on, therein subsuming the former genius' flame, fame, or glory, among other variations along these lines; a genius not prominent in the public mind or cultural milieu.

Overview

Historically, a few classic citation examples of forgotten geniuses, include: Charles Wheatstone, William Gilbert, Robert Hooke, John Ray, and Oliver Heaviside. [1]

In 1993, Keith Laidler classified (Ñº) Elizabeth Fulhame (c.1750-c.1820) (SIG:20) (Ñº), aka "mother of mechanistic chemistry" (Ñº), noted for her demonstration of photoimaging, as a "forgotten genius".

Quotes

The following are related quotes:

> "Heaviside was the **forgotten genius** of physics."
>
> — Leon Brillouin (1970), *Relativity Reexamined* [2]

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θΔics

In hmolscience, **formative drive** or “bildungstrieb” (Blumenbach, 1781), from *bildung* meaning "formation" + *trieb* meaning "drive", is a hypothesized epigenetic driving force posited to direct form reproduction in plants, animals, and humans. [1]

See also

- Freud-Schiller drive theory

References

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θΔics

In theories, **fortuitous concourse of atoms**, a terminological forerunner, in some sense, to the late 20th century "blind, random, chance, accident" model of mutation-based evolution, tends to generally refer to a non-divine model of plant, animal, and human formation according to pre-Cicero Greek atomic theory models.

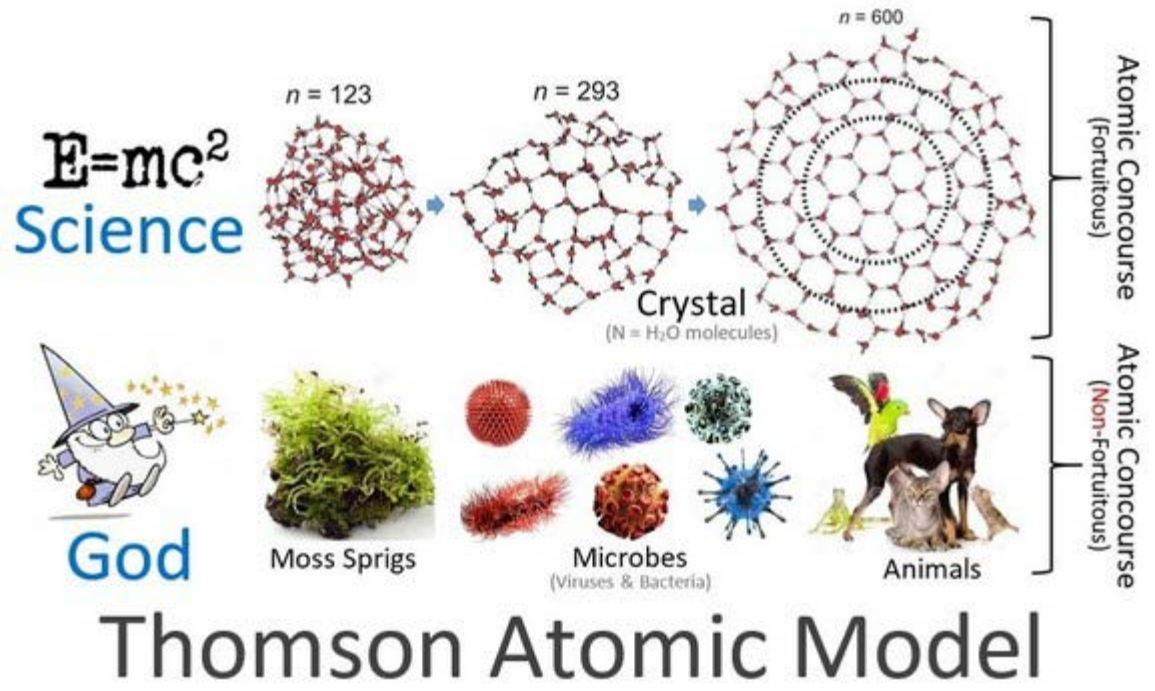

The William Thomson (1903) model of atomic formation of structures, according to which non-living structures, e.g. crystals, are able to form via "**fortuitous concourse of atoms**", whereas anything "living", e.g. sprig of moss, microbe, or animal, being the handiwork of god and his miracles. [2]

Overview

The notion of things coming into being via a "fortuitous" concourse of atoms, supposedly originated in the Greek writings of Epicurus; possibly associated, in namesake, influence, or etymology, with the Greek goddess Fortuna (Q), goddess of fate, chance, and luck.

In c.1700, the phrase "fortuitous concourse of atoms" was making the rounds among the English writers:

> "A wonder it must be that there should be any man found **so stupid** as to persuade himself that this most beautiful world could be produced by the **fortuitous concourse of atoms**."
>
> — John Ray (c.1700) (Q)

> "Philosophers say, that man is a microcosm, or little world, resembling in miniature every part of the great; and, in my opinion, the body natural may be compared to the body politic; and if this be so how can the Epicurean's opinion be true, that the universe was formed by a **fortuitous concourse of atoms**; which I will no more believe, than that the accidental jumbling of the letters of the alphabet could fall by chance [see: typing monkeys] into a most ingenious and learned treatise of philosophy. *Risum tincatis amici?* [hor] This false opinion must needs create many more; it is like an error in the first concoction, which cannot be corrected in the second; the foundation is weak, and whatever superstructure you raise upon it, must of necessity fall to the ground. Thus men are led from one error to another, until with Ixion they embrace a cloud instead of Juno; or, like the dog in the fable, lose the substance in gaping at the shadow: For such opinions cannot cohere; but like the iron and clay in the toes of Nebuchadnezzar's image, must separate and break in pieces. I have read in a certain author, that Alexander wept, because he had no more worlds to conquer; which he needed not have done, if the **fortuitous concourse of atoms** could create one; but this is an opinion fitter for that many headed beast the vulgar to entertain, than for so wise a man as Epicurus; the corrupt part of his sect only borrowed his name, as the monkey did the cat's claw to draw the chestnut out of the fire."
>
> — Jonathan Swift (c.1720), "A Critical Essay on the Faculties of the Mind" (Q)

In 1770, Baron d'Holbach clarified what correctly is meant by the term as follows:

> "In seeing the world, we acknowledge a material cause of those phenomena which take place in it; and this cause is nature, of whom the energy is shown to those who study her. **Let us not be told, that, according to this hypothesis, we attribute every thing to** a 'blind cause', to the 'fortuitous concurrence of atoms'; to 'chance'. We only call those blind causes, of which we know not the combination, the power, and the laws. We call fortuitous, those effects of which we are ignorant of the causes, and which our ignorance and inexperience prevent us from foreseeing. We attribute to chance, all those effects of which we do not see the necessary connection with their causes. Nature is NOT a blind cause; she does NOT act by chance; NOTHING that she does would ever be fortuitous to him who should know her mode of acting, her resources, and her course. Every thing which she produces is necessary, and is never more than a consequence of her fixed and constant laws; every thing in her is connected by invisible bands (see: bond), and all those effects which we see flow necessarily from their causes, whether we know them or not."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 234)

(add)

Quotes

The following are related quotes:

> "My task has been rigorously confined to what, humanly speaking, we may call the '**fortuitous concourse of atoms**', in the preparation of the earth as an abode fitted for life. Mathematics and dynamics fail us when we contemplate the earth, fitted for life but lifeless, and try to imagine the commencement of life upon it. This certainly did not take place by any action of chemistry, or electricity, or crystalline grouping of molecules under the influence of force, or by any possible kind of fortuitous concourse of atoms. We must pause, face to face with the mystery and miracle of creation of living creatures."
>
> — William Thomson (1897), "The Age of the Earth as an Abode Fitted for Life" [1]

> "Cicero denied that [living things] could have come into existence by a **fortuitous concourse of atoms**. Was there anything so absurd as to believe that a number of atoms by falling together of their own accord could make a crystal, a sprig of moss, a microbe, a living animal? People thought that, given millions of years, these might come to pass, but they could not think that a million of millions of years could give them unaided a beautiful world like ours. They had a spiritual influence, and in science a knowledge that there was that influence in the world around them. He admired the healthy, breezy atmosphere of free thought in professor [John] Henslow's (Q) lecture. Let no one be afraid of true freedom. They could be free in their thoughts, in their criticisms, and with freedom of thought they were bound to come to the conclusion that science was not antagonistic to religion but a help for religion."
>
> — William Thomson (1903), show of thanks statement during the George Henslow "Christian Apologetics" lecture; note: Thomson recanted on this (see: Thomson on religion), in respect to crystals, two days later [2]

> "Thus we can reconcile the philosophical position of our time with the words of the apostle; for the 'higher pantheism' [Tennyson] agrees with him in asserting the existence of the eternal 'in whom we live and move and have our being.' Science, conceiving of the universe as the manifestation of an immanent god, can only endorse these words. Goethe's name for the cosmos, which the **fool in his folly** was pleased to call a '**fortuitous concourse of atoms**,' is this—'the living garment of god'."
>
> — Caleb Saleeby (1904), "The Living Garment of God" [**3**]

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θΔics

In phenomena, **founders of**

Left: in 1946, American physical chemist Gilbert Lewis, central founder of modern chemical thermodynamics, at the age of 70, was coincidentally found dead in his laboratory next to an open bottle of poisonous liquid cyanide, following a lunch with a long-time rival physical chemist Irving Langmuir, who years earlier had culled off his bonding theories to win the 1932 Nobel Prize in chemistry, whereas Lewis never won despite 35 nominations (and several student Laureates). Center: in 1906, Austrian physicist Ludwig Boltzmann hung himself in his hotel room, while on vacation with his family, after a decade of battle with the energeticists (see: energetics debate), Wilhelm Ostwald and Ernst Mach, in particular, who would not accept the existence of atoms. Right: in 1850, German physician-physicist Robert Mayer, after discovering that James Joule had claimed discovery of the mechanical equivalent of heat, while his work was still unknown, jumped out of a third-story window, and was later put in an asylum.

thermodynamics and suicide (LR:2) refers to the noticeable curiosity that among thermodynamics founders (Mayer, Haber, Lewis, Bridgman), statistical mechanics/statistical thermodynamics founders (Boltzmann, Ehrenfest), human chemical thermodynamics founders (Adams [his wife], Wieninger [Goethe's protege], and Freud), and human affinity chemistry pioneers (Goethe [novel *Werther*], Shelley), among others, a curiously large number are associated with suicides or suicide attempts. This peculiar coincidence was summarized famously by American physicist David Goodstein, in the opening lines to his 1975 book *States of Matter*, as follows*:* [9]

> "Ludwig Boltzmann, who spent much of his life studying statistical mechanics, died in 1906, by his own hand. Paul Ehrenfest, carrying on the work, died similarly in 1933. Now it is our turn to study statistical mechanics. Perhaps it will be wise to approach the subject cautiously."

In sum, thermodynamics, what many consider to be the most intellectually difficult subject of all, is noted for its prevalence of suicides and suicide attempts by a large percentage of its founders, including German physicist and physician Robert Mayer (jumping out of window), Austrian physicist Ludwig Boltzmann (hanging), American physical chemist Gilbert Lewis (cyanide), English morphological thermodynamics poineer Alan Turing (eating cyanide laced apple), among others, discussed below.

Atomic theory | Founders

Two of the four originators atomic theory, a cousin science to thermodynamics, namely Democritus and Lucretius, both of who were of the view that death was simply a dissolution of the atoms, supposedly committed suicide:

> "Democritus, when at ripe old age warned him that mind and memory were failing, **went freely to place his person in death's path**. Epicurus himself died when life's light ran out, he who in mind surpassed all men—eclipsed them all, as the sun hung high in heaven, the stars."
>
> — Lucretius (55BC), *On the Nature of Things* (pg. 81; 3:1039-44)

> "Lucretius, as reported by Jerome [c.410BC], was driven mad by a 'love potion', and in the intervals of his insanity, wrote 'books' that were later edited by Cicero, and he **eventually committed suicide**."
>
> — Frank Copley (1977), "Introduction" to *On the Nature of Things*

The later defense of atomic theory by Ludwig Boltzmann, against the views of Ernst Mach, Wilhelm Ostwald, and others, who believed that atoms did not exist, later worked as a tension that in 1906 drove Boltzmann (age 44), in turn, to the noose (as discussed below).

Burton

In 1621, Robert Burton, in his *The Anatomy of Melancholy*, impressively employed electricity (amber), magnetism (loadstone), and heat (warmth) logic to explain love and beauty; the following is a noted excerpt: [1]

> "As amber attracts a straw, so does beauty admiration, which only lasts while the warmth continues. But virtue, wisdom, goodness, and real worth, like the loadstone, never lose their power."

This, as cited by Henry Finck (1887), is a classic proto physical science based love theory, classified along with: Empedocles, Goethe, Ludwig Buchner, Schopenhauer, in the early history of human chemical thermodynamics. Here, of note, we recall the later work of James Froude (first English translator of Goethe's *Elective Affinities*), on magnetism, heat, and love. In 1640, Burton hung himself in a room at Christ Church, Oxford. This room was later occupied by a young Robert Hooke, as a college student, as talked about by Hooke, an EPD genius, whose father had also committed suicide.

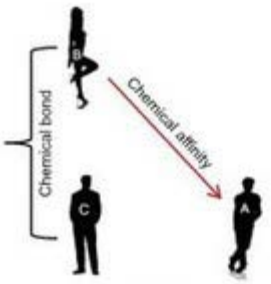

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

In 1773, German polyintellect Johann Goethe, the initiator of human chemical thermodynamics and **founder** of human chemistry, via his 1796 affinity-based "human chemical theory", wrote his first novel, the 1773

Goethe

In 1773, German polyintellect Johann Goethe, the founder of human chemistry, via his pioneering work on human chemical reaction theory (see also: Henry Adams, Otto Weininger, below), and precursory founder of "human chemical thermodynamics", via his work on chemical affinities applied to humans, the precursor to free energies (see also: Fritz Haber, Gilbert Lewis, and Percy Bridgman, below), as quantified by the Goethe-Helmholtz equation (shown below), at the age of 24, penned his first work themed on suicide, which caused him to become instantly world famous.

Specifically, in six weeks of intensive writing during January–March 1774, following the suicide of his close associate [add name], Goethe pens his great tale *Werther* (famously read by Napoleon six times during battle)—or *The Sorrows of Young Werther* in full—about an unstable love triangle — Lotte (engaged via arrangement to Albert), Albert (an older wealthier man), and Werther (in love with Lotte) — according to which Werther had come to the realization that he had to die in order to resolve the situation. Unable to hurt anyone else or seriously consider committing murder, Werther sees no other choice but to take his own life. After composing a farewell letter to be found after his suicide, he writes to Albert asking for his two pistols, under a pretence that he is going "on a journey". Lotte

Werther, on the topic of suicide resulting from a love triangle.

receives the request with great emotion and sends the pistols. Werther then shoots himself in the head, but does not expire until 12 hours after he has shot himself.

Although the story Werther is fiction, albeit based an associate of Goethe (add), who did die by his own hand, mixed win with thoughts on the the love triangle of Charlotte Buff a youthful acquaintance of Goethe, who he fell in love with, who rejected him, owing supposedly to financial issues, instead married Johann Christian Kestner, a diplomat and art collector, Goethe, himself does not die (dereact) by his own hand—his last and final words at the age of 82 being "more light"; but, the dangerous theory he initiates, that human passions can be quantified, measured, and predetermined, as the chemist measures heats of reaction, as explained in his 1809 *Elective Affinities*, via hidden layers of code, his so-called "most dangerous book", opened a pandora's box of aftermath, so to speak, one striking example being Otto Weininger (below), who in 1903, less than four months after boasting about being the first to pick up Goethe's unfinished work on human chemistry, shoots himself in the heart, or Henry Adams, the first to pick up Goethe's unfinished work on human chemistry, in the post-modern chemical thermodynamic era, finds that his wife has swallowed potassium cyanide KCN less than eight months after he defined the subject Goethe initiated as the study of the "attraction and repulsion of human molecules"; a blaze that has not yet reached its peak.

Shelley

In 1822, Percy Shelley, age 29, following a hardened social existence, after infamously getting expelled from Oxford ten years earlier (age 19), for his *Necessity of Atheism*, then married Mary Shelley, famed *Frankenstein* author, in the "Church of Elective Affinities", tried to obtain a lethal dose of prussic acid (Ñº), aka hydrogen cyanide (HCN), and then on Jul 8, a month shy of his 30th birthday, was reported to have "mysteriously" drowned (in his own rowboat); his obituary read as follows:

> "**Shelley**, the writer of some infidel poetry, has been drowned: now he knows whether there is a god or no."
>
> — Author (1822), "Shelley Obituary" (Ñº), *London Troy newspaper*

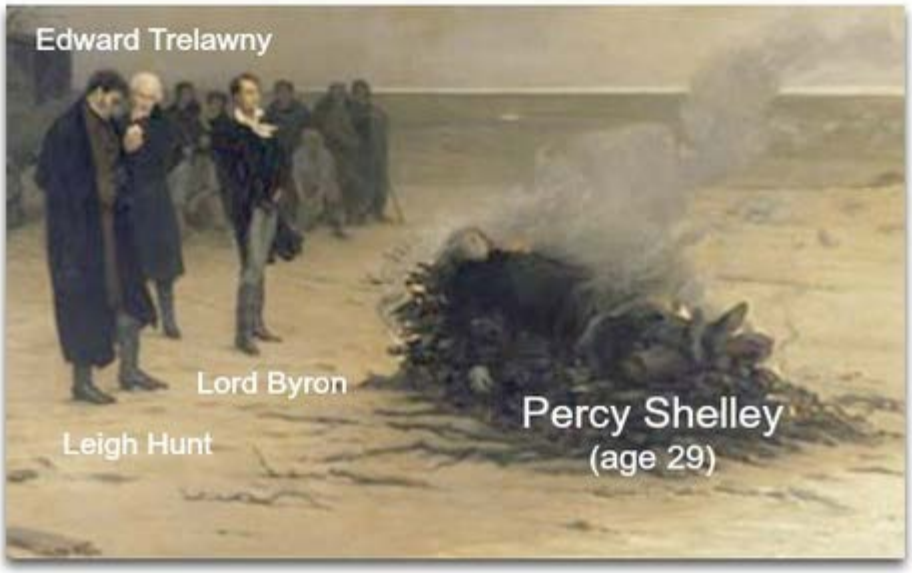

A rendition (Ñº) of the 18 Jul 1822 cremation of **Percy Shelly**, by Louis Fournier (1899), after Shelley's body had washed ashore, six days earlier (Jul 12), on a beach near Viareggio; reported by some as boating accident during storm and as suicide by others.

Shelley's reaction end has been suggested, e.g. Richard Holmes (2004) (Ñº), Lynn Shepherd (2013) (Ñº), among others, to have been suicide. Shelley, like Goethe, was a "human elective affinity" theorists, i.e. the forerunner to the modern variant of "human free energy" theorist, the core subject of human chemical thermodynamics.

Mayer

In 1840, German physician and physicist Robert Mayer, one of the first to state the first law of thermodynamics, while working as a ship's doctor on a Dutch vessel which visited the East Indies, had conceived of the mechanical equivalent of heat by study of the color of the blood of his crewmates and the temperature difference between the tropics and Europe. In 1842, after returning to Germany, he began to publish his scientific theories on in obscure journals, such as *Annals of Chemistry and Pharmacy*, but his theories went largely unnoticed as these journals were not read by physicists. Those who did notice, however, ridiculed his work, as it was not based on experimental data. [10]

During this period, one of his sons and two of his daughters fell ill and died before the age of three. He also discovered that English physicist James Joule had claimed discovery of the mechanical equivalent of heat, while his theory was still

unknown. In 1850, during an attack of insomnia, Mayer jumped out of a third-story window and fell almost thirty feet to the ground and broke both his legs. It is said that in 1851, he was placed in an asylum, but later released. [13]

He survived, but soon was forced to begin spending long series of voluntary and involuntary hospitalizations and even occasional restraint by strait-jacket. [1] Curiously, in Poggendorf's authoritative 1863 *Dictionary of the History of Science* it was incorrectly claimed that Mayer had already died—in an insane asylum (see: insanity and genius).

Adams | Molecular love triangle

On 27 Jun 1872, American physical science historian Henry Adams (social Newton #2 behind Goethe) married Marian Hooper (Clover Adams).

In Jan 1881, Henry Adams met the 24-year-old Elizabeth Cameron, for the first time, in the drawing room of the house of John Hay can Clara Hay. On 19 May 1883, when Cameron and her husband (senator J. Donald Cameron), by arranged marriage, departed for Europe, Adams initiated a correspondence with Elizabeth Cameron, expressing unhappiness with her departure and his longing for her return.

On 7 Dec 1884, *exactly* one year before the suicide of Clover Adams, Henry Adams wrote to Cameron:

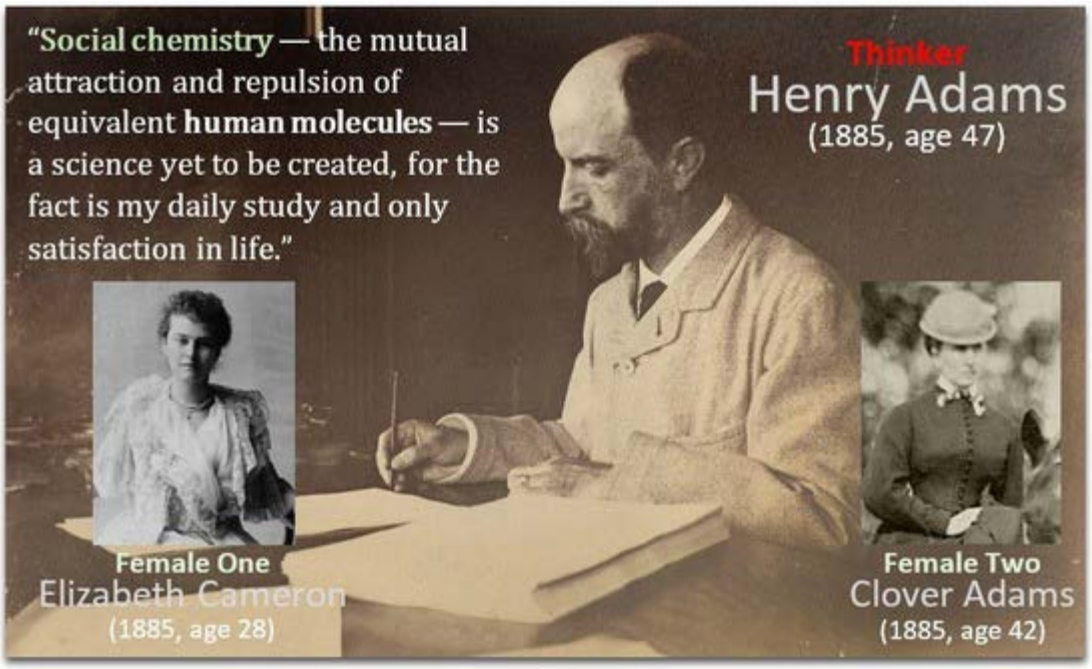

A depiction of the so-called "Henry Adams love triangle" (see: love thought experiment), in 1885, wherein, seemingly, the introduction of molecule B (Elizabeth Cameron), into the reaction system of molecule C (Henry Adams), seems to have worked to precipitate the dissolution or detachment of molecule A (Clover Adams) from the AC marriage bond (Henry-Clover relationship), via the action of suicide, on 6 Dec 1885, via ingestion of potassium cyanide KCN. [15]

> "I shall dedicate my next poem to you. I shall have you carved over the arch of my stone doorway. I shall publish your volume of extracts with your portrait on the title page. None of these methods can fully express the extent to which I am yours."

On 12 Apr 1885, Adams, while on an extended work stay-over in Washington, wrote Clover the following:

> "I am not prepared to deny or assert any proposition which concerns myself; but certainly this solitary struggle with platitudinous atoms, called men and women by courtesy, leads me to wish for my wife again. How did I ever hit on the only women in the world who fits my cravings and never sounds hollow anywhere?
>
> Social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life."

This subject "yet to be created", as Adams put it, would be developed in the two centuries to follow (Fairburn, *Human Chemistry*, 1914; Dreier, *We Human Chemicals*, 1948; Thims, *Human Chemistry*, 2007).

It would seem, here, in the above "equivalent" human molecules statement, to be the case, speculatively speaking, that the three human molecules Adams had in mind in this statement, subsequently, would have been himself, his side love affair (or interest) Elizabeth Cameron, and his wife Clover Adams.

On 13 Apr 1885, Clover's father died, and this was said to have initiated a period of mourning which evolved into mental depression from which she did not recover.

On 4 Dec 1885, two days before her suicide by cyanide (Dec 6), Clover Adams, visited Elizabeth Cameron, who was then three-months pregnant.

On 6 Dec 1885, Clover died by suicide via swallowing potassium cyanide.

On 29 Sep 1908, Adams wrote Cameron the following telling insight about his encounter with the chemical thermodynamics equations of Willard Gibbs:

> "I have run my head hard up against a form of mathematics that grinds my brains out. I flounder like a sculpin in the mud. It is called the 'law of phases', and was invented at Yale. No one shall persuade me that I am not a phase."

Here, we see the affinity chemistry belief system (or belief state) to chemical thermodynamics belief system (or belief state) transition occurring, according to which, whereas Goethe believed himself to be some type of animated chemical governed by the forces of chemical affinity, Adams, alternatively albeit equivalently (in science upgrade terms), believed himself to be a both a "molecule" (1885) and "phase" (1908) or state of "equilibrium" defined by the chemical thermodynamics of Willard Gibbs. Adams would go on to pen out his "physicochemical dynamic theory of history" as he called it, at least in outline and in letters of communication, prior to his 1912 debilitating stroke.

Weininger

In 1903, Austrian philosopher Otto Weininger, following unknowingly in the footsteps of Henry Adams (or rather his wife), in respect to elaborating on a type of human chemical thermodynamics, finished his *Sex and Character: A Fundamental Investigation*, a noted very erudite quote of which is:

Austrian philosopher Otto Weininger shot himself in the heart four months after finishing his Goethe-influenced human chemical theory stylized *Sex and Character*, in the same room where Ludwig Beethoven died.

> "If iron sulphate and caustic potash are brought together, the SO_4 ions leave the iron to unite with the potassium. When in nature an adjustment of such differences of potential is about to take place, he who would approve or disapprove of the process form the moral point of view would appear to most to play a ridiculous part."

in which he claims to be the first to extrapolate upon German polymath Johann Goethe's 1809 chemical affinity theory of relationships, passions, sex, marriage and divorce: [26]

> “I must confess to being proud that this book is the first work to take up [Goethe’s] [human chemical theory] ideas.”

Four months later (in the same hotel room Beethoven died) he shot himself in the heart.

> “This book ... is a sensational work, both by reason of its contents and of the tragic fate of its author. Weininger, as is commonly known, **shot himself** in the autumn of 1903 **at the early age of twenty-three, in the house in Vienna where Beethoven had died**. . . . But it is the book itself, even more than its author's individuality, which is abnormal. It is nothing less than an attempt to construct a system of sexual characterology on the broadest scientific basis, with all the resources of the most modern philosophy.”
>
> — Author (1907), “Review”, *General News Paper* (*Allgemeine Zeitung*) [26]

Specifically, in June 1903, after months of concentrated work, Weininger finished his human chemistry upgrade book *Sex and Character: A Fundamental Investigation* , an attempt "to place sex relations in a new and decisive light"—namely, it seems, and expansion of Goethe’s human chemical theory applied to feminism and sexual relation issues. The book did not created the expected “stir”, although at one point it was attacked by German neurologist and Goethe-Schopenhauer-Nietzsche scholar Paul Mobius who accused him of plagiarism. Deeply disappointed, and seemingly depressed, Weininger left for Italy. Back in Vienna he spent his last five days with his parents. On October 3, he took a room in the house in Schwarzspanierstraße 15 where Ludwig van Beethoven died. He told the landlady that he was not to be disturbed before morning since he planned to work and then to go to bed late. This night he wrote two letters, one addressed to his father, the other one to his brother Richard, telling them that he was going to shoot himself. On October 4, Weininger was found mortally wounded, having shot himself through the heart. He died in *Wiener Allgemeines Krankenhaus* at half past ten that morning. Weininger was buried in the Matzleinsdorf Protestant Cemetery in Vienna. The epitaph by his father translates:

> “This stone closes the resting place of a youth whose spirit never found rest on earth. And when he had made known the revelations of his spirit and of his soul, he could no longer bear to be among the living. He sought out the death precinct of one of the greatest in Vienna's Schwarzspanier house, and there destroyed his bodily existence.”

(add)

Boltzmann

In 1895, Boltzmann, in his now-famous *Lectures on Gas Theory*, was discussing the probability of suicide in a given population in comparison to the improbability of unlikely events occurring, such as one mole of gas finding itself in one half of a container: [11]

$$S = k \log W$$

> “One may recognize that this is practically equivalent to never, if one recalls that in this length of time, according to the laws of probability, there will have been many years in which every inhabitant of a large country committed suicide, purely by accident, on the same day, or every building burned down at the same time—yet the insurance companies get along quite well by ignoring the

possibility of such events."

In 1906, Austrian physicist Ludwig Boltzmann, central founder of statistical mechanics, at the age of 62, hung himself, while on vacation with his wife and daughter, after decades of attack on his theory of the statistical behavior of molecules; a theory vindicated to the greatest extent years after his death.

Boltzmann's ideas in these years were not accepted by many scientists. In 1895, at a scientific meeting in Lübeck, Wilhelm Ostwald presented a paper in which he stated:

> "The actual irreversibility of natural phenomena thus proves the existence of processes that cannot be described by mechanical equations, and with this the verdict on scientific materialism is settled."

Arnold Sommerfeld, who was at the meeting, described the resulting battle between Ostwald and Boltzmann, as follows:

> "Boltzmann was seconded by Felix Klein. The battle between Boltzmann and Ostwald resembled the battle of the bull with the supple fighter. However, this time the bull was victorious. The arguments of Boltzmann carried the day. We, the young mathematicians of that time, were all on the side of Boltzmann."

Ostwald led the opposition to Boltzmann's ideas which were opposed by many European scientists, they misunderstood them, not fully grasping the statistical nature of his reasoning. However some, including Mach, thought the arguments were too violent. [24]

On Aug 3, 1897, Boltzmann prefaced his lecture notes on mechanics with the following motto: [25]

> "But forward what is true; so write that it is clear, and fight for it to the end!"

In 1898, the resolve of Austrian physicist Ludwig Boltzmann, one the founders of statistical thermodynamics, in his work, was beginning to weaken, following prolonged onslaught from Ernst Mach and others from the energetics school who denied the existence of atoms, the linchpin of Boltzmann's gas theory; the following statement, according to Jing Chen (Ñº), among others, made that year is said to be parlay into his eventual end: [19]

> "I am conscious of being only one individual struggling weakly against the current of time. But it still remains in my power to make a contribution in such a way that, when the theory of gases is again revived, not too much will have to be rediscovered."

In 1900, because of his dislike of working with Mach, Boltzmann moved to Leipzig but here he became a colleague of his strongest scientific opponent Wilhelm Ostwald. Despite their scientific differences Boltzmann and Ostwald were on good personal terms. Despite this, depressed by scientific arguments with Ostwald, from the 1895 Leipzig meeting, which are described below Boltzmann unsuccessfully attempted suicide during his time in Leipzig. [24]

In 1905, Boltzmann took a trip from Vienna to California to lecture on thermodynamics during the summer session at the University of California, Berkeley (the same school where Gilbert Lewis would later commit suicide). By this time in his life he was plagued by a variety of illnesses: deteriorating eyesight, asthma attacks, angina, and migraines. Worse, he suffered from deep depressions that periodically carried him off into his own private hell, and had led to a suicide attempt a few years earlier. [1] Not long before the California trip, Boltzmann's wife, Henriette, had lamented to their daughter: "Father gets worse every day. I have lost my confidence in the future".

The central difficulty facing Boltzmann was his strong belief in the reality of atoms and the opposition to this belief

professed by his closest friends and many of his scientific peers. Yet, in spite of universal acceptance of his statistical thermodynamics theories of gas interactions, during his travel to Berkeley he was at the height of his fame. Students flocked to his lectures, and colleagues throughout the world sought his counsel. His identification of entropy with probability was recognized as a masterpiece of theoretical physics. On his sixtieth birthday, during the previous year, a collection of his papers had been published in his honor, with contributions from 117 scientists and he had received countless medals and honorary doctorates. But he was not a happy man. [1]

On Thur, Sep 6, 1906, at the Hotel Ples – which is now part of the international United World College of Adriatic (Collegio del Mondo Unito dell' Adriatico) – while his wife Henriette Boltzmann and daughter Elsa Boltzmann (1891-1965) were out swimming, Boltzmann hung himself with a short cord from the crossbar of a window casement of the hotel room. His daughter was the first to discover the suicide. He left no suicide note. [25]

Thermodynamics historian Stephen Brush comments on Boltzmann's ironic death that: [12]

> "This suicide must be ranked as one of the great tragedies in the history of science, made all the more ironic by the fact that the scientific world made a complete turnabout in the next few years and accepted the existence of atoms, following Perrin's experiments on Brownian motion."

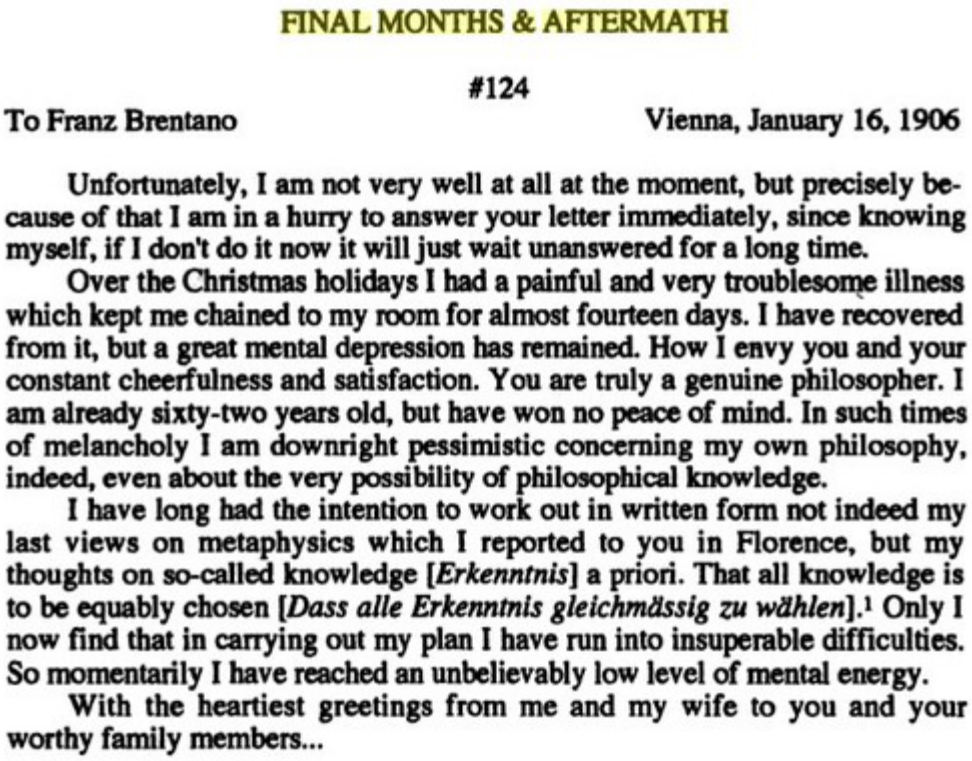

FINAL MONTHS & AFTERMATH

#124

To Franz Brentano — Vienna, January 16, 1906

Unfortunately, I am not very well at all at the moment, but precisely because of that I am in a hurry to answer your letter immediately, since knowing myself, if I don't do it now it will just wait unanswered for a long time.

Over the Christmas holidays I had a painful and very troublesome illness which kept me chained to my room for almost fourteen days. I have recovered from it, but a great mental depression has remained. How I envy you and your constant cheerfulness and satisfaction. You are truly a genuine philosopher. I am already sixty-two years old, but have won no peace of mind. In such times of melancholy I am downright pessimistic concerning my own philosophy, indeed, even about the very possibility of philosophical knowledge.

I have long had the intention to work out in written form not indeed my last views on metaphysics which I reported to you in Florence, but my thoughts on so-called knowledge [*Erkenntnis*] a priori. That all knowledge is to be equably chosen [*Dass alle Erkenntnis gleichmässig zu wählen*].[1] Only I now find that in carrying out my plan I have run into insuperable difficulties. So momentarily I have reached an unbelievably low level of mental energy.

With the heartiest greetings from me and my wife to you and your worthy family members...

The title page to John Blackmore's 1990 chapter "Final Months & Aftermath" on Ludwig Boltzmann's final year, dereacting on 5 Sep 1906 via hanging himself. [22]

In other words, in 1909, only three years after Boltzmann hung himself for having the scientific community, namely: Ernst Mach, Gustav Jaumann, Ernst Zermelo, and Wilhelm Ostwald, reject his belief of the existence of atoms and his interpretation of thermodynamics as an atomic and molecular phenomenon, French chemist Jean Perrin proved that atoms exist, experimentally, by calculating and determined the number of atoms in one mole of substance.

Austrian physicist Paul Ehrenfest, Boltzmann's famous student, shot himself in 1933 owing to, as his associate Albert Einstein

Ehrenfest

In 1933, Boltzmann's noted student Austrian physicist Paul Ehrenfest, said, according to his associate Albert Einstein, to have been depressed from an overloaded workload, made arrangements for the care of his other three children, then on September 25 first shot his Down syndrome son Wassik, then shot himself.

A good deal of correspondence, in 1932, preceded Ehrenfest's suicide, among them communications of despair with Einstein, about obtaining a less-demanding post in America, about his growing inability to understand quantum mechanics, and something about his failure to understand what he was copying from a book by Hermann Weyl, among other issues. (Ñº)

summarized, "work overload and depression".

William James

In psychological thermodynamics, American psychologist William James is noted for his 1906 reserve energy theory of mental and physical activity, which argued that reserve reservoirs of energy lay latent in the human only waiting to be tapped. In *circa* 1908, however, James' theory came into contact with the repercussion of the second law of thermodynamics through a reading of his friend American historian Henry Adams' manuscript *A Letter to American Teachers of History*, in which it was argued that human history is subject to degradations of energy. In response, James' sent a letter of criticism and rebuttal to Adams arguing against Adams' theory; followed by two later postcards in the same effort. James, who in his early adulthood had suffered from periods of depression during which he contemplated suicide for months on end, died on August 26, 1909, exactly two months after sending his last postcard to Adams. Robert Richardson, in his 2007 biography on James, comments on this last stand effort before his death: [6]

> "What can one say about the philosophical bravado, the cosmic effrontery, the sheer panache of this ailing philosopher with **one foot in the grave** [see also: Thomas Jefferson, 1819] talking down the second law of thermodynamics? It is a scene fit to set alongside the death of Socrates."

In short, Adam's *Letter to American Teachers of History* essentially laid question to James' theory of innate reserve energies, and this may have acted as his tipping point.

Haber family

On 1-2 May 1915, German physical chemist and gas reaction

Clara Haber (1870-1915), shown (left), who married to Fritz Haber in 1901, and who committed suicide, on 1-2 May 1915, by shooting herself in the heart, after, supposedly, finding that her husband was having an affair with Charlotte Nathan (1889-1976), whom and Fritz married two years later; their 25 Aug 1917 wedding photo shown (right).

thermodynamics pioneer Fritz Haber's wife Clara Haber (Clara Immerwahr), shot herself in the heart with her husband's pistol. Official reports were that she did so over objections to her husband's involvement in chemical gas warfare used against the French and Russians.

Alternatively, Hermann Lutke, a mechanic in Haber's institute, reported (1958), in a series of letters to a man hoping to write a biography on Haber, that late in the evening of May 1, Clara encountered her husband with Charlotte Nathan, a young business woman who ran Haber's downtown club, in an "embarrassing situation", realizing that the two were having an affair. [5] Haber, after his wife's suicide, married Nathan in 1917, after which the couple had two children.

In 1946, their son Hermann took his own life and, shortly thereafter, Hermann's oldest daughter did the same. [5]

Freud | Physician-assisted suicide

On 22 Sep 1939, Sigmund Freud, aged 83, central founder of the thermodynamics based psychodynamics (see: A

Project for Scientific Psychology), who for the last 20 years of his existence had developed mouth cancer, from his heavy cigar smoking, during which he had undergone 23 operations, eventually forced to wear a prosthesis, exhausted, persuaded his physician, Max Schur, to give him enough morphine to bring about an end to his reaction existence. Schur, conducive to these wishes, gave Freud three 2-3 milligram does of Morphine, over the course of 12-hours, Freud went into a coma, and died (dereacted) at 3AM 23 Sep 1939. [27]

Lewis

In 1946, it was superficially reported that American physical chemist Gilbert Lewis, one of the central founders of modern chemical thermodynamics, at the age of 70, had died of a heart attack while working in his laboratory. He had been working on an experiment with liquid hydrogen cyanide, and deadly fumes from a "broken line", which seems to be a misrepresentation of facts (see Jolly report below), were leaking into the laboratory when a graduate student found the professor's lifeless body under a workbench. The coroner said Lewis died of coronary artery disease; however, some believe that the death may have been a suicide. UC Berkeley professor Emeritus William Jolly, who reported the various views on Lewis' death in his 1987 history of the University of California, Berkeley's College of Chemistry, *From Retorts to Lasers*, said one higher-up in the department believed the suicide theory; one excerpt of which is as follows: [21]

> "In a retrospective symposium honoring **G.N. Lewis**, Michale Kasha attempted to quash the suggestion that Lewis committed **suicide**, but his arguments were not compelling."

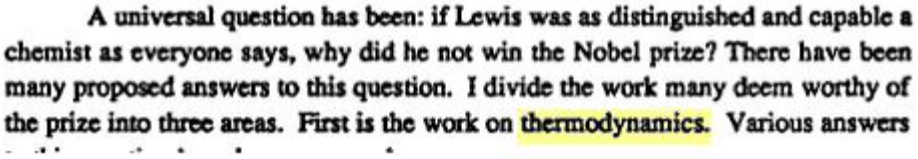
A universal question has been: if Lewis was as distinguished and capable a chemist as everyone says, why did he not win the Nobel prize? There have been many proposed answers to this question. I divide the work many deem worthy of the prize into three areas. First is the work on thermodynamics. Various answers

An excerpt from American chemist Edward Lewis' 1998 biography on how Gilbert Lewis had done work meritable to the equivalent of three Nobel Prizes, yet at the age of 70, despite 35 nominations, had puzzlingly not yet won? [20]

The common argument or reasoning given to Lewis' peculiar reaction end (death), was depression following a lunch with American physical chemist Irving Langmuir. Langmuir and Lewis had had a long rivalry, dating back to Langmuir's extensions of Lewis' theories on the chemical bond, and Langmuir had been awarded the 1932 Nobel Prize in chemistry for his theories of surface chemistry, while Lewis had not received the Nobel Prize despite 35 nominations.

On the day of Lewis' death, Langmuir and Lewis met for lunch at the University of California, Berkeley—a meeting that was recalled by Lewis' last research associate, Michael Kasha, only years later. [2] It was reported by associates that Lewis came back from the meeting in a dark mood. He reportedly sat down for a morose game of bridge with some colleagues, and then went back to work in his lab. An hour later, Lewis was dead. Langmuir's papers at the Library of Congress confirm that he was on the University of California, Berkeley campus that day. Langmuir had gone to the University of California, Berkeley to receive an honorary degree.

In 2006, American a self-employed business-consulting chemist Patrick Coffey, a visiting scholar at UC Berkeley's Office for the History of Science and Technology, gave talk at Berkeley's Chemistry College, packing the house, on his recent historical investigations into Lewis' mysterious

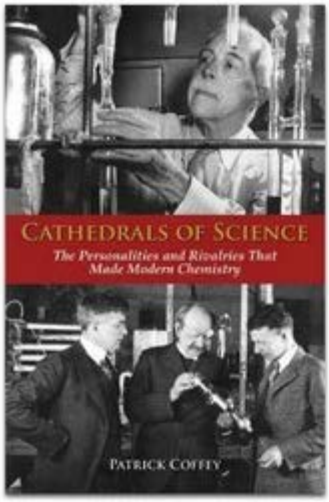

American chemistry historian Patrick Coffey's 2008 *Cathedrals of Science*, in which he devotes an end chapter to Gilbert Lewis' mysterious death, in 1946 by via hydrogen cyanide (HCN), drawn to understand the nature of the "haunted eyes" looking out from one of Lewis' last photos (on his 70th birthday). [15]

end, for a chapter he was writing devoted to the subject, as found in his *Cathedrals of Science* (2008). [15] As SFGate.com reporter Rich VelVecchio, in his "What Killed Famed Cal Chemist?" interview article, summarizes: [16]

> "The focus of Coffey's current fascination is a character whose haunted eyes look out from a portrait taken shortly before he unexpectedly died under cloudy circumstances 60 years ago."

Coffey reports William Jolly, in his history of the Berkeley chemistry department, as having writing the following: [15]

> "One of Lewis's bridge-playing cronies, Gerald Marsh, said that on the afternoon of March 23, 1946, Lewis appeared to be morose while playing cards at the Faculty Club. He then went to his laboratory in Gilman Hall, where he was later found dead near a broken ampoule of hydrogen cyanide."

In 1998, American chemist and Gilbert Lewis biographer Edward Lewis, in his *A Biography of Distinguished Scientist Gilbert Newton Lewis*, give his opinion on the matter as follows: [20]

> "The suggestion of suicide by cyanide in Jolly's book—although originated earlier by [Joel] Hildebrand and [Kenneth] Pitzer, both of whom knew him well—is to me out of character, and not supported by the autopsy."

There is, to note, a statistical pattern which indicates that Nobel Prize winners live (react) longer than Nobel Prize losers (or non-winners); this may, indeed, have been a factor with Lewis, one of the greatest chemists ever:

> "The fact that Lewis never was awarded the Nobel Prize for his breathtaking work is one of the stains in the history of this prize. Yet the very same Lewis was the direct mentor of more Nobel Prize winners in chemistry than any Nobel Prize winner in any category."
>
> — Adriaan de Lange (1998), "On Entropy" [18]

The general supposition offered here is that Lewis suffered from the so-called genius "catch up effect"; namely, in 1946,

the world had not yet caught up to what Lewis had done. It would not be, in fact, into the early 21st century, that the immense genius of Lewis would be recognized, the foremost of which was his work on the free energies of chemical substances, which is something still not yet absorbed into the minds of the physical science elites at the forefront of knowledge. In short, the bigger the genius one becomes, the more one's work is likely to be recognized or rather absorbed posthumously—the greater the distance in time between point of inception and point of absorption, the greater the genius.

Turning

In 1952, British polymath, mathematician, engineer, computer scientist, code breaker, and chemist Alan Turing, publishing his chemical thermodynamics based based "The Chemical Basis of Morphogenesis", wherein he aimed to explain morphological development of organisms, via a possible mechanism by which the genes of a zygote or embryo may determine the anatomical structure of resulting organisms, via recourse to equilibrium reaction theory and free energy determinates. That same year he was convicted of 'Acts of Gross Indecency', after admitting a sexual relationship with another man. He was given a choice between 18 months prison time (which considering his crime, was not exactly wise), or chemical castration, which included side effects such as breast enlargement. He chose the latter.

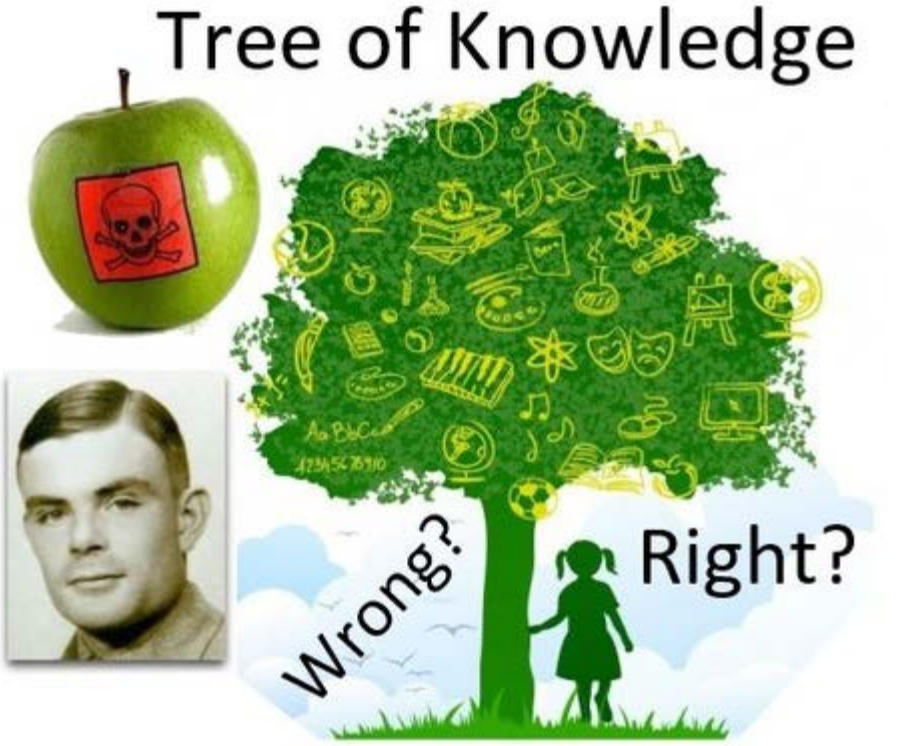

British polymath Alan Turing met his end via cyanide-laced apple in 1954 for so-called "homosexual" crimes committed two years prior while doing pioneering work on the in chemical thermodynamics of morphology.

On the 7 Jun 1954, unable to endure the humiliation and pain of his punishment, Turing took his own life by eating an apple laced with cyanide:

> "Turing was found by his cleaner when she came in on 8 June 1954. He had died the day before of cyanide poisoning, a half-eaten apple beside his bed. His mother believed he had accidentally ingested cyanide from his fingers after an amateur chemistry experiment, but it is more credible that he had successfully contrived his death to allow her alone to believe this. The coroner's verdict was suicide."
>
> — Andrew Hodges (1995), Turing.org.uk (Ñº)

Despite this, it would take another 13-years for homosexuality to be decriminalized in the Britain. [14] It is conjectured, by Libb Thims (2016), among others, e.g. David Quammen (2001), as shown below, that Turing' use of the apple was a symbolic message to humankind:

> "Still another irony, conscious on his part, appeared in his choice of a suicide method. From the evidence found in his house, it seems that he soaked half an apple in a solution of potassium cyanide. He lay calmly on his bed. He ate a few bites of the apple and died. What was he trying to say about the tree of knowledge of good and evil?"
>
> — David Quammen (2001), *The Boilerplate Rhino: Nature in the Eye of the Beholder* (pg. 148)

In short, knowing that Turing's forced demise resulted from the society-deemed legally-enforced view that homosexuality was a "wrong" behavior, i.e. an unnatural act, in the Biblical-minded eyes of many, that Turing's use of the "apple" to meet his reaction end may have been symbolic of message for humankind to eat more from the forbidden tree of knowledge so that the future might have a better foundational handle on the fundamental difference between "right" behavior as compared to "wrong" behavior.

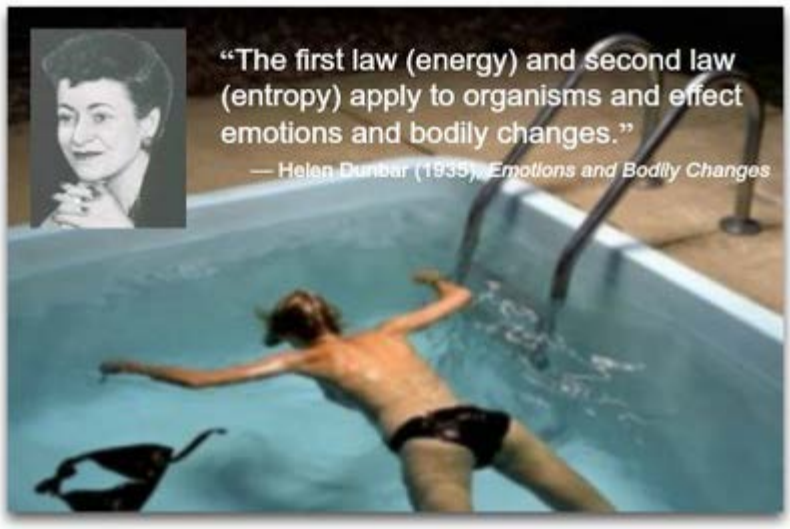

In 1959, American "emotional thermodynamics" founder Helen Dunbar, age 57, was found "floating face down" in her swimming pool; her dereaction reported as suicide, following a period, in her last years, of increased "stress handled with alcohol".

Dunbar

In 1959, American polymath Helen Dunbar, the founder of the "emotional thermodynamics", was found face down in her pool, after about a decade of increased social resistance (mostly of the religious type) to her Freud "energy psychology" based theories and other issues. Having endured a certain level of emotional abuse growing up, because of her 4'11'' height, dubbed "Little Dunbar" in youth and "Pocket Minerva" at medical school, diagnosed with pseudo infantile paralysis, a "rachitic, weakening disease", and in adolescence with a "metabolic disturbance" (Powell, 1974); others have labeled her condition as "failure to thrive" (Hart, 1996). Her last reaction state is reported by Hendriak Kemp as follows: [23]

> "Dunbar's last years were difficult, and she sometimes handled the stress with alcohol. Soule's views on social medicine created problems for her with the New York Academy of Medicine; a secretary committed suicide in 1948, a patient (Raymond Roscoe Squier) in 1951; Dunbar was in a near-fatal auto accident 1954; she had to defend herself against a senseless and sensational lawsuit. On 21 August 1959 Dunbar was "found floating face down in her swimming pool" (Powell, 1974, p. 275). The New York *Times* and *Herald-Tribune* reported her death as a suicide; the coroner ruled it simply death by drowning."

Dunbar's stress increase, no doubt, was triggered into a higher level, when in 1942, she was forced to departure from her role as medial director of the Council Council for Clinical Training of Theological Students, which she began in 1930, for reasons was due in part to her Freudian and Reichian ideas. [2]

Bridgman

In 1961, American physicist Percy Bridgman, noted for his high pressure physics work, thermodynamics formula derivation system, aka the Bridgman formulas (720 equations, organized into 10 groups), and the so-called Bridgman paradox about the supposed inability to calculated state functions of living things (e.g. people), committed suicide by gunshot after living with metastatic cancer for some time. Specifically, in 1961, Bridgman, at the age of 79, shot himself in the head; his suicide note read in part: [7]

In 1961, American physicist Percy Bridgman, eponym of Bridgman formulas, the systematic collection and derivation of the main equations in thermodynamics, at the age of 79, shot himself in the head after living with megastatic cancer form some time.

> "It isn't decent for society to make a man do this thing himself. Probably this is the last day I will be able to do it myself."

American surgeon, bioethicist, and death-with-dignity advocate Sherwin Nuland (Ñº), in his *How We Die: Reflections on Life's Final Chapter*, following discussion of Seneca's views on death, cites Bridgman as the foremost clarion call to reason in respect to the need for death with dignity: [13]

> "Against such a standard, the suicide of **Percy Bridgman** was close to being irreproachable. Bridgman was a Harvard professor whose studies in high-pressure physics won him a Nobel Prize in 1946. At the age of seventy-nine and in the final stages of cancer, be continued to work until he could no longer do so. Living at his summer home in Randolph, New Hampshire, he completed the index to a seven-volume collection of his scientific works, sent it off to the Harvard University Press, and then shot himself on August 20, 1961, leaving a suicide note in which he summed up a controversy that has since embroiled an entire world of medical ethics:
>
> > 'It is not decent for society to make a man do this to himself. Probably, this is the last day I will be able to do it myself.'
>
> When he died, Bridgman seemed absolutely clear in his mind that he was making the "right" choice. He worked right up to the final day, tied up loose ends, and carried out his plan. I'm not certain how much consideration he gave to consulting others, but his decision had certainly not been kept a secret from friends and colleagues, because there is ample evidence of his having at least informed some of them in advance. He had become so sick that he felt it doubtful that he would much longer be capable of mustering up the strength to carry out his ironclad resolve. In his final message, Bridgman deplored the necessity of performing his deed unaided. A colleague reported a conversation in which Bridgman said:
>
> > 'I would like to take advantage of the situation in which I find myself to establish a general principle; namely, that when the ultimate end is as inevitable as it now appears to be the individual has a right to ask his doctor to end it for him.'?
>
> If a single sentence were needed to epitomize the battle in which we are all now joined, you have just read it."

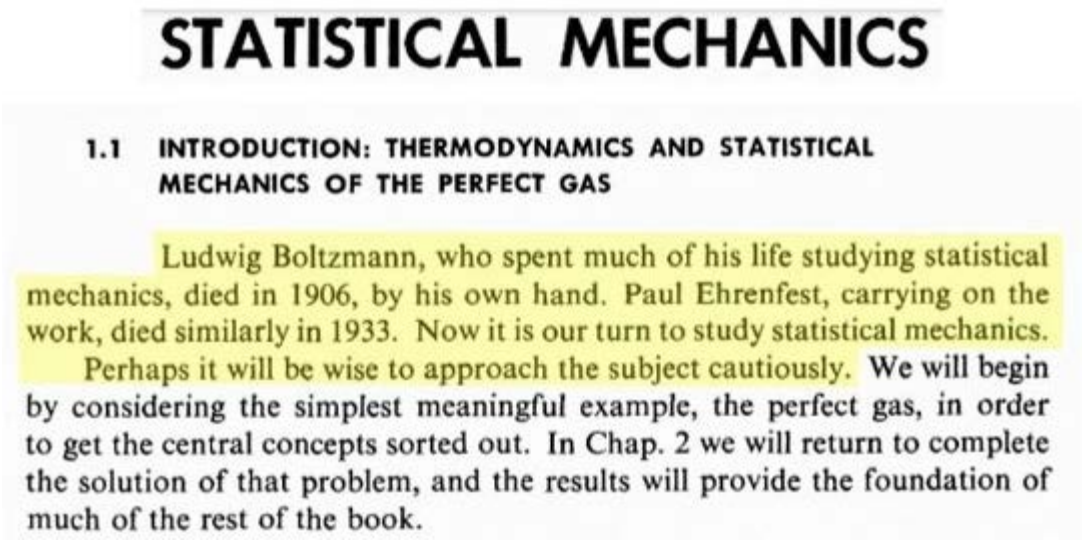

STATISTICAL MECHANICS

1.1 INTRODUCTION: THERMODYNAMICS AND STATISTICAL MECHANICS OF THE PERFECT GAS

Ludwig Boltzmann, who spent much of his life studying statistical mechanics, died in 1906, by his own hand. Paul Ehrenfest, carrying on the work, died similarly in 1933. Now it is our turn to study statistical mechanics.

Perhaps it will be wise to approach the subject cautiously. We will begin by considering the simplest meaningful example, the perfect gas, in order to get the central concepts sorted out. In Chap. 2 we will return to complete the solution of that problem, and the results will provide the foundation of much of the rest of the book.

Opening paragraph to American physicist David Goodstein's 1975 book *States of Matter*, characterized by some (Ñº) as "possibly the greatest opening paragraph in a science textbook ever." [9]

Here we see the precise methodicalness and relentless pristine logic with which Bridgman ran ever moment of his existence, which would seem to capture the mindset of a large percentage of thermodynamicists outlined above, namely a young adult going into an extremely precise systematic way of deriving the main 720-equations of thermodynamics

(1914) by taking the first derivatives of the 10 fundamental quantities (see: Bridgman formulas), to his operationalism model of meaning (1926), which asserts that ALL concepts without a operational means of "measurement" are meaningless, his 1941 *The Nature of Thermodynamics*, the 1946 Bridgman paradox, on the seeming impossibility of calculating the entropy of a living organism (powered CHNOPS+ system), and for his involvement in the Princeton Department of Social Physics.

The high discerning Bridgman suicide note is frequently quoted (Ñº) in euthanasia and physician-assisted suicide legalization arguments who are up against a culture mind-soaked in mythological-based ethics models of death, as Neuland puts it.

Hawking

In 1985, Stephen Hawking, one the founders of black hole thermodynamics, following a complication wherein he caught pneumonia, after which he underwent a tracheostomy operation, during which a tube was inserted into his windpipe through his neck, bypassing his mouth and nose and irreversibly removing his voice, he admitted that he tried to commit suicide:

> "I admit that when I had my tracheostomy operation, **I briefly tried to commit suicide** by not breathing. However, the reflex to breathe was too strong."
>
> — Stephen Hawking (2014), "Interview" (Ñº), Independent, Jul 17

A screenshot from a 2014 article(Ñº) wherein Stephen Hawking, one of the main founders of blackhole thermodynamics, talks about how he tried to commit suicide by "holding his breath" amid or after a pneumonia -induced tracheostomy operation.

(add)

Deleuze

In 1995, Gilles Deleuze, noted from some type of molecular/molar social thermodynamics theory of sorts, faced with growing respiratory problems, stemming tuberculosis and lung removal, wherein simple tasks such as writing required laborious effort, committed suicide by throwing himself from the window of his apartment. (Ñº)

Fergus

In 2015, Patrick Fergus, noted Atheism Reviews co-host, with human chemical thermodynamics pioneer Libb Thims, shortly before his 30th birthday, similar to atheist Percy Shelley, a co-founder of human affinity chemistry, the forerunner to human chemical thermodynamics, committed suicide, via alcohol and drug overdose, while on vacation in Thailand, after reportedly telling a number of people that he probably wouldn't be coming back.

Other

In the 2008 world government and politics human thermodynamics education lecture notes of American government professor Richard Hughes, he states that a reading of chapter eighteen of Greek-born Belgian physicist Grégoire Nicolis and Belgian chemist Ilya Prigogine's, 1977 *Self-Organization in Non-Equilibrium Systems*, one of the founding books of

nonequilbrium thermodynamics, will help one get "through many a rough night avoiding the thoughts of suicide." [3]

Lecture notes

A number of thermodynamics and or statistical thermodynamics writers and professors, on David Goodstein's 1975 lead, now open to semi-humorous warnings about the dangers of studying statistical mechanics and or thermodynamics, e.g. Y.V.C Rao (Ñº), Franco Nori (Ñº), etc.;

> "When I was an undergraduate studying physics, my physics supervisor introduced me to thermodynamics by explaining that Ludwig Boltzmann committed suicide in 1906, as did Paul Ehrenfest in 1933. Now it was my turn to study what had driven them both to take their own lives."
>
> — Peter | telescoper (2009), "The Thermodynamics of Beards" (Ñº), Jul 14

The following is an opening quote from Benjamin Crowell's thermodynamic chapter: (Ñº)

> "S = k *log* W — Inscription on the tomb of Ludwig Boltzmann, 1844-1906. Boltzmann, who originated the microscopic theory of thermodynamics, was driven to suicide by the criticism of his peers, who thought that physical theories shouldn't discuss purely hypothetical objects like atoms."

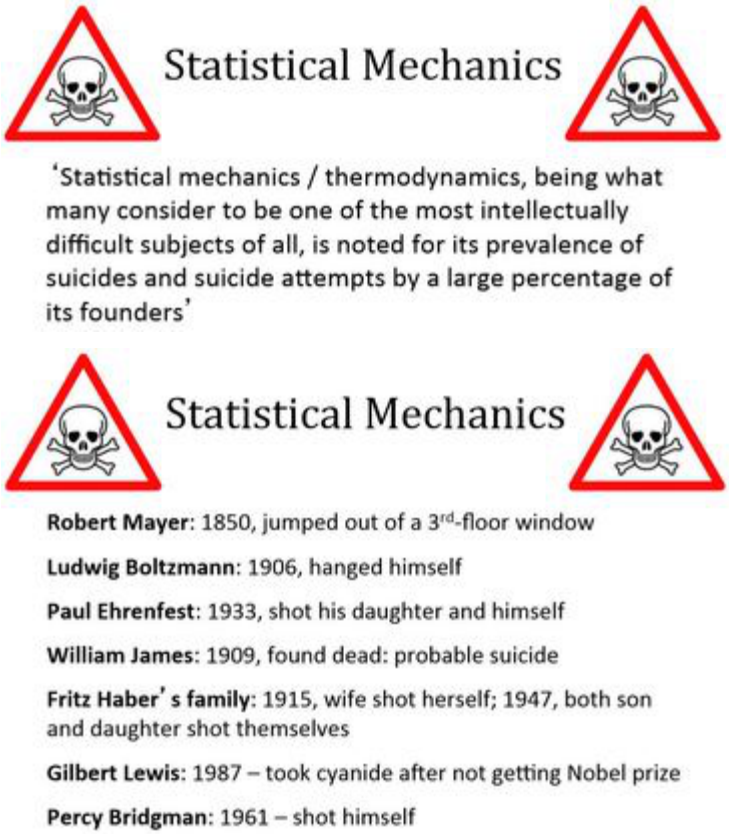

Online PowerPoint lecture notes English professor Brian Cowan's Statistical Mechanics course. (Ñº)

Shown adjacent (Ñº) are English professor Brian Cowan's Statistical Mechanics course PowerPoint lectures. Correctly, to note, William James didn't commit suicide, and Gilbert Lewis' death (reaction end) date (1946) is off; but, whatever the case, humor it seems wins out in this bullet point stylized case in point.

Films | Cited

The 2018 film The Laws of Thermodynamics, by by Mateo Gil, indirectly cites the above article, when the professor warns his graduate student, at least twice, about how there have been many thermodynamics founders and entire families and children of founders, e.g. Fritz Haber, who have committed suicide.

Quotes | Cited

The following are quotes that cite the above article:

> "Historians of science have long made note of the surprisingly high rate of suicide attempts amongst the founders of thermodynamics. On the face of it, it makes a great deal of sense; thermodynamics is a particularly grim branch of physics which (among other, much more useful things) seems to prove the inevitability and irreversibility of death. Indeed, in applying it to the entire universe, Lord Kelvin argued that not only life itself, but all physical processes anywhere would eventually become impossible. I admit that I am sympathetic to this view, and that I can even occasionally make myself dizzy by thinking about it too deeply. And yet, at the same time, coming from my own, individual perspective, I actually often find the idea of entropy to be comforting. The reason is this: it is very easy, as a transgender person, to fall into the trap of thinking of yourself as a defect. This, indeed, is how broad segments of society see us and there

is a tendency to internalize this view; that we are nothing more that a sort of blight upon the perfect, Platonic forms of gender; that, indeed, in a perfect world, we would not exist at all. But **thermodynamics cuts through this nonsense**. It shows that on a macroscopic scale, variation is not only to be expected– but is, indeed, necessary. And further, that this variation is a much more fundamental aspect of nature than all of these illusory, macroscopic-scale forms which are ultimately nothing more than emergent properties of massive numbers of atoms. It becomes apparent that things like gender determination are nothing more than complex sequences of chemical reactions, and that in such complicated reactions, some degree of variation is almost inevitable. I should note that I am not stating this as to make any sort of prescriptive statement; this is merely how I justify my own existence to myself."

— Jaime (2013), "The Consolation of Thermodynamics" (Ñº), Jun 21

"Decided to drop my applied thermodynamics class after reading this post."

— Ara (2018), Tweet (Ñº), Mar 4

See also

â— Christian de Duve | Dereacted (age 95) at the time of his choice via euthanasia, which is legal in Belgium
â— Ettore Majorana (disappearance)
â— Halbwachs indicator | Suicide rate as gauge of social temperature

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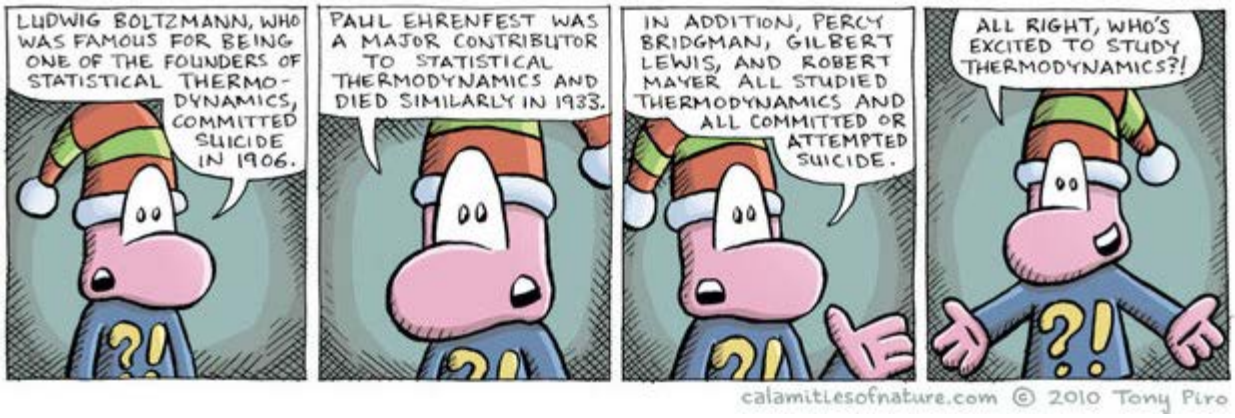

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External links

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θΔics

In hmolscience, **founding fathers fallacy** refers to the over-common, albeit misaligned, assertion, that the founding fathers of America were Christian and that American was founded as a "Christian nation". Correctly, in the US Constitution, the founding document of America, the word "god" is NOT found; moreover, the First Amendment (1791) prohibits such integration.

Founding Fathers | List

The following is a meta-analysis ranked listing of the "founding fathers" of America:

	Founder	[3]	[4]	[5]	Atheism	Ligare | Belief	Discussion
1.	Thomas Jefferson (1743-1826) | **P3** IQ:180|#91	3	3	3	[HD:17] [FA:54] [GA:28]	Atheist [labeled] Epicurean materialism [self-defined]	Authored: Declaration of Independence (1776); advised his nephew to "question with boldness the existence of god" (1797); penned his own Jefferson Bible (1813); most-intelligent American President according to polled (2013) opinion. [7]
2.	James Madison (1751-1836) | **P4** IQ:165|#245	5	4	5	[HD:18] [FA:57]	Atheist [labeled] Social physics [see: Princeton] Anti-Episcopalian	Authored: US Constitution (1787), wherein the word "god" not employed, based on Newtonian mechanics (see: Newtonian government).
3.	John Adams (1735-1826) | **P2** IQ:170|#216	4	2	2	[HD:14]	Free-thinker [self-defined] Irreligionist [self-defined]	"The government of the United States is **not in any sense founded** on the Christian religion." — John Adams (1797), Article 11 of Treaty of Tripoli, Jun 7
4.	Benjamin Franklin (1706-1790) IQ:175|#160	1	5	4	[HD:13] [FA:40]	Atheist [labeled] Deist [self-defined]	He edited out the term "sacred", in Jefferson's first draft of the Declaration, for the term "self-evidence", so to replace a religion assertion with a rational assertion. (Q)(Q)
5.	George Washington (1732-1799) | **P1**	2	1	1		Atheist [labeled] Deist / Christian [classified] (Q)	In his day, was often labeled an atheist; evidence shows that he was a man of deep, though unorthodox, faith, with views tending toward deism; was fond of referring to god as providence. (Q) Used Thomas Paine's writings to inspire his troops to remember what they were fighting for, and even suggested that no other individual had done more for the cause of American independence. [6] Refused to take communion; refused to kneel in prayer in churches or at

	IQ:140|#415						Valley Forge; refused to have a priest at his death bed; refuse to take last rites.
6.	Thomas Paine (1737-1809)	10	7	6	[HD:15] [FA:49] [GA:28]	Notorious atheist Deist [self-characterized] Penned: Atheist's Bible	Considered the first American freethinker to be "labeled an atheist" (Jacoby, 2004). His writings were used by Washington to inspire troops to remember what they were fighting for, and even suggested that no other individual had done more for the cause of American independence. John Adams stated that without his pen, Washington's military victories would have been in vain. [6]
7.	Samuel Adams (1722-1803)	11	6	7		Puritan (Q)	A supporter and correspondent (Q) of Thomas Paine and his *Common Sense* and *Age of Reason*.
8.	Alexander Hamilton (1755-1804)	6	9	9		Secular (Q)	
9.	Patrick Henry (1736-1799)		8	8			
10.	John Jay (1745-1829)	7	14				
11.	James Monroe (1758–1831) | **P5**	8				Deist (Q)	
12.	Abigail Adams (1744-1818)	9					
13.	Gouverneur Morris (1752-1816)		10	10			
14.	John Hancock (1737-1793)	12	11				
15.	John Marshall (1755-1835)		12				
16.	Peyton Randolph (1721-1775)		13				
17.						Atheist	Founding father of Vermont, the 14th state.

Ethan Allen
(1737-1789)

(add)

Overview

It is frequently asserted, amid religious vs atheism discussions, that America was founded on the Bible and or Christianity. This, however, is incorrect.

In 1996, James Haught, in his *2,000 Years of Disbelief*, summarized the founding father's fallacy as such: [2]

> "Since disbelief remains a taboo topic, the pattern that people usually called 'great' tend to be religious skeptics, is rarely mentioned. Church men generally contend that great figures in history, such as **America's founders**, were conventional worshipers. That's untrue. 'One of the embarrassing problems for the early nineteenth-century champions of the Christian faith was that not one of the first six presidents of the United States was an orthodox Christian', philosopher and educator Mortimer Adler and a team of *Encyclopedia Britannica* writers said."

In 2014, Matthew Stewart, in his *Nature's God: the Heretical Origins of the American Republic*, traced the origins of the secular nature of the founding fathers; the abstract of which is as follows: [8]

> "America's founders intended to liberate us not just from one king but from the ghostly tyranny of supernatural religion. Drawing deeply on the study of European philosophy, Stewart brilliantly tracks the ancient, pagan, and continental ideas from which America's revolutionaries drew their inspiration. In the writings of Spinoza, Lucretius, and other great philosophers, Stewart recovers the true meanings of "Nature's god," "the pursuit of happiness," and the radical political theory with which the American experiment in self-government began."

(add)

Declaration of Independence

The following shows the famous 28 Jun 1776 presentation of the Declaration of Independence, the declaration itself penned by Thomas Jefferson, by the so-named Committee of Five (Q)(Q), the three main committee members, namely Jefferson, John Adams, and Benjamin Franklin shows with their respective Haught disbeliever rankings, of the top 64 disbelievers of history:

Signing of the Constitution

The following depicts the scene at the 17 Sep 1787 scene (Q) at the signing of the Constitution of the United States, following its 1776 "Declaration of Independence", by the newly formed 13 American colonies, from Great Britain, with key players, namely William Hamilton, Benjamin Franklin, James Madison, the architect of the constitution, who used Newtonian government as the foundation of its structure, and Thomas Jefferson, the first American President, along with respective Haught disbeliever rankings shown below Franklin and Madison:

Other

The following are related images founding fathers John Adams, Thomas Jefferson, and James Madison:

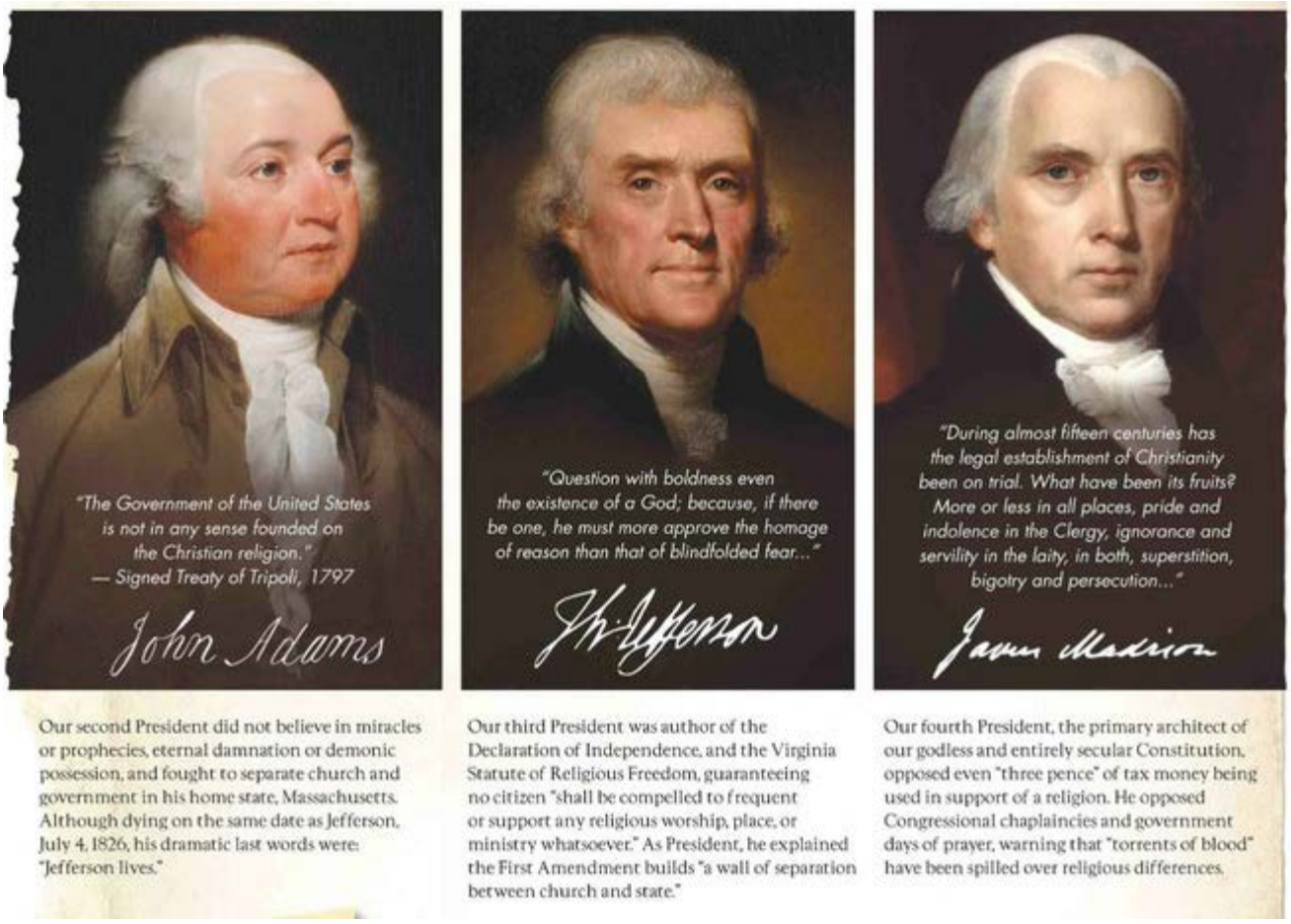

The following are related images founding fathers Thomas Paine, author of *Age of Reason* (1794), Benjamin Franklin, and George Washington:

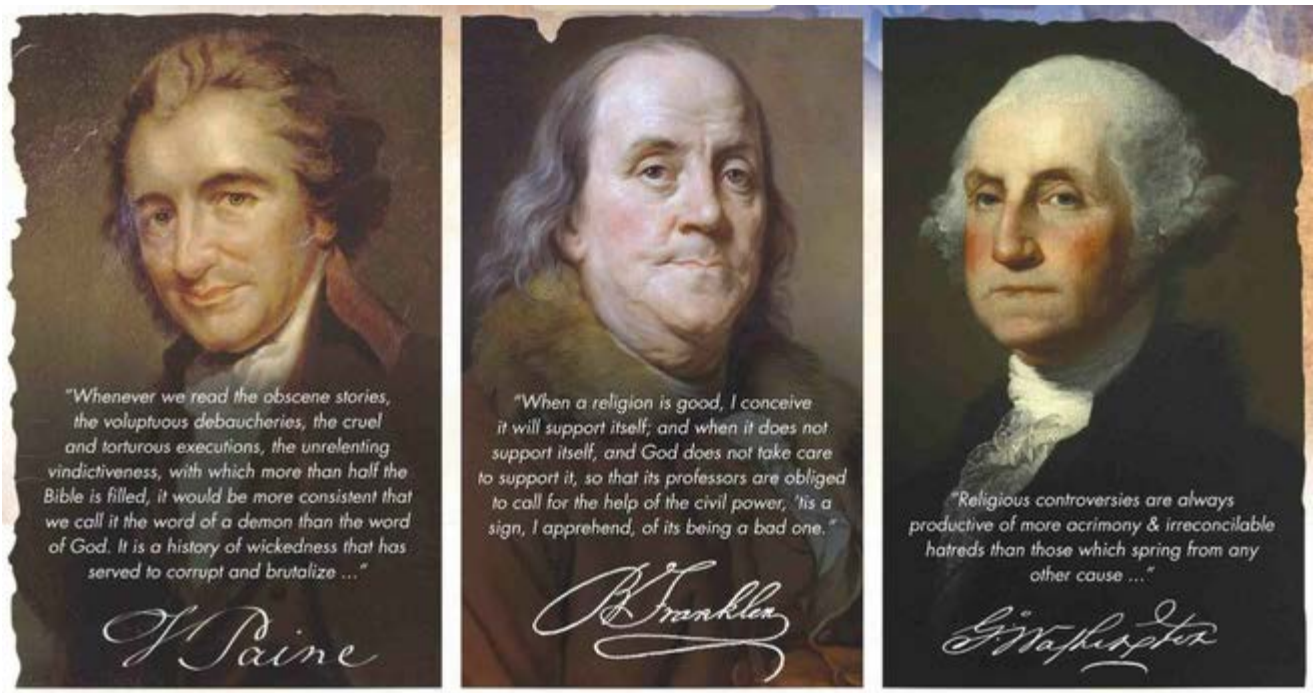

The revolutionary who gave the United States of America its very name and who fanned the flames of the American Revolution utterly repudiated Christianity and the bible. Paine wrote that "My religion is to do good" and "My own mind is my own church."

This revolutionary and Deist suggested the motto on currency should read "Mind your business." As Secretary of the Constitutional Convention he recorded that there was no prayer or support for his own prayer motion: "The Convention, except three or four persons, thought prayer unnecessary."

Our first U.S. President refused to take communion, kneel in prayer in churches (or at Valley Forge), have a priest at his deathbed or take last rites.

The seven main founding fathers, according to Historian Richard Morris (1973), are: John Adams, patriarch of physicochemical social dynamics pioneer Henry Adams, Benjamin Franklin [science believer], Alexander Hamilton, John Jay, Thomas Jefferson [separation of church and state], James Madison [Newtonian government constitution], and George Washington. [1] Another noted founder is: John Witherspoon, a Princeton social physics chief.

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External links

● Founding Fathers of the United States – Wikipedia.
● The Faiths of the Founding Fathers – Wikipedia.

θΔics

In science, **four element theory**, as compared to three element theory (Heraclitus, 500BC), refers to the belief that the universe is comprised of four "elements" (Plato, 375BC) or "roots" (Empedocles, 445BC), namely: earth, air, water, and fire:

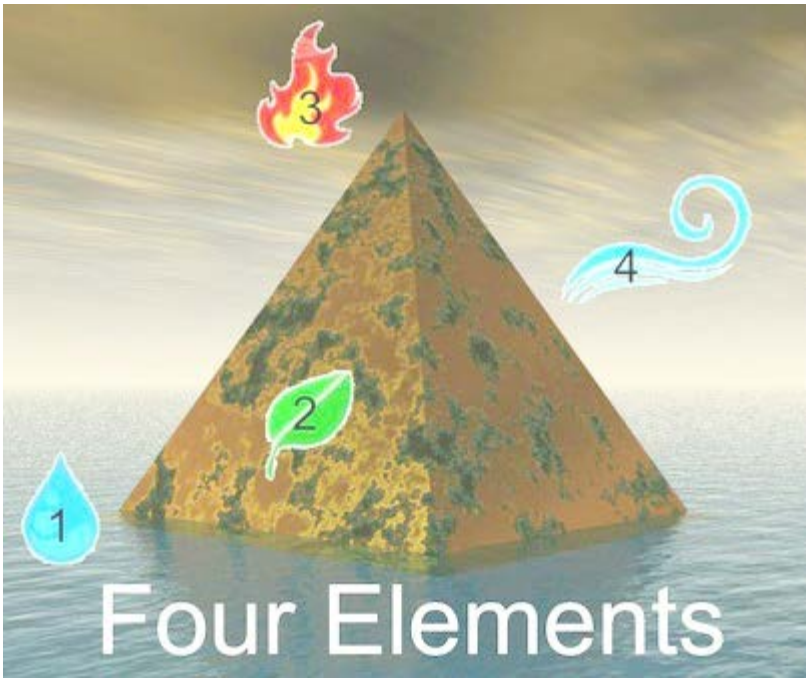

The basic Egyptian "**four element theory**", based on Heliopolis creation myth (3100BC), which Thales, in his 600BC studies in Egypt, absorbed as the basis of his water as the primary element theory, which eventually morphed into the Greek four element theory, which was passed along for two thousand years, until superseded by discover of the 92 naturally occurring periodic table of "elements", beginning in the late 18th century, generally initiated in the work of Lavoisier.

along with a fifth carrier-like element "ether", according to some models.

History

In 3100, Egyptian thinkers conceptualized a three-element model of the cosmos, having originally been "water", out of which "earth" (land mound or Nun) arose, from which "fire" (sun or Ra) burst forth, the logic of which may possibly be found in the 2600BC writings of Imhotep, regarding the Heliopolis creation myth, out of which "air" (Shu) and "moisture" (Tefnut) were engendered, albeit all conceptualized at types of gods.

In 600BC, Greek philosopher Thales of Miletus (c.624-c.546BC), who is attributed by Aristotle to have been the first philosopher in the Greek tradition, was the first to initiate the study of Egyptian philosophy, and or Egyptian mythology, of nature, by himself traveling to Egypt.

Here, Thales learned, according to Heliopolis creation myth, and its derivatives, that water came first, out of which earth and fire came next, and later wind, albeit in the form of the gods: Nun, Ptah, Ra, and Shu, respectively. Thales, according to most accounts, scraped the gods, but held to the four element theory, or at least held to the model that "all is water", out of which all else proceeds. [1]

The theory of “four elements”, according to Plato (375BC), is attributed to a list created by Empedocles (445BC), who in turn assembled the list as a type of unified theory, from the thinkers before him, namely: Thales (575BC), who regarded “water” as the primordial element, Anaximenes (550BC) “air”, Heraclitus (475BC) “fire”, and Parmenides (475BC) or the Eleatics “earth”. (Ñº)

In 77AD, Pliny the elder, in his *Natural History*, summarized the then-prevalent, mostly Aristotle based, four element theory, as follows: [2]

> “I do not find that any one has doubted that there are

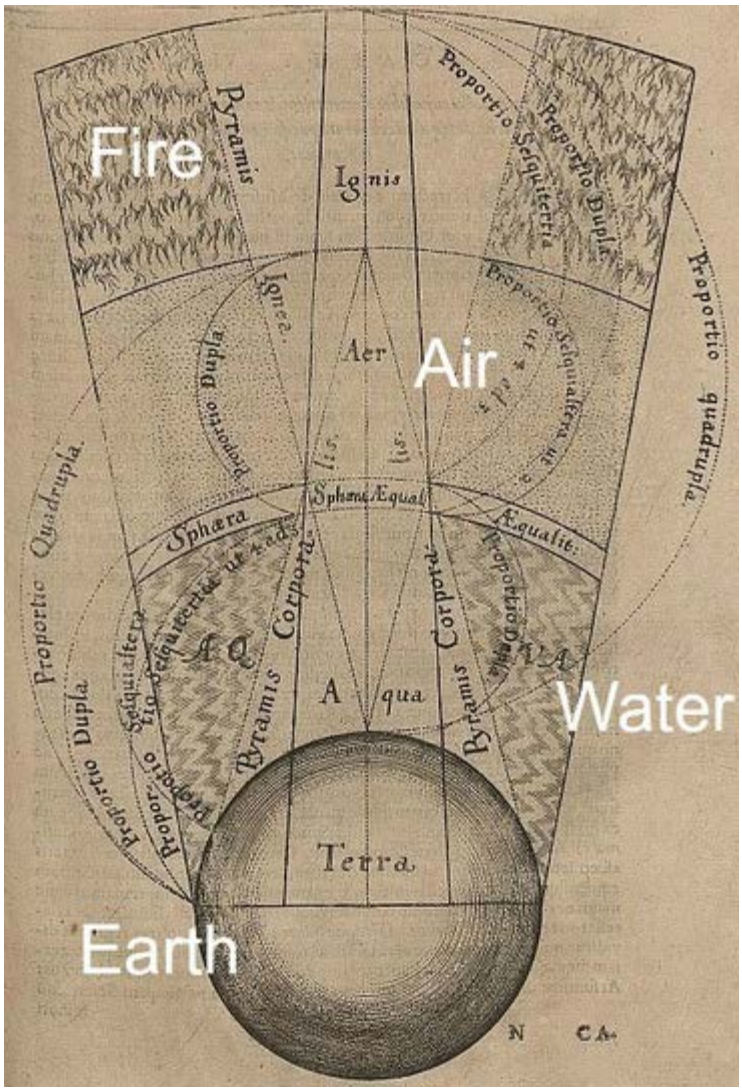

Robert Fludd's 1617 **four element model** of the the earth.

four elements. The highest of these is supposed to be fire, and hence proceed the eyes of so many glittering stars. The next is that spirit, which both the Greeks and ourselves call by the same name, air. It is by the force of this vital principle, pervading all things and mingling with all, that the earth, together with the fourth element, water, is balanced in the middle of space. These are mutually bound together, the lighter being restrained by the heavier, so that they cannot fly off; while, on the contrary, from the lighter tending upwards, the heavier are so suspended, that they cannot fall down. Thus, by an equal tendency in an opposite direction, each of them remains in its appropriate place, bound together by the never-ceasing revolution of the world, which always turning on itself, the earth falls to the lowest part and is in the middle of the whole, while it remains suspended in the centre, and, as it were, balancing this center, in which it is suspended. So that it alone remains immoveable, whilst all things revolve round it, being connected with every other part, whilst they all rest upon it."

In 1617, Robert Fludd outlined a four element theory, depicted adjacent, based conceptualized geocentric cosmology, showing a segment of the macrocosm showing the elemental spheres of terra (earth), aqua (water), aer (air), and ignis (fire). (Ñº)

In 1804, Percy Shelley, age 14, entered Eton College, during which time he translated half of Pliny's *Natural History*, spent his money on books, chemical instruments, and acts of liberality; one of his oft-spoken pronouncements during this time was: [4]

> "Nothing ever delighted me so much as the discovery that there were no *elements* of earth, fire, or water."

(add discussion)

Quotes

The following are related quotes:

> “Let those philosophers disappear, who attribute natural corporeal principles to the intelligence attached to matter, such as Thales, who refers everything to water, Anaximenes to air, the Stoics to fire, Epicurus to atoms, that is to say, to infinitely small objects that can neither be divided nor perceived.”
>
> — Augustine (c.400)

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θΔics

In terminology, **four horsemen of atheism**—a spin on the "Four Horsemen of the Apocalypse", described in Revelations, the last book of the New Testament of the Bible, about a book or scroll in God's right hand, closed with seven seals, made to open via the appearance of the Lamb of God (aka Jesus Christ), the entity known to take away the sins of the world (i.e. scapegoat), who opens the first of the four of seven seals, which summons four "beings" that ride out on white (conqueror), red (war), black (famine), and pale (death) horses, representative of harbingers of the last judgment—refers to either the four Greek atomic theory philosophers: Leucippus, Democritus, Epicurus, and Lucretius, aka the chiefs of the "school of atheism" (Francis Bacon, c.1601), or the so-called leaders of new atheism movement: Richard Dawkins, Daniel Dennett, Sam Harris, and Christopher Hitchens, who in 2007 began to be referred to as the "four horsemen of new atheism". [1]

The original **four horsemen of atheism**, namely: the Greek atomic theorists: Leucippus (450BC), Democritus (400BC), Epicurus (300BC), and Lucretius (75BC), who did away with the belief in the existence of gods in favor of belief in the existence of atoms and voids.

Greek atheism

The Greek atomic theory philosophers: Leucippus, Democritus, Epicurus, and Lucretius, have and always will be the original harbingers of the end of faith, the "chiefs of the school of atheism" as Francis Bacon referred to them.

New atheism

In 2007, the term "four horsemen" was used in reference to Richard Dawkins, Christopher Hitchens, Daniel Dennett, and Sam Harris during a debate in which they discussed their criticisms of religion and advocated critical thinking. [3]

In 2008, the phrase "four horsemen" of atheism or new atheism was being used in a number of books in reference to the four individuals: Richard Dawkins (*The God Delusion*, 2006) Sam Harris (*The End of Faith*, 2004), Christopher Hitchens (*God is Not Great*, 2007), and Daniel Dennett (*Breaking the Spell*, 2007), and their best-selling books.

Top left: a 2011 annotated image of the **four horsemen** of new atheism: Christopher Hitchens, Daniel Dennett, Richard Dawkins, and Sam Harris, who after 9/11 penned best-selling call to end faith stylized and or anti-god belief books. Right: European lawyer, philosopher and self-defined lapsed agnostic Bo Jinn's 2013 ebook *Illogical Atheism*, supposedly, "takes

The phrase "four horsemen of new atheism", according to John Lennox, is attributed, at least in book form, to the publication Scott Hann and Benjamin Winker's *Answering the New Atheism: Dismantling Dawkins' Case Against God*, published on 8 May 2008, wherein they state the following: [2]

"We live at a point in history where atheism is shoving its way into the public square, and noisily declaring the need to remove religion. A cadre of militant unbelievers calling themselves **The Four Horsemen**—Richard Dawkins, Sam Harris, Christopher Hitches, and Daniel Dennett—have assumed the leadership of a growing Anglo-American movement, releasing volley after volley .."

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down all four horsemen", of the new atheists, in one book, showing how they are lacking and easily defeated. (Ñº)

New Atheism: Dismantling Dawkins' Case Against God (pg. 10). Road Publishing.
(b) Lennox, John. (2011). *Gunning for God: Why the New Atheists are Missing the Target* (pg. 94). Lion Books.
2. Pasquini, John J. (2009). *Atheist Personality Disorder: Addressing a Distorted Mindset* (pgs. xi-xii). AuthorHouse.
3. Gribbin, Alice. (2011). "Preview: the Four Horsemen of New Atheism Reunited" (Ñº), *New Statesman*, Dec 22.

External links

â— Four Horsemen of the Non-Apocalypse (section) – Wikipedia.

θΔics

In thermodynamics, the **fourth law of thermodynamics** refers any of a number of various hypothetical or postulated statements regarding either energy, matter, temperature, time, or power principles in nature.

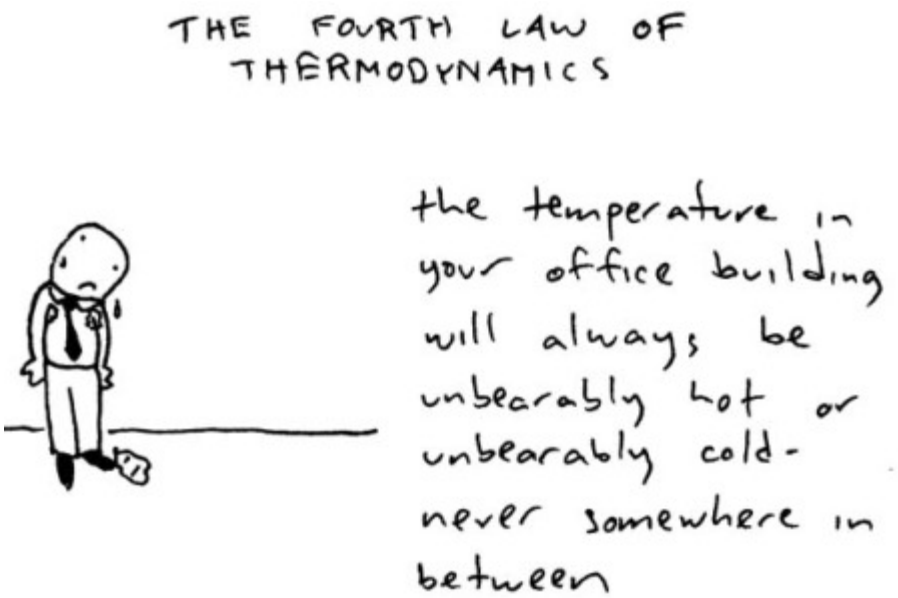

A 2005 thermodynamics humor version of a **fourth law** of thermodynamics. [9]

Newly stated fourth laws often have reference to evolution, in such a way that they are said to reconcile the increasing entropy tendencies of the second law. In the history of thermodynamics, there have been dozens of various supposed "fourth laws". [1]

Overview

The first mention of the idea of a 'fourth law' of thermodynamics seems to have occurred in the 1930s lectures of German chemist Walther Nernst, formulator of the third law. Specifically, at the end of a 1937 lecture at Oxford University, remembered vividly by English physical chemist Keith Laidler, Nernst commented that it took three people to formulate the first law, two for the second, but that he had been obliged to do the third all by himself; hence, by extrapolation, there could never be a fourth law. [8] A later 1990 restatement of this logic by American physicist Peter Landsberg is: [6]

> "There cannot really be a fourth law for the following reason: There were three main personalities whose work led to the formulation of the first law: Mayer, Helmholtz, and Joule. Two people, Carnot and Clausius, were the main pioneers of the second law, while only one person, Nernst, was involved in the original statement of the third law. Thus nobody can formulate a **fourth law**. Now the zeroth law does not fit into this scheme, but then everybody knows about that law."

In other words, Nernst (and later Landsberg) was using mathematical humor to say or argue that:

Number of people behind development of	People	Law
3	Mayer, Joule, Helmholtz	First law
2	Carnot and Clausius	Second law
1	Nernst	Third law
0	Nobody (according to Nernst, via extrapolation of first column)	Fourth law

No one, as history has shown, however, has ever seemed to heed this warning as to the impossibility of the forth law, as discussed below.

In 1952, Norwegian-born American physical chemist Lars Onsager's 1929 reciprocal relations began to be referred to as the fourth law of thermodynamics.

In 1972, American physicist Peter Landsberg began to refer to the far from equilibrium theories of Belgian chemist Ilya Prigogine, specifically applied to living systems, as a fourth law of thermodynamics. [5]

In economic thermodynamics, Romanian-born American mathematical economist Nicholas Georgescu-Roegen's 1977 statement that in a closed system, such as a human society, "material entropy must ultimately reach a maximum," has popularly (or rather infamously) become known as the Georgescu's fourth law of thermodynamics [2] This statement has been paraphrased as "in a closed system it is impossible to completely recover the matter involved in the production of work." [3]

Between 1992 and 2000, Sven Jorgensen has been aiming to promote the following statement "ecosystems attempt to develop toward a higher level of exergy" as a tentative fourth law. [7]

In 2000, American biochemist Stuart Kauffman posited a new fourth law, based on the logic of thermodynamic work cycles, to justify a view that in Darwinian evolution there exist chemical systems that act to better their own interest. [4]

Since about 2006, Romanian-born American mechanical engineer Adrian Bejan has been moving to position his 1996 constructal theory to position of a 'new principle of thermodynamics'. In 2009, he has begun to allude to the proposition that his theory is the fourth law of thermodynamics: [10]

> "This body of empirical evidence forms the basis for a new law of nature that can be summarized as the constructal law. This 'fourth law' brings life and time explicitly into thermodynamics and creates a bridge between physics and biology."

In 2010, Norwegian geneticist Bjorn Sponberg began promoting a religious thermodynamics themed fourth law.

Other

Other uncited humorous versions of so-called forth laws include:

> "If you can disprove the first three ... no funding for you!"
>
> —Anon (Ñº)

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θΔics

In human physics, **Francesco Algarotti** (1712-1764) was an Italian natural philosopher noted for his 1737 book *Newtonianism for the Ladies*, in which he "employs the inverse square law to calculate the power of attraction between a pair of separated lovers". [1]

Overview

In 1737, Algarotti, in his *Newtonianism for the Ladies*, is said to have used Newtonian mechanics to develop or outline a theory of love. [2] Algorott, in short, conceptualized attraction between two people as being proportional to the inverse of their respective distance of separation squared:

$$\text{attraction} \propto \frac{1}{d^2}$$

Said another way:

$$\text{Love} \propto \frac{1}{d^2}$$

meaning that, according to Algarotti, love, the the attraction of passion, falls off with distance of separation. This is equivalent, in some sense, to the modern saying “different area codes, different rules” aka the “area code rules” (Ñº) of urban relationship folklore.

Algarotti's book, naturally enough, was placed on the Vatican's Index of banned book. (Ñº)

Education

Algarotti studied natural sciences and mathematics and the University of Bologna. Algarotti in 1728 studied natural sciences and mathematics under Cartesian-turned-Newtonian follower Francesco Zanotti, at the University of Bologna, and so naturally enough, in his 1737 book *Newtonianism for the Ladies*, considering people as like celestial bodies, modelling their interaction via celestial mechanics. [4]

Associates | Students

Algarotti was a friend and associate of Voltaire, and, along with Daniel Bernoulli, among others, was one of the mathematics and physics teachers of Emilie Chatelet. [3]

References

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3. Andrew, Edward. (2006). *Patrons of the Enlightenment* (pg. 101). University of Toronto Press.
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External links

â— Francesco Algarotti – Wikipedia.

θΔics

In science, **Francesco Sagredo** (1571-1620) was an Italian scientist and diplomat notable for his interest in physics of temperature and magnets for and support of Galileo Galilei.

Overview

Sagredo, supposedly, was extremely interested in the magnet experiments of William Gilbert. [3]

Sagredo added a scale to Galileo's thermoscope to enable the quantitative measurement of temperature. [4]

In 1613, Sagredo gave the first definition of a thermometer, which he defined as an 'instrument for measuring heat', in his description of the device his friend and mentor Italian scientist Galileo Galilei had invented in 1592. [1] Sagredo used the device for measuring the difference in temperature between air, snow, and ice.

Name

In various publications, Sagredo is referred to by at least nine different variants: 'Francesco Sagredo', 'Giovanni Sagredo', 'Gian Francesco Sagredo', 'Gioan Francesco Sagredo', 'Gianfrancesco Sagredo', 'Giovan Francesco Sagredo', Giovan-francesco Sagredo', or 'Giovanni Francesco Sagredo', 'Count Sagredo', variations which seems to depend on the English translator. In his 1632 *Dialogue Concerning the Two Chief World Systems*, according to a translation by Stillman Drake, Galileo was said to have commented: "Many years ago I was often to be found in the marvelous city of Venice, in discussions with Signore **Giovanni Francesco Sagredo**, a man of noble extraction and trenchant wit." [2] The shortened usage-in-text name Francesco Sagredo, found in common usage as early as 1879, seems outnumber other variants; moreover, the middle and last name seem to be the only thing consistent regarding written reference to him; whereas, the first name is found in over five different inflections.

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● Reston, James. (2000). *Galileo: A Life* (Gianfrancesco Sagredo, pg. 48). Beard Books.
● Muller, Ingo. (2007). *A History of Thermodynamics - the Doctrine of Energy and Entropy* (Gianfrancesco Sagredo, pg. 3). New York: Springer.

External links

● Giovannni Francesco Sagredo – Wikipedia.

θΔics

In existographies, **Francesco Lana de Terzi** (1631-1687), aka “Lana Terzi” (Caldwell, 1917), was an Italian physicist, mathematician, naturalist, and linguist, noted for []

Overview

In 1663, Terzi has proposed, based on the work of Otto Guericke, to make a lighter than air flying vessel, based on the premise that four vacuum bulbs could be used to lift a light boat into the air, conceived on the idea that that air was like a fluid.

In 1670, Terzi, in his *Prodrome*, chapter: “On New Inventions Premised on the Master Art”, diagrammed his flying boat as follows:

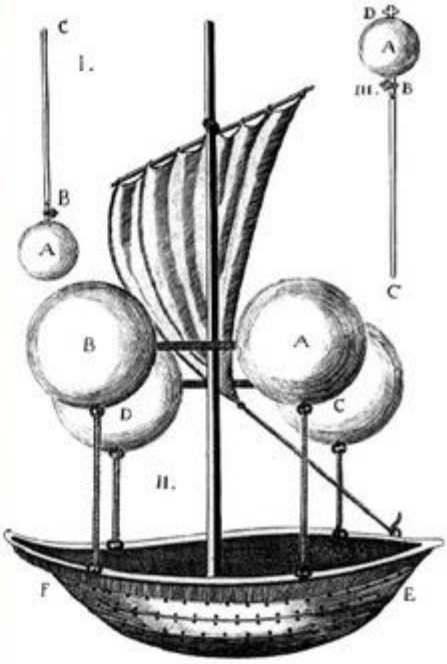

In 1782, Joseph Montgolfier, and his brother brother Etienne Montgolfier, realized this general concept, in the form of hot air balloons.

Further reading

â— Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 12). Cornell University Press.

External links

â— Francesco Lana de Terzi – Wikipedia.

θΔics

In existographies, **Francis Bacon** (1561-1626) (IQ:190|#27) (Cattell 1000:5) [RGM:130|1,500+] (Gottlieb 1000:84) (LPKE:4|18+) (GPhE:#) [CR:149] was English physicist, natural philosopher, and general polymath, a said to be last person to know everything, a commentator on atheism, a pioneer of the scientific method, noted for being one of the first to state, in circa 1600, that heat is motion. [1] Bacon was one of the first to define impelling power. [3]

Education

At age 13, Bacon's mind had revolted against the accepted doctrines, supposedly attributing the sources of error to Aristotle. [10]

Aristotle | Final cause

In 1605, Bacon, in his *The Advancement of Learning*, he dug into the inherent error surrounding final causes.

Of Atheism

In 1597, Bacon penned his essay "Of Atheism", which is filled with a number of frequently cited atheism quotes (Q);

> "Nay, even that school which is most accused of **atheism** doth most demonstrate religion; that is, the school of Leucippus and Democritus and Epicurus. For it is a thousand times more credible, that four mutable elements, and one immutable fifth essence, duly and eternally placed, need no God, than that an army of infinite small portions, or seeds unplaced, should have produced this order and beauty, without a divine marshal."

The following are other related Bacon atheism quotes:

> "Atheism leads a man to sense, to philosophy, to natural piety, to laws, to reputation, all which may be guides to an outward moral virtue, though religion were not but superstition dismounts all these, and erecteth an absolute monarchy in the minds of men."
>
> — Francis Bacon (1625) (Q)

Bacon, supposedly, claimed to be a believer, but the way he put emphases on nonsupernatural causation, according to Kerry Walters (2010), "pushed god into the background and prepared the way for materialism and overt rejection of god belief". (Q)

Enlightenment

Bacon is sometimes classified as one so-called "fathers of the enlightenment", along with Benedict Spinoza, Rene Descartes, John Locke, Isaac Newton, Voltaire, among a few others; many of the latter being indirect proteges of Bacon and his philological pursuits. (Q)

Tree of knowledge

Bacon, in his 1605 *Advancement of Learning*, was the first to make reference to the division of knowledge being like the branches of a tree or what has since come to called the "tree of knowledge". [7]

Heat

The following is his noted quote on the matter which comes from extracts of the twentieth aphorism of the second book of the 1620

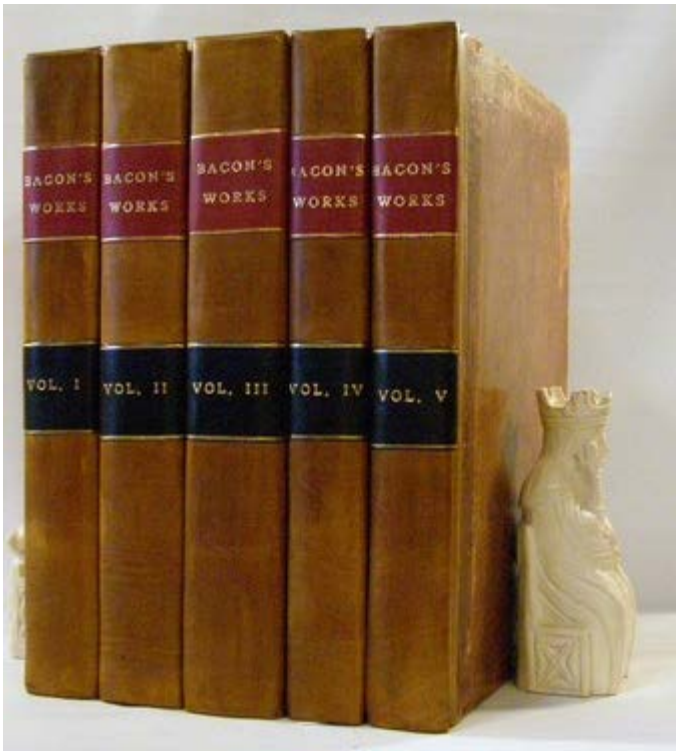

A 5-volume **Francis Bacon** collected works set (Q); a 15-volume collection was also published in circa 1900 by Houghton Mifflin. (Q)

publication *New Instruments* (*Novum Organum*): [2]

> "Heat itself, its essence and quiddity, is motion and nothing else."

This is one of the first statements of what would come to be known in the early 19th century as the kinetic theory of heat.

Goethe | Elective affinity

In 1620, Bacon developed theories on chemical affinity to explain the inherent nature of motion and its causes. Bacon reasoned that 'dispute and friendship are the spurs to motion in nature, and the keys to her works.' [4] Bacon defined chemical affinity as such: [5]

> "It is certain that all bodies whatsoever, though they have no sense, yet they have perception; for when one body is applied to another, there is a kind of **election** to embrace that which is agreeable, and to exclude or expel that which is ingrate; and whether the body be alterant or altered, evermore perception precedeth operation; for else all bodies would be like one to another."

This logic, naturally, evolved into a conception of elective attraction or *elective affinity*, defined as 'a favorable inclination to one more than to another' or a process in which 'a substance tends to combine with certain substances in preference to others.' [6]

It is known that Benedict Spinoza studied Bacon and in turn Goethe studied Spinoza, but it remains to be discerned if Goethe culled directly from Bacon as in the above "election to embrace" model. [8]

Quotes | On

The following are quotes on Bacon:

> "**Bacon** was the wisest, brightest, meanest of mankind."
>
> — Alexander Pope (c.1730), *Publication* [13]

> "Who is there that upon hearing the name of **Lord Bacon** does not instantly recognize everything of genius the most profound, everything of literature the most extensive, everything of discovery the most penetrating, everything of observation of human life the most distinguished and refined."

— Edmund Burke (c.1780), *Publication* [13]

"It is generally allowed that **Lord Bacon** of Verulam **comprehended nearly the whole circle of human knowledge** at the period in which he lived, and foresaw most of the discoveries which have since been made. He laid the foundation of an encyclopedia, and was very near discovering various important philosophical results, such as the weight of the air, &c."

— Charles F. Partington (1825), note on Edward Somerset's 1663 universal character theory [14]

Quotes | By

The following are noted quotes by Bacon:

"Knowledge is power."

— Francis Bacon (c.1610) [6]

"Truth emerges more readily from error than from confusion."

— Francis Bacon (c.1610) [9]

"The worst of all things is defied error."

— Francis Bacon (c.1610), *Publication* (O); cited by Robert Owen (1829) in *Evidences of Christianity: a Debate Between Robert Owen and Alexander Campbell* (pg. 92)

"Truth is the daughter of time."

— Francis Bacon (c.1610) (O)

"We are much beholden to Machiavelli and others who write what men do and not what they ought to do."

— Francis Bacon (c.1610), cited by Lawrence Henderson (1935) [11]

"The first question concerning the celestial bodies, is whether there be a system, i.e., whether they world or universe compose altogether one globe, with a center; or whether the particular globes of earth and the stars be scattered dispersedly, each on its own roots, without any system or common center."

— Francis Bacon (c.1610), *Intellectual Description of the Globes* (*Descriptio globi intellecualis*); in *Philosophical Works* (1905) (pg. 683); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 108)

"If it be granted that the earth moves, it would seem more natural to suppose that there is no system at all, but scattered globes, than to constitute a system of which the sun is the center."

— Francis Bacon (c.1610), *Intellectual Description of the Globes* (*Descriptio globi intellecualis*); in *Philosophical Works* (1905) (pg. 685); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 110)

"We ought to make a collection of particular history of all monsters and prodigious births or productions, and in a word of every thing new, rare, and extraordinary in nature. But this must be done with the most severe scrutiny, lest we depart from truth. Above all, every relation must be considered as suspicious, which depends in any degree upon religion, as the prodigies of Livy: and no less so, everything that is to be found in the writers of natural magic or alchemy, or such authors, who seem, all of them, to have an unconquerable appetite for falsehood and fable."

— Francis Bacon (1620), *Novum Organum* (book 2, aphorism 29); cited by David Hume (1748) in "Of Miracles" [12]

"It is certain that all bodies whatsoever, though they have no sense, yet they have perception; for when one body is applied to another, there is a kind of election to embrace that which is agreeable, and to exclude or expel that which is ingrate; and whether the body be alterant or altered, evermore a perception precedeth operation; for else all bodies would be like one to another. And sometimes, this perception, in some kind of bodies, is far more subtle than sense; so that sense is but a dull thing in comparison of it: we see a weatherglass will find the least difference of the weather in heat or cold, when we find it not. And this perception is sometimes at a distance, as well as upon the touch; as when the loadstone draweth iron; or flame naphtha of Babylon; a great distance, as well as upon the touch; as when the loadstone quiry, to enquire of the more subtile perceptions; for it is another key to open nature, as well as the sense; and sometimes better. And besides, it is a principal means of natural divination; for that which in these perceptions appeareth early, in the great effects cometh long after."

— Francis Bacon (1620), *Forest of Forests: a Natural History*; cited by Alfred Whitehead (1925); Trevor Levere (1971); Libb Thims (2007) [5]

See also

● Roger Bacon (1214-1294) (IQ:175|#170) [RGM:363|1,250+] (Cattell 1000:199)

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External links

● Francis Bacon – Wikipedia.

θΔics

In hmolscience, **Francis Collins** (1950-) (CR:5) (CIR:17) is American geneticist note for 2000 to 2006 self-described "taking a public bath" outpourings of his his faith + science blended beliefs and convictions, sparked into the public sphere in the wake of the announcement of the completion of human genome mapping project.

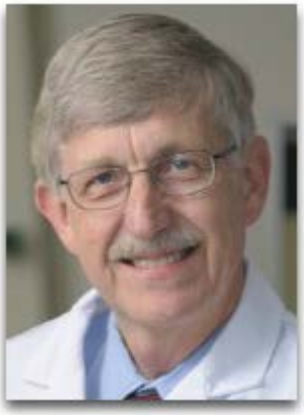

Religion

Collins culled his views on God from Irish-born British writer C.S. Lewis, and atheist (15) turned theist (31) turned Christian (33) and his theory of "universal morality" as presented in his works such as the *The Chronicles of Narnia*.

In Jun 2000, Craig Venter's group announced they had completed a working draft of the human genome. (Q) Collins, at this juncture, standing alongside Bill Clinton, Venter, made the following announcement:

> "The working draft of the human genome is a humbling and awe-inspiring glimpse into our own instruction book, previously known only to god."
>
> — Francis Collins (2000), On the Craig Venter human genome announcement, Jun [5]

This "moment", as Collins reflected in 2006, caused him to begin to talk more publicly about his faith and to write his 2006 book *The Language of God: A Scientist Presents Evidence for Belief*; he comments, in reflection on this engagement, amid all of the email praise and condemnent Collins surmised that the experience was something akin to bathing publicly naked:

> "It's like taking a public bath."
>
> — Francis Collins (2006), on his public dialogues on the genome, god, and his faith [6]

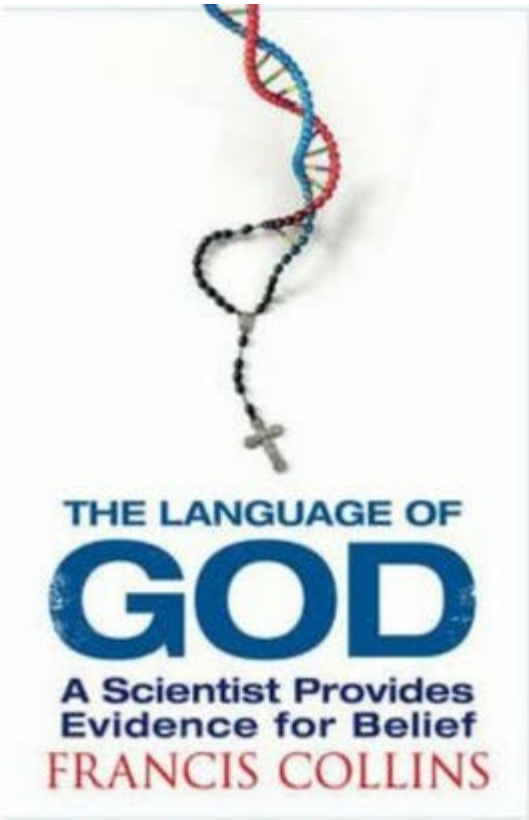

Collins holds the view, as outlined in his book, that after evolution had prepared a sufficiently advanced "brain", that at some point god gifted humanity with the knowledge of good and evil, what he calls the "moral law", with free will, and an immortal soul, and that some humans use their free will to break the moral law, leading to an estrangement from god, for which Jesus is the solution.

Stem cells | Embryos

In regard to stem cells, Collins considers embryos created via somatic-cell nuclear transfer to be distinct from those formed through the union of sperm and egg, the former being "not part of God's plan to create the human individual", the latter being "very much part of God's plan." [2] In 2006, in interview with Steven Paulson (Q), Collins stated:

> "I believe that the product of a sperm and an egg, which is the first cell that goes on to develop a human being, deserves considerable moral consequences. This is an entity that ultimately becomes a human. So I would be opposed to the idea of creating embryos by mixing sperm and eggs together and then experimenting on the outcome of that, purely to understand research questions. On the other hand, there are hundreds of thousands of such embryos in

freezers at in vitro fertilization clinics. In the process of in vitro fertilization, you almost invariably end up with more embryos than you can reimplant safely. The plausibility of those ever being reimplanted in the future, more than a few of them, is extremely low. Is it more ethical to leave them in those freezers forever or throw them away? Or is it more ethical to come up with some sort of use for those embryos that could help people? I think that's not been widely discussed."

Collins' 2006 *The Language of God*, wherein he explains his C.S. Lewis stylized god beliefs as intertwined with science beliefs.

(add discussion)

Debates

When pressed about the scientific details of his belief in soul and resurrection, according to Sam Harris (Q), he deflects the question to consultation of English theoretical physicist and priest John Polkinghorne and English bishop N.T. Wright, whose work, according to Harris is "pure madness, a bizarre conflation, a word salad". Collins is described by Paul Myers (2009) as a "lovable dufus" when it comes to issues of religion and some scientific principles (Q).

Quotes | Employed

The following are quotes cited by Collins in his effort to find a basis on which to assert his soul beliefs:

> "If the origin of the human body comes though living matter which existed previously, the spiritual soul is created directly by god."
>
> — Pope Pius XIII (1950), *Humani Generis* (Q); cited by Collins [3]

> "New findings lead us toward the recognition of evolution as more than a hypothesis."
>
> — Pope John Paul II (1996), message to Pontifical Academy of Science; cited by Collins [3]

Quotes | By

The following are related quotes:

> "A lot of scientists really don't know what they are missing by not exploring their spiritual feelings."
>
> — Francis Collins (c.2001) [2]

> "As believers, you are right to hold fast to the concept of god as creator; you are right to hold fast to the truths of the Bible; you are right to hold fast to the conclusions that science offers no answers to the most pressing questions of human existence; and you are right to hold fast to the certainty that claims of atheistic materialism must be steadfastly resisted."
>
> — Francis Collins (2006), *The Language of God* [4]

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External links

● Francis Collins – Wikipedia.

θΔics

In existographies, **Francis Crick** (1916-2004) (IQ:175|#220) [RGM:200|1,500+] (DN:6) (FA:152) (RE:88) (CR:107) was an English molecular chnopsologist (biologist), neuroscientist, atheism advocate, and anti-vitalism philosopher, noted []

Overview

In 1953, Crick, together with James Watson, discovered the molecular structure of the DNA molecule; in 1966, Crick, in his *Of Molecules and Men*, put forward the cogent and reasoned suggestion: [1]

> "Let us abandon the word 'alive'."
>
> — Francis Crick (1966), *Of Molecules and Men* (pg. 6)

This sharp statement is a lead into the modern subject of "life terminology upgrades", which has been formerly initiated as standard practice in 2013 *Journal of Human Thermodynamics* articles. Crick, in short, delves into the blurry intersection between chemistry and biology (chnopsology), topics such as: vitalism / neo-vitalism (e.g. Walter Elsasser), reductionism, and what he calls the "borderline between the living and the nonliving", the latter of which seems to tiptoe around the defunct theory of life / unbridgeable gap issue. [1]

Vitalism

In circa 1963, Crick gave a lecture to the Cambridge Humanists group on the topic of vitalism. In February and March of 1966, Crick gave a series of lectures at the University of Washington under the title "Is Vitalism Dead?", which seem to have been a reaction to the so-called metaphysical vitalism of Pierre Teilhard and the scientific vitalism of Michael Polanyi, the latter of which Crick takes the most issue with: [1]

> "Polanyi believes that a steam engine—and hence an enzyme molecule (which can be thought of as a machine at the molecular level)—cannot be totally described in terms of physics and chemistry."

Crick states that Polanyi's position "seems to be ridiculous". The Board of Regents of the University of Washington allowed Crick to enlarge his vitalism thoughts into the form of the book *Of Molecules and Men*. [1]

In 1966, at the University of Washington, Crick gave his "Of Molecules and Men" set of three lectures—turned-book: in the first lecture discussing modern vitalism, in the second discussing the borderline between the organic and inorganic, and in the final lecture "The Prospect Before Us" he explorations into right-side vs. left-side uses of the brain, controversies surrounding the existence of the soul, the dead end of ESP investigations, and above all the challenges of explaining consciousness in completely scientific terms.

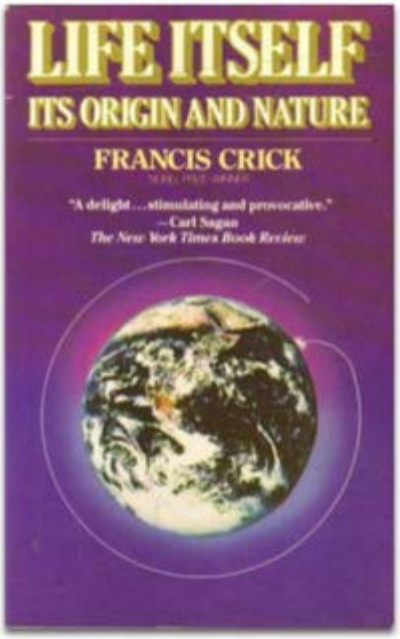

Left: Crick's 1966 *Of Molecules and Men*, wherein he digs into the precipice foundations of the defunct theory of life with his view that we should "abandon the word *alive*." [1] Right: Crick's 1981 *Life Itself*, wherein he asserts that the

After suggesting that it would become possible for people to wonder if a computer might be programmed so as to have a soul, he wondered: at

origin of life is a happy accident.

what point during evolution did the first organism have a soul? At what moment does a baby get a soul? Crick stated his view that the idea of a non-material soul that could enter a body and then persist after death is just that, an imagined idea. These deep queries bring to mind the early 19th century queries on the same subject by Napoleon Bonaparte.

The latter partial speculations on the soul and consciousness resulted in the 1994 book *The Astonishing Hypothesis: the Scientific Search for the Soul*, wherein he argued that traditional conceptualizations of the soul as a non-material being must be replaced by a materialistic understanding of how the brain produces mind. [2]

Life Itself

In 1981, Crick, in his *Life Itself: its Origin and Nature*, referred to the origin of life as a “happy accident”, and discusses how we will never be able to find "molecular fossils" to corroborate the time he seems to conceptualize as the origin of life. [8] The following is a popular quote from this work cited by the creationists, such as Lee Strobel (2004) and by the chemistry portal (Ñº) section of the CreationWiki: [9]

> “An honest man, armed with all the knowledge available to us now, could only state that, in some sense, the origin of life appears at the moment to be almost a miracle, so many are the conditions which would have had to have been satisfied to get it going.”
>
> — Francis Crick (1981), *Life Itself: Its Origin and Nature* (pg. 88)

(add discussion)

Humanism | Atheism

Crick transformed, deconversionly-speaking, from being a paternally-introduced "nonconformist Protestant" youth to an age 12 "skeptic and agnostic with a strong inclination toward atheism", to a later anti-vitalism defender (1966).

Crick, together with his brother, when they were old enough, began to go to a nonconformist Protestant church. His first puzzlement about religious doctrine occurred when his mother warned him not to mention, to the other church members, the fact that their father sometimes played tennis on Sundays, since some of the congregation members would “almost certainly not approve of such sinful conduct” as his mother told him.

In 1928, at the age of 12, or thereabouts, while transitioning into science studies, Crick lost his religious faith, which he recounts in 1990 as follows: [4]

> “At exactly which point I lost my early religious faith I am not clear, but I suspect I was then about twelve years old. It was almost certainly before the actual onset of puberty. I remember telling my mother that I no longer wished to go to church, and she was visibly upset by this. I imagine that my growing interest in science and the rather lowly intellectual level of the preacher and his congregation motivated me, though I doubt if It would have made much difference if I had known of other more sophisticated Christian beliefs. Whatever the reason, from then on I was a skeptic, an agnostic with a strong inclination toward atheism.”

This would seem to categorize him as Dawkins number 6.

In the 1960s, following what seems to be his vitalism debates, Crick elaborated on his religious views as follows

> “The simple fables of the religious of the world have

come to seem like tales told to children."

> — Francis Crick (1966), "Why Am I a Humanist" [5]

"Christianity may be OK between consenting adults in private but **should not be taught** to young children."

> — Francis Crick (1969), "Notes from Rickman-Godlee Lecture, UCL" (Ñº)

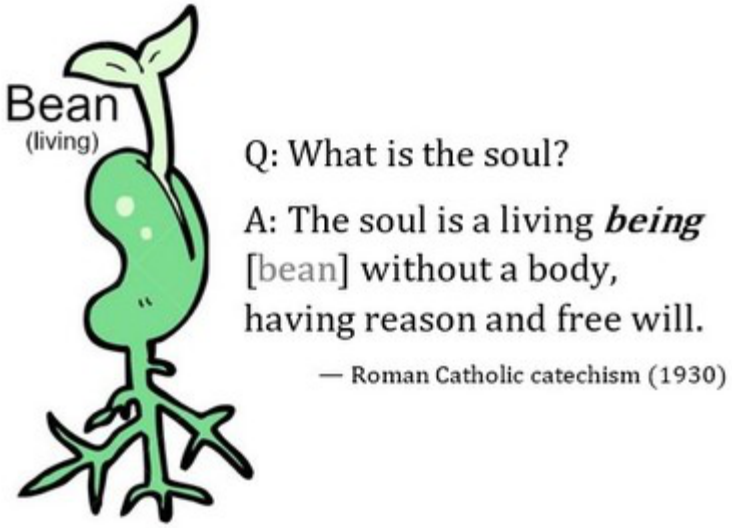

Definition of the soul taught to Odilie Watson (1920-2007)—the famous 1953 illustrator (Ñº) of DNA as it appears in *Nature*—as child, the term "living being" heard to hear as "living bean", which she remained puzzled about, but remained silent on, until her later discussions with her husband of 55-years **Francis Crick**, who cites this in the opening chapter of his 1995 *The Astonishing Hypothesis*. [3]

In 1995, Crick, at the reaction extent (age) of 78, published his *The Astonishing Hypothesis: The Scientific Search For The Soul* (1995), wherein he opens to the header quote Q&A: "What is the soul?", shown adjacent, which he footnotes as follows: [4]

> "As a small child my wife, Odilie, was taught the catechism by an elderly Irish lady who pronounced 'being' as 'be-in'. Odilie heard this as 'bean'. She was extremely puzzled by the idea of the soul as a living bean without a body but kept her worries to herself."

(add discussion)

DNA

On 28 Feb 1953, Crick, together with James Watson, discovered the double helix structure of DNA; the diagrammatic development of this as follows:

Crick explained and diagrammed, above (second from left), his excitement about his discovery to his son as follows:

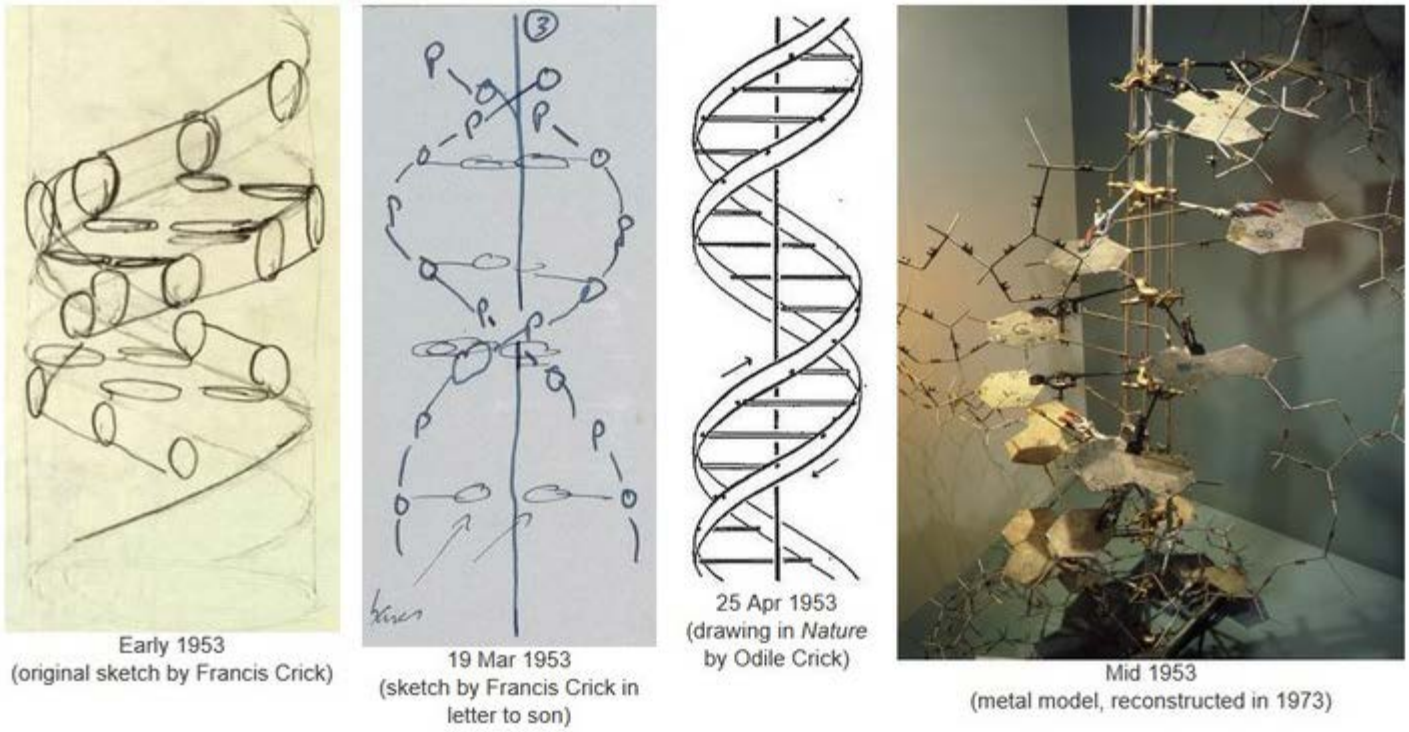

A visual timeline of renditions of the double helix structure of DNA.

> "We have built a model for the structure of de-oxy-ribose-nucleic-acid (read it carefully) called D.N.A. You may remember that the genes of the chromosomes – which carry the hereditary factors – are made up of protein and D.N.A. Our structure is very beautiful. Now we believe that the D.N.A. is a code. That is, the order of the bases (the letters) makes one gene different from another gene (just as one page of print is different from another). In other words we think we have found the basic copying mechanism by which life comes from life."
>
> — Francis Crick (1953), letter to son Michael Crick (age 12) at boarding school, Mar 19 (Ñº)

On 25 Apr 1953, Crick and Watson famously published their findings in *Nature*.

The discovery of the structure of DNA won them the 1962 Nobel Prize in physiology or medicine.

In 2013, Crick's DNA discovery letter to son, partly quoted above, was sold at Christie's action, New York for $6 million dollars, a world record price for a letter sold at a public auction. (Ñº)

Quotes | Atheism

The following are noted Crick quotes on religion and atheism:

> "If revealed religions have revealed anything it is that they are usually wrong."
>
> — Francis Crick (1990), "How I Got Inclined Towards Atheism" [10]

> "A knowledge of the true age of the earth and of the fossil record makes it impossible for any balanced intellect to believe in the literal truth of every part of the Bible in the way that fundamentalists do. And if some of the Bible is manifestly wrong, why should any of the rest of it be accepted automatically?"
>
> — Francis Crick (1990), "How I Got Inclined Towards Atheism" [10]

Quotes | Vitalism

The following are noted Crick quotes on vitalism:

> "The ultimate aim of the modern movement in biology is to explain all biology in terms of physics and chemistry."
>
> — Francis Crick (1966), *Of Molecules and Men* (pg. 11)

> "A 'neovitalist' is a man who believes in vitalist ideas while denying that he does so!."
>
> — Francis Crick (1966), *Of Molecules and Men* (pg. 22)

> "Neo-vitalists [are those] who hold vitalistic ideas but do not want to be called a vitalist."
>
> — Francis Crick (1966), *Of Molecules and Men* (pg. 22); paraphrase by Lila Gatlin (1972) [7]

> "Exact knowledge is the enemy of vitalism."
>
> — Francis Crick (1966), *Of Molecules and Men* (pg. vii)

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Further reading

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External links

â— Francis Crick – Wikipedia.

In human physics, **Francis Edgeworth** (1845-1926) (IQ:180|#175) (SN:40|58+) was Irish mathematical economist noted for his 1881 *Mathematical Psychics: an Essay on the Application of Mathematics to the Moral Sciences*, in the first part of which he attempts to meld utilitarianism (principle of maximal happiness) with the Lagrangian-Hamiltonian description of the energy of a system (principle of maximum energy), along the way citing and discussing the ideas of thinkers, including: Henry Sidgwick (1838-1900), and his ethical hedonism theory, Jeremy Bentham, Stanley Jevons, among others, all done in aims to outline or make a calculus, i.e. minima or maxima calculation, based model of the humanities, or what he calls "utilitarian calculus".

Catallatic molecules | Neuter atoms

Edgeworth, in his *Mathematical Psychics* (pgs. 30-31), mentions the science of catallactics (Ñº), or the "science of exchanges", as Richard Whately (1831) defines it, being the proper name for political economy (Ñº), then states the following rather peculiar passage:

> "The catallactic molecule is compounded, when we suppose the Xs and Ys dealing in respect each of several articles with several sets of Zs, As, Bs, etc.; a case solved by Walras."

This blurry passage would seem to imply that the people (Xs and Ys) bound into an exchange market, buying and selling commodities (Zs, As, Bs, etc.) would constitute some type of economic molecule bound via the exchange forces of buying and selling, or something along these lines?

This, according to William Henderson (2006), is some type of hydrodynamic analogy, being that Edgeworth goes on in latter passages (pgs. 40 and 48, which refer by to hydrodynamics, pg. 5) to speak of "neuter atoms", and "jumbles of catallactic molecules", etc. (Ñº)

End and means

Edgeworth, in his introduction, gives the following overview, which seems to be the gist argument of his theory: [1]

> "The central concept of utilitarian calculus is greatest happiness, the greatest possible sum-total of pleasure summed through all tie and over all sentience [in which] mathematical reasoning are employed partly to confirm Sidgwick's proof that greatest happiness is the ***end*** of right action; partly to deduce middle axioms, ***means*** conducive to that end."

Here, firstly, we see the Achilles' heel—or deadly weakness in spite of overall strength, which can actually or potentially lead to downfall—in Edgeworth's argument, namely the assumption that there is difference between so-called "right" and "wrong" action, and that that right action is that which leads to total sentient being happiness; which, again, leads to further weakness in theory, namely were is the boundary of total sentient being existence "summed over time", as Edgeworth puts it?

Secondly, we are reminded of Aldous Huxley's 1937 *Ends and Means: an Inquiry into the Nature of Ideals*, who addresses the so-called happiness issue in rather frank terms as follows:

> "The moral argument for theism may be very briefly summed up as follows. Moral action aims at the realization of the highest good. The highest good cannot be realized except where there is a virtuous rational will in persons and a world in which this virtuous rational will is not thwarted—a world where virtue is united with happiness. But it is a matter of brute empirical fact that, in the world of phenomena, the most virtuous are not necessarily the happiest and that the rational will is not always that which gets itself

> done. It follows therefore that the union of virtue and happiness, without which the highest good cannot be realized, must be effected by some power external to ourselves, a power which so arranges things that, whatever partial and temporary appearance may be, the total world order is moral and demonstrates the union of virtue with happiness. Those who oppose this argument do so, first, on the ground that it is merely a piece of 'wishful thinking', and, second, that words like 'virtue', the 'good' and all the rest have no definite meaning, but change from one community to another."

Huxley, goes on to arrive, after citing Benedict Spinoza's views on happiness, at alternative conclusions, namely a meaninglessness philosophy. [8]

Sentients

Edgeworth then states that this summation applies to all "sentients", supposedly defined as entities responsive to or conscious of sense impressions, aware, and or finely sensitive in perception or feeling, and "classes of sentients", i.e. sentients grouped or classified by their level of ability to experience more or less pleasure, e.g. imagination or sympathy, and less pain, e.g. fatigue, than others. While this side steps the life/non-life divide issue, which is imaginary, according to the defunct theory of life, we are still left with the sentient/non-sentient divide, which has issues of its own. Edgeworth, to note, also clarifies the above with the following:

> "There is no presumption that equality of circumstances is the most felicific arrangement; especially when account is taken of the interests of posterity."

Namely, the note that equality will not always lead to the greatest happiness; a realization certainly felt in the Marxism-based varieties of society and government attempted in Russia, from 1917 rise of Vladimir Lenin, and the implementation of a theoretical Marxism based government, resulting in the infamous bread lines, to the collapse of the 1980s collapse of the Soviet union. (Ñº)

Mathematical Psychics

In 1881, Edgeworth published his *Mathematical Psychics: an Essay on the Application of Mathematics to the Moral Sciences*, an application of mathematics to the moral sciences, wherein he expressed his belief that the future would one day see the science of social mechanics vaulted along side that of celestial mechanics in a unified manner: [1]

> "'**Mecanique sociale'** may one day take her place along with 'mecanique celeste,' throned each upon the double-sided height of one maximum principle [principles of Lagrange], the supreme pinnacle of moral as of physical science. As the movements of each particle, constrained or loose, in a material cosmos are continually subordinated to one maximum sum-total of accumulated energy, so the movements of each soul, whether selfishly isolated or linked sympathetically, may continually be realising the maximum energy of pleasure. Mecanique sociale, in comparison with her elder sister, is less attractive to the vulgar worshipper in that she is discernible by the eye of faith alone. The statuesque beauty of the one is manifest; but the fairylike features of the other and her fluent form are veiled. But mathematics has long walked by the evidence of things not seen in the world of atoms (the methods whereof, it may incidentally be remarked, statistical and rough, may illustrate the possibility of social mathematics). The invisible energy of electricity is grasped by the marvellous methods of Lagrange; the invisible energy of pleasure may admit of a similar handling."

The concept of pleasure, according to Edgeworth, as summarized by English chemical physicist Philip Ball (2004), was the force that his hedonistic 'charioteers', the individual agents of society who interact like so many atoms in the void, according to which the view the glimpsed whereby economies treat people like "multiety of atoms which constitute the foundations and uniformity of physics." [2]

Edgeworth argues that mathematical *psychics*, or rather 'psychological mathematics' (or mathematical psychology) in a modern sense, can be divided into pure and applied, wherein he attempts formulation on concepts such as a quantity of pleasure, principles of maximum energy, and a calculus of feeling, among others. Edgeworth cites William Thomson and Peter Tait's *Treatise on Natural Philosophy*, which seems to be the backbone of the book. In a mention of the second law of thermodynamics, he cites James Maxwell's *Theory of Heat.*

In 1915, Edgeworth, in his "Recent Contributions to Mathematical Economics", discussed the economic views of Henri Poincare as being in alignment with Vilfredo Pareto. [7]

Philosopher historian Robert Heilbroner summarized Edgeworth as such: [5]

> "Edgeworth's simplification was this assumption: *every man is a pleasure machine*. Jeremy Bentham had originated the conception in the early nineteenth century under the beguiling title of Felicific Calculus, a philosophical view of humanity as so many living profit-and-loss calculators, each busily arranging his life to maximize the pleasure of his psychic adding machine. To this general philosophy Edgeworth now added the precision of mathematics."

Greek economists Stavros Drakopoulos and Ioannis Katselidis summarize Edgeworth's contribution as such: [3]

> "Edgeworth represents the highest point of classical physics influence to the development of mainstream economic methodology. Edgeworth's close parallelism between celestial and social mechanics expressed in his analogies between utility and energy and the principle of utility maximization to maximum energy, are important indications of the physics scientific ideal for economics."

Soul

Edgeworth had the following to say on the concept of the soul: [4]

> "The application of mathematics to the world of the soul is countenanced by the hypothesis that pleasure is the concomitant of energy. *Energy* may be regarded as the central idea of mathematical physics; *maximum energy* the object of principal investigations in that science. By aid of this conception we reduce into scientific order physical phenomena, the complexity of which may be compared with the complexity which appears so formidable in social science."

(add)

Education

Edgeworth is said to have had a photographic memory and could repeat numerous passages from Milton, Pope, Virgil, and Homer in his old age. He knew Greek, Latin, German, Italian, and Spanish. Edgeworth, supposedly, owned very little books, preferring to do his reading at the public library. [6]

Edgeworth studied ancient and modern languages at Trinity College, Dublin and Balliol College, Oxford. In 1869, about to graduate from Oxford, in response to an obscure question during his finals, he is reported to have said "shall I answer briefly, or at length?", and then spoke for half an hour. [6]

Following college, described as a 'voracious autodidact', he taught himself mathematics and economics. In 1877, he completed a law degree in London. In the 1888, he became the chair of economics at King's College London and in 1891 professor of political economy at Oxford University.

Quotes

The following are other noted Edgeworth quotes:

> "The invisible energy of electricity is grasped by the marvelous Lagrange, via Maxwell; the invisible energy of pleasure may admit a similar handling."
>
> — Francis Edgeworth (1883), *Mathematical Psychics* (pg. 13) [9]

> "The energy generated by pleasure force is the physical concomitant and measure of the conscious feeling of delight."
>
> — Francis Edgeworth (1881), *Mathematical Psychics* (pg. 13)

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(b) Maxwell, James. (1873). *A Treatise on Electricity and Magnetism* (pg. vii). Dover, 1954.

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External links

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θΔics

In human chemistry, **Francis Ford Coppola** (1939-) is an American film director noted for []

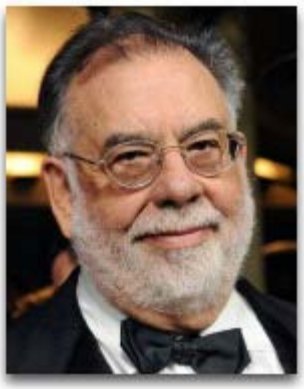

Elective Affinities

In 1979, Coppola began to envision an effort towards a realization of an English-rendition of English German polymath Johann Goethe's 1809 puzzle-laden physical chemistry based novella *Elective Affinities*, in the form of a four-part eight-hour megafilm. [1] Coppola, in a 2003 interview, commented on this: [2]

> "After *Apocalypse Now* [1979], I had imagined that I was going do this great work, which was going be a series of four films loosely inspired by the Goethe novel *Elective Affinities*. Those of you who know *Elective Affinities* know it's one of the first modern novels and it's a very simple story about a man and his wife. They're living in an absolutely wonderful place, and the man suggests, "Oh, my friend the captain, he's an architect, and I thought it would be nice if he came and lived with us for a while, and he could plan the gardens and stuff." And the wife says, "Well, you know, I really… We're so perfect and happy here that, I was going to say, my niece is—her mother has died, and I was going to invite the niece to come live." And they said, "Well, let's have the captain and the niece." So you have the basic setting of the man, the woman, the other man, the other woman. In Goethe's mind, he was working on a chemical formula. A, B, A-prime, B-prime. And I had a concept to make an ambitious film on that theme."

Likewise, in *circa* 2004, Coppola told Associate Press:

> "My super-production, my great work that I was thinking of, was going to be basically taken from the Goethe novel *Elective Affinities*. And I had this idea to set it in modern Japan starring a film director who makes a film in Japan."

At different times, Coppola also said that the film would be eight hours long, and be filmed over 10 years, with the characters aging. [1]

In January or February of 1983 Coppola apparently began working on another variation of *Elective Affinities*, called *Megalopolis*, and had 400 pages of notes, and script pages.

In 1988, Coppola gave an interview with Jill Kearney of *Mother Jones*, the key parts of which are as follows: (Ñº)

> than political economy. And so we are left with Francis Ford Coppola, the current prototype of the independent and visionary director, who wants to make *Elective Affinities*, based on Goethe's novel. Coppola has explained how he would treat the proposed quartet of films. Although the whole project would be 'a big movie,' the films would also be 'Very, very intimate epics.' *Elective Affinities* would deal with love: 'male-female love; sexual love; romantic love; spiritual love.' Coppola's film incorporates rocket ships, 'the birth of the universe,' politics, and 'the first moving hologram.' He also contemplates a step toward vertical integration: entering the exhibition field:[15]

A 2003 summary of Coppola's vision to make a futuristic big bang theory based version of Goethe's *Elective Affinities*. [5]

> Intro: Coppola is eager to return to Napa, California, to resume writing on two projects consuming him now: a screenplay based on Goethe's *Elective Affinities* and an unnamed experimental project that he is unwilling to detail. But Coppola is willing to talk about his just completed Tucker: The Man and His Dream.
>
> K: Is Goethe's *Elective Affinities* one of these projects?
>
> C: I have really only two projects in front of me. I will do *Elective Affinities* after the thing I'm writing now,

> which is a long film-maybe 3 hours and 45 minutes. I've been writing it for four years. At the end of Zoe I'm not going to do any publicity, any film festivals, I'm just going to be free to implement this idea. It's not just writing-it involves actors, and music, and art, and all the other things, except the production level. I have a lot of new theories about composing film that represents a different way of working that's only possible now because of the computer and video revolutions. You couldn't make an airplane until you had aluminum and the internal combustion engine, so the idea of flight had to wait. There are whole art forms that are going to be born now. In 10 or 20 years cinema is going to be as different from the way we make movies now as the infantry is from a squadron of planes. Sound cinema is only 60 or 70 years old. A lot of people figure that innovation is when you get a car that goes 20 miles an hour to go 60. But maybe an innovation is a car that flies, or a car that doesn't even move, but gets you there anyway. Innovation doesn't mean you can just do more of the same. Sometimes it's a different way to skin the cat.

Coppola was still talking about that film when he announced *Le Ribellion di Catilina* in 1989, which sounded a lot like *Megalopolis*, with its bent sense of time and its plot that leapt from Ancient Rome to modern Manhattan (similar to *Arcadia*). After he made *Tucker* (1988), he announced *Megalopolis* yet again, but as always, the money wasn't there. [1]

Loose mentions of *Megalopolis* were still in the air as of 2009, the film said to be about an architect, possibly similar to the Captain, in a futuristic New York who tries to create utopia through architecture. Coppola once described the film as: "The setting is modern New York. It deals... with the idea that the future world we're going to live in is being negotiated today... It's kind of a shape-of-things-to-come film in which the characters are concerned with artists, businessmen, proletariat all having a stake in the future but very few of them having a hand in what it's going to be like. It's a little bit like an Ayn Rand novel." [4]

In 1998, Peter Biskind, in his *Easy Riders, Raging Bulls*, devoted a section to “Coppola's mad plan for a 10-hour film of Goethe's *Elective Affinities* in 3-D”, as one review (Ñº) put it. In the grip of clinical manic depression and anxiety over his incomplete opus *Apocalypse Now*, and while purportedly under the influence of his girlfriend, screenwriter Melissa Mathison, proposed making a "ten-hour film version of Goethe's *Elective Affinities*, in 3D”; the following is the paragraph where this is discussed:

> “To those around him, it was evident that Coppola was in the grip of a full-blown, clinical case of manic depression. One day in 1979, near the end of a post on *Apocalypse*, he virtually held a roomful of editors prisoner for several hours, haranguing them with a machinegun fusillade of wild ideas. Word processers hand just come out, and he described them as the key to a new way of making movies. He wanted to do a ten-hour film version of Goethe’s *Elective Affinities*, in 3D, which people attributed to Melissa’s influence. He began negotiating to buy Hollywood General Studios in LA, and started to talk about taking over Hollywood, building an empire, When the mania ebbed, he became depressed and paranoid, convinced that everyone was out to get him.”

Though the mega-film *Elective Affinities* project has yet to come to fruition, the 1982 film *One From the Heart*, directed by Coppola, and the 2003 film *Lost in Translation*, written and directed by Sofia Coppola, his daughter, have thematic elements, to a certain extent, of *Elective Affinities*, in them—the latter film capitalizing on the Japan setting and taking the namesake of Charlotte as the lead female character.

See also

â— Elective Affinities (film adaptations)

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θΔics

In existographies, **Francis Galton** (1822-1911) (IQ:145|#714) [RGM:289|1,500+] was an English anthropologist, half-cousin to English naturalist Charles Darwin, noted for being in the first-ever person to be assigned with a IQ of 200, and for having dialogue, in 1879, with Scottish physicist James Maxwell on the topic of free will and also for his interest in hearing Scottish physicist William Thomson's lecture on Maxwell's demon at the Royal Institute, and likely later commentary on the matter. [1]

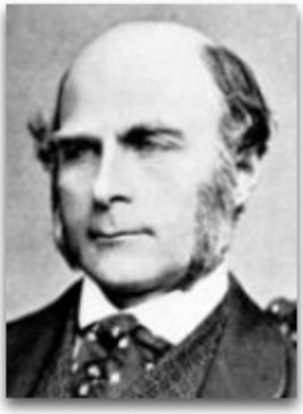

IQ | 200?

See main: IQ miscalculation

Galton's 1869 book *Hereditary Genius* is said to be the first scientific attempt to study genius and greatness. [2] American psychologist Lewis Terman, one year after inventing the modern 100 point IQ scale (1916), average IQ being 100, assigned Galton with the first-ever, psychologist-determined, "200 IQ". Specifically, as discussed in his 1917 article "The Intelligence Quotient of Francis Galton in Childhood," Terman states that his team has studied many thousands of children in several cities and several counties in California, and found only a handful above IQ=150, the highest being IQ=170. Terman summarizes: [3]

> "From the evidence given, one is justified in concluding that between ages of three and eight years, at least, Francis Galton must have had and intelligence quotient not far from 200."

English biologist Peter Medawar famous commented on this calculation "God alone knows how [Lewis Terman] estimated Galton's IQ as 200." [6]

> In his diatribe against "the unnatural science" of IQ and its heritability, Medawar says that "God alone knows how [Lewis Terman] estimated Galton's IQ as 200" (1977b), implying that such an estimate could have been based only on some very weird and ridiculous speculation. But in fact Terman's method was very simple and straightforward (Terman 1917: 209). On the basis of Karl Pearson's biography of Galton, which gave ample evidence of Galton's extraordinary precocity, Terman concluded that between the age of three and eight years Galton's mental age (MA) was approximately double his actual age (CA). Now if in Galton's case MA = 2 × CA, then in accordance with the then standard practice of calculating IQ, the equation "IQ = (MA/CA) × 100" immediately gives the value of his IQ: (2 × CA)/CA × 100 = 200.

A 2005 summary of the method American psychologist Lewis Terman used to determine **Galton**'s IQ as 200, the first-ever 200-range IQ, using the age ratio IQ method. [4]

Education

At age four, a day before his fifth birthday, he wrote out the following summary of his abilities: [5]

> "I am four years old and I can read any English book. I can say all the Latin substantives and adjectives and active verbs besides fifty-two lines of Latin poetry. I can cast up any sum in addition and can multibly by 2, 3, 4, 6, 8, 9, 10, 11. I can also say the pence table. I read French a little and know the clock."

By age six he was already being described as a prodigy, for his abilities, such as reading Shakespeare's works for pleasure, reading each page twice, and repeating it by heart. At age 13, he designed a steam-engine driven flying machine. Galton began medical school at age 15. [3]

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External links

â— Francis Galton – Wikipedia.

θΔics

In existographies, **Francis Hauksbee** (1660-1713), or “Hawksbee”, was an English scientist and instrument maker, noted for []

Overview

In Nov 1703, with the passing of Robert Hooke (1635-1703), Newton returned to the Royal Society, and appointed Hauksbee as the new Royal Society curator of experiments.

In 1705, Hauksbee, inspired by Jean Picard (Q), who discovered that if he shook a mercury-containing barometer it would produce a glow (Q), placed mercury inside of a Guericke generator, which he built, shown below, which he then evacuated, with a vacuum pump, to make a mild vacuum inside, then rubbed the glass ball to build up a charge, and observed that a glow was visible when he placed his hand on the outside of the globe. [1]

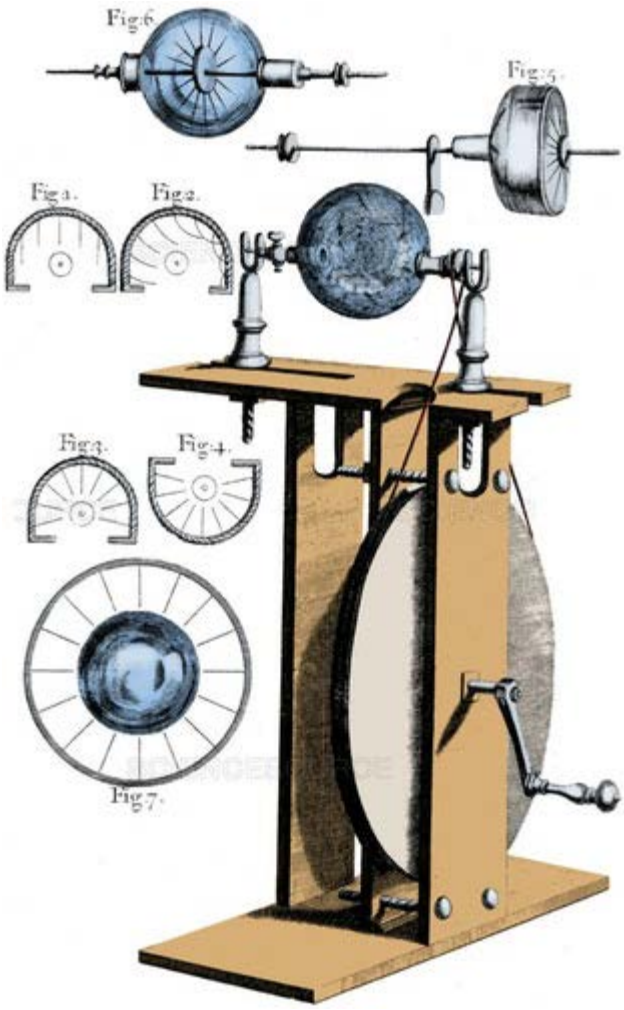

In 1767, Jean Nollet, in his *Leçons de Physique*, illustrated the Hauksbee generator experiment as follows: (Q)

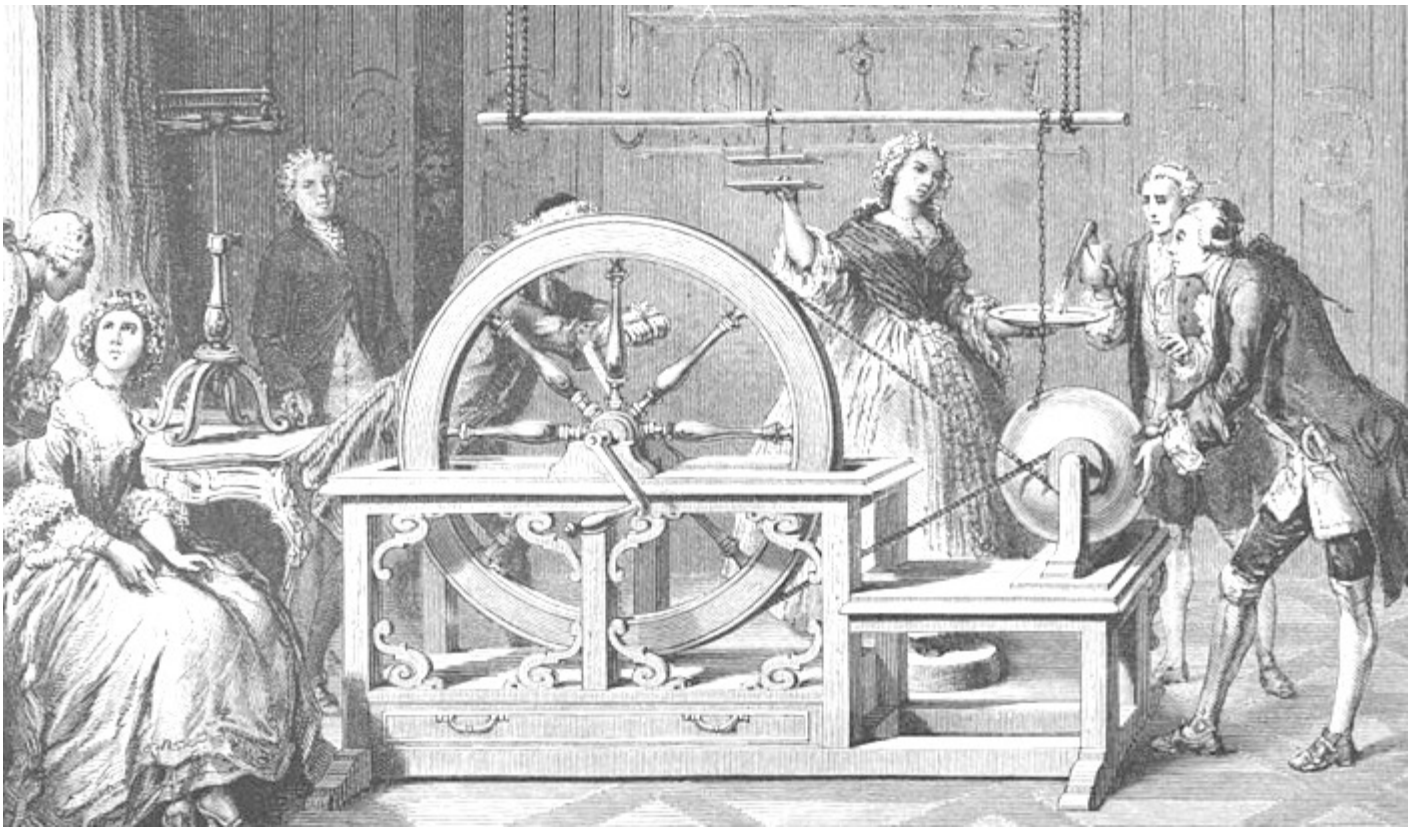

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External links

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θΔics

In hmolscience, **Francis Maximus Macnab** (c.1763-c.1833), or MacNab, was a Scottish barrister and moral philosopher noted for his 1818 *A Theory of the Moral and Physical System of the Universe*, an early religion and science reconciliation attempt, the logic of which, supposedly, being comparable (Q) in some way to Jeremy Bentham, in which he outlines a seven-stage, i.e. seven floods (to explain fossil evidence), five phenomena (mechanical, chemical, vegetable, animal, intellectual) mind and morals from matter and light creationism-structured theory.

Mind-sense-matter | Loophole

The following is Macnab's opening mind-sense-matter ontic opening like loophole argument platform: [1]

> §:3-4. Matter is perceived by sense, mind is understood by reason; but mind cannot be perceived, neither can matter be understood. Our senses inform us only respecting the phenomena of matter; our reason informs us only respecting the phenomena of mind. In the universe, our senses perceive nothing but matter; while our understanding assures us, that everything must depend upon mind. We cannot perceive the efficiency of an intelligent cause, neither can we understand the efficiency of a physical one. Intelligent efficient causation is beyond our senses; physical efficient causation is beyond our understanding. Hence the opposite doctrines of Berkeley and Hume; the one denying the the existence of matter, the other denying the existence of mind; and each supporting his hypothesis by plausible arguments. Of the essence of matter, we are as ignorant as we are of the essence of mind. We know them only by their properties, i.e. their relations or analogies. Accordingly, our knowledge of matter and mind is only a knowledge of relations or analogies. But these analogies are parts of one great analogy, embracing all possible knowledge. Every subject of human thought is connected with an immense scheme, which comprehends the natural and moral universe. Every object, atom, thought, or idea, the least as well as the greatest, are all parts of that scheme."

Macnab then interjects, in downgrade terms, that only "god is absolute", that it is only "him who knows the whole", etc.

Deceptive senses | Relative rest

The following is Macnab's Plato's allegory of the cave like section on how one's beliefs—specifically beliefs about relative motion, and in turn thought—can reoccurring be deceptive and false: [1]

> §5. A man on board a ship, gliding in a calm sea, may imagine himself to be at rest, and think and act upon that supposition with the utmost propriety; because, though not absolutely at rest, he is relatively so. He afterwards, however, on going ashore, sits down, and, smiling at his mistake, says, 'Now I See my error; I have not been at rest till now.' But still he is mistaken; for the earth itself on which he sits or stands, is in motion round the sun. 'Well, then,' says he, 'the sun at any rate is at rest.' 'Not so,' says the well-informed astronomer; 'the sun also,

and the whole solar system, are in motion through absolute space.' But here the person who was first deceived in the ship asks the astronomer, 'What proof have you that the universe itself is fixed in absolute space? or what is it you call *absolute*? I have already been three times deceived by adopting that-term; and will henceforth ascribe the title of absolute to no created being.' What has thus been said regarding *motion*, is true also regarding *thought*. In human knowledge, there is nothing absolute; no fixed principles; no standard to which we can appeal."

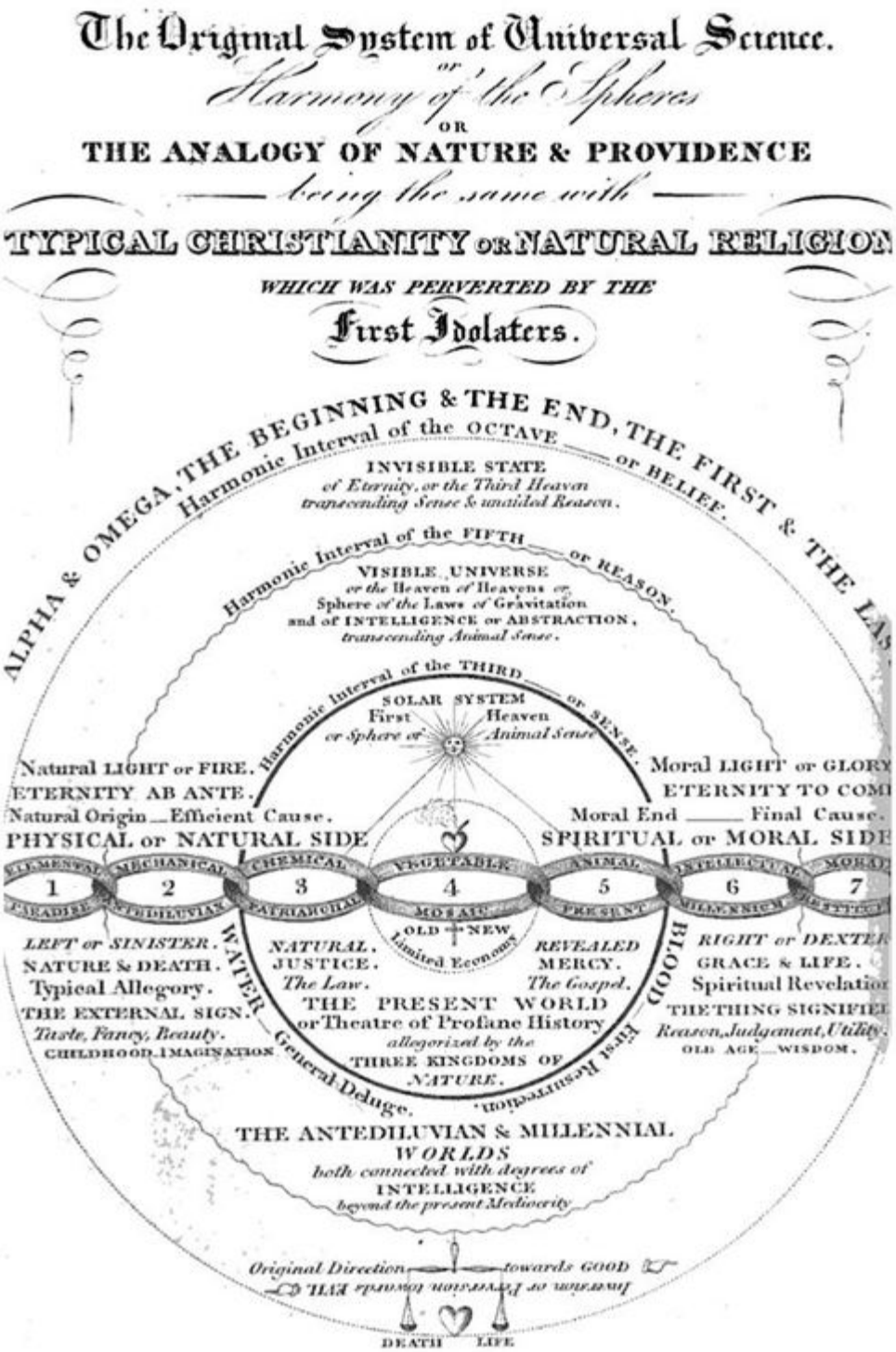

To title page illustration of **Macnab's** universal mind and morals from matter and light emergence theory.

This is relatively cogent, so-to-speak. With this said, however, he asserts, in downgrade form, in end footnote like style, that the only thing to which we can appeal is the word of god, citing Biblical passages; and that, therefore, we must search the Bible for the outlines of general knowledge, and a basis on which to build.

Fossil evidence

Macnab, in his §30, in order to recently-discovered fossil records, cites Georges Cuvier's *Theory of the Earth* (1813), and concurs something to the effect that the fossils are organized in the layers of the earth as described in Genesis, with human bones found in the upper most layer, and the lowest layer "containing no petrifactions, nor traces of carbon".

Moral period theory

Macnab, in his §38-44, interjects into the more hilarious aspects of his entire theory, which is that there were seven periods of creation, the last of which resulted in the moral universe, and that phenomena can be divided into five types: mechanical, chemical, vegetable, animal, and intellectual, the first two classified as "matter", the latter two classified as "spirit", the middle (vegetable) having a combination of both, but also neither alive nor dead. Macnab describes his theory as follows:

> §38. From the beginning to the end of time, all that intervenes is comprehended in seven periods, whereof the first six were occupied in evolving the mystery of creation, and the seventh in evolving the mystery of providence. The first six unfold the history of the natural, the seventh that of the moral universe, the former being a type of the latter.
>
> §39. Accordingly, the entire system of nature is to be viewed, in the first place, as a series of seven periods, the last of which is the moral world. This septenary scale being split into two halves, the one belongs to matter, the other to mind, agreeably to the general analogy (§1-2). But these two, matter and mind, are united by means of the central [Greek word]. To the left of this central step, are three belonging to matter; to the right, three belonging to mind. We shall bye and bye see how this corresponds with the sacred record; for I am, in the meantime, concerned only with the rough sketch, or first outline of the picture. It stands thus:

Matter.	*Central state.*	*Mind.*
1, 2, 3,	4,	5, 6, 7.

> §40. Between matter and mind, there is, as I have said, a perfect antithesis or contrast (§2-3). The first is passive, the second is active; the first is acted upon by general laws, the second acts by its own particular volition; the first is *dead*, the second is *alive*. But, between the animal spirit, and the inanimate clod, there is a middle state partaking of both. It is neither a passive, inert substance, nor is it an active living principle. The growing plant is not dead, neither is it alive. It has no volition, like the animal spirit, neither is it under the dominion of those general laws which operate upon inanimate matter. It possesses a kind of life or vitality, depending upon the influence of the sun, which seems, in a special manner, to rule over the vegetable kingdom, and inspire and quicken it. Accordingly, the *sun* may be said to the *soul* of the vegetable world. In his presence they live; in his absence they sleep, or die.

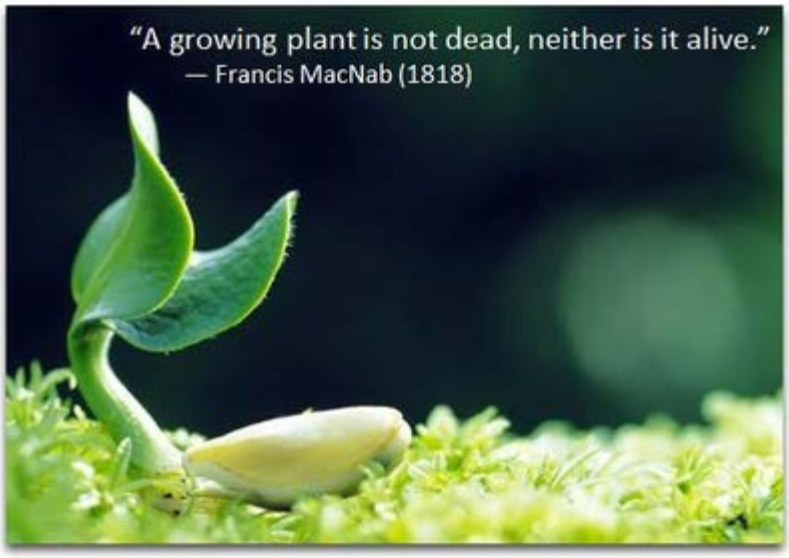

One of MacNab's arrived at absurdities, i.e. that growing plants are neither alive nor dead (§40), an intermediate view to the defunct theory of life, resulting from his 1818 attempt to reconcile religious theory (Biblical views) with modern science (fossil evidence, Copernican system, law of gravitation, atomic theory, chemistry, etc.). [1]

This the "growing plant is not dead, neither is it alive" is some hilarious stuff; very germane in precursor absurdity logic to arrival of the defunct theory of life (2009). Likewise, his the "*sun* may be said to the *soul* of the vegetable world"

assertion is rather telling, in respect to divide.

Macnab continues, in what seems to be even more hilarious than the former:

> §41. But though we can thus discern, by our outward senses, not only the organic bodies of vegetables, but also the glorious luminary which quickens them, we cannot thus discern the principle which quickens the organic bodies of animals: for every animal is quickened by a principle which belongs to itself, and has a will of its own. Its body, indeed, may be called a *moveable vegetable*, because it is an organic machine, exactly analogous to that of the vegetable. The difference lies here: that the vegetable organic machine is set a-going and kept in order by the sun; but the animal organic machine is set a-going and kept in order by a particular agent which inhabits it. This agent is its *soul*, or *animal spirit*, and belongs to the predicament of mind, or the right side of the scale (§39).

In short, the "vegetable organic machine" (e.g. a flower), according to Macnab, is set a-going and kept in order by the agency of the sun, whereas the "animal organic machine" (e.g. a human) is set a-going and kept in order by the agency of the soul or animal spirit. This is hilarious to the last. Hardly anything, in modern literature argument, can be found stated so frankly and openly, yet it is the crux of the matter which continues to inflame the modern religion | science divide. The humor continues:

> §42. Thus, in the central step of the scale, the most prominent object is the sun, considered as the soul of the vegetable kingdom, and ruler of the planetary system. To his left is the reign of matter, typical of *death*; to his right, the reign of mind, typical of *life*. I shall afterwards follow out that beautiful analogy by which the natural sun is shown to be a type of the 'sun of righteousness?' But in the mean time, I am occupied, as I have said, with the first general sketch, or outline of the scheme.

> 43. As to the passive substance of matter, which lies to the left of the scale, if we exercise our senses upon it, we acquire by by experience a knowledge of its *chemical* phenomena; and if we exercise our reason upon it, we understand by demonstration, its *mechanical* phenomena. In like manner, in the contrast (§:2-3), as to the active principle of mind, if we attend to our sensations, we acquire by experience a knowledge of its *animal* phenomena; and if we attend to our ratiocinations, we understand by intuition, its *intellectual* phenomena. Thus, by the exercise of sense and reason, we arrive at the knowledge of five different kinds of phenomena, viz:
>
> 1. Mechanical phenomena, inferred by reason.
> 2. Chemical phenomena, perceived by sense.
> 3. Vegetable phenomena, perceived by sense.
> 4. Animal phenomena, perceived by sense.
> 5. Intellectual phenomena, inferred by reason.
>
> §44. Of these five kinds of phenomena, the two first belong to *matter*, the two last to *spirit*, the middle to both. The three middle kinds are perceived by sense, and acquired by experience; they cannot be reasoned out *a priori*, nor understood, nor deduced by argument from any premises; without actually perceiving them, we can never know them. But the first and last cannot be perceived by sense; for though in common language we talk of seeing or perceiving mechanical phenomena, such as the figure of a square, a circle, a triangle, etc., the things we look at are not truly such; they are rough, clumsy, shapeless figures, as will appear when the microscope is applied. For the animal senses cannot perceive mathematical truth; it is not perceived by sense, but understood by the intellect.

(add discussion)

Other

Other noted sections include: “Analysis of the Rational Soul” (VI) and “The Mystery of the Moral and Physical Good and Evil” (VII).

Education

Macnab, in 1818, entitles himself having the credentials of s.s.c. or “solicitor of the supreme courts of Scotland”, implying possibly that he was some type of barrister or something akin.

Keys

Macnab’s curious, and relatively unknown book, held by only 18 WorldCat libraries, was found, in Google Books, via the search keys “moral, etymology”, during an effort to track down citations or discussions of the Roman god Mor (equivalent to the Greek god Thanatos, e.g. as found in the term thanatochemistry), the personification of death (Q), as the likely etymological origin of the term “moral”.

References

1. Macnab, Francis M. (1818). *A Theory of the Moral and Physical System of the Universe, Demonstrated by Analogy: in which the Elements of General Science are Explained Upon a Principle Entirely New*. London: Ogles, Duncan, and Cochrane.

Further reading

● Anon. (1819). “Macnab on the Universe”, *Blackwood’s Edinburgh Magazine*, 5:337-40; in: *Atheneum, Or, Spirit of the English Magazines* (Q), 6:37-40, 1820

External links

● Macnab, Francis Maximus – WorldCat Identities.

θΔics

In thermodynamics, **Francis Weston Sears** (1898-1975) was an American physicist noted a number of thermodynamics textbooks. [1] Sears is widely known also for his *University Physics* textbook written with American physicist Mark Zemansky, often referred to as *Sears and Zemansky*, a 1632-page textbook, in its 12th edition, as of 2007.

Education

Sears was a professor at the MIT school of thermodynamics from 1921 to 1955, thereafter teaching at Dartmouth College.

Quotes

The following are related quotes:

> "There is no concept in the whole field of physics which is more difficult to understand than is the concept of entropy, nor is there one which is more fundamental."
>
> — Francis Sears (1950), *Principles of Physics* [2]

References

1. (a) Sears, Francis W. (1950). An Introduction to Thermodynamics, the Kinetic Theory of Gases and Statistical Mechanics. Addison Wesley.
(b) Sears, Francis W. (1963). Thermodynamics: an Introductory Text for Engineering Students (2nd ed). Addison Wesley.
(b) Sears, Francis W. (1975). Thermodynamics, Kinetic Theory, and Statistical Thermodynamics (3rd ed). Addison Wesley.
2. Sears, Francis W. (1950). *Principles of Physics I: Mechanics, Heat, and Sound* (pg. 459). Addison-Wesley.

External links

â— Francis Sears – Wikipedia.

θΔics

In hmolscience, **Francisco Ayala** (1934-) is a Spanish-born American evolutionary geneticist and philosopher noted for his 1983 "Biology and Physics: Reflections and Reductionism", in which, firstly he presents a short overview of the so-called recent reductionist anti-reductionist debate, citing Rene Descartes, in the pro side, and Aristotle, Henri Bergson, Hans Driesch, on the con side, then secondly, siding in an unmentioned manner with his covert religious faith, Christianity, he attempts to argue that reduction of biology to the physicochemical sciences is impossible, his concluding argument being that biology has teleological properties, whereas chemistry and physics do not.

Problem of reductionism

Ayala defines what he refers to as the "problem of reductionism" as follows: [1]

> "The issue here is whether or not physicochemical entities and processes underlie all living phenomena. Are organisms constituted of the same components as those making up inorganic matter? Or, is it the case that organism consist of other entities besides molecules and atoms? Other questions related to the previous ones are the following: Are organisms nothing else than aggregations of atoms and molecules? Do organisms exhibit properties other than those of their constituent atoms and molecules?"

(add discussion)

Ayala summarizes the reductionist anti-reductionist debate as follows:

> "In the ontological or constitutive domain, the **reductionist-antireductionist controversy** in its extreme form resolves into the mechanism versus vitalism issue. The mechanist position is that organism are ultimately made up of the same atoms that make up inorganic matter, and of nothing else. Vitalists argue that organism are made up not only of material components (atoms, molecules, and aggregations of them) but also of some nonmaterial entity, various called by different authors, entelechy, vital force, elan vital, radial energy and the like."

(add discussion)

Ayala, in his attempt to criticize what he refers to as the "nothing but" fallacy, compares an, similar to the rock vs human comparison, an organism to a steam engine to an electronic computer as follows:

> "Organisms consist exhaustively of atoms and molecules. A steam engine may consist only of iron and other materials, but it is something else than iron and other components. Similarly, an electronic computer is not only a pile of semiconductors, wires, plastic, and other materials. Organisms are made up of atoms and molecules, but they are highly complex patterns, and patterns of patters, of these atoms and molecules."

(add discussion)

Next, in a uncited reference to the John Mill table salt emergent properties argument, first states the following:

> "Consider the following question: are the properties of common salt, sodium chloride, simply the properties of sodium and chlorine when they are associated according to the formula NaCl? If among the properties of sodium and chlorine we include their association into table salt and the properties of the latter, the answer is 'yes'."

Then he makes the following backwards nearly inane statement:

> "Among the properties of hydrogen we do not usually include the properties of water, of ethyl alcohol, or proteins, and of human beings. Nor do we include among the properties of iron those of the steam engine."

The gist of which being that each "atomic aggregation", as he refers to things bigger than typical molecule, has distinct "properties" not connected in any way to the elements that make up each aggregate, which, again, is but a descent into idiocy-ville. He continues, likewise:

> "Can the properties of benzene be predicted from knowledge about oxygen, hydrogen, and carbon? Or, at a higher level of complexity, can the behavior of a cheetah chasing a deer be predicted from the knowledge about the atoms and molecules making up these animals?"

(add discussion)

Religion

In 1960, Ayala was ordained as a Dominican priest, but left the priesthood that same year. Ayala identifies as a Christian, tending not to discuss his religious views, but is of the view that "science is compatible with religious faith in a personal, omnipotent and benevolent God." He is a critic of creationism, intelligent design, Christian apologists, and US restrictions on federal funding of stem cell research. In 2009, he debated Christian apologists William Craig. In 2010, Ayala won the Templeton Prize, of $1.5 million, for his vicarious efforts at attempts to reconcile religion and science. (Ñº)

References

1. Ayala, Francisco J. (1983). "Biology and Physics: Reflections and Reductionism"; in: *Old and New Questions in Physics, Cosmology, Philosophy, and Theoretical Biology: Essays in Honor of Wolfgang Yourgrau* (editor: Alwyn Merwe) (§A1:525-34). Plenum Press.
2. Lawton, Graham. (2010). "Templeton Prizewinner: We Need Science Plus Morality" (Ñº), *New Scientist*, Apr 02.

Further reading

â— Ayala, Francisco J. (2010). *Am I a Monkey?: Six Big Questions about Evolution*. JHU Press.

External links

â— Francisco J. Ayala – Wikipedia.

θΔics

In hmolscience, **Francisco Louca** (1956-) is Portuguese politician and economist noted for his 2000s work on the history of physics based economics.

Overview

In 2001, Louca, in his "Particles or humans? Econometric Quarrels on Newtonian Mechanics and the Social Realm", on human particle models, discussed topics such as Philip Mirowski's 1989 economic thermodynamics views, and how that in the late 19th century a powerful drive towards the incorporation of a new wave of mechanical analogies met with considerable resistance from some of the more established economists. [1]

In 2007, Louca, in his *The Years of High Econometrics*, discussed how in the early 20th century, thinkers such as Joseph Schumpeter (1946) or Vilfredo Pareto influenced Italian economist Luigi Amoroso (1931) discussed concepts such as will, physics, determinism, molecules, kinetic theory, physics, etc., in respect to economic implications. [2]

References

1. Louca, Franciso. (2001). *Economics and Interdisciplinary Exchange* (ch. 7: "Particles or humans? Econometric Quarrels on Newtonian Mechanics and the Social Realm", pgs. 171-180). Routledge.
2. Louca, Francisco. (2007). *The Years of High Econometrics: a Short History of the Generation that Reinvented Economics* (pg. 118). Routledge.

External links

â— Francisco Louca – Wikipedia.

θΔics

In existographies, **Francisco Suarez** (1548-1617) (IQ:160|#542) was a Spanish theologian, philosopher, and law scholar; ranked with Duns Scotus (1266-1308), Thomas Aquinas, and William of Ockham, as most important/influential middle ages philosopher-theologians; complete works: 27-volume (Latin); cited by Guericke, Leibniz, Grotius, Pufendorf, Holbach, Schopenhauer, and Heidegger.

External links

â— Francisco Suarez – Wikipedia.

θΔics

In hmolscience, **Francisco Tellez** (c.1980-) is a Chilean psychologist noted, in human thermodynamics, for his 2003 theory of irreversible sexual reactions.

Overview

In 2003 article "Transorgasmic Sexuality", in which he outlined a loose thermodynamics-metaphor based model of a type of sex or sexual practice that results to be a transcendent or transmutation type of "reversible expansion", where sexual energy is conserved, rather than being quickly dissipated (as in "irreversible expansion"), in the process of lovemaking. [1] In his own words: [2]

> "I compare transorgasmic sex to the activity of a nuclear reactor, which performs many mini-reactions leading to an extended, and emotionally more exquisite, pleasure … instead of [conversely] reaching climax all at once in [a] irreversible way."

The model is meant to be an alternative to the standard four-stage Masters and Johnson model: excitement, plateau, orgasm, and resolution. Tellez' theory is based, in part, on a modification of the psychodynamics works and theories, e.g. psychological energy, libido, ego, repression, etc., of Sigmund Freud, Carl Jung, and Wilhelm Reich. [3]

References

1. Tellez, Francisco M. (2003). "Transorgasmic Sexuality" (Sexualidad Transorgásmica), (part-1, part-2) *Local Magazine*, Santiago de Chile.
2. Marnia. (2008). "Transorgasmic Sex", *Reuniting.com*, Aug. 23.
3. Marnia. (2008). "Transorgasmic Sex: Moreno Letter", *Reuniting.com*, Jan. 11.

External links

â— Francisco Moreno Tellez (profile) – Blogger.com.

θΔics

In science, **Francisco Varela** (1946-2001) was a Chilean neurologist-philosopher noted for his 1974 implementation, together with is mentor Humberto Maturana, of cellular automata computer simulations to make what they called autopoietic networks, consisting of a production, bonding, and disintegration model of computer simulated growth, framed on the notions of catalyst and substrate elements; upon which they derived their later 1980 autopoiesis theory. [1]

Varela is classified as "follower" of Prigogine. [2]

References

1. Capra, Fritjof. (1996). *The Web of Life: A New Scientific Understanding of Living Systems* (pgs. 196-97). Anchor books.
2. Rabinovitz, Lauren and Geil, Abraham. (2004). *Memory Bytes: History, Technology and Digital Culture* (pgs. 58, 59, 74). Duke University Press.

Further reading

â— Juarrero, Alicia. (1999). *Dynamics in Action: Intentional Behavior as a Complex System* (Varela, pg. 263). MIT Press.
â— Deacon, Terrence W. (2011). *Incomplete Nature: How Mind Emerged from Matter* (Varela, 9+ pgs.). W.W. Norton & Co.

External links

â— Francisco Varela – Wikipedia.

θΔics

In existographies, **Francois Arago** (1786-1853) (IQ:180|#187) (Cattell 1000:259) was a French mathematician, physicist, astronomer, and politician, noted for []

Overview

In 1811 to 1816, Arago's name, in the history of classical electrodynamics, is predominate three times. [3]

Arago studied the phenomenon of magnetic rotation and the fact that a wire coil could be magnetized by passing electrical current through it; discovered, along with, along with Augustin Fresnel, the principles governing the polarization of light and established the theory of light as a wave; studied the velocity of sound, and made it possible to invent the polariscope. Began the studies of the velocity of light which lead to discoveries by Leon Foucault. (Q)

Steam engine

In 1829, Arago published some type of hackneyed article, in the *Directory of the Bureau of Longitudes* (*Annuaire du Bureau des Longitudes*), which attempted to outline the early history of the steam engine; the following is an English translation of the preface of his article: [1]

> "The steam engine has rendered such important services to industry and navigation, that we cannot be astonished at the eagerness with which various nations have disputed the honour of the invention. Yet it will not be heard without surprise, that in England alone one hundred thousand copies of the works in which this historical question is discussed, have been sold within a very few years. Such striking success is due, I doubt not, principally to the lively interest which the steam engine must naturally excite in a country where it is met with at every step; but may we not suppose that self-love has had some share in producing this effect? Ask the member of the House of Lords, and the most simple artisan; the merchant whose speculations have led him into every region of the world, and the farmer who has never passed the borders of his own county; traverse the manufactories of Birmingham, Manchester, and Glasgow, and the humblest workroom of a cottage; every where you will hear that the first inventor of the steam engine was the Marquis of Worcester [1602-1667] (Q)(Q). Everywhere this name will be cited, and it will be followed by those of Savery, of Newcomen, of Beighton, of Watt, of Hornblower, of Woolfe, &c. &c. Literary men, and those who cultivate the sciences, have, in general, opinions no less decided.
>
> If you open the recent *Encyclopædia* of Dr. Rees, you will find this passage; "the steam engine follows next to the ship in the order of inventions, but in an English Encyclopædia it will take the lead, from the circumstance of its being wholly invented and brought into general use by our own countrymen." And then, as if this were not sufficiently clear; 'the steam engine has been invented by a small number of individuals, all of them Englishmen." - "The celebrated professor John Robison, of Edinburgh, is quite as positive. He says, "the steam engine was, beyond all doubt, first invented by the Marquis of Worcester, in the reign of Charles the Second." Then, after having refuted by arguments, which I will examine, the pretensions of those French authors who affect to mix up the name of Papin with the history of the steam engine, Robison declares, "that he does not hesitate in giving the honour of the first and complete invention to the Marquis of Worcester." A philosopher, not less illustrious for the profoundness of his knowledge, than for the vastness of his erudition, Dr. Thomas Young, has joined his imposing testimony to those I have quoted. According to him, the Marquis of Worcester is the first inventor of the steam engine, the first who has used the of vapour as a prime mover. In the rapid view which he takes of the ameliorations which this machine has successively undergone, no names appear but those of Englishmen. I could also cite the able professor of Mechanics at the Royal Institution, Mr. Millington; a distinguished member of the new University of London, Dr. Lardner; the author of an esteemed *Treatise on Mechanics*, Mr. Nicholson, &c. &c. "Decisions so numerous, so positive, the just reputation of the works from which I have quoted them, would seem to exclude the shadow of a doubt. When, therefore, at the desire of the pupils of the Polytechnic School, I attempted, some years since, to trace the chronological series of 'improvements in the steam engine, from

> its origin till our own time, I expected, I say it without equivocation, to have only English mechanics to cite. This was, however, a mistake. Our neighbours on the other side of the channel are not the sole, neither are they the first, inventors of the steam engine."

The concluding point of Arago's article was his assertion, albeit falsely reasoned, that the true inventor of the steam engine was Salomon de Caus.

Arago, whatever the case, in the decade to follow, was being cited as a reference to this Salomon de Caus false attribution. [2]

Quotes | By

The following are quotes by Arago:

> "Such is the privilege of genius; it perceives, it seizes relations where vulgar eyes see only isolated facts."
>
> — Francois Arago (c.1830), *Publication* (Q)

References

1. Anon. (1829). "On the Early History of the Steam Engine" (Q), *Journal of the Franklin Institute*, 4(8):319-27.
2. Anon. (1830). "On the Early History of Steam, and Steam Engines" (pg. 43), *The Mechanics Magazine*, 1:42-25.
3. Errede, Steven. (2007). "A Brief History of the Development of Classical Electrodynamics" (pdf), University of Illinois at Urbana-Champaign, Fall.

External links

- Francois Arago – Wikipedia.

θΔics

In hmolscience, **Francois Broussais** (1772-1838) was a French surgeon, general pathologist, philosopher, and asoulist noted for his his moral theory investigations.

Overview

In 1814, Broussais began to promulgate his views on the relation between life and stimulus, and on the physiological interdependence and sympathies of the various organs.

Broussais, at some point, denied the existence of the soul, on the basis that he never found one in the corpses one dissects (e.g. pineal gland of the Cartesian soul; the heart of the Egyptian soul, etc.) (Ñº)(Ñº); a view similar to Napoleon Bonaparte and his surgeon soul queries.

Broussais, while attacking the spiritualists of his time, simultaneously denied he was a materialist and an atheist. (Ñº)

Propositions

The following, from Broussais' *An Outline of the Association of Ideas*, seem to be of note:

> "To think or to reflect, is to exercise recollection and judgment. No other elements are contained in what we call thinking. What recollection and judgment are, such is thought therefore."
>
> — Francois Broussais (1828), Prop. 18: "Of Thought" (pgs. 399)

> "The will is that state of the brain, attendant upon vivid sensations or ideas, concomitant with desires and aversions, and that excites us to action; it is as real as the sensations or ideas, and as really corporeal. For instance, that sensation called hunger does not arise, when the stomach is completely satisfied, and therefore it depends on the state of the bodily organs. I see before me on the table, a piece of roast beef, a knife, fork and plate: if my stomach needs food, the sensation accompanying these visible images, will be associated with hunger: if the stomach be satisfied it will not. If it be accompanied by hunger, the desire, wish, will or volition to eat, and the consequent motions to carry that volition into effect, will take place not otherwise. That desire, therefore, is a state of the brain dependent on the excited state of the bodily organs that act by transmitted excitement, that is, by innervation, on the encephalon. It is a peculiar state of the brain associated with a peculiar state of the stomach. All desires and aversions, wishes and volitions when analyzed will in like manner be found nothing more than modifications of cerebral motion arising from the circumstances that excited the motions themselves."
>
> — Francois Broussais (1828), Prop. 19: "Of the Will" (pgs. 399)

> "I know nothing approaching to satisfactory proof of any innate moral sense. It is one of the dreams of the ontologists and metaphysicians."
>
> — Francois Broussais (1828), Prop. 20: "Of the Moral Sense; Conscience" (pgs. 399-402)

(add discussion)

Quotes | About

The following are quotes on or about Broussais:

> "Cabanis is the true master of **Broussais**, because for him, the moral is only the physical considered under certain particular points of view."

— E.F. Dubois d'Amines (1864), "Broussais" [1]

Quotes

The following are noted quotes:

> "My intention is to rescue 'the physical and moral science of man' from the obfuscations and obscurities of those who seek to 'plunge us once again into the illusions of chimeras of ontology'."
>
> — Francois Broussais (1828), *On Irritation and Instanity* [3]

> "It is no more 'just' to punish an assassin than a tiger."
>
> — Francois Broussais (c.1834), paraphrase of fatatist views of Spinoza, Hobbes, or Priestley [2]

References

1. (a) d'Amiens, E.F. Dubois. (1864). "Broussais", Publication (pg. 91); see also: M.Levy, "Eloge de Broussais" (1839), Publication (pg. 387).
(b) Clarke, Edwin, and Jacyna, L.S. (1992). *Nineteenth-Century Origins of Neuroscientific Concepts* (pg. 273-77). University of California Press.
2. Thomson, Ann. (2008). *Bodies of Thought: Science, Religion, and the Soul in the Early Enlightenment* (pg. 226). Oxford University Press.
3. (a) Broussais, Francois. (1828). *On Irritation and Insanity: Wherein the Relations of the Physical with the Moral Conditions of Man, are Established on the Basis of Physiological Medicine; to which are added Two Tracts on Materialism, and An Outline of the Association of Ideas* (*De l'irritation et de la folie*) (translator: Thomas Cooper) (morality, 8+ pgs; moral, 100+). S.J. M'Morris, 1831.
(b) Williams, Elizabeth A. (2002). *The Physical and the Moral: Anthropology, Physicology, and Philosophical Medicine in France, 1750-1850* (§:The Physiological Medicine of F.J.V. Broussais, pgs. 166-). Cambridge University Press.

External links

â— Francois-Joseph-Victor Broussais – Wikipedia.

θΔics

In human thermodynamics, **Francois E. Cellier** (1948-) is a Swiss electrical engineer and computer scientist noted for []

Overview

In 1991, Cellier, in his chapter "Modelling in Nonequilibrium Thermodynamics", voiced his opinion that a PhD dissertation on the thermodynamics of macroeconomics (economic thermodynamics) would be a very worthwhile topic; his full statement on this is as follows: [1]

> "We have discussed thermodynamics from a systemic rather than a phenomenological viewpoint. We have seen that bond graphs present us with a tool to ensure adherence to physicality in modeling thermodynamic systems … bond graphs [however] are quite meaningless when applied to the description of mathematical equations bare of their physical interpretation. It is therefore not currently feasible to apply bond graphs to the description of a macroeconomic model, for example, since we don't know what energy conservation means in such a model.
>
> What does economic power mean in a system theoretical rather than in a political sense? We don't know? Consequently, we cannot define a set of adjugate variables that describe the behavior of a macroeconomy. However, I would like to go one step further. While I cannot prove this to be correct, I am personally convinced that any real system that can meaningfully be describe by a differential equation model—and macroeconomic systems are among those without any question—possesses some sort of 'energy' that obeys the law of conservation of energy. It is just that, to my knowledge, nobody has ever looked into systems, such as macroeconomies, from quite that perspective and tried to formulate a meaningful and consistent definition of the the terms 'energy' and 'power', and from there derived a set of adjugate variables, the product of which is 'power'. **This would be a very worthwhile topic for a PhD dissertation**."

On Cellier's "to my knowledge" comment, a perusal of the 500+ theorists listed on the HT pioneers page, with economic icons adjacent to their names, would certainly shed light on the great underground history of economic thermodynamics.

Education

Cellier completed his BS in electrical engineering in 1972, his MS in automatic control in 1973, and his PhD in in 1979 in technical sciences in 1979 all at ETH Zurich, Switzerland. In 2005, Cellier became professor emeritus of computer engineering at the University of Arizona.

See also

- Human thermodynamics dissertations
- Human thermodynamics education
- Two cultures department

References

1. Cellier, Francois. (1991). *Continuous System Modeling* (§8: Modelling in Nonequilibrium Thermodynamics, pgs. 297-345; quote, pg. 330). Springer.

External links

- Francois E. Cellier (faculty) – ETH Zurich, Switzerland.

θΔics

In existographies, **Francois Fenelon** (1651-1715) (IQ:180|#209) (Cattell 1000:102) (CR:6), aka "De Cambria" (Meslier, 1729), was a French Catholic theologian, poet, and writer, noted for []

Overview

In c.1689, Fenelon, in his *Refutation of the System of Malebranche on Nature and Grace*, rebuts the theology of Nicolas Malebranche.

In 1699, Fenelon, in his *Adventures of Telemachus*, did a retake on Telemachus, son of Ulysses, of Homer's Odyssey, a work that was influential to Jean Rousseau, Charles Montesquieu, Thomas Jefferson, Johann Herder, and Alfred Tennyson.

Matter | Thinking & feeling

Jean Meslier first cites Horace and laughing at humorous work:

> "Could you, my friends, contemplating this work, hold yourselves back from laughing?"
>
> — Horace (c.19BC), *Art of Poetry* (5)

Fenelon said the following about laughing children (see: laughing children rule) and people who would attribute feelings to stones: [1]

> "Matter cannot think or feel and the people, even children, cannot be persuaded otherwise. People and children are far from believing that matter is capable of thinking and feeling in anyway, so that they could not help laughing if you told them that a stone, a piece of wood, a table, or their dolls felt pain or pleasure and joy or sadness."
>
> — Francois Fenelon (c.1690), *On the Existence of God*

Meslier rebuts this logic as follows: [1]

> "Now that is a lovely argument for a person of such rank, merit, and erudition! People and even children could really have a reason to laugh and make fun of those who to amuse themselves would like to make them believe that stones, tables, boards, furniture, or dolls had knowledge and sentiment because they know, indeed, that these sorts of things cannot know or feel anything. But, their laughter would not come, as **Fenelon** would like to make them understand, from the fact that these kinds of things are only matter or made of matter, but because they would see that these things are not 'animate' and do not have life like animals and consequently they cannot think or feel."

(add)

Quotes | On

The following are quotes on Fenelon:

> "It very well seems that **Fenelon**, archbishop of Cambrai, did not care much about these so-called miracles and did not put much faith in them since he did not deign to say a word about them in his *On the Existence of God*."

— Jean Meslier (1729), *The Testament* (pg. 132)

"The god of a Socrates, or of a **Fenelon**, may be suitable to minds as gentle as theirs; but he cannot be the god of a whole nation, in which it will always be extremely rare to find men of their temper."

— Baron d'Holbach (1770), *The System of Nature* (pg. 295)

Quotes | By

The following are quotes by Fenelon:

"The idea that is formed of the infinite [as god] is astonishing and overwhelming. No extension and no composition can be infinite, considering that every extension and composition is only a mass of many finite and limited units that all together cannot form an infinite, as far as nothing that is limited and finite can make the infinite."

— Francois Fenelon (c.1690), *On the Existence of God*; cited by Jean Meslier (1729) in *The Testament* (§79)

"Nothing is more despicable than a professional talker who uses his words as a quack uses his remedies."

— Francois Fenelon (c.1700)

References

1. Meslier, Jean. (1729). *Testament: Memoir of the Thoughts and Sentiments of Jean Meslier* (translator: Michael Shreve; preface: Michel Onfray) (pgs. 560-61). Prometheus Books.

External links

â— Francois Fenelon – Wikipedia.

θΔics

In thermodynamics, **Francois Massieu** (1832-1896) was a French engineer noting his 1869 "characteristic function", symbol Ψ (psi), of a fluid body, or Massieu functions, as they have come to be known. [1] In the 1876 views of American engineer Willard Gibbs: [3]

> "Massieu has shown how all the properties of a fluid 'which are considered in thermodynamics' may be deduced from a single function, which he calls a characteristic function of the fluid considered; he introduces two different functions of this kind, vis, a function of the temperature and volume, which he denotes by Ψ, and a function of the temperature and pressure, which he denotes by Ψ'; in both cases he considers a constant quantity (one kilogram) of the fluid, which is regarded as invariable in composition."

In other words, Gibbs cites Massieu as being the originator of the prototype of the 'fundamental equation', which Gibbs would go on to explain and develop in detail to the all of the various possibilities to which a body may be subjected.

Thermodynamics

The following are the thermodynamics sections, French-to-English translate, from the 1897 "Notice of the Life and Work of Massieu" by French engineer Edmond Nivoit. [3]

"Especially in the field of thermodynamics that Massieu left the light trace of its passage. It is probable that he was encouraged to follow this path, where were also his personal tastes and habits of mind, by his colleague from the Faculty of Rennes, Athanase Dupre, who published a series of papers on the mechanical theory of heat, in the *Annals of Chemistry and Physics.* More than once it had recourse to the penetrating mind and keen Massieu to increase the rigor of the demonstrations or to shed light on some obscure point, he was sometimes even brought on his advice, abandon proposals hazardous. It also fully inserted in his memoirs of his collaborator two notes: one on the *molecular attraction,* the other on the *work of complete disintegration,* or total work required to separate molecules from each other, despite the forces they opposed.

In 1870, Massieu presented, to the Academy of Sciences, a brief on the characteristic functions of the various fluids and value theory, which I will try to give a brief idea. Everyone agrees that the state of a body is completely defined when we know two of the three quantities that represent the volume of this body, its temperature and pressure on its surface. Any one of these quantities must be regarded, for each body, as a function of two others taken to the independent variables.

Based on the fundamental principles of thermodynamics and choosing as variables, the volume and temperature or pressure and temperature, Massieu established by a simple calculation, an equation where both are exact differentials and from which he derived a function, independent of any hypothesis, he called the characteristic function of the body considered, because it implicitly contains all the thermodynamic properties of the body. It may indeed serve to express, either by itself or through partial derivatives, the pressure on the body or volume (as the independent variables that have been taken), the entropy of Clausius or function, internal energy, then by a little less simple calculations, the two specific heats, a constant pressure, the other at constant volume, the two coefficients of expansion at constant pressure and volume, the coefficient of compressibility .

Massieu then applied his theory to the ideal gas, which follow the laws of Mariotte and Gay-Lussac, the saturated vapor and superheated vapor. For ideal gases, it naturally finds no new property, since the properties of these bodies are used to precisely determine the complete expressions of the fundamental principles of thermodynamics. For saturated vapor, it also reflected by an elegant analysis, formulas already known, including one that calculates the density of dry saturated steam under various pressures using the experimental data of Regnault. His aim in this analysis is to show the simplicity and generality of his method.

Regarding the superheated steam, the elements of uncertainty abound, since the only experimental data that one has to determine the characteristic function, which is the value of the specific heat of water vapor varies with temperature and

with the pressure. The author first establishes its formulas without any hypothesis, but to translate them into numbers, it is obliged to make various assumptions. He admits that the first specific heat of water vapor is constant and its value is equal to the figure obtained by Regnault in specific conditions, which amounts to assimilate in this report to a perfect gas vapors. This is a perfectly acceptable assumption for the practice, if we do not take a very rigorous.

But the industry does not seek to obtain strong overheating, and rightly so, because, as Massieu shows the theory, they would be of little use in steam engines arranged like those we use. The almost unique advantage they bring is to reduce heat losses due to condensation in the cylinder. Just a small amount of heat used to superheat steam admitted, for a relatively large reduction in the expenditure of the steam. In a second case, the author represents the specific heat by a formula with three factors, it can be calculated using the known law of maximum tension. Just as this law has not quite a general character, since the integral contained in the formula that translates is caught between two specific limits, which are the saturation temperature and infinite temperature, we understand that can give the form of a function, but only the numerical value of some coefficients. This second hypothesis, however, provide much better results that approached those obtained with the previous, where specific heat is regarded as constant, and it should be preferred when the overheating becomes an inconsiderable.

The characteristic function of a body is so good, as we see, the condensation of all its thermodynamic properties. It suffices to express a limited number of numerical coefficients, and when, or could obtain these data, one must choose among those that experience provides the easiest, the thermodynamic theory of this body is complete.

She still has a valuable property which greatly increases its scientific value and gives a great philosophical interest. It is a kind of touchstone, with which to test any statement relating to the mechanical theory of heat and recognize if it is pure alloy. Thus Massieu has demonstrated the inaccuracy of some theorems formulated hastily by way of analogy and he did see that other, instead of corresponding to general truths, applicable only to body of a certain category.

An eminent judge, Joseph Bertrand (*Thermodynamique,* 1887), did not hesitate to declare, in a report read to the Academy of Sciences July 25, 1870, that "the introduction of this function in formulas that summarize all the possible consequences of the two fundamental theorems for the theory seems a similar service and has almost equivalent to that given Clausius' theorem in relating the Carnot entropy.

Shortly after the release of this remarkable memoir, which discontinued its author among the masters of thermodynamics, Massieu released a memo written to please a few people who were interested in his work, in which he gives a full statement of two fundamental principles, he had accepted without question and without the show: one, known as the principle of equivalence between heat and work, stated by Meyer and the other due to Carnot, which defines the influence of temperature on the thermal phenomena whose machines are registered.

He thought, the great mathematician Lagrange, that if these formulas are very useful in the development of a science, they often interfere with the clarity of the exposition of its principles. There are about thirty years, when Massieu was engaged in his search for rational mechanics, the mechanical theory of heat was again applied only within narrow limits to the study of steam engines. In education we continued to rely mostly on two assumptions which are incorrect, however, was well demonstrated. They assumed that because the saturated vapor follow the laws of Mariotte and Gay-Lussac, who are already not absolutely rigorous for gas in perfect condition, and more than vapor, when they relax in a cylinder engine to remain without saturation or overheating occur or partial condensation.

In fact many scholars, such as Clausius, Zeuner, Rankine, Combes, and Resal, have shown how practical implications could be drawn from the new theory and gave some numerical examples. But it had not yet established formulas that can be applied widely in construction workshops and permitting, is to discuss the pros and cons of various measures adopted in the machinery, or to sense the value changes that might be tempted to introduce.

Massieu had planned to fill this gap and to publish a text of a rational theory of steam engines, based on the fundamental principles of thermodynamics. He possessed all the elements of this work he could do was to coordinate and establish numerical tables that would have been the translation of its most important formulas. This might have been such a work, developed by a man so admirably prepared, it is easily understood. The introduction and first two chapters, including the statement of principles, as well as studying the properties of gases and vapors are only completed. Clarity is dominant,

too abstract calculations have been avoided with the utmost care, which makes reading easier for those people who have only the rudiments of calculus. The third chapter, on superheated steam, which was to be the original part of the book, is sketched."

Philosophy

See main: Unbridgeable gap; HMS pioneers

Massieu, according to the views of Massieu obituary biographer French engineer Edmond Nivoit, was a teacher of great merit who knew how to vibrate his audience and often choose lectured themed on grand philosophical questions. In a speech he was charged to deliver at the start of the Faculties of Rennes, he regrets the division that has developed between science and philosophy, these two branches of human knowledge so well done to hear and render mutual support: [2]

> "They cut the man into two parts, soul and body, the philosopher took one, and another naturalist, they both have worked, studied on their behalf have lost sight and we find ourselves today in the presence of a duality, convenient perhaps, but unwise, in that it overlooked the man to deal with only two elements that constitute it. But in doing so we run the risk of being wrong. If one wanted to know the chemical properties of water [H_2O], seek it in those of oxygen [O_2] and hydrogen [H_2]? No, because he knows that there is little relationship between the characteristics of a substance and those of simple bodies which enter into its composition.
>
> To study humans, it is perhaps even more reserve, his corpse is certainly different from his living, his soul is a being whose morality tells us in existence, but whose philosophy can boast of acquire specific knowledge, since it can be studied in a free state, the revelation can only speak in this regard. But what science and philosophy can and should perhaps only study, is a man indivisible and tangible for us, where the angel and the beast are inseparable, which has a body and ailments, but also passions and faculties, such as intelligence, memory and reason."

In these penetrating comments, we see Massieu digging into some of the very same comments that exist in modern times, when confronted with the logic of the person viewed as the human molecule, and the question of what to do with incongruous concepts, such as soul, life, free will, choice, etc., that have never been applied to chemicals in their reactions.

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(b) Massieu, Francois. (1876). *Thermodynamique: Mêmoire sur les fonctions catactéristiques des divers fluides et sur la théorie des vapeurs*. 92-pgs. Académie des Sciences de L'Institut National de France.
2. Nivoit, Edmond. (1897). "Notice of the Life and Work of Mr. Massieu, Inspector General of Mines" (French → English), Annales des Mines, 9th Series, Volume. 11.
3. Gibbs, Willard. (1876). "On the Equilibrium of Heterogeneous Substances" (Massieu, pgs. 86, 358),*Transactions of the Connecticut Academy*,III. pp. 108-248, Oct., 1875-May, 1876, and pp. 343-524, may, 1877-July, 1878.

External links

â— Francois Massieu – Wikipedia.
â— Francois Massieu (French → English) – Wikipedia.

θΔics

In existographies, **Francois Quesnay** (1694-1774) (IQ:165|#391), pronounced (Q) “kay-nay” or “kuh-NAY”, was a French physician and economist, characterized a "clever man" (Mettrie, 1745) the "height of genius" in political economy (Marx, 1860), noted for []

Overview

In 1747, Quesnay, in his *Essay on the Physics of Animal Economics*, a treatise dedicated (Q) to establishing the physical and chemical foundation of the nutrition, generation, and sensitivity of organisms, attached to the second edition an addendum entitled “Treatise on Fire”, wherein he posits, according to Mettrie (1745), that heat and cold play the main role in the formation of bodies. [1]

In 1758, Quesnay, in his *Economic Table*, outlined the ideas behind the “physiocrat”, from the Greek phýsis, meaning “nature,” and kràtos, meaning “power”, school of economics, e.g. that the source of economic strength or wealth is “land”, which is generally considered to be the first school of economic thinking. [2]

Influence

Quesnay was influential to Adam Smith, who began to read his work in 1764 while in France.

Quotes | On

The following are quotes on Quesnay:

> “Never before had thinking in political economy reached such heights of genius.”
>
> — Karl Marx (c.1860), on Quesnay (Q)

Quotes | By

The following are representative quotes:

> “To secure the greatest amount of pleasure with the least possible outlay should be the aim of all economic effort.”
>
> — Francois Quesnay (c.1758) (Q)

> “Calculations are to the economic science what bones are to the human body. Without them it will always be a vague and confused science, at the mercy of error and prejudice.”
>
> — Francois Quesnay (c.1758) (Q)

References

1. (a) Quesnay, Francois. (1747). *Essay on the Physics of Animal Economics* (*Essai physique sur l’economie animale*). Paris: Publisher.
(b) La Mettrie, Julien. (1751). *Machine Man and Other Writings: Treatise on the Soul, Man as Plant, The System of Epicurus, Anti-Seneca or the Sovereign Good, Preliminary Discourse* (translator and editor: Ann Thomson) (pg. 53). Cambridge University Press, 1996.
2. Tableau Economique (Francois Quesnay) – Marxist.org.

External links

- Francois Quesnay – Wikipedia.

θΔics

In existographies, **Francois Rabelais** (c.1489-1553) (IQ:170|#318) (Cattell 1000:121) (FA:42) (CR:13) was French writer, physician, humanist, and Greek scholar, characterized an "aggressive atheist" (Abel Lefranc, c.1890), "ape of Lucian", "Democritus reborn" (du Bellay, c.1550), and or "secular sage" (Hecht, 2004), depending on disposition, noted for []

Overview

In c.1532, Rabelais published the first volume of his pentalogy *The Life of Gargantua and Pantagruel*, wherein he tells the funny adventures of two giants, Gargantua and his son Pantagruel, full of "messy carousing, unceremonious sexual adventures, excretions, and general muck", wherein many people make fun of priests, scripture, Church hierarchy and ritual. [1]

The philosophy of the son, Pantagruel, is called "Pantagruelism", is rooted in "a certain gaiety of mind pickled in the scorn of fortuitous things", which seems to be code for Epicureanism (see: fortuitous atoms).

In 1942, Lucien Fabvre, in his *The Problem of Unbelief in the Sixteenth Century: the Religion of Rabelais*, asserted nobody, Rabelais included, before Rene Descartes (c.1620), could have been "real atheist", per reason that people labeled as atheists prior to Descartes were the result of historians "impressing modern values on the past", and that the label "atheist" in these days was used a way to insult one another. [2]

Associates

Rabelais was a friend of Etienne Dolet.

Influence

Honore Balzac was a student of Rabelais. [4]

Quotes | On

The following are quotes on Rabelais:

> "Who can, with so much learning write, that now we have at last in France, **Democritus reborn**, whose lance cuts through the schoolmen's murky light."
>
> — Joachim du Bellay (c.1550) [3]

> "The writings of **Rabelais** are often considered to afford the first instance of religious skepticism in the French language."
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 372)

> "There has been a considerable number of those whom history calls atheists. Leucippus, Democritus, Xenophanes, and others of the Atomistic and Eleatic Schools, are said to have been such. In his *Intellectual System*, Cudworth puts into this category: Seneca and the younger Pliny among the Romans. Since the Reformation, such men as: **Rabelais**, Machiavel, Bruno, Vanini, D'Alembert, Diderot, Buffon, Condorcet, Mirabeau, La Place, Frederick II, and even Pope Leo X, have been charged with atheism."
>
> — Willis Lord (1875), *Christian Theology for the People* (pg. 67)

Quotes | By

The following are quotes by Rabelais:

> "Sleep, gluttony, wine, women, jest, and jibe: these were my gods, my only god, when I was alive."
>
> — Francois Rabelais (c.1550), his general view, according to Joachim du Bellay (1553) [3]

References

1. (a) Gargantua and Pantagruel – Wikipedia.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 279). HarperOne.
2. (a) Febvre, Lucien. (1942). *The Problem of Unbelief in the Sixteenth Century: the Religion of Rabelais* (translator: Beatrice Gottlieb) (pg. xi). Harvard University Press, 1982.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 279). HarperOne.
3. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 285). HarperOne.
4. Balzac, Honore. (1936). *The Atheist's Mass: and Other Short Stories* (*La Messe de l'Athee*) (translator: Clara Bell; preface: George Saintsbury) (Rabelais, pg. xii). J.M. Dent and Co, 1896.

External links

â— Francois Rabelais – Wikipedia.

In existographies, **Francois Rochefoucauld** (1613-1680) (IQ:170|#350) (Cattell 1000:621) [RGM:261|1,500+], aka "La Rochefoucauld" (Q), was a French writer noted for booklet *Maxims*, characterized as a dense collection of 504 sharp one-line philosophies, curated, tested, and developed in the French salons.

Influenced

The *Maxims* of Rochefoucauld, according (Q) to Voltaire, was one of the single biggest things that shaped French minds; Rochefoucauld was frequently name-dropped by Nietzsche. [1]

Quotes | By

The following are noted quotes by Rochefoucauld:

> "True love is like ghosts, which everybody talks about and few have seen."
>
> — Francois Rochefoucauld (c.1865), *Maxims*

> "Absence diminishes small loves and increases great ones, as the wind blows out the candle and fans the bonfire."
>
> — Francois Rochefoucauld (c.1865)

> "No persons are more frequently wrong, than those who will not admit they are wrong."
>
> — Francois Rochefoucauld (c.1865)

References

1. Nietzsche, Friedrich. (1885). *Will to Power: An Attempt at a Revaluation of All Values* (translator: Walter Kaufmann and Reginald Hollingdale; editor: Walter Kaufmann) (pdf) (txt). Random House, 2011.

External links

- Francois de la Rochefoucauld – Wikipedia.

θΔics

In existographies, **Francois Roddier** (1936-) is a French-born American physicist and astronomer noted for his 2001 to present work in the area of the thermodynamics of evolution with focus on bio-sociological and economic topics.

Overview

In 2001, Roddier, having retired from space research, began blogging at Francois-Roddier.fr (in French), via "An Astronomer's Point of View", focused on research into physics applied to biology, in the direction of sustainability focused topics, limited resources, global warming, human extinction, etc., from the point of view of the laws of thermodynamics, and on his ideas, which are that humans are dissipative structures, but Gibbsian thermodynamics underlie biology, and that the ideas of Edwin Jaynes ideas are important.

In 2010, Roddier, at the Institute of Astrophysics of Paris, lectured at a conference on "The Thermodynamics of Evolution: from Big Bang to Human Sciences". [2]

In 2012, Roddier, in his *The Thermodynamics of Evolution: an Essay on Thermo-Bio-Sociology*, attempted to summarize his ideas in essay book form.

Economics

In 2015, Roddier, after developing his own human thermodynamics variables, generally based on the idea that economies are governed by Gibbs potentials, was lecturing and conferencing on economic thermodynamics ideas and theories. [3]

In 2015, Roddier, in his workshop talk "The Thermodynamics of Economic Transitions", after opening to a Nicholas Georgescu-Roegen quote, attempted to argue that the metabolism of an economy is governed by thermodynamics, just as the physiological aspects of human metabolism is governed by thermodynamics. [4]

The following, of note, is one of is one of Roddier's economic thermodynamic surfaces, modeled on thermodynamic surfaces (see: history of thermodynamic surfaces), which seems to be one of the first such constructions seen in economics, barring the possible mental ruminations of Paul Samuelson: [3]

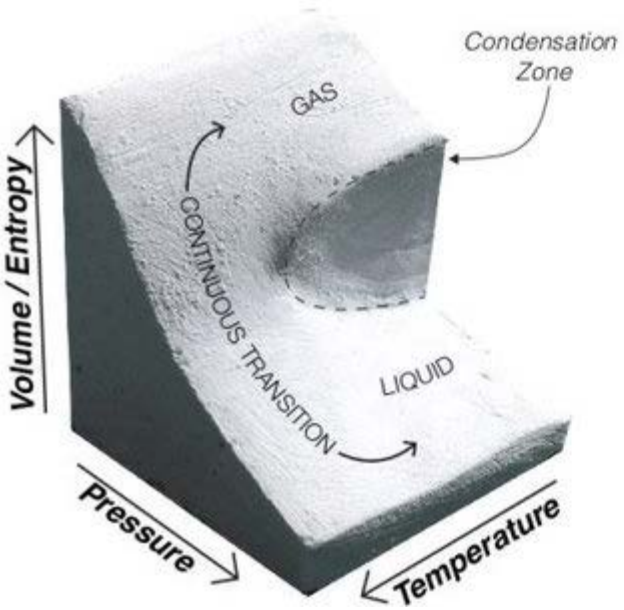

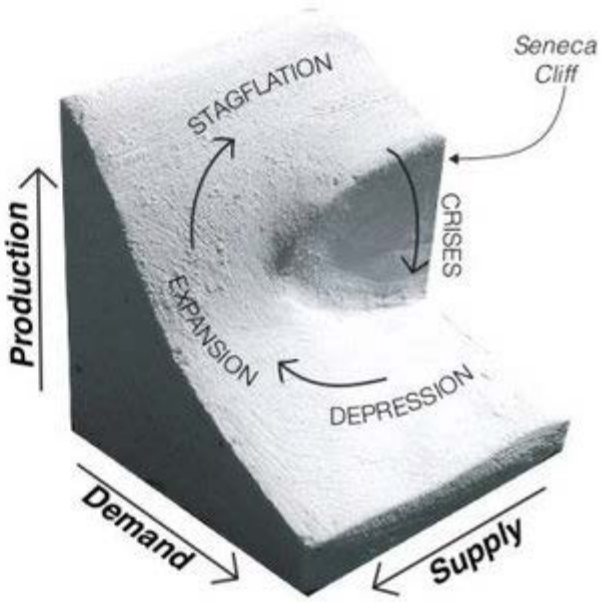

(add)

Semantics

Roddier, in his *Thermodynamics of Evolution* (pg. 5-6), states the following on interdisciplinary language problems:

> “One of the issues that I have struggled with is language, as each discipline develops its own jargon. To assist the readers, a definition of the scientific and technical terms that are in italic in the main text will be found in a glossary at the end of the book. The use of everyday language turned out to be equally tricky. Richard Dawkins entitled his first book *The Selfish Gene*, as if a gene could exhibit human behaviour. Dawkins justified this by saying that it was a figure of speech. My own book goes even further: it is my goal to show that, under different aspects, one is able to find the same underlying processes as much in physics as in biology or sociology. One can follow these processes continuously from one discipline to another and therefore can describe them with the same vocabulary.”

Here, in Roddier's self-gene example, we not that one may excuse Dawkins, a zoologist, for using loose terms in writing a pop science book geared to tickle the ears of the layman; when, however, a physicist is writing, the rules for language are more exact, e.g. Alfred Lotka's "Regarding Definitions" (1925). In this regard, Dawkins' book title violates the principle of inertia, as Karl Pearson so aptly pointed out, in respect to all terms that use the prefix "self-" (see: self terminology reform). Roddier continues:

> “Everyday language is especially suited for describing human and even animal behaviour. But can one also use it to talk about things? People say, for instance, that an individual imitates another. The same thing can be said about a monkey or a bird. But if a magnet aligns itself to its neighbor, can we say that this, too, is imitation? In this book (section 3.1), I will show how these processes are actually fully similar. **The issue of language becomes particularly acute**, when we are dealing with manifestations of intention. If we kill a rabbit to eat, a cat could be said to do the same with a mouse, albeit perhaps more instinctively. As we shall see, bacteria orientate themselves towards their food source. Is this because they intend to feed themselves or, more simply, because their behaviour follows the law of Le Chatelier (section 9.1)? For me, this is purely a question of language.”

(add)

Difficulties

Roddier, of note, thinks that entropy of information theory and the entropy of thermodynamics are the same thing; he also believes in Ilya Prigogine's views on thermodynamics (which is free will and creationism based); he also crouches his theory around self-organization premises (a violation of the principle of inertia); he also believes in the existence of life (see: life does not exist) and thinks that the origin of life is explained by autocatalysis. [1]

Education

Roddier completed his PhD in 1964 in astrophysics at the University of Paris, France. In 2001, he retired from the astronomy department at the University of Hawaii.

Quotes | Employed

The following are quotes employed by Roddier:

> “The true physics is that which will, one day, achieve the inclusion of man in his wholeness in a coherent picture of the world.”
>
> — Pierre Teilhard (1936), *The Phenomenon of Man* [1]

Quotes | By

The following are quotes by Roddier:

> “Had I been told me ten years ago that the laws of statistical mechanics could explain human behavior, I would have smiled doubtfully. Today, however, I am absolutely convinced that they can. The fundamental laws of biochemistry are those of thermodynamics, as established by Gibbs, and insofar living beings are made up of biochemical reactions, they cannot but obey these laws.”
>
> — Francois Roddier (2017). *The Thermodynamics of Evolution* (pg. 3) [1]

> “In a world where everything is changing, how do you know the laws that govern its evolution? A mathematician, Emmy Noether, has shown that if evolution obeys fixed laws, then there is a measurable quantity that remains constant. Physicists call such a quantity an invariant. Discovered in the nineteenth century, this invariant has been given the name of energy. It can be thought of as the Ariane’s thread that allows us to track the evolution.”
>
> — Francois Roddier (2012), *Thermodynamics of Evolution* (pg. 10)

References

1. Roddier, Francois. (2012). *The Thermodynamics of Evolution: an Essay on Thermo-Bio-Sociology* (pdf). Parole Editions; English, 2017.
2. Roddier, Francois. (2010). “The Thermodynamics of Evolution: from Big Bang to Human Sciences” (Q) (vid), Institute of Astrophysics of Paris.
3. Roddier, Francois. (2016). “Entropy, Money, Investment and Debt” (Q), Blog, Jul 3.
4. Roddier, Francois. (2015). “The Thermodynamics of Economic Transitions” (La thermodynamique des transitions économiques) (vid), Think Tank Workshops, The Shift Project, Mar 12.

Further reading

● Roddier, Francois. (2013). “Francois Roddier beyond the Effect of the Red Queen” (“François Roddier par-delà l’effet de la Reine Rouge”) (French → English), Le Monde, Oct 30.

Videos

● Roddier, Francois. (2010). “The Thermodynamics of Evolution: From the Big Bang to the Human Sciences” (“La thermodynamique de l'évolution : du Big Bang aux sciences humaines”) (Q), Conférence donnée à l'IAP, Oct 5.

External links

● Francois Roddier (French → English) – Wikipedia.
● Francois Roddier (faculty) – University of Hawaii.

θΔics

In existographies, **Francois Vayer** (1588-1672) (IQ:170|#330), aka "L'amotte le Vayer" (Holbach, 1770) or "La Mothe le Vayer" (Thomson, 1996), pseudonym Orosius Tubero, was a French writer and anti-religious philosopher, characterized as the "one of the leading exponents of French Pyrrhonism" (Q) (see: Pyrrho), tutor of Louis XIV, a close friend of Moliere, inheritor of the Michel Montaigne personal library, the popularizer of Sextus Empiricus, noted for []

Moliere

Vayer was a close friend of French playwright and comedic actor Moliere (IQ:165|#387) (Cattell 1000:39) (Murray 4000:8|WL), and it is said that many of Moliere's plays were based on Vayer's erudite and savage (if carefully hidden) criticism of religious hypocrisy.

La Mettrie

In 1642, Vayer, in his *The Virtue of the Pagans*, discussed ideas of the pagans, particularly the stoics; this work was later cited several times by Julien la Mettrie in his *Anti-Seneca*. [1]

Quotes | On

The following are quotes on Vayer:

> "**Vayer** was independent French thinker and writer who developed a philosophy of skepticism more radical than that of Michel Montaigne but less absolute than that of Pierre Bayle."
>
> — Anon (c.2017), *Britannica* (Q)

Quotes | By

The following are quotes by Vayer:

> "Of the most dependable things, the safest is to doubt."
>
> — Francois Vayer (c.1650) (Q)

> "Theanthropy (Q) is the foundation of every system of Christianity."
>
> — Francois Vayer (c.1655) *Publication*; cited by Baron d'Holbach (1770) in *The System of Nature* [2]

References

1. (a) Vayer, Francois. (1642). *The Virtue of the Pagans* (*De la Vertue des Payens*). Publisher.
(b) La Mettrie, Julien. (1751). *Machine Man and Other Writings: Treatise on the Soul, Man as Plant, The System of Epicurus, Anti-Seneca or the Sovereign Good, Preliminary Discourse* (translator and editor: Ann Thomson) (Vayer, pg. xxii). Cambridge University Press, 1996.
2. d'Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (pg. 181). J.P. Mendum, 1889.

Further reading

● Vayer, Francois. (1653). "Of a Man Born Blind". Publisher; in: *Blindness and Enlightenment* (translator: Kate Tunstall) (§: Appendix Two, pgs. 229-37). Bloomsbury, 2011.

External links

- Francois de La Mothe Le Vayer – Wikipedia.

θΔics

In science, **Frank James Allen** (1854-1943), oft-cited "F.J. Allen", was English physiologist noted for []

Overview

In 1878, Allen read a paper entitled "The Origin of Life", before the Cambridge University natural Science Club, wherein he introduced his idea that the role of nitrogen is the ruling element in all vital action, and discussed the relation of oxygen to nitrogen in living matter.

In 1880, Allen, in his *Popular Science* article "Life in Other Worlds", he discussed his theory of how "energy traffic" is unique to life; which he describes as follows:

> "Though the ultimate nature of life is as yet unknown to us, its secrets are being gradually unraveled by research; and it becomes more and more apparent that the phenomena of life are but special and intricate developments of physical action. The most prominent and perhaps most fundamental characteristic of life is what may be called the 'energy traffic' or the function of trading in energy; and the phenomena of assimilation, growth, movement, etc., are the outward and visible signs of this traffic. Living substance possesses in the highest degree: the property of absorbing radiant energy, as heat or light, storing it in a potential form, and subsequently expending it in active forms such as motion, mechanical work, heat and electricity.
>
> Actions of this kind are not unknown in the inorganic world. For example, the atmosphere and ocean absorb the energy of light and heat from the sun, store it temporarily and convert it subsequently into the energy of wind and wave, lightning and thunder. But in living substance there exists a more finely coordinated energy-trading system, evolved out of the chemical capacities of a small number of elements acting under the physical conditions which prevail on our planet. The energy traffic depends, no doubt, on causes at present unknown to us; and some biologists are wont to personify these causes as a 'vital force', an influence (sometimes regarded as external) which modifies the behavior of matter and energy without affecting their quantity. But as we cannot exclude the probability of similar directing and modifying influences in the inorganic world, it is best provisionally to regard the causes of life as present alike in living and not living substances--conspicuous in living substance because coordinated, but hardly observed in not-living substance, owing to incoordination. If a simile be needed, it may be found in the behavior of light: for certain properties of light, though ever present, become evident only when coordinated by polarization; and polarization, be it noted, is a purely physical action.
>
> While every element present in living substance may assist in the work, the energy-traffic is carried on chiefly amongst the four elements: nitrogen, oxygen, carbon, and hydrogen."

In 1895, Allen, in his *The Physical Basis of Life*, his Cambridge University graduation thesis, outlined more developed views of his earlier origin of life paper.

In 1899, Allen, in his "What is Life?", was referring to Eduard Pfluger's 1875 heated cyanogen origin of life theory (pg. 59) as follows: [1]

> "Most persons who have speculated as to the origin of life, have dated its commencement from a time when the conditions at the earth's surface were altogether different from what they are now. For instance, Pfluger in 1875 wrote: 'life originates from fire, and in its main conditions was instituted at a time when the earth was still a glowing fireball.' He believed that under certain circumstances of high temperature synthetic processes would be started between carbon, nitrogen, hydrogen, &c., which would lay the foundations of life."

Allen therein (pg. 56) gives his own take on heated nitrogen origin of life theory as follows:

> 1. Every vital phenomenon is due to a change in a nitrogenous compound, and indeed in the nitrogen atoms of that compound.
> 2. There is no vital action without transfer of oxygen, and the transfer is performed by nitrogen (often assisted by iron).
> 3. In the anabolic action of light on plants, the nitrogen compounds are affected primarily, and the CO2 and water secondarily.
> 4. In the living and active molecule the nitrogen is centrally situated and often in the pentad state. In the dead molecule it is usually peripheral and in the triad state.
> 5. The oxygen store of the living molecule is more or less united with the nitrogen, but passes to some other element at death.
> 6. The nitrogen of the living molecule is combined in a complex and perhaps changeable manner, the compound resembling in some respects the cyanogen compounds, in other respects the explosives such as nitroglycerine; other analogies are also traceable.

Allen ends this by stating that this explains the physico-chemical origin of life, i.e. that "life is the direct outcome of the properties of matter and energy and possibly other things unknown; but notes that the "cause" of the phenomena is the domain of metaphysics.

Allen's theory has been cited and discussed by those including: Alexander Oparin (1936), James Strick (2003 to 2015) (Ñº)(Ñº)(Ñº).

Education

In 1875, Allen entered St. John's College, Cambridge, gaining first class in the natural sciences tripos (1878), whereat he completed his MA in 1883. completed his degree in physiology at Cambridge Universe in 1895, after which he became a professor or physiology at Mason College, Birmingham. He then completed medical training at St. George's Hospital graduating MB at Cambridge in 1886 and completing his MD in 1895, and in 1887 became a professor of physiology at Mason College, Birmingham.

Religion

In 1899, Allen, aged 45, strangely, the year in which he covertly speculated, in his "What is Life?" paper, about things, or "agents at work" in the universe, other than matter and energy, retired from chair of physiology, took three years off, and in 1902 took up residence in Cambridge, where for the remainder of his days, devoted himself to archaeology and the study of old churches. [3] This would seem evidence a switch from atheism and or agnosticism to theism; or something to this effect, i.e. a reconversion (see: deconversion).

Other

In 1896, Allen, in his article "Mirror Writing" (Ñº), discussed his age 13 discovered ability to writer backwards with his left hand.

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θΔics

In hmolscience, **Frank Tracy Carlton** (1873-1961) was an American engineer, physicist, social scientist, and economist, a cross-disciplinary "two cultures" theorist, noted for his avocation of the extrapolate upward view, namely that just as there is law and order in physics and chemistry level, so to is there law in order in the social and political level.

Overview

In 1912, Carlton, in his "History-Making Forces", stated: [1]

> "Social scientists are reaching the long-delayed conclusion that happenings in the social and the political sphere are not the result of chance, and individual impulse or willing, or of direct and arbitrary interference of an infinite power [god]. Social and political happenings, like physical and chemical actions and reactions, occur in an orderly and law-abiding manner. Events, movements, reforms, agitations, decay or growth of institutions may, in a measure, be prophesied, directed and aided or retarded. There is, or may be, a social science (or social sciences) as well as physical sciences. Social mechanics, social physics and social chemistry are real terms."

In 1920, Carlton, in his *Elementary Economics*, stated: [2]

> "There is law and order in the realm of physics and chemistry, so cause and effect may be studied in the political and social life of human beings."

Curiously, by 1973 Carlton was "nearly forgotten", or only remembered by labor historians as a pioneer who worked with in the framework of progressive scholar ship to make suggestions about the relationship of material conditions, behavior, and intellectual expression. [3] This is similar to many cross-disciplinary "two cultures" thinkers, such as Leon Winiarski and Ettore Majorana to name a few. Clearly, this is a puzzling situation, to say the least?

Education

Carlton completed his undergraduate and graduate training in engineering and physics, after which he moved into the social sciences, making economics his field of specialization. He studied with Albion Small and others at the University of Chicago's pioneering Department of Sociology and then at the University of Wisconsin with Richard Ely. [2] In 1904, Carlton was a professor at Toledo University School. [3] In 1912, he was a professor of economics and sociology at Albion College. In 1920, he was a professor of economics at de Paul University.

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θΔics

In existographies, **Frank O. Copley** (1907-1993) was an American Latin scholar noted for his 1977 English introduction to and translation of Lucretius' *On the Nature of Things*. [1]

Overview

Copley's special interests included the Roman poet Catullus and Latin elegiac poetry. His translations of Virgil's *The Aeneid*, Cicero's *On Old Age* and *On Friendship* and Lucretius' *On the Nature of Things*, among many others, made the classics accessible to the public. [2]

Education

Copley completed his BA at Stanford in 1930, his MA at Harvard in 1931, then studied at the University of Goettingen, Germany, before returning to Stanford where he completed his PhD in 1935. [2] He was a professor at the University of Michigan from 1934 until his retirement in 1977.

Quotes

The following are related quotes:

> "The Epicureans were neither determinists nor atheists, although they were commonly accused of being both."
>
> — Frank Copley (1977), "Introduction" to *On the Nature of Things* (pg. xv)

References

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2. Anon. (1993). "Obituary: Frank Copley" (Ñº), *The University Record*, University of Michigan, Feb 15.

θΔics

In existographies, **Frank Lambert** (1918-2018) (CR:45) was an American organic chemist, noted for his 1969 publications on the thermodynamics of evil and for his 1990s to 2000s efforts to get college chemistry textbooks to stop describing entropy as disorder and to instead describe it as dispersion.

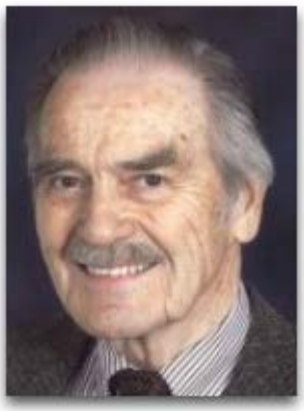

Thermodynamics of evil

In 1969, Lambert proposed a way of looking at evil in terms of thermodynamics. According to author George Miller, Lambert defines two aspects of thermodynamic evil. One involves evil as an unwarranted disruption of an individual's dynamic pattern in life and thought—a randomization, or disorder, of one's patterns. [2] The second aspect of evil is the opposite. It is a crystallizing or subhuman ordering, of life, like the Nazi tyranny of putting people in concentration camps. This latter type being representative of excessive order. [4]

Entropy as energy dispersion

See main: Energy dispersion

In the late 20th century, Lambert taught a course on entropy to non-science students for a number of years at Occidental College, California; in retrospect, commenting that he has never understood entropy. Lambert has stated that, although he has never read any of the works of German physicist Rudolf Clausius, he was inspired to re-educate the chemistry departments of the United States, on the new view of entropy as a function of energy dispersion or the spreading out of energy, after reading of the 1874 Maxwell-demon themed article "Kinetic Theory of the Dissipation of Energy" by William Thomson. [3]

In the 1990s and 2000s, Lambert, via the Internet, worked to get the word "disorder", as a description of entropy, removed from chemistry textbooks and replaced with the word "energy dispersal" or the view that entropy increase equates to the "spreading out of energy". [1] In 2009, Lambert self-defines himself as someone: [6]

> "Known for his successful advocacy of deleting the definition of thermodynamic entropy as 'disorder' from U.S. general chemistry texts and its replacement by viewing entropy as a measure of molecular energy dispersal."

Curiously, through aggressive petitioning efforts, Lambert has gotten his view of entropy into 21 different textbook. The story of how Lambert came into his understanding of entropy, in the teaching of what he called a "baby thermo" class to humanities undergraduates, is quite humorous, shedding light on the lack of basic thermodynamics knowledge in the chemistry departments of the United States.
Lambert promotes his views on a number of websites, such as SecondLaw.com, 2ndLaw.com, Shakespeare2ndLaw.com, EntropySimple.com, EntropySite.com, etc., where, supposedly, he has educated millions of people to the correct view of what entropy is. As of 2007, Lambert claims to have convinced over a dozen different chemistry textbook authors to remove the word "disorder" from their chapters on entropy and thermodynamics. All-in-all, the situation of reverse education seems to exemplify a case of the blind leading the blind.

Education

Lambert completed his AB from Harvard University in 1939 in chemistry. Of note, in his senior year at Harvard, Lambert had "great difficulty" with his thermodynamics course, so much so that he was forced to change majors from physical chemistry to organic chemistry.He went on to complete a PhD in organic chemistry in 1942 at the University of Chicago, with a dissertation on "the Effect of Metallic Halides on some Grignard Reactions", from the University of Chicago. [5]

Lambert's thermodynamics difficulty seems to have left a void of insecurity in his mind, being that sixty years later, at the age of eighty, in retirement, having unresolved issues with the disorder view of entropy, Lambert went searching for

the true meaning of entropy, supposedly finding it in 2002, and thus going on to supposedly educate America and its chemistry textbook authors about what entropy really is via his numerous websites and requests to have the word disorder simply replaced by the word dispersion.

See also

- Entropy (misinterpretations)

References

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θΔics

In existographies, **Frank Leavis** (1895-1978), oft-cited as "F.R. Leavis", was a British literary critic noted for []

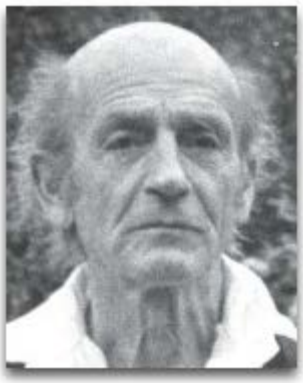

Overview

In 1962, Leavis, in his "Two Cultures? The Significance of C.P. Snow" lecture, sparked the two cultures debate, with a frontal attack on Charles Snow, stating, e.g., that "Snow is not only not a genius, he is intellectually as undistinguished as it is possible to be".

Religion

Leavis' arguments, according to R.P. Bilan (1979), are filled with "religious language"; hence, Leavis was a closet theist, and his therein his underlying objection to Snow was a religious objection. Leavis, therein, accordingly, can be classified alongside: Pitirim Sorokin (and his battle with reductionist Lawrence Henderson) and Werner Stark (and his battle with all classical reductionists).

Quotes | By

The following are quotes by Leavis:

> "Snow is the spokesperson for the technologico-Benthamite reduction of human experience to the quantifiable, the measurable, the manageable."
>
> — Frank Leavis (1962), "The Significance of C.P. Snow" [1]

References

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(b) Collini, Stefan. (1993). "Introduction", in: *The Two Cultures* (by Charles Snow) (technologio-Benthamite, pg. xxxiii; Coleridge vs. Bentham, pg. xxxv). Canto.
2. Bilan, R.P. (1979). *The Literary Criticism of R.F. Leavis* (pg. 24). Cambridge University Press.

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θΔics

In science, **Frank MacDougall** (1883-1974) was an American physical chemist noted for his 1921 *Thermodynamics and Chemistry*, one of the transition publications in going from "theoretical" chemical thermodynamics , those dealing with the theory of chemical thermodynamics, to "quantitative" chemical thermodynamics, i.e. those dealing with quantification. [1]

Education

MacDougall was associated with the University of Minnesota. [2]

References

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2. Jensen, William B. (2011). “The Quantification of 20th-Century Chemical Thermodynamics: a Tribute to *Thermodynamics and the Free Energy of Chemical Substances*” (pdf), Unpublished Lecture, Symposium, Mar 28.

External links

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θΔics

In existographies, **Frank Schweitzer** (c.1955-) is a German theoretical physicist, philosopher, and sociophysicist, noted for []

Overview

In 2002, Schweitzer co-organized, with and Klaus Troitzsche, the ZiF Sociophysics Conference, which included talks by: Jurgen Mimkes, Wolfgang Weidlich, Dietrich Stauffer, and Gunter Haag.

In 2003, Schweitzer, in his *Brownian Agents and Active Particles: Collective Dynamics in the Natural and Social Sciences*, discussed social movement in terms of Brownian motion theory, e.g. in the form of active Brownian agent theory. [1]

In 2018, Schweitzer, in his "Sociophysics" article, cited a number of thinkers, including: David Hume, Auguste Comte, Adolphe Quetelet, and mentions how someone [?] in the 1940s was using social lattice theory [see: Beg (1987)], and ends with a plea to get a sociophysics journal started and to have tenured professors of sociophysics in universities [See: Nightingale Chair of Social Physics]. [2]

Influences

Schweitzer has been influenced by Goethe and his metamorphology theory. [4]

Education

In 1981, Schweitzer, age 26, completed his PhD with a dissertation on "Soil mechanical properties of African laterites in their parameters and relationships" (Q), and in 1984, age 29, completed a second PhD in the philosophy of science; presently, he is chair of the department of systems design at ETH Zurch.

Quotes | Employed

The following are quotes employed by Schweitzer:

> "Economics is harder than physics; luckily it is not quite as hard as sociology."
>
> — Paul Krugman (1994), *Peddling Prosperity*; cited by Schweitzer (2119) in "Sociophysics" [3]

Quotes | By

The following are quotes by Schweitzer:

> "SocioPhysics has become an attractive field of research over the past years, despite some controversies about its scientific eligibility and potential use for the understanding of social phenomena. This international conference tends to reflect these discussions: It brings together scientists from various disciplines, such as physics, sociology, informatics, demography, philosophy, political sciences, economics. They will jointly discuss whether and to what extent physical models and tools can be reasonably used to enhance quantitative methods and computer simulations in the social sciences. Ideally, this interdisciplinary dialog will result in a mutual enhancement: Social scientists may learn about the latest development in applying physical methods to the life and social sciences, physicists and other natural scientists may increase their awareness of problems, methods, and needs in the social sciences."
>
> — Frank Schweitzer (2002), "Aim and Scope" of SocioPhysics Conference [1]

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2. Schweltzer, Frank. (2018). "Sociophysics: To the extent that individuals interact with each other in prescribed ways, their collective social behavior can be modeled and analyzed", *Physics Today*, 72(2):40.
3. (a) Krugman, Paul. (1994). *Peddling Prosperity: Economic Sense and Nonsense in the Age of Diminishing Expectations*. Norton.
(b) Schweltzer, Frank. (2018). "Sociophysics: To the extent that individuals interact with each other in prescribed ways, their collective social behavior can be modeled and analyzed", *Physics Today*, 72(2):40.
4. Frank Schweitzer (personal webpage) (German → English) – SG.ETHZ.ch.

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External links

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● Frank Schweitzer – WorldCat Identities.

θΔics

In science, **Frank Parker Stockbridge** (1870-1940) was an American writer noted for

Overview

In 1912, Stockbridge, in his article "Creating Life in the Laboratory", gave a summary of the some of the recent parthenogenesis and or laboratory-created life work of those including: Louis Pasteur, Jacques Loeb, and Henry Bastian, in which he famously summarizing the crux of the issue as such:

> "'Life is a chemical reaction; death is the cessation of that reaction; living matter, from the microscopic yeast spore to humanity itself, is merely the result of accidental groupings of otherwise inert matter, and life can actually be created by repeating in the laboratory nature's own methods and processes!' [Loeb/Bastian?] Think for a moment what this declaration signifies. If it be true, where is the theology? If you and I are merely physico-chemical compounds, slightly more complex than a potato, a little less durable than a boulder, what is the basis of our moral code? If man can lump together sand and salt and by pouring water on them create life, what becomes of the soul?"

This ripe statement, which seems to be a mixture of Loeb, Bastian, and Stockbridge, has become a popular quote in scientific circles, e.g. making the pages of: Carl Gaither's *Chemically Speaking* (2001) and English chemical physicist Philip Ball's *Unnatural* (2012). [2]

The quote embodies much content: it seems to capture the heart of the physicochemical morality puzzles—one might say it captures much of the Goethean revolution that is yet to come to fruition: namely it was Goethe who, beginning in 1796 (see: timeline), first addressed this grand "what becomes of our moral code?", if we are but chemical compounds, query—concluding rather cryptically in the end the the solution is to be found in the "moral symbols" of physical chemistry. [2]

Quotes

The following are other noted quotes:

> "A little bit of this, a little more of that, a pinch of something else, boil blank minutes, and set aside in the same vessel –thus might read the biologists' formula for creating life."
>
> — Frank Stockbridge (1912), "Creating Life in the Laboratory" (pg. 775) (Ñº)

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(b) Ball, Philip. (2011). *Unnatural: the Heretical Idea of Making People* (pg. 145). Vintage Books.

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External links

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θΔics

In hmolscience, **Frank Sulloway** (1947-) is an American psychologist and science historian noted for []

Overview

In 1979, Sulloway, in his *Freud: Biologist of the Mind*, devoted a section to the thermodynamics of Sigmund Freud's psychodynamic theories, e.g. his death drive; Sulloway opens his thermodynamics discussion to the following: [1]

> "Several psychoanalytic writers have not been troubled by this distinction between animate and inanimate forms of the stability principle and have sought to equate Freud's death instinct, through Fechner's inanimate principle of absolute stability, with the second law of thermodynamics (e.g. Alexander, 1921; Bernfeld and Feitelberg, 1930; Lichtenstein, 1935; and Saul, 1958). The second law of thermodynamics, otherwise known as the law of entropy, specifies that all forms of energy—for instance, heat—tend to dissipate within a closed system. Entropy, the measure of unavailable energy within a system, is therefore a directional and irreversible quantity reflecting the tendency of things to 'run themselves down'. Seen in terms of this entropy principle, Freud's death instinct has become considerably more palatable to certain psychoanalysts by virtue of a respectable alliance with the physical sciences."

Sulloway then, while discussing the works of Franz Alexander (1921), Siegfried Bernfeld and Sergei Feitelberg (1930), Heinz Lichtenstein (1935), and Leon Saul (1958), goes on to discuss the upsides and downsides of this logic.

American entropy in the social sciences scholar Eric Zencey summarizes Sulloway's work as follows: [2]

> "Psychology, too, felt the impulse of thermodynamic ideas, which lurk behind such concepts as libidinal energy, affect charge, and arguably, the death instinct. The lines of debate between those who do and those who do not find the second law behind Freud's death instinct are admirably drawn by **Frank Sulloway** (*Freud: Biologist of the Mind*, 1979)."

(add discussion)

Religiosity studies

Sulloway, in existence of god studies, is also noted for his religiosity study done with Michael Shermer, involving a large survey of randomly chosen Americans, which found that religious belief is negatively correlated with education, with interest in science, and with political liberalism. [3] Richard Dawkins comments that this study is similar to one done by sociologists which found that only one in twelve break away from their parent's religious beliefs. [4]

Education

Sulloway completed his AB (1969) in history and science and his AM (1971) and PhD (1978) in the history of science all at Harvard University. Currently, Sulloway is an adjunct professor in the department of psychology at the University of California, Berkeley.

References

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(c) Bernfeld, Siegfried and Feitelberg, Sergei. (1930). "Der Entropiesatz und der Todestrib", *Imago*, 16:187-206.
(d) Alexander, Franz. (1921). "Metaphyschologische Betrachtungen", *Internationale Zeitschrift fur Psychoanalysie*, 6:370-85.

(e) Saul, Leon J. (1958). “Freud’s Death Instinct and the Second Law of Thermodynamics”, *International Journal of Psycho-Analysis*, 39:323-25.
2. Zencey, Eric. (1983). “Entropy as Root Metaphor”, Conference on Science, Technology, and Literature, Feb, Long Island University, New York; in: *Beyond the Two Cultures: Essays on Science, Technology, and Literature* (editors: Joseph Slade and Judith Lee) (§9:185-200), Iowa State University Press, 1900.
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- Frank J Sulloway (faculty) – UC Berkeley, Psychology.
- Sulloway, Frank J. – WorldCat Identities.

θΔics

In existographies, **Frank Thone** (1891-1949) (CR:16) was an American plant physiologist, ecologist, and science writer, noted for []

Overview

In 1936, Thone, in his article “Nature Ramblings: ‘Chnops,’ Plus”, describes plants and animals, chemically, as “Chnops plus” [CHNOPS+] systems, via employing the following labeled by him visual:

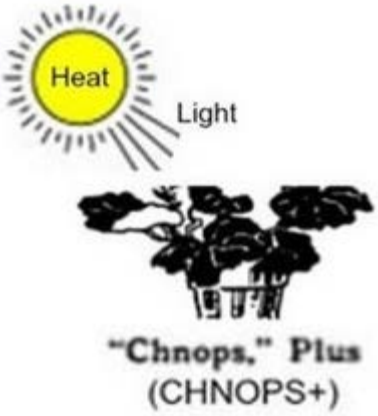

In other words, he described biological systems as systems comprised of the elements: carbon, hydrogen, nitrogen, oxygen, phosphorus, sulfur (CHNOPS) plus potassium and calcium, among others. [1]

This addition of the " + " notation is been very helpful in the development of proper chemical thermodynamic terminology of what exactly a "human" is, as, e.g. a physics and chemistry, and thermodynamics in particular, do not recognized (Sherrington, 1938) the term life or "bio-".

Education

In 1922, Thone completed his dissertation, MS or PhD, entitled “Ecological Factors in Region of Starved Rock, Illinois”. In 1936, Thone was a staff writer for *Science News Letters*. In 1945, he was a Science Service biology editor and also was involved in radio-based promotions of science, e.g. national science talent searches.

References

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Further reading

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θΔics

In hmolscience, **Frank Tipler** (1947-) is an American physicist noted, in cessation thermodynamics, for 1994 theory that computers in the future will resurrect the dead, and therein will be the physics of immortality.

Overview

In 1994, Tipler, in his *The Physics of Immortality*, argued, as summarized by Eric Schneider (2005), the following: [3]

> "Conterentropic notion that genetic engineering and computer science will team up with inexhaustible energy resources to make God in the far future."

To make this argument, Tipler builds on French philosopher Pierre Teilhard's 1938 omega point theory in conjunction with English-born American physicist Freeman Dyson's 1979 paper "Time Without End: Physics and Biology in an Open Universe", to reconcile the second law of thermodynamics, with life, heat death, and Biblical resurrection. [1] In response to English physicist Stephen Hawking's statement that "my opinion would be libelous", when asked to comment on Tipler's theory, Tipler responded with:

> "All I do in my work is accept the logical consequences of the known laws of physics: quantum mechanics, relativity, and the second law of thermodynamics. The reality that the ancients were trying to capture in the word 'soul' is expressed by defining the soul to be a computer program being run on the human brain. With this redefinition, we can keep the religious concept, and make it consistent with the facts. But most importantly, the redefinition makes the scientist realize that immortality is perfectly possible: there's no physical reason why a program cannot exist forever."

In conclusion of his theory, Tipler postulates that the future will have an all-powerful, all-knowing, universal-sized supercomputer in it that will resurrect the dead as described in the New Testament.

Education

Tipler completed his BS in physics from MIT in 1969 and his PhD, with a dissertation on singularities and time machines, in 1976 at the University of Maryland, College Park. His has since been a professor of mathematical physics at Tulane University.

References

1. Tipler, Frank J. (1994). *The Physics of Immortality: Modern Cosmology, God and the Resurrection of the Dead* (second law, pgs. 67, 72-73, 90, 94, 135, 295, 297, 441-42, 461-63, 476-78). Anchor Books.
2. Shermer, Michael. (2003). *How We Believe: Science, Skepticism, and the Search for God* (pgs. 103-07). MacMillan.
3. Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Life* (pg. 189). Chicago: The University of Chicago Press.

External links

â— Frank J. Tipler – Wikipedia.
â— Tipler, Frank J. – WorldCat Identities.

θΔics

In existographies, **Frank Turek** (c.1960-) (CR:2) is an American Christian apologeticist noted for several books wherein he uses the second law, expanding universe, radiation afterglow, galaxy seeds, and general relativity, as debate tools (O), to argue for intelligent design and the existence of god and against evolution.

Education

Turek has a MA in public administration from George Washington University and a PhD in apologetics from Southern Evangelical Seminary.

Notes

In 2011, Turek was fired (O) from both Cisco and Bank of America for his anti-gay marriage publications, his 2008 *Correct, Not Politically Correct; How Same-Sex Marriage Hurts Everyone*, in particular, being that his views were not in alignment with company values.

Hitchens | Debate

The following are noted quotes from Turek's 2008 debate with Christopher Hitchens:

> "Now Christopher talked about atrocities, but again, on the atheistic world view—here's the main point—how do you define what an atrocity is? Who defines it? Who has the authority to define what an atrocity is? The carbon atom? The benzene molecule? I'm not saying you have to believe in god to be moral. I'm not saying that only religious people are moral. I'm not saying atheists can't be moral. I'm not saying atheists don't know morality. I'm saying there's no way to justify what is right and what is wrong unless there's some authority that provides it. What is the authority? In a materialistic world view there is no authority.
>
> The carbon atom has no moral authority over you. And it seems that Christopher goes on and on about how he does not want to be under any some kind of divine totalitarianism. That is a moral rejection of god. Where does he come up with this immoral totalitarianism? His world view does not afford immorality because his world view does not afford morality. He has to borrow from the Christian world view in order to argue against it. In fact, he has to sit in god's lap to slap his face. Where does he get morality from? Where does he get reason from? Where does he get mathematics from? Where does he get consciousness from? Where does the universe—he said there are explanations for where the universe came from, atheistic. I'd love to hear them. I haven't heard one yet. How does something come from nothing with extreme fine tuning? What is the explanation for that?
>
> He said there are arguments for the beginning of life that are naturalistic. Not according to the people who are studying the matter. How about Francis Crick? If I could find his quote here,... Francis Crick said, "Every time I write a paper on the origin of life, I swear I will never write another one because there's too much speculation running after too few facts."
>
> — Frank Turek (2008), "Hitchens vs Turek, Debate: Does God Exist?, Virginia Commonwealth University, Sep 8 [1]

(add)

Shermer | Debate

The following are noted quotes from Turek's 2018 debate with Michael Shermer:

> "How can we reason if we're just molecules in motion [If naturalism is true, how can we even reason if we are just chemicals and motion?]? If we're just 'moist robots', why should anybody believe what I say or you say? If every thought I have is a result of a previous natural cause over which I have no control and the

same for you?"

— Frank Turek (2018), "Naturalism Can't Justify Reason" (debate with Michael Shermer) (0:30-) (Q), Feb 14

"Michael, you are a materialist, so what is the chemical composition of justice?"

— Frank Turek (2018), "Naturalism Can't Justify Reason" (Q|1:08-), Feb 14

(add)

References

1. Hitchens, Christopher, Turek, Frank. (2008). "Hitchens vs Turek, Debate: Does God Exist?" (2:11:51-hrs) (full:Q) (txt)(clips:Q), Virginia Commonwealth University, Sep 8.

Debates

- Dennis Normark (Nontheist) vs Frank Turek (Christian) | 2014 (Q) (Q)

Further reading

- Geisler, Norman, L. and Turek, Frank. (2004). *I Don't Have Enough Faith to be an Atheist* (second law, 76-78, 80, 84, 86, 90, 124-25). Crossway Books.

External links

- Frank Turek – Wikipedia.
- Turek, Frank – WorldCat Identities.
- Frank Turek – YouTube.

θΔics

In thermodynamics, **Frank Albert Weinhold** (1941-) is an American chemist noted for his 2009 *Classical and Geometrical Theory of Chemical and Phase Thermodynamics*, which, supposedly, is the first authoritative textbook presentation of equilibrium chemical thermodynamics and phase thermodynamics in a reformulated geometrical framework—possibly a treatise on simplified graphical thermodynamics—expressed with only elementary high school level geometry concepts, instead of the standard fare partial differential equation calculus-based thermodynamics expositions.

The book contains interesting biographical sections, such as on, for course, Willard Gibbs, the founder of graphical thermodynamics; but also on other background mathematicians, such as sections on explaining the influence of the mathematics of space and of the physical forces work of German mathematician Bernard Riemann (1826-1866) on the thermodynamics and relativity theories of German-born American physicist Albert Einstein. [1]

Education

Weinhold completed his BA in 1962 at the University of Colorado, Boulder, and his AM in 1964 and PhD in 1967 at Harvard University, the latter with a dissertation on "Reduced Density Matrices of Atoms and Molecules". Weinhold held postdoctoral and teaching appointments at Oxford, Berkeley, and Stanford before joining the chemistry department at the University of Wisconsin-Madison in 1976, where he presently is professor emeritus.

Quotes

The following are related quotes:

> "Gibbs' thermodynamic papers—difficult, abstract, and buried in an obscure journal on the fringes of European scientific awareness-remained for a time virtually unknown except among a small circle of admirers. Fortunately, the latter included physicist James Maxwell, who advocated effectively for Gibbs' insights and methods. Major centers of Gibbsian influence began to appear in Germany, Holland, and elsewhere, as Nobel Prizing winning careers were launched from a passing remark or footnote in Gibbs' monumental masterpiece."
>
> — Frank Weinhold (2009), *Classical and Geometrical Theory of Chemical and Phase Thermodynamics* (pg. 151)

References

1. Weinhold, Frank. (2009). *Classical and Geometrical Theory of Chemical and Phase Thermodynamics* (Riemann, pgs. 421-28). Wiley.

External links

â— Frank Weinhold (faculty) – University of Wisconsin-Madison.
â— Weinhold, Frank (1941-) – WorldCat Identities.

θΔics

In hmolscience, **Franklin Giddings** (1855-1931) was an American sociologist and economist noted for []

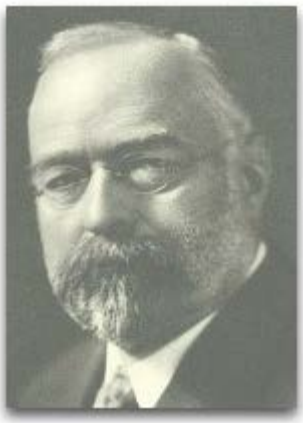

Overview

In 1896, Giddings, in his *Principles of Sociology*, argued, as summarized by Howard W. Odum (1929), something to the effect of the following:

> "The theory of social equilibration posits that "all social activities tend to equilibrium, but for an indefinite period it may be a moving equilibrium." Since all energy is physical energy, social energy is transformed physical energy. To secure equilibration there must be a constant redistribution of matter and motion. Either population becomes denser and more closely integrated or there is more mobility and a tendency toward "social dissolution." These continual adjustments between population and environment to maintain equilibration make a perfect equilibrium in society impossible and the result is a "moving equilibrium"."

In 1924, Giddings, in his *The Scientific Study of Human Society*, speculated on measuring societal energies thusly: [2]

> "Adequacy, and therefore the ultimate effectiveness of societal energies, is measured by two sets of correlations, namely: (I) The negative correlation of birth rate and the positive correlation of death rate with hereditary defect. (2) The positive correlation of birth rate and the negative correlation death rate with conditioned intelligence. These correlations measure the net value of human society; the net value of the existing, or of any possible societal order. They are a value measure of regress. They should be ascertained not only for entire populations, but also for component d constituent groups, because the shifting of these, when so measured, will indicate the trend of our civilization. They should be ascertained for color races, for the native and foreign born, for nationalities, for local communities, for kindreds and families, the adherents of religious sects, for the alumni of colleges and universities, and for occupations."

Odum, to note, ranks (Ñº) Giddings alongside: Lester Ward, Albion Small, and William Sumner as the first four sociologists, of some type of classification.

Quotes | By

The following are representative quotes:

-

> "To teach the theory of state to these who have not learnt the first principles of Sociology is like teaching astronomy or thermodynamics to men who have not learnt Newton's law of motion."
>
> — Franklin Giddings (1896), *Principles of Sociology* (Ñº)

-

> "Social evolution is but a phase of cosmic evolution. All social energy is transmuted physical energy. The conversion of physical into social energy is inevitable, and it necessarily occasions those orderly changes in groupings and relationships that constitute development."
>
> — Franklin Giddings (1896), *Principles of Sociology* (pgs. 363-64)

> "A sociology which follows society back to quanta and electrons and projects telesis into a new heaven and

earth, cannot hope to escape satirical description as a science of organized smatter."

— Franklin Giddings (1929), *Publication*; cited (Ñº) by Robert Bannister (1987)

References

1. (a) Giddings, Franklin. (1896). *Principles of Sociology: an Analysis of the Phenomena of Association and of Social Organization*. MacMillan.
(b) Odum, Howard W. and Jocher, Katharine C. (1929). *An Introduction to Social Research* (pg. 112). H. Holt and Co.
2. (a) Giddings, Franklin H. (1924). *The Scientific Study of Human Society* (pg. 207). University of North Carolina Press.
(b) Odum, Howard W. and Jocher, Katharine C. (1929). *An Introduction to Social Research* (pg. 303). H. Holt and Co.

External links

â— Franklin Henry Giddings – Wikipedia.

θΔics

In hmolscience, **Franz Boas** (1858-1942) (Simmons 100:14) (CR:4) was a German-born American physical geographer, a , noted for his application of physics to geographical aspects of anthropology—therein developing "physical anthropology", so to say; in short, he superimposed the criteria of the physical sciences unto cultural anthropology, employing materialistic convictions throughout.

Education

In 1877, he studied mathematics and physics at the University of Heidelberg, after which he studied mathematics, physics, botany, and geography at the University of Bonn for four semesters, after which he studied geography, physics, and philosophy, at the University of Kiel, completing his PhD there in 1881 overtly in physics, with a dissertation on "Contributions to the Understanding of the Color of Water", wherein his examination subjects were: geography, physics, and philosophy.

Boas, in more detail, says the following, in an 1882 letter "Psychic Life from a Mechanistic Viewpoint", sent to his uncle, about these university years: [2]

> "The objectives of my studies shifted quite a bit during my university years. While in the beginning my intention was to regard mathematics and physics as the final goal, I was led though the study of the natural sciences to other questions which prompted me also to take up geography, and this subject captured my interest to such an extent that I finally chose it as my major study. However, the direction of my work and study was strongly influenced by my training in natural sciences, especially physics. In the course of time I became convinced that my previous materialist *Weltanschauung* (a particular philosophy or view of life; the worldview of an individual or group)—for a physicist a very understandable one—was untenable, and I gained thus a new standpoint which revealed to me the importance of studying the interaction between the organic and the inorganic, above all between the life of a people and their physical environment.
>
> Thus arose my plan to regard as my life's task the following investigation: How far my we consider the phenomena of organic life, and especially those of the psychic life, from a mechanistic point of view, and what conclusions can be drawn from such a consideration?
>
> In order to solve such questions I need at least a general knowledge of physiology, psychology, and sociology, which up to now I do not possess and must acquire."

Boas goes on to state that he is going to following the migratory patterns of Eskimos.

Zucker

In 1945, American physical historian Morris Zucker, in the context of his physical history theories, discussed some of Boas' physical anthropology theories. [3]

Quotes | On

The following are quotes on Boas:

> "Patterns of culture do not operate in accordance with the laws of physics. How are you going to prove in terms of the laws of physics that a certain 'attitude' exists within a culture? What is an attitude in terms of the laws of molecular interaction? What is a cultural value? How are you going to show *scientifically* that a certain culture has certain values? You can't. Science has no values. Not officially."
>
> — Robert Pirsig (1991), commentary on commentary on Boas' physical anthropology; see: John Tukey (1966) on free energy based "attitude" states [1]

References

1. Pirsig, Robert M. (1991). *Lila: An Inquiry into Morals* (physics of culture, pgs. 52-53). Random House, 2013.
2. (a) Boas, Franz. (1882). “Psychic Life from a Mechanistic Viewpoint”, Letter to Uncle, Apr 10.
(b) Boas, Franz. (1989). *A Franz Boas Reader: the Shaping of American Anthropology, 1883-1911* (editor: George Stocking) (§4:43-pgs. 43-44). University of Chicago Press.
3. (a) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory*. Arnold-Howard Publishing Co.
(b) Zucker, Morris. (1945). *The Philosophy of American History: Periods in American History*. Arnold-Howard Publishing Co.

External links

â— Franz Boas – Wikipedia.

θΔics

In hmolscience, **Franz Brentano** (1838-1917) was an Austrian-German philosopher and psychologist noted for his circa 1869 entropological proof for the existence of god and for his overall effort to use the scientific method and positivism to establish a new form of natural theology.

Overview

Brentano, was an avid student of Aristotle, and did his PhD dissertation on "On the Several Senses of Being in Aristotle". [1]

In 1864, Brentano was ordained a Catholic priest, but nine years later left the church. [2]

In 1868 to 1869, at the University of Wurzburg, during the year when both Adolf Fick and Rudolf Clausius were colleague professors, according to Helge Kragh, produced, independently, the second entropological proof for the existence of god. [2]

In 1869, Brentano, in an article, discussed his favor for positivism, referring to Auguste Comte as "one of the foremost thinkers of which our century can boast." [2]

Freud

Brentano was influential to Sigmund Freud, e.g. by helping supervise his doctoral dissertation.

References

1. Brentano, Franz. (c.1920). *On the Existence of God: Lectures given at the Universities of Wurzburg and Vienna (1868-1891)* (translator: Susan F Krantz) (entropy, 9+ pgs). Springer, 1987.
2. Kragh, Helge S. (2008). *Entropic Creation: Religious Contexts of Thermodynamics and Cosmology* (Brentano, 13+ pgs). Ashgate Publishing, Ltd.

External links

â— Franz Brentano – Wikipedia.

θΔics

In hmolscience, **Franz Mesmer** (1734-1815) (CR:10) was a German physician-astronomer noted for his 1770s animal magnetism theory, aka Mesmerism, according to which he hypothesized that some type of "magnetism", akin to standard iron-loadstone attraction, existed between animals; or something along these lines.

Overview

In 1774, Mesmer had his patient, Francisca Osterlin, suffering from hysteria, swallow a preparation containing iron, then attached magnets to various parts of her body, during which she reported a mysterious fluid running through her body.

In 1779, Mesmer published an 88-page booklet *Memoir on the Discovery of Animal Magnetism*, wherein he gave various propositions concerning his animal magnetism theory.

In 1788, Benjamin Bablot (1754-1802) published *Essay on the Power of Imagination of Pregnant Women*, in which he defended Burton and seventeenth-century theorists, but also invoked Mesmer and his theory of hypnotic influence to support his arguments. [1]

Goethe, at some point, supposedly, digested Mesmer; and may have included some of his ideas in his use of the maternal imagination theory aspects employed in his *Elective Affinities*.

References

1. Bablot, Benjamin. (1788). *Essay on the Power of Imagination of Pregnant Women* (*Dissertation sur le Pouvoir de l'imagination des femmes enceintes*). Publisher.
2. Mesmer, Franz. (1779). *Memoir on the Discovery of Animal magnetism* (*Mémoire sur la découverte du magnétisme animal*). Publisher: chez P. Fr. Didot le jeune.

External links

â— Franz Mesmer – Wikipedia.

θΔics

In science, **Franz Josef Pisko** (1827-1888), oft-cited as F.J. Pisko, was a Austrian teacher, textbook author, and physicist noted for his 1879 “On the Present Fundamental Conceptions of Physics”, wherein he gives a fairly cogent verbal historical overview of thermodynamics, and for his circa 1875 view, cited by German physicist Ludwig Buchner, that modern science of the thermodynamics of force and matter had displaced or supplanted God. [1]

Overview

Pisko was a physics professor somewhere. His main publications include: *Textbook of Physics* (1854), *The Newer Acoustic Devices* (1865), *Light and Color* (1869), and *What is Heat?* (1875).

Quotes

The following are related quotes:

> “And if the inscription on the ancient pyramid of Sais says, ‘I am all that is, that was, and that will be, no mortal man has yet removed the veil’, it might be replied thereto, that modern science has removed the veil and has discovered that force and matter were, are, and will be.”
>
> — Franz Pisko (c.1875), front matter quotes to Ludwig Buchner’s *Force and Matter* [2]

Von tiefstem Schmerze gebeugt, gebe ich hiemit allen Freunden und Bekannten Nachricht, dass mein innigstgeliebter, unvergesslicher Gatte, Herr

Phil. Dr. Franz Josef Pisko,

k. k. Regierungsrath, pensionirter Director der Staats-Oberrealschule in Sechshaus bei Wien, emeritirter ordentlicher Professor der Physik an der k. k. technischen Militär-Akademie und am Central-Infanteriecurs in Wien, Ritter des Franz-Josephs-Ordens, Besitzer des goldenen Verdienstkreuzes mit der Krone, Ehrendoctor der Philosophie der Universität Jena, correspondirendes Mitglied der königlich belgischen Akademie der Wissenschaften in Lüttich, des Niederösterreichischen Gewerbe-Vereins in Wien, Ehrenmitglied mehrerer naturforschender Gesellschaften des In- und Auslandes etc etc. etc.,

Dienstag den 26. Juni 1888 um 10½ Uhr Vormittags in Aussee (Steiermark) nach längerem Leiden im 62. Lebensjahre sanft und ergeben in den Willen Gottes in ein besseres Jenseits entschlummerte.

Die irdische Hülle des theuren Verblichenen wird Samstag den 30. d. M. um ¾3 Uhr Nachmittags vom Hause: IV., Schleifmühlgasse 8, in die Pfarrkirche zu den heiligen Schutzengeln (PP. Paulaner) überführt, daselbst feierlich eingesegnet und hierauf auf dem Ortsfriedhofe in Gersthof in der eigenen Familiencapelle zur ewigen Ruhe beigesetzt.

Die heiligen Seelenmessen zum Troste des theuren Verstorbenen werden Dienstag den 3. Juli um 9 Uhr Morgens in obgenannter Pfarrkirche gelesen.

WIEN, den 28. Juni 1888.

Katharina Pisko geb. Blass.

The German obituary of **Pisko**. [3]

References

1. (a) Pisko, Franz J. (1879). “On the Present Fundamental Conceptions of Physics” (translator: L. Stoerzer), Two Lectures delivered in Vienna on the 10th and 17th of Dec, in; *Report of the Board of Regents, Volume 34* (pgs. 485-518). Publisher.
(b) Pisko (German → English) – Wikipedia.
2. Buchner, Ludwig. (1855). *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon* (15th German edition; 4th English edition) (iv). New York: Peter Eckler, 1891.
3. Franz Josef Pisko (obituary) – Geni.com.

Further reading

â— Pisko, Franz J. (1875). *What is Heat?* (*Was ist die WaÌˆrme?*). Sechshaus, Selbstverlag der k.k. Realschule.

External links

â— Pisko, Franz Josef (1827-1888) – WorldCat Identities.

θΔics

In science, **Frantisek (Franz) Wald** (1861-1930), oft-cited "F. Wald", Austrian-born Czech theoretical chemist noted for []

Overview

In 1889, Wald, in his *The Energy and its Devaluation*, seems to have ventured his opinion on the energetics debate, i.e. on whether atoms exist or alternatively if all is energy; during which time he seems to have partially aligned with the views of Ernst Mach.

In circa 1900, Wald published *The Mistress of the World and her Shadow*, on energy and entropy, which was read by Robert Emden in his youth, and who, in his 1938 *Nature* article "Why do we Have Winter Heating?" commented on some of Wald's views.

Education

In 1881, Wald completed a degree in "technical chemistry", and thereafter worked as chief chemist at Prazska Zelezarska Spolecnost Ironworks, Kladno, near Prague. In 1907, he became chair of the department of theoretical chemistry, physical chemistry, and metallurgy, of Prague Polytechnic (now: Czech Technical University), during which time he was associated with notables, including: philosopher Tomas Maryk, physicist Ernst Mach, and physical chemist Wilhelm Ostwald. [1]

Quotes | Cited

The following are quotes that cite Wald:

> "As a student, I read with advantage a small book by **F. Wald** entitled *The Mistress of the World and her Shadow*. These meant energy and entropy. In the course of advancing knowledge the two seem to me to have exchanged places. In the huge manufactory of natural processes, the principle of entropy occupies the position of manager, for it dictates the manner and method of the whole business, whilst the principle of energy merely does the bookkeeping, balancing credits and debits."
>
> — Robert Emden (1938), "Why do we Have Winter Heating?" [2]

Quotes

The following are noted quotes:

> "As far as I am concerned the roots of this law [the second law of thermodynamics] go much deeper [than any molecular hypothesis can tell], and to correlate molecular hypothesis and entropy is rather a lucky achievement for this hypothesis than advantageous for the second law of thermodynamics."
>
> — Franz Wald (1889), *The Energy and its Devaluation* (pg. 104) [3]

> "This [molecular] hypothesis should remain only a makeshift for our weak power of comprehension; by no means should it be used to replace the causal law that is expressed in the theorem of the devaluation of energy"
>
> — Franz Wald (1889), *The Energy and its Devaluation* (pg. 105) [3]

References

1. Ruthenberg, Klaus. (2007). "Biography: Frantisek Wald (1861-1930)" (pdf), *Short Biographies of Philosophizing Chemists*, *HYLE: International Journal for Philosophy of Chemistry*, 13(1):55-61.
2. (a) Emden, Robert. (1938). "Why do we Have Winter Heating?" (pdf), *Nature*, 141:908.

(b) Sommerfeld, Arnold. (1952). *Lectures on Theoretical Physics: Thermodynamics and Statistical Mechanics* (pg. 41) (*Thermodynamic und Statistick: Vorlesungen uber theoretische Physik*) (translator: Joseph Kestin). Academic Press, 1956.
(c) Dolloff, Norman H. (1975). *Heat Death and the Phoenix: Entropy, Order, and the Future of Man* (Emden, pg. xi). Exposition Press.
(d) Volkenstein, Mikhail. (2009). *Entropy and Information* (pg. 59). BirkHauser Basel.
(e) Kreuzer, Hans J. and Tamblyn, Isaac. (2010). *Thermodynamics* (Emden, pg. 138). World Scientific.
3. (a) Wald, Franz. (1889). *The Energy and its Devaluation* (*Die Energie und ihre Entwertung*) (pg. 104). Publisher.
(b) Ruthenberg, Klaus. (2007). "Biography: Frantisek Wald (1861-1930)" (pdf), *Short Biographies of Philosophizing Chemists*, *HYLE: International Journal for Philosophy of Chemistry*, 13(1):55-61.

Further reading

â— Wald, Franz. (1918). *The Chemistry of Phases* (*Chemie Fasi*). Publisher.

External links

â— Frantisek Wald (Chez → English) – Wikipedia.
â— Frantisek Wald (German → English) – Wikipedia.

θΔics

In evolution, **Fred Leon Bookstein** (1947-) is an American statistician, mathematician, and zoologist noted for his 1983 reaction article "Comment on a 'Nonequilibrium' Approach to Evolution", a criticism of the Brooks-Wiley theory of evolution, in which he argues the following:

> "Wiley and Brooks misconstrued the meaning of their crucial conceptual borrowings."

particularly in regard to their conceptually-borrowed terms: entropy-of-information and entropy-of-cohesion.

References

1. (a) Willey, Edward O. and Brooks, Daniel R. (1982). "Victims of History: a Nonequilibrium Approach to Evolution" (abs), *Systematic Zoology*, 31:1-24.
(b) Bookstein, Fred L. (1983). "Comment on a 'Nonequilibrium' Approach to Evolution" (abs), *Systematic Zoology*, 32(3): 291-300.
(c) Brooks, Daniel R. and Wiley, Edward O. (1985). "Nonequilibrium Thermodynamics and Evolution: Responses to Bookstein and to Wicken" (abs), *Systematic Zoology*, 34(1):89-97.

External links

â— Fred Bookstein (faculty) – University of Michigan.
â— Bookstein, Fred L. (1947-) – WorldCat Identities.

θΔics

In existographies, **William Frederic Cottrell** (1903-1979) (CR:4), aka "Fred Cottrell" (Adams, 1988), not to be confused with American physical chemist and noted Gibbsian (Q) thinker Frederick Cottrell (1877-1948), was an American sociologist, semi-discussed in sociological thermodynamics, noted for his 1955 book *Energy and Society*, wherein, supposedly, he sought to explain human societies as thermodynamic systems. [1] Cottrell's book is also said to be one of the first to connect a society's energy conditions and the evolution of its culture. [2]

American social energetics historian Eric Zencey summarizes Cottrell as someone who linked social and economic change to changes in energy sources and the technologies they powered. [3]

Quotes | On

The following are quotes on Cottrell:

> "**Fred Cottrell**'s 1955 classic *Energy and Society* was received with muted applause in sociology."
>
> — Richard Adams (1988), *The Eight Day* (pg. xv)

References

1. Trigger, Bruce G. (1990). "Monumental Architecture: a Thermodynamic Explanation of Symbolic Behavior", *World Archaeology*, 22(2): 119-132.
2. (a) Cottrell, Fred. (1955). *Energy and Society: the Relationship between Energy, Social Change, and Economic Development* (thermodynamics, pgs. 14, 18; entropy, pgs. 13, 24) (revised, 2009). Freeman.
(b) Energy and Society – Encyclopedia of Earth.
3. Zencey, Eric. (2013). "Energy as a Master Resource" (pdf), in: *State of the World 2013: Is Sustainability Still Possible?* (§7:##-; image, figure 1-2). Island Press, 2013.

Further reading

● Cottrell, William F. (1972). *Technology, Man, and Progress*. Merrill.

External links

● William Frederic Cottrell – Encyclopedia of Earth.
● Cottrell, William Frederick – The Energy Library.

θΔics

In hmolscience, **Fred Wayne Fox** (1919-2007) was an American scientist noted, in human thermodynamics, for his 1976 suggestion that anti-entropy conceptualized morality should be taught in science class.

Overview

In 1976, Fox published "The Recolored Mentality: Ethical Lessons From Science", the abstract of which is as follows: [1]

> "Discusses ethical lessons arising from conceptual science and ways to incorporate them into the secondary school science curriculum. Includes discussions about the Western analytical mind, the right to control nature, and the relationship between man and nature."

Fox, in short, attempted to show that students who build hope or reason on a framework of ethics, based on science, can carry away various ethical lessons, particularly from the second law of thermodynamics. In particular, according to Fox: [1]

> "Man's physical body and his social aspirations are anti-entropic, representing states of higher organization and concentration of potential energy."

(add discussion)

Education

Fox was a professor of science education at Oregon State University.

References

1. Fox, Fred W. (1976). "The Recolored Mentality: Ethical Lessons From Science" (abs) , *The Science Teacher*, May, pgs. 25-30.

θΔics

In existographies, **Fred Hoyle** (1915-2001) (CR:12) was an English astronomer noted for his 1949 coining of the term "big bang", for his 1957 "living cloud" science fiction theory (see: Paul Davies), and for his 1981 Boeing 747 chance-based creation description (see: typing monkeys).

Big bang

In 1949, Hoyle coined the phrase that came to be applied to Georges Lemaitre's exploding atom theory of the universe, referring to it as "this *big bang* idea" during a BBC Radio broadcast. In 1967, together with Jayant Narlikar, Hoyle would go on to state: [6]

> "In the 'big bang' cosmology the universe must start with a marked degree of thermodynamic disequilibrium and must eventually run down."

(add)

Living black cloud | Davies

In 1957, Hoyle published the science fiction novel *The Black Cloud*, wherein he describes a large cloud of gas from interstellar space arrived in the solar system, which was said to be 'alive'.

In the mid-1960s, Paul Davies, as an undergraduate physics student, read Hoyle's *The Black Cloud*, during a time when he was ruminating on a variant of the anthropic principle, and became intrigued by Hoyle's "living cloud" theory, about which he says the following in retrospect: [1]

> "How can a cloud be alive? I puzzled over this at length. Surely gas clouds just obey the laws of physics? How could they exhibit autonomous behavior, have thoughts, make choices? But, then, it occurred to me, all living things supposedly obey the laws of physics."

Hoyle's living cloud premise left Davies 'baffled and vaguely disturbed', leaving him questioning the 'what exactly is life question' and 'when did it start?' issue. Next, Davies' PhD advisor (Michael Seaton or Sigurd Zienau) then gave him a copy of Hungarian-American physicist Eugene Wigner's 1961 essay "The Probability of the Existence of a Self-Reproducing Unit" which purported to prove that a physical system cannot make a transition from a nonliving state to a living state without contravening the laws of quantum physics, arguing to the effect, according to Davies, that 'something funny must have gone on when life started.' [2] Davies supervisor then passed him Australian astrophysicist Brandon Carter's circa 1970 paper on the 'anthropic principle' (a term he coined), which argues to affect that the laws of nuclear physics are fine-tuned to make carbon in stars, and hence predisposed to the development of life, and hence anthropocentric laws are made to favor the development of human life, in short. Davies then worked under Hoyle and with Carter for two years at Cambridge, from 1970 to 1972. During this period he chanced across a copy of Erwin Schrodinger's famous 1944 booklet *What is Life?*, as we all have, which gave Davies the view that biological organisms can be explained by physics. This seems to have been Davies first indoctrination into the basics of the thermodynamics of life and his later circa 1980s gravitational entropy theory of life. In 1999, Davies, in fact, declared the second law to the "ultimate problem of biogenesis". In his 2003 *The Origin of Life*, Davies attempts to answer the question: [3]

> "Is life written into the laws of nature, or just a bizarre accident, unique in the universe? How can a mix of non-living chemicals be transformed into something as complex as the living cell?

In 2006, Davies, in his *The Goldilocks Enigma: Why Is the Universe Just Right for Life?*, pictured adjacent, in which he argues that the earth, with its so-called "bio-friendly" conditions habitable zone, was fine-tuned by accident, and found in one of many universes. [4]

Life cloud

In 1978, Hoyle, together with Chandra Wickramasinghe, published *Lifecloud*, wherein the begin by pointing out the improbability of the "chemical evolution" scenarios that have been postulated, after which the conclude that life arose via comet. [7] Their suggestion that the main ingredient of interstellar dust is the bacterium *E. coli*, however, ran into ridicule. [8]

Boeing 747 | Chance-based creation

In 1980 or 1981, Fred Hoyle, together with Chandra Wickramasinghe, who co-authored *Evolution From Space: a Theory of Cosmic Creation* (1981) (Q) and *Cosmic Life Force* (1990) (Q), began to state that: "It is ridiculous to suppose that the random shuffling of constituent molecules could create life, and wrong to teach children [this] ... and that such an event is comparable to the "chance that a tornado sweeping through a junk yard might assemble a Boeing 747 from the materials therein." (Q)

> "The chance that higher life forms might have emerged in this way is comparable with the chance that a tornado sweeping through a junk-yard might assemble a Boeing 747 from the materials therein."
>
> — Fred Hoyle (1981), "Hoyle on Evolution", *Nature*, 294(5837):105, Nov 12 (Q)

> "The chances that life occurred are about as unlikely as a typhoon blowing through a junkyard and constructing a Boeing 747."
>
> — Chandra Wickramasinghe (1981), comment (Q) made during McLean v. Arkansas trial; he testified (Q) in defense of creationism

This is known to some as the junkyard tornado (Q) argument.

Quotes | By

The following are related quotes:

> "When a problem remains unsolved, general opinion must be wrong."
>
> — Fred Hoyle (c.1965), *Publication* [5]

> "The problem as it seemed to many scientists was to explain in terms of the real laws of physics (like Maxwell's and Einstein's) why entropy never decreased. Perhaps the most penetrating analysis of this question was given in 1909 by the German mathematician C. Caratheodory. His work did not commend itself generally, however, because it did not arrive at the wanted result. What Caratheodory proved was that either entropy could never decrease or it could never increase, but he couldn't say which! To agree with the observed situation, it was still necessary to make an arbitrary choice."
>
> — Fred Hoyle (1981), *Evolution From Space: a Theory of Cosmic Creationism* (Q)

> "A commonsense interpretation of the facts suggests that superintellect has monkeyed with physics, as well as with chemistry and biology, and that there are no blind forces worth speaking about in nature."

— Fred Hoyle (1982), “The Universe: Past and Present Reflections” [9]

References

1. Davies, Paul. (1999). *The 5th Miracle: the Search for the Origin and Meaning of Life* (cloud, pg. 14). Orion Productions.
2. Wigner, Eugene. (1961). “The Probability of the Existence of a Self-Reproducing Unit”, in: *The Logic of Personal Knowledge: Essays in to Michael Polanyi on his Seventieth Birthday, 11 March 1961* (ch. 19, pgs. 231-). Free Press.
3. Davies, Paul. (2003). *The Origin of Life* (abs). Penguin.
4. Davies, Paul. (2006). *The Goldilocks Enigma: Why the Universe is Just Right For Life?* Hoiughton Miflin Harcourt.
5. Harrison, Lionel G. (2011). *The Shaping of Life: the Generation of Biological Pattern* (pg. 46). Cambridge University Press.
6. (a) Hoyle, Fred and Narlikar, Jayant V. (1967). “Article”, in: *The Nature of Time* (editor: Thomas Gold) (pg. 25). Cornell University Press.
(b) Layzer, David. (1975). “The Arrow of Time”, *Scientific American*, 233:56-69.
7. Hoyle, Fred and Wickramasinghe, Fred. (1978). *Lifecloud: the Origin of Life in the Universe* (Q). Harper & Row.
8. Rowan-Robinson, Michael. (1999). *The Nine Numbers of the Cosmos* (pg. 18). Oxford University Press.
9. (a) Hoyle, Fred. (1982). “The Universe: Past and Present Reflections”, *Annual Review of Astronomy and Astrophysics*, 20.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 94). Zondervan, 2009.

External links

- Fred Hoyle – Wikipedia.

θΔics

In psychology, **Fred A. Moss** (1893-1966) was an American psychologist noted for his theory of "drives" and "resistances" in the dynamics of animal behavior as outline, in terms of eight-principles, in his 1923 PhD dissertation "A Study of Animal Drives". [1] Moss' PhD, was the first PhD ever awarded at the department of psychology at George Washington University. [2]

Moss later went on to receive an MD from George Washington University and is famously known as the creator of the MCAT, the medical school admissions test that served as a forerunner of numerous aptitude tests such as the SAT. [3]

References

1. (a) Moss, Fred A. (1924). "Study of Animal Drives", *J. Exp. Psychol*. 7, 165–185.
(b) Young, Paul T. (1936). *Motivation of Behavior – the Fundamental Determinants of Human and Animal Activity*, (ch. 2: "The Energetics of Activity", pg. 70-73). New York: Wiley.
(c) Comparative Psychology – Moss, Fred A. (1893-1996), *AntiQBook.com*
2. About Us (see: History) – Department of Psychology, George Washington University.
3. MCAT history: in 1928, to curb the issue of the near to 50% dropout rates at medical schools, Moss and his colleagues developed the "Scholastic Aptitude Test for Medical Students" consisting of true-false and multiple choice questions divided into 6-8 subtests. Topics tested included visual memory, memory for content, scientific vocabulary, scientific definitions, understanding of printed material, premedical information, and logical reasoning. The score scale varied from different test forms.

θΔics

In hmolscience, **Fred Alan Wolf** (1934-), a creationism scientist ranked by idiocy (#11), oft-classified as fringe and or new age, is an American physicist noted for a number of publications, beginning in about 1975, attempting to use quantum mechanics to argue for scientifically-themed god talk theory, e.g. world soul, consciousness, life, etc.

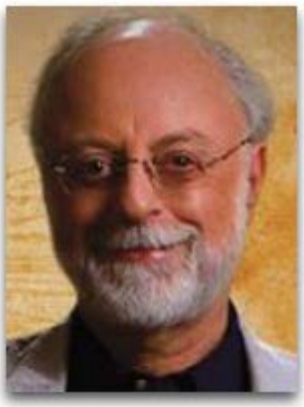

Overview

In 1981, Wolf, in his *Taking the Quantum Leap*, began to use quantum mechanics to argue that "God's order appears to us as a principle of uncertainty", i.e. your basic ontic opening polemic, that we are "free to choose", but that we "cannot predict the results of our choices". [1]

Wolf's dozen or so books thereafter venture off into new age kingdom, e.g. his *The Spiritual Universe: How Quantum Mechanics Proves the Existence of the Soul* (1996), argues that individual souls don't exist, but rather there is one cosmic soul (see: world soul), which is mysteriously linked with the vacuum of space.

American theoretical physicist Jack Sarfatti (1939-) claims (Ñº) that he and Wolf started the "new age physics" movement with the publication of their 1975 book *Space-Time and Beyond*, whose work was cited in Gary Zukav's 1979 *The Dancing Wu Li Masters: an Overview of the New Physics*. (Ñº)

Quotes | About

The following are quotes about Wolf:

> "Organic systems arise at the micro-meso intersect when according, to **Wolf**'s vortex hypothesis, an electrical spark breeds life to photon-electron interactions."
>
> — Paris Arnopoulos (1993), per citation of *Star Wave* [2]

References

1. Wolf, Fred, A. (1981). *Taking the Quantum Leap: the New Physics for Non-Scientists*. Harper Collins, 2010.
2. (a) Wolf, Fred A. (1984). *Star Wave: Mind, Consciousness, and Quantum Physics* (abs). Harper Perennial.
(b) Arnopoulos, Paris. (1993). *Sociophysics: Cosmos and Chaos in Nature and Culture* (pg. 39). Nova Publishers, 2005.

External links

â— Fred Alan Wolf – Wikipedia.

θΔics

In chemistry, **Frederic L. Holmes** (1932-2003) was an American science historian noted for his work on the 1800 to 1803 elective affinity theories of Claude Berthollet and also for his historical writings on Scottish chemist Joseph Black's 1760 discovery the concepts of both latent heat and specific heat. [1]

Education

Holmes completed his BS in quantitative biology at MIT in 1954, his MA at the Harvard History Department in 1958, and PhD in at the Harvard History of Science Department 1962 with a dissertation on Claude Bernard, specifically "Claude Bernard and the Concept of the Internal Environment". He then spent two years at MIT, then became assistant professor of history of science and medicine at Yale. In 1972, he went to University of Western Ontario, becoming department chair, remaining there until 1972, after which he returned to Yale as full professor and chair, remaining in that position until 2002.

References

1. (a) Holmes, Frederic L. (1962). "From Elective Affinities to Chemical Equilibria: Berthollet's Law of Mass Action" (JSTOR) (GB), *Chymica*, 8: 105:45.
(b) Holmes, Frederic L. (1987). *Lavoisier and the Chemistry of Life: an Exploration of Scientific Creativity* (Black, latent heat and specific heat, pg. 158). University of Wisconsin Press.

External links

â— Holmes, Frederic Lawrence – WorldCat Identities.

θΔics

In hmolscience, **Frederic Myers** (1843-1901) was an English psychical researcher noted, in cessation thermodynamics, for his 1890s arguments in support of scientific para-psychology, e.g. he used Maxwell's demon as support to explain seances.

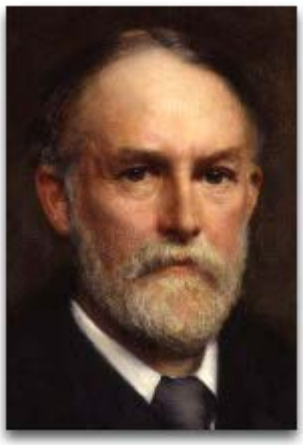

Overview

In 1896, Myers, in his *Human Personality and its Survival of Bodily Death*, a collection of his series of papers on subliminal consciousness, attempted to explain spirits, hauntings, telekinesis, and ghosts, etc., in terms of energy and conservation of energy, albeit in a rather contrived incorrect way.

Myers defined ghost or a dead person permitted to communicate with the living, for example, to be a manifestation of persistent personal energy or as a kind of force being exercised after death. Myers defines ‘ectoplasy’ to be an extrusion from the organism of vital energy.

Maxwell's demon

Myers, in his appendix, referencing Irish physicist James Maxwell’s 1871 *Theory of Heat* and William Thomson’s 1879 description of Maxwell’s sorting demon, to explain physical expenditure modified by spirit control, particularly séances, in a subsection entitled ‘control over individual molecules; resulting in abrogation of ordinary thermal laws, and in aggregation and disaggregation of matter’, so to explain spirit action on a living brain. The following is humorous quote from this section:

> “To foresee or to guide the affinities of each several molecule would be for the physicist as great a step in advance as it would be for the registrar-general could he foresee or guide every impulse to wedlock in the United Kingdom.”

This quote, curiously, is germane to the logic of reaction matching.

James

Myers, supposedly, was a friend and colleague of William James. [2] Together, supposedly, the advanced some type of anti-reductionist transmission or filter theory of mind-brain dualism. (Ñº)

References

1. Myers, Frederic. (1896). *Human Personality and its Survival of Bodily Death, Volume Two* (personal energy, pg. 4; conservation of energy, pgs. 301-02, 510, 542; Maxwell’s demon, 529-38; quote, pg. 530). Longmans, Green, and Co, 1903.
2. James, William. (1901). “Frederic Myers’ Service to Psychology”, *Psychical Research*, 198.

External links

â— Frederic William Henry Myers – Wikipedia.

θΔics

In hmolscience, **Frederick Bakewell** (1800-1869) was an English physicist noted for his 1835 *Natural Evidence of a Future Life*, wherein he attempts to show that evidence derived from the consideration of the properties of matter, and the functions of the corporeal organs, prove that the mind survives the dissolution of the body. [1]

Overview

In 1835, Bakewell published *Natural Evidence of A Future Life, Derived From The Properties And Actions Of Animate And Inanimate Matter*, wherein he attempts to address questions on topics such as the origin of life, death, afterlife, morality when nature is reduced down to the atomic level and the general difference between animate matter and inanimate matter. [2]

The gist of the effort, based on the preface, seems to be to construct some type of materialism-themed natural theology, with belief in a universal creator, implicit, or something along these lines.

References

1. Anon. (1936). "Review: *Natural Evidence of a Future Life", Gentleman's Magazine and Historical Chronicle, Volume 6*, pgs. 49-55.
2. Bakewell, Frederick C. (1835). *Natural Evidence Of A Future Life: Derived From The Properties And Actions Of Animate And Inanimate Matter*. London: Longman, Rees, Orme, brown, Green, and Longman.

Further reading

â— Bakewell, Frederick C. (1833). *Philosophical Conversations*. London: Longman, Rees, Orme, brown, Green, and Longman.
â— Bakewell, Frederick C. (1853). *Electric Science: its History, Phenomena, and Application.* Ingram, Cooke.

External links

â— Frederick Bakewell – Wikipedia.

θΔics

In existographies, **Frederick Donnan** (1870-1956) (CR:7) was an Irish physical chemist, generally known for his work on membrane equilibria, named Donnan equilibrium (Q)(Q)(Q)(Q), noted particularly for a number of summaries and publications, one together with Arthur Haas, on chemical thermodynamics the work of Willard Gibbs, which are cited by Herbert Salzer as prerequisites readings to any type of equilibrium theories at the cellular upwards level.

Quotes | By

The following are noted quotes by Donnan:

> "Gibbs ranks with men like Newton, Lagrange and Hamilton, who by the sheer force and power of their minds have produced those generalized statements of scientific law which mark epochs in the advance of exact knowledge."
>
> — Frederick Donnan (1924), "The Influence of J. Willard Gibbs on the Science of Physical Chemistry" [1]

> "Nothing in the history of science is more remarkable than the way in which Gibbs in 1878 provided the electrochemical science of the succeeding generation with its thermodynamic *Principia*."
>
> — Frederick Donnan (1925), "Influence of J. Willard Gibbs" [2]

> "Although Gibbs' treatment of thermodynamics has been accessible in English, French, and German for many years, its highly condensed and abstract form has repulsed the great majority of students, with the result that the science of thermodynamics has been recast in many different moulds during the last fifty years."
>
> — Frededrick Donnan (1932), *Publication*

See also

- Jeans, Donnen, Guggenheim debate

References

1. (a) Donnan, Frederick G. (1924). "The Influence of J. Willard Gibbs on the Science of Physical Chemistry" (pg. 4), an address by F. G. Donnan, on the occasion of the centenary celebration of the founding of the Franklin institute and the inauguration exercises of the Bartol research foundation, September 17, 18, 19. Franklin Institute.
(b) Fisher, Irving. (1930). "The Applications of Mathematics to the Social Sciences" (abs) (pdf), *Bulletin of the American Mathematical Society*, 36(4): 225-243.
2. (a) Donnan, Frederick G. (1925). "Influence of J. Willard Gibbs", *Jour. Franklin Institute.*
(b) Rukeyser, Muriel. (1942). *Willard Gibbs - American Genius*, (pg. 271). Garden City, New York: Doubleday, Doran & Co., Inc.

Further reading

- Donnan, Frederick G., Haas, Arthur. (1936). *A Commentary on the Scientific Writings of J. Willard Gibbs*. Yale University Press.

External links

- Frederick G. Donnan – Wikipedia.

θΔics

In existographies, **Frederick II** (1194-1250) (IQ:170|#321) (Cattell 1000:204) (Gottlieb 1000:480) (FA:17) (CR:41) was an Italian born German king turned Roman emperor noted for []

Religion | Questioning

Frederick, being educated under the shadow of a pope, made Pope Boniface VIII crazy for his "faith doubts". He questioned things such as the existence of angels, to the existence to peaceful coexistence god-demon; and doubted the immaculate conception (virgin birth).

The following gives a synopsis as to his atheism attribution: (Q)

> "**Frederick** at this time was chiefly solicitous about Sicily, towards which he was drawn by his Norman parentage on the mother's side, while the character of his own German people did not attract his sympathies. He had grown up in Sicily where Norman, Greek, and Mohammedan civilization had intermingled, at once strengthening and repelling one another. The king, endowed with great natural ability, had acquired a wonderful fund of learning which made him appear a prodigy to his contemporaries, but, although he was intimately acquainted with the greatest productions of eastern and western genius, his soaring spirit never lost itself in romantic dreams. He eagerly studied both the more and the less important interests of the political and economical life of Southern Italy. The funding of the University of Naples sufficiently attests his interest in education. He was an intelligent admirer of the beauties of nature, his love for which was intensified by his natural powers of observation. The unlimited resources of the physical world and its constantly multiplying problems increased the inclination of this sceptical spirit towards a thorough empiricism. In none of his contemporaries does intellectual subjectivism show itself so strongly and at the same time so one-sidedly. This desire to penetrate into the secrets of the universe, as well as his scandalous sensual indulgence, brought on Frederick the reputation of an atheist."

Frederick II was even called "antichrist" and to have asked theologians, mockingly, while pointing to the sky, "tell me where you see god in the universe?" (Q)

Three Impostors

In circa 1235, Frederick II is attributed to have penned an anonymous *Treatise on the Three Impostors*, the first so-dubbed Atheist's Bible, on the three impostors argument, wherein he asserted that Jesus, Moses, and Muhammad were impostors; it, supposedly, began to circulate (Q) in the centuries to follow; and or, was written by Simon of Tournai (1130-1201) or Bernardino Ochino (1487-1564), independently, or based on Frederick II's conjecture's.

Soul | Experiment

> *See main: Soul experiments*

Frederick II, in one experiment, among his may inquisitive experiments carried out on people, recorded by the monk Salimbene di Adam, in his *Chronicles* (Q), he shutting a prisoner up in a cask to see if the 'soul' could be observed escaping though a hole in the cask when the prisoner died.

Language | Experiment

In a second experiment, on the basis that Adam and Eve were the first two humans, Frederick conducted a language deprivation experiment, wherein he had children raised by foster mothers and nurses that were allowed to bathe, wash, and suckle the children, but in no ways to prattle or speak with them; his aim, supposedly, was to discover what language would have been imparted unto Adam and Eve by god, i.e. whether they would speak the Hebrew language (which he took to have been the first), or Greek, or Latin, or Arabic, or perchance the tongue of their parents of whom they had been born. He found, however, that the children "could not live without clappings of the hands, and gestures, and gladness of countenance, and blandishments".

Digestion | Experiment

To test digestion, in one experiment, Frederick II fed two prisoners, sending one out to hunt and the other to bed and then had them disemboweled to see which had digested their meal better.

Quotes | On

The following are Frederick II related quotes:

> "**Frederick II**, this pestilent king, a scorpion spitting out poison from the stinger of his tail, has notably and openly stated that—in his own words—the whole world has been **fooled** by three imposters, Jesus Christ, Moses, and Muhammad, two of whom died honorably, while Jesus himself died on the cross. Moreover, he has dared to affirm, or rather, he has fraudulently claimed, that all those who believe that a virgin could give birth to the god who created nature, and all the rest, were fools. And Fredrick has aggravated the heresy by this insane assertion, according to which no one can be born without having been conceived by the prior intercourse of a man and woman; he also claims that people ought to believe nothing that cannot be proven by the strength and reason of nature."
>
> — Pope Gregory IX (1239), address to monarchs

> "**Frederick II** was man of extraordinary culture, energy, and ability – called by a contemporary chronicler *stupor mundi* (the wonder of the world), by Nietzsche the first European, and by many historians the first modern ruler – Frederick established in Sicily and southern Italy something very much like a modern, centrally governed kingdom with an efficient bureaucracy."
>
> — Donald Detwiler (1999), *Germany: A Short History* [1]

Quotes | By

The following are noted quotes by Frederick II:

> "How much longer can this deception last?"
>
> — Frederick II (c.1235), remarked at sight of priest on his way to administer last rights [2]

> "The soul dissipates like a breath and rots like an apple, given that fruit, like man, is made up of four essences."
>
> — Frederick II (c.1235) [2]

See also

- Frederick the Great (1712-1786), aka Frederick II of Prussia

References

1. Detwiler, Donald. (1999). *Germany: A Short History* (pg. 43). Southern Illinois University Press.
2. Minois, Georges. (2009). *The Atheist's Bible: the Most Dangerous Book that Never Existed* (translator: Lys Weiss) (quotes, pg. 7). University of Chicago Press, 2012.

External links

- Frederick II, Holy Roman Emperor – Wikipedia.

θΔics

In thermodynamics, **Frederick Koenig** (1902-1974) was an American chemist noted for his popularization of the thermodynamic square (1932, 1972), and for his 1959 article "On the History of Science and of the Second Law of Thermodynamics", wherein he is said to give a good critical account of the steps leading to the full formulation of the second law. [1]

Education

Koenig was on the chemistry faculty of Stanford University for thirty-seven years, becoming emeritus in 1968. [2]

References

1. (a) Koenig, F.O. (1935). "Families of Thermodynamic Equations. I. The Methods of Transformation by the Characteristic Group" (abs), *J. Chem. Phys.* 3:29-35; and 56:4556, 1972.
(b) Koenig, Frederick O. (1959). "On the History of Science and of the Second Law of Thermodynamics", in Herbert McLean Evans, ed., Men and Moments in the History of Science, Publisher.
(c) Koenig, Frederick O. (1972). "Families of Thermodynamic Equations. II. The Case of Eight Characteristic Function" (abs), *J. Chem. Phys.* 56:4556.
2. Eastman, Richard H., Hutchinson, Eric, and Kline, Stephen. (date). "Memorial Resolution: Frederick Otto Koenig (1902-1974)." HistSoc.Stanford.edu.

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â— Koenig, Frederick O. (1950). "On the Thermodynamic Relation between Surface Tension and Curvature" (abs), *J. Chem. Phys*. 18:449-60.
â— Koenig, Frederick O., Horne, Frederick H., and Mohilner, David M. (1961). "On Thermodynamic Coupling of Chemical Reactions" (abs), *Journal of the American Chemical Society*, 83(5):1029-33.

External links

â— Koenig, Frederick Otto – WorldCat Identities.

θΔics

In thermodynamics, **Frederick Reif** (1927-) is an Austrian-born American physicist noted for his 1965 *Fundamentals of Statistical and Thermal Physics*, which has helped at least two physicists, namely Vladimir Pokrovskii (1999) and Reiner Kummel (2011), come to understand entropy and to understand how it can be applied in economics in economic thermodynamics formulation. [1]

Education

Reif completed his PhD in physics at Harvard in 1953, after which he was a professor of physics at the University of Chicago, from 1953 to 1960, a professor of physics and education at the University of California at Berkeley, from 1960 to 1989, a professor of physics and education at Carnegie Mellon University, from 1989 to 2000, and emeritus professor thereafter.

References

1. (a) Reif, Frederick. (1965). *Fundamentals of Statistical and Thermal Physics*. McGraw-Hill.
(b) Pokrovskii, Vladimir N. (1999). *Physical Principles in the Theory of Economic Growth* (Reif, 3+ pgs.). Ashgate Pub Ltd.
(c) Kummel, Reiner. (2011). *The Second Law of Economics: Energy, Entropy, and the Origins of Wealth* (Reif, pg. xi). Springer.

External links

â— Frederick Reif (faculty) – Carnegie Mellon University.

θΔics

In existographies, **Frederick Rossini** (1899-1990) (IQ:180|#138) [SN:7] (RE:91) [CR:175] was an American physical chemist, chemical engineer, and chemical thermodynamicist, a product of the Lewis school of thermodynamics, noted for his 1950 textbook *Chemical Thermodynamics*, and most importantly for his 1971 Priestley Medal address 'Chemical Thermodynamics in the Real World', in which he used a modified version of the combined law of thermodynamics to explain the paradox between freedom, as in being free to do what one wants, and security, as in being safe from harm, in social life; in that the more secure one is, the less free he or she will be, and conversely; very advanced for 1971 and in fact is still advanced even in modern times (see: human free energy).. [1]

Priestly Medal address

See main: Rossini debate

In 1971, American chemical thermodynamicist Frederick Rossini argued that governments are regulated by the laws of chemical thermodynamics. In particular, during one part of his Priestley Medal address, he used a modified version of the combined law of thermodynamics, as shown below, to understand the paradox between freedom and security in social life: [2]

$$\ln K = -\frac{\Delta H^\circ}{R}\left(\frac{1}{T}\right) + \frac{\Delta S^\circ}{R}$$

He then educated his audience to the fact that, K increases with increase in the entropy change $\Delta S°$, as well as with a decrease in enthalpy chage $\Delta H°$. In addition, he stated that an increase in $\Delta S°$ comes 'with *increase in randomness*, leading to greater *freedom* in the system' and that a decrease in $\Delta H°$ comes 'with *increase in the energy of binding* of the atoms in the molecular structure, leading to greater *security* in the system.' In this scenario, he is correlating atoms to humans (human molecules), the security of the system to the security of the nation state, ΔH to social binding, and ΔS to social order.

This lecture, 35-years later, in 2006, came to spark quite a debate between Americans chemist Harold Leonard, physical chemist John Wójcik, and chemist Todd Silverstein. [3] To cite one opinion in this debate, voiced by Wójcik:

> "Worst of all, there is some danger that chemical thermodynamics will have ascribed to it a power that it simply does not have, namely, the power to explain the human condition."

(add)

Religion

In 1971, Rossini in his "Chemical Thermodynamics in the Real World", ended with the following paragraph, namely his view that a "creator" (god) fashioned the laws of thermodynamics: [7]

> "The point of all of this is that our creator has fashioned laws that are deep seated and broadly applicable, that science is heavily intertwined in our everyday life, frequently without our realization, that we need to break down the compartmentalization of knowledge, that we need to work for a unification of learning, and that we need to understand better the meaning and purpose of life."

In 1999, Ernest Eliel, in his NAS existography on Rossini, described him as devout Catholic: [4]

> "Rossini was a **devout Catholic** all his life, and this was probably an important factor in his move to the University of Notre Dame in 1960 as dean of the College of Science there. The head of the chemistry department G. F. D'Alelio had resigned the previous year and the department was rudderless. Realizing that chemistry was one of the better departments in the college but needed help, Rossini additionally assumed the position of acting head, which he filled for over three years. (I followed him as head in 1964.) The combination of these administrative responsibilities obligated Rossini to suspend his beloved thermochemical research for the 11 years he stayed at Notre Dame."

This classifies Rossini, paradoxically, as a creationist thermodynamicist.

Education

In 1920, at the age of twenty-one, Rossini entered Carnegie-Mellon University in Pittsburgh, graduating with a BS in chemical engineering in 1925, followed by an MS degree in science in physical chemistry in 1926. As a result of reading American physical chemist Gilbert Lewis and Merle Randall's 1923 textbook *Thermodynamics and the Free Energy of Chemical Substances* he wrote to Lewis and a result he was offered a teaching fellowship at the University of California at Berkeley. Among his teachers were Lewis as well as American chemist William Giauque, winner of the 1949 Nobel Prize in chemistry for studies on the properties of matter at temperatures close to absolute zero. Rossini's doctoral dissertation on the heat capacities of strong electrolytes in aqueous solution was supervised by Merle Randall. His PhD degree was awarded in 1928, after only 21 months of graduate work, even though he continued to serve as a teaching fellow throughout this entire period.

A young **Frederick Rossini**, Gilbert Lewis' most noted student, in respect to the human chemical thermodynamics. [6]

Quotes | On

The following are quotes on Rossini:

> "In 1971, **Rossini** received the Priestley Medal, the highest distinction conferred by the American Chemical Society, during which, in his address 'Chemical Thermodynamics in the Real World', he made a clever comparison of the counterplay of **enthalpy** and *entropy* in thermodynamics with that of **security** vis-à-vis *freedom* in the world at large."
>
> — Ernest Eliel (1999), "Frederick Rossini" in *Biographical Memoirs* [4]

> "**Rossini** was one of the preeminent thermodynamicists of the twentieth century."
>
> — Ernest Eliel (1999), *Biographical Memoirs*, National Academies of Press (see: generations) [4]

Quotes | By

The following are quotes by Rossini:

> "Gilbert Lewis: inspirer to many to travel the broad highway of thermodynamics."
>
> — Frederick Rossini (1950), *Chemical Thermodynamics* (pg. v) [5]

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θΔics

In existographies, **Frederick Soddy** (1877-1956) (IQ:#|#) (Murray 4000:18|C) (CR:69) was an English physical chemist and radiochemist noted, in hmolscience, his 1911 to 1921 publications on relationship of matter, energy, and thermodynamics to economics.

Overview

In 1911, Soddy, in his *Matter and Energy*, began to lay out his view that energy and wealth are synonyms, and how energy relates to natural sources of value, such as gold, and to the use of natural fuels. [2] A noted quote from this work, cited by American anthropologist Leslie White, is: [6]

> "Through the various ideas on phlogiston, imponderable fluids, attractions, repulsions, affinities, and forces, science has ended with the simple universal concept of energy."

In 1920s, Soddy began to apply the laws of thermodynamics to basic economic systems and devoted a significant portion of his professional career to a critique of the standard economic theory. In terms of his views on the relation to wealth and energy, Soddy stated in 1920 that "energy, someone may say, is a mere abstraction, a mere term, not a real thing … in this, as in many another respects, it is like an abstraction no one would deny reality to, and that abstraction is wealth. Wealth is the power of purchasing, as energy is the power of working. I cannot show you energy, only its effects … Abstraction or not, energy is as real as wealth – I am not sure that they are not two aspects of the same thing." [3]

for his theories on the relation between energy, wealth, economics, and thermodynamics. His 1926 book *Wealth, Virtual Wealth and Debt* is an oft-referenced book in economic thermodynamics; albeit in it Soddy mainly discusses the conservation of energy in relation to interest, and thermodynamics very sparsely in a few verbal passages. [1]

> "It is just because the application of the every-day principles of **engineering** to the animate engine [humans] offers such a powerful corrective to the make-believes of the economic systems of society that I have ventured to address you on the subject."
>
> — Frederick Soddy (1921) "Cartesian Economics Lectures"

In general, according to Soddy, thermodynamics governs all physical activity in the world, as expressed in the following popular 1911 quote by Soddy: [5]

> "The laws [thermodynamics] that express the relation between matter and energy, govern the rise and fall of political systems, the freedom or bondage of societies, the movements of commerce and industries, the origin of wealth and poverty, and the general physical welfare of a people."

Soddy is also noted for his part in the 1913 coining and explanation of the term isotope, in which he explained that it appeared from his investigations as if each position in the periodic table was occupied by multiple entities.

Cartesian economics

In 1921, Soddy defined Cartesian economics as the study of economies from the perspective that the most important forms of knowledge useful to how do people live, is the force and processes of fire, of air, and all other bodies that surround humanity, so to employ people in the same fashion. [7] The subject was introduced in 1920 by Soddy, modeled on early views of French scientific philosopher Rene Descartes. The following statement indicates the starting point for Cartesian economics, according to Soddy: [1]

> “The starting point of Cartesian economics is the well-known laws of the conservation and transformation of energy, usually referred to as the first and second laws of thermodynamics.”

The lecture resulted from a long controversial correspondence with English biochemist Henry Lyster Jameson, who held a neo-Marxian or proletarian view in economics, and the strengthening of Soddy's resolution on his view. In this lecture, Soddy began to elaborate on how the laws of energy govern sociology and economics:

> “The energy laws that govern the life of men provide the intellectual foundations of sociology and economics, and expose some of the principles causes of failure, not only of our own but, of all the great civilizations that came before.”

Beyond this, he reasoned that:

> “The phenomenon of life derives the whole of its physical energy or power not from anything self-contained in living matter, but solely from the inanimate world. It is dependent for all necessities of its physical continuance upon the principles of the steam engine. The principles of ethics of all human conventions must not run counter to those thermodynamics.”

Soddy firmly positioned the fact that solar energy is the fuel that facilitates or empowers all life processes. He explains this as such:

> “For men, no different from any other form of heat engine, the physical problems of life are energy problems.”

In 1926, Soddy published his *Virtual Wealth and Debt*, where aside from being based on principles in thermodynamics he seems to borrow the term "trigger action", as shown in the adjacent video, from Alfred Lotka who used the term in 1922 to explain the energetics of collisions in preditor-prey interactions.

Cessation thermodynamics

See main: Cessation thermodynamics

On the topic of death and its connection to the conservation of energy, and Soddy outlined a short synopsis on his views in his article subsection “Immortality or the Conservation of Personality” in his 1919 book *Science and Life*. He states, “the real part of a man is not his bodily organism, which is continually wasting away and being as continually renewed, nor the physical energy at its command, which is derived entirely from the inanimate world, but is the personality resident in the body and in control of it.” On this perspective, he eludes to the hypothesis that this quantity is conserved after death; a kin to the conception of immortality of the soul; although, he notes, it is not a conservation phenomenon applicable to the inanimate world. [3]

Influence

Soddy, supposedly, was influenced by English social theorist John Ruskin's view that economics required a scientific component and his description of wealth as a "dynamic flowing stream". [8]

Students

Soddy's work inspired many, such as American engineer Howard Scott and his 1932 book *Technocracy - a Thermodynamic Interpretation of Social Phenomenon*, American economist Herman Daly, and Russian

bioelectochemist Octavian Ksenzhek and this 2007 book *Money: Virtual Energy - Economy through the Prism of Thermodynamics*.

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θΔics

In existographies, **Frederick the Great** (1712-1786) (IQ:165|#405) (Cattell 1000:49) [RGM:N/A|1,320+] (Murray 4000:N/A) was an Prussian king, from 1740 to 1786, and philosopher noted for being the host to Voltaire, when he was banished from France, for appointing, by suggestion of Pierre Maupertuis, Julien la Mettrie as his court physician, who was posthumously referred to as the "court atheist" (or "royal atheist") by Voltaire, and for his general efforts to promote French enlightenment stylized ideals in Prussian empire.

Quotes | By

The following are quotes by Frederick the Great:

> "My principal occupation is to combat ignorance and prejudice ... to enlighten minds, cultivate morality, and to make people as happy as it suits human nature, and as the means at my disposal permit."
>
> — Frederick the Great (c.1750) (Q)

See also

- Alexander the Great
- Frederick II (1194-1250)

External links

- Frederick the Great – Wikipedia.

θΔics

In hmolscience, **Frederick Turner** (1861-1932) was an American historian noted for his 1920 thesis that migration to the American frontier served as a kind of “safety valve” in early American history, reducing social pressure and thus avoiding social explosions. [1]

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External links

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θΔics

In business chemistry, **free electron** is the modelling of certain highly energetic workers as a valence shell electrons in the sense that choose their own occupational work orbitals (see: human molecular orbital theory).

An example of a "free electron" type of worker, according to American electrical engineer and consultant Tom DeMarco, would include someone who is highly-motivated or self-directed and or works non-traditional jobs, such as freelance work, self-employment, contracting, consulting, etc., can be likened to a valence shell electron, in the sense that the choose their work orbits, so to speak, rather than having a traditional single location company “job” in the normal sense of the word. [1]

Etymology

The implementation of the term “free electron” used in the business sense was introduced in circa 1986 by American business executive Steve McMenamin who defined self-motivated super-achievers of corporations, who define their own job, as “free electrons” since “they have a strong role in choosing their own orbits.” This business model became the chapter “Free Electrons” of the 1987 book *: Productive Projects and Teams* by Americans electrical engineer and consultant Tom DeMarco and business consultant Timothy Lister. [1]

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External links

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θΔics

In thermodynamics, **free energy** is the measure of the portion of energy of a chemical system that can be converted into external work or the measure of a system's ability to do work. [1]

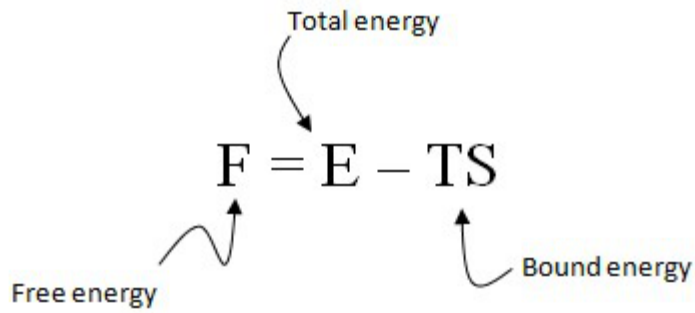

A depiction of the "**free energy**" component of the equation for the Helmholtz free energy.

Overview

In 1942, American physical chemist Hugh Taylor stated the following about free energy: [10]

> "The heat of a reaction is not the true thermodynamic criterion for chemical reaction. On the contrary, the change of **free energy**, the capacity of the system to do chemical, electrical or mechanical work, is the correct measure of the driving force of a reaction."

In isothermal-isobaric systems, free energy is called "Gibbs free energy". In isothermal-isochoric systems, free energy is called "Helmholtz free energy".

Etymology

The term free energy, or *freie energie* in the original German, was introduced in German physicist Hermann Helmholtz' 1882 article "The Thermodynamics of Chemical Processes", a term he modeled or stylized on the earlier term "available energy" used in 1876 by American engineer Willard Gibbs. [6] Helmholtz conceived of "bound energy" (*gebundene energie*) and "free energy" in thermodynamic systems, and showed that the quantitative value of free energy in a reactive chemical system was a measure of the chemical "affinity" between the reactants. [4]

Helmholtz's 1882 was spurred into publication out of the growing incorrectness being pushed forward that the release of heat acts as the true driving force of a chemical reaction, i.e. the so-called Berthelot-Thomsen principle (1854-64). Helmholtz proved that, owing to the aspects of entropy, it is the free energy, not heat that is the measure affinities. This is the same article in which the term free energy was coined. The Berthelot-Thomsen principle, to note, still held sway in the minds of many, such as James Johnstone (1921), into the early 20th century. [11]

Human chemistry

In human chemical reactions, which are constant temperature (isothermal), constant pressure (isobaric), surface chemistry reactions, it is the the Gibbs free energy is the quantity of importance. [2] Changes in the value of free energy can be used to determine if a reaction is thermodynamically favorable. [3]

Calculation of

The first systematic study of all the thermodynamic date necessary for the calculation of the free energy changes in a group of important reactions was published in Germany by Fritz Haber in his 1905 *Thermodynamics of Technical Gas Phase Reactions.* [7]

Others following Haber include: German physical chemist Walther Nernst, Danish physical chemist Johannes Bronsted, and Americans Arthur Noyes, Merle Randall and Gilbert Lewis. [8]

Some argue that American physicist John Kirkwood, a protégé of Noyes, laid the foundations for the standard method for estimating free energy differences, namely perturbation theory and thermodynamic integration, by building on the chemical affinity and extent of reaction work of Theophile De Donder. Others to have furthered this approach include: Robert Zwanzig, Lev Landau, and Benjamin Widom. [9]

Perutz | Schrodinger

In 1987 commentary on Erwin Schrödinger's 1944 book *What is Life?* (see: Note to Chapter 6) and his ideas on life and "negative entropy", Austrian-born English molecular biologist Max Perutz argued that we live on free energy and that

there is no need to postulate the conception of negative entropy. [5]

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Videos

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External links

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θΔics

In thermodynamics, **free energy barrier** refers to a heightened state of free energy, typically Gibbs free energy, of the various possible conformations or paths of one or more molecular entities. The term free energy barrier, used frequently in discussions of energy landscapes, seems, in most cases to be a synonym of activation energy or "activation energy barrier", although there do seem to be similarities and more investigation of the subtlety differences between the two terms is in order.

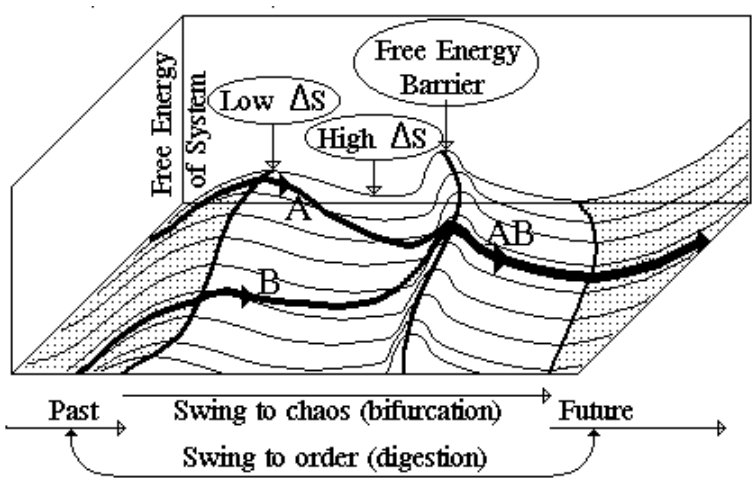

Figure 2: Free Energy Landscape

Depiction of a free energy barrier in South African physical chemist Adriaan De Lange's 2001 discussion of human free energy landscape in the evolutionary-perspective, employing a mixture of chaos theory, Prigoginean bifurcation theory, order-disorder logic, time (past vs future), path functions, and discussions of high and low values of entropy change. [1]

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θΔics

In thermodynamics, **free energy change**, ΔG or ΔF, refers to the change in measurement of the free energy, Gibbs free energy G or Helmholtz free energy *F*, depending on if the system is isothermal-isobaric or isothermal-isochoric, respectively, of a system on passing from the initial state to the final state of the reaction, or on going from reactants to products; in Gibbs free energy terms as:

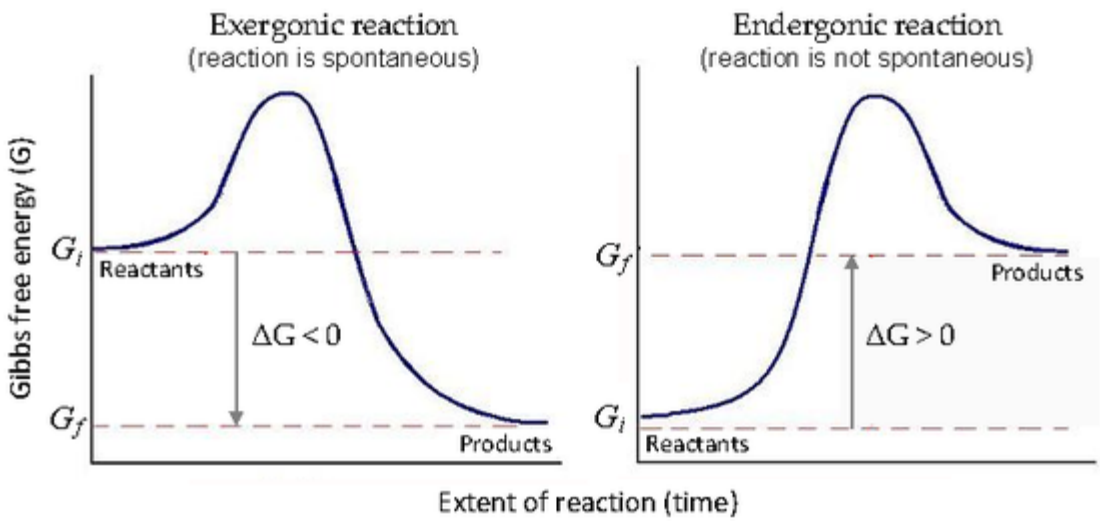

Diagrams of the **free energy change** for both exergonic and endergonic reactions, indicating that the former is characterized by a negative free energy change (decrease in free energy) and the latter a positive free energy change (increase in free energy).

$$\Delta G = G_f - G_i$$

or in Helmholtz free energy terms as:

$$\Delta F = F_f - F_i$$

the Greek symbol Delta Δ meaning 'change', the subscript *f* refers to the free energy measure of the system in the final reaction state of the process, and *i* the free energy measure of the system in the initial reaction state.

External links

â— Free energy changes – Purdue University.

θΔics

In thermodynamics, **free energy coupling** refers to the rule that the free energy changes of coupled reactions are additive. Specifically, given a set of reactions, *i* through *k*, typically occurring under isothermal-isobaric (biological) conditions, the total Gibbs free energy change, for the mixture of reactions will be the summation of the free energies of the component reactions:

$$\Delta G_{total} = \sum_{i=1}^{k} \Delta G_i$$

$$G = U + PV - TS$$

In other words, the energy released from one reaction (spontaneous ones) will, in effect, drive other reactions which are not energetically favored (non-spontaneous ones).

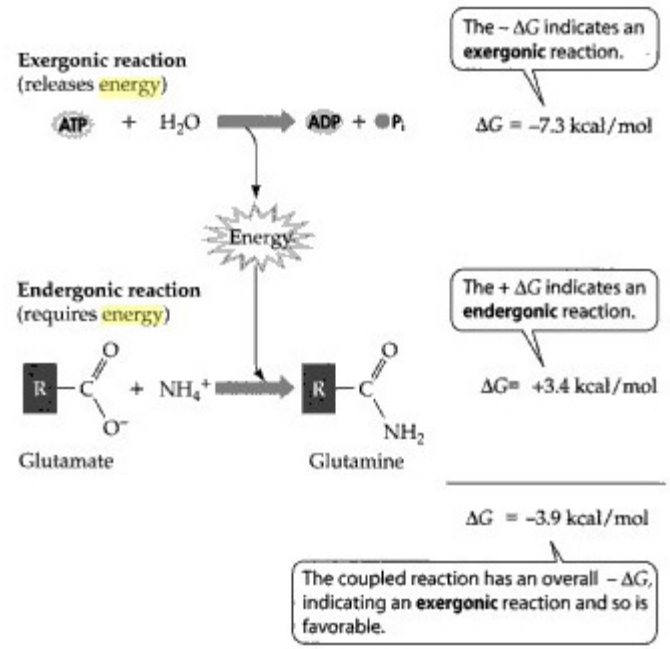

The **coupling** of the exergonic ATP hydrolysis reaction to the endergonic glutamine synthesis reaction. [2]

In short, given two or more reactions in which one is not energetically favorable the logic of free energy coupling, which seems to be based on the rule that state functions are additive, stipulates that the set of coupled or energetically connected reactions in contact will proceed, when mixed together, as long the magnitude of the free energy change for the exergonic reaction[s] is greater than that of the endergonic reaction[s], whereby the free energy released from one or more powerful reactions will drive the weaker free energy absorbing reactions.

If, for example, the one spontaneous reaction is mixed with a non-spontaneous reaction, such as shown below:

A → B	Natural (Spontaneous)	$\Delta G_{AB} < 0$
C → D	Unnatural (Non-spontaneous)	$\Delta G_{CD} > 0$

the non-spontaneous reaction can be driven into reaction as long as: $|\Delta G_{AB}| > |\Delta G_{CD}|$.

History

The basics of this rule seem to stem from Hess' law of heat summations. This logic applied to summations of Gibbs free energies, however, seems to have arisen in the 1941 paper "Metabolic Generation and Utilization of Phosphate Bond Energy" of German-born American biochemist Fritz Lipmann's and the recognition of the universal energy currency of phosphates, e.g. ATP, in biological systems, and how the energy released from the high energy phosphate triple bond can be used to drive many energetically unfavorable biochemical reactions. [1]

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External links

â— Bioenergetics (see: Energy Coupling), Biochemistry and Biophysics Program at Rensselear Polytechnic Institute – rpi.edu.

θΔics

In science, **free energy of formation**, aka “Gibbs free energy of formation” or “standard Gibbs free energy of formation”, depending on context of discussion, refers to the measure of the Gibbs free energy changes that accrued during the formation of any element based thing, e.g. chemical substance (Lewis, 1914), "butane, snake, or spider" (Dolloff, 1975), mouse (Goldstein, 1993), or human (Thims, 2007). []

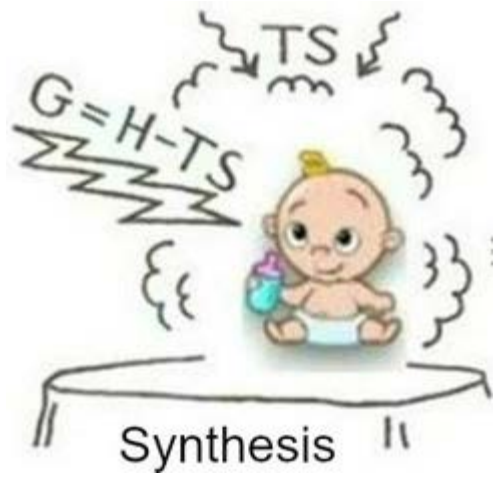

Every element-based "thing" on surface of the earth, whether a baby or a boron atom, has a quantifiable **free energy of formation**, which is the Gibbs function measure of the energy and entropy changes that resulted during the formation or synthesis of the thing in question.

Overview

In 1914, Gilbert Lewis, in his “The Free Energy of Oxygen, Hydrogen, and the Oxides of Hydrogen”, defined the standard free energy of formation as follows: [1]

> “Values obtained for the increase in free energy, at 25°C, in the formation of a substance (at unit activity) form the elements in their standard reference states.”

In 1923, Lewis, in his *Thermodynamics and the Free Energy of Chemical Substances*, expanded these free energy of chemical substances measurements into the form of tabulated values of free energies of formations, aka free energy tables. [2]

In 1946, Percy Bridgman, during the famous 1946 Harvard "what is life in terms of physics and chemistry?" debate, raised the following objection:

> “How can we compute or even evaluate the entropy of a living being? In order to compute the entropy of a system, it is necessary to be able to create or to destroy it in a reversible way. We can think of no reversible process by which a living organism can be created or killed: both birth and death are irreversible processes. There is absolutely no way to define the change of entropy that takes place in an organism at the moment of death.”

In 1957, Keith Burton, in his "Free Energies of Formation from the Elements" table, published as an appendix to Hans Krebs and Hans Kornberg's *Energy Transformations in Living Matter*, listed the free energies of formation of about 100 biochemical species (chnopsological chemical species). [3]

In 1975, Norman Dolloff, in his *Heat Death and the Phoenix: Entropy, Order, and the Future of Man*, gave the following so-called “organism synthesis equation”, to quantify the synthesis of “any” organism, be it hydrogen, butane, snake, spider, or a human:

$$\sum n_i \rightarrow \text{organism}; \Delta G_R^\circ = +; \Delta S_R^\circ = -$$

where Σn_i represents the “sum of simpler chemical species”. This, historically, is the first known coherent attempts, beyond the "entropy = disordering" / "evolution = ordering" confusion of lay science, at stating that animals, whether mice or men, have a Gibbs free energy of formation.
In 1993, Martin Goldstein, in his section “Entropy of a Mouse”, gave the following semi-cogent statement: [5]

> “To apply thermodynamics to the problem of how life got started, we must ask what net energy and entropy

changes would have been if simple chemical substances, present when the earth was young, were converted into living matter [as in the formation of a mouse] … to answer this question [for each process], we must determine the energies and entropies of everything in the initial state and final state."

In 2000, Daniel Schroeder, in his *Thermal Physics*, stated the following, which he captioned below the a diagram (shown adjacent) of a magician making a rabbit appear on a table via the powers of Gibbs energy: [6]

> "To create a rabbit [or human] out of nothing and place it on the table, the magician need not summon up the entire enthalpy, $H = U + PV$. Some energy, equal to TS, can flow in spontaneously as heat; the magician must provide only the difference, $G = H - TS$, as work."

Image of a magician making a rabbit synthetically appear on a table via the power of Gibbs energy (Schroeder, 2000). [6]

In 2007, Libb Thims, in his *Human Chemistry*, outlined how the Lewis-based logic of calculating the free energies of formations of chemical species based on the energies and entropies of the elements existing on the earth, in their standard states, can be extrapolated up and applied to the calculation of the free energies of formation of humans. [7]

References

1. Lewis, Gilbert and Randall, Merle. (1914). "The Free Energy of Oxygen, Hydrogen, and the Oxides of Hydrogen", *Journal of American Chemical Society*, 35:1964.
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3. Krebs, H.A. and Kornberg, H.L. (1957). *Energy Transformations in Living Matter* (with an Appendix by K. Burton with 21 figures). Berlin: Springer-Verlag.
4. Dolloff, Norman H. (1975). *Heat Death and the Phoenix: Entropy, Order, and the Future of Man* (figure 1.3, pg. 19; free energy, 27+ pgs; Gibbs, 9+ pgs; god; 3+ pgs; social, 9+ pgs). Exposition Press.
5. Goldstein, Martin and Goldstein, Inge F. (1993). *The Refrigerator and the Universe: Understanding the Laws of Energy* (section: Entropy of a mouse, pgs. 297-99). Harvard University Press.
6. Schroeder, Daniel V. (2000). *An Introduction to Thermal Physics* (magician diagram, pg. 150; one rabbit, two rabbit diagram, pg. 163). Addison Wesley Longman.
7. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (§11: "Affinity and Free Energy", §§: Human affinity - Gibbs free energy - tables, pgs. 464-68). Morrisville, NC: LuLu.

External links

â— Standard Gibbs energy of formation – Wikipedia.

θΔics

In thermodynamics, a **free energy table** or “table of standard free energies of formation at 25 °C”, is a set of calculated data for values of free energy, enthalpy, and entropy of various chemical species that is used to determine reaction feasibility among other information.

An example of a basic free energy table for various organic species is shown adjacent. [1]

Species	Formula	ΔH_f°(kJ/mol)	ΔG_f°(kJ/mol)	S°(J/K·mol)
Acetic acid(l)	CH_3COOH	-484.2	-389.45	159.83
Acetaldehyde(g)	CH_3CHO	-166.35	-139.08	264.2
Acetone(l)	CH_3COCH_3	-246.8	-153.55	198.74
Acetylene(g)	C_2H_2	226.6	209.2	200.8
Benzene(l)	C_6H_6	49.04	124.5	172.8
Carbon dioxide(g)	CO_2	-393.5	-394.4	213.6
Ethanol(l)	C_2H_5OH	-276.98	-174.18	161.04
Ethane(g)	C_2H_6	-84.7	-32.89	229.49
Ethylene(g)	C_2H_4	52.3	68.1	219.45
Formic acid(l)	HCOOH	-409.2	-346.0	128.95
Glucose(s)	$C_6H_{12}O_6$	-1274.5	-910.56	212.1
Methane(g)	CH_4	-74.85	-50.8	186.19
Methanol(l)	CH_3OH	-238.7	-166.3	126.78
Oxygen(g)	O_2	0	0	51.05
Sucrose(s)	$C_{12}H_{22}O_{11}$	-2221.7	-1544.3	360.24
Water(l)	H_2O	-285.8	-237.2	69.9

An example 1998 thermodynamic table showing the standard enthalpy of formation ΔHf°, standard Gibbs free energy of formation ΔGf°, and standard entropy S°. [1]

Affinity tables

The precursor to the free energy tables were the various "affinity tables", the first of which was constructed in 1718 by French physician and chemist Étienne Geoffroy during a translation into French of English physicist Isaac Newton's famous "Query 31" of his *Opticks*, wherein verbal affinity preferences are enunciated. [2] The largest affinity table built was Bergman's affinity table constructed in 1775 by Swedish chemist Torbern Bergman. It soon thereafter became apparent that each affinity reaction depend on temperature, and that each table would need to be constructed anew for each different temperature. Affinity table construction generally came to a halt, in the years to follow, because of this impediment.

Free energy tables

See main: Thermodynamic data table

In the decades 1775-1840s, it was increasingly becoming apparent that the "affinity table" approach to the quantification of chemical reactions had its limitation. One, Bergman's multi-page map size affinity table was approaching the limit in functionability. Two, and most importantly, it was becoming apparent that that reactions seemed to depend on temperature, meaning that one would have to construct a different affinity table for each temperature, and hence make hundreds of affinity tables. Third, and most importantly, was the puzzling nature of heat, which between 1780s to 1830s, had its roots in the now defunct so-called "caloric theory of heat" which held that heat was a type of fluid-like indestructible particle (caloric).

In the late 1850s and into the 1870s, the so-called "thermal theory of affinity" was proposed, which held that heat release was the measure of affinity and hence the true measure of the driving force of chemical reactions. This theory, however, soon showed limitations: for instance, it could not explain endothermic reactions.

In 1882, German physicist Hermann Helmholtz, in his seminal paper "On the Thermodynamics of Chemical Processes", showed that the true measure of affinity is not "heat" but rather "free energy", which depended on reaction conditions, as shown below:

	Thermal theory of affinity (1854-1864)	**Thermodynamic theory of affinity (1882-1936)**
Driving force / Measure of affinity (isochoric-isobaric reactions)	Q	U – TS
Driving force / Measure of affinity (isothermal-isobaric reactions)	Q	U + PV – TS

Helmholtz, in short, showed that heat is NOT the driving force of a reaction, but rather "free energy" is and also that the measure of affinity A is free energy change (ΔF or ΔG, depending on the type of process):

$A = -\Delta F$ (isochoric-isobaric processes)

$A = -\Delta G$ (isothermal-isobaric processes)

Soon thereafter, free energy tables began to be made, listing the standard free energy of formation for various elements, molecules, and compounds. Helmholtz's proof that overthrew the thermal theory of affinity of thermochemistry, updating things with the newly-forming science of chemical thermodynamics. In the decades to follow affinity tables were soon replaced by free energy tables.

The first outlines of which were made by German physical chemist Fritz Haber in regards to gas phase reactions. [1] In more detail, according to Gilbert Lewis (1923), "the first systematic study of all the thermodynamic data necessary for the calculation of the free energy of chemical substances in a group of important reactions was done by Haber", as presented in his 1905 work *Thermodynamics of Technical Gas Reactions*. [5] Haber, however, did not make actual free energy tables, but rather made tables of equilibrium constants, discussing reaction energies, which is nearly synonymous with free energy, loosely speaking.

Lewis | 1923

The work of Haber gave way to the construction of the first so-called “table of free energies” made in 1914 by American physical chemists Gilbert Lewis and Merle Randall, giving free energies of formation values for oxygen, hydrogen, and a few oxides of hydrogen. [6] This formed the basis for their expanded-followup 1923 “Table of Standard Free Energies of Formation at 25 °C”, giving free energies of formation for 28 cations and a few metallic compounds and 111 non-metallic compounds and anions, as shown below: [5]

TABLE OF FREE ENERGIES

TABLE OF STANDARD FREE ENERGIES OF FORMATION AT 25°C

CATIONS AND A FEW METALLIC COMPOUNDS

Substance	$\Delta F°_{298}$	Equation (or Table)	Substance	$\Delta F°_{298}$	Equation (or Table)
H^+	0		Hg_2^{++}	36854	T XXX-7
Li^+	−68248	T XXX-7	HgCl(s)	−25137	XXXV-22
Na^+	−62588	T XXX-7	HgO(s)	−13808	XXXIV-15
NaCl(s)	−91792	XXXV-26	Tl^+	−7760	T XXX-7
K^+	−67431	T XXX-7	TlCl(s)	−44164	XXXV-25
$KClO_3$(s)	−69250	XXXV-28	Tl_2O(s)	−32410	XXXIV-55
Rb^+	−67473	T XXX-7	TlOH(s)	−45400	XXXIV-53
Cu^{++}	15912	T XXX-7	Sn^{++}	−6276	T XXX-7
Ag^+	18448	T XXX-7	Pb^{++}	−5630	T XXX-7
AgCl(s)	−26187	XXXV-23	$PbCl_2$(s)	−74990	XXXV-24
Ag_2O(s)	−2395	XXXIV-10	PbO(s)	−41000	XXXIV-57
CaH_2(s)	−34780	XXXIII-4	Fe^{++}	−20350	T XXX-7
Zn^{++}	−34984	T XXX-7	Fe^{+++}	−3120	T XXX-7
Cd^{++}	−18348	T XXX-7	NH_4^+	−18930	XXXIX-11

NON-METALLIC COMPOUNDS AND ANIONS

Substance	$\Delta F°_{298}$	Equation	Substance	$\Delta F°_{298}$	Equation
H(g)	37730	XXXIII-2	H_2(g)	0	
O_2(g)	0		H_2O_2(g)	−24730	XXXIV-49
O_3(g)	32400	XXXIV-4	H_2O_2(l)	−28230	XXXIV-47
H_2O(g)	−54507	XXXIV-23	H_2O_2(s)	−27980	XXXIV-48
H_2O(l)	−56560	XXXIV-20	H_2O_2(aq)	−31470	XXXIV-39
H_2O(s)	−56418	XXXIV-25	HO_2^-	−15610	XXXIV-41
OH^-	−37455	XXXIV-28			
Cl(g)	32400	XXXV-2	HCl(aq)	−31367	XXXV-7
Cl_2(g)	0		Cl^-	−31367	XXXV-7
Cl_2(g. 1 at.)	−6	XXXV-1	HClO(aq)	−19018	XXXV-16
Cl_2(l)	1146	XXXV-3	ClO^-	−6500	XXXV-17
Cl_2(aq)	1650	XXXV-4	$HClO_3$(aq)	−250	XXXV-19
Cl_2(in CCl_4)	1030	XXXV-6	ClO_3^-	−250	XXXV-21
HCl(g)	−22692	XXXV-10			
Br(g)	18250	XXXVI-6	HBr(aq)	−24595	XXXVI-17
Br_2(g)	755	XXXVI-1	Br^-	−24595	XXXVI-15
Br_2(l)	0		Br_3^-	−25230	XXXVI-19
Br_2(s)	314	XXXVI-7	HBrO(aq)	−19680	XXXVI-21
Br_2(aq)	977	XXXVI-11	$HBrO_3$(aq)	2300	XXXVI-23
Br_2(in CCl_4)	389	XXXVI-9	BrO_3^-	2300	XXXVI-23
HBr(g)	−12540	XXXVI-14			

NON-METALLIC COMPOUNDS AND ANIONS—*Continued*

Substance	$\Delta F°_{298}$	Equation	Substance	$\Delta F°_{298}$	Equation
I(g)	15470	XXXVII-4	HI(aq)	−12361	XXXVII-9
I_2(g)	4630	XXXVII-2	I^-	−12361	XXXVII-9
I_2(l)	920	XXXVII-1	I_3^-	−12315	XXXVII-11
I_2(s)	0		HIO(aq)	−23170	XXXVII-13
I_2(aq)	3926	XXXVII-5	HIO_3(aq)	−31580	XXXVII-16
HI(g)	315	XXXVII-8	IO_3^-	−31580	XXXVII-16
S(g)	30240	XXXVIII-21	S^{--}	23450	XXXVIII-31
S_2(g)	18280	XXXVIII-25	SO_2(g)	~~69660~~	XXXVIII-39
S_6(g)	11900	XXXVIII-17	SO_2(aq)	−69770	XXXVIII-44
S_8(g)	10000	XXXVIII-18	H_2SO_3(aq)	−126330	XXXVIII-45
S_λ(l)	94	XXXVIII-7	HSO_3^-	−123920	XXXVIII-46
$S_{\lambda,\mu}$(l)	93	XXXVIII-9	SO_3^{--}	−116680	XXXVIII-47
S(monocl.)	18	XXXVIII-4	SO_2Cl_2(g)	−71560	XXXVIII-52
S(rhomb.)	0		SO_3(g)	−~~53590~~	XXXVIII-50
H_2S(g)	−7840	XXXVIII-24	H_2SO_4(aq)	−176600	XXXVIII-53
H_2S(aq)	−6490	XXXVIII-27	SO_4^{--}	−176500	XXXVIII-54
HS^-	2980	XXXVIII-29			
N_2(g)	0		NO_2(g)	11920	XXXIX-16
NH_3(g)	−3910	XXXIX-2	N_2O_4(g)	22640	XXXIX-19
NH_3(l)	−2620	XXXIX-5	HNO_2(aq)	−13070	XXXIX-35
NH_3(aq)	−6300	XXXIX-7	NO_2^-	−8500	XXXIX-34
NH_4OH(aq)	−62860	XXXIX-9	HNO_3(g)	−18210	XXXIX-30
NH_4^+	−18930	XXXIX-11	HNO_3(aq)	−26500	XXXIX-32
NO(g)	20850	XXXIX-12	NO_3^-	−26500	XXXIX-33
NOCl(g)	16010	XXXIX-22			
C(diamond)	390	XL-2	HCOOH(aq)	−87920	XL-25
C(graph.)	0		C_2H_5OH(l)	−45100	XL-28
CH_4(g)	−12800	XL-3	$CO(NH_2)_2$(s)	−47280	XLI-2
C_6H_6(l)	27100	XL-6	$CO(NH_2)_2$(aq)	−48840	XLI-4
CO(g)	~~−32510~~	XL-14	HCN(g)	28910	XLI-15
$COCl_2$(g)	−48770	XL-30	HCN(l)	28870	XLI-16
COS(g)	−39600	XL-33	HCN(aq)	27520	XLI-13
CO_2(g)	~~−94260~~	XL-16	CN^-	39370	XLI-11
H_2CO_3(aq)	−148810	XL-18	HCNO(aq)	−29100	XLI-8
HCO_3^-	−140000	XL-20	CNO^-	−23750	XLI-6
CO_3^{--}	−125760	XL-22	C_2N_2(g)	92000	XLI-21
HCOOH(l)	−84040	XL-26	CNI(s)	42790	XLI-19

(add discussion)

Burton | 1957

The first thermodynamic table for biochemical species, according to Robert Alberty, was the 1957 "Free Energies of Formation from the Elements" table, made by English electrical engineer and physicist Keith Burton, as found the appendix of tables in Hans Krebs and Hans Kornberg's *Energy Transformations in Living Matter*. [7] Burton's table, which contains about 100 biochemical species, is shown below: [3]

Table 9. *Free energies of formation from the elements*

Name	$-\Delta G^{\circ}f$ (kgcal) Pure compound	In aqueous solution	References and comments
Acetaldehyde (gas)	31.96	33.38	ROSSINI et al. (1952); cf. BURTON and WILSON (1953). Solution data from WURMSER and WURMSER (1936).
Acetic acid (liq.)	93.75	95.48	BURTON and KREBS (1953). Uncertainty (±1 kgcal) in combustion data.
Acetate⁻	—	88.99	
Acetoacetate⁻	—	118	Approximate value from β-hydroxybutyrate and redox potential (see Table 10).
Acetone (liq.)	37.18	38.52	BURTON and WILSON (1953).
cis-Aconitate³⁻	—	220.51	BURTON (1955).
Adenine	−71.55	—	STIEHLER and HUFFMAN (1935).
L-Alanine	88.40	88.75	BURTON and KREBS (1953).
Allantoin	106.62	—	STIEHLER and HUFFMAN (1935).
NH_3 (gas)	3.98	6.37	ROSSINI et al. (1952).
NH_4^+	—	19.00	
L-Arginine	57.44	—	HUFFMAN and ELLIS (1937).
L-Asparagine	183.50 (monohydr.)	125.86	BORSOOK and HUFFMAN (1938). Value adjusted slightly in view of data for anh. compound and for heats of solution.
L-Aspartic acid	174.76	172.31	BURTON and KREBS (1953). Combustion data do not agree with those of OKA [1944(a)].
L-Aspartate⁺²⁻	—	166.99	
n-Butanol (liq.)	40.39	41.07	BURTON and KREBS (1953).
n-Butyric acid (liq.)	90.65	90.86	BURTON and KREBS (1953), HANSEN, MILLER, and CHRISTIAN (1955). No WASHBURN correction.
n-Butyrate⁻	—	84.28	
CO_2 (gas)	94.26	92.31	ROSSINI et al. (1952).
HCO_3^-	—	140.31	
Citrate³⁻	—	279.24	BURTON (1955).
iso-Citrate³⁻	—	277.65	
Creatine	63.19 (anh.)	—	BORSOOK and HUFFMAN (1938).
	121.11 (monohydr.)	63.17	
Creatinine	6.90	6.91	
Cysteine	163.55	159.00	Combustion data not accurate; no WASHBURN correction (cf. SKINNER 1954). Values calculated from BORSOOK, ELLIS and HUFFMAN (1937) and adjusted to be consistent with KOLTHOFF, STRICKS and TANAKA (1955).
Cystine	82.08	81.21	

Table 9. (Continued)

Name	$-\Delta G^{\circ}f$ (kgcal) Pure compound	In aqueous solution	References and comments
H_2O_2	—	32.67	LEWIS and RANDALL (1923). Re-calculated using data for BaO and Ba^{++} from ROSSINI et al. (1952). Approximate.
H_2S (gas)	7.89	6.54	ROSSINI et al. (1952).
HS^-	—	−3.0	KURY, ZIELEN and LATIMER (1953).
β-Hydroxybutyric acid	—	127	Approximate values by analogy from butyric acid cf. BURTON and KREBS (1953).
β-Hydroxybutyrate⁻	—	121	
Hypoxanthine	−18.39	−21.4	STIEHLER and HUFFMAN (1935), ALBERT and BROWN (1954).
α-Ketoglutarate	—	190.62	BURTON and KREBS (1953).
Lactate⁻	—	123.76	BURTON and KREBS (1953).
α-Lactose	419.11 (monohydr.)	362.15	BURTON and KREBS (1953). Data are inconsistent. N.B. Heats of combustion are not consistent with each other and with heats of solution (HUDSON and BROWN 1908).
β-Lactose	374.56 (anh.)	375.26	
L-Leucine	82.63	81.68	BORSOOK and HUFFMAN (1938). Value adjusted (+0.03 kgcal) to take account of those for D- and DL-leucine and ΔG° of racemization.
Mannitol	225.20	225.29	PARKS et al. (1926, 1946), FINDLAY (1902).
Malate²⁻	—	201.98	BURTON and KREBS (1953).
β-Maltose	413.48 (monohydr.)	357.80	Activity coefficient of 2 assumed for saturated solution. Not consistent with other data, BURTON and KREBS (1953).
Methane (gas)	12.14	—	ROSSINI et al. (1952).
Methanol (liq.)	39.73	41.88	ROSSINI et al. (1952).
NO_3^-	—	26.41	ROSSINI et al. (1952).
NO_2^-	—	8.25	LATIMER (1952).
Oxalic acid	166.8	—	ROSSINI et al. (1952).
Oxalate²⁻	—	161.3	
Oxaloacetate²⁻	—	190.53	BURTON and KREBS (1953).
Palmitic acid	25.7	—	PARKS and HUFFMANN (1932). No WASHBURN correction.
n-Propanol	41.21	42.02	PARKS et al. (1929), ROSSINI (1934), BUTLER et al. (1935).
iso-Propanol	43.26	44.44	BURTON and WILSON (1953).
Pyruvate⁻	—	113.44	BURTON and KREBS (1953).
Sorbose	217.57	—	CLARKE and STEGEMAN (1939), JACK and STEGEMAN (1941).
Sorbitol	—	225.31	From fructose and Table 10.

Table 9. (Continued)

Name	$-\Delta G^{\circ}f$ (kgcal) Pure compound	$-\Delta G^{\circ}f$ (kgcal) In aqueous solution	References and comments
Dulcitol	227.19	—	Parks, Kelley and Huffman (1926), Parks, West, Naylor, Fujii and McClaine (1946).
Erythritol	154.09	—	
Ethanol (liq.)	41.77	43.39	Rossini et al. (1952), Butler, Ramchandani and Thomson (1935).
Ethylene glycol (liq.)	77.12	—	Rossini et al. (1952).
Formaldehyde (gas)	26.30	31.2	Rossini et al. (1952), Parks and Huffman (1932).
Formic acid (liq.)	82.7	85.1	Rossini et al. (1952).
Formate$^-$	—	80.0	
		83.77	Woods (1936). Apparent inconsistency.
Fructose	—	218.78	Calculated from glucose and epimerization data (Wolfrom and Lewis 1928). Agrees with assumed entropy of 52.8 E.U. and with heat of combustion (Clarke and Stegeman 1939).
Fumaric acid	156.49	154.67	Burton and Krebs (1953).
Fumarate^{2-}	—	144.41	
α-D-Galactose	220.00	220.73	Clarke and Stegeman (1939), Jack and Stegeman (1941), Talley and Hunter (1952). Activity coefficient of 1.28 assumed for saturated solution.
α-D-Glucose	217.56	219.22	Huffman and Fox (1938) Taylor and Rowlinson (1955).
L-Glutamic acid	173.81	171.76	Borsook and Huffman (1938). Combustion and entropy data confirmed by Oka [1944 ( ), (*b*)].
L-Glutamate^{+2-}	—	165.87	
Glycerol (liq.)	114.02	116.76	Burton and Krebs (1953).
Glycine	88.61	89.26	Rossini et al. (1952), Borsook and Huffman (1938).
Glycogen	—	158.3	Burton and Krebs (1953). Value is for one glucose unit. Independent of concentration.
Glycollate$^-$	—	126.9	From glyoxylate and redox potential (Table 10).
Glyoxylate$^-$	—	112.0	Approximate value from Metzler, Olivard and Snell (1954) and appropriate $\Delta G^{\circ}f$ values.
Guanine	−11.23	—	Stiehler and Huffman (1935).
H_2O (liq.)	56.69	—	Rossini et. al. (1952).
OH^-	—	37.60	

Table 9. (Continued)

Name	$-\Delta G^{\circ}f$ (kgcal) Pure compound	$-\Delta G^{\circ}f$ (kgcal) In aqueous solution	References and comments
Succinic acid	178.68	178.39	Burton and Krebs (1953).
Succinate^{2-}	—	164.97	
Sucrose	369.20	370.90	Burton and Krebs (1953). Not consistent with other data.
SO_4^{2-}	—	177.34	Rossini et al. (1952).
SO_3^{2-}	—	118.8	
$S_2O_3^{2-}$	—	122.7	Mel (1953).
L-Threonine	—	123.0	Approximate. From Metzler, Longenecker and Snell (1954) and data for glycine and acetaldehyde.
L-Tyrosine	96.10	92.55	Huffman and Ellis (1937), Borsook and Huffman (1938). Combustion data do not agree with those of Oka [1944 (a)].
Urea	47.12	48.72	Rossini et al. (1952).
Uric acid	90.41	85.3	Stiehler and Huffman (1935), Albert and Brown (1954).
Urate$^-$	—	77.9	
	—	77.8	Green (1934) and value for hypoxanthine.
Water (liq.)	56.69	—	Rossini et al. (1952).
Xanthine	39.64	—	Stiehler and Huffman (1935).
	—	33.3	Green (1934) and value for hypoxanthine or urate$^-$ ion.

(add discussion)

Chang | 1998

The following is Chinese-born American Raymond Chang's thermodynamic data table, from his 6th edition, 1998 college *Chemistry* textbook, which in and of itself is nothing unique but is representative of the late 20th century view that the concept of elementary chemical thermodynamic reaction calculations is something that had distilled down, in a generic format, to the level of the general chemistry chemistry student (and possibly high school level chemistry student): [8]

Selected Thermodynamic Data at 1 atm and 25°C

INORGANIC SUBSTANCES

SUBSTANCE	ΔH_f° (kJ/mol)	ΔG_f° (kJ/mol)	S° (J/K · mol)
$Ag(s)$	0	0	42.7
$Ag^+(aq)$	105.9	77.1	73.9
$AgCl(s)$	−127.0	−109.7	96.1
$AgBr(s)$	−99.5	−95.9	107.1
$AgI(s)$	−62.4	−66.3	114.2
$AgNO_3(s)$	−123.1	−32.2	140.9
$Al(s)$	0	0	28.3
$Al^{3+}(aq)$	−524.7	−481.2	−313.38
$Al_2O_3(s)$	−1669.8	−1576.4	50.99
$As(s)$	0	0	35.15
$AsO_4^{3-}(aq)$	−870.3	−635.97	−144.77
$AsH_3(g)$	171.5		
$H_3AsO_4(s)$	−900.4		
$Au(s)$	0	0	47.7
$Au_2O_3(s)$	80.8	163.2	125.5
$AuCl(s)$	−35.2		
$AuCl_3(s)$	−118.4		
$B(s)$	0	0	6.5
$B_2O_3(s)$	−1263.6	−1184.1	54.0
$H_3BO_3(s)$	−1087.9	−963.16	89.58
$H_3BO_3(aq)$	−1067.8	−963.3	159.8
$Ba(s)$	0	0	66.9
$Ba^{2+}(aq)$	−538.4	−560.66	12.55
$BaO(s)$	−558.2	−528.4	70.3
$BaCl_2(s)$	−860.1	−810.66	125.5
$BaSO_4(s)$	−1464.4	−1353.1	132.2
$BaCO_3(s)$	−1218.8	−1138.9	112.1
$Be(s)$	0	0	9.5
$BeO(s)$	−610.9	−581.58	14.1
$Br_2(l)$	0	0	152.3
$Br^-(aq)$	−120.9	102.8	80.7

SUBSTANCE	ΔH_f° (kJ/mol)	ΔG_f° (kJ/mol)	S° (J/K · mol)
$Mg(OH)_2(s)$	−924.66	−833.75	63.1
$MgCl_2(s)$	−641.8	−592.3	89.5
$MgSO_4(s)$	−1278.2	−1173.6	91.6
$MgCO_3(s)$	−1112.9	−1029.3	65.69
$Mn(s)$	0	0	31.76
$Mn^{2+}(aq)$	−218.8	−223.4	−83.68
$MnO_2(s)$	−520.9	−466.1	53.1
$N_2(g)$	0	0	191.5
$N_3^-(aq)$	245.18	?	?
$NH_3(g)$	−46.3	−16.6	193.0
$NH_4^+(aq)$	−132.80	−79.5	112.8
$NH_4Cl(s)$	−315.39	−203.89	94.56
$NH_3(aq)$	−80.3	−26.5	111.3
$N_2H_4(l)$	50.4		
$NO(g)$	90.4	86.7	210.6
$NO_2(g)$	33.85	51.8	240.46
$N_2O_4(g)$	9.66	98.29	304.3
$N_2O(g)$	81.56	103.6	219.99
$HNO_2(aq)$	−118.8	−53.6	
$HNO_3(l)$	−173.2	−79.9	155.6
$NO_3^-(aq)$	−206.57	−110.5	146.4
$Na(s)$	0	0	51.05
$Na^+(aq)$	−239.66	−261.87	60.25
$Na_2O(s)$	−415.89	−376.56	72.8
$NaCl(s)$	−411.0	−384.0	72.38
$NaI(s)$	−288.0		
$Na_2SO_4(s)$	−1384.49	−1266.8	149.49
$NaNO_3(s)$	−466.68	−365.89	116.3
$Na_2CO_3(s)$	−1130.9	−1047.67	135.98
$NaHCO_3(s)$	−947.68	−851.86	102.09
$Ni(s)$	0	0	30.1
$Ni^{2+}(aq)$	−64.0	−46.4	159.4
$NiO(s)$	−244.35	−216.3	38.58
$Ni(OH)_2(s)$	−538.06	−453.1	79.5
$O(g)$	249.4	230.1	160.95
$O_2(g)$	0	0	205.0
$O_3(aq)$	−12.09	16.3	110.88
$O_3(g)$	142.2	163.4	237.6
P(white)	0	0	44.0
P(red)	−18.4	13.8	29.3
$PO_4^{3-}(aq)$	−1284.07	−1025.59	−217.57
$P_4O_{10}(s)$	−3012.48		
$PH_3(g)$	9.25	18.2	210.0
$HPO_4^{2-}(aq)$	−1298.7	−1094.1	−35.98
$H_2PO_4^-(aq)$	−1302.48	−1135.1	89.1
$Pb(s)$	0	0	64.89
$Pb^{2+}(aq)$	1.6	24.3	21.3

SUBSTANCE	ΔH_f° (kJ/mol)	ΔG_f° (kJ/mol)	S° (J/K · mol)
$HBr(g)$	−36.2	−53.2	198.48
C(graphite)	0	0	5.69
C(diamond)	1.90	2.87	2.4
$CO(g)$	−110.5	−137.3	197.9
$CO_2(g)$	−393.5	−394.4	213.6
$CO_2(aq)$	−412.9	−386.2	121.3
$CO_3^{2-}(aq)$	−676.3	−528.1	−53.1
$HCO_3^-(aq)$	−691.1	−587.1	94.98
$H_2CO_3(aq)$	−699.7	−623.2	187.4
$CS_2(g)$	115.3	65.1	237.8
$CS_2(l)$	87.9	63.6	151.0
$HCN(aq)$	105.4	112.1	128.9
$CN^-(aq)$	151.0	165.69	117.99
$(NH_2)_2CO(s)$	−333.19	−197.15	104.6
$(NH_2)_2CO(aq)$	−319.2	−203.84	173.85
$Ca(s)$	0	0	41.6
$Ca^{2+}(aq)$	−542.96	−553.0	−55.2
$CaO(s)$	−635.6	−604.2	39.8
$Ca(OH)_2(s)$	−986.6	−896.8	76.2
$CaF_2(s)$	−1214.6	−1161.9	68.87
$CaCl_2(s)$	−794.96	−750.19	113.8
$CaSO_4(s)$	−1432.69	−1320.3	106.69
$CaCO_3(s)$	−1206.9	−1128.8	92.9
$Cd(s)$	0	0	51.46
$Cd^{2+}(aq)$	−72.38	−77.7	−61.09
$CdO(s)$	−254.6	−225.06	54.8
$CdCl_2(s)$	−389.1	−342.59	118.4
$CdSO_4(s)$	−926.17	−820.2	137.2
$Cl_2(g)$	0	0	223.0
$Cl^-(aq)$	−167.2	−131.2	56.5
$HCl(g)$	−92.3	−95.27	187.0
$Co(s)$	0	0	28.45
$Co^{2+}(aq)$	−67.36	−51.46	155.2
$CoO(s)$	−239.3	−213.38	43.9
$Cr(s)$	0	0	23.77
$Cr^{2+}(aq)$	−138.9		
$Cr_2O_3(s)$	−1128.4	−1046.8	81.17
$CrO_4^{2-}(aq)$	−863.16	−706.26	38.49
$Cr_2O_7^{2-}(aq)$	−1460.6	−1257.29	213.8
$Cs(s)$	0	0	82.8
$Cs^+(aq)$	−247.69	−282.0	133.05
$Cu(s)$	0	0	33.3
$Cu^+(aq)$	51.88	50.2	−26.36
$Cu^{2+}(aq)$	64.39	64.98	98.7
$CuO(s)$	−155.2	−127.2	43.5
$Cu_2O(s)$	−166.69	−146.36	100.8
$CuCl(s)$	−134.7	−118.8	91.6

SUBSTANCE	ΔH_f° (kJ/mol)	ΔG_f° (kJ/mol)	S° (J/K · mol)
$PbO(s)$	−217.86	−188.49	69.45
$PbO_2(s)$	−276.65	−218.99	76.57
$PbCl_2(s)$	−359.2	−313.97	136.4
$PbS(s)$	−94.3	−92.68	91.2
$PbSO_4(s)$	−918.4	−811.2	147.28
$Pt(s)$	0	0	41.84
$PtCl_4^{2-}(aq)$	−516.3	−384.5	175.7
$Rb(s)$	0	0	69.45
$Rb^+(aq)$	−246.4	−282.2	124.27
S(rhombic)	0	0	31.88
S(monoclinic)	0.30	0.10	32.55
$SO_2(g)$	−296.1	−300.4	248.5
$SO_3(g)$	−395.2	−370.4	256.2
$SO_3^{2-}(aq)$	−624.25	−497.06	43.5
$SO_4^{2-}(aq)$	−907.5	−741.99	17.15
$H_2S(g)$	−20.15	−33.0	205.64
$HSO_3^-(aq)$	−627.98	−527.3	132.38
$HSO_4^-(aq)$	−885.75	−752.87	126.86
$H_2SO_4(l)$	−811.3	?	?
$SF_6(g)$	−1096.2	?	?
$Se(s)$	0	0	42.44
$SeO_2(s)$	−225.35		
$H_2Se(g)$	29.7	15.90	218.9
$Si(s)$	0	0	18.70
$SiO_2(s)$	−859.3	−805.0	41.84
$Sr(s)$	0	0	54.39
$Sr^{2+}(aq)$	−545.5	−557.3	39.33
$SrCl_2(s)$	−828.4	−781.15	117.15
$SrSO_4(s)$	−1444.74	−1334.28	121.75
$SrCO_3(s)$	−1218.38	−1137.6	97.07
$W(s)$	0	0	33.47
$WO_3(s)$	−840.3	−763.45	83.26
$WO_4^-(aq)$	−1115.45		
$Zn(s)$	0	0	41.6
$Zn^{2+}(aq)$	−152.4	−147.2	106.48
$ZnO(s)$	−348.0	−318.2	43.9
$ZnCl_2(s)$	−415.89	−369.26	108.37
$ZnS(s)$	−202.9	−198.3	57.7
$ZnSO_4(s)$	−978.6	−871.6	124.7

SUBSTANCE	ΔH_f° (kJ/mol)	ΔG_f° (kJ/mol)	S° (J/K · mol)
$CuCl_2(s)$	−205.85	?	?
$CuS(s)$	−48.5	−49.0	66.5
$CuSO_4(s)$	−769.86	−661.9	113.39
$F_2(g)$	0	0	203.34
$F^-(aq)$	−329.1	−276.48	−9.6
$HF(g)$	−271.6	−270.7	173.5
$Fe(s)$	0	0	27.2
$Fe^{2+}(aq)$	−87.86	−84.9	−113.39
$Fe^{3+}(aq)$	−47.7	−10.5	−293.3
$FeO(s)$	−272.0	−255.2	60.8
$Fe_2O_3(s)$	−822.2	−741.0	90.0
$Fe(OH)_2(s)$	−568.19	−483.55	79.5
$Fe(OH)_3(s)$	−824.25	?	?
$H(g)$	218.2	203.2	114.6
$H_2(g)$	0	0	131.0
$H^+(aq)$	0	0	0
$OH^-(aq)$	−229.94	−157.30	−10.5
$H_2O(g)$	−241.8	−228.6	188.7
$H_2O(l)$	−285.8	−237.2	69.9
$H_2O_2(l)$	−187.6	−118.1	?
$Hg(l)$	0	0	77.4
$Hg^{2+}(aq)$		−164.38	
$HgO(s)$	−90.7	−58.5	72.0
$HgCl_2(s)$	−230.1		
$Hg_2Cl_2(s)$	−264.9	−210.66	196.2
$HgS(s)$	−58.16	−48.8	77.8
$HgSO_4$	−704.17		
$Hg_2SO_4(s)$	−741.99	−623.92	200.75
$I_2(s)$	0	0	116.7
$I^-(aq)$	55.9	51.67	109.37
$HI(g)$	25.9	1.30	206.3
$K(s)$	0	0	63.6
$K^+(aq)$	−251.2	−282.28	102.5
$KOH(s)$	−425.85		
$KCl(s)$	−435.87	−408.3	82.68
$KClO_3(s)$	−391.20	−289.9	142.97
$KClO_4(s)$	−433.46	−304.18	151.0
$KBr(s)$	−392.17	−379.2	96.4
$KI(s)$	−327.65	−322.29	104.35
$KNO_3(s)$	−492.7	−393.1	132.9
$Li(s)$	0	0	28.0
$Li^+(aq)$	−278.46	−293.8	14.2
$Li_2O(s)$	−595.8	?	?
$LiOH(s)$	−487.2	−443.9	50.2
$Mg(s)$	0	0	32.5
$Mg^{2+}(aq)$	−461.96	−456.0	−117.99
$MgO(s)$	−601.8	−569.6	26.78

ORGANIC SUBSTANCES

SUBSTANCE	FORMULA	ΔH_f° (kJ/mol)	ΔG_f° (kJ/mol)	S° (J/K · mol)
Acetic acid(l)	CH_3COOH	−484.2	−389.45	159.83
Acetaldehyde(g)	CH_3CHO	−166.35	−139.08	264.2
Acetone(l)	CH_3COCH_3	−246.8	−153.55	198.74
Acetylene(g)	C_2H_2	226.6	209.2	200.8
Benzene(l)	C_6H_6	49.04	124.5	172.8
Ethanol(l)	C_2H_5OH	−276.98	−174.18	161.04
Ethane(g)	C_2H_6	−84.7	−32.89	229.49
Ethylene(g)	C_2H_4	52.3	68.1	219.45
Formic acid(l)	$HCOOH$	−409.2	−346.0	128.95
Glucose(s)	$C_6H_{12}O_6$	−1274.5	−910.56	212.1
Methane(g)	CH_4	−74.85	−50.8	186.19
Methanol(l)	CH_3OH	−238.7	−166.3	126.78
Sucrose(s)	$C_{12}H_{22}O_{11}$	−2221.7	−1544.3	360.24

(add discussion)

Free energy of formation of an animal

The following 1993 quote by American physical chemist Martin Goldstein, from his chapter section on the "Entropy of a Mouse", gives idea of what is means for a biochemical species or for that matter a so-called biological entity, such as a mouse (or a human) to have a free energy value in a given state: [9]

> "To apply thermodynamics to the problem of how life got started, we must ask what net energy and entropy changes would have been if simple chemical substances, present when

> the earth was young, were converted into living matter [as in the formation of a mouse] … to answer this question [for each process], we must determine the energies and entropies of everything in the initial state and final state."

To create a rabbit out of nothing and place it on the table, the magician need not summon up the entire enthalpy, $H = U + PV$. Some energy, equal to TS, can flow in spontaneously as heat; the magician must provide only the difference, $G = H - TS$, as work.

A semi-cartoonish, semi-realistic rendition of relationship between **Gibbs free energy**, G, and the "creation" of a rabbit (compare: creation by breath), from American physicist Daniel Schroeder's 2000 *Thermal Physics* textbook.

In other words, the above table, showing the Gibbs free energies of formation for different biochemical species, such as Fructose (218 kgcal), molecular formula $C_6H_{12}O_6$, gives way to the idea that this logic can be extrapolated upward to calculate the standard Gibbs free energy of formation for different types of proto-life entities, chemicals, or molecules, such as a mouse.

Human free energy tables

The future goal of human chemical thermodynamics, will be to calculate "human free energy tables" for the calculation of reaction feasibilities and spontaneities of different combinations of human chemical species (human molecules); as in different sets of potentials in the process of "love the chemical reaction." [4] The affinity-based beta-stage online pair-matching site ReactionMatch.com has this goal in mind.

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External links

â— Thermodynamics tables – URI.edu.
â— Thermodynamic tables – GenChem.net.

θΔics

In thermodynamics, **free enthalpy** or *freie Enthalpie* (common German translation) is an older synonym for Gibbs free energy (or Gibbs energy), the isothermal-isobaric potential, used by German scientists in the years following Dutch physicist Heike Kamerlingh-Onnes 1909 coining of the quantity 'U + PV' by the name enthalpy, whereby the difference of enthalpy less the bound energy 'TS' would be considered 'free enthalpy'. [1]

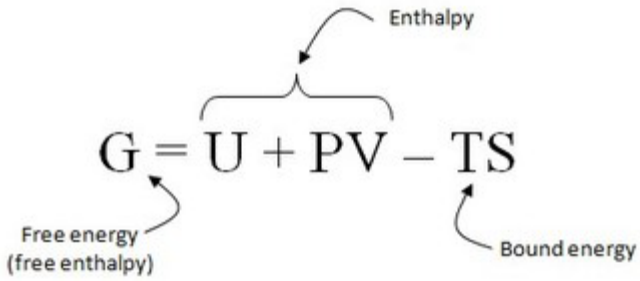

A basic visual of "**free enthalpy**" being the "enthalpy" less the "bound energy".

Discussion

In 1976, Ryogo Kubo asserted that "free enthalpy" is a synonym of Gibbs free energy. This, however, may not be consistent in all cases. The following abstract from German geophysical hydroecologist Peter Mauersberger's 1981 "Entropy and Free Enthalpy in an Aquatic Ecosystem" gives an example usage, that seems to differentiate the term free enthalpy from free energy: [3]

> "Modelling aquatic ecosystems, the second law of thermodynamics must be taken into consideration: The local entropy production always is positive definite. Therefore, this paper deals with the definition of thermodynamic functions in the framework of the macroscopic theory of aquatic ecosystems. Taking dissolved and inorganic material, particulate organic matter, solid phases, and aquatic biota at different trophic levels into account, the entropy, the **free enthalpy**, and the free energy in an aquatic ecosystem are determined on the basis of the theory of dilute solutions."

It may be that Mauersberger here is using the logic:

> Entropy = S
> Free energy = U – TS (Helmholtz free energy)
> Free enthalpy = H – TS (Gibbs free energy)

In any event, German thermodynamics historian Ingo Muller (2004) defines free enthalpy as being a synonym of Gibbs free energy. [4]

In his 1993 thermodynamics textbook by German chemist Roland Reich on chemical thermodynamics, Gibbs free energy and free enthalpy are explicitly described as being synonymous terms in German. [5]

In 1995, Walter Greiner, et al, in their *Thermodynamics and Statistical Mechanics*, devote a section to free enthalpy, wherein, supposedly, the discuss that the term "free enthalpy" is used to distinguish between "enthalpy" and "free energy" of the Helmholtz free energy variety. [8]

Coining

It remains to be tracked down as to who actually introduced the term "free enthalpy"—though it seems German technical physicist Walther Meissner (1882-1974), doctoral student of Max Planck, was using the term "free enthalpy" in 1931 in his work on low temperature research. [6] Into the 1940s and 50s the term seems to came into common usage.

The function H – TS was formerly named, in English publications, Gibbs free energy in 1933 by English thermodynamicist Edward Guggenheim; hence, it seems, in the 1930s there were two competing names, namely "free enthalpy" (German) and Gibbs free energy" (English), for the same function. [2] Some, to note, use the portmanteau "Gibbs free enthalpy" for the function H – TS. [7]

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θΔics

In terminology, **free thinker**, or "freethinker", depending, is someone who thinks freely about things, without regard to consequences; particularly those concerning deeply held ideas, such as those professed by religions; one "willing to use their minds without prejudice and without fearing to understand things that clash with their own customs, privileges, or beliefs" (Tolstoy, c.1890). Term was first used in English by William Molyneux (1697) in reference to John Toland, and his controversial *Christianity Not Mysterious*, in letter discussion with John Locke.

A generic depiction of a "**free thinker**", as one who is willing to broach his or her own path, in search of truth, at all costs, including disbandment from the group, society, or one's country; the solo person is exemplified by John Toland, who was forced to flee Ireland, for publishing his controversial *Christianity Not Mysterious*, which was burned in Ireland by the local hangman, for whom the term "freethinker" (Molyneux, 1697) was first used.

Overview

In 1696, John Toland published *Christianity Not Mysterious*, wherein the Bible was read in a new critical mode, which included the most doubting aspects of John Locke's philosophy; the publication was said to have started the "deist controversy" (see: deism); the book was burned in Ireland in 1697 and Toland had to flee the country. [1]

On 24 Dec 1697, Irish natural philosopher William Molyneux (1656-1698) (Q), in a letter to John Locke, referred to Toland as a "candid freethinker", as follows: [2]

> "In my last to you, there was a passage relating to the author of *Christianity Not Mysterious*. I did not then think he was so near me as within the bounds of this city; but I find since that he has come over hither, and have had the favor of a visit from him. I now understand that he was born in this country, but that he has been a great while abroad, and his education was for some time under the great Le Clerc. But that for which I can never honor him too much, is his acquaintance and friendship to you, and the respect which upon all occasions he expresses for you. I take a great deal of satisfaction in his conversation. I take him to be a candid **freethinker**, and a good scholar. But there is a violent sort of spirit which reigns here, which begins already to show itself against him, and I believe will increase daily, for I find the clergy alarmed to a mighty degree against him. And last Sunday he had his welcome to this city, by hearing himself harangued against out of the pulpit, by a prelate of this country."

This, as is generally cited, was the first English usage of the term "free thinker". [3] There is, of note, a prevalent amount of literature mis-citation (e.g. Hecht, 2003), dating to the late 20th century, stating that Locke was the one that "coined" the term freethinker, in reference to Toland, which, as the above letter (in full) evidences, is not the case. [5] The letter exchange, between Molyneux and Locke, on Toland, continues as follows:

> "For the man I wish very well, and could give you, if needed, proofs that I do so. And, therefore, I desire you to be kind to him; but I must leave it to your prudence in what way and how far. For it will be his fault alone, if he proves not a very valuable man, and have not you for his friend."
>
> — John Locke (c.1698) "Letter to William Molyneux", c. Jan (Q)

> "I look upon Mr. Toland as a very ingenuous man, and I should be very glad of any opportunity of doing him service, to which I think myself indispensably bound by your recommendation."

— William Molyneux (c.1698) “Letter to John Locke”, c. Jan (Q)

“He has had his opposers here, as you will find by a book which I have sent to you. The author (Peter Brown) is my acquaintance, but two things I shall never forgive in his book: the one is the foul language and opprobrious names he gives Mr. Toland ; the other is upon several occasions, calling in the aid of the civil magistrate, and delivering up Mr. Toland to secular punishment. This, indeed, is a killing argument, but some will be apt to say, that where the strength of his reason failed him, then he flies to the strength of his sword. And this reminds me of a business that was very surprising to many, the presentment of some pernicious books and their authors by the grand jury of Middlesex. This is looked upon as a matter of dangerous consequence, to make our civil courts judges of religious doctrines; and no one knows upon a change of affairs whose turn it may be next to be condemned. But the example has been followed in this country, and Mr. Toland and his book have been presented here by a grand jury, not one of whom I am persuaded ever read one leaf in *Christianity Not Mysterious*. Let the Sorbonne forever now be silent ! A learned grand jury, directed by as learned a judge, does the business much better. The Dissenters here were the chief promoters of this matter, but, when I asked one of them 'What if a violent Church of England jury should present Mr. Baxter's books as pernicious, and condemn them to the flames, by the common executioner,' he was sensible of the error, and said he wished it had never been done.”

— William Molyneux (c.1698) “Letter to John Locke”, c. Jan (Q)

“The Dissenters had best consider; but they are a sort of men which will always be the same.”

— John Locke (c.1698) “Letter to William Molyneux”, c. Jan (Q)

“Mr. Toland is at length driven out of our kingdom; the poor gentleman at last wanted a meal's meat, and the universal outcry of the clergy ran so strong against
him, that none durst admit him to their tables. The little stock of money which he had was soon exhausted, he fell to borrowing, and to complete his hardships, the
Parliament fell on his book, voted it to be burnt by the common hangman, and ordered the author to be taken into custody by the Sergeant-at-Arms, and to be prosecuted by the Attorney General. Hereupon he is fled out of this kingdom, and none here knows where he has directed his course.”

— William Molyneux (c.1698) “Letter to John Locke”, c. Jan (Q)

In 1713, Anthony Collins published his *Discourse of Freethinking, Occasioned by the Rise and Growth of a Sect called Freethinkers*, after which the term “free thinker” went into common usage; Collins usage, to note, was that of an anti-atheism position; to exemplify: [5]

“Ignorance is the foundation of atheism, and **freethinking** the cure of it.”

Free thought, and being a "free thinker", contrary to Collins usage, however, has generally, in the following centuries, been a liberal atheism synonym.

Quotes

The following are related quotes:

“I have steadily endeavored to keep
my **mind free**, so as to give up any

hypothesis, however much beloved (and I cannot resist forming one on every subject), as soon as facts are shown to be opposed to it."

— Charles Darwin (1877), on his own intelligence and ability (Q)(Q)

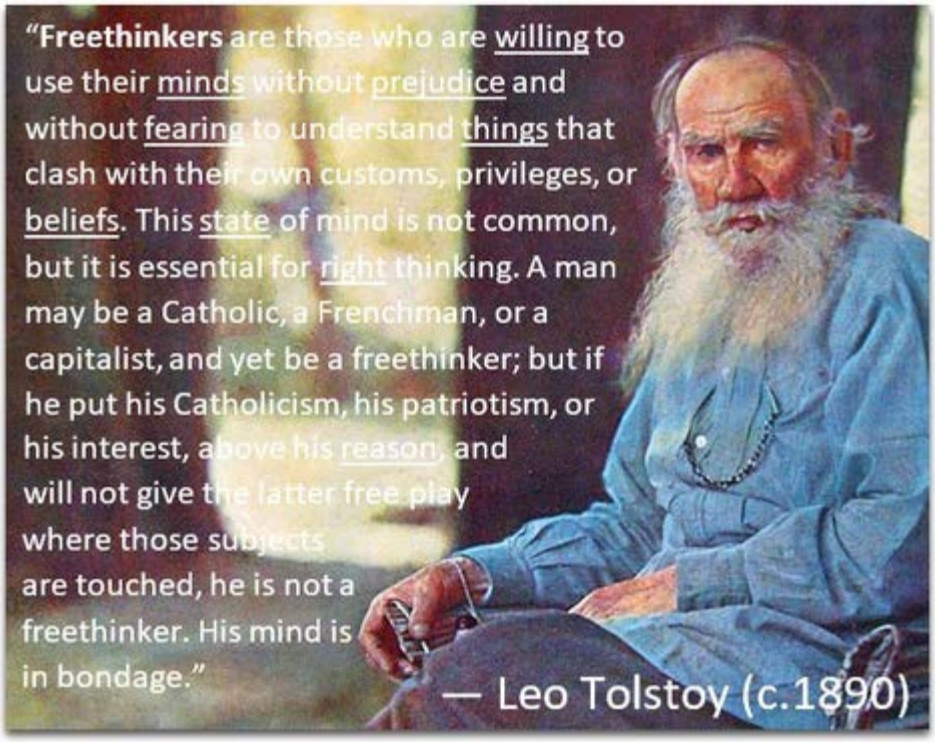

"**Freethinkers** are those who are willing to use their minds without prejudice and without fearing to understand things that clash with their own customs, privileges, or beliefs. This state of mind is not common, but it is essential for right thinking. A man may be a Catholic, a Frenchman, or a capitalist, and yet be a freethinker; but if he put his Catholicism, his patriotism, or his interest, above his reason, and will not give the latter free play where those subjects are touched, he is not a freethinker. His mind is in bondage."

— Leo Tolstoy (c.1890) (Q)(Q) [6]

"Buchner's *Force and Matter* also became the Bible of a new movement, '**free thinking**', otherwise known as atheism."

— Howard Bloom (2012), *The God Problem* (pg. #)

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(c) Author. (2003). "Article", in: *New Catholic Encyclopedia, Ead-Fre* (pg. 966; date given is 1697; note: other sources give 1697). Thomson/Gale.
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External links

- Freethought – Wikipedia.

θΔics

In theories, **free will** is a conception that a person exercises control over the choices made in their reaction existence (life), in a way that is autonomous and or exempt from the laws of nature.

A 2007 **free will** cartoon used in a theist blog (Ñº) about William Craig (Ñº) and the asserted formula:

No Free Will = No Moral Responsibility

(add discussion)

Overview

The reason that many people seem to deny the view that the theory of free will is now defunct is that the the model of free will and the subsequent "choosing" of right from wrong which lies at the heart of morality and and thus ingrained views of life-death, purpose, and the understanding of the "self" in the context of the universe.

Legal implications

See main: Science-connected legal cases ; See also: Slave stealing parable

One reason many hold fast to the notion of free will is that it not only underwrites the religious notion of "sin" and the theory of "judgment", as described in the Ra theology theory of the weighting of the soul (soul weight in the Ab-ra-ham-ic faiths or karma weight in the B-ra-hma-ic faiths), but also underwrites the legal system of most countries.

In the US, for instance, the 1978 case of United States v. Grayson established the Supreme Court's stance on free will as being a "universal and persistent" foundation of the system of law, distinct from "a deterministic view of human conduct that is inconsistent with the underlying precepts of the criminal justice system." Therefore, a scientific non-belief in the theory of free will is considered an illegal view in modern times. Said another way, according to American neuroscientist Sam Harris, "any scientific developments that threaten our notion of free will would seem to put the ethics of punishing people for their bad behavior in question." [13]

Hmol sciences

In human chemistry and human thermodynamics, a human being is defined as a molecule, i.e. a "human molecule", and systems of humans are defined as thermodynamics systems, governed by the laws of chemistry and physics. In this view, the conception of a molecule, human or otherwise, with a free will, becomes an absurdity. The modern view, conversely, shows the concept of free will to be a defunct scientific theory, replaced by more updated views, such as induced movement, among others.

Readiness potential

The first scientific disproof of the theory of free will was done in 1982 by American neuroscientist Benjamin Libet, who found that electrical activity of the brain precedes so-called "conscious" choice of free will by 350 milliseconds.

Thermodynamics

When one first begins to analyze the process of human life from either a chemical or thermodynamic point of view, such as Goethe did in 1809, as Henry Adams did in 1910, as C.G. Darwin did in 1952, as Bazargan did in 1956, or as Valiery Chalidze did in 2000, the issue of "free will" is one of

Human Molecule

$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}$
$Mg_{E24}Fe_{E23}F_{E23}\ Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}$
$Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$

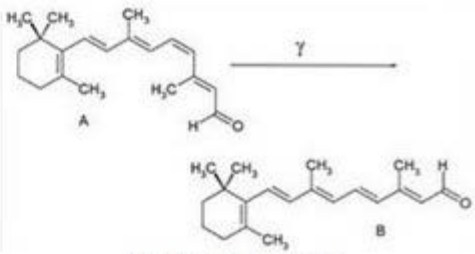

Retinal Molecule

$C_{20}H_{28}O$

The "forced" input of a billions of photons (force carriers) causes the twenty-six-element human molecule to "move" into a straightened upright position; when the light is no longer present (e.g. nighttime), the human molecule reverts back to its bent position (e.g. curled in sleep). The "forced" input of a single photon (a force carrier) causes the three-element retinal molecule to "move" into a straightened position; when the light is no longer present, the retinal molecule reverts back to the bent position.

the first major topics of debate that arises. In other words, from a chemical or thermodynamic point of view, a person is a molecule, i.e. a human molecule, no different than any other heat-driven animate molecule in the universe, and the actions or movements of molecules are determined by Gauge boson exchange forces. [1]

When viewing the question of free will and "choice" in terms of human chemical reactions, particularly regarding the effect of love, as in love the chemical reaction, the distinction becomes clearer. Sixty-five percent of people, for instance, agree with the statement: "falling in love was not really a choice; it just struck me (e.g. love at first sight)" [9]

ABC model of will | Retinal model of molecular choice

The basic model for the description of "free will" or induced movement in molecular life (animate activity), is the movement dynamics involved in the life of the 3-element retinal molecule $C_{20}H_{28}O$ (pictured above), a light sensitive molecule found in the retina of the eye. If the energy contained in a single photon is of the correct wavelength, between 400 and 700 nm, it will function to break what are called pi-bonds found between the eleventh and twelfth carbon atoms near the kink in the structure of the retinal molecule. When these pi-bonds break, this 'forces' the retinal molecule to rearrange into a straightened configuration.

This basic model, in which a molecule is forced to react, i.e. moves dynamically, to a photon or field particle stimulus, is the basic model (poster child) for human molecular life, i.e. for all human behavior. The human molecule, a 26-element molecule, is no different than the retinal molecule, a 3-element molecule. Human chemical reactions will always be exact and repetitive, similar to the bending and straightening actions of the simple retinal molecule. More to the point, the central nervous system of the retinal molecule is no different, complexity aside, than the central nervous system of the human molecule: each CNS is comprised, at its core, of valence shell electron-photon interactions.

This photon inducing, exchange force, retinal-bending mechanism, to note, was is an expansion of the 1913 Bohr model of the atom applied to the phenomenon of molecular movement and

mechanism with light interaction as discovered in 1958 by the American biochemist George Wald and his co-workers; work for which Wald won a share of the 1967 Nobel Prize in Physiology or Medicine with Haldan Keffer Hartline and Ragnar Granit. [2]

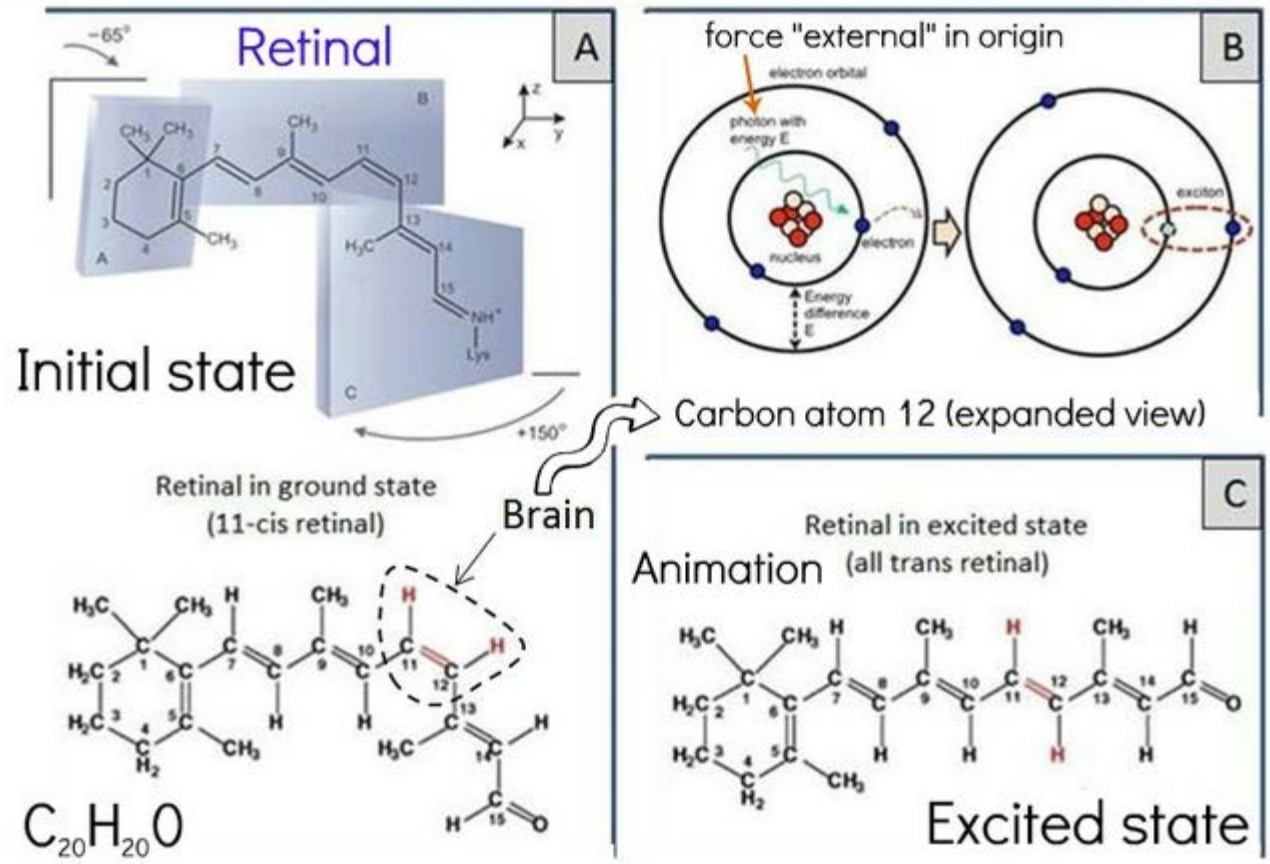

The "ABC model" of **free will**: (A) retinal molecule in ground state (normal state); (B) light (or one or more photons) with a frequency of 400 to 700 nm absorbs into the the carbon atom (note: atom shown is actually beryllium) at the 11 position, thus causing (exchange force) an electron to jump up in orbital position (excited state); (C) the retinal molecule reacts to this by "moving" to the straightened position, a short-lived heightened energy configuration. [14]

Correct view

One of the first to state the correct view of free will, namely that from a molecular point of view, was Dutch philosopher Bededict de Spinoza, who in the 17th century stated that “experience tells us clearly that men believe they are free simply because they are conscious of their actions and unconscious of the causes whereby these actions are determined; further, it is plain that the dictates of the mind are simply another name for the appetites that vary according to the varying state of the body.” [3] These states, in a human chemistry point of view, can be understood in an analogous fashion as being evolved forms of the "octet rule" where atoms and molecules seek to satisfy their orbital satieties.

The correct view, as Goethe discerned, is that person does not have a free will, but only a "perceptual free will". In his own words, "none are so hopelessly enslaved as those who falsely believe they are free". In other words, the feeling that one is "choosing their actions" is nothing more than a build up of electromagnetic potential, in the neurological structure and social bonding structure of the individual, that mediates the force of choice over other possible actions. [1] In 1784, German philosopher Immanuel Kant outlined the one of the clearest statements on the description of free will, in a form which predates the basics of human chemical mechanism, after reading Prussian demographer Johann Peter Süssmilch’s tables of births and deaths: [7]

> “Whatever concept one may hold, from a metaphysical point of view, concerning the *freedom of will*, certainly its appearances, which are human actions, like every other natural event are determined by universal laws.”

In 1869, Russian novelist and philosopher Leo Tolstoy stated the all-molecules-obey-the-same-laws-logic in his classic book *War and Peace*: [8]

> "A particle of matter cannot tell us that it is unconscious of the laws of attraction and repulsion and that the law is not true; but man, who is the subject of history, says bluntly: I am free, and am therefore not subject to laws."

In modern terms, one can see the logic of Tolstoy's argument when looking at standard molecular evolution tables.

Incorrect view

The incorrect view that a person does have a free will, implies that all molecules have a free will. This type of logic, however, leads to obvious theoretical absurdities.

In 1921, English experimental biologist James Johnstone speculative about the physical chemistry implications of free will vs. determinism in biology, concluding that the question is meaningless, because the mind cannot be measured. [12]

In his 1921 lecture on Cartesian economics, English physical chemist Frederick Soddy set to position the science of economics on the first two laws of thermodynamics, but teetered on the divide between animate (cell or amoeba) and inanimate (Brownian movement) life but on the topic of free will stated: [11]

> "Life is the expression of the interaction of two totally distinct things represented by probability and **free will**, thought the ultimate nature of these two things will probably remain, a thousand years hence, as far off as ever."

In 1952, to cite an example of logic gone wrong, English physicst Charles Galton Darwin, in his book *The Next Million Years*, correctly argued that humans are molecules and that thermodynamics governs their operation, but then in a side note he states that man, differing from other molecules, has a free will owing to his unpredictibility. Specifically, in a system of gas molecules, the external conditions are determined by the constraints of the containing vessel; the analogy for humans, according to Darwin, is that the earth itself is the containing vessel. Similarly, the internal conditions of human systems, which are analogous to the property of being conservative dynamical systems, lies, as Darwin says, 'of course much deeper'. In short, Darwin argues that: [4]

> "The laws governing the nature of human molecules, lie much deeper [as compared to systems of gas molecules], because unlike a molecule, a man has a **free will**, which make his actions unpredictable."

In a modern sense, we know that Darwin is completely wrong on this latter point, i.e. man absolutely does not have a free will, nor does any other atom or molecule. The short of this explanation is that if one believes that one type of molecule has a free will than one must prove that all molecules have a free will, which is an argument in absurdity. Nevertheless, Darwin justifies this, humorously, by stating that the 'the individual collisions of the human molecules may be a little less predictable than those of the gas molecules.' [4]

In 1956, likewise, Iranian engineer and thermodynamicist Mehdi Bazargan stated that: [5]

> "When dealing with human societies and humans with **free will**, thermodynamic law and formulae require a coefficient, which can be called a *balancing coefficient* and is less than 1 in unbalanced societies and more than 1 in societies governed by true religions and affections."

This type of flawed logic, wherein human beings are supposed to have special exceptions in the laws of science, is a common one.

In 1985, one of the more convoluted arguments in support of the existence of free will was proposed by American physical chemist George Scott in his book *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will*, wherein he argued, essentially, that human nervous systems a in a far-from-equilibrium state, governed by Prigoginean type nonequilibrium thermodynamics of the sort that "could chaotically amplify indeterminate events at the micro level." [10]

In the 2000 book *Entropy Demystified - Potential Order, Life, and Money*, writer Valery Chalidze spends the first 190-pages outlining his take on economic thermodynamics, but then knowing that the implications of thermodynamics precludes free will, i.e. makes impossible by necessary consequence, she inserts a four page in conclusion section at the end of the book titled "The Unpredictability of Will and Physics" where he states, for instance:

> "Our **will**, which is informed energy, is capable of deviating from the prescriptions of physical laws."

Beyond this, he argues that "the obvious reason to reject human will as a physical property is its unpredictability." [6]

Quantum mechanics

In 1927, Werner Heisenberg derived the Heisenberg uncertainty relation and the following year Arthur Eddington, in his *On the Nature of the Physical World*, speculated on free will in the context of quantum mechanics. In the years since, countless numbers have engaged in quantum-based theories, collectively known as "ontic opening theories", either for or against free will. [13] One recent example would be American quantum physicist Robert Doyle who argues that the collapse of the wave function gives people a two-stage version of free will.

Quotes

The following are related quotes:

> "It would thus make no difference whether a quantum of **mental energy** inserts itself into the course of the material process or not: the law of the conservation of energy as formulated hitherto would not be impaired."
>
> — Oswald Kulpe (c.1900), cited by Carl Jung [2

> "This tentative extension of the forced movement or tropism theory of animal conduct may explain why higher animals and human beings seem to possess freedom of will, although all movements are of the nature of forced movements. The tropistic effects of memory images and the modification and inhibition of tropisms by memory images make the number of possible reactions so great that prediction becomes almost impossible and it is this impossibility chiefly which gives rise to the doctrine of **free will**. The theory of free will originated and is held not among physicists but among verbalists. We have shown that **an organism goes where its legs carry it** and that the direction of the motion is forced upon the organism."
>
> — Jacques Loeb (1918), *Forced Movements, Tropisms, and Animal Conduct* (pg. 171)

> "Our conception of the existence of "**free will**" in human beings rests on the fact that our knowledge is often not sufficiently complete to account for the orienting forces, especially when we carry out a "premeditated" act, or when we carry out an act which gives us pain or may lead to our destruction, and our incomplete knowledge is due to the sheer endless number of possible combinations and mutual inhibitions of the orienting effect of individual memory images."
>
> — Jacques Loeb (1918), *Forced Movements, Tropisms, and Animal Conduct* (pg. 172)

> "Scientists and philosophers realized long ago that **free will** could not be squared with our growing understanding of the physical world. Nevertheless, many still deny this fact."
>
> — Sam Harris (2010), *The Moral Landscape* [13]

See also

â— Einstein-Murphy dialogue

Left: Belgian surrealist artist Rene Magritte's 1933 oil on canvas painting entitled "Elective Affinities" based on the human chemical theory of German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*, according to which the "will" is largely determined by forces external (1796), and his general motto that: "none are so hopelessly enslaved than those who believe they are free" (P2:C5) Goethe's protégé Arthur Schopenhauer's stylized his own will to power theory, similar to the above. Right: a circa 2012 **free will** artwork, based on Margritte's painting, the idea that we are each hatched into a world caged by external forces. [15]

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External links

â— Free will – Wikipedia.
â— Do humans have free will? (05 Jan 2011) – Amazon.com.

θΔics

In terminology, **freedom**, a state of existence associated with being free or feeling free, is a term that frequently comes up when viewing humanity as a system of chemicals governed by physical and chemical laws of operation.

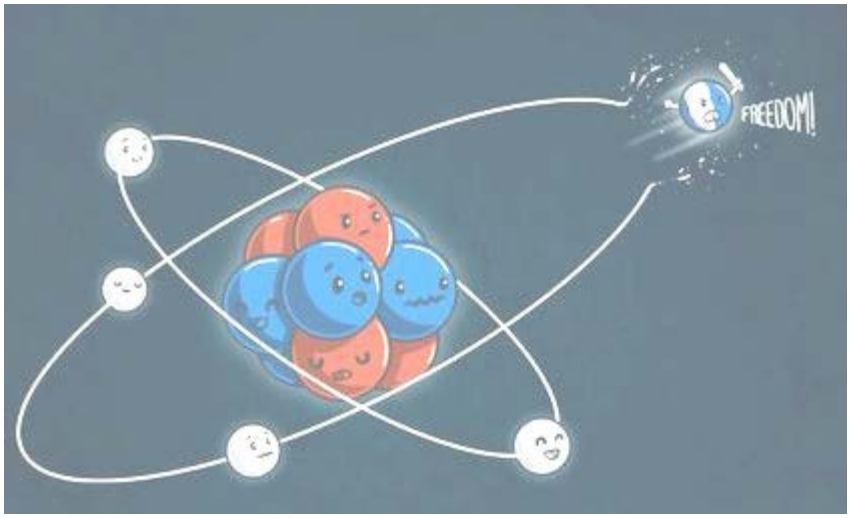

A wirdou.com anthropomorphized image (O) of a valence shell electron breaking loose from its orbital and gaining **freedom** (see also: free electron).

Goethe | Elective Affinities

The following famous quote by German polymath Johann Goethe, the founder of human chemistry, gives one perspective on individual human freedom:

> "None are more hopelessly enslaved than those who falsely believe they are **free**."

This motto is capture pictorially by Belgian surrealist artist by René Magritte oil on canvas painting "Elective Affinities (1933)" based on construct of Goethe's 1809 novella *Elective Affinities*.

Overview

The following is an example 1997 use by German literature professor Kevin Yee in discussing German polymath Johann Goethe's 1809 *Elective Affinities*: [1]

> "The implied 'correct' outcome of the human reaction (a simple exchange of partners), which was predicted much like a chemical reaction, is avoided because the Captain is a catalyst and not a normal reactant … [Goethe's] presentation of the Captain, the wild card in the mix of reactants, saves for humanity the possibility of **freedom**."

Although Yee's assertion here is incorrect, namely the Captain was not conceived as a catalyst (Mittler the mediator played this roll), but rather as a reactant, we do see mention or discussion of "freedom" in respect to chemical reaction.

In Goethe's novella, the characters, and in implication all of humanity, were said to be governed by the dynamics of reactions between individuals regulated by the chemical affinities of the following governing equation:

$$A = T\Delta S - \Delta H$$

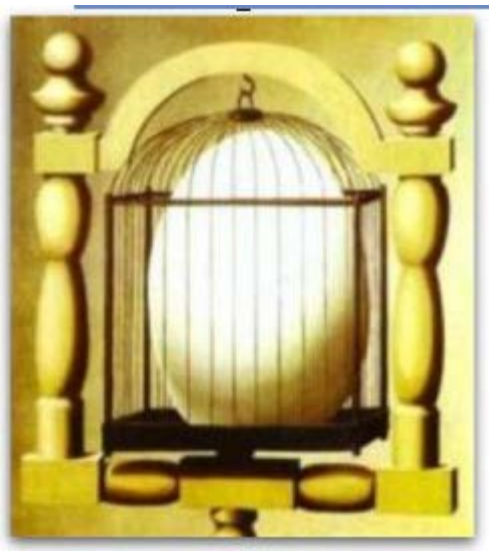

Rene Magritte's 1933 painting "Elective Affinities", characterizes the perspective that although one is born free or may, at times, feel free, one is always "caged" by the force of chemical affinity.

The first connected use of the discussion of "freedom" in the context of human chemistry, was in the 1871 coining of the term 'social molecule', a collective of people viewed as an aggregate of human particles or human atoms, by English biologist Thomas Huxley: [2]

> "Every society, great or small, resembles ... a complex molecule, in which the *atoms* are represented by *men*, possessed of all those multifarious attractions and repulsions which are manifested in their desires and volitions, the unlimited power of satisfying which we call **freedom** ... the social molecule exists in virtue of the renunciation of more or less of this freedom by every individual. It is decomposed, when the attraction of

desire leads to the resumption of that freedom the expression of which is essential to the existence of the social molecule. The great problem of **social chemistry** we call politics, is to discover what desires of mankind may be gratified, and what must be suppressed, if the highly complex compound, society, is to avoid decomposition."

(add discussion)

Chemical Thermodynamics in the Real World

See main: Chemical Thermodynamics in the Real World; Rossini debate

The topic of freedom, in a similar sense came up again in the famous 1971-2006 Rossini debate between American chemistry professors Harold Leonard, John Wojcik, and Todd Silverstein, on the legitimacy of American chemical thermodynamicist Frederick Rossini's political thermodynamics arguments, expressed in his 1971 Priestley Medal address "Chemical Thermodynamics in the Real World", in which Rossini argued that the first and second laws of thermodynamics could be used to understand the paradox between freedom and security in social life, as understood through enthalpy and entropy changes in society, whose central message from his address was: [3]

> "The picture we have developed from thermodynamics is very simple: One cannot have a maximum of **freedom** and a maximum of security at the same time. If there is a maximum of freedom, there will be zero security."

Rossini argues, similar to Goethe, that paradox between freedom and security can be explained using the following equation, which is a form of the combined law of thermodynamics:

$$\ln K = -\frac{\Delta H^\circ}{R}\left(\frac{1}{T}\right) + \frac{\Delta S^\circ}{R}$$

Interestingly, as we see, both Goethe and Rossini believe that the feeling of freedom felt by a person can be understood in terms of enthalpy changes ΔH and entropy changes ΔS of individual human chemical reactions in the context of the coupled reactions of the social group or system.

Humans seek to maximize their freedom.

An individual acts to maximize his or her own personal freedom but against this tendency stands the same driving force acting on the other humans in the society to which the individual belongs. Thus we should understand the desire of someone to be rich as a desire to become free and the desire of a salesman to have his customers' money as an attempt to optimize freedom somewhere else in society. The richer among us are more free in the sense that they can place their money in many different investments, which can be changed with time. Ultimately, what we want to buy with money is freedom. This word "freedom" is perhaps hard to define precisely, let alone maximize, but I claim that it is a fair translation of the concept of "entropy" from thermodynamics of inanimate matter to thermodynamics of human life. It is also a most positive concept almost synonymous with life itself. Who could then doubt the need for a concept of entropy or deny its claim to be central to the theory of change be it inanimate or animate?

A section from Swedish physical chemist Sture Nordholm's 1997 article "In Defense of Thermodynamics: an Animate Analogy"on human **freedom** and

Quotes

The following are related quotes:

> "To deny the **freedom** of the will is to make morality impossibility."
>
> — James Froude (1871), "Calvinism", Mar 17 [5]

See also

- Surface/mass 'longevity' – Discussion (2009)

chemical thermodynamics. [4]

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(c) Anon. (2008). “The Priestley Medalists, 1923-2008.”, Chemical and Engineering News, Vol. 86, No. 14, pgs. 60-61, Apr 07.
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Further reading

● Chen, Jing. (2008). “Understanding Social Systems: A Free Energy Perspective”, *September*, 16. pgs. 1-10. Social Science Resource Network.

External links

● Freedom – Wikipedia.

θΔics

In processes, a **freely-running** or "freely going" process is a reaction which runs freely, like the combustion of a fuel or the action of an acid upon metal, and thus constitute systems subject to no external forces except the constant pressure of the atmosphere. In the original 1923 words of American physical chemist Gilbert Lewis: [1]

> "In the preceding discussion we have considered a chemical process which is in some way harnessed for the production of useful work. We may now turn to the far more common case of a reaction which **runs freely**, like the combustion of a fuel, or the action of an acid on a metal. In other words, let us consider a system which is subject to no external forces, except a constant pressure exerted by the environment."

Examples of **"freely-going"** processes: Left: the combustion of fuel, in this case wood, in a campfire, which is the reaction of a hydrocarbon (methane shown below) with oxygen to produce water, carbon dioxide, light, and fire:

$$CH_4 + 2O_2 \rightarrow CO_2 + H_2O$$

Center: A photo of copper metal in a beaker of nitric acid wherein oxidation of copper metal by nitric acid, a process having the chemical equation shown below, produces nitric oxide (NO) gas which is immediately oxidized in air to form brown nitrogen dioxide (NO_2) gas. The copper atoms lose two electrons to form Cu2+ ions which give a blue color in water. [6]

$$\mathrm{Cu}(s) + 4\,\mathrm{H}^+(aq) + 2\,\mathrm{NO}_3^-(aq) \rightarrow \mathrm{Cu}^{2+}(aq) + 2\,\mathrm{NO}_2(g) + 2\,\mathrm{H}_2\mathrm{O}(l)$$

Right: A CartoonStock.com love cartoon entitled "Burning love", depicting love as a combustion reaction (see: human chemical reaction theory), which in the case of a human reproduction reaction type combustion reaction has the following time-accelerated chemical equation form: [7]

$$AB + CD \rightarrow A \equiv C + BD$$

which is the reaction of two human molecules, AB (man + sperm) and CD (woman + egg), produce, in the process of love the chemical reaction, a dihumanide molecule A≡C and a new precipitate human molecule BD (child). [8]

Examples of freely going reactions are shown adjacent.

Governing equation

In freely running reactions, the Lewis inequality for natural processes governs the process:

$$\Delta G < 0$$

If, conversely, the process is in some way harnessed for the production of useful work, e.g. when the electrical energy produced from reactions of a Galvanic cell (or battery) is coupled or connected to a system external motor or other electrical device, used, for instance, to light a bulb, then it is a universal rule that if any isothermal-isobaric process is to occur with finite velocity, it is necessary that:

$$-\Delta G > w'$$

where w' is the net work. [1] The work of Adriaan de Lange (1982) and—inspired by de Lange, the work of Gavin Ritz (2001), seem to be the only ones to have perused the implications of this latter coupling "net work" factor in sociological terms (see: human free energy).

Evolution

The process of chnopsological evolution (biological evolution) is a "freely going" process, a type of ongoing green combustion, or "green fire" as Russian geochemical mineralogist Vladimir Vernadsky, in 1926, described the dynamics of change in the "biosphere" (sphere of life) in chemical thermodynamic terms, sparked daily by the heating of the light from the sun. [2]

While the main work of Lewis wasn't necessarily concerned with applications of his chemical thermodynamics derivations in evolution theory, he did, to note, in his 1925 Silliman lectures, turned book *Anatomy of Science* (§7: Non-Mathematical Sciences), delve into the tricky question of evolution of the animate things/living things (terms which he rotates usage of), commenting:

> "Suppose that this hypothetical experiment could be realized, which seems not unlikely, and suppose we could discover a whole chain of phenomena [evolution timeline], leading by imperceptible gradations form the simplest chemical molecule to the most highly developed organism [human molecule]. Would we then say that my preparation of this volume [*Anatomy of Science*] is only a chemical reaction [extrapolate up approach], or, conversely that a crystal is thinking [extrapolate down approach] about the concepts of science?"

In 1982, in loose connection to 1923 Lewis definition that the Lewis inequality governs freely going Earth-surface-attached reactions, in 1982 Canadian zoologist Daniel Brooks and American systems ecologist Edward Wiley published there very controversial 1982 article "Victims of History: a Nonequilibrium Approach to Evolution", wherein the gave the following "equation for evolution": [4]

$$E = \frac{dS_i + dS_c + dS_e}{dt}$$

where E represents evolution, dS_i stands for the change in entropy levels of information, dS_c for changes in entropy levels of cohesion, and dS_e for changes in something else (add), an equation which supposedly is time derivative portmanteau or blend of Prigogine entropy and Shannon entropy, which of course is the reason why the article resulted in such a backlash (see: Brooks-Wiley theory). [5]

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θΔics

In hmolscience, **Freeman Dyson** (1923-) (CR:20) is an English-born American theoretical physicist, a 2014 smartest person existive (#9), noted for his 1970s publications on energy, the universe, and intelligent beings, the latter of which he argues generate an amount of entropy per thought.

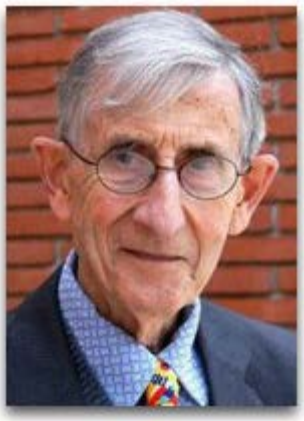

Overview

Dyson is an Aneki.com second ranked (behind Hawking) "Greatest Living Physicist" (Q); noted $850/day rent-a-genius "Jason" think tank member (Q); his 1971 "Energy in the Universe", cited by Peter Atkins (1992), in which he attempts to explain how things degrade in the movement of the universe in terms of the second law and weak and strong interactions; his 1979 "Time without End: Physics and Biology in an Open Universe", cited by Frank Tipler (1994), argues that life in the future will be able to cope with the cooling and dimming expected from heat death of the universe; somewhere postulates that intelligent beings generate a fixed entropy ΔS per thought; downgrade (↓) for, supposedly, being an anti-reductionism Christian. [1]

God

In 1992, Dyson, in interview with Wim Kayzer, stated the following about his belief in god: [5]

> "I like to describe [God] as the "world soul" — which was my mother's phrase — so that we are little bits of the world soul. And so it may well be that we are part of the world's growth. That's the kind of world I would like to live in, and as a working hypothesis it seems to me quite reasonable. In detail the world shows no evidence of any sort of conscious design. If there is to be a conscious design, it probably has to be ours."

(add)

Atoms | Sentience

In 1979, Dyson, in what seems to be a dialogue (Q), said the following: (Q)

> "It is remarkable that mind enters into our awareness of nature on two separate levels. At the highest level, the level of human consciousness, our minds are somehow directly aware of the complicated flow of electrical and chemical patterns in our brains. At the lowest level, the level of single atoms and electrons, the mind of an observer is again involved in the description of events. Between lies the level of molecular biology, where mechanical models are adequate and mind appears to be irrelevant. But I, as a physicist, cannot help suspecting that there is a logical connection between the two ways in which mind appears in my universe. I cannot help thinking that our awareness of our own brains has something to do with the process which we call "observation" in atomic physics.
>
> That is to say, I think our consciousness is not just a passive epiphenomenon carried along by the chemical events in our brains, but is an active agent forcing the molecular complexes to make choices between one quantum state and another. In other words, *mind is already inherent in every electron*, and the processes of human consciousness differ only in degree but not in kind from the processes of choice between quantum states which we call 'chance' when they are made by electrons."

In 2014, in a debate (Q) between Deepak Chopra and Richard Dawkins, Chopra asserted, per above citation, supposedly, the statements that Dyson says that "atoms have sentience" and also that "atoms have awareness". (Q)

Entropy of beings

In human thermodynamics, Dyson also postulates that intelligent beings generate a fixed entropy ΔS per thought. [2] In his 1999 book *Origins of Life*, Dyson supposedly argues that the complexity of a living organism is proportional to the

negative of its entropy and also computes the entropy of a human being. [3]

Purpose?

In 1971, Dyson, in his article “Energy in the Universe”, introduced a term called "quality" that incorporates a energy-entropy type description of different forms of energy, such as light.

English physical chemist Peter Atkins cites Dyson's 1971 article significantly to explain how things degrade in the movement of the universe in terms of the second law and weak and strong interactions, as a basis to argue for the purposeless of human existence. Atkins summarized things such that a high-quality (low-entropy) form of energy as contrasted with heat, which Atkins summarizes as a low-quality (high-entropy) form of energy, or something along these lines, and uses this model to conclude that "life lives off quality", which is short to mean that life can only emerge on a planet surrounding a star (light) and not from the heat of the planet alone. [4]

In 1992, Dyson, in interview with Wim Kayzer, stated the following view on purpose: [5]

> “The tree of life becomes more diverse as it evolves… Whether [evolution] has a purpose or not… I wouldn’t be dogmatic. We certainly don’t understand whatever purpose it may have, but to deny the existence of a purpose seems to me as foolish as to believe that it has to have a purpose. I would say, we’ll wait and see. Maybe it does have a purpose. Maybe we’ll create a purpose. I think it’s foolish to preach about questions like that.”

(add)

Religion

Dyson considers himself a Christian and is dual-sided scientific thinker, supposedly against reductionism, and considering “science and religion two windows that people look through, trying to understand the big universe outside, trying to understand why we are here.”

Education

Dyson completed his BA in mathematics at the University of Cambridge in 1945 and later became a professor of physics at Cornell University from 1951 to 1953, although never completing a PhD. Dyson then a professor of physics at Princeton from 1953 to 1994, after which he became a professor emeritus.

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(b) Kayzer, Wim. (1997). *A Glorious Accident: Understanding Our Place in the Cosmic Puzzle*. W.H. Freeman & Co.
(c) Popova, Maria. (2016). “Legendary Physicist Freeman Dyson on God, Unanswerable Questions, and Why Diversity Is the Ruling Law of the Universe” (Q), Brain Pickings, Mar 07.

External links

- Freeman Dyson – Wikipedia.
- Freeman Dyson (about) –Sns.Ias.edu.

θΔics

In genius epochs, **French genius** refers to []

Overview

In 1592, when the complete works of Michel Montaigne became available, particularly his "Essays", this became an early anchor-point for the growth of later French geniuses.

In 1729, when three copies of Jean Meslier's *The Testament* were found under his bed, these worked to grow French philosophical atheism, inspiring, those including: Baron d'Holbach, Denis Diderot, and Voltaire (Ñº).

In 1794, when the Ecole Polytechnique was founded, this became a hotbed for French scientific genius and engineering.

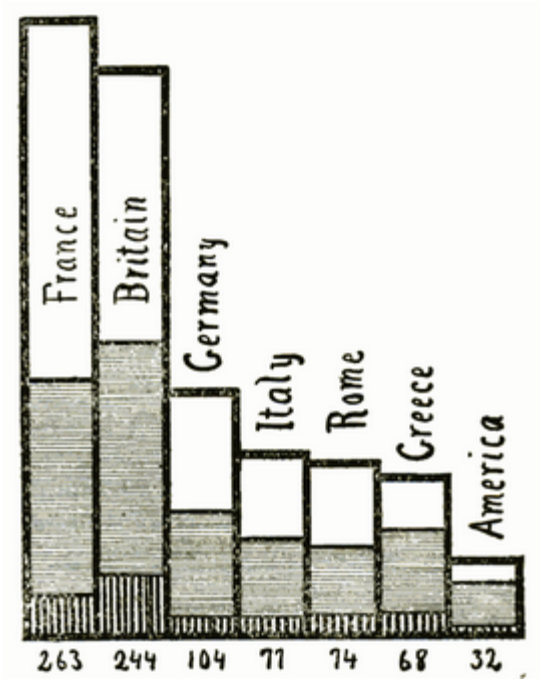

A comparative distribution of numbers of **French geniuses** from James Cattell's 1894 Cattell 1000 rankings. [2]

Quotes

The following are related quotes:

> "Montaigne was the **first Frenchman** who dared to think."
>
> — Julien la Mettrie (1751), "Anti-Seneca" (pg. 129)

> "The result was that between 1790 and 1825, **France** produced the **brightest galaxy of scientific genius** that the world has witnessed to day."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pgs. 119-20) [1]

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θΔics

In hmolscience, **Freud-Schiller drive theory** refers to the Austrian physical psychologist Sigmund Freud's 1910 drive theory, or "theory of drives" (or instinctual drives), an ego-based sex drive and death drive, as based on the "foothold" of German poet philosopher Friedrich Schiller's famous 1795 aphorism about the forces of love and hunger being behind the fundamental "drives" (or driving force) of human nature, itself possibly related to Johann Blumenbach's 1781 "formational drive theory" (see: bildungstrieb); both Schiller and Blumenbach both influencing Goethe and his affinity-based chemical forces theory of reactions and drives, the latter of whom influenced Freud significantly.

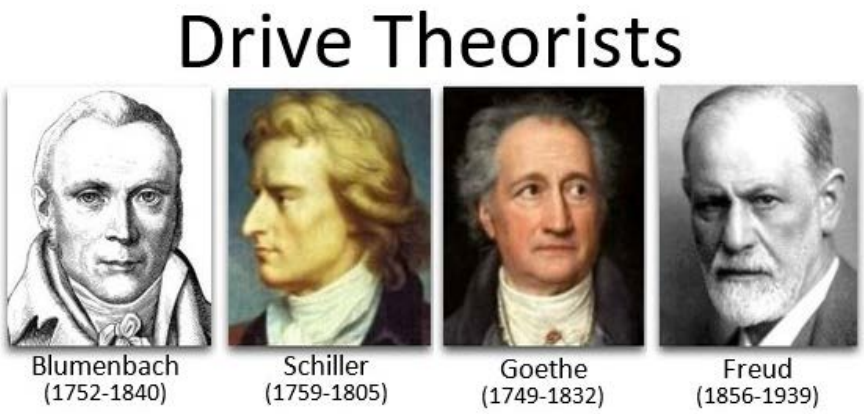

The four main thinkers behind the formative drive theory of morphological change and development: Blumenbach, Schiller, Goethe, and Freud.

Blumenbach | Formative drive

In 1781, German physician Johann Blumenbach published his *On the Formative Drive of the Generation Process*, wherein he posited the existence of a "bildungstrieb" or "formational drive" in human development, a term that united growth, maintenance, healing, regeneration, and reproduction as variations of the single goal of maintaining form. [1] A representative exert of this position is: [2]

> "In all living creatures from the human to the maggot and from the cedar up to the seed there lies a particular, inborn, effective drive active throughout life, first in order to attain their specific form, then to maintain it, and if it is destroyed, to restore it where possible."

American German studies professor Karl Fink, to note, is of the view that Blumenbach's formative drive theory, is a "recasting" of Johann Herder' term "Volkgeist" used to unite mind-body-spirit in his theory of culture; and that somehow the mixture of these two terms, combined with the Latin-Greek "energia" is the etymological root of the physics term eigenenergie; though this last part may be pure speculation. [3]

Schiller | Love and hunger

In circa 1790s, German poet-philosopher Friedrich Schiller began to develop a drive theory, which or may not have connection to Blumenbach, in which argued something along the lines of the following: [4]

> "The animal drives [*Triebe*] awaken and develop the spiritual drives"; he opposed the material drive (*Stofftrieb*) to the form drive (*Formtrieb*). The *Spieltrieb* (play-drive)—which expresses play, the beautiful, freedom, and the total man—is posited as an ideal nexus between the two *Triebe*. It is also the force that drives creation: "It is union of the unconscious and reflection that makes the poetic artist."

(add discussion)

In 1795, Schiller penned his poem "The World Ways", shown in the original German and English-to-German translate below:

The World Ways
(Die Weltweisen)

German	English
Der Satz, durch welchen alles Ding Bestand und Form empfangen, Der Nagel, woran Zeus den Ring Der Welt, die sonst in Scherben ging, Vorsichtig aufgehangen, Den nenn' ich einen großen Geist, Der mir ergründet, wie er heißt, Wenn *ich* ihm nicht drauf helfe – Er heißt: Zehn ist nicht Zwölfe. Der Schnee macht kalt, das Feuer brennt, Der Mensch geht auf zwei Füßen, Die Sonne scheint am Firmament, Das kann, wer auch nicht Logik kennt, Durch seine Sinne wissen. Doch wer Metaphysik studiert, Der weiß, daß, wer verbrennt, nicht friert,	The rate by which all things Receive inventory and shape, The nail what the Zeus ring The world went to pieces otherwise, Carefully hung, To what I call a great spirit, The fathomed me how he is, When *I told* him it does not help - He says: Ten is not twelve. The snow makes cold, the fire burns, The man walks on two feet, The sun is shining in the firmament, This can, who knows neither logic Know through his senses. But who studied metaphysics, He knows that he who burns not freeze, Knows that the Wet moistens

In 1823, French engineer Sadi Carnot, famously stated that the "fall of caloric", from the hot body (boiler) to the cold body (condenser), through the working substance in the operation of the steam engine, is comparable, in principle, to the "fall of water", from the higher location, through the rotary mechanism of the water mill, to the lower location, in the machines operated by falling water, in the

Weiß, daß das Nasse feuchtet
Und daß das Helle leuchtet.
Homerus singt sein Hochgedicht,
Der Held besteht Gefahren;
Der brave Mann thut seine Pflicht
Und that sie, ich verhehl' es nicht,
Eh noch Weltweise waren.
Doch hat Genie und Herz vollbracht,
Was *Lock'* und *Des Cartes* nie gedacht,
Sogleich wird auch von diesen
Die Möglichkeit bewiesen.
Im Leben gilt der Stärke Recht,
Dem Schwachen trotzt der Kühne,
Wer nicht gebieten kann, ist Knecht;
Sonst geht es ganz erträglich schlecht
Auf dieser Erdenbühne.
Doch wie es wäre, fing' der Plan
Der Welt nur erst von vornen an,

Ist in Moralsystemen
Ausführlich zu vernehmen.
»Der Mensch bedarf des Menschen sehr
Zu seinem großen Ziele;
Nur in dem Ganzen wirket er,
Viel Tropfen geben erst das Meer,

Viel Wasser treibt die Mühle.
Drum flieht der wilden Wölfe Stand
Und knüpft des Staates dauernd Band.«
So lehren vom Katheder
Herr Puffendorf und Feder.
Doch weil, was ein Professor spricht,
Nicht gleich zu Allen dringet,
So übt *Natur* die Mutterpflicht
Und sorgt, daß nie die Kette bricht
Und daß der Reif nie springet.
Einstweilen, bis den Bau der Welt
Philosophie zusammenhält,
Erhält *sie* das Getriebe
Durch Hunger und durch Liebe.

And that the bright lights.
Homer sings his wedding poem,
The hero is danger;
A good man does his duty
And she did, I do not conceal,
Eh were world way.

But genius and heart has accomplished,
What *Lock 'and Des Cartes* never thought
Immediately is also of this
The opportunity proved.
In life, the strength is right
The weak defies the Bold
If you can not command, is servant;
Otherwise it's quite tolerable bad
On this earth stage.
But what it would be caught 'the plan
The world first only by vornen to,

In moral systems
Detail to be heard.
"Man needs of the people very
To his great aims;
Only in the whole he worketh,
Many drops to give only the sea,

Plenty of water drives the mill.
Drum escapes of wild wolves as
Ties and the state band permanently. "
To teach from the lectern
Mr. Puffendorf and spring.
But because of what a professor says,
Penetrateth not equal to all,
Mother *Nature* exerts the required
And ensures that the chain never breaks
And that the frost never Springet.
The **construction of the world**
Philosophy holds,
Receives its transmission
By hunger and by love.

production of motive power.

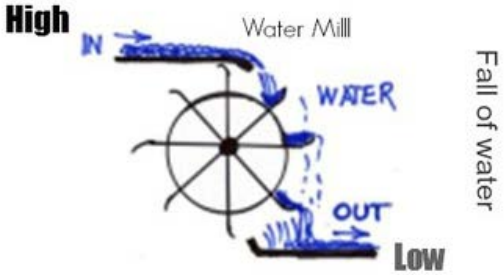

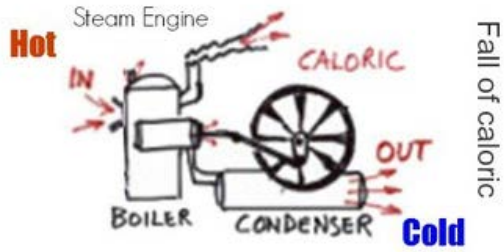

A water mill driven by waterpower, according to which the fall of the water "drives" the mechanical operation of the mill, which is to grind grain.

In 1930, Sigmund Freud that he got his free energy/bound energy libido "drive theory", in start, from Schiller's "The World Ways" poem, which Freud encapsulates as: "hunger and love are what move the world"

In 1920, Schiller's poem, it seems (check), was paraphrased by Russian writer Yevgeny Zamyatin, as follows:

> "Love and hunger rule the world. Ergo, to rule the world, one must master love and hunger."
>
> — Yevgeny Zamyatin (1920), *We*

The popular modern truncated versions, deriving from it seems the Zamyatin truncation, is:

> "Love and hunger rule the world."
>
> — Friedrich Schiller (1795), "The Philosophers" (Die Welteisen) (Ñº); StatusMind.com (Ñº)

Goethe | Schiller | Blumenbach

In the period 1798 to 1801, Goethe's entered into his historiography of science, which began with a brief but rich exchange of letters with his intellectual friend German author Friedrich Schiller (1759-1805) and ended with an equally brief and stimulating contact with the Gottingen school of history (university professors); in Schiller, according to Karl Fink (2009), he found an irreplaceable friend, whose "reflective power" quickly focused his project; and in the Gottingen school "nowhere was I advanced so quickly as in Gottingen where I was with great generosity and active support permitted use of the invaluable collection of books". The exchange is said to have begun with his 13 Jan 1798 letter to Schiller, wherein he comments that he had been studying "various writings in physics", learning how Newton turned optics into a geometry, how mechanists turned light into particles, how chemists attributed everything to 'caloric' (warmestoff), along with new theories on oxygen. [6]

Schiller aside, Goethe also seems to have been keenly aware of Blumenbach's formative drive theory.

American comparative literature scholar Stefani Engelstein, for example, argues rather effectively that parts of Goethe's physical chemistry based *Elective Affinities*, such as his grafting of shoots (P#:C#), are derived, in part, from the bildungstrieb concept. [3]

Freud | Sex drive

In 1910, Austrian psychologist Sigmund Freud began to employ Schiller's poem to help him get a "foothold" on distinguishing the sexual instincts from the ego instincts, as he stated in retrospect in his 1930 *Civilization and its Discontents*, wherein he quotes Schiller as follows (1961 James Strachey translation):

> "Hunger and love are what moves the world."
>
> — Friedrich Schiller (1795), quoted by Sigmund Freud, in *Civilization and its Discontents* (1930) (Ñº), as basis if his drive theory (Ñº)

Somehow, all this connects together with is earlier 1895 *Project for Scientific Psychology*, and his utilizations of free energy and bound energy; thought the details of this connection remain to be worked out.

In any event, in sum, Freud claims that he derived his general theory of drives: sex drive (libido energy), death drive (analysis energy), and his steam engine "id, ego, superego" model of the human mind, the basis of the "theory of instincts" of psychoanalysis, from Schiller; thought Freud also states that the reason he went to medical school was because of a poem he read of Goethe; and Schiller was Goethe's closest intellectual friend; hence, further details of origins of Freud's general drive theory remain to be mapped out.

Chemical thermodynamics

The details of how the so-called Schiller-Freud drive theory connects up into and through modern human chemical thermodynamics remains, in terms of Gibbs free energy differentials:

> "The quantity '–ΔG' [is] the driving force of a [human chemical] reaction."
>
> — Gilbert Lewis (1923)

remains a project to be worked out.

Also, connected to this, there is Mexican-born American triple-valedictorian chemist Vicente Talanquer's 2013 so-called chemical teleology debunking opinion that, in respect to how the Le Chatelier's principle, in modern college chemistry textbooks, is often, supposedly, described by authors using "teleological" like statements, that:

> "The same type of thinking can be applied to the chemical processes in equilibrium. For example, when pressure is applied on a reacting system in chemical equilibrium, the system does not shift towards reactants or products "so that" or "in order to" counterbalance the effect of the change. What happens is that the change in pressure affects the probability of the forward and backward chemical processes going on in the system. The change in pressure affects the probability of collisions for the backward and forward processes in different ways. As a result, the likelihood of one process becomes higher than the other. There is NO DRIVE to attain a new equilibrium state. There is only particles randomly moving and interacting, involved in competing processes with different probabilities."

This will have to be studied.

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θΔics

In atheism types, **Freudian atheism** [HD:44] is the brand of atheism of Austrian psychologist Sigmund Freud; the roots of which are diagrammatically shown on the atheism genealogy page.

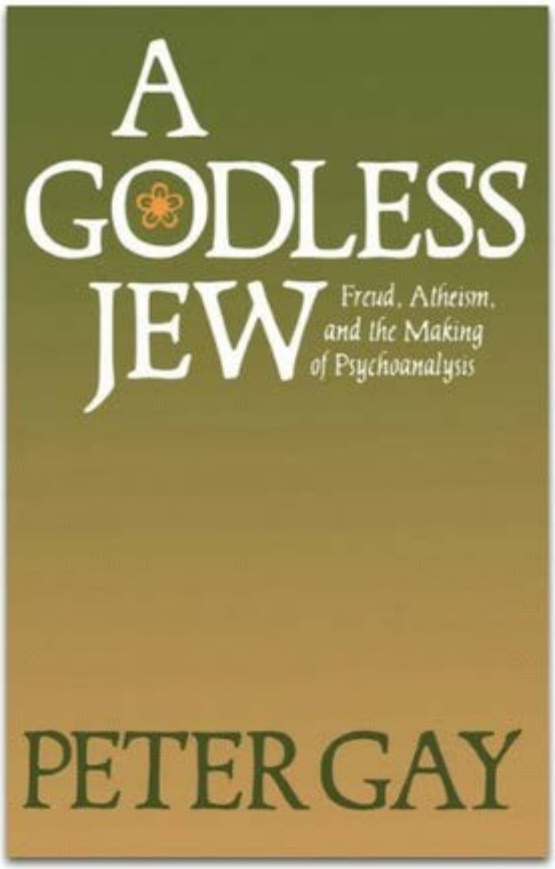

Peter Gay's 1989 *A Godless Jew*, delves into Sigmund Freud's atheism (aka **Freudian atheism**), his Jewish cultural identity, and their role in the development of psychoanalysis. [4]

Overview

In 1895, Austrian psychologist Sigmund Freud penned his draft outline "A Project for Scientific Psychology", wherein he sought to supplant mental psychological world with the chemical thermodynamic logic of free energy and bound energy; an atheism implicit method of logic.

Freud's main atheism-espousing works, according to general opinion, are: *The Future of an Illusion* (1927), *Civilization and Its Discontents* (1930), and *Moses and Monotheism* (1939). [1] Freud, in his *Moses and Monotheism*, asserted that Moses was but either Akhenaten, and that psychoanalytic research leads to the result that reduces religion to but a neurosis; specifically:

> "Religion is a neurosis of mankind. Its grandiose powers [are but the result of] a neurotic obsession in individuals."
>
> — Sigmund Freud (1939), *Moses and Monotheism* (pg. 68)

In 1966, French philosopher Paul Ricoeur, in his "The Atheism of Freudian Psychoanalysis", amid writing on the general topic "is god dead?", recognized Freud as one of the outstanding atheists of modern culture. [1]

Types | Other

The following is a listing of other atheism types:

- Epicurean atheism
- Feuerbachian atheism
- Goethean atheism
- Lenin atheism
- Marxian atheism
- Nietzschean atheism
- Schopenhauerian atheism
- Thimsian atheism

Quotes

The following are related quotes:

> "Freud's originality—the originality of Freudian atheism—is that his atheism is not just another instance of philosophical empiricism or scientific positivism, but of an interpretation of personal experience. In this fashion, Freudian thought comes to be classed along with the thought of Feuerbach, Marx, and Nietzsche."
>
> — Bernard Lonergan (1973), "Sacralization and Secularization" [2]

> "The grandfather of Marxian atheism and **Freudian atheism** is Ludwig Feuerbach, who was first a

theologian, then a Hegelian, and finally an atheistic philosopher."

— Hans Kung (1990), *Freud and the Problem of God* [3]

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θΔics

In physics, **friction** (TR:119) is the force that resists the motion of one surface relative to another with which it is in contact. [1]

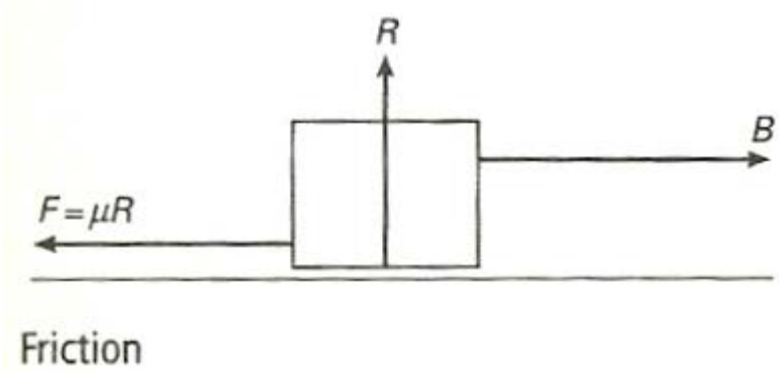

A diagram of **friction** showing force normal R or "contact force", a horizontal force B, being applied to the body with the intention of moving it, and a resisting force F that arises to resist the intended motion. [1]

Overview

In the 18th century, ideas about what "friction" was, i.e. it's method of operation to produce heat or fire, tended to concern various "matter theories of heat", i.e. that the rubbing worked to release heat particles, e.g. phlogiston, terra pinguis, or caloric.

In 1798, Benjamin Thompson performed his famous "cannon boring experiment", the results of which published in his "An Inquiry Concerning the Source of Heat which is Excited by Friction", wherein he showed that the caloric theory of heat was faulty, and that friction was something that increased the motion of the particles of the bodies being rubbed, not something that released "caloric" particles. This eventually led to the kinetic theory or kinetic theory of heat.

See also

â— Social friction

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External links

â— Friction – Wikipedia.

θΔics

In animate thermodynamics, **Friedrich Cramer** (1923-2003) (DN:1) was a German chemist, philosopher, and geneticist noted for his 1993 cosmology and philosophy conference proceedings chapter "The Entropic Versus the Anthropic Principle: on the Self-Organization of Life", wherein he outright says frankly that the notion of "self-organization" lets the metaphysical into physics (see: ontic openings) and hence justifies the notion of creation by God, as he sees things (and believes in), and discusses how he thinks "dead matter" equates to equilibrium. [1]

Religion

Cramer seems to be attempting to sell god via an ontic opening of his theory of "evolution field", a new description of matter, and self-organization; the following being one example statement, the term "creative potential" being code for god:

> "Self-organization is a rather abbreviated expression for a basic property of matter: self-organization in the evolution field. Self-organization is not a mere 'accident' of matter. It is inseparable from matter and is an attribute of the material substance. Self-organization is the creative potential of evolving matter. Every piece of matter has this capacity depending on its energy level in a dissipative structure."

Cramer ends off this discussion by concluding on Genesis defined in the Bible; and stated "with my new broader concept of matter, god can exist in the concepts of science."

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Further reading

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External links

â— Friedrich Cramer (German → English) – Wikipedia.

θΔics

In existographies, **Friedrich Engels** (1820-1895) (IQ:#|#) [RGM:944|1,500+] (Gottlieb 1000:415) (FA:104) (CR:51) was a German social scientist, oft-cited in economic thermodynamics, noted for for being an early commenter on the implications of the newly developing field of thermodynamics on economies viewed as physical systems theorized in the field of political economics.

Social | Phase transitions

In 1878, Engels, in his *Anti-Duhring*, a work in opposition to the ideas of German philosopher Eugen Durhing (1833-1921), invoked water metaphors when he likened the revolutionary transformation of a society (see: social phase) to the qualitative phase transformation of ice into water and water into steam. [13]

Marx | Historical materialism | Scientific socialism | Dialectical materialism

In 1841, German thinker Karl Marx finished his dissertation entitled "Difference Between the Democritean and Epicurean Philosophy of Nature," from which his conception of historical materialism, and its near synonym description "scientific socialism", coined by Engels, supposedly, arose based on research on the materialism philosophy of Epicurus, as well as his reading of Adam Smith, and other writers in classical political economy. [4]

In 1859, Engels used the phrase "materialistic conception of history", supposedly, in reference to the Marxist perspective. [10] Later, in 1892, Engels coined the term "historical materialism" as an equivalent for what he had previously referred to as the "materialistic conception of history." [11]

The term "dialectical materialism", an extension in some way of historical materialism, e.g. to include the laws of thought, or something along these lines, was used in 1891 by Russian political theorists Georgi Plekhanov and in 1894 by Vladimir Lenin to describe Marx's philosophy. [12]

Second law

Engels, supposedly, first became aware of Rudolf Clausius' formulation of entropy, or of at least William Thomson's 1862 heat death version of the second law, in 1869 as stated in a March 21st letter to Karl Marx: [8]

> "In Germany the conversion of the natural forces, for instance, heat into mechanical energy, etc., has given rise to a very absurd theory—that the world is becoming steadily colder … and that, in the end, a moment will come when all life will be impossible. I am simply waiting for the moment when the clerics seize upon this theory."

In his 1882 *Dialectics of Nature*, according to Jacques Monod, Engels, supposedly, was led to deny the second law. [9]

In an 1888 letter to Russian economist Nikolai Danielson, Engels expressed the view that: [1]

> "The nineteenth century is the century of Darwin, of Mayer, Joule, and Clausius, of evolution and the transformation of energy."

(add)

Podolinsky

In 1880, Ukrainian social-physicist Sergei Podolinsky wrote to Engels about an interest in the implications of thermodynamics for human economics. [16] In an article published in 1881, for instance, Podolinsky strove to reconcile

the work-based theory of value with energy accounting by integrating economic cycles with natural cycles, amid the skepticism of Engels who deemed it: [4]

> "It is totally impossible to try to express economic relationships in physical terms."

Engels discussed Podolinsky's views on economics and thermodynamics with German political economist Karl Marx who both, supposedly, took great importance to the first law, but were either scantly receptive or hostile to the second law. In fact, when Engels was first confronted with Podolinsky's efforts to reconcile Marxism with thermodynamics, Engels was "uninterested", and choose to ignore the problem. [5] Later, however, Engels told Marx in a letter of 1882 that: "What Podolinsky has completely forgotten is that the working man is not only a fixer of present solar energy, but more than that, a squanderer of past solar heat. The degree wastage of energy reserves, coal, minerals, forests, etc., you know only too well, more than I do." [6]

Podolinsky communicated his opinions to Engels, on several occasions, that the socialist model was flawed because it assumed that scientific socialism would overcome all natural resource scarcities and enable unlimited material expansion. Podolinsky's biophysical analysis led him to conclude that ultimate limits to economic growth lay not in the shackles of the relations of production, but in physical and ecological laws. [7]

Marx and Engels

In 1848, Engels together with Karl Marx produced *The Communist Manifesto*, the founding treatise on communism, a socialist theory posited to end capitalism and the systems which they perceived to be responsible for the exploitation of workers. After the death of Marx (1883), Engels edited the draft versions of the second and third volumes of Marx's *Capital*, published in 1885 and 1894, respectively (volume one published by Marx in 1867).

Karl Marx and **Friedrich Engels**; life-long collaborators on theories of political economy.

As of 2008, there seems to be the general consensus that both Engels and Marx rejected the second law of thermodynamics; although via textual analysis, as argued by John Foster and Paul Burkett, it seems, Engels criticized not the second law, but rather the extrapolation of this to the heat death theory of the universe. [2]

Quotes | By

The following are quotes by Engels:

> "One day we shall certainly 'reduce' thought experimentally to molecular and chemical motions in the brain."
>
> — Friedrich Engels (1882), *Dialectics of Nature* [3]

> "If ever anybody dedicated his whole life to the 'enthusiasm for truth and justice', using this phrase in a good sense, it was Diderot."
>
> — Friedrich Engels (c.1880) (Ñº)

> "The desire to re-import the thermodynamical category of 'work' back into economics would result in nothing but nonsense."

— Friedrich Engels (1883), *The Dialectics of Nature* [15]

> "The whole of nature accessible to us forms a system, an interconnected totality of bodies ... In the fact that these bodies are interconnected is already included that they react on one another, and it is precisely this mutual reaction that constitutes motion."

— Friedrich Engels (1886), *Publication* (pg. 71) [14]

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External links

â— Friedrich Engels – Wikipedia.

θΔics

In human chemistry, **Friedrich Gundolf** (1880-1931) was a German literature scholar noted for []

Overview

In 1916, Gundolf, in his *Goethe*—his most famous work—devotes a 27-page chapter section to an analysis of German polymath Johann Goethe's physical chemistry based 1809 novella *Elective Affinities*, commenting, among other things, that: [1]

> "Goethe, in *Elective Affinities*, brooded over the juridical procedures of god."

(add discussion)

References

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External links

● Friedrich Gundolf (German → English) – Wikipedia.
● Friedrich Gundolf – Wikipedia.

θΔics

In existographies, **Friedrich Lange** (1828-1875) (CR:23), or "Frederick Lange" (Thomas, 1877), was a German philosopher, characterized as neo-Kantian and against but sympathetic to materialism (Russell, 1925), and sociologist noted for his 1865 *The History of Materialism and Critique of its Present Importance*, which was expanded into a two-volume second edition (1875), and translated into English as a three-volume set (1881), a work influential to John Tyndall and Friedrich Nietzsche, among others, wherein he recounts the history of materialism from Democritus and his atomic theory through Francis Bacon into Ludwig Buchner and his extreme materialism. [1]

Marx

German sociopolitical economic theorist Karl Marx, supposedly, gave a critique of Lange's book that was more vehement than his critique of Buchner's lectures. [2]

Quotes | Employed

The following are quotes employed by Lange:

> "I am a body, and I think."
>
> — Voltaire (c.1770), *Publication*; cited by Fredrich Lange (1873) in *History of Materialism, Volume One* (pg. 13)

Quotes | On

The following are quotes on Lange:

> "In the 1860s the critical philosophy was rehabilitated chiefly as the handmaiden of the rapidly expanding natural sciences. Its task was to justify the logic of scientific discourse, and to curb the pretensions of metaphysics, whether they were the extravagancies of Schelling's and Hegel's *Natural Philosophy* or the crudities of Buchner's and Moleschott's materialism. Hermann Helmholtz, Eduard Zeller and **Friedrich Lange**—the first generation of neo-Kantians—saw the critical philosophy as little more than an epistemology of the natural sciences, and their interest in it scarcely extended beyond the first *Kritik* (criticism)."
>
> — Frederick Beiser (2011), *The German Historicist Tradition* (pg. 377)

Quotes | By

The following are quotes on Lange:

> "With few great men of antiquity can history have dealt so despitefully as with [Democritus] **Demokritos**. In the distorted picture of unscientific tradition, almost nothing appears of him except the name of the " laughing philosopher," while figures of incomparably less importance extend themselves at full length. So much the more must we admire the tact with which Bacon, ordinarily no great hero in historical learning, chose exactly Demokritos out of all the philosophers of antiquity, and awarded him the premium for true investigation, whilst he considers Aristotle, the philosophical idol of the Middle Ages, only as the originator of an injurious appearance of knowledge, falsely so called, and of an empty philosophy of words."
>
> — Friedrich Lange (1873), *History of Materialism, Volume One* (pg. 14)

> "History has but too frequently shown that if the educated men begin to laugh at the gods, or to resolve their

existence into philosophical abstractions, immediately the half-educated masses, becoming unsteady and unquiet, seize upon every folly in order to exalt it into a religion."

— Friedrich Lange (1875), *The History of Materialism, Volume One* (pg. 50)

"Materialism gave the preference to mathematical and physical investigations - that is, those departments in which the human mind is first able to secure results of permanent value."

— Friedrich Lange (1877), *The History of Materialism, Volume One* (pg. 53)

"Democritus also mastered the whole extent of the science of his time, and that probably with greater independence and thoroughness than was the case with Aristotle; but we have no trace whatever of his having brought all these sciences under the yoke of his system.."

— Friedrich Lange (1875), *The History of Materialism, Volume One* (pg. 82)

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2. Ball, Terence. (1994). *Reappraising Political Theory: Revisionist Studies in the History of Political Thought* (pgs. #). Oxford University Press.

Further reading

â— Lange, Fredrich. (1873). *This History of Materialism: and Criticism of its Present Importance, Volumes 1-3* (translator: Ernest Chester; Introduction: Bertrand Russell). K. Paul, Trench, Trubner & Company, 1925.

External links

â— Friedrich Albert Lange – Wikipedia.
â— History of Materialism and Critique of its Present Importance – Wikipedia.

θΔics

In hmolscience, **Friedrich List** (1789-1846) was a German-born American economist noted for his 1841 economic model—similar in theme to Hermann Gossen (1853)—according to which "force" was the central concept in his model of the economy; his ideas, supposedly, were influential to Henry Carey. [1] List, supposedly, had some type of economic social gravitation theory (Q) arguing that group actions could be studied in terms of their distance from each other, their mass, and their consequent attraction or repulsion.

Quotes

The following are representative quotes:

> "The more a person learns how to use the forces of nature for his own purposes, by means of perfecting the sciences and the invention and improvement of machines, the more he will produce."
>
> — Friedrich List (c.1841) (Q)

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External links

- Friedrich List – Wikipedia.

θΔics

In existographies, **Friedrich Nietzsche** (1844-1900 ACM) (IQ:190|#29) [RGM:30|1,500+] (Murray 4000:15|WP) (Perry 80:7|Li) [HD:44] (FA:138) (GAE:2) [RGA:21|370+] (GPhE:#) [CR:320] was a Polish-ethnicity German-born atheist asoulist philosopher, third generation student of Goethe, via Schopenhauer, noted for his 1882 "god is dead"; his unfinished magnum opus *The Will to Power*, wherein he grapples, via 1,067 fragments, or numbered "apothegms", as Henry Mencken (1920) calls them, with the "god void" replacement issue, i.e. what is to replace god or belief in the existence of god in the wake of his absence, via modern physical science based reformulated outlines of new classical philosophy. [1]

Justice

In 1883, Nietzsche, supposedly, arrived at his model of the essence of what is "just" following a reading of Georg Schneider's *The Animal Will* (188); this is summarized by Martin Heidegger (1943) as follows: [20]

> "The essence of what is 'just', assigned this essence of justice, is determined by Nietzsche unequivocally in the following note from the summer of 1883, made on the occasion of his reading of a new book by Schneider, *Der thierische Wille* (*Animal Will*): 'What is just = the will, to perpetuate an actual power relation'."

Schneider argued, supposedly, that "actions arise out of the drives which come into play when the idea of pleasure to be gained arouses them", in an evolutionary psychology theme, akin to Helvetius. Nietzsche commented (Ñº) on this: "But the drive *itself* is what first produces this idea—I say."

Schopenhauer | Education

In the years 1865 to 1868, Nietzsche encountered the works of Arthur Schopenhauer, thereafter becoming his vicarious intellectual mentor. In 1876, in "Schopenhauer as Educator", of his *Untimely Meditations*, Nietzsche had the following to say about his first encounter with Schopenhauer: [13]

> "If I am to describe what an event my first glance at Schopenhauer's writings was for me, I must dwell for a moment on an idea which used to come to me in my youth more pressingly, and more frequently, than perhaps any other. When in those days I roved as I pleased through wishes of all kinds, I always believed that sometime fate would take from me the terrible effort and duty of educating myself: I believed that, when the time came, I would discover a philosopher to educate me, a true philosopher whom one could follow without any misgiving because one would have more faith in him than one had in oneself ... Schopenhauer produced upon me, that magical outpouring of the inner strength of one natural creature on to another that follows the first and most fleeting encounter; and when I subsequently analyze that impression I discover it to be compounded of three elements, the elements of his honesty, his cheerfulness and his steadfastness. **He is honest because he speaks and writes to himself and for himself**, cheerful because he has conquered the hardest task by thinking, and steadfast because he has to be."

Or, as some recent chronologies have summarized things, in 1865, Nietzsche abandoned the study of theology, lost his Christian faith, and began to read Schopenhauer. [21]

Chemistry | Feelings

In 1878, Nietzsche, in his *Human, All Too Human*, a book dedicated to Voltaire, opened to aphorism #1: "Chemistry and the Notion of the Feelings", of 144 aphorisms (eventually expanded to 1,400 aphorisms), declared the following, using the Alexander Harvey (1908) translation, with translation alternatives: [15]

German	English

Chemie der Begriffe und Empfindungen
Die philosophischen Probleme nehmen jetzt wieder fast in allen Stücken dieselbe Form der Frage an, wie vor zweitausend Jahren: wie kann Etwas aus seinem Gegensatz entstehen, zum Beispiel Vernünftiges aus Vernunftlosem, **Empfindendes aus Todtem**, Logik aus Unlogik, interesseloses Anschauen aus begehrlichem Wollen, Leben für Andere aus Egoismus, Wahrheit aus Irrthümern? Die metaphysische Philosophie half sich bisher über diese Schwierigkeit hinweg, insofern sie die Entstehung des Einen aus dem Andern leugnete und für die höher gewertheten Dinge einen Wunder-Ursprung annahm, unmittelbar aus dem Kern und Wesen des „Dinges an sich“ heraus. Die historische Philosophie dagegen, welche gar nicht mehr getrennt von der Naturwissenschaft zu denken ist, die allerjüngste aller philosophischen Methoden, ermittelte in einzelnen Fällen (und vermuthlich wird diess in allen ihr Ergebniss sein), dass es keine Gegensätze sind, ausser in der gewohnten Übertreibung der populären oder metaphysischen Auffassung und dass ein Irrthum der Vernunft dieser Gegenüberstellung zu Grunde liegt:

nach ihrer Erklärung giebt es, streng gefasst, weder ein unegoistisches Handeln, noch ein völlig interesseloses Anschauen, es sind beides nur Sublimirungen, bei denen das Grundelement fast verflüchtigt erscheint und nur noch für die feinste Beobachtung sich als vorhanden erweist. — Alles, was wir brauchen und was erst bei der gegenwärtigen Höhe der einzelnen Wissenschaften uns gegeben werden kann, ist eine Chemie der moralischen, religiösen, ästhetischen Vorstellungen und Empfindungen, ebenso aller jener Regungen, welche wir im Gross- und Kleinverkehr der Cultur und Gesellschaft, ja in der Einsamkeit an uns erleben: wie, wenn diese Chemie mit dem Ergebniss abschlösse, dass auch auf diesem Gebiete die herrlichsten Farben aus niedrigen, ja verachteten Stoffen gewonnen sind? Werden Viele Lust haben, solchen Untersuchungen zu folgen? Die Menschheit liebt es, die Fragen über Herkunft und Anfänge sich aus dem Sinn zu schlagen: muss man nicht fast entmenscht sein, um den entgegengesetzten Hang in sich zu spüren? —

Chemistry and the Notion of the Feelings
Philosophical problems, in almost all their aspects, present themselves in the same interrogative formula now as they did two thousand years ago: how can a thing develop out of its antithesis, e.g. the reasonable from the non-reasonable, the "animate from the inanimate" ["sentient in the dead", Hollingdale (1986)], the logical from the illogical, altruism from egoism, disinterestedness from greed, truth from error? The metaphysical philosophy formerly steered itself clear of this difficulty to such extent as to repudiate the evolution of one thing from another and to assign a miraculous origin to what it deemed highest and best, due to the very nature and being of the "thing-in-itself." The historical philosophy, on the other hand, which can no longer be viewed apart from physical science, the youngest of all philosophical methods, discovered experimentally (and its results will probably always be the same) that there is no antithesis whatever, except in the usual exaggerations of popular or metaphysical comprehension, and that an error of the reason is at the bottom of such contradiction.

There is, strictly speaking, neither unselfish conduct, nor a wholly disinterested point of view. Both are simply sublimations in which the basic element seems almost evaporated and betrays its presence only to the keenest observation. **All that we need** and that could possibly be given us in the present state of development of the sciences, **is a chemistry of the ‘moral’, ‘religious’, ‘aesthetic’** conceptions and **‘feeling’**, as well as of those **‘emotions’** which we experience in the affairs, great and small, of society and civilization, and which we are sensible of even in solitude. But what if this chemistry established the fact that, even in its domain, the most magnificent results were attained with the basest and most despised ingredients? Would many feel disposed to continue such investigations? Mankind loves to put by the questions of its origin and beginning: must one not be almost inhuman in order to follow the opposite course?”

This is one of the earliest examples of a two cultures calls, specifically for the need for the science of: human chemistry, social chemistry, or physicochemical sociology, or some namesake variant thereof.

In 1888, Nietzsche, in one of his *Will to Power* fragments , expanded on the above, with the following discerning logic:

> “In the chemical world, the sharpest perception of the difference between forces reigns. With the organic world, imprecision and appearance begin.”
>
> — Friedrich Nietzsche (1888), *Will to Power*; cited by Gilles Deleuze (1983), commented on by John Protevi (2001) [16]

(add)

Goethe

Nietzsche, in his *The Anti-Christ* (§57), according to Walter Kaufmann (Ñº)(Ñº), borrowed the phase "courtesy of the heart" from Goethe's *Elective Affinities* (*Die Wahlverwandtschaften*), as follows:

> "There is a **courtesy of the heart**; it is related to love. It gives rise to the most comfortable of external behavior."
>
> — Johann Goethe (1809), *Elective Affinities* (*Die Wahlverwandtschaften*) (P2C5, pg. 201)

> "When the exceptional human being treats the mediocre more tenderly than himself and his peers, this is not mere **courtesy of the heart**—it is simply his duty"
>
> — Friedrich Nietzsche (1888), *The Anti-Christ* (§57)

Nietzsche, of note, seemed to believe that he was a better writer than Goethe; in letter to a friend, he wrote: [10]

> "I have brought German language to a state of perfection. After Luther and Goethe, a third step had to be taken."

He goes on, in the letter, to state that his shaping of the German language was "superior to his in strength and manliness, without becoming, as Luther did, loutish."

In 2015, Julian Young, in her "Nietzsche's Scientific Community: Elective Affinities" (Ñº), devoted much discussion to the influence of Goethe on Nietzsche.

Posthumous genius

> *See main: Posthumous genius*

Nietzsche, seemingly, was keen to his own genius and to the fact that he was well ahead of his time. The following, mentioned, in part, in a letter to Carl Fuchs, shortly before the composition of *Ecce Homo* (1888), is testament to this: (Ñº)

> "My time has not yet come, some people are born posthumously. I write for a species of men that do not yet exist."

Sudanese-born American philosopher Monydit Malieth, citing this quote, claims that somewhere Nietzsche prophesied that his words would not begin to be understood until after the year 2000. [10]

Education

In 1864, Nietzsche enrolled in the University of Bonn to study theology and classical philology. In 1865, he transferred to the University of Leipzig, to pursue a doctorate in philology. It was here, according to atheism historian Michael Palmer, that Nietzsche encountered the atheist philosophy of Arthur Schopenhauer. [9] In 1868, at the age of 24, he became a professor of at the University of Basil, remaining there for 10-years.

Convalescence | Hiatus period

See main: Genius hiatus effect

In 1870 to 1871, during the Prussian War, Nietzsche, while working as a hospital attendant, per resumption of his military service, contracted diphtheria and dysentery; in 1879, his health had deteriorated sufficiently so that resigned from his post at Basel, then aged 34, after which, from 1880 until his final collapse in 1889, he led a nomadic reaction existence (life), subsiding off his university pension, traveling around the spas of Europe, during which time he wrote the bulk of his work. [9]

Thermodynamics

Nietzsche advocated the conservation of force models, particularly of Friedrich Mohr and Robert Mayer, whose books he read in 1873 and 1881. [4]

Will to power

See also: Free will

In 1865, Nietzsche discovered the work of Arthur Schopenhauer and his emphasis on "will" and the concept of "will to live", and, the following year, through a reading of Friedrich Lange's 1865 *History of Materialism*, discovered the work of Roger Boscovich and his *Theory of Natural Philosophy*, and through these went on to develop a "centers of force" (see: atomic theory) theory of "will to power" as the embodiment of what Nietzsche believed was the main driving force in man. [2]

In American philosopher William Plank's 2002 book *The Quantum Nietzsche: the Will to Power and the Nature of Dissipative Systems*, he puts a modern-day reinterpretation of Nietzsche's 1883 theory of "will to power" in terms of the quantum theory, particularly the work of physicists Irish-born American John Bell and American-born Brit David Bohm, and thermodynamics, specifically using the Prigoginean dissipative structure logic. [5]

Atheism

In 1882, Nietzsche famously proclaimed that "god is dead", a pronouncement that can be said to mark the start of the modern atheism movement or popular disbelief in the existence of god.

Uberman

In 1883, Nietzsche postulated the notion of the "uberman" (1883), a person, according to Bertrand Russell, with an IQ of at least 180, who would eventually become the replacement model for the "idea of god" (theory of God); role models of whom, according to Nietzsche, are: Socrates (IQ=160), Caesar (IQ=170), Da Vinci (IQ=205), Michelangelo (IQ=180), Shakespeare (IQ=185), Goethe (IQ=230), and Napoleon (IQ=175), or a person who would become a synthesis of these eight intellectual giants (IQ_{avg}=186). [3]

Nihilism

Nietzsche devotes a considerable amount of effort to a critique and dissection of the concept or possibility of the rise of nihilism, possibly as outlined earlier by Fyodor Dostoyevsky, particularly within the framework of the decline of Christianity. [4] The following might be an example of Nietzsche's nihilism conception: [7]

A photo of some of the books in the personal library in the home of Nietzsche. (Ñº)

> "This spirit affirmatively takes into itself the most painful aspects of existence. For this spirit, suffering is not a means to a transcendent, holy existence, because being in this world is itself holy enough to justify a tremendous amount of suffering. He can smile in the face of the most terrible thought—meaningless, aimless existence recurring eternally."

(add)

Eternal recurrence

In 1886 to 1888, Nietzsche penned a number of fragmented notes on eternal recurrence. [6] The following are a few fragments:

> "The two most extreme modes of thought—the mechanistic and the Platonic—are reconciled in the *eternal recurrence*: both as ideals."
>
> — Friedrich Nietzsche (1887-1888), *Will to Power* (§1061)

> "The law of conservation of energy demands *eternal recurrence*."
>
> — Friedrich Nietzsche (1886-1887), *Will to Power* (§1063)

The gist of this, noting his citation of William Thomson and heat death (§1066), seems to be Nietzsche's effort to grapple with eschatology, i.e. whether the universe is cyclic or running down.

Ecce Homo

In 1888, Nietzsche published his *Ecce Homo: How One Becomes What One Is*, the Latin term *ecce homo* meaning "behold the man" — term famously employed (Ñº) in the Bible to unveil the bound and crowned (with thorns) Jesus Christ to the crowd before his crucifixion — wherein Nietzsche tells that the following comment by Stendhal is the best atheist joke: [11]

> "God's only excuse is that he does not exist."

Ecce Homo, to note, is the last original book written by Nietzsche before his final years of insanity, and in which he gives commentary on his own work. [12] Translator Walter Kaufmann declares it "one of the treasures of the world." [9]

Reaction end

On 3 Jan 1889, Nietzsche suffered a mental breakdown, after he witnessed the flogging of a horse at the opposite end of a piazza; he is reported to have run over to the horse and held it in his arm to protect it before he collapsed to the ground. He never recovered, dereacting (dying) the following year.

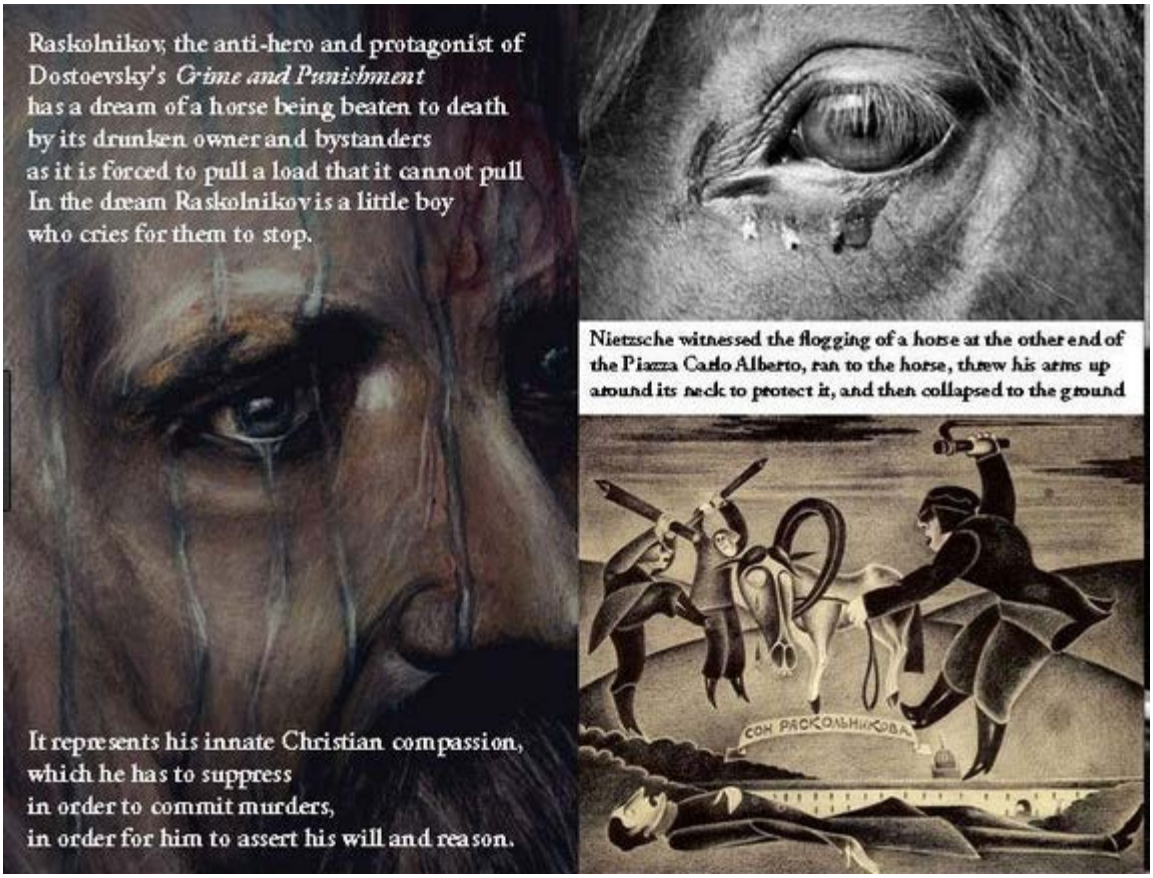

A 2006 Tweet (Ñº) of the Dostoyevsky-Nietzsche horse beating connection, a dream of Dostoyevsky as a child and the way Nietzsche met his reaction end, via mental breakdown.

Here, we note that Fyodor Dostoyevsky, the only "psychologist" about whom Nietzsche commented in 1887 that he had "anything to learn", in his *Crime and Punishment* (1866), has a compelling opening scene of the lead character Raskolnikov dreaming about "peasants beating a horse", which is said to be symbolic of at least five symbolic human maladies allegorized later in the book; such as: [17]

- â— The horse suggests the drunken young lady being stalked by the man.
- â— The man stands for the cruel peasants, mentioned a few pages earlier.
- â— The horse can represent the pawnbroker, who is beaten to death.
- â— The horse could also represent Raskolnikov's sister, who is controlled by Svidrigailov.
- â— The horse could stand for Raskolnikov's conscience, which has been beating down by his crime.

It is therefore possible, accordingly, as some have pointed out, e.g. as shown adjacent, that the underlying meaning of Dostoyevsky's horse beating symbolism, e.g. the difficultly of defining right from wrong and or describing uncaught punishment amid a nihilist framework, worked to trigger a irrecoverable break in Nietzsche's strained mind.

Collected works

See also: Power center

Nietzsche penned some 5,000+ pages in total on his thoughts and theories, estimated as to be 18-volumes (Ñº) to 50-volumes (Ñº) of collected works set; the magnum opus of which, slated as *Will to Power* (see: will to power), however, following his 1889 breakdown, never reached complete fruition, and was only published posthumously as found near-to-finished; a portion of his collected works, shown adjacent. (Ñº) A 30-volume complete works set in German was published in 1967. [8]

Quotes | On

The following are quotes on Nietzsche:

> "Most men, the herd, have never tasted solitude. They leave father and mother, but only to crawl to a wife and quietly succumb to new warmth and new ties. They are never alone, they never commune with themselves."
>
> — Hermann Hesse (1919), *Zarathustra's Return*

> "**Nietzsche's** real forefather was Heraclitus. It is in Heraclitus that one finds the germ of his primary view of the universe — a view, to wit, that sees it, not as moral phenomenon, but as mere aesthetic representation."
>
> — Henry Mencken (1920), "Introduction" to *Anti-Christ* (pg. 4)

> "**Nietzsche** is one of the first thinkers with a comprehensive philosophy to complete the break with religion."
>
> — Walter Kaufmann (1954), *The Portable Nietzsche* [19]

> "**Nietzsche** is the supreme philosopher when it comes to the topic of morality. His critique of religion is easily the most comprehensive attack on religiosity of all time; therefore making him the greatest atheist that has ever lived. Epicurus is the first great atheist in history; Schopenhauer is the first modern atheist; and Nietzsche is the greatest atheist of all time. Albert Camus called Nietzsche the 'most famous of God's assassins'."
>
> — Monydit Malieth (2013), *The Future Affects the Past* [10]

> "**Nietzsche**'s philosophy is an extension of Schopenhauer's philosophy."
>
> — Monydit Malieth (2013), *The Future Affects the Past* [10]

> "**Nietzsche**. You don't need anything other after this.ï»¿"

— Jan Andhisfiets (2015), post response (Ñº) to query "where to start with philosophy?" 52+ thumbs up, Jun

Quotes | By | Dated

The following are noted dated quotes by Nietzsche:

"If you wish to seek peace of mind and happiness, then believe. If you wish to be a disciple of truth, then investigate."

— Friedrich Nietzsche (1865), "Letter to Sister"; quoted in 2016 BBC "Modern Genius" documentary (Netflix)

"It sometimes seems to me I am looking at things and people like someone who is long dead—they move, terrify, and delight me, but I am quite distant from them."

— Friedrich Nietzsche (1881), "Postcard to Paul Ree", Jul 6 [14]

"*Historia abscondita*. — Every great human being exerts a retroactive force: for his sake all of history is placed in the balance again, and a thousand secrets of the past crawl out of their hiding places — into his sunshine. There is no way of telling what may yet become part of history. Perhaps the past remains essentially undiscovered! So many retroactive forces are still needed!"

— Friedrich Nietzsche (1882), *The Gay Science*; cited by Alex Kierkegaard (Ñº)(Ñº)(Ñº)

"Is man merely a mistake of god's? Or god merely a mistake of man's?"

— Frederick Nietzsche (1888), *Twilight of the Idols* (Ñº)(Ñº), Sep 3

"The Christian church has left nothing untouched by its depravity; it has turned every value into worthlessness, and every truth into a lie, and every integrity into baseness of soul."

— Friedrich Nietzsche (1888), *The Antichrist* [9]

"With gloomy caution I pass through whole millenniums of this madhouse of a world, call it 'Christianity', 'Christian faith' or the 'Christian church', as you will—I take care not to hold mankind responsible for its lunacies."

— Friedrich Nietzsche (1888), *The Anti-Christ* (§37)

"It is indecent to be a Christian today. *And here my disgust begins.* I look about me: not a word survives of what was once called 'truth'; we can no longer bear to hear a priest pronounce the word. Even a man who makes the most modest pretensions to integrity *must* know that a theologian, a priest, a pope of today not only errs when he speaks, but actually *lies*—and that he no longer escapes blame for his lie through 'innocence' or 'ignorance'."

— Friedrich Nietzsche (1888), *The Anti-Christ* (§37)

“In the world of ideas of the Christian there is nothing that so much as touches reality: on the contrary, one recognizes an instinctive *hatred* of reality as the motive power, the only motive power at the bottom of Christianity.”

— Friedrich Nietzsche (1888), *The Anti-Christ* (§39)

“Paul simply shifted the center of gravity of that whole life to a place *behind* this existence—in the *lie* of the “risen” Jesus. *What* was the only part of Christianity that Muhammed borrowed later on? Paul’s invention, his device for establishing priestly tyranny and organizing the mob: the belief in the immortality of the soul—*that is to say, the doctrine of “judgment”*.... That every man, because he has an “immortal soul,” is as good as every other man; that in an infinite universe of things the “salvation” of *every* individual may lay claim to eternal importance; that insignificant bigots and the three-fourths insane may assume that the laws of nature are constantly *suspended* in their behalf.”

— Friedrich Nietzsche (1888), *The Anti-Christ* (§42-43)

“Such a religion as Christianity, which does not touch reality at a single point and which goes to pieces the moment reality asserts its rights at any point, must be inevitably the deadly enemy of the “wisdom of this world,” which is to say, of *science*.”

— Friedrich Nietzsche (1888), *The Anti-Christ* (§47)

“The experience of all disciplined and profound minds teaches *the contrary*. Man has had to fight for every atom of the truth, and has had to pay for it almost everything that the heart, that human love, that human trust cling to. Greatness of soul is needed for this business: the service of truth is the hardest of all services.”

— Friedrich Nietzsche (1888), *The Anti-Christ* (§50)

“The fact that faith, under certain circumstances, may work for blessedness, but that this blessedness produced by an *idée fixe* by no means makes the idea itself true, and the fact that faith actually moves no mountains, but instead *raises them up* where there were none before: all this is made sufficiently clear by a walk through a *lunatic asylum*.”

— Friedrich Nietzsche (1888), *The Anti-Christ* (§51); quote is a Goethe paraphrase

“Faith means the will to avoid known what is true.”

— Friedrich Nietzsche (1888), *The Anti-Christ* (§52)

“Conviction as a means: one may achieve a good deal by means of a conviction. A grand passion makes use of and uses up convictions; it does not yield to them—it knows itself to be sovereign.”

— Friedrich Nietzsche (1888), *The Anti-Christ* (§54)

“A law-book never recites the utility, the grounds, the casuistical antecedents of a law: for if it did so it

would lose the imperative tone, the "thou shall," on which obedience is based."

— Friedrich Nietzsche (1888), *The Anti-Christ* (§57)

"Christianity is the formula for exceeding *and* summing up the subterranean cults of all varieties, that of Osiris, that of the Great Mother, that of Mithras, for instance: in his discernment of this fact the genius of Paul showed itself. This was his revelation at Damascus: he grasped the fact that he *needed* the belief in immortality in order to rob "the world" of its value, that the concept of "hell" would master Rome—that the notion of a "beyond" is the *death of life*.... Nihilist and Christian: they rhyme in German, and they do more than rhyme."

— Friedrich Nietzsche (1888), *The Anti-Christ* (§58)

"Within my writings, my *Zarathustra* stands by itself. I have, with this book, given mankind the greatest gift that has ever been given it."

— Friedrich Nietzsche (1888), *Ecce Homo* (pg. 4)

"My father died at age thirty-six. In the same year in which his life declined, mine too declined; in the thirty-sixty year of my life, I arrived at the lowest point of my vitality – I still lived, but without being able to see three paces in front of me. At that time – it was 1879 – I relinquished my Basel professorship, lived through the summer like a shadow in St Moritz and the following winter, the most sunless of my life, as a shadow in Naumburg."

— Friedrich Nietzsche (1888), *Ecce Homo* (pg. 8); compare James Maxwell (died age 48 from stomach cancer; same age and disease as his mother)

"I am a pure-blooded Polish nobleman, in whom there is no drop of bad blood, least of all German."

— Friedrich Nietzsche (1888), *Ecce Homo* (pg. 11)

"God, immortality of the soul, redemption, the beyond, all them concepts to which I have given no attention and no time, not even as a child – perhaps I was never childish enough for it? I have absolutely no knowledge of atheism as an outcome of reasoning, still less as an event; with me it is obvious by instinct. I am too inquisitive, too questionable, too high spirited to rest content with a crude answer. God is a crude answer, a piece of indelicacy against us thinkers – fundamentally even a crude prohibition to us: you shall not think!"

— Friedrich Nietzsche (1888), *Ecce Homo* (pg. 21)

"Another form of sagacity and self-defense consists in 'reacting' as seldom as possible and withdrawing from situations and relationships in which one would be condemned as it were to suspend one's 'freedom', one's initiative, and become a mere reagent."

— Friedrich Nietzsche (1888), *Ecce Homo* (pg. 33); see: bachelorhood and genius

"I am not a man, I am dynamite. There is nothing in me of a founder of religion. Religions are affairs of the rabble. I have to wash my hands after contact with religious people."

— Friedrich Nietzsche (1888), *Ecce Homo* (pg. 96)

"Have I been understood? What defines me, what sets me apart from all the rest of the mankind, is that I have 'unmasked' Christian morality. The concept of 'god' invented as the antithetical concept to life. The concept of 'soul', 'spirit', finally even 'immortal soul', invented so as to despise the body. The concept of 'sin' invented together with the instrument of torture which goes with it, the concept of 'free will', so as to confuse the instincts, so as to make mistrust of the instincts into second nature!"

— Friedrich Nietzsche (1888), *Ecce Homo* (pgs. 101-104)

Quotes | By | Undated

The following are noted dated unquotes by Nietzsche:

"When one speaks of 'humanity', the idea is fundamental that this is something which separates and distinguishes man from nature. In reality, however, there is no such separation: 'natural' qualities and those called truly 'human' are inseparably grown together. Man, in his highest and noblest capacities, is wholly nature and embodies its uncanny dual character. Those of his abilities which are terrifying and considered *inhuman* may even be the fertile soil out of which alone all humanity can grow into impulse, deed and work."

— Friedrich Nietzsche (c.1880), from an early work [18]

"The struggle between science and religion is like the primordial struggle between bird and gravity."

— Friedrich Nietzsche (c.1885) [10]

"As an old artilleryman, I bring out my heavy guns; I am afraid that I am shooting the history of mankind into two halves. I sometimes look at my hands now with some distrust, because I seem to have the destiny of mankind in the palm of my hand."

— Friedrich Nietzsche (c.1885) [10]

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θΔics

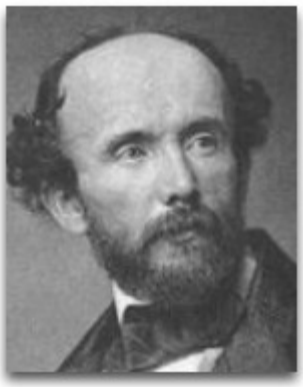

In existographies, **Friedrich Pecht** (1814-1903) was a German historical and portrait painter, lithographer, and art writer noted for his 1863 “Goethe Gallery”, co-drawn with Austrian-born painter German artist Arthur Ramberg (1819-1875), which contains fifty steel engravings of the various people and characters in Goethe’s existence and in his works, notably renditions of the characters: Eduard, Charlotte, and Ottilie from his 1809 *Elective Affinities*, with text description by Pecht.

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External links

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â— Goethe Gallery (German → English) – Wikipedia.

θΔics

In human chemistry, **Friedrich Riemer** (1774-1845) was a German writer, librarian, and philologist, noted for being an associate of German polymath Johann Goethe who, along with Johann Eckermann, became the joint editor of the complete edition of Geothe's works in 40 volumes (1839-1840).

Elective Affinities

In 1808, a year before the publication of Goethe's novella *Elective Affinities*, Goethe famously explained to Riemer that: 'his idea for the new novella was to portray social relationships and their conflicts symbolically', as in *a*, *b*, *ac*, *abd*, *abcd*, ab + c → ac + b, etc., and that: [1]

> "The moral symbols used in the natural sciences were the elective affinities discovered and employed by the great Bergman."

This comment in reference to symbols, refers directly to Swedish chemist Torbern Bergman's 1775 *A Dissertation on Elective Attraction*, which is based in part on Scottish physician and chemist William Cullen's 1757 pioneering development of affinity reaction diagrams:

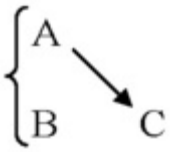

in which, for instance, as diagrammed above, if chemical species *A* and *B* are attached in a weakly bonded chemical union, signified by the bonding bracket "{", ordered such that if species *C* were introduced into the system, the greater affinity preference of *A* for *C* would cause *A* to displace *B* and to thus form a new union with *C*, which equates to the following in modern terms:

$$AB + C \rightarrow AC + B$$

In other words, what is moral or amoral, in Goethe's view, is a point of view inherent in the laws of chemistry according to which species react.

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External links

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θΔics

In existographies, **Friedrich Schelling** (1775-1854) (IQ:185|#82) (Cattell 1000:154) [RGM:106|1,500+] (CR:37) was a German philosopher, physicist, and panpsychist (Skrbina, 2005), noted for his circa 1796 natural philosophy theory, an attempt go beyond the mechanistic universe views of Rene Descartes and Newton and to go beyond the model of Immanuel Kant, all while aiming to bring all the sciences, human will and feelings, affinity, electricity, and magnetism, together into one unified theory; the theory, however, supposedly, ran amuck in a "mystery forces" language; aspects of the theory were said to have influenced Goethe, the theory was later rejected by the Helmholtz school.

Ideas for a Philosophy of Nature

In 1797, Schelling, in his *Ideas for a Philosophy of Nature*, devotes his first chapter to combustion, wherein he points to affinity as the new possible linchpin of grand philosophy: [8]

> "The abstract term 'affinity' is perfectly proper to describe the phenomenon [of combustion], but it is not adequate to explain it. Every verifiable explanation of it, however, would at the same time have to give us clues concerning the nature of what are called basic materials. The new system of chemistry, the work of a whole era, spreads its influence ever more widely over the other branches of natural science, and employed over its whole range may very well develop into the universal system of nature."

He then steps though chapters on light and electricity, among others, at the end of which, according to a recent synopsis (1988):

> "It stands in opposition to the Newtonian picture of matter as constituted by inert, impenetrable particles, and argues instead for matter as an equilibrium of active forces that engage in dynamic polar opposition to one another. In the revisions of 1803 Schelling incorporated this dialectical view into a neo-Platonic conception of an original unity divided upon itself."

These "active forces" of Schelling, supposedly, were rejected as "mystery forces" by the Helmholtz school (below). What exactly constitutes the Schelling force, as compared to the Kantian force, however, seems to be a convoluted mess (Ñº), to say the least.

On the World Soul

In 1798, Schelling, in his *On the World Soul*, outlined some type of "world soul" using strict natural scientific methodology as that of the physico-theologists (Ñº), supposedly resulting in some type of quasi-divine theory of forces, baring exact reading; an attempt at tackling the problems raised by teleological causality in Kant's *Critique of Judgment* and attempts to given an account of organic structure in nature in relation to a "supersensible ground of unity" (world soul) (Ñº), or something to this effect.

First Outline of a System of the Philosophy of Nature

In 1799, Schilling, in his *First Outline of a System of the Philosophy of Nature*, employed the terms "anorganic" and "organic", in a way that seems synonymous with "inorganic" and "organic", but discussed in his own peculiar theory. [10]

Goethe | Elective Affinities

The following is a synopsis, by Bernard Joly (2006), attempting to connect Schelling as an influence of the theory behind Goethe's *Elective Affinities*: [7]

> “Goethe himself had however indicated in a letter of June 1809 to another of his friends, he had borrowed its title from a treaty of Swedish chemist Torbern Bergman published in Latin in 1775, De attractionibus electivis, and translated into German from 1782 under the title Die Wahlverwandtschaften, which is the title of the novel. The French translation of the Treaty of Bergman (1788) is called Treaty chymical elective affinity or attraction. Regardless of whether we actually read Goethe's book Bergman, where he became acquainted as a result of its trade with **Schelling**, which he had read in 1798 *Ideas for a Philosophy of Nature* published the previous year and the *Soul of the World* published the same year, works in which the professor of Jena, following Kant gave to chemical science a very important role, elective affinities expressed by him at a higher level the two forces fundamental attraction and repulsion. It is not impossible that Goethe had heard of "some ingenious pages on the application of elective affinities of chemistry elective affinities feelings" had written the Duchess of Bouillon, whose adopted daughter had married in 1795 Baron de Vitrolles that relates all this in his autobiographical Memories of a migrated. Gibelin, who reports this passage in an article in the *Journal of Comparative Literature* in 1953, notes that the Bouillon Duchess lived in Erfurt, but one of his friends went two or three times a month in Weimar, sometimes taking with Vitrolles him who claims to have had with Goethe and "very good conversation", which raises the possibility that he had informed the poet of the work of his stepmother.”

Norwegian literary theorist Frode Pedersen (2011) argues that Schelling's natural philosophy theory influenced Goethe and his chemical philosophy theory.

In 1797, after reading Schelling’s *Ideas Towards a Philosophy of Nature*, Goethe began conducting experiments with magnetics, to investigate how the notion of “polarity” connects the organic and the inorganic worlds. [2]

On 28 May 1798, Goethe met Friedrich Schelling for the first time, at his home, after which, according to Goethe’s diary, they spent the next two days performing optical experiments. [3]

Schelling was said to have been “quite enchanted” with Goethe’s 1809 *Elective Affinities*. [4]

Helmholtz school

The Helmholtz school, supposedly, was reaction against the ‘mystery force’ nature-philosophy school of thought, advocated by Schelling, supposedly, that led Johannes Muller to search for what actually happened during the process of “feeling”, the result of which he came up, in 1840, his law of specific nerve energies, according to which each organ when stimulated only gave rise to a specific sensation, ear to sound, eye to light, etc. Muller's concluding theory was that "the will sets in activity the nervous fibers, like the keys of a piano." [1]

Education

Schelling at 11 was enrolled in a class with boys of age 18 and 19 who recognized him as their equal in knowledge and ability. By age 20 he had outlined his philosophy. [5]

Other

Schelling was a friend of Georg Hegel in youth.

Quotes | On

The following are quotes on Schelling:

> “With regard to the differences between the sexes, for instance, the most useful theory that has been put forward is the existence of a kind of polarity, two extremes separated by a multitude of intermediate conditions. The characterological differences appear to follow this rule in a fashion not dissimilar to the suggestion of the Pythagorean, Alcmaeon of Kroton, and recalling the recent chemical resurrection of **Schelling**'s *Natur-philosophie*.”

— Otto Weininger (1903), *Sex and Character* (pg. 81)

"Arnauld, Comte, Goethe, Grotius, Laplace, Leopardi, Michelangelo, Newton, Pascal, the younger Pitt, Sarpi, **Schelling**, Voltaire and Wolsey probably rated at 200 IQ or even higher."

— Catherine Cox (1926) [5]

Quotes | By

The following are quotes by Schelling:

"In all of us there dwells a secret marvelous power of freeing ourselves from the changes of time (see: flow state), of withdrawing to our secret selves away from external things, and of so discovering to ourselves the eternal in us in the form of unchangeability. This presentation of ourselves to ourselves is the most truly personal experience upon which depends everything that we know of the supra-sensual world. This presentation shows us for the first time what real existence is, whilst all else only appears to be. It differs from every presentation of the sense in its perfect freedom, whilst all other presentations are bound, being overweighted by the burden of the object. Still there exists for those who have not this perfect freedom of the inner sense some approach to it, experiences approaching it from which they may gain some faint idea of it. . . . This intellectual presentation occurs when we cease to be our own object, when, withdrawing into ourselves, the perceiving self merges in the self-perceived. At that moment we annihilate time and duration of time; we are no longer in time, but time, or rather eternity itself, is in us. The external world is no longer an object for us, but is lost in us."

— Friedrich Schelling (1795), *Philosophical Letters upon Dogmatism and Criticism* [9]

"I protest against that blind and thoughtless mode of investigating nature which has become generally established since that corruption of philosophy by Bacon and of physics by Boyle and Newton."

— Friedrich Schelling (c.1820) [1]

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Untersuchung) (pgs. 165-66). Vienna: Braumüller & Co, 1906
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θΔics

In existographies, **Friedrich Schiller** (1759-1805) (IQ:185|#69) (Cattell 1000:75) [RGM:85|1,260+] (CR:144) was a German "poet-philosopher", as Sigmund Freud (1930) describes him, noted for his intellectual kinship with German polyintellect Johann Goethe, with whom Goethe first began in 1799 to discuss his newly forming "human chemical theory" of the existence of physical chemistry based human elective affinities governing human relationships. [1]

Crebillon

In a 23 October 1799 conversation with Schiller, Goethe criticizes French dramaticist Prosper Crebillon, pseudonym of Prosper Jolyot, French dramatist; considered, according to Merriam-Webster (2000), the rival of Voltaire; wrote Idomenee (1705), Electre (1708), Xerxes (1714), among others—in terms that make Goethe's view that human relationships are chemical relationships explicit: [13]

> "There is no trace of the delicate relationship (*chemische verwandtschaft*) through which they (his characters) attract and repel, neutralize each other, separate again and re-establish themselves."

The openness, and without introduction of this quote, implies that Schiller and Goethe had previously interjected on this topic.

Drive theory | The World Ways

> *See main: Freud-Schiller drive theory*

Schiller, somewhere along the line, supposedly, penned out a theory of the drives: [5]

> "The animal drives [*Triebe*] awaken and develop the spiritual drives"; he opposed the material drive (*Stofftrieb*) to the form drive (*Formtrieb*). The *Spieltrieb* (play-drive)—which expresses play, the beautiful, freedom, and the total man—is posited as an ideal nexus between the two *Triebe*. It is also the force that drives creation: "It is union of the unconscious and reflection that makes the poetic artist."

In 1795, Schiller penned his poem "The World Ways", shown in the original German and English-to-German translate below:

The World Ways
(Die Weltweisen)

German	English
Der Satz, durch welchen alles Ding	The rate by which all things
Bestand und Form empfangen,	Receive inventory and shape,
Der Nagel, woran Zeus den Ring	The nail what the Zeus ring
Der Welt, die sonst in Scherben ging,	The world went to pieces otherwise,
Vorsichtig aufgehangen,	Carefully hung,
Den nenn' ich einen großen Geist,	To what I call a great spirit,
Der mir ergründet, wie er heißt,	The fathomed me how he is,
Wenn *ich* ihm nicht drauf helfe –	When *I told* him it does not help -
Er heißt: Zehn ist nicht Zwölfe.	He says: Ten is not twelve. The
Der Schnee macht kalt, das Feuer	snow makes cold, the fire burns,

brennt,
Der Mensch geht auf zwei Füßen,
Die Sonne scheint am Firmament,
Das kann, wer auch nicht Logik kennt,
Durch seine Sinne wissen.
Doch wer Metaphysik studiert,
Der weiß, daß, wer verbrennt, nicht friert,
Weiß, daß das Nasse feuchtet
Und daß das Helle leuchtet.
Homerus singt sein Hochgedicht,
Der Held besteht Gefahren;
Der brave Mann thut seine Pflicht
Und that sie, ich verhehl' es nicht,
Eh noch Weltweise waren.
Doch hat Genie und Herz vollbracht,
Was *Lock'* und *Des Cartes* nie gedacht,
Sogleich wird auch von diesen
Die Möglichkeit bewiesen.
Im Leben gilt der Stärke Recht,
Dem Schwachen trotzt der Kühne,
Wer nicht gebieten kann, ist Knecht;
Sonst geht es ganz erträglich schlecht
Auf dieser Erdenbühne.
Doch wie es wäre, fing' der Plan
Der Welt nur erst von vornen an,

Ist in Moralsystemen
Ausführlich zu vernehmen.
»Der Mensch bedarf des Menschen sehr
Zu seinem großen Ziele;
Nur in dem Ganzen wirket er,
Viel Tropfen geben erst das Meer,

Viel Wasser treibt die Mühle.
Drum flieht der wilden Wölfe Stand
Und knüpft des Staates dauernd Band.«
So lehren vom Katheder
Herr Puffendorf und Feder.
Doch weil, was ein Professor spricht,
Nicht gleich zu Allen dringet,
So übt *Natur* die Mutterpflicht
Und sorgt, daß nie die Kette bricht
Und daß der Reif nie springet.

The man walks on two feet,
The sun is shining in the firmament,
This can, who knows neither logic
Know through his senses.
But who studied metaphysics,
He knows that he who burns not freeze,
Knows that the Wet moistens
And that the bright lights.
Homer sings his wedding poem,
The hero is danger;
A good man does his duty
And she did, I do not conceal,
Eh were world way.
But genius and heart has accomplished,
What *Lock 'and Des Cartes* never thought
Immediately is also of this
The opportunity proved.
In life, the strength is right
The weak defies the Bold
If you can not command, is servant;
Otherwise it's quite tolerable bad
On this earth stage.
But what it would be caught 'the plan
The world first only by vornen to,

In moral systems
Detail to be heard.
"Man needs of the people very
To his great aims;
Only in the whole he worketh,
Many drops to give only the sea,

Plenty of water drives the mill.
Drum escapes of wild wolves as
Ties and the state band permanently. "
To teach from the lectern
Mr. Puffendorf and spring.
But because of what a professor says,
Penetrateth not equal to all,
Mother *Nature* exerts the required
And ensures that the chain never breaks
And that the frost never Springet.
In the meantime, until the construction of the world

In 1823, French engineer Sadi Carnot, famously stated that the “fall of caloric”, from the hot body (boiler) to the cold body (condenser), through the working substance in the operation of the steam engine, is comparable, in principle, to the “fall of water”, from the higher location, through the rotary mechanism of the water mill, to the lower location, in the machines operated by falling water, in the production of motive power.

A water mill driven by waterpower, according to which the fall of the water "drives" the mechanical operation of the mill, which is to grind grain.

In 1930, Sigmund Freud that he got his free energy/bound energy libido "drive theory", in start, from Schiller's "The World Ways" poem, which Freud encapsulates as: "hunger and love are what move the world"

Einstweilen, bis den Bau der Welt Philosophie zusammenhält, Erhält *sie* das Getriebe Durch Hunger und durch Liebe.	Philosophy holds, *It* receives the transmission By hunger and by love.

In 1910, Austrian psychologist Sigmund Freud situated himself in Schiller's wake by distinguishing the sexual instincts from the ego instincts, and in his *Civilization and its Discontents*, stated that Schiller, with his hunger and love poem, had provided him with an initial "foothold" for his free energy and bound energy connected "drive theory" or libido energy (id, ego, superego) model of the "theory of instincts" of psychoanalysis from the final line of Schiller's 1795 poem, which according to the 1961 translation by James Strachey, Freud quotes as follows:

> "Hunger and love are what moves the world."
>
> — Friedrich Schiller (1795), quoted by Sigmund Freud, in *Civilization and its Discontents* (1930) (Ñº), as basis if his drive theory (Ñº)

Two other versions, that may or may not have been derived from Schiller, are as follows:

> "Hunger and love are two fundamental forces that reign in the living world, they are the primary source of all phenomena, mental and social."
>
> — Leon Winiarski (1899), *Essay on Social Mechanics*

> "Love and hunger rule the world. Ergo, to rule the world, one must master love and hunger."
>
> — Yevgeny Zamyatin, *We* (1920)

The popular modern truncated version of the conclusion of Schiller's poem is:

> "Love and hunger rule the world."
>
> — Friedrich Schiller (1795), "The Philosophers" (Die Welteisen) (Ñº); StatusMind.com (Ñº)

Einstein

As found in Einstein's personal library at Princeton, according to the 2008 views of German-born American physicist Gerald Holton, noted student of American thermodynamicist Percy Bridgman: [2]

> "Throughout his life **Einstein** was a man of the **book**, to a much higher degree than other scientists. The remarkably diverse collection of volumes in his library grew constantly. If we look only at the German-language books published before 1910 that survived Einstein's Princeton household, the list includes much of the cannon of the time: Boltzmann, Buchner, Friedrich Hebbel, the works of Heine in two editions, Helmholtz, von Humboldt, the many books of Kant, Gotthold Lessing, Mach, Nietzsche, and Schopenhauer. But what looms largest are the collected works of Johann von Goethe in a thirty-six volume edition and another of twelve volumes, plus two volumes on his *Optics*, the exchange of letters between

> Goethe and **Schiller**, and a separate volume of *Faust*."

In other words, Einstein, supposing he had read all of the books in his library, would have known about the above comment by Goethe. It is thus puzzling why Einstein commented in the 1920s: [3]

> "How on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?"

Explanations on his statement are puzzling, if in fact Einstein had read the above 1799 comment of Goethe to Schiller as well as Goethe's *Elective Affinities*? It could be that Einstein, being so absorbed in his own work, relativity, although oddly his first 30 papers were in thermodynamics, may have not seen the trees between the forest (see: forest blind)?

Quotes | By

The following are noted Schiller quotes:

> "Keep true to the dreams of your youth."
>
> — Friedrich Schiller (c.1790), Ranker.com (Ñº)

> "There is no such thing as chance; and what seem to us merest accident springs from the deepest source of destiny."
>
> — Friedrich Schiller (c.1790), Ranker.com (Ñº)

> "The relationship of gravity to the living power of the bird is about the same as inclination is related to law-giving reason."
>
> — Friedrich Schiller (c.1790) (Ñº)

> "I do not ignore the advantages which the present generation, regarded as a whole, and measured by reason, may boast over what was best in the bygone world; but it must enter the contest as a compact phalanx and measure itself as whole against whole. What individual modern could enter the lists, man against man, and contest the prize of manhood with an individual Athenian? When then arises this unfavorable individual comparison in the face of ever advantage from the standpoint of the race?"
>
> — Friedrich Schiller (1795), *Publication*; cited by Carl Jung (1924) in *Psychological Types* (pg. 91); cited by Roderick Seidenberg (1950) in *Post-Historic Man* (pg. 191)

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(c) Prosper Jolyot de Crebillon – Wikipedia.
2. Galison, Peter, Holton, Gerald J., and Schweber, Silvan S. (2008). *Einstein for the 21st Century: His Legacy in Science, Art, and Modern Culture* (ch. 1: Who Was Einstein? Why is He Still so Alive?, pgs 3-15; quote: pg. 10). Princeton University Press.
3. (a) Among the letters Einstein received in England was one from a man who had a theory that gravity meant that as

the earth rotated people were sometimes upside down or horizontal. Perhaps, reasoned the man, this led people to do foolish things, like falling in love. This prompted Einstein to scribble on the letter: “falling in love is not the most stupid thing that people do … but gravitation cannot be held responsible for it.”
(b) Source: Isaacson, Walter. (2007). *Einstein*, (pg. 423). Simon and Schuster.
(c) In the late 1920s at the California Institute of Technology, as recorded by Henry Borsook (1956), physical chemist Edwin Cohn asked geneticist Thomas Morgan what is research plans were? Morgan answer was: “I am not doing any genetics. I am bored with genetics. But I am going out to Cal Tech where I hope it will be possible to bring physics and chemistry to bear on biology.” Shortly after Morgan arrived at Cal Tech, Einstein visited the laboratory and posed almost the same question. Morgan answered similarly as before. In response, Einstein shook his head and said: “No, this trick won’t work. The same trick does not work twice. How on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?”
(d) Source: Kang, Manjit. (2002). *Quantitative Genetics, Genomics, and Plant Breeding*, (pg. 12). CABI Publishing.
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Further reading

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External links

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θΔics

In existographies, **Karl Wilhelm Friedrich Schlegel** (1772-1829) (Cattell 1000:837) (CR:4), aka "Friedrich Schlegel", younger brother of August Wilhelm Schlegel (1767-1845) (Cattell 1000:705), aka "August Schlegel", was poet and literary critic noted for his *circa* 1798 poetry and writings using what he believed was a kind of verbal chemical logic, thus producing a type of chemistry poetry, possibly akin to the poems of Mala Radhakrishnan, or a version of literature chemistry. [1]

Overview

In his poetic and linguistic productions, according to American comparative literature scholar Michel Chaouli, Schlegel never develops any sort of model or theory, but rather speaks endlessly on "saturation" and "condensation", of "synthesis and analysis", of "oxidation" and of "azote" (nitrogen), and above all of "eternally dividing and mixing forces". [2]

In short, Schlegel's chemistry poetry is a more dilettantish and chaotic way than as compared to the romantic chemical writings of German polyintellect Johann Goethe (1809), or other early German romanticism writers who had more than a passing knowledge of chemistry: Immanuel Kant, who knew it well, Friedrich Schelling, who lectured on it at length, Novalis, who studied it intensely, and Samuel Coleridge, who had a remarkable firm grasp of it. [2]

Quotes | On

The following are quotes on Schlegel:

> "If we are to speak of the 'key' to early romanticism, it is to be found in one of the thinkers of antiquity, Plotinus. For his neoplatonic philosopher not only inspired the entire system of Novalis, scattered through innumerable fragments, and many of the ideas of Schelling in his middle period; his arm reached farther: through Novalis and Schelling he exercised an influence, though an indirect one, upon both Schlegels [August Schlegel and **Friedrich Schlegel**], and without knowledge of this fact many a passage in the 'Dialogue concerning Poetry' and the Berlin lectures of August Schlegel remains an enigma."
>
> — Paul Reiff (1912), "Plotin und die Deutsche Romantik" [4]

Quotes | By

The following are related quotes:

> "A pure physics must be completely divorced from mathematics; only then will it disclose the (poetic) view of nature."
>
> — Friedrich Schlegel (c.1810) [3]

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External links

â— Karl Wilhelm Friedrich Schlegel – Wikipedia.

θΔics

In existographies, **Friedrich Schleiermacher** (1768-1834) (IQ:160|#446) (Cattell 1000:254) [RGM:N/A|1,320+] (Murray 4000:N/A) was a German theologian, philosopher, and biblical scholar known for his attempt to reconcile the criticisms of the Enlightenment with traditional Protestant Christianity.

Quotes | On

The following are quotes on Schleiermacher:

> "It is enough to make the general statement that there is not a single woman in the history of thought, not even the most manlike, who can be truthfully compared with men of fifth or sixth-rate genius, for instance with Ruckert as a poet, Van Dyck as a painter, or **Schleiermacher** as a philosopher."
>
> — Otto Weininger (1903), *Sex and Character* (pg. 69)

> "Since the time of **Schleiermacher** the philosophy of Anaximander has received marked attention from historians of philosophy, and the literature on the subject has grown to large proportions. By many Anaximander is regarded as a metaphysician—as the first metaphysician. In this essay the attempt will be made to study the records, so far as they may conceivably be regarded as containing a metaphysical scheme, without express reference to other interpretations, although they have been conscientiously read and considered. The treatise of Anaximander was known to Aristotle and Theophrastus; there is no reason to think that it was studied by later writers for the purpose of ascertaining his opinions,' although Apollodorus may have inspected it with a view to determine his chronology. Theophrastus remarks upon its high-flown style,' which suggests that it was not discursive but, like that of Heraclitus, somewhat curt and aphoristic. We must therefore look to Aristotle and Theophrastus for a knowledge of the facts; but we shall be under the necessity of somehow checking their conclusions, the more since it is no longer a secret that Theophrastus was absolutely under the spell of his master, and that Aristotle himself, with all his speculative genius, or just because of it, was not always able to distinguish between that which his predecessors said and that which their words suggested to him."
>
> — W.A. Heidel (1912), "On Anaximander" [1]

References

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External links

â— Friedrich Schleiermacher – Wikipedia.

θΔics

In science, **Friedrich Wohler** (1800-1882) was a German chemist noted for his 1828 synthesis of urea, an undoubtedly "organic" molecule, starting from ammonium cyanate, which was then considered to be an "inorganic", or at least "nonliving", as Francis Crick retrospectively described things, chemical. [1] In his "On the Artificial Formulation of Urea" Wohler stated: [2]

> "This investigation has yielded an unanticipated result that reaction of cyanic acid with ammonia gives urea, a noteworthy result in as much as it provides an example of the artificial production of an organic, indeed a so-called animal, substance from inorganic substances."

Wohler was a student of Swedish chemist Jacob Berzelius, author of *Animal Chemistry* (1806), who, prior to Wohler's discovery, was of the mindset that organic atoms, in contrast to inorganic atoms, were responsive to vital force. [3]

The fact that Wohler specifically made urea, a supposed "living chemical" (chemical responsive to the vital force) or chemical of living things, from non-living components, specifically from: dried blood, hoofs, and horns, brought into question the then-dominant vital force theory of "organic chemistry". [1]

Organic | Inorganic life

Wohler's urea synthesis thus disproved the then-dominate theory that only organic matter (living matter or technically "vital force" infused matter could produce organic matter or organic life (in contrast to inorganic life). While Wohler's urea synthesis effectively disproved the vital force theory of organic chemistry, the organic/inorganic or more to the point "organic life"/"inorganic life" divide still exists in the minds of many, particularly in regards to the modern day origin of life question.

American writer Edgar Poe's 1944 short story "Mesmeric Revelation" gives a glimpse into the organic life/inorganic life mindset during this period. [4]

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External links

â— Friedrich Wöhler – Wikipedia.

θΔics

In science, **friendship** is a type of human chemical bond or chemical association that is step above that in strength of a passing acquaintance association, but below that in strength of an intimate sexual relationship bond.

Overview

In 1841, American philosopher Ralph Emerson, in his essay on friendship, defined the nature of friendship in terms of chemical affinity, in the context of soul mate theory, as such: [1]

> "Conversation is the practice and consummation of **friendship** and great conversation requires an absolute running together of two souls into one, yet it is affinity that determines *which* two shall converse."

This definition, supposedly, was based on German polymath Johann Goethe's 1809 'elective affinity' description of the coming and goings of friendships. [2] The term 'soul', used here, to clarify, is the Ra-theology based term for what would be called "moral movement" described and quantified by the "moral symbols", in modern physical science parlance.

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External links

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θΔics

In science, **fringe science**, a semi-synonym to "new age" or new age science, refers to fields of study, investigation, and or theory on the outer "fringes" of established science, in some cases boarding on pseudoscience and or metaphysics.

See also

- Fringe thermodynamics

External links

- Fringe science – Wikipedia.

θΔics

In hmolscience, **fringe thermodynamics**, is fringe science, tending towards the use and claiming application of thermodynamics, particularly in human thermodynamics, in subjects on the fringe of science, various new age types of theories, or crossover concepts, often barely tenable or conceivable, such as ghost-spirit hunting, telekinesis, ectoplasy, bioenergy, paranormal, energy medicine, the sixth sense, or other types sideline theories.

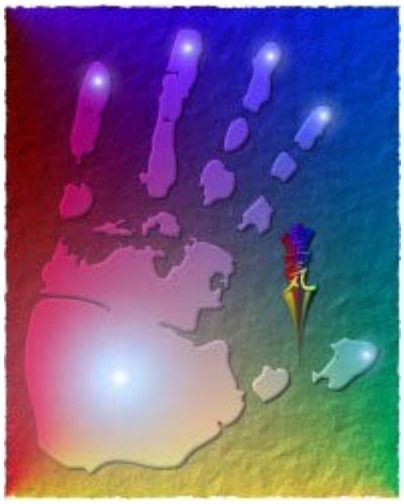

Typical Icon for a new age site on **fringe** topics bioenergy, holistic healing, channelling, aromatherapy, reiki, or chakras.

Overview

In 1896, English psychical researcher Frederic Myers 1896 used Maxwell's demon and the conservation of energy to explain spirits and afterlife, along with supposed phenomena such as hauntings, telekinesis, and ghosts, using his ‘ectoplasy’ theory, said to be an extrusion from the organism of vital energy.

(add)

See also

â— New age
â— Ontic opening

External links

â— Fringe science – Wikipedia.

θΔics

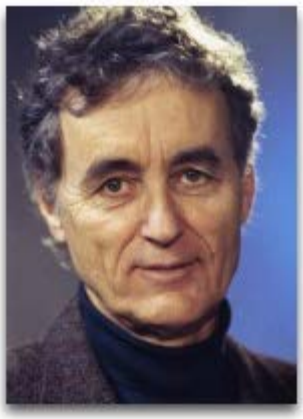

In existographies, **Fritjof Capra** (1939-) (CR:32) is an Austrian-born American physicist noted for the publication of his 1996 book *The Web of Life*, in which he outlines a view that the ordered formation and emergence of life is a type of emergent, self-organized, dissipative structure, formed similar to Bénard cell organizations. [1] Capra's thermodynamic or rather evolution thermodynamics logic is modeled on the thermodynamics of Belgian chemist Ilya Prigogine, both being types of ontic opening physics. [2]

Turning point | Mindwalk

The 1990 film *Mindwalk* (Q), which Daniel Rigney calls "intellectually provocative", to note, is based on Capra's 1982 book *The Turning Point*, which contains notable chapters on the Cartesian-Newtonian mechanistic models of life and economics, one noted scene being when the poet, politician, and physicist debate Cartesian reductionism while standing next to a large mechanical clock. [8] The film, supposedly, contains dialogues on systems theory, holism, quantum mechanics, and particle physics. [9]

Non-reductive emergent materialism

See main: Non-reductive materialism

The gist argument of Capra's book is nearly identical to that of Cuban-born American philosopher Alicia Juarrero's 1999 *Dynamics in Action* as well as American neurological anthropologist Terrence Deacon's 2011 *Incomplete Nature: How Mind Emerged From Matter*, all of which seem to well classify under the category of "non-reductive materialism emergence" theory. [5]

In 2002, in his symposium presentation "Complexity of Life", Capra summarized the gist of this philosophical position as follows: [6]

> "This spontaneous emergence of order at critical points of instability, which is often referred to simply as 'emergence,' is one of the hallmarks of life. It has been recognized as the dynamic origin of development, learning, and evolution. In other words, creativity—the generation of new forms—is a key property of all living systems."

Likewise, in his 2002 *The Hidden Connections*, Capra employs the classic emergent property argument to make his point—a tool frequently used by emergentists: [7]

> "When carbon (C), oxygen (O) and hydrogen (H) atoms bond in a certain way to form sugar [e.g. glucose $C_6H_{12}O_6$], the resulting compound has a sweet taste. The sweetness resides neither in the C, nor in the O, nor in the H; it resides in the pattern that emerges from their interaction. It is an emergent property. Moreover, strictly speaking, is not a property of the chemical bonds. It is a sensory experience that arises when the sugar molecules interact with the chemistry of our taste buds, which in turns causes a set of neurons to fire in a certain way. The experience of sweetness emerges from that neural activity."

This, of course, is but a smoke and mirrors argument, generally done to give a scientific appearance to various arguments of the proposed existence of things, such as: mind, consciousness, life, mysticism (one of Capra's favorite terms), among others.

What is life?

See main: What is life? (theories of existence)

In particular reference to the question “what is life?”, Capra states, on the terminology of Prigogine, that life a “far from thermodynamic equilibrium” system that has emerged, due to the flow of matter and energy, past the “bifurcation point”. [3] Capra, similar to Prigogine, uses a type of anthropomorphic thermodynamics in his description of molecular behavior. In his 1996 book, to cite on example, he states:

> “Prigogine’s detailed analysis of Bénard cells showed that as the system moves farther away from equilibrium, it reaches a critical point of instability, at which the ordered hexagonal pattern emerges” and that, during convection, “heat is transferred by the coherent motion of large numbers of molecules.”

In short, Capra argues that life is a Prigoginean thermodynamics type of phenomenon.

Choice | Humans vs molecules

Capra, ignorant of the fact that humans are molecules (see: human molecule), posits the following backwards view in regards to human "choice" as compared to molecular "choice": [2]

> “Human beings can choose whether and how to obey a social rule; molecules cannot choose whether or not they should interact.”

Capra, to back up this erroneous statement, cites Gail Fleischaker (1992) and John Mingers (1995). [4]

Influences

Capra has been influenced by: Gregory Bateson, Ludwig Bertalanffy, David Bohm, Rene Dubos, Stanislav Grof, Erich Jantsch, Carl Jung, Thomas Kuhn, Ervin Laszlo, James Lovelock, Ernst Schumacher, and Ken Wilber.

Quotes | On

The following are quotes on Capra:

> “Jantsch (1975) and **Capra** (1982) find some stimulation in the pattern fit between the model of nature that is now emerging and that derived from mystical religions. Such correspondences may stimulate theory building, but I find them of little help in the present exercise.”
>
> — Richard Adams (1988), *The Eighth Day* (pg. 7)

See also

● Scrooge Tiny Tim dialogue | Steven Weinberg on Capra

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Further reading

● Capra, Fritjof. (1982). *Social Implications of Modern Physics*. Simon & Schuster.

External links

● Fritjof Capra – Wikipedia.

θΔics

In existographies, **Fritz Haber** (1868-1934) (IQ:180|#129) (Becker 160:92) (GCE:30) [CR:61] was a German physical chemist noted for his pioneering 1905 work in gas reaction thermodynamics, wherein he formerly organized data on free energy, and for his later 1907 solving of the problem of ammonia synthesis, via the Haber process, namely how to the strongly bonded nitrogen molecule N_2 to break apart, i.e. to break its triple bond (three covalent bonds), and to recombine with three hydrogen atoms, according to the following process:

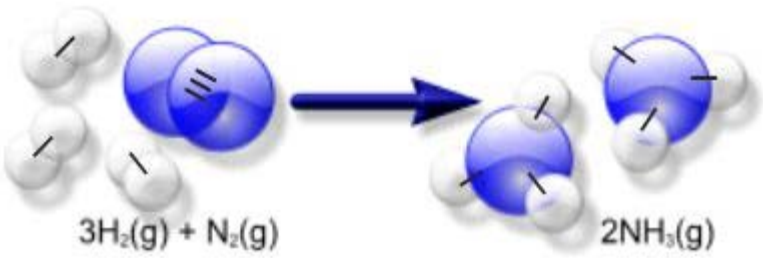

which, in May 1909, working together with English technical engineer Robert Le Rossignol, they were able to achieve, in a process that produced 6 percent yield of ammonia NH_3 at about 300°C and 200 atm pressure, using osmium as a catalyst, a feat par excellence of using thermodynamic prediction methodology to obtain desired products, at a given equilibrium state.

Education

In 1891, Haber competed his dissertation, at the University of Berlin, on chemical reactions involving piperonal, after attending the lectures of Hermann Helmholtz and studying in the laboratory of Robert Bunsen.

During this time, Haber met fellow student Richard Abegg, eventual discoverer of Abegg's rule (1904), the forerunner to the Octet rule, as popularized by Gilbert Lewis, who introduced Haber to physical chemistry. Abegg and Haber both wrote to Wilhelm Ostwald, asking to join his laboratory in Leipzig, the then leading physical chemist in Germany. Abegg's application was accepted; Haber's wasn't. [5] Ironically, it was Haber who would go on to become one of the world's leading physical chemist.

Free energy

Haber's 1905 *Thermodynamics of Technical Gas Reactions*, according to American physical chemists Gilbert Lewis, was the first systematic study of all the thermodynamic data necessary for the calculation of the free energy of chemical substances in a group of important reactions. [1]

Nernst-Haber rivalry | Ammonia synthesis

In 1904, Haber received a request from the Austrian Chemical Works (Österreichische Chemische Werke), Vienna, to investigate the synthesis of ammonia from its elements. Haber, sometime shortly thereafter, discovered the 1884 work of William Ramsay and Sidney Young, who showed that passing a mixture of dry nitrogen and dry hydrogen through a heated glass tube containing iron filings produced some ammonia:

$$N_2 + 3H_2 \rightleftharpoons 2NH_3$$

Ramsay and Young, in turn, had built on earlier work of Henri Deville (1865) and William Donkin (1873). [11]

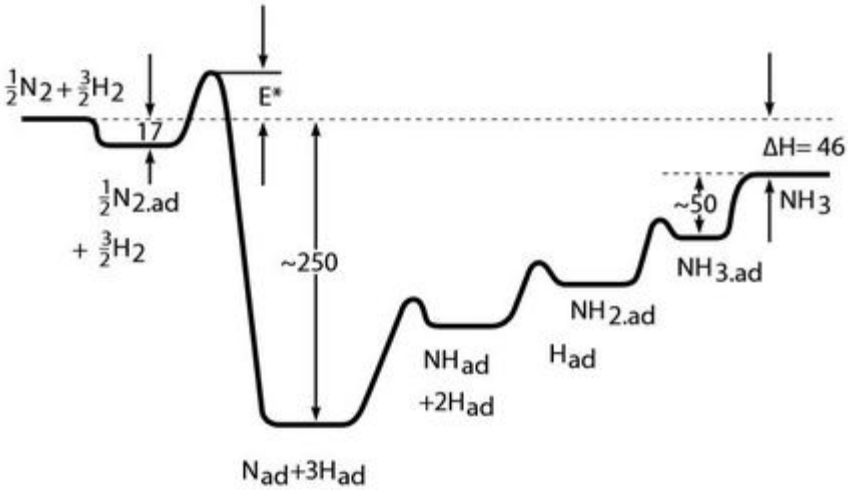

Left: the original laboratory apparatus designed by **Fritz Haber** and Robert Le Rossignol in 1908 for synthesizing ammonia from its elements. A metal catalyst bed, where ammonia was produced, is in the large cylinder at the left. (Ñº) Right: the reaction mechanism of the Haber process, described by Gerhard Ertl (1983), in which the cleavage of the nitrogen molecule is the rate-limiting step. (Ñº)

Building on this insight, Haber, together with his assistant Gabriel van Oort, used the 1884 van't Hoff equation to predict the amount of ammonia in the equilibrium mixture at lower temperatures. The van't Hoff equation showed that relatively low temperatures favored the process. If the unreacted gases could be recycled, and if an appropriate catalyst could be developed, then the process might have potential. Haber, however, dismayed by their efforts, commented:

> "From dull red heat upwards, no catalyst can produce more than a trace of ammonia under ordinary pressure. Even at greatly increased pressures, the position of equilibrium must remain unfavorable. To attain practical success with a catalyst at ordinary pressure, its temperature must be no higher than 300°C."

This was 1905, at which point Haber temporarily abandoned his work on the ammonia synthesis problem.

Independently, German physical chemist Walther Nernst, at about this time, was working on his new heat theorem, and decided that Haber and van Oort's 1905 results would be a good test for his theorem. Nernst found, however, that his new law (third law) conflicted with Haber and Oort's experimentally-derived data, and so Nernst decided to investigate the reaction himself. Nernst decided to at 30-75 atm, reasoning that ammonia concentrations would be more accurately measureable.

In 1906, Nernst informed Haber of his experimental findings, and, supposedly, how they were at odds with Haber's results.

In 1907, Nernst, supposedly, reported successful ammonia synthesis, becoming the first to synthesis ammonia under pressure. The debate spilled over into public statements that Haber's work was error-filled. That year, Nernst published the following derisive comment: [12]

> "It is that so little ammonia is formed in this state of equilibrium, compared with what Haber's highly inaccurate numbers led us to assume. Because otherwise one might actually have considered it feasible to synthesize ammonia directly from hydrogen and nitrogen. Now the situation is much less favorable."

In Mar 1909, spurred on by public derogation, Haber, working with Robert Le Rossignol, produced an 6 percent yield of ammonia at about 300°C and 200 atm pressure, using osmium as a catalyst; and by Jul 1909, began using uranium as a better catalyst, to obtain higher yields. Their apparatus, currently on display at the Deutsches Museum, Munich, is shown adjacent.

Haber showed the process, aka the Haber process, to Carl Bosch, who then scaled the process up to the industrial production level; the first so-called Haber-Bosch process plant becoming operation in 1913.

Haber was awarded the 1918 Nobel Prize in chemistry for this work.

Haber and Einstein in 1914 at the Kaiser-Wilhelm Institute of Physical Chemistry.

Einstein

In 1811-1813, Haber travelled to Zurich to recruit the new physical science celebrity Albert Einstein to come to Berlin. The two, supposedly, became close friends; it was Haber, e.g., who played the role of mediator in the 1914 divorce between Einstein and his wife Mileva. [5] The following is an interesting thermal word laced communication from Einstein to Haber:

> "I'm glad that your earlier love for the blond beast has cooled off a bit."
>
> — Albert Einstein (1933), "Letter to Fritz Haber", Aug 9 [13]

The blond beast being reference to one of Friedrich Nietzsche's writings on a "splendid blond beast" that prowls in the spirits of all the great nations, a kind of nation id, untamed and bent on conquest; a jab at Haber's relinquished detachment to the German cause. [14]

Sackur

On 17 Dec 1914, Haber, and his two oldest friends of his institute, Gerhard Just and Otto Sackur, the latter author of *Textbook on Thermochemistry and Thermodynamics* (1912), stood together preparing to mix two chemicals in effort to make a gas warfare device. Someone then called for Haber to come to the mechanic's shop. Just after Haber left the room, the test tube exploded maiming Just and killing (dereacting) Sackur. [5] Sackur's textbook, to note, would go on to become the precursor textbook of soon-to-become famous University of California, Berkeley chemical and chemical engineering department, and the Lewis school of thermodynamics; Lewis' 1923 *Thermodynamics and the Free Energy of Chemical Substances*, supplanting the former.

Thermodynamics | Suicide

See main: *Founders of thermodynamics and suicide*

On 1-2 May 1915, Fritz' wife Clara Haber (Clara Immerwahr), shot herself in the heart with her husband's pistol. Official reports were that she did so over objections to her husband's

1915
(age 45)

↔

1917
(age 28)

Clara Haber (1870-1915), shown (left), who married to **Fritz Haber** in 1901, and who committed suicide, on 1-2 May 1915, by shooting herself in the heart, after, supposedly, finding that her husband was having an affair with Charlotte

involvement in chemical gas warfare used against the French and Russians.

Nathan (1889-1976), whom and Fritz married two years later; their 25 Aug 1917 wedding photo shown (right). (Ñº)

Alternatively, Hermann Lutke, a mechanic in Haber's institute, reported (1958), in a series of letters to a man hoping to write a biography on Haber, that late in the evening of May 1, Clara encountered her husband with Charlotte Nathan, a young business woman who ran Haber's downtown club, in an "embarrassing situation", realizing that the two were having an affair. [5] Haber, after his wife's suicide, married Nathan in 1917, after which the couple had two children.

In 1946, their son Hermann took his own life and, shortly thereafter, Hermann's oldest daughter did the same.

Quotes | On

The following are quotes on Haber:

> "[**Haber** made] the most important contribution to the subject of predicting the course of a chemical reaction from a few characteristic constants (after the ill-starred attempt of Berthelot)."
>
> — Arthur Lamb (1907), English translator of *Thermodynamik Technischer Gasreactionen* [2]

> "**Haber** lived the life of a modern Faust, willing to serve any master who could further his passion for knowledge and progress."
>
> — Daniel Charles (2005), Haber biographer [5]

Quotes | By

The following are quotes by Haber:

> "It's the same feeling that makes both of us dissatisfied—the urge to extricate oneself from the narrow surroundings; to abandon, at all costs, the harbor into which my father has withdrawn himself after arduously weathering the storms of life; to sail out into the limitless ocean of life and future, guided by no other star than by one's own will and striving."
>
> — Fritz Haber (1885), age 17 letter Max Hamburger, Jun 23 [7]

> "God and the universe, soul and consciousness, idealism, realism! I swim in a sea of formal dialectic and logic, unfortunately not with my former ease. More experienced swimmers have enticed me too often into the rapids and eddies."
>
> — Fritz Haber (1887), aged 19 letter Max Hamburger, Jan 23 + Feb 2 [8]

> "Last but not least I have to be independent. I don't want to be anyone's assistant."
>
> — Fritz Haber (1905), letter to [niece Elisabeth] Freund, Jun 11 [10]

> "You have to see how the liquid ammonia is pouring out!"

— Fritz Haber (1909), early year exclamation of ammonia synthesis success to laboratory colleague Max Mayer [9]

"Woman are like butterflies to me. I admire their colors and glitter, but I get no further."

— Fritz Haber (c.1910), walking conversation with Max Mayer [5]

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Further reading

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External links

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θΔics

In existographies, **Fritz Krafft** (1935-) is a German science historian, recognized a 30-year plus Guericke researcher, noted for []

Overview

In 1978, Krafft, in his *Otto von Guericke*, and existography on Otto Guericke, stated, supposedly based on some sort of research, that Guericke invented the "vacuum pump" in "1647", a year before the end of the Thirty Year War (1618-1648). [1] The traditional dating of the vacuum pump invention, by Guericke, is most-often cited at 1654, or a year earlier.

Education

Krafft completed his university studies in classical philology and history of science at the University of Hamburg; was professor of the history of science at the University of Mainz, from 1970 to 1988, and at Marburg, Germany, from 1988 to 2000, he was director of the Institute for the history of pharmacy. His historical topics of focus include: Plato, Aristotle, Ptolemy, Copernicus, Kepler, Guericke, Herschel, Lichtenberg, and the team discovery of nuclear fusion by Otto Hahn, Lise Meitner, and Fritz Strassman. [2]

Quotes | On

The following are quotes on Krafft:

> "Unaware of most of the discussion, the Magdeburg Mayer Otto Guericke **started experimenting with his air-pump around 1647**. His aim was to establish the existence of a vacuum by creating one? Although his research fitted well into the on-going discussion, Von Guericke's involvement was spurred by a different concern. The invention of his machine had as its main purpose the refutation of Descartes' cosmology and his related ideas on space and matter."
>
> — Anne Helden (1991), "The Age of the Air-Pump" (pg. 151); per citation of Fritz Krafft (1978) and his *Otto von Guericke* (pgs. 55-57) [1]

References

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(b) Helden, Anne. (1991). "The Age of the Air-Pump" (pdf), *Tractrix: Yearbook for the History of Science, Medicine, Technology, and Mathematics*, 3:149-72.
2. Fritz Krafft (curriculum vitae) – Academia.edu.

Further reading

â— Krafft, Fritz. (2013). *Otto von Guericke's New (so-called) Magdeburg Experiments on the Empty Space* (*Otto Von Guerickes Neue (Sogenannte) Magdeburger Versuche über den Leeren Raum*). Publisher.

External links

â— Fritz Krafft (German → English) – Wikipedia.

θΔics

In existographies, **Fritz Lipmann** (1899-1986) (IQ:165|#450) (CR:62) was a German-born American physician and biochemist (CHNOPS-chemist) noted, in thermodynamics, for his 1941 bond energy coupling theory of how activity is powered thermodynamically inside of animate organisms.

Overview

In 1941, Lipmann, in his "Metabolic Generation and Utilization of Phosphate Bond Energy", outlined his ideas on how bond energy were presented as embodied in the now-famous theory of the universal energy currency of phosphates and phosphate bond energy of ATP was presented. [1] The following is an opening excerpt:

> "The recent recognition that in nature there occurs a widespread utilization of phosphate bonds as energy carriers, necessitates a still further revision of the earlier view concerning the biological significance of phosphate turn-over. During various metabolic processes phosphate is introduced into compounds not merely, or at least not solely, to facilitate their breakdown, but as a prospective carrier of energy. The outline of the metabolic generation and the circulation of this peculiar type of chemical energy is the primary purpose of this paper."

In this work, Lipmann showed how the energy released from the high energy phosphate triple bond can be used to drive many energetically unfavorable biochemical reactions through a mechanism of "energetic coupling" (or free energy coupling). In this period, Lipmann was considered as one of the early experts on the subject of thermodynamics in relation to "energetic coupling" of phosphorylation and oxidation. [2] Out of this work, it is now know that an average person at rest hydrolyzes and produces some 40 kg of ATP per day. [6]

Lipmann's theory of the generalized phosphate bond as a versatile energy distributing system stimulated his 1953 co-win of the Nobel Prize in Physiology or Medicine (along with Hans Krebs) for "his discovery of co-enzyme A and its importance for intermediary metabolism." [9] In this sense, Lipmann's work on energy metabolism acted to form an early basis for biochemical thermodynamics, where Co-A plays a central role. Protein elongation and tyrocidine synthesis, for example, are polymerizations that thermodynamically require energy of activation.

Lewis school

It seems that the theory of phosphate energy coupling has its basis in the Lewis school of thermodynamics. In particular, in developing his theories, Lipmann worked in close collaboration with Danish-born American biochemist Herman Kalckar, who was said to have been trained "in the orbit of the great G.N. Lewis school of thermodynamics". Kalckar had previously (or simultaneously) showed that phosphate compounds could provide energy, by demonstrating that in frog muscles where glycolysis had been inhibited with iodoacetate, muscular contraction continued for a short period using phosphocreatine as a source of energy. [4] This suggested for the first time that phosphate compounds acted as a link between catabolism and anabolism. [5] Beyond this, reference number twenty to Lipmann's paper is Lewis and Randal's famous 1923 *Thermodynamics and the Free Energy of Chemical Substances*; and the symbols for the free energy equations in Lipmann's paper are styled on those of Lewis' notation.

Education

Lipmann completed his MD (1924) and PhD (1927) in biochemistry, both at the University of Berlin. [3]

Influences

Lipmann's work has been influential to American physicist Ronald Fox, in the development of his energy theory of evolution. [7] Lipmann's work on energy coupling was influential to American chemical engineer Libb Thims in his conceptual development of Gibbs free energy coupling in driving the connections of human chemical bonds, e.g. how powerful family bonds and associations can promote nepotism or drive weaker offspring reactions, that wouldn't normally go on their own. [8]

Quotes | On

The following are quotes on Lipmann:

> "Two groups of important discoveries nourish the thinking of [post Lamarckian-Darwinian] biologists today. For the one part, the astonishing progress since **Fritz Lipmann** in the domain of bioenergetics and for the other, the impetus which thermodynamics has assumed under the fertile impulse of the genius of Prigogine. We are thus led to relegate the panoply of classic concepts as accessories and to **re-think** (see: unlearn) biological facts from the viewpoint of thermodynamics."
>
> — Ernest Schoffeniels (1973), *Anti-Chance* (pg. xi)

> "On the basis of his achievements, Lipmann was unquestionably, a **biochemical genius**. How these achievements were made, however, differ from the expected characteristics of a scientist of such stature. To begin with, he was either unwilling or unable to follow a complicated argument. It was not unusual for him to state that he could not follow the logic of a seminar or a personal conversation. When he wanted to understand a train of thought he asked question after question to get the speaker to make smaller and smaller steps between an observation and conclusion. As a result of this much closer scrutiny, Lipmann might find that a conclusion was untenable. I believe that this constant striving to simplify contributed to his success. His curiosity and desire to learn also prompted him to ask many questions of a general nature, that might seem elementary for a first year graduate student. This curiosity and enthusiasm never waned. After understanding the background of a problem, however, he was often able to make incisive comments or pose questions that helped to clarify ideas and concepts. Nearly everyone who came into contact with him held high regard for his scientific intuition. The source of this astuteness, however, might defy or transcend apparent logic. Lipmann wrote that he lacked the ability to make a good impression. Although he spent considerable time preparing for various symposium talks, he was not a gifted speaker. He was also ill at ease in answering questions after his seminars. After contemplating a question for several days (or months), he might formulate a new line of experimentation which went further than any implications that the questioner might have originally had in mind. Although his **thought processes** may have lacked speed, they certainly possessed **undeniable power**."
>
> — Robert Roskoski (1987) "Lipmann Obituary", *Trends in Biochemical Sciences* [10]

Quotes | By

The following are quotes by Lipmann:

> "I can't function anymore."
>
> — Fritz Lipmann (1986), "last words" (age 87); stated while preparing a lecture to be delivered at the meeting of the Federal European Biochemical Society, Berlin [10]

See also

â— Walter Lippmann

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2. Lipmann, Fritz, Kaplan, Nathan O., Kennedy, Eugene. (1966). *Current Aspects of Biochemical Energetics: Fritz Lipmann Dedicatory Volume* (pg. 2).
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7. Fox, Ronald F. (1988). *Energy and the Evolution of Life* (sections: Jacket; Preface, pgs. ix-xi; Free energy table, pgs. 16-19). New York: W.H. Freeman and Company.
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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (Google books). Morrisville, NC: LuLu.
9. (a) Nobel Prize Medicine (1953) – NoblePrize.org.
(b) Lipmann, Fritz. (1953). "Development of the Acetylation Problem: A Personal Account." *Nobel Lecture*, Dec. 11.
10. Kleinkauf, Horst; Dohren, Hans Jaenicke, Lothar. (2011). *The Roots of Modern Biochemistry: Fritz Lippmann's Squiggle and its Consequences* (last words, pg. 1; biochemical genius, pg. 49). Walter de Gruyter.

External links

â— Fritz Albert Lipmann – Wikipedia.
â— Fritz Lipmann – NNDB.

θΔics

In hmolscience, **Fritz Sollner** (c.1965-), Söllner or Soellner, is a German environmental economist noted, in human thermodynamics, ecological economics in particular, for his late 1990s work in economics and thermodynamics.

Overview

In 1996, Soller finished his habilitation *Thermodynamik und Umweltökonomie* (*Thermodynamics and Ecological Economics*), in which he attempts to derive a thermodynamics based value theory of environmental economics applicable to the issue of sustainability and macro-economic environmental policy guidance. [1]

In 1997, Sollner, in his "A Reexamination of the Role of Thermodynamics in Environmental Economics", as commented on by Herman Daly and James Kay, extends on his earlier work.

In 1999, Sollner published "Aristotle, Soddy, and the Conflict Between Money and Nature", wherein he comments on Frederick Soddy and money, possibly on the subject of financial thermodynamics. [2]

Education

Sollner completed his BA in business administration in 1987; his PhD in 1990, with a dissertation "The Inflation Tax in Developing Countries"; and habilitation, with a thesis on "Thermodynamics and Environmental Ecology", in 1996, all at the University of Bayreuth. Presently, he is a professor of economics, specializing in finance, at the Technical University of Ilmenau.

References

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(b) Sollner, Fritz. (1996). *Thermodynamik und Umweltökonomie* (*Thermodynamics and Ecological Economics*). Habilitation. Physica, Heidleberg.
2. Söllner, Fritz. (1999). "Aristotle, Soddy, and the Conflict Between Money and Nature", *Journal of Ecology and Conservation*, 8: 97-108.

External links

â— Fritz Söllner (faculty) (German to English) - Technical University of Ilmenau.

θΔics

In human chemistry, **Frode Pedersen** (c.1980-) is a Norwegian literary theorist noted for []

Overview

In 2011, Pedersen, in his paper "Demonic Affinities: On Goethe's *Die Wahlverwandtschaften*", at the Bergen University literature chemistry conference Literature and Chemistry: Elective Affinities, argued that:

> "Goethe's usage of the term 'elective affinity', culled from Bergman's 1775 *De Attractionibus Electivis* (German translation, 1785), referred to the tendency of certain chemical species to form pairs. When extended to the sphere of interpersonal relationships, as is done in Goethe's novel, this has implications for the view on the human as such. If persons behave like chemical species, their behavior must to some extent be pre-determined, with no room for free will. Goethe's thinking on these matters must be viewed in relation to Schelling's philosophy of nature, in which the sphere of nature and the sphere of human consciousness are seen as continuous."

In other words, Pederson attempts to argue that Goethe gathered parts of his chemical philosophy theory from the natural philosophy of German philosopher Friedrich Schelling (1775-1854) (IQ=185-190), whom Goethe had invited to Jena in 1798 where he stayed until 1803. Goethe, supposedly, appreciated the poetic quality of the *Naturphilosophie*, reading *Von der Weltseele*. [2]

Education

Pedersen, currently, is an associate professor of linguistic, literary, and aesthetic studies at the University of Bergen, Norway.

References

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(b) Pratt-Smith, Stella. (2011). "Literature and Chemistry: Elective Affinities" (call for papers) (program) (abs), The British Society for Literature and Science, Interdisciplinary conference organized by the research group Literature and Science, Department of Foreign Languages and Literatures, The University of Bergen 27-28 Oct.
2. Friedrich Schelling – Wikipedia.

External links

â— Frode Helmich Pedersen (faculty) – University of Bergen, Norway.

θΔics

In science, **fugacity**, or "escaping tendency", symbol Ψ (Psi), is a quantity that captures the tendency of a molecular species to escape from the phase in which it is in, when that phase is brought into contact with any other phase not containing that species, defined by the following two conditions: [1]

The first segment of a ten page science cartoon on **fugacity** by Lucas Landherr. [4]

> a. The fugacity of a molecular species is the same in two phases when these phases are in equilibrium as regards the distribution of that species.
> b. The fugacity of a gas approaches the gas pressure as a limiting value if the gas is indefinitely rarefied, i.e. the escaping tendency of a perfect gas is equal to its gas pressure.

(add)

Hmolscience

See main: Social fugacity

In 1934, American sociologist George Homans, in his *An Introduction to Pareto: His Sociology*, in reference to Harvard Pareto circle, in an attempt to clarify Vilfredo Pareto's physico-chemical based definition of socio-economic equilibrium, cited, via footnote, the following 1915 statement by American physical chemist Edward Washburn (Ñº): [2]

> "The effect of any physico-chemical equilibrium, produced by an attempt to alter any one of the factors which influence it, can be qualitatively predicted by means of a theorem formulated by Le Chatelier which may be stated as follows: If an attempt is made to alter any one of the factors (e.g. the temperature or pressure of the system or the **fugacity** of any constituent of the system) which influence any physico-chemical equilibrium, then a shift in the equilibrium will take place in such a direction as to decrease the magnitude of the alteration which would otherwise occur in that factor."

It does not seem, however, that Homans here had any idea what the term "fugacity" meant, as it is one of the more veiled terms in chemical thermodynamics, possibly second only to that of entropy.

In 1987, Mirza Beg, in his *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, employed the fugacity concept in an attempt to quantify or describe the tendency of a human, conceptualized as a fluid-like molecule, to escape his or her society; the following are examples: [3]

> "If the study of **fugacity** is applicable to the escaping tendency of a set of organisms from a certain environment, it could be extended to the process of urbanization. It might be possible to calculate the rate of migration from the rural to the urban areas and later on, the rate of emigration from the country."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. 3)

(add)

References

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2. (a) Washburn, Edward W. (1915). *An Introduction to the Principles of Physical Chemistry* (pg.s 306-07). McGraw-Hill.
(b) Homans, George C. and Curtis, Charles P. (1934). *An Introduction to Pareto: His Sociology* (fugacity, pg. 273). Alfred A. Knopf.
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3. Beg, Mirza Arshad Ali. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (intro) (fugacity, pg. 25). Karachi: The Hamdard Foundation.
4. Shepherd, Dante. (2019). “Fugacity” (artist: Joan Cooke), Science Comic, North Eastern University.

External links

â— Fugacity – Wikipedia.

θΔics

In thermodynamics, a **function** is a mathematical expression of one thermodynamic variable as a function of one or more other thermodynamic variables or quantities.

History

In 1673, German mathematician Gottfried Leibniz introduced the term “function” to describe a quantity related to a curve, such as a curve’s slope at a specific point. [1]

In 1718, Swiss mathematician Johann Bernoulli, father of Hydrodynamics author Daniel Bernoulli, had defined the function as any expression made up of a variable and some constants. [2]

In circa 1734, the familiar notation “f(x)” was introduced through the works of both French mathematician Alexis Clairaut and Swiss mathematician Leonhard Euler. [2] In 1755, Euler was using f(x) to denote the function f applied to the argument x. [3]

The Euler-definition of the function is said to have remained unchanged until French physicist Joseph Fourier introduced the so-called trigonometric series in his investigations of heat flow. [2]

Thermodynamics

The gas laws, beginning with the inception of Boyle’s law in circa 1657, were the first basic thermodynamic functions.

The first main principle and second main principle, developed by Rudolf Clausius from 1850 to 1865, are the two core thermodynamic functions.

The logic of deriving new thermodynamic functions was said to have arisen out of the need to deduce values and interpretations for the entropy and internal energy, which in themselves lack a means of direct physical interpretation or quantification.

The ‘idea’ behind these types of new thermodynamic functions, supposedly, was said to have been first suggested in 1869 by French engineer Francois Massieu as explained in his “characteristic function” as he called it or Massieu functions, as they are called now. [4]

See also

â— Thermodynamic function

References

1. Function (mathematics) – Wikipedia.
2. Eves, Howard. (1990). *Foundations and Fundamental Concepts of Mathematics* (pg. 234-35) *Third Edition*. Dover.
3. Boyer, Carl B., Merzbach, Uta C. (1991). *A History of Mathematics* (pp.439–445). John Wiley & Sons.
4. Author. (1996). “Article”, *Historical Studies in the Physical and Biological Sciences* (pg. 98), Vol 27, Part 1.

θΔics

In physics, **fundamental force**, or "fundamental interaction", refers to a force or exchange force that that cannot be reduced; of which there are four: gravitation (gravity; gravitational force), electromagnetic force, weak force (weak nuclear force), and strong nuclear force (strong interaction).

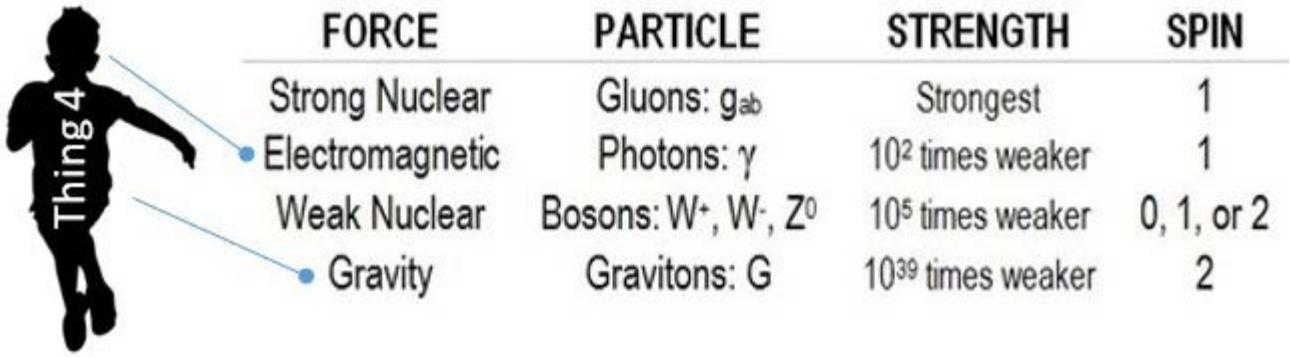

FORCE	PARTICLE	STRENGTH	SPIN
Strong Nuclear	Gluons: g_{ab}	Strongest	1
Electromagnetic	Photons: γ	10^2 times weaker	1
Weak Nuclear	Bosons: W^+, W^-, Z^0	10^5 times weaker	0, 1, or 2
Gravity	Gravitons: G	10^{39} times weaker	2

The four **fundamental forces**: strong nuclear force, electromagnetic force, weak nuclear force, and gravitational force, ordered by strength; in human interactions, the two forces of relevance are the electromagnetic force, which tends works on the mind, e.g. one tends to covet what one sees daily, and the gravitational force, which tends to work on the body, e.g. it regulates the female menstrual cycle (see: in heat).

External links

â— Fundamental interaction – Wikipedia.

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θΔics

In famous publications, "**Further Studies on the Thermal Equilibrium of Gas Molecules**" is a ninety-five page article by Austrian physicist Ludwig Boltzmann, published in October of 1872, which contains what Boltzmann called his 'minimum theorem', later christened the "H-theorem", otherwise known as the Boltzmann equation, the first explicit probabilistic expression for the entropy of an ideal gas. [1] In this paper, called "great paper of 1872", by Boltzmann's biographer Italian physicist Carlo Cercignani, Boltzmann is said to have presented one of the first proofs of the second law. [2]

SITZUNGSBERICHTE

DER KAISERLICHEN

AKADEMIE DER WISSENSCHAFTEN.

MATHEMATISCH-NATURWISSENSCHAFTLICHE CLASSE.

LXVI. BAND. III. HEFT.

Jahrgang 1872. — October.

ZWEITE ABTHEILUNG.

Enthält die Abhandlungen aus dem Gebiete der Mathematik, Physik, Chemie, Mechanik, Meteorologie und Astronomie.

WIEN.

AUS DER K. K. HOF- UND STAATSDRUCKEREI.

IN COMMISSION BEI CARL GEROLD'S SOHN,

BUCHHÄNDLER DER KAISERLICHEN AKADEMIE DER WISSENSCHAFTEN.

1872.

Boltzmann's 1872 "**Further Studies on the Thermal Equilibrium of Gas Molecules**" introduced the H-theorem, the precursor to the $S = k \ln W$ Planck entropy formula.

Discussion

Boltzmann wrote to his mother in Vienna in September 1872 saying that he had given a lecture on his theorem to the Physical Society in Berlin, but that hardly anyone was able to follow him—apart from German physicist Hermann Helmholtz, with whom an interesting discussion developed. [3]

A noted quote from Boltzmann's *Further Studies*, in which he compares people to molecules (human molecules), is: [4]

> "Molecules are like to many individuals, having the most various states of motion, and the properties of gases only remain unaltered because the number of these molecules which on average have a given state of motion is constant."

American chemist Philip Ball claims that the theme of this quote traces to Boltzmann's reading of English historian Henry Buckle's 1861 *History of Civilization*. [5]

References

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(b) Reprinted in: *Wisssenschaftliche Abhandlungen, ed.* F. Hasenohrl, vol.1, pg. 317. J.A. Barth, Leipzig, 1909.
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â— Cohen, E.G.D. and Thirring, W. (1973). *The Boltzmann Equation: Theory and Applications.* Proceedings of the International Symposium "100 Years Boltzmann Equation" in Vienna, 4th-8th September 1972 (Few-Body Systems). Springer.

External links

â— 'Further Studies on the Thermal Equilibrium of Gas Molecules' ($3600) – ManhattenRareBooks-Science.com

θΔics

In genius studies, **future genius** refers to someone, likely synthesized in the years post 300 AG, or equivalent scientifically-neutral dating system, who []. [N1]

Overview

The future genius will:

(a) find the secret principle of the universe;
(b) embody Henry Adams' famous 1910 “call for the aid of **another Newton**", someone who comes forth to give the “complete solution”, as Adams, who worked on the problem through Gibbs, Clausius, Darwin, etc., put it, to the elective affinities problem: explaining morality, sociology, economics, and history, etc., according to chemistry, physics, and mechanics, *via* pure mathematics, symbols, figures, and one "common formula"—in a sense, the "new Goethe";
(c) be the final version of Nietzsche’s 1883 prophesized “final Uberman”;
(d) solve the: gravity/electromagnetic force problem, double slit problem, accelerating universe problem, and the spin-coupling problem (see: modern queries)—all integrated with new findings in particle physics, the final version of quantum mechanics, among other new experimental findings that may arise, all subsumed under the auspices of first law (fundamental law) and second law (supreme law) of thermodynamics—the only science, of universal content, "least likely", in the words of Einstein, to ever be overthrow (unless, of course, it is overthrown).
(e) they will know, without thought, which of the three elements on the adjacent "BaBY GeNiUS" chemical alphabet shirt, are in their atomic composition (see: human molecular formula; hmolscience periodic table) and will understand the uniqueness of this fact in respect to individuality (see: individuality problem), as embodied in "I think therefore I am", human free energy tables, and human free energy of formation.

(add)

Quotes

The following are related quotes:

“It is absurd to hope that **another Newton** will arise in the future who shall make comprehensible by us the production of a blade of grass according to natural laws which no design has ordered.”
— Immanuel Kant (1790), *Critique of Judgment* [3]

“If the physicists and the physico-chemists can at last find their way to an arrangement that would satisfy the sociologists and the historians, the problem would be wholly solved. Such a complete solution seems not impossible; but at present—for the moment—as far as the stream runs—it also seems, to an impartial bystander, to call for the aid of **another Newton**.”

— Henry Adams (1910), *A Letter to American Teachers of History* [1]

“… emergence, the physicochemical, the organismal, the mental and the social. Hence, it till the advent of a **few super-Einsteins**, theoretical biology must stand as a combination of oppositions—a *compositio oppositorum*.”

— William Wheeler (c.1935), “Essay”

"Science has not yet produced the Vignola of its ensemble architecture—**the 'Newton'** called for by Adams."

— Roderick Seidenberg (1950), *Post-Historic Man* (pg. 163)

"Another option is to admit the inadequacy of all current approaches and to wait for the appearance of **the 'Galileo'** or the **'Newton' of sociology** to come along with a new approach that will solve all the problems."

— Jane Azevedo (1997), *Mapping Reality* [4]

"Where will the **next Einstein** lead scientific thinking?"

— Chris Quigg (2004), "Physics of the Large Hadron Collider Workshop" (Ñº)

"The physics of the point that existed 13.7 billion years ago is mostly beyond our imaginations, not to mention our conceptual tools. Gravity, electromagnetism—all the forces at work around us did not have an independent existence. Matter as we know it didn't exist. With everything that would become the universe packed so tightly in one spot, there was an enormous amount of energy. In such a universe, the physics of small particles, quantum mechanics, and that of large bodies, general relativity, were somehow part of a single, overarching, and still unknown theory. Just what that theory is awaits the **next Einstein**."

— Neil Shubin (2013), *The Universe Within* [2]

References

1. Adams, Henry. (1910). *A Letter to American Teachers of History*. Washington.
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3. (a) Kant, Immanuel. (1790). *Critique of Judgment* (Ñº). Publisher.
(b) Henderson, Lawrence J. (1917). *The Order of Nature* (pg. 59). Harvard University Press.
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Notes

N1. This page was started (Jul 2018) as an expansion of the IQ 235 "future genius" section, above Goethe, in the top 1000 geniuses page, following queried discussion (Ñº) of specifics of the future genius.

θΔics

In science, **fuzzy entropy** is the entropy of a fuzzy set, loosely representing the information of uncertainty. [1] The fuzzy entropy is peculiar to mathematics, information theory, and computer science, tracing to the fuzzy set (1965) and fuzzy logic (1973) theories of Iranian-born American electrical engineer and computer scientist Lotfi Zadeh, who extended the Claude Shannon entropy theory to be applied as a fuzzy entropy of a fuzzy subset for a finite set. [2] The conception of fuzzy entropy, in some publications, seems to find crude overlap, carrying thermodynamic connotations into other fields, although mostly baseless.

Human systems

In 1992, Polish-born, American industrial engineer Waldemar Karwowski developed a theory of human entropy, in what seems to be based on fuzzy entropy logic. [3] The French website EntropyAndThen.net run by a Joseph Martin, for instance, is devoted to the calculations of fuzzy entropy production by humans. [4] It is extremely likely, however, that these extraplations have little merit.

References

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(b) Karwowski, Waldemar. (1995). “A general modeling framework for the human-computer interaction based on the principle of ergonomic compatibility requirements and human entropy.” In Grieco, A. Molteni, G., Occhipinti, E. and Piccoli, B. (eds.) *Work witrh Display Units 94* (Amesterda: North-Holland), pgs. 473-8.
4. Fuzzy Entropy (definition) – EntropyAndThen.net

Further reading

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θΔics

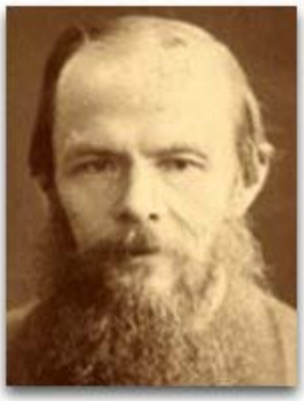

In existographies, **Fyodor Dostoyevsky** (1821-1881) (IQ:180|#118) [RGM:44|1,500+] (Gottlieb 1000:77) (Murray 4000:11|WL) (GLA:30|43+) (CR:50) was a Russian novelist, psychologist (Nietzsche, 1887), and moral philosopher, noted for his 1864 *Notes From the Underground*, his 1866 *Crime and Punishment*, wherein he employs Adolphe Quetelet's social physics, and for his 1880 *The Brothers Karamazov*, which enters deeply into the ethical debates on the existence of god, free will, and morality, in which the character Ivan Karamazov espouses the Dostoyevsky dilemma.

Influences

In the 1840s, Dostoyevsky, via the Petrashevsky Circle (Q), came under the influence (Q) of utopian social physics of Charles Fourier

Dostoyevsky read Henry Buckle's *History of Civilization in England* (1861) twice; a book itself based on Adolphe Quetelet's *Essay on Social Physics*. [7]

Underground man

In 1864, Dostoyevsky, in his *Notes From the Underground*, has his character the underground man imagine a scientist telling him:

> "Nature doesn't consult you; it doesn't give a damn for you wishes or whether its laws please you or do not please you. You must accept it as it is."

to which the underground man replies:

> "Good god, what do I care about the laws of nature and arithmetic if for one reason or another, I don't like these laws."

American physicist Steven Weinberg (1992) comments on this: [6]

> "At its nuttiest extreme are those with holistics in their heads, those whose reaction to reductionism takes the form of a a belief in psychic energies, life forces that cannot be described in terms of the ordinary laws of inanimate nature."

Weinberg elaborates:

> "The reductionist worldview *is* chilling and impersonal. It has to be accepted as it is, not because we like it, but because that is the way the world works."

Weinberg, here, in his mention of "chilling", obviously has not heard of Goethe and his human chemical theory of elective affinities, both in the form of interpersonal elective affinities and social elective affinities, which forms the basis or rather mechanistic understanding of human chemical thermodynamics.

Crime and Punishment

In 1865, Dostoyevsky read Adolphe Quetelet's social physics (1835) ideas, wherein Quetelet argues, based on

statistical methods, that one could predict the percentage of the population that would murder, turn to prostitution, marry, divorce, commit suicide, etc., and thus in Quetelet's 'social physics', crime is regarded as an unavoidable fact of life. [4] [N1]

In 1866, Dostoyevsky penned *Crime and Punishment*, wherein he incorporated the logic of Quetelet's social physics. [3]

In *Crime and Punishment*, the character Raskolnikov, specifically, is said to apply Quetelet's social theory to the young women he meets on the street, reasoning that there is no point in helping her, since her fate had already been determined statistically by the laws of social physics. In this example, according to a review by Harold Bloom, Dostoevsky is said to be exemplifying "how the laws of social physics conflict with Christ's commandment to love one's neighbor." (see: Bible vs. physical science conflicts) [4]

The following are selected end notes (O) from chapter 5 of the Literary Touchstone Edition of *Crime and Punishment*, showing some of the influences on Dostoyevsky, such as Charles Fourier, Newton, Kepler, Lycurgus, Solon, Napoleon, and ideas such as "the soul is reactionary".

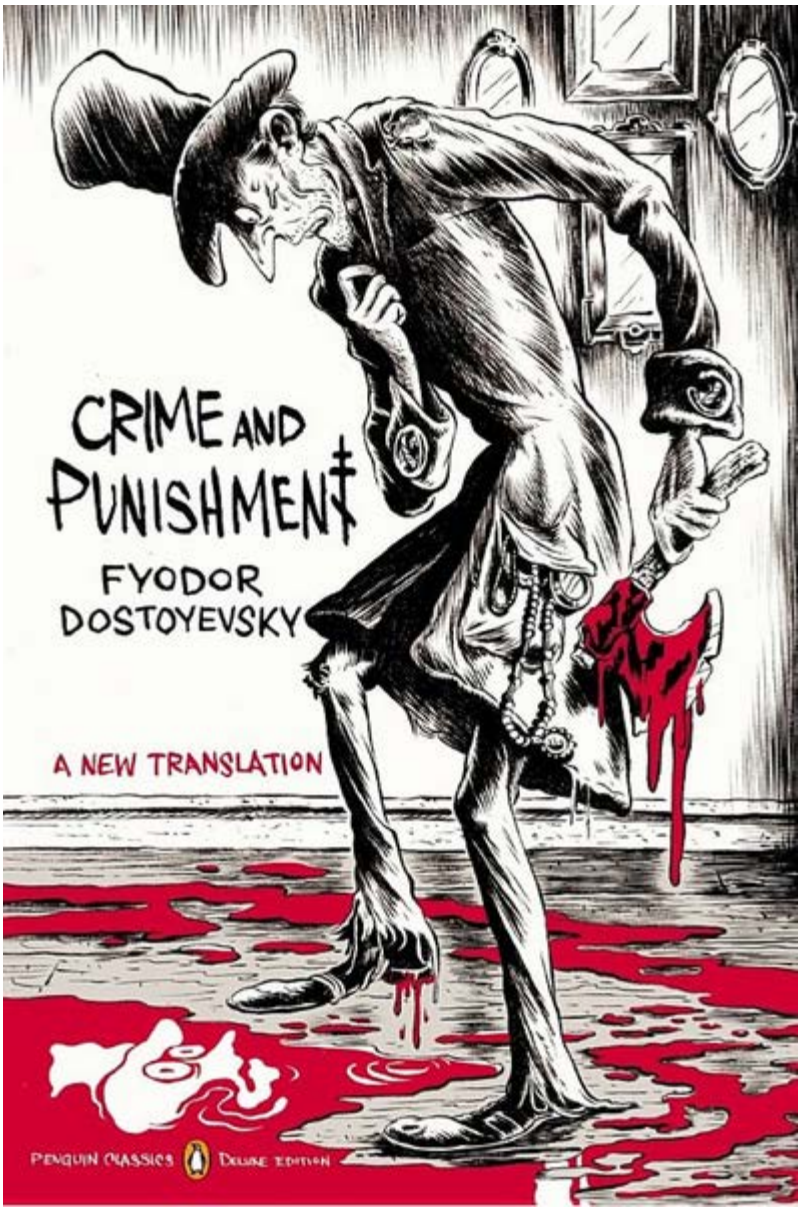

CHAPTER V

"It began...causes admitted!..." – Razumihin is stating that in socialism, the cause of a crime is only an individual's protesting against society. This theory removes the blame for the crime from the individual. The idea is in sharp contrast to Razkolnikov's internal guilt.

"the soul is reactionary" – Dostoevsky is saying that a person's soul is the exact opposite of what socialism declares it to be. Therefore, a human soul cannot co-exist within a socialist society.

phalanstery – buildings in a self-sustaining community; this represents the ideal social organization for living put forth by a French Utopian socialist, Charles Fourier [See note *"the system of Fourier and the Darwinian theory"* in Part V, Chapter 1.]

Ivan the Great – Ivan III Vasilevich (1440-1505), the prestigious grand duke of Moscow from 1462-1505; among his many triumphs as duke was the freeing Moscow from the rule of the Tatars (1480). He became known as the "Grand Duke of all the Russias."

"Kepler and Newton" – Johannes Kepler (1571-1630), a German mathematician and astronomer is regarded as the founder of modern astronomy. Kepler's three laws describe planetary movement as they orbit the sun.
Nearly 60 years after Kepler's death, an English mathematician and physicist, Sir Issac Newton, (1642-1727) created a theory discussing universal gravitation using Kepler's laws as a guide. Newton also developed theories about the nature of light and invented calculus.

Lycurgus, Solon, Mahomet, Napoleon – The Lycurgus (c. 9th century B.C.) reference most likely applies to the celebrated lawgiver responsible for transforming Spartan society.
Solon (c.639-559 B.C.) was an Athenian poet and lawmaker who eventually wrote the constitution. He created laws for the good of the people: among many others, he introduced the trial by jury concept, and created child protection laws.

(add)

Brothers Karamazov

In 1880, Dostoyevsky, in his *The Brothers Karamazov*, entered deeply into the ethical debates on the existence of God, free will, and morality, in which the character Ivan Karamazov espouses the Dostoyevsky dilemma: [1]

> "If god does not exist, everything is permissible."

This assertion, known as the Dostoyevsky dilemma, according to Jean-Paul Sartre (1945), is the starting point of existentialism. [2]

The "everything is permissible" assertion, for many, tends to equate to the logic that "no god = no immorality", which translates to the belief that in a godless world there is no virtue, or something along these lines. (Q)

Nihilism

Dostoyevsky's 1872 novel *The Possessed*, according to French philosopher Albert Camus (Q), is a prophecy about the devastating effects of nihilism.

Other

In genius rankings, Dostoyevsky has the eleventh highest “space allocation” ranking in 2002 western literature. [5]

Quotes | On

The following are quotes on Dostoyevsky:

> “Dostoyevsky is the only psychologist from whom I have anything to learn.”
>
> — Friedrich Nietzsche (1887) (Q)

> “Dostoyevsky gives me more than any scientist, more than Gauss.”
>
> — Albert Einstein (c.1930) (Q)

> “Dostoyevsky wrote of the unconscious as if it were conscious; that is in reality the reason why his characters seem ‘pathological’, while they are only visualized more clearly than any other figures in imaginative literature. He was in the rank in which we set Dante, Shakespeare and Goethe.”
>
> — Edwin Muir (c.1940) (Q)

> “**Dostoyevsky** lived a century and a hemisphere away from Walker Percy. During his early association with the Petrashevsky Circle (Q), a group of intellectuals attracted to the utopian socialism of Charles Fourier and to Western European liberalism generally, Dostoyevsky wrote his first novel, *Poor Folk*, as a reformer with seemingly clear political intent. But he soon took a radically different course. After his 1849 arrest by tsarist authorities and subsequent imprisonment in Siberia, Dostoyevsky reclaimed his inherited Orthodox faith and mounted a vehement critique of modern Western ideologies in his major novels *Crime and Punishment*, *The Idiot*, *The Possessed*, and *The Brothers Karamazov*. *Notes from Underground*, published in 1864, ‘initiates the exploration of human separation from god’ that dominates these mature works." Furthermore, *Notes* arguably remains Dostoyevsky's ‘most profound statement of the human need for Christ’.”
>
> — Farrell O’Gorman (2013), “Confessing the Horrors of Radical Individualism in *Lancelot* (Q)

Quotes | By

The following are related quotes by Dostoyevsky:

> “Man—the meaning of man and of life—is a mystery: if you spend your entire life trying to puzzle it out, then do not say that you have wasted your time. I occupy myself with this mystery, because I want to be a man.”
>
> — Fyodor Dostoevsky (1839), personal correspondence (Q)

> “I want to say to you, about myself, that I am a child of this age, a child of unfaith and skepticism, and probably (indeed I know it) shall remain so to the end of my life. How dreadfully has it tormented me (and torments me even now) this longing for faith, which is all the stronger for the proofs I have against it. And yet god gives me sometimes moments of perfect peace; in such moments, I love and believe that I am

loved; in such moments, I have formulated my creed, wherein all is clear and holy to me. This creed is extremely simple; here it is: I believe that there is nothing lovelier, deeper, more sympathetic, more rational, more manly, and more perfect than the savior; I say to myself with jealous love that not only is there no one else like Him, but that there could be no one. I would even say more: If anyone could prove to me that Christ is outside the truth, and if the truth really did exclude Christ, I should prefer to stay with Christ and not with truth."

— Fyodor Dostoyevsky (1854), "Letter to N.D. Fonvisin" (Q)

"You say, science itself will teach man that he does not really have either caprice or will of his own and that he has never had it, and that he himself is something like a piano key or an organ stop, and that, moreover, laws of nature exist in this world, so that everything he does is not done by his 'will' at all, but is done by itself, according to the laws of nature. Consequently, we have only to discover these laws of nature, and man will no longer be responsible for his actions and life will become exceedingly easy for him."

— Fyodor Dostoyevsky (1864), *Notes From the Underground* (pg. #); supposedly, a satirical response to the view of Nikolay Chernyshevsky (1860), as summarized by George Scott (1985) in *Atoms of the Living Flame* (pg. 117)

"I could not become anything; neither good nor bad; neither a scoundrel nor an honest man; neither a hero nor an insect. And now I am eking out my days in my corner, taunting myself with the bitter and entirely useless consolation that an intelligent man cannot seriously become anything, that only a fool can become something."

— Fyodor Dostoyevsky (c.1875) (Q)

"Love in action is a harsh and dreadful thing compared with love in dreams."

— Fyodor Dostoyevsky (c.1860), *Publication*

Notes

N1. In modern terms, to note, these unavoidable facts are quantified by the Lewis inequality for unnatural processes viewed in the context of thermodynamic coupling.

See also

- Leo Tolstoy
- Melchior Lengyel | It's a Chemical Reaction, That's All

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3. Crime and Punishment – Wikipedia.
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5. Human Accomplishment – Wikipedia.
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7. Mlodinow, Leonard. (2009). *The Drunkard's Walk: How Randomness Rules Our Lives* (pg. 159). Random House.

External links

- Fyodor Dostoyevsky – Wikipedia.

θΔics

In symbols, **G** is mathematical shorthand for Gibbs free energy, defined by the function:

$$G = U + PV - TS$$

or

$$G = H - TS$$

The expression is named after American engineer Willard Gibbs.

Etymology

In the first 75-years of thermodynamics, different symbols were assigned to different functions. In 1897, referring to the 1882 words of Hermann Helmholtz, Max Planck states that the following formula:

$$G = U - F = T\Phi$$

is the *latent energy* (gebundene energy) of the system. [1] A number of other formulations came about in the mean time. In 1933, however, English chemical thermodynamicist Edward Guggenheim set the following definition in stone: [2]

> "The function G [H–TS] is due to Gibbs, and is often referred to by modern writers as 'free energy'. We shall call *G* the 'Gibbs free energy'."

Hence, ever since, G as referred to Gibbs free energy.

Gibbs energy

In circa 1980, IUPAC made an attempt to "banish" the term 'free' from the name Gibbs free energy, replacing it with Gibbs energy, symbol G. [3] This effort, however, has had a marginal effect.

References

1. Planck, Max. (1897). *Treatise on Thermodynamics* (G, pg. 113). Longmans, Green and Co.
2. Guggenheim, Edward, A. (1933). *Modern Thermodynamics by the Methods of Willard Gibbs* (pg. 11). London: Methuen & Co.
3. (a) Battino, Rubin. (2001). "Ch. 4: A Brief History of Thermodynamics Notation", in: *Drug-Receptor Thermodynamics: Introduction and Application* by Robert Raffa. Wiley.
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θΔics

In economic thermodynamics, **Gabriel Alfredo Lozada** (1959-) is an American economist noted for his 1999 to 2005 ideas to promote what seems to be Roegen-Daly school and or material entropy ideas about how entropy change, not free energy change, is behind economic processes.

Overview

In 1999, Lozada, in his *Economics, Entropy, and the Environment*, co-written with Thomas Beard, in which the included a chapter entitled "An Economists' Primer on Thermodynamics", wherein they seem to grease the wheel of ideas to allow for digestion of Nicholas Georgescu-Roegen.

In 2005, Lozada, in his "Entropy, Free Energy, Work, and other Thermodynamic Variables in Economics", interestingly, Lozada takes aim at American geologist Stephen Gillett's effort to apply Gibbs free energy concepts in economics (in place of the Roegen-Daly school concept of "low entropy"), but in the end, following a rather incongruous and haphazard attempt at derivation and argument, concludes, in what seems to be in complete ignorance of the nearly 300-year history of chemical thermodynamics, that: [2]

> "It is not free energy change, which in general determines the direction of spontaneous change, but entropy change. It is shown that changes in free energy as traditionally defined are not, in general, related to the amount of work a system can perform. Free energy is *not* related to economic value. It is unclear how free energy could have any economic importance."

Correctly, Lozada would be wise to heed the following words of American physical chemist Thomas Wallace, who in his 2009 appendix section "Fundamentals of Thermodynamics Applied to Socioeconomics", states as a matter of scientific fact: [3]

> "The spontaneity of a thermodynamic process is measured by its free energy change, ΔG, and is mathematically represented at constant temperature as $\Delta G = \Delta H - T\Delta S$. For a process to be spontaneous and irreversible, its free energy change is required to be a negative quantity. The system undergoes change as a result of, and at the expense of, free energy. The thermodynamic parameter free energy represents the fundamental driving force in nature and determines whether physical and chemical processes conducted by nature and society will take place."

Here, without going into too much detail, Lozada is an example of an economist attempting to teach physical chemistry, having no prior training, and as a result he seems to be completely in the dark of the fact that German physicist Hermann Helmholtz, in his 1882 "On the Thermodynamics of Chemical Processes", famously proved that free energy is the driving force of chemical processes, thus disproving the Thomsen-Berthelot principle. The general issue seems to be that Lozada's underlying agenda is to justify the now-defunct 1971 material entropy theory of Romanian mathematician Nicholas Georgescu.

Education

Lozada completed his PhD in 1987 with a dissertation on "Equilibrium in Exhaustible Resource Industries" in economics at Stanford University. Currently he is an economics professor at the University of Utah.

References

1. Beard, Thomas R. and Lozada, Gabriel A. (1999). *Economics, Entropy, and the Environment: the Extraordinary Economics of Nicholas Georgescu-Roegen* (ch. 5: An Economists Primer on Thermodynamics, pgs. 83-98 (Q); ch. 6: Thermodynamics and Georgescu-Roegen's Economics, pgs. 99-119). Edward Elgar Publishing.
2. (a) Lozada, Gabriel A. (2005). "Entropy, Free Energy, Work, and other Thermodynamic Variables in Economics",

Ecological Economics, 56: 71-78.
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(c) Gillett, Stephen L. (2005b). "Entropy and its misuse, II. Matter matters less. *Ecological Economics*.
3. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (§A: The Fundamentals of Thermodynamics Applied to Socioeconomics, pgs. 469-90). AuthorHouse.

Further reading

● Mirowski, Philip. (2001). Review of T. Beard & G. Lozada, *Economics, Entropy and the Environment* in *Economic Journal*, June.
● Lozada, Gabriel. (2004). "Entropy and the Economic Process", in: *Encyclopedia of Energy*, Volume 2, 471-78. Elsevier.

External links

● Gabriel Lozada (faculty) – University of Utah.
● Lozada, Gabriel A. (1959-) – WorldCat Identities.

θΔics

In existographies, **Gabriel Naude** (1600-1653) was an Italian physician, librarian, and remembered-as-atheist, noted for []

Quotes | By

The following are quotes by Naude:

> "A library should not be without Sextus Empiricus and the two best books in the world are the Bible and Pierre Charron's *Of Wisdom*."
>
> — Gabriel Naude (c.1640), reply to cardinal Bagini on what were the two best books in the world [1]

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 308). HarperOne.

External links

â— Gabriel Naude – Wikipedia.

θΔics

In existographies, **Gabriel Tarde** (1843-1904) (CR:6) was French sociologist and criminal psychologist, who is categorized with Auguste Comte, in theme, and Emile Durkheim, whom he debated with, who is noted, in hmolscience, for his 1893 *Monadology and Sociology*, wherein he applied Gottfried Leibniz' one nature universal monad or monadology theory, intermixed with semi-modern chemistry and physics, to social theory and questions, according to which he conceived sociology as based on small psychological interactions among individuals—much as if it were chemistry—the fundamental forces being imitation and innovation.

Chemical affinity | War

Tarde seems to have promulgated some type of chemical affinity themed collision theory of war; a summary of which is as follows: [2]

> "All forms of biological, social, and even physical battle terminate in victory for the stronger, called in biology survival of the fittest. This is as true for the competition of physical forces or chemical affinities as it is for the completion of species or nations—whence there follows a selection, alternately physical, biological, or social, whose main property is elimination or purification but not creation."

Tarde elaborates on this as follows:

> "What is the harmonious accord of two invisible movements produced by chemical combinations. Conversely, the clearest form of physical opposition is an impact, the encounter of two diametrically opposed movements on the same straight line. The sharpest form of biological opposition is *murder* in the most general sense of the term, which includes the suffocation of one plant by another or the destruction of a plant by an animal as well as a fatal duel between two animals. The most violent form of social opposition is *war*, which appears to be no more than the magnification of an animal duel but which basically differs greatly from the latter by the nature and precise awareness of its internal cause: the *contradiction* of judgments or the contrariness of the schemes involved."

(add)

Influence

Tarde's work, supposedly, has been influential to Sigmund Freud and Bruno Latour.

Quotes | Employed

The following are quotes cited by Tarde:

> "Organic nature, as well as mineral nature, operates like human industry, by which I mean that it harmonizes irreconcilable effects in absolute geometry. These approximate arrangements yield different degrees and multiple solutions in series of crystals as well as in the series of living beings. This is also the necessary rule for human societies."
>
> — Marcellin Berthelot (1893) [2]

References

1. Tarde, Gabriel. (1893). *Monadology and Sociology*. Re Press, 2011.
2. Tarde, Gabriel. (2010). *Gabriel Tarde on Communication and Social Influence: Selected Papers* (translator: Terry

Clark) (pgs. 146-47). University of Chicago Press.
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(b) Tarde, Gabriel. (2010). *Gabriel Tarde on Communication and Social Influence: Selected Papers* (translator: Terry Clark) (pg. 271). University of Chicago Press.

Further reading

â— Tarde, Gabriel. (1898). *Social Laws: an Outline of Sociology* (translator: Howard Warren). Publisher.

External links

â— Gabriel Tarde – Wikipedia.

θΔics

In existographies, **Galen** (130-210AD) (IQ:170|#370) (Cattell 1000:443) [RGM:290|1,500+] (Murray 4000:4|Med) (CR:11) was a Greek physician, surgeon, and philosopher; general curator of the innate heat model of heart function (later discarded by da Vinci); noted for []

Quotes | On

The following are quotes on Galen:

> "The handling of final causes, mixed with the rest in physical inquiries, hath intercepted the severe and diligent inquiry of all real and physical causes, and given men the occasion to stay upon these satisfactory and specious causes, to the great arrest and prejudice of further discovery. For this I find done not only by Plato, who ever anchoreth upon that shore, but by Aristotle, **Galen**, and others which do usually likewise fall upon these flats of discoursing causes. For to say that "the hairs of the eyelids are for a quickset and fence about the sight;" or that "the firmness of the skins and hides of living creatures is to defend them from the extremities of heat or cold;" or that "the bones are for the columns or beams, whereupon the frames of the bodies of living creatures are built;" or that "the leaves of trees are for protecting of the fruit;" or that "the clouds are for watering of the earth;" or that "the solidness of the earth is for the station and mansion of living creatures;" and the like, is well inquired and collected in metaphysic, but in physic they are impertinent. Nay, they are, indeed, but *remoras* and hindrances to stay and slug the ship from further sailing; and have brought this to pass, that the search of the physical causes hath been neglected and passed in silence. And, therefore, the natural philosophy of Democritus and some others, who did not suppose a mind or reason in the frame of things, but attributed the form thereof able to maintain itself to infinite essays or proofs of nature, which they term fortune, seemeth to me (as far as I can judge by the recital and fragments which remain unto us) in particularities of physical causes more real and better inquired than that of Aristotle and Plato."
>
> — Francis Bacon (1605), *Advancement of Learning* [1]

Quotes | By

The following are quotes by Galen:

> "Employment is nature's physician and is essential to human happiness."
>
> — Galen (c.200) (Ñº)

> "One could say that everything is 'one' in nature and in power, as Epicurus, Democritus, and their followers say of the atoms."
>
> — Galen (c.200), *On the Elements: According to Hippocrates* (I.2) [2]

References

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2.Taylor, C.C.W. (1999). *The Atomists: Leucippus and Democritus: Fragments: a Text and Translation with a Commentary by C.C.W. Taylor* (pg. 80). University of Toronto Press.

External links

â— Galen – Wikipedia.

θΔics

In human thermodynamics, **Galen J. Wilkerson** (c.1971-) is an American applied computer scientist noted for []

Overview

In 2012, Wilkerson initiated a thermodynamics of human mobility research project, which he summarizes as follows: [1]

> "The city can be seen as an organism, with flows of people, energy, and waste. New mobility data lets us look at something that has been hard to understand until now: the urban 'metabolism'. Mobility requires energy, either in the form of automobile driving or other forms of transportation. Houses require mobility to exist. A house far away from commonly visited places or jobs markets requires a lot of mobility. This is a fundamental source of energy consumption, hence CO_2 emissions and climate change. We wish to first estimate energy budget of geographic areas, then see if we can begin to understand them using physical models of kinetic and potential energy, i.e. how much we move around and how far we live from those places we visit. Understanding this can let us do many thing: understand populations that are underserved, understand what kinds of cities are 'efficient' and what are not, and perhaps begin to understand fundamental 'laws' about how people move."

Wilkerson's project is a type of applied human thermodynamics, wherein he is attempting to use cellular tracking data, computer programming, and physics models formulate concepts such as "social heat map" (see: social heat) based on mobility and density patterns in cities, perhaps using a mixture of complexity theory, statistical physics, and a Hamiltonian formalism approach. A visual outline of his project proposal is shown adjacent. [2]

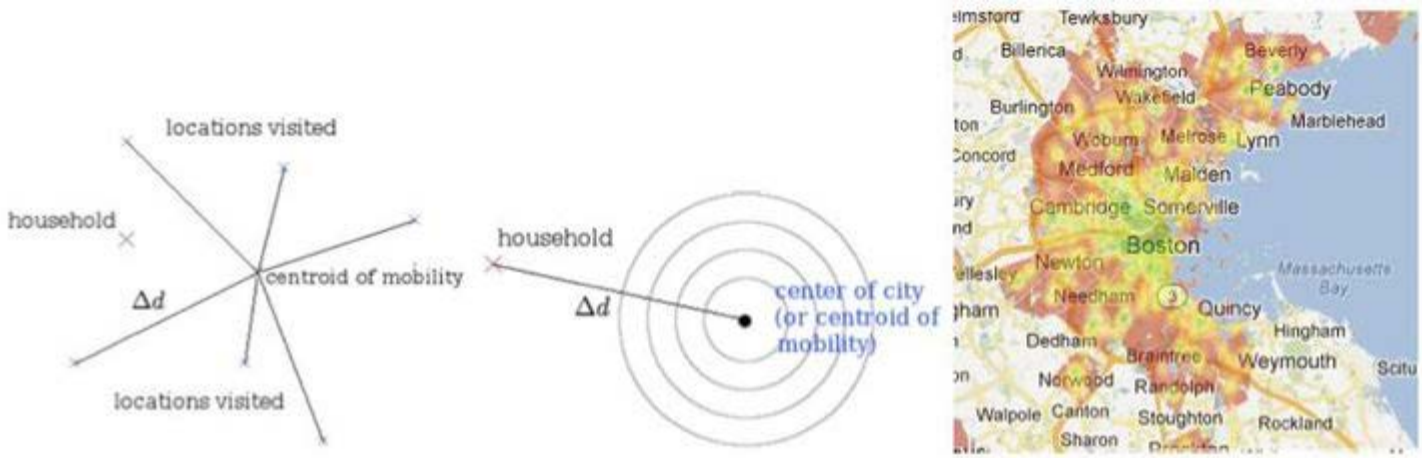

Wilkerson's **mobility energy model**, from left to right: kinetic energy model, potential energy model, and a simulated social heat map (see: social heat). [2]

Education

Wilkerson completed a BA in political science in 1993 and a BS in computer science in 2003 both at the University of Maryland; he completed two years of graduate work in natural resources and mathematics and the University of Vermont; he completed a MS in computer science at Northeastern University, Boston, in 2012. [2]

Currently, Wilkerson is working on a "thermodynamics of human mobility" research project, possibly to be turned PhD dissertation, pending funding, with Felix Creutzig's energy assessment of economics of sustainable transport and land use group at the Technical University of Berlin, wherein he is attempting to apply kinetic energy and potential energy models, mixed in with cellular, internet, and GPS tracking methods, to formulate thermodynamic-based computer models of energy use. [3]

See also

â— Human thermodynamic instruments

â— Human molecular orbital theory

References

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(b) Felix Creutzig (about) – Technical University Berlin.
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3. Galen J. Wilkerson (cv) – Erinmez.com.tr.

θΔics

In existographies, **Galileo Galilei** (1564-1642) (IQ:195|#9) (Cattell 1000:46) [RGM:4|1,500+] (Murray 4000:2|CS / 5|P / 2|A) (EP:10) [GPE:5] (GAE:2) [CR:273] was an Italian physicist, astronomer, and philosopher, noted for his 1632 *The Assayer*, wherein he states that the motion of atoms is the cause or perception of what we call heat, and for his 1632 *Dialogue concerning the Two New Sciences* (*Discorsi e dimostrazioni matematiche intorno a due nuove scienze*), wherein he presents his Galileo engine, a device for testing the strength of the vacuum.

Influenced

Galileo had immediate influence on the following people:

- Giovanni Baliani
- Gasparo Berti | Berti vacuum experiment

  → Athanasius Kircher
  → Rafael Magiotti
  → Niccolo Zucchi
  → Emmanuel Maignan

- Evangelista Torricelli | Torricelli vacuum

  → Vincenzo Viviani

- Blaise Pascal | Pascal atmospheric pressure experiment

Thermometer

In 1592, Galileo constructed a thermometer, using expansion and contraction of air, in a bulb, to move water in an attached tube. [1]

This device, in the words of his associate Francesco Sagredo (1613), who used the device for measuring the difference in temperature between air, snow, and ice, was "an instrument for measuring heat." [2]

Copernicus

In 1596, Galileo, age 32, received a copy of an age 25 Johannes Kepler's *The Cosmic Mystery*, the first book to use a Copernican system model of the universe; Galileo replied as follows: [11]

> “Many years ago, I accepted Copernicus’ theory, and from that point of view I discovered the reasons for numerous natural phenomena which unquestionably cannot be explained by the conventional cosmology. I have written down many arguments as well as refutations of objections. These, however, I have not dared to publish up to now. For I am thoroughly frightened by what happened to our master, Copernicus. Although he won immortal fame among some persons, nevertheless among countless – for so large is the number of fools – he became a target of ridicule and derision. I would of course have the courage to make my thoughts public, if there were more people like you. But since there aren’t, I shall avoid this kind of activity.”

In 1610, Galileo built a telescope, in Holland, and began doing research with this new instrument, therein discovering things such as that Jupiter has four moons, which revolve about it (not earth); this was the final nail in the coffin of Ptolemaic cosmology. [11]

In 1613, Galileo, in his *Letters on Sunspots*, published his first formal endorsement of Copernican cosmology.

In 1616, the church banned him from teaching Copernican theory.

In 1632, Galileo penned, but did not formerly publish, his *Dialogue Concerning the Two Chief World Systems*, comparing the then controversial Copernican system with the inconsistencies of the older earth-centric Ptolemaic system.

In 1633, he was famously brought to trial (see: religion vs science legal cases) and convicted.

In 1638, Galileo, freed to some extent from the restrictions his trial situation, formally published his *Dialogue Concerning the Two Chief World Systems*, the ideas of which thereafter began to reach the world.The invention of dynamics, as a mathematical science, according to Irish mathematician William Hamilton, was said to have been initiated by this publication. [3]

The Assayer

In 1623, Galileo published *The Assayer* (*Il Saggiatore*), which used so much atomic theory that it was called an Epicurean book; the church attacked the work per reason that it left no reason for the doctrine of transubstantiation. [10]

Vacuums

On 27 Jul 1630, Giovanni Baliani, a physicist and experimenter, wrote to Galileo asking him why a siphon, designed by Galliano, made to carry water over a hill of 21 meters, failed to work? If the tube of the siphon was filled with water by means of a pump, and then the pump was stopped, the water separated high in the tube and flowed out both ends. [12] Galileo responded as follows, namely stated his view that water was like a rope that broke:

> "If hemp or steel cords break under excessive weight, what doubt could we have that a **cord of water will likewise break**? In fact, it will break more easily, insofar as the parts of water, becoming separated from one another, do not have to overcome resistances other than that of the vacuum that is created at the moment of division. This is because in the case of iron and other solids, there is a very strong and tenacious attachment of the parts that is absent in water."
>
> — Galileo (1630), "Letter to Giovani Baliani" (Q), Aug 6

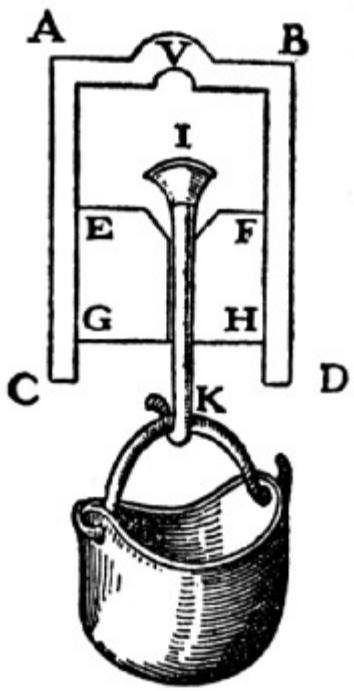

Galileo's 1632 experiment, aka Galileo engine, for testing the "force of the vacuum". [5]

On 22 Feb 1632, Galileo, having thought a good deal about the pump problem, published his opinions on the matter in *Discourses Concerning the Two New Sciences*, wherein he takes up the issue of why water cannot be raised more than a certain height via a thought experiment as illustrated adjacent, wherein CABD represents the cross section of a cylinder of the pump, made of metal or glass, and EGHF is cylinder of wood, fitted into the cylinder, capable of up and down motion, through which a hole is bored through the cylinder to receive an iron wire carrying a hook at the bottom, which has a conical head I at the top of the wire, which makes a perfect fit with the countersunk wooden cylinder.

The cylinder, in the area above the wooden piston, is then filled completely with water, and weights are added gradually, into the bucket (supposedly), until the water separates, i.e. "breaks" (like a rope) as Galileo envisioned things, and the bucket falls, according to which the weight of the stopper, wire, bucket, and contents, thus measures the "force of the vacuum", according to Galileo; he summarized his view as follows:

> "Up to this time, I had been so thoughtless that, although I knew a rope... if sufficiently long would break by its own weight when held at the upper end, it never occurred to me that the same thing would happen only much more easily to a column of water. And really is not that thing which is attracted in the pump [raising water from the well] a column of water attached at the upper end and stretched more and more until

finally a point is reached where it breaks, like a rope, on account of its excessive weight."

— Galileo (1638), *Two New Sciences* (character: Segredo, a challenger of Galileo's views)

"That is precisely the way it works; this fixed elevation of 18 cubits (about 10 m) is true for any quantity of water whatever, be the pump large or small."

— Galileo (1638), *Two New Sciences* (character: Salviati, spokesman for Galileo)

Galileo, in sum, argued that the reason that the siphon failed to work over hills greater than twenty-one meters in height was that it was the power of the vacuum that held the water up, but that past a certain height the amount of water simply became too much and the force could not hold any more, like a cord that can only withstand so much weight hanging from it.

Galileo's friend and student Italian physicist Evangelista Torricelli made the first mercury barometer in 1643 in his investigations of the vacuum.

Education

It would seem that Galileo, in his independent manner of thinking, was influenced greatly by his father Italian musician Vincenzo Galilei who had the anti-appeal to authority mentality that:

"Those who rely simply on the weight of authority to prove any assertion, without searching out the arguments to support it, act absurdly. I wish to question freely and to answer freely without any sort of adulation. That well becomes any who are sincere in the search for truth."

It would well seem that Galileo adopted this motto to the fullest degree.

Quotes | On

The following are notes of praise and or tribute:

"**Galileo** does not say that he admits the operations of heavy air, but persists in asserting that nature also concurs in resisting a vacuum."

— Evangelista Torricelli (1644), "Letter to Michelangelo Ricci", Jun 11 [14]

"Dynamics is the science of accelerating or retarding forces, and of the varied motions which they must produce. This science is wholly due to the moderns, and **Galileo** is the one who threw or made the first foundations."

— Joseph Lagrange (1788), *Analytical Mechanics* (Volume One, pg. 221) [13]

"What the founders of modern science, among them **Galileo**, had to do, was not to criticize and to combat faulty theories, and to correct or replace them by better ones. They had to do something different. They had to destroy one world [view] and to replace it by another. They had to reshape the framework of our intellect itself, to restate and reform its concepts, to evolve a new approach to 'being', an new concept of knowledge, a new concept of science—and even to replace a pretty natural approach, that of common

sense, by another."

— Alexandre Koyre (1943), "Galileo and Plato" [7]

Quotes | By

The following are noted quotes:

"Like you, I accepted the Copernican position several years ago and discovered from thence the causes of many natural effects which are doubtless inexplicable by the current theories. I have written up many of my reasons and refutations on the subject, but I have not dared until now to bring them into the open, being warned by the fortunes of Copernicus himself, our master, who procured immortal fame among a few but stepped down among the great crowd (for the foolish are numerous), only to be derided and dishonored. I would dare publish my thoughts if there were many like you; but, since there are not, I shall forebear."

— Galileo Galilei (1597), "Letter to Johannes Kepler" (Q)

"I think, my Kepler, we will laugh at the extraordinary stupidity of the multitude [common herd]. What do you say to the leading philosophers of the faculty [academy] here, who are filled with the stubbornness of an asp and do not want to look at either the planets, the moon or the telescope, even though I have freely and deliberately offered them the opportunity a thousand times. Truly, just as the asp stops its ears, so do these philosophers shut their eyes to the light of truth."

— Galileo Galilei (1610), "Letter to Johannes Kepler", Aug [9]

"If the vacuum cannot be recognized either by the senses or by the intellect, how have you managed to find out that it does not exist?"

— Galileo (c.1620), annotations, in his copy of Julius Galla's *On the Appearance of the Orbit of the Moon* (*De phaenomenis in orbe lunare*), after the phrase 'concerning the vacuum'; cited by William Middleton (1964) in *The History of the Barometer* (pg. 5)

"Philosophy is written in that great book that lies before our gaze—I mean the universe—but we cannot understand it if we do not first learn the language and grasp the symbols in which it is written."

— Galileo Galilei (1623), *The Assayer* [6]

"The book of nature is written in the language of mathematics and without it one wanders about in a dark labyrinth."

— Galileo Galilei (c.1620) [8]

"I do not think it is necessary to believe that the same god who has given us our senses, reason, and intelligence wished us to abandon their use, giving us by some other means the information that we could gain through them."

— Galileo Galilei (c.1630), in FSM app

"Nothing physical which sense-experience sets before our eyes, or which necessary demonstrations prove to us, ought to be called into question, much less condemned, upon the testimony of biblical passages."

— Galileo Galilei (c.1630) in FSM app

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(c) Dialogue Concerning the Two Chief World Systems – Wikipedia.
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Publications

● Galileo. (1632). *Dialogues Concerning the Two New Sciences* (translators: Henry Crew; Alfonso Salvio). Macmillan, 1914.

External links

● Galileo Galilei – Wikipedia.

θΔics

In engines, **Galileo engine**, or "Galileo vacuum device", refers to a 1632 theoretical vacuum measuring device described by Galileo in his *Dialogues Concerning the Two New Sciences*, in respect to a tentative solution to the pump problem being "vacuum break" in a column of water, in a piston and cylinder.

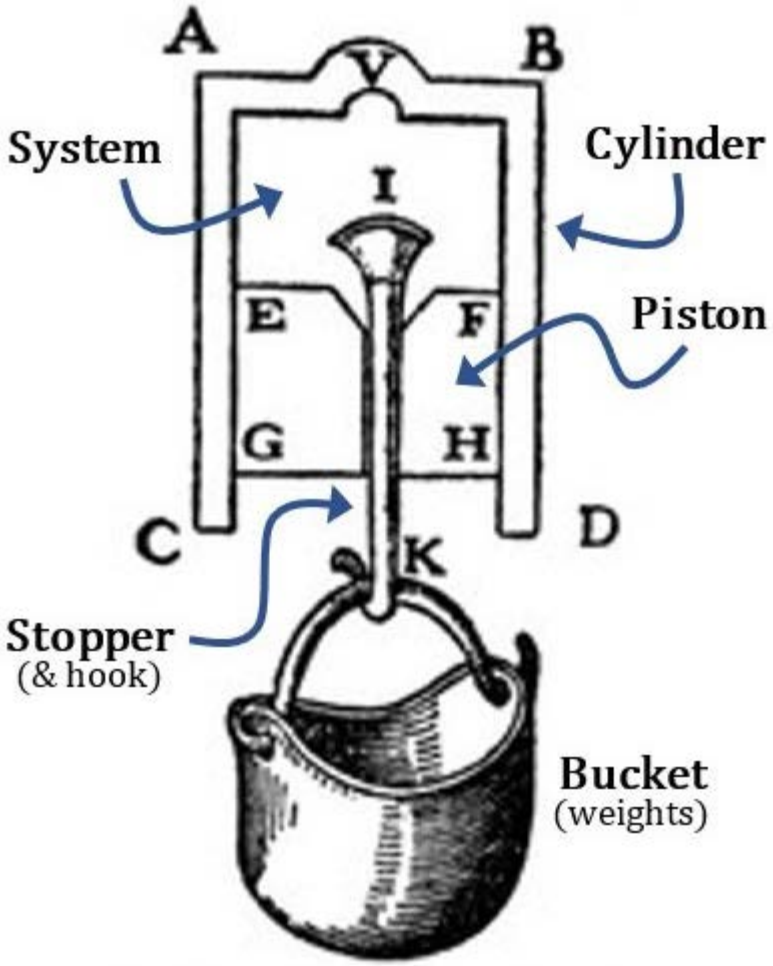

The main parts of the **Galileo engine** (1632), shown without weight bucket attacked (to hook k), comprised of cylinder ABCD, inserted with piston EFGH, and adjustable wire/hook device IK, with conical head I, which can allow the excess fluids to escape, prior to fitting the conical head into its groove, which Galileo proposes can be used to test the "force of the vacuum". [1]

Overview

In 1632, Galileo (EP:10), in his *Dialogues Concerning the Two New Sciences*, following preliminary dialogue of the possiblity of "vacuum breaking", presented a dialogue on the possibly of vacuum formation or rather the "resistance of the vacuum" made by nature, being that he believed that vacuums could not exist, per the nature abhors a vacuum dictum, in siphon water pumps that stopped working past about 30-feet.

The following is an important preliminary or pre-context statement by Galileo (voice: Salviati):

> "I feel that for a complete explanation, of the question of **what is binding material** which holds together the parts of solids so that they can scarcely be separated, other considerations might well enter; yet I must not now digress upon this 'particular topic' since you are waiting to hear what I think about the breaking strength of other materials which, unlike ropes and most woods, do not show a filamentous structure. The coherence of these bodies is, in my estimation, produced by other causes which may be grouped under two heads. One is that much-talked-of ***repugnance which nature exhibits towards a vacuum***; but this 'horror of a vacuum' NOT being sufficient, it is necessary to introduce another cause in the form of a **gluey or viscous substance** which binds firmly together the component parts of the body. First, I shall speak of the vacuum, demonstrating by **definite experiment** the *quality* and *quantity* of its **force [virtù]**. If you take **two highly polished and smooth plates** of marble, metal, or glass and place them face to face, one will slide over the other with the greatest ease, showing conclusively that there is nothing of a viscous nature between them. But when you attempt to separate them and keep them at a constant distance apart, you find the plates exhibit such a repugnance to separation that the upper one will carry the lower one with it and keep it lifted indefinitely, even when the latter is big and heavy."
>
> — Galileo (1638), *Dialogues Concerning the Two New Sciences* (pgs. 8 + 11)

The main dialogue, in regards to Galileo's "vacuum measuring" device, pictured adjacent, is as follows:

> Sagredo [Baliani]: "go ahead, Salviati; assume that I admit your conclusion and show us your **method of separating the action of the vacuum** from other causes; and by **measuring it** show us how it is not sufficient to produce the effect in question."
>
> Salviati [Galileo]: "I will tell you how to separate the **force of the vacuum** from the others, and afterwards

how to measure it. For this purpose let us consider a continuous substance whose parts lack all resistance to separation except that derived from a vacuum, such as is the case with water, a fact fully demonstrated by our Academician in one of his treatises. Whenever a cylinder of water is subjected to a pull and offers a resistance to the separation of its parts this can be attributed to no other cause than the resistance of the vacuum. In order to try such an experiment, I have **invented a device** [engine], shown below, which I can better explain by means of a sketch than by mere words.

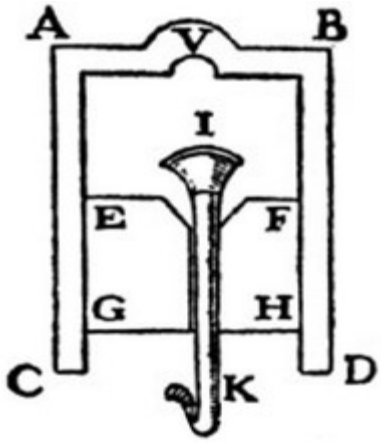

Let CABD represent the cross section of a cylinder either of metal or, preferably, of glass, hollow inside and accurately turned. Into this is introduced a perfectly fitting D cylinder of wood, represented in cross section by EGHF [piston], and capable of **up-and-down motion** [see: reciprocating motion]. Through the middle of this cylinder is bored a hole to receive an iron wire, carrying a hook at the end K, while the upper end of the wire, I, is provided with a conical head. The wooden cylinder is countersunk at the top so as to receive, with a perfect fit, the conical head I of the wire, IK, when pulled down by the end K. Now insert the wooden cylinder EH in the hollow cylinder AD, so as not to touch the upper end of the latter but to **leave free a space of two or three finger-breadths**; this space is to be filled with water by holding the vessel with the mouth CD upwards, pushing down on the stopper EH, and at the same time keeping the conical head of the wire, I, away from the hollow portion of the wooden cylinder. The **air is thus allowed to escape alongside the iron wire** (which does not make a close fit) as soon as one presses down on the wooden stopper.

The air having been allowed to escape and the iron wire having been drawn back so that it fits snugly against the conical depression in the wood, invert the vessel, bringing it mouth downwards, and hang on the hook K a vessel which can be filled with sand or any heavy material in quantity [weight] sufficient to finally separate the upper surface of the stopper, EF, from the lower surface of the water to which it was attached only by the resistance of the vacuum. Next weigh the stopper and wire together with the attached vessel and its contents; we shall then have the force of the vacuum *[forza del vacuo]*. If one attaches to a cylinder of marble or glass a weight which, together with the weight of the marble or glass itself, is just equal to the sum of the weights before mentioned, and if breaking occurs we shall then be justified in saying that the vacuum alone holds the parts of the marble and glass together; but if this weight does not suffice and if breaking occurs only after adding, say, four times this weight, we shall then be compelled to say that the vacuum furnishes only one fifth of the total resistance *[resistenza]*."

In c.1645, this Galileo theoretical engine, in the mind of Otto Guericke, inspired the construction of the Guericke engine, which inspired the pneumatical engine (1658) device of Robert Boyle and Robert Hooke, along with the gunpowder engine devices and later steam engine devices of Christiaan Huygens and Denis Papin.

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θΔics

See:

REDIRECT

Galileo engine

In animate thermodynamics, **garden of thermodynamics** is a term used to refer to the numerous metaphysical weeds, theological weeds, etc., that tend to grow fervently in the "garden" of the science of thermodynamics.

American real estate theorist Gary Woltal's depiction of a **garden** whose order is maintained according to the second law of **thermodynamics**. [3]

Etymology

In American physical chemist Gilbert Lewis' 1925 Silliman Lecture turned book *Anatomy of Science*, he discusses the second law in relation to life and in his discussion of time and motion gave the following account of ether as one of the weeds of 19th century science and how relativity freed us from ether theory: [4]

> "Often in our more carefully cultivate **gardens of thought** some rank weed grows with such vigor as to stunt the growth of the neighboring useful vegetables. So the scientific literature of the nineteenth century was overgrown with a discussion of ether, its stresses and strains, its density, its movement with the earth or through the earth. A mechanism that we designed to be servant had become master; until now that we are suddenly freed from this obsession we feel as if awakened from a hideous nightmare."

In 1966, likely influenced by the above quote, having been a well-known *Silliman Lecture*, by American science historian Erwin Hiebert, in his "The Uses and Abuses of Thermodynamics in Religion", penned the following oft-quoted pungent statement about the garden of thermodynamics: [1]

> "The laws of thermodynamics demonstrate that no matter how good, how secure, or how elegant a scientific theory is, it is never immune to being used in ways that transgress the limits of credulity to the point of sheer ridiculousness—at least in the eyes of subsequent generations. All kinds of private metaphysics and theology have grown like weeds in the **garden of thermodynamics**."

In other words, starting on the pretext of thermodynamics, it is common in theories applied outside of thermodynamics proper, to be filled with metaphysical fancies, far removed from anything within the framework of established science.

In 1998, in the preface to the English translation of *Dictionnaire de thermodynamique*, French thermodynamicist Pierre Perrot opened to the following: [4]

> "**Thermodynamics** in the form a dictionary may seem somewhat surprising. It does, however, allow readers to wander as in a **garden**, at their fancy or according to their need for explanation. In order that the walk be pleasant, the landscape must be attractive and varied; from that point of view, thermodynamics fears no competition, but there are obstacles in the way, stones in the path; isn't thermodynamics a fine intellectual structure, bequeathed by past decades, whose every subtlety only experts in the art of handling hamiltonians would be able to appreciate?

Weed theories and theorists

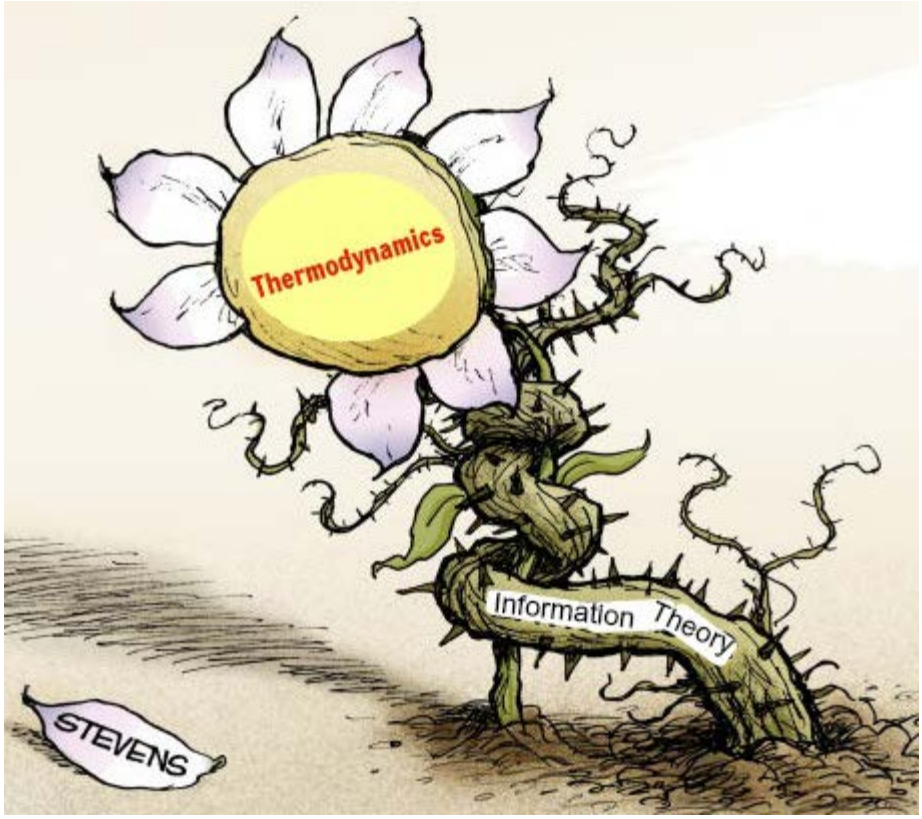

A 2012 depiction of information theory as one of the weeds in the **garden** of thermodynamics. [5]

A weed theorist is someone who promotes theories that act as "weeds" in the garden of thermodynamics, namely those whose theories "transgress the limits of credulity to the point of sheer ridiculousness" or rather those whose theories are so far off the broad highway of pure thermodynamics, as Lewis put it, that they are not even thermodynamical, i.e. within the bounds of reality, in any sense of the matter. In this sense, the various metaphysics and theologies found in the garden of thermodynamics continuously need to be weeded and removed so to not choke out the beauty of the thermodynamics, pure, proper, and applied.

The biggest weed in thermodynamics, currently, is information theory and its incorrigible attempts at thermodynamics association.

Noted weed theorists, include: Corrado Giannantoni, and his "quality thermodynamics" theory; Ivan Kennedy and his "action thermodynamics" theory; Jeremy Rifkin and his agenda; Nicholas Georgescu-Roegen, and his material entropy theory; among numerous others.

See also

â— Highway of thermodynamics
â— Pure thermodynamics

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θΔics

In existographies, **Garrett Hardin** (1915-2003) (CR:5) was an American ecologist and philosopher, noted for []

Overview

In 1968, Hardin, in his essay *The Tragedy of the Commons*, argued something to the effect that unregulated use of the commons, e.g. herding grassland or office refrigerator, leads to damaging effects on the environment.

Quotes | Employed

The following are quotes employed by Hardin:

> "The fact that there are no known exceptions to the laws of **thermodynamics** should be incorporated into the axiomatic foundation of **economics**."
>
> — Daniel Underwood (1989), "On the Ideological Foundations of Environmental Policy" [1]

Quotes | By

The following are quotes by Hardin:

> "The concept of carrying capacity calls for the conservative, balanced equation type of thinking that has led to the triumphs of thermodynamics and modern chemistry. But applied to human problems connected with exploiting the environment the concept of carrying capacity has been perceived as a threatening one. As regards populations of non-human animals and plants, we are just now beginning to grapple with the implications of carrying capacity. When it comes to humanity itself, it is doubtful if we yet have the courage to systematically examine all possibilities."
>
> — Garrett Hardin (1977), "Ethical Implications of Carrying Capacity" (Ñº)

> "I am appalled at your omission, misunderstanding, or denial of the second law of thermodynamics, conservation laws, the idea of limits."
>
> — Garrett Hardin (c.1996), "Letter to Julian Simon"; comment on his second law denying book *The Ultimate Resource*

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External links

â— Garrett Hardin – Wikipedia.

θΔics

In human chemistry, **Gary Freedman** (c.1950-) is an American paralegal turned bloger noted for his circa 2009 ebook *Significant Moments*, written in a somewhat nontraditional manner, namely writing each sentence or sentence fragment followed by the title of a book (and author) thematic to the sentence, in an alternating manner, one section of which of note he thematically groups a selection of books on the thematic topic of human chemistry. [1]

Human chemistry

As summarized his 2010 blog posting "The Chemistry of Human Relations", the following gray colored and double indented text (or yellow highlighted, as done in his blog) sections are said to be representative of human "relationship chemistry", so to speak, or at least as Freedman sees things: [2]

> The reader, at this point, will have realized for some time now that this is not a chemical treatise: my presumption does not reach so far—"ma voix est foible, et meme un peu profane." Nor is it an autobiography, save in the partial and symbolic limits in which every piece of writing is autobiographical, indeed every human work; but it is in some fashion a . . .
> Primo Levi, *The Periodic Table*
> . . . poetic endeavor . . .
> Kirsten Wille, *Poetic License*
> . . . whose aim it is to elucidate . . .
> Irvin Goldman, *Abductory Inference, Communication Theory and Subjective Science*
>
> > . . . the mysterious chemistry of the mind and . . .
> > Ernest Newman, *The Life of Richard Wagner*
>
> . . . of human woes, passions and felicities.
> K.R. Eissler, *Talent and Genius*
> Now our interest is in this human content.
> Sigmund Freud, *The Theme of the Three Caskets*
> And yet, do not those very endeavors speak for the fact that . . .
> Sigmund Freud, *The Moses of Michelangelo*
>
> > . . . it happens also in chemistry as in . . .
> > Primo Levi, *The Periodic Table*
>
> . . . the man-world that . . .
> Jack London, *The Valley of the Moon*
>
> > . . . attraction and relatedness . . .
> > Johann Goethe, *Elective Affinities*
>
> . . . play their . . .
> Upton Sinclair, *The Jungle*
> . . . fateful roles
> Bruno Bettelheim, *Freud and Man's Soul*
> Permit me to clarify the situation by a metaphor.
> Hermann Hesse, *Magister Ludi: The Glass Bead Game*
>
> > Now the molecules of inorganic matter . . .
> > Carole Angier, *The Double Bond: Primo Levi, A Biography*
>
> . . . as I have learned, . . .
> Anthony Trollope, *The Last Chronicle of Barset*

. . . attach to each other at one point only, making long but stable chains. Organic molecules, by contrast, have a double bond: they attach to each other at two or even more points, making possible richer but also less stable combinations.
Carole Angier, *The Double Bond: Primo Levi, A Biography*
To continue:
Leo Tolstoy, *Resurrection*

> The hydrogen bond is only a twentieth as strong as the bonds that usually hold atoms together within a molecule. It is strong enough, even so, to hold the two strands . . .
> Isaac Asimov, *The Wellsprings of Life*
> . . . of DNA code . . .
> Richard Preston, *The Cobra Event: A Novel*
> . . . in place. Yet it is also weak enough to break and allow the two chains to separate on occasion . . .
> Isaac Asimov, *The Wellsprings of Life*
> At present I should have to put you off with dreadful technical terms which would still give you no idea of what is happening. One has to have these entities before one's eyes, and see how, although they appear to be lifeless, they are in fact perpetually ready to spring into activity; . . .
> Johann Goethe, *Elective Affinities*
> . . . but if . . .
> Henry Adams, *The Education of Henry Adams*
> . . . to comprehend is the same as forming an image, we will never form an image of a happening whose scale is a millionth of a millimeter, whose rhythm is a millionth of a second, and whose protagonists are in their essence invisible. Every verbal description must be inadequate, and one will be as good as the next, so let us settle for the following description.
> Primo Levi, *The Periodic Table*
> Atoms attract one another, atoms repel one another.
> Leo Tolstoy, *War and Peace*
> It needs little imagination . . .
> Johann Goethe, *Elective Affinities*

. . . to see reflected in . . .
Anna Katherine Green, *The Woman in the Alcove*
. . . the record of the friendship of Wagner and Nietzsche . . .
Ernest Newman, *The Life of Richard Wagner*
. . . a metaphor from which we may extract . . .
Johann Goethe, *Elective Affinities*
. . . a lesson that . . .
Henry Adams, *The Education of Henry Adams*
. . . is neither remote nor metaphysical:
Primo Levi, *The Periodic Table*
So long as each seemed to the other to be just a factor in his own egoistic . . .
Ernest Newman, *The Life of Richard Wagner*
. . . development, a . . .
Victor Hugo, *Les Miserables*

> . . . chemical alter ego . . .
> Primo Levi, *The Periodic Table*
> . . . their mutual attraction was stronger than their repulsion.

But from the moment that this . . .
Ernest Newman, *The Life of Richard Wagner*

. . . anarchy of atoms, . . .
Friedrich Nietzsche, *The Case of Wagner*
. . . this always unstable equilibrium became still more unstable

by reason of Nietzsche's gradual realisation of what he was in himself, and his own illimitable self-esteem, his sense of his mission, his lust for power, his inability to suffer contradiction clashed with a similar complex of forces in Wagner, a breach between the two men was inevitable.
Ernest Newman, *The Life of Richard Wagner*

Freedman, in this same blog post notes that although he received a "D" (barely passing) in his high school chemistry classes, he did have a liking for the tenacity or rather dedication of his teacher Ethel B. Fischer to her profession, and comments that he originally intended to dedicate the book to her. Freedman also noted that the above passage, on the overlap of chemistry and human behaviors, is an example of" homospatial thinking", the active conception of two or more discrete entities occupying the same space, a conception leading to the articulation of new identities and creative thinking. [2] In retrospect 2012 commentary, in response to the query: "can you elaborate on the above section, i.e. what you meant by the "chemistry of human relations" in regards to the above book section?", Freedman stated:

"I am referring to the fact that people have complementary personality characteristics -- like atoms (individuals) in a molecule (a group of 2 or more persons)."

This would classify Freedman, so to speak, as a "human atom" point of view theorist.

Origin of life

In an earlier part of his book, Freedman summarizes the origin of life as follows:

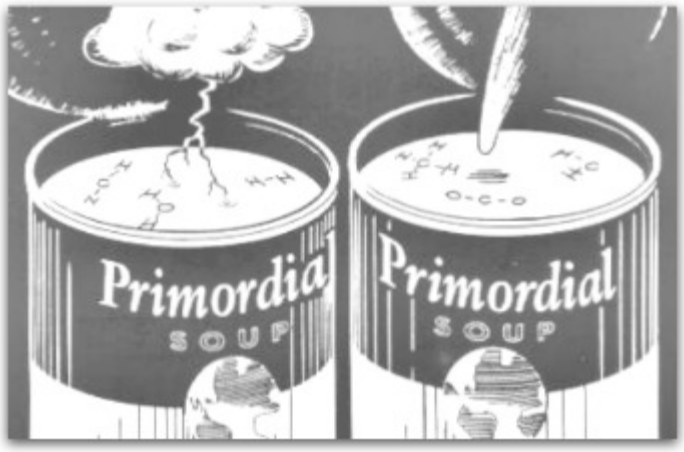

A humorous take on the two prevailing primordial soup origin of life theories, as described adjacent by Freedman: left: lightening strike origin of life; right: comet strike origin of life; each, in turn, striking a so-called "soup of organic molecules" and bringing about the first self-reproducing organism in the Darwinian-based evolution mechanism.

Isaac Asimov, *The Wellsprings of Life*

The Greeks were . . .

Richard Wilbur, *Excerpt from Lamarck Elaborated*

. . . the first . . .

William Shakespeare, *The Tempest*

—did you know—

Guy de Maupassant, *Fascination*

. . . who said . . .

Richard Wilbur, *Excerpt from Lamarck Elaborated*

. . . that all bodies are composed of indivisible and unchangeable atoms.

Will Durant, *The Life of Greece*

Chemically, all life is one.

Isaac Asimov, *The Wellsprings of Life*

> That life is chemistry is true but boring, like saying that football is physics. Life, to a rough approximation, consists of the chemistry of three atoms, hydrogen, carbon and oxygen, which between them make up ninety-eight percent of all atoms in living beings. But it is the emergent properties of life—such as heritability—not the constituent parts that are interesting.

Matt Ridley, *Genome: The Autobiography of a Species in 23 Chapters*

> "Once upon a time, very long ago, . . .

Isaac Asimov, *The Wellsprings of Life*

> . . . in the dark backward and abysm of time . . .

William Shakespeare, *The Tempest*

> . . . perhaps two and a half billion years ago, under a deadly sun, in an ammoniated ocean topped by a poisonous atmosphere, in the midst of a soup of organic molecules, a nucleic acid molecule came accidentally into being that could somehow bring about the existence of another like itself—"
> And from that all else would follow!

This typical "soup of organic molecules" origin of life picture, shorthand for the warm pond model + Urey-Miller experiment, as many people currently see things, is one of the stepping stone to arrival of the "defunct theory of life" view.

Education

From 1988 to 1991, Freedman was a paralegal at the law firm; sometime thereafter he began blogging about his state of affairs. (Ñº)

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θΔics

In existographies, **Gary Greenberg** (1943-) (RMS:106) (CR:71) is an American lawyer, archeologist, Egyptologist, and Biblical scholar noted for his 1996 book *The Bible Myth: the African Origins of the Jewish People* and followup 2000 book *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* in which he ferrets out a large part of the Osiris religion and Ra theological structure to the Ab-*ra*-ham-ic faiths (Torah religions).

Overview

Greenberg was drawn into religio-mythology when he saw parallels between the Genesis chronology and the Egyptian kings list; a short version of this thesis was published in *Moses Mystery*. [6]

In c.1990, Greenberg began studying works such as Richard Friedman's *Who Wrote the Bible* (1987).

In 1996, Greenberg, in his *The Bible Myth: the African Origins of the Jewish People*, deconstructed much of the Bible back into Egyptian mythology, at the end of which he asserted that the sacrifice of Isaac by Abraham (see: Abraham and Isaac) is a rescript of the sacrifice Osiris by Set or something to this affect; a rewrite of the ritualistic act of the release of the ba (soul) of Osiris. [5] This conjecture, not note, may be off per reason (a) the Osiris cult was mostly jettisoned during the Jewish recension (see: Recension theory) of the Egyptian religion, and (b) Abraham is a rescript of Ra NOT Osiris.

In 2000, Greenberg, in his *101 Myths of the Bible: How Ancient Scribes Invented Biblical History*, debunked most of the stories in the Old Testament in terms of their underlying myths.

In 2003, Greenberg wrote a book (Q) on Manetho (c.325-275BC) (Q).

Thims

In 2003, Greenberg's work was instrumental, in the growth of the religio-mythology work of Libb Thims, during his half Buffett-level research into the thermodynamics of religion; Thims was able to discern the following from Greenberg's general model:

> Ab-*ra*-ham-ic faiths (53%): Christianity 33%, Islam 20%, Judaism 0.2%, Baha'ism 0.1%, and Mandaeism 0.001%.

In short, building on the previous translation work of Thomas Young (1822), Jean Champollion (1824), and Wallis Budge (1895), Greenberg's work, has been instrumental in helping to trace out the theoretical structure of "Abrahamic" religions, or "Father Ra born of Nun" religions, to the daily life-death cycle of the Egyptian sun god Ra (born out of the Nun) and the life-death-morality theories derived therefrom, particularly as embodied in the logic of the negative confessions and ba weighing, which were carried over into the the concept of "karma weight" and "soul weight" in the Vedic and Torah religions, respectively.

Thims, in short, connected the key fact that the Ab-ra-ham-ic theologies (Torah religions) and B-ra-hma-ic theologies (Vedic religions), are derivative religions of the parent religion of Ra theology (Egyptian religion): [2]

Ra religions

Ab-***ra***-ham-ic faiths:	Christianity 33%, Islam 20%, Judaism 0.2%, Baha'ism 0.1%, and	53%

Abraham

Brahma

B-*ra*-hma-ic faiths:

Mandaeism 0.001%.

Hindu 13%, Buddism 6%, Sikhism 0.4%, and Jainism 0.07%. 20%

72%

The six main giveaways that show the underlying Egyptian connections between the two religions (Vedic and Torah) are:

(a) Both Abraham and Brahma are the said-to-be creators all humans (Ra is the main creator god of the Egyptian pantheon).
(b) Both Abraham and Brahma have the same etymology: “Father Ra son of Nun”.
(c) Both Abraham and Brahma derived from the Nun (Noah and Ma-Nu, respectively).
(d) Both Abraham and Brahma have the same sister-wife, in namesake, Sarai and Saraswati, respectively.
(e) Both Abraham and Brahma have the same thrice sister-wife parable (creation by incest rewrite).
(f) The slaying of son reoccurs in both cases (release of the soul rewrite).

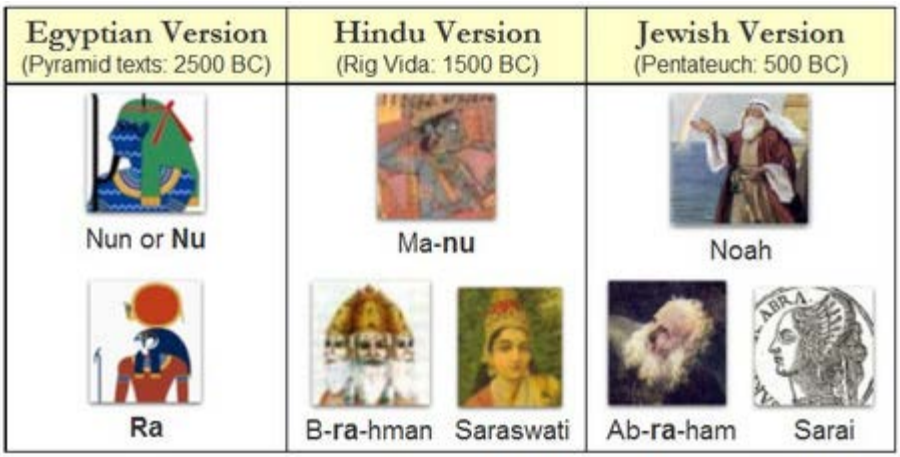

Ra theology: a diagrammatic tracing of the Nu-Ra story into Hinduism and Judaism.

Greenberg seems to have been the first to explain the Egyptian origins to the latter two points, in his chapter sections "Abraham pretended that Sarah was his Sister" (2000) and "The Osirian Iconography in Isaac's Sacrifice" (1996). [1]

One point that remains to be tracked down is the details of the etymology of Sarai and Saraswati, albeit it seems to have its origin in the story and name of "Isis" or "star of the sea", the wife-sister of Osiris, and mother to Isaac (at the age of 90). Her name was originally שָׂרַי *(Saray or Sarai)*, but in Genesis 17:15 it is said that God changed it to Sarah:

> “And god said unto Abraham, as for Sarai thy wife, thou shalt not call her name Sarai, but Sarah* shall her name be.”

The footnote * to this being that Sarah = Princess. The underlying details of this god-directed "name change", or jump from Isis to Princess to Sarah, however, is still a bit blurry.

Slaying son | Paradox

See main: Abraham killing Isaac

The story of Abraham “choosing” killing Isaac (his son), in the name of god,

according to Greenberg, is a release of the Egyptian ritual of the release of the soul re-write.

Depiction of Abraham about to kill Isaac per god's order, during which an angel steps into stop the execution; Greenberg (1997) conjectures this has to do with Osiris myth.

> "The Atenists needed to break the link between Horus and the resurrected Osiris, and they did so in Genesis with the story of Abraham's sacrifice of Isaac. This is perhaps the most puzzling story in the Bible and has caused commentators no end of difficulty in explaining why the Hebrew god would ask Abraham to offer up his son as sacrifice. By placing the story in the context of the Osiris myth, we can resolve the moral dilemma.
>
> — Gary Greenberg (1996), *The Bible Myth* (pg. 242)

(add)

Quotes | On

The following are quotes on Greenberg:

> "Scholars such as Gerald Massey, Albert Churchward [RMS:66] (O), and **Gary Greenberg** have argued that the first Israelites were Egyptians and followers of the Pharaoh Akhenaten, whose attempts to introduce monotheism into …"
>
> — Joseph Holloway (2002), *An Introduction to Classical African Civilizations* (O)

Quotes | By

The following are quotes by Greenberg:

> "For the history of Biblical textual analysis, I draw primarily upon Richard Friedman's *Who Wrote the Bible* (1987)."
>
> — Gary Greenberg (1996), note to statement that Thomas Hobbes was first scholar to argue against Mosaic authorship of the Bible [3]

> "The first important scholars to independently argue *against* the prevailing view, namely that the Pentateuch was written by a divinely-inspired Moses (e.g. Newton believed this), were: Thomas Hobbes, Benedict Spinoza, and Isaac la Peyrere."
>
> — Gary Greenberg (1996), *The Bible Myth* [2]

> "Jewish patriarchal history is pure myth, derived from Egyptian stories about the god Osiris and his family, and ancient Israel had no genealogical history prior to the Exodus."

— Gary Greenberg (1996), *The Bible Myth: the African Origin of the Jewish People* (pg. 208)

" '**Ham**', the name of Noah's second son, is pronounced 'Chem' in Hebrew, and he is depicted as the father of the Egyptian and African peoples. The name derives from the Egyptian word 'Keme', an ancient name for Egypt. It means the 'black land' and refers to the fertile black soil left behind when the annual Nile flood withdraws to its banks."

— Gary Greenberg (1996), *101 Myths of the Bible* (pg. 74)

"As a general rule, I rely on basic mainstream scholarship as a framework for my analysis, although I always have my own spin on how that should apply. To keep in touch with what is academically acceptable I like Bart Ehrman and Raymond Brown. Brown, now deceased is, a leading scholar who brings an enormous amount of material together and source citations from all points of view. So, even though there is much to disagree with and criticize, I find him helpful in wading through the weeds. On a more way out source, long ago, I was very interested in Robert Graves' "White Goddess" (not used in any racial sense) and found it very interesting but frequently difficult to accept. I was more interested in seeing how he looked behind myths than with what conclusions he came up with."

— Gary Greenberg (2017), response to query "who are the main, say top five or ten, scholars, come before you [RMS:106|130+], who influenced you in your work?" [6]

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Further reading

● Greenberg, Gary. (2007). *The Judas Brief: Who Really Kidded Jesus*. Bloomberg Publishing.
● Greenberg, Gary. (2011). *Who Wrote the Gospels? Why New Testament Scholars Challenge Church Traditions*. Pereset Press.

External links

● Gary Greenberg – RationalWiki.
● Gary Greenberg – TriPod.com.
● Greenberg, Gary (1943-) – WorldCat Identities.
● Gary Greenberg (about) – BibleAndHistory.com.

θΔics

In science, **gas** is a state of matter, in which the particles of its composition, i.e. atoms, molecules, or ions, etc., being characterized by weak interactions, move about in space in relatively random motions, often assumed to have non-correlation of velocities, at speeds proportional to the temperature of its volumetric containing region, tending to completely occupy the volume of any given space into which it is put. [1] The term was coined in the early 17th century by Flemish physician and chemist Johann Helmont in reference to "spirits" released during combustion. [4]

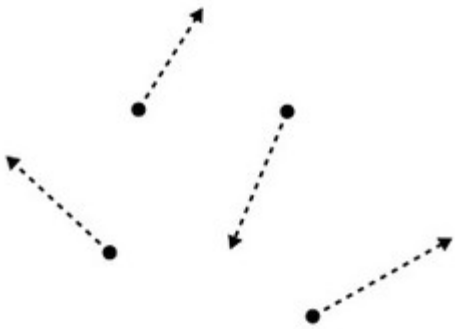

Gas particles moving about at speeds of 500 meters per second.

Air

To give a three-dimensional picture of a gas, a sugar-lump sized cube of the gas called “air”, for instance, which is comprised of approximately ten chemical species: nitrogen (N_2) 78%, oxygen (O_2) 21%, as well as argon (Ar), neon (Ne), helium (He), methane (CH_4), krypton (Kr), hydrogen (H_2), nitrous oxide (N_2O), and xenon (Xe), in smaller percentages, at room temperature, contains 30-trillion particles.

Velocities

The average speed of gas particles is on average 500-meters per second (or 1200-mph). [2] It was German physicist Rudolf Clausius who, in his 1857 article “On the Nature of the Motion which we call Heat”, made the first calculation of the speed of gas particles.

History

In the earlier 16th century writings of Swiss alchemist and physician Paracelsus the word *khaos* was used in the occult sense of "proper elements of spirits" or "ultra-rarified water". [3]

During the years 1609 to 1644, Flemish physician and chemist Johann Helmont defined the word “gas” as a type of spirit that can be reduced to liquid form and can, if produced, cause glass containing vessels to explode. [6] Helmont likely derived the term from the Greek *khaos* (*chaos*) meaning void or "empty space", being that the Dutch "g" is roughly equivalent to that of Greek "kh." The word was gas was introduced by Helmont in an experiment where he burned 62 pounds of oak after which time only one pound of ash remained. Thus, he concluded that 61-pounds (or 98%) of the material was converted into a new type of invisible air or spirit, to which he affixed the name “gas”. Specifically, in his writings, Helmont states: [4]

> “The flame which is only burning smoke, perishes at once in a closed vessel, and charcoal may be heated continuously in a closed vessel without wasting … yet it 62-pounds of oak charcoal contain 1-pound of ashes, the remaining 61-pounds are “wild spirit” (*spiritus silvestre*), which cannot escape from the shut vessel.”

Then tells us:

> “I call this spirit, hitherto unknown, by the new name of **gas** (*Hunc spiritum, incognitum hactenus, novo nomine Gas voco)*, which can neither be retained in vessels nor reduced to a visible form, unless the seed is first extinguished.”

More than once, Helmont concluded that he was the “inventor” of gas. He investigated and categorized a number of gases, such as gas from eructions (belches) or CO_2, poisonous red gas (NO_2) that is formed when aqua fortis (HNO_3) acts on silver, sulfurous gas that “flies off” burning sulfur, and others. He says that gas is composed of invisible atoms which can come together by intense cold and condense to minute liquid drops; and that gases can be contained in bodies in fixed form, and set free again by heat, fermentation, or chemical reaction. [4] In relation to combustion, he concluded

that there were two classes of gas: [5]

- â— Gas sylvestre – one that would not burn or support combustion.
- â— Gas pingue – one that would burn (a combustible gas).

Gas laws

See main: Gas laws, Ideal gas law

In the 1834 publication *Memoir on the Motive Power of Heat*, French physicist Émile Clapeyron derived one of the first formulations of what is now called the "ideal gas law". In particular, after a few substitutions in a discussion on various aspects of the Carnot cycle, Clapeyron states that Mariotte's law (PV = k, at constant temperature) combined with that of Gay-Lussac's law (P = kT, at constant volume) gives the expression: [10]

$$Pv = R(267 + t)$$

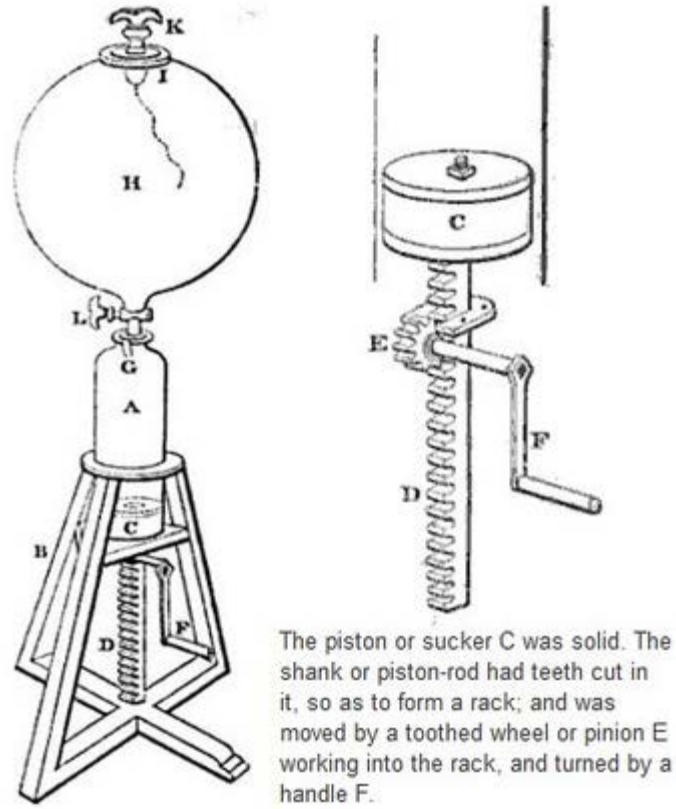

The pneumatical engine, invented in 1658 by Irish scientist Robert Boyle, based on the earlier 1650 vacuum pump design of German engineer Otto Guericke, the device used to calculate Boyle's law, the first of the gas laws.

Building on the work of Clapeyron, in relation to the development of the science of thermodynamics, the term "perfect gas" was defined in 1859 by Scottish engineer William Rankine as "a substance in such a condition that the total pressure exerted by any number of portions of it, at a given temperature, against the sides of a vessel in which they are enclosed, is the sum of the pressures which each portion would exert if enclosed in the vessel separately at the same temperature." [7] By 1890, the phrase "ideal perfect gas" was being used in relation to gases that obeyed the laws of Charles and Boyle, as defined by the following "characteristic equation":

$$\frac{PV}{T} = K$$

in which *P* is the pressure, *V* the volume, and *T* the absolute temperature of the gas. [8] In 1923, American chemical physicists Gilbert Lewis and Merle Randall, in their famed *Thermodynamics* textbook, had come to define "the perfect gas or ideal gas is an invented substance, defined by certain properties which are not possessed by any actual substance, but which are supposed to be approached by any every actual gas as its pressure is indefinitely diminished." They continue, by stating that the perfect gas is a substance which meets the criterion that its energy is a function of temperature alone, quantified by the following function:

$$\left(\frac{\partial E}{\partial T}\right)_T = 0$$

and that when its temperature, pressure, and volume are changed the gas obeys the relation:

$$PV = nRT$$

where *n* is the number of mols of gas and *R* is universal constant (8.316 joules per degree), that has the same value for all gases. [9] Into the 1950s, this latter equation, describing the state of the ideal perfect gas, had come to be commonly known as the "ideal gas law".

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External links

â— Gas – Wikipedia.

θΔics

In science, the **gas constant**, symbol "R", is the proportionality constant in the ideal gas law having a value of: [1]

$$8.314 \frac{J}{K \cdot mol}$$

This modern value for the gas constant was assigned in YEAR (add).

History

The first dominant use of *R* as a constant in the various gas laws seems to have been the use by French engineer Emile Clapyron's use in his 1834 *Memoir on the Motive Power of Fire*, where he states that Mariotte's law (PV = k, at constant temperature) combined with that of Gay-Lussac's law (P = kT, at constant volume), the latter of which being derived by French chemist Joseph Gay-Lussac in 1802, gives the expression: [2]

$$Pv = R(267 + t)$$

This is sometimes referred to as the 'G-M law' or the 'law of Marriatte and Gay-Lussac'.

In 1850, German physicist Rudolf Clausius updated the work of Clapeyron using the 1847 work of French chemist Henri Regnault, where he reevaluated the content inside of the parentheses, rewriting the gas equation as: [3]

$$Pv = R(273 + t)$$

In 1864, Clausius further simplified this expression by using the absolute temperature scale, conceived by Irish physicist William Thomson in 1848:

$$T = 273 + t$$

where *t* is in degrees centigrade and *T* is in Kelvin, such that with substitution in the second previous equation, by 1864 he had arrived at:

$$pv = RT$$

The first person to convert R into a universal gas constant, according to American chemistry historian William Jensen, was German chemist August Horstmann who in 1873 rewrote the previous equation as: [4]

$$up = RT$$

where *u* is the "volume of molecular weight [mole] of the gas" and where R is "the constant for the G-M law with regard to the molecular volume [molar volume]." [5] In this sense, if *u* is taken as volume per number of particles n (on the original 1738 use by Daniel Bernoulli), then we would have:

$$\frac{Vp}{n} = RT$$

or

$$PV = nRT$$

This later version of the equation, with the explicit use of "n" as the number of mols, seems to have been first use in the classic 1923 textbook *Thermodynamics and the Free Energy of Chemical Substances* by American physical chemists Gilbert Lewis and Merle Randall. [6]

Symbol etymology

See main: R (etymology section)

The origin of the symbol R, prior to its 1834 use by Clapeyron, is difficult to pin down. This seems to be due to the fact often early versions of the gas laws were simply stated verbally.

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External links

â— Gas constant – Wikipedia.

θΔics

In thermodynamics, **gas laws** are a set of equations that describe the behavior of bodies of gas under what are known as ideal, perfect, standard, or non-extreme conditions. The various laws, as listed below, came into existence following the invention of German engineer Otto Guericke's vacuum pump in 1645, beginning with the experimentation's of Irish chemist Robert Boyle. The central law for most gases is the ideal gas law.

Boyle's law

See main: Boyle's law

In 1658, Irish chemist Robert Boyle and his assistant Robert Hooke built a combination air pump/vacuum, which they called a 'pneumatical engine', based on the design of German engineer Otto Guericke's vacuum pump in the 1657 book *Mechanical Hydraulic Pneumatics* by German scientist Gaspar Schott. [1] After conducting a number of experiments with their air pump, Boyle published the results in the 1660 book *New Experiments: Physico-Mechanical, Touching the Spring of the Air, and Its Effects (Made for the Most Part in a Pneumatical Engine)*. In the 1669 second edition of *Spring of the Air*, a statement of what is now known as "Boyle's law" can be found defined in modern shorthand as: [2]

$$PV = K \mid_{n,T}$$

which says that for a body of gas at constant number of particles *n* and temperature *T* the product of the measure of the pressure *P* and volume *V* of gas will be a constant *K*. The *Spring of the Air* had a great influence on other scientists, who built their own air pumps, and devised new experiments of their own.

Marriott's law

See main: Mariotte's law

In 1676, French physicist Edme Mariotte published an essay entitled *De la Nature de l'air* (*The Nature of Air*) in which it is said he recognized Boyle's law, in his statement that 'the volume of a gas varies inversely as the pressure'.

Subsequently, Boyle's law is often synonymously called Mariotte's law (or sometimes Boyle-Mariotte's law), stated to the effect that 'the pressure of an ideal gas at constant temperature varies inversely with volume'.

Amonton's equation

See main: Amontons' law

In 1702, French physicist Guillaume Amontons, as discussed in his paper "Discourse on a Few properties of Air, and the Means to know the Temperature in all Climates of the Earth", was said to have stated that the product of the pressure times volume equals the product of temperature times an unknown constant; in modern formulation would be an equation of the form:

$$PV = kT$$

This is the first prototype of what would later become, with the inclusion of the particle number *n* and the gas constant *R*, the ideal gas law. Dutch-born Swiss physicist Daniel Bernoulli, in his 1738 *Hydrodynamica*, credits Amontons as having been the originator of this formulation of the gas laws.

Charles' law

See main: Charles' law

In *circa* 1787, French scientist Jacques Charles conducted an experiment where he filled five balloons to the same volume with different gases. He then raised the temperature of the balloons to 80ºC and noticed that they all increased in volume by the same amount.

In 1800, an eighteen-year-ear old French chemistry student named Joseph Gay-Lussac, a recent graduate of the École Polytechnique, met and became a lab assistant and protégé of chemist Claude Berthollet. While working under Berthollet, Gay-Lussac discovered that gases expand by the same proportion for an equivalent rise in temperature. Gay-Lussac's approach to chemistry was to express laws mathematically. [3]

Supposedly, Charles' unpublished experiment was later referenced by Gay-Lussac in 1802 when he published a paper on the precise relationship between the volume and temperature of a gas, which Gay-Lussac named "Charles' Law" in honor of Jacques Charles' original experiment. In modern terms, Charles' law is define as:

$$V = KT\,|_{n,P}$$

which states that for a body of gas at constant particle number *n* and pressure *P* the volume *V* of the gas will be constant *K*.

Gay-Lussac's law

See main: Gay-Lussac's law

In 1802, French chemist Joseph Gay-Lussac published the results of his findings in what is now known as Gay-Lussac's law, which in modern terms is:

$$P = KT\,|_{n,V}$$

which states that the pressure *P* of a body of gas at constant volume *V* and particle count *n* will be proportional *K* to its temperature *T*.

Law of Mariotte and Gay-Lussac

In 1834, French engineer Emile Clapyron gave a derivation in which he stated that Mariotte's law (PV = k, at constant temperature) combined with that of Gay-Lussac's law (P = kT, at constant volume) gives the expression: [4]

$$Pv = R(267 + t)$$

This is sometimes referred to as the 'G-M law' (e.g. by German chemist August Horstmann, 1873) or the 'law of Mariotte and Gay-Lussac' (according to Ingo Muller, *A History of Thermodynamics*, 2007).

Boyle-Charles law

See main: Boyle-Charles law

Into the 1890s, the phrase "ideal perfect gas" was being used in relation to gases that obeyed the laws of Charles and Boyle (or Boyle-Charles law), as defined by the following "characteristic equation": [5]

$$\frac{PV}{T} = K$$

which says that the ratio of the product of the pressure and the volume of the gas by the temperature is constant for in ideal perfect gas. The term 'perfect' in this case a residual carry-over from the earlier days of attempts to make a 'perfect vacuum' (perfect gas) in gunpowder engine. In most cases the phrase Boyle-Charles law was a precursor synonym for the later term 'ideal gas law', which arrived after the concept of the mole or particle count unit *n* was invented.

Ideal gas law

See main: Ideal gas law

The ideal gas law is a single combined expression of all of the various gas laws in one equation:

$$PV = nRT$$

which states that the product of the pressure and volume of an ideal gas is proportional to the product of the particle count and temperature of the gas. This modern version of the ideal gas law was being used in 1895 by Germans chemist Walther Nernst and in 1897 by physicist Max Planck.

See also

- Boyle-Charles law
- Social ideal gas law

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θΔics

In physics, **gas theory** refers, generally, to the collected theories on the thermodynamics, statistical mechanics, and kinetic theory of gas particle systems by Austrian physicist Ludwig Boltzmann, inclusive of subjects such as H-theorem, Boltzmann chaos assumption, among others. In 1895, Boltzmann collected his various articles, written over the last three decades, into the form of a unified lecture on the subject of what he called 'gas theory', publishing them in two parts, 1896 (part one) and 1898 (part two), under the title "Lectures on Gas theory" or *Vorlesungen uber Gastheorie*. [1]

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θΔics

In existographies, **Gaspar Schott** (1608-1666) (CR:33), aka "Kaspar Schottus", "Jesuit Schottus" (Boyle, 1660), "P. Gasparis Schotti" (Q), or “Caspar Schott” (Shapin, 1985), was a German mathematical physicist noted for his 1657 book *Mechanics of Gas Hydraulics (Mechanica Hydraulico-Pneumatic*), in which he detailed the experimental work on vacuums, vacuum bulbs, vacuum pumps, and the Magdeburg hemispheres of German engineer Otto Guericke.

Guericke | Pneumatico-Hydraulical Mechanics

In 1654, Schott had come to learn about the vacuum experimental work of Otto Guericke from Johann Philipp who had obtained a set of vacuum equipment from Guericke, following the Imperial Assemby at Regensburg, who then gave this equipment to Schott to test and study.

In 1657, Schott, in his *Pneumatic-Mechanical Hydraulics (Mechanica Hydraulico-Pneumatic*), dedicates an appendix with illustrations and description of the the experimental work on vacuums, vacuum bulbs, vacuum pumps, and the Magdeburg hemispheres of German engineer Otto Guericke. [5] The following shows the how this publication became a vehicle for the transmission of Guericke's ideas around the continent: [8]

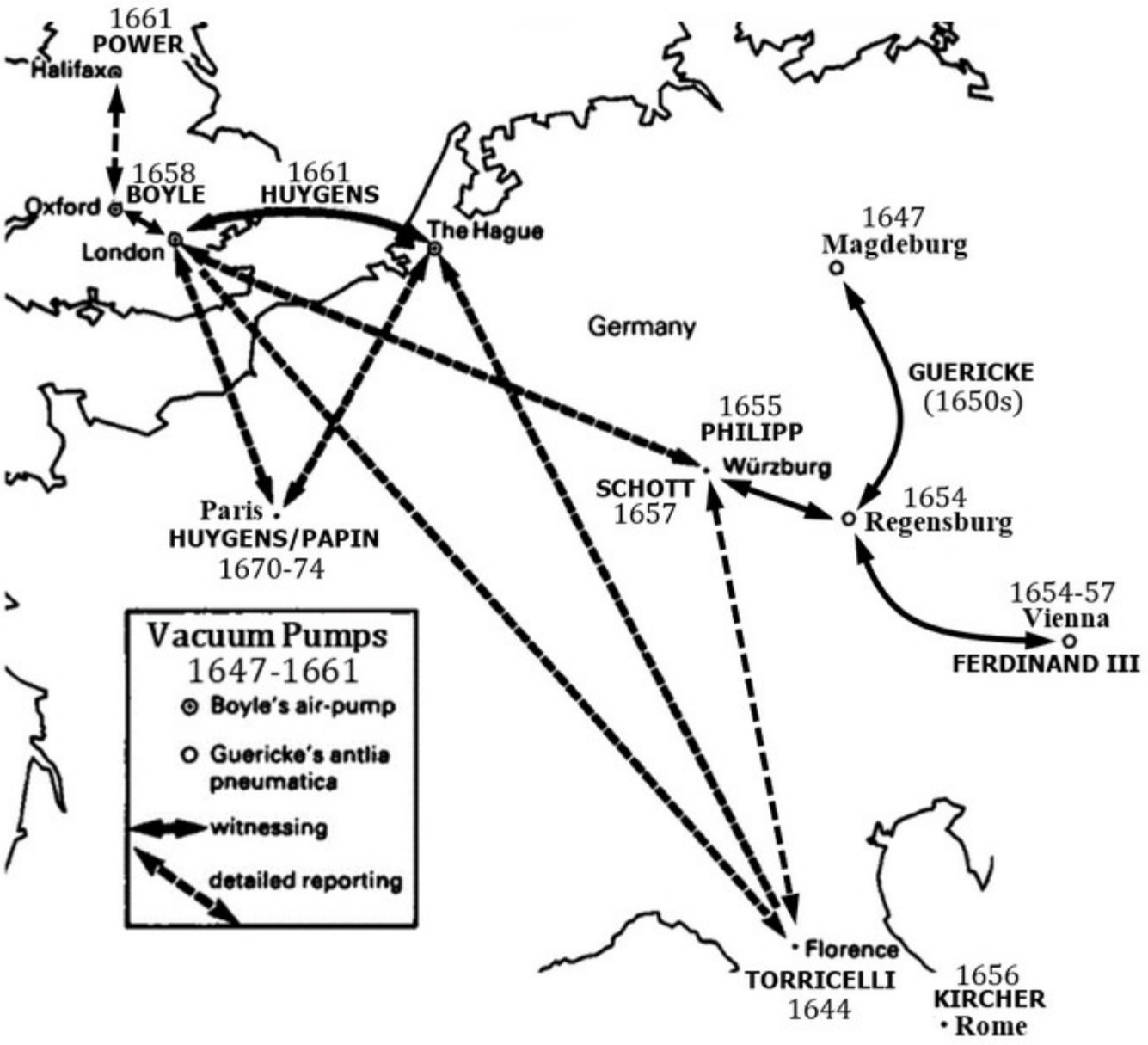

Guericke, in respect to this timeline map of Guericke’s movements and influence, is said to have conducted ten experiments while in Regensburg, according to a conjectured list made by Hans Schimank (1936), based on the two

published accounts by Gaspar Schott (1657; 1663), as reviewed by Thomas Conlon (2011), such as: [7]

1. The crushing of an air-tight vessel as air was withdrawn from it; the air being allowed to expand into a previously evacuated receiver.
2. A number of men were only able to pull an airtight piston halfway up a copper cylinder
3. Extraction of air using a vacuum pump
4. Extinction of a flame in a sealed vessel
5. Raising water vertically inside a vacuum bulb against its natural tendency to fall

(add)

Boyle and Huygens

Schott, and his publication, acted as a sort of liaison between the work of Guericke and Christiaan Huygens and Robert Boyle, who after reading his book began to make their own vacuum-based instruments, Boyle directing the construction of the pneumatical engine (air pump and vacuum pump), built in 1658 by his employee Robert Hooke, and Huygens, working with Denis Papin, making some of the first working gunpowder engines, wherein the explosion would act to create the vacuum. [2]

The results of Boyle and Hooke were published in the 1660 *New Experiments on the Spring of the Air*, which lead to the 1662 second edition statement of the Boyle's law, the first of the gas laws, that the product of the pressure and the volume of the body of gas is constant, when the particle count and temperature are held constant.

In c.1660-1661, Schott had come to learn of Boyle's vacuum experiments from Philip Ernest Vegelin, who by late 1661 or early 1662, sent Schott a copy of Boyle's *New Experiments on the Spring of the Air*. [4]

Technical Curiosities

In 1664, Schott, in his *Technical Curiosities*, published a diagram of the Berti vacuum experiment.

Schott also, following an entire chapter to Guericke's vacuum work, devoted chapter two to Boyle's vacuum work. [4]

Quotes | On

The following are quotes on Schott:

> "As soon as the Reverend Fathers of the Society of Jesus and the professors of the public University of Werzburg, under the chairman-ship of the same Eminent Elector, had verified these experiments of mine, they wrote out a draft of their findings and communicated them to the scholars in Rome and elsewhere and at the same time sought their opinions. Among this group of particular importance was the Reverend Father **Kaspar Schott**, Professor of Mathematics at the same university, who wrote me regarding the experiments and sought more information about them. Ultimately, he added, as an Appendix to his book, *The Art of Mechanical Hydraulic Pneumatics* (*De Arte Mechanica Hydraulico-Pneumatica*), published in 1657, these 'new experiments' of mine and called them "Magdeburgica", and these were set up in type so that they might be available for many to read and study."
>
> — Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* (pg. xix)

Quotes | By

The following are quotes by Schott:

> "These and many other considerations are adduced on both sides of this question. Melchior Cornaeus (Q),

professor of theology at our own university of Wurzburg, has learned and at some length argued these matters in a discussion of his own dedicated to this topic. On several occasions he and I observed and carefully scrutinized the experiments in question. When I first saw them, I sent an account to Kircher at Rome and to some other friends and scholars, asking their opinion of them. All of them sided with the Aristotelians against the 'vacuists'. Among the replies I received was this from Kircher."

— Gaspar Schott (c.1656), summary of communications on Otto Guericke's vacuum experiments [4]

"I do not hesitate to speak openly and declare without qualification that I have never seen nor heard of any experiments of this kind more worthy of admiration nor read nor even imagined such, and I do not believe that the sun ever shone upon anything like them from time immemorial. And I might add, this is the judgment of powerful princes and learned scholars as well, with whom I have been in communication as regards these experiments, etc."

— Gaspar Schott (1664), *Technical Curiosities* (pg. 3) [3][6]

See also

- Schott diagrams

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External links

- Gaspar Schott – Wikipedia.
- Correspondence of Caspar Schott (178 letters) – Early Modern Letters Online.

θΔics

In science, **Gaspard Monge** (1746-1818) (DN=7) was a French mathematician notable for founding the École Polytechnique, the original thermodynamics school, in 1794, together with French engineer Lazare Carnot (father of Sadi Carnot, thermodynamics initiator).

Quotes

The following are related quotes:

> "Descriptive geometry has two objects: the first is to establish methods to represent on drawing paper which has only two dimensions,—namely, length and width,—all solids of nature which have three dimensions,—length, width, and depth,—provided, however, that these solids are capable of rigorous definition.
> The second object is to furnish means to recognize accordingly an exact description of the forms of solids and to derive thereby all truths which result from their forms and their respective positions."
>
> — Gaspard Monge (c.1790), On the Purpose of Descriptive Geometry (Ñº)

External links

â— Gaspard Monge – Wikipedia.

θΔics

In existographies, **Gasparo Berti** (c.1600-1643) (CR:5), aka "Gaspar Berti" (Magiotti, 1650) was an Italian mathematician noted for his c.1639 water column vacuum experiment in which he set out to disprove the claim, found in Italian physicist Galileo Galilei's 1632 *Two New Sciences*, that water could not be raised 'a hair's breath above 18 braccia' (c. 11 meters). [1]

Overview

See main: Berti vacuum experiment

Galileo's ideas reached Rome in December of 1638 via 50 copies of his *Two New Sciences*, that quickly sold out. [2] Rafael Magiotti (c.1590-c.1658), owner of house depicted (below), and Gasparo Berti were excited by these ideas, and decided to seek a better way to attempt to produce a vacuum than with a siphon. Magiotti devised such an experiment, and sometime between 1639 and 1641, Berti (with Magiotti, Athanasius Kircher and Nicolo Zucchi present) carried it out. [3]

In Mar 1648, Rafael Magiotti, in a letter to Marin Mersenne (1588-1648), described how they upended a a large "lead siphon" c.22 braccia long that Berti had set up in the courtyard of his Magiotti's house. Magiotti claims that Berti, using the results of his experiments, managed to disprove Galileo's findings. [5]

In his first measurement, Berti measured from the bottom of the barrel, and hence measured a height well above 18 braccia, which gave him the initial conclusion that he had disproved Galileo. When it was point out to him, however, that he should have measured starting from the height of the water at the top—and not the bottom—of the barrel, he found the result exactly as Galileo had predicted. [2]

Reports by Athanasius Kircher and Gaspar Schott also describe Berti's experiments aimed at demonstrating the presence of the vacuum in a barometric tube. [5]

Four total accounts of Berti's experiment exist, but a simple model to his experiment consisted of filling a long tube with water that had both ends plugged up, then placing the tube into a basin already full of water. The bottom end of the tube was opened, and the water that had begun inside of it poured out of the bottom hole into the basin. However, only part of the water in the tube flowed out, and the level of the water inside the tube stayed at an exact level, which happened to be thirty-four feet, the exact height Baliani and Galileo had observed that was limited by the siphon. What was most important about this experiment was that the lowering water had had left a space above it in the tube which had had no intermediate contact with air to fill it up. This seemed to suggest the possibility of a vacuum existing in the space above the water. [4]

In sum, Berti, in an attempt to prove Galileo wrong, affixed a metal tube some 22 braccia long to the side of a several story building, depicted adjacent—his findings proved Galileo correct.

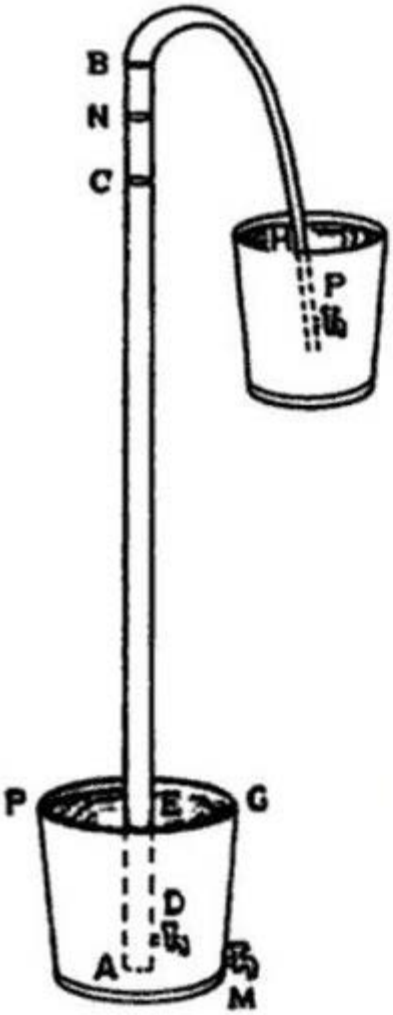

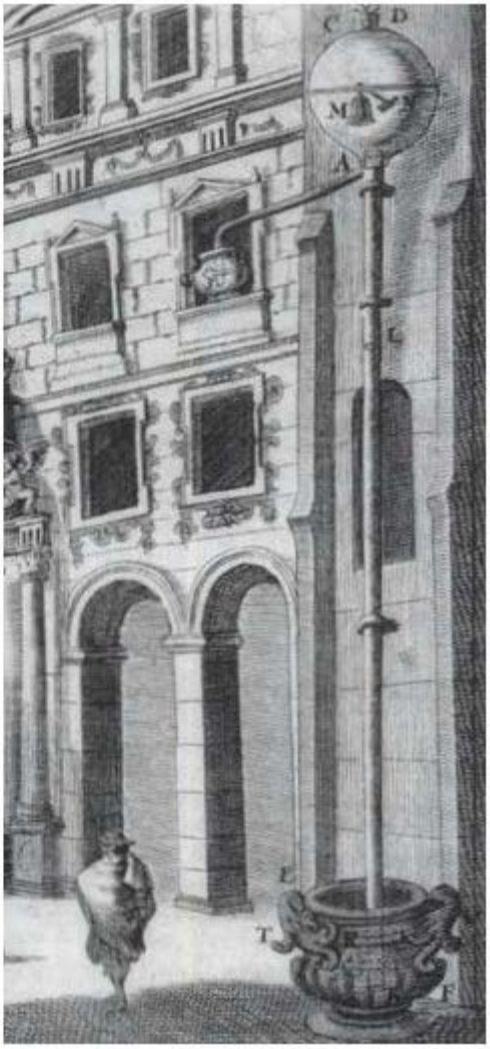

Two different depictions of Italian mathematician **Gasparo Berti**'s famous *circa* 1641 water tube vacuum testing experiment; the one to the right shown affixed to the house of Rafael Magiotti (c.1590-c.1658), who later described the experiment in a March 1648 letter to Marin Mersenne (1588-1648). [2]

Repercussion

The unwieldy size of the experiment led Italian physicist Evangelista Torricelli, in 1643, to redo the experiment, albeit using mercury, a denser than water fluid, which allowed for a smaller room-sized experimental device to be used.

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4. History of the barometer – Strange-Loops.com.
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External links

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θΔics

In existographies, **Gaston Bachelard** (1884-1962) (CR:7) was a French philosopher noted for his 1938 book *The Psychoanalysis of Fire* in which he analyzes the existence of fire (as well as heat and light), both as a real presence throughout the history of humankind and more importantly a literary, symbolic presence, such as discussed in the fields of literature chemistry and literature thermodynamics. [1] Bachelard, in short, seems to address the subject of the psychoanalysis or critique of the use of thermal words (or thermal phrases), such as the fire of passion, the heat of love, the light of my life, etc.

Romantics

Bachelard seems to have been one of the first to digress into the subject of relation of love or sexual value, in literature, to fire, heat (e.g. sexual heat, sexual temperature, sexual energy, etc.), or light . He cites the following passage of German philosopher Gotthilf Schubert's passage as a example of the fire or heat as a psychoanalytic tool:

> "Just as friendship prepares us for love, so by rubbing together of similar bodies, nostalgia (heat) is created and love (flame) spurts forth."

He goes on to cite, what seems to be about two dozen or so, other various usages of heat or fire as a metaphor, analogy, or model for the intricacies of human romance, relationships, and love; one example being Bohemian–Austrian poet Rainer Rilke:

> "To be loved means to be consumed in the flame; to love is to shine with an inexhaustible light."

(add)

Discussion

In studying these various passages, in modern human chemistry and human thermodynamics terms, one is quickly led into a deep analysis. How, for example, does the last passage scale down from the human chemical reaction of love, such as in the pair bonding male-female reaction:

$$Mx + Fy \rightarrow MxFy$$

or from the human reproduction reaction scale:

$$Mx + Fy \rightarrow MxFy + Bc$$

where the reactants Mx (male human molecule) and Fy (female human molecule) are "consumed" in the human chemical reaction, to the level of a smaller sized (easier to study) hydrocarbon combustion reaction, such as methane reacting with oxygen, giving off heat and light:

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$$

In comparing the two reactions, hydrocarbon combustion and human romantic combustion, one is quickly led into a very deep and involved subject. The mention of "light", by Rilke, for example, leads one into the question of how light

functions in human chemical reactions, of which topics including the metaphor (or non-metaphorical) term "bright", which is then related to the social nebular hypothesis theories of light, heat, or energy, hypothesized to be created by human gravitational contractions (social gravitation); as well as the exchange force and primary field particle theories, among others.

Quotes | On

The following are quotes on Bachelard:

> "Although very difficult to escape concepts and a vocabulary dedicated by usage, i.e. the 'epistemological obstacle' (Ñº) of **Bachelard** (1938), the effort is certainly worthwhile."
>
> — Ernest Schoffeniels (1973), *Anti-Chance* (pg. 4)

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External links

â— Gaston Bachelard – Wikipedia.

θΔics

In existographies, **Gaston Maspero** (1846-1916) was a French Egyptologist noted for []

Overview

In 1873, Maspero completed his doctoral thesis on "The Epistolary Genre among Ancient Egyptians. [1]

In 1881, Maspero discovered the Pyramid Texts at Saqqara, covering several pharaohs, including Unas , Pepi I and Pepi. [1]

In 1895 to 1899, Maspero published a nine-volume *History of Egypt: Chaldea, Syria, Babylonia, and Assyria*, in volume six (pg. 101) of which he gives an illustration of the tamarisk tree growing out of the tomb of Osiris, an early illustration of the now-famous Christmas Tree. [2]

Budge

In 1904, English Egyptologist Wallis Budge, in his two-volume *The Gods of the Egyptians*, cites Maspero over 40+ times; the gist summary of Maspero's contribution summarized as follows:

> "In the same year [1885] in which the first section of Brugsch's work appeared, **Maspero** published in the *Revue des Religions* (tom. xii., p. 123 f.) a masterly article, entitled *La Religion Egyptienne d'apres les pyramides de la V' et cle la VI' dynastie*, in which he gave to the world some of the results of his study of the " Pyramid Texts," which contain the oldest known Recension, i.e., the Heliopolitan, of the *Book of the Dead.* In 1887, Signor Lanzone published the last part of his *Dizionario di Mitologia Egizia*, which is one of the most valuable contributions to the study of Egyptian mythology ever made, and which contains the names of a large number of gods, demons, spirits, etc., arranged alphabetically, and a series of drawings of many of them printed in outline in red ink. In 1888 and 1889, Maspero, in two admirable articles in the *Revue des Religions (La Mythologie Egyptienne*, tom, xviii., p. 253 f., and tom, xix., p. 1 f.), discussed and criticized both the works of Brugsch and Lanzone, and shed a great deal of new light upon the facts collected in both. To Maspero belongs the credit of being the first to consider the Egyptian religion and mythology from the anthropological point of view, and all the evidence on these subjects which has since become available goes to prove the general correctness of the opinion which he stated some fifteen or sixteen years ago."

(add discussion)

Quotes

The following are noted quotes:

> "Jewish apocalypse [from Egypt] that were adapted or imitated by Christians were themselves preceded by rudimentary sorts of apocalypses composed by Pagans, some in Greek, others in the native language of the Egyptians."
>
> — Gaston Maspero (1899), "Review of Steindorff's *Apokalypse des Elias*" [3]

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3. Maspero, Gaston. (1899). “Review of Steindorff’s *Apokalypse des Elias*” (Ñº), *Journal des Savants*, 43.
4. (a) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (Maspero, 38+ pgs; quote, pg. ix). Dover, 1969.
(b) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (Maspero, 9+ pgs). Dover, 1969.

External links

â— Gaston Maspero – Wikipedia.

θΔics

In hmolscience, **Gates model**, as compared to the Camus model (1942), is the reaction extent model of the reaction trajectory of Bill Gates, in respect to the formation of Microsoft, as a physico-chemical process, as physical chemistry, and chemical thermodynamics, in particular, and collision theory (kinetics), would view him as a powered CHNOPS+22 molecule, employed to discuss a deanthropomorphic, physico-chemically neutral, non-teleological, re-conceptualized, terminologically-reformed version of "purpose" in the language of Gibbs forces and Gibbs potentials, similar to the way the Newtonian forces and gravitational potentials explain why a rock falls to the surface of the earth or a surfer rides a wave; a rectification or reification, so to say, of the partially-incorrect oft-flouted "Sisyphean purpose" model (Camus, 1942), "purposeless universe" (Atkins, 1998) model, and or "pointlessness universe" (Weinberg, 1993) models. (Q)

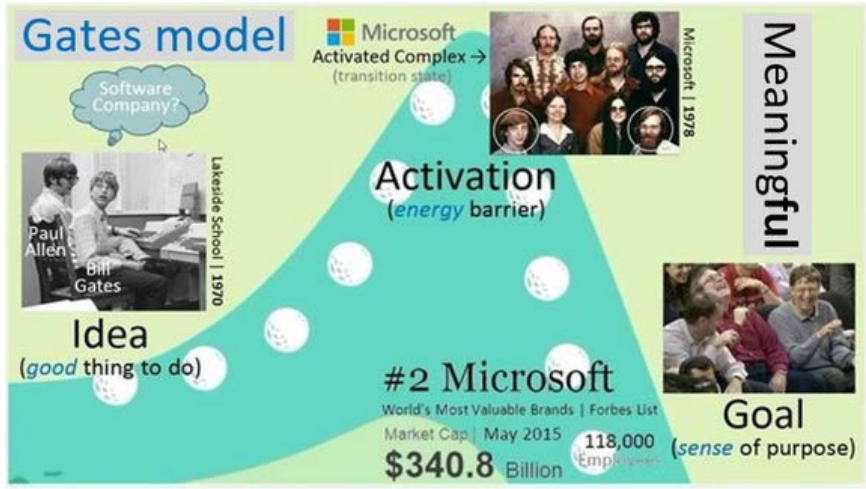

A visual of the so-called "**Gates model**", from the 2015 "Zerotheism for Kids: Lecture 4: Enthalpy & Entropy, Moral Compass, and Monism" (Q) (14:47-) video, by Libb Thims, also discussed in the 2014 "25 Smartest People Alive | Existive (2 of 5) (Q) (3:49-8:40) video, therein depicting a visual of the "gravito-electromagnetic force", aka Gibbs force (see: force function), that moved Bill Gates, from his two person initial state, through his reaction coordinates, over the activation energy barrier, forming the activated complex of the 11-member Microsoft "group" at the apex, and "falling" into the product stage (end state) of the Microsoft corporation, valued at $341 billion in 2015, employing some 120 thousand people, which is akin to the "gravitational force" causing a rock to fall through its gravitational potential, say if tipped off a cliff.

Overview

In 2007, Libb Thims, in his *Human Chemistry*, was using the so-called "Hwang model", i.e. the extent of reaction diagrams of David Hwang (2001), depicting happy and unhappy couples, to visually show reaction potentials (thermodynamic potentials) between people: [1]

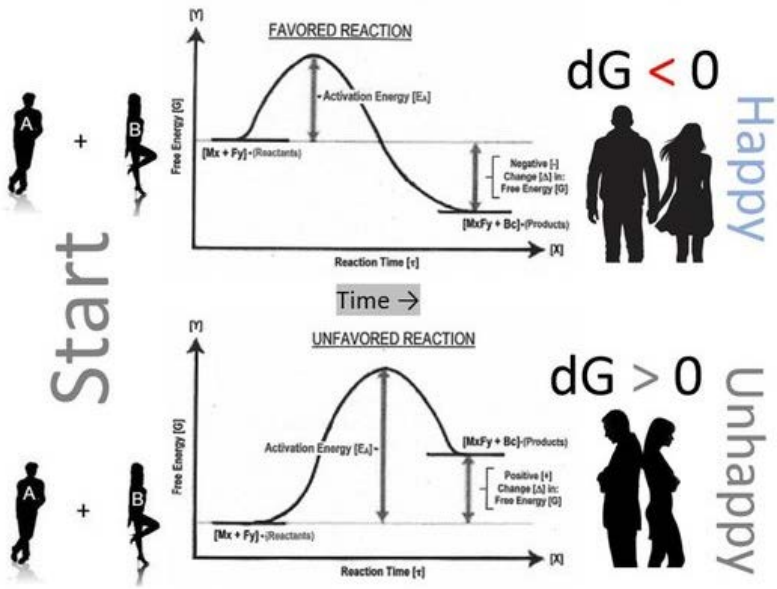

In 2010, Thims was citing the so-called "de Lange model", of Adriaan de Lange, in Hmolpedia and thereabouts in related projects:

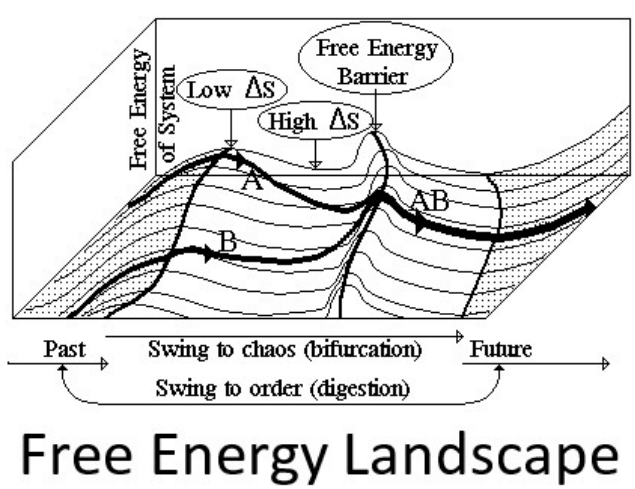

Some of this combined "Hwange-de Lange model" may be visualized in respect to a surfer riding (Q) a wave:

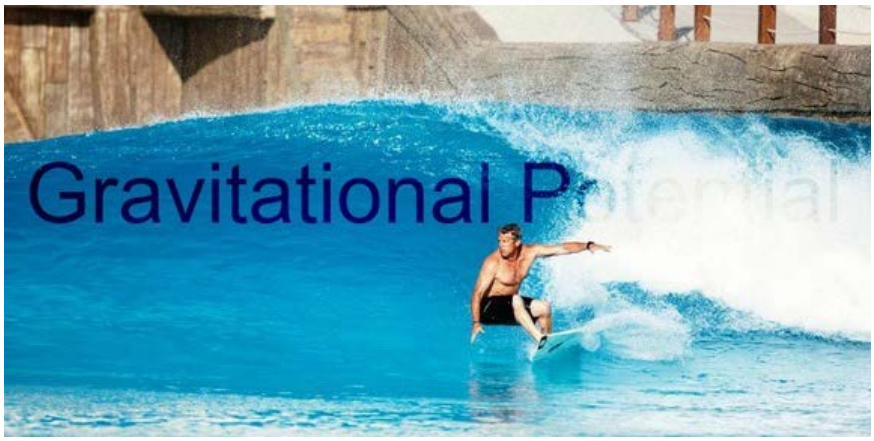

The following shows the basic outline of the dynamics of wave mechanics:

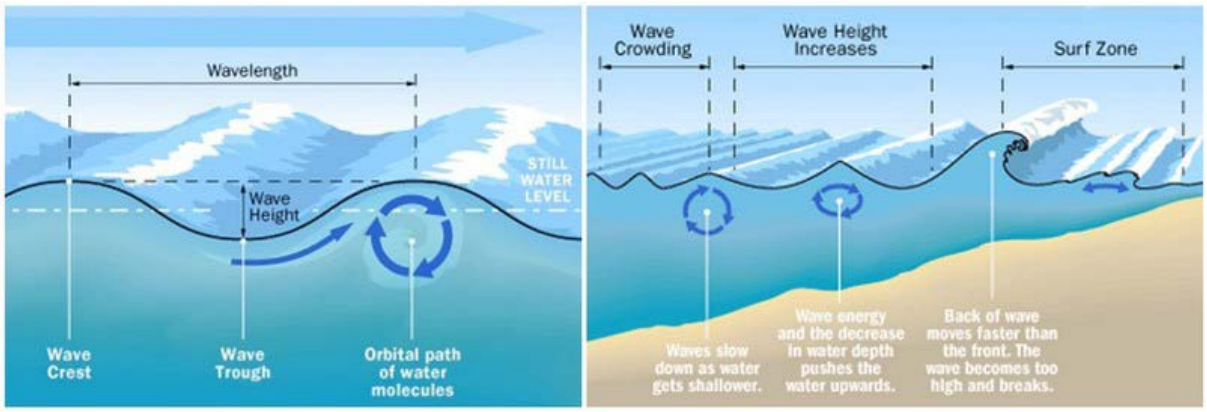

In a sense, the way in which the movement of the moon and earth trigger and regulate the waves and tides, causing water molecules to go through orbital paths (see: social orbital theory) of increasing size, so to do human molecules in society, regulated in somewhat of a similar manner, go through orbital paths of increasing size, e.g. see Pareto on circulation of elites, in his spinning top social pyramid model, within which circulating levels of agitated and less-agitated human molecules rise and fall or orbit, according to which a keen social surfer, e.g. a Bill Gates, or an "Einstein type" who "divines a sense of purpose", etc., can, do, and will ride similar types of social waves, according to which the Newtonian force pushing the wave-rider becomes the Gibbsian force pushing the social wave-rider, or something to this effect. The following shows some basic (O) wave riding physics, which may be extrapolated to some basic principles of wave riding social physics:

Here, in respect to the "all good rides must come to an end" truism, one should be keen to keep in mind Goethe's phoenix aphorism:

> "Our passions are true phoenixes: as the old one burns away a new one immediately rises from the ashes."
>
> — Goethe (1809), "Ottilie's aphorisms" (EA | P2:**C4** [A22])

Each "wave", in other words, according to Goethe, is a passion; when one ends, a new one will soon rise from the ashes. Powered reaction existence, accordingly, in this view of "things", is but a ride on multiple passion waves.

In 2013, Thims, during his "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" lecture, PowerPoint slide #4 in particular, shown below, was outlining how the "force functions" of Gibbsian geometry are but three dimensional versions of the two-dimensional force functions, e.g. gravity, of Newtonian geometry: [2]

Newtonian Geometry

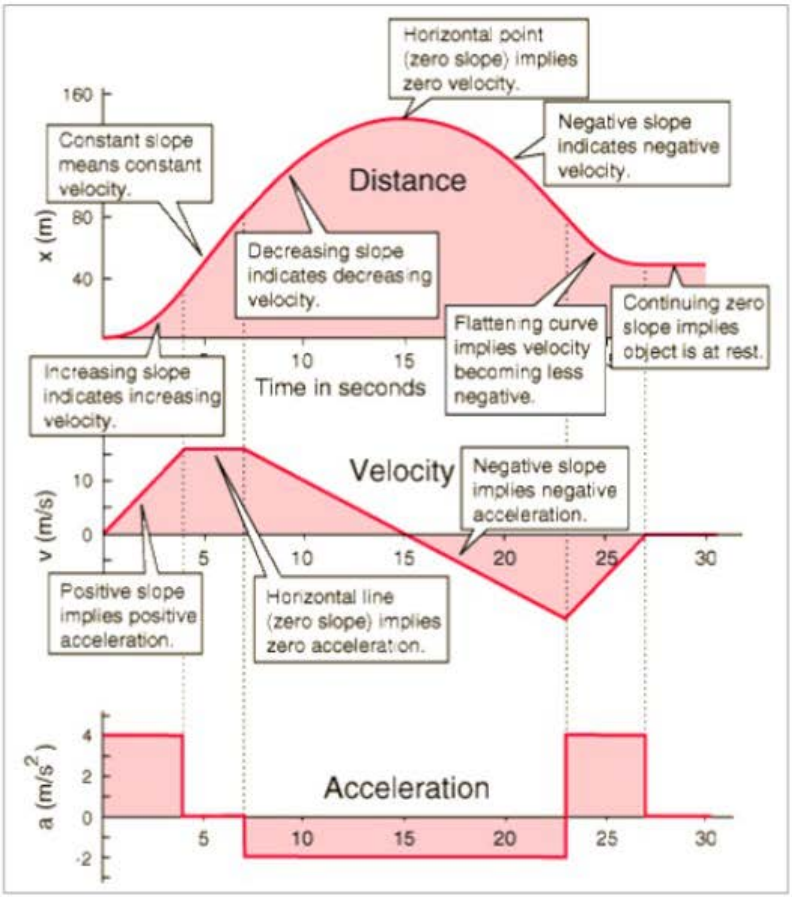

Gibbsian Geometry

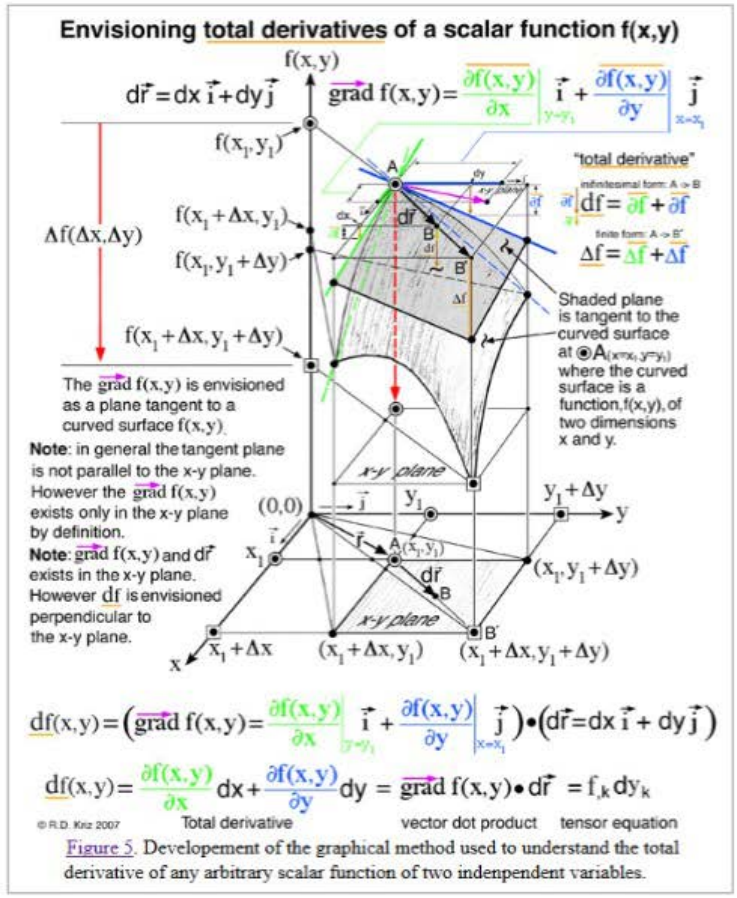

Figure 5. Developement of the graphical method used to understand the total derivative of any arbitrary scalar function of two independent variables.

In 2014, Thims, during his "25 Smartest People Alive | Existive" countdown, used the reaction path of Bill Gates, then (Q) ranked #20, to explain Einstein's "divine a sense of purpose" motto in terms of riding Gibbs potentials. [3]

In 2015, Thims, during the "Zerotheism for Kids" lecture, an Ostwald-styled (see: Monistic Sunday Sermons) smart atheism Monday school, so to say, given to six kids, aged 2 to 11: girl 2, boy 6, girl 7, boy 9, girl 10, and boy 11, in Chicago, employed the Gates model again, amid showing the children Kareem Jarrah's TED-ed "What Triggers a Chemical Reaction?" video, to explain to them how when they go out into the world, some of them, as Einstein said, may "divine a sense of purpose", and ride these Gibbs potentials, like a surfer rides a wave, that fits into the movement of the universe, like and Adams creed wave. [4]

References

1. Hwang, David. (2001). "The Thermodynamics of Love" (WB) (pdf), *Journal of Hybrid Vigor*, Issue 1, Emory University.
2. Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (video, 1:33-min) (article, 40-pgs) (PowerPoint, 36-slides), Key speaker talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29; in: *Econophysics, Sociophysics, and other Multidisciplinary Sciences Journal* (Q) (pdf), 3(2):5-25.
3. Thims, Libb. (2014). "25 Smartest People Alive | Existive (2 of 5)" (Q) (3:49-8:40) video, Human Chemistry 101, Dec 11.
4. (a) Thims, Libb. (2015). 2015 "Zerotheism for Kids: Lecture 4: Enthalpy & Entropy, Moral Compass, and Monism" (Q) (14:47-). Atheism Reviews, Sep 7.
(b) Jarrah, Kareem. (2015). "What triggers a chemical reaction? (Q:1-3:45) video, TED-ed lesson, Jan 20.

θΔics

In hmolscience, **Gavin Ritz** (1959-) is a New Zealand business engineer noted, in business thermodynamics, for his 1992 to 2009 effort to develop an Adriaan de Lange based theory of thermodynamics applied to society and business.

Overview

In circa 1992, Ritz began to work on theories on the energetics and thermodynamics of human organizations and behavior. [1] The following is Ritz's reasoning as to how thermodynamics can be applied in society: [3]

> "The fundamental formula can therefore show what type of balance is required to keep an organization or society from too much or too little concentrated Gibbs free energy change and work. If, for example, too much free energy of individuals in a society is concentrated on a singular qualitative value, such as purity, this can lead to massive societal and organizational destruction like national socialism."

Ritz also has developed tools to measure values, motives, and also business strategy, all based on thermodynamics, particularly entropy.

Ritz's key proposition is that at a fundamental level behind all business, organizational and economic structures and processes is energy and its counterpart work, just as is in the science of thermodynamics. Ritz proposes that this energy and work can be formulated by what he calls the fundamental formula. In short, Ritz contends that the main impetus of his theory, as of 2009, is that the Gibbs fundamental equation: [4]

$$\Delta F = \Delta H - T\Delta S$$

whereby the free energy change, as defined by German physicist Hermann Helmholtz, refers to the amount of energy of the system that can freely be converted into external work, is the work energy involved in the creation of civilization. Ritz connects this logic to the 2002 formula for 'organic work' defined by Canadian psychologist Elliott Jaques: [5]

$$W_o = JT$$

where *Wo* is organical work done by living organisms, *J* is the mental exertion, and *T* is the target time. Using this expression, Ritz postulates that Gibbs free energy change for a business or economic system will be less than the sum of organic work plus another type of standard work W, as defined by modern science:

$$\Delta F < W_o + W$$

Beyond this basis, Ritz's argument at many points becomes rather incoherent, e.g. he seems to neglect free energy coupling in nature and society, but he does clearly state that it is the free energy that converts to work, which is the cause of everything that happens.

Most of Ritz's theory, as found in his 2009 article "The Fundamental Formula as Energy and Work", to note, seems to be based on the online book *Irreversible Self-Organization* by African physicist and creationist writer Adriaan de Lange. [4]

Motivational entropy production

He postulates that it is possible to measure 'motivational entropy production', which might be an effective measure for organizational adaptability, having correlation to the 'state of the organization'. Theories he culls from include: ego psychology, cybernetics, Prigoginean thermodynamics (force-flux pairings and entropy dissipation), Nicholas Georgescu-Roegen, and Shannon information theory. [1]

Ritz argues that in human production systems, factors such as time and cost are system extensive variables, whereas factors such as cognition and knowledge are system intensive variables, and that pairings of these factors can be used to calculate entropy production of motivation, similar to how the extensive variable temperature T with the intensive variable heat dQ can be used to calculate the entropy dQ/T of a physical system.

Education

Ritz completed his BS in civil engineering and geotechnics in 1984, an honors in business and administration in 1986 and later his MBA in 1987. He has taught graduate and general business courses for over fifteen years. [2]

References

1. Ritz, Gavin. (2001). Motivation Modeling: A Systems Thinking Approach", Nov. 17, *Scribd.com.*
2. Gavin Ritz (profile) – Performance Associates.
3. Ritz, Gavin (2009). "The Fundamental Formula as Energy & Work." *Scribd.com.*
4. De Lange, A. (2009). "Irreversible Self-organization (pt. 8: Energy and Entropy Laws; pt. 12: The Big Wet; pt. 13: The Rate of Entropy Production; pt. 14: The Creative Inploffing;" pt. 15: Entropy Increase is Necessary but not Sufficient; etc.), (Afrikaans → English), Woes.co.za.
5. (a) Jaques, Elliott. (2002). *The Life and Behavior of Living Organisms: a General Theory* (organical work, 35-pages). Preager.
(b) Jaques, Elliott. (2002). "Orders of Complexity of Information and the Worlds we Construct." Unpublished Paper.
(c) Jaques, Elliott. (1996). *Requisite Organization.* Cason hall.

Further reading

- Ritz, Gavin (2001). "Motivational Modelling": 9th World Conference on Thinking, Auckland, New Zealand, 2001.
- Ritz, Gavin. (2005). "Power and Organization: A Practitioner's Complexity Approach" (pg. 239-), in: *Systems Thinking and Complexity Science: Insights for Action:* proceedings of the 11th ANZSYS/Managing the Complex V Conference (held in Christchurch, New Zealand, 5th-7th December, 2005) by Kurt A. Richardson, Wendy J. Gregory, Gerald Midgley, ISCE Pub., 2006.
- Ritz, Gavin (2005). "What is Knowledge." *Scribd.com.*
- Ritz, Gavin (2007). "Foundations of Organisation a Fundamental Concept." *Scribd.com.*

θΔics

In hmolscience, **Gavrilo Princip** (1894-1918) was a Bosnian Serbian and member of the terrorist organization Black Hand who at the age of nineteen, sometime shortly before 11AM on June 28, 1914, shot and killed Austro-Hungarian Archduke Franz Ferdinand, an act which set off a chain reaction resulting in WWI and WWII, embroiling nearly the entire world, at the end of which, in 1945, thirty-one years later, 100 million casualties resulted. [1]

Human catalyst

American chemical engineer Scott Fogler, in his 1992 *Elements of Chemical Reaction Engineering*, argues that a person who starts a riot and then ducks out before things get violent would be an example of a human catalyst: [2]

> "A catalyst is a substance that affects the rate of a reaction but emerges from the process unchanged. A man inciting a mob to riot and then ducking out before the tanks roll in can be regarded as a catalyst."

In this sense, we might be inclined to think of Princip as the catalyst to the followup coupled reactions of the WWI reaction and the WWII reaction. A catalyst, however, in a typical sense, is considered as something that emerges from the process unchanged. Princip was, however, was captured and died four years later in prison.

Quotes

The following are related quotes:

> "There is no need to carry me to another prison. My life is already ebbing away. I suggest that you nail me to a cross and burn me alive. My flaming body will be a torch to light my people on their path to freedom."
>
> — Gavrilo Princip (1914), said to prison warden on being moved to another prison (O)

See also

- War thermodynamics
- Tipping point

References

1. (a) Buchanan, Mark. (2000). *Ubiquity: Why Catastrophies Happen* (pg. 3). Three Rivers Press.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (Gavrilo Princip, pg. 62). Morrisville, NC: LuLu.
(c) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
2. (a) Fogler, H. Scott. (1992). *Elements of Chemical Reaction Engineering* (catalyst, pg. 242). Prentice Hall.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (Fogler, human catalyst, pg. 94). (preview), (Google books). Morrisville, NC: LuLu.

External links

- Gavrilo Princip – Wikipedia.

θΔics

In gas laws, **Gay-Lussac's law** states that the pressure *P* of a body of gas at constant volume *V* and particle count *n* will be proportional *K* to the temperature *T* of the gas:

$$P = KT\,|_{n,V}$$

The law was first enunciated in 1802 by French chemist Joseph Gay-Lussac.

θΔics

In religio-mythology, **Geb**, spelled: Seb, Keb, Gebb, Kebb; in hieroglyphics: (goose + god symbol), (egg + god symbol), 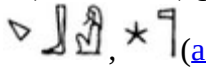 (astro-theology + god symbol), or ; in c.800BC identified with the Greek gods Kronos or Gaia (Greek), depending; in c.500BC transliterated as Joseph (Hebrew), is, according to Heliopolis creation myth (Ennead), the Egyptian "earth god"; the son of Shu and Tefnut; male counterpart to the goddess Nut; father of Osiris, Isis, Set, and Nephthys. [1]

A picture of **Geb** (aka Kronos), the Egyptian conception of the flat earth as a god, lying on his back, being separated from his lover Nut (aka Rhea), by the god Shu (aka Atlas), each god shown with Greek equivalent identification gods, according to Plutarch (100AD).

Overview

The following are two typical images of Geb, both images he is shown holding the was scepter (right hand) and ankh (left hand); in the right image he has a goose on his head:

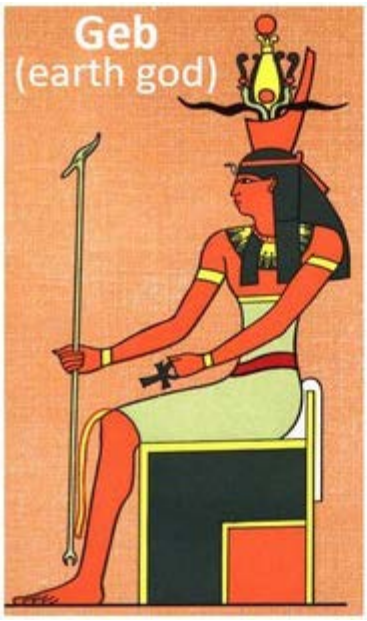

(add)

Greek mythology

In Greek mythology, via Homer (c.800BC), Hesiod (c.800BC), and Virgil (30BC), Geb was the forerunner to and or equated with the Greek god Kronos (Cronos), the father of Zeus, and or Gaia, the earth god, depending.

Jewish mythology

In Judaism, Geb was "god reduced" into the Biblical character of Joseph, i.e. "J- Seb" or god Geb, the step-father of

Jesus, just as Geb was the mythical father to Osiris.

Quotes

The following are related quotes:

> "Plutarch's version of the myth of Isis and Osiris connects the various episodes, many of which can be documented from Egyptian sources, into a single, running narrative (*On Isis and Osiris*, 12-19). The story be-gins with Kronos (**Geb**, the Egyptian earth god) and Rhea (Nut, the Egyptian sky goddess) overcoming the curse of Helios (Re, the sun god) with the help of Hermes (Thoth, the Egyptian moon god) by producing five children on five intercalary days: Osiris, Horus, Typhon (Set), Isis, and Nephthys. As pharaoh of Egypt, Osiris brings civilization to that country and to the whole world. Typhon, however, gathers conspirators and plots to kill Osiris. First, he imprisons Osiris within a coffin and throws it into the Nile River, and later he dismembers the body of Osiris and scatters the pieces all around Egypt. One piece, the penis, is lost forever in the Nile River. In both episodes, the reproductive power of Osiris is sub-merged in the Nile. (Isis grieving and searching for Osiris and burning away the mortality of the infant prince of Byblos can be compared with …"
>
> — Marvin Meyer (1999), *The Ancient Mysteries* (Ñº)

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (§: Seb, pgs. 94-; image, pgs. 94-96). Dover, 1969.

External links

â— Geb – Wikipedia.

θΔics

In existographies, **Geber** (c.721-c.815) (IQ:175|#250) [RGM:630|1,500+] (MAG:8) (CR:20), aka 'Jābir ibn Hayyān', was an Arabian chemist, noted for his 'three principles' theory of generalized chemical properties, one of which, sulphur representative of combustion, was a precursor to the formulation of entropy. [1]

Three principles

To further explain the phenomena of combustion and metallic properties, metals (copper, iron, gold, etc.) were said to be formed out of two elements: *sulphur*, 'the stone which burns', which characterized the principle of combustibility, and *mercury*, which contained the idealized principle of metallic properties.

This evolved into the Arabic three principles: *sulphur* giving flammability or combustion, *mercury* giving volatility and its opposite, and *salt* giving solidity.

Paracelsus

See main: Entropy formulations

Geber's sulphur principle combustion theory was modified by Paracelsus in 1524; Paracelsus' combustion theory was modified by Johann Becher in 1669 to yield the terra pinguis combustion theory; Becher's combustion theory was modified in 1703 by Georg Stahl to yield the phlogiston theory; Stahl's combustion theory was modified in 1787 by French chemist Antoine Lavoisier to yield caloric theory; caloric theory was modified by German chemist Rudolf Clausius in 1850 through 1865 to yield entropy theory, later to be known as the second law of thermodynamics.

Quotes | By

The following are noted quotes:

> "As long as a word remains unspoken, you are its master; once you utter it, you are its slave."
>
> — Geber (c.800) (Q)

> "Make books your companions; let your bookshelves be your gardens; bask in their beauty, gather their fruit, pluck their roses, take their spices and myrrh."
>
> — Geber (c.800) (Q)

> "In seeking wisdom, the first step is silence, the second listening, the third remembering, the fourth

practicing, the fifth – teaching others."

— Geber (c.800) (O)

References

1. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (§: Heat and affinity, pgs. 426-36). LuLu.

External links

- Jābir ibn Hayyān – Wikipedia.

θΔics

In categorizations, **genealogies** are lineages that track ascendants and descendants, whether familial or educational, through time; e.g. the genealogy of Goethe. [1]

List

The following are hmolscience-relevant genealogies:

- Bernoulli genealogy
- Euler genealogy
- Thomson genealogy
- Gauss genealogy
- Goethe genealogy

References

1. Goethe genealogy (see bottom) – The Esoteric Redux, Blogspot.com.

θΔics

In theories, **general systems theory**, developed in *circa* 1950 by Austrian biologist Ludwig Bertalanffy, situates a general model of "systems" being a melting pot mixture of biology, information theory (from Claude Shannon), cybernetics (from Norbert Wiener), and bit of verbal thermodynamics, in an attempt to differentiate between open and closed systems. [1] The 1968 book *General System Theory* by Bertalanffy worked to migrate the subject to other areas of science to a large extent.

Influence

The book was one of the first to connect entropy, in very simple terms, to biological and social systems; late influencing those such as Dick Hammond and Kenneth Bailey, among others.

References

1. Boulding, Kenneth E. (1956). "General Systems Theory: the Skeleton of Science", *Management Science*, 2: 197-208.
2. Bertalanffy, Ludwig. (1968). *General Systems Theory: Foundations, Development, Applications* (pgs. 39-44). New York: George Braziller.

θΔics

In science, **gnergy**, complementary union of *information* (gn-) and *energy* (-ergon), is a hypothetical concept, conceived in 1991 by American theoretical cell biologist Sungchul Ji, which is argued to drive 'all self-organizing processes in the universe, including the evolution of life'. [1] Ji's online site Conformon.net as well as his 2012 *Molecular Theory of the Living Cell* outlines the details of this convoluted theory. [1]

Discussion

A paradoxical aspect of Ji's convoluted argument is that he seems to be relatively knowledgeable about chemical thermodynamics, mentioning, for example, free energy, predominately, Gibbs free energy, on some 86+ pages, as well as free energy landscapes (see: energy landscapes) for protein folding (see: protein thermodynamics), but seems to be ignorant of the fact that, according to Gilbert Lewis (1923), it is Gibbs free energy that is the driving force for freely-going reactive movements, such as evolution, that occur on the surface of the earth.

References

1. (a) Ji, Sungchul. (2012). *Molecular Theory of the Living Cell: Concepts, Molecular Mechanisms, and Biomedical Applications* (pdf) (free energy, 86+ pgs) (§4.7: The Information-Entropy Relations, pgs. 97-101). Springer.
(b) Home – Conformon.net.

θΔics

In religio-mythology, **Genesis**, from the Hebrew bereshīt (בְּרֵאשִׁית) meaning “in the beginning” , from the Egyptian kepheru [glyph] (Budge, 1904, pg. 294), meaning “evolutions” or “rollings” of Ra, refers to [] [N3][N4]

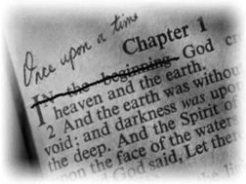

Overview

Noted religio-mythology scholars to first begin to decode Biblical Genesis, as either illogical and or redaction or recension theory based include: Origen (c.230), Wallis Budge (1904), Muata Ashby (1997), and Gary Greenberg (2000), to name a few.

Location | Nome #20

The location of the “site” of creation, as told in Genesis, in the original Egyptian formulation, as summarized by Wallis Budge (1904), based on descriptions the *Book of the Dead*, was nome #20 (see: nome list) of Upper Egypt, called Henen-su (also: Suten-hene, Het-Henen-su, or Ninsu) (O), by the Egyptians, or Herakleopolis, by the Greeks; Budge summarizes this as follows: [9]

> “Henen-su [Herakleopolis], the center of the worship of Khnemu under the form of Her-shefi, is often referred to in the *Book of the Dead*, and a number of important mythological events are said to have taken place there. Thus, **it was here** that Ra rose for the first time **when the heavens** [Nut] **and the earth** [Geb] **were created** (xvii. 7-9), and it was this rising which formed the first great act of creation, because as soon as Ra rose he separated the earth from the sky.”

Budge, citing Edouard Naville (1894), also states that the following mythological events also took place in Herakleopolis: [10]

> “Osiris was here crowned lord of the universe, and here his son Horus assumed the throne of his father left vacant by the death of Osiris. When Ra ordered the goddess Sekhet to go forth and destroy mankind [Gen 6:5-7] because they had mocked him and had spoken lightly of his age, she started on her journey from Henen-su. To this place also returned Set after his defeat by Horus, who had wounded him severely, and Osiris was believed to have taken a spade and covered over with earth the blood which dropped from him and his fiends, and to have buried the bodies of those whom Horus had slain.”

Budge also tells us (pg. 59) that the great Benu bird, aka the phoenix, resided here.

Genesis

The following shows the religio-mythology morph of Genesis 1:1 to 2:3 over time:

#	**Hermopolis Recensions** [Hermopolis creation myth] (2800BC) [Recension theory]	**Hebrew** (500BC)	**Alexandrian redaction** (310BC) Nesi-Amsu Papyrus [Creation Version A] [5]	**Alexandrian redaction** (310BC) Nesi-Amsu Papyrus [Creation Version B] [5]	**Leningrad Codex** (1009) [Hebrew] (O)	**Geneva Version** (1560)	**King James Version** (1611) [Latin]	**New International Version** (1973)
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0.1			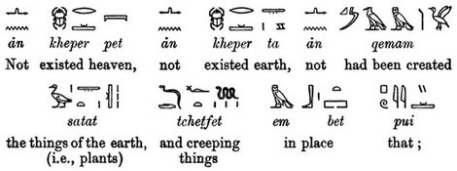			[two pre "in the beginning" pages] [N3]		
							Creation Start (KJV)	**Creation Start** (NIV)
1.1	“In the beginning, god [Shu or Re-Atum, depending] created heaven [Nut] and earth. [Geb]		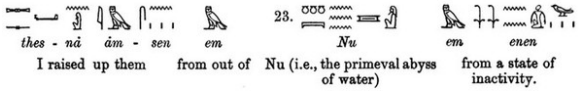		In the beginning, Elohiym [אֱלֹהִים] created the heaven [שָׁמַיִם / shamayim] and the earth [אֶרֶץ / 'erets]		In the beginning God created the heaven and the earth.	In the beginning God created the heavens and the earth.
1.2	And the earth was without form [Huh] and void [Hauhet]; and the darkness [Kuk] was upon the face of the deep [Kauket]. And the Spirit of god [Amen] moved upon the face of						And the earth was without form, and void; and darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters.	Now the earth was formless and empty, darkness was over the surface of the deep, and the Spirit of God was hovering over the waters.

	the waters [Amenet].”							
							Light Made	**Light Made**
1.3							And God said, Let there be light: and there was light.	And God said, “Let there be light,” and there was light.
1.4	“The one (i.e. Amen) that came into being in the first time when no god was yet created, when you [Amen-Ra] opened your eyes to see with them and everybody became illuminated by means of the glances of your eyes, when the **day had not yet come into being**.”						And God saw the light, that it was good: and God divided the light from the darkness.	God saw that the light was good, and he separated the light from the darkness.
1.5	(see: Thebian creation myth)						And God called the light Day, and the darkness he called Night. And the evening and the morning were the first day.	God called the light “day,” and the darkness he called “night.” And there was evening, and there was morning—the first day.
							Second Day (KJV)	**Second Day** (NIV)
1.6							And God said, Let there be a firmament in the midst of the waters, and let it divide the waters from the waters.	And God said, “Let there be a vault between the waters to separate water from water.”
1.7							And God made the firmament, and divided the waters which were under the firmament from the waters which were above the firmament: and it was so.	So God made the vault and separated the water under the vault from the water above it. And it was so.
1.8							And God called the firmament Heaven. And the evening and the morning were the second day.	God called the vault “sky.” And there was evening, and there was morning—the second day.
							Third Day (KJV)	**Third Day** (NIV)
1.9							And God said, Let the waters under the heaven be gathered together unto one place, and let the dry land appear: and it was so.	And God said, “Let the water under the sky be gathered to one place, and let dry ground appear.” And it was so.
1.10							And God called the dry land Earth; and the gathering together of the waters called he Seas: and God saw that it was good.	God called the dry ground “land,” and the gathered waters he called “seas.” And God saw that it was good.
							Plant Life	**Plant Life**
1.11							And God said, Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind, whose seed is in itself, upon the earth: and it was so.	Then God said, “Let the land produce vegetation: seed-bearing plants and trees on the land that bear fruit with seed in it, according to their various kinds.” And it was so.
1.12							And the earth brought forth grass, and herb yielding seed after his kind, and the tree yielding fruit, whose seed was in itself, after his kind: and God saw that it was good.	The land produced vegetation: plants bearing seed according to their kinds and trees bearing fruit with seed in it according to their kinds. And God saw that it was good.
1.13							And the evening and the morning were the third day.	And there was evening, and there was morning—the third day.
							Fourth Day (KJV)	**Fourth Day** (NIV)
							And God said, Let there be	

1.14							lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days, and years:	And God said, “Let there be lights in the vault of the sky to separate the day from the night, and let them serve as signs to mark sacred times, and days and years,
1.15							And let them be for lights in the firmament of the heaven to give light upon the earth: and it was so.	and let them be lights in the vault of the sky to give light on the earth.” And it was so.
							Sun and Moon	**Sun and Moon**
1.16							And God made two great lights; the greater light to rule the day, and the lesser light to rule the night: he made the stars also.	God made two great lights—the greater light to govern the day and the lesser light to govern the night. He also made the stars.
1.17							And God set them in the firmament of the heaven to give light upon the earth,	God set them in the vault of the sky to give light on the earth,
1.18							And to rule over the day and over the night, and to divide the light from the darkness: and God saw that it was good.	to govern the day and the night, and to separate light from darkness. And God saw that it was good.
1.19							And the evening and the morning were the fourth day.	And there was evening, and there was morning—the fourth day.
	5th Day						**Fifth Day** (KJV)	**Fifth Day** (NIV)
1.20							And God said, Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven.	And God said, “Let the water teem with living creatures, and let birds fly above the earth across the vault of the sky.”
							Animal Life	**Animal Life**
1.21							And God created great whales, and every living creature that moveth, which the waters brought forth abundantly, after their kind, and every winged fowl after his kind: and God saw that it was good.	So God created the great creatures of the sea and every living thing with which the water teems and that moves about in it, according to their kinds, and every winged bird according to its kind. And God saw that it was good.
1.22							And God blessed them, saying, Be fruitful, and multiply, and fill the waters in the seas, and let fowl multiply in the earth.	God blessed them and said, “Be fruitful and increase in number and fill the water in the seas, and let the birds increase on the earth.”
1.23							And the evening and the morning were the fifth day.	And there was evening, and there was morning—the fifth day.
	6th Day						**Sixth Day** (KJV)	**Sixth Day** (NIV)
1.24							And God said, Let the earth bring forth the living creature after his kind, cattle, and creeping things, and beast of the earth after his kind: and it was so.	And God said, “Let the land produce living creatures according to their kinds: the livestock, the creatures that move along the ground, and the wild animals, each according to its kind.” And it was so.
1.25							And God made the beast of the earth after his kind, and cattle after their kind, and every thing that creepeth upon the earth after his kind: and God saw that it was good.	God made the wild animals according to their kinds, the livestock according to their kinds, and all the creatures that move along the ground according to their kinds. And God saw that it was good.
							Human Life	**Human Life**
1.26							And God said, Let us make man in our image, after our likeness: and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth.	Then God said, “Let us make mankind in our image, in our likeness, so that they may rule over the fish in the sea and the birds in the sky, over the livestock and all the wild animals, and over all the creatures that move along the ground.”
							So God created man in his own image, in the image of God created he him;	So God created mankind in his own image, in the image of God he created

1.27	male and female created he them.	them; male and female he created them.	
1.28	And God blessed them, and God said unto them, Be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth.	God blessed them and said to them, "Be fruitful and increase in number; fill the earth and subdue it. Rule over the fish in the sea and the birds in the sky and over every living creature that moves on the ground."	
1.29	And God said, Behold, I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in the which is the fruit of a tree yielding seed; to you it shall be for meat.	Then God said, "I give you every seed-bearing plant on the face of the whole earth and every tree that has fruit with seed in it. They will be yours for food.	
1.30	And to every beast of the earth, and to every fowl of the air, and to every thing that creepeth upon the earth, wherein there is life, I have given every green herb for meat: and it was so.	And to all the beasts of the earth and all the birds in the sky and all the creatures that move along the ground—everything that has the breath of life in it—I give every green plant for food." And it was so.	
1.31	And God saw every thing that he had made, and, behold, it was very good. And the evening and the morning were the sixth day.	God saw all that he had made, and it was very good. And there was evening, and there was morning—the sixth day.	
2.1	Thus the heavens and the earth were finished, and all the host of them.	Thus the heavens and the earth were completed in all their vast array.	
7th Day	**Seventh Day** (KJV)	**Seventh Day** (NIV)	
2.2	And on the seventh day God ended his work which he had made; and he rested on the seventh day from all his work which he had made.	By the seventh day God had finished the work he had been doing; so on the seventh day he rested from all his work.	
2.3	And God blessed the seventh day, and sanctified it: because that in it he had rested from all his work which God created and made.	Then God blessed the seventh day and made it holy, because on it he rested from all the work of creating that he had done.	

(add discussion)

Why Seven Days?

As for the reason for why creation, as presented in Genesis, occurs in "seven" days, only speculative theories have been forthcoming.

In 1997, Muata Ashby, in his section: "The Pauti: Nine Principles of Creation according to the Theology of Anu [Heliopolis]", of his *Anunian Theology*, describes the Heliopolis creation myth, alludes to the effect that "day one" of in the beginning creation was the birth of Ra (or Ra-Atum), the sun. out of the Nun (water), after which Hathor, Thoth (moon), and Maat (order principle) emerged, after which the god pairs Shu (water) and Tefnut (moisture), Geb (earth) and Nut (sky), where born, and this was day one. Ashby then the story of the five added days of the Egyptian calendar constitutes the next five steps in creation: Horus the elder born (day two), Set born (day three), Isis born (forth day), and Nephthys born (fifth day). [6] The later addition (seventh day) story of Set mating with Nephthys making Anubis and Osiris mating with Isis making Horus, is loosely asserted by Ashby; and or possibly that this was not an actual day, i.e. a six-day creation model.

In 2000, Gary Greenberg, in his *101 Myths of the Bible*, through Myths 1-14, generally does a good job of tracing the Egyptian mythology and Babylonian mythology underpinnings of Genesis, on the topic of seven days are employed is generally silent, except in myth #15: God Rested on the Seventh Day, where he says that "sabbath day" rest period was a late edition, deriving the views of King Josiah, as penned in Deuteronomy 5:15, which states that "god commanded by mighty hand and stretched out arm [see: Aten's fingers] to keep the Sabbath." [7]

Other

In c.230, Origen said the following: [4]

> "To what person of intelligence, I ask, will the account seem logically consistent that says there was a 'first day' and a 'second' and 'third', in which also 'evening' and 'morning' are named, without a sun, without a moon, and without stars, and even in the case of the first day without a heaven (Gen. 1:5-13)? …. Surely, I think no one doubts that these statements are made by Scripture in the form of a type by which they point toward certain mysteries."

In c.1803, Thomas Paine, in his "Origin of the Christian Religion", asserted the following: [3]

> "The [Christian] Cosmogony, that is, the account of the creation with which the book of Genesis opens, has been taken and mutilated from the Zend-Avesta of Zoroaster, and was fixed as a preface to the Bible after the Jews returned from captivity in Babylon, and that the Robbins of the Jews do not hold their account in Genesis to be a fact, but mere allegory. The six thousand years in the Zend-Avesta, is changed or

interpolated into six days in the account of Genesis."

In 1930, Henry Mencken, in his *Treatise on the Gods* (O), attempted to reconstruct Genesis as follows:

> "The cosmogony of the Jews, as recorded in Genesis, was mainly borrowed from the Babylonians. According to Archibald Sayce, the creation myth that it embodies arose at Eridu, a town on the Persian Gulf. Here, he says in the Hastings' *Encyclopedia of Religion and Ethics* [part nine], 'the land was constantly growing through disposition of silt, and the belief consequently arose that the earth had originated in the same way. The water of the great deep accordingly came to be regarded as the primordial element out of which the universe was generated. The deep was identified with the Persian Gulf, which was conceived as encircling the earth'."

In 2000, Gary Greenberg, in his *101 Myths of the Bible*, asserted a similar argument, albeit with more focus on the Egyptian mythology basis of Genesis.

Adam and Eve

The following shows the religio-mythology morph of Genesis 2:4 to 2:25. over time:

#	Egyptian | Unas Version (2345BC)	Hebrew (200AD)	King James Version (1611)	Heston Illustrated Version [Watson Heston] (1890)	English | New International Version (1973)
			Adam and Eve (KJV)		**Adam and Eve** (NIV)
2.4			These are the generations of the heavens and of the earth when they were created, in the day that the Lord God made the earth and the heavens,		This is the account of the heavens and the earth when they were created, when the Lord God made the earth and the heavens.
2.5			And every plant of the field before it was in the earth, and every herb of the field before it grew: for the Lord God had not caused it to rain upon the earth, and there was not a man to till the ground.		Now no shrub had yet appeared on the earth and no plant had yet sprung up, for the Lord God had not sent rain on the earth and there was no one to work the ground,
2.6			But there went up a mist from the earth, and watered the whole face of the ground.		but streams came up from the earth and watered the whole surface of the ground.
2.7			And the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man [**N1**] became a living soul.	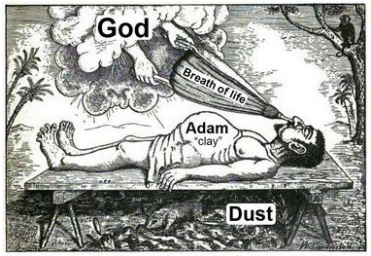 "And the **Lord God** formed **man** of the **dust** of the ground, and **breathed** into his nostrils the **breath of life**, and man became a **living soul**." — Anon (c.500BC), *Bible* (Genesis 2:7)	Then the Lord God formed a man [**N2**] from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being.
			Garden of Eden (KJV)		**Garden of Eden** (NIV)
2.8			And the Lord God planted a garden eastward in Eden; and there he put the man whom he had formed.		Now the Lord God had planted a garden in the east, in Eden; and there he put the man he had formed.
			Tree of Knowledge (KJV)		**Tree of Knowledge** (NIV)
2.9			And out of the ground made the Lord God to grow every tree that is pleasant to the sight, and good for food; the tree of life also in the midst of the garden, and the tree of knowledge of good and evil.		The Lord God made all kinds of trees grow out of the ground—trees that were pleasing to the eye and good for food. In the middle of the garden were the tree of life and the tree of knowledge of good and evil.
			Four Rivers (KJV)		**Four Rivers** (NIV)
2.10			And a river went out of Eden to water the garden; and from thence it was parted, and became into four heads.		A river watering the garden flowed from Eden; from there it was separated into four headwaters.
2.11			The name of the first is Pison: that is it which compasseth the whole land of Havilah, where there is gold;		The name of the first is the Pishon; it winds through the entire land of Havilah, where there is gold.
2.12			And the gold of that land is good: there is bdellium and the onyx stone.		(The gold of that land is good; aromatic resin and onyx are also there.)
2.13			And the name of the second river is Gihon: the same is it that compasseth the whole land of Ethiopia.		The name of the second river is the Gihon; it winds through the entire land of Cush.
2.14			And the name of the third river is Hiddekel: that is it which goeth toward the east of Assyria. And the fourth river is Euphrates.		The name of the third river is the Tigris; it runs along the east side of Ashur. And the fourth river is the Euphrates.
	Don't Eat Knowledge (UV)		**Don't Eat Knowledge** (KJV)		**Don't Eat Knowledge** (NIV)

2.15	And the Lord God took the man, and put him into the garden of Eden to dress it and to keep it.	The Lord God took the man and put him in the Garden of Eden to work it and take care of it.
2.16	And the Lord God commanded the man, saying, Of every tree of the garden thou mayest freely eat:	And the Lord God commanded the man, "You are free to eat from any tree in the garden;
2.17	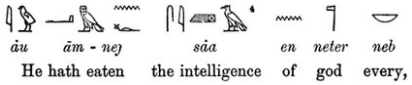 But of the tree of the knowledge of good and evil, thou shalt not eat of it: for in the day that thou eatest thereof thou shalt surely die.	but you must not eat from the tree of the knowledge of good and evil, for when you eat from it you will certainly die."
	Creation of Woman (KJV)	**Creation of Woman** (NIV)
2.18	And the Lord God said, It is not good that the man should be alone; I will make him an help meet for him.	The Lord God said, "It is not good for the man to be alone. I will make a helper suitable for him."
2.19	And out of the ground the Lord God formed every beast of the field, and every fowl of the air; and brought them unto Adam to see what he would call them: and whatsoever Adam called every living creature, that was the name thereof.	Now the Lord God had formed out of the ground all the wild animals and all the birds in the sky. He brought them to the man to see what he would name them; and whatever the man called each living creature, that was its name.
2.20	And Adam gave names to all cattle, and to the fowl of the air, and to every beast of the field; but for Adam there was not found an help meet for him.	So the man gave names to all the livestock, the birds in the sky and all the wild animals. But for Adam [the man] no suitable helper was found.
2.21	And the Lord God caused a deep sleep to fall upon Adam, and he slept: and he took one of his ribs, and closed up the flesh instead thereof;	So the Lord God caused the man to fall into a deep sleep; and while he was sleeping, he took one of the man's ribs and then closed up the place with flesh.
2.22	And the rib, which the Lord God had taken from man, made he a woman, and brought her unto the man.	Then the Lord God made a woman from the rib he had taken out of the man, and he brought her to the man.
2.23	And Adam said, This is now bone of my bones, and flesh of my flesh: she shall be called Woman, because she was taken out of Man.	The man said: "This is now bone of my bone, and flesh of my flesh; she shall be called 'woman,' for she was taken out of man."
2.24	Therefore shall a man leave his father and his mother, and shall cleave unto his wife: and they shall be one flesh.	That is why a man leaves his father and mother and is united to his wife, and they become one flesh.
2.25	And they were both naked, the man and his wife, and were not ashamed.	Adam and his wife were both naked, and they felt no shame.

"And the rib, which the Lord God had taken from man, made he a woman, and brought her unto the man."
— Anon (c.500BC), *Bible* (Genesis 2:22)

(add discussion)

Eating Knowledge

Gen 2.9 and 2.15-17, wherein we are told about Adam eating from the "tree of knowledge", and therein becoming "like gods", and therein knowing "good and evil", is derived, in part, from the Unas Pyramid Texts (O), the oldest known Pyramid Texts, the last king of the 5th dynasty (2498-2345BC) – which can be compared to the Teti Pyramid Texts (O)(O), the successor to Unas – wherein, according to the Gaston Maspero (1885) translation, cited and commented on by Wallis Budge (1904), who defines it as the "Heliopolitan recension", aka Heliopolis creation myth derivative, in the section titled "Unas: the Slayer and Eater of Gods", we find the following: [3]

> "Unas, it is said, hath **eaten the "knowledge,"** **of every god**, and the period of his life and his existence are merged into eternity and everlastingness, which he may pass in any way that pleaseth his spiritual body *(sdh)*, and during this existence he has no need whatsoever to do anything which is distasteful to him. Moreover, the soul[s] and spirits of the gods are in and with Unas, and their souls, and their shadows, and their divine forms are with him."

(add discussion)

Four Rivers

In the four rives section, Gen 2.10-14, we find reference to four rivers.

Firstly, Ralph Ellis, in his *Eden in Egypt* (2004), asserts (O) that the river of Eden, described with four branches is the Nile River, with the Blue Nile and White Nile,

being two branches, and two rivers of the Nile Delta being the other two branches. [8] Others (Q), similar to Ellis, have summarized this as follows:

> "The Nile starts its flow in the Ethiopian highlands. To many Ethiopians "Gihon" as they call the Nile is one of the **four rivers** that flowed out of Eden at the beginning of the World. It was the river mentioned in the Bible's Genesis. In ancient times, powerful Ethiopian kingdoms knew not where the river went exactly, just as the Egyptians knew not where it came from. There even was a great and powerful king named Gihon. The Ethiopians said the river had no resting place."

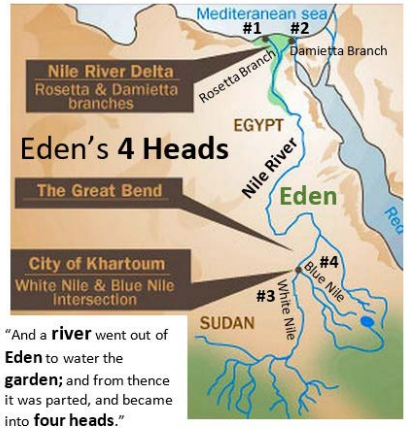

"And a **river** went out of **Eden** to water the **garden;** and from thence it was parted, and became into **four heads**."
— Genesis 2.10

Alternatively, we might see an attempt to morph or syncretize Heliopolis creation myth (3100BC), i.e. the flood myth of the Nile River, whose two major tributaries are the White Nile and Blue Nile, which discharges into the Nile Delta, and Sumerian creation myth (3,400BC), i.e. the flood myth of the Tigris river and Euphrates river, who merge to create the Shatt al-Arab river (Q), which discharges into the Persian Gulf; the gist of this four river, two myth syncretism is summarized as follows:

> "The Hebrew redactors used Egyptian myths to make the biblical stories; which, from time to time, had Babylonian myths grafted onto earlier texts or replaced portions of the original stories."
>
> — Gary Greenberg (2000), *101 Myths of the Bible* (pg. 7)

Or, as Thomas Paine, in his "Origin of Christianity" (1803), put things, Babylonian mythology was "fixed as a preface to the Bible after the Jews returned from captivity in Babylon".

Fall of Man | Original Sin

The following shows the religio-mythology morph of Genesis 3.1 to 3.24 over time:

#	Egyptian | Unas Version (2345BC)	Hebrew (200AD)	Leningrad Codex (1009) [Hebrew] (Q)	King James Version (1611)	Heston Illustrated Version [Watson Heston] (1890)	New International Version (1973)
3.1				Now the serpent was more subtil than any beast of the field which the Lord God had made. And he said unto the woman, Yea, hath God said, Ye shall not eat of every tree of the garden		Now the serpent was more crafty than any of the wild animals the Lord God had made. He said to the woman, "Did God really say, 'You must not eat from any tree in the garden'?"
3.2				And the woman said unto the serpent, We may eat of the fruit of the trees of the garden:		The woman said to the serpent, "We may eat fruit from the trees in the garden,
3.3				But of the fruit of the tree which is in the midst of the garden, God hath said, Ye shall not eat of it, neither shall ye touch it, lest ye die.		but God did say, 'You must not eat fruit from the tree that is in the middle of the garden, and you must not touch it, or you will die.'"
3.4				And the serpent said unto the woman, Ye shall not surely die:		"You will not certainly die," the serpent said to the woman.
				Good and Evil (KJV)		**Good and Evil** (NIV)
3.5				For God doth know that in the day ye eat thereof, then your eyes shall be opened, and ye shall be as gods, knowing good and evil.		"For God knows that when you eat from it your eyes will be opened, and you will be like God, knowing good and evil."
3.6				And when the woman saw that the tree was good for food, and that it was pleasant to the eyes, and a tree to be desired to make one wise, she took of the fruit thereof, and did eat, and gave also unto her husband with her; and he did eat.		When the woman saw that the fruit of the tree was good for food and pleasing to the eye, and also desirable for gaining wisdom, she took some and ate it. She also gave some to her husband, who was with her, and he ate it.
3.7				And the eyes of them both were opened, and they knew that they were naked; and they sewed fig leaves together, and made themselves aprons.		Then the eyes of both of them were opened, and they realized they were naked; so they sewed fig leaves together and made coverings for themselves.
				Why Disobeyed God? (KJV)		**Why Disobeyed God?** (NIV)
3.8				And they heard the voice of the Lord God walking in the garden in the cool of the day: and Adam and his wife hid themselves from the presence of the Lord God amongst the		Then the man and his wife heard the sound of the Lord God as he was walking in the garden in the cool of the day, and they hid from the Lord God among the trees of the

trees of the garden.

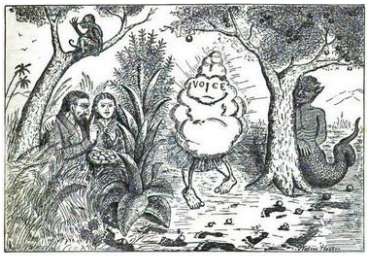

"And they heard the voice of the Lord God walking in the garden in the cool of the day: and Adam and his wife hid themselves from the presence of the Lord God amongst the trees of the garden."
— Anon (c.500BC), *Bible* (Genesis 3:8)

garden.

3.9		And the Lord God called unto Adam, and said unto him, Where art thou?	But the Lord God called to the man, "Where are you?"
3.10		And he said, I heard thy voice in the garden, and I was afraid, because I was naked; and I hid myself.	He answered, "I heard you in the garden, and I was afraid because I was naked; so I hid."
3.11		And he said, Who told thee that thou wast naked? Hast thou eaten of the tree, whereof I commanded thee that thou shouldest not eat?	And he said, "Who told you that you were naked? Have you eaten from the tree that I commanded you not to eat from?"
3.12		And the man said, The woman whom thou gavest to be with me, she gave me of the tree, and I did eat.	The man said, "The woman you put here with me—she gave me some fruit from the tree, and I ate it."
3.13		And the Lord God said unto the woman, What is this that thou hast done? And the woman said, The serpent beguiled me, and I did eat.	Then the Lord God said to the woman, "What is this you have done?" The woman said, "The serpent deceived me, and I ate."
		Punishment (KJV)	**Punishment** (NIV)
3.14		And the Lord God said unto the serpent, Because thou hast done this, thou art cursed above all cattle, and above every beast of the field; upon thy belly shalt thou go, and dust shalt thou eat all the days of thy life:	So the Lord God said to the serpent, "Because you have done this, "Cursed are you above all livestock, and all wild animals! You will crawl on your belly, and you will eat dust, all the days of your life:
3.15		And I will put enmity between thee and the woman, and between thy seed and her seed; it shall bruise thy head, and thou shalt bruise his heel.	And I will put enmity, between you and the woman, and between your offspring and hers; he will crush your head, and you will strike his heel."
3.16		Unto the woman he said, I will greatly multiply thy sorrow and thy conception; in sorrow thou shalt bring forth children; and thy desire shall be to thy husband, and he shall rule over thee.	To the woman he said, "I will make your pains in childbearing very severe; with painful labor you will give birth to children. Your desire will be for your husband, and he will rule over you."
3.17		And unto Adam he said, Because thou hast hearkened unto the voice of thy wife, and hast eaten of the tree, of which I commanded thee, saying, Thou shalt not eat of it: cursed is the ground for thy sake; in sorrow shalt thou eat of it all the days of thy life;	To Adam he said, "Because you listened to your wife and ate fruit from the tree about which I commanded you, 'You must not eat from it,' "Cursed is the ground because of you; through painful toil you will eat food from it, all the days of your life.
3.18		Thorns also and thistles shall it bring forth to thee; and thou shalt eat the herb of the field;	It will produce thorns and thistles for you, and you will eat the plants of the field.
3.19		In the sweat of thy face shalt thou eat bread, till thou return unto the ground; for out of it wast thou taken: for dust thou art, and unto dust shalt thou return.	By the sweat of your brow, you will eat your food, until you return to the ground, since from it you were taken; for dust you are and to dust you will return."
		Naming Eve (KJV)	**Naming Eve** (NIV)
3.20	And Adam [אָדָם / 'adam] called his wife's name Eve [חַוָּה / Chavvah]; because she was the mother of all living [חַי / chay].	And Adam called his wife's name Eve; because she was the mother of all living.	Adam named his wife Eve, because she would become the mother of all the living.
3.21	Unto Adam also and to his wife did the Lord [Yehovah] God [Elohiym] make coats of skins, and clothed them.	Unto Adam also and to his wife did the Lord God make coats of skins, and clothed them.	The Lord God made garments of skin for Adam and his wife and clothed them.

"Unto Adam also and to his wife did the Lord God make coats of skins, and clothed them."
— Anon (c.500BC), *Bible* (Genesis 3:21)

	Cast Out of Eden (KJV)		**Cast Out of Eden** (NIV)
3.22	And the Lord God said, Behold, the man is become as one of us, to know good and evil: and now, lest he put forth his hand, and take also of the tree of life, and eat, and live for ever:		And the Lord God said, "The man has now become like one of us, knowing good and evil. He must not be allowed to reach out his hand and take also from the tree of life and eat, and live forever."
3.23	Therefore the Lord God sent him forth from the garden of Eden, to till the ground from whence he was taken.	"Therefore the Lord God sent him forth from the garden of Eden, to till the ground from whence he was taken." — Anon (c.500BC), *Bible* (Genesis 3:23)	So the Lord God banished him from the Garden of Eden to work the ground from which he had been taken.
3.24	So he drove out the man; and he placed at the east of the garden of Eden Cherubims, and a flaming sword which turned every way, to keep the way of the tree of life.	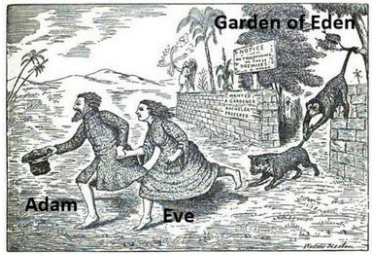 "So he drove out the man; and he placed at the east of the garden of Eden Cherubims, and a flaming sword which turned every way, to keep the way of the tree of life." — Anon (c.500BC), *Bible* (Genesis 3:24)	After he drove the man out, he placed on the east side of the Garden of Eden cherubim and a flaming sword flashing back and forth to guard the way to the tree of life.

(add discussion)

See also

- Advice of the Guardian of the Ragusa Capuchins
- Joshua 10:13
- How the Bible was written?

Notes

N1. Hebrew: dust of the ground [2]
N2. The Hebrew for *man (adam)* sounds like and may be related to the Hebrew for *ground (adamah)*; it is also the name *Adam* (see verse 20) [2]
N3. In 1604, king Kames VI, in aims to upgrade the Geneva Bible (1560) (Q), which he considered to have "borderline revolutionary notes" (Q), commissioned 47 scholars to make a new Bible with "no marginal notes at all, but only explanation of the Hebrew or Greek words" (rule #6). The "King James Version" of the Holy Bible was completed in 1611 with the omission of 3 complete books, multiple chapters and verses, hundreds of words were either omitted, added or changed and the 2 pages of text in the Book of Genesis that came before "In the beginning God created..." was removed. (Q)
N4. The early English editions of the Bible, according to Benjamin Disraeli (1804-1881), as reported by Elizabeth Stanton, in her "Women's Position in the Christian Church" (1888), contain some 6,000 errors in the translation from Hebrew to English (Hecht, 2003).

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(b) Budge. Wallis. (1904). *The Gods of the Egyptians, Volume One* (eating knowledge, pgs. 43; eating intelligence, pg. 54). Dover, 1969.
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(b) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (Nes-Amsu Papyrus discussion, pgs. 293-307; Creation Version A, pgs. 308-13; Creation Version B, pgs. 313-21). Dover, 1969.
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7. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (pg. 38). Source Books.
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Further reading

● St. Clair, George. (1898). *Creation Records Discovered in Egypt*. Nutt.

Videos

● Maggard, Larry N. (2012). “Book of Genesis (Verbatim Hebrew to English translation)” (O), Larry N Maggard, YouTube, Jan 11.

External links

● Genesis 1-2 In Light Of Ancient Egyptian Creation Myths – Bible.org.

θΔics

In religious thermodynamics, **genetic entropy** is a term defined in 2005 by American plant geneticist John Sanford as the *mutational entropy* affects within large genomes that cannot be reversed by natural selection. [1] This, according to Sanford, makes the eventual extinction of such genomes inevitable. Due to the religious undertones used in Sanford's book, the term has since been taken up by the intelligent design and creation science movement.

The term "genetic entropy" to note, in a loose sense, was previously used by authors V. K. Savchennko and U. K. Sauchanka in 1997 in association with their concept of gentropy. [2]

References

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2. Savchennko, V. K. and Sauchanka, U. K. (1997). *The Genosphere: the Genetic System of the Biosphere*, (pg. 4, pgs. 41-42). Informa Healthcare.

A circa 2010 talk by American plant geneticist John Sanford on his "**genetic entropy**" theory.

θΔics

In terminology, **genius**, from the Latin *gignere* (meaning to 'beget' or produce), is someone who is able to hit targets invisible to others, in whom intellect tends to predominate over will much more than the average person, wherein a strong leaning and inclination tends to exist, and often in which a polymathic nature and autodidactic traits tend to reign. [1]

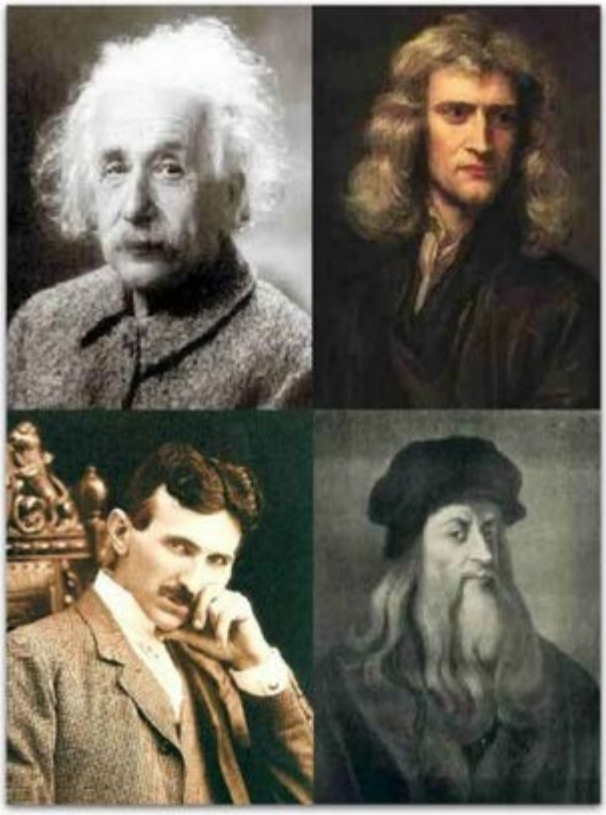

A typical genus poster, depicting archetypical geniuses: Albert Einstein, Isaac Newton, Nikola Tesla, and Leonardo da Vinci, a group representative of the motto: "a **genius** is someone who has mastered certain principles and ways of conducting themselves, so that they can achieve any desire they want—because there are certain laws at work which we are not aware of, yet which the genius has discovered through trial and error." [6]

Commonalities

Both Jean Rousseau (IQ:180|#145) and Friedrich Nietzsche (IQ:190|#30) held their hand in fire, in youth (c. age 12), to test the strength of their will to glory in respect to the Mucius Scaevola hand burning legend.

Both Goethe (IQ:220|#1) and Percy Shelley (IQ:185|#65), in college (or before), became atheists after reading Baron d'Holbach's *The System of Nature* (1770).

Categories | Top

The mean IQ of **"anti-chance" based philosophers**, based on those above with established IQ citations, namely: Spinoza (185|#53), Holbach (185|#57), Goethe (225|#1), Schiller (185|#69), Einstein (215|#3), Lotka (185|#79), and Henderson (180|#105), is: **194|#52** (Jan 2018)

The mean IQ of the rare breed of aware **"unlearn" expositors**, specifically: Hypatia (IQ:190|#44) [RGM:145|1,245+], Desiderius Erasmus (IQ:185|#89) [RGM:212|#1,245+], Rene Descartes (IQ:195|#13) [RGM:36|1,245+], Thomas Jefferson (IQ:190|#45) [RGM:29|1,245+], and Jonathan Swift (IQ:180|#160) [RGM:170|1,246+] is **188|#64** (also mean RGM:115) (Nov 2017).

The mean IQ of "**thing philosophers**", specifically: Aristotle (IQ:195|#10), Lucretius IQ:180|#94), Marcus Aurelius (IQ:180|#125), Nicholas of Cusa (IQ:180|#40), Giordano Bruno (IQ:190|#35), Benedict Spinoza (IQ:185|#53), Napoleon Bonaparte (IQ:180|#111), and Rene Lubicz (IQ:175|#270), is: **IQ:183|#92** (Jan 2018).

Genius | Epochs

See main: Genius epochs

The following are genius types by epoch or by nationality:

- Egyptian genius
- Greek genius
- Italian genius
- Roman genius
- Chinese genius
- Middle ages genius
- German genius
- English genius
- French genius
- American genius

(add)

Types

In 1758, John Adams, aged 23, in his diary entry, had the following to say about genius, in general, and its five main types: mechanical genius, poetical genius, philosophic genius, moral genius, and political genius, as he say things: [32]

> "What are the proofs, the characteristics of genius? — Answer invention of (a system) new systems or combinations of old ideas.
>
> > 1. The man, who has a faculty of inventing and combining into one machine, or system, for the execution of some purpose and accomplishment of some end, a great number and variety of wheels, levers, pullies, ropes, etc., has a great 'mechanical genius'. And the proofs of his genius (unless it happens by mere luck) will be proportionably to the number, and variety of movements, the nice connection of them, and the efficacy of the entire machine to answer its end. The last, I think at present, ought to be considered in [estimating?] any genius. For although genius may be shown in the invention of a complicated machine, which may be useless, or too expensive, for the end proposed, yet one of the most difficult points is to contrive the machine in such a manner, as to shorten, facilitate, and cheapen, any manufacture, etc. For to this end a man will be obliged to revolve in his mind perhaps a hundred machines, which are possible but too unwieldy or expensive, and to select from all of them, one, which will answer the purposes mentioned.
> >
> > 2. The man who has a faculty of feigning (a great number, and variety of characters, actions, events, etc.) and combining into one regular, correct, consistent plan or story, a great number and variety of characters, actions, events, etc. has a great 'poetical genius'. And the proofs of his genius are in proportion to the variety, consistency and number of his characters, actions and events; and to the nice connection and dependence of these upon each other through a whole poem. And these proofs have been given in a surprising degree by Milton and Shakespeare, Homer, Virgil, etc. Milton has feigned the characters of arch angels and devils, of sin, death, etc., out of his own creative imagination and has adjusted, with great sagacity, every action and event in his whole poem to these characters.
> >
> > 3. The man, who has a faculty of inventing experiments and [reasoning?] on them [means?] of starting new experiments from that reasoning, and on these experiments forming new reasonings till he reduces all his experiments, all his phenomena, to general laws and rules, and combines those rules to an orderly [and regular dependence on each other, through the whole system, has a great 'philosophic genius'.
> >
> > 4. The man who has a faculty of considering all the faculties and properties of human nature, as the senses, passions, reason, imagination and faith, and of (combining) classing all these into order, into rules, for the conduct of private life, has a great 'moral genius' (genius in morality).
> >
> > 5. He who has a faculty of combining all these into rules, for the government of society, to procure peace, plenty, liberty, has a great 'political genius'.
>
> Thus order, method, system, connection, plan, or whatever you call it, is the greatest proof of genius, next to invention of new wheels, characters, experiments, rules, laws, which is perhaps the first and greatest.
>
> Query. Does not the word invention express both these faculties, of inventing wheels &c. and putting them in order.
> Query. May not genius be shown in arranging a man's diet, exercise, sleep, reading, reflection, writing, etc., in the best order and proportion, for his improvement in knowledge?

> These are but vague, general, indeterminate reflections. I have not patience to pursue every particular attentively. But, this patience' (is the greatest attainment) or a great superiority to a man's own unsteadiness, is perhaps one of the greatest marks of genius. inattention, wandering, unconnected thoughts, are the opposites to this patience."

Adams would go on to become a great "political genius" (see: American Presidents by IQ) as well as the patriarch of the Adams geniuses (see: Adams), most notably: two cultures genius Henry Adams.

Libraries | Personal

See main: Libraries

Most big time geniuses, e.g. Young, Jefferson, Goethe, Einstein, etc., tend to have personal libraries in the 1,000 to 6,000 book range.

Latitude | Genius

See main: Latitude and genius; 42˚ rule (see also: Monydit Malieth)

The optimum latitude for the development of genius mind development, per reasons of sun light distribution, as historical data evidences, e.g. Nobel Prizes winner upbringing locations, famous schools locations, happiness vs suicide rate distributions (a genius needs to be not too happy, but also not to suicidal, to be functional), etc., is 42 degrees in latitude ±10˚; there's a reason why there's no Harvards at Hawaii, in short.
-

Genius's genius

The term "genius's genius", similar to the term "shoulder genius", e.g. Rene Descartes and Robert Hooke being shoulder geniuses to Newton, is a term spuriously attributed to a few individuals, including: Leonardo da Vinci (Q), Isaac Newton (Q), Heinrich von Kleist (Q), Johann Goethe (Q), Samuel Coleridge (Q), Theodore von Karman (Q)(Q), and John Neumann (Q), to name a few.

Genius | Age

See main: Genius age rule; See also: Famous publications by age

What is referred to as the "Holmes hypothesis", cited by genius studies scholar Dean Simonton, states that the 40th year mark is the making or breaking point of genius. [29]

> "If you haven't cut your name on the door of fame by the time you've reached 40, you might as well put up your jackknife."
>
> — Oliver Wendell Holmes Jr. (c.1840), publication (Q)

In physics, likewise, the make or break point is said to be the 30th year, so says Einstein and Dirac, likely on the former's ideology:

> "A person who has not made his great contribution to science before the age of thirty will never do so."
>
> — Albert Einstein (date), publication (Q)

> "You are now past 30 and you are no longer a physicist."
>
> — Paul Dirac (1931), comment to Heisenberg shortly after his 30th birthday (Dec 5) [28]

Simonton, however, points out that: Newton published his *Principia* at 45, Kant his *Critique of Pure Reason* at 57, Copernicus his *Revolution of the Heavenly Spheres* at 70, as examples to contradict the above. We may, herein add to this, that Goethe published his *Elective Affinities* at 60 and *Faust* at 82, Adams and Rossini both published their famous treatises at age 72, and Wallace published his magnum opus at 74.

Brain temperature

The condition which produces optimal thinking is for the upper part of the body, particularly the head region, to be within a temperature range of 69 to 72°F; whereas when temperature increase to at or above 75°F thinking tends to slow. It is best to have two digital thermometers, one at 2.5-feet above the ground and another at the 6-foot level above the ground, so as to monitor head zone temperature. In the summer, air conditioning is needed along with a tilting circular fan angled at 45° to keep up down convection of air in circulation.

Marriage

> *See main: Bachelorhood and genius*

In respect to genius attainment level, there seems to exist some yet unwritten law according to which genius rank is inversely proportional to time spent married. Sudanese-born American thinker Monydit Malieth summarizes this as follows: [30]

> "Geniuses are often misanthropist; they enjoy their lonesomeness because their minds are their best entertainment. Geniuses are also inclined to misogyny. If a background check is run on all of the world's geniuses, a substantial percentage of them had relationship problems with women and a high percentage of them never married."

Said another way, genius level, in many cases, seems directly proportional, in increasing amount, to the amount of passion, devotion, and time one puts into his or her work, which is reciprocal, in decreasing amount, to the amount of passion, devotion, and time one puts into his or her relationships.

> "Look what happens to people when they get married."
>
> — Niels Bohr (1937), comment to George Gamow, in reference to Paul Dirac's 1937 post-honeymoon lackluster cosmology theory letter to *Nature* (Q)

Accordingly, there is a certain correlation, to some extent, to genius and bachelorhood; the following is an example quote by Tom Siegfried (2006): [27]

> "Adam Smith had a lot in common with Isaac Newton. Both were lifelong bachelors. Both became professors at the university they had attended. Both were born after their fathers had dies. And both became fathers themselves of a new scientific discipline. Newton built the foundation of physics; Smith authored the bible of economics."

Three of the biggest mononym geniuses: Newton, Gibbs, and Tesla, never married.

Will to power | Will to genius

The following three quotes, based on Nietzsche's will to power idea, come to mind here:

> "Training is nothing! The will is everything! The will to act."
>
> — Christopher Nolan and David Goyer (2005), *Batman Begins* (vid)

> "I know the rage that drives you. That impossible anger strangling the grief, until the memory of your loved ones is just poison in your veins."
>
> — Christopher Nolan and David Goyer (2005), *Batman Begins* (vid)

> "Like you, I was forced to learn the rhythm without decency. Your anger gives you great power, but if you let it, it will destroy you, as it almost did me."
>
> — Christopher Nolan and David Goyer (2005), *Batman Begins*, version (Q) as heard by Thims (vid)

The two geniuses above Newton, were Einstein (he may be below Newton, this is an undecided issue) and Goethe; the seeds of the latter were terminated within one generation (see: Goethe genealogy). Another bachelor genius is Oliver Heaviside (Q) .

Genius IQs

See main: Genius IQs (ranking of the top 1000 geniuses)

The standard numerical value for the classification of a genius IQ is the standard Terman definition of an IQ at or above 140, as listed below, along with other noted assignment criterion proposals and definitions: [2]

> IQ = 125+ Catherine Cox definition (1926)
> IQ = 140+ Lewis Terman definition (c.1917)
> IQ = 140+ Tony Buzan definition (1994)
> IQ = 145+ Ronald Hoeflin definition (1982)
> IQ = 160+ Leta Hollingworth definition (c.1930)

In terms of how these high-end IQ values have been determined, there have been two general ways to categorize so-called 'geniuses' in terms of IQs: one being the retrospect peer ranking method, namely assigning an IQ value to historical geniuses, in the context of the peers of that time period and prior. A meta-analysis of this sort yields the Cox-Buzan IQ anchor point geniuses.

Insanity and Genius

See main: Insanity and genius; See also: Crackpot

There is no form of genius, Aristotle famous pointed out, "without a tincture of madness."

Lightening genius

In circa 1850, Danish philosopher Soren Kierkegaard, one of the four main existentialism founders, along with Fyodor Dostoyevsky (1821-1881), Friedrich Nietzsche, and Jean-Paul Sartre (1905-1980), explained the "lightening genius" as follows: (Q)

> “There are two kinds of **geniuses**. The characteristic of the one is roaring, but the lightning is meagre and rarely strikes; the other kind is characterized by reflection by which it constrains itself or restrains the roaring. But the lightning is all the more intense; with the speed and sureness of lightning it hits the selected particular points - and is fatal.”
>
> “Geniuses are like thunderstorms. They go against the wind, terrify people, cleanse the air.”
>
> “The ‘established’ has invented various lightning rods to counteract or divert geniuses: if they are successful—so much the worse of the established, for if they are successful once, twice, thrice—the next thunderstorm will be all the more dreadful.”

It remains to track down who he had in mind in making these statements.

> “Great men are meteors that burn so that the earth may be lighted.”
>
> — Napoleon Bonaparte (c.1820) (Q)

(add)

Hiatus effect | Bueller effect

See main: Genius hiatus effect

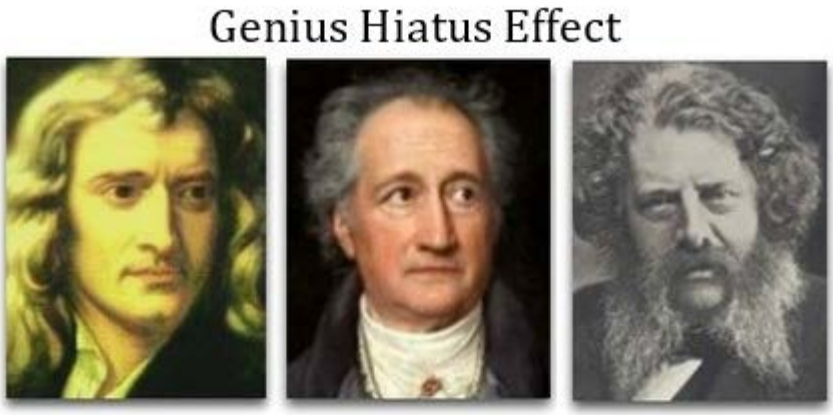

Three **hiatus effect** geniuses: Newton (2-yrs), Goethe (1-yr), and Rankine (6-yrs), each of whom entered a period of "forced" convalescence prior to their rise to **genius**-stature fame.

A significant number of geniuses seem to have the commonality of what seems to be seeds or inceptions of novel and/or revolutionary theory developed or conceived in preliminary outline during times of hiatus—gaps or breaks in the interruption of space, time or continuity, or in some cases spells of convalescence. We might well refer to this as the "hiatus effect" or convalescence effect.

The preeminent example of the hiatus effect genius being William Rankine who in 1830, at age 10, was forced to leave school owing to an illness, thereafter spending the next six years being taught by his father David Rankine, a respected railway engineer in the Edinburgh & Dalkeith Railway, who four years later, when he turned age 14, gave him a copy of Isaac Newton’s *Principia*, in Latin, which he subsequently absorbed, thus laying the foundation of his knowledge in higher mathematics, dynamics, and physics, shortly thereafter, in the next decade or so, penning out the world's earliest known equations of love, as found in his *circa* 1845 "The Mathematician in Love" poetry song. The same "forced" hiatus phenomena is common to equation of love theorists: Goethe (1809): two year hiatus, and Thims (1995): 10-year hiatus, discussed further below.

We might well also refer to this, stepping out the incessant flow of time genius phenomena, as the Bueller effect, based the well-known film line:

> “Life moves pretty fast. If you don't stop and look around once in a while, you could miss it.”
>
> — Ferris (1986), *Ferris Bueller’s Day Off*

English physicist Isaac Newton's forced private studies at his home in Woolsthorpe, following the August 1665 Cambridge University temporarily closing as a precaution against the Great Plague, over the subsequent two years saw the development of his theories on calculus, optics, and the law of gravitation, the seeds of what would become his greatest work.

German polyintellect Johann Goethe's age 18-19 forced period of convalescence at home in bed (1768-1769) is where he began his studies in chemistry, particularly the work of Paracelsus (1493-1541) and Susanne Klettenberg (1723-1744), and was conducting chemical experiments in his attic using a draught furnace, the seeds of which would result in what he would later describe as his "best book", namely his 1809 physical chemistry based *Elective Affinities*, wherein he explains the human chemical theory part of his metamorphology theory of evolution.

German physicist Albert Einstein, in 1900, after being awarded the Zurich Polytechnic teaching diploma, was unable to find a teaching post, and so while taking a digression from the normal university path, he worked as a patent clerk, during which time he notable developed the mass-energy equivalence theory, the photon theory of light, and the theory of relativity all arrived at in 1905. Einstein would latter comment the following, in reflection, on the nature of these depressurized theoretical fruits:

> "Science is a wonderful thing if one does not have to earn one's living at it. One should earn one's living by work of which one is sure one is capable. Only when we do not have to be accountable to anyone can we find joy in scientific endeavor."
>
> — Albert Einstein (1951), reply letter to female student thinking about becoming a professional astronomer (24 Mar)

In modern terms, where time moves pretty fast, as Ferris says, both American economist Thomas Schelling and Romanian-born American mechanical engineer Adrian Bejan conceived the work they are best known for while stuck on a plane, thus having "hiatus time", so to speak, to think.

American electrochemical engineer Libb Thims, likewise, developed the seeds of the work he is best known for after taking a forced step out of the main flow of the typical top-of-the-class engineer, when in circa 1997, nearing the final year of finishing two of the highest paying degrees available—chemical engineer and electrical engineer, finishing in the top 10 percent of his class at one of the world's top engineering schools, and being very sought after, company recruit wise—abruptly called and cancelled all of his scheduled company recruitment, all-expense-paid trips out to New York and California, with companies including Big Five financial corporation, a Silicon Valley computer chip producing company, among others, sensing, owing to a number of other compounding factors, that something was not right, and that he needed to step out of the hoop-jumping fast lane. The following quote by Einstein captures some aspects of this:

> "I, too, was originally supposed to become an engineer. But I found the idea intolerable of having to apply the inventive faculty to matters that make everyday life more elaborate—and all, just for dreary money-making. Thinking for its own sake, as in music! … When I have no special problem to occupy my mind, I love to reconstruct proofs of mathematical and physical theorems that have long been known to me. There is no *goal* in this, merely an opportunity to indulge in the pleasant occupation of thinking."
>
> — Albert Einstein (1918), Letter to Heinrich Zangger

It was during this period of detachment that ,on 15 Nov 2001, at 3:00 AM, Thims began to see through the so-called "reverse engineering problem"; to wit, how one can reverse-engineer the equations of chemical thermodynamics to explain human movement and human spontaneity, something which he had been puzzled about since 1995 (see: history). No doubt, had Thims chosen the path "more traveled", the road of the well-paid, but intellectually unrewarded, engineer, over the path "less traveled", he would never have had the so-called "hiatus time" to arrive at solution.

Magnitude geniuses

The biggest pound-for-pound genius in magnitude, i.e. the genius with the greatest ratio of intellectual output per year goes to James Maxwell (IQ=210), hands down, whose reaction existence ended prematurely at age 48, when he terminated, strangely, at the same age as his mother, and as a result of the same disease (stomach cancer) that she had succumbed to.

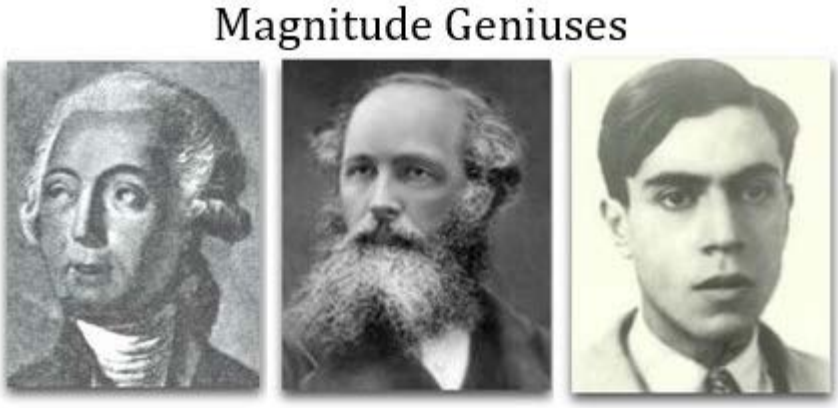

Three **magnitude geniuses**: Antoine Lavoisier (RE=51), James Maxwell (RE=48), and Ettore Majorana (RE=32), who each produced a great density of genius work in a very compacted number of years, as compared to epicenter geniuses, e.g. Aristotle (RE=62), Newton (RE=84), Goethe (RE=83), Einstein (RE=76), whose genius productions extended over a larger reaction extent (RE) or number of years (age) of reaction existence.

Second place, in the category of thinkers with incisive, prolific outputs in short bursts of time and energy, might well go to French chemist Antoine Lavoisier, whose intellectual output, prior to being guillotined at the age of 50, during the French revolution years, for some trumped up tax conspiracy charges, was unprecedented, in his achievements, theories, experiments, and impact. French mathematician Joseph Lagrange had the perspicacity to comment, on this ironic situation: "It took them only an instant to cut off his head, but France may not produce another such head in a century."

Italian engineer and theoretical physicist Ettore Majorana, who, prior to a mysterious disappearance at age 32, independently described the existence of the neutrino (1932), synthesized an exchange force theory of nuclear bonding, and who, in his 1935 sociophysics article “The Value of Statistical Laws in Physics and Social Sciences”, suggested the application of quantum statistical physics to social sciences(something that is even beyond grasp, for many, in the modern day: see Moriarty-Thims debate), might well rank in as second to Maxwell in regards to genius magnitude.

> “There are several categories of scientists in the world; those of second or third rank do their best but never get very far. Then there is the first rank, those who make important discoveries, fundamental to scientific progress. But then there are the geniuses, like Galilei and Newton. Majorana was one of these.”
>
> — Enrico Fermi (1938) (IQ=190), Italian physicist

Indian mathematician Srinivasa Ramanujan, might fall in a distant third place, who prior to ending at age 32 from malnutrition, independently compiled nearly 3900 results, mostly identities and equations, most of which have been proven correct.

Genius puzzles

Of significance, to quickly note a few salient points discerned from the above genius IQs table, firstly: every single genius in the IQ=205+ range, namely Da Vinci (c.1508), Newton (1704), Goethe (1826), Maxwell (1871), and Einstein (1908), by no coincidence, worked on the "blue sky problem", in some way or another, prior to and even after (in the case of Einstein) its partial solution by Rudolf Clausius (IQ=205), in 1847, and final solution by John Strutt (IQ=190), in 1899.

The hardest intellectual genius puzzle of them all, however, is the "elective affinity problem": namely to explain human passions and experience via the chemical affinities or free energies, such as depicted adjacent. The elective affinities

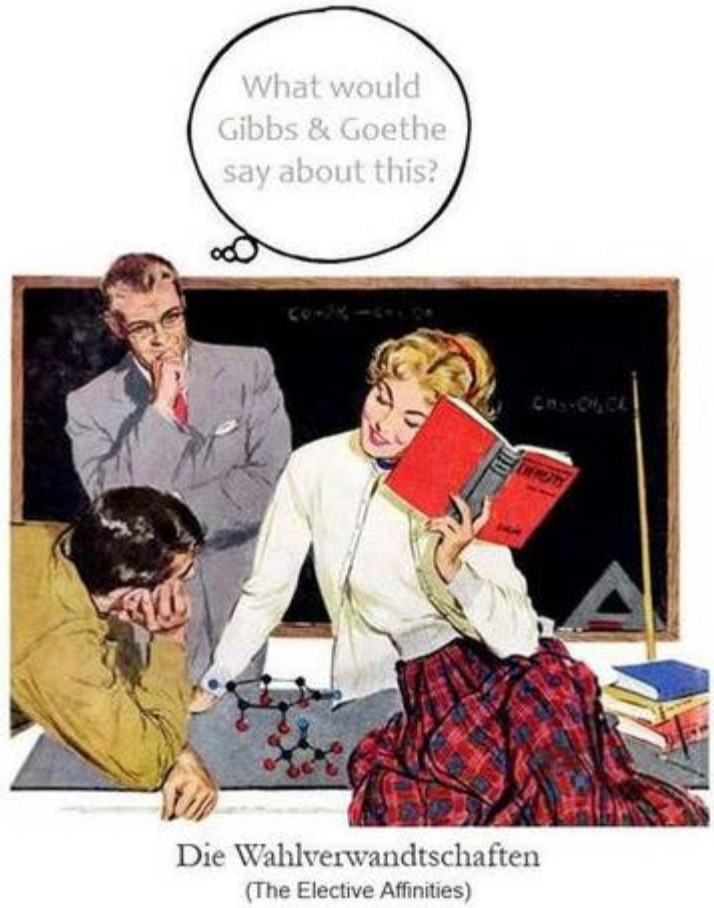

A playboy art style depiction of the "elective affinities problem", namely how to explain passions of existence in terms of Bergman's 1775 chemical affinities theories (Goethe's day) or in terms of Gibbs' 1876 free energies (modern day).

problem is the only puzzle common to the rare ceiling geniuses cited in the IQ=225+ range, namely:

- Goethe (1796) (IQ_{Cit}=225; IQ=230), who called his solution to this problem his "greatest work" or "best book" (1809), of all his 142+ collected works publications, in which he embedded a secret principle which he said was “true” and which was “only production of greater extent” in which he was “conscious of having labored to set forth a pervading idea”;
- Einstein (IQ_{Cit}=225; IQ=220), who commented on the problem (see: Einstein on love), in a somewhat irritated perplexment scribble note: “gravitation cannot be responsible for people falling in love” (1933) and previously in query to geneticist Thomas Morgan: “how on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?” (1920s);
- Thims (1995) who was led into the problem, similar to Goethe, via a mixture of the "love thought experiment" and the "reverse engineering puzzle";
- Hirata (2000) (IQ_{Cit}=225; IQ=190), who called his solution a "fun compilation of worthless applications of physics and mathematics to relationships";

Even the great child prodigy William Sidis (IQ_{Cit}=250-300; IQ=195) attempted a solution, in a round-about-way, via his 1920 theories on animate matter and entropy.

No formal education geniuses

Thirdly, as far as self-made, informally educated geniuses go, the title ranking seems to go to: George Green (IQ=190), who learned via his Nottingham Subscription Library membership; he is followed closely by Michael Faraday (IQ=175), largely self-taught through reading of books at a bindery he worked at as a child; third place might go to Srinivasa Ramanujan (IQ=185), who, supposedly, by age 12, had re-discovered the Euler identity by reading Sidney Loney’s trigonometry book (in the strict sense of the matter Ramanujan did seem to have a certain educational contact; contrary to his myth-like Good Will Hunting film description: “he lived in this tiny hut somewhere in India, but he had no formal education. He had no access to any scientific work. But he came across this old math text. And from this simple text, he was able to extrapolate theories that had baffled mathematicians for years.”).

Likewise, American Charles Breder, while possibly not necessary a genius, claimed that all he learned about biology, ichthyology, and, supposedly, entropy, origin of life, and the arrow of time, having only a high school education, was

from the Newark Public Library. (Q)

A depiction of the burning of the books of the Library of Alexandria by Gustave Dore.

Library of Alexandria | Dark ages

The burning of the library of Alexandria coterminous with the 415AD stoning-to-death of Greek universal genius Hypatia can be well-said to mark the start of the dark ages, a period of intellectual decline, which would continue until the century to following the invention of the printing press by German inventor Johannes Gutenberg in 1450. To a certain extent, many of the famous genius puzzles, such as heliocentrism, atomic theory, the nature abhors a vacuum problem, etc., had to be re-solved all over again. The five most "tantalizing losses from the Library of Alexandria", supposedly, are: Hero's (IQ=190) *circa* 50AD *Pneumatica*, in which, he overview of the physics of Strato and Ctesibius, outlines an atomic theory in which matter consists of particles mixed with distributed vacua, and in which he describes how to make an aeolipile; may have used a type of Philo thermometer (240BC) in his experimental work; was said to have openly challenge the nature abhors a vacuum belief, etc., along with the works of Aristarchus of Samos (IQ=?), Hypatia (IQ=190), Sappho (IQ=?), and Berossus (IQ=?) and his *Babylonaica*. [10]

Universal genius

See main: Universal genius; Last universal genius; Last person who knew everything

A rare few are considered as universal geniuses, being one with a universal mastery of knowledge, Leonardo da Vinci (1452-1519), the one to whom this eponym is generally assigned. The so-called "last universal genius", frequently mentioned include: Gottfried Leibniz (1646-1716), and Johann Goethe (1749-1832), Goethe being the preeminent example of this group:

> "Goethe comes as close to deserving the title of a universal genius as any man who has ever lived"; "Scholars agree that Goethe was the last universal genius: practically nothing within reach of the human mind escaped his attention";
>
> "The middle of the eighteenth century witnessed the first powerful revolt against cultural tradition, which is marked by Rousseau. This tradition was restarted by universal genius Goethe. But it was restarted for the last time. Goethe had not been succeeded by another universal genius"; "Since my method is juxtaposition, I delight in bringing together universal genius Goethe, with Sigmund Freud, Samuel Johnson, and Thomas Mann."

The universal genius mindset is summed up well by Goethe who commented that "if one does not know what went on for the last three thousand years, he or she remains ignorant, merely surviving from day-to-day." In 1832 terms this amounts to having in one's possession a personal library, actual and mental, of over 5,000 books, and having written works in the over a 50-volume set level, as was the case with Goethe.

Reading habits | Standing up

See main: Stand up writing

Stand-Up Reading Geniuses

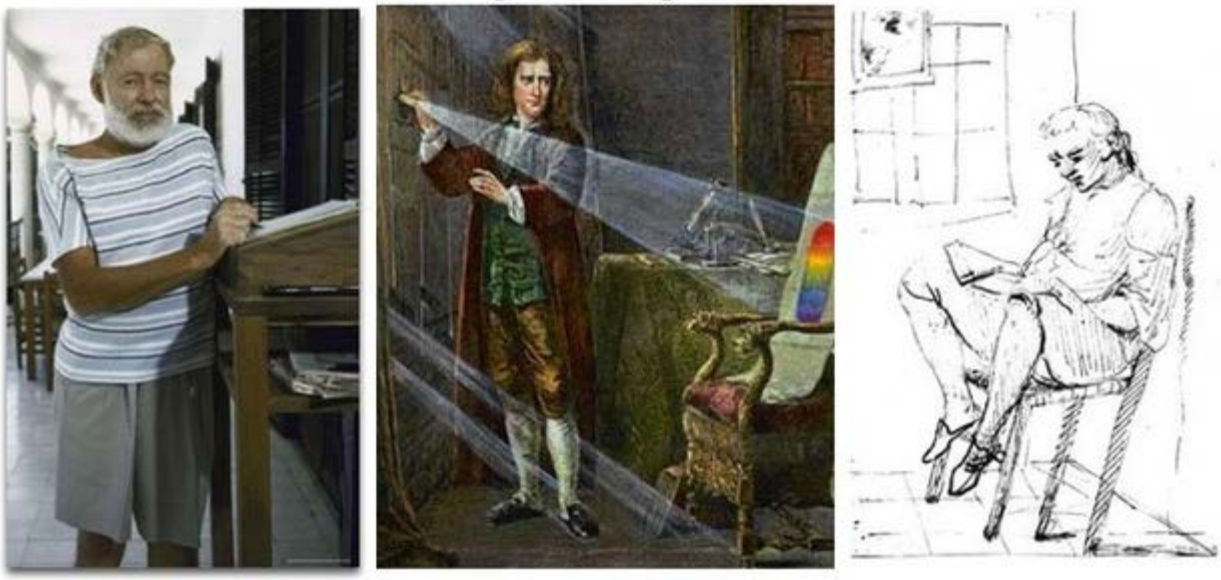

Left: American literary genius Ernest Hemingway reading and writing at his standup desk. Hemingway once declaring that: “writing and travel broaden your ass if not your mind and I like to **write standing up**,” which he did by perching his typewriter on a chest-high shelf, while his desk became obscured by books. [14] Center: Newton's geometrical proof of universal gravitation: in which he showed that if a body Q orbits in an ellipse, the implied force toward the focus S (not the center C) varies inversely with the square of distance; a proof that he derived while **standing up**. [12] Right: Goethe **reading ajar** during his Roman adventure years (c.1787); he began to read avidly, at age six, following the disturbing news of the 1755 earthquake of Lissabon, Portugal, during which more than 30,000 people dereacted.

Isaac Newton wrote his entire *Mathematical Principles of Natural Philosophy*, during the years mid 1686 to 28 Apr 1686, in which he proved by geometry, the mode of universal gravitation, namely that if a body Q orbits in an ellipse, the implied force toward the focus S (not the center C) varies inversely with the square of distance, as diagrammed adjacent, while standing. As summarized by James Gleick: [12]

> "The alchemical furnaces went cold; the theological manuscripts were shelved. A fever possessed him, like non since the plague years. **He ate** mainly in his room, a few bites **standing** up. He **wrote standing** at his desk. When he did venture outside, he would seem lost, walking erratically, turn and stop for no apparent reason, and disappear inside once again. Thousands of sheets of manuscript lay all around, here and at Woolsthorpe, ink fading on parchment, the jots and scribbles of four decades, undated and disorganized. He had never written like this: with a great purpose, and meaning his words to be read."

American electrochemical engineer Libb Thims, during the first year of his ascension up the education ladder, at about the age of 20, learned that to get an perfect score on a test, he had to drink diet coke studying during the night and in particular to keep the mind awake to place a chair on the dinner table and to read with the book placed on the seat of the chair while standing.

Thims did this ad hoc chair-rigged method for some years, before, in circa 1995-1996, he solidified the method by taking a 70x32 inch gray folding, such as shown adjacent, and elevating it to the sub chest level by placing stacks of books under each leg so to raise its height from 29 inches to 44 inches.

When he moved to Chicago, in circa 1998-2000, he upgraded the cumbersome book stacking method, by removing the metal folding legs and replacing them with permanent cross-braised wooden legs with 2-inch caster wheels so that the table would be motile.

FIG. 27. KOTTMANN'S DESK ARRANGED FOR STANDING

FIG. 26. KOTTMANN'S DESK FOR SITTING AND STANDING, ARRANGED FOR SITTING

Left: Thims' *circa* 1995-1998 72x30-inch width by 29-inch height gray folding table, which he raised to 44-inches, by stacking books under each leg, so to "read (and write) standing up", as did Newton when he wrote his *Principia* from 1686 to 1688. **Right:** the same 44-inch sub chest-height / belly-button height standing-up-table, modified with permanent wheeled wooden legs attached, *circa* 1999-present. **Right:** Knottmann's 1899 sit-stand desk, a semi-modern genius study method; the "stand method" being common to geniuses such as: Newton, Hemingway, Nietzsche, and Thims. [15]

Knowledge rift

See main: Two cultures genius

A turning pointing or rather breaking point in the so-called grasp of the universality of knowledge at the genius level can be said to have occurred or typified in the 1833 Whewell-Coleridge debate after which the term "scientist" was coined over the older term "natural philosopher". This rift is captured well in American literature scholar Frederick Burwick's 1986 discussion of this growing rift, in the framework of Goethe's *Faust*:

> "The age of *Faust* [1772-1832] had been the age of the 'Renaissance man', a time when the possibility of a **universal knowledge**, mastery of the arts and sciences, still seemed to be open to the ambitious mind;thereafter the separation and dispersion of intellectual endeavors, dubbed the 'two cultures' by C.P. Snow,resulted; whereafter, in the decades to follow, individuals such as Thomas Young (1773-1829), Humphry Davy (1778-1829),and William Hamilton (1805-1865), could all make serious claims to humanistic breadth, if not universality, in their intellectual accomplishments; nevertheless, a rift between the arts and the sciences was evident."

The term scientist in this period (1833) came to be defined as a student of the knowledge of the "material world", with an explicate footnote that the "moral world" was to be left to the natural philosophers and religious thinkers. This divided tension soon led to the 1874 Tyndall-Stewart-Tait debate on the question of whether religion should submit completely to the control of science.

This rift still exists in modern times, with over 72% of the lay population of the world still adhering to one variation or another of the Ra theology version of morality.

Traits | True geniuses

See also: Real genius

Noted traits of true geniuses, such as Albert Einstein or

Thomas Young, are firstly the trait of tending to process knowledge at a slower rate, then as compared to the tendency to pass over and assimilate given knowledge at a high rate of speed as being assumed correct. Young comments on this in his autobiographical sketch about himself: [3]

Aristotle's (IQ=195), above middle right, had the habit of **walking about while he talked**; his followers, called Peripatetics, are said to take their name from the word peripatêtikos, meaning "given to walking about") or because he held lessons beneath the colonnades (or peripatoi) of the Lyceum. [16]

> "Though he wrote with rapidity, he read but slowly, and perhaps the whole list of the works that he studied, in the course of 50 years, does not amount to more than a thousand volumes."

A second trait is the initiation of a sort of unwritten combatant with the densest of works of the geniuses of the past. Young, for instance, comments on his intellectual battle with Joseph Lagrange (IQ=185) as follows: [3]

> "Scientific investigations are a sort of warfare, carried on in the closet or on the couch against all one's contemporaries and predecessors; I have often gained a single victory when I have been half asleep, but more frequently found, on being thoroughly awake, that the enemy had still the advantage of me when I thought I had him fast in a corner."

Similarly, Einstein comments:

> "I have little patience for scientists who take on a board of wood, look for its thinnest part, and drill a great number of holes when the drilling is easy."

These examples tend to highlight the criterion for "genius" as one who drawn to problems based on their density, the higher the density or difficulty the greater the draw.

Epicenter geniuses

See main: Epicenter genius

The following noted quote by William James, from his 1880 article "Great Men, Great Thoughts, and the Environment" (Q), exemplifies the phenomenon of the genius who is an epicenter of geniuses:

The three big epoch or "epicenter geniuses" of history: Aristotle, Goethe, and Einstein,

> "Sporadic great men come

everywhere. But for a community to get vibrating through and through with intensely active life, many **geniuses** coming together and in rapid succession are required. This is why great epochs are so rare, – why the sudden bloom of a Greece [Aristotle], an early Rome [Cicero], a Renaissance [Goethe], is such a mystery. Blow must follow blow so fast that no cooling can occur in the intervals. Then the mass of the nation glows incandescent, and may continue to glow by pure inertia long after the originators of its internal movement have passed away.

about which a regular secession and hammering of surrounding geniuses produced the hardest blade of intellect centrally.

We often hear surprise expressed that in these high tides of human affairs not only the people should be filled with stronger life, but that individual geniuses should seem so exceptionally abundant. This mystery is just about as deep as the time-honored conundrum as to why great rivers flow by great towns. It is true that great public fermentations awaken and adopt many geniuses who in more torpid times would have had no chance to work. But over and above this there must be an exceptional concourse of genius about a time, to make the fermentation begin at all. The unlikeliness of the concourse is far greater than the unlikeliness of any particular genius; hence the rarity of these periods and the exceptional aspect which they always wear."

Epicenter geniuses include: Aristotle (IQ=195), Goethe (IQ=230), Voltaire (IQ=195), Clausius (IQ=205), and Einstein (IQ=220).

Common dietary needs of the genius: caffeine, which has a synergistic effect with calcium inside of brain cells to facilitate memory and thinking speed; chocolate, which has some kind of yet unidentified synergy between genius thinking and the brain (see also: chocolate theory of love); fish oil consumption, similar to milk (particularly in infants), is well documented to be associated with higher IQ levels.

Nutritional needs

See: Genius and diet

Caffeine: Voltaire (IQ=195) was said to drink 40 cups of coffee a day. Warren Buffett (IQ=175±) at age 16, had read at least one hundred books on business (see: Buffett number); shortly thereafter, he entered the Wharton School of Finance, wherein upon arrival he reported that 'he knew more than the professors'; on a return trip home, he was warned not to neglect his studies, to which he replied insouciantly: 'all I need to do is open the book the night before and drink a big bottle of Pepsi-Cola and I'll make 100'. American electrochemical engineer Libb Thims, early on in his age 19 launched quest to master the hardest subjects and to discern the hidden secrets and puzzles of nature and existence, read that a famous 20,000+ person study of physicians showed that drinking upwards of 12 cups of coffee per day was did no harm, and has since steadily consumed 1-4 Vivarins per day along with continuous drinking of Diet Coke.

Chocolate: Voltaire (IQ=195) notably mixed his 40+ cups of coffee with chocolate. American electrochemical engineer Libb Thims learned early on, in his pre-engineering studies, that to excel on tests one needs to consume large amounts of chocolate, particularly brownies; he has daily consumed about 4-9 ounces, on average of Hershey bars, either with almonds (or with almonds and toffee chips) for some two decades. Jeanne Calment (1875-1997), the French supercentenarian who had the longest confirmed human life span in history, reacting to the age of 122-years, 164-days, ate more than two pounds of chocolate per week; rode a bike until she was 100, and had a penchant for foie gras (fattened duck liver).

Red meat: Warren Buffett (IQ=175±) has a strange penchant for hamburgers, to the exclusion of other foods; quote: " [Buffett] just eats hamburgers and drinks Pepsi-Colas" [Fred Stanback]. Oleic acid, one of the main oils of red meat, is

the main component of myelin sheath, the white matter of the brain that surrounds never fibers: the thinker the sheath, the faster the firing of the nerve messages.

Milk: The association between milk and genius is puzzling phenomenon, the underlying nutritional reason of which remains to be discerned.

Milk Drinking & Genius

Right: one of the many milk scenes from the 2004 film *The Aviator*, the most memorable being the "come in with the milk", which is based on the reaction existence of Howard Hughes (see also: why is this site here?). The 1971 film *A Clockwork Orange* written, directed and produced by Stanley Kubrick, adapted from Anthony Burgess's 1962 novella *A Clockwork Orange*, has a similar sort of milk scene.

Oliver Heaviside, the person who condensed Maxwell's field equations with 20 variables down to four equations with two variables, had very specific food preferences and an unnatural interest in food. He sometimes lived like a cat, drinking bowls of milk for days. Milk, and nothing else. Strangely, as eccentric geniuses biographer Clifford Pickover reports (1998), Tesla also lived on milk, and for many years. Thomas Edison's only foods were milk and the occasional glass of orange juice. [11] American electrochemical engineer Libb Thims frequently consumes 2-3 gallons of 1% milk (2% or sometimes whole) per week, especially so after long extended 10-hour+ periods of study, after which milk is the only thing that will quench and calm the brain. Richard Kirwan, the “brilliant 18th-century polymath”, as Pickover describes him, existed entirely on a diet of only milk and ham. Theodore Kaczynski, math prodigy turned unabomber, as noted by his college dorm mates, had a room piled with trash two feet deep underneath it all were what smelled like unused cartons of milk.

The most-famous film depiction of the genius milk phenomenon is the “come in with the milk” scene from the 2004 film *The Aviator* based on the existence reaction of American aviation and film pioneer Howard Hughes (see also: why is this site here), as shown adjacent, wherein one can count 60 milk bottles filled with urine.

Fish oil: The main brain nutrient of fish is DHA and EPA: the main component oil of the white matter of the brain. It is well known that babies fed DHA/EPA enhanced breast milk, result to have higher adulthood IQs. American electrochemical engineer Libb Thims attributes a large part of his early acceleration to the top 8 percent of his chemical engineering graduating class, starting from a dead bottom high school educational level, to fish oil: at one point, unknowingly, he was consuming so much fish oil, owing to his early body building dietary protein consumption needs, that at one point he was purchasing upwards of 9-10 cases (48 cans per case) of tuna-fish per shop; owing to mercury build up side affects, in the 2000s he switched over to Norwegian bottled cod liver oil (sometime after reading Udo Erasmus' 1993 *Fats that Heal, Fats that Kill*), which he drinks 2-3 times daily.

Other: Other important nutrients for the genius mind include: nuts, oils (almond, walnut, flax), eggs (at least one per day drank raw) mixed into oil-protein-milk-oat-all bran shake; so as to keep uptake of the high usage rate of the brain.

Genius exercise habits

Geniuses & Exercise

Epicenter genius Albert Einstein famously commented “I thought of that while riding my bicycle” in comment on his theory of relativity. Greek polymath and smartest female ever candidate Hypatia, famously had a rigorous physical training regime. The majority of the solutions to various conceptual human chemistry problems, as found in "highest IQ ever" cited genius Libb Thims' 2007 *Human Chemistry* textbook, were arrived at while running at 7.8-mph at a 15% incline, for an average of 6 miles per day, throughout the 2000s; photo at right is a circa 2012 shot of Thims' 15% incline running apparatus, with four hold on handles, four stop watches, and iPhone holder.

See main: Genius and exercise

Einstein (IQ=220) has frequently commented that a large number of his theories were conceived while riding his bicycle. Einstein famous commented “I thought of that while riding my bicycle” in comment on his theory of relativity.

Hypatia (IQ=190): as part of his plan for his soon-to-be universal genius daughter, Theon, the last head of the Library of Alexandria, established a regimen of physical training for Hypatia, such as rowing, swimming, and horseback riding, to ensure that her body would be as healthy as her well-trained mind.

Thims (IQ=190±) early on followed a motto that "once goes the body, so goes the mind"; early on in his educational climb, he frequently rode his bicycle some 20 miles per day, nearly throughout his entire electrical engineering education; most of the writing of his 2007 Nobel Prize nominated *Human Chemistry* textbook, which Russian physical chemist Georgi Gladyshev claims "symbolizes the beginning of a new era (epoch) in human history", was done at while running on the treadmill at a 15% incline, at various Powerhouse/X-Sport gyms; in fact towards the tail end of the writing process, in order to ensure completion, Thims ran continuously ever day, seven days a week, for six months straight, exactly 6 miles per day, at a 15% incline, at exactly 7.8 miles per hour, for a total of 1,080 miles, during which time new concepts and theories and solutions to problems were pushed out and grew in the mind while on the treadmill. At one point, prior to this six month stretch, on one particular day, Thims had ran a record total 40-miles, at the same rate and incline, although broken up into 10 four mile chunks, with 15-minute breaks in between run sets. It is well-known that rats running on tread mills, as compared to non-running rats, experience growth in brain structure, in areas not solely connected to motor function.

Geniuses who failed | intelligence tests | school | labeled as dunces

See main: Mislabeled geniuses and IQ tests

French physicist Henri Poincare did so poorly on the Binet IQ that he was judged an imbecile (IQ=35); although we now rank him at IQ=195. American chemist Linus Pauling, who we now rank, in retrospect, at IQ=190, notably, *failed* to take some required American history courses and did not qualify for his high school diploma. The school awarded him the diploma 45 years later only after he had won two Nobel Prizes. Those who many consider the three greatest scientific minds of all time—Newton, Maxwell, and Einstein—were all viewed as ‘dunces’ in

childhood. [8] Albert Einstein (IQ=220), supposedly, was three or four years old before he could speak and seven before he could read—he was born with a misshapen head: as a result, his parents feared he was mentally retarded; he so withdrawn or "set outside the group" that one governess nicknamed him ‘Father Bore’. [9] Einstein latter attempted to skip high school by taking an entrance exam to the Swiss Polytechnic, a top technical university, but famously *failed* the art portion. Isaac Newton (IQ=215), supposedly, did poorly in grade school. [9] Thomas Edison (IQ=180), as a boy, was told by his teachers that he was too stupid to learn anything. [9] Walt Disney (IQ_B=123) was fired as a newspaper editor because, supposedly, he had “no good ideas”. [9] Leo Tolstoy (IQ=?) flunked out of college. [9] Winston Churchill failed sixth grade. [9] American electrochemical engineer Libb Thims, who in 2012 was cited as having the "highest IQ ever", above that of Goethe, Newton, and Einstein, famously "flunked" second grade, i.e. was held back second grade and made to take the entire year over again, owing to teacher reports stating that he was "bored in class".

Genius physical and mental over-stressings

A number of over "stresses", both physical and mental, are common to geniuses.

In 1735, Swiss-born Russian mathematician Leonhard Euler (IQ=195) lost sight in one eye, supposedly, by overexerting himself to solve a problem in three days that normally took months. In 1766, he lost sight in the other eye. An operation to restore the better of the two was successful, but infection invaded both eyes. After horrible agony he permanently lost his sight. His collected works are said to amount to the size of several encyclopedias. [13]

William Sidis famous cracked at age 11 after giving a lecture to the Harvard mathematics club on four dimensional bodies.

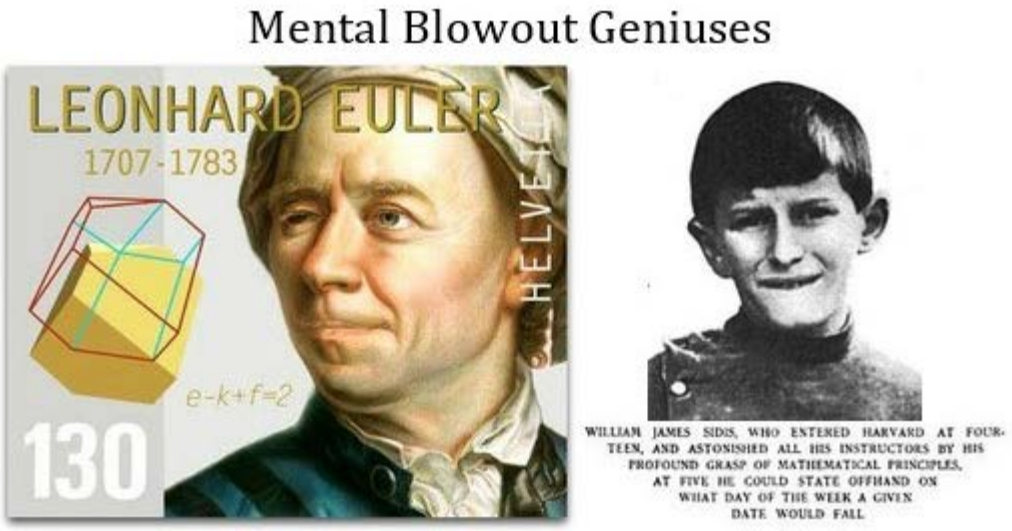

Left: Swiss-born Russian mathematician Leonhard Euler (IQ=195) lost sight in his right eye in 1735 from studying too hard continuously for three days straight while work on a complex problem; years later he lost sight in the other eye, in likewise manner. [13] Right: In 1937, the America's greatest child prodigy William Sidis, cited with a 250-300 IQ, sued the *New Yorker*, for their "April Fools" article on him, and *Advertiser*, which eventually settled for $375. In a breach-of-privacy suit against the *New Yorker*, the court ruled that Sidis could not claim privacy rights because he was still a public figure. In 1944 the magazine paid a reported $500 to settle a companion suit for malicious libel. Sidis died, met his reaction end, of a cerebral hemorrhage three months later. He was 46.

A commonality among extreme genius is to permanently dereact (die) via aneurism or brain hemorrhage.

Sidis later met their reaction end following cerebral hemorrhage.

Likewise, the so-called Russian female Einstein, Naida Camukova, only child of a neurosurgeon mother and lawyer father, who is said to have published 25-books and read 3000 books, able to read a 300-page book in two hours, who, to note, many claim is some kind of genius racket scam artist, whatever the case, supposedly: had a brain hemorrhage at age 23 (was in coma for 20-days).

Sleep methods

See main: Geniuses and sleep

Geniuses have always been particular about sleep, amount of sleep, and division of sleep, study in relation to sleep, among others. Italian genius Leonardo da Vinci (1452-1519) is said to have utilized a "sleep formula",

A number of geniuses, including Aristotle, used the ball in hand sleep method.

sleeping no more than four hours at a time, so to optimize his intellectual output. Several thinkers including Aristotle (IQ=195), Aristotle's student Alexander the Great (356-323BC), and John Wilkinson (1728-1808) used the ball in hand sleep method, in which they would sleep with an iron or brass ball in their hand, which was held over an iron or brass jug, whereby if they stirred, typically owing to say a dream, they would wake up, and thus insure continued interruption to their slumbers, in some cases waking up to write down the thought or inspiration of their dream. [17]

Ichondras of Milletus contrived a plane so narrow that he could not sleep on it except at full length, and of such an height and length as to insure his sliding down it in about six hours, at which point his feet would dip into a vase of cold water, thereby disturbing his rest. [18]

American electrochemical engineer Libb Thims typically uses a two alarm system, with the day divided by two segments of sleep, being that dreaming and nightmares in particular are very effective for producing and processing effect knowledge assimilation, digestion, and consumption. Thims, in respect to alarm devices, devised a two-stage alarm system, wherein he had first alarm, and in times wherein sleep total amounted two four-hours (range) per day, he employed a second loud radio alarm that was locked in a box, with the key to the box placed off in a distant place, e.g. out in the car, so to be sure he was alert enough to get up during periods of intense sleep deprivation.

In modern times, to note, it is known that too much sleep has a inverse ratio to genius effect, according to the neurochemical finding that too much sleep has an effect on one of the drive or depression neurochemicals (check).

Catch up effect | Intellectual inertia / myopia

See main: Catch up effect; Posthumous genius

Accelerated "active mind" geniuses who were victims of the so-called **mental inertia effect**: Jean Sales, who was imprisoned for his human molecule based moral philosophy, yet visited by Voltaire; Galileo Galilei, who was banished in exile and forced to recant heliocentric theory; Goethe, who for 23-years was not "vouchsafed many kind words" concerning his controversial *Elective Affinities*; and Henry Adams, coiner of the mental inertia theory, who was so far ahead of his time, in respect to the chemistry, physics, and thermodynamics of human social-history that in 1995 he was still being labeled, in a nearly upside down manner, as "more of a crank than a prophet" (John Diggins).

American two cultures genius Henry Adams, who was some 134-years ahead of his time in thinking, e.g. with with his view that: "social chemistry, the mutual attraction of equivalent human molecules, is a science yet to be created" (human chemistry was established as a science in 2007)—himself having to self-educate on his own beyond his Harvard education, which he considered to be a completed waste, that by 1907 he concluded that the highly "active mind" tends to be surrounded by less active minds moving with a type of "intellectual inertia", inertia defined as the resistance of any physical object to any change in its motion (including a change in direction):

> “The object of education should be the teaching [of] how to react with vigor and economy. No doubt the world at large will always **lag so far behind the active mind** as to make a soft cushion of inertia to drop upon; but education should try to lessen the obstacles, diminish the friction, invigorate the energy, and should train minds to react, not at haphazard, but by choice, on the lines of force that attract their world.”
>
> — Henry Adams (1907), *The Education of Henry Adams*

This genius lag is evidenced well in the May 2017 rankings of Arthur Schopenhauer (1788-1860) (IQ:185|#63) [RGM:50|1,260+] (Cattell 1000:N/A) (CR:112|#33) (FA:93) (GA:10) (SN:15). Here, we see that at 40-years *after* his existence cessation, he does not make the Cattell 1000 (1894) ranking. Yet, by 157-years of general public "active mind" lag, as Adams refers to it, we see that Schopenhauer falls well into the top 60 position of independent greatest minds rankings (IQ:185|#63) [RGM:50|1,260+] and is ranked as a top ten atheist (GA:10) and top 15 social Newton (SN:15); and the full result of his ideas (e.g. "will of the copper", 1844) are yet to be fully assimilated and processed, publicly.

The following are equivalent mental inertia quotes:

> “When a **true genius** appears in this world, you may know him by this sign, that the dunces are all in confederacy against him.”
>
> — Jonathan Swift (1706), “Thoughts on Various Subjects, Moral and Diverting” [21]

> “It is difficult to overestimate the value of Goethe’s work to humanity. The bequest which he left to the world in his writings, and in the whole intellectual result of his life, is not as yet appreciated at its full worth; because, intellectually, the **world has not yet caught up to him**. His influence today asserts itself in a hundred minute ways—even where no one suspects it. The century has received the stamp and impress of his mighty personality. The intellectual currents of the age, swelled and amplified by later tributaries, flow today in the directions which Goethe indicated.”
>
> — Hjalmar Boyesen (1885), *The Life of Goethe*

> “Over thirty-seven years ago, Seligman first published his *Economic Interpretation of History*. It has gone through several printings, editions and translations. In itself that work is a living example of the peculiar **myopia** which afflicts the intellectual world. Sometimes it takes ten or fifteen years for that world **to catch up** with a Spengler. Kyserling was more transparent. Seligman himself in 1902 commented upon the fact that fifty years after Marxism had made its first appearance and had stirred to the depths economic, social and philosophical thought among European scholars, here in America Marx was scarcely known outside of a few obscure immigrants socialists.”
>
> — Morris Zucker (1945), *The Historical Field Theory* [23]

> “I must say, I started watching your videos over a year ago, and have re-watched many. And they still fascinate me. I’m only 17 and I’m seriously considering doing a degree in chemistry after watching your videos. The only downside is not many people I know can have a conversation about the things you’re talking about. You were right your videos are **decades if not a century in front** of its time.”
>
> — Benjamin Cresdee (2011), comment on Human Chemistry 101 YouTube channel

> “Sadly logic barely has any significance amongst a swarm of imbeciles. Some people are doomed to feel

like an alien."

— Torandrius (2011), commentary on Libb Thims' HumanChemistry101 YouTube channel (Q)

In other words, active mind genius often suffers from what is called the "catch up effect", namely, a multi-century delay in respect to the ability of culture to digest what a " lightening bolt genius" (person, date) or "hammered genius" (William James, 1880) produces. While some of this "mental inertia" issue, that active geniuses have to face, can be attributed to the so-called Semmelweis reflex—the reflex-like tendency to reject new evidence or new knowledge because it contradicts established norms, beliefs, or paradigms—other aspects of it would seem to have to do something with the time it takes to rewire the cultural brain to the new truths perceived by the active mind, who may well be accelerated in thinking by some 1,000 books (e.g. Thomas Young) to 5,000 books (e.g. Goethe) in reading and digestion level, whereas for the cultural brain it may be delayed by multiple generations in respect to the same level of learning about nature and the universe. American physicist Percy Bridgman, in 1919, summarized this intellectual adjustment delay issue as follows:

> "The first business of a man of science is to proclaim the truth as he finds it; and let the world adjust itself as best it can to the new knowledge."

This "world adjustment", for some truth seekers, e.g. Benedict Spinoza, will only accrue posthumously.

Types

See main: Greatest economist ever

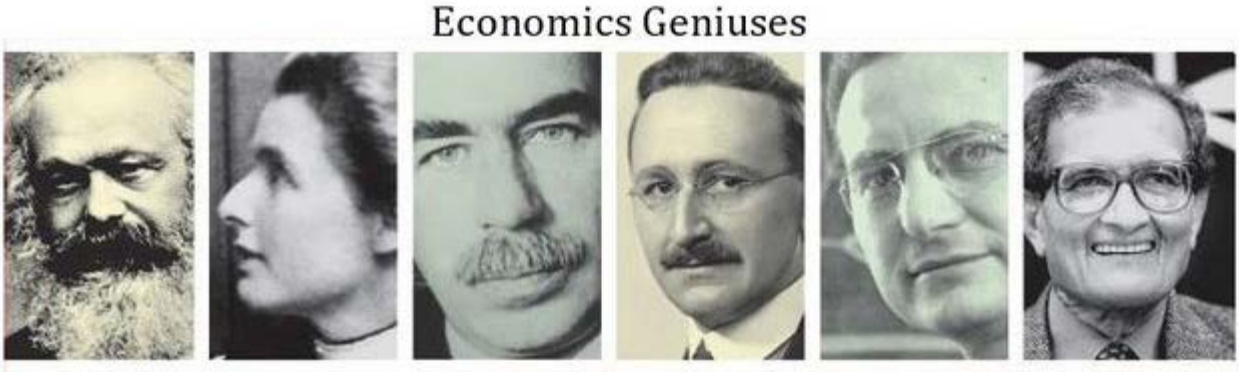

Among "types" of geniuses, one example is "economic geniuses", six of which, from Sylvia Nasar's *Grand Pursuit: the Story of Economic Genius* (2011), are shown above, namely: Karl Marx (first), Paul Samuelson (fifth), and four others. [25]

Among geniuses, the great "universal genius" types aside, there are a number of subject specific geniuses, including: political genius, military genius, literary genius, economic genius, philosophical genius, among others. Adjacent, e.g., as shown on the cover of the 2011 *Grand Pursuit: the Story of Economic Genius*, by Sylvia Nasar, are six examples of "economic geniuses", showing Karl Marx (first), Paul Samuelson (fifth), and four others. [5] In regards to "political geniuses", in 1758, American political thinker John Adams, great grandfather to two cultures social Newton genius Henry Adams, soon-to-become second American President (1797-1801) and most intelligent president, according to Dean Simonton, wrote a short essay on the nature of "genius", which he defined as follows: "someone who is capable of inventing new systems or combinations of old ideas." After discussing the various different kinds of genius, based on this definition, e.g. writing, mechanics, morality, etc., he then went on to discuss the political genius: "he who as faculty of combining … these [laws of human nature] into rules, for the government of society, to procure peace, plenty, liberty, has great political genius." [24]

Genius on genius

See main: Uber genius comparison quotes

The following are geniuses commenting their views on the greatness of other geniuses:

"1642 [the year of Newton's birth] is the Christmas of the modern age."

— Goethe (c.1800) (Q)

"I admire Goethe as one of the smartest and wisest men of all time."

— Einstein (c.1935) to Leopold Casper [22]

"What Descartes did was a good step. You [Hooke (IQ=195)] have added much several ways, and especially in taking the colors of thin plates into philosophical consideration. If I have seen further it is by standing on your shoulders of giants."

— Newton (c.1790), letter to Robert Hooke (1676)

"If all the **geniuses** of the universe were assembled, Newton should lead the band."

— Voltaire (c.1770)

"Taking mathematics from the beginning of the world to the time of Newton, what he has done is much the better half."

— Leibniz (c.1810), told to the Queen of Prussia

"The five greatest men I can name are: Newton, Bacon, Leibniz, Montesquieu, and myself."

— Buffon (c.1770) when asked how many great men he could name

"Goethe and Da Vinci are perhaps two of the most many-sided intellects known to us."

— Otto Weininger (1903), *Sex and Character*

"Gibbs' work is the greatest synthetic achievement in science since Newton's construction of the theory of universal gravitation."

— Boltzmann (c.1880) [18]

"Newton was the greatest **genius** that ever existed."

— Lagrange (c.1800) (Q)

Quotes

See main: Genius quotes

The following are related quotes:

“The secret of **genius** is to carry the spirit of childhood into maturity.”

— Thomas Huxley (c.1890)

“Shakespeare, Bacon, Newton present an individual element which nothing in their parentage or nationality or locality serves to explain. Why each expended his power in a given way, may in part be made clear, but the source of those original gifts in inscrutable. The word, *gifts*, indicates this. **Genius** in any form is not a product to be compounded by the most subtle organic or social chemistry. This assertion does not deny a genetic dependence, but only a complete and exhaustive one. This proper name Milton or Goethe, remains forever the final designation of underived, unweighted combination of powers.”

— John Bascom (1876) [20]

“Towering **genius** disdains a beaten path. It seeks regions hitherto unexplored.”

— Abraham Lincoln (1838), Speech, Jan 27 (Q)

“When nature has work to be done, she creates a **genius** to do it.”

— Ralph Emerson (1841), “The Method of Nature”, Aug 11 (Q) (Q)

“A **genius** is simply one who has taken full possession of his own mind and directed it toward objectives of his own choosing, without permitting outside influences to discourage or mislead him.”

— Napoleon Hill (c.1925) (Q)

“The first and last thing which is required of **genius** is the love of truth.”

— Johann Goethe (c.1810) [7]

“Talent accumulates knowledge, and has it packed up in the memory; genius assimilates it with its own substance, grows with every new accession, and converts knowledge into power.”

— Edwin Whipple (c.1870), *Publication* (Q)

“He is warmed by the sun, and so of every element; he walks and works by the aid of gravitation; he draws on all knowledge as his province, on all. beauty for his innocent delight, and first or last he exhausts by his use all the harvests, all the powers of the world. For man, the receiver of all, and depositary of these volumes of power, I am to say that his ability and performance are according to his reception of these various streams of force. We **define ‘genius’** to be a sensibility to all the impressions of the outer world, a sensibility so equal that it receives accurately all impressions, and can truly report them without excess or loss as it received.”

— Ralph Emerson (1877), “Perpetual Forces”

“The task of the early investigators who lay the foundation is quite a different one from that of their successors. The former have to seek out and establish the weightiest facts only, and to do this, as history teaches, calls for more intelligence than is generally believed.”

— Ernst Mach (1897), *The Mechanics in Their Historical-Critical Development* [26]

“The tendencies of an age appear more distinctly in its writers of inferior rank than in those of commanding **genius**. These latter tell of past and future as well as of the age in which they live. They are for all time. But on the sensitive responsive souls, of less creative power, current ideals record themselves with clearness.”

— George Palmer (1905), *The English Works of George Herbert* (pg. xii); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 20)

“The test of a first-rate intelligence is the ability to hold two opposing ideas in the mind at the same time and still retain the ability to function.”

— F. Scott Fitzgerald (1936) (O) [31]

“Improvement makes straight roads, but the crooked roads, without improvement, are roads of genius.”

— Edgar Poe (c.1840) (O)

“We are fools to say, ‘He's a genius.’ We want to say that he attains something which is at the highest point of sensation, feeling, belief, knowledge, attachment.”

— Nadia Boulanger (c.1970s), piano teacher, on performing genius (c.1970s) (O)

“Persons of genius with mysterious gifts: in many cases a wound has been inflicted early in life, which impels the person to strive harder or makes him or her extra-sensitive. The talent, the genius, is the scab on the wound, there to protect a weak place, an opening to death. Man and women who come successfully out of misfortune, they have a strength that is extraordinary.”

— Elia Kazan (1988), *Elia Kazan: a Life* (O)

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See also

- Certified genius

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External links

● Genius – Wikipedia.
● 10 famous geniuses with truly weird secret habits (2014) – ListVerse.com.

θΔics

In genius studies, **genius age rule** is the folklore rule-of-thumb that one has to make their mark by a certain age, or else they never will; a rule that seems to vary with specialty: music (circa early 20s), physics (by age 30), general fame (by age 40), and meta-philosophy (by age 60-74).

A parody of the "**age 30 rule**" of physics, namely that if one doesn't make their mark by their 30th birthday, they never will. [1]

Overview

In general fame, what is referred to as the "Holmes hypothesis", cited by genius studies scholar Dean Simonton, states that the 40th year mark is the making or breaking point of genius. [4]

In physics, at least was the inside joke in the 1920s, the make or break point is said to be the 30th year, so later said Albert Einstein and Paul Dirac. In particular, the age 30 rule in physics seems to, unwrittenly, stem from Einstein's 1905 age 26 so-called "miracle year" (Ñº), during which he published four pioneering articles on: space, time, mass, and energy, which altered modern physics thereafter.

American genius studies scholar Dean Simonton, however, points out that: Newton published his *Principia* at 45, Kant his *Critique of Pure Reason* at 57, Copernicus his *Revolution of the Heavenly Spheres* at 70, as examples to contradict the above.

Outside of physics proper, the rule is inexact. Darwin, e.g., didn't publish *Origin of Species* (1859) until age 50.

Hmolscience

See main: Famous publications by age; hmolscience (youngest thinkers)

In hmolscience, the standing benchmark is the 1809 age 60 publication of *Elective Affinities* by Goethe. After Goethe, stepping a century ahead in time, in the field of inquiry of people are viewed as molecules or chemicals, the following (shown bolded) are the new general intellectual benchmarks:

Idea Inception (age)	± →	Finished Product (age)	Thinker	Publication	Date
9/47	13	60	Johann Goethe	*Elective Affinities*	1809
25/47	25	**72**	Henry Adams	*A Letter to American Teachers of History / Phase Rule Applied to History*	1910
		64	Vilfredo Pareto	*Treatise on General Sociology*	1912
		72	Frederick Rossini	"Chemical Thermodynamics in the Real World"	1971
42	13	**55**	Mirza Beg	*New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*	1987
		19	Christopher Hirata	"The Physics of Relationships"	2000
		74	Thomas Wallace	*Wealth, Energy, and Human Values*	2009

Adams and Rossini both published their famous treatises at age 72, and Wallace published his magnum opus at 74.

Of note, is Vilfredo Pareto (SN:3), being that it is often said that he didn't start his so-called "second career" until the second half of his reaction existence; specifically he didn't initiated the start of his intellectual legacy until age 48 (*Course on Political Economics*), and didn't complete his four-volume (*Treatise on General Sociology* magnum opus until age 64.

Quotes

The following are related quotes:

> "If you haven't cut your name on the door of fame by the time you've reached 40, you might as well put up your jackknife."
>
> — Oliver Wendell Holmes Jr. (c.1840), publication (Ñº)

> "You are now past 30 and you are no longer a physicist."
>
> — Paul Dirac (1931), comment to Heisenberg shortly after his 30th birthday (Dec 5) [3]

> "A person who has not made his great contribution to science before the age of thirty will never do so."
>
> — Albert Einstein (c.1940), publication [2]

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θΔics

In genius studies, **genius and diet** refers to the dietary habits of geniuses.

An **genius and diet** stylized image, from Eric Weiner's 2016 article "Gastronomy of Genius: History of Great Minds and the Foods that Fueled Them", showing: Albert Einstein, eating ice cream, Steve Jobs, eating carrots, Isaac Newton, eating an apple, Gandhi, drinking tea [?], Pythagoras, drinking hemlock [?] with his beans, Honore Balzac, eating a cherry with his 50 cups of daily coffee, and Marie Curie, drinking coffee [?] with her butter and bread. [2]

Evolution

It is a theory that smarter humans didn't evolve from less-intelligent ape-like ancestors until the apes gained access to rivers and began to eat fish; genius, accordingly, in part, is a function of diet. In nature, when animals kill, certain parts of the body are devoured first, such as the brain and eggs.

Two notable books on brain optimality and diet are: Udo Erasmus' *Fats that Heal and Fats that Kill* (1993) and Jean Carper's *Your Miracle Brain: Maximize Your Brainpower, Boost Your Memory, Lift Your Mood, Improve Your IQ and Creativity, Prevent and Reverse Mental Aging* (2000), both of which summarize scientific findings relating intellectual optimization and diet, e.g. that rats to better in maze tests when fed blueberries, and worse when fed pig fat.

Caffeine

Studies have shown that caffeine and calcium in brain cells, when working together, have a synergistic effect in respect to memory and brain power.

The great Voltaire was said to drink 40 cups of coffee a day. Warren Buffett at age 16, had read at least one hundred books on business (see: Buffett number); shortly thereafter, he entered the Wharton School of Finance, wherein upon arrival he reported that 'he knew more than the professors'; on a return trip home, he was warned not to neglect his studies, to which he replied insouciantly: 'all I need to do is open the book the night before and drink a big bottle of Pepsi-Cola and I'll make 100'. American electrochemical engineer Libb Thims, early on in his age 19 launched quest to master the hardest subjects and to discern the hidden secrets and puzzles of nature and existence, read that a famous 20,000+ person study of physicians showed that drinking upwards of 12 cups of coffee per day was did no harm, and has since steadily consumed 1-4 200mg caffeine per day along with continuous drinking of Diet Coke.

Chocolate

Chocolate consumption is a stable diet component of the genius. While the specifics of the mechanism are wanting, chocolate consumption is known to boost serotonin (Q); flavonoids and magnesium of chocolate, supposedly, boost brain speed. (Q)

Voltaire notably mixed his 40+ cups of coffee with chocolate. American electrochemical engineer Libb Thims learned early on, in his pre-engineering studies, that to excel on tests one needs to consume large amounts of chocolate, particularly brownies; he has daily consumed about 4-9 ounces, on average of Hershey bars, either with almonds (or with almonds and toffee chips) for some two decades. Jeanne Calment (1875-1997), the French supercentenarian who had the longest confirmed human life span in history, reacting to the age of 122-years, 164-days, ate more than two pounds of chocolate per week; rode a bike until she was 100, and had a penchant for foie gras (fattened duck liver).

Meat | Red

Red met contains oleic acid, which is the main component of myelin sheath, the white matter of the brain; the thicker sheath one has, the faster one thinks.

Warren Buffett has a strange penchant for hamburgers, to the exclusion of other foods; quote: "[Buffett] just eats hamburgers and drinks Pepsi-Colas" [Fred Stanback]. Oleic acid, one of the main oils of red meat, is the main component of myelin sheath, the white matter of the brain that surrounds never fibers: the thinker the sheath, the faster the firing of the nerve messages.

Milk

The association between milk and genius is puzzling phenomenon, the underlying nutritional reason of which remains to be discerned.

Oliver Heaviside, the person who condensed Maxwell's field equations with 20 variables down to four equations with two variables, had very specific food preferences and an unnatural interest in food. He sometimes lived like a cat, drinking bowls of milk for days. Milk, and nothing else. Strangely, as eccentric geniuses biographer Clifford Pickover reports (1998), Tesla also lived on milk, and for many years. Thomas Edison's only foods were milk and the occasional glass of orange juice. American electrochemical engineer Libb Thims frequently consumes 2-3 gallons of 1% milk (2% or sometimes whole) per week, especially so after long extended 10-hour+ periods of study, after which milk is the only thing that will quench and calm the brain. Richard Kirwan, the “brilliant 18th-century polymath”, as Pickover describes him, existed entirely on a diet of only milk and ham. Theodore Kaczynski, math prodigy turned unabomber, as noted by his college dorm mates, had a room piled with trash two feet deep underneath it all were what smelled like unused cartons of milk.

The most-famous film depiction of the genius milk phenomenon is the “come in with the milk” scene from the 2004 film *The Aviator* based on the existence reaction of American aviation and film pioneer Howard Hughes (see also: why is this site here), as shown adjacent, wherein one can count 60 milk bottles filled with urine.

Fish oil

The main brain nutrient of fish is DHA and EPA: the main component oil of the white matter of the brain. It is well known that babies fed DHA/EPA enhanced breast milk, result to have higher adulthood IQs. American electrochemical engineer Libb Thims attributes a large part of his early acceleration to the top 8 percent of his chemical engineering graduating class, starting from a dead bottom high school educational level, to fish oil: at one point, unknowingly, he was consuming so much fish oil, owing to his early body building dietary protein consumption needs, that at one point he was purchasing upwards of 9-10 cases (48 cans per case) of tuna-fish per shop; owing to mercury build up side affects, in the 2000s he switched over to Norwegian bottled cod liver oil (sometime after reading Udo Erasmus' 1993 *Fats that Heal, Fats that Kill*), which he drinks 2-3 times daily.

Other

Other important nutrients for the genius mind include: nuts, oils (almond, walnut, flax), eggs (at least one per day drank raw) mixed into oil-protein-milk-oat-all bran shake; so as to keep uptake of the high usage rate of the brain.

Vegetarianism

While a few purported “vegetarian geniuses” exist, such as: Leonardo da Vinci and John Stewart, it is a general rule that one of the reasons that man evolved from ape was access to red meat and fish. Moreover, religious-based vegetarianism, such as found in India, have shown to yield the lower levels of intellectual development, as evidenced by laureates per capita. (Q) Vegans lack access to oleic acid, and hence have thinner myelin sheath and therefore slower thinking.

Pork

While a certain amount of pig meat may be health in respect to the intellectual affects of the mind, e.g. adding a little bacon to one’s burger, studies show that rats fed pig meat do worse in mazes, the Morris water maze (1984), which tests learning and memory (Q), in particular, as compared to other similar dies. One example of this is in Poland, the country with the highest import, exporter and consumer of pig products in the world, which seems to be the root of the “dumb Pole” joke.

> “The Poles are advanced in knowledge; but **their diets** hold forth a dreadful scene of the conflict of private

and public good."

— John Stewart (c.1790), comment on the Poles, according to according to Ralph Griffiths

The hydro-carbon structure of pig fat, in short, seems to deter intellectual development.

Quotes

The following are related quotes:

"May not genius be shown in **arranging a man's diet**, exercise, sleep, reading, reflection, writing, etc., in the best order and proportion, for his improvement in knowledge?"

— John Adams (1758). "What are the proofs, the characteristics of genius?", Diary entry

See also

- Milk and genius

References

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(b) Adams, John. Butterfield, L.H. (1966). *The Earliest Diary of John Adams* (pgs. 72-73) (editors: Lyman Butterfield, Wendell Garrett, Marc Friedlaender). Harvard University Press.
(c) Siemers, David J. (2010). *Presidents and Political Thought* (pg. 24). Missouri University Press.
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Further reading

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θΔics

In genius studies, **genius and exercise** refers to the exercise habits peculiar to geniuses, e.g. walking, riding bikes, running, in their daily or weekly regimen, and also to studies on brain development and exercise.

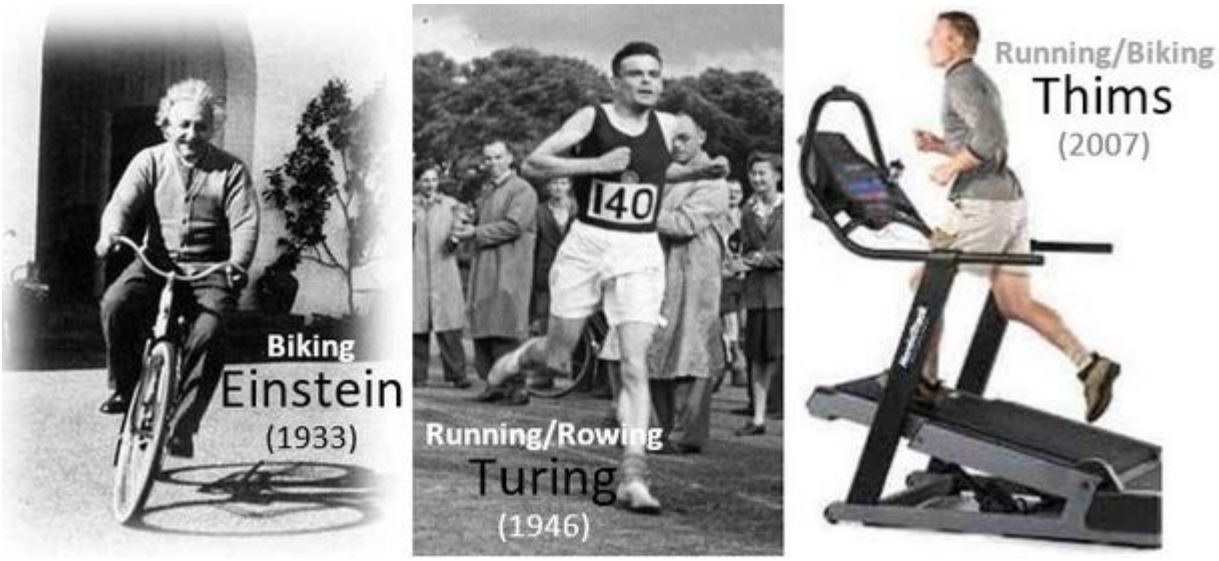

A number of **geniuses** follow a regular **exercise** routine and or think up their best insights and solutions while exercising, such as: Einstein (biking), photo shown being him riding a bicycle (1933) in front of Ben Meyer's house, Santa Barbara, Turing (running and rowing), photo shown being him running (Ñº) a marathon (or some race) in 1946, Hypatia (rowing, swimming, horseback riding), Dirac (walking), Kierkegaard (walking), and Thims (running, biking, free weights, primarily, [along with: elliptical, stair climber, swimming, etc., on occasion]), photo shown being a mock photo of him running at a 15 percent incline at 7.8 mph at one of the Chicago gyms.

Turing

English polymath Alan Turing used rowing as an undergraduate at Cambridge and then later, after winning a fellowship to King's College, began to run intensely, continuing to do so into his 30s and thereafter to process information. In his mid-30s he supposedly ran a very-impressive 2:46:03 marathon, and was mentioned as possible representative for England in the 1948 Olympics. He is said to have often run a route from Cambridge to Ely and back, a distance of 50 kilometers (31 miles)

Sometime after WWII, in circa 1947, when asked by J.F. Harding, the secretary of Walton Athletic Club, the local athletic club, in which Turing was considered the best runner, why he "punished himself so hard in training", he responded: [6]

> "I have such a stressful job that the only way I can **get it out of my mind** is by running hard; it's the only way I can get some release."
>
> — Alan Turing (c.1947), reply to J.F. (Peter) Harding on why he punished himself so much in training [7]

Turing often ran the 10-miles between the two places where he did most of his work, the National Physical Laboratory and the electronics building on Dollis Hill, beating colleagues who took public transportation to the office. (Ñº)

Libb Thims, very similar to Turing, ran his first marathon (Chicago Marathon, 2001), for the first 18 miles, at a 2:50:00 marathon time (Ñº) pace, which was his "predicted marathon time", based on estimation charts according to his 1-mile and 5K times, albeit finish eventually at 3:06 (a Boston Marathon qualifying time), had longest one day run distance of 40-miles (ran on a treadmill at 7.8 mph at 15% incline), a one mile time of 4:55-min, and frequently as a youth while on vacation, in the upper peninsula of Michigan, would run from town to town (30 mile distances), and or bike from town to town (60 mile distances), wherein he had different relatives, in the for fun.

Studies

A number of studies show positive correlation between exercise and cognitive ability.

In the 1990s, Carl Cotman, and colleagues, at the University of California at Irvine, conducted experiment in which they found that putting rats on treadmills induced their brain cells to produce chemical "growth factor" that spurs growth of dendrites, thereby expanding communication networks. The study found that neuronal grown happened not only in parts

of the brain that have to do with motor control, but also in areas of the brain that control memory, reasoning, thinking, and learning. Exercise was also found to increase blood flow to the brain. Moreover, older humans who exercised scored higher on tests of cognitive function than nonexercisers. Cotman summarized his findings as follows: [1]

> "Simply running a few days a week increases brain proteins, and helps protect nerve cells from injury, cells known to be associated with cognition."

Another study, conducted by Arthur Kramer, at the University of Illinois at Urbana-Champaign, wherein 124 men and women, aged 60-75, who never or rarely exercised, were put on an exercise program of either a brisk one-hour walk or yoga type stretching, three times a week, after which, six months later, found that "walkers" scored 25 percent higher than "stretchers" on cognitive tests of executive control or memory, specifically in higher functions of decision-making, planning, scheduling, ability to quickly switch tasks, look up and remember phone numbers. [1]

In a study by William Greenough, at the University of Illinois at Urbana-Champaign, wherein rats were raised in three different environments: alone in cages, two to a cage, and in a large playground cage with many young rats, toys, and treadmills, it was found that only with four days of exposure, rats in playground environment "went wild with new growth—the dendrites of their synapses and the length of their dendrites increased profusely and rapidly and they suddenly acquired more connections per nerve cell—more synapses—and a lush forest of dendrites", as Jean Carper summarizes. [1]

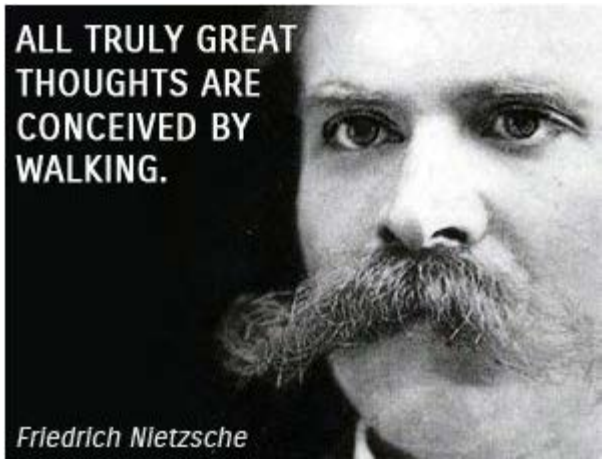

In a study done by neuroscientist Fred Gage, at the Salk Institute for Biological Studies, La Jolla, California, new born rats were put either into ordinary laboratory housing and others into enriched environment housing, replete with climbing tubes and running wheels, novel food, and lots of social interaction, after which, two months later, the teenage rats, per examination using a tracer drug to pinpoint new brain cells, varied to the effect that the standard environment rats had 270,000 neurons per hippocampus hemisphere, whereas the enriched environment rats had 320,000 neurons per hippocampus hemisphere, i.e. the enriched rats had 20 percent more brain cells in the memory and learning centers of the brain. Moreover, the enriched rats were smarter, performing better on water maze tests of memory and learning. [1]

American anthropologist Helen Fisher, citing the *New York Times* article "Runner's High", reports the following: [5]

> "Jogging, biking, and other forms of strenuous physical activity are known to drive up levels of dopamine in the nucleus accumbens of the brain, bestowing feelings of euphoria."

The cited article, as reported by former addict Bill Fox and recreational bicyclists, notes that two-hours of sweaty, intense, vigorous exercise, produces an equivalent effect equivalent to cocaine, a "well-being kind of feeling, that Superman kind of feeling". [6]

Fisher continues:

> "Exercise also elevates serotonin and some endorphins, calming substances. And it increases BDNF (brain-derives neurotropic factor) in the hippocampus, the memory center, which protects and makes new nerve cells."

(add discussion)

Genius exercise habits

A number of geniuses either followed a certain exercise regimen-philosophy or, if they were forced prodigies, had parents who initiated a certain physical exercise program to coincide with the mental exercise program.

The most famous of these is Greek female universal genius Hypatia (IQ=190) who, per the guidance of Theon, the last head of the Library of Alexandria, as part of his plan to raise a female polymath, established a regimen of physical training for Hypatia, such as rowing, swimming, and horseback riding, to ensure that her body would be as healthy as her well-trained mind.

German-born American physicist Albert Einstein (IQ=220) frequently commented that a large number of his theories were conceived while riding his bicycle. The most famous of these responses, was when Einstein was queried about his theory of relativity, to which he replied, something to the effect that he conceived the relativity while riding a bike.

Paul Dirac famously preferred to spend his nights talking long, solitary walks around the city, of Copenhagen, setting out from his lodgings after dinner, take a tram to its terminus and walk the streets back to his digs, thinking about the problems of quantum mechanics. [3]

Danish philosopher Soren Kierkegaard took what he referred to as a “people bath” each day walking around his native streets for some two decades in the 1830s chewing over ideas. [4]

American electrochemical engineer Libb Thims early on followed a motto that "once goes the body, so goes the mind"; early on in his educational climb, he frequently rode his bicycle some 20-miles per day, nearly throughout his entire electrical engineering education; most of the writing of his 2007 Nobel Prize nominated *Human Chemistry* textbook, which Russian physical chemist Georgi Gladyshev claims "symbolizes the beginning of a new era (epoch) in human history", was done at while running on the treadmill at a 15% incline, at various Powerhouse/X-Sport gyms; in fact towards the tail end of the writing process, in order to ensure completion, specifically after chapter 10 (Goethe’s Affinities), Thims ran continuously every day for six months straight, exactly 6-miles per day, at a 15% incline, at exactly 7.8 miles per hour, for a total of 1,080 miles, during which time new concepts and theories and solutions to problems were pushed out and grew in the mind "while on" the treadmill.

At one point, prior to the writing of *Human Chemistry*, on one particular day, Thims had ran a record total 40-miles, at the same rate and incline, although broken up into 10 four mile chunks, with 15-minute breaks in between run sets.

German polyintellect Johann Goethe noticeably met his reaction end at the reaction extent (age) of 82 without an ounce of fat on his body, as recounted by Eckermann: “Frederick drew aside the sheet, and I was astonished at the divine magnificence of the limbs. The breast was powerful, broad, and arched; the arms and thighs were elegant, and of the most perfect shape; nowhere, on the whole body, was there a trace of either fat or of leanness and decay” (see: Goethe timeline, 23 Mar 1832).

In forced prodigies, Sufiah Yusuf (1984-), similar to Hypatia, albeit not a success in the long run, was forced child math prodigy, who passed her maths A level aged 12 and started at St Hilda's College, Oxford at age 13. Her domineering father Farooq Yusuf, early on subjected her to his "accelerated learning technique", in which her days revolved around stretching and breathing exercises in freezing-temperature rooms so as "to keep her brain attentive"; Sufiah would then study hard and be forced to play tennis with just as much intensity as fanatical Farooq drove her on. The routine was so effective, that Sufiah was seeded number eight in the country for under 21s (Ñº). The pressure and or technique, however, was too much, and at age 15, she eventually ran away and become a $400 per date ($95,000 annually) escort, telling the police that she'd "had enough of 15 years of physical and emotional abuse".

Quotes

The following are related quotes:

“No man has the right to be an amateur in the matter of physical training. It is a shame for a man to grow old without seeing the beauty and strength of which his body is capable.”

— Socrates (c.410BC), *Publication*

“I have walked myself into my best thoughts.”

— Soren Kierkegaard (c.1840) [4]

“All truly great thoughts are conceived by walking.”

— Friedrich Nietzsche (Ñº)

“I thought of that while riding my bicycle.”

— Albert Einstein (c.1930), response to query about relativity [2]

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θΔics

In genius studies, **genius and latitude** refers to []

Overview

In 2003, Libb Thims, in his draft chapter sixteen "Entropy G[S] and Attraction III" of *Human Thermodynamics*, took the latitude and country location of 631 Nobel Prize laureates, and and ranked them according to "country population" divided by "laureates produced", along with fish, the main decahexanoic acid (DHA) source for the gray matter portion (memory), i.e. brain cells, of the brain, and beef and veal, the main oleic acid (OA) source for the white matter portion (thinking speed), i.e. myelin sheath, of the brain consumption per capita for each country, of 40 countries in total: [1]

Rank	Country	Total	1999 Population (x1000)	Ratio: Population/Noble	Latitude°	Fish: (Lbs)/Capita	Beef & Veal: (Lbs)/Capita
1	Iceland	1	273	273	65°	200	40
2	Sweden	23	8,911	387	58°	58	40
3	Luxembourg	1	429	429	50°	43	51
4	Switzerland	15	7,275	485	47°	30	48
5	Denmark	11	5,357	487	56°	52	44
6	Britain	85	59,113	695	52°	44	37
7	Ireland	5	3,633	727	53°	37	38
8	Norway	6	4,439	740	59°	111	40
9	Netherlands	15	15,808	1054	52°	34	45
10	Germany	73	82,087	1124	51°	27	36
11	U.S.A	242	272,640	1127	42°	46	98
12	Austria	7	8,139	1163	48°	23	45
13	France	42	58,978	1404	49°	63	60
14	Belgium	5	10,182	2036	51°	43	51
15	Finland	2	5,158	2579	61°	72	48
16	Canada	12	31,006	2584	47°	49	75
17	Australia	5	18,784	3757	35°	42	79
18	Italy	15	56,735	3782	42°	49	58
19	Portugal	2	9,918	4959	40°	132	40
20	Hungary	2	10,186	5093	47°	9	18
21	Greece	2	10,707	5354	39°	56	47
22	Poland	7	38,609	5516	52°	23	22
23	Yugoslavia	2	11,206	5603	44°	5	20
24	Israel	1	5,750	5750	32°	50	18
25	Spain	6	39,168	6528	40°	89	29
26	Chile	2	14,974	7487	29°	49	134
27	Czechoslovakia	2	15,677	7839	50°	19	67
28	Bulgaria	1	8,195	8195	43°	4	19
29	Argentina	3	36,738	12246	30°	25	134
30	Guatemala	1	12,336	12336	15°	2	9
31	USSR	15	266,000	17733	55°	43	50
32	Japan	7	126,182	18026	37°	152	27
33	South Africa	2	43,426	21713	28°	17	33
34	Romania	1	22,334	22334	45°	5	16
35	Egypt	2	67,274	3673	26°	21	18
36	Colombia	1	39,309	39309	5°	10	36
37	Mexico	2	100,294	50147	20°	23	44
38	Nigeria	1	113,829	113829	9°	14	20
39	Pakistan	1	138,123	138123	29°	4	9
40	India	3	1,000,894	333616	23°	10	3

This analysis found, firstly, that the mean geographic latitude of all Nobel Prize winners is 46˚ degrees. Moreover, the top 10 highest Laureate per capita producing countries all were found to fall between 47˚ to 65˚ degrees in latitude. Thims, at this point, was summarizing this finding as follows:

> “If you want your children, or yourself, to be ‘book smart’, it would pay to live near to the ‘latitude of intellect’ (46˚) or safely within the ‘band of intellect’ (35˚-65˚).”
>
> — Libb Thims (2003), *Human Thermodynamics* (pg. 392) [1]

Secondly, in respect to genius and diet, countries with low fish and meat consumption per capita, such as India, Pakistan, Romania, and Guatemala, all ranked in the bottom 25% of the 40 laureate producing countries.
Thirdly, those countries located close to either equatorial (0˚) latitudes, or the so-called "vacation latitude" (24˚), aka the "happy latitude". These Nobel laureate production rates tend to correlated to latitudes where annual sunshine hours are not too high (more than 3000-hours per year), where happiness levels tend to be higher, or too low (less than 1400-hours per year), wherein suicide rates tend to be higher. (Q) In particular, the mean latitude for the top 20 countries with the highest suicide rates is 49˚ degrees, which by no coincidence is the mean latitude for thermodynamics founding schools (see: founders of thermodynamics and suicide), as summarized below; and the mean latitude for the top 20 countries with lowest suicide rate is 24˚ degrees. [1]

Thermodynamics schools

In 2010, Thims mapped out the founding schools of thermodynamics by degrees latitude, finding a mean latitude of 49.6˚, which is indicative of a potentially optimized latitude with which to learn thermodynamics:

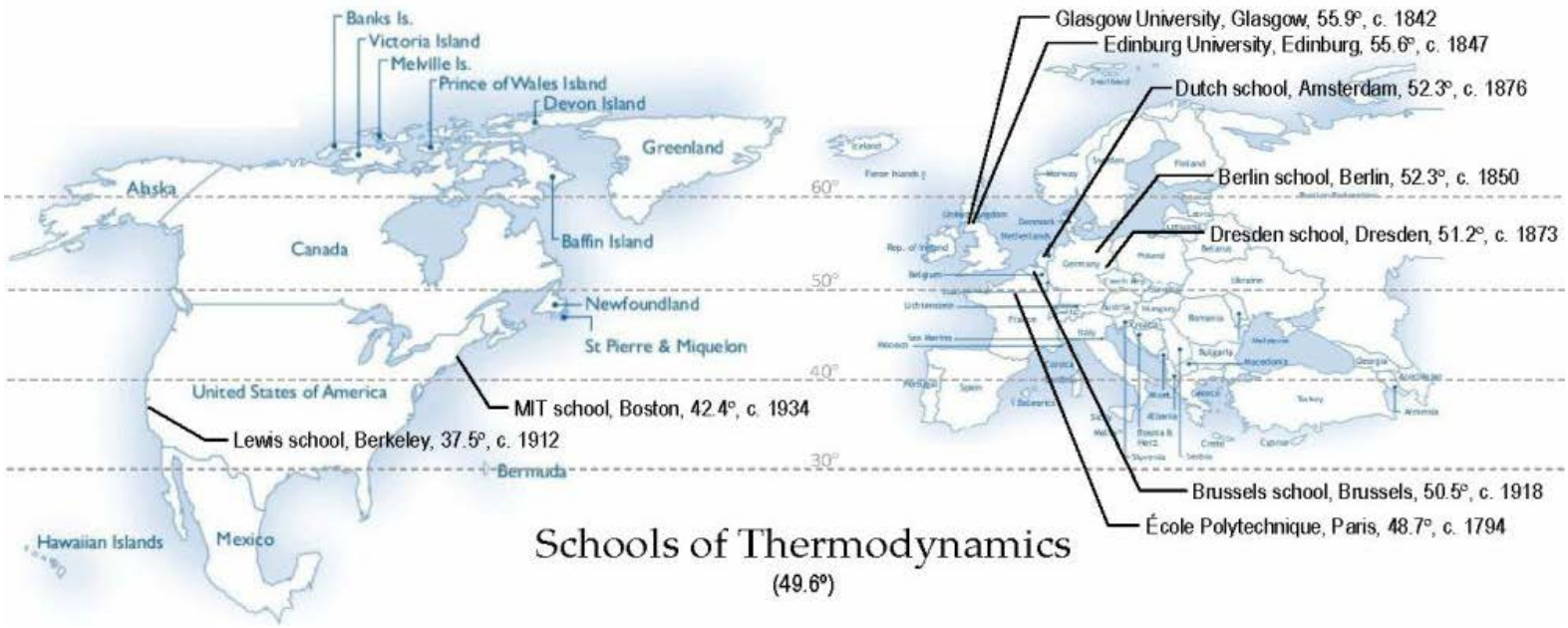

Of note, the "Yale school", at New Haven, Connecticut, centered around the work of Willard Gibbs, which is not shown (per reason that while his impact was great, he did not per se found a school), is at 41.8˚ degrees.

42 degree | 46 degree rule?

Thims, in his 2003 chapter, also, of note, touched on the fact that the top schools of business, engineering, law, and medicine, in the US were in the 41° to 43° degree range, about which, talking into account the river and port location factors that led to these anchor point schools and cities, along with thoughts on Roman genius and how Rome's latitude is 42° and Greek genius, Greece having a mean latitude of 39° degrees, along with the intellect forming at Berkeley California, e.g. Lewis school and Silicon valley, 38°, etc., was discussing a "42±10° rule" or a 42 degree rule. As to whether or not the genius trend presently is a 42°±, 46°±, or 47°±, that is a matter of discussion, depending on what genius sample one is using. [2]

Other

Of note, relate to genius latitude, is the Pangaea theory, how the continents rise, come together, and separate over 300-million year periods; also how ice age periods change climate and habitat condition, e.g. supposedly about 7,000 years ago, large parts of what is now desert, near to Egypt, used to be plush and green, and most of Europe, about 10,000 years ago was covered by sheets of ice.

Quotes

The following are related quotes:

> “Britons are too stupid to make good slaves.”
>
> — Cicero (50BC), paraphrased attributed (Q)(Q)

> “It’s a scientific fact that if you stay in California, you lose one point off your **IQ** every year.”
>
> — Truman Capote (c.1965), *The Portable Curmudgeon* (pg. 59) (Q)

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2. 47˚ ±9 rule (Dec 2017) – Hmolpedia treads.

θΔics

In genius studies, **genius epochs** are []

Overview

The following are the main types of genius confluences, grouped generally by nationality, era, or epoch, the rise and falls of which discernable via empire power size distributions with time on the histomap:

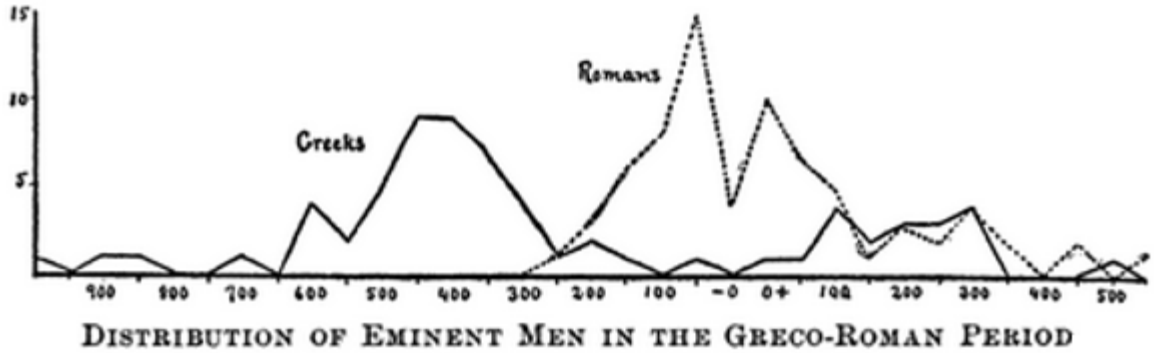

A distribution of **genius epochs**, from the Cattell 1000 (1894), showing Greek genius peaking at 500-450BC and Roman genius peaking at 100BC-50AD.

- Egyptian genius
- Greek genius
- Roman genius
- Chinese genius
- Middle ages genius
- Italian genius [3]
- German genius
- English genius
- French genius
- American genius

In 1894, James Cattell, in his methodological collection of the top 1000 biggest names of history (see: Cattell 1000), based on text size discussion devotion, of six biographical dictionaries and encyclopedias, two French, one German, and one American, discerned the following epoch peaks in respect to Greek genius and Roman genius: [1] Cattell also found the following number distributions from among his Cattell 1000 names:

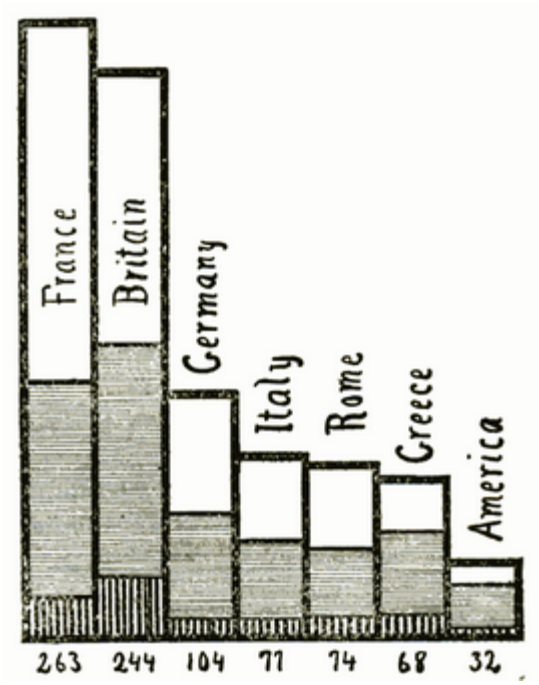

wherein we see that, as of 1894, French genius, English genius (or British genius), and German genius have relatively solidified, and past their peak, but that "American genius" was, at this point, and seemingly still is, an epoch yet to come into formation or fruition.

Quotes

The following are related quotes:

> "The **European**, accustomed to the use of gunpowder, passes it by, without thinking much of its extraordinary energies; the workman, who labors to manufacture it, finds nothing marvelous in its properties, because he daily handles the matter that forms its composition. The **American**, to whom this powder was a stranger, who had never beheld its operation, looked upon it as a divine power, and its energies as supernatural. The uninformed, who are ignorant of the true cause of thunder, contemplate it as the instrument of divine vengeance. The experimental philosopher considers it as the effect of the electric matter, which, nevertheless, is itself a cause which he is very far from perfectly understanding.—It required the keen, the penetrating mind of a Franklin, to throw light on the nature of this subtle fluid—to develop the means by which its effects might be rendered harmless—to turn to useful purposes, a phenomenon that made the ignorant tremble—that filled their minds with terror, their hearts with dismay, as indicating the anger of the gods: impressed with this idea, they prostrated themselves, they sacrificed to Jupiter or Jehovah, to deprecate his wrath."
>
> — Baron d'Holbach (1770), *The System of Nature* [2]

See also

- Epicenter genius
- Schools of thermodynamics

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θΔics

In genius studies, **genius hiatus effect**, convalescence effect, or Bueller effect, refers to the commonality among a significant number of path or groundbreaking breaking geniuses of the germination of seeds or inceptions of new, original, novel and or revolutionary theory developments, conceived, in preliminary or trajectory outline, during times of convalescence or hiatus—gaps or breaks in the interruption of space, time or continuity—reoccurring examples being: prolonged illnesses followed by periods of recovery, school closures owing to outbreaks, academic interruptions or moves due to war and or other various unusual circumstances, in which a slowed down prolonged stepping out of time, out of the normal fast paced pressurized and structured flow of normal existence occurs.

Isaac Newton (1642-1727)

Johann Goethe (1749-1832)

William Rankine (1820-1872)

Three **hiatus effect geniuses**: Newton (2-yrs), Goethe (1-yr), and Rankine (6-yrs), each of whom entered a period of "forced" convalescence prior to their rise to genius-stature fame; two of which, Newton and Goethe, found the idea seeds of their greatest contributions in those convalescence windows.

The term "Bueller effect", based on the following well-known film quote, seems to, in some sense, capture the essence of this forced hiatus phenomena:

> "Life moves pretty fast. If you don't stop and look around once in a while, you could miss it."
>
> — Ferris (1986), *Ferris Bueller's Day Off*

(add discussion)

Alhazen

The prolific output of Arabic polymath Alhazen, particularly on optics and the nature of light, has been attributed to the genius hiatus effect, namely, according to legend, owing to the caliph's anger over his supposed inability to regulate the flow of the Nile, he feigned madness and was put under house arrest from 1011 to 1021, during which time he wrote his influential seven-volume *Book of Optics*, along with treatises on astronomy, geometry, number theory, and natural philosopy.

Newton

English physicist Isaac Newton's forced private studies at his home in Woolsthorpe, following the August 1665 Cambridge University temporarily closing as a precaution against the Great Plague, over the subsequent two years saw the development of his theories on calculus, optics, and the law of gravitation, the seeds of what would become his greatest work.

Goethe

German polyintellect Johann Goethe's age 18-19 forced period of convalescence at home in bed (1768-1769) is where he began his studies in chemistry, particularly the work of Paracelsus (1493-1541) and Susanne Klettenberg (1723-1744), and was conducting chemical experiments in his attic using a draught furnace, the seeds of which would result in what he would later describe as his "best book", namely his 1809 physical chemistry based *Elective Affinities*, wherein he explains the human chemical theory part of his metamorphology theory of evolution.

Rankine

The preeminent example of the hiatus effect genius being William Rankine who in 1830, at age 10, was forced to leave school owing to an illness, thereafter spending the next six years being taught by his father David Rankine, a respected

railway engineer in the Edinburgh & Dalkeith Railway, who four years later, when he turned age 14, gave him a copy of Isaac Newton's *Principia*, in Latin, which he subsequently absorbed, thus laying the foundation of his knowledge in higher mathematics, dynamics, and physics, shortly thereafter, in the next decade or so, penning out the world's earliest known equations of love, as found in his *circa* 1845 "The Mathematician in Love" poetry song. The same "forced" hiatus phenomena is common to equation of love theorists: Goethe (1809): two year hiatus, and Thims (1995): 10-year hiatus, discussed further below.

Einstein

German physicist Albert Einstein, in 1900, after being awarded the Zurich Polytechnic teaching diploma, was unable to find a teaching post, and so while taking a digression from the normal university path, he worked as a patent clerk, during which time he notable developed the mass-energy equivalence theory, the photon theory of light, and the theory of relativity all arrived at in 1905. Einstein would latter comment the following, in reflection, on the nature of these depressurized theoretical fruits:

> "Science is a wonderful thing if one does not have to earn one's living at it. One should earn one's living by work of which one is sure one is capable. Only when we do not have to be accountable to anyone can we find joy in scientific endeavor."
>
> — Albert Einstein (1951), reply letter to female student thinking about becoming a professional astronomer (24 Mar)

(add discussion)

Henderson

In circa 1903 to 1907, the seed for what would become the famous Harvard Pareto circle, which blossomed in the decade 1932 to 1942, was planted into the mind of American physical chemist and physiologist Lawrence Henderson (1878-1942). American psychologist Burrhus Skinner explains this as follows: [1]

Lawrence Henderson (1878-1942)

Mehdi Bazargan (1907-1995)

Libb Thims (c.1975-)

Three of the biggest geniuses of human thermodynamics: Henderson, Bazargan, and Thims, all produced the fruit of their work owing to, in part, the **hiatus effect** phenomenon.

> "Pareto's influence had reached Harvard through a strange accident: Professor L.J. Henderson, who may be remembered longer for his *Fitness of the Environment* than for his pioneering work in the chemistry of blood, had ulcers. In the middle or late twenties he was recovering from an attack in a hospital in his beloved Paris, when his friend William Wheeler, the entomologist, brought him a copy of Pareto's *Traite*. Henderson read it with complete absorption during the rest of his stay in the hospital and on the voyage back to America, and he returned to Cambridge a dedicated convert."

(add discussion)

Sidis

In 1920, American child prodigy William Sidis wrote his magnum opus *The Animate and Inanimate*, while incarcerated in his parent's insane asylum, as a stipulation of his parole for his May Day protests.

Heisenberg

In 1925, Werner Heisenberg, to alleviate his suffering from hay fever, took a vacation in the lonely North Sea island of Helgoland, to get away from the flowering fields near Gottingen. This "moment", according to Steven Weinberg, marks the birth of quantum mechanics. [3]

Warntz

In 1943, American third year economics undergraduate William Warntz, at Penn University, enlisted in the US Army Air Force, amid the interruption of WWII, and the following year, following a crash landing from a mission, was sent to Cambridge to recuperate, during which time he read Isaac Newton's papers, from among the library that contains the largest single deposit of such papers in the world. After the war ended, Warntz remained in the Army Air Force and was posted to Gander at the Newfoundland Base Command for sea search and rescue missions, wherein, in base's small library he found John Q. Stewart's Coasts, Waves and Weather for Navigators (1945), with its appendix, or "exotic chapter", as Warntz called it, in which Stewart described "population potentials", likening equipotential lines to isobars within a cyclonic system. Warntz later said that was his "Ah-ha" moment, when "social science and the things I learned about meteorology and navigation" came together. This was the seed or glue for the eventual formation of the Princeton social physics school, one of the four modern quantitative schools of geography.

Bazargan

Iranian mechanical engineer and thermodynamicist Mehdi Bazargan, who in 1979 became 75th prime minister of Iran, wrote his *Thermodynamics of Humans*, something nobody has yet accomplished even into the 21st century, i.e. publish a book entitled "human thermodynamics", American electrochemical engineer Libb Thims unpublished 2002-2004 draft manuscripts aside, from Spring to Autumn of 1955 during a 5-month incarceration resulting from his political views, a precipitate of the 1953 Iranian coup and its subsequent political restrictions. The book was first published in 1957, according to private documents in possession of Bazargan's biographer Saeed Barzin. [2]

Thims

American electrochemical engineer Libb Thims, likewise, developed the seeds of the work he is best known for after taking a forced step out of the main flow of the typical top-of the class engineer jump to high-paying working engineer, when in circa 1997 nearing the final year of finishing two of the highest paying degrees available—chemical engineer and electrical engineer, finishing in the top 10 percent of his class at one of the world's top engineering schools, and being very sought after, company recruit wise—abruptively called and cancelled all of his scheduled company recruitment paid for flights out to New York and California, with companies including big five financial corporation, a silicon valley computer chip producing company, among others, sensing, owing to a number of other compounding factors, that something was not right, and that he needed to step out of the hoop-jumping fast lane, until the sense of flow correctness returns. The following quote by Einstein captures some aspects of this:

> "I, too, was originally supposed to become an engineer. But I found the idea intolerable of having to apply the inventive faculty to matters that make everyday life more elaborate—and all, just for dreary money-making. Thinking for its own sake, as in music! … When I have no special problem to occupy my mind, I love to reconstruct proofs of mathematical and physical theorems that have long been known to me. There is no *goal* in this, merely an opportunity to indulge in the pleasant occupation of thinking."
>
> — Albert Einstein (1918), Letter to Heinrich Zangger

It was in this period of detachment, outside of the high-paying six-figure salary engineering fastlane, when on 15 Nov 2001, at 3:00 AM, Thims began to see through the so-called "reverse engineering problem", namely of how one can reverse engineer the equations of chemical thermodynamics to explain human movement and human spontaneity, something he had been puzzled about since 1995 (see: history), which is the same problem worked on by both Goethe and Henderson, in their forced convalescence periods, the resultant finished product (*Elective Affinities*, 1809) about which Goethe claimed was his greatest work (see: best book), completed 40-years after his convalescence period of introspective thought (1769).

Another noted precipitate of Thims forced hiatus was the 2009 arrival of solution to the great problem of natural philosophy (1836), the explanation of how life came from non-life, a subject in most cases broached, partially, only by a few discerning minds, well into the near retirement years, in passing, and hence not deep enough to see solution. Had Thims chosen the path "more traveled", the road of the well-paid, but typically unrewarded intellectually, engineer, over

the path "less traveled", he would, no doubt, never have had the so-called "hiatus time" to arrive at solution.

Plane flights

In modern terms, where time moves pretty fast, as Ferris says, both American economist Thomas Schelling and Romanian-born American mechanical engineer Adrian Bejan conceived the work they are best known for while stuck on a plane, thus having “hiatus time”, so to speak, to think.

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θΔics

In genius studies, **Genius IQ candidates** refers to individuals tentatively slated, estimated, or nominated to have possible have a genius IQ of 140 (Terman) to 160 (Hollingworth) or above ranking in the tentative future project of the 1000 greatest geniuses of all time listing, a list actively growing presently at the Genius IQs rankings table, whose nominations stem from a number of sources: such as peer genius rankings, multiple thread nominations, historically established genius fame and retrospect ability, among others. This page, to some extent, is an expanded spinoff of the IQ: 200 (±) candidates page, just as the Genius IQs page is an expanded spinoff of the IQ: 200+ page. Thread nominations (with reason) are welcome.

The following are in the slated to be added to the genius IQs table.

IQ	Person?	Estimate	Description
	Ken Uston (1935-1987)	IQ_O=169	Entered Yale age 16; MBA at Harvard; youngest ever vice president Pacific Stock Exchange; thereafter inventing team card counting and becoming known as the “genius card-counter”. (link)

Existive candidates

The following are genius IQs potentials who are still existive [alive + reactive] sometime of which have been affixed with the title "smartest living person", which, to note, in a somewhat oxymoronic fashion, if one was indeed cited as the smartest "living" person, he or she would at least be smart enough to know that there is no such thing as a "living thing", person or otherwise, as Nikola Tesla disproved this doctrine nearly a hundred years ago (see: defunct theory of life), and as such would be in possession of learned ignorance, or possibly be a pseudo-intellectual or an intellectual moron.

IQ	Person?	Estimate	Description
	Edward Thorp (1932-)	IQ_O=170-200	Didn’t speak until age 3 (similar to Einstein); at 3.5 spoke like an adult, could count to a million, and had a photographic memory; to win ice cream cones, he would bet grocers that he could add customers’ bills in his head faster than the grocer could using an adding machine; for fun, would take IQ tests at the local library, typically scoring in the 170 to 200 range; made homemade explosives such as nitrocellulose and ammonium iodide to blow up things and make rocket cars; in 1955, while a physics graduate student at UCLA, one bare boned budget of $100 a month, while putting in 50-60 hours studying and in classes, he realized time was money, so he began to read books on psychology for tips on how to study faster; thereafter he began to study the ‘physics’ of roulette wheels, and in 1961 invented the world’s first wearable computer, learning Fortran to do the programing, to make predictive bets in the few seconds after the croupier releases the white ball, while bets are still open; in 1960, while a mathematics instructor at MIT, became gambling (blackjack/roulette) theorist cohort with Claude Shannon (IQ=180±) and together they built pocket computer casino device. [13]
	Murray Gell-Mann (1929-)		[GPE] Taught himself calculus at age 7 (link); in 1961, he (and Kazuhiko Nishijima) to introduce a classification scheme for hadrons, elementary particles that participate in the strong interaction (this scheme was independently proposed by Yuval Ne'eman)—his scheme is now explained by the quark model; in 1964, Gell-Mann and George Zweig, independently, went on to postulate the existence of quarks” (a term coined by Gell-Mann),

particles of which hadrons are composed.

Edward Witten (1951-)

String theory, quantum gravity, quantum field theory researcher; first physicist to be awarded a Fields Medal (1990); named by *Time* (2004) as world's greatest still existive [existing+reactive] theoretical physicist; 10+ thread posts on him as "missing candidate" (here) (thread).

Noam Chomsky (1928-)

His *Manufacturing Consent* was mentioned in *Good Will Hunting*; oft-labeled as the "smartest person alive". [4]

(add)

See also

- IQ history
- IQ: 225+
- Last person to know everything
- Smartest person ever
- Polymath
- Universal genius
- Last universal genius
- IQ+ 150+ | Smartest woman ever
- Two cultures genius (two cultures)

References

4. The Smartest People Alive (2010) – MindFlash.com.
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External links

- The World's 50 Smartest Teenagers (2014) – TheBestSchools.org.

θΔics

Note: this is an archived page (Jan 2014);
***New version**: Top 1000 geniuses (Feb 2014 - present)*

IQ	Classification
Above 140	"Near" genius or genius.
120–140	Very superior intelligence.
110–120	Superior intelligence.
90–110	Normal, or average, intelligence.

The original definition of a **genius** range **IQ** according to American psychologist Lewis Terman (1916); alternatively, American psychologist Leta Hollingworth (1942), in her "Children Above 180 IQ", sets the genius mark at 160+. [1]

In genius studies, **genius IQ** (LR:6) is an intelligence quotient (IQ) or integer number at or above 140 (Terman) or 160 (Hollingworth), "which expresses the relative brightness or intelligence of any given individual" (Cox, 1926), the validity of the method used to discern IQ number being of prime importance.

> "Talent hits a target no one else can hit; **genius** hits a target no one else can see."
>
> — Arthur Schopenhauer (c.1845), *Publication*

In these rankings, a total of **460+** geniuses current (Jan 2014), i.e. 421 (below) + 39 (candidates page), strong weight is affixed to the conditional term "genius", from the Latin *gignere* "to beget" (to produce), in the sense that one may have a strong aptitude, marked capacity, or heightened inclination in some area, but if one does not *beget* of esteemed respected intellectual note, one is not necessarily a genius and the IQ estimate may be a pseudo-estimate, false positive, or over-estimate. The genius IQs table itself is an expanded version of the popular 2008-2010 constructed IQ: 200+ table, albeit extended down to the 140 range, with cited IQs shifted (↑,↓) up or down ± 5-10 (upgrade/downgrade) or more points (per modern day hard science perspective), giving a blended representative, realistic, and comparative listing of elite geniuses, media-promoted genius, new comer geniuses, child prodigies, and others, and their said-to-be IQ estimates (third column), listed in realistic descending order of intelligence. The updown arrow (â†•) is shown next to still reactive (existing) individuals, and or a newly-added yet-unprocessed individual, listed on the table; being that true genius IQs, which can change per decade (shift up or down), can only be estimated in retrospect—thus allowing for clear unbiased prolonged digestion of the weight of the person's work.

Methodology

See main: IQ ranking methodology

The following (under construction) listing is ranked in descending order of realist (real), or "true IQ", using genius studies pioneer Catherine Cox's 1926 term, in the sense of who is the smartest, ranked by a number of factors, firstly meta-analysis of known IQ estimates (Cox, Buzan, Guinness, psychologists, etc.), universal genius [UG] or "last universal genius" [LUG] status (IQ=207+), last person to know everything [LPKE], two cultures genius [TCG], greatest physicist ever [GPE], greatest mathematician ever [GME], greatest chemist ever [GCE], greatest engineer ever [GEE], greatest philosopher ever [GPhiE], greatest thermodynamicist ever [GTE], greatest literary author ever [GLAE], polymath (IQ_{AVG} = 189), uberman (IQ=186+), double Nobel Prize [DNP] winners, among other factors, and last but not least Hmolpedia citation ranking [**HCR**]. The twenty-three agreed upon classic, elite, or anchor point "Cox-Buzan geniuses" (Catherine Cox (1926) + Tony Buzan (1994)), shown bolded in **RED**, is the reference point IQ-estimation benchmark ruler (common geniuses to both IQ studies), each of which are adjusted, upon which the other known genius IQ estimates are fitted. A KEY below the table explains the icons and IQ subscripts. Those geniuses with enlarged (75px) photos are shoulder geniuses, e.g. Newton claiming that he saw farther by standing on the shoulders of Descartes (shoulder genius) and Boyle, Tesla speaking about how he read through 100 volumes of Voltaire (shoulder genius), Einstein speaking of Euclid (shoulder genius) as the "holy geometry book", and of course Aristotle, whose name resonates beyond a certain discernible and controllable circumference, in short: names recurrently cited by other large geniuses, that the seem to have established a certain genius within genius ranking.

IQ	Person	IQ estimates	Description
235	**Future Genius** (years)		The future genius will: (a) find the secret principle of the universe; (b) embody Henry Adams' (IQ=190) famous 1910 "call for the aid of **another Newton**" (IQ=215), someone who comes forth to give the "complete solution", as Adams, who worked on the problem through Gibbs (IQ=200), Clausius (IQ=205), Darwin (IQ=175), etc., put it, to the elective affinities problem: explaining morality, sociology, economics, and history according to chemistry, physics, and mechanics, *via* pure mathematics, symbols, figures, and one "common formula"—in a sense, the "new Goethe" (IQ=230); (c) be the final version of Nietzsche's 1883 prophesized "final Uberman"; and (d) solve, among other things, the: gravity/electromagnetic force problem, double slit problem, accelerating universe problem, and the spin-coupling problem (see: modern queries)—all integrated with new findings in particle physics, the final version of quantum mechanics, among other new experimental findings that may arise, all subsumed under the auspices of first law (fundamental law) and second law (supreme law) of thermodynamics—the only science, of universal content, "least likely", in the words of (Einstein (IQ=220), to ever be overthrow.
230	Johann Goethe (1749-1832) ↑↑↑ CR:1|916 Occupations: 35+ Polyglot: 7+	IQ_{CB}=**213** IQ_{O}=180, 225 IQ_{C}=210	**#2** in genius meta-analysis rankings; **#1** social Newton (historical); **epicenter genius** (IQ_{avg}=210); a **dual** scientific revolutions genius; blue sky problem theorist; [LUG] [LPKE] [TCG] [polymath] [uberman]; a GLAE candidate; a Cattell 1000 (top 10); founder of human chemistry (theory: human elective affinities (1796); forerunner to the future 22nd century hard science of human chemical thermodynamics); known for: literature (second ranked WorldCat behind Shakespeare (IQ=185)), evolution theory (forerunner to Darwin (IQ=175)), poetry (top 10 greatest), anatomy (discovered the intermaxillary

1	languages Collected works: 142+ Library: 5,000+ books Vocabulary: 100,000+ words W	IQ_B=215 IQ_W=200	bone, proving an connection between humans and lower animals); physics (color theory of light in opposition to Newton's (IQ=215) corpuscular theory); philosophical and intellectual mentor to: Einstein (IQ=220), Tesla (IQ=195), Helmholtz (IQ=195), Freud (IQ=180), Elliot (IQ=190), Jung (IQ=160), among others; a founder of religious mythology (1770); world's largest active vocabulary (50,000-90,000 words); very high in emotional intelligence; highest-ranked "longevity genius" (â…˜th-century-long prolificness).
220 | 2	 Isaac Newton (1643-1727) ↑ CR:6|392 Occupations: 7+ Library: 1,752+ books (369 scientific) W	IQ_{CB}=**193** IQ_O=200 IQ_C=190 IQ_B=195 IQ_W=170	**#1** in genius meta-analysis rankings; **triple** scientific revolutions genius; blue sky problem theorist; [GPE] [GME]; a Cattell 1000 (top 20); known for: mechanics, laws of motion, gravitational theory, Query 31: affinity chemistry launcher; differential equations, optics.
215 | 3	 Albert Einstein (1879-1955) ↑ CR:12|293 Occupations: 2 Polyglot: 2+ languages Library: 650+ (52+ by Goethe) W	IQ_O=160, 200, 225 IQ_B=205	**#6** in genius meta-analysis rankings; **epicenter genius** (IQ_{avg}=210); a **triple** scientific revolutions genius; blue sky problem theorist; [GPE]; known for: the light quanta hypothesis (quantum mechanics); relativity, radiation thermodynamics; kept a bust of Goethe in his study.
210 | 4	 James Maxwell (1831-1879) CR:5|410 W	$IQ_?$=195-215	A **dual** scientific revolutions genius; blue sky problem theorist; [GPE]; known for: electromagnetic theory (electromagnetic force), kinetic theory, thermodynamics (graphical thermodynamics); intellectual giant to Einstein; highest-ranked "magnitude genius" (prolific output in short time). [GTE] [GCE] [GPE] [GEE]; first American PhD engineer whose his intellectual stature is summarized best by Albert Nock (1931): > "In the last generation, this country produced one of the most eminent men of science in the whole world. His name was quite unknown among us while he lived, and it is still unknown. Yet I may say without too great exaggeration that when I heard it mentioned in a professional assembly in the Netherlands two years ago, everybody got down under the table and touched their foreheads to the floor. His name was Josiah Willard Gibbs" .
210 | 5	 Willard Gibbs (1839-1903) CR:2|759 W	$IQ_?$=195-210	central founder of chemical thermodynamics, statistical mechanics, vector analysis; quote: "[untold number of] Nobel Prizing-winning careers [have been] launched from a passing remark or footnote in Gibbs' monumental masterpiece [*Equilibrium*, 1876]" (Frank Weinhold, 2009); his 700-equation *Equilibrium* is the most-complex, dense, and treasure-filled scientific treatise ever published—the **key** to the elective affinities problem (see: affinity-free energy equation)—the greatest of all genius puzzles—that was described by John Strutt (IQ=190), official solver of the two-century long blue sky problem, the problem worked on by every IQ=205+ range genius (above), as being "too difficult and too condensed for most, I might say all, readers"—James Maxwell (IQ=210), in fact, was the only one, of the 300 scientists Gibbs mailed it to, that immediately understood it (see: thermodynamic surface).
205 | 6	 Rudolf Clausius (1822-1888) CR:3|614 W	$IQ_?$=195-210	**Epicenter genius** (IQ_{avg}=210); a **dual** scientific revolutions genius; blue sky problem theorist; [GTE]; known for: thermodynamics (founder and greatest), entropy, kinetic theory; intellectual mentor to Gibbs (IQ=210), Maxwell (IQ=210), and Einstein (IQ=220); see: Euler genealogy to discern the significance and density of his influence.
			↑ 205+
200 | 7	 Galileo Galilei (1564-1642) ↑ CR=99 W	IQ_{CB}=**183** IQ_C=185 IQ_B=180 $IQ_?$=185-200	**#6** in genius meta-analysis rankings; **dual** scientific revolutions genius; [GPE]; a Cattell 1000 (top 50); known for: dynamics, vacuum theory, temperature, astronomy, heliocentric theory; intellectual giant to Einstein.
200 | 8	 Leonardo da Vinci (1452-1519) CR=61 W	IQ_{CB}=**200** IQ_C=180 IQ_B=220 IQ_O=210 IQ_W=167	[GEE] [LPKE] [uberman] ; blue sky problem theorist; a Cattell 1000 (top 100); known for: animal heat theory, art, engineering, warfare technology, flight; said to have utlilizied a "sleep formula", sleeping no more than four hours at a time, so to optimize his intellectual output; wrote in code, backwards and upside down, so that only those clever enough to look at the document in a mirror would be able to read it. [LPKE] [polymath]; noted physical sciences encyclopedist pioneer; known for coining the the modern term "energy" (with formulation), double slits (experiment inventor), Rosetta

200 | 9		Thomas Young (1773-1829) CR=86 Library: 1,000+ books	$IQ_{?}$=185-200	Stone (translator); quote: “scientific investigations are a sort of warfare, carried on in the closet or on the couch against all one’s contemporaries and predecessors; I have often gained a single victory when I have been half asleep, but more frequently found, on being thoroughly awake, that the enemy had still the advantage of me when I thought I had him fast in a corner—and all this, you see, keeps one alive” (commentary on the mathematics of Joseph Lagrange (IQ=190)).
				↑ 200+
195 | 10		Hermann Helmholtz (1821-1894) CR=362	$IQ_{?}$=190-210	[LUG] so-called "last of the last universal geniuses" (following Goethe); quote: “I believe it is a common saying that Helmholtz was the last universal genius, and we are fast arriving at the point where even a single subject becomes too vast for one man. At any rate, whether or not any of my learned colleagues could write an entire chemical engineering handbook, I could not—hence the present [multiple contributor] form” (Donald Liddell, *Handbook of Chemical Engineering*, 1922); solver of the thermodynamic theory of affinity (see: affinity-free energy equation).
195 | 11		Aristotle (384-322BC) ↑ CR=108	$IQ_{?}$=195 IQ_{B}=190 IQ_{O}=190-210	**#4** in genius meta-analysis rankings; **epicenter genius** (IQ_{avg}=210); first dominate blue sky problem theorist; [LPKE]; a Cattell 1000 (top 10); student of Plato (IQ=180)—teacher of Alexander the Great (IQ=180), the synergy and transmission of which, in Alexandria, resulted to bring about the unification of Aristotelian cosmos theory with Egyptian cosmos theory into what we now know as Christianity; first to document the Mpemba effect; in his circa 350 *Metaphysics*, was the first to dominantly introduced the term energy; central advocate of the nature abhors a vacuum dictum—that complete vacuums are impossible. [10]
195 | 12		Gilbert Lewis (1875-1946) ↑ CR=389	$IQ_{?}$=190-200	[:35] Eponym of the Lewis school of thermodynamics, first to translated and distill Willard Gibbs' (IQ=200) *On the Equilibrium of Heterogeneous Substances*—the densest scientific treatise of all time—into a practical and workable language chemists could readily understand; invented the dot structure pair model of chemical bonding; did some of the first work on relativity; coined the term photon; Linus Pauling's (IQ=190) *On the Nature of the Chemical Bond* (1939) was dedicated to him; quote: “Lewis was the direct mentor of more Nobel Prize winners in chemistry than any Nobel Prize winner in any category” (Adriaan de Lange, 1998); his 1925 *Anatomy of Science*, speculated on hmolscience, i.e. on whether or not him writing this book was nothing but a large "chemical reaction" (extrapolate up) or conversely whether crystals "think" (extrapolate down); his protégé Frederick Rossini, author of the 1950 *Chemical Thermodynamics*, followed up on the former approach with his 1971 Priestley Medal address ‘Chemical Thermodynamics in the Real World’, which sparked the later 21st century Rossini debate.
195 | 13		Gottfried Leibniz (1646-1716) ↓ CR=92	IQ_{CB}=**194** IQ_{C}=205 IQ_{B}=182 IQ_{W}=200	[LUG] [LPKE]; a Cattell 1000 (top 40); known for: differential equations, dynamics (vis viva, vis mortua); told the Queen of Prussia that in mathematics there was all previous history, from the beginning of the world, and then there was Newton; and that Newton was the better half. [23][24] Downgrade (↓) for having his 1710 optimistic approach to the problem of evil, i.e. his assertion that this is “best of all possible worlds”, lampooned by Voltaire in his 1759 *Candice* (see: Alexander Pope) and also ridiculed by Schopenhauer (Ñº).
195 | 14		Pierre Laplace (1749-1827) ↑ CR=86	IQ_{C}=190	Known for his famous Napoleon Laplace anecdote (1802), where when queried about God in the framework of the new celestial mechanics, famous replied ‘I had no need of that hypothesis’.
195 | 15		Ludwig Boltzmann (1844-1906) CR=336	$IQ_{?}$=190-195	A **dual** scientific revolutions genius; formulator of the famous H-theorem model of entropy (1872), the seed to the 1901 later S = k ln W model of entropy; initiator of the "What is Life?"—in physical science terms—debate (see: theories of existence), via his infamous riddled postulate: 1886 postulate that "life is a struggle for entropy" (1886); initiator of the quantum hypothesis (quantum mechanics): “I see no reason why energy shouldn’t also be regarded as divided atomically” (1891) (see: energy element); hung himself (1906) as a result of prolonged attack by the energetics school of his usage of atomic theory to explain thermodynamics.
195 | 16		Leonhard Euler (1707-1783) ↑ CR=81	$IQ_{?}$=180-200	[GME]; upgrade for his reciprocity relation (mathematical proof behind state functions, in particular entropy; see: Mathematical Introduction); see: Euler genealogy.
195 | 17		Voltaire (1694-1778) ↑ CR=51	IQ_{C}=190 IQ_{O}=200 $IQ_{?}$=185-200 IQ_{W}=185	An **epicenter genius** (IQ_{avg}=210); a Cattell 1000 (top 10); upgrade for his support of Jean Sales (IQ=190) and his human molecular hypothesis; known for: Newtonian mechanics, physics, literature, hmol philosophy, religious mythology; lover of Emilie Chatelet (IQ=185); very high emotional intelligence (a greatest philosopher ever candidate).
		Rene Descartes	IQ_{CB}=**178**	[GME]; Cattell 1000 (top 25); known for: Cartesian coordinate system, atomic theory

195 | 18	(1596-1650) ↑ CR=77	W IQ_C=180 IQ_B=175 IQ_W=175	revival (1637), vis viva theory (c.1640), the “I think, therefore I am” philosophy, automaton theory (mechanical theory of life), ethereal heat theory; intellectual giant to Newton.
195 | 19	Nikola Tesla (1856-1943) CR=59	W IQ_O=230-310 IQ_O=200 IQ_O=140-160	Known for: defunct life theory, electricity, magnetism, human energy, radio technology, alternating current, electromagnetic motors; adhered to a Goethean philosophy, to the exclusion of all other philosophies.
195 | 20	Ettore Majorana (1906-1938) HCR=33	W IQ_O=183-200	Known for: human quantum mechanics, neutron discovery, exchange force, chemical bonding theory; quote: “There are several categories of scientists in the world; those of second or third rank do their best but never get very far. Then there is the first rank, those who make important discoveries, fundamental to scientific progress. But then there are the geniuses, like Galilei (IQ=200) and Newton (IQ=215). Majorana was one of these.” (Enrico Fermi (IQ=190)).
195 | 21	Henri Poincare (1854-1912) CR=40	W $IQ_?$=180-195 IQ_{SB}=35	[LPKE] [GME]; known for: Poincare conjecture, relativity, thermodynamics, mathematics. [5]
195 | 22	Robert Hooke (1635-1703) CR=87	W $IQ_?$=190-205	A **triple** scientific revolutions genius; intellectual giant, along with Descartes (IQ=195), to Newton (IQ=215); self-taught: mastered Euclid’s *Elements* by age 15; claims (c.1679) to have been the first to arrive at the inverse square law of gravity (before Newton); inventor of the pneumatical engine; possibly mathematician behind Boyle’s law; nature abhors a vacuum theorist; heat as motion advocate; in 1685, defined the a universal law of volume expansion (for all bodies) some forty-years before it was codified as law (Boerhaave's law, 1724), evolution theorist, cellular anatomist; light theory (wave theory of light), etc., etc.
195 | 23	Henry Adams (1838-1918) CR=241 Collected works: 12+	W $IQ_?$=185-195	**#2** social Newton (historical); penned nine-volume American history set solely to prove cause and effect; his *The Education of Henry Adams* (1907), which is ranked as the greatest American nonfiction book of the twentieth century (American Library), grapples with: Goethe (IQ=230), Gibbs (IQ=200), Clausius (IQ=205), Thomson (IQ=185), Pearson (IQ=185?), Darwin (IQ=175), among others, in search of a unified theory of the humanities and physical sciences; prophet of the "another Newton"; biggest hmolscience thinker since Goethe; spent five decades on the social-history aspects of the elective affinities problem; quote: “social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life”(1885); quote: "I would travel a few thousand-million miles to discuss with [Thomson] the thermodynamics of socialistic society” (1909); probably the first true hmolscientist (human chemist + human thermodynamicist + human physicist); known to many as an enigmatic genius of political thought.
			↑ 195+
24	Vilfredo Pareto (1848-1923) ↑↓ CR=133 Occupations: 5+ Collected works: 12+	W $IQ_?$=185-195±	**#3** social Newton (historical); his four-volume *Treatise on General Sociology* as been characterized as the *Principia* of the social sciences, destined to bring about a revolution (see: Goethean revolution) in social methodology (Andrew Bongiorno, 1930); a “scholar of encyclopedia ambitions and Machiavellian dispositions” (Steve Fuller, 2000); his system has been characterized as the alternative to that of Karl Marx; eponym of the influential Harvard Pareto circle; Quote: “Pareto was one of the last Renaissance scholars. Trained in physics and mathematics, he became a polymath whose genius radiated into nearly all other major fields of knowledge.” (Joseph Lopreato and Sandra Rusher, 1999) (Ñº); he might go up or down ↑↓ depending, after his corpus of work is completely translated into English and fully digested; and likewise compared and contrasted with his peer Leon Winiarski, none of whose work is yet translated into English, and who may resultantly outrank him in intellect, though the matter is still undecided.
25	Carl Gauss (1777-1855) CR=50	$IQ_?$=180-195	[LPKE] [GME]; known for: mathematics, astronomy, electromagnetics; at age 24 famously solved the Ceres tacking problem; considered by Laplace to have been the greatest mathematician in the world; described as a “powerful intellect” by Maxwell; downgrade (↓) for his late age 60 religious-fallout grappling issues, commenting, e.g., how religious matters, such as ethics, destiny, human future, etc., are outside the province of science.
↕ | 26	Oliver Heaviside (1850-1925) CR=8	W $IQ_?$=190-195	Almost entirely a self-taught genius: although he went to school until age 16 and finished fifth among more than 500 candidates for a College of Preceptors Examination given in 1865, he had no formal education after this point; in 1918 he wrote of his obsessive need to absorb Maxwell’s (IQ=210) writings: “I saw that it was great, greater and greatest, with prodigious possibilities in its power. I was determined to master the book and set to work … It took me several years before I could understand as much as I possibly could. Then I set Maxwell aside and followed my own course. And I progressed much more quickly”;

the result of which, he was able to condense Maxwell's equations with 20 variables down to just two equations in two variables; he played a significant role in the Gibbs-Heaviside vector algebra method supplantment of the older less-congruous Hamilton-Tait quaternion method.

190 | 27	Emanuel Swedenborg (1688-1772) CR=22	IQ_C=165 IQ_G=210 IQ_O=205 W	[LPKE]; a Cattell 1000 (top 90); known for: nebular hypothesis, atomic theory; the 1974 *Guinness Book*, based on Stanford University genius studies (aka Catherine Cox's group), listed him (Ñº) at IQ of 210.
190 | 28	Joseph Lagrange (1736-1813) ↑ CR=73	IQ_C=185 W	Noted for his 1788 Lagrangian formulation of the total energy or force function quantification of a system; see also: Euler genealogy; quote: "the invention of dynamics as a mathematical science [was founded by] Galileo (IQ=200), and [through] the wonderful extension which was given to that science by Newton (IQ=215)—among the successor to those illustrious men: Lagrange has perhaps done more than any other analyst to give extent and harmony to such deductive researches, by showing that the most varied consequences respecting the motions of systems of bodies may be derived from one radical formula; the beauty of the method so suiting the dignity of the results, as to make of his great work a kind of scientific poem" (William Hamilton (IQ=180), 1834).
190 | 29	Jean Sales (1741-1816) CR=68	$IQ_?$=190	Initiator, through the publication of his multi-volume 1775 *The Philosophy of Nature: Treatise on Human Moral Nature*, of the human molecular hypothesis (1789): "We conclude that there exists a principle of the human body which comes from the great process in which so many millions of atoms of the earth become many millions of human molecules."
190 | 30	Sadi Carnot (1796-1832) CR=310	$IQ_?$=180-195 W	a theory and work that was condemned, for presenting morality views contrary to religion; he was imprisoned and eventually banished from France for this; while imprisoned, in 1777, he was visited by Voltaire (IQ=195), who gave 500 pounds to towards his release. Initiator of the science of thermodynamics; quotes: "Sadi Carnot was, perhaps, the greatest genius, in the department of physical science at least, that this century has produced" (Robert Thurston, 1890); "The most original work ever written in the physical sciences, with a core of abstraction comparable to the best of Galileo" (Tom Shachtman, 1999); son of Ecole Polytechnic founder Lazare Carnot (IQ=175).
190 | 31	Christiaan Huygens (1629-1695) ↑ CR=43	IQ_C=175 W	Mathematical mentor to Gottfried Leibniz (IQ=182-205) (see: Euler genealogy); liaison between the vacuum work of Otto Guericke and the invention of the steam engine, via his gunpowder engine research with his associate Denis Papin (Papin engine, 1690); determined that the quantity mv^2 (later called vis viva by Leibniz) remains constant during perfectly elastic collisions; noted for his wave theory of light (1678), in opposition to Isaac Newton's (IQ=190-200) later corpuscular theory of light.
190 | 32	Erwin Schrödinger (1887-1961) CR=122	$IQ_?$=185-195 W	Known as a polymath (IQ_{AVG}=196) (*Schrodinger: Centenary Celebration of a Polymath*, 1989); his rather unique formulation of 1926 "Schrodinger equation" is the capstone to quantum mechanics, in the derivation of which he combined De Broglie's 1924 electron wave postulate together with the Lagrangian classical version (K + U = E) of the conservation of energy of a system, to synthesize a "wave equation" that that represents mathematically the distribution of a charge of an electron distributed through space, being spherically symmetric or prominent in certain directions, i.e. directed valence bonds, which gave the correct values for spectral lines of the hydrogen atom; his 1943 "What is Life?" lecture-turned-book (a) seeded the later discovery of DNA (in 1953 by James Watson (IQ=?) and Francis Crick (IQ=173)) and (b) launched the what is life: thermodynamic-view debate (see: theories of existence), wherein he famous gave a derivation that "life" is something that feeds on negative entropy; a view that, however, soon came under rigorous attack (e.g. Linus Pauling (IQ=190)), after which he had to append an infamous "Note to Chapter 6", explaining that had he been catering to a rigorous hard science audience that he would have "turned the discussion to free energy"; a very-riddled proposition, more-correct than the latter position, but one that eventually led to the "defunct theory of life" (Thims, 2009)—the discernment that "life" is something that does not exist (atoms and molecules, of which humans are the latter variety (i.e. human molecules) of, are "not alive", and cannot be made to come alive (or die) or given life—as the olden-days creation by breath (divine creation), creation by spark, creation by heat, Urey-Miller creation, or auto-catalytic creation into perpetual motion, etc.., theories would have things.
190	John Neumann (1903-1957) ↑↑↓ CR=130	IQ_O=163-180 $IQ_?$	A universal genius, possibly a "last universal genius", after Helmholtz, though no citation for this term can be found; upgrade for 1934 economics thermodynamics "variables table" work; upgrade for Neumann automaton theory (1940s); down grade for Shannon bandwagon initiation (1939); upgrade for being known as the "father of the computer";

33		W	=185-200	upgrade for quantum thermodynamics work; upgrade for famously solved the “fly puzzle” in a matter of seconds at a cocktail party; could multiply eight digit numbers in his head as a child, etc., etc.
190 — 34	Hero of Alexandria (c.10-70AD) CR=53	W	$IQ_{?}$=180-195	[GEE] Physicist, top five greatest engineers ever (EngineeringDaily.net), and top forty greatest mathematician ever (W.C. Eells, 1962), noted for: his *circa* 50AD *Pneumatica*, in which, he overview of the physics of Strato and Ctesibius, outlines an atomic theory in which matter consists of particles mixed with distributed vacua, and in which he describes how to make an aeolipile; may have used a type of Philo thermometer (240BC) in his experimental work; was said to have openly challenge the nature abhors a vacuum belief, but his attempts to create an artificial vacuum failed; invent and build the world’s first working heat engine, namely a steam engine that opens temple doors; built a number of famous “automata”, wind turbines, and hydrostatic fountains; said to have discovered imaginary numbers; his *Pneumatica* was translated by Gottfried Leibniz (IQ=200) and also read by Denis Papin (IQ=), likely being influential in the inception of the Papin engine, the first piston and cylinder steam engine; his works, along with the works of Aristarchus of Samos (IQ=?), Hypatia (IQ=185), Sappho (IQ=?), and Berossus (IQ=?) and his *Babylonaica*, are said to be the five most “tantalizing losses from the Library of Alexandria”. [30]
190 — 35	Linus Pauling (1901-1994) ↑ CR=55	W	IQ_{O}=160 $IQ_{?}$=180-195	[GCE] [DNP]; startup chemical company (before age 15); BS in chemical engineering age 21 (1922), during which time he became aware of the work of Gilbert Lewis (IQ=190) and Irving Langmuir on the electronic structure of atoms and their bonding to form molecules, PhD in physical chemistry and mathematical physics (1925), then (1926) to Europe on a Guggenheim Fellowship, to study under Arnold Sommerfeld (IQ=180) in Munich, Niels Bohr (IQ=185) in Copenhagen, and Erwin Schrödinger (IQ=190) in Zürich, during which time he became interested in how quantum mechanics might be applied in his chosen field of interest, the electronic structure of atoms and molecules; also, in Zürich, Pauling was also exposed to one of the first quantum mechanical analyses of bonding in the hydrogen molecule, done by Walter Heitler (IQ=?) and Fritz London; after which he became one of the first scientists in the field of quantum chemistry and a pioneer in the application of quantum theory to the structure of molecules; his 1938 *The Nature of the Chemical Bond* has been referred to as the “bible” of modern chemistry; gets upgrade for, in 1989, ripping apart Schrodinger's thermodynamic views on life (see: Note to Chapter 6).
190 — 36	Richard Feynman (1918-1988) CR=57	W	$IQ_{?}$=190 IQ_{O}=125	Motto: "believe in the atomic hypothesis" (Feynman time capsule wisdom); known for: quantum electrodynamics; see also: Feynman problem solving algorithm. [4]
190 — 37	Enrico Fermi (1901-1954) CR=44	W	$IQ_{?}$=175-195 IQ_{AI}=164	Known as the “last universal physicist”, in the tradition of great men of the 19th century, and “the last person who knew all of physics of his day”. [17]
190 — 38	Pierre Gassendi (1592-1655) ↑ CR=122	W	IQ_{C}=185	Was one of the first to revive the atomic theory work of Epicurus (IQ=), writing a set of books on the philosophical implications of this subject, supposedly written to counter the philosophical views of Rene Descartes (IQ=195); was the first to coin the term “molecule”, which he described as “fitted together atoms”; gave one of the first chemical creation models: “atoms” → “molecules” → “small structures similar to molecules” description of evolution (a forerunner to the later human molecular hypothesis (1789) of Jean Sales (IQ=).
190 — 39	Blaise Pascal (1623-1662) ↓ CR=44	W	IQ_{C}=195 IQ_{W}=192	A GME (top 20); a Cattell 1000 (top 70); at age 19 (1642), made a counting machine, with toothed wheels and gears, moving drums carrying numbers, that could add, subtract, multiply and divide; built 50 in total—they impressed Rene Descartes (IQ=195); in 1646 repeated Evangelista Torricelli's vacuum experiments; from 1652-64, spent all his time on the mathematics of gambling; after his 1654 brush with death (age 31) he "found God" and thereafter seems to have lost his ability to think objectively and productively (relating all his theories to the Bible); dereacted at 39.
190 — 40	Max Planck (1858-1947) CR=203	W	$IQ_{?}$=180-195	A **dual** scientific revolutions genius; a top three greatest physicist of all time; known for: launching the quantum mechanics (quantum revolution), radiation thermodynamics, and for solving the ultraviolet catastrophe.
190 — 41	Nicolaus Copernicus (1473-1543) ↑ CR=55	W	IQ_{CB}=**173** IQ_{C}=160 IQ_{B}=185 IQ_{T}=100-110	Known for: his heliocentric universe model, which launched the scientific revolution (Copernican revolution).
	Christopher Hirata			Youngest medalist ever (age 13) of the International Physics Olympiad; upgrade for his

↕ — 42	(1983-) ↑ CR=80	IQ_R=225 $IQ_?$=170-195	*circa* age 17 derived "relationship physics" version of human chemical thermodynamics (a very niche subject *strangely* common to IQ=225+ thinkers: Goethe, Sidis, Thims); astrophysics; high emotional intelligence.
190 — 43	George Green (1793-1841) CR=8	$IQ_?$=170-190 W	At age 35, a self-educated miller (read books via the Nottingham Subscription Library), having had almost no formal schooling, self-published his 1828 “An Essay on the Application of Mathematical Analysis to the Theories of Electricity and Magnetism”, wherein starting from the work of Pierre Laplace (IQ=190), he introduced the concept of “potential function”, i.e. the potential as a function of Cartesian coordinates V(x,y,z), particularly the potential energy of an arbitrary static distribution of electric charges; he also derived the divergence theorem independent of Carl Gauss (IQ=195); is the eponym of the Gauss-Green-Stokes theorem (fundamental theorem of calculus).
190 — 44	Archimedes (287-212BC) CR=28	IQ_B=190 W	[GME]; Known for: hydrostatics, statics, and an explanation of the principle of the lever; one of fabled "last persons to know everything".
190 — 45	John Strutt (1842-1919) CR=21	$IQ_?$=180-190 W	Called, by some, the “last of the great Victorian polymaths” (IQ_{AVG}=196); noted for his 1870 discussions with Ludwig Boltzmann (IQ=195) on the so-called truth of the second law; his 1871 "scatter theory" solved the two-millennium old blue sky problem (the only problem common to the IQ=205+ group), about which he gave the definitive explanation of in 1899; his 1892 discussions with Willard Gibbs (IQ=200) on statistical mechanics; his 1894 isolation, with William Ramsay, of the element argon (work for which he would win the 1904 Nobel Prize in physics); and his 1900 formulation of spectral energy flux density of black body radiation, which led to the ultraviolet catastrophe problem, and hence to the "energy element" solution by Max Planck (IQ=190), which launched the science of quantum mechanics.
190 — 46	Emilie Chatelet (1706-1749) CR=20	$IQ_?$=170-190 W	Eponym: "smartest woman ever"; combined Isaac Newton’s definition of energy (E=mv) with Gottfried Leibniz’ definition of energy ($E=mv^2$) with Willem Gravesande’s brass balls clay surface impact experiments to synthesize the first version of the conservation of energy (vis viva into vis mortua); mistress of Voltaire (IQ=195); had immense library comparable to the Paris academy of science; ran the biggest research lab in France; very highly ranked "magnitude genius" (prolific output in short time).
190 — 47	Hypatia (360-415) CR=16	IQ_O=170-210 IQ_O=180-200 $IQ_?$=175-192 W	One of fabled "last persons to know everything"; only known female universal genius; noted early irreligionist; her famous stoning to death can be said to mark the start of the dark ages; is rumored that to explain the seasonal variations of the apparent size of the sun, she conceived of elliptical orbit heliocentrism, some 1300 years before Johannes Kepler (IQ=180) formulated this into a law in 1609; Bertrand Russel (IQ=180) and Voltaire (IQ=195), supposedly, rendered her the most uplifting compliments and praises. [7]
190 — 48	George Eliot (1819-1880) ↑↑ CR=20	IQ_B=185 IQ_O=160 W	A GLAE candidate; gets five point upgrade, above Buzan IQ estimate, for basing her most-famous 1872 realism novel *Middlemarch* on Goethe’s 1809 *Elective Affinities*, which has been has been described as the “greatest novel in the English language” by those including Martin Amis and by Julian Barnes; Eliot cogently and correctly considered Goethe (IQ=230) to be "the last true polymath to walk the earth"; she took a three-month pilgrimage to Goethe's home town of Weimar; was said to have been able to read and absorb 40 books per month (which, using the conservative estimate that she began reading at that rate at age 10, would indicate that she had read over 24,000+ books in her existence; in her time, she acquired the epitaph of “very wise woman” and also was measured by a phrenologist as having “very large brain”; quote: “the quickest of us walk around well-wadded with stupidity.”
190 — 49	Athanasius Kircher (1602-1680) CR=9	$IQ_?$=180-195 W	One of fabled "last persons to know everything"; Johann Goethe (IQ=230) commented, during his researches of optics and other subjects, “thus, entirely unexpected, Father Kircher is here again”; was present at the 1641 Gasparo Berti test of the "nature abhors a vacuum" experiment; coined the term electromagnetism; the first Egyptologist; formulator of magnetic cosmology (1667).
190 — 50	William Shakespeare (1564-1616) ↓ CR=82	IQ_B=210 $IQ_?$=175-190 W	A GLAE candidate (#1); a Cattell 1000 (top 10); one of Nietzsche’s uberman (IQ=186+); known for: literature, literature chemistry, Promethean heat; very high emotional intelligence.
190 — 51	Friedrich Schelling (1775-1854) CR=6	IQ_C=190 W	His 1795 natural philosophy theory, according to Frode Pedersen (2011), influenced Goethe and his 1796 chemical philosophy theory; the two were conducting “optical experiments” in 1798 and the year prior Goethe had been conducting magnetic experiments, after reading his *Ideas Towards a Philosophy of Nature*, in attempts to find a unified theory.
			↑ 190+

185 | 52	William Thomson (1824-1907) ↑↑↓ HCR=252	W	$IQ_{?}$=185-190	Known for: absolute temperature, thermodynamics; Glasgow University age 10; defended Joseph Fourier's 1822 theory of heat over that of Philip Kelland's 1837 heat theory (age 13); by age 15-16; published first scientific papers by age 17; in 1845 (age 21), after graduating second wrangler (Cambridge), simultaneous unearthed (↑ ↑) the then unknown and forgotten memoirs of Sadi Carnot's 1824 thermodynamics memoir and George Green's 1828 memoir on the mathematics of electricity and magnetism, now known as two of the most-original works in science; and gave the first mathematical development of Michael Faraday's (IQ=170-180) idea that electric induction takes place through an intervening medium; downgrade (↓) for latter religious undertone based calculations, e.g. age of the sun, etc.
185 | 53	Hugo Grotius (1583-1645) ↓ HCR=14	W	IQ_{C}=200 IQ_{W}=197	
185 | 54	Thomas Wolsey (1472-1530) ↓ HCR=11	W	IQ_{C}=200	
185 | 55	Robert Boyle (1627-1691) ↑ HCR=117	W	IQ_{C}=160 $IQ_{?}$=170-185	A **dual** scientific revolutions genius; corroborator with Isaac Newton (IQ=215) in the initiation of affinity chemistry; supervised Robert Hooke (IQ=195) in the construction of the pneumatical engine, the experimental device that led to the discovery of Boyle's law, the first gas law.
185 | 56	William Sidis (1898-1944) ↓ HCR=114	W	IQ_{P}=250-300 IQ_{O}=200 $IQ_{?}$=180-195	Person behind both the 10% myth (the reserve mental energy theory was used, by his father, in his accelerated upbringing) and the character of *Good Will Hunting* (excelling in math, physics, chemistry, law); down-grade for his magnum opus: *The Animate and the Inanimate*, a rather convoluted second law based "no origin" theory of life, utilizing a two-section universe model, which results to being a patched-together mess of an argument, in spite of his legendary genius prodigy fame status.
185 | 57	Otto Guericke (1602-1686) HCR=60	W	$IQ_{?}$=175-195	See: Thomas Coulson's 1943 booklet "Otto von Guericke: a Neglected Genius"; the originality, variety, polymathly, and influence of Guericke's contributions are difficult to summarize in short; to say the least: he is the person behind the invention of the vacuum engine and the so-called: "first and greatest of the electrical discoverers".
185 | 58	Arthur Schopenhauer (1788-1860) ↑↑ HCR=69	W	$IQ_{?}$=170-190	His two-volume 1,100+ page *The World as Will and Representation* (1814, 1844) built on on Goethe's human elective affinities theory (see: elective affinity problem) to explain "will" in a universal manner, similar to Goethe, e.g. in terms of the "will of the copper" atom in electrochemical reaction.
185 | 59	Friedrich Schiller (1759-1805) ↑↑↑ HCR=82	W	IQ_{C}=165	Gets a 20-point upgrade, above Cox IQ estimate, for (a) being the person in whom Goethe (IQ=230), in 1796, first confided in his newly-forming solution to the elective affinities problem and for (b) being Goethe's closest intellectual comrade (see adjacent: Goethe looking into Schiller's skull); a Cattell 1000 (top 80); they discussed philosophy, science, aesthetics, and satirical poetry, etc; in 1797, in Jena, he introduced the Humboldt brothers, Wilhelm (IQ=175) and Alexander (IQ=185), to Goethe, an epicenter genius circle of intellect wherein they discussed, in Goethe's own words, "all of nature from the perspectives of philosophy and science; Goethe's last words mentioned him.
185 | 60	Stephen Hawking (1942-) HCR=89	W	$IQ_{?}$=160-190 IQ_{B}=180 IQ_{O}=160	Noted: black hole thermodynamics; public advocate of atheism; (link).
185 | 61	Euclid (c.340-280BC) HCR=20	W	IQ_{B}=182	[GME]; His geometry treatise *Elements* was influential to many, including: James Thomson (mathematician), father to noted child prodigy William Thomson (IQ=185), who edited a version of *Elements* (1834); James Maxwell (IQ=210), who mentions Euclid in his last-dying poem "A Paradoxical Ode", Albert Einstein (IQ=220), who at age 12 was given a text on Euclidean geometry, which he called the "holy geometry book"; to Sarah Sidis (tutored by Boris Sidis; mother to William Sidis (IQ=195)) who in 1891 (age 17) "propped Euclid up above the sink, and studied while she washed the dishes"; and to Yevgeny Zamyatin, who intersperses his 1923 literature thermodynamics work with mentions of Euclid.
185 | 62	Humphry Davy (1778-1829) HCR=44	W	IQ_{C}=185	Noted for his 1799 "ice-rubbing experiments", one of the first mechanical equivalent of heat experiments; for his 1806 lecture on electricity and chemical affinity; for his 1813 "point atom" theory of a human; and for the discovery of a number of elements.
185 | 63	John Mill (1806-1873)	W	IQ_{CB}=**183** IQ_{C}=180 IQ_{B}=185	One of fabled "last persons to know everything"; known for: political philosophy, utilitarianism; was a split-brainer who could write two different languages simultaneously, one in each hand.

			IQ_O=200	
185 | 185 64		Jean D'Alembert (1717-1783)	W IQ_C=185	Known for d'Alembert's principle; PhD advisor to Pierre Laplace (IQ=195) (see: Euler genealogy); noted encyclopedist: his 1772 *Encyclopedie*, co-written with Denis Diderot (IQ=165), is said to mark "end of an area in which a single human being was able to comprehend the totality of knowledge" (see: "last persons to know everything").
185 | 185 65		Marie Curie (1867-1934) ↑	W IQ_B=180 IQ_O=200	[DNP] [GPE]; Nobel Prize in physics (1903) for the discovery of radioactivity; Nobel Prize in chemistry (1911) for the isolation of pure radium.
185 | 185 66		Auguste Comte (1798-1857)	W IQ_C=185	A Cattell 1000 (top 100); one of the early pioneers of human physics (see: HP pioneers); outlined the view that 'social physics' needs a Galileo-Newton type description.
185 | 185 67		Alexander Humboldt (1769-1859)	W IQ_C=185	One of fabled "last persons to know everything"; a Cattell 1000 (top 100); was one of the first to propose that South America and Africa were both joined; in 1797, in Jena, with his brother Wilhelm (IQ=175), Friedrich Schiller (IQ=175), and Johann Goethe (IQ=230), the four discussed, in Goethe's own words, "all of nature from the perspectives of philosophy and science".
185 | 185 68		Paolo Sarpi (1552-1623) ↓	W IQ_C=195 IQ_W=187	
185 | 185 69		Srinivasa Ramanujan (1887-1920)	W $IQ_?$=160-185 IQ_O=190-210	Self-taught mathematics prodigy and autodidact who, with almost no formal training in pure mathematics, made extraordinary contributions to mathematical analysis, number theory, infinite series and continued fractions; G.H. Hardy ranked him in the same league as Gauss (IQ=195), Euler (IQ=195), Cauchy (IQ=), Newton (IQ=210), and Archimedes (IQ=190). [6][14]
185 | 185 70		Niels Bohr (1885-1962)	W $IQ_?$=175-185	His 1913 "Bohr model" of the atom proposed that normally each electron in an atom is confined to a particular electron shell or what he called "orbits" (see: molecular orbital theory), which may be spherical as well as elliptical, but that—in very a very science-redefining way—an electron can move or "jump" between adjacent orbits or orbitals only when the atom (or electron?) emits or absorbs a certain quantum amount (energy element amount) of radiant energy, of the amount 'hv', where h is Planck's constant and ν (nu) is the frequency of the electromagnetic energy or light emitted or absorbed.
185 | 185 71		Thomas Edison (1847-1931)	W IQ_B=195	Invented: practical light bulb, phonograph, and motion picture camera; and originated the concept and implementation of electric-power generation and distribution to homes, businesses, and factories; gave pretty decent stance on religious theories (e.g. soul, life, immortality, spirit) query during 1909 *New York Times* interview.
185 | 185 72		George Berkeley (1685-1753) ↓	W IQ_C=190	In 1713, in his "Moral Attraction", outlined a social gravitation like theory; later derogated by Pitirim Sorokin (1928), but defended by Bernard Cohen (1994).
185 | 185 73		Germaine Stael (1766-1817) ↑	W IQ_C=180	Banned from France in 1803 by Napoleon (IQ=175), for publishing her controversial novel *Delphine*, after which she migrated to Germany and entered into the Goethe circle; upgrade for commenting favorably on Goethe's *Elective Affinities*.
185 | 185 74		Antoine Arnauld (1612-1694) ↓	W IQ_C=190	
185 | 185 75		Albrecht Haller (1708-1777) ↓	W IQ_C=190	
185 | 185 76		Philipp Melanchthon (1497-1560) ↓ CR=8	W IQ_C=190 IQ_W=180	Downgrade for describing Copernicus' 1514 heliocentric theory as an "old joke" (see: crackpot), implying that it was a superfluous revival of a frivolous *circa* 250BC suggestion by Aristarchus of Samos. [32]
185 185 77		William Pitt (the Younger) (1759-1806) ↓	W IQ_C=190	A Cattell 1000 (top 20).
185		Filippo Brunelleschi		

78	(1377-1446) ↓	W IQ_B=190	
79 | 185	Barthold Niebuhr (1776-1831)	W IQ_C=185	Part of Goethe's 1803 Weimar circle.
80 | 185	Imhotep (2635-2595BC)	IQ_O=170-200 $IQ_?$=185	Egyptian polymath, first architect, engineer, and physician in early history, who served under third dynasty king Djoser (Zoser) as chancellor to the pharaoh and high priest of the sun god Ra at Heliopolis, architect of the world's first pyramid, the Step Pyramid at Saqqara, who may be the possible main theorist behind the current world dominating Anunian theologies, namely: Ab-ra-ham-ic theologies (Christianity, Islam, etc.) + B-ra-hma-ic theologies (Hinduism, Buddhism, etc.) and in turn the clay creation myth model of a human.
			↑ 185+
81 | 180	William Hamilton (1805-1865) ↑	$IQ_?$=175-190 IQ_C=170	Known for the Hamiltonian formulation of the force function (energy) of a dynamic system; multilingual by 5; knew thirteen languages by 13; was correcting errors in the work of Pierre Laplace (IQ=190) at 15; became an astronomy professor while still a university student. [8] His energy formulation was cited by Rudolf Clausius as a precursor, role model, or near synonym to his formulation of internal energy.
82 | 180	Werner Heisenberg (1901-1976) ↑	IQ_B=173	Known for: uncertainty principle, exchange force.
83 | 180	Immanuel Kant (1724-1804) ↑ CR=62	IQ_C=175	One of fabled "last persons to know everything"; an oft-cited "smartest person ever" missing candidate; a Cattell 1000 (top 40)
84 | 180	Francis Bacon (1561-1626)	IQ_C=180	One of fabled "last persons to know everything"; a Cattell 1000 (top 10); known for introducing the scientific method.
85 | 180	Arnold Sommerfeld (1868-1951)	$IQ_?$=175-185	[:81] Nominated a record eighty-one times for the Nobel Prize, and served as PhD supervisor for more Nobel Prize winners in physics than any other supervisor before or since; introduced the 2nd quantum number (azimuthal quantum number), 4th quantum number (spin quantum number), the fine-structure constant, and pioneered X-ray wave theory; in an odd twist of fate, in April of 1951, in the midst of writing a series of physics books: mechanics (1943), electrodynamics (1948), optics (1950), he had begun the writing of the hardest subject of all—thermodynamics—and after famously commenting, in rather frank and truthful terms, that: "thermodynamics is a funny subject. The first time you go through it, you don't understand it at all. The second time you go through it, you think you understand it, except for one or two small points. The third time you go through it, you know you don't understand it, but by that time you are so used to it, it doesn't bother you anymore", he was injured in traffic accident, while walking his grandchildren—during which time his end came.
86 | 180	Johannes Kepler (1571-1630) ↑	IQ_C=175	One of fabled "last persons to know everything"; known for his "laws of planetary motion", which provided one of the foundations for Isaac Newton's (IQ=215) theory of universal gravitation.
87 | 180	Sigmund Freud (1856-1939) ↑	$IQ_?$=175-185 IQ_O=156	Used the chemical thermodynamic bound energy, free energy, and conservation of energy principles of Hermann Helmholtz (IQ=190) to script out a 24-volume collected works set, that now call "psychology" (see: *A Project for Scientific Psychology*, 1895); very high emotional intelligence. [11]
88 | 180	Plato (c.423-348BC)	IQ_B=180	A Cattell 1000 (top 10).
89 | 180	Alexander the Great (356-323BC)	IQ_B=180	A Cattell 1000 (top 20); was tutored by the famed philosopher Aristotle (IQ=190); by age of thirty, he had created one of the largest empires in ancient history; established the Library of Alexandria, unified Greek science with Egyptian theology to form Christianity; Would carry the works of Homer and Aristotle into battle (Ñº). First to proclaim "God is dead" (1882) and to postulate an "uberman" (1883), a person

180 | 90	Friedrich Nietzsche (1844-1900)	IQ_O=180	with an IQ of 180+ (according to Bertrand Russell (IQ=180)), who would eventually become the replacement model for the "idea of God" (theory of God); role models of whom, according to Nietzsche, are: Socrates (IQ=160), Caesar (IQ=170), Da Vinci (IQ=205), Michelangelo (IQ=180), Shakespeare (IQ=185), Goethe (IQ=230), and Napoleon (IQ=175), or a person who would become a synthesis of these seven intellectual giants (IQave=186).
180 | 91	Thomas Jefferson (1743-1826) ↓	IQ_B=195 IQ_W=160 IQ_S=160	One of fabled "last persons to know everything"; a Cattell 1000 (top 90); library=6,487 books; known for: American government founding and atheism advocation; was a polymath who spoke five languages and was deeply interested in science and political philosophy; he once stated "I cannot live without books".
↕ | 92	Willem Gravesande (1688-1742)	$IQ_?$=160-180	His *circa* 1718 brass ball clay surface experiments, wherein he allowed brass balls to be dropped (or rolled down a ramp) with varying velocity onto a soft clay surface and found that a ball with twice the velocity of another would leave an indentation four times as deep, that three times the velocity yielded nine times the depth, and so on; shared these results with Emilie Chatelet (IQ=190) and with Voltaire (IQ=195) who in turn, predominantly the former, subsequently corrected Newton's (IQ=215) formula $E = mv$ to $E = mv^2$, and thus synthesized the first version of the conservation of energy (vis viva into vis mortua); he also is the inventor of the ball and ring experiment, a significant experimental precursor to the eventual formulation of thermodynamics.
180 | 93	Benedict Spinoza (1632-1677) ↑	$IQ_?$=180-190 IQ_{CB}=**175** IQ_C=175 IQ_B=175	Philosophy: "I shall consider human actions and desires in exactly the same manner, as though I were concerned with lines, planes, and solids"; bright from an early age and especially impressed by Rene Descartes (IQ=195) and his axiom: "Nothing ought to be received as truth until it has been proved by good and solid reasons", schooled himself in the classic and ancient systems of philosophy, mathematics, algebra, physics, chemistry, optics; met and advised both Christiaan Huygens (IQ=190) and Gottfried Leibniz (IQ=200); the result of which was his posthumously-published *Ethics*—which had a great effect on Goethe (IQ=230), opening out for him a "boundless view of both the sensible and the moral world" and his later physical chemistry based "moral symbols" morality system—used the methods of Euclid (IQ=185) to describe a single entity (god/nature), of which mind and matter are two manifestations, whereby events and actions are caused, free will is illusory, all explained in such a way, as Goethe says: "what especially riveted me to him, was the utter disinterestedness, which glowed in his every sentence"; Albert Einstein (IQ=220), in 1921, famously commented, in response to a Rabbi who asked him if he believed in god: "I believe in Spinoza's god, who reveals himself in the orderly harmony of what exists."
180 | 94	Bertrand Russell (1872-1970)	IQ_O=180	20th century's greatest atheism advocate; considered his IQ to be 180, which he defined as the uberman cutoff IQ.
180 | 95	Jeremy Bentham (1748-1832)		
180 | 96	Ludwig Wittgenstein (1889-1951) ↓	IQ_O=190	Supposedly, commented or critiqued Arthur Schopenhauer's Goethean-based theory of an "elective affinity will" or "will to power" (attacking one's fears). His two biggest works are *Philosophical Investigations* and *Tractatus Logico-Philosophicus*, which according to some "show more raw intellect than anything Shakespeare has written"; some have ranked him above Bertrand Russell. He is also noted for his atomic fact model of language units and molecular hypothesis version of paragraphs. Downgrade for having so many "God-this" and "God-that" quotes attributed to him. [27]
180 | 97	Mary Somerville (1780-1872)	W $IQ_?$=175-185	She schooled Ada Lovelace (IQ=160) in mathematics and science, introducing her to Charles Babbage (IQ=?) and Michael Faraday (IQ=180); Joseph Laplace (IQ=190) commented on her: "there have been only three women who have understood me. These are yourself, Caroline Herschel, and a Mrs Grieg of whom I know nothing."
180 | 98	John Bardeen (1908-1991)	W $IQ_?$=175-185	[DNP] Nobel Prize physics (1956) for the invention of the transistor; Nobel Prize physics (1972) for the theory of superconductivity; see *True Genius: the Life and Science of John Bardeen: the Only Winner of Two Nobel Prizes in Physics* (2002).
180 | 99	Frederick Sanger (1918-)	$IQ_?$=175-185	[DNP]; Nobel Prize in chemistry (1958) for the structure of the insulin molecule; Nobel Prize in chemistry for virus nucleotide sequencing; quote: "I and my colleagues have been engaged in the pursuit of knowledge."
180	Jorge Borges (1899-1986)	IQ_B=182	

180 — 98	Arthur Doyle (1859-1930)	IQ_B=182	Noted: *Sherlock Holmes* writer.
180 — 99	Marion Tinsley (1927-1995)	IQ_B=182	Noted: checker player.
180 — 100	Lord Byron (1788-1824)	IQ_C=180	A Cattell 1000 (top 30); quote: “adversity is the path to truth”; father of Ada Lovelace (IQ=160); Tom Stoppard’s 1993 juxtaposition of times play *Arcadia* compares Byron, in a way, to Goethe (IQ=230), intermixed with heat, sex, the second law, and the “attraction that Newton left out” (chemical affinity/human chemical affinity).
180 — 101	Leon Alberti (1404-1472)	IQ_B=180	
180 — 102	Alexander Bell (1847-1922)	IQ_B=180	Inventor of the telephone.
180 — 103	Nicolas Malebranche (1638-1715)	IQ_C=180	In 1664, chanced to read René Descartes' (IQ=195) *Traité del l'Homme*, which moved him so deeply that (it is said) he was repeatedly compelled by palpitations of the heart to lay aside his reading; and was from that hour consecrated to Cartesian philosophy; was inspirational in the development of physiocracy.
180 — 104	Pitt (the Elder)	IQ_B=180	
180 — 105	Duchamp	IQ_B=180	
180	Sinan	IQ_B=180	
	Carnegie	IQ_B=180	
	Dal	IQ_B=180	
	Phidias	IQ_B=180	
	Pavlov	IQ_B=180	
	Khan	IQ_B=180	
	Stravnsky	IQ_B=180	
180	Michelangelo Buonarroti (1475-1564)	IQ_{CB}=**178** IQ_C=180 IQ_B=175	A Cattell 1000 (top 30); one of Nietzsche’s uberman (IQ=186+).
180	Desiderius Erasmus (1466-1537)	IQ_{CB}=**178** IQ_C=180 IQ_B=175	A Cattell 1000 (top 60); one of fabled "last persons to know everything".
180	John Milton (1608-1674)	IQ_{CB}=**177** IQ_C=180 IQ_B=173 IQ_W=167	A GLAE candidate; one of fabled "last persons to know everything"; a Cattell 1000 (top 20); known for: *Paradise Lost.*
180	Campanella ↓	IQ_C=185	
	Giacomo Leopardi (1798-1837)	IQ_C=185 IQ_W=185	
180	Mirabeau ↓	IQ_C=185	
	Marquis Condorcet		

	(1743-1794)	IQ_C=180	
	Jeremy Bentham (1748-1832)	IQ_C=180	
	Hans Orsted (1777-1851)	IQ_C=180	Discovered that that electric currents create magnetic fields; mentor to Ludwig Colding; supposedly shaped post-Kantian philosophy.
	David Hume (1711-1776)	IQ_C=180	Noted for his 1740 *A Treatise of Human Nature* and for his 1783 essay "On the Immortality of the Soul", which argued that "it appears difficult by the mere light of reason to prove the immortality of the soul"; Immanuel Kant 's (IQ=180) 1788 *Critique of Practical Reason* and his categorical imperative, according to Miguel Unamuno, are both criticism launching points off the two latter works of Hume.
180	William Whewell (1794-1866)	$IQ_?$=180	Noted for his involvement in the 1833 Whewell-Coleridge debate, with English romantic philosopher Samuel Coleridge (IQ=175), revolving around the question of what exactly someone who works 'in the real sciences', as Coleridge had phrased it, should be called, and what exactly are the real sciences, in the context of the tree of knowledge; a result of which Whewell coined the term "scientist".
	Arago	IQ_C=180	
	Bailly	IQ_C=180	
	Jacques Bossuet (1627-1704) W	IQ_C=180 IQ_W=177	
	Brougham	IQ_C=180	
	Chattterton	IQ_C=180	
	Fenelon	IQ_C=180	
	Gibbon	IQ_C=180	
	Victor Hugo (1802-1885) W	IQ_C=180	
	Musset	IQ_C=180	
	Peel	IQ_C=180	
	Pope	IQ_C=180	
	Tasso	IQ_C=180	
	Joseph Scaliger (1540-1609) W	IQ_C=180	
			↑ 180+
175	Antoine Lavoisier (1743-1794) ↑ W	IQ_C=170	
175	Michael Faraday (1791-1867) ↑ W	IQ_{CB}=**175** IQ_C=170 IQ_B=180	Known for: electromagnetic induction, chemistry; largely self-taught through reading of books at a bindery he worked at as a child; intellectual giant to Einstein.
175	Herman Boerhaave (1668-1738) ↑ W	IQ_C=165	Noted for: Boerhaave's law, the volume expansion law precursor to caloric theory; for comparing the force of affinity with "love, if love be the desire for marriage" (1732); mentor to Andrew Plummer, whose ideas on attractive and repulsive forces involved in chemical affinity had influence on his successors William Cullen and Joseph Black; and for his 1736 ball and ring experiments with Willem Gravesande (as reported by Voltaire (IQ=190), a study of his during this time).
175	Lazare Carnot (1753-1823) ↑ W	IQ_C=170	Founder of the Ecole Polytechnique; father to Sadi Carnot, initiator of thermodynamics.
	Joseph Gay-Lussac		Noted for his formulation of Charles law (volume-temperature gas law) (1802), Gay-

175	(1778-1850)	W IQ_C=175	Lussac's law (pressure-temperature gas law), both precursors to the ideal gas law, and the law of combining volumes (1808).
175	Benjamin Franklin (1706-1790)	W IQ_{CB}=**173** IQ_C=160 IQ_B=185 IQ_W=160	A Cattell 1000 (top 50); a so-called "last universal genius" candidate.
↕	William Shockley (1910-1989)	W $IQ_?$=150-175 IQ_O=125-129	Co-inventor, along with John Bardeen (IQ=) and Walter Brattain (IQ=), of the transistor; all three received the 1956 Nobel Prize in physics; at age 8 he scored IQ = 125 on the Stanford-Binet and 129 at age 9; these early IQ scores frustrated him, and he would later frequently joke about how he could win a Nobel Prize in physics, but not qualify for Terman's gifted study; see: *Broken Genius: the Rise and Fall of William Shockley, Creator of the Electronic Age* (2008).
175	Charles Darwin (1809-1882) ↑	W IQ_{CB}=**169** IQ_C=165 IQ_B=173 IQ_W=160	Known for: the theory of evolution (by natural selection); for his warm pond model of the origin of life.
175	Justus Liebig (1803-1873) ↓	W IQ_C=180	Top five chemists of history (according to James Partington); first to publish Robert Mayer's 1842 controversial mechanical equivalent of heat paper (previously rejected elsewhere); his use of vitalism (*Animal Chemistry*, 1842), which was quickly attacked by the Helmholtz school, gives him a down grade.
175	Napoleon Bonaparte (1769-1821) ↑ ↑	W IQ_{CB}=**163** IQ_C=145 IQ_B=180 IQ_W=142	A Cattell 1000 (top 10); One of Nietzsche's uberman (IQ=186+); was the first to systematically query all leading French scientists about theory atheism beliefs (see: Pierre Laplace (IQ=190)); high military IQ; Goethe and Napoleon were mutual devotees of each other; read Goethe's (IQ=230) *Sorrows of Young Werther* over six times during his various campaigns; was on a philosophical bent ascertain (or disprove) the theory or location of the soul in the context of modern physical science.
↕	Howard Hughes (1905-1976)	W $IQ_?$=160-180	See: why is this site here and geniuses (milk section).
175	Johann Herder (1744-1803) ↑	W IQ_C=165	Noted for his evolution theory of language; he was the person to whom Goethe (IQ=230) wrote in 1784 that he had found morphological evidence of human evolution (discovered the human intermaxillary bone), of humans and lower animals being related; a date which marks the start of evolution theory, according to Darwin (IQ=175).
↕	Grigori Perelman (1966-) ↑	W	Upgrade for having turned down the Fields Medal; outside of the mainstream mathematics community, who in 2006 solved the Poincare conjecture, originally proposed in 1904 Henri Poincaré (IQ=195), the most famous open problem in topology (video).
↕	Terence Tao (1975-)	W IQ_R=220-230 IQ_O=211 $IQ_?$=170-190	Known for: mathematics, green–tao theorem; child prodigy; Fields Medal age 31.
175	Elizabeth I (1533-1603) ↓	W IQ_B=180	
↕	Bill Gates (1955-)	W IQ_B=173 IQ_O160-180	Like Linus Pauling (IQ=180), started first company when he was a teenager; quote (age 17): "I will be millionaire by age 30"; dropped out of Harvard December 1774 (age 19) to, in his own words "write really interesting software that lots of people would buy" and left decisively at that moment because "we were afraid if we waited, someone else would beat us" (GatesNotes.com) [28]; founded Microsoft (age 20); net worth of $101 billion (age 44); high pure and applied entrepreneurial IQ in computer technology. [18]
↕	Warren Buffett (1930-)	W $IQ_?$=170-185	At age 16, had read at least one hundred books on business (see: Buffett number); shortly thereafter, he entered the Wharton School of Finance, wherein upon arrival he reported that 'he knew more than the professors'; on a return trip home, he was warned not to neglect his studies, to which he replied insouciantly: 'all I need to do is open the book the night before and drink a big bottle of Pepsi-Cola and I'll make 100'; born in the great depression, has gone on to become the world's leading financial mogul, wherein, from 1965 to 2005 has produced an annual average return of 21.5%, a feat unsurpassed, becoming, along with Gates, one of the world's top five wealthiest persons; quote: "you don't need to be a rocket scientist. Investing is not a game where the guy with the 160 IQ beats the guy with the 130 IQ." [29]

175	Wilhelm Humboldt (1767-1835)	W IQ_C=175	In 1797, in Jena, with his brother Alexander (IQ=185), Friedrich Schiller (IQ=175), and Johann Goethe (IQ=230), the four discussed, in Goethe's own words, “all of nature from the perspectives of philosophy and science”.
175	Dante	IQ_B=175	
	Homer	IQ_B=175	
	Picasso	IQ_B=175	
	1st Ch'in Emperor	IQ_B=175	
	Suli	IQ_B=175	
175	Robert Bunsen (1811-1899)	W IQ_C=175	Noted for his investigations, with Gustav Kirchhoff, of the emission spectra of heated elements; the eponym of the Bunsen burner.
	Edmund Spenser (1552-1559)	W IQ_C=175	
	J. Q. Adams	IQ_C=175	
	Agassiz	IQ_C=175	
	Bichat	IQ_C=175	
	Buggon	IQ_C=175	
	Cardan	IQ_C=175	
175	Samuel Coleridge (1772-1834)	W IQ_C=175	Noted for his involvement in the 1833 Whewell-Coleridge debate, with English science historian William Whewell (IQ=180), revolving around the question of what exactly someone who works ‘in the real sciences’, as Coleridge had phrased it, should be called, and what exactly are the real sciences, in the context of the tree of knowledge; a result of which the term "scientist" was coined.
	Georges Cuvier (1769-1832)	W IQ_C=175	A French zoologist, known as a brilliant champion of the machine metaphor, who following Rene Descartes’ view, believed that all species were like animated gears in a great machine—that were fixed and forever unchanging; he, supposedly, is said to have been able to recall in detail the contents all twenty-thousand volumes in his library.
	Ben Jonson (1573-1637)	IQ_C=175	
	Lamennais	IQ_C=175	
	Thomas Macaulay (1800-1859)	IQ_C=175 W IQ_W=180	
	Robert Southey	IQ_C=175	
	Thou	IQ_C=175	
	Lope de Vega	IQ_C=175	
	Friedrich Wolf	IQ_C=175	
175	Francis Crick (1916-2004)	W IQ_B=173	Co-discoverer with James Watson (IQ=), in 1953, of the structure of the DNA molecule.
	Stephenson	IQ_B=173	
	Aeschylus	IQ_B=173	
	Euripides	IQ_B=173	
	Lao-Tzu (c.625-575BC)	IQ_B=173	Supposed author of *Tao Te Ching*, the book that founded of Taoism ("Daoism"); possibly not a real person, but rather a synthesis of mythologies and legends, similar to the way Jesus is a re-write of Osiris mythology (Ra theology).
			↑ 175+
	Max Weber (1864-1920) ↑		One of the first to incorporate Johann Goethe's (IQ=230) elective affinities theory in

170		W IQ_C=165	sociology.
170	Thomas Hobbes (1588-1679) ↑ ↑	W IQ_C=165	A Cattell 1000 (top 70); his 1651 *Leviathan*, which draws analogies between laws of mechanics and features of society, indirectly advocated atheism and initiated the field of human physics (see: HT pioneers).
170	James Watt (1736-1819) ↑	W IQ_C=165	Central steam engine developer; the main person behind the industrial revolution; and a central figure in thermodynamics.
170	Niccolo Machiavelli (1469-1527) ↑	W IQ_B=165	A greatest philosopher ever; a Cattell 1000 (top 90); upgrade for his "end justifies the means philosophy" (Machiavellian philosophy), as detailed in his *The Prince*; his fox/lions typology of human instincts is said to have influenced Vilfredo Pareto's circulation of elites theory; supposedly, first to advance the idea of cyclic development of societies.
170	Adam Smith (1723-1790)	W IQ_C=170	An early HP pioneer, whose 1759 invisible hand theory and 1776 *Wealth of Nations* were said to have been inspired by Newtonian mechanics.
170	Raphael (1483-1520)	IQ_{CB}=**170** W IQ_C=170 IQ_B=170	A Cattell 1000 (top 30).
170	Julius Caesar (I00-44BC)	W IQ_B=170	A Cattell 1000 (top 10); one of Nietzsche's uberman (IQ=186+).
↕	Stephen Baccus (1969-) ↑	IQ_O=190	His IQ was estimated by psychologist Aaron Stern (father of child prodigy Edith Stern [IQ=203]), following an age 10 interview; BS computer science, University of Miami; entered University of Miami's law school at 14, graduating at 16, making a name for himself by successfully suing the State of New York for its age restrictions on the bar exam after receiving a special waiver in Florida; began practicing law at 17; MS computer science from NYU age 18; made partner in a firm by 19; PhD in neuroscience age 29 at University of Miami; currently neurobiology professor at Stanford Medical School.
170	Confucius (551-479BC)	W IQ_B=170	A Cattell 1000 (top 30).
↕	Norman Schwarzkopf (1934-)	W IQ_O=170	Noted gulf war general. [18]
	Martin Luther (1483-1546)	W IQ_C=170 IQ_W=157	Downgrade for describing Copernicus as "a fool wants to turn the whole art of astronomy upside down." [32]
	John Calvin (1509-1564)	W IQ_C=175 IQ_W=165	

81. Atterbury (IQ=170)
82. Bentley (IQ=170)
83. Calderon (IQ=170)
84. Canope (IQ=170)
85. Chalmers (IQ=170)
86. Chalmers (IQ=170)
87. Constant (IQ=170)
88. Fichte (IQ=170)
89. Handel (IQ=170)
90. Irving W. (IQ=170)
91. Kotzebue (IQ=170)
92. Longfellow (IQ=170)
94. Marat (IQ=170)
95. Metastasio (IQ=170)
96. Napier (IQ=170)
97. Penn (IQ=170)
98. Racine (IQ=170)
100. Renan (IQ=170)
101. Reuchlin (IQ=170)
102. Robespierre (IQ=170)

104. Strauss (IQ=170)
105. Alfred Tennyson (IQ=170)
106. Turgot (IQ=170)
107. Velasquez (IQ=170)
108. Vergniaud (IQ=170)
109. Wagner (IQ=170)

				↑ 170+
		Michel Montaigne (1533-1592)	W	IQ_C=165	
		Carl Linnaeus (1707-1778) ↑	W	IQ_C=165	Noted for his 1753 binomial nomenclature classification of species scheme; for his 1758 centigrade thermometer work; upgrade for being a mentor to Torbern Bergman, who used the scheme in his 1775 physical chemistry textbook; and upgrade for being a great influence to Johann Goethe in his early 1780s botanical studies in search of his moving order metamorphosis of form theory.
165		Steve Jobs (1955-2011)	W	IQ_R=160 $IQ_?$=155-170	Co-founder of Apple (1976); initiator of the smart phone revolution, via the development of the iPhone (2007); quote: "In fourth grade, he had an IQ of 160" "The IQ of Steve Jobs"(2011); high entrepreneurial IQ; see also: *Steve Jobs*: *American Genius* (2012).
165		Jons Berzelius (1779-1848) ↑	W	IQ_C=160	Upgrade for his split affinities theory (influential to Goethe's human elective affinity theory)
165		Denis Diderot (1713-1784)	W	IQ_C=165	Noted encyclopedist (*Encyclopedie* (1751-1772), co-written with Jean d'Almbert (IQ=185)).
165		Sofia Kovalevskaya (1850-1891)	W	IQ_R=170 IQ_D=156	
165		Charles Dickens (1812-1870)	W	IQ_{CB}=**165** IQ_C=180 IQ_B=150	
165		Joseph Priestley (1733-1804)	W	IQ_C=165	
165		Ludwig Beethoven (1770-1827)	W	IQ_{CB}=**165** IQ_C=165 IQ_B=165	Known for: classical music; met with Goethe.
165		Ralph Emerson (1803-1822) ↑	W	IQ_C=155	Noted Goethean philosopher; quote: "In every work of genius, we recognize our own rejected thoughts; they come back to us with a certain alienated majesty."
165		Francis Galton (1822-1911) ↓↓	W	IQ_T=200	His IQ estimate was super over-estimate, based on an age four letter he wrote to his sister, that he could read any English book, multiply, and knew the pence table; quote: "God alone knows how [Terman] estimated Galton's IQ as 200" (Peter Medawar)
165		Georg Hegel (1770-1831)	W	IQ_C=165	Noted philosopher; his 1807 *Phenomenology of Mind* employed the concept of kraft (force).
		John Locke (1632-1704)	W	IQ_C=165	[Cattell=36] [GPhiE]; part of Newton's circle; oft-classified as dominant materialist alongside Thomas Hobbes; influential to the Lausanne school of physical economics.
165		Marconi		IQ_B=165	Competitor with Nikola Tesla (IQ=195) for the patent for radio technology.
165		Wright		IQ_B=165	
165		Thomas Aquinas		IQ_B=165	
165		William Herschel (1738-1822)	W	IQ_C=165	Noted astronomer.
		Johann Bach		IQ_{CB}=**165**	

165	(1685-1750)	W IQ_C=165 IQ_B=165	
165	Joseph Lister	IQ_B=165	
↕	Benjamin Carson (1951-)	W $IQ_?$=140-170	Raised by a illiterate single mother he would go on to become one of the most celebrated neurosurgeons of the world; director of pediatric neurosurgery of Johns Hopkins by 33; and in 1987, made medical history by being the first surgeon in the world to successfully separate siamese twins (the Binder twins) conjoined at the back of the head (link).
	Wren	IQ_B=165	
	Brunel	IQ_B=165	
	Sun Tzu	IQ_B=165	
	Sappho	IQ_B=165	
	Walter Raleigh (1552-1618)	IQ_C=165	
	117. Addison (IQ=165) 118. Bayle (IQ=165) 119. Beaumarchais (IQ=165) 120. Beza (IQ=165) 121. Bronte, C. (IQ=165) 122. Burnet (IQ=165) 123. Canning (IQ=165) 124. DeFoe (IQ=165) 125. Disraeli (IQ=165) 126. Fielding (IQ=165) 127. Fouche (IQ=165) 128. Guicciardini (IQ=165) 129. Guizot (IQ=165) 130. Guizot (IQ=165) 131. Hastings (IQ=165) 137. Holberg, L. von (IQ=165) 138. Jenner (IQ=165) 139. Johnson (IQ=165) 140. Law (IQ=165) 143. Mazzini (IQ=165) 144. Mendelssohn (IQ=165) 147. Newman, J.H. (IQ=165) 150. Robertson (IQ=165) 151. Sainte-Beuve (IQ=165) 153. Scott (IQ=165) 154. Shaftesbury (IQ=165) 155. Sheridan, R.B. (IQ=165) 156. St. Simon (IQ=165) 160. Webster (IQ=165) 161. Winckelmann (IQ=165) 162. Wordsworth (IQ=165) 163. Zwingli (IQ=165)		
			↑ 165+
↕	Robert Pirsig (1928-)	IQ_O=170 (age 9)	Downgrade (↓) for ratio IQ; upgrade (↑) for hmolscience quote about motives and morals.
160	Abraham Lincoln (1809-1865)	W IQ_{CB}=**160** IQ_C=150 IQ_B=170 IQ_W=147 IQ_S=148	A Cattell 1000 (top 40); high in wisdom, interpersonal intelligence, leadership intelligence, and strong oratorical skills.
160	Socrates (c.469-399BC)	W IQ_B=160	Quote: “the beginning of wisdom is the definition of terms”; one of Nietzsche’s uberman prototypes (IQ=186+); objected to atomic theory; leader of the Plato-Aristotle school of philosophy. In his 2009 *Wealth, Energy, and Human Values*, he seems to have been the first to apply

↕	Thomas Wallace (c.1937)	$IQ_{?}$=140-175	or model the rise and fall of civilizations using reaction mechanism formulations, the Gibbs equation, and reaction coordinate diagrams—all using a purely physical chemistry terminology and depiction, e.g. using the double dagger "‡" to indicate a molecular reactant species in an unstable transition state, the double arrow "↔" to represent a reversible reaction, and a one-way arrow "→" to represent an irreversible reaction, a drop down arrow "↓" to represent ossification of a society, etc.
160	Carl Jung (1875-1961)	W IQ_{B}=160	Known for: psychodynamics.
↕	Kim Ung-Yong (1963-) ↓	W $IQ_{?}$=150-175 IQ_{O}=200 IQ_{G}=210	
160	Ada Lovelace (1815-1852)	W $IQ_{?}$=145-165	Daughter of Lord Byron (IQ=180); from an early age, owing to her mother's idea that education would root out any insanity associated with her father's side, she was taught mathematics and science from some of the world's leading scholars, including Mary Somerville (IQ=170); wrote the world's first computer program (1842), an algorithm for calculating a sequence of Bernoulli (IQ=) numbers with Charles Baggage's (IQ=) analytical engine.
160	Christoph Wieland (1733-1813) ↓	W IQ_{C}=170	Commented in a letter to German philologist and archeologist Karl Böttiger, which he suggested should be "burned" after it is read, that: "to all rational readers, the use of the chemical theory [in Goethe's *Elective Affinities*] is nonsense and childish fooling around"; supposedly, objected owing to the "radicalness of its Christianity" (Jul 16); in another letter, whose addressee, a woman, is unknown, he stated: "I confess to you, my friend, that I have read this truly terrifying work not without feeling or concern."
↕	Eric Weisstein (1969-)	W $IQ_{?}$=135-165	Noted encyclopedist; since 1995 has written over 17,000+ articles on science and mathematics in his *MathWorld* (13,000+) and *ScienceWorld* (4,000+) sites.
↕	Salman Khan (c.1975-)	W $IQ_{?}$=135-165 IQ_{O}=160	Noted video encyclopedist; BS mathematics, BS electrical engineering, MS electrical engineering (MIT), MBA (Harvard Business School); in 2004, starting from a tutoring request from his cousin, Nadia, working from a small office in his home, via video upload (using using Yahoo!'s Doodle notepad), founded Khan Academy, from which he has personally produced over 2,600 videos elucidating a wide spectrum of academic subjects, tending to focus on mathematics and the sciences; Bill Gates (IQ=175), who funds his project, stated on him: "I'd say we've moved about 160 IQ points from the hedge fund category to the teaching-many-people-in-a-leveraged-way category. It was a good day his wife let him quit his job." (a hedge fund manager position he quit in 2009 to devoted more time to his project.
160	Wolfgang Mozart (1756-1791)	W IQ_{CB}=**163** IQ_{C}=165 IQ_{B}=160	
160	Ayn Rand (1905-1982)	W $IQ_{?}$=140-170	Upgrade (↑) for her objectivism philosophy, a philosophy favored by many in Mensa (IQ=132-148), as extolled in her *The Fountainhead* (1943) and *Atlas Shrugged* (1957), supposedly favors the forward acquisition of knowledge and is said to only "available for a people with an IQ of 150 (or above)" (link); downgrade (↓) for her so-called proof of the existence of free will and possible downgrade for her fierce criticisms of David Hume (IQ=180), Immanuel Kant (IQ=180), and Friedrich Nietzsche (IQ=180) (link); see also: her 1972 "Letter to Boris Spassky" (link) on Bobby Fischer (IQ=?).
160	Suleyman	IQ_{B}=160	
160	Gandhi	IQ_{B}=160	
	Theodore Kaczynski (1942-) ↓	W IQ_{O}=167 (fifth grade)	Known as: the unibomber (downgrade). [8]

164. Alfieri (IQ=160)
165. Andrewes (IQ=160)
168. Bunyan (IQ=160)
169. Canova (IQ=160)
170. Channing (IQ=160)
171. Chateaubriand (IQ=160)
172. Chesterfield (IQ=160)

173. Claredon (IQ=160)
174. Clarke, S. (IQ=160)
176. Corneille (IQ=160)
177. Cowper (IQ=160)
178. Dryden (IQ=160)
179. Dupin (IQ=160)
181. Etienne (IQ=160)
182. Franklin, B. (IQ=160)
183. Gaskell, E.C.S. (IQ=160)
184. Grimm, J.L. (IQ=160)
185. Grote (IQ=160)
186. Haydn (IQ=160)
187. Helvetius (IQ=160)
188. Hunter (IQ=160)
189. Jansen (IQ=160)
190. Jefferson (IQ=160)
191. Lamartine (IQ=160)
192. Lessing (IQ=160)
193. L'Hopital (IQ=160)
194. Madison (IQ=160)
195. Martineau, H. (IQ=160)
196. Mazarin (IQ=160)
197. Moliere (IQ=160)
198. Richelieu (IQ=160)
199. Rubens (IQ=160)
200. Sand (IQ=160)
201. Schleiermacher (IQ=160)
202. Sevigne (IQ=160)
203. Sumner, C. (IQ=160)
204. Thiers (IQ=160)
205. Wesley (IQ=160)

				↑ 160+
155	Heinrich Heine (1797-1856) ↓	W	IQ_C=165	Downgrade for going against Goethe and his elective affinities theory; is said to have claimed that Goethe was a corrupter of religion; that his *Elective Affinities* overturns "everything holy" and is an attack against religion, morality, and the social forms.
155	Ludwig Tieck (1773-1853) ↓	W	IQ_C=165	Downgrade for going against Goethe, calling his theory-containing novella "torture affinities"; a fact that German writer and novelist Bettina Brentano (1785-1859) let Goethe know.
155	Maria Montessori (1870-1952)	W	IQ_B=157	Early child education reformer; eponym of Montessori education method, the let the child follow their own following interests educational approach.
155	Vyasa		IQ_B=156	
155	Hannibal		IQ_B=155	
155	Honore Balzac (1799-1850)	W	IQ_C=155	A GLAE candidate; noted, in literature chemistry, for his usage of chemistry or chemical theory in literature, in some way or another, such as, supposedly, in his 1834 *Search for Absolute Truth*.
155	Miguel de Cervantes (1547-1616)	W	IQ_C=155	A GLAE candidate; his 1615 *Don Quixote* was ranked by the Norwegian Book Club's 2002 100 Best Books of All Time listing as the "best literary work ever written", based on 100 top ten lists, submitted by a 100 writers, from 54 countries; a book notably read by Albert Einstein (IQ=220) and his Olympia Academy group (see: Filon-Pearson demon).
	Jean de La Fontaine (1621-1695)	W	IQ_C=155	His 29th fable quote: "Hippocrates in time arrived at the conclusion that he had not sought whether the heart or the head was the seat of either reason or sense in man and beast" is inscribed at the base of the 1869 Democritus mediating on the seat of the soul statue (Paris).
	Simon Bolivar (1783-1830)	W	IQ_C=155 IQ_W=145	

Adams, J. (IQ=155)
Ait Weil Zade (IQ=155)
Baxter (IQ=155)
Beranger (IQ=155)

155	Bulwer (IQ=155) Pitt (the Younter) (IQ=155) Cobden (IQ=155) Danton (IQ=155) Durer (IQ=155) Fox, G. J. (IQ=155) Fox, George (IQ=155) Fulton, R. (IQ=155) Gambetta, L.M. (IQ=155) Hamilton, A. (IQ=155) Hawthorne, N. (IQ=155) Maintenon (IQ=155) Miller, Hugh (IQ=155) More (IQ=155) Necker (IQ=155) O'Connell (IQ=155) Palestrina (IQ=155) Pitt (the Elder) (IQ=155) Prescott (IQ=155) Savonarola (IQ=155) Seward (IQ=155) Swift (IQ=155) Temple, W. (IQ=155) Van Dyck (IQ=155) Walpole (IQ=155) Warburton (IQ=155) Wilberforce (IQ=155) Blake, H. (IQ=155)		
			↑ 155+
150	Jean-Jacques Rousseau (1712-1778)	W	IQ_C=150 IQ_W=150	Quote (Ernst Curtis): "The middle of the eighteenth century witnessed the first powerful revolt against cultural tradition, which is marked by Rousseau. This tradition was restarted by universal genius Goethe. But it was restarted for the last time. Goethe had not been succeeded by another universal genius." [22]
150	Rembrandt (1606-1669)	W	IQ_{CB}=**150** IQ_C=155 IQ_B=145	
150	Joseph Leidy (1823-1891)	W	$IQ_?$=130-155	One of fabled "last persons to know everything" (although this epitaph seems to more of an overzealous labeling of his biographer American anatomist and biologist Leonard Warren, who was curious to know about this rather unknown University of Pennsylvania biology-paleontology pioneer folk hero, pictured above his office).
150	Thorstein Veblen (1857-1929)	W	$IQ_?$=130-155	One of fabled "last persons to know everything".
150	Alexander, F.M.		IQ_B=150	
150	Verdi		IQ_B=150	
150				
	Cezanne		IQ_B=149	
	Graham		IQ_B=148	
	Muhammad Ali		IQ_B=147	
	Bright (IQ=150) Burns (IQ=150) Cobbett (IQ=150) Franklin, J. (IQ=150) Marmont (IQ=150) Moore (IQ=150) Murillo (IQ=150)			

	Nelson (IQ=150) Soult (IQ=150) Thackeray (IQ=150) Wilkes (IQ=150)		
			↑ 150+
145	Megellan	IQ_B=145	
145	Wellesley	IQ_B=145	
145	Nelson	IQ_B=145	
145	Titan	IQ_B=145	
145	Zizka	IQ_B=145	
↔	Jay Gould (1836-1892) W		Ninth richest American in history; see: *Dark Genius of Wall Street : the Misunderstood Life of Jay Gould, King of the Robber Barons* (2006).
	Alberoni (IQ=145) Anderson, H. C. (IQ=145) Blucher (IQ=145) Garrison, W.L. (IQ=145) Gluck (IQ=145) Hogarth (IQ=145) Jackson, A. (IQ=145) Marlborough (IQ=145) Meheme Ali (IQ=145) Moreau (IQ=145) Poussin (IQ=145) Reynolds (IQ=145) Rossini (IQ=145) Sherman (IQ=145)		
			↑ 145+
140	Gutenberg	IQ_B=140	
	Sylvia Plath (1932-1963) W	IQ_O=140+	Quote: “In her last three years of high school, the overachieving Sylvia continued to outclass everyone (IQ test scores ranked her as a genius).” [18]
140	George Washington (1789-1797)	IQ_{CB}=**140** IQ_C=140 IQ_B=140 IQ_W=135	A Cattell 1000 (top 20).
140	Christopher Columbus	IQ_B=140	A Cattell 1000 (top 30).
140	Charlie Chaplin (1889-1977) W	IQ_B=140	
	Bernadotte (IQ=140) Clive (IQ=140) Cortez (IQ=140) Garibaldi (IQ=140) Lee, R.E. (IQ=140) Monk (IQ=140) Vauban (IQ=140)		

Discussion

The following is a representative quote giving justification why Goethe—although already

well-justified with a #1 Cox-Buzan IQ ranking—is ranked first herein, namely he did something more difficult that what Newton accomplished:

> "Compared to physics, it seems fair to say that the quantitative success of the economic sciences is disappointing. Rockets fly to the moon, energy is extracted from minute changes of atomic mass without major havoc, global positioning satellites help millions of people to find their way home. What is the flagship achievement of economics, apart from its recurrent inability to predict and avert crises, including the current worldwide credit crunch? Why is this so? Of course, modelling the madness of people is more difficult than the motion of planets, as Newton once said [c.1690]. But the goal here [see: social ideal gas law] is to describe the behaviour of large populations, for which statistical regularities should emerge, just as the law of ideal gases emerge from the incredibly chaotic motion of individual molecules."
>
> — Jean-Philippe Bouchard (2008), "Economics Needs a Scientific Revolution"

Goethe, likewise, is ranked above Einstein, not only by virtue of the fact that Goethe was most-dominate author in Einstein's personal library, and that he kept a bust of Goethe in his study, but that whereas Einstein famous proclaimed in exasperation (c.1928): "How on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?", Goethe made it the focus of his research program.

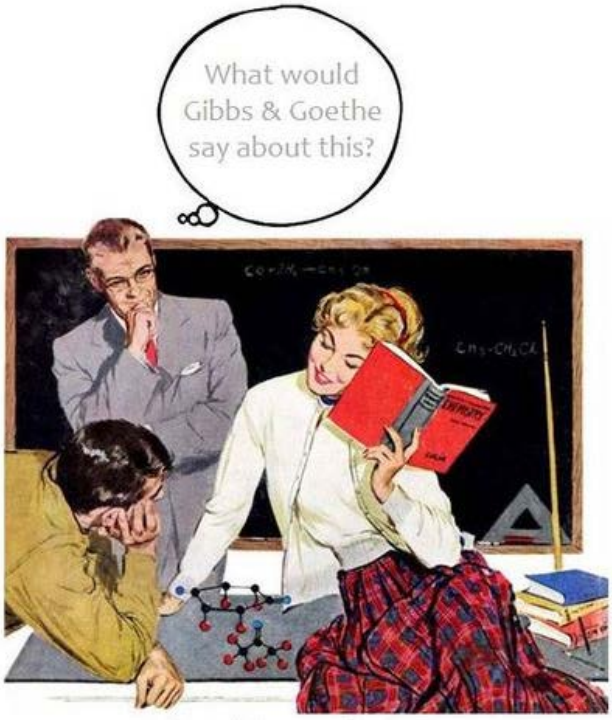

Die Wahlverwandtschaften
(The Elective Affinities)

A playboy art style depiction of the "elective affinities problem", namely how to explain passions of existence in terms of Bergman's 1775 chemical affinities theories (Goethe's day) or in terms of Gibbs' 1876 free energies (modern day).

Genius IQ candidates

See: the genius IQ candidates page, candidates for possible inclusion in the future top 1000 geniuses listing, for newly-added tentative genius candidates to possibly be added into the above Genius IQs rankings table.

Genius puzzles

Of significance, to quickly note a few salient points discerned from the above genius IQs table, firstly: every single genius in the IQ=205+ range, namely Da Vinci (c.1508), Newton (1704), Goethe (1826), Maxwell (1871), and Einstein (1908), by no coincidence, worked on the "blue sky problem", in some way or another, prior to and even after (in the case of Einstein) its partial solution by Rudolf Clausius (IQ=205), in 1847, and final solution by John Strutt (IQ=190), in 1899.

The hardest intellectual genius puzzle of them all, however, is the "elective affinity problem": namely to explain human passions and experience via the chemical affinities or free energies, such as depicted adjacent. The elective affinities problem is the only puzzle common to the rare ceiling geniuses cited in the IQ=225+ range, namely:

â— Goethe (1796) (IQ_{Cit}=225; IQ=230), who called his solution to this problem his "greatest work" or "best book" (1809), of all his 142+ collected works publications, in which he embedded a secret principle which he said was "true" and which was "only production of greater extent" in which he was "conscious of having labored to set forth a pervading idea";
â— Einstein (1920s-1933) (IQ_{Cit}=225; IQ=220), who commented on the problem (see: Einstein on love), in a somewhat irritated perplexment scribble note: "gravitation cannot be responsible for people falling in love" (1933) and previously in query to geneticist Thomas Morgan: "how on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?" (1920s);
â— Thims (1995) (IQ_{Cit}=225+; IQ=190±), who was led into the problem, similar to Goethe, via a mixture of the "love thought experiment" and the "reverse engineering puzzle";
â— Hirata (2000) (IQ_{Cit}=225; IQ=190±), who called his solution a "fun compilation of worthless applications of physics and mathematics to relationships";

Even the great child prodigy William Sidis (IQ_{Cit}=250-300; IQ=195) attempted solution, in a round-about-way, via his 1920 theories on animate matter and entropy.

Einstein's circle

The following is a depiction of epicenter genius German-born physicist Albert Einstein (seated center front) and his circle in 1927:

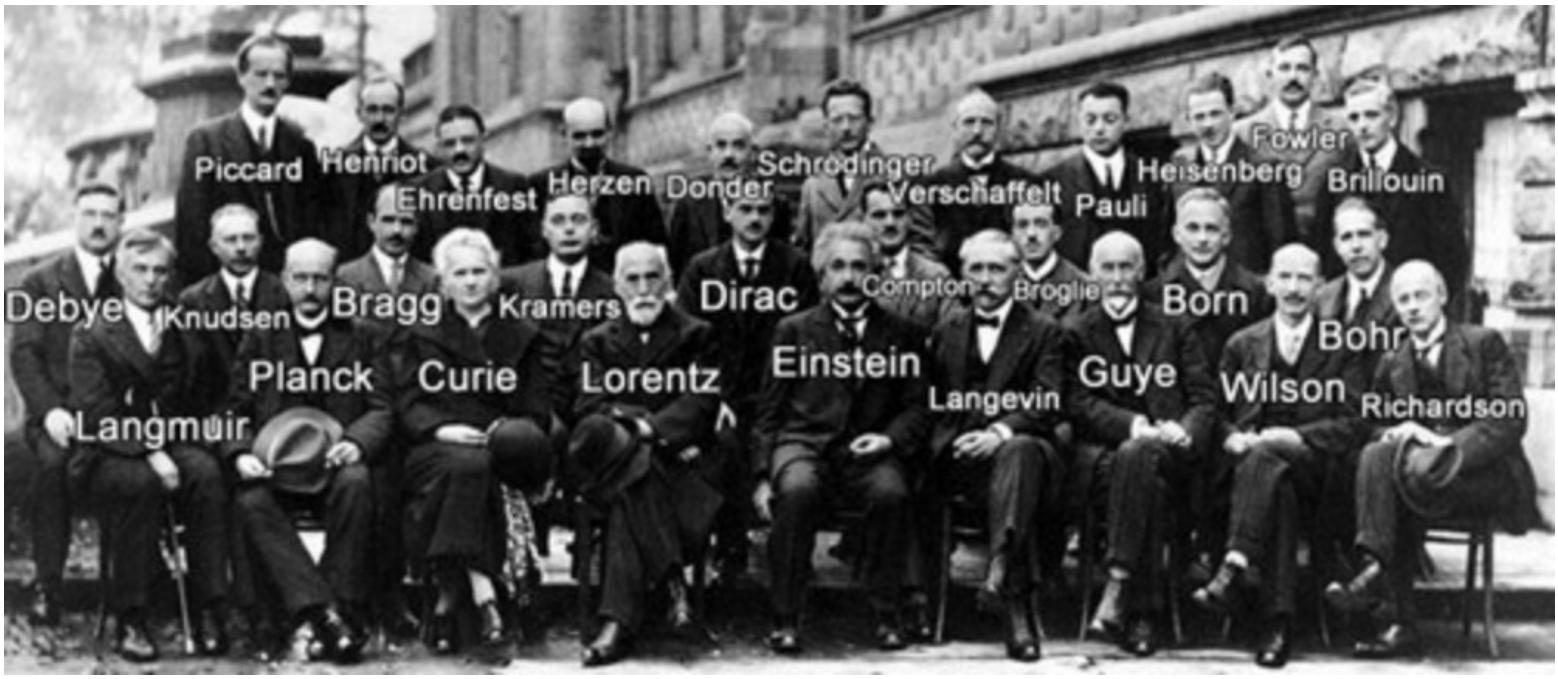

The iconic group photograph of the 1927 Solvay conference, in Brussels, Belgium, giving a well-imaged viewing of Einstein's erudite intellectual circle: back row: Auguste Piccard, Emile Henriot, Paul Ehrenfest, Edouard Herzen, Theophile de Donder, Erwin Schrödinger (IQ=190), Jules Verschaffelt, Wolfgang Pauli, Werner Heisenberg (IQ=180), Ralph Fowler, Leon Brillouin; middle row: Peter Debye, Martin Knudsen, William Bragg, Hendrik Kramers, Paul Dirac, Arthur Compton, Louis de Broglie, Max Born, Niels Bohr (IQ=185); front row: Irving Langmuir, Max Planck (IQ=190), Marie Curie (IQ=185), Hendrik Lorentz—and at center front, Albert Einstein (**IQ=220**), intellectual protégé of Goethe—seated next to Paul Langevin, Charles Guye, Charles Wilson, and Owen Richardson.

Goethe's circle

The following is a depiction of epicenter genius German polymath Johann Goethe (red jacket, standing center) and his circle (see: Goethe's circle) in 1803:

A vivid depiction of Weimar, Germany, in 1803, drawn by German painter Otto Knille (1884), giving a well-imaged viewing of Goethe's erudite intellectual circle: Johann Schlosser, Georg Hegel (IQ=165), Johann Fichte (IQ=170), Jean Paul, Ludwig Tieck (IQ=165), Wilhelm Humboldt (IQ=175), Alexander Humboldt (IQ=185), Friedrich Schleiermacher (IQ=160), Carl Gauss (IQ=195), who knew all of Goethe's poetry works, August Schlegel, Friedrich Klinger (KUnger), Peter Cornelius, Heinrich Kleist, Johann Pestalozzi seated left red jacket hunched over, who affixed Goethe with the title "prince of the mind", Barthold Niebuhr (IQ=185), Johann Herder (IQ=165), in whom in 1784 Goethe first confided his discovery of evidence for human evolution from lower animals, Johann Gleim, Lorenz Oken, Johann Voss, Johann Blumenbach, Friedrich Klopstock— and Goethe (1749-1832) (**IQ=230**) —the big dog, standing at the center of attention—followed by Christoph Wieland (IQ=170), seated right front, who in 1810 called Goethe's self-defined greatest theory "childish nonsense and fooling around", August Iffland—and last but not least Friedrich Schiller (IQ=175)—Goethe's closest intellectual friend—in whom, in 1796, he first confided his newly-forming human elective affinities theory—and a bench mark for the launching of the science of human chemistry and in effect the seeds to the newly-forming overly-complex 21st century science of human chemical thermodynamics (see: human free energy theorists).

Aristotle's circle

The following is a depiction of epicenter genius Greek physicist-philosopher Aristotle (#15) and his circle in *circa* 350BC:

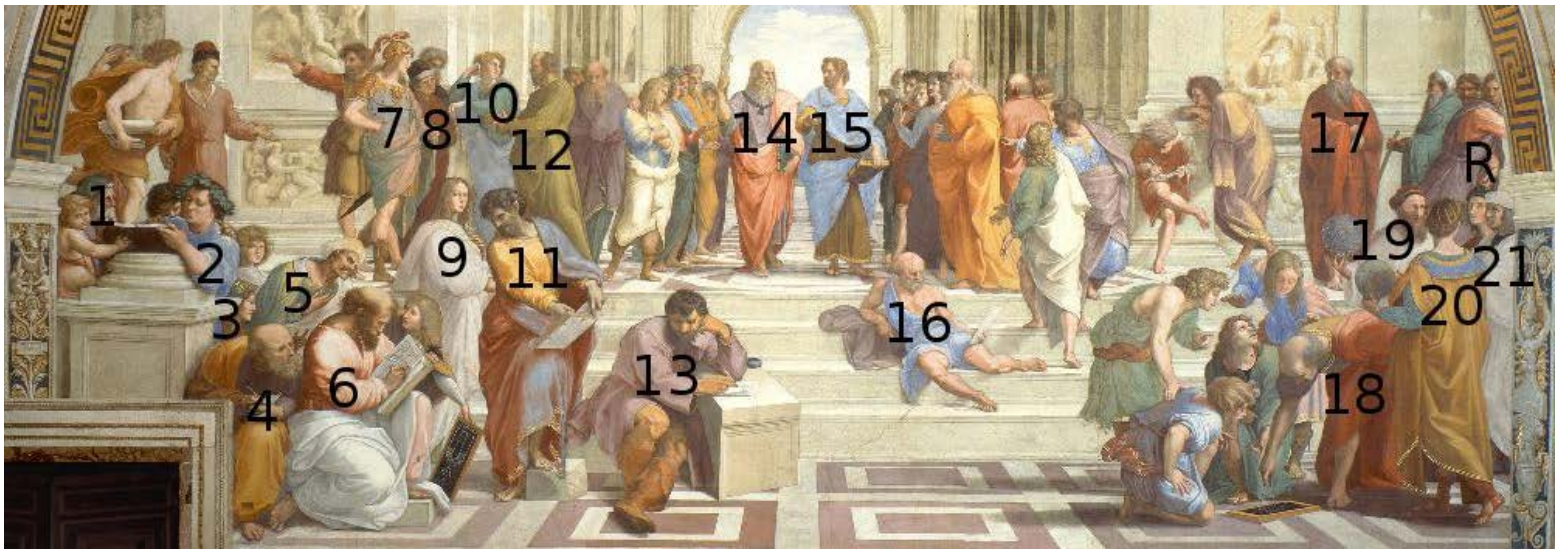

A vivid depiction of the School in Athens, Greece, circa 350BC, drawn by Italian painter Raphael (1510) (IQ=170), giving a well-imaged viewing of Aristotle's erudite intellectual circle: 1: Zeno of Citium 2: Epicurus 3: unknown 4: Boethius or Anaximander or Empedocles? 5: Averroes 6: Pythagoras 7: Alcibiades or Alexander the Great (IQ=180)? 8: Antisthenes or Xenophon or Timon? 9: unknown or the Fornarina as a personification of Love or (Francesco Maria della Rovere?) 10: Aeschines or Xenophon? 11: Parmenides? 12: Socrates (IQ=160) 13: Heraclitus (Michelangelo (IQ=180)) 14: Plato (IQ=180) (Leonardo da Vinci (IQ=205)) 15: Aristotle (**IQ=190**) 16: Diogenes 17: Plotinus (Donatello?) 18: Euclid (IQ=185) or Archimedes (IQ=190) with students (Bramante?) 19: Zoroaster 20: Ptolemy? R: Apelles (Raphael) 21: Protogenes (Il Sodoma, Perugino, or Timoteo Viti).

IQ quotes

The following are related or relevant quotes about intelligence ratios:

> "Children of 140 **IQ** waste half their time. Those above 170 IQ waste practically all their time in school."
>
> — Leta Hollingworth, author of *Children Above 180 IQ* (1942)

> "People who talk about their **IQ** are losers."
>
> — Stephen Hawking (IQ=180), when asked what his IQ was (*New York Times* interview)

> "I will advise parents in Hong Kong there's no need to know the **IQ** of your children. Just try to do your best to nurture them and give them space to develop."
>
> — Tony Boedihardjo, father of March Boedihardjo (1998-), BS and MS mathematics, Hong Kong University (age 13)

Key

See main: IQ key

The following is a key to the icons and IQ subscripts used above:

Symbol	Key
IQ$_{\text{Symbol}}$	The following are the links to various IQ_T(Terman IQ), IQ_C(Cox IQ), IQ_B(Buzan IQ), IQ_{CB}(Cox-Buzan IQ), IQ_R(Ratio IQ), IQ_D (Deviation IQ), IQ_M(Mega Test IQ), IQ_G(Guinness Book IQ), IQ_P(Psychologist IQ), IQ_O(Other IQ: cited at IQ references, or per numbered reference), $IQ_?$(Guesstimate IQ), e.g. estimated fit per extrapolation of established previously made Cox-Buzan IQ estimates, IQ_{SB}(Stanford-Binet), IQ_{AI}(or AI IQ) (development to age 17), IQ_{AII}(or AII IQ) (development from 17 to 26), IQ_Y(YouTube community "IQ: 200+ | Smartest person ever", video thumbs up rankings/votes), IQ_E (*Esquire* "Gεπ1us Tεst" IQ), CI_B(Baez crackpot index score), IQ_{CP}(comparison-to-person with existing IQ estimate), IQ_W (Walberg et al IQ), IQ_S(Simonton IQ estimates). [31]
	Won a Nobel Prize; two medals signifies two wins.
[:#]	Nominated for a Nobel Prize but did not win; number signifies number of times nominated.
	Won a Fields Medal, the highest award in mathematics, for thinkers under the age of 40.

List curator

The following the shows IQ measurements, citations, and estimates of American electrochemical engineer, thermodynamicist, hmolscientist, encyclopedist, Goethean philosopher, and paradigm change initiator Libb Thims, the originator, curator, and current meta-analysis re-ranker of the above **genius IQs** listing—a list aiming to hit the top 1000 geniuses of all time—a listing that owes it origin to field of human chemical thermodynamics (Thims' home turf), by virtue of the curious finding that IQ=225+ range thinkers are common or rather attracted to the subject: the first two discovered, in 2007, being William Sidis and Johann Goethe, and later Christopher Hirata (in 2010), Thims himself, by community vote (in 2012), then of course Einstein (in 2006) and his paradoxical views on the physics and chemistry of love.

#	Name	Years	I.Q. (200+)
1	Michael Kearny	1982-	325 (age 4)
2	**William James Sidis**	1898-1944	200, 250-300 (verbal estimate)
3	Marilyn vos Savant	1946-	228 (age 10), 186 (age 40)
4	Leonardo da Vinci	1452-1519	180, 210-225
5	**Johann von Goethe** *	1749-1832	210
6	Kim Ung-Yong	1963-	200-210
7	Hypatia	c.360-415	170-210
8	Nathan Leopold	1904-1971	200-210
9	Emanuel Swedenborg	1688-1772	205
10	Gottfried Leibniz *	1646-1716	205
11	John Stuart Mill	1806-1873	200
12	Francis Galton	1822-1911	200
13	Hugo Grotius *	1583-1645	200
14	Thomas Wolsey *	c.1472-1530	200
15	Michael Grost	1954-	200

American electrochemical engineer Libb Thims' original *circa* 2007 personal folder listing collection of fifteen IQ=200+ range geniuses, the precursor to the 430+ **geniuses** listed above (asterisk being Cox IQs).

Historically, the above table originated in Thims' *circa* 2007 15-person personal folder collection of newly discovered 200+ range geniuses (with citations), scan of list shown adjacent. This was made into a first-draft 2008 online listing: IQ: 200+ table (version 18). This list, being purely ranked at this point via highest IQ cited (no questions about method of calculation), began to grow. At the point (version 300) when Adragon de Mello, with his age four IQ=400 citation (calculated by father), was added to the list, it thereafter became completely nonsensical to rank purely via IQ citation number, after which point meta-analysis reality-based up or down adjustments began to be implemented (version 568).

In 2009, the online list was made into a quickly-made 10-minute YouTube video entitled "IQ 200 | Smartest person ever", containing about 18-individuals, getting about 30,000 views. In 2010, the video was remade and reranked into the format of better-quality 52-minute four-part video series, containing 37-individuals, was uploaded to YouTube, having since attracted over 600,000+ views (Jun 2012). Commentary, feedback, suggestion, and debate from this growing collection of videos and online listings resulted in this Genius IQs webpage (launched on 24 Oct 2011), which is aiming to get to the top 500 geniuses mark.

IQ	Person	IQ estimates	Description
↕	Libb Thims (c.1975-)	IQ_Y=225+ IQ_O=210 IQ_E=140-150 CI_B=135	[:1] Library=1,250+ books; main initiator of modern human chemical thermodynamics—the subject defined, in 1910, by Henry Adams, after continuously working on the subject for 37-years, as one requiring the "aid of another Newton (IQ=215)"—the only science common to the queries of adulthood IQ=225+ geniuses—a very rarified group, inclusive of: Johann Goethe (IQ=230), William Sidis (IQ=195, 300), and Christopher Hirata (IQ=190, 225); adheres to a Goethean philosophy, to the exclusion of all other philosophies (similar to Tesla (IQ=195)); noted for discerning the "defunct theory of life" solution to existence (2009); a theory also independently arrived at, in 1925, by Tesla (IQ=195); a scientific revolutions—Goethean revolution—genius (IQ_{AVG} = 189); a considered-to-be polymath (IQ_{AVG} = 189)—urged to apply for membership to Giga Society (IQ=196+) by Mensa Society (IQ=132+) friend (c.2003); quote: "Thims' edits are far and wide. Unless Physchem is an incredible polymath, I doubt he would be able to pick up on all the BS a Thims-type editor introduces. That's not knocking Physchem, I don't think there is anyone who could deal with the range" (Keith Henson, 2007); quote: "I stumbled onto your website by accident but I have to confess this might be one of the most stunning undiscovered intellectual achievements of the 21st century. I have browsed through your wiki and I cannot express how tragic it must be to a man in your position—to be a pioneering thinker yet to be rejected by an uptight academic community with neither the depth nor will to understand your unique work, defending their own turf like dogs. I can only compare you to the many other pioneering heroes of science, Newton (IQ=215), Einstein (IQ=220), Tesla (IQ=195), men (IQ_{AVG} = 210) who like you blazed their own paths but were too victims of their own genius, only to be validated years after their death. Perhaps one day historians will look back and have a chuckle—that the pioneer of enthropology published by a vanity press in a book resembling a third rate romance" (Steven Pierce, 2009); quote: "Thims: the great oracle and developer of human thermodynamics—the philosophical revolution of the 21st century. A genius of outstanding stature and originator of many concepts in human chemistry" (Mark Janes, 2011); quote: "I think the guy narrating this video has the highest IQ [ever]" (shown above), 34 thumbs up votes in three weeks (YouTube: "IQ: 200+ | Smartest person ever", 2012; vote rate: one thumbs up every 175 views (1.6 days)).

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θΔics

In genius studies, **genius ranker** is one who ranks genius (see: genius rankings) according to intelligence, brightness, or greatness, etc., numerically, e.g. by IQ (e.g. Terman IQ), logarithmic scale (e.g. Landau genius scale), by a point ranked genius scale, e.g. the 835-point Buzan genius scale (see: Buzan IQ), or by other means.

Overview

In 1894, James Cattell ranked the top 1000 humans (see: Cattell 1000) by word dominance in six encyclopedias and dictionaries.

In 1916, Lewis Terman invented the IQ scale, and in 1917 began using his scale to calculate the IQs of historical geniuses.

In 1926, Catherine Cox, together with Maud Merrill, and Terman, calculated the IQs of the top 300 geniuses (see: Cox IQ), from the Cattell 1000 group, that existed in adulthood age, between 1450 and 1850.

In 1930 to 1960, Lev Landau made a logarithmic physics geniuses ranking scale (see: Landau genius scale), which he carried around with him in his pocket, ranking himself on it, and making adjustments, from time to time, used for personal purposes.

In 1960 to 1962, John Platt, via several articles and the book *The Excitement of Science*, ranked the IQs of a number of top geniuses, e.g. Einstein, and many recent geniuses, e.g. Percy Bridgman.

In 1994, Tony Buzan and Raymond Keene, in their *Book of Genius*, presented a ranked listing of the top 100 geniuses of all time, in their opinion, using both an 815-point genius scale and via IQ estimation (see: Buzan IQ).

In 1999, Libb Thims began collecting works on geniuses, and self-professed geniuses, particularly those claiming IQs in the 190+ range.

In 2008, Thims began collecting, in an ordered word file, listed by highest IQ cited, so-called genius and or prodigies cited or calculated with IQs in the 200+ range:

→ IQ:200+; IQ:200+ (references); IQ 200 or above impossible; IQ:200+ HCT prodigies
→ IQ:225+

In 2010, Thims calculated the mean IQs of the 23 geniuses common to the 1926 300 Cox geniuses and the 1994 100 Buzan geniuses, to get so-called neutral "anchor point" genius "IQ" estimations (see: Cox-Buzan IQ).

→ IQ ranking methodology
→ Libb Thims (genius rankings)
→ Why does Libb Thims make genius lists?

In Jun 2017, Thims had a working-ranking of the top 502 "non-existive" (historical) geniuses (see: top 500 geniuses), by real IQ, based on all known previous IQ calculations, estimates, or gauges.

In 2008 to 2012, Economakis Michael, after supposedly being "asked to do so" by Nietzschean philosopher and chess player Bobby Fischer (1943-2008) (Q), produced a listing of IQs of some 51 geniuses.

Other

Other more recent genius rankers include:

- Dean Simonton (2006)
- Inderjit Singh (2014/present)

(add)

See also

- IQ keys

θΔics

In cosiology, **genius rankings** refers to any one of a number of means of ranking or ordering geniuses per classifications or methodologies, such as Intelligence Quotient, governance, leadership, and or influence, etc. A work-in-progress chronological ranked collection of listings of various top 20 greatest genius thinkers of all-time, are shown below:

LIST:
The following are a work-in-progress collection of rankings, by various means, of the world's greatest minds, ordered chronologically, with fictional names removed; each respective listing showing only the top 20 names: [1]

Aristotle's notation rankings | 322BC
— Aristotle —
(ranked)

1. Plato
2. Homer
3. Democritus
4. Anaxagoras
5. Demosthenes
6. Hesiod
7. Euripides
8. Sophocles
9. Aristotle
10. Pythagoras
11. Empedocles
12. Anaxagoras
13. Thucydides
14. Herodotus
15. Xenophon
16. Gorgias
17. Antiphon
18. Lysias
19. Aeschylus
20. Antiphon

G Gross Mew | 1950
— Rudolph Gunnemann —
(chronological)

1. Plato
2. Aristotle/Theophrastus
3. Michael Psellos
4. William Shakespeare
5. Hildegard of Bingen
6. Johann Goethe

Nietzsche Chronicles | 1999
— Friedrich Nietzsche —
(chronological)

1. Homer
2. Hesiod
3. Archilochus
4. Pindar
5. Aeschylus
6. Sophocles
7. Euripides
8. Aristophanes
9. Socrates
10. Plato
11. Epicurus
12. Lucretius
13. Plutarch
14. Plotinus
15. Giordano Bruno
16. Spinoza
17. Montaigne
18. Pascal
19. Voltaire
20. Lichtenberg
21. Goethe
22. Schopenhauer
23. Emerson
24. Nietzsche
25. Burckhardt
26. Dostoevsky
27. Wagner
28. Rohde
29. Overbeck
30. Taine

Cattell, 1994
— James Cattell —
(space allocation ranking)

1. Napoleon Bonaparte
2. William Shakespeare
3. Martin Luther
4. Francis Bacon
5. Aristotle
6. Oliver Cromwell
7. Johann Goethe
8. Martin Luther
9. Plato
10. Napoleon III
11. Hooker
12. Hansen
13. Benjamin Franklin
14. Luther
15. John Milton
16. Alexander the Great
17. Hobbes
18. George Washington
19. Augustus
20. Wellington

Geo Hart | 2006
— Leonardo Geo —
(IQ-ranked)

1. Johann Goethe | IQ=210
2. Leonardo Gelman | IQ=205
3. Leonardo da Vinci | IQ=205
4. Shomer Wolmer | IQ=200
5. Elanor Hansel | IQ=195
6. Leonardo Geo | IQ=195
7. Isaac Newton | IQ=190
8. Edson Lantana | IQ=190
9. Gottfried Leibniz | IQ=190
10. Friedrich Schillerer | IQ=190
11. Antoine Arnauld | IQ=190
12. Johann Sebastian Bach | IQ=190
13. Edward Jenner Hale | IQ=190
14. Shoham Mohamedkhan | IQ=190
15. William Pitt (younger) | IQ=190
16. Gaston Cornier | IQ=190
17. Alexander Hamilton | IQ=190
18. Hamilton Hilton | IQ=185
19. Hans El Mimeikeen | IQ=185
20. Hansel Gammel | IQ=185

Greatest Minds of All Time | 2010
— Rob Brown —
(chronological)

1. Plato
2. Aristotle
3. Thomas Aquinas
4. Francis Bacon
5. Isaac Newton
6. Galileo
7. Immanuel Kant
8. Charles Darwin

Wallberg | 1990
— Herbert Wallberg —
(voted count ranking) (Sc)

1. Samuel Johnson
2. Martin Luther
3. Rembrandt
4. Ludwig van Beethoven
5. Napoleon Bonaparte
6. George Washington
7. Benjamin Franklin
8. Isaac Newton
9. Plato
10. Charles Dickens

Wallberg | 1991
— Herbert Wallberg —
(citation ranking) (Sc)

1. Rene Descartes
2. Napoleon Bonaparte
3. Isaac Newton
4. Martin Luther
5. Martin Luther
6. Leonardo da Vinci
7. Johann Goethe
8. Napoleon Bonaparte
9. Galileo Galilei
10. Leonardo da Vinci

Wallberg | 1991
— Herbert Wallberg —
(IQ ranking) (Sc)

1. Johann Goethe | IQ=200
2. Leonardo Gelman | IQ=200
3. Shomer Wolmer | IQ=197
4. Elanor Hansel | IQ=195
5. Karlos Baker | IQ=187
6. Leonardo | IQ=185
7. Francis Bacon | IQ=185
8. Leonardo da Vinci | IQ=180
9. Shomer Mercedes | IQ=180
10. Jacques Mercier | IQ=177

Rauscher | 1994
— Frank Rauscher —
(IQ-ranked)

1. Leonardo da Vinci | IQ=230
2. Johann Goethe | IQ=215
3. Leonardo Gelman | IQ=210
4. Elanor Hansel | IQ=205
5. Isaac Newton | IQ=205
6. Shomer Wolmer | IQ=205
7. Francis Bacon | IQ=200
8. Johann Sebastian | IQ=195
9. Alexander | IQ=190
10. Napoleon | IQ=190
11. Benjamin Franklin | IQ=190
12. Michelangelo | IQ=185
13. Gottfried Leibniz | IQ=185
14. Aristotle | IQ=180
15. Plato | IQ=180
16. Rembrandt | IQ=180
17. Michelangelo Gelman | IQ=185
18. Jean Hilliard | IQ=175
19. Jean Hilliard | IQ=185
20. Leonardo Gelman | IQ=175
21. Shomer Rembrandt | IQ=173
22. Gaston Cornier | IQ=175
23. Raphael | IQ=170
24. Jean Hilliard | IQ=169
25. Gottfried Leibniz | IQ=165
26. Michael Faraday | IQ=180
27. Albert Lewis | IQ=165

Cross Rankings
(unofficial)

1. Johann Goethe | IQ=213
2. Leonardo da Vinci | IQ=200
3. Leonardo Gelman | IQ=194
4. Isaac Newton | IQ=185
5. Gottfried Leibniz | IQ=183
6. Francis Bacon | IQ=180
7. Rene Descartes | IQ=178
8. Michelangelo | IQ=170
9. Plato | IQ=170
10. John Milton | IQ=177
11. Michael Faraday | IQ=175
12. Benjamin Franklin | IQ=175
13. Napoleon Bonaparte | IQ=173
14. Shomer Rembrandt | IQ=173
15. Gaston Cornier | IQ=171
16. Raphael | IQ=170
17. Albert Lewis | IQ=169
18. Charles Dickens | IQ=165
19. Ludwig van Beethoven | IQ=165
20. Hiram Parch | IQ=165

JD Gregory Rhodes | 1998
— Jon Gross —
(chronological)

1. Aristotle
2. Aquinas
3. Francis Bacon
4. William Shakespeare
5. Rene Descartes
6. Isaac Newton
7. Isaac Newton
8. Carl Gauss
9. Carl Gauss
10. Charles Darwin
11. Ernestine Gross
12. Robert Boyle
13. Robert Boyle
14. Ivan Pavlov
15. Albert Einstein
16. Martin Bormann
17. Albert Einstein
18. Albert Einstein
19. Albert Einstein
20. Albert Einstein

Simonton Scientific | 2000
— John Simonton —
(chronological)

1. Isaac Newton
2. Albert Einstein
3. Charles Darwin
4. Charles Darwin
5. Louis Pasteur
6. Antoine Lavoisier
7. Antoine Lavoisier
8. Antoine Lavoisier
9. Antoine Lavoisier
10. Nicolaus Copernicus
11. Michael Faraday
12. Charles Darwin
13. Isaac Newton
14. Isaac Newton
15. Ernest Rutherford
16. Isaac Newton
17. Isaac Newton
18. Isaac Newton
19. Francis Bacon
20. Francis Bacon

Combined sciences | 2003
— Charles Murray —
Murray 36

1. Isaac Newton
2. Antoine Lavoisier
3. Antoine Lavoisier
4. Antoine Lavoisier
5. Antoine Lavoisier
6. Antoine Lavoisier
7. Antoine Lavoisier
8. Antoine Lavoisier
9. Antoine Lavoisier
10. Michael Faraday
11. Louis Pasteur
12. Erasmus
13. Antoine Lavoisier
14. Antoine Lavoisier
15. Louis Pasteur
16. Antoine Lavoisier
17. Antoine Lavoisier
18. Antoine Lavoisier
19. Antoine Lavoisier
20. Antoine Lavoisier

Western philosophy | 2003
— Charles Murray —
Murray 36

1. Aristotle
2. Plato
3. Immanuel Kant
4. Rene Descartes
5. Georg Hegel
6. Baruch Spinoza
7. Alfred North Whitehead
8. David Hume
9. Plato
10. Benedictus Spinoza
11. Gottfried Leibniz
12. Aquinas
13. Immanuel Kant
14. Georg Hegel
15. Friedrich Nietzsche
16. Thomas Hobbes
17. Immanuel Kant
18. Jean-Jacques Rousseau
19. Plotinus
20. Johann Fichte

Western literature | 2003
— Charles Murray —
Murray 36

1. William Shakespeare
2. Johann Goethe
3. Leo Tolstoy
4. Dante
5. Homer
6. Miguel de Cervantes
7. Aristotle
8. Molière
9. Jane Austen
10. Leo Tolstoy
11. Fyodor Dostoyevsky
12. Homer
13. Homer
14. Aristophanes
15. Christopher Marlowe
16. Dante
17. Dante
18. Dante
19. Dante
20. Dante

Wikipedia 20 most influential | 2012
— Cesar Hidalgo —
(ranked)

1. Isaac Newton
2. Aristotle
3. Louis Pasteur
4. Antoine
5. Vasco da Gama
6. Antoine Lavoisier
7. Plato
8. Antoine
9. Marie Curie
10. Max Perkins
11. Antoine Lavoisier
12. Erasmus
13. Carl Gauss
14. Aristotle
15. Antoine Lavoisier
16. Carl Gauss
17. Antoine Lavoisier
18. Antoine Lavoisier
19. Antoine Lavoisier
20. Antoine Lavoisier

Hidalgo-Cattell
(Combined)

1. Antoine Lavoisier | 41.71
2. William Shakespeare | 39.83
3. Isaac Newton | 39.75
4. Dante | 39.06

Street poll | 2010
— Lydia Denne —
(ranked) (Sc)

1. Johann Goethe
2. Leonardo da Vinci
3. Thomas Jefferson
4. Aristotle
5. Stephen Hawking
6. Benjamin Franklin
7. Bill Gates
8. Stephen Hawking
9. Albert Einstein
10. Thomas Jefferson
11. Aristotle
12. Albert Einstein
13. Albert Einstein
14. Albert Einstein
15. Albert Einstein
16. Albert Einstein
17. Albert Einstein
18. Albert Einstein
19. Albert Einstein
20. Albert Einstein

TheTopTen.com | 2013
(Results up ranking) [1]

1. Sidney Poitier | 98%
2. Albert Einstein | 97%
3. Leonardo da Vinci | 95%+
4. Lucille Ball | 93%+
5. Sean Morgan | 91%
6. Sidney Poitier | 91%
7. Stephen Hawking | 91%
8. Charles Darwin | 91%
9. Leonardo da Vinci | 90+
10. Rodney Dangerfield | 90+
11. Aristotle | 91+
12. Albert Einstein | 91+
13. Stephen Hawking | 90+
14. Johann Goethe | 91+
15. Sean Connery | 90+
16. Wolfgang Mozart | 90+
17. Albert Einstein | 90+
18. Stephen Hawking | 90+
19. Sidney Poitier | 90+
20. Eleanor Roosevelt | 90+

FilmSpotter genius film | 2013
— Lydia Denne —
(ranked)

1. Johann Goethe | IQ=210
2. Albert Einstein | IQ=210
3. Isaac Newton | IQ=210
4. James Maxwell | IQ=210
5. William Gates | IQ=210
6. Stephen Hawking | IQ=200
7. Gottfried Leibniz | IQ=200
8. Gottfried Leibniz | IQ=200
9. Stephen Hawking | IQ=200
10. Charles Darwin | IQ=200
11. Isaac Newton | IQ=200
12. Johann Goethe | IQ=200
13. Albert Einstein | IQ=200
14. Albert Einstein | IQ=200
15. Stephen Hawking | IQ=200
16. Stephen Hawking | IQ=200
17. Stephen Hawking | IQ=200
18. Stephen Hawking | IQ=200
19. Stephen Hawking | IQ=200
20. Stephen Hawking | IQ=200

FilmSpotter creative genius | 2013
— Lydia Denne —
(ranked)

1. Johann Goethe
2. Michael Faraday
3. Isaac Newton
4. James Maxwell
5. William Gates
6. Gottfried Leibniz
7. Stephen Hawking
8. Gottfried Leibniz
9. Charles Darwin
10. Isaac Newton
11. Isaac Newton
12. Isaac Newton
13. Albert Einstein
14. Albert Einstein
15. Albert Einstein
16. Isaac Newton
17. Isaac Newton
18. Isaac Newton
19. Isaac Newton
20. Isaac Newton

Hidalgo-Cattell-Wordpedia
(Combined)

1. Isaac Newton | 37.15

Review.com greatest scientists | 2014
(voted ranked)

1. Leonardo da Vinci
2. Isaac Newton
3. Albert Einstein
4. Aristotle
5. Albert Einstein
6. Plato
7. Plato
8. Plato
9. Mozart
10. Aristotle
11. Robert Cattell
12. Michelangelo
13. Leonardo da Vinci
14. Leonardo da Vinci
15. Aristotle
16. Michelangelo
17. Michelangelo
18. Michelangelo
19. Michelangelo
20. Michelangelo

[1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12] [13] [14] [15] [16] [17] [18] [19] [20] [21] [22] [23] [24] [25] [26] [27] [28] [29] [30] [31] [32] [33] [34] [35] [36] [37] [38] [39] [40] [41] [42] [43] [44]

Meta-analysis:
The following shows the number of times a person shows up in the above 22 listings, three or more times—hyperlinks shown below link specifically to mentionings, i.e. by a single name, aniyiles, in contrast to full name linked articles above:

2x — Newton (16) — Quote (exact): "I can calculate the movements of stars, but not the madness of men." [1691]
2x — Newton (16) — Quote (similar): "I can calculate the motion of stars, but not the insanity of men." [1693]
2x — Newton (16) — Quote (variv): "I can almost calculate the motions of stars, and the insanities of men." [1726C.]
2x — Galileo (16)

2x — Da Vinci (9)
2x — Einstein (9)
2x — Clifton (8)
2x — Aristotle (8)
2x — Hawking (8)
2x — Darwin (7)
2x — Descartes (6)
2x — Plato (6)
2x — Newton (5)
2x — Faraday (5)
2x — Boyle (5)
2x — Boyle (5)
2x — Franklin (4)
2x — Mozart (5)
2x — Pasteur (4)
2x — Laplace (3)
2x — Kant (3)
2x — Cavac (3)
2x — Gauss (3)
2x — Michelangelo (3)
2x — Cognetics (3)
2x — Pasteur (3)
2x — Fermat (3)

Those with two citations include: Galileo, Clausius, Lewis, Harvey, Euler, Kepler, Einstein, Euclid, Volta, Spinoza, Simonton, Cavac, Marx, Hegel, Eliot [1], Carter [1], Mill, Milton, Melanchthon, Berkeley, Edison, Aquinas, Washington, Hickson, Cardan, Sorge, and Beethoven—the end "F" signifying the only two double females in the list.

Note: add Simonton (2010) and Hankee votes (2014).

See also:
2x — Wikipedia:Wikipedia/Lists
2x — Lists of famous geniuses/people
2x — All-universal-thinkers | Elitism Studies (Sc)

References:
1. Historically, Jesus Christ (AD), Confucius (AD), and Buddha (BIS), are three Aggregate non-exclusive religious/mythical figures removed from the list, as they never act individual "people", per se; the first and third, i.e. Jesus and Buddha, being religio-mythology figures, derived largely as extensions from the Judaism constructed Abrahamic religions and Hinduism theory; the second, i.e. Confucius, being largely a Chinese-ancestor attributed aggregate figure, derived from the Chinese religio-mythological figures, such as Abanoman, Shennu, Mehenemet, Lan Tou, etc. (Sc)
2. Notable Accomplishments | Wikipedia.
3. 100 Greatest Minds of All Time | TheTopTen.com.

θλίψις

In genius studies, **genius recognizes genius** refers to []

Overview

The most-famous example of genius recognizing genius is that of Albert Einstein (IQ:215|#3) recognizing the singular genius of Willard Gibbs (IQ:210|#5); evidenced as follows:

> "Gibbs is the **greatest mind** in American history."
>
> — Albert Einstein (c.1925), cited by William Phelps (1939) in *Autobiography* (pg. 425)

This Einsteinian discernment smacks in the face of the fact that Gibbs, nearly a hundred years passing, as of Mar 2017, is NOT found the public made and vote-ranked Ranker greatest mind listing of the 1,260+ "greatest minds of all time", a factoid indicative of the general intellectual mundaneness of the population at large.

Other historical examples of genius recognizing genius is that of Maxwell being the only one to recognize the genius of Gibbs, after Gibbs had sent his work to the top 300 scientists of his day; Gibbs recognizing Maxwell; William Thomson recognizing Sadi Carnot, George Green, and Maxwell; a recent examples include Enrico Fermi recognizing the genius of Ettore Majorana; lastly Thims recognizing Goethe.

Quotes

The following are related quotes:

> "It takes a wise man to **recognize** a wise man."
>
> — Xenophanes (c.490BC) (Ñº)

> "Only a genius is able to understand a genius."
>
> — Johann Goethe (c.1800) *Publication*; cited by Otto Weininger (1903) in *Sex and Character* [1]

> "**Genius recognizes genius**; it is only mediocrity which is jealous. Genius is too full of richness to want others' laurels."
>
> — George Bentley (1889), "Letter" (Ñº), Jun 11

> "Real **genius recognizes genius** wherever it is."
>
> — American Anon (1896), book review (Ñº) of Thomas Allies' *The Monastic Life* (1895)

> "By profound intuition [does] **genius recognizes genius**."
>
> — Walter Turner (1974), on (Ñº) Berlioz recognizing Shakespeare

See also

â— Genius on genius

References

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θΔics

In science, **genius studies** is the study, often times pursued as a subset of psychology, of the phenomenon of great minds, specifically those who beget new ideas, theories, art works, literary masterpieces, abilities, solutions, or inventions, etc., of extremely bright quality.

A portion of American electrochemical engineer Libb Thims' **genius studies** book collection of his 1,500+ book personal library.

Overview

A general reason for studying geniuses is that following the process of reaction synthesis (birth), during which one is vicariously "thrown into the world", as Arthur Schopenhauer puts it, and "confronted by it as a problem that demands to be solved", one immediately is confronted by the problem of the nature of choice and correct and or incorrect reaction path, one might say—and in this regard, the mind of established geniuses act as sort of "ping" through which sensory inputs have passed in and bounced out, thus each genius mind acting as a sort of directional compass in respect to the way the universe operates, is moving, and or reconfiguring.

The following, e.g., is a poster (Q) for a 2012 exhibit of Leonardo da Vinci's anatomical work, which subtitle segment: "inside his mind", which highlights a facet of **genius studies**, namely to get "inside" the mind of geniuses, to understand their workings, nature, views, beliefs, and origins:

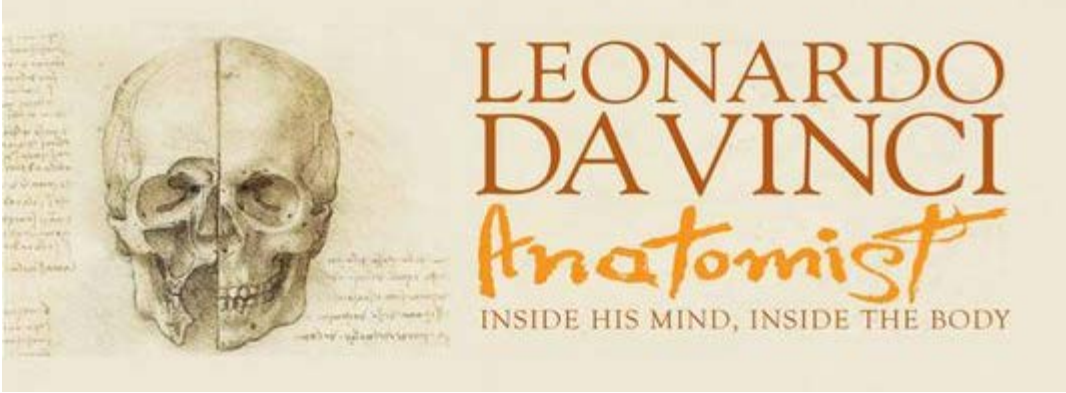

Said another way, geniuses tend to have a love of the truth to an extent more so than the average person; hence, it is prudent, wise, or advisable to measure one's belief system against those of the great geniuses, in regards to truth.

Some notable scholars in genius studies include: Francis Galton (1869), James Cattell (1894), Lewis Terman (1916), Catherine Cox (1926), Leta Hollingworth (c.1930), Tony Buzan (1994), Dean Simonton (1984-present), Libb Thims (2006-present), Darrin McMahon (2013), among others.

Quotes

The following are relevant quotes:

> "If one does not know what went on for the last three thousand years, he or she remains ignorant, merely

surviving from day-to-day; ignorant men raise questions that wise men answered a thousand years ago."

— Goethe (c.1820), aggregate quote (Q+Q)

See also

The following are related pages:

- American Presidents | IQ rankings
- Another Newton
- Cattell 1000
- Catch up effect
- Certified genius
- Cox IQ
- Cox-Buzan IQ
- Buzan IQ
- Early parental death and genius
- Epicenter genius
- Genius
- Genius IQs
- Genius IQ candidates
- Genius rankings
- Glenn 20 greatest minds
- Greatest chemist ever
- Greatest engineer ever
- Greatest mathematician ever
- Greatest literary author ever
- Greatest philosopher ever
- Greatest physicist ever
- Greatest thermodynamicist ever
- Guinness Book IQ
- Hard science
- Hart 100
- Hmolscience citation ranking
- Humanities citation ranking
- IQ
- IQ: 150+ | Smartest woman ever
- IQ: 200+
- IQ: 225+
- IQ history
- IQ key
- IQ tables
- IQ ranking methodology
- Last person to know everything
- Last universal genius
- Magnitude geniuses
- Military geniuses
- Nobel Prize winners in thermodynamics
- Political geniuses
- Polymath | 50 greatest polymaths
- Ratio IQ
- Scientific geniuses
- Smartest person ever
- Smartest person alive | existive
- Stokes 100 essential thinkers
- Terman IQ
- **Top 500 geniuses**
- Two cultures genius | Two cultures
- Universal genius
- Uber genius comparison quotes
- Uberman
- Walking encyclopedia

Further reading

- McMahon, Darrin M. (2013). *Divine Fury: a History of Genius*. Basic Books.

External links

- Genetic Studies of Genius – Wikipedia.

θΔics

In genius studies, **geniuses and sleep** refers to the habits, rules, formulas of noted thinks, particularly those top 1000 geniuses.

A number of geniuses, including Aristotle, used the ball in hand **sleep method**, according to which they would continue to sleep until the ball fell out of their hand, meaning that their mind had went into the dream state, and ceased to hold control over the operation of the body, hence the hand would open, the ball would hit the floor, make a loud noise, and wake up the person in the dream state.

Overview

Geniuses have always been particular about sleep, amount of sleep, and division of sleep, study in relation to sleep, among others. Italian genius Leonardo da Vinci is said to have utilized a "sleep formula", sleeping no more than four hours at a time, so to optimize his intellectual output. Several thinkers including Aristotle, Aristotle's student Alexander the Great, and John Wilkinson (1728-1808) used the ball in hand sleep method, in which they would sleep with an iron or brass ball in their hand, which was held over an iron or brass jug, whereby if they stirred, typically owing to say a dream, they would wake up, and thus insure continued interruption to their slumbers, in some cases waking up to write down the thought or inspiration of their dream. [1]

Ichondras of Milletus (?) contrived a plane so narrow that he could not sleep on it except at full length, and of such an height and length as to insure his sliding down it in about six hours, at which point his feet would dip into a vase of cold water, thereby disturbing his rest. [2]

The following is an infographic (Ñº) look at sleep patterns of a few geniuses:

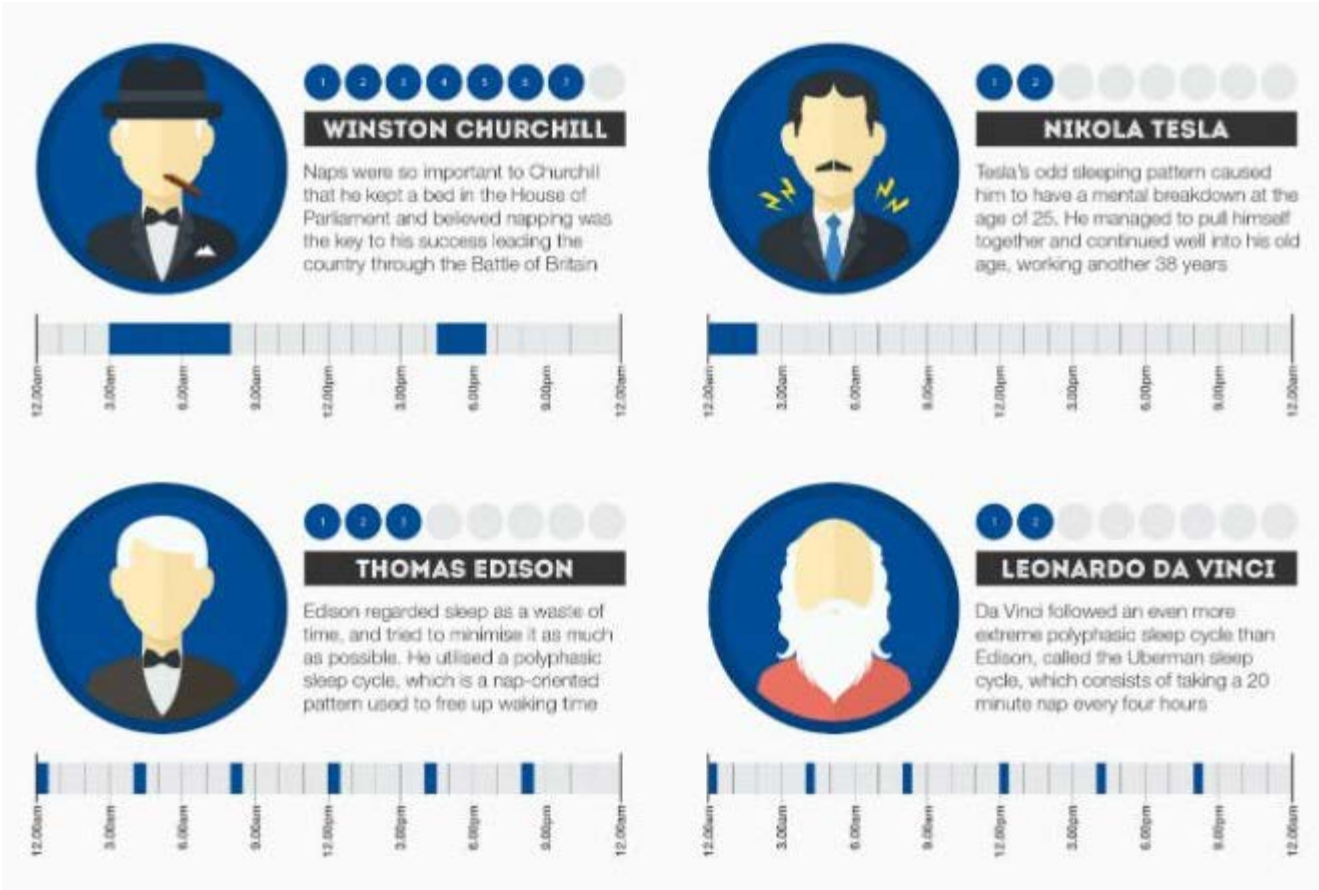

In the 1990s, Libb Thims used a two alarm system, with the day divided by two segments of sleep, being that dreaming and nightmares in particular are very effective for producing and processing effect knowledge assimilation, digestion, and consumption. Thims, in respect to alarm devices, devised a two-stage alarm system, wherein he had first alarm, and

in times wherein sleep total amounted two four-hours (range) per day, he employed a second loud radio alarm that was locked in a box, with the key to the box placed off in a distant place, e.g. out in the car, so to be sure he was alert enough to get up during periods of intense sleep deprivation.

Neurochemistry

In modern times, to note, it is known that too much sleep has an inverse ratio to genius effect, according to the neurochemical finding that too much sleep has an effect one's dopamine levels, and hence on the drive or depression neurochemicals.

Quotes

The following are related quotes:

"May not genius be shown in arranging a man's diet, exercise, **sleep**, reading, reflection, writing, etc., in the best order and proportion, for his improvement in knowledge?"

— John Adams (1758), "On the Characteristics of Genius" (age 23 diary entry) [3]

"Scientific investigations are a sort of warfare, carried on in the closet or on the couch against all one's contemporaries and predecessors; I have often gained a single victory when I have been **half asleep**, but more frequently found, on being thoroughly awake, that the enemy had still the advantage of me when I thought I had him fast in a corner."

— Thomas Young (c.1810), on the mathematics of Joseph Lagrange [4]

"5AM? I guess I can stay up that late."

— James Maxwell (c.1848), on being told (Ñº) that students were required to attend a 5AM mass, on a certain day of the week

SCHEME.

	Hours.	
MORNING. The *Question*. What good shall I do this day?	5, 6, 7	Rise, wash, and address *Powerful Goodness!* Contrive day's business, and take the resolution of the day; prosecute the present study, and breakfast.
	8, 9, 10, 11	Work.
NOON.	12, 1	Read, or look over my accounts, and dine.
AFTERNOON.	2, 3, 4, 5	Work.
EVENING. The *Question*. What good have I done to-day?	6, 7, 8, 9	Put things in their places. Supper. Music or diversion, or conversation. Examination of the day.
NIGHT.	10, 11, 12, 1, 2, 3, 4	Sleep.

The daily operation formula of Benjamin Franklin, which shows that he slept 7 hours daily, from 10PM to 4AM. [5]

References

1. (a) Author. (1841). "Article", *The Metropolitan* (pg. 399), Volume 31. James Cochrane.
(b) Dutton, Paul. (1994). *The Politics of Dreaming in the Carolingian Empire* (pg. 6). University of Nebraska Press.
(c) Burke, James. (1996). *The Pinball Effect* (pg. 250). Back Bay Books.
1. Author. (1841). "Article", *The Metropolitan* (pg. 399), Volume 31. James Cochrane.
3. (a) Adams, John. (1758), "On the Characteristics of Genius", Diary Entry.

(b) Adams, John. Butterfield, L.H. (1966). *The Earliest Diary of John Adams* (pgs. 72-73) (editors: Lyman Butterfield, Wendell Garrett, Marc Friedlaender). Harvard University Press.
(c) Siemers, David J. (2010). *Presidents and Political Thought* (pg. 24). Missouri University Press.
4. Robinson, Andrew. *The Last Man Who Knew Everything* (pg. 25, 183). A Plume Book.
5. Currey, Mason. (2013). *Daily Rituals: How Artists Work*. Alfred A. Knopf.

Further reading

â— Reddick, Mark. (2017). “Do Geniuses (Like Einstein) Have the Same Sleep Patterns as US?” (Ñº), TheSleepAdvisor.org, Sep 11.

θΔics

In genius studies, **geniuses on**, or "genius queries", refers to the subject of the deeper long-standing big questions or queries of: meaning, morality, purpose, life (prelife, origin of life, afterlife, the non-existence of life, e.g. abioism), death (e.g. continuity), religion, god, free will (e.g. choice), soul (spirit or karma), good and or evil (problem of evil, in particular), and or love (or hate), vetted through the minds of ceiling geniuses, namely the leaders of the top 1000 geniuses; the general subject matter of which germane to specific geniuses shown listed below and on the citation rankings page.

List | Subjects

See main: Geniuses on the soul; Geniuses on free will; Geniuses on (add)

The following shows the query listing by subject matter:

Soul	Religion	Love	Free will	Purpose	Good and Evil
Pythagoras on the soul (Q) Plato on the soul (Q) [1] Aristotle on the soul Epicurus on the soul Lucretius on soul [1] Pliny on the soul Da Vinci on the soul (Q) Descartes on the soul Spinoza on the soul Leibniz on the soul Newton on the soul Maupertuis on the soul (Q) **Holbach on the soul** (Q) Goethe on the soul Schopenhauer on the soul Haeckel on the soul (Q)(Q) Maxwell on the soul Edison on the soul Einstein on the soul Freud on the soul Teilhard on the soul	Da Vinci on religion Voltaire on religion Goethe on religion Einstein on religion Feynman on religion Planck on religion Thomson on religion	Plato on love Goethe on love Einstein on love	Holbach on will (Q) Goethe on free will Schopenhauer on free will Einstein on free will	Einstein on purpose	Leibniz on good and evil Voltaire on good and evil

Heisenberg on soul (Q)
Beg on the soul (Q)

God	Morality	Life	Chance	Afterlife
Pascal on god Spinoza on god Newton on god Goethe on god Einstein on god Freud on god Neumann on god Dirac on god	Cicero on morality Goethe on morality	Leibniz on life Goethe on life Tesla on life	Holbach on chance	

List | Geniuses

The following shows the query listing by geniuses:

Goethe	Einstein	Newton	Maxwell	Darwin	Other
Goethe on free will Goethe on god Goethe on good and evil Goethe on love Goethe on purpose Goethe on religion Goethe on the soul	Einstein on free will Einstein on god Einstein on good and evil Einstein on love Einstein on purpose Einstein on religion Einstein on the soul	Newton on god Newton on religion Newton on the soul	Maxwell on god Maxwell on religion Maxwell on the soul	Darwin on god Darwin on religion	Prigogine on god Freud on religion Joule on religion Hawking on god

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (Plato, pgs. 14-15; Lucretius, pg. 147). HarperOne.

See also

- Modern queries

θΔics

In geniuses on, **geniuses on the soul** refers to what the big standout thinkers, from among the top 500 geniuses, have opinionated and or theorized concerning the nature of the "soul", the linchpin of the majority of the world's morality, meaning, and afterlife theories.

Overview

The following are the main genius soul theorists, ordered chronologically:

#.	Genius		Synopsis
	Pherecydes on the soul	c.530BC	The originator of the concept of the "soul" (Cicero, c.55BC); teacher of Pythagoras.
1.	Pythagoras on the soul		(Q)
2.	Plato on the soul	c.300BC	
3.	Aristotle on the soul	322BC	After penning his *On the Soul*, a 52-page treatise on historical views about the nature of the soul, surmised his view that "happiness is the settling of the soul in its most appropriate spot." (Q)
4.	Lucretius on soul	55BC	Asserted that the soul is made of a certain type of atoms that have a "swerve" (or clinamen) property, which thus gives humans the property of free will based choice. [1]
5.	Pliny on the soul		
6.	Da Vinci on the soul		(Q)
7.	Descartes on the soul		Posited, in a dualistic sense, that the soul resides in the pineal gland; see: Elizabeth Stuart (1643).
8.	Spinoza on the soul		
9.	Leibniz on the soul		Posited, in a monistic sense, that the soul is comprised of monads, or something to this effect.
10.	Newton on the soul		
	La Mettrie on the soul	1745	In his *The Natural History of the Soul*, and related materialism-advocating works, was first to openly deny and ridicule soul theory as nonsense.
11.	Maupertuis on the soul	1751	See: Maupertuis-Diderot debate.
	Holbach on the soul	1770	
12.	**Goethe on the soul**	1813 [1830]	Building on Aristotle and Leibniz, in part, asserted that he soul is the "initial points from which the animation of the whole proceeds."
13.	Schopenhauer on the soul		
14.	Haeckel on the soul		(Q)(Q)
15.	**Maxwell on the**	1850	

	soul	[1878]	
16.	Edison on the soul	1910	Stated: “after death the force, or power, we call ‘will’ undoubtedly endures; but it endures in this world, not in the next. And so with the thing we call life, or the soul—mere **speculative terms** for a material thing which, under given conditions, drives this way or that. It too endures in this world, not the other.”
17.	Einstein on the soul		
18.	Freud on the soul		
19.	Teilhard on the soul		
20.	Heisenberg on soul		Speculated that the world needs a new electromagnetic "soul compass" (Q)
21.	Beg on the soul		(Q)

(add)

Quotes | Related

The following are related quotes:

-

> “Cicero said the opinion about the immortality of the soul was first introduced by Pherecydes of Syros in the time of King Tullus (others attribute it to Thales, others to others). It is the part of the human science that is treated with the most reservation and doubt. The firmest dogmatists are forced to take cover in the shadow of the academy. No one knows what Aristotle taught about the subject (or even all of the ancients in general who handle it with unsteady belief) and he left it to his successors to battle it out about his opinion on the matter. It is marvelous how those who are stubborn in this opinion about the immortality of our souls come up short and are powerless to establish it by their human powers. They are the dreams of a man who teaches nothing, but is hopeful. As Cicero said: ‘dreams are not of a teacher, but of the wisher’ (*somnia sunt non docentus, sed optantis*) (*Academia*, 2:38).”
>
> — Michel Montaigne (c.1590), *Essays* (§2:12); cited by Jean Meslier (1729) in *The Testament* (pg. 570) [2]

> “Before soul beliefs were molded into their modern form, conceptions of the soul had to pass through the sieves of history’s greatest minds. While most people were content to just believe in souls, the greatest philosophers began to reflect on them in a more systematic fashion, profoundly altering the course of their evolution.”
>
> — Julien Musolino (2015), *The Soul Fallacy* (pg. 43)

See also

- Do atoms have souls?
- Soul theorist

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (Plato, pgs. 14-15; Lucretius, pg. 147). HarperOne.
2. (a) Montaigne, Michel. (c.1590). *Essays* (§2.12). Publisher.
(b) Meslier, Jean. (1729). *Testament: Memoir of the Thoughts and Sentiments of Jean Meslier* (translator: Michael

Shreve; preface: Michel Onfray) (pg. 570). Prometheus Books.

θΔics

In religious thermodynamics, **genopsych**, a conjunction of *geno-* (genetics) + *-psyche* (mind), is a hypothetical anti-entropy (or entropy antonym) conceptualized, said to be extensive psychological-thermodynamic property, entity posted to operate counter to entropy, reasoned to give directionality to the process of evolution, to cause non-random variations in the genome, indicative of information creation, is said to be the basis of native intelligence of plants, microorganisms, such as bacteria, and DNA, and is supposed to be god or a part of god inside of humans that has evolved people to their present form. [1]

Overview

In 2007, Indian chemical engineer DMR Sekhar, in an attempt to reconcile evolution, genetics, Hinduism, Christianity, and the second law of thermodynamics, conceived his so-called genopsych model, according to which he hypothesized a entropic type of genetic psychology; the logic of which stems, according to Sekhar, to the 1983 work of Russian biophysicist Mikhail Volkenshtein who stated, in respect to Chargaff's rules (Ñº), that: [2]

> "The replacement of the pair A-T by G-C is evidently thermodynamically favorable since G is bound to C more strongly than A to T. If it were for thermodynamics alone, the relative G-C content in DNA should have increased during the evolution."

On this statement, Sekhar reasoned that, if it is not thermodynamics alone then there must exist a further explanation to account for evolution in light of genetic mechanism.

Sekhar also finds similar point of view in the off-quoted statistical argument that the second law only holds in *most* cases. Sekhar cites British astrophysicist Stephen Hawking's 1987 statement that "the second law of thermodynamics has a rather different status than that of other laws of science, such as Newton's law of gravity, for example, because it does not hold always, just in the vast majority of cases." [3] An argument which reasons that in a system governed by the Boltzmann chaos assumption all states will have equal probability, thus implying that an ordered state may be the outcome of a disordered system by some probability or that "the self-compression of a gas is not absolutely impossible". [4]

Difficulties

The central difficulties of Sekhar's genopsych theory, aside from the obvious argument for god proposition, are firstly that he assumes the second law doesn't hold in the biosphere, in his own words "the formation of ordered molecules such as DNA is impossible if the classical version of the second law of thermodynamics prevails", and secondly his view that smaller life-like molecular structures, such as genes, bacteria, microorganisms, plants, etc., are conscious and struggle to exist.

On the first issue, Sekhar seems to have a limited understanding of the chemical thermodynamics application of "systems" in the studies of the biosphere, e.g. he relies on the verbal isolated systems view and the disorder connection of ideal gas phase systems in his discussions of evolution. On the second issue, if he is to argue that smaller molecular life forms, such as bacteria (i.e. a bacterial molecule) or DNA (i.e. a genetic molecule, $C_{10}H_{16}O_{13}N_5P_3$), etc., are conscious, than according to the logic of molecular evolution tables, which show an evolutionary descendency to the hydrogen atom, one also has to prove that all molecules, e.g. the hydrogen ion molecule, H_2, as well as that the hydrogen atom, are conscious, an argument that leads to numerous absurdities. [5]

See also

â— Genetic entropy
â— Gentropy

References

1. (a) Sekhar, DMR. (2007). "On the Incompatibilities of the Second Law of Thermodynamics, Primary Instincts, Natural Selection, and the Properties of DNA." (8-pages). Submitted as article proposal to the *Journal of Human Thermodynamics*.

(b) Genopsych – DMR Sekhar talk page (Wikiversity).
(c) Sekhar, DMR. (2009). “Genpsy: Genopsych – the self programmability of genome”, Google Knol, January.
(d) Sekhar, DMR. (2007). "Genopsych and the God", *Blog*, July, 16.
(e) Sekhar, DMR. (2007). “Genopsych: Some aspects on Philosophy”, Dmrsekhar Blogs, Sulekha.com, July 26.
(f) Sekhar, DMR. (2007). “Genopsych: Some Aspects of Philosophy”, *Sulekha.com*, 26 July.
2. Volkenshtein, Mikhail V. (1983). *Biophysic*s. Moscow: MIR Publishers.
3. Hawking, Stephen Hawking. (1987). *A Brief History of Time*. Toronto: Bantam Books
4. Yeremin, E.N. (1983). *Fundamentals of Chemical Thermodynamics*. Moscow: MIR Publishers.
5. Thims, Libb. (2008). *The Human Molecule*, (preview). Morrisville, NC: LuLu.

θΔics

In animate thermodynamics, **gentropy**, a combination of the words genes and entropy, is loosely defined as the phenomenon of variability of the biosphere's genetic system as a result of entropy processes. [1] The term seems to be a relatively new one coined in 1997 by authors V. K. Savchennko and U. K. Sauchanka. It is little used and stated mostly in analogy.

Savchennko and Sauchanka state that the the *gentropy* (entropically-related change in the genetic system of the biosphere, affecting its structure and function) caused by global contamination includes: (a) "increase in the mutation rate of the population of species inhabitation the biosphere, leading to a growth of the total number of mutations in the genosphere and to the intensification of the process of genetic entropy"; (b) "increase frequency of oncological diseases in human populations and in populations of animals and plant species, leading to the growth of oncogenic pressure on the biosphere"; (c) changes in the structure of the genetic systems of terrestrial and water organisms; and (d) a decrease in the general stability of the global genetic system due to the growth of genetic entropy processes and loss of the genetic material of animal and plant species, among other consequences. [2]

Architectural design

In 2001, American architect Scott Shaw, reports that ISPs, professional responsibility, and "negentropy" are concepts that architects put to work, almost as a byproduct of the search for a more streamlined design process. He states that architects facilitate connections with the community to get work and get work for those we respect. Shaw reasons that we facilitate "gentropy" by encouraging participation and team interaction through all phases of the design/construction process and that "it's all about making connections to the communities in which we work and live". [3] The sense of the term *gentropy* used by Shaw, however, may not be of the same etymology as that used by Savchennko and Sauchanka.

See also

â— Genopsych

References

1. Savchennko, V. K. and Sauchanka, U. K. (1997). *The Genosphere: the Genetic System of the Biosphere*, (pg. 4). Informa Healthcare.
2. ibid, pgs. 41-42.
3. Hobbs, Richard W. (2001). "Readers Report on Becoming Integrated Service Providers", *AIArchitect – Marketplace Research.*

θΔics

In thermodynamics, **geochemical thermodynamics** is the application of chemical thermodynamics to the study of geological systems, such as rocks, minerals, magmas, hydrothermal solutions, etc. [1] Synonyms include geothermodynamics and geological thermodynamics.

History

The first use of thermodynamics in the geosciences, according to American geoscience chemical thermodynamicist Bruce Fegley, was when in 1867 English geologist Roderick Murchison referred to the "principles of thermodynamics." [4]

The first book on the application of thermodynamics in geology seems to be the 1964 *Thermodynamicque de Base pour Mineralogistes, Petrographes et Geologues* by Raymond Kern and Alain Weisbrod, which, according to its 1967 English translator American geochemist Robert Garrels, was "a book long overdue". [2] Prior to this, according to Garrels, "one would have to search through a half-dozen texts on chemical thermodynamics to find how to treat in detail problems involving such topics as phase changes at elevated temperatures and pressures, the relation of chemical equilibrium to the earth's gravitational field, or the effects of differences in pressure within a system".

The 2008 book *Thermodynamics in Earth Sciences*, by American geologist Jimabitra Ganguly, based on courses taught at the University of Arizona, gives an exposition of a large spectrum of geological, geochemical and geophysical problems that are amenable to thermodynamic analysis. It also includes selected problems in planetary sciences, relationships between thermodynamics and microscopic properties, particle size effects, methods of approximation of thermodynamic properties of minerals, and some kinetic ramifications of entropy production. [3]

References

1. Anderson, Greg, M. and Crerar, David A. (1993). *Thermodynamics in Geochemistry - the Equilibrium Model.* New York: Oxford University Press.
2. (a) Kern, Raymond and Weisbrod, Alain. (1967). *Thermodynamics for Geologists* (preface to English edition by Robert M. Garrels). San Francisco: Freeman, Cooper and Co.
(b) Robert Garrels - Wikipedia .
3. Ganguly, Jimabitra. (2008). *Thermodynamics in Earth Sciences*. Springer.
4. (a) Murchison, Roderick. (1867). *Siluria*. Publisher.
(b) Fegley, Bruce. (2013). *Practical Chemical Thermodynamics for Geoscientists* (with contributions by Rose Osborne) (pg. 1). Academic Press.

Further reading

● Nordstrom, Darrell K. (1986). *Geochemical Thermodynamics.* Blackwell Science Inc.
● Anderson, Greg M. (1996). *Thermodynamics of Natural Systems.* New York: John Wiley & Sons, Inc.
● Anderson, Greg M. (2005). *Thermodynamics of Natural Systems* (2nd ed.). Cambridge: Cambridge University Press.
● Nordstrom, Darrell K., and Munoz, James L. (2006). *Geochemical Thermodynamics* (2nd ed). The Blackburn Press.

θΔics

In existographies, **Geoffrey Chaucer** (1343-1400) (IQ:165|#459) (Cattell 1000:170) [RGM:313|1,500+] (Gottlieb 1000:62) (Bloom 100:10) (MAG:21|35+) (CR:5) was an English poet and author, noted for []

Quotes | By

The following are quotes by Chaucer:

> "Time and tide wait for no man."
>
> — Geoffrey Chaucer (c.1390), *Publication* (Ñº)

> "Women desire six things: They want their husbands to be brave, wise, rich, generous, obedient to wife, and lively in bed."
>
> — Geoffrey Chaucer (c.1390), *Publication* (Ñº)

Further reading

â— Klassen, Norman. (1995). *Chaucer on Love, Knowledge, and Sight*. Boydell.

External links

â— Geoffrey Chaucer – Wikipedia.

θΔics

In existographies, **Geoffrey Warnock** (1923-1995) was an English philosopher, noted for []

Overview

In c.1958 to 1971, Warnock, somewhere in his works, supposedly, argued (O) that it is the role of ethics to offer an anti-entropic (see: entropy antonyms) response to order and structure in society, or something along these lines.

Quotes | On

The following are quotes on Warnock:

> "**Geoffrey Warnock** argues that morality is linked with "the betterment—or non-deterioration—of the human predicament." According to Warnock, society has a natural tendency to get worse, an entropy of social relations. Because of limitations in resources, intelligence, knowledge, rationality, and sympathy, the social fabric tends to come apart, which as a result threatens to pro-duce a Hobbesian state of nature in which chaos reigns. Morality is antientropic. It opposes these limitations, especially by concentrating on expanding our sympathies."
>
> — Louis Pojman (2016), *Cengage Advantage Ethics: Discovering Right and Wrong* (pg. 228)

External links

- Geoffrey Warnock – Wikipedia.

θΔics

In existographies, **Etienne Geoffroy Saint-Hilaire** (1722-1844) (IQ:#|#) (Cattell 1000:481) (EvT:9|21+) (CR:6), or "Geoffroy Saint-Hilaire" (Darwin, 1860s) or "Geoffroy St. Hilaire" (Haeckel, 1899), was a French naturalist noted for his 1795-1833 views on the origin and form change of animals, characterized as a "deism-based materialistic evolutionary determinism" theory of species origins (Hecht, 2003). [2]

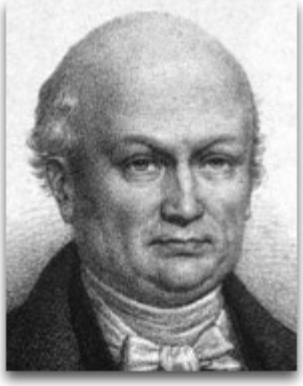

Overview

In 1830, there was a famous confrontation, or public collision, between the creationism theist Georges Cuvier and Hilaire, at the French Academy of Sciences; Adrian Desmond, in his *The Politics of Evolution* (1989) retrospectively describes the encounter as follows: [3]

> "The famous 1830 confrontation between Georges Cuvier and **Geoffroy Hilaire**, at the French Academy of Sciences, was in effect a collision between Hilaire's '**coldly deterministic views** (see: chilling effect) of animal form and evolution and Cuvier's 'extreme views' that animals were broken into discrete 'divisions'."

(add)

Great problem of natural philosophy

In circa 1836, Saint-Hilaire stated the so-called great problem of natural philosophy as follows: [1]

> "It is quite certain that there was a moment when life did not exist on our planet, and another moment when it appeared. It is the passage between these two states that forms the great problem of natural philosophy today."

This problem was solved in 2009 by Libb Thims.

Darwin

Saint-Halaire, of note, was one of three people, along with Johann Goethe (1784) and Erasmus Darwin (1791), cited by English naturalist Charles Darwin in his 1859 *Origin of Species* as having been a forerunner to his own evolution theory.

Quotes | By

The following are related quotes:

> "Can the organization of vertebrated animals be referred to one uniform type?"
>
> — Geoffroy Saint-Hilaire (1818), *Anatomical Philosophy* (Q)

> "The external world is all-powerful in alteration of the form of organized bodies.. . these [modifications] are inherited, and they influence all the rest of the organization of the animal, because if these modifications lead to injurious effects, the animals which exhibit them perish and are replaced by others of a somewhat different form, a form changed so as to be adapted to the new environment."
>
> — Geoffroy Saint-Hilaire (c.1830) (Q)

> "Of the two theories on the development of organs, one supposes the preexistence of the germs and their

indefinite nesting; the other admits their successive formation and their evolution in the course of ages."

— Geoffroy Saint-Hilaire (1833), "Article" [1]

"Influence of the surrounding world changes animal forms.."

— Geoffroy Saint-Hilaire (1833) (O)

See also

- Scientific revolutions

References

1. Guyader, Herve Le. (2004). *Geoffroy Saint-Hilaire: a Visionary Naturalist* (Note 13: to page 281). University of Chicago Press.
2. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 403). HarperOne.
3. Desmond, Adrian. (1989). *The Politics of Evolution: Morphology, Medicine, and Reform in Radical London* (pg. 9). University of Chicago Press.

External links

- Etienne Saint-Hilaire – Wikipedia.

θΔics

In existographies, **Geoffroy Vallee** (c.1545-c.1574) was an French anti-religion writer, characterized an "Epicurean deist" (Q), discussed by Pierre Bayle (1697), who found unbelief in god in Ecclesiastes and the first psalm (Hecht, 2003), who burned at the stake for atheism or for not believing in god in 1571 or for heresy in 1574, depending. [1]

Overview

In c.1570, Vallee published *Erre Geru: the Scourge of the Colorful Foy* (*Erre Geru, le fieau de la Foy bigarr'ee*), which was full of blasphemies and impieties against Jesus Christ.

Valee claimed that believers were "like parrots" reciting the irrational views they had memorized before they left the cradle. He asserted that one should only believe that which could be learned by the senses and those ideas for which one could show rational proof. [1]

Further reading

● Vallee, Geoffroy. (c.1570). *The Art of Believing Nothing*. Publisher.
● Kors, Alan C. (2014). *Atheism in France, 1650-1729, Volume I: The Orthodox Sources of Disbelief* (pgs. 26-27). Princeton University Press.

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (parrots, 287; pg. 332). HarperOne.
2. Bayle, Pierre. (1697). *Historical and Critical Dictionary, Volume Five* (pgs. 441-41). Publisher.

θΔics

In affinity chemistry, **Geoffroy's affinity table** is 16-column, 9-row affinity table, constructed in 1718 by French chemist Étienne Geoffroy, listing main bonding species on the top row, and the chemical species that it could possibly bond to in the column below listed in a descending order of chemical affinity strength. In other words, in the table, shown below, the lowest ranked affinity species, in the bottom row, have the least chemical affinity for the top species, meaning that the two could react and bond, but the strength or force of the bond would be marginal; whereas the species directly below (second row) each top row species, has the strongest chemical affinity towards that top row species, compared to all other possible chemical bonding partners.

The table works as prophetic sort of catalog of the various possible single elective affinities (single displacement reactions) possible between one bonded chemical entity and the various reactants that could be introduced with that bonded entity, so as to possibly cause displacement of the weakest partner.

Geoffroy's table was the world's first-ever affinity table. In the century to follow, dozens of other larger and larger affinity tables were made by various chemists, modeled on Geoffroy's table, in attempts to catalog all known reactions. The largest table ever constructed was Bergman's affinity table, 59-column, 55-row table made by Swedish chemist Torbern Bergman in 1775 and expanded on in 1785. Affinity tables would eventual be replaced with free energy tables, the first one, supposedly, made by German chemist Fritz Haber in his 1905 *Thermodynamics of Technical Gas Phase Reactions*, when it was noticed that chemical reactions are temperature dependent, and that the entropic energy (TS) comes into play, whereby one would have to make a big multipage affinity table, per each degree of temperature, which was an insurmountable task.

A framed copy of French physician and chemist Étienne Geoffroy's 1718 **affinity table**, entitled: Table of Affinities Between Different Substances (Inter Differentes Substantias); captioned: Not invented, or thought involved, but to be seen what the nature of the issue, or does (Non Fingendum Aut Exogit Andum, Sed Videndum Quid Natura Ferat; Aut Faciat), at Museo Galieo, Florence, Italy. [2]

History

Geoffroy made his table during a translation into French of Newton's newly published revised and updated 1717/18 English edition of *Opticks*, who used verbal descriptions of affinity gradients, as found in Query 31. [1]

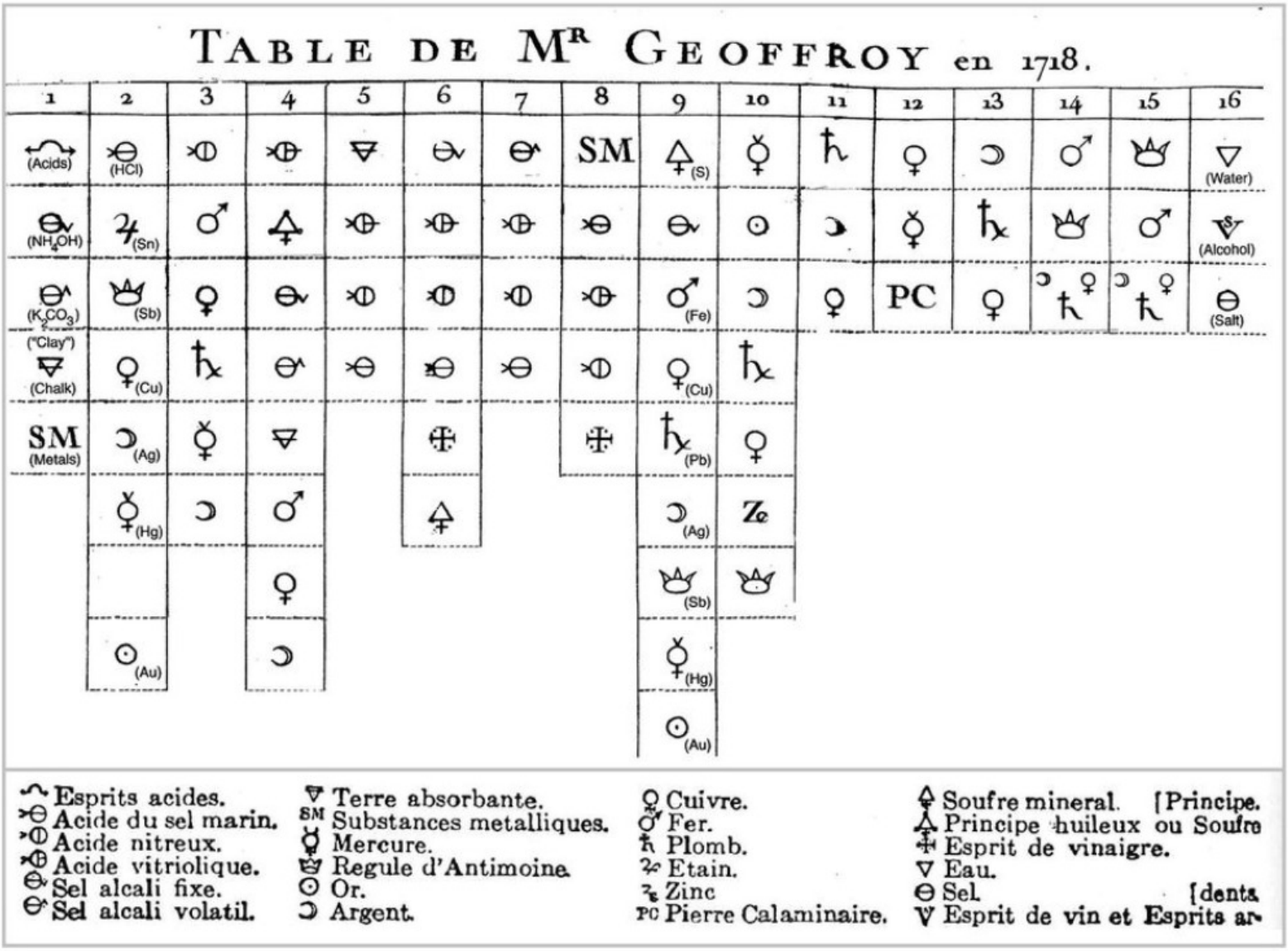

(add discussion)

References

1. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (ch. 10, section: Affinity theories: 450-1686, pgs. 376-95). Morrisville, NC: LuLu.
2. Tabula Affinitatum: Inter Differentes Substantias (Table of Affinities between different substances) – Florence, Italy.

θΔics

In chemistry, **Geoffroy's law of affinity** is the following statement concerning chemical combinations and reactions concerning the forces of attraction and repulsion between three different chemical entities: [1]

> "Whenever two substances are united that have a disposition to combine and a third is added that has a greater affinity with one of them, these two will unite, and drive out the other."

An alternative fuller translation reads: [2]

> "Whenever two substances which have some disposition to unite, the one with the other, are united together and a third which has more affinity for one of the two is added, the third will unite with one of these, separating it from the other."

Terminologically, this soon came to be known as a "single elective affinity" (single displacement reaction), as contrasted with a "double elective affinity" (double displacement reaction).

History

In 1717-1718, English chemical-physicist Isaac Newton's famously penned his last and famous Query 31 outlining his final views about chemistry, the forces of chemical action, and chemical reaction.

In 1718, French chemist Etienne Geoffroy, while doing a French-to-English translation of Newton's *Opticks*, wherein Query 31 is found, conceived of his affinity law, based verbal descriptions of a power series of chemical reactions as described by Newton. [2]

In 1775, Swedish chemist Torbern Bergman, in his *A Dissertation on Elective Attractions*, add letter symbol notation to Geoffroy's affinity law.

Human chemistry

In 1809, Geoffroy's affinity law, via an 1885 German-translation of Bergman's textbook, was scaled up and applied as the governing universal rule of human-human reactions in German polyintellect Johann Goethe's physical chemistry based novella *Elective Affinities*. The book has aroused considerable debate ever since, splitting the divide between admirers and enemies.

In 1855, American editor Charles Norton, in semi-ambivalent objection to Goethe's 1796 human chemical theory, on the premise of his opinion that people are not chemical substances, stated the following: [1]

> "The misery of the elective affinities scheme is that **men are not chemical substances**, and in nine cases out of ten the force of the attraction works more constantly and lastingly upon the woman than the man."

This point of view, however, conflicts with American physician George Carey's 1919 *Chemistry of Human Life*, in which he states:

> "Man's body **is a chemical formula** in operation."

This exemplifies a classic dividing line found to be expanding and becoming clarified as led by the HMS pioneers group.

See also

â— Geoffroy’s affinity table

References

1. (a) Adler, Jeremy. (1990). "Goethe's use of chemical theory in his *Elective Affinities*" (ch. 18, pgs. 263-79; Geoffroy’s law of affinity, pg. 265) in *Romanticism and the Sciences* - edited by Andrew Cunningham and Nicholas Jardine, New York: Cambridge University Press.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (pg. 371). Morrisville, NC: LuLu.
2. Geoffroy, Etienne-Francois. (1718). “Concerning the Different Affinities Observed in Chemistry Between Different Substances”, *Memoires de l’Academie Royale des Sciences*, 202-12; in: *A Source Book in Chemistry, 1400-1900* (editors: Henry Leicester, Herbert S. Klickstein). Harvard University Press.
3. Norton, Charles E. (1855). “Memoir of Shelley”, in: *The Poetical Works of Percy Bysshe Shelley: in Three Volumes* (pg. xxviii). Little, Brown and Co.

θΔics

In science, **geology**, from Greek γῆ, *gē*, i.e. "earth", from Egyptian "Geb", the earth god of Heliopolis creation myth, + -λογία, *-logia*, i.e. "study of, discourse", is the study of the earth, its processes, changes, and forms.

Overview

In 1785, Scottish geologist James Hutton published his *Theory of the Earth: an Investigation of the Laws observable in the Composition, Dissolution, and Restoration of Land upon the Globe*, which in the years to follow allowed his "disciples to remove the assumption that six thousand years was the age of this planet", which, according to Norman Dolloff (1975), was a "relaxation [that] gave Darwin the lever to pry biology loose from religion." [4]

In 1830, Charles Lyell, in his *Principles of Geology*, showed that according to geological evidence that the earth was more than 300-million years old, rather than 6,000-years-old, the Biblical view.

In 1831, Charles Darwin, aged 22, was given a copy of volume one of Lyell's *Principles of Geology*, by HMS Beagle captian Robert FitzRoy, which he read during their famous voyage around south America. [3]

Geomorphology

In 1962, American hydro-geomorphologists Luna Leopold (1915-2006) and Walter Langbein (1907-1982), in their "The Concept of Entropy in Landscape Evolution", applied thermodynamics to the study of the evolution of hydraulic geomorphologies, river shape evolution in particular. [1]

In 2012, Jeff Tuhtan historically touched on the work of Leopold and Langbeing. [2]

References

1. (a) Leopold, Luna B. and Langbein, Walter B. (1962). "The Concept of Entropy in Landscape Evolution" (pdf), *Theoretical Papers in the Hydrologic and Geomorphic Sciences*, U.S. Geological Survey Professional Papers, 500-A, pgs. A1-A20.
(b) Luna Leopold – Wikipedia.
(c) Walter B. Langbein – NASOnline.org.
(d) Scheidegger, Adrian E. (1967). "A Complete Thermodynamic Analogy for Landscape Evolution" (pdf), *International Association of Scientific Hydrology. Bulletin*, 12(4):57-62.
2. Tuhtan, Jeff. (2012). "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality" (pdf), PhD dissertation, Stuttgart University, Germany.
3.Principles of Geology – Wikipedia.
4. Dolloff, Norman H. (1975). *Heat Death and the Phoenix: Entropy, Order, and the Future of Man* (pg. xiv). Exposition Press.

External links

- Geology – Wikipedia.

θΔics

In existographies, **Georg Hegel** (1770-1831) (IQ:170|#243) (Cattell 1000:51) [RGM:51|1,500+] (Gottlieb 1000:59) (Murray 4000:5|WP) (Stokes 100:48|Idealists) (Perry 80:3|Art) (GPhE:#) [CR:79], aka Friedrich Hegel, was a German natural philosopher, a semi-classified a "modern Aristotle" (Ladlier, 2000) (Q) (Peperzak, 2012) (Q), e.g. in "young Marx's eyes" (McBride, 1977) (Q), noted for []

Overview

Hegel, supposedly, did work in affinity chemistry, being familiar with the work of Antoine Lavoisier, Claude Berthollet, writing at length on Torbern Bergman's affinity notion, debating with Jacob Berzelius on the matter and even inventing his own formulation of chemical affinity around 1803, all supposedly later employed in some way in his philosophy of nature. [1]

In 1807, Hegel, in his *Phenomenology of Mind*, employed the concept of kraft (force).

Goethe | Schopenhauer

Hegel has some kind of association with Goethe and it remains to be discerned how the two may have influenced each other in respect to affinity theory.

Quotes | On

The following are quotes on Hegel:

> "Philosophy, if one still wants to call it that, has had to sink lower and lower, until it finally reached the lowest level of abasement in the ministerial creature **Hegel**, who in order to smother again the 'freedom of thought', which Kant had struggled for and won, made of 'philosophy', the daughter of reason and the future mother of truth, a tool of state aims, obscurantism, and Protestant Jesuitism. In order to cover up the disgrace and at the same time to bring about the greatest possible stupefaction of minds, he drew over it a cloak of the emptiest word rubbish and silliest gallimathias that have ever been heard outside the insane asylum."
>
> — Arthur Schopenhauer (1839), *Essay on the Freedom of the Will* (pgs. 85-86) [2]

> "This question, namely: where scientific thought should link itself with the big questions, has occupied the minds of the most profound thinkers of all epochs and all nations, since time immemorial, from Thales to **Hegel**."
>
> — Max Planck (1941), "The Meaning and Limit of Exact Science", Nov [3]

> "**Hegel** dominated philosophy in the period after Kant and introduced the idea of history as an unfolding self-revelation of the world spirit."
>
> — Jennifer Hecht (2003), *Doubt: a History* [4]

Quotes | By

The following are quotes by Hegel:

> "The first task of philosophy, is to conceive of absolute nothingness."

— Georg Hegel (1802), *Faith and Knowledge* (Glauben und Wissen) (Q)

References

1. Brakel, Jaap van. (2012). "§3: Hegel, Schelling, and Peirce, esp. pg. 25). In: *Philosophy of Chemistry* (editors: Robin Findlay Hendry, Andrea I. Woody, Paul Needham). Elsevier.
2. Schopenhauer, Arthur. (1839). *Essay on the Freedom of the Will* (pgs. 85-86). Dover, 2005.
3. Planck, Max. (1941). "The Meaning and Limit of Exact Science", Lecture delivered in Nov; in: *Scientific Autobiography and Other Papers* (translator: Frank Gaynor) (§4:80-119; pg. 82). Philosophical Library, 1949.
4. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 377). HarperOne.

External links

- Georg Wilhelm Friedrich Hegel – Wikipedia.
- Georg Hegel – ChemistryDaily.com.

θΔics

In existographies, **Georg Helm** (1851-1923) (CR:40) was a German mathematical physicist, of the Dresden school, noted for []

Overview

In 1881, Helm married Elise Zeuner, the daughter of German physicist Gustav Zeuner, the creator of technical thermodynamics and founder of the Dresden school of thermodynamics.

In 1887, Helm, in his *The Doctrine of Energy*, argued that the hypothesis of atomism was an unnecessary hypothesis and that the science of energy and entropy was all that was need to uniform physics; a book that contained an appended final chapter on the extension of the energy principle to social theory and economics, traversing the hierarchy of physical energy to vital energy to social energy. [1]

On the subject of economic thermodynamics, for instance, Helm postulated that money was the economic equivalent of the lowest form of "social entropy". In another sense, Helm, supposedly, was the first to argue that money constitutes the economic equivalent of "low entropy". This latter view, however, may have been a mis-translation by Romanian mathematician Nicholas Georgescu-Roegen. [5]

In 1898, Helm, in his *Historical Development of Energetics*, included a section on “Classical Thermodynamics”, arguing to the effect that thermodynamics had reached such a well-established state that “it can certainly be called ‘classical’”, hence the name classical thermodynamics. [6] Helm, supposedly, comments, however, that the label ‘classical’ had first been used not by him but by those who opposed all efforts to develop thermodynamics further. [7]

Education

Helm studied mathematics at Dresden Polytechnic during the years 1867 and 1872. He completed his PhD at the University of Leipzig in 1881. He then became professor of analytical geometry, mechanics and mathematics, and physics at Dresden University of Technology from 1888 to 1922.

Ostwald

Helm’s work attracted the attention of German physical chemist Wilhelm Ostwald who adopted Helm’s precept that “in the last analysis everything that happens is nothing but changes in energy.” [3] This principle view, supposedly, was utilized by Ostwald, in his 1909 book *Energetic Bases of Cultural Studies*, to argue that the function of law, commerce, government, and language were the transformations of “crude” energy into “useful” energy with a minimum of waste. [4]

References

1. (a) Helm, Georg F. (1887). *Die Lehre von der Energy* (*The Doctrine of Energy*). Leipzig: Felix.
(b) Helm, Georg F. (1887). *Die Lehre von der Energie: Historisch-Kritisch Entwickelt, Nebst Beiträgen Zu Einer Allgemeinen Energetik* (*The Doctrine of Energy: Historical-Critical Developed, Along with contributions to one general energetics*). Biobiobazaar, 2010.
(b) Mirowski, Philip. (1989). *More Heat than Light – Economics as Social Physics, Physics as Nature’s Economics* (pgs. 267-28). Cambridge: Cambridge University Press.
2. Georg Helm - Technical University at Dresden.
3. Lindsay, Robert B. (1976). *Applications of Energy: Nineteenth Century* (pg. 339). Dowden, Huthchinson, and Roth.
4. Ostwald, Wilhelm. (1909). *Energetic Bases of Cultural Studies* (*Energetische Grundlagen der Kulturwissenschaften*). Leipzig: Duncker.
5. Georgescu-Roegen, Nicholas. (1971). *The Entropy Law and the Economic Process* (pg. 283). Cambridge, Massachusetts: Harvard University Press.
6. (a) Helm, Georg F. (1898). *Die Energetik: Nach Ihrer Geschichtlichen Entwickelung* (*Energetics: Historical Development*). Leipzig.
(b) Staley, Richard. (2008). *Einstein’s Generation: the Origins of Relativity Revolution* (Georg Helm, pg. 355-57). University of Chicago Press.
7. Helm, Georg F. (2000). *The Historical Development of Energetics* (pg. 153-60). Kluwer Academic Press.

Further reading

â— Deltete, Robert J. (2005). "*Die Lehre von der Energie:* Georg Helm's Energetic Manifesto". *Centaurus,* Vol. 47, Issue 2, pgs. 140-62.

External links

â— Georg Helm – Wikipedia.
â— Georg Helm – Technical University of Dresden (German → English)

θΔics

In hmolscience, **Georg Hirth** (1841-1916) was a German writer noted for his 1900 *Entropy of the Germinal System and Hereditary Enfranchisement*, wherein he attempts to tackle the problem of evolution genetics via thermodynamics, e.g. seemingly using human free energy theory, e.g. he has a section on human as a machine and discusses Helmholtz energy in the book, but done so with a tinge of mysticism, as Nicholas Georgescu-Roegen (1971) surmised.

Overview

In 1900, Hirth, in his *Entropy of the Germinal System and Hereditary Enfranchisement*, introduced the entropy antonym term "ektropy" to denote the principle that opposes the entropy principle of degradation in life-bearing structures. [1] In his work, Hirth speculated on the differences in the modes of energy between the sperm and egg, in the sense that the former represents kinetic energy and the latter potential energy. [4] The term ektropy, as introduced by Hirth, is said to refer to morphic order or generating order or form in ordinary space. [5]

The following is the partial table of contents of Hirth's *Entropy of the Germinal System*:

#	Section (German)	Section (English)
12	Spezifsche Enerien	Specific energy
16	Energie und Massengesetz	Energy and mass action
18	Die Systemfrage	The system question
19	Subjektive Empfindungen	Subjective sensations
24	Gebunden und freie Energie	Bound and free energy
29	Freiheitsgrade der Energy	Freedom and energy
31	Die lebenden Organismen als energetische Systeme	The living organism of an energy system
34	Keimsysteme; energetische Epigenensis	Germinal system; and energetic epigenesis
35	Epigenetische Energiformen	Epigenetic energyform
38	Teleogische Vorurtheile – Der praktische Standpunkt	Teleogische prejudice - the practical point of view
39	Der Entropiebegriff	The Entropiebegriff
40	Mayer's Wasserflasche	Mayer's water bottle
42	Warme ist ungeodnet Bewegung	Warm is ungeodnet Movement
45	Weltather und Clausius'sche Weltentropie	Weltather and Clausius' Weltentropie
47	Es gibt kein streng abgeschlossenes System	There is no strictly closed system
48	Maxwell's Damonen	Maxwell's demon
49	Die Funktionen U, S, F	The functions U, S, F
50	Die helmholtz'sche Anmerkung	The Helmholtz Note

The following, to give a taste of Hirth's views, is an example translation of one of Hirth's eight mentions of the term Mensche (man) or "human", in this case Lord of man (pg. 145), i.e. god:

Das Bestreben, ohne Weiteres Alles, was sich der herrschenden sittlichen, Gesellschaftsund Staatsordnung nicht fügen will, als »krankhaft« zu kennzeichnen, wird nicht besser illustrirt als durch die Kulturgeschichte selbst. Mit der Auflösung der Ordnung, der Kulturentropie, stellen sich sofort oder allmählich ähnliche Zustände ein, wie sie die Befreiung einer grösseren Anzahl von Menageriebewohnern mit sich bringen würde. Sogar unsere bissigen Hausthiere verwildern sehr rasch,

The endeavor readily everything that the ruling moral, social and political order will not add, as "morbidly" to identify is well illustrated no better than by the cultural and religious history. With the dissolution of order, cultural entropy, tune in immediately or gradually conditions similar one, as it would bring the liberation of a large number of residents menagerie

und die nichtbissigen verlieren alle Haltung. Warum soll gerade der »Herr von Mensch« eine Ausnahme machen? Nur Erziehung, Wohlwollen, Verpflichtung durch Wohlthaten können bewirken, dass in den grossen Massen neben der Furcht auch Liebe zur Kultur und zur Arbeit erwächst. Aber man sollte es sich abgewöhnen, jeden in einzelnen ungezähmten, unerzogenen Naturen stärker sich regenden Raubthierinstinkt als erbliche Belastung zu — brandmarken. Derartige Instinkte sind vielleicht ganz unzertrennlich von einem kraftvollen Menschenthum; wir erkennen sie nur nicht mehr unter der Zwangsjacke der Gesittung und im Rahmen unserer kontradiktorischen Hemmungen.

with it. Even our snappy domestic animals run wild very quickly, and do not lose all snappy attitude. Why should the "Lord of man" make an exception? Only education, benevolence, commitment by good deeds can cause in large masses in addition to the fear arises also love to culture and from work. But one should wean themselves, each in individual untamed, uneducated natures are more active ligands carnivorous instinct as to heredity - brand. Such instincts are perhaps quite inseparable from a powerful manhood; we recognize not only among the straitjacket of civilization and as part of our adversarial inhibitions.

Hirth's idea and terminology were taken up by German physicist Felix Auerbach in 1910 in the form of "ectropy". [3]

The majority of Hirth's work, according to Romanian-born American mathematician and economist Nicholas Georgescu-Roegen, is said to be "pervaded by confusing mysticism", attributed to the fact that Hirth was not a scientist by trade. [2]

Danish science historian Helge Kragh, in his history of entropy in religion, mentions Hirth in one footnote as follows: [6]

> "The name 'ectropy' goes back to 1900, when it was introduced by **Georg Hirth** in the context of biological systems (Hirth, 1900). It became widely known through Felix Auerbach's *Extropismus oder die physikalische Lehre des Lebens* (Leipzig, 1910). The mistaken view that the evolution of life forms contradicts the second law continued to play a role during the twentieth century, since the 1960s often in the context of new creationism. Local processes, such as the building up of complicated molecules from simpler ones, can occur even though they involve a decrease in entropy. Because the energy diminishes in such a way that the free energy is lower for the product, they are in full accord with the second law of thermodynamics. For an overview, see: Patterson (1983)."

(add discussion)

References

1. (a) Hirth, George. (1900). *Entropie der Keimsysteme und erbliche Entlastung* (*Entropy of Germ Systems and Hereditary Discharge* (or *Entropy of the Germinal System and Hereditary Enfranchisement*)) (Mensch (human), 8+ pgs). Munich: G. Hirth's Verlag.
(b) Entropy – Dictionary of Ideas.
(c) Rifkin, Jeremy. (1989). *Entropy: Into the Greenhouse World* (pg. 302). Bantam Books.
2. Georgescu-Roegen, Nicholas. (1971). *The Entropy Law and the Economic Process* (pgs. 189-90). Harvard University Press.
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4. (a) ibid, Hirth (pgs. 89-90).
(b) Bloch, Iwan. (2006). *The Sexual Life or Our Time* (pgs. 71-72). Kessinger Publishing.
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6. (a) Patterson, John W. (1983). "Thermodynamics and Evolution", in: *Scientists Confront Creationism* (editor: Laurie Godfrey) (§6:99-116). Norton & Co.
(b) Kragh, Helge S. (2008). *Entropic Creation: Religious Contexts of Thermodynamics and Cosmology* (Hirth, pg. 190). Ashgate Publishing, Ltd.

External links

â— Georg Hirth – Wikipedia (German → English).

θΔics

In existographies, **Georg Lichtenberg** (1742-1799) (IQ:170|#313) (FA:84) was a German physicist, philosopher, and satirist, noted for []

Overview

One of the first scientists to introduce experiments with apparatus in their lectures; associates with Goethe and Kant; Volta and Gauss sat in on his lectures; from 1765 (age 23) to 1799 (age 56), he kept a series of personal notebooks, quotations that struck Lichtenberg, titles of books to read, autobiographical sketches, and short or long reflections, including keen observations on human nature, à la the 17th-century French moralists, which gained him posthumous fame as one of the best aphorists in Western intellectual history; greatly influential to other later atheists, e.g. Schopenhauer (he is one of those who "think for their own instruction", who are "genuine 'thinkers for themselves' in both senses of the words"), Feuerbach (cites him in "The Natural Sciences and the Revolution", 1850), Tolstoy (I'm perplexity "why the Germans of the present day neglect this writer so much"), Nietzsche, and Freud (who his "Why War?" letter to Albert Einstein) mentioned Lichtenberg's invention of a "Compass of Motives" in a discussion on the combination of human compounded motives and quoted him as saying, "The motives that lead us to do anything might be arranged like the thirty-two winds and might be given names on the same pattern: for instance, 'food-food-fame' or 'fame-fame-food',"); an enlightenment figure nonbeliever (Haught, 1996).

Quotes | By

The following are quotes by Lichtenberg:

> "We are obliged to regard many of our original minds as crazy, at least until we have become as clever as they are."
>
> — Georg Lichtenberg (c.1774), *Notebook D* (aphorism #97) [1]

> "I thank the lord a thousand times for having made me become an atheist."
>
> — Georg Lichtenberg (c.1768), *Notebook E 252, 1765-1770* (compare: George Shaw)

> "It is almost impossible to bear the torch of truth through a crowd without singeing someone's beard."
>
> — Georg Lichtenberg (c.1770)

> "There is a sort of transcendental ventriloquy through which men can be made to believe that something which was said on earth came from heaven."
>
> — Georg Lichtenberg (c.1770)

> "As nations improve, so do their gods."
>
> — Georg Lichtenberg (c.1770)

> "After all, is our idea of god anything more than personified incomprehensibility?"
>
> — Georg Lichtenberg (c.1770)

“Probably no invention came more easily to man than when he thought up heaven.”

— Georg Lichtenberg (c.1770)

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1. Lichtenberg, Georg. (1799). *The Waste Books* (translation and Introduction: Reginald Hollingdale). Penguin, 1990.

External links

â— Georg Christoph Lichtenberg – Wikipedia.

θΔics

In existographies, **Georg Ohm** (1789-1854) (IQ:165|#453) [RGM:154|1,500+] [Kanowitz 50:27] (GPE:93) (SIG:18) (CR:5) was a German physicist and mathematician, noted for his 1826 discovery of the “Ohm's law”, which states that current is directly proportional to the voltage and inversely proportional to the resistance.

Overview

In 1826, Ohm, following a number of experiments, stated that the amount of current in a circuit is directly proportional to the difference in potential difference (voltage), or "pressure" of the current, and inversely proportional to the resistance. [1]

Ohm, in these experiments, drawing inspiration from Fourier on heat conduction, after testing with voltaic piles, he switched to a bismuth copper thermocouple, as shown, wherein he measured the current passing through the copper strip, with one junction dipped in ice and the other in boiling water (Q), and then added test wires of varying length, diameter, and material to complete the circuit:

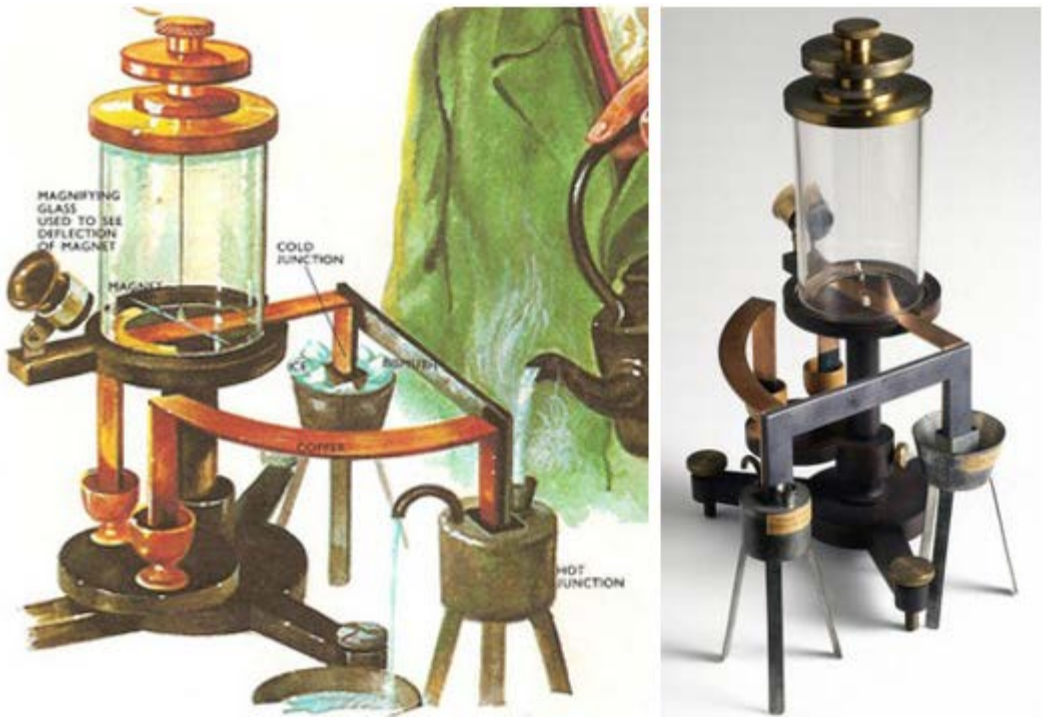

In 1827, Ohm, in his *The Galvanic Circuit Investigated Mathematically*, based on his research on a Volta-style electrochemical cell, stated that electromotive force acting between the extremities of any part of a circuit is the product of the strength of the current, and the resistance of that part of the circuit.

This finding has since come to be known as “Ohm's law” (Q), defined as follows:

$$I = \frac{V}{R}$$

where V is the voltage, R is the resistance, and I is the current.

Quotes | By

The following are quotes by Ohm:

> “The force of the current in a galvanic circuit is directly as the sum of all the tensions, and inversely as the entire reduced length of the circuit.”
>
> — Georg Ohm (1827), *The Galvanic Circuit Investigated Mathematically* (pg. 36) (O)

References

1. Kirby, Richard. (1956). *Engineering in History* (co-authors: Sidney Withington, Arthur Darling, Frederick Kilgour) (pg. 333). Courier, 1990.

Further reading

● Jungnickel, Christa and McCormmach, Russell. (1990). *Intellectual Mastery of Nature: Theoretical Physics from Ohm to Einstein, Volume One: the Torch of Mathematics, 1800 to 1870* (Ohm, 23+ pgs). Publisher.

External links

● Georg Ohm – Wikipedia.

θΔics

In existographies, **Georg Rheticus** (1514-1574) was German mathematician and astronomer noted for his desire to go meet the famed Nicolaus Copernicus, thereafter becoming the latter's sole pupil, and whose 1540 *First Report* was the first published synopsis introduction to Copernicus' heliocentric theory..

First Report

In 1539, Rheticus travelled to meet the reclusive Nicolaus Copernicus; whom he eventually would stay with and study under for two years.

In 1540, Rheticus, in his *First Report*, a student's review of Copernicus' heliocentric model, about a quarter of the way into the booklet, reported the following two big picture of things bombshells:

> "These phenomena of observed planetary motion – of annual direct, stationary, retrograde, near to and from the earth, etc. – can be explained, as my teacher shows, by a regular motion of the spherical earth (see: flat earth); that is, by having the sun occupy the center of the universe, while **the earth revolves**, instead of the sun, **on the eccentric** [about the sun], which it has pleased him to name the 'great circle'. Secondly, **the earth, like a ball on a lathe, rotates** from west to east, as god's will ordains; and that by this motion, the terrestrial globe produces day and night."

In mid Feb, Rheticus sent a preliminary batch of pages of the *First Report* to Philipp Melanchthon, to inform the university rector about his activities, and to Andreas Osiander (Ñº), the publisher.

Quotes | On

The following are related Rheticus quotes:

> "[Some think it] a distinguished achievement to construct such a **crazy thing** as that Prussian astronomer [Copernicus] who moves the earth and fixes the sun. Verily, wise rulers should tame the unrestraint of men's minds." [1]
>
> "Many hold it an excellent idea to praise an **absurd matter**, like that sarmatic [Polish] astronomer, who moves the earth and lets the sun stand still." [4]
>
> — Philipp Melanchthon (1541), "Letter to Correspondent", commentary on **Rheticus**' 1540 *First Account* (*Narratio Prima*) (Ñº), Oct

> "The *Narratio* has made the name of Copernicus famous."
>
> — Cornelius Scepperus (1541), "Letter to Achilles Gasser", from Brussels, Jul

> "**Rheticus'** *First Report*, to this day, is arguably the best primer on the heliocentric theory of Copernicus."
>
> — Jack Repcheck (2007), *Copernicus' Secret* [3]

Quotes | By

The following are quotes by Rheticus:

“This man [Copernicus] whose work I am now treating is in every field of knowledge and in mastery of astronomy not inferior to Regiomontanus. I rather compare him to Ptolemy.”

— George Rheticus (c.1540) [2]

“From the time that I became a spectator and witness of the labors which my teacher performs with energetic mind and has in large measure already accomplished, I realize that I had not dreamed of even the shadow of so great a burden of work. And it is so great a labor that it is not any here who can endure it and finally complete it.”

— George Rheticus (c.1543) [2]

“I heard of the fame of master Nicolaus Copernicus in the norther lands, and although the University of Wittenberg had made me a public professor in those arts, nonetheless, I did not think that I should be content until I had learned something more through the instruction of that man. And I also say that I regret neither the financial expenses nor the long journey nor the remaining hardships. Yet, it seems to me that there came a great reward for these troubles, namely, that I, a rather daring young man, compelled this venerable man to share his ideas sooner in this discipline with the whole world.”

— Georg Rheticus (c.1545), retrospect commentary on his 1539 to 1541 sojourn with Copernicus and his *On the Revolution of the Heavenly Spheres* (1543) [2]

References

1. Crowther, James G. (1995). *Six Great Scientists: Copernicus, Galileo, Newton, Darwin, Marie Curie, Einstein* (pg. 36-38). Barnes & Noble.
2. Repcheck, Jack. (2007). *Copernicus' Secret: How the Scientific Revolution Began* (reward, pgs. 130-31; compare him, pg. 139, hero, pg. 140). Simon & Schuster.
3. (a) Rheticus, Georg. (1540). *First Report* (*Narratio prima*) (pdf). Publisher.
(b) Repcheck, Jack. (2007). *Copernicus’ Secret: How the Scientific Revolution Began* (pg. 149). Simon & Schuster.
4. Repcheck, Jack. (2007). *Copernicus’ Secret: How the Scientific Revolution Began* (pg. 160). Simon & Schuster.

External links

â— Georg Joachim Rheticus – Wikipedia.

θΔics

In existographies, **Georg Simmel** (1858-1918) [RGM:1,358|1,500+] (Scott 50:35) (CR:13) was a German sociologist and philosopher, stylized the "brightest man in Europe" (Santayana, c.1913), classified by Werner Stark (1962), as a "secondary form" social mechanism theorist, noted for his 1908 *Sociology*, wherein he classifies himself as an anti-organist, supposedly, and talks about powerful forces pushing man and woman towards each other, speak of man as the "atom of society" and of people as "elements [that] incessantly gain, lose and shift their equilibrium."

Overview

In 1893 to 1910, a number of Simmel's writings began to appear in the American periodicals, especially *The American Journal of Sociology*, translated largely by Albion Small, many of which were later (1925) criticized by Pitirim Sorokin. [4]

Energy | Money

In 1905, Simmel, in his *Philosophy of Money*, as discussed (Ñº) by Yuri Tarnopolsky (c.2015), used an analogy between the exchange of energy in the physical world to describe the exchange of money in the economy. [3]

Associates

Simmel corresponded with Max Weber.

Education

In 1874, Simmel then aged 16, his father, a partner in a well-known chocolate factory de-ceased (died), after which a family friend, the founder of an international music publishing house, became his appointed guardian, who left Simmel with a considerable fortune, enabling him to pursue the path of a scholar. [4]

In 1876, Simmel, aged 18, entered the University of Berlin, where he studied history and philosophy, with focus on a special study of Petrarch.

In 1881, Simmel completed his doctorate with a thesis on "The Nature of Matter According to Kant's Physical Monadology". (Ñº)

Simmel then became a professor at the University of Berlin, lecturing on logic, principles of philosophy, history of philosophy, modern philosophy, Kant, Lotze, Schopenhauer, Darwin, pessimism, ethics, philosophy of religion, philosophy of art, psychology, social psychology, political psychology, and sociology. [4]

Quotes | On

The following are quotes on Simmel:

> "If Carey fancies himself as the Newton of sociology [see: another Newton], **Simmel**, in so far as he was a formalist, wanted to be its Euclid."
>
> — Werner Stark (1962), *Fundamental Forms of Social Thought* [1]

Quotes | By

The following are quotes by Simmel:

> "There is no entropy of being."
>
> — Georg Simmel (1913), "Death and Immortality" (note #6); cited by Wilbur Urban (1929) in "The New Gotterdammerung: Degradation and Value" [2]

> “Color, molecules, letters, particles of water indeed ‘exist’; but the painting, the book, the river are syntheses: they are units that do not exist in objective reality but only in the conscious-ness which constitutes them. . . . It is perfectly arbitrary to stop the reduction, which leads to ultimately real elements, at the individual. For this reduction is interminable.”
>
> — Georg Simmel (c.1900), *Publication* [4]

References

1. Stark, Werner. (1962). *The Fundamental Forms of Social Thought* (Simmel, 18+ pgs.; esp. pgs. 147-49). Routledge & Kegan Paul.
2. (a) Simmel, Georg. (1913). “Death and Immortality”; in: *The View of Life: Four Metaphysical Essays with Journal Aphorisms* (§3: 63-98, quote, pg. 84). University of Chicago Press, 2015.
(b) Urban, Wilbur M. (1929). “The New Gotterdammerung: Degradation and Value”, in: *The Intelligible World: Metaphysics and Value, Volume 14* (§:12:395-427; Simmel, pg. 395) (thermodynamics, pgs.). Routledge, 2002.
3. Stewart, Janet. (2014). “Sociology, Culture and Energy: The Case of Wilhelm Ostwald’s ‘Sociological Energetics’ – A Translation and Exposition of a Classic Text” (abs), *Cultural Sociology*, 8(3), Apr 14.
4. Simmel, Georg. (1950). *The Sociology of Georg Simmel* (translator: Kurt Wolff) (Arc) (§:Introduction, pgs. xvii-). The Free Press.

External links

â— Georg Simmel – Wikipedia.

θΔics

In existographies, **Georg Stahl** (1659-1734) (IQ:170|#315) (CR:29) was a German chemist and physician, characterized a "great genius" (Mettrie, 1745), noted for his 1703 phlogiston theory of heat (see: entropy models), wherein he viewed heat as being comprised of small particles with mass which he termed as "phlogiston"; and for his 1708 discussions of soul and movement.

Overview

In c.1620, Johann Helmont conducted oak burning experiments, wherein he found that 62 lbs of oak were burned into 1 lb of ashes and 61 lbs of "wild spirit", aka gas. These experiments, according to James Partington (1937), contain the germ of ideas in Stahl's theory of combustion.

Stahl explained natural phenomena by affirming that "heat matter", a hypothetical entity to which he assigned the name "phlogiston", was contained in all combustible bodies and was made to appear when such bodies were burned. [1]

A precursor to Stahl's theory was the 1669 terra pinguis theory of combustion developed by his mentor Johann Becher.

Stahl's theory was eventually replaced by French chemist Antoine Lavoisier's 1789 "caloric theory".

Animism

In 1708, Stahl, in his *True Medical Theory* (*Theoria Medica Vera*), outlined some type of animism (Ñº), wherein life and disease were explained by the action of the "sensitive soul" or *anima*, which inhabited every part of the organism and prevented its spontaneous putrefaction.

> "I am aware that this opinion has not been to the taste of all scientists and that **Stahl** above all had only contempt for it. That great chemist wanted to persuade us that the soul alone was the cause of all our movements; but that is the talk of a fanatic, not a philosopher."
>
> — Julien la Mettrie (1747), *Man: a Machine* (pg. 31)

(add)

Quotes | On

The following are about related quotes:

> "In order to explain the union of the soul with the body, there is no need to torture one's mind as much as those great geniuses: Aristotle, Plato, Descartes, Malebranche, Leibniz and Stahl did."
>
> — Julien la Mettrie (1745), *Treatise on the Soul* (pg. 64)

> "About eight days ago I discovered that sulfur in burning, far from losing weight, on the contrary, gains it; it is the same with phosphorus; this increase of weight arises from a prodigious quantity of air that is fixed during combustion and combines with the vapors. This discovery, which I have established by experiments, that I regard as decisive, has led me to think that what is observed in the combustion of sulfur and phosphorus may well take place in the case of all substances that gain in weight by combustion and calcination; and I am persuaded that the increase in weight of metallic calxes is due to the same cause... This discovery seems to me one of the most interesting that has been made since **Stahl** and since it is difficult not to disclose something inadvertently in conversation with friends that could lead to the truth I have thought it necessary to make the present deposit to the Secretary of the Academy to await the time I

make my experiments public."

— Antoine Lavoisier (1772), Sealed note deposited with the Secretary of the French Academy (Ñº), Nov 1

Quotes | By

The following are related quotes:

"Briefly, in the act of composition, as an instrument there intervenes and is most potent, fire, flaming, fervid, hot; but in the very substance of the compound there intervenes, as an ingredient, as it is commonly called, as a material principle and as a constituent of the whole compound the material and principle of fire, not fire itself. This I was the first to call phlogiston."

— Georg Stahl (1703), *Specimen Beccherianum* (Ñº)

References

1. Hemmeter, John C. (1918). "Lavoisier and the History of the Physiology of Respiration and Metabolism: Contemporary Views of the Life Processes", *Bulletin of the Johns Hopkins Hospital* (pg. 262), 29: 254-64, Nov.
2. Partington, James R. (1937). *A Short History of Chemistry* (pgs. 48-51). Dover.

External links

â— Georg Ernst Stahl – Wikipedia.

θΔics

In hmolscience, **George Thomas Armstrong** (1916-1982) was as American scientist noted for his 1930 to 1975 work on the thermodynamics, specifically heats of combustion and heats of formation, of a number of CHNOPS comprised compounds, work generally aimed, via NASA funding, at facilitating the detection of life on other planets.

In the 1960s, Armstrong was consulted by Harold Morowitz. [1]

References

1. Armstrong, George T. and Domalski, Eugene S. (1969). “Sixteenth Report on a Survey of Thermodynamic Properties of the Compounds CHNOPS” (pdf), NASA, Jun 30.

Further reading

â— Armstrong, George T. and Goldberg, Robert N. (1976). *An Annotated Bibliography of Compiled Thermodynamic Data Sources for Biochemical Aqueous Systems (1930-1975)*. National Bureau of Standards.

External links

â— Armstrong, George T. – WorldCat Identities.

θΔics

In hmolscience, **George Beadle** (1903-1989) was an American geneticist noted for []

Religion | Evolution

Beadle is listed (Q) at NNDB as "Christian". The following is a 2003 recount of Beadle's pragmatic compatibilist approach to the inherent conflict between religion and evolution, as recounted by his former student Millard Susman, when he taught evolution: (Q)

> "I met George Beadle in 1957, when I arrived at CalTech as a new graduate student in the Division of Biology. I had been offered a teaching assistantship to support my first year of study, but the offer did not specify the course I would be teaching. As it turned out, I was assigned to the team of teaching assistants (TAs) in Bio 1, the introductory biology course in which George Beadle and James Bonner were the lecturers. I had, of course, heard of both Beadle and Bonner before I arrived at CalTech, and I was pleased to be given an assignment that would give me an opportunity to get to know them.
>
> I want to mention Beadle's introduction to his lecture on evolution, because it differed so dramatically from the introduction that I had heard when I was a freshman biology student. My professor at Washington University had started the lecture by saying that the Missouri Synod of the Lutheran Church, to which many of the students in the class belonged, rejected the idea of evolution. "When the church and science are in conflict on some issue," said the professor, "the church had better back down." This statement made a good many students extremely unhappy. Beadle, on the other hand, introduced the subject by saying that some religious people were uncomfortable with the theory of evolution, but he did not see why. If you wanted to think of god as the creator of all living things, what would be wrong with thinking that god used evolution as the mechanism? It was clear that Beadle was no more religious than my professor at Washington University, but he was certainly more diplomatic."

In 1962, Beadle stated the following view:

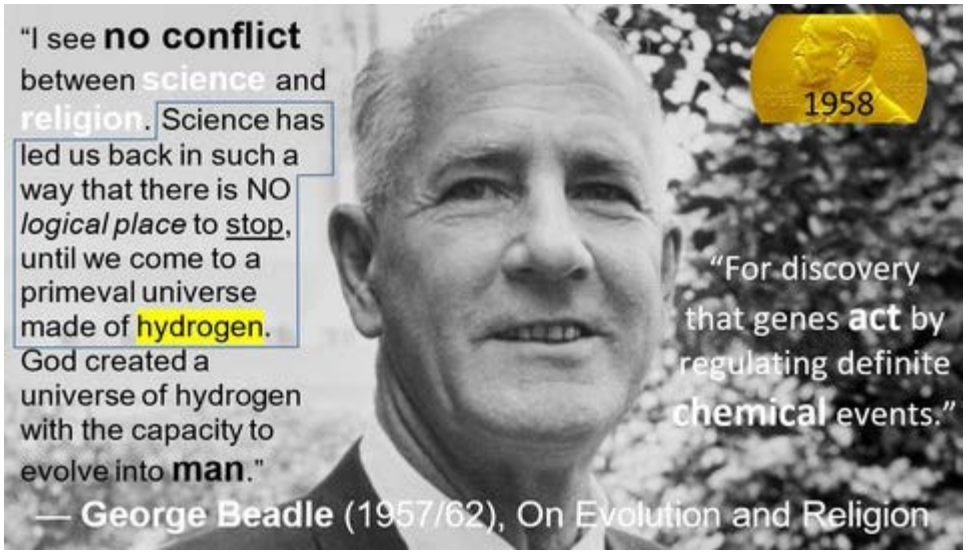

> "I see no conflict between science and religion. The answer to the question of creation still remains in the realm of faith. In early biblical times, it was believed as a matter of faith that man was created as man. Since then, science has led us back in such a way that there is no logical place to stop, until we come to a primeval universe made of hydrogen. But then we ask, 'whence came the hydrogen?' and science has no answer. Is it any less awe-inspiring to conceive of a universe created of hydrogen with the capacity to evolve into man than it is to accept the creation of man as man? I believe not."

— George Beadle (1962), "Address at the Chicago Sunday Evening Club" (to Christian layman), Chicago, Mar 18

This compatibilist take on religion + science, was countered by Ravi Zacharias (1990), as an absurd view, particularly when it came to the question of "morals" deriving from hydrogen that turned into "thinking" aggregations of hydrogen atoms. [2]

Quotes

The following are related quotes:

> "You too can win Nobel Prizes. Study diligently. Respect DNA. Don't smoke. Don't drink. Avoid women and politics. That's my formula."
>
> — George Beadle (c.1970) (Q)

References

1. (a) Beadle, George. (c.1962). "Address at the Chicago Sunday Evening Club", quoted in: *Chicago Daily News* (1862), Mar 18.
(b) Anon. (1962). "Religion: Faith & the Scientist" (Q), *Time*, Jun 29.
2. Zacharias, Ravi. (1990). *The Real Face of Atheism* (hydrogen, pg. 44). Baker Books, 2004.

External links

- George Wells Beadle – Wikipedia.

θΔics

In existographies, **George Berkeley** (1685-1753) (IQ:180|#145) (Cattell 1000:289) [RGM:304|1,500+] (Murray 4000:14|WP) (Stokes 100:44) (**SN**:56) (CR:23), aka "Bishop Berkeley", was Irish-born English philosopher, noted for a blurry god-based Newtonian sociology gravitation like description of the of sous; that was ridiculed by Baron d'Holbach (1770) ↓↓, but, ironically, derogated by Pitirim Sorokin (1928) ↑, but later defended, in some sense, by Bernard Cohen (1994).

Moral attraction | Social gravity

In 1713, Berkeley published a 5-page essay entitled "Moral Attraction", wherein he attempted to adapt Newtonian terminology to a psychological interpretation of social processes, via an earlier version of social gravitation theory; the following are noted excerpts: [1]

> "Now, if we carry our thoughts from the corporeal [planetary] to the moral world, we may observe in the spirits or minds of men a like principle of [gravitational] attraction, whereby they are drawn together in communities, clubs, families, friendships, and all the various species of society."

> "The several great bodies which compose the solar system are kept from joining together at the common center of gravity by the rectilinear motions the author of nature has impressed on each of them; which, concurring with the attractive principle, form their respective orbits round the sun: upon the ceasing of which motions, the general law of gravitation that is now thwarted would show itself by drawing them all into one mass. After the same manner, in the parallel case of society, private passions and motions of the soul do often obstruct the operation of that benevolent uniting instinct implanted in human nature; which, notwithstanding, doth still exert, and will not fail to show itself when those obstructions are taken away."

As to the nature of the soul, Berkeley has the following to say:

> "The mutual gravitation of bodies cannot be explained any other way than by resolving it into the immediate operation of god, who never ceases to dispose and actuate his creatures in a manner suitable to their respective beings. So neither can that reciprocal attraction in the minds of men be accounted for by any other cause. It is not the result of education, law, or fashion; but is a principle originally engrafted in the very first formation of the soul by the author of our nature. And as the attractive power in bodies is the most universal principle which produceth innumerable effects, and is a key to explain the various phenomena of nature; so the corresponding social appetite in human souls is the great spring and source of moral actions. "

The following seems to be Berkeley's jab at utilitarianism theory:

> "To the intention of the author of our being, who aims at the common good of his creatures, and as an indication of his will, hath implanted the seeds of mutual benevolence in our souls; the interest, because the good of the whole is inseparable from that of the parts; in promoting therefore the common good, everyone doth at the same time promote his own private interest."

(add)

Sorokin

In 1928, Russian-born American sociologist Pitirim Sorokin, in his infamous "The Mechanistic School" chapter, of his *Contemporary Sociological Theories*, gave the following summary of Berkeley: [3]

> "Along the lines of social physics of the seventeenth century **George Berkeley** constructed his theory of moral attraction and social stability. According to his 'social physics', physical gravitation has its analogue. The centrifugal forces are manifest in the form of egoism, which drives persons apart; while the social instincts correspond to the centripetal forces, because they draw persons together. Society is stable when the centripetal forces are greater than centrifugal. The role of physical mass in social mechanics is played by the population; the role of physical distance, by the homogeneity or heterogeneity of individuals."

Sorokin, here, clearly reads Berkeley more than what he seems to have said.

In 1994, American science historian Bernard Cohen had the following sharp words to say about Sorokin's review: [4]

> "The eminent sociologist Pitirim Sorokin translated **Berkeley's** correct Newtonian physics into a hodgepodge of incorrect pre-Newtonian explanations. Sorokin not only would have Berkeley make use of the misleading notion of a balance of centrifugal and centripetal forces, but continued his travesty by saying that Berkeley concluded that 'society is stable when the centripetal forces are greater than the centrifugal'. This is plainly nonsense even in pre-Newtonian physics; if the centripetal forces should be greater than the centrifugal forces, then obviously there would be no stability but an instability, a lack of balance or equilibrium, and a result motion inward, as Berkeley clearly stated would be the case under such circumstances."

Cohen, in any event, in his followup "Newton and the Social Sciences" chapter spends time discussing what he refers to as "Berkeley's Newtonian sociology", a term which seems but a stretch, given the terseness of Berkeley's essay. [5]

Malebranche

In circa 1710, Berkeley entered into some type of interview with French philosopher Nicolas Malebranche, which turned into some type of notable metaphysical argument.

Quotes | On

The following are quotes on Berkeley:

> "But what shall be said of a **Berkeley**, who has endeavored to prove to man, that every thing in this world is nothing more than a chimerical illusion, and that the universe exists nowhere but in himself: that it has no identity but in his imagination; who has rendered the existence of all things problematical by the aid of sophisms, insolvable even to those who maintain the doctrine of the spirituality of the soul."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 76)

> "**Berkeley** categorically denied the existence of matter."
>
> — George Strodach (1963), "Introduction to *Epicurus: the Art of Happiness* (pg. 21)

Quotes | By

The following are quotes by Berkeley:

> "That there is no such thing as what philosophers call material substance, I am seriously persuaded: but if I

were made to see any thing absurd or skeptical in this, I should then have the same reason to renounce this, that I imagine I have now to reject the contrary opinion. Doth the reality of sensible things consist in being perceived? or, is it something distinct from their being perceived, and that bears no relation to the mind?"

— George Berkeley (1713), *Three Dialogues Between Hylas and Philonous* (voice of Philonous) (Q)

"Few men think; yet all have opinions."

— George Berkeley (1713), *Three Dialogues Between Hylas and Philonous* (voice of Philonous) (Q)

"Truth is the cry of all, but the game of the few."

— George Berkeley (1744), *Siris* (Q)

References

1. Author. (1921). "Article" (pg. 153), *The Sociological Review*, Vol. 13.
2. Berkeley, George. (1713). "Moral Attraction", *Guardian*, No. 126, Aug 5; in: *The Works of George Berkeley, Volume 4: Miscellaneous Works, 1707-50* (editor: Alexander Fraser) (pgs. 186-90). Clarendon Press, 1901.
3. Sorokin, Pitirim. (1928). *Contemporary Sociological Theories* (§1: The Mechanistic School (pdf), pgs. 4-62; Berkeley, pg. 11). Harper & Brothers.
4. Cohen, I. Bernard. (1994). *Interactions: Some Contacts between the Natural Sciences and the Social Sciences* (pg. 82). Publisher.
5. Cohen, I. Bernard. (1994). "Newton and the Social Sciences: with Special Reference to Economics, or, the Case of the Missing Paradigm", in: *Natural Images in Economic Thought: Markets Read in Tooth and Claw* (editor: Philip Mirowski) (§3). Cambridge University Press.

Further reading

● Barnes, Harry E. (1922). "Bishop Berkeley's Essay on Moral Attraction: an Illustration of the Influence of Seventeenth Century Natural Science on Social Philosophy" (pdf), *The Open Court*, 36:251-56

External links

● George Berkeley – Wikipedia.

θΔics

In existographies, **George Boole** (1815-1864) (IQ:175|#227) [RGM:424|1,280+] [GME:77] was English mathematician, educator, philosopher and logician; noted for []

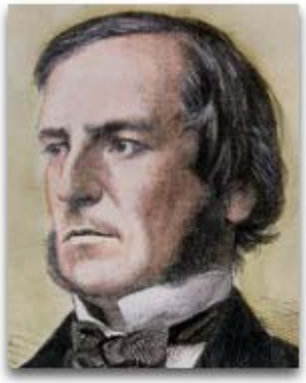

Overview

Born to a poor cobbler who self-taught himself mathematics, by studying Newton, among others; invented Boolean algebra, the basis of modern computer logic (as later ferreted out by Claude Shannon (1938) in terms of logic gates), with the publication of his 1847 *Mathematical Analysis of Logic*; his 1854 book *The Laws of Thought*, one of the first books in human mathematics, showed how to reduce human reasoning (logic) to a symbolic form resembling ordinary numerical algebra; was a college professor in mathematics by age thirty-four (despite holding no university degree); published a treatise on differential equations (1859).

Further reading

â— Boole, George. (1847). *Mathematical Analysis of Logic*. Publisher.
â— Boole, George. (1854). *The Laws of Thought*. Publisher.

External links

â— George Boole – Wikipedia.

θΔics

In existographies, **George Byron** (1788-1824) (IQ:180|#134) (Cattell 1000:30) [RGM:347|1,260+] (CR:28), aka "Lord Byron" (royal name) or "Byron", was an English romantic movement poet, a categorized boredom philosopher, a top 10 Western literature author (Q), by Murray space allocation ranking (2002), noted for []. [1]

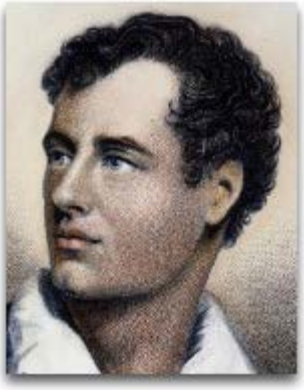

Elective affinities

In 1814, Byron, in some way, seems to have been a part of the Percy Shelley and Mary Shelley circle and their so-called "Church of Elective Affinities", some of which Mary Shelley recounts as follows: [3]

> "The results of this marriage were two children, a daughter and a son, and a separation. The circumstances of the disagreement between Shelley and his wife, have never been cleared up. Perhaps it would have been quite as noble if Shelley had continued the martyr of a youthful misstep instead of making his wife the victim of notions about marriage in which there is no evidence that she shared. However this may be, he made himself so acceptable to Miss Godwin, daughter of the novelist and Mary Wolstonecraft, that she consented to elope with him to Switzerland in July, 1814. They crossed to Calais in an open boat, not without danger of being lost. A Miss Claremont went with them. She also was a deaconess in the Church of the Elective Affinities, and (**Lord Byron** having joined the party) became the mother of the Allegra, mentioned in his will. This, however, seems to have been on a second visit to the Continent, the fugitives having in the meanwhile returned for a short time to England. This last continental tour occupied but a few months, during which the northern part of Italy was visited."

Byron was also present at Percy Shelley's 1822 cremation, following is age 29 supposed suicide.

In 1993, Tom Stoppard, in his play *Arcadia* compares Byron, in a way, to Goethe and his *Elective Affinities*, intermixed with heat, sex, the second law, and the "attraction that Newton left out", i.e. chemical affinity and or human chemical affinity.

Lovelace

Byron's daughter Ada Lovelace (1815-1852) (IQ:175), herself a Ranker greatest mind (#415|1,123) and smartest woman ever (#18), owing to her mother's idea that education would root out any insanity associated with her father's side, was raised as an accelerated child prodigy / forced prodigy, so to say, and was taught mathematics and science from some of the world's leading scholars, including Mary Somerville; and in 1842, wrote the world's first computer program, and algorithm for calculating a sequence of Bernoulli numbers with Charles Babbage's analytical engine.

Quotes | On

The following are Byron related quotes:

> "You are right; we must speak with respect of Lucretius; I see no one who can compare with him except **Byron**, and Byron has not his gravity nor the sincerity of his sadness. The melancholy of the ancients seems to me more profound than that of the moderns, who all more or less presuppose an immortality on the yonder side of the black hole. But for the ancients this black hole has the infinite itself; the procession of their dreams is imaged against a background of immutable ebony. The gods being no more and Christ not being not yet, there was between Cicero and Marcus Aurelius a unique moment in which man stood alone. Nowhere else do I find this grandeur; but what renders Lucretius intolerable is his physics, which he gives as if positive. If he is weak, it is because he did not doubt enough; he wished to explain, to arrive at a conclusion!"
>
> — Gustave Flaubert (c.1875), "Letter to Madame Roger des Genettes" [2]

Quotes

The following are example Byron quotes:

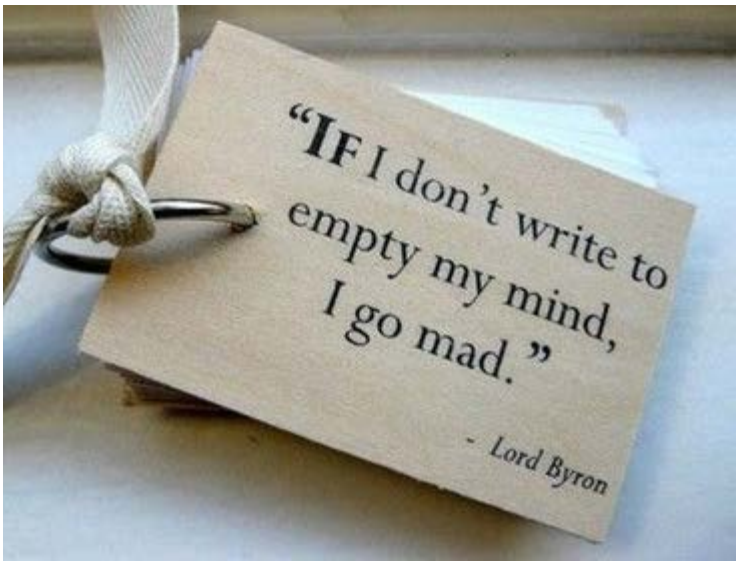

Byron on writing, mind, and madness.

> "Those who will not reason are bigots, those who cannot are fools, and those who dare not are slaves."
>
> — Lord Byron (c.1810)

> "Adversity is the path to truth."
>
> — Lord Byron (c.1810)

> "There is something of a pagan in me that I cannot shake off. In short, I deny nothing, but doubt everything."
>
> — George Byron (c.1810)

> "There are four questions of value in life. What is scared? Of what is the 'spirit' made of? What is worth living for and what is worth dying for? The answer to each is the same. Only love."
>
> — George Byron (c.1810) (O)

> "The great object of life is sensation—to feel that we exist, even though in pain."
>
> — George Byron (c.1810) (O)

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3. Shelley, Mary. (1839). "Memoir of Shelley", in: *The Poetical Works of Percy Bysshe Shelley: in Three Volumes* (pg. xxviii) (editor: Mary Shelley with a Memoir). Little, Brown and Co, 1855.

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● Lord Byron – Wikipedia.

θΔics

In hmolscience, **George Carey** (1845-1924) was an American physician known, particularly in human chemistry, for the 1919 publication of his *The Chemistry of Human Life* in which he set forth the view that: [1]

> "Man's body is a chemical formula in operation and there can be but one law of chemical operation in vegetable or animal organisms."

It would by another eighty-one-years (2000) before the first calculation of this formula would be made by American limnologists Robert Sterner and James Elser. [2]

Carey's person as a "chemical formula in operation view" was a precursor book to the modern science of human chemistry, according to which the human being is a twenty-six element molecule (a human molecule) no different than any other molecule in the universe.

Overview

A significant turning-point thinker in the history of the human molecule concept was American physician George Carey who, in his 1919 book *The Chemistry of Human Life*, made an attempt to integrate biochemistry with chemical affinity logic along with knowledge of active elements into a synthesis of a chemistry of the human being. Although his work is detracted a bit by religious and other mineral elixir types of healing remedies, he does outline a few gems. In a truncated opening quote, for instance, Carey points to the idea that: [3]

> "The human organism is an intelligent entity that works under the guidance which man has designated as chemical affinity."

This seems to be an example of the external force model of human movement. Carey goes on to state that the human body is a storage battery that must be supplied with the proper elements—chemicals—to set up motion at a rate that will produce what we please to call a live body. In commentary on how the laws of chemistry apply universally, he states:

> "There can be but one law of chemical operation in vegetable or animal organisms. When man understands and cooperates with that life chemistry, he will have solved the problem of physical existence."

The most interesting point in his book is his statement that:

> "Man's body is a chemical formula in operation"

It would be eighty-one years before Sterner and Elser would actually make an attempt at calculating this formula. And the addendum 'in operation' is a huge topic not yet even begun to be simplified, e.g. as exemplified the fact that human molecules have 98 percent annual atomic turnover rate, whereas other molecules, such as H_20, do not seem to have such a turnover rate.

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External links

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● Carey, George W. (1845-1924) – WorldCat Identities.

θΔics

In philosophy, **George Carlin** (1937-2008) was an American stand-up comedian noted for his 1992 “entropy fan” skit, wherein he defines himself as a fan of entropy, and for his 1999 "god skit", wherein he makes a parody of religion as but a bit bullsh*t story. [1]

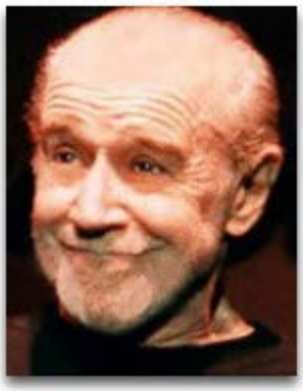

Entropy

In 1992, Carlin gave the following routine in one of his stand-ups: [2]

> “I'm a bit perverted, but it amuses me that no one can really trust the water anymore. And the thing I like about it the most is, it means the system is beginning to collapse, and everything is slowly breaking down. I enjoy chaos and disorder, not just because they help me professionally, they're also my hobby, you see, I'm an entropy fan. I'm an entropy fan, when I first heard of entropy in high school science I was attracted to it immediately. When they told me that in nature all systems are breaking down, I thought what a good thing, what a good thing, perhaps I can make some small contribution in this area myself.
>
> And of course it's not just in nature, in this country, the whole social structure just beginning to collapse, you watch, just beginning now to come apart at the edges and the seams. And the thing I like about that, is that it means it makes the news on television more interesting,... The planet will be here for a long, long, long time after we're gone, and it will heal itself, it will cleanse itself, cause that's what it does. It's a self correcting system..." The decay and disintegration of this culture is astonishingly amusing if you are emotionally detached from it... I sincerely believe that if you think there's a solution, you're part of the problem. My motto: Fu*% Hope!”

(add discussion)

Religion | Atheism

In 1999, Carlin, in atheism circles, did his famous so-called "god skit" on religion: [3]

> “When it comes to bullsh*t, big-time, major league bullsh*t, you have to stand in awe of the all-time champion of false promises and exaggerated claims, religion. No contest. No contest. Religion. Religion easily has the greatest bullsh*t story ever told. Think about it. Religion has actually convinced people that there's an invisible man living in the sky who watches everything you do, every minute of every day. And the invisible man has a special list of ten things he does not want you to do. And if you do any of these ten things, he has a special place, full of fire and smoke and burning and torture and anguish, where he will send you to live and suffer and burn and choke and scream and cry forever and ever 'til the end of time! But He loves you. He loves you, and He needs money! He always needs money! He's all-powerful, all-perfect, all-knowing, and all-wise, somehow just can't handle money! Religion takes in billions of dollars, they pay no taxes, and they always need a little more. Now, you talk about a good bullsh*t story. Holy sh*t! ”

(add discussion)

Quotes

The following are other noted quotes:

> “Religion is like drugs, it destroys the thinking mind.”
>
> — George Carlin (c.1999) (Ñº); a seeming play on the "religion is the opium of the masses" ideology

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3. (a) Carlin, George. (1999). "You are All Diseased" (V), 11th HBO live broadcast, Beacon Theater, New York, Feb 6.
(b) You Are All Diseased – Wikipedia.

External links

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θΔics

In existographies, **George Devereux** (1908-1985), born “Gyorgy Dobo”, was an Austria-Hungarian-born French American, ethnologist and psychologist, noted for []

Overview

In 1978, Devereux published a 47-page chapter overview of his “Collected Works”, wherein he outlines some type of space-time model of people defined as “social mass” moving in a “social space” according to the laws of thermodynamics, give or take some peculiar ideas, along the way touching on things such as the Jeans-Donnan debate (1934). [1]

Education

In c.1928, Devereux, as a youth, studied chemistry and physics with Marie Curie in Paris. He was looking for ‘objective’ truth in physics and 'subjective' truth in music. In his later writings, he often referred to notions taken from the natural sciences.

In 1931, Devereux, at the Ecole des Langues Orientales, studied the Malay language, then studied under Marcel Mauss and Paul Rivet in anthropology, graduating from the Institute of Ethnology.

In c.1932, Devereux stated (Ñº) that he had been “converted to Freud”.

In 1936, Devereux completed his PhD at the University of California, Berkeley, under Alfred Kroeber.

In 1963, Devereux began to work with Claude Levi-Strauss, carefully studying his *A World on the Wane* (*Tristes tropiques*).

Keys

Devereux was found via the Google Books keys: social mass, thermodynamics.

Quotes | By

The following are quotes by

> “I next turn to the structure of ‘social space’, viewed as a gravitational field in which the concept of the ‘social mass’ of the individual plays a crucial role as a nucleus of attraction. The ‘social mass’ of an individual contributes to the structuring of the social space surrounding him. The ongoing relationship between two individuals can be analyzed via the transformation of systems of coordinates. This permits one to view society as a space so curved that for Y the least path will be that which passes near X. The **‘curvature’ of the social space** can also be called customs or morals. I next consider stability and change in terms of the third law of thermodynamics and recall once more that all living systems, society included, are chronoholistic systems which must be described in integro-differential equations not reducible by any amount of differentiation to differential equations involving a ‘one point memory’; these equations must involve statistical macro-parameters. I conclude with the observation that sociological theory resembles an investigation of the ‘metrical’ properties of ‘social space’. The scheme presented here is compatible with any logically coherent sociological theory.”
>
> — George Devereux (1978), “Collected Works” (pg. 383) [1]

> “It seems probable that, for some time to come, psychological anthropology—and even all sciences of man—will have to face the **inside/outside (object/observer) problem** [see: advanced perspective] **which has preoccupied me scientifically since 1931** and will have to come to terms with the distortions resulting

from it. No matter how many new techniques we devise, it is unlikely that, in the foreseeable future, data will come to us as aseptically packaged as did, in the 1930s, certain food products proudly labelled ‘untouched by human hands’. For even the contents of such hypothetically uncontaminated fact-packages end up in someone's (contaminated) mind.”

— George Devereux (1978), “Collected Works” (pg. 399) [1]

References

1. Devereux, George. (1978). “Collected Works”, in: *The Making of Psychological Anthropology* (editor: George Spindler) (§11: 361-408; quote, pg. 383). University of California Press.

External links

â— George Devereux – Wikipedia.

θΔics

In existographies, **George Drysdale** (1825-1904) was an English social theorist, noted for []

Overview

In 1854, Drysdale in his anonymously published *Elements of Social Science*, seems to have made an effort to educate people about sexual diseases, recommend the use of birth control, help with poverty and crime, all via some type of spirit-in-matter stylized sociology.

Influenced

Drysdale was cited as an anonymous "able mind" by Ludwig Buchner in his *Force and Matter* (pgs. 53, 376).

Quotes | By

The following are quotes by Drysdale:

> "It is a duty of all men to study the laws of their body, no less than those of their mind."
>
> — George Drysdale (1854), *Elements of Social Science* (pg. 4)

> "Neither in crime nor in madness is there anything strange or extraordinary. Both arise from settled and definite causes, which are just as accessible to our investigation as the laws of natural philosophy, except that the human mind is harder to understand, on account of its greater complexity .... It is a truth that each one of us would become criminal or mad, if he were placed in conditions favorable thereto."
>
> — George Drysdale (1854), *Elements of Social Science* (pg. 4); cited by Ludwig Bucher (1855) in *Force and Matter* (pg. 376)

References

1. Drysdale, George R. (1854). *The Elements of Social Science: Physical, Sexual and Natural Religion*. London: E. Truelove.

External links

â— Drysdale, George R. (-1904) – WorldCat Identities.
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θΔics

In hmolscience, **George Effinger** (1947-2002) was an American writer noted, in literature thermodynamics, for his 1972 religio-mythology thick book *What Entropy Means to Me*.

Overview

In 1972, Effinger, in his science fiction novel *What Entropy Means to Me*, employs an end section called a "well of entropy", described like a black hole into which all matter fall, electrons stop spinning, becoming more dissociated, tending to the primal chaotic state of randomly distributed energy.

This narrative concept (a spin on black hole entropy), seems to trace to American theoretical physicist John Wheeler's 1971 comment to Mexican-born Jewish physicist Jacob Bekenstein that black holes seem to flout the second law of thermodynamics and to Bekenstein's 1972 solution to this issue that black holes should have a well-defined entropy. [2]

In his novel, Effinger contrasts the Well with "the River", the symbol and essence of divinity on the planet they are found. He proclaims that God is the ultimate order, the embodiment of organization, and that the River and the Well are two poles of existence; wherein that the River has its source in the Well, making the cycle complete.

Effinger's book, according to one review, presents a story thick with religious and mythological significance. [3]

Education

Effinger attended Yale University, but was dissuaded by an organic chemistry course in his aims to become a doctor. [1]

References

1. Effinger, George A. (1972). *What Entropy Means to Me* (section: "the well of entropy", pg. 171;About the Author, pg. 177) Signet, 2002.
2. Baeyer, Hans Christian von. (2004). *Information - the New Language of Science.* Cambridge, (pgs. 205-11). Massachusetts: Harvard University Press.
3. Wagner, T.M. (2002). "Review: What Entropy Means to Me", SFReviews.net.

External links

â— George Alec Effinger – Wikipedia.

θΔics

In existographies, **George Eliot** (1819-1880) (IQ:175|#232) [RGM:212|1,500+] (GFG:4) (SWE:3) (CR:34), born "Mary Ann Evans" or "Marian Evans" (Hecht, 2003), was an English realism philosopher and novelist noted, in human chemistry, for her 1872 novel *Middlemarch*, described by those including Martin Amis and Julian Barnes as the "greatest novel" in the English language, a novel which was modeled on German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities* (*Die Wahlverwandtschaften*), which explained reality according to the science and principles of physical chemistry, according to which humans are large types of evolved chemical entities whose reactions are governed by the principles of affinity chemistry, in Elliot and Goethe's day, or the laws and principles of chemical thermodynamics, modern days.

Translations

In the early 1840s, Eliot has openly renounced Christianity, and thereafter translated David Strauss' *Life of Jesus* and Ludwig Feuerbach's *Essence of Christianity*; the latter was the only book she ever published in her own name. [8]

Goethe

English German-literature scholar Gerlinde Roder-Bolton gives the following opinion as to when Eliot read Goethe's *Elective Affinities*: [6]

> "Eliot greatly admired *Die Wahlverwandtschaften*, but she first read it in her twenties and continued thinking about German literature for another thirty years.It would be very difficult to recover what she thought of this work as her ideas developed during this period. She did not have a single view of this work."

From 1854 to 1855, Eliot spent eight months in Germany, a period that marked the start of her existence with English philosopher and literary critic George Lewes (1817-1878), known for his 1855 prose literature book *The Life of Goethe*, in which he, supposedly, analyzed Goethe's *Elective Affinities*. Though Eliot documented this journey more extensively than any other, it has remained an under-researched part of Eliot's biography.

In the 2006 book *George Eliot in Germany, 1854-55: Cherished Memories*, Roder-Bolton draws on Eliot's own writings, as well as on extensive original research in German archives and libraries, to provide the most thorough account yet published of the couple's visit. Rich in historical, social, and cultural detail, the book not only records the couple's travels but also supplies a context for their encounters with people and places; and in which Roder-Bolton shows how the crossing of geographical boundaries may be read as symbolic of Eliot's transition from single woman to social outcast and from translator and critic to writer of fiction. Roder-Bolton states that by the end of this trip, Eliot had read every published word by Goethe.

Eliot, at one point, she took a three-month pilgrimage to Goethe's home town of Weimar.

Stahr | Goethe

On late 1854, as noted by Roder-Bolton, Eliot had a disagreement with German writer and literary historian Adolf Stahr (1805-1876) about the *dénouement* of Goethe's *Die Wahlverwandtschaften*. [3] Specifically, on 29 Dec 1854 Eliot recorded the following in her journal: [7]

> "Friday 29. A fine frosty morning. Wrote to Noel and to my Sister. Worked a little at Spinoza but not well enough to do much . Read a little of Scherr. Read aloud Heine's *Salon*. Then we went to Prof. Stahr's house and spent the evening there. A remarkable miniature of Schiller of which there is not engraving. We talked of the *Wahlberwandschaften*, amongst other things. Stahr finding fault with the dénouement which I defended. (Concession or license)."

German literary historian Adolf Stahr with whom Eliot in 1854 argued against in defense of Goethe's *Elective Affinities* denouement. [7]

Stahr argued that it was wrong, while Eliot defended Goethe. [2] The issue was important enough for her to enlarge on it in her "Recollections on Berlin", where she insisted that Goethe's ending truthfully followed from the characters of the individuals in the work. Goethe's *Elective Affinities*, from this point forward, is said to have had a significant influence on Eliot's work and realism philosophy.

Middlemarch

In 1872, Eliot, building on realism literature model of Goethe's published the novel *Middlemarch*, wherein, according to Carl Krockel (2007), she "systematically elaborates on what Goethe only suggests in *Die Wahlverwandtschaften*, since each of her four characters is also bound to wider social relationships through affinity". The following, as highlighted by Tweeter (Ñº) poster Zach Fruit (2016), points out a key connecting point between the two works:

He paced up and down in the big drawing-room, tried all manner of things but could concentrate on nothing. What he wanted was to see her, and see her alone, before Charlotte came back with the Captain. It grew dark, the candles were lit.

At last she came in, radiantly lovable. The feeling that she had done something for her friend had enhanced her whole being beyond itself. She laid down the original and the copy on the table in front of Eduard. 'Shall we compare?' she said with a smile. Eduard did not know what to reply. He looked at her, he looked at the copy. The first pages were written with the greatest care, in a delicate female hand; then the writing seemed to change, to become easier and freer; but how great was his astonishment when he ran his eyes over the final pages. 'In heaven's name!' he cried. 'What is this? That is my handwriting.' He looked at Ottilie, and again at the pages. Especially the ending was exactly as if he had written it himself. Ottilie said nothing, but she was looking into his eyes with the greatest satisfaction. Eduard raised his arms. 'You love me!' he cried. 'Ottilie, you love me!' And they held one another in a tight embrace. It would not have been possible to say who first seized hold of the other.

Elective Affinities | 1809

her hand with a spasmodic movement; and so they stood, with their hands clasped, like two children, looking out on the storm, while the thunder gave a tremendous crack and roll above them, and the rain began to pour down. Then they turned their faces towards each other, with the memory of his last words in them, and they did not loose each other's hands.

"There is no hope for me," said Will. "Even if you loved me as well as I love you—even if I were everything to you—I shall most likely always be very poor: on a sober calculation, one can count on nothing but a creeping lot. It is impossible for us ever to belong to each other. It is perhaps base of me to have asked for a word from you. I meant to go away into silence, but I have not been able to do what I meant."

"Don't be sorry," said Dorothea, in her clear tender tones. "I would rather share all the trouble of our parting."

Her lips trembled, and so did his. It was never known which lips were the first to move towards the other lips; but they kissed tremblingly, and then they moved apart.

The rain was dashing against the window-panes as if an angry spirit were within it, and behind it was the great swoop of the wind; it was one of those moments in which both the busy and the idle pause with a certain awe.

Dorothea sat down on the seat nearest to her, a long low ottoman in the middle of the room, and with her hands folded over each other on her lap, looked at the drear outer world. Will stood still an instant looking at her, then seated himself beside her, and laid his hand on hers, which turned itself upward to be clasped. They sat in that way without looking at each other, until the rain abated

Middlemarch | 1872

In the passage highlighted, Goethe, as adopted by Eliot, exposes the view that just as is the case when two chemicals in the laboratory are put in contact that it is impossible to say which of the two chemicals triggered the reaction between the two, so it is the case for humans reacting in love the chemical reaction. In modern terms, one can state that the exchange force operates between the two atomic bound state bodies in question, chemicals or human, and that it is the exchange of bosons that triggers or forces the mechanism of the micro-movements. In simpler terms, in respect to the belief in love at first sight, one of the pair, according to studies, must be in the state of mind of wanting or ready to fall in love, according to which the "sight" (light reflection) of the desired object first triggers the said human chemical reaction.

In 2007, English German-cultures scholar Carl Krockel, in his PhD dissertation "D.H. Lawrence and Germany: the Politics of Influence" turned book, summarized the Goethe-Eliot connection as follows: [4]

> "German culture played a dominate role in **George Eliot**'s life, beginning with her shift from Evangelicism to free-thought when she studied German historical criticism of the Bible in the 1840s. Her lover George Lewes acknowledge her contribution to his analysis of *Die Wahlverwandtschaften* in his pioneering biography of Goethe and *The Mill on the Floss* shares similar scenes to those in Goethe's novel. George Eliot may be thinking about *Die Wahlverwandtschaften* in parts of her 1855 article 'The Morality of Wilhelm Meister', where she describes how Goethe 'quietly follows the steam of fact and of life; and waits patiently for the moral processes of nature as we all do for her maternal process.' George Eliot's appraisal of Goethe as 'the man who helps us to raise to a lofty point of observation, so that we may see things in their relative proportions' [see: advanced perspective] is comparable to Georg Lukacs's characterization of Goethe's 'consistently thought-out systemization of these relationships, contrasts and nuances, and his ability to transform all these features into a vivid plot with can characterize them'. For Lukacs, in the plot of *Die Wahlverwandtschaften* Goethe comes closest to the designs of the nineteenth-century realist novel, of which *Middlemarch* is the supreme example.
>
> The chemical theory is the structural backbone of Goethe and George Eliot's realism. Chemicals are only electively affined when their attraction excludes other chemicals. In his narrative Goethe uses the framework of two pairs of lovers, whose attraction to different aspects of each other reveals their psychological 'properties'. Eduard and Charlotte are married, having known each other since childhood; the Hauptmann arrives, and links up with Eduard in their horticultural plans while excluding Charlotte for being too fanciful. Charlotte is satisfied by the arrival of the childlike Ottilie, and is also finding her own measured nature in affinity with the Hauptmann's. Meanwhile, Ottilie appeals to Eduard's childlike side, but the Hauptmann finds her ideas disturbing. And so the narrative continues.
>
> In *Middlemarch* George Eliot systematically elaborates on what Goethe only suggests in *Die Wahlverwandtschaften*, since each of her four characters is also bound to wider social relationships through affinity."

Interestingly, Krockel also notes that English novelist and literary critic D.H. Lawrence (1885-1930) was "certainly aware of Goethe's theory of affinities, if only through reading of Ernst Haeckel's account of it in *The Riddle of the Universe*" and argues that Haeckel's pantheism helped Lawrence break from his Christian upbringing, for a monism based on the material universe. The Lukacs work mentioned above, to note, seems to be his 1968 *Goethe and His Age*.

Education

Eliot was well educated and well connected. Through a social connection, she obtained a position as assistant editor of the Westminster Review, a rather shocking achievement for a woman at that time, and one which allowed her to

Alternative depictions and facial expressions of **George Elliot**, the late 19th century's greatest literary advocate of German polymath Johann Goethe's 1809 physical chemistry based model of literary realism.

become acquainted with London's literary crowd. Among that crowd was George Lewes, who encouraged Eliot to begin writing fiction in additional to poetry. And write fiction, she did—becoming one of England's most revered and prolific novelists

Eliot was said to have been able to read and absorb 40 books per month; which, using the conservative estimate that she began reading at that rate at age 10, would indicate that she had read over 24,000+ books in her existence; in her time, she acquired the epitaph of "very wise woman" and also was measured by a phrenologist as having "very large brain". [1]

American 19th century literature scholar Peter Dale, in his 1989 *In Pursuit of a Scientific Culture*, devotes a chapter or two to Eliot's interest in 'higher physics'. [5]

Quotes | By

The following are noted quotes:

> "The quickest of us walk around well-wadded with stupidity."
>
> — George Eliot (c.1850)

> "Goethe was the last true polymath to walk the earth."
>
> — George Eliot (c.1870)

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(c) Peter Dale (faculty) – University of California, Davis.
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Further reading

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External links

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θΔics

In hmolscience, **George Ellis** (1939-) is []

Overview

In 2005, Ellis, in his "Physics and the Real World", citing Philip Anderson on reductionism, sought to address the following, in his mind, conceptual problem:

> "No current physics experiment or theory explains the nature—or even the existence—of emotions, money, fine art, football games, or people. What can physics say about such things?"

The article that follows, however, falls short of its subtitle: he cites Robert Laughlin's *A Different Universe: Reinventing Physics from the Bottom Down* (2005), and his "protected states emergence over reduction" theory, employs the term "emergence" ten times, and concludes that "physics can't account for human intentions", let alone can "physics and chemistry predict the development or functioning of a single cell".

In circa 2006, Ellis' article, to note, was listed as required reading (Q) material for honors 462 course (Q) taught by American physicist Richard DiDio (Q) at LaSalle University.

God | Free will

> *See main: Einstein on free will*

In 2014, Ellis seems to have been arguing for free will and for top down causation; in interview with John Horgan, when given the following Einstein quote:

> "If the moon, in the act of completing its eternal way around the earth, were gifted with self-consciousness, it would feel thoroughly convinced that it was traveling its way of its own accord…. So would a being, endowed with higher insight and more perfect intelligence, watching man and his doings, smile about man's illusion that he was acting according to his own free will."

Then asked if he believed in free will, Ellis responded with the following:

> "Yes. Einstein is perpetuating the belief that all causation is bottom up. This simply is not the case, as I can demonstrate with many examples from sociology, neuroscience, physiology, epigenetics, engineering, and physics. Furthermore if Einstein did not have free will in some meaningful sense, then he could not have been responsible for the theory of relativity – it would have been a product of lower level processes but not of an intelligent mind choosing between possible options. I find it very **hard to believe** this to be the case – indeed it does not seem to make any sense. Physicists should pay attention to Aristotle's four forms of causation – if they have the free will to decide what they are doing. If they don't, then why waste time talking to them? They are then not responsible for what they say."

Ellis, similar to Terrence Deacon (2011), who also reacts against American physicist Philip Anderson's 1972 "More is Different", here is trying to sell god in coded repackaged scientifically-sounding form via a mix Aristotelian causation and emergence talk, similar to what Deacon and others have attempted.

Education

In 2005, Ellis was an emeritus professor of mathematics at University of Cape Town, South Africa.

See also

- Chemical Thermodynamics in the Real World

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- George F.R. Ellis – Wikipedia.
- George F.R. Ellis (faculty) – University of Cape Town.

θΔics

In thermodynamics, **George Fordyce** (1736-1802) was a Scottish physician and chemist noted for his *circa* 1785 experiments in which he was said to have measured a *gain* in the weight of water after it was frozen, thus implying a rather incredulous finding about the nature of heat, i.e. that heat has some type of negative weight, a finding that prompted American-born English physicist Benjamin Thompson to repeat the same experiment in the winter of 1787, resulting in his followup studies on the nature of heat, in particular his famous 1798 cannon-boring experiment, the famous experiment that would eventually go on to lay rest to the caloric theory. [1]

In 1785, Fordyce also reported a *loss* in the weight of bodies when melted or heated. [2]

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θΔics

In hmolscience, **George Arthur Gerhold** (1937-) is an American physical chemist noted for his two cultures synergy work with American sociologist Ed Stephan on the subject of how the Gibbs fundamental equation applies to sociology and social territories. [1]

Other

Gerhold was co-author with Peter Rock of the 1974 book *Chemistry: Principles and Applications*, which is his most-widely held work.

Education

Gerhold completed his PhD with a dissertation on "An Experimental and Theoretical Investigation of Stopping Bands in Molecular Crystals" in 1963 at the University of Washington. Gerhold from 1969 to 2004 was a physical chemistry professor at Western Washington State College. In 1993, Gerhold was associate dean of arts and sciences. [2] Gerhold currently is emeritus professor of physical chemistry. [3]

See also

â— Two cultures department

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θΔics

In thermodynamics, **George Ernest Gibson** (1884-1959) was a Scottish-born American chemist noted for 1917 English translation of German physical chemist Otto Sackur's 1912 *Textbook on Thermochemistry and Thermodynamics*, which was used as the primary teaching textbook in chemical thermodynamics at the Lewis school of thermodynamics, up until the publication of the 1923 *Thermodynamics and the Free Energy of Chemical Substances* by Gilbert Lewis and Merle Randall.

Education

Gibson, was the son of John Gibson, a professor of chemistry at the University of Edinburg, the school at which the younger Gibson completed his BS in 1906. Gibson then completed his PhD at the University of Breslau under Otto Lummer in 1911. In 1914, following teaching and research positions at the University of Breslau and the University of Edinburg, Gibson became a chemistry instructor (and later professor) at the University of California, Berkeley, at the time when the chemistry department was being reorganized by American physical chemist Gilbert Lewis in the formation of what eventually came to be known as the Lewis school of thermodynamics.

Gibson's first three research publications (he produced ten before coming to Berkeley) were in the field of organic chemistry, but he soon transferred his major interest to physical chemistry and quantum theory. His work on thallium vapor, published in 1911, was the first conclusive proof that spectral lines are produced by thermal emission.

Lewis, whose major interests were thermodynamics and physical chemistry, placed Gibson in charge of two new honors courses, 'thermodynamics' and 'advanced physical chemistry'. Out of this, Gibson published, in 1917, an English translation of *A Textbook of Thermochemistry and Thermodynamics*, by Otto Sackur, and this served as a reference text for this subject until 1923, when Lewis and Randall's now-famous *Thermodynamics and the Free Energy of Chemical Substances* on chemical thermodynamics appeared.

Gibson's early research in Berkeley followed two main patterns, spectroscopy and low temperature calorimetry. His first applications of spectroscopy were devoted to a study of solutions formed by dissolving alkali and alkaline earth metals in liquid ammonia and methylammine. He also studied the extraordinarily large electrical conductivities of these solutions.

Entropy

In 1917, Gibson published, in collaboration with Lewis, a survey of the entropies of the elements from existing but rather inadequate low temperature calorimetric data. He enlisted three of his graduate students, Wendel M. Latimer, George S. Parks, and William Giauque, in low temperature researches designed to test the validity of this method of evaluating absolute entropies of elements and compounds.

The low temperature calorimetric experiments on ethyl and propyl alcohols and their mixtures (Parks and Latimer) and related work on glycerine glass and crystals (Giauque) showed that the third law of thermodynamics could not be applied to non-crystalline states. These three students of Gibson served as nuclei (Parks at Stanford and Latimer and Giauque at Berkeley) for a rapid spread of low temperature research through their own students. This development put the United States in a leading position in experimental work related to the third law of thermodynamics. Gibson retired in 1954.

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θΔics

In hmolscience, **George F. Gilder** (1939-) is an American writer noted, in economic thermodynamics, for his 1981 to 2006 anti-reductionism publications, aimed to substantiating religious views over that of scientific views in economics.

Overview

In 1981, Gilder, in his million-copy best seller *Wealth and Poverty*, penned a last chapter discussion on how the second law or "entropy theory" is only a metaphor and that when applied to the economics of human activity is not to be concerned with. [1] Gilder seems to rely heavily on information theory to justify his suppositions and suggestions. The following is an example quote: [2]

> "Gone is the view of a thermodynamic world economy, dominated by natural resources being turned into entropy and waste by human extraction and use … the key fact of knowledge is that it is anti-entropic: it accumulates and compounds as it is used … Concerning the microcosm, the mind transcends every entropic trap and overthrows matter itself."

In his 1990 book *Microcosm: the Quantum Revolution in Economics and Technology* he has a chapter on the Curve of Declining Entropy. [3] In his 2000 book *Telecosm: How Infinite Bandwidth will Revolutionize Our World*, uses the information theory work of Claude Shannon to argue, in short, that:

> "Through learning, civilization defies the thermodynamic laws of decline and fall."

In 2006, Gilder, in his "Evolution and Me", gave a summary of how evolution could never have arisen from chemical processes because of Claude Shannon's 1948 information theory. The following excerpt is the meat of his argument, which has to one of the most inane and incoherent convolutions of mis-logic attempted on a disproof of evolution: [5]

> "After *Wealth & Poverty*, my work focused on the subject of human creativity as epitomized by science and technology and embodied in computers and communications. At the forefront of this field is a discipline called information theory. Largely invented in 1948 by Claude Shannon of MIT, it rigorously explained digital computation and transmission by zero-one, or off-on, codes called "bits." Shannon defined information as *unexpected* bits, or "news," and calculated its passage over a "channel" by elaborate logarithmic rules. That channel could be a wire or another other path across a distance of space, or it could be a transfer of information across a span of time, as in evolution.
>
> Crucial in information theory was the separation of content from conduit — information from the vehicle that transports it. It takes a low-entropy (predictable) carrier to bear high-entropy (unpredictable) messages. A blank sheet of paper is a better vessel for a new message than one already covered with writing. In my book *Telecosm* (2000), I showed that the most predictable available information carriers were the regular waves of the electromagnetic spectrum and prophesied that all digital information would ultimately flow over it in some way. Whether across time (evolution) or across space (communication), information could not be borne by chemical processes alone, because these processes merged or blended the medium and the message, leaving the data illegible at the other end."

The idiocy of this statement bears witness to the prime example of mathematics gone wrong.

Religion

Glider is vocal opponent of materialism, reductionism, and evolution, and instead supports religious-based concepts intelligence design, irreducible complexity, and a Shannon information theory view of evolution, i.e. that the increase in

the information accumulation in the mind circumvents the laws of thermodynamics. [5] Glider also heads the Discovery Institutes, an organization that funds religious-centric science. In other words, Glider is a Bible-backer.

Education

Glider completed a BA in political science in 1962 at Harvard University.

References

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θΔics

In thermodynamics, **George Alfred Goodenough** (1868-1929), often cited as G.A. Goodenough, was an American mechanical engineer and thermodynamics professor noted for his 1911 *Principles of Thermodynamics*. [1] The textbook contains good definitions on terms such as degradation, the inequality of Clausius, among others.

Education

In the 1900s, Goodenough was an associate professor of mechanical engineering, at the University of Illinois and by 1916 he was professor of thermodynamics.

Quotes

The following are related quotes:

> "The famous **Goodenough** treatise on thermodynamics appeared in its first edition in 1911."
>
> — Anon (1929), American Society of Refrigerating Engineers [2]

References

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θΔics

In existographies, **George Gore** (1826-1908) (IQ:175|#250) (SN:42) was a British electrochemist, physics and chemistry lecturer, and moral philosopher, noted for []

Deism | Atheism

Gore's entire presentation, as suggested by citation of classic deists like Alexander Pope and crypto-atheists such as Thomas Hobbes, seems to be basically of the implicit atheism variety or closet atheism variety, if it were to be classified; he seems, however, to avoid the social opprobrium brought on by direct disavowal of god and open atheism by recasting his presentation as a "god as truth" ideology, akin to Benedict Spinoza's god as nature ideology, albeit based on experiment and scientific method based arrival of truth; the following are a few representative statements:

> "As new scientific knowledge has increased, belief in witchcraft, sorcery, demonology, exorcism, evil influences and omens, unseen spirits, a 'god of evil', supernatural and occult powers, supernatural sources of strange diseases, evil presages from comets and eclipses, fetishism, worship of images and of the sun, a belief that the earth is the chief body in the universe, that man is the "lord of creation', &c., &c., have largely passed away, and beliefs more consistent with facts and with true inferences drawn from them, have taken their place."
>
> — George Gore (1880), *The Scientific Basis of National Progress* (pg. 119)

> "The whole of the book is written in the spirit that '**god is truth**', and that obedience to 'truth' in accordance with the requirements of universal energy comes before all other considerations; and the entire book may be regarded as a plea for greater ideas, for truth, and obedience to law."
>
> — George Gore (1899), *The Scientific Basis of Morality* (pg. v)

In this arena, then, he seems to avoid discussion of god and or explicit atheism, and instead to do battle, with the prevalence of the "supernatural ideas about the human will", in respect to consciousness, choice, and seeming discussion about the "soul", in the context of science.

Overview

In 1880, Gore, age 54, in his *The Scientific Basis of National Progress: Including that of Morality*, chapter: "The Scientific Basis of Mental and Moral Progress", which he dedicated to the Birmingham Philosophical Society, sketched out a materialist model of morality (see: materialistic morality); the synopsis of which is as follows: [1]

> "The dependence of mental progress upon science may be rendered manifest in several ways :
>
> > 1st. By showing that new scientific knowledge is continually extending and modifying our views of existing things.
> > 2nd. That inventions based upon scientific discoveries have aided and extended our mental powers.
> > 3rd. That mental phenomena may be made the subject of experiment, observation, analysis, and inference.
> > 4th. That the criteria of truth, and the mental powers and processes employed for discovering and detecting truth, are the same in mental as in physical science.
> > 5th. That mental action is subject to the great principles and laws of science.
>
> Moral progress may be proved to have a scientific basis:

1st. By showing that moral actions are a class of mental actions, and therefore subject to the same fundamental laws and influences.
2nd. That the discovery of new scientific knowledge, and the use of inventions based upon it, often conduce to morality.
3rd. That **moral phenomena may be made the subject of experiment**, observation, analysis, and inference.
4th. That the criteria of truth, and the mental faculties and processes employed, in discovering truth, are the same in moral as in physical science.
5th. That **the fundamental rules of morality are subject to the great principles of science**.
6th. That moral improvement follows in the wake of scientific advance.
7th. By showing the moral influence of experimental research in imparting "the scientific spirit"; promoting a love of truth; dispelling ignorance and superstition; detecting error; imparting certainty and accuracy to our knowledge; inculcating obedience to law; producing uniformity of belief; aiding economy and cleanliness, promoting humanity, &c., &c.

Each of these will be treated with extreme brevity."

In 1899, Gore expanded his early scientific morality chapter into the *The Scientific Basis of Morality: the Great Laws of Science are Chief Guides of Life*; the following are representative quotes:

"The chief subject of this book, and the main idea pervading it, are expressed in its title. Its leading object is to show, in a general way, that the entire conduct of man—physical, mental and moral—is based upon a scientific foundation; to make clear the truth that the great powers and laws of science are the chief guides of life; to show that universal energy acting according to law is the true 'divine' power governing physical, moral social, and religious conduct; and to illustrate the influence of science upon the material, mental, and moral progress of mankind."

— George Gore (1899), *The Scientific Basis of Morality* (pg. v)

"The **energies of nature** are viewed as being the causes and regulators of all things; as determining the existence of man, the rate of human progress and of civilization, and the rise and fall of nations, sects and families; as fixing the duration of human life, the limits of human ability, and man's mental and physical powers. and of his 'freedom of will'; as forming the basis of human consciousness, of mind, and of the chief rules of physical and moral conduct; as being the causes of knowledge and ignorance, good and 'evil', morality and 'immorality', pleasure and pain, happiness and unhappiness, reward and punishment, wealth and poverty, economy and waste ; as being the origin of competition, and intimately related to justice, truthfulness, and honesty; and to man's powers of self-discipline, self-regulation, choice and selection, his material prosperity, etc."

— George Gore (1899), *The Scientific Basis of Morality* (pg. iii-iv)

"Morality, the subject of duty, or of right and wrongdoing in conscious creatures, is usually considered to relate only to those actions over which a man has or might have had control, and which it was his duty either to perform or avoid, and not to those which are entirely beyond his influence, it is therefore essentially dependent upon the power of selection or choosing. As then all moral actions require voluntary choice between right and wrong, and every act of choice is a mental one of comparison of two or more things, all moral actions are mental ones. We cannot compare things which have not made any mental impression upon us. We know further, and the evidence already given proves, that mental actions are

intimately dependent upon the principles of nature operating within and around us. If then all acts of morality (or immorality) are mental ones, and if all mental actions are intimately dependent upon the great principles of nature; then all acts of morality are dependent upon those principles. Morality also cannot be properly understood without a knowledge of various sciences, especially biology, because it relates to human creatures, all of whom are morally affected by the various forces and substances belonging to the physical and chemical sciences."

— George Gore (1880), *The Scientific Basis of National Progress* (pgs. 120-21)

(add)

Education

Gore was born in Blackfrairs, Bristol, England to a George Gore, senior, a cooper (Ñº); in his adolescence, he was educated at a small private school, from which he was removed at age 12 to become an errand boy. In 1943, Gore, age 17, was apprenticed to a cooper, where he stayed for four years; supposedly "supplementing his scanty education in his leisure hours". In 1851, Gore, age 25, migrated to Birmingham, where first found employment at Birmingham as timekeeper at the Soho works, next as a practitioner in medical galvanism; he subsequently became a chemist to a phosphorus factory, afterwards (1870–80) was lecturer in physics and chemistry in King Edward's School, and finally, from 1880 onwards, was head of the Institute of Scientific Research, Easy Row, Birmingham, which Gore conducted privately, and where he resided for the remainder of his days. [4] In 1902, he was signing himself off as "Dr. G. Gore, F.R.S."

Quotes | Employed

The following are quotes employed by Gore:

"There is only one reality in the world—it is movement, external, without beginning, the cause of each and every change."

— Thomas Hobbes (c.1651), *Publication*; cited by George Gore (1902) in "The Coming Scientific Morality" (pg. 422); cited by Baptist Anon (1902) in "Materialist Morality"

"Everything that exists depends upon the past, prepares the future, and is related to the whole."

— Hans Orsted (c.1840), *Publication*; cited by George Gore (1902) in "The Coming Scientific Morality" (pg. 430)

"It is impossible to lay down a railway without creating an improved intellectual influence. It is probable that Watt and Stephenson will eventually modify the opinions of mankind, almost as profoundly as Luther and Voltaire."

— Anon (c.1850), *Publication*; cited by George Gore (1880) in *The Scientific Basis of National Progress* (pgs. 87-88)

Quotes | By

The following are quotes by Gore:

"When all is known and all is understood. Mankind will see, **whatever IS, is good**."

— George Gore (1899), *The Scientific Basis of Morality* (iii); a paraphrase of Alexander Pope's 1734 "one truth is clear: whatever IS, is right" motto

"On the authority of sufficient evidence I venture to affirm that the only permanent basis of morality is immutable truth; and as well-verified science is the most perfect truth we possess, we may reasonably expect to find a fixed basis of morality in it. By the term 'science' I mean knowledge derived from proper and sufficient evidence; by 'morality' I mean such human conduct as produces justifiable effects on sentient creatures; by 'immorality', the infliction of unjustifiable injury upon living beings; and by 'truth' I mean statements consistent with all known facts."

— George Gore (1902), "The Coming Scientific Morality" (pg. 420) [2]

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External links

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θΔics

In existographies, **George Green** (1793-1841) (GPE:#) (CR:16) was a English mathematical physicist noted for his 1828 treatise "An Essay on the Application of Mathematical Analysis to the Theories of Electricity and Magnetism", in which he introduced the concept of "potential function". [1]

Overview

Green, starting from Pierre Laplace's equation, was the first to define the potential as a function of Cartesian coordinates V(x,y,z), particularly the potential energy of an arbitrary static distribution of electric charges.

Green's article was self-published, and sold only 51 copies. Curiously, it was Irish physicist William Thomson who in 1845 (age 21) first unearthed Green's treatise and brought it into the hands of the leading scientists; which is the same year he also unearthed Sadi Carnot's 1824 treatise on thermodynamics, bring that into the hands of the leading scientists. [2]

Some of Green's mathematical concepts seem to have been influential in the writings of Peter Tait and James Maxwell. [5]

Green, independent of, it seems, albeit nearly in the same time period of, Carl Gauss, did the first work on the divergence theorem. [6]

Green also is the eponym of the Gauss-Green-Stokes theorem, the fundamental theorem of calculus:

$$\int_a^b f(x)\,\mathrm{d}x = F(b) - F(a)$$

which asserts that the integral of the derivative of some function in an interval is equal to the difference in the values of the function at the endpoints of the interval: [7]

Education

Green's biography is somewhat remarkable in that he was almost entirely self-taught, having only had about one year of formal schooling as a child between the ages of 8 and 9, after which he read books via a Nottingham Subscription Library to educate himself.

In 1833, aged 40, he later entered Cambridge University, as an undergraduate, and graduated in 1837. After graduation Green stayed on at Cambridge, writing on optics, acoustics, and hydrodynamics. However, in 1840 he became ill and returned to Nottingham where he died the following year.

Mispicture

Green being a relatively obscure genius, photo correctness seems to be an issue. The 2008 book *Continuum Thermodynamics*, by Polish materials science engineer Krzysztof Wilmanski, for example, mis-pictures a George Green (1793-1841) alongside Augustin Cauchy (1789) and Leonhard Euler (1707-1783), whereas the book photo shown is some American named George Bernard Green (1822-1901). [4]

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External links

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θΔics

In existographies, **George Gurdjieff** (c.1872-1949) was Russian-born French mystic philosopher or “esoteric teacher” (Najovits, 2003), noted for []

Egypt | Christianity

In early adulthood, according to his own account, Gurdjieff's curiosity led him to travel to Central Asia, Egypt, Iran, India, Tibet and Rome before he returned to Russia for a few years in 1912.

In 1915, Gurdjieff, met P.D. Ouspensky in Moscow, during which time or shortly thereafter, Gurdjieff said the following:

> “Christianity was not invented by the fathers of the church. It was all taken in a ready-made form from Egypt, only not from the Egypt that we know but from one which we do not know. This Egypt was in the same place as the other but it existed much earlier...prehistoric Egypt was Christian many thousands of years before the birth of Christ.”
>
> — George Gurdjieff (c.1915), reported (Ñº) by P.D. Ouspensky; cited by Simson Najovits (2009)

In 2003, Simson Najovits was citing Gurdjieff as having made some “links between Egyptian religion and Christianity.” [1]

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1. Najovits, Simson R. (2003). *Egypt, Trunk of the Tree, Volume 1: A Modern Survey of and Ancient Land* (pg. 41). Algora.

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θΔics

In thermodynamics, **George Hatsopoulos** (1927-) is a Greek-born American mechanical engineer, of the MIT school of thermodynamics, noted for his co-authoring of the 1960 *Thermodynamics* textbook with Joseph Keenan.

Education

George Hatsopoulos, who has three thermodynamics professor uncles at the Greek Polytechnic, came to the US on a PhD scholarship to study at MIT in the late 1940s. [5] Hatsopoulos received his bachelor's (1949), master's (1950), engineer's (1954), and doctorate (1956) degrees all in mechanical engineering at MIT. Of note, it is said that Hatsopoulos did not fall in love with thermodynamics at first sight and that he disliked his first class in thermodynamics. [4]

Thermo Electron Corporation

In 1956, he finished his doctoral dissertation, in which he described his newly invented device a "thermionic energy converter", which purported to convert heat energy directly into electric energy without any moving parts, by the operation of the release of electrons.

Hatsopoulos theorized that, properly heated, some materials could give off electrons (that is, produce electricity) to a nearby receptor. If he could only find the right material, he would dispense with huge steam generating plants. There would be an immense savings in raw energy and a giant leap in economic efficiency.

Shortly thereafter George and his brother John Hatsopoulos (1935-), who was in the process of finishing a BA in history (minor in mathematics) at Northeastern University, decided they should form a company and sell the device. To fund the startup company, which they named Thermo Electron Corporation, according to John: [5]

> "We borrowed $50,000 from a Greek ship owner to start the company. He was a family friend. His son was at that time at the Harvard Business School. The ship owner was a very tough guy who earned more money than God. He said, 'OK, I will loan you the $50,000 to teach my stupid son that is not a way to start a company'."

They began by using George's living room and basement (in Belmont, a few miles away from MIT) as a manufacturing faculty and skipping forward a few years, the electric heat engine idea never worked out, but the effort resulted in the formation of a new growing engineering company, which as of 2011, is worth $25 billion. [3][5] George remained as chairman of the company until 2001.

Thermo Fisher Scientific

In 2006, Thermo Electron Corporation acquired Fisher Scientific, founded in 1902 by American engineer Chester Fisher, and became Thermo Fisher Scientific, making it one of the most important life sciences corporations in Massachusetts, employing 30,000 people with a stock market value of $15.5 billion. [2]

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θΔics

In existographies, **George Holyoake** (1817-1906) (FA:107) was a British editor, commonly known as the coiner of the term "secularism" (1851), noted for []

Overview

In 1841, Holyoake, together with radical bookseller Charles Southwell (1814-1860), dissented from the official policy of Owenism, i.e. the utopian socialist philosophy of 19th-century social reformer Robert Owen and his followers and successors, that lecturers should take a religious oath, to enable them to take collections on Sunday; founded the atheist publication *Oracle of Reason*, because of which he was soon imprisoned because of its content; Holyoake took over as editor, and was moved to an atheist position as a result of his experiences.

In 1846, Holyoake became the editor of the free thinker paper *The Reasoner*, wherein the famous atheist "human chemistry" coiner E.B. published several noted articles.

In 1851, Holyoake coined the term "secularism" because (Ñº)(Ñº) he regarded "atheism" as a negative word. [1]

Holyoake was influenced by Auguste Comte, Jean Lamarck (Hecht, 2003), and Charles Darwin; he was an associate of Harriet Martineau, an atheist oft-said to have been the first female sociologist, who notable wrote to Holyoake upon reviewing Darwin's *On the Origins of Species*. [2]

In 1871, Holyoake, in his *The Principles of Secularism Illustrated*, discussed Thomas Jefferson's god questionings. (Ñº)

Quotes | By

The following are quotes by Holyoake:

> "I do not believe there is such a thing as a god."
>
> — George Holyoake (1868), London lecture [3]

> "Free thought means fearless thought. It is not deterred by legal penalties, nor by spiritual consequences. Dissent from the Bible does not alarm the true investigator, who takes truth for authority not authority for truth. The thinker who is really free, is independent; he is under no dread; he yields to no menace; he is not dismayed by law, nor custom, nor pulpits, nor society-whose opinion appalls so many. He who has the manly passion of free thought, has no fear of anything, save the fear of error."
>
> — George Holyoake (1896), English Secularism: A Confession of Belief (pg.18) (Ñº)

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θΔics

In hmolscience, **George Homans** (1910-1989) was an American sociologist, part of the Harvard Pareto circle, noted for his 1934 *An Introduction to Pareto: His Sociology*, co-written with Charles Curtis, wherein the retell the synopsis of the Lawrence Henderson run two-year Vilfredo Pareto seminar at Harvard on mathematical physics and chemistry applied to the social sciences. [1] The following seems to encapsulate Homans existence: [2]

> "It was Henderson, the philosopher of science, who told DeVoto to read Pareto, with fateful consequences for me."

American sociologist Leon Warshay characterizes Homans as having been "mechanistic".

Quotes

The following are other noted quotes:

> "In my last three years DeVoto was my tutor in my field of English literature, with whom I met once a week to discuss my reading. Henderson had urged the *Sociologie* on DeVoto, as he urged it on everyone; DeVoto in turn urged it on me, not because it was sociology but because it might clear a lot of nonsense from my mind."
>
> — George Homans (1962), "Autobiographical Introduction" [3]

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θΔics

In human chemistry, **George Lewes** (1817-1878) (CR:14), of-cited as "G.H. Lewis", was an English philosopher and critic of literature who became part of the mid-Victorian ferment of ideas which encouraged discussion of Darwinism, positivism, and religious skepticism, who is noted for his 1855 two-volume *Life of Goethe*, wherein, together with his lover George Elliot, supposedly, they "analyzed" German polymath Johann Goethe's 1809 *Elective Affinities*. [1]

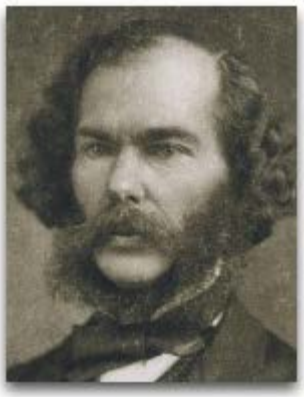

Minna Herzlieb

Lewes was one of the first to make the connection between sending Minna Herzlieb off to school and sending Ottilie off to school: [2]

> "At length it was resolved to send Minna to school, and this absolute separation saved them both" just as "in the novella, Ottilie also is sent back to school."

Emergence

In 1875, Lewis, in his *Problems of Life and Mind*, is oft-cited for his use of the term emergence, which, supposedly, were influenced by John Mill:

> "Every resultant is either a sum or a difference of the co-operant forces; their sum, when their directions are the same—their difference, when their directions are contrary. Further, every resultant is clearly traceable in its components, because these are homogeneous and commensurable. It is otherwise with **emergents**, when, instead of adding measurable motion to measurable motion, or things of one kind to other individuals of their kind, there is a co-operation of things of unlike kinds. The emergent is unlike its components insofar as these are incommensurable, and it cannot be reduced to their sum or their difference."

(add discussion

Other

Irish mathematical economist Francis Edgeworth, in his discussion of the nervous energy of the consciousness, cites Lewes for some reason. [4]

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θΔics

In thermodynamics, **George Augustus Linhart** (1885-1951) was a Viennese-born American physicist, associated with the Lewis school of thermodynamics, noted for his derivation of a general formula for heat capacity vs. temperature from thermodynamic principles, using a Bayesian approach to probability. [1]

Education

Linhart completed his BS at the University of Pennsylvania in 1909 and his MA and PhD from Yale University, at the Kent Chemical Laboratory, under Frank Gooch, in 1909 to 1913. He taught at the University of Washington, Seattle (1913-1914), Simmons College, Boston (1915), University of California, Berkelely (1915-1920), Eureka Junior College, CA (1921), and Riverside Junior College, Riverside, CA (1921-1948). Most of his publications were in organic chemistry.

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Threads

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θΔics

In science, **George Liveing** (1827-1924) was a English chemist noted for his 1885 *Chemical Equilibrium the Result of Dissipation of Energy*, an early theoretical book in the development of the science of modern chemical thermodynamics. [1]

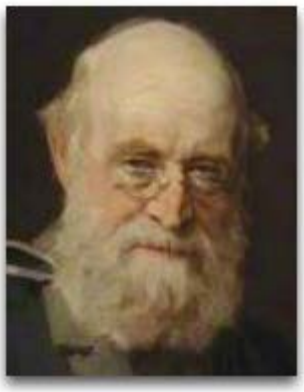

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θΔics

In existographies, **George Lucas** (1944-) (RGM:949|1,500+) (CR:2) is an American film maker, noted for his 1977 epic space opera *Star Wars*, which describes a "force that binds the universe", as being behind all things.

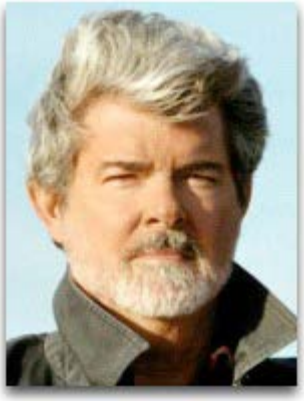

Castaneda

In 1974, American anthropologist Carlos Castaneda (1925-1998), in his *Tales of Power*, describes his encounters, while taking peyote, with the Yaqui Indian religious shamans, and their models of forces and powers of things, and description of people as "luminous beings". Lucas read this book and used its general scheme as the basis for the now-famous "force" of Star Wars.

Medi-Chlorians

See also: Abioism

In 1999, Lucas, in Star Wars: Episode I, in an attempted to elaborate on the force and life, introduced the concept of "medi-chlorians", a portmantua of "medium", or substance through which another passes (Ñº), and "chlorophyll" (1819), itself coined by French chemists Pierre Pelletier (1788-1842) and Joseph Caventou (1795-1877) from Greek khloros "pale green" (see: Chloe) + phyllon "a leaf" (see: folio). [2]

Quotes | On

The following are related quotes:

> "Congratulations to the Cantina crowd and all the **forces of your imagination** that made Star Wars so worthy of the throne."
>
> — Steven Spielberg (1977), "Open Letter to George Lucas" (Ñº), Variety, Oct 2

> "**Lucas**, in his search for fantasy, read Grimm's fairy tales and C.S. Lewis' *Narnia Chronicles*, J.R.R. Tolkien and James Frazier's *Golden Bough*. He also read Greek, Islamic and Indian mythology and the works of modern mythologists like Carlos Castaneda and Joseph Campbell."
>
> — Garry Jenkins (1997), *Empire Building* (pg. 38) [1]

> "**Lucas** had by now simplified the mysticism in his script. Obi-Wan Kenobi would be a guardian of the wisdom of the Jedi knights and the force, a mysterious power that 'binds the universe together'. Lucas had found the inspiration for the idea in a story in Carlos Castaneda's *Tales Of Power* (1974), in which a Mexican Indian mystic, Don Juan, described a 'life force'."
>
> — Garry Jenkins (1997), *Empire Building* (pg. 62) [1]

References

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θΔics

In hmolscience, **George Lundberg** (1895-1966) (CR=33) (SN:31) was an American sociologist—classified, in Stark classification (1962), as a "secondary form" of social mechanism thought—noted for his 1939 *Foundations of Sociology*, wherein he espousing extreme theories of social mechanism in which the individual is discussed in guise of the physicalist terms of atoms and molecules, and for his use of notions of motion, energy, and force as social processes for defining, based on the earlier views of Albert Weiss (1925), societal groups as 'electron-proton configurations'. [1]

The following is a noted preface statement: [5]

> "If we follow this [scientific] method as faithfully in the social sciences as we have followed it in physics it may yield us a corresponding reward in our powers of control."

In his 1947 book *Can Science Save Us?*, which seems to be his most-popular work, he mentions thermodynamics on one page. [4] Austrian social economist Werner Stark was a harsh objector to Lundberg's ideas on social mechanics.

Humans | Proton-electron configurations

The following is a truncated aggregate quote of Lundberg's argument: [2]

> "The arrangement of electrons and protons into various types of groups of different symmetrical relations to each other constitute matter. The structure of matter (and of behavior) is, then, a function of its electron-proton configuration. From these elementary hypothetical entities, systems of all degrees of complexity are constructed, variously called atoms, molecules, elements, compounds, tissues, plants, animals, men, races, nations, constellations, galaxies, etc. The social sciences are concerned with the behavior of those electron-proton configurations called societal groups, principally human groups. Just as the properties of a substance are a function of the dynamic and spatial arrangements of limited groups of electrons and protons, so the various energy transformations are functions of the movement types by which tone type of electron symmetry changes into another until a new symmetry has been established."

(add discussion)

Sociological phlogistons

Lundberg seems to have been the first to employ the so-called "sociological phlogiston" argument, namely that many of our most cherished terms, in the future, via progressive scientific advancement and reductionism, will turn out to be phlogiston-like concepts, once thought to exist and be real, but eventually found superfluous, superseded, disproved and or defunct and not corroborative with growing evidence: [6]

> "The less objective our objectifying technics are for certain experiences (i.e. the 'subjective' and 'spiritual') the greater is the task of communicating them so that they can be verified (the test of objectivity). Indeed, this process of objectifying them may involve analysis, reclassification, and designation by new and strange symbols. Many terms at present will probably be abandoned entirely as devoid of content when the behavior phenomena to which they once referred have been more adequately described by other terms. As science has advanced this has been true of all pre-scientific terms and categories.
>
> Let us take one illustration: Phlogiston. Chemists one-hundred and fifty years ago [saw] phlogiston as a necessary element in the explanation of combustion. By experiments involving much careful and accurate weighing, Lavoisier was able to demonstrate finally the unnecessary character of the hypothetical entity, phlogiston. The terms 'will', 'feeling', 'ends', 'motives', 'values', etc. These are the phlogiston of the

social sciences. I have no doubt that a considerable part of the present content of the social sciences will turn out to be pure phlogiston."

This type of argument—dubbed eliminative materialism—independently, it seems, is found in the 1988 statements of Patricia Churchland: (Ñº)

> "The various sciences of the mind-brain will likely converge upon unified explanations. Perhaps not of 'consciousness', for in the evolved framework that may have gone the way of 'caloric fluid' or 'vital spirit'."

In the years to follow, both her and Paul Churchland, her husband, have become famous for employing the it seems both the caloric and phlogiston arguments of the mind: "According to the prominent eliminativists, Patricia and Paul Churchland, beliefs are more like ether or phlogiston than like electrons." (Ñº)

Henderson | Gibbs

American equilibrium historian Cynthia Russett asserts that Lundberg drew freely from the equilibrium work of Lawrence Henderson, and hence gained his understanding of a scientific system, according the physicochemical system models of Willard Gibbs. [7] This, however, may have been an over-exaggeration. While Lundberg does indeed devote two pages of his *Foundations of Sociology* to re-quotes of Henderson's 1935 *Pareto's General Sociology* descriptions of Gibbs' physicochemical systems, and while he does cite Henderson on six pages, there does not seem to be further direct discussion of Gibbs. [8] His 1964 abridged edition, e.g., cites neither Henderson nor Gibbs. Whatever the case, Russett summarizes Lundberg's outlook as follows: [9]

> "Lundberg proposed to view human behavior (his ultimate datum) as 'movement within a field of force in time.' Manifestations of this behavior were to be considered functions of energy, energy being simply 'a name for amounts of change in relationships' In other words every observable event embodied a transformation of energy from one form to another. These transformations were at least theoretically predictable rather than simply random: they always tended toward equilibrium.
>
> There is always one state which is the most probable of all: 'the most probable state of a situation or a system is in physics called *equilibrium*.' Hence, 'all natural movement … may be thought of as tending to establish an equilibrium within the area where it operates.' This was, Lundberg added, a dynamic or moving equilibrium since in dynamic systems (of which, presumably, society was one) the point of reference of the system was continually changing."

Russett goes on to assert that Lundberg had in mind here the second law of thermodynamics and how the velocities of gas molecules will, whatever their original distribution, will, over time, approach the Maxwell-Boltzmann distribution. While Lundberg does cite Maxwell on one page of his *Foundations*, neither thermodynamics nor entropy are mentioned.

Sorokin

In 1940, Pitirim Sorokin gave his typical scathing review. On equilibrium, generally referring to the Henderson-Gibbs pages, some of which are quoted above, Sorokin states the following:

> "Lundberg's failure to carry through his *profession du foi* is demonstrated in many ways; first, in an inadequate knowledge and distortion of the main principles of mechanics, physics, mathematics, and other natural sciences. For instance, his notion of equilibrium (pp. 208 ff.) has hardly anything in common with either D'Alembert's, Lagrange's, Hoff's, Le Chatelier's, Ostwald's, or Gibbs', or any other concept of

> equilibrium in mechanics, physics, or chemistry. It is something bizarre, reminding of one of the Aristotelian notion of the tendency of the heavy bodies to fall down and of the light bodies to go up—a humorous situation for an author who declares Aristotle antiquated."

This certainly is pretty funny. Here we see Sorokin throwing out a string of big names, as though seemingly in command of hard science knowledge, but in realty unaware of the deep historical connectiveness of the integrations and absorptions of each variant of equilibrium theory, from D'Alembert up through Gibbs, and into Henderson, and then into quotes of Henderson on equilibrium by Lundberg — as though Sorokin were fiending at being a physical chemistry.

Sorokin, to the end, it seems was anti-physical science, when it came to sociology. In his 1936 presidential address before the Internal Congress of Sociology, in a paper entitled "Le concept d'equilibre: est-il necessaire aux sciences socialies?", Sorokin stated: [11]

> "Equilibrium appears to me inadequate and represents a liability rather than an asset in the social sciences, and for this reason, should be dropped rather than used in these disciplines."

He goes on to state:

> "We must cut short this imitation of the physico-chemical, and even in part biological, sciences, we must acquire the autonomy to speak a language which is not distorted by borrowings from the other natural sciences."

Soul | Spirit → Physical science

The following is Lundberg's very sharp take on the history and future of the slow replacement of all the spiritual and soul conceptions into pure physical descriptions: [6]

> "Semantic confusion has resulted in a most mischievous separation of fields of knowledge into the 'natural' and 'physical' on one hand as against the 'social' and 'cultural' (mental, non-material, spiritual) on the other. As a consequence, it has been assumed that the methods of studying the former field are not applicable to the latter. The generally admitted lag in the progress of the 'social' as contrasted with the 'physical' sciences has been a further result. The history of science consists largely of the account of the gradual expansion of the realms of the 'natural' and the 'physical' at the expense of the 'mental' and the 'spiritual'. One by one 'spiritual' phenomena have become 'physical'. The evolution of the concept of the 'soul' is especially relevant, because its final stage of transition or translation by way of the 'mind' into purely 'physical' concepts is still under way."

(add discussion)

Praise | Tribute

The following are notes of praise and or tribute:

> "The most able and influential of the positivists is **George Lundberg**, who has been professor of sociology at the University of Washington for a number of years. The works embodying his position most fully are *Foundations of Sociology* and *Can Science Save Us?*"
>
> — Don Martindale (1998), *The Nature and Types of Sociological Theory* [13]

"In fairness, we should note, however, that some theorists in the positivist tradition, e.g. **Lundberg** (*Can Science Save Us?*, 1947), have made sincere efforts to reconcile political and moral concerns with the dream of a positivist science."

— Daniel Rigney (2001), "Society as a Machine" [12]

Quotes

The following are noted quotes:

"The scientific method, as developed in the physical sciences during the last four hundred years, has proved incomparably powerful in solving certain age-long problems of cold, darkness, famine, epidemics, distance, communication, transportation, and a thousand other needs. Ironically, he finds himself today [in the wake of WWI 1914-19 and WWII 1939-45] engulfed in difficulties with his fellow man. Why does he not turn in this predicament to the methods which have proved themselves so potent in other fields? The principle reason is tradition. Human relations are not yet generally believed to be proper subjects for serious scientific study. Indeed, a great many accredited social scientists, in the sense of practicing economists, sociologists, psychologists, anthropologists, and above all 'political' scientists, are not themselves convinced that science can and should mean, in their respective field, the same impersonal, rigorous, and nonethical discipline that the word implies in the physical world."

— George Lundberg (1947), *Can Science Save Us?* (pg. 4)

"There is no doubt that much of what we not teach on social subjects is worse than useless, because it consists merely of transmitting the errors, prejudices, and speculations of bygone generations. Unless knowledge is constantly tested and replenished through scientific research, education may be an enemy rather than an aid to social amelioration."

— George Lundberg (1947), *Can Science Save Us?* (pg. 8)

"Many thoughtful people, including some scientists of distinction and unquestioned competence in their own fields, genuinely feel that there are certain differences between the subject matter of the physical and social sciences which preclude the applicability of the same general methods to both."

— George Lundberg (1947), *Can Science Save Us?* (pg. 18)

"One distinguished scientist [Julian Huxley, 1940] has urged that a basic difference between the physical and the social sciences is that in the latter 'the investigator is inside instead of outside his material.' This is supposed to be self-evident and require no analysis."

— George Lundberg (1947), *Can Science Save Us?* (pg. 20) [14]

Lundberg's 1947 *Can Science Save Us?*, wherein he applies the scientific method to sociology, is said to be one of his best books, in respect to positivism.

"Most people's acquaintance with science has involved laboratories and controlled experiments. Indeed, the word science probably conjures up to most people the image of a man in a white coat looking critically at a test tube. Accordingly, another insuperable obstacle to social science is usually urged. How can a piece of society be put in a test tube [see: social retort]?"

— George Lundberg (1947), *Can Science Save Us?* (pg. 21)

"Another fatal obstacle to a full-fledged natural science of human social phenomena is alleged to be the presence in the latter of a unique and mysterious something called *motives*. What is meant by motives? The word is used to designate those circumstances to which we find it 'reasonable' to attribute an occurrence. The motive we impute to an act is accordingly entirely relative to the frame of reference we adopt and accept as reasonable. To a scientist, the motives of a stone rolling downhill or of a boy murdering his father are simply the full set of circumstances resulting in either event."

— George Lundberg (1947), *Can Science Save Us?* (pg. 22)

"Social scientists are today merely chipping flint in the stone age of their science, I do not see that we have any choice but to follow the rough road that other sciences have traveled."

— George Lundberg (1947), *Can Science Save Us?* (pgs. 27-28)

"Shall we are shell we not assume that we can formulate laws of human behavior which are comparable to the laws of gravity, thermodynamics, and bacteriology? These latter laws do not of themselves create engineering wonders or cure disease. Nevertheless they constitute knowledge of a kind which is indispensable."

— George Lundberg (1947), *Can Science Save Us?* (pg. 29)

"The application of scientific knowledge obviously involves value judgments of some sort. The problem is equally present in other sciences. After we know how to produce dynamite and what it will do, there remains the question: Shall we drop it from airplanes to destroy cathedrals and cities, or shall we use it to build roads through the mountains? After we know the effects of certain drugs and gases, the question remains: Shall we use them to alleviate the pain and prevent disease, or shall we use them to destroy helpless and harmless populations? There is certainly nothing in the well-developed sciences of chemistry or physics which answers these questions."

— George Lundberg (1947), *Can Science Save Us?* (pg. 37)

"The business of social scientists, broadly speaking, is to be able to predict with high probability the social weather, just as meteorologists predict sunshine or storm."

— George Lundberg (1947), *Can Science Save Us?* (pg. 38)

> “Pious platitudes doubtless will continue to be heard for some time about the ‘unpredictability’ of human behavior.”
>
> — George Lundberg (1947), *Can Science Save Us?* (pg. 49)

> “Human relations will improve when we undertake serious scientific study of how to improve them. In the meantime, we continue to rely on incantations, denunciations, exhortations, and exorcism exactly as our prescientific fore fathers did regarding their physical maladjustments. One reason for the failure of our schools to turn out people more familiar with the scientific approach is that even the physical sciences still receive a minor proportion of attention in the liberal arts college, not to mention the grades and high school.”
>
> — George Lundberg (1947), *Can Science Save Us?* (pg. 77)

> “One of the most significant things about the highly developed physical sciences, such as chemistry and physics, is their remarkable capacity to compel agreement on answers to physical and chemical questions. At the same time, scientists allow themselves the widest imaginable liberty and difference of opinion regarding ultimate values and philosophies.”
>
> — George Lundberg (1947), *Can Science Save Us?* (pg. 125-26)

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(b) Russett, Cynthia. (1966). *The Concept of Equilibrium in American Social Thought* (pgs. 125-26). Yale College.
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(b) Russett, Cynthia. (1966). *The Concept of Equilibrium in American Social Thought* (pg. 131). Yale College.
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(b) Russett, Cynthia. (1966). *The Concept of Equilibrium in American Social Thought* (pgs. 131). Yale College.
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14. (a) Huxley, Julian. (1940). “Science, Natural and Social”, *Scientific Monthly*, 57, Jan; in: *Science and Man* (editor: R.N. Anshen) (pg. 273). Brace and Co., 1942.
(b) Lundberg, George. (1947). *Can Science Save Us?* (thermodynamics, pg. 25). Longmans, Green and Co.

External links

â— George A. Lundberg – Wikipedia.

θΔics

In hmolscience, **George Francis Millin** (c.1841-c.1910) was an English science-religion reconciliation philosopher, on the side of theism, noted for his 1896 *Evil and Evolution: an Attempt to Turn the Light of Modern Science on to the Ancient Mystery of Evil*, wherein he attempts, in basically a waste of time style, to relegates religion to myth, embraces evolution theory, and therein attempts to track down the physical science origins of good and evil, citing thinker such as: Plato, John Milton, Goethe, Mill, Pope, Herbert Spencer, among others, with chapters such as "Natural Laws and Human Laws" (§7), "Satan Relegated to the Realms of Myth" (§1), discussing scientific concepts such as temperature and latent heat in respect to human conundrums, among others. [1]

Overview

The following is Millin's abstract:

> "The existence of evil in the world is the standing riddle of all the ages. This book is the outcome of an attempt to reconsider the subject in the light of the modern theory of evolution. Readers of it may notice that it contains scarcely any reference to the Bible: no passages are quoted from it, no appeal is made to it. Nothing should be inferred from this as to the writer's opinion of the Bible. This book is intended for general readers, all of whom have a very vital interest in the world's sorrow and suffering, but many of whom are in doubt and perplexity as to the degree of authority to be accorded to the Bible. The writer is convinced that if anything useful is to be said upon the matter at the present time, it can only be by bringing to bear upon the facts of the world around an eye of quiet observation, and a judgment fearless of everything but falsehood, and quite unbiased by authorities ancient or modern. This is what he has endeavored to do."

The Google Books key term search of Millin's book lures one into full reading, but the end result is time wasted. Nothing of note is found in the book.

Pope

Millin, in his *Evil and Evolution*, citing Alexander Pope, via John Mill, states the following on Pope's 4.128 "shall gravitation cease when you go by?" poem puzzle: [4]

> "In your perfect world, if a rock should fall when a man happened to be under it, what would save that man from being crushed? I cannot tell. I could not have suggested the law of latent heat to save the man from being drowned if he happened to be under a snow-covered hill when the temperature suddenly rose one degree above freezing point. That gravitation should cease is perhaps not so inconceivable as Pope would evidently have supposed."

(add discussion)

Quotes | Employed

The following are other quotes employed by Millin:

> "The theory of the devil must take its place with alchemy, the Ptolemaic theory of the universe, and other beliefs that the knowledge of the world has outgrown."
>
> — Minot Savage (1876), *The Religion of the Evolution*; cited by George Millin in *Evil and Evolution* (pg. 6) [5]

(add discussion)

Education

Millin, in his *Life in Our Villages* (1891), labeled himself as the "special commissioner of the *Daily News*", supposedly some type of London newspaper. [2] In his 1892 *The Social Horizon*, Millin states that he has been a London journalist for many years, interesting in solving the problems of poverty and industrial strife, stating that his book is but the "musings of an independent and unbiased observer perplexed by the movements of time." [3]

Quotes

The following are noted quotes:

> "All science starts with hypothesis."
>
> — George Millin (1896), title page quote to *Evil and Evolution*; a supposed truncation of Roger Bacon's Aristotelian-framed scientific method (1265) [1]

> "'God is good, and all that is good in the world is to be ascribed to him. The devil is bad, and all that is evil around us is to be ascribed to - him.' This was the simple faith of the writer of that old account of creation, and it has since been the faith of unnumbered generations who have never thought of questioning its truth. But science has entirely repudiated that old account of the origin of things. Neither in the world of matter nor in the world of mind is there, we are now assured, anything like creation of the perfect and complete. Such an idea has been wholly abandoned. It is all a matter of germ growth, of development, of unfolding, of evolution."
>
> — George Millin (1896) "Satan Relegated to the Realms of Myth", in *Evil and Evolution* (§1:2)

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2. Millin, George F. (1891). *Life in Our Villages*. London, Paris & Melbourne: Cassell & Co.
3. Millin, George F. (1892). *The Social Horizon* (pg. iv). Publisher.
4. (a) Pope, Alexander. (1734). *An Essay on Man* (§2: "Of the Nature and State of Man with Respect to Himself, as an Individual" (Q) (Q); §4: "On the Nature and State of Man with Respect to Happiness" (Q) (Q)). Publisher.
(b) Mill, John S. (c.1852). "Nature", in: *Three Essays on Religion* (pgs. 3-68; Pope, pg. 28). Longmans, Green & Co., 1885.
(c) Millin, George. (1896). *Evil and Evolution: an Attempt to Turn the Light of Modern Science on to the Ancient Mystery of Evil* (quote, pg. iii; Pope, pg. 78). MacMillan and Co.
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Further reading

● Yong, Amos. (2011). *The Spirit of Creation: Modern Science and Divine Action in the Pentecostal-Charismatic Imagination* (Millin, pg. 183). Wm. B. Eerdmans Publishing.

External links

● Millin, George Francis – WorldCat Identities.

θΔics

In science, **George Mobus** (c.1950-) is an American computer scientist turned systems modeler noted for []

Overview

In 2014, Mobus, together with co-author Michael Kalton, in their *Principles of Systems Science*, attempt to outline an Odum school like model of systems theory, employing loosed thermodynamical ideas along the way. [1]

In 2016, Mobus was a speaker at BPE 2016.

Education

Mobus completed his BS in zoology, an MBA in decision science, and a PhD in computer science at the University of Washington, Seattle. (Ñº)

References

1. Mobus, George E. and Kalton, Michael. (2014). *Principles of Systems Science* (thermodynamics, 34+ pgs). Springer.

External links

â— George Mobus (faculty) – University of Washington, Tacoma.

θΔics

In existographies, **George Moore** (1873-1958) (Stokes 100:80), aka “G.E. Moore” (citations), “Moore” (colleagues),” or “Bill” (family), was an English philosopher, noted for []

Overview

In 1903, Moore, in his *Princia Ethica*, argued that the question of “what is good?” is the central problem in ethics. [1] In Moore’s view, the question of whether something is good is always an open question and that ‘good’ denotes some simple natural property of the universe of which we are intuitively aware. [1]

Other

Moore, along with Gottlob Frege (IQ:165|#482) [RGM:235|1,310+], before him, and Bertrand Russell, co-existive with him, and Ludwig Wittgenstein, afterwards, are oft-classified as founders of the analytic philosophy.

Quotes | By

The following are quotes by Moore:

> “It is my personal opinion that Mr. Wittgenstein’s thesis [Tractatus Logico-Philosophicus] is a work of genius; but be that as it may, it is certainly well up to the standard required for a Cambridge degree of Doctor of Philosophy.”
>
> — George Moore (1929), “PhD review committee comments” (Ñº), Cambridge University

See also

â— Thomas Moore (1779-1852) (IQ:150|#680) [RGM:436|1,500+]

References

1. Moore, George. (1903). *Princia Ethica.* Publisher.
2. Stokes, Philip. (2002). *Philosophy 100: Essential Thinkers* (pgs. 166-67). Enchanted Lion Books.

External links

â— G.E. Moore – Wikipedia.

θΔics

In existographies, **George Santayana** (1863-1952) [HD:49] (FA:131) (CR:6) was a Spanish-born American philosopher noted for []

Quotes | By

The following are quotes by Santayana:

> "A conception not reducible to the small change of daily experience is like a currency not exchangeable for articles of consumption; it is not a symbol, but a fraud."
>
> — George Santayana (1906), "Reason in Society" [2]

> "My atheism, like that of Spinoza, is true piety towards the universe and denies only gods fashioned by men in their own image, to be servants of their human interests."
>
> — George Santayana (1922), "On My Friendly Critics", *Soliloquies in England* (Q)(Q)

> "All of our sorrow is real, but the atoms of which we are made are indifferent."
>
> — George Santayana (1925), *Dialogues in Limbo* [1]

> "Faith in the supernatural is a desperate wager made by man at the lowest ebb of his fortunes."
>
> — George Santayana (c.1925), *Dialogues in Limbo* (Q) [1]

References

1. (a) Santayana, George. (1925). *Dialogues in Limbo*. Charles Scribner's Sons.
(b) Cooper, Leon N. (1976). *Science and the Human Experience: Mephistopheles is Alive and Well and Living in the Space Age – Values, Culture, and Mind* (Amz) (pg. 150). Cambridge University Press.
2. (a) Santayana, George. (1906). *The Life of Reason* (§8: Reason in Society) (Q) Publisher.
(b) Andrews, Robert. (1993). *The Columbia Dictionary of Quotations* (pg. 906). Columbia University Press.

Further reading

- Santayana, George. (1910). *Three Philosophical Poets: Lucretius, Dante, and Goethe*. Harvard University Press.
- Santayana, George. (1950). *Atoms of Thought: an Anthology of Thoughts* (Lucretius, 8+ pgs). Philosophical Library.

External links

- George Santayana – Wikipedia.

θΔics

In existographies, **George Scott** (1921-2002) (IQ:#|#) (SN:30) [CR:53] was an American physical organic chemist noted, in hmolscience, for his 1985 Zeno of Citium inspired book *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will*, in which he extolled on the view that with the *circa* 1912 acceptance of the atomic hypothesis, the year that Wilhelm Ostwald admitted tentative acceptance of the existence of atoms, that we must now begin to grapple with the reality that humans are "molecular people" governed by physicochemical law.

USD | Two Cultures | Interdisciplinarity Program

In 1959, Scott, then at the at the University of South Dakota, as he retrospectively explains, in his chapter "Snow Drifts in the Heart of Texas" (a play on C.P. Snow's Two Cultures [1959] lecture), of his *Atoms of the Living Flame* (1985) (pgs. 133-39), was chosen as "research director" to oversee the distribution of funds of a grant from the NSF totaling over a quarter of a million dollars, distributed annually over a period of ten years (1959-1969), to support a summer research program for cross-campus departments, including: chemistry, physics, geology, biology, experimental psychology, the behavior of monkeys. In the course of this, Scott worked with Roger Davis, student of Harry Harlow, the monkey mother love behaviorist.

USD | Two Cultures | Honors Program

In late 1960s, NSF funding was cut to the USD summer program, after which Scott became half-time director of a newly formed USD "interdisciplinary honors program", which covered social sciences, the humanities, business, education, arts, during which he had to set up and fund senior thesis projects, in nearly almost every conceivable subject. During this period, he engaged in debate with Burrhus Skinner scholar Nancy Skeen (c.1945-) (Ñº), the chairperson of University of South Dakota's philosophy department, keen to Skinner's behaviorist philosophy of things, on the subject of behaviorism, free will, determinism and physical science, revolving around questions such as Clarence Darrow's determinism models in respect to crime and punishment.

Scott also, during this period, co-taught an interdisciplinary course, with social psychologist George Breed, noted for doing some research on eye contact in human interactions, entitled "Disorder in Nature and Human Affairs", relating behaviorism and physical science. During one course, Scott did a rock vs human scenario, of him standing on a ladder dropping rocks on people, themed in some way on the Skinner model of pigeons dropping bombs on the Germans, so to argue that people have free will, whereas rocks don't; which he summarizes as follows:

> "During one of our 'Disorder in Nature and Human Affairs' courses, I can still remember one fine afternoon, when I tried to explain the difference between human 'acts' and deterministic 'acts', described by physical natural laws, by describing a street scene in which I carried a rock onto a ladder above a sidewalk and allowed it to drop while people walked underneath. 'If I had dropped it from the right height and instant, I might have hit someone in the head and killed them. The fall of the rock should be deterministically calculated from Galileo's formula: $h = ½gt^2$, and the rock will fall according to physical natural law, but the height and timing of the initiation of the fall would be my own 'free will' choice!"
>
> — George Scott (1985), *Atoms of the Living Flame* (pgs. 135-36)

A depiction of **Scott**'s c.1769 thought experiment,

Here, of course, we are reminded of Alexander Pope's poetic quip about a rock falling on his head:

either done in his USD class, or described, in his attempt to argue that humans have free will, whereas the the rock just falls according to "physical natural law" as he thinks.

> "When the loose mountain trembles from **on high**; shall gravitation cease, if you **go by**?"
>
> — Alexander Pope (1734), *An Essay on Man* (§:4.128)

Scott goes on to discuss how he and Breed argued about this, Breed suggesting that he could Skinnerian like positive conditioning, with "beautiful, voluptuous maidens" to turn Scott into his hitman:

> "Suppose, I just waited repeatedly until, by chance, you carried a rock, time after time, up the ladder and every time you came closer and closer to hitting someone on the head, I gave you a 'beautiful, voluptuous maiden', like Skinner giving pigeons food to make them dance in figure eights. Then, you'd be conditioned by positive reinforcement to be my hitman, just like Skinner's pigeons, and it wouldn't be 'free will' act at all!"
>
> — George Breed (c.1969), dialogue with Scott on his rock dropping scenario

Scott, then goes onto tell the story of how Hasan Sabah, as reported by Marco Polo, constructed some sort of lush garden between two mountains, filled with wine, women, and food, and would get newly trained assassins passed out drunk, and leave them to wake up in this mysterious garden, then bring them out, somehow, making them think it was the "afterlife" described by the Koran, and use this as trick to get them to assassinate for him.

Scott also states that during this course he polled his students with the following free will like questions:

Question	Yes	No	Undecided
Do you believe you have free will?	10	2	4
Is a man a machine?	2	13	1
Is man a physical system?	3	12	1

The "machine" part here comes from Scott teaching about Julien la Mettrie and or Rene Descartes automatons.
-

Prigogine

In 1974, Scott, while on sabbatical at the University of Texas, attempting to draft his "two cultures" aiming *Atoms of the Living Flame* book, started to attend the lectures of Ilya Prigogine, who was lecturing on campus. Scott then began to read his books, and understand more of Prigogine, particularly after he won the Nobel Prize in 1977. Scott, thereafter, while not making Prigogine the basis of this book, does include some dissipative structure logic; Scott argues, e.g. that "the action of potential waves on the bubble thin membranes of the nerve cells [which] are the most fundamental control activity in human behavior" are of nonequilibrium thermodynamic phenomena of the sort that could chaotically amplify indeterminate events at the micro level. [2]

Influences

Scott was influenced by: Democritus, Clarence Darrow, Burrhus Skinner, Ilya Prigogine, Nancy Skeen (c.1945-) (Ñº), and George Breed, to name a few.

Education

Scott completed his BS in chemistry in 1943 at Worchester Polytechnic institute and his PhD in 1949 in organic chemistry, on the subject of infrared study of colchicine, at the University of Rochester in New York under D.S. Tarbell. He then became professor of chemistry at the University of South Dakota, in Vermillion. Scott retired in 1985. [3]

A *circa* 1940s photo of Scott, possibly a college graduation photo, permission courtesy of the George Prescott Scott Papers, Archives and Special Collections, University Libraries, University of South Dakota. [4] The above photo is a 1977 photo from his *Atoms of the Living Flame* (pg. 274) in a picture together with Max Delbruck.

Quotes | Employed

The following are quotes employed by Scott:

> "No thing is real but atoms in a void, and all things happen by chance and necessity."
>
> — Democritus (c.420BC), *Publication*; cited by Jacques Monod (1971) in *Chance and Necessity* (pg. #); cited by George Scott (1985) in *Atoms of the Living Flame* (pg. 33)

> "The Romans revere flame symbolically, because it is like a living thing. It needs air and sustenance, it moves of itself, and when it is extinguished, with water, it gives out a sound as if it were being slain."
>
> — Plutarch (c.100), *Publications*; cited by George Scott (1985) in *Atoms of the Living Flame* (pg. 75)

Quotes | By

The following are noted quotes

> "Since my name is not Socrates or Einstein and I hold only one [organic chemistry] of the seven or eight PhD degrees this problem requires, readers are quite justified in questioning my qualifications to testify as such a multidisciplinary expert."
>
> — George Scott (1985), *Atoms of the Living Flame* (pg. viii)

> "Lucretius had two similar words, 'animus' and 'anima' which he identified with mind and soul and they sometimes create confusion. However, since Epicureans are materialists, they believe that for animus or anima to be real, they must be made of atoms and they must be located somewhere. Lucretius believed they form a union centered, not in the brain, but in the breast, though part of the soul moves throughout the body. Because thoughts and feelings move quickly, and because no change in form or weight is observed upon death, atoms of the soul and mind must be 'tiny bodies, round and quick to roll'."
>
> — George Scott (1985), *Atoms of the Living Flame* (pg. 41)

> "Those robot machine statues of Diana and Neptune described by Descartes in the royal French gardens and indeed machines in general are highly artificial, specialized, freakish creations. We shall, elaborate the point later, but machines are indeed poor physicochemical models for life. Flames, on the other hand, are common spontaneous natural phenomena that can be set by lightning as well as human hands. The great question about the 'nature of life' concerns not really whether 'man is a machine' [e.g. La Mettrie (1748)]

but whether man is a flame-like phenomenon **reducible to nothing but physics and chemistry** or whether something non-physical is essential. The **physico-chemical reductionism question**, as we now call it, took form at this point in history."

— George Scott (1985), *Atoms of the Living Flame* (pg. 76)

"To a materialist no thing is real but atoms in a void and we are but 'molecular people' controlled by the actions of natural physicochemical law."

— George Scott (1985), *Atoms of the Living Flame* (pg. 181)

"Thermodynamics is the science of absolutely everything."

— George Scott (1985), *Atoms of the Living Flame* (pg. 181)

"Thermodynamics, unfortunately, has, and almost deserves, the reputation of being the most difficult undergraduate course on campus. This is especially unfortunate for social scientists and humanists, who don't take it. Some, moreover, will tell you it is the sort of thing they became social scientists or humanists to avoid."

— George Scott (1985), *Atoms of the Living Flame* (pg. 181)

"The laws of thermodynamics, we assume, apply to the whole biosphere of life in exactly the same way they apply to machinery and black boxes."

— George Scott (1985), *Atoms of the Living Flame* (pg. 182)

References

1. Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (thermodynamics, pgs. 181-84; ubiquitous quote: pg. 265). University Press of America.
2. Kane, Robert. (1998). *The Significance of Free Will* (pgs. 129-30). Oxford University Press.
3. George Prescott Scott (history) – USD.edu.
4. Hanson, Sarah A. (2012). "Email to Libb Thims (7 Aug 2012); scan of Scott photo by Sarah A. Hanson, Digitization and Photographs Associate; permission for use in Hmolpedia article of Scott by Daniel Daily, Interim Dean of Libraries, Aug 7.

Further reading

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â— Scott, George P. (1991). *Time, Rhythms, and Chaos in the New Dialogue with Nature: report of the Third John Lawrence Interdisciplinary Symposium, an interpretive symposium on the social and humanistic applications of dissipative structures and self-organization in science*. Iowa State University Press.

External links

â— Scott, George P. – WorldCat Identities.

θΔics

In existographies, **George Smith** (1949-) is a Japanese-born American libertarian philosopher and famous atheist (#91), of the Randian atheism (Randianism) variety, noted for his 1974 *Atheism: the Case against God*, wherein he discusses topics such as "implicit atheism" , disbeliever George Holyoake's 1851 coining of "secularism" as a more neutral indirect term for "atheism", among other topics. [1]

Overview

In 1972, Smith, at age 23, penned some kind of atheism book (Q); which seems to be the draft for his 1973-finished (1974-published) *Atheism: the Case against God* (1974); along with two other atheism books.

Quotes | About

The following are quotes on Smith:

> "Smith's *Atheism: the Case against God*, is the best book on the topic of atheism, due to his strong foundation in Rand's philosophy of objectivism."
>
> — Steve Weiss (2014), YouTube forum post, Nov (Q)

Quotes

The following are noted quotes:

> "It is my firm conviction that man has nothing to gain, emotionally or otherwise, by adhering to a falsehood, regardless of how comfortable or sacred that falsehood may appear. Anyone who claims, on the one hand, that he is concerned with human welfare, and who demands, on the other hand, that man must suspend or renounce the use of his reason, is contradicting himself. There can be no knowledge of what is good for man apart from knowledge of reality and human nature, and there is no manner in which this knowledge can be acquired except through reason. To advocate irrationality is to advocate that which is destructive to human life."
>
> — George Smith (1979), *Atheism: the Case against God*; most-liked (Q) at Goodreads.com

A circa 2012 screen shot of **Smith**, amid his home library, during his "Interview with an Atheist" with Marilyn Moore. [2]

References

1. Smith, George H. (1974). *Atheism: the Case against God*. Prometheus Books, 1989.
2. More, Marilyn. (2012). "Interview of an Atheist: George H. Smith" (parts: 1, 2, 3, 4, 5), George Smith, Oct 11 – Nov 8.

Further reading

● Smith, George. (1991). *Atheism, Ayn Rand, and Other Heresies*. Prometheus Books.

Videos

● Smith, George H. (1996). “On the Moral Right to Resist Authority” (Q), conference of the International Society of Individual Liberty, Libertarianism.org.

External links

● George H. Smith – Wikipedia.

θΔics

In existographies, **George St. Clair** (c.1833-1910) (RMS:70) was an English geologist, anthropologist, and biblical archeologist, noted for []

Overview

In 1907, St. Clair, in his *The Secret of Genesis: an Astro-Religious Record*, after opening to a quote by Origen, attempted to surmise the astro-theological basis of Genesis, e.g. Cain and Abel. [1]

Quotes | Employed

The following are quotes employed by St. Clair:

> "What man of sense will think that there was a first and second and third day, evening and morning, without any sun, moon, or stars? And who would be so stupid as to imagine that god, after the fashion of a human gardener, had planted a garden in Eden towards the East, and set in it a tree of life that should be seen and felt, so that one who ate of its fruit with his bodily teeth should acquire life? Why need I say more when anyone who is not blind can quote multitudes of such examples, written down as though they had occurred, and yet never having occurred in the literal sense?"
>
> — Origen (c.230), *Publication*; quoted by J. Armitage-Robinson (1904); cited by George St. Clair (1907) in *The Secret of Genesis* (pg. 5)

Quotes | On

The following are quotes on St. Clair:

> "It is the astronomical and time-measuring key that has been used by a few writers who have endeavored to understand the *Book of Genesis*, such as Railston Skinner and **George St. Clair**. Their explanations are, however, very difficult."
>
> — Author (1926), "Article" (pg. 377), *The Theosophist*

References

1. St. Clair, George. (1907). *The Secret of Genesis: an Astro-Religious Record -- The Legends and Their Interpretation, from the Fall of the Angels to the Building of the Babel Tower* (pg. 108-10). Francis Griffiths.

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- St. Clair, George. (c.1907). *Will Christ Come?* Publisher.

θΔics

In existographies, **George Stephenson** (1781-1848) (IQ:175|#304) (Murray 4000:19|T) (EP:30) (CR:3) was an English mechanical engineer and civil engineer, noted for the invention of the Invented the miner's safety lamp, and for his development of passenger steam engine to pioneer mass public train transportation.

Overview

In 1814, Stephenson, building on Richard Trevithick's 1801 passenger steam engine work along with the 1811 locomotive engine of John Blenkinsop (1783-1831), began to pioneer mass public train transportation.

In 1829, Stephenson offered a prize of about 500 pounds to the person who could make the best locomotive; four competed, Stephenson's so-called "Rocket" locomotive, shown below, won, drawing a carriage with 30 passengers at 25 to 30 mph:

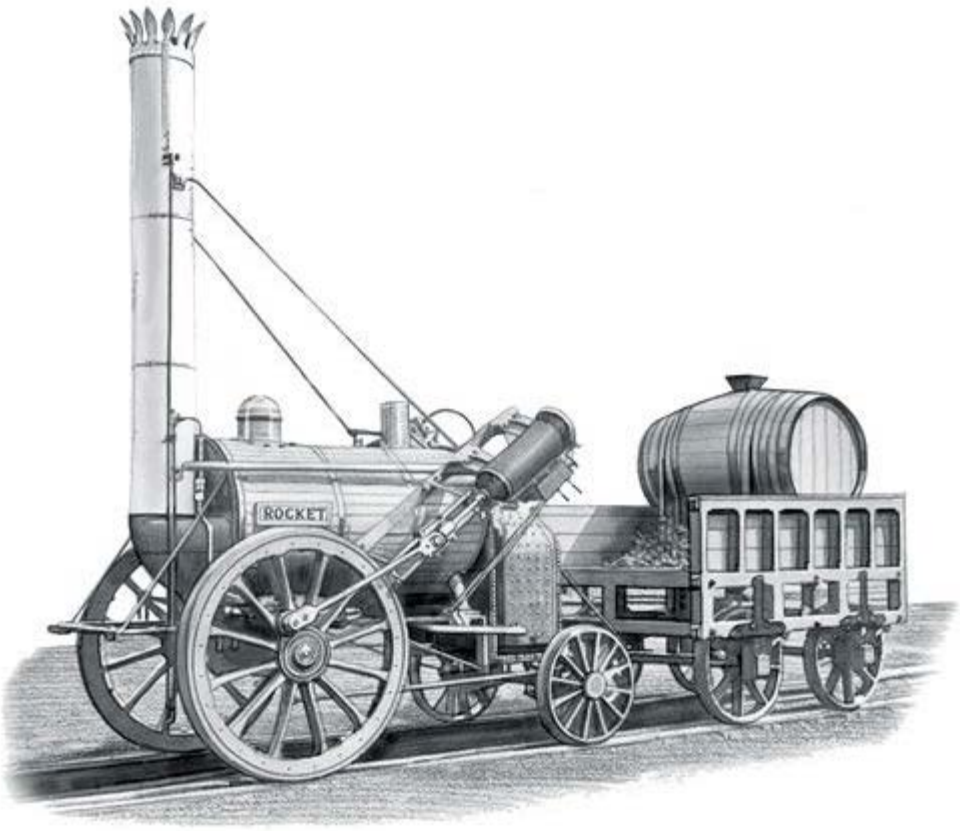

(add)

Other

In 1827, Robert Stephenson (1803-1859), Stephenson's son, met Richard Trevithick in Venezuela, and funded his mining efforts. [1]

References

1. Kirby, Richard. (1956). *Engineering in History* (co-authors: Sidney Withington, Arthur Darling, Frederick Kilgour) (pgs. 275-79). Courier, 1990.

External links

â— George Stephenson – Wikipedia.

θΔics

In hmolscience, **George Stokes** (1819-1903) was an Irish-born English physical scientist, generally known for his work in fluid dynamics, noted for his 1869 British Association address on the nature of organic, artificial compounds, chemical affinity, and mechanics in respect to the problem of life and mind arising from "dead matter" and his followup 1893 Gifford Lectures turned book *Natural Theology*, on the same subject wherein he argues for what he terms "directionalism" as an alternative to materialism to explain life and will. [1]

References

1. (a) Stokes, George. (1869). "Title" (Ñº), Presidential Address, British Association.
(b) Stewart, Balfour and Tait, Peter G. (1875). *The Unseen Universe: or Physical Speculations on a Future State* (§235). Macmillan.
(c) Stokes, George. (1893). *Natural Theology* (dead matter, 3+ pgs). A. and C. Black.

External links

â— Sir George Stokes, 1st Baronet – Wikipedia.

θΔics

In existographies, **George Zipf** (1902-1950) (CR:10) was an American “empiric social scientist”, as he defined himself, noted for his 1949 *Human Behavior and the Principle of Least Effort*, which was cited by American astrophysicist and social physicist John Q. Stewart as being the work of an investigator keenly aware of the necessity and advantages of cutting across academic boundaries, such as in the sociology | physics academic boundary. [1]

Power laws

Zipf is noted for his statement that:

> “Hyperbolic distributions are to the social sciences what the Gaussian distribution is to the physical sciences.”

A hyperbolic distribution, according to American-born Italian chemical physicist Bernard Lavenda, has a probability density of the following form: [5]

$$f(x) = \frac{1}{x^{D+1}}$$

where D is referred to as the characteristic exponent and x is scaled variable whose minimum value is unity, and equation having the form of a "power law" which finds applicability economics of wealth distributions (Pareto principle), among other fields such as linguistics, Zipf's usage, and taxonomy.

Principle of least effort

See main: Principle of least effort

The principle of least effort (or least action) was used by Francis Edgeworth (1881) according to which he found that maximum pleasure was associated with maximum of physical energy and therefore of least expense or least effort. Leon Winiarski, in 1903, is said to have made the principle of least effort the "basis of social science". [4]

In this group, Zipf, in his in his 1949 book *Human Behavior and the Principle of Least Effort*, is said to have given the preeminent "mechanistic model of behavior." [4] Zipf's theory is the postulate that animals, people, even well designed machines will naturally choose the path of least resistance or "effort."

The following is a noted quote from Zipf about his so-called principle of least effort: [3]

> “Each individual will adopt a course of action that will involve the expenditure of the probably least average of his work (by definition, least effort).”

In modern hmolscience terms, however, something about this seems to be off or amiss here in this statement—the old saying “I’d climb the highest mountain” being but one example that seems contrary to Zipf’s principle. The subject of free energy coupling, only compounds clarification.

Zipf's law

The recent social thermodynamics work of Gregory Botanes uses Zipf’s law in his applied human thermodynamics theories. [2]

References

1. (a) Zipf, George. (1949). *Human Behavior and the Principle of Least Effort: An Introduction to Human Ecology*. Cambridge.
(b) Stewart, John Q. (1950). "The Development of Social Physics" (abs), Invited paper before The American Association of Physics Teachers, Brinckerhoff Theater, Columbia University, Feb 3; in: *American Journal of Physics*, May 1950, 18: 239-53.
2. Zipf's law – Wikipedia.
3. (a) Zipf, George. (1949). *Human Behavior and the Principle of Least Effort: An Introduction to Human Ecology* (pg. 18). Addison-Wesley.
(b) Quotes by George Kingsely Zipf – StrangeWondrous.net.
4. Berthe, Benedicte and Renault, Michel. (2001). "Economic Analysis of Human Effort in Organizations: an Historical and Critical Perspective", in: *Evolution and Path Dependence in Economic Ideas: Past and Present* (editors: Pierre Garrouste and Stavros Ioannides) (§9, Lausanne school, Winiarski, pg. 184). Edward Elgar Publishing.
5. (a) Lavenda, Bernard H. (1995). *Thermodynamics of Extremes* (pg. 2). Horwood Publishing.
(b) Bernard H. Lavenda – Wikipedia.

External links

â— George Zipf – Wikipedia.

θΔics

In hmolscience, **Georges Balandier** (1920-) is French anthropologist noted, in anthropological thermodynamics, for his 1960s use of entropy in anthropology.

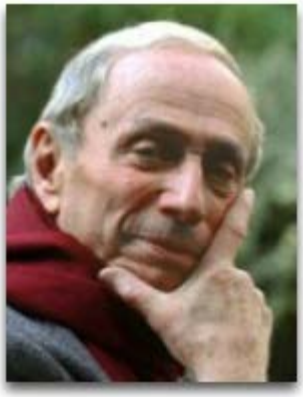

Overview

In 1967, Balandier, in his *Political Anthropology*, posted that: [1]

> "Power may be defined, for every society, as resulting from the need to struggle against the entropy that threatens it with disorder."

(add discussion)

References

1. (a) Balandier, Georges. (1967). *Anthropologie politique*. Paris.
(b) Balandier, Georges. (1970). *Political Anthropology*. Allen Lane.
(c) Adams, Richard N. (1975). *Energy and Structure: a Theory of Social Power* (pg. 6). Austin: University of Texas Press.

External links

â— Georges Balandier – Wikipedia.
â— Georges Balandier – Wikipedia (French → English).

θΔics

In existographies, **Georges Cuvier** (1769-1832) (IQ:170|#397) (Cattell:98) [RGM:693|1,500+] (Murray 4000:4|B) (EvT:11|21+) (CR:13) was a French theism naturalist noted for []

Overview

In 1813, Cuvier, in his *Essay on the Theory of the Earth* (1813), hypothesized a periodic catastrophic flood theory, conceptualized on Biblical flood theory (see: Noah's flood), according to which new species were "created", not by a processes of evolution, such as espoused by Jean-Baptiste Lamarck and Geoffroy Saint-Hilaire, but by the power of god, such that each species was "fixed" in its god-given place, after each successive flood period.

Cuvier's theories drew the attention of those including: Saint-Hilaire (in opposition), who advocated a "deism-based materialistic evolutionary determinism" (Hecht, 2003) theory, Johann Goethe (in opposition), John Hunter (in comparison), Francis Macnab (in supportive usage), and Honore Balzac (in praised status citation usage). [3]

Hunter

Cuver's classification of living forms has been compared or contrasted with John Hunter's scheme, as follows: [1]

> "The scope of Hunter's labors may be defined as the explication of the various phases of life exhibited in organized structures, both animal and vegetable, from the simplest to the most highly differentiated. By him, therefore, comparative anatomy was employed, not in subservience to the classification of living forms, as by **Cuvier**, but as a means of gaining insight into the principle animating and producing these forms, by virtue of which he perceived that, however different in form and faculty, they were all allied to himself. 'In what does life consist?' is a question which in his writings he frequently considers, and which seems to have been ever present."

(add)

Macnab

In 1818, Francis Macnab, in his *A Theory of the Moral and Physical System of the Universe* (§30), in order to recently-discovered fossil records, cites Cuvier's *Theory of the Earth* (1813), and concurs something to the effect that the fossils are organized in the layers of the earth as described in Genesis, with human bones found in the upper most layer, and the lowest layer "containing no petrifactions, nor traces of carbon".

Goethe

In circa 1830, Cuvier's efforts attracted the attention of Goethe, in his final years, recounted by Johann Eckermann as follows: [2]

> "At the close of this (20 Jul 1830), and in the beginning of the next year, Goethe turned again to his favorite studies, the natural sciences. At the suggestion of Boisseree, he occupied himself with deeper inquiries into the laws of the rainbow; and also, from sympathy with the dispute between **Cuvier** and St. Hilaire, with subjects referring to the metamorphoses of the plant and animal world. He, likewise, revised with me the historical part of the "Theory of Colors," taking also lively interest in a chapter on the blending of colors, which I, by his desire, was arranging to be inserted in the theoretical volume."

(add discussion)

Library

Cuvier, of note, supposedly, is said to have been able to recall in detail the contents all twenty-thousand volumes in his library. [4] This boast, however, is likely over-inflated fiction, compared to known "libraries" (1,000 to 6,000 book range) and minds (e.g. Young to Jefferson).

References

1. John Hunter (GB) – Encyclopedia Britannica, 1911.
2. Goethe, Johann, Eckermann, Johann, Soret, Frederic, Oxenford, John. (1901). *Conversations with Eckermann: Being Appreciations and Criticisms on Many Subjects* (pg. 379). M.W. Dunne.
3. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 402-03). HarperOne.
4. Frenay, Robert. (2006). *Pulse: the Coming Age of Systems and Machines Inspired by Living Things* (pg. #). Farrar, Straus and Giroux.

External links

â— Georges Cuvier – Wikipedia.

θΔics

In hmolscience, **Georges Guillaume** (1896-1969) was a Swiss-French economist noted, in economic thermodynamics, for his 1932 PhD dissertation "On the Fundamentals of the Economy with Rational Forecasting Techniques", co-written with the "mathematical assistance" of his brother physicist Edouard Guillaume, which applied the formalism of thermodynamics to the theory of value. [1]

Overview

In 1932, Guillaume completed his PhD dissertation, entitled "On the Fundamentals of the Economy with Rational Forecasting Techniques", in which the following seems to be thematic: [5]

> "It is curious that in political economy, we have not yet succeeded in establishing very general laws, analogous to the fundamental principles of the physico-chemical sciences."

In 1937, the Guillaume brothers, following fertile discussions of their work at the *Ecole Polytechnique*, published the book *Rational Economics* (*Economique Rationnelle*). [7]

Guillaume's book is said to be critical of the "Lausanne mathematical school", i.e. the Lausanne school of economics founded by Leon Walras, as not having based its abstractions upon sufficiently scientific concepts. [2]

In 1938, American mathematician Harold Davis published a joint review of the 1937 book by the Guillaume's and of Jan Tinbergen's *An Econometric Approach to Business Cycle Problems* in the *Bulletin of the American Mathematical Society*. [12] In 2003, American physicist Joseph McCauley falsely asserted that Guillaume's book was one of the first publications to make neo-classical equilibrium economic analogies with thermodynamics. [2] This, however, is not be the case, being that the use of employing thermodynamics in economics, with respect to economic equilibrium are found in the work of Vilfredo Pareto (1893-1912), and thermodynamics in economics, generally, dates back to at least as far back as the 1875 work of German mathematical physicist Carl Neumann.

A noted recent scholar of the Guillaume brothers is Belgian economist Guido Erreygers.

Bridgman

The Guillaume brothers work is said to be based on the thermodynamics of Percy Bridgman. [8] There main argument or objection, supposedly, was that the subjective concept of value did not obey the principle of conservation. [7]

Neumann

In 1934, Abraham Flexner, the director of the Institute for Advanced Study at Princeton, sent Guillaume's *Sur le fundements de l'economique rationelle* (1932) to American chemical engineer John Neumann to read. [2] After reading the book, Neumann commented back: [5]

> "I think that the basic intention of the authors, to analyze the economic world, by constructing an analogous fictitious 'model', which is sufficiently simplified, so as to allows an absolutely mathematical treatment, is —although not new—sound, and in the spirit of exact sciences. I do not think, however, that the authors have a sufficient amount of mathematical routine and technique, to carry out program out.
>
> I have the impression that the subject is not yet ripe (I mean that it is not yet fully enough understood, which of its features are the essential ones) to be reduced to a small number of fundamental postulates—like geometry, or mechanics (cf. pgs. 77-78). The analogies with thermodynamics are probably misleading (cf. pgs. 69, 85). The authors think that the 'amortization' is analogous to 'entropy'. It seems to me, that if this analogy can be worked out at all, the analogon of 'entropy' must be sought in the direction of 'liquidity'. To be more specific: if the analogon of 'energy' is 'value' of the estate of an economical

subject, then analogon of its thermodynamic ‘free energy’ should be its ‘cash value’.

The technique of the authors to set up and deal with equations is rather primitive, the way, for instance, in which they discuss the fundamental equations (1) and (2) on page 81-85 is incomplete, as they omit to prove that 1: the resulting prices are all positive (or zero), 2: that there is only one such solution. A correct treatment of this particular question, however, exists in the literature. Various other technical details in the setting up of their equations and in their interpretations could be criticized, too. I do not think that their discussion of the ‘stability of solutions’, which is the only satisfactory way to build up a mathematical theory of economic cycles and of crises, is mathematically satisfactory.

The emphasis the authors put on the possibility of states of equilibrium in economics (cf. pgs. 68-69) seems to me to entirely justified. I think that the importance of this point has not always been duly acknowledged. I cannot judge the value of their statistical methods, as they are given in the last part of the book for practical purposes. Their aim is to diagnose the present status of economics, and to lead to forecasts. But I think that the theoretical deduction, which lead to them is weak and incomplete.”

This incident is recounted in greater detail by Canadian economics historian Robert Leonard’s 1995 article “From Parlor Games to Social Science”. In this article, Leonard summarizes that Guillaume's book is an effort to construct a mathematical economics in the manner of Leon Walras and Vilfredo Pareto, treating not just exchange but also global production, along the way drawing parallels between economics and physics. [4]

Einstein

German physicist Albert Einstein, in a letter dated 24 Aug 1946, expressed support for the Guillaume brother’s work: [10]

> “Dr. G. Guillaume, whose family was well known to me in Switzerland, has explained to me a method for mechanized determination of the relative values of the various commodities (in unction of time). I believe that the use of this method may be practical and useful in providing an objective way to obtain an incontestable measure of economic values.”

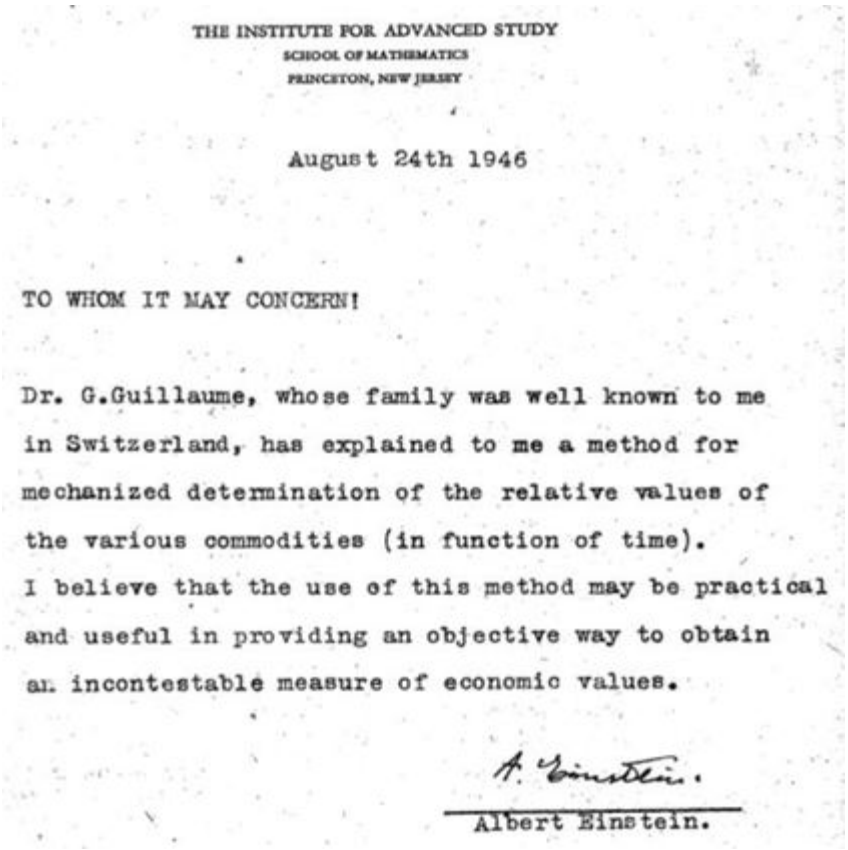

THE INSTITUTE FOR ADVANCED STUDY
SCHOOL OF MATHEMATICS
PRINCETON, NEW JERSEY

August 24th 1946

TO WHOM IT MAY CONCERN!

Dr. G.Guillaume, whose family was well known to me in Switzerland, has explained to me a method for mechanized determination of the relative values of the various commodities (in function of time). I believe that the use of this method may be practical and useful in providing an objective way to obtain an incontestable measure of economic values.

A. Einstein.

Albert Einstein.

German physicist Albert Einstein's 1946 letter to the Guillaume brothers in support of the economics theories.

The quote appears in reproduced in their 1947 book *The Supreme Arbiter*, in which they attempt to outline a “general energetics” theory as a foundation for conflict resolution. [11]

Education

Education Georges worked as a financial trader in the *Banque de Paris et de Pays-Bas*, after which he completed a PhD in economics in 1932 at the University of Neuchatel, Switzerland, then formed a number of discussion circles with economists and engineers associated with the Ecole Polytechnique. He then founded his own research institute in Paris, where he used his economic models to earn money. After 1945, his work, aiming to pen out some type of universal theory of everything, was said to take a “mystical turn”. [7]

Other

Guillaume is often classified as a "French economist" and was a member of the Centre d'Etude des Problemes Humains (Center for the Study of Human Problems), founded by Jean Coutrot in association with thinkers including: Aldous Huxley, and Pierre Teilhard. [6]

References

1. Guillaume, Georges and Guillaume, Edouard. (1932). *Sur le Fundements de l'economique Rationelle avec une technique de la prevision* (*On the fundamentals of the economy with rational forecasting technique*) (WorldCat) (Google books). Paris: Gautier-Villars.
2. McCauley, Joseph L. (2003). "Thermodynamic Analogies in Economics and Finance: Instability of Markets." *Physica A*, 329 (2003): pp. 199-212.
3. Mirowski, Philip. (2002). *Machine Dreams: Economics becomes a Cyborg Science* (pg. 104). Cambridge University Press.
4. (a) Leonard, Robert J. (1995). "From Parlor Games to Social Science: von Neumann, Morgenstern, and the Creation of Game Theory, 1928-1944" (abs), *Journal of Economic Literature*, 33(2): 730-761.
(b) Leonard, Robert J. (2010). *Von Neumann, Morgenstern, and the Creation of Game Theory* (pg. i). Cambridge University Press.
5. Neumann, John. (1934). "Letter to Abraham Flexner", May 25, Faculty Files, Folder 1933-35. VNIAS.
6. Zukin, Sharon and DiMaggio, Paul (1990). *Structures of Capital: the Social Organization of the Economy* (pg. 360). CUP Archive.
7. Erreygers, Guido. (2013). "Mechanics Meets Economics, Once Again: On the Rationale of 'Rational Economics' of the Guillaume Brothers" (pdf), paper for conference "The Pioneers of Linear Models of Production", EconomiX, Université Paris Ouest Nanterre La Défense, 17-18 January 2013.
8. (a) Fischman, Marianne and Lendjel, Emeric. (2000). "X-Crise et le modèle des frères Guillaume" (pgs. 370-72), in: Pierre Dockès, Ludovic Frobert, Gérard Klotz, Jean-Pierre Potier, André Tiran (eds), *Les Traditions Économiques Françaises, 1848-1939*, Paris: CNRS Editions, pp. 369-82.
(b) Erreygers, Guido. (2013). "Mechanics Meets Economics, Once Again: On the Rationale of 'Rational Economics' of the Guillaume Brothers" (pdf), paper for conference "The Pioneers of Linear Models of Production", EconomiX, Université Paris Ouest Nanterre La Défense, 17-18 January 2013.
10. Erreygers, Guido. (2013). "Mechanics Meets Economics, Once Again: On the Rationale of 'Rational Economics' of the Guillaume Brothers" (pdf) (pg. 13), paper for conference "The Pioneers of Linear Models of Production", EconomiX, Université Paris Ouest Nanterre La Défense, 17-18 January 2013.
11. Guillaume, Georges and Guillaume, Edouard. (1947). *The Supreme Arbiter* (*L'Arbitre Supreme*) (pg. 62) (Ñº). Publisher.
12. (a) Davis, Harold T. (1938), "[Book review]", *Bulletin of the American Mathematical Society*, 44(11): 761-2.
(b) Erreygers, Guido. (2013). "Mechanics Meets Economics, Once Again: On the Rationale of 'Rational Economics' of the Guillaume Brothers" (pdf), paper for conference "The Pioneers of Linear Models of Production", EconomiX, Université Paris Ouest Nanterre La Défense, 17-18 January 2013.

External links

â— Guillaume, Georges – WorldCat Identities.

θΔics

In science, **Georges Le Sage** (1724-1803) (IQ:150|#498) was a Swiss mathematical physicist and electrical engineer, described by Balfour Stewart and Peter Tait as having a "singularly acute mind", notable for being the co-winner, along with physician Jean Philippe de Limbourg (a former student of Herman Boerhaave), of the Academy of Rouen's 1758 find a physico-mechanical system of affinities competition (see: affinity table), on which he supplied a mathematical exposition of affinity in line with the concept of gravity. [1]

Gravitation

Le Sage is said to not only devised his own rather elaborate gravitation theory, but also written an extensive treatise on history of gravity theories. William Thomson, in the 1871 *Proceedings of the Royal Society of Edinburgh*, gave an account of Le Sage's gravity theory along with suggestion for improvement, based on his vortex atom theory. [1]

Kinetic theory of gases

Le Sage's work on the kinetic theory of gases was cited by Rudolf Clausius and James Maxwell. [3]

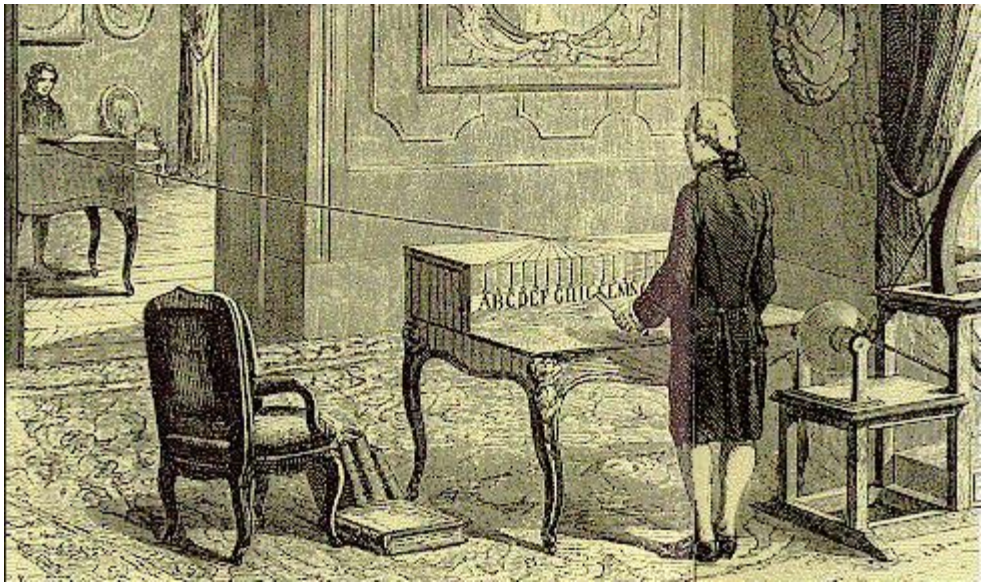

Le Sage and his 1774 telegraph.

Electrical engineering

In 1774, in electrical engineering, Le Sage invented the first electric telegraph consisting of 24 wires, each suitably spaced and insulated by means of glass partitions at frequent intervals, placed in a trough in the ground, according to which each wire represented a certain letter of the alphabet:

Le Sage, knowing that gold leaf is extremely sensitive to minute electric impulses, placed a small piece of gold leaf at the end of each wire. To send a signal over any particular wire corresponding to a certain letter of the alphabet, a small static charge was sent thru the wire by touching it at the transmitting station with a glass rod which had previously been electrically excited by rubbing it with silk. This system was rather limited in its application, room to room in application, as it is very difficult to insulate a static charge for any great distance. [2]

Education

His father, who was the author of many papers on various subjects, occupied his son of his own studies early, including the works of the Roman poet Lucretius at the age of 13. According to Pierre Prévost and some notices of Le Sage, the education by his parents in his early years was very strict (see: parentally created genius), and Le Sage reacted to this by isolating himself and with meditation on various subjects. Contrary to his father, who allegedly only accepted facts and had little interest in generalization, Le Sage was primarily interested in general and abstract principles. Against the will of his father, Le Sage devoted his life to mathematics and, in particular, a search for the mecanisms of gravity.

Quotes

The following are related quotes:

> "I have been born with four dispositions well adapted for making progress in science, but with two great defects in the faculties necessary for that purpose. 1. An ardent desire to know the truth; 2. Great activity of

mind; 3. An uncommon (justesse) soundness of understanding; 4. A strong desire for precision and distinctness of ideas; 5. An excessive weakness of memory; 6. A great incapacity of continued attention."

— Georges Le Sage () [4]

References

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2. Historic electric apparatus – Alternative-Technologies.org.
3. (a) Clausius, Rudolf. (1862), "Über die Wärmeleitung gasförmiger Körper", *Annalen der Physik*, 115: 1–57.
(b) Maxwell, James. (1867), "On the Dynamical Theory of Gases", *Transactions of the Royal Society of London*, 157(0): 49–8.
4. Playfair, John. (1807), "Notice de la Vie et des Ecrits de George Louis Le Sage" (English), *Edinburgh Review*: 137–153.

External links

â— Georges-Louis Le Sage – Wikipedia.

θΔics

In existographies, **Georges Lemaitre** (1894-1996) (GPE:#) (CR:7) was a Belgian priest, astronomer, and physicist noted for his 1931 proposition that the universe began as a single "primeval atom", which broke up into a series of "super-radioactive" decays to form the elements.

Thermodynamics

In 1931, Lemaitre, according to Michael Rowan-Robinson, came up with a "primeval atom" theory origin of the universe from thermodynamic considerations. [1]

Primeval atom theory

In 1931, Lemaitre proposed that the universe began as a single "primeval atom", which broke up into a series of "super-radioactive" decays to form the elements; a view that he summarized in a later article as follows: [1]

> "The atom world broke up into fragments, each fragment into still smaller pieces. Assuming, for the sake of simplicity, that this fragmentation occurred in equal pieces, we find that two hundred and sixty successive fragments were needed in order to reach the present pulverization of matter into poor little atoms which are almost too small to be broken father. The evolution of the world can be compared to a display of fireworks that has just ended: some few red wisps, ashes, and smoke. Standing on a cooled cinder, we see the slow fading of the suns, and we try to recall the vanished brilliance of the origin of the worlds."

Lemaitre's aim was to speculate about how the periodic table as a whole might have originated.

In 1949, Fred Hoyle coined the phrase that came to be applied to Lemaitre's exploding atom theory of the universe, referring to it as "this *big bang* idea" during a BBC Radio broadcast, thereafter coming to be known as "big bang" theory.

Quotes | By

The following are related quotes:

> "As far as I see, such a theory [of the primeval atom] remains entirely outside any metaphysical or religious question. It leaves the materialist free to deny any transcendental being. He may keep, for the bottom of space-time, the same attitude of mind he has been able to adopt for events occurring in non-singular places in space-time. For the believer, it removes any attempt to familiarity with god, as were Laplace's chiquenaude or Jeans' finger. It is consonant with the wording of Isaiah speaking of the 'hidden god' hidden even in the beginning of the universe ... Science has not to surrender in face of the universe and when Pascal tries to infer the existence of god from the supposed infinitude of nature, we may think that he is looking in the wrong direction."
>
> — Georges Lemaitre (1958), "The Primeval Atom Hypothesis and the Problem of Clusters of Galaxies" [2]

References

1. Rowan-Robinson, Michael. (1999). *The Nine Numbers of the Cosmos* (quote, pgs. 9-10; thermodynamics, pg. 71). Oxford University Press.
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External links

â— Georges Lemaitre – Wikipedia.

θΔics

In existographies, **Georgi Georgiev** (c.1970-) (CR:2) is an American physicist, specializing in complexity, self-organization, non-equilibrium thermodynamics, and cybernetics, noted for []

Overview

In 2019, Georgiev, in his talk "Self-Organization and Cosmic Evolution", building on Jan Smuts and Eric Chaisson, attempted to discuss the evolution of the cosmos. [1]

In 2020, Georgiev, in coordination with Ram Poudel, worked to co-orchestrate the so-called "Thermodynamics 2.0" conference.

Influences

Georgiev has been influenced by: Pierre Maupertuis, namely his principle of least action, Georg Hegel, William Ritter, Jan Smuts, Buckminster Fuller, Edwin Jaynes, namely his principle of maximum entropy production, Ray Kurzweil, Eric Chaisson. [1]

Education

Georgiev completed his BS in physics and chemistry and MS in physics and chemistry, at Sofia University, California, followed by a second MS in physics at TUFTS University, then in 2002 a PhD in physics, at Tufts university, Massachusetts. Presently he is a physics professor at Worcester Polytechnic Institute, Massachusetts. [2]

Quotes | By

The following are quotes by Georgiev:

> "In Bernard cells, internal entropy decreases, compensated by the increase of entropy production. As a prototype of self-organization of an out of equilibrium [compare: far-from equilibrium] system, it uses 'free energy' to form a flow channel network with increasing action efficiency."
>
> — Georgi Georgiev (2019), "Self-Organization and Cosmic Evolution" (47:03-) [1]

References

1. Georgiev, Georgi. (2019). "Self-Organization and Cosmic Evolution" (Ñº), NERCCS Pre-Conference School, Apr 3.
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External links

â— Georgi Georgiev – Google Scholar.

θΔics

In existographies, **Georgi Pavlovich Gladyshev** (1936-) (SNE:12) [CR:213] is a Russian physical chemist noted for his 1978 Gibbs free energy theory of evolution and sociology (sociological thermodynamics), both modeled on the movement of particles in the thermodynamics of chromatography, for his *circa* 1990s thermodynamic anti-aging theories of foodstuffs, and for his theoretical contributions to the development of human thermodynamics beginning in 2005. [1]

Overview

In his seminal 1978 article "On the Thermodynamics of Biological Evolution", Gladyshev argues that the methods of classical thermodynamics, conceived through a framework of hierarchical thermodynamics, in contrast to Prigoginean thermodynamics evolution models, regulates the process of the evolution of biological structure. [2]

This theory was written in direct opposition to the non-equilibrium thermodynamic evolution theory of Belgian chemist Ilya Prigogine, winner of the 1977 Nobel Prize in chemistry for his dissipative structure evolution theory in which biological structure is argued to self-assemble in thermodynamic systems far from equilibrium through the method of bifurcations and fluctuations. [3]

In 2007 and audio recording of Gladyshev lecturing at the American Association for Anti Aging Medicine (A4M) Conference in Las Vegas was recorded. [5]

Prediction

See main: Prediction

The following is 2000 memo (in Russian) with a circa 2010 hand-written note (in English) by Gladyshev, sent to American electrochemical engineer Libb Thims, in a package of Gladyshev's collected works on his various thermodynamic theories, wherein he points out that from some time, since at least the late 1990s, he has been under the strong conviction that "history can be predicted" using thermodynamics.

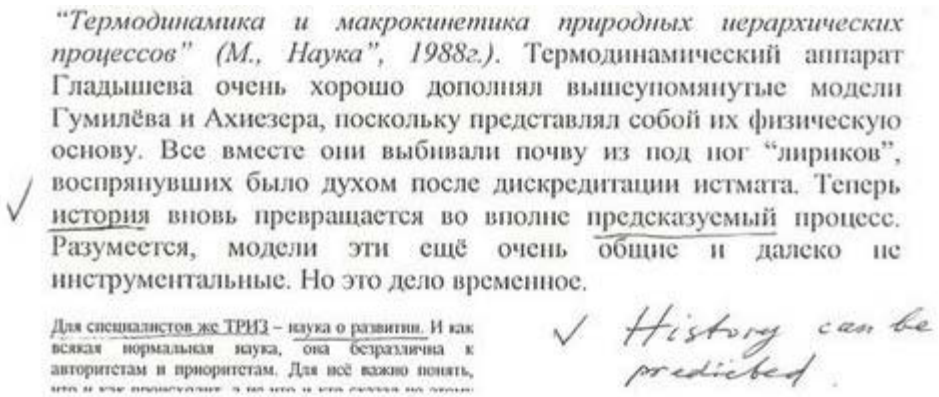
"Термодинамика и макрокинетика природных иерархических процессов" (М., Наука", 1988г.). Термодинамический аппарат Гладышева очень хорошо дополнял вышеупомянутые модели Гумилёва и Ахиезера, поскольку представлял собой их физическую основу. Все вместе они выбивали почву из под ног "лириков", воспрянувших было духом после дискредитации истмата. Теперь история вновь превращается во вполне предсказуемый процесс. Разумеется, модели эти ещё очень общие и далеко не инструментальные. Но это дело временное.

Для специалистов же ТРИЗ – наука о развитии. И как всякая нормальная наука, она безразлична к авторитетам и приоритетам. Для неё важно понять,

History can be predicted.

A section of hand-written document, given to American electrochemical engineer Libb Thims, wherein Gladyshev points out, in his early writings, where he says that "history can be predicted" by the methods of thermodynamics.

Here we recall similar views expressed in the 1952 work of English physicist C.G. Darwin.

Thims

Beginning in 2005, Gladyshev began collaborating with American chemical engineer Libb Thims in the exchange of ideas and development of new theory. Gladyshev was of great influence to Thims, especially in construction and subsequent publication of his first two books, the 2007 *Human Chemistry* and the 2008 *The Human Molecule*. In December 2007, Thims and Gladyshev started the *Encyclopedia of Human Thermodynamics*.

Thermodynamic theory of the evolution of living beings

See main: Thermodynamic Theory of the Evolution of Living Beings

In 1997, Gladyshev published his 142-page book *Thermodynamic Theory of the Evolution of Living Beings*, in Russian and English, in which he set forth the first unified theory of the origin and evolution of living beings from the view point of thermodynamics, built on the chemical thermodynamics work of American mathematical engineer Willard Gibbs. [1]

The logic of Gladyshev's thermodynamics constitutes what he calls "hierarchical thermodynamics". This theory, to note,

was in direct contrast to the more-established 1970s paradigm of the far-from-equilibrium dissipative structure theory of Belgian chemist Ilya Prigogine, who developed an "internal entropy" generation function model to account for the appearance of spontaneously forming ordered structures in the high heat flow regime of viscous mediums, such as the formation of Bénard cells in silicon oil placed on a hot plate, in which the heat is turned up past the turbulent flow regime.

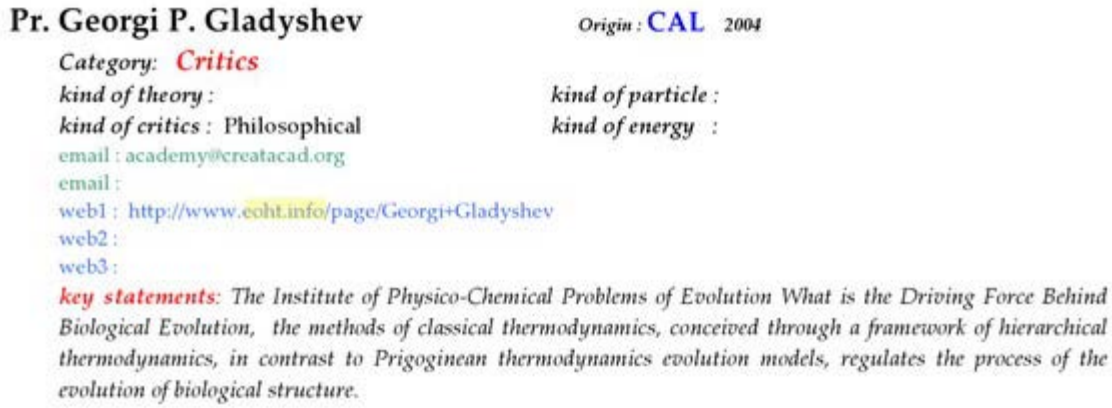
Pr. Georgi P. Gladyshev
Origin : CAL 2004
Category: Critics
kind of theory :
kind of critics : Philosophical
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kind of energy :
email : academy@creatacad.org
email :
web1 : http://www.eoht.info/page/Georgi+Gladyshev
web2 :
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key statements: The Institute of Physico-Chemical Problems of Evolution What is the Driving Force Behind Biological Evolution, the methods of classical thermodynamics, conceived through a framework of hierarchical thermodynamics, in contrast to Prigoginean thermodynamics evolution models, regulates the process of the evolution of biological structure.

Gladyshev's 2014 listing (Q) in Jean de Climont's *The Worldwide List of Dissidents Scientists*, of more than 8000 physics based natural scientists who have proposed alternative theories.

Living systems evolution model

During the process of the evolution of the earth, according to Gladyshev, the existence of local equilibrium, within sub-systems of the biosphere, each being found surrounded by isothermal and isobaric thermostats, means that at times comparable with the periods of relaxation to equilibrium we deal with a set of thermodynamically closed microvolumes, i.e. an elementary volume that is still so large that it contains a great number of particles, constituting the phase under consideration. Within this phase, according to the laws of chemical thermodynamics, the integral value of the specific, i.e. averaged over the volume, Gibbs function corresponding to the formation of averaged local "evolved" conformation of aggregated supramolecular structures achieves a minimum:

$$\bar{\tilde{G}}^{im} = \frac{1}{V}\int_0^V \frac{\partial \tilde{G}^{im}}{\partial m}(x,y,z)\,dxdydx \rightarrow min$$

Here, V is the volume of the system, m the mass of the selected microvolumes; x, y, and z the coordinates; the bar "–" means that the specific value is considered and the tilde "~" symbol indicating a heterogeneous system; the "im" superscript indicating the intermolecular component of the system.

Education

See main: Gladyshev: Biography

Gladyshev was born September 19, 1936 in Alma-Ata, Russia. In 1959, he graduated from the Chemistry Department of the State University in Alma-Ata in and in 1962 received the Degree of Candidate of Science (Ph.D.) and a Doctorate Degree in polymer chemistry in 1966. He became Professor of Physical Chemistry in 1969. In about 1975, Gladyshev began working on the problem of the thermodynamics of the macro-biological scale.

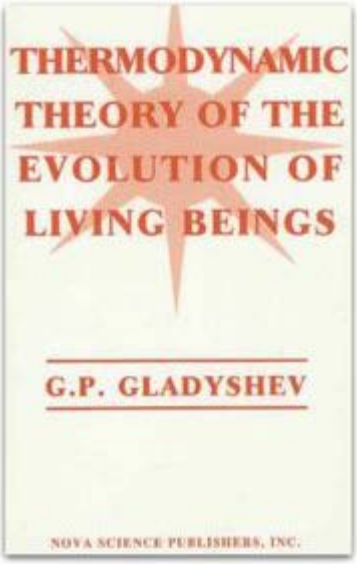

Gladyshev's 1997 book, which explains evolutionary change via Gibbs' equilibrium criteria. [1]

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1. Gladyshev, Georgi, P. (1997). *Thermodynamic Theory of the Evolution of Living Beings*. Commack, New York: Nova Science Publishers.
2. Gladyshev, Georgi, P. (1978). "On the Thermodynamics of Biological Evolution", *Journal of Theoretical Biology*, Vol. 75, Issue 4, Dec 21, pp. 425-441 (Preprint, Chernogolovka, Institute of Chem. Phys. Academy of Science of USSR, May, 1977, p. 46).

3. Prigogine, Ilya. (1977). "Time, Structure, and Fluctuations", Nobel Lecture (in chemistry), Dec 08.
5. Gladyshev, Georgi. (2007). "Hierarchical Thermodynamics: Quality Food and Medicine", A4M Las Vegas, Dec 12, 9:00 am – 12:00pm, 27m 03s, 36 slides (PDF or MP3).

Further reading

● Newspaper interview (1999) with Prof. Georgi P. Gladyshev (correspondent Mr. A. Gubanov).
● Gladyshev, Georgi P. (1999). "On Thermodynamics, Entropy and Evolution of Biological Systems: What Is Life from a Physical Chemist's Viewpoint." *Entropy* 1, no. 2: 9-20.
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● Gladyshev, Georgi. (2010). "On the Thermodynamics of the Evolution and Aging of Biological Matter." *Journal of Human Thermodynamics*, 6: 26-38.

Videos

● Thims, Libb. (2010). "Gladyshev and the Thermodynamics of Evolution" (commentator: Georgi Gladyshev) (Q), Human Chemistry 101, YouTube, Mar 18.

External links

● Georgi Gladyshev - Biography Overview
● Georgi Gladyshev - A4M Conference Library, Speaker Profile
● Georgi Gladyshev - My Science Life, A Wetpaint Wiki
● Georgi Gladyshev - Wikibin

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The **Georgi Gladyshev (biography)** page contains the full biography and life curriculum of Georgi Gladyshev includes work ranging from polymer chemistry, to planetary interactions, to the thermodynamics of evolution. Gladyshev is a full professor of physical chemistry and is the President and founder of the International Academy of Creative Endeavors, Chief of the Laboratory of thermodynamics and macrokinetics of non-equilibrium processes (1970-2005) and Principal Researcher (2006-) of N.N. Semenov Institute of Chemical Physics, Russian Academy of Sciences, HT - Researcher of Institute of Human Thermodynamics (USA) is the son of Pavel Gladyshev and Apollinariya Zaikova.

Georgi Gladyshev (2007)

Overview

Gladyshev was born on 19 September 1936 in Alma-Ata, Kazakhstan, he graduated the Chemistry Department of the State University in Alma-Ata in 1959 and received the Degree of Candidate of Science (Ph.D.) in 1962 and a Doctorate Degree in polymer chemistry in 1966. He became Professor of Physical Chemistry in 1969 and in 1970 Chief of the Laboratory at the Institute of Chemical Physics of the USSR (Russian) Academy of Sciences in Moscow. Since 1968 he has been a visiting professor and Scientific adviser at several state universities, industrial plants, and firms. In 1989 he was elected President of the Academy of Creative Endeavors of the USSR (now - the International Academy of Creative Endeavors). In 1990 he became the head of the Institute of Ecological Biophysical Chemistry (now – the Institute of Physico–chemical Problems of Evolution of the International Academy of Creative Endeavors).

He is the author of more than five hundred scientific articles, patents and ten monographs in the fields of Physical Chemistry, Life Science and Polymer Chemistry. His latest monographs include "Thermodynamics and Macrokinetics of Natural Hierarchical Processes" (Nauka, Moscow, 1988), "Ecological Biophysical Chemistry" (Nauka, Moscow, 1989), “Thermodynamic theory of the evolution of living beings” (Nova Science Pub., INC., N.Y., 1997), “Supramolecular thermodynamics is a key to understanding phenomenon of life. *What is life from a physical chemist’s viewpoint*”, M., 2002; Second Edition - Moscow – Izevsk, 2003.

He has conducted research in the fields of polymer chemistry, physical chemistry, biology (chemical kinetics, the physico-chemical mechanism of the formation of the planetary system, the mechanism of chirality formation, the nature of ball lightning, biological evolution, aging and macrothermodynamics).

Education

He studied at the Chemistry Department of the State University in Alma-Ata where he engaged in experimental research in various fields of physical chemistry under Professor, academician M.I. Usanovich. He explored the phase diagrams for two-component systems, incorporating perchloric, sulphuric, nitric, acetic and chloroacetic acids. He confirmed the existence of nitronium cation in the nitrating mixtures and established the existence of a number of compounds of products of interacting inorganic acids. This was an excellent school for a physical chemist-experimenter.

As a post-graduate student at the Kazakh Academy of Science Institute of Chemistry under Professor, academician S.R. Rafikov, he conducted research in the mechanism of the polymerization of vinyl monomers with the aim of creating a new technological process in the manufacture of large blocks from organic glass. This research was continued and resulted in the industrial introduction of an original technology in attaining organic blocks. To date the efficiency of this technology has not been surpassed. The results of his research were summarized in the thesis of his doctorate.

Post-graduate work

While working at the Institute of Chemistry in Alma-Ata he published two books, one of which (an advanced textbook) is still used in laboratories as a practical manual - "The Polymerization of Vinyl Monomers" (Academy of Science of the Kazakhstan SSR, Alma-Ata, 1964, 322 p.). Between 1968 and 1970 he worked at the Institute of Chemistry of the Bashkiran Branch of the USSR Academy of Sciences in Ufa (Ural). There together with his post-graduate students he

carried out a number of researches in the field of immune adsorption, photochemistry, and synthesis of new polymers.

At the Institute of Chemical Physics of the USSR Academy of Sciences in Moscow, where he had been invited by professors, academicians N.N. Semenov and N.M. Emanuel, he organized a small Laboratory of thermostable polymers (1970) and since 1987 the Laboratory of thermodynamics and macrokinetics of non-equilibrium processes. He was in charge of research in the field of the radical polymerization and stabilization of polymers. Some results of the research are reflected in the monograph "Radical Polymerization at High Conversion" (Nauka, Moscow, 1974, 243 p., co-author, B.A. Popov) and a number of articles, for example Vysokomol. Soed., A18, No. 11, 2387-2394, 1976 and J. Polymer Sci., Polymer Chem. Ed., 14, 1753-1759, 1976. In the course of an experiment conducted in the same period, he discovered and explained the phenomenon of the periodic polymerization in the two-phase heterogeneous systems (Reports of USSR Academy of Sciences, 260, No. 6, 1394-1397, 1981). Beginning with 1968-1970, he carried out theoretical research pertaining to the fundamental problem of physical science.

In February 1977 he published a scientific paper presenting an original model of the formation of the Solar System ("The Role of Physico-Chemical Processes in the Formation of the Planetary Systems", Institute of Chemical Physics of the USSR Academy of Sciences, Chernogolovka, 28, February, 1977). Previously known models examined a number of stages of the planetary systems formation are merely taking into consideration the physical effects, including the magnetohydrodynamic phenomenon (H. Alfven, G. Arrhenius, and other). Professor Gladyshev's model includes a new lengthy stage of evolution that is connected with the diffusion (mass transfer) of matter of protosun into protonebulae. As a result of the chemical (physical – chemical) reactions of matter of the protosun and protonebulae, new matter is formed which is condensed from a supersaturated (supercooling) state.

The well-known mechanism (known in chemistry as the spatially periodic condensation) permits explaining the origin in the solar protonebula (as the planetary protonebulae) of ring structures, in accordance with the well-known law of Titius-Bode (The Moon and the Planets, 18, 217-221, 1978; 19, 89-98, 1978; 25, 413-425, 1981, co-author, V. P. Budtov). Professor Gladyshev's model allowed him to make a number of predictions that were subsequently confirmed by Voyager-2. Moreover the model foresaw the existence of rings encircling Uranus before their discovering in March 1977, also the rings of Neptune and other now known facts. A similar model was proposed also for the condensation of matter in the comets' atmosphere, etc. ("Thermodynamics and Macrokinetics of Natural Hierarchical Processes", Moscow, p. 288, 1988).

A theoretical study of the physical chemical processes (reactions) in deep Space permitted putting forward a new conception of the possible origin of the optical activity of molecules. On Earth when there is no stereospecific catalyst, it is impossible to give preference to left or right structures - the products of chemical reactions. This is impeded by the thermal background whose energy determined by the magnitude kT (k - Boltzmann constant, T - temperature) extends by far the energy of natural electric and magnetic fields which in principle are able to orientate some responding molecules. In deep Space where there is only a background of relict radiation, and the intervals between the collisions of molecules are enormous, they can orientate themselves in natural electric and magnetic fields.

During the interaction of oriented molecules a substance can be formed containing more left than right isomers or vice-versa. It stands to reason that this model describes the possible emergence of optical activity in separate parts of the Universe (The Moon and Planets, 19, 89-98, 1978; Origins of Life, 10, 247-254, 1980, co-author, M.M. Khasanov; J. Theor. Biol., 90, 191-198, 1981, co-author, M.M. Khasanov) . Another model of the emergence of asymmetry in the bioworld is linked with the possible influence of Coriolis forces on the growth of living organisms. The model has reliable substantiation, if it is assumed that the growth of biotissues of separate organisms may be considered as a flow of some fluids (Ukrainian Polymer Journal, 1, No. 1, 55-62, 1992).

One of the models of ball lightning was made possible on the basis of the physico-chemical mechanisms. According to the model the ball lightning feeds on direct electric currents in the atmosphere. In the flame zone of ball lightning, atmospheric nitrogen is combustible. This endothermic reaction demands energy that is fed to it by currents flowing between the areas carrying volumetric electric charges. This short but original article was published in Reports of the USSR Academy of Sciences (24, No. 2, 341-344, 1983) and presented as a report at the International symposium in Tokyo (“Science of Ball Lightning – Fire Ball”, Ed. Yoshi-Hiko Ohtsuki, World Scientific, Singapore, 1985, pp. 242-253).

Biological macrothermodynamics

From 1975 through 2007 Professor Gladyshev was engaged in working on biological macrothermodynamics. On its basis, he proposed the physical theory of origin of life, biological evolution and aging living beings. [1]

Macrothermodynamics studies on integral level complex heterogeneous chemical and biological systems, primarily the open hierarchical systems, exchanging matter and energy with the environment. The methods of macrothermodynamics are based on the foundation of classical thermodynamics and macrokinetics aimed in the development of classical thermodynamic theory. The law of unidirectional series of relaxation times (life times) – the law of temporal hierarchies has been formulated:

$$\ldots \ll t\text{-}m \ll t\text{-}im \ll t\text{-}organelle \ll t\text{-}cell \ll t\text{-}org \ll t\text{-}pop \ll t\text{-}com \ll \ldots \quad \text{(eq. 1)}$$

Here *t* – average lifetime of “free” molecules-metabolites (*m)*;supramolecular (intermolecular) structures (*im*); organelles (*organelle*); cells in the tissue (*cell*); organisms (*org*); populations (*pop*); communities (com*).* The law (1) is a general law of nature.

If one were to examine for instance, the hierarchy of man’s - "community, population, organism, cell, organelle, macromolecule, molecule", one would notice that in many cases molecules of metabolites in the bio-tissue “freely exist” (live) on average minutes, macromolecules - many hours, organelles – many days. Cells, organisms, populations, communities, live still longer. However, these structural types are not general for all bio-systems. For instance, it is possible that certain cells (nerve cells, heart muscle cells in the adult organism) are not renewed throughout the human life. These cells are, as if, not cells in the usual sense; in this case, *t (cell)* should be removed from the series (1).

A similar phenomenon is observed for the fruit fly: no cell in the adult fly body undergoes division. Likewise, the proteins of the animal eye lens are almost never renewed. In this case, the lifetimes of these macromolecules do not fit the series (1) either. The space hierarchy does not match the temporal hierarchy in the above examples. In such a case, the corresponding lifetimes of the structures are as though involved in the next temporal hierarchy. If one has no information about lifetimes of organelles, cells one can use the law (1) in form:

$$\ldots \ll t\text{-}m \ll t\text{-}im \ll t\text{-}organism \ll t\text{-}pop \ll t\text{-}com \ll \ldots$$

It is easily shown that the existence of series of the lifetimes allows us to pick out the summation of structures of one hierarchy as a subsystem and to consider this subsystem as a quasi-closed system. In order to study such a system, it is possible to use the methods of quasi-equilibrium hierarchical thermodynamics. For example, insofar as cells live for a far shorter time than organisms, one may consider that the organisms’ (organ’s) medium for all practical purposes does not change during the lifetime of many types of cells. This medium fulfills the role of a thermostat (in a broad sense of this physical term) for the quasi-closed subsystem (system) of the organism – cells.

It is necessary to bear in mind that each species of living being (tissue, types of cell, types of organelle, etc.) is characterized by its lifetime values of the elements of the different hierarchical structures. However, for all lower level hierarchies of living systems, which is part of a higher level hierarchy (population, organism, cell, supramolecular formation, and so on), series (1) usually is fulfilled. This law can be formulated in another way:

> “*Any living system of any temporal hierarchical level in a normal state has a thermostat - a surrounding medium that is characterized by slightly changing average values of thermodynamic parameters.”*

The main reason for this statement is connected with the phenomenon of metabolism and the exchange of mater of different hierarchies. Lower level hierarchical structures are often reproduced in a medium of higher level hierarchical structures during the lifetime of the latter. Thus, we have:

t-i << t-(i+1), (eg. 2)

where - average lifetime of structures of lower temporal hierarchical level, - average lifetime of structures of higher temporal hierarchical level. The existence of law (1-2) allows us to use quasi-closed thermodynamic models to investigate living systems. Although the "spectrums" of the lifetimes of each structural type is wide, nevertheless it is possible to distinguish triads of relaxation lifetimes with strong inequality. The latter signifies that one can distinguish the system under study and its thermostat (the environment with practically no changes in the significant parameters). If this is achieved, it is possible to use with a certain degree of approximation the principles of classical thermodynamics and macrokinetics in describing the evolution of the biological systems (which may be presented as a series of successive processes of condensation whereby higher hierarchical structures arise from the lower hierarchical structures).

Unlike non-equilibrium thermodynamics of systems far from the state of equilibrium, macrothermodynamics explores systems close to the state of equilibrium; their conditions are determined by functions whose differentials are total. Professor Gladyshev succeeded in substantiating that the mean specific values of the Gibbs function related to a unit of volume or mass for intermolecular interactions, at the formation of supramolecular (supracellar) structure of an j-th organism's tissue, has the tendency to a minimum.

This trend of to a minimum accounts for the accumulation in the biosystem of a substance with a chemically high-energy capacity that leads to the growth of a specific chemical component of Gibbs function of bio-object in the course of ontogenesis, phylogenesis and separate stages of evolution. This approach made it possible to substantiate and experimentally prove the possibility of accumulating and transferring hereditary thermodynamic features in the course of extensive periods of biological evolution (Herald of the Russian Academy of Sciences, 63, No. 3, p. 164, 1993; Encyclopedia of Chemistry, vol.4, 1995, Moscow).

The macrothermodynamic theory permits the spreading to the biological systems (quasi-closed systems) of all hierarchies the principle of Le Chatelier-Braun on a quantitative basis. The latter is very promising for pharmacology, therapy, gerontology, geriatrics, nutrition, physiology of sports; in particular it will make it possible to determine man's physiological age, the optimal doses of medication, and the optimal work-out load during training sessions, etc. The principle of substance stability was formulated. Recently the macrothermodynamic theory has spread to social systems of human society that apparently resulted in building one of the prospective models in the economy (Academy of Creative Endeavors, Moscow, p. 6, 1993).

Memberships and honors

Professor Gladyshev, H.E. is a member of many associations, societies and academies: Honorary Member of the International Order of Merit - IOM; Member of IBA - Cambridge, England; Honorary Member of International Higher Education Academy of Sciences - IHEAS, Moscow; Honorary Member of Russian Higher Education Academy of Sciences; Honorary Member of Russian Academy of Fine Arts; Active member - academician of International Academy of Sciences - IAS, Munich; Member (academician) of International Academy of Creative Endeavors; Member of Academy of Human Pursuit, (USSR, Russia, 1991-1992); Member of Russian Academy of Physical (Natural) Sciences - RAEN, Moscow; Member of Academy of Book’s Arts, Russia (1990); Member (academician) of A.M. Prokhorov Engineering Science Academy of Russia; Member and Professor of Academy of Golden Deeds for Glory of Fatherland (25 Dec. 2007), Member of Geopolitical Academy of Russia (2006), Member and Professor of Academy of the Academy of security, defense and monocracy, DP â„– 13611 (2007), Member of World Literary Academy, England; Member of the International Royal Heritage Academy of the United Nations (New York, Paris, Monte Carlo, London, etc); Member of the International Academy of Sciences, Education, Industry, & Arts (CA, the USA); Member of the New York Academy of Sciences (to 2000); Member of Engineer-Technological Academy of the Chuvash Republic; Member of the Amer. Chem. Soc., 1978; Member of the National Geographic Society, Washington, D.C.; Member of the academic Advisory council for the Laboratory of Bio-organic-phosphorus chemistry (Tsinghua university, China); International Member AAAS - USA, 1996 - 2001 and others.

He was one of the Editors of the "Journal of Biological Systems" to 2005 (World Scientific, An international publisher, Singapore). Member of the Advisory Board of “the Ukrainian Polymer Journal”, 1991-1993; Journal “Entropy” (the

USA, SWITZ, to 2006), “Electronic Journal of Mathematical and Physical Sciences” (the USA) and so on. Chairman of the Board of Trustees of Journal “The Summary of Technologies”, to 2004 (Russia). He is also the recipient of many honors and awards, including the Willard Gibbs Gold Medal, the International Academy of Creative Endeavors (1991, Gladyshev’s name was recommended by academician Nikolai Bogolubov); The "World Intellectual" (1993, IBC); "The Twentieth Century Award for Achievement" (1992, IBC); "Grand Ambassador of Achievement" - twenty-five years of outstanding personalities (1992, ABI); World Lifetime Achievement Award (USA -1993, 1995, 1996). He has been honored the International Order of Merit "Exellentia"(1994, without some payment); Gold Ivan Pavlov's Pin of the International Academy of Science, Munich (1999); Order of Creation, International Academy of Science, Russia Department, Moscow (2000); Silver medal of Irina Archipova Fund (No. 24, 2004); N. Sats gold medal (2005); A.M. Prokhorov gold medal (2006); Medal “For services to the high school” (International higher education academy of science, 2007); “Order of Peter the Great”, Height (National Committee of Premiums of Russia, 2007); Gold star - the sign for noble deals (Academy of Golden Deeds for Glory of Fatherland, Order â„– 005, Dec. 25, 2007); Order of Mikhail Lamonosov (National Committee of social - public premium), N 192,d 2007 ,and others. His name is included into the list of very outstanding scientists of all times and nations (http://www.humanthermodynamics.com/HT-history.html http://www.humanthermodynamics.com/HT-tree.html).

In addition to his great interest in science, he enjoys music, mountaineering and travelling. He has one son, Andrei, who was born in 1960, a daughter, Ekaterina, who was born in 1962, a grandson Ilya, who was born in 1984.

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θΔics

In existographies, **Gerald Joyce** (1956-) (CR:4) is an American RNA-world origin of life theorist noted, in chnopsology, for his 1991 high-cited so-called working-definition of life, which reads as follows: [1]

> "Life is a self-sustained chemical system capable of undergoing Darwinian evolution."

This definition is positioned, according to Robert Hazen, as being one of the better ones as found amid a recent origin-of-life text featuring an appendix of 48 different authorities, including: John Maynard Smith (any population of entities which has the property of multiplication, heredity, and variation), Stuart Kauffman (an expected collectively self-organized property of catalytic polymers), among other definitions, such as: "the ability to communicate", "a flow of matter, energy, and information", etc. [1]

Joyce's definition, interestingly, has retained a certain amount of chain-like recitation popularity; having come to be known, as of 2007, supposedly, as NASA's working definition of life, particularly in regards to their so-called exobiology program or search for extraterrestrial life. [3]

Difficulties

One of the unique aspects of Joyce's popular definition, is that it, in a way, attempts to intertwine, mold, or mend the disjunct between the Darwin view of natural selection and the chemical view of natural selection, in a seemingly innocuous manner—although not so innocuous to the more discerning eye. The gist of Joyce's definition is as follows:

Chemical Transformation (model)	goes into →	Darwinian Transformation (model)
"chemical thermodynamics"		"survival of the fittest"
first law + second law	(4 BYA) (gap)	DNA random mutation + natural selection

Joyce, in short, attempts to surmount the unbridgeable gap, with the use of the term "self-sustained chemical system" which is code, for those who don't know, for perpetual motion or rather perpetual motion of the living kind, i.e. a self-sustaining thing, reaction, or process, is a violation of the principle of inertia and the first law of motion (see: self terminology reform). The issue is summarized well by Roger Caillois' famous 1973 quote: [4]

> "Clausius and Darwin cannot both be right."

In matters of dispute, of such universal importance, one always is advised to side with the "supreme law" of the universe, above that of all else, in the famous words of Arthur Eddington. In this case, nature "selects" and distinguishes between what is both "natural" and what is "unnatural" and chooses, in the end, those system transformation processes that result in free energy decrease differentials, system overall, over time. Hence, we side with Clausius and not with Joyce and his perpetual motion model of life.

Education

Joyce completed his BA in the biological sciences in 1978 at the University of Chicago and his MD-PhD in 1984 in neurosciences and chemistry at the University of California, San Diego.

Quotes

The following are related quotes:

> "You have to build a straw man upon straw man to get to the point where RNA is a viable first biomolecule."
>
> — Gerald Joyce (1989), "RNA Evolution and the Origins of Life" [5]

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External links

â— Gerald Joyce – Wikipedia.
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θΔics

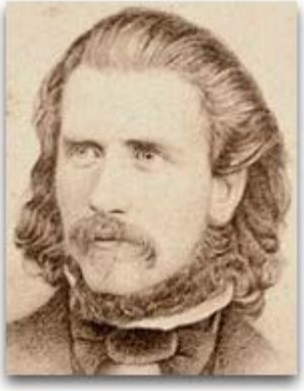

In existographies, **Gerald Massey** (1828-1907) (IQ:185|#67) [RGM:506|1,500+] (RE:79) [CR:99] was an English freethinker, poet, archeologist, Egyptologist, evolution advocate, and leading religio-mythology scholar, noted for his 1883 *Natural Genesis*, wherein he explains how the Christian story of Jesus Christ, the basis of Christianity, is but a re-write of the Egyptian myth of the Egyptian god-human Horus born from the god Osiris and the goddess Isis, aka "Stella Maris" (star of the sea), of the Heliopolis Ennead (9 gods) of Anunian theology in Egyptian cosmology (see: religio-mythology transcription and syncretism). [1]

Poetry

In 1869, Massey published *My Lyrical Life: Poems Old and New*, which is said (Q) to bear "features of his genius" in a resemblance to Keats, along with thoughts and expressions found within which "remind the reader of Shakespeare."

Christ-Horus connection

In 1883, Massey, in his chapter eight entitled "The Mythical Christ", of his *Natural Genesis*, supposedly stated the following:

> "Christianity was neither original nor unique, but that the roots of much of the Judeo/Christian tradition lay in the prevailing Kamite (ancient Egyptian) culture of the region. We are faced with the inescapable realization that if Jesus had been able to read the documents of old Egypt, he would have been amazed to find his own biography already substantially written some four or five thousand years previously."

In c.1888, Massey in his "Luniolatry: Ancient and Modern", was making the following Egyptian-to-Christian transliterations: [8]

> "By comparing the various myths with the Gospel versions, we find that
>
> > Sut and Horus = Satan and Jesus
> > Anup and Horus = John and Jesus
> > The Double Horus = Two-fold Christ
> > Khunsu = Christ
>
> The French retain a tradition that the man in the moon is Judas Iscariot, who was transported there for his treason to the Light of the World. But that story is pre-Christian, and was told at least some 6,000 years ago of Osiris and the Egyptian Judas, Sut, who was born twin with him of one mother, and who betrayed him, at the Last Supper, into the hands of the 72 Sami, or conspirators, who put him to death. Although the Mythos became solar, it was originally lunar, Osiris and Sut having been twin brothers in the moon."

(add)

Zeitgeist

In 2007, Massey was a key citation staple of Peter Joseph's viral film *Zeitgeist*; the following is an example quote:

> "They must find it difficult … those who have taken authority as the truth, rather than truth as the authority."
>
> — Gerald Massey (1883), *Natural Genesis, Volume One* (title page quote); cited (Q) by Peter Joseph (2006) *Zeitgeist*

(add)

Religulous

In 2008, American comedian Bill Maher, a Catholic-Jewish raised person turned skeptical agnostic atheist into his 40s, in his film *Religulous*, used Massey's *Ancient Egypt: the Light of the World*, as the basis of the portion of the film wherein it is argued that the Jesus story is a re-write of the Horus story. [3] In the film, Maher confronts an unprepared Christian with the Horus = Jesus claim; the gist of which is as follows: [10]

A Nov-Dec 2012 issue of *Catholic Answers Magazine*, shows Horus (left), American atheist-agnostic comedian Bill Maher (center), and **Massey** (right) (Q) said to be representative how the so-called claim that Jesus is based on the Egyptian god Horus has been making the rounds recently.

> Maher: But the Jesus story wasn't original.
>
> Christian man: How so?
>
> Maher: Written in 1280 BC, the *Book of the Dead* describes a god, Horus. Horus is the son of the god Osiris, born to a virgin mother. He was baptized in a river by Anup [Anubis] the Baptizer [see: baptism] who was later beheaded. Like Jesus, Horus was tempted while alone in the desert, healed the sick, the blind, cast out demons, and walked on water. He raised Asar from the dead. "Asar" translates to "Lazarus." Oh, yeah, he also had twelve disciples. Yes, Horus was crucified first, and after three days, two women announced Horus, the savior of humanity, had been resurrected.

(add)

Education

Massey's first two books, circa age 8 to 12, were the Bible and John Bunyan. He then read Robinson Crusoe, followed by some Wesleyan tracts.

In 1843, Massey, age 15, moved to London, therein discovering English, Roman, and Greek history, where at he procured a voracious appetite for books; which he recounts as follows: (Q)

> "Till then [age 15], I had wondered why I lived at all. Now I began to think that the crown of all desire and the sum of all existence was to read and get knowledge. Read! Read! Read! I used to read at all possible places—and in bed till three in the morning—nothing daunted by once setting the bed on fire. Greatly indebted was I also to the bookstalls, where I have read a great deal, often folding a leaf in a book and returning the next day to continue the subject; but sometimes the book was gone, and then great was my grief! When out of a situation, I have often gone without a meal to purchase a book."

Here he read works by Thomas Paine, Constantin Volney, and Louis Blanc, which he had read prior to 1849. [7]

Quotes | Employed

The following are quotes employed by Massey:

> "In the customs and institutions of schools, academies, colleges, and similar bodies destined for the abode

of learned men and the cultivation of learning, everything is found adverse to the progress of science. For the lectures and exercises there are so ordered, that to think or speculate on anything out of the common way can hardly occur to any man. And one or two have the boldness to use any liberty of judgment, they must undertake the task all by themselves: they can have no advantage from the company of others. And if they can endure this also, they will find their industry and largeness of mind no slight hindrance to their fortune. For the studies of men in these places are confined and as it were imprisoned in the writings of certain authors, from whom any man dissent he is straightway arraigned as a turbulent person and an innovator."

— Francis Bacon (1620), *New Instrument of Science* (Q); cited by Gerald Massey (1883) in *Natural Genesis, Volume One* (pg. iv)

"The few who had the courage to call the child by its right name, the few that knew something of it, who foolishly opened their hearts and revealed their vision to the many, were always burnt or crucified."

— Johann Goethe (c.1810), *Source*; cited by Gerald Massey (1883) in *Natural Genesis, Volume One* (pg. iv)

"Bind it about thy neck, write it upon the tablet of thy heart: 'everything of Christianity is of Egyptian origin."

— Robert Taylor (1829), *Oakham Gaol*; cited by Gerald Massey (1883) in *Natural Genesis, Volume One* (pg. iv)

"It may be that this fabular relation borders on the verity of physical science."

— Plutarch (100), *De Iside* (§36) (Q); cited by Gerald Massey (1883) in *Natural Genesis, Volume One* (pg. iv)

Quotes | On

The following are quotes on Massey:

"**Massey** is a fiery genius who good books warm my chilled heart."

— Louis Kossuth (c.1885) (Q)

Massey (Gerald), poet and archæologist, b. of poor parents at Tring, in Herts, 29 May, 1828. At eight years of age he was sent to a factory to earn a miserable pittance. At the age of fifteen he came to London as an errand boy, read all that came in his way, and became a Freethinker and political reformer. Inspired by the men of '48, he started *The Spirit of Freedom*, '49. It cost him five situations in eleven months. In '53 his *Ballad of Babe Christabel, with other Lyrical Poems* at once gave him position as a poet of fine taste and sensibility. Mr. Massey devoted himself to the study of Egyptology, the result of which is seen in his *Book of Beginnings* and *Natural Genesis*, '81-83, in which he shows the mythical nature of Christianity. Mr. Massey has also lectured widely on such subjects as Why Don't God Kill the Devil? The Historical Jesus and the Mythical Christ, The Devil of Darkness in the Light of Evolution, The Coming Religion, etc. His poems are being re-published under the title *My Lyrical Life*.

An 1889 existography of **Massey**, from Joseph Wheeler's *Biographical Dictionary of Freethinkers*, describing him as a freethinker, poet, and archeologist. [9]

"Justin Martyr [c.150] says that Christ was born on the same day on which the sun was re-born in stabulo Augiae, and the stable of Angles, cleansed by Hercules in his sixth labor, corresponds to the cave in Capricorn, which is the cave of Mithra and of the other saviors. Abba Udda, the Akkadian name of the tenth month, answering roughly to Dec, the month of Capricorn, denotes the cave of light. The cave or winter solstice in Capricorn was the birthplace of the

Mithraic Messiah from 2410 to 255 BC and this was continued as the cave or birthplace of the Christ after it had ceased to be applicable to the solar god. Justin, however (determined to include both), asserts that Christ was born in the stable and afterwards took refuge in the cave." But no messiah, whether called Mithra, Horus or Christ could have been born in the stable of Augias, or the cave of Abba Udda, on the 25th of Dec, after the date of 255BC because the solstice had passed out of that sign into the constellation of Sagittarius."

— Robert Shaw (1904), *Sketch of the Religions of the World* (pg. 209); elaborated re-quote of **Gerald Massey** (c.1890) in *The Historical Jesus and the Mythical Christ* (pg. 41)

"**Massey's** story is that of many men of genius, born in poverty, reared in the school of difficulty, he learned in suffering what he taught in song."

— James Robertson (1908), *Spiritualism: the Open Door to the Unseen Universe* (Q)

"**Massey**, with brilliant scholarship and insight, pierced Egypt's enigmatic scriptology, and documented the provenance of both Old and New Testament literature from remote Egyptian sources. He forced us to ask how the four Gospels of the Christian canon could be the biography of any Messianic personality living in the first Christian century, when he traced their texts back to Egyptian documents that must have been venerable even in 3500 BC."

— Alvin Kuhn (1963), *A Rebirth for Christianity* [2]

"**Massey**, a man of many talents, distinguished himself as a social reformer, a poet and an Egyptologist. His fame rested mainly on the six monumental volumes in which he dealt at length on the mythology and religion of ancient Egypt, and on his poetry. Although he was a capable lecturer, the lectures were not widely circulated, and were privately printed in an obscure volume."

— John Jackson (1976), "Forward" to *Gerald Massey Lectures* [2]

"Gerald **Massey** was a man of **vivid genius** and poetic fire who distinguished himself as a social reformer, a poet, and especially an Egyptologist. His poetry won the admiration of both Tennyson and Ruskin. His fame, however, rests mainly on six monumental volumes that dealt at length with the mythology and religion of ancient Egypt. He studied the extensive Egyptian records housed in the British Museum and taught himself to decipher the hieroglyphics. Although he was a capable lecturer, his speeches and books were not widely circulated. The record shows that his controversial work was considered taboo in what were regarded in his day as respectable literary and religious circles. He was nevertheless light-years ahead of his time."

— Tom Harpur (2004), *The Pagan Christ* (pg. 9)

"In exploring the various Egyptian influences upon the Christian religion, one name frequently encountered is that of lay Egyptologist Gerald **Massey**. Born in abject poverty in England, Massey was almost entirely self-taught; yet, he was able to write and lecture about several subjects with **tremendous erudition** and authority. Despite his lack of formal education, Massey could read several languages, including not only English but also French, Latin, Greek and evidently Hebrew and Egyptian to a certain degree."
— Dorothy Murdock (2008), *Christ in Egypt: the Horus-Jesus Connection* (Q)

Quotes | By

The following are noted quotes by Massey:

> "The child comes into the world like a new coin with the stamp of god upon it."
>
> — Gerald Massey (1855), *Poems and Ballads* [6]

> "It takes the latter half of all of one's lifetime to unlearn the falsehood that was instilled into us during the earlier half. Generation after generation we learn, unlearn, and re-learn the same lying legendary lore. Henceforth, our studies must begin from the evolutionist standpoint in order that they may not have to be gone over again."
>
> — Gerald Massey (1883), *The Natural Genesis, Volume One* (pg. 2)

> "The human mind has long suffered an eclipse and been darkened and dwarfed in the shadow of ideas, the real meaning of which has been lost to the moderns. Myths and allegories whose significance was once unfolded to initiates in the mysteries have been adopted in ignorance and re-issued as real truths directly and divinely vouchsafed to mankind for the first and only time! The earlier religions had their myths interpreted. We have ours misinterpreted. And a great deal of what has been imposed on us as god's own true and sole revelation to man is a mass of inverted myths."
>
> — Gerald Massey (1883), *The Natural Genesis, Volume One* (pg. 13); cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 30)

> "The Gospels do not contain the history of an actual man, but the myth of the god-man, Jesus, clothed in an historical dress."
>
> — Gerald Massey (c.1888), "Luniolatry: Ancient and Modern" [8]

> "There are none so blind as those who **won't** see, except those who **can't**."
>
> — Gerald Massey (1888), "Are the Teachings Ascribed to Jesus Contradictory?" [5]

> "I court honest criticism, and welcome genuine correction. I do not mind being misunderstood, but do resent misrepresentation. I am in search of realities myself, and have no tolerance for men or things in masks. I try to follow truth, like the old Egyptians, my masters, with all the force of sincerity, all the fervor of faith. That is comparatively easy now-a-days when bonfires are no longer made of man or book, and the penalties are so very slight. A loaf or two of bread the less; a greeting here or there with an offensive epithet, a rotten egg, or a dead cat, are things to be smiled at when we remember our forerunners that were her lovers from old, who beat out a pathway for us through all the long dark night of the past, and lit it with illimitable rows of their burning bodies, each turned into a flaming Torch for Truth."
>
> — Gerald Massey (c.1890), "The Historical Jesus and the Mythical Christ" [4]

> "The human soul never was 'conceived as a bird', but might be imaged as a bird, according to the primitive system of representation. The golden hawk, for instance, was a bird which typified the sun that soared aloft as Horus in the heavens, and the same bird in the eschatology was then applied to the human soul in its resurrection from the body. Hence the hawk with a human head is a compound image, not the portrait of a human soul. The **celestial poultry** that **pass for angels** in the imagination of Christendom have no direct relation to spiritual reality. A **'feathered angel'** was never yet seen by clairvoyant vision, and is not a result of revelation. We know how they originated, why they were so represented, and where they came from into the Christian eschatology. They are the human-headed birds that were compounded and portrayed for souls in Egypt [see: Egyptian human], and carried out thence into Babylonia, Judea, Greece, Rome, and other lands."
>
> — Gerald Massey (1907), *Ancient Egypt: The Light of the World: a Work of Reclamation and Restitution in Twelve Books, Volume One* (pg. 136)

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● Massey, Gerald. (1883). *The Historical Jesus and the Mythical Christ: Natural Genesis & Typology of Equinoctial Christolatry* (242-pgs) (pdf); originally §13 of *Natural Genesis* (and or lecture); 45-pg version (Q), Secular Society Limited by the Pioneer Press, 1900; Publisher, 1992.

External links

● Gerald Massey – Wikipedia.
● Nile Genesis – Gerald-Massey.org.uk.

θΔics

In hmolscience, **Gerard G. Nahum** (1956-), or Gerry Nahum, as he goes by, is an American chemical engineer turned physician known for his 1998 theory that the soul can be weighed scientifically at the point of (death) dereaction, via measuring it's energy-information content, with electromagnetic sensors.

Overview

In 1961, at age five, Nahum, as he estimates in retrospect, states that he began to ruminate on a theory of consciousness. Specifically, Nahum states that "he became convinced that the first law of thermodynamics applied to consciousness" when he was five years old, after which time he began to theorize as to the question of "where does it go" after death? [7]

In 1978, Nahum states that he had a semi-solidified version of a energy theory of consciousness. [7]

In 1998, Nahum began to promulgate, in various scientific circles, a 25-page presentation entitled "A Proposal for Testing the Energetics of Consciousness and its Physical Foundation", a cessation thermodynamics proposal to conduct a consciousness-weighing project to quantify the energy-information of consciousness (the "weight of the soul"), at the point of death using a negative entropy theory, and estimated that it would cost approximately $100,000. [1] Nahum defines the soul or rather 'residual energy/information' after the complete dissolution of an organism after death as: [2]

> "Soul is the (obligatory) negative entropy (i.e., energy/weight equivalent) that is necessary to allow for the nonequilibrium meta-stable physical 'quasi-steady-state' of a living/conscious biological system."

While not a religious man, Nahum has spent a good portion of his life on this puzzle, attempting to get funding for a thermodynamics-information based consciousness quantification experiment from the Catholic church, various physics departments, and institutes like the University of Arizona's Human Energy Systems Laboratory. [1]

He often attends science-of-consciousness and quantum theory gatherings, hoping to discover potential partners.

Nahum uses a mixture of information theory, thermodynamics, and the mass-energy equivalence relation, to explain the conservation of consciousness at the point of death. In short, according to Nahum, the change in heat dQ that has to be liberated per bit of information lost is:

$$dQ_I = 3 \times 10^{-21} J$$

This loss or destruction of information at death, in the processing consciousness, is hypothesized to potentially occur, according to Nahum, as a result of the destruction of brain cell microtubules, which during life act like an "abacus for molecular calculation at the subcellular level". Using this numerical figure as a basis, Nahum then uses Einstein's mass-energy equivalence relation:

$$E = mc^2$$

to calculate that the weight of one bit, the basic unit of information and of consciousness, is a "billionth billionth billionth of a billionth of a kilogram" or:

$M_{bit} = 10^{-36} kg$ (verbal approximation) or $3.3 \times 10^{-38} kg$ (exact value)

Beyond this, Nahum estimates that consciousness may be comprised of a minimum of 1-10 million bits of information, but that he doesn't know how much more may be necessary. Based on this logic, he postulates that one could measure the changes in mass that are associated with the loss of information comprising consciousness at death using scales that have at least picogram ($10^{-12} g$) sensitivity or better. On this basis, Nahum postulates that the weight of the consciousness *W(t)* surviving after death can be quantified by the following expression:

$$\int_{t_0}^{t} W(t)dt = \frac{g}{c^2}\left(\int_{t_0}^{t} E(t)dt + \int_{t_0}^{t} C(t)dt\right)$$

where *W(t)* is the weight of the system containing the experimental subject as a function of time, *E(t)* is the energy radiated or dissipated by the system as a function of time over all spatial dimensions, *C(t)* is the time dependent energy deficit not accounted for by measurable system energy radition-dissipation, t_0 is the time of death of the biological system, *t* is the time elapsed since the death of the biological system, *g* is the local acceleration of gravity, and *c* is the speed of light. Nahum then comments, after several pages of experimental procedure, that: [4]

> "Assuming that these experimental goals can be accomplished, then the quantity of negative entropy and or energy that is associated with the phenomenon of consciousness should, in principle, be both measurable and quantifiable."

(add discussion)

Difficulties on theory

Nahum's theory, in short, posits that consciousness can be associated with a certain amount of information content of some part of a living, sentient being (presumably within the central nervous system); that this information is equivalent to a certain amount of negative entropy (order) or energy; that at the point of irreversible neurological activity cessation (or death) the magnitude of the energy associated with consciousness will be conserved according to the law of conservation of energy; that this consciousness energy loss will correspond to a loss of physical mass according to the mass-energy equivalence relation; and that by measuring the radiation of all possible types of energy at the point of termination in an isolated chamber that the mass of departed consciousness could be measured in units of kilograms.

The first issue with this argument is that the mass-energy equivalence relation has been shown to apply only to situations wherein there is a transformation of sub-atomic particle into another type of subatomic particle, releasing energy in the process, such as in radioactive decay, e.g. carbon-14 converting to nitrogen-14 plus radiation; solar thermonuclear reactions, e.g. four protons converting to one helium-4 atom, releasing energy in the form of gamma ray photons and neutrinos, whereby 0.7% of the mass of the original four protons is lost; or as in various types energy-mass changes that occur in high speed particle colliders.

None of these types of decay processes, however, are known to occur when a person dies; thus, the process by which a person dies should conform to the laws of chemistry, the conservation of mass being of predominance. The mass-energy equivalence principle, in the form of hydrocarbon molecules (or other types of atoms) undergoing nuclei transformation, at the point of death, to release energy, should not apply to human death as Nahum posits.

The second issue of difficulty with Nahum's theory is the postulate of correlating mental intelligence, in the form of stored information, to entropy or rather negative entropy. While it is has been argued, as Hermann Helmholtz stated in 1882, that the magnitude of entropy is proportional to the order of a system, no one has ever presented a derivation starting with the basic 1865 Clausius definition entropy, as differential unit of heat *dQ* passing the boundary of a system divided by the absolute temperature *T* of the system, to arrive at some formulation of entropy (or the negative of entropy) as a absolute measure of brain intellect or better yet consciousness (or the information value of consciousness). Nahum, however, states, in his abstract, that these connections are "well-established", specifically commenting that the "equivalence of energy/negative entropy with information system content" is a well-established physical relationship.

This, however, is not the case, although many would like to say it is so, simply by citing the likes of Leó Szilárd (1929), Claude Shannon (1948), Leon Brillouin (1950), Edwin Jaynes (1957), or Myron Tribus (1961), among others. All connections of thermodynamic entropy to system information content stem from American electronics engineer Ralph Hartley's 1927 introduction of the logarithmic function to measure high and low voltage signals in telegraph wires, where he defined *H* as information defined by the following function:

$$H = n \log s$$

where *n* is the number of successive selections or readings of a sequence of voltage levels in a telegraph receiver tape, and *s* is the number of possible voltage levels by which the signal may be transmitted by the sender. Although Hartley's derivation had nothing to do with heat engines or thermodynamic working bodies, Shannon would later declare *H* to the same as the entropy in statistical mechanics, defined by Ludwig Boltzmann, forever convoluting the two completely different "systems", telegraph sending systems and steam engine systems.

On these views, to justify his proposed consciousness weighing experiment, Nahum gives a short derivation in his appendix in which he states that Clausius entropy (1865), Boltzmann entropy (1901), and Shannon entropy (1948) are all equivalent expressions of the entropy of any physical systems:

Entropy	Type	Applicablity
$\Delta S \geq \frac{\Delta Q}{T}$	Clausius entropy	All physical systems of the universe.
$\Delta S = k \log \Delta P$	Boltzmann entropy	Systems having non-correlation of velocity, i.e. those ascribing to the Boltzmann chaos assumption.
$\Delta S_{bit} = -k \log 2$	Shannon entropy	Information transmission systems, i.e. current or voltage variations sent down telegraphy, telephone, fiber optic lines, etc.

This, however, is far from the truth. Clausius entropy applies to all physical systems; Boltzmann entropy is a statistical approximation of Clausius entropy, generally applicable to only ideal gas systems; and Shannon entropy is not even an entropy of thermodynamics, but refers to measurements of strings of binary Morris code sent in transmissions. In any event, Nahum substitutes Shannon entropy into Clausius entropy, eliminating the entropy change variable ΔS to arrive at an expression for heat loss per loss of bit of information in the nervous system:

$$\Delta Q_{bit} \leq -Tk \ln 2$$

citing Claude Shannon (1949), Charles Bennett (1982), and Alvin Weinberg (1982), as justification for this calculation. [6]

Beyond these issues, Nahum postulates that, based on the increase of black hole entropy in the region of event horizons, that similarly the negative entropy or post-death ordered transformed consciousness may go into a type of extra-dimensional parallel universe hyperspace, in the regions of the Planck length, where the energy of the departed consciousness goes into small types of singularities embedded within our own four-dimensional space-time world. [5] To explain how this "energy of consciousness" may be able to depart or transfer to the hyperspace domains, whereas other varieties of standard energies do not, Nahum reasons:

> "One possible explanation may depend upon the precise time-frequency spectrum of the energy liberated as a result of the loss of biological consciousness, possibly imparting to it a particular signature that may allow it passage to hyperspace domains, whereas other more 'usual' forms of energy in other conformations do not permit access."

(add discussion)

Education

Nahum completed his BS in chemical engineering, with special interest in thermodynamics and information theory, at Yale University and his MD at Stanford University. Nahum was a professor of obstetrics and gynecology at Duke University until 2004, after which he began working for the U.S. Food and Drug Administration in Rockville, Maryland. Nahum, currently, is Vice President of Global Development, General Medicine, at Bayer HealthCare Pharmaceuticals. [3]

References

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(c) Spook: Science Tackles the Afterlife – Wikipedia.

(d) Roach, Mary. (2006). "What Happens After You Die?", *New Scientist*, Nov. 18.
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4. (a) Nahum, Gerard. (1998). "A Proposal for Testing the Energetics of Consciousness and its Physical Foundation" (25-pgs), Presented at an international meeting in Tuscson, AZ called *Tuscon III: Towards a Science of Consciousness*.
(b) ibid, Nahum. (2005). "A Proposal for Testing the Energetics of Consciousness and its Physical Foundation (33-pgs)", Submitted for review to *Consciousness and Cognition.*
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Further reading

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External links

â— Gerry Nahum – Wikipedia.
â— Gerard Nahum – Vitals.com.

θΔics

In existographies, **Gerardus D. Bouw** (c.1943-) is a Danish-born Canadian-American creationist-focused astronomer, noted for []

Overview

In 1975, Bouw, outlined some draft notes on overpopulation, entropy, and creation. [3]

In 1998, Bouw, in his "The Waves of Sin", started with Freeman Dyson's 1970 definition of entropy as something that "measures of the degree of disorder associated with the energy; energy must always flow in such a direction that the entropy increases", to attempt to make some type of convoluted backwards idea that Biblical "truth" can be measured by Boltzmann entropy, or something along these lines.

Bouw followed this up by his "Entropy and the Human Situation" (1999) and "Entropy and the New World Order" (2000) in which he argued that things such as: stars, planets, financial wealth, information wealth, intelligence, economic aggregates, and life are examples of "local entropy reversal" (see: local entropy decrease; entropy reversal), after which he attempts to make some type of "sin" argument using Boltzmann entropy formula arguments, most of which amounts of a mess of argument, typical of most religious thermodynamics papers. [2]

Religion

Bouw raised a Christian, and became an atheist during his undergraduate studies, then became a "generalist" during his graduate studies, after finding that science could not answerer everything. Later, in 1974, while unemployed, Bouw began to read Robert Heinlein's 1973 *Time Enough For Love* (Q), which inspired him to read the Bible to look for inconsistencies, after which he became a literal King James Version Bible-believing geocentric creationist. [3]

Education

In 1967, Bouw completed his BS in astrophysics at the University of Rochester, and in 1973, completed his PhD in astronomy at Case Western Reserve University. [3]

Quotes | Employed

The following are quotes employed by Bouw:

> "**Positivism** is a doctrine contending that sense perceptions are the only admissible basis of human knowledge and precise thought."
>
> — Anon (c.1990), *American Heritage Dictionary* [2]

References

1. Bouw, Gerardus D. (1998). "The Waves of Sin" (Q), *Biblical Astronomer*, 8(85):28.
2. (a) Bouw, Gerardus D. (1999). "Entropy and the Human Situation" (Q), *Biblical Astronomer*, 9(89):16-25.
(b) Bouw, Gerardus D. (2000). "Entropy and the New World Order" (drafted: 1975) (pdf), *Biblical Astronomer*, 93:5-15.
3. Gerardus Dingeman Bouw (overview) – Geocentricity.com.

External links

- Gerardus Bouw – CreationWiki.
- Gerardus D. Bouw – Natural Philosophy Wiki.

θΔics

In science, **Gerardus Mulder** (1802-1880) was a Dutch organic chemist noted for []

Overview

In *circa* 1837, Mulder conducted an experiment, done on the advice of Swedish chemist Jacob Berzelius, and results of which, as summarized by Scottish agricultural chemist James Johnston (1846), were as follows: [1]

> "Mulder examined the fibrin of blood, the albumen or white of the egg, and the gluten of wheat. When these substances are dissolved in caustic potash, with the requisite precautions, and the solution is then made slightly acid by the addition of vinegar, a white precipitate falls, which Mulder collected and carefully analyzed. To this substance, for certain theoretical reasons, he gave the name of *protein.* It was free from sulphur and phosphorus,—both of which are contained in the albumen of the egg and the fibrin of the blood. It consisted of carbon, hydrogen, nitrogen, and oxygen only, and was represented by him by the formula: C_{40} H_{51} N_5 O_{12}."

In modern terms, with the addition of sulfur and phosphorus, what Mulder found in his elemental analysis of common proteins, is that nearly all proteins have the following 6-element empirical formula: [2]

$$C_{400}H_{620}N_{100}O_{120}P_1S_1$$

This may have had some type of influential connection to the Hill order based CHNOPS model of protoplasm (living substance).

Protein etymology

In a 10 Jul 1838 letter from Jacob Berzelius, sent to Mulder on namesake suggestion, Berzelius stated:

> "The name protein that I propose for the organic oxide of fibrin and albumin, I wanted to derive from Greek word *πρωτειος* [primacy], because it appears to be the primitive or principal substance of animal nutrition."

Mulder went on this suggestion and used the name in his 1838 publication "On the Composition of Some Animal Substances" assigned the name "protein" for the organic oxide of fibrin and albumin.

Animal | Vegetable life debate

Mulder's discovery was said to have sparked a heated debate between the so-called difference between "animal life" and "plant life" or vegetable life.

References

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Further reading

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External links

â— Gerardus Johannes Mulder – Wikipedia.

θΔics

In existographies, **Gerardus Vossius** (1577-1649), or Gerard Vossius, a friend of Hugo Grotius, was Dutch classical religio-mythology scholar, noted for []

Overview

In c.1620, Vossius published some type of mythology textbook; Richard Popking (1990) summarizes Vossius' religio-mythologies ideas as follows:

> "Vossius, like the Florentine and Cambridge Platonists, accepted the theory of a tradition of "ancient theology," a *prisca theologia*, which showed that an original, initially clear, divine revelation was given to Moses which then trickled down into the religions of other cultures and became, in this process, corrupted into pagan views when idolatrous elements were introduced and connections made between natural events and divine personalities and forces. By tracing back what is known of the earliest forms of pagan theology, following later developments, and identifying how traces of Hebrew theology could still be discerned in the histories of pagan traditions (for example, recognizing that the Hebrew Moses must be identified with such pagan figures as Mocchus, Mises, Moso, Palaestinus, Jockim, or Melehil), one could understand the origin and history of heathen mythologies and cults. Vossius' text is a handbook of mythology, ancient and modern."

In 2010, Dorothy Murdock was citing Vossius, along with Pierre Huet, as two early religio-mythology scholars, whose works were in need of translation. [2]

References

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External links

â— Gerardus Vossius – Wikipedia.

θΔics

In existographies, **Gerbert** (c.946-1003) (Cattell 1000:679), aka “Gerbertus” (Latin birth name), “Gerber of Aurillac”, or “Pope Sylvester II”, was a French intellectual, dubbed a “Pope philosopher” (Kitchin, 1922), noted for []

Overview

In c.990, Gerbertus, as reported by historian William of Malmesbury (c.1095-1143) (Q), built some type of organ blown by air escaping from a vessel in which it was compressed by heated water, which is sometimes cited as being an early steam engine of some sort. [1]

Quotes | On

The following are quotes on Gerber:

> “Hero's engine (150 BC) was a form of reaction turbine; **Gerbert**, a professor in the schools of Rheims, had an ‘organ worked by heated water’; Leonardo da Vinci (about 1500) proposed a steam gun; Cardan (about 1550) devised a machine using the vacuum from condensed steam; Porta (Naples, 1601) raised water by steam pressure, also using the vacuum idea; and de Caus (France, about 1600) forced water up by a steam fountain’. A different type of machine (corresponding to the impulse turbine) was the steam ‘hurdy-gurdy’ of Branca, in Italy, in 1629. All of the foregoing types may be said to be experimental or preparatory to the period which followed. The first machine which did actual work was that of Edward Somerset, Marquis of Worcester, in about 1663. We next hear of an alcohol engine, using a surface condenser, proposed by Hautefeuille (1678). This appears to have been forgotten. In 1690 the Frenchman Papin devised the first engine with a piston, and in 1698 Thomas Savery patented an apparatus for lifting water from the Cornish mines. Two vessels were filled with steam alternately, the maximum lift being 24 feet. This type is still in use; it is known as the "pulsometer." It may be of interest to note that the story of the "boy and the teakettle" is told of Worcester, of Savery, and of Watt. Thomas Newcomen in 1705 produced a machine where a jet of water was thrown into the cylinder. In all these engines, the valves were worked by hand. Now we come to the story of Humphrey Potter, the boy who in 1713 devised a self-acting valve motion which he called a "scrogger." With practically no other improvement, the steam engine remained as it was for about forty years. James Watt in 1763 was repairing a model of an engine (Newcomen type) from a collection in a college in Glasgow. In 1765 the idea of the separate condenser struck him, and he then began his great work. Though sometimes discouraged and reduced to poverty, forced to discontinue his experiments and go to work at surveying for support, he persevered; and the next ten years saw the addition of the governor, expansive working, the indicator, the principle of compounding, etc. He found the steam engine a crude and imperfect apparatus, and left it a marvelous instrument for the progress of the world.”
>
> — A.L. Jordan (1917), “Short Stories of Great Inventions” [2]

References

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Further reading

● Kitchin, William P.H. (1922). “A Pope-Philosopher of the Tenth Century: Sylvester II (Gerbert of Aurillac)” (Q), *The Catholic Historical Review*, 8(1):42-54.

External links

- Pope Sylvester II – Wikipedia.

θΔics

In chemistry, **Germain Henri Hess** (1802-1850) was a Swiss-born Russian chemist noted for his 1840 article “Constant Heat Sums” (Constanz der Warmesummen) in which Hess’ law, which states that heats of reactions in successive reactions must be added, was established. [1] German physical chemist Wilhelm Ostwald cites Hess, through his 1840 work, as being the founder of thermo-chemistry. [2]

References

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External links

â— Germain Hess – Wikipedia.

θΔics

In existographies, **Germaine Stael** (1766-1817) (IQ:165|#442) (Cattell 1000:164) (CR:5), aka "Madame de Steal", was French-born German writer, part of Goethe's circle, an *Elective Affinities* admirer, noted for []

Education

Stael was the only child of Swiss-born French statesman and financier Jacques Necker (1732-1804) (IQ:155|#553) (Cattell 1000:235) and Swiss-born Suzanne Curchod (Suzanne Necker), noted for her who hostessing of Rue de la Chaussée-d'Antin one of the most popular salons of Paris. Her mother, at an early age, tried to make her into a prodigy of sorts, piling the books on her.

Suzanne wanted to educate her daughter according to the principles of Jean Rousseau and to endow her with the intellectual education and Calvinist discipline instilled in her by her own Protestant pastor father; accordingly, she habitually brought Germaine as a young child to sit at her feet in her salon, where the guests, e.g. Comte de Buffon, Jean-François Marmontel, Melchior Grimm, Edward Gibbon, the Abbé Raynal, and Jean-François de la Harpe, took pleasure in stimulating the brilliant child. This exposure occasioned a nervous breakdown in adolescence, but the seeds of a literary vocation had been sown.

At the age of thirteen she read Charles Montesquieu, William Shakespeare, Jean Rousseau and Dante Alighieri.

Germany

In 1803, Stael was banned from France in by Napoleon, for publishing her controversial novel *Delphine*, after which she migrated to Germany and entered into the Goethe circle; upgrade for commenting favorably on Goethe's *Elective Affinities*.At Weimar she learned the German language and was said to have "astonished and perplexed Goethe and Schiller by her remarkable conversation and her virile intellect so strongly contrasted with her vivacity." [3]

Quotes | On

The following are quotes on Stael:

> "She was a woman of considerable talent and of great ambition, but so extremely intriguing and restless as to give rise to the observation that she would throw her friends into the sea, that, at the moment of drowning, she might have an opportunity of saving them. I was obliged to banish her from court. She was ardent in her passions, vehement and extravagant in her expressions."
>
> — Napoleon Bonaparte (c.1800) (Ñº)

> "Madame de Stael, whose work on Germany is probably the greatest book ever produced by a woman, is supposed to have been intimate with August Wilhelm Schlegel, who was a homo-sexualist, and who had been tutor to her children."
>
> — Otto Weininger (1903), *Sex and Character* [1]

Quotes | By

The following are quotes by Stael:

> "To understand all, is to pardon all."
>
> — Honore Mirabeau (c.1800), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pgs. 366)

> “One cannot deny that there is in this book [*Elective Affinities*] a profound understanding of the human heart, but it is a discouraging one. Life is presented as a thing of indifferent value, however one regards it—sad when one gets to the bottom of it, pleasant enough when one evades it, prone to moral ills, which one must cure if one can and of which one must die if one cannot.”
>
> — Germaine Stael (c.1810), on Goethe’s *Elective Affinities* [2]

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External links

â— Germaine de Stael – Wikipedia.

θΔics

In genius studies, **German genius** refers to the genius epoch, from about 1750 to 1930, in Germany, that, owing to a prolific cultural state, produce a large number of leading geniuses.

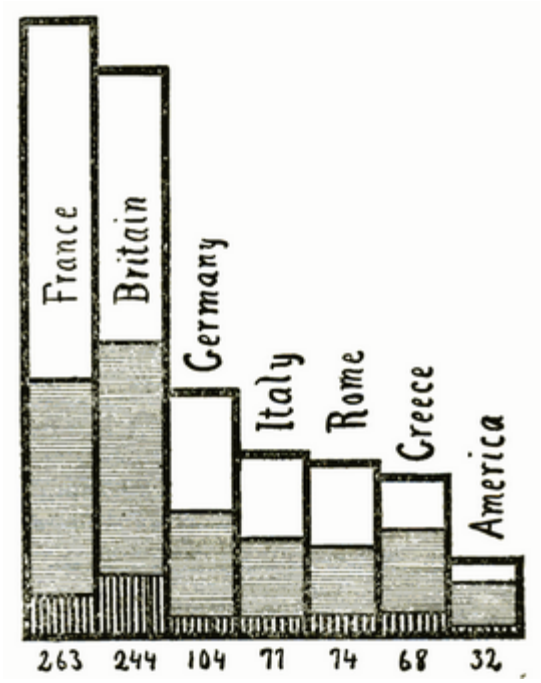

A distribution of nationalities from the Cattell 1000 (1894), showing Germany, with 104 thinkers, being the third-most predominate nation, in respect to name citation and use dominance.

Overview

Early notable German geniuses include: Martin Luther (1483-1543), Johann Faust (c.1485-c.1540), Athanasius Kircher (1602-1680), Johann Bach (1685-1685).

The 1669 terra pinguis theory of heat of Johann Becher, followed by 1703 phlogiston theory of heat, by his student Georg Stahl, mark a peak of German genius in the domain of chemistry; these theories eventually gave way to the start of French genius, in the work of Antoine Lavoisier.

In 1755, Immanuel Kant published his *Universal Natural History and the Theory of the Heavens: Essay on the Constitution and the Mechanical Origin of the Whole Universe according to Newtonian*; this can be said to mark an early rise or start of German genius, as a collective.

In 1803, German genius, centered in Weimar, Germany, was at its so-called first great intellectual peak; the following being a retrospect reconstruction drawn by German painter Otto Knille (1884):

The illustration gives a well-imaged viewing of Goethe's erudite intellectual circle: Johann Schlosser, Georg Hegel, Johann Fichte, Jean Paul, Ludwig Tieck, Wilhelm Humboldt, Alexander Humboldt, Friedrich Schleiermacher, Carl Gauss, who knew all of Goethe's poetry works, August Schlegel, Friedrich Klinger (KUnger), Peter Cornelius, Heinrich Kleist, Johann Pestalozzi seated left red jacket hunched over, who affixed Goethe with the title "prince of the mind", Barthold Niebuhr, Johann Herder, in whom in 1784 Goethe first confided his discovery of evidence for human evolution from lower animals, Johann Gleim, Lorenz Oken, Johann Voss, Johann Blumenbach, Friedrich Klopstock — and Goethe —the big dog, standing at the center of attention—followed by Christoph Wieland, seated right front, who in 1810 called Goethe's self-defined greatest theory "childish nonsense and fooling around", August Iffland—and last but not least Friedrich Schiller — Goethe's closest intellectual friend — in whom, in 1796, he first confided his newly-forming human elective affinities theory.

In 1865, Rudolf Clausius published *The Mechanical Theory of Heat*; this was another apex of German intellectual achievement.

In 1882, Hermann Helmholtz published "The Thermodynamics of Chemical Processes", thereafter becoming known as the "last of the last universal geniuses" (Liddell, 1922); this was another apex of German intellect.

In 1927, Albert Einstein was at the center of the confluence of geniuses at the Solvay conference, as shown below:

This can be said to mark the last apex of German genius.

Quotes

The following are related quotes:

> "To find a true and positive, not negative, solution of the problem of the philosophy of history may be said to have formed, and to continue to form, consciously and unconsciously, the ultimate object of that great effort of the 'German mind' which has produced Goethe and Schiller in literature; Kant, Fichte, Schelling, and Hegel in philosophy; Lessing, Schlegel, and Niebuhr in criticism and historical research."
>
> — Christian Bunsen (1854), *Outlines of the Philosophy of Universal History* [1]

> "From the end of the Baroque age and the death of Bach in 1750 to the rise of Hitler in 1933, Germany was transformed from a poor relation among western nations into a dominant intellectual and cultural force more influential than France, Britain, Italy, Holland, and the United States. In the early decades of the 20th century, German artists, writers, philosophers, scientists, and engineers were leading their freshly-unified country to new and undreamed of heights, and by 1933, they had won more Nobel prizes than anyone else and more than the British and Americans combined."
>
> — Peter Watson (2010), *The German Genius* [1]

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θΔics

In existographies, **Gerolamo Cardano** (1501-1576) (IQ:175|#292) (Murray 4000:14|M) (Eells 100:10) (GME:13) (EP:5) (CR:26), aka “Cardan”, "Cardanus", “Jerome Cardan” (Usher, 1929), or "Geronimo Cardan" (Kirby, 1956), was an Italian mathematician, physician, chnoposologist (biologist), physicist, chemist, astronomer, philosopher, gambler, an “accused atheist” (Lessing, c.1755) (Ñº)(Ñº), and generally classified polymath, characterized a “tormented towering renaissance figure” (Ñº) and “eccentric genius” (Ñº), noted for []

Overview

In 1550, Cardano, his *On the Subtlety of Things* (*De Subtilitate rerum*), amid discussion of Aristotle, Archimedes, Ctesibius, and Albertus Magnus, along with purported vacuum disproving devices described by Giorgio Valla (c.1495), outlined his ideas on the general principals of matter, form, vacuum, the repulsion of bodies, natural motion and place. [6]

Electricity

Cardano, in his *On the Subtlety of Things*, was the first, supposedly, to differentiate between the attraction of amber and the attraction of lodestone. [9] The following is how he viewed attraction in amber:

> “Amber has a fatty and glutinous humor which, being emitted, the dry object desiring to absorb it is moved toward the source, that is the amber. For every dry thing, as soon as it begins to absorb moisture, is moved toward the moist source, like fire to its pasture; and since the amber is strongly rubbed, it draws the more because of its heat.”
>
> — Gerolamo Cardano (1550), *On the Subtlety of Things* (Volume 5) [10]

This “fatty and glutinous humor” later became the basis or origin of William Gilbert’s *ab humore effluvia* or “electric effluvia”. [10]

Vacuums

Cardano, in his *On the Subtlety of Things*, supposedly, stated that the "condensation of steam could make a vacuum" and or that he "devised a machine using the vacuum from condensed steam", yet the passage is said to be obscure; the following are two recent summaries:

> “Hero's engine (150 BC) was a form of reaction turbine; Gerbert, a professor in the schools of Rheims (1125), had an ‘organ worked by heated water’; Leonardo da Vinci (about 1500) proposed a steam gun; **Cardan** (about 1550) devised **a machine using the vacuum from condensed steam**; Porta (Naples, 1601) raised water by steam pressure, also using the vacuum idea; and de Caus (France, about 1600) forced water up by a steam fountain’. A different type of machine (corresponding to the impulse turbine) was the steam ‘hurdy-gurdy’ of Branca, in Italy, in 1629. All of the foregoing types may be said to be experimental or preparatory to the period which followed. The first machine which did actual work was that of Edward Somerset, Marquis of Worcester, in about 1663. We next hear of an alcohol engine, using a surface condenser, proposed by Hautefeuille (1678). This appears to have been forgotten. In 1690 the Frenchman Papin devised the first engine with a piston, and in 1698 Thomas Savery patented an apparatus for lifting water from the Cornish mines. Two vessels were filled with steam alternately, the maximum lift being 24 feet. This type is still in use; it is known as the "pulsometer." It may be of interest to note that the story of the "boy and the teakettle" is told of Worcester, of Savery, and of Watt. Thomas Newcomen in 1705 produced a machine where a jet of water was thrown into the cylinder. In all these engines, the valves were worked by hand. Now we come to the story of Humphrey Potter, the boy who in 1713 devised a self-acting valve motion which he called a "scrogger." With practically no other improvement, the steam engine remained as it was for about forty years. James Watt in 1763 was repairing a model of an engine (Newcomen type) from a collection in a college in Glasgow. In 1765 the idea of the separate condenser

struck him, and he then began his great work. Though sometimes discouraged and reduced to poverty, forced to discontinue his experiments and go to work at surveying for support, he persevered; and the next ten years saw the addition of the governor, expansive working, the indicator, the principle of compounding, etc. He found the steam engine a crude and imperfect apparatus, and left it a marvelous instrument for the progress of the world."

— A.L. Jordan (1917), "Short Stories of Great Inventions" [5]

"Both **Cardan** and Porta were concerned with the phenomena of steam, but though they made some progress their results were seriously qualified by misconceptions of the nature of steam, which they still identified with air. Cardan in one obscure passage (1550) points out that **a vacuum may be created by the condensation of steam**; this suggestion, cogent as it would have been if clearly conceived, can hardly have had the significance that we might naturally be inclined to attribute to it. Porta's work on steam was rather more deliberate, and some of his experimental apparatus was highly suggestive. The attempt to measure the volume of steam by the amount of water displaced by steam pressure led him close to a positive distinction between steam and air, but he drew no decisive conclusions him-self. A late contemporary, Salomon de Caus, with essentially similar apparatus, took this decisive step. He declared that steam is evaporated water, and that upon cooling the vapor returns to its original condition. A similar experiment with mercury showed the same phenomena of evaporation and subsequent return to the liquid condition. De Caus was thus able to set down (1615) a series of propositions that represented a great advance upon all previous achievements in the field of gases and their phenomena. Air and steam were thus specifically distinguished and the practical conclusion was drawn that there were potentialities in steam pressure of much greater magnitude than were to be found in air pressure."

— Abbott Usher (1929), *A History of Mechanical Inventions* [4]

These two conjectures, namely that Cardano either built a machine based on vacuum creation or suggested that a vacuum can be made by cooling steam, may be misattribution, being that most of Cardano's text is a refutation of the existence of a vacuum. Other related quotes are as follows:

"The text of the passage of Cardan to which Usher refers contains, first, the emphatic and categorical statement that a vacuum does not exist; and, secondly, the statement that if you assume, for the sake of argument, that a vacuum does exist, you cannot explain anything by it. The argument is, first, that we have no evidence of the existence of the vacuum; and, secondly, that the assumption of a vacuum explains nothing. Cardan's point of view is here best presented in his own alternative theory that the effects hitherto ascribed to a vacuum are really effects brought about by unnatural rarity of a substance."

— Myrtle Cass (1934), "commentary on Cardan's *De Subtilitate*" [7]

"European scholars in 1500, still held to the Greek view which did not distinguish steam from air. The vacuum was not understood; it was still something 'abhorred by nature'. **Girolamo Cardan** suggested that a vacuum might be produced by the condensation of steam. Giovanni Porta, an Italian philosopher, came close to distinguishing steam from air, but did not make the conception explicit. It was Salomon de Caus, a French landscape gardener and engineer, who 'took this decisive step', according to Usher (1929): he declared that steam is evaporated water; that upon cooling the vapor 'returns to its original condition'."

— Leslie White (1975), *Modern Capitalist Culture* [2]

> “The first book of Cardano's *De subtilitate* (1550) was devoted to the general principles of ‘matter, form, vacuum, the repulsion of bodies, natural motion, and place’; his discussion of the various devices that some claim prove the existence of the vacuum are derived in part from Valla. But Cardano must have had a source beyond Valla, since he described a machine that Valla had omitted (*Pneumatica* 1.37). Elio Nenci, Cardano's modern editor, suggested that he also relied on the preliminary discussion of the vacuum omitted by Valla, but I see no evidence of that—Cardano never mentions the interparticulate vacuum, for instance.”
>
> — Roy Laird (2017), “Hero of Alexandria and Renaissance Mechanics” [8]

In 1556, Cardano, supposedly, proposed the use of gunpowder for propelling road vehicles and boats. (Ñº)

Da Vinci

In 1519, at the reaction end of Leonardo da Vinci, his manuscripts passed to Francisco Melzi, from which the first two main synopsis publications of which were done by Cardano; mechanical sciences historian Abbott Usher (1929) summarizes as follows; [3]

> “Internal evidence, together with the actual history of the manuscripts, have made it clear that they were circulated rather extensively. The entire mass of manuscripts was left to the care of Francisco Melzi, the secretary and friend of Leonardo. In order to enhance the fame of his master, Melzi permitted copies to be made of various manuscripts and, with some restrictions, allowed various artists and scientists to use the collection. After Melzi's death his heirs were less concerned about the preservation of the collection intact. Some volumes were sold, some were given away, some were stolen. Leonardo's work was thus of direct influence for not less than two generations. Among the scientists allowed to delve in this fertile source of inspiration was **Jerome Cardan**, a Milanese of genuine talent and of a rather acquisitive disposition. Most of the theories of Leonardo in the field of mechanical sciences thus appeared in print in an organized form in the two substantial treatises of Cardan: *De subtilitate* (*The Fineness*) and *Opus novum de proportionibus* (*We Need a New Proportions*). It was in this form that the work of Leonardo came to exercise its most notable influence upon the early development of the mechanical sciences.
>
> The most decisive innovation was the introduction of systematic experimentation. This mode of inquiry is in evidence at every turn, sometimes incidentally, sometimes as a protracted search for specific formulas. The phenomena of percussion and recoil were studied. Experiments were made with falling bodies and a formula for the acceleration was suggested. The strength of struts and girders was studied with reference to variations of length and cross section; differences between single members and composite members were also determined. It is not easy to separate the new from the old, but nearly all this work was new in spirit, and even if not immediately final it was by these methods that final results were achieved.
>
> Dynamics received much attention, but the results were not decisive. The old metaphysical impediments to the effective study of motion were overcome and most of the fundamental problems were studied. **Leonardo's mind was reaching out to a new concept of force**, and though his formulation was not wholly happy it contained important elements of truth. He made it easier to proceed with the study of the flight of projectiles, impacts, and falling bodies, though he himself achieved no final results. He was progressing toward a formulation of the principles of the composition of forces, but there is much doubt as to the exact nature of his accomplishment. **There is always a danger of our reading later knowledge into his notes and diagrams**. In this whole field one fact is patent: all the important problems were redefined by Leonardo's efforts, and reduced to forms that made solution possible. This in itself is no mean achievement. As the solutions of the primary problems of principle were not achieved until rather more than a century later, we may readily judge the difficulties that remained. Leonardo defined problems of dynamics that were adequately solved only through the efforts of Galileo and Huygens.
>
> In the field of statics, the achievements of Leonardo were less novel but more complete and finished. All the primary problems and concepts were derived from the medieval writers, most especially from the

> **‘school of Jordanus’** and the work of Albert the Saxon [c.1320-1390] (Ñº)(Ñº)(Ñº)(Ñº). Under his hands, the rather imperfectly apprehended principles became a system of thought which carried Leonardo far. The work of the school of Jordanus was developed until all the primary theorems were clearly enunciated and the scope of mathematical calculation in mechanics greatly extended. The propositions and corollaries of Albert the Saxon were elaborated, and a correct solution was given for the equilibrium of a body. As long as the center of gravity is above the base of a body, the body remains in equilibrium; otherwise it falls. The doctrine of the center of gravity had thus carried Leonardo definitely into the boundaries between statics and dynamics. Furthermore, speculation along the lines of these problems and principles led him to adopt the heliocentric hypothesis as early as 1508. This is significant only as an index of the intellectual temper of Italy at that time, for Copernicus had already begun work upon the problem, largely as a result of the stimulus of contacts with Italy.”

Interesting, here we see that Cardan had an entire school.

Other

In 1616, Lucilio Vanini built his atheism-pro treatise *Of the Marvelous Secrets of the Queen and Goddess of the Mortal Ones, Nature*, in part, on Cardano, and also on Pietro Pomponazzi. [1]

Quotes | On

The following are quotes on Cardano:

> “As for the opinions of Epigenes, Bienewitz, **Cardano**, Scaliger, let these pass because they are not apposite to the subject and I do not have the at hand right now a copy of their work. As for whether storms are stirred by demons, as Paracelsus holds, this should be discussed at some length and a distinction should be made between the demons.”
>
> — Otto Guericke (1665), “Reply Letter to Sanislaus Lubienietzki”, Mar 29; in *New Experiments on the Vacuum of Space* (pg. 289)

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External links

â— Gerolamo Cardano – Wikipedia.

θΔics

In hmolscience, **Gerrit Feekes** (c.1945-) is an American science writer noted for his *The Hierarchy of Energy Systems: from Atoms to Society*, wherein he attempts to outline a crude physics-conceptualized, or in loose speak "energy system", laymanized theory of everything, the content of which has been characterized as similar to Arthur Young and to some extent Howard Pattee.

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θΔics

In terminology, **gestalt**, or 'Gestalt' (German), is form, shape, or "external appearance"; essence or shape of an entity's complete form; the manifestation of competing drives that yield form change or metamorphosis; a dynamical and evolutionary event. [1] Romanian socioeconomic physicists Gheorghe Savoiu and Ion Siman explain the term gestalt as follows: [5]

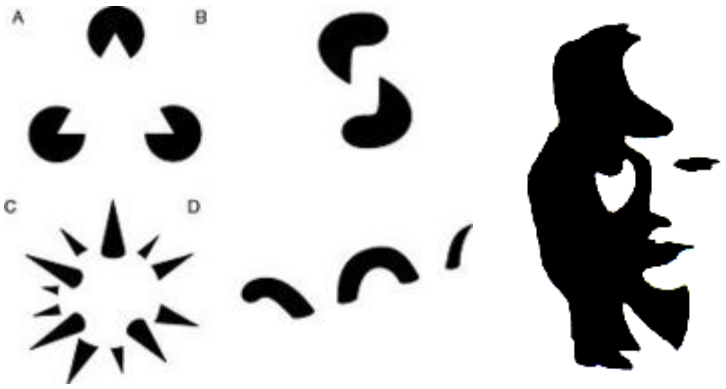

Visual examples of "**gestalt**", of images or forms hidden in images or forms, depending on perspective.

> "Physics—with its solutions of decomposing a system into its parts and in its final manner of understanding known as '*the whole is greater than the sum of its parts*' (the **Gestalt** phenomenon)—can contribute more or less unexpectedly to the understanding of economic problems, processes, or decisions."

Gestalt, in this sense, seems to have some kind of relation or similarity to the English term synergy.

Etymology

The term "gestalt", supposedly, is said to have its roots, some way or another, in the work of Plato, particularly his famous allegory of the cave, wherein a puppet trickster makes a shadow theater on a wall for chained prisoners, confined such that all they can see are the shadows, to watch, and who in turn come to form beliefs about the shadows in that they are people moving about outside, whereas in "reality" their perception led them into a perceptual allusion.

German thinker Johann Herder's term *Bildung* or "natural shape" is said to an historical precursor, of sorts, to the term "Gestalt", albeit one which became overshadowed with the notion of development towards and ideal.

Modern gestalt theory, according to German-American historian Paul Tillich, originated in Plato's ideas on essences, which transcend empirical reality—but more directly was the organismic interpretation of nature of Johann Goethe, according to which nature is not a causal assemblage of isolated atoms, but is composed of structures; in the psychological realm these became the archetypes of David Hume (1711-1776). [4]

Elective Affinities

German polyintellect Johann Goethe's usage of Gestalt, possibly having connectedness in idea to Plato, is said to be a modified variant of Herder's *Bildung*, however, one which was a fixed term disconnected, supposedly, from the antecedent unity and with the future notion of becoming. [3]

Following the publication of his 1809 *Elective Affinities*, Goethe, according to summary reviews by American Goethean scholar Astrida Tantillo (2001), wrote to many people about the novel, informing them "a unified 'Gestalt', hidden meanings, and the necessity of multiple rereadings." [2]

In a letter to German composer Carl Zelter, for example, Goethe stated that he had placed numerous different elements within the text, but that many of these were hidden; also that past the veiled quality of the work lays the "truly intended Gestalt."

Discussion

The English re-translation of what Goethe means by "unified Gestalt" or "intended Gestalt", however, is a bit of a puzzling and open-ended subject, being that Goethe seemed to be using this term in the framework of a number of contexts, not only in respect to *Elective Affinities* but also, it seems, in *Faust* context, as well as plant metamorphosis, human and animal evolutionary anatomical common origin, chemical reaction level change (scaled up to the human-human interaction level), competing drives that produce or yield balanced growth and or monstrous growth (in plants), among other complicalities.

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â— Gestalt (German → English) – Wikipedia.

θΔics

In hmolscience, **Ghassan Hage** (1957-) is a Lebanese-born Australian social anthropologist noted for []

Overview

In 2011, Hage was the co-editor of the collaborative book *Force, Movement, Intensity: the Newtonian Imagination in the Humanities and Social Sciences*, along with Australian cultural anthropologist Emma Kowal, noted for her work on machines as metaphor for society (see: human machine), such as found in the work of Thomas Hobbes, which is filled with sixteen rich multi-author chapters on what seems to be the history of physical sociology, scientific sociology, and social physics (see: two cultures namesakes), discussing thinkers such as Vilfredo Pareto, Lawrence Henderson, Auguste Comte, indexed with niche topics such as social gravity. [1]

The book discusses Prussian general Carl Clausewitz, noted for his moral and romantic theory of warfare, who in his 1832 posthumously-published treatise *On War*, used the principle of friction to distinguish real war from the mechanical, Newtonian world, and speculates on his possible knowledge of the thermodynamics of Sadi Carnot—though this latter supposition seems doubtful, as Carnot's self-published 1824 *On the Motive Power of Fire* was not generally known until 1834 when popularized by Emile Clapeyron.

Hage, an expert in the work of Pierre Bourdieu, contributed a chapter entitled "Social Gravity: Pierre Bourdieu's Phenomenological Social Physics" on Bourdieu's supposed social gravity based social physics theories. [2]

Quotes

The following are noted quotes from the book:

> "Why were the first human scientists so determined to be the Newton's of social theory? Surely, the activities of human beings are not like the motions of planets in their orbits, or rigid spheres rolling down inclined planes? Surely, they are far more like the behavior of living creatures? So why did the initial creators of the human sciences not rely on models from biology in their theory-building, rather than on implausible analogies with physics."
>
> — Stephen Toulmin (1998), "The Idol of Stability" [3]

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(b) Emma Kowal (faculty) – University of Melbourne.
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External links

â— Ghassan Hage – Wikipedia.
â— Ghassan Hage (faculty) – University of Melbourne.

θΔics

In hmolscience, **Gheorghe Savoiu** (1957-), or Gheorghe Săvoiu, is a Romanian economist, chief of the Romanian school of physical socioeconomics, noted for his *circa* 2005-present work, together with Romanian physicist Ion Siman, in the development of the fields of econophysics of sociophysics.

Romanian econophysicists

Noted Romanian econophysicists, according to Savoiu and Siman, include: Sorin Solomon, Adrian Dragulescu, Radu Chisleag, Mircea Bulinski, Mircea Gligor, and Margareta Ignat. [6]

Overview

In their 2008 article "Some Relevant Econophysics' Moments of History, Definitions, Methods, Models and New Trends", Savoiu and Siman trace history of econophysics to French engineer and economist Nicolas-Francois Canard's 1801 view that supply and demand are ontologically like contradicting physical forces. [4]

Savoiu's 2008 article "The Scientific Way of Thinking in Statistics, Statistical Physics and Quantum Mechanics", which cites English chemical physicist Philip Ball's 2004 *Critical Mass*, among others, is abstracted as follows: [1]

> "This paper focuses on the way of thinking in both classical and modern physics and statistics, statistical mechanics or statistical physics and quantum mechanics. These different statistical ways of thinking and their specific methods have generated new fields for new activities and new scientific disciplines, like econophysics (between economics and physics), sociophysics (between sociology and physics), mediaphysics (between all media and communication sciences), etc. After describing some recent definitions of statistical thinking, implications of statistical education for developing econophysics, sociophysics, mediaphysics, etc., from statistical and quantum mechanics are discussed. Several opinions are given as a direct liaison between the classical and modern statistical sciences and thoughts of a scientific research in general. The main conclusion is that statistics developing habits of mind for statistical physics in econophysics, for the quantum mechanics in quantum physics, for the sociology in sociophysics will be essential for the future of all."

Chapter 10 Sociophysics: A New Science or a New Domain for Physicists in a Modern University 149
Gheorghe Săvoiu and Ion Iorga simăn
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Savoiu and Siman's 2012 chapter 10.5 "Why Sociophysics is Necessary in a Modern University", a two cultures department subject, in which in which the call for the inception of "sociophysics" in a multidisciplinarity teaching approach in universities, centered on core concepts such as the teaching of entropy in sociology, and teaching the history of the subject, which they date back to Italian physicst Ettore Majorana and his 1936 human quantum mechanics theories. [3]

The article discusses American engineer Willard Gibbs' 1902 statistical mechanics, American economist Irving Fisher, Italian physicist Ettore Majorana, and theories such as the Brownian motion of market behavior (see also: Meng-Hua Ye).

Econo-engineering

See main: Human molecular engineering

Savoiu and Siman, in 2008, comment interestingly on the newly emerging field of what they refer to as econo-engineering: [4]

> "After 2000, econophysics has matured enough to allow generalized applications, their field being called sometimes econo-engineering."

This seems similar, in a subdivision sense, i.e. in the sense of Dutch-born American mathematician, theoretical physicist, economist Tjalling Koopmans 1947 definition of an economic agent as a human molecule.

EDEN workshops

In 2008, Savoiu and Siman launched the "Exploratory Domains of Econophysics News" workshops, or EDEN, hosted at the University of Pitesti, Romania, which seems to have been hosted annually since. [5]

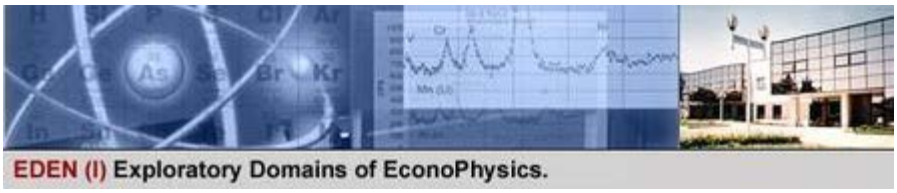

Banner to the 2008-launched "Exploratory Domains of Econophysics News" (EDEN) workshops, hosted at the University of Pitesti, under the direction of Savoiu and Siman. [5]

In 2013, American electrochemical engineer Libb Thims, is scheduled in the June EDEN V workshop to be an invited "key speaker", with the lecture title: "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?", a critique of the various chemical and physical based historical economic-themed models of "behavior". [5]

ESMS journal

In 2011, Savoiu and Siman launched University of Pitesti's new academic publication *Econophysics, Sociophysics and other Multidisciplinary Sciences Journal*, acronym ESMSJ, which has produced articles on multidisciplinary topics such as "quantum economics", which gives way to the need for a "new" umbrella two cultures like namesake that captures this newly-forming modern science. [2]

Recent

In 2012, Savoiu and Siman published their joint chapter "Sociophysics: A New Science or a New Domain for Physicists in a Modern University", in which the call for the inception of "sociophysics" in a multidisciplinarity teaching approach in universities, centered on core concepts such as the teaching of entropy in sociology, and teaching the history of the subject, which they date back to Italian physicst Ettore Majorana and his 1936 human quantum mechanics theories. [3]

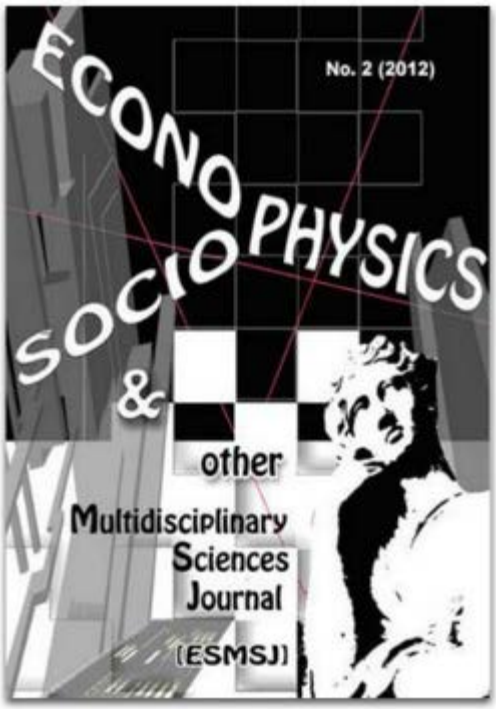

Left: the University of Pitesti's new 2011-launched *Econophysics, Sociophysics and other Multidisciplinary Sciences Journal*, acronym ESMSJ, headed by Savoiu and physicist and sociophysicist Ion Iorga-Siman, containing articles on multidisciplinary topics such as "quantum economics", which gives way to the need for a "new" umbrella two cultures like namesake that captures this newly-forming modern science. [2] Right: Photo form the first international workshop EDEN - Exploratory Domains of Econophysics News - Pitesti, 2008 (see: EDEN/UPESW 2013), showing front to back: Ion Siman, Mircea Gligor, among others. [5]

Education

Savoiu currently is an economics professor at the University of Pitesti, Romania.

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3. Savoiu, Gheorghe. (2012). *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (§10: Sociophysics: A New Science or a New Domain for Physicists in a Modern University, pgs. 149-65). Academic Press.
4. Savoiu, Gheorghe and Iorga-Siman, Ion. (2008). "Some Relevant Econophysics' Moments of History, Definitions, Methods, Models and New Trends" (pdf), Romanian Economic and Business Review 3 (3), 29-41.
5. (a) EDEN – Project description.

(b) Thims, Libb. (2013). “Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?” (abs) (main), Keyspeaker at EDEN V workshop: Exploratory Domains of Econophysics News, University of Pitesti, Romania, Jun 29-30.
5. Zanocea, Cosette. (2012). “Professor at the ‘Roman-Voda’ Researcher in Belgium, PhD physical economics” (Romanian → English) , Ziarul de Roman, Aug 27.
6. Savoiu, Gheorghe. (2012). *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (Romanian econophysicists, pg. 13). Academic Press.

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● Savoiu, Gheorghe and Iorga-Siman, Ion. (2009). *Exploratory Domains of Econophysics*. News EDEN I&II Ed. Universitara Bucureşti.
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External links

● Săvoiu, Gheorghe – WorldCat Identities.
● Gheorghe Savoiu (publications) – Ideas.Repec.org.

θΔics

In hmolscience, **Giambattista Vico** (1668-1744) was an Italian philosopher noted for his anti-reductionism responses to Rene Descartes (1596-1650) and Cartesianism—about which, in 1695, as he relates in his autobiography, upon returning to Naples following a nine-year tutoring stint at Vatolla, he found the "physics of Descartes at the height of its renown among the established men of letters."

Where Descartes had argued, supposedly, that the history of the social world could never be objective in the manner of mathematical physics, Vico argued that because history and society are created by persons, we can understand them better than the physical world, which is alien to us. [1]

Vico, in his *De Italorum Sapientia*, stated the following:

> "To introduce geometrical method into practical life is 'like trying to go mad with the rules of reason,' attempting to proceed by a straight line among the tortuosities of life, as though human affairs were not ruled by capriciousness, temerity, opportunity, and chance. Similarly, to arrange a political speech according to the precepts of geometrical method is equivalent to stripping it of any acute remarks and to uttering nothing but pedestrian lines of argument."

which, is in direct opposition to argument followed by Benedict Spinoza (1632-1677), who said we can use geometrical methods to explain the passions.

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1. (a) Vico, Giambattista. (1725). *The New Science of Giambattista Vico* (translators: Thomas Bergin and Max Fisch). Cornell, 1948.
(b) Brown, Richard H. (1976). *A Poetic for Sociology: Toward a Logic of Discovery for the Human Sciences* (pg. 10). University of Chicago Press, 1989.

Further reading

â— Nickles, Tom. (2007). "Vico versus Voltaire: The Natural Sciences versus the Humanities" (Ñº), WolfWeb.unr.edu.

External links

â— Giambattista Vico – Wikipedia.

θΔics

In existographies, **Gian Beretta** (c.1951-) (CR:4) is an Italian thermodynamicist, of the MIT school of thermodynamics, noted for []

Overview

Beretta believes that Joseph Keenan's 1965 *Principles of General Thermodynamics*, co-authored with Elias Gyftopoulos, was the greatest thermodynamics textbook of the 20th century.

In 2006, Beretta stated that, in his personal library, he owns about 50-60 thermodynamics books. [2]

Beretta was one of the peer reviewers (Ñº) for Libb Thims' 2007 *Human Chemistry*.

Education

Beretta completed his BS in nuclear engineering, his MS in mechanical engineering, and in 1981 completed his ScD (Ñº) in mechanical engineering, with a thesis "On the general equation of motion of quantum thermodynamics and the distinction between quantal and nonquantal uncertainties", at MIT. [1]

Quotes | By

The following are quotes by Beretta:

> "Physics is the science that attempts to describe all aspects of all phenomenon pertaining to the perceivable universe. It can be viewed as a large **tree** with many **branches**, such as mechanics, electromagnetism, gravitation, and chemistry, each specialized in the description of a particular class of phenomenon. T**hermodynamics** [however] is not a branch … it pervades the entire tree."
>
> — Elias Gyftopoulos (1991), *Thermodynamics* (coauthor: Gian Beretta) [3]

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1. Home – QuantumThermodynamics.org.
2. Beretta, Gian. (2006). "Email to Libb Thims", Oct-Nov.
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4. Hatsopoulos, George N. and Keenan, Joseph H. (1965). *Principles of General Thermodynamics* (New York: John Wiley & Sons, Inc.

External links

â— Gian Paolo Beretta – MIT.edu.
â— Gian Paolo Beretta – Google Scholar.

θΔics

In science, **Gibbs** [CR:188] is the surname of American engineer Willard Gibbs (1839-1903).

Terms

The following is a listing eponymous Willard Gibbs terms:

- Gibbsian

  Gibbsian thermodynamics

  Gibbsian school

- Gibbs collected works
- Gibbs energy
- Gibbs energy flow
- Gibbs energy of attraction
- Gibbs energy of repulsion
- Gibbs entropy
- Gibbs equation
- Gibbs free energy
- Gibbs free energy change
- Gibbs function
- Gibbs fundamental equation
- Gibbs landscape
- Gibbs stamp
- Gibbs tombstone
- Gibbs and Goethe
- Gibbs-Clausius equations

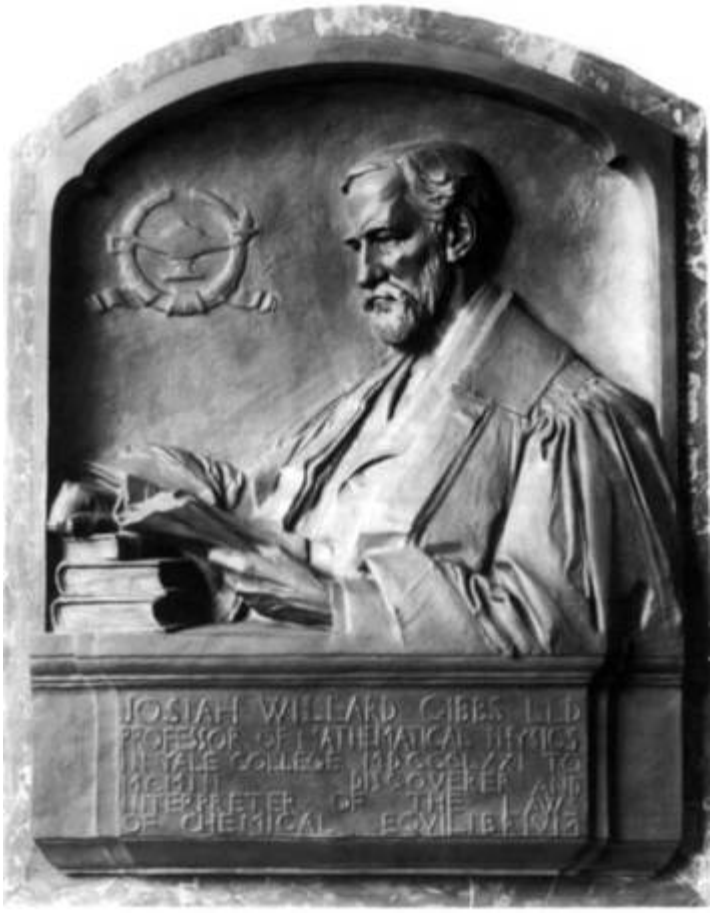

A wall statue, with name **Gibbs** engraved, of American engineer Willard Gibbs (at Yale University), captioned as "discoverer and interpreter of the laws of chemical equilibrium", the central founder in the history of chemical thermodynamics.

θΔics

In hmolscience, **Gibbs and Goethe** (TR:50), or "Goethe + Gibbs" connection, refers the connection of the 1876 chemical thermodynamics work of American engineer Willard Gibbs to the 1809 human chemical theory work of German polyintellect Johann Goethe, the two connected by the 1882 thermodynamic theory of affinity proof by German physicist Hermann Helmholtz that free energy is the "true" measure of chemical affinity, formulaically related by the affinity-free energy equation.

Goethe
(1749-1832)

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

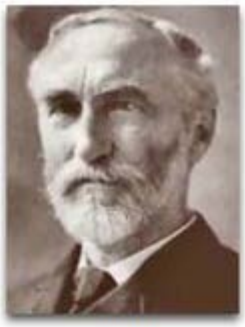

Gibbs
(1839-1903)

A snapshot of the **Goethe + Gibbs connection**, namely: the connection between the 1809 social "affinities" work of Goethe and the 1876 general systems "free energy" work of Gibbs; affinity A and free energy G shown to be equivalent by Helmholtz in 1882, the conclusion of which being that micro-social interactions described by affinities are determined by the macro Gibbs energy changes of the social system; only about nine people have independently made this connection before 2010. The general equation connecting the two concepts, shown above, is the Goethe-Helmholtz equation, first put into the form above by Theophile de Donder in circa 1930.

Overview

The connection between Gibbs and Goethe is a very niche subject that only a little more than a handfull of people have independently arrived at, or at least published on; only four people prior to the 21st century, namely: Carl Snyder (1902), Wilhelm Ostwald (1905), Fielding Garrison (1910), and Richard Schowen (1984), seem to have been aware of the revolution-implicating connection.

(add summary)

Table

The following shows the chronology of known Gibbs + Goethe connectors, showing both "independent" and "dependent" connections, the latter shown by the # box shown in grey color.

#	Person	Date	Summary
1.	Carl Snyder (1869-1946) American chemistry historian, economist, and statistician	1902	In his “Fifty Years of Synthetic Chemistry”, outlined a rich history of synthetic chemistry, connecting the dots between Marcellin Berthelot to Willard Gibbs and then back go Johann Goethe, in human chemistry. In his 24-part MIT Affinity lecture gives a modern history of affinity chemistry, 1775-1905, therein connecting Goethe to Gibbs as follows: **The Elective Affinities** [**Goethe**] 207 Stahl's reaction number 208 Bergmann, Relationship Tables 209 Berthollet and incomplete responses 210 The concentration of Wenceslas Law 211

2.	Wilhelm Ostwald (1853-1932) German physical chemist, radical atheist, and monism philosopher	1905	Fate of these problems 213 Contact between the organic - Preparative Chemistry 215 Justification of the thermochemistry by Hess 217 development by J. Thomsen and M. Berthelot 218 Resurgence of Bergmann's theory 219 Justification of the right doctrine, by Guldberg and Waage 220 Carnot UUD the Second Law 222 Act of events 227 Horstmann's application of thermodynamics to chemistry 228 229 **W. Gibbs** The energetics 230 General principles of scientific development 231 The phase law 232 The displacement law 237 Labile, stable and neutral equilibrium 238 The law of mass action, 243 Resolution of old problems 245 The strength of the acids 247 The development struggles of modern physical chemistry 249 Your next future 251

Ostwald, in the first part, "The Elective Affinities", opens to a discussion and quote from Goethe's *Elective Affinities*, wherein he seems to assert that this model is "ideal for all nature as a scientific research", in part 12 discusses Sadi Carnot and the second law, part 14 discusses August Horstmann application of thermodynamics to chemistry, then in part 15 digs into Gibbs and what Ostwald calls the "energetics". As the entire lecture series is not yet fully translated into English it remains to be discerned if Ostwald made the direct connection between affinity and free energy, though, to note, he does cite Hermann Helmholtz on at least three pages (201, 216, 256). [4] This may have been the last robust intellectual connection between Gibbs and Goethe. Ostwald would shortly thereafter venture into his "Monistic Sunday Sermons", a monism-framed radical atheism, which is the next broach one has to break after connecting Gibbs to Goethe.

In his "A Note on Traube's Theory of Osmosis and 'Attraction-Pressure'", written the year following the publication of his tripartite article "Josiah Willard Gibbs and his Relation to Modern Science", commented the following telling remarks: [1]

3.	Fielding Garrison (1870-1935) American physician, librarian, and science historian	1910	"Suppose chemical substances to be represented by a number of men and women of varying degrees of strength of character and "attractiveness," and suppose the marital combinations or what Goethe called the "elective affinities" between these men and women to be determined by certain mysterious "laws." If a man strong in character should mate with a woman, weaker but otherwise "attractive," or *vice versa*, one set of observers might affirm that the union was due to the man's superior potentiality or masculinity, others might maintain that the real strength in the combination or "affinity" lay in the woman's "attractiveness "; or *vice versa*. Curiously enough, these anthropomorphisms, which **seem so plausible and fascinating** in Goethe's novel, are daily and hourly employed to explain the facts of chemical combination."

In his University of

Kansas Humanities Lecture Series address "Elective Affinities: Science, Certainty and Freedom in Goethe, Henry Adams and Thomas Pynchon", made the Gibbs-Goethe connection, via or with Henry Adams, as follows: [5]

4.	Richard Schowen (1934-) American organic chemist	1984	"In this examination of texts of Goethe from 1809, of Henry Adams from 1909 and of Thomas Pynchon from 1973, we have, I think, never lost the red thread. The theme of affinity, certainty and binding, of election, freedom and flux, and of the hidden variable that lies beyond the veil, rendering certainty and freedom equally illusory, pervades the texts. Variations on the theme have come with times. The growth of thermodynamics and precise rendering of affinity and flux in the language of enthalpy and entropy gave Henry Adams' phase rule of history a form that would have been incomprehensible to Goethe but which, because of further change, seems quint and eccentric to us today. But always there is the red thread. It shows the power of this metaphor of affinity and election, uncertainty and flux and of the conflicting promise of science, of a reliable mapmaker with continual revision underway, that has run the strands of our culture for two centuries."
5.	Jurgen Mimkes (1939-) German metallurgist, solid state thermodynamicist, and physical socioeconomist	2000	In his "Society as a Many Particle System", and other articles to follow, cites both Empedocles and Goethe, in the context of his Gibbs free energy theory, in the form of the Lagrange principle, of socioeconomics; Mimkes, to note, doesn't seem to be aware of the direct connection of free energy to affinity via the affinity-free energy equation proved in 1882 by Hermann Helmholtz.
6.	Kaspar Bott (1933-) German organic chemist	2001	In his April fool's day *News in Chemistry* article "Humans, All Too Chemical", made the Gibbs and Goethe connection, passingly discussing Gibbs energy and driving force in respect to love and passion. [7]
7.	Tominaga Keii	2004	In his chapter "Thermodynamics and Chemical Reactions", devoted an entire chapter subsection entitled "Chemical Affinity in 1806", of his book *Heterogeneous Kinetics: Theory of Ziegler-Natta-Kaminsky*, to the connection, but in the end

	(1920-2009) Japanese chemical engineer and chemical thermodynamicist		averred with the forest blind comment that Goethe's *Elective Affinities* "did not add any scientific knowledge." [2] In his Valentine's day article "Chemical Eye on Love", made the Gibbs + Goethe connection as follows: [6]
8.	Preston MacDougall (1961-) Canadian-born American chemist	2006	"Chemistry and romance have a long history. A comparison of books on Western civilization, and the history of science, will reveal that physics became King of the sciences during the Enlightenment, while chemistry became their Queen with the inadvertent help of Romanticism. The German romantic, Johann Goethe, may be most famous for his timeless portrayal of Herr Faust and his deal with the devil. Literary chemists, however, are enamored with his most fundamental depiction of human emotions in "Elective Affinities". In this novel, the characters act out the chemistry of acids and bases, positives and negatives, that the author, a closet chemist, believed to have the ultimate starring role on life's stage. To revisit this long-lost sentimentality, I would like to chemically paraphrase John Lennon's famous theorem ["all you need is love", 1967 (Ñº)]. First, however, I need to tell you that the most important thing about chemical reactions is that they try to reach *equilibrium*. Or, to put it in thermodynamic terms, when they occur in the open, they seek to minimize their Gibbs energy, which is universally given the symbol capital G. Graphically, and truthfully, one can say that reacting molecules spontaneously find the lowest spot on their G-curves ["G-spot" (Ñº) pun]. Getting back to the Beatles, perhaps the love you take is in equilibrium with the love you make?"
9.	Libb Thims (c.1975-) American electrochemical engineer	2007	After working on the elective affinities problem, albeit in terms of "Gibbs energies", i.e. human free energy theory, the same problem Goethe worked on (see: love thought experiment), for about eleven years (1995-2006), discovered Goethe, in 2006, via footnote 2.5 of Ilya Prigogine, went on over the next 14-months and 18-days to write the world's first Gibbs + Goethe based "human chemistry" textbook. [3]
10.	Alec Groysman (1948-) Russian-born Israeli chemical engineer	2011	In his conference presentation "Use of Art Media in Engineering and Scientific Education", cites the human chemistry work of Johann Goethe and Libb Thims, among others; and discusses how not only is their "two cultures", but more likely "three cultures"; and advocates the teaching of Goethe + Gibbs based human chemistry in engineering.

(add discussion)

See also

â— Goethe + Empedocles

â— Gibbs, Goethe, and Empedocles
â— Hmolscience citation ranking
â— Scientists who've cited *Elective Affinities* (Ñº)

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3. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
4. Ostwald, Wilhelm. (1905). *The career of science: Seven public lectures evident from the history of chemistry* (*Der Werdegang einer Wissenschaft: Sieben Gemeinverständliche Vorträge aus der Geschichte der Chemie*), MIT, autumn (Goethe, pgs. 122, 192; Sixth Lecture: Affinity (Affinität)", pgs. 207-; *Die Wahlverwandtschaften*, pg. 207). Akademische Verlagsgesellschaft m. b. H., 1908.
5. Schowen, Richard L. (1984). "Elective Affinities: Science, Certainty and Freedom in Goethe, Henry Adams and Thomas Pynchon", Humanities Lecture Series, University of Kansas.
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7. Bott, Kaspar. (2001). "Humans, All Too Chemical" ("Menschliches, allzu Chemisches"), *News in Chemistry* (*Nachrichten aus der Chemie*) (abs), 49(4):471-72, April.

θΔics

In collected works, **Gibbs collected works** refers to the collective publications of American engineer and mathematical physicist Willard Gibbs.

After Gibbs' reaction end (death) in 1902, Gibbs student Irving Fisher financed the publication of his *Collected Works*, in two volumes, the first in thermodynamics, the second being his work in dynamics, vector analysis and multiple algebra, and the electromagnetic theory of light, a collection prefaced in 1906 by Gibbs' student Henry Bumstead and nephew Ralph Gibbs van Name, a professor of physical chemistry at Yale. [1]

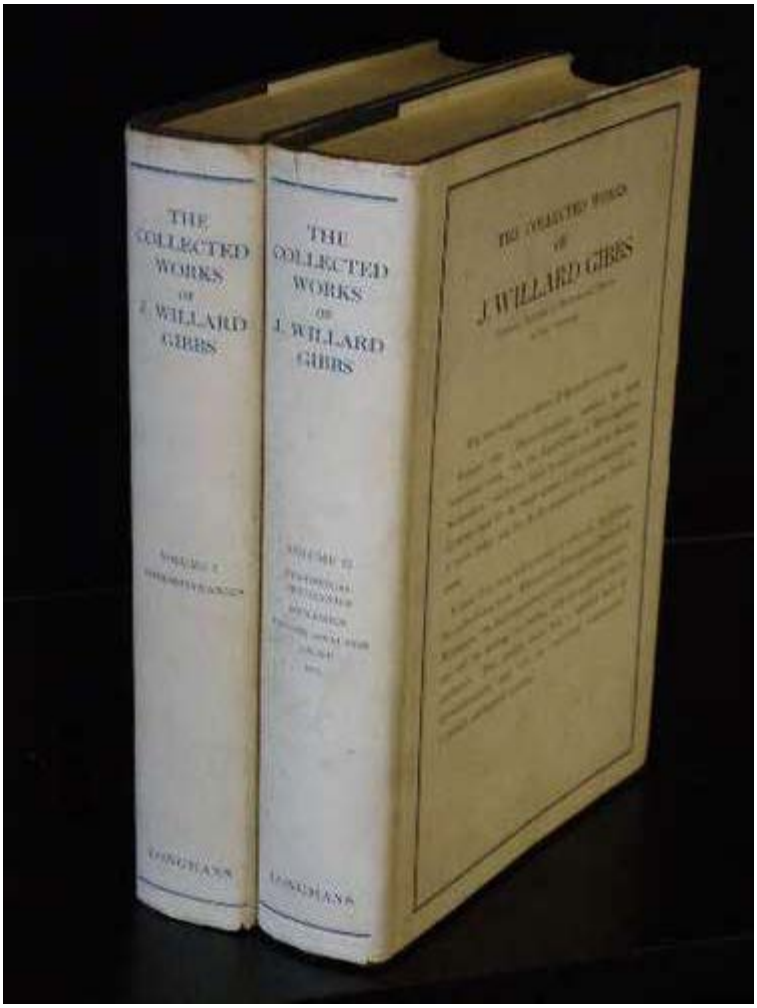

The 1931 two-volume collected works of Willard Gibbs, entitled *The Collected Works of J. Willard Gibbs, Two Volumes*, published by Longmans, Green and Co., the same set, supposedly, financed by Gibbs student Irving Fisher. [1]

Hastings list

The following is a listing of Gibbs collected found in the National Academy of Sciences biography done by American physicist Charles Hastings in 1909. [2] Those additions indicated by red bullet ● were added in by American electrochemical engineer Libb Thims:

● Gibbs, J. Willard. (1873). "Graphical methods in the thermodynamics of fluids". *Transactions of the Connecticut Academy of Arts and Sciences* **2**: 309–342.
● Gibbs, J. Willard. (1873). "A method of geometrical representation of the thermodynamic properties of substances by means of surfaces". *Transactions of the Connecticut Academy of Arts and Sciences* **2**: 382–404.
● Gibbs, J. Willard. (1874-1878). "On the equilibrium of heterogeneous substances". *Transactions of the Connecticut Academy of Arts and Sciences* **3**: 108–248, 343–524.
● Gibbs, Willard. (1878). "On the Equilibrium of Heterogeneous Substances: Abstract by the Author", *American Journal of Science*, 3 ser., Vol. XVI, pgs. 441-58, Dec.
● Gibbs, J. Willard. (1879). "On the fundamental formulae of dynamics". *American Journal of Mathematics* **2**: 49–64.
● Gibbs, J. Willard. (1879). "On the vapor-densities of peroxide of nitrogen, formic acid, acetic acid, and perchloride of phosphorus". *American Journal of Science*. 3rd series **18**: 277–293, 371–387.
● Gibbs, J. Willard. (1882). "Notes on the electromagnetic theory of light. I. On double refraction and the dispersion of colors in perfectly transparent media". *American Journal of Science*. 3rd series **23**: 262–275.
● Gibbs, J. Willard. (1882). "Notes on the electromagnetic theory of light. II. On double refraction in perfectly transparent media which exhibit the phenomena of circular polarization". *American Journal of Science*. 3rd series **23**: 460–476.
● Gibbs, J. Willard. (1883). "Notes on the electromagnetic theory of light. III. On the general equations of monochromatic light in media of every degree of transparency". *American Journal of Science*. 3rd series **25**: 107–118.
● Gibbs, J. Willard. (1883). "On an alleged exception to the second law of thermodynamics". *Science* **1**: 160.
● Gibbs, J. Willard. (1886). "Velocity of light in air and refracting media". *American Journal of Science*. 3rd series **31**: 62–67.
● Gibbs, J. Willard. (1886). "On the velocity of light as determined by Foucault's revolving mirror". *Nature* **33**: 582.
● Gibbs, J. Willard. (1887). "Vice-president's address before the section of mathematics and astronomy of the American Association for the Advancement of Science: Multiple algebra". *Proceedings of the American Association for the Advancement of Science* **35**: 37–66.
● Gibbs, J. Willard. (1887). "Electro-chemical thermodynamics". *Report of the British Association for the Advancement of Science*: 388–389.

● Gibbs, J. Willard. (1888). "A comparison of the elastic and electrical theories of light, with respect to the law of double refraction and the dispersion of colors". *American Journal of Science*. 3rd series **35**: 467–475.
● Gibbs, J. Willard. (1889). "Electro-chemical thermodynamics". *Report of the British Association for the Advancement of Science*: 343–346.
● Gibbs, J. Willard. (1889). "A comparison of the electrical theory of light with Sir William Thomson's theory of a quasi-labile ether". *American Journal of Science*. 3rd series **37**: 129–144.
● Gibbs, J. Willard. (1889). "On the determination of elliptic orbits from three complete observations". *Memoirs of the National Academy of Sciences* **4**: 81–104.
● Gibbs, J. Willard. (1889). "Rudolph Julius Emanuel Clausius". *Proceedings of the American Academy of Arts and Sciences*. New series **16**: 458–465.
● Gibbs, J. Willard. (1891). "On the role of quaternions in the algebra of vectors". *Nature* **43**: 511–514.
● Gibbs, J. Willard. (1891). "Quaternions and the Ausdehnungslehre". *Nature* **45**: 79–82.
● Gibbs, J. Willard. (1893). "Quaternions and the algebra of vectors". *Nature* **47**: 463–464.
● Gibbs, J. Willard. (1893). "Quaternions and vector analysis". *Nature* **48**: 364–367.
● Gibbs, J. Willard. (1896). "Velocity of propagation of electrostatic force". *Nature* **53**: 509.
● Gibbs, J. Willard. (1897). "Semi-permeable films and osmotic pressure". *Nature* **55**: 461–462.
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2. (a) Hastings, Charles S. (1909). "Josiah Willard Gibbs", *Biographical Memoirs of the National Academy of Sciences*, 6, 373–393.
(b) Uhler, Horace S. (1938). "Biographical Memoir of Charles Sheldon Hastings 1848-1932" (pdf), *National Academy of Sciences*, Fall.

External links

● Publications – Talk:Josiah Willard Gibbs, Wikipedia.

θΔics

In science, **Gibbs energy**, shorthand "Gibbs free energy" (Edward Guggenheim, 1933) or Gibbs function, as compared to Helmholtz energy (i.e. Helmholtz free energy), is a term tending to be employed and or advocated (by some) in more advanced treatises and publications, wherein the historical importance of the distinction between Helmholtzian 1882 phraseology of "free energy" and "bound energy" is deemed unimportant, or wherein the shorter term seems apt, e.g. the phrase "Gibbs energy vs Gods energy" in God is dead article, or the term "molar Gibbs energy", in recent physical chemistry treatises, etc. [1]

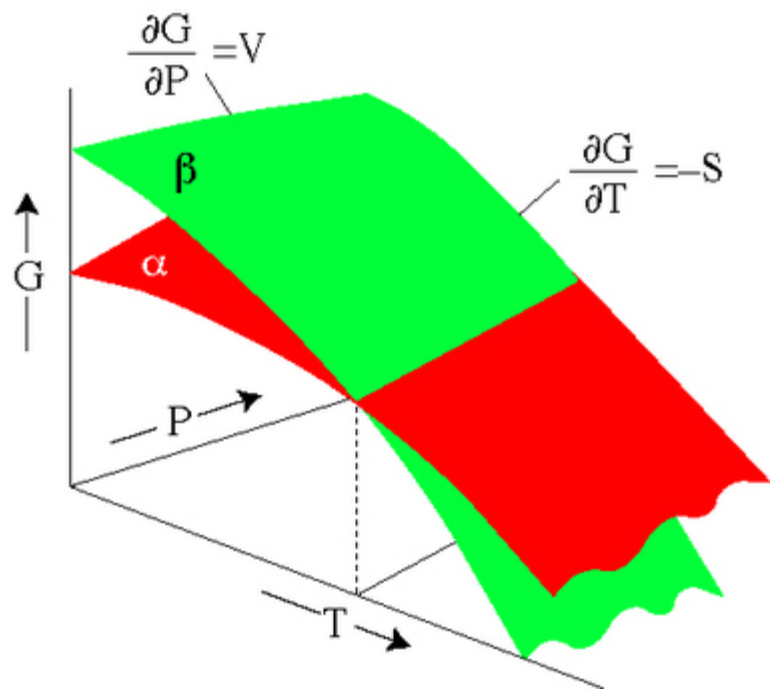

A comparing the "**Gibbs energy**" (i.e. Gibbs free energy) or rather Gibbs energy surfaces of two minerals, α and β, both with the same composition, from the lecture notes of Bradley Hacker (Q), showing that the mineral with the lowest energy is stable, namely: α is stable under some P-T conditions, and β is stable under different conditions. [3]

Etymology

It is difficult to say who exactly first began to explicitly use the term "Gibbs energy".

In 1900, the term or phrase "Gibbs energy surface" was being employed, by physical chemist J.E. Trevor, in his book review (Q) of Edgar Buckingham's 1900 *An Outline of the Theory of Thermodynamics*. [2]

In 1936, Frederick Donnan and or Arthur Haas, in their *A Commentary on the Scientific Writings of J. Willard Gibbs*, where using the phrase "Gibbs energy function". (Q)

In 1951, the following is found: (Q)

> "This quantity, the free energy, has come more recently to be known as the **Gibbs energy** after the famous mathematical physicist, Willard Gibbs. Every chemical element and compound has a certain amount of enthalpy (H) and entropy (S) at..."

In 1969, Daniel Stull, Edgar Westrum, and Gerard Sinke, in their *The Chemical Thermodynamics of Organic Compounds*, stated things as follows: (Q)

> "… constant pressure conditions are more generally encountered by chemists, G is the more useful function and will be called simply the **Gibbs energy.** It should be noted that in the past F has been used chiefly in the United States and Russia; in European and other countries G has been commonly used to denote theGibbs energy (see discussion in Chapter 8), …"

In 1970, Defore Ginnings, of the National Bureau of Standards, Washington, D.C., in his chapter section "General Principles and Terminologies", in reference to heat, stated the following: (Q)

> "The term *entropy*, *S*, applied to calorimetric experiments, is defined simply by the relation $dS = \delta q/T$, in which dS is the change in entropy in a *reversible* process and δq the heat involved at the temperature T. The term *free energy* has been used for many years to include the ***Gibbs energy***, defined as $H - TS$ or *Helmholtz energy*, defined as $E - TS$. Of these two quantities, the Gibbs energy has been used more frequently.

> There has not been international agreement on symbols for these two quantities [see: characteristic function notation table]. European textbooks have used the symbol *F* and the name *free energy* or *Helmholtz energy* for the function, *E* — *TS*. These books also use the symbol *G* and names such as *Gibbs function*, *Gibbs energy*, or *free enthalpy* for the function, *H* — *TS*. On the other hand, in America, the quantity, *H* — *TS*, has been represented by the symbol *F*, and the quantity, *E* — *TS*, by the symbol *A*. As a result of the international confusion on these symbols, I.U.P.A.C. has recommended that the function, *H* — *TS*, be named the *Gibbs energy*, represented by the symbol *G*, and the function *E* — *TS* be named the *Helmholtz energy*, represented by the symbol *A*. This notation will be used throughout in this book. A summary of notation used is given in the Appendix."

In 2006, in Wikipedia, there was an extensive debate and discussion on whether or to name the article that dealt with the function "H – TS" by the name "Gibbs free energy" or "Gibbs energy", the consensus siding with the former name. (Q)

God's energy

See main: God's energy

Into the late 20th century, beginning generally with Ilya Prigogine's 1972 statement that the free energy function, Helmholtz free energy function in particular, is not applicable to the explication of social organizations, chemical thermodynamics and "god talk" began to become intermixed in a subtly incongruent manner (see: human free energy). The most conspicuous of these is Indian-born Pakistani organometallic chemist Mirza Beg's 1987 assertion that God's energy (or Allah's energy) underlies Gibbs energy and thereby mediating his will via the chemical thermodynamics operations of humans, albeit in such a way that fall-back citation to Quranic proscriptions are mandatory in all questions of morality and right and wrong.

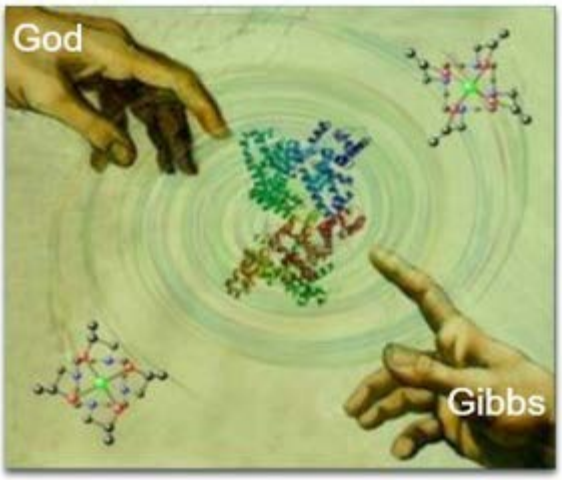

A 2013 depiction of the God vs Gibbs debate, stemming from the human molecular formula work of Libb Thims. [4]

See also

- Gibbs energy flow
- Gibbs energy of attraction
- Gibbs energy of repulsion
- Gibbs energy surface (Q)

References

1. Chang, Raymond. (2005). *Physical Chemistry for the Biosciences* (§4.6: Gibbs energy, pgs. 101-02; Gibbs energy, 77+ pgs). University Science Books.
2. Buckingham, Edgar. (1900). *An Outline of the Theory of Thermodynamics*. Macmillan Co.
3. Gibbs energy – Carleton College.
4. Staff. (2013). "Fórmula química del ser humano" (Chemical Formula of Human), Triplenlace Quimica, i.e. Triple≡Bond Chemistry (triplenlace.com), Sep 4.

θΔics

In thermodynamics, **Gibbs energy flow** refers to the movements and couplings of Gibbs free energies involved in the reactions and dynamics of biological activities. The term was used in 2008 by American physical chemist Dilip Kondepudi, in relation to biological systems. In particular, according to Kondepudi, in biological systems, the much discussed "energy flow" through such systems is "Gibbs energy flow" and the thermodynamic force is the change in the Gibbs free energy ΔG during the movement, evolution, or change. [1]

References

1. Kondepudi, Dilip. (2008). *Introduction to Modern Thermodynamics*, (chapter 13: Biological Systems, pg. 379, section: 13.3: Gibbs Energy Flow in Biological Systems, pgs. 386-98). John Wiley and Sons.

θΔics

In thermodynamics, **Gibbs energy of attraction**, symbol G_a, is the measurement of the energy (or free energy?) associated with an attractive force that exists or operates between two molecular objects, surfaces, or structures. In formulaic terms, Gibbs energy of attraction is defined as follows: [1]

$$G_a = \int_{l_i}^{l_f} F_a dl \Big|_{T,P}$$

where l_i is an initial length or distance of separation, l_f is a final length or distance of separation, F_a is the attractive force, dl is differential of length, and the where the conditional subscripts T and P signify an isothermal-isobaric process.

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Attraction and Repulsion (Wayback)– IUPAC Reports, 2001.

θΔics

In thermodynamics, **Gibbs energy of repulsion**, G_r is the measurement of the energy (or free energy?) associated with a repulsive force that exists or operates between two molecular objects, surfaces, or structures. In formulaic terms, Gibbs energy of repulsion is defined as follows: [1]

$$G_r = \int_{l_i}^{l_f} F_r dl \Big|_{T,P}$$

where l_i is an initial length or distance of separation, l_f is a final length or distance of separation, F_r is the repulsive force, dl is differential of length, and the where the conditional subscripts T and P signify an isothermal-isobaric process.

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Attraction and Repulsion (Wayback)– IUPAC Reports, 2001.

θΔics

In thermodynamics, **Gibbs entropy** refers to the statistical formulation of entropy for an ideal gas system of particles as found in American engineer Willard Gibbs 1902 book *Elementary Principles in Statistical Mechanics.* [1]

References

1. Gibbs, J. Willard (1901). *Elementary Principles in Statistical Mechanics - Developed with Special Reference to the Rational Foundation of Thermodynamics.* New York: Dover.

Further reading

● Li, Ming, Vitanyi, P.M.B. (1997). *An Introduction to Kolmogorov Complexity and its Application* (section: 8.4.3: Gibbs Entropy, pgs. 564-65). Springer.

θΔics

In thermodynamics, the **Gibbs equation** or *Gibbs free energy equation* (also Gibbs function) refers to the basic equation for the Gibbs free energy change Δ for isothermal-isobaric chemical reactions occurring in a closed system:

$$\Delta G = \Delta H - T\Delta S$$

where ΔG is the change in the Gibbs free energy, ΔH the change in the enthalpy, T the temperature, and ΔS the change in the entropy of the system on going from its initial state to its final state, respectively. This equation, which is the best-known chemical thermodynamics equation to chemistry students, is the also called the combined law of thermodynamics, is a derivative of the more advanced Gibbs fundamental equation, and can be thought of as the cliff notes version of American engineer Willard Gibbs' 1876, 700-equation, treatise *On the Equilibrium of Heterogeneous Substances*.

Human thermodynamics

The change in Gibbs free energy embodies the directionality of natural processes in human social interactions as quantified by the spontaneity criterion. [2] As explained in American physical chemist Thomas Wallace's 2009 appendix section 'The Fundamentals of Thermodynamics Applied to Socioeconomics': [3]

> "The thermodynamic parameter free energy, mathematically defined by ΔG = ΔH – TΔS, represents the fundamental driving force in nature and determines whether physical and chemical processes conducted by nature and society will take place."

Wallace explains further that free energy is 'nature's intrinsic dynamic force, representing the probability parameter entropy S and the energy content parameter enthalpy.' In more correct detail, Wallace, here, to note, is using Boltzmann-Planck type entropy descriptions, which are specifically culled from gas theory, wherein the particles are said to have a non-correlation of velocities. Humans, however, have correlated velocities; subsequently it is necessary to return to the original work of Clausius and his universal description of entropy change as the 'equivalence value of all uncompensated transformations', to human social transformation. Beyond this, enthalpy is not simply an 'energy content parameter', but one must use the full expression for enthalpy:

$$\Delta H = \Delta U + P\Delta V$$

to study human social systems in terms of both internal energy changes ΔU and the work-energy PΔV associated with volume changes ΔV in systems, such as exemplified by the volume change in territory in the course of the rise and fall of Rome during a 1,000-years of human expansion and contraction reactions.

See also

- Gibbs-Helmholtz equation
- Gibbs-Duhem equation
- Gibbs entropy
- Gibbs energy flow

References

1. Mascetta, Joseph A. (2008). *Barron's SAT Subject Test Guide* (Gibbs equation, pg. 242). Barron's Educational Series.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
3. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from*

Ancient Greece to America (Appendix A: The Fundamentals of Thermodynamics Applied to Society, pgs. 469-89). AuthorHouse.

θΔics

In hmolscience, **Gibbs force**, a general synonym for the "gravito-electromagnetic force", which works to move humans, is the "force" of the Gibbs force functions; generally those of an isothermal-isobaric nature, i.e. freely-running reactions near the earth surface. [1]

A visual of the so-called "Gates model", from the 2015 "Zerotheism for Kids: Lecture 4: Enthalpy & Entropy, Moral Compass, and Monism" (Ñº) (14:47-) video, by Libb Thims, also discussed in the 2014 "25 Smartest People Alive | Existive (2 of 5) (Ñº) (3:49-8:40) video, therein depicting a visual of the "gravito-electromagnetic force", aka **Gibbs force** (see: force function), that moved Bill Gates through his reaction coordinates, over the activation energy barrier, forming the activated complex of the 11-member Microsoft "group" at the apex, and "falling" into the product stage of the Microsoft corporation, valued at $341 billion in 2015, employing some 120 thousand people, which is akin to the "gravitational force" causing a rock to fall through its gravitational potential, say if tipped off a cliff.

Overview

The following shows the Newtonian force, aka gravity, working on a rock as it falls near the surface of the earth through a gravitational potential:

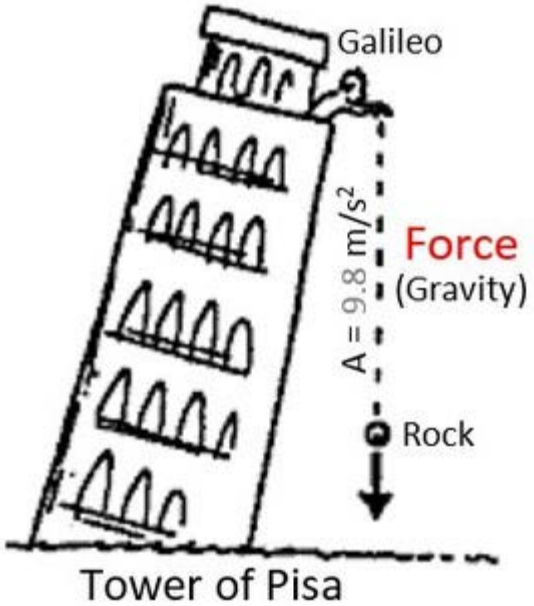

The force that moves humans, however, is a combination of the Newtonian force, aka gravity, and the Maxwellian force, aka, electromagnetic force, which is found described by Willard Gibbs' isothermal-isobaric force function, i.e. the gravito-electromagnetic force, aka Gibbsian force or "Gibbs force", some of which is outlined in the adjacent "Gates model", according to which Bill Gates went from the 1970 "idea stage", past the activation energy barrier, and "accelerated" into the product stage over the course of 45-years.

The acceleration constant, however, is not known for the gravito-electromagnetic force, in social free falls, like it is with the gravitational force operating near the surface of he earth.

Quotes

The following are related quotes:

> "In general, an object in a given force field will, of necessity, behave in a calculable and predictable way. For any object, whether a **stone**, a plant, or a human society, force means movement."
>
> — Mehdi Bazargan (1980), "Cause of Movement" [2]

See also

â— Gibbs landscape

References

1. Müller, Ingo. (2007). *A History of Thermodynamics: the Doctrine of Energy and Entropy* (docstoc) (pg. 149). New York: Springer.
2. Bazargan, Mehdi. (c.1980). "Religion and Liberty" (Section: Opposition: the Cause of Movement and Life, pgs. 81-82, note 23: Thermodynamics of Humanity); originally in *Rediscovery of Values* (*Bazyabi-e Arzeshha*); reprinted in *Liberal Islam: a Source Book* (chapter 7, pgs. 73-84) edited by Charles Kurzman, Oxford University Press, 1998.

θΔics

In chemical thermodynamics, **Gibbs free energy**, or Gibbs energy, is the free energy of an isothermal-isobaric system. Gibbs free energy, in more detail, is a state function of a closed isothermal-isobaric system in chemical equilibrium. The status of Gibbs free energy is summarized as follows: [8]

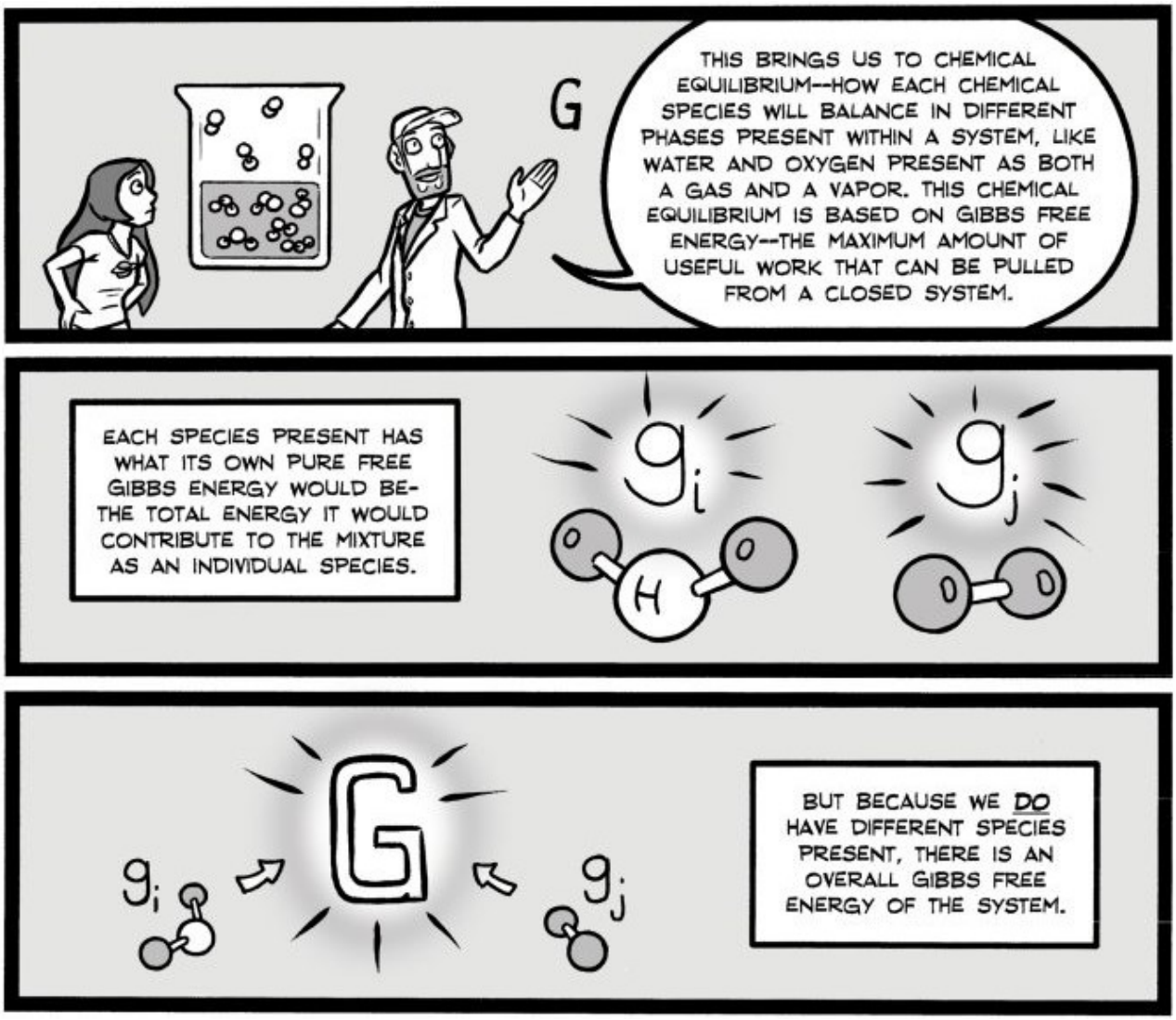

A segment on **Gibbs free energy**, from a ten page science cartoon on fugacity, by Lucas Landherr. [11]

> "The single most important concept in chemical thermodynamics is that of the **Gibbs free energy** G a function of state which provides the criterion for deciding whether or not a change of any kind will occur."

(add)

Etymology

In the 1910s and 1920s, the isothermal isobaric potential went by the name of free enthalpy, among German writers. [5] The symbol of G was assigned to Gibbs, in great predominance, in 1933 by English thermodynamicist Edward Guggenheim who stated: [4]

> "The function *G* is due to Gibbs, and is often referred to by modern writers as 'free energy'. We shall call *G* the '**Gibbs free energy**'."

There has been some effort, by the IUPAC, to expunge the middle clarifying term 'free' so to call G simply 'Gibbs energy', but this, for most purposes, has been a failed effort, and it is puzzling why the effort was even made in the first place?

Overview

Changes in the value of free energy can be used to determine if a reaction is thermodynamically favorable. In an equilibrium system at constant temperature and pressure, the the Gibbs free energy is quantified by what is called the Gibbs function:

$$G = H - TS$$

where *H* is the enthalpy, *T* the temperature, and *S* the entropy of the body; an expression representing the part of the energy content of a system that is available to do external work, also known as the free energy *G*. [6] In an equilibrium system at constant temperature and pressure, *G = H–TS*, where *H* is the enthalpy (heat content), *T* the temperature, and *S* the entropy (decrease in energy availability). [6] The function was named after American engineer Willard Gibbs. In expanded form, showing enthalpy as a function of internal energy *U* and pressure volume work *pV*, the Gibbs function becomes:

$$G = U + pV - TS$$

The formula was introduced by American mathematical physicist Willard Gibbs in 1873 and called by him "available energy". [1] In chemistry, for simple reactions, the change in Gibbs free energy, between the initial stage and final stage of a reaction, for a system of reacting species, takes the form:

$$\Delta G = \Delta H - T\Delta S$$

K	*ΔG*	Direction
>1.0	Negative	Proceeds forward
1.0	Zero	At equilibrium
<1.0	Positive	Proceeds in reverse

- if *ΔG* is a positive then the reaction is unfavorable and the initial state is favored,
- if *ΔG* is zero the reaction is in equilibrium, and
- only if *ΔG* is negative will the reaction occur spontaneously.

Top: The relationships between the equilibrium constant K, Gibbs free energy change ΔG, and the direction of a chemical reaction. Bottom: the spontaneity criterion rules for reaction direction. [7]

where *â^†H* is the change in enthalpy, *T* the temperature, and *â^†S* the change in entropy for the reaction.

Affinity | Spontaneity criterion

A spontaneous or energetically favored reaction will satisfy the following condition (spontaneity criterion):

$$\Delta G < 0$$

To determine the feasibility or reaction possibility for a given reaction, the value of *â^†G* must be determined. To do this, precalculated values of enthalpy change and entropy (per species) are generally listed in standard thermodynamic tables, as shown below (left).

Prior to 1882, wherein German physicist Hermann von Helmholtz showed that free energy was a measure of the chemical "affinity" between the reactants, these reaction calculation tables took the form of affinity tables, the first of which was constructed in 1718 by French physician and chemist Étienne Geoffroy, as shown below (right).

Chemical equilibrium

In 1884, Dutch physical chemist Jacobus van't Hoff showed that for a generic reversible reaction of the form:

Affinity Table (1718)

Species	Formula	ΔH_f°(kJ/mol)	ΔG_f°(kJ/mol)	S°(J/K·mol)
Acetic acid(l)	CH_3COOH	-484.2	-389.45	159.83
Acetaldehyde(g)	CH_3CHO	-166.35	-139.08	264.2
Acetone(l)	CH_3COCH_3	-246.8	-153.55	198.74
Acetylene(g)	C_2H_2	226.6	209.2	200.8
Benzene(l)	C_6H_6	49.04	124.5	172.8
Carbon dioxide(g)	CO_2	-393.5	-394.4	213.6
Ethanol(l)	C_2H_5OH	-276.98	-174.18	161.04
Ethane(g)	C_2H_6	-84.7	-32.89	229.49
Ethylene(g)	C_2H_4	52.3	68.1	219.45
Formic acid(l)	HCOOH	-409.2	-346.0	128.95
Glucose(s)	$C_6H_{12}O_6$	-1274.5	-910.56	212.1
Methane(g)	CH_4	-74.85	-50.8	186.19
Methanol(l)	CH_3OH	-238.7	-166.3	126.78
Oxygen(g)	O_2	0	0	51.05
Sucrose(s)	$C_{12}H_{22}O_{11}$	-2221.7	-1544.3	360.24
Water(l)	H_2O	-285.8	-237.2	69.9

Thermodynamic Table (2007)

The historical transformation of affinity tables (1718) into free energy tables (1905), linked via the equation A = –ΔG, meaning that the affinity of an closed isothermal-isobaric reacting system is equal the negative of the Gibbs free energy change, as was proved in German physicist Hermann Helmholtz's 1882 paper "The Thermodynamics of Chemical Processes", captures a great density of the underlying corpus of modern science.

$$xA + yB \rightleftharpoons zC + wD$$

where x, y, z, and w are the stoichiometric coefficients, and in which equilibrium constant is defined by follow equation:

$$K = \frac{[C]^z [D]^w}{[A]^x [B]^y}$$

where [A], [B], [C], and [D] are the concentrations of the various reactants and products at the equilibrium, that the following relation will hold:

$$\Delta G^\circ = -RT \ln K$$

The form of this expression, as indicated here, to note, was not derived by van't Hoff exactly, but rather he refers to the previous work of German chemist August Horstmann who suggested that thermodynamics could be applied to chemical equilibrium issues. [3]

Goethe's elective affinities

See main: Goethe's human chemistry

In 1809, German polymath Johann von Goethe used Swedish chemist Torbern Bergman's 1775 chemistry textbook *A Dissertation on Elective Attractions* and specifically its fifty-row, fifty-column affinity table, showing thousands of possible chemical reactions between the known chemical species, to write the famed novella *Elective Affinities*, a chemical treatise on the origin of love, in which the characters react according to their natural affinity preferences, producing or absorbing work, and forming or breaking bonds along the way. This was the start of the science of human chemistry. [2]

In 1995, American chemical engineer Libb Thims, unaware of Goethe's previous work, began to try to figure out the same type of logic for reactions between people using thermodynamic tables. It took seven years before the

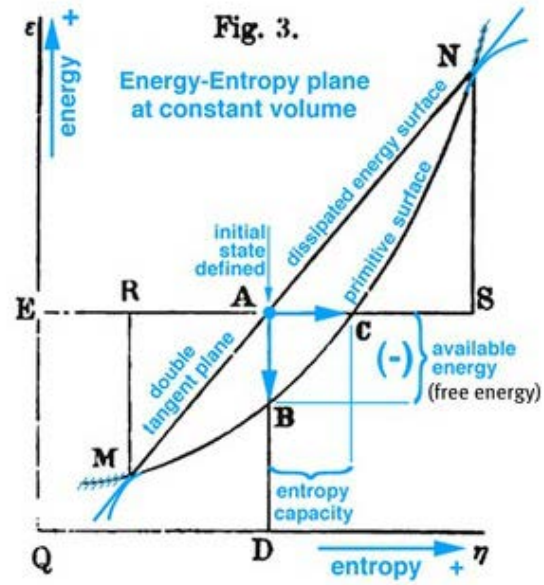

Left: an annotated version (by Ronald Kriz) of Willard Gibbs original 1873 graphical thermodynamics depiction of "available energy" (section AB), as he called it; latter to be named "free energy", by Hermann Helmholtz (1882); which eventually diverged into two types: Helmholtz free energy (isochoric-isobaric processes) and **Gibbs free energy** (isothermal-isobaric processes) names assigned by Edward Guggenheim (1933). [9]

technical and conceptual issues behind the problem began to make any sort of sense.

Graphical representation

See main: Graphical thermodynamics

The following diagram shows the first ever two-dimensional (middle, left), three-dimensional (middle, right), and physical-scale (right) representation of Gibbs free energy, which is represented by section AB and originally called "available energy" (the free energy namesake was introduced in German physicist Hermann Helmholtz's 1882 article "On the Thermodynamics of Chemical Processes"):

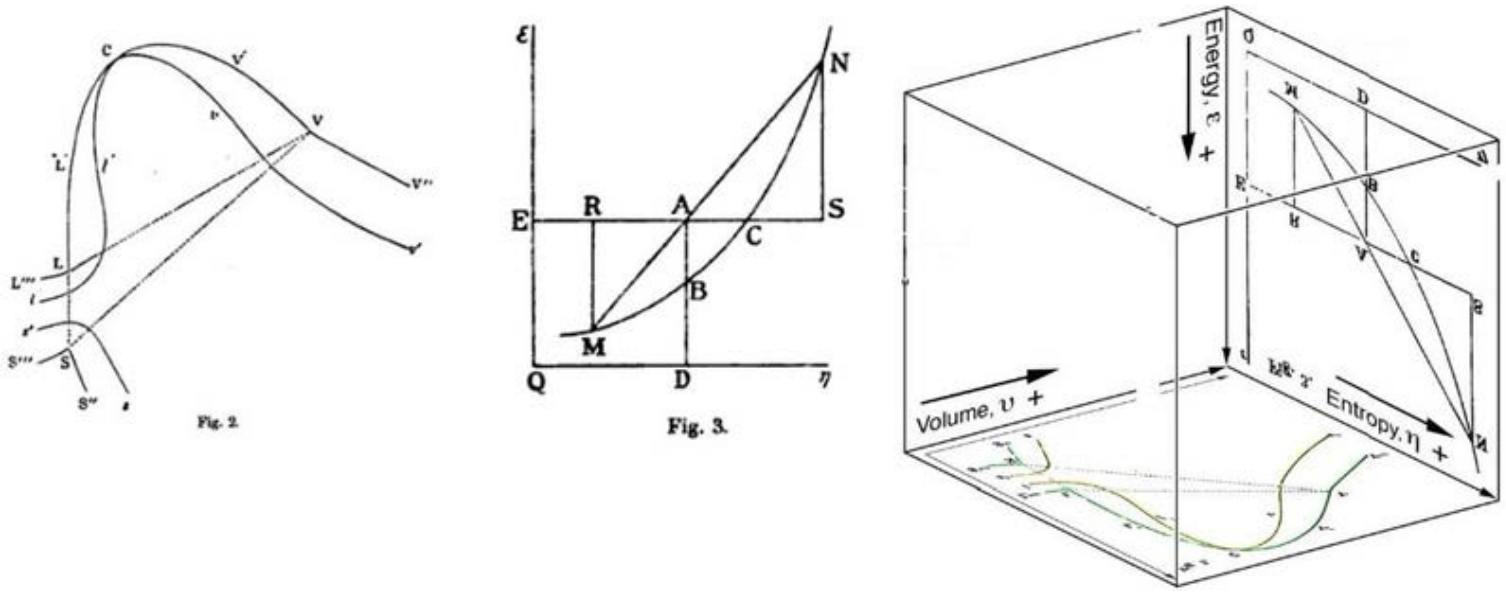

American engineer Willard Gibbs' 1873 figures two and three (above left and middle) used by Scottish physicist James Maxwell in 1874 to create a three-dimensional entropy (x), volume (y), energy (z) thermodynamic surface diagram for a fictitious water-like substance, transposed the two figures of Gibbs (above right) onto the volume-entropy coordinates (transposed to bottom of cube) and energy-entropy coordinates (flipped upside down and transposed to back of cube), respectively, of a three-dimensional Cartesian coordinates; the region AB being the first-ever three-dimensional representation of Gibbs free energy, or what Gibbs called "available energy"; the region AC being its capacity for entropy, what Gibbs defined as "the amount by which the entropy of the body can be increased without changing the energy of the body or increasing its volume."

In 1873, Gibbs published his first thermodynamics paper, “Graphical Methods in the Thermodynamics of Fluids”, in which Gibbs used the two coordinates of the entropy and volume to represent the state of the body. In his second follow-up paper, “A Method of Geometrical Representation of the Thermodynamic Properties of Substances by Means of Surfaces”, published later that year, Gibbs added in the third coordinate of the energy of the body, defined on three figures. In 1874, Scottish physicist James Maxwell used Gibbs' figures to make a 3D energy-entropy-volume thermodynamic surface of a fictitious water-like substance. Thus, in order to understand the very difficult concept of Gibbs free energy one must be able to understand its interpretation as Gibbs defined originally by section AB on his figure 3 and as Maxwell sculpted that section on his 3D surface figure.

Modern chemical thermodynamics

See main: Chemical thermodynamics, History of chemical thermodynamics

The distillation of the rather complicated formulation of available energy or free energy, in somewhat laymanized standard terminology, as applied to standard temperature and pressure volume-changing earth-bound reaction, in the context of what has come to be known as "modern chemical thermodynamics" came about in through the following to publications:

Gilbert Lewis
(1875-1946)
American physical chemist

1923

Together with his graduate student Merle Randall, published the 1923 textbook *Thermodynamics and the Free Energy of Chemical Substances*, which resulted to replace the notion of "affinity" with the notion of "free energy" in the corpus of modern science, in his chapter sub-section "The Driving Force of a Chemical Reaction", he famously situated the "driving force" thermodynamic view of chemical process and introduced what he defined as a "universal rule" as follows:

> “It is a universal rule that if any isothermal process is to occur with finite velocity, it is necessary that:
>
> $$\Delta F > w'$$
>
> [This applies to] a chemical process which is in some way harnessed for the production of useful work. In the far more common case of a reaction which runs freely, like the combustion of a fuel, or the action of an acid upon a metal; in other words, systems which are subject to no external forces except a constant pressure [exerted by the atmosphere]. In such cases w’ = 0, and it follows that no actual isothermal processes is possible unless:
>
> $$\Delta F < 0$$
>
> Therefore if we know the value of ΔF for any isothermal reaction, and if this value is positive, then we know that the reaction, in the direction indicated, is thermodynamically impossible.”

The quantity w’ above is what Lewis defines as "net work" namely work done by a chemical reaction, less the pressure volume work (done by the reaction expanding against the atmosphere), that can be connected to a motor or other electrical system for a use (purpose). He continues:

"We may think of:

$$-\Delta F$$

as the driving force of a chemical reaction."

Lewis and Randall's book would go onto become the most-cited thermodynamics textbook of all time.

Edward Guggenheim (1901-1970) English chemical thermodynamicist

1933

In his *Modern Thermodynamics by the Methods of Willard Gibbs*, building on the previous work of Lewis and Randall, he stated the conditions for what is "natural" and "unnatural" in isothermal-isobaric surface-attached reaction conditions (earth-bound freely-running processes), namely the Lewis inequality for a natural process (dG < 0) and the Lewis inequality for an unnatural process (dG > 0).

for a natural process

$$dT = 0 \qquad dP = 0 \qquad dG < 0$$

for an unnatural process

$$dT = 0 \qquad dP = 0 \qquad dG > 0$$

Human-Social-Economic Gibbs free energy

See also: Social free energy, Social Gibbs free energy, Economic free energy, Social Gibbs energy, Human Gibbs free energy, etc.

In human thermodynamics, human free energy or "human Gibbs free energy" is the measure of the Gibbs free energy, Gibbs free energy change, or differential of Gibbs free energy of human chemical reactions (see: human chemical reaction theory). [2]

To create a human out of nothing and place it on the table, the magician need not summon up the entire enthalpy, $H = U + PV$. Some energy, equal to TS, can flow in spontaneously as heat; the magician must provide only the difference, $G = H - TS$, as work.

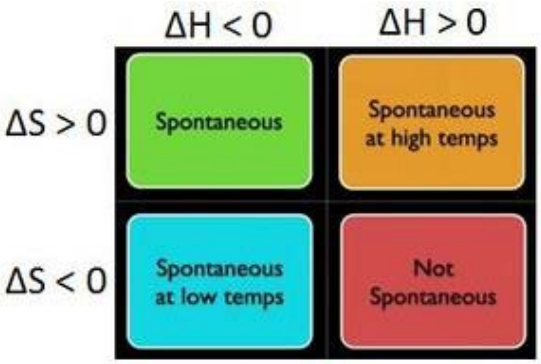

Left: a rendition of relationship between **Gibbs free energy** *G* and the "creation" (synthesis) of a **human** or rather "human molecule"; from American physicist Daniel Schroeder's 2000 *Thermal Physics* textbook. [10] Right: video of free energy applied to society. Right: an so-called Gibbs spontaneity chart (V) , showing the basic criterion for spontaneous and nonspontaneous reactions. (Ñº)

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(b) Van't Hoff, J.H. (1896). *Studies in Chemical Dynamics* (Chemical Equilibrium, pgs. 143-54; Affinity, pgs. 229-36; Determination of the Work Done by Affinity, pgs. 237-41; Applications, 241-50; Electrical Work Performed by a Chemical

Change, pgs. 251-73; Principle of maximum work, pgs. 224-28, 241-42); *Revised and Enlarged by Ernst Cohen (trans. Thomas Ewan).* 286-pgs. London: Williams & Norgate.
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Further reading

â— Kriz, Ronald D. (2009). "Triple Point Processes Associated with Gibbs' Free Energy", College of Engineering, Virginia Tech, *SV.VT.edu.*

External links

â— Gibbs free energy – Wikipedia.

θΔics

In thermodynamics, **Gibbs free energy change**, symbol ΔG, is the change Δ in Gibbs free energy G in a system in going from an initial state to a final state and is quantified by the difference of the latter over the former. This is stated mathematically as:

$$\Delta G = G_f - G_i$$

(add discussion)

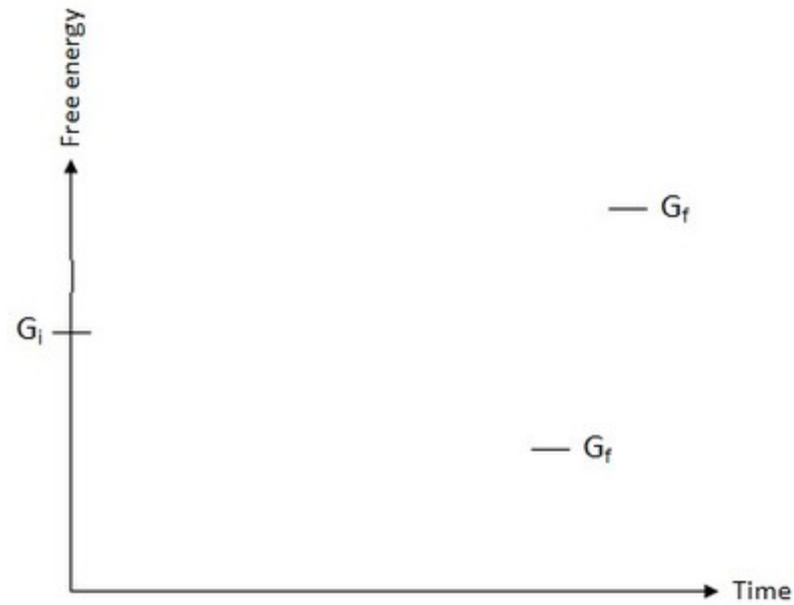

Generic plot showing to possible **Gibbs free energy changes** over time: the lower G_f position indicating a free energy change decrease, the higher G_f position indicating a free energy change increase.

Enthalpy and entropy

The expression for Gibbs free energy change, can be expanded, by substitution for the Gibbs function, in terms of initial and final values of enthalpy *H* and entropy *S* of the states of the system:

$$\Delta G = (H - TS)_f - (H - TS)_i$$

or

$$\Delta G = H_f - TS_f - H_i + TS_i$$

which states that Gibbs free energy change of a process can be studied in terms of the difference in the measures of the enthalpy and entropy of the system in the final state, H_f and S_f, as contrasted with the values of the enthalpy and entropy in the initial state, H_i and S_i.

Further reading

â— Anslyn, Eric V. and Dougherty, Dennis A. (2006). *Modern Physical Organic Chemistry* (pg. 68). University Science Books.

θΔics

In thermodynamics, the **Gibbs fundamental equation**, also called the combined law of thermodynamics, states that the change in energy of a system can always be written as the product of an intensive and an extensive parameter. This takes the form of: [1]

$$\Delta U = \sum_i X_i \Delta Y_i$$

where *Xi* is an intensive quantity, such as pressure or temperature, and *Yi* is an extensive quantity, such as volume. The expression on the right side of this equation is called a Pfaffian form.

History

The Gibbs equation, was first derived by American engineer Willard Gibbs in the first two pages to his 1873 "Graphical Methods in the Thermodynamics of Fluids" as: [2]

$$d\varepsilon = td\eta - pdv$$

where, according to Gibbs, ε is the energy, t the temperature, η the entropy, p the pressure, and v the volume of the body in a state.

Advanced systems

When a system does work or has work done on it the system internal energy is effected, such as when it has a volume dV change due the action of a pressure P, i.e. pressure-volume work (dW = pdV), an expansion of a material section or elongation dl in response to the application of a force F, i.e. elongation work (dW = Fdl), does work (μdn) by transporting a certain number of atoms or molecules dn against a concentration gradient, where μ is the chemical potential, i.e. transport work (dW = μdn), or, among many other possible examples, does work in the action of charge transport in which an amount of charge dq is transported against an electric potential ψ, i.e. electrical work (dW = ψdq), then the Gibbs fundamental equation becomes: [3]

$$dU = TdS - PdV + Fdl + \sum_{i=1}^{m} \mu_i dn_i + \Psi dq$$

The application of this type of quantification of internal energy of human social systems, e.g. how does one quantify the transport of a singe human molecule across the boundary of a system or how human pressures, temperatures, or volumes are quantified, etc., is one of the most advanced topics in human thermodynamics. [4]

References

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2. Gibbs, J. Willard. (1873). "Graphical Methods in the Thermodynamics of Fluids", *Transactions of the Connecticut Academy*, I. pp. 309-342, April-May.
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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (Ch. 16: "Human Thermodynamics", pgs. 653-702). Morrisville, NC: LuLu.

θΔics

In hmolscience, **Gibbs landscape** is the thermodynamic potential of isothermal-isobaric system in the form of a two or three dimensional energy landscape.

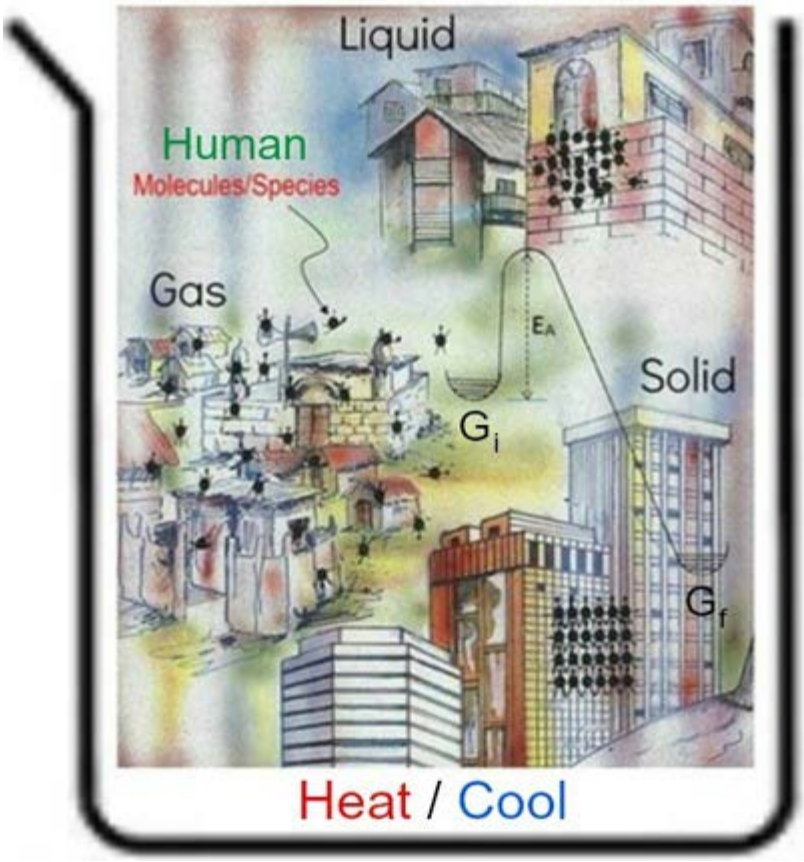

An annotated version Mirza Beg's 1987 conception of physicochemical sociology, showing an activation energy barrier, equation overlay, depiction of a society going from say a gas or "slum" phase, at an initial value of Gibbs energy G_i, to a liquid or "city" phase, and a final value of Gibbs energy G_f, an hmolscience conceptual type of "**Gibbs landscape**", so to say. [4]

Etymology

In 1931, Mexican-born American theoretical chemist Henry Eyring and Hungarian-born English physical chemist Michael Polanyi, in their "On Simple Gas Reactions", developed the graphical model of the "potential energy surface", wherein they used the London equation (1927) to described the journey of the nuclei from reactant state of the system to the product state of the system, passing through the crucial intermediate state of activated complex. The reaction they dealt with was:

$$H + H_2 \rightarrow H_2 + H$$

The development of these types of diagrams led to the conception of transition state theory in 1935. The potential energy graphical work of Eyring and Polanyi eventually evolved into the concept of three-dimensional "energy landscape" constructions. By mid 1980s, energy landscape models were being employed in the study of protein folding; and in 1993, with the rise of protein thermodynamics, the theory of RNA free energy landscapes was being utilized. The term “Gibbs landscape” has been in use in physical chemistry since at least 2005. [1]

Blum

In 1934, Harold Blum introduced the chemical peneplanation model of non-chance based evolution, described in terms of thermodynamic potentials.

Lindsay

In 1983, Bruce Lindsay introduced a posited thermodynamic potential model upgrade to teleology.

De Lange

In 2001, South African physical chemist Adriaan de Lange developed a Gibbs free energy theory of human evolution, mixed in with energy landscape theory and fitness arguments:

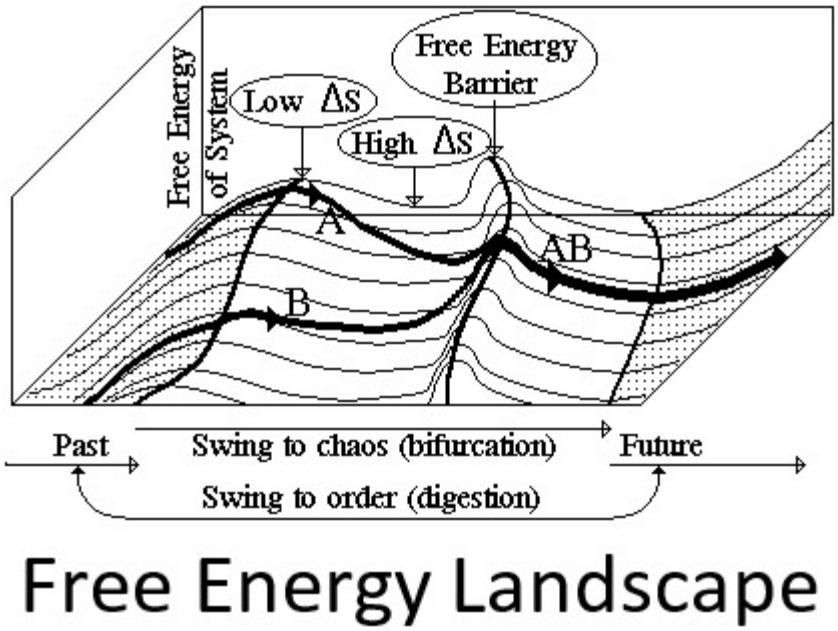

about which he summarizes:

> "All **fitness functions**, how imaginative we may create them, depend on free energy as the mother of them all. No change is possible without free energy changing somewhere in the universe, whether in the system S_Y or in the surroundings S_U. The free energy F is not merely a theoretical concept of the imagination. It is a quantity based on innumerous measurements and calculations in the realm of physical chemistry. It is a quantity of bewildering consequences, the nemesis of many a student in physical chemistry."

(add)

Hand

In 2011, American planetary scientist Kevin Hand asserted that the "Gibbs energy" concept, applied ecologically and to civilizations, in the form of energy landscape models, i.e. as "Gibbs landscapes" constructions, is one of the top 100 concepts of the 21st century that will make you smarter. [2]

> "When you start to view the world around you with Gibbsian eyes [compare: molecular goggles] you see the untapped potential in so many of our modern technological and industrial ecosystems."
>
> — Kevin Hand (2011), concept that would improve everybody's cognitive toolkit

Hand's conception of "Gibbs landscape" here, to note, is that conceptualized along the lines of a renew, recycle, and green movement ecosystem conception, in the sense of "waste not free energy", as English physiologist William Bayliss (1915) translated Wilhelm Ostwald's thermodynamic imperative; and not that of a Gibbs landscape conception of reactions between humans, as in human chemical reaction theory, themselves conceptualized as molecules, akin to the way Mirza Beg illustrates the cover of his *New Dimensions* with activation energy diagrams, shown adjacent, or the way de Lange makes his evolution-conceptualized Gibbs landscapes, or the way Thomas Wallace makes his rise and fall of civilization free energy diagrams.

Hand's suggestion was selected as one of Sean Carroll's favorites. [3]

See also

â— Harold Blum | Chemical peneplanation
â— HCT | Fitness landscape

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2. (a) Hand, Kevin. (2011). "The Gibbs Landscape", Submission (Ñº) (pdf) to the *Edge* World Question Center's query: "What Scientific Concept Would Improve Everybody's Cognitive Toolkit?", Jan, in: *This Will Make You Smarter* (§:The Gibbs Landscape, pgs. 312-14). Harper Perennial, 2012.
(b) Kevin Hand (about) – Jet Propulsion Laboratory, Caltech.
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θΔics

In science, the **Gibbs stamp** is a commemorative 37 cents stamp issued, by the United States Post Office in 2005, in honor of American mathematical engineer Willard Gibbs, founder of chemical thermodynamics. [1]

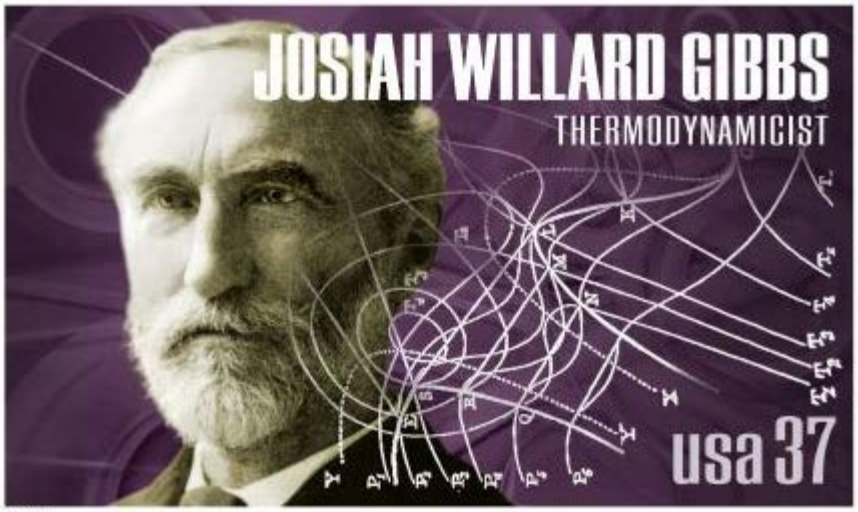

The 2005 **Gibbs stamp**, with James Maxwell's thermodynamic surface, derived from Gibbs's work, shown in the background.

Overview

The Gibbs stamp was issued in a set of four, along with geneticist Barbara McClintock, mathematician John von Neumann, and physicist Richard Feynman, in honor of great American scientists. [2] The stamp unveiling ceremony took place on May 4th, 2005 at Yale University, attended by John Willard Gibbs, a distant cousin, who spoke at the ceremony. [3] A framed picture of the Gibbs stamp adorns the wall at the entrance to the Dean's office at the faculty of engineering at Yale University. [4]

Designer

The overall stamp design, showing what seems to be a three-dimensional graphical representation of various temperatures and pressures of the states of some substance, meant to represent the work "associated with major contributions made by the scientist", was completed by American artist Victor Stabin, based on design input from American chemical engineer Kenneth Jolls, who specified the graph and the use of the Gibbs equation on the collar (not shown above). [10] Stabin had previously designed the 2004 commemorative postage stamp of American composer Henry Mancini, of which 87 million copies were made. [11]

Portrait

The portrait of Gibbs is a photograph taken from collections of the American Institute of Physics' Emilio Segre Visual Archives; it was made toward the end of Gibbs' life, at about the time of his final publication in 1902. [12]

Kenneth Jolls

The origin of the stamp design traces to the webpages of American Kenneth Jolls, a professor of chemical engineering at Iowa State University, a site containing computerized Gibbs model graphical diagrams, based on research by Daniel Coy, Joll's former doctoral student. [6] Jolls has devoted much of his professorial career to applying computer visualization technology to representing thermodynamic concepts that prior generations of researchers were forced to construct painstakingly from either wood or clay. In searching out a design, the USPS had come across Jolls' website on Gibbs and retained his expertise to aid in the stamp design. [7] In working out the design, with the USPS, as Jolls recounts: [10]

> "We started getting material together. We got through the first cut, and they wanted suggestions for a design to go along with Gibbs' picture. I argued that the design had to be related to Gibbs' famous three-dimensional energy-entropy-volume surface, and we finally settled on the map of the USV surface that I had dug out of the tombs at the Berkeley Library from Maxwell's 1875 *Treatise on Heat*. USPS accepted the idea and sent a draft design to me about a year and a half ago for comments."

The "famous" three-dimensional energy-entropy-volume surface, referred to here by Jolls is likely the "statue of water" plaster model (of which three were made, two remaining in Cambridge) that Maxwell had sent to Gibbs in New Haven in *circa* 1873. [13] JoIIs also convinced the USPS to rename Gibbs as a thermodynamicist, rather than its original title of chemist, upon his recommendation.

Graph

The graph of the back of the stamp shows figure 26d, titled "Thermodynamic Surface", from Scottish physicist James Maxwell's 1875 book *Theory of Heat.*

The graph is meant to represent Gibbs 1873 publications on the graphical methods in thermodynamics ("Graphical Methods in the Thermodynamics of Fluids" and "A Method of Geometrical Representation of the Thermodynamic Properties of Substances by Means of Surfaces"), as fully described in a three-dimensional plaster surface of water Maxwell made in 1875, one of which he sent to Gibbs as a gift.

albeit the actual graph shown is not to be found in his major works.

The Gibbs stamp bears the two-dimensional map (pictured adjacent) of the energy-entropy-volume function, specified by JoIIs, from the fourth edition (1875) of "Theory of Heat" by Scottish physicist James Maxwell. [8]

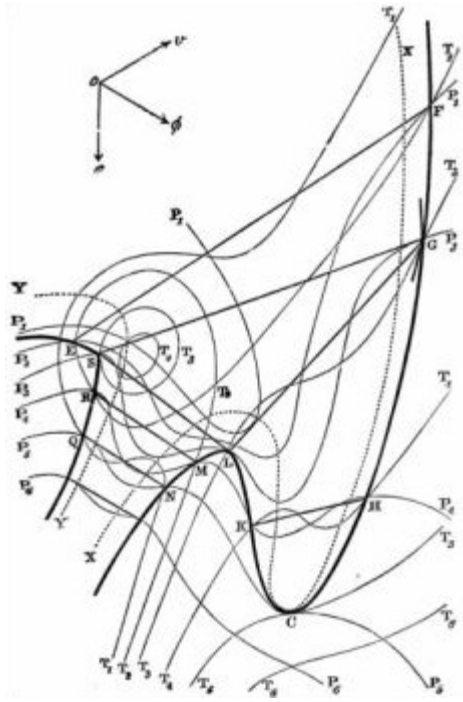

Fig 26d. "Thermodynamic Surface" in James Maxwell's 1875 book *Theory of Heat*, visualized more fully in Maxwell's thermodynamic surface.

Equation

All four 2005 American scientists' stamps have a small equation on hidden on the collars of each scientist. Most of the stamps have such equation although, to note, some poster prints and web images (such as shown above) have no equations. In the case of the Gibbs stamp, it was Jolls who convinced the Postal Service to incorporate the differential equation of the Gibbs surface function, which in modern notation is:

$$dU = TdS - PdV$$

into the design as well. Gibbs, however, used Greek notation for his equation. Hence, the equation shown on his collar is:

$$d\varepsilon = td\eta - pdv$$

The tiny equation is mostly unnoticeable to the average observer. Trained thermodynamicists, however, are drawn to it and often excited to find it hidden. In 2006, for instance, MIT propulsion thermodynamics professor Zolti Spakovszky, discovered the equation after his wife had given him the book of stamps as a gift. In an April 08, 2006 letter to the editor of *Mechanical Engineering*, titled "Stamp of Authenticity", pictured adjacent, Spakovszky shows how one can find the the 1873 Gibbs equation on the collar of Gibbs' shirt by magnification. [5]

In his letter, Spakovszky remarks on his disdain over the Postal Service choosing a thermodynamic graph over that of the Gibbs fundamental equation. In commentary on his finding of the secret hidden formula, he states:

> "I couldn't take my eyes off the **Gibbs stamp**. I noticed that there were some dark spots on his collar. A closer look under the microscope revealed a very pleasant discovery: the Gibbs equation is written on his

collar. It is in the original form Gibbs reported on the second page of his paper, "Graphical Methods in the Thermodynamics of Fluids," published in the *Transactions of the Connecticut Academy*, 1873."

In 2009 commentary, Spakovszky affirms that finding the equation hidden on the collar was a "delightful experience". [9]

2008 series

On March 6, 2008, Postal Service issued the second in its American Scientists series of commemorative stamps, also designed by Stabin. The 41–cent stamps come in four designs in a pressure–sensitive adhesive pane of 20 stamps honoring theoretical physicist John Bardeen, biochemist Gerty Cori, astronomer Edwin Hubble, and structural chemist Linus Pauling. [14]

See also

â— Gibbs tombstone

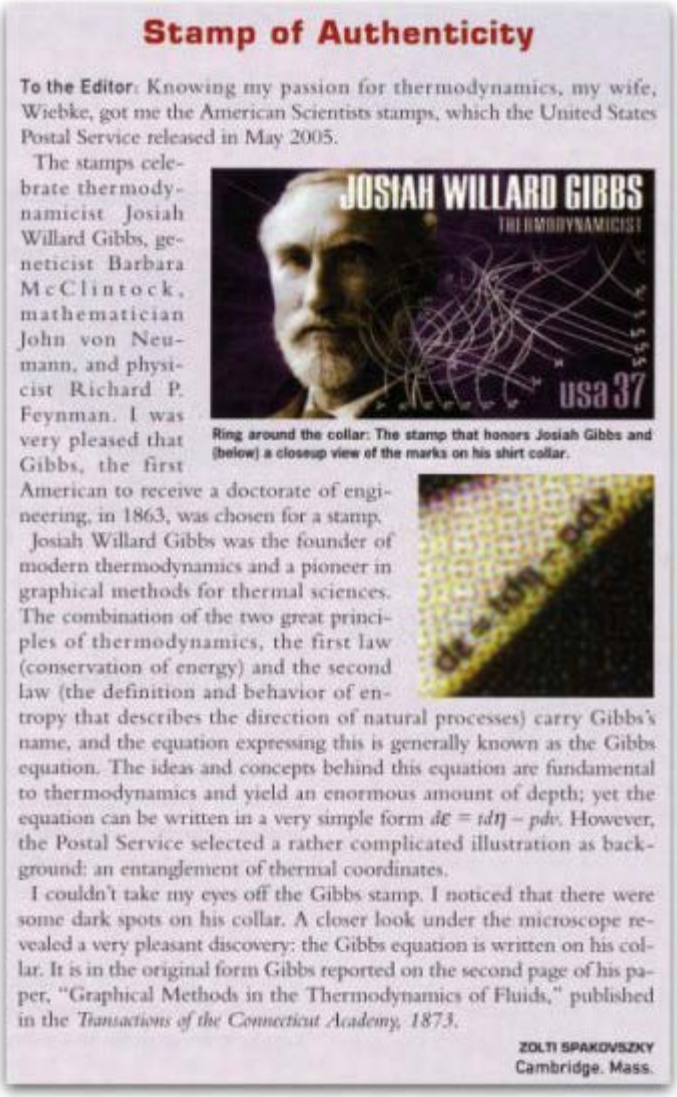

Stamp of Authenticity

To the Editor: Knowing my passion for thermodynamics, my wife, Wiebke, got me the American Scientists stamps, which the United States Postal Service released in May 2005.

The stamps celebrate thermodynamicist Josiah Willard Gibbs, geneticist Barbara McClintock, mathematician John von Neumann, and physicist Richard P. Feynman. I was very pleased that Gibbs, the first American to receive a doctorate of engineering, in 1863, was chosen for a stamp.

Ring around the collar: The stamp that honors Josiah Gibbs and (below) a closeup view of the marks on his shirt collar.

Josiah Willard Gibbs was the founder of modern thermodynamics and a pioneer in graphical methods for thermal sciences. The combination of the two great principles of thermodynamics, the first law (conservation of energy) and the second law (the definition and behavior of entropy that describes the direction of natural processes) carry Gibbs's name, and the equation expressing this is generally known as the Gibbs equation. The ideas and concepts behind this equation are fundamental to thermodynamics and yield an enormous amount of depth; yet the equation can be written in a very simple form $d\varepsilon = td\eta - pdv$. However, the Postal Service selected a rather complicated illustration as background: an entanglement of thermal coordinates.

I couldn't take my eyes off the Gibbs stamp. I noticed that there were some dark spots on his collar. A closer look under the microscope revealed a very pleasant discovery: the Gibbs equation is written on his collar. It is in the original form Gibbs reported on the second page of his paper, "Graphical Methods in the Thermodynamics of Fluids," published in the *Transactions of the Connecticut Academy, 1873*.

ZOLTI SPAKOVSZKY
Cambridge, Mass.

Letter to editor: "Stamp of Authenticity", April 08, 2006 *Mechanical Engineering*, by Zollti Spakovszky.

References

1. Gibbs stamp (large .jpg image) – Yale.edu
2. The 2005 Commemorative Stamp Program – US Postal Service.
3. Gibbs Stamp Ceremony (images and notes), May 04, 2005 – Eng.Yale.Edu.
4. Picture of Faculty of Engineering (Doorway) – Eng.Yale.Edu.
5. (a) Letter to Editor (Stamp of Authenticity), Zolti Spakovszky, c. 2006
(b) Letters (April, 2006) – Mechanical Engineering.
(c) Josiah Willard Gibbs – Scientific-web.com
6. Anon. (2005). "Postal Service Pays Homage to Josiah Willard Gibbs", *Chemical Engineering Progress*, 01 July.
7. Gibbs Models – Iowa State University (Kenneth R. Jolls).
8. Maxwell, James. (1875). *Theory of Heat* (Fig. 26d. "Thermodynamic Surface", pg. 207). Dover.
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10. Anon. (c. 2004). "Iowa State Chemical Engineer Drives Issue of New Stamp Honoring Father of Thermodynamics." *College Feature*, Iowa State University – College of Engineering.
11. (a) Victory Stabin (overview) – StabinMorykin.com
(b) Victor Stabin - Homepage.
12. Hacker, Annette. (2004). "ISU Professor Helps Develop Postage Stamp Honoring Noted Scientist.", *News Service*. Iowa State University.
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14. American Scientists (2008) – USPS.

External links

â— Gibbs Stamp (News & Events) – Yale Engineering.
â— U.S. Postage Stamp Series Unveiling at Yale to Celebrate Exceptional Scientists – Yale News Release.

θΔics

In science, **Gibbs tombstone** is the marker for the final resting place of American engineer Willard Gibbs (d. 1903), central founder of chemical thermodynamics, located at Grove Street Cemetery in New Haven, Connecticut. [1]

Gibbs is buried next to the grave of his father, Josiah Willard Gibbs, Sr., shown behind, to the left, in the photo; such as shown below:

The Willard **Gibbs tombstone** at Grove Street Cemetery in New Haven, Connecticut.

(add discussion)

See also

â— Clausius tombstone
â— Gibbs stamp
â— Boltzmann tombstone

References

1. (a) Gibbs Stamp Honoring Ceremony (Grove Street Cemetery), 04 May 2005.
(b) Images tagged “Josiah Willard Gibbs” – Flickr.
(c) Josiah Willard Gibbs (Tombstone) – Flickr.

θΔics

In hmolscience, **Gibbs, Goethe, and Empedocles** refers to the subset of Gibbs and Goethe scholars, who also cited Empedocles, and or make a general connection to the works of all three, namely: Carl Snyder (1902), Lawrence Henderson (1917), and Jurgen Mimkes (2000). [1]

The discovery of Carl Snyder (1902), of note, was found via the Google Books search key combination: Goethe, Gibbs, Empedocles; a key that returns similar thinkers including: Lawrence Henderson (*The Order of Nature*, 1917) (Ñº), and Libb Thims (*Human Chemistry*, 2007) (Ñº).

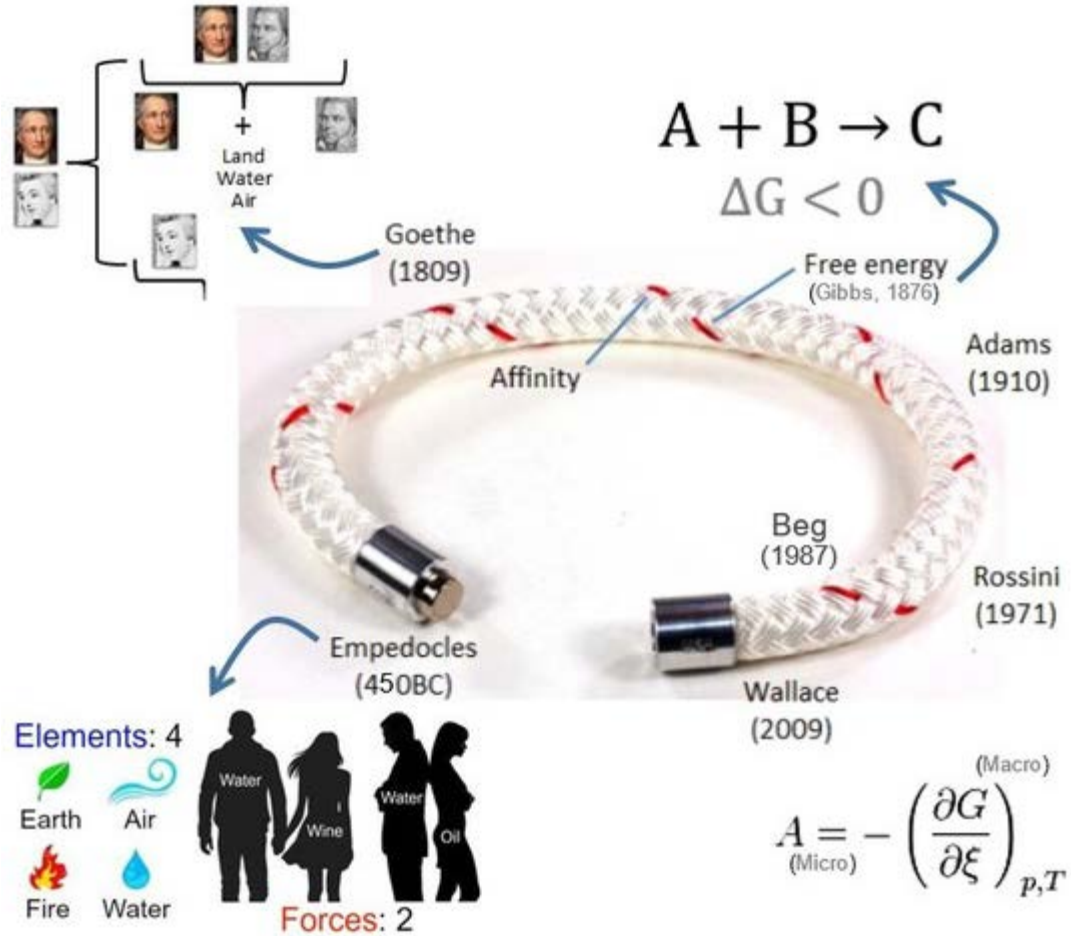

A general diagram of the **Gibbs, Goethe, and Empedocles** connection, via Richard Schowen's 1984 red thread model; according to which, after the year 1882, wherein Hermann Helmholtz showed that free energy is he measure of affinities, people began to make the discerning red thread connection: Gibbs to Goethe to Empedocles.

Quotes | Reduction

The following are extreme reductionism themed quotes:

> "Physical science will not stop short of a **reduction of** the universe and **all** it contains to the basis of mechanics; in more concrete terms, to the working of a machine."
>
> — Carl Snyder (1903), *New Conceptions in Science* (Ñº)

> "There is nothing but the difficulty of the task to hinder the **reduction of all** [socio-] physiological processes to physical and chemical phenomena."
>
> — Lawrence Henderson (1927), "The Process of Scientific Discovery" [2]; note: the "*socio*-" insert, making the statement indicative of **"extreme" reductionism**, is a retrospect addition, per his later Gibbs-based ventures into sociology (see: "Sociology 23" + Harvard Pareto circle)

These two, to note, are both, independently, Gibbs, Goethe, and Empedocles scholars; namely each viewed the universe and all in it as being reducible to forces and elements, as did Empedocles, via his two force, four element model.

Other

Their exist a few Gibbs, Goethe, and Empedocles key word connecting publications, that are goose chases, one being: a Stephen Toulmin (1985) connection, in respect to Gibbs, seems to cite the 1970s evolution publications of Francois Jacob, who supposedly, in turn, cited the statistical mechanics of Gibbs. Moreover, the Empedocles name drop is but mention of an example of pre-Socratic. The Goethe mention here, also, seems to be general Goethe discussion, no mention of *Elective Affinities*. [2]

Another is one by Arthur Zajonc (*Catching the Light*, 1995) (Ñº), who cited Gibbs for his quote on William Thomson's vortex atom theory; no oil and water Empedocles discussion is employed; and no *Elective Affinities* discussion is found.

References

1. Mimkes, Jürgen. (2000). "Society as a many-particle System" (abs), *Journal Thermal Analysis*, 60(3):1055-69.
2. Toulmin, Stephen. (1985). *The Return to Cosmology: Postmodern Science and the Theology of Nature* (Empedocles, pg. 9; Gibbs, pg. 160; Goethe, pgs. 109,130, 131, 137, and 187) (Ñº). University of California Press.

θΔics

In thermodynamics, the **Gibbs-Clausius equations** are the 1,158 equations that constitute the combined works of German physicist Rudolf Clausius (448 numbered equations and 10 fundamental equations) and American engineer Willard Gibbs (700 numbered equations), as found in the *The Mechanical Theory of Heat* (1875) and *On the Equilibrium of Heterogeneous Substances* (1876), which together define modern thermodynamics, and in particular modern chemical thermodynamics.

Clausius fundamental equations

The following are the ten fundamental equations of thermodynamics, according to German physicist Rudolf Clausius, who assigned these with Roman numerals, as contrasted with the other 448-numbered equations found in his 1875 second edition:

Equation	Description	#	Pg.
$dQ = dH + dL$	Development of the first main principle (Heat *dQ* imparted to any body whatsoever acts to increase the quantity of heat *dH* and the quantity of work *dL* done)	I	27
$dQ = dH + dJ + dW$	Forces against which work is done (the quantity of work *dL* may be divided into two classes: (a) internal work *dJ*, those which the molecules of the body exert among themselves, and which depend on the nature of the body itself; (b) external work *dW*, those which which arise from external influences, to which the body is subjected)	II	27
$dQ = dU + dW$	First main principle (first law of thermodynamics)	III	31
$dQ = dU + pdv$	Pressure-volume work (Case in which the only external force is a uniform pressure normal to the surface)	IV	38
$\int \frac{dQ}{T} = 0$	Convenient expression for the second main principle (if in a reversible cyclical process every element of heat taken in (positive or negative) be divided by the absolute temperature at which it is taken in, and the difference so formed be integrated for the whole course of the process, the integral so obtained is equal to zero)	V	89
$dQ = TdS$	Second main principle (second law of thermodynamics)	VI	90
$\int \frac{dQ}{\tau}$	Discussion on the function τ as being the absolute temperature T	VII	105
$dQ = \tau dS$		VIII	107
$\int \frac{dQ}{T} \leq 0$	Non-reversible processes (uncompensated transformations must always be positive)	IX	213
$dQ \leq TdS$		X	214

Gibbs fundamental equation

These were advanced further in 1876 by American engineer Willard Gibbs, in his *On the Equilibrium of Heterogeneous Substances*, in the form of the combined law of thermodynamics and the Gibbs fundamental equation, a treatise containing exactly 700-numbered equations. Others to build on the ten equations of Clausius include: Boltzmann

entropy, Prigogine entropy, Gibbs entropy, among others.

θΔics

In mononyms, **Gibbsian** (TR:19) refers to the work, theories, equations, models, systems, applications, ideas, and derived philosophical applications of American engineer and physiochemical mathematician Willard Gibbs (see: Gibbs), in particular his 1876 *On the Equilibrium of Heterogeneous Substances*; a Gibbsian, in some sense, is a more refined and generalized Clausiusian, so to say; both of which, so to say, are modern "Lagrangian" (see: Joseph Lagrange) conceptualized models of the universe, pure and applied; all of which are "Newtonian" (see: Isaac Newton) in foundation.

Quotes

The following are related quotes:

> "Gibbs' thermodynamic papers—difficult, abstract, and buried in an obscure journal on the fringes of European scientific awareness-remained for a time virtually unknown except among a small circle of admirers. Fortunately, the latter included physicist James Maxwell, who advocated effectively for Gibbs' insights and methods. Major centers of **Gibbsian** influence began to appear in Germany, Holland, and elsewhere, as many Nobel Prize winning careers were launched from a passing remark or footnote in Gibbs' monumental masterpiece."
>
> — Frank Weinhold (2009), *Classical and Geometrical Theory of Chemical and Phase Thermodynamics* [1]

See also

â— Gibbsian school
â— Gibbsian thermodynamics

References

1. Weinhold, Frank. (2009). *Classical and Geometrical Theory of Chemical and Phase Thermodynamics* (Gibbsian, pg. 151). Wiley.

θΔics

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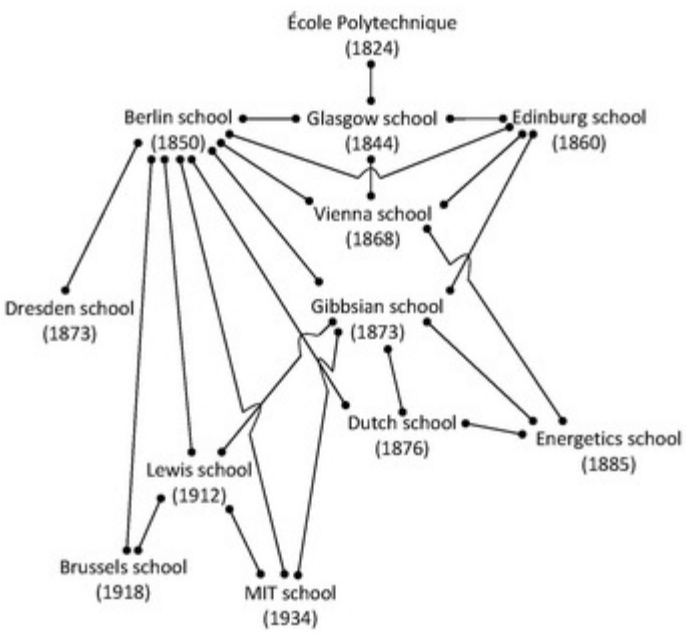

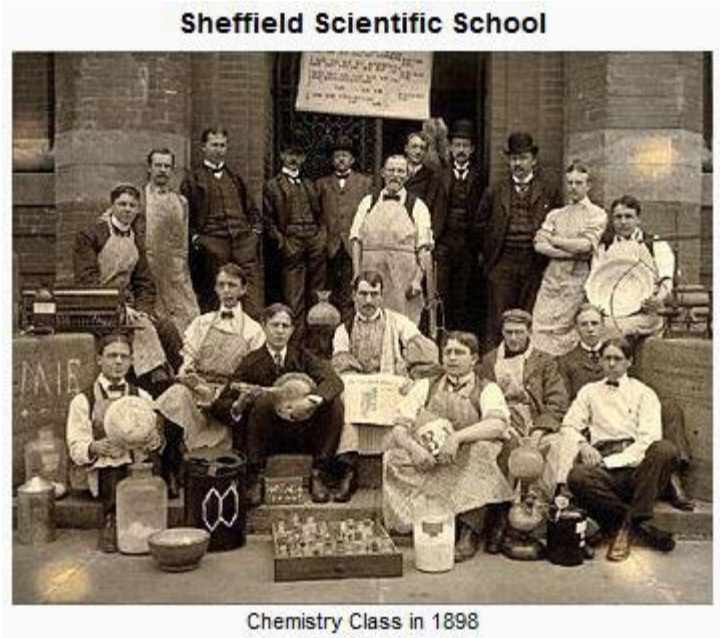

Left: The nodal connectivity map of the various schools of thermodynamics. The Gibbs correspondence table of letter and publication transmissions gives further detail behind these connections. [5] Right:
The chemistry class of the Sheffield Scientific School at Yale, founded in 1847, the school, which incorporated both the sciences and the liberal arts, that in some way allowed Gibbs to make his roots and or produced Gibbs in some sense.

thermodynamics schools, the **Gibbsian school**, Gibbs school, Yale school of thermodynamics, or in some cases the Sheffield scientific school, refers to the school of teaching associated with the work of American engineer Willard Gibbs, as captured in the term Gibbsian thermodynamics, and his direct and indirect students.

The following quote gives an in-context perspective explaining that an example of a pre-Gibbsian school is the Van't Hoff school (Dutch school): [1]

> "In the early years of this century the pre-**Gibbsian** (or van't Hoff's) **school**, with its emphasis on dilute and ideal systems, was running out of steam, and the more general examples of phase equilibrium were outside their scope."

Overview

The Gibbs school, launched in 1873, the year of the publication of Gibbs "Graphical Methods in the Thermodynamics of Fluids", is a precipitate, branch, or product, so to speak, of the Sheffield scientific school, a chemistry-engineer focused division of Yale University initiated in 1847. [2]

Gibbs entered Yale University at the age of 15 graduating, in 1858, at the age of 18. [3] He then entered the new Yale graduate school earning the first PhD in engineering in the United States, completed in 1863. Gibbs' PhD thesis was "On the Form of the Teeth of Wheels in Spur Gearing". [4] In 1871, two years after returning from a study abroad at various universities in Europe, Gibbs became Yale's first professor of mathematical physics.

Gibbs had very few direct students, one being Mathematician Edwin Wilson, often is often said to have been Gibbs "sole protégé", and Wilson's famous student Economist Paul Samuelson, who used thermodynamics in economics. Most of Gibbs students were indirect students, via study of his work.

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θΔics

In thermodynamics, **Gibbsian thermodynamics** is a common term that refers to three papers published by American engineer Willard Gibbs, specifically *Graphical Methods in the Thermodynamics of Fluids* (1873), *A Method of Geometrical Representation of the Thermodynamic Properties of Substances by Means of Surfaces* (1873), and *On the Equilibrium of Heterogeneous Substances* (1875-1878). [1]

Overview

All-in-all, this set of publications is an extension of the German physicist Rudolf Clausius' 1865 thermodynamics textbook *Mechanical Theory of Heat*, particularly his formulations of energy and entropy, to more varied situations, such as particle flow into or out of the system, gravitations effects, coexistence of phases, stability of fluids, critical phases, geometrical illustrations, phases of dissipated energies, gas mixtures with convertible components, equilibriums of stressed solids, capillarity, liquid films, as well as the effect of electromotive forces. [2]

Etymology

The term "Gibbsian thermodynamics" seems to have become common in the 1950s, likely following the publications of *Thermodynamics and the Free Energy of Chemical Substances* (1923), by American physical chemists Gilbert Lewis and Merle Randall, and *Modern Thermodynamics by the Methods of Willard Gibbs* (1933) by English physical chemist Edward Guggenheim. [3] The first clear distinction of the term "Gibbsian thermodynamics", as a subset of equilibrium (or classical thermodynamics), seems to have been made in 1966 by American physicist Laszlo Tisza, of the MIT school of thermodynamics. [4] Specifically, Tisza wrote a section in his *Generalized Thermodynamics* textbook titled Gibbsian thermostatics and used the term Gibbsian thermodynamics ubiquitously, as version of thermodynamics that takes a physical-chemical look inside the "black box" thermodynamic system of Clausius and Kelvin. [5]

See also

â— Prigoginean thermodynamics

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θΔics

In lectures, **Gifford Lectures** is an annual lecture series, held at one of four Scottish universities, established by the will of Adam Gifford (1820-1887) (O), a Scottish advocate and judge, themed on the promotion of natural theology, in the widest sense of the term.

James

In 1900 to 1902, William James, at the University of Edinburgh, gave his *The Varieties of Religious Experience*, which is a classic in world religions studies.

Whitehead

In 1927 to 1928, Alfred Whitehead, at the University of Aberdeen, gave his *Process and Reality: an Essay in Cosmology*, wherein he attempts to introduce what he calls "organism philosophy" or a "philosophy of the organism", which seeded panpsychism, in a general sense.

Eddington

In 1926 to 1927, Arthur Eddington, at the University of Edinburgh, gave his *The Nature of the Physical World*, wherein he positioned thermodynamics, particularly the second law, above everything else, in the grand scheme of things.

Sherrington

In 1937 to 1938, Charles Sherrington, at the University of Edinburgh, in his *Man on His Nature*, gave the most cogent to date clarion call to jettison the concept of “life”, which he classifies as a defunct anthropism (see: defunct theory of life), from repertoire of modern knowledge. This was the most-powerfull of all Gifford Lectures.

External links

- Gifford Lectures – Wikipedia.

θΔics

In hmolscience, **Gilbert Chauvet** (1942-) is a French mathematical physicist, physiologist, and philosopher noted, in animate thermodynamics, for his 1992 to present effort to outline a mathematics themed melting pot theory of biological organization, themed on what he calls "orgatropy", one of many entropy antonyms.

Overview

In 2004, Chauvet, in his *The Mathematical Nature of the Living World*, attempts to integrate biology, physics, thermodynamics, physiology, and neuroscience through the lens of mathematics all centered around an effort to explain how living organisms originated from non-living matter; or rather, in plain speak, supposedly, to explain what separates the two or maintains the perceptual dichotomy. [1]

His 2006 book *Understanding the Organization of Living and its Evolution Towards Consciousness* attempts to expand on his model to explain human consciousness, among other subjects. [2]

In framing out his theory, Chauvet seems to be knowledgeable about a number of historical "what is life" thermodynamics theories, discussing, for instance, the ideas of Ludwig Boltzmann, Max Planck, Erwin Schrodinger, and Ilya Prigogine, along with lesser known theories such as the network thermodynamics theories of Aharon Katchalsky, among others.

In respect to the second law, Chauvet introduced a term he calls "orgatropy", a term he originally introduced in 1992 to explain organizations aspects of neural networks, as what seems to be an contraction of organization + entropy, to account for the organization principle found in biology and evolution in relation to entropy. [3] He defines orgatropy as the thermodynamic "potential of functional organization", which is the "functional equivalent of the second law of thermodynamics applied to living organisms". [1]

Difficulties on theory

See main: Entropy (portmanteaus), Entropy antonyms

Chauvet's notion of "orgatropy", of course, is incorrect, being that Gibbs free energy is the thermodynamic potential of animate organizations found naturally on the surface of the earth, whether internal bodily or social organizations. The invention or coining of new entropy-like terms to explain biology or reconcile the life vs non-life issue are common to thinkers who venture into this arena; historical examples are numerous: anti-entropy, disentropic, ectropy, ektropy, entropy ethics, entropy reduction, entropy reversal, genetic entropy, gentropy, inverse entropy, local entropy decrease, entropy islands, low entropy, mental entropy, syntropy, syntropic, teleonomic entropy, genopsych, among others.

Education

Chauvet states that from an early age, he has always been puzzled by the questions of 'what is life?' and 'what is the difference between living beings and the matter that makes up living beings?' This set of questions, a subject about which he states that he has spent at least 30 years on, drew him into research. Chauvet completed a MS in pure mathematics (1964) and MS in applied mathematics (1965), both at University of Poitiers; a PhD in solid state physics (1968), with a dissertation on "Optical Constants in Metals at High Temperatures", and a PhD in theoretical molecular physics (1974), with a dissertation on "Symmetry Groups and Force Constants in Complex Molecules", both at the University of Nantes, and a PhD in medicine (1976), in biomathematics, at the University of Angers. Chauvet currently his professor emeritus of the Angers Medical School.

See also

- Francis Edgeworth
- Spiru Haret

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15+ pgs; orgatropy, 7+ pgs). World Scientific Publications.
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External links

- Gilbert Chauvet (articles) – Gilbert-Chauvet.com.
- Gilbert Chauvet (about) – Gilbert-Chauvet.com.

θΔics

In existographies, **Gilbert Chesterton** (1874-1936), oft-cited G.K. Chesterton, was an English writer, philosopher, lay theologian, or "sheepish obscurantist" (Lovecraft, 1931), noted, in hmolscience, for []

Quotes | By

The following are noted quotes:

> "A dead thing can go with the stream, but only a living thing can go against it."
>
> — Gilbert Chesterton (1925), *The Everlasting Man* [1]

> "Men believe that death is stronger than life, and therefore **dead things** must be stronger than living things; whether those dead things are gold and iron and machinery or rocks and rivers and forces of nature. It may sound fanciful to say that men we meet at tea tables or talk to at garden-parties are secretly worshippers of Baal or Moloch. But this sort of commercial mind has its own cosmic vision and it is the vision of Carthage. It has in it the brutal blunder that was the ruin of Carthage. The Punic power fell, because there is in this materialism a mad indifference to real thought. By disbelieving in the soul, it comes to disbelieving in the mind."
>
> — Gilbert Chesterton (1925), *The Everlasting Man* [1]

> "An open mind, like an open mouth, does have a purpose: to close upon something solid."
>
> — Gilbert Chesterton (c.1925), *Source* [2]

Quotes | Attributed

The following are quotes attributed to Chesterton, but not found extant:

> "When men stop believing in god, they don't believe in nothing, they believe in anything."
>
> — Gilbert Chesterton (c.1930), Widely attributed (Ñº), although not traced in his works; first recorded (Ñº) as 'The first effect of not believing in god is to believe in anything' in Emile Cammaerts Chesterton: The Laughing Prophet (1937)

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External links

â— G.K. Chesterton – Wikipedia.

θΔics

In existographies, **Gilbert Newton Lewis** (1875-1946) (IQ:195|#12) [RGM:652|1,500+] [CR:429] was an American physical chemist and chemical thermodynamicist notable for the publication of his 1923 textbook *Thermodynamics and the Free Energy of Chemical Substances*, written via dictation to American physical chemist Merle Randall, that resulted to be the most referenced thermodynamics textbook (by other thermodynamics textbooks) of the 20th century, known as the the so-called "thermodynamic bible", that resulted, in the 1956 words of American chemistry historian Henry Leicester, to "replace the term 'affinity' by the term 'free energy' [throughout] the English-speaking world."

Lewis is also noted for the development of the Lewis dot structure (electron pair) model (1902) of the covalent bond, e.g. H:H for the hydrogen molecule H_2, for his *Anatomy of Science* conjectures on a speculative future "wonderful science" (see: hmolscience), somewhere between mechanics and psychology, that explains the behavior of both the electron and a person (1925), for coining the term photon as the particle of light (1926), for his interjection into the Szilard demon argument (1930), and in general for the formation of what has come to be known as the "Lewis school", centered around the University of California, Berkeley, which, as summarized by South African physical chemist Adriaan de Lange, has produced "more Nobel Prize winners in chemistry than any Nobel Prize winner in any category", a school of influence that is still being felt.

Evolution

See related: Chemistry professor paradox

In his 1925 *Anatomy of Science* (§7: Non-Mathematical Sciences), Lewis delves into the tricky question of evolution of the animate things/living things (terms which he rotates usage of) from atoms and molecules in the context of physical science. To begin with he starts with the famous what's the difference between a rock and a human query. He points out that so-called living cells have optically active substances. Then, however, he says:

> "It is possible, however, that we may find some missing link to connect the animate with the inanimate?"

He acknowledges that 'living creatures' are often characterized by the 'power of reproduction'; but discredits this definition, by pointing out that crystals have the power of reproduction. He then states the following, which seems to be lead into an emergence point of view:

> "Inanimate things we describe as obeying laws which are fixed for all time, but the living organism is an opportunist, making new laws from time to time in its constant evolution."

He then brings up "autocatalysis" as a possible solution, which he describes as a type of catalysis in which a reaction is accelerated by one of its own products, so that a long time may elapse before anything happens, but if that product begins to form, or is introduced form with, the reaction goes faster and faster." This, which is nothing more than an unconscious attempt at solution via promoting a perpetual motion of the living kind theory, is similar to Stuart Kauffman's recent 1990s platform of "auto-catalytic closure" thermodynamic theory of the origin of life. Lewis then spends a page or two describing a thought experiment where we are told to imagine a "certain solution capable of producing a given organic substance, but that it will not produce this substance unless one molecule of this substance is already there, after which more and more of these molecules form at the expense of the nutrient solution." He then goes on to explain how isomers of these molecules could form, then begin to collide with each other, knocking off certain atoms, leading to mutations. He then concludes:

> "We should see a process of evolution, each molecule reproducing itself exactly, until an accidental

> rearrangement would set a new molecule to propagating itself. Would not this be reproduction with transmission of acquired characteristics?"

A molecule that "propagating itself", however, is perpetual motion—it is biological theory forced biasedly into chemistry. Lewis defends this by commenting "you may object to my using terms drawn from biology." In any event, he then boldly digs into the heart of the matter, i.e. the gist of what we now have come to define as hmolscience (human chemistry + human thermodynamics + human physics):

> "Suppose that this hypothetical experiment could be realized, which seems not unlikely, and suppose we could discover a whole chain of phenomena [evolution timeline], leading by imperceptible gradations form the simplest chemical molecule to the most highly developed organism [human molecule]. Would we then say that my preparation of this volume [*Anatomy of Science*] is only a chemical reaction [extrapolate up approach], or, conversely that a crystal is thinking [extrapolate down approach] about the concepts of science?"

This is all a very excellent Hegelian dialectic juxtaposition of the issues: how do we defining "thinking" if all phenomena is only variations of atomic structures? Is Lewis himself nothing but an "complex chemical molecule" that has evolved from imperceptible gradations form "simple chemical molecules"? Lewis then answers his own questions (similar to the way, in modern times, many jump to the label of human chemistry or human thermodynamics as "crackpot") by commenting:

> "**Nothing could be more absurd**, and I once more express the hope that in attacking the infallibility of categories I have not seemed to intimate that they are the less to be respected because they are not absolute. The interaction between two bodies is treated by methods of mechanics; the interaction of a billion such bodies must be treated by the statistical methods of thermodynamics."

He then jumps to the "emergence" point of view solution to the origin of life (his italics):

> "They are the same bodies and presumably follow the same behavior, but a great group of new phenomena ***emerges*** when we study an immense number, and by this we must mean merely that phenomena appear that never would have been recognized of dreamed of if the two bodies alone had been studied."

The emergence view has been employed by others recently, e.g. Georgi Gladyshev (c. 2011), but nevertheless is a defunct patch solution. What is interesting to see is Lewis turning his back on chemical thermodynamics, the subject he is largely responsible for developing, which he famously said only two years prior was a "universal rule", when it comes to so-called "living things" and evolution theory: in other words, Lewis seems to have sided with Darwin, than himself. Lewis would have been well-advised, had he had the chance to go-back and re-write this chapter to have heeded the honed wisdom of Max Planck, who commented his famous ultraviolet catastrophy problem solving philosophy, in a 1931 letter to R.W. Wood: [17]

> "It was an act of desperation. For six years I had struggled with blackbody theory. I knew the problem was fundamental, and I knew the answer. I had to find a theoretical explanation at any cost, except for the inviolability of the two laws of thermodynamics."

(add)

Lewis school

See main: Lewis school of thermodynamics

Frederick Rossini, Lewis' most noted student, in respect to the human chemical thermodynamics. [19]

Lewis, after schooling himself at the MIT school of thermodynamics, became the head of the chemistry department at the University of California, Berkeley, stimulating thermodynamics research there, between the years 1912 and 1946. His influence, and many students, have since come to be associated with the "Lewis school", including Frederick Rossini, noted for his 1950 textbook *Chemical Thermodynamics* textbook and for his 1971 "Chemical Thermodynamics in the Real World" wherein he suggested that chemical thermodynamics could be used to explain the nature of freedom and security in social existence, a conjecture that, following 9/11, sparked the famous 2006-launched Rossini debate on the possibility of the reality of the science of human chemical thermodynamics.

Free will | Behavior

In the last chapter of his *The Anatomy of Science* (§8: Life; Body and Mind), Lewis seems to have dove off the deep end of his hard science platform, in his speculations about "biology", arguing, with a bit of ambivalence, that:

> "The science of physics rests on the postulate of determinism; the science of biology, unless it is to ignore deliberately the phenomenon of behavior, must abandon this postulate and substitute therefor a postulate of choice or freedom."

He even seems to side with vitalism, to some extent in his presentation (although he admits to being ignorant to the history of this term). Prior to this ending synopsis, however, he does leave the question open to future possibilities:

> "Perhaps our genius for unity will some time produce a science so broad as to include the behavior of a group of electrons and the behavior of a university faculty, but such a possibility seems now so remote that I for one would hesitate to guess whether this wonderful science would be more like mechanics or like a psychology."

In retrospect, the future "science" Lewis here speaks of seems to hmolscience, and or a combination or one or another of: human chemistry, human thermodynamics, and human physics, depending.

Thermodynamics and animated organisms

In 1925, Lewis was invited to give the Silliman Lectures at Yale, which were published the following year as *The Anatomy of Science*, wherein, in popular talk style, he outlined his own personal philosophy of science. [13] In regard to life in the context of the second law, as summarized by English fellow chemical thermodynamicist John Butler (1944), Lewis outlined a somewhat peculiar view, considering the precision used in his work in chemical thermodynamics, loosely that life somehow cheats the second law: [14]

> "[Living organisms are] cheats in the game of entropy, [which] alone seem able to breast the great stream of apparently irreversible processes. These processes tear down, living things build up. While the rest of the world seems to move towards a dead level of uniformity, the living organism is evolving new substances and more and more intricate forms."

Lewis Leaves Thermodynamics and the Chemical Bond

In 1923, Lewis finished writing *Thermodynamics and the Free Energy of Chemical Substances*, the work that had consumed him since his days as a graduate student a quarter of a century earlier. Merle Randall, Lewis's first doctoral student and now on the faculty at Berkeley, was named as a coauthor, but the book was Lewis's—according to chemist William Jolly, "Lewis would dictate, and Randall wrote it down."[3] The book had a great effect on the practice of chemistry; it changed the way most chemists and chemical engineers thought about planning and analyzing chemical reactions. Thermodynamics, which had been an abstruse field, suddenly became accessible. Lewis's book included tables of the free energies and entropies of a number of substances. These allowed prediction of the equilibrium points of many chemical reactions, and Lewis gave detailed methods for measuring the activity of substances in other reactions, which would allow chemists to determine still more free energies. He intended the book not as a textbook, but rather as a working tool for research chemists:

> A textbook is a sort of table d'hôte to which any one may sit down and satisfy his hunger for information, with no thought of the complex agricultural processes which converted these raw materials into food stuffs, nor of the arts of cookery responsible for the well-prepared meal which is set before him. It has not been our desire to offer such a repast to the reader. Our book is designed rather as an introduction to research, and as a guide to anyone who wishes to use thermodynamics in productive work.[4]

A summary of Merle Randall, according to chemist William Jolly, as seemingly being Randall's note taker, throughout the writing of his famous textbook, rather than as an actual co-author. [13]

Lewis' biographer Patrick Coffey (2008) goes on to summarize, supposedly, that Lewis espoused a Lamarckian view that offspring could inherit acquired traits from their parents, and comments that his biological philosophy was "close to vitalism", with his opinions that the processes of life are quite different from physical and chemical processes, and that animate beings may have some way to cheat the second law. [15]

Chemical affinity

See main: Chemical affinity, Affinity table, Elective affinity, etc.

To give an idea of the density of the word 'affinity', of which entire historical treatises have been written, per century, the following is the opening explanation of Lewis as to how his textbook came about:

"Indeed, our purpose at the outset (1909) was to merely to collect, for the practical use of the chemist and the chemical engineer, the data which we have obtained, or which we have assembled from the work of other investigators, pertaining to the 'great problem of chemical affinity.' But then we were convinced that mere reference tables would hardly render full service without some description of the methods by which they were obtained. The development of these methods of applying thermodynamics to chemical problems has occupied the greater part of our time for many years (1909-23) (14-years)."

By 1956, Lewis and Randall's textbook, according to American chemistry historian Henry Leicester, had led to the replacement of the word 'affinity' by the term 'free energy' throughout the English speaking world. [14]

Education

Lewis educated at home by his parents in the style of the English tutoring system. His only public schooling occurred between the ages of 9 to 13 years in Lincoln, Nebraska. At age 13, Lewis entered the University of Nebraska but transferred to Harvard College after three years. Lewis completed his BS in chemistry (1896), his MA (1898), and PhD (1899) at Harvard. His thesis was "Some Electrochemical and Thermochemical Reactions of Zinc and Cadmium Amalgams", which was published jointly with American chemist Theodore Richards. [11] Richards trained him in experimental techniques, careful measurements, and fostered his interest in thermodynamics. [3]

Lewis stayed as an instructor at Harvard for a year before taking a traveling fellowship, studying under the physical chemists Wilhelm Ostwald at Leipzig and Walther Nernst at Göttingen. [4] He later returned to work for a period at Massachusetts Institute of Technology and in 1900 to 1907 he expanded and clarified the work of American engineer Willard Gibbs' thermodynamics and introduced and developed concepts such as fugacity and activity. [5]

Chemical bond

Aside for his work in thermodynamics, Lewis also pioneered the Lewis dot structures, of labeling electrons in paired dots around atoms, developed 1902 during his lectures at Harvard, wrote the famous 1916 article "The Atom and the

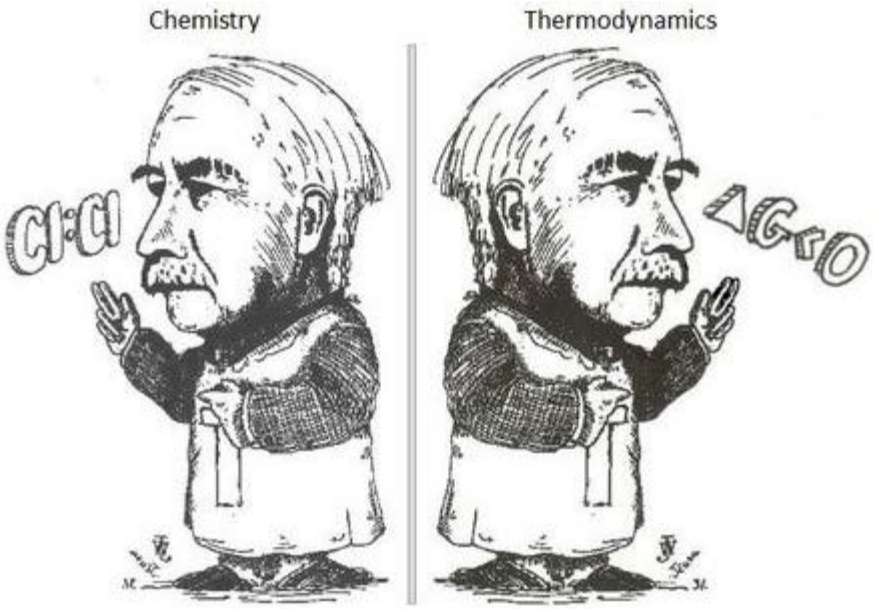

Left: caricature of Lewis, by American chemistry historian William Jensen, depicted as a prophet of the chemical bond for the vision of his dot structure notation developed as an aid to students during his 1902 chemistry lectures at Harvard. [16] **Right**: retouched caricature of Lewis, by Libb Thims, as one of the prophets of modern thermodynamics, for the publication of his 1923 chemical thermodynamics textbook, soon known as the "**bible**" of thermodynamics (see: thermodynamic bible), for, in the words of chemistry historian Henry Leicester, (a) replacing the word "affinity" by the word "free energy" throughout the English speaking world, and most importantly (b) through the simplification of 700-equation treatise of Willard Gibbs into the following truncated equation: $\Delta G < 0$, which has since come to be called the Lewis inequality for natural processes, an equation which has been found to govern both human nature and chemical nature (see: human free energy) or as put succinctly by Goethe "there is, after all, only one nature".

Molecule", and developed a basic theory of chemical bonding. In particular, in about 1900, Lewis began to use dots in lecture, while teaching undergraduates at Harvard, to represent the electrons around atoms. His students favored these drawings, which stimulated him in this direction. From these lectures, Lewis noted that elements with a certain number of electrons seemed to have a special stability.

This phenomenon was pointed out by the German chemist Richard Abegg in 1904, to which Lewis referred to as "Abegg's law of valence" (now generally known as Abegg's rule). To Lewis it appeared that once a core of eight electrons has formed around a nucleus, the layer is filled, and a new layer is started. Lewis also noted that various ions with eight electrons also seemed to have a special stability. On these views, he proposed the rule of eight or octet rule: *Ions or atoms with a filled layer of eight electrons have a special stability*. [6]

In other words, electron-pair bonds are formed when two atoms share an edge, as in structure C below. This results in the sharing of two electrons. Similarly, charged ionic-bonds are formed by the transfer of an electron from one cube to another, without sharing an edge A. An intermediate state B where only one corner is shared was also postulated by Lewis. Hence, double bonds are formed by sharing a face between two cubic atoms. This results in the sharing of four electrons.

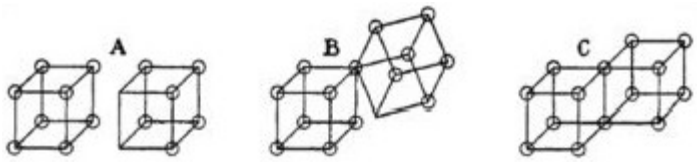

Lewis cubit atoms bonding at electron corners to form chemically bonded cubit molecules B, in such a matter that each atom finds the most atom finds the most stability when it satisfies "Abegg's law of valence" (shells filled with eight electrons are especially stable).

Moreover, noting that a cube has eight corners Lewis envisioned an atom as having eight sides available for electrons, like the corner of a cube. Subsequently, in 1902 he devised a conception in which cubic can bond on their sides to form cubic-structured molecules. In 1913, while working as the chair of the department of chemistry at the University of California, Berkeley Lewis read a preliminary outline of paper by an English graduate student, Alfred Lauck Parson, who was visiting Berkeley for a year. In this paper, Parson suggested that the electron is not merely an electric charge but is also a small magnet (or "magneton" as he called it) and furthermore that a chemical bond results from two electrons being shared between two atoms. [7] This, according to Lewis, meant that bonding occurred when two electrons formed a shared edge between two complete cubes.

On these views, in his famous 1916 article *The Atom and the Molecule*, Lewis introduced the "Lewis structure" to represent atoms and molecules, where dots represent electrons and lines represent covalent bonds. [8] In this article, he developed the concept of the electron-pair bond, in which two atoms may share one to six electrons, thus forming the single electron

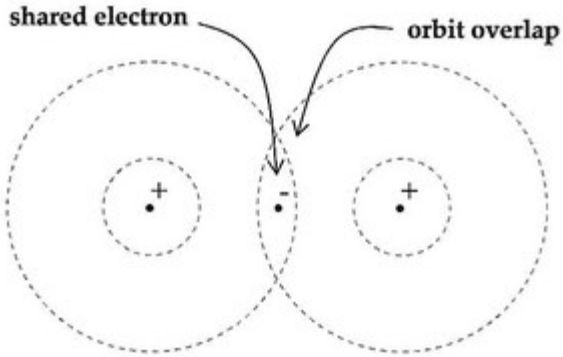

bond, a single bond, a double bond, or a triple bond. In his own words: "An electron may form a part of the shell of two different atoms and cannot be said to belong to either one exclusively."

Lewis proposed that an atom tended to form an ion by gaining or losing the number of electrons needed to complete a cube. Thus, Lewis structures show each atom in the structure of the molecule using its chemical symbol. Lines are drawn between atoms that are bonded to one another; occasionally, pairs of dots are used instead of lines. Excess electrons that form lone pairs are represented as pair of dots, and are placed next to the atoms on which they reside. To summarize his views on his new bonding model, Lewis stated:

> "Two atoms may conform to the rule of eight, or the octet rule, not only by the transfer of electrons from one atom to another, but also by sharing one or more pairs of electrons...Two electrons thus coupled together, when lying between two atomic centers, and held jointly in the shells of the two atoms, I have considered to be the chemical bond. We thus have a concrete picture of that physical entity, that "hook and eye" which is part of the creed of the organic chemist."

The subject of the history of chemical bonding theory goes into more on this.

Conservation of photons

Lewis was the person who coined the word photon. In a letter titled "The Conservation of Photons", dated October 29, 1926, to the editor of Nature magazine, Lewis wrote: [10]

> "I therefore take the liberty of proposing for this hypothetical new atom, which is not light but plays an essential part in every process of radiation, the name ***photon***."

(add)

Suicide

See main: *Founders of thermodynamics and suicide*

Lewis, who is politely reported to have died from a heart attack, was found dead with a bottle of poisonous liquid hydrogen cyanide near his body, only hours after meeting with his long-time rival Irving Langmuir, who, it is said, won all the glory for Lewis' work.

Quotes | On

The following are quotes about Lewis:

> "The influential textbook [*Thermodynamics and the Free Energy of Chemical Substances*] of **G.N. Lewis** and Merle Randall led to the replacement of the term 'affinity' by the term 'free energy' [throughout] the English-speaking world."

— Henry Leicester (1956), *The Historical Background of Chemistry* [12]

"The fact that **Lewis** never was awarded the Nobel Prize for breathtaking work is one of the stains in the history of this prize. Yet the very same Lewis was the direct mentor of more Nobel Prize winners in chemistry than any Nobel Prize winner in any category."

— Adriaan de Lange (1998), Thread: "Entropy" [18]

"**Lewis**, Randall and Guggenheim must be considered as the founders of modern *chemical thermodynamics* because of the major contributions of these two books in unifying the applications of thermodynamics to chemistry."

— Juliana Boerio-Goates (2000), *Chemical Thermodynamics: Principles and Applications* [2]

Quotes | By

The following are noted quotes by Lewis:

"Perhaps our genius for unity will some time produce a science so broad as to include the behavior of a group of electrons and the behavior of a university faculty, but such a possibility seems now so remote that I for one would hesitate to guess whether this wonderful science would be more like mechanics or like a psychology."

— *The Anatomy of Science* (1925)

Gilbert Lewis, the eminent American physical chemist and specialist in chemical thermodynamics, agreed that it was rash to extrapolate laboratory experiences to the entire universe. He considered the second law to be 'a source of uneasiness' and suggested in 1930 an anti-Eddington time-symmetric theory where irreversibility was only apparent. The assumption of a running-down universe has 'no support from thermodynamics', he wrote, for 'Gain in entropy always means loss of information, and nothing else.'[15] According to Lewis, entropy was to be understood as a measure of our ignorance of the actual distribution of a system of particles, and therefore as a purely subjective concept. He believed that it followed from Boltzmann's statistical interpretation of thermodynamics that if the universe is finite, then the present state of the universe has occurred in the past and will recur in the future. His claim that the law of increase of entropy is merely a statement about the information we have about a physical system has since been elaborated by a large number of researchers and forms an important part of modern information theory.

German thermodynamics historian Helge Kragh's 2008 take on Lewis and his views on entropy, irreversibility, and the universe. [20]

"Organic chemistry is one of the less mathematical sciences. The whole theory of structure requires about as much mathematics as a child needs for building houses with blocks."

— *The Anatomy of Science* (1925)

"Time is not one of the variables of pure thermodynamics."

— "The Symmetry of Time in Physics" (1930)

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External links

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θΔics

In hmolscience, **Gilbert L. Wedekind** (c. 1946-) is an American engineer and creationist thermodynamicist noted, in religious thermodynamics, for his natural theology stylized *Spiritual Entropy*, wherein he attempt to blend god and entropy to argue that thermodynamics operates socially, albeit via god's commandments.

Overview

In 2003, Wedekind, inspired by the theological thermodynamic views of American mechanical engineer Gordon Van Wylen, published *Spiritual Entropy*, wherein he attempted to explain what entropy, and its supposed spiritual analog spiritual entropy, has to say about God among other matters; in the following, e.g., Wededind proffers to speculate on the thermodynamics of marriage and work: [1]

> "Why does a couple's relationship tend to become strained if they don't keep working at their marriage? Entropy seems to operate in social situations. Why do we get stressed out when we are overworked? Entropy appears to work in the psychological domain."

Discussing entropy in the context of marriage would seem to be an interesting read. In other points in the book, however, the argument becomes nonsensical, as is often the case when one attempts to reconcile a literal interpretation of Biblical views with thermodynamic laws. In one case, for example, Wedekind argues that the second law came into existence around the time of the fall of Adam and Eve, whereby a curse was put on humankind, using the anti-aging enzyme telomerase as support for his argument: "perhaps telomerase or some equivalent was present in all cells of living things prior to the curse and, at the time of the curse, God withdrew them."

Education

Wedekind received his PhD from the University of Illinois, Champaign-Urbana and is a professor of engineering emeritus from Oakland University, Rochester, Michigan, where he taught thermodynamics for over thirty-five years. [2] Wedekind is also an ordained pastor.

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External links

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θΔics

In existographies, **Gilles Deleuze** (1925-1995) (IQ:#|#) (RGM:726|1,500+) (Becker 139:94) (HuCR:12) (GPhE:#) (CR:7) was a French atheist philosopher, noted for []

Overview

Deleuze, based on his reading of Henri Bergson, supposedly, promoted some type of "radical materialism", that situated a hierarchy of matter, life, and spirit, or something along these lines. [1]

Deleuze, supposedly, used "lines of force" theories somewhere in his arguments and discussions. [1]

Deleuze, along with Félix Guattari, sometimes showed, supposedly, that there are indeed two social levels, the micro or molecular, corresponding to the individual person, and the macro or molar, corresponding to society as a whole. (Q)

Deleuze also seems to have developed some type of Nietzsche-Bergson stylized thermodynamics of sociology model, supposedly based on the idea that whereas you can split a glass of water in half and get two new cups, you can't split the temperature of water in half, because the latter is in intensive property, hence there are thermodynamic intensities in society, or something to this effect. (Q)(Q)

Reaction end

See also: Founders of thermodynamics and suicide

In 1995, Deleuze, faced with growing respiratory problems, stemming tuberculosis and lung removal, wherein simple tasks such as writing required laborious effort, committed suicide by throwing himself from the window of his apartment. (Q)

Associates

Deleuze was friends and or associates (Q) of Jean Sartre and Michel Foucault.

Related

Thinkers related to Deleuze, according to Google search patterns, are: Michel Foucault, Jacques Derrida, Pierre Bourdieu, Friedrich Nietzsche, Martin Heidegger, Jacques Lacan, and Jean Sartre.

Quotes | Employed

The following are quotes employed by Deleuze:

> "In the chemical world, the sharpest perception of the difference between forces reigns. With the organic world, imprecision and appearance begin."
>
> — Friedrich Nietzsche (1888), *Will to Power*; cited by Gilles Deleuze (1983), commented on by John Protevi (2001) [3]

Quotes | On

The following are quotes on Deleuze:

> "The 20th century will be **Deleuzean**."
>
> — Michel Foucault (c.1970) (Q)

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External links

● Gilles Deleuze – Wikipedia.

θΔics

In existographies, **Gilles Roberval** (1602-1675) (Eells 100:43) was a French mathematician and physicist, noted for []

Overview

In 1628, Roberval arrived in Paris in 1628 and made contact with "Mersenne's circle", that centered around Marin Mersenne, with Claude Hardy, Claude Mydorge, Etienne Pascal, and Blaise Pascal. [1]

Influences

Roberval was influenced by: Euclid, Archimedes, Viete, Torricelli, Gassendi, Descartes, Mersenne, Kepler, Vitruvius, Herodotus, Cicero and Quintillian (35-100) (Ñº) (Cattell 1000:608), as found in his personal library. [1]

Quotes | On

The following are quotes on Roberval:

> "They began to discuss the problem of the vacuum. Descartes became particularly serious on the subject. The others explained a recent experiment to him and asked him what he thought entered into the space of the emptied tube. He said that it was his 'subtle matter'. My brother [Blaise Pascal] responded to this theory as best he could. Believing that my brother was having some difficulty expressing himself, **Roberval** took on Descartes with not a little passion, although he remained civil. Descartes responded rather bitterly that he could speak to my brother as long as he desired because my brother spoke reasonably but that he wouldn't continue to talk with Roberval, because the latter spoke out of too many prejudices. With that, he glanced at his watch and saw that it was noon. He stood up, because he had a dinner date in the Faubourg Saint-Germain."
>
> — Jacqueline Pascal (1647), "Letter to [Name]", Sep 25 [3]

> "For Descartes, the mercury was sustained by the weight of the atmosphere, but the Torricellian space was filled by some form of subtle matter. For Descartes' inveterate opponent **Roberval**, the Torricellian space was indeed empty, but the height of the mercury depended upon the limit of the horror of the vacuum (*horror vacui*)."
>
> — Steven Shapin (1985), *Leviathan and the Air Pump* [1]

References

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(b) Gilles Roberval – MacTutor.

External links

â— Gilles de Roberval – Wikipedia.

θΔics

In existographies, **Giordano Bruno** (1548-1600) (IQ:185|#46) (Cattell 1000:655) (RGM:138|1,500+) (FA:47) (GAE:15) [CR:118] was an Italian philosopher, mathematician, astronomer, and priest noted for being the first of the so-called renaissance atomic theorists, the revival period of atomic theory, the years 1550-1800, according to which he conceived of the atom as a three-dimensional physical particle capable of spontaneously moving itself.

Expulsion of the Triumphant Beast

In 1584, Bruno, in his *The Expulsion of the Triumphant Beast*, presented a dialogue between three interlocutors, which digressed on what seems to be change philosophy; a noted quote is:

> "If there were no change in bodies, no variety in matter, and no vicissitude in beings, there would be nothing agreeable, nothing good, nothing pleasant. **Pleasure and satisfaction consist in nothing else but a certain passage, progress, or motion from one state to another**. We can have no delight in anything present till we have been first weary of what is past. The change from one extreme to another, with all the intervals, moving from one contrary to another by all the intermediate spaces, is sure to bring satisfaction."
>
> — Giordano Bruno (1584), *The Disengagement of the Triumphant Beast* [7]

The title is a reference to the belief that moral and political regeneration will only be achieved though the expulsion of the beast of superstition.

In 1713, John Toland published an English translation of this work, and began to circulate it around England and the continent. [8]

Other

In 1584, Bruno, while living in the household of Michel de Castelnau, the French Ambassador to the court of Queen Elizabeth of England, completed three books of cosmological dialogues: *The Ash Wednesday Supper*, *On Cause, Principle and Unity* (or *On Cause, Primary Origin, and the One*), and *On the Infinite Universe and Worlds*.

In his *On the Infinite Universe and Worlds*, the most famous of the three, drawing on Lucretius, Nicholas of Cusa, Nicolaus Copernicus, penned views, refuting Aristotle, on many points, e.g. that "there is nothing beyond the heavens", so outrageous, to the people of his time, that he had to pen a preface stating to the effect that what people were about to read was "not a joke". [6]

Religio-mythology | Beliefs / Denials

Bruno, according to Reginald Witt (1971), was an adept religio-mythology scholar, connecting, in the pre-Rosetta Stone era, Christianity back to Egyptian mythology: [3]

> "Less than 400-years ago, **Bruno** suffered a martyr's death by fire. Excommunicated by an obscurantist ecclesiasticism he went to the stake for his beliefs. He was convinced that the wisdom and magic-born religion of ancient Egypt excelled the fanatical theology that burnt dissident thinkers as heretics. For him the Biblical record was on a par with the Greek myths. Refusing to retract his teachings, he met his doom dauntlessly, for he had less cause than his judges to fear the verdict of history and could snap his fingers at them in warning. Giordano Bruno, the unfrocked monk, perished on 16 Feb 1600, for his intransigent denial that Christianity was unique."

The belief system Bruno held, according to Jennifer Hecht (2003), was "materialistic pantheism", according to which god and the world were one; god did not make the universe, which was eternal, rather god was the universe; a

repercussion of which being that Christianity was meaningless. He held that Christ was not god but merely a unusually skillful magician; he denied virgin birth and resurrection. [5]

Universe

The following, as summarized Scott Gosnell (2014), by is a synopsis of Bruno's model of the universe in comparison to the other four then-competing models: [6]

> "At the end of the 16th century, at least five models of the universe were extant: the traditional Aristotelian-Ptolemaic model, with a spherical, immobile earth at the center, orbited by the sun, moon and planets embedded in crystalline spheres, surrounded by a sphere of fixed stars, and powered from an external motive source, a prime mover or primum mobile; the Copernican system, which placed the sun in the center, orbited by the earth and other planets; the Tychonian system, a hybrid in which the sun and moon orbited the earth and the other planets orbited the Sun; Digges' system, which resembled the Copernican, but with the stars distributed in an indeterminately large space, yet still centered on the solar system; and Bruno's model, of an infinitely large universe, in which every visible star was sun or planet like our own, each of which was populated with its own plants, animals and people. Bruno's model combines three accurate insights."

Bruno, using Lucretius as a basis, extended Copernican heliocentrism to argue that the universe is made up of an infinite number of suns with their own planetary systems; and viewed matter as following an active animistic principle, in that matter is 'intelligent', discontinuous in structure, and made up of discrete atoms or four elements (water, earth, fire, and air).

Aquinas

Bruno opposed Thomas Aquinas' causality argument, and, in its place, added Lucretius' atomic theory together with Copernican heliocentrism to argue for an infinite world's hypothesis.

Monads

Bruno also proposed the view that everything that exists is made up of infinitesimal monads, of three varieties: god (the monad of monads), souls, and indivisible atoms.

Atheism

Bruno is a debatably-labeled (Ñº) (Ñº) "atheist" and or "courageous thinker who lay under the stigma of atheism" (Ñº).

Bruno burning at the state on 16 Mar 1600.

Reaction end

On 17 Feb 1600, after refusing to refute his claims, i.e. would not recant, after which his tongue was cut out, he was stripped naked and burned at the stake, and his ashes were dumped in the Tiber River. Bruno's burning, in the history of atheism (Ñº), is said to mark a transition point for the re-emergence of atheism; though, to note, his works remained on the Index of Prohibited Books until 1965, and it was not until 2000 that he received a public apology from the Catholic Church. [2]

In 1889, at dedication statue was erected at the site of his demise, the central Roman market Campo de' Fiori, the dedication ceremony of which being attended by Herbert Spencer and Ernst Haeckel. The inscription reads:

> "To **Bruno**, from the generation he foresaw, here, where the pyre burned."

The unveiling of Bruno's statue was attended by 30,000 people. [1]

Influence

In the centuries to follow, Bruno's ideas were held up for ridicule, debate, or inspiration. In 1664, Margaret Cavendish, e.g., wrote an entire series of poems against "atoms" and "infinite worlds" in *Poems and Fancies*.

Quotes | Employed

The following are quotes employed by Bruno:

> "The seeds together in this world of ours, must be confessed in other realms there are still other worlds, still other breeds of men, and other generations of the wild."
>
> — Seneca the Younger (50 ACM), *Medea* (318); cited by Giordano Bruno (1584) in *On the Infinite, the Universe, and the Worlds* (pg. 205)

Quotes | On

The following are quotes on Bruno:

> "In contrast to the Cartesian caution, in Germany — where orthodox Cartesianism never gained a foothold — several prominent thinkers embraced the belief that the fixed stars were surrounded by planets and spread throughout an infinite universe. The *Ecstatic Celestial Journey* (*Iter exstaticum coeleste*), 1656, by the Jesuit Athanasius Kircher explicitly characterized the fixed stars as suns with encircling planets, although it denied inhabitants even to the planets of our solar system and to the moon. And Otto Guericke, famous for the 'Magdeburg experiments' proving the existence of a vacuum, devoted a section of his *Experimenta Nova* (1672) to an examination and endorsement of Kircher's view of other planetary systems. Von Guericke also noted the possibility of an inhabited moon and planets, and emphasized (following Galileo) that any inhabitants would not be men, but rather diverse creatures beyond all our imaginings. But von Guericke denied Descartes's equation of extension and matter, and instead traced his ideas to Galileo, Kepler, Antonius de Rheita (Ñº), Mersenne, **Bruno**, and Nicholas of Cusa."
>
> — Steven Dick (1984), *Plurality of Worlds* (pg. 116)

Quotes | By

The following are noted Bruno quotes:

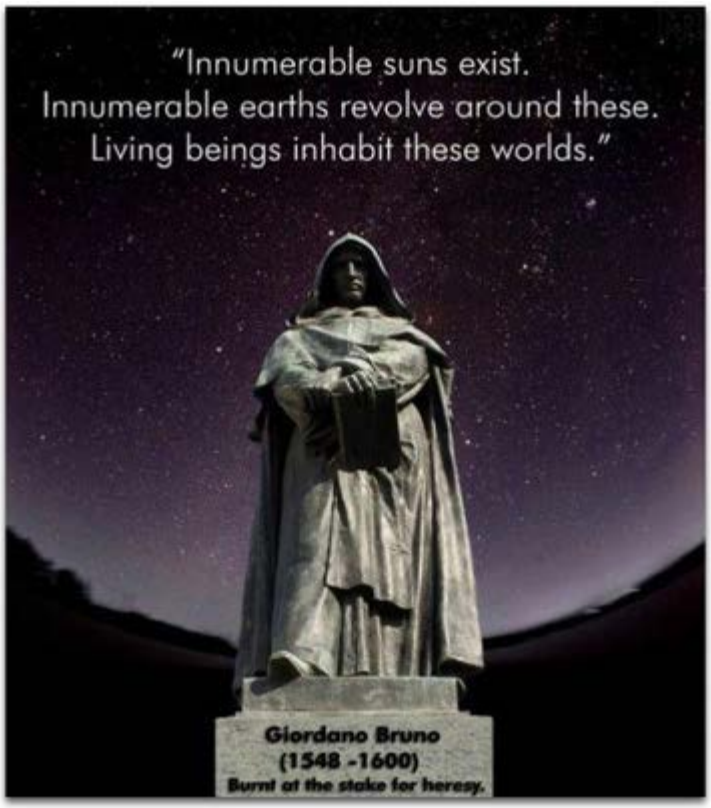

Dedication statue was erected (1889) at the site of Bruno's demise, in the central Roman market Campo de' Fiori.

"Because I have tried to describe the field of nature, consider the disposition of the soul, partake of the life of the mind, and travel like a master artificer, i.e. do what Daedalus did, **through the maze of the intellect**, those who have regarded me have threatened me, those who have seen me have assailed me, those who have encountered me have tried to bite me, and those who have understood me have tried to destroy me; not just one, nor a few, but many, or virtually all."

— Giordano Bruno (1584), *On the Infinite Universe and Worlds* (pgs. 6-7) [6]

"They spoke Latin well, were proper min, of good reputation, fairly competent in learning, but mediocre in education, courtesy and breeding, for 'tis *yes my master; yes my father, or my mistress; yes forsooth*; elect indeed, with their long robes, clad in velvet. One wore two shining gold chains about his neck while the other, by god, whose precious had bore twelve rings, had rather the appearance of a rich jeweler. Did they know aught of Greek? Aye and also of beer. One was the herald of obscurity and the other the bailiff of the goddess of presumption."

— Giordano Bruno (1584), commentary on his interview with the Oxford theologians [4]

"There is no absolute up or down, as Aristotle taught; no absolute position in space; but the position of a body is relative to that of other bodies. Everywhere there is incessant relative change in position throughout the universe, and the observer is always at the center of things."

— Giordano Bruno (1584), *On Cause, Primary Origin, and the One*; this, supposedly, is a close paraphrase of Epicurus ("Letter to Herodotus")

"We have experience that sense-perception deceives us concerning the surface of this globe on which we live, much more should we hold suspect the impression it gives us of a limit to the starry sphere."

— Giordano Bruno (1584), *On the Infinite Universe and Worlds* (character: Philotheo)

"Truth does not change because it is, or is not, believed by a majority of the people."

— Giordano Bruno (c.1590)

> “A spirit exists in all things, and no body is so small but contains a part of the divine substance within itself, by which it is animated.”
>
> — Giordano Bruno (c.1590), *Publication*; cited by Henry Bray (1910) in *The Living Universe* (pg. 180)

> “Perhaps you, my judges, pronounce this sentence against me with greater fear than I receive it.”
>
> — Giordano Bruno (c.1599), commentary on being sentenced to death by fire [5]

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â— On the Infinite Universe and Worlds (1584) – WikiQuote.

θΔics

In existographies, **Giorgio Valla** (1447-1500) was an Italian academic, mathematician, and translator, noted for []

Overview

In c.1490, Valla began to acquire and secure a number of high-valued Greek science manuscripts, such as a copy of Archimedes Codex A, Ptolemy's Almagest, and works by Euclid. (Q)

In 1501, Valla, in his posthumous *De Expetendis de fugiendis Rebus Opus*, supposedly presented some of the early pages of Hero's *Pneumatica*; and at least partial translations (Q) of Hero's *Pneumatica* date back to the 12th century. [3]

Quotes | On

The following are quotes on Valla:

> "The first book of Cardano's *De subtilitate* (1550) was devoted to the general principles of 'matter, form, vacuum, the repulsion of bodies, natural motion, and place'; his discussion of the various devices that some claim prove the existence of the vacuum are derived in part from **Valla**. But Cardano must have had a source beyond Valla, since he described a machine that Valla had omitted (*Pneumatica* 1.37). Elio Nenci, Cardano's modern editor, suggested that he also relied on the preliminary discussion of the vacuum omitted by Valla, but I see no evidence of that—Cardano never mentions the interparticulate vacuum, for instance."
>
> — Roy Laird (2017), "Hero of Alexandria and Renaissance Mechanics" [2]

References

1. Valla, Giorgio. (1501). *De Expetendis de fugiendis Rebus Opus*. Venice: Aldus.
2. Laird, W. Roy. (2017). *Mathematical Practitioners and the Transformation of Natural Knowledge in Early Modern Europe* (editors: Lesley Cormack, Steven Walton, John Schuster) (§8: Hero of Alexandria and Renaissance Mechanics, pgs. 149-166; §§:8.2.3: Girolamo Cardano, pgs. 156-). Springer.
3. Boas, Marie. (1949). *The Mechanical Philosophy* (pg. 546). Publisher.

External links

- Giorgio Valla – Wikipedia.

θΔics

In existographies, **Giovanni Aldini** (1762-1834) was an Italian physicist, nephew of Luigi Galvani, noted for []

Overview

On 18 Jan 1803, Aldini took the recently declared dead corpse of an aged 26 man named George Forster (1777-1803), a criminal hung for drowning his wife and daughter, into the operating theater of the Royal College of Surgeons, and before a packed crowd, began to experimentally apply a massive voltaic pile to the body, touching the electrode and counter-electrode to various parts of the body, therein obtaining the following reactions: [1]

> Contact: Mouth and ear
> **Reaction**: produced facial convulsions and opened left eye
>
> Contact: mouth and rectum
> **Reaction**: clenched fist punched air, legs kicked, and his back arched violently; he supposedly sat up

The following shows and depiction of the experiment:

News of this experiment, to note, made its way into the discussions of Mary Shelley, Percy Shelley, and George Byron, and the 1817 novel *Frankenstein*, by the former.

Quotes | By

The following are quotes by Aldini:

> "The experiments I did on the hanged criminal did not aim at reanimating the cadaver, but only to acquire a practical knowledge as to whether galvanism can be used as an auxiliary, and up to which it can override

other means of reanimating a man under such circumstances."

— Giovanni Aldini (1804) [2]

References

1. (a) Anon. (2016). "Jan 18, 1803: Giovanni Aldini Attempts to Reanimate the Dead" (Ñº), Odd Salon, Jan 18.
(b) Pilkington, Mark. (2004). "Sparks of Life" (Ñº), The Guardian, Oct 6.
(c) Musolino, Julien. (2015). *The Soul Fallacy: What Science Shows We Gain from Letting Go of Our Soul Beliefs* (Forward: Victor Stenger) (pg. 162). Prometheus Books.
2. Anon. (2016). "Jan 18, 1803: Giovanni Aldini Attempts to Reanimate the Dead" (Ñº), Odd Salon, Jan 18.

External links

â— Giovanni Aldini – Wikipedia.

θΔics

In existographies, **Giovanni Aleotti** (1546-1636) was an Italian architect, hydraulics engineer, cartographer, geometer, and translator, noted for []

Overview

In 1589, Aleotti, amid a period of forced inactivity due to illness, devoted himself to study studies and to an Italian translation and printed edition of Federico Commandino's 1575 Latin translation of Hero's 50AD *Pneumatica*. [1]

Quotes | On

The following are quotes on Aleotti:

> "Annexed to **Aleotti**'s translation of Heron are four theorems in which he sought to display his own virtuosity. The first three are really re-combinations of elements present in Heron. The fourth theorem, however, reveals something novel. This involved the exploitation of the refrigerative power of compressed air expanding on its release through narrow-gauge tubes. Accordingly, we find Aleotti describing how a room could be kept deliciously cool during the burning days of summer by this means"
>
> — Graham Hollister-Short (2004), "The Formation of Knowledge Concerning Atmospheric Pressure and Steam Power in Europe from Aleotti [1589] to Papin [1690]" [2]

> "In explaining how these devices worked **Aleotti** bases himself, not without some confusion, on Heron's ideas regarding the composition of matter. Nature did not permit a continuous vacuum to exist but Aleotti was somewhat ambivalent about following Heron further in admitting the compressibility of air and its rarefaction. In a manuscript composed about 1615, and examined by Alex Keller some years ago, Aleotti pointed to the phenomena observable when a ramrod was used to compress the charge in a cannon. It was difficult to force down the ramrod when the touch-hole was stopped up because air could not be compressed, and difficult to extract when the ramrod was in the barrel and the touch-hole was then stopped up because the extraction of the ramrod would have begun to create a vacuum. Since Aleotti was unwilling to entertain either the idea of the vacuum or of micro-vacua existing in nature, this meant that Aleotti could not explain why the devices he himself had created were able to work."
>
> — Graham Hollister-Short (2004), "The Formation of Knowledge Concerning Atmospheric Pressure and Steam Power in Europe from Aleotti [1589] to Papin [1690]" [2]

References

1. (a) Hero. (50AD). *The Curious Art of Vapor Movement* (*The Artificiosi et Curious Spiritual Movements*) (translator: Federico Commandino). Publisher, 1575.
(b) Hero. (50AD). *Pneumatica* (translator: Giovanni Aleotti). Publisher, 1589.
2. Hollister-Short, Graham. (2004). "The Formation of Knowledge Concerning Atmospheric Pressure and Steam Power in Europe from Aleotti [1589] to Papin [1690]" (pg. 146), *History of Technology, Volume 25* (editor: Ian Inkster) (§10, pgs. 137-50). Bloomsbury, 2016.

External links

â— Giovan Battista Aleotti – Wikipedia.
â— Giovanni Battista Aleotti (German → English) – Wikipedia.
â— Giovan Battista Aleotti (Italian → English) – Wikipedia.

θΔics

In existographies, **Giovanni Baliani** (1582-1666) (CR:9) was an Italian mathematician, physicist, experimenter, lawyer, and senator, noted for []

Siphon problem

See main: Nature abhors a vacuum, Pump problem

On 27 Jul 1630, Baliani wrote a letter to Galileo Galilei about the explanation of an experiment he had made in which a siphon, led over a hill about twenty-one meters high, failed to work. Baliana attributed the fact that the pumps used to raise water at that time worked to the pressure of the earth's atmosphere, but doubted that the total weight of an air column many miles high could be less than that of a thirty-foot high water column. [1]

> "The higher we go in the air, the less heavy it is."
>
> — Giovani Baliani (1630), "Letter to Galileo" (note: in this letter, Baliani, supposedly made it clear that he believed a vacuum could exist, from the time he first knew that air had weight), Oct 24 [2]

Galileo responded with an explanation of the phenomena: he proposed that it was the power of a vacuum which held the water up, and at a certain height (in this case, thirty-four feet) the amount of water simply became too much and the force could not hold any more, like a cord that can only withstand so much weight hanging from it.

Mechanical equivalent of heat

In *c.*1635, Baliani experimentally demonstrated that by placing an iron pot filled with water on a spinning metal disk it was possible to make water boil. This experiment is said to have been one of the first references to an experimental determination of the equivalence between heat and work (mechanical equivalent of heat).

Associates

Baliani, from 1615 onward, was an associate of Italian physicist Galileo Galilei (and possibly also of Evangelista Torricelli), and the two were said to have corresponded on scientific experiments and theories for over two decades. [1]

Education

Baliani seems to have been a lawyer and public office holder (governor and senator) by occupation, but a physicist by inclination. He appears to have occupied himself with questions of science from around 1612, when he was prefect of the fortress in Savona, where it struck him that cannonballs, although they have different weights, always fall to the earth at the same speed. At this time he also built a pot of iron that rotated in an iron vessel and that was so warmed by frictional heat that it was possible to cook inside it.

See also

â— Giovanni Benedetti | Principle of inertia formulator

References

1. Baliani, Giovanni Battista – The Archimedes Project.
2. (a) Baliani, Giovani. (1630). "Letter to Galileo", Oct 24.
(b) Galilei, Galileo. (1904). *Le Opere de Galileo Galilei, Volume 14* (20 volumes) (editor: Antonio Favaro) (pg. 157-60). Barbera. (c) Middleton, William E. (1964). *The History of the Barometer* (pg. 9) (Amz). Publisher.

External links

â— Giovanni Battista Baliani – Wikipedia.
â— Giovanni Battista Baliani (Italian → English) – Wikipedia.

θΔics

In existographies, **Giovanni Branca** (1571-1645) (EP:8) was an Italian physician, engineer, and architect, noted for []

Overview

In 1629, Branca, in his *The Machine*, invented an steam windmill, possibly inspired by Hero's aeolipile, variations of which shown below, in which the steam being generated in a boiler was directed by a spout against the flat vanes of a wheel, which was thus set in motion: [11]

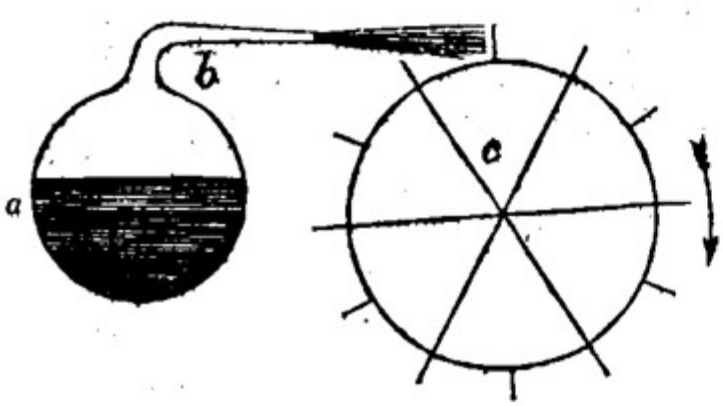

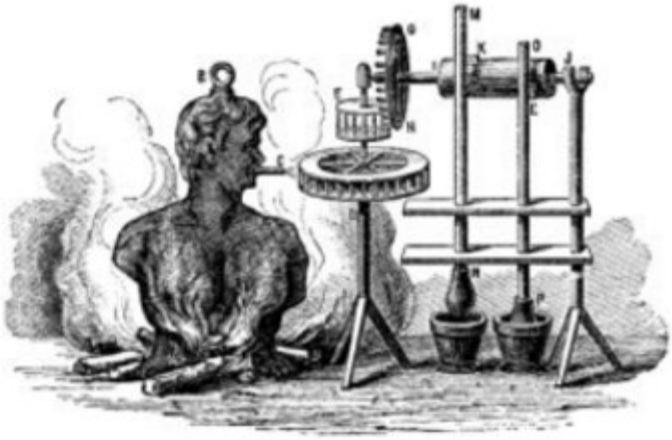

(add)

Quotes | On

The following are quotes on Branca:

> "**Branca**, in his mechanical treatise (1629), this distinguished physician describes a rotatory steam engine he used for grinding his drugs. He gives the top of the boiler the form of a man's head with a pipe in his mouth, blowing a jet of steam against the arms of a wheel (adjacent figure), to cause it to rotate on its axis, and by the pinion give motion to the drug machinery. A modification of this plan was tried at the Surrey Docks, with a wheel of 11.5 feet diameter, making 500 revolutions per minute. But the consumption of steam for an equal duty being greater with the rotatory than with a piston engine, led to its disuse. Branca also describes a hot-air rotatory engine, driven by the heat and smoke collected from a smith's forge; whereby to aid the smith in his operations; but all these engines he gives as the invention of others and not his own."
>
> — Daniel Clark (1885), *An Elementary Treatise on Steam and the Steam-Engine* [2]

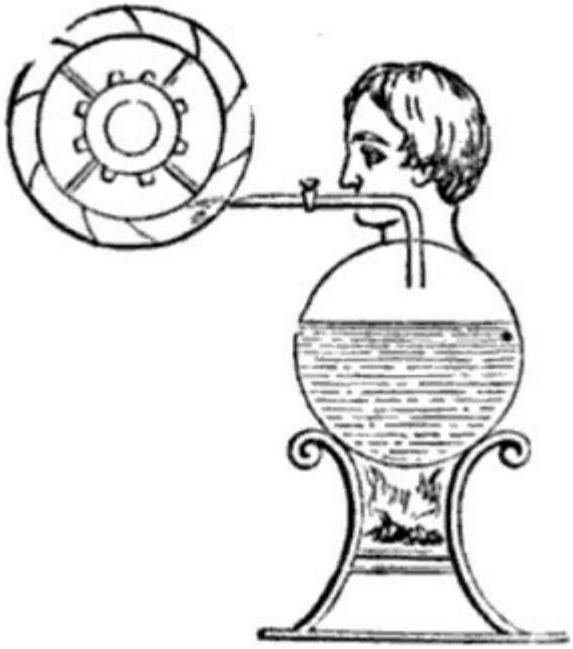

A side-profile of a Branca engine, a sort of modified aeolipile engine design. [2]

References

1. (a) Branca, Giovanni. (1629). *The Machine* (*Le Machine*) (plate #25). Publisher.
(b) Anon. (1829). "On the Early History of the Steam Engine" (Ñº), *Journal of the Franklin Institute*, 4(8):319-27.
(c) Thurston, Robert Henry (1878). *A History of the Growth of the Steam-Engine* (pg. #). D. Appleton and Company.
(d) Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 151). Courier, 1990.
2. Clark, Daniel. (1885). *An Elementary Treatise on Steam and the Steam-Engine*, *Stationary and Portable: an Extension of the Elementary Treatise on Steam of John Sewell* (pgs. 17-18). Crosby.

External links

â— Giovanni Branca – Wikipedia.

θΔics

In hmolscience, **Giovanni Busino** (c.1938-) (CR:7) is a French political sociologist noted for being the editor of the complete works of Vilfredo Pareto, which totals some 20 books or booklets, more than 600 articles in journals, magazines, and newspapers, and over 100 published book reviews, introductions, prefaces, and or interviews, on subjects including: physics, mathematics, statistics, public policy, and sociology (Ñº); and, supposedly, for a 1967 collected works set on Leon Winiarski's social mechanics publications entitled *Essays on the Social Mechanism* (*Leon Winiarski et la Mechanique Sociale*). [1]

Some of Busino's work on Pareto seems to be cited in the 1968 *International Encyclopedia of the Social Sciences* article on Pareto. [2]

Education

Since 1982, Busino began teaching general sociology at University of Lausanne and currently is professor and directory of social and political sciences at the University of Lausanne, where he seems to be one of the leading historical scholars of Lausanne school of physical economics (see also: two cultures synergy).

References

1. Winiarski, Leon. (1967). *Essais Sur la Mecanique Sociale: Textes reunis et presents par Giovanni Busino* (*Essay on Social Mechanics: Collected Works presented by Giovanni Busino*) (Thermodynamique, 13+ pages; entropy integrals, pg. 257). Librairie Droz.
2. Vilfredo Pareto – International Encyclopedia of the Social Sciences (1968)

External links

â— Giovanni Busino (French → English) – University of Lausanne.

θΔics

In existographies, **Giovanni Porta** (1535-1615) (IQ:#|#) (EP:6) (CR:17), aka “Giambattista della Porta”, was an Italian mathematician, chemist, physicist, and general polymath, noted for his 1586 invention of a telescope, able to see things miles away, and for his 1601 steam engine constructions.

Overview

In 1601, Porta, in his *Spiritali*, following or amid a French translation of Hero’s steam machine work, reproduced Hero's aeolipile (fig 1) and his solar boiler device (fig 2), shown below:

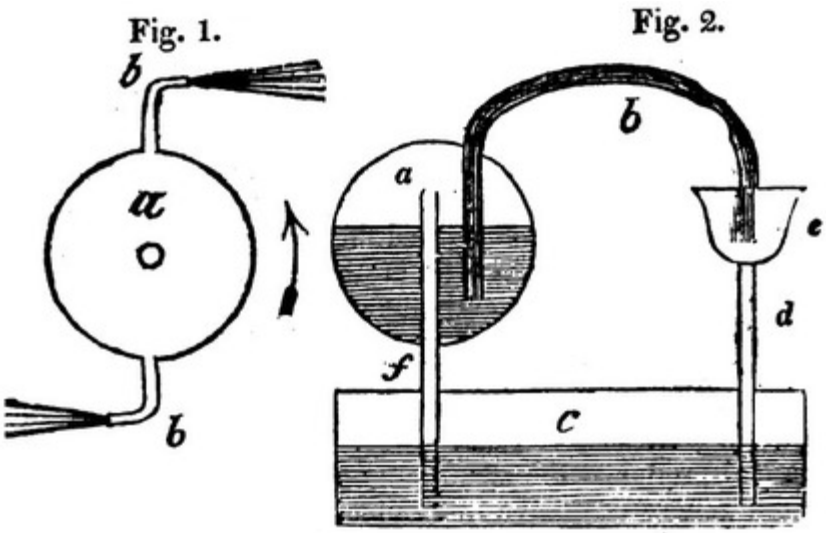

After which, he added an illustrated modified variant of his own, similar to a combination of the above two devices; as shown below, wherein, a fire is put under flask a, filled with water, which makes steam, that enters closed container b, filled with cold water, which forces the water to shoot out of tube c, into the external air: [2]

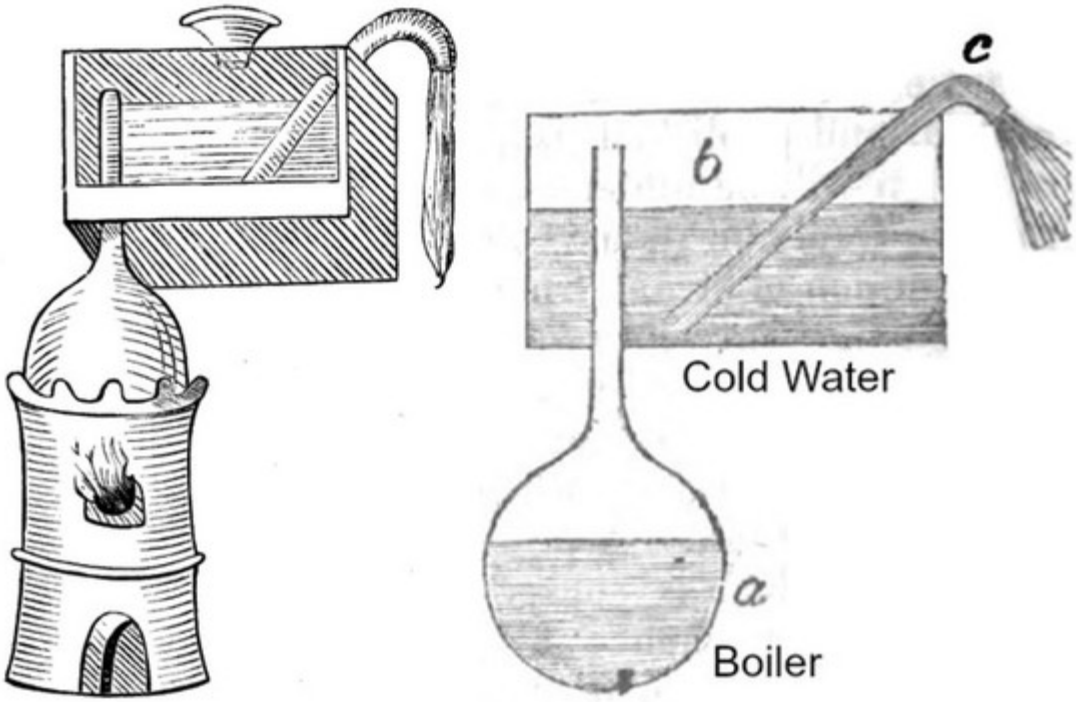

This device was named by Porta an “improved Hero’s fountain” which he also referred to as a “steam fountain”.

Porta, in this work, according to Robert Thurston (1878), described “with perfect accuracy the action of condensation in producing a vacuum, and sketched an apparatus in which the vacuum thus secured was filled by water forced in by the pressure of the external atmosphere”. His contrivances, however, were never, apparently, applied to any practical use, and were just in the “speculation stage” and not yet in the “application stage” in the history of steam engines. [4]

Other

In 1655, Edward Somerset, supposedly, made a variant of Porta's water raising device. [2]

Quotes | On

The following are quotes on Porta:

> “**Porta** is described as a mathematician, chemist, and physicist, a gentleman of fortune, and an enthusiastic student of science. His home in- Naples was a rendezvous for students, artists, and men of science distinguished in every branch. He. invented the magic lantern and the camera obscura, and described it in his commentary on the *Pneumatica*.”
>
> — Robert Thurston (1878), *A History of the Growth of the Steam-Engine* [3]

> “By 1601, **Giovanni Battista della Porta** noted that a vacuum developed as steam condensed and that it could be used to draw up water.”
>
> — Richard Kirby (1956), *History of Engineering*; compare Robert Hooke: “the vacuum left by fire lifts a weight” (1675) [1]

Quotes | By

The following are quotes by Porta:

> “I have made glasses [see: telescope] that can recognize a man several miles away.”
>
> — Giovanni Porta (1586), “Letter” [5]

References

1. Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 154). Courier, 1990.
2. Anon. (1829). “On the Early History of the Steam Engine” (Ñº), *Journal of the Franklin Institute*, 4(8):319-27.
3. Thurston, Robert. (1878). *A History of the Growth of the Steam-Engine* (Porta, pg. 13-14). D. Appleton and Company.
4. (a) Porta, Giovanni. (1601). *Spiritali*. Publisher.
(b) Thurston, Robert. (1878). *A History of the Growth of the Steam-Engine* (Porta, pg. 13-14). D. Appleton and Company.
5. Telescopes – Bo.Astro.it.

External links

â— Giambattista della Porta – Wikipedia.

θΔics

In econophysics, **Giuseppe Palomba** (1908-1986) was an Italian mathematical economist, characterized as the "most prolific and talented" products the Pareto school (Pomini, 2014), noted for a large number of publications aimed at pushing forward the analogy with the physical world that was dear to his intellectual mentors Vilfredo Pareto and Luigi Amoroso.

In 1939, Palomba, in his *Introduction to the Study of Economic Dynamics*, introduced the Lotka-Volterra equations in economics

Palomba, in turn, attempted to demonstrate how large monopolistic or oligopolistic enterprises create a disturbance of the market which is similar to a gravitation field. [1]

American physical economics historian Philip Mirowski classifies Palomba (1968), as a "further out neosimulator", in the history of non-neoclassical or anti-neoclassical economics programs of the appropriation of physics metaphors, that he has stumbled upon in his research, along with: Johannes Lisman (1949), Andrew Pikler (1951), Marc Lichnerowicz (1970), John Bryant (1982), and Edwin Jaynes (1983). [2]

Amoroso

Palomba studied economics under Luigi Amoroso (1886-1965), whose methodology, supposedly, was aimed at highlighting the analogies between economic and mechanical phenomena, and whose research program was responsible for the continuation and development of the work of Vilfredo Pareto. Amoroso, in his 1942 *Economic Mechanics*, e.g., tried to demonstrate how it is possible to use Einstein's relativity equations in economics.

References

1. Pomini, Mario. (2014). *The Paretian Tradition During the Interwar Period: From Dynamics to Growth* (pg. 14). Routledge.
2. Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (pg. #). Cambridge University Press.

External links

â— Giuseppe Palomba (economist) (Italian → English) – Wikipedia.

θΔics

In human thermodynamics, **Georgi and Thims** refers to the synergy of ideas exchanged and developed between Russian physical chemist Georgi Gladyshev and American chemical engineer Libb Thims, beginning in 2005, on the nature of the use of Gibbsian thermodynamics in the study of biological evolution and in human society.

A photo of Libb Thims and Georgi Gladyshev in Chicago during their first meeting.

Overview

Of significant influence to Thims, was the work of Russian physical chemist Georgi Gladyshev, with whom he first made contact with in 2005. [1] In particular, sometime between 2002 to 2004, during which Thims began to undertake the project of writing a short book on the subject of "human thermodynamics", Thims had come across a number of individuals who seemed to be using a similar logic, in certain respects, to his own, including: Ilya Prigogine, John Avery, Jing Chin, David Hwang, and Gladyshev, among others. In this group, Gladyshev seemed to be the closest competion in that he was using a fully-rigorous Gibbs free energy based thermodynamic approach to the evolution of life.

The exact link through which Thims became acquainted with the work of Gladyshev was a short two-page (English) book review of Gladyshev's 1996 100-page (Russian) book *Thermodynamic Theory of the Evolution of Life Forms* by Russian physical chemist Yuri Lipatov that Thims had come across on May 10, 2004. [2] To cite an excellent excerpt from this review:

> "The author's thesis is that under the action of the sun's energy, substances which are thermodynamically stable in the early conditions of the earth are transformed into various products of photosynthesis, those transforms being regulated by thermodynamic principles. During this process, from the resulting products only those stable suprastructures are selected which correspond to minimum states of the free energy of a biosystem. These structures are formed into micro- and macrovolumes of the system."

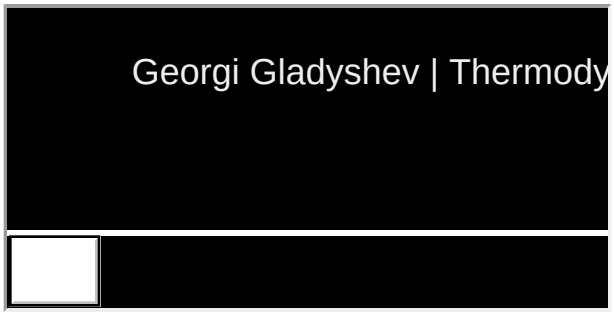

As the book was printed in Russian with only 100-copies, however, Thims abandoned his short-term efforts to find the works of Gladyshev. By 2005, however, Thims had stumbled upon the 142-page 1997 English version of Gladyshev's work among a other papers of his. Thims was very impressed and stimulated by Gladyshev's work, particularly his use of a "thermostat" criterion to define evolving microvolumes within volumes in relation to biospheric hierarchies, as well as his use of the integral value of the specific Gibbs function corresponding to the formation of averaged local "evolved" conformation of aggregated supramolecular structures per unit volume, and in particular his appendix section on "Differential Equations of Macrothermodynamics: Systems and Processes", wherein he outlines the use of the the combined law of thermodynamics:

$$TdS \geq dU + pdV - \sum_k X_k dx_k - \sum_k \mu_k dm_k$$

in complex hierarchic natural evolving systems. In this expression, T denotes temperature, S the entropy, U the internal energy, p pressure, V volume, X_k any generalized force except pressure, x_k any generalized coordinate except volume, η_k *chemical potential*, m_k the mass of the *k-th* substance, which can be replaced by the number of moles. [3] Prior to this, Thims had never spent much time considering the effects and understanding of "volumes" or "generalized forces" in relation to human molecules interacting in human thermodynamic systems. This new perspective convinced him that a complete mastery of Gibbs *On the Equilibrium of Heterogeneous Substances* would be essential to the necessary

development of a rigorous differential form of human thermodynamics.

In 2005, Thims contacted Gladyshev via email and over the next two-years, on a weekly basis, they exchanged ideas and built theory together. Gladyshev twice flew out from Moscow to meet with Thims, once in June of 2006 and second time on December 12 of 2007. This visits coincided with Gladyshev's lectures at the 14th annual International Anti-Aging Congress and Exposition in Chicago and at the 2007 Exposition in Las Vegas, wherein Gladyshev's anti-aging hierarchical thermodynamics and Thims' human thermodynamics, human chemistry, and human molecules were discussed. [4]

-

Fallout

In 2009, Thims wrote a letter to Gladyshev stating that he was now under the view that life was a defunct scientific theory.

-

In 2010, Thims wrote the Hmolpedia article "defunct theory of life".

-

In 2011, Gladyshev started the debate tread "defunct theory of life" (Ñº), at the end of which Gladyshev retreated into a non-communication state with Thims, and they never communicated again, Gladyshev siding with an emergence view of life, Thims with abioism and the nonexistence of life.

References

1. (a) Gladyshev, Georgi, P. (1978). "On the Thermodynamics of Biological Evolution", *Journal of Theoretical Biology*, Vol. 75, Issue 4, Dec 21, pp. 425-441.
(b) Gladyshev, Georgi, P. (1997). *Thermodynamic Theory of the Evolution of Living Beings*. Commack, New York: Nova Science Publishers.
2. Lipatov, Yuri S. (1997). "Book Review: Thermodynamic Theory of the Evolution of Life Forms", *Journal of Biological Physics*, 23: 129-31.
3. Gladyshev, G. P. (2000). Differential Expressions for Macrothermodynamics Systems and Processes, *International Academy of Creative Endeavors* [Moscow, Russia].
4. Gladyshev, Georgi, P. (2007). The invited and guest speakers. The lecture: "Hierarchical thermodynamics – general theory of existence and living world development: model of aging and anti-aging quality of foods and medicines." The 15th Annual World Congress on Anti-Aging Medicine & Regenerative Biomedical Technologies, held at The Venetian Hotel, Las Vegas, Nevada, on December 12-15, 2007. American Academy of Anti-Aging Medicine.

θΔics

In thermodynamics schools, the **Glasgow school of thermodynamics** was a focal point of thermodynamics development centered at the University of Glasgow, Scotland, particular associated with English physicist William Thomson and the Glasgow philosophical society. The coining and definition of 'thermo-dynamics' is a product of the Glasgow school.

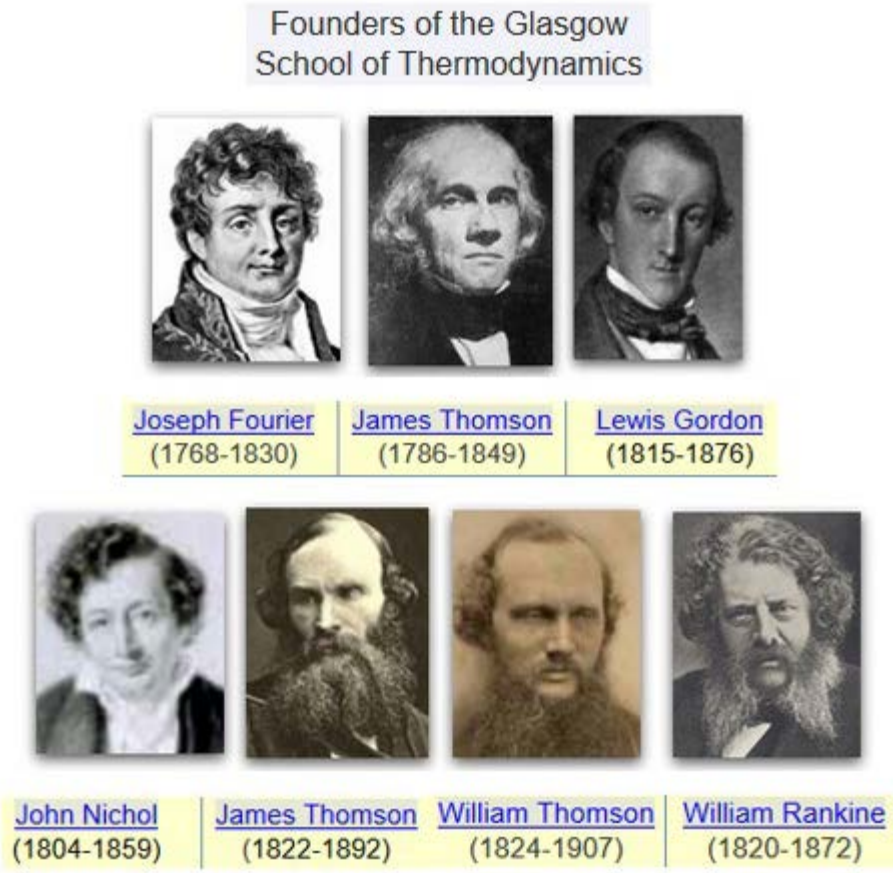

James Thomson | Mathematician

In 1832, James Thomson (mathematician), son of James Thomson (farmer), father of James Thomson (engineer) and William Thompson (physicist), became professor of mathematics at the Glasgow University, a position which he held throughout his life.

Fourier-Nichol-Thomson

From 1836 to 1859, Scottish astronomer John Nichol was a professor of practical astronomy at the University of Glasgow. In this span, for a period of two years, beginning in 1839, Nichol's taught classes in natural philosophy, as a fill-in for the regular professor William Meikleham who had become absent due to illness. [1]

When Nichol's took the chair of natural philosophy, he quickly updated the curriculum, introducing students to the new mathematical works of French mathematical physicist Joseph Fourier's, particularly his 1822 *Analytical Theory of Heat.* [2]

The mathematical treatment much impressed young 15-year old William Thomson, who became intrigued with Fourier's *Théorie analytique de la chaleur* and committed himself to study the "continental" mathematics resisted by a British establishment still working in the shadow of English physicist Isaac Newton.

In particular, after listening to the praises of Fourier's book by Nichol, likely in one of his lectures, Thomson asked whether he should read the *Théorie Analytique*, to which Nochol's replied "the mathematics is very difficult". [3] William later got the book from the library. In his own words, "On the 1st of May … I took Fourier out of the University Library; and in a fortnight I had mastered it—gone right through it." [4] This was said to be Thomson's first intellectual stimulator as to puzzle behind the nature of heat.

Gordon

In 1840, Scottish civil engineer Lewis Gordon, a student of the Edinburgh school of thermodynamics, set up a civil engineer partnership with Lawrence Hill in Glasgow. From 1841 to 1855, Gordon was the first holder of the chair of civil engineering and mechanics at Glasgow University. In 1855, supposedly frustrated with the lack of facilities at Glasgow, he handed over his position to William Rankine and moved on to a private practice involved with the designing iron bridges.

During the 1841-42 school year, a 19-year old James Thomson (the older brother) went to Glasgow College and was able to study engineering under Gordon, a newly appointed professor of civil engineering and mechanics (1840-45). [2] During his mentoring of James, in some way or another, it seems that Gordon's French education at the Ecole Polytechnique, the school of Sadi Carnot, author of *Reflections on the Motive Power of Fire* (1824) and Emile Clapeyron, author of *Memoir on the Motive Power of Fire* (1834), the first two papers on thermodynamics, seems to have rubbed off on James, being that a discussion with his younger brother William on the early two French pioneers of

heat engine theory (Carnot and Clapeyron). In a letter to William in August, 1844, James inquired who it was that had proved there was a definite quantity of mechanical effect (work) given out during the passage of heat from one body to another. He stated his intentions of writing an article for the *Artisan* about the theoretical possibility of working steam engines without fuel by using over again the heat which was thrown out in the hot water from the condenser, noting that:

> "I shall have to enter on the subject of the paper you mentioned to me".

This paper, according to historian British energy historian Crosbie Smith, was almost certainly the 1837 translation for Taylor's *Scientific Memoirs* of Clapeyron's "Memoirs on the Motive Power of Heat". [3] The discussions in James letter of 1844, according to Smith, are the earliest record of implicit references to Clapeyron and Carnot by the Thomsons.

Clausius

In 1848, Gordon famously gave William Thomson (the younger brother) a copy of French physicist Sadi Carnot's 1824 memoir *Reflections on the Motive Power of Fire*. [1] It was after reading this memoir, which William had previously spent years searching for (particularly in the bookstores of Paris), that William essentially launched the science of thermodynamics, when he published his 1848 "On an Absolute Thermometric Scale founded on Carnot's Theory of the Motive Power of Heat, and Calculated from Regnault's Observations" (written before receiving Carnot's book) and 1849 "An Account of Carnot's Theory of the Motive Power of Heat; with Numerical Results Deduced from Regnault's Experiments on Steam" (written after receiving Carnot's book), the latter of which found its way into the hand of German physicist Rudolf Clausius who in turn was so intrigued with this new subject that he "founded", in the retrospect words of American engineer Willard Gibbs, the science of thermodynamics with the publication of his most-famous memoir the 1850 "On the Moving Force of Heat and the Laws of Heat which may be Deduced Therefrom".

Other

William Thomson, through the workings of his father, James Thomson (mathematician), would later replace Meikleham after his death in 1846 as professor of natural philosophy at Glasgow University, where he was instrumental in the development of and guidance of the *Glasgow Philosophical Society*. [5]

In 1849, through the actions of William Thomson, Rankine, a previous student of the University and Edinburgh, was elected a fellow of the *Royal Society of Edinburgh*, which thus connects him to the Edinburgh school.

Rankine then became professor of civil engineering and mechanics at the University of Glasgow in 1855, as mentioned, until his death in 1872, pursuing engineering research along a number of lines in civil and mechanical engineering. Rankine's vacant position was filled by James Thomson (junior) in 1873 a position he held until his retirement in 1889.

A later thermodynamics publications from this school is the 1892 work of mathematician Peter Alexander. [6]

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6. Alexander, Peter. (1892). *Treatise on Thermodynamics*. Glasgow University. Published by Longmans, Green.

External links

- William Thomson (collection) – University of Glasgow Library.
- Biography of John Pringle Nichol – University of Glasgow.

θΔics

In human thermodynamics, a **glass wall** is a term used to describe the barriers to solution one runs into in attempts to apply the universal laws of thermodynamics to the nature of the processes, mechanisms, and reactions of the human condition.

An almost **invisible** mirrored tree house (built in Sweden in 2010), which makes itself nearly invisible by reflecting the surroundings about it, the future technology-laden home, inside of which, remains completely hidden to outside observers. The invisible mirrored treehouse is a good semi-representative depiction of a human thermodynamics **glass wall** (the glass walls of human thermodynamics, however, conceptualized as being free-standing door-way-like invisible glass walls located in various unseen spots in vast fields of greenery. [1]

This idea of glass walls is explained well by Romanian mathematician Nicholas Georgescu, in his famous 1971 book *The Entropy Law*, in which he attempts to outline the application of the governance of the second law to the economic process: [1]

> "The fact that a natural law is involved in every aspect of man's behavior is so common that we would not expect the study of the influence of the entropy law on man's economic actions to present any unusually complications. Yet **manifold avenues** open up almost as soon as one begins to tackle the problem."

Georgescu's mention here of "manifold avenues" opening up, is an underestimate to the number of conceptual problems that arise in applying thermodynamics, particularly chemical thermodynamics to the explication of human activity. Georgescu was a mathematician, untrained in thermodynamics, who became slowed by the increasing density of the problem when he began to see manifold avenues, which acted to halt his solution seed, in that he did not immediately know which avenue to follow. When one is trained, fundamentally, in thermodynamics, the thickening of the density of the problem increases.

Visualization

The visualization of this term is such the nature of the attack of attempt to formulate any of the various branches in human thermodynamics will follow a certain sequence:

(a) One will come across the subject of thermodynamics, in their studies.
(b) One will come to the understanding that thermodynamics governs all natural processes.
(c) One will come to the understanding that human activity is a natural process.
(d) One will have some question on his or her mind, regarding human existence, and grasp on to the vision that thermodynamics will give solution to this question.
(e) One will apply the framework of thermodynamics on to the question; often times, in a sense, "running" towards what he or she sees as the solution or finish line, with the zest of a euphoric child.
(f) One will run into an invisible "glass wall" of conceptual difficulty that he or she did not see in the original viewpoint, which will act to bring the running to a complete halt, as if a speeding mime ran into an imaginary glass wall.
(g) One will begin to pry on the glass wall, to find a working model either around or through the glass wall, so as to continue on with the running to the finish line.
(h) One will run into a second glass wall.

(i) One will repeat the process of part (g).

Human chemical bond

On the largest glass walls in human thermodynamics is the arrival upon the subject of the human chemical bond. In simple term, the logic of chemical thermodynamics states that society (a thermodynamic system) is comprised of various progressively reacting human molecules. The set of these reactions, on their approach to equilibrium points, must actuate to show a decrease in Gibbs free energy, signified by the spontaneity criterion; which will consist of free energy coupled reactions (some being exergonic, others being endergonic, the sum of these being exergonic). The study of one single exergonic reaction, will consist typically of "single" unattached reactants in the initial state and "bonded" products in the final state in a combination reaction:

$$A + B \rightarrow AB$$

In this scheme, the bonded product can either be written as AB, signifying an attachment of two chemical species, or C, meaning C equates to AB, signifying that a new molecule has formed. The study of physics and chemistry of the AB attachment, in terms of what fundamental forces of the universe act to hold this pairing together, is a subject never before tackled or even conceived of as a subject; that is until one sees it as a needed subject in the description of the energy state of the products, before further progress can be made in the formulation of human thermodynamics. The startled researcher who first arrives at this "glass wall" problem, will be come to a complete halt in their solution process, curious as to significance and previously unknown awareness of this problem (subject of study). It takes nearly three years of hard science prying on this puzzle to even begin to see around the glass wall, let alone get past the wall.

Life

One significant glass wall in human thermodynamics is the question of applying cold hard and precise chemical thermodynamic logic to the question of the origin of life viewed in particular from the human molecule/molecular evolution table/evolution timeline perspective. It takes roughly six years to go through this problem before the solution is seen (see: defunct theory of life).

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1. Georgescu-Roegen, Nicholas. (1971). *The Entropy Law and the Economic Process* (pg. 3). Harvard University Press.
2. Alter, Lloyd. (2010). "Almost Invisible Mirrored Tree House Build in Sweden", Yahoo Green, Jul 21.

θΔics

In hmolscience, **Glen E. Gordon** (1936-1992) was an American environmental chemist noted for []

Overview

In 1981, Gordon, in his "Thermodynamics and Society", gave a short derisive book review of Jeremy Rifkin's 1980 book *Entropy: a New World View*, and his usage of Nicholas Georgescu-Roegen as his so-called thermodynamics "expert", at the end of which Gordon comments: [1]

> "Thermodynamics, and the second law in particular, can be used quite effectively in dealing with many problems of our society and has been by several authors, notably Alvin Weinberg, Stephen Berry, and Barry Commoner."

(add discussion)

Quotes

The following are noted Gordon quotes:

> "In taking up entropy, Rifkin is like a child with a new toy—he has great fun applying the concepts to all aspects of our high-technology society."
>
> — Glen Gordon (1981), "Thermodynamics and Society" [1]

Education

Gordon completed his BS in chemistry at the University of Illinois in 1956 and his PhD in chemistry at the University of California, Berkeley, in 1960, after which he became a chemistry professor at MIT until 1969, after which he transferred to the University of Maryland, where he remained until his reaction end.

References

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θΔics

In genius rankings, **Glenn 20 greatest minds** refers to the 1996 listing of the twenty greatest scientific geniuses made by Jim Glenn, (c.1945-) is a writer and editor of scientific, mathematical, and computer science publications, including: *The Complete Patents of Nikola Tesla* (1994), *Danger Signs: Colds and Coughs* (1985), *Win at Poker* (1987), among others (Ñº); and seeming editor of *Black's Concise Atlas of Human Anatomy* (2005). [1]

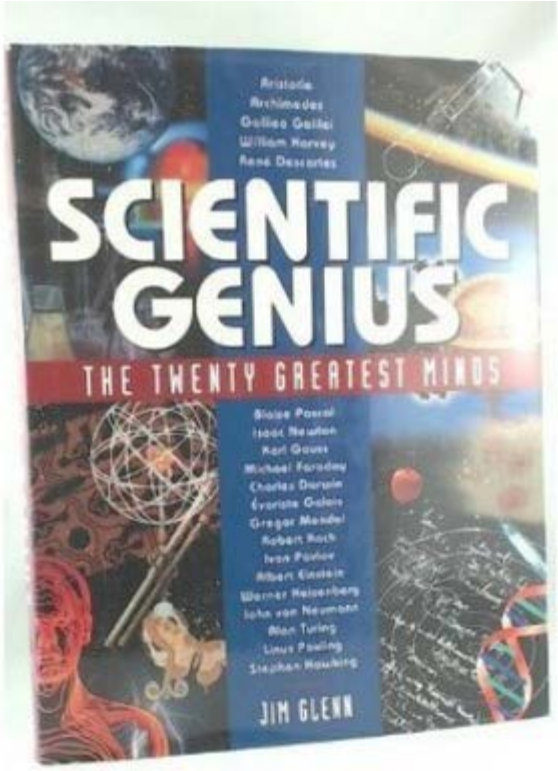

Jim Glenn's 1996 *Scientific Genius*, which presents overviews of twenty great minds from Aristotle to Hawking. [1]

List

The following is Glenn's list of twenty greatest scientific geniuses:

1. Aristotle
2. Archimedes
3. Galileo Galilei
4. William Harvey
5. Rene Descartes
6. Blaise Pascal
7. Isaac Newton
8. Carl Gauss
9. Michael Faraday
10. Charles Darwin
11. Evariste Galois
12. Gregor Mendel
13. Robert Koch
14. Ivan Pavlov
15. Albert Einstein
16. Werner Heisenberg
17. John Neumann
18. Alan Turing
19. Linus Pauling
20. Stephen Hawking

(add)

References

1. Glenn, Jim. (1996). *Scientific Genius: the Twenty Greatest Minds* (Glenn, pg. 163). Crescent Books.

θΔics

In science, **go** means to move on a course; proceed; to move out of or away from a place; to take a certain course of follow a certain procedure; or to pass by means of a process like journeying. [1]

Maxwell

In 1834, at the age of three, to the inquisitive mind of James Maxwell everything that moved, shone, or made a noise drew the question:

> "What's the **go** o' that?"

and if that did not satisfy his curiosity, the more specific query:

> "What's the *particular* **go** o' that?"

would follow. Likewise, in 1834, his mother described him as such: "he has great work with doors, locks, keys, etc., and:

> "show me how it **doos**"

is never out of his mouth. He also investigates the hidden course of streams and bell-wires, the way the water gets from the pond through the wall." [2]

Huxley

In 1880, English natural philosopher Thomas Huxley used the alternative synonym "goes" for life (see: life terminology upgrades): [3]

> "The elements of living matter are identical with those of mineral bodies; and the fundamental laws of matter and motion apply as much to living matter as to mineral matter; but every living body is, as it were, a complicated piece of mechanism which **'goes'**, or lives only under certain conditions."

(add)

Wicken

Somewhere in the work of American evolutionary bio-chemist (chnops-chemist) Jeffrey Wicken, according to Eric Schneider, he is said to have argued that the second law is the "go" of life. [4]

Quotes

The following are related quotes:

> "It is only because our lives are so short compared to the slow, slow movement of evolution, that it is hardly possible to notice the change and growth either in the earth or in ourselves. Because we never knew Italy to look anything other but a Wellington boot, we never pause to think that it was once different, and may change again. Because we never knew that time when man grew his own furry dress, we overlook the fact that, as he has outgrown this likeness to the animal, he may still outgrow others. Yet we must make our minds broad enough to realize the facts. The hour of a watch moves so slowly that you cannot see it move; and yet you know that, so long as the watch is going, its movement never stops. The earth, from its rocks

and gases and flowers and animals, is **still 'going'**."

— Hilda Finnemore (1924), *A History of the Earth: from Stardust to Man* (pgs. 56-57) [5]

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5. Finnemore, Hilda. (1924). *A History of the Earth: from Star-Dust to Man* (pgs. 56-57). Longmans, Green, and Co.

θΔics

In philosophy, **go-thing philosophy** is the affinity of wisdom related to the go of things; the view that all things in the universe have a go to them.

Quotes

The following are related quotes:

> "What's the go o' that?"
>
> — James Maxwell (1834), age 3 response to any thing that moved, shone, or made a noise; and if that did not satisfy his curiosity, the more specific query "what's the *particular* **go** o' that?" would follow [1]

> "The only thing which can be directly perceived by the senses is force, to which may be **reduced** light, heat, electricity, sound and all the other things which can be perceived by the senses."
>
> — James Maxwell (1847), *Publication* (age 16) [1]

> "This general model or dual point of view ideology ["I live on earth at present, and I don't know what I am. I know that I am not a category. I am not a thing — a noun. I seem to be a verb, an evolutionary process – an integral function of the universe", Buckminster Fuller (1970)], is why I refer to myself, not necessarily in reference to Fuller, in my Hmolpedia article, as a **"go-thing philosopher"** (go-thing philosophy), i.e. a thing philosopher, in the ancient Greek-Roman view of a universe comprised of "things", but also the view that motion exists, and that moving things have a "go", in the age 3 Maxwell "what's the go o that?" sense or question of the reason behind the motion of things. In order to study the "go" of humans, you have to start with Newton's "Query 31", then work your way up through: Goethe, Clausius, Gibbs, Lewis, and modern human free energy theorists, which is one of the reason's that I'm flying to Pakistan this Aug to interview Mirza Beg, currently ranked as "social Newton (existive)" #2 (previously I flew to Washington DC in 2016 to interview #1 SN existive Jurgen Mimkes). The presumed "genius" of Beg is working to "move" my physical body from Chicago to Pakistan."
>
> — Libb Thims (2019), "Reddit r/RealGeniuses post" (Ñº), May

> "All **things go**."
>
> — Micki Minaj (2014), song (Ñº) from album *The Pinkprint* (Ñº) co-written with: Matthew Samuels, Ester Dean, Anderson Hernandez, and Allen Ritter; favorite motto/philosophy of Skylar Hartfield, e.g. reply made when asked (Jan 2020) about how she felt about her aunt dying

References

1. Mahon, Basil (2003). *The Man Who Changed Everything – the Life of James Clerk Maxwell* (what's the go 'o that, pg. #; senses quote, pg. 25) (Ñº). Hoboken, NJ: Wiley.

In

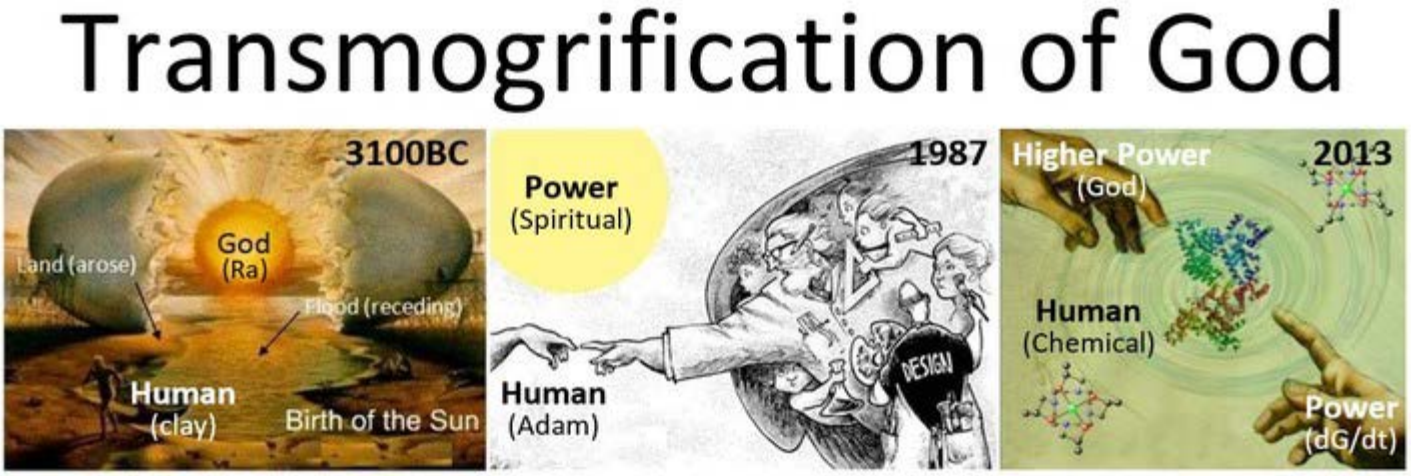

The transmogrification of god from Heliopolis creation myth (3100BC) sun model of god, to intelligent design (1987) model of god, to Gibbs energy (2013) view of god (see: God vs Gibbs) and or physicochemical atheism.

terminology, **god** (TR:1,553) from the Egyptian neter (3500BC), or gods (plural), aka *deity*, or "chimera" (Meslier, 1729), typically defined as the supernatural creator and overseer of the universe, is a "scientific moral power above man" (Durkheim, 1898) is a theory often found to have a thermodynamic interpretation. Typical examples include: that god formulated the laws of thermodynamics, that god set the universe, now operating according to scientific laws, in motion in the act of creation, or that god is an organizing force opposite to that of disordering force of negentropy, or that living human existence is under the operation of thermodynamical laws, but that the spiritual realm or afterlife is under god's operation, among others.

Pledge of Allegiance

In 1954, in reaction to “Red scare”, the words “under god” were added to the US Pledge of Allegiance (Ñº) (Ñº), to the dismay of many. (Ñº)

God is dead

In 1882, Friedrich Nietzsche famously stated that "god is dead", meaning that grip of the Bible has waned. A variant of this is the following:

> “**God** is dead; Marx is dead; and I don’t feel too well myself.”
>
> — Michel Le Bris (1976), part of book or essay he was working on (Ñº) [13]

(add discussion)

Thermodynamics

In the 1939 book *The Philosophy of Power*, author Donald Murray devoted a two-page section to the subject of “God and Thermodynamics” outlining views on a relation between god and the steam engine. [1]

In 1999, author Holmes Rolston stated that: “one can posit god as a countercurrent to entropy, a sort of biogravity that lures life upward.” [2]

In 2007, Indian chemical engineer DMR Sekhar postulated a theory of "genopsych" (genetics+psychology), which he conceived as "an extensive property running or operating counter to entropy" that "is god or a part of god inside of humans that has evolved people to their present form." [3] Sekhar's theory was an effort to find unification between genetics, evolution, thermodynamics, the Bhagavat Gita, and the Holy Bible.

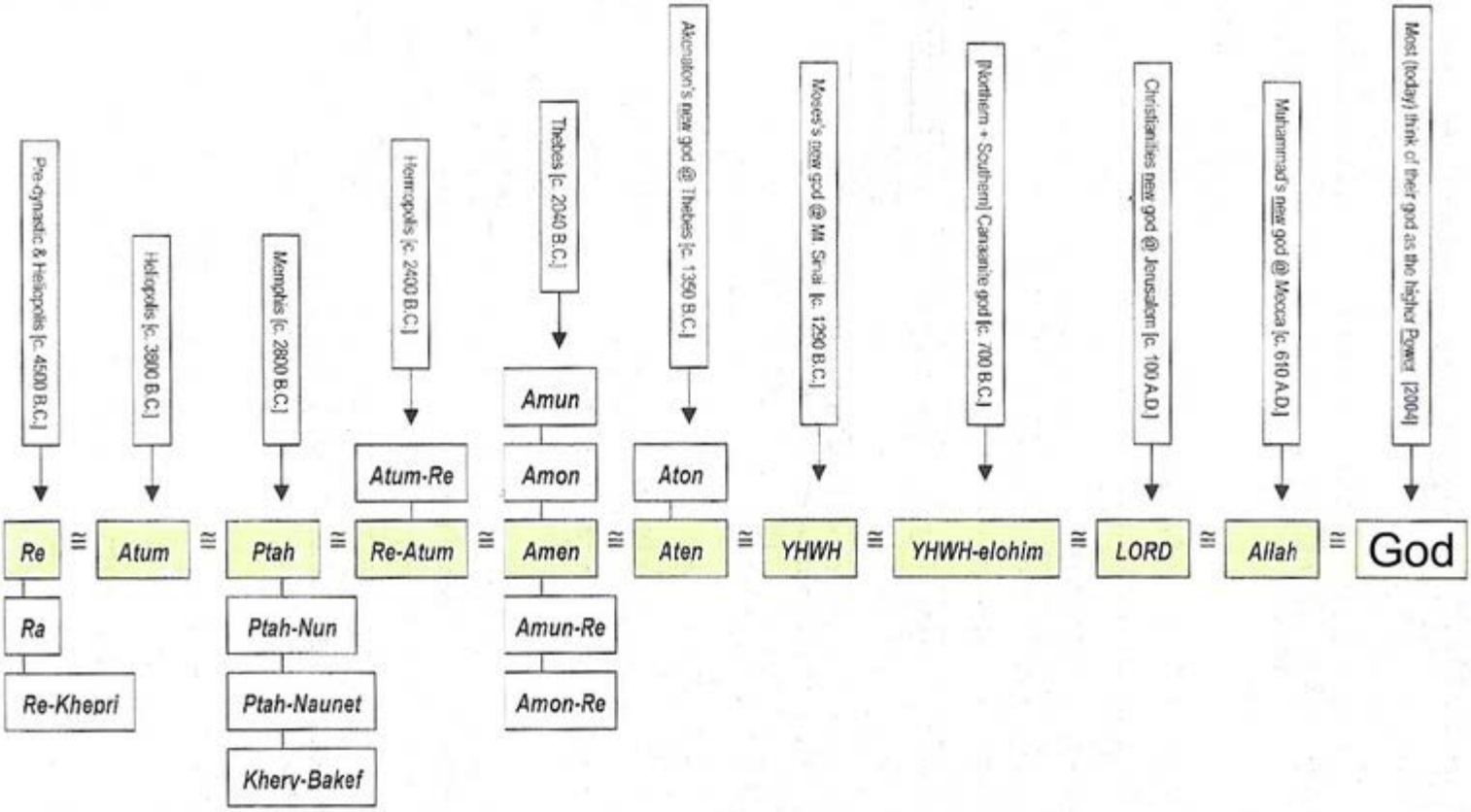

A timeline of the evolution of god: from the Ra sun god precursors, of Egyptian times, to the Ab-Ra-ham-ic (Christianity, Islam) + B-Ra-hmaic (Hinduism) reformulation versions of modern times.

In the 2008 book *Reinventing the Sacred*, American biochemist Stuart Kauffman argues that the Abrahamic idea of god as a supernatural creator needs to be reinterpreted as a natural creativity in the universe, and does this using a logic of thermodynamic work cycles. [4]

Neuroanatomy

Electrical stimulation of the temporal lobes is found to induce the "sense" or feeling of the presence of god (Jesus or Mary, if one is Christian, Muhammad, if one is Islam, etc.). [11]

Egyptian origin

See main: Religio-mythology transcription and syncretism

Seventy-two percent of all modern Gods are syncretisms Egyptian gods, with the addition of a few Mesopotamian deities. The basic outline of the modern "God" (Christian/Muslim) is as follows:

Belief in god

In modern age, circa post 2010, curious, a large percentage (~84%) still people believe in god or some variation of this, and the question of ‘is there a god?’ is one of the big philosophical conundrums on the mind of the average person. One popular god belief scale (Dawkins levels) was put forward recently by English evolutionary biologist Richard Dawkins, in his popular 2006 book *The God Delusion*. [10]

Entropological proof

See main: Entropological proof

Another religious thermodynamic postulate is that God created the low-entropy singularity or grandly-unified mass of energy that initiated the universe at the act of the Big Bang. [5] This conception derives from what has been called the

“entropological proof” for the existence of god. [6] This proof reasons, according to English statistical thermodynamicist Peter Landsberg, that: [6]

> (a) the universe is an isolated system.
> (b) that, by experimental definition, isolated systems reach internal thermal equilibrium given time, after which fluctuations about this equilibrium state can take place.
> (c) the universe is presently in a far-from-equilibrium state.
> (d) if the universe is in a far-from-equilibrium state, it must have had a finite age and hence a beginning.
> (e) this beginning must be a state of minimum entropy at which the cosmos was born.
> (f) this original state was brought about by God, who also created the initial values of parameters such as initial internal energy, matter, entropy, etc., such that the initial universe was wound up, i.e. “the spring was set”, and the universe is now running down to an eventual heat death.

One of the obvious contradictions in this proof is that point (c) contradicts point (a). In other words, far-from-equilibrium systems, such as Benard cells, can only maintain such a state if they are continuously being driven by an external flux of energy or matter, and as such are open and cannot be isolated.

Second law argument

One of the more classic connections often made between god and thermodynamics is the second law argument. This argument loosely states that because the “commonly known” version of the second law states that the universe tends towards disorder or is running down, and that because, as evolution as shown, life is running upward towards more ordered states, that these two processes can only be reconciled if God has a hand in it. [7]

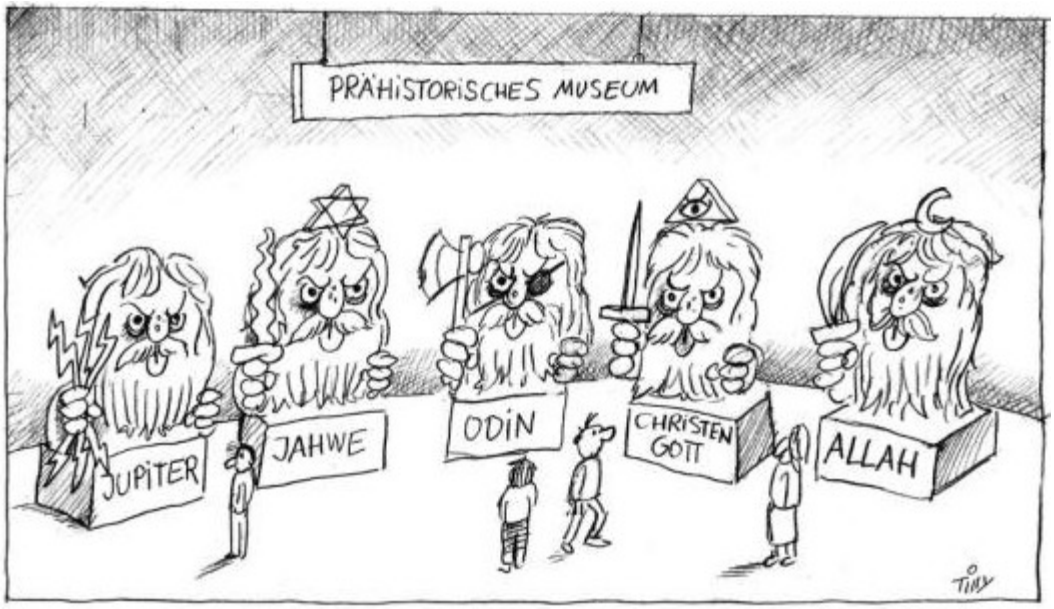

Caricatures of several noted modern Gods. [12]

Free energy source

A newer interpretation of God is that god is the original source of the free energy (chemical, gravitational, etc.), that is driving the universe. In short, it is often reasoned that at the start of the Big Bang the early universe was at thermodynamic equilibrium, but that as it expanded and cooled its symmetry was broken creating free energy gradients. To elaborate on this, in 2004 American-born English historian David Christian asks: “did the universe start out with a stock of free energy on which all ordered entities have drawn ever since? If so, where did that energy capital come from and how long will it be before it runs out (heat death)?” He continues, in reference to a type of pseudo-deity efforts:

> “Something (or someone?) must have done some heavy lifting in the early days of the universe to create the gradients and differences that create and sustain the patterns we see around us … if it was not a creator **god** who did this, then how was it done?”

He concludes “the ultimate source of free energy (and therefore order) remains one of the great puzzles of modern cosmology, because, as far as we can tell, the early universe was remarkably homogeneous.” [8]

Einstein

In 1954, German-born American physicist Albert Einstein sent a letter to Jewish philosopher Eric Gutkind in which he stated that “the word of God is nothing more than an expression of human weakness; described the Bible as “pretty childish” ; and stated that “all religions are incarnations of the most childish superstitions”. The famous letter sold in 2008 for $440,000 at an auction in London. [9]

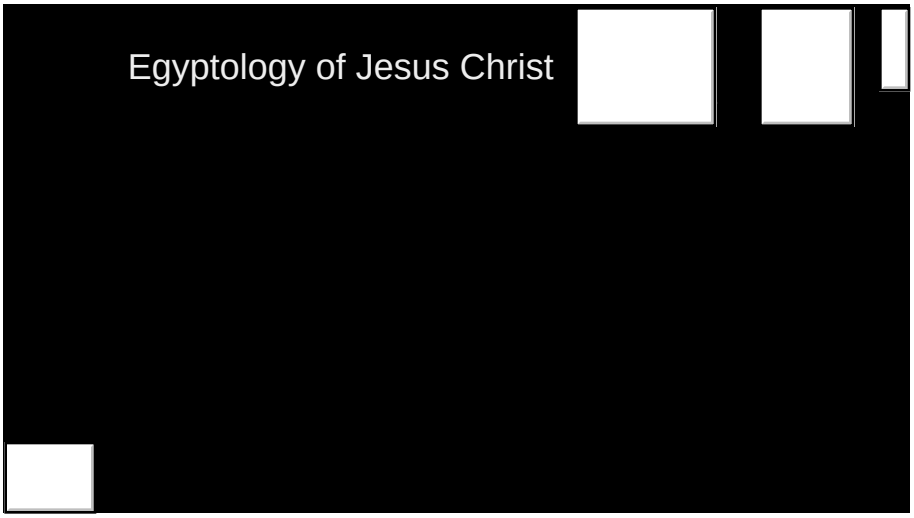

A 2010 video "Evolution of Jesus Christ", a history of the 6,000-year-old theory of the life death morality theory of the sun and its modern form, Christianity or Jesus Christ, the son of **God**.

Quotes | Related

The following are quotes are related quotes:

> “This obligation is the proof that these ways of acting and thinking are not the work of the individual but come from a moral power above him, that which the mystic calls ‘**god**’ but which can be more scientifically explained.”
>
> — Emile Durkheim (1898), “Individual and Collective Representations”; in *Sociology et Philosophie* (1924) (pgs. 32-35); cited by Jennifer Hecht (2003) in *Doubt* (pg. 411)

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Further reading

â— Chaline, Eric. (2004). *The Book of Gods and Goddesses: a Visual Directory of Ancient and Modern Deities.* Harper Collins.
â— Miller, Jeff. (2007). “God and the Laws of Thermodynamics: A Mechanical Engineer’s Perspective”, *Apologetics Press*, April, 4: 25-31.

External links

â— The existence of god and the second law (6 articles) – Helium.com.
â— God – Wikipedia.

θΔics

In atheism terminology, **god = nature**, aka "Spinoza's god", pantheism, or secret atheism (Bunge, 2010), depending on details, refers to []

Overview

In 1616, Italian freethinker Lucilio Vanini, who was considered an atheist, was said to have been holding some type of god in nature (or god = nature) pantheism type view.

Quotes

The following are representative quotes:

> "What one man calls god, another calls the laws of physics."
>
> — Nikola Tesla (c.1920) attributed (Ñº) to Tesla in Internet since 2007 (Ñº)

> "I believe in god, only I spell it 'nature'."
>
> — Frank Wright (c.1940) in FSM app

> "Spinoza's equation '**god = nature**' is self-contradictory, and must be seen as a subterfuge. After all, Spinoza's motto was 'be prudent'. Consequently, the vulgar characterization of Spinoza as a pantheist is incorrect: he was a secret atheist because he was a naturalist. The same holds for Einstein, who once declared that his religion was Spinoza's, i.e. none."
>
> — Mario Bunge (2010), *Matter and Mind: a Philosophical Inquiry* [1]

References

1. Bunge, Mario. (2010). *Matter and Mind: a Philosophical Inquiry* (Spinoza, pg. 97; Mach, pg. 247). Springer.

θΔics

In terminology, **god assassin**, or "assassin of god", refers to someone, e.g. Friedrich Nietzsche (said to be the greatest), among famous atheists, trained in the art of anti-theism, able to, metaphorically speaking, assassinate "god", i.e. to assassinate belief in the existence of god, and related "god talk" or god theory (or god hypothesis) baggage, from the mind of the learned scholar, firstly, and the general populous, secondly; similar to how Einstein in 1905 disabused the notion of 'ether', the medium in which electromagnetic waves were *thought* to be propagating, from physics.

In 1882, German philosophy Friedrich Nietzsche, student of Arthur Schopenhauer—Germany's first admitted and inexorable atheist (himself trained by Goethe, promulgator of physical chemical morality theory)—declared "God is dead!"; in 1886, Nietzsche published Beyond Good and Evil*: Prelude to a Philosophy of the Future*; in 1888, before going insane, he drafted *Will to Power*, the last pages of which were devoted to figuring out how to replace the defunct theory of god with the newly-arising field of thermodynamics; in 1942, Nietzsche was declared, by Albert Camus, to be the "greatest of **god's assassins**."

Goethe | Schopenhauer + Nietzsche

In 1796, German polyintellect Johann Goethe, a Haught disbeliever (#19), after previously working out his own version of evolution, he called metamorphology, began to work out the problem how the "moral symbols" of nature, specifically from physical chemistry, make Christian morality superfluous, null and void, and in fact defunct, as per human relationships and interactions are understood as chemical reactions.

In 1806, Goethe began to interact with and to mentor a then 18-year-old budding philosopher named Arthur Schopenhauer, who would absorb Goethe physicochemical philosophy, into the mold of his own the world as "will" and representation philosophy, and therein became Germany's first avowed atheist.

In 1868, a then 24-year-old philosopher named Friedrich Nietzsche abandoned his struggle of the Hegel scholars and seized on the writings of Schopenhauer, thereafter becoming his main intellectual "educator"; in 1882, Nietzsche famously declared "god is dead"; in 1888, in his last draft manuscript *Will to Power*, was working on the problem of how to replace a dead god with thermodynamics.

In 1942, Albert Camus, in his *The Myth of Sisyphus*, characterized Nietzsche as the most-famous of the assassins of god: [1]

> "Nietzsche was the most famous of **God's assassins**."

(add discussion)

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1. Malieth, Monydit (aka Tonnerre). (2013). *The Future Affects the Past: What Destination is Time Rushing To?* (pg. 57). Red Lead Books.

θΔics

In religio-mythology, **god character rescripts**, or "god character equivalents", refers to Egyptian god to Sumerian god to Indian, Greco-Roman, and Judeo-Christian god, character, or prophet equivalences; which resulted over time owing to cultural migrations, dynasty or empire recensions, and or general religious redaction, e.g. Hebrew scholars turning gods into prophets (Dunlap, 1858), Romans templating off Greek gods, e.g. Dionysus to Bacchus, and general intercultural wars and conquering.

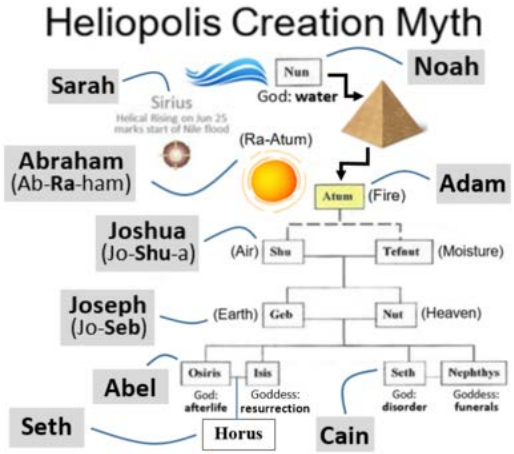

Overview

The decoding of gods and religious characters from parallel sources, backwards to their original source and meaning is an intricate subject; a simple example being the comparison of Ovid's 8AD version of creation — namely the formation of the world out of chaos, the making of man "from clay", the fall of the original evil race of man, global flood, and the one righteous version of man and woman, namely Deucalion and Pyrrha, saved on a rowboat, landing on the world's one mountain — with the Biblical version of creation, which tells exactly the same story, with the substitution of the names Noah and Naamah. By backtracking, one can trace backwards through cultural time, to find the original source of this story.

Equivalence table

See also: Osiris rescripts

The following is a work-in-progress tabulation of the transliteration of physically real thing or phenomenon, e.g. 150 annual Nile River flood, to Egyptian god, to Indian character or god, to Greek god, to Roman god, to Judeo-Christian god or prophet equivalents, generally ordered per the standard Heliopolis creation myth cosmological appearance of things:

			Mesopotamian mythology														Notes
	Physical Thing (Astro-Theology)	**Egyptian** (3100-2400BC) Egyptian mythology	**Sumerian** (2100-1600BC) Sumerian mythology	**Akkadian** (1200BC) Akkadian mythology	**Babylonian** (1100BC) Babylonian mythology	**Assyrian** (700BC) Assyrian mythology	**Indian** (900BC) Hindu mythology	**Persian** (750BC)	**Greek** (600BC) Greek mythology	**Roman** (400-10BC) Roman mythology	**Hebrew** (300BC) Jewish mythology	**Christian** (200AD) Christian mythology	**Germanic** (700AD) Nordic mythology	**Muslim** (800AD) Islamic mythology	**Modern** (c.1800)	**Scholar**	
1.	**Nile River** 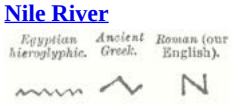	**Nun** (**Nu**)	Abzu Nammu (water god) A**Nu** (sky water god) Enki (god) Utnapishtim (man)	Absu Ea			Vish**Nu** (god) Ma**Nu** (man)		Chaos Nestis (Ñº)	Deucalion	**Noah**			**Nuh**			[10] [13]
		Naunet (Ñº)								Pyrrha	Naamah (wife)						[13]
	Argo-Navis constellation	→ Nu's solar barque	→ Ziusudra's boat → Utnapishtim's ship	Atrahasis' boat			→ MaNu's boat			Rowboat	→ Noah's ark						[10] (Ñº)
		→ Benu bird (phoenix)	→ Dove, swallow, raven								→ Raven, dove, dove						
		Ogdoad					Sherma				Shem						(Ñº)
		Keme					Hama				Ham						(Ñº)
		Ptah [2800BC]					Jiapheta		Hephaestus	Vulcan	Japheth						[N6] (Ñº)
2.	**Pyramid** (Primordial land)	**Atum** [3000BC]					Atman Adimo				**Adam**			Adam		Kant (c.1769) Voltaire (c.1770)	[5][9] (Ñº)

																	[6][7]
							Heva		Pandora		Eve			Hawwa			(Ñº)
	Morality	Maat (Ra's daughter)							Dike (Zeus's daughter)	Justita (Jupiter's daughter)							
	Life									Vita							
	Death								Thanatos	Mor							
	Time						Shani		Cronos	Saturn							
2.	**Sun** 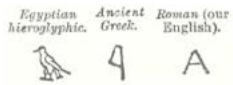	**Ra**	Ud	Utu			**Brahma**		Helios		**Abraham**			Ibrahim		Postel (c.1570)	[N4] [9] [10]
		Amen [2000BC]						Zoroaster				**Amen**					[N2]
		→ Amen-Ra [1500BC]							**Zeus**	**Jupiter**							[8]
		Aten [1300BC]									Yahweh / YHWH						
		Apep			Tiamat												[14]
3.	**Sirius** (Stella Maris)	**Isis**	Inanna	Ishtar			**Saraswati**		Athena Demeter (Ñº)(Ñº)		**Sarah**	**Virgin Mary**		Sara/Maryam			[8] [12]
	Milky Way	Hathor							Aphrodite	Venus	**Eve**			Hawa			
											Isaac			Ishaq			
4.	Air	Shu			Marduk				Atlas		Joshua						[11]
5.	Moisture	Tefnut			Tiamat				Artemis	Diane							[6] [11]
6.	**Earth**	Geb (Seb/Keb)	Ki				Ganesha		Cronos/Gaia		Joseph			Yusuf			[4][9] (Ñº)
7.	Heaven (Sky)	Nut	An						Rhea								[4]
8.	**Orion constellation**	**Osiris**	Tammuz	Dumuzi		Sargon	Shiva (Ñº) [15]	Zoroaster	Dionysus	Bacchus ↔ Serapis	**Moses**	Lazarus	Odin	Musa	Santa Claus	(Vossius, c.1630)	[N1]
										Zipporah	Zipporah						[N1]
	→ Orion's Belt (3 stars)											Three Kings					
	→ Orion's dog (Canis Major)	Anubis								Caleb	[Moses' dog]	John the Baptist		Yahya			[N1]
		Horus		Tammuz					Hercules	Apollo							[14]
		→ Osiris-Horus	Ninurta (Ñº) (Ñº)				**Buddha** → Krishna	Mithra	Adonis			**Jesus**	Thor	Isa		(Cooper, 1877) (Hislop, 1853)	[N3] [N5]
9.	[Name] constellation	**Set (Seth)**					Satya			Typhon		**Satan** (Devil)		Shaytan			
		Nephthys										Mary Magdalene					
10.	**Moon**	Thoth		Theuth					Prometheus Hermes								[4]
		Min							Pan (Ñº)								
											Gabriel			Jibril			

(add)

Discussion

A large part of the above god character respect occurred in c.800BC when Greek mythology was formulated based on a rewrite of Egyptian mythology, owing to scholars, such as Thales and Homer, travelling to Egypt and studying under their priests and in their libraries.

The following is a table of Egyptian god to Greek quod equivalents, according to Herodotus, as adapted (Ñº) from Ivan Linforth's 1926 *Greek Gods and Foreign Gods in Herodotus*:

Egyptian Deity	Greek Deity	Location in Herodotus
Ptah	Hephaestus	II.3.1, 112.1
Horus	Apollo	II.144.2
Osiris	Dionysus	II.42.2, 144.2
Isis	Demeter (Io)	II.59.2 (II.41.2)
Set/Apophis	Typhon	II.144.2, 156.4
Bubastis (Bast)	Artemis	II.137.5
Neith	Athena	II.28.1, 59.3
Amun	Zeus	II.42
Hathor	Aphrodite	II.42
Khonsu (?)	Herakles	II.42
Min	Pan	II.46.4
Apis	Epaphus	II.153.1

(add)

Quotes

The following are related quotes:

> "Let me not be called a wicked atheist for seeing the likeness between Brahma and Abraham.'"
>
> — Godfrey Higgins (1833), *Anacalypsis, Volume One* (pg. 391)

> "In this way antiquity disposes of its sun-gods. The **Hebrews turned [the gods] into Patriarchs** [see: god reduction]. Adam, Abraham, Israel, were names of Saturn. Edom is Adam; and the ancient usage was to name the nation, the land or city after the chief god. The Greeks made these deities founders of tribes."
>
> — Samuel Dunlap (1858), *Vestiges of the Spirit of Man*

> "Herodotus found the similarity between the rites of Osiris and Dionysus so great, that he thought it impossible the latter could have arisen

independently; they must, he thought, have been recently borrowed, with slight alternations, by the Greeks from the Egyptians."

— James Frazer (1907), *Adonis, Attis, Osiris* [2]

"Plutarch's version of the myth of Isis and Osiris connects the various episodes, many of which can be documented from Egyptian sources, into a single, running narrative (*On Isis and Osiris*, 12-19). The story begins with Kronos (Geb, the Egyptian earth god) and Rhea (Nut, the Egyptian sky goddess) overcoming the curse of Helios (Re, the sun god) with the help of Hermes (Thoth, the Egyptian moon god) by producing five children on five intercalary days: Osiris, Horus, Typhon (Set), Isis, and Nephthys. As pharaoh of Egypt, Osiris brings civilization to that country and to the whole world. Typhon, however, gathers conspirators and plots to kill Osiris. First, he imprisons Osiris within a coffin and throws it into the Nile River, and later he dismembers the body of Osiris and scatters the pieces all around Egypt. One piece, the penis, is lost forever in the Nile River. In both episodes, the reproductive power of Osiris is **sub-merged** in the Nile. (Isis grieving and searching for Osiris and burning away the mortality of the infant prince of Byblos can be compared with …"

— Marvin Meyer (1999), *The Ancient Mysteries* (Ñº)

"It is impossible to ignore the similarities between the Egyptian quarternity: Isis and Nephthys (known as 'the Two Goddesses' in Egypt), Osiris and Set (personifications of life and death), and the leading characters of the Eleusinian drama: Demeter and Persephone (also known simply as 'the Two Goddesses'), Dionysus and Hades. Diodorus of Sicily, first century BC, clearly states that the initiatory rites of Demeter in Eleusis were transferred from Egypt (Diodorus Siculus, 1.29.2). Later he states: The rite of Osiris is the same as that of **Dionysus** and that of Isis very similar to that of Demeter; the names alone having been interchanged, and the punishments in Hades of the unrighteous, the Fields of the Righteous and the fantastic conceptions, current among the many - all these were introduced by Orpheus in imitation of the Egyptian funeral customs.' (1.96.4-5)."

— Timothy Freke and Peter Gandy (2001), *Jesus and the Lost Goddess* [3]

"Stories of Hindu heroes: Adimo, Heva, Sherma, Hama and Jiapheta apparently were replicated into legends about: Adam, Eve, Shem, Ham, and Japeth."

— Gore Burnelli (2008) (Ñº)

See also

â— Egyptian-to-Christian transliteration
â— Mangnall's abstract of Heathen mythology

Notes

N1. Osiris, Dionysus-Bacchus, and Moses
N2. Supreme god timeline
N3. Buddhism
N4. Abraham and Brahma
N5. Christ myth theory
N6. (a) Memphis creation myth
(b) Hermopolis creation myth

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3. Freke, Timothy and Grandy, Peter. (2001). *Jesus and the Lost Goddess: The Secret Teachings of the Original Christians* (Osiris, 18+ pgs; quote, pg. 255). Random House.
4. Meyer, Marvin. (1999). *The Ancient Mysteries: a Sourcebook of Sacred Texts* (pg. 160). University of Pennsylvania Press.
5. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (Adam = Atum, pgs. 46-47). Source Books.
6. Anon. (2007). "Egyptian Parallels to Greek Deities" (Ñº), Atlantis Online, Feb 17.
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11. (a) Tiamat – Wikipedia.
(b) Babylonian religion – Wikipedia.
(c) Enuma Elis – Wikipedia.
(d) Peterson, Jordan. (1999). *Maps of Meaning: The Architecture of Belief* (atheism, pgs. 6, 452, 448; Osiris, 8+ pgs; Tiamat, 10+ pgs). Publisher.
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(b) Ishtar – Wikipedia.

(c) Tammuz (deity) – Wikipedia.
13. Ovid. (8AD). *Metamorphosis: Stories of Changing Form* (§:Introduction, pgs. v-ix) (translator and introduction: Rolfe Humphries) (Deucalion and Pyrrha, pgs. 12-13). Indiana University Press, 1955.
14. Cheyne, Thomas K. (1907). *Traditions and Beliefs of Ancient Israel* (pgs. 4-5). A. and C. Black.
15. Georg Creuzer (c.1837) (Ñº) identified Shiva with Osiris and Baccus.

External links

â— List of Germanic deities – Wikipedia.

θΔics

In models, **god complex** or "god concept" refers to the structured belief in the existence of a divine and or supernatural entity (i.e. god), in the mind of a believer, which conceptually exists in the form of a seven nodal point belief system (or belief state), comprised of the nodes or fortification points of: (a) the religious text (e.g. Bible, Quran, etc.), surrounded by (b) the creation model, (c) prayer, (d) other believers, (e) personal relationship (e.g. personal god), (f) morality system, and (g) logical arguments (e.g. that it is illogical, according to Greek atomic theory atheism, or Dawkins atheism, etc., that things formed by chance).

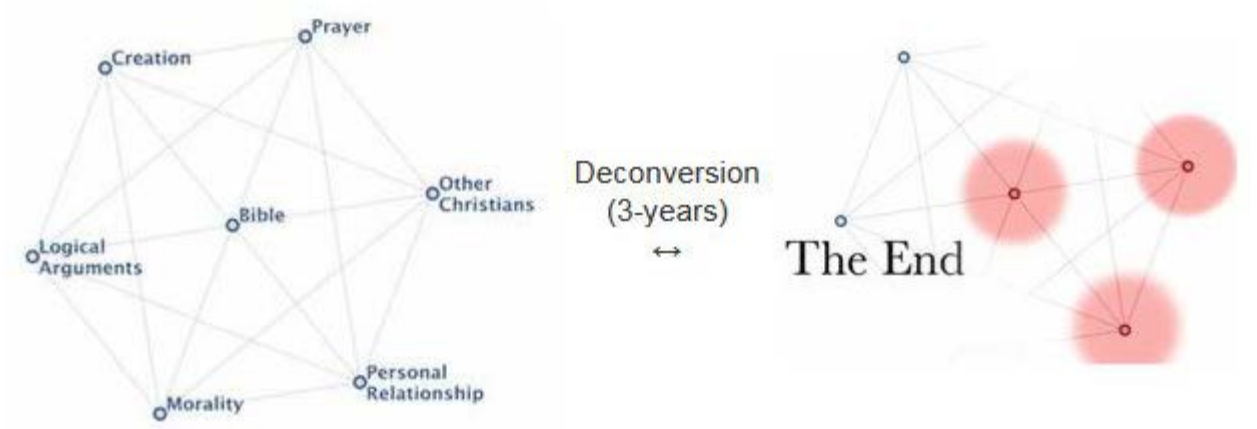

An overview of the "**god complex**, in the so-called Redford deconversion model, a 7-nodal point belief system of the mind model of the "God Concept", according to which belief in God is not one belief by a interlinked network of seven main belief aspects: morality, personal relationship, other Christians, prayer, creation, logical arguments, all centered around the Bible, and that before religious deconversion to a new belief system can accrue, three or more belief system nodal points have to come come under attack in regards to question of validity.

Deconversion

To deconvert, i.e. deconversion, the mind of one whose belief in god, according to Christopher Redford, is in the form of a seven-point nodal structured "god concept" or "god complex", at least 4 of the seven nodal points have to come under attack.

In more detail, according to the so-called "**Redford deconversion model**, or “Redford belief system model” refers to the 7-point nodal structure, held in the mind, by typical Abrahamic religious adherents, specifically the mind of American Christian-turned-atheist Christopher Redford, in regards to the so-called “God concept”, a mental connectivity of the points: morality, personal relationship, other Christians, prayer, creation, logical arguments, all centered around the Bible, interconnected together into a belief in the existence of god:

according to which, for deconversion into atheism to accrue, four of the seven nodal belief points have to come under susceptible attack, and eventually fall, and that this processes, if it accrues, tends to take about 3-years to happen.

Etymology

The Redford deconversion model was outlined in 2009 to 2012 by American computer scientist Christopher Redford, via a 22-part video series, which goes into retrospect detail the transition from a door-to-door recruiting Bible-thumping

Christian to an evidence-based atheist.

Sometime in 2013 and 2014, Libb Thims began citing the "nodal structure" aspect of the model in and around Hmolpedia.

θΔics

In non-existences, **god does not exist**, similar to ether, caloric, or life does not exist, etc., refers to conclusion that "god" (or gods) is something that does not exist, in or outside the context of the universe and its operation, and has never existed; and is but a defunct, once-employed, non-evidenced, devoid fictional hypothesis, based purely on religio-mythology and the Hippocrates divine ignorance argument.

The "three main reasons" why there is no god (i.e. **why god does not exist**), i.e. reasons for being a zerotheist (aka smart atheist), from American electrochemical engineer Libb Thims's "Zerotheism for Kids" (2015) lecture. [1]

Proofs

See main: Disproofs of the existence of god

The three main proofs that god does not exist, are (a) that according to comparative religion and mythology (see: religio-mythology scholars), gods are all rescripts of astro-theological entities, e.g. stars, planets, constellations, galaxies (e.g Milky Way), the sun, rivers (e.g. Nile River), and (b) modern science has explained everything that god or god of the gap once represented.

Dostoyevsky dilemma

The so-called "Dostoyevsky dilemma" (Q), reads as follows:

> "If god does not exist, everything is permissible."
>
> — Fyodor Dostoyevsky (1880), *The Brothers Karamazov*

This gets into, among other things (see: physicochemical morality puzzles) the question of "legislating morality", without god as backer. Frank Turek (2003), citing previous quote, puts it like this: [4]

> "Nietzsche understood that when god 'died', all absolutes died with him. Therefore, with no 'moral lawgiver' to prescribe right and wrong, he claimed we must create our own morality. After all, if values do not originate in heaven, then we must make them up on earth."

(add)

Quotes

The following are related quotes:

> "Meslier's war cry [*Testament*, 1729], never before heard in the history of western thought, offers one of

the first true atheist moments, if not the first. Prior to him, they call the *agnostic* an atheist who, as Protagoras, concludes that when it comes to god one can conclude nothing; the *pantheist* who, such as Spinoza, affirms its existence consubstantial with nature; the *polytheist*, like Epicurus, who teaches its multiplicity; the *deist*, in the way of Voltaire, for whom god creates the world en bloc, but does not care about the details; or whoever's idol does not correspond to the strict criteria established by the church. Now, the *atheist* clearly says that '**god does not exist**'. This is what Meslier clearly writes: 'there is no god' (chapters 59, 74, 93, 94)—that is clear and distinct, blunt, and straightforward."

— Michael Onfray (2009), "Preface: The War Song of an Atheist Priest" (pg. 19) [5]

"Live a good life. If there are gods and they are just, then they will not care how devout you have been, but will welcome you based on the virtues you have lived by. If there are gods, but unjust, then you should not want to worship them. If **there are no gods**, then you will be gone, but will have lived a noble life that will live on in the memories of your loved ones."

— Marcus Aurelius (c.160AD), *Meditations, Book II* [1]

"Natural atheology, the attempt to prove that **god does not exist** or that at any rate it is unreasonable or irrational to believe that he does—in which the most widely accepted and impressive piece or representative has to do with the so-called problem of evil—is the opposite of natural theology, attempts to give successful arguments or proofs for the existence of God [in nature]."

— Alvin Plantinga (1974), *God, Freedom, and Evil* [2]

"Yes, I do have proof that **god does not exist**. It is perfect and irrefutable. I'm not going to show it to you however. You cannot detect it in any way. You cannot deduct it from the laws of logic either. You might claim that I do in fact have no such proof, but you have not proof that I don't. Sound familiar?"

— Rune Friberg (c.2013)

See also

- Atheism types by denial and belief
- Belief in the existence of god by scientists
- Existence of god
- God does not play dice
- God hypothesis
- God is dead
- God void issue
- God vs Gibbs
- Gods energy
- Soul does not exist / Asoulism
- Year god was disabused form science

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θΔics

In hmolscience, **God does not play dice** is statement made often by German-born American physicist Albert Einstein, originally in 1926, and many times after in respect to quantum mechanics, generally alluding to the idea that god or nature is non-chance (see: anti-chance) based.

A **"God playing dice"** cartoon, by John C. Holden (O), showing Niels Bohr and Albert Einstein arguing about whether the universe is deterministic (non-chance based) or indeterministic (chance based), as quantum mechanics sees things.

Einstein | Dice talk

German-born American physicist Albert Einstein, in the rise of quantum mechanics, often used to talk often about God and dice. Einstein's belief in the existence of god, as he has said, was supposed to have been akin to Benedict Spinoza's "god = nature" model, with slight adjustment.

In 1926, Einstein, in a letter to German physicist Max Born, about quantum mechanics, commented the following: [1]

> "Quantum mechanics is certainly imposing. But an inner voice tells me that it is not yet the real thing. The theory says a lot, but does not really bring us any closer to the secret of the "old one." I, at any rate, am convinced that ***He* does not throw dice**."

In 1943, Einstein, in conversation with biographer William Hermann, concerning what is real and exists versus what is but mental constructs, stated the following: [2]

> "Nature doesn't know chance, it operates on mathematical principles. As I have said so many times, **God doesn't play dice with the world**."

(add discussion)

Dirac | Objection

In 1927, at the fifth Solvay Conference in Brussels, while sitting around one evening at the hotel's smoky lounge, some of the younger physicists were sitting around on chairs and sofas, among them English theoretical physicist Paul Dirac, along with Werner Heisenberg, and Wolfgang Pauli, during the course of which, as recalled by Heisenberg, Dirac went off on rant about religion, triggered by a comment about Einstein's habit of referring to God during discussions of fundamental physics: [3]

> "If we are honest — and scientists have to be — we must admit that religion is a jumble of false assertions, with no basis in reality. The very idea of God is a product of the human imagination. It is quite understandable why primitive people, who were so much more exposed to the overpowering forces of nature than we are today, should have personified these forces in fear and trembling. But nowadays, when we understand so many natural processes, we have no need for such solutions. I can't for the life of me see how the postulate of an Almighty God helps us in any way. What I do see is that this assumption leads to such unproductive questions as why God allows so much misery and injustice, the exploitation of the poor

> by the rich and all the other horrors He might have prevented. If religion is still being taught, it is by no means because its ideas still convince us, but simply because some of us want to keep the lower classes quiet. Quiet people are much easier to govern than clamorous and dissatisfied ones. They are also much easier to exploit. Religion is a kind of opium that allows a nation to lull itself into wishful dreams and so forget the injustices that are being perpetrated against the people. Hence the close alliance between those two great political forces, the State and the Church. Both need the illusion that a kindly God rewards — in heaven if not on earth — all those who have not risen up against injustice, who have done their duty quietly and uncomplainingly. That is precisely why the honest assertion that God is a mere product of the human imagination is branded as the worst of all mortal sins."

At the end of which Pauli, when asked what he thought, declared: [4]

> "Well our friend Dirac, too, has a religion, and its guiding principle: There is no God and Dirac is his prophet."

after which everyone laughed, including Dirac. The following, likewise, is an unpublished 1933 handwritten note by Dirac: [5]

> "Any further assumption implied by belief in a God which one may have in one's faith is inadmissible from the point of view of modern science, and should not be needed in a well-organized society."

which, to note, is near verbatim to the famous 1802 "I had no need of that hypothesis" Napoleon Laplace anecdote on Pierre Laplace's god-free celestial mechanics.

Other

In 1975, English physicist Werner Ehrenberg was working on the book *Dice of the Gods: Causality, Necessity and Chance*, published posthumously (1977), with discussion of soul and indeterminism. [6]

In 1994, Stephen Hawking, during a debate with Roger Penrose, at the Isaac Newton Institute for Mathematical Sciences, University of Cambridge, about whether or not Einstein was wrong in his God does not throw dice statement, gave his opinion that: [6]

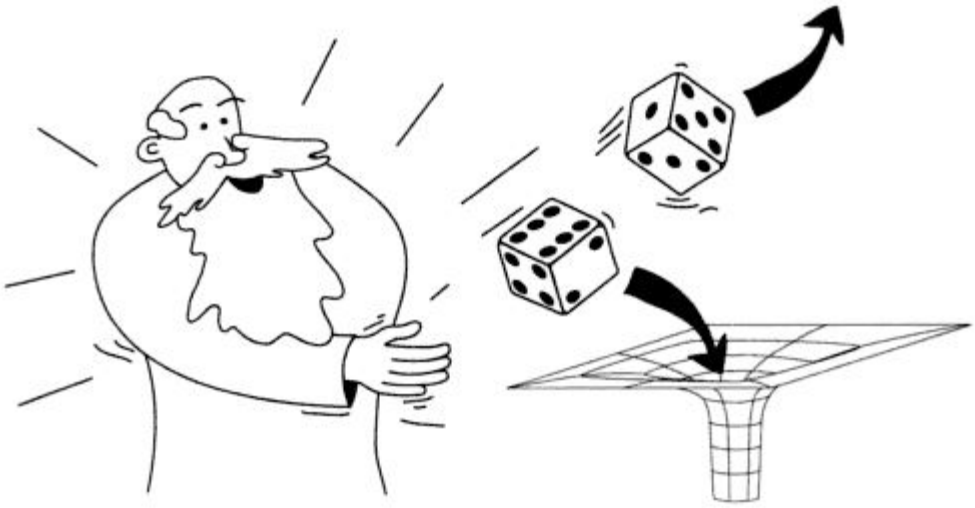

A cartoon of Stephen Hawking's **god playing dice** around a black hole. [7]

> "Consideration of black holes suggests, not only that **God does play dice**, but that he sometimes confuses us by throwing them where they can't be seen."

(add discussion)

References

1. Einstein, Albert. (1926). "Letter to Max Born", Dec 4; in: *The Born-Einstein Letters* (translated by Irene Born)

(Walker and Company, New York, 1971).
2. Hermanns, William. (1983). *Einstein and the Poet: In Search of the Cosmic Man* (pg. 57-58). Branden Books.
3. Heisenberg, Werner. (1971). *Physics and Beyond: Encounters and Conversations* (pgs. 85-86). Harper.
4. Farmelo, Graham. (2009). *The Strangest Man: the Hidden Life of Paul Dirac, Mystic of the Atom* (Dirac is his prophet, pg. 138; reductionism, pg. 158). Basic Books.
5. (a) Dirac, Paul. (1933). three page hand-written note, Jan 17; in Private Papers of Mary Dirac.
(b) Farmelo, Graham. (2009). *The Strangest Man: the Hidden Life of Paul Dirac* (pg. 222). Basic Books.
6. Ehrenberg, Werner. (1977). *Dice of the Gods: Causality, Necessity and Chance* (indeterminism, 4+ pgs; quote, pg. 13). Birkbeck College.
7. Hawking, Stephen. (2000). *The Nature of Space and Time* (pg. 26). Princeton University Press.

θΔics

In hmolscience, **god face** refers to the face of someone who is so doped up on god or theological belief, e.g. in the existence of god (or something equivalent), that the feeling it produces is equivalent to taking opium, Prozac, an equivalent serotonin reuptake inhibitor, or breathing laughing gas; thereby keeping the person "happy", at least on the surface, producing a fake-smile face, akin a tamed-down version of a black hole sun video (Q), continuously, in public, irrespective of how far one's views, beliefs, and or statements may diverge from reality into the extreme nonsensical range.

An example of a "**god face**" from slide one (Q) from the 2015 Zerotheism for Kids lecture, wherein kids were taught that god or religion, according to Marquis de Sade (1797), was an opiate for the mind and that "drugs were bad" and that it is better to be a "free thinker" than a "god head" and to search out to get real true happiness rather than artificial happiness, e.g. via god or pharmaceuticals.

Overview

In circa 2010, Libb Thims began to notice a distinguishable difference between those faculty pages of theologians or theologian-minded thinkers, e.g. pretty much everybody listed in the creation scientists ranked by idiocy has the "god face" look in their pictures, e.g. Michael Behe, Kent Hovind, Gordon van Wylen, and William Craig, to new a few:

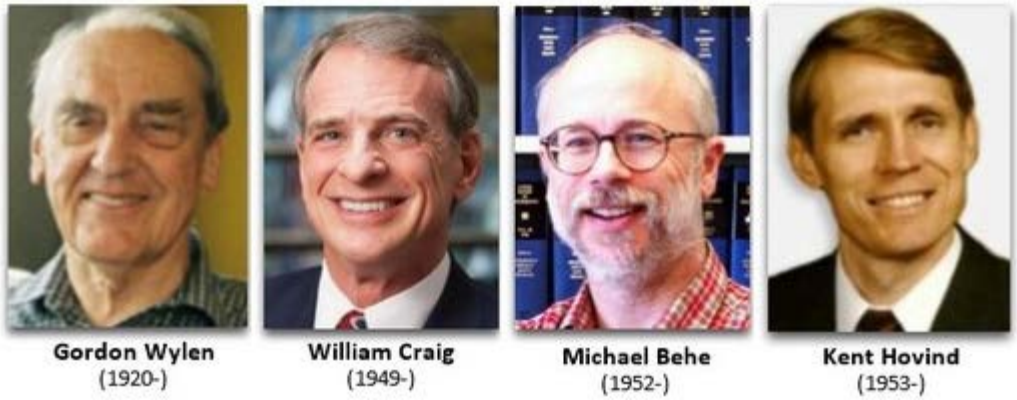

as though they're just doped up happy on god, deflecting evidence from their mind as though god was a vertical ping pong table, and the evidence was the pong ball, as compared to more sober-minded thinkers, e.g. Friedrich Nietzsche and Judson Herrick, whose fathers, to note, were pastors, or Henry Mencken, each of whom were willing, to forego theological drug use, to take a stand for truth and reason:

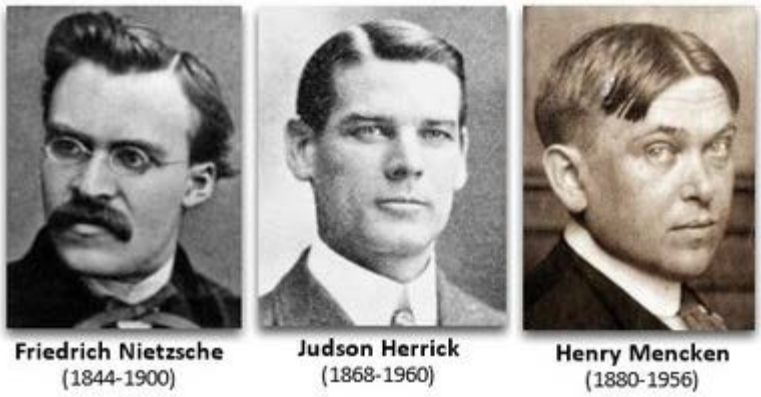

Thims also began to notice the god face on some atheists, e.g. Alexander Rosenberg (2014), who were frank and open about their pharmaceutical happiness formula:

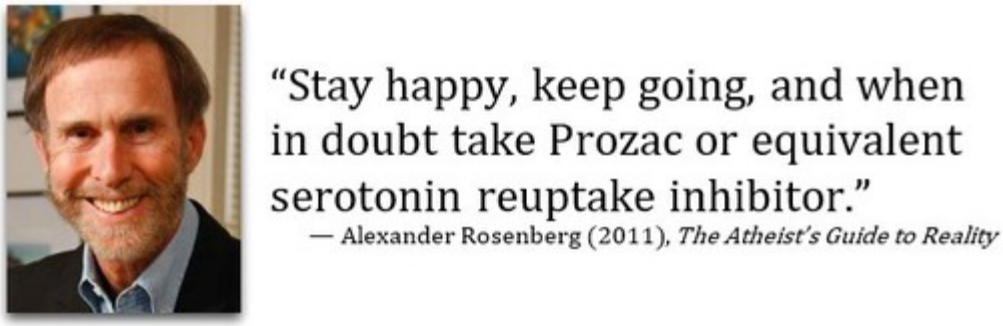

In 2016, Thims started this "god page" article after first reading about Alan Padgett's 1996 "entropy applies to everything" article, then searching for his faculty page (shown above right), after which all the "god faces" just glared out, to the effective conclusion "oh, he's a god head", or something along these lines.

Discussion

(add discussion)

Quotes

The following are related quotes:

> "Do you, good people, believe that Adam and Eve were created in the Garden of Eden and that they were forbidden to eat from the tree of knowledge? I do. The church has always been afraid of that tree. It still is afraid of knowledge. Some of you say religion makes people happy. So does laughing gas. So does whiskey. I believe in the brain of man."
>
> — Clarence Darrow (c.1925), Scopes Monkey trial commentary

> "I prefer the honest jargon of reality to

the outright lies of books."

— Jean Rostand (c.1950)

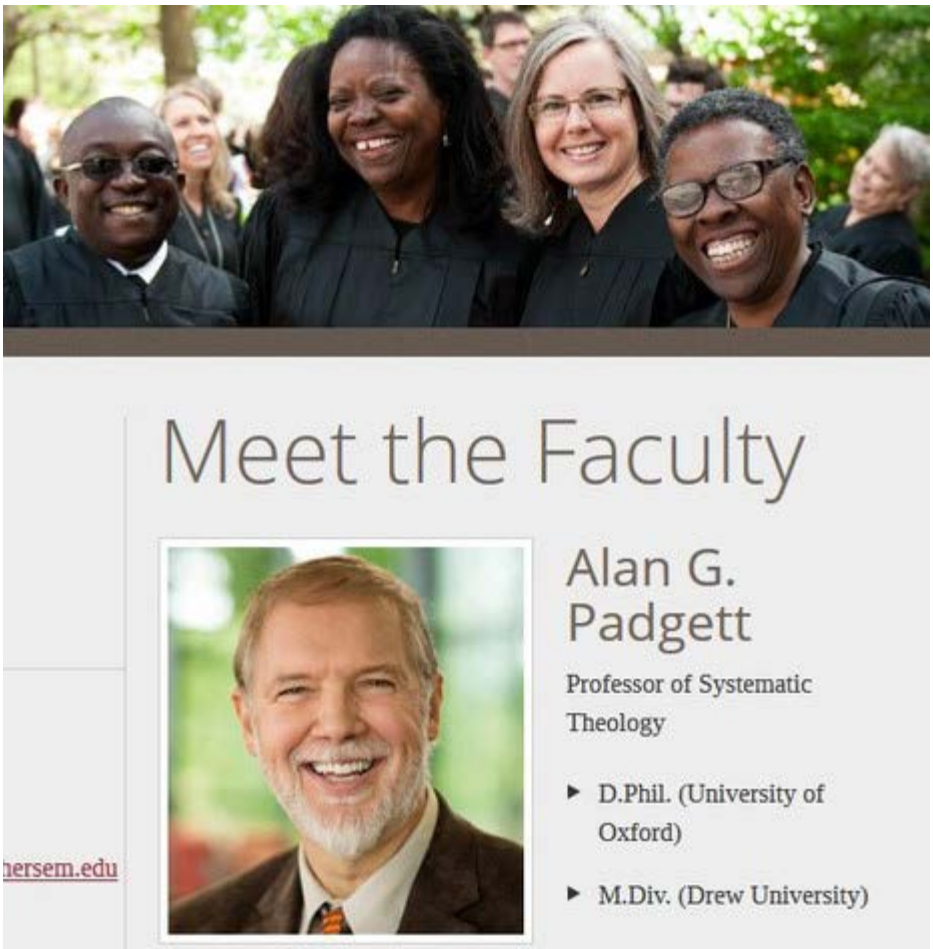

The faculty profile of Alan Padgett, noted entropy applies to everything (but not god) theorist, showing five "**god faces**", all doped up on their belief in the existence of god and the happiness and well-being that this feeling produces for them. [2]

"Religion — as noted by Marquis de Sade (1797), Novalis (1798), Marx (1843), and Dirac (1927) — is but an opiate or opium for the mind; and like all drugs, it can be replaced, upgraded, or in some cases treated, with a better or less symptomatic one."

— Libb Thims (2014), personal note, arisen into view, conceptualized as the embodiment of the future day when the physicochemical belief system becomes the new religion for humankind, the term "religion" deriving from the Latin *ligare* "system which binds", while attempting to add the 1927 Dirac religion rant to the atheism timeline, and thereby investigating the historical origin of the "religion is a kind of opium" phrase usage by Dirac, at 1:30 PM CST, Sep 17

References

1. (a) Padgett, Alan G. (1996). "The Mutuality of Theology and Science: An Example from Time and Thermodynamics" (pdf), *Christian Scholars' Review* (Q), 26:12-35, Fall; in: *Science and the Study of God* (pg. 113). Wm. B. Eerdmans Publishing Co.
(b) Alan G. Padgett (faculty) – Luther Seminary.

θΔics

In hmolscience, **god fog** refers to a general type of ingrained, unaware, or belief system rooted admixture of god talk, god baggage, and god hypothesis (or god theory), blended into a illusionary metaphorical mental "fog", mist, or smoke-like confusion, left in the wake of the god void, oft-resulting in the "god face" look, which clouds thinking in the minds of people, even in atheists, when deeper questions or subject matter in the humanities are discussed, in respect to how the physical, chemical, and or natural sciences, subjects which are "uncontaminated by spiritual values", as Judson Herrick (1930) put it, and god-disabused, as Laplace (1802) said (see: year god was disabused from science).

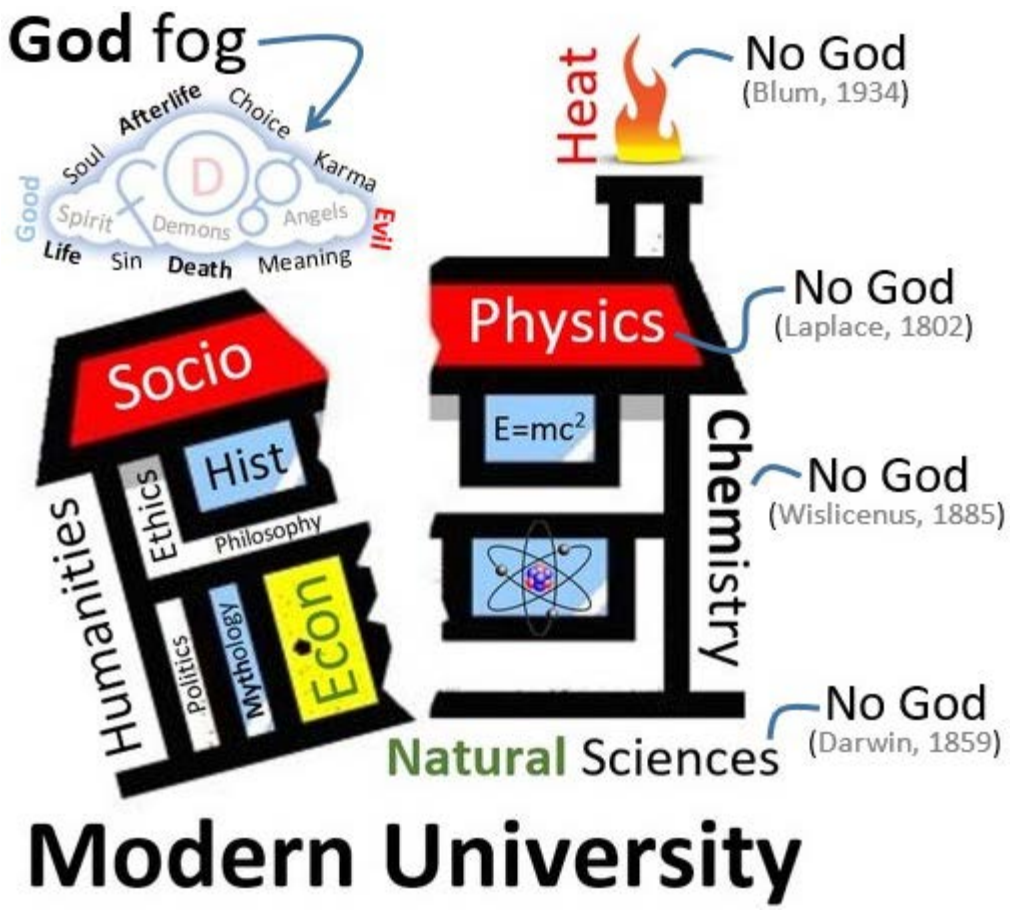

Overview

In 1809, the basic element of the "god fog" was touched on by Goethe, in Ottilie's aphorism (#13) of EA | P2:**C4**:

> A13. "The ridiculous arises out of a moral contrast, in which two things are brought together before the mind in an innocent way."
>
> — Goethe (1809), James Froude (1854) translation

In 1595, Johannes Kepler believed that planets were driven around the sun by "angels" flapping their wings. Some four centuries later, in American (2014), scientists, e.g. Joshua Greene and Alfred Mele, and university presidents, e.g. Jim Wagner, president of Emory University, or Amy Gutmann, president of Pennsylvania University (and Chair of the President's Commission for the Study of Bioethical Issues), can be found debating, amid discussions of "bioethics", about whether or not angels exist and whether or not humans are driven around in their orbits, i.e. "animated" in motion, in their so-labeled ethical or non-ethical behaviors, by "souls", during the meetings of the Presidential Commission for the Study of Bioethical Issues (example quotes of which are shown below).

> A13. "We laugh when the elements of a moral discrepancy are brought home to our senses in a harmless way."
>
> — Goethe (1809), David Constantine (1994) translation

The following is a god fog like statement:

> "God is dead: but considering the state man is in, there will perhaps be caves, for ages yet, in which is shadow will be shown."
>
> — Friedrich Nietzsche (c.1885)

On 30 Dec 1953, when John Q. Stewart gave his "Remarks on the Current State of Social Physics", to the American Association for the Advancement of Science conference meeting in Boston, which prompted Rockefeller science-funding chief Warren Weaver to cut-off funding to the Princeton social physics project, per reasons as detailed here, this was a prime example of "god fog" clouding the judgment of the mind of Weaver; a well-embodied example of the

mindset of the bulk percentage of the mindsets of modern world.

In 5 Apr 2016, Libb Thims, while making the "house divided" (against itself) diagram (an extra-annotated version of which is shown adjacent) — for the Herrick's Humpty Dumpty article, i.e. to show how, in Judson Herrick's 1930 view of the University of Chicago, at the dedication of the new "Social Science" building, the "humanities" departments were house-divided against the physical science, chemical science, and natural science departments — was attempting to visually show, e.g. see Modern University (version 7), how there was a sort of "**higher powers**" fog, smoke, or mist hovering over the minds of people, whether young children (the emotionally-heated parental objections to the 2015 "Zerotheism for Kids" lectures comes to mind) or college students (the 2010 UIC bioengineering thermodynamics student hand-written (Q) lecture reaction commentaries comes to mind), college professors (the 2009 Moriarty-Thims debate comes to mind), and or everyday people (e.g. thread posts), in the humanities departments, used the following "higher power" labeled photo of a village enveloped in fog or morning mist, to get at this idea of how even some of the most devout atheists have this "god fog" in their mind, in respect to theories about the humanities:

as compared to the physical, chemical, and natural science departments, which were all expunged of any and all type of god theory, god talk, or god baggage, etc., in the 19th century and early 20th century (see: year god was disabused from science).

Adjacent is a 2016 rendition of Thims' own personal "god fog", particularly in respect to fact that it is approaching the 10-year mark in regards to the grappling with problem of issues with the term "life" stage (see, e.g., Lotka's 1925 Regarding Definitions), e.g. as found in Thims' "Molecular Evolution" (2007) chapter, to the defunct theory of life (2009) stage, to life terminology upgrades (2012) stage, to life does not exist (2014) stage, to the abioism (2015) stage, to the (Apr 2016)

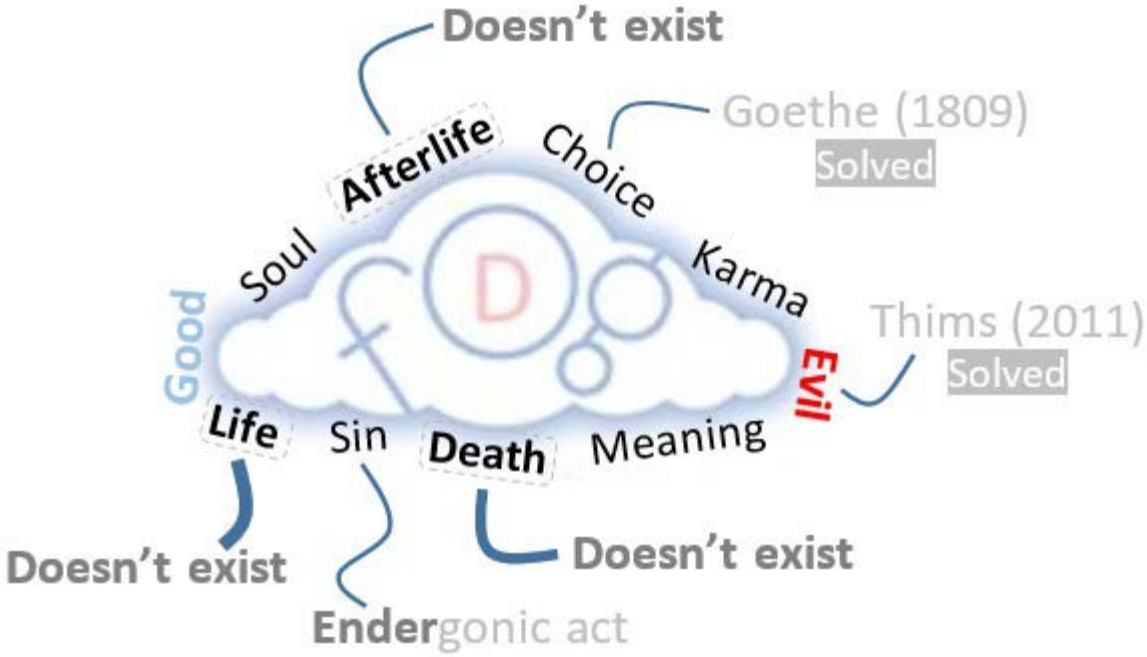

viewing of the 2011 To Have Done With Life conference videos, to Thims' own conference presentation stage, on this topic, i.e. talk on Lotka's Jabberwock at BPE 2016 (Jun 2016), and it is still difficult to completely expunge the roots of the weed out of his head.

A rendition of Thims' own personal **god fog**, as of 2016, wherein it is still difficult to completely expunge the god-fogged belief in "life" out of his mind, whereas the rest are basically defogged; e.g. in the 2015 "Zerotheism for Kids" lecture, in order to explain, chemical thermodynamically, why stealing was wrong, after kids were asked to give an example of some "thing" they had done, but afterwards felt bad about, Thims explained wrong acts as being "endergonic" as compared to good (or right) acts, where are "exergonic", using the Gates model (exergonic) and Kennedy model (exergonic) as compared to the Dahmer model (endergonic); and the Caddyshack model to explain nepotism via exergonic + endergonic mixing of coupled reactions.

While, to go through one example, it is patently obvious, to the modern erudite thinker, e.g. Thims, that the "soul does not exist" (similar to the "spirit does not exist" views of the 18th century thinkers), i.e. Thims is an adamant asoulist, the fog left behind in the wake of this so-called god fog based "soul void" is well-evidenced by what the great geniuses have said on this topic:

Pythagoras on the soul (Q)
Plato on the soul (Q)
Aristotle on the soul
Da Vinci on the soul (Q)
Descartes on the soul
Spinoza on the soul
Leibniz on the soul
Newton on the soul
Maupertuis on the soul (Q)
Goethe on the soul
Schopenhauer on the soul
Haeckel on the soul (Q)(Q)
Maxwell on the soul
Edison on the soul
Einstein on the soul
Freud on soul
Teilhard on soul
Heisenberg on soul (Q)

(add discussion)

Polls

On 17 Apr 2016, Thims did an informal sampling poll of seven people, of various levels of religious belief or non-belief, in respect to what their own "personal" god fog was, the way a Bible-thumper might deny evolution owing to belief in Adam and Eve, or a Buddhist might deny the non-free will view owing to a belief in karma and choice, finding the following:

Afterlife | 3
Choice | 2
Good/Evil | 1
Karma | 1

The one atheist, in the group, stated they had dismissed all the other terms, long ago, but that the "good/evil" distinction still was a bit foggy.

Quotes

The following are related quotes:

> "So do you have evidence that there is one intuitive feeling of choosing? Because all of the evidence that I know of suggests people have very different, not infinitely different, but different intuitions about choosing. In other words, I don't know whether you are speaking now as a scientist or as a philosopher about people's intuitions about choosing. I mean, most people in the United States, if you ask them on a public poll, you'll get intuitions about whether there's **angels** in the universe, you know, all kinds of things. So are you saying scientifically speaking people's intuitions about choosing requires the incompatibalist's view or is there a division there scientifically speaking about what people's intuitions are? I'm trying to figure out you see where your neuroscience – yes."
>
> — Amy Gutmann (2014), "Statement" in: "Presidential Commission for the Study of Bioethical Issues"; President of the University of Pennsylvania, Chair of the President's Commission for the Study of Bioethical Issues, Jun 10 [1]

> "It's less contentious that there are things that we can do to people's brains, with their consent of course and with good evidence that it will work and not harm them and all of the things we expect from medical interventions, and there's a debate about where's the line between fixing a problem versus enhancement and what are the ethical issues that come with that, and I think that's interesting and tricky. But whether you have a full-blown metaphysical view of human nature where we're bodies and **souls** joined somehow, everybody agrees that there's a body."
>
> — Joshua Greene (2014), "Reply to Jim Wagner (president of Emory University, and vice-chair of bioethics meeting)"; in: "Presentation in Presidential Commission for the Study of Bioethical Issues, Meeting 17, Session 6", Jun 10

> "I am inclined to think that these are important questions but that they are orthogonal questions. Not that everything isn't related in interesting ways, but I think that whether or not you think, when it comes to the proximate causes of behavior, just brains, or whether you think that we are brains that are in some sense being animated by minds or **souls** that are distinct from brains, brains are still what most immediately cause behavior."
>
> — Joshua Greene (2014), "Reply to Jim Wagner (president of Emory University, and vice-chair of bioethics meeting)"; in: "Presentation in Presidential Commission for the Study of Bioethical Issues, Meeting 17, Session 6", Jun 10

> "Another point is that what's really being tested in these studies is how good we are at detecting when we first become conscious of an urge or a decision or intention. And it may be that that's really not very important. We might be a little bit off, like 200, 300 milliseconds off. What may be most important is the conscious reasoning that influences the decision making. When I say conscious reasoning, I'm not talking about anything immaterial or involving a **soul** or anything of the sort. It's brain activity. It's just brain activity of a certain kind."
>
> — Alfred Mele (2014), "Presentation at Meeting 17, Session 6, of Presidential Commission for the Study of Bioethical Issues", Jun 10

References

1. (a) Greene, Joshua. (2013). *Moral Tribes: Emotion, Reason, and the Gap Between Us and Them* (soul, 5+pgs; moral

force, pg. 241; hallway study, pgs. 76-78; value premises, pg. 106; metamorality, pg. 147; personal force, 11+ pgs, esp. pg. 247; magic, 17+, magic formula, pgs. 256-57; Nichols-Knobe determinism study, pg. 274; secular Jew, pg. 365; ongoing debates, pg. 99). Penguin.
(b) Gutmann, Amy. (2014). “Presidential Commission for the Study of Bioethical Issues” (Q), President of the University of Pennsylvania, Chair of the President's Commission for the Study of Bioethical Issues, and discussion mediator between presenters: Joshua Greene and Alfred Mele, Meeting 17, Session 6, Jun 10.
(c) Mele, Alfred. (2014). *Why Science Hasn’t Disproved Free Will*. Oxford University Press.

θΔics

In terminology, **god hypothesis** refers to the hypothesis that a god, or supernatural power, exists (see: existence of god) that is responsible and or the cause, i.e. first cause and or final cause, for life, afterlife, morality, meaning, and purpose.

Overview

In 1802, Pierre Laplace told Napoleon Bonaparte (see: Napoleon Laplace anecdote) that he had no need of the "hypothesis of god", or "that hypothesis" as he put it, in the new formulation of the celestial mechanics.

In 1981, Carl Sagan, in interview response to questions asked by Edward Wakin, stated the following: [1]

> "Those who raise questions about the **god hypothesis** and the soul hypothesis are by no means all atheists. An atheist is someone who is certain that God does not exist, someone who has compelling evidence against the existence of God. I know of no such compelling evidence. Because God can be relegated to remote times and places and to ultimate causes, we would have to know a great deal more about the universe than we do now to be sure that no such God exists. To be certain of the existence of God and to be certain of the nonexistence of God seem to me to be the confident extremes in a subject so riddled with doubt and uncertainty as to inspire very little confidence indeed."

In 2007, Victor Stenger, in his *God: the Failed Hypothesis*, attempts to show how modern science shows that god does not exist. [2]

See also

- God theory
- Purposeless universe hypothesis
- Soul hypothesis
- Spirit hypothesis

References

1. Sagan, Carl, Head, Tom. (2006). *Conversations with Carl Sagan* (pg. 70). University Press of Mississippi.
2. God: the Failed Hypothesis – RationalWiki.org.

θΔics

In aphorisms, **God is dead** refers to the 1882 proclamation made by German philosopher Friedrich Nietzsche, in his *The Gay Science*, epitomizing the emerging view, in his discerning mind, about the people of his day, not that God or a god once existed, and now is dead, but rather that the Christian God, i.e. the father of Jesus Christ, was no longer a viable source of any absolute moral principles.

1882 1966 1969 2006

A visual timeline of the so-called "**God is dead**" statement: from Friedrich Nietzsche's famous or infamous, depending, 1882 statement, to Time's 8 Apr 1966 "Is God Dead?" issue, along with its lesser-known 26 Dec 1969 "is God coming back to life?" issue, and the 2006-present "Gibbs energy usurping Gods energy" stylized Rossini debate, sparked into journal article debate via American chemist Harold Leonard's *Journal of Chemical Education* suggestion that American physical chemist Frederick Rossini's 1971 "Chemical Thermodynamics in the Real" reasoning might help us "find a formula for fighting terrorism, while preserving civil liberties".

The following is a 23 Dec 2010 pro-Christian "God is" billboard (Q), on the New Jersey side of the Lincoln Tunnel , which replaced the American Atheists 26 Nov 2010 "Christmas is a myth" billboard (Q), graffiti bombed with the word "Dead" (Q), in reference to Nietzsche's famous proclamation.

Nietzsche's "god is dead" proclamation is second-most famous statement, in the timeline of atheism, behind French physicist Pierre Laplace's more famous 1802 "I had no need of that [god] hypothesis" declaration to Napoleon (see: Napoleon Laplace anecdote); and Galileo's c.1633 "still, it moves" quip.

The Madman

The full text of the proclamation, from his section 125: "The Madman", is as follows: [1]

> "Have you not heard of that madman who lit a lantern in the bright morning hours, ran to the market place, and cried incessantly: "I seek God! I seek God!"—

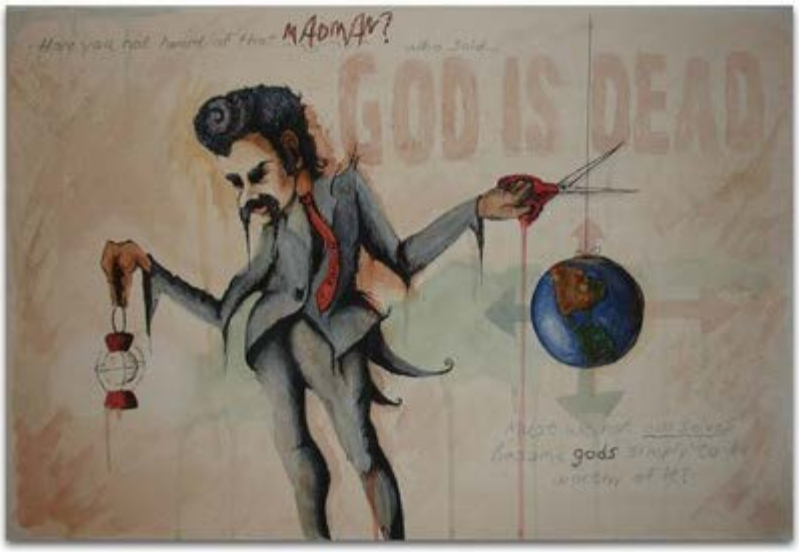

A 2007 DevianArt.com rendition (Q) of Nietzsche cutting earth—or rather the stronghold of on "moral absolutes"—from the strings of God.

As many of those who did not believe in God were standing around just then, he provoked much laughter. Has he got lost? asked one. Did he lose his way like a child? asked another. Or is he hiding? Is he afraid of us? Has he gone on a voyage? emigrated?—Thus they yelled and laughed

The madman jumped into their midst and pierced them with his eyes. "Whither is God?" he cried; "I will tell you. We have killed him—you and I. All of us are his murderers. But how did we do this? How could we drink up the sea? Who gave us the sponge to wipe away the entire horizon? What were we doing when we unchained this earth from its sun? Whither is it moving now? Whither are we moving? Away from all suns? Are we not plunging continually? Backward, sideward, forward, in all directions? Is there still any up or down? Are we not straying, as through an infinite nothing? Do we not feel the breath of empty space? Has it not become colder? Is not night continually closing in on us? Do we not need to light lanterns in the morning? Do we hear nothing as yet of the noise of the gravediggers who are burying God? Do we smell nothing as yet of the divine decomposition? Gods, too, decompose. **God is dead**. God remains dead. And we have killed him.

"How shall we comfort ourselves, the murderers of all murderers? What was holiest and mightiest of all that the world has yet owned has bled to death under our knives: who will wipe this blood off us? What water is there for us to clean ourselves? What festivals of atonement, what sacred games shall we have to invent? Is not the greatness of this deed too great for us? Must we ourselves not become gods [see: uberman] simply to appear worthy of it? There has never been a greater deed; and whoever is born after us—for the sake of this deed he will belong to a higher history than all history hitherto."

Here the madman fell silent and looked again at his listeners; and they, too, were silent and stared at him in astonishment. At last he threw his lantern on the ground, and it broke into pieces and went out. "I have come too early," he said then; "my time is not yet. This tremendous event is still on its way [see: another Newton], still wandering; it has not yet reached the ears of men. Lightning and thunder require time; the light of the stars requires time; deeds, though done, still require time to be seen and heard. This deed is still more distant from them than most distant stars—and yet they have done it themselves.

It has been related further that on the same day the madman forced his way into several churches and there struck up his requiem aeternam deo [eternal rest to god]. Led out and called to account, he is said always to have replied nothing but: "What after all are these churches now if they are not the tombs and sepulchers of God?"

(add discussion)

Gibbs vs God

See main: God vs Gibbs

The above “God vs Gibbs” (or “Gibbs vs God”, depending) depiction — a Michelangelo-inspired rendition of the hand of God (or Gods energy) reaching down and giving “life” to DNA, or some type of enzyme or protein molecule, shown opposed to the hand of Willard Gibbs (or Gibbs energy) reaching up and taking away the concept of life (or theory of life) from the domains of morality, meaning, and sense of purpose (see: defunct theory of life and life terminology upgrades), a labeled-rendition of the artwork found in the 2013 *Triple≡Bond Chemistry* (triplenlace.com) article “Chemical Formula of a Human” (Spanish → English), on the religious-overthrowing implications of human molecular formulas, citing the Sterner-Elser molecular formula (2000) and Thims human molecular formula (2002) — embodies the inherent nature of the 2006-present “Gibbs energy usurping Gods energy” stylized Rossini debate, “sparked”, no thermal word analogy intended, into journal article debate via American chemist Harold Leonard’s *Journal of Chemical Education* suggestion that American physical chemist Frederick Rossini's 1971 “Chemical Thermodynamics in the Real” reasoning, i.e. human chemical thermodynamics (or physicochemical humanities) formulations, might help us “find a formula for fighting terrorism, while preserving civil liberties”, is indicative of the realization that, despite Friedrich Nietzsche’s famous 1882 aphorism, God certainly is not yet completely dead, certainly not amid the general populous, percentages varying per country (see: existence of god), nor among the minds of elite scientists (see: belief in the existence of god by scientists), and that the battleground for the “war on god” is something occurring between physical scientists and or physicochemical scientists, found amid the equations of chemical thermodynamics applied to the humanities, and the formulas derived therefrom, applied to the deeper questions of freedom, security, liberty, and the pursuit of happiness.

Quotes

The following are other related quotes:

> “**God is dead**: but considering the state of the species man is in, there will perhaps be caves, for ages yet, in which is shadow will be shown.”
>
> — Friedrich Nietzsche (c.1882) (Q)

References

1. Nietzsche, Friedrich. (1882). *The Gay Science* (God is dead, 5+ pgs, esp. §125: The madman, pgs. 119-120). Cambridge University Press, 2001.

External links

- God is dead – Wikipedia.
- Is God Dead? – Wikipedia.

θΔics

In religio-mythology, **god reduction** refers to the “techniques”, e.g. syncretism, i.e. two or more gods merged into one, such as the gods Ra and Atum becoming the god Atum-Ra (or Amen-Ra, in his merger with Amen), “methods”, de-deification, e.g. making gods into prophets, such as the turning of the god Nun into the person Noah, and “processes”, e.g. “god atrophy, wherein certain gods become obsolete, to the point where they are no longer worshiped or have active function, wherein the number of gods in a given theology becomes reduced or lowered in number.

Overview

In 3100BC (1st dynasty), Horus was the supreme god, and there were at least 42 local nome gods, along with many other parallel gods, e.g. Set.

In the 4th to 6th dynasty Egyptian theology, there were 200+ active gods, and many chief gods, and one or more supreme gods, depending on period or dynasty; with some counts going as high as 1,200+ assorted gods (e.g. 19th dynasty).

In c.2300BC, the general state of the Egyptian pantheon (Ñº) of gods looked something akin to the following, showing the main supreme gods: Ra, Ptah, Atum; Khnum, the creator of humans; the two main god families: Ogdoad (of Hermopolis) and Ennead (of Heliopolis), along with Horus, the "oldest of all the gods", who at this period had become rescripted as being the offspring of the Ennead:

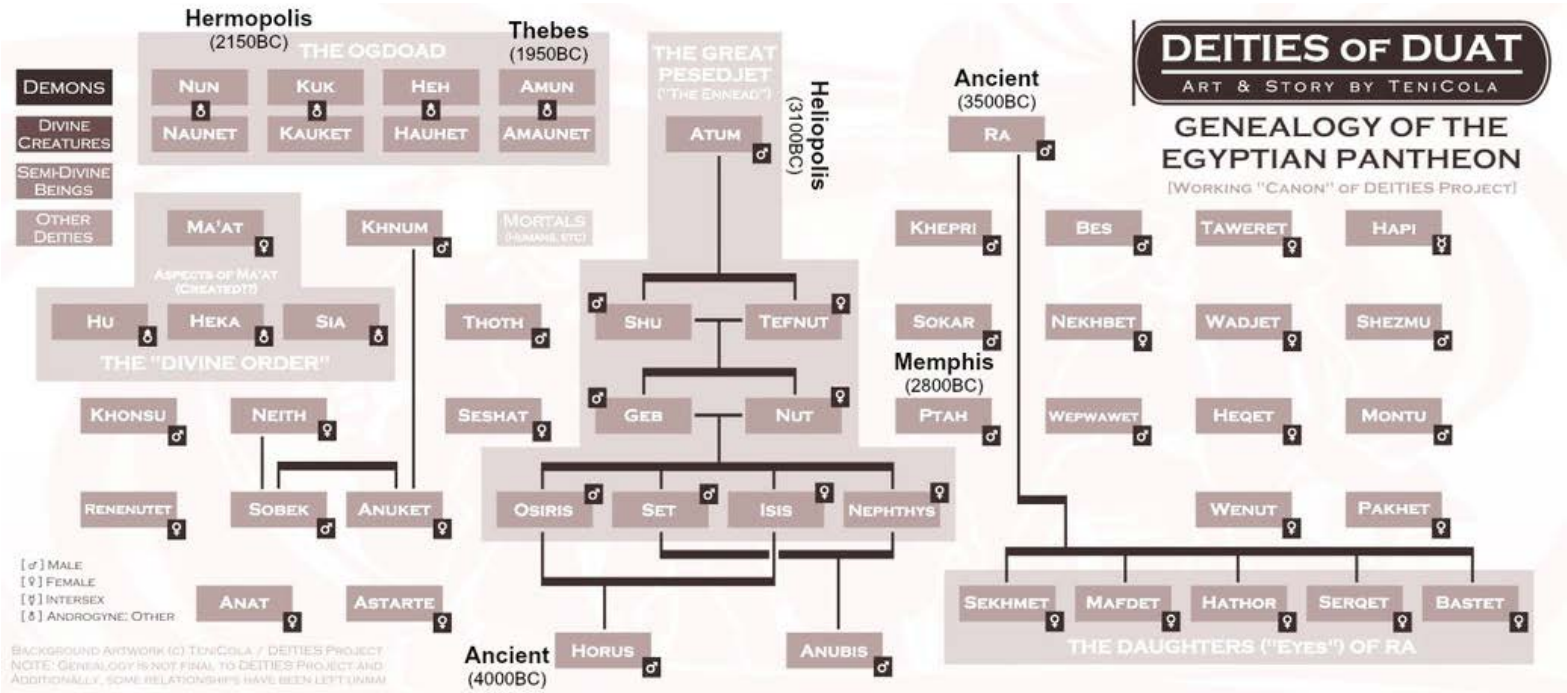

In 2181 to 2061BC, or 7th to 11th dynasty (first intermediate period), during the so-called “Hermopolis recension”, Hermopolis became the state capital of Egypt, according to which the Ogdoad became the supreme god or god power, so to say, of Egypt, and a synretism occurred in which the Ogdoad was said to have created Ra or Ra-Atum (Atum-Ra), who, in turn, was then said to have created the Ennead, therein bringing about a unification of 18 different gods into one general creation scheme:

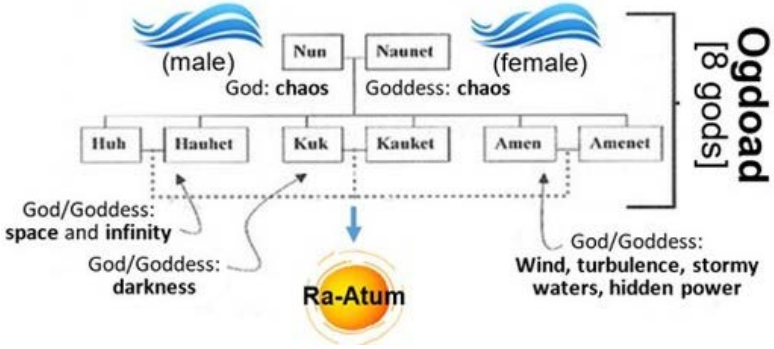

In c.2000-1800BC (12th dynasty), Amen, the previous local god of Hermopolis, as seen in the Ogdoad, was reconceptualized as being a synretism of four previous supreme gods: Nun, Ra, Ptah, and Atum, each being Amen "reincarnate", as he was conceived, thereafter being visualized into one new supreme god, as shown below right, having all the body parts of the previous four supreme gods, rolled into one:

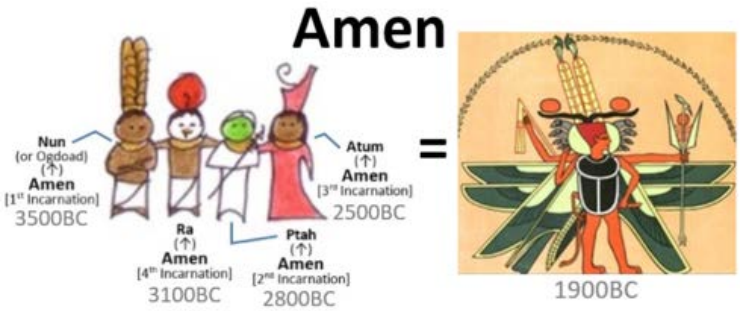

In 1352-1336 BC (18th dynasty), the radical Egyptian pharaoh Akhenaten attempted to reduce all the gods and supreme gods to one god, named Aten, conceptualized as the power of the sun, or something to this effect, in which all other sub-gods were jettisoned, this becoming the world's first attempt at monotheism, i.e. a true one god monotheism religion:

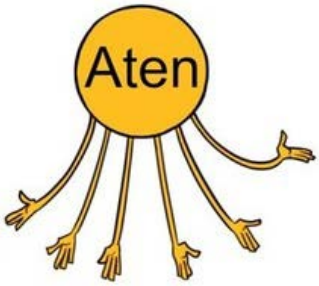

This reduction, however, lasted only a few decades, after which the state religion reverted back to the gods of the Ennead, in various combinations of stories, in respect to who was the supreme god or god pairs, e.g. Set vs Horus, Osiris vs Set, Osiris-Ra, etc (see: supreme god timeline).

In c.500BC, a sect of Egyptian priest teachers, called the Cohens (Herodotus, 450BC), took aspects of Aten-based religion, which the combined with the older Egyptian religions, in such a way that they turned the various supreme gods and key gods and goddess into Patriarchs, angels, and demons.

The following is one take, being partially accurate (e.g. Atum [not Edom] became Adam), on this complex reduction:

> "In this way antiquity disposes of its sun-gods. The **Hebrews turned [the gods] into Patriarchs**. Adam, Abraham, Israel, were names of Saturn. Edom is Adam; and the ancient usage was to name the nation, the land or city after the chief god. The Greeks made these deities founders of tribes."
>
> — Samuel Dunlap (1858), *Vestiges of the Spirit of Man*, citing Franz Movers (1841) [1]

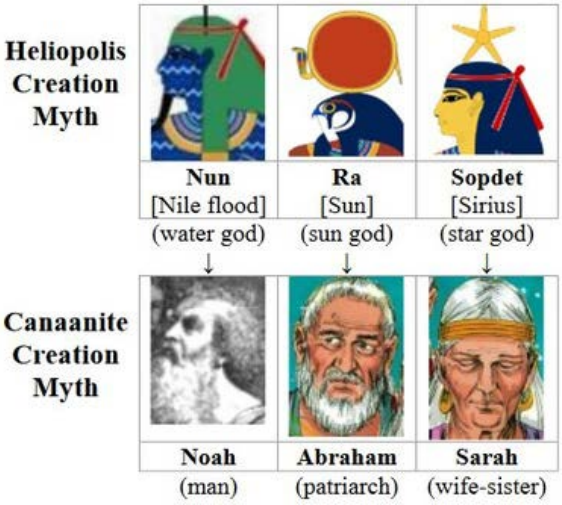

The gist of the god-to-patriarch method of "**god reduction**" used by the Cohen Egyptians to make a new coded monotheism. [2]

The adjacent diagram shows the thrust of the god-to-patriarch method of "god reduction", used by these Cohen Egyptians, aka Is-Ra-El-ites, specifically: Nun became the man Noah, Ra became the man Abraham, and Sopket became the woman Sarah.

The following, according to Moustafa Gadalla (1997) (Ñº), shows an actual editing out of the term "ye gods" (Qumram cave scroll) (c.70AD) with "angels of gods" (Hebrews 1:16) in the so-called "Song of Moses":

Song of Moses (Qumram cave scroll, c.70AD)	**Song of Moses** (Hebrews 1:16, c.100AD)
"Rejoice, O heavens, with him; and do obeisance to him, **ye gods**."	"Rejoice, O heavens, with him; and do obeisance to him, **ye angels of god**."

In c.100AD, a newly forming sect of "Christian Egyptians", in continuation of the Jewish Egyptian technique of turning gods into patriarchs, elaborated on the former reductions, with a reduction of the Ennead group of gods, according to which Osiris became the man Lazarus (and or :god the father", depending), Isis became the woman Mary, Nephthys became the woman Martha (or Mary Magdalene), and Horus became the man-god Jesus: [2]

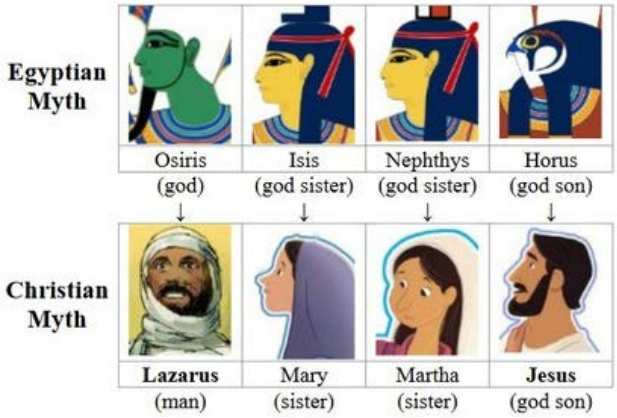

In c.250AD, Plotinus further reduced things by rescripting the three god things: "god the father" (Osiris + Amen-Ra), "god the son" (Horus), and the "holy spirit" (magical powers of Thoth; see: virgin birth), into the idea of the "trinity". In c.300AD, Arius also had penned heterodox ideas about the trinity. In c.400AD, Augustine (c.400AD) learned the trinity idea from Plotinus, after which it became a stable concept of now monotheistic Christianity.

Quotes

The following are related quotes:

> "The **reduction in the number of the gods** of Egypt began when man first realized that certain gods were mightier than others, for he ceased gradually to worship those who had, in his opinion, failed to justify his belief in them, and transferred his allegiance to the gods who were able to give him the most help. In process of time the god or goddess of a certain village or town would obtain a fame and reputation for power which would outrival those of the deities of the neighboring cities, and the growth of the worship of such god or goddess would be accompanied by a corresponding decline in that of the gods in the towns round about."
>
> — Wallis Budge (1904), *The Gods of the Egyptians, Volume One* (pg. 75)

> "The houses of the gods, or temples, became larger and larger and more magnificent as increased wealth flowed into the country as the result of foreign conquest, but the gods remained the same, and the processions and ceremonies, though more magnificent under the New Empire, preserved the essentials of the early period. But if we examine the religious texts carefully it will be seen that the Egyptians were always trying to **reduce the number of their gods**, or, in other words, were always advancing from polytheism to monotheism."
>
> — Wallis Budge (1904), *The Gods of the Egyptians, Volume One* (pg. 115)

> "The process of **reducing** the fairy-godmother's coach-and-six to the status of a one-horse cab may be seen in the Gospel according to Luke in getting rid of Osiris. The pair of sisters, Martha and Mary, appear in this Gospel, but without their brother Lazarus, and also without the resurrection. After all that has now been done towards identifying Bethany with the house in Annu [Heliopolis] and the nest of the two sisters, the two sisters with Isis and Nephthys, and the Christ with Horus, it cannot be considered far-fetched if we look upon Lazarus as a form of the Osiris that was dead and buried and raised to life again. As to the name, the Egyptian name of the Greek Osiris is Hesar, or Asar. And when we take into consideration that some of the matter came from its Egyptian source through the Aramaic and Arabic languages (witness the Arabic Gospel of the infancy) there is little difficulty, if any, in supposing that the Al (article the) has been adopted through the medium of the Arabic, or derived from the Hebrew prenominal stem × ×œ [AL], to emphasize a thing, as in 'the Osiris' [the mummy], which passed into the article Al for "the" in Arabic, and was prefixed to the name of Osiris as Al-Asar, which, with the Greek "s" for suffix becomes L-azarus. The connecting link whereby Al-Asar was turned into Lazarus, *the* Osiris, was in all likelihood made in the Aramaic language, which had its root-relations with the Egyptian. Hieroglyphic papyri are among its monumental remains, as well as the inscription of Carpentras."
>
> — Gerald Massey (1907), *Ancient Egypt, the Light of the Modern World, Volume Two* (pgs. 264)

> "**Pantheonic adjustment** is a form of [god family] manipulation to promote political ends, which, in Egypt, occurred thrice: when Ptah, Amen and Aten were declared supreme gods at different periods. Around 3000BC, the deity Ptah was declared the 'supreme one'. He was the presiding deity of the city of Memphis from where King Menes ruled. Ptah displaced the deity Ra of Heliopolis, till then the overlord (see: Heliopolis creation myth, 3100BC). The priests fabricated a suitable mythology to support the claim. A very important document, the Memphite theology (see: Memphis creation myth, 2800BC), was brought out to legitimize Ra as the creation of Ptah. The occasion for this change-over was the unification of southern and northern Egypt. The purpose was political though the socio-religious point was put forth, namely the need to have one god at the apex of the pantheon in a unified nation. → [see: Hermopolis creation myth, 2150BC] ← By about 1971BC, the powerful noble families of the city of Thebes (see: Thebian creation myth, 2000BC), declared their deity Amen as the supreme god. In this case the deity Ra was incorporated with Amen who by 1870BC, during the reign of Senusret III, became Amen-Ra. In 1372BC, Amenhotep introduced a form of sun worship through his chosen deity Aten. He changed his name to Akhenaten, dropping 'Amen' from Amenhotep and placing Aten in the second part of the name (see: Amarnan creation myth, 1330BC). Aten too fell after a period. The next king Tutankhaten changed his name to Tutankhamen and revived lord Amen. On all these occasions theologians and priests fabricated suitable mythologies connecting other deities in a subordinate relationship to the supreme deity of the moment."

— Govind Ghurye (c.1950), *Publication* (Ñº); as summarized by Devadas Pillai (1997) in *Indian Sociology Through Ghurye: a Dictionary* (pg. 237)

References

1. (a) Movers, Franz C. (1841). The Phoenicians, Volume One (*Die Phonizier, Volume One*) (86, 130) (arc). Publisher.
(b) Dunlap, Samuel F. (1858). *Vestiges of the Spirit History of Man* (Israel, pg. 53). Publisher.
2. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

θΔics

In religio-mythology, **god replacement** refers to a model, concept, or thing that usurps and replaces the role previously held by belief in a god (or gods). [N1]

Overview

In c.300BC, Epicurus replace god with "chance" and the universe as but atoms moving in a void.

In c.1807, Georg Hegel (1770-1831), asserted his opinion that Christianity was the best of the religions, but yet offered a new "secular morality" in which "community" replaced god as the arbiter of good and evil. [1]

In 1837, Karl Marx began to be attracted to the mental pantheism ideas of Hegel; some of Hegel's "community" god replacement logic seems to echo in Marx as follows:

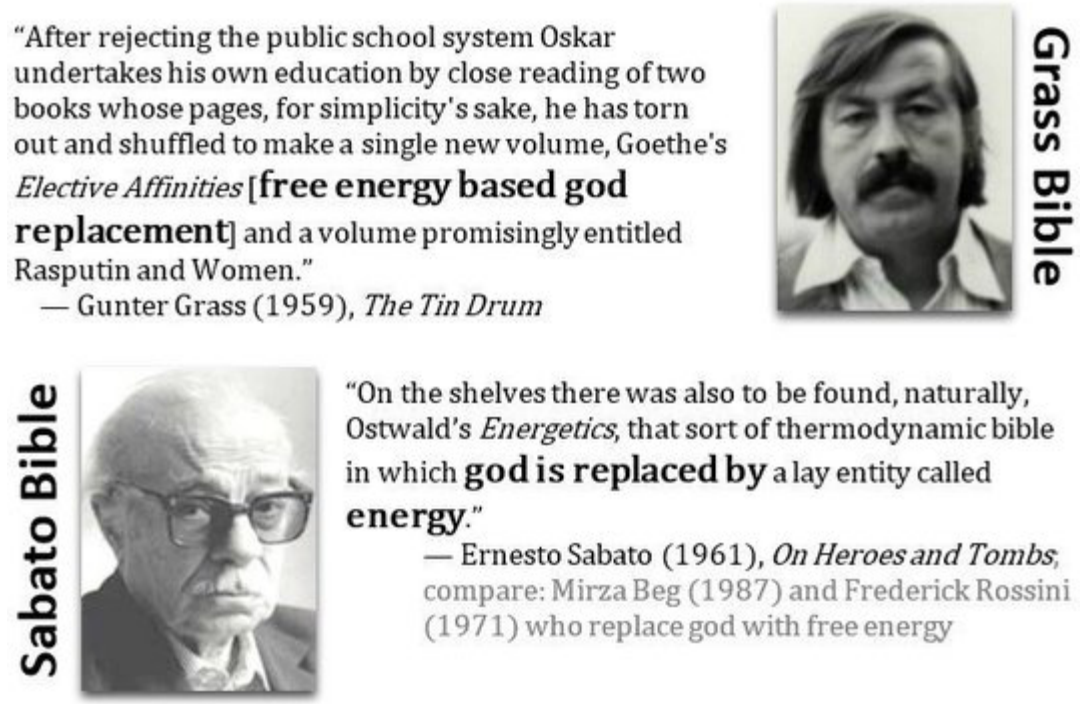

A visual of two semi-fictional "Atheist's Bibles", each with a near-equivalent **god replacement**, namely: the Grass Bible (1959), where "chemical affinity" (aka free energy, in modern speak) replaces god, conceived by Gunter Grass, and the Sabato Bible (1961), where "energy" replaces god, conceived by Ernesto Sabato.

> "Let the ruling classes tremble at a Communist revolution. The proletarians have nothing to lose, but their chains. Workers of the world unite!"
>
> — Karl Marx (c.1848) a Ranker (Q) top quote (#4)

In this period, Marx went to a café where the "young Hegelians" (Q) frequented, where he met Bruno Bauer, characterized as one of "fieriest atheists" of the period, and early Jesus myth proponent. The rest of this story is found in the rise and fall of Communism.

In 1934, Harold Blum, in his "A Consideration of Evolution from a Thermodynamic View-Point", cited Lawrence Henderson (1913) and Gilbert Lewis (1923), to outline a coupling theory plus free energy decrease based theory of orthogenesis (directional-change) conceptualized evolution, in the explicitly-stated "religious-free" form of what he refers to as "chemical peneplanation", i.e. an synonym the semi-modern term Gibbs landscapes, as seems to be the case. In this human chemical thermodynamics model, god is replaced with Gibbs energy (see: God vs Gibbs) instead of chance (this is an anti-chance model). This is a smart atheism god replacement model.

In 1959, Gunter Grass, in his novel *The Tin Drum*, replaced god with "chemical affinity", as defined by Goethe's *Elective Affinities*; which equates to god being replaced by Gibbs energy, in modern speak.

In 1961, Ernesto Sabato, in his *On Heroes and Tombs*, used Wilhelm Ostwald's *Energetics* (1906) textbook, and or possibly his radical atheistic "Monastic Sunday Sermons" (1910), as a "sort of atheist's bible", wherein god is replaced with energy. In modern speak, as Ostwald was a proto-thermodynamics model, this equates to god being replaced by Gibbs energy.

In recent years, in loose upgrade to Epicurus' chance-as-god replacement, admixtured with Darwinism, the publications

of Richard Dawkins' *The Selfish Gene* (1976) and *The God Delusion* (2006) have left the generally Epicurean-Darwinian-plus unstated imprint that god has been replaced with "chance" based evolution and the so-called moral imperative being to pass along one's selfish "genes" to the next generation; some have referred (Q)(Q) to this atheistic model as "Dawkins' god" and or "Darwin's dice" (Johnson, 2014). [2] This, to note, is a dumb atheism god replacement model, but one that easily, baring complicated chemical thermodynamics discussion, can be assimilated by the masses.

Quotes | By

The following are notable quotes by Holbach:

> "Would it not be a thousand times better to depend upon blind matter, upon a nature destitute of intelligence, upon chance, or upon nothing?"
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 200) [3]

See also

- Existence of god
- God theory
- Theory of god

Notes

N1. Note: some of the outline of this page originated in the "selling" column of the Religio-mythology scholars page; the "community" replaced god as the arbiter of good and evil; and the Grass Bible and Sabato Bible 27 Feb 2017 image Tweet. (Q)

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 388-89). HarperOne.
2. Johnson, Curtis. (2014). *Darwin's Dice: the idea of Chance in the Thought of Charles Darwin* (chance, god, 44+ pgs). Oxford University Press.
3. (a) Gaskin, J.C.A. (1989). *Varieties of Unbelief: from Epicurus to Sartre* (pg. 92). Prentice-Hall.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 353). HarperOne.

θΔics

In terminology, **god talk**, or "God-talk", akin to "bibledygook" (Q), synonymous to "God language" (Oliver, 1984), is a generic term refering to religious-themed and or god-centric language, ideas, and theory.

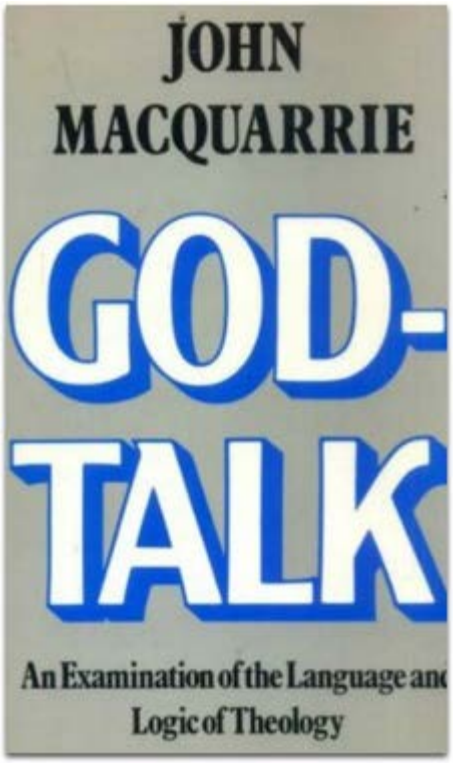

Scottish-born theologian, philosopher and Anglican priest John Macquarrie's 1967 book *God-Talk: an Examination of the Language and Logic of Theology*, is said to have introduced the phrase "**god talk**" into the colloquial vernacular.

Etymology

The term "God-Talk", as a characterization of the language of theology, according to Harold Oliver (1984), is attributed to the publication of Scottish-born theologian, philosopher and Anglican priest John Macquarrie's 1967 book *God-Talk: an Examination of the Language and Logic of Theology*: [1]

> "Lest it seem that relational hermeneutics is insensitive to the religious dimensions of myths, I shall attempt to explicate in relational terms what the expression 'of the gods' means within mythic consciousness. What follows is intended to apply with equal validity to originative religious stories and to statements of belief modeled on them. The first step toward this explication is the simple translation of the phrase 'stories of gods' into the generic formulation of *God Language*. Some might prefer the term '**God-Talk**', suggested by Macquarrie [1967], but they must bear in mind that he coined it as a characterization of theology. God-Language seems to me best suited to represent the distinctive dimension of mythical..."

Quotes

The following are related quotes:

> "Why do we interject **god-talk** into our language? One reason, I suppose, is because we think in this way we clear up mysteries. Thus we use sentences like 'God knows,' or 'God must want it that way,' or 'It must have been the will of God' to avoid using sentences like 'I don't know,' or 'I am totally ignorant,' or 'It was a chance event.' The fact that we appeal to a mystery to explain a mystery will not be pointed out to us by most people because their critical faculties are blunted by our pious appeal to deity. Only a philosopher, or some other cantankerous person, will call out attention to the emptiness of our way of removing mysteries."
>
> — Troy Wilson Organ (c.1975), "God-Talk and Beyond" (Q) (Q)

> "We can talk about anything we want – I'm happy to talk about consciousness – but please notice that when we migrate away from the God that is really shaping human events or the **God-talk** that is really shaping human events in our world at this moment …"
>
> — Sam Harris (2010), debate with Deepak Chopra, Mar 23 (Q)

See also

- God's energy
- God's work
- God's power
- God's force

Reference

1. (a) Macquarrie, John. (1967). *God-Talk: an Examination of the Language and Logic of Theology*. S.C.M. Press.
(b) Oliver, Harold. H. (1984). *Relatedness: Essays in Metaphysics and Theology* (pg. 61). Mercer University Press.

External links

- Who uses the term “God-talk” and what do they mean? (Q) – StackExchange.com.

θΔics

In atheism terminology, **god theory** – not to be confused with “theory of god”, i.e. theory of the purported existence or nature of god (see: god does not exist) – refers to any god-based theoretical construct, e.g. soul, spirit, karma, afterlife, etc., which has god or the power of god as a component of the principles of the theory; some types of atheists, e.g. spiritual atheists, will not believe in the existence of god, but will continue to adhere to aspects of god theory, e.g. believe in the existence of soul or free will.

θΔics

In hmolscience, **God void**, or "nihilistic void", refers to the logic that because "nature abhors a vacuum", in the wake of the disappearance of belief in the existence of god, which Nietzsche posted began in 1882 with his famous "god is dead" proclamation, that nature will force people to fill the void left in wake of god's disappearance.

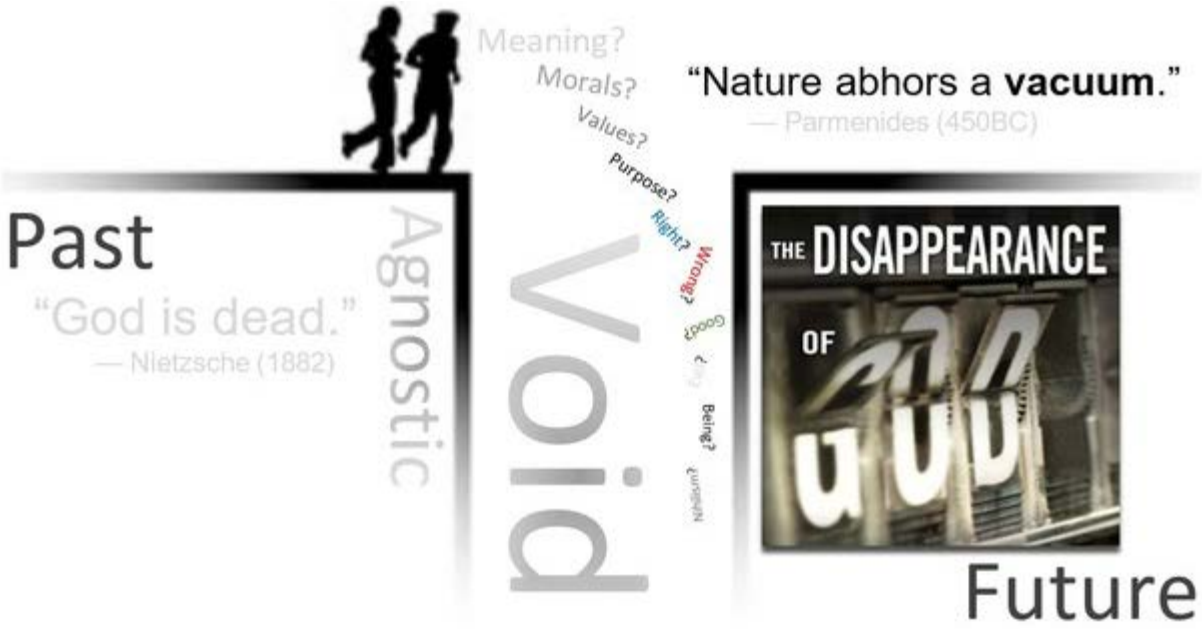

A rendition of the "**god void**" namely that as god disappears from the beliefs of the minds of people a void or vacuum will be left, in respect to concepts such as: meaning, morals, values, purpose, right, wrong, evil, being, or nihilism, etc., which, according to the nature abhors a vacuum ideology, will tend to be filled as time progresses.

The "god void", in short, refers to host of unanswered philosophical problems and queries, such as moral questions, meaning, purpose, value, point, etc., left behind in the wake or intellectual vacuum of disappearance of god from human belief systems, amid growing scientific knowledge of the physical operation of the universe.

The following 2009 Pew Research poll on the science and religion conflict void, left behind in the wake of the disappearance of god, gives clues to the specifics of the void in need of filling: [1]

> "When those who say science conflicts with their own beliefs are asked to describe the ways in which these conflicts arise, 41% refer specifically to evolution, creationism, Darwinism and debates about the origin of life. Another 15% cite differences over the beginning of life, primarily concerns about abortion (12%) but also cloning and birth control. Among the other areas where people say science conflicts with their own religious beliefs are concerns about the use of stem cells (9%), denial of God (4%), issues surrounding the use of medicines and blood transfusions (3%) and conflicts with the Bible (2%)."

As more no one, as of yet, has come forward to address all of this mess, some 95% of Americans are left clinging to mythological beliefs.

In 2014, Theo Hobson penned an article (Ñº) on the moral aspects of the "god void" issue.

Quotes

The following are quotes related to the god void left behind in the absence of god:

> "The human mind found food in this mystical being; it was occupied by it unceasingly; the imagination embellished it in its own manner; ignorance fed itself with the fables which had been recounted of it; habit identified this phantom with the existence of man, it became necessary to him; man believed he **fell into a vacuum** when it was tried to detach him from it, to lead him back to a nature which he had long ago learnt to despise, or to consider only as an impotent mass of matter, inert, dead, and without energy; or as a contemptible assemblage of combinations and of forms subject to perish."
>
> — Baron d'Holbach (1770), *The System of Nature* (pgs. 243-44)

"God is dead: but considering the state man is in, there will perhaps be caves, for ages yet, in which is shadow will be shown."

— Friedrich Nietzsche (c.1885)

"I admit that the generation which produced Stalin, Auschwitz and Hiroshima will take some beating, but the radical and universal consciousness of the death of god is still ahead of us. Perhaps we shall have to colonize the stars before it is finally borne in upon us that god is not out there."

— Reginald Hollingdale (1971), *Thomas Mann: A Critical Study*

"We place our children in day care centers where they learn their socialization skills among their peers under the law of the jungle. Our school systems teach our children that they are nothing but glorified apes who are evolutionized out of some primordial soup of mud. We teach our children that there are no laws of morality that transcend us, that everything is relative, and that actions don't have consequence—what the heck, the President gets away with it. No [sarcastically] it must have been the guns."

— Tom DeLay (1999) comment on the Columbine shootings [5]

"To think that we just evolved from a bang, that we used to be monkeys, that seems unbelievable when you look at the complexity of the human body …. If you tell children there is *no purpose* to their life—that they are just a chemical mutation—that doesn't build self-esteem."

— Nigel McQuoid (2001), Headmaster of Emmanuel College

"Modern thinking centers around the premise that man is just the product of a pointless natural process—undirected evolution. This very widely taught doctrine, when taken to its logical conclusion, leads us to believe that we are just meaningless 'bags of molecules', and in the last analysis—nothing matters. It is for this reason that the overwhelming majority of youth who start out with a belief that there is more to life than mere chemistry, will lose faith while at college."

— John Sanford (2005), *Genetic Entropy and the Mystery of the Genome* [2]

"The implications were fairly horrifying when it came to man's place in this Darwinian world. Higher purpose was gone. And what of the soul? Only men had souls, it was said, but if humans shared a legacy with apes and sharks and slugs, did that leave room for a soul? For an afterlife? The logic of Darwin suggests that human existence is nothing more than a happy accident brought about by blind chance."

— Edward Humes (2007), *Monkey Girl: Evolution, Education, Religion, and the Battle for America's Soul*

"It is a common assumption of religious faith that, without God, life is essentially meaningless and purposeless, with human beings condemned to the depressing and uninviting prospect of the compost heap."

— Michael Palmer (2013), *Atheism for Beginners* [3]

"Leaving aside security as a motive for grabbing territory, opportunistic expansion is a core principle of power politics. Just as nature abhors a vacuum, great powers — motivated by an irresistible temptation to cash in on an opportunity to make gains relative to their competitors — move quickly to fill power vacuums with their own influence."

— Randall Schweller (2014), *Maxwell's Demon and the Golden Apple* [1]

"God can never be dead, because he's never existed."

— Patrick Fergus (2014), response to query: in what year did Nietzsche declare that 'god is dead?' (V|2:45-) in "History of Atheism | Timeline", Atheism Reviews, Nov 5

"We are not taught the problems with evolution, naturalism and materialism; we are simply taught the big bang is fact. We and our children are taught that there is no divine lawmaker, and therefore, there is no absolute law or morality. And we wonder why our kids act like animals today."

— Mirza Beg (2014), Beg-Thims discussion (#69), Jul 12

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2. Sanford, John C. (2005). *Genetic Entropy and the Mystery of the Genome - the Genome is Degenerating* (pg. ix). Lima, New York: Ivan Press.
3. Palmer, Michael. (2013). *Atheism for Beginners: a Coursebook for Schools and Colleges* (pg. 164). Lutterworth Press.
4. Schweller, Randall L. (2014). *Maxwell's Demon and the Golden Apple: Global Discord in the New Millennium* (pg. 88). JHU Press.
5. (a) Clines, Francs X. (1999). "Capitol Sketchbook: in a Bitter Culture Ware, an Ardent Call to Arms" (Ñº), *New York Times*, Jun 17.
(b) Tom DeLay – Wikipedia.
(c) Musolino, Julien. (2015). *The Soul Fallacy: What Science Shows We Gain from Letting Go of Our Soul Beliefs* (foreword: Victor Stenger) (pg. #). Prometheus.

θΔics

In hmolscience, **God void 2** is

→ God void (mobile; readable; NON-editable)
→ God void (online; readable) – WayBack (2017)
→ **God void** (hacked; Non-readable)

θΔics

In hmolscience, **God vs Gibbs**, or "Gibbs vs God", depending, i.e. depending on whom one considers to be on trial, i.e. God (or belief in the existence of God) or American engineer Willard Gibbs (or belief that chemical thermodynamics has the power to explain the human condition), refers, generally, to the debate about whether or not the thermodynamics-based science of work, heat, energy, and power is or is not going to be able to replace the age-old religious-based notions of "divine" (or spiritual) work, energy, and power believed colloquially, in deeply-held convictions, to underlie and direct human nature, and, more recently, to the underlying tension of the Rossini debate (2006-present).

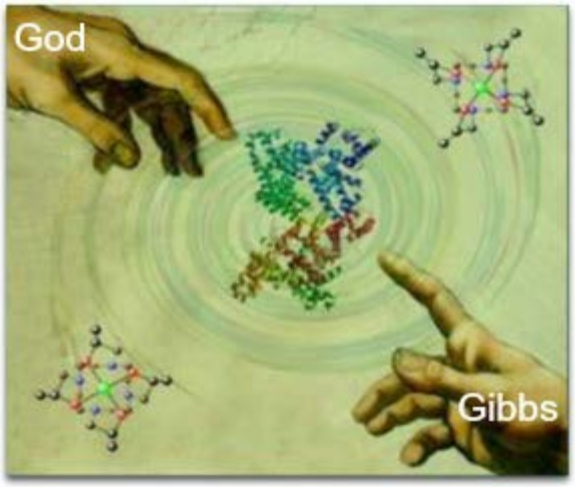

An illustration of the **God vs Gibbs** debate (see: Rossini debate), the illustration—labeled with the names "God" and "Gibbs", respectively—from the 2013 article "Chemical Formula of a Human", on the independent human molecular formula work of American scientists Robert Sterner and James Elser (2000) and Libb Thims (2002), pointing out the inherent conflict in regards to the origin of life issue, as to whether power or energy of God created life (see: clay creation myth) or alternatively whether "life" is something that does not exist (see: defunct theory of life and life terminology upgrades), a religio-mythology ingrained fiction of the mind so-to-say, and that concordantly scientifically-defined "power" or "energy" synthesized humans from the elements, via the cyclical action of heat, according to the nebular hypothesis, according to which Gibbs energy, NOT God's energy , is the governing faction, or rather driving force, behind the goings on behind human social processes and evolution. [1]

Overview

Historically, the God vs Gibbs debate has its precursors in the various and numerous 19th and 20th century energy and entropy vs religion debates (see: religious thermodynamics); as are well documented by historian Helge Kragh, in his 2008 *Entropy Creation: Religious Contexts of Thermodynamics and Cosmology*.

In 1987, Pakistani organometallic chemist Mirza Beg, in his *New Dimensions in Sociology: a Physio-Chemical Approach to Human Behavior*, was selling a "God's will IN Gibbs energy" model of sociology.

In 2006, the first semblance of the God vs Gibbs debate, i.e. a "Gibbs energy usurping Gods energy" implicit debate, erupted in the *Journal of Chemical Education*, aka the Rossini debate, following American chemist Harold Leonard's *Journal of Chemical Education* suggestion that American physical chemist Frederick Rossini's 1971 "Chemical Thermodynamics in the Real" reasoning, i.e. human chemical thermodynamics (or physicochemical humanities) formulations, might help us "find a formula for fighting terrorism, while preserving civil liberties", in a post 9/11 world. The a proposition was vehemently objected to specifically by American Christianity-believing physical chemist John Wojcik (Dec 2006), who inflamed the debate into subsidence.

In 2013, the Spanish journal *Triple≡Bond Chemistry* (triplenlace.com), in their "Chemical Formula of a Human" (Spanish → English), published a discussion on the religious-overthrowing implications of human molecular formulas, citing the Sterner-Elser molecular formula (2000) and Thims human molecular formula (2002), with an image, shown adjacent, of a Michelangelo-inspired rendition of the hand of God (or Gods energy) reaching down and giving "life" to DNA, or some type of enzyme or protein molecule, shown opposed to the hand of Willard Gibbs (or Gibbs energy) reaching up and taking away the concept of life (or theory of life) from the domains of morality, meaning, and sense of purpose (see: defunct theory of life and life terminology upgrades).

In short, the trend seems to have occurred that, despite Friedrich Nietzsche's famous 1882 aphorism, god certainly is not yet completely dead, certainly not amid the general populous, percentages varying per country (see: existence of god), nor among the minds of elite scientists (see: belief in the existence of god by scientists), and that the battleground for the "war on god" is something occurring between physical scientists and or physicochemical scientists, found amid the equations of chemical thermodynamics applied to the humanities, and the formulas derived therefrom, applied to the deeper questions of freedom, security, liberty, and the pursuit of happiness.

In 2014, American electrochemical engineer and extreme atheist Libb Thims, author if *Human Chemistry* (2007) and Pakistani organometallic chemist and theist Mirza Beg, author of *New Dimensions in Sociology: a Physio-Chemical Approach to Human Behavior* (1987), engaged into public debate (see: Beg-Thims dialogue) on the physicochemical

reformulation of religion; at the end of which Beg would not recant in his belief that the will of Allah underlies the the driving force of Gibbs energy behind all chemical reactions, atomic reactions to human chemical reactions.

Etymology

The term "God vs Gibbs" and labeled God's hand vs. Gibbs' hand diagram were first used in the 9 Sep 2014 editing changes of the Rossini debate article as a way to state, in simple terms, the inherent or rather underlying nature of the debate, specifically the supposed "dangers" existive in premise of "chemical thermodynamics having the power to explain the human condition", and the concordant effort to use this logic to help "find a formula for fighting terrorism, while preserving civil liberties", as suppositioned by American chemist Harold Leonard (Jan 2006).

God vs Clausius

An alternative title, for this article, might very well be "God vs Clausius" or "God vs Carnot", the following quotes being evidence to this:

> "He was a practical electrician fond of whiskey, a heavy, red-haired brute with irregular teeth. He doubted the existence of a Deity but accepted Carnot's cycle, and he had read Shakespeare and found him weak in chemistry."
>
> — H.G. Wells (1906), *The Door in the Wall, and Other Stories*, Lord of the Dynamos [2]

> "Clausius and Darwin cannot both be right."
>
> — Roger Caillois (1973), *Coherences Aventureuses* [3]

These, to note, are both akin to the more common "God vs Darwin", felt commonly or rather over abundantly in the popular debate forums (Ñº), i.e. Clausius underlies Darwin, but the ramifications and details of this have not yet completely been worked out, being that, to the less-informed populous, i.e. less-informed in respect to knowledge of physical chemistry and chemical thermodynamics, the state function formulation of "heat" differentials, known colloquially as "entropy", has played center stage in most thermodynamics vs religion debates in the last century and a half; much of which, during the years 1860 to 1920, is well-documented in Helge Kragh's 2008 *Entropy Creation: Religious Contexts of Thermodynamics and Cosmology*. [5]

Entropy, however, is not the thermodynamic potential of social systems, but rather Gibbs free energy is. Subsequently, the Gibbs vs God debate is more subtle, something tending to be "felt" by the trained physicist, chemist, and or engineer. The question of whether the Gibbs energy, e.g., in the form of bond energy, say in a marriage bond, the birth of one's first child often times being the best memory of one's existence, is God-derived or simply a product of fermion-boson interactions, leads many hardened scientists into deep questions about their underlying belief systems (see: Moriaity-Thims debate, as a case in point).

Quotes

The following are related quotes:

> "Turning now to the proposed booklet you have sent me, correct me if I am wrong, but it appears to make the assertion that the new 'God' or purpose of mankind is a form of the Gibbs function, i.e. that science has disproved the God of old as envisaged so far by humankind."
>
> — John Bryant (2011), review commentary on Libb Thims' draft manuscript *Purpose? (in a Godless universe)* [4]

See also

â— Turnover rate | Religious section

References

1. (a) Sterner, Robert W. and Elser, James J. (2002). *Ecological Stoichiometry: the Biology of Elements from Molecules to the Biosphere* (chapter one) (human molecule, empirical formula, pg. 3; discussion, pgs. 47, 135). Princeton University Press.
(b) Thims, Libb. (2008). *The Human Molecule*, (preview) (Google Books). Morrisville, NC: LuLu.
(c) Vallejo, Jose. (2013). "Fórmula química del ser humano" ("Chemical Formula of a Human") (Spanish → English), Triplenlace Quimica, i.e. Triple≡Bond Chemistry (triplenlace.com), Sep 4.
2. (a) Wells, H.G. (1906). *The Door in the Wall, and Other Stories*, Lord of the Dynamos, Chapter 7; *The Daily Chronicle*, Summer No. July 14th.
(b) Gaither, Carl C. and Cavazos-Gaither, Alma E. (2002). *Chemically Speaking: a Dictionary of Quotations* (pg. 125). CRC Press.
3. (a) Caillois, Roger. (1976). *Coherences Aventureuses*. Paris: Gallimard.
(b) Thaxton, Charles B., Bradley, Walter L., Olsen, Roger L. (1992). *The Mystery of Life's Origin: Reassessing Current Theories*, (ch. 7: "Thermodynamics of Living Systems", ch. 8: "Thermodynamics and the Origin of Life"). Lewis and Stanley.
(c) Bushev, Michael. (1994). *Synergetics: Chaos, Order, Self-organization* (pg. 130). World Scientific.
(d) Prigogine Ilya, (1981). *From Being to Becoming: Time and Complexity in the Physical Sciences*. San Francisco: W.H. Freeman and Co.
4. (a) Bryant, John. (2011). "Review of Libb Thims' draft manuscript *Purpose? In a Godless Universe*" (pdf) (quote, pg. 2), email communication, Jun 7.
(b) Thims, Libb. (2011). *Purpose? (in a Godless universe)*. (94-pg manuscript) (unfinished) (quote, pg. vii); Online as 105-page unfinished manuscript (14 Apr 2013). IoHT publications.

θΔics

In religio-mythology, **god-to-prophet** is a god reduction technique, employed prominently by Hebrew theologians, wherein previously defined "gods" and goddess, e.g. Ra, Isis, Osiris, are rescripted into the literary guise of being famous patriarch-like humans, e.g. Abraham, Sarah, Moses, etc., who tended to be described as being in close communication with the divine.

Overview

In c.500BC, Hebrew theologians, most of whom were senior Egyptian priest-teachers called "Choens" (Herodotus, 450BC), in efforts to make a reformed stable monotheism out of the extant henotheism of the dominate cultural milieu, instead of jettisoning all the main gods, such as attempted by Akhenaten (c.1335BC), rescripted the creation story to the effect that the main gods and goddess became human prophets and leaders in story form; the following table, third column, shows the six main Jewish god-to-human rescripts: [2]

	Egyptian (3100BC)	**Hindu** (800BC)	**Jewish** (300BC)	**Christian** (300AD)	**Muslim** (700AD)
Nile	Nun	VishNu / MaNu	Noah	Noah	Nuh
Earth	Atum	Atman / Adimo	Adam	Adam	Adam
Milky Way	Hathor		Eve	Eve	Hawa
Sun	**Ra**	**Brahma**	Abraham	Abraham	Ibrahim
Sirius	Isis	Saraswati	Sarah	Sarah / Mary	Sara / Maryam
Orion	Osiris	Krishna	**Moses**	**Jesus**	Musa

In 1858, Samuel Dunlap, in his *Vestiges of the Spirit of Man*, citing Franz Movers, who in his *The Phoenicians* (1841) discusses the mingling and mixing of Greek and Egyptian myths in Phoenicia (c.1100-300BC), stated that the Hebrews were the first to turn the ancient sun gods into patriarchs, therein mediating a de-deification or god reduction: [1]

> "In this way antiquity disposes of its sun-gods. The **Hebrews turned [the gods] into Patriarchs**. Adam, Abraham, Israel, were names of Saturn. Edom is Adam; and the ancient usage was to name the nation, the land or city after the chief god. The Greeks made these deities founders of tribes."

A coded literary tool, often employed in the Old Testament, to signify that a god or goddess has been rescripted into the form of a human character, is the description that god has instructed the said person to change their name, e.g. Abram → Abraham (Genesis 17:13-6), Sarai → Sarah (Genesis 17:15-16), or Jacob → Israel (Genesis 32:26-30).

Quotes

The following are related quotes:

References

1. (a) Movers, Franz C. (1841). *The Phoenicians: Investigations on the religion and deities of the Phoenicians with regard to the murdered Cult of the Carthaginians, Syrians, Babylonians, Assyrians, the Hebrews and the Egyptians, Volume One* (*Die Phonizier, Volume One*) (86, 130) (arc). Publisher.
(b) Franz Karl Movers – Wikipedia.
(c) Dunlap, Samuel F. (1858). *Vestiges of the Spirit History of Man* (Israel, pg. 53). Publisher.
2. Thims, Libb. (2019). *Human Chemical Thermodynamics: Chemical Thermodynamics Applied to the Humanities – Sociology, Economics, History, Philosophy, Ethics, Government, Politics, Business, Religion, and Relationship* (pdf) (table, pg. 14). Publisher.

External links

â— Name changes in the Bible – GodWords.org.

θΔics

In existographies, **Godfrey Higgins** (1772-1833) (IQ:175|#268) (RMS:49|155+) (CR:23) was an English lawyer, religious historian, and mythologist, noted for []

Influence

Higgins was influential to Alvin Kuhn.

Education

In 2004, Tom Harpur, summarized Higgins education as follows: [2]

> "Higgins, whose father was a 'gentleman of small, though independent, fortune', went to Trinity Hall, Cambridge. He had grounding in Greek and Latin and early on wrestled with the works of Euclid, John Locke's *On Understanding*, and the writings of Varro, Macrobius, and Cicero. He preferred the philosopher Epictetus to the Greek poets, and he gained familiarity with an impressive range of other possible he turned his attention to the 'evidence upon which our religion was founded', and was both shocked and intrigued by what he discovered."

(add)

Quotes

The following are noted quotes:

> "One thing is clear — the mythos of the Hindus, the mythos of the Jews and the mythos of the Greeks **are all at bottom the same**; and what are called their early histories are not histories of humankind, but are contrivances under the appearance of histories to perpetuate doctrines."
>
> — Godfrey Higgins (c.1830), *Anacalypsis*

> "I came to a resolution to devote six hours a day to this pursuit for ten years. Instead of six hours daily for ten years, I believe I have, upon the average, applied myself to it for nearly ten hours daily for almost twenty years. In the first ten years of my search I may fairly say, I found nothing which I sought for; in the latter part of the twenty, the quantity of matter has so crowded in upon me, that I scarcely know how to dispose of it."
>
> — Godfrey Higgins (c.1830), *Publication* (Q)

> "Almost all of the latter part of my life has been spent unlearning the nonsense I learned in my youth."
>
> — Godfrey Higgins (1833), *Anacalypsis, Volume One* (pg. x); cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 200)

> "Let me not be called a wicked atheist for seeing the likeness between Brahma and Abraham; for what says the learned Joseph Hager [1801]: 'As the Indian alphabets are all syllabic, and every consonant without a vowel annexed is understood to have an A joined to it, there is no wonder if from *Abraham* was made Brahma; and thus we see other Persian words in the Sanskrit having an *a* annexed as *deva* from *div*, *appa* from *ab*, *deuda* from *deud*, etc.'"

— Godfrey Higgins (1833), *Anacalypsis, Volume One* (pg. 391) [1]

"One thing is clear—the Mythos of the Hindus, the Mythos of the Jews, and the Mythos of the Greeks, are all, at the bottom, the same; and what are called their early histories are not the histories of man, but are contrivances under the appearance of histories, to perpetuate doctrines, or perhaps the history of certain religious opinions, in a manner understood by those only who had a key to the enigma. Of this we shall see many additional proofs hereafter. The histories of Brahma, of Genesis, and of Troy, cannot properly be called *frauds*, because they were not originally held out as histories; but as the covers for a secret system. But in later times they were mistaken for history, and lamentable have been the effects of the mistake. The history of Lazarus in the Gospel is not true, but it is not a fraud."

— Godfrey Higgins (1833), *Anacalypsis, Volume One* (pg. 441); cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 30)

References

1. (a) Hager, Joseph (1801). *Dissertation on the Newly Discovered Babylonian Inscriptions* (Abraham, 5+ pgs; quote, pgs. 9-10). London.
(b) Higgins, Godfrey. (1833). *Anacalypsis: an Attempt to Draw Aside the Veil of the Saitic Isis: Or an Inquiry Into the Origin of Languages, Nations and Religions, Volume 1* (Abraham, 49+ pgs; Brahma, 50+ pgs; Brahma and Abraham [Hager], pg. 391). Longman, 1836.
2. Harpur, Tom. (2004). *The Pagan Christ* (pg. 199). Thomas Allan Publishers.

Further reading

● Higgins, Godfrey. (1833). *Anacalypsis: an Attempt to Draw Aside the Veil of the Saitic Isis: Or an Inquiry Into the Origin of Languages, Nations and Religions, Volume 2* (Abraham, 50+ pgs; Brahma, 13+ pgs). Longman, 1836.

External links

● Godfrey Higgins – Wikipedia.
● Anacalypsis – Wikipedia.

θΔics

In religio-mythology, **gods** (TR=697), or "deities", as compared to "God" (or the deity), in a monotheistic (mono-ergonic) belief system, aka religion, refers to one or a number of deities or supernatural beings in a polytheistic (poly-ergonic) belief system.

Quotes

The following are related quotes:

> "The universe, that is the all, is made neither of **gods** nor men, but ever has been and ever will be an eternal living fire, kindling and extinguishing in destined measure."
>
> — Heraclitus (c.470BC) [1]

References

1. References

1. (a) Heidegger, Martin and Fink, Eugen. (1967). *Heraclitus Seminar* (translator: Charles Seibert) (pg. 56). Northwestern University Press, 1979.
(b) Stokes, Philip. (2002). *Philosophy 100: Essential Thinkers* (pg. 15). Enchanted Lion Books.

External links

- Deity (Gods redirect) – Wikipedia.
- Names of god – Wikipedia.
- God (word) – Wikipedia.
- God – Wikipedia.

θΔics

In terminology, **God's energy** refers to "energy", either of a conceptualized metaphysical or supernatural kind or energy of the physical kind, conceptualized as God-directed, God-infused, or the embodiment of god, or something along these lines; the antonym of which is Gibbs energy.

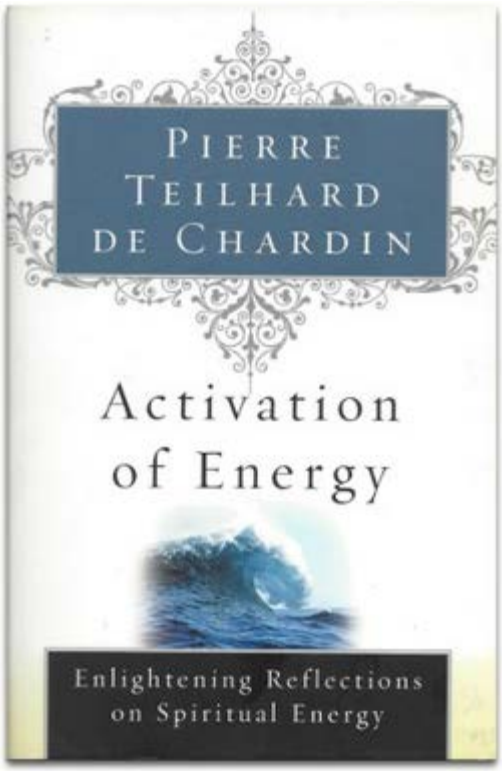

French physical chemist and priest Pierre Teilhard's posthumously published 1976 *Activation of Energy: Enlightening Reflections on Spiritual Energy*, where he attempts an upgrade formulation, of religion restated in the guise of science, akin to Gottfried Leibniz' "monads", or monadology, mixing "spiritual" talk, e.g. spirit-matter or spirit-energy, in with physical chemistry, in argument. [1]

Overview

God's energy, in short, as contrasted with Gibbs energy, refers to any number of new age types of syncretisms of "energy", as defined by science, and "power", or energy per unit time, conceptualized as the "will of God" or "design of God", etc., all tending to be of In religio-mythology origin, as defined by religion, or a mixture of religion and science.

Earlier depictions of God's energy, so to say, might include Egyptian pharaoh Akhenaten's 1336 BC depictions of the solar deity Aten with the rays of sun stylized as the hands of god. The lightning bolts of Zeus might also have some type of Gods energy conceptualization to them.

In modern days, the new age theories about the energy or power of God would seem to number into the 100s, some becoming extremely abysmal, such as when ontic opening arguments, e.g. the use of Heisenberg uncertainty principle or zero point energy, etc., are mixed into the picture.

Into the late 20th century, beginning generally with Ilya Prigogine's 1972 statement that the free energy function, Helmholtz free energy function in particular, is not applicable to the explication of social organizations, chemical thermodynamics and "god talk" began to become intermixed in a subtly incongruent manner (see: human free energy). The most conspicuous of these is Indian-born Pakistani organometallic chemist Mirza Beg's 1987 assertion that God's energy (or Allah's energy) underlies Gibbs energy and thereby mediating his will via the chemical thermodynamics operations of humans, albeit in such a way that fall-back citation to Quranic proscriptions are mandatory in all questions of morality and right and wrong.

Teilhard

A few sharp attempts, amid abysmal attempts, at mixing God and energy together exist. Among these, the work of French physical chemist and priest Pierre Teilhard is one of the better examples. Teilhard's 1936 book *The Phenomena of Man*, attempts to mix energy theory (physical chemistry), evolution theory (Darwinian logic), and god theory together (teleology), producing a rather intricate argument. Teilhard's ideology, in overview, was such that "everywhere he saw God's energy at work and a design that evolved toward fulfillment through Christ the son … [towards omega point]." (Q)

Teilhard's writings, to note, are very dense and deeply stitched. On "force", wherein when a force moves an object through a distance the result is a measure of "energy" (or work), and "heat" (or fire), Teilhard has the following to say:

> "I am far from denying the destructive and disintegrating forces of passion. I will go so far as to agree that apart from the reproductive function, men have hitherto used love, on the whole, as an instrument of self-corruption and intoxication. But what do these excesses prove? Because fire consumes and electricity can kill are we to stop using them? The feminine is the most formidable of the forces of matter. True enough. "Very well, then," say the moralists, "we must avoid it." "Not at all," I reply, "we take hold of it." In every domain of the real (physical, affective, intellectual) *"danger" is a sign of power*. Only a mountain can create a terrifying drop. The customary education of the Christian conscience tends to make us confuse tutiorism with prudence, safety with truth. Avoiding the risk of transgression has become more important to us than

> carrying a difficult position for God. And it is this that is killing us. "The more dangerous a thing, the more is its conquest ordained by life": it is from that conviction that the modern world has emerged; and from that our religion, too, must be reborn."
>
> — Pierre Teilhard (1934), "The Evolution of Chastity" (1934), as translated by René Hague in *Toward the Future* (1975) (Q)

Here we see the inherent difficulty in dismissing the writings and arguments of Teilhard as "bunk", which tends to be easy to do with the run-of-the-mill "Gods energy" theorists.

On energy, Teilhard has the following to say: (Q)

> "The universal energy must be a thinking energy if it is not to be less highly evolved than the ends animated by its action. And consequently ... the attributes of cosmic value with which it is surrounded in our modern eyes do not affect in the slightest the necessity obliging us to recognize in it a transcendent form of personality."

Teilhard, as summarized by Joseph Ratzinger, later Pope Benedict XVI, "looks on Christ as the energy that strives toward the noosphere and finally incorporates everything in its 'fullness'." (Q) Again, we see, the difficulties associated with Teilhard classification.

God-based human free energy theories

South African chemical physicist Adriaan de Lange (1982) and Pakistani organometallic chemist Mirza Beg (1987) are two examples of thinkers who conceptualized the free energy of chemical reactions as applying to the governance of reactions between people, albeit conceptualized as being an energy, power, force or spirituality governed by God, the Christian "God", i.e. the father of Jesus Christ, in de Lange's case, and the Islamic god "Allah", in Beg's case. These, in short, are God-based human free energy theories.

Inanity | Quotes

The following are a few, haphazard, randomly picked, illiterate examples of term usage quotes:

> "**God's energy** is transmuted directly to us through the power of their radiation. We can understand this more completely by taking a scientific example. Newton's law of thermodynamics tells us …"
>
> — Andrew Vidich (2008), *Light Upon Light* (Q)

> "Not only do missional churches tap into the unlimited supply of **God's energy** source, they produce energy. According to Brian McLaren, ... ministry begun, and every new church started, the first law of thermodynamics is broken. New energy is…"
>
> — Milfred Minatrea (2012), *Shaped By God's Heart* (Q)

> "... better to connect to **God's energy** source (infinite) than to humanity's energy source (nonexistent). ... The second law of thermodynamics is equally interesting, and again reveals something of spiritual importance. This law, known as the law of..."
>
> — Richard Swenson (2014), *More Than Meets the Eye* (Q)

References

1. Teilhard, Pierre. (1976). *Activation of Energy: Enlightening Reflections on Spiritual Energy*. Harvest Books.

θΔics

In mononyms, **Goethe** [CR:1208] tends to refer to the surname of German polyintellect Johann Goethe (1749-1832); or in some discussions to his related family (see: Goethe genealogy)

A stack of books of famous German authors at the 2006 Walk of Ideas, books size representative of author influence, stacked loosely according to a mixture of rank and possibly chronology: with the name **Goethe** at base.

See also

- Goethe and chemistry
- Goethe meets Napoleon

  - Goethe on free will
  - Goethe on god
  - Goethe on good and evil
  - Goethe on love
  - Goethe on purpose
  - Goethe on religion
  - Goethe on the soul

- Goethe timeline
- Goethe's advertisement
- Goethe's affinity table
- Goethe's collected works
- Goethe’s daimonic
- Goethe's human chemistry
- Goethe (pronunciation)
- Goethe quotes
- Goethe-Helmholtz equation
- Goethean philosophy
- Goethean revolution
- Goethendipity

Other

The following, from the from the Dawkins scale, is a 2011 employed "Goetheanist" definition:

> **Goetheanist**
> **Humans** are evolved chemicals
> **Morality** is based on the laws of physical chemistry

(add)

Publications

- Positions of Rights | 1771
- Faust | 1806/1829
- Elective Affinities | 1809

θΔics

In pronunciations, **Göethe** (GU(R)-tuh) (audio), aka "Göthe" (Buckle,1651), of German polymath Johann Goethe, the latter shown with no accent on the “o”, is a complex and difficult name to render in the English tongue, the result of the fact that the German alphabet is an extended Latin alphabet consisting of 30 letters – the same letters that are found in the basic alphabet plus four extra letters: three letters with diacritics: Ä/ä, Ö/ö, Ü/ü, and one ligature: ß/ß called *eszett* (sz) or *scharfes S*, sharp s. [1] Hence, German-to-English translation of Göethe:

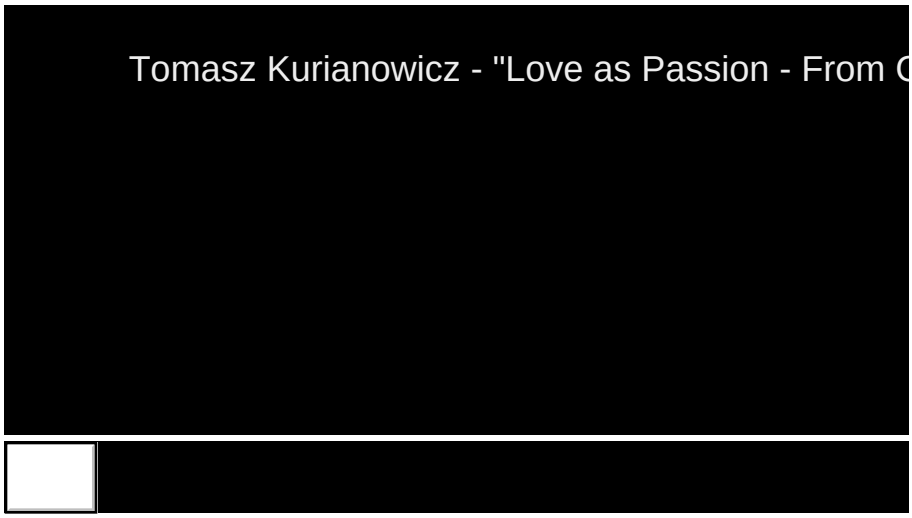

Left: the letter Ö, on a boundary stone at the border between Austria and Germany, such as found in the surname “Göethe”, wherein languages that do not have the letter as part of the regular alphabet (such as English), the O-umlaut, the double dots above the letter (ö), is frequently replaced with the digraph "oe", thus rendering the name as "Goeethe" (English). Right: German Tomasz Kurianowicz discussing Goethe, to hear example pronunciation.

> Göethe → Goethe

The “ö”, or umlaut (double dots), is lost, or if kept in the name, not a symbol recognized to the English speaker, especially the American speaker.

Overview

In 1894, American poet John Spollon stated the following about pronunciation: [5]

> “Goethe, whose name in charity to young pronouncers should be spelled Getty, was the father of affinity. If there is a more dangerous combination than a woman, a kerosene can and damp kindlings, it is a poet, an inquiring mind and the science called Chemistry. While tinkering with the science in an amateur way. Getty, the German Shakespeare, discovered, what every chemist knew, that there are certain atoms that possess elective affinities for certain other atoms; that is, they were intended by Nature to meet with and adhere to each other, forming a perfect whole.”

In 2006, Irish-born, English-educated, Australian aesthetics theorist John Armstrong, in his “Note on Pronunciation”, an introduction page to his *Love, Life, Goethe*, gave the following well-rounded look at some of the issues, for non-German speakers, in attempts to render the name of Goethe: [2]

> “Goethe’s name is something of a problem. At least for English speakers it raises a tricky issue of pronunciation.
>
> Growing up in Glasgow I occasionally heard of a German writer called ‘Go-th’. It’s not a bad attempt and carries interesting resonances: Gothic architecture and the Goths—always linked with Vandals and Huns.

> My mother sometimes spoke of someone called ‘Gerter’ or ‘Gerder’—tentatively acknowledging the ‘otherness’ of the name. It has no ‘r’s’ in it so perhaps, by the perverse logic of a foreign tongue, you stress them precisely because they’re not there. It does sound quite Germanic. My mother is the perfect audience for the Dublin building-site joke:
>
> A new construction worker is a bit confused and asks: ‘Joist? Girder?’ What’s the difference?’ The foreman patiently explains: ‘Joist wrote *Uylsses*, Girder wrote *Faust*.’
>
> I was still following the construction-site usage when I happened to mention Goethe while teaching English as a foreign language. A German student assumed I was talking about someone he hadn’t heard of until I commented that, of course, the writer’s best-known work was *Faust*—at which point he said: ‘Oh, you mean “Goo-t’i”.’ (Say ‘oo’ while thinking intently about the letter ‘r’; the ‘I’ is weak, as in ‘it’).
>
> ‘Goo-t’i’ it is: in my opinion less pleasant than some of the mispronunciations. It’s an additional, if perhaps minor, obstacle to the reception of the man and his work. I still feel anxious when I mention his name to people who have heard of *Faust* but are entirely unsure who this ‘Goo’ person might be.
>
> Although this is the settled modern pronunciation, it was not such a clear-cut matter in Goethe’s own day. There is a letter by the lovely Caroline Flachsland, who later knew Goethe very well, referring to ‘Gede’—a young poet (Goethe) all her friends were talking about. So they must have been pronouncing the great man’s name in a way that would upset today’s sophisticates.”

In 2010, American blogger Michael Kelleher gave the following account of the first time he heard Goethe’s name spoken: [4]

> “I remember the first time I heard Goethe's name spoken aloud. I had a professor in college who taught modern American drama. The class was comprised of two elements: long, tedious theater anecdotes and unexplained references to figures, works, and ideas that no one in the class knew a thing about. I was that kind of generous spirit that assumed the teacher was not just an ostentatious prick but rather a caring soul who wanted us to learn something on our own, so when I heard a reference I did not understand, I would go look it up, thinking it might give me a better understanding of what we were talking about in class. It rarely did, though it at least let me know when he was just showing off, which was often.
>
> Anyhow, I can remember a whole class, I think it was on Eugene O'Neill, in which he dropped the name *Faust* into the discussion several times without ever telling us who this Faust was or what he had to do with Eugene O'Neill. And then he kept saying the name of the author, "Gurta". Gurta said this. Gurta said that, and so on. Well, I kept going to the library to look up Gurta, but there was no such author that I could discover. When I looked up Faust, I saw the name "Goethe," but the lack of an 'r' in the name threw me off the scent. I have a memory of it taking me a long time to put two and two together, but it might not have been that long. Memory is funny that way.”

In 2010, American electrochemical engineer Libb Thims, published his million+ viewed “Smartest Person Ever”, a four-part video series on YouTube, Goethe ranking at #1, in the original making of which, Thims pronounced his name as “Goat-ah”, which quickly came under correction-attack in the threads; some examples of which are as follows: [3]

> “In addition to these mispronunciations: "Goat-a?" Who the hell is "Goat-a"? I think it's pronounced closer to something like "Gerta".”
>
> — turtlecasserole (2011), in reply to fecesfeces9, May

“No doubt Goethe can be called the smartest human ever. He is also one of the most influential. However, why can't the producer of this video learn how to pronounce this great genius' name. Please check out what the two little dots above the "o" do to the sound of that vowel.”

— 1Victorinus (2011), Aug

“Do you realize that you are pronouncing Goethe incorrectly?”

— 1anero (2012), May 2

“He's doing pretty well of course he can't pronounce "ö" properly at least he's trying.”

— probaner92 (2012), in reply to 1anero, May 4

A 2013 Goethe **pronunciation** argument (Q), in part three of the smartest person ever video.

“GOAT-uh? What in the hell? Someone who claims to be in the position to discuss intelligence has no better sense than to pronounce Goethe as GOAT-uh?”

— Chase Kimball (2012) (Q)

“It's not GU(R)-tuh, but Götuh: ö like u in "further.”

— SellusionStar (2012) (Q)

“Goethe is pronounced something more like '**Ger-ta**' than the pronunciation 'Go-the' used.”

— aucourant (2016), comment (Q) on “IQ 200+ | Smartest Person Ever (4 of 4)”, Jun 23

(add discussion)

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Audio pronunciations

- Goethe (audio) – GoetheSociety.org.

θΔics

In human chemistry, **Goethe affinity table** is an affinity table, argued to have been constructed by German polymath Johann Goethe in *circa* 1808, a reconstruction of which is shown adjacent, in which the reactants (top row), on the table, were the characters in the 1809 novella *Elective Affinities*, and where the new species (new reactants) introduced into the system (estate), chapter by chapter, are those listed *below* each header reactant (top row), per column, listed via descending affinity force preference (or human free energy measure, in modern terms; see: free energy table), according to the laws of affinity (laws of thermodynamics, in modern terms); those individuals with the weakest elective affinity to the header reactant (top row), listed at the bottom of the table.

Synopsis

The following shows the basic synopsis of what Goethe had in mind when he made his conceptual human affinity table, i.e. he took the basic logic of Geoffroy's affinity table (1718), in the form of Bergman's affinity table (1875), both of which deriving from Newton's last and final "Query 31", all of which Goethe had absorbed as the new system of nature, and used this basis of reaction of forces to make a conceptual affinity table based on his own relationship experiences, which he re-told in the form of a novella with new character names:

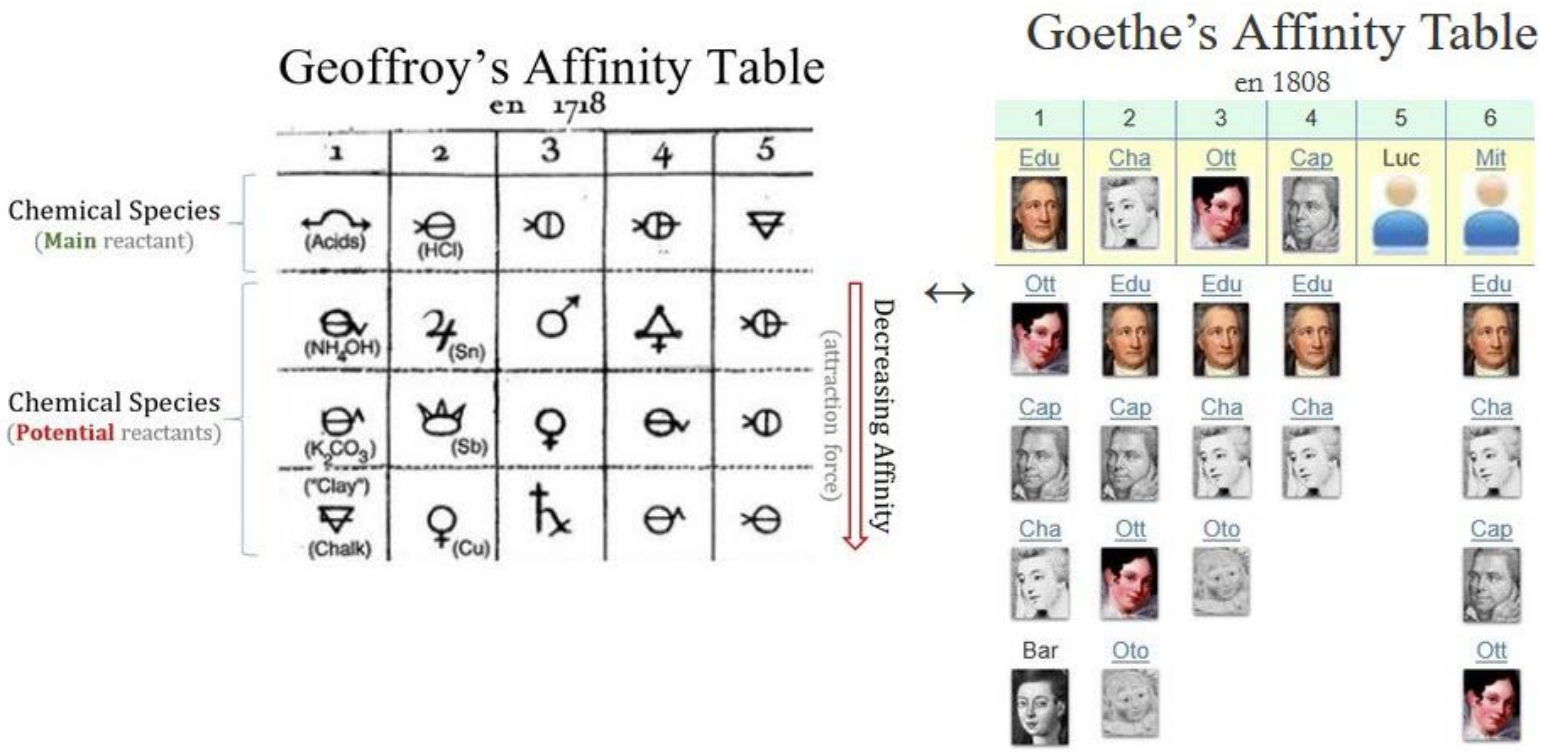

(ass summary)

Overview

Goethe readily admits that his novella was based on the Swedish chemist Torbern Bergman's 1775 affinity table, and accompanying textbook with its sixty-four affinity reaction diagrams:

> "My idea in the new novel *The Elective Affinities* is to show forth social relationships and the conflicts between them in symbolic concentration" (28 Aug 1808) and "the moral symbols in the natural sciences, that of the elective affinities invented and used by the great Bergman, are more meaningful and permit themselves to be connected better with poetry and society (24 Jul 1809)."

The following both affinity tables, themselves, being expanded versions of French chemist Etienne Geoffrey's 1718 affinity table; a table which was itself based on verbal descriptions of affinity reactions in Query 31 to the 1718 edition of English physicist Isaac Newton's *Opticks*.

1	2	3	4	5	6	7	8	9	10	11	12
Edu	Cha	Ott	Cap	Luc	Mit	Cou	Bar	Nan	Ass	Arc	Oto
Ott	Edu	Edu	Edu		Edu	Bar	Cou	Oto	Ott	Ott	Ott

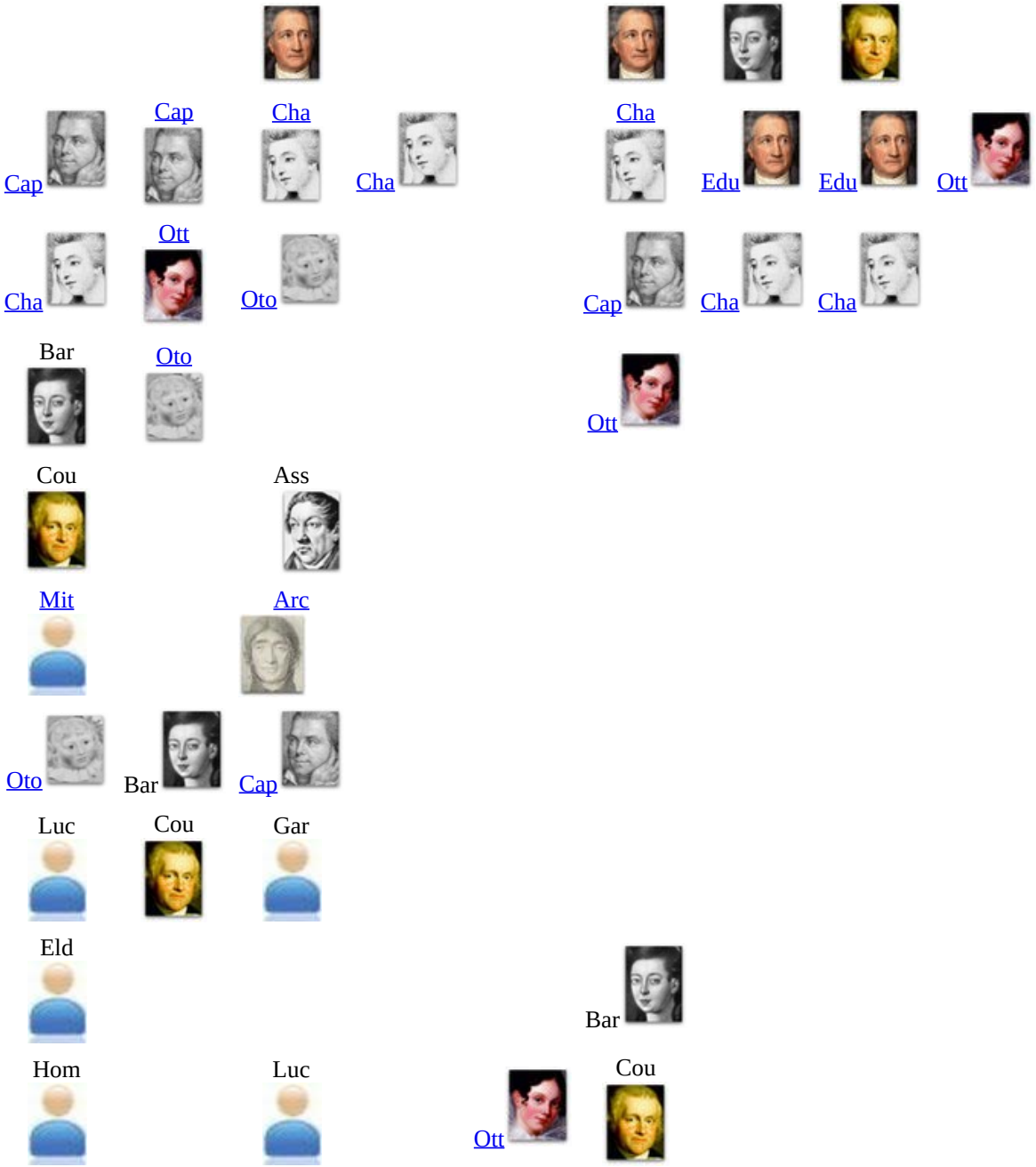

German science historian Jeremy Adler, who did his 1969 PhD dissertation on the chemists and affinity tables used by Goethe in the construction of his novella, argues that there were close to a dozen more chemists and various affinity tables used by Goethe developing the theoretical construct of his novella. [4]

The fact that Goethe, contrary to his usually practice, "destroyed all of his notes and manuscripts" to this novella, as well as all of his correspondences with Christiane Vulpius (1765-1816), during the tumoltuous war years, circa 1806, however, precludes certain verification of his table, but there is no doubt that he at least made one in his mind, if not surely on paper.

Reconstruction

The adjacent table is an improved reconstructed version of Goethe's original human elective affinity table; as originally found as a 11-column, 11-row human affinity table, constructed by American electrochemical engineer Libb Thims, as found in his 2007 textbook *Human Chemistry*, based on affinity reaction descriptions in the novella.

The following are the human chemical symbols used: Eduard (Edu), Charlotte (Cha), Ottilie (Ott), the Captain (Cap), in addition to the symbol assignments: Luciane (Luc), Mittler (Mit), the Count (Cou), the Baroness (Bar), Otto (Oto), the Nanni (Nan), the Assistant (Ass), the Architect (Arc), the Elderly clerk (Eld), Homeless people (Hom), the Gardener (Gar), the Lawyer (Law), the Parson (Par), the Surgeon (Sur), the Englishman (Eng), the Traveling companion (Tra), among others.

In the photos to the adjacent table, the photo of Minna Herzlieb will be assumed to be representative of Ottilie, until further determination can be made (as discussed below). More photos will be added when they are found.

The affinity table works, as described affinity table pioneer Etienne Geoffrey, such that at the head of each column is a header species with which all species below can combine or have a rapport with. The latter are so placed such that any higher species replaces all others lower in the column from their compounds with that at the head of the table. In other words, the species at the head of the table can potentially react with any species below it. All the species below the header species are ranked by chemical affinity preferences relative to the top species, with a higher rank corresponding to a higher affinity tendency. The species at the bottom of each column, for instance, have the least amount of affinity for the header species. If the bottom species is in a weakly bonded relationship with the header species, any species above it can potentially displace it from its attached partner. [8]

To go through one example, in the opening of the novella Eduard (Edu) is bonded in comfortable, but tending towards mundane, marriage to Charlotte (Cha), signified by the bonding Edu=Cha. When Eduard's old friend the Captain (Cap) arrives, however, they rekindle their friendship, and thus act to displace Charlotte from her bond with Eduard. This is described as a single elective affinity reaction:

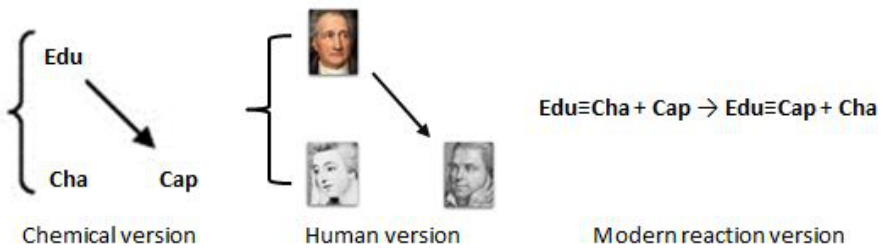

In other words, the Captain has a stronger chemical affinity for Eduard as compared to Charlotte, as represented by her lower position on the affinity table; thus when the Captain is introduced into the mixture (Estate viewed as a closed system, to other reactants) he acts to displace Charlotte from her attachment to Eduard.

Symbols

Goethe assigned the following Bergman-style letter chemical symbols to each character in the novella:

Symbol	Person	Verbal assignment
A	Charlotte	'Provided it does not seem pedantic,' the Captain said, 'I think I can briefly sum up in the language of signs. Imagine an *A* intimately united with a *B*, so that no force is able to sunder them; imagine a *C* likewise related to a *D*; now bring the two couples into contact: *A* will throw itself at *D*, *C* at *B*, without our being able to say which first deserted its partner, which first embraced the other's partner.'
B	Eduard	$AB + CD \rightarrow AD + CB$
C	Captain	'Now then!' Eduard interposed: 'until we see all this with our own eyes, let us look on this formula as a metaphor from which we may extract a lesson we can apply immediately to ourselves. You, Charlotte, represent the *A*, and I represent your *B*; for in fact I do depend altogether on you and follow you as *A* follows *B*. The *C* is quite obviously the Captain, who for the moment is to some extent drawing me away from you. Now it is only fair that, if you are not to vanish into the limitless air, you must be provided with a *D*, and this *D* is unquestionably the charming little lady Ottilie, whose approaching presence you may no longer resist.'
D	Ottilie	

Goethe, however, if he did at first draw this reaction out prior to writing the above paragraph, would have used Cullen's bonding "brackets" and "darts", in his scheme, as the above horizontal style chemical reaction had not yet evolved to that point. These human chemical symbol assignments would then be A = Charlotte, B = Eduard, C = Captain, and D = Ottilie, as pictured above

Eduard

It seems to be obvious that Eduard was Goethe. As Goethe commented to his associate Johann Eckermann, at the end of his life: "I lived every word of my *Elective Affinities*."

Character		Assigned Person	Actual description	Novella description

Eduard (Edu)	=		Johann Goethe (1749-1832)	Comment (circa 1825): “I lived every word of my *Elective Affinities*.”	Wealthy baron in the best years of his life; he follows his instincts.

Charlotte

Goethe's biographer Herman Grimm, in his 1880 *The Life and Times of Goethe*, argues that “in *Elective Affinities*, his put his broken friendship with Frau von Stein was, at last able to receive poetic transformation. [14] The name "Frau von Stein" refers to Charlotte von Stein was rather severe lady who Goethe was married to for ten years around circa 1786, but whom he broke away from and traveled incognito (just as Eduard did in the novella); by the time of the novella, supposedly, Goethe was again on speaking and friendship terms with her.

Character		Assigned Person		Actual description	Novella description
Charlotte (Cha)	=		Charlotte von Stein (1742-1827)	She remained for Goethe an unattainable feminine ideal. [5] Was in a relationship with Goethe, around circa 1786, but from which Goethe was said to have 'broke away from' and traveled incognito.	Eduard breaks away from his marriage to Charlotte, traveling incognito about the world; she is renowned for her aplomb in difficult social situations; she diffuses conflict, smooths over unpleasantness. Previously she tried to fix Ottilie for marriage with Eduard.

David Constantine, English translator of the 1994 Oxford World Classics edition of *Elective Affinities*, likewise argues that Charlotte was based on Charlotte von Stein.

Ottilie

Constantine argues that Ottilie could have been based on one of three people, firstly Christiane Vulpius, a girl from a local flower shop, who became Goethe’s mistress and whom he lived with for eighteen years. Ottilie could also have been Minna Herzlieb who Goethe began to have feelings for, a year after marrying Christiane. As Contantine comments: [2]

> “Goethe wrote a sequence of sonnets for her [Herzlieb]; and it has very often been said that she moved him to write *Elective Affinities* much as Charlotte Buff had moved him to write *Werther*, and that she appears in it as Ottilie.”

Constantine, however, also argues that Ottilie could have been Sylvie von Ziegesar whom Goethe was seeing frequently during his usual summer stay in Karlsbad in 1808. It has also been noted that between 1788 and 1816 Goethe was in love, more or less passionately, more or less intimately, half-a-dozen times at least. [2]

Character		Assigned Person		Actual description	Novella description
Ottilie (Ott)	=		Christiane Vulpius (1765-1816)	A girl from a local flower shop, who became Goethe’s mistress (because of her class), whom he lived with for eighteen years; married her in 1806; bore him five children.	Charlotte's adopted niece from her deceased best friend; sent to boarding school so that she and Eduard could be alone and happy.
	=		Minna Herzlieb (1765-1839)	In 1807, she came to Weimar, where she met Goethe, who presented her with some sonnets; it has been argued that she may have been one of the models for Ottilie. [6] [2]	
	=		Sylvie von Ziegesar (1785-1858)	Goethe was seeing her frequently during his usual summer stay in Karlsbad in 1808; and it has been said she to was the model for Ottilie. [2] She was the subject of Goethe's poem: "To Sylvie von Ziegesar". [7]	

The most-cogent argument for the person behind Ottilie, however, comes from Goethean scholar Hjalmar Boyesen who, in 1879, explained that Ottilie was based on Minna Herzlieb: [12]

> “Goethe’s affair with Minna Herzlieb, the adopted daughter of the bookseller Fromman, in Jena, was a kind of poetic devotion, at

> a time when he was yet bound to another naturally stimulated him to many reflections concerning the nature and validity of marriage, and these reflections, embodied in living characters, furnished the theme of the novel, *Elective Affinities*."

In other words, just as Ottilie was the adopted daughter of Charlotte's deceased best friend, so to was Minna the adopted daughter of one of Goethe's friends, the bookseller Fromman, in Jena, with whom Goethe had developed strong amorous feelings towards. To corroborate, as Goethean historian Calvin Thomas explains: [13]

> "[Toward the end of 1807] to while away the otherwise lonely and tedious winter evenings he resorted to the homes of congenial friends, among whom was the bookseller Frommann. One of the members of the Frommann household was Wilhelmina Herzlieb, a shy girl of eighteen year whom Goethe had known casually for ten years. He liked her very much—more than was 'proper', as he admitted to Zelter some years later—while she seems to have looked up to him with veneration, counting herself blest to be admitted to such choice society."

Therefore, to conclude, the main source for the Ottilie character seems to have been Minna Herzlieb.

The Captain

The 1916 article "Goethe and the Chemists", by Roy House, seems to convincingly indicate that German chemist-physician Wilhelm Buchholz, described as a "prosperous and jovial man of the world" and "genuine scientist", was the Captain based on the fact that Buchholz was lecturing to Goethe in 1798 at the weekly Friday Society meetings on the latest findings in chemistry and that in the novel, the Captain states that he will attempt to explain 'affinity' to Charlotte as he had learned it ten years ago, which coincides with Buchholz last lectures on the latest chemistry to Goethe in 1798 the year of his death.

Character		Assigned Person	Actual description	Novella description
Captain (Cap)	=	Wilhelm Buchholz (1734-1798)	German physician-chemist; part of Goethe's Friday Society at Weimar, where, from from 1791 to 1798, Buchholz presented the latest chemical findings.The death of Buchholz would corroborate with the "ten years ago" (1808 - 10 = 1798) comment by the Captain in the novella, the year when Goethe began to write *Elective Affinities*.	In describing affinity to Charlotte, the Captain comments: "as well as I can from what I learned from reading about it some ten years ago. Whether the scientific world still thinks of it in the same way, or whether it agrees with the latest theories, I cannot say."
	=	Johann Dobereiner (1780-1849)	German chemist; lifelong friend of Goethe's whose weekly lectures he attended. Dobereiner may not have been the Captain, as it seems that Goethe was not acquainted with him until 1810.	A man of knowledge, talents, and ability; presently unemployed, through no fault of his own; becomes a Major after the war; lectures to Eduard and Charlotte on the principles of modern chemistry (chapter four).
	=	Jacob Spielmann (1722-1783)	French chemist; Goethe attended his lectures in 1770-71 at Strasbourg University.	

To note, in 2007 Thims argued that the Captain was likely based on a mixture of Goethe's alter-ego (as some have claimed) and Goethe's lifelong friend German chemist Johann Dobereiner, whose weekly chemistry lectures Goethe attended, just as the Captain in the novella lectures Eduard and Charlotte on the principles of modern chemistry in chapter four. [3] This, however, seems to have been an incorrect guess, as the Goethe seems not to have become acquainted with Dobereiner until 1810 (the year after his novella was already published). This false supposition, i.e. that Goethe based his human elective affinities theory as he had learned it from Dobereiner's lectures (an incorrect supposition), has been carried forward in print in at least one chemistry textbook. [15]

Count and Baroness

A logical guess as to the people behind the characters of the Count and the Baroness would be Duke Karl August and Duchess Luise Auguste, the latter a princess of the House of Darmstadt. The two were married, by arrangement, in 1775, the year before Karl appointed Goethe to be minister of state at Wiemar, after which the three remained in association for some decades. More investigation needs to be done on this potential assignment.

Character		Assigned Person	Actual description	Novella description

Count (Cou)	=		Karl August (1757-1828)
Baroness (Bar)			Luise Auguste (1757-1830)

The Child

It is argued, cogently, by Goethean scholar John Armstrong that the Child in the novel, and the death of the Child, mirrors the Goethe's relationship to his only surviving child August Goethe, the illegitimate son "love child" of Goethe, aged 19 at the time of writing *Elective Affinities*, and the horrors at how the child had turned out, Goethe having been an absenteeism father, to a large extent. To quote: [11]

> "The death of the infant stands for the relationship between a stable home and the life of a child. The instability of the Goethe household didn't kill August—but it may well have seemed to his father that he had damaged his son. The extraordinary stability of his own childhood—the deep psychological security Goethe drew from his own parents—was unavailable to his own son."

Although difficult to summarize, Armstrong seems to argue that Goethe had some intended moral message in the death of the child, that he had learned from his own affairs, in the sense that people often viewed August to be the "the son of not only Goethe but also of 'mademoiselle' Vulpius, the uneducated, unrefined woman; someone who was an embarrassment in polite circles, someone who could not be invited to tea, whom one could not meet socially."

Character		Assigned Person	Actual description	Novella description
Child	=	August von Goethe (1789-1830)	Goethe's only surviving child.	Misfortunate child born out of the mental double adultery.

In other words, it may be that Goethe had intended the death of the child to represent the conflict between pure unadulterated physical lust and the nuances of social acceptances and social binding structures involved in relationships and particularly their affect on the child reared unstably in such circumstances.

To the point, it may have been that the death of Goethe's own four children and the poor resulting nature of his only surviving child bear testament to the real-life repercussions that result when one mates in socially unacceptable ways.

Assistant

The assistant in the novella was no doubt likely based on Goethe's own personal assistant Friedrich Riemer, to whom Goethe confided in a year prior to the novella's publication that the moral symbols are those employed by Bergman.

Human molecular free energy tables

Interestingly, the above table is a precursor to the logic of human molecular free energy tables, as outlined in by Thims in 2007 as future type of application in algorithms of online dating site matching theory (a billion-dollar per year industry), on the premise that affinity is equal to the negative of the change in the free energy, i.e. $A = -\Delta G$, in the modern chemical thermodynamics sense. [9] This idea, to note, has been passed around to executives at Match.com (who stated that they were not interested at the present time) and is the basis to the possible future site: ReactionMatch.com.

See also

â— Goethe's human chemistry

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θΔics

In hmolscience, **Goethe and chemistry** refers to the intersection of chemistry with the reaction existence (life), times, and philosophy of German polyintellect Johann Goethe, from his 1758 (age 9) devotions to sulfur lit by a candle; to his 1768 (age 18) chemical studies, e.g. of Paracelsus, and others, and chemical experiments in his attic with a draught furnace (heat) to reveal the principle that permeates the whole universe; to his 1770 (age 20) declaration to Susanne Klettenberg that "chemistry is still my secret love"; to his 1780 (age 31) metamorphology theory of form change, mineral to plant to human (evolution); to his 1796 (age 47) comparison of attractions and repulsions and or elective affinities of minerals to those of humans; to his 1799 (age 50) assertion that in literature one should not treat the passions like playing cards by via the delicate elective affinities; to his 1809 (age 60) founding of the science of human chemistry, via the publication of his chemically-coded novella *Elective Affinities*; to his 1830 (age 80) comment to Carl Zelter that the ten commandments, the 6th in particular (do not commit adultery), need to be reformulated, foundationally, in terms of physicochemical principles; to his 1832 (age 82) completion of *Faust*, which tells the tales of Wagner, a famed sorcerer's former student, who creates laboratory life (homunculus) in a beaker, via fire and chemicals, and the journey that ensues.

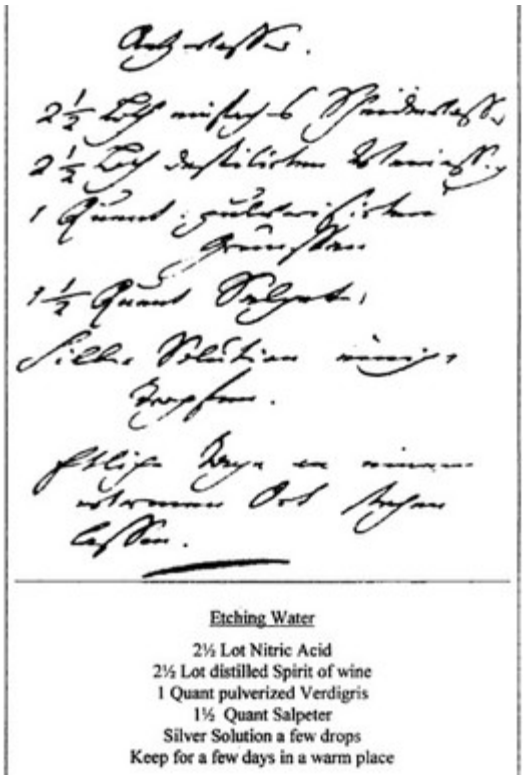

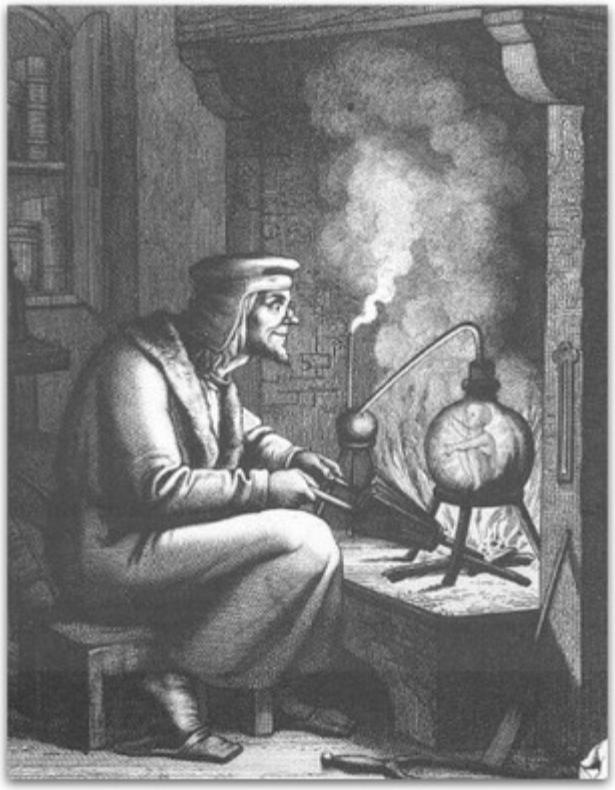

Left: directions for the preparation of corrosive water for etching, one of Goethe's first chemical experiments. [4] Right: Wagner, the famed sorcerer's former student, of Goethe's *Faust*, who creates laboratory life, i.e. a homunculus, in a beaker, via fire and chemicals.

Overview

In 1758, at age 9, Goethe erected an altar of natural products, derived largely from his father's natural history collection, surmounting it with a candle, which he lit when making his devotions, the whole surmounted by sulphur, signifying the unity of nature. [2]

In 1768, at age of 19, during his convalescent year at home in bed (1768-69), through the direction of Susanne Klettenberg (1723-1744), he studied the works of Paracelsus, Anton Kirchweger's *The Golden Chain of Homer: a Description of Nature and Natural Things* (1723), Georg von Welling's *Opus Mago-Cabalisticum*, the writings of Hermann Boerhaave, and others; and was conducting chemical experiments in his attic using a draught furnace to reveal the 'principle that permeates the whole universe'.

Some have argued that Goethe was drawn into the science of chemistry during his 1768 spell of illness during his return home from the University of Leipzig wherein he was treated by a physician who claimed to have found an infallible panacea or mysterious drug which he did not dare use because he was afraid of the legal action against him, but that was convinced into using, after his patient was suddenly seized with an attack of violent illness which threatened his life, after which Goethe began to mend and soon recover. [3]

In 1769, at the age of 20, Goethe was conducting chemical experiments in his attic using a draught-furnace. As Goethe wrote, at age 21, in a 1770 letter to writer Susanne von Klettenberg, age 47, who to note had helped Goethe during his

Leipzig disease two years prior: [4]

> "Chemistry is still my secret love."

Books on chemistry and alchemy, according to Goethe's biographer Heinrich Düntzer, became "almost a craze with him", though, seeking exact knowledge, he was sometimes made desperate by their strange mystifications. [5] Goethe's reading of Bavarian alchemist Georg von Welling's 1735 *Opus Mago-Cabalisticum*, a sort of religious-chemistry mixture, for instance, led him to the clearer chemistry of Dutch physician and chemist Herman Boerhaave's 1724 *Elements of Chemistry*, a book greatly influential to French chemist Antoine Lavoisier and his 1787 *Elements of Chemistry*. [6] Goethe also studied the works of Swiss physician and chemist Paracelsus. [7]

Right: Goethe's notebooks of 4-7 Oct 1793, the reaction diagram in the upper right hand corner showing a double elective affinity (double displacement reaction), using Bergman reaction diagram notation, of experiments with Berlin-blue liquor. [8]

Quotes

The following are related quotes:

> "Goethe's interest in chemistry continued until the time of his death in 1832."
>
> — Eugene Blank (1942), "Alchemy and Chemistry in Literature" [1]

See also

- EA|IAD: Reaction decipherment
- Goethe's human affinity table
- Goethe's human chemistry

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θΔics

In hmolscience, **Goethe and Empedocles** refers to those who have been able to make the connection between Empedocles, on water and wine and oil and water, and Goethe's 1809 expansion of Empedocles' chemical aphorisms.

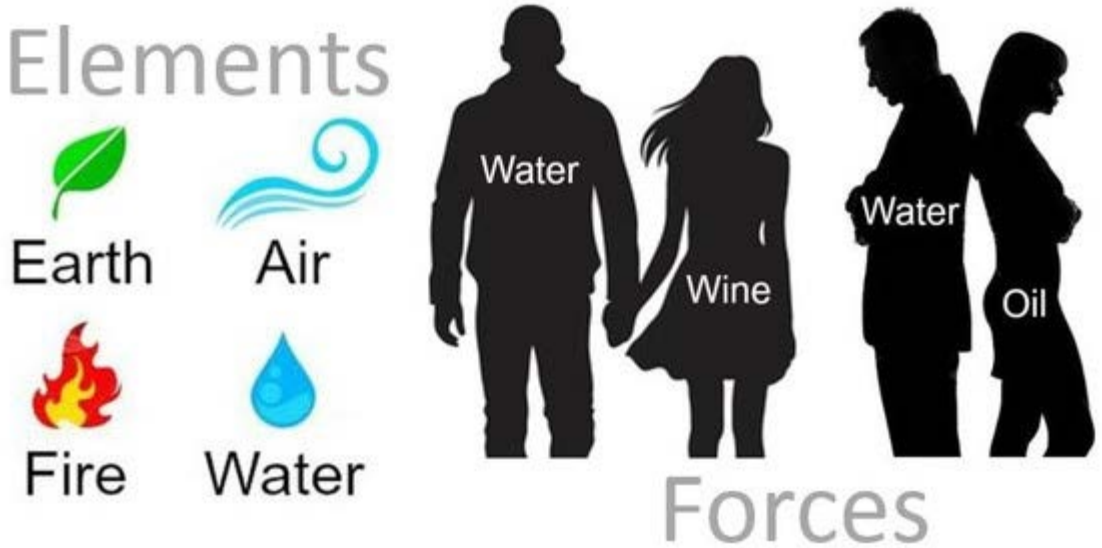

The basic **Empedoclean** model, according to which everything (humans included) is comprised of four elements (earth, air, fire, and water), or "roots" as he called them, and two forces, namely "philia" (love/attraction) and "neikos" (hate/repulsion), as he called them; the logic of which was upgraded by **Goethe** in 1809, via Torbern Bergman stylized affinity chemistry (physical chemistry) plus metamorphology (evolution) explanation; the third upgrade of which, i.e. Gibbs and Goethe connection, namely the re-interpretation of "affinity" in terms of Gibbs energy is an upgrade in progress, one very intricate.

Overview

The following shows the main two connecting points:

> "Water has a greater affinity with wine, but with olive oil it is unwilling to mix."
>
> — Empedocles (c.450BC), fragment 56 (B91);
> Philoponus, *Commentary on Aristotle's Generation of Animals*, 123.19-20 [1]

Here, to note, in the extant fragments of Empedocles, he does not actually apply his love and hate force principle to people mixing and non-mixing the way he does with wine, water and oil; this was something inferred into existence, generally following Goethe and his *Elective Affinities* (1809), the main connecting passage of which is the following:

> "And that," interrupted Edward, "will be different according to the natural differences of the things themselves. Sometimes they will meet like friends and old acquaintances; they will come rapidly together, and unite without either having to alter itself at all—as **wine mixes with water**. Others, again, will remain as strangers side by side, and no amount of mechanical mixing or forcing will succeed in combining them. **Oil and water** may be shaken up together, and the next moment they are separate again, each by itself."
>
> — Johann Goethe (1809), *Elective Affinities* (P1:C4)

The following is Haeckel's synthesis of the two:

> "The fundamental unit of affinity in the whole of nature, from the simplest chemical process to the most complicated love story, [as] was recognized by **Empedocles** [and] **Goethe**, [can be] reduced, on logical analysis, to matter (space filling substance) and energy (moving force), [which] are but two inseparable attributes of one underlying substance."
>
> — Ernst Haeckel (1895), *The Riddle of the Universe* [7]

In 1904, Caleb Saleeby stated the following:

> "Has not **Goethe**, following **Empedocles**, told us how carbon and oxygen love each other, how

passionately they fly, lover-like, into each other's arms? The union is extremely firm, as is testified by the quantity of heat evolved by a fire during the process of combination, and by the chemist's great difficulty when he seeks artificially to undo it."

— Caleb Saleeby (1904), "The Green Leaf" [2]

Here, of note, in chronological retrospect, we see the heat theory of affinity being applied as the underlying model of chemical combinations, human-scale and atomic-scale, whereas correctly it is the thermodynamic theory of affinity that is the evidencing factor, i.e. the free energy decrease is the determining factor NOT the amount of heat evolved during the process; a discerning perspective nonetheless.

Quotes

The following are other related quotes:

"These elements are equal, all of them, and of like ancient race; and one holds one office and another and each has his own nature"—some being predominantly warm, others cold. They were coeval and eternal—for if they perish whither should they go? (Fragment 87.) "From these arose blood and various kinds of flesh" (203), "and if your faith be at all lacking in regard to these (elements), how from water and earth and air and sun (fire) when they are mixed arose such colors and forms of mortal things," the attraction and repulsion of modern physical chemistry, symbolized under the conception of love and hate accomplished it, a simile carried out in the meaning of **Empedocles** by **Goethe** in his wonderful novel *Elective Affinities* (*Die Wahlverwandtschaften*). Combinations of the elements arose under "the uniting power of Aphrodite" (210). He seems to have thrown much, if not all, of his written work into the form of poetry and his other physical ideas as well, are full of poetical conceptions even in the reports and traditions of later writers. So Goethe made poetry of the *Metamorphosis of Animals and Plants*."

— Jonathan Wright (1920), "Empedocles the Primitive Physiologist" [3]

"The idea [of society as a many particle system] goes back to **Empedocles** who in his *On Nature* explains the solubility of wine in water by the attraction of love of relatives, the segregation of water and oil by the hate of enemies. **Goethe** used this idea in his *Elective Affinities* to demonstrate that human relations depend on the chemical laws of society."

Atoms and people like and attract each other, dislike and repel each other or are indifferent. This model will be the basis of social interactions of heterogeneous agents. The idea actually goes back to Empedokles of Acragas (495–435 B. C.), who related the mixing of social groups to the solubility of liquids: *people, who love each other mix like water and wine; people, who hate each other segregate like water and oil.* J. W. Goethe (1809) discussed this idea in his novel "*Die Wahlverwandtschaften*". More recently, W. Weidlich (1971) has introduced sociodynamics by theoretical means of modern thermodynamics.

A snippet of Jurgen Mimkes on **Goethe and Empedocles**, from his "Interactions of Heterogeneous Agents in Stochastic Socio-economic Systems", presented at the 2003 7th annual Workshop on Economies with Heterogeneous Interacting Agents; at the end of which he mentions Wolfgang Weidlich (1971). [9]

— Jurgen Mimkes (1997), "Society as a Many Particle System" [4]

"The reinterpretation of the process of combustion requires the very elements of chemistry—literally and figuratively—to be ordered anew. For the new conception no longer permits the notion, maintained by the philosophers, alchemists, and chemists since antiquity, that all matter consists of admixtures of four elements joined by attraction and sundered by repulsion—or, as **Empedocles** would have it, by love and hate, thus anthropomorphizing matter in a way that turned out to have great resonance for **Goethe**."

— Michel Chaouli (2002), *The Laboratory of Poetry* [8]

"Relatives mix like water and wine; enemies avoid each other like water and oil."

— Jurgen Mimkes (2005), "Chemistry of the Social Bond" [5]

"People who love each other mix like water and wine; people who hate each other segregate like water and oil."

— Libb Thims (2007), *Human Chemistry* [6]

See also

â— Gibbs and Goethe
â— Empedocles, Goethe, and Beg

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θΔics

In hmolscience, **Goethe and mathematics** refers to the topic of Goethe's relationship with mathematics, the subject of which, along with astronomy, he seemed to have peculiar distancing relationship with. [1]

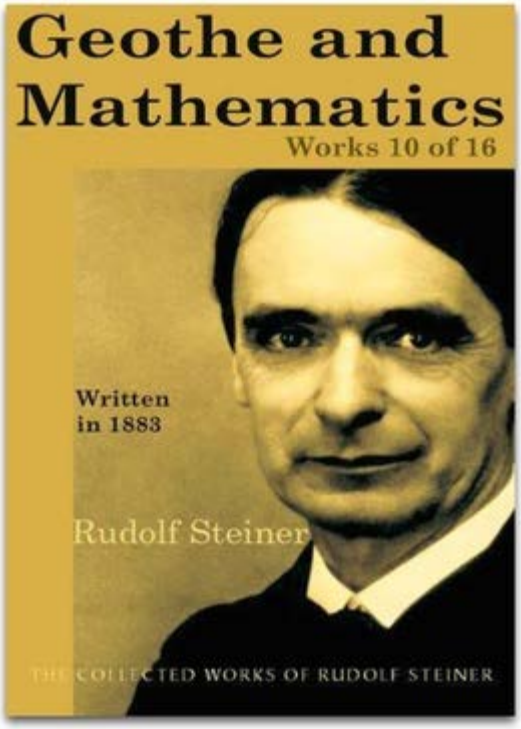

An 1883 lecture (O) by Rudolf Steiner on Goethe and mathematics.

Overview

In 1893, Goethe penned "Mathematics and its Abuse", some noted quotes of which are as follows: [5]

> "Considering my inclinations and conditions I had to appropriate to myself very early the right to investigate, and to conceive nature in her simplest, most conspicuous creations also without the aid of mathematics. I was accused of being an opponent, and enemy of mathematics in general, although nobody can appreciate it more highly than I, as it accomplishes exactly those things which I was prevented from realizing."
>
> — Johann Goethe (1893), "Mathematics and its Abuse" (pg. 78)

> "It is a wrong conception to think that a phenomenon could be explained by calculus or words. Mathematicians are like Frenchman; if one speaks to them they translate it into their own language, and then it will be very soon something entirely different."
>
> — Johann Goethe (1893), "Mathematics and its Abuse" (pg. 98)

Here, to note, we are reminded of Gibbs and his c.1895 statement that: "a mathematician may say anything he pleases—but a physicist must be a least partially sane". In the next quote, Goethe seems to praise Lagrange:

> "The mathematician is perfect only in so far as he is a perfect man, as he feels the beauty of truth; only then does he become thorough, penetrating, pure, clear, graceful and even elegant. All this is necessary to become like Lagrange."
>
> — Johann Goethe (1893), "Mathematics and its Abuse" (pg. 138)

In 1826, Goethe, in his "On Mathematics and its Misuse", a discussion of his objection to the work on light and color by Newton, commented: [2]

> "I receive mathematics as the most sublime and useful science, so long as they are applied in their proper place; but I cannot commend the misuse of them in matters which do not belong to their sphere, and in which noble science as they are, they seem to be mere nonsense. As if things only exist when they can be mathematically demonstrated [see: da Vinci on real science]. **It would be foolish for a man not to believe in a woman's love for him because she could not prove it to him mathematically** [compare: The Mathematician in Love]**.** She can mathematically prove her dowry, but not her love. The mathematicians did not find out the metamorphosis of plants. I have achieved this discovery without mathematics, and the mathematicians were forced to put up with it. To understand the phenomena of color nothing is required but unbiased observation and a sound head, but these are scarcer than folks imagine."

Ironically, Goethe did prove that love exists mathematically, seventeen-years prior, in his 1809 *Elective Affinities*, when he used the chemical mathematics of Swedish chemist Torbern Bergman's 1775 affinity tables, to present a treatise on the additions and subtractions of human chemical reactants when brought together, to participate in human chemical affinity reactions. The point expressed by Goethe, above, is exemplified by ridiculous incorrectness of the conclusions reached in the 1962 stable marriage problem, using pure mathematics, versus conclusions reached using the more realistic circa 1975 Gottman stability ratio (measurement + psychology + mathematics), versus even more realistic modern synthesis of circa 2005 human chemical bonding theory (measurement + chemistry + thermodynamics + physics + evolutionary psychology + mathematics).

In commentary on individuals such as d'Alembert and Lagrange, Goethe states: [4]

> "It pleased me not to find my intentions were falsely interpreted. I have heard accusations against me as though I were an opponent, an enemy of mathematics altogether; yet there is none who holds it in greater esteem than I, for it is able to do the very thing which to perform has totally denied me."

On the topic of mathematical physics, he said "number and proportion, in their nakedness, destroy all form, and banish the spirit that informs real perception." Goethe seemed to use mathematics in his own unique way.

Other

In 1914, Emch Arnold penned "Goethe and Schopenhauer on Mathematics", comparing Goethe and Arthur Schopenhauer (see: Goethe and Schopenhauer) and their similar relation to mathematics. [6]

In 1958, Ernst Lehrs penned "Goethe, Faraday, and Mathematics", a comparison of Goethe with Michael Faraday, wherein he summed up the view of Goethe's style of mathematics as follows: [3]

> "In recent centuries there have been two great men who have shown, in their approach to scientific research, that man is capable of proceeding like a true mathematician even though he is not using mathematics in the accepted sense. These two men were Goethe and Faraday."

Considered mathematics "the most sublime and useful science", but was guarded against its misuse or misapplication, where it can become reduced to nonsense. Curiously, Goethe seemed to have been attacked by fellow scientists for his non-direct use of mathematics.

Quotes | On

The following are related quotes:

> "Goethe's theory of colors was most criticized for the non-use of mathematics therein, and therefore, one presumed to categorize this epoch-making work of physics among the productions of the fine arts. What a miscalculation!"
>
> — Johann Werneburg (1817) [7]

Quotes | By

The following are quotes by Goethe in respect to mathematics:

> "Mathematics has the completely false reputation of yielding infallible conclusions. Its infallibility is nothing but identity. Two times two is four, but it is just two times two, and that is what we call four for

short. But four is nothing new at all. And thus it goes on and on in its conclusions, except that in the higher formulas the identities fades out of sight."

— Johann Goethe (c.1820); compare: feigned IQ (Q)

"Mathematics can remove no prejudices and soften no obduracy. It has no influence in sweetening the bitter strife of parties, and in the moral world generally its action is perfectly null."

— Johann Goethe (c.1820) (Q); compare "friction of rubbing together of human molecules" (Carey, 1858); see also: moral symbols (and Otto Weininger 1903 quotes)

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Threads

- Goethe, Math & Universal Genius (2010) – Hmolpedia.

θΔics

In genealogies, **Goethe genealogy**, diagrammed below, refers to the ancestors and descendants of German polyintellect Johann Goethe (1749-1832).

Generations

The genealogy of Goethe is unique in that although it can be traced back through eleven generations, his seed only carried forward through two generations, and in this sense, it is more apt to say correctly that we are the progeny of his prolific output. [1]

First generation

A

Johann Caspar Goethe (1710-1782)

+

B

Catharina Textor (1731-1808)

→

C

Johann Wolfgang Goethe (1749-1832)

+

D

Cornelia Goethe (1750-1777)

Second generation

A

Johann Wolfgang Goethe (1749-1832)

+

B

Christiane Vulpius (1765-1816)

→

C

August von Goethe (1789-1830)

Third generation

A

August Goethe (1789-1830)

+

B

Ottilie Pogwisch (1796-1872)

→

C + D + E

Walter Wolfgang von Goethe (1818-1885)

Maximilian Wolfgang von Goethe (1820-1883)

Sedina Alma Henrietta Cornelia von Goethe (1827-1844)

Goethe's grandchildren Walter and Maximilian, as it has been noted, turned homosexual in mating behaviors, thus producing no offspring, and their sister Sedina (Alma), ended at the age of 17 during the typhoid epidemic, thus producing no offspring—hence, stands the 1885 passage on Walter's tombstone: [2]

Inscription (German)	Inscription (German)
Walther von Goethe	*Walther von Goethe*
born 9th April 1818 in Weimar, died in Leipzig 15th April 1885.	geb. zu Weimar 9ten April 1818, gest zu Leipzig 15ten April 1885.
With him went out Goethe's seed, whose name survives forever.	Mit ihm verlosch Goethes Geschlecht, dessen Namme alle Zeiten überdauert.

Discussion

In genius studies (see "marriage" section of the genius page), there seems to exist some yet unwritten law according to which genius level is directly proportional, in increasing amount, to the amount of passion, devotion, and time one puts into his or her work, which is reciprocal, in decreasing amount, to the amount of passion, devotion, and time one puts into his or her relationships and family, which has some sort of trickle down effect.

In respect to Goethe and his offspring lineage termination, some unnamed principle or law at work here, in the neighborhood of "having one's cake and eating it to", in regards to elite geniuses and progeny, something akin to the two being inversely proportional to each other, as in Beckhap's law.

References

1. Goethe genealogy (see bottom) – The Esoteric Redux, Blogspot.com.
2. Grabtafel (grave panel) of Walther von Goethe – Wikipedia.

Threads

â— Goethe’s modern day ancestors (2014)

θΔics

In thought experiments, **Goethe love thought experiment** refers to the 1808 love thought experiment conceptualized by German thinker Johann Goethe about a scenario of a hero simultaneously in love with four women and how he should go about choosing one; which led into a discourse on the nature of "choice", as reality sees things, i.e. the physical sciences and physicochemical sense of the matter.

Johann Goethe
(1749-1832)

Charlotte Stein
(1742-1827)

Christiane Vulpius
(1765-1816)

Minna Herzlieb
(1765-1839)

Sylvie Ziegesar
(1785-1858)

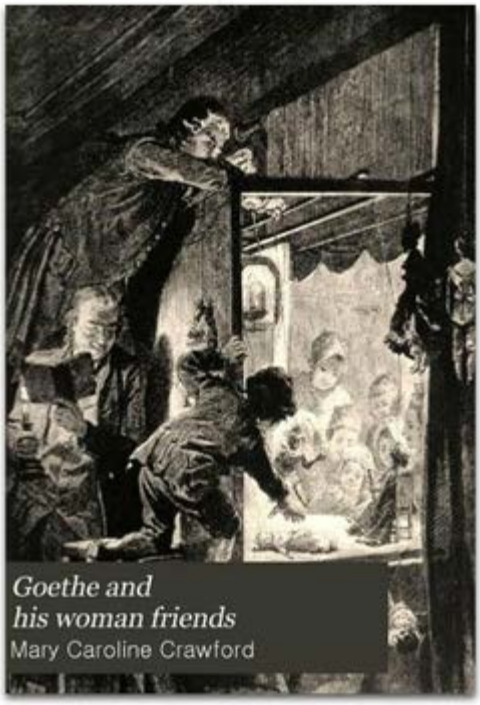

Left: a depiction of "**Goethe love thought experiment**", an 1808 conceived love thought experiment (see: Goethe timeline), conceived in the mind of German polymath Johann Goethe about the paradoxical situation surrounding the nature of love in the scenario of a hero being simultaneously in love with four women; this premise was worked into a draft story called "The Renouncers", which, with the addition of the solution method of employing Torbern Bergman's affinity diagram logic to deal with the issue of "choice", in the following year, ballooned into the physical chemistry based passions novella *Elective Affinities*.

Right: the cover of American romantic period historian Mary Crawford's 1911 *Goethe and His Woman Friends*, giving indication to fact that the sheer number of female relationships Goethe's culled in his reaction existence, makes for a focused subject in itself. [3]

Overview

In the middle of 1808, German polymath Johann Goethe, a few months before he met Napoleon (Oct 2), he had started writing a story called "The Renouncers", which, according to one of Goethe's assistants, was about a hero simultaneously in love with four women; the synopsis of which, in Goethe's view, was that:

> "Each in her own way is lovable; whichever one he is drawn to in the mood of the moment, she alone is lovable."

Goethe took it up again early the next year, after which the tale ballooned into a novel, progressed quickly, and before the end of the year (Oct 3, 1809) (see: Goethe timeline) it was in print under the enigmatic title *Elective Affinities*, a physical chemistry based treatise on love, relationships, and human interactions viewed purely as affinity reactions or chemical reactions. [1]

American literature professor Stefanie Markovits, in her summary English poet Arthur Clough's circa 1849 long poem *Amours de Voyage*, discusses innate "thought experiment" nature of Goethe's 1809 physical chemistry based novella *Elective Affinities* (*Die Wahlverwandtschaften*): [2]

> "Why, Claude wonders, should he fall for Mary rather than some other girl who would be equally suitable

and equally attractive? Is love just the chance collision of two people who are, as the saying goes, in the right place at the right time—a kind of lucky hit in the dark? 'Juxtaposition', within the frame of *Amours*, fits into two sets of metaphors. The first of these is chemical and has to do with the concept of elective affinities: the idea that elements having inherent tendencies to form combinations and that they will combine and recombine according to these tendencies when placed in solution with each other. Goethe had explored the social and sexual implications of the concept in his novel *Die Wahlverwandtschaften* (1809), a work that obviously influenced Clough's reflections on the subject of *Amours*. [4]. **Goethe**'s novel is really more of a **thought experiment** about enlightenment than anything else. In it, a hyperrational couple invite into their home a pair of outsiders, only to discover that the foreign elements bring with them dangerous forces of elective affinity. The four main characters find themselves reshuffling their relations according to these affinities, and the results are devastating."

Markovits goes on to state that the point that Goethe made—and that Clough worries about—is that there is nothing genuinely elective about elective affinities: we have no choice in these matters, other than the choice to oppose our inherent passions. She also states that Clough interjected further on this issue, in regards to "mechanical ethics", the teaching of behaviors, and passions, in his "1849 (Roma) Notebook".

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θΔics

In famous meetings, **Goethe meets Napoleon** refers to the 2 Oct 1808 meeting of German polyintellect Johann Goethe with French emperor Napoleon Bonaparte; the incident depicted adjacent by Hillemmacher: [1]

Napoleon, a great fan of Goethe, who had read his *Werther*, supposedly, six times during battle. [1] Napoleon's famous greeting of the author was:

> "Now here is a real man!"

Or, in the original French, "Voilà un homme!".

See also

- Goethe meets Beethoven
- Napoleon Laplace anecdote

Threads

- Napoleon Bonaparte and Johann Goethe (2010) – Hmolpedia thread.

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θΔics

In geniuses on, **Goethe on evolution** refers to the origin of species (animals and plants) views of Johann Goethe, i.e. the proto-evolution or precursory evolution theory views of humans, animals, and plants, or "metamorphology" as he referred to it. Goethe, in 1784, discovered the human intermaxillary bone, thought to be unique to animals only, thus yielding anatomical proof of common origin; in his 1790 *Metamorphosis of Plants* (see: metamorphosis), he outlined a theory of form change in plants; he outlined his newly discovered principle further in his 1795 "Sketch of a General Introduction to Comparative Anatomy"; from 1796 to 1809, with the publication of his *Elective Affinities*, he explained his principle of "moving order" (bewegliche ordnung) at the chemical level for humans and chemicals, in terms of affinity chemistry and the force of elective affinity (forerunner to the modern free energy view of evolution).

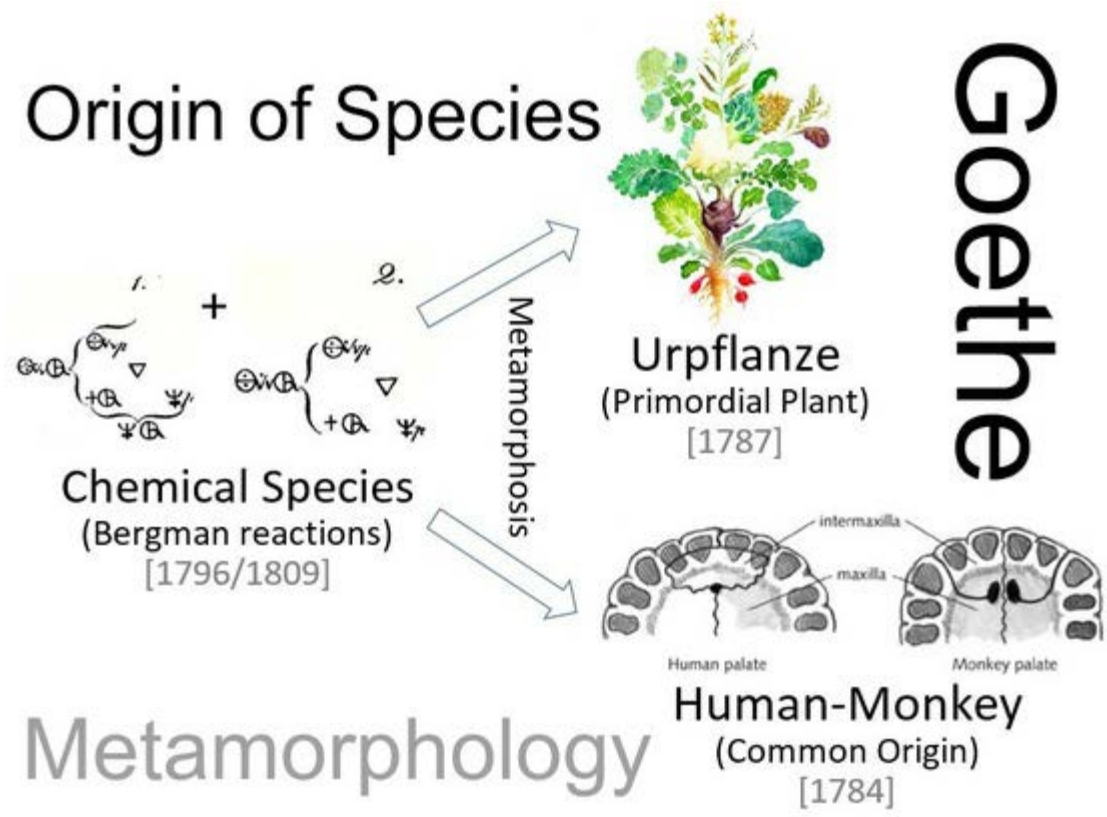

A general overview of Goethe's metamorphology theory, aka "evolution" as Darwin would later, citing Goethe, popularize, showing Goethe's views of monkey-human common origins (Ñº) and his notion of the urpflanze (Ñº) or "primordial plant", a general model of the origin of plants, animals, and humans, each of which by 1809 were believed to originated from a combination of morphological forces and chemical reaction mechanism.

Overview

In circa 1770, Dutch physician Petrus Camper (1722-1789) proposed the Biblically-friendly theory, which quickly became dogma, that the anatomical difference between man and animal was the missing intermaxillary bone in man, this being the distinguishing feature between man and monkey. [13]

In 1775 to 1786, Goethe was, in an effort to disprove Camper, began studying elephant bones, the formation of mosses, and was discussing a book with Charlotte von Stein which asserted that humans were originally plants and animals; about which Owen Barfield, in his "Goethe and Evolution" (1949), summarizes as follows: [12]

> "Was Goethe then an introvert? Mainly interested in ferreting about among those half-formed emotions and impulses and huge creative forces which move in a mysterious way within us, we are told, as the forces of nature drive us and shape us from without? Not for a moment. He was the most exact and conscientious observer of plants and animals and the physical structure of man – especially his bones. Nothing delighted him more than the loan of an elephant-skull. He seems to have been about as good at borrowing other people's bones as Coleridge was at borrowing other people's books; and at least one rather aggrieved letter, which is still extant, suggests that he was not always much better at returning them. Incidentally I think Charlotte von Stein has been a little unfairly treated by some of Goethe's biographers. The intellectual and active life of that lady between the years 1775 and 1786 must have been something of a marathon. When she was not mugging up Spinoza in Latin as well as German – or inspecting musty skulls, she was always liable to get an urgent request from Goethe for 'mosses of all sorts, if possible with the roots – *and wet*'.

> In the same letter Charlotte speaks of a "new book" which makes it probable that men were originally plants and animals. And this brings me to the hardest part of my task. For I have to try to describe the origin of something new in the world of thought. Or rather – which makes it still harder – something then new, but now very familiar to us all. I do not mean a theory. The absence of that is easy enough to look back on. No, I mean an image or construct, a meaning, a *Vorstellung*, a *Bild*, as the Germans say – whatever word or phrase you choose, as long as you grasp that it is not a theory I am talking about, but rather the raw stuff about which theories are formed."

In 1784, Goethe disproved the then-prevailing theory that humans and other animals were not related in origin because humans had no intermaxillary bone, whereas animals did, by discovering, via fossil investigation the human intermaxillary bone, which he pronounced in a missive to Johann Herder from Jena, March 27, at night (quote to right):

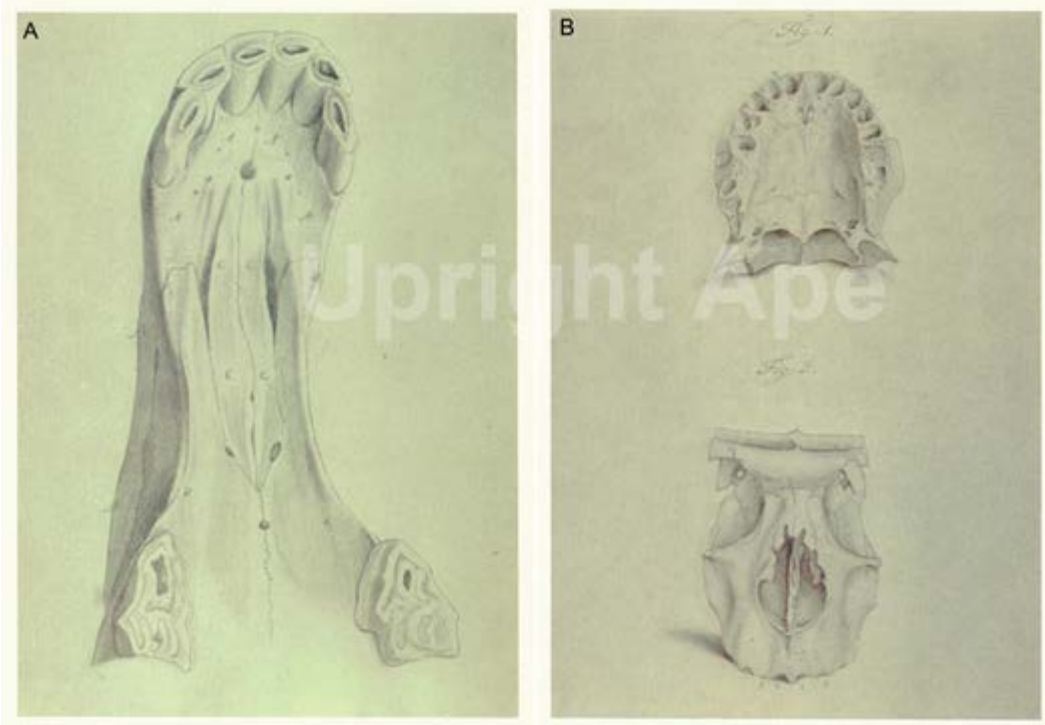

Sketches of **Goethe**'s 1784 discovery of the intermaxillary bone in animals (left) and humans (right), see: human intermaxillary bone, thus giving "evidence" of a common origin of form, thus disproving the then-prevalent separate creation theory; the oft-cited starting point for modern **evolution** theory.

> "I have found neither gold nor silver, but something that unspeakably delights me—the **human Os intermaxillary**! I was comparing human and animal skulls with Loder, hit up the right track, and behold—Eureka! Only, I beg of you, not a word—for this must be a great secret for the present. You ought to be very much delighted too, for it is like the keystone to anthropology—and it's there, no mistake! But how?"

The specific observation that led Goethe to this fertile conception of evolution, is found in Goethe's monograph on the intermaxillary bone, written as early as 1786. Prior to this publication, it was known that in most vertebrates (mammalia, birds, amphibia, and fishes) that the upper jaw consists of two bones, the upper jaw-bone and the intermaxillary bone. The former always contains in the mammalia the molar and canine teeth, the latter the incisors. Humans, being distinguished from all other animals by the absence of the projecting snout, have, on the contrary, on each side only one bone, the upper jaw-bone, containing all the teeth. This being so, according to Helmholtz, Goethe discovered in human the skull faint traces of the sutures, which in animals unite the upper and middle jaw-bones, and thus concluded from it that man had originally possessed an upper jaw-bone.

In circa 1794, Goethe came to learn German physician Johann Blumenbach's formative drive theory, which came to be a framework for part of the mechanism of the operation of his developing metamorphology theory.

By 1795, following more studies in osteology, Goethe had become convinced of the universality of his "newly discovered principle", and was able to define the idea in his "Sketch of a General Introduction to Comparative Anatomy", wherein he laid down with the utmost confidence and precision, that "all differences in the structure of animals must be looked upon as variations of a single primitive type, induced by the coalescence, the alteration, the increase, the diminution, or event the complete removal of singe parts of the structure."

In 1790, Goethe, in his treatise on the metamorphosis of plants, according to Helmholtz, worked out the principles behind the transformation of stem-leaves into sepals and petals, and of sepals and petals into stamens, nectaries, and overaies, just as the "anterior extremity of vertebrate animals takes different forms, becoming in man and apes an arm, in other animals a paw with claws, or a forefoot with a hoof, or a fin, or a win, but always retains the same divisions, the same positions, and the same connection with the trunk, all resembling each other to a certain extent in origin and composition, and even under certain conditions passing from one form into the other." [2]

In 1831, Goethe, in his *Story of My Botanical Studies*, wrote: [9]

> "The ever-changing display of plant forms, which I have followed for so many years, awakens increasingly within me the notion: The plant forms which surround us were not all created at some given point in time and then locked into the given form, they have been given… a felicitous mobility and plasticity allows them to grow and adapt themselves to many different conditions in many different places."

A depiction of Goethe circa 1780 ruminating on a theory of common descent of humans, animals, and plants from chemicals; and his searching for an discovering the human intermaxillary bone (1784), upon which he built his metamorphology theory, aka "evolution" as Darwin would popularize things.

Goethe's last writings were said to have been devoted to defending Saint-Hilaire. [7]

Helmholtz | On

In 1853, German physician-physicist Hermann Helmholtz, in his essay "On Goethe's Scientific Researches", summarized that Goethe's studies of comparative botany and comparative anatomy led him to "a happy glimpse of an all-pervading law" of the conception that the differences in the anatomy different animals or morphology of different plants are to be "looked upon as variations from a common phase or type, induced by differences of habit, locality, or food."

In 1892, Helmholtz reiterated on Goethe's metamorphosis theory, that Goethean morphology had so shaped nineteenth-century biology that it paved the way for Darwin's theory. [2]

Darwin | On

In 1861, Charles Darwin, in the third edition of his *On the Origin of Species*, cites Goethe as the oldest forerunner to his theory of the origin of species, as follows:

> "It is rather a singular instance of the manner in which similar views arise at about the same time that Goethe in Germany, Erasmus Darwin in England, and Geoffroy Saint-Hilaire in France, came to the same conclusion on the origin of species, in the years 1794-95."

Robert J. Richards, in his "Did Goethe and Schelling Endorse Species Evolution? (2011), asserts that Darwin learned of Goethe's so-named "transmutation" of species theory from Geoffroy Hilaire. [11]

Goethe's 1786-1795 theories on metamorphosis and variation of plant and animal species, as being descendant common ancestors, through a process of transformation, had a significant influence on English naturalist Charles Darwin and the reception of his 1859 *Origin of Species*.

> “We see that our researches on the fixity or the variation of the species, lead us directly to the ideas issued by two men justly famous, Geoffroy Saint-Hilaire and Goethe.”

This passage was also cited by Darwin. In total, in his in his 'Historical Sketch', on those who advocated variations on a theory of origin of species, prior to 1859, Darwin gives thirty-four authors who believe in the modification of species, or at least disbelieve in separate acts of creation, of which twenty-seven have written on special branches of natural history or geology, in which the two foremost of these, according to Darwin, are Goethe and Geoffroy.

Haeckel | On

In 1864, Ernst Haeckel, in a letter to Charles Darwin, cited Goethe, Kant, and Hilaire as forerunners to Darwin's theory of evolution: [10]

> “The history of the theory of descent is also extremely interesting and I witness with great joy, how even a long time ago, the greatest German philosophers and thinkers have *a priori* proclaimed this theory to be the *only possible way* of understanding the origin of species. But you, through the epoch-making discovery of ‘*Natural Selection*’ and ‘*Struggle for life*’, have for the first time provided the *concrete* proof for that abstract statement. The most beautiful expression of this was given by our greatest poet, *Goethe*, in his Essays on Morphology, and, most especially, in the review of *Geoffroy*'s ‘Principes de Philosophie zoologique'’, written shortly before his death. I find that in the excellent biography of Goethe by your compatriot *Lewes*, this great merit of Goethe's is perfectly appreciated (in the tenth Chapter of book V entitled ‘The poet as a man of science’). Our greatest philosopher, *Kant*, has also expressed himself in equally decided terms as being for the ‘Theory of *Epigenesis*’, as he calls it. Indeed, all possible organic manifestations of nature, both in animal and vegetable life are thus so simply and harmoniously explained, that I do not understand how so many and such learned naturalists can still be opposed to your view.”

Haeckel further corresponded with Darwin on Goethe's theories in 1868 (Jun 22 and Nov 9) and in 1871 (Ñº); not to mention that the two met in person at some point.

In 1899, Haeckel summarized Goethe’s evolution theory as follows: [3]

> “It is easy to understand that these prevalent ideas of the absolute unchangeability and supernatural creation of organic species could not satisfy the more penetrating thinkers. We find several eminent minds already, in the second half of the last century, busy with the attempt to find a natural explanation of the ‘problem of creation.’ Pre-eminent among them was the great German poet and philosopher, Wolfgang Goethe, who, by his long and assiduous study of morphology, obtained, more than a hundred years ago, a clear insight into the intimate connection of all organic forms, and a firm conviction of a common natural origin. In his famed *Metamorphosis of Plants* (1790) he derived all the different species of plants from one primitive type, and all their different organs from one primitive organ—the leaf. In his vertebral theory of the skull he endeavored to prove that the skulls of the vertebrates —including man—were all alike made up of certain groups of bones, arranged in a definite structure, and that these bones are nothing else than transformed vertebrae. It was his penetrating study of comparative osteology that led Goethe to a firm conviction of the unity of the animal organization; he had recognized that the human skeleton is framed on the same fundamental type as that of all other vertebrates— ‘built on a primitive plan that only deviates more or less to one side or other in its very constant features, and still develops and refashions itself daily.’ This remodelling, or transformation, is brought about, according to Goethe, by the constant interaction of two powerful constructive forces—a centripetal force within the organism, the ‘tendency to specification’, and a centrifugal force without, the tendency to variation, or the ‘idea of metamorphosis’; the former corresponds to what we now call heredity, the latter to the modern idea of adaptation.”

Haeckel, to note, goes on to summarized that Goethe's work on the origin of species of plants and animals, did "not amount to more than certain general conclusions".

Sherrington

In 1949, Charles Sherrington, curiously, in his ignorance, supposedly, in a second edition of one of his books, disparaged Goethe via the following assertion: [10]

> "There is no reason to believe that Goethe had a remote inkling of the concept of evolution, though admirers, strained the words of some poem or apothegm, have called him Darwin's precursor."

In 1952, Otto Haas, in his "Goethe and Evolution", devotes eight pages to correct Sherrington. [10]

Other

It should be noted that Ernst Haeckel and Lester Ward considered Geoffroy Saint-Hilaire's contributions to evolutionary theory to be relatively insignificant and instead ranked Jean Lamarck along side Erasmus Darwin and Goethe. While both Haeckel and Ward agree that Erasmus Darwin was the least important of the three they disagree on whom was most important. Haeckel ranks his fellow countryman Goethe at the top while Ward considers Lamarck's body of work to be superior. [8]

In 2003, Carl Becker, in his *A Modern Theory of Evolution* (2003), surmised that Goethe, in his bone discovery, had "discovered the evolution of the human being from the ape", a concept that prior to him had only existed as a metaphor in occult tradition: the ape representing man untransformed by alchemy. [1]

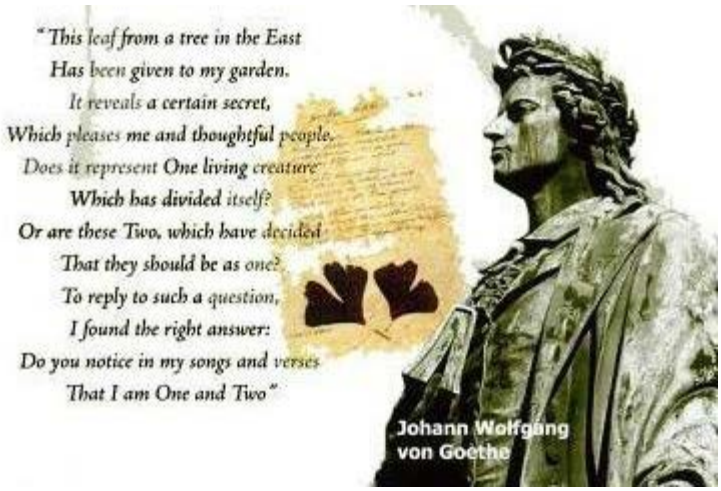

Sketch of Goethe's research and poem entitled *Ginkgo Biloba* which gives a hint of what he was digging for in his work on comparative botany. [6]

Quotes

The following are related quotes:

> "How deeply Goethe had penetrated into their character by these philosophic studies of the 'construction and reconstruction of organic natures,' and how far, therefore, he must be considered the most important precursor of Darwin and Lamarck."
>
> — Ernst Haeckel (1882), "The Systems of Darwin, Goethe, and Lamarck" [5]

> "About the end of the eighteenth century fruitful suggestions and even clear presentations of this or that part of a large evolutionary doctrine came thick and fast, and from the most divergent quarters. Especially remarkable were those from Erasmus Darwin in England, Maupertuis in France, Oken in Switzerland, and Herder, and, most brilliantly of all, from Goethe in Germany."
>
> — Andrew White (1896), *A History of Warfare of Science with Theology in Christendom* [9]

> “I often think of the different ways Goethe and Darwin got at evolution. Goethe had the poetic conception of it all right; Darwin worked it out step by step. Who's ahead? And which has any business scoffing at the other?”
>
> — Susan Glaspell (c.1915) (Ñº)

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13. (a) Hellmich S. (1982). “The Intermaxillary Bone and Goethe’s Mephistopheles” (abs), *Laryngol Rhinol Otol (Stuttg).* 61(10):552-6.
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Further reading

â— Steiner, Rudolf. (1921). “Goethe and the Evolution of Consciousness” (Ñº), Lecture at Dornach, Aug 19.

θΔics

In hmolscience, **Goethe on religion** refers to the collective views of German polyintellect Johann Goethe, a Haught disbeliever (#19), on religion, God, and its residual theory, e.g. soul, spirit, life, afterlife, among others.

A sketch of Goethe studying in Frankfurt in the years *circa* 1769 to 1772 (see: Goethe timeline), before and after which he had begun delving into the religion question.

Synopsis

The following is a work-in-progress synopsis, with bolded years discerned by Alexander Rustow (1954), showing the change in faith, creed, and or religious belief state of Goethe: [12]

1755 | age 6 | Faith questioner
1758 | age 9 | Chemical / Natural history worshiper
1770 | age 21 | Christianity debunker
1782 | age 33 | Decided non-Christian | Stoic deism religion
1790 | age 41 | Un-Christian / Anti-Christian / Crucifix-loathing
1809 | age 60 | Bergmanian / Physiochemical moralist
1810 | age 61 | Decried the Bible as the most dangerous book ever
1815 | age 66 | God-denier | Universalistic panentheist (Ñº) | Cosmic animating force philosopher
1831 | age 81 | Skeptical / Faithless

(add discussion)

Agnostic | Deist | Atheist

Theists frequently like to claim Goethe for their side and say he was a god believer (theist). Google Books, however, indicate a 9-to-1 ratio for the phrase “Goethe was an atheist” compared to “Goethe believed in God”. [10] Goethe prayed to “sulphur” as a child (age 9); his law degree (age 21), was on a debunking of Christianity; his 1774 (age 25) poem “Prometheus”, states the following:

> “I know of no poorer thing under the sun, than you gods! And you would starve if children and beggars were not fools full of hope.”

Goethe seems, therefore to have been an Spinozan atheist of the "Being = God" variety; who held the view that only fools believe in God or gods.

Early years

Born into a Lutheran family, Goethe's early faith was shaken by news of such events as the 1755 Lisbon earthquake and the Seven Years' War. [4]

Goethe had questioned the traditional concept of God at an early age

At age 9, as described in his *Dichtung und Wahrheit*, in poetic language, he built his own altar to nature out of his father’s natural history collection, surmounting it with sulfur, and lit a candle, when making his devotions. It has been argued that his readings of the works of Benedict Spinoza later confirmed these feelings. [5]

Daimonic principle

In circa 1770, Goethe stated, as discussed in retrospect, in book 20 of his *Poetry and Truth* (1811-1814), how in his pre-1775 youth years he was searching for a universal rule to explain the happenings of existence:

> "I perceived something in nature (whether living or lifeless, animate or inanimate) that manifested itself only in contradictions and therefore could not be expressed in any concept, much less any word. It was not divine, for it seemed irrational; not human, for it had no intelligence; not diabolical, for it was beneficent; and not angelic, for it often betrayed malice. It was like chance, for it laced continuity, and like providence, for it suggested context. Everything that limits us seemed penetrable by it, and it appeared to dispose at will over the elements necessary to our existence, to contract time and expand space. It seemed only to accept the impossible and scornfully to reject the possible."

This statement has since come to be known as Goethe's daimonic principle.

Dissertation | Christianity = Political institution

Scene from the 2011 film *Young Goethe in Love*, wherein he is told that his Christianity-dismantling law degree dissertation failed.

In 1770, Goethe, age 21, at the University of Strasbourg, completing a dissertation (rejected on the grounds that it was unorthodox) on "The Legislature, On the Power of the Magistrate to Determine Religion and Culture", in which he contended, among other things, that "Jesus Christ is not the author of Christianity, but rather 'tis a subject composed by a number of wise men and that Christian religion is merely a rational, political institution." The dissertation was rejected being that it was attack on orthodoxy—as a result, he only achieved the "licentiate" to practice law. Following dissertation rejection, to show contempt for university authorities he offered a series of 56 theses for disputation, e.g. "natural law is what nature has taught all creatures" (thesis 1), "should the woman who kills her newly born child suffer the death penalty? (thesis 55), a moral issue reoccurs in *Faust*, etc., all themed on his distaste for learned authority, and casting for a new way of looking at the relationship between humans to nature, society, and tradition. [8]

In 1782, he described himself as"not anti-Christian, nor un-Christian, but most decidedly non-Christian."

In 1790, in his *Venetian Epigram* 66, Goethe listed four things that he loathed: "tobacco smoke, bugs, garlic, and †." [4]

In his collected works of poems, Goethe famously stated the following famous synopsis:

> "He who possesses science and art,
> Possesses religion as well;
> He who possesses neither of these,
> Had better have religion."

It does seem to be the case that Goethe had some type of belief in the existence of God—some have summarized this to be similar to the embodiment of nature (pantheistic) type of god held in the mind of Benedict Spinoza, one of Goethe's intellectual mentors.

In 1815, Goethe, in a poem, expressly stated the recognition of the sign of the cross, to which he had been tempted by

the tiny cross on the neckchain of his beloved, is repellent to him and a **denial** of *his own* god, a renegade act like the temptation of Solomon by the women of the harem to honor the animal-headed Egyptian deities. [12]

In 1827, Goethe, in a letter to to his friend German composer Carl Zelter, the same letter that he famously comments how people have treated his *Elective Affinities* like the "garment of Nessus", to exemplify, comments in ending: [6]

> "With the kindest greetings, let me exhort and cheer you on to persevere in that activity, to cultivate which —in the midst of peace—we are encouraged and compelled by the hostile pressure of the world. If we help ourselves, God will help us."

In 1831, a year before his end, Goethe commented the following: [7]

> "I have found no confession of faith to which I could ally myself without reservation."

Interesting, indeed.

Elective Affinities | Ten commandments

In 1809, Goethe penned his physical chemistry-based novella *Elective Affinities*, which implicitly usurps God-based religion; or as Heinrich Heine put it: "it overturns everything holy."

In 1830, Goethe, in a letter to his friend, composer Carl Zelter, stated the following about the novella: [9]

> "Following on what went before, let me tell you in fun, that in my *Elective Affinities*, I took care to round off the inward, true catharsis, with as much purity and finish as possible, but I do not therefore imagine that any handsome fellow could thereby be purged from the lust of looking after the wife of another. The sixth commandment, which seemed to the Elohim-Jehovab to be so necessary, even in the wilderness, that he engraved it on granite tables with his own finger,—this it will still be necessary to uphold in our blotting-paper catechisms."

The central aim of Goethe's *Elective Affinities*, according to his 1830 statements, was to show that the laws of god, the 6th commandment in particular, are incompatible with the laws of physical chemistry.

Hence, the "double mental adultery" that takes place in the novel explained through the language of a "double elective affinity reaction" (double displacement reaction) in physical chemistry (affinity chemistry) terms.

God | Gretchen question

See main: Gretchen question

On the question of whether Goethe believed in the existence of god, several citations seem to point to Goethe's *Faust* and his so-called *Gretchenfrage*, meaning "crutch question" or Gretchen question, the incident in the story when the figure Margarete, called Gretchen, asks the main character Heinrich Faust the about his attitude to religion and if he believe in god; specifically: [1]

> “Now tell me how you feel about religion? You are cordially good man, But I think you do not think much of it?”

Margaret, called Gretchen, is a very young girl who is being courted by the older, respectable scientist. After they have already met several times and even kissed, but not yet slept together, Gretchen makes her question to Faust. [2] She asks him directly how he stood with God and religion, to which he answers: [3]

Faust and Gretchen in the garden during which time she asks the so-called "Gretchen question", namely: what is your opinion on religion and do you believe in God? (Painting James Tissot, 1861) (Ñº) The riddled poetic answer to which Faust gives, supposedly, being indicative of his own views, to some extent.

> “Leave that, child! Truly, my love is tender;
> For love, blood and life would I surrender,
> For Faith and Church, I grant
> *to each his own*.
>
> My darling, who shall dare
> ‘I believe in God!’ to say?
> Ask priest or sage the answer to declare,
> And it will seem a mocking play,
> A sarcasm on the asker.
>
> Hear me not falsely, sweetest countenance!
> Who dare express Him?
> And who profess Him,
> Saying, I believe in Him?
> Who, feeling, seeing,
> Deny His being,
> Saying: I believe Him not!

This, according to Adolf Just, is an “evasive, entirely obscure answer”, of Faust, which does “not satisfy the reader either.” [3]

In 1937, Max Planck, aged 79, in his “Religion and Natural Science” lecture, opens to the Gretchen question, as a sort of ice breaker, as follows: [13]

> “ ‘Tell me: how do you stand on religion?’ — If Goethe’s *Faust* contains at all a simple phrase that captivates even a sophisticated listener and arouses a hidden tension within him, it must be this worried question of an innocent girl, in fear for her newly-found happiness, to her lover whom she recognizes as a higher authority.”

(add)

Bible

Goethe, at least since the 1930s, has had the following quote attributed to him: (Ñº)

> "The Bible grows more beautiful as we grow in our understanding of It."

If indeed he did say this, and when, one cannot fault thinkers before the translation of the Rosetta stone (c.1820s), for making faulty statements about the Bible, being that after Egyptian hieroglyphics were deciphered, it was found that the entire Bible is but a monotheistic re-dress of Anunian theology, centered around the Osiris resurrection theory.

Quotes

The following are other related quotes:

> "All unsuccessful attempts at conversion leave him who has been selected for a proselyte stubborn .and obdurate; and this was especially the case with me when Lavater (Ñº) at last came out with the hard dilemma.—'Either Christian or atheist!' Upon this I declared that if he would not leave me my own Christianity as I had hitherto cherished it I could readily decide for atheism, particularly as I saw that nobody knew precisely what either meant."
>
> — Johann Goethe (c.1790), *Truth and Fiction* (Book XIV) (pg. 240) (Ñº)

> "Spinoza does not prove the existence of god. Being is god. If others denounce him as an atheist for this, I wish to exalt him."
>
> — Johann Goethe (c.1810), response to a book that labeled Spinoza as an atheist [11]

> "Christianity is the fairytale of Christ."
>
> — Johann Goethe (c.1810) [11]

> "The most dangerous of all books, so far as the history of the world is concerned, is indubitably the Bible, because no other book has brought so much good and so much evil to the human race."
>
> — Johann Goethe (1810), conversation (Ñº) with a bigoted Roman Catholic doctor, in the presence of the pious Louis Bonaparte, ex-king of Holland, as recorded by Falk, Nov 10

> "When man had ceased to utter his lament, / A god then let me tell my tale of sorrow."
>
> — Johann Goethe (1823), motto of the *Marienbad Elegy* (Ñº)

> "If god created this world, he should review his plan."
>
> — Johann Goethe (c.1820) (Ñº)

"God himself could not alter the course of nature."

— Johann Goethe (c.1820), cited by Oliver Heaviside (1903) amid 'what is entropy debate?' with Max Planck in respect to the perceived idea that entropy increase means that 'nature has a choice' [14]

See also

â— Bible vs. physical science conflicts
â— Goethe on the soul

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External links

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â— Goethe and religion (2009) – Goethetc.Blogspot.com.

θΔics

In genius queries, **Goethe on the soul** refers to German polyintellect Johann Goethe's statements and or dialogues on the concept of the soul and or its residual theories, initiated in the year 1813, following the passing of Christoph Wieland, and up until 1830, approximately, wherein he attempted the query as to whether or not the soul is annihilated following death (existence cessation, dereaction, etc.), via employing the terms entelechy (Aristotle), monad (Leibnitz), "initial points", or something from which the animation of the whole proceeds.

A synopsis of Goethe's 1813-1830 speculative discussions on the "soul", or theory of being existence continuity, which, for lack of a better word, he described in Aristotle-Leibnitz entelechy and or monad stylized speak.

Overview

In 1910, American editor Paul Carus collected the main statements by Goethe on the concept of the soul and or what happens to a person after they cease to exist and or come into existence. Carus, was keen to note that Goethe never committed any of these ideas to paper:

> "As to his view of the nature of the soul, Goethe was careful not to commit himself definitely in his writings, but in conversation he now and then uttered ideas."

Also, that all of the commentary known to have communicated by Goethe is absorbed commentary taken down by associates of Goethe, and therefore not presented, possibly, as accurately as the former would have it.

Falk | Wieland funeral

In 1813, the main dialogue by Goethe, on the speculative nature of the theory of the soul, was taken down by Johann Falk (1768-1826), who accompanied Goethe on his return from the funeral of Christoph Wieland (1733-1813). With reference to the possibility that Wieland's soul could have been annihilated, Goethe is reported to have said the following:

> "There can be no thought of an annihilation in nature of such high psychic powers, nor under any conditions, for she is not wasteful of her capital. Wieland's soul is by nature a treasure, a real gem. Moreover, during the whole of his long life he did not use up these spiritual and beautiful talents, but increased them. A personal continuance of our soul after death by no means conflicts with the observations which I have made for many years concerning the constitution of our own beings and all those in nature. On the contrary, it seems to be an outcome of them and finds in them new confirmation.
>
> How much or how little of a personality deserves to be preserved, is another question, and an affair which we must leave to God. At present I will only say this: I assume different classes and degrees of ultimate aboriginal elements of all beings which are, as it were, the initial points of all phenomena in nature. I might call them 'souls' because from them the animation of the whole proceeds. Perhaps I had better call them monads. Let me retain this term of Leibnitz, because it expresses the simplicity of these simplest beings and there might be no better name. Some of these monads or initial points, experience teaches, are so small and so insignificant that they are fit only for a subordinate service and existence. Others however are quite strong and powerful.
>
> All monads are by nature so indestructible that they can not stop or lose their activity at the moment of

dissolution, but must continue it in the very same moment. Thus they only part from their old relations in order to enter at once into new ones. In this change all depends on the power of intention which resides in this or that monad. Each monad proceeds to whithersoever it belongs, into the water, into the air, into the earth, into the fire, into the stars, yea the secret tendency which conducts it thither, contains at the same time the secret of its future destiny. Any thought of annihilation is quite excluded.

Should we venture on suppositions, I really do not understand what could prevent the monad to which we owe the appearance of Wieland on our planet to enter in its new state of existence into the highest combination of this universe. By its diligence, its zeal, its genius, through which it has incorporated into its own existence so many historical states, it is entitled to anything. I should not be astonished at all should I, after millenniums, meet Wieland again as a star of the first magnitude. Then I should see him and bear witness how he with his dear light would gladden and quicken everything that would come near him.

To bring light and clearness into the nebular existence of some comet should be deemed a joyous task for a monad such as the one of our Wieland! Considering the eternity of this universe of ours, no other duty, generally speaking, can be assumed for monads than that they in their turn should partake of the joys of the gods as blessed creative powers. They are conversant with the becoming of creation. Whether called or uncalled, they come by themselves from all sides, on all paths, from the mountains, from the oceans, from the stars. Who can prevent them? I am sure that I, such as you see me here, have lived a thousand times, and hope to come again another thousand times."

On these passages, Carus comments the following keen notes: [1]

"There is a great lack of lucidity in these sentences. On the one hand the monads are the simplest realities, a kind of atoms, which belong to fire, water, earth, and other elementary existences; on the other hand, they are psychic agencies, and are introduced to personify the law that sways the formation of a nebula into a planetary system; and again they are assumed to be psychic entities. Perhaps some monads are thought to be chemical atoms and others psychic powers; and the latter, after the fashion of the Greek deities, are expected to do the work of the natural laws. Such thoughts are poetry, not science; fiction, not psychological facts; mythology, not philosophy. If we knew Goethe from this passage alone we would say that he was a mystic. We grant that he had a mystic vein whenever he happened to speak or refer to the soul, but even here he disliked the excrescences of mysticism."

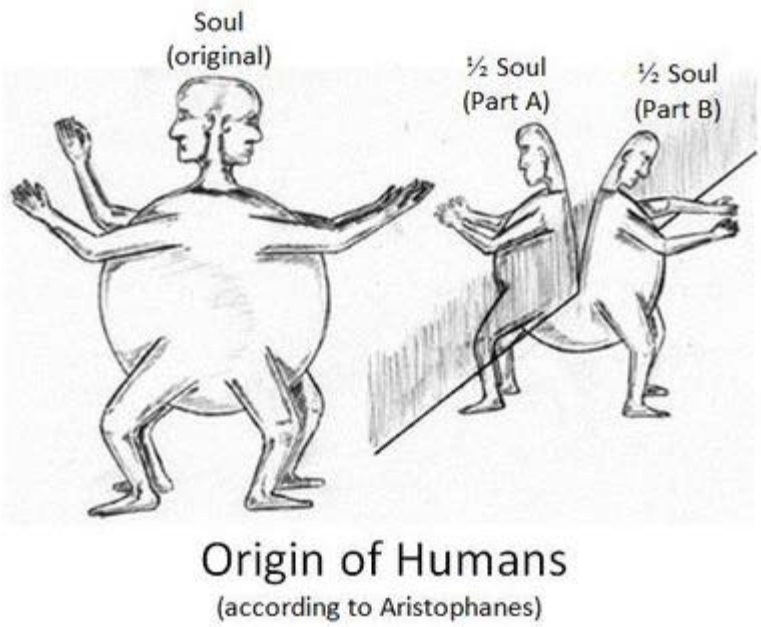

A rendition of Plato's split soul theory, in regards to the hypothetical origin of humans, employed by Goethe in his *Elective Affinities* (P1:C5), via alternate side headache logic, that the characters (or reactants) Eduard and Ottilie are long lost soul mates destined for each other.

(add discussion)

Elective Affinities | Plato

In 1809, Goethe, among the many love theories he secretively employs his *Elective Affinities*, uses Plato's split soul theory, as told by Aristophanes, in regards to his theory of the origins of humans, via the subtle mention (P1:C5) of how Eduard (rightside headache) and Ottilie (leftside headache) had headaches on opposite sides of each other's heads, implying that they were at birth attached, back to back, as one entity, but then split in two, and thereafter finding each other as true loves.

Other

The following are latter recorded comments by Goethe on his soul talk speculations:

> "In the sympathy which binds our souls, in bygone ages, I feel, you must have been either my sister or my wife."
>
> — Johann Goethe (c.1774), Poem to Charlotte von Stein [1]

> "It would be quite impossible for a thinking being to entertain the idea of its own non-existence or the discontinuance of its thought and life. Accordingly everyone carried a proof of his own immortality quite immediately in himself, but as soon as he tried to commit himself to objective statements, as soon as he would venture to come out with it, as soon as he wanted to prove dogmatically or comprehend a personal continuance, as soon as he would bolster up this inner observation in a commonplace way, he would lose himself in contradictions."
>
> — Johann Goethe (1823), Conversation with Chancellor von Mueller and Herrn von Riemer, Oct 19 [1]

> "To be engrossed with the ideas of immortality is only for the leisure classes, and especially for women who have nothing to do. An able man who needs to make himself useful here, and who accordingly has to exert himself daily, to struggle and to work, leaves the future world alone and is active and useful in this one."
>
> — Johann Goethe (1824), Conversation with Chancellor von Mueller, Feb 25 [1]

> "Each entelechy is a piece of eternity, and those few years during which it is joined to its terrestrial body do not make it old."
>
> — Johann Goethe (1828), Conversation with Johann Eckermann, Mar 11 [1]

> "I do not doubt our continuance, for nature cannot do without continuity; but we are not all immortal in the same way, and in order to manifest himself as a great entelechy, a man must first be one."
>
> — Johann Goethe (1829), "Conversation with Johann Eckermann", Sep 1 [1]

> "The persistence of the individual and the fact that man rejects what does not agree with him, are proofs to me that such a thing as an entelechy exists. Leibnitz cherished similar ideas concerning such independent entities, only that what we call 'entelechy' he called 'monads'."

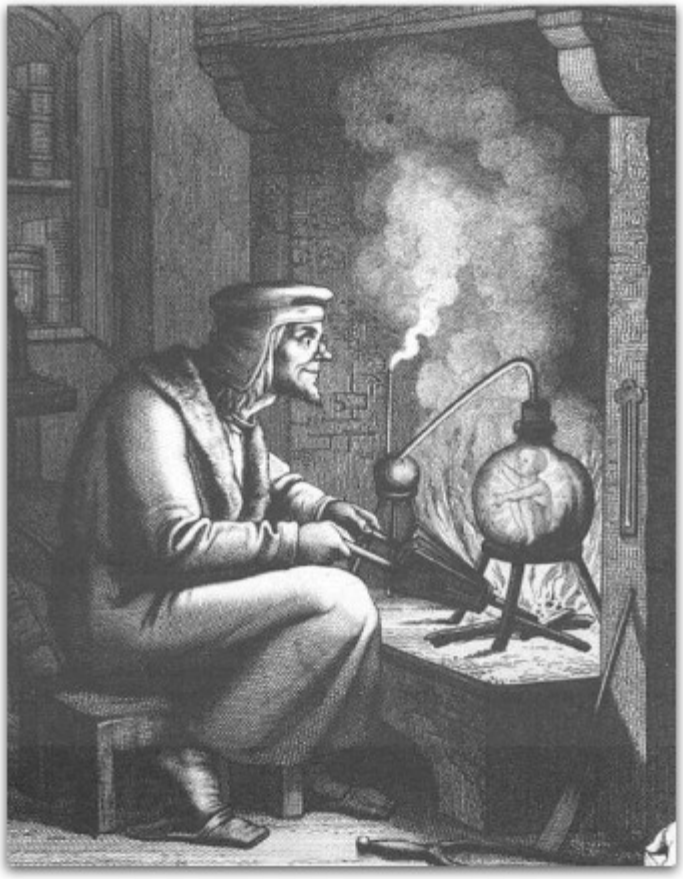

Wagner, a famed sorcerer's former student, creating **Homunculus** in the chemical laboratory using fire (or heat) and some type of chemical apparatus, as described in Goethe's 1832 *Faust part II* (see: laboratory produced life); in his talk with Eckermann, Goethe is supposed to have said that Homunculus is virtually the same as the Leibnizian entelechy or monad, according to John Williams. [3]

— Johann Goethe (1830), "Conversation with [add]", Mar 30 [1]

Quotes | Related

The following are related quotes:

"Goethe's conversation with Falk is perhaps the most important passage to be quoted on the mooted topic, and it may be well to bear in mind that it was Falk and not Goethe who wrote these sentences, and that they therefore must be used with discretion."

— Paul Carus (1910), "Goethe's Soul Conception" (pg. 750) [1]

See also

â— Do atoms have a soul?
â— Edison on the soul | Thomas Edison (1910)
â— Heisenberg-Pauli dialogue

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θΔics

In Hmolpedia, **Goethe quotes** refers to some of the noted quotations by German polymath Johann Goethe, some of which are listed below.

-

"From the power that binds all beings, that man frees himself who overcomes himself."

— Johann Goethe (c.1800), *Geheimnisse* (Q)

"The works of Lavoisier and his associates operated upon many of us at that time like the Sun's rising after a night of moonshine: but Chemistry is now betrothed to the Mathematics, and is in consequence grown somewhat shy of her former admirers."

— Johann Goethe (c.1816), "Correspondence with Luke Howard", Continental Journey (Q)

-

"The world admires wealth and velocity—these are the things for which everyone strives. Railroads, the post, steamboats, and all possible modes of communication are the means by which the world overeducates itself and freezes itself in mediocrity. We will be, with a few others, the last of an epoch that does not promise to return any time soon."

— Johann Goethe (1825), "Letter to Carl Zelter" (Q)

A woman (2011) holding up the famous **Goethe quote** on freedom, from *Elective Affinities* (P2:C5), at the Occupy Wall Street protests (Zuccotti Park, New York, Sep 28.

"Mathematics has the completely false reputation of yielding infallible conclusions. Its infallibility is nothing but identity. Two times two is four, but it is just two times two, and that is what we call four for short. But four is nothing new at all. And thus it goes on and on in its conclusions, except that in the higher formulas the identities fades out of sight."

— Johann Goethe (c.1820); see: Goethe and mathematics (Q)

"Every day we should hear at least one little song, read one good poem, see one exquisite picture, and, if possible, speak a few sensible words."

— Johann Goethe (c.1820), *Wilhelm Meister's Lehrjahre* (Apprenticeship) (1786-1830), Book V, Ch. 1 (Q)

"Only a person who has himself experienced the impact of a fertile idea will understand what passionate activity is stirred in our minds, what enthusiasm we feel, when we glimpse in advance and in its totality something which is later to emerge in greater and greater detail in the manner suggested by its early development. Thus, the reader must surely agree, having been captured and driven by such an idea, I was bound to be occupied with it, if not exclusively, nevertheless during the rest of my life."

— Johann Goethe (1831), reflection of his 1786-87 visit to a public garden in Palermo, Sicily (Q)

"Of all discoveries and opinions, none may have exerted a greater effect on the human spirit than the

doctrine of Copernicus. The world had scarcely become known as round and complete in itself when it was asked to waive the tremendous privilege of being the center of the universe. Never, perhaps, was a greater demand made on mankind for by this admission so many things vanished in mist and smoke! What became of our Eden, our world of innocence, piety and poetry; the testimony of the senses; the conviction of a poetic religious faith? No wonder his contemporaries did not wish to let all this go and offered every possible resistance to a doctrine which in its converts authorized and demanded a freedom of view and greatness of thought so far unknown, indeed not even dreamed of."

— Johann Goethe (c.1820) (O)

Elective Affinities

See main: Elective Affinities (Quotes)

The following are quotes from *Elective Affinities* (1809):

"None are more hopelessly enslaved than those who falsely believe they are free."
("Niemand ist mehr Sklave, als der sich für frei hält, ohne es zu sein.")

— Goethe (1809) *Elective Affinities* (P2:C5) [3]

"Nothing shows a man's character more than what he laughs at."

— Goethe (1809) *Elective Affinities* (P2:C4) [6]

Reality | Non-reality

The following are reality themed quotes:

"We do not have to visit a madhouse to find disordered minds; our planet is the mental institution of the universe."

— Goethe (c.1815)

"Few people have the imagination for reality."

— Goethe (c.1815) (O)

Newly added

The following are newly added Goethe quotes:

"If I accept you as you are, I will make you worse; however if I treat you as though you are what you are capable of becoming, I help you become that."

— Goethe (c.1815) (O)

List

The following is a growing list of relevant Goethe quotes:

> "The modern age has a false sense of superiority because it relies on the mass of knowledge that it can use, but what is important is the extent to which knowledge is organized and mastered."
>
> — Goethe (1810), *Source* (Q)

> "The human has an unstoppable drive, at least to try, to detect the inmost force, which binds the world, and guides its course."
>
> — Goethe (c.1830), quote from *Faust* [1]

> "If one does not know what went on for the last three thousand years, he or she remains ignorant, merely surviving from day-to-day."
>
> — Goethe (c.1830)

> "A person who does not know the history of the last 3,000 years wanders in the darkness of ignorance, unable to make sense of the reality around him."
>
> — Goethe (c.1830) (Q)

> "The history of science is science itself."
>
> — Goethe (1810) *Theory of Colors* [2]

> "A creation of importance can only be produced when its author isolates himself; it is a child of solitude."
>
> — Goethe (c.1810)

> "Only by joy and sorrow does a person know anything about themselves and their destiny. They learn what to do and what to avoid."
>
> — Goethe (c.1810)

> "The first and last thing which is required of genius is the love of truth."
>
> — Goethe (c.1810) [4]

> "He who is firm in will moulds the world to himself."
>
> — Goethe (c.1810)

"Every animal is an end in itself."

— Johann Goethe (1819), *Athroismos* (poem); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 189)

"A little passion, is the only thing which can render a watering place supportable; without it, one dies of ***ennui***."

— Johann Goethe (1831), conversation (O) with Johann Eckermann, Jul 20 [7]

Attributed

The following are quotes sometimes attributed to Goethe:

"What does not kill me makes me stronger."

Goethe (original): "What doesn't kill us makes us stronger." (source?)
Nietzsche (paraphrased): "That which does not kill me makes me stronger." (*Twilight of the Idols* 1888)

Praise | Tribute

The following are quotes on or about Goethe:

"Goethe was raised to the rank of Shakespeare."

— Henry Adams (1907), *The Education of Henry Adams*

"Words like 'great' and 'genius' could aptly be used for but a select number of artists—for Michelangelo or say Shakespeare. In the United States, the works of these great artists have been incorporated into popular culture as the epitome of visual and linguistic beauty. By contrast, on these shores, Goethe's works remain largely unread and rarely discussed except among college students, most of whom develop a healthy dose of amnesia shortly after graduation."

— Daniel Spiro (2005), "Remember to Live! The Philosophy of Johann Wolfgang von Goethe" [5]

See also

- Adams quotes

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θΔics

In science, **Goethe's human chemistry**, or Goethe's "human chemical theory", refers to the version of human chemistry conceived by German polymath Johann Goethe, from 1796 to 1832, the time of his end, called by him "elective affinities", as largely presented as a set of coded "principles", as he stated, in his 1809 physical chemistry based novella *Elective Affinities*.

The Hauptmann is invited to join Eduard and Ottilie; and it is the resulting threesome that one evening discusses the notion of "Wahlverwandtschaften" (elective affinities), processes of bonding and rebonding in chemistry. At issue is the possibility that a particular compound can be fractured by the appearance of a third substance which then bonds with one of the previously conjoined substances — almost as though some kind of choice were being exercised. At one level, the discussion amongst the three friends genuinely does concern recently discovered chemical processes.[3] At another level, the characters ceaselessly make metaphorical links between the behavior of chemical substances on the one hand and the chemistry of human attraction on the other. And, as soon as one formulates the matter in this way, in terms of "human chemistry," one asks oneself whether this, too, is a literal or metaphorical statement. Are men and women subject to the laws of material reality in the same way as the chemical substances are? If so, what is the force of "Sitten und Gesetze" (272) in the human sphere?

A 2002 "**human chemistry**" interpretation of Goethe's theory of elective affinities. [2]

Overview

Goethe viewed people as "metamorphosized", a term he adopted from Ovid, types of human chemical species that react with each other in relationships, both intimate, social, and political, are no different than chemical species and that just as the relationships of chemical species are predetermined by the laws of affinity (the precursors to the laws of quantum valency and chemical thermodynamics) as detailed on affinity tables, then so to are the relationship lives of people. [1]

This theory, the notes of which he destroyed, was published in cryptic form in the 1809 novella *Elective Affinities*. This was written when Goethe was sixty-one and he considered it his greatest work. Although each chapter in the novella depicts a basic human chemical reaction described in story form, in the famous "chapter four" is the characters intermingle the chemical theory with human existence to a brilliant effect.

Categorization

In categorization terms, Goethe's human chemistry, might be well compared to Empedocles human chemistry (450BC), whom Goethe cites, Schopenhauer's human chemistry (1818), who was Goethe's student, Carey's human chemistry (1858), Huxley's human chemistry (1871), Adams' human chemistry (1885), Drier's human chemistry (1910), Fairburn's human chemistry (1914), Thims' human chemistry (1995), Tarnopolsky's human chemistry (2009) (see: HC pioneers).

Laws of affinity

In the history of chemistry, there are at least a dozen or more laws of affinity, depending on which chemist is sourced. One of the first, was Plato's c. 390 BC affinity law that "like tends towards like". Over the years, these affinity laws became more elaborate and complex as new chemical discoveries occurred.

The seed for the theoretical structure of Goethe's novella was Geoffroy's first law of affinity as stated in 1718 by French physician and chemist Étienne Geoffroy, that "whenever two substances are united that have a disposition to combine and a third is added that has a greater affinity with one of them, these two will unite, and drive out the other." To expound on this law, using data from the 1718 edition of Newton's *Opticks* (query 31), Geoffroy made a sixteen-column, eight-row, affinity table containing twenty-four reacting species, showing specifically what affinity reactions would occur between various combinations of reactants.

Étienne Geoffroy's 1718 affinity table.

At the head of each column is a header species with which all species below can combine or have a rapport

with. The latter are so placed such that any higher species replaces all others lower in the column from their compounds with that at the head of the table. In other words, the species at the head of the table can potentially react with any species below it. All the species below the header species are ranked by chemical affinity preferences relative to the top species, with a higher rank corresponding to a higher affinity tendency. The species at the bottom of each column, for instance, have the least amount of affinity for the header species. If the bottom species is in a weakly bonded relationship with the header species, any species above it can potentially displace it from its attached partner.

Goethe, in turn, viewed Geoffroy's affinity table as though it were filled with different chemically reactive people with varying amounts of bonding affinity for one another. Each header species, for example, would represent a different man or women. The species below each person would be the various reactants with which that specific header person could potentially react with, arranged according to unique chemical affinity preferences. Goethe believed these relations to exist in human life, owing to the fact that the logic of this affinity table chemistry was based on a well established law of nature.

Chapter four

See main: Chapter four

In the Goethe's 1809 *Elective Affinities*, people are described as chemical species whose amorous affairs and relationships were pre-determined via chemical affinities similar to the pairings of alchemical species. Goethe outlined the view that passion, marriage, conflict, and free-will are all subject to the laws of chemistry and in which the lives of human species are regulated no differently than the lives of chemical species. In the novella, the central chemical reaction that takes place is a double displacement reaction (double elective affinity), between a married couple Eduard and Charlotte (BA), at the end of their first year of marriage (for each their second marriage), and their two good friends the Captain and Ottilie (CD), respectively.

The first marriages, for both Eduard and Charlotte, are described as having been marriages of financial convenience, essentially arranged marriages. Specifically, when they were younger, Eduard was married off to a rich older women through the workings and insatiable greed of his father; Charlotte, likewise, when her prospects were none the best, was compelled or obliged to marry a wealthy man, who she did not love. In the fourth chapter, the characters detail the world's first ever verbally-depicted human double displacement chemical reaction.

The chapter begins with description of the affinity map (reaction map) or 'topographical chart' as Goethe calls it. On this reaction map, we are told that on it 'the features of the estate and its surroundings were clearly depicted, on quite a large scale, in pen and in different colors, to which the Captain had give a firm basis by taking trigonometrical measurements'. Next, to explain the reaction, we are told:

> "'Provided it does not seem pedantic,' the Captain said, 'I think I can briefly sum up in the language of signs. Imagine an *A* intimately united with a *B*, so that no force is able to sunder them; imagine a *C* likewise related to a *D*; now bring the two couples into contact: *A* will throw itself at *D*, *C* at *B*, without our being able to say which first deserted its partner, which first embraced the other's partner.'"

This is shown below, in modern reaction terms:

$$AB + CD \rightarrow BD + AC$$

> "'Now then!' Eduard interposed: 'until we see all this with our own eyes, let us look on this formula as a metaphor from which we may extract a lesson we can apply immediately to ourselves. You, Charlotte,

represent the *A*, and I represent your *B*; for in fact I do depend altogether on you and follow you as *A* follows *B*. The *C* is quite obviously the Captain, who for the moment is to some extent drawing me away from you. Now it is only fair that, if you are not to vanish into the limitless air, you must be provided with a *D*, and this *D* is unquestionably the charming little lady Ottilie, whose approaching presence you may no longer resist.'"

(add discussion)

Discussion

Although there have been dozens of argumentative papers published, being either for or against Goethe's use of chemical theory, one of the best was German historian Jeremy Adler's 1987 "Goethe's Elective Affinity and the Chemistry of its Time", wherein he made educated guesses as to which chemist Goethe sourced during each scene or chapter.

References

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θΔics

In equations, the **Goethe-Helmholtz equation**, an Hmolpedia-assigned name, refers to any equation, of differing formats, relating the affinities of an isothermal-isobaric reaction to the change in the Gibbs free energy of the system; the most common version of which is:

$$A = -\Delta G$$

where A is the chemical affinity or driving forces, of the isothermal-isobaric reaction, and ΔG is the change in the Gibbs free energy of the reaction or process.

A version of the **Goethe-Helmholtz equation** designed (2009) by American electrochemical engineer Libb Thims for the 200th anniversary of the publication of Goethe's 1809 *Elective Affinities*, his self-defined "best book". [1]

Etymology

The name "Goethe-Helmholtz equation" is an Hmolpedia assigned name, done in honor of German polymath Johann Goethe who first applied "affinities" as sets of regulating principles to human interactions and affairs (1796-1832), viewing human interactions as human chemical reactions, and who in defense of his theory, famously commented (Dec 1809), emphatically, in response to a women who reproached him in the street, that:

> "The principle illustrated in the book is true and not immoral."

and German physician-physicist Hermann Helmholtz, the last universal genius, following Goethe, who famously proved ("On the Thermodynamics of Chemical Processes", 1882) that free energy is the true measure of affinity—hence, Gibbs free energy is the true measure of the affinities of human existence.

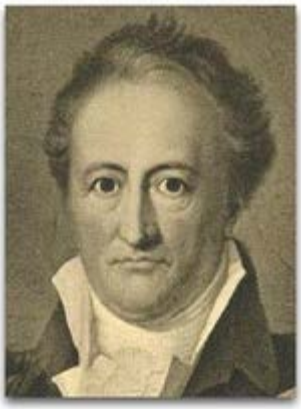

Goethe | human chemistry

In 1796, German polymath Johann Goethe, in his "Third Lecture on Anatomy", outlined the first inklings of his new theory that human behaviors, interactions, relationships, and reactions are governed by chemical forces or affinities:

> "To facilitate our comprehension of the concept of organic existence, let us first take a look at mineral structures. Minerals, whose varied components are so solid and unchanging, do not seem to hold to any limits or order when then combine, although laws do determine these conditions. Different components can be easily separated and recombined into new combinations. These combinations can again be taken apart, and the mineral we thought destroyed can soon be restored to its original perfection.
>
> The main characteristic of minerals that concerns us here is the indifference their components show toward the form of their combination, that is, their coordination or subordination. There are, by nature, stronger or weaker bonds between these components, and when they evidence themselves, they resemble attractions between human beings. This is why chemists speak of elective affinities, even though the forces that move mineral components [or humans] one way or another and create mineral structures are often purely external in origin, which by no means implies that we deny them the delicate portion of nature's vital inspiration that is their due."

The depiction of this, in the mind of Goethe, at this time, is shown

adjacent; a model which takes it cues from Scottish chemist-physician William Cullen 1757 Glasgow University lecture notes, wherein he pioneered the use of diagrams as chemical ‘equations’ and was the first to diagram the force of affinity using arrow notion, which he explains as follows: [2]

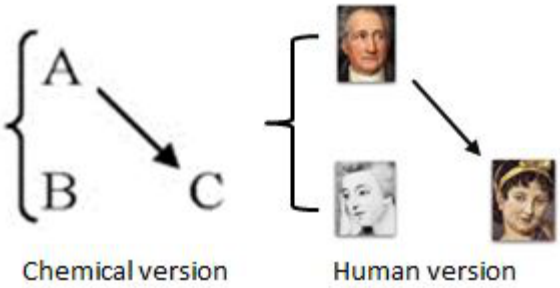

The arrow represents the "elective affinity", external in origin to the reactants and products, humans or chemicals, as Goethe stated in 1796.

“The dart → between them expresses the *elective attraction*; when I put a dart with the tail to one substance and the point to another, I mean that the substance to which the tail is directed unites with the one to which the point is directed more strongly than it does with the one united to it in the crotchet {” .

Using this chemical equation reaction model, as told through Swedish chemist Torbern Bergman (*A Dissertation on Elective Attractions*, 1775), Goethe presented the final version of his theory in the form of coded gestalt in his 1809 physical chemistry based novella *Elective Affinities* (see: Goethe timeline), about which he latter commented that "the principles in it are true" and that it was greatest work.

To exemplify, using the depicted Bergman-style example reaction (above), the Goethe-Cullen conception equates to the model wherein, for example, the reaction: AB + C → AC + B (in modern terms), where AB and AC, technically called "dihumanide molecules", are held by human chemical bonds, A≡B and A≡C, and the "force", symbolized by the dart (→), is the electromagnetic force, acting "external" to the reactants (people or chemicals), in the form of an exchange force.

Thermal theory of affinity

In the middle of the 19th century, independently proposed by Danish chemist Julius Thomsen (1854) and French chemist Marcellin Berthelot (1864), the “thermal theory of affinity” was proposed, arguing that all chemical action, not due to external energy, tends to the production of the body or bodies which set free the greatest heat. [3] This theory, however, soon began to show deficiencies, such as not being able to explain bodies formed as a result of endothermic reactions.

Thermodynamic theory of affinity

In 1882, German physicist Hermann Helmholtz, in his famous “On the Thermodynamics of Chemical Processes”, combined the earlier chemical thermodynamics work of American engineer Willard Gibbs with his own electrochemical thermodynamics work and, with the following statement, effectively overthrew the thermal theory of affinity:

> “Given the unlimited validity of Clausius' law, it would then be the value of the free energy, not that of the total energy resulting from heat production, which determines in which sense the chemical affinity can be active.”

and gave the following equation formulation for affinity in relation to the direction of reaction changes spontaneously occurring:

$$\frac{dF}{dt} \leq 0$$

where, in modern terms, *F* is the Helmholtz free energy, and *t* is time, which states that the affinities will only be active when the system of the chemical process shows a decrease in free energy with time.

Heat theorem | Absolute zero

In the late 1880s, German physical chemist Walther Nernst, having an excellent grasp of the relationship between free energy, affinity, and the external work output of chemical processes, as well as their relation to the natural advancement of processes in nature, set out to solve the long-sought question of the determination and measurement of the "chemical affinity" of a reaction. In is 1893 *Theoretical Chemistry from the Standpoint of Avogadro's Rule and Thermodynamics*, Nernst explained that neither the "heat-toning" (heat releasing) effects of a reaction, as French chemist Marcellin Berthelot had argued, in his 1875 principle of maximum work, nor the velocity of a reaction can function as a measure of affinity, but rather only the free energy can. In summary Nernst states: [3]

> "Since every chemical process, like every process of nature, can only advance without the introduction of external energy only in the sense in which it can perform work; and since also for a measure of the chemical affinity, we must presuppose the absolute condition, that every process must complete itself in the sense of the affinity—on this basis we me may without suspicion regard the maximal external work of a chemical process (i.e. the change of free energy), as the measure of affinity. Therefore the clearly defined problem of thermo-chemistry is to measure the amounts of the changes of free energy associated with chemical processes, with the greatest accuracy possible … when this problem shall be solved, then it will be possible to predict whether or not a reaction can complete itself under the respective conditions. All reactions advance only in the sense of a diminution of free energy, i.e. only in the sense of the affinity."

Here we see the first inklings of the view that, when scaled up to the human-human reaction level, in the future, when the details of this problem are worked out, it will be possible to "predict" whether or not a given human chemical reaction (e.g. love the chemical reaction) can complete itself under the respective conditions.

In his 1906 *The New Heat Theorem*, Nernst had formulated his so-called "heat theorem or "third law of thermodynamics", as it eventually came to be called), showed that the Thomsen-Berthelot principle (thermal theory of heat) is only true at absolute zero, in the sense that as the temperature approaches zero, entropy change becomes zero:

$$\lim_{T \to 0} \Delta S = 0$$

and when substituted into the Helmholtz formula for affinity (above):

$$A = -\Delta U$$

at which point heat, or rather the heat released form the internal energy (bond energy) chances "ΔU" of the chemical reactions, becomes the true measure of chemical affinity. Nernst was awarded the 1920 Nobel Prize in chemistry for this work.

Gibbs free energy | Driving force of a reaction

In 1923, American physical chemist Gilbert Lewis, former student of Nernst, published the 1923 textbook *Thermodynamics and the Free Energy of Chemical Substances*, wherein, in his chapter sub-section "The Driving Force of a Chemical Reaction", he famously situated the "driving force" thermodynamic view of chemical process and introduced what he defined as a "universal rule" as follows (using modern notation):

"It is a universal rule that if any isothermal process is to occur with finite velocity, it is necessary that:

$$\Delta G > w'$$

[This applies to] a chemical process which is in some way harnessed for the production of useful work. In the far more common case of a reaction which runs freely, like the combustion of a fuel, or the action of an acid upon a metal; in other words, systems which are subject to no external forces except a constant pressure [exerted by the atmosphere]. In such cases w' = 0, and it follows that no actual isothermal processes is possible unless:

$$\Delta G < 0$$

Therefore if we know the value of ΔF for any isothermal reaction, and if this value is positive, the we know that the reaction, in the direction indicated, is thermodynamically impossible."

The quantity w' above is what Lewis defines as "net work" namely work done by a chemical reaction, less the pressure volume work (done by the reaction expanding against the atmosphere), that can be connected to a motor or other electrical system for a use (purpose). He continues:

"We may think of:

$$-\Delta G$$

as the driving force of a chemical reaction."

This chapter subjection, in the summary words of American chemistry historian Henry Leicester (1956), resulted to replace the notion of "affinity" with the notion of "free energy" throughout the corpus of modern science.

Brussels school

In 1936, Belgian physicist Theophile de Donder, in his *Thermodynamic Theory of Affinity*, head of the so-called "Brussels school of thermodynamics", using a parallel albeit slightly different approach, presented a formulation where the symbol "A" for affinity as the negative partial of the partial of the Gibbs free energy per unit partial of extent of reaction for a change in a isothermal isobaric system: [4]

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

and would go on to discuss this, using coupling theory, in terms of how reactants and chemicals can be made to go, move, or react in a direction contrary to their own affinity, or in an anthropomorphic sense, as Goethe would have seen things, in a direction contrary to their own will. De Donder's approach, according to Indian-born American physical chemist Dilip Kondepudi, of his school, is said to be based on American engineer Willard Gibbs' 1876 concept of chemical potential. [5] In this sense, the definition of what is called "standard affinity", according to French thermodynamicist Pierre Perrot (*A to Z of Thermodynamics*, 1998), is:

$$A^\circ = -\Delta_r G^\circ$$

which, according to Perrot, equates to:

$$A^\circ = \sum_{i=1}^{k} -\nu_i \mu_i^\circ$$

such that the affinity of the chemical reaction is calls "standard" when each constituent is taken in its standard state. [6]

Dissection

The above logic, in simplified modern "Delta", before (initial state) and after (final state), notation, simplifies to the following:

$$A = -\Delta G$$

which shows, conclusively, that the theory contained in Goethe's 1809 *Elective Affinities*, or "principles", as he called them, are true, as he so rightly said, and that his novella was a modern-day treatise on the explication of Gibbs free energy changes involved in the determination of human chemical reactions. In reduced modern format, Goethe showed, over two-hundred years ago, that the affinities, or the forces of love and hate, which are balanced in stability ratios in successful relationships, of human relationships are functions of enthalpy change ΔH, entropy change ΔS, and temperature T:

$$A = T\Delta S - \Delta H$$

which, noting that H = U + PV, equates to:

$$A = T\Delta S - \Delta U - P\Delta V$$

meaning that human affinity, or the affinity between two people, i.e. the force of reaction between people, according to Helmholtz and Goethe, is a function of temperature, entropy, internal energy, pressure, and volume. This means that affinity will be favored, between two people, when there is an increase in entropy, a decrease in internal energy, and a decrease of volume, of the interactive system, over time. One can expand on this equation in more detail, by noting that Rudolf Clausius defined internal energy of the system, which in this case concerns a system of interacting people or human molecules, as the sum of the vis viva and the ergal, or U = T + J, which referring to a change Δ over time is:

$$\Delta U = \Delta T + \Delta J$$

Subsequently, the measure of the affinity between two people, wherein A > 0 for spontaneously favored relationships (or ΔG < 0, thermodynamic sense, i.e. according to the spontaneity criterion), is expressed by the equation:

$$A = T\Delta S - P\Delta V - \Delta T - \Delta J$$

meaning that in addition to an entropy increase, ΔS > 0, or transformational content increase (meaning that heat was transformed in to system internal evolution work), which signifies that the body or boundaried system of the relationship has transformed or evolved over time, and a volume decrease, ΔV < 0, associated with favorable relationships, meaning that spatial movements of the pair come together over time rather than diverging (simplified by saying that two homes become one), a vis viva decrease, ΔT < 0, and an ergal decrease, ΔJ < 0, will also be associated with favored relationships. A decrease in vis viva seems to make intuitive sense, in that a couple nearing their golden wedding anniversary will invariably tend to have less kinetic energy then a newly minted couple, in the sense that the former's daily movements will often be slow and tending to be confined to the kitchen, bathroom, and television room. The subject of an ergal decrease over time as associated with stable relationships requires more thought. In formulaic terms, ergal change over time is defined as:

$$\Delta J = J_f - J_i$$

Thus, a negative ergal change, which be the above reasoning is associated with favored relationships, implies that the ergal at the start of the relationship, J_i, must be greater than the ergal at the end of the relationship, J_f. In the terminology of William Hamilton, this is expressed by saying that the was a decrease in the force function of the relationship over time or in the terminology of William Rankine, this is expressed by saying that there was a decrease in the potential energy of the relationship over time.

Said another way, Goethe showed that human relationships (affinity relationships) are governed by the laws of chemical thermodynamics.

Coupling

With the publication of German-born American biochemist Fritz Lipmann's 1941 paper "Metabolic Generation and Utilization of Phosphate Bond Energy", which showed that, in nature, endergonic reactions are coupled to exergonic reactions, we know that human chemical reactions between people are coupled to each other, as Goethe showed in his

novella, or that bond energy released from some certain energy dense human bonds, acts to drive less energetic human reactions that wound not otherwise go on their own. Thus, wherein affinity equates to free energy *G* and elective affinity reaction equates to chemical reaction in modern terms, Goethe pioneered the science of human chemical thermodynamics, two-hundred years ahead of its time.

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θΔics

In eponyms, **Goethean**, pronounced “gurt-ean”, refers to the one or more of the views or philosophical tenets of or relating to or in the manner of German polyintellect Johann Goethe, e.g. Goetheanism, Goetheanist, Goethendipity, Goethean philosophy, Goethean atheism, Goethean morality, Goethean revolution, Goethean calendar, Goethean scholar, among others.

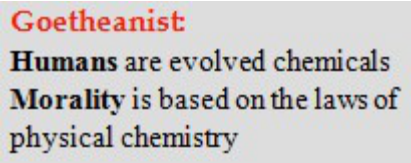

A 2011 "Goetheanist" term definition image, from the Dawkins scale page.

Quotes

The following are related quotes:

> “We love them as we love a child. We want to see them realized, and we intervene on their behalf because they are a part of our own being. The idea is the guideline for conduct, and love is the driving force in **Goethean** morality.”
>
> — Rudolf Steiner (c.1883), *Nature’s Open Secret: Introduction to Goethe’s Scientific Writings* [1]

> “Libb Thims is a strong atheist who adheres to a physics-based morality, and considers himself a **Goethean** revolutionist.”
>
> — David Bossens (2013), Belgian philosopher; on Thims and the Goethean revolution

External links

â— Goethean – TheFreeDictionary.com.

θΔics

In calendars, **Goethean calendar** is a modern era, abbreviation BG/AG notion employed, dating system, i.e. a non-mythology based alternative and upgrade to the BC/AD Gregorian calendar (aka Christian calendar) dating system, which dates time in years to the epoch of the reaction synthesis (birth) of German polyintellect Johann Goethe (1749-1832), who emerged from birth canal at noon on the day of 28 Aug 1749 (in Gregorian calendar years), according to which time is thus categorized as years "Before Goethe" (BG) and years "After Goethe" (AG) or *Anno* Goethe, if one prefers Latin.

Goethean Calender

...	2050BG	...	4BG	3BG	2BG	1BG	← | →	0AG	1AG	2AG	3AG	...	260	...
...	300BC	...	1746	1747	1748	1749	Dec 31 / Jan 1	1750	1751	1752	1753	...	2010	...

A snapshot of the **Goethean calender** dating system, which dates years before (**BG**) or after (**AG**) the reaction synthesis, i.e. birth (28 Aug 1749), of human chemistry founder Johann Goethe.

Conversion formulas | BC/AD to BG/AG

The following conversion formula facilitates the conversion of "before Christ" BC years into "before Goethe" BG years:

$$BG_{years} = BC_{years} + 1750$$

The following conversion formula facilitates the conversion of "Anno Domini" AD years from 0 AD to 1749 AD to "before Goethe" BG years:

$$BG_{years} = 1750 - AD_{years}$$

The following conversion formula facilitates the conversion of "Anno Domini" AD years from 1750 AD to the present to "Anno Goethe" AG years:

$$AG_{years} = AD_{years} - 1750$$

(add summary)

History

The Goethean calendar was devised by American electrochemical engineer Libb Thims and first employed online in Hmolpedia articles on 4 Apr 2013 (see: atheism timeline). On 5 Nov 2014, the Goethean calendar dating system began to be used to date the publication date of uploads of Atheism Reviews YouTube videos. [1]

Quotes

The following are related quotes:

> "1642 [the year of Newton's birth] is the Christmas of the **modern age**."
>
> — Johann Goethe (c.1810), Publication

> "All before Goethe [28 Aug 1749] are ancients, and all who have read him are **modern**."
>
> — Ralph Emerson (1852), commentary on Margaret Fuller

References

1. Atheism Reviews – YouTube.

θΔics

In

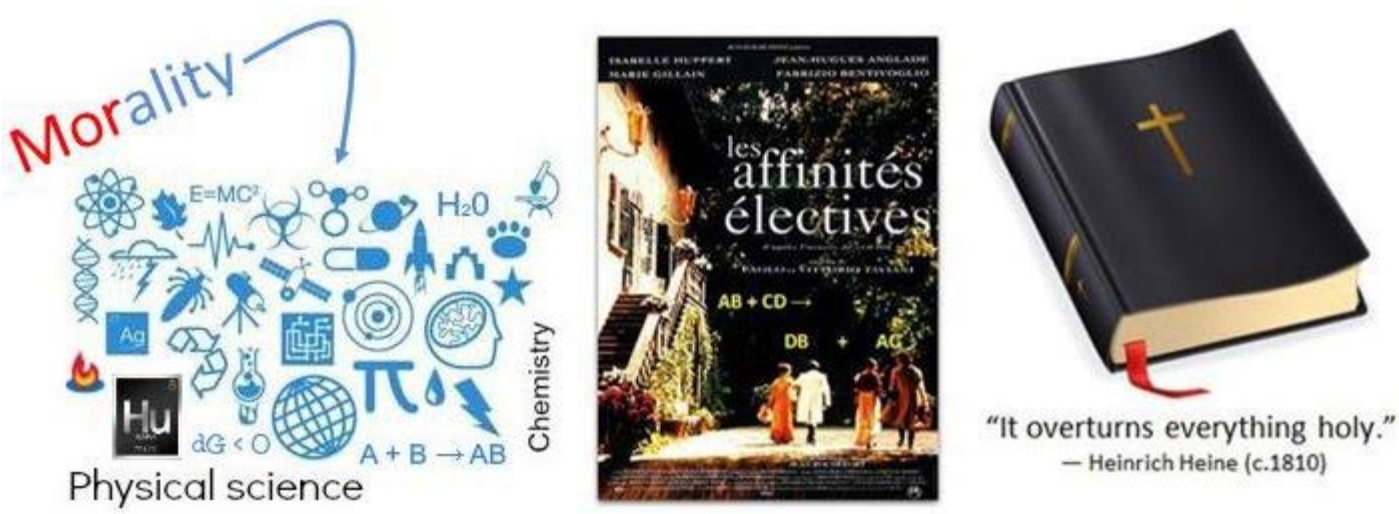

A depiction, from the atheism timeline, of **Goethean morality**, namely a morality based on the symbols of physical chemistry, the logic of which, according to Heinrich Heine (c1810), "overturns everything holy".

hmolscience, **Goethean morality** refers to []

Overview

Goethean morality is the view that individual "choice" is determined by the mutual "affinities", aka exchange forces, of micro social system interactions (see: Goethe on the soul); the "naturalness" of each choice gauged in terms of the endergonic-ness or exergonic-ness of each choice-determined reaction; the sum of which, according to coupling theory, actuating in the direction of what is natural according to the system, as the universe sees the ongoing process of things, as measured and determined by Gibbs free energy minimas.

Quotes

The following are representative quotes:

> "The **moral symbols** in the natural sciences—for example that of the elective affinities invented and used by the great Bergman—are more intelligent and permit themselves to be connected better with poetry, even connected with society better than any others, which are, after all, even the mathematical ones, anthropomorphic. The thing is that the former (the chemicals) belong with the emotions, the latter (mathematics) belong with the understanding."
>
> — Johann Goethe (1809), "Conversation with Friedrich Reimer", Jul 24 [1]

> "Goethe sees morality arising from the human world of ideas. Only ideas that are clear in themselves, though which we give ourselves our own direction, can guide moral conduct, not objective norms or mere impulses. We love them as we love a child. We want to see them realized, and we intervene on their behalf because they are a part of our own being. The *idea* is the guideline for conduct, and *love* is the driving force in **Goethean morality**. For him duty means 'to love what we have commanded ourselves to do' (*Verses in Prose*)."
>
> — Rudolf Steiner (c.1900), *Nature's Open Secret: Introduction to Goethe's Scientific Writings* (pg. #)

See also

â— Atheistic morality
â— Goethean philosophy
â— Zerotheism for kids

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θΔics

In philosophy, **Goethean philosophy** refers to []

Overview

In c.1770s until 1882, Goethe, via his various intellectual circles, and published works (140+ volumes), outlined an advanced

Realism	"Every stage of life corresponds to a certain philosophy. A child appears a realist; for it is as certain of the existence of pears and apples as it is of its own being.	(age 9) (age 15)
Idealism	A young man, caught up in the storm of his inner passions, has to pay attention to himself, look and feel ahead; he is transformed into an idealist.	(age 24) (age 38)
Skepticism	A grown man, on the other hand, has every reason to be a skeptic; he is well advised to doubt whether the means he has chosen to achieve his purpose can really be right. Before action and in the course of action he has every reason to keep his mind flexible so that he will not have to grieve later on about a wrong choice.	(age 42) (age 59)
Mysticism	An old man, however, will always avow mysticism. He sees that so much seems to depend on chance: unreason succeeds, reason fails, fortune and misfortune unexpectedly come to the same thing in the end; this is how things are, how they were, and old age comes to rest in him who is, who was and ever will be."	(age 69) 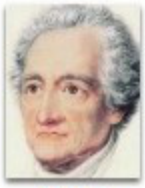 (age 81)

A summary of the **four stages of ideological states** an advanced thinker, will proceed through, in his average 80-years of existence, broken up into 20-year stages of "mindset".

philosophical outlook on nature, existence, and experience held in the mindset of German polymath Johann Goethe—as found in his 142+ publications collected works set—the description and meaning of which varies from person to person—Einstein, for example, kept a bust of Goethe in his study along with a 52-volume collected works set of Goethe's publications, the most representative author in his personal library, but may not have explicitly stated what this meant to him, philosophically-speaking—Tesla, likewise, owned a thorough collection of Goethe's scientific texts and read these to the exclusion of all other philosophies—the central message, however, of Goethe's philosophy being found in coded layers of hidden gestalt in the text of his self-defined greatest work: his 1809 physical chemistry based novella *Elective Affinities*, the formulation of which as is explicitly stated in the famous chapter four—the gist of which being well summarized in the 1816 words of his human chemistry protégé Arthur Schopenhauer:

> "As the title indicates [*Elective Affinities*], though Goethe was unaware of this, [it] has as its foundation the idea that the will, which constitutes the basis of our inner being, is the same will that manifests itself in the lowest, inorganic phenomena."

which, when combined with Goethe's 1799 critical comments, on the work of French author Prosper Crebillon, to his closest his intellectual friend German author Friedrich Schiller that:

> "Crebillon … treats the passions like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. There is no trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover."

taken together with his 1796 *Lectures on Anatomy* views:

> "There are, by nature, stronger or weaker bonds between chemical components, and when they evidence themselves, they resemble attractions between human. This is why chemists speak of elective affinities, even though the forces that move chemical components [or humans] one way or another and create chemical structures are often purely external in origin."

statements, about which, Goethe defended in Dec 1809 by telling a women in the street who attacked him about his greatest theory that:

> "The principle illustrated in the book is true and not immoral."

meaning that, in sum, this "principle", Goethe speaks of here, which can be generally attributed to his 24 Jul 1809 comment:

> "The moral symbols in the natural sciences, that of the elective affinities invented and used by the great Bergman, are more meaningful and permit themselves to be connected better with poetry and society."

is "Goethean philosophy", about which, as he summarized, in retrospect reflection, in discussion with his associate Johann Eckermann, on 06 May 1827:

> "The only production of greater extent, in which I am conscious of having labored to set forth a *pervading idea*, is probably my *Elective Affinities*."

In sum, the "pervading idea" and the "principle" illustrated in "hidden layers of gestalt" in his coded 1809 physical chemistry treatise is Goethean philosophy, pure and simple—and thus constitutes a modern day "belief system" to many a modern intellectual person, such as exemplified in the description of the central character Oskar of Gunter Grass's 1959 novel *The Tin Drum*, in which *Elective Affinities* is one of the two books which Oskar uses for guidance, along with a book on Rasputin.

Formulation

The essence of the Goethean philosophy is embodied, quantitatively, in the 1882 Goethe-Helmholtz equation, which refers to any equation, of differing formats, relating the affinities of an isothermal-isobaric reaction (i.e. the attractions, repulsions, reunitings, separations, and or neutralizations, in Goethe's words) to the change in the Gibbs free energy of the system, a value that can be measured; the most common version of which is:

$$A = -\Delta G$$

where A is the chemical affinity or driving forces, of the isothermal-isobaric reaction, and ΔG is the change in the Gibbs free energy of the reaction or process.

Goethean philosophers

Scottish satirical writer, essayist, historian and teacher Thomas Carlyle (1795-1881) and American philosopher Ralph

Emerson (1803-1882) are said to be two noted early mediators of the "Goethean philosophy"; although, possibly not in the same "chemical philosophy" sense, described above, as was mediated in the works of Schopenhauer, who went on to structure his two-volume opus *The World as Will and Representation* around Goethe's chemical philosophy in the form of a will to power philosophy, so to speak. [1]

American electrochemical engineer Libb Thims is one of the greatest modern-day adherents to Goethean philosophy, in the chemical philosophy sense of the term, such as he discusses in the adjacent 2011 video, wherein he explains that, on the Dawkins scale, he is a 10 and that in verbal terms:

> "Myself, I am a Dawkins number 10. Like Russell, I was forced to tread through a path of self-education, starting from an age 5 question about where does God live?—upward through chemical engineering studies—and further prolonged research in the field of comparative religion and mythology, in a quest for knowledge, which, to note, is embodied presently in a personal library totaling 1,247 books, of which 330 are in thermodynamics, the subject upon which the modern physical chemistry morality system is based. In plain speak, for me, the is no God—it is not even a thought in the back of my mind—there are no supernatural forces, all that exists is matter and energy governed by the laws of hard physical science; the theory of life, death, afterlife—in particular 'life' and the 'origin of life'—is a defunct theory, passed on to us through religious-mythological teachings. Morality, however, does exist: and is explained within the framework of thermodynamics, the laws that govern the known universe in particular, by way of being explained by differentials of Gibbs free energy, the same energy that governs and describes the nature of the reactions that occur between the atoms of the periodic table—a morality system as outlined in 1809 [1796] by German polymath Johann von Goethe—hence I am what might be called, one step above atheism, as a 'Goetheanist' or a believer in **Goetheanism**—or humanism mixed with physicalism mixed with materialism."

In short, to elaborate, although about 95 percent of modern scientists (see: existence of God) are atheists, by declaration and definition, this only explains what one does not believe in—Goetheanism, or a belief in (a) the periodic table (what one is comprised of), (b) the laws of thermodynamics, and (c) the main tenets Goethe's chemical philosophy of existence, is a step above this, a way of explaining what one does believe in—a cogent distancing from nihilism or belief in nothing.

See also

- Goethean revolution
- Goethe timeline
- Goethe's affinity table
- Goethean human chemistry
- Elective Affinities: Illustrated, Annotated, and Decoded

References

1. Wahr, Frederick B. (1915). *Emerson and Goethe* (Goethean philosophy, pg. 47). G. Wahr.

θΔics

In scientific revolutions, **Goethean revolution**, or equivalently: "physicochemical sociology revolution" (Jalibi, 1987), in respect to the work of Mirza Beg, i.e. "Beg revolution" (Thims, 2019), or "Thimsian revolution", in respect to the work of Libb Thims, and or physicochemical humanities revolution, refers to paradigm shift in thinking brought about by the publication of Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*, the embodiment of his 1796 theory (see: human chemical theory) that humans are large-scale sized "chemicals" or metamorphized atomic structures reactive to each other and governed by the very same laws as are the atoms and molecules of physical chemistry or affinity chemistry as it was called in Goethe's day.

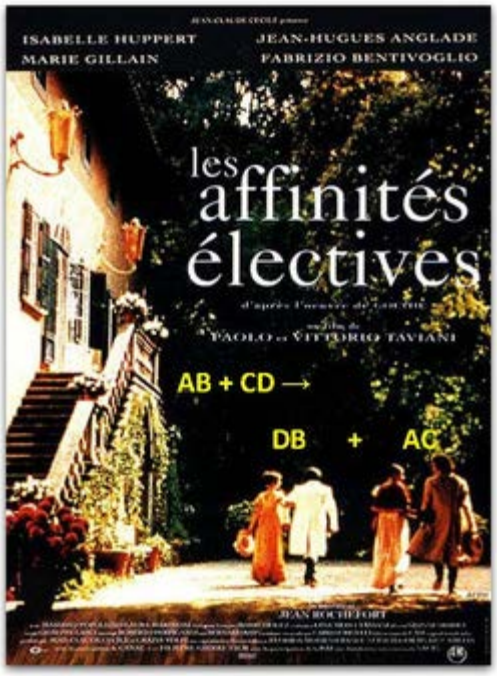

↔

Left: the 1996 French-Italian film adaption of Goethe's 1809 *Elective Affinities*: showing the basic double elective affinity reaction threading the chapters of the book together (see: history), giving a chemical depiction of the **revolution** in thinking Goethe's human chemistry theory will eventually bring about in the future. Right: A visual depiction of the **Goethean revolution**: namely, as summarized by Victoria Woodhull (1871), the theory contained in Goethe's novel will eventually be accepted as scientific truth, and thereby result to reform "the whole scope of morals and social order", which equates to overthrowing the Bible, the Quran, and the Rig Vida—the big books of the Anunian theologies.

Overview

American woman's rights activist Victoria Woodhull, in her 1871 "Introduction" section to the D.W. Niles English translation of Goethe's *Elective Affinities*, seems to have been the first to state explicitly that there is a revolution in human thought embedded in Goethe's self-defined best book:

> "The tale is, in a word, of the simple construction and genial and moderate character of the "Vicar of Wakefield" rather than in the exciting style of Dickens' *Christmas Carols*: but, everywhere, the interest is skilfully kept up, and the subtle insinuation of a **great revolutionary** doctrine pervades the whole, and to the thoughtful reader makes the chief point of interest. Doctrines, however, which are here merely insinuated and illustrated by allusions to science, are now so openly expounded and advocated that a portion of the community will regard the great German as too conservative, while yet, doubtless, to the great mass of readers, the radical element may startle, and in some instances offend.
>
> If this fundamental thought of the man who has proved to be the seer or prophet of science in so many other things, is also a scientific truth, the fact cannot be appreciated by the world too soon, nor its immense sweep of consequences be too clearly foreseen and provided for. It will affect the whole scope of morals and social order, whether we accept it in our theories or not, and the less hurtfully and the more beneficently, in proportion as we thoroughly study and understand the subject."

Likewise, the following 2011 passage, by the faculty of arts and sciences at Kingston University, on the relationship of the 1950s writings of Polish writer Witold Gombrowicz and Goethe's 1796 human chemistry theory, gives a gist

snapshot of the Goethean revolution, one that we are in beginning to see glimpses of now, but as a whole remain largely unaware or more correctly ignorant of: [1]

> "Both Goethe and Gombrowicz incorporate explanations of structure into their narratives, and both make references to a chemical model of combination. 'Gombrowicz's novelty consists in his going one step further and perfecting **Goethe's revolution**': the character of Olek Skuziak allows him to destroy the narratives completely and put himself 'in the position of speaking to oneself alone'. Regnault writes, on Gombrowicz's behalf: 'My pornography is an optic of perversions, but it is also an inversion of the art of writing, a pornology of writing'. When Gombrowicz writes of 'persevering in obscenity', the persevering designates the rigours of the structure, which allow one to surpass the charms of obscenity and lead to their expulsion."

The Goethean revolution, in short, is the change in public thinking that we are not "beings" with "free will" created by "God", but rather "chemical entities" created or rather synthesized by "nature" whose "will", and structures formed therefrom, e.g. couples, societies, etc., and moral nature are determined by "forces" that largely external to the reactants [humans] themselves, all being processes, reactions, and events governed by the laws of physical chemistry.

Beg | Physiochemical revolution

In 1997, Indian-born Pakistani organometallic chemist Mirza Beg published *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, wherein he re-interprets all of aspects of society and social interaction through the lens of physical chemistry and the physicochemical principles, similar to what Goethe did with affinity, albeit without citation of Goethe, and done more extensively, not only in terms of affinity, but also in terms of: free energy, human chemical reaction theory, solution theory, activation energy, transition states, fugacity, etc. The ideas presented in Beg's book have rightly been referred to as a "potential" revolution, if they stand the test of time:

> "If it could stand the test of time, [Beg's] ideas, presented in [*New Dimensions in Sociology*] will rediscover new frontiers in sociology and will **revolutionize** the existing theories of human behavior as it has so far been propounded by philosophers."
>
> — Jameel Jalibi (1987), "Foreword by a Sociologist" [12]

(add)

Paretian revolution

The 1912 completion of *Treatise on General Sociology* by French-Italian engineer turned socioeconomist Vilfredo Pareto, a top three social Newton, below Goethe (#1) and Henry Adams (#2), which, similar to Goethe, also employs a human molecule based mechanistic, physicochemical approach to the social sciences, also has also instilled and or imbedded something of the flavor of coming revolution in the social sciences:

> "If we are to speak of Pareto's treatise as a seminal book, we must use the epithet in the sense in which we apply it to Newton's *Principia*. No **revolution** can follow it, except a revolution in the methods of the social sciences. That revolution is already in its first stages in Italy and in France, and my yet spread to England and to America."
>
> — Andrew Bongiorno (1930). "A Study of Pareto's *Treatise on General Sociology*" [11]

(add)

Thimsian revolution | Paradigm change

See main: Paradigm change

The efforts of American electrochemical engineer Libb Thims, 1995-present, to upgrade and explicate the theory and principles of all of the social Newtons, Pareto, Adams, etc., albeit with focus on what is presented in Goethe's great novel into modern chemical thermodynamic terms and to get this into the working framework or teaching structure of the American educational system, might qualify or be categorized as a subset or rather continuation of the revolution started by Goethe, possibly something the future will come to categorize as the "Thimsian revolution", to distinguish the modern chemical thermodynamics aspect or phase of the revolution started by Goethe. The following peer-commentary exemplify a gist of this:

The human being is the most recognized shape on the planet. As of mid 2008, there were 6.7 billion of them existent on its surface a number that increases at a rate of 6.4 million per month.[1] Modern DNA evidence indicates that humans originated out of East Africa's rift valley about 150,000 years ago.[2] In between these two points, very little has been said about what exactly is a human and particularly what is a human from the viewpoint of atoms, chemistry, reactions, and evolution. In this view, according to current mass composition tables, a human being is a twenty-six element molecule that has evolved or reactively formed from hydrogen and helium atomic precursors over the last 13.7 billion years. The approximate molecular formula for the human being is shown below:[3]

$$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}$$
$$Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$$

In short, the human is a molecule. Whatever reasons one might have for denying this fact, they can hardly be expressed publically without leaving oneself open to the ridicule of children and feeble minds. In the new millennium, the implications of this basic human molecular definition will invariably bring about a **revolution** in human thought and philosophy.

The opening section of American electrochemical engineer Libb Thims' 2008 *The Human Molecules*, giving the view that the new human molecule paradigm will eventually work to bring about a **"revolution"** in human thought in the coming millennium. [10].

"Thims' brilliant book [*Human Chemistry*] symbolizes the beginning of a **new era (epoch)** in human history."

— Georgi Gladyshev (2006), Russian physical chemist [2]

"I stumbled onto your website by accident but I have to confess this might be one of the most stunning undiscovered intellectual achievements of the 21st century. I have browsed through your wiki and I cannot express how tragic it must be to a man in your position—to be a pioneering thinker yet to be rejected by an uptight academic community with neither the depth nor will to understand your unique work, defending their own turf like dogs. I can only compare you to the many other pioneering heroes of science, Newton (IQ=215), Einstein (IQ=220), Tesla (IQ=195), men who like you blazed their own paths but were too victims of their own genius, only to be validated years after their death. Perhaps one day historians will look back and have a chuckle—that the **pioneer of enthropology** published by a vanity press in a book resembling a third rate romance."

— Steven Pierce (2009), Canadian mathematical physicist and computer scientist [5]

"One of the most interesting topics [human molecule] I have ever had the pleasure to read. Going through it a second time, and looking forward to the third. [*The Human Molecule*] covers the most fundamental change in human knowledge since Charles Darwin's *On the Origin of Species* [1859], by presenting a theory that we are fundamentally molecules, and that the question of life itself is a fundamentally flawed one. Especially important is the carefully laid out historical narrative of how Thims came to his theory of the human as a molecule. Whether you ultimately agree with this work or not, it represents a **paradigm**

shift in viewing our place in the world."

— Jeff Tuhtan (2011), American civil engineer and ecological thermodynamicist [3]

"The matter of using thermodynamics to the hypothesis of hell, in efforts to corroborate or controvert, in a modern human thermodynamic logic is a modern view. Thermodynamics presumes that humans are particles, complete, unadulterated, and trouble-free, synchronized by the laws of chemical thermodynamics similar to all other molecules in an established chemical system. This understanding straight away gives rise to a lot of issues which actually require a near **total revolution** to define and comprehend of constituting a human and living. Any new person in this subject will surely inquire as to whether a human molecule has a soul. Therefore modern theory will have to find answers to a lot of questions. For instance it has to be found out as to what takes place when the basic molecules making up a human being move about in the cosmos and later on stop moving meaning dead. Does an individual's entire activities and progress be it good or bad, affect the motion of the universe. If so, how can this be clarified in terms of the first law of thermodynamics?"

— Baby Rani, edited by Lamar Stonecyper (2011), BrightHubEngineering.com [9]

"Libb Thims: the great oracle and developer of human thermodynamics—the **philosophical revolution** of the 21st century. A genius of outstanding stature and originator of many concepts in human chemistry."

— Mark Janes (2011), online biographical listing of Libb Thims

"[Human thermodynamics] is a branch of science that attempts to predict the behavior of people via chemical and thermodynamical equations. It is an interesting philosophy, a **change of paradigm**, perhaps even leaving having a broader explanation for human behavior than Darwinian evolution. Human thermodynamics can also be useful as a new framework for the origin of life. For instance, Libb Thims, proposed online that the idea of Darwin's [IQ=175] 'dark pond' which suddenly sprang to 'life', is not a very coherent one [defunct theory of life], and that it would be much more creditable and parsimonious to have as a rule that molecules bond and form ever more complex beings. Libb Thims also proposed a 'human molecule' where people are attracted to each other by chemical bonds [human chemical bond]. All this I believe to be a reasonable explanation: even if Darwin's theory is still correct, they approach of thermodynamics and chemistry is a much more simple, and at the same time broader view. If the concept of biology is somehow redundant, then we must study it by means of chemistry and physics."

— David Bossens (2012), "Reflections: Criticisms of Science" [7]

Discussion

The adjacent above (right), personal 13 Aug 2010 scratch paper note by Thims, shown above French chemist Antoine Lavoisier's 20 Feb 1773 personal note commentary on the chemical revolution he foresaw, also exemplify this reflective perspective on seeing or rather foreseeing revolutions. The dates might also give us a tentative benchmark ruler as to when this "new revolution" will come about, in the sense that we can

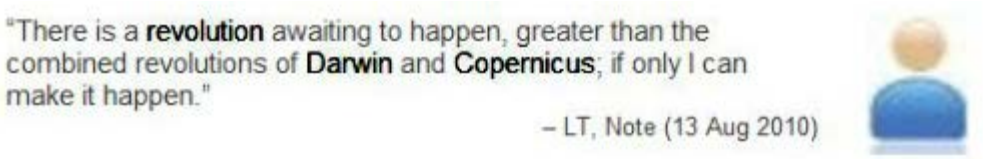

A 13 Aug 2010 scratch paper personal note by American electrochemical engineer Libb Thims (see: quotes); similar in vision to French chemist Antoine Lavoisier who commented on 20 Feb 1773, in what resulted to become the chemical revolution:

> "The importance of the end in view prompted me to undertake all this work, which seemed to me destined to bring about a **revolution** in . . . chemistry."

compare the date of Lavoisier's mention of a foreseeable revolution "destined" to come about and Google books earliest mention of "chemical revolution" and compare the distancing of the two dates.

together which we can only look back in retrospect and find the start of scientific revolutions.

French chemist Antoine de Fourcroy's 1803 *A General System of Chemical Knowledge*, has a rather detailed section entitled "Commencement of a Great Chemical Revolution", giving historical steps leading up to Lavoisier, discussing things "previous to the time of the chemical revolution" and "before the epoch of the chemical revolution", which would put the time-to-result at 30 years, meaning that the revolution could come about as early as the 2040. [8]

The fact that the Goethe's great work has remained hidden from main-stream physical sciences, for some 200-years, however, not to mention that by 1871 it was pointed out clearly that "great revolutionary doctrine pervades the whole", leavees the question as to when the revolution will come about a bit open ended? We note that it took nearly 2,000-years for the atomic revolution to be realized; this might be representative of the high end of the estimate, implying that the Goethean-Thimsian revolution might not actualize well into past the year 4,000 AD (if this dating system is even used at this time, which is doubtful).

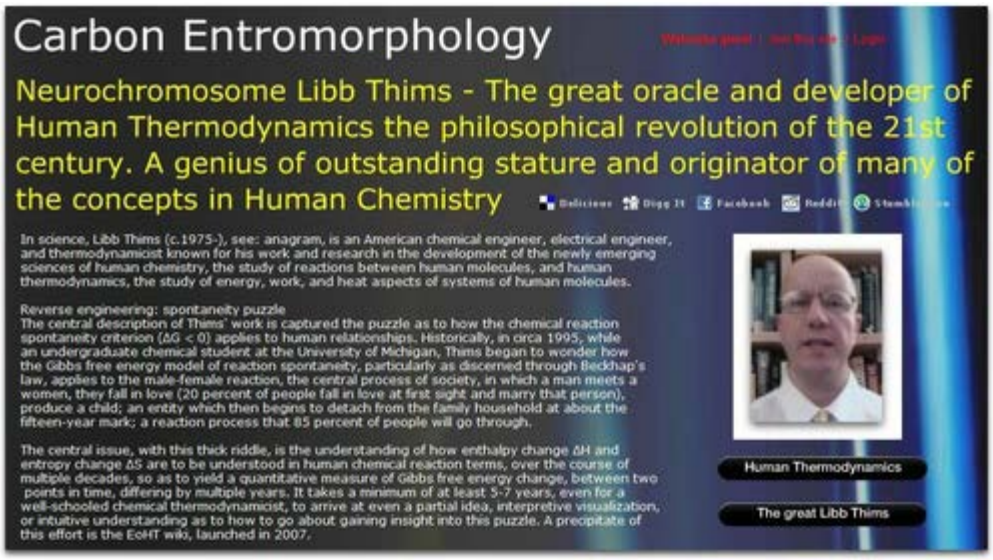

Historically, to put this "revolution" foreseeing issue in context, in 1995, completely unaware of the great (yet largely unknown) human chemistry work of Goethe (*Elective Affinities*, 1809), what he in fact called his "greatest work", Thims began working on the very same problem [elective affinities problem] as Goethe worked on (1796-1809), namely how to apply affinity chemistry, physical chemistry, and chemical thermodynamics to the predictions and explanations and rules of human-human interactions.

English biotechnologist Mark Janes' *circa* 2011 website biography listing of Libb Thims describing him as follows: [6]

> "Libb Thims: the great oracle and developer of human thermodynamics—the **philosophical revolution** of the 21st century. A genius of outstanding stature and originator of many concepts in human chemistry."

Janes, to note, a former chemical engineering student (1993), had previously been at work on the very same problem (human free energy theory), independently, since 2006, prior to coming into contact with Thims in 2010.

In 2006, after working on and researching the problem for eleven years, Thims finally discovered the great buried treasure of Goethe, via the great "footnote 2.5" of Belgian chemist Ilya Prigogine's 1984 *Order Out of Chaos*, and over the course of the next 18-months and 14-days exactly published the first textbook on the subject of human chemistry as Goethe envisioned and as modern hard science sees things.

Some of the following quotes (above) exemplify the continuation or forward movement the revolution started by Goethe but not yet completed.

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1. Synopsis of Francois Regnault, "Optique de Gombrowicz" – Kingston University.
2. Peer-review commentary on Thims' *Human Chemistry*, as found in the "Praise for" section of *Human Chemistry* (pages ix-x).
3. Tuhtan, Jeff. (2011). "Review: *The Human Molecule*", Amazon.com Reviews, Jan 28.

4. Goethe, Johann. (1872). *Elective Affinities: with an Introduction by Victoria C. Woodhull*. D.W. Niles.
5. Hmolpedia personal messaging; see: Sadi-Carnot (complements section).
6. Janes, Mark. (2011). "Libb Thims", Carbon-Entromorphology.com.
7. Bossens, David. (2012). “Reflections: Criticisms of Science” (abs), LuLu.com, Jun 06.
8. Fourcroy, Antoine de. (1804). *A General System of Chemical Knowledge* (chemical revolution, ogs, 36, 72, 75). Cadell and Davies.
9. Rani, Baby. (2011). “The 1st Law of Thermodynamics” (editor: Lamar Stonecypher), BrightHubEngineering.com, May 31.
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12. Jalibi, Jameel. (1987). “Foreword by a Sociologist”, in: *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (pgs. iv-v). Hamdard Foundation Press.

External links

â— Goethean science – Wikipedia.

θΔics

In philosophy, **Goetheanism** (#18 ism by denial/belief), the general philosophical outlook of German polyintellect Johann Goethe, is a philosophical naturalism (one nature), semi-Darwinism, monism ideology that traces all human states of experience down the great chain of being to the chemical or periodic table level of reactions and experience; compositionally: Spinozism, Bergmanism, plus Shakespearian atheism.

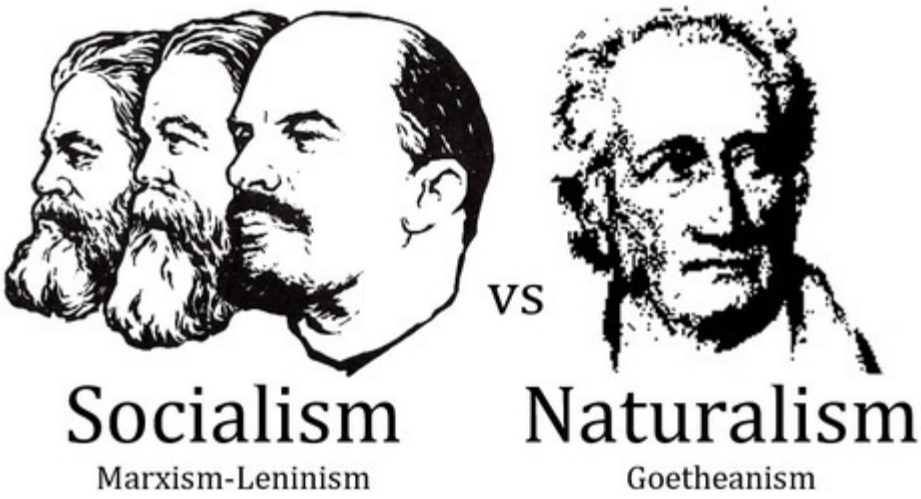

A 2015 depiction of **Goetheanism**, from *Afinidades* (2010) film article, as compared to "socialism", both being god-free materialism-like theories of society, albeit differing on important points, e.g. socialism: all workers are equal, Goetheanism: when a worker gets a promotion (e.g. Captain to Major) a sexual attraction change accrues, thereby effecting the dynamics of the human reactions. In the film, people of the socialism-collapsing Cuba, e.g. Vladimir Cruz, begin to turn to the human chemical philosophy (human chemical theory) of Goethe to get a handle on existence amid a loss of values and meaning, in the post-revolution years.

Overview

The following gives some visual aspect of Goetheanism, as carried through the works of Goethe's protege Arthur Schopenhauer, who in turn influenced a young Friedrich Nietzsche:

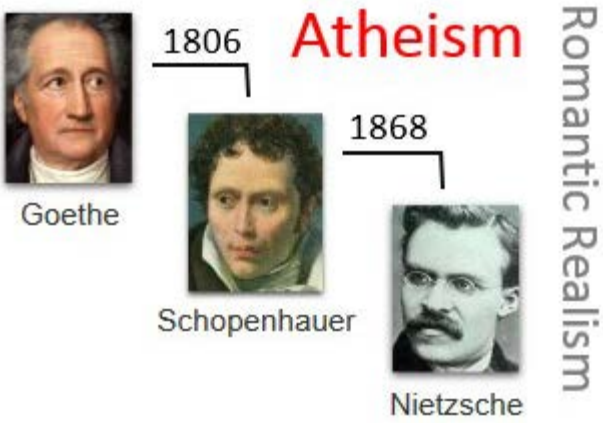

In 1899, Ernst Haeckel published his monism-based *The Riddle of the Universe*, which seems to espouse a certain flavor of Goetheanism and his metamorphology theory.

In 1914, Rudolf Steiner, gave a series of lectures in Vienna, during which time he explains his take on Goetheanism as follows: [1]

> "In contract to all these things there is **Goetheanism**. I do not mean by this something to be fixed dogmatically, but one has to use names for something which goes far beyond the name. Under 'Goetheanism' I do not understand that which Goethe thought up to the year 1832, but rather something which may perhaps, be thought in the sense of Goethe during the next thousand years: that which may develop out the Goethean view, out of the Goethean concepts and impressions. It is for this reason that everything which is drying up views as its real enemy whatever is related in any way with Goetheanism."

Steiner's interpretation of Goethe's metamorphology theory and philosophical outlook, however, had a certain seemingly added metaphysical + spiritual grain embedded, i.e. he thought it would give birth to a contemporary

philosophy that was “an exact knowledge of man in all his bodily and spiritual metamorphoses”, as Guenther Wachsmuth (1955) summarizes. These sideline Sterner metaphysical-spiritual aspects, however, are not part of 21st century Goetheanism; which is growing in the form of human chemical thermodynamics and physicochemical sociology.

The character Oskar Matzerath, of Gunter Grass’ *The Tin Drum* (1959), who carries around with him pages from Goethe’s *Elective Affinities*, mixed with notes from Rasputin, for guidance in an insane world, might be considered a Goetheanist in philosophy.

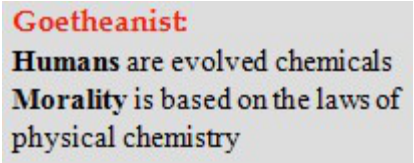

A 2011 image of **Goetheanism**, as found on the Dawkins scale page.

The following is a 2014 visual of Goethean morality, one aspect of Goetheanism, from the Goethe timeline:

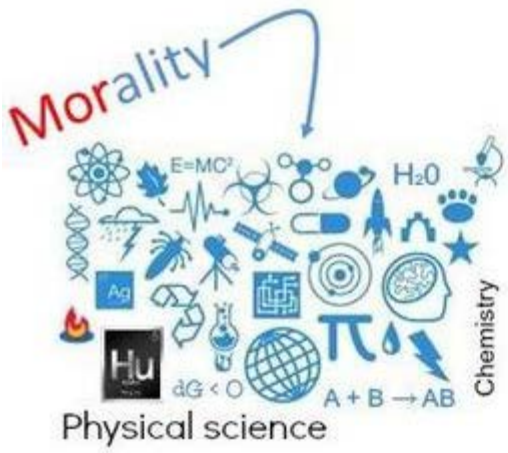

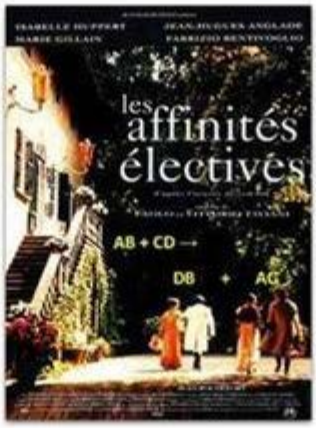

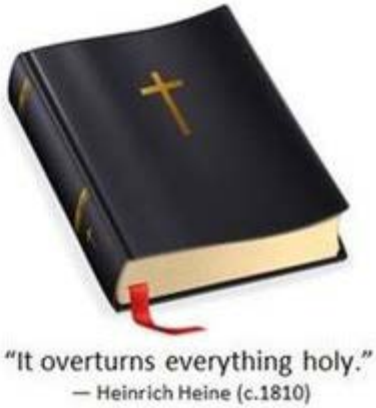

The following is a 2015 visual Goethean reality, one aspect of Goetheanism, e.g. see: literary realism, from the famous atheists page:

(add discussion)

Quotes

The following are related quotes:

> “But if you really study everything I have written you will see that I have always done justice to Darwinism, but have done so by contrasting it with **Goetheanism**, the view of the evolution of life.”
>
> — Rudolf Steiner (1917), *The Fall of the Spirits of Darkness, Fourteen Lectures given in Dornach, 29 Sep to 28 Oct* (O)

See also

- Goethean philosophy
- Goethean revolution

References

1. Wachsmuth, Guenther. (1955). *The Life and Work of Rudolf Steiner* (pg. #). Garber Communications, 1989.

External links

- Home – Goetheanism.org.

θΔics

In philosophy, **Goethendipity**, a portmanteau of Goethe + serendipity, is a principle which states that if one has a plan or a dream, one must act on it; one must resolve oneself to carry it out. Once that resolve has been taken, events will move in one's favor. It is serendipity with plan, vision, and intention.

Overview

The principle was conceived in the early 1990s by English accelerated learning expert Tony Buzan who, on a trip to Africa, was invited to speak on the development of genius on a radio show, and to explain to his interviewer that it was not 'luck' or serendipity that had brought the two of them together, but *Goethen*-dipity that had brought them together, a term themed on the following quotation by German polymath Johann Goethe: [1]

> "Until one is committed there is always hesitancy, a chance to draw back. Always ineffectiveness concerning all acts of initiative and creation. There is one elementary truth—the ignorance of which kills countless ideas and splendid plans—that **the moment one definitely commits oneself, then providence moves too**. All sorts of things occur to help one, that would never otherwise have occurred. A whole stream of events issues from the decision, raising in one's favor all manner of unforeseen incidents and material assistance, which no man could have dreamed would have come this way. Whatever you can do or dream you can do, begin it. Boldness has genius, power and magic in it, begin it now."
>
> — Goethe (1832), *Faust*

The passage, supposedly, comes from part two of Goethe's *Faust*, via extended translation elaboration. [2]

Buffett

Another version of the same principle seems to be found in American business mogul Warren Buffett's favorite book *One Thousand Ways to Make $1,000* dollars, that he read as a youth—the central advice of which was to "begin, begin" whatever scheme one might, but, by all means, not to wait. [3]

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Quotes

The following are related quotes:

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> "There's something magical in movement, in action — it allows you to 'think', to discover new ideas, and to feel like you're making progress. Don't sit around waiting — act."
>
> — Hamdi Ulukaya (2017) [2]

-

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External links

â— Goethendipity principle (Dutch → English) – JWGoethe.org.

θΔics

In the Goethe timeline, **Goethe's advertisement** refers to the 4 Sep 1809 anonymous advertisement Goethe put in the *Morning Paper for the Educated Professional* (*Morgenblatt fur Gebildete Stande*) in an attempt to shape the reception of the up-coming soon-to-be controversial novella *Elective Affinities*. [1] British German-literature scholar David Constantine, English translator to the 1994 Oxford University Press edition, translated the advertisement as such: [6]

> "The author must have been led to his strange title by his continuing work in the physical sciences where we often make use of comparisons drawn from the world of human behavior so that things which are essentially remote from us may be brought a little nearer; and in the novel, in a case concerning morality, doubtless the author was seeking to trace an expression used as an analogy in chemistry back to its origin in the life of the human spirit. [The advertisement concludes with a general remark, the essence of which is] **there is after all only one nature**, and that even in our human zone of it, the cheerful zone of reason and freedom of choice, still there are traces, in the passions, of bleak and irresistible necessity."

Goethe's Advertisement
for *Elective Affinities* (Tantillo, 2001)

Es scheint, daß den Verfasser seine fortgesetzten physikalischen Arbeiten zu diesem seltsamen Titel veranlaßten. Er mochte bemerkt haben, daß man in der Naturlehre sich sehr oft ethischer Gleichnisse bedient, um etwas von dem Kreise menschlichen Wissens weit Entferntes näher heranzubringen, und so hat er auch wohl in einem sittlichen Falle, eine chemische Gleichnisrede zu ihrem geistigen Ursprunge zurückführen mögen, um so mehr, als doch überall nur *eine* Natur ist und auch durch das Reich der heitern Vernunftfreiheit die Spuren trüber, leidenschaftlicher Notwendigkeit sich unaufhaltsam hindurchziehen, die nur durch eine höhere Hand und vielleicht auch nicht in diesem Leben völlig auszulöschen sind. (quoted from *HA*, 6:639, emphasis in original)

"Es scheint, daß den Verfasser seine fortgesetzten **physikalischen** [physics] Arbeiten zu diesem seltsamen Titel veranlaßten. Er mochte bemerkt haben, daß man in der **Naturlehre** [Natural philosophy/Physical sciences] sich sehr oft ethischer Gleichnisse bedient, um etwas von dem Kreise menschlichen Wissens weit Entferntes näher heranzubringen,

und so hat er auch wohl in einem sittlichen Falle, eine **chemische Gleichnisrede** [Chemical parable] zu ihrem **geistigen Ursprunge** [mental origins] zurückführen mögen, um so mehr, als doch überall nur ***eine*** Natur ist

und auch durch das Reich der **heitern** [serene] **Vernunftfreiheit** [rational freedom] die **Spuren** [path/track] **trüber** [cloudy], **leidenschaftlicher** [of passionate] **Notwendigkeit** [need] sich **unaufhaltsam** [inexorably] hindurchziehen, die nur durch eine **höhere Hand** [higher hand] und vielleicht auch nicht in **diesem Leben** [this life] völlig auszulöschen sind."

Constantine concludes, "the question whether we—or the characters in the novel—have any choice or not, is central."

A full version of the original German version, from Astrida Tantillo (2001), is shown in the adjacent caption box, with emphasis as found in the original, modified with bracketed [] terms added adjacent to terms, shown bolded, with possible interpretive issues. [3]

In addition to the Constantine-translation, four different translation renditions are shown below, in ranked descending order of cogentness to the original sense in which Goethe would have viewed the advertisement:

Thims | Google translation

A 2012 Google term-by-term cleaned and formatted meta-analysis (of below translations) translation by American electrochemical engineer Libb Thims is shown below:

> "It seems that the author's continued work in the physical sciences caused him to arrive at this strange title. He might have noticed that in the natural sciences very often ethical parables, far removed from the circle

of human knowledge, are employed in order to bring about a closer match of the two—and in this sense, in the case of morality, he likely sought to drive the nature the **chemical parable** back to its mental origins—being that there is, after all, only ***one*** nature—and also since, within serene realm of rational freedom, the cloudy tracks of passionate necessity move inexorably through their course, only to be wiped out by a higher hand, and perhaps not completely wiped out in this life."

(add)

Winnett translation

The 1993 translation by Susan Winnett, head of the department of American studies at the University of Dusseldorf, Germany, translation is as follows: [2]

"Thus he must have wanted to take an ethical case and to follow a **chemical metaphor** back to its **intellectual origins**, especially since there is ultimately only one nature everywhere, and even the realm of serene freedom of reason is ceaselessly permeated with the traces of dark, passionate necessity that are only extinguishable by a higher power and perhaps also not in this life."

"So hat er wohl in einem sittlichen Falle eine **chemische Gleichnisrede** [chemical metaphor] zu ihrem **geistigen Ursprunge** [intellectual origins] zuruckfuhren mogen, um so mehr, als doch uberall nur eine Natur ist und auch durch das Reich der heitern Vernunftreiheit die Spuren trüber, leidenschaftlicher Notwendigkeit sich unaufhaltsam hindurchziehen, die nur durch eine höhere Hand und vielleicht auch nicht in diesem Leben vollig auszulöschen sind."

This, overall, seems to be a cogent translation representation of Goethe's advertisement.

Corngold's translation

The following is a 2003 translation done by American German-literature scholar Stanley Corngold, noted 1996 English translator of Walter Benjamin's 1922 essay "Goethe's *Elective Affinities*", from his keynote University of Western Ontario "Distortion" conference address "Compulsive Affinities: Goethe, Kafka, Benjamin": [5]

"It seems that this strange title [Elective Affinities] was suggested to the author by the experiments he carried on in the physical sciences. He might have noticed that in the natural sciences ethical analogies (Gleichniße) are very often used to make more accessible [. . .] things far remote from the sphere of human knowledge; and therefore he was very likely inclined, [in dealing here] with an ethical case, to refer [i.e. to relay] a discourse of chemical allegories [eine chemische Gleichnisrede] back to its spiritual origin. This is all the more so, since, indeed, everywhere there is but One Nature, and also the traces of disturbing [or opaque, "trübe"] passionate necessity incessantly run through the serene empire of rational freedom--traces that can be entirely extinguished only by a higher hand, and perhaps not in this life either" (P320)

Tantillo translation

The 2001, in what seems to be less-cogent, translation by Astrida Tantillo of this is as follows: [3]

"It seems as if the author's continued natural studies have caused him to use this unusual title. He may have noticed that in the natural sciences one often uses ethical parables in order to bring closer what is quite distant from the circle of human knowledge; and so he also probably wanted, in a moral case, to bring a **chemical figure of speech** back to its **spiritual origins**, especially since there is only one nature overall, and also since throughout the realm of cheerful freedom of reason the traces of sad, passionate necessity irresistibly pull themselves and may only be erased by a higher hand, and perhaps even then not in this life."

Namely, she translates "chemische Gleichnisrede" as chemical figure of speech rather than the more-correct phrase "chemical parable" and most importantly, she translates "geistigen Ursprung" as "spiritual origin", a rather contentious and derrogatory term to summarized Goethe's greatest work, rather than the more-correct and cogent translation of "mental origin" or "intellectual origin"; in short, a rather slanted attempt to imply that Goethe was seeking to find the "spirit" or spiritual nature of chemical reactions, which is nearly completely backward to the sense in which Goethe saw things.

Plato's *Symposium* | Aristophanes' speech

The following outlines some discussion on the possible relation between terms and passages in Goethe's advertisement and Aristophanes' speech (of Plato's *Symposium*):

vielleicht auch nicht in diesem Leben völlig auszulöschen sind | Google translates as: "perhaps not completely eradicated *in this life*". There are aspects of the "in this life" passage in Aristophanes' speech (which William Lillyman argues Goethe used in the Edward/Ottilie pairing): [7]

> “Wherefore, if we would praise him who has given to us the benefit, we must praise the god Love, who is our greatest benefactor, both leading us **in this life** back to our own nature, and giving us high hopes for the future, for he promises that if we are pious, he will restore us to our original state, and heal us and make us happy and blessed.”

Notwendigkeit | Google translates as either: "need", "necessity", or "essential"; American German-literature scholar William Lillyman thinks that the use of this term in the advertisement, and as used in key points in the novel, signifies the need of perfect loves to reunite according to Aristophanes theory of love, as explained in Plato's *Symposium*. [7]

Term discussions

The following outlines some discussion on the more controversial translation terms:

geistigen Ursprunge | The “geistiger Ursprung” term is a very tricky and meaning-specific term to interpret: Google translates it, in standalone, as “intellectual origins”, albeit in context (full paragraph) as “spiritual origins”; but “geistigen”, alone, as “mental”, and “Ursprung”, alone as “origins”, as in: geistigen [mental] Ursprung [origins]. Winnett (1993) translates the term as “intellectual origins” (which seems cogent). Both Tantillo (2001) and Corngold (2003) translate the term as “spiritual origins”.

> The first (intellectual origins) and second (intellectual origins) of these, as translated by Google [standalone] and Winnett, seem cogent. Goethe had already discovered evolution in plant life (1780) and in animal life (1784) and into the late 1790s, in his physical science studies, was looking to trace the origin of both back down to the chemical reaction level—and hence to discern the origin of aspects of the mind—the passions of the mind or intellect in particular.

Dissection

> The latter of these (spiritual origins) does *not* at all, in any sense of the matter, seem cogent: Goethe specifically names Swedish physical chemist Torbern Bergman as the backbone core to the theory of his novella—not the Bible, God, or spirituality, as Tantillo seems to believe, in her translation—in other words, Goethe likely meant by this statement that his intention was to trace the “being and becoming” of human “existence

and experience" back down the evolutionary timeline to the laws and principles governing the chemical level of existence, in its purest form).

In commentary on this very-contentious hypothetical translation "spiritual origins", in 2012, Thims replied to Corngold in regards to his translation: "I still strongly do not think that Goethe meant 'spiritual origins' by the term 'geistigen Ursprung', the entire book is about the passions of relationships, the rules of which he sought to understand through Bergman's physical chemistry textbook, non of which has religious connotations, nor was Goethe overtly religious, in any sense of the matter, aside from his view of nature as the embodiment of God, or something like that, along the lines of Spinoza god." [4] To this reply, Corngold commented back: "I agree that the word "spiritual" is not ideal. Still, when persons who have any sense whatsoever of German see the word "spiritual" in translations from the German, they're supposed to think "spirit-ual" in the sense, for example, of "the human spirit" or "the spirit of Philadelphia." "Spirit," in such contexts, is not religious. "Intellectual" is too narrow; "mental" is too blah. It's the same problem with translating the Renaissance word virtù. My prof used to say "will flooded with intelligence." So "Geist" would be "higher Mind flooded with . . . er . . . spirit." There's no single-word winner, here: it requires a footnote." [4]

Vernunftfreiheit | Google translated the "Vernunftfreiheit" term as "rational freedom". Corngold (2003), likewise, translates the term as "rational freedom". Tantillo (2001), however, translates the term as "cheerful freedom". Winnett (1993) translates the term as "serene freedom".

Dissection

The first of these (rational freedom) seems to be the most cogent. Goethe had very frank views on freedom; in one of his noted quotes: "none are so hopelessly enslaved than those who believe they are free." The second of these (cheerful freedom) seems to be the most dubious: the likelihood of Goethe putting the word "cheerful" in the one-paragraph advertisement for a book in which, in his own words, "in it, as in a burial urn, I have deposited with deep emotion many a sad experience." The novella, in short, is not thematically-cheerful in its course. The latter of these (serene freedom) may have some cogentness to it: with the term *serene* being defined as "marked by utter calm and unruffled repose or quietude" or "clear and free from storms or unpleasant change, as this state does seem to aptly characterized or describe the opening chapters of the novella, as the "calm before the storm" so to speak.

chemische Gleichnisrede | The "chemische Gleichnisrede" is tricky, the translation of which seems to depend on author biases: namely how he or she views chapter four: metaphor, parable, analogy, allegory or reality (as Goethe viewed things). Winnett (1993) translates the term as "chemical metaphor". Tantillo (2001) translates the term as "chemical figure of speech". Google translates the term as "chemical parable". Corngold (2003) translates the term as "chemical allegory".

Dissection

Here we see a diverse mixture of debate and point of views, namely is the model presented in Goethe's novella: metaphor (Winnett), figure of speech (Tantillo), parable (Google), or allegory (Corngold)? The correct answer, based on Goethe's followup mention of the fact that "there is after all only one nature", meaning that chemical nature and human nature are one and the same, which implies that both are governed by the regulative nature of the affinities (or regulative nature of the free energies, modern), as experimentally discerned via Torbern Bergman's 180 chemical reaction experiments (or as experimentally discerned via free energy reaction measurements made by Fritz Haber, Walther Nernst, Gilbert Lewis, and others, modern), meaning that in Goethe's mind, he would have conceptualized his presentation as "reality".

Corngold, to note commented further on this term, via a footnote:

> "I follow Muret-Sanders (1910) in translating this term—'Gleichnisrede'—as 'figurative speech or allegory'—and not just a single simile." [5]

Merriam-Webster (2000) defines *allegory* as the "expression by means of symbolic fictional figures and actions of truths or generalizations about human existence."

Naturlehre | Dict.cc (German→English) translates "naturlehre" as "(physical) science" or physical science. Google, alternatively, translates this as "natural philosophy". Both Tantillo (2001) and Corngold (2003) translates the term as "natural sciences".

Dissection

The term "Naturlehre", as well as the nearly-related preceding term "physikalischen", seem to embody, in some way or another, the growing tension in regards to how the expanding fields of science (mathematics, physics, chemistry, and natural scientist) were beginning to be defined at the start of the 19th century, a tension that peaked during the Whewell-Coleridge debate (1833) during which time the bloated term "natural philosopher" came under attack, after which or rather the result of which the term "scientist" was coined (William Whewell, 1834).

The 1870s Tyndall-Stewart-Tait debate, likewise, was a continuation of this debate in regards to the distinction of one who studies the 'moral world', which was thought to be the work or realm of god, as contrasted with one who studies the 'material world', the field of the scientist (e.g. mathematician, physicist, or naturalist [e.g. Darwin]).

physikalischen | The term "physikalischen" seems to be a bit more difficult to translate. Dictionary.Reverso.net defines "physikalisch" as "physics". Google translates the term, in paragraph context, as "physics". Corngold translates it as "physical sciences". Tantillo, however, again, in what seems to be a corrupted translation, reinterprets the term as "natural studies".

Dissection

This term, inline with the previous discussion on the closely related term Naturlehre, is a bit elusive to pin down. The field Goethe culled from to derive his theory (the "great Bergman"), was not necessarily physics, or chemical physics (exactly, as this is a more modern niche term), but rather physical chemistry (modern), to be exact, although it is difficult to say exactly what this generalized field was called back in his day, aside from being affinity chemistry as we categorize it historically?

höhere Hand | Winnett (1993) translates "higher power". Tantillo (2001) translates this as "higher hand". The former (higher power) implies or alludes to God; the latter (higher hand) may have been a term used by Goethe, similar to the various scientific demons conceived in the history of science, which may possibly be a reference to his 1796 description of elective affinities as "forces" (higher hand), moving minerals or people, being external in origin:

> "This is why chemists speak of elective affinities, even though the forces that move mineral components [or humans] one way or another and create mineral structures are often purely

external in origin."

Which, in a modern sense, may possibly be attributed to the exchange force model of human interaction, movement, dynamics, and bonding.

Matsui's comments

In 2012 commentary on the above, in discussion with Libb Thims, Japanese Goethean scholar Takaoki Matsui, who is working on a German-to-Japanese translation of part two of *Elective Affinities*, comments on the above discussion: [4]

"You can criticize Tantillo's translation if you like; but the underlined part is inaccurate:

"He might have noticed that in the natural sciences very often ethical parables, far removed from the circle of human knowledge, are employed in order to bring about a closer match of the two"

Tantillo is right in this point, for "ethical parables" are not "far removed from the circle of human knowledge":

"He may have noticed that in the natural sciences one often uses ethical parables in order to bring closer what is quite distant from the circle of human knowledge"

On the other hand, you are right in interpreting "heiter / trübe" as "serene / cloudy" rather than as "cheerful / sad"."

Tuhtan's comments

In 2012, American-born German-educated civil-ecological engineer Jeff Tuhtan gave the following take on the above: [4]

The first two paragraphs look good, not easy to translate this old writing style! The third paragraph I would translate a bit differently. Here is my two cents, for what it is worth:

"and also through the serene world of intellectual freedom, driven unstoppably along a trail which is by necessity clouded by passions, and which can only be completely put to rest by the actions of a higher hand, possibly not even in this life."	und auch durch das Reich der heitern [serene] Vernunftfreiheit [rational freedom] die Spuren [path/track] trüber [cloudy], leidenschaftlicher [of passionate] Notwendigkeit [need] sich unaufhaltsam [inexorably] hindurchziehen, die nur durch eine höhere Hand [higher hand] und vielleicht auch nicht in diesem Leben [this life] völlig auszulöschen sind.”

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θΔics

In collected works, **Goethe's collected works** refers to the collected publications of German polymath Johann Goethe, which comprises "over 140 volumes in German", according to Princeton University Press; or "142 volumes comprise the entirety of his literary output", according to Wikipedia, ranging from the poetical, totaling some *circa* 3000 poems, to the philosophical, including 50 volumes of correspondence, autobiography, novels, plays, and treatises. [1]

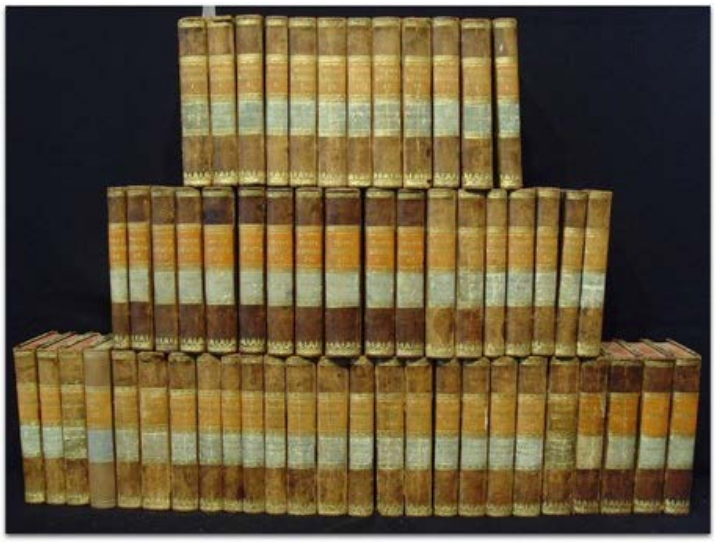

A 55-volume Goethe collected works set, a portion of his total 142 volume collected works set. [10]

Goethe's personal library

Goethe, at the age of about 80, had a 5,000 book personal library.

Best book

Of his publications, Goethe's self-defined "best book" was his 1809 *Elective Affinities*. [2] As summarized by American musicologist Kristina Muxfeldt, it was a "work he counted among his greatest achievements". [3] Noted *Elective Affinities* critique Walter Benjamin (1892-1940) notes "the speechless irony" of a scene reported by Heinrich Laube (1806-1884): [4]

> "A lady addressed Goethe on the subject of *Elective Affinities*: 'I do not approve of this book at all, Herr von Goethe; it is truly immoral and I do not recommend it to any women.'—Thereupon Goethe kept a serious silence for awhile, and finally, with great civility, replied: 'I am sorry, for it is my **best book**.'"

Goethe's 1809 novella *Elective Affinities* (*Die Wahlverwandtschaften*), original German cover, his self-defined best book (of his 142+ **collected works** publications); adjacent to an updated reprint ot the H.M. Waidson translation (1960, *Kindred by Choice*), One World Classics edition.

A fuller version of the incident, as recounted in the 1949 *Goethe: the Story of a Man: Being the Life of Johann Wolfgang Goethe as Told in his Own Words and the Words of his Contemporaries*, is as follows: [7]

> "A women friend of mine said to Goethe at that time: 'I cannot approve of *Elective Affinities*, Herr von Goethe; it really is an immoral book!' According to her report Goethe was silent for a while and had then said with great earnestness: 'I'm sorry you feel that way. It is my **best book**, and don't think that this is the mere whim of an aging man. I grant you that one loves most deeply the child of one's last marriage, the product of one's late power of generation. But you wrong me and the book. The principle illustrated in the book is true and not immoral. But you must regard it from a broader point of view and understand that the conventional moral norms can turn into sheer immorality when applied to situations of this character."

To corroborate this deep view held by Goethe that this was his greatest work, in 1827 he commented to his associate German author Johann Eckermann: [8]

> "The only production of greater extent, in which I am conscious of having labored to set forth a pervading idea, is probably my *Elective Affinities*."

Einstein's library

The dominant portion of German-born American physicist Albert Einstein's personal library was a 52-volume collected works set of Goethe's publications, as recounted in 2008 by German-born American physicist Gerald Holton: [5]

> "Throughout his life Einstein was a man of the book, to a much higher degree than other scientists. The remarkably diverse collection of volumes in his library grew constantly. If we look only at the German-language books published before 1910 that survived Einstein's Princeton household, the list includes much of the cannon of the time: Boltzmann, Buchner, Friedrich Hebbel, the works of Heine in two editions, Helmholtz, von Humboldt, the many books of Kant, Gotthold Lessing, Mach, Nietzsche, and Schopenhauer. But what looms largest are the **collected works** of Johann von Goethe in a thirty-six volume edition and another of twelve volumes, plus two volumes on his *Optics*, the exchange of letters between Goethe and Schiller, and a separate volume of *Faust*."

WorldCat Identities

According to computer cataloging of the world's literature, as determined by WorldCat Identities, the five biggest names in world literature, excluding the names Jesus Christ (Osiris Anointed) and Mary (Isis or Stella Maris), which derive from the Egyptian Osiris-Isis resurrection story (see: comparative mythology and religion) (see also: link), are as follows:

39,345 works (Hamlet #1) in 110,020 publications in

1. Shakespeare: **138** languages and 4,387,523 library holdings (link).
2. Goethe: 26,918 works (Faust #1) in 63,794 publications in **81** languages and 698,814 library holdings (link).
3. Mozart: 31,429 works (Le Nozze de Figaro #1) in 103,242 publications in **65** languages and 937,666 library holdings (link).
4. Lincoln: 19,904 works in 30,491 publications in **65** languages and 1,143,104 library holdings (link).
5. Bach: 26,953 works (Brandenburg concertos #1) in 87,937 publications in **41** languages and 834,142 library holdings (link).

In short, the world's two biggest authors are Shakespeare (#1) and Goethe (#2) and the greatest work of the latter is *Elective Affinities*, which is so far advanced for its time, that many leading scientists (physicists and chemists) of modern times, still believe that the human chemical thermodynamics theory contained in his "greatest book" is crackpottery (see: crackpot article), whereas in the correct modern physical science sense it is pure genius, a somewhat paradoxical humor, if there ever was one.

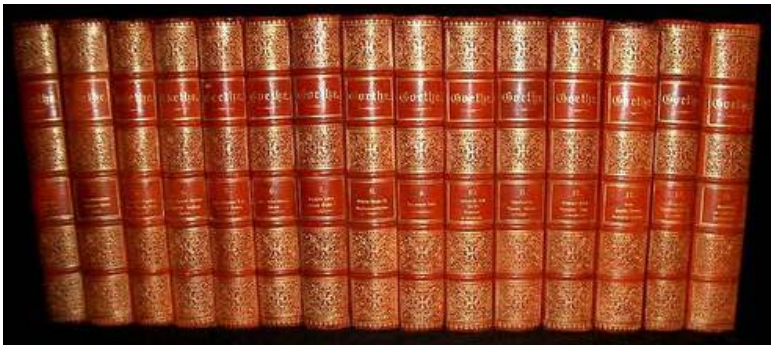

An 1881 (Stuttgart. J.G. Gottafchen) 15-volume **collected works** set of Goethe, in German. A 42-book Goethe collected works set.

The following is a image of volumes 1-20 of a Cotta 40-volue completed final collected works set: [9]

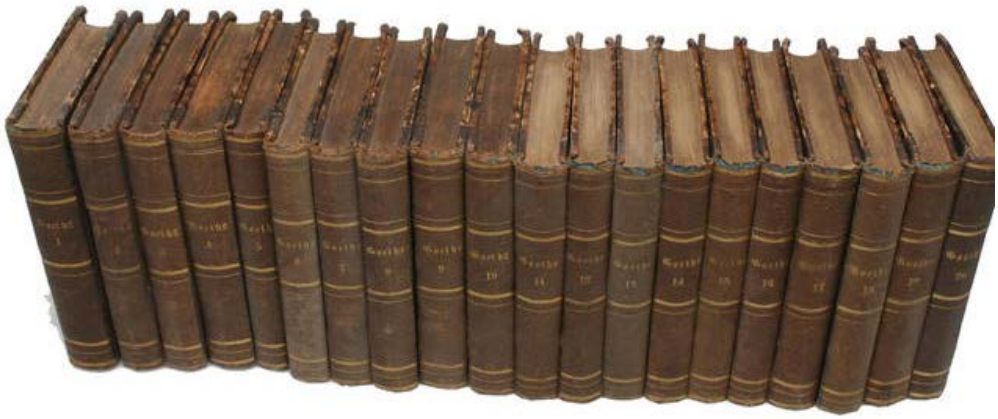

Other

The personal library of Yugoslav novelist Ivo Andric (1892-1975) has a special place in it occupied by Goethe's collected writings in German and the collected works of Honoré de Balzac in French. [6]

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External links

â— Goethe: Biography and complete works – BooksFactory.com.

θΔics

In philosophy, **Goethe's daimonic** (or **daemonic**), das Dämonische (German), or Goethean daimonic principle, from the Greek *daimon* or "elementary power" (Rollo May) (Q) or "power of any natural function to take over the whole", conceptualized as a force of nature, good or bad, without regard to rational control, is a conceptualized principle that "steps in between all other principles" (Goethe, 1770) in an overarching governing manner.

A depiction of Prussian officer Ferdinand von Schill (Q), or one of his commanders, possibly Ludwig von Lutzow (Q) (Q), during 3 May 1809 unsuccessful "war of liberation" revolt against the French, in Kothen, Germany, a seeming embodiment of Patrick Henry's 1775 Virginia Convention speech statement "give me liberty or give me death!", credited with having swung the balance in convincing the Virginia House of Burgesses to pass a resolution delivering the Virginia troops to the Revolutionary War (Q), both of which, whether Germans against French or Americans against Americans, according to Goethe (c.1825), are embodiments of **daimonic principle** of nature.

> "The **daimonic** is the power of nature. Poetry and music, religion and patriotic enthusiasm of the wars of liberation, Napoleon and Lord Byron, were all daimonic."
>
> — Goethe (c.1825) [2][7]

Synonyms

The "Goethean daimonic principle" (c.1770), is presaged by Plutarch's commingling of good and evil law of nature, and seems to be synonymous, if not directly precursory, to both the "Adamsian waves and tides theory" (1863) and to human coupling theory, aka "Thimsian coupling theory" (2011), in uniformity namesake.

Greek daimonic

The concept of the "daemonic" traces back to the Greeks and thereafter absorbed into the mind of German polyintellect Johann Goethe, which, as English Anglo-German comparative literature scholar Angus Nicholls, abstracts, from his *Goethe's Concept of the Daemonic: After the Ancients* (2006), accrued as follows: [8]

> "For Plato, the daemonic is a sensibility that brings individuals into contact with divine knowledge; Socrates was also inspired by a "divine voice" known as his "daimonion." Goethe was introduced to this ancient concept by Hamann and Herder, who associated it with the aesthetic category of genius. Young Goethe depicted the idea of daemonic genius in works of the Storm and Stress [German: Sturm und Drang] period—literally "storm and drive" period, the 1760s early 1780s, wherein individual subjectivity and, in particular, extremes of emotion were given free expression in reaction to the perceived constraints of rationalism imposed by the enlightenment and associated aesthetic movements (Q)—before exploring the daemonic in a series of later poetic and autobiographical works. Goethe's works on the daemonic, as discerned through theorists such as Lukacs, Benjamin, Gadamer, Adorno, and Blumenberg, shows that they contain arguments concerning reason, nature, and subjectivity that are central to both European romanticism and the enlightenment."

(add discussion)

Goethean daimonic principle

In circa 1770 (age 21), or before 1775 (age 26), per autobiographical entries, intuited the following about

nature: [1]

> "I perceived something in nature (whether living or lifeless, animate or inanimate) that manifested itself only in contradictions and therefore could not be expressed in any concept, much less any word. It was not divine, for it seemed irrational; not human, for it had no intelligence; not diabolical, for it was beneficent; and not angelic, for it often betrayed malice. It was like chance, for it laced continuity, and like providence, for it suggested context. Everything that limits us seemed penetrable by it, and it appeared to dispose at will over the elements necessary to our existence, to contract time and expand space. It seemed only to accept the impossible and scornfully to reject the possible."

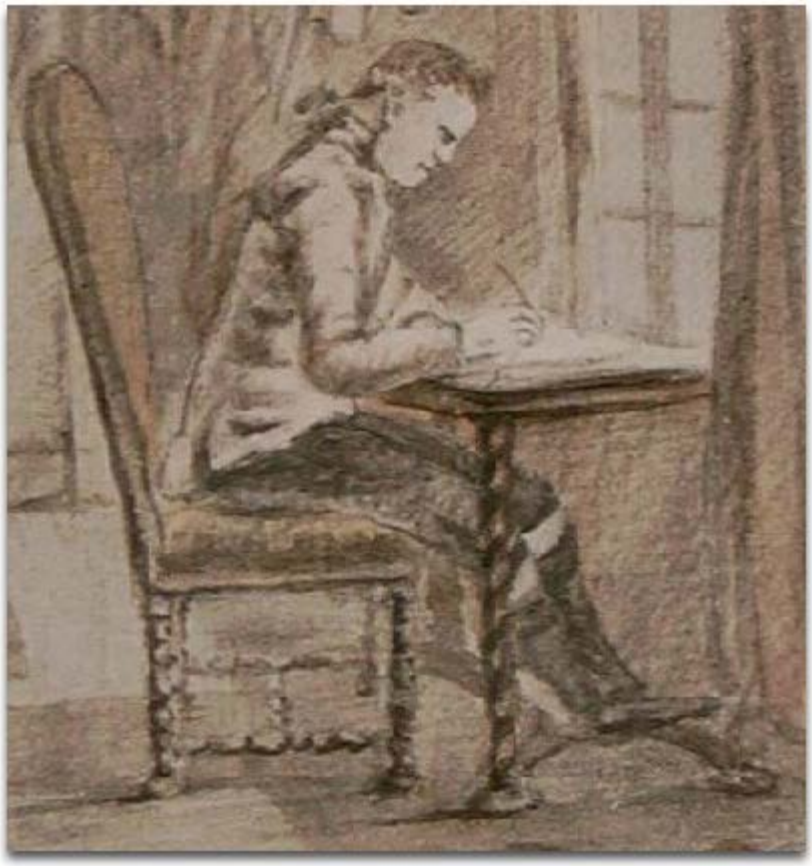

Goethe studying in Frankfurt in the years *circa* 1769 to 1772, at about the time when he intuited his so-called **daemonic** principle of nature.

An alternative translation reads: [2]

> "I discovered in nature, animate and inanimate, with soul and without soul, something which was only manifested in contradictions, and therefore could not be grasped under one conception, still less under one word … Only in the impossible did it seem to find pleasure, and the possible it seemed to thrust from itself with contempt. This principle, which seemed to step in between all other principles, to separate them and to unite them, I named **'daemonic'**, after the example of the ancients, and of those who had become aware of something similar."

Towards the end of his biography, he elaborates: [3]

> "Although the **demonic** can manifest itself in the most remarkable way even in some animals, it primarily is connected with man. It represents a power which is, if not opposed to the moral order of the world, yet at cross-purposes to it; such that one could compare the one to the warp, and the other to the woof. There exist innumerable names for the phenomena which it produces; all philosophies and religions have tried, in prose or poetry, to solve the enigma and then have done with it—which also in future may be their prerogative. In the most awesome form the demonic appears when it manifests itself in some human beings. In the course of my life I have had the opportunity of observing several cases either from near or from afar. They are not always men superior in mind or talents, seldom do they recommend themselves by the goodness of their heart. Yet a tremendous power emanates from them, they possess an incredible force over all other creatures and even over the elements; nobody can say how far their influence will reach."

The "some human beings", Goethe refers to here, would seem to be: Napoleon and Beethoven, at least, two of the more "powerful" men of his time that he had personal and famous encounters with.

Here, Goethe, tells in retrospect from book 20 of his *Poetry and Truth* (1811-1814), how in his pre-1775 youth years he was searching for a universal rule to explain the happenings of existence.

Adams | Waves and tides

In 1863, Henry Adams, at the age of 25, writing to Charles Gaskell, seems to have begun searching for a universal theory of existence, atom to human to universe, akin to Goethe' daemonic, which he describes as follows: [4]

> "Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday within this law. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."

This quote is discussed by American comparative literature scholar Matthew Taylor, noted for doing his 2008 PhD dissertation, in part, in Adams' physics-based theory of human existence.

Thims | Coupling

The gist of what Aristotle, Goethe, and Adams seem to have been grasping at seem to be captured in the free energy coupling aspect of natural processes, namely that natural and unnatural processes are intimately linked or "coupled" to each other, the former driving or "powering" the latter, the way phosphate bond cleavage of ATP denaturization, and exergonic process, powers other endergonic process, such as muscle contraction, according to which free energy minimization in any spontaneous process is the great leveler. The following quote would seem to capture some of this logic:

> "Seeking to do evil, inevitably effects some good in the process."
>
> — Stephen Diamond (1996), *Anger, Madness, and the Daimonic* (paraphrase of Mephistopheles of *Faust*) [5]

The only two known attempts at human coupling theory are Robert Kenoun (2006), albeit via internal energy coupling logic (see: social internal energy minimization theory), which is close in logic, albeit with the issue that it uses the wrong thermodynamic potential, and Libb Thims (2011), via free energy coupling logic. [6]

Quotes

The following are related quotes:

> "Eros is a **daimon**."
>
> — Plato (c.350BC) (Q)

> "Nature is **daimonic**."
>
> — Aristotle (c.322BC) [7]

See also

- Secret principle

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External links

- Daimonic – Wikipedia.
- Daimonic – WikiQuote.

θΔics

In famous publications, *An Almost Magical Attraction:* ***Goethe's Elective Affinity and the Chemistry of its Time*** is a 1987 book, by Jeremy Adler, based on his 1977 or 1978 PhD dissertation, wherein he systematically goes through, in robust affinity history theory, the chemists, chemistry, affinity theory, and affinity tables most-likely used by Goethe's 1809 physical chemistry-based, human chemical theory-conceptualized novella *Elective Affinities*; a subject precluded by the fact that Goethe, contrary to his usually practice, destroyed all his notes to this work. [1]

Jeremy Adler's Goethean chemistry PhD dissertation turned 1987 book *An almost Magical Attraction: Goethe's Elective Affinity and the Chemistry of its Time*. [1]

Adler can be compared, in some sense, to Thomas Young and his preliminary 1820 translation work of the Rosetta Stone—a previously undeciphered trilingual stele, written in: hieroglyphs, demotic script, and Greek; Goethe's *Elective Affinities* being a partially undeciphered multi-lingual coded treatise written in three-plus languages: affinity chemistry, auto-existography, scientific love theory (classical), and a new morality system, to name the four main codes, written in layers, and hidden, as Goethe commented. Adler, in short, did the first decoding work on the scientific underpinnings of Goethe's human chemical reaction theory.

Overview

In 1969, Jeremy Adler, in London, began to work on the theoretical dissection of Goethe's *Elective Affinities* as a PhD thesis under professor Claus Bock (compiler of the 1960 book *Goethe the Critic*). Bock's suggestion was to examine the connection between Swedish chemist Torbern Bergman, particularly his 1775 textbook *A Dissertation on Elective Attractions*, and Goethe's novel. In this direction, Adler soon discovered links to many other chemists, beginning with the works of French chemist Pierre Macquer, i.e. his 1849 *Elements of Theoretical Chemistry* (*Elemens de Chymie Theorique*) and his 1778 *Dictionary of Chemistry* (*Dictionnaire de chymie*), and the other dictionary writers, and then extended his search to as much of the tradition as he could uncover.

John McEvoy (later at Pittsburgh) and his supervisor, Satish Kapoor (Sussex), gave Adler assistance with the background to the history of chemistry. Satish was working on French chemist Claude Berthollet at the time, and suggested to Adler that he switch to the history of chemistry; and so Adler joined the outfit of historians of science in England that ranged from the old masters, such as Joseph Needham and Walter Pagel, to his colleagues, like Roy Porter, Nick Jardine and others, interested in linking literature and science. Needham, for instance, references Adler's work in *Science and Civilization in China* in his chapter concerning Chinese affinity theory. Adler also had good contact with English affinity chemistry historian Alistair Duncan, who was working on the history of affinity theory. With this basis of support and study, analysis of the vocabulary in Goethe's book convinced Adler that the use of affinity theory to explain human interactions and life was a thorough-going theme. [3]

In 1977, Adler, supposedly, completed his PhD on Goethe and his elective affinity theory.

In 1987, Adler published his PhD, either revised or exact, in book form, as *An Almost Magical Attraction: Goethe's Elective Affinity and the Chemistry of its Time* (*Eine fast magische Anziehungskraft: Goethe's 'Wahlverwandtschafte' und die Chemie seiner Zeit*), shown above, which has yet to see an English translation.

The following diagram (below left), from this work (pg. 75-77), is a reprint of Goethe's 4-7 Oct 1793 notebook diagrammatic representation of the "double elective affinity" reaction experiments with Berlin-blue liquor, shown with a partial translation of some Adler's

commentary:

Goethe also appears to have had direct access Torbert Bergman's chemistry. He had two of his mineralogical writings and mentions him in his geological work. Apparently he also knew Tabor's translation of the little physical and chemical plants in the stands from the attraction, since it about 1793 for work on chemical paints a passage from the second band wrote themselves out. The body of the essay comes from the metallic Präcipitaten, namely the fifth part, the <Farben Metallniederschlag>. Bergman points there emphatic attention to the <Verwandtschaft>. He claims: << That resolution seye an effect of attraction, can no longer be doubt in our days. Put this sentence ish so the reason. >> He calls the double << [e] >> Attraction, refers explicitly to the Attractionstabelle << >> << and finally refers to his treatise of the attractive forces. >>

Abb. 9. Goethe, diagrammatische Darstellung der ‹doppelten Wahlverwandtschaft›, Versuche mit der Berliner-blau-Lauge [...], 4.–7. Oktober 1793, Notizbuch D, Bl. 58–59, Goethe- und Schiller-Archiv, Weimar.

Figure 9 Goethe, diagrammatic representation of the <double elective affinity>, experiments with the Berlin-blue liquor [...], 4.7. October 1793, Notebook E, B. 58-59, Goethe and Schiller Archives, Weimar.

Goethe scheint auch zu Torbert Bergmans chemie direkten Zugang gehabt zu haben. Er besaß zwei seiner mineralogischen Schriften und erwähnt ihn in seinen geologischen Arbeiten. Offenbar kannte er auch Tabors Übersetzung der Kleinen physischen und chemischen Werke, in der Von der Attraction steht, da er sich etwa 1793 bei der Arbeit an chemischen Farben eine Stelle aus dem zweiten Band herausschrieb. Die Stelle entstammt der Abhandlung Von den metallischen Präcipitaten, und zwar dem fünften Teil, <Farben der Metallniederschlag>. Bergman weist dort emphatisch auf die <Verwandtschaft> hin. So behauptet er: <<Daß Auflösung eine Wirkung der Attraction seye, läßt sich in unsern Tagen nicht mehr bezweifeln. Diesen Satzlege isch also zum Grund>>. Er nennt die <<doppelt[e] Attraction>>, beruft sich ausdrücklich auf die <<Attractionstabelle>> und verweist schließlich auf seine <<Abhandlung von den anziehenden Kräften>>.

(add discussion)

In 1990, Adler published a one chapter English translation synopsis of his work, entitled "Goethe's Use of Chemical Theory in his Elective Affinities", the first page of which is as follows: [2]

18

Goethe's use of chemical theory in his Elective Affinities

JEREMY ADLER

By 1800, the gulf between natural philosophy and the arts had already developed into a cultural problem which some of the best minds determined to resolve. Ever since the return from his Italian journey of 1786–7, Goethe was intent on linking literature with the sciences: 'Nowhere', he protested, when commenting on the poetic version of his *Metamorphosis of Plants* (1798), 'would anyone admit that science [*Wissenschaft*] and poetry could be united. People forgot that science had developed out of poetry, and failed to consider that after a revolution of the ages [*Umschwung von Zeiten*], the two could cheerfully meet again on a higher level and to mutual advantage' (*LA*, I, 9, p. 67).[1] The work of Goethe's which most powerfully combines science – that is, natural philosophy – with literature is his novel of 1809, *Die Wahlverwandtschaften* (*Elective Affinities*). The very title translates a chemical term, *attractio electiva*, and the process which this term designates provides a basic pattern for the plot: a so-called 'double affinity' ($AB + CD \rightarrow AC + BD$) takes place between a married couple, Eduard and Charlotte, and their two friends, the Captain and Ottilie. The novel pursues this chemical analogy into the characters' innermost thoughts. In the central episode, the 'spiritual adultery' (*Ehebruch im Ehebett*), a 'double affinity' alienates spirit from flesh. Eduard and Charlotte come together, supposedly in the act of love, yet each imagines a different partner: Eduard sees only Ottilie before him, and the Captain's image floats before Charlotte's mind. To some considerable extent, the action externalizes this psychological 'affinity'. The erotic entanglement increasingly dominates and eventually ruins the lives of all four characters, resulting in the tragic death of Ottilie, and that of her beloved Eduard. Thus radically, and for some of his contemporaries scandalously, did Goethe confront chemistry with life, seeming thereby to inquire whether human life is governed by chemical laws. By extending the reference of an established chemical theory to encompass social interaction, the novel provides the basis for a universal theory of affinity.

(add discussion)

Thims | Human chemistry

Adler's 1990 chapter was a veritable gold mine, in the mind of Libb Thims, much of which went into the framework of chapters 10: "Goethe's Affinities" and 11 "Affinity and Free Energy" of volume two of *Human Chemistry*.

Quotes

The following are related quotes:

"At first glance it might seem surprising that it is a British scholar [Adler] of German literature who tackles

this particular aspect of the ‘German genius’, Goethe, but unfortunately enough in Germany the division between the ‘Two Cultures’ is still considerably deeper than in the English-speaking world. Recently, however, the attempts in interdisciplinary research to build a bridge and to indicate the fertile interplay between science and poetry are increasing, even in Germany. **Adler’s book** represents an important step in this direction.”

— Karin Figala (1988), book review of Adler’s *Goethe’s Elective Affinities and the Chemistry of its Time* [5]

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θΔics

In ethics, **golden rule** is []

> The golden rule of ethics is ... a principle found in the "moral symbols" of physical chemistry.
>
> — Goethe (1809), Conversation with Friedrich Riemer, Jul 24

A quote label, from Libb Thims' favorite quotes page, the phrase "**golden rule** of ethics" added on to Goethe's famous "moral symbols" saying.

Overview

In 1956, Judson Herrick, in his *The Evolution of Human Nature*, sited the golden rule as follows: [1]

> "It follows that the discovery of what is good for us, i.e. what is 'right' conduct, is a scientific problem, which can be solved only on factual evidence. This evidence has long been available. Five-hundred years before Christ, Confucius laid down this rule: 'do not do unto others what you would not have others do unto you'. This, as he said, is a fundamental principle of all other good rules of conduct. The closer we follow this '**golden rule**', the more stable and efficient is our culture, a fact confirmed by abundant historical evidence."

Herrick then cites the following definition of an "educated person" by social scientist Kermit Eby: [2]

> "An 'educated man' is one who can see the consequences of his acts in the sum total of their relationships. The relationships that are the most significant for human conduct are those with other people, and in the present state of world-wide communication this means all the people there are. The isolationist (in family, church, or state) is not an educated man, however learned he may be."

In modern terms, the educated mindset, who sees the sum of their acts in the sum total of their relationships (relationships seen in chemical reaction terms), these seen in terms of the bigger picture of universal operation, as this knowledge presents itself to us, therein begins to see a physico-chemical sort of golden rule of morality, so to say.

In 2016, Libb Thims, in his *Smart Atheism: for Kids*, penned a draft chapter entitled "Golden Rule Plus", the abstract of which is: [3]

> "Smart atheists should aim to follow the **golden rule**, but also be keen to the fact that gold [Au] only selectively follows the golden rule."

The golden rule, in other words, is a good secular ethics fallback rule-of-thumb, but the sharp person needs also to heed the fact that humans are reactive chemical species whose treatment of others, will, invariably, in the end, follow natures dictated by "moral symbols" of physico-chemical sciences, as Goethe (1809) pointed; if, said another way, one tries to follow the golden rule to the point of "unnaturalness", only ethical confusion will abound.

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External links

â— Golden Rule – Wikipedia.

θΔics

In ethics, **good**, as opposed to bad (or evil) is a term describing a number of effects or variables of favorable character or tendency, generally being predisposed towards life. [1]

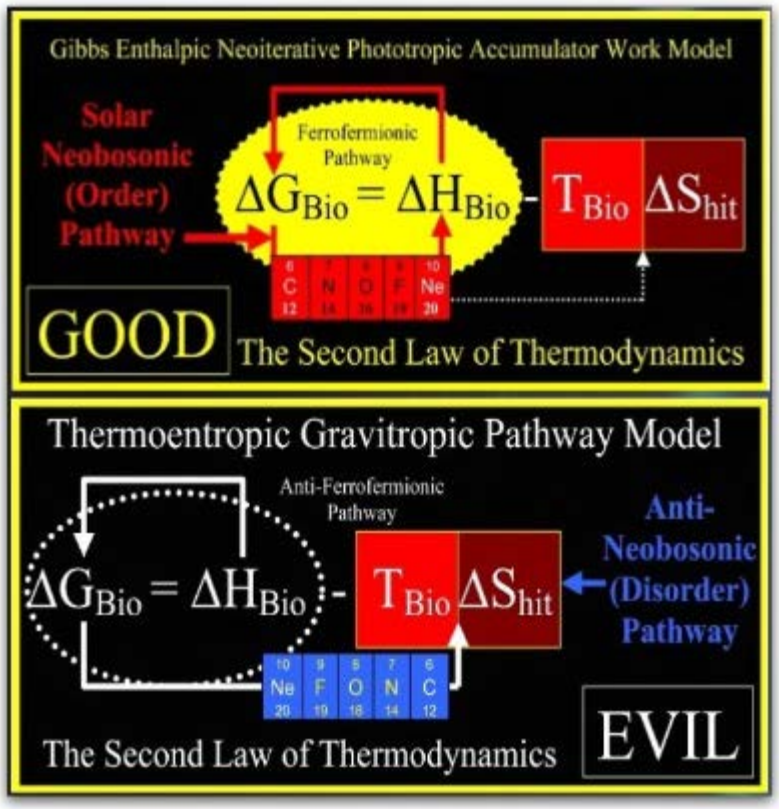

English biophysicist Mark Janes circa 2009 conception of **good** and evil in a thermodynamic sense. [5]

Overview

In 1903, George Moore, in his *Princia Ethica*, argued that the question of "what is good?" is the central problem in ethics. [3] In Moore's view, the question of whether something is good is always an open question and that 'good' denotes some simple natural property of the universe of which we are intuitively aware. [4]

The description a drug, such as Valium, or a human pair of reactants, such as Ginger Rogers and Fred Astaire, being characterized as having "good chemistry" together invariably leads into a discussion on what in chemistry, as a whole, is "good" as contrasted with that which is "bad" or in the extreme case evil. [2] Likewise, the characterization of what is good in thermodynamics, particularly in the thermodynamic analysis, of humans invariably leads into a theory of morality or ethics and questions on how to teach this in schools. [3]

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See also

â— Right | Wrong

External links

â— Good and evil – Wikipedia.

θΔics

In film trivia, ***Good Will Hunting*** the 1997 film about a Boston child prodigy William Hunting, to a near 90% overlap, was based on the true life story of IQ 225+ cited Boston 'Southie' William Sidis (1898-1944) a Harvard-trained, MIT-working, war-protesting, officer-assaulting, FBI-followed (film: CIA recruited), asylum-inmate, child prodigy, lawyer-mathematician-physicist, who fell in love with a girl he met *in* jail (film: girl he called from jail), who was released from jail on the condition that he see a psychologist (reality: psychologist was his father, Boris Sidis).

Harvard alumni Matt Damon and comedian Robin Williams playing the roles of Boston prodigy **Will Hunting** and MIT psychologist Sean Maguire.

Will Sidis
model for
(Will Hunting)

Boston prodigy William Sidis (IQ=250-300) the role model for Will Hunting: accepted to MIT at age 8; Harvard mathematics age 16, law school age 17.

Boris Sidis
model for
(Sean Maguire)

Harvard psychologist Boris Sidis, the role model for Sean Maguire: was Will's parole psychologist for one year (1919) after his arrest for assaulting an officer.

Overview

Sidis was a forced prodigy who became a mathematician-astrophysicist-lawyer with an eidetic memory, who at age eight scored a hundred percent on the MIT entrance exam; graduated from Harvard at age sixteen; was in Harvard law school by age seventeen; and at the age of twenty-one was sentenced to 18-months jail time for assaulting an officer; but was release on bail on the condition that he see a therapist, who happened to be his father, Harvard psychologist Boris Sidis.

In the film, the character Will Hunting was played by Harvard alumnus Matt Damon, who also co-wrote the script. The first article on the similarities between the two was published the following year in *Harvard Magazine*, entitled "Good Will Sidis". [1] The following bullets summarize some of the main similarities:

● Sidis scored perfect on the MIT entrance exam at age 8.
● Both Hunting and Sidis were Boston "Southies"; Sidis living his out his post-MIT life in a "small South End apartment" (as did Hunting).
● In 1909, Sidis (age 11) he lectured to Harvard mathematics professors (as did Hunting); specifically on four dimensions, to the Mathematics Club.
● On the subject of vector analysis, Sidis was said to have surpassed his professors (as did Hunting).

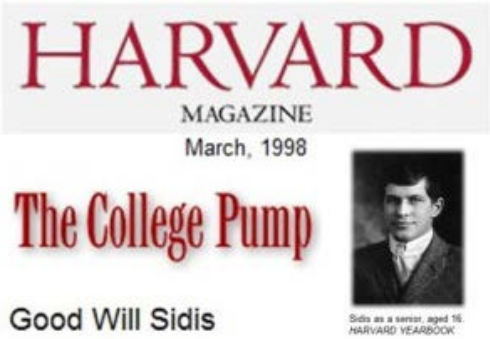
HARVARD
MAGAZINE
March, 1998
The College Pump
Good Will Sidis
Sidis as a senior, aged 16. HARVARD YEARBOOK

Clip of the 1998 article "Good Will Sidis", first publication to note the similarities between those of Sidis and Hunting. [1]

● In 1919 (age 21), after spending two years in Harvard Law School, Sidis defended himself in court, getting the charges dropped (so to speak)
● In 1919 (age 21), Sidis was sentenced to eighteen months jail—six months for rioting and a year for assaulting an officer (for protesting on May Day).

● Both Hunting and Sidis meet the love of their lives just before going to jail (Hunting calls his love from jail; Sidis meets his love in jail, a co-protester at the May Day protests).
● Sidis appealed, and was released on five hundred dollars bail under the condition that he spend a year seeing a psychologist, a psychologist that happen to be his father, Harvard psychologist Boris Sidis who puts Will in his private asylum for one year of treatment, which Will, in retrospect, described as "mental torture".

● Both Hunting and Sidis worked at MIT labs, as a condition of their parole.
● Both Hunting and Sidis spent the remainder of their life working menial clerical jobs.
● Sidis ends up going out to California following is period of psychological probation, just as does Hunting at the end of the movie, so "to see about a girl."

● Both Sidis (age 20) and Damon (age 22) dropped out during their last semester of coursework at Harvard (Sidis while in Harvard Law), while in good academic standing, for no apparent reason, failing to degree.

Matt Damon | Amy Wallace

To note, there does not seem to exist an actual published statement where Damon explicitly claims to have based the story on Sidis. In a 2010 interview, Damon says that the film started as a 40-page draft written in a play-writing class at Harvard of which a couple of pages survived and made it into the film. [13]

Amy Wallace

This is weakly evidence by an anonymous 2007 Wikipedia talk page post by someone from Seattle Washington who commented: [14]

> "I knew Matt when they were writing this script and remember that the

central character was based on a story that was circulating at the time about someone."

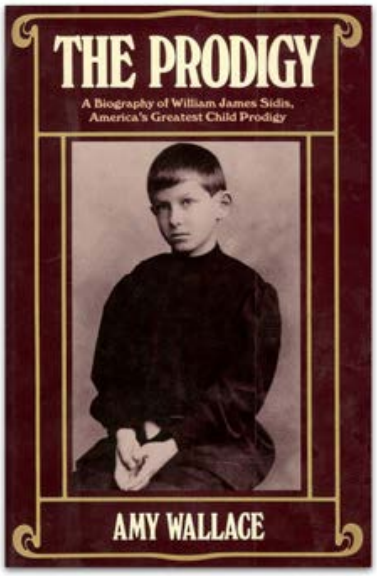

The Prodigy: a Biography of William James Sidis, America's Greatest Child Prodigy, the book on which the script for the 1997 film *Good Will Hunting* is based.

Daniel Mahony

Written by Amy Wallace (1986) who built on the prior biographical research (1976-79) of Daniel Mahony.

whom the poster seems to recall as being someone from Yale? The more than near two dozen coincidence similarities between Sidis and Hunting, discussed herein, however, more than substantiate, beyond doubt, that the film was based on the life of Sidis, at Harvard/MIT.

What most likely occurred is that, while a student at Harvard, during the years 1988-1992, Damon came across the infamous story of Harvard legend William Sidis (1898-1944), who has famously been on the cover of the *New York Times* over nineteen times for his intellectual abilities at MIT and Harvard, and in turn read the recently published 1986 book *The Prodigy* by biographer Amy Wallace. Wallace's book contains pictures (shown in this article), biographical depictions, and anecdotes of the main characters in Sidis' life, which fit precisely those of the characters in the film.

Wallace's biography, in turn, is a continuation of the earlier 1976-79 biographical researches of American political psychologist Dan Mahony, the legal official biographer of Sidis, who had been studying Sidis' writings and notes in attempts to write a biography on both William Sidis and his father Boris Sidis. [2] Mahony is the curator of the 1999 site Sidis.net, a growing collected works, notes, and related writings of Sidis. [10] A scene by scene comparison of the structure of the film clearly indicates that the script of the film came from Wallace's book, as discussed further below. [3]

Damon, having dropped out of Harvard, one year away from completing an English degree, was betting his money on his acting/screenwriting ability, and would have thus been intuitively aware that a "based on true story" movie would be less-marketable than an "original screenplay" film, of such a grand story as Sidis, albeit keeping the script origin an inside secret.

Damon | 2013 interview

In a 2013, in a 15-year anniversary interview for *Boston Magazine*, Damon states that he started working on the script during a 1992 playwriting class at Harvard, the culmination of which was to write a one-act play, which resulted in a 40-some-odd-page document. Damon then moved to LA and began working on the expanding the script with Ben Affleck, daily: "We would improvise and drink like six or twelve beers or whatever and record it with a tape recorder", as Affleck says. The script was finished in 1994, at which point Damon and Affleck approached their agent. The shooting started on April 14, 1997, and was completed in just nine weeks. (Q) The multi-cast and director interview, to note, makes no mention of Sidis.

Film title

The first name, Will, no doubt, is modeled on Will (Sidis) or "Bill" as he was called by friends. The name "William", in the naming of William James Sidis (1898-1944), was assigned in honor of American psychologist William James (1842-1910), mentor to Boris Sidis at Harvard, and the originator of the reserve energy theory, used in the accelerated mental raising of the William Sidis.

The surname, 'Hunting', may have come from numerous reports of how Sidis parents spent their remaining life 'hunting' him down after he escaped from their asylum in 1921. In his Sidis' own retrospect words, "the parents resorted, from time to time, to various efforts to track him down and to persuade his friends to turn him over" so to get him back to the "old tortures". [4]

Physical abuse

The part in the film where the judge states that he is aware that Hunting had been through several foster homes, experiencing severe physical abuse in some, would likely again come from Sidis published commentary on how he was he was "railroaded" into an asylum and afterwords moved from home to home, in California and Boston.

During his year-long stay at the asylum, Sidis commented in

Will Sidis intensely reading as a child at about age 8 when he was about to graduated from high school and passed the MIT entrance exam.

Will Hunting reading a psychology book at a rate of one page per second in his apartment while he works as a janitor at MIT. [5]

retrospect that he was “kept under various kinds of mental torture, verbally abused while sedated with sleep medication, and threatened to be transferred to a regular insane asylum.” [4]

Carmine beat Will up in kindergarten

The part where Will gets revenge on a bully named Carmine Scarpaglia, who, according to Will, used to "beat the **** out of him in kindergarten" was no doubt based on the incident in which Sidis, at age 16, after graduating from Harvard with his undergraduate mathematics degree, had enrolled in the Harvard Graduate School of Arts and Sciences and while walking home one day after school “a gang of Harvard boys took William outside and threatened to beat him up”, after which Sidis was said to have only “confided his rage and humiliation to his five-year-old sister.” [3] Owing to this incident, his parents convinced Sidis to leave Harvard graduate school and move to Rice University in Houston to work as a mathematics professor with a stipend of $750 per annum, while he worked towards his doctorate degree, so as to leave the “hostile environment of the Harvard campus.”

It is also known that in his sophomore year, owing to his very young age (age 12) as compared to his college classmates (age 19), Sidis had roomed for a time in the Yard, but was teased so remorselessly that his parents moved him to an apartment. [1]

Religion

One noted and significant inconsistency between the film version and the real life version is that in the film Hunting assaults the officer while prominently wearing a gold Christian cross, whereas in real life, Sidis was a confirmed atheist at age 6 and at age 21, while in court for assaulting an officer, when asked if he believed in god, he replied “No” and clarified that evolution was his god; when pressed further about this he stated that he did not believe in the “big boss of the Christians”, but that he did believe in something “that is in a way apart from a human being”. The probability of someone who wears a gold cross replying no to belief in god while in court is slim to none.

Skylar | Martha Foley

The photographs of the key people in Sidis' life are all found in chapter ten of *The Prodigy*; two of these, invariably, served as the function of the story to the characters Skylar, Hunting's love interest, and Chuckie Sullivan, Hunting's best buddy.

Skylar (left), in the racetrack scene, styles her hair (side part) based on the photo of Martha (right) in the Wallace's book *The Prodigy*.

Skylar (Minnie Driver) Hunting called her from jail.

Martha Foley (model for Skylar) Sidis met her in jail.

The character Skylar, played by Minnie Driver, whom Hunting meets at a bar and who he later telephones while in jail is no doubt based on Sidis’ only love interest, a 20-year-old Irish socialist Martha Foley (pictured adjacent), who Hunting (age 21) meets while in jail in 1919; both Foley and Sidis were among the 114 people arrested May 1st, for the May Day communist anti-war rally protest.

When Sidis died from a cerebral hemorrhage in 1944, he was still carrying Martha Foley's picture (although she'd long since married someone else).

Chuckie | Isaac Rabinowitz

Chuckie was most likely based on Sidis' life long buddy Isaac Rabinowtiz, who was well-aware that Sidis lived out the reminder of his life working menial jobs, thus doing little with his so-called mental "lottery ticket", as expressed by Chuckie in the film.

Morgan and Billy

Hunting's other friends in the movie, Morgan O'Mally (Casey Affleck) and Billy McBride (Cole Hauser) were

William Sidis and life-long friend
Isaac Rabinowitz (1943), nicknamed "Rab" by Sidis

Will Hunting and is life-long friend **Charles Sullivan** (1997), nicknamed "Chuckie" by Hunting.

most likely based on Sidis' college buddies, as described in *The Prodigy*, who were said to help him out from time to time and try to visit him while he was locked up.

Professor Lambeau | Professor comstock

As to the person behind the character MIT professor Gerald Lambeau, the character was based on MIT physics professor Daniel Comstock, a noted Technicolor inventor, who was an MIT graduate himself (1904) and who in the 1910s was working on researching the relation between matter and electricity. [6] Comstock was well acquainted with Sidis during his early Harvard years and is mentioned several times in *The Prodigy*. Early on Comstock commented about Sidis that:

> "Gauss is the only example in history, of all prodigies, whom Sidis resembles."

Daniel Comstock
MIT professor who gave Will Sidis his first job working at MIT working on "some advanced theoretical problems".

Gerald Lambeau
(Stellan Skarsgard)
MIT professor who gave Will Hunting a job at MIT working on "some advanced combinatorial mathematics".

Sidis, at age 5, invented a base twelve logarithm table; Gauss, at age 23, having previously taught himself math and reading before age three (similar to Sidis), famously calculated the trajectory for the missing planetoid Ceres, in his head, using logarithms, a calculation that puzzled many, being that it would normally have taken multiple months if not years, if done via the logarithmic look up method. [12]

After Sidis' 1909 (age 11) lecture to the Harvard Mathematical Society on "Four-Dimensional Bodies", Comstock told reporters that the boy would someday be the greatest mathematician of the century.

In 1918 (age 20), Sidis got his first job working with Comstock at MIT who needed an assistant in his laboratory, which at the time was working on the development of a submarine-detection program. As Comstock explained to William's mother Sarah: [3]

> Comstock: "I'm hiring Will for two reasons—I need a brilliant mind, and I hope to keep the boy out of **jail** for his refusal to go to war."

The film version:

> Lambeau: "Well, if he doesn't show up and I have to file a report saying he wasn't here and he goes back to **jail**, it won't be on my conscience,
>
> Sean."
> Lambeau: "What problems does he have, Sean, that he is better off as a janitor or in **jail** or hanging around with –"

Comstock, likewise, was said to have given Sidis "some advanced theoretical problems", just as Lambeau was said to have brought Hunting into his laboratory to work on "some advanced combinatorial mathematics". In real life, to note, Comstock did not tell Sidis of their military application (that the programming work he was doing was to be used to destroy submarines). In fact, when Sidis found out that the theoretical physics problems he was working on had underlying military applications, he was said to be "extremely indignant" and resigned immediately. [3] This incident was played out in the famous "club a baby seal" interview response (below).

To note, this biographical factoid about Sidis finding out the work he was doing was to be used to kill people, seems to be the basis behind the story in the 1985 film *Real Genius* about how the supergenius Lazlo Hollyfeld "cracked" severely when he found out the work he was doing and

the problems he was solving were killing people.

Club a baby seal scene

The part of Sidis resigning after finding out that his programming work was to be used to destroy submarines, discussed previously, was played out brilliantly during Hunting's interview with the national security agency (NSA) where after being asked "the question isn't why should you work for the NSA, the question is why shouldn't you?", Hunting responds with:

"Why shouldn't I work for the NSA? That's a tough one, but I'll take a shot. Say I'm working at the NSA and somebody puts a code on my desk. Something no one else can break. Maybe I take a shot at it, maybe I break it. I'm real happy with myself because I did my job well. But maybe that code was the location of some rebel army in North Africa or Middle East.

NSA interview "club a baby seal" scene, which is based on Sidis quitting MIT labs after finding out his work is to be used for military purposes.

Once they have that location, they bomb the village where the rebels are hiding. Fifteen hundred people that I never met, never had no problems with, get killed. Now the politicians are saying, 'Send in the Marines to secure the area', 'cause they don't give a ****. It won't be their kid over their getting' shot, just like it wasn't them when they their number got called 'cause they were off doing a tour in National Guard. It'll be some kid from Southie over there takin' shrapnel in the ass.

He comes back to find that the plant he used to work at got exported to the country he got back from, and the guy who put the shrapnel in his ass got his old job, 'cause he'll work for 15 cents a day and no bathroom breaks. Meanwhile, he realizes the only reason he was over there in the first place was so that we could install a government that would sell us oil at a good price.

Of course, the oil companies used a skirmish over there to scare up domestic oil prices. A cute little ancillary benefit for them, but it ain't helpin' by buddy at 2.50 a gallon. They're takin' their sweet time bringin' the oil back, for course. Maybe they even took the liberty to hire an alcoholic skipper, who likes to drink martinis and ******' play slalom with the icebergs. It ain't too long till he hits one, spills the oil…and kills all the sea life in the North Atlantic. So now my buddy's out of work, he can't afford to drive, so he's walkin' to the ******' job interviews…which sucks because the shrapnel in his ass is givin' him chronic hemorrhoids. Meanwhile, he's starvin', 'cause every time he tries to get a bit to eat, the only blue plate special he's servin' is North Atlantic scrod with Quaker State.

So what did I think? I'm holding out for somethin' better. I figure, **** it. While I'm at it, why not just shoot my buddy, take his job, give it to his sworn enemy, hike up gas prices, bomb a village, club a baby seal, hit the hash pip and join the National Guard? I could be elected president."

FBI

In real life the FBI had tracked and monitored Sidis, believing him to be a dangerous radical; originally, during the period WWI, Sidis was classified as 1-A for a time, but eventually reclassified as 4-F. In 1940, one of the bureau's agents wrote two letters to Bureau chief J. Edgar Hoover, describing Sidis as the leader of the "Boston Metropolitan Transfer Group", a group mistaken for a communist activities group, and went on to track various alias' of Sidis, such as Parker Greene, wherein, supposedly, in *The New Yorker*, he is described as a "promising Red", for his earlier anti-draft anti-war protesting activities.

In the film version, Damon and Affleck, in the original version of the script, were going to make Hunting become a "G-man". Specifically, Affleck and Damon originally wrote the screenplay as a thriller: Young man in the rough-and-tumble streets of South Boston, who possesses a superior intelligence, is targeted by the FBI to become a G-Man. Castle Rock Entertainment president Rob Reiner later urged them to drop the thriller aspect of the story and to focus the relationship between Will Hunting (Damon) and his psychologist (Robbin Williams). At Reiner's request, noted screenwriter William Goldman read the script and further suggested that the film's climax ought to be Will's decision to follow his girlfriend Skylar to California.

Chemistry

In the film, Hunting solves Skylar's chemistry homework on the proton structure for the Ebola virus; in real life, as described in *The Prodigy*, Sidis would help Bill Rab (Isaac Rab's son) with his chemistry homework, when he visited the house. In Bill Rab's own words "I was particularly stupid in chemistry. I had problems with it in school. But Bill's [William Sidis] approach made it hold some scope. It helped me out a hell of a lot."

Anatomy

In the film, Skylar explains that after Harvard she is going to Stanford Medical school, but is going to experiment on Will first for her anatomy class; in real life, Sidis had passed the Harvard Medical School anatomy exam at age six.

Bar scene

In the famous bar scene, which is one of the intellectual peaks in the film, Hunting calls out Harvard graduate student Clark on his plagiarism of quotes, by instantaneously citing the page number, i.e. page 98, of the 1994 book *Farmers & Fisherman: Two Centuries of Work in Essex County, Massachusetts, 1630-1850* by early America historian Daniel Vickers: [9]

Daniel Vickers
(Clark is said to plagiarize his views to impress Skylar at the Harvard bar) [11]

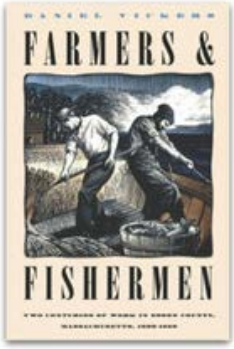

> "Wood drastically underestimates the impact of social distinctions predicated upon wealth, especially inherited wealth. You got that from **Vickers**, *Work in Essex County*, page 98, right?"

This quote, however, does not in reality exist on page 98 of Vickers' work, nor does Vickers cite Gordon Wood, but may have been a bit of movie fiction. As Vickers commented on this scene in 2010: [11]

> "Actually, I have no idea where *"Wood 'drastically underestimates the impact of social distinctions predicated upon wealth, especially inherited wealth.' You got that from Vickers, 'Work in Essex County,' page 98, right?*" comes from. On p. 98, I discuss the rise of the Massachusetts cod fishery in the 17th century, and nowhere in the book do I refer to Gordon Wood; I don't think I even footnote him. Finally, although I have disagreements with Wood, they don't relate much to inequality, let alone inequality based on inherited wealth. Other historians have taken him to task on this, but not me. I think Matt Damon, who I have been told took history courses at Harvard, was writing this from memory and confused both the book's title and its contents."

The exchange between Hunting and Clark, however, as some have noted, may have been based on an obscure 1994 *New York Review of Books* article by American historian Gordon Wood that discussed Canadian historical geographer James T. Lemon's writings; referring, it seems, also to a subsequent letter to the editor by Lemon rather than on Wood's more well-known writings. Whatever the case, the famous dialog is played out as follows:

"No, no...there's no problem here. I was just hoping you might give me some insight into the evolution of the market economy in the Southern colonies. My contention is that prior to the Revolutionary War, the economic modalities, *especially* in the southern colonies, could most aptly be characterized as agrarian, pre-capitalist …"

"Of course that's your contention. You're a first year grad student. You just got finished readin' some Marxian historian -- Pete Garrison probably. You're gonna be convinced of that 'til next month when you get to James Lemon, and then you're gonna be talkin' about how the economies of Virginia and Pennsylvania were entrepreneurial and capitalist way back in 1740. That's gonna last until next year - you're gonna be in here regurgitating Gordon Wood, talkin' about, you know, the Pre-revolutionary utopia and the capital-forming effects of military mobilization."

"Well, as a matter of fact, I won't, because Wood drastically underestimates the impact of --."

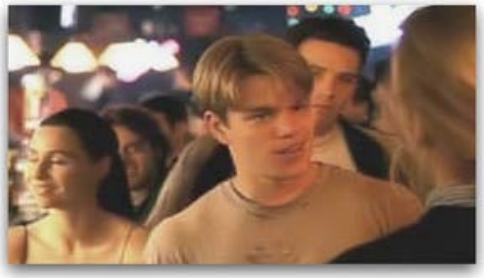

"Wood drastically -- Wood 'drastically underestimates the impact of social distinctions predicated upon wealth, especially inherited wealth.' You got that from Vickers, 'Work in Essex County,' page 98, right? Yeah, I read that too. Were you gonna plagiarize the whole thing for us? Do you have any thoughts of your own on this matter? Or do you...is that your thing? You come into a bar. You read some obscure passage and then pretend...you pawn it off as your own idea just to impress some girls and embarrass my friend? See the sad thing about a guy like you is in 50 years you're gonna start doin' some thinkin' on your own and you're gonna come up with the fact that there are two certainties in life. One: don't do that. And two: You dropped a hundred and fifty grand on a f****n' education you coulda' got for a dollar fifty in late charges at the public library."

"eah, but I will have a degree. And you'll be serving my kids fries at a drive-through on our way to a skiing trip."

"Yeah, maybe. Yeah, but at least I won't be unoriginal. But .... if you have a problem with that ... we could just step outside and we could figure it out."

Photographic memory

The famous bar scene, alludes to the idea that Hunting had the ability to recall volumes of memorized books down to the page number, almost instantaneously. As to if William Sidis had this ability to recall quotes down to the page number, is a matter of some debate, or in fact if anyone has this ability. Sidis, certainly was well-read and did seem to have a photographic memory. At age six, to give a comparison example, he recited the first scene of the first act of Shakespeare's Julius Caesar "with full intelligence and expression", supposedly taking the teacher's breath away.

In later life, Sidis' ability to do crossword puzzles was legendary. Sidis, according to Bill Rab, could do the entire New York Times crossword puzzle, in a matter of minutes, without ever writing anything down, but would do them in his head:

> "My father [Isaac Rab] would do it in ink, right off the bat. But Bill—Jesus! He would just look at the thing. He had a **photographic memory** and didn't have to write down too much. Maybe one letter instead of a word, sometime in the middle so he wouldn't lose his place, while he was doing the downs. But it was mostly done mentally."

After Sidis finished a puzzle in his head, Isaac Rab would then quiz him "What have you got for thirty-six across?", where after Sidis would explain from where he got the answer.

Other noted book memorizes

As it is difficult to find a reference stating that Sidis knew citations down to the page numbers, it is worth while to note that others claim to be be able memorize 1,000s of books down to the comma:

The ability is similar to the claims of Russian Naida Camukova (c. 1976-), with a supposed IQ=200, who claims to read a book a day and have a photographic memory of over 3,000 books, where she remembers every comma in each book, Camukova also, coincidently had a brain hemorrhage at age 23 (in coma for 20-days) similar to Sidis who died of a cerebral hemorrhage at age 46. Similar to Sidis, Camukova, started talking age 1, learned to read and write at age 2; age 14 was enrolled in both Moscow State University (history) and Daghestan State University (literature); began medical school at age 9 (or 15); speaks seven languages; age 25 became professor of history and literature; has published 25-books.

American mega-savant Kim Peek (1951-2009), person behind the 1988 film *Rain Main*, who was born

without a corpus callosum (the bundle of nerves that connects the two hemispheres of the brain), may have had this ability. He would read books, memorized them, and then placed them upside down on the shelf to show that he had finished reading them, a practice he maintained. He can read a book in about an hour, and remember almost everything he had read, and was thus able to memorizing vast amounts of information in subjects ranging from history and literature, geography, and numbers to sports, music, and dates.

His reading technique consisted of reading the left page with his left eye and the right page with his right eye and in this way he could read two pages at a time with a rate of about 8-10 seconds per page. It is believed he could recall the content of at least 12,000 books from memory. On a side note, this ability is similar to John Stuart Mill (IQ=200), who "could write Greek with his left hand while writing Latin with his right."

Other trivia

● Damon was a neighbor of American Howard Zinn, author of the 1980 book *A People's History of the United States*, which as Hunting comments in the film "that book will knock you on your ass."
● In the film, Hunting is compared to Indian mathematician Srinivasa Ramanujan (IQ =190-210) (link).
● The Unabomber American mathematician Theodore Kaczynski (IQ=170) is also mentioned in the film.

Other citations

● Doug Renselle (c.2000) reasons: "Amy describes incredible visits by Sidis and Sharfman to Paul Saunders' home. Sharfman told Saunders that Sidis was the greatest brain in our USA. Sidis loved Saunders' library. He would browse Saunders' 20 volume *Golden Bough* set (by James Frazer) with ease and almost as if he knew it all, in parallel, instantaneously. He knew what material was on which page in Saunders' whole set! Sharfman brought to mind a recent movie, *Good Will Hunting*, touched upon briefly in a Harvard link near this page's top." (link)
● John H. Lienhard (1999) argues that Sidis was a likely model for Hunting, along with Evariste Galois (link).

Clip on how thermodynamicist William Sidis is the basis for the 1997 film *Good Will Hunting*.

Other claims

Other more doubtful claims as to origin of various that parts of *Good Will Hunting* include the following stories, which are more likely simply coincidences:

(a) That Hunting was based on MIT janitor Walter Pitts. [7]
(b) That the parts where Hunting solves two famous unsolved problems he finds on the hallway chalkboard is based on the 1939 story of Berkeley PhD mathematics student George Dantzig coming late for class, finding two famous unsolved problems in statistics on the blackboard, and assuming they were homework problems. [8]
(c) That Hunting was modeled on music prodigy Henry Cowell, whom IQ test originator Lewis Terman met in circa 1920 at Stanford University, who had been unschooled since the age of seven and at the time was working as a janitor in a one-room schoolhouse not far from the Stanford campus. Cowell would sneak away from his job and play the school piano. Terman was fascinated by him and tested his IQ to be at genius level of 140 (Malcolm Gladwell, *Outliers*, 2008). This model, although an interesting similarity, is highly doubtful, being that as Hunting says when he looks at piano keys, "all he sees is chopsticks".

10% myth

Sidis is also, by no coincidence, the very same person behind the now-famous ten percent myth, the idea that the average person uses only ten percent of his or her brain; a myth based on American psychologist William James' 1890 "reserve energy theory", as used by his father, Harvard psychologist Boris Sidis (role model for Sean Maguire/Robin Williams) to raise his son, from birth, in an extremely-accelerated rate.

Other films

Other movies to have been steeped in thermodynamics in basis, biography, or theory include: the 1973 film *The Exorcist*, based in part on French religiosity philosopher Pierre Teilhard (the role model for character of Father Merrin) and his Omega point theory, and the 2006 film *The Celestine Prophecy*, discusses how all relationships function as means to get energy, via transformations, power, etc., a book based on the 1964 book *The Games People Play* by Eric Berne, which in turn was based on the Freud's psychodynamic id-ego model to explain human interactions as role play in a game.

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2. (a) Sidis, Helen. (1978). "Notary Letter: authorizing Daniel H. Mahony to be the official biographer on Boris Sidis and William Sidis, authorizing him to receive any and all documents related to the Sidis family ", Notary Public, New York, Aug 26.
(b) Quote: "To Dan, without you this book probably could not have been written--Amy (autograph), *The Prodigy*, 1986."

3. Wallace, Amy. (1986). *The Prodigy: a Biography of William James Sidis: America's Greatest Child Prodigy* (threatening to get beat up, pg. 122; black holes, pg. 157; Dan Mahony, pgs. 157, 188-89; Daniel Comstock, pgs. 53-54, 135, 231-32). Dutton Adult.
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5. Note (on reading at rate of one reading at a rate of one page per second): Not even Kim Peek (above) who, having is corpus callosum missing, could read the left page with his left eye and the right page with his right eye and in this way he could read two pages at a time with a rate of about 8-10 seconds per page, could read at the rate shown in the film clip and also have and eidetic memory of content down to the page number and references.
6. (a) Daniel Frost Comstock – Wikipedia.
(b) Comstock, Daniel Frost. (1908). "The Relation of Mass to Energy", *London, Edinburg, and Dublin Philosophical Magazine*, Jan. pgs. 1-21.
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(b) William James Sidis Archives (2000) - Internet Archive.
(b) Sidis.net (launched: 1999) - Internet Archive.
11. Email from Daniel Vickers to Libb Thims (31 Mar 2010).
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Further reading

● Damon, Matt and Affleck, Ben. (1997). *Good Will Hunting: a Screenplay.* Miramax Books.

External links

● Good Will Hunting – Wikipedia.

In thermodynamics, **Gordon Van Wylen** (1920-) is an American mechanical engineer noted, in religious thermodynamics, for his 1959 to 1973 *Fundamentals of Classical Thermodynamics*, wherein the state that thermodynamical laws are man's description of god's work; which for many years was a creationist apologetics citation staple.

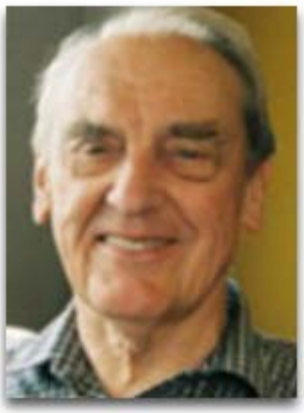

Overview

In 1959, Wylen, in his *Fundamentals of Classical Thermodynamics*, included an unusual, to-common-practice, paragraph, wherein he cites the laws of thermodynamics as being man's description of God's continuing work.

In the 1963 edition, Van Wylen, in his preface, was acknowledging that his textbook was written with "the help and grace of God, the Creator of the Universe." [1]

In the 1973 second edition, Wylen and co-author American mechanical engineer Richard Sonntag (1933-2010), appended a two-page section to their Entropy chapter on general comments regarding entropy and some of its philosophical aspects, asking questions such as 'how did the universe get into a law entropy state?' or 'are there processes unknown to us that occur somewhere in the universe, such as continual creation, that have a decrease in entropy associated with them, and thus offset the continual increase in entropy with the natural processes that are known to us?', or 'is the second law valid for the entire universe?'. The then conclude that conclusive answers cannot be given, but that in their opinion: [3]

> "The second law of thermodynamics is man's description of the prior and continuing work of a creator, who also holds the answer to the future destiny of man and the universe."

(add discussion)

Religion

Van Wylen is a devout Christian, stating that he has "lived a life committed to Jesus Christ" and for at least sixteen years he and his wife hosted a weekly international student Bible study in their home. Van Wylen was an inspiration for the 2003 book *Spiritual Entropy* by American engineer, thermodynamics professor, and ordained pastor Gilbert Wedekind. [2]

Education

Van Wylen graduated from the University of Michigan in the 1940s, later becoming chairman of mechanical engineering there in 1969. For a period, Van Wylen was dean of the University of Michigan and in 1972 he became president of Hope College, Holland, Michigan, retiring in 1987. [2]

See also

â— List of thermodynamics textbooks that include human thermodynamics

References

1. Van Wylen, Gordon J. (1959). *Thermodynamics* (God, pg. xi). Wiley.
2. (a) Wedekind, Gilbert L. (2003). *Spiritual Entropy: Life-Changing Insights Revealed by a Unique Natural law* (pgs. ix, 148). Xulon Press.
(b) Gilbert Wedekind (about) – SpiritualEntropy.com.
3. (a) Lewis, Gordon R. and Demarest, Bruce A. (1996). *Integrative Theology* (pg. 53). Zondervan.
(b) Wylen, Gordon and Sonntag, Richard. (1973). *Fundamentals of Classical Thermodynamics* (section: 7.16: Some General Comments Regarding Entropy, pgs. 247-48; creator, pg. 248), 2nd ed. Wiley.
(c) Wylen, Gordon and Sonntag, Richard. (1985). *Fundamentals of Classical Thermodynamics* (creator, pg. 233), 3rd ed. Wiley.

External links

â— Van Wylen, Gordon J. (1920-) – WorldCat Identities.
â— Gordon Van Wylen – Wikipedia.

θΔics

In existographies, **Gorgias** (c.485-380BC) (ACR:17) (CR:4) was a Greek philosopher (see: Greek philosophy), aka "Gorgias the Nihilist" (Thomson, 1887) (Q), noted for his argument, based partly on Melissus and Zeno of Elea, based and a convoluted Parmenidean-like "being argument" that "nothing exists" and that "nothing can move". [1]

Empedocles

Some have reported that Gorgias was a pupil of Empedocles.

References

1. (a) Aristotle. (322BC). *The Complete Works of Aristotle, Volume Two* (editor: Jonathan Barnes) (*On Melissus, Xenophanes, and Gorgias* , pgs. 1539-51). Princeton University Press, 1995.
(b) Pseudo Aristotle. (c.50AD). *On Melissus, Xenophanes, and Gorgias* (Q)(W). Publisher.

External links

- Gorgias – Wikipedia.

θΔics

In thermodynamics, **Gorrie's law** states that compressed air produces heat and expanding air produces cold. This phenomena was described as a "well-known law of nature" in the early 1840s by American physician John Gorrie, who used the latter effect, which he said was "particularly marked when [air] is liberated from compression", to make the first prototype air-conditioners, which he used to cool hospital rooms. [1]

See also

- Newton's law of cooling
- Boerhaave's law

References

1. Shachtman, Tom. (1999). *Absolute Zero and the Conquest of Cold* (pgs. 73-74). Mariner Books.

External links

- John Gorrie – Wikipedia.

θΔics

In hmolscience, **Gosta Ehrensvard** (1910-1980) was a Swedish physiological and biological chemist noted for his 1960 "living puddle" origin of life theory, according to which a body of water envisioned as a single diffuse organismal mass is the first form of life and for his later 1970s publications, namely: *We and They: Molecules and Life in the Cosmos* (1971) and *Living Matter: What is Life? What is Biochemistry?* (1973), wherein he seems to make "living matter" and "biochemistry" suspect to confusion, possibly precursory defunct theory of life and or life does not exist lines of thought.

American thinker Dean Wooldridge (1968), in his chapter on the origin of living cells, cites Ehrensvard's "Out of Dust and Fire" and "Activity" chapters. [1]

A noted student (Q) of Ehrensvard is Klaus Mosbach. [3]

Quotes

The following are representative quotes:

> "Life is older than organisms."
>
> — Gosta Ehrensvard (1960), *Life: Origin and Development* [2]

References

1. (a) Ehrensvard, Gosta. (1960). *Life: Origin and Development* (*Liv: Ursprung och utformning*) (§7: Out of Dust and Fire; §10: Activity). University of Chicago Press, 1962.
(b) Wooldridge, Dean. (1968). *The Mechanical Man: the Physical Basis of Intelligent Life* (§2:The Origin of Living Cells). McGraw-Hill.
2. (a) Ehrensvard, Gosta. (1960). *Life: Origin and Development* (*Liv: Ursprung och utformning*). University of Chicago Press, 1962.
(b) Williams, George C. (2008). *Adaptation and Natural Selection: a Critique of Some Current Evolutionary Thought* (pg. 135). Princeton University Press.
3. Klaus Mosbach – Wikipedia.

Further reading

● Ehrensvard, Gosta. (1971). *We and They: Molecules and Life in the Cosmos* (*Vi och de: molekyler och liv i kosmos*) (editors: Gosta Ehrensvard and Jan Stenflo). Publisher.
● Ehrensvard, Gosta. (1973). *Living Matter: What is Life? What is Biochemistry?* (*Levande materia: vad är liv? vad är biokemi?*) Publisher.

External links

● Gosta Ehrensvard (chemist) (Swedish → English) – Wikipedia.

θΔics

In existographies, **Gottfried Leibniz** (1646-1716) (IQ:190|#24) (Cattell 1000:34) [RGM:32|1,500+] (Murray 4000:14|CS / 6|M / 11|WP) (GME:8) [LUG] [LPKE] [CR:276] was a German mathematician, physicist, and philosopher, aka the "German Plato" (Erman, 1828) (Ñº), noted for the 1686 coining of Christiaan Huygens' quantity mv^2 by the name *vis viva* or "living force", for his general theory of the conservation of vis viva, and for his 1697 monad theory. [1]

Monadology | Souls + motion

In 1696, Leibniz began to employ the term "monad", which he conceived as a solution to dualism, the mind-body problem, and difficulties over the concepts of origin of forms, entelechies or souls. [4]

In 1714, Leibniz penned a two short texts on his philosophical system, namely *Principles of Nature and Grace Found in Reason* (*Principes de la nature et de la grâce fondé en raison*) and *Monadology*, in the latter of which he posited that there are indefinitely many substances , i.e. "monads", individually 'programmed' to act in a predetermined way, each program being coordinated with all the others, according to which any interaction between substances was mere appearance. [4] The following is an example description of monads: (Ñº)

> "It is very evident that created substances depend upon God who preserves them and can produce them continually by a kind of emanation just as we produce our thoughts. God alone is the ultimate unity or the original simple substance, of which all created or derivative monads are the products, and arise, so to speak, through the continual outlflashings of the divinity from moment to moment."

Leibniz, in section cited by Lawrence Henderson (1917) in a discussion of the final cause problem, stated the issue as follows: [5]

> "Descartes saw that souls cannot at all impart force to bodies, because there is always the same quantity of force in matter. Yet, he thought that the soul could change the direction of bodies. This was, however, because at that time the law of nature, which affirms also the conservation of the same total direction in the motion of matter, was not known. If he had known that law, he would have fallen upon my system of pre-established harmony. According to this system bodies act as if (to suppose the impossible) there were no souls at all."

Leibniz, in other sections, states the following:

> "Every organic body of a living being is a kind of divine machine, or natural automaton, infinitely surpassing all artificial automatons. Because a machine constructed by man's skill is not a machine in each of its parts; for instance, the teeth of a brass wheel have parts or bits which to us are not artificial products, and contain nothing in themselves to show the use to which the wheel was destined in the machine. The machines of nature, however, that is to say, living bodies, are still machines in their smallest parts *ad infinitum.* Such is the difference between nature and art, that is to say, between divine art and ours."
>
> — Gottfried Leibniz (1714), *Monadology* (pg. 265-66)

> "There is nothing fallow, nothing sterile, nothing dead in the universe. If there were a vacuum, it is evident that there would be left sterile and fallow places in which, nevertheless, without prejudice to any other things, something might have been produced. But it is not consistent with wisdom that any such places

> should be left. In every particle of the universe a world composed of an infinity of creatures is contained. Just as there is no vacuum in the varieties of the corporeal world, so there is no less variety among intelligent creatures."
>
> — Gottfried Leibnitz (1714), *Monadology* (aggregate quote); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 182)

In 1893, Gabriel Tarde attempted to extend Leibniz's monadology theory to sociology, intermixed with semi-modern views on physics and chemistry, supposedly in the form of a proto-sociochemistry. [6]

Problem of evil

See main: Problem of evil

Leibniz, the early 18th century, published two works, namely: *Theodicy* (1710) and *Essay on Man* (1734), wherein he put forward the so-called optimistic solution to the so-called problem of evil, namely that this is the best of both possible worlds.

In 1759, Voltaire penned his satirical *Candice*, a parody of Leibniz's problem of evil solution, the key section being the following:

> "Appalled, stupefied, distraught, covered in blood and shaking uncontrollably, Candice said to himself: 'If this is the best of all possible worlds, what must the others be like?'"

German philosopher Arthur Schopenhauer later commented the following: [3]

> "I cannot assign to the *Theodicy* any other merit than that it gave rise to the immortal *Candice* of the great Voltaire. In this way, of course, **Leibniz's** oft-repeated and lame excuse for the evil of the world, namely that the bad sometimes produces the good, obtained proof that for him was unexpected."

(add)

Existence

The etymology of the infamous philosophical query "why is there something rather than nothing?" (see: Lawrence Krauss), is generally attributed to Leibniz who asked "Why is any world .... something rather than nothing? There isn't. There's both."

Similarly, in his 1686 *De Veritatibus Primis*, Leibniz famous stated "everything that is possible demands to exist."

Calculus notations

Leibniz was also the first to employ the use of the symbols for differentiation "d" and integration "∫", which are used so predominately in thermodynamics on the various integrations of the working body. According to Leibniz's notebooks, a critical breakthrough occurred on 11 November 1675, when he employed integral calculus for the first time to find the area under a function $y=f(x)$. He introduced several notations used to this day, for instance the integral sign ∫ representing an elongated S, from the Latin word *summa* and the *d* used for differentials, from the Latin word *differentia*. This ingenious and suggestive notation for the calculus is probably his most enduring mathematical legacy. Leibniz did not publish anything about his calculus until 1684. [2]

Leibniz's version of calculus, to note, was used, over that of Isaac Newton's, by French engineer Lazare Carnot, who

made use of Leibniz's ideas about mechanical energy conservation.

Sufficient reason | Principle

Leibniz, in one of his works, proposed a so-called "principle of sufficient reason", which is oft-employed by theists in modern days to argue about things; the following are related quotes:

> "The law of sufficient reason, applied to actual existents, reduces itself to the assertion of final causes."
>
> — Bertrand Russell (c.1920), volume on Gottfried Leibniz; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 146) [2]

> "This difficulty Samuel Clarke effectively pressed home in his controversy with **Leibniz**. The celebrated ass of Buridan, being, by hypothesis, a perfectly rational ass, was unable to choose between two equally large and equally appetizing bales of hay equidistant from his nose; having no **sufficient reason** for preferring one to the other, the sagacious animal starved to death in the midst of plenty. Clarke pointed out, in substance, that Leibniz attributed to his Maker precisely such an irrational excess of rationality."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pg. 168)

Here, Leibniz was caught on the question of volition:

> "Where there is no preponderance of value in one contemplated object rather than another, an intelligent agent would be as powerless to move as a piece of matter in an equilibrium of forces."
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pg. 169)

(add)

Quotes | On

The following are quotes on Leibniz:

> "So far as the main part of the work is concerned, it is principally about the right understanding and perception of the universal vessel or container of all things, which I, to use one word, call 'space' but not understood in its usual three-dimensional sense, but as that in which every body and every substance either has its being and subsistence or could so have. Space yields to nothing and is not displaced according to the volume of the body it receives; it is permanent and immobile, everywhere in everything and through everything, whether corporeal or incorporeal and to which nothing brings being whether it is occupied or empty."
>
> — Otto Guericke (1671), "Letter to Gottfried Leibniz", Jun 6; cited by Thomas Conlon (2011) in *Thinking About Nothing* (pg. 90)

> "If there is to be any matter at all, then it must be continuous; there can be no empty spaces where matter might have been but is not. **Leibniz** therefore vehemently attacked the physical vacuists."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pgs. 180-81)

Quotes | By

The following are noted quotes by Leibniz:

> "It is a hypothesis worthy of belief that in the course of the vast changes, which have taken place in the conditions of the earth's crust, even the species of animals have many times been transformed. It is possible, that at some previous time, many species which have in them something of the cat, such as the lion, the tiger, the lynx, may have been the same race, and may now be regarded as new sub-varieties of the original cat species."
>
> — Gottfried Leibniz (1693), *Protoggaea*; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 256)

> "The earliest animals, probably, were marine forms, and amphibia and land animals are descended from these."
>
> — Gottfried Leibniz (1710), *Publication*; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 256)

> "It is certain that the soul of every animal has pre-existed, since the creation, and also that it has pre-existed in an organic body of its own. Every birth of an animal is only the transformation of an animal already alive."
>
> — Gottfried Leibniz (1715), *Publication*; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 257)

> "I should suppose that the souls which will some day become human have, like those of the other species, been in the seeds, and in the ancestors, up to Adam, and have consequently existed since the beginning of things, always a sort of organized body."
>
> — Gottfried Leibniz (c.1715), *Philos. Schriften*, VI, 152; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 258)

> "The eternity which is reserved in the future for all animate souls, or rather animate beings, is a vast field, designed to give, though by degrees, the greatest perfection to the universe."
>
> — Gottfried Leibniz (c.1715), unpublished fragment; cited by: J. Baruzzi (1909) in *Leibniz* (pg. 296); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 258)

> "To create everything from nothing, one is sufficient." (Latin original: "Omnibus ex nihilo ducendis sufficit unum.")
>
> — Gottfried Leibniz (1697), letter to Rudolph Augustus (Ñº), comparing the binary system to the creation of the universe out of nothing (0) by God's word (1)

> "Men are linked with the animals, these with the plants and these with the fossils, which in turn merge with those bodies which our senses and our imagination represent to us as absolutely inanimate."
>
> — Gottfried Leibniz (c.1697), *Publication*; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 145)

> "What if these theories were true, and we were magically shrunk and put into someone's brain while she

was thinking, we would see all the pumps, pistons, gears and levers working away and we would be able to describe the workings completely, in mechanical terms, thereby completely describing the thought processes of the brain. But that description would not contain any mention of thought! It would contain nothing but descriptions of pumps, pistons, levers!”

— Gottfried Leibniz (c.1700), discussion (Ñº) on automatons

References

1. George E. Smith. (2006). "The Vis Viva Dispute: A Controversy at the Dawn of Dynamics", *Physics Today* 59, Oct., Issue 10, pp 31-36.
2. (a) For an English translation of this paper, see Struik (1969: 271–84), who also translates parts of two other key papers by Leibniz on the calculus.
(b) Struik, D. J. (1969). *A Source Book in Mathematics, 1200–1800*. Harvard Uni. Press.
3. Jorgensen, Larry M. and Newlands, Samuel. (2014). “Introduction”, in: *New Essays on Leibniz’s Theodicy* (pg. 4). Oxford University Press.
4. Monadology – Wikipedia.
5. (a) Leibniz, Gottfried. (1714). *Monadology* (translator: George Montgomery) (pgs. 80-81). Chicago, 1908.
(b) Henderson, Lawrence J. (1917). *The Order of Nature* (pg. 36). Harvard University Press.
6. Tarde, Gabriel. (1893). *Monadology and Sociology*. Re Press, 2011.

External links

â— Gottfried Leibniz – Wikipedia.

θΔics

In existographies, **Gotthold Lessing** (1729-1781) (IQ:160|#546) (Cattell 1000:149) [RGM:261|1,500+] (CR:6) was a German writer, philosopher, dramatics, publicist, and art critic, noted for []

Overview

In 1754, Lessing, aged 24, in his essay "Rettung des Hier. Cardanus", defended Gerolamo Cardano from the charge of atheism. (Ñº)

Quotes | On

The following are quotes on Lessing:

> "Throughout his life Einstein was a man of the book, to a much higher degree than other scientists. The remarkably diverse collection of volumes in his library grew constantly. If we look only at the German-language books published before 1910 that survived Einstein's Princeton household, the list includes much of the cannon of the time: Boltzmann, Buchner, Friedrich Hebbel, the works of Heine in two editions, Helmholtz, von Humboldt, the many books of Kant, **Gotthold Lessing**, Mach, Nietzsche, and Schopenhauer. But what looms largest are the collected works of Johann von Goethe in a thirty-six volume edition and another of twelve volumes, plus two volumes on his Optics, the exchange of letters between Goethe and Schiller, and a separate volume of Faust."
>
> — Gerald Holton (2008), commentary (Ñº) on Einstein's personal library

Quotes | By

The following are quotes by Lessing:

> "The value of a man does not depend on the truth he possesses or believes he possesses, but on the sincere labor he has bestowed upon getting at the truth; for it is not the possession of, but the search for truth, that increases his strength and thereby makes him more perfect."
>
> — Gotthold Lessing (c.1770), *Publications*; quoted by Ludwig Buchner (1855) in *Force and Matter* (pg. xiii)

External links

â— Gotthold Lessing – Wikipedia.

θΔics

In genius rankings, **Gottlieb 1000** (Gottlieb 1000:#) refers to the top thousand people, who existed between 998 and 1998, ranked, via order of "shaping influence", according to the 1998 book *1,000 Years, 1,000 People: Ranking the Men and Women Who Shaped the Millennium*, by Agnes Gottlieb, Brent Bowers, Henry Gottlieb, and Barbara Bowers. [1]

Overview

The following is the listing of the Gottlieb 1000; the notation f, e.g. Rene Descartes (Gottlieb 1000:25), in Hmolpedia existographies, is hyperlink shorthand for an individuals Gottlieb ranking:

1-100	101-200	201-300	301-400	401-500
1. Johannes Gutenberg 2. Christopher Columbus 3. Martin Luther 4. Galileo Galilei 5. William Shakespeare 6. Isaac Newton 7. Charles Darwin 8. Thomas Aquinas 9. Leonardo Da Vinci 10. Ludwig Beethoven 11. John Locke 12. Mohandas Gandhi 13. Michelangelo Buonarroti 14. Karl Marx 15. Sigmund Freud 16. Napoleon Bonaparte 17. Albert Einstein 18. Nicolaus Copernicus 19. Jean Rousseau 20. Adolf Hitler 21. Adam Smith 22. George Washington 23. Wilbur Wright 24. Orville Wright 25. Rene Descartes 26. Louis Pasteur 27. Peter the Great 28. Thomas Edison 29. William I of England 30. Dante Alighieri 31. Elizabeth I 1588-1603 32. Abraham Lincoln 33. Johannes Kepler	101. Petrus Peregrinus 102. Otto Lilienthal 103. Father Berthold Schwartz 104. Gregor Mendel 105. Nikolaus Otto 106. Charles Montesquieu 107. Anton Leeuwenhoek 108. Paracelsus 109. Carl Gauss 110. James Watt 111. William Thomson 112. Petrarch 113. William Sherman 114. Carl Von Clausewitz 115. Saint Ignatius of Loyola 116. Okubo Toshimichi 117. Queen Isabella of Spain 118. Otto Von Bismarck 119. Michael Faraday 120. Florence Nightingale 121. Burrhus Skinner 122. Joseph Lister 123. James D Watson 124. Thomas Hunt Morgan 125. Vasco Da Gama 126. Saladin 127. David Ricardo	201. John Keynes 202. Tycho Brahe 203. Pope Leo IX 204. W.E.B. Dubois 205. James Maxwell 206. Emmeline Pankhurst 207. Marcel Proust 208. Niels Bohr 209. Jane Addams 210. Aldus Manutius 211. Robert Koch 212. Theodor Herzl 213. Thomas Starzl 214. John Adams 215. Friedrich Nietzsche 216. Jomo Kenyatta 217. Alfred Nobel 218. Matsuo Basho 219. Giotto 220. Emil Von Behring 221. Henry IV (of France) 222. Jawaharlal Nehru 223. Balthasar De Beaujoyeulx 224. Wilhelm II of Germany 225. Bartolomeo Cristofori 226. Francis Xavier 227. Elizabeth Blackwell 228. Lorenzo De Medici 229. Ivan the Great 230. Carl Linnaeus 231. Claudio Monteverdi	301. Edouard Manet (1832-1883) 302. François Rabelais 303. Girolamo Savonarola 304. Helen Keller 305. Ida B. Wells 306. Thomas Malthus 307. Pierre Beauchamp 308. Elisha Otis 309. Ferdinand Ritter Von Mannlicher 310. Ram Singh 311. Thomas Paine 312. David Ben-Gurion 313. Ibn Taymiyah 314. Jonas Salk 315. William Blake 316. Barthelemy Thimonnier 317. Horace Mann 318. Walt Whitman 319. Donatello 320. John Hawkins 321. Giovanni Boccaccio 322. Louis Armstrong 323. Margaret Fuller 324. Hung Hsiu-Chuan 325. Domingo Faustino Sarmiento 326. Henry Bessemer 327. Paul McCartney 328. John Lennon 329. Samuel Morse 330. Alexander Pushkin 331. Sandro Botticelli 332. Kublai Khan	401. Mikhail Bakunin 402. Bartolomeu Dias 403. Giovanni Bellini 404. Nichiren 405. Vaslav Nijinsky 406. John Harington 407. Osman I 408. Guido of Arezzo 409. Andre Ampere 410. George Washington Carver 411. Leif Eriksson 412. Roger Bacon 413. Wallace Hume Carothers 414. Frederick Winslow Taylor 415. Friedrich Engels 416. John I of England 417. Ferdinand Foch 418. Aristide Boucicaut 419. Charles-Maurice De Talleyrand-Périgord 420. Eleanor of Aquitaine 421. Ferdinand De Lesseps 422. Yung-Lo 423. Gustavus Adolphus of Sweden 424. Frederic Chopin 425. Alessandro Volta 426. Eugene O'Neill 427. Philip II of Spain 428. Mathew Brady 429. Leon Trotsky 430. John Harvey Kellogg

34. Leo Tolstoy
35. Johann Bach
36. Voltaire
37. Franklin Delano Roosevelt
38. Winston Churchill
39. St. Francis of Assisi
40. Niccolo Machiavelli
41. Vladimir Lenin
42. Ferdinand Magellan
43. Genghis Khan
44. Miguel De Cervantes
45. Mary Wollstonecraft
46. Rembrandt
47. William Harvey
48. Simon Bolivar, Libertador
49. Immanuel Kant
50. Mao Zedong (毛泽东)
51. Henry Ford
52. Wolfgang Amadeus Mozart
53. John Milton
54. Benjamin Franklin
55. Alexander Fleming
56. Martin Luther King Jr
57. Toyotomi Hideyoshi
58. Frederick the Great
59. Georg Hegel
60. Chu Yuan-Chang
61. Charles V, Holy Roman Emperor
62. Geoffrey Chaucer
63. Louis XIV (1638-1715)
64. Thomas Jefferson
65. Pope Urban II
66. Marco Polo
67. Antoine Lavoisier
68. Robespierre (1758-1794)
69. John Calvin
70. Charles Dickens
71. Suleiman the

128. Ernest Rutherford
129. Raphael Sanzio
130. Auguste Comte
131. Johann Goethe
132. Maimonides
133. Andrea Palladio
134. Lech Wałęsa
135. Eli Whitney
136. Max Planck
137. Joseph Priestley
138. Catherine the Great
139. Susan B. Anthony
140. Karl Benz
141. Eleanor Roosevelt
142. Robert Boyle
143. George Stephenson
144. Blaise Pascal
145. D W Griffith
146. Carl Jung
147. George Boole
148. Akbar
149. Pablo Picasso
150. Hernan Cortes
151. Thomas Hobbes
152. Fakr Ad-Din Ar-Razi
153. Henry the Navigator
154. Sarah Bernhardt
155. Le Corbusier
156. Louis-Jacques-Mande Daguerre
157. Gavrilo Princip
158. Vincent Van Gogh
159. Masaccio
160. Frank Lloyd Wright
161. Avicenna
162. Oliver Cromwell
163. Victor Hugo
164. Averroes ابن رشد
165. Richard Wagner
166. Hugo Grotius
167. Henrik Ibsen
168. Jane Austen
169. Allen Du Mont
170. Jamal Abdel

232. Oliver Evans
233. Franz Kafka
234. Andreas Vesalius
235. John Mcadam
236. Vilhelm Bjerknes
237. Mikhail Gorbachev
238. Gianlorenzo Bernini
239. Bartholome De Las Casas
240. Lucretia Mott
241. John III Sobieski (Jan III Sobieski)
242. Ito Hirobumi
243. Ivan 'The Terrible'
244. Ivan Pavlov
245. Anna Pavlova
246. Robert Fulton
247. Georges Danton
248. John Dalton
249. Gratian
250. Paul Ehrlich
251. Benedict Spinoza
252. Charlotte Perkins Gilman
253. Dmitri Mendeleyev
254. Honore Balzac
255. Saint Bernard of Clairvaux
256. Pieter Bruegel the Elder
257. Sir Francis Drake
258. Donato Bramante
259. Christopher Wren
260. Auguste Rodin
261. Daniel Fahrenheit
262. Mayer Amschel Rothschild
263. Samuel Adams
264. Leonardo of Pisa
265. Anders Celsius
266. Francis Joseph I
267. Antoinette Louisa Brown Blackwell
268. James Madison
269. Henri Matisse
270. Denis Diderot

333. Christiaan Huygens
334. Andres Bello
335. Jan Van Eyck
336. Lise Meitner
337. John Wycliffe
338. Johannes Eckehart
339. Jan Pieterszoon Coen
340. Francisco De Goya
341. George Berkeley
342. Franz Schubert
343. Pope John XXIII
344. General of the Army George Marshall
345. Sir Thomas More
346. Auguste Escoffier
347. Gerardus Mercator
348. Thurgood Marshall
349. Cardinal Richelieu
350. Ibn Al-Arabi
351. Charles Babbage
352. Elvis Presley
353. Johannes Brahms
354. Nelson Mandela
355. Maria Theresa
356. Firdawsi
357. Sir Walter Scott
358. Betty Friedan
359. Henry II of England
360. Babe Ruth
361. Yamagata Aritomo
362. Pierre Fermat
363. Constantin Brancusi
364. Ludwig Mies Van Der Rohe
365. Soren Kierkegaard
366. John Dryden
367. Ezra Pound
368. Giuseppe Garibaldi
369. Jean Piaget
370. Tokugawa Ieyasu

431. Konrad Adenauer
432. Michel Montaigne
433. Jean Monnet
434. Jean-Francois Borel
435. John Pierpont Morgan
436. Henry Maudslay
437. Woodrow Wilson
438. Li Hung-Chang
439. John III of Portugal
440. Joseph Monier
441. Virginia Woolf
442. Jackie Robinson
443. James Buchanan Duke
444. John Roebling
445. Alan Turing
446. Louis Lumiere
447. Vincent of Beauvais
448. Henry Cavendish
449. Gabriele Falloppio
450. John Gorrie
451. Wassily Kandinsky
452. George III
453. Heinrich Hertz
454. Gertrude Elion
455. Chiang Kai-Shek
456. Ibn Al-Haytham
457. Harriet Beecher Stowe
458. Booker T Washington
459. Charles De Gaulle
460. Benito Mussolini
461. Ch'ien-Lung
462. Frederick Banting
463. Albert Kahn
464. Pope Clement Vii
465. Konstantin Stanislavsky
466. Fidel Castro
467. Philip of Hesse
468. Eugène

Magnificent
72. Paul Cezanne
73. Murasaki Shikibu
74. Alexander Graham Bell
75. Marie Curie
76. John Eckert
77. Fyodor Dostoyevsky
78. Pope Innocent III
79. Frederick Douglass
80. Robert Oppenheimer
81. John Mill
82. Joseph Stalin
83. Joan of Arc
84. Francis Bacon
85. Filippo Brunelleschi
86. Elizabeth Cady Stanton
87. Vladimir K Zworykin
88. Gottfried Wilhelm Leibniz
89. William Jenney
90. Edward Jenner
91. Queen Victoria
92. Babur
93. Chu Hsi
94. Phineas T Barnum
95. Guglielmo Marconi
96. Marsilius of Padua
97. Desiderius Erasmus
98. Alexander Von Humboldt
99. Margaret Sanger
100. Henry VIII 1509-47

Nasser
171. James Joyce
172. Peter Abelard
173. Mehmed II the Conqueror
174. Joseph-Marie Jacquard
175. Jean Baptiste Poquelin Moliere
176. Caravaggio
177. Emperor Henry IV
178. Robert Goddard
179. Klemens Von Metternich
180. Edmund Burke
181. Kemal Ataturk
182. Samuel Johnson
183. Igor Stravinsky
184. George Eliot
185. David Hume
186. Albrecht Dürer
187. Ramanuja
188. Mark Twain
189. K'ang-Hsi
190. Alexander Hamilton
191. Saint Elizabeth of Hungary
192. Anton Chekhov
193. Yoshida Shoin
194. James Cook
195. Benito Juarez
196. Claude Monet
197. Daniel Defoe
198. Saint Dominic
199. Hieronymus Bosch
200. Nicolas Appert

271. Mitsui Takatoshi
272. Jacob Grimm
273. Wilhelm Grimm
274. Claude Debussy
275. Gottlieb Daimler
276. John of Austria
277. Wilhelm Conrad Rontgen
278. Arthur Wellesley 1st Duke of Wellington
279. Edgar Allen Poe
280. John Donne
281. Peter Paul Rubens
282. Sir Edward Coke
283. El Greco
284. Leo Hendrik Baekeland
285. Norman Borlaug
286. Ignaz Phillipp Semmelweis
287. John Marshall
288. Leopold Von Ranke
289. Clara Barton
290. Sun Yat-Sen
291. Johannes Fibiger
292. William Blackstone
293. James Naismith
294. Jean-Baptiste Colbert
295. Mi Fei
296. Franz Joseph Haydn
297. John Keats
298. John II of Portugal
299. Giambattista Vico
300. Franz Liszt

371. Ulysses S. Grant
372. Louisa May Alcott
373. Clarence Birdseye
374. Dwight D. Eisenhower
375. Henry David Thoreau
376. George P Marsh
377. Rachel Carson
378. Pope Gregory VII
379. Margaret Mead
380. Menelik II of Ethiopia
381. Bill W.
382. Agatha Christie
383. Jeremy Bentham
384. Pierre-Auguste Renoir
385. Lord Byron
386. James Starley
387. Jan Hus
388. Ernest Hemingway
389. Jean-Baptiste Racine
390. Saint Bernadette Soubirous/ Sainte Bernadette Soubirous
391. John Bunyan
392. Richard Francis Burton
393. Aphra Behn
394. Samuel Taylor Coleridge
395. Enrico Fermi
396. Yo Fei
397. James Boswell
398. Gustave Flaubert
399. Jean-Paul Marat
400. Tomas De Torquemada

Delacroix (1798-1863)
469. Irving Berlin
470. Frederick Law Olmsted
471. Thomas Cranmer
472. Sir Walter Raleigh
473. John Montagu
474. Cesare Beccaria
475. Pope Gregory Ix
476. Giuseppe Verdi
477. Hiroshige
478. Shah Jahan
479. Emily Dickinson
480. Emperor Frederick II
481. Anne Frank
482. Edgar Degas
483. Jorge Borges
484. Bernardo O'Higgins
485. Harry S Truman
486. John D. Rockefeller
487. George Eastman
488. 'Abd Al-Aziz Ibn Sa'ud
489. William the Silent
490. Wilhelm Wundt
491. Maria Agnesi
492. Jonathan Swift
493. Jakob Fugger
494. Walt Disney
495. Edmund Kean
496. Ambroise Pare
497. Baybars I
498. Yasir Arafat
499. Yuri Gagarin
500. Amelia Jenks Bloomer

501-600	601-700	701-800	801-900	901-1000
501. Aaron Montgomery Ward 502. Karen Horney 503. Luigi Galvani	601. William of Ockham 602. King Gillette 603. Rowland Hill	701. William Morton 702. Emperor Joseph II 703. Peter Drucker 704. Amelia Earhart	801. El Cid 802. Pope Gregory Xiii 803. Johann Strauss 804. William Pitt the Elder	

504. Ralph Waldo Emerson
505. Meriwether Lewis
506. Iwasaki Yataro
507. Alfred Krupp
508. Jean De La Fontaine
509. Percy Shelley
510. Nettie Marie Stevens
511. Tamerlane
512. Charles Lyell
513. Jan Vermeer
514. Hokusai
515. Robert E. Lee
516. Charles Lindbergh
517. Alp Arslan
518. Winslow Homer
519. Jules Verne
520. Giovanni Casanova
521. William Butler Yeats
522. Emily Bronte
523. Dag Hammarskjold
524. Johnny Torrio
525. William Faulkner
526. Duke Ellington
527. Philip II of France
528. Giovanni Pierluigi Da Palestrina
529. John Jacob Astor
530. Francesco Borromini
531. Christopher Latham Sholes
532. Thomas Chippendale
533. Francios Villon
534. Harriet Tubman
535. Frederick Hopkins
536. Albert Luthuli
537. Jose Julian Marti
538. Enirco Caruso
539. Godfrey Newbold Hounsfield
540. Levi Strauss
541. Benvenuto Celliini
604. John R Pierce
605. Joseph Henry
606. Georgia O'Keeffe
607. Emile Zola
608. Robert Browning
609. Charles Goodyear
610. Mary Stuart
611. Alexis De Tocqueville
612. Robert Swanson
613. Louis Ix of France
614. Helena Rubinstein
615. Sergey Prokofiev
616. Ian Wilmut
617. Niccolo Paganini
618. Christina Rossetti
619. Nikita Khrushchev
620. Regiomontanus
621. Andreas Marggraf
622. Charles Michel De L'epee
623. 邓小平　鄧小平 / Deng Xiaoping
624. Horatio Nelson
625. Berthe Morisot
626. Paul Julius Reuter
627. Pope John Paul II
628. Stephen Langton
629. Anna Freud
630. Jose De San Martin
631. Ernest Mach
632. Catherine De Medicis
633. Charles Baudelaire
634. Ludwig Wittgenstein
635. Duns Scotus
636. Dietrich Bonhoeffer
637. Konstantin Tsiolkovsky
638. William Gladstone
639. Benjamin Disraeli
705. René Geronimo Favaloro
706. Abbas I of Persia
707. Matthew Perry
708. James Monroe
709. Sophie Germain
710. John Bardeen
711. Georges Clemenceau
712. John Ford
713. Stephen Wozniak
714. Leo Szilard
715. Seymour Cray
716. Herman Melville
717. Katherine Dexter McCormick
718. Giuseppe Fiorelli
719. Margaret Thatcher
720. T.S. Elliot
721. Colette
722. Alfonso X of Spain
723. Martin Buber
724. David Livingstone
725. Gertrude Stein
726. Albertus Magnus
727. David Packard
728. Julia Margaret Cameron
729. Edward Robinson Squibb
730. Robert Noyce
731. Milton Friedman
732. Antonio Vivaldi
733. Theodor Schwann
734. Mobutu Sese Seko
735. Salvador Dali
736. Queen Margaret of Denmark
737. Alexander Nevsky
738. Friedrich Von Hayek
739. Matteo Ricci
740. Ray Kroc
741. Franz Boas
742. Helmut Kohl
743. Pierre De Coubertin
805. Henry De Bracton
806. Max Weber
807. Miguel Hidalgo Y Costilla (Página De Las Conmemoraciones De México 2010)
808. Herbert Spencer
809. Pierre Teilhard
810. William Wilberforce
811. Ben Johnson
812. Brigham Young
813. Leon Battista Alberti
814. Alexander Cartwright
815. Hans-Joachim Pabst Von Ohain
816. Jerzy Neyman
817. Henri-Toulouse Lautrec
818. Martha Graham
819. Charles Hard Townes
820. Laurence Olivier
821. Malcolm X
822. Igor Sikorsky
823. John Pym
824. John Graunt
825. Willard Gibbs
826. Felix Hoffmann
827. Sarah Josepha Hale
828. Robert Frost
829. Francis Fry
830. David Sarnoff
831. Dom Perignon
832. Friedrich Serturner
833. Stephen Foster
834. Federico Fellini
835. Edwin Drake
836. Simon Stevin
837. Boniface VIII
838. Sergei Diaghilev
839. Paul Klee
840. Pele
841. Richard Rodgers
842. Louis Wirth
843. Jayavarman Vii of Indochina
901. John Steinbeck
902. Frances Perkins
903. Michael Jordan (player)
904. Richard Nixon
905. Reinhold Niebuhr
906. Friedrich Froebel
907. Cesar Ritz
908. Erich Maria Remarque
909. Gregory Martin
910. Karl Barth
911. William Jennings Bryan (1908)
912. Noam Chomsky
913. Hannah Arendt
914. Martin Heidegger
915. Franklin Kameny
916. Frank Gilbreth
917. Walter Hunt
918. Joseph Goebbels
919. William Cobbett
920. Girolamo Fracastoro
921. Sri Ramana Maharshi
922. Paul Robeson
923. Grote Reber
924. John Phillip Sousa
925. Antonio De Mendoza
926. Jean Auguste Dominique Ingres
927. Samuel Beckett
928. Peter Behrens
929. Federico García Lorca
930. Jane Cunningham Croly
931. Francois Truffaut
932. Sir Robert Peel 1841 - 46
933. Steve Biko
934. Marcel Marceau
935. George Mallory
936. Henry Clay
937. Hugh Hefner
938. Pancho Villa
939. Ibn Battutah

542. Francisco De Orellana
543. William James
544. Washington Irving
545. Paul Gauguin
546. Tecumseh
547. John Knox
548. Margaret Bourke-White
549. Ibn Khaldun
550. Hans Christian Andersen
551. Lope De Vega
552. Shaka
553. Joseph Conrad
554. Isadora Duncan
555. Fannie Farmer
556. Martin Behaim
557. Henry James
558. Jean-Baptiste Say
559. Marie Lachapelle
560. Gustave Courbet
561. Pierre Corneille
562. Benjamin Spock
563. Abigail Adams
564. Ruben Dario
565. George Frideric Handel
566. Cornelius Vanderbilt
567. Jalal Ad-Din Ar-Rumi
568. Jean-Baptiste Camille Corot
569. Duncan Phyfe
570. Bartholomaeus Anglicus
571. Omar Khayyam
572. Edwin Hubble
573. Simone De Beauvoir
574. Oscar Wilde
575. George Wythe
576. Zhou Enlai
577. William Wordsworth
578. Gustav Mahler
579. Anna Comnena
580. St. Angela Merici
581. Babe Didrikson Zaharias
582. Eamon De Valera
640. Philippe Pinel
641. James Gordon Bennett
642. Inigo Jones
643. Pierre-Marie-Alexis Millarder
644. William Morris
645. Peter Goldmark
646. Robert a Watson-Watt
647. Aleksandr Solzhenitsyn
648. Pierre-Joseph Proudhon
649. William Randolph Hearst
650. Maria Montessori
651. Tsao Chan
652. Nicolas Leblanc
653. Dorothy Day
654. Edward Gibbon
655. James Wolfe
656. Saint Elizabeth Ann Seton
657. Pierre Bonnard
658. Saint Stephen I of Hungary
659. Henry Vii of England
660. John Gregg
661. Samuel Gompers
662. Crazy Horse
663. Gotthold Lessing
664. Grandma Moses
665. Luther Burbank
666. Francisco Franco
667. Dom Pedro II of Brazil
668. Charles Atlas
669. Haile Selassie
670. Albert Schweitzer
671. Hector Berlioz
672. John James Audubon
673. Al-Mahdi
674. George Gamow
675. Nathaniel Hawthorne
676. Antonin Dvorak
677. Frances Willard
678. Jim Thorpe
744. Ralph Nader
745. Eduard Bernstein
746. Alfred Hitchcock
747. Edward Bernays
748. Sebastien Le Prestre De Vauban
749. Charles Proteus Steinmetz
750. Friedrich Wilhelm Bessel
751. Jean Nidetch
752. Albert Camus
753. Juan Domingo Peron
754. Stephen Crane
755. Mary Cassatt
756. Robert Louis Stevenson
757. Tulsidas
758. Samuel Pepys
759. Elizabeth Barrett Browning
760. George Orwell
761. Jean-Bernard-Leon Foucault
762. James McNeill Whistler
763. John Harvard
764. William S Gilbert
765. Herbert of Cherbury
766. Muddy Waters
767. Izaak Walton
768. Daniel Edgar Sickles
769. Buckminster Fuller
770. Charles Frederick Worth
771. Ou-Yang Hsiu
772. Mother Teresa
773. Mordecai Anielewicz
774. Toni Morrison
775. Andrei Sakharov
776. Heinrich Schliemann
777. Barthold Niebuhr
778. Euclides Da Cunha
779. Emily Post
780. Fernao Lopes
781. Marie Antoinette
844. Langston Hughes
845. Lewis Carroll
846. Algernon Charles Swinburne
847. Umm Kulthum
848. Lord Palmerston
849. Alfred Kinsey
850. Marquis De Lafayette
851. Cosimo De Medici
852. Queen Catherine of Aragon
853. Miyan Tansen
854. Bronislaw Malinowski
855. Maurice Ravel
856. Bernardino Ramazzini
857. George Gershwin
858. Francisco Pizzaro
859. George Gallup
860. Bonaventure
861. Florence Kelley
862. Anwar El-Sadat ~~ أنور السادات
863. John Napier
864. Karl Landsteiner
865. Johann Pestalozzi
866. Christine De Pisan
867. Harvey Wiley
868. Akira Kurosawa
869. Robert Clive
870. Anthony Van Dyck
871. Luigi Pirandello
872. John Dewey
873. Dorothea Dix
874. Alexandre Dumas
875. Francois-Andre Philidor
876. Willard Libby
877. Alexander Mackenzie
878. Isaac Bashevis Singer
879. James I of England
880. Judah Ha-Levi
881. Paul Kruger
940. Mata Hari
941. Ernesto Che Guevera
942. Andre Malraux
943. Emperor Maximilian I
944. Rosa Parks
945. Simon Wiesenthal
946. Benjamin Lee Guinness
947. Josef Pilsudski
948. Matthew Arnold
949. Saint Teresa of Avila
950. Kahlil Gibran
951. Katherine Hepburn
952. Cary Grant
953. Julius Nyerere
954. Dwight L Moody
955. Amina
956. Louis Braille
957. Edward Lear
958. Ingmar Bergman
959. John Neumann
960. Ada Byron Lovelace
961. Andrew Carnegie
962. Mary Pickford
963. Roger Bannister
964. John L Lewis
965. Aaron Copeland
966. Srinivasa Ramanujan
967. Charles Drew
968. Captain Kidd
969. Sciopone Riva-Rocci
970. Harry Houdini
971. Virginia Apgar
972. Coco Chanel
973. Francis Baring
974. Rene-Theopile-Hyacinthe Laennec
975. Jethro Tull
976. Sergey Korolyov
977. Henry Shrapnel
978. Alfred Sloan Jr
979. Albert Lasker
980. Daniel Hale Williams
981. A.P. Giannini
982. John Pemberton

583. Mahmud of Ghazna
584. Thomas Mann
585. Mohammed Ali Jinnah
586. Mary Mallon
587. Honoré Daumier
588. Francisco de Miranda
589. Robert Owen
590. Rashi
591. Lu Hsun
592. Henri Cartier-Bresson
593. Bertrand Russell
594. William of Sens
595. Anthony of Padua
596. Eisai
597. Ramakrishna
598. Minamoto No Yoritomo
599. Nicolas De Ovando
600. Douglas Macarthur
679. Sato Eisaku
680. Joseph Glidden
681. Muhammad Ali
682. Dorothy Hodgkin
683. Blackbeard
684. Alexander Parkes
685. Jacques Cousteau
686. Henry Fielding
687. Gerhard Groote
688. Chester Carlson
689. Elizabeth Kenny
690. Kwame Nkrumah
691. Thomas Carlyle
692. John L Sullivan
693. Hannah Glasse
694. Blanche of Castile
695. Zwangendaba
696. Neil Armstrong
697. Bayezid
698. Thomas Hopkins Gallaudet
699. Unkei
700. Theodore Roosevelt
782. Toussaint Louvreture
783. Alexander Calder
784. Louise Brown
785. Jackson Pollock
786. George Fox
787. Jonathan Edwards
788. Werner Forssmann
789. Robert Baden Powell
790. Robert the Bruce
791. Indira Gandhi
792. Peter Carl Faberge
793. Cyrus McCormick
794. Pope Julius II
795. Charlie Chaplin
796. Thomas Babington Macauley
797. Piet Mondrian
798. David Bushnell
799. Thomas Huxley
800. John Chapman
882. Thomas Nast
883. Alfonso De Albuquerque
884. Marcello Malpighi
885. John MacDonald
886. Emma Goldman
887. Arthur Rimbaud
888. Bob Dylan
889. Warren Buffett
890. Henri Bergson
891. John H Hammond, Jr
892. Giuseppe Mazzini
893. Samuel Hahnemann
894. Golda Meir, Israel
895. Henry Moore
896. John Henry Newman
897. Rabindranath Tagore
898. Mikhail Kutuzov
899. Jack London
900. Cole Porter
983. Marion Donovan
984. Mahalia Jackson
985. Henry Rous
986. Henry Robert
987. Al Neuharth
988. Walter C Wingfield
989. Fela
990. Joseph Bramah
991. Hubert Booth
992. Edmond Hoyle
993. Ella Fitzgerald
994. William Levitt
995. Elijah McCoy
996. Bernard Cornfeld
997. Marilyn Monroe
998. Dr. Seuss
999. George Santayana
1000. Andy Warhol

(add)

See also

- Cattell 1000
- Murray 4000

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θΔics

In human chemistry, **Gottman stability ratio** is ratio the the exchanges of positive-to-negative interactions in a relationship, in which stable long-term marriages have a 5-to-1 ratio of attraction to repulsion in the exchange force of their bond. [1] The term is named after American mathematical psychologist John Gottman, who discovered the dynamic ratio in the 1970s after video recording the interactions of several hundred married couples and then later keeping track of divorce patterns years later. [2]

See also

- Müller stability ratio

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External links

- Stable marriage problem – Wikipedia.

θΔics

In terminology, **govern**, as in governing or government, means to exercise continuous sovereign authority over; to control, direct, or strongly influence the actions or conduct; or to exert a determining or guiding influence in or over an entity. [1]

Hmolscience

In modern culture, the notion that human movements are "governed" by the same laws of the universe, e.g. conservation of energy, second law of thermodynamics, reaction stoichiometry, second law of motion, etc., that govern atoms and smaller molecules is, for many, a very contentious notion, and for a few outspoken individuals a lunatic notion, if not outright blasphemy, and something to be condemned and some cases its author banned, excommunicated, and or jailed (see: human molecule (banned)).

The following 1858 statement by American sociologist Henry Carey and so-called "extreme" social mechanism theorist, to exemplify: [2]

> "In the inorganic world, every act of combination is an act of motion. So it is in the social one. If it is true that there is but one system of laws for the **government** of all matter, then those which govern the movements of the various inorganic bodies should be the same with those by which is regulated the motion of society; and that such is the case can readily be shown."

according to the views of Czechoslovakian-born English sociologist Werner Stark (1968) is characteristic of someone, supposedly, in "back in his strait-jacket", as Stark sees things. [3] Dividing lines on this matter continue up to the present, see for instance similar views expressed in respect to the "one nature" theories of Johann Goethe, Henry Adams, and Libb Thims, as discussed in the "crackpot" article.

Prior to Carey, in the 18th century, the so-called "one nature" point of view was the apex of the intellectual renaissance. In the 1770s, French chemist Antoine Lavoisier considered the "elective affinities", or force of reaction, to play the role of the governing influence over all of nature, chemical to plant to animal. As American historian Peter Reill, in his 2005 *Vitalizing Nature in the Enlightenment*, summarizes: [3]

> "Elective affinities, in Lavoisier's eyes, **governed** all chemical reactions, from the simplest to the most complex. For him, the physical universe was teeming with continuous combinations and reductions ... and such was the case in the 'animal and vegetable kingdoms'."

German polymath Johann Goethe, independent of Lavoisier, beginning in 1796 (see: Goethe timeline), likewise considered the "elective affinities" to be the governing aspect, not just for chemicals, vegetables, and animals, but for human movements and relationships as well, as he outlined in his tripartite "metamorphology" theory. This theory, likewise, has since gone on over the last two centuries to be Goethe's "most dangerous work" Goethean biographer Herman Grimm put it in 1880.

Quotes

The following are related quotes:

> "Three passions, simple but overwhelmingly strong, have **governed** my life: the longing for love, the search for knowledge, and unbearable pity for the suffering of mankind."
>
> — Bertrand Russell (1956), "What I Have Lived For", Prologue to *Autobiography* [9]

See also

â— Governor

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θΔics

In terminology, **government** is the system by which a state or community is governed; the action or manner of controlling or regulating a state, organization, or people. [1]

A 19th century German "new" **government** propaganda poster (Q), of a Marx-conceptualized Darwinian government, featuring a goddess handing a sword to the desperate masses which reads "knowledge is power." Her foot rests upon the works of Marx, Darwin and Lassalle (Q) . The figure in the foreground lifts up the remains of "social reform."

Overview

In the early 20th century, the traditional "Newtonian government" ideologies, were beginning to come up against the so-called "Darwinian government" ideologies, such as found in the presidential platform of Woodrow Wilson, in America, and Vladimir Lenin and Karl Marx socialism programs, in Russia. (Q)

Scholars

Note scientific-based forms of government scholars include: English political scholar Michael Foley (1990), who writes on the idea that the Constitution reflects some kind of concept of Newtonian machine, especially in the notions of balance and separation of powers, and American science historian Bernard Cohen (1995), who discusses, among other things, how there was a debate between John Adams and Benjamin Franklin on the form of the constitutions, during which the question arose of the meaning and possible application of a Newtonian physical principle. [2]

Newtonian government vs Darwinian government | → Gibbsian government

Where the 18th century saw the rise of Newtonian government systems, and the late 19th and early 20th century saw the rise of Darwinian government systems, the late 21st and early early 22nd centuries will see the rise of Gibbsian government systems, the Gibbsian-model of operation and change being a synthesis of both Newtonian and the Darwinian view, such as outlined by Lawrence Henderson (1917).

Scientific paradigm based

The following are noted leaders of countries who each based their governance models on one or another distinct scientific paradigms:

- Adolf Hitler | Charles Darwin, Friedrich Nietzsche
- Benito Mussolini | Vilfredo Pareto, Friedrich Nietzsche
- James Madison | Isaac Newton
- Joseph Stalin | Karl Marx
- Mehdi Bazargan |
- Napoleon Bonaparte | Johann Goethe
- Thomas Jefferson | Epicurus
- Woodrow Wilson | Isaac Newton, Charles Darwin

Quotes

The following are related quotes:

> "The *Constitution* was founded on the law of gravitation. The **government** was to exist and move by virtue of the efficacy of 'checks and balances.' The trouble with the theory is that government is not a machine, but a living thing. It falls, not under the theory of the universe, but under the theory of organic life. It is accountable to Darwin, not to Newton. It is modified by its environment, necessitated by its tasks, shaped by the sheer pressure of life."
>
> — Woodrow Wilson (1912), Presidential candidate campaign speech [3]

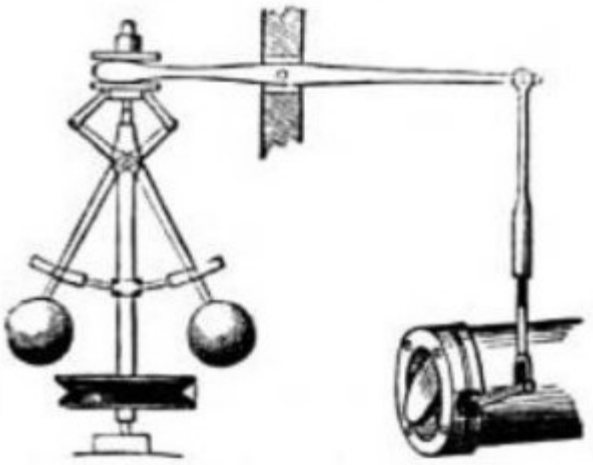

Governor

An 1868 Watt "governor" which regulates the flow of fuel (or steam) into the heat engine, thus keeping it from running too fast (or too slow) and exploding. People elected (**government**) to run a societyact similar to a Watt governor, operating to regulate the speed of a social system, a type of solar powered heat engine.

See also

- American presidents
- Princeton Department of Social Physics

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External links

- Government – Wikipedia.

θΔics

In engineering, **governor** is a device that regulates the passage of either steam or fuel into a cylinder, thus acting to either increase or decrease the driving force of the heat engine, in a balancing manner.

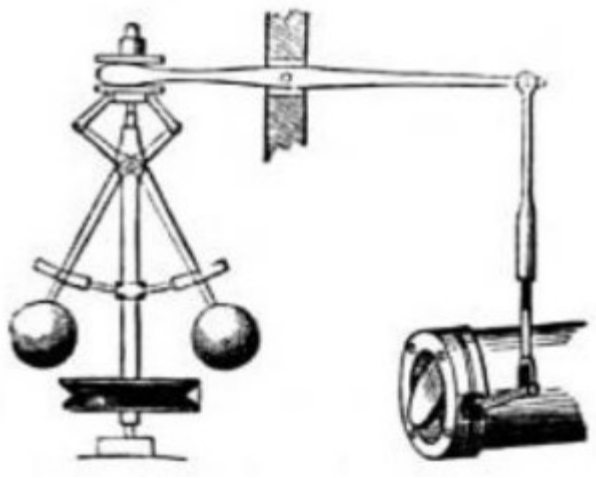

An 1868 diagram of one of Scottish engineer James Watt's steam engine **governors**, in which the spinning of the weighted balls acts to regulate the inflow of steam into the piston and cylinder. [1]

Overview

An upright spindle has two balls jointed to it, and revolving along with it, the spindle being set in motion by a pulley in connection with some shaft of the machinery. At the ordinary velocity of the engine, the balls have a certain divergence, bat when, as often happens, the resistance to the machinery becomes for a time less, and the speed consequently increases, the balls, having their centrifugal force increased, begin to diverge further. In doing so, the upper ends of the rods by which they hang pull down a boss that slides upon the spindle, and is clasped by the forked end of a lever. This lever is connected with a *throttle-valve*, or circular disc, in the tube that conveys the steam to the cylinder; and the depression of the end of the lever has the effect of closing more or less the passage for the steam, and thus diminishing the driving-force.

History

In 1788, James Watt invented the governor for controlling the steam throttle and thus the speed of his engine, by adapting the centrifugal or flyball governor from the flour mills, where it was used to regulate the ‘distance from the top millstone from the bed stone’, for use in his Watt engine. [3]

In 1868, Scottish physicist James Maxwell, in his “On Governors”, did some of the first mathematical analysis of the governor. [2]

In c.1870, Willard Gibbs made a governor, which is shown below:

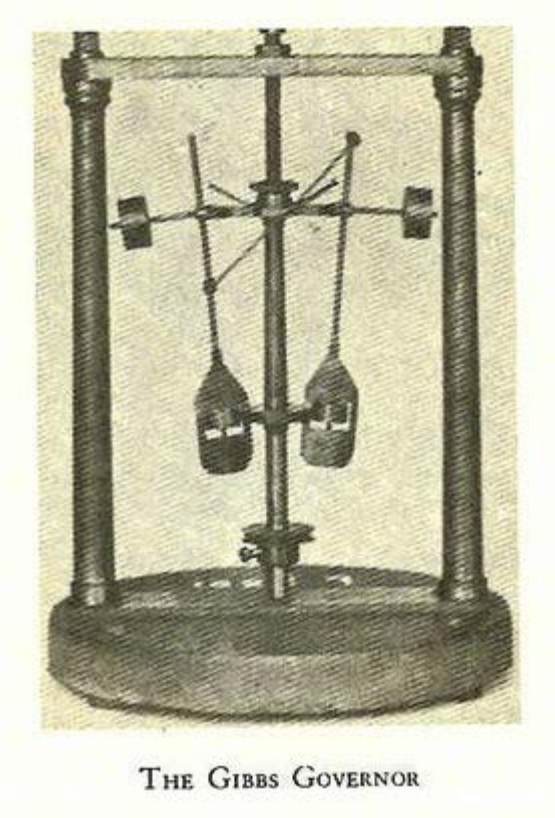

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External links

â— Governor (device) – Wikipedia.
â— Centrifugal governor – Wikipedia.

θΔics

In abbreviations, **GR** is the acronym for "genius rankings", meta-analysis section, the number of which refers to meta-analysis genius ranking position in accumulative genius rankings.

The term (GR:#), as of 2015, e.g. Goethe (GR:1), is shorthand notation for the person's ranking position in the Top 500 geniuses rankings

On some older, pre 2014 pages, the Isaac Newton page, to exemplify, the notation: (IQ:220|2) (GR:1) signifies that on the Genius IQs page, Newton is ranked second with a real IQ (true IQ) of 220 and ranked first on the genius rankings page, according to meta-analysis of 22+ genius ranking lists.

Other

The GR as genius rankings is not to be confused with, in literature thermodynamics, the GR acronym of *Gravity's Rainbow*, a work of Thomas Pynchon, who has a sort of cult following, who occasionally make statements such as: "GR is our new Bible, and Pynchon's a zany Moses in America."

See also

â— Genius studies

θΔics

In hmolscience, **Granville Sewell** (c.1944-) (DN=1) is an American mathematician and intelligent design advocate, noted, in religious thermodynamics, for his 2000 to present efforts to argue against the local entropy decrease model of human formation so to disprove Darwinian evolution.

Overview

In 1997, Sewell met Michael Behe, newly-infamous for his *Darwin's Black Box* (1996), discussing with him how he could find more support for his ideas in mathematics, physics and computer science.

In 2000, Sewell, in his "A Mathematician's View of Evolution", elaborated on his suggestions to Behe, in the form of an argumentative article, at the end of which he states the following:

> "The other point is very simple, but also seems to be appreciated only by more mathematically-oriented people. It is that to attribute the development of life on earth to natural selection is to assign to it — and to it alone, of all known natural 'forces' — the ability to violate the second law of thermodynamics and to cause order to arise from disorder. It is often argued that since the Earth is not a closed system — it receives energy from the sun, for example — the second law is not applicable in this case. It is true that order can increase locally, if the local increase is compensated by a decrease elsewhere, i.e. an open system can be taken to a less probable state by importing order from outside. For example, we could transport a truckload of encyclopedias and computers to the moon, thereby increasing the order on the moon, without violating the second law. But the second law of thermodynamics—at least the underlying principle behind this law—simply says that natural forces do not cause extremely improbable things to happen, and it is absurd to argue that because the Earth receives energy from the Sun, this principle was not violated here when the original rearrangement of atoms into encyclopedias and computers occurred."

This is the traditional argument against local entropy decrease to disprove evolution theory. His first statement on this matter is the following reverse Laplace's demon sort of argument:

> "I imagine visiting the earth when it was young and returning now to find highways with automobiles on them, airports with jet airplanes, and tall buildings full of complicated equipment, such as televisions, telephones and computers. Then I imagine the construction of a gigantic computer model which starts with the initial conditions on earth four billion years ago and tries to simulate the effects that the four known forces of physics would have on every atom and every subatomic particle on our planet. If we ran such a simulation out to the present day, would it predict that the basic forces of nature would reorganize the basic particles of nature into libraries full of encyclopedias, science texts and novels, nuclear power plants, aircraft carriers with supersonic jets parked on deck, and computers connected to laser printers, cathode ray tubes, and keyboards? If we graphically displayed the positions of the atoms at the end of the simulation, would we find that cars and trucks had formed, or that supercomputers had arisen? Certainly we would not, and I do not believe that adding sunlight to the model would help much."

Sewell central argument seems to be that there is no way in which the four fundamental forces could have worked to synthesized society starting with the atoms and subatomic particles of the primitive earth, as it existed four to five billion years ago and that "adding sunlight to the model would not help much." [1] He expands on this statement in 2010:

> "It is probably fair to say that the majority view of science today holds that physics explains all of chemistry, chemistry explains all of biology, and biology completely explains the human mind; thus, physics alone explains the human mind. Since there are only four known forces of physics (gravitational,

> electromagnetic, strong, and weak nuclear forces), this means that these four forces must explain everything that has happened on earth, according to this majority view."

Sewell then goes on to argue that this logic falls apart in the view of the entropy compensation postulate, in some way or another. His 2010 book *In the Beginning*, summarizes most of his arguments, and takes aim at the oft-used idiom that "anything can happen in an open system" objection to the mention that thermodynamics violates the evolution. [2]

His latest article, the 2011 "A Second Look at the Second Law", following its supposed acceptance and drum roll by *Applied Mathematics Letters*, and later recant, has stirred a bit of a blog following. [3]

Interesting some of Sewell's publications have provoked physicists and lay scientists into the role of pulpit preaching self-proclaimed thermodynamics experts (as often is the case in religion evolution debates); one example being Ukrainian-born American physicist Mark Perakh making fallacious and completely incorrect statements such as that: [4]

> "While expressions like 'entropy flows into the system,' are common in thermodynamics, they are just metaphors. Entropy is not a substance which can literally 'flow' from or into a system. Entropy is a measure of disorder and the actual mechanism of its decrease in one place and accompanying increase in another place is statistical. It is realized via random motion of particles chaotically exchanging their energy and moment through collisions."

In the correct sense, entropy is a differential unit, state variable unit heat flow that does flow into our out of systems, a simple example being radiation entropy, e.g. the passage of electromagnetic radiation into or out of a black body.

Likewise, in 2008 American computer scientist and ScienceBlogs.com writer Mark Chu-Carroll comments "no serious scientist, ever has said anything as idiotic as 'natural selection is an exception to the second law of thermodynamics''. [5] In the correct sense, the list of serious scientists who have comment on one version or another of this issue is long and distinguished, as is evidenced by the dozens of thinkers to have adopted the view that humans are akin to little Maxwell demons negating the second law against the tide of entropy; as is evidenced by Harold Whiting's 1885 view that natural selection is akin to Maxwell's demon and is thus an exception to the second law. [6] A few other noted historical examples being Herbert Spencer, William James, and John Bowlby.

See also

- Creationism scientists ranked by idiocy

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External links

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External links

- Natural science – Wikipedia.

θΔics

In science, **gravitate** means to move under the influence of gravity; to move in response to the force of gravity; or to be attracted by or as if by an irresistible force. [1]

Etymology

The term dates to at least 1692, deriving from the New Latin *gravitātus* (ptp. of gravitāre; which seems to corroborate with its usage coming into existence following the publication of Isaac Newton's 1686 *Principia.* Usages include: "youngsters gravitate toward a strong leader" (Rose Friedman), "musicians gravitate toward one another", etc.

Electromagnetate

In 2007, American chemical engineer Libb Thims updated the outdated Newtonian-view that gravity is what draws like people together to explain that, in a correct modern sense, it is the electromagnetic force that draws people together, and that the expression "certain people naturally *electromagnetate* towards each other" is the more-correct or way of saying things, over that of "certain people naturally *gravitate* towards each other"; although, to note, gravity does play a role in bringing together two human molecules in reaction in many overall-governing ways, e.g. controlling day light hours, controlling the female menstrual cycle, augmenting the moods of people, e.g. people drink 25 percent less alcohol during a full moon. [2]

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θΔics

In science, **graviton** is a hypothetical force carrier, of mass zero and spin two, posited as the exchange force particle operating in the mechanism of the gravity.

Etymology

The term “graviton” was introduced in 1934 by Russian physicists Dmitrii Blokhintsev and F. M. Gal'perin who, in their “Neutrino Hypothesis and Conservation of Energy”, stated: [1]

> “The comparison displayed above indicated that the **graviton** and the neutrino have much in common. This probably testifies that in general the highly improbable process of gravitation radiation becomes practically observable in beta-decay. If the neutrino turns out to be the graviton this would mean that temporary physics had approached the limits beyond which there would be no present insurmountable barrier between gravitation and electromagnetism. Due to theoretical considerations it is hard to identify gravitons with the neutrion since it is hard to admit that they have the same spin ½ as the neutrino. In this respect gravitons have much more in common with light quanta. It is impossible, however, to totally rule out a theoretical possibility of their identification. So fra it is much more correct to regard the neutrino as an independent type of particle.”

In 1959, Paul Dirac, in his annual American Physical Society lecture, announced that just as James Maxwell’s field theory of electromagnetism predicts the existence of electromagnetic waves, including visible light, and that—according to Planck-Einstein views—the energy of the field comes in quanta, known as photons, that Albert Einstein’s general theory of relativity predicts the existence of gravitational waves, according to which, by extension, the energy of the field also should come in quanta, which Dirac referred to as “gravitons”, in a reintroduction terminology manner. [2]

Humans

In 1992, Rush Dozier, applied the graviton theory to humans, with the following statements: [3]

> “We exchange **gravitons** not just with the earth but with all other objects in the universe. Massive objects such as stars and planets are intense sources of gravitons. Less massive objects, such as human beings, produce only a glimmer of gravitons in comparison.”

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External links

â— Graviton – Wikipedia.

θΔics

In science, **gravity** or "gravitation" is the name of the proposed force that acts on bodies with mass, in an equal and opposite manner, such that large bodies act to cause respectively smaller bodies, in its vicinity, to accelerate towards its central direction. [1]

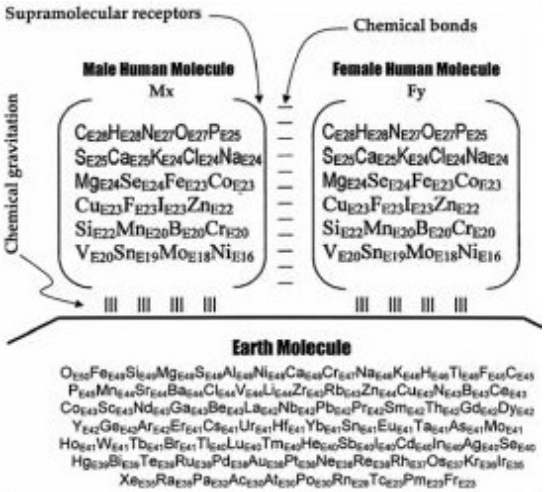

Left: A circa 1246 view of a spherical earth with people being affixed on all sides via the so-called '**gravitational** force'. Right: Modern (2007) view of two human molecules (people) affixed to the earth molecule (earth), whereby attachments between molecules (human and earth) are defined as 'chemical bonds'.

Relativity | Force illusion

In 1999, Michael Rowan-Robinson, on Einstein's relativity theory, stated the following: [8]

> "**Gravity** is not really a force but is a consequence of the curvature of space-time induced by masses. Space is curved around a massive body so small test particles moves in a curved orbit around the body, giving the illusion of a force acting on the particle."

(add discussion)

Overview

In 1798, American-born English scientist Benjamin Thompson gave one of the earliest references to mechanism and gravity: [2]

> "Nobody, surely, in his sober senses, has ever pretended to understand the mechanism of **gravitation**."

This perspective is no less true today. The science of human chemistry, however, illuminates the probability that gravity may be in the family of the chemical bond, and thus related to the electromagnetic force, having an explanation in photon-electron mechanism (or spin).

Thermodynamics

In 2010, Danish physicist Erik Verlinde contended that gravity is an illusion, explaining as an alternative that that both Newtonian and Einsteinean gravity is a consequence of the laws of thermodynamics. [6] His central derivation seems to rest on this statement:

> "The product of the temperature and the change in entropy due to the displacement of matter is shown to be equal to the work done by the gravitational force."

Cartoonish depiction of Danish physicist Erik Verlinde's 2010 claim that gravity doesn't exist, by NY Times artist Elwood Smith, but that gravity is a consequence of the thermodynamics. [6]

This statement is loosely correct in that energy quantified by the term TdS is associated with the changes in the positions of the particles of a system due to heat, as explained in the term equivalence-value and transformation equivalents, in which gravity comes into play by virtue of the principle of the transmission of work.

The weak point in his article is his utilization of 'information', which is not a thermodynamic quantity. He states: “gravity is explained as an entropic force caused by changes in the information associated with the positions of material bodies”. Beyond this, most of his argument is based on Hawking-type analogy laws of black hole thermodynamics and information, the latter of which itself has very negligible connection to thermodynamics. [7]

Human chemistry

See main: Human chemistry

In the study of the nature of the force of attachments between larger structures, such as between humans, between humans and the earth, or between the earth and the sun, each structure is described via a “molecular formula”, namely: human molecule, earth molecule, sun molecule. In short, the human being is a large 26-element molecule, defined as a human molecule, and attachments of human molecules, such as between a man Mx and woman Fy: Mx≡Fy, can be clearly explained via extrapolations and use of standard chemical bonding methodologies. In a duplicate manner, the force that holds one human molecule to the earth (a 92-element molecule), E≡Mx , or the earth to the sun (a 72-element molecule), S≡E, should each find a similar explanation in culling theory from chemistry; namely in the study of the attachment of two hydrogen atoms, H≡H, out of which all mentioned larger structures are made. These molecular formulas are shown below.

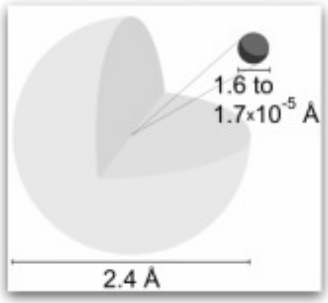

Hydrogen

H

H≡H Chemical bond

Human molecule

Mx≡Fy Human chemical bond

H_{E27} O_{E27} C_{E27} N_{E26} P_{E25} Ca_{E25} K_{E24} Na_{E24} S_{E24} Cl_{E24} Mg_{E24} Fe_{E23}
F_{E23} Zn_{E22} Si_{E22} Cu_{E21} B_{E21} Cr_{E20} Mn_{E20} Ni_{E20} Se_{E20} Sn_{E20} I_{E20} Mo_{E19} Co_{E19} V_{E18}

E≡E Chemical gravitation

Earth molecule

$O_{E50}Fe_{E49}Si_{E49}Mg_{E49}S_{E48}Al_{E48}Ni_{E48}Ca_{E48}Cr_{E47}Na_{E46}K_{E46}H_{E46}Ti_{E46}F_{E45}C_{E45}P_{E45}Mn_{E44}Sr_{E44}Ba_{E44}Cl_{E44}$
$V_{E44}Li_{E44}Zr_{E43}Rb_{E43}Zn_{E44}Cu_{E43}N_{E43}B_{E43}Ce_{E43}Co_{E43}Sc_{E43}Nd_{E43}Ga_{E43}Be_{E43}La_{E42}Nb_{E42}Pb_{E42}Pr_{E42}$
$Sm_{E42}Th_{E42}Gd_{E42}Dy_{E42}Y_{E42}Ge_{E42}Ar_{E42}Er_{E41}Cs_{E41}Ur_{E41}Hf_{E41}Yb_{E41}Sn_{E41}Eu_{E41}Ta_{E41}As_{E41}Mo_{E41}Ho_{E41}$
$W_{E41}Tb_{E41}Br_{E41}Tl_{E40}Lu_{E40}Tm_{E40}He_{E40}Sb_{E40}I_{E40}Cd_{E40}In_{E40}Ag_{E40}Se_{E40}Hg_{E39}Bi_{E39}Te_{E39}Ru_{E38}Pd_{E38}$
$Au_{E38}Pt_{E38}Ne_{E38}Re_{E38}Rh_{E37}Os_{E37}Kr_{E36}Ir_{E35}Xe_{E35}Ra_{E35}Pa_{E32}Ac_{E30}At_{E30}Po_{E30}Rn_{E28}Tc_{E23}Pm_{E23}Fr_{E23}$

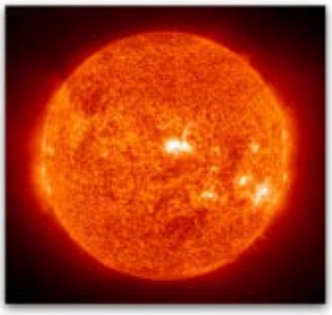

S≡S Chemical gravitation

Sun molecule

$H_{E57}He_{E56}O_{E54}C_{E53}Ne_{E53}N_{E53}Fe_{E52}Si_{E53}Mg_{E52}S_{E52}$

In the study of the mechanisms and dynamic formations and attachments involved in human bonding, between two or more human molecules, the new view illuminated in investigations of the human chemical bond, modeled on the standard chemical bond, is that photon electron interactions, mediated by field particles, explains such attachments.

This gives way to a view that the force of gravity, such as between one human molecule and a given planet, such as the earth molecule, or between earth molecule and the sun molecule, may have a type of chemical mechanism explanation, similar to the attachment of two hydrogen atoms; as all such cases seem to be the result of interactions between photons and the electrons. [1] Hence, the attachments between, for instance, the earth E and one human Mx, E≡Mx, or between the earth E and the sun S, S≡E, or as between to hydrogen H atoms, H≡H, should have a universal mechanism. [1]

Einstein on love and gravity

See main: Einstein on love

Among the letters Einstein received in England was one from a man who had a theory that gravity meant that as the earth rotated people were sometimes upside down or horizontal. Perhaps, reasoned the man, this led people to do foolish things, like falling in love. This prompted Einstein to scribble the following response on the letter: [3]

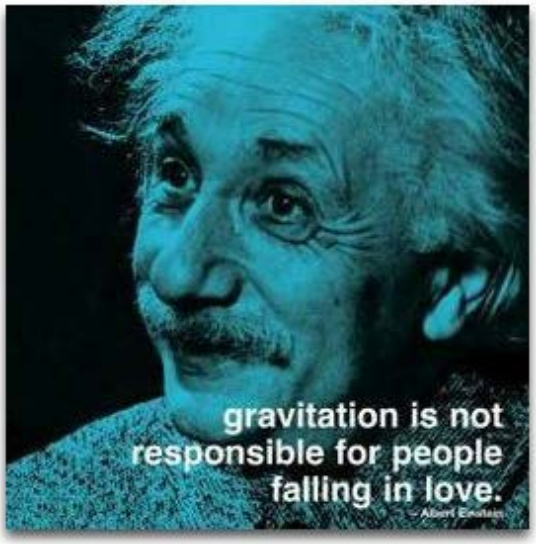

Einstein, his 1933 jottings on theories of love, and how he thought **gravity** cannot be held responsible for it.

> "Falling in love is not the most stupid thing that people do … but **gravitation** cannot be held responsible for it."

In the late 1920s at the California Institute of Technology, as recorded by Henry Borsook (1956), physical chemist Edwin Cohn asked geneticist Thomas Morgan what is research plans were? Morgan answer was: "I am not doing any genetics. I am bored with genetics. But I am going out to Cal Tech where I hope it will be possible to bring physics and chemistry to bear on biology." Shortly after Morgan arrived at Cal Tech, Einstein visited the laboratory and posed almost the same question. Morgan answered similarly as before. In response, Einstein shook his head and said: [4]

> "No, this trick won't work. The same trick does not work twice. How on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?"

(add discussion)

Quotes

The following are related quotes:

> "The theory of gravity so exactly accounts for all the physical phenomena of the solar system, that it is impossible it should be false; and although we cannot determine its nature or its essence, it is as unreasonable to doubt its existence, as to doubt the existence of animate beings, because we know nothing of the principle of life."
>
> — Horatio Robinson (1849), *A Treatise on Astronomy* [1]

See also

â— Biogravity
â— Social gravitation
â— Universal gravitation law

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External links

â— Gravitation – Wikipedia.

θΔics

In science, **great problem of chemical affinity** refers to the ancient puzzle as to the nature of the chemical reaction, i.e. why certain things react together, whereas others don't, and what is the nature or measurement of the driving force of a chemical reaction.

Overview

In 1692, Newton wrote the draft notes for his "Query 31", wherein he he outlined the chemical force tendencies when different chemical entities are put in contact.

Prior to 1919, a knowledge of the specific heats of substances, near absolute zero, such as worked on by Walther Nernst and his pupils, was said to be essential towards a complete solution of the problem of chemical affinity. [2]

In 1923, American physical chemist Gilbert Lewis stated the following about the problem: [3]

> "Indeed, our purpose at the outset (1909) was to merely to collect, for the practical use of the chemist and the chemical engineer, the data which we have obtained, or which we have assembled from the work of other investigators, pertaining to the '**great problem of chemical affinity**.' But then we were convinced that mere reference tables would hardly render full service without some description of the methods by which they were obtained. The development of these methods of applying thermodynamics to chemical problems has occupied the greater part of our time for many years (1909-23) (14-years)."

Lewis' effort, in turn, would go on to become the most referenced thermodynamics textbook of the 20th century, and result eventually to replace the word "affinity" by the word "free energy" throughout the English speaking world. [4]

In 1949, Frederick Philbrick, et al, summarized things as follows: [1]

> "By studying the energy relations of chemical change it is possible to understand much that must otherwise remain obscure, and in particular to form some ideas of the **great problem of chemical affinity**: why will substance A react with substance B but not with substance C?"

The latter part of this statement, of course, is Geoffroy's first law of affinity (1718), itself culled from Isaac Newton's famous Query 31, together which became the seed for the construction of affinity tables (1718-c.1800), and the later 18th, 19th century versions of affinity chemistry, which gave way eventually to chemical thermodynamics (1876-onward), and modern chemical thermodynamics (1923-onward).

See also

â— Great problem of natural philosophy

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3. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pg. viii). McGraw-Hill Book Co., Inc.
4. Leicester, Henry M. (1956). *The Historical Background of Chemistry* (pg. 206). Dover.

Further reading

â— Thims, Libb. (2007). *Human Chemistry (Volume Two)* (pg. 376). Morrisville, NC: LuLu.

θΔics

In modern queries, the **great problem of natural philosophy** is question of how life arose from non-life.

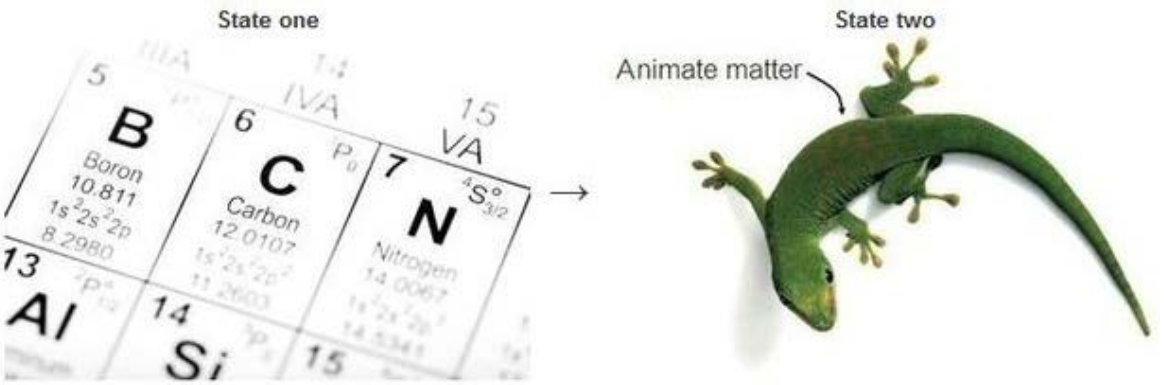

A visual depiction of the "**great problem of natural philosophy**", as French naturalist Etienne Saint-Hilaire described it in *circa* 1836, namely how "animate matter" (as the defunct theory of life views things) or "life" (as Saint-Hilaire viewed things), such as a gecko, arose from the collection of 92 naturally-occurring elements of the periodic table in the context of the nebular hypothesis? Serbian-born American electrical engineer Nikola Tesla claimed to have solved the problem in 1915, although his solution was riddled with panbioism. The complete solution was arrived at in 2009 by American electrochemical engineer Libb Thims, via the defunct theory of life.

Solution | Overview

The question of the wherewith-hows of life from non-life, in short, is a vicarious trick question, of sorts, it presupposes or assumes that "life" is something that exists in the universe, and particularly something within or characterizing the person ruminating on the question, previously thought to find resolution in the thermodynamics of some said-to-be hypothetical chemical mechanism occurring 3.85 billion years ago. The so-called "great problem" was solved or rather unraveled in 2009 by American electrochemical engineer Libb Thims (see: below).

History | Saint-Hilaire's statement

The problem was first stated explicitly by French naturalist Etienne Saint-Hilaire who in *circa* 1836 stated the following: [1]

> "It is quite certain that there was a moment when life did not exist on our planet, and another moment when it appeared. It is the passage between these two states that forms the **great problem of natural philosophy** today."

In modern terms, this is sometimes equivalent to asking how the inorganic, inorganic matter, dead matter, or non-organic matter, transitioned or passed, at one specific moment in time, into the organic, organic life, living matter, or carbon-based life, among other synonyms, state two?

Saint-Hilaire's solution

In later 13 Jul 1838 letter to French writer Georg Sand (IQ=160), Saint-Hilaire explained his reasoned position on this problem as follows: "God created materials predisposed for organization, by endowing them with all the virtual conditions to pass through all possible transformations according to the prescriptions of unceasingly variable ambient media. Animal forms are thus unceasingly variable." In short, Saint-Hilaire left the solution to the deism standpoint. The modern physical science perspective, initiated with the famous *circa* 1802 Napoleon Laplace anecdote, which declared God and "unneeded hypothesis", however, has no use for religious explanation; hence a modern physical science based solution is needed.

Tesla's attempted solution

In 1915, Serbian-born American electrical engineer Nikola Tesla (IQ=195), in his 1915 article "How Cosmic Forces Shape Our Destines", which extols a mixture of the defunct theory of life and, to some extent, the panbioism perspective, stated that he claims to have solved the great problem of natural philosophy, although he attributes the querying the problem to English natural philosopher Herbert Spencer, attributing him as saying: [2]

> "What is it that causes inorganic matter to run into organic forms!"

This seems to be a paraphrasing of the following statement made by Spencer in his 1887 *The Factors of Organic Evolution*: [3]

> "Biologists in general agree that in the present state of the world, no such thing happens as the rise of a living

creature out of non-living matter. They do not deny, however, that at a remote period in the past, when the temperature of the earth's surface was much higher than at present, and other physical conditions were unlike those we know, inorganic matter, through successive complications, gave origin to organic matter. So many substances once supposed to belong exclusively to living bodies, have now been formed artificially, that men of science scarcely question the conclusion that there are conditions under which, by yet another step of composition, quaternary compounds of lower types pass into those of highest types. That there once took place gradual divergence of the organic from the inorganic, is, indeed, a necessary implication of the hypothesis of evolution, taken as a whole; and if we accept it as a whole, we must put to ourselves the question—What were the early stages of progress which followed, after the most complex form of matter had arisen out of forms of matter a degree less complex?"

Tesla's so-called solution to the problem is as follows, the last paragraph in particular: [2]

"Every living being is an engine geared to the wheelwork of the universe. Though seemingly affected only by its immediate surrounding, the sphere of external influence extends to infinite distance. There is no constellation or nebula, no sun or planet, in all the depths of limitless space, no passing wanderer of the starry heavens, that does not exercise some control over its destiny—not in the vague and delusive sense of astrology, but in the rigid and positive meaning of physical science.

More than this can be said. There is no thing endowed with life—from man, who is enslaving the elements, to the humblest creature—in all this world that does not sway it in turn. Whenever action is born from force, though it be infinitesimal, the cosmic balance is upset and universal motion result.

Herbert Spencer has interpreted life as a continuous adjustment to the environment, a definition of this inconceivably complex manifestation quite in accord with advanced scientific thought, but, perhaps, not broad enough to express our present views. With each step forward in the investigation of its laws and mysteries our conceptions of nature and its phases have been gaining in depth and breadth.

In the early stages of intellectual development man was conscious of but a small part of the macrocosm. He knew nothing of the wonders of the microscopic world, of the molecules composing it, of the atoms making up the molecules and of the dwindlingly small world of electrons within the atoms. To him life was synonymous with voluntary motion and action. A plant did not suggest to him what it does to us—that it lives and feels, fights for its existence, that it suffers and enjoys. Not only have we found this to be true, but we have ascertained that even matter called inorganic, believed to be dead, responds to irritants and gives unmistakable evidence of the presence of a living principle within.

Thus, everything that exists, organic or inorganic, animated or inert, is susceptible to stimulus from the outside. There is no gap between, no break of continuity, no special and distinguishing vital agent. The same law governs all matter, all the universe is alive. **The momentous question** of Spencer, "What is it that causes inorganic matter to run into organic forms!" **has been answered**. It is the sun's heat and light. Wherever they are there is life. Only in the boundless wastes of interstellar space, in the eternal darkness and cold, is animation suspended, and, possibly, at the temperature of absolute zero all matter may die."

In short, Tesla gives the answer that "organic matter", his synonym for what is colloquially known as "life", arose through the cyclical action of the sun's heat and light. This is all correct, except for he decisive point that his solution clings to panbioism, i.e. the "everything is alive" point of view. In other words, in order for Tesla's solution to be correct, the hydrogen atom as to be alive. This, however, is not the case. This was first clearly stated in the 1938/39 "Man On His Nature" lectures of English physiologist Charles Sherrington, as follows: [4]

"Life is an example of the way in which an energy-system in its give and take with the energy-system around it can continue to maintain itself for a period as a self-centered, so to say, self-balanced unity. "Perhaps the most striking feature of it is that it acts as though it 'desired' to maintain itself. But we do not say of the spinning of a heavy top which resists being upset that it 'desires' to go on spinning. The very constitution of the living system may compel

it to increase; thus a self-fermenting protein system, granted its conditions, *must* increase. The behavior of a living body is an example of this, and we call it 'living'. The behavior of the atom is an example of this and we *do not* call it 'living'. The behavior of those newly discovered so-called 'viruses' is an example of this and there is hesitation whether or not to call it 'living'."

The atom, in short, according to Sherrington (and modern science), is not alive. This fact takes a long time to soak in when working on the great problem of natural philosophy. In any event, Tesla, being an accolade of Goethean philosophy, which he read to the exclusion of all other philosophies, was only but one step away from the solution.

Thims' solution

The so-called "great problem of natural philosophy" was officially solved on 2 Jan 2009 by American electrochemical engineer Libb Thims via the defunct theory of life; although, to note, the precursory work to the solution was preceded by 14-years of thought experiment on the overlap of the elective affinities problem and human chemical reaction theory and modern chemical thermodynamics, and followed by 3-years of post mental solidification before the solution actually began to conclude as a "problem solved" point of view (2012). The construction of the 2005 molecular evolution table and writing of the 2007 chapter "Molecular Evolution" (*Human Chemistry*) were decisive stepping stones into the solution of the great problem of natural philosophy, as Saint-Hilaire labeled it.The following is an overview diagram of the 2009 solution to the great problem of natural philosophy, i.e. life from non-life problem:

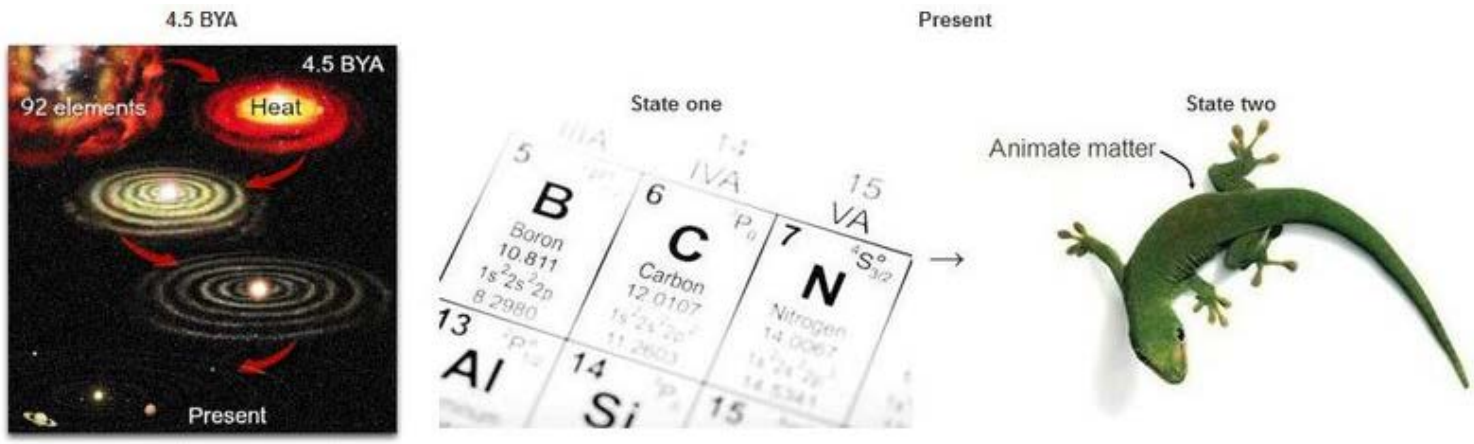

(add discussion)

Quotes

The following are related quotes:

> "No intelligent person can fail to be interested in the **great question**, what makes physical matter living matter? This question has been the oldest, and still remains the latest topic of scientific discussion. It is well, therefore, to recognize at the outset why no agreement has been reached on the subject."
>
> — William H. Thomson (1909), *What is Physical Life? Its Origins and Nature* [1]

> "The problem of the origin of life is one of the oldest enigmas with which the human mind has been concerned; and yet it is a problem which is ever-recurring, seemingly as insurgent as life itself."
>
> — Oliver Reiser (1940), "Life as a Form of Chemical Behavior" [6]

See also

â— Great chain of being.
â— Homework problems
â— Origin of life

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θΔics

In genius studies, **greatest** refers to []

Quotes

The following are related quotes:

> "Your question [about god] is the most difficult in the world. It is not a question I can answer simply with yes or no. I am not an atheist. I do not know if I can define myself as a Pantheist. The problem involved is too vast for our limited minds. We see a universe marvelously arranged, obeying certain laws, but we understand the laws only dimly. Our limited minds cannot grasp the mysterious force that sways the constellations. I am fascinated by Spinoza's pantheism [see: Spinoza's god]. I admire even more his contributions to modern thought. Spinoza is the **greatest** of modern philosophers, because he is the first philosopher who deals with the soul and the body as one, not as two separate things."
>
> — Albert Einstein (1930), interview with George Viereck [2]

> "I am the **greatest**! Fifteen times I have told the clown what round he's going down, and this chump ain't no different. He'll fall in eight, to prove that I'm great. And if he keeps talking jive, I'm gonna cut it to five."
>
> — Muhammad Ali (1964), "Speech before Sonny Liston Fight" (Q), Feb

> "Temple praises Homer as the '**greatest** universal genius'."
>
> — Kirsti Simonsuuri (2010), *Homer's Original Genius* [1]

> "**Libb Thims**, whose real IQ I estimate at 200, is an American electrochemical engineer, and one of the ten most intelligent humans currently reacting on this planet. His primary website, the *Encyclopedia of Human Thermodynamics*, is widely considered the **greatest** intellectual achievement on the Internet. The EoHT Forum discusses topics spanning from morality to 'life' and 'death', and from literature and art to the many fields of science. Reading through the threads on the forum will probably yield an increase in the reader's IQ."
>
> — Inderjit Singh (2015), "Knowledge is Power" (Q), Oct 3

See also

The following is collection of Hmolpedia "greatest ever" rankings:

- Greatest artistic geniuses
- Greatest atheist ever
- Greatest astronomer ever
- **Greatest chemist ever**
- Greatest economist ever
- Greatest engineer ever
- Greatest fictional geniuses ever
- Greatest musical geniuses

- Greatest historian ever
- Greatest literary author ever
- **Greatest mathematician ever**
- Greatest middle ages geniuses
- Greatest philosopher ever
- **Greatest physicist ever**
- Greatest sociologist ever
- Greatest thermodynamicist ever
- Greatest military geniuses
- Greatest female geniuses
- Greatest black geniuses

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1. Simonsuuri, Kirsti. (2010). *Homer's Original Genius: Eighteenth-Century Notions of the Early Greek Epic (1688-1798)* (pg. 163). Cambridge University Press.
2. Viereck, George S. (1930). *Glimpses of the Great* (pgs. 372-73) (O). Duckworth.

θΔics

In genius studies, **greatest artistic geniuses**, in the visual sense (compare: greatest musical geniuses), refers to the greatest painters, sketchers, etchers, and sculpture makers ever.

Overview

In c.1500, Leonardo da Vinci, in his Codes Ashburnham, Manuscript 2038, 19 recto, 19 vrso and 20 recto, penned a short discussion as to who was more of a genius: the poet or the painter; which reads as follows: [1]

> "If you call painting 'dumb poetry', then the painter may say of the poet that his art is 'blind painting'. Consider then which is the more grievous affliction, to be blind or be dumb! Although the poet has a wide a choice of subjects as the painter, his creations fail to afford as much satisfaction to mankind as do paintings, for while poetry attempts to represent forms, actions and scenes with words, the painter employs the exact images of these forms in order to reproduce them. Consider, then, which is more fundamental to man: the name of man or his image? The name changes with change of country; the form is unchanged except by death."

Da Vinci, in short, believed that the painter was more of a genius than the poet.

IQ | Rankings

The following, a work in progress, are some of the artistic geniuses:

#				
1.	7 — 200 Leonardo da Vinci (1452-1519)	IQ_O=260 IQ_{SS}=250 IQ_{BR}=233 IQ_B=220 IQ_O=210 IQ_{CB}=**200** IQ_C=180 IQ_W=167	(Cattell 1000:86) [RGM:1|1,310+] (Murray 4000:3|T / 4|WA) (RMS:13) [GEE] [LPKE] [uberman] (CR:84|#51) Italian artist, technologist, polymath, universal genius, physicist, astronomer, and general philosopher; note for: blue sky problem theorist; animal heat theory, engineering, warfare technology, flight; said to have utilized a "sleep formula", sleeping no more than four hours at a time, so to optimize his intellectual output; heliocentrism advocate; gets upgrade (above Galileo) for, supposedly, doing a pumpkin growing variant of Johann Helmont's later more-popular willow growing experiment; IQ of 260 (Araugo, 2017).	
2.	116 — 180 Michelangelo (1475-1564)	IQ_{CB}=**178** IQ_C=180 IQ_B=175	(Cattell 1000:28) [RGM:11|1,320+] (Murray 4000:1|WA) Italian sculptor, painter, architect and poet; a Nietzsche uberman; painter of the "Creation of Adam" (see: God vs Gibbs).	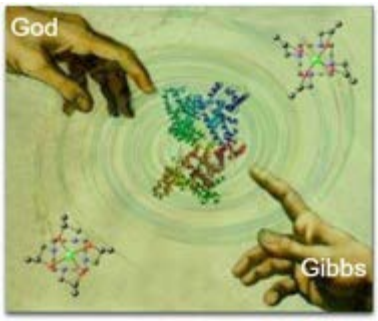
3.	202 — 180 Leon Alberti (1404-1472)	IQ_B=180	(Cattell 1000:N/A) [RGM:N/A|1,300+] (Murray 4000:N/A) Italian humanist author, artist, architect, poet, priest, linguist, philosopher and cryptographer; epitomized the 'renaissance man'.	

4. 180 | 208 Phidias (500-432BC) IQ_B=180 (Cattell 1000:402) [RGM:222|1,330+] (Murray 4000:N/A) Greek sculptor; noted for statue of Zeus at Olympia, considered one of the Seven Wonders of the Ancient World.

5. 175 | 301 Salvador Dali (1904-1989) IQ_B=180

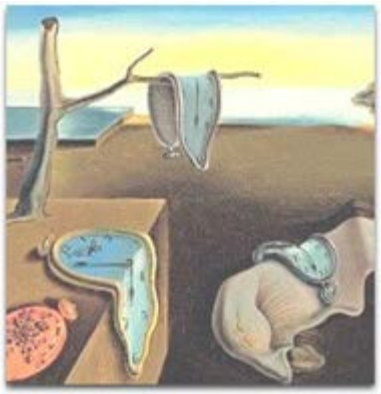

[RGM:170|1,300+] (Murray 4000:N/A) Spanish surreal artist; noted for melting clock painting, i.e. The Persistence of a Memory (1931); when asked by Ilya Prigogine whether this art piece had something to do with Einstein's relativity theory, Dalí replied that the soft watches were not inspired by the theory of relativity, but by the surrealist perception of a Camembert (cheese circle) melting in the sun; ; considered himself a "genius" as describes in his *Diary of a Genius* (1964) (Ñº), akin to a striving to be "Nietzsche of the irrational" or an "almost divine genius like Raphael", or something to this effect.

6. 175 | 302 Pablo Picasso (1881-1973) IQ_B=175 IQ_{SS} =175 [RGM:347|1,500+] (Murray 4000:3|WA) Spanish-born French painter, sculptor, printmaker, ceramicist, stage designer, poet and playwright.

7. 175 | 314 Marcel Duchamp (1887-1968) ↓ IQ_B=180 [RGM:N/A|1,500+] French-American painter, sculptor, chess player and writer;

8. 170 | 332 Raphael (1483-1520) IQ_{CB} =**170** IQ_C=170 IQ_B=170 (Cattell 1000:22) [RGM:60|1,320+] (Murray 4000:3|WA) Italian painter and architect; best known for *The School of Athens* (1511).

9. 165 | 450 Vincent van Gogh (1853-1890) IQ_O =150-200 IQ_O =150+

[RGM:70|1,500+] (Murray 4000:18|WA) Dutch Post-Impressionist painter; in about a decade, he created about 2,100 artworks, including around 860 oil paintings, most of them in the last two years of his existence; noted works: The Starry Night (1889), Irises (1889), Sunflowers (c.1885), The Potato Eaters (1885), and Café Terrance at Night (1888); IQ:150+ (Ñº), IQ:150-200 (Ñº); top 1000 missing candidate (Jan 2019); first-slating: 165|#450 (Jan 2019).

[RGM:352|1,500+] (Collins 20:8) French sculptor;

10. | 165 506

Auguste Rodin (1840-1917)

"To any artist, worthy of the name, all in nature is beautiful, because his eyes, fearlessly accepting all exterior truth, read there, as in an open book, all the inner truth."
— Auguste Rodin (c.1900)

Noted for: The Thinker (1902), The Kiss (1882), Monument to Balzac (1898) (Ñº), and The Gates of Hell (1917); Ruth Butler's *Rodin: the Shape of Genius* (1996) recounts the "myths that have grown up around him"; first-slating: 165|#506 (Jan 2019).

11. | 160 525

Sandro Botticelli (1445-1510)

(Cattell

1000:N/A) [RGM:160|1,320+] (Murray 4000:N/A) Italian painter; noted for: *The Birth of Venus*, e.g. as illustrated in the Lucretius article, Sistine Chapel works, etc.; first-slating: 160|#440 (Feb 2018) per crude artistic geniuses rankings.

12. | 155 582

Titian (1488-1576) IQ_B=145

(Cattell 1000:146) [RGM:200|1,500+] (Murray 4000:3|WA) Italian painter;

"Giotto, Titian, Rembrandt, and Goya were the great painters. I am only a public clown."
— Pablo Picasso (1952), Interview (Ñº)

Noted for: Assumption of the Virgin (1518), Venus of Urbino (1534), Diana and Actaeon (1559), among others; upgraded from IQ:145|#662 to IQ:155|#582.

(Cattell 1000:168) [RGM:93|1,500+] (Murray 4000:7|WA) Dutch draughtsman, painter and printmaker;

"A pious mind,

13. 150 | 631

Rembrandt (1606-1669)

IQ_{CB} =**150**
IQ_{C}=155
IQ_{B}=145
IQ_{O}=110

paces honor above wealth."
— Rembrandt (1634) (Ñº)

"Giotto, Titian, Rembrandt, and Goya were the great painters. I am only a public clown."
— Pablo Picasso (1952), Interview (Ñº)

regarded as the greatest artist of Holland's 'golden age'; his "Pendant Portraits of Maerten Soolmans and Oopjen Coppit", which sold for $190M, is the eight most expensive painting (Ñº) in history; is ranked #4 in Ranker.com's Best Painters of All Time (Ñº) listing; his "The Night Watch", adjacent, is Ranker.com ranked at #23 "Best Paintings of All Time" (Ñº) out of 200; IQ cited at 110 (Cawley, 2006) (Ñº).

14. 145 | 662

Claude Monet (1840-1926)

[RGM:119|1,500+] (Collins 20:7) French impressionist painter; best known for his series of serene water lilies paintings; first-slating: IQ:145|#662 (Jan 2019).

(add)

Murray 4000 | Western Art

The following are the top twenty "western artists" from the Murray 4000 rankings:

1. Michelangelo ✓
2. Pablo Picasso ✓
3. Raphael ✓
4. Leonardo da Vinci ✓
5. Titian ✓
6. Albrecht Durer
7. Rembrandt ✓

Collins Top 20

The following is Neil Collins' 2009 (Ñº) ranking of the top 20 Greatest Painters and Sculptors, from his online Art Encyclopedia:

1. Michelangelo (1475-1564) ✓
2. Rembrandt (1606-1669) ✓
3. Pablo Picasso (1881-1973) ✓
4. Leonardo Da Vinci (1452-1519) ✓
5. J.M.W. Turner (1775-1851)
6. Donatello (1386-1466)
7. Claude Monet (1840-

8. Giotto	1926) ✓
9. Gian Bernini	8. Auguste Rodin (1840-1917) ✓
10. Paul Cezanne	9. Jan van Eyck (1390-1441)
11. Peter Rubens	10. Peter Rubens (1577-1640)
12. Caravaggio	11. Raphael (1483-1520) ✓
13. Diego Velazquez	12. Diego Velazquez (1599-1660)
14. Donatello	13. Jan Vermer (1632-1675)
15. Jan van Eyck	14. Caravaggio (1573-1610)
16. Francisco Goya	15. Giambologna (1529-1608)
17. Claude Monet ✓	16. Titan (1488-1576) ✓
18. Masaccio	17. John Constable (17876-1837)
19. Vincent van Gogh ✓	18. Nicolas Poussin (1594-1665)
20. Paul Gauguin	19. Edgar Degas (1834-1917)
	20. Amedeo Modigliani (1884-1920)

(add)

(add)

References

1. Da Vinci, Leonardo. (c.1518). *The Notebooks of Leonardo Da Vinci* (pgs. 45-46). Arcturus, 2017.

See also

â— Middle agees genius

External links

â— The Greatest Painters of All Time – Ranker.com.
â— 12 Greatest Visual Artists of All Time – ThoughtCo.com.

θΔics

In genius studies, **greatest astronomer ever** refers to an opinionated ranking of the top thinkers in the field of astronomy ordered by greatness.

Overview

The following is a meta-analysis ranking of the **top 100+ greatest astronomers** , culled from a variety of sources, e.g. top 1000 geniuses and Murray 4000, along with extant top 10+ polls and rankings, as listed at bottom of this page:

	IQ	Person	Astronomy Rankings	Overview
1.	185 | 56	Nicolaus Copernicus (1473-1543)	(Murray 4000:5|A)	(Cattell 1000:341) [RGM:14|1,500+] (Gottlieb 1000:18) [Kanowitz 50:15] (GPE:35) [CR:136] Polish mathematician, astronomer, and physician; "**Copernicus** is the 'master' who dared to take the first step." — Galileo (1597), "Letter to Kepler" 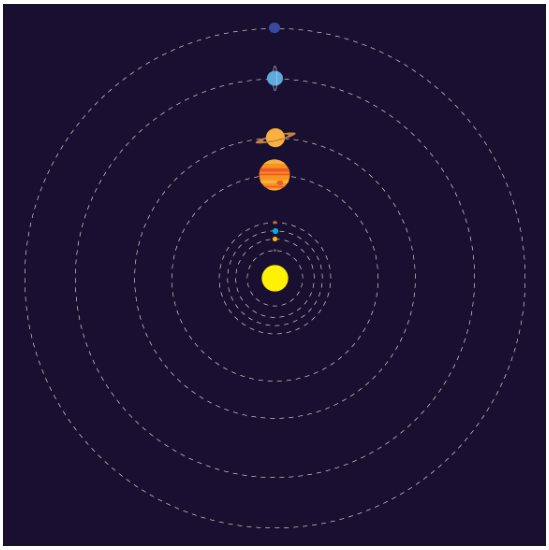 Known as the "next Ptolemy" (Reinhold, 1542), noted for his 1514 forty-page booklet "Little Commentary" (Commentariolus), in which he began to lay out the basics of his heliocentric model of the universe, as opposed to the older geocentric model of the universe, eventually publishing the finalized version as the 1543 *On the Revolution of the Heavenly Spheres*, the "first book in nearly 1,400-years to rival Ptolemy's *Almagest*" (Repcheck, 2007), which introduced the revolutionary idea to the world that the "earth moves" or that "the earth is moving and the stars are at rest" (Anon, 1542), a view opposed to that of the older 350BC physics model of Aristotle that the earth is the center of the universe and stationary.
2.	195 | 11	Galileo Galilei (1564-1642)	(Murray 4000:2|A)	(Cattell 1000:46) [RGM:4|1,500+] (Murray 4000:2|CS / 5|P / 2|A) (EP:10) [GPE:5] (GAE:2) [CR:273] Italian physicist, astronomer, and philosopher,
3.	175 | 221	Ptolemy (c.100-170)	(Murray 4000:6|A)	(Cattell 1000:80) [RGM:98|1,500+] (Murray 4000:12|CS / 6A) (Eells 100:23) (GAE:3) (CR:45) Greco-Egyptian mathematician and astronomer; in his 130AD *Syntaxis Mathematica*, he supposedly was the first to introduce the zero number; his 150AD Aristotle-based Ptolemaic "geocentric model" (adjacent), was not superseded for some thirteen centuries, namely until Nicolaus 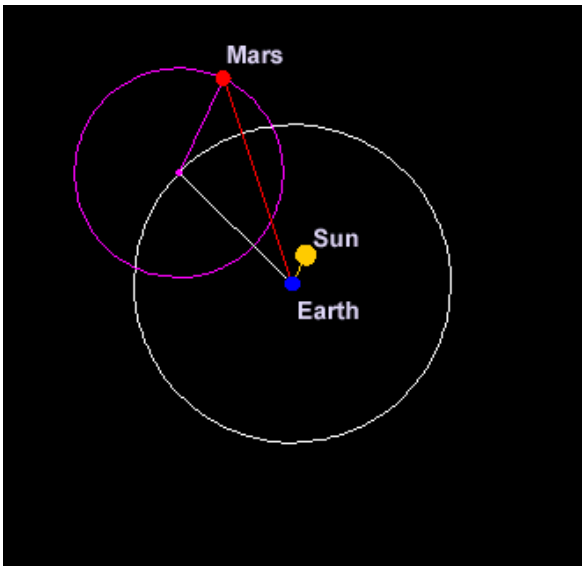

Copernicus established the heliocentric model (1543);

4. 180 | 91

Johannes Kepler (1571-1630) (Murray 4000:2|A)

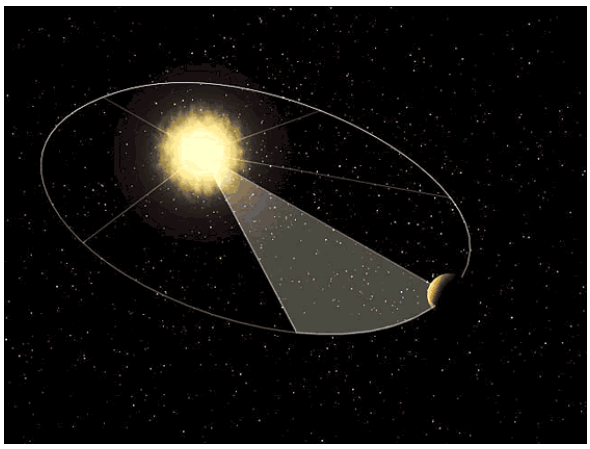

(Cattell 1000:157) [RGM:18|1,500+] (Murray 4000:4|CS / 2|A) (GAE:4) [CR:100] German mathematician and astronomer; a fabled "last persons to know everything", known for his 1619 three laws of planetary motion, according to which planets, based on the Copernican model, move not in spherical but rather "elliptical" orbits, which he derived from astronomical observations made by Tycho Brahe, that planets move faster at perihelion and slower at aphelion, according to geometric rules, and that "a line between the sun and the planet sweeps equal areas in equal times" (second law), as shown adjacent; his work provided foundations for Isaac Newton' theory of universal gravitation; down-grade ↓ for believing that planets were moved by angels flapping their wings (see: Ra).

5. 220 | 2

Isaac Newton (1643-1727)

(Cattell 1000:14) (Gottlieb 1000:6) [RGM:3|1,500+] (Murray 4000:2|CS / 1|P / 2|M) (EPD:F0) (GR:1) (SIG:1) (RE:84) [CR:866] English physicist, chemistry, mathematician, and philosopher;

6. 215 | 3

Albert Einstein (1879-1955)

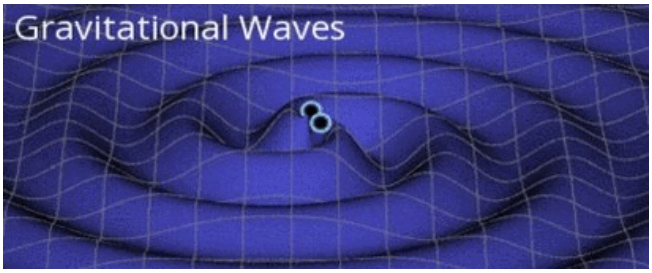

(Gottlieb 1000:17) [RGM:2|1,500+] (Murray 4000:9|CS / 2|P) (LGS:1) [Kanowitz 50:2] [Cropper 30:1|R] (GPE:1) (HD:52) (RE:76) [CR:737] German physicist, astronomer, and philosopher; his 1919 general theory of relativity predicted the existence of gravitational waves (as shown adjacent).

165 | 502

Tycho Brahe (1546-1601)

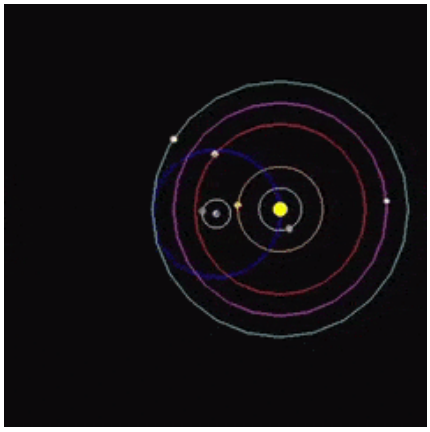

[RGM:78|1,500+] (Murray 4000:7|A) (Gottlieb 1000:202) (Simmons 100:22) (CR:6) Danish astronomer;

"For those [observations] that I made in Leipzig in my youth and up to my 21st year, I usually call childish and of doubtful value. Those that I took later until my 28th year [i.e., until 1574] I call juvenile and fairly serviceable. The third group, however, which I made at Uraniborg during approximately the last 21 years with the greatest care and with very accurate instruments at a more mature age, until I was fifty years of age, those I call the observations of my manhood, completely valid and absolutely certain, and this is my opinion of them."

— Tycho Brahe (1598), description of instruments and scientific work

built on the Copernican model to make is Brahe model of the world (adjacent); colorful character (Ñº); gather the data, used by Johannes Kepler, to formulate the laws of planetary motion

7. | 180 112 Heraclides (387-312BC)

Greek philosopher and astronomer; proposed that the earth rotates on its axis [compare: Ecphantus (c.500BC)]; posited that the soul was light; did battle with Aristotle, supposedly, on the question whether the universe is finite or infinite; and is rumored, according to Simplicius (c.590AD), to have formulated heliocentrism (or at least the precursor model to what Aristarchus (c.240BC) put into book form).

8. | 175 267 Hipparchus (190-120BC)

(Cattell 1000:781)

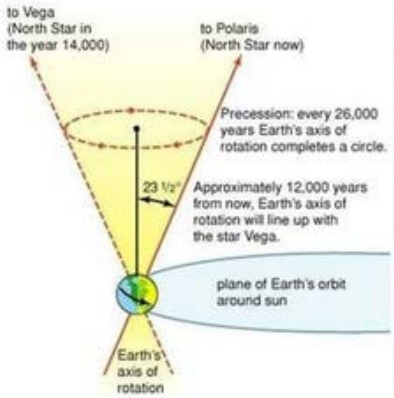

[RGM:637|1,330+] (Murray 4000:10|A) (GAE:8) was a Greek astronomer, geographer, and mathematician;

"**Hipparchus** was a lover of truth (phila-lÄ"thÄ"s)."

— Ptolemy (c.150), *Publication* (Ñº)

founder of trigonometry; famous for his incidental discovery of precession of the equinoxes

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11. | 150 700 Hans Lipperhey (1570-1619)

(CR:3) German-born Dutch spectacle maker; he is generally credited (Ñº) with the invention of the telescope or "Dutch perspective glass"; a device he tried to obtain a patent for in 1608; news of this design reached the ears of Galileo, who improved on the designs; on 7 Jan 1610, Galileo had built a new improved 30 power telescope (shown adjacent), and pointed it towards Jupiter, and found three small, bright stars near the planet (Ñº); that year, he published a small book titled *The Starry Messenger*, outlining his findings;

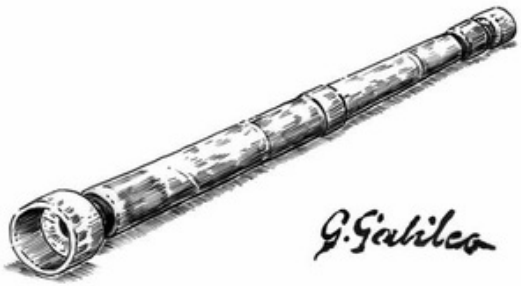

12.

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(Cattell 1000:655) (RGM:138|1,500+) (FA:47) (GAE:15) [CR:118] Italian

15. 46 | 185 Giordano Bruno (1548-1600)

philosopher, mathematician, astronomer, and priest;

“There is no absolute up or down, as Aristotle taught; no absolute position in space; but the position of a body is relative to that of other bodies. Everywhere there is incessant relative change in position throughout the universe, and the observer is always at the center of things.”

> — Giordano Bruno (1584), *On Cause, Primary Origin, and the One*; this, supposedly, is a close paraphrase of Epicurus (“Letter to Herodotus”)

Burned at the stake for refusing to recant his belief in atoms and a universe made of multiple solar systems;

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Discussion

The following is the succession of astronomical genius, before and after Copernicus:

→ Aristotle

→ **Ptolemy**

→ Al-Battani

→ Regiomontanus

→ **Copernicus**

→ Brahe

→ Kepler

→ **Galileo**

→ Newton

In this mix, we note that Galileo, in discussion with Kepler, called Copernicus "the master" who dared to take the first step.

Murray 4000

In 2003, Charles Murray, in his Murray 4000, a top 20 category grouping from a larger analyzed collection of 4,139 biggest names of history, produced the following top 20 ranking of astronomers:

1. Galileo
2. Johannes Kepler
3. William Herschel
4. Pierre Laplace
5. Nicolaus Copernicus
6. Ptolemy
7. Tycho Brahe
8. Edmond Halley
9. Giovanni Cassini
10. Hipparchus
11. Walter Baade
12. Edwin Hubble
13. Friedrich Bessel
14. William Huggins
15. George Ellery Hale

16. Arthur Eddington
17. Ejnar Hertzsprung
18. Heinrich Olbers
19. Gerard Kuiper
20. Johannes Hevelius

(add)

Chao top 10

In Feb 2013, Tom Chao, in his Space.com article "The Most Famous Astronomers of All Time", gave the following chronologically ranked list: [1]

1. Ptolemy
2. Nicolaus Copernicus
3. Johannes Kepler
4. Galileo
5. Isaac Newton
6. Christiaan Huygens
7. Giovanni Cassini
8. Charles Messier
9. Albert Einstein
10. Carl Sagan

(add)

Total History | Top 30

In 2013, the Total History YouTube channel, in their "Famous Astronomers: 30 Greatest Astronomers in History" (Ñº), a video based on an earlier 2012 online list of "Famous Astronomers" (Ñº), produced the following chronological listing:

1. Aristarchus of Samos
2. Hipparchus
3. Ptolemy
4. Aryabhata
5. Al-Kindi
6. Bhaskara
7. Nasir al-Din al-Tusi
8. Nicolaus Copernicus
9. Tycho Brahe
10. Galileo Galilei
11. Johannes Kepler
12. Christiaan Huygens
13. Edmund Halley
14. Charles Messier
15. Joseph Lagrange
16. William Herschel
17. Pierre Laplace
18. Caroline Herschel
19. Johann Galle
20. Annie Jump Cannon
21. Edwin Hubble
22. Fritz Zwicky
23. George Gamow
24. Clyde Tombaugh
25. Thomas Gold
26. Carl Sagan
27. Stephen Hawking
28. Jocelyn Bell
29. Neil Tyson
30. Michael Brown

(add)

Jaramillo top 10

In 2014, Eduardo Jaramillo, in his ListVerse.com article "Top 10 Most Important Astronomers" (Ñº), produced the following list:

1. Galileo
2. Hipparchus
3. Edwin Hubble
4. Johannes Keppler
5. William Herschel
6. Nicolaus Copernicus
7. Arno Penzias and Robert Wilson
8. Tycho Brahe

9. Ptolemy
10. Charles Messier

(add)

Star-Name | Top 11

In 2017, an anon writer, in their “The Most Famous Astronomers of All Time” (Ñº), produced the following list:

1. Ptolemy
2. Nicolaus Copernicus
3. Johannes Kepler
4. Galileo
5. Isaac Newton
6. Christiaan Huygens
7. Giovanni Cassini
8. Charles Messier
9. Albert Einstein
10. Carl Sagan
11. Stephen Hawking

(add)

Google | Top Astronomers

In Apr 2020, the Google search term “greatest astronomer ever”, yielded an algorithmic order of images, as shown adjacent, ranked as follows:

1. Galileo
2. Albert Einstein
3. Nicolaus Copernicus
4. Johannes Kepler
5. Isaac Newton
6. Ptolemy
7. Edwin Hubble
8. Carl Sagan
9. Tycho Brahe
10. William Herschel
11. Hipparchus
12. Charles Messier
13. Christiaan Huygens
14. Edmond Halley
15. Aristarchus of Samos
16. Henrietta Leavitt
17. Giovanni Domenico
18. Subrahmanyan Chandrasekhar
19. Caroline Herschel
20. Eratosthenes
21. Robert Wilson
22. Arno Penzias
23. Annie Cannon
24. Frank Drake
25. Harlow Shapley
26. Kip Thorne
27. George Gamow
28. Clyde Tombaugh
29. Arthur Eddington
30. Abd al-Rahman al-Sufi
31, Michael Brown
32. Jocelyn Burnell
33. Neil Tyson
34. Pierre Laplace
35. Cecilia Payne-Gaposchkin
36. Brahmagupta
37. William Hartmann
38. Georges Lemaitre
39. Karl Jansky
40. Thomas Gold
41. Joseph Lagrange
42. Hans Bethe
43. Antony Hewish
44. Jean Richer
45. Fred Hoyle
46. Pythagoras
47. Joseph Fraunhofer
48. John Herschel
49. Eudoxus of Cnidus
50. Nasir al-Din al-Tusi

The following is a screen shot of this Google top 50 listing:

The above list, of note, ends with: Maria Mitchell (#51), for some reason.

Quotes

The following are related quotes:

> "Al-Battani and al-Fargani are astronomers of the first rank among Arabs."
>
> — Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* (pg. 57) [1]

References

1. Chao, Tom. (2013). "The Most Famous Astronomers of All Time" (Ñº), Space.com, Feb 5.
2. Guericke, Otto. (1663). *New Magdeburg Experiments: on the Vacuum of Space* (*Ottonis de Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (translator and preface: Margaret Ames) (Albattani, 5+ pgs). Publisher, 1672; Kluwer, 1994; Springer, 2012.

θΔics

In genius rankings, **greatest atheist ever** refers to the greatest, biggest, and most-powerful atheists of all time ranked by density of ideas, work, impact, influence, and god-overthrowing revolution factor—the millennial-old "theory of god" (see also: god theory) being the most deeply ingrained, established, entrenched and believed, the world over, proto-scientific theory ever; below is a work-in-progress meta-analysis ranking of the top one-hundred greatest atheists; below is a ranked listing of the top 35+ greatest atheists.

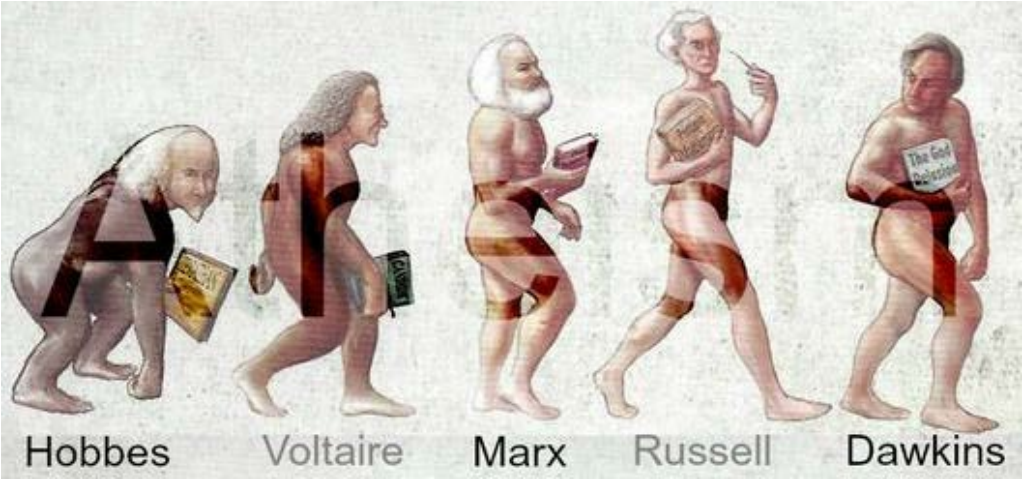

An annotated cover section of Nick Spencer's *Atheists: the Origin of Species* (2014), artwork by Phill Hatton, showing famous atheists: Thomas Hobbes, Voltaire, Karl Marx, Bertrand Russell, and Richard Dawkins; numbers shown being top 100 ranking position; each brand of atheism conceptualized as a different type of species. [3]

Overview

In the 16th century, Epicurus (341-270 BC) held the general "chief atheist" as he was head of the "school most accused of atheism" (Bacon, 1597). In the 17th century, Benedict Spinoza (1632-1677) held the standing rank of the "greatest atheist ever" (Bayle, 1682), above that of Epicurus.

Then came Jean Meslier (1664-1729) whose *Testament* jaw-dropped most atheists for the next century; the fruition of which giving rise to singular phenomena of Baron d'Holbach (1723-1789), his famous intellectual atheism salons, the Hume-Holbach dinner party (1763) anecdote, his finished product atheism manual *The System of Nature* (1770), who thereafter was ranked as the "Newton of the atheists".

Then came Thomas Paine (1737-1809) who, with his appealing-to-the-masses easy-to-read book *Age of Reason* (1794), one of the most oft-cited atheist's bibles, held reign on the title, in a colloquial sense, of "greatest atheist", for about a century.

Then came Friedrich Nietzsche (1844-1900), the most-powerful brand of atheism seen to date, whose finished products far-surpassed all previous atheists to date. After Nietzsche, atheists could only be ranked as greatest "per century" (e.g. Bertrand Russell, 20th century) or per country (e.g. Percy Shelley, most famous of all British atheist).

The history of ranking atheists by "greatness" is a relatively new subject; Monydit Malieth (2013) is a rare example of being able to give cogent loose top atheist ranking. Moreover, to confuse matters, the recently seen "new atheism", being but a weaker and atrophied variety of a number of classical hardened atheisms, have much pop-appeal and fan-fare to it, therein clogged with over-zealousness; one example being the Sep 2015 forum post (Q): "Richard Dawkins [#27] > Neil Tyson", with 25+ likes and 26+ replies (Tyson admits that he is an agnostic and not even an atheist; Dawkins admits that he is not 100% in his disbelief in god).

List

The following 35+ individuals, a power ranking the 250+ chronologically-listed famous atheists, is the work-in-progress ranking of the aiming-to-be top 100 greatest atheists ever; the rare breed of powerful female atheists, of note, are highlighted in pink:

100 Greatest Atheists			
#	**Person**	**Date**	**Significance**
			Read: Jean Meslier; explicit atheist; wrote

1. Baron d'Holbach (1723-1789)

|→ **Extreme atheist**

1770

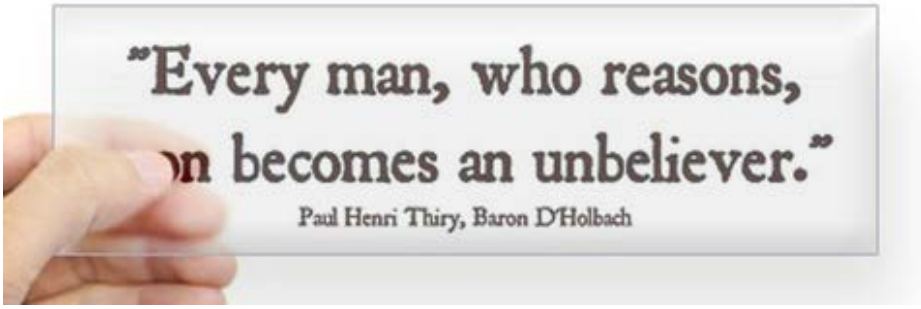

volumes against religion, the most famous being ***The System of Nature*** (1770), itself known as the "Atheist's Bible"; for thirty years (1750-1780), at his second mansion Le Château de Grand-Val, outside of Paris, he ran a bi-weekly intellectual salon, with the entice of excellent food, expensive wine, and a library of over 3000 volumes, he attracted many notable visitors, including: Diderot, Grimm, Condillac, Condorcet, D'Alembert, Marmontel, Turgot, La Condamine, Helvétius, Jean-Jacques Rousseau, Adam Smith, David Hume, and Benjamin Franklin. He is widely known as the "Newton of the atheists" (Q) even cited so in history of atheism documentaries. (V|1:45)

2. Friedrich Nietzsche (1844-1900)

1882

[HD:40] Quote: "God is dead. God remains dead. And we have killed him. Yet his shadow still looms. How shall we comfort ourselves, the murderers of all murderers? What was holiest and mightiest of all that the world has yet owned has bled to death under our knives: who will wipe this blood off us? What water is there for us to clean ourselves? What festivals of atonement, what sacred games shall we have to invent? Is not the greatness of this deed too great for us? Must we ourselves not become gods simply to appear worthy of it?"

Left: the 23 Dec 2010 pro-Christian "God is" billboard (Q), on the New Jersey side of the Lincoln Tunnel , which replaced the American Atheists 26 Nov 2010 "Christmas is a myth" billboard (Q) , graffiti bombed with the word "Dead" (Q), in reference to Nietzsche's famous proclamation.

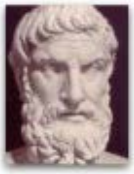

3. Epicurus (341-270 BC)

310BC

Epitaphs: "head of school most-accused of atheism" (Francis Bacon, 1597); "chief father of atheism" (Jonathan Edwards, c.1750) (Q); "father of atheism" (Monydit Malieth, 2013); eponyms: Epicureanism; Epicurean atheism; is the main conduit of atheism, throughout history, in atheism genealogy; e.g. Marxian atheism, Freudian atheism, and Jeffersonian atheism (American atheism) all stem from him, along with all the other big atheist, e.g. Giordano Bruno, Pierre Gassendi, Walter Charleton, among unlistable others; in his "Letter to Herodotus" (Q), he, supposedly, relegates the gods to the role of non-interfering material entities, in capable of controlling human affairs. Diogenes Laertius (c.225) asserts, to note, that he borrowed most what he wrote from "outright atheist" Theodorus and his *On the Gods*.

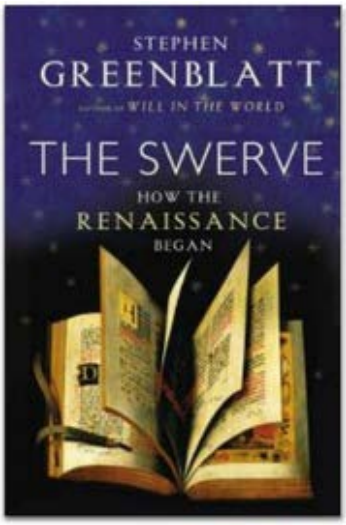

"Meslier's *Testament* is the most singular phenomenon ever seen

among all the meteors fatal to the Christian religion."

— Voltaire (1766) [2]

4.
Jean Meslier (1664-1729)

|→ **Extreme atheist**

1729

Oft-said to mark the start of "**true atheism**"; overtly, a French Catholic priest (abbe) who was discovered, upon his death (dereaction), to have written an atheism advocating essay like book entitled *Testament*, that denied the existence of the soul, dismissed the notion of free will, denounced all belief in God, and all religion, with a "frenzied anger that makes Richard Dawkins' *The God Delusion* (2006) seem like a work of reasoned scholarship", as atheism historian Nick Spencer characterizes (Q) him.

Grand Poobah (Q) of modern chemical atheism; described by Albert Camus (1942) as the trainer of the "greatest assassins of god", namely: Nietzsche, Schopenhauer, and Freud, in respective order.

5.
Johann Goethe (1749-1832)

1809

"The **moral symbols** of nature are the elective affinities discovered and employed by the great Bergman."

— Johann Goethe (1809), comment to Friedrich Riemer, Jul 24

[HD:19] His *Elective Affinities*, which "overturns everything holy" according to Heinrich Heine (1810), showed how physical chemistry invalidates the logic of the Ten Commandments, the sixth commandment in particular.

Modern Christian

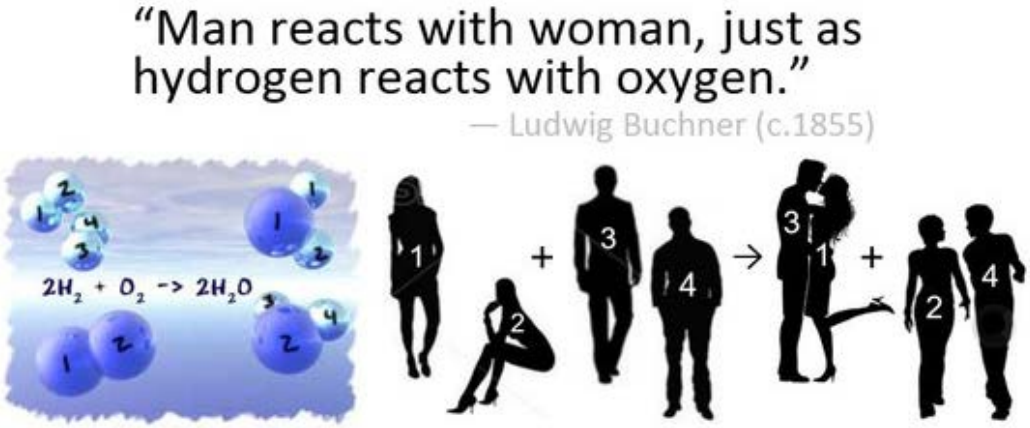

6.
Ludwig Buchner (1824-1899)

|→ **Extreme atheist**

1855

apologists consider Büchner the father of atheistic evangelism (Q), or antitheism, in Germany, a counterpart to Thomas Huxley, who some consider to be the first atheistic evangelist—though Huxley himself denied, supposedly, that he was an atheist, preferring the term

agnostic, which he coined in 1868—the ‘atheistic evangelism’ standard, as some have categorized, since then has been carried by Bertrand Russell, Henry Mencken, Richard Dawkins, and Sam Harris.

Traveled “by foot” around the entire world to study “morality” systems; the result of which being the following very-peculiarly entitled godless treatise on Newtonian-based moral motion (frontispiece shown adjacent):

> *The Moral State of Nations: Travels Over the Most Interesting Parts of the Globe, to Discover the Source of Moral Motion; Communicated to Lead Mankind Through the Conviction of the Senses to Intellectual Existence, and an Enlightened State of Nature. In the Year of Man's Retrospective Knowledge, by Astronomical Calculation 5000*

7.

John Stewart (1749-1822) ↑↓

He employs not only a godless (astronomically-calculated) dating system, similar to Thimsian atheism (see: Goethean calendar); but also promulgates a "moral motion" (or moral movement) theory (akin to Goethe's moral symbols logic).

Note: currently number #2 ranked atheist by denial/belief combination rankings (see: Atheism types by denial).

Note: the “Advertisement” (O), to his *Moral State of Nations*, which he indirectly refers to as the “Bible of Nature”, states that he presents a scheme of “pantheism”, a golden mean between “deluded superstition, dogmatic deism, and chaotic atheism”.

Known for this *Essence of Christianity*; known as a "legendary atheist" (O) (O), whose “extreme atheism” (O) was sometimes tempered with “divine humanism”.

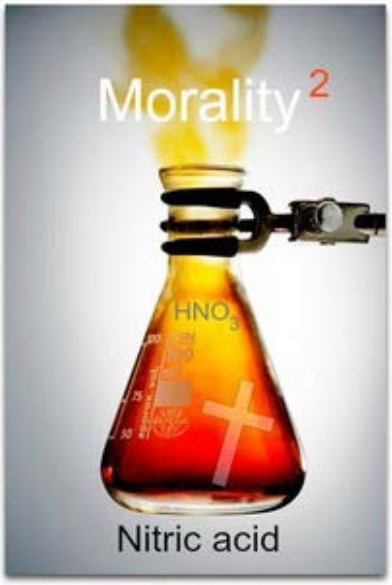

“Someday the scientific revolution, chemistry in particular, will dissolve Christianity in vat of nitric acid.”

> — Ludwig Feuerbach (1850), *The Natural Sciences and the Revolution*

8.

Ludwig Feuerbach (1804-1872)

|→ **Extreme atheist**

1841

“Whenever morality is based on theology, whenever the right is made dependent on divine authority, the most immoral, unjust, infamous things can be justified and established. Morality is then surrendered to the groundless arbitrariness of religion.”

> — Ludwig Feuerbach (c.1860) (O)

In atheism genealogy, is characterized as the “grandfather of Marxian atheism and Freudian atheism” (Hans Kung, 1990).

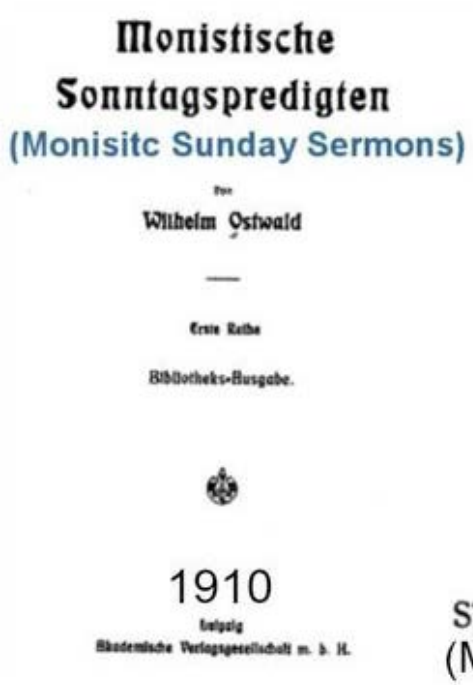

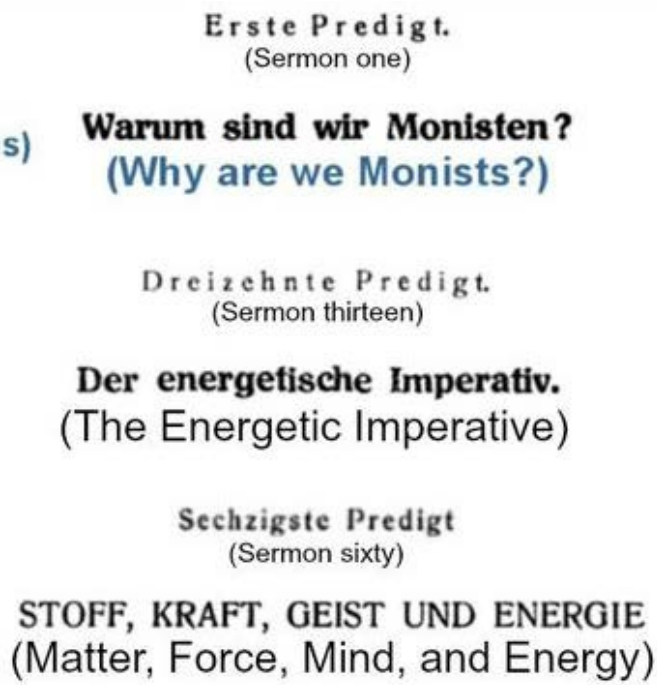

Described by American chemical engineer Stephen Contakes (2012), one of his sides shown adjacent, as "physical chemistry's original *new atheist*", prior to all the Sam Harris initiated post 9/11 huff-and-puff without substance new atheists. [1]

9.
Wilhelm Ostwald (1853-1932)

1901

"Everything we sensually experience can be reduced to energy relationships between our sense organs and the world around us."

— Wilhelm Ostwald (1809), autobiographical reflection of his spring "pentecostal inspiration"; as recounted in his *Lifelines: an Autobiography*, 1926

"Research workers were, at one time, obliged to endeavor to ensure that their theories did not contradict those of the church; nowadays, in contrast the church is at pains to prove that its teachings are compatible with those of science. In other words, the church acknowledges science as the higher authority."

— Wilhelm Ostwald (1909). "On Catalysis", Nobel Lecture

"I am made from the C-H-N-O-S-P combination from which a Bunsen, Helmholtz, Kirchhoff came."

— Wilhelm Ostwald (1926), *Lifelines: an Autobiography*

"Ostwald, who was the most 'radical atheist' among these scholars [Marx, Buchner, Fourier, Weber, Riehl], used the instrument of the 'Monistic Sunday Sermons' to spread his ideas on rationality."

— Gird Spittler (2010), "Beginnings of Anthropology" [10]

In 1901, gave a seven part lecture series on "natural philosophy", wherein he sought to upgrade, in his own words, the classical atheistic "matter-and-motion theory (or scientific materialism)" with the new replacement theory named of *energetics*; in 1905, he was relieved of his lecture duties owing to "religious questions" issues, as biographer Eduard Farber puts it,

at the time of the official obsequies for freethinker Johannes Wislicenus (1935-1902); after retiring in 1906, with Ernst Haeckel, he founded the “Monisten Bund” or German Monist League (Q), in Jena, a free-thinking organization; in 1910, Haeckel elected Ostwald as the president of the Monist League, after which he began giving his famous “Monistic Sunday Sermons”, at the center of which was his energy or energetics based universal belief, which usurped god and religion; in 1912, his *The Energetic Imperative*, outlined a thermodynamic imperative to Kant’s “categorical imperative”.

Trained by Goethe, at age 18, in the art of chemical atheism, he become the first "god assassin", whose work intellectually mentored Friedrich Nietzsche in the art of god assassination.

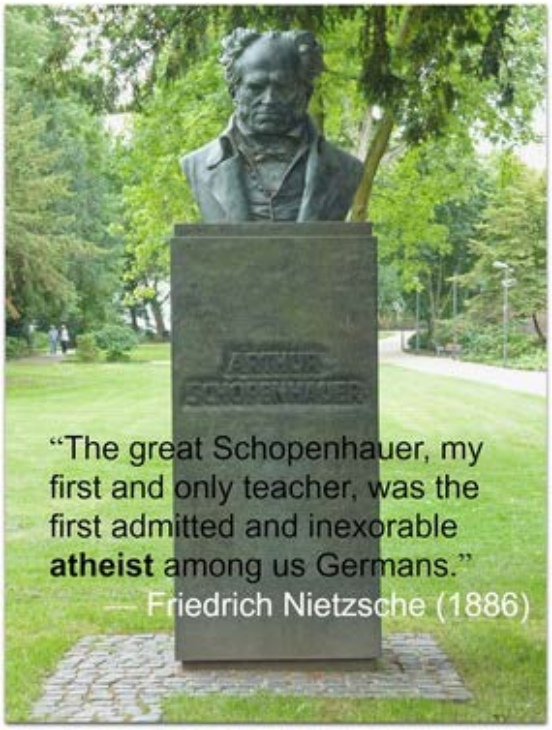

“Schopenhauer was the first admitted and inexorable atheist among us Germans.”

— Friedrich Nietzsche (1882), *The Gay Science* (Q)

10. 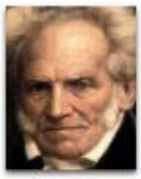
Arthur Schopenhauer (1788-1860)

1814

“Schopenhauer prided himself on being the **first true atheist** in German philosophy, and scorned his contemporaries’ attempts to substitute a world spirit for a bankrupt deity. Yet he never abandoned a notion of cosmic justice.”

— Susan Neiman (2004), *Evil in Modern Thought: an Alternative History of Philosophy* (Q)

He called all of his dogs “Atma”, the Hindu name for the supreme and universal soul, from which all individual souls arise, owing to his theory of individuality, which maintained that in lower animals there was little individuality (Q); the logic of which, in modern terms, being the great chain of being reductionism ideology that humans derive from hydrogen atoms [below that fermions and bosons] which have identical individuality.

An “extreme materialist” (Q) philosopher Julien la Mettrie—a translator of Seneca’s essay on happiness—in his *The Natural History of the Soul* (1745), argued for a mechanist materialistic position, according to which there was no need of the soul to animate matter, that life was a property of matter, not something breathed into; to quote: “What is the soul, but an empty word to which no idea corresponds?”

“Humanity will not be happy until it is atheistic.”

— Julien la Mettrie (c.1748) (Q)

11.
Julien la Mettrie (1709-1751)

1745

“They have *spiritualized* matter rather than 'materializing' the soul.”

— Julien la Mettrie (c.1748), the “incomprehensible” monadism of Leibniz and his supporters

|→ **Extreme atheist**

His 1747 *Man a Machine*, dubbed a “materialist manifesto” (Q), rooted in quasi-atheistic principles, caused a scandal because it denied Cartesian dualism, i.e. it denied that there was a

distinction between humans, who alone had souls (in the pineal gland), and animals who, like machines, had none. He rejected immortality, arguing that humans, like all other beings in the entire universe, consist of nothing but matter. He was known throughout Europe as an advocate of godlessness and vice, was eventually condemned, his books were **burned**, after which he fled to Prussia, where he was granted a safe haven by King Frederick II, where he was asked to be the King's personal physician. (Q)

12.

Voltaire (1694-1778)

1864

[HD:9] [L50:6] (Q) Read and translated: Jean Meslier; published on *The Three Imposters*; his *Philosophical Dictionary* (1764), is credited as being first atheism/agnostic like encyclopedia (Bill Cooke, 2006); known, in his day, as the most "influential atheist of Europe" (Q); technically, although: an "atheism-curious agnostic deist" (see: Voltaire on religion); one of the books to avoid in the Christian captain parable (along with Thomas Paine [#26] and Robert Ingersoll [#27]).

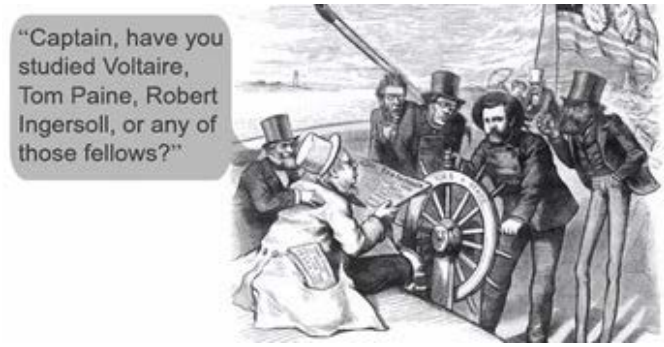

13.

Sigmund Freud (1856-1939)

1895

[HD:51] [L50:15] (Q) In his "A Project for Scientific Psychology", he sought to base all of mental phenomena on the logic of free energy (Gibbs energy) and bound energy (entropy), an atheism-implicit (implicit atheism) program; eponym of **Freudian atheism**, a synthesis of Feuerbach, **Epicurean atheism** (Epicureanism), and German atheism; noted Moses religio-mythology debunker (*Moses and Monotheism*, 1939).

14.

Johannes Wislicenus (1935-1902)

1885

"That must disappear!"

— Johannes Wislicenus (1885), order to his guide, during his orientation tour of the University of Leipzig, as the new chemistry professor successor to Hermann Kolbe, in reference to Kolbe's Biblical quotation "God has arranged all things by measure and number and weight" (Wisdom of Solomon 11:20) in large letters, such as depicted adjacent, above the periodic table chart of the chemical elements at the front of his lecture theater (Q)

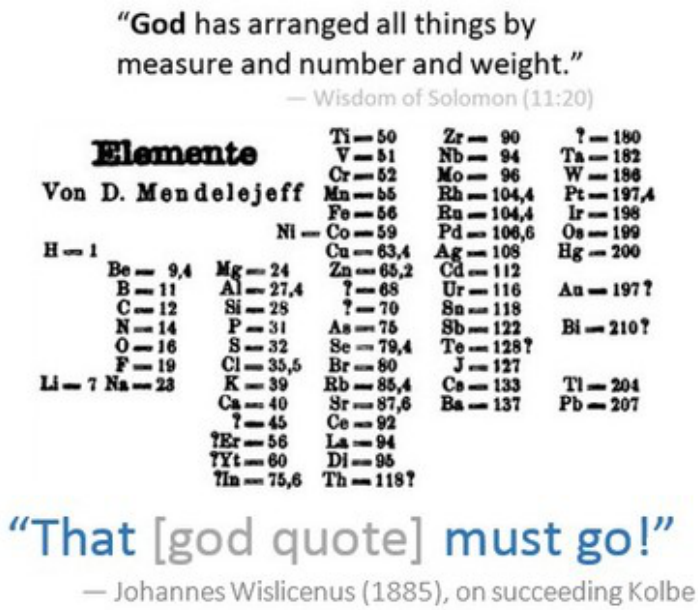

Husband of Mary Shelley [L50:26] (Q), whose *Frankenstein: the Modern Prometheus* (1814), delved into the electrochemical seeming reanimate nature of life and death; adjacent is a 1935 *Scientific American* article "Can Science Raise the Dead? (Q) (Q), a modern heart-resuscitation spinoff of the earlier dead frog leg twitching electrochemical arc experiments of Luigi Galvani (1791). (see: laboratory produced life).

> "If ignorance of nature gave birth to gods, knowledge of nature is made for their destruction."
>
> — Percy Shelley (1811), *The Necessity of Atheism* (inspired by Spinoza)

15.

1811

Percy Shelley
(1792-1822)

> "Every time we say that god is the author of some phenomenon, that signifies that we are ignorant of how such a phenomenon was able to operate by the aid of forces or causes that we know in nature."
>
> — Percy Shelley (1811), *The Necessity of Atheism* (inspired by Spinoza)

Described as the "most famous of all British atheists"; his: *The Necessity of Atheism*, got him expelled from Oxford.

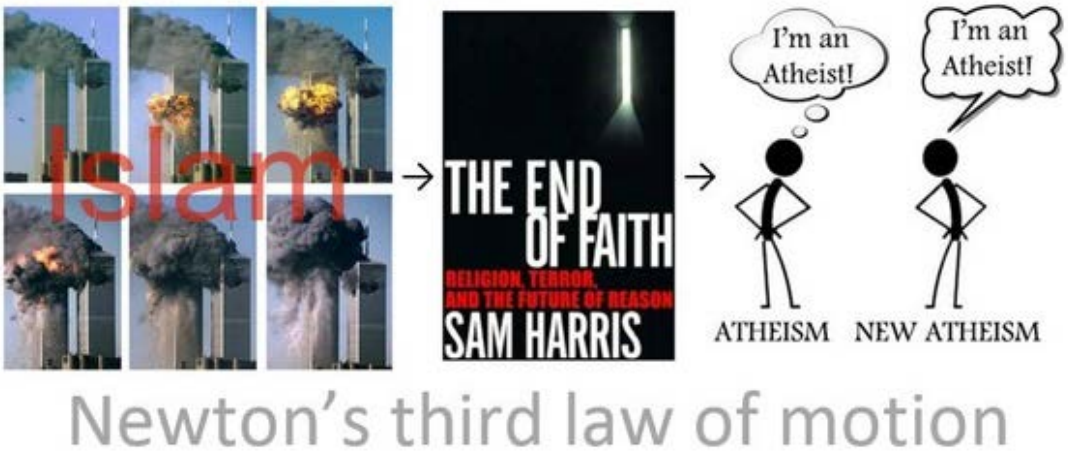

16.

2004

Sam Harris
(1967-)

Launching the "new atheism" movement, something he began to initiate the day after 9/11, as he described in his 2004 *The End of Faith*:

> "I began writing this book on September 12, 2001. Many friends read and commented on a long essay that I produced in those first weeks of collective grief and stupefaction, and that text became the basis for this book."

which would go on to sell over 250,000 copies within three years alone. (Q)

"I had no need of that [god] hypothesis."

> — Pierre Laplace (1802), response to Napoleon why the divine was not found in his new celestial mechanics book (see: Napoleon Laplace anecdote)

17.

1802

Pierre Laplace
(1749-1827)

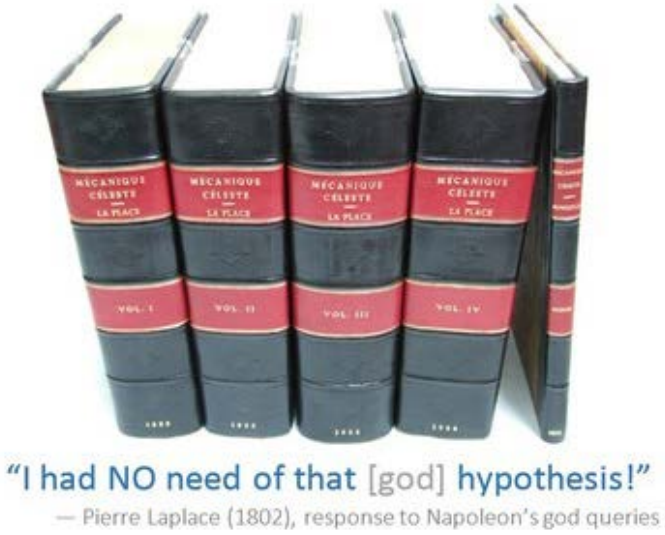

"Critias seems to be from the ranks of the atheists when he says that the lawgivers of ancient

18. Critias (c.460-403BC)

times invented god as a kind of overseer of the right and wrong actions of men. Their purpose was to prevent anyone from wronging his neighbors secretly, as he would incur the risk of vengeance at the hands of the gods."

— Sextus Empiricus (c.200AD) (Q)

● Sutton, Dana. (1981). "Critias and Atheism" (Q), *The Classical Quarterly*, 31(1):33-38.

19.

Benedict Spinoza (1632-1677)

[HD:6] Debatably labeled a pantheist or atheist, per his "god OR nature" style of argument; was a springboard for a number of atheists to follow: Goethe, Shelley, Einstein, among others.

20.

Giordano Bruno (1548-1600)

1600

A debatably-labeled (Q) (Q) "atheist" and or "courageous thinker who lay under the stigma of atheism" (Q), in opposition to Thomas Aquinas' causality argument, added Lucretius' atomic theory together with Copernican heliocentrism to argue for an infinite world's hypothesis, and for these views, which he would not recant, was burned at the stake. Bruno's burning, in the history of atheism (Q), is said to mark a transition point for the re-emergence of atheism; though, to note, his works remained on the Index of Prohibited Books until 1965, and it was not until 2000 that he received a public apology from the Catholic Church. [2]

21.

Bertrand Russell (1872-1970)

1927

[HD:51] [L50:8] (Q) Oft-ranked as the greatest atheist of the 20th century, for his *Why I Am Not a Christian* (1927)—itself sometimes referred to as an "atheist's bible"—among later television appearances; quote: "I see no reason, [owing to the universal nature of] the second law of thermodynamics, to believe in any sort of god, however vague and however attenuated."

22.

Lucilio Vanini (1585-1619)

1619

Italian philosopher, physician and free-thinker, who was one of the first significant representatives of intellectual libertinism; among the first modern thinkers who viewed the universe as an entity governed by natural laws (nomological determinism); was the first literate proponent of the thesis that humans evolved from apes; was executed for the "crime of atheism".

23.

[HD:17] In 1800, during his presidential campaign, he was said to be unfit to hold office because he did not have orthodox religious beliefs and called a "howling atheist"; in 1802, he added the separation of church and state clause to the Constitution; in the years to follow he became reticent, vacillated in belief system labels over time; in private letters, variously refers to himself as "Christian" (1803), "a

Thomas Jefferson
(1743-1826)

sect by myself" (1819), an "Epicurean" (1819), a "materialist" (1820), and a "Unitarian by myself" (1825). (Q)

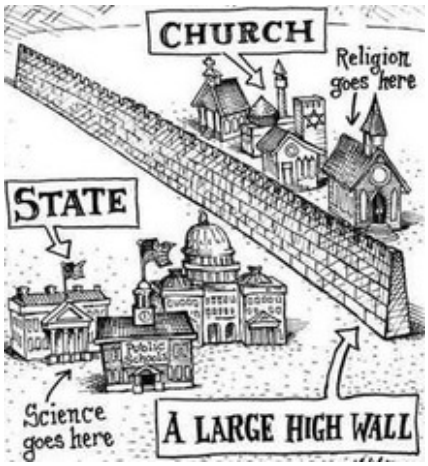

24.

Ayn Rand
(1905-1982)

|→ **Extreme atheist**

1957 The first women to publicly state on television that she does not believe in god; her "objectivism" is atheism-based philosophy, with a number of followers.

25.

Theodorus of Cyrene
(c.340-250BC)

"The Theodoreans derived their name from Theodorus, known as 'the atheist', and adopted his doctrines. Theodorus was a man who utterly rejected the current belief in the gods. And I have come across a book of his entitled *Of the Gods* which is not contemptible. From that book, they say, Epicurus borrowed most of what he wrote on the subject."

— Diogenes Laertius (c.225), *Lives and Opinions of Eminent Philosophers* [9]

Classified, along with Diagoras of Melos, as one of the first two "outright atheists". [7] Studied the lectures of determinism philosopher Zeno of Citium. [8]

26.

Karl Marx
(1818-1883)

The eponym of "Marxian atheism", a derivative of Epicurean atheism, Ludwig Feuerbach, and new scientific ideas, the result of which was dialectical materialism.

27.

Richard Dawkins
(1941-)

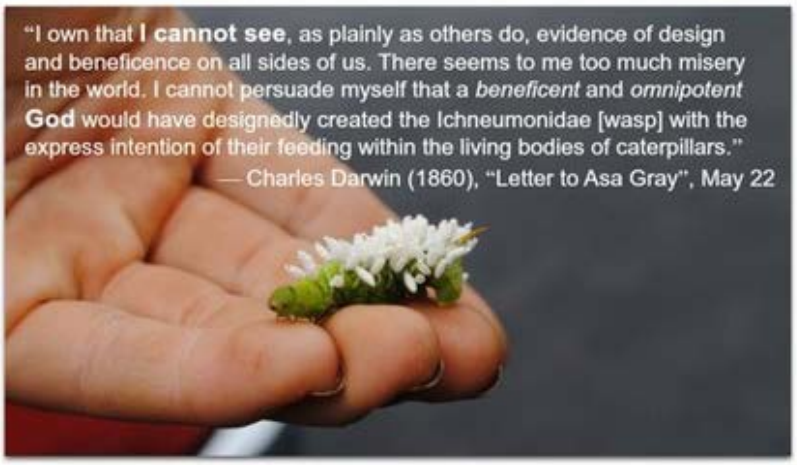

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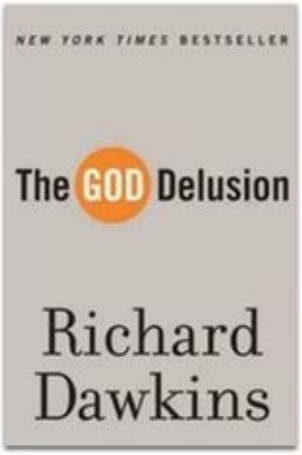

DN=6.5/6.9

In 1986, in his *The Blind Watchmaker*, he argued for the view that humans were not created by God, but by blind random purposeless chance; his 2006 *The God Delusion*, takes aim at the theory of god, arguing that god does not exist, that religion is a delusion, and in which he introduced the 1-7 Dawkins scale of belief in the existence of God, on which he says he is about a 6.5 or "6 leaning towards 7" whatever that means.

28.
Thomas Paine
(1737-1809)

1794

[HD:15] Known as the "leading atheistic writer in the American colonies" (Q); his *The Age of Reason* (1794) is the most-widely cited "atheist's bible", historically (Q)(Q); one of the rocks to avoid in the Christian captain anecdote;

29.
Robert Ingersoll
(1833-1899)

1879

[HD:34] Nicknamed the "great agnostic"; image shown is the frontispiece from his 1879 *The Gods and Other Lectures*

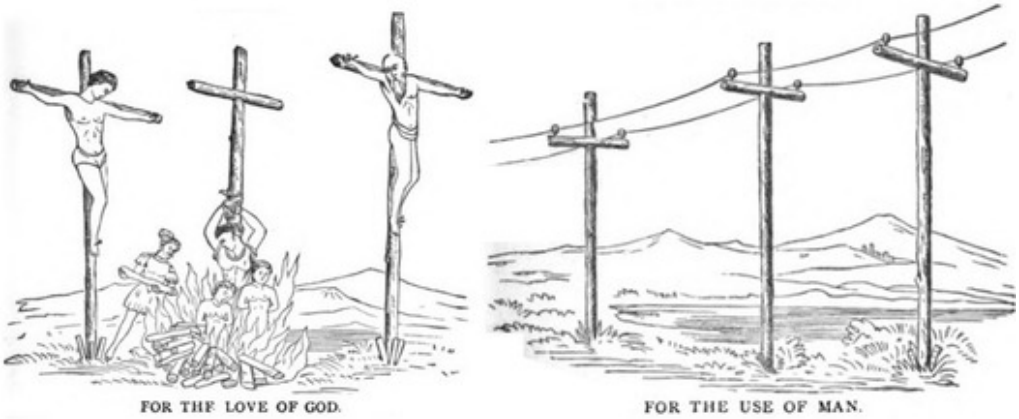

(Q); by 1888, two response books were published subtitled the "great American atheist" (Q); his *Some Mistakes of Moses* (1880), is one of the books cited in the Redford deconversion model; is one of the most-prolific atheism quotesmiths; one of the rocks to avoid in the Christian captain anecdote.

30.
Thomas Hobbes
(1588-1679)

1651

[HD:5] His *Leviathan: or the Matter, Form, and Power, of a Common Wealth Ecclesiastical and Civil*, an attempt to develop a political theory out of the mechanical view, sometimes associated with the term "atheist's bible" (Q), is described by British atheism historian David Berman, as a "crypto-atheistic work". [4]

31.
John Tyndall
(1820-1893)

1874

Tyndall employed the absurdity of the all terrestrial things or living agents (Joseph Butler, 1736) arising from "dead atoms" argument, so conclude that religion needs to step aside; his unbendable opinion being the following:

> "All religious theories, schemes and systems, which embrace notions of cosmogony, or which otherwise reach into the domain of science, must, in so far as they do this, submit to the control of science, and relinquish all thought of controlling it."

The Tyndall-Stewart-Tait debate continued until 1878, culminating in James Maxwell's last

and final poem “A Paradoxical Ode” (1878).

32.

Paul Dirac (1902-1984)

1927

“Any further assumption implied by belief in a god which one may have in one’s faith is inadmissible from the point of view of modern science, and should not be needed in a well-organized society.”

— Paul Dirac (1933), hand-written note to self

In 1927, during the fifth Solvay Conference, famously, during smoky hotel lounge conversation, began to rip on Einstein, and his “god talk”, e.g. his "god does not play dice" statement, depicted adjacent, to Werner Heisenberg and Wolfgang Pauli.

33.

Diagoras of Melos (c.448-388BC)

“With reason did the Athenians adjudge Diagoras guilty of atheism, in that he not only divulged the Orphic doctrine, and published the mysteries of Eleusis and of the Cabiri, and chopped up the wooden statue of Hercules to boil his turnips, but openly declared that there was no god at all.”

— Athenagoras (200AD), *A Plea for the Christians*

Semi-labeled as the "**first true atheist**"; known as “Diagoras ‘the Atheist’ of Melos”, a disciple of Democritus (Q), cited by Cicero, among others, sometimes referred to, in the history of atheism (Q), as the “first atheist” or history's earliest known “confirmed atheist”, as some (Q) describe him.

34.

Thomas Edison (1847-1931)

1910

[HD:41] His 1910 *New York Times* interview (see: the Edison on the soul) on whereabouts of William James [HD:38], following is passing, is a fairly cogent and frank religion-ripping piece of work.

35.

Hippocrates (c.460-370BC)

Quote: “Men think epilepsy divine, merely because they do not understand it. We will one day understand what causes it, and then cease to call it divine. And so it is with everything in the universe.” Note: while often deemed atheist, the Hippocratic oath (Q) speaks of “gods and goddesses” being witness to oath.

Quotes

The following are related ranking quotes:

> “Nay, even that **school** which is **most accused of atheism** doth most demonstrate religion; that is, the school of Leucippus and Democritus and Epicurus. For it is a thousand times more credible, that four mutable elements, and one immutable fifth essence, duly and eternally placed, need no god, than that an army of infinite small portions, or seeds unplaced, should have produced this order and beauty, without a divine marshal.”
>
> — Francis Bacon (1597), “Of Atheism”

"Spinoza [#19] was the **greatest atheist** there **ever** was and who was so infatuated with certain principles of philosophy that, to meditate on them better he went into retirement, renouncing all that may be called the pleasures and vanities of the world and concerning himself only with abstruse meditations."

— Pierre Bayle (1682), *Various Thoughts on the Occasion of the Comet*

"Thomas Paine [#28], deeply shocked at the rising atheism in France, wrote his *Age of Reason* in which he urged the belief in a supreme being but attacked the established religions so fiercely that he was execrated in England and America as the **world's greatest atheist**."

— Author (1943), "Article" (Q), *New York History*

"Now that fact had the guts to go to bat for Madalyn Murray, our leading living atheist, how about doing something on Thomas Paine, America's **greatest atheist ever**? When are we going to publicly acknowledge the role Paine played in creating our democracy?"

— Author (1964), "Article" (Q), *Fact Magazine*

"Even Nietzsche, the **world's greatest atheist**, was well aware of this basic dishonesty; he wrote 'we godless anti-metaphysicians still take our fire, too, from the flame lit by a faith that is thousands of years old, that Christian faith, which was also the faith of Plato, that god is truth, that truth is divine'."

— David Seel (2000), *Parenting Without Perfection* (pg. 159)

"In addition to being an effort and a plea to advance atheism, this book is also a tribute to the **greatest atheist** of the modern era and arguably the greatest atheist of all time, Friedrich Nietzsche."

— David Eller (2007), *Atheism Advanced: Further Thoughts of a Free Thinker* (pg. xiv)

"When we think of the **giants of atheism**, Nietzsche is traditionally seen as **standing at the very very top**. Why is this? For two reasons. One, Nietzsche is perhaps the most coherent articulator of classical atheism. Two, Nietzsche takes this classical atheism to a novel extreme, an extreme length, which few people rarely go to."

— David Deane (2012), "Nietzsche's Atheism" (Q), Apr 20

"Nietzsche [#1] is the supreme philosopher when it comes to the topic of morality. His critique of religion is easily the most comprehensive attack on religiosity of all time; therefore making him the **greatest atheist** that has ever lived. Epicurus [#4] is the **first great atheist** in history; Schopenhauer [#10] is the first modern atheist; and Nietzsche is the greatest atheist of all time. Albert Camus [FA:100] called Nietzsche the 'most famous of god's assassins'."

— Monydit Malieth (2013), *The Future Affects the Past* [4]

"One of my favorite woodshed sorties involves the [splitting] of the friendship between Ludwig Wittgenstein, a great Christian thinker of the twentieth century, and Bertrand Russell [#21], one of the **greatest atheist**

philosophers of the twentieth century."

— Leonard Sweet (2012), *What Matters Most* (pg. 106)

"**Ostwald** was certainly an atheist in the strong sense. The 1969 biography by Rodnyj and Solowjew contains a section on Ostwald entitled 'A Pugnacious Atheist' ['als streitbarer Atheist'] and an entire German language book on this subject was published in 1960: *Science versus Faith in God: From the Atheist writings of the Great Chemist Wilhelm Ostwald* (Friedrich Herneck)."

— William Jensen (2015) [2]

References

1. (a) Contakes, Stephen. (2013). "Exploring the New Atheist Movement with Wilhelm Ostwald" (Q), Yumpu.com.
(b) Stephen Contakes (faculty) – Westmont College.
2. (a) Jensen, William. (2015). "Email to Libb Thims", Jul 5.
(b) Herneck, Friedrich. (1960). *Science versus faith in God: From the atheist writings of the great chemist Wilhelm Ostwald* (*Wissenschaft contra Gottesglauben: Aus den atheistischen Schriften des grossen Chemikers Wilhelm Ostwald*). Jena.
(c) Rodnyj, N.I. and Solowjew, J.U. (1969). *Wilhelm Ostwald* (in Russian; translation to German). Leipzig: B.G. Teubner, 1977.
3. Spencer, Nick. (2014). *Atheists: the Origin of Species*. Bloomsbury Publishing.
4. Malieth, Monydit (aka Tonnerre). (2013). *The Future Affects the Past: What Destination is Time Rushing To?* (greatest atheist, pg. 57). Red Lead Books.

External links

- 50 Greatest Atheists (2013) – VikasLather.WordPress.com.
- Top Ten Atheists (Thims vote-probing quickly-made draft) (2015) – TheTopTens.com.
- 50 Most Brilliant Atheists of All Time (2000) – Brainz.org.

θΔics

In genius studies, **greatest black geniuses** refers to geniuses whose skin color is darker, i.e. indicative of a more equatorial ethnicity, e.g. Africans, or heritage, e.g. African-Americans. [N1][N2]

Overview

The following is a work-in-progress of greatest black geniuses; IQ numbers in left column are from the said genius's position amid the top 1000 genius rankings, numbers in brackets [#] indicating position therein:

Greatest Black Geniuses			
IQ	**Person**	**IQ estimates**	**Description**
175 — 1 [215]	Imhotep (2635-2595BC)	IQ_O=170-200 IQ_{SS}=150, 170, 190	[RGM:266|1,260+] Egyptian polymath, first architect, engineer, and physician in early history, who served under third dynasty king Djoser (Zoser) as chancellor to the pharaoh and high priest of the sun god Ra at Heliopolis, architect of the world's first pyramid, the Step Pyramid at Saqqara; a possible main theorist behind the current world dominating Anunian theologies.
170 — 2 [250]	Akhenaten (c.1380-1335BC)	IQ_O=215	Generally credited as the person who moved the world, or at least Egypt, from a henotheism-based state religion, i.e. one supreme god (see: supreme god timeline) + lesser gods, to monotheism-based state religion, one god (Aten), where god became, a few anthropomorphisms aside (e.g. Aten's finger), the the heat or energy of the sun.
160 — 3 [520]	Frederick Douglass (1818-1895)		[RGM:276|1,400+] American social reformer, abolitionist, orator, writer, and statesman; "You are not judged by the height you have risen, but from the depth you have climbed." — Friedrich Douglass (1881) (Q) "**Douglass** was beyond all comparison the ablest man whom the black race ever produced in our country, either among pure black or the class of mixed blood." — James Pond (1900), *Eccentricities of Genius* (pg. 29)
4.	William Du Bois (1868-1963)		An Inderjit Singh (2016) (Q) top 150 genius; Quora gauged (2015) (Q), speculatively, with George Carver, at the possible intellectual level of Newton, given social impediments. [RGM:N/A|1,600+] African-American scholar; mentored (Q) at Harvard by William James; noted for his "brilliant and seminal" (Jacoby, 2004) *The Souls of Black Folks*, wherein he prophesies that the problem (Q) of the 20th century is the problem of the color-line, in which he argues against Booker Washington's model of education and progress for black men being solely focused on industrial education, instead advocating the addition of a classical education to establish leaders and educators in the black community; name-dropped in the film *Akeelah and the Bee* (2006).

5.		Hubert Harrison (1883-1927)		A Thomas Paine proselyte; who was well-read in Galileo, Rene Descartes, Newton, David Hume, Benedict Spinoza, Denis Diderot, Jean d'Alembert, Voltaire, and Baron d'Holbach; quote: "I am agnostic; not a dogmatic disbeliever nor a bumptious and narrow infidel. I am not at all of the Col. Ingersoll's school. I am agnostic such as Huxley was"; "These French deists made certain false premise which we smile at today; the believed in keeping monotheism, but fixing it, which is absurd"; "I prefer to go to the grave with my eyes open"; characterized the "black Socrates" (Hecht, 2003; Jackson, 2015) (Q) and an "intellectual giant". [1]
— 140 [6] 493		Martin King (1929-1968)	IQ_{O}=140+	[RGM:68|1,260+] American civil rights pioneer; "I have always been somewhat precocious, both physical and mentally. **My IQ stands somewhat above the average**. So, it seems that from a hereditary point of view, nature was very kind to me." — Martin King (1950) , age 21 essay on the religious development of personality; generally considered genius (Q)
7.		George Carver (c.1865-1943)		A 2012 "missing genius" candidate (Q)
8.		Hatshepsut (1507-1458)		[RGM:457|1,260+] Egyptian pharaoh (5th of Eighteenth Dynasty); "Hatshepsut is the first great woman in history of whom we are informed." — James Breasted (c.1910)
9.		Neil Tyson (1958-)		[RGM:353|1,260+] (FA:173) oft-characterized as the "black Carl Sagan" (IQ:170|#262)
10.		Barack Obama (1961-)	IQ_{O}=134	
11.		Ayaan Ali (1969-)		[RGM:491|1,260+] (FA:185)
12.		Booker Washington (1856-1915)		American educator;

		Jamaican-born American black nationalism activist;
13.	Marcus Garvey (1887-1940)	“Liberate the minds of men and ultimately you will liberate the bodies of men.” — Marcus Garvey (c.1930)
		Colloquially ranked (Q) with William Bois, Booker Washington, and George Carver as a top four black genius.
14.	Ben Carson (1951-)	American neurosurgeon and presidential candidate; born to an illiterate single mother, became head of Johns Hopkins neurosurgery by age 30; American presidential candidate in 2016; noted for his sharp religion vs science "we developed from a puddle of promiscuous biochemicals. And if you believe in anything other than that, you’re a moron" (2015) take on entropy and the second law.
	Benjamin Bradley (c.1830-1895)	African-American slave turned inventor; at age 16, using scrapes in a printing office, he built a steam engine, then sold it and got a job at United States Naval Academy in Annapolis, Maryland; during which time he engine large enough to drive the first steam-powered warship at 16 knots (Q); a 2017 National Geographic spotlighted “Top 7 Geniuses” (Q) who you’ve never heard of;
15.	Greydon Square (1981-)	(FA:198)

(add)

Quotes

The following are related quotes:

> “These stories have been collected in a volume entitled *Black Empire* and feature the megalomaniacal Dr. Henry Belsidus, a **black genius** accurately described as ‘Du Bois, Booker T. Washington, George Washington Carver, and Marcus Garvey rolled into one fascist superman’ (Gates 42).”
>
> — Author (2013), *A Companion to African American Literature* (pg. #)

Notes

N1. Of note, “black geniuses” are a rarer breed, per reason of the 42-degree rule, namely that heightened intellectual development is a function solar heat input distribution, which as quantified by latitude, indicates that the happiest latitude is 22 degrees, the most intelligent latitude if 42 degrees, the most suicidal latitudes are in the 50+ degree range, and that equatorial latitudes, near zero-degrees, tend to be too hot to produce the order of a genius mind; there are, e.g., only "six" black geniuses (Imhotep, Douglass, King, Tyson, Hatshepsut, Ali) amid the top 500 ranker greatest minds and "three" black geniuses (Imhotep, Akhenaten, Martin King) in the Hmolpedia top 500 geniuses (Jun 2017).
N2. The “black genius rarity phenomenon” is similar, albeit for different reasons, than the “female genius rarity phenomenon” (see: smartest woman ever); the latter, however, is a function of system environment, namely because humans exist in an air environment, children have to be reared in a liquid environment for 9-months, according to which nature “selects” differently for woman than for men, per function of this fact (in the fish world, e.g., roles are reversed:

female fish lay eggs on the ocean floor, men brood over them, and the females are bigger and more intelligent).

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1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 435-39). HarperOne.

Further reading

● Brawley, Benjamin. (1937). *The Negro Genius: a New Appraisal of the Achievement of the American Negro in Literature and the Fine Arts*. Publisher.
● Russell, Dick. (2013). *Black Genius: Inspirational Portraits of African-American Leaders*. Skyhorse Publishing.

External links

● Home – BlackInventor.com.

θΔics

In intellectual rankings, **greatest chemist ever** is an epitaph given to a person, depending on ranking methodology, some rankings of which are listed below, that classify, list, or describe someone as being the greatest thinker in the field of chemistry of all time.

Ranking

The following is a work-in-progress meta-analysis ranking of the greatest chemists of all time:

#	Person	CC	TB	AG	GK	SC	JP	Notability
1.	180 | 94 Antoine Lavoisier (1743-1794)	77			2	1	26	On the basis of Boerhaave's law formulated caloric theory; among numerous other feats, such as playing a key role in the standardization of chemical nomenclature; his 1787 textbook *Elements of Chemistry* is generally considered to have marked the inception of modern chemistry.
2.	180 | 152 Jacob Berzelius (1779-1848)				5		52	Noted for electrical affinity theory (1811), acid base theory (1831), and catalysis theory (1835), among others.
3.	175 | 233 Justus Liebig (1803-1873)						39	Considered one of the foremost chemists of the first half of the 19th century, doing a prodigious amount of work in the fields of organic chemistry, agricultural chemistry, and physiological chemistry.
4.	Jean Dumas (1800-1884)						38	After 1840, Dumas and Liebig were said to have “divided the authority which formerly belonged to Berzelius”.
5.	185 | 56 Robert Boyle (1627-1691)			142	7		30	In 1658, built an air pump and began to experimentally determine the gas laws, publishing Boyle’s law in his 1660 treatise *Spring of the Air*; his 1661 booklet *The Sceptical Chymist* was a stepping stone away from alchemy to modern chemist, considered by some to be the date of inception of modern chemistry; formulated the first part of the ideal gas law, i.e. Boyle's law (PV = k, at constant temperature).

6.	170 | 322	Joseph Priestley (1733-1794)		16	1	23	In 1774, discovered oxygen, which he called "dephlogistated air", and attempted to redefine the old phlogiston theory in opposition to Lavosier's newer caloric theory.
7.	165 | 444	August Kekule (1829-1896)		23	4	22	In 1857, conceived the idea of assigning certain atoms to certain positions within the molecule, connected via “affinity units” (Verwandtschaftseinheiten), based largely on evidence from chemical reactions; in 1865, famously initiated the study of molecular structure when he conceived of the ring structure of benzene while dreaming about a snake biting its tale.
8.	170 | 335	Henry Cavendish (1731-1810)			3	21	Was the first to determine the electrical conductivity of salt solutions; rejected the material theory of heat; experimentally proved the inverse square law; did work on latent heat and specific heat, etc., etc. His first publication was the 1766 *On factitious Airs*, on the work of Black, Boyle, and others.
9.	180 | 125	Leucippus (c.500-450BC)					
10.	165 | 475	Carl Scheele (1742-1786)		10		20	In 1770, made of number of chemical discoveries, e.g. oxygen (before Priestley), chlorine (before Davy), as published in his *Chemical Treatise on Air and Fire*.
11.		Claude Berthollet (1748-1822)				19	Particularly noted for his 1799 theories on "split affinities".
12.	185 | 66	Humphry Davy	18	15	7	17	In 1807, discovers that electricity transforms chemicals when he uses Alessandro Volta's newly invented electric pile (1800) to separate salts via electrolysis.

		(1778-1829)							
13.	175 — 221	Joseph Gay-Lussac (1778-1850)						17	In 1802, formulated the second part of the ideal gas law, Gay-Lussac's law (P = kT, at constant volume)
14	180 — 171	Joseph Black (1728-1799)						16	Father of thermochemistry: In 1761, discovered “latent heat”; invented the “ice calorimeter” in 1782; student of chemical reaction diagram pioneer William Cullen.
15.	225 — **1**	Johann Goethe (1749-1832)	1	2	131			1	In circa 1808 made the first human affinity table and in 1809 founded the science of human chemistry with the publication of his *Elective Affinities*, in which he wrote out 36-human chemical reactions based on the science of affinity chemistry (Newton, Geoffroy, Cullen, Bergman, Berthollet, etc.), a publication which, in his own words, he considered his 'best book' or greatest work. [39]
16.	180 — 190	Johann Helmont (1579-1644)						16	Founder of pneumatic chemistry; coined the term in circa 1609 “gas”.
17.		Friedrich Wohler (1800-1882)				9	4	16	In 1828, synthesized urea thus initiating the field of organic chemistry.
18.	220 — 2	Isaac Newton (1643-1727)	7					6	A life-long passionate student of alchemy, who seeded the chemical revolution with his "Query 31" appended to his 1704 *Opticks*.
19.	175 —							1	In 1757, pioneered the idea of the "chemical equation" (AB + C → AC + B) based on Geoffroy's affinity table.

	242	William Cullen (1710-1790)							
20.	180 | 145	John Dalton (1766-1844)			248	6	2	14	In 1803, he assigned an atomic weight of one to hydrogen, and began determining molecular formulas, such as that the ratio of nitrous anhydride was 2 to 3, giving N_2O_3.
21.		Wilhelm Ostwald (1853-1932)							
22.	175 | 251	Dmitri Mendeleyev (1834-1907)			253	1	6	6	In 1869, formulated the periodic table of elements.
23.	175 | 285	Amedeo Avogadro (1776-1856)				4		10	
24.	195 | **14**	Rene Descartes (1596-1650)	29	39	25			4	In 1625, developed the hood-and-eye model of atomic bonding, whereby a bond was said to form when the hook of one atom got caught in the eye of another atom; this chemical bond theory was taught up until 1917 (specifically to Linus Pauling).
25.	180							3	In 1718, during a translation in to French of Newton's *Opticks*, translated Newton's verbal descriptions of affinity preferences

	172	Etienne Geoffroy (1672-1731)				between various chemical into the world's first affinity table, which launched the chemical revolution.
26.	180 | 162	Torbern Bergman (1735-1784)			9	In his 1775 *A Dissertation on Elective Attractions*, he pioneered the use the single letters (a, b, c, etc.,) and adjacent letters (ab, ac, etc.) to represent single and attached chemical species, respectively, and made the world's biggest affinity table (50-rows, 59 columns) ever published and contains a fold-out page of 64 affinity reaction diagrams.
27.	175 | 232	Paracelsus (1493-1541)	108		7	In 1524, combined Aristotle's c. 350 BC four element theory with Geber's c. 790 three principles, to derive a sulphur theory of how wood burned; coining the word gas; had theories on chemical affinity.
28.	180 | 203	Herman Boerhaave (1668-1738)			7	Originator of Boerhaave's law (cited on the first page of Lavoisier's treatise); his 1724 book *Elements of Chemistry*, was the forerunner to Lavoisier's book of the same title.
29.	210 | 5	Willard Gibbs (1839-1903)	825	12	3	In 1876, founded the science of chemical thermodynamics; conceiving of a number of novel applications, such as chemical potential, among others.
30.	190 | 35	Linus Pauling (1901-1994)		25		In 1937, wrote *On the Nature of the Chemical Bond*, called the "bible" of the modern chemist; after being taught Descartes 1625 "hook-and-eye" bonding theory, while an undergraduate chemical engineering student, in 1917, at Oregon State University.
31.	180 | 96				11	

		Michael Faraday (1791-1867)					
32.	180 | 96	Fritz Haber (1868-1934)					An 2011 8th-ranked "greatest chemist of all time" via Twitter poll vote, by editors of *Nature Chemistry*.
33.	180 | 163	Ernest Rutherford (1871-1937)				6	Noted for conceiving of the Rutherford model of the atom, that of a tiny central nucleus surround by electons.
34.	180 | 119	Marie Curie (1867-1934)	11	11	2		Chemically extracted uranium from uranium ore, noting that the residual material is more ‘active’ than the extracted pure uranium, concluding that the ore must contain new elements, which led to the discovery of polonium and radium.
35.	180 | 120	Albertus Magnus (1193-1280)				6	One of the foremost alchemists of the 13th century; one of the earliest theorists on affinity theory.
36.		Frederick Sanger (1918-)	14				

Building on this core ranked Partington group the table (under-construction) is an updated ranked "greatest chemists of all-time" listing using chemists found in the American psychologist Catherine Cox (CC) 300 genius list (years: 1450-1850), the English accelerated learning expert Tony Buzan (TB) 100 geniuses (years: prior to 1994), Agnes Gottlieb (AG) top 1,000 most influential people (years: 1,000 to 2,000), integrated together with South African born Canadian chemical engineer and science historian Gavin Kanowitz’s (GK) 2009 ranked list of the top 40 chemists of all time, along with the Science Channel's [SC] ranking of the top 13 greatest discoveries in chemistry, grouped by discoverer. [4]

Goethe, of significance, will intentionally be placed first on this list, in spite of the fact that he has only one page mention in Partington's *History*, who comments that German chemist Johann Dobereiner. Goethe is specifically placed first in ranking owing to the fact that he has recently emerged as the founder of human chemistry, a relatively new,

albeit very advanced, branch of chemistry, extremely likely to be the dominant branch of chemistry in the years to come. Only a few are aware of the density of Goethe's work in chemistry, a fact barricaded by the extreme difficulty involved in the pure understanding of the subject of chemical thermodynamics, which forms the basis of Goethe's work. One who seemed to have caught glimpse of what Goethe's chemistry mindset was Belgian chemical thermodynamicist Ilya Prigogine, Nobel Laureate in thermodynamics (1871), who commented, in his discussion of the method by which Newton derived celestial mechanics from the universal theory of chemical affinity between all atomic bodies of the universe, "we may recall the importance of the mediator in Goethe's *Elective Affinities*, and gives his opinion that "for what concerns chemistry, Goethe was not far from Newton". [5] Similar to the view of Prigogine, American chemical engineer Libb Thims, author of the first-ever textbook on *Human Chemistry* (2007), considers Goethe to be, by far, the highest ranked chemist of all-time. [6]

We specifically place Lavoisier second (first in the Partington ordering scheme, versus fifth) owing to the fact that his caloric theory is largely responsible for the inception of the science of thermodynamics, and hence chemical thermodynamics (the grandest branch of chemistry); in addition to the fact that he accomplished so much in chemistry in such a short time (he was guillotined at the age of 51 over tax conspiracy accusations).

Meta-analysis

The most renowned of all chemistry historians is English chemist James Partington (JP), noted for his four-volume treatise *The History of Chemistry*, totaling about 3,600-pages of information. This opus was condensed into 1937 *A Short History of Chemistry*, which was revised and enlarged in 1957 to 415-pages in length. [3] This is the standard go-to quick reference for historians of chemistry. Over the years, Partington collected a considerable library of works, over 1500 books or items on the history of alchemy and chemistry which are preserved in the John Rylands Library in Manchester. The number of pages to which any given chemist is referenced in Partington's *Short History*, gives what is called a Partington rank as to the dominance of the influence of that individual in the historical development of chemistry. The top ten greatest chemists according to JP, as mentioned abobe, are: Jacob Berzelius (52), Justus Liebig (39), Jean Dumas (38), Robert Boyle (30), Antoine Lavoisier (26), August Kekule (22), Joseph Priestley (23), Henry Cavendish (21), Carl Scheele (20), and Claude Berthollet (19), each number in brackets indicating page index count. These big ten chemists are followed by Humphry Davy (17), Joseph Gay-Lussac (17), Joseph Black (16), Johann van Helmont (16), Friedrich Wohler (16), Edward Frankland (15), Hermann Kolbe (15), John Dalton (14), August Laurent (13), Thomas Thomson (13), Robert Bunsen (12), August Hofmann (12), Robert Hooke (12), Michael Faraday (11), John Mayow (11), Julius Meyer (10), Amedeo Avogadro (10), Richard Kirwan (10), Adolf Baeyer (10), Georg Stahl (9), Torbern Bergman (9), Aristotle (9), Fourcroy (9), Hales (8), Gmelin (8), Avicenna (7), Herman Boerhaave (7), Werner (7), Paracelsus (7), Albertus Magnus (6), Guyton Morveau (6), Graham (6), Johann Becher (6), Isaac Newton (6), Ostwald (6), Cannizzaro (6), Rutherford (6), J.B. Richter (6), Pasteur (6), Marcellin Berthelot (5), Willard Gibbs (3), Geber (2), Johann Goethe (1), among others in the near 1-4 page range. These are shown in the following table, numbers shown in the JP column, as discussed further below.

Partington rank stature

See main: Partington ranking

The 50 greatest chemists (by historical citation) according to English chemical thermodynamicist and renowned chemistry historian James Partington's 1937 *A Short History of Chemistry*, based on "name index" page citation count, which is the shortened version of his large three-volume treatise (*A History of Chemistry*), are: [3]

1. Jacob Berzelius (52)
2. Justus Liebig (39)
3. Jean Dumas (38)
4. Robert Boyle (30)
5. Antoine Lavoisier (26)
6. Friedrich Kekule (22)
7. Joseph Priestley (23)
8. Henry Cavendish (21)

9. Carl Scheele (20)
10. Claude Berthollet (19)
11. Humphry Davy (17)
12. Joseph Gay-Lussac
13. Joseph Black (16)
14. Johann Helmont
15. Friedrich Wohler (16)
16. Edward Frankland (15)
17. Hermann Kolbe (15)
18. John Dalton (14)
19. August Laurent (13)
20. Thomas Thomson (13)
21. Robert Bunsen (12)
22. August Hofmann (12)
23. Robert Hooke (12)
24. Michael Faraday (11)
25. John Mayow (11)
26. Julius Meyer (10)
27. Amedeo Avogadro (10)
28. Richard Kirwan (10)
29. Adolf Baeyer (10)
30. Georg Stahl (9)
31. Torbern Bergman (9)
32. Aristotle (9)
33. Fourcroy (9)
34. Hales (8)
35. Gmelin (8)
36. Avicenna (7)
37. Herman Boerhaave (7)
38. Werner (7)
39. Paracelsus (7)
40. Albertus Magnus (6)
41. Guyton Morveau (6)
42. Graham (6)
43. Johann Becher (6)
44. Isaac Newton (6)
45. Wilhelm Ostwald (6)
46. Cannizzaro (6)
47. Ernest Rutherford (6)
48. J.B. Richter (6)
49. Louis Pasteur (6)
50. Marcellin Berthelot (5)

These are followed by others, including: Willard Gibbs (3), Geber (2), Johann Goethe (1), among others in the near 1-4 page range.

Farber | Great chemists

In 1961, Eduard Farber, in his 1,600+ page *Great Chemists*, listed 114 “great chemists” in chronological order, some discussion of selection methods of which he discusses in his preface; the first selection of which are listed below: [7]

1. Babylonian chemists
2. Interlude I, philosophers and practitioners

3. Arabic chemists
4. Interlude II, philosophers and alchemists and practical metallurgists
5. Paracelsus
6. Libavius and Jean Beguin
7. Joan van Helmont
8. Rudolf Glauber
9. Robert Boyle
10. Nicolas Lemery
11. Herman Boerhaave
12. Duhamel du Monceau
13. Guillaume-Francois Rouelle
14. Andreas Sigismun Marggraf
15. Mikhail Lomonosov
16. Joseph Black
17. Henry Cavandish
18. Joseph Priestley
19. Carl Scheele
20. Antoine Lavoisier

(add)

Nature Chemistry's 2011 Twitter poll

In 2011, the editors of *Nature Chemistry* conducted a Twitter poll on the query "Who is the greatest chemist of all-time?", the results of which (86 votes) are shown below (those receiving two or more votes):

1. Linus Pauling (16)
2. Dmitri Mendeleyev (11)
3. Antoine Lavoisier (7)
4. Marie Curie (6)
5. R.B. Woodward (4)
6. Michael Faraday (4)
7. Gilbert Lewis (3)
8. Amedeo Avogadro (2)
9. Fritz Haber (2)
10. JÄ bir ibn HayyÄ n (2)
11. August Kekulé (2)
12. Niels Bohr (2)
13. E. J. Corey (2)

Everyone else received one vote (in no particular order): Friedrich Wöhler (1), Alfred Werner (1), Henry Moseley (1), Paul Walden (1), Robert Robinson (1), Ludwig Boltzmann (1), Jacobus Henricus van 't Hoff (1), Robert Boyle (1), Walther Nernst (1), Svante Arrhenius (1), Shigeru Terabe (1), James Joule (1), Victor Grignard (1), William Perkin (1), Stanislao Cannizzaro (1), Wallace Carothers (1), Emil Fischer (1), Wilhelm Ostwald (1), RyÅ ji Noyori (1), Paracelsus (1), Louis Pasteur (1), Humphry Davy (1).

Bracher's top 5

In followup to *Nature Chemistry*'s poll, ChemBark blogger, Harvard-trained organic chemist Paul Bracher listed opinion on the top 5 chemists ever: [1]

1. Linus Pauling
2. Gilbert Lewis
3. Willard Gibbs
4. Antoine Lavoisier
5. R.B. Woodward

(add)

See also

â— Greatest physicist ever
â— Greatest philosopher ever
â— Greatest mathematician ever
â— Greatest thermodynamicist ever
â— Greatest engineer ever

â— Polymath
â— Last person to know everything
â— Universal genius
â— Last universal genius

â— Genius IQs (top 1000 geniuses)
â— IQ: 200+ | Smartest person ever
â— IQ: 150+ | Smartest woman ever

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(b) Buzan, Tony and Keene, Raymond. (1994). *Book of Genius.* Stanley Paul.
(c) Gottlieb, Agnes, Gottlieb, Henry, Bowers, Barbara and Bowers, Brent. (1998). *1,000 Years, 1,000 People*: *Ranking the Men and Women Who Shaped the Millennium.* Kodansha America, Inc.
(d) Kanowitz, Gavin. (2009). "40 Greatest Chemists of All-Time", WorldOReason.Blogspot.com. Mar 02.
(e) 13 Greatest Discoveries in Chemistry – Science Channel.
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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (Quote: "The founder of this new science [human chemistry] is the German writer, scientist, and polymath Johann von Goethe", pg. 371; ch. 10: "Goethe's Affinities", pgs. 371-422). Morrisville, NC: LuLu.
7. Farber, Eduard. (1961). *Great Chemists*. Interscience Publishers.

External links

â— 40 Greatest Chemists of All-Time (2009) – WorldOfReason, Blogspot.com.

θΔics

In genius studies, **greatest economist ever** refers to []

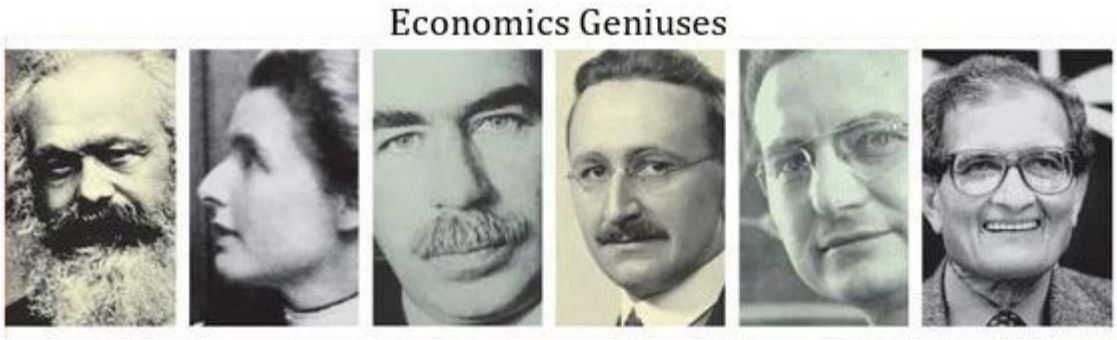

A depiction of six "**economic geniuses**", namely: Karl Marx (first), Paul Samuelson (fifth), and four others, from Sylvia Nasar's 2011 *Grand Pursuit: the Story of Economic Genius*. [2]

Overview

In 1951, Joseph Schumpeter, in his *Ten Great Economists: from Marx to Keynes*, discussed the following ten economists: [1]

1. Karl Marx
2. Leon Walrus
3. Carl Menger
4. Alfred Marshall
5. Vilfredo Pareto
6. Eugene Bawerk
7. Frank Taussig
8. Irving Fisher
9. Wesley Mitchell
10. John Keynes

In 2013, Tomas Sedlacek, in his "Five Most Influential Economic Philosophers", listed the following: (Ñº)

1. Rene Descartes
2. Bernard Mandeville
3. John Locke
4. David Hume
5. Adam Smith

In 2015, The Complete University Guide (Ñº) ranked the top 10 most influential economists of all time as follows:

1. Adam Smith
2. Karl Marx
3. John Keynes
4. Milton Friedman
5. Jan Tinbergen
6. John Nash
7. Muhammad Yunas
8. Steven Levitt & Steven Dubner
9. Warren Buffett
10. Alfred Marshall

In 2016, TFE Times, aka *The Financial Engineer*, ranked the "10 best economists of all time" as follows: (Ñº)

1. Milton Friedman
2. Adam Smith
3. John Keynes

4. Friedrich Hayek
5. Karl Marx
6. Amartya Sen
7. Ludwig von Mises
8. Joseph Stiglitz
9. David Ricardo (1772-1823) [RGM:746|1,500+]
10. Daniel Kahneman

(add)

Top 1000

The following is a work-in-progress listing of economists or thinkers who professed economic ideas, from the top 1000 geniuses rankings, ordered by established IQ rankings:

	IQ	Economist	IQ Estimates	Description
1.	195 | **11**	Aristotle (384-322BC)	IQ_{SS}=250 IQ_{O}=190-210 IQ_{B}=190	Professed ideas on economics (Ñº), published by him, his students, or a successor, such as Theophrastus.
2.	195 | **14**	Rene Descartes (1596-1650)	IQ_{C}=180 IQ_{CB} =**178** IQ_{B}=175 IQ_{W}=175	"Economics started to develop at the time when his legacy received widespread recognition. The first economists widely discussed theories of knowledge, and all have proven to be successors to Descartes. His ideas were brought to England by John Locke and David Hume. Through them, Descartes's teachings penetrated economics as well—and they have remained firmly built into it to this day. In no other social science were the Cartesian ideas accepted with as much enthusiasm as in economics." — Tomas Sedlacek (2013) (Ñº)
3.	190 | 23	Vilfredo Pareto (1848-1923)		See: Cartesian economics by Frederick Soddy. [RGM:N/A|1,310+] (Scott 50:29) French-born Italian mathematical engineer and physical socioeconomist; **#3** social Newton (historical); his four-volume *Treatise on General Sociology* as been characterized as the ***Principia*** **of the social sciences**, destined to bring about a revolution (see: Goethean revolution) in social methodology (Andrew Bongiorno, 1930); a "scholar of encyclopedia

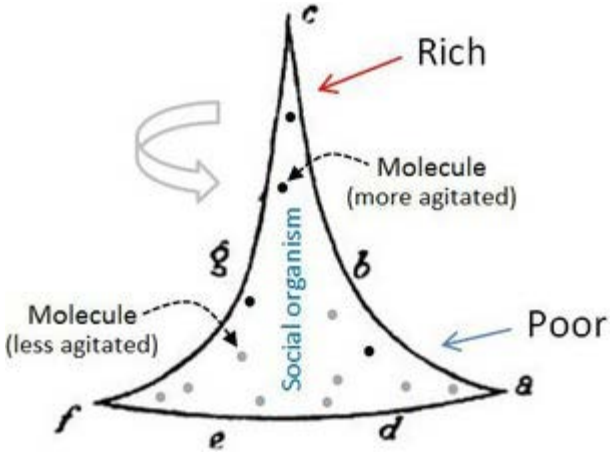

ambitions and Machiavellian dispositions" (Steve Fuller, 2000); his system has been characterized as the alternative to that of Karl Marx; eponym of the influential Harvard Pareto circle; see his spinning top social pyramid model of wealth circulation, Pareto principle, and Pareto school; he might go up or down ↑↓ depending, after his corpus of work is completely translated into English and fully digested; and likewise compared and contrasted with his peer Leon Winiarski, none of whose work is yet translated into English, and who may resultantly outrank him in intellect, though the matter is still undecided

[RGM:178|1,350+] (Scott 50:23) (CR:118|#37) (FA:102) German sociopolitical economic theorist;

4.	125 | 180		Karl Marx (1818-1883)	IQ_{CP}=189 IQ_{O}=140-160
6.	307 | 170		Adam Smith (1723-1790)	IQ_{C}=170
7.	379 | 170		John Keynes (1883-1946)	
8.	391 | 165		Francois Quesnay (1694-1774)	
8.				
9.				
10.	475 | 160		Xenophon (c.430-354)	

"It is the ultimate aim of this work, to lay bare the economic law of motion of modern society."

— Karl Marx (1867), *Capital*

Noted for his work with Friedrich Engels on dialectical materialism (which led to communism)

French physician and economist; characterized a "clever man" (Mettrie, 1745) the "height of genius" in political economy (Marx, 1860), noted for his 1758 *Economic Table*, which outlined the ideas behind the "physiocrat", from the Greek phýsis, meaning "nature," and kràtos, meaning "power", school of economics, e.g. that the source of economic strength or wealth is "land", which is generally considered to be the first school of economic thinking; influential to Adam Smith; first-slating: 165|#391 (Apr 2018).

(Cattell 1000:223) Greek philosopher, historian, soldier, mercenary, and student of Socrates; noted for his 362 book *Oeconomicus* (Ñº), on "household management and agriculture", which is the origin of the word economics; first-slating: 160|#475 (Apr 2018).

(add)

Quotes

The following are related quotes:

> "Never before had thinking in political economy reached such heights of genius."
>
> — Karl Marx (c.1860), on Francois Quesnay (Ñº)

References

1. (a) Schumpeter, Joseph. (1951). *Ten Great Economists: from Marx to Keynes*. Oxford University Press.
(b) Ellis, Howard S. (1952). "Ten Great Economists" (Ñº), *Journal of Political Economy*, 60(5):433-36.
2. Nasar, Sylvia. (2011). *Grand Pursuit: the Story of Economic Genius*. Simon and Schuster.

θΔics

In intellectual rankings, **greatest engineer ever** is an epitaph given to a person, depending on ranking methodology, some rankings of which are listed below, that classify, list, or describe someone as being the greatest thinker in the field of engineering of all time.

EngineeringDaily.net top ten

The following are the top ten most "remarkable engineers of all time" according to *The Engineering Daily*: [1]

1. Leonardo da Vinci
2. Thomas Edison
3. Henry Ford
4. Wilbur Wright and Orville Wright
5. Hero
6. James Watt
7. Archimedes
8. Nikola Tesla
9. Nicolaus Otto
10. Alan Turing

(add)

See also

- Greatest chemist ever
- Greatest philosopher ever
- Greatest mathematician ever
- Greatest thermodynamicist ever
- Greatest physicist
- Polymath
- Last person to know everything
- Universal genius
- Last universal genius
- Genius IQs (top 1000 geniuses)
- IQ: 200+ | Smartest person ever
- IQ: 150+ | Smartest woman ever

External links

1. Top 10 remarkable engineers of all time – Engineering Daily.net.

θΔics

In genius studies, **greatest female geniuses** refer to the smartest woman, retrospectively gauged, of all time. [N1]

A photo of Rene Descartes teaching Christina Alexandra (1649), Queen of Sweden, aka "Minerva of the North", as she was known, about mechanical philosophy.

Overview

Female geniuses, as a rule, are rarer then male geniuses. Statistically, about **3.8% of geniuses are female**, based on th the fact that among the top 1000 geniuses, at the c.720 geniuses ranked level (Jan 2019), only 28 are female (see: version 8). This trend, generally, has to do with the fact that, in evolutionary psychology terms, the mate selection trait "intelligence" is selected for in men, just as "beauty" is selected for in women, both of which are characteristic traits produced by the sexual selection mechanisms, and that beauty and brains tend to be found, on average, inversely proportional to each other (see: Beckhap's law).

> “It is enough to make the general statement that there is not a single **woman** in the history of thought, not even the most manlike, who can be truthfully compared with men of fifth or sixth-rate genius, for instance with Ruckert as a poet, Van Dyck as a painter, or Schleiermacher as a philosopher.”
>
> — Otto Weininger (1903), *Sex and Character* (pg. 69)

This, moreover, to the consternation of many, is not a "sexist" or "misogynistic" rule, but rather a repercussion that humans exist in an air-based system environment, wherein eggs are raised intrauterine.

In aquatic systems, e.g. rivers, lakes, and oceans, the rolls are reversed: females are more intelligent and larger, per reason that because of the liquid environment, eggs can be laid on the ocean floor and males can sit on them and hatch them. Whatever the case, historically, there have been notable female geniuses.

Rankings

The following is a work-in-progress ranking of the greatest female geniuses of all time, generally being the female subset of the top 1000 geniuses page: [N1]

	IQ	Person	IQ estimates	Description
1.	190		IQ_O=180-200 IQ_{SS}=195	[RGM:123|1,500+] (GFG:1) (CR:38) Greek philosopher, physicist, and astronomer; “Fables should be taught as fables, myths as myths, and miracles as poetic fancies. To teach superstitions as truth is a most terrible thing. The child mind accepts and believes them, and only through great pain and perhaps tragedy can he or she be in

— 38	Hypatia (360-415)	IQ_O=170-210 IQ_O=170	after years relieved of them. The reason for this is that a superstition is so intangible a thing that you cannot get at it to refute it.”	one of fabled "last persons to know everything"; only known female universal genius; noted early irreligionist; credited with the invention of the astrolabe (adjacent); is rumored that to explain the seasonal variations of the apparent size of the sun, and conceived of elliptical orbit heliocentrism; Kepler; Bertrand Russel and Voltaire praised her; stoned to death; IQ:170 (Ñº).
2. — 118	Emilie Chatelet (1706-1749)			[RGM:649|1,500+] (CR:20) French philosopher and physicist; eponym: "smartest woman ever"; combined Isaac Newton’s definition of energy (E=mv) with Gottfried Leibniz’ definition of energy (E=mv²) with Willem Gravesande’s brass balls clay surface impact experiments to synthesize the first version of the conservation of energy (vis viva into vis mortua); mistress of Voltaire (IQ=195); had immense library comparable to the Paris academy of science; ran the biggest research lab in France; very highly ranked "magnitude genius" (prolific output in short time); downgrade from 190|#41 to 185|#48 (Feb 2018) per reason that intuition deems her less of a genius than Hypatia; downgrade to 180|#119 after reading Julien la Mettrie's summary of her physics (Apr 2018).
3. — 119	Marie Curie (1867-1934) ↓	IQ_{SS}=205 IQ_O=200 IQ_B=180		[RGM:13|1,500+] (Murray 4000:14|P) (CR:29) Polish-born French physicist and chemist; noted for work in radioactivity; downgraded ↓ from 185|#76 to 180|#120 (Feb 2018) per reason (a) she seems to be more of a “over-rated genius”, e.g. her husband Pierre Curie, a pioneer in crystallography, magnetism, piezoelectricity and radioactivity, has a higher Murray ranking (Murray 4000:10|P), but is hardly famous in genius ranking circles [RGM:N/N|1,330+]; if it was a man who did the same work she did, namely: help develop the theory of radioactivity (with another researcher) and discover two elements (polonium and radium), he would likely not get so-easily ranked in top 100 genius level, nor get ranked with purported IQ 200+ range estimates (e.g. it was Henri Becquerel who ACTUALLY discovered radioactivity) and (b) she is not known (compare: Hypatia) as a big question addressing genius.
4. — 175		George Eliot (1819-1880)	IQ_B=185 IQ_O=160	[RGM:212|1,500+] (GFG:4) (SWE:3) (CR:34) English realism philosopher and novelist; noted, in human chemistry, for her 1872 novel *Middlemarch*, described by those including Martin Amis and Julian Barnes as the “greatest novel” in the English language, a novel based on

239

Johann Goethe's 1809 physical chemistry based novella *Elective Affinities* (*Die Wahlverwandtschaften*); first-slating: 180|#108 (c.2016).

American forced prodigy turned journalist, editor, critic, women's rights advocate, and transcendentalism and Goethean philosopher;

"Romantic attractions result from unalterable chemical affinities and should be obeyed regardless of marital ties."

> — Margaret Fuller (c.1835), paraphrase of her view, by Megan Marshall, following her 1832 reading of Goethe's Elective Affinities

5. | 175 280

Margaret Fuller (1810-1850)

"I now know all the people worth knowing in America, and I find no intellect comparable to my own."

> — Margaret Fuller (c.1840), *Publication* (Ñº)

Praised by Edgar Poe and Ralph Emerson as being an intellect among intellects.

6. | 175 294

Mary Shelley (1797-1851)

[RGM:N/A|1,500+] (EPD:0M) (GFG:6) (CR:47) English philosopher and novelist; noted for her 1818 fictional character "Vicktor Frankenstein", who discovers the "principle of life" (see: life principle), and thereby reanimates, revives, or brings to life a dead corpse with electricity, i.e. creates laboratory produced life; for her 1839 discussions of the atheist-based "Church of Elective Affinities", in which she alluded to have married her husband Percy Shelley; top "female genius" (Ñº); an About.com top 100 (#49) Women of History (Ñº); first-slating: #225 (below Paine) (Jun 2017).

7. | 170 354

Elizabeth I (1533-1603) ↓

IQ_B=180

(Cattell 1000:116) [RGM:488|1,500+] Queen of England (reign: 1558 to 1603); educated by renowned scholar, Roger Ascham; as a student, she studied Greek, Latin, rhetoric, and philosophy; she mastered all of these subjects; when she came to power, she transformed the English court into a center for poets, writers, musicians, and scholars; connections to literary figures such as William Shakespeare, Edmund Spenser, and Christopher Marlowe; Brought England into her zenith as a world power; down-grade from 175|#292 to 170|#354 per RGM ranking and via comparison to leaders such as Marcus Aurelius, Alexander the Great, and Frederick the Great (Jan 2019).

[RGM:542|1,500+] (Siegfried 10:1) German mathematical physicist;

"In the judgement of the most competent living mathematicians, Fraulein **Noether** was the most significant creative mathematical genius thus far produced since the higher education of women began."
— Albert Einstein (1935), "Letter to New York Times" (Ñº)

8. | 170 417

Emmy Noether (1882-1935)

Noted for her 1918 "Noether's theorem", which showed, based on group theory, that every invariance or symmetry property of a physical law corresponds a conservation principle; developed in her effort to help

Einstein and David Hilbert understand how the conservation of energy integrates into a general theory of relativity; Hmolpedia ranked (2011) as top 7 smartest women ever; first slating: 170|#416 (Jan 2019).

9. 165 | 441

Mary Somerville (1780-1872)

[RGM:911|1,500+] Scottish mathematician, astronomer, and science writer, aka “queen of 19th-century science” (Ñº); mathematics tutor to Ada Lovelace; first-slating: 180|#143 (c.2017); downgraded to: 165|#441 (Jan 2019).

10. 165 | 442

Germaine Stael (1766-1817)

IQ_C=180

(Cattell 1000:164) [RGM:N/A|1,500+] (CR:5) French-born German writer; only child of Swiss-born French statesman and financier Jacques Necker (1732-1804) (IQ:155|#553) (Cattell 1000:235) and Swiss-born Suzanne Curchod (Suzanne Necker), noted for her who hostessing of Rue de la Chaussée-d'Antin one of the most popular salons of Paris; her mother, at an early age, tried to make her into a prodigy of sorts, piling the books on her; in 1803, she was banned from France by Napoleon, for publishing her controversial novel *Delphine*; after which she went to German and became part of Goethe’s circle and an *Elective Affinities* admirer; down-graded from 175|#239 to 165|#442 (Jan 2019).

11. 165 | 443

Sofia Kovalevskaya (1850-1891)

IQ_R=170
IQ_D=156

Russian mathematician; noted for contributions to analysis, partial differential equations, and mechanics; as an infant, owing to a wallpaper shortage, her nursery had been covered with pages from her father’s old calculus text, supposedly she “gazed for hours at those pages, craving to understand them”, reports John Lienhard; at age 19, she entered University of Heidelberg, studying mathematics under Hermann Helmholtz, Gustav Kirchoff, and Robert Bunsen; by age 25, finished her doctorate on partial differential equations, along with a paper on the dynamics of Saturn's rings, and one on elliptic integrals, at the University of Göttingen, graduating *summa c*m laude*; she thereby became the first woman in Europe to hold that degree (Ñº) (Ñº); Dduring an invite to one of George Elliot’s Sunday salons, she met Herbert Spencer and was led into a debate, at Eliot's instigation, on "woman's capacity for abstract thought".

12. 165 | 474

Charlotte Bronte (1816-1855)

IQ_C=165

(Cattell 1000:721) [RGM:N/A|1,500+] English novelist and poet; at age 7, when asked by her father to name “the best book in the world”, answered “the Bible”, and in response to the followup query: “and the next best?” replied “the Book of Nature” (Ñº); oft-ranked “greatest literary author ever” (next to Ayn Rand) according to 2012 street poll; noted for genius quotes (Ñº).

13. 165 | 492

Lise Meitner (1878-1968)

(Cropper 30:3/NP) Austrian-born Swedish physicist; noted for her 1938 solution to the mystery of uranium fission; first female physics professor in Germany; the second women ever to get a PhD; she was dubbed by Einstein “our Marie Curie” or the "German Marie Curie" (Ñº); in 2012, she was speculatively ranked on the “smartest woman ever” page as #15 with an IQ of 175; first-slated in top 1000 genius rankings at 165|#475 (Nov 2018).

Mary

(Cattell 1000:851) [RGM:528|1,320+] (Murray 4000:N/A) (Stokes 100:75) English philosopher, wife of William Godwin, mother of Mary

14. | 160 | 512

Wollstonecraft (1759-1797)

Shelley (wife of Percy Shelley); best known for: *A Vindication of the Rights of Woman* (1792), wherein she argues that women are not naturally inferior to men, but appear to be only because they lack education, that both men and women should be treated as rational beings, and imagines a social order founded on reason; first-slating: 160|#433 (Feb 2018).

15. | 160 | 515

Virginia Woolf (1882-1941)

16. | 160 | 515

Ada Lovelace (1815-1852)

[RGM:434|1,500+] English mathematician, writer, and computer programmer; daughter of George Byron; from an early age, owing to her mother's idea that education would root out any insanity associated with her father's side, she was taught mathematics and science from some of the world's leading scholars, including Mary Somerville; in 1842, wrote the world's first computer program, an algorithm for calculating a sequence of Bernoulli numbers with Charles Baggage's analytical engine; possibly [?] an over-sold genius ↓ or overrated genius, per reason that Babbage, supposedly, already had did the programming 6 to 7 years before Lovelace (Ñº); first-draft gauged at 145-165 (c.2015).

17. | 160 | 518

Dorothy Murdock (1960-2015)

[RGM:N/A|1,320+] American religio-mythologist, with specialty in astrotheology; from 1999 to 2009, her books on Christ myth theory and Moses myth theory, etc., were intellectual staples, in viral films, such as Zeitgeist, in bring about a 21st century awakening on the long latent "Jesus = Osiris-Horus" connection; first-slating: 160|#435 (Feb 2018).

18. | 160 | 519

Ayn Rand (1905-1982)

[RGM:456|1,500+] (CR:32) Russian-born American "vulgar philosopher" (Solomon, 1981), extreme atheist and activist;

"If devotion to truth is the hallmark of morality, then there is no greater, nobler, more heroic form of devotion than the act of a man who assumes the responsibility of thinking. The alleged short-cut to knowledge, which is faith, is only a short-circuit destroying the mind."
— Ayn Rand (1957), *Atlas Shrugged* (Ñº)

noted for her applied atheism philosophy of objectivism, which argues that because each of us is born into a godless world "alone", each of us therefore is "justified in pursuing our own self-interests", much of which is outlined in her 1957 magnum opus *Atlas Shrugged*; downgrade (↓) for her so-called proof of the existence of free will and possible downgrade for her fierce criticisms of David Hume, Immanuel Kant, and Friedrich Nietzsche (Ñº); see also: her 1972 "Letter to Boris Spassky" (Ñº) on Bobby Fischer; first-draft gauged at 140-175 (c.2015).

19.	160 | 534	Hildegard Bingen (1098-1179) ↑↑		[RGM:209|1,500+] [GMG:14] German Benedictine abbess, writer, composer, philosopher, Christian mystic, visionary, and polymath; a smartest woman ever (Ñº) (IQ:150+) candidate; first-slating: IQ:160 (c.2015).
20.	160 | 558	Harriet Martineau (1802-1876)		(Cattell 1000:893) [RGM:N/A|1,310+] (Murray 4000:N/A) (Scott 50:22) (FA:99) British sociologist; Made of the first calls for a secular children's bible (see: children's atheism bible).
21.	160 | 572	Cleopatra (69-30BC)		[RGM:413|1,500+] Egyptian diplomat, naval commander, linguist, and medical author; Into her teens, she became fluent in Greek, Hebrew, Arabic, Persian, and Egyptian, and was the only queen in 300 years to learn the local tongue; last active ruler of the Ptolemaic Kingdom of Egypt; colloquially ranked as 2nd ranked smartest woman of all time" (Thims, c.2011); Marc Anthony gave over 200,000 scrolls to her for inclusion in the Alexandrian library (Ñº); was compared to George Sand as "another woman of royal soul (Howe, 1861) (Ñº); IQ crudely gauged at 180 (c.2011) (Ñº)(Ñº); first-slating: 160|#572 (Jun 2019).
22.	160 | 567	George Sand (1804-1876)	IQ_C=160 IQ_O=150	(Cattell 1000:173) [RGM:N/A|1,310+] French novelist, memoirist, and socialist; "We cannot tear out a single page of our life, but we can throw the whole book in the fire." Before 17, she had read Plutarch, Livy, Herodotus, Tacitus, and Rousseau, whose philosophy she was particularly devoted; influential to: Victor Hugo, Fyodor Dostoevsky, and Walt Whitman; IQ:150 (Ñº).
23.	160 | 568	Madame Sevigne (1626-1696)	IQ_C=160	(Cattell 1000:222) [RGM:N/A|1,310+] French epistolary writer; gained posthumous fame for her 1,120 letters, addressed to her daughter over the course of 30 years, note for their wit and vividness; influential to Voltaire (Ñº).
24.	155 | 591	Maria Montessori (1870-1952)	IQ_B=157	[RGM:N/A|1,500+] Italian physician and educator; best known for the philosophy of education, aka Montessori school, that bears her name, and her writing on scientific pedagogy.
25.	155		IQ_C=160	(Cattell 1000:N/A) [RGM:N/A|1,310+] English novelist, biographer, and short story writer; down-graded from: 160|#550 to 155|#602 per relative

	— 602	Elizabeth Gaskell (1810-1865)		non-notability, as compared to other GFG (Jan 2019).
26.	150 — 641	Martha Graham (1895-1991)	IQ_B=148	[RGM:834|1,500+] American dance choreographer; inspiration to Madonna, who stated upon meeting her: “she absolutely lived up to all my expectations with her wit, intelligence, and nerve-wracking imperiousness”.
27.	140 — 685	Hannah Arendt (1906-1975)		[RGM:1,015|1,330+] (HCR:25) (Perry 80:7|Li) German-born American political theorist and philosopher; student of Martin Heidegger, who was deeply influenced by Nietzsche; first-slating: 140|#620 (Mar 2018).
28.	140 — 691	Sylvia Plath (1932-1963)	IQ_O=140+	[RGM:1,220|1,500+] American poet, novelist, and short-story writer; quote on: “In her last three years of high school, the overachieving Sylvia continued to outclass everyone (IQ test scores ranked her as a genius).”

(add)

Candidates

The following are newly-found potential top 100 female geniuses candidates, not yet ranked, such as above, per se:

#	IQ	Person	IQ estimates	Description
		Margaret Cavendish (1623-1673)		â— Battigelli, Anna. (2015). *Margaret Cavendish and the Exiles of the Mind*. University of Kentucky Press.
		Christina Alexandra (1626-1689)		

Katharine Hepburn
(1907-2003)

American film actress;

"I'm an atheist, and that's it. I believe there's nothing we can know except that we should be kind to each other and do what we can for each other."
— Katherine Hepburn (1991), "Interview", *Ladies Home Journal*, Oct [1]

IMDb ranked #1 actress of all time (Ñº); Ranker.com ranked at #3 best actress in film history (Ñº).

(add)

Quotes

The following are related quotes:

> "Every woman is worth more when she learns to read."
>
> — Ramon Llull (c.1300) (Ñº)

> "My dear boy, no **woman** is a genius. Women are a decorative sex. They never have anything to say, but they say it charmingly. Women represent the triumph of matter over mind, just as men represent the triumph of mind over morals."
>
> — Oscar Wilde (1890), *The Picture of Dorian Gray* (Ñº)

> "A life spent in the routine of science need not destroy the attractive human element of a woman's nature."
>
> — Annie Cannon (c.1910)

Notes

N1. This page is an upgrade to the now-archived IQ:150+ | Smartest woman ever (2011) page [itself was a spinoff of the female portion of the IQ: 200+ page], which began to have inconsistency issues, in respect to the tendency to over-rank female geniuses, when on an isolated page, as compared to the gender-blind ranking method in the top 1000 geniuses article.

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 483). HarperOne.

θΔics

In genius studies, **greatest fictional geniuses ever** refers to greatest fictional geniuses ever seen in print, folklore, and or film.

List | Meta-analysis

The following is a work-in-progress ranking, by IQ, shown below in loose descending order of conceptualized intellect, of the greatest fictional geniuses of all time, culled from various listings and sources, ranked generally per standard IQ ranking methodology protocol, such as seen in the genius IQs table of non-fictional geniuses—many of which serving as conceptual models for fictional geniuses, as indicated: [1]

Dr. John Faust (1587) | See: Faust; Faustian; Johann Faust
Hari Seldon (*Foundation Series*, 1942) | See: Isaac Asimov
Will Hunting (*Good Will Hunting*, 1997) | Based on William Sidis (Q) whose IQ is cited between 250 to 300
Eddie Morra (*Limitless*, 2011) | Claimed IQ: four-digits; called a "21st century Faust" (Q)

Chris Knight (*Real Genius*, 1985)

> Note: Mitch Taylor (*Real Genius*, 1985) | Based on Stephen Baccus (Q) whose IQ is cited between 180-something (Q) to 190, the latter as estimated by Aaron Stern, father of famous forced prodigy Edith Stern (IQ estimated at 203) [3]

Sheldon Cooper (*The Big Bang Theory*, 2007) | Claimed IQ: 187; based on Leon Cooper (1930-) (Q)

Fred Tate (*Little Man Tate*, 1991)

Victor Frankenstein (*Frankenstein: the Modern Prometheus*, 1818) | See: laboratory produced life (Mary Shelley)

Dr. Hannibal Lecture (*Silence of the Lambs*, 1991)

Yoda (*The Empire Strikes Back*, 1980)

Seth Brundle (*The Fly*, 1986)
Dr. Manhattan (*Watchman*, 2009)
Max Cohen (Pi, 1998)

Mr. Spock (*Star Trek*, 1964)
Dr. Emmett Brown (*Back to the Future*, 1985)

Sherlock Holmes (*A Study in Scarlet*, 1887)

Jeremy Reed (*Powder*, 1995)

Dr. Stephen Falken (*WarGames*, 1983)

Elyes Gabel (*Scorpion*, 2014) | Based on Walter O'Brien who claims an IQ of 197 (Q)

Jimmy Neutron (*Jimmy Neutron: Boy Genius*, 2001)
Dr. Alexander Hartdegen (*The Time Machine*, 2002)
Gandalf (*The Hobbit*, 1937)

Jamal Wallace (*Finding Forrester*, 2000)
Robert Llewellyn (*Proof*, 2005)
Anna Hart (*Anna to the Infinite Power*, 1982)
Nick Newell (*The Kid with the 200 I.Q.*, 1983)

(add discussion)

Poll | Colloquial opinion

A Jun 2014 poll, conducted by American electrical engineer Libb Thims, who queried a number of people with the question: "who do you think are the three greatest fictional people or characters of all time?", found the following results:

1. Sherlock Holmes | 5 votes
2. Dr. Gregory House | 5 votes
3. Bruce Wayne (Batman) | 3 votes
4. James Bond | 3 votes
5. Tony Stark (Iron Man) | 2 votes
6. Prof X (Charles Xavier) | 2 votes

other names mentioned included: Morpheus, Hannibal Lector, MacGyver, Spock.

The following is a wikia list of super geniuses from the Marvel universe: [4]

1. Reed Richards
2. Hank Pym
3. Bruce Banner
4. Doctor Doom
5. Tony Stark
6. T'Challa (aka Black Panther)
7. Hank McCoy
8. Samuel Sterns
9. M.O.D.O.K.

Superhero geniuses

The following is a ranked listing of the 10 smartest superheroes according to a 2005 *Business Week* article by Joseph Pisani: [2]

1. Reed Richards
2. Bruce Wayne | Semi-modeled on: Howard Hughes
3. Tony Stark | Semi-modeled on: Howard Hughes
4. Henry Pym (or Hank Pym)
5. Hank McCoy
6. Bruce Banner
7. Barbara Gordon
8. Peter Parker
9. Charles Xavier
10. Ray Plamer

One Marvel Answers discussion lists the following as the top four plus or minus: (Q)

1. Tony Stark
2. Reed Richards
3. Bruce Banner
4. Hank Pym

(add discussion)

Other

● The 2006 film *The Genius Club*, premised on a scientist with an IQ of over 200 who builds a bomb and threatens to blow Washington DC up unless the President brings together all the people he can find with IQs over 200 to an abandoned building in DC to play a game. The game consists of a Q & A with questions all relating to solving the world's problems. The participants (which turns out to be seven geniuses with IQs over 200) are taken from their lives on Christmas Eve and are put through the test and if they can amass 1,000 points before dawn the next morning, they can walk and DC is safe. At times, the discussion is said to be reminiscent of university lectures, but as the questions progressed to being more moral, the feel of the movie changes. The discussions, however, come off as more like those of a randomly selected group of reasonably intelligent people, who end up discussing rather mundane questions, such as why toner ink is so expensive, war, famine, etc., the culmination of which is an attempt to arguably prove the existence of god, albeit a discussion that results to be the same old tired Rene Descartes and C.S. Lewis arguments.

Books

● Pfeffer, Adam. (2011). *The Genius with the 225 IQ*. iUniverse.

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1. (a) 23 Awesome Geniuses in Movies (2011) – TotalFilm.com.
(b) Top 10 Movie Geniuses (2014) – (WatchMojo.com) YouTube.com.
(c) Ten Films Portraying Genius (2010) – ListVerse.com.
(d) The 10 Best Movies About Genius (2012) – OnlineUniversities.com.
2. Pisani, Joseph. (2006). "The Smartest Superheroes" (list), *Business Week*, May 31.
3. (a) Burns, Ashley and Schildhause, Chloe. (2015). "The Behind the Scenes Story of *Real Genius*" (Q), UpRoxx, Dec 4
(b) Baccus, Stephen A. (2010), "Email to Libb Thims" (quote: "The 190 estimate was given by psychologist Aaron Stern after he interviewed me when I was around 10 years old. Hope this helps."), Oct 2.
4. Marvel's Super-Geniuses – Wikia.com.

External links

● Improbably High IQ – TVTropes.org.
● List of fictional child prodigies – Wikipedia.

In genius studies, **greatest historian ever** refers to individuals with a sharpened ability, technique, or approach to recount historical events of humans, in a brilliant way.

Overview

The following is a work in progress listing of famous historians as found in the top 1000 genius rankings:

	IQ	Historian	IQ citations	Description
1.	195 | 20	Henry Adams (1838-1918) Collected works: 12+		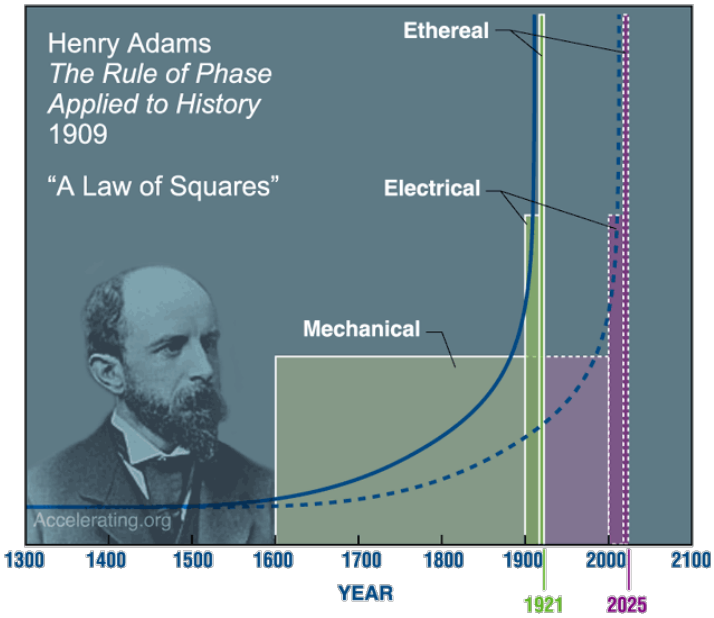 [RGM:811|1,310+] (SN:2) (CR:241)Spent over five decades attempting to explain history according to physical principals, physico-chemical principles generally; in his 9-volume *History of United States America* (1891), covering the years during the Jefferson administration (1801-1817), was penned with the sole intention to demonstrate causality in the course of human history, or as Adams would latter summarize "to satisfy himself whether, by severest process of stating, with the least possible comment, such facts as seemed sure, in such order as seemed rigorously consequent, he could fix for a familiar moment a necessary sequence of human movement"; his *The Tendency of History* (1896), attempted to describe history according to the second law of thermodynamics, albeit of the form of William Thomson's 1852 paper "On a Universal Tendency to the Dissipation of Mechanical Energy"; his *The Rule of Phase Applied to History* (1909) was reviewed by physicist Henry Bumstead, one of the few and only students of Willard Gibbs, the inventor of the phase rule; his *A Letter to American Teachers of History* (1910) gave sound advice for future generations of historians to start looking back at history scientifically, the way scientists look at reaction patterns between molecules, to view people as human molecules, and historical progress as governed by the laws of thermodynamics, just as is the historical progress of the universe. (Cattell 1000:60)

2. 180 | 170

Edward Gibbon (1737-1794)

IQ_C=180

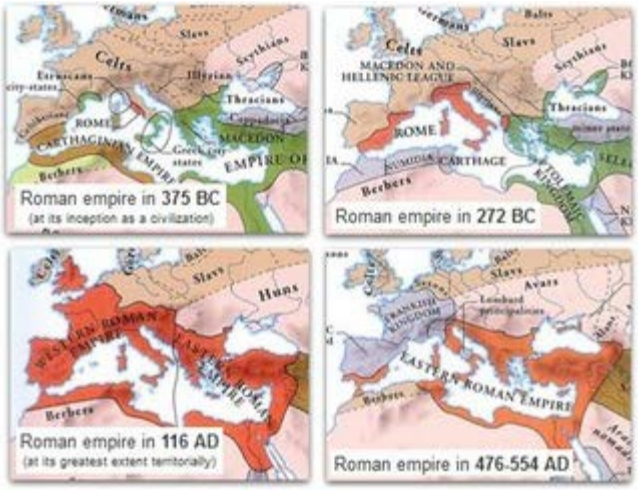

[RGM:495|1,400+] (Murray 4000:N/A) [HD:12] (FA:76) (GHE:2) (CR:18) English historian; noted for his six-volume *The History of the Decline and Fall of the Roman Empire*, peer reviewed by David Hume (1776), wherein he openly criticized organized religion, telling the story of the rise and fall of Roman, without the intervention of god, as was previously the standing historical *modus operandi*, but instead from the point of view of Rome's decline as due the "disease of Christianity" spreading through the Roman empire and rotting it.

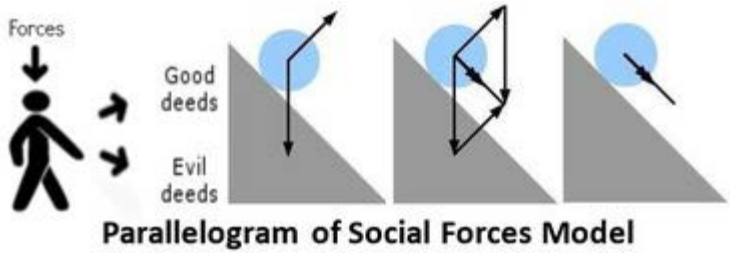

(Library:21,000) (CR:34) English social physics themed historian;

3. 175 | 213

Henry Buckle (1821-1862)

"The actions of men are in reality never inconsistent, but however capricious they may appear only form part of one vast system of universal order."

— Henry Buckle (1861), *History of Civilization in England*

In his 3-volume *History of Civilization in England*, which was immediately praised by Maxwell and Boltzmann, he focused on solving the question of whether the actions of people operate by (a) fixed laws, (b) chance, or (c) supernatural interference, via physical science means, i.e. strong positivism.

4. 175 | 249

Herodotus (484-425BC)

(Cattell 1000:202) [RGM:171|1,500+] (CR:51) was a Greek historian, aka "father of history" (Cicero, 50BC), noted for his digression on a number of thinkers, e.g. Thales, and topics, e.g. his use of the term "phoenix" for Ra, of Heliopolis creation myth, connection of Osiris with Dionysus (see: Osiris, Dionysus, and Bacchus), mummification, the Egyptian pig superstition behind Mark 5:1-17, among others

(RGM:245|1,500+) (CR:15) was a German philosopher of history;

5. | 170 | 349

Oswald Spengler (1880-1936)

IQ_{EM}=170

"Today we live so cowed under the bombardment of this intellectual artillery that hardly anyone can attain to the inward detachment that is required for a clear view of the monstrous drama. The will-to-power operating under a pure democratic disguise has finished off its masterpiece so well that the object's sense of freedom is actually flattered by the most thorough-going enslavement that has ever existed."

> — Ostwald Spengler (1923), *The Decline of the West, Volume Two* (pg. 461)

His two-volume *The Decline of the West* (1922), wherein he outlines a Goethean-Nietzschean view of rise and falls of civilization, intermixed, supposedly, with entropy discussion.

6. | 160 | 527

Bede (672-735)

(Cattell 1000:878) [RGM:615|1,500+] (CR:15) English historian and monk; noted for being one of the first to connect John the Baptist with the Aquarius constellation; recounted the "warm sparrow" anecdote Christianity adoption in England; his *Ecclesiastical History of the English People* (1731) gained him the epitaph as the "father of English history".

7. | 160 | 569

Thucydides (460-395BC)

(Cattell 1000:72) [RGM:175|1,500+] (FA:14) (CR:3) Greek historian and general;

"Modern criticism rightly regards Thucydides as the model of the rational and objective historian who made it his first duty to leave the finger of god out of history and to tidy up the mundane events of the human drama. The contrast between his work with respect to the gods and the histories of his predecessor Herodotus and his successor Xenophon is plain; it is a contrast so great, in fact, as to provoke the observation from some (e.g. K. J. Dover) that Thucydides may well have been an atheist."

> — Borimir Jordan (1986), "Religion in Thucydides"

noted for his participation in and later secular recounting of the Peloponnesian War (431-404BC), wherein the Athenians battled the Spartans; considered, by some (Ñº), to be the father of "scientific history", i.e. history based on evidence-gathering and analysis of cause and effect.

8. | 155 | 611

Livy (59BC-17AD)

(Cattell 1000:119) [RGM:N/A|1,310+] (Murray 4000:N/A) Roman historian; noted for his *History of Rome* (9BC), wherein he discusses the Mucius Scaevola hand burning legend (famously tested by Jean Rousseau and Friedrich Nietzsche in youth); Thomas Jefferson, in his recommended education letter to his nephew Peter Carr, says that one should read the Bible as one "would read Livy or Tacitus"; read by John Mill (Ñº) between ate 8 and 12; cited in the silent historians problem

9. Tacitus (58-120AD)

(Cattell 1000:294) (CR:11) Roman senator, public official, historian of the Roman Empire, who is noted as someone oft-cited having referred to the punishment of "Christians" by Nero and the execution of their founder "Christus" by Pontius Pilate; considered

by Thomas Jefferson to be a good historian to read

10. — 155 614 Josephus (c.37-100AD)

(Cattell 1000: 645) (CR:7) Roman-Jewish historian, scholar, and hagiographer, oft-cited in the silent historians problem on whether or not he refers to a "Jesus" as the "Christ", a detail that was “unknown” to Origen (c.230AD), who had copies of his works; he also conjectured that the Jewish exodus was based on the 1300BC expulsion of the Hyksos from Egypt

11. Manetho (c.300-250BC)

Egyptian historian and priest, centered in Heliopolis, noted for his *History of Egypt*, written, in Greek, for Ptolemy II (reign: 283-246BC), based on materials collected in the library of the priesthood of Ra; his division of the rulers of ancient Egypt into 30 dynasties is still used as the basic framework for ancient Egyptian history. (Ñº)

(add)

See also

â— Morris Zucker
â— Silent historians problem

External links

â— Ranking history’s greatest historians (2018) – History Reddit.

θΔics

In intellectual rankings, **greatest literary author ever** is an epitaph given to a person, depending on ranking methodology, some rankings of which are listed below, that classify, list, or describe someone as being the greatest author of world literature of all time.

According to WorldCat 100 Identities, the two biggest authors in world literature, according to library books representation, are: William Shakespeare and Johann Goethe, respectively. [2]

WorldCat Identities

See main: WorldCat 100

The WorldCat 100 rankings lists the top 43 literary authors of all time, ranked by world library holdings, according to 2011 WorldCat Identities library rankings, as culled from the top 100 identities (shown adjacent) of the worlds libraries, non-literary authors removed:

US Street poll | 2012

The following are the ranked results of a 2012 informal polling of 54 average Americans, in Chicago, who were asked to provide three names of people who they considered to be the three greatest literary authors of all time (numbers in brackets being vote count): [1]

1. William Shakespeare (18)
2. Ernest Hemingway (16)
3. Mark Twain (11)
4. Scott Fitzgerald (9)
5. Charles Dickens (8)
6. Dr. Seuss (8)
7. Edgar Allen Poe (7)
8. J.K. Rollins (7)
9. Stephen King (6)
10. Jane Austin (4)
11. Walt Whitman (3)
12. William Faulkner (2)
13. John Milton (2)
14. Fyodor Dostoyevsky (2)
15. J.R.R. Tolkien (2)
16. J.D. Salinger (2)
17. Charlotte Bronte (2)
18. Ayn Rand (2)
19. Roald Dahl (2)

Other voted candidates, with one vote, in no particular order, are: Johann Goethe, Leo Tolstoy, Jean Auel, Janet Evanovich, Barbara Kingsolver, James Joyce, Nikki Giovanni, Richard Wright, Robert Frost, Francis Fitzgerald, Agatha Christie, John Keats, Margaret Mitchell, John Steinbeck, Joyce Carol Oats, Sherwood Anderson, John Dunn, John Carpenter, Louis Carol, R.L. Stein, Daniel Steel, Dante, Nicholas Sparks, Jean-Jacques Rousseau, Art Spiegelman, Karen Abbott, Homer, Thomas Hardy, Stephen Chbosky, Oscar Wilde, Louisa May Alcott, Chaucer, Silvia Platt, Tony Morrison, Kurt Vonnegut, C.S. Eliot, Julies Vern, Harper Lee, George R.R. Martin, Paulo Coelho, Moliere, Aesop, Herman Melville, Octavio-Paz, Suzann Collins, Jack London, John Grisham, Harper Lee, and Ralph Emerson.

Discussion

One salient observation noticeable, between the two rankings, world ranking and US common opinion ranking, is that

although both listings have the common names of Shakespeare, Twain, and Dickens in the top, the number two ranked world author "Goethe" is strikingly missing from the US cultural mind. In fact, the only reason Goethe found his way into the US polling owes to the fact that Libb Thims, the poll data collector added in his three tentative votes of Goethe, Tolstoy, and Mitchell, into the running. Most Americans have never even heard of Goethe let alone pronounce his name correctly, for those few who do know him. American lawyer-author philosopher Daniel Spiro comments on this as follows: [3]

> "Words like 'great' and 'genius' could aptly be used for but a select number of artists–for Michelangelo or say Shakespeare. In the United States, the works of these great artists have been incorporated into popular culture as the epitome of visual and linguistic beauty. By contrast, on these shores, Goethe's works remain largely unread and rarely discussed except among college students, most of whom develop a healthy dose of amnesia shortly after graduation."

One possible explanation as to why this is so could possibly have something to do with a carry-over aversion to anything German by Americans in the aftermath of WWI and WWII. The fact that American Ralph Waldo Emerson, who rose to literary fame prior to WWI, was a Goethean philosopher, would seem to corroborate this possibility. Whatever the case, it is indeed a puzzling paradox? The obliviousness of Americans to genius, literary, scientific, and philosophical, of Goethe is so pronounced that, to exemplify, it took American electrochemical engineer Libb Thims eleven years and nearly 1,000-books to find Goethe, which he did in 2006, following a decade of search and research for the person to have applied chemical thermodynamics reaction prediction methods to human chemical reactions (see: Thims history), where prior to this he had absolutely no idea who this "Goethe" person was, but has since amassed about a 30-book Goethe library collection surrounding his work, similar to Einstein who had a 52-volume collected set of Goethe's work (along with a bust of him); or possibly similar to Nietzsche who stated that the "best German book there is" was Johann Eckermann's *Conversations with Goethe*.

Quotes

The following are relevant and or representative quotes:

> "Charles LaPorte points out that Swinburne is both continuing a tradition of Victorian bardolatry with constructed Shakespeare as the **'greatest author ever'**, while deliberately invoking the idea of 'one book' which civilization cannot afford to lose, only to replace its familiar referent, the Bible, with Shakespeare."
>
> — Travis DeCook (2011), "Apocalyptic Archives" (Ñº)

> "Goethe was raised to the rank of Shakespeare."
>
> — Henry Adams (1907), *The Education of Henry Adams*

References

1. Thims, Libb. (2012). "Poll [N=54]: Who Are the Three Greatest Literary Authors of All Time?", Institute of Human Thermodynamics, Chicago.
2. WorldCat Identities – Home.
3. Spiro, Daniel. (c.2005). "Remember to Live! The Philosophy of Johann Wolfgang von Goethe", talk delivered at the Washington, D.C., Spinoza Society, Goethe-Institute.

Further reading

â— Hubbard, Will and Carnevale, Alex. (2009). "The 100 Greatest Writers of All Time", *ThisRecording.com*, Aug 03.

External links

â— The 100 Best Books of All Time – Wikipedia.

θΔics

In intellectual rankings, **greatest mathematician ever** is an epitaph given to a person, depending on ranking methodology, some rankings of which are listed below, that classify, list, or describe someone as being the greatest thinker in the field of mathematics of all time; the work-in-progress ranking of which is shown below; the IQ column shows the mathematician's real IQ and ranking position amid the top 1000 geniuses of all time:

#		Person	Other Rankings	Meta-analysis Ranking	Publication
1	195 | 16	Leonhard Euler (1707-1783)	(Cattell 1000:512) [RGM:101|1,500+] (Murray 4000:14|CS / 1|M) (CR:103)	(4,4,4,4,1) (12%) (64283)	
2.	190 | 23	Carl Gauss (1777-1855)	(Cattell 1000:848) [RGM:39|1,500+] (Murray 4000:4|M) (CR:73)	(7,3,2,5,2) (10%) (50699)	
3.	220 | 2	Isaac Newton (1643-1727)	(Cattell 1000:14) [RGM:3|1,500+] (Murray 4000:2|CS / 1|P / 2|M) (CR:595)	(1,1,1,0,10) (1%) (9199)	"On the Quadrature of Curves" (1706)
4.	185 | 55	Euclid (c.340-280BC)	(Cattell 1000:501) [RGM:50|1,500+] (Murray 4000:19|CS / 3|M) (CR:65)	(6,6,3,0,5) (8%)	*Elements* (c.300BC)
5.	190 | 39	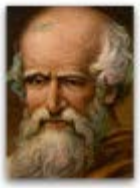 Archimedes (287-212BC)	(Cattell 1000:414) [RGM:9|1,330+] (Murray 4000:20|M / 5|T) (CR:28)	(8,2,0,0,3) (10%)	*The Method of Mechanical Theorems* (c.250BC)
6.	195 | **13**	Rene Descartes	(Cattell 1000:23) [RGM:33|1,500+] (Murray 4000:6|CS / 7|M / 4|WP)	(9,17,9,0,9) (2%)	"The Geometry" (1637)

		(1596-1650)	(CR:290)		
7.	190 | 24	Joseph Lagrange (1736-1813)	(Cattell 1000:512) [RGM:558|1,500+] (CR:114)	(3,8,0,0,6) (61065) (6%)	
8.	195 | 21	Gottfried Leibniz (1646-1716)	(Cattell 1000:34) [RGM:32|1,500+] (Murray 4000:14|CS / 6|M / 11|WP) (CR:252)	(2,10,0,0,7) (66592) (6%)	"A New Method for Maxima and Minima, and Also for Tangents, Which Stops at Neither Fractions nor Irrational Quantities, and a Singular Type of Calculus for These" (1686)
9.	190 | 44	Henri Poincare (1854-1912)	[RGM:471|1,500+] (CR:64)	(90,7,6,0,20)	
10.	180 | 86	Pythagoras (c.570-490BC)	(Cattell 1000:89) [RGM:15|1,500+] (CR:86)	(0,29,0,1,8) (3%)	
11.	180 | 115	Bernhard Riemann (1826-1866)	[RGM:280|1,500+] (Murray 4000:10|M) (CR:14)	(38,5,7,0,21)	
12.	175 | 215	David Hilbert (1862-1943)	[RGM:421|1,500+] (Murray 4000:11|M)	(0,9,5,0,24) (20414)	
	175		(Murray		

13.	__ 292	Gerolamo Cardano (1501-1576)	4000:14|M) (CR:8)	(10,91,11,3,0)
14.	| 175 | 224	Pierre Fermat (1601-1665)	(Cattell 1000:893) [RGM:628|1,500+] (Murray 4000:5|M) (CR:8)	(17,12,0,0,13)
15.	| 170 394	Felix Klein (1849-1925)		(9,45,0,0,11)
16.		Georg Cantor (1845-1918)	[RGM:478|1,500+] (Murray 4000:8|M)	(0,25,13,6,30) (1)
17.	| 165 455	Evariste Galois (1811-1832)	[RGM:517|1,500+]	(84,14,8,0,23)
18.	| 185 47	Blaise Pascal (1623-1662)	[RGM:42|1,500+] (Murray 4000:9|M)	(19,35,10,0,41)
19.	| 160 528	Augustin Cauchy (1789-1857)	[RGM:315|1,500+] (Murray 4000:18|M) (CR:10)	(15,21,0,0,15)
		Jacob		

20.	175 | 307	Bernoulli (1654-1705)	(Murray 4000:12|M) (CR:12)	(28,53,0,0,56)
21.	175 | 276	Adrien Legendre (1752-1833)	(Murray 4000:16|M)	(11,0,0,0,0)
22.		Diophantus (c.207-293)	(Murray 4000:13|M)	(26,38,0,0,0)
23.		Francois Viete (1540-1603)	(Murray 4000:15|M)	(22,48,0,0,0)
24.		Leonardo Fibonacci (1170-1250)	(Murray 4000:19|M)	(21,30,0,0,0)
25.		John Wallis (1616-1703)	(Murray 4000:17|M)	(34,0,0,0,0)
26.	185 | 84	Jean	(Cattell 1000:124) (CR:28)	(14,44,0,0,0)

d'Alembert
(1717-1783)

27. (34,39,0,0,0)

William Hamilton
(1805-1865)

28. (Eells 100:24)

190 | 33

Christiaan Huygens
(1629-1695)

29.

30. (25,0,19,0,0)

Srinivasa Ramanujan
(1887-1920)

(add)

Meta-analysis ranking

The adjacent box shows a combined meta-analysis summary ranking (combination of 5 different rankings below) of the greatest mathematicians ever (known descendants listed as well), the numbers in brackets being the rank of each mathematician of each ranking study (below), in chronological order. Meta-analysis ranking positions (a,b,c,d,e) come from the following sources:

a. W.C. Eells (1962) | mathematics professor

(100 greatest list)

b. James Allen (1998) | mathematics historian

(180 greatest list)

c. Clifford Pickover (2001) | science historian

(10 greatest list)

d. Alex Bellos (2010) | mathematician

(10 greatest list)

e. Top 10 Lists (2012) | public vote

(64 choices)

The "percentage" is the percentage of votes from the 2012 The-Top-Tens.com's listing of the "Greatest Mathematician of All Time", the ranking of this list shown by position five or "e" in the bracketed listing. The hyperlinked number, shown next to some mathematicians, e.g. Hilbert (20,414), shows the number of descendents, according to the data base at the mathematics genealogy project, a sixth factor taken into account in the meta analysis ranking.

Eells' 1962 rankings

See main: Eells 100 mathematicians

In the 1962 issue of *Mathematics Teacher*, American mathematician W.C. Eells' published a listing of who he considered to be 100 greatest mathematicians of all time: [1]

1. Isaac Newton
2. Gottfried Leibniz
3. Joseph Lagrange (Euler genealogy)
4. Leonhard Euler (Euler genealogy)
5. Pierre Laplace
6. Euclid
7. Carl Gauss
8. Archimedes
9. Rene Descartes
10. Gerolamo Cardano
11. Adrien-Marie Legendre
12. Pitagora
13. Gaspard Monge
14. Jean d'Alembert
15. Augustin Cauchy
16. Joseph Fourier
17. Pierre Fermat
18. John Napier
19. Blaise Pascal
20. Apollonius
21. Leonardo Fibonacci
22. François Viete
23. Ptolemy
24. Christiaan Huygens (Euler genealogy)
25. Regiomontanus
26. Diophantus
27. Colin Maclaurin
28. Jacob Bernoulli (Bernoulli family)
29. Pappus
30. Bonaventura Cavalieri
31. Carl Jacobi
32. Johann Bernoulli (Bernoulli family)
33. John Wallis
34. William Hamilton
35. Niccolò Tartaglia
36. Heron
37. Jean-Victor Poncelet
38. Bernhard Riemann
39. Siméon Poisson
40. Niels Abel
41. Michel Chasles
42. Luigi Cremona
43. Gilles Roberval
44. Roger Boscovich
45. Galileo Galilei
46. Alexis Clairaut
47. Johann Lambert
48. Isaac Barrow
49. Jacques Strum
50. Simon Stevin
51. Augustus de Morgan
52. Brook Taylor
53. Johannes Kepler
54. Daniel Bernoulli (Bernoulli family)
55. Girard Desargues
56. Henri Briggs
57. James Sylvester
58. Lazare Carnot
59. Pierre Maupertuis
60. Charles Babbage
61. Charles Hermite
62. Thales
63. Henry Smith
64. Sofia Kovalevskay
65. Luca Pacioli
66. Hippocrates (of Chois)
67. Gerbert
68. Alfred Clebsch
69. Julius Plucker
70. Hermann Grassmann
71. Peter Dirichlet
72. Arthur Cayley
73. Muhammed al-KhwÄ rizmi
74. Roger Cotes
75. Abraham De Moivre
76. George Boole
77. Karl Weierstrass
78. Sophus Lie
79. Nikolai Lobachevsky
80. Ahmes (the scribe)
81. Jean-Charles Borda
82. Eugenio Beltrami
83. Paolo Frisi
84. Evariste Galois
85. Evangelista Torricelli
86. Jean-Étienne Montucla
87. Otto Hesse
88. Jordanus de Nemore
89. Plato
90. Henri Poincare
91. Jakob Steiner
92. Edmond Halley
93. Andre Ampere
94. Guillaume L'Hospital
95. William Thomson
96. Boethius
97. Ehrenfried Tschirnhausen
98. Bhaskara II
99. Eratosthenes
100. Zeno of Elea

The key (Eells 100:#) is shorthand for each persons W.C. Eells ranking.

Allen's 1998 ranking

In 1998, American computer programmer (turned mathematics history hobbyist) James Allen decided to practice his HTML skills by making a listing of the top thirty greatest mathematicians listing. In his own words: [2]

> “When I was first learning to create html pages, for some reason I chose to build a list of great mathematicians as a practice page, even though I wasn't qualified to make such a list without a lot of advice. Since then I've invested a lot of time reading mathematical histories and biographies and revising the page. I'm proud of it now: please read it! (With 60 mini-biographies, the single page has now grown to over 100 kilobites).”

Allen's ranking, as of 2012, has become Google search top result for "greatest mathematicians" and currently lists the 100 “Greatest Mathematicians of All Time”, ranked in approximate order of greatness, born before 1930, whose work has breadth, depth, and historical importance (the numbers in brackets being the position in Eells' 1962 ranking): [3]

1. Isaac Newton (1)
2. Archimedes (8)
3. Carl Gauss (7)
4. Leonhard Euler (4) (Euler genealogy)
5. Bernhard Riemann (38)
6. Euclid (6)
7. Henri Poincare (90)
8. Joseph Lagrange (3)
9. David Hilbert (0)
10. Gottfried Leibniz (2)
11. Alexandre Grothendieck (0)
12. Pierre Fermat (17)
13. Niels Abel (40)
14. Évariste Galois (84)
15. John Neumann (0)
16. Karl Weierstrass (77)
17. Rene Descartes (9)
18. Carl Jacobi (31)
19. Srinivasa Ramanujan (0)
20. Brahmagupta (0)
21. Augustin Cauchy (15)
22. Peter Dirichlet (71)
23. Hermann Weyl (0)
24. Eudoxus of Cnidus (0)
25. Georg Cantor (0)
26. Muhammed al-KhwÄ rizmi (73)
27. Arthur Cayley (72)
28. Emma Noether (0)
29. Pythagoras (0)
30. Leonardo Fibonacci (21)
31. Kurt Godel (0)
32. Aryabhata (0)
33. Charles Hermite (0)
34. Apollonius of Perga (0)
35. Blaise Pascal (19)
36. Pierre Laplace (5)
37. Richard Dedekind (0)
38. Diophantus (26)
39. William Hamilton (34)
40. Bháscara Áchárya (0)
41. Gaspard Monge (13)
42. George Boole (76)
43. Stefan Banach (0)
44. Jean d'Alembert (14)
45. Felix Klein (0)
46. Ferdinand Eisenstein (0)
47. Jacques Hadamard (0)
48. Francois Viete (22)
49. Johannes Kepler (53)
50. Elie Cartan (0)
51. Jean-Victor Poncelet (37)
52. Archytas of Tarentum (0)
53. Jacob Bernoulli (28) (Bernoulli family)
54.

The shorthand (Allen 100:#) is key for each person's Allen top 100 mathematicians ranking.

Pickover's 2001 ranking

In American science biographer Clifford Pickover's listing in his 2001 *Wonders of Numbers: Adventures in Mathematics, Mind, and Meaning*, in which he devotes a chapter to "A Ranking of the 10 Most Influential Mathematicians", based on, supposedly, surveys and interviews with mathematicians (the numbers in the brackets being the position in Eells' 1962 ranking and Allen's 1998 ranking, respectively): [4]

1. Isaac Newton (1,1)
2. Carl Gauss (3,7)
3. Euclid (6,6)
4. Leonhard Euler (4,4)
5. David Hilbert (0,9)
6. Henri Poincare (90,7)
7. Bernhard Riemann (38,5)
8. Evariste Galois (84,14)
9. Rene Descartes (9,17)
10. Blaise Pascal (19,35)

Runners-up Girolamo Cardano, Kurt Godel, Georg Cantor, and John Napier.

Bellos 2010 top 10

The following is the 2010 listing of the “10 Best Mathematicians” by Brazilian mathematician Alex Bellos (author of the recent book *Alex's Adventures in Numberland*), ordered via ranking of "revolutionary discoveries said to have changed the world" (the numbers in the brackets being the position in Eells' 1962 ranking, Allen's 1998 ranking, and Pickover's 2001 ranking, respectively): [5]

1. Pythagoras (0,29,0)
2. Hypatia (0,~140,0)
3. Girolamo Cardano (10,91,11)
4. Leonhard Euler (4,4,4)
5. Carl Gauss (7,3,2)
6. Georg Cantor (0,25,13)
7. Paul Erdos (0,95,0)
8. John Conway (0,~140,0)
9. Grigori Perelman (0,~140,0)
10. Terrance Tao (0,0,0)

The last three of which, to note, are still reactive (living) and seem to be more of celebrity mathematicians, rather than the "greatest" as history may show.

The-Top-Tens.com's 2012 listing

The following is the 2012 current ranking (by percentage vote) of The-Top-Tens.com’s listing of the “Greatest Mathematician of All Time”: [6]

1. Leonhard Euler (12%) (4,4,4,4)
2. Carl Gauss (10%) (7,3,2,5)
3. Archimedes (10%) (8,2,0,0)
4. Aryabhata (9%) (0,32,0,0)
5. Euclid (8%) (6,6,3,0)
6. Joseph Lagrange (6%) (3,8,0,0)
7. Gottfried Leibniz (6%) (2,10,0,0)
8. Pythagoras (3%) (0,29,0,1)
9. Rene Descartes (2%) (9,17,9,0)
10. Isaac Newton (1%) (1,1,1,0)
11. Felix Klein (9,45,0,0)
12. Brahmagupta
26. Karl Weierstrass
27. Peter Dirichlet
28. Omar Al Khayyam
29. Jean Serre
30. Georg Cantor (0,25,13,6)
31. Muhammad Al-Khowarizmi
32. Sridhar Acharya
33. Johannes Kepler (53,49,0,0)
34. Albert Einstein
35. Hippocrates
51. Pafnuti Chebyshev
52. Charles Hermite
53. Richard Dedekind
54. George Boole
55. Andrey Kolmogorov

(0,20,0,0)
13. Pierre Fermat (17,12,0,0)
14. Alexandre Grothendieck (0,11,0,0)
15. Augustin Cauchy (15,21,0,0)
16. Apollonius
17. Pierre Laplace (5,36,0,0)
18. Niles Abel (40,13,0,0)
19. John Neumann (0,15,0,0)
20. Henri Poincare (90,7,6,0)
21. Bernhard Riemann (38,5,7,0)
22. Bhascar Acharya
23. Évariste Galois (84,14,8,0)
24. David Hilbert (0,9,5,0)
25. Srinivasa Ramanujan (0,19,0,0)
36. James Maxwell
37. Galileo Galilei
38. Jacob Steiner
39. Aristotle
40. Kurt Godel
41. Blaise Pascal (19,35,10,0)
42. Abu Biruni
43. Christiaan Huygens
44. Liu Hui
45. Nicolai Lobachevsky
46. Alex Clairaut
47. Jean Darboux
48. Panini
49. Johann Lambert
50. Hermann Minkowski
56. Jacob Bernoulli
57. Hipparchus
58. Alhazen
59. Godfey Hardy
60. Andrew Weil
61. Jean-Victor Poncelet
62. Jacques Hadamard
63. Francois Viate
64. Elie Cartan

The numbers in the brackets being the position in Eells' 1962 ranking, Allen's 1998 ranking, Pickover's 2001 ranking, Bellos's 2010 ranking, respectively.

Quotes

The following are notable and or relevant quotes:

"Taking mathematics from the beginning of the world to the time of Newton, what he has done is much the better half."

— Gottfried Leibniz (1700), told to the Queen of Prussia

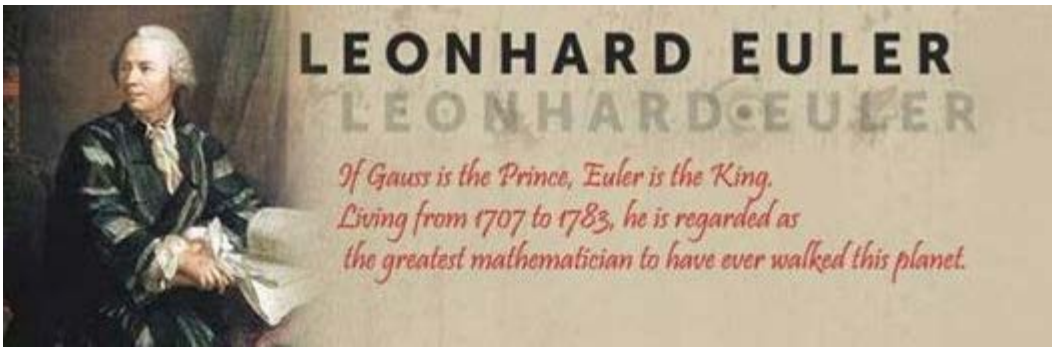

A related greatest mathematician image made by Indian mathematician Vinod Sir. [7] Euler also gets extra ranking points for blowing out both his eyes in the name of the proof; see: genius page (section: "physical and mental over-stressing").

"If we take the mathematics, and those mixed sciences to which they are applicable, it will be universally admitted that their most successful cultivators in France during the seventeenth century were Descartes, Pascal, Fermat, Gassendi, and Mersenne. Fermat, among these, was one of the most profound thinkers of the seventeenth century, particularly as a geometrician, in which respect he was second only to Descartes. The most important steps are those concerning the geometry of infinites, applied to the ordinates and tangents of curves; which he completed in or before 1636."

— Henry Buckle (1856), *History of Civilization, Volume One* (pg. 499-50)

"The **greatest mathematicians**, as Archimedes, Newton, and Gauss, always united theory and applications in equal measure."

— Felix Klein (c.1900) (Ñº)

"One of the properties inherent in mathematics is that any real progress is accompanied by the discovery and development of new methods and simplifications of previous procedures … The unified character of mathematics lies in its very nature; indeed, mathematics is the foundation of all exact natural sciences."

— David Hilbert (c.1910), Publication [8]

"You will see it written that Hadamard was the last of the universal mathematicians (see: last person to know everything) —the last, that is, to encompass the whole of the subject, before it became so large that this was impossible. However, you will also see this said of Hilbert, Poincare, **Klein**, and perhaps of one or two other mathematicians of the period. I don't know to whom the title most properly belongs, though I suspect the answer is actually Gauss."

— John Derbyshire (2003), *Prime Obsession: Bernhard Riemann and the Greatest Unsolved Problem in Mathematics* [9]

See also

- Greatest chemist ever
- Greatest physicist ever
- Greatest thermodynamicist ever
- Greatest philosopher ever
- Greatest engineer ever
- Polymath
- Last person to know everything
- Universal genius
- Last universal genius
- Genius IQs (top 1000 geniuses)
- IQ: 200+ | Smartest person ever
- IQ: 150+ | Smartest woman ever

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9. Derbyshire, John. (2003). *Prime Obsession: Bernhard Riemann and the Greatest Unsolved Problem in Mathematics* (pg. 159) (Ñº). Joseph Henry Press.

External links

- Greatest mathematician of All Time (2009) – TheScienceForum.com.

θΔics

In genius rankings, **greatest middle ages geniuses** (CR:25) refers to great shinning minds who existed amid the period of the middle ages, generally from the fall of Rome, in 474 to the beginning of the renaissance, in the 14th to 15th century, or from fall of the Roman Empire in the West (5th century) to the fall of Constantinople (1453), or, more narrowly, from c.1100 to 1453, or prior to the start of the Renaissance, loosely demarcated by the mind of Erasmus (1466-1536) as a turning point genius.

Rankings

The following is a ranked ordering, according to top 1000 genius rankings, of the top middle ages geniuses:]

	IQ	Person	IQ estimates	Description
1.	180 | 97	Roger Bacon (1214-1294)		(Cattell 1000:199) [RGM:364|1,310+] (Murray 4000:N/A) English natural philosopher; "Argument is conclusive, but it does not remove doubt, so that the mind may not rest in the sure knowledge of the truth, unless it finds it by the method of experiment." — Roger Bacon (c.1280) a two cultures genius, a last person to know everything claimant, a "savant with an enormous encyclopedic mind" (Hackett, 1980), and the so-called "first scientist" (Clegg, 2003), and originator of the scientific method; upgraded ↑ from 175±|#154 to 180|#109 (2017).
2.	180 | 120	Albertus Magnus (1205-1280)		(Cattell 1000:601) [RGM:N/A|1,330+] (Murray 4000:N/A) German-born chemical philosopher; "The aim of natural science is NOT simply to accept the statements of others, but to investigate the causes that are at work in nature." — Albertus Magnus (c.1270), "On Minerals" (*De Mineralibus*) (Q)(Q) oft-classified "universal genius" (Waite, 1815); aka "Universal Doctor" (*Doctor Universalis*) for the extraordinary depth of his knowledge and learning (Q); his affinity chemistry work marks the start of physical chemistry (Partington, 1937); cited by Mary Shelley (IQ:175|#225) as one of the three great pre-Newtonian "secrets of nature" probers, alongside Cornelius Agrippa (1486-1535) (Cattell 1000:c.660) (Q), and Paracelsus (IQ:175|194) (Cattell 1000:553).
3.	180 | 129	Avicenna (980-1037) ↑		(Cattell 1000:364) [RGM:307|1,500+] (GPhE:20±) (GCE:40±) (CR:20) (MAG:3) Persian physician, philosopher, chemist, and general polymath; Da Vinci claimed to disprove his child birth soul origin theory; first draft slating: 75 to 125 tier (Dec 2016). (Cattell 1000:N/A) [RGM:241|1,320+] (Murray 4000:N/A) Proposed the earth was a sphere, spinning daily on its axis orbiting the sun—also, in opposition to Aristotle's circular orbit theory, argued that perfect spherical orbits are impossible, thus predating the elliptical orbit theories of Johannes Kepler; that heavenly bodies were made of the same material as the earth; proposed

4. 180 | 141 Nicholas of Cusa (1401-1464)

dropping objects from towers to see why they fell as they did; described rules for experimentation; took the pulse; forecast the weather; argued for an infinite universe; invented reading glasses; wrote on squaring the circle, among other mathematical subjects; his best known work is his *Learned Ignorance*, according to which a person of learned ignorance is not a person of erudition (Q); Nicolaus Copernicus, Galileo Galilei, Giordano Bruno, and Kepler were all, supposedly, aware of his writings, the latter citing him in the first paragraph of his first published work; commonly labeled as a polymath also many-sided genius; first-draft gauged at 170-185 (2016).

5. 180 | 184 Genghis Kahn (c.1162-1227) IQ_B=180 IQ_O=120-125

[RGM:313|1,300+] Founder of the Mongol Empire, the largest contiguous empire (Q) in history; the secret of their power, was said to be their drinking of mare's milk, which heightened their intellect and warrior power; IQ Quora gauged (Q) at 120-125 (2017); Hmolpedia gauged (Q) as intellectually comparable to: Adolf Hitler (155|#573), Alexander the Great (180|#152), and Napoleon Bonaparte (180|#108), and Charlemagne (179|#180), by Morris Zucker (1945).

6. 175 | 222 Boethius (c.480-524AD)

(Cattell 1000:N/A) [RGM:N/A|1,320+] (Murray 4000:N/A) (Eells 100:96) Roman philosopher, mathematician, and senator; view: "there was an intelligence to the universe, which was once called fate, and now we understand it to be a universal force"; discoursed on the laws of love and the problem of evil; first-slating: 175|#211 (Mar 2018).

(Murray 4000:3|AL) (FA:32) (CR:10) Syrian-born blind philosopher, poet, skeptic, and irreligionist, aka the "Arab Lucretius" (Issa, 2016); ; is oft-compared to the following:

7. 175 | 233 Al-Marri (973-1057) IQ_{CP}=178

- Lucretius (99-55 BC) (IQ:180|#92) [RGM:N/A|1,260+] (Cattell 1000:209)
- Lucian (c.120-190AD) (IQ:175|#250) [RGM:N/A|1,250+] (Cattell 1000:387)
- John Milton (1608-1674) (IQ:180|#111) [RGM:330|1,250+] (Cattell 1000:16)
- Dante Alighieri (1265-1321) (IQ:175|#218) [RGM:51|1,260+] (Cattell 1000:42)

would yield him (Jun 2017) a four-person genius comparison synthesis intelligence of (IQ:178|#164) [RGM:191|1,260+] (Cattell 1000:164); which, rounding down on the safe side of genius ranking guesstimation, yields an first draft IQ of 175 mean position #173 (which falls in the 180 IQ ranges); therefore #206 intuited.

8. 175 | 250 Geber (c.721-c.815)

[RGM:630|1,500+] (CR:20) Arabian chemist, noted for his 'three principles' theory of generalized chemical properties, one of which, sulphur representative of combustion, was a precursor to the formulation of entropy; first-slating: IQ:175 (c.2017).

9. 175 | 253 Averroes (1126-1198) IQ_B=175

(Cattell 1000:347) [RGM:503|1,500+] (FA:38) (CR:16) Andalusian polymath, Aristotle commentator, and middle ages genius; his work on atheism was influential to those including: Siger of Brabant, Lucilio Vanini, and Salman Rushdie; he is associated with the "three impostors" hypothesis.

10. 175 | 266 Dante Alighieri (1265-1321) IQ_B=175

(Cattell 1000:42) [RGM:53|1,310+] Italian poet noted for his c.1310 *Divine Comedy*, wherein he tells the story of how he and Latin poet Virgil travel through the nine circles of hell towards, the ninth of which is frozen and at the center of the earth, where Satan resides, the location to which all heavy sinful matter is attracted; a logic based on an Aristotelian universe conception of things, where fire, being the lightest of the four elements, rises to the outer circles of the earth, in geocentric terms

11. 175 | 270 Alhazen (c.965-1040)

[RGM:616|1,500+] (GME:58) (CR:10) Arabic polymath;

"The seeker after the truth is not one who studies the writings of the ancients and, following his natural disposition, puts his trust in them, but rather the one who suspects his faith in them and questions what he gathers from them, the one who submits to argument and demonstration, and not to the sayings of a human being whose nature is fraught with all kinds of imperfection and deficiency. Thus the duty of the man who investigates the writings of scientists, if learning the truth is his goal, is to make himself an enemy of all that he reads, and, applying his mind to the core and margins of its content, attack it from every side. He should also suspect himself as he performs his critical examination of it, so that he may avoid falling into either prejudice or leniency."

— Alhazen (c.1020) (Q)

Noted for work in astronomy and optics, and for his semi "scientific method" like experimental work on light; first-slating: IQ:175 (c.2017).

12. 175 | 277 Frederick II (1194-1250)

(Cattell 1000:204) [RGM:N/A|1,310+] (FA:34) Italian-born German king who became the head of the Holy Roman Empire during its greatest territorial extent; purportedly originated of the *Treatise on the Three Impostors* (see: three impostors theory); conducted human experiments to test the truths of various religious models, e.g. that Adam and Eve were the first two humans (language deprivation experiments) and soul detection experiments; first-slating: 175|#250 (Mar 2018).

13. 175 | Petrarch (1304-1374)

(Cattell 1000:52) [RGM:150|1,310+] Italian scholar, poet, and philosopher; regarded by humanists as their first master; his discoveries of the lost works of Cicero were said to have initiated the Italian renaissance; quote: Written in the land of the living; on the right bank of the Adige, in Verona, in the year of that

283

god whom you never knew the 1345th" (compare: Goethean calendar); first-draft gauged at #240 (Dec, 2017).

(Eells 100:25) (CR:6) German astronomer and mathematician;

14. | 170
320 Regiomontanus (1436-1467)

"You, who wish to study great and wonderful things, who wonder about the movement of the stars, must read these theorems about triangles. Knowing these ideas will open the door to all of astronomy and to certain geometric problems."

> — Regiomontanus (1464), *On Triangles of Every Kind* (*De Trianguis Omnimodis*) (Q)

Noted for his *Epitome of the Almagest*, wherein he stated that Ptolemy was wrong; was the main shoulder genius of Copernicus; first-draft slotted at #250 (Jun 2017).

15. | 170
345 Thomas Aquinas (1225-1274) ↑↑ IQ_B=165

(Cattell 1000:384) [RGM:103|1,360+] (Murray 4000:6|WP) Italian theological philosopher;

16. | 170
366 William of Ockham (c.1288-1348) ↑

(Cattell 1000:N/A) [RGM:222|1,330+] (Murray 4000:N/A) English theologian, scholastic philosopher, and physicist; noted, in the history of atomic theory, for being critical of Aristotle; claimed that matter could be reduced down to elementary particles; popularly known for "Occam's razor", a problem solving principle, which states that among competing hypotheses, the one with the fewest assumptions should be selected; first-slating: IQ:170 (c.2017).

(RGM:719|1,500+) (FA:17) (CR:7) Persian physician, chemist, and polymath;

17. | 170
375 Al-Razi (865-925)

"As a result of being long accustomed to their religious denomination, as days passed and it became a habit. Because they were deluded by the beards of the goats, who sit in ranks in their councils, straining their throats in recounting lies, senseless myths, and 'so-and-so told us in the name of so-and-so …"

> — Zakariya Razi (c.910)

generally known for his discovery of alcohol; noted, in atheism, for being one of the first outspoken religion-questioners in the Islamic world; first-gauged: IQ: 150-180 (c.2016).

[RGM:345|1,500+] (GME:#) (GAE:#) (CR:5) Indian mathematician, astronomer, and physicist;

"Just as a person travelling on a boat fees that the trees on the bank are moving, people on the earth feel the sun is moving.

> — Aryabhata (c.520), *Publication* (Q); cited by Kishore Dash (2019) in *The Story of Econophysics* (pg. 2)

18. | 170 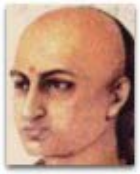

employed 62,832/20,000 (= 3.1416) for π; speculated, supposedly, that π (pi) is

	375	Aryabhata (476-550)		irrational, as later conjectured by Leonhard Euler, and proved by Johann Lambert (Q); stated that the earth rotates on its axis; classified as a physicist for his explicit mention of the relativity of motion; is said to have been the first to employ a zero symbol concept, and that his later countryman Brahmagupta was to use a zero symbol and the first to show that subtracting a number from itself results in zero (Q); a "24 smartest person ever" genius (Ratner, 2016) (Q); first-slating: 170|#375 (Apr 2020).
1#.	170 — 400	Johann Reuchlin (1455-1522)	IQ_C=170	(Cattell 1000:377) [RGM:262|1,310+] German-born humanist and Greek and Hebrew scholar.
19.	170 — 411	Maimonides (1135-1204)		(Cattell 1000:N/A) [RGM:398|1,320+] (Murray 4000:N/A); Spanish-born Moroccan physician-philosopher and theologian; a top middle ages genius; noted for his *circa* 1190 *The Guide of the Perplexed*, wherein he states that we should ignore accident-based atomic theory because it denies the existence of god; first-draft slating: 170|#350 (Jan 2018).
20.	170 — 414	Abu al-Suli (854-946) ↓	IQ_B=175	(Cattell 1000:N/A) [RGM:N/A|1,500+] Arab poet, scholar, and chess player; non-notability downgrade 175|#298 to 170|#358 (Feb 2018).
21.	165 — 436	Geoffrey Chaucer (1343-1400)		(Cattell 1000:170) [RGM:296|1,500+] English poet and author; widely considered the greatest English poet of the Middle Ages, he is best known for The Canterbury Tales; in the film *Se7en* (1995), the *Parson's Tale*, the intended final tale of his *The Canterbury Tales*, is an important clue to the methods of a serial killer who chooses his victims based on the seven deadly sins; slotted at #320 based on his RGM position (Jun 2017).
22.	165 — 458	Al-Battani (c.858-929)		Arab astronomer and mathematician; referred to as the "Ptolemy of the Arabs"; considered the greatest and best known astronomer of the medieval Islamic world; noted for his work in trigonometry; quoted by Copernicus; cited by Guericke (1663) who he refers to as the "follower [or successor] of Ptolemy"; first-slating: 165|#445 as 10 IQ points below Ptolemy (Feb 2009).
23.	165 — 450	Robert Grosseteste (1170-1253)		[RGM:764|1,500+] (MAG:23) (CR:4) English scholastic philosopher, statesman, and theologian, generally noted as an early formulator of the scientific method, particularly in respect to controlled experiment; influenced: Roger Bacon, Bonaventure, and Johannes Kepler; first slating: 165|#450 (Aug 2019).
2#.	165 — 451	John Philoponus (c.490-570)		[RGM:772|1,500+] Roman philosopher, scientist, theologian, grammarian (Q), and astronomer (Q); "Philoponus is one of the greatest geniuses of antiquity." — Pierre Duhem (1913), *The System of the World* (*Le système du monde*) noted for commentary on Democritus; for his impetus theory of motion; influential to: Avicenna, Bonaventure, John Buridan (or Jean Buridan), and Galileo, the latter of whom, in his *The Two New Sciences* (1638), cites Philoponus, and the later development of inertia (principle of inertia); first-slating: IQ:165|#451 (Jan 2019).

23. | 160 | 509

Bede (672-735)

(Cattell 1000:878) [RGM:649|1,310+] (Murray 4000:N/A) English historian and monk; noted for being one of the first to connect John the Baptist with the Aquarius constellation; recounted the “warm sparrow” anecdote Christianity adoption in England; his *Ecclesiastical History of the English People* (1731) gained him the epitaph as the “father of English history”; first-slating: 160|#431 (Mar 2018).

24. | 160 | 525

Sandro Botticelli (1445-1510)

(Cattell 1000:N/A)

[RGM:160|1,320+] (Murray 4000:N/A) Italian painter; noted for: *The Birth of Venus*, e.g. as illustrated in the Lucretius article, Sistine Chapel works, etc.; first-slating: 160|#440 per crude artistic geniuses rankings (Feb 2018).

25. | 160 | 529

Omar Khayyam (1048-1131)

[RGM:443|1,500+] (HD:1) (FA:18) (CR:9) Persian philosopher, mathematician, astronomer, nonbeliever;

“The Koran! Well, come put me to the test; lovely old book in hideous error drest. Believe me, I can quote the Koran too; the unbeliever knows his Koran best. And do you think that unto such as you, a maggot-minded, starved, fanatic crew, god gave the secret, and denied it me? Well, well, what matters it! Believe that too.”

— Omar Khayyam (c.1120), a statement of disbelief in Islam (Q)

known as a skeptic, whose poetry satirized the claims and practices of religion (Hitchens, 2007); an seeming "Persian Voltaire" so to say; first-gauged: IQ:160 (c.2017).

26. | 160 | 534

Hildegard Bingen (1098-1179) ↑↑

[RGM:209|1,500+] [GMG:14] German Benedictine abbess, writer, composer, philosopher, Christian mystic, visionary, and polymath; a smartest woman ever (Q) (IQ:150+) candidate; first-slating: IQ:160 (c.2015).

27. | 160 | 539

Virgil of Salzburg (c.700-784)

(Cattell 1000:N/A) [RGM:N/A|1,350+] (Murray 4000:N/A) Irish abbot; noted for his teaching of the “antipodal” humans theory, namely that the earth was round, had an “antipode” point, as professed by Pythagoras, Aristotle, Eratosthenes, Macrobius, and Bede, and that there were other people at these antipodes; the church condemned him has a heretic and to be burned, per reason that these other antipodal people would not be descendants of Adam and Eve, and therefore not saved by Christ; was an inspiration to Johannes Kepler; ranked as a great scientific martyr, alongside Galileo and Aristotle (Holbach, 1770); first-slating: 160|#490 (Feb 2018).

28. | 160 | 566

Al-Kindi (c.800-873)

[RGM:745|1,500+] (CR:1) Muslim Arab philosopher, polymath, mathematician, physician, musician cryptographer (Q); top ten middle ages genius; one of the first to initiate the import of Greek philosophy into Arabic thinking, including: Socrates, Aristotle, Plotinus, and Euclid; was one of the first blue sky problem theorists; an alchemy debunker, e.g. asserting that base

metals cannot be transformed into gold or silver; first-slating: IQ:160|#556 (Jan 2019).

29. 160 | 567 Abu Al-Biruni (973-1048)

(GME:43) (CR:8) Iranian-born Afghanistan astronomer, mathematician, physicist, comparative religions scholar, a universal genius claimant;

"The difference between you and me is that you're a philosopher and I'm a [mathematical] scientist."
— Abu Al-Biruni (c.1020), "Letter to Avicenna"

A top 20 scientific genius of the middle ages. [5] First-slating: 160|#567 (Jan 2019).

30. 160 | 570 Peter Abelard (1079-1142)

(Cattell 1000:110) [RGM:N/A|1,360+] French scholastic philosopher, theologian, and logician, characterized a "fine genius" (Bayle, c.1693) and "keenest thinker of the 12th century" (Chambers, 1897); first-slating: 160|#517 (Mar 2018).

31. 145 | 663 Jan Zizka (c.1360-1424) IQ_{B}=145

(Cattell 1000:N/A) [RGM:N/A|1,310+] Czech general; his Battle of Kutna Hora (1421), wherein he defeated the army of the Holy Roman Empire and Hungary, was the first case of recorded use of field artillery (previously, artillery was used only during sieges of towns); one of several commanders in history who never lost a battle (alongside Alexander the Great, Bai Qi, Scipio Africanus, Julius Caesar, Khalid ibn al-Walid, Subutai, Yi Sun-Shin, the Duke of Marlborough, Alexander Suvorov, Fyodor Ushakov, and Paul von Lettow-Vorbeck); his skin, according to his dying wish, was used to make drums so that he might continue to lead his troops even after death.

32. 145 | 664 Meister Eckhart (1260-1327)

[RGM:266|1,500+] German theologian, philosopher, and spiritual mystic;

"Only the hand that erases can write the true thing."
— Meister Eckhart (c.1310) (Q)

first-slating: 145|#664 (2018).

33. 145 | 673 Poggio Bracciolini (1380-1459)

(Cattell 1000:694) [RGM:N/A|1,310+] Italian papal secretary; his 1417 discovery of Lucretius' *On the Nature of Things* (55BC) together with Petrarch's 1385 find of the lost *Letters of Cicero* (50BC) are said to have initiated the Italian renaissance; first-draft gauged at #515 (Dec, 2017).

34. 145 | 674 Marco Polo (1254-1324)

(Cattell 1000:127) [RGM:107|1,350+] (Murray 4000:N/A) Italian merchant, explorer, and writer; first-slating: 145|#610 (Mar 2018).

35. 140 | 698 Thomas of Kempis (c.1380-1471)

Dutch-German cannon; noted for his *The Imitation of Christ*, advocating inner existence, over vanity and worldly affairs; supposedly, this was a precursor to the later reformation by Martin Luther influential to Thomas More, and Alfred Rogers; first-slating: IQ:140|#697 (Jan 2019).

(add)

Other

The following is a chronological listing of other purported to be middle ages geniuses, albeit unranked, presently:

Middle Ages Geniuses

#	Person	IQ Estimation	Description
	Isidore of Seville (c.560-636)		
1.	Brahmagupta (598-670)		Introduced the idea of zero; explained negative numbers, a concept thought to be “absurd” by the Greeks.
2.	Paul of Aegina (625-690)		
4.	Al-Jahiz (776-869)		Expanded on Aristotle (Q); known as the Voltaire (Q) of the Arab language, akin to al-Marri known as the Lucretius of the Arabs.
5.	Al Khwarizmi (780-850)		Inventor of algebra coiner of “algorithm”.
7.	Abu Isa al-Warraq (c.815-870)		Early Islam skeptic and god doubter; friend and mentor to Ibn al-Rawandi.
8.	Thabit Ibn Qurra (826-901)		
9.	Ibn al-Rawandi (827-c.880)		A former Shia, turned free thinker and "radical atheist"; a skeptic of Islam and a critic of religion in general.
12.	Alpharabius (Abu Nasr Al-Farabi) (c.872-950)		
13.	Abu Zahrawi (936-1013)		
18.	Ibn Hazm (994-1064)		Noted love poetry scholar.
19.	Al-Ghazali (Algazel) (c.1058–1111)		[6]
20.	Ibn Zuhr (1094-1162)		Described by Maimonides as “unique in his age and one of the great sages”; colleague of Averroes.
22.	Al-Jazari (1136-1206)		Mechanical engineering genius; author of *Book of Knowledge of Mechanical Devices* (Q)
24.			
25.	Ibn Al-Baitar (1197-1248)		
	Ramon Llull (1232-1315)		
	Siger of Brabant (c.1240-1284)		
27.	Nicole Oresme (1320-1382)		

28. Ibn Khaldun (1332-1406) IQ_{SK}

[RGM:470|1,500+] Arabian historiographer, historian, sociologist, demographer, and economist; a 2013 ListVerse.com rankrf “Top 10 Medieval Scientists Smarter than Einstein” [1]; gauged (Q) at IQ of 190 by Sperging Kermit (Jan 2019); not too much interesting in his Wikiquote (Q) page.

(add discussion)

Golden age | 750-1258

The four big scientific figures, to have flourished amid Islam’s golden age (750-1258), according to Algerian-born astrophysicist Nidhal Guessoum (2010), are: [4]

1. Al Khwarizmi (780-850) | Inventor of algebra coiner of “algorithm”.
2. Alhazen (Ibn al-Haytham) (c.965-1040)
3. Avicenna (Ibn Sina) (980-1037)
4. Abu Al-Biruni (973-1048) | Oft-cited universal genius; top 20 scientific genius of the middle ages [5]

ListVerse

The following is a 2013 ListVerse.com ranking of the “Top 10 Medieval Scientists Smarter than Einstein”: [1]

1. Thomas Aquinas (1225-1274)
2. Al-Ghazali (Algazel) (c.1058–1111)
3. Paracelsus (1493-1541)
4. Abu Zahrawi (936-1013)
5. Averroes (Ibn Rushd) (1126-1198)
6. Al Khwarizmi (780-850) | Inventor of algebra coiner of “algorithm”.
7. Albertus Magnus (c.1200-1280)
8. Paul of Aegina (625-690)
9. Ibn Khaldun (1332-1406)
10. Avicenna (Ibn Sina) (980-1037)

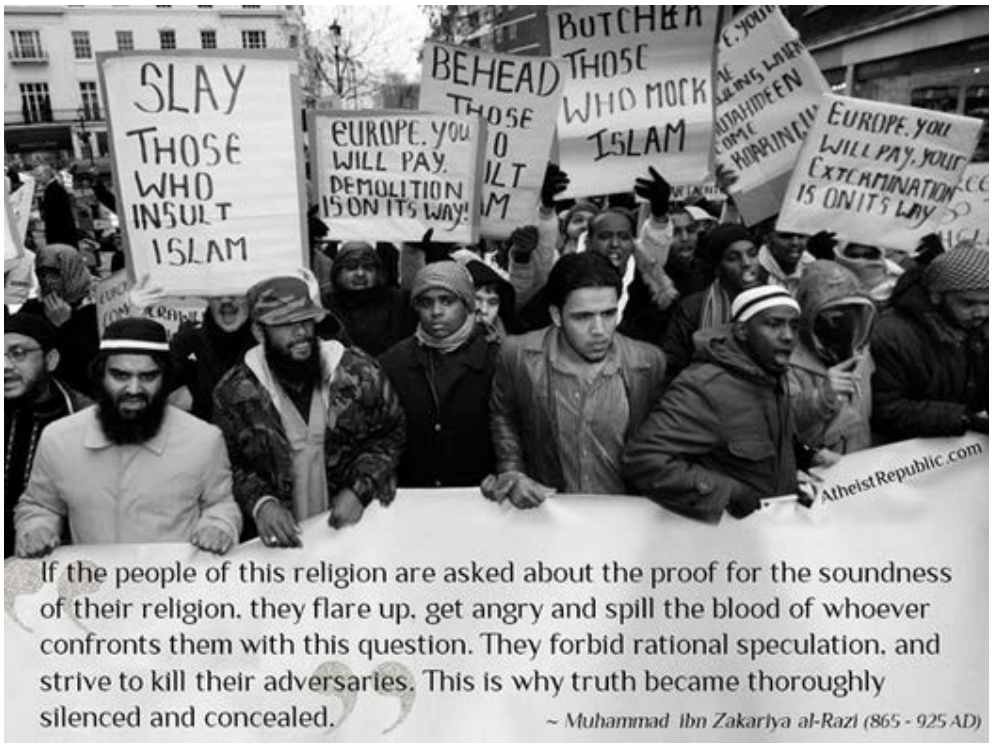

Other

The following is are the three middle age geniuses from Tom Siegfried’s 2014 list of top 10 unsung geniuses: (Q)

8. Nicole Oresme (1320-1382)
9. Robert Grosseteste (1170-1253)
10. Brahmagupta (598-670) | Introduced the idea of zero; explained negative numbers, a concept thought to be “absurd” by the Greeks.

The others, being non-middle age geniuses, are: 1. Emmy Noether, 2. Emile Borel, 3. William Clifford, 4. Adolphe Quetelet, 5. Mary Somerville (1780-1872), 6. Antoine Parent (1666-1716), and 7. Thomas Harriot (1560-1621).

The following is a selection (Q) of so-labeled "Muslim geniuses":

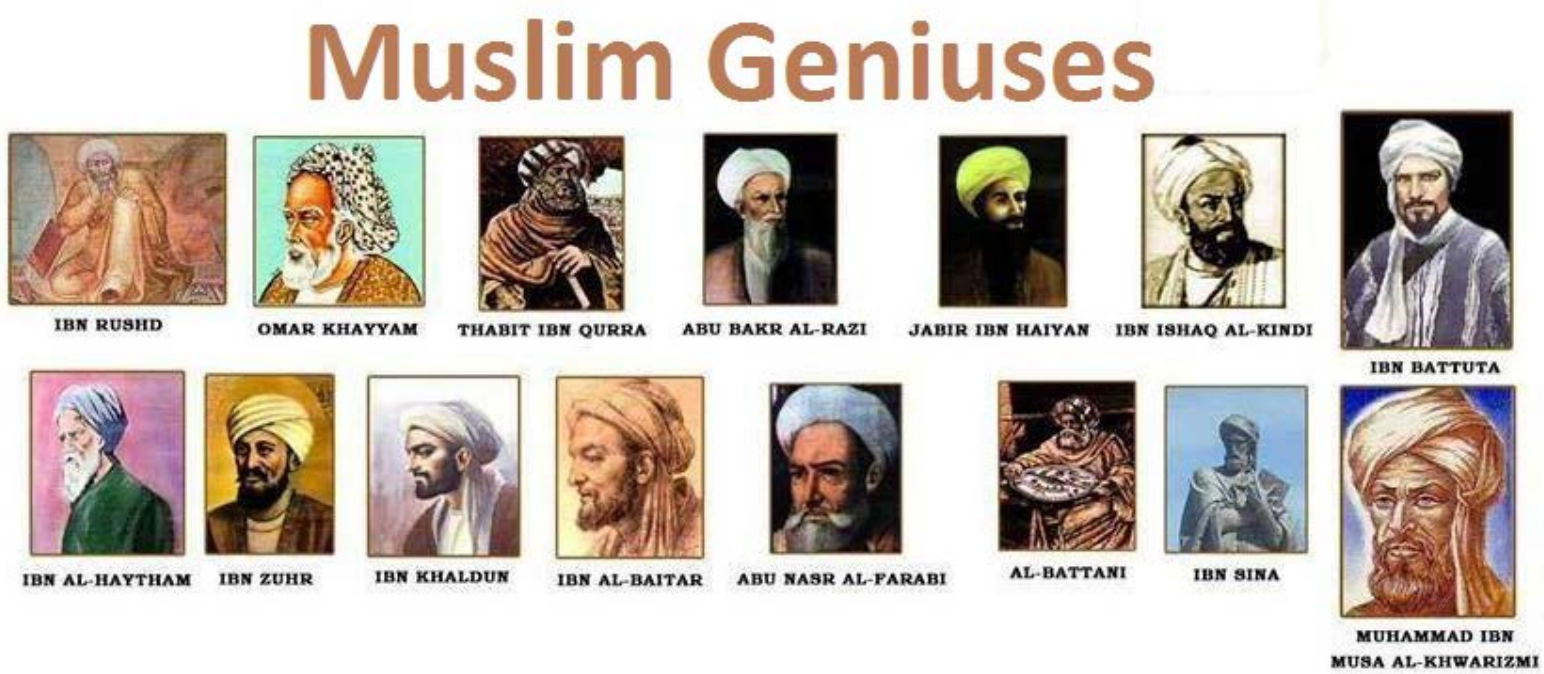

(add)

Quotes

The following are related quotes:

> "The regions in between the gods and men were believed to be inhabited by cosmic messengers or *daemons*. Eventually the Greek concept of the *daemon* influenced the Roman *genius*, so that each man was said to possess a 'soul' (*genius* or *daemon*) born with him. The messenger *daemon*, under the influence of Christianity, became an evil demon or renegade angel connected with astrology, dreams, and the black arts, and was itself replaced by the good angel."
>
> — Jane Nitzsche (1975), *The Genius Figure in Antiquity and the Middle Ages*

> "The three worst zindiqs [anti-religionist radicals] of Islam, according to Islamic literary tradition, were: al-Rawandi, al-Tauhidi, and al-Mararri."
>
> — Jennifer Hecht (2004), *Doubt: a History* (pg. 231)

A 1974 cover story article **middle ages genius** Abu Al-Biruni (973-1048), known as a universal genius, for his his work in astronomy, history, botany, pharmacology, geology, poetry, philosophy, mathematics, geography, and comparative religion, and the humanities. [3]

> "**Ibn al-Haytham** [Alhazen] was certainly the world's greatest physicist in the almost two millennia gap between Archimedes and Galileo. There were others, like Biruni, Al-Kindi, Khwarizmi (it's a long list) but none of the others did physics (theory and experiment) in way we understand the subject today."
>
> — Jim Al-Khalili (2019), Tweet (Q), Jan 10

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2. (a) Nitzsche, Jane C. (1975). *The Genius Figure in Antiquity and the Middle Ages*. Columbia University Press.
(b) Nicholls, Angus J. (2006). *Goethe's Concept of the Daemonic: After the Ancients* (pg. 76). Camden House.

3. Gafurov, Bobojan. (1974). “Al-Biruni: A Universal Genius in Central Asia a Thousand Years Ago”, *Courier* (pgs. 4-9), Jun.
4. Guessoum, Nidhal. (2010). “Interview: Islamic Golden Age”, in: *Atoms and Eden* (§16:215-28; Al-Biruni, pg. 217). Oxford University Press.
5. Salah, Abeer. (2015). *One Giant Step for Mankind: One Verse at a Time* (pg. 61). Cedar Graphics.
6. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (Al-Ghazzali, pgs. 233-37; Averroes, pgs. 237-39). HarperOne.

θΔics

In genius studies, **greatest military geniuses** refers to []

Ranking

The following is a work in progress ranking of military geniuses, the first-draft ordering of which derived from IQ|# ranking in the as found in the top 1000 geniuses rankings:

	IQ	Person	IQs cited	Description
1.	180 — 107	Napoleon Bonaparte (1769-1821)	IQ_U=186 IQ_B=180 IQ_{CB} =**163** IQ_C=145 IQ_W=142	(Cattell 1000:1) [RGM:149|1,320+] (CR:34) (HD:20) (FA:67) French military leader, emperor, and philosopher; Nietzsche uberman (IQ:186+); was the first to systematically query all leading French scientists about theory atheism belief (see: Napoleon Laplace anecdote); high military IQ; Goethe and Napoleon were mutual devotees of each other; read Goethe's *Sorrows of Young Werther* over six times during his various campaigns; was on a philosophical bent ascertain (or disprove) the theory or location of the soul in the context of modern physical science.
2.	180 — 153	Alexander the Great (356-323BC)	IQ_O=200 IQ_B=180	(Cattell 1000:17) [RGM:83|1,320+] Greek emperor-warlord; tutored by Aristotle; by age of thirty, he had created one of the largest empires in ancient history; established the Library of Alexandria, unified Greek science with Egyptian theology to form the forerunner religion to what, in the Roman recension would become Christianity (some argue, that via a reformulation of Osiris-Horus, he was prototype to Jesus); carried the works of Homer and Aristotle into battle (Ñº); cited by some (Ñº) with IQ of 200.
3.	180 — 180	Charlemagne (c.1742-814)		[RGM:176|1,500+] Frankish king; noted for his rulee of much of Western Europe from 768 to 814; classified, by Morris Zucker (1945), with Alexander the Great, Napoleon, and Genghis Kahn, in *The Philosophy of American History: The Historical Field Theory* (pg. 57), the four dominate examples of "purely synthetic creations of individual genius", in respect to great man theory of history.
4.	180 — 183	Genghis Kahn (c.1162-1227)	IQ_B=180 IQ_O=120-125	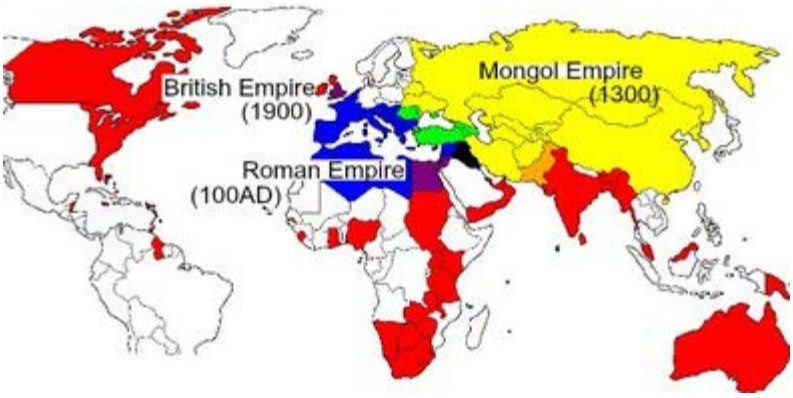 [RGM:313|1,300+] Founder of the Mongol Empire, the largest contiguous empire (Ñº) in history; the secret of their power, was said to be their drinking of mare's milk, which heightened their intellect and warrior power; IQ Quora gauged (Ñº) at 120-125 (2017); Hmolpedia gauged (Ñº) as intellectually comparable to: Alexander the Great, and Napoleon Bonaparte, and Charlemagne, by Morris Zucker (1945).
		Julius Caesar		(Cattell 1000:8) [RGM:131|1,320+] Roman general, statesman, Latin

5.	170 | 341	(I00-44BC)	IQ_B=170	prose author; noted for his critical role in the events that led to the demise of the Roman republic and the rise of the Roman empire; Nietzsche uberman (IQ:186+).
6.	165 | 451	Frederick the Great (1712-1786)		(Cattell 1000:49) [RGM:N/A|1,320+] [GCH:12|300+] Prussian king, from 1740 to 1786, and philosopher noted for being the host to Voltaire, when he was banished from France, for appointing, per suggestion of Pierre Maupertuis, Julien la Mettrie as his court physician, who was posthumously referred to as the "court atheist" (or "royal atheist") by Voltaire, and for his general efforts to promote French enlightenment stylized ideals in the Prussian empire; first slating: 170|#311 (Jan 2018); second-slating: 165|#405 (Apr 2018) per Frederick II and Francois Vayer rankings. 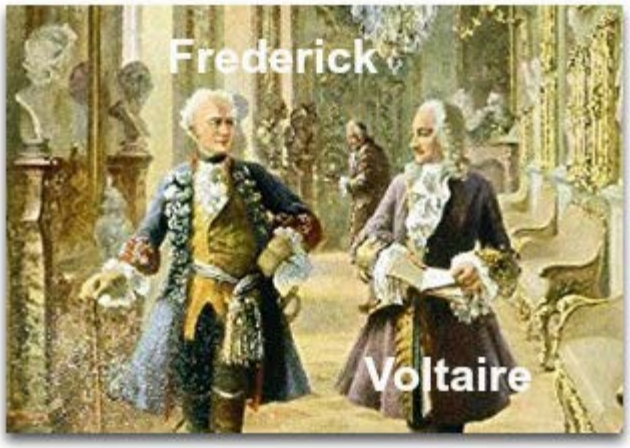
7.	165 | 472	Sun Tzu (c.540-496BC)	IQ_B=165	(RGM:45|1,500+) [GCH:34|300+] a top ranked Chinese genius; purported author of the *Art of War*.
8.	165 | 510	Norman Schwarzkopf (1934-2012)	IQ_O=170 IQ_O=150-168	High school valedictorian; MS in mechanical and aerospace engineering; went on to successfully lead all coalition forces during Persian Gulf War (1990-1991).
9.	155 | 605	Carl Clausewitz (1780-1831)		[RGM:226|1,500+] (GMG:9) (CR:9) Prussian general noted for his moral, i.e. “moral force”, and romantic theory of warfare, who in his 1832 posthumously-published treatise *On War*, used the principle of friction to distinguish real war from the mechanical, Newtonian world; a Philoepisteme “top 10 missing” (Ñº) top 1000 geniuses candidate (2018); first-slating: 155|#605 (Oct 2019).
10.	155 | 617	Adolf Hitler (1889-1945)	IQ_{SS}=143 IQ_O=125-150	TopTens.com's "10 Smartest People in History" (Ñº); IQ cited at: 125 (Ñº), 130 (Ñº), and 150 (Ñº); must be at least comparable to: Alexander the Great, Genghis Khan, or Napoleon, all of which sought world domination.
		Simon Bolivar	IQ_C	

1#.	155 — 618		(1783-1830)	=155 IQ_W=145	(Cattell 1000:N/A) [RGM:640|1,500+] [GCH:277|300+] Venezuelan statesman and military leader; noted for []
11.	155 — 619		Hannibal (247-182BC)	IQ_B=155	(Cattell 1000:107) [RGM:N/A|1,500+] Carthaginian military commander (see: greatest military genius); noted as the man who nearly brought Rome to its knees.
12.	155 — 654		Robert Blake (1599-1657)	IQ_C=155	(Cattell 1000:460) [RGM:N/A|1,310+] [GCH:42|300+] English admiral.
13.	150 — 663		Horatio Nelson (1758-1805)	IQ_{CB} =**148** IQ_C=150 IQ_B=145	(Cattell 1000:N/A) [RGM:N/A|1,500+] [GCH:6|300+] British naval commander and national hero; famous for his naval victories against the French during the Napoleonic Wars.
14.	150 — 678		John Franklin (1786-1847)	IQ_C=150	(Cattell 1000:442) [RGM:N/A|1,310+] English naval officer.
15.	150 — 679		Auguste de Marmont (1774-1852)	IQ_C=150	(Cattell 1000:174) [RGM:N/A|1,310+] French marshal.
16.	145 — 694		Jan Zizka (c.1360-1424)	IQ_B=145	(Cattell 1000:N/A) [RGM:N/A|1,310+] Czech general; his Battle of Kutna Hora (1421), wherein he defeated the army of the Holy Roman Empire and Hungary, was the first case of recorded use of field artillery (previously, artillery was used only during sieges of towns); one of several commanders in history who never lost a battle (alongside Alexander the Great, Bai Qi, Scipio Africanus, Julius Caesar, Khalid ibn al-Walid, Subutai, Yi Sun-Shin, the Duke of Marlborough, Alexander Suvorov, Fyodor Ushakov, and Paul von Lettow-Vorbeck); his skin, according to his dying wish, was used to make drums so that he might continue to lead his troops even after death.
17.	145 — 706		John Churchill (1650-1722)	IQ_C=145	(Cattell 1000:187) [RGM:N/A|1,310+] [GCH:11|300+] British general.
18.	140 — 717		George Washington	IQ_{CB} =**140** IQ_C=140 IQ_B=140 IQ_W=135	(Cattell 1000:19) [RGM:50|1400+] [GCH:85|300+] (EPD:F11) American political leader, military general, statesman, and Founding Father who also served as the first president of the United States from 1789 to 1797; noted for his "Crossing of the Delaware", an Art of War stylized surprise attack, on Christmas eve Dec 25, 1776, during the Revolutionary War, against the Hessian forces in Trenton, New Jersey.

		(1789-1797)		
19.	140 — 727	Hernan Cortes (1485-1547)	IQ_C=140	(Cattell 1000:219) [RGM:N/A|1,310+] [GCH:128|300+] Spanish soldier; conqueror of Mexico.
20.	140 — 728	Giuseppe Garibaldi (1807-1882)	IQ_C=140	(Cattell 1000:234) [RGM:N/A|1,310+] [GCH:157|300+] Italian general, politician, and nationalist.
21.	140 — 730	Robert Lee (1807-1870)	IQ_C=140	(Cattell 1000:585) [RGM:N/A|1,310+] American general.
22.	140 — 731	George Monk (1608-1670)	IQ_C=140	(Cattell 1000:317) [RGM:N/A|1,310+] English general.

Other

Redditor u/spergingkermit thinks Charles XII (1682-1718) is a military genius (Ñº) with a guesstimated IQ of 165 (Ñº). George Patton (1885-1945) [GCH:12|300+] will likely rank high.

See also

â— War thermodynamics

Videos

â— Anon. (2019). “100 Greatest Generals in History” (Ñº), Cottereau, Mar 15.

θΔics

In genius studies, **greatest moral genius** (GMG:#) refers to a moral philosopher whose ideas or theories on morality and ethics ventures into the genius range of thinking (see: geniuses on).

Overview

The following is a work-in-progress ranking of the top moral geniuses of all time:

	IQ	Person	IQ estimates	Description
1.	225 | **1**	Johann Goethe (1749-1832)	IQ_{O}=240 IQ_{MM}=225 IQ_{BR}=233 IQ_{B}=215|#2 IQ_{SK}=215|#4 IQ_{CB}=**213** IQ_{C}=210|#1 IQ_{SS}=210, 200+, 188 IQ_{W}=200 IQ_{O}=180	Stated, based on the principles of affinity chemistry and evolution, that the what is "moral" in nature and society, is determined by the "moral symbols" of physical chemistry, Torbern Bergman's affinity reaction symbols, specifically; a theory which he outlined in coded form, in his *Elective Affinities* (1809).
2.	185 | 75	Immanuel Kant (1724-1804)	IQ_{O}=250+ IQ_{C}=175	In 1785, introduced his famous "categorical imperative" of moral action, influential to many; "There is only a single categorical imperative and it is this: act only on that maxim through which you can at the same time will that it should become a universal law. — Immanuel Kant (1797), *Metaphysics of Morals* (Ñº) oft-cited in modern terms as certain actions being a "moral imperative".
3.	180 | 95	Niccolo Machiavelli (1469-1527)	IQ_{B}=165	
4.	185 | 69	John Mill (1806-1873)	IQ_{O}=200 IQ_{EM}=190 IQ_{B}=185 IQ_{CB}=**183** IQ_{C}=180	In c.1958, building on Kant's categorical imperative (1785) and Ostwald's energetics imperative (1906), during his physics lectures at

Brown University, began to teach students an outline of a "thermodynamics imperative", using entropy to base ethics; later elaborated in his 1963 book *The Role of Science in Civilization*, among other talks.

"The second law conveys, to me, the distinct suggestion that we as individuals should endeavor to consume as much entropy as possible to increase the order in our environment. This is the **thermodynamic imperative**, possibly not unworthy to rank alongside the categorical imperative of Kant or even the golden rule."

— Bruce Lindsay (1970), "The Larger Cybernetics" (pg. 134)

5.

Bruce Lindsay (1900-1985)

In his last years (age 83) he was getting close to the correct view of morals based on the minimum principles of physics:

"Hamilton's principle, e.g., says that for a conservative dynamical system the motion between any two instants of time is such that the time integral of the difference between the kinetic and potential energies taken between these two instances has a stationary value. **It has as if the system had a certain purpose to satisfy. A rational individual is said to arrange his actions so as to be sure of achieving his fundamental desires**, whether it be to accumulate wealth or gain power over his fellow men. In particular, the aim here is almost always to try to attain the given desired end at minimum cost in human effort. This **strongly suggests a heuristic connection with the [Gibbsian] minimum principles of physics**."

— Bruce Lindsay (1983), "Social Exemplifications of Physical Principles"

In other words, according to Lindsay, although he does not say this explicitly, an ethics based on Gibbs energy minimization is the modern realization of Kant's categorical imperative.

English jurist and philosopher;

"Snow is the spokesperson for the technologico-Benthamite reduction of human experience to the quantifiable, the measurable, the manageable."

— Frank Leavis (1962), "The Significance of C.P. Snow"

6.

Jeremy Bentham (1748-1832)

noted for his 1789 *Introduction to the Principles of Morals and Legislation*, wherein he took ideas from: Helvetius, Denis Diderot, Voltaire, John Locke, and David Hume, while simultaneously discarding ideas from: Plato, Aristotle, and Immanuel Kant, e.g. his "categorical imperative" (1785), and therein introduced the so-called: 'utilitarianism' system of morality, wherein he suggested that we forget about parsing "good and evil" and work logically to minimize pain and

increase pleasure; aimed at the greatest happiness for the greatest number; teacher of John Mill.

His 1849 *Nemesis of Faith*, wherein he digresses on the "will of the copper" in relation to heated and cooled magnets, was burned in moral philosophy class at Oxford;

7. | 180 | 161

James Froude (1818-1894)

"What is man the wiser or the happier for knowing how the air-plants feed, or how my centuries the flint-stone was in forming, unless the knowledge of them can be linked on to humanity, and elucidate for us some of our hard moral mysteries?"

in 1854, he became the first English translator of Goethe's *Elective Affinities*, done anonymously per reasons of caution as to its Christianity overthrowing contents

Oft-referred to "Newton of moral sciences" (Foley, 1990);

"There has been an opinion very industriously propagated by certain philosophers, that morality is susceptible of demonstration; and though no one has ever been able to advance a single step in those demonstrations; yet it is taken for granted, that **this science** may be brought to an equal certainty with geometry or algebra. Upon this supposition, vice and virtue must consist in some relations."

— David Hume (1740), *Treatise on Human Nature* (§3.1-3.3: Of Morals, pgs. 455-603; quote, pg. 463)

8. | 180 | 111

David Hume (1711-1776)

IQ_C=180

his 1740 *A Treatise of Human Nature* (1740), which its morality section, wherein the "Is-ought problem" is presented (Ñº)(Ñº), and "On the Immortality of the Soul" (c.1770), where, according to Miguel Unamuno, launching points, in respect to criticism, for Immanuel Kant's 1788 *Critique of Practical Reason*, wherein his categorical imperative is presented.

9. | 190 | **29**

Friedrich Nietzsche (1844-1900)

IQ_Q=190, 210
IQ_{SS}=160, 200, 200+
IQ_O=180
IQ_O=186
IQ_O=180

His *Beyond Good and Evil* (1886) and *On the Genealogy of Moral s* (1887) attempted to digress on morals from a nihilistic and or atheistic point of view.

10. | 180 | 103

Cicero (106-43BC)

190

In c.1906, building on Kant's categorical imperative (1785), introduced

11.	— 38 Wilhelm Ostwald (1853-1932)		an energetics-based "energetic imperative".
12.	William Wollaston (1659-1724) ↑↑		His 1722 *The Religion of Nature Delineated*, which contains the "pursuit of happiness" moral ideology of the American declaration of independence, attempted, supposedly, the first systematic proof of a system of ethics based on nature alone, without revealed wisdom, akin to what Newton had done, via inducing moral laws through a mathematical model of the world (Ñº); seems to have been the goad behind Hume's 1740 morality chapter of his *Treatise on Human Nature*.
13.	— 180 — 186 Francis Edgeworth (1845-1926)		His 1881 *Mathematical Psychics: an Essay on the Application of Mathematics to the Moral Sciences*, in the first part of which he attempts to meld utilitarianism (principle of maximal happiness) with the Lagrangian-Hamiltonian description of the energy of a system (principle of maximum energy), along the way citing and discussing the ideas of thinkers, including: Henry Sidgwick (1838-1900), and his ethical hedonism theory, Jeremy Bentham, Stanley Jevons, among others, all done in aims to outline or make a calculus, i.e. minima or maxima calculation, based model of the humanities, or what he calls "utilitarian calculus".
14.	— 180 — 168 Socrates (c.469-399BC)	IQ_{SS}=235 IQ_{O}=185+ IQ_{B}=160	Purported a "moral genius like Kant" according to Albert Schweitzer (1899).
15.	Henry Sidgwick (1838-1900)		Argued, supposedly, that 'good is indefinable' and that 'ought is unanalyzable' (Moore, 1903) (Ñº); influenced Francis Edgeworth.
16.	George Moore (1873-1958)		His 1903 *Principia Ethica* (Ñº), attempted to argue, via citation to Sidgwick's 'good is indefinable' conjecture, that one cannot equate the property of 'goodness' with some non-moral property, whether naturalistic (e.g. pleasure) or supernatural (e.g. god's command).

(add)

Quotes

The following are related quotes:

> "Through causes of which we are ignorant, analogous to those which produce a great poet, or a great painter, men of **moral genius** arise, who 'feel' what others do not feel, exactly as the poet or painter feel and see what others appear to be insensible to."
>
> — Theodule Ribot (c.1880) (Ñº)

> “In analogy to the ‘religious genius’, the ‘**moral genius**’ likewise presents itself as the accomplishment of a higher unity in evaluating phenomena on the basis of the dominant moral determination of the person. Socrates accomplished this unity in appraising the world of appearances morally without feeling the need for extending this unity to the whole field of events and seizing as unitary all happenings in the world in a moral evaluation. Kant, too, is a moral genius like Socrates—and one of overwhelming magnitude. He is a moral genius in that he comprehends and undertakes scientific research merely for the purpose of demonstrating the reality of the moral law. At the moment when, in the development of the epistemological problem posed by Descartes, the consequences were drawn from his moral indifference—which a Spinoza could still pass over lightly—Kant, in his critical investigations, so transforms the setting and solution of the problem that it tends toward a moral interpretation of the world.”
>
> — Albert Schweitzer (1899), *The Essence of Faith: Philosophy of Religion* (pg. #)

> “It is the privilege of man’s **moral genius**, impersonated by inspired individuals, to advance ethical axioms which are so comprehensive and so well founded that men will accept them as grounded in the vast mass of their individual emotional experience. Ethical axioms are found and tested not very differently from the axioms of science. Truth is what stands the test of experience.”
>
> — Albert Einstein (c.1940), *Out of My Later Years*

See also

â— Moral power

References

1. Massoudi, Mehrdad. (2016). “A Possible Ethical Imperative Based on Entropy Law” (pdf), *Entropy*, Discussion, Nov 3.

θΔics

In genius studies, **greatest musical geniuses** (GMG:#) (TR:17) refers to []

Genius rankings

The following is a work-in-progress ranking of classical musical geniuses amid the top 1000 geniuses:

	IQ	Person	Musical Rankings	Discussion
1.	180 — 170	Ludwig Beethoven (1770-1827)		[RGM:18|1,310+] (Murray 4000:1|WM) (RBCC:2|275+) A classical musical genius; met with Goethe (see: Goethe and Beethoven); Otto Weininger (IQ:180|#106) died in the same room he did; ListVerse (2009) top 15 Composer (#3) [3]; polls (2015) are split (Q) as to whether Mozart or Beethoven was smarter; Giovetti (2011) top 10 Composers (#4) [4]; Plotkin (2011) top 10 Composers (#3) [4]; Tommasini (2011) top 10 Composers (#2). [4]
2.	175 — 175	Richard Wagner (1813-1883)		(Cattell 1000:337) [RGM:98|1,310+] (Murray 4000:4|WM) (RBCC:13|275+) IQ estimate 175 (Q); a semi-ranked "universal genius" (T.K. Seung, 2006); read Schopenhauer four times in 1853, which switched his mind from Feuerbachian atheism to an Schopenhauerian atheism; had a peculiar relationship (Q) with Nietzsche (IQ:190|31); ListVerse (2009) top 15 Composer (#4) [3]; Plotkin (2011) top 10 Composers (#8) [4]; Tommasini (2011) top 10 Composers (#9). [4]
3.	170 — 320	Wolfgang Mozart (1756-1791)		(Cattell 1000:N/A) [RGM:8|1,310+] (Murray 4000:2|WM) (MG:3) (RBCC:3|275+) Austrian classical era composer; ListVerse (2009) top 15 Composer (#2) [3]; Giovetti (2011) top 10 Composers (#3) [4]; Tommasini (2011) top 10 Composers (#3). [4]
4.	165 — 337	Johann Bach (1685-1750)		[RGM:16|1,310+] (Murray 4000:3|WM) (RBCC:1|275+) ListVerse (2009) top 15 Composer (#1) [3]; Giovetti (2011) top 10 Composers (#2) [4]; Plotkin (2011) top 10 Composers (#2) [4]; Tommasini (2011) top 10 Composers (#1). [4]
5.	165 — 349	Johannes Brahms (1883-1897)		[RGM:114|1,310+] (RBCC:7|275+) Cox 300 (Q) missing genius (Robinson, 2010); ListVerse (2009) top 15 Composer (#9) [3]; 500 geniuses cited (Q) missing candidate (2017); Tommasini (2011) top 10 Composers (#7). [4]
6.	165 — 350	Igor Stravinsky (1882-1971)		[RGM:380|1,310+] (RBCC:22|275+); Giovetti (2011) top 10 Composers (#9) [4]; Tommasini (2011) top 10 Composers (#6). [4]

7. 165 | 347 George Handel (1685-1759)

[RGM:N/A|1,310+] (RBCC:9|275+) ListVerse (2009) top 15 Composer (#14). [3]

8. 165 | 355 Frederic Chopin (1810-1849)

[RGM:110|1,310+] ListVerse (2009) top 15 Composer (#7) [3]; a "Classical Composer" missing genius (2017) to the "Top 500 geniuses: 301-400" range [1]; Plotkin (2011) top 10 Composers (#6). [4]

9. 165 | 365 Felix Mendelssohn (1809-1847)

[RGM:N/A|1,310+] (RBCC:19|275+) Grandson of Moses Mendelssohn; student of Carl Zelter; performed for Goethe at age 12.

10. 165 | 369 Franz Schubert (1797-1828)

[RGM:132|1,310+] (RBCC:8|275+) Cox 300 (Q) missing genius (Robinson, 2010); 500 geniuses cited (Q) missing candidate (2017); ListVerse (2009) top 15 Composer (#5) [3]; Giovetti (2011) top 10 Composers (#5) [4]; Plotkin (2011) top 10 Composers (#4) [4]; Tommasini (2011) top 10 Composers (#4). [4]

11. 165 | 370 Giuseppe Verdi (1813-1901)

[RGM:82|1,310+] (RBCC:16|275+) ListVerse (2009) top 15 Composer (#10) [3]; Giovetti (2011) top 10 Composers (#6); [1]; Tommasini (2011) top 10 Composers (#8). [4]

12. 160 | 410 Peter Tchaikovsky (1840-1893)

[RGM:62|1,310+] ListVerse (2009) top 15 Composer (#12) [3]; Plotkin (2011) top 10 Composers (#9). [4]

13. 160 | 411 Sergei Rachmaninov (1873-1943)

[RGM:N/A|1,310+] ListVerse (2009) top 15 Composer (#13). [3]

Hildegard

14.	160 — 412	von Bingen (1098-1179)	[RGM:206|1,310+] Giovetti (2011) top 10 Composers (#1) [4]; a Mike Fuller (2014) smartest woman ever (Q) (IQ:150+) candidate.
15.	160 — 413	Hector Berlioz (1803-1869)	[RGM:N/A|1,310+] HMS pioneer; a 2010 “Classical Composer” missing genius to the “Top 500 geniuses: 301-400” range [1]; Plotkin (2011) top 10 Composers (#4). [4]
16.	160 — 425	Christoph Gluck (1714-1787)	On his opera "Iphigénie en Tauride" (Iphigenia in Tauris) (1779) (Q), a drama is ultimately based on the play Iphigenia in Tauris by the ancient Greek dramatist Euripides which deals with stories concerning the family of Agamemnon in the aftermath of the Trojan War, Friedrich Schiller (IQC 165) (1801) commented, in a letter to his friend Körner, "Never has so pure and lovely a music affected me, it is a world of harmony which presses directly to the soul and dissolves in sweet exalted melancholy." Richard Wagner (IQC 170) called him "the great Gluck". IQ gauged (Q) by LePenseur (Dec 2017) at 160.
17.		Gustav Mahler (1860-1911)	ListVerse (2009) top 15 Composer (#11) [3]; Giovetti (2011) top 10 Composers (#7). [4]
18.		Claude Debussy (1862-1918)	A 2017 “Classical Composer” missing genius to the “top 500 geniuses: 301-400” range [1]; Tommasini (2011) top 10 Composers (#5). [4]
19.		Bela Bartok (1881-1945)	A 2017 “Classical Composer” missing genius to the “Top 500 geniuses: 301-400” range [1]; Tommasini (2011) top 10 Composers (#10). [4]
20.		Claudio Monteverdi (1567-1643)	Plotkin (2011) top 10 Composers (#1). [4]
21.		Robert Schumann (1810-1856)	ListVerse (2009) top 15 Composer (#6). [3]
22.		Franz Liszt (1811-1886)	ListVerse (2009) top 15 Composer (#8). [3]
23.		Arnold Schoenberg (1874-1951)	A 2017 “Classical Composer” missing genius to the “Top 500 geniuses: 301-400” range. [1]
24.		Dmitri Shostakovich (1906-1975)	A 2017 “Classical Composer” missing genius to the “Top 500 geniuses: 301-400” range. [1]
25.	160 — 595	Joseph Haydn (1732-1809)	(Cattell 1000:300) [RGM:383|1,500+] (Murray 4000:5|WM) (Gottlieb 1000:396) (GMG:26) Austrian composer; “There was no one near to confuse me, so I was forced to become original.” — Joseph Haydn (c.1790), *Publication* (Q) aka “Joseph Haydn” (Sirius Pops, 2020); ListVerse (2009) top 15 Composer (#15). [3]
26.		Charles Ives (1874-1954)	Giovetti (2011) top 10 Composers (#8). [4]

27.	Richard Strauss (1864-1949)	Plotkin (2011) top 10 Composers (#10). [4]
28.	David Lang (1957-)	Giovetti (2011) top 10 Composers (#10). [4]

(add)

Classical composers

In Feb 2017, the following were the top 500 geniuses rankings for classical composers: [1]

1. Igor Stravinsky (IQ:180|#141)
2. Richard Wagner (IQ:175|#175)
3. George Handel (IQ:170|#253)
4. Ludwig Beethoven (IQ:165|280)
5. Johann Bach (IQ:165|#288)
6. Wolfgang Mozart (IQ:165|#302)
7. Mendelssohn (IQ:165|#308)
8. Giuseppe Verdi (IQ:150|#424)

This group yields a mean IQ of 167 (166.88).

In 2010, British genius studies (Q) scholar Andrew Robinson, in his *Sudden Genius? The Gradual Path to Creative Breakthroughs*, stated that the following musical geniuses are blatantly missing from the Cox IQ group: [2]

Johannes Brahms
Franz Schubert

(add)

See also

- Artistic geniuses

References

1. Anon (Michigan). (2017). "Classical Composers", Thread post (Q), to page: Top 500 geniuses: 301-400, Feb 24.
2. (a) Robinson, Andrew. (2010). *Sudden Genius? The Gradual Path to Creative Breakthroughs* (pg. 20). Oxford University Press.
(b) Robinson, Andrew. (2011). *Genius: a Very Short Introduction*. Oxford University Press.
(c) W. Andrew Robinson – Wikipedia.
3. Anon. (2009). "Top 15 Greatest Composers of All Time" (Q), Dec 17.
4. Wise, Brian. (2011). "Ten Greatest Composers: Beyond the Usual Suspect" (top ten lists: Olivia Giovetti, Judd Greenstein, Fred Plotkin) (Q), WQXR.org, PodCast (23-min), Jan 21.

θΔics

In intellectual rankings, **greatest philosopher ever** (GPhE:#) is an epitaph given to a person, depending on ranking methodology, some rankings of which are listed below, that classify, list, or describe someone as being the greatest thinker in the field of philosophy of all time.

Overview

The following is a work-in-progress meta-analysis ranking of the **top 100+ greatest philosophers**, culled from a variety of sources, e.g. top 1000 geniuses (current), Murray 4000 (2003), Stokes 100 (2002), Perry 80 (2015), etc., along with extant top 10+ polls and rankings, as listed at bottom of this page:

	IQ	Person	Philosophy Rankings	Overview
1.	195 | 10	Aristotle (384-322BC)	(Murray 4000:1|WP) (Stokes 100:8|Academics) (Perry 80:3|Life) (TopXBest 51:3) (StreetPoll 10:3) (ListVerse 10:1)	(Cattell 1000:6) [RGM:5|1,500+] (Murray 4000:3|CS / 1|WP) (Glenn 20:1) (Perry 80:3|Li) (**EPD**:M&F) [LPKE] (RE:62) [CR:537] Greek physicist-philosopher;
2.	180 | 98	Plato (c.423-348BC)	(ACR:1) (Murray 4000:2|WP) (Stokes 100:8|Academics) (Perry 80:1|Life) (TopXBest 51:2) (StreetPoll 20:2) (ListVerse 11:1) (OldWizard 10:2)	[RGM:5|1,240+] (Cattell 1000:10) (Murray 4000:2|WP) (Perry 80:1|Li) (CR:271) Greek philosopher; 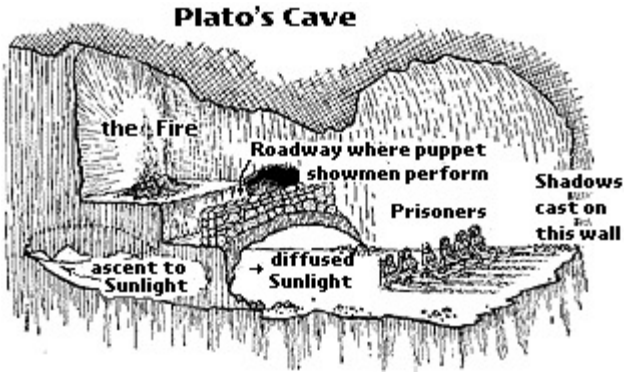 "The intense yearning which lovers have toward each other does not appear to be the desire for sexual intercourse, but for something else which the soul of each desires and cannot tell, and of which he or she has only a dark and doubtful presentiment." — Plato (c.380BC), voice of Aristophanes, *Symposium* teacher of Aristotle; known for: Plato's cave (expositor: Socrates), Plato's god, soul mate theory (expositor: Aristophanes), allegory of the charioteer, etc.; upgrade ↑ for his first law of affinity, i.e. likes attract; downgrade ↓for saying that to buy up and burn all the works of Democritus; downgrade ↓ for harsh reviews by d'Holbach (1770),

who calls him the ‘great inventor of chimeras’, and Jefferson (1820), who says ‘no writer, ancient or modern, has bewildered the world with more *ignes fatui* [misleading influence]’.

3. | 180 | 92

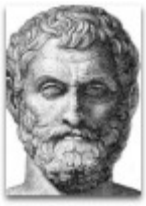

Thales (c.624-546 BC)

(ACR:23) (Stokes 100:1|Presocratics) (TopXBest 51:23)

(Cattell 1000:914) [RGM:84|1,500+] (Eells 100:62) (Stokes 100:1) (EvT:1|21+) [CR:91] Greek physical scientist and philosopher;

“Thales is the ‘father’ of Greek philosophy.”

— Aristotle (c.350BC), *Publication*

root scholar of Greek philosophy (70+ philosophers); after studying in Egypt, he reformulated Egyptian water god Nun into a secular first principle of science, i.e. water as first principle, out of which fire and earth are formed (see: three element theory; four element theory).

4. | 195 | 13

Rene Descartes (1596-1650)

(Murray 4000:4|WP) (Stokes 100:33|Rationalists) (Perry 80:11|Man/Self) (TopXBest 51:6) (StreetPoll 20:7) (OldWizard 11:3) (ListVerse 10:4)

(Cattell 1000:23) [RGM:33|1,500+] (Murray 4000:6|CS / 7|M / 4|WP) (Gottlieb 1000:25) (GPE:13) (GME:6) (Library:2,000) [CR:441] French physicist, philosopher, and mathematician;

“Descartes is the restorer of modern philosophy.”

— Baron d’Holbach (1770), *System of Nature*

Outlined a matter and motion theory of everything.

(Cattell 1000:108) [RGM:157|1,500+] (Murray 4000:10|WP) [HD:6] [FA:50] [RMS:19] (EPD:M6) [CR:194] Dutch philosopher;

“All our modern philosophers, though often perhaps unconsciously, see through the glasses which **Spinoza** ground.”

— Heinrich Heine (c.1835), *Publication*

5. | 185 | 51

Benedict Spinoza (1632-1677)

(Murray 4000:10|WP) (Stokes 100:36|Rationalist) (Perry 80:4|God) (TopXBest 51:26)

Known as a "celebrated atheist" (Holbach, 1770), noted for, in hmolscience, his 1676 posthumously-published *Ethics: Demonstrated in Geometrical Order*, a treatise on morality written, supposedly, in the style of Euclid's *Elements*, as a series of geometrical proofs of numerous philosophical points, accompanied by definitions, axioms, demonstrations, and corollaries, as well as intervening stretches of

friendlier prose (*scholia*).

(Cattell 1000:240) [RGM:72|1,500+] (FA:22) (GAE:3) [CR:356] Greek atomic theory philosopher;

6. | 185 | 50

Epicurus (341-270BC)

(Stokes 100:11|Atomists) (Perry 80:1|Free Will) (TopXBest 51:12) (ListVerse 10:9)

"Democritus, when at ripe old age warned him that mind and memory were failing, went freely to place his person in death's path. Epicurus himself died when life's light ran out, **he who in mind surpassed all men**—eclipsed them all, as the sun hung high in heaven, the stars."

— Lucretius (55BC), *On the Nature of Things* (pg. 81; 3:1039-44)

student of Democritus, mentor to Lucretius; name-dropped by nearly ever genius thereafter (e.g. Pierre Gassendi, Thomas Jefferson, etc.); eponym of Epicureanism, Epicurean atheism.

(Cattell 1000:7) (Gottlieb 1000:131)

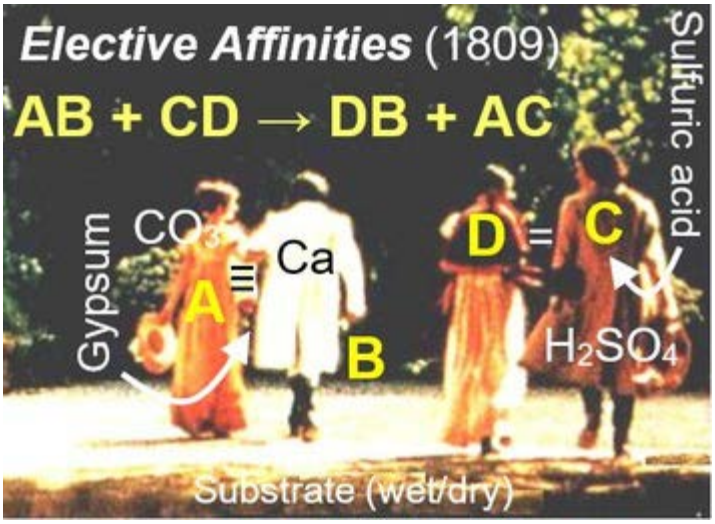

7. | 225 | 1

Johann Goethe (1749-1832)

(Perry 80:2|Love)

[RGM:36|1,500+] (Murray 4000:2|WL) (GMG:1) (Perry 80:1|Li) [LUG] [LPKE] [TCG] [polymath] [uberman] (**SN**:1) (HD:19) (FA:56) (GA:6) (LR:2) (Re:82) (EvT:8|21+) [CR:2151] German poly-intellect; via his 1809 *Elective Affinities*, he has become the main expositor of "physico-chemical philosophy", a philosophy wherein people are viewed as reactive chemicals, and nature of affairs is determined by the forces of the chemical affinties; semi-classified as "philosophical romanticism" (Kompridis, 2006). [4]

(Cattell 1000:721) (Stokes 100:4) (CR:121) Greek physicist-philosopher;

"Heraclitus, to the contemporary reader, is a philosopher of the first rank."

— Charles Kahn (1981), *The Art and Thought of Heraclitus* (pg. ix)

8. | 185

(ACR:9) (Stokes 100:4|Presocratics) (Perry 80:1|Death)

noted for his now lost *On Nature* (c.500BC), on the universe, politics,

	79	Heraclitus (c.535-450BC)	(TopXBest 51:30)	and theology, wherein he outlines a three element theory, according to which the universe is comprised of three principle elements: fire, earth, and water, but that fire was the primary element, controlling and modifying the other two, and that everything is in a continuous state of flux, or change, and war and strife between opposites is the eternal condition of the universe; Nietzsche considered his world view to be Heraclitean one;
9.	180 | 170	Socrates (c.469-399BC)	(ACR:8) (Murray 4000:12|WP) (Stokes 100:7|Academics) (TopXBest 51:1) (StreetPoll 20:1) (OldWizard 11:1)	(Cattell 1000:29) [RGM:10|1,500+] (Murray 4000:12|WP) (FA:11) [CR:123] Greek philosopher, student of Anaxagoras; leader of the Plato-Aristotle school of philosophy;
10.	190 | 31	Baron d'Holbach (1723-1789)		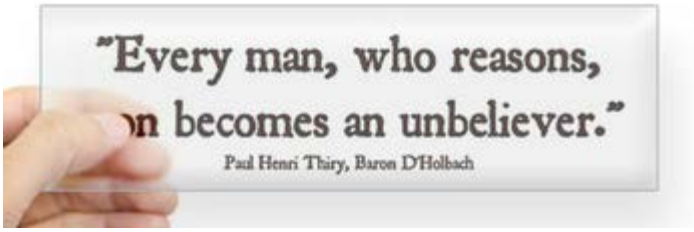 [RGM:414|1,500+] [**SN:12**] (FA:74) (GAE:1) [CR:251] German-born French-raised atheism-explicit, anti-chance based, matter-and-motion philosopher; "Holbach's *System of Nature* is the most exhaustive [and intellectually thorough-going] discussion of atheism — from a scientific, philosophical, moral, and political perspective — ever written." — Sunand Joshi (2014), *The Original Atheists* (pg. #) aka "Newton of the atheists" (Ñº) (V|1:45); a top-ranked extreme atheist; the Hume-Holbach dinner party (1763) encounter situate him between Voltaire and David Hume in intellect, **if not above** [?] Voltaire; his mentally-penetrating *The System of Nature* turned both Goethe and Percy Shelley into the atheist natural philoosphy mode of thinking. (Murray 4000:16|B) (FA:74) (GPhE:11) [CR:127] was a German physician, turned Goethe-promoting, Darwin-promoting zoologist; "The fundamental unit of affinity in the whole of nature, from the simplest chemical process to **the most complicated love**

11. | 180 | 202

Ernst Haeckel
(1834-1919)

story, [as] was recognized by Empedocles [and] Goethe, **[can be] reduced,** on logical analysis, **to matter** (space filling substance) **and energy** (moving force)**,** [which] are but two inseparable attributes of one underlying substance."

— Ernest Haeckel (1899), *The Riddle of the Universe*

characterized an "unabashed atheist" (Brix, 1992), noted for his "physico-chemical monism" philosophical conception "of the world" (1892)*;* a rare Goethe and Empedocles scholar.

[RGM:30|1,500+] (Murray 4000:15|WP) (Perry 80:7|Li) [HD:44] (FA:138) (GAE:2) [RGA:21|370+] [CR:320] Polish-ethnicity German-born atheist asoulist philosopher;

12. | 190 | 29

Friedrich Nietzsche
(1844-1900)

(Murray 4000:15|WP) (Stokes 100:70|Existentialists) (Perry 80:7|Life) (TopXBest 51:16) (StreetPoll 20:5) (OldWizard 11:5)

"Do you know what the 'world' is to me? Shall I show it to you in my mirror? This world: a **monster of energy**, without beginning, without end; a firm, iron magnitude of **force** that does not grow bigger or smaller, that does not expend itself but only transforms itself."

— Friedrich Nietzsche (1885), *The Will to Power* (WP:1067)

third generation student of Goethe, via Schopenhauer, noted for his 1882 "god is dead"; his unfinished magnum opus *The Will to Power*, wherein he grapples, via 1,067 fragments, or numbered "apothegms", as Henry Mencken (1920) calls them, with the "god void" replacement issue, i.e. what is to replace god or belief in the existence of god in the wake of his absence, via modern physical science based reformulated outlines of new classical philosophy.

(Cattell 1000:83)
[RGM:54|1,500+] (Gottlieb

13. | 180 | 95

Niccolo Machiavelli (1469-1527)

(Stokes 100:26|Age of Science) (TopXBest 51:50) (StreetPoll 20:8)

1000:40) (CR:53) Italian realism philosopher, historian, politician, and diplomat;

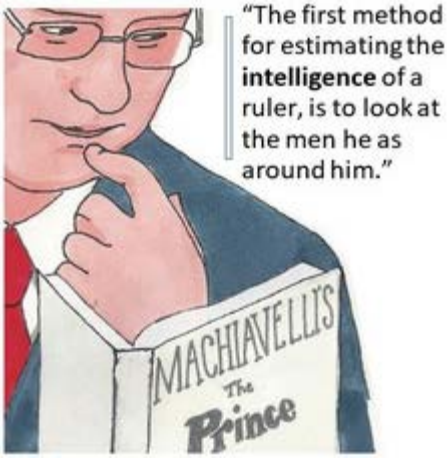

"We are much beholden to **Machiavelli** and others, that write what men do, and not what they ought to do."
— Francis Bacon (1605), *The Advancement of Learning* (Nº)

best known for his 1513 leadership advice book *The Prince*, political ethics discourse advocating an 'ends outweigh the means' (or "end justifies the means") philosophy; influential to: Francis Bacon and Vilfredo Pareto.

(Cattell 1000:63) [RGM:127|1,500+] (Murray 4000:16|WP) (Gottlieb 1000:151) (HD:5) (FA:58) (GA:30) [RMS:18] [CR:169] English philosopher, social physicist, political theorist, and psychologist (Romanes, 1895);

14. | 185 | 74

Thomas Hobbes (1588-1679)

(Murray 4000:16|WP) (Stokes 100:31|Age of Science) (Perry 80:1|Man/Self) (TopXBest 51:36)

"That when a **thing** lies still, unless somewhat else stir it, it will lie still forever, is a truth that no man doubts of. But that when a thing is in motion, it will eternally be in motion, unless somewhat else stay it, though the reason be the same, namely, that nothing can change itself, is not so easily assented to. For men measure, not only other men, but all other things, by themselves; and because they find themselves subject after motion to pain, and lassitude, think everything else grows weary of motion, and seeks repose of its own accord; little considering, whether it be not some other motion, wherein that desire of rest they find in themselves, consistent."

— Thomas Hobbes (1651), *Leviathan* (§2: On Imagination) (pg. 3)

His 1651 book *Leviathan*, draws analogies between the laws of mechanics and the features of society.

[RGM:89|1,500+] (Murray 4000:13|WP) (**SN**:15) (FA:93) (GA:10) (GPhE:#) [CR:250] German atheistic natural philosopher;

15. | 185 | 60

Arthur Schopenhauer (1788-1860)

(Murray 4000:13|WP) (Stokes 100:49|Idealists) (Perry 80:3|Love) (TopXBest 51:43)

"The will of the copper, claimed and preoccupied by the electrical opposition to the iron, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive."

— Arthur Schopenhauer (1844), *The World as Will and*

his *The World as Will and Representation* (1814, 1844), building on Goethe's human elective affinities theory (see: elective affinity problem), explains "will" in a universal manner.

16. | 190 — 24

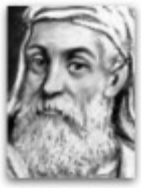

Empedocles (495-435BC)

(ACR:3) (EvT:5|21+)

(Cattell 1000:896) [RGM:401|1,500+] (ACR:11) (FA:8) (EvT:5|21+) [CR:276] Greek physical science philosopher;

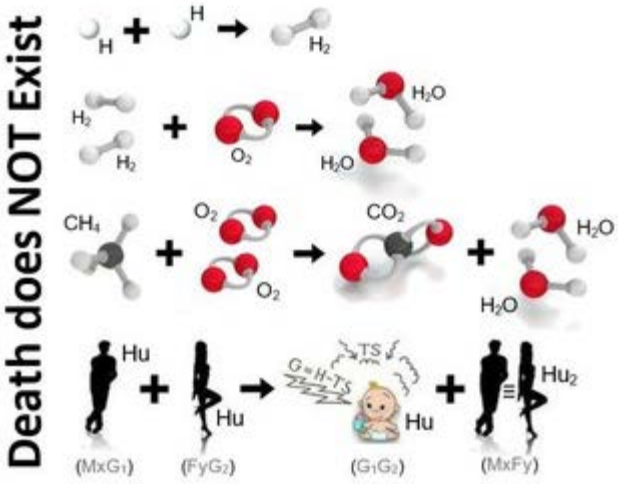

"There is neither birth nor death for any mortal, but only a combination and separation of that which was combined, and this is what amongst laymen they call 'birth' and 'death'. **Only infants or short-sighted persons imagine** any thing is 'born' which did not exist before, or that any thing can 'die' or parish totally."

— Empedocles (c.450BC), Fragment I21 / DK8 + Fragment I23 / DK11;

outlined a "two-force / four-element" philosophical theory of everything.

17. | 185 — 75

Immanuel Kant (1724-1804)

(Murray 4000:3|WP) (Stokes 100:45|Idealist) (Perry 80:5|Life) (TopXBest 51:15) (StreetPoll 20:10) (OldWizard 11:6)

(Cattell 1000:33) [RGM:19|1,500+] (Murray 4000:3|WP) (Perry 80:5|Li) (RMS:21) [CR:210] German philosopher, a fabled "last persons to know everything", an oft-cited "smartest person ever" missing candidate, noted for doing work on the Nebular hypothesis (1855), the Abraham and Brahma problem (c.1869), the categorical imperative (1785), among other areas.

18. | 180 — 136

Michel

(Perry 80:3|Death) (TopXBest 51:45)

(Cattell 1000:171) [RGM:222|1,500+] (Gottlieb 1000:432) (HD:2) (FA:29) (CR:73) French atomic theory based realism philosopher;

"**Montaigne** was the first Frenchman who dared to think."

— Julien la Mettrie (1751), "Anti-Seneca" (pg. 129)

Montaigne
(1533-1592)

His three-volume 1580 *Essays*, attempts to explore thoughts on existence and learning, much of which themed the 55BC *On the Nature of Things*, particularly those views of Epicurus, cautioned with the more conserved views of Lucretius, followed by those of Cicero, thirdly; many of the essays centered around: sex and death; wore a medallion around his neck that said "what do I know?" and "I hold back, or reserve judgment" around his neck (adjacent).

19. 180 | 103

Cicero
(106-43BC)

(Stokes 100:13|Stoics)

(Cattell 1000:15) [RGM:116|1,500+] [CR:200], aka "Tully", was a Roman philosopher and politician;

"**Cicero** provided the 'renaissance' with its prime methods of philosophical dialogue, and its fullest knowledge about the ancient philosophical schools."

— Michel Montaigne (c.1580), *Publication*

noted for his 45BC *On the Nature of the Gods*, a discourse on Greek and Roman theologies, namely a dialogue on a comparison of the pros and cons of stoicism (character: Balbus), Epicurean theology (character: Velleius), and Platonic Academy based skepticism (character: Cotta); also known for thoughts on morals, society, the legal system, etc., as both religion and and Epicurean atomic theory would each see things

20. 180 | 161

Plutarch
(c.46-120)

(Cattell 1000:134) [RGM:204|1,500+] (FA:31) [CR:116] Greek-born Roman historian and philosopher, noted for his commentary on the Osiris resurrection theory (100AD), i.e. Egyptian state religion, for his discussions on the theory of the cold element (118AD) and for his Theseus's ship (see: turnover rate) paradox discussions.

21. 180 | 111

David Hume
(1711-1776)

(Murray 4000:8|WP) (Stokes 100:39|Empiricists) (Perry 80:17|Knowledge) (TopXBest 51:18) (OldWizard 11:9)

(Cattell 1000:58) [RGM:109|1,500+] (Murray 4000:4|WP) (Gottlieb 1000:185) (SN:49) (GMG:7) (EPD|F2) [CR:90] Scottish philosopher;

"There is nothing to be learned from a professor, which is not to be met with in the books."

— David Hume (1735), "Letter to Jemmy Birch"

aka "Newton of moral sciences" (Foley, 1990); noted for his 1740 *A Treatise of Human Nature*; his 1783 essay "On the Immortality of the Soul", argued that "it appears difficult by the mere light of reason to prove the immortality of the soul"; Kant's 1788 *Critique of Practical*

Reason and his categorical imperative, according to Miguel Unamuno, are both criticism launching points off the two latter works; his posthumous *Dialog Concerning Natural Religion* (1777) did a modern remake of Cicero's *The Nature of the Gods*; famously-known, in atheist circles, for his encounter with Baron d'Holbach, wherein boasted "I do not believe in atheists, because I have never met one" (see: Hume-Holbach dinner party).

22. | 180 | 123

Marcus Aurelius (121-180)

(Stokes 100:16|Stoics) (Perry 80:4|Life) (TopXBest 51:7)

(Cattell 1000:50) [RGM:102|1,500+] (Stokes 100:16) (Perry 80:4|Li) (FA:24) (EPD:F3) [CR:46] Roman "philosopher king", politician, the 16th Roman emperor (Ñº), thing philosopher, an adherent of stoicism, an oft-classified "anti-theist" (Ñº), noted for his keen intellect and wisdom on a number of topics, such as atheism, nature, and change, to name a few, generally known for his *Mediations* (167AD), characterized as the "gospel of those who do not believe in the supernatural" (Zimmern, 1887), wherein he extols on a common sense practical Heraclitus-Zeno stylized stoicism

23. | 180 | 105

Bertrand Russell (1872-1970)

(Murray 4000:17|WP) (Stokes 100:77|Linguistics) (Perry 80:|Language) (TopXBest 51:38) (StreetPoll 20:12)

(RGM:145|1,500+) (Gottlieb 1000:593) (EPD:M2/F4) [HD:51] [FA:117] (GAE:21) (Stokes 100:77) [CR:165] British mathematician and philosopher; 20th century's greatest atheism advocate.

24. | 170 | 362

Plotinus (207-270)

(Murray 4000:19|WP) (Stokes 100:18|Neoplatonist) (Perry 80:1|Time)

(Cattell 1000:773) [RGM:500|1,500+] (Stokes 100:18) (Murray 4000:19|WP) (GPhE:#) (CR:27) Greek-Egyptian born Italian anti-atomicist philosopher, characterized a "non-Christian" (Copleston, 1948), founder of the neoplatonic school, noted for his circa 265 collected works set *Enneads*, wherein he attempts to grapple with phenomena such as "passions" and concepts such as "soul" in terms of atomic theory, something rarely seen in modern time;

25. | 170 | 360

Thomas Aquinas (1225-1274)

(Murray 4000:6|WP) (Stokes 100:22|Scholastics) (Perry 80:3|God) (TopXBest 51:8) (ListVerse 10:6)

(Cattell 1000:384) [RGM:110|1,500+] (Murray 4000:6|WP) (Gottlieb 1000:8) (CR:54) Italian theological philosopher;

26. | 180 | 126

Parmenides (510-450BC)

(ACR:11)

[RGM:216|1,500+] [CR:118] Greek physicist-philosopher; in his "On Nature" (485BC) he argued that a void or rather a vacuum, in nature, could not exist, per reason that "being" could not go into "non-being"; this riddled argument launched the famous 2,000-year plus nature abhors a vacuum debated and the Parmenides vs Heraclitus debate.

27. | 195 | 16

Voltaire (1694-1778)

(Stokes 100:41|Empirists) (TopXBest 51:9) (StreetPoll 20:1)

(Cattell 1000:4) [RGM:34|1,500+] (Murray 4000:7|WL) (EPD:M7) [CR:313] French writer, philosopher, scientist;

28. | 180 | 183

John Locke (1632-1704)

(Murray 4000:7|WP) (Stokes 100:38|Empericists) (Perry 80:2|Free will) (TopXBest 51:13) (ListVerse 10:10)

(Cattell 1000:35) [RGM:108|1,500+] (Murray 4000:7|WP) (Gottlieb 1000:11) (Stokes 100:38) [HD:7] (FA:63) (CR:67) English physician and social philosopher; noted for his 1690 *Essay Concerning Human Understanding*, wherein, he made, supposedly, the first serious attempt to explain the functioning of the mind in purely naturalistic terms, WITHOUT the need for divine intervention in the development of reason;

29. | 180 | 125

Leucippus (c.500-450BC)

(ACR:18)

(GCE:10) [CR:212] Greek atomic physicist and philosopher;

"Nothing happens *in vain*, but everything from reason and by necessity."

— Leucippus (c.460BC), *On Mind* (Fragment L1)

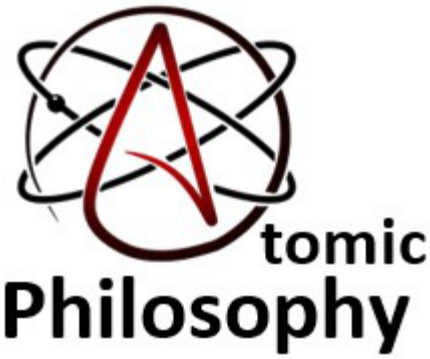

noted for conceiving of the atomic theory, which was a reactionary theory developed in response to Greek philosopher Parmenides' 485BC denial of the void;

30. | 190 | 27

Francis Bacon (1561-1626)

(Stokes 100:29|Age of Science) (TopXBest 51:20)

(Cattell 1000:5) [RGM:130|1,500+] (Gottlieb 1000:84) (LPKE:4|18+) (GPhE:#) [CR:149] English physicist, natural philosopher, and general polymath;

31. | 170 | 324

Zeno of Citium (c.334-c.262BC)

(TopXBest 51:11) (ListVerse 10:8)

(Cattell 1000:859) [RGM:792|1,500+] (GPhE:#) (CR:44) Greek natural philosopher, noted for employing a determinism philosophy of action, particularly in regards to crime and punishment (see: slave stealing parable; flower stealing model),

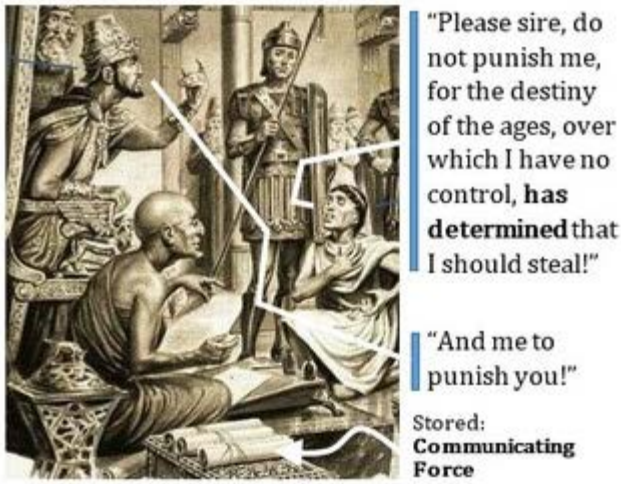

and also the founder of stoicism, a philosophy which holds that the

wise man should be free from passion, unmoved by joy or grief, and submissive to natural law and or one apparently or professedly indifferent to pleasure or pain.

32. 185 | 70

Sigmund Freud
(1856-1939)

(Becker 139:119)
(Stokes 100:66)

33. 165 | 483

Karl Popper
(1902-1994)

(Stokes 100:94)
(TopXBest 51:51)
(Spenko 27:14)

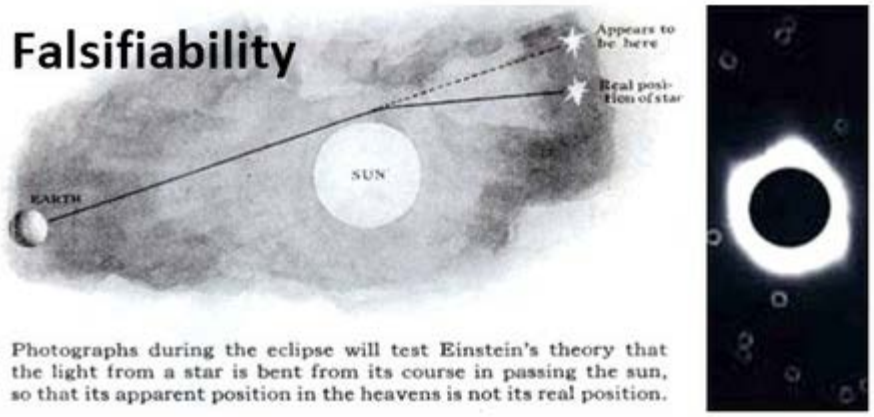

(RGM:1182|1,500+) (Stokes 100:94) (GPhE:25) (CR:25) Austrian-born English philosopher, noted for his 1919 falsifiability model of good science, according to which to know if something is true or not, e.g. a new theory like relativity, there must be a way to test it, e.g. measure during an eclipse if the mass of the sun bends light, and for his latter discussions on the arrow of time in relation to entropy as well as his critique on general laws of science.

(Cattell 1000:51) [RGM:51|1,500+] (Gottlieb 1000:59) (Murray 4000:5|WP) (Stokes 100:48|Idealists) (Perry 80:3|Art) (GPhE:#) [CR:79] German natural philosopher;

34. 170 | 342

Georg Hegel
(1770-1831)

(Murray 4000:5|WP)
(Stokes 100:48|Idealists)
(Perry 80:3|Art)
(TopXBest 51:21)
(OldWizard 11:4)

"Philosophy, if one still wants to call it that, has had to sink lower and lower, until it finally reached the lowest level of abasement in the ministerial creature **Hegel**, who in order to smother again the 'freedom of thought', which Kant had struggled for and won, made of 'philosophy', the daughter of reason and the future mother of truth, a tool of state aims, obscurantism, and Protestant Jesuitism. In order to cover up the disgrace and at the same time to bring about the greatest possible stupefaction of minds, he drew over it a cloak of the emptiest word rubbish and silliest gallimathias that have ever been heard outside the insane asylum."

> — Arthur Schopenhauer (1839), *Essay on the Freedom of the Will* (pgs. 85-86)

semi-classified a "modern Aristotle" (Ladlier, 2000) (Ñº), specifically in "young Marx's eyes" (McBride, 1977) (Ñº).

35.	165 — 452	Martin Heidegger (1889-1976)	(Stokes 100:71|Existentialists) (Perry 80:4|Language) (TopXBest 51:42) (Spenko 27:5)	[RGM:170|1,500+] (Gottlieb 1000:914) (Perry 80:4|La) (HCR:14) (FA:105) (CR:41) German atheistic existentialist philosopher (Sartre, 1945); influenced deeply by Nietzsche; teacher of Hannah Arendt; noted, predominately, for his 1927 *Being and Time*, in which he suggest that the meaning of our being must be tied up with time, i.e. that we are temporal beings, a logic somehow based on critique of Kant and a synthesis of Nietzsche
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45.	155 — 625	Zeno of Elea (495-435BC)	(ACR:12) (Stokes 100:6|Eleatics)	(Cattell 1000:726) (Eells 100:100) (CR:19) Greek-Italian philosopher, was one of three main philosophers of the Eleatic school, founded by Parmenides, whose third member includes Melissus (500-440BC) — whose essential tenets were the denial of change, denial of the void (or non-being), denial of movement, in support of the overarching postulate of continuity of being (or being oneness), or something along these lines — generally known for his famous paradoxes, e.g. Achilles and the tortoise, which aimed to repudiate plurality and change, and thus motion.
46.				
47.				
48.				
49.				
50.	175 — 247	Ludwig Wittgenstein (1889-1951)	(Stokes 100:78|Linguistics) (TopXBest 51:22)	[RGM:219|1,500+] (Gottlieb 1000:634) (CR:38) Austrian-British philosopher; noted for comments on Schopenhauer's "elective affinity will" or "will to power" (attacking one's fears); his two biggest works are *Philosophical Investigations* and *Tractatus Logico-Philosophicus*, which according to some "show more raw intellect than anything Shakespeare has written"; downgrade for having so many "god-this" and "god-that" quotes attributed to him; some have ranked him above Bertrand Russell.

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The following is a useful key:

(Murray 4000:#|WP)
(Murray 4000:#|CP)
(Stokes 100:#|Name)
(Perry 80:#|Name)
(TopXBest 51:#)
(Spenko 27:#)
(StreetPoll 20:#)
(OldWizard 11:#)
(ListVerse 10:#)

(add)

Old-Wizard.com | 2008

The following is a 2008 top 10 greatest philosophes of all time listing (with accompanying top 10 philosophical works of all time) from Old-Wizard.com: [1]

1. Socrates
2. Plato
3. Rene Descartes
4. Friedrich Hegel
5. Friedrich Nietzsche
6. Immanuel Kant
7. Soren Kierkegaard

ListVerse.com | 2011

The following is a 2011 listing of the "Top 10 Greatest Philosophers in History" by ListVerse.com: [2]

1. Aristotle
2. Plato
3. Paul of Tarsus [fictional]
4. Rene Descartes
5. Confucius [fictional]
6. Thomas Aquinas
7. Avicenna

Street poll | 2011

The following are the top 10 greatest philosophers of all time according to informal in person street poll of random Chicagoans (numbers being votes received): [3]

1. Socrates (11)
2. Plato (9)
3. Aristotle (7)
4. Confucius (3) [fictional]
5. Friedrich Nietzsche (2)
6. Bruce Lee (2)
7. Rene Descartes
8. Machiavelli
9. Voltaire
10. Immanuel Kant
11. Soren Kierkegaard

8. Edmund Husserl
9. David Hume
10. Martin Heidegger
11. Jean Rousseau

8. Zeno of Citium
9. Epicurus
10. John Locke

12. Bertrand Russell
13. Jean-Paul Sartre
14. Ayn Rand
15. Michel Foucault
16. Friedrich Engels
17. Henry Thoreau
18. Karl Marx
19. Homer
20. Nero

(add)

TopXBestList | 2016

The following, from TopXBestList.com (2016), is a top 51 greatest philosophers listing: (Ñº)

1. Socrates
2. Plato
3. Aristotle
4. Paul the Apostle [fictional]
5. Confucius [fictional]
6. Rene Descartes
7. Marcus Aurelius
8. Thomas Aquinas
9. Voltaire
10. Avicenna
11. Zeno of Citium
12. Epicurus
13. John Locke
14. Leo Tolstoy
15. Immanuel Kant
16. Friedrich Nietzsche
17. John Mill
18. David Hume
19. Laozi [fictional]
20. Francis Bacon
21. Georg Hegel
22. Ludwig Wittgenstein
23. Thales
24. Anaxagoras
25. Gottfried Leibniz
26. Benedict Spinoza
27. Jean Rousseau
28. Boethius
29. Diogenes of Sinope
30. Heraclitus
31. Charles Montesquieu
32. Jean Sartre
33. Jeremy Bentham
34. Zeno of Elea

Spenko | 2019

The following is Jan Spenko's so-called "modest list" (Ñº) of 27 post-Nietzsche era "really great philosophers":

1. Theodor Adorno; *Dialectic of Enlightenment: Philosophical Fragments. The Culture Industry*
2. Max Horkheimer; *Eclipse of Reason. Critical Theory: Selected essays.*
3. Jurgen Habermas; *The Structural transformation of the public sphere: An inquiry Into a category of Bourgeois Society.*
4. Hans-Georg Gadamer; *Truth and Method. Philosophical Hermeneutics.*
5. Martin Heidegger; *Being and Time.*
6. Walter Benjamin; *Illuminations: Essays and Reflections.*
7. Ludwig Wittgenstein; *Tractatus Logico-Philosophicus. Philosophical investigations.*
8. John Rawls; *A Theory of Justice.*
9. Willard Quine; *Word and Object.*
10. Jean-Paul Sartre; *Being and Nothingness.*
11. Alfred Ayer; *Language, Truth, and Logic.*
12. John Dewey; *Experience and Nature.*
13. Edmund Husserl; *Logical Investigations. Ideas.*
14. Karl Popper; *Logic of Scientific Discovery. The Open Society and its Enemies.*
15. Michel Foucault; *Discipline and Punish*
16. Jacques Derrida*; Of Grammatology. Writing and Difference.*
17. Emmanuel Levinas*; Totality and Infinity: An essay on Exteriority.*
18. Richard Rorty; *Philosophy and the Mirror of Nature.*
19. Ernst Cassier*; An Essay on Man: An introduction to a Philosophy of Human Culture.*
20. Roland Barthes*; Mythologies.*
21. Antonio Gramsci; *Prison Notebooks (3 volumes).*

35. Soren Kierkegaard
36. Thomas Hobbes
37. Adam Smith
38. Bertrand Russell
39. George Berkeley
40. Augustine of Hippo
41. Simone Beauvoir
42. Martin Heidegger
43. Arthur Schopenhauer
44. Willard Quine
45. Michel Montaigne
46. William James
47. Maimonides
48. Ayn Rand
49. Jacques Derrida
50. Niccolo Machiavelli
51. Karl Popper

22. Robert Nozick; *Anarchy, State, and Utopia.*
23. Gilles Deleuze; *Difference and Repetition.*
24. Jean Baudrillard; *Simulacra and Simulation.*
25. Herbert Marcuse; *One-Dimensional Man.*
26. Erich Fromm; *Escape from Freedom.*
27. Louis Althusser; *For Marx. Reading Capital.*

See also

- Greatest chemist ever
- Greatest physicist ever
- Greatest mathematician ever
- Greatest thermodynamicist ever
- Greatest engineer ever
- Polymath
- Last person to know everything
- Universal genius
- Last universal genius
- Genius IQs (top 1000 geniuses)
- IQ: 200+ | Smartest person ever
- IQ: 150+ | Smartest woman ever

References

1. 10 greatest philosophes of all time (2008) – Old-Wizard.com.
2. Top 10 Greatest Philosophers in History (2011) – ListVerse.com.
3. Thims, Libb. (2011). "Street Poll", Chicago, IL, Nov 5.
4. Kompridis, Nikolas. (2006). *Philosophical Romanticism* (Goethe, 54+ pgs). Routledge.

External links

- Becker 144 (Ñº) (c.2019) – Greatest Philosophers of All Time | Ranked.

θΔics

In intellectual rankings, **greatest physicist ever** is an epitaph given to a person, depending on ranking methodology, some rankings of which are listed below, that classify, list, or describe someone as being the greatest thinker in the field of physics of all time; the table below shows a ranked listing of the top 100+ physicists of all time

Overview

The following is a meta-analysis ranking of the **top 100+ greatest physicists** based on the Murray 4000 top 20 names in physics [Murray 4000:#|P], Millennium Poll (2009) [MP|#], Physics Forum Poll (2005 + 2007) [FFP|#], Google Hits Study (2009) [GHS|#], Landau Genius Scale [LGS|#], Kanowitz 50 (2008), Cropper 30 (2001), the Ranker.com Famous Male Physicists [FMP:#] (Ñº), RankOPedia 28 (2012), among others, each as discussed below, along with IQ|position from the top 1000 genius rankings, shown in second column:

	IQ	Person	Physics Rankings	Overview
1.	215 | 3	Albert Einstein (1879-1955)	(Murray 4000:2|P) (LGS:1) [MP:1] [PFP:2] [GHS:1] [Kanowitz 50:2] [Cropper 30:1|R]	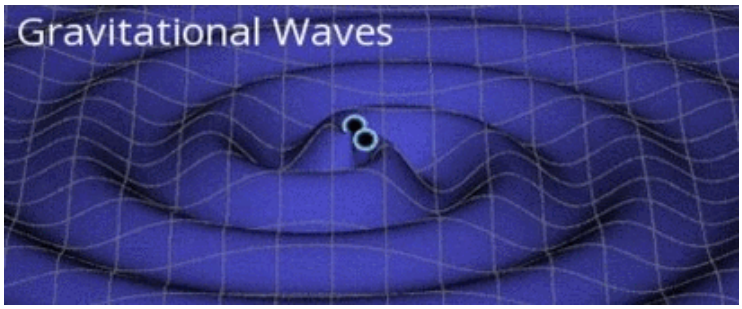 [RGM:2|1,500+] (Murray 4000:9|CS / 2|P) (HD:52) (DN:5.5±) (RE:76) (CR:523) German physicist and philosopher; he is **#6** in genius meta-analysis rankings; **epicenter genius** (IQ_{avg}:210); a **triple** scientific revolutions genius; blue sky problem theorist; [GPE]; known for: the light quanta hypothesis (quantum mechanics); his 1919 general theory of relativity predicted the existence of gravitational waves (as shown adjacent); noted in: radiation thermodynamics; kept a bust of Goethe in his study, and Goethe's works were the most predominant amid his personal library (see: Einstein's library).
2.	220 | 2	Isaac Newton (1643-1727)	(Murray 4000:1|P) (LGS:0) [MP:2] [PFP:1] [Kanowitz 50:1] [Cropper 30:2|M]	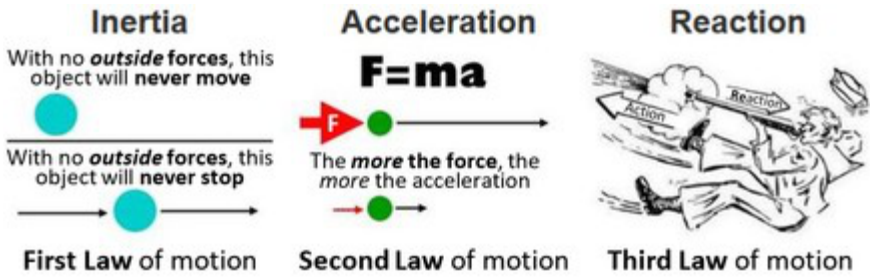 (Cattell 1000:14) [RGM:3|1,500+] (Murray 4000:2|CS / 1|P / 2|M) (EPD:F0) (GR:1) (SIG:1) (RE:84) (CR:595) English physicist, chemistry, mathematician, and philosopher; noted for his 1686 *Principia: Mathematical Principles of Natural Philosophy*, where he introduced the laws of motion, which he applied to both falling apples and falling planets; the **#1** in genius meta-analysis rankings; **triple** scientific revolutions genius; blue sky problem theorist; [GPE] [GME]; known for: mechanics, gravitational theory; his Query 31 launched affinity chemistry (the key behind Goethe's 1809 *Elective Affinities*) and well as physical chemistry; known for: differential equations, optics, etc; IQ of 250+ (Azak, 2011).

(Cattell 1000:N/A)

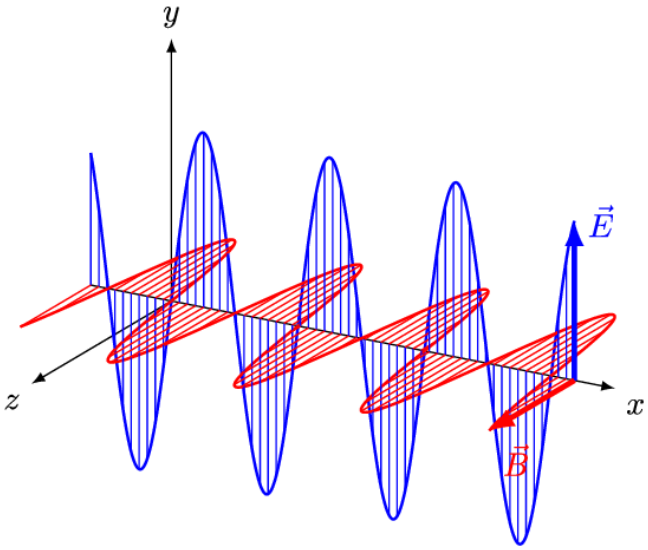

3. | 210 | 4

James Maxwell (1831-1879)

(Murray 4000:9|P)
[MP:3]
[PFP:4.5]
[Kanowitz 50:9]
[Cropper 30:2|EM]

[RGM:112|1,500+] (Murray 4000:20|CS / 9|P) (EPD:M8) (DN:4±) (RE:48) (CR:437) Scottish mathematical physicist;

"**Was it a god that wrote these signs**, revealing the hidden and mysterious forces of nature around me, which fill my heart with quiet joy?"

> — Ludwig Boltzmann (1893), on Maxwell's equations, inspired by opening monologue of Goethe's *Faust*; which, itself, he considered the "greatest of all works of art"

a **dual** scientific revolutions genius; blue sky problem theorist; known for: electromagnetic theory, model of the electromagnetic force (pictured), kinetic theory, thermodynamics (graphical thermodynamics); highest-ranked "magnitude genius" (prolific output in short time); one of the three shoulder genius Einstein said (Ñº) he stood on; first-slating: 195-215 (c.2015).

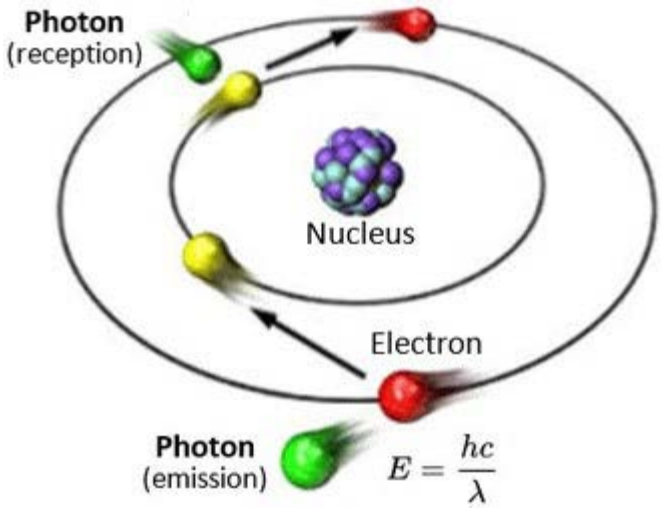

4. | 180 | 89

Niels Bohr (1885-1962)

(Murray 4000:7|P)
(LGS:1)
[MP:4]
[PFP:6]
[GHS:4]
[Kanowitz 50:11]
[Cropper 30:2|QM]

[RGM:47|1,500+] (LGS:1) (CR:76) Danish physicist; his 1913 "Bohr model" of the atom proposed that normally each electron in an atom is confined to a particular electron shell or what he called "orbits" (see: molecular orbital theory), which may be spherical as well as elliptical, but that—in very a very science-redefining way—

an electron can move or "jump" between adjacent orbits or orbitals only when the atom (or electron?) emits or absorbs a certain quantum amount (energy element amount) of radiant energy, of the amount 'hν', where h is Planck's constant and ν (nu) is the frequency of the electromagnetic energy or light emitted or absorbed; first-slating: IQ:175-185 (c.2016); downgrade ↓ from 185|#77 to 180|#90 following digestion of his *Atomic Physics and Human Knowledge* (1958) lectures, wherein he attempts to defend, in a puerile middle ground sense, the concepts of life, free will, and teleological like purpose, via recourse to uncertainty principle arguments (Oct 2018).

5. | 195 | 11

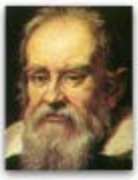

Galileo Galilei (1564-1642)

(Murray 4000:5|P) [MP:6] [PFP:3] [Kanowitz 50:3] [Cropper 30:1|M]

(Cattell 1000:46) [RGM:4|1,500+] (Murray 4000:2|CS / 5|P / 2|A) [GPE:5] (CR:157|#24) Italian scientist;

"Many years ago, I accepted Copernicus' theory, and from that point of view I discovered the reasons for numerous natural phenomena which unquestionably cannot be explained by the conventional cosmology. I have written down many arguments as well as refutations of objections. These, however, I have not dared to publish up to now. For I am thoroughly frightened by what happened to our master, Copernicus. Although he won immortal fame among some persons, nevertheless among countless – for **so large is the number of fools** – he became a target of ridicule and derision. I would of course have the courage to make my thoughts public, if there were more people like you. But since there aren't, I shall avoid this kind of activity."

> — Galileo Galilei (1596), "Letter to Johannes Kepler", after receiving copy of Kepler's *The Cosmic Mystery*

a **#6** in genius meta-analysis rankings; **dual** scientific revolutions genius; ; known for: dynamics, vacuum theory, temperature, astronomy, heliocentric theory; intellectual giant to Einstein; first draft slating: IQ:185-200 (c.2014).

6. | 190 | 32

Paul Dirac (1902-1984)

(Murray 4000:15|P) (LGS:1) [MP:8] [PFP:7.5] [Kanowitz 50:28] [Cropper 30:1|PP]

7. | 190 | 27

Erwin Schrodinger

(LGS:1) [MP:9] [PFP:9] [Kanowitz 50:24] [Cropper 30:6|QM]

(1887-1961)

8. 205 | 6

Rudolf Clausius
(1822-1888)

[Cropper 30:6|T]

9. 185 | 48

Richard Feynman
(1918-1988)

[MP:7]
[PFP:4]
[Kanowitz 50:4]
[Cropper 30:2|PP]

10. 210 | 5

Willard Gibbs
(1839-1903)

[Cropper 30:7|T]
[FMP:148]

11. 180 | 96

Michael Faraday
(1791-1867)

(Murray 4000:4|P)
[PFP:10]
[Kanowitz 50:2]
[Cropper 30:1|EM]

12. 180 | 90

Werner Heisenberg
(1901-1976)

(Murray 4000:13|P)
(LGS:1)
[MP:5]
[PFP:10.5]
[GHS:7]
[Kanowitz 50:13]
[Cropper 30:4|QM]

13. 190 | 23

Carl Gauss
(1777-1855)

180

(Murray 4000:3|P)
[MP:10]

14. — 163
Ernest Rutherford
(1871-1937)

[Kanowitz 50:14]
[Cropper 30:2|NP]

15. | 190 | 43
Enrico Fermi
(1901-1954)

(Murray 4000:12|P)
[GHS:5]
[Kanowitz 50:21]
[Cropper 30:4|NP]

16. | 195 | 21
Gottfried Leibniz
(1646-1716)

17. | 190 | 42
Max Planck
(1858-1947)

[PFP:10.5]
[GHS:2]
[Kanowitz 50:8]
[Cropper 30:1|QM]

18. | 195 | 19
Robert Hooke
(1635-1703)

(Murray 4000:20|P)
[Kanowitz 50:45]

19. | 180 | 188
Joseph Thomson
(1856-1940)

(Murray 4000:8|P)
[Kanowitz 50:33]

20. | 185 |

83
Ettore Majorana
(1906-1938)

21. | 195 / 9
Hermann Helmholtz
(1821-1894)
[Cropper 30:4|T]

22. | 180 / 190
Louis de Broglie
(1892-1987)
[Kanowitz 50:33]
[Cropper 30:4|QM]

23. | 170 / 335
Henry Cavendish
(1731-1810)
(Murray 4000:6|P)
[Kanowitz 50:18]

24. | 195 / **13**
Rene Descartes
(1596-1650)

25. | 190 / 26
Sadi Carnot
(1796-1832)
[Cropper 30:1|T]

26. | 195
[Kanowitz 50:44]
[Cropper 30:1|SM]

15 Ludwig Boltzmann (1844-1906)

27. | 190 | 33

Christiaan Huygens (1629-1695)

(Murray 4000:17|P) [Kanowitz 50:16]

28. | 180 | 165

James Joule (1818-1889)

(Murray 4000:16|P) [Kanowitz 50:17] [Cropper 30:3|T]

(CR:138|#30) English physicist and engineer;

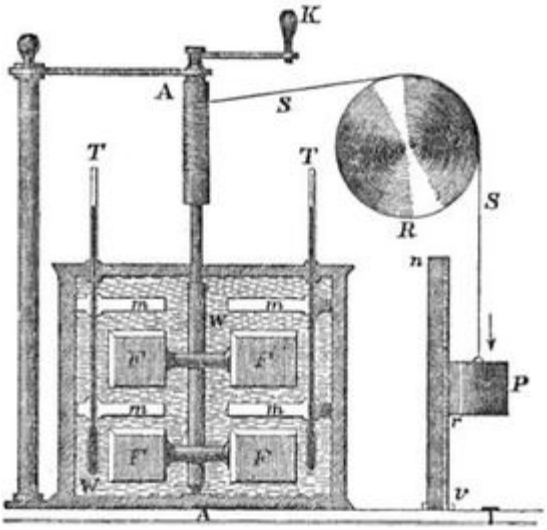

"The height of the pulleys from the ground was twelve yards, and consequently, when the weights had descended through that distance, they had to be wound up again in order to renew the motion of the paddle. After this operation had been repeated sixteen times, the increase of the temperature of the water was ascertained by means of a very sensible and accurate thermometer."

> — James Joule (1845), "On the Existence of an Equivalent Relation between Heat and the Ordinary Forms of Mechanical Power" (Ñº) (Ñº)

together with Hermann Helmholtz and Robert Mayer, are the three main derivers of the mechanical equivalent of heat (aka the conservation of energy) the big three thinkers of Thomas Kuhn's group of 12 independent formulators of the conservation of energy paradigm change theory; gauged at IQ 175-190 (c.2015).

29. | 180 | 119

Marie Curie (1867-1934)

(Murray 4000:16|P) [GHS:3] [Kanowitz 50:10] [Cropper 30:1|NP]

(Cattell

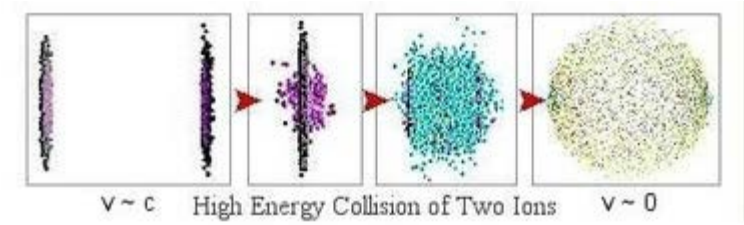

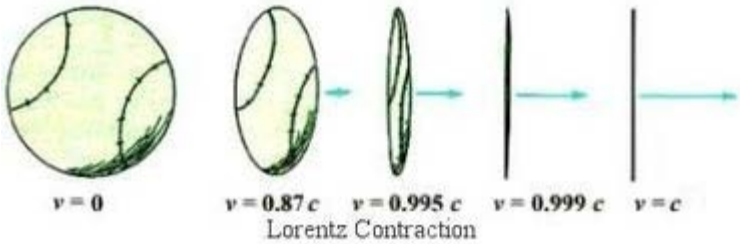

30. | 180 109

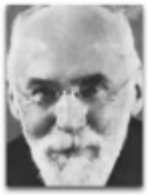

Hendrik Lorentz
(1853-1928)

[Kanowitz 50:42] 1000:N/A) [RGM:N/A|1,300+] (Murray 4000:N/A) Dutch physicist;

"Lorentz is the greatest and most powerful thinker I have ever known. I never met Willard Gibbs, but, perhaps, had I done so, I might have placed him beside Lorentz."

> — Albert Einstein (1954), response to question about who were the greatest men, and most powerful thinkers he had known

a top ranked GPE; noted for his postulate that light derives from oscillating electrons in atoms; for his 1892 postulate of relativistic length contraction; many other deep-minded insights; first slating: 175|#244 (c.2017); upgraded ↑ to 180|#110 (Jun 2018).

31. | 185 81

Satyendra Bose
(1894-1974)

(LGS:1)

(Cattell 1000:6)

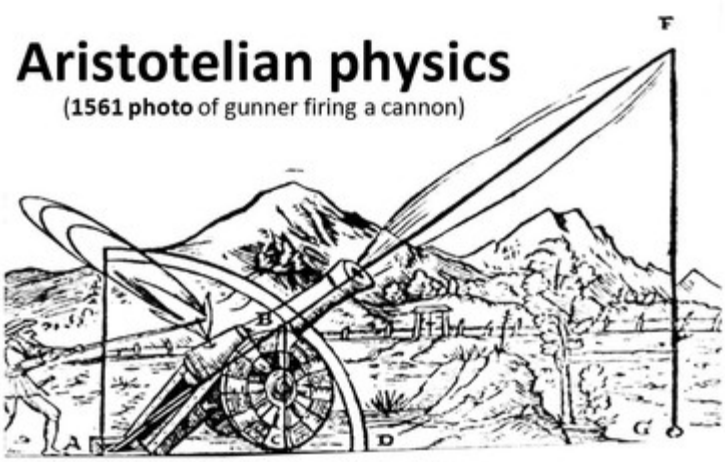

32. | 195 **10**

Aristotle

[RGM:6|1,310+] (Murray 4000:3|CS / 1|WP) (Glenn 20:1) (Perry 80:3|Li) (CR:265|#14) [LPKE] Greek physicist philosopher; #4 in genius meta-analysis rankings; epicenter genius; first dominate blue sky problem theorist; student of Plato—teacher of Alexander the Great, the synergy and transmission of which, in Alexandria,

(384-322BC)

resulted to bring about the unification of Aristotelian cosmos theory, i.e. a 55-sphere earth-centric universe model, with Egyptian astro-theology into what we now know as Christianity; first to document the Mpemba effect; in his circa 350 *Metaphysics*, was the first to dominantly introduced the term energy; central advocate of the nature abhors a vacuum dictum—that complete vacuums are impossible; His physics asserted that all matter had a proper place to which it tried to return, e.g. as shown by cannon ball falling back earth (photo) (Ñº) when impelling force ceased, and that heavier objects should fall faster than lighter ones (an idea disproved by Galileo); .

33. | 170 317

Charles Coulomb (1736-1806)

[Kanowitz 50:36]

(Cattell 1000:N/A) [RGM:N/A|1,350+] (Murray 4000:N/A) (SIG:15) French physicist and military engineer; noted for his 1785 construction of a built a torsion balance (Ñº), as shown, wherein, in an effort to prove Joseph Priestley's 1766 inference that the force of attraction or repulsion between two small charged spheres would be inversely proportional to the square of the separating distance, using Hooke's spring law, and showed quantitatively that charged spheres haven an inverse proportionality relationship, which he explained formulaically (see: Coulomb's law); first-slating: 170|#291 (Mar 2018).

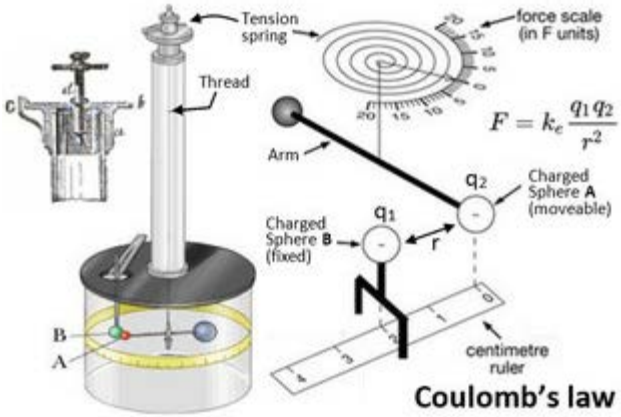

34. | 195 14

Pierre Laplace (1749-1827)

35. | 185 **56**

Nicolaus Copernicus (1473-1543)

[Kanowitz 50:15]

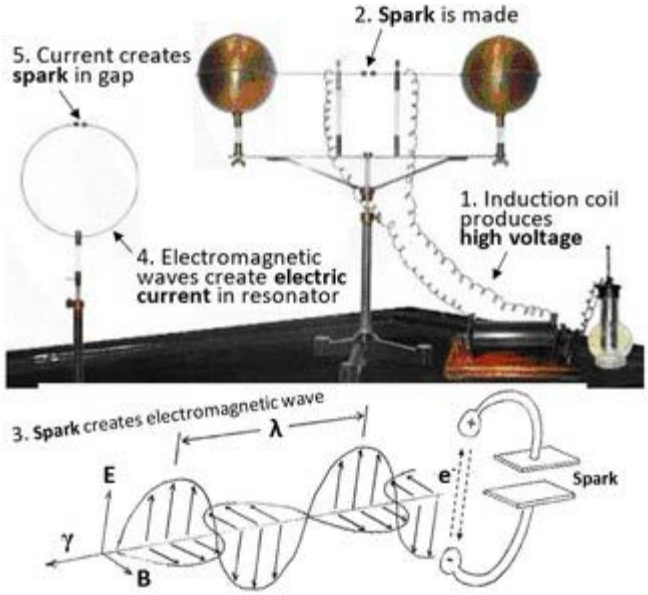

36. 180 | 202

Heinrich Hertz
(1857-1894)

[Kanowitz 50:24]

[RGM:151|1,500+] (Murray 4000:N/A) (Kanowitz 50:24) (SIG:11) (Ñº) German physicist;

“It's of no use whatsoever. This is just an experiment that proves Maestro Maxwell was right—we just have these mysterious electromagnetic waves that we cannot see with the naked eye. But they are there.”

— Heinrich Hertz (1887) (Ñº)

noted for his 1886 experimental proof, via detection of radiowaves, of Maxwell's electromagnetic theory, via experimental setup as shown adjacent; first-slating: 180|#185 (Dec 2017).

37. 190 | 36

Democritus
(c.460-370BC)

38. 190 | 24

Joseph Lagrange
(1736-1813)

39. 185 | 57

Robert Boyle
(1627-1691)

[Kanowitz 50:41]

41. | 190 | 25

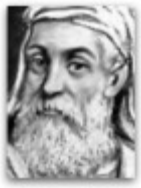

Empedocles
(495-435BC)

42. | 200 | 8

Thomas Young
(1773-1829)

(Murray 4000:19|P)
[Kanowitz 50:20]

43. | 185 | 66

Humphry Davy
(1778-1829)

(Cattell 1000:203) (CR:59) English chemist and physicist; noted for his 1799 "ice-rubbing experiments"; for his 1802 experiment wherein he took a battery and connected wires from it to a piece of carbon, which glowed; this was known as the "electric arc", forerunner to the light bulb (Edison, 1878) (Ñº); for his work on the conservation of force, among other areas of research, such as the discovery of many elements.

44. | 170 | 356

Daniel Bernoulli
(1700-1782)

[RGM:1309|1,500+] (CR:52) Dutch-born Swiss mathematician, physicist, and physician noted for his 1738 *Hydrodynamica* in which he outlined the basics of the ideal gas law, the precursors for the kinetic theory of gases, and gave the first basic definition of pressure

45.

William Hamilton
(1805-1865)

(Cattell

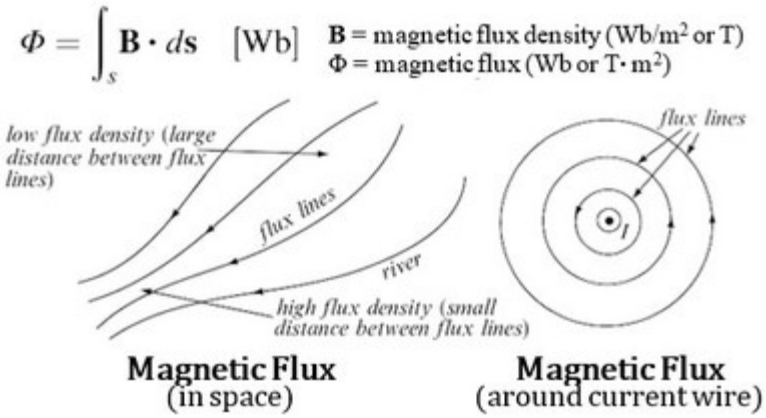

46. | 195

[Kanowitz 50:7]

1000:N/A) [RGM:7|1,500+] (Murray 4000:N/A) (RE:87) (CR:94|37)

18

Nikola Tesla
(1856-1943)

Serbian-born American electrical engineer, inventor, and philosopher;

“I am an automaton endowed with power of movement, which merely responds to external stimuli beating upon my sense organs.”

— Nikola Tesla (1900), “The Problem of Increasing Human Energy”

known for: defunct life theory, electricity, magnetism, human energy, radio technology, alternating current, electromagnetic motors; adhered to a Goethean philosophy, to the exclusion of all other philosophies.

47. | 185 | 53

William Thomson
(1824-1907)

[Kanowitz 50:19]
[Cropper 30:5|T]

(Cattell 1000:N/A)
[RGM:N/A|1,500+] (CR:361)
Irish-born Scottish mathematical physicist; known for: absolute temperature (adjacent), thermodynamics; Glasgow University age 10; defended Joseph Fourier’s 1822 theory of heat over that of Philip Kelland’s 1837 heat theory (age 13); by age 15-16; published first scientific papers by age 17; in 1845 (age 21), after graduating second wrangler (Cambridge), simultaneous unearthed (↑↑) the then unknown and forgotten memoirs of Sadi Carnot’s 1824 thermodynamics memoir and George Green’s 1828 memoir on the mathematics of electricity and magnetism, now known as two of the most-original works in science; and gave the first mathematical development of Michael Faraday's idea that electric induction takes place through an intervening medium; downgrade (↓) for latter religious undertone based calculations, e.g. age of the sun, etc.; first-slating: 185-190 (c.2015).

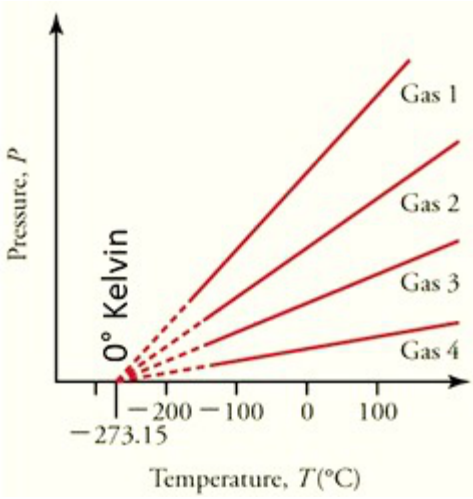

48.

Walter Heitler
(1904-1981)

49.

Joseph Priestley
(1733-1804)

49. | 175 | 264

Gustav Kirchhoff
(1824-1887)

(Murray 4000:11|P)

50. | 175 | 294

Robert Millikan
(1868-1953)

[RGM:N/A|1,330+] (Murray 4000:N/A) (CR:8) American physicist, known for his 1910 oil drop experiment (Ñº), conducted with Harvey Fletcher, wherein they calculated the charge on a single electron (1.6 × 10E-19 C); for his 1914 work on proving Einstein's 1905 photoelectric effect correct; downgrade for his 1928 cosmic ray anti-entropy heat death religious theory; first-slating: 175|#271 (Mar 2018).

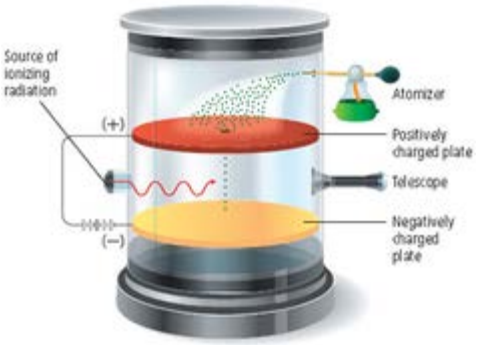

51. | 180 | 157

John Bardeen
(1908-1991)

[Kanowitz 50:26]

52. | 185 | 76

William Gilbert
(1544-1603)

(Murray 4000:18|P)

(Cattell 1000:N/A)

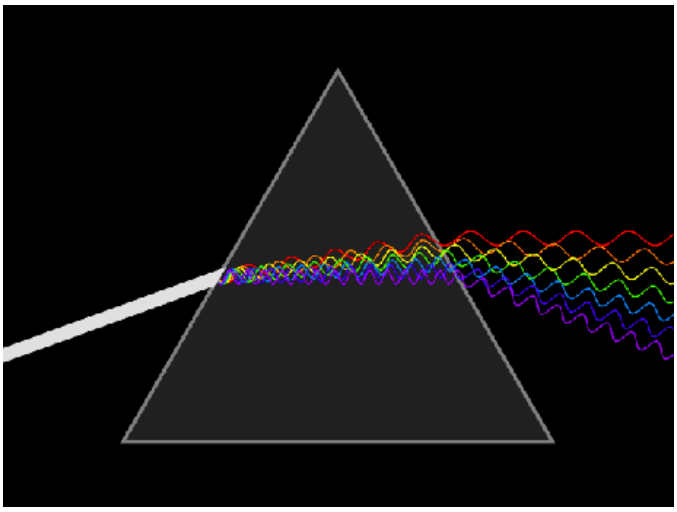

53. — 173

Augustin Fresnel
(1788-1827)

[RGM:N/A|1,330+] (Murray 4000:N/A) French engineer-physicist;

"By the genius of Young and Fresnel the wave theory of light was established in a position so strong that hence forth the corpuscular hypothesis was unable to recruit any adherents among the younger men."

> — Edmund Whittaker (1987), *A History of the Theory of Aether and Electricity* (Ñº)

co-founder, with Thomas Young, of the wave theory of light; 2018 missing (Ñº) GPE candidate; first-slating: 180|#170 (Mar 2018).

(Cattell 1000:557)
[RGM:558|1,500+] (Eells 100:93)
(CR:15) French physicist and mathematician;

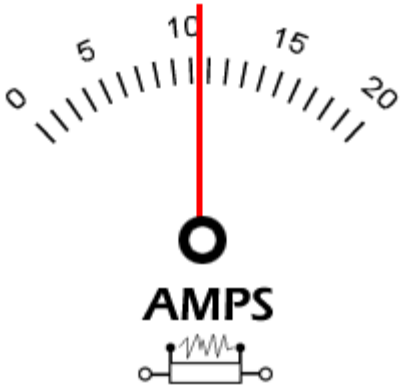

54. — 180 — 143

Andre Ampere
(1775-1836)

[Kanowitz 50:32]

"The experimental investigations by which Ampere established the laws of mechanical action between electric currents is one of the most brilliant achievements in science. The whole, theory and experiment, seems as if it had leaped, full grown and full armed, from the brain of the **'Newton of electricity'**. It is perfect in form, and unassailable in accuracy, and it is summed up in a formula from which all the phenomena may be deduced, and which must always remain the cardinal formula of electro-dynamics."

> — James Maxwell (1873), *Treatise on Electricity and Magnetism, Volume 2*

Dubbed the "father of electrodynamics" (Heaviside, 1888); coiner of electrodynamics, the study of currents and dynamical movements; a "tortured genius" who had the phrase "Tandem felix" ("Happy, at last") engraved on his tombstone; gauged at 180-190 (c.2015).

55.

Guillaume Amontons (1663-1705)

5#.

Alexander Friedman (1888-1925)

56.

Pierre Curie (1859-1906)

(Murray 4000:10|P) [GHS:9]

57. 185 | 46

Blaise Pascal (1623-1662)

(Cattell 1000:61) [RGM:42|1,500+] (Murray 4000:8|M) (GME:18) (CR:44) French mathematician, physicist, and philosopher; at age 19 (1642), made a counting machine, impressed Descartes, with toothed wheels and gears, moving drums carrying numbers, that could add, subtract, multiply and divide; built 50 in total; in 1646 repeated Evangelista Torricelli's vacuum experiments; from 1652-64, spent all his time on the mathematics of gambling; after his 1654 brush with death (age 31) he "found god" (downgrade ↓) and thereafter seems to have lost his ability to think objectively (see: Pascal's wager) and productively (relating all his theories to the Bible); upgrade (↑) for his *Thoughts* dialogues (Einstein-Pascal dialogue on purpose); dereacted at 39; down-graded from 190|#49 to 185|#47 (Feb 2017).

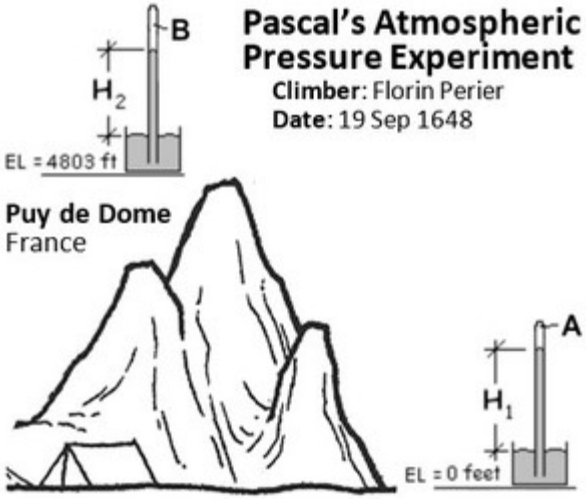

165

58. [GHS:6]

—
449
Guglielmo Marconi
(1874-1937)

59. | 175 | 289
Heike Kamerlingh-Onnes
(1853-1926)

60.
William Rontgen
(1845-1923)

[GHS:10]
[Kanowitz 50:50]

61. | 170 | 343
Lev Landau
(1908-1968)

(LGS:2)

62. | 190 | 37
Otto Guericke
(1602-1686)

[RGM:878|1,500+]
(CR:112) German engineer, physicist, philosopher, diplomat;

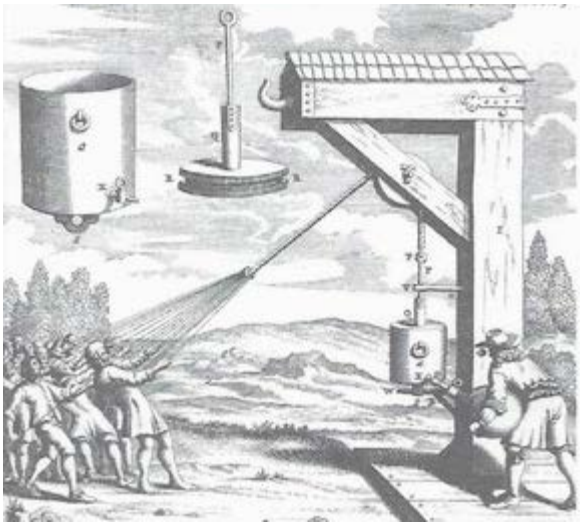

"Theories which are demonstrated by **experiment** and visual perception must be preferred to those derived from reasoning, however probable and plausible, for many things seem true in speculation and discussion, which in actual fact defy reality."

— Otto Guericke (1663), *New Magdeburg Experiments on the Vacuum of Space* (pg. xvii)

In 1854, he experimentally disproved Aristotle's theories about space and and his view that nature abhors a vacuum; a characterized “neglected genius” (Coulson, 1943) (Ames, 1994) (Ñº); the originality, variety, polymathly, and influence of his contributions are difficult to summarize in short; to say the least: he is the person behind the invention of the vacuum engine and the so-called: “first and greatest of the electrical discoverers”; first slated at 185|#61 (c.2017).

63. | 190 44

Henri Poincare
(1854-1912)

64. | 170 360

Subrahmanyan Chandrasekhar
(1910-1995)

[Cropper 30:2AP]

65. | 175 227

Wolfgang Pauli
(1900-1958)

[Cropper 30:3|QM]

66. | 185 49

Pierre Maupertuis
(1698-1758)

67. | 170 324

Edwin Hubble
(1889-1953)

[Kanowitz 50:30]
[Cropper 30:1|AP]

(Cattell 1000:414)
[RGM:9|1,500+] (Murray

68. 190 | 39

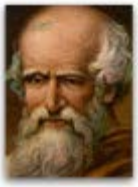

Archimedes
(287-212BC)

[Kanowitz 50:6]

4000:20|M / 5|T) [GME] (CR:28) Greek physicist, mathematician, and mechanical engineer; a fabled "last persons to know everything"; known for: hydrostatics, statics, the principle of the lever, steam cannon; categorized as both an "overrated genius" (Ñº) and an "underrated genius" (Ñº), depending.

69.

Hans Bethe
(1906-2005)

(LGS:1.5|Vote) [FMP:88]

[RGM:1234|1,500+] (Landau scale:1.5|Vote) German-born American physicist; noted for his c.1933 work, with Enrico Fermi, on the development of exchange force theory, by suggesting that interactions between charged particles could be described in terms of photons being exchanged between particles; 1939, Bethe added the final pieces to Arthur Eddington's proton-proton chain reaction model, by showing that a proton can beta decay into a neutron via the weak interaction during the brief moment of fusion, making deuterium the initial product in the chain.

70. 185 | 77

Roger Boscovich
(1711-1787)

71. 185 | 84

Jean d'Alembert
(1717-1783)

72. 180 | 91

Johannes Kepler
(1571-1630)

[Kanowitz 50:5]

(Cattell

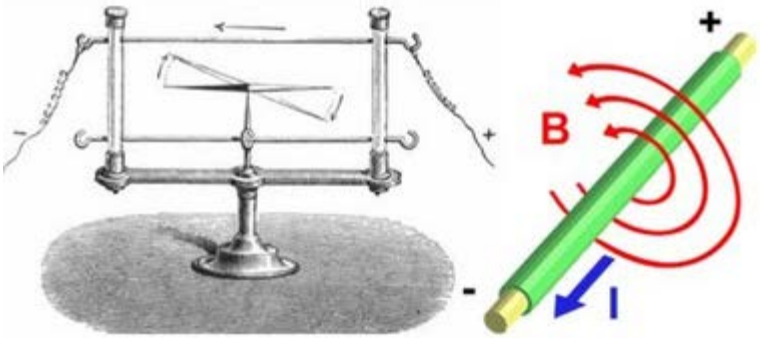

Hans

73. 175 | 270

Orsted
(1777-1851)

[Kanowitz 50:40]

1000:523) [Kanowitz 50:40] (GPE:73) (CR:11) Danish physicist, chemist, and natural philosopher; noted for his 1820 discovery that when a compass is brought near a current-carrying wire, that the needle deflects, i.e. he discovered that electric currents create magnetic field, aka aka "Orsted law" (Ñº), later shown to operate according to the "right-hand rule" (Ampere, c.1831); mentor to Ludwig Colding; supposedly shaped post-Kantian philosophy; downgrade ↓ from 180|#165 to 175|# per Buchner ridicule of his "eternal intelligence" (aka god) theory, and generally for reason that his discovery, while notable, is not as profound as followup work, e.g. Ampere, Maxwell, Faraday, etc., based this simple discovery (Feb 2019).

(Cattell 1000:N/A) [RGM:N/A|1,310+] (Murray 4000:N/A) (FA:20) Greek philosopher; nicknamed the "physicist"; successor to Theophrastus;

> "Equally intolerable is the inconsistency of Theophrastus, for at one moment he allots the divine primacy to mind, at another to the heavens, and yet another to the signs of the heavenly stars. Another figure unworthy of attention is Theophrastus' disciple **Strato**, the one they call the 'physicist', for he proposes that all divine power lies in nature, which bears within it the causes of birth, growth, and diminution, but which lacks all sensation and shape."
>
> — Cicero (45BC), *On the Nature of the Gods*

74. 180 | 101

Strato
(c.335-269BC)

Strato taught in Lampsacus; where he might have known Epicurus; he attended Aristotle's school in Athens, after which he went to Egypt as tutor to Ptolemy (309–246 BC) (Ñº), where he also taught Aristarchus (famed heliocentric theory pioneer) ↑; returned to Athens after the death (dereaction) of Theophrastus (c.287 BC), succeeding him as head of the Lyceum; he emphasized the need for exact research, and, as an example of this, he made use of the observation of how water pouring from a spout breaks into separate droplets as evidence that falling bodies accelerate; Hero's 50AD *Pneumatica*, was said to overview the physics of Strato and Ctesibius, via outlining an atomic theory in which matter consists of particles mixed with distributed vacua; David Hume declared Strato's brand of atheism to be: "the most dangerous of the ancients"; first-slating: 180|#105 (Feb 2018).

75. | 175 | 239

Walther Nernst
(1864-1941)

[Cropper 30:8|T]

76. | 180 | 140

Joseph Fourier
(1768-1830)

(Cattell 1000:N/A) [RGM:N/A|1,310+] (Eells 100:16) French physicist and mathematician; his *The Analytical Theory of Heat* (1822), wherein he outlined a heat flow theory based his reasoning on Newton's law of cooling, namely, that the flow of heat between two adjacent molecules is proportional to the extremely small difference of their temperatures, was read like gospel by William Thomson and James Maxwell in youth, therein being instrumental in the later development of thermodynamics; the book also provided the foundation for the Fourier transform; first-draft gauged at 180± (#138) (Jan 2018).

77. | 180 | 166

Robert Mayer
(1814-1878)

[Cropper 30:2|T]

78. | 180 | 92

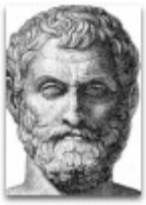

Thales
(c.624-546 BC)

79. | 180 | 99

John Strutt
(1842-1919)

80.

Arthur Compton
(1892-1962)

[RGM:N/A|1,500+] (CR:12) American physicist; in his 1932 "A Quantum Theory of the Scattering of X-Rays by Light Elements", gave experimental evidence for the particle view of light, aka Compton effect.

(Cattell 1000:684)
[RGM:140|1,500+] (SIG:13)
(CR:18) Italian physicist;

81. | 175 245

Alessandro Volta (1745-1827)

[Kanowitz 50:23]

"What is possible to do well, in physics in particular, are those things that can be reduced to degrees and measures."

— Alessandro Volta (c.1800) (Ñº)

noted for his famous 1776 "animal electricity" debated with his friend Luigi Galvani on the topic of the mechanism of the twitching of dead frog legs in an electric circuit, in respect to what separates a "living thing" from a "dead thing", moved by purely electro-physico-chemical means; which resulted in Volta inventing the battery, or "Voltaic pile", in 1800, so to prove Galvani wrong about his animal electricity theory; first-slated 175±|#156 (c.2015).

82. | 180 100

Stephen Hawking (1942-2018)

[Cropper 30:2|AP]

83 | 180 112

Heraclides (387-312BC)

Greek philosopher and astronomer; proposed that the earth rotates on its axis (compare: Ecphantus (c.500BC)); posited that the soul was light; did battle with Aristotle, supposedly, on the question whether the universe is finite or infinite; and is rumored, according to Simplicius (c.590AD), to have formulated heliocentrism (or at least the precursor model to what Aristarchus (c.240BC) (IQ:175|#244) put into book form); first draft slated at 180|#115, a grade above Aristarchus.

84. | 165 508

Lise Meitner (1878-1968)

[Kanowitz 50:39]
[Cropper 30:3|NP]

85.

Georges Lemaitre (1894-1996)

[Kanowitz 50:37]

86.

Wilhelm Weber (1804-1891)

[Kanowitz 50:47]

87.

Harlow Shapley (1885-1972)

88. | 180 150

Gustave Coriolis (1772-1843)

(CR:35) French physicist; noted for his 1829 *Calculation of the Effect of Machines*, wherein he introduced the modern formulaic definition of work as force times distance; some references assert, of note, that also in this book he introduced the introduced the factor ½ in German mathematician Gottfried Leibniz's 1686 *vis viva* for the sake of mathematical convenience (others say it was Joseph Lagrange who did this in 1811); also noted for his 1835 paper, wherein he stated that "any particle moving in the northern hemisphere is deflected to the right, and any particle moving in the southern hemisphere is deflected to the left", aka the Coriolis effect, according to which explains why toilets drain clockwise in the northern hemisphere and counterclockwise in the southern hemisphere.

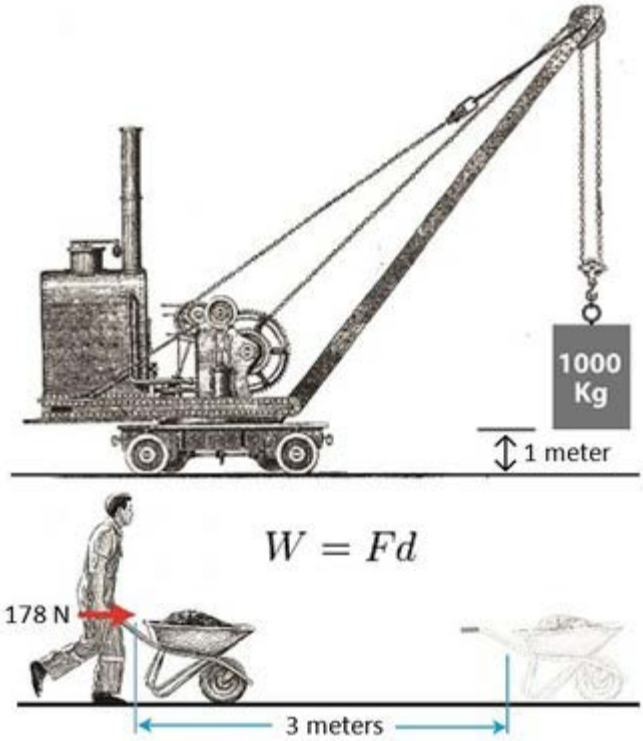

89	 Evangelista Torricelli (1608-1647)	[Kanowitz 50:46]	
90.	 Heraclitus (c.535-450BC)	[FMP:137]	
91.	 James Chadwick (1891-1974)	[FMP:25]	[RGM:N/A|1,500+] English physicist; noted for his 1932 discovery of the neutron—though, technically, Ettore Majorana, independently, arrived at the same conclusion, namely the existence of a “heavy neutral particle”, as he termed it, within the same period that year.
92.	 Pieter Zeeman (1865-1943)	[Kanowitz 50:31]	
93.	 Georg Ohm (1789-1854)	[Kanowitz 50:27]	
94.	 Arthur Eddington (1882-1944)		[RGM:N/A|1,500+] (CR:88) English astronomer, physicist, and mathematician; noted for his 1920 "The Internal Constitution of the Stars", wherein he anticipated the discovery and mechanism of nuclear fusion processes in stars, explaining that source of stellar energy, then a complete mystery, was fusion of hydrogen into helium (work later completed by Hans Bethe); noted for his expedition to observe the 29 May 1919 eclipse, which famously provided one of the earliest confirmations of general relativity (see: falsifiability).

95.

Henri Becquerel
(1852-1908)

[Kanowitz 50:34]

96. | 180 | 203

Benjamin Franklin
(1706-1790)

[Kanowitz 50:25]

97. | 175 | 244

Willem Gravesande
(1688-1742)

(GPE:97) (CR:31) Dutch physicist, experimenter, mathematician, lawyer and philosopher;

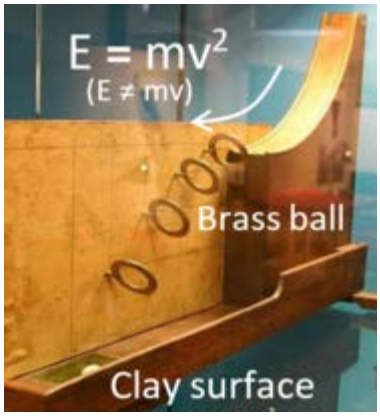

"**Gravesande** is to be ranged among the most important expounders of Newtonian physics in Europe."

> — Andrea Strazzoni (2013), *Dutch Cartesianism and the Birth of Philosophy of Science* (pg. 174)

noted for his *circa* 1718 brass ball clay surface experiments, data from which, showing that the moving ball has an energy of E = mv², rather than E = mv, as many argued, was used to resolve the vis viva controversy; did 1736 ball and ring experiments with Herman Boerhaave (as reported by Voltaire). ; first-draft slotted at #125 (Jun 2017); down-grade ↓to 175|#245 (Apr 2020).

9#. | 175 | 248

Ernst Mach
(1838-1916)

(Cattell 1000:N/A) [RGM:198|1,350+] (Murray 4000:N/A) (CR:16) Austrian physicist and philosopher; popularly known for his 1885 work on supersonic speed; he rejected the existence of god, as well as Isaac Newton's concept of absolute time and space; he argued that no statement in science is admissible unless it is empirically verifiable, which led him to reject atomic theory, which put him in the energetics school which did battle with Boltzmann and Planck (Mach lost); Einstein (1930) said that Mach's ideas should be considered the precursor of the general theory of relativity; first to document turning tendencies (pictured) in human movement; first slating: 175|#235 (Mar 2018).

98. | 170 386

Christian Doppler (1803-1853)

[Kanowitz 50:38]

(Cattell 1000:N/A) [RGM:N/A|1,350+] (Murray 4000:N/A) (Kanowitz 50|38) Austrian mathematician and physicist; noted for his 1842 explanation that observed frequency of a wave, e.g. color, depends on the relative speed of the source and the observer, aka "Doppler effect", e.g. red shift or blue shift, which he used to explain the color of binary stars; first slating: 170|#350 (Mar 2018).

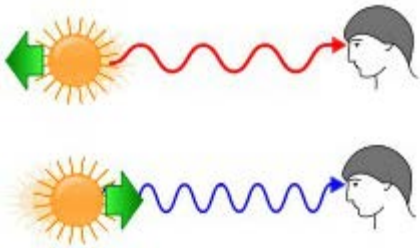

99.

Joseph Henry (1791-1867)

(SIG:19)

100.

Charles Wilson (1869-1959)

[FMP:30]

[RGM:N/A|1,500+] Scottish physicist and meteorologist; noted for his invention of the cloud chamber (1911).

101.

Ernst Siemens (1816-1892)

(SIG:19)

102.

Carl Anderson (1905-1991)

[FMP:60]

American physicist; noted for his 1932 discovery of the "positron" (antielectron) particle, predicted by Paul Dirac (1927) and Ettore Majorana (1928).

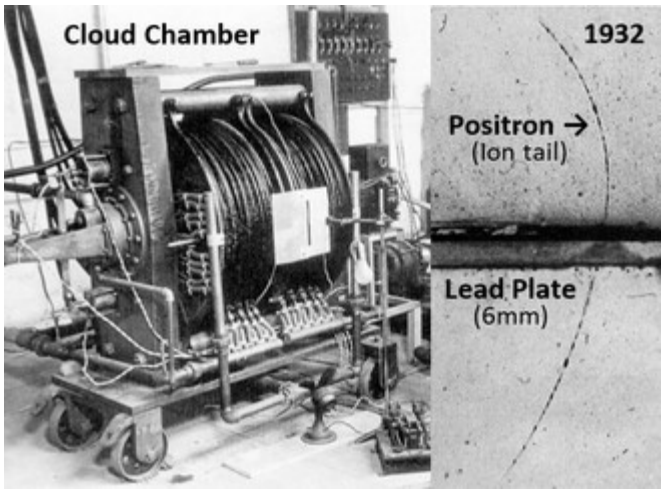

103.
Robert Oppenheimer (1904-1967)

[RankOPedia:11]

104.
John Wheeler (1911-2008)

[Kanowitz 50:49]

105.
Joseph Fraunhofer (1787-1826)

106.
Max von Laue (1879-1960)

(Simmons 100:56) (CR:10) German physicist, noted for his work in x-ray crystallography, namely in 1911 he conducted an experiment showing X-ray diffraction in a crystal lattice, from which he developed a law that connects the scattering angles and the size and orientation of the unit-cell spacings in the crystal; he later did work in relativistic thermodynamics.

107

[FMP:147]

(Gottlieb 1000:674) characterized an "ordinary genius" (Serge, 2013). [10]

	George Gamow (1904-1968)		
108.	William Bragg (1890-1971)	[FMP:71]	
109.	Henry Moseley (1887-1915)	[FMP:78]	English physicist; “We have here a proof that there is in the atom a fundamental quantity, which increases by regular steps as one passes from one element to the next. This quantity can only be the charge of the central positive nucleus, of the existence of which already have definite proof.” — Henry Mosely (c.1914) noted for his 1914 determination of the atomic numbers of each of the known elements.
110.	 Benjamin Thompson (1753-1814)	[FMP:115]	(CR:39) American-born English physicist; noted for his 1798 cannon-boring experiments (compare: ice rubbing experiment, 1799), which provided data for the first calculation of the mechanical equivalent of heat, and which laid question to the then-established caloric theory (of Antoine Lavoisier).
111.	 Oliver Lodge (1851-1940)	[FMP:117]	British physicist; noted for work in wireless telegraphy credited, by Lorentz, supposedly, with the first published description of the length contraction hypothesis, in 1893, though in fact Lodge's friend George Francis FitzGerald had first suggested the idea in print in 1889.
112.	 Osborne Reynolds (1842-1912)	[FMP:136]	
113.	Francois Argo (1786-1853)	[FMP:141]	
114.	 Dennis Gabor (1900-1979)	[FMP:148]	Hungarian electrical engineer and physicist noted, generally for his 1948 invention of holography; noted, in information thermodynamics, for his 1964 disproof of Maxwell’s demon (based on his 1951 lecture), in which he argues, similar to Leon Brillouin (1951), that the use of light by the demon, in attempting to gain information about the speeds of the particles, acts to dissipate energy in accordance with the second law.

115.	165 | 468 Charles Townes (1915-2015)	[FMP:151]	American physicist; noted for his 1954 invention of the “maser” or microwave amplification by stimulated emission of radiation, the forerunner to the laser.
	George Green (1793-1841)		A missing Kanowitz 50 physicist.
	Leó Szilárd (1889-1964)		A missing Kanowitz 50 physicist.
	Abdus Salam (1926-1996)		A missing Kanowitz 50 physicist.

(add)

Discussion

One of the more dominant surveys was the recent millennium poll on the greatest physicist of all time, conducted by the British journal *Physics World* who surveyed 130 leading physicists worldwide. [1] Two followup PhysicsForum.com polls (2005, N=80; 2007, N=65), seemingly using the top ten millennium physicists as starting candidates, are also shown below. [2] The a "merged" 2005 + 2007 Physics Forum Poll is also shown below (where a person, e.g. Heisenberg, only shows up in one year, the mean is taken assuming he placed at position #12):

Millennium Poll (1999)	Physics Forum Poll (2005)	Physics Forum Poll (2007)	Physics Forum Poll (2007+2009)	Google Hits Study (2009)
1. Albert Einstein	1. Isaac Newton	1. Isaac Newton	1. Isaac Newton	1. Albert Einstein
2. Isaac Newton	2. Albert Einstein	2. Albert Einstein	2. Albert Einstein	2. Max Planck
3. James Maxwell	3. Galileo Galilei	3. James Maxwell	3. Galileo Galilei	3. Marie Curie
4. Niels Bohr	4. Richard Feynman	4. Richard Feynman	4. Richard Feynman	4. Niels Bohr
5. Werner Heisenberg	5. Niels Bohr	5. Galileo Galilei	4.5. James Maxwell	5. Enrico Fermi
6. Galileo Galilei	6. James Maxwell	6. Erwin Schrodinger	6. Niels Bohr	6. Guglielmo Marconi
7. Richard Feynman	7. Paul Dirac	7. Niels Bohr	7.5. Paul Dirac	7. Werner Heisenberg

8. Paul Dirac	8. Michael Faraday	8. Paul Dirac	9. Erwin Schrodinger	8. Erwin Schrodinger
9. Erwin Schrodinger	9. Max Planck	9. Werner Heisenberg	10. Ernest Rutherford	9. Pierre Curie
10. Ernest Rutherford	10. Ernest Rutherford	10. Ernest Rutherford	10. Michael Faraday	10. Wilhelm Rontgen
			10.5. Max Planck	
			10.5. Werner Heisenberg	

An alternative study, “Estimating Achievement from Fame” (2009), which excludes pre-Nobel Prize era physicists, attempting to rank what might be called modern era physicists, was done by Mikhail Simkin and Vwani Roychowdhury at the University of California, Los Angeles, who ranked Nobel Prize winners in physics, by equating their achievements with their fame as measured by hits on Google. [3]

Another note to discern in these rankings is that of "retrospect time" in the sense that only time can tell if a person, in the long run, will be still ranking as one of the greatest physicists. Thus, for example, in 1923 *Time* magazine ranked J.J. Thomson as the "greatest living physicist", likely owing to the hoopla over his recent 1897 discovery of the electron, but he was soon thereafter surpassed by Einstein and other soon to come discoveries in sub-atomic physics. [5]

Landau physicist genius rankings

See main: Landau genius scale

The following is Russian physicist Lev Landau's circa 1930s-developed personal genius rankings scale, a list that he would carry around with him, supposedly penned in via some kind logarithmic formula:

#	Landau physicist genius scale
0	Isaac Newton
0.5	Albert Einstein
1	Niels Bohr, Werner Heisenberg, Erwin Schrodinger, Paul Dirac, Satyendra Bose, Eugene Wigner, and a few others.
1.5	
2	Lev Landau (self-estimate in his late years, supposedly after his 1962 Nobel Prize)
2.5	Lev Landau (self-estimate before 1962 Nobel Prize)
3	
3.5	
4	
4.5	David Mermin (per his own estimate ±)

5 Mundane or "pathologists"

(add)

Other rankings

The following table, first column, shows the 2008 listing of the “50 Most Influential Physicists/Astronomers of All Time” according to world history blogger Gavin Kanowitz. [4] The second column shows William Cropper's listing from his 2001 book *Great Physicists: the Life and Times of Leading Physicists from Galileo to Hawking*, listed chronologically and grouped by division. [6] Rankopedia's top 28 greatest physicist ever listing is shown as well: [8]

Kanowitz top 50	**Cropper 30** (chronological & grouped)	**Rankopedia top 28** (based on 25 votes: 2010-2012)
1. Isaac Newton	**Mechanics**	1. Albert Einstein 80.90
2. Albert Einstein	1. Galileo Galilei	2. Isaac Newton 77.42
3. Galileo Galilei	2. Isaac Newton	3. Galileo Galilei 59.62
4. Michael Faraday		4. Marie Curie 33.34
5. Johannes Kepler	**Thermodynamics**	5. Stephen Hawking 28.03
6. Archimedes	1. Sadi Carnot	6. Michael Faraday 27.15
7. Nikola Tesla	2. Robert Mayer	7. Niels Bohr 25.73
8. Max Planck	3. James Joule	8. Werner Heisenberg 16.78
9. James Maxwell	4. Hermann Helmholtz	9. John Napier 10.53
10. Marie Curie	5. William Thomson	10. Enrico Fermi 9.20
11. Niels Bohr	6. Rudolf Clausius	11. Robert Oppenheimer 8.80
12. Erwin Schrodinger	7. Willard Gibbs	12. Chushiro Hayashi 8.68
13. Werner Heisenberg	8. Walther Nernst	13. Henri Poincaré 7.60
14. Ernest Rutherford		14. Robert Hooke 6.02
15. Nicolaus Copernicus	**Electromagnitism**	15. Carl Gauss 6.00
16. Christiaan Huygens	1. Michael Faraday	16. James Maxwell 5.86
17. James Joule	2. James Maxwell	17. Murray Gell-Mann 4.90
18. Henry Cavendish		18. Ludwig Boltzmann 4.40
19. William Thomson	**Statistical mechanics**	19. Pierre-Gilles de Gennes 3.80
20. Thomas Young	1. Ludwig Boltzmann	20. Andre Ampere 3.20
21. Enrico Fermi		21. Evangelista Torricelli 2.80
	Relativity	

22. Richard Feynman
23. Alessandro Volta
24. Heinrich Hertz
25. Benjamin Franklin
26. John Bardeen
27. Georg Ohm
28. Paul Dirac
29. Robert Millikan
30. Edwin Hubble
31. Pieter Zeeman
32. Andre Ampere
33. Joseph Thomson
34. Henri Becquerel
35. Louis de Broglie
36. Charles Coulomb
37. Georges Lemaitre
38. Christian Doppler
39. Lise Meitner
40. Hans Oersted
41. Robert Boyle
42. Hendrik Lorentz
43. Joseph Fraunhofer
44. Ludwig Boltzmann
45. Robert Hooke
46. Evangelista Torrecelli
47. Wilhelm Weber
48. Ernst Mach
49. John Wheeler
50. Wilhelm Roentgen

(add)

1. Albert Einstein

Quantum mechanics

1. Max Planck
2. Niels Bohr
3. Wolfgang Pauli
4. Werner Heisenberg
5. Louis de Broglie
6. Erwin Schrodinger

Nuclear physics

1. Marie Curie
2. Ernest Rutherford
3. Lise Meitner
4. Enrico Fermi

Particle physics

1. Paul Dirac
2. Richard Feynman
3. Murray Gell-Mann

Astrophysics

1. Edwin Hubble
2. Subrahmanyan Chandrasekhar
3. Stephen Hawking

22. Max Planck 2.40
23. Amit Goswami 1.94
24. Edouard Branly 1.60
25. Andrei Sakharov 1.46
26. Wilhelm Bjerknes 0.80
27. Georges Charpak 0.57
28. David Ruelle 0.40

Aneki.com | Top 20 Existive

The following is an Aneki.com "Top 20 Living Physicists" list of the supposed greatest physicists existive (alive): (Ñº)

1. Stephen Hawking

McKie Top 10

In 2013, Robin Mckie, in her *Guardian* article "The 10 Best

2. Freeman Dyson
3. Leo Kadanoff
4. Edward Witten
5. Yoichiro Nambu
6. Michael Fisher
7. Anthony Leggett
8. Peter Higgs
9. Frank Wilczek
10. Carl Wieman
11. Gerard ‘t Hooft
12. Tsung-Dao Lee
13. Alan Guth
14. David Thouless
15. Theodore Hansch
16. Peter Zoller
17. Alkexander Polyakov
18. Steven Weinberg
19. Chen Ning Yang
20. Martin Rees

(add)

Quotes

The following are related quotes:

> “Lorentz is the greatest and most powerful thinker I have ever known. I never met Gibbs, but, perhaps, had I done so, I might have placed him beside Lorentz.”
>
> — Albert Einstein (1954), aggregate quote

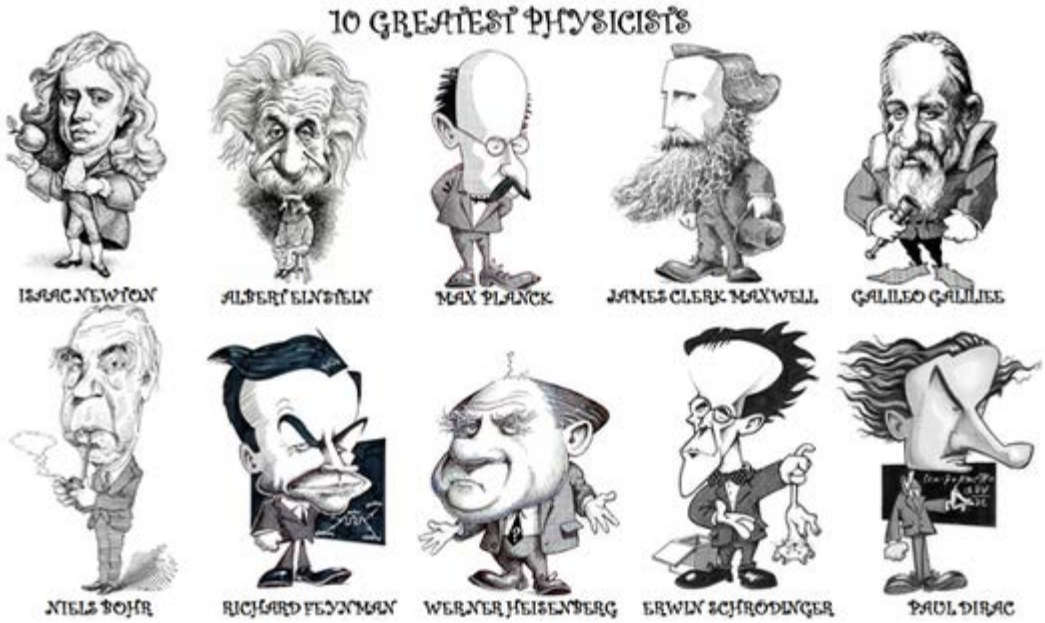

A caricature of ten top ranked physicists, from Newton to Dirac.

> “Who was the last universal physicist? Perhaps that is already beyond us or perhaps there will still come one last physicist—the last man who actually combines those two areas in himself. I can give you an answer about the past: Enrico Fermi was certainly the last physicist of whom I know.”
>
> — Johann Rafelski (1984), *Why and How in Theoretical Physics* [9]

> “The top-ten physicists in history according to two polls have been announced. One of the polls was conducted by Physics World magazine, published by the Institute of Physics (IOP), the British professional organization of physicists celebrating its 125th anniversary this year. The other was made by PhysicsWeb, also published by IOP on the web. We can extract another top-ten list from John Simmons' book (see: Simmons 100), which gives a ranking of 100 most influential scientists from the past to the present. Physicists are present in all the three lists: **Newton**, **Einstein**, **Maxwell**, Galilei, Bohr and Schrödinger.

Physicists: From Subatomic to Cosmic, the Pick of the Pioneers” (Ñº), using no discerning criterion, listed the following ten best physicists:

1. Isaac Newton
2. Niels Bohr
3. Galileo Galilei
4. Albert Einstein
5. James Maxwell
6. Michael Faraday
7. Marie Curie
8. Richard Feynman
9. Ernest Rutherford
10. Paul Dirac

Four physicists appear twice: Dirac, Feynman, Faraday and Heisenberg. Planck, Rutherford, Kepler and Copernicus are found in a single list."

— Tatsuo Tabata (1999), "The Top Ten Physicists" (Ñº), Dec 5

See also

- â— Greatest chemist ever
- â— Greatest philosopher ever
- â— Greatest mathematician ever
- â— Greatest thermodynamicist ever
- â— Greatest engineer ever
- â— Polymath
- â— Last person to know everything
- â— Universal genius
- â— Last universal genius
- â— Genius IQs (top 1000 geniuses)
- â— IQ: 200+ | Smartest person ever
- â— IQ: 150+ | Smartest woman ever

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(b) Greatest Physicist Ever (2007) – PhysicsForums.com.
3. (a) Anon. (2009). "The World's Greatest Physicists (as Determined by the Wisdom of Crowds), The Physics arXiv Blog, Jun 6.
(b) Simkin, M.V. and Roychowdury, V.P. (2009). "Estimating Achievement from Fame", *ArXiv.org*, Jun 19.
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(b) Cronin, James W. (2004). *Fermi Remembered* (pg. 31). University of Chicago Press.
(c) Author. (2005). "The Last Universal Physicist", *Physics World*, Apr. 1.
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θΔics

In genius studies, **greatest sociologist ever**, abbreviation (GSE:#), refers to the greatest mind or geniuses, depending, in sociology off all time. []

Overview

In 2007, English sociologist John Scott (Scott 50:#), in his multi-contributor treatise *Fifty Key Sociologists: the Formative Theorists*, published an alphabetically listed ordering of 50 key sociologist, as follows:

1. Jane Addams
2. Theodor Adorno
3. Charles Booth
4. Helen Bosanquet
5. Auguste Comte
6. Charles Cooley
7. Oliver Cox
8. William DuBois
9. Emile Durkheim
10. Edward Evans-Pritchard
11. Sigmund Freud
12. Antonio Gramsci
13. Ludwig Gumplowicz
14. Maurice Halbwachs
15. Leonard Hobbouse
16. Frederic le Play
17. Gyorgy Lukacs
18. Bronislaw Malinowski
19. Karl Mannheim
20. Herbert Marcuse
21. T.H. Marshall
22. Harriet Martineau
23. Karl Marx
24. Marcel Mauss
25. George Mead
26. Lewis Morgan
27. Gaetano Mosca
28. Gunnar Myrdal
29. Vilfredo Pareto
30. Alfred Radcliffe-Brown
31. Seebohm Rowntree
32. Ferdinand de Saussure
33. Max Scheler
34. Alfred Schutz
35. Georg Simmel
36. Albion Small
37. Werner Sombart
38. Pitirim Sorokin
39. Herbert Spencer
40. William Sumner
41. Gabriel Tarde
42. Alexis de Tocqueville
43. Ferdinand Tonnies
44. Edward Tylor
45. Thorstein Veblen
46. Lester Ward
47. Lloyd Warner
48. Beatrice Webb
49. Max Weber
50. Florian Znaniecki

In 2008, WikiBooks editors, in their "famous sociologists" chapter (Q), of *Introduction to Sociology*, amassed the following chronologically ordered list:

1. Auguste Comte
2. Emile Durkheim
3. Karl Marx
4. Herbert Spencer
5. Georg Simmel
6. Thorstein Veblen
7. Charles Cooley
8. George Mead
9. Max Weber
10. Talcott Parsons
11. Harold Garfinkel
12.Erving Goffman
13. Pierre Bourdieu

In 2013, DegreeInSociology.net published (Q) the following list of "10 Influential Sociologists of the 20th Century":

1. Emile Durkheim
2. Max Weber
3. Charles Mills (1916-1962)
4. Daniel Bell (1919-2011)
5. Erving Goffman
6. Michel Foucault
7. Jurgen Habermas (1929-)
8. Pierre Bourdieu
9. Anthony Giddens (1938-)
10. Gary Fine (1950-)

In 2017, Eliran Bar-El, a PhD sociology candidate, at the University of Cambridge, at TheQuestion.com, in response to the query: “What are the top 10 modern sociologists to read and why?”, posted (Q) the following listing, with detailed commentary:

1. Harriet Martineau
2. Emile Durkheim
3. Gabriel Tarde
4. Karl Marx
5. Max Weber
6. Georg Simmel
7. W.E.B. du Bois
8. Erving Goffman
9. Pierre Bourdieu
10. Bruno Latour

(add)

See also

- Greatest economist ever
- Greatest historian ever
- Greatest philosopher ever
- Humanities citation ranking

See also

- Sociological Theory Timeline (2014) – Hmolpedia thread.

References

1. Scott, John. (2007). *Fifty Key Sociologists: the Formative Theorists* (methodology, pg. #). Routledge.

External links

- List of sociologists – Wikipedia.

θΔics

In intellectual rankings, **greatest thermodynamicist ever** is an epitaph given to a person, depending on ranking methodology, some rankings of which are listed below, that classify, list, or describe someone as being the greatest thinker in the field of thermodynamics of all time.

World's Greatest Thermodynamicist T-shirt designed by Jobs in 2007. [3]

The term "greatest thermodynamicist" is a niche query, on the topic of ranking famous thermodynamicists, opinions of which seem to differ depending on the background of the population queried, e.g. chemistry, physics, or engineering, or expertise of the author of the the book the tribute is found in, such as shown below. The following page discusses some of these views. To clarify, up front, for those in the know, the greatest thermodynamicist is German physicist Rudolf Clausius, the founder of the subject. On the heels of Clausius, the vote seems to go to either Gibbs, in the chemist's view, or Boltzmann, in the physicist's view.

> "The translation of your main work is nearly complete and I cannot resist repeating here my amazement. If you had published this work over a longer period of time in separate essays in an accessible journal, you would now be regarded as *by far* the **greatest thermodynamicist** since Clausius—not only in the small circle of those conversant with your work, but universally—and as one who frequently goes far beyond him in the certainty and scope of your physical judgment. The German translation, hopefully, will more secure for it the general recognition it deserves."
>
> – Wilhelm Ostwald, German chemist, letter to Willard Gibbs, August (1891) [5]

> "To the memory of the **greatest thermodynamicist** of them all: Josiah Willard Gibbs."
>
> – John Fenn, American chemical engineer, *Engines, Energy, and Entropy* (1992) [1]

> "Ludwig Boltzmann was the **greatest thermodynamicist** of them all."
>
> – Rick Fleeter, American thermodynamicist, *Travels of a Thermodynamicist* (2007) [2]

Another repeated quote, which seems to have originated from New Zealand philosopher and psychologist Rom Harre in 1975, declares English physicist William Thomson to be the greatest: [6]

> "Kelvin, who was both one of the greatest physicists of his time, the **greatest thermodynamicist** in any case, proved, by his calculations that the life of the solar system could not possibly have exceeded about twenty-five million years."

Thomson, was not a core thermodynamicist, never actually writing a full treatise on the subject, although he was significantly noted for having introduced the work of Carnot to Clausius, via his proto-thermodynamics articles (1849-54), and for his work on the absolute temperature scale; this shows through in the fact that the quoter above is not a thermodynamicist, let alone a physicist or chemist. Thomson, true to note, however, is often considered a great thermodynamicist, by the layperson, owing to the fact that most of his contributions to thermodynamics were of the verbal type, and often grandiose in there proclamations, and thus easier to understand; yet as discussed below, none of his equations are used in modern thermodynamics textbooks.

Generational thermodynamicists

Another way to rank thermodynamicists, according to American physics historian and chemist William Cropper, who defines Gibbs as the “principle third generation thermodynamicist”, and eludes to the idea that Clausius and Thomson were the principle second generation thermodynamicists, with Carnot being first generation or initiator of the "Carnot legacy", is to compare thermodynamicists by generation and not which generation was the greatest.

Polls

The following shows the results of a poll run at the EoHT founders of thermodynamics page (2007-2010), started by American chemical engineer Libb Thims, in which 15 votes were submitted, and another run at the science blog "Uncertain Principles: Physics, Politics, Pop Culture" (2009-2010), started by American astrophysicist Chad Orzel, in which 196 votes were submitted: [4]

Encyclopedia of Human Thermodynamics (EoHT.info) (2007-2010)		Uncertain Principles: Physics, Politics, Pop Culture (ScienceBlogs.com) (2009-2010)	
Who is the greatest thermodynamicist of all time?	**Results** (2010) (15-votes)	**Which of these thermodynamicists is the best?**	**Results** (2010) (196-votes)

1. Clausius (53.3%)
2. Gibbs (26.7%)
3. Boltzmann (13.3%)
4. Maxwell (6.7%)

- Ludwig Boltzmann
- Sadi Carnot
- Rudolf Clausius
- James Joule
- Robert Boyle
- William Thomson
- Some other physicist who I will name in a comment
- Some chemist who I will name in a comment, you horrible physics snob
- I take issue with the whole concept of this poll, and will explain at length in a comment

1. Boltzmann (59%) (115 votes)
2. Carnot (17%) (34 votes)
3. Boyle (10%) (19 votes)
4. Thomson (5%) (10 votes)
5. Other chemist (3%) (5 votes)
6. Other per comment (2%) (4 votes)
7. Clausius (2%) (3 votes)
8. Joule (2%) (3 votes)
9. Other physicist (2%) (3 votes)

See also

- Greatest chemist ever
- Greatest physicist ever
- Greatest mathematician ever
- Greatest thermodynamicist ever
- Polymath
- Last person to know everything
- Universal genius
- Last universal genius

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2. Fleeter, Rick. (2007). *Travels of a Thermodynamicist* (description). Outskirt Press.
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4. Orzel, Chad. (2009). "Historical Physicist Smackdown: Thermodynamics Edition", *Science Blogs*, Uncertainty Principles.
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(b) Ridley, Mark. (1997). *Evolution* (pg. 391). Oxford University Press.
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θΔics

In mythology, **Greek mythology**, generally based on Hermopolis creation myth, via Homer (800BC), where the Ogdoad became the primordial deities, Atum-Ra (or Amen-Ra) became Zeus, and the Ennead became the Gaia (earth) and Uranus (sky) who procreate the warring factions of the Olympians and the Titans, generally modeled on the great war between Osiris and his faction and Set and his faction.

A general visual of how, Egyptian mythology, namely: Heliopolis creation myth (2800BC) turned Hermopolis creation myth (2400) turned Theban creation myth (2050BC), became **Greek mythology** (800BC), wherein Shu, the Egyptian god who separates Geb (earth) from Nut (heaven), becomes the Greek Atlas, who holds up the heavens, Amen-Ra became Zeus, Osiris became Dionysus, and Set became Typhon, to name a few (see: god character equivalences).

Overview

In Greece, during their rise to power (see: histomap), scholars, such as Homer (c.800BC), Hesiod (c.800BC), and Virgil (30BC), learned of the god structure of the Egyptians, in large part, and rewrote their own god genealogy in modified template form, based on the Egyptian models of the Heliopolis creation myth, Memphis creation myth, Hermopolis creation myth, Theban creation myth, Ennead, and Ogdoad; Plutarch put things as follows:

> "They say that the sun and moon do not use chariots, but boats in which to sail round in their courses; and by this they intimate that the nourishment and origin of these heavenly bodies is from moisture. **They think also that Homer, like Thales, had gained his knowledge from the Egyptians**, when he postulated water as the source and origin of all things; for, according to them, Oceanus is Osiris, and Tethys is Isis, since she is the kindly nurse and provider for all things. In fact, the Greeks call emission *apousia* and coition *synousia*, and the son (*hyios*) from water (*hydor*) and rain (*hysai*); Dionysus also they call Hyes since he is lord of the nature of moisture; and he is no other than Osiris. In fact, Hellanicus seems to have heard Osiris pronounced 'Hysiris' by the priests, for he regularly spells the name in this way, deriving it, in all probability, from the nature of Osiris and the ceremony of finding him."
>
> — Plutarch (100AD), *On Isis and Osiris* (§34)

The Egyptian god Shu, e.g., in slightly re-written fashion, became the Greek god Atlas who with his brother Menoetius sided with the Titans in their war against the Olympians, the Titanomachy. When the Titans were defeated, many of them (including Menoetius) were confined to Tartarus, but Zeus condemned Atlas to stand at the western edge of Gaia (the Earth), according to the Virgil (30BC) version, and hold up the "sky" (or Nut, in original Egyptian version) on his shoulders, to prevent the two from resuming their primordial embrace. (Ñº)

In c.680BC, Orpheus (c.725-675BC), according to Diodorus (c.40BC), travelled from Thrace to Egypt, wherein he was initiated into the mysteries of an Egyptian "Dionysus", aka Osiris, which he brought back to Greece; Aaron Johnson summarizes (Ñº) this line of argument as follows:

> "When Orpheus visited Egypt in search of wisdom and knowledge, he was initiated into the mysteries of Osiris/Dionysus, but wanting to make the Thebans of Greece happy, he changed the place of Dionysus' birth to Hellenic Thebes and then initiate the Thebans in the mysteries."

In c.580BC, Greek reformer Solon (c.638-558BC), according to Plato (Ñº), substituted Greek names for Egyptian ones, in writing about the deities, according to which Amen-Ra became Zeus, Set became Typhon, Osiris became Dionysus, Horus became Hercules, Shu became Atlas, etc. Solon, according to Plutarch, spent some time in Egypt and discussed philosophy with two Egyptian priests, Psenophis of Heliopolis and Sonchis of Sais. Solon, according to Plato's dialogues Timaeus and Critias, visited Neith's temple at Sais (see: recension theory) and received from the priests there an account of the history of Atlantis. (Ñº)

In 435BC, Greek historian Herodotus, in his *Histories* (pgs. 92; 100), based on first-hand interviews, attempted to summarize the convolution of Egyptian and Greek gods as follows (truncate quote):

> "Ethiopians inhabit the country immediately above Elephantine, and one half of the island; the other half is inhabited by Egyptians. Meroe is said to be the capital of all Ethiopia. The inhabitants worship no other gods than Jupiter and Bacchus; but these they honor with great magnificence; they have also an oracle of Jupiter; and they make war, whenever that god bids them by an oracular warning, and against whatever country he bids them. All those who have a temple erected to Theban Jupiter, or belong to the Theban district, abstain from sheep, and sacrifice goats only. For the Egyptians do not all worship the same gods in the same manner, except Isis and **Osiris, who, they say, is Bacchus**; but these deities they all worship in the same manner."

In 40BC, Greek historian Diodorus Siculus, in his 20-volume *Historical Library*, stated the following (aggregate quote):

> "The initiatory rites of Demeter in Eleusis were transferred from Egypt (1.29.2). The rite of Osiris is the same as that of Dionysus and that of Isis very similar to that of Demeter; **the names alone having been interchanged**, and the punishments in Hades of the unrighteous, the Fields of the Righteous and the fantastic conceptions, current among the many - all these were introduced by Orpheus in imitation of the Egyptian funeral customs. (1.96.4-5). Isis, after having invented the practice of medicine, taught this art to her son Orus [Horus], named also Apollo, who was the last of the gods that reigned in Egypt."

In c.50AD, Cornutus commented on the comment on the Osiris and Dionysus/Bacchus equivalence.

In 100AD, Greek-born Roman historian Plutarch, in his *On Isis and Osiris*, stated the following:

> "The histories on which the most solemn feasts of Bacchus, the Titania and Nuktelia, are founded, exactly correspond with what are related of the cutting to pieces of Osiris, of his rising again, and of his new life."

This point is generally considered the start of the need to make Egyptian to Greek to Roman god equivalency tables, per reason that one needs these translation equivalents so to be able to read Plutarch's account of things cogently.

Titans | Olympians

In 700BC, Hermopolis creation myth, with its two primordial god families, i.e. Ogdoad and Ennead, became, via the Greek scholars travelling to Egypt to study under their priests, Hesiod, as detailed in his *Theogony* (c.700BC), and Homer, in particular, became rewritten such that the Ogdoad became the Greek "primordial deities" (Ñº) and the Ennead, in a general sense, becomes the god family (Ñº) of the "Titans" and the "Olympians", the where the war that

famously ensues is the rescript of the famous battle between Set and Horus and on the question of the right to rule over both Upper and Lower Egypt.

Quotes

The following are related quotes:

> "The trumpets they conceal in **Bacchic wands** (see: Thyrsus), as Socrates has stated in his treatise on *The Holy Ones.* Furthermore, the tales regarding the Titans and the rites celebrated by night agree with the accounts of the dismemberment of Osiris and his revivification and regenesis."
>
> — Plutarch (100AD), *On Isis and Osiris* (§35)

> "A tradition says Solon (638-558), Thales, and Plato all visited the great college at Heliopolis, and that the last-named actually studied there, and that Manetho (c.300-250BC), the priest of Sebennytus, who wrote a history of Egypt in Greek for Ptolemy II., collected his materials in the library of the priesthood of Ra."
>
> — Wallis Budge (1904), *The Gods of the Egyptians* [1]

> "Interesting to note the parallels to certain Greek myths. Ra foresees that the children of Nut will overtake him, and taking steps to prevent them from doing so, just as Uranus and Cronus foresaw and attempted to prevent their own overthrow by their own children. Even more strikingly, Isis goes on a search for her lost husband, goes to work for a noble family in disguise, and attempts to make their child immortal by burning their mortal flesh away, before being interrupted by the child's mother, and growing wrathful. This is markedly similar to one version of the myth of Demeter and Persephone, in which Demeter, after searching for her lost daughter for several days, comes across a town, where she takes up a disguise, goes to work for a noble family, grows fond of their child, and tries to make the child immortal by burning away his mortal flesh, before being interrupted by the mother, and placing a curse on the town in vengeance. I wonder... did the Greeks borrow this myth from the Egyptian, do both stem from some older myth, or are the similarities somehow just coincidental?"
>
> — Erudito otidurE (2018), thread comment on Osiris Myth Animated [2]

References

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2. Anon. (2018). "Egyptian Mythology: Osiris Myth Animated" (Ñº), Captivating History, YouTube, Jun 14.

External links

â— Greek mythology – Wikipedia.

θΔics

In pantheons, **Greek pantheon** refers to the consortium of gods, supreme gods (e.g. Zeus) and god families (e.g. Olympians, Titans) developed by Greek writers and theologians in predominantly the years 850BC to 650BC, most of which is based on a recension and rescripting of the Egyptian pantheon.

Overview

In c.700BC, Hesiod, as described in his *Theogony*, followed by Solon (c.590BC), and others, e.g. Lycurgus (c.840BC), Homer (c.800BC), Orpheus (c.680BC) (Q), and Pherecydes (c.430BC), after studying in Egypt, in Heliopolis and Memphis, formalized their own state religion pantheon (See: Greek mythology) based, in outline, on the above Egyptian pantheon, then prevalent (see: **histomap**), with modifications and reductions; the gist of which, as outlined below [2], being that Ogdoad (see: Hermopolis creation myth, 2150BC) became "chaos", which gave birth to Gaea (or Geb) and Uranus (or Nut), from the Ennead; Amen-Ra became Zeus, the new supreme god; the model of there being two competing pauts or god groups, namely the Ogdoad and the Ennead, mixed with the eternal god camp battle, of good and evil (or light and darkness) between Horus and Set (or Ra and Apep, depending), became the model for the battle between the Titans and the Olympians; Osiris became Dionysus; Isis became Demeter; Nephthys became Persephone; Horus became Apollo; Shu became Atlas; Khnum became Prometheus; Thoth became Cronus and or Hermes, depending; Hathor became Aphrodite [3]; Neith (Q) became Athena [3]; Ptah became Hephaestus; Set became Typhon; among others (see: god character rescripts), and the gods took human forms (as opposed to human-animal forms, in the Egyptian scheme):

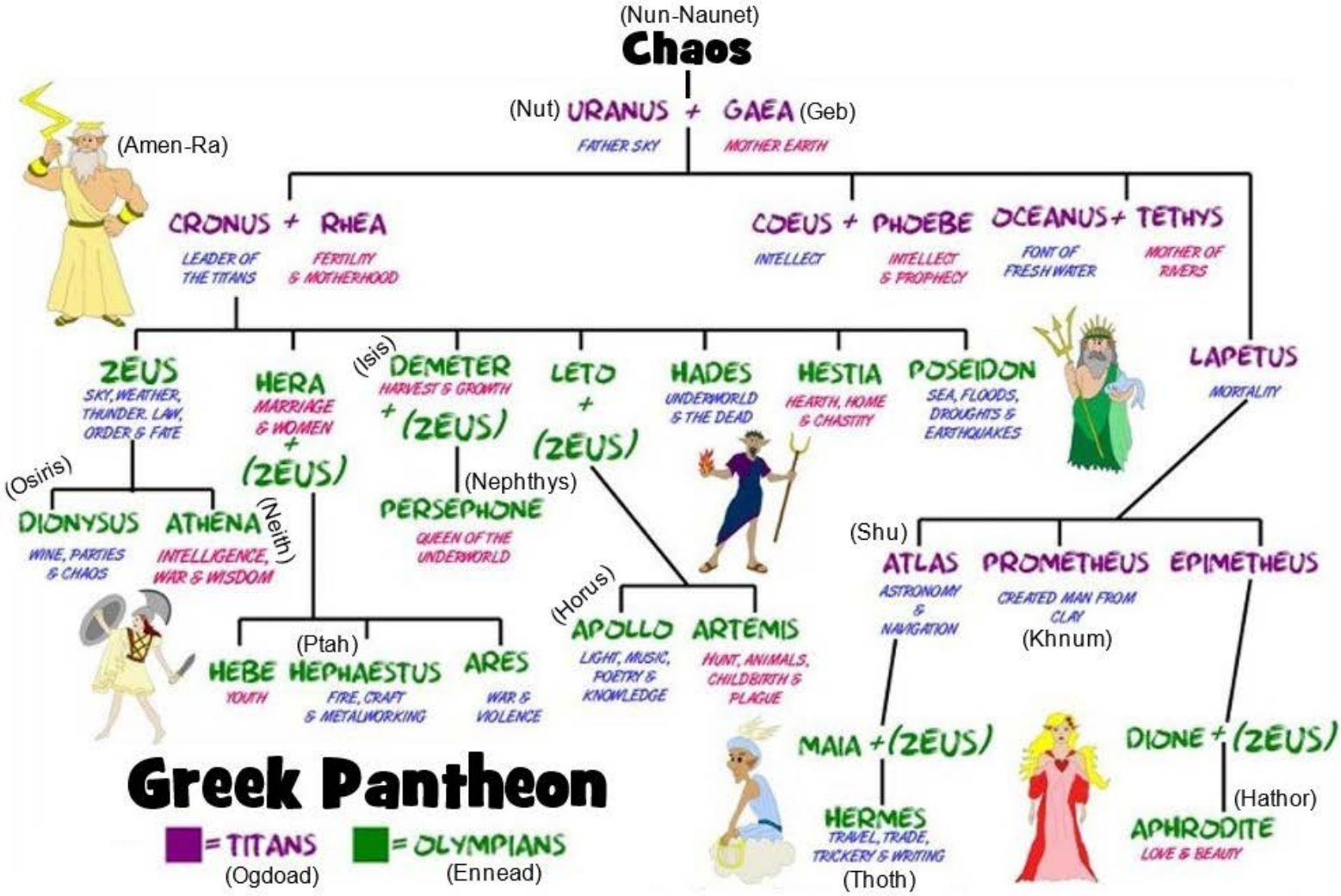

In 330BC, Epicurus, aged 12 or 14, depending, studied Hesiod's *Cosmogony* at school, and finding that everything was explained to arise from chaos, he cried out and asked: 'Whence, then, came chaos?' His teacher, likely being ignorant of the fact that Hesiod's model of chaos, was culled from the Nun and Naunet god pair, of the Hermopolis Ogdoad, however, had "no reply that would content him" (Lange, 1975), after which he began to develop his own philosophy (see: Epicureanism); thereafter coming in contact with atomic theory of Democritus, which expanded into the form of 300 scrolls, which eventually found there way into the hands of Lucretius, who transformed this logic into the now famous publication *On the Nature of Things*, which later, following the dark ages, seeded the enlightenment.

Quotes

The following are related quotes:

> "The Greeks got the names of all their Olympian gods from the Egyptians except Poseidon and Hera."
>
> — Herodotus (450BC), *History* (book 2) (Q)

“The initiatory rites of Demeter in Eleusis were transferred from Egypt (1.29.2). The rite of Osiris is the same as that of Dionysus and that of Isis very similar to that of Demeter; **the names alone having been interchanged**, and the punishments in Hades of the unrighteous, the Fields of the Righteous and the fantastic conceptions, current among the many - all these were introduced by Orpheus in imitation of the Egyptian funeral customs. (1.96.4-5). Isis, after having invented the practice of medicine, taught this art to her son Orus [Horus], named also Apollo, who was the last of the gods that reigned in Egypt.”

— Diodorus (40BC), *Historical Library*

“The trumpets they conceal in Bacchic wands (see: thyrsus), as Socrates has stated in his treatise on *The Holy Ones*. Furthermore, the tales regarding the Titans and the rites celebrated by night agree with the accounts of the dismemberment of Osiris and his revivification and regenesis.”

— Plutarch (100AD), *On Isis and Osiris* (§35)

“Herodotus upon this occasion says, that the whole romance of the soul and its transmigrations was **invented by** the Egyptians, and **propagated in Greece by men, who pretended to be its authors**. I know their names, adds he, but shall not mention them (lib. 2). Cicero, however, has positively informed us, that it was Pherecydes, master of Pythagoras. Tuscul. lib. 1, sect. 16. Now admitting that this system was at that period a novelty, it accounts for Solomon's treating it as a fable, who lived 130 years before Pherecydes.”

— Constantin Volney (1791), *The Ruins* (O)

See also

- Egyptian pantheon
- Judeo-Christian pantheon

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θΔics

In philosophy, **Greek philosophy** refers to the love of knowledge views of the ancient Greeks, oft divided by the pre-Socratic era, i.e. philosopher before Socrates (469-399BC), whose works only exist in fragments, the longest being fragment 17 of Empedocles, and post-Socratic.

Genealogy | Schools

See also: Map of physics

The following shows the general genealogy of the 72+ main Greek philosophers and their thinking — originating with the great sage Thales, who was the first Greek to take it upon himself to study abroad, in Egypt, i.e. to learn Egyptian philosophy (logic based on Egyptian mythology, which is based on astro-theology) — the main schools of Greek philosophy, and some of the transition thinkers going into Roman philosophy:

Imhotep (2635-2595BC)

Egyptians

Mochos (c.1250-1200BC)

Homer (c.850-750BC)

Hesiod (c.750-650BC)

Thales (c.624-546BC)

Water

Ionian school

Pherecydes (c.580-520BC)

Anaximander (c.610-564BC)

Pythagoras
(c.570-490BC)

Italian school

Anaximenes
(585-528BC)

Telauges
(c.540-470BC)

Ecphantus
(c.530-460BC)

Heraclitus
(c.535-450BC)

Xenophanes
(c.560-480BC)

Hippo (c.500-440BC)

[See: Parmenides vs Heraclitus]

Anaxagoras
(500-428BC)

Parmenides
(510-450BC)

Eleatic school

Zeno of Elea
(495-435BC)

Melissus
(c.470-400BC)

Leucippus (Q)
(c.500-450BC)

Atomic school

Empedocles
(495-435BC)

Herodotus
(484-
425BC)

Euripides
(c.480-
406BC)

Archelaus
(c.470-410BC)

Socrates (469-
399BC)

Democritus
(c.470-390BC)

Gorgias
(c.485-
380BC)

Aristophanes
(c.446-
386BC)

Aristippus
(c.435-
356BC)

Plato (427-
348BC)

Diogenes
(c.408-
323BC)

Xenocrates
(396-314BC)

Aristotle
(384-322BC)

Peripatic school

Metrodorus
(c.430-350BC)

Protagoras
(c.490-
420BC)

Diagoras
(c.448-
388BC)

Heraclides
(387-
312BC)

Pyrrho
(c.360-
270BC)

Nausiphanes
(c.360-

Naucydes
(c.350-

290BC) 300BC)

Eudemus (c.370-300BC)

Theophrastus (c.371-287BC)

Epicurus (341-270BC)

Anaxarchus (c.380-320BC)

Hippocrates (c.460-370BC)

Euclid (c.340-280BC)

Praxiphanes (c.350-290BC)

Zeno of Citium (c.334-262BC) **Stoic school**

Xenophon (c.430-354BC)

Cleanthes (330-230BC)

Hermarchus (325-250BC)

Leontion (c.330-280BC)

Leonteus (c.320-260BC)

Colotes (c.320-268BC)

Aristarchus (c.310-230BC)

Chrysippus (279-206BC)

Polystratus (c.290-220BC)

Dionysius (c.260-205BC)

Basilides the Epicurean (c.250-175BC)

Panaetius (185-109BC)

Apollodorus (c.160BC-100BC) (Q)

Zeno of Sidon (c.150-75BC) (Q)

Demetrius (c.160-90BC)

Seleucus (c.190-

120BC)

Posidonius (c.135-51BC)

Philodemus (c.110-35BC)

Lucretius (99-55BC)

Cicero (106-43BC)

Virgil (70-19BC)

Strabo (c.63BC-24AD)

Rome recension

Epictetus (55-135AD)

Marcus Aurelius (121-180AD)

Diogenes of Oenoanda (c.77-142AD)

Hippolytus (170-235AD)

Sextus Empiricus (c.160-210AD)

Plotinus (205-270AD)

Diogenes Laertius (c.190-250)

Hypatia (350-415AD)

Porphyry (233-305)

Simplicius (c.490-560)

John Philoponus (c.490-570)

DARK AGE

Geber (c.721-c.815)

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                                                  |                 |
Al-Jahiz                                          |                 |
(776-869)                                         |                 |
                                            Poggio            Petrarch
                                            Bracciolini       (1304-
                                            (1380-1459)       1374)
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                                       |                 |                 |
                                       |            Erasmus            |
                                       |            (1466-1536)        |
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θΔics

In hmolscience, **green fire** is a 1926 theory by Russian geochemical mineralogist Vladimir Vernadsky according to which the expansion of living matter in the biosphere is argued to be a type of vegetable life themed or analogized combustion process, fed by the sun, a process which acts to pressure other beings into becoming more complex and more dispersed. [1]

References

1. Margulis, Lynn and Sagan, Dorion. (1999). *What is Life?* (pg. 51). University of California Press.

θΔics

In hmolscience, **Greg Myers** (1954-) is an American-born English rhetoric and communications professor noted, in human thermodynamics, for his 1985 "Nineteenth-Century Popularizations of Thermodynamics and the Rhetoric of Social Prophecy", wherein he gives a short history of the usage of thermodynamics in the humanities.

Overview

In 1985, Myers, in his "Nineteenth-Century Popularizations of Thermodynamics and the Rhetoric of Social Prophecy", gives a fairly through account of the usage and application of thermodynamics in the humanities, and in particular social prophecy. [1] Myers thematically opens his paper to German historian-philosopher Oswald Spengler's 1918 quote regarding his cyclical entropy-based theory of the rise and fall of civilizations: [2]

> "What the myth of Gotterdammerung signified of old, the myth of entropy signifies today—the world's end as completion of an inwardly necessary evolution."

The German *Götterdämmerung* is a translation of the Old Norse phrase *Ragnarök*, which in Norse mythology refers to a prophesied war of the gods that brings about the end of the world. [3]

Myers then goes on to discuss similar discussions and extensions of thermodynamics and the physical sciences into the humanities made by others: Henry Adams, Erwin Hiebert, William Jordy, Henry Buckle, John Tyndall, John Ruskin, Stephen Brush, David Wilson, Theodore Porter, Balfour Stewart, Thomas Huxley, Peter Tait, Karl Marx, Nicholas Georgescu, Jeremy Rifkin, Yevgeny Zamyatin, Herbert Spencer, and Thomas Pynchon, to name a few. [4]

Education

Myers completed his BA at Pomona College, California, his PhD at Columbia University, and in 1985 was associated with the University of Lancaster. Presently, Myers is a professor of rhetoric and communication at Lancaster University.

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1. Myers, Greg. (1985). "Nineteenth-Century Popularizations of Thermodynamics and the Rhetoric of Social Prophecy." *Victorian Studies*, 29: 35-66.
2. (a) Spengler, Oswald. (1918). *The Decline of the West* (*Der Untergang des Abendlandes*) (entropy, 8+ pgs). Publisher
(b) The Decline of the West – Wikipedia.
3. Gotterdamerung – Wikipedia.
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(b) Brush, Stephen G. (1967). "Thermodynamics and History: Science and Culture in the Nineteenth Century", *The Graduate Journal*, 7: 481-543.
(c) Wilson, David B. (1974). "Kelvin's Scientific Realism: the Theological Context", *Philosophical Journal*, 11: 41-60.
(d) Brush, Stephen G. (1976). "Irreversibility and Determinism: Fourier to Heisenberg", *Journal of the History of Ideas*, 37: 603-30.
(e) Brush, Stephen G. (1978). *The Temperature of History*: *Phases of Science and Culture in the Nineteenth Century*. Burt Franklin.

External links

â— Greg Myers (faculty) – Linguistic and English Language department, Lancaster University.
â— Myers, Greg (1954-) – WorldCat Identities.

θΔics

In science, **Grégoire Nicolis** (1940-) is a Greek-born Belgian physicist noted for the coauthoring of a number of books and articles with Belgian chemist Ilya Prigogine, in reference to human or biological evolutionary applications of Bénard cells type Prigoginean thermodynamics, i.e. a far-from-equilibrium interpretation of self organization in human systems. [1] Nicolis' latest work has been on the application of nonequilibrium thermodynamics in complexity theory and its argued application to "human systems". [2]

Education

Nicolis studied engineering at the Technical University of Athens. In 1965, Nicolis completed his PhD in physics at the University of Brussels (Bussels school of thermodynamics) under Prigogine, his doctorial advisor, with the thesis "Some Aspects of Transport Phenomena in Non-Uniform Systems" (*Quelques aspects des phénomènes de transport dans les systèmes non-uniformes*). [3] Soon thereafter, Nicolis became professor of theoretical physical chemistry at the University of Brussels.

References

1. (a) Nicolis, Grégoire and Prigogine, Ilya. *Self-Organization in Non-Equilibrium Systems: From Dissipative Structures to Order Through Fluctuations* (esp. ch. 18). Wiley.
(b) Nicolis, Grégoire and Prigogine, Ilya. (1989). *Exploring Complexity - an Introduction* (esp. sect. "Self-Organization in Human Systems", pgs. 238-42). New York: Freeman and Co.
(c) Prigogine, Ilya, Nicolis, Grégoire, and Babloyants, Agnes. (1972). "Thermodynamics of Evolution," *Physics Today*. Vol. 25, Nov. pg. 25.
2. Nicolis, Grégoire and Nicolis, Catherine. (2007). *Foundations of Complex Systems: Nonlinear Dynamic Statistical Physics Information and Prediction.* Publisher.
3. Grégoire Nicolis – Mathematics Genealogy Project.

θΔics

In existographies, **Gregor Mendel** (1822-1884) (IQ:165|#412) [RGM:41|1,260+] (Glenn 20:10) (Hart 100:52) was an Austrian physicist and plant experimenter, noted for []

Overview

In 1856 to 1863, Mendel conducted breeding experiments on pea plants in attempts to discern rules for parent to offspring trait inheritance; in doing so he initiated the field of genetics.

> "My scientific studies have afforded me great gratification; and I am convinced that it will not be long before the whole world acknowledges the results of my work."
>
> — Gregor Mendel (c.1865) (Ñº)

Further reading

â— Henig, Robin M. (2001). *The Monk in the Garden: the Lost and Found Genius of Gregor Mendel, the Father of Genetics*. Publisher.

External links

â— Gregor Mendel – Wikipedia.

θΔics

In existographies, **Gregory Bateson** (1904-1980) (CR:11) was an English social anthropologist noted for his 1940s systems theory and cybernetics-based "ecology of mind" theory.

Overview

In 1979, Bateson published *Mind and Nature*, wherein, citing: thermodynamics, Pierre Teilhard, John Neumann, teleology, James Watt, Charles Darwin, the great chain of being, among others, he attempts to bridge biology and moral philosophy; the result, however, amounted to page fluff. [5]

Swedish literary critic Erland Lagerroth summarizes Bateson's contribution to the effect that he divined a large exposition on the form of existence, common to life and non-life, that was similar to the models developed by Ilya Prigogine and discovered by Erich Jantsch.

Bateson attended the Macy Conferences (1946–53), which hosted a core group that included Norbert Wiener, W. Ross Ashby, Heinz von Foerster, Margaret Mead (his wife), John Neumann, and Buckminster Fuller.

Ulanowicz | Ascendency

Bateson's ideas (possibly his 1972 *Steps to an Ecology of Mind*) are somehow connected or related to American ecosystem engineer Robert Ulanowicz' 1979 free energy modeled "ascendency" theory. In his own retrospect words, as explained in a chapter footnote to his 2009 book *A Third Window*: *Natural Life Beyond Darwin and Newton*, Ulanowicz states: [2]

> "My method of scaling was not motivated by **Bateson's** considerations, about which I was unaware at the time. I had simply drawn upon my background in thermodynamics to define in analogy to Gibbs or Helmholtz free energies (measures of the capacity of a system to do effective work [Schroeder, 2000]). Both of these quantities take the form of a scalar measure of the system's energy multiplied by a logarithmic term (as with AMI) indicative of its constituents."

(add)

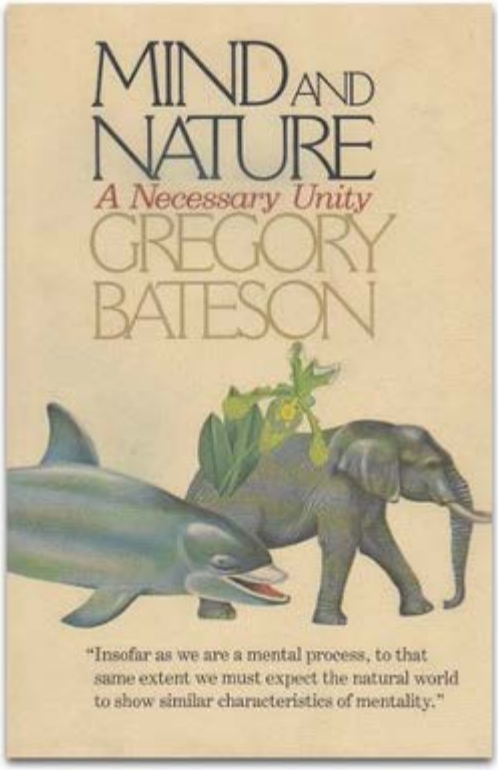

Bateson's 1979 *Mind and Nature*, wherein he attempts to meld moral philosophy with biology. [5]

Religion | Atheism

Bateson, the son of geneticist William Bateson, has been described as a fourth or fifth generation atheist, fascinated by the sacred. [3] In his 1972 *Steps to an Ecology of Mind*, Bateson describes how his father used to read him passage of the Bible at breakfast so that they wouldn't grow up to be empty-headed atheists. [4]

Quotes | By

The following are quotes by Bateson:

> "When I kick a stone, I give energy to the stone, and it moves with that energy; and when I kick a dog, it is true that my kick has a partly Newtonian effect. If it is hard enough, my kick might put the dog into Newtonian orbit, but that is not the essence of the matter. When I kick a dog, it responds with energy got from metabolism. In the 'control' of action by information, the energy is already available in the

respondent, in the advance of the impact of the events."

— Gregory Bateson (1979), *Mind and Nature* (pg. 101)

References

1. Lagerroth, Erland. (2009). "In the Beginning was the Process", Aug. 11. Amazon.com Reviews.
2. (a) Schroeder, Daniel V. (2000). *An Introduction to Thermal Physics*. Addison Wesley Longman.
(b) Ulanowicz, Robert E. (2009). *A Third Window: Natural Life beyond Newton and Darwin* (note 4.9, pg. 171) . Templeton Press.
3. Roark, Tom. (2010). "Gregory Bateson: Atheist Prophet of the Sacred", CantLearnLess, Blogspot, Feb 13.
4. Bateson, Gregory. (1972). *Steps to an Ecology of Mind* (pg. 343). Ballantine Books.
5. (a) Bateson, Gregory. (1979). *Mind and Nature: a Necessary Unity* (thermodynamics, 5+ pgs). Dutton.
(b) Solomon, Robert C. (1981). *Love: Emotion, Myth, & Metaphor* (pg. 115). Prometheus Books, 1990.

External links

â— Gregory Bateson – Wikipedia.

θΔics

In hmolscience, **Gregory Botanes** (c.1965-) is a Spanish entrepreneur noted, in business thermodynamics, for his 2009 thermodynamics based methodology consulting company.

Overview

In 2009, Botanes founded a consulting company called "Social Thermodynamics Applied Research", abbreviated SThAR, a social thermodynamics applied research company for business needs. [1] The slogan of Sthar is the pioneer and world's leader in the application of social thermodynamics universal laws to real business needs. [2] Botanes claims that: [3]

> "Sthar is the first company in the word to apply the revolutionary and recently discovered social thermodynamics universal laws to model social networks behavior and predict social changes, based on a mathematical model instead of existing statistics-based models."

A central aspect of their approach, is they claim to be able to predict the future of business needs and issues, just as is prediction is done in thermodynamics.

Botanes works with Spanish physicist Alberto Hernando who they self-define as the "father of social thermodynamics". The theoretical approach of their company is based on a mixture of subjects including Zipf's law, the Dunbar number, six degrees of separation, Shannon information, MaxEnt theory, and Fisher information. [4] This combined logic, supposedly, is explained in the 2009 paper "Fisher-information and the Thermodynamics of Scale-invariant Systems", in which Hernando and his associates "confirm analogy between properties of social systems (such as electoral results, city populations, citations in physics journals) and the thermodynamics of gases and liquids." [5]

Education

Botanes completed his undergraduate degree in telecommunications engineering, Polytechnic University of Madrid in 1990 and his MBA at IE Business School, Madrid, in 1997.

Logo for the 2009 social thermodynamics company SThAR.

References

1. (a) Gregory Botanes – LinkedIn.com.
(b) SThAR (home) – SocialThermodynamics.org.
2. SThAR Company Profile – LinkedIn.com.
3. Gregory Botanes (info) - Facebook.com.
4. Principles and Overview of Sthar (15 page PDF) – SocialThermodynamics.org.
5. Hernando, Alberto, Vesperinas, C., and Plastino, A. (2009). "Fisher-information and the Thermodynamics of Scale-invariant Systems", ArXiv. Aug 04.

External links

â— Gregory Botanes – Facebook.com.
â— Gregory Botanes (Spanish → English) – Xing.com.

In questions, **Gretchen question**, or *Gretchenfrage* (German), meaning "crutch question", refers to the religion and or god belief question a person asks their new prospective lover; the question is presented in Goethe's *Faust*, *Part One* (1808).

Faust and Gretchen in the garden (1808) during which time she asks the so-called "**Gretchen question**", namely: what is your opinion on religion and do you believe in God? (Painting James Tissot, 1861) (Ñº) The riddled poetic answer to which Faust gives, supposedly, being indicative of his own views, to some extent.

Overview

In 1808, Goethe, in *Faust*, *Part One*, gives the new lovers encounter, in the story, when the figure Margarete, called Gretchen, asks the main character Heinrich Faust about his attitude to religion and if he believe in god; specifically: [1]

> "Now tell me how you feel about religion? You are cordially good man, But I think you do not think much of it?"

Gretchen, is a very young girl who is being courted by the older, respectable scientist. After they have already met several times and even kissed, but not yet slept together, Gretchen makes her question to Faust. [2] She asks him directly how he stood with God and religion, to which he answers: [3]

> "Leave that, child! Truly, my love is tender;
> For love, blood and life would I surrender,
> For Faith and Church, I grant *to each his own*.
>
> My darling, who shall dare
> 'I believe in God!' to say?
> Ask priest or sage the answer to declare,
> And it will seem a mocking play,
> A sarcasm on the asker.
>
> Hear me not falsely, sweetest countenance!
> Who dare express Him?
> And who profess Him,
> Saying, I believe in Him?
> Who, feeling, seeing,
> Deny His being,
> Saying: I believe Him not!

As to whether Goethe, himself, believed in the existence of god, several citations seem to point to Goethe's *Faust* and this so-called Gretchen question, as his views on the matter.

This answer, according to Adolf Just, is an “evasive, entirely obscure answer”, of Faust, which does “not satisfy the reader either.” [3]

In 1937, Max Planck, aged 79, in his “Religion and Natural Science” lecture, opens to the Gretchen question, as a sort of ice breaker, as follows: [4]

> “ ‘Tell me: how do you stand on religion?’ — If Goethe’s *Faust* contains at all a simple phrase that captivates even a sophisticated listener and arouses a hidden tension within him, it must be this worried question of an innocent girl, in fear for her newly-found happiness, to her lover whom she recognizes as a higher authority.”

Planck, here, at this point, to note is anti-atheistic, in his lecture, and openly says he doesn't want to ruffle and feathers, so to say; therein attempting to console the religious person in the context of growing science; here, however, we see Planck expressing his own "hidden tension" on the issue, even as an aged man.

Quotes

The following are related quotes:

> “To ask the ‘**Gretchen question**’ is to ask about someone’s deepest religious or political convictions; from Goethe, *Faust*, I.—MEB]”
>
> — Eugene Boring (2009), note (pg. 150) (Ñº) in translation of Udo Schnelle’s *Theology of the New Testament*

References

1. (a) Faust (verse: 3417) (German → English) – SoftScience.at.
(b) Barbour, Julian. (2000). *The End of Time: the Next Revolution in Physics* (pg. 338). Oxford University Press.
2. Gretchenferage (German → English) – Wikipedia.
3. Just, Adolf. (1996). *Return to Paradise: Paradise Regained* (pg. 268). Health Research Books.
4. Planck, Max. (1937). “Religion and Natural Science”, lecture, May; in: *Scientific Autobiography and Other Papers* (translator: Frank Gaynor) (§6:151-50; pg. 125). Philosophical Library, 1949.

θΔics

In acronyms, **GS**, refers to "Google Search" return ranking, not to be confused with the "Genius Score" (GS) abbreviation of the Buzan IQ 835-point ranking scale, and refers to the position in Google search returns that any given *Hmolpedia* (2007-launched) entry falls, articles predominately written by American electrochemical engineer Libb Thims, as compared to similar online entries from: *Wikipedia* (2003-launch), *Britannica* (2007-launched), *MacTutor History of Mathematics Archive* (1997-launched), written by Scottish mathematicians John O'Connor and Edmund Robertson, at the University of St Andrews, Scotland, *Eric Weisstein's World of Science* (2002-launched), written by American astrophysicist Eric Weisstein, *The Information Philosopher* (2004-launched), written by American physicist Robert Doyle, among other noted online encyclopedias.

Name | Examples

For niche names, such as Leon Winiarski (GS:2), Hmolpedia ranks high (9 Apr 2014):

1. Leon Winiarski – Wikipedia.
2. Leon Winiarski – **Hmolpedia.**

Likewise, a Google query for Willard Gibbs (GS:2) yields:

1. Josiah Willard Gibbs – Wikipedia.
2. Willard Gibbs – **Hmolpedia.**
3. J. Willard Gibbs (American scientist) – Britannica.
4. Josiah Willard Gibbs (1839-1903) – AIP.org.
5. J. Willard Gibbs – APS.org.
6. Gibbs summary – MacTutor History of Mathematics, University of St. Andrews.
7. Gibbs biography – MacTutor History of Mathematics, University of St. Andrews.
8. Josiah Willard Gibbs – Wikiquote.
9. J. Willard Gibbs – Engines of Our Ingenuity.
10. Josiah Willard Gibbs Lectures – AMS.org.

A Google query for Rudolf Clausius (GS:5) yields the following return positions:

1. Rudolf Clausius – Wikipedia.
2. Rudolf Clausius – MacTutor History of Mathematics, University of St. Andrews.
3. Rudolf Clausius – Britannica.
4. Clausius, Rudolf (1822-1888) – Eric Weisstein's World of Scientific Biography.
5. Rudolf Clausius – **Hmolpedia.**
6. Rudolf Julius Emanuel Clausius – ASME.org.
7. Rudolf Clausius – NNDB.
8. Rudolf Clausius – Answers.com.
9. Rudolf Clausius – Encyclopedia of Earth.
10. Rudolf Julius Emanuel Clausius – Wikisource.

A Google query for Leon Brillouin (GS:9) yields the following return positions:

1. Leon Brillouin – Wikipedia.
2. Leon Brillouin – The Information Philosopher.
3. Brillouin, Leon (1889-1969) – Eric Weisstein's World of Scientific Biography.
9. Leon Brillouin – **Hmolpedia.**

Google queries for modern hmolscience scholars, without a Wikipedia entry, but with an Hmolpedia page, will tend to yield top returns, such as:

1. Jeff Tuhtan – **Hmolpedia.**
2. Jeffrey Tuhtan – Google Scholar Citations.
3. Jeffrey A. Tuhtan – Academia.edu.

1. Christopher Hirata – **Hmolpedia.**
2. Chris Hirata – Department of Astronomy, Ohio State University.
3. Christopher Hirata – TAPIR Group, Caltech.

Entries for more popular scientists, Hmolpedia articles may tend to rank lower, take the case of Gilbert Lewis (GS:12):

1. Gilbert N. Lewis – Wikipedia.
2. Gilbert N. Lewis (American scientist) – Britannica.
3. Gilbert Newton Lewis – ChemHeritage.org.
4. Gilbert Newton Lewis – Project Nova, California State Polytechnic University, Pomona.
5. Gilbert Lewis – Inventor of the Week, MIT.edu.
6. Gilbert Newton Lewis – RSC.org.
7. Gilbert Newton Lewis – HumanTouchOfChemistry.com.
8. Origin of the word 'photon' – NoBeliefs.com.
9. Gilbert Newton Lewis (1875-1946) – About.com.
10. Gilbert N. Lewis – ChemistryExplained.com.
11. Gilbert Newton Lewis, 1875-1946 (pdf) – NASOnline.org.
12. Gilbert Lewis – **Hmolpedia.**

Likewise for other popular thinkers such as: Sadi Carnot (GS:13).

For the peculiar case of Johann Goethe (GS:34), the most cited name in Hmolpedia citation rankings (CR#1:916), we find a lower ranking in Google search return ranking, largely owing to the fact that Goethe is a top 7 name in world literature, according to WorldCat Identities, hence his popularity.

Some names, such as Max Planck (CR#15:215), are so popular, one has to do a double query, e.g. "Max Planck, thermodynamics" (Ñº) to get a GS:8 ranking, otherwise his Hmolpedia entry will not show up in the top 100 Google returns.

Term | Examples

Some Google term queries, e.g. "entropy etymology" (GS:1), returns a #1 Hmolpedia position:

1. Entropy (etymology) – **Hmolpedia.**
2. Entropy – Online Etymology Dictionary.
3. Entropy – Wiktionary.
4. History of entropy – Wikipedia.
5. Entropy – Dictionary.com.

Though, to note, other key terms, e.g. thermodynamics (GS:58), have lower search return rankings.

θΔics

In engines, **Guericke engine** or Guericke vacuum engine is the first operational “engine”, or machine for producing work, using a piston and cylinder design and vacuum creation, per each cycle, as the operational principle.

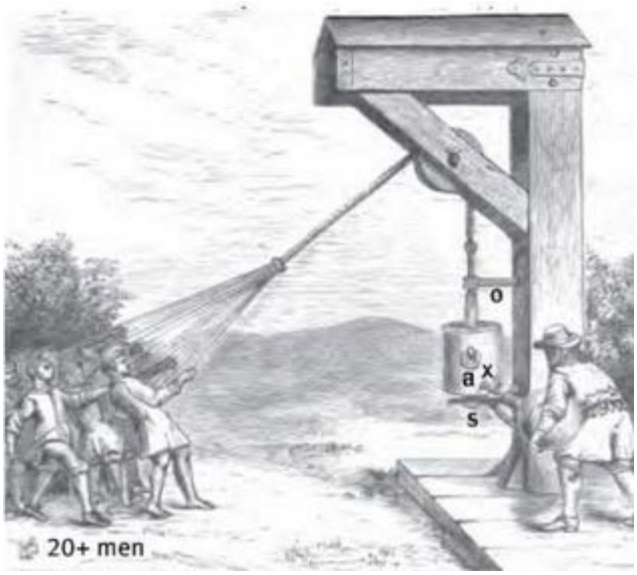

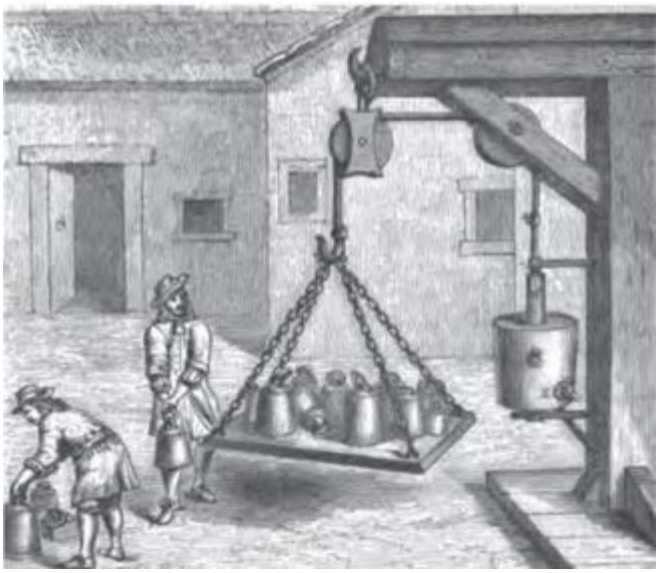

Left: the **Guericke engine** (circa 1670) in which a small boy attaches vacuum bulb to a piston and cylinder, and with the twist of the stop-valve, he is able draw down the piston and tug forward on a rope held by 20+ men. Right:
The 1672 "lifting device" version of the **Guericke engine**, the in which a scale loaded with 2,686 lbs attached to it was lifted through a height when a vacuumed-out bulb was attached to the connector, at location X, such that a small boy, with the simple twist of the connector, would suck out the air in the piston, which would force the piston down, and raise the weight through a height of gravity, i.e. do work (W = Force x distance or W = mgh).

The engine was built in circa 1672 by German engineer Otto Guericke, using his 1650 vacuum pump and piston and cylinder, to demonstrate the power of the vacuum and to thus disprove Parmenides’ 485 BC denial of the void or "nature abhors a vacuum" dictum. [1]

See also

â— Engine development timeline
â— Timeline of thermodynamics

References

1. (a) Wilson, George. (1849). “On the Early History of the Air-Pump in England”, *The Edinburgh New Philosophical Journal*, (pgs. 330-54).
(b) Galloway, Robert L. (1881). *The Steam Engine and its Inventors*. London: MacMillan and Co.

θΔics

In hmolscience, **Guido Erreygers** (1959-) is a Belgian economist noted for his 2013 historical work on the "rational economics" work of the Guillaume brothers, Georges Guillaume and Edouard Guillaume, a type of thermodynamics imbibed, Ernst Mach, Percy Bridgman cited, and Isaac Newton framed rational mechanics based (similar to the Lausanne school), physical economics or econophysics— which notably attracted the attention of two of the biggest geniuses of the 20th century: John Neumann (1934) and Albert Einstein (1946). [1]

Erreygers has also written a book chapter on the economic and social energetics views of Ernest Solvay. [2] He has also written on Belgian econometrician Bernard Chait and Swedish economist Knut Wicksell, and his views on Slovay, whom he thinks are hmolscience relevant.

Education

Erreygers complete his PhD in economics with a thesis "Land, Rent and Choice of Technique. A Study on Neo-Ricardian Theory" at University Paris X, Nanterre. Currently, Erreygers is professor of economics and chair of the economics department at the University of Antwerpen, Belgium.

References

1. Erreygers, Guido. (2013). "Mechanics Meets Economics, Once Again: On the Rationale of 'Rational Economics' of the Guillaume Brothers" (pdf), paper for conference "The Pioneers of Linear Models of Production", EconomiX, Université Paris Ouest Nanterre La Défense, 17-18 January 2013.2. Erreygers, Guido. (1998). "The Economic Theories and Social Reform Proposals of Ernest Solvay (1838-1922)", in: Warren SAMUELS (Ed.), *European Economists of the Early 20th Century, Volume One: Studies of Neglected Thinkers of Belgium, France, The Netherlands and Scandinavia* (pgs. 220-262). Cheltenham, Edward Elgar.

External links

â— Guido Erreygers (faculty) – University of Antwerpen, Belgium.

θΔics

In existographies, **Guillaume Amontons** (1663-1705) (IQ:175|#250) (GPE:55) (CR:14) was a French physicist and engineer, noted for []

Overview

In 1699, Amontons, building on Galileo, Robert Boyle, and Edme Mariotte, built a constant-volume air thermometer with which he used to develop the first verbal formulation of the ideal gas law and to argue that there was a zero point of temperature characterized by the absence of heat, which he calculated to be −239.5° C (or 33.65° K), the modern values being: −273.15° C (or 0° K).

Fire wheel

See main: Fire wheel

In 1699, Amontons published his experimental work in thermometry and on the development of the ideal gas laws and research into the nature of cold, which were said to have been repercussions of his failed attempt to create a 'fire wheel' that used the heat of a fire to expand air and make it move a wheel. The device was described as a very ingenious mill wheel, moved by the action of fire, based on a large number of experiments, and on arguments, which he called a *moulin à feu* (mill of fire). Some of his fire wheel research was used to create better thermometers. [1]

It is also said that Amontons had designed a "steam wheel" (a name which may be a synonym for his fire mill wheel), a sort of prototype steam engine, and that he tried to evaluate its performance in terms of the number of men or horses it could replace. [3]

Cannon engine

In 1699, Amontons, in his "Method of Substituting the Force of Fire for Horse and Man Power to Move Machines", supposedly, pointed out that the "cannon" was a type of heat engine, or "fire engine", that could be used to move machinery. [5]

Temperature | Boiling water

See main: Amontons gas law; See also: Gas laws

In 1699, Amontons, built his so-called "constant volume air thermometer", shown adjacent, consisting U-shaped tube ending in a bulb, filled with mercury, the long end of the tube being 45 inches, the height of the long arm being the measure of the "spring" which the air, in the region above the mercury in the big bulb, had obtained.

In one of his first experiments, Amontons submerged the bulb into boiling water, and observed that the mercury always stood at the same level, no matter how long or how vigorously he boiled the water. Herein, as Halley had done, he arrived at the idea of "constancy of the boiling point".

In 1702, Amontons did another experiment with *different volumes* of air, under same initial pressure, at room temperature, namely he heated three unequal masses of air and water in glass bulbs, submerged in boiling water; commenting:

> "Uneven masses of air loaded with equal or equal weights also increased the force of their spring by equal degrees of heat."
>
> — Guillaume Amontons (1702), *Publication* [7]

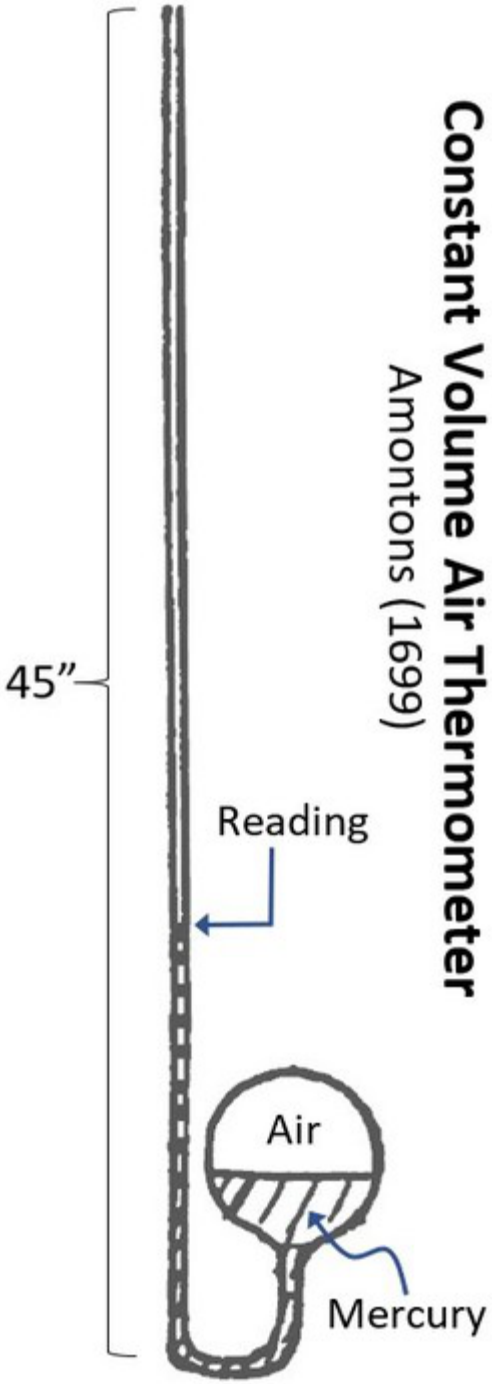

A picture of **Amontons**' 1699 constant-volume air thermometer. [7]

In 1702, Amontons did an experiment with different initial pressures, finding that at the same temperature of boiling water, the air could always sustain a column of mercury 1/3 longer than it could at room temperature; commenting:

> “The same degree of heat, however small it may be, can always increase the spring force of the air more and more, if this air is always loaded with a greater and greater weight.”
>
> — Guillaume Amontons (1702), *Publication* [7]

In 1702, Amontons, in his “Discourse on a Few properties of Air, and the Means to know the Temperature in all Climates of the Earth”, stated, supposedly, that the product of the pressure times volume equals the product of temperature times an unknown constant. [4] In modern formulation, thus would be an equation of the form:

$$PV = kT$$

which is the first prototype of the ideal gas law. The details of this, however, are a bit wanting; people, supposedly, in the 18th century were referring to Amontons law, as follows:

> “The law connecting pressure and temperature at constant volume has been referred to as ‘Amontons law’.”
>
> — W.S. James (1929), “The Discovery of the Gas Laws. II. Gay-Lussac’s Law” [7]

Said another way, Amontons work, according to James (1929), amounted to an experimental proof of what would later be known as "Gay-Lussac's law" (1802) as formulated by Joseph Gay-Lussac.

Absolute zero

In 1703, Amontons mathematically derived the idea of an "absolute zero". [1] Specifically, Amontons calculated "extreme cold", as he referred to it, to −239.5° C (or 33.65° K), the modern values being: −273.15° C (or 0° K) (or −459.67° F). In commentary on this, he said the following:

> "It appears that the '**extreme cold**' [absolute zero] of this thermometer is that which would reduce the air by its 'spring', to sustain no load at all."
>
> — Guillaume Amontons (1703), *Publication* [7]

Amontons also calculated the coefficient of expansion to be 1/239.5 per degree ° C. This, supposedly, was a value more accurate than most of the values obtained over the next hundred years. [7]

Using his gas equation, he showed that a total absence of heat was theoretically possible, in the sense that if the product of the pressure times volume became zero, the temperature would go to zero; although, to note, Amontons supposedly did not come right out and say that there was an 'absolute zero'.

Friction | Laws

Amontons, in engineering mechanics (Ñº), not to get his "Amontons law" of gases confused, also has two "Amontons laws" of friction named after him, in respect to laws of dry (unlubricated) friction, when blocks are pushed on a surface, as shown below:

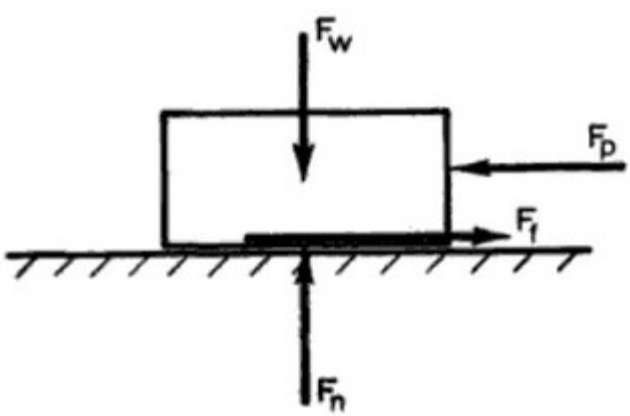

(add)

Influences

Amontons was influenced by Galileo, Robert Boyle, and Edme Mariotte.

Influenced

In c.1724, Daniel Fahrenheit used Amontons' "fixed point" of the constant temperature of boiling water in the construction of his now-commonly used Fahrenheit thermometer.

In 1738, Daniel Bernoulli, in his *Hydrodynamica*, credited Amontons as having been the first to derive the gas law equation; which according to Bernoulli was published in the Society memoirs of 1702.

Education

Amontons was born deaf and was largely self-taught in the sciences.

Quotes | On

The following are quotes on Amontons:

> "I read that the celebrated **Amontons**, using a thermometer of his own invention, had discovered that water boils at a fixed degree of heat. I was at once inflamed with a great desire to make for myself a thermometer of the same sort, so that I might with my own eyes perceive this beautiful phenomenon of nature."
>
> — Daniel Fahrenheit (1724), "Experiments and Observations Concerning the Congealment of Water in a Vacuum" [6]

> "The question whether there is a limit to the degree of cold possible, and, if so, where the zero must be placed, was first attacked by the French physicist, **G. Amontons**, in 1702–1703, in connexon with his improvements in the air-thermometer. In his instrument temperatures were indicated by the height at which a column of mercury was sustained by a certain mass of air, the volume or "spring" of which of course varied with the heat to which it was exposed. Amontons therefore argued that the zero of his thermometer would be that temperature at which the spring of the air in it was reduced to nothing. On the scale he used the boiling-point of water was marked at 73 and the melting-point of ice at 51½, so that the zero of his scale was equivalent to about –240° on the centigrade scale. This remarkably close approximation to the modern value of –273° for the zero of the air-thermometer was further improved on by Johann Lambert (*Pyrometrie*, 1779), who gave the value –270° and observed that this temperature might be regarded as absolute cold."
>
> — Anon (1911), *Encyclopedia Britannica* (§:Cold)

> "**Amontons** seems to have been the first to realize the importance of actually measuring the thermal expansion of elastic fluids, and the first to have studied the increase of pressure with temperature. Amontons also noticed, as Halley had done, that when water boils the temperature remains constant. Unlike Halley, he seems to have recognized the importance of this: boiling water provides an eminently suitable datum or fixed point for a thermometric scale."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pgs. 18-19)

> "**Amontons**, who had been deaf since childhood, invented and perfected various scientific instruments. In 1687 he made a hygrometer (an instrument for measuring moisture in the air), in 1695 he produced an improved barometer, and in 1702-03 a constant-volume air thermometer. In 1699 he published the results of his studies on the effects of change in temperature on the volume and pressure of air. He noticed that equal drops in temperature resulted in equal drops in pressure and realized that at a low enough temperature the volume and pressure of the air would become zero -an early recognition of the idea of absolute zero. These results lay largely unnoticed and the relationship between temperature and pressure of gases was not reexamined until the next century (by scientists such as Jacques Charles). Amontons also published in 1699 the results of his studies on friction, which he considered to be proportional to load."
>
> — John Daintith (1994), *Biographical Encyclopedia of Scientists* (pg. 18)

> “The macroscopic laws of friction (Ñº) found in textbooks were first published by the French engineer **Amontons** about 300 years ago, albeit the first recorded studies go back even further to the Italian genius da Vinci. Both found that the friction F between two solid bodies, firstly is independent of the apparent area of contact, and secondly is proportional to the force normal L or load that pushes the two objects together.”
>
> — Martin Muser (2003), “Statistical Mechanics of Static and Low-Velocity Kinetic Friction” (pg. 190)

> “Although **Guillaume Amontons**, the son of a lawyer from Normandy, had no format scientific education, he nevertheless studied geometry and the sciences and made important contributions in physics and meteorology. Amontons *became deaf* at an early age white in a Paris Latin school but was not deterred by this handicap. He went on to design many scientific instruments, such as a hygrometer (1687), an improved barometer (1688), an optical telegraph (1688-95), a conical nautical barometer (1695), a thermometer (1699), and various air and liquid thermometers including a constant-volume air thermometer (1702). As a career, however, he worked in government on various public works projects as an engineer.”
>
> — Don Rittner (2014), *A to Z of Scientists in Weather and Climate* [8]

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External links

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â— Guillaume Amontons – Nano-World.org.
â— Guillaume Amontons – NNDB.com.

θΔics

In hmolscience, **Guillaume de Greef** (1842-1924) (SN:19) was Belgian socialist noted for his 1910s commentaries on chemistry and physics applied to sociology.

Overview

In 1903, de Greef, in his "Introduction to Sociology", discussed concepts such as molecular sociology and speculated on the possible application of chemistry and physics principles to the humanities, albeit alluding to the supposed dangers of Auguste Comte's social theories: [1]

> "Between the method of Quetelet, who represents, so to speak, molecular sociology, and that of Comte, who especially represents synthetic sociology, Spencer takes the mean, which, although it is without the qualities of the first, is also without the qualities of the first, is also without the dangers of second."

In respect to social gravity theory, the following is an example speculation of physical chemical based sociology: [1]

> "Physics and chemistry show us in a general way that the solid, liquid, and gaseous substances which compose the terrestrial globe are not indiscriminately mingled: the rocks, the liquids, the gases occupy definite, limited spaces. They show a certain order in their static disposition; this order and these limits are the conditions of their equilibrium.
>
> Thus, just as our solar system gravitates around an unknown center, and just as in our system the planets gravitate around the sun, we also see all the bodies upon the earth equilibrated about its center by gravitation, and all the molecules of inorganic aggregates equilibrated differently among themselves, according to their different conditions, under the name of molecular attraction. In the same way, also, all the chemical modifications are the result of molecular equilibrations determined and limited by reciprocal relationships. Thus, the general law of limitation appears to us as inseparable from the very conception of aggregate or mass.
>
> Chemistry, by showing us atomical and molecular equilibrations of greater and greater complexity, prepares us for the consideration of a new aspect of statics. The law of definite proportions, and that of multiple proportions, are examples of chemical limits. Indeed, it will remain with us to see whether this law of limitation extends to the organic, psychic, and social world."

(add discussion)

Education

De Greef, born in Brussels, was raised by a family of free thinkers and artists; in his youth he read progressive philosophers, such as Voltaire; and in college he was attracted to the works of Henri Saint-Simon and Charles Fourier, before coming to Pierre Proudhon, who became his greatest influence. [3]

De Greef was a professor of sociology at the University of Brussels for a number of years; supposedly working an a synthesis and extension of the works of Auguste Comte and Herbert Spencer. [2]

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θΔics

In IQs, **Guinness Book IQs** are those published in the *Guinness Book of World Records* under the section "Highest IQ", from at least the mid 1960s to circa 1990.

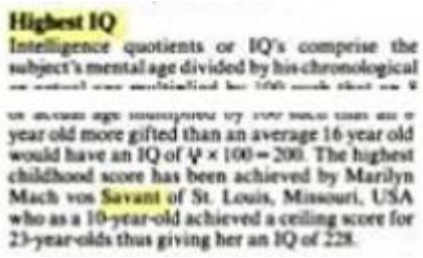
Highest IQ
Intelligence quotients or IQ's comprise the subject's mental age divided by his chronological

year old more gifted than an average 16 year old would have an IQ of 4/2 × 100 = 200. The highest childhood score has been achieved by Marilyn Mach vos Savant of St. Louis, Missouri, USA who as a 10-year-old achieved a ceiling score for 23-year-olds thus giving her an IQ of 228.

1986 clipping of the Guinness Book listing of Marilyn Mach vos Savant's **IQ of 228** under the category of "Highest IQ", a title which she held until the 1989, after which the category was removed, on the basis that it is becoming incoherent to substantiate such a high IQ.

Category removal

The category was removed, in 1989/90 following an exaggerated test score sent into Guinness in 1983 that resulted to christen a previously unknown American writer Marilyn Savant as the world's smartest person, that was published for a period of about five years. The *infamous* sentence, pictured adjacent, found in the *Guinness Book*, from circa 1984 to 1989, reads:

> "The highest childhood score has been achieved by Marilyn Mach vos Savant who as a 10-year-old achieved a ceiling score for 23-year-olds thus giving her an IQ of 228."

The actual IQ she received on this test was 132. Nevertheless, Savant has passed into folk legend as the possessor of the highest IQ ever recorded, albeit under false pretenses. In sum, the category was removed on the grounds that it was impossible to justify this category; concluding that IQ tests are not reliable enough to designate a single world record holder. [10]

Early editions

The 1966 edition of the *Guinness* listed Christopher Harding (1945-) under the category, "The Smartest Man in the World"; in 1974, Harding founded the International Society for Philosophical Enquiry; about the third oldest high IQ society (IQ=146+).

A quote from the 1978 edition is: "HIGHEST IQ: This Korean boy, with a 210 quotient, at the age of 4 years 8 months spoke 4 languages **...** A similar rating has also been attributed to Emanuel Swedenborg." [2]

In the 1981 edition of *Guinness Book*, listed: "a figure of 210 has been attributed to Kim Ung-Yong". [3]

Super-brain Christopher Harding is one of only five people listed in the *Guinness Book of World Records* under "Highest IQ" — but he hasn't worked in years, and his last jobs were sorting mail, washing cars and dumping trash!

. . . and he's a jobless janitor!

What's more, the 197 IQ genius, who never went to college, is often mistaken for a bum!

"You'd have to classify me as a misfit, a loner in modern-day society," admits the 47-year-old bachelor — who's so absent-minded he sometimes forgets to wear his dentures or even eat.

While the rest of the world is caught up in the day-to-day business of living, Harding's mind is soaring in a far-off world of abstract concepts and advanced math theories.

The only kind of TV screen he watches is his computer terminal, spending days on end formulating complex programs.

The shy genius lives at his parents' home in Rockhampton, Australia. He seldom ventures far from there.

"I don't like to talk about growing up — it's too painful," said Harding, who was speaking in complete sentences at 10 months. "Socially, I was a leper — a complete leper.

"Kids picked on me a lot. I found I couldn't do what my teachers asked. I was always learning on my own. My mind was always busy, thinking out problems. I'd withdraw into my own world.

"When I graduated from high school I couldn't face going to a university. I worked briefly as a clerk. But I quit because people tried to force me into friendships. Then I got a job in a college library, returning borrowed books to their shelves. I was there for 11 years. After a staff cutback, I was moved to the mail room.

"Later, I was moved to an odd-job role, washing cars and emptying trash cans. I'd shuffle along, and everyone was probably feeling sorry for that poor, eccentric misfit. But my brain, my whole being, was thinking and sorting things out.

"About five years ago I quit. Now I spend my time with my computer, reading or just thinking. Sometimes the cops stop me as I stroll around the neighborhood late at night. They think I'm a vagrant in my rumpled clothes."

Harding is totally wrapped up in creating two new computer programs — one to predict stock market trends and the other to foretell weather years in advance.

"At last, I'm doing what I want," he says happily.

— MICHAEL PHILIPS

WEEKLY WORLD NEWS June 25, 1991 38

The 1982 edition of *Guinness*, listed the ceiling of the Stanford Binet as IQ 200 and listed Kevin Langdon (IQ=196), of Berkeley, California, and Chris Harding (IQ=196), Bruce Whiting (IQ=196), of Boston, Robert Bryzman (IQ=196), Baltimore, and Leta Speyer (IQ=196) of New York city, as all having reported an IQ of 196 on the Stanford-Binet scale. [8] Kevin Langdon to detect intelligences beyond that which the MENSA tests were designed to do. He was starting a "Four-Sigma-Society", for people, supposedly, like him who had four standard deviations above the mean, i.e. an IQ of 160 or above, one deviation being equal to 15 IQ points. [9]

In 1982, three people began to hold the title of world's highest IQ of 197, Australian Christopher Harding, of Rockhampton, Queensland, and two Americans, a Dr. Johannes Veldunis, a university professor, and engineer Ferris Alger. [7]

On page seventeen of the 1985 *Guinness Book*, Christopher Harding is listed with a score of 197 on the Stanford-Binet scale. [4] The example article clipping is an example of a *Guinness Book* IQ citation, of Christopher Harding (IQ=197), as found in the June 25, 1991 issue of *World Weekly News*. [1] Harding was later intertwined with Savant, as discussed below.

The entire entry under "Highest IQ", on page 29, of the 1988 edition of *Guinness Book of World Records*, states:

> "Intelligence quotients or IQ's comprise the subject's mental age divided by his chronological age or actual age multiplied by 100, so that an 8-year-old more gifted than an average 16-year-old would have an IQ of 16/8 × 100 = 200. The highest childhood score has been achieved by Marilyn Mach vos Savant of St. Louis, Mo, who as a 10-year-old achieved a ceiling score for 23-year-olds, thus giving her an IQ of 228.
> In adult High IQ clubs, admission requirements are not on IQ points but are gauged in percentiles. An IQ exhibited by 1 person in 10,000 for instance coincides with 158 on the Stanford-Binet scale but 187 on the Cattell scale. The most elite ultra-high IQ society is the Mega Society with 26 members with percentiles of 99.9999 or 1 in a million. The topmost scorer in the Mega admission test, devised by its founder Ronald K. Hoeflin, has been 46 out of 48 by Marilyn Mach vos Savant superseding the 43 of Jeff Ward.
> The 3 members who scored 197 are Christopher Philip Harding (b Keynsham, England, 1944) of Rockhampton, Australia; Dr Ferris Eugene Alger (b Des Moines, Ia, 1913) of New Hope, Pa, and Dr Johannes Dougles Veldhuis (b Hamilton, Ont, Canada, 1949) of Charlottesville, Va.
> The highest IQ published for a national population is 115 for the Japanese born in 1960–61. At least 10 percent of their whole population has an IQ over 130."

(add)

Marilyn vos Savant | IQ: 228?

The calculation of Marilyn Savant's now-famous IQ of 228 is a bit of a story, the details of it being described as a "bit murky", by *New York Magazine* reporter Julie Baumgold, as discussed in her 1989 article "In the Kingdom of the Brain". [5] To begin with, Savant seems to have been an IQ test aficionado, taking them frequently in her childhood, joining Mensa in 1969 (age 23), and later becoming part of the "IQ test making industry", by consulting on IQ test manuals for Japanese students and later making IQ quizzes/puzzles as a job for *Omni* magazine.

● FIGURE 8.1 With a score of 230, Marilyn vos Savant has the highest IQ ever officially recorded. When she was only 7 years and 9 months old, vos Savant could answer questions that the average 13-year-old can answer. At ages 8, 9, and 10, she got perfect scores on the Stanford-Binet scale. Now in her 60s, she is a well-published author and recently became the host of an *Ask Marilyn* segment for CBS TV News.

2009 psychology textbook excerpt of Savant defined as the person having the "**highest IQ** (230) ever officially recorded."

● In 1953, age 7-years 7-months, Savant scored an IQ of 127 on a intelligence test, the ceiling of the test thus giving her an IQ of:

$$IQ_{age7} = 127$$

● In march 1957, age 11-years 4-months, according to actual records with the St. Louis board of education, she took the old version of the Stanford-Binet, geared for students aged 15 or younger, which according to IQ scale inventor Lewis Terman's age ratio IQ formula would give her an intelligence quotient of 132:

$$IQ_{age11} = 100\frac{15}{11+4/12} = 132$$

No one who knows vos Savant fairly well could doubt she has an extremely high IQ, that she is eerily smart and scored a 167+ on the Stanford Binet when she was ten, but then the **saga** of the 228 gets a little complicated. Its **derivation is murky**, and even the man who helped present it to Guinness and compute the 228 now computes 218.

Julie Baumgold's 1989 investigative article on Savant, explaining that in the calculation of Savant's enfamous 228 IQ the "derivation is murky". [5]

The story how this age eleven test score resulted fifty years later to her being listed as the "world's smartest person", as pictured (above) with a IQ of 230 is a bit convoluted, but boils down to number and date fudging.

As investigative reporter Julie Baumgold puts it in her 1989 article, shown adjacent, the "derivation is murky" and there is an entire "saga", which there seems to be, as discussed in detail below, to the 228 calculation.

● In short, twenty-six years later, during a 1983 dinner conversation American Lawyer Andrew Egendorf, the two concocted a publicity plan to convert her age 11 Stanford Binet score into the "world's highest IQ". During this period, Savant was a relatively unknown person, aside from having association in various up and coming IQ societies, and worked as an IQ puzzle writer for *Omni* magazine.

American lawyer **Andrew Egendorf**.

American Mega Test creator **Ronald Hoeflin**.

English Guinness Book editor **Norris McWhirter**.

Egendorf was writing a book on high IQ societies and believed that if he got Savant the title of "Highest IQ" in *Guinness Book*, it would be a win-win situation for both of them. Egendorf sent her scores to Guinness on July 25 of that year.

● Savant then approached American Mega Society (1982) and Mega Test creator Ronald Hoeflin about sending supporting data into the *Guinness Book*. On this idea, Hoeflin comments:

> "Marilyn told me she had received a perfect score on the Binet when she was ten. I computed it. I divided 22 years 11 months by 10 years 6 months, and her IQ was 218. Marilyn [also] showed me a report card that listed her IQ as 167+."

The IQ of 167 figure, supposedly, comes from this calculation:

$$100\frac{17+10/12}{10+8/12} = 167$$

In other words, at age 10 years and 8 months (dates from Savant's memory), she aced a high school IQ test, or as one interview respondent put it: "When Marilyn was a ten-year-old student at Susan R. Buder school, she supposedly got a perfect score on the Stanford Binet. She hit the ceiling of that test, when appears on here school record as 167+. That

figure was arrives at by dividing her mental age, recorded as 17-years 7-months [10-months, above calculation] by her chronological age, recorded as 10-years 8-months, and multiplying by 100". As Hoeflin commented on this matter: "Guinness had been listing IQs of 196 as the world's highest, but Hoeflin knew there were higher, as he states:

> "Marilyn asked me to write on her behalf," he says, and he did. Norris McWhirter, former editor of the Guinness book, says he based vos Savant's listing on the material from the Mega Society. "I haven't got anything original," he says.

Thus the highest IQ in the world was born. "She values it as a way of getting publicity for her literary work," says Hoefling. The problem here is that the date at which Marilyn told everyone she took the test were incorrect. As one reporter puts it:

> "Both the month that Marilyn took the test and the mental age she achieved on it are matters of some question that contribute to the murkiness over the Guinness top score. Her record with the St. Louis board of education shows she took the test in March 1957; she insists she first took it in September 1956."

This is the first issue with her IQ calculation. When questioned about this, she responded:

> "She says documents supporting her claims were provided by a teacher whose name she can't remember and sent to Christopher Harding, a Mega society member, now in Australia."

The second issue with her IQ calculation, is the jump from 167 to 228. To substantiate this, in her own words: "I answered some additional questions in the adult portion of the test to bring my score to a mental age of 22-years, 10-months." This, however, would give her the following IQ:

$$100\frac{22+10/12}{10+8/12}=214$$

This value seems to follow in alignment with this reporter finding: "She has an extremely high IQ, and scored a 167+ on the Stanford Binet when she was ten, but then the saga of the 228 gets a little complicated. Its derivation is murky, end even the man who helped present it to Guinness and compute the 228 now computes 218." The reporter here, supposedly, is referring to Hoeflin. The value of 228 arose by the claim of Savant that she took her test at age ten, and assuming that the test ceiling mental age was 22 years and 10 months which yields a ratio IQ of 228:

$$100\frac{22+10/12}{10}=228$$

The value of 230, such as depicted above in the 2009 psychology textbook, seems to have been arrived at by truncating all the dates to the simplified view that at age 10 Savant scored perfect on an age 23 intelligence test:

$$100\frac{23}{10}=230$$

On a side note, Savant also took Marilyn vos Savant took Ronald Hoeflin's Mega Test in circa 1985 (age 39), scoring 46 out of 48, which, according to Hoeflin, corroborates to having an IQ of 186:

$$IQ_{age39} = 186$$

Savant IQ scam | Summary

In 2009, American noted IQ test psychologist Alan Kaufman summarized, in his book *IQ Testing 101*, that: [6]

American psychologist **Alan Kaufman**.

> "Miss Savant was given an old version of the Stanford-Binet (Terman & Merrill 1937), which did, indeed, use the antiquated formula of MA/CA × 100. But in the test manual's norms, the Binet does not permit IQs to rise above 170 at any age, child or adult. And the authors of the old Binet stated: 'Beyond fifteen the mental ages are entirely artificial and are to be thought of as simply numerical scores.' (Terman & Merrill 1937). . . . the psychologist who came up with an IQ of 228 committed an extrapolation of a misconception, thereby violating almost every rule imaginable concerning the meaning of IQs."

In other words, according to American psychology professor Alan Kaufman, head of the Yale's University's Child Study Center, using the ceiling mental age of 15 of the test she took and the actual dates on record at the school she took the test, Savant's actual IQ based on this test would have been 132:

$$100\frac{15}{11 + 4/12} = 132$$

To correct this summary by Kaufman to note it was not a psychologist that came up with IQ of 228, but rather it was a combination of the figuring of Andrew Egendorf, Marilyn Savant, and Ronald Hoeflin.

Results

In sum, in 1983, Marilyn vos Savant cajoled her Mega Society members to unknowingly send in incorrect test dates, which don't match actual school records, to the *Guinness Book* to claim a 228 IQ (or 157 according to actual records), after which she become the reigning champion of the the world's smartest person category, for a period of about five years, or until 1989 or 1990. Whatever the publicity scheme worked:

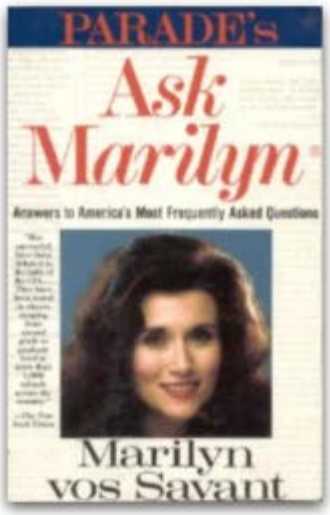

Ask Marilyn, Parade Magazine

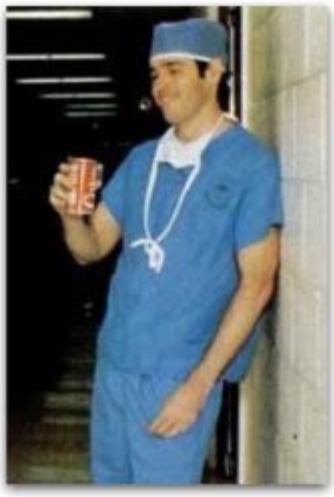

Robert Jarvik (1982)

> (a) Within 3-years (1986), her "highest IQ" listing got her a job as a newspaper columnist for *Parade Magazine*, in the Sunday "Ask Marilyn" section;
> (b) Within 4-years (1987), her "highest IQ" listing landed her a husband, American physician Robert Jarvik, inventor of the artificial heart, who sought her out after reading an article about her.

Iqbal Abba | IQ: 235?

According to a number of spurious Internet postings, dating from 2005, the removal of the "highest IQ" category story occurred because of Sri Lankan-born American “Iqbal Saleh Abba” (1962-), who in 1971, at the age of 5, according to his own account (2010) (Q), “was doing partial non-linear differential equations, studying quantum mechanics, writting but never publishing articles in quantum electrodynamics, did work on the 3-body problem, and worked in philosophy, logic, epistemology, advanced mathematics, and science, and found errors in Laplace's celestial dynamics, and who at age 9, according to his own account (2014) (Q), scored an IQ (ratio IQ) of 230 on the Stanford-Binet, a score that in 1989 he sent into the Guinness Book Records office, after which, supposedly, as a result of, in the 1990 edition, they removed the category of “highest IQ”. In 2012, Abba posted his opinion, supposedly, that he thinks that American philosoher Ronald Hoeflin’s mega test is “totally spurious test which does not measure anything except education level” (Q).

This Abba person, to note, may not actually exist, akin to the 2006 fictional “William Alfred Quannigton” (Child IQ=350+; Adult IQ=300+) created as a joke in AnswerBag forum (Q); being that no references to him, other than Internet postings, seem to exist.

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θΔics

In human chemistry, **Gundula Sharman** (c.1974-) is a Scottish German-literature scholar noted for her 1997 description of Goethe's *Elective Affinities* and its embedded human chemical theory as the "scientific model of human experience". [1]

Overview

In 1997, Sharman, in her conference symposium lecture "Elective Affinities with Ireland: John Banville's *The Newton Letter* and Goethe's *Die Wahlverwandtschaften*", presented on the relation between the 1892 work of Irish writer John Banville (*The Newton Letter*) and German polymath Johann Goethe's 1809 physical chemistry base masterpiece *Elective Affinities* (*Die Wahlverwandtschaften*), the latter of which contains both hidden and open to plane sight "principles", about which Goethe famously defended in the street saying they were "true" and not immoral (Dec 1809), that, according to Sharman, is a subject that defines the "scientific model for human experience." [1]

Education

Sharman completed her PhD in 2000 at the University of Aberdeen on *Twentieth-Century Reworkings of German Literature*, which analyzes how selected canonic texts ranging from Goethe to Thomas Mann, were received by post-1945 writers, including Brecht, Wolfgang Koeppen, and the Irish novelist John Banville. [2] Building on that work, while presently a teaching fellow in the German department of the University of Aberdeen, she is currently focusing on intertextualities between Goethe's Werther and Büchner's Lenz.

See also

- Literature chemistry

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1. Sharman, Gundula. (1997). "Elective Affinities with Ireland: John Banville's *The Newton Letter* and Goethe's *Die Wahlverwandtschaften*", in: *The Novel in Anglo-German Context: Cultural Cross Currents and Affinities*: *Papers from the Conference Held at the University of Leeds from 15 to 17 September 1997* (pgs. 369-84; image, pgs. 372-73) (edited by Susan Stark). Rodopi, 2000.
2. Sharman, Gundula. (2002). *Twentieth-Century Reworkings of German Literature: an Analysis of Six Fictional reinterpretations from Goethe to Thomas Mann* (§6: Constellation of Character: Goethe's *Die Wahlverwandtschaften*; Hugo von Hofmannsthal's *The Chandos Letter*; and John Banville's *The Newton Letter*, pgs. 151-74). Camden House.

External links

- Gundula-Maria Sharman (faculty) – University of Aberdeen, Scotland.
- Sharman, Gundula – WorldCat Identities.

θΔics

In hmolscience, **Gungor Gunduz** (c.1950-) is an Turkish chemical engineer, interested in sociophysics and econophysics (Q), noted for []

Overview

In 2012, Gunduz, in his "Thermodynamics of Relation-Based Systems with Applications in Econophysics, Sociophysics, and Music", attempts to argue the following: [1]

> "A methodology was developed to analyze relation-based systems evolving in time by using the fundamental concepts of thermodynamics. The behavior of such systems can be tracked from the scattering matrix which is actually a network of directed vectors (or pathways) connecting subsequent values, which characterize an event, such as the index values in stock markets. A system behaves in a rigid (elastic) way to an external effect and resists permanent deformation, or it behaves in a viscous (or soft) way and deforms in an irreversible way. It was shown in the past that a formula derived using the slope of paths gives a measure about the extent of viscoelastic behavior of relation-based systems Gündüz (2009), Gündüz and Gündüz (2010). In this research the 'work' associated with 'elastic' component, and 'heat' associated with 'viscous' component were discussed and elaborated. In a simple two subsequent pathway system in a scattering diagram the first vector represents 'the cause' and the second 'the effect'. By using work and heat energy relations that involve force and also storage and loss modulus terms, respectively, one can calculate the energy involved in relation-based systems. The modulus values can be found from the parallel and vertical components of the second vector with respect to the first vector. Once work-like and heat-like terms were determined the internal energy is also easily found from their summation. The parallel and vertical components can also be used to calculate the magnitude of torque and torque energy in the system. Three cases, (i) the behavior of the NASDAQ-100 index, (ii) a social revolt, and (iii) the structure of a melody were analyzed for their 'work-like', 'heat-like', and 'torque-like' energies in the course of their evolution. NASDAQ-100 exhibits highly dissipative behavior, and its work terms are very small but heat terms are of large magnitude. Its internal energy highly fluctuates in time. In the social revolt studied work and heat terms are of comparable magnitude. The melody depicts highly organized structure, and usually has larger work terms than heat terms, but at some intervals heat terms burst out and attain very large magnitudes. Torque terms reach high values when the system is recovering from a minimum value."

(add discussion)

Education

Gunduz completed his BS and MS in chemical engineering at Middle East Technical University and his PhD in nuclear engineering at Iowa State University, and currently is professor of chemical engineering at Middle East Technical University, where his areas of expertise are: theoretical physics, physical chemistry, and polymer chemistry.

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1. Gunduz, Gungor. (2012). "Thermodynamics of Relation-Based Systems with Applications in Econophysics, Sociophysics, and Music" (abs), *Physica A: Statistical Mechanics and its Applications*, 391(20):4637-53, Oct 15.

Further reading

● Gunduz, Gungor, and Gunduz, Ozdogan. (2014). "The phase space interpretation of the Le Chatelier-Braun principle and its generalization as a principle of natural philosophy" (abs), *Physics Essays*, 27(3):404-10.

External links

● Gungor Gunduz (faculty) – Middle East Technical University.
● Gungor Gunduz (publications) – ResearchGate.net.

θΔics

In science, **gunpowder**, aka "Chinese salt", "saltpeter" (Bacon, 1267), or "Cannon powder" (Huygens, 1673) ,is a granular-like mixture, comprised of potassium nitrate (KNO3) (75%), charcoal (C) (15%), typically in the form of partially pyrolyzed cellulose, in which the wood is not completely decomposed, and sulfur (S) (10%), which is classified as an explosive, similar to dynamite or gasoline. [1]

Overview

The simplified chemical reaction for the combustion of gunpowder is:

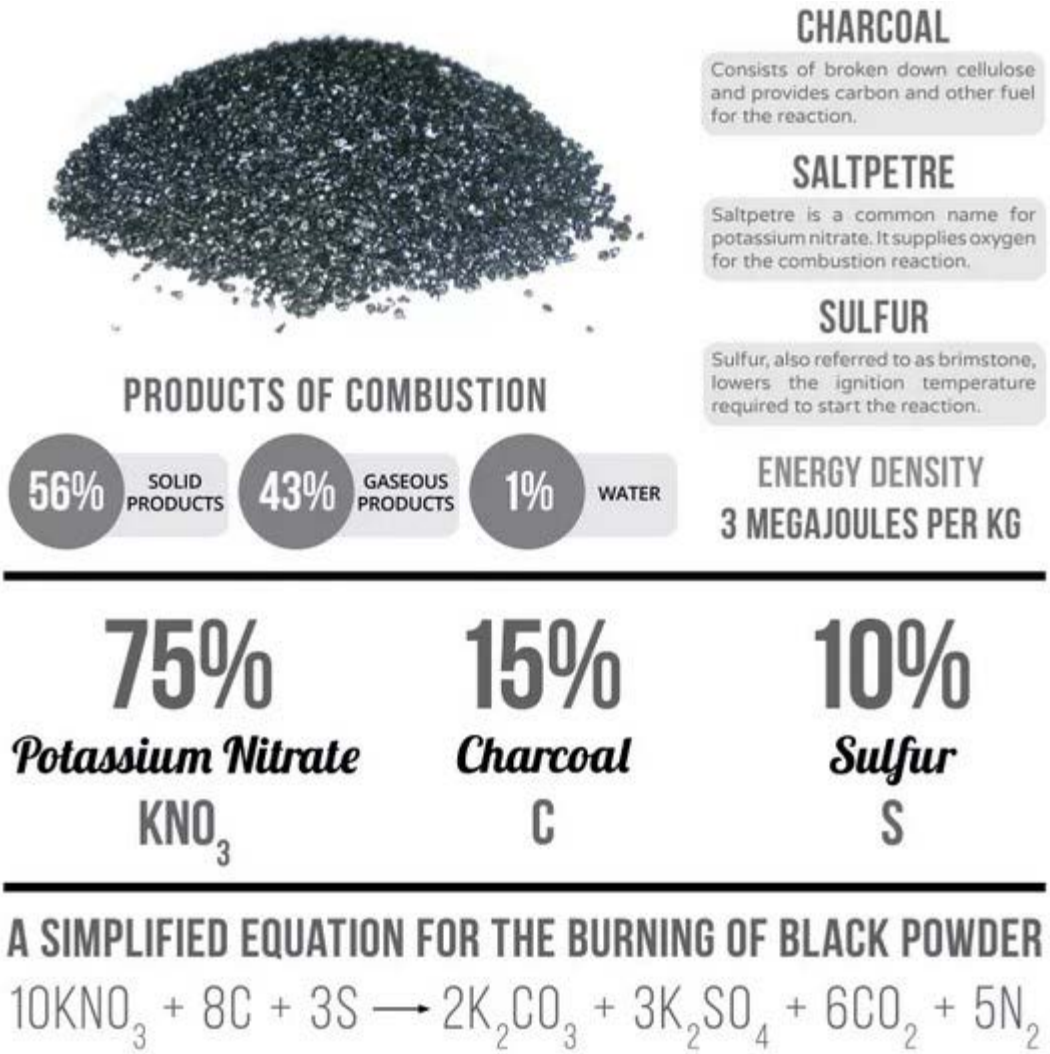

A basic infographic for **gunpowder**, showing that the products of combustion are solid products (56%), gaseous products (43%), and water (1%); the great volume change explains its use in the gunpowder engine. [3]

$$2KNO_3 + S + 3C \rightarrow K_2S + N_2 + 3CO_2$$

The following shows the reactant and products in terms of states, which includes a one-percent water product (not shown above):

Solid (100%) → solids (56%) + gases (43%) + liquid (1%)

Gunpowder releases 3 megajoules per kilogram and contains its own oxidant, which ca be compared to dynamite (4.7 megajoules per kilogram), or gasoline (47.2 megajoules per kilogram; but gasoline requires an oxidant, so an optimized gasoline and O2 mixture contains 10.4 megajoules per kilogram).

History

In 808, the anon author of *Taishang Shengzu Jindan Mijue*, made a reference to gunpowder; the substance is said to have been "discovered" while trying to make the "elixir of life" .

In 1267, Roger Bacon, in his *Opus Maius*, and later in his *Opus Tertium* (1268), having learned about gunpowder from the Chinese, described what seems to be a firecracker: [2]

> “We have an example of these things (that act on the senses) in (the sound and fire of] that children's toy which is made in many [diverse] parts of the world; i.e. a device no bigger than one's thumb. From the violence of that salt called **saltpetre** (together with sulphur and willow charcoal, combined into a powder]' so horrible a sound is made by the bunting of a thing so small, no more than a bit of parchment (containing it], that we find (the ear assaulted by a noise] exceeding the roar of strong thunder, and a flash brighter than the most brilliant lightning. (Especially if one is taken unawares this terrible flash is very alarming. If an instrument of large size were used, no one could with-stand the noise and blinding light; and if the instrument were made of solid material, the violence of the explosion would be much greater.”
>
> — Roger Bacon (1267), *Opus Maius* [2]

This saltpeter was studied by Bacon's contemporary Albertus Magnus (1205-1280).

See also

- Gunpowder engine
- Gunpowder theory of life

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1. Daintith, John. (2005). *Oxford Dictionary of Science* (pg. 376). Oxford University Press.
2. Needham, Joseph. (1987). *Science and Civilization in China: Volume 5*, *Chemistry and Chemical Technology*, *Part 7*, *Military Technology: The Gunpowder Epic* (Roger Bacon, pgs. 48-49). Cambridge.
3.. Anon. (2014). “The Chemistry of Gunpowder” (Q), CompoundChem.com, Jul 2.

External links

- Gunpowder – Wikipedia.

θΔics

In engines, **gunpowder engine** is one that employs gunpowder to produce a vacuum inside the piston and cylinder causing the atmospheric pressure to perform work in driving the piston downward to eliminate the vacuum. [1]

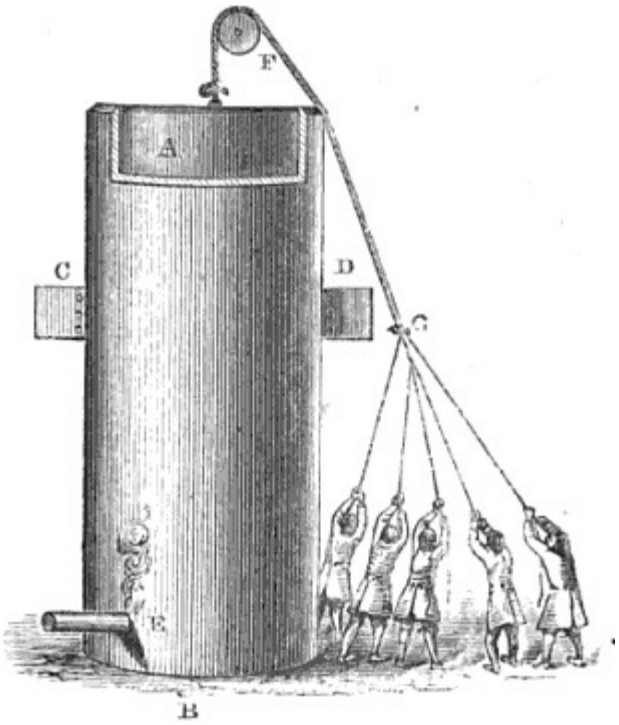

A 1682 demonstration of Christiaan Huygens **gunpowder engine** (see: Huygens engine), where a dram of gunpowder creates enough vacuum to lift 7-8 boys into the air.

Da Vinci

See main: Da Vinci engine

In 1508, Leonardo da Vinci designed an upside-down cannon barrel, fitted with a piston, as sketched by him below (left), which had a rod attached to the bottom of the piston, which he stated could be used to lift a weight of large size, if gunpowder was ignited inside the cannon, therein consuming the oxygen inside of the working body volume, thereby making a vacuum, which, owing to the force of the atmospheric pressure, would lift the weight: [3]

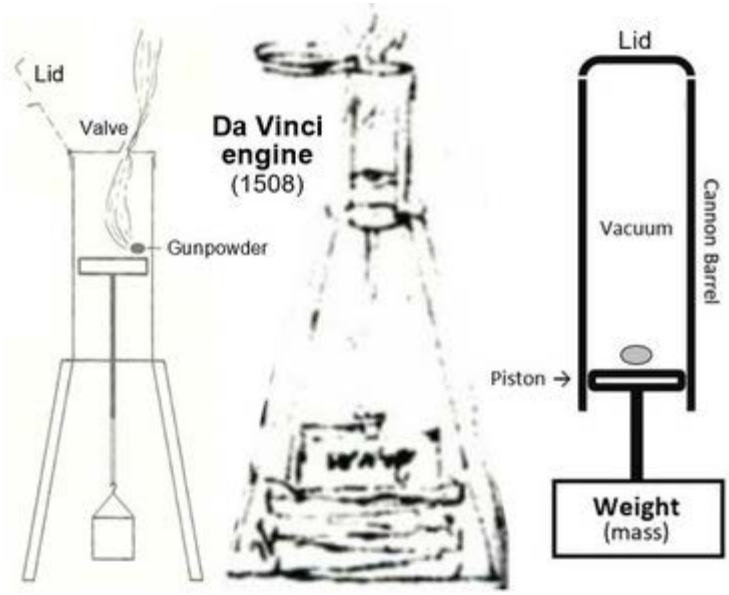

(add)

Morland

In 1661, Samuel Morland, supposedly, published designs for engines that used gunpowder to facilitate the raising of water.

Hooke

In 1663, Robert Hooke built a “gunpowder trier”, as shown below: [4]

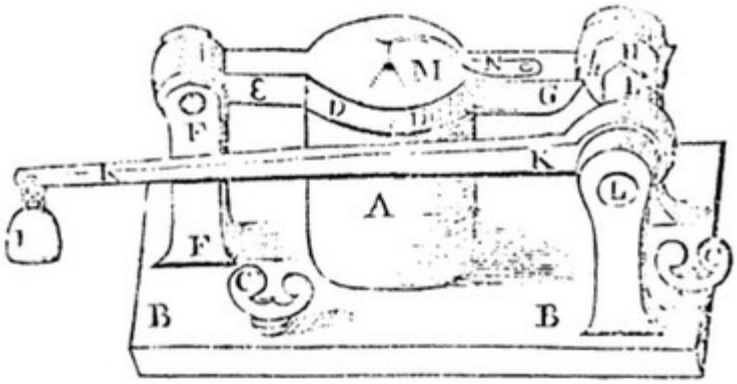

Triers, or "powder triers" (Ñº), are devices for testing the strength of various gunpowders; one of the earliest built, being the the "hinged lid" design built by John Bate (1634). [4] Hooke's design was unique in that it was capable of raising a variable weight (as shown above, left). Hooke also used this device for the bending of springs. Joseph Needham classifies Hooke's trier as an "almost gunpowder engine", as follows:

> "Hooke's gunpowder trier was, in fact, **almost a gunpowder engine**, because it was capable of raising a variable weight, and was later applied to the bending of springs."
>
> — Joseph Needham (1987), *Science and Civilization in China, Volume 5, Part 7* (pg. 551)

In 1675, Hooke also understood the basic principle of the vacuum in respect to combustion and the raising of a weight:

> "The vacuum left by fire lifts a weight."
>
> — Robert Hooke (1675), "A New Invention in Mechanics of Prodigious Use, Exceeding the Chimera's of Perpetual Motions for Several Uses"

In respect to the above "patient secret", as Hooke conceptualized it, to his "new mechanical invention" that uses the void made by fire to lift a weight, we note that the Huygens-Papin gunpowder engine experiments (1673), conducted in France, were published, not only in Paris (1674) in French, but also in the form of five papers, by Huygens and Papin jointly, in the *Philosophical Transactions of the Royal Society*, Hooke being the chief experimenter of the Royal Society, from 1663 to about 1680. No doubt, Hooke, being affronted by the presumed "claims to priority" of Huygens and Papin, in respect to the invention of the gunpowder engine, having now read a report of their work in English, likely had something similar in mind prior to Feb 1673, the date of the Huygens-Papin experiments (see: below), and by penning the above principle, was attempting to make a stake to priority, or something along these lines [?].
We also note that from 1676 to 1679, "Denis Papin", the key connecting figure in the history of the invention of the gunpowder engine, assisted Robert Boyle, a good friend of Hooke, in air pump experiments; also that from Jul to Dec 1679, Papin was employed at the Royal Society by Hooke as an amanuensis.

Huygens

On 10 Feb 1673, Christiaan Huygens, who had employed Denis Papin as his assistant since 1671, stated that he had a working gunpowder engine:

> "I have constructed an engine for obtaining a new motive power by means of gunpowder and the pressure

of air.”

> — Christian Huygens (1673), *Oeuvres, Volume 22* (pg. 241), Feb 10; cited by Joseph Needham (1987) in *Science and Civilization in China: Volume 5, Part 7* (pg. 556-57)

He also gave the following sketch, which shows a piston, with two rope attachments, at the top of a cannon, pointed upwards, held by a frame at its base, with a port at the bottom for igniting a charge of gunpowder, along with a watery leather escape vent attached to the upper left side of the cannon: [7]

Description
(approximately)

Huygens’ engine consisted of a hollow cylinder A, well polished within and of uniform size throughout. B, a moveable piston inserted into the top of the cylinder, the upper portion of which is surrounded by a small quantity of water. C, C, two apertures, each one-half the diameter of the cylinder.

D, D, tubes of moist and soft leather secured to little cylinders which are fastened to the main cylinder at the apertures (one of the tubes being shown extended, the other hanging).

E, E, holdfasts, by which the cylinder is joined to the case in which it sits, which is not shown in the figure.

F, F, a cord attached to the piston and passing over a pulley G, for the purpose of raising whatever is attached to it.

H, a small box for receiving the charge of gunpowder, attached to the bottom of the cylinder by means of a screw, a leather ring being employed to aid in making the joint air-tight.

On the explosion of the charge, the air contained in the cylinder was driven out through the leather tubes C D, C D, which were momentarily extended, but immediately closed again by the external air; and the cylinder being vacuous, the piston B was driven down by the atmospheric pressure, drawing with it the cord F, and raising whatever was suspended by it.

On 22 Sep 1673, Huygens sent the following simplified sketch of his new gunpowder engine to his brother, which

shows the rope and pulley attached to a weight to be raised, and also shows two vent baffles: [8]

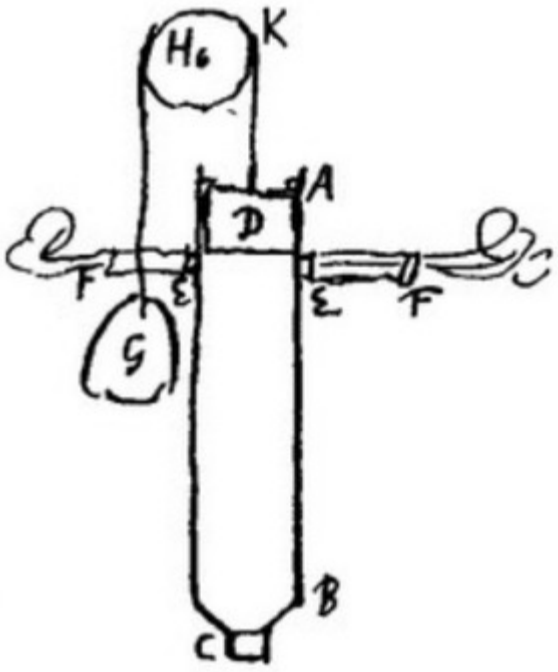

In 1673, Huygens, in his his *Varia Academica* (pg. 242), gave the following sketch:

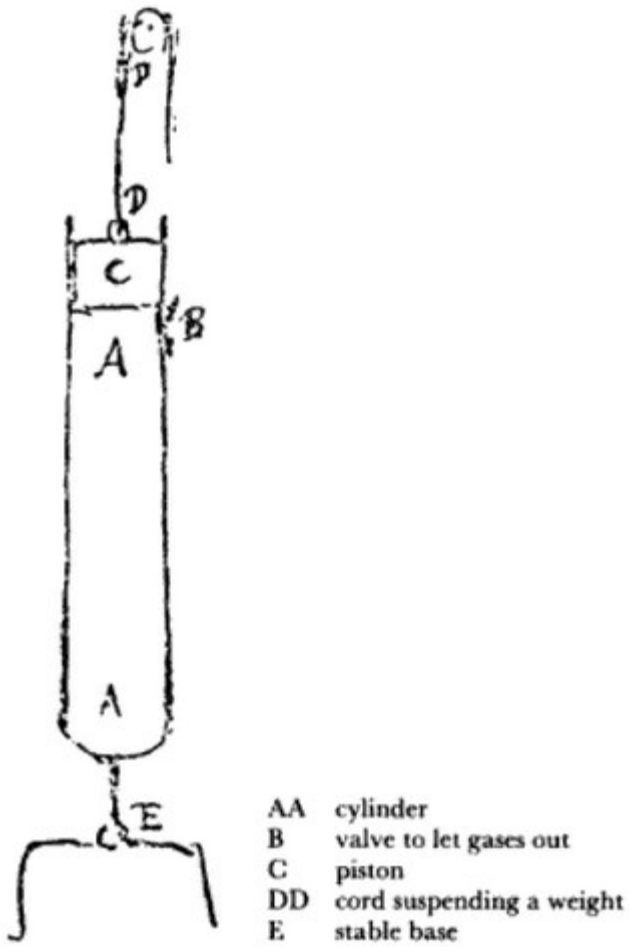

It operated such that the "partial vacuum" produced in the cylinder, as the gases left, which brought down the piston and accordingly raised the weight suspended from the pulley. Huygens said the following about his device:

> “The force of **cannon powder** [gunpowder] has served hitherto [he wrote] only for very violent effects such as mining, and blasting of rocks, and although people have long hoped that one could moderate this great speed and impetuosity to apply it to other uses, no one, so far as I know, has succeeded in this, or at any rate no notice of such an invention has appeared.”
>
> — Christian Huygens (1673), *Publication*; cited by Joseph Needham (1987) in *Science and Civilization in China: Volume 5* (pg. 557)

In 1674, the results of the Huygens-Papin gunpowder engine experiments were published in Paris as *Experiments on the Void* (*Experiences du Vuide*); in 1675, they also published their results in the form of five papers, by Huygens and Papin jointly, in the *Philosophical Transactions of the Royal Society*.

In 1678, Huygens had the following working model built:

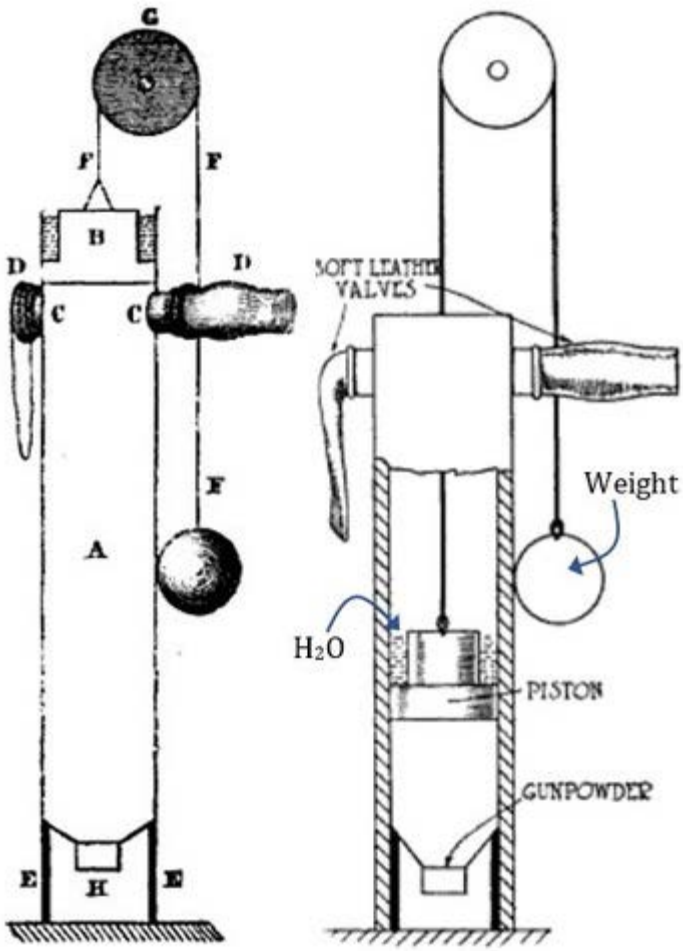

In 1680, Huygens, in his “A New Motive Power by Means of Gunpowder and Air”, formerly gave an account of his new gunpowder engine. [2]

In 1682, Huygens had built a larger piston and cylinder device, as shown below right, and had successfully shown that a dram (1/16th of an ounce) of gunpowder, in a cylinder seven or eight feet high and fifteen or eighteen inches in diameter, could raise seven or eight boys (or about 1,100 pounds) into the air, who held the end of the rope (photo above, right).

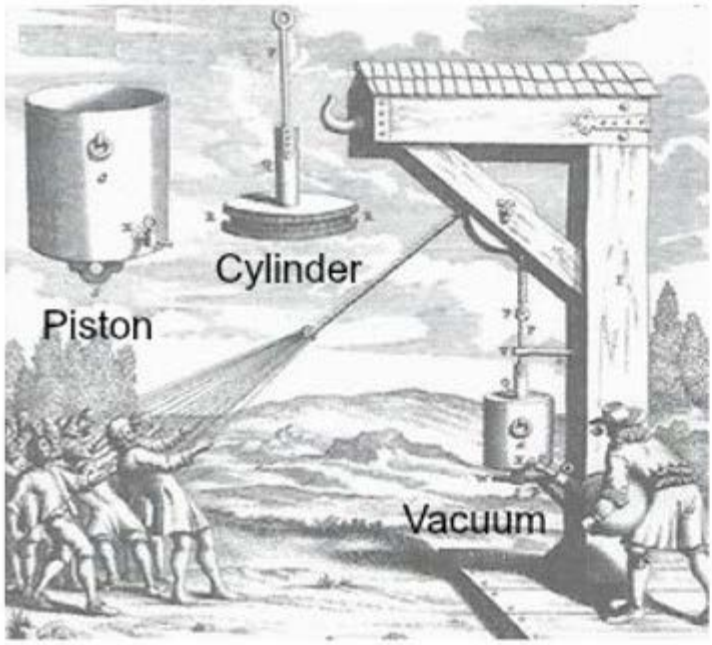

Guericke experiment
(1654)

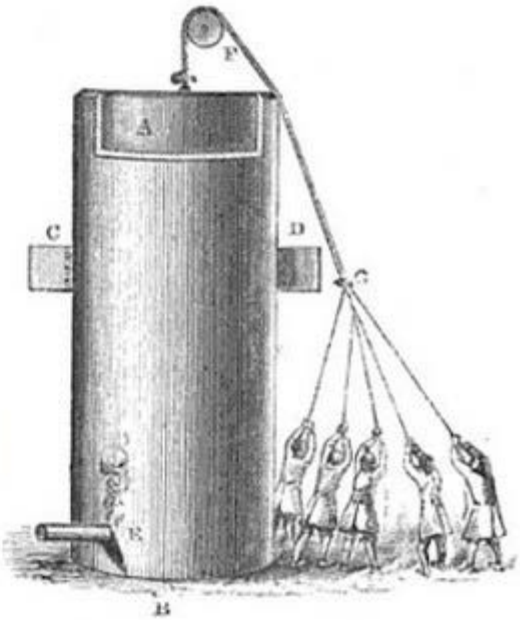

Huygens experiment
(1673; 1682)

Huygens commented the following:

> "I have seen some surprising effects in raising weights and men pulling the rope. If we could well see the air it would be much more ..."
>
> — Christian Huygens (c.1675), *Publication*; cited by Joseph Needham (1987) in *Science and Civilization in China: Volume 5* (pg. 557)

To summarize, what is clear at this point is that Huygens (and or Papin) in making his piston and cylinder design, aside from the use of "gunpowder" to make the vacuum, is employing the engine designs of Otto Guericke (1654), which had been published by Gaspar Schott in 1657 for global consumption (see: Schott diagrams). So the question, at this point, is: whose idea was it to use gunpowder to make the vacuum: Huygens or Papin, or possibly did one of the two hear about da Vinci's 1508 gunpowder engine design and or experiment? Huygens' design, to note, is basically the same as Da Vinci's design, except that the vents or release valves are on the side, whereas Da Vinci put his escape valve on the top. As to the "date" of Huygens gunpowder engine experiments, English technology historian Graham Short (Ñº) conjectures that they commenced following the publication of Guericke's *New Magdeburg Experiments on the Vacuum of Space* (1672):

> "The publication of von Guericke's *New Magdeburg Experiments on the Vacuum of Space* in 1672, in which a much more sophisticated version of the weight-lifting rig of1654 takes its place, **seems likely to have been the event** which set the stage for Christiaan Huygens to think about how to exploit the vacuum in a less labor-intensive way than von Guericke's. His invention in early 1673 of a **gunpowder engine** was designed to do just that. Instead of having two burly men labor with an air pump for many hours to create a reasonable vacuum, Huygens dreamt of creating a rapid sequence of vacuums by exploding very small quantities of gunpowder at a brisk tempo."
>
> — Graham Hollister-Short (2004), "The Formation of Knowledge Concerning Atmospheric Pressure and Steam Power in Europe from Aleotti [1589] to Papin [1690]" [6]

Huygens, on an aside, also described other future uses for such a device:

> “This new motive power could be used, in the future, for raising water or weights, working mills, driving vehicles on land or water, or even for aerial vehicles powered in such a way.”
>
> — Christian Huygens (1673), “Letter to Lodewyk Huygens” (+ aggregate quotes), Sep 22

> “I think that a flexible wooden tail at the stern of a boat, as I have visualized it, and as I believe they make use of in China, would be a good application for this, if moved by the force generated in this cylinder.”
>
> — Christian Huygens (1673), *Publication*; cited by Joseph Needham (1987) in *Science and Civilization in China: Volume 5, Part 7* (pg. 558)

Huygens calculated, supposedly, that a single pound of gunpowder possessed enough energy to raise 3,000lbs 30 feet and that a 3ft diameter cylinder would give upwards of 40HP, according to Joseph Needham’s footnoted translations (note: HP or horsepower was not yet an invented unit in this century).

Hautefeuille

In 1678, Jean Hautefeuille published designs for engines that used gunpowder to facilitate the raising of water, one of which employed a piston and cylinder.

Misattribution

Of note, Peter Drucker, in his *Innovation and Entrepreneurship* (2014), misattributes the actual construction of the first gunpowder engine to Robert Boyle, and that this “Boyle engine” was the one that fouled with each explosion, and that his assistant Denis Papin was the one who realized the plans for the first working combustion engine. (Ñº) Boyle, however, does not seem to have been ever cited as having originated any gunpowder engines; his main focus was the pneumatic engine.

Quotes

The following are related quotes:

> “At the moment of the explosion, the gases formed swept out most of the air through a valve which was then immediately shut, so that as everything cooled a partial vacuum was produced, and the piston was sucked down with great force—but not the whole way, for, as Huygens noted, about one-sixth of the air and gas remained. The down-stroke was therefore incomplete.”
>
> — Joseph Needham (1987), *Science and Civilization in China: Volume 5* (pg. 557)

> “As early as 1508, Leonardo da Vinci was speculating on yet a further use for gunpowder's explosion: an engine that could be used to lift weights or pump water. In 1673, the Dutch scientist and inventor of the pendulum clock, Christiaan Huygens, drew up a plan for an engine that could use a controlled detonation of gunpowder to build pressure and drive a piston inside a metal tube. He optimistically postulated that his newfangled device would one day enjoy widespread uses, such as powering mills and propelling carts. In the following years [1674] Huygens's assistant, Denis Papin, built the first model of the **gunpowder engine** at the Academie Royale des Sciences in Paris, where he hoped that it could be used to mechanically suck water from the Seine River and spray it skyward from Louis XIV's famous fountains. Alas, gunpowder combustion was not ideally suited to the tranquility of the fantastically manicured and tranquil gardens. Not only was it loud, but the explosion was too powerful and most of the gasses had to be released through a system of valves as the piston was pushed out; as the remaining gasses cooled they sucked the piston back,

but with an insufficient vacuum because not all the gasses could be evacuated from the cylinder."

— Stephen Bown (2005), *A Most Damnable Invention* [5]

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3. Reti, Ladislao. (1969). "Leonardo da Vinci the Technologist: the Problem of Prime Movers", in: *Leonardo's Legacy: and International Symposium* (editor: C.D. O'Malley) §4:67-100; quotes, pgs. 95-98). University of California Press.
4. Needham, Joseph. (1987). *Science and Civilization in China: Volume 5, Chemistry and Chemical Technology, Part 7, Military Technology: The Gunpowder Epic* (Hautefeuille's engine, pg. 563; Bate's design, pg. 549; Hooke's design, pg. 551). Cambridge.
5. Bown, Stephen R. (2005). *A Most Damnable Invention: Dynamite, Nitrates, and the Making of the Modern World* (pg. #). MacMillan.
6. Hollister-Short, Graham. (2004). "The Formation of Knowledge Concerning Atmospheric Pressure and Steam Power in Europe from Aleotti [1589] to Papin [1690]" (pg. 146), *History of Technology, Volume 25* (editor: Ian Inkster) (§10, pgs. 137-50). Bloomsbury, 2016.
7. (a) Huygens, Christiaan. (1673). "Cannon powder engine design", *Oeuvres Completes, Volume 22* (pg. 243). The Hague, 1950.
(b) Hollister-Short, Graham. (2004). "The Formation of Knowledge Concerning Atmospheric Pressure and Steam Power in Europe from Aleotti [1589] to Papin [1690]" (pg. 146), *History of Technology, Volume 25* (editor: Ian Inkster) (§10, pgs. 137-50; Huygens engine sketches, pg. 146). Bloomsbury, 2016.
8. (a) Huygens, Christiaan. (1673). "Cannon powder engine: Simple Sketch", Letter to Brother; *Oeuvres Completes, Volume 7* (pg. 357). The Hague, 1950.
(b) Hollister-Short, Graham. (2004). "The Formation of Knowledge Concerning Atmospheric Pressure and Steam Power in Europe from Aleotti [1589] to Papin [1690]" (pg. 146), *History of Technology, Volume 25* (editor: Ian Inkster) (§10, pgs. 137-50; Huygens engine sketches, pg. 146). Bloomsbury, 2016.

θΔics

In life theories, **gunpowder theory of life** was a circa 17th century theory according to which life was conceived as being powered by something akin to the explosion of gunpowder occurring inside of animals and humans. [1]

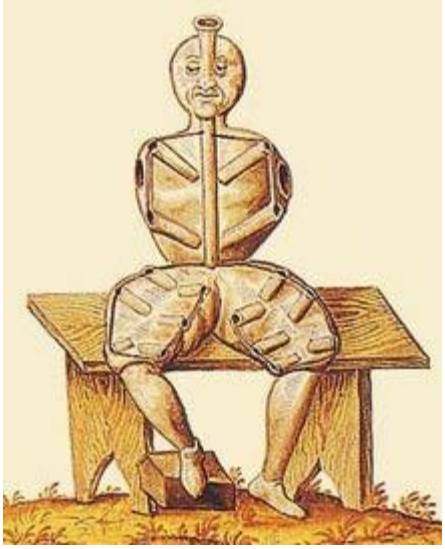

Left: a circa 1598 of firework loaded monk and nun figures seemingly dancing on a turning wheel (when spun). [3] Right: a 1610 construction of a seated figure; supposedly ready to be loaded with fireworks, to depict animation. [4]

The gunpowder theory of life was superseded by spark theory of life, following the discovery of animal electricity by Italian physicist-physician Luigi Galvani in circa 1771. [2]

See also

â— Animal heat

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3. From anonymous manuscript titled *Feuerwerksbuch*, Strasbourg, ca. 1598.
4. Nassau-Siegen, Johann I. von. (1610). *Etliche schöne Tractaten von aller-/handt Feüerwercken und deren Künstlichen Zubereitung*. Publisher.

θΔics

In literature, **Gunter Grass** (1927-2015) is a German author noted for his 1959 elective affinities philosophy based novel *The Tin Drum*.

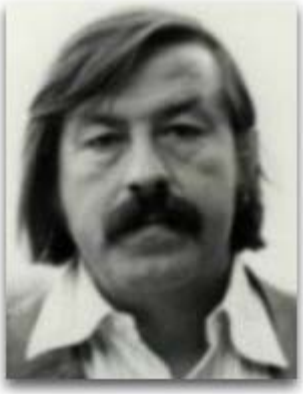

Overview

In 1959, Grass published his *The Tin Drum*, wherein the central character Oskar uses two books for guidance, one: Goethe's 1809 novella *Elective Affinities* and two: a book on Rasputin. [1] Irish-born Canadian literature thermodynamics analyzer Patrick O'Neill summarizes the Oskar character and his self-educated philosophy as follows: [2]

> "After rejecting the public school system Oskar undertakes his own education by close reading of two books whose pages, for simplicity's sake, he has torn out and shuffled to make a single new volume, Goethe's *Elective Affinities* and a volume promisingly entitled *Rasputin and Women*."

This seems to be a well-honed depiction of a Goethean philosopher, in the strict chemical philosophy sense of the matter, which no doubt is found in a partial representation of Grass and his hue of philosophy.

Grass was the 1999 winner of the Nobel Prize in Literature, for his body of over 20 works, written over a period of 40 years.

In 2006, American German-literature scholar John McCarthy (1942-) (CR:4), in his *Remapping Reality: Chaos and Creativity in Science and Literature (Goethe – Nietzsche – Grass)*, seems to give a ripe analysis of the Grass in respect to *The Tin Drum*, e.g. how Grass once remarked that "in everyone of my novels there lies a philosophical concept", about which McCarthy argues here is a synthesis of Nietzsche's "will to power" + Goethe's "elective affinities" + Rasputin's "faith healer/magic" concepts; an abstract of which is as follows: [3]

following. Drawing on the analysis of chaos, complexity, and creativity in the first part of this study, I wish to plant Grass squarely within debates old and new on the meaning of life and on the relationship between reductionism and the mythmaking process. We can see his novel as participating in the search for ultimate laws in the mapping of reality. If Goethe saw the hand of God inherent in the operations of nature and if Nietzsche determined that humanity must do away with God for the sake of nature, then Grass seems to combine the two views in a new synthesis of profane materiality and sacred belief. The ground had been prepared by instrumental reason and the loss of tradition. The mind of God, Stephen Hawking once remarked, is inscribed in the laws of nature.[7] Others have also asked about the place of God in the universe, much like Grass asks about His place in the historical events rendered in *The Tin Drum*. Even if one believes that the universe is a pointless system (as Steven Weinberg does), we are nevertheless part of that system. As the philosopher Richard Taylor put it, nature is "a vast machine, feeding on itself, running on and on forever to nothing."[8] By asking daring and impudent questions, we influence the very environment that produced us. Maybe that is why Grass reintroduces magic into his realism. More on that later.

Grass once remarked that behind every one of his novels there lies a philosophical concept. For example, *Aus dem Tagebuch einer Schnecke* (From the Diary of a Snail, 1972) pits Hegel against Schopenhauer.[9] Although Grass did not specify which philosopher he had in mind when planning *The Tin Drum*, his extraordinary monument to postwar Germany, he does clearly state Oskar's determination "to wield a will to power that would have no need of vassals or henchmen" ("der Wille zu einer Macht, die ohne Gefolgschaft auskommen sollte"; *TD* 60; *BT* 70). The allusion is both to Nietzsche's concept of the will to power and to Zarathustra, who has no need for disciples. While Nietzsche is a subtle presence in the novel, references to Goethe are quite specific. For example, Oskar admits that he sometimes envisions himself as Goethe and admires his "world-encompassing feeling for nature." Grass uses the aura of Goethe to temper the elemental drive of Oskar's other mentor, the faith healer Rasputin (*TD* 278). In particular, Grass includes repeated references to Goethe's *Faust*, *Elective Affinities*, and *Theory of Color* (e.g., *TD* 90–91, 278), all three of which are heavily indebted to Goethe's nature studies.[10] In the following, I will suggest that Nietzsche as well as Goethe served as the conscious philosophical inspiration for Grass's novel.[11] Of course, it also contains references to other authors such as Dante, Cervantes, Shakespeare, and Laurence Sterne, but they reflect more localized themes and motifs. In particular, the positive and negative dimensions of the will to power as the total economy of life will loom large. Grass integrates in a single grotesque, childlike

(add discussion)

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External links

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θΔics

In science, **Gustav Fechner** (1801-1887) (IQ:165|#420) (CR:19) was a German experimental psychologist noted for his 1860 stimulus sensation psychodynamics experiments, for his panpsychism-themed atomic theory, and for his inanimate principle of absolute stability.

Schopenhauer

German philosopher Arthur Schopenhauer (1788-1860), described as a pessimistic panpsychist, sole protege of Johann Goethe and his human chemical theory (1809), was said to have influenced Fechner in his panpsychism views, albeit to the effect that Fechner saw the world as beautiful and life-enhancing, supposedly. [7]

Atomic theory | Panpsychism

In 1828, Fechner, after translating Jean Biot's 1816 textbook into German, constructed a dynamic atomic model (see: atomic theory) in which the 'atoms simulate in small dimensions the situations of the astronomical objects in larger dimensions, being animate in any case by the same forces; and each body may be regarded as a system of innumerably many small suns, floating at comparatively large distances from one another, such that each or several of them together are surrounded by orbiting planetary atoms." [1]

Fechner has been classified, by David Skrbina (2005), as a noted western panpsychist philosopher, along with: Friedrich Schelling, William Clifford, Paul Carus, Empedocles, Epicurus, William Gilbert, William James, Gottfried Leibniz, Carl von Nageli, Josiah Royce (mentor to John Boodin), and the Stoics, each of whom were read and cited by Charles Peirce. [6]

Soul of Plants

In 1848, Fechner, in his *Nanna: the Soul of Plants*, outlined the view that consciousness did not depend on having a brain. [7]

Psychophysics | Psychodynamics

In circa 1850s, Fechner Fechner demonstrated what is now referred to as the Weber-Fechner law, a quantification between the feeling of psychological sensation and the measure of physical intensity of a stimulus, mathematically stated as:

$$S = c \log R$$

where S stands for the sensation, R for the stimulus numerically estimated, and c for a constant that must be separately determined by experiment in each particular order of sensibility.

In 1860, Fechner, in his *Elements of Psychophysics*, coined and introduced the subject of psychophysics. [2] This work, in some way, seems to have been influential to Sigmund Freud and his later 1895 to 1920s development of psychodynamics. [3]

In 1878, Fechner, in discussion of Wilhelm Weber, it seems, was citing and discussing Thomas Young's definition of energy, along with William Thomson's more resent work. [5]

Influence

In 1926, Ludwig Bertalanffy, at the University of Vienna completed his PhD thesis on the topic of Fechner.

Quotes | Related

The following are Fechner related quotes:

> "Several psychoanalytic writers have not been troubled by this distinction between animate and inanimate forms of the stability principle and have sought to equate Freud's death instinct, through **Fechner**'s inanimate principle of absolute stability, with the second law of thermodynamics (e.g. Alexander, 1921; Bernfeld and Feitelberg, 1930; Lichtenstein, 1935; and Saul, 1958). The second law of thermodynamics, otherwise known as the law of entropy, specifies that all forms of energy—for instance, heat—tend to dissipate within a closed system. Entropy, the measure of unavailable energy within a system, is therefore a directional and irreversible quantity reflecting the tendency of things to 'run themselves down'. Seen in terms of this entropy principle, Freud's death instinct has become considerably more palatable to certain psychoanalysts by virtue of a respectable alliance with the physical sciences."
>
> — Frank Sulloway (1979), *Freud: Biologist of the Mind* [4]

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θΔics

In thermodynamics, **Gustav Jaumann** (1863-1924) was an Austrian physicist who, according to Belgian chemist Ilya Prigogine, was the leader of the Vienna school of thermodynamics.

Jaumann was a student of Ernst Mach and carried Mach's prejudice against atoms far into the twentieth-century, resulting to make himself an outsider of scientific circles. [1]

Jumann, to note, sought Boltzmann's chair at his reaction end demise, which he was officially offered, but rejected, for unclear reasons. [2]

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External links

â— Gustav Jaumann – Wikipedia.

θΔics

In thermodynamics, **Gustav Kirchhoff** (1824-1887) (IQ:175|#250) (Murray 4000:11|P) (CR:34) was a German physicist noted for doing the research on the determination of the energy of bodies, which later functioned in support of German physicist Rudolf Clausius' 1875 chapter on the determination of the energy and entropy of bodies, wherein he cites how Kirchhoff called his U function of the energy (or internal energy) of the body by the name "function of activity" (wirkungsfunction). [1]

Influence

In 1871, a newly minted undergraduate Dutch physicist Heike Kamerlingh-Onnes, winner of the 1913 Nobel Prize in physics for his low-temperature thermodynamics work, went to Heidelberg where he studied under German chemist Robert Bunsen and Kirchhoff from October 1871 until April 1873.

German physicist Felix Auerbach, author of the 1910 book *Ectropy and the Physical Theory of Life*, which introduced the notion of "ectropy" as a type of biological anti-entropy, studied under Kirchhoff at the University of Breslau, in Heidelberg.

German mathematical physicist Carl Neumann's 1875 *Lectures on the Mechanical Theory of Heat*, which introduced the now-common notation, Ä' (d-hat), for the inexact differential, used methods on heat similar to Kirchhoff. [2]

In 1877, German physicist Max Planck, winner of the 1918 Nobel Prize in physics for his quantum theory work, studied under Kirchhoff in Berlin for one year. Planck's 1900 reformulation of Kirchhoff's equations on black body radiation started the quantum revolution.

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Further reading

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External links

â— Gustav Kirchhoff – Wikipedia.

θΔics

In thermodynamics, **Gustav Zeuner** (1828-1907) was a German physicist notable for a number of publications in the early developmental stages of thermodynamics, the first being his 1859 *Fundamentals of the Mechanical Theory of Heat* (*Grundzüge der Mechanischen Wärmetheorie*). [1] His central textbook, deriving from his 1859 paper and intended for his lectures at the Technical High School at Dresden, was the 1887 *Technical Thermodynamics*, which went through five editions, turning eventually into a two-volume set. [2]

Dresden school of thermodynamics

In schools of thermodynamics, Zeuner, in some circles, is considered as the founder of the "Dresden school of thermodynamics". Specifically, in 1873, Zeuner took on the post of director at the Royal Saxon Polytechnicum in Dresden (now Technische Universität Dresden). Zeuner's efforts there led to the introduction of the humanities; the extension of the range of subjects taught resulted in the polytechnic's rise to a full-scale polytechnic university in 1890. In 1889, aged 61, Zeuner gave up his position as director of the polytechnic to work as a lecturer until his retirement in 1897. Those physicists, engineers, and thermodynamicists educated at Dresden during Zeuner's oversight are said to have come from the Dresden school of thermodynamics.

Internal energy

In relation to German physicist Rudolf Clausius' description of internal energy U of a body, in his 1879 *Mechanical Theory of Heat*, he has disagreement with Zeuner's description and interpretation of a "quantity called U", used by Zeuner, which in 1860 Zeuner calls "interior heat" of the body and in 1866 calls "internal work" of the body. [3]

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θΔics

In existographies, **Gaspard-Gustave Coriolis** (1772-1843) (IQ:180|#150) (SIG:9) (CR:35) was a French physicist, a student of the École Polytechnique, noted for []

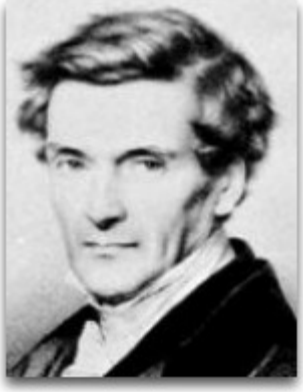

Work

In 1829, Coriolis, in his *Calculation of the Effect of Machines*, introduced what he called the "principle of the transmission of work", which states that the product of force times distance equals the work done:

$$W = Fd$$

Coriolis, in his *Calculation of the Effect of Machines*, which has yet to receive an English translation, supposedly, employed the term "dynamode" (Q)(Q) for the quantity of force times distance, defining one dynamode as being the amount of "effect", or work as we say presently, to lift an object of mass 1,009 kg by one meter into the air:

French engineer and mathematician Jean-Victor Poncelet, the commandant general of the École Polytechnique, and also professor of mechanics applied to machines (1824), thereafter, built on the logic of Coriolis and lectured successfully on the topic of work done by machines, wherein he used the word travail, which is French for "work", to signify Coriolis dynamode effect. [5]

Poncelet, supposedly, was the first to acknowledge that the word "work" was brought in by Coriolis. [4] This, supposedly, was first formulation of the term "work", in a scientific sense.

Education

In 1808, Coriolis took the entrance exam for the École Polytechnique, placing second of all students entering that year. After graduation he entered the École de Ponts et Chaussees (School of Bridges and Roads) in Paris. [8]

½ factor

Supposedly, also in his *Calculation on the Effect of Machines*, according to several references, it was Coriolis who introduced the factor ½ in German mathematician Gottfried Leibniz's 1686 *vis viva* for the sake of mathematical convenience. [2] Other references, however, claim that years prior, in 1811, Italian mathematician Joseph Lagrange used calculus to show that a factor of two is involved in the relationship "vis mortua" (potential energy) and "vis viva" (kinetic energy). [3]

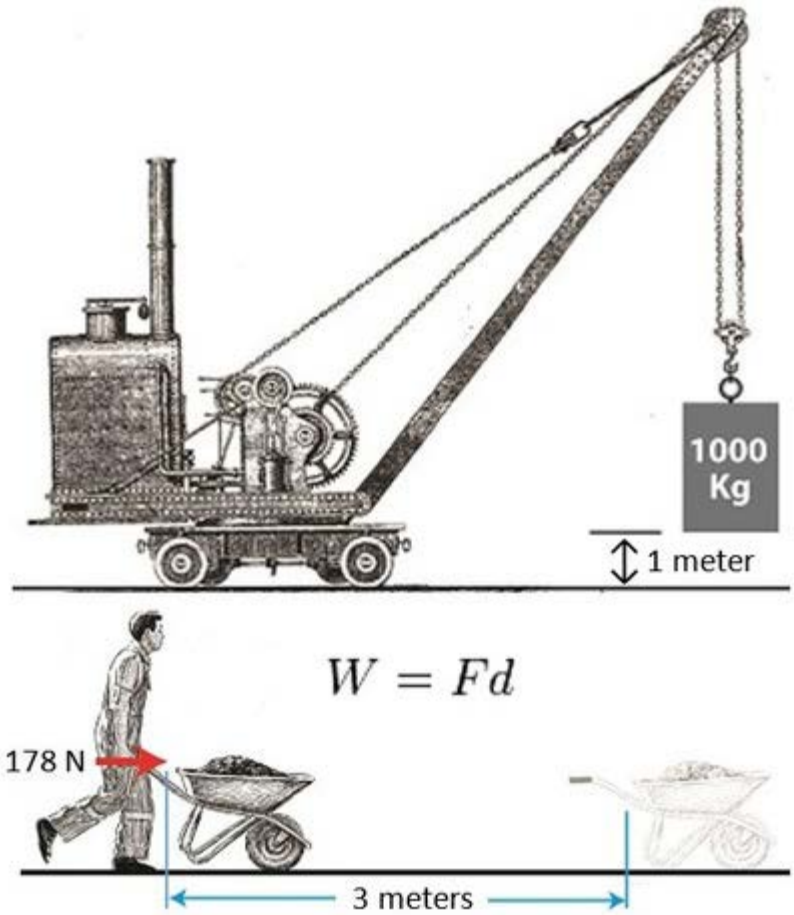

Examples "dynamode" (Q)(Q) of the Coriois principle of the transmission work, according to which whenever a force moves an body though unit distance work is done.

Turning forces

Supposedly, in his 1835 paper Coriolis stated that: [6]

> "Any particle moving in the northern hemisphere is deflected to the right; and to his left in the southern hemisphere."

Hence, known well in urban folklore, toilets drain clockwise in the northern hemisphere and counterclockwise in the southern hemisphere. This has since come to be known as the Coriolis force. This phenomenon is that to which in 1885 Austrian physicist Ernst Mach would refer to as "turning tendencies" when discussing the circular movements of troops on dark nights, a precursor to human molecular spin. [7]

References

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- Gaspard-Gustave de Coriolis – MacTutor Biographies.

θΔics

In existographies, **Gustave Flaubert** (1821-1880) was a French literary realism novelist noted for []

Overview

In 1856, Flaubert, in his novel *Madame Bovary*, presented the character Monsieur Homais, the village chemist and pharmacist; when he was told "be quite, you are an infidel; you've no religion", he responds:

> "I have a religion, my religion, and I even have more than all these others with their mummeries and their juggling. I adore god, on the contrary. I believe in the 'supreme being', in a 'creator', whatever he may be. I care little who has placed us here below to fulfill our duties as citizens and fathers of families; but I don't need to go to church to kiss silver plates, and fatten, out of my pocket, a lot of good-for-nothings who live better than we do. For one can know him as well in a wood, in a field, or even contemplating the eternal vault like the ancients. My god! Mine is the god of Socrates, of Franklin, of Voltaire, and of Beranger! [Pierre Beranger (1780-1857) (Ñº) (IQ:155) (Cattell 1000:323) reputed (Ñº) atheist (Ñº)] [compare: Spinoza's god] I am for the profession of faith of the 'Savoyard Vicar,' and the immortal principles of '89! And I can't admit of an old boy of a God who takes walks in his garden with a cane in his hand, who lodges his friends in the belly of whales, dies uttering a cry, and rises again at the end of three days [see: resurrection]; things absurd in themselves, and completely opposed, moreover, to all physical laws, which prove to us, by the way, that priests have always wallowed in turpid ignorance, in which they would fain engulf the people with them"

The novel ends with a young widower looking in on his dead wife over and over, while Homais advocates in the background in "read Voltaire!"; "Read d'Holtach", "read the *Encyclopedia*" in opposition to the village priest who pipes "read the modern Christian tomes". [1]

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External links

â— Gustave Flaubert – Wikipedia.

θΔics

In existographies, **Gustave Hirn** (1815-1890) (CR:38) was a French physicist known, in human thermodynamics, for his 1856 experimental calculations of the mechanical equivalent of heat of humans. Hirn also authored the *Experience on the Speed Limit of Gas* (1839), the *Thermal Effect of Work* (1840), *The Mechanical Theory of Heat* (1862), and most notably, and most-importantly *Philosophical Implications of Thermodynamics* (1868), the first book in in the field of philosophical thermodynamics. [6] Hirn saw thermo-dynamics as the science of the forces (energies) that brought matter into motion; subsequently, his aims were to moralize power. [1] His work on heat theory led him to a generalized metaphysics based on the notion of force. [5]

Of note, the terms human thermodynamics and human thermo-dynamics were both coined in 1893 paper "The Scientific Work of Gustav Adolph Hirn" by English engineer Bryan Donkin. [4]

Mechanical equivalent of heat of humans

Hirn was the first to make a calculated value for the mechanical equivalent of heat for a man, an "animated motor", doing work in a sealed chamber, done probably similar to Antoine Lavoisier's combustion theory of animal heat experiments (c.1780) on humans.

To achieve this end, a man was placed in a hermetically closed chamber, and made to turn a wheel which could, at choice, revolve with or without doing work. The heat given out in the chamber was then ascertained by the ordinary calorimetric process. From these experiments, Hirn deduced a valuation of the mechanical equivalent of heat for animated motors; but the number which he obtained differed considerably from the standard obtained by James Joule through the standard physico-electric-mechanical methods. [2]

Education

Hirn, owing to his delicate health, was never allowed to attend school, and instead was home-schooled in the large cotton mill of his maternal grandfather M. Haussman, where his father was also a partner. His first studies were in the chemical laboratory of the Mill. In 1845, at the age of thirty, he was placed in charge of the steam engines working the Mill, which is about what time he is said to have begun his serious work, an office he remained at for nearly thirty-five years.

See also

- History of human thermodynamics

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Statue of **Hirn** in Colmar, France. [3]

External links

● Gustave-Adolphe Hirn – Wikipedia.

θΔics

In existographies, **Gustave Le Bon** (1841-1931) was a French social psychologist, sociologist, anthropologist, inventor and amateur physicist noted for []

Overview

In 1895, Le Bon, in his *The Crowd: a Study of the Popular Mind*, as cited by James Coleman (1994), building on Charles Darwin and Ernst Haeckel, employed the following chemical combination logic of crowd dynamics—comparing the behavior changes resulting via the combination of people to the behavior changes resulting from the combination of acids and bases: [1]

> "The most striking peculiarity presented by a psychological crowd is the following: Whoever be the individuals that compose it, however like or unlike be their mode of life, their occupations, their character, or their intelligence, the fact that they have been transformed into a crowd puts them in possession of a sort of collective mind which makes them feel, think, and act in a manner quite different from that in which each individual of them would feel, think, and act were he in a state of isolation. There are certain ideas and feelings which do not come into being, or do not transform themselves into acts except in the case of individuals forming a crowd. The psychological crowd is a provisional being formed of heterogeneous elements, which for a moment are combined, exactly as the cells which constitute a living body form by their reunion a new being which displays characteristics very different from those possessed by each of the cells singly.
>
> Contrary to an opinion which one is astonished to find coming from the pen of so acute a philosopher as Herbert Spencer, in the aggregate which constitutes a crowd there is in no sort a summing-up of or an average struck between its elements. What really takes place is a combination followed by the creation of new characteristics, just as in chemistry certain elements, when brought into contact—bases and acids, for example—combine to form a new body possessing properties quite different from those of the bodies that have served to form it."

(add)

Quotes | On

The following are quotes on Le Bons:

> "Thermodynamics, like Darwinism, became a reservoir of metaphors and arguments that were transposed from physics to social thought so that, to the same extent it is possible to speak of a social Darwinism, it is possible to speak of a 'social thermodynamics' as well. By the same token, the ideology of thermodynamics becomes mythopoieic, and the term 'energy' is borrowed from its scientific context to be turned into a mythical notion able to explain everything without any single counterfactual evidence. Thus, thermodynamics is interpreted — for example in Henry Adams [1910] and **Gustave le Bons** [1895] (Ñº) — as a philosophy of history and as an explanation for the increasing disorder of society."
>
> — Sergio Franzese (2008), *The Ethics of Energy* (pgs. 156-57)

Quotes | By

The following are quotes by le Bon:

> "The most careful observations seem to prove that an individual immerged for some length of time in a crowd in action soon finds himself—either in consequence of the magnetic influence given out by the

crowd, or from some other cause of which we are ignorant—in a special state, which much resembles the state of fascination in which the hypnotized individual finds himself in the hands of the hypnotizer."

— Gustave le Bon (1895), *The Crowd* (pg. 34)

References

1. (a) Le Bon, Gustave. (1895). *The Crowd: a Study of the Popular Mind*. MacMillan, 1897.
(b) The Crowd: A Study of the Popular Mind – Wikipedia.
(c) Coleman, James S. (1994). *Foundations of Social Theory* (pg. 200). Harvard University Press.

External links

â— Gustave Le Bon – Wikipedia.

θΔics

In human chemistry, **Gustavus John Esselen** (1888-1952) was an American chemist noted for being the consulting chemist for the 1948 book *We Human Chemicals* by Thomas Dreier, wherein he gave suggestions on chemical terms and analogies. [1]

Education

Esselen completed his AB in chemistry (1909) and PhD in chemistry (1912), thesis: "Studies on Benzhydrols: I: The resolution of p-Aminobenzhydrol into its optical isomers, II: The splitting of Benzhydrols by the action of bromine", both at Harvard University. [2]

Notes

The Gustavus John Esselen Award, which recognizes a chemist whose scientific and technical work, within the last five years, has contributed to the public well-being, and has thereby communicated positive values of the chemical profession, was established in Esselen's honor in 1987 by the Northeastern Section of the American Chemical Society. [3]

References

1. Dreier, Thomas. (1948). *We Human Chemicals: the Knack of Getting Along with Everybody*. (section: Genesis of this Book, pgs. xiii-xv). Updegraff Press.
2. Gustavus John Esselen (biography) – American Chemical Society.
3. Gustavus John Esselen Award – Northeaster Section of the American Chemical Society.

Further reading

â— Esselen, Gustavus J. (1948). "There Are No Atheists in the Laboratory", in *Guideposts: Personal Messages of Inspiration and Faith*, by Norman Peale, pgs. 183-87.

â— Anon. (2005). "Gustavus John Esselen (1888-1952) and the Esselen Award" (pdf), *The Nucleus*, 83(8):4-5, Apr.

External links

â— Gustavus Esselen – Wikipedia.

θΔics

In thermodynamics, **H-theorem** is a Newtonian mechanics based equation that quantifies the heat of an ideal gas, by a numerical quantity 'H', short for heat, defined in terms of the velocity distributions of the atoms and molecules of the body of gas, such that when the system particles fall into a Maxwell-Boltzmann distribution (Gaussian distribution), *H* assumes it minimum possible value and that any gas system not at its minimal value of *H* will transform its distribution of velocities, through collisions, towards the minimum value associated with the Maxwell-Boltzmann distribution. [1] In simple terms, the H-theorem is kinetic theory-based definition of entropy, albeit applicable to only gas systems, and is often claimed as an analytical proof of the second law of thermodynamics. [2]

History

In 1866, Irish physicist James Maxwell published his "On the Dynamical Theory of Gases", showing how, through kinetic theory, to obtain physical properties of gases from the underlying distribution of velocities. Building on this work, Austrian physicist Ludwig Boltzmann developed what he called a 'minimum theorem', in his famous 1872 paper "Further Studies on the Thermal Equilibrium of Gas Molecules", which derived a kinetic expression for the entropy of an ideal gas.

The term 'H-theorem' was said to have been an English translation of Boltzmann's term 'minimum theorem', made by English mathematical physicist Samuel Burbury between 1875 and 1894, in the sense of Boltzmann's 'heat theorem'. In his 1899 book *A Treatise on the Kinetic Theory of Gases*, which was essentially devoted to an explication of Boltzmann's 1872 work, Burbury states that the *H* theorem is known as 'Boltzmann's minimum theorem' and that *H* is called 'Boltzmann's minimum function or, as it is sometimes, called the entropy function.' [3]

References

1. Lindley, David. (2001). *Boltzmann's Atom: the Great Debate that Launched a Revolution in Physics* (H, pg. 75, Burbury, pgs. 109-22). Free Press.
2. Burbury, S. H. (1876). "On the Second Law of Thermodynamics, in Connection with the Kinetic Theory of Gasses", *Philosophical Magazine*, 1: 61-67.
3. Burbury, S. H. (1899). *A Treatise on the Kinetic Theory of Gases* (H theorem, pgs. v-vii, 10, 30, 39-45, etc.). Cambridge University Press.

External links

â— H-theorem – Wikipedia.
â— H-theorem – Eric Weisstein's World of Physics.

θΔics

In existographies, **H.H.** (c.1777-c.1850) (CR:3) was an anonymous Scottish engineer, noted for []

Overview

In 1822, H.H., in his “Account of a Steam-Engine Indicator”, presented to the world the first published account of James Watt’s 1796 steam engine indicator and indicator diagram, based on based on details of the device given by a “Mr. Field”, the following are his illustrations: [1]

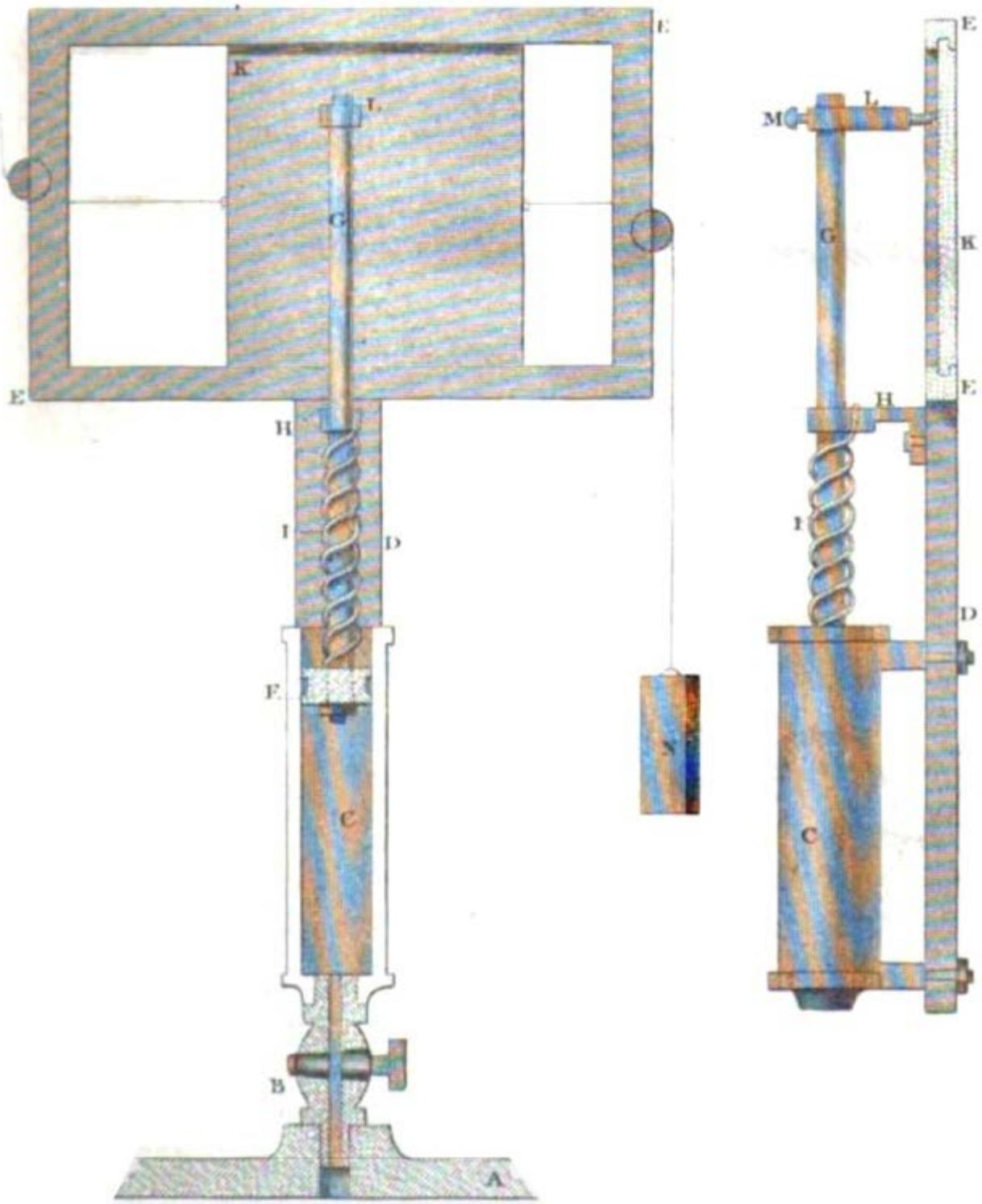

H.H. also gave an example of the PV diagram or indicator diagram that the device made, shown below:

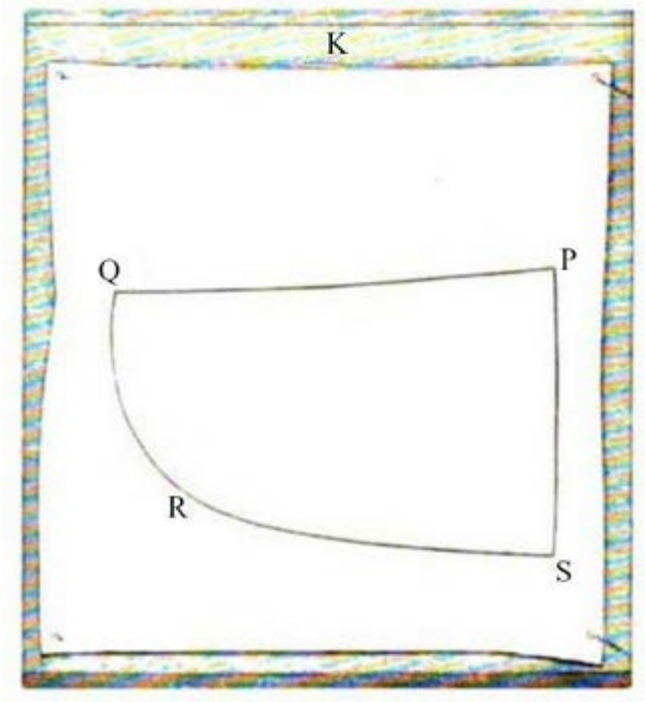

(add)

Influenced

It may have been possible that H.H.'s "Account of a Steam-Engine Indicator" is from where Emile Clapeyron (1834) learned of the indicator diagram method.

Quotes | By

The following are quotes by H.H.:

> "It is only upon the unbiased results exhibited to our actual observation through the medium of inanimate matter, acting on known principles, that implicit confidence ought to be placed."
>
> — H.H. (1822), "Account of a Steam-Engine Indicator"; cited by: Davis Baird (2004) in *Thing Knowledge: a Philosophy of Scientific Instruments* (pg. 189) [2]

References

1. (a) H.H. (1822). "Account of a Steam-Engine Indicator", Letter to the Editor of *Quarterly Journal of Science*, Literature and the Arts, 13:91-95. in: *The Repertory of Arts and Manufactures* (pgs. 14-19). Publisher, 1822.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 80). Cornell University Press.
2. Baird, Davis. (2004). *Thing Knowledge: a Philosophy of Scientific Instruments* (pg. 189). University of California Press.

θΔics

In chemistry, the **Haber process** is the synthesis of ammonia NH_3 from nitrogen N_2 and hydrogen H_2 gas at high temperature (sometimes also at high pressure) with the help of iron as a catalyst. The process was developed in circa 1905 by German chemist Fritz Haber.

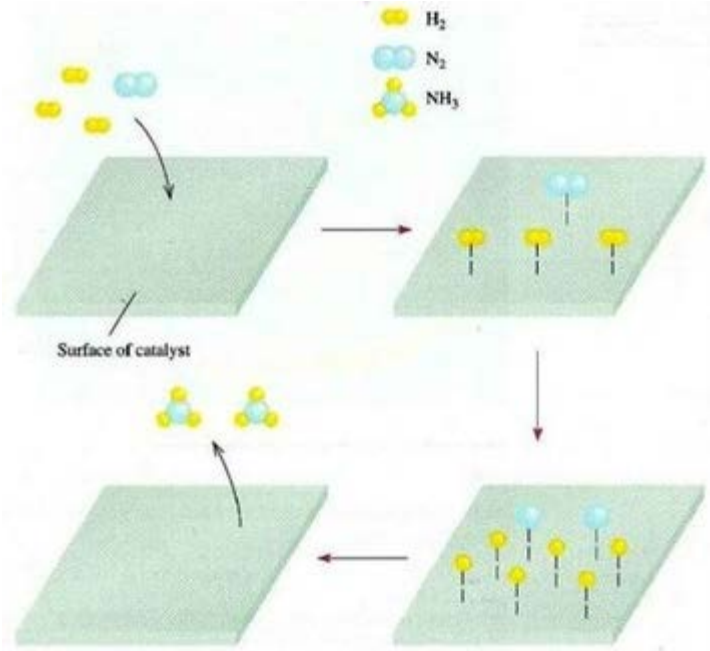

Diagram of the mechanism of the **Haber process**, showing how dihydrogen H_2 and dinitrogen N_2 react together over a substrate or catalyst of iron oxide, in a system heated and pressurized, the state of which works to form ammonia NH_3 as a product. [2]

Overview

In his 1905 book *Thermodynamics of Technical Gas Reactions*, Haber recorded the production of small amounts of ammonia from N_2 and H_2 at a temperature of 1000° C with the help of iron as a catalyst. [1] Later he decided to attempt the synthesis of ammonia and this he accomplished after searches for suitable catalysts, by circulating nitrogen and hydrogen over the catalyst (iron plus a few oxides of potassium and aluminum) at a pressure of 150-200 atmospheres at a temperature of about 500° C. The following is an example Haber process reaction schematic: (Q)

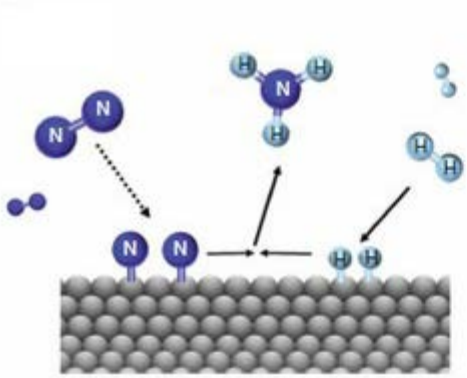

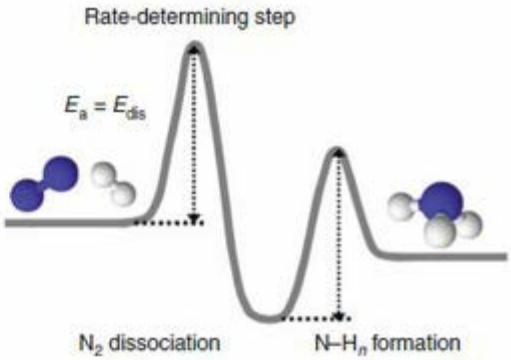

In this process, called "heterogeneous catalysis", the "surface" of the solid catalyst is the site of the reaction, in which the initial step involves the dissociation of N_2 and H_2 on the metal surface. In this state, the dissociated species are not truly free atoms because they are bonded to the metal surface, but are highly reactive. The two reactant molecules are said to "behave differently" on the catalyst surface, in the sense that the desired reaction is facilitated. [2]

The successful development of this process resulted in the establishment, with the cooperation of Bosch and Mittasch, of the *Oppau and Leuna Ammonia Works*, which enabled Germany to prolong the First World War when, in 1914, its supplies of nitrates for making explosives had failed. Modifications of this Haber process also provided ammonium sulphate for use as a fertilizer for the soil. The principle used for this process and the subsequent development of the control of catalytic reactions at high pressures and temperatures, led to the synthesis of methyl alcohol by Alwin Mittasch and to the hydrogenation of coal by the method of Bergius and the production of nitric acid.

Haber won the 1920 Nobel Prize in chemistry for this work. [3]

Human chemistry

In human chemistry, the Haber process also serves as an excellent comparison model example of how human molecules (people) react differently together depending on which region of earth substrate (surface) the reaction takes place. [4] The crust of the earth, by comparison, is five percent iron and of the oxides embedded in it, sixteen percent are aluminum oxides and three percent are potassium oxides.

References

1. Haber, Fritz. (1905). *Thermodynamics of Technical Gas Reactions*, (Translator's Preface, 1907, pg. vii). Longmans, Green, and Co.
2. Chang, Raymond. (1998). *Chemistry*, (pgs. 540-41, 585). McGraw-Hill.
3. Haber, Fritz. (1920). "The Synthesis of Ammonia from its Elements", *Nobel Lecture*, June 02.
4. Thims, Libb. (2007). *Human Chemistry (Volume One)*, (Haber process, pgs. 95-96), (preview), (Google books). Morrisville, NC: LuLu.

External links

- Haber process – Wikipeda.
- Haber process – Ausetute.com
- Haber process (effect on fertilizers) – by Raymond Zmaczynski, Princeton.edu.

θΔics

In science, **habitable zone** is the circumstellar radius or region around stars, at a distance according to which heat radiation yields states of matter from about the freezing point to boiling point of water, in which animate CHNOPS-based matter can exist.

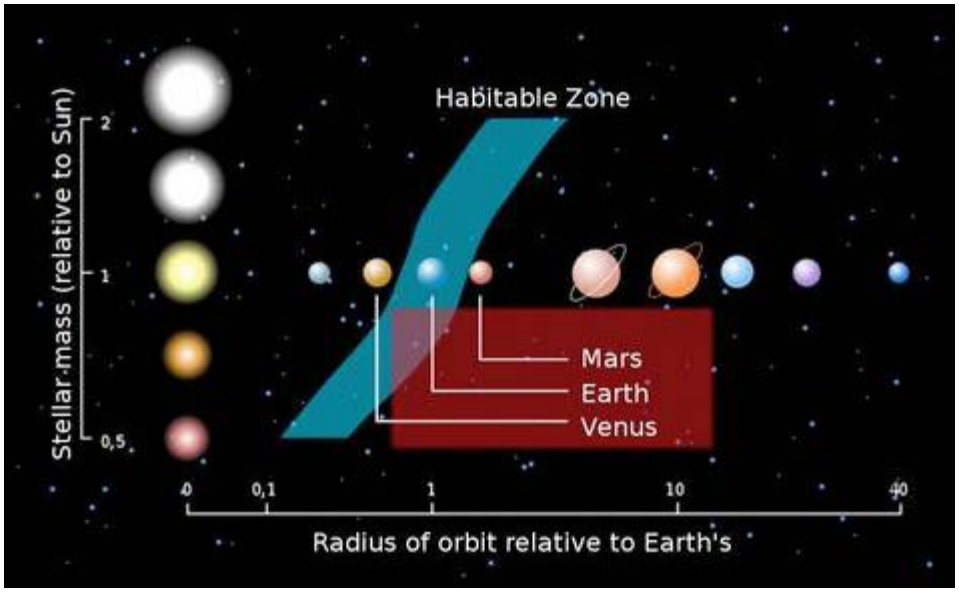

A few depictions of the **habitable zone**, or just right temperature regions, in which carbon-based, e.g. retinal, or CHNOPS-based intelligent animate matter, e.g. humans, can exist.

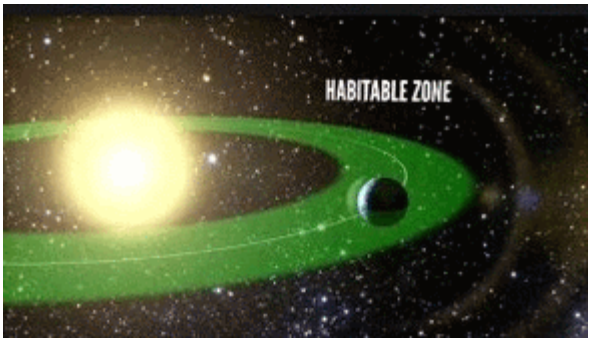

Overview

In 1585, Giordano Bruno, in his *On the Infinite, the Universe, and the Worlds*, posited that there were many suns with many planets and that those not too cold or not too hot would be "inhabited", although, to note, he did not get into specifics about zones.

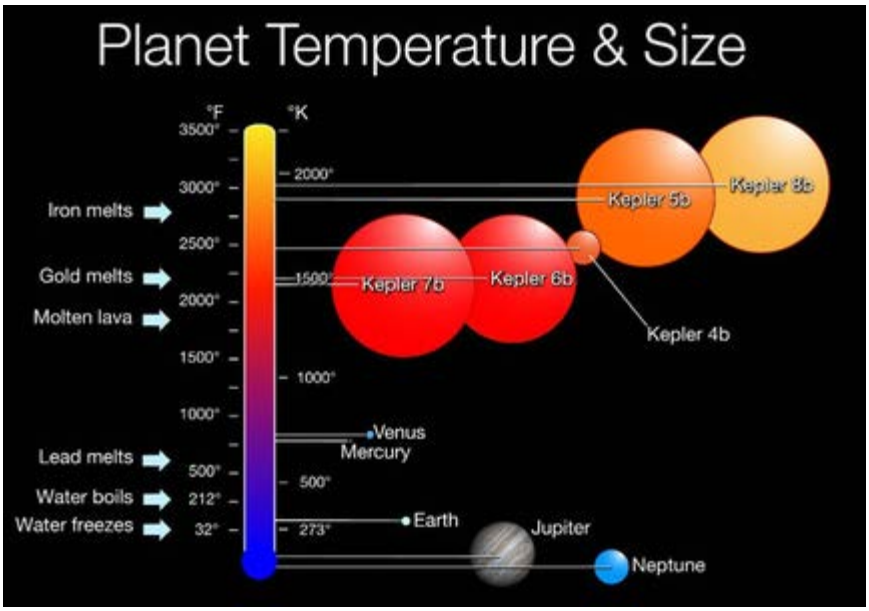

In 1974, Henry Swan vicariously defined the habitable zone as a medium powered region, as follows: [1]

> "Biosphere: region of energy-supplied liquid water existing terrestrial surface, encompassing steady-state organizations of CHNOPS matrix forms."

In 2006, Paul Davies, in his *The Goldilocks Enigma: Why Is the Universe Just Right for Life?*, argues that pictured below;

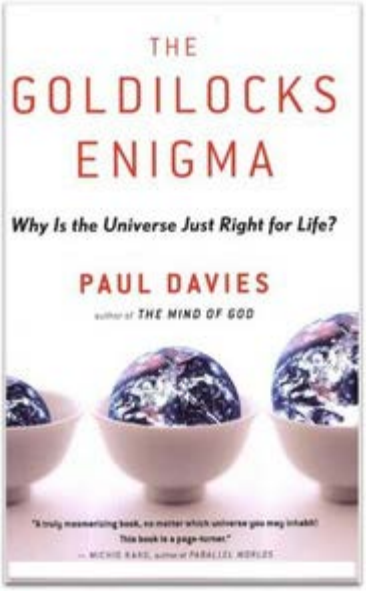

in which he argues that the earth, with its so-called "bio-friendly" conditions habitable zone (Ñº) , was fine-tuned by accident, and found in one of many universes.

References

1. Swan, Henry. (1974). *Thermoregulation and Bioenergetics: Patterns for Vertebrate Survival* (CHNOPS, 9+ pgs; biochemistry, pg. 2). American Elsevier Pub. Co.

External links

â— Circumstellar habitable zone – Wikipedia.

θΔics

In science, **half-alive theory** or "more alive" / "less alive" theory is a speculative origin of life conjecture, hypothesis, or type of thought experiment which supposes that prior to the formation of the first "life" there existed a half-living thing (John Haldane, 1929), semi-living molecule (*Time*, 1957), in contrast to a living molecule, or less-alive molecule (Libb Thims, 2007), in contrast to a more-alive molecule, acting as a precursor to the first living thing.

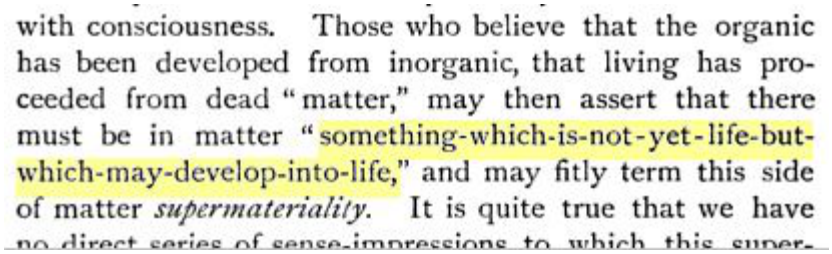
with consciousness. Those who believe that the organic has been developed from inorganic, that living has proceeded from dead "matter," may then assert that there must be in matter "something-which-is-not-yet-life-but-which-may-develop-into-life," and may fitly term this side of matter *supermateriality*. It is quite true that we have

English mathematician-physicist Karl Pearson's 1892 interjection on the jump from living (matter) to lifeless (matter), or dead matter to living matter, in regards to something "not yet life", which is a **half-alive** type of theory speculation. [6]

Supermateriality

In 1892, English mathematical physicist Karl Pearson, in his *The Grammar of Science*, a book looking at mind and life in the context of modern physical science, stated the following: [6]

> "Those who believe that the organic [see: living matter] has been developed from inorganic, that living has proceeded from dead 'matter' [see: dead matter], may then assert that there must be in matter '**something-which-is-not-yet-life**-but-which-may-develop-into-life', and may fitly term this side of matter *supermateriality*."

(add)

Half-living thing

In 1929, English bio-chemist (chnops-chemist) John Haldane, in an article published in *Rationalist Annual*, argued that the atmosphere of the early earth was mostly carbon dioxide, ammonia, and water vapor, containing little oxygen; without oxygen no ozone would be present, hence: [1]

> "When ultra-violet light acts on a mixture of water, carbon dioxide, and ammonia, a vast variety of organic substances are made, including sugars and apparently [Edward Baly, 1920s] some of the materials from which proteins are built up. The first living or **half-living things** were probably large molecules synthesized under the influence of the sun's radiation, and only capable of reproduction in the particularly favorable medium in which they originated."

In 2017, Krishna Dronamraju, in his *Popularizing Science*, devoted an chapter section to Haldane's views on "half-living things". [10]

Biocule

In 1927, while not exactly a "half-alive theory", per se, but in the neighborhood, British animal psychologist Lloyd Morgan, gave the following outline: [7]

> "Let us provisionally arrange 'natural entities' in ascending order in an emergent hierarchy. Such a suit may be: atom, molecule, colloidal unit, '**biocule**', cell, multicellular organism, community of such organisms. Here 'biocule' stands for a hypothetical link in the chain."

Morgan, in 1929, elaborated on this "biocule" (i.e. first "living molecule") hypothesis as follows: [8]

> "On the assumption that all are in accordance with nature, and that they stand in order of evolutionary

genesis, it follows that, at some stage of evolution *a*, there were atoms only; at stage *b*, molecules (and atoms) only. Not until stage *c* was reached were there living units (may one say '**biocules**'?) in biochemical relationship. Here we come into touch with the hypothesis, the fullest knowledge of the nature and properties of the atomic world at stage *a* would not enable the most for-sighted atomic logician, so to speak, to deduce and foretell the nature and properties of the molecules at stage *b*; nor would the fullest knowledge of molecules at this stage of evolution enable the molecular logician to predict the distinctive character of 'biocules' at stage *c*, that is before any 'biocule' had come into existence."

While, again, this is not specifically a half-alive theory, the following is the gist of what Morgan is supposing, in his assertion that somewhere in or amid the jump from "stage *a*" to "stage *b"* (or at stage *b*) that "life" appeared:

atoms (dead) + molecules (dead) → biocules (alive)

A prolonged study and introspection of this "hypothetical" reaction in terms of free energy is where its logic shows through as faulty; thought, to note, this conclusion is not immediate.

Semi-living molecules

An early January 1957 Manhattan meeting for the American Association for the Advancement of Science, a debate arose over what seems to be Haldane's 1929 reducing atmosphere / hot thin soup (see: primordial soup) origin of life theory—supposedly in regards to his conjecture that: "that the first living or half-living things were probably large molecules synthesized under the influence of the sun's radiation". This debate spurred the *Time* magazine article "Of Molecules & Men", which speculated on this further, discussing concepts such as "semiliving molecules" and automation: [2]

"The business of biology is to study all aspects of life, from **semiliving molecules** to automation. At last week's Manhattan meeting of the American Association for the Advancement of Science, which goes heavy on biology, platoons of speakers went to work on life. Some highlights: Original Soup. Best theory of how life began assumes that the earth once had a "reducing" atmosphere of methane, ammonia, hydrogen and water, as the outer planets have now. Solar radiation and lightning, according to the theory, turned this mixture into organic molecules which gradually grew complex enough to..."

More alive / less alive theory

See main: More alive / less alive theory

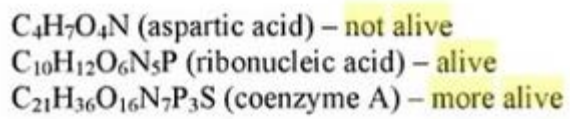

American electrochemical engineer Libb Thims' 2007 ridicule diagram of the absurdity of the "more alive" (coenzyme A, a 6-element molecule), "alive" (RNA, a 5-element molecule), not alive or "less alive" (aspartic acid a 4-element molecule), or definitely not alive hydrogen molecule (a 1-element molecule) or hydrogen atom position. [3]

In 1993, Canadian political scientist Paris Arnopoulos, in his "Life" chapter, to his *Sociophysics*, gave the following summary: [9]

"Primitive and pagan people attribute some kind of life to all creation. The pre-Socratics concurred with this belief, as Thales' hylozoism and Pythagoras' pananimism attest. From this traditional viewpoint, all beings are alive in different ways and various degrees, the more formidable the complexity of its components, the **more alive** is the system."

In 2007, American electrochemical engineer Libb Thims, in his "Molecular Evolution" chapter, to his *Human Chemistry*, was vacillating on on the popular notion that the RNA molecule is the first form of life, when viewed in the light of a molecular evolution table, which holds that evolution from the hydrogen atom (a presumed to be "not alive"

entity) to the human molecule (a presumed to be "alive" entity) is but a progressive increase in element count (26 for humans), animation, and reactivity properties.

Thims, at this point, was indecisive as to the solution.

Defunct theory of life

In 2009, the faulty merits of the above "more alive / less alive" argument (2007), a repercussion of the RNA = first life theory, acted as a ridicule or Aunt Sally type stepping stone to arrival of the defunct theory of life, by American electrochemical engineer Libb Thims. [4] In this new perspective, namely that the grand unpublished "theory of life" is not a scientific theory, but rather a religious-mythology based theory forced into modern physical science and hence a defunct scientific theory that becomes acute in the chemical perspective (e.g. “chemistry does not know the word life", Charles Sherrington, 1938; “[I suggest we] abandon the word ‘alive’”, Francis Crick, 1966) and especially so in the chemical thermodynamic perspective (e.g. “there is no thing endowed with life”, Nikola Tesla, 1915), the premise of a "semi-living molecule", i.e. a molecule that is so-to-say "half-alive", in retrospect, is a near-absurdity, but one difficult to discern in conceptual context; such as was the case in the 2007-mindset of Thims.

Autogen theory

In 2011, American neurological anthropologist Terrence Deacon, in his mind from matter book *Incomplete Nature*, outlined his "autogen theory", which argues that prior to the formation of the first living thing (some type of membrane-bound cell with genetic material in his view) that a hypothetical molecular entity called an "autogen" (self-generating system) existed, which Deacon explicitly defines as being "not alive", that self-assembled or self-generated, via autocatalysis, autopoiesis, autocatalytic closure, recursive, circular, etc. methods, to form the first life. [5] Deacon's theory, however, is smothered in layers upon layers of emergence theory and hypothetical coinings and terms, to the point that discussion of his theory is crouched in hundreds of pages of his own made-up vocabulary (e.g. telodynamics, morphodynamics, autogenic chemistry, autogenesis, to name a few) and is a theory that amounts to a perpetual motion of the living kind theory.

See also

â— First life
â— Half-life
â— Virus molecule

References

1. Ball, Philip. (2011). *Unnatural: the Heretical Idea of Making People* (pgs. 135-36). Vintage Books.
2. Staff. (1957). “Science: Of Molecules & Men”, *Time*, Jan 07.
3. Thims, Libb. (2007). *Human Chemistry (Volume One)* (more alive, pg. 130-31). Morrisville, NC: LuLu.
4. Thims, Libb. (2009). “Letter: Life a Defunct Scientific Theory”, *Journal of Human Thermodynamics*, Vol. 5:20-21.
5. Deacon, Terrence W. (2011). *Incomplete Nature: How Mind Emerged from Matter* (autogen, pgs. 305-). W.W. Norton & Co.
6. Pearson, Karl. (1900). *The Grammar of Science* (§The Definition of Living and Lifeless, pgs. 338-40; quote, pg. 339). Publisher.
7. Morgan, C. Lloyd. (1927). “A Conception of the Organism, Emergent and Resultant” (pgs. 141; biocule, pgs. 151-52), *Proceedings of the Aristotelian Society*.
8. Morgan, C. Lloyd. (1929). *Mind at the Crossways* (pg. 6; biocule, pgs. 16-17). Williams & Norgate.
9. Arnopoulos, Paris. (1993). *Sociophysics: Cosmos and Chaos in Nature and Culture* (being, pg. 31; more alive, pg. 39). Nova Publishers, 2005.
10. Dronamruju, Krishna R. (2017). *Popularizing Science: the Life and Work of JBS Haldae* (§§: Origin of Life; §: Half-Living Things, pgs. 143-). Oxford University Press.

θΔics

In science, **half-life**, or "period of half-decay" (William Ramsay, 1907), in terminologically-neutral language, refers, in its original meaning, to the time required for half of a sample of radioactive nuclides to spontaneously transform or decay into a daughter nucleid, which may be radioactive or not, with the emission of one or more particles or photons; the time taken for the activity of a given amount of a radioactive substance to decay to half of its initial value; in a general sense, the time required for one-half of a given material to undergo chemical reactions. [1]

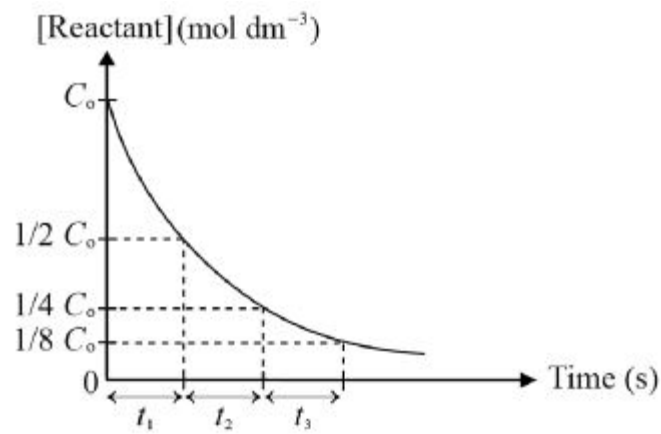

An initial concentration C_o versus time diagram for a generic first-order reaction, showing that first-order reactions have a constant **half-life** (or half-period), i.e. $t_1 = t_2 = t_3$, meaning that the half-period is independent of the initial concentration of the reactant. (Q)

Synonyms | Terminology issues

Synonym alternatives, to half-life, collectively, include: "half transformation time" (Ernest Rutherford, 1905), "period of half-decay" and "half-life-period" (William Ramsay, 1907), "life-period", "half-life-period", among others. Only two of these, namely half transformation time and period of half-decay, are scientifically-neutral, while the others affix anthropomorphic religio-mythology based speak to transformation of radioactive elements (uranium, radium, or thorium) into other elements.

The anthropomorphic terms half-life, life-period, etc., imply, indirectly, to the effect, that when uranium-238 (half-life of 4.7 billion years) transforms or disintegrates into radium-226, or when radium-226 (half-life of 1,600 years) transforms or disintegrates into lead-206, etc., that elements (or specifically radioactive elements, depending), while existing in a certain bound state as a certain isotope, "live", and likewise that when a transformation into a new element occurs that the previous reactant element "dies". While this subtle mythology-base language usage may seem innocuous, to some, it is a subtle one in great need of correction; akin to the prevalence of the Greek god of life Vita (e.g. the root of the word vitality), and his brother the god of death Mor (root of the word mores and morality), seen in the 19th century vitalism and 20th century neo-vitalism debates, all of which is but in need of terminology reform, per the defunct theory of life position (see: life terminology upgrades).

Examples

The following are example half-lifes of a few chemical entities:

Tritium | 12.32 years (Q)
Carbon-14 | 5,730±40 years
Uranium (isotope) | 4.5 billion years (Q)
Thorium (isotope) | 14 billion years (Q)
Hydrogen | 10E36 years (Q)

Etymology

The following shows a semi-accurate half-life etymology snippet by John Ayto (2002): [2]

half-life *n* (1907) the time in which the quantity of a radioactive substance in a sample decreases by half. In earliest usage it occurs in the expression *half-life period*; it is not recorded on its own until the early 1950s

1907 *Journal of the Chemical Society*: Rutherford and others have shown that whilst radium A, B, and C have a life-period of only a few hours, radium D has a half-life-period of

In 1905, Ernest Rutherford, in his “Present Problems in Radioactivity”, stated the following: [3]

> “For convenience, these successive products of the emanation will be termed radium A, radium B, and radium C. The time *T* for each of these products to be **half** transformed and the radiations from each product are shown in the following table [adjacent].”

Product.	*T*	Radiations.
Radium,		α rays.
Emanation,	4 days,	α rays.
Radium A,	3 mins.,	α rays.
Radium B,	21 mins.,	no rays.
Radium C,	28 mins.,	α, β and γ rays.

Here it would seem that Rutherford was employing the phrase "half transformation time"; though he does not, to note, in this article, use the later synonym term half-life or anything to this effect.

In 1907, William Ramsay, who was also working on the radioactivity problem, was employing the terms "period of half-decay" and "half-life-period" in reference to a decrease in half of the measurements of the emanations from radium, which occurred in 3.75 days. [4]

Science biographer Elizabeth Oakes, in her *Encyclopedia of World Scientists* (2007), to note, incorrectly typos (pg. 276) that Rutherford coined the term half-life in 1890, which is hardly possible being that radioactivity wasn’t discovered until 1896 by Henri Becquerel; her later entry on Rutherford (pg. 639), however, seems to clarify the situation to the effect that the Rutherford discerned that the time it takes half a substance, i.e. a radioactive element (uranium or thorium), to decay occurs geometrically over time. [5]

See also

- First life
- Half-life
- Lifetime

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1. (a) Ramsay, William. (1907). “A Radio-Active Gas” (period of half-decay, pg. 67), *Journal of The Royal Society of Arts*, 56:64-, Dec 13.
(b) Daintith, John. (2005). *Oxford Dictionary of Chemistry* (pg. 174). Oxford University Press.
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5. Oakes, Elizabeth. (2007). *Encyclopedia of World Scientists* (half-life, pgs. 276, 639). Infobase Publishing.

External links

- Half-life – Wikipedia.

In religio-mythology, **halo** (TR:50) is a circular or ringed artistic representation, often seen "behind" or "above" the head of semi-modern religious figures, or angels, of what was formerly the sun or sun disc (or sun god), carried by a bird, e.g. the phoenix, or other animal, e.g. scarab beetle (see: Khepri Ra), on its head, in its perceptual journey through the day sky, viewed in the context of geocentrism, i.e. the sun going around the earth or flat earth cosmological model.

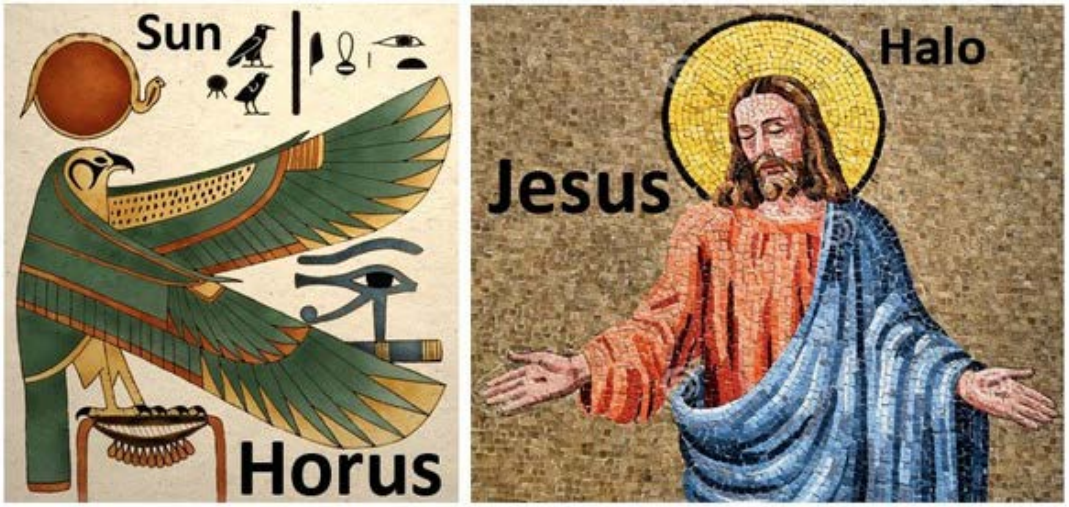

A visual of the artistic and conceptual five-thousand year jump from the original model of the Egyptian god Horus (3100BC), carrying the sun or "sun disc" *on* his head, to the Christian man-god Jesus with "halo" *behind* his head. In short, the bird is the god Ra, generally, or Horus or Ra-Horus (aka Ra-Horakhty, "Ra, who is Horus of the Two Horizons"), depending on time period of supreme god syncretism and worship, carrying the sun disk on its head.

Overview

In 1900, Gerald Massey, in his "The Historical Jesus and the Mythical Christ", outlined some type of sun disc turned halo historical. [3]

In 2000, James Arthur, in his *Mushrooms and Mankind*, mistakenly asserted his belief that the aura around the head of Jesus was a “mushroom cap”. [1]

In 2004, Libb Thims, in chapter "Thermodynamics and Religion", stepped through the following visual timeline of how the Ra sun god model, of a bird carrying the sun on its head, morphed over time into the model of a halo above the head of angels, Jesus, and other modern religious figures; images 9, 12-13 show, to note, the moon as a disc carried on the head of a baboon or the god Thoth:

This was followed by a period of anthropomorphizing, during the early rise of Christianity (350BC-780AD), where the animal gods began to be re-written as god like humans, angels, and demons, during which period the sun disc began to move behind the head, rather than on top, as depicted at the Roman Catacombs, the Apocalypse of Beatus, and the c.450-550 Mosaics from Ravenna (14-17), this change in effect acting to loose resemblance to its original "carrying" aspect as a solar disc; in the years 1295-1430, a number of artists, such as Cavallini, Cimabue, Giotto, Fabriaon, and Duccio, began to incorporate a "cross" depiction inside of the sun disc (19-20), thus, unknowingly or not, intending to represent the stellar configuration known as the "Northern crux" visible at the time of the December 25 birth of the sun.

Somewhere in the midst of this Egyptian-to-Christian conceptual transformation, in the years 1000BC to 1000AD, a number of middle eastern and eastern religions (Hinduism, Buddism, Zoroastrianism, and Shinto) began to incorporate the halo-sun disc model into artwork (23-27); in the years 1438 to 1516, a number of artists, indluding Masolino, Angelico, Lippi, Mantegna, and Bartolommeo, began to depict a shifted or slanted forward sun disc (28-33), the result of which transformed the original vertical forward-facing sun disc into a hovering horizontal stylized halo; Jacopo Tintoretto's 1547 painting of *The Last Supper* (34) depicts a sparkle like halo; in 1600, the Sikh religion began to adopt the halo model (35-38), the same for the Jewish halo of Abraham (39), Confusius (40), the Islamic halo of Adam (41), the Jain halo of Tirthankara (42), the Sufi halo (43), the 19th century Theosophy halo showing the charka points of energy (or universal life force), right up to the adult-sized "angel kits" one can purchase at places such as StarCostumes.com; culminating with the famous crown of thorns (corona of sun rays) depiction of Jesus Christ in the controversial 2004 Mel Gibson film *The Passion of Christ*. [6]

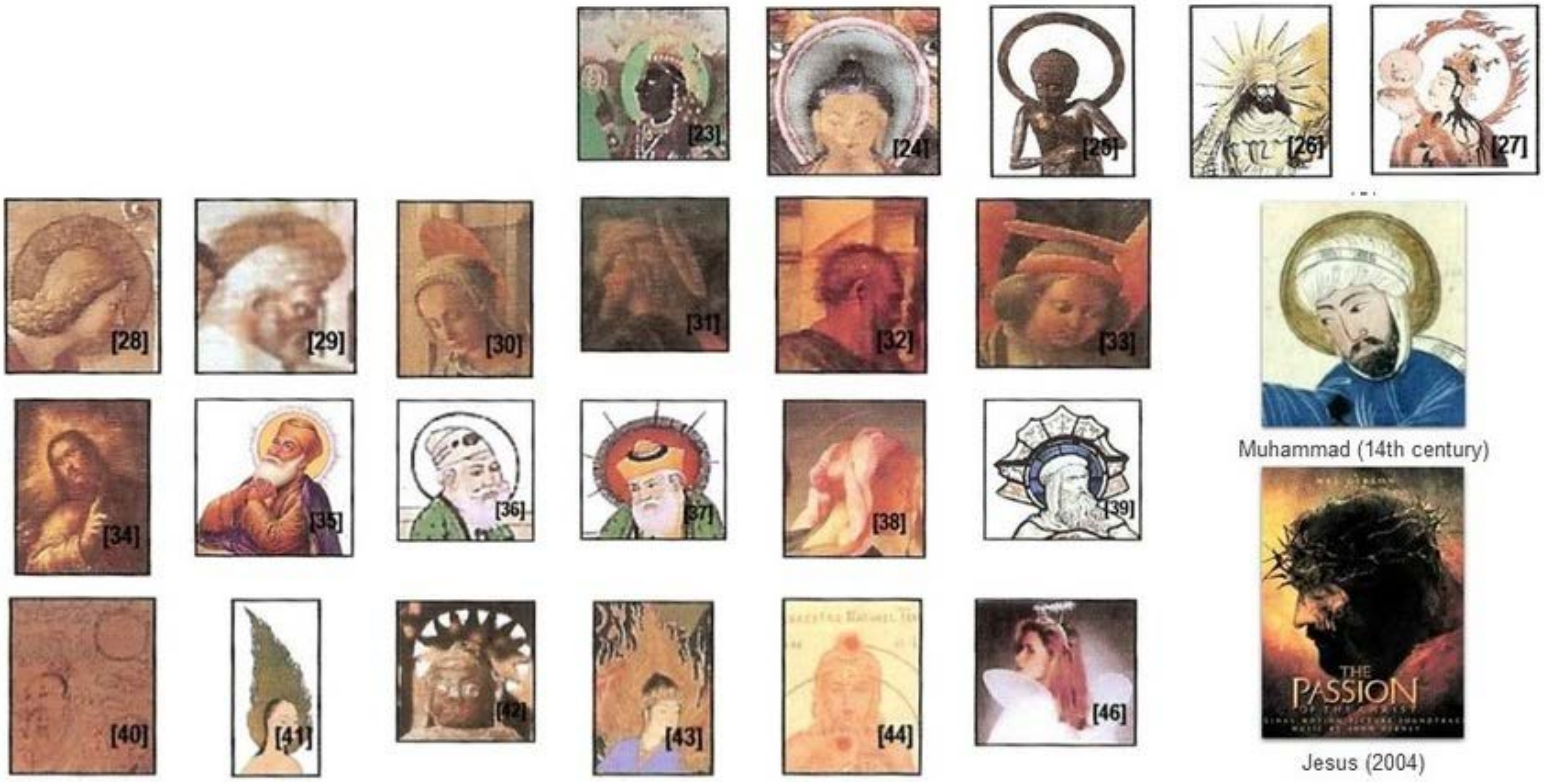

(add summary)

Corona Borealis | Thorns

In 1843, Jean Ragon, in his *The Mass and the Mysteries*, in respect to the so-called “crown of thorns” worn by Jesus, asserted the following: [5]

> “Like the pontiffs of Isis, the priests of Moses had to wear a second very ample robe beneath their white robe. It was called a cope (1), and came down to the

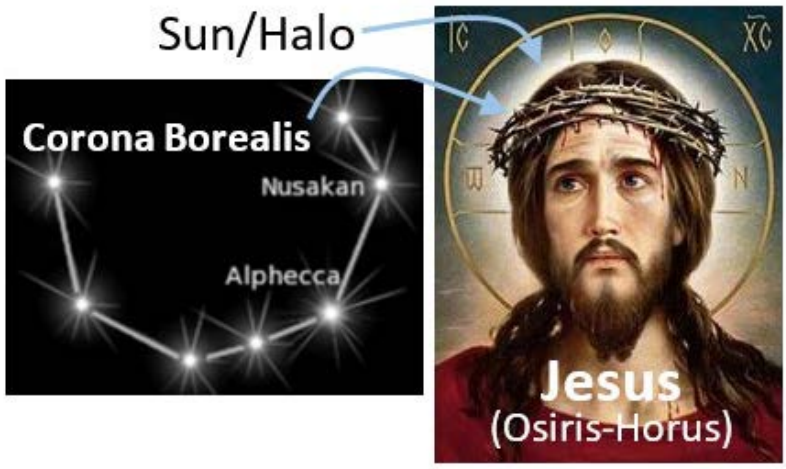

A depiction of the "crown of thorns", on the head of Jesus (Osiris-Horus), behind which is the **halo** (sun disc), said to be representative of either the Corona Borealis or the rays of the sunlight, depending on opinion.

> feet, around which were attached 72 little bells made of gold intermixed with woolen pomegranates of different colors. Among the Egyptians, these reflected the 72 murderers of Osiris; it was the number of thorns which had made up the Corona Borealis and that crown, corona, placed on the head of Jesus."

In 1916, Swiss psychologist Carl Jung asserted that the "crown of thorns", famously worn during the crucifixion of Jesus, is actually a representation of a "solar corona", so as to represent or reenact the birth of the sun (or sun god). [1]

In 2000, Jordan Maxwell, in his chapter "The Solar Cult", of his *That Old-Time Religion*, asserted his view that the thorns worn by Jesus, as he depicted below, were representative of the rays of light from the sun. [3]

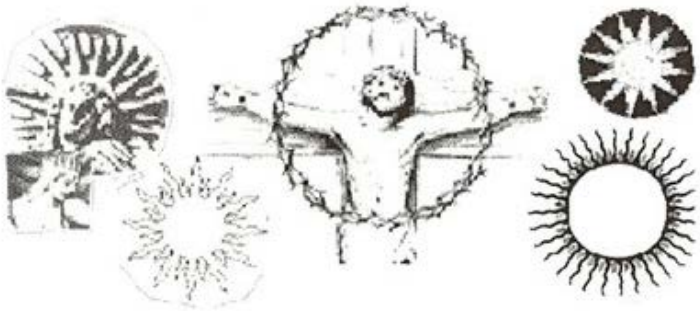

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(b) Jean-Marie Ragon (French → English) – Wikipedia.

External links

â— Halo (religious iconography) – Wikipedia.

θΔics

In terminology, **Ham**, aka "Cham" (Schedel, 1493), is the Hebrew transliteration equivalent of the Egyptian name “keme’, meaning black soil, a reference to the black soil of the Nile River, deposited on the banks of the Nile, annually, by the 150-day flood, wherein soil, soot, particle matter, from the Ethiopian mountains, is carried down the rivers, in the flood waters, from the melting snow, which is left on the banks of the Nile, when the flood recedes.

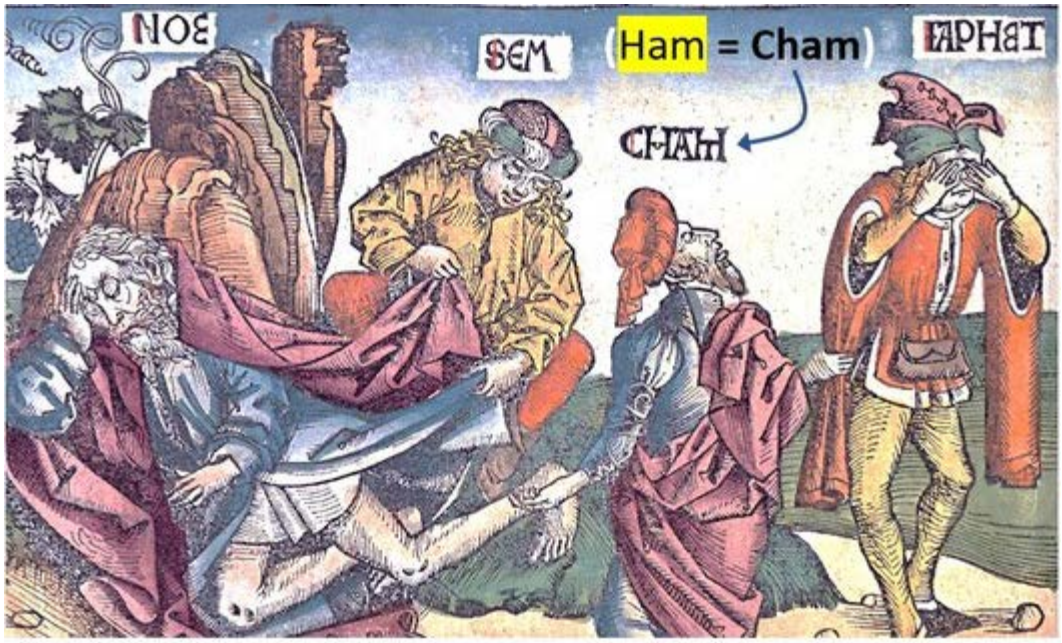

Illustration from the ***Nuremberg Chronicle*** (1493) by Hartmann Schedel

An image, form Hartmann Schedel’s 1943 *Nuremberg Chronicle*, showing Noah (Noe), with his three sons: Shem (Sem), **Ham** spelled “Cham”, and Japheth (Eaphet). [3]

Religio-mythology

In Judaism, the name Abraham, which translates as father (Ab) **Ra** of **Egypt** (Ham), or Ab-Ra-ham, the patriarch of the Judeo-Christian Islamic pantheon.

In c.500BC, the Jews or Is-Ra-El-ites, made a reformulated monotheistic religion out of the then extant version of Egyptian mythology.

In 1893, Perry Rufus, in his *The CÈ—shite: The Descendants of Ham*, via citation to Christian Stock’s *The Key of the Holy Tongue of the Old Testament* (1717), explains the etymology of Ham as follows: [1]

Treating of Ham in his elaborate Key to the Bible, Dr. Christian Stock says: “Pater fuit Mizraimi, Autoris Ægyptiorum, Gen. x. 6; 1. Chron. i. 8. Unde ab istius nomine Aegyptus dicitur nunc *Cham*, nunc terra *Cham*.

Hireronymus in Gen. testatur Ægyptum usque ad sua tempora Ægyptiorum linguâ dictam fuisse *Cham*.”

And under the head of *Cush* he says: “Primus filiorum Chami, Gen. x. 6. qui Æthiopibus nomen dedit, unde Æthiopia Chusch dicta fuit, 2 Reg. 19. 9.”

That is, “the father of Mizraim, the founder of the Egyptians, was Ham. Whence, from this name, Egypt was called now Ham; now the land of Ham. St. Jerome (in Gen.) asserts that always, even down to his time, Egypt had been called *Ham* in the tongue of the Egyptians.”

(add)

Quotes

The following are related quotes:

> "Therefore, it would be found to be composed of the first two letters of the alphabet. This is precisely what is found in the Hebrew word for father: AB. Linking it with the Egyptian RA, the radiant solar deity, we have AB-RA-M, receiving later in its evolution the developed powers of godhood represented by the fifth Hebrew letter, he, and so becoming **AB-RA-H-AM**. And as Abram came out of the primordial empyreal fire, UR, it is hardly coincidental that even UR begins with that letter, U, which (with V) represents the downward line of descent, the turning upward and the return to the heights."
>
> — Alvin Kuhn (1900), *Esoteric Structure of the Alphabet* (Ñº) (pg. 23)

> " '**Ham**', the name of Noah's second son, is pronounced 'Chem' in Hebrew, and he is depicted as the father of the Egyptian and African peoples. The name derives from the Egyptian word 'Keme', an ancient name for Egypt. It means 'the black land' and refers to the fertile black soil left behind when the annual Nile flood withdraws to its banks."
>
> — Gary Greenberg (1996), *101 Myths of the Bible* (pg. 74) [2]

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External links

â— Ham (son of Noah) – Wikipedia.

θΔics

In science, **Hamiltonian** (TR:10) is []

Lagrange

In 1788, French mathematician Joseph Lagrange, in his *Analytical Mechanics*, introduced his 'central function', aka Lagrangian.

Hamilton

In Mar 1834, William Hamilton, in his "Introductory Remarks", to his two-part *On a General Method in Dynamics*, opened to the following: [1]

> "The theoretical development of the laws of motion of bodies is a problem of such interest and importance, that it has engaged the attention of all the most eminent mathematicians, since the invention of dynamics as a mathematical science by Galileo, and especially since the wonderful extension which was given to that science by Newton. Among the successors of those illustrious men, Lagrange has perhaps done more than any other analyst, to give extent and harmony to such deductive researches, by showing that the most varied consequences respecting the motions of systems of bodies may be derived from **one radical formula**; the beauty of the method so suiting the dignity of the results, as to make of his great work a kind of scientific poem. But the science of force, or of power acting by law in space and time, has undergone already another revolution, and has become already more dynamic, by having almost dismissed the conceptions of solidity and cohesion, and those other material ties, or geometrically imaginably conditions, which Lagrange so happily reasoned on, and by tending more and more to resolve all connections and actions of bodies into attractions and repulsions of points: and while the science is advancing thus in one direction by the improvement of physical views, it may advance in another direction also by the invention of mathematical methods. And the method proposed in the present essay, for the deductive study of the motions of attracting or repelling systems, will perhaps be received with indulgence, as an attempt to assist in carrying forward so high an inquiry.
>
> In the methods commonly employed, the determination of the motion of a free point in space, under the influence of accelerating forces, depends on the integration of three equations in ordinary differentials of the second order; and the determination of the motions of a system of free points, attracting or repelling one another, depends on the integration of a system of such equations, in number threefold the number of the attracting or repelling points, unless we previously diminish by unity this latter number, by considering only relative motions. Thus, in the solar system, when we consider only the mutual attractions of the sun and the ten known planets, the determination of the motions of the latter about the former is reduced, by the usual methods, to the integration of a system of thirty ordinary differential equations of the second order, between the coordinates and the time; or, by a transformation of Lagrange, to the integration of a system of sixty ordinary differential equations of the first order, between the time and the elliptic elements: by which integrations, the thirty varying coordinates, or the sixty varying elements, are to be found as functions of the time. In the method of the present essay, this problem is reduced to the search and differentiation of a single function, which satisfies two partial differential equations of the first order and of the second degree: and every other dynamical problem, respecting the motions of any system, however numerous, of attracting or repelling points, (even if we suppose those points restricted by any conditions of connection consistent with the law of living force,) is reduced, in like manner, to the study of one central function, of which the form marks out and characterizes the properties of the moving system, and is to be determined by a pair of partial differential equations of the first order, combined with some simple considerations. The difficulty is therefore at least transferred from the integration of many equations of one class to the integration of two of another: and even if it should be thought that no practical facility is gained, yet an intellectual pleasure may result from the reduction of the most complex and, probably, of all researches respecting the forces and motions of body, to the study of one characteristic function, [N1] the unfolding of one central relation.
>
> N1. Lagrange and, after him, Laplace and others, have employed a single function to express the different forces of a system, and so to form in an elegant manner the differential equations of its motion. By this

> conception, great simplicity has been given to the statement of the problem of dynamics; but the solution of that problem, or the expression of the motions themselves, and of their integrals, depends on a very different and hitherto unimagined function, as it is the purpose of this essay to show.
>
> The present essay does not pretend to treat fully of this extensive subject, task which may require the labors of many years and many minds; but only to suggest the thought and propose the path to others. Although, therefore, the method may be used in the most varied dynamical researches, it is at present only applied to the orbits and perturbations of a system with any laws of attraction or repulsion, and with one predominant mass or center of predominant energy; and only so far, even in this one research, as appears sufficient to make the principle itself understood. It may be mentioned here, that this dynamical principle is only another form of that idea which has already been applied to optics in the 'Theory of Systems of Rays' [1833], and that an intention of applying it to the motion of systems of bodies was announced at the publication of that theory. And besides the idea itself, the manner of calculation also, which has been thus exemplified in the sciences of optics and dynamics, seems not confined to those two sciences, but capable of other applications; and the peculiar combination which it involves, of the principles of variations with those of partial differentials, for the determination and use of an important class of integrals, may constitute, when it shall be matured by the future labors of mathematicians, a separate branch of analysis."

Hamilton then enters into a derivation of a force function of a system; to quote the key statement:

> "The function which has been here called *U* may be named the 'force-function' of a system: it is of great utility in theoretical mechanics, into which it was introduced by Lagrange."

(add discussion)

Clausius

In 1850 to 1865, Rudolf Clausius, while penning the science of thermodynamics, implicitly used the framework of Lagrangian-based Hamiltonian force function mathematics and dynamics in his formulation of the first and second law of thermodynamics; in 1875, in retrospect discussion of the symbol U, Clausius outlined how his internal energy formulation derives, thereabouts, from the function of Hamilton.

The famed "inequality" of the Clausius inequality, the core of the second law of thermodynamics, was introduced at first *only verbally* in 1856 by German physicist Rudolf Clausius who derived the following equality based (=) equation to hold good in every cyclical process: [2]

$$\int \frac{dQ}{T} = -N$$

with the verbal addendum that:

> "In non reversible processes, those in which uncompensated transformations necessarily arise, the magnitude of *N* has consequently a determinable and necessarily **positive value**."

where N is the sum of the equivalence-values involved in the cyclical process. Thus, in mathematical notation, although Clausius, in this year, did not use the inequality (something he began doing in 1862), this would be:

$$|N| > 0$$

and we would have the following version of the Clausius inequality (the version defined by Clausius in 1865):

$$\int \frac{dQ}{T} \leq 0$$

In any event, this seemingly innocuous mention that "the magnitude of N has a positive value" introduced the notion of irreversibility into Newtonian mechanics and the arrow of time into cosmology, thus bring about the thermodynamic revolution and thus the quantum revolution, the latter being a precipitate of the former, and likely several revolutions yet to come.

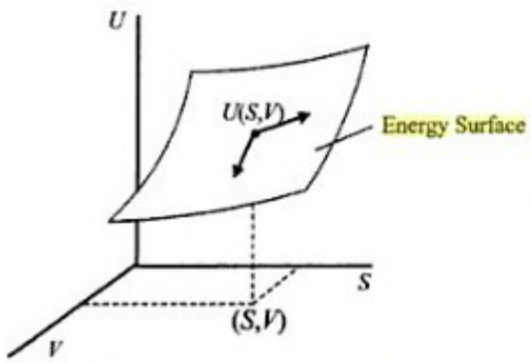

Modern depiction of Gibbs' 1873 energy U, volume V, entropy S energy surface, first made into an actual plaster 3D surface by Irish physicist James Maxwell in 1875.

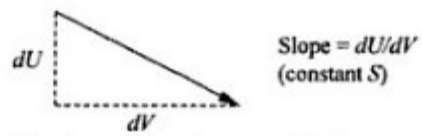

Side view of the downward left arrow, showing that the derivative:

$$\frac{dU}{dV}_S$$

calculates the slope of the tangent of the curve of energy surface at that point.

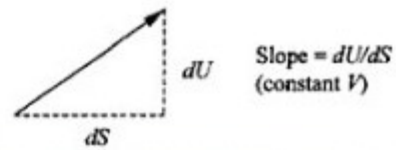

Side view of the upward right arrow, showing that the derivative:

$$\frac{dU}{dS}_V$$

calculates the slope of the tangent of the curve of the energy surface at that point.

Gibbs

In 1873, American engineer Willard Gibbs, building on Clausius, began to apply Clausius' inequality methods to the graphical thermodynamic analysis of the behavior of fluids and began to formulate new thermodynamic "force functions" by taking the slopes of various thermodynamic curves, similar to how Isaac Newton calculated the "force" acting on a moving body as the product of the mass of the body by the time derivative (or slope) of velocity change:

$$\mathbf{F} = \frac{\mathrm{d}}{\mathrm{d}t}(m\mathbf{v})$$

In 1876, Gibbs then parlayed this graphical basis into what he called the "general theory of thermodynamic equilibrium" and in doing so formulated five new versions of partial derivative inequalities, in which certain variables are held constant and thus extended the Clausius inequality to more general varieties of systems, such as chemical systems, open systems, electrical systems, etc. The five central Gibbs inequalities are as follows:

Inequality (1876 notation)	**Inequality** (modern notation)	**Description**
		For the equilibrium of any isolated system it is necessary and sufficient that in all possible variations δ of the state of the system which do not alter

$(\delta\eta)_\epsilon \leqq 0$	$dS_U \leq 0$	its energy ε, the variation of its entropy η shall either vanish or be negative.
$(\delta\epsilon)_\eta \geqq 0$	$dU_S \geq 0$	For the equilibrium of any isolated system it is necessary and sufficient that in all possible variations δ of the state of the system which do not alter its entropy η, the variation of its energy ε shall either vanish or be positive.
$(\delta\psi)_t \geqq 0$	$dF_T \geq 0$ where $F = (U - TS)$	Where by letting psi ψ represent the available energy [free energy] of the system, expressed by the formula ψ = ε – tη, it is found that for the equilibrium of any isolated system it is necessary and sufficient that in all possible variations δ of the state of the system which do not alter its temperature *t*, the variation of its available energy ψ shall either vanish or be positive. The difference in the two values of available energy ψ for two different states of the system which have the same temperature represents the work which would have to be expended in bringing the system from one state to another by a reversible process and without change of temperature.
$\delta\epsilon \geqq 0$	$dU \geq 0$	The reduced form of the second of equilibrium criterion for systems incapable of thermal changes, whereby we may regard the entropy as having the constant value of zero.
$\delta\psi \geqq 0$	$dF \geq 0$	The reduced form of the third equilibrium criterion for systems incapable of thermal changes, whereby we may regard the entropy as having the constant value of zero.

Gibbs goes on to state that the "suffix letter" (subscript) in each case indicates that the quantity which it represents remains constant. Lastly, and most importantly, Gibbs outlines the basics of the so-called thermodynamic "driving forces" of chemical processes:

> "The quantities '–ε' (negative energy) and '–ψ' (negative available energy), related to a system without sensible motion, may be regarded as a kind of force-function for the system."

The first of these '–ε', Gibbs says, is the force-function for constant entropy, i.e. when the states of the systems under consideration have constant entropy. The second of these '–ψ', he says, is the force-function for constant temperature, i.e. when the states of the system under consideration have constant temperature.

Lewis

In 1923, American physical chemist Gilbert Lewis, starting with the foundation of Gibbs inequalities, which he says are applicable to "chemical processes which are in some way harnessed for the production of useful work", introduced a new inequality as follows:

Inequality (1923 notation)	Inequality (modern notation)	Description
$dF < 0$ where $F = (E + PV - TS)$	$\Delta G < 0$ where $G = (U + PV - TS)$	Whereby "no actual isothermal process is possible unless it meets this condition", which applies to "the far more common case of a reaction which runs freely, like the combustion of a fuel, or the action of an acid upon a metal; or, in other words, a system which is subject to no external forces, except a constant pressure exerted by the environment."

In modern format, assuming that from hence forth we use the term "process" to mean all natural isothermal-isobaric processes that occur on the surface of the earth, such as human chemical reactions occurring between people, what Lewis states here is that:

> "No actual natural process is possible unless it meets this inequality $\Delta G < 0$ criterion."

This is huge statement. Getting directly to the point: any hypothetical relationships will only be possible if the free energy change for the process is less than zero. Next, Lewis goes on to state, similar to Gibbs' description of the two force-functions, that:

> "We may think of the quantity '$-\Delta F$' as the driving force of a reaction; where, in a thermodynamic sense, a system is stable when no process can occur with a diminution in free energy."

This, again, is a huge statement. Lewis introduce here not only the notion that free energy change is the driving force of earth-bound natural processes, as was described in 1718 by Isaac Newton in terms of respective values of the force of chemical affinity A as being the driving force behind reactions:

Newton notation (1718)	Lewis notation (1923)	Partington notation (1924)	Modern notation (1933)
$A > 0$	$A = -\Delta F$	$A = -\Delta Z$	$A = -\Delta G$

but also introduces the notion of "stability", i.e. that when the variation of free energy for the process or reaction reaches its lowest value, or, as Lewis puts it, when "no further process can occur with a diminution in free energy", the system will be said to be stable, as would be indicated graphically by the lowest point of free energy on the reaction coordinate, as depicted adjacent.

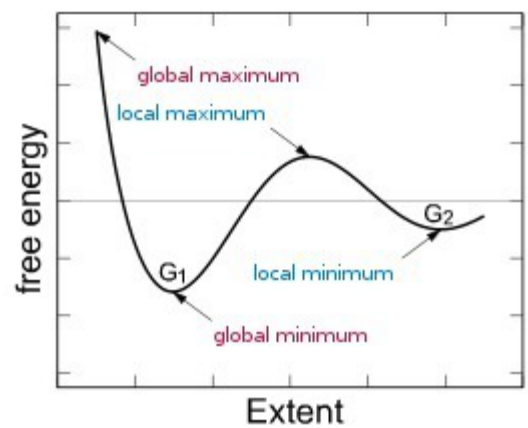

The position of G_1 is such that, in the words of Gilbert Lewis (1923), "no further process can occur with a diminution in free energy", and is thus representative of a state of maximal stability; whereas the position of G_1 could decrease further in free energy, to the position of state one, and is thus not maximally stable.

Thims

In 2014, Libb Thims, in thread dialogue with Inderjit Singh, in respect to an assimilation of the above, stated the following:

> "Re (#4): "where is the director?" [Kierkegaard], this brings to mind the so-called purpose question—which you commented somewhere, in some thread, was your point or apex of debate collision with me—and what Bruce Lindsay (1983) has to say about this in regards to physics, the teleology debate issue, and sense of purpose. The key statement being the following:

> > 'A rational individual is said to arrange his actions so as to be sure of achieving his fundamental desires, whether it be to accumulate wealth or gain power over his fellow men. In particular the aim here is almost always to try to attain the given desired end at minimum cost in human effort. This strongly suggests a heuristic connection with the minimum principles of physics.'

Prior to this, Lindsay cites the following so-called minimum principles: Newtonian (not exactly a minimum principle) → Lagrangian → **Hamiltonian**, and how they have merged into each other, to increasingly quantify the dynamics of the motions of systems comprised of moving particles (e.g. social systems). What he doesn't state, however, is that the Hamiltonian, via Clausius (1865) and Gibbs (1876), got transformed into the so-called 'Gibbsian' minimum principle, according to which Lindsay's statement, in 2014 retrospect, is something along the lines of:

> 'A rational individual is said to arrange his actions so as to be sure of achieving his fundamental desires, whether it be to accumulate wealth or gain power … the aim here is almost always to try to attain the given desired end at minimum cost in human effort. This strongly suggests a heuristic connection with the [Gibbsian] minimum principles of the [physicochemical sciences].'

And hence, if as a rational individual, as Lindsay says, you desire to understand your desires, you are led naturally enough into a study of the so-called 'human free energy' theorists, so as to better understand the 'whys' and 'hows' associate with 'minimum principles' as they related to the arrangements your actions. This is not to say, to note, that atoms, molecules, and concordantly humans have "purpose", so to say, in the sense of 'the purpose of hydrogen is to bond with oxygen to form water', etc., as this is a type of non-sensical statement, whereby so it must also be so with humans (or human molecules), or are governed by "teleological" principles, as the covert religion-siding scientists like to argue, as this is an model that only works in an Aristotelian universe, but rather that there seems to be some well-honed truth, in need of deeper clarification, in what Lindsay states above."

(add discussion)

Quotes

The following are related quotes:

> "I have also a great respect for the elder of those celebrated acrobats, Virial and Ergal, the Bounding Brothers of Bonn …. But it is rare sport to see those learned Germans contending for the priority of the discovery that the 2nd law of θΔcs is the **Hamiltonsche Princip**, when all the time they *assume* that the temperature of a body is but another name for the vis viva of one of its molecules, a thing which was suggested by the labors of Gay-Lussac, Dulong, etc., but the first deduced from the dynamical statistical considerations by dp/dt [myself]. The Hamiltonsche Princip, the while, soars along in a region unvexed by statistical considerations, while the German Icari (Ñº) flap their waxen wings in nephelococcygia [cloud-cuckoo-land] (Ñº) amid those cloudy forms which the ignorance and finitude of human science have invested with incommunicable attributes of the invisible Queen of Heaven."
>
> — James Maxwell (1873), "Letter to Peter Tait", Dec (Number 483) [1]

See also

â— Newell Sims

References

1. (a) Hamilton, W.R. (1834). "On a general method in dynamics by which the study of the motions of all free systems of attracting or repelling points is reduced to the search and differentiation of one central relation, or characteristic function." *Philos. Trans. R. Soc. London*, 124:247-308.

(b) Hamilton, W.R. (1835). "A second essay on a general method in dynamics." *Philos. Trans. R. Soc. London*, 125:95-144.
2. Clausius, Rudolf. (1865). *The Mechanical Theory of Heat* (pg. 144). John van Voorst.
3. Thims, Libb. (2014), "Thread posts #8-9" (Ñº), Sep 3.
4. (a) Maxwell, James C. (1995). *The Scientific Letters and Papers of James Clerk Maxwell: Volume II, 1862-73* (editor: Peter Harman) (pg. 18). Cambridge University Press.
(b) Coopersmith, Jennifer. (2010). *Energy, the Subtle Concept: the Discovery of Feynman's Blocks from Leibniz to Einstein* (pg. 325). Oxford University Press.
(c) Flood, Raymond, McCartney, Mark, and Whitaker, Andrew. (2014). *James Clerk Maxwell: Perspectives on His Life and Work* (pg. 170). Oxford University Press.

External links

â— Hamiltonian – Wikipedia.

θΔics

In existographies, **Hannah Arendt** (1906-1975) (IQ:140|#620) [RGM:1,049|1,330+] (HCR:25) (Perry 80:7|Li) was a German-born American political theorist and philosopher; noted for []

Overview

In 1958, Arendt, in her *The Human Condition*, argued, supposedly, that we have become mechanical creatures as a result of scientism; according to which we have been content to pass our time in mere "labor", with an emphasis on the satisfaction of "biological" needs and the consumption of goods. Building on Aristotle, who located "life" (existence meaning) in the social and political world, intermixed with views by Friedrich Nietzsche, she pushed out the ideas that we take "action" when we submit our views to public scrutiny and engage others in philosophical conversation, and that this is also associated with what she called "natality" or the ever-present possibility of new beginnings. [1]

Education

Arendt was the pupil of Martin Heidegger, who from she learned Nietzschean existentialism views.

References

1. Perry, Kevin. (2015). *Philosophy: an Illuminating Guide to History's Greatest Thinkers* (foreword: Simon Critchley) (pgs. 32-33). Fall Rivers Press.

Quotes | By

The following are quotes by Arendt:

> "In an ever-changing, incomprehensible world, the masses had reached the point where they would, at the same time, believe everything and nothing, think that everything was possible and nothing was true."
>
> — Hanna Arendt (c.1965) (Ñº)

External links

â— Hanna Arendt – Wikipedia.

θΔics

In existographies, **Hans Bethe** (1906-2005) [RGM:1234|1,500+] (GPE:66) (Landau scale:1.5|Vote) was a German-born American physicist noted for his work, with Enrico Fermi, on the development of exchange force theory.

Overview

In circa 1933, Enrico Fermi and Bethe summarized the core exchange force model by suggesting that interactions between charged particles could be described in terms of photons being exchanged between particles. [1]

In 1939, Bethe added the final pieces to Arthur Eddington's proton-proton chain reaction model, by showing that a proton can beta decay into a neutron via the weak interaction during the brief moment of fusion, making deuterium the initial product in the chain.

Education

Bethe completed his PhD under Arnold Sommerfeld.

References

1. Gribbin, John. (2002). *Quantum Physics: A Beginner's Guide to the Subatomic World*. DK Publishing.

Further reading

â— Schweber, Silvan S. (2012). *Nuclear Forces: the Making of the Physicist Hans Bethe*. Harvard University Press.

External links

â— Hans Bethe – Wikipedia.

θΔics

In science, **Hans Driesch** (1867-1941) was a German zoologist, a student of Ernst Haeckel, noted for his *circa* 1891 experiments on sea urchin embryos, about which he suspected that there must be a nonmaterial "life force" that supervised and regulated embryological development, after which he spent the remainder of his career working out a vitalism theory to explain his observations, a type of "scientific vitalism" as Jacques Monod classifies things. [1]

Entelechy | Thermodynamics

Driesch, supposedly, argued, at some point, that "entelechy", his brand of vitalism, may operate by suspending, as occasion requires, the operation of the second law of thermodynamics. [2] American physiologist Lawrence Henderson ripped on Driesch's argument as follows: [2]

> "**Driesch's** theory is ingenious, but I believe untenable. In fact it involves a reduction to the sphere of molecules of the old fallacy of Descartes. For to suspend the operation of the second law of thermodynamics would be precisely equivalent to an alteration, without the expenditure of energy, of the direction of motion of the particles of a material body. Under these conditions an object which had fallen to the ground might, by cooling itself, rise again into the air. Nothing could be more radically inconsistent with the fundamental principles of physical science, as now generally admitted, than this assumption or the theory which it is designed to support."

(add discussion)

References

1. (a) Mitchell, Robert. (2013). *Experimental Life: Vitalism in Romantic Science and Literature*. JHU Press.
(b) Monod, Jacques. (1970). *Chance and Necessity: Essay on the Natural Philosophy of Modern Biology* (*Le Hasard et la Nécessité: Essai sur la philosophie naturelle de la biologie moderne*) (English translator: Austryan Wainhouse) (pgs. 34-35). Vintage, 1971.
2. Henderson, Lawrence J. (1917). *The Order of Nature* (pg. 91). Harvard University Press.

External links

â— Hans Driesch – Wikipedia.

θΔics

In existographies, **Hans Ijzerman** (c.1980-) is a Danish social psychologist, noted for []

Overview

In 2009, Ijzerman, together with Gun Semin, in their "The Thermometer of Social Relations: Mapping Social Proximity", summarized the findings of their grant-funded study, in which they brought two groups of students into a room to watch and describe a short film showing animated chess pieces, wherein one group was room with a temperature in the low 60s˚F (59-64) and the other group in a room with temperature in the low 70s˚F (72-75), after which they studied the thermal words used in the descriptions of each group, in an effort to discern a correlation between ambient temperature and "social proximity", which they define as "a perceived distance between self and other, which is different from physical distance".

Education

Ijzerman completed his PhD in social psychology at Utrecht University in 2010.

Quotes | By

The following are quotes by Ijzerman:

> "People in physically warmer conditions are more attenuated to engage in relationships."
>
> — Hans Ijzerman (2012), synopsis (Q) of his 2009 temperature variation of social relations study

See also

- Social temperature
- Social thermometer

References

1. (a) Ijzerman, Hans; Semin, Gun R. (2009). "The Thermometer of Social Relations: Mapping Social Proximity" (abs) (pdf), *Psychological Science*, 20(10):1214-20, Oct 1.
(b) Anon. (2009). "Study Maps Social Proximity to Temperature" (Q), Psychological Science, Oct 3.

External links

- Hans Ijzerman – SocialPsychology.org.

θΔics

In human thermodynamics, **Hans Kreuzer** (c.1945-) is a Canadian atmospheric physicist noted for his 2010 *Thermodynamics* textbook, co-written with Canadian physicist Isaac Tamblyn, which includes a chapter section on economic thermodynamics, the material of which is largely based on American physicist Wayne Saslow's 1999 article "An Economic Analogy to Thermodynamics". [1]

Overview

In 2010, Kreuzer, in his his §8.6: Thermodynamics in Economics, chapter subsection to his *Thermodynamics*, co-authored with Canadian physicist Isaac Tamblyn, seems to make a "guessed" economic formulation of utility of economics modeled on the internal energy U of thermodynamics, guided, it seems, by starting point the letter "U" (Utility and "U" symbol of internal energy the same) similarity, i.e. the so-called "letter rhyming derivation method"; an abstract section of which is as follows:

Economic theory introduces a utility function to choose to buy one good over another in an analogous way to the internal energy U determining which processes can proceed. Thus we identify U as the utility function, measured in some monetary values. Another quantity in economics is wealth which has two contributions

$$W = \boldsymbol{\lambda} \cdot \mathbf{M} + \mathbf{p} \cdot \mathbf{N} \tag{8.22}$$

Here $\boldsymbol{\lambda}$ and M are vectors containing the value, i.e. the price one would get relative to some standard (like the gold standard) and the amount of money held in different currencies. Likewise, $\mathbf{p}$ and $\mathbf{N}$ represent prices and numbers of goods respectively. The difference between the utility function and wealth is called the surplus

$$\Psi = U - W \tag{8.23}$$

or

$$U = \Psi + W \tag{8.24}$$

$$= \Psi + \boldsymbol{\lambda} \cdot \mathbf{M} + \mathbf{p} \cdot \mathbf{N} \tag{8.25}$$

We can quantify the term "poverty" as meaning zero surplus and zero economic activity. Together with the fact that a surplus by definition is positive, we identify the surplus with TS and get

$$U = U(S, M, N) \tag{8.26}$$

$$= T_e S + \boldsymbol{\lambda} \cdot \mathbf{M} + \mathbf{p} \cdot \mathbf{N} \tag{8.27}$$

This is our fundamental relation for a simple economic system. What is the meaning of S in economics? Instead of using the term disorder we call it a measure of available leisure in the sense that with zero surplus there is

(add discussion)

See also

- List of thermodynamics textbooks that include human thermodynamics

References

1. (a) Kreuzer, H.J. and Tamblyn, Isaac. (2010). *Thermodynamics* (§8.6: Athletes: the Human Engine, pgs. 160-62; §8.6: Thermodynamics in Economics, pgs. 162-66). World Scientific.
(b) Saslow, Wayne M. (1999). "An Economic Analogy to Thermodynamics", *American Journal of Physics*, 67(12): 1239-1247.
(c) Isaac Tamblyn (curriculum vitae) – DAL.ca.

Further reading

● Kreuzer, H.J. (1981). *Nonequilibrium Thermodynamics and its Statistical Foundations*. Clarendon Press.

External links

● Hans Kreuzer (faculty) – Dalhousie University, Nova Scotia, Canada.
● Kreuzer, H. J. (Hans J.) – WorldCat Identities.

θΔics

In existographies, **Hans Lippershey** (1570-1619) (IQ:150|#700) (GAE:#) (CR:3), aka "Johannes Lippersein" (Sirtori, 1612) or “Johann Lipperhey”, was a German-born Dutch spectacle maker, noted for his 1609 invention of the telescope.

Overview

In early 1608, Lippershey, as the story goes, observed, as a spectacle maker, one of his customers looking through two eye pieces, one concave, one convex, one in front of the other, and therein gleaned the "idea" for putting two such lenses into a tube, so to see things far away.

On 2 Oct 1608, Lipperhey applied for a patent for a device, aka telescope, for “seeing things far away as if they were nearby”.

Influenced

On 7 Jan 1610, news of Lippershey’s telescope invention reached Galileo, who built a new improved 30x power telescope. [2]

Quotes | On

The following are quotes on Lipperhey:

> “In the year 1609 [sic], there appeared a genius or some other man, as yet unknown, of the race of Hollanders, who, in Middleburg in Zeeland, visited **Johannes Lippersein**, a man distinguished from others by his remarkable appearance, and a spectacle-maker. There is no other [spectacle-maker] in that city, and he ordered many lenses to be made, concave as well as convex. On the agreed day he returned, eager for the finished work, and as soon as he had them before him, raising two of them up, namely a concave and a convex one, **he put the one and the other before his eye and slowly moved them to and fro, either to test the gathering point or the workmanship**, and after that he left, having paid the maker. The artisan, by no means devoid of ingenuity, and curious about the novelty, began to do the same and to imitate the customer, and quickly his wit suggested that these lenses should be joined together in a tube. And as soon as he had completed one, he rushed to the court of Prince Maurice and showed hint the invention. The prince had one [or, had been acquainted with one] before, and lest it should be suspected that [the device] was of military value, and very necessary, had kept it a secret. But now that he found by chance that it had become known he disguised [his prior knowledge], rewarding the industry and good intentions of the artisan.”
>
> — Giovanni Sirtori (1612), *Publication* [1]

> “Genius, although often ascribed to a lone individual, is always a team effort. Socrates' ideas might have been lost without Plato's reconstruction of and addition to these ideas in the Dialogues. At the very least, geniuses build upon past work. For example, Galileo used **Hans Lippershey**’s invention, the telescope, to study the stars and support the Copernican view of a heliocentric solar system through the study of celestial motion. Even if they reject that work, they are still using it as a springboard for their new ideas.”
>
> — Dean Simonton (2014), *The Wiley Handbook of Genius* [1]

References

1. Simonton, Dean. (2014). *The Wiley Handbook of Genius* (pg. #). Wiley.
2. Gonzalez, Karina; Burch, Chante R. (2014). “Physical Sciences: Elementary Physics – Telescopes, Mankind’s Eye into the Universe” (Ñº), Salt Lake City Community College, Physics 1010, Fall.

External links

â— Hans Lipperhey – Wikipedia.

θΔics

In existographies, **Hans Orsted** (1777-1851) (IQ:175|#270) (Cattell 1000:523) [Kanowitz 50:40] (GPE:73) (CR:11), Ørsted or Oersted, was a Danish physicist, chemist, and natural philosopher noted for being a mentor to Danish civil engineer Ludwig Colding and for discovering (1820) that electric currents create magnetic fields, i.e. he discovered that a compass deflects when near a current carrying wire. [1]

Overview

In 1820, Orsted found that when a compass is brought near a current-carrying wire, that the needle deflects, i.e. he discovered that electric currents create magnetic field, aka aka "Orsted law" (Ñº); as shown below:

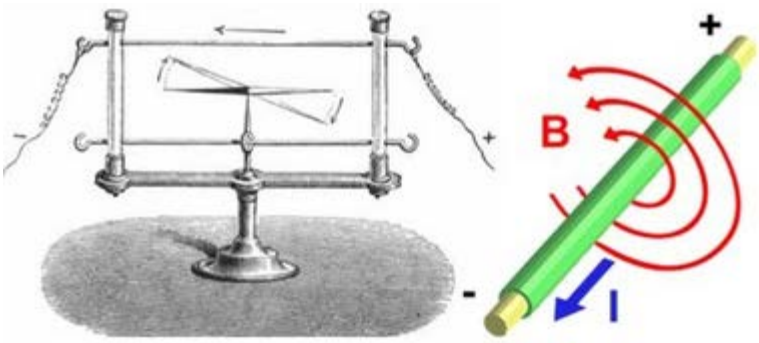

In c.1831, Andre Ampere showed that this phenomena operates according to the "right-hand rule".

Beliefs

The following is a belief statement by Orsted, namely that he believes in an "eternal intelligence" (aka god):

> "The world is governed by an eternal intelligence, which manifests to us its workings as immutable natural laws."
>
> — Hans Orsted (c.1840), *Publication*; cited by Ludwig Buchner (1855) in *Force and Matter* (pg. 82)

On this statement, Ludwig Buchner ridicules it as follows: [2]

> "But nobody can comprehend how an eternal and ruling intelligence can be in unison with immutable natural laws. Either the natural laws rule, or the eternal intelligence rules; working side by side, they would fall to loggerheads at every moment; the rule of the latter would render the former useless, while the working of immutable natural laws admits of no exception nor of any personal interference, and therefore can never be set down as a system of government rule."

(add)

Quotes | By

The following are related quotes:

> "It appears, according to the reported facts, that the electric conflict is not restricted to the conducting wire, but that it has a rather extended sphere of activity around it .. the nature of the circular action is such that

movements that it produces take place in directions precisely contrary to the two extremities of a given diameter. Furthermore, it seems that the circular movement, combined with the progressive movement in the direction of the length of the conjunctive wire, should form a mode of action which is exerted as a helix around this wire as an axis."

— Hans Oersted (1813), *Recherches sur l'identité des forces chimiques et électriques* (Ñº)

"Everything that exists depends upon the past, prepares the future, and is related to the whole."

— Hans Orsted (c.1840), *Publication*; cited by George Gore (1902) in "The Coming Scientific Morality" (pg. 430)

References

1. Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (pgs. 49-50). Cambridge University Press.
2. Buchner, Ludwig. (1855). *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon* (15th German edition; 4th English edition) (pg. 82). London: Asher and Co, 1891.

External links

â— Hans Christian Orsted – Wikipedia.

θΔics

In existographies, **Hans Schimank** (1888-1979) was German physicist, physical chemist, exact science historian, and Otto Guericke scholar, noted for []

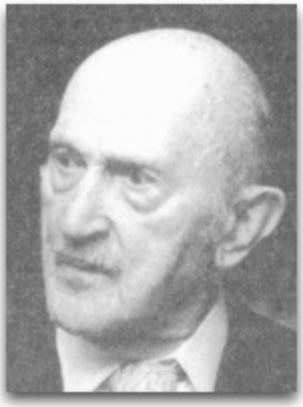

Guericke

In 1928, Schimank became involved in a writing project titled "On the History of Exact Sciences in Hamburg", which led to a plan for a German edition of Otto Guericke's *New Magdeburg Experiments on the Vacuum of Space*, which, it is said, "occupied Schimank for decades". [3]

In 1936, Schimank, in his *Otto von Guericke: Mayer of Magdeburg – a German Statesman, Thinker, and Researcher*, produced a list of ten experiments that Otto Guericke is said to have done in 1654 at the Regensburg meeting, based on the two published accounts by Gaspar Schott (1657; 1663), as reviewed by Thomas Conlon (2011), some of which are: [2]

1. The crushing of an air-tight vessel as air was withdrawn from it; the air being allowed to expand into a previously evacuated receiver.
2. A number of men were only able to pull an airtight piston halfway up a copper cylinder
3. Extraction of air using a vacuum pump
4. Extinction of a flame (combustion) in a sealed vessel
5. Raising water vertically inside a vacuum bulb against its natural tendency to fall
6. Weighted the air
7. Caused clouds and wind to form in the glass vessels
8. Shattered toughened glass into splinters
9. Showed that sound is not heard in a vacuum (compare the Kircher "bell" in the Berti vacuum, c.1639)
10. (add)

(add)

Education

In 1909, Schimank, at the University of Berlin, studied physics, physical chemistry, philosophy, and art history, while training under Max Planck, Fritz Haber, Walther Nernst, and Albert Einstein. [3]

In 1914, Schimank completed his PhD with a dissertation on "Behavior of Electrical Resistance of Metals at Low Temperatures" under Walther Nernst. [3]

Quotes | By

The following are quotes by Schimank:

> "Here stood a man **entirely on his own**. There was no Medici family to put resources at his disposal. Scientifically, he was in a less favorable situation than the members of the Florentine Academia del Cimento who could advise each other. He had to **think out for himself** every little artifact and design emery piece of auxiliary apparatus so that it could be made by a Magdeburg based business. Perhaps it is this that is at the root of the preference, that all his experiments show, for a **certain unsophisticated directness**. When someone in Florence carried out experiments on the pressure of the air, he could rely on the availability of the highest technical expertise. Here in Magdeburg, the equipment for scientific research was the solid and durable work of a local forge. While this, on the one hand, made it harder to perform experiments it also, on the other, gave them an overwhelming direct impact."
>
> — Hans Schimank (1936), *Otto von Guericke* (pg. 40) [1]

References

1. (a) Schimank, Hans. (1936). *Otto von Guericke: Mayer of Magdeburg – a German Statesman, Thinker, and Researcher* (*Otto von Guericke: Burgermeister von Magdeburg. Ein deutscher Staatsman, Denker und Forscher*) (one his own, pg. 40; name change, pg. 69). Publisher.
(b) Conlon, Thomas. (2011). *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum* (Amz) (on his own, pg. 44). Saint Austin Press/LuLu.
2. (a) Schimank, Hans. (1936). *Otto von Guericke: Mayer of Magdeburg: a German Statesman, Thinker, and Researcher* (*Otto von Guericke: Burgermeister von Magdeburg. Ein deutscher Staatsman, Denker und Forscher*) (name change, pg. 69). Publisher.
(b) Conlon, Thomas. (2011). "Air Pressure and the Vacuum" (Ñº), Otto Guericke, Wikipedia Edit, Oct 22.
(c) Conlon, Thomas. (2011). *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum* (Amz) (Ten 1654 Regensburg experiments, pgs. 63-64). Saint Austin Press/LuLu.
3. Hans Friedrich Wilhelm Erich Schimank (1888-1970) (German → English) – University of Hamburg.

External links

â— Schimank, Hans (1888-1979) – WorldCat Identities.

θΔics

In terminology, **happiness** is a term that characterizes a "state" of well-being, contentment, and or emotional and physical satiety. [1] From a human chemistry perspective, happiness can be defined as the reaction "state" in which a human molecule finds bonding or reaction satiety. [4] Recent studies, for instance, have found a correlation between happiness and the number of bonds in a person's social or friendship network. [5]

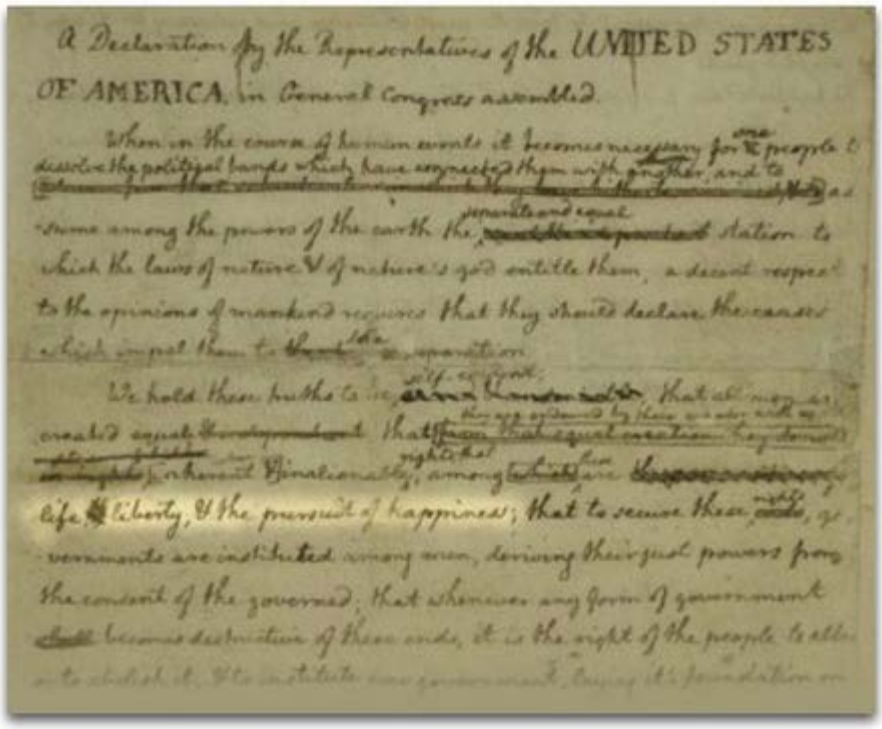
A Declaration by the Representatives of the UNITED STATES OF AMERICA, in General Congress assembled.

When in the course of human events it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the earth the separate and equal station to which the laws of nature & of nature's god entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.

We hold these truths to be self-evident, that all men are created equal, that they are endowed by their creator with certain unalienable rights, that among these are life, liberty, & the pursuit of happiness; that to secure these rights, governments are instituted among men, deriving their just powers from the consent of the governed; that whenever any form of government becomes destructive of these ends, it is the right of the people to alter or to abolish it, & to institute new government, laying it's foundation on

A Jun 1776 draft copy of *The Declaration of Independence*, by Thomas Jefferson, wherein the phrase: "life, liberty, and property" is changed to "life, liberty and the pursuit of **happiness**" as the three unalienable rights of humans.

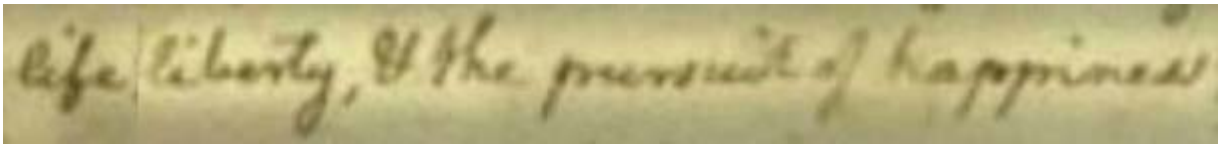
life liberty, & the pursuit of happiness

Pursuit of happiness

On 29 Nov 1775, American thinker Thomas Jefferson wrote the following to John Randolph: [7]

> "Believe me, dear Sir: there is not in the British empire a man who more cordially loves a union with Great Britain than I do. But, by the God that made me, I will cease to exist before I yield to a connection on such terms as the British Parliament propose; and in this, I think I speak the sentiments of America."

In Jun 1776, Jefferson began drafting *Declaration of Independence*, a formal announcement of the detachment of the thirteen newly independent American states from the British Empire, in which he originally penned the phrase "life, liberty, and property" as the three "unalienable rights" that humans need to exist. (Ñº) He later edited, shown adjacent, it to read "life, liberty and the pursuit of happiness", which has since become one of the most famous statements in American government documentation:

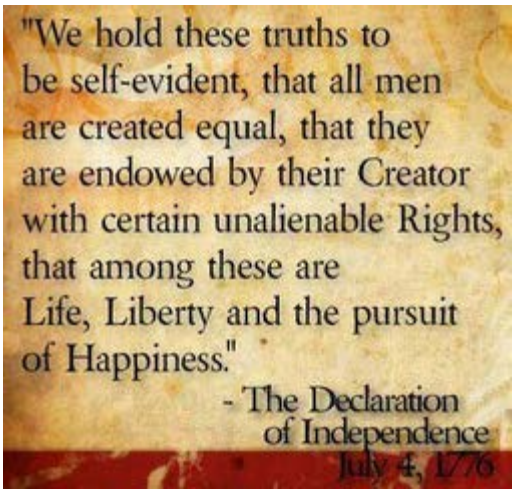

This change, baring prolonged discussion, may have reflected certain aspects of Jefferson's Epicurean belief system.

Ostwald happiness formula

See main: Ostwald happiness formula

In 1905, German physical chemist Wilhelm Ostwald penned a happiness equation based on his energetics theories. [6] Ostwald's happiness equation reads as follows:

$$G = k(A - W)(A + W)$$

where *G* is *Gluck* (happiness), *A* is *Arbeit* (work or 'energy expended in doing useful work'), *W* is *Widerstand* (energy dissipated in overcoming resistance), and *k* supposedly some type of proportionality constant. [8]

Porteus' theory of happiness

See main: Porteus' theory of happiness

In 1987, American philosopher Elizabeth Porteus, daughter of the James Dole the "Pineapple King" of Hawaii, her *My Twentieth Century Philosophy*, discuss a connection between thermodynamics, happiness, and impulses.

Porteus outlined the view that since, according to generalized colloquial point of view, the second law of thermodynamics is a "law of disintegration", meaning that "complicated arrangements always break down into less complicated ones", a state of life happiness would occur when one aligns themselves with the force or "impulse of integration" in unison with the current of creation or growth of structure and form as seen in evolution. [2] By "creative", Porteus refers to not only what is commonly considered creative such as "painting pictures, making music, writing books, making pottery or making any kind", but also to "any impulse to create a new integrated arrangement of the elements of reality." [3]

Quotes

The following are related quotes:

> "We see many who are struggling against adversity who are **happy**, and more although abounding in wealth, who are wretched."

— Publius Tacitus (c.100)

References

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External links

â— Happiness – Wikipedia.

θΔics

In science, **hard science**, as compared to soft science, refers to subjects with hardened, universally-agreed upon, laws and principles.

Savoiu ranking (economist)		Siman ranking (physicist)
1a. Physics	HARD	1. Quantum physics
1b. Particle physics		
2. Nuclear physics	↑	2. Chemistry
3a. Astrophysics		3. Particle physics
3b. Cosmology		
4a. Chemistry		4. Cosmology
4b. Sociophysics		
4c. Econophysics		
5. Biology		5. Molecular biology
6. Molecular biology		6. Genetics
7. Organic biology		7. Environmental physics
8. Geology		8. Communications sciences
9. Climatology		9a. Mathematics
		9b. Econophysics
		9c. Sociophysics
10. Physiology		10. Quantum psychology
11. Sociology		11. Sociology
12. Psychology		12. Ecology
13. Ecology		13. Economics
14. Economics	↓	14a. Political sciences
		14b. Robotics
15. Political sciences	SOFT	15. Religious sciences

A 2013 spontaneous polling of "economist" Gheorghe Savoiu and "physicist" Ion Siman, conducted by Libb Thims, while driving around Romania (polling done in a car while driving), in route to a socio-econo-physics conference, of their respective opinions of hard/soft rankings.

Overview

The terms 'hard' and 'soft', and unwritten divisions in the sciences, frequently come to the fore when attempting to explain human-centric or the so-called life-centric subjects in terms of chemistry or physics.

Top sciences are considered 'hard' while those at the bottom are considered 'soft' and generally distinguished, in the former, by ability to measure tangible things precisely, e.g. that the speed of light in a vacuum is exactly 299,792,458 meters per second, as contrasted with the inability to measure indiscernible things precisely, in the latter, e.g. that biology is the study of the so-called term 'life', albeit a term that no one has ever been able to define precisely (and is coming to be seen as a defunct term), just as psychology, the study of the elusive 'mind', is considered to be a 'very soft' science, although some in the past have attempted to harden its foundation, such as Austrian psychologist Sigmund Freud and his 1895 'A Project for Scientific Psychology', in which he postulated that in the future psychology will be framed in the exact sciences of chemistry and thermodynamics (specifically the conservation of energy). [2]

Often is the case that in debate on cherished conceptions such as free will, choice, life, among others, that the less cogently-minded person will incorrectly conclude with the view that the hard science will bend to the views of the soft science, whereas correctly a hard science, by definition, is inflexible, in this regard.

In 1964, John Platt gave the following popular inside summary on the underlying but often unstated demarcation on the comparison of the various so-called sciences: [3]

> "Scientists these days tend to keep up a polite fiction that all science is equal. Except for the work of the misguided opponent whose arguments we happen to be refuting at the time, we speak as though every scientist's field and methods of study are as good as every other scientist's, and perhaps a little better. This keeps us all cordial when it comes to recommending each other for government grants."

In 1993, Mae-Wan Ho gave the following statement on hard sciences, alluded to the premise that there is no "glass bead game", being a reference to Hermann Hesse's 1943 futuristic intellectual game, in hard science, i.e., that the rules do not change as the game goes along: [1]

There is No Glass Bead Game

In this final Chapter, I shall on the one hand, give free rein to my imagination without apology, as I try to convey what the physics of organisms means to me personally, and on the other, demonstrate explicitly that there is no discontinuity between the so-called **'hard' sciences** such as physics and chemistry and the **'soft' sciences** such as psychology and philosophy. This Chapter is not just the icing on the cake, but stems from a deep conviction that knowledge, especially participatory knowledge, is what we live by, and so, there should also be no discontinuity between knowledge and action. There can be no 'glass bead game' to knowledge,[1] especially scientific knowledge, for it matters far too much.

An example of the defectiveness of this polite view idea that “all sciences are equal”, is in debates on whether the concept of “life” is in fact a defunct theory, replaceable with the thermodynamic-view of animate physical-chemical mechanism. Indian chemical engineer DMR Sekhar, an example of a misguided opponent, and advocate of a "self-drive" theory of human motion, arguing that biology is more central than is thermodynamics, commented, in rebuttal to the response “according to you, we chemists, physicists, and engineers should bow down to the biologists and let them tell us how the universe runs”, that “science is science”. [6] This tension in the soft-hard debate is evidenced in American philosopher Massimo Pigliucci summary, in his 2010 chapter on hard vs soft science, that “the debate between scientists on what constitutes 'hard' (often equated with good, sound) and 'soft' (implicitly considered less good) science has not subsided since.” [4]

Hard

The "hardest" of all sciences is thermodynamics, a premise based on the logic that firstly the structure of classical thermodynamics (*The Mechanical Theory of Heat*, 1865) is framed in the two strongest laws in all of science (Einstein's conjecture) and secondly that all other sciences are said to be reducible to it (Eddington rule) or derived from it (e.g. quantum mechanics) or based on it (e.g. physical chemistry). The two central hard sciences are considered to be chemistry and physics. The grouping of all the hard sciences are sometimes classified under the label of "physical sciences". The central language of hard science is mathematics and is the language (Gibbs, c.1900) that explains reproducible universal experimental findings. This distinction is evidenced by the fact the hardest science major is generally agreed to be chemical engineering, the most unified subject of mathematics, chemistry, physics, and thermodynamics in structure and application. [7]

Pliable

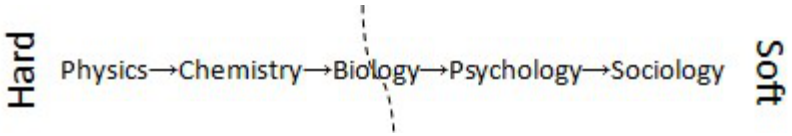

A 2010 view on hard-soft “hierarchy” by a philosophy professor, who comments “if I were to draw a line between the hard and the soft, I'd probably place it between biology and psychology.” [5] The diagram shown places the divide farther to the left, being that biology, the study of "life", which is a defunct term according to modern hard science, is thus a defunct subject.

There are some so-called scientific subjects in the middle ground between hard and soft, in the sense that they are bendable or open-ended, to a certain extent, and will conform to the hard science, if need be. An example is the subject of astronomy or cosmology, which is often labeled a hard science, albeit one with many unanswered and unexplained anomalies, such as the pioneer anomaly or the dark matter problem. It is found that astronomy will often "bend" to the laws of the hard science. When the "yet solidified" topic of black holes, for example, came to the fore in the 1970s, it was found that certain observations and models did not fit to the hard science of thermodynamics. Soon, however, the models were then corrected and the later discovery of Hawking radiation confirmed that the hard laws of thermodynamics were correct and thus the black hole models were forced into

the "hardened mold" of thermodynamics. This is the same in the case of cross-breed subjects such as "biochemistry" (a blend of a soft and hard science), wherein, for instance, chemical mechanisms are re-worked until the fit the hardened mold of the governing equations of chemical thermodynamics.

Soft

The soft sciences include: economics, psychology, sociology, anthropology, history, political science, psychology, all generally labeled as the "social sciences" or humanities. The science of biology is a soft science, although some have argued that since theory of evolution, genetics, and DNA, that biology is becoming harder. The language of soft science tends to be the written language and the inability of a theory to move into the position of a law, an example being the "theory" of evolution, which is almost never referred to as the "law" of evolution, being the theory is not yet explained in the language of mathematics of the central hard sciences.

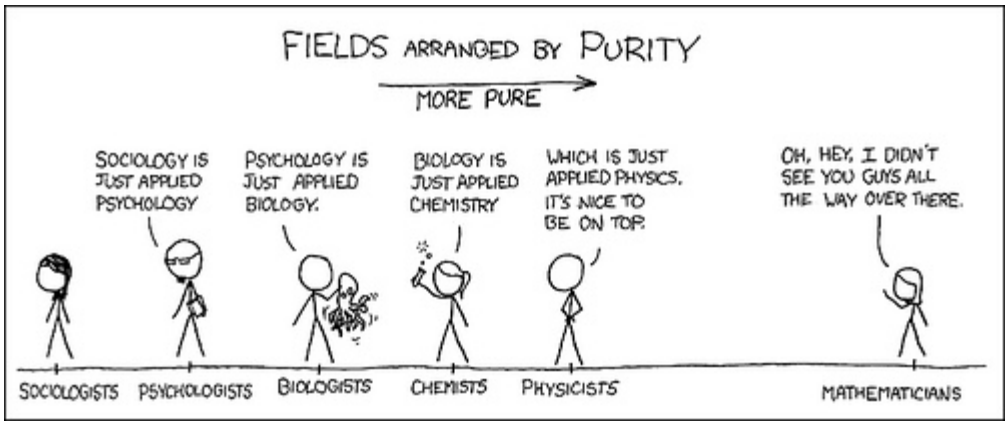

A cartoon style rendition of the perceptual ranking of the sciences by purity, **hardness**, exactness (see: exact science), or realness (see: real science).

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External links

â— Hard and soft sciences – Wikipedia.

θΔics

In fictional geniuses, **Hari Seldon** is a futuristic character created by Isaac Asimov, first appearing in his 1942 his *Foundation Series*, presented as a physical science based mathematical professor, of a galactic society, allegedly 50,000-years into the future (Q), able to predict, via his "psychohistory" model, social reactions between people, e.g. able to foresee future disasters, particularly the eventual fall of the galactic empire.

A depiction of Isaac Asimov's character **Hari Seldon**, by artist Michael Whelan (Q), who, as mathematics professor at Streeling University on Trantor, develops "**psychohistory**", a new science allowing him to predict the future in probabilistic terms, which he uses to predict the eventual fall of the Galactic Empire, hence his nickname "Raven" Seldon (see: Mor).

Overview

Asimov, of note, has commented that the voice of Nat Schachner and his "Past, Present, and Future" (1937) (Q) story, "sounded in his ear" several times when he came to write *The Foundation Series*.

Adams?

In 1998, Gary Wolfe, in his "Stasis and Chaos" (Q), was alluding to the suggestion that Hari Seldon, in Asimov's mind, was based on Henry Adams:

> "In these seven years man had translated himself into a new universe which had no common scale of measurement with the old. He had entered a supersensual world, in which he could measure nothing except by chance collisions of movements imperceptible to his senses, perhaps even imperceptible to his instruments, but perceptive to each other, and so to some known ray at the end of the scale. Langley [Samuel Pierpont Langley] seemed prepared for anything, even for an indeterminable number of universes interfused—physics stark mad in metaphysics. Historians undertake to arrange sequences—called stories, or histories—assuming in silence a relation of cause and effect. These assumptions, hidden in the depths of dusty libraries, have been astounding, but commonly unconscious and childlike; so much so, that if any captious critic were to drag them to light, historians would probably reply, with one voice, that they had never supposed themselves required to know what they were talking about."
>
> — Henry Adams (1908), *An Education of Henry Adams* (pgs. 381-82)

(add)

Buckle?

In recent years, some have conjectured that Heri Seldon was based on Henry Buckle:

> "Buckle was the '**Hari Seldon**' of his day, and much anger was directed at him by establishments who ruled superstitious and nationalist societies. Even Darwin, called "the most dangerous man in England" by priests, didn't provoke the level of hatred aroused by Buckle. That fear and hatred seems to persist even today in parts of the English establishment."
>
> — Ray Dickenson (2000), "Notes on Henry Buckle: the First Scientific Analyzer of Social Evolution" [4]

"Buckle has been referred to as the '**Hari Seldon**' of the 19th century."

— Tom Siegfried (2006), *A Beautiful Math* [1]

"At the other extreme lay the views of Henry Buckle, who, in *History of Civilization in England, Volume 1* (1857), looked forward to the day when the power of statistics would forge laws of the social sciences and afford a comparable predictability to that acquired by physics through the use of mathematics. The future, of course, was to reveal that the truth lay in between the visions of Cournot (Q) and Buckle. But even in the mid-twentieth century, the most famous of science fiction sagas, *The Foundation Trilogy* (1951-1953) by Isaac Asimov (January 2, 1920—April 6, 1992), predicted that a kind of social statistical mechanics applied on a galactic scale would eventually permit statistically significant forecasts of dominant social trends that lay hundreds of years in the future."

— Mark Rubinstein (2011), *A History of the Theory of Investments* (pg. #)

While difficult to find an actual statement by Asimov that he based "Seldon" on Buckle, some (Q) have pointed out that both Asimov and Buckle were avid chess players. Generally, Buckle and his use of "statistics" to make his model of history, would seem more thematic to the Seldon character, than as compared to Adams and his "chemical thermodynamics" based history model.

Quotes

The following are related quotes:

"**Hari Seldon** devised psychohistory by modeling it upon the kinetic theory of gases. Each atom or molecule in a gas moves randomly so that we can't know the position or velocity of any one of them. Nevertheless, using statistics, we can work out the rules governing their overall behavior with great precision. In the same way, Seldon intended to work out the overall behavior of human societies even though the solutions would not apply to the behavior of individual human beings."

— Isaac Asimov (1986), "Explanation by character Janov Pelorat" [3]

"**Hari Seldon** is the intellectual hero of Isaac Asimov's Foundation series. In his capacity as mathematics professor at Streeling University on Trantor, he developed psychohistory (Q), allowing him to predict the future in probabilistic terms. His ability to predict disasters is the reason behind his nickname 'Raven' Seldon."

— Anon (2019), "Hari Seldon" [2]

"Coming in at #1, in the polled ranking of the top ten most iconic sci-fi characters of all time, is Hari Seldon from Isaac Asimov's *Foundation Series* is your choice for most epic sci-fi character of all time. In his capacity as mathematics professor at Streeling University on the planet Trantor, Seldon develops psychohistory, an algorithmic science that allows him to predict the future in probabilistic terms. **On the basis of his psychohistory he is able to predict the eventual fall of the Galactic Empire and to develop a means to shorten the millennia of chaos** [see: transition state] **to follow**. The significance of his discoveries lies behind his nickname "Raven" Seldon. In the first five books of the Foundation series, Hari Seldon made only one in-the-flesh appearance, in the first part of the first book (Foundation), although he did appear at other times in pre-recorded messages to reveal a Seldon Crisis."

— Anon (2019), "The Most Iconic Sci-Fi Character of All Time" (Q), Mar 21

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External links

● Hari Seldon – Wikipedia.

θΔics

In existographies, **Harlan Ellison** (1934-) (FA:173) is an American speculative fiction writer, noted for []

Quotes

The following are quotes by Ellison:

> "I am so far 'beyond atheism' that there is no word for my level of disbelief in the English language."
>
> — Harlan Ellison (c.1995), comment on the Tom Snyder show *Tomorrow* [1]

> "The people who bomb churches and synagogues, they quote the Bible. The people who shoot doctors use the Bible."
>
> — Harlan Ellison (1997), episode of "Politically Incorrect" with Bill Maher [2]

References

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(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 481). HarperOne.
2. Harlan Ellison – FFRF.org

External links

â— Harlan Ellison – Wikipedia.

θΔics

In existographies, **Harlow Shapley** (1885-1972) (IQ:#|#) (FA:171) was an American astronomer, dubbed the "modern Copernicus" by his colleagues, noted for his 1917 determination of the center of the galaxy, his 1920s deduction that the sun lies near the central plane of the Milky Way Galaxy and not at the center but some 30,000 light-years away, and for his 1953 “liquid water belt” theory, aka the habitable zone.

Influenced

A noted student of Shapley was Carl Sagan.

Atheism | Religion

Shapley, supposedly an auto-proclaimed “agnostic”, seems to have been a progressive atheist in many of his lectures and books; Craig Helge (2004) summarizes things as follows: [2]

> “Hoyle's atheism and scientific attitude to nature and mind was to some extent shared by **Harlow Shapley**, the outstanding American astronomer and statesman of science. Intellectually, they were both descendants of the Victorian scientific naturalists. Shapley was not committed to any particular model of the expanding universe, but he did have strong opinions about the relationship between astronomy and religion. A confirmed agnostic, in the postwar period he often participated in science-religion discussions, and in 1960 he edited a major work on the subject—*Science Ponders Religion*.
>
> In Shapley's view, the universe began with a collection of hydrogen atoms, and **neither it nor life was in need of any divine intercession**. ‘In the beginning was the Word, ... and I might venture that the word was hydrogen gas’, he said in a lecture of 1959. As to the question of **where the hydrogen atoms came from**, he dismissed it as metaphysics.
>
> 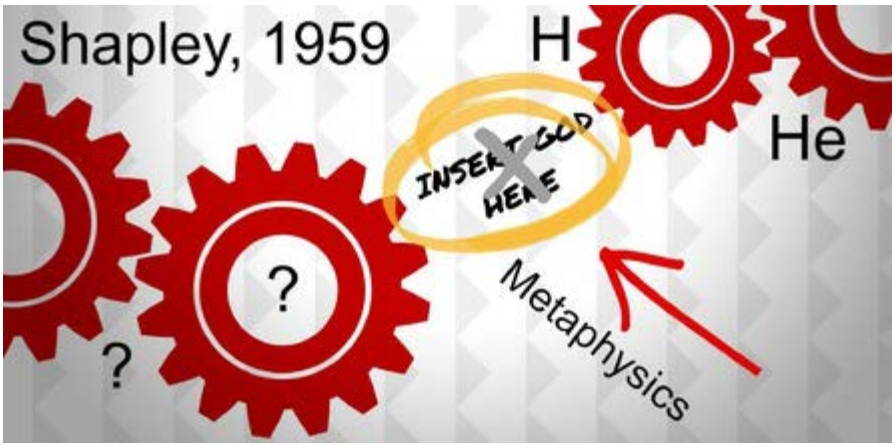
>
>
> In a 1959 lecture, **Shapley** stated that we now no longer think of "in the beginning god", but rather "in the beginning hydrogen", which made helium He, and everything else, after which he was queried with "what came before hydrogen", to which he dismissed as metaphysics.
>
> Insofar as religion deserved to survive, in Shapley's view it could only be in a modernized, secular version based on the insights of science. For this reason, he welcomed the pope's 1951 address as ‘an indication that church teaching can also evolve.’ But he considered traditional Christianity to be hopelessly fossilized and rather, looked ‘for religious beliefs that are founded on science, and that grow with science’. In a popular book of 1958, he asked: ‘May not science, broadly taken, be the fundamental cultural soil in which we plant and vitalize our religions? Need so many of them remain dated and non-rational?’ Such a belief—one would scarcely call it religion—he found in a kind of pantheism, although one in which …”

(add)

Quotes | By

The following are quotes by Shapley:

> “It will indeed be interesting to see how many of the things which astronomers have learned during this last

century will have to be unlearned."

— Harlow Shapley (c.1935) *Publication*; cited by Edmund Fuller (1941) in *Thesaurus of Quotations* (pg. 64)

"In the beginning was the word, it has been piously recorded, and I might venture that modern astrophysics suggest that the word was hydrogen gas. In the very beginning, we say, were hydrogen atoms; of course there must have been something antecedent, but we are not wise enough to know what."

— Harlow Shapley (1959), "Lecture" [2]

"Some piously record 'In the beginning god', but I say 'In the beginning hydrogen'."

— Harlow Shapley (c.1960); possible c.1980 (Q) or 1994 (Q) paraphrase of above [?]

"To place ourselves somewhere in the energy table has practically no meaning. We could compute the amount of energy represented by the masses of our bodies and compare it with the energies represented by the same masses of stars and atoms. But that comparison has already been done in effect by finding our placed in the organization of material systems."

— Harlow Shapley (1964), *Of Stars and Men* [1]

"The solar system is off center and consequently man is too."

— Harlow Shapley (1969), *Through Rugged Ways to the Stars*

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(b) Helge, Kragh. (2004). *Matter and Spirit in the Universe: Scientific and Religious Preludes to Modern Cosmology* (pg. 237). World Scientific.

Further reading

● Shapley, Harlow. (1960). *Science Ponders Religion*. Appleton-Century-Crofts.

External links

● Harlow Shapley – Wikipedia.
● Harlow Shapley (quotes) – GoodReads.com.

θΔics

In existographies, **Harold Bloom** (1930-) (PL:25K) (CR:4) is an American literary critique, noted for []

Literary geniuses

See main: Bloom 100

In 2002, Bloom, in his *Genius: a Mosaic of One Hundred Exemplary Creative Minds*, presented a listing of the 100 greatest language and literature geniuses, in his opinion.

Dostoyevsky

In 2004, Bloom, in commentary on Fyodor Dostoyevsky's *Crime and Punishment*, wherein the character Raskolnikov is said to apply Adolphe Quetelet's social physics theories to the young women he meets on the street, reasoning that there is no point in helping her, since her fate had already been determined (see: fatalism) statistically by the laws of social physics, states that in this example Dostoyevsky is said to be exemplifying "how the laws of social physics conflict with Christ's commandment to love one's neighbor", which, according to Mark 12:31 (Q), is the second greatest commandment in the Bible. [1]

Quotes | By

The following are quotes by Bloom:

> "Since my method is juxtaposition, I delight in bringing together universal genius Goethe, with Sigmund Freud, Samuel Johnson, and Thomas Mann."
>
> — Harold Bloom (2002), *Genius: a Mosaic of One Hundred Exemplary Creative Minds* [1]

See also

- Howard Bloom
- Harold Blum

References

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2. Bloom, Harold. (2002). *Genius: a Mosaic of One Hundred Exemplary Creative Minds*. Fourth Estate.

External links

- Harold Bloom – Wikipedia.

θΔics

In existographies, **Harold Blum** (1899-1980) (IQ:#|#) (EvT:20|21+) (CR:55) was an American physicochemical physiologist, zoologist, and biologist (chnopsologist), generally know as one of the pioneers of the biologic (chnopsologic) study of light, noted for his 1934 to 1950 publications on evolutionary thermodynamics. [2]

Overview

In 1934, Blum, in his "A Consideration of Evolution from a Thermodynamic View-Point", cites Lawrence Henderson (1913) and Gilbert Lewis (1923), to outline a coupling theory plus free energy decrease based theory of orthogenesis conceptualized evolution, in the form of what he refers to as "chemical peneplanation", i.e. an synonym the semi-modern term Gibbs landscapes, as seems to be the case. [6]

In 1950, Blum published his *Time's Arrow and Evolution*, in which he aimed to reconcile the second law of thermodynamics with organic evolution. [7]

Blum, in his *Time's Arrow and Evolution*, according to Steven Polgar (1960), supposedly, states that the second law does not apply to biochemical transformations. [1]

Blum argues that evolution did not begin with the formation of the first life, nor was the origin of life a precise event—rather, since the beginning of the universe, physical and chemical laws have inexorably channeled the course of change, so that possibilities were already limited and that life emerged. [3]

The anchor point for Blum's work seems to have been English astronomer Arthur Eddington's 1928 *The Nature of the Physical World*, wherein the term "time's arrow" was originally coined, in connection to the second law.

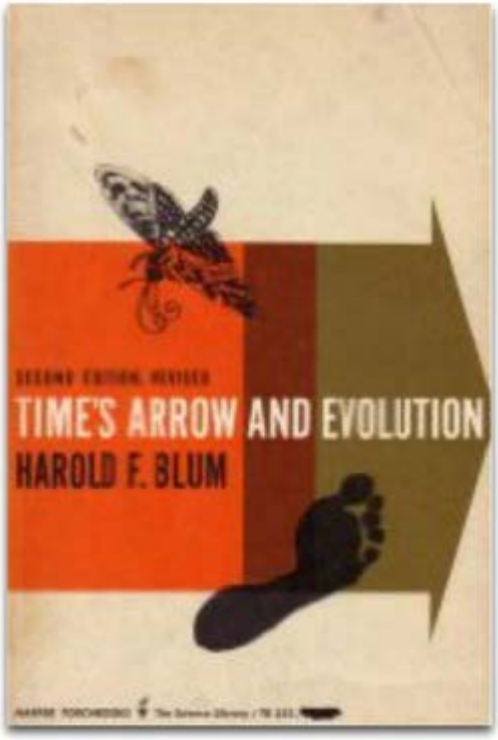

Left: Blum's 1951 *Time's Arrow and Evolution.* [1] Left: an older photo of Blum; as compared to hisyounger photo (above). [5]

Education

In 1922, Blum completed his BS in zoology, with a publication "On the Effect of Low Salinity on Teredo Navalis" (Q), graduating with honors, at the University of California, Berkeley, and in 1927 completed his PhD in physiology from Harvard Medical School, after which he worked as professor of animal biology at the University of Oregon, then as an instructor of physiology at Harvard Medical School, then an associate professor of physiology at the University of California, Berkeley. In 1938, he joined the newly founded National Cancer Institute, remaining there until his retirement in 1967. [2]

His career in higher education included posts at the University of California, Temple University Skin and Cancer Hospital, Columbia University, Harvard Medical School, Princeton University, the Naval Medical Research Institute, the National Cancer Institute, and the State University of New York at Albany. Much of his work was focused on photobiology, such as his work on irradiation experiments on mice and cancer.

Quotes | On

The following are quotes on Blum:

> "An ability to metabolize, involving some system of catalysts is another fundamental property which cannot be conceived of except in conjunction with a mechanism for converting free energy, and we are deeply indebted to **Blum** and his *Time's Arrow and Evolution* (1951) for his masterly analysis of this extremely important aspect of this subject."

— Sergius Morgulis (1952). “Introduction” to Alexander Oparin’s *The Origin of Life* [8]

Quotes | By

The following are quotes by Blum:

> “Practically since its first definitive formulation by Darwin the concept of chance variation and natural selection has dominated the study of evolution, although frequent attempts have been made to replace or modify it. Probably most such attempts are provoked by a vaguely defined awareness of an insufficiency in the natural selection hypothesis, and the recognition of a directive factor in evolutionary processes which persists through successive generations. The latter concept which is commonly known as ‘orthogenesis’, is supported a by considerable amount of evidence (Leo Berg, 1926), but at present is not widely accepted among biologists. The general reason for abandoning or neglecting this concept has been the failure, thus far, to demonstrate the existence of the **necessary directing factor outside of the theological doctrine**; and one may suspect that fear of leaning too closely to such doctrine has caused most biologists to ‘shy off’ from orthogenesis. It will be the aim of the writer to indicate the actual existence of a directing factor in evolutionary processes, while at the same time avoiding all necessity of invoking theological concepts.”
>
> — Harold Blum (1935), “A Consideration of Evolution from a Thermodynamic Viewpoint” [6]

> “No matter how carefully we examine the energetics of living systems we find no evidence of defeat of thermodynamic principles.”
>
> — Harold Blum (1950), *Time’s Arrow and Evolution* (pg. 119) (Q)

A latter photo of Blum.

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External links

- Harold F. Blum – Wikipedia.
- Blum, Harold F. (Harold Francis) (1899-) – WorldCat Identities.
- Blum, Harold Francis (1899-1980) – The Internet Encyclopedia of Science, DavidDarling.info.
- The Harold F. Blum Papers, 1939-43 – The University of Tennessee.

θΔics

In economics, **Harold Hitchens Burbank** (1887-1951), oft-cited as H.H. Burbank, was the chairman of the Harvard economics department, from 1927 to 1938, noted for his communications and interactions with American mathematician Edwin Wilson (1934-1938) about teaching some type of physical "mathematical economics" course, based on thermodynamics, steam engine theory, and equilibrium as described by physical chemistry, and latter, supposedly, for denying a post at Harvard to economist Paul Samuelson, because he disliked people who were "smart, Jewish, or Keynesian", as Robert Solow later commented (Ñº).

Wilson

See main: Harvard Pareto circle

On 23 Mar 1934, American mathematician Edwin Wilson, the famous sole protégé of Willard Gibbs, wrote the following to Burbank: [1]

> "I should not attempt to teach economics but simply mathematical economics, which in many respects is a different thing. I couldn't teach the steam engine, but I have taught thermodynamics and the analogy is about the same."

On 20 Dec 1938, Wilson wrote the following to Burbank: [2]

> "Schumpeter has suggested that it would be particularly well for me to give as I gave last time a general theory of equilibrium such as this is understood by physical chemists including the phase systems of Willard Gibbs. Most of our equilibrium theory in economics really has for its background the notions of equilibrium which arise in mechanics. It is pretty high-brow stuff. Mathematically or physically it isn't any more high-brow than things which I long taught at Yale University and at the Institute of Technology. Although Pareto was certainly quite familiar with the types of equilibrium which arise in physical chemistry and are necessary in fact for the study of the steam engine he doesn't use this line of though in economics."

A few weeks prior, on 4 Nov 1938, Wilson wrote the following to Lawrence Henderson: [3]

> "I have never understood what John Dewey meant, if he really meant anything, by saying that the social sciences must not imitate the natural sciences in their methodology but must develop their own methodology."

Here, what Wilson is ruminating about is the age old two cultures debate, which comes in various reincarnations: one nature vs. two natures thinkers, Clausius culture vs. Shakespeare culture, left brain (scientists and engineers) vs. right brain (humanities scholars) culture, natural scientists vs. social scientists, etc., all of which underlyingly is a religious (belief system) tension issue, generally rooted in differences in understanding about choice and morality, one hardly ever addressed openly.

Samuelson

At the time of the completion of Paul Samuelson's dissertation, *Foundations of Analytical Economics*—written at fever pitch from mid-1940 to Jan 1941, which followed suit in the wake of his advisor Edwin Wilson's decisive 1938 critical review comment suggestion to Samuelson that he use equation 133 of Willard Gibbs' *On the Equilibrium of Heterogeneous Substances*, to formulate a theory of economic stability, modeled on chemical thermodynamic stability and equilibrium change—two factors seemed to have been floating around in the mind of Burbank, in regards to his opposition to Samuelson. The first of which, as has been speculated about elsewhere, Burbank had developed an

immense dislike and aversion to the use of mathematics and or physical mathematics in economics, possibly as a result of Wilson's push of the difficult 700-equation filled treatise of Willard Gibbs at him for the foundation of mathematical economics at Harvard, in the last six or so years. Economics, before Samuelson, traditionally did not use a substantial amount of mathematics. English economist Alfred Marshall's 1890 *Principles of Economics*, the dominant textbook of the previous decades, for example, relegated all mathematics to the appendix.

The second, as has been documented, was a combination of the lingering antisemitism in the air at Harvard at the cusp of WWII and Burbank's anti-semitism inclinations.

As a result of these circumstances, Burbank ordered the hand-set plates to Samuelson's prize winning, Le Chatelier principle using, dissertation in economics, one that would later win him the second inaugural Nobel Prize in economics, destroyed after 1,500 copies. American economics journalist David Warsh explains the Samuelson situation as follows: [4]

> "At Harvard erupted a series of battles that cost the great old university its leadership in economics. The resistance to mathematics continued. Although Harvard University Press was compelled by prior agreement to publish *Foundation*, because Samuelson's dissertation had won the economics department's prize for best thesis, Chairman Harold Burbank ordered the laboriously hand-set plates (with their thousands of equations) destroyed after a single printing of 1,500 copies. That meant no revisions were possible for the next thirty-five years. Then, too, the Veritas Society, a group of alumni dedicated to opposing Keynesian influences, waged a witch hunt against the department."

Swedish-born American economic sociologist Richard Swedberg corroborates on this further, through the lens of Joseph Schumpeter, who disliked Burbank, viewing him as a rather bitter man, a mediocre scholar, strongly anti-semitic, who had complete power over the junior faculty appointments which he used to keep down a number of Jews in the faculty, Samuelson in particular, whose appointment he blocked. [5]

The Jewish-issue, to note may not have been the complete reason for Samuelson's block; as reported by one biographer, after one faculty meeting during which Samuelson's appointment was discussed, Schumpeter proclaimed in a loud voice: [7]

> "I could have understood if they didn't want to hire him because he is a Jew. But that wasn't it—he was just too brilliant for them."

In any event, in spite of Burbank's plates destruction ordering and the alleged blocking of Samuelson's post, his 1948 *Economics: an Introductory Analysis*, became the best-selling economics textbook of the 20th century—by 2009 it had been translated into 41 languages and had sold over 4 million copies—and his classical thermodynamics influenced dissertation *Foundations of Economic Analysis* became the "Bible of Economics" (Ñº), superseding Alfred Marshall's *Principles of Political Economy* (1890), and prior to that Adam Smith's *Wealth of Nations* (1776), for the title of Economic Bible. [7]

Education

Burbank completed his A.B. at Dartmouth College in 1909, followed by his A.M. at Harvard University in 1910 with a dissertation on "General Property Tax in Massachusetts,1775 to 1792" (Ñº) (Ñº), after which he became teacher of political economy, administrative, officer and editor, Harvard University member of the Department of Economics, 1915-51, and Chairman, 1927-38, and from 1942-49 a member of the Board of Editors of the *Review of Economics and Statistics*. (Ñº)

Burbank professorship

The Burbank chair or "Harold Hitchens Burbank Professor of Political Economy" was established with funds from the

estate of Burbank, the first holder of which was Richard Musgrave, followed by Bob Fogle, then Dwight Perkins (1963-2006), and currently Torben Iversen and or James Stock. [6]

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θΔics

In existographies, **Harold Davis** (1892-1974) (CR:11) was an American mathematician noted, in economic thermodynamics, for his 1938 to 1941 publications on how some thermodynamics equations and economic equations show formal similarity.

Overview

In 1938, Davis published a joint review of the 1937 book by Georges Guillaume on thermodynamics and economics and of Jan Tinbergen's *An Econometric Approach to Business Cycle Problems* in the *Bulletin of the American Mathematical Society*. [5]

In 1941, Davis digressed in discussions of a formal similarity between fundamental thermodynamic equations and some equations of economic models. [1] Davis considered the budget equations of macroanalysis and suggested that the utility of money represents "economic entropy". [2]

In 1949, in commentary on Davis' thermodynamic economics attempt, Dutch economist Johannes Lisman argued that none of the variables used in Davis' mathematical economic models seem to play the same role as entropy in thermodynamics. Based on Lisman's review, Davis theory seems to be a classic case of the use of employing thermodynamic isomorphisms. [4]

Education

Davis completed his AB in 1915 and Ll.D. in 1949 both at Colorado College, after which he completed an AM Harvard University in 1919 followed by a two-part PhD dissertation: *I. An Existence Theorem for the Characteristic Numbers of a Certain Boundary Value Problem. II. An Extension of the Problem of the Elastic Bar*, in 1926 at the University of Wisconsin-Madison. [3]

Quotes | Employed

The following are quotes employed by Davis:

> "The writer can remember, as a student, meeting with the 'entropy' as a mysterious abstraction, enshrined in the writings of Lord Kelvin and others, but which no one dreamed of vulgarizing by the attachment of numerical values. Now every engineer's pocket-book contains tables of the entropy of different substances, and that most useful quantity is made available to the vulgar."
>
> — Robert Lehfeldt (1914), "The Elasticity of the Demand for Wheat"; cited by Harold Davis (1941) in *The Theory of Econometrics* (pg. 98) [6]

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External links

â— Harold Davis (about) – Colorado College.
â— Harold T. Davis (about) – Cowles Commission for Research in Economics.

θΔics

In existographies, **Harold J. Hamilton** (1924-) is an American computer scientist and complexity theory philosopher, noted for []

Overview

In 1977, Hamilton, in his "A Thermodynamic Theory of the Origin and Hierarchical Evolution of Living Systems", attempted to explain evolution on the platform of Ilya Prigogine and some type of chemical affinity theory; the abstract of which is as follows:

> "Growing interest in the origin of life, the physical foundations of biological theory, and the evolution of animal social systems has led to increasing efforts to understand the processes by which elements or living systems at one level of organizational complexity combine to form stable systems of higher order. J. Bronowski saw the need to extend or reformulate evolutionary theory to deal with the hierarchy problem and to account for the evolution of systems of "stratified stability." The hierarchy problem has become a matter of great interest also in nonequilibrium thermodynamic theory.
>
> An effort is made here to develop an abstract, phenomenological model, based on the laws of thermodynamics, to account for the origin and hierarchical evolution of living systems. It is argued that the principle of minimum entropy production, developed by I. Prigogine, applies generally to all thermodynamic systems and processes and is implicit in an extended and more complete formulation of the second law of thermodynamics. From this are derived a thermodynamic criterion and a principle of thermodynamic selection governing the formation of stable systems of "elements" of various levels of organization.
>
> Thermodynamic selection gives rise to the creation of "elements" having increasingly "open" characteristic structures which may combine spontaneously to form "social" or crystalline systems capable of growing and reproducing themselves through processes of fissioning or budding. Such simple, self-reproducing systems are capable of evolving by natural selection, which is seen to be a special case of the more general process of thermodynamic selection. The principle of natural selection, thus formulated, has the character of a fundamental physical law. Self-reproducing systems with suitably open hereditary programs may combine to form stable social systems, which may grow and reproduce as a unit. In this way self-reproducing systems of increasing hierarchical order, size, and organizational complexity **may evolve through processes of thermodynamic (natural) selection**. Some implications of this open-ended model and opportunities for testing its empirical and theoretical utility are explored."

In c.1978, Hamilton sent a copy of his nonequilibrium theory of evolution to Alexander Zotin, who urged him to apply his reasoning to not only organism, but also to "physical or even cosmic problems". [4]

Other

In 2010, Georgi Gladyshev, in his "Hierarchical Thermodynamics and Homeokinetics", claimed that Hamilton may have been influenced by his 1977 article "On the Thermodynamics of Biological Evolution"; specifically he claims that Hamilton "was well informed about the preprint of my [1977] publication that was published six months before his work". [2]

Education

In 1940, Hamilton trained in radar theory and engineering at Stanford University, and served in the Army Signal Corps during WWII, until his discharge in 1946. In 1949, Hamilton completed his undergraduate degree at Stanford.

In 1950, he joined the Librascope division of General Precision to supervise the development of digital computers for the military. In the 1950s to 1962, Hamilton worked for the Airforce to develop a gas-ion simulation of excitable membrane as a means for modelling neural systems.
In 1964, Hamilton began working to complete an interdisciplinary PhD, at the University of Southern California, on the

development of theoretical and pragmatic tools for coping with what Warren Weaver called "problems of organized complexity", during which time he generalized Wassily Leontief's input / output analysis of economic systems, in some way having supposed applicability to Darwinian selection theory.

In 1977, Hamilton was a fellow of the Center for World Studies, Granada Hills, Ca. In 1981, Hamilton joined Censtor Corp, a Silicon Valley startup, where he developed perpendicular magnetic recording devices for multiple computers to store and share mass information.

In 1994, Hamilton retired from Censtor Corp, after which he began re-engage into research in "thermodynamics and living systems". [4]

Religion

In 2013, Hamilton, in his *Gravity in Relativistic Particle Theory*, discusses how his "nonequilibrium thermodynamic imperative" theory, resulting from "my extended second law and the Heisenberg indeterminacy principle", has allowed him to develop a self-consistent theory of "the creation" and how "all of creation, so evident before our eyes and instruments, is a natural evolutionary consequence of a universal driving force, i.e. a creative force". Hamilton overall aim, in short, is to sell a Trojan horse ontic opening type of god theory wrapped in Prigogine-styled thermodynamics.

Quotes | On

The following are quotes on Hamilton:

> "One attempt to apply the minimum entropy principle to society appears as part of **Hamilton**'s model for the entire course of evolution and natural selection, beginning with prebiotic evolution and carrying through to expanding postindustrial societies of today."
>
> — Richard Adams (1988), *The Eighth Day* (pg. 47)

Quotes | By

The following are quotes by Hamilton:

> "The process by which stable organized systems, including living systems, are created may be explained most satisfactorily in terms of a general quantum theory of the affinities between elements and its phenomenological counterpart derived from the principle of minimum entropy production."
>
> — Harold Hamilton (1977), "A Thermodynamic Theory of the Origin and Hierarchical Evolution of Living Systems" (pg. 299) [3]

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● Hamilton, Harold J. (1978). *A Thermodynamic Theory of the Origin and Hierarchical Evolution of Living Systems*. University of Chicago Press.

External links

● Hamilton, H.J. – WorldCat Identities.

θΔics

In existographies, **Harold Kaplan** (1916-2015) was an American literary critic, Henry Adams scholar, and poet, noted for []

Education

Kaplan was a Northwestern University professor of English and American literature. [2]

Quotes

The following are noted quotes:

> "Force and war must be moralized somehow, perhaps as in a physical or chemical process that reaches equilibrium."
>
> — Harold Kaplan (1981), *Power and Order: Henry Adams and the American Naturalist Tradition*; synopsis of Adams' formulaic view of natural history [1]

References

1. Kaplan, Harold. (1981). *Power and Order: Henry Adams and the American Naturalist Tradition* (chemistry, pg. 79). Transaction Publishers, 2010.
2. Meyer, Erin. (2015). "Harold Kaplan: Literary Critic, Author, Poet Dies at 99" (Ñº), *News Center*, Northwestern University, Mar 12.

θΔics

In hmolscience, **Harold E. Leonard** (c.1926-) is an American professor emeritus of chemistry from Cayuga Community College noted for his January 2006 letter "Chemical Thermodynamics in the Real World" in which he reprinted an excerpt of American chemical thermodynamicist Frederick Rossini's 1971 Priestley Medal address: "Chemical Thermodynamics in the Real World", to allude to the suggestion that chemical thermodynamics could be used to help society understand freedom and security in relation to post 9/11 terrorism. [1] Leonard's letter launched the Rossini debate.

Education

In 1955, Leonard taught high school chemistry for one year. In 1956, owing to a pay increase, he began teaching chemistry at Auburn Community College (now called Cayuga Community College), Auburn, New York. He retired from Cayuga Community College in 1996, continuing as an adjunct professor until 2000; making donations to the college up until at least 2006. (Ñº) [2]

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(b) Leonard, Harold, E. (2006). "Chemical Thermodynamics in the Real World." (pdf) *Letters, Journal of Chemical Education*, (83) 39, Jan, No. 1. pg. 39.
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θΔics

In existographies, **Harold J. Morowitz** (1927-2016) (CR:20) was an American biophysicist noted, in hmolscience, for his 1963 *Life and the Physical Sciences*, on the topic of the use and application of thermodynamics in the study of biology, with focus on the origin of life, thereafter cited in the 1960s in respect to carbon-based life theories; for his testimony in the McLean vs Arkansas (1982), aka Scopes II trial, among a number of other areas of note.

Origin of life

Morowitz' believes that life arose on earth by processes that may be understood by considering the laws of chemistry and physics as applied to complex adaptive systems.

On the issue of thermodynamics and biology, he comments: [1]

> "The use of thermodynamics in biology has a long history rich in confusion and rampant with attempts to use equilibrium constructs under nonequilibrium conditions."

Morowitz' first attempt at alleviating this confusion was the 1970 book *Entropy for Biologists*, originally seeded by a 1953 request by several distinguished kidney physiologists, at the National Heart Institute, that a course in thermodynamics be included in a new postgraduate training program, covering topics such as membrane physiology, cellular energetics, and macromolecular configuration, among others. [2] Morowitz has been called the "present-day grandfather of the application of thermodynamics to biology." [9]

Human | Chemical value

In 1976, Morowitz received a birthday card that assessed a human body's raw materials at only 97 cents; after which, Morowitz, famously known for his 1968 elemental composition of human table (see: hmolscience periodic table), he recalculated the cost based on synthesized ingredients from a biochemical company catalog and re-evaluated his worth at more than $6 million. (Ñº)

Teilhard | Gibbs free energy

In 2002, Morowitz, in his *The Emergence of Everything*, speculated on a Gibbs free energy interpretation of the work of Pierre Teilhard on the emergence of mind from matter in terms of enthalpy (H) and bound energy or transformation content energy (–TS). [10]

Interdisciplinarity | Splitters and lumpers

See main: Anti-interdisciplinarity

In 1979, on the so-called two cultures interdisciplinarity fragmentation issue, Morowitz had the following ripe words to say: [11]

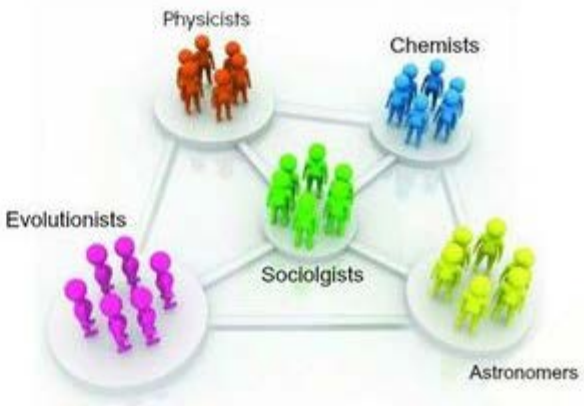

An artistic rendition of **Morowitz's** 1979 take the so-called "splitters and lumpers anti-interdisciplinarity mental divide dilemma". [12]

> "The terms 'splitters' and 'lumpers' come from taxonomy, where the classifiers were separated into those who liked to create new taxa because of small differences and those who preferred to coalesce categories because of similarities. The concept has found wider applicability as knowledge in all fields expands. Specialists are confined to ever-narrowing domains while generalists survey the immensity of information in an effort, one hopes, to find higher orders

> of structure. It is clear that in the university and intellectual community ... the splitters are in command and the lumpers are in serious disarray, unable to keep up with the output of printouts that are generated in such a variety of ways. It is saddening to witness the loss of status of those engaged in integrative thought, for one sees in it the fragmentation of scientific and humanistic disciplines."

(add)

McLean v. Arkansas

> *See main: Religious thermodynamics*

In 1982, in the famous case of McLean vs. Arkansas Board of Education, on the debate of whether creation science should be taught in public schools, Morowitz was designated an expert in biophysics and biochemistry and was tasked with demonstrating that the origins of life did not violate the laws of thermodynamics. [3] The transcript, available online, is a fairly humorous read. He states, for instance, in reference to creation scientists, that "they play fairly fast and loose with the second law of thermodynamics." [4]

Entropy and the Magic Flute

Morowitz has a good sense of humor as is evidenced on the cover of his 1992 book *Entropy and the Magic Flute*, which shows a pied piper playing a magic flute to the tune of the entropy indicating the equivalence of the following formulas:

$$S = k \ln W = dQ/T = - k \Sigma f_i \ln f_i \text{ ... black hole entropy}$$

on the play of Boltzmann entropy (1900), Clausius entropy (1854), Gibbs entropy (1901), and black hole entropy (1972), respectively; all of which seemingly leading its followers (scientists) down a swirling black hole.

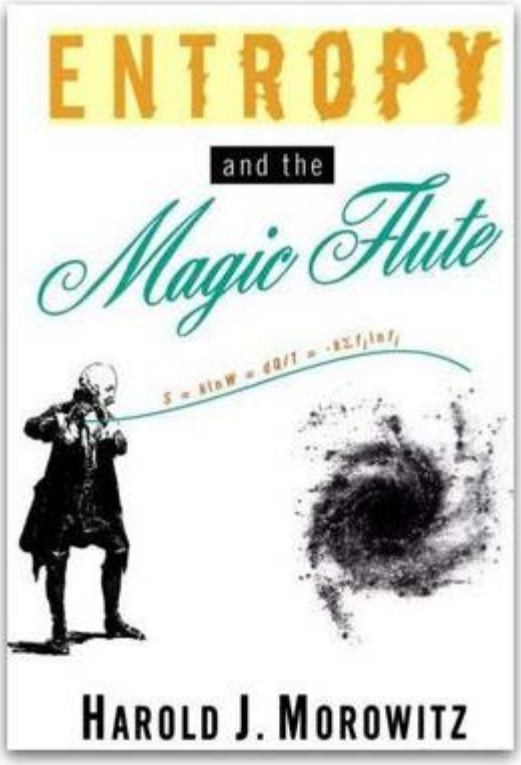

Morowitz' 1992 book *Entropy and the Magic Flute*, showing various entropy formulations.

Boltzmann and biology

Morowitz recounts his late 1960s days of indexing, on 3 x 5 cards, his book on thermodynamics and biology, noting how the name "Boltzmann" began to pile up. Seeing this, he realized how he knew so little about such a scientist whose name figured so prominently in the science of thermodynamics. This led him on a pilgrimage, as many scientists have done, to the famous Boltzmann tombstone at the Vienna Central Cemetery, where inscribed in stone above the bust of Boltzmann is the formula S = k ln W. [8]

Religion

Morowitz's is a bit difficult to classify, in respect to theistic/atheist belief labels. Based on his 1982 McLean vs Arkansas testimony against creation science, he would seem to classify as a scientific atheist. Others, however, have classified him as an agnostic. (Ñº) Then again, some have speculated he was a closet Christian:

> "What I learned in school is that one day lightning struck pond-scum and produced life. Or maybe it was volcano vents. On the other hand, claims of miracles — such as the resurrection of Christ — are sheer bunkum. — I'm going with Christ. I only hope (sans-evidence) that Morowitz was a closet Christian. Clearly the man had the capacity for great faith."
>
> — Leodp (2016), post (Ñº) to his UncommonDescent.com obituary blog, Apr 5

His 2002 *The Emergence of Everything*, having the alternative title *Twenty-Eight Steps from the Beginning to the Human Spirit*, written at the age of 75, with support for Teilhardian spirit matter theories, however, would seem to point to the possibility that Morowitz may have "found god" in his latter decade, expounding on what seems to be a new-found religious view. In particular, negating his earlier 1982 separation of religion and science court testimony, he now argues that one can know god through the study of emergence. Morowitz argues in favor of a theory of god, and of free will, volition, and consciousness, in an attempt at a sort of ill-fated, thermodynamics-based, poetic-type religious philosophy, with aims to reconcile the two (religion and science). [6] Yet, then again, in what seems to be a second mental back-flip on his 2002 ideas, he co-authors the 2005 article "Intelligent Design Has no Place in the Science Curriculum", arguing that religion and science cannot go together. [7]

Education

Morowitz completed his BS in physics and philosophy in 1947, his MS in physics in 1950, and PhD in biophysics in 1951 all at Yale University, after which he became a professor of molecular biophysics and biochemistry at Yale until 1986. In 1988, he became a professor of biology and natural philosophy at George Mason University. Since 1987, he has been associated with the Santa Fe Institute. [5]

Quotes | By

The following are quotes by Morowitz:

> "Mind in dualist doctrine must be non-material and cannot exert force on material objects, for this would be a source of energy in contradiction to the conservation of energy. This would leave for mind the role of choosing between energetically equivalent alternatives, a perfectly plausible role within the first law of thermodynamics. [The soul could, however, circumvent the problem posed by the first law if it could play the role of Maxwell's demon. The demon, however, was exorcised in the 1950s by Leon Brillouin]. Mind-body dualism thus is in direct contradiction to the second law of thermodynamics."
>
> — Harold Morowitz (1987), "The Mind Body Problem and the Second Law of Thermodynamics" [12]

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External links

â— Harold Morowitz (Clarence J. Robinson Professors) – George Mason University.

θΔics

In hmolscience, **Harold Nieburg** (1927-2001) was an American political scientist noted, in political thermodynamics, for 1973 discussion of energy and entropy in politics.

Overview

In 1973, Nieburg, in his chapter "Political Thermodynamics", with a section on energy and entropy, to his 1973 book *Culture Storm*, postulated that:

> "In any specific bargaining engagement, one party's order becomes another's entropy."

Nieburg cites a few HT pioneers, such as: Bertrand Russell, Claude Levi-Strauss, and Eric Berne. The following is example aggregate quote: [1]

> "We assume that all individuals and groups seek to impose order around them. The boundaries of conflicting systems of order, however, overlap creating arenas of social entropy (relative disorder) and competition. Thus, one may postulate a thermodynamic law of behavior: assuming, based on the law of conservation of energy, that organisms seek to conserve energy and values, and, based on the law of entropy, that social disorder and decay are constant threats that energy and values must overcome."

Beyond this, Nieburg really doesn't seem to go into too much detail in theory speculation, although he does use the term entropy as the measure of social disorder in some of his other works. In his 1984 book *Public Opinion, Tracking, and Targeting*, for instance, he comments that "symbols, which are the main tokens in the transactions of public opinion, enable society to combat entropy", where "entropy is the second law of thermodynamics." He seems to have first used entropy concept in his 1966 book *In the Name of Science*, chapter five: Entropy and Prime Pumping. [3]

Education

Nieburg completed his PhD in political science in 1960 at the University of Chicago. He was a political science professor from 1970 to 1995 at Harpur College of Arts & Sciences, Binghamton University. [2]

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External links

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θΔics

In existographies, **Harriet Martineau** (1802-1876) (IQ:160|#506) (Cattell 1000:892) (Scott 50:22) (FA:99) was a British sociologist noted for []

Overview

In 1846, Martineau travelling around America to study the great religions, thereafter concluding:

> "There is no theory of a god (see: god theory; theory of god), of an author of nature, of an origin of the universe, which is not utterly repugnant to my faculties."
>
> — Harriet Martineau (c.1846) [1]

Soon thereafter, Martineau began to call for a children's book for the "secular order of parents" (see: children's atheism bible).

She publicly declared her atheism with the publication of her *The Atkinson Letters* (Q); thereafter embracing atheism, as a philosophy. (Q)

Comte

In 1851, Martineau translated a six-volume work Auguste Comte into two, to his approval, to tremendous success. [1]

Associates

Martineau was an associate of George Holyoake.

Quotes | On

The following are quotes on Martineau:

> "There is no god, and **Harriet Martineau** is her prophet."
>
> — Douglass Jerrold (c.1852), see also: Paul Dirac and *The Strangest Man* (pg. 456)

> "**Martineau** was born to be a destroyer of slavery in whatever form, in whatever place."
>
> — Florence Nightingale (c.1890) [1]

Quotes | By

The following are quotes by Martineau:

> "All new sciences are for some time engrossed by the learned. It is certain, however, that sciences are only valuable in as far as they involve the interests of mankind at large, and that nothing can prevent their sooner or later influencing general happiness. This is true with respect to the knowledge of the stars; to that of the formation and changes in the structure of the globe; to that of chemical elements and their combinations; and, above all, to that of the social condition of men."
>
> — Harriet Martineau (1832) (Q)

“It is my deliberate opinion that the one essential requisite of human welfare in all ways is scientific knowledge of human nature.”

— Harriet Martineau (1855) (Q)

“They can never be quite secure from the danger that their air-built castle shall dissolve at the last moment. I used to think and feel all this before I became emancipated from the superstition. But now the release is an inexpressible comfort; and the simplifying of the whole matter has a most tranquilizing effect. I see that the dying … desire and sink into death as into sleep. Under the eternal laws of the universe, I came into being, and, under them, I have lived a life so full that it’s fullness is equivalent to length.”

— Harriet Martineau (1855), *Autobiography* (written after being diagnosed with fatal heart disease; she continued being reacting, however, for another 21-years) [1]

References

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External links

● Harriet Martineau – Wikipedia.

θΔics

In hmolscience, **Harrison White** (1930-) is an American sociologist noted for his 1992 physics metaphor sociology arguments about identity and control.

Overview

In 1992, White, in his *Identity and Control*, outlined social life based on atoms and molecules using a blurry sort of metaphorical scheme in which he views the social molecule as a discipline. [1] In whites' scheme: "each human is in more than one social molecule". [2] White also dabbles a bit in thermodynamics metaphors, such as "temperatures of colonialism", a type of social temperature theory. [3]

Education

In 1945, White, being an accelerated learner of sorts, at age 15, entered MIT, completing his BS in 1950 (age 20), and PhD in 1955 (age 25) in theoretical physics, after which he started doctoral studies in sociology at Princeton.

Quotes

The following are representative quotes:

> "Control and production, analogous to temperature and force-gradients, are the impetuses to social process. Both are social analogue to space and the analogue to molecule are emergent and negotiable; they are context and identity established by chance. But surely that is true of their physical analogues too."
>
> — Harrison White (1992), *Identity and Control* (pg. 175)

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External links

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θΔics

In hmolscience, **Harry Overstreet** (1875-1970) was an American philosopher and self-defined "naturalist humanist" noted, in human thermodynamics, for his introduction of the term "extropy", conceived as a counter-entropy (or anti-entropy) quantity, i.e. an entropy antonym. [1]

Overview

Overstreet, according to one of his students Sidney Hook (1987), was a convert of John Dewey's conception of philosophy, although only to a certain ability, to the effect that "he could not hold up his end of the technical arguments when challenged by philosophy students". [4]

In 1967, Overstreet's stated the following about his extropy is as follows: [2]

> "… material bias, we examine organic and psychological life, we seem to discover that instead of entropy (a turning in) being their outstanding characteristic, that which we might call by contrast extropy (a turning out) is predominant … A new kind of initiating agency has appeared, which accommodating itself to the physical laws, is not 'completely subject to them' [ref] [like Maxwell's demon]. Extropy involving truth, and beauty and goodness, would be expected to lead inevitably to God."

Overstreet seems to have been more of a renegade agnostic, in regards to theology. In the *Hibbert Journal* (1913–1914), Overstreet rejected the idea of God as a father, creator, person, or "ideally perfect being," and accepted only "a god that is ourselves and grows with the world." He also declared, "Christianity as an institutionalized religion has laid no stress on the pursuit of truth. Indeed, for the most part it has been suspicious of the truthseeking process. The truthseeker might overturn accepted beliefs."

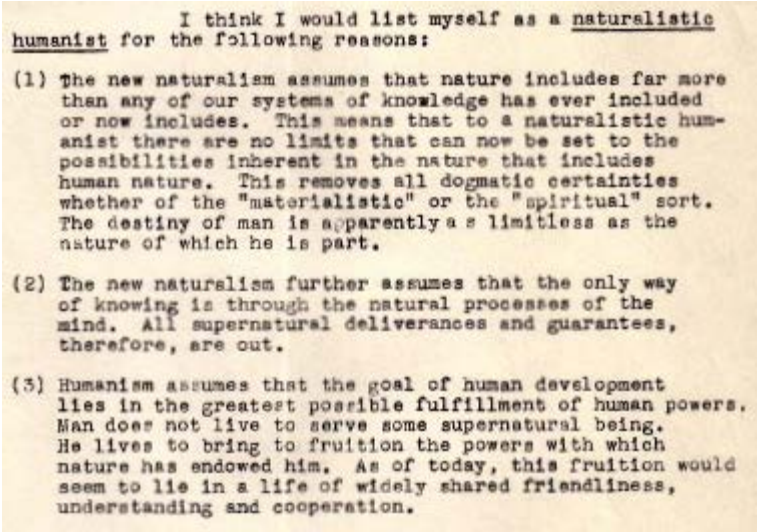

I think I would list myself as a naturalistic humanist for the following reasons:

(1) The new naturalism assumes that nature includes far more than any of our systems of knowledge has ever included or now includes. This means that to a naturalistic humanist there are no limits that can now be set to the possibilities inherent in the nature that includes human nature. This removes all dogmatic certainties whether of the "materialistic" or the "spiritual" sort. The destiny of man is apparently as limitless as the nature of which he is part.

(2) The new naturalism further assumes that the only way of knowing is through the natural processes of the mind. All supernatural deliverances and guarantees, therefore, are out.

(3) Humanism assumes that the goal of human development lies in the greatest possible fulfillment of human powers. Man does not live to serve some supernatural being. He lives to bring to fruition the powers with which nature has endowed him. As of today, this fruition would seem to lie in a life of widely shared friendliness, understanding and cooperation.

Overstreet's 1951 letter communication definition of himself as a self-defined "naturalistic humanist", as what seems to be a compromise between materialism and spiritualism, with accumulated human knowledge having the last say on the matter.

Education

Overstreet completed his BA (1899) and his BS (1901) both at the University of California, Berkeley, after which he taught philosophy at Berkeley from 1901 to 1911, and thereafter became chair of the Department of Philosophy and Psychology at the City College of New York, a position he held until his retirement in 1939. [3]

References

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External links

â— Harry Allen Overstreet – Wikipedia.

θΔics

In hmolscience, **Harry Waton** (1871-1959) was a Russian-born American monotheism philosopher, focused on the works of Karl Marx and Benedict Spinoza, noted for []

Overview

In 1932, Waton, in his *The Philosophy of Spinoza*, gave the following physicalism-like argument about free will or the freedom of the will: [1]

> "The will is free. Free in what sense? It is free to act according to its nature. This, in fact is true of all realities. Take steel. Steel is free to act as steel, and nothing in existence can make steel act otherwise than steel should act."

This seems to have some Marcus Aurelius flavor, mixed in with scorpion and the frog parable logic; and the will of the steel is reminiscent of the discussions of Arthur Schopenhauer.

Marx

The following are Waton's views on Karl Marx and communism:

> "Communism is the destiny of mankind. There is only one work on sociology, and only one work, and that is Marx's *Capital*."

(add discussion)

Education

Waton, as some cursory sources (Ñº) indicate, is described as a Dr. and or rabbi, prolific author, and Marxism lecturer.

References

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External links

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- â— Harry Waton (1871-1959) (Dutch → English) – Spinoza.Blogse.nl.

θΔics

In genius studies, **Hart 100** refers to the 1978 ranked listing of the most influential persons in history, according to American astrophysicist Michael Hart (1932-), as found in his 1978 *The 100: a Ranking of the Most Influential Persons in History*, a book having been sold more than 500,000 copies and been translated into 15 languages. [1]

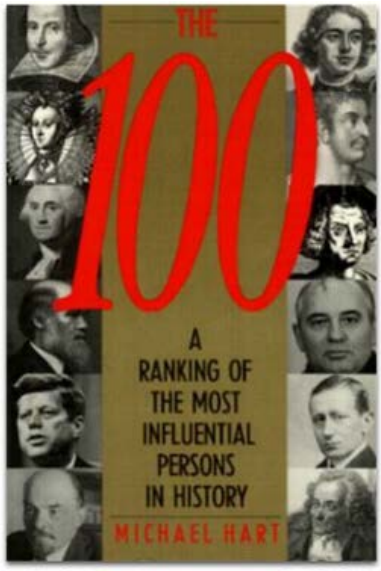

Cover of Michael Hart's ***The 100***. [1]

Introduction

The following is the logic behind Hart's listing:

> "In his book *Letters of the English*, Voltaire relates that during his stay in England, in 1727, he overheard some learned men discussing the question: who was the greatest man—Caesar, Alexander, Tamerlane, or Cromwell? One speaker maintained that Newton was beyond a doubt the greatest man. Voltaire agreed with this judgment, per the following reasoning:
>
> > 'It is to him who masters our minds by the force of truth, and not those who enslave them by violence, that we owe our reverence."
>
> Whether Voltaire was truly convinced that Newton was the greatest man who ever lived or was simply trying to make a philosophical point, the anecdote raises an interesting question: of the billions of human beings who have populated the earth, which persons have most influenced the course of history? This book is solely involved with the question of who were the 100 persons who had the greatest effect on history and on the course of the world. I have ranked these 100 persons in order of importance: that is, according to the total amount of influence that each of them had on human history and on the everyday lives of other human beings."

(add discussion)

Image

The following is a tier-ranked image of the Hart 100 (larger image: Ñº)

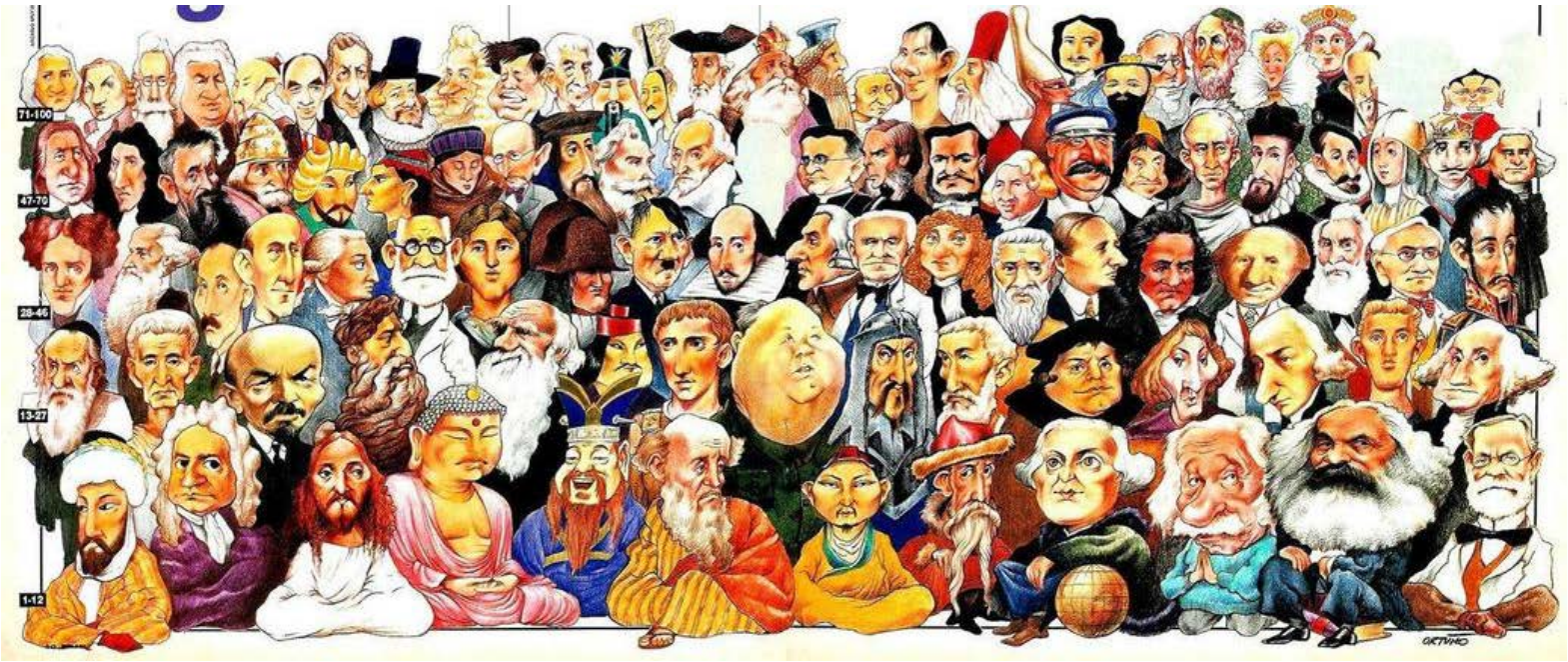

List

The following is Hart's ranked listing of most influential persons—with religio-mythology aggregates (e.g. Jesus Christ, Buddha, etc.), i.e. non-real people, removed (and re-listed below):

1. Isaac Newton
2. Ts'ai Lun [Cai Lun]
3. Johannes Gutenberg
4. Christopher Columbus
5. Albert Einstein
6. Louis Pasteur
7. Galileo Galilei
8. Aristotle
9. Euclid
10. Charles Darwin
11. Shih Huang Ti [Qin Shi Huang]

12. Augustus Caesar
13. Nicolaus Copernicus
14. Antoine Lavoisier
15. Constantine the Great
16. James Watt
17. Michael Faraday
18. James Maxwell
19. Martin Luther
20. George Washington
21. Karl Marx
22. Orville Wright & Wilbur Wright
23. Genghis Khan
24. Adam Smith
25. William Shakespeare
26. John Dalton
27. Alexander the Great
28. Napoleon Bonaparte
29. Thomas Edison
30. Antonie van Leeuwenhoek
31. William T.G. Morton
32. Guglielmo Marconi
33. Adolf Hitler
34. Plato
35. Oliver Cromwell
36. Alexander Graham Bell
37. Alexander Fleming
38. John Locke
39. Ludwig van Beethoven
40. Werner Heisenberg
41. Louis Daguerre
42. Simon Bolivar
43. Rene Descartes
44. Michelangelo
45. Pope Urban II
46. Umar ibn al-Khattab
47. Asoka
48. Augustine
49. William Harvey
50. Ernest Rutherford
51. John Calvin
52. Gregor Mendel
53. Max Planck
54. Joseph Lister
55. Nikolaus August Otto
56. Francisco Pizarro
57. Hernando Cortes
58. Thomas Jefferson
59. Queen Isabella I
60. Joseph Stalin
61. Julius Caesar
62. William the Conqueror
63. Sigmund Freud
64. Edward Jenner
65. Wilhelm Conrad Roentgen
66. Johann Bach
67. Voltaire
68. Johannes Kepler
69. Enrico Fermi
70. Leonhard Euler
71. Jean-Jacques Rousseau
72. Niccolo Machiavelli
73. Thomas Malthus
74. John F. Kennedy
75. Gregory Pincus
76. Vladimir Lenin
77. Sui Wen Ti
78. Vasco da Gama
79. Cyrus the Great
80. Peter the Great
81. Mao Zedong
82. Francis Bacon

83. Henry Ford
84. Queen Elizabeth I
85. Mikhail Gorbachev
86. Menes
87. Charlemagne
88. Homer
89. Justinian I

Removals | Non-real people

The following are religio-mythology aggregates exorcised from the list—numbers shown being original ranking position:

[1] Muhammad
[3] Jesus Christ
[4] Buddha
[5] Confucius
[6] St. Paul
[15] Moses
[73] Lao Tzu
[83] Mani
[84] Sui Wen Ti
[85] Mencius
[93] Zoroaster
[94] Mahavira

(add discussion)

References

1. (a) Hart, Michael. (1978). *The 100: a Ranking of the Most Influential Persons in History* (first 46-pgs, pdf) (Ñº). Hart Pub. Co.
(b) Michael H. Hart – Wikipedia.
(c) Malieth, Monydit (aka Tonnerre). (2013). *The Future Affects the Past: What Destination is Time Rushing To?* (pg. 58-59). Red Lead Books.

External links

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θΔics

In schools, **Harvard Pareto circle**, aka "Pareto circle" at Harvard, Pareto clique, Hendersonians, or "Pareto cult", as some liberals and Marxists pejoratively referred to it—not to be confused with any of the original Pareto schools or circles one might derive from original Lausanne school—refers to efforts of American physical chemist and physiologist Lawrence Henderson who, from 1932 up through 1942, worked to bring the dense physicochemical rational mechanics based economics and social theories of Italian engineer Vilfredo Pareto, integrated with newer chemical equilibrium views of American engineer Willard Gibbs, to bear on students and professors at Harvard University, humanities applied.

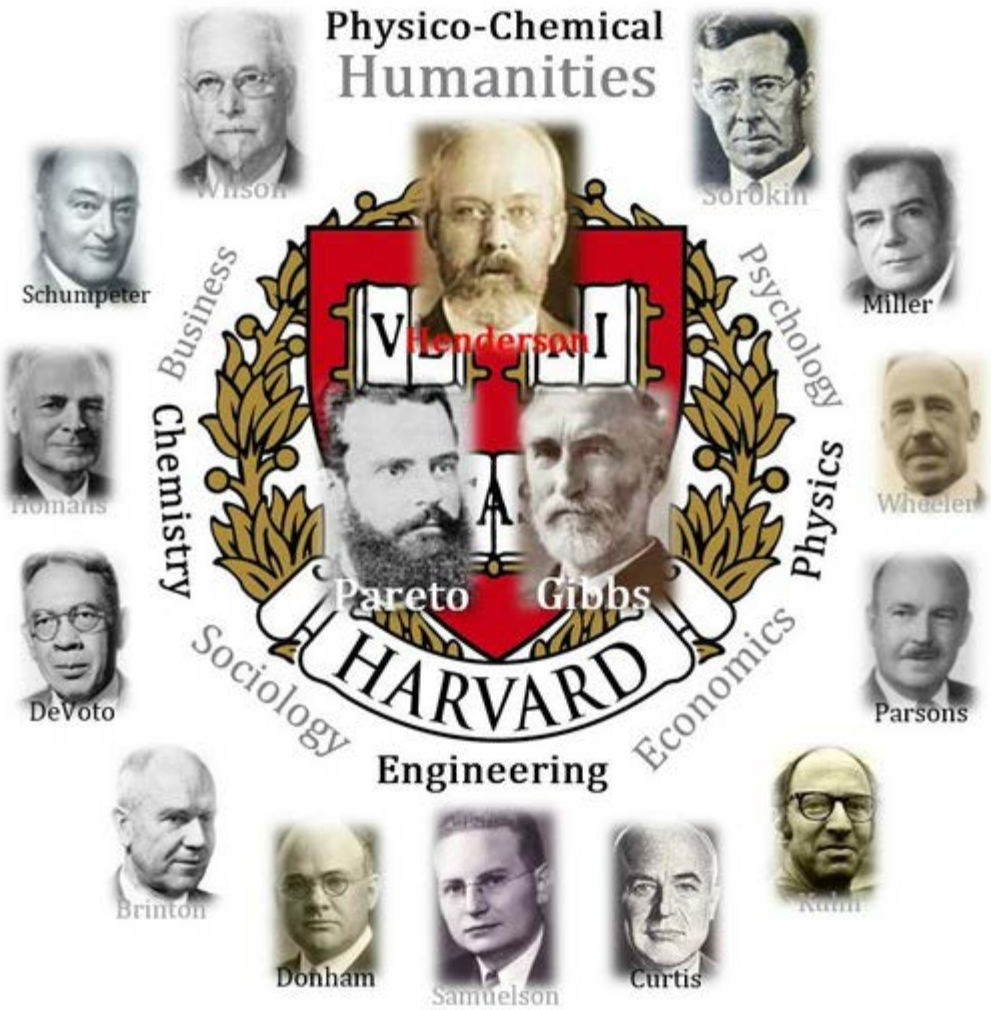

A depiction of the 1930s and early 1940s **Harvard Pareto circle** according to American sociologist Barbara Heyl, centered around the 1890s to 1910s work of Vilfredo Pareto, intermixed or rather upgraded with the "systems" based chemical thermodynamics equilibrium model work of Willard Gibbs, via the lead of American physical chemistry trained physiologist Lawrence Henderson. [1]

The "circle", as it was dubbed, included the notable individuals: George Homans, characterized by Leon Warshay as being "mechanistic", Charles Curtis, a good friend of Henderson who gave some assistance in running the two year course on Pareto, Joseph Schumpeter, Talcott Parsons, Bernard DeVoto, Crane Brinton, and Elton Mayo, who each, at Harvard University, attended the two-year (1932-34) seminar or course entitled "Pareto and the Methods of Scientific Investigation" run by Henderson on Italian engineer Vilfredo Pareto's unified large-scale modelling of socio-political phenomena and history, via the "society as a system of mutually interacting particles", making equilibrium adjustments. [1]

The combination of the start of WWII, the reaction end (death) of Henderson (1942), and a switch to Karl Marx based sociology and economics focus, admixtured with Max Weber, brought about a demise of the circle.

Wheeler → Henderson | Pareto | 1926

American psychologist Burrhus Skinner gives a rather detailed account of the *circa* 1926 origin or beginnings of the Harvard Pareto circle as follows: [23]

> "Pareto's influence had reached Harvard through a strange accident: Professor L.J. Henderson, who may be remembered longer for his *Fitness of the Environment* than for his pioneering work in the chemistry of blood, had ulcers. In the middle or late twenties he was recovering from an attack in a hospital in his beloved Paris [see: genius hiatus effect], when his friend William Wheeler, the entomologist, brought him a copy of Pareto's *Traite*. Henderson read it with complete absorption during the rest of his stay in the hospital and on the voyage back to America, and he returned to Cambridge a dedicated convert. He was then director of the Fatigue Laboratory at Harvard Business School, which was already involved in projects

very close to sociology and social anthropology, and he organized a series of seminars on Pareto.

> One of the friends with whom Henderson talked about Pareto was Bernard DeVoto, who was then teaching at Harvard. DeVoto had a young tutee of the class of 32 named George Homans. He told George that he should read Pareto, and George did—'at least the first volume' at that time, as he later reported. DeVoto [then] introduced George to Henderson, and because George had read Pareto, Henderson asked him to help in his seminar. And that was how George spent his first year out of Harvard—as an assistant to L.J. Henderson without pay."

(add discussion)

Etymology

In 1966, American equilibrium historian Cynthia Russett was referring to people who came under the influence of Lawrence Henderson's expositions on equilibrium—specifically a mixture of the hard version (Willard Gibbs based) and soft version (Walter Cannon based) of equilibrium, as she classified things—as adherents of 'Hendersonianism'. While she doesn't use the term "circle" or "school", in her chapter entitled 'Epogony', signifying follower or disciple, she gives the following group of Hendersonians: [14]

> "The roster of men who came under Lawrence Henderson's influence, whether as student, colleague, or friend, is long and distinguished. Among the Harvard faculty during the 1930s Henderson's views measurably affected Wallace Donham, Elton Mayo, Fritz Roethlisberger of the Harvard School of Business Administration; the historian Crane Brinton; and the historian and essayist Bernard DeVoto. The poet Conrad Aiken, the businessman Chester I. Barnard, author of the classic organizational study *The Functions of Executive*, and the lawyer and legal historian Charles Curtis, Jr. also acknowledged and intellectual debt to Henderson. George Homans and Talcott Parsons, both sociologists, and Eliot D. Chapple and Conrad Arensberg, anthropologists, absorbed some basic Hendersonian tenets."

In 1968, independent, it seems, of Russett, the term Harvard "Pareto circle" was introduced in by American sociologist Barbara Heyl, in the title of her article "The Harvard 'Pareto Circle'", which focuses on four specific individuals of the Henderson circle of influence: Henderson, naturally, followed by George Homans, Talcott Parsons, and Crane Brinton. The following is Heyl's diagram of the "Parato circle" timeline association diagram, of her four main players of interest, in respect to who attended the Pareto seminar (1932-34), the Society of Fellows meetings, and or the Saturday Club, each different groups at Harvard, wherein Pareto began to be discussed: [1]

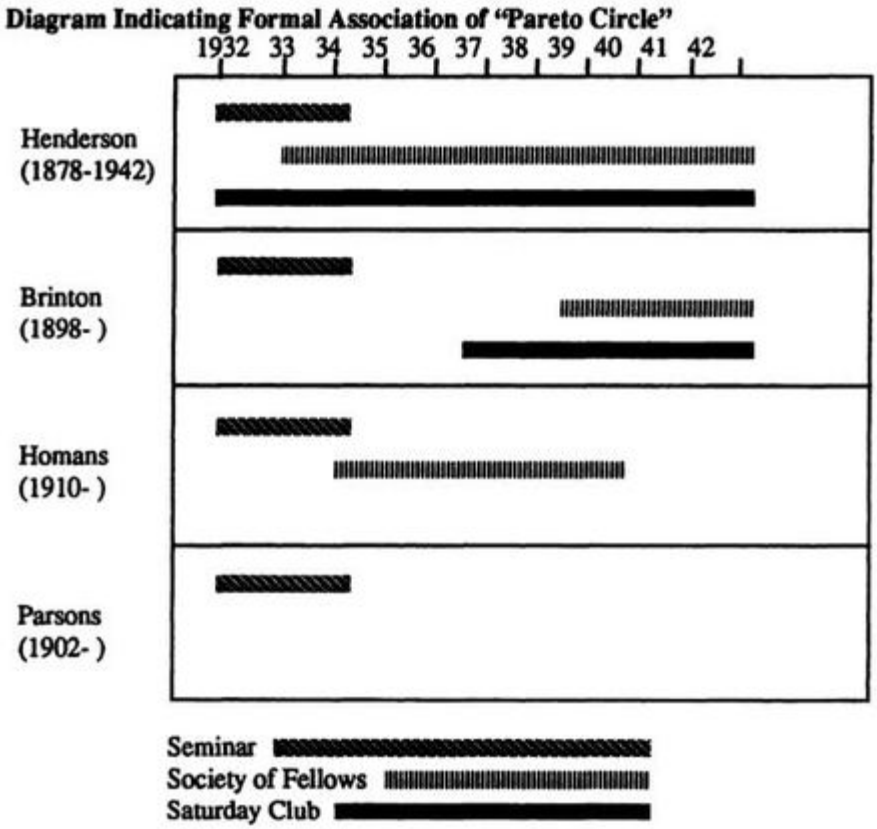

Soon thereafter, Heyl's article soon became "one widely cited article" (Joel Isaac, 2008), the term "Pareto circle" stuck, and Heyl's article currently (2014) is cited about 100 times in Google scholar.

Overview

In 2000, American sociologist Steve Fuller, in his chapter subsection "The Harvard Strategy for Resisting a New Deal for Science", gives a rather cogent nuts and bolts summary the Pareto circle: [5]

> "**Harvard's Pareto Circle**, which was convened from 1932 to 1942, spawned a theory of revolution that stressed, true to the original Latin, a 'turning back', a restoration of natural order. The circle's convener was the practicing biochemist, certified physician, and amateur sociologist Lawrence Henderson. Among the circle's members were the future luminaries of sociology as Talcott Parsons, George Homans, and Robert Merton, as well as intellectual historian Crane Brinton, and occasionally Joseph Schumpeter, who had taken up a professorship at Harvard in 1932. The official charge of Henderson's group was to discuss the ideas of the Italian founder of modern sociology, the political economist Vilfredo Pareto, and independently wealthy scholar of encyclopedia ambitions and Machiavellian dispositions."

Fuller goes on to comment how Benito Mussolini regarded Pareto as such a formative influence on his own fascist ideology that he

Harvard Paretians

(Hendersonians)

1.	Lawrence Henderson	Physical chemist
2.	Talcott Parsons	Sociologist
3.	Joseph Schumpeter	Economist
4.	Charles Curtis	Legal historian
5.	George Homans	Sociologist
6.	Bernard DeVoto	Historian
7.	Wallace Donham	Business scholar
8.	Crane Brinton	Historian
9.	Pitirim Sorokin	Sociologist
	Bernard Barber	Sociologist
10	Elton Mayo	Industrial psychologist
11.	Fritz Roethlisberger	Business scholar
12.	Conrad Aiken	Poet
13.	Chester I. Barnard	Businessman
14.	Eliot D. Chapple	Anthropologist
15.	Conrad Arensberg	Anthropologist
16.	Robert Merton	Sociologist

made Pareto a peer in Italy's House of Lords; that people in the middle third of the twentieth century often referred to Pareto as the "Marx of the master class" and one of the founding fathers of sociology, along with Karl Marx, Emile Durkheim, and Max Weber; that Pareto, supposedly, was inspired by Machiavelli's distinction between two types of human instincts, one oriented toward tradition (lions) and one toward innovation (foxes), and that this is from where he gets his circulation of elites theory, in part, from; and that Harvard chemist (1916) turned Harvard president (1933) James Conant—whose uncle-in-law was Henderson—and his recruitment of Thomas Kuhn resulted in Kuhn becoming a vicarious Pareto theorist in influence; among other footnoted details.

17. Thomas Kuhn	Paradigm scholar
18. C. Wright Mills	Sociologist
19. Henry Murray	Psychologist
20. Clyde Kluckhohn	Social anthropologist
21. William Wheeler	Entomologist
22 Edwin Wilson	Polymath
23. Paul Samuelson	Economist
24. James Miller	Psychologist

In 2008, English American history scholar Joel Isaac, in his "The Harvard Pareto Circle Revisited" seminar paper, refers to Heyl's article as a "one widely cited article", and summarizes the subtleties of the Pareto connection epicenter at Harvard quite well, as follows: [2]

> "The **Harvard 'Pareto circle'** occupies a peculiar position in the history of modern social thought. On the one hand, the band of Harvard University students and faculty members that embraced Pareto's *Trattato di Sociologia Generale* for a relatively brief moment in the 1930s is frequently identified as the source of several, usually conservative, traditions of inquiry in the American social sciences. The origins of structural-functional sociology, organization theory, industrial psychology, and the history and sociology of science have been traced to the Pareto vogue in Depression-era Cambridge.
>
> On the other hand, however, the historical footprint of the circle is by all accounts slight. Even those who credit the Harvard Paretians with considerable feats of ideological innovation point only to desultory examples of their activities in the precincts of Harvard Yard: a seminar here, a letter there. As a consequence, much of the scholarly literature on the Pareto circle concerns itself with tracing lines of influence through a relatively narrow set of published texts. The clinching move of such studies is usually the demonstration that this or that seminal figure—Talcott Parsons, say, or Thomas Kuhn—has deployed a particular concept from the Paretian armoury: "system," "equilibrium," "the circulation of elites," and so on."

Isaac, after stating that, in his view, the Pareto circle is much larger than Heyl describes, states that the reason for writing his symposium paper is to overturn Fuller's earlier "political reading" of Pareto, as he calls it. Isaac also lists the following as having attended the symposium: Thomas North Whitehead, Hans Zinsser, Clyde Kluckhohn, W. Lloyd Warner, Henry Murray, Robert K. Merton, William Foote Whyte, and Kingsley Davis.

Assimilation

Many of the Pareto workshop attendees would later go onto employ and profess what they had learned in followup publications. Industrial psychologist Elton Mayo, in his 1933 *The Human Problems of an Industrial Civilization*, for example, stated the following: [20]

> "The physiologists have found that work can continue to be performed only in a 'steady state', only for so long as an inner equilibrium is maintained between a large number of mutually dependent variables."

Anthropologist Eliot Chapple, in association with Carleton Côôn, in their 1942 *Principles of Anthropology*, state the following: [21]

> "Every institution, political or otherwise, must necessarily work out an equilibrium, if it is to survive."

Moreover: [21]

> "Human history is a record of continual change in the adjustments of people and of institutions, of continuous shiftings of states of equilibrium."

Sociologist Talcott Parsons seems to have been the one to carry forward the torch of equilibrium the most. In his 1951 *The Social System*, he supposedly outlined the view that of equilibrium as the tendency of systems to maintain certain stable patterns of activity and interaction among their component parts, a stability that enables systems to maintain their boundaries relative to their environment. Parson's defined equilibrium as follows: [22]

> "Equilibria is the empirically observed pattern constancies of a boundary-maintaining system."

Moreover: [22]

> "The denial of [equilibrium's] legitimacy in the conceptual armory of social science is at the least, in my perhaps not very humble opinion, symptomatic of the denial that social science itself is legitimate, or realistically possible."

Here, interestingly, we see Parsons devoting definitional focus to the boundary problem. In this period, Parsons played an active role in the Macy conferences (1946-1953) on systems theory, and began to read the works of Norbert Wiener and Ross Ashby.

The assimilation of the equilibrium models into the mind of sociologist George Homans is an interesting case study. Adrift after graduating from Harvard in the depression year of 1932, Homans accepted an invitation of Henderson to sit in on his first series of seminars on Pareto. Toward the end of the conference, in 1934, lawyer Charles Curtis, a friend of the Homans' family, also an attendee of the seminar, suggested that they collaborate on an exposition of Pareto's sociology. The result was the 1934 *An Introduction to Pareto*. At this point, it seems, Homans gave what seems to be summaries of what he had just absorbed, e.g. "most societies at most times" have a tendency to be in equilibrium. Sixteen years later, at the time of his 1950 *The Human Group*, Homans had grown more, and he had begun to rethink his earlier formulations of equilibrium. He now wrote: "some social groups under some circumstances" are in equilibrium. Moreover:

> "Not every state of a social system is a state of equilibrium, nor does every social system 'seek' equilibrium."

In 1961, at the time of publication of his *Social Behavior: its Elementary Forms*, his views diverted even more: (Ñº)

> "Equilibrium is not a state toward which all creation moves."

Here, it seems, Homans is grasping with vestiges of coupling theory? Or possibly, on a remote chance, he had begun to read up on nonequilibrium state theory and or nonequilibrium thermodynamics? We also, to note, see possible

religiously coded phrasing, namely "creation", being employed. Interesting turn of mind, nevertheless.

Marx vs Pareto | WWII → Weber

In the early 20th century, Vilfredo Pareto was often referred to as the “Marx of the bourgeoisie”, “Marx of the master class”, or “Karl Marx of the bourgeoisie or of fascism” (Henderson, 1935), and in this sense, Pareto was employed as an alternative to Marxism or Karl Marx dominated sociology. The following diagram shows the general difference between Paretism (left) and Marxism (right), the social structure view advanced by Pareto being one of a social pyramid spinning top, filled with people conceptualized as molecules, in which elites circulate based on their respective level of agitation, the social structure advocated by Karl Marx, being one of a equal level social structure, filled with people likewise conceptualized as molecules, albeit ones conceptualized as all being equal in wealth, work output, and ideology: [17]

vs.

→

Karl Marx (1818-1883) | Vilfredo Pareto (1848-1923) | Max Weber (1864-1920)

In the 1930s, "Marxism" or equal workers in a one level workers state theory was in vogue at Harvard. The alternative, emerging in 1932, was "Paretism" or unequal workers (work based on individual level of agitation) in spinning social pyramid theory. [18] The two theories frequently collided in debate at Harvard in the period 1932 to about 1942, after which Paretism fell off in place of a growing attachment to the theories of Max Weber.

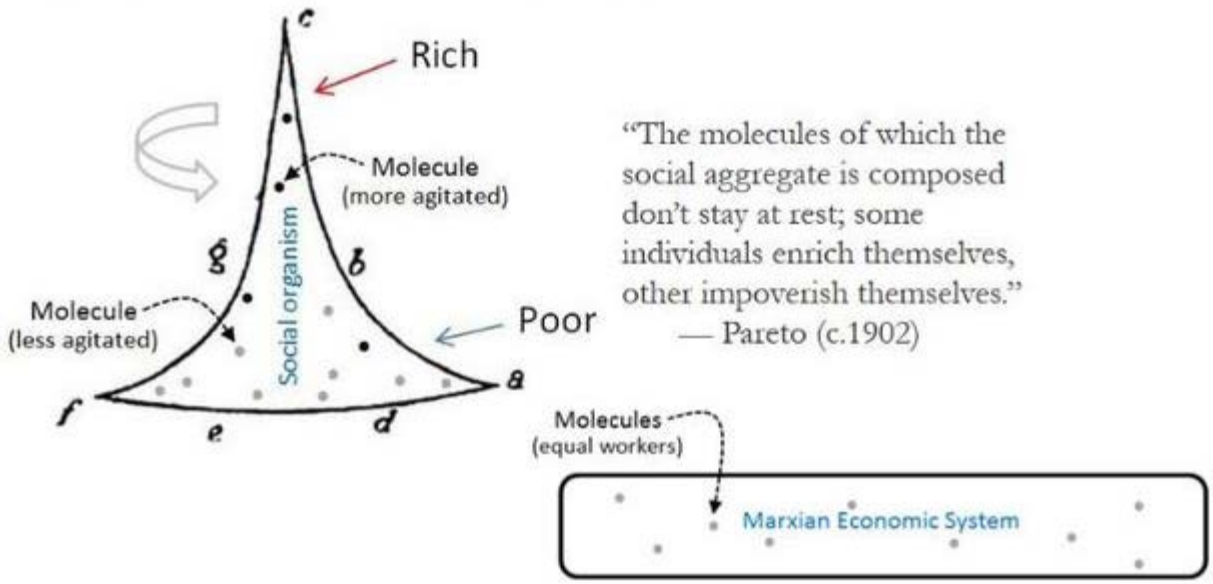

In the 1930s, according to Barbara Heyl, the Marxist framework was particularly in vogue; but Pareto’s writings posited a comparable albeit alternative grand historical theory to the Marxist approach. American sociologist George Homans wrote the following about this: [16]

> “As a Republican Bostonian who had not rejected his comparatively wealthy family, I felt during the thirties that I was under personal attack, above all from the Marxists. I was ready to believe Pareto because he provided me with defense.”

American historian Crane Brinton, likewise, wrote the following: [16]

> "At Harvard in the thirties there was certainly, led by Henderson, what the then Communists or fellow-travelling or even just mild American style liberals in the University used to call 'the Pareto cult.' The favorite smear phrase for Pareto was 'Karl Marx of the bourgeoisie.' The Pareto cult was never one that influenced a majority of the faculty, but it had fairly wide repercussions."

Heyl summarizes that the Marxists and Paretans frequently confronted one another at Harvard in the thirties, and that many tended to embrace Pareto's ideas, if not in reaction to the prevailing Marxist notions on campus, as a useful defense in debate against them. The zeal of Henderson-Pareto model, however, for some reason, lost fuel during the course of WWII (1939-45), after which a switch to focus on a Max Weber (in place of Pareto) based sociology occurred as the alternative to Marxism. [15]

American sociologist Talcott Parsons (1968) gave his opinion that the reason for the fall off of Pareto-interest, after WWII, was scientific limitation: [18]

> "Most of the neglect of Pareto stems from the scientific limitations of subsequent generations of sociologist rather than from his irrelevance to their interests."

This seems cogent. With the passing (reaction end) of Henderson in 1942, there was no one *qualified*—a physical chemistry and or chemical thermodynamics background needed at a minimum to translate Pareto's ideas into the language of reaction equilibrium physical chemistry and modern Gibbsian thermodynamics—and *capable*—Henderson spent the years 1926 to 1932 absorbing the corpus of Pareto's works (~10 volumes)—enough to lead the way further; hence, into the mid 1940s the wake of the Henderson-driven wave began to reside.

Henderson | Sorokin

American economist Roy Weintraub, in his 1991 *Stabilizing Dynamics: Constructing Economic Knowledge*, has documented a certain number of background letters illuminating connections between Edwin Wilson, Paul Samuelson, Pitirim Sorokin, and Joseph Schumpeter, all Pareto circle members, with a very interesting discussion on how Wilson taught or was attempting to teaching some type of physical chemistry and or thermodynamics based economics course. [6] Firstly, quoting from George Homans 1984 autobiography, we find the following: [7]

Mechanistic

Lawrence Henderson (1878-1942)

vs.

Anti-Mechanistic

Pitirim Sorokin (1889-1968)

Russian-born American sociologist Pitirim Sorokin, with his anti-social mechanism position, was the sole arguer, in opposition to American physical chemist Lawrence Henderson, and his Pareto-based physicochemical mechanics model of society.

> "The seminar met for a couple of hours late in the afternoon for the better part of the academic year in, I think the junior Common Room of the Winthrop House. Henderson worked slowly through the *Traite*, providing his exegesis of selected passages. After each of these he would ask for questions. If there were none, he would go on.
> Except from Sorokin, I do not remember there was much argument. Toward the end of the first year of the seminar Charlie Curtis approached me and suggested that we collaborate in writing an introduction to Pareto's sociology for American readers."

The mention of Pitirim Sorokin being the sole arguer in this 1932-33 seminar would certainly have been something to see. A mere skim of Sorokin's 1928 opening chapter "The Mechanistic School" (see: mechanistic school), of his *Contemporary Sociology*, a full on assault of any and all type of social mechanism theory, is indication of how much he heatedly objected to any and all types of social physics, social mechanics, social chemistry, and social thermodynamics. [9] Sorokin, to the end, it seems was anti-physical science, when it came to sociology. In his 1936 presidential address

before the Internal Congress of Sociology, in a paper entitled "Le concept d'equilibre: est-il necessaire aux sciences socialies?", Sorokin became very explicit about this: [19]

> "Equilibrium appears to me inadequate and represents a liability rather than an asset in the social sciences, and for this reason, should be dropped rather than used in these disciplines. We must cut short this imitation of the physico-chemical, and even in part biological, sciences, we must acquire the autonomy to speak a language which is not distorted by borrowings from the other natural sciences."

The only person who would seem to comes close to Sorokin, in his heated rage against the physical science based sociologies, is Austrian sociologist Werner Stark (1962). [10]

It would have been quite a sight to see, Henderson and Sorokin going head to head, to say the least. The battle would have amounted, as an approximate estimate, to a physicochemical mechanism bulldog (Henderson) going against a vitalism bulldog (Sorokin); though, to note, it remains to be discerned to what exactly Sorokin was so vehemently objective about, whether it be the "mechanism-vitalism alteration and the theory of abiogenesis" as Robert Merton (1933) communicated with Sorokin about, whether it was some type of hidden religious or free will objection, or whether it had to do with bubbling hatred of the historical materialism of the Karl Marx variety, being that Sorokin, prior to becoming the founding chairman of the Harvard sociology department, was imprisoned three times by the Czarists, three times by the Bolsheviks, and released from the death sentence by Vladimir Lenin himself (Ñº); or possibly it was another issue yet to be discerned.

The book proposal referred to above by Homans, to note, resulted in the 1934 *An Introduction to Pareto: His Sociology*. [8]

Wilson | Schumpeter | Samuelson

In any event, on 23 Mar 1934, American mathematician Edwin Wilson, the famous sole protégé of Willard Gibbs, wrote to Harvard economics chairman Harold Burbank, the following: [6]

> "I should not attempt to teach economics but simply mathematical economics, which in many respects is a different thing. I couldn't teach the steam engine, but I have taught thermodynamics and the analogy is about the same."

Edwin Wilson (1879-1964)

Joseph Schumpeter (1883-1950)

Paul Samuelson (1915-2009)

In the 1930s, at Harvard, American polymath Edwin Wilson taught a physical chemistry based economics course, the nature of which he discussed via letter exchanges with Joseph Schumpeter, the product of which was American economist Paul Samuelson, to took these ideas to heart, in the writing of his economics theories.

Wilson's course for economics, described here, as Weintraub speculates, was "most probably a course either taken by Samuelson or whose readings were studied by Samuelson."

Burbank, to note, was the one who would later deny Paul Samuelson a position at Harvard, because he disliked people who were "smart, Jewish, or Keynesian", as Samuelson's colleague Robert Solow commented, had an intense aversion to mathematical economics, and would later order the hand-set plates to Samuelson's prize winning dissertation destroyed after 1,500 copies, meaning that no revisions would be possible for the next 35-years.

On 19 May 1937, Austrian-born American economist Joseph Schumpeter gave the following opinion to Wilson in letter: [12]

> "I perfectly agree with those who object to the practice of some economists, simply to copy out what they believe is an economic argument from textbooks of pure or theoretical mechanics or physics, and I hope you will not interpret what I am to say in the sense of that practice … We must not copy out actual arguments but we can learn from physics how to build up an exact argument. Most important of all is the consideration that there are obviously a set of concepts and procedures which, although belonging not to the field of pure mathematics but to the field of more or less applied mathematics, one of so general a character as to be applicable to an indefinite number of different fields. The concepts of potential, or friction or inertia are of that kind."

In 1938, Wilson communicated the following to Burbank in letter:

> "Schumpeter has suggested that it would be particularly well for me to give as I gave last time a general theory of equilibrium such as this is understood by physical chemists including the phase systems of Willard Gibbs. Most of our equilibrium theory in economics really has for its background the notions of equilibrium which arise in mechanics. Although Pareto was certainly quite familiar with the types of equilibrium which arise in physical chemistry and are necessary in fact for the study of the steam engine he doesn't use this line of though in economics."

Here, to clarify, while it is true that Pareto, in his *Treatise on General Sociology*, did use the term "chemistry" on 41 pages and "thermodynamics" on 16 various pages, he only uses or rather grapples with the more complex term "entropy" once, namely in the fourth volume, which is the key term one would have to grapple with if he or she was so inclined to attempt to reformulate the general equilibrium theory of economics in "thoroughly thermodynamic terms", as American science historian Hunter Heyck (2005) seems to intuit. [11] In short, Wilson, in his assertion that Pareto, in the 1910s drafting period of his treatise, was "quite familiar with the types of equilibrium which arise in physical chemistry", is a bit overzealous; physical chemistry was barely a field at this time, and modern equilibrium chemical thermodynamics would not arise until the decades to follow 1923, when Gilbert Lewis published his thermodynamics textbook, making Gibbs work available to chemists as a tool.

Of note, as Weintraub points out, Wilson, the same day in 1938, also writes the following to Pitirim Sorokin:

> "It has always seemed to me that the analogies used by people in the social sciences which were drawn from physics were limited to mechanics. In the early days physical chemistry was treated on the analogy to mechanics and the treatment was most often awkward and ignored some of the most striking phenomena. It was only with the slow infiltration of Gibbs' notion about the phases into the general teach about physical chemistry that physical chemists came to extend equilibria and quasi-equilibria on a broader basis than they could be understood form mechanical analogies. I am inclined to believe that sometime in the discussion of social phenomena it [may be] necessary to have some concepts even more general than that of the phase system."

Ten days later, Wilson wrote the following to Samuelson with critical comments on a paper by Samuelson:

> "Moreover, general as the treatment is I think that there is the possibility that it is not so general in some respects as Willard Gibbs would have desired. [In] discussing equilibrium and displacements from one position of equilibrium to another position [Gibbs] laid great stress on the fact that one had to remain within the limits of stability. Now if one wishes to postulate the derivatives including the second derivatives in an absolutely definite quadratic form one doesn't need to talk about the limits of stability because the definiteness of the quadratic form means that one has stability. I wonder whether you can't make it clearer or can't come nearer following the general line of ideas [that] Gibbs has given in his *Equilibrium of*

Heterogeneous Substances, equation 133."

The very impressive mention of "equation 133", from Gibbs' subsection "Internal Stability of Homogeneous Fluids as indicated by Fundamental Equations", is the following:

$$U - TS + PV - M_1 m_1 - M_2 m_2 ... - M_n m_n$$

Wilson, in other words, is suggesting, as it seems to be, to Samuelson that he use the Gibbs fundamental equation to formulate a theory of economic stability. Very hilarious indeed. Even the best of the best top dozen of the three dozen or so known human free energy theorists have been barely able to get a handle on this very intricate problem. No wonder Samuelson, into the 1970s, would become so irritated when people queried him about entropy and or sent him entropy-based economic papers to look at.

Gibbs circle in economics

Related, in a way, to the so-called Harvard Pareto circle, is what American economist Paul Samuelson referred to as the "Gibbs circle in economics", as follows in the opening page of his 1989 symposium presentation "Gibbs in Economics": [13]

> "My title could just as aptly have been: **'The Gibbs Circle in Economics'**. It would of course have begun in New Haven with Irving Fisher at its epicenter. Edwin Wilson, Gibbs' last protégé, transported his tradition to MIT and Harvard. Lawrence Henderson, Harvard physiologist turned philosopher and zealot for Pareto's sociology, was not quite an economist but he did proselytized for Gibbsian equilibrium in blood and elites. Wilson was my master, first among equals. Through his lineage I could claim Gibbs as my grandfather; and when my first PhD student Lawrence Klein came to generalize the Le Chatelier's principle to quadratic forms of statistical variances, this Nobelist could claim rights to the apostolic succession."

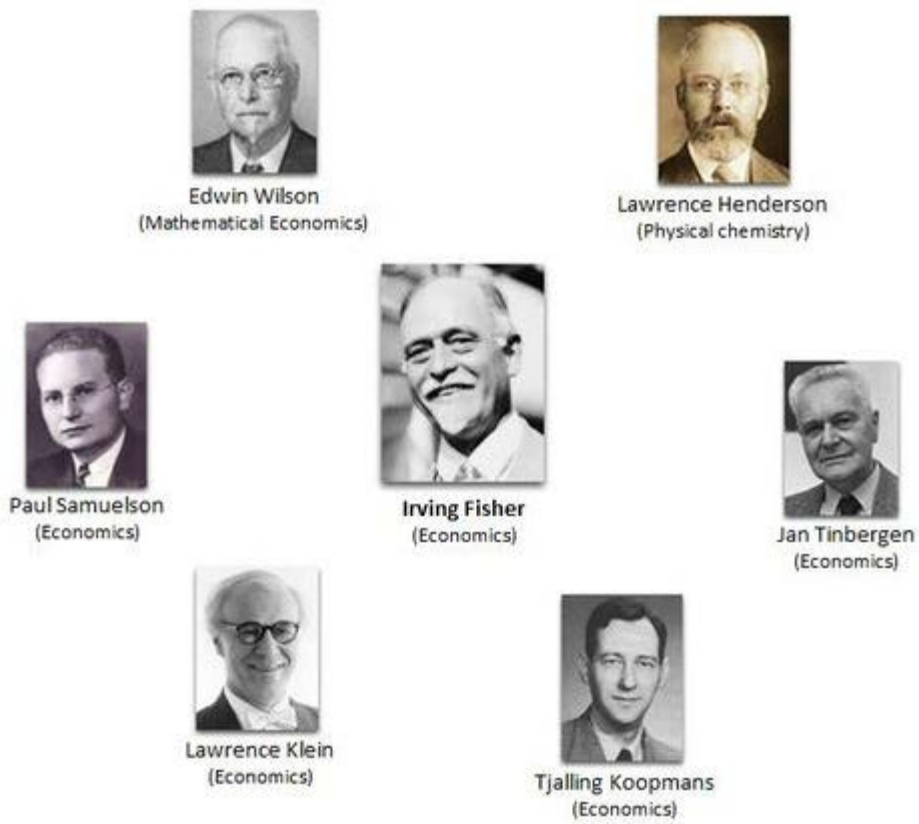

The so-called **"Gibbs circle in economics"**, with Irving Fisher at the epicenter, flanked above right by Lawrence Henderson, and clockwise: Jan Tinbergen, Tjalling Koopmans, Lawrence Klein, Paul Samuelson, and Edwin Wilson, all Gibbsian proselytes, according to Samuelson (1989), in that each built their economics models on or via influence of the thermodynamics work of Willard Gibbs. [13]

To this group, Samuelson adds in Jan Tinbergen and Tjalling Koopmans as two Nobel laureates in economics who showed Gibbsian Influence. Roy Weintraub, who completed his PhD in mathematical economics under Klein, would also seem to be grouped here.

Quotes

The following are related quotes:

"Pareto's *Trattato di Sociologia Generale* [*Treatise on General Sociology*] is the hardest boiled book I have ever read. Three times, since I passed my puberty, has my mind been made over. Once by a nexus of which Henry Adams was the center, once by a matrix of which Frazer burned brightest, and once by a long study of genetics and evolution. Pareto is doing the job a fourth time, and far more vitally than any others."

— Bernard DeVoto (1928) [3]

"The **circle** is completed, and virtually unbroken: Gibbs to Wilson, Gibbs to Henderson, Poincare to Birkhoff, Pareto to Henderson, energetics to Lotka to Wilson—roll them all together in the **Harvard** of the 1930s, add one young scientifically open-minded Samuelson eager to please his senior fellows, simmer in the Society of Fellows, and the *Foundations* emerges, contingent as it must be on its contents."

— Roy Weintraub (1991), On Wilson in respect to the Harvard Pareto circle [6]

"It appears that Homans early involvement with Pareto and the locally influenced **'Pareto Circle'**—along with his own talent and hard work—were the keys to his successful rise at Harvard. Shocking as it may now seem, in 1945 key decision makers felt that Homans' Pareto-influenced scholarship in *English Villagers* demonstrated that he was clearly superior over other candidates [e.g. Samuel Stouffer and Robert Merton] for permanency."

— Lawrence Nichols (2006). "The Rise of Homans at Harvard: Pareto and the *English Villagers*" [4]

See also

â— Epicenter genius | Newton's circle
â— Lewis school | University of California, Berkeley | Lewis' orbit
â— Two cultures synergy

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In information thermodynamics, **Harvey S. Leff** (1937-) is an American physicist noted for his 1990 book *Maxwell's Demon*, on entropy and Maxwell's demon as discussed in computing, and for 1996 'energy spreading' theory of entropy, which in circa 2000 he seems to have infused American organic chemist Frank Lambert's 'energy dispersal' theory of entropy, to promote in chemistry teaching textbooks. [1]

Education

Leff completed his BS in 1959 at the Illinois Institute of Technology and his MS in 1960 at Northwestern University, both in physics. He completed his PhD in physics at the University of Iowa in 1963 with a dissertation on "Statistical Theory of Energy-Level Spacing Distributions for Complex Spectra". [2] Leff currently is physics professor emeritus at California State Polytechnic University, Pomona.

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Further reading

● Leff, Harvey S. (2007). "Entropy, Its Language, and Interpretation", *Found. Phys.* 37:1744-66.
● Leff, Harvey S. (2012). "Removing the Mystery of Entropy and Thermodynamics—Part I" (abs), *The Physics Teacher*, Jan, 50(1):28-31.
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External links

● Leff, Harvey S. (1937-) – WorldCat Identities.

θΔics

In human chemistry, the term **hate** signifies an intense aversion to someone or something, described quantum electromagnetically as an effect or force of repulsion. [1] In human chemical bonds, "hate" or the quantum stability effect mediated by the psychological effect of the phenomenon is a necessary component in bond stability, generally quantified in a 5-to-1 ratio (Gottman stability ratio) of love-to-hate or attraction-to-repulsion in stable long-term marriage bonds. [2]

SBT scale

The range of attraction (like) or repulsion (dislike) effects mediated by "force exchanges" in human life, e.g. a smile or a frown, exists as a gradient on a range of extreme repulsion to extreme attraction:

-4	-3	-2	-1	0	+1	+2	+3	+4
Hate with a Passion	Hate	Extremely Dislike	Don't Like	Ambivalent	Like	Like a Lot	Love	Love with a Passion

Situational Bond Type Scale

The numbers shown, represent a gradient on a nine-point situational bond type (SBT) scale, numbers which can be used to quantify the "set" of over-lapping attraction and repulsion forces existing in any given human bond. [1]

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (ch. 16 "Attraction and Repulsion", pgs. 147-182). Morrisville, NC: LuLu.
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θΔics

In Egyptian mythology, **Hathor** (Greek rescript: Aphrodite; Roman rescript: Venus), from Hat- "House, domain, or temple" + -Hor "Horus", aka House of Horus (Q), is the mother goddess and or goddess of love, worshiped from c.3000 BCM to 400 ACM, often depicted as a cow, conceptualized as the sky (see: destruction of mankind), or a cow goddess with horns; she is the daughter of Ra, and in ancient times, prior to the rise of popularity of the Osiris legend, she was considered the mother of Horus, after which Isis became the mother of Horus, wherein Hathor was relegated to role of a protective mother like figure of Horus as well as all Egyptian pharaohs. [1]

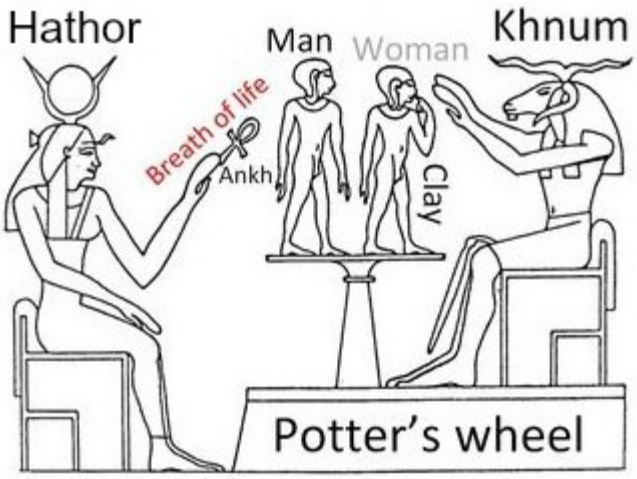

A depiction of **Hathor** using the ankh to input the power of life into human clay figures (see: clay creation myth) made by the god Khnum on his potter's wheel, which is one of the oldest origin of life theories.

Milky Way

In astro-theology, Hathor was conceptualized as being symbolic of the Milky Way star constellation, which was thought to be mirrored as the Nile River on earth, her amniotic fluid breaking forth at birth, thought to be played out as the annual Nile River flood and the "birth of the sun" or Horus (or Ra) as sun god, or something to this effect (Q); the following is the Egyptian view of Hathor as the Milky Way conceptualized such that the sun, either as Horus or Ra, depending on period, is going through her body, at night, only to be reborn in the morning:

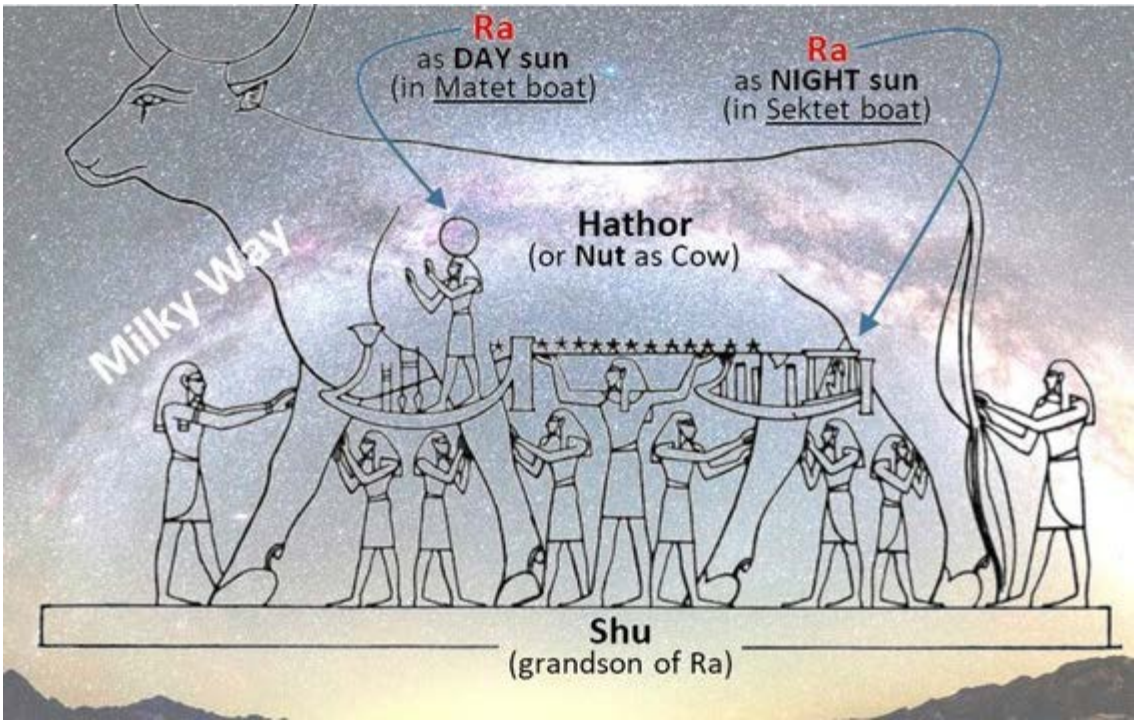

(add)

Christianity

The rescript of Hathor into the Judaeo-Christianity story is a bit elusive (Q); but generally she becomes the power of love or life, or something to this effect, in the sense of her as Eve meaning "breath or spirit" in Hebrew (Massey, 1907) (Q) .

References

1. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (pg. 97). Facts on File, Inc.

External links

- Hathor – Ancient.eu.
- Hathor – Wikipedia.

θΔics

In genius rankings, **Haught disbeliever** refers to American writer James Haught's 1996 listing of the top 64 disbelievers, an admixture of either famous atheists and or famous doubters in the existence of god, over the last 2,000-years, as found in his *2000 Years of Disbelief: Famous People with the Courage to Doubt*. [1] The notation (HD:#), e.g. Shakespeare (HD:4), refers to the Haught disbeliever ranking #, listed below, of the person cited.

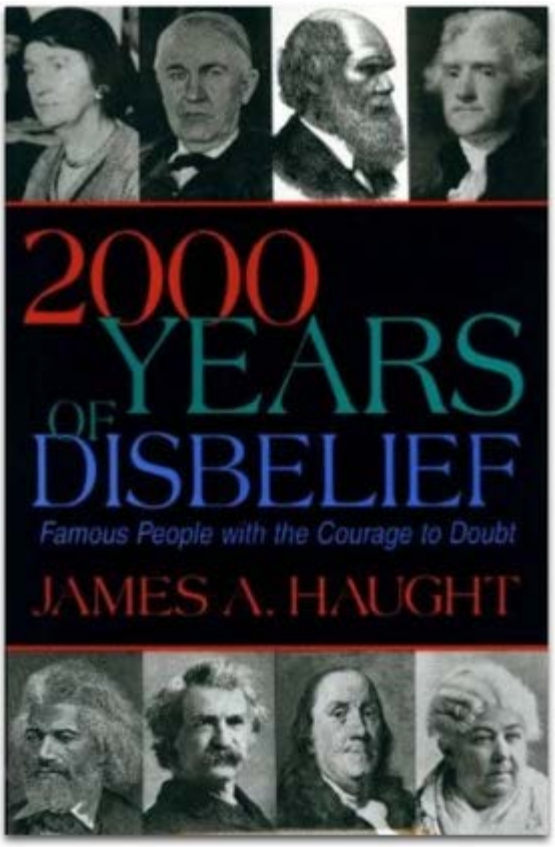

American writer James Haught's 1996 book *2000 Years of Disbelief: Famous People with the Courage to Doubt*, wherein he devotes three page sections to 66 main "disbelievers" of history, listed below, with summary and quote selections. [1]

Research

Haught's *2000 Years of Disbelief*, lists over one-thousand disbeliever related quotations, which he says he procured over the course of three decades, from scores of books, anthologies, and collections, and other sources. His main citation staples are the following:

- Buckner, Edward M. and Buckner, Michael E. (1993). *Quotations That Support the Separation of Church and State*. The Atlanta Freethought Society.
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- Greeley, Roger E. (1988). *The Best of Humanism*. Prometheus Books.
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- Peter, Laurence J. (1977). *Peter's Quotations: Ideas for Our Time*. William Morrow & Co.
- Seldes, George. (1960). *The Great Quotations*. Lyle Stuart.
- Vernon, Thomas S. (1989). *Great Infidels*. M&M Press.
- Wilcox, Laird and George, John. (1994). *Be Reasonable: Selected Quotations for Inquiring Minds*. Prometheus Books.

(add summary)

List

The following is James Haught's listing of the top 64 disbelievers, i.e. famous people with the courage to doubt, over the last 2,000-years:

Early Rationalism

1. Omar Khayyam

The Renaissance

2. Michel Montaigne
3. Christopher Marlow

4. William Shakespeare

The European Enlightenment

5. Thomas Hobbes
6. Benedict Spinoza
7. John Locke
8. Charles Montesquieu
9. Voltaire
10. David Hume
11. Denis Diderot
12. Edward Gibbon

American Rationalists

13. Benjamin Franklin
14. John Adams
15. Thomas Paine
16. Ethan Allen
17. Thomas Jefferson
18. James Madison

19th Century

19. Johann Goethe
20. Napoleon Bonaparte
21. Arthur Schopenhauer
22. Percy Shelley
23. Ralph Emerson
24. John Mill
25. Abraham Lincoln
26. Charles Darwin
27. Charles Dickens
28. Elizabeth Stanton
29. Henry Thoreau
30. George Eliot
31. Matthew Arnold
32. Thomas Huxley
33. Leo Tolstoy
34. Robert Ingersoll
35. Mark Twain
36. Charles Swinburne
37. John Burroughs
38. William James
39. Ambrose Bierce
40. Friedrich Nietzsche

Early 20th Century

41. Thomas Edison
42. Luther Burbank
43. Elbert Hubbard
44. Sigmund Freud

45. Bernard Shaw
46. Clarence Darrow
47. Francisco Ferrer
48. John Dewey
49. George Santayana
50. William Du Bois
51. Bertrand Russell
52. Albert Einstein
53. Henry Mencken

Mid and Late 20th Century

54. Margaret Sanger
55. Will Durant
56. Walter Lippmann
57. Langston Hughes
58. Ayn Rand
59. Jean-Paul Sartre
60. Alfred Ayer
61. Isaac Asimov
62. Gene Roddenberry
63. Steve Allen
64. Kurt Vonnegut

(add discussion)

See also

- Atheism timeline

References

1. (a) Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt*. Prometheus.
(b) James A. Haught (publications) – Wvinter.net.
(c) James A. Haught (about) – UUHumanistSymposium.com.

θΔics

In hmolscience, **Hauptmann**, from the German haupt- “head, main” + -mann “man”, means “head man”, which is the German word for “Captain” in the English equivalent.

Elective Affinities

In 1809, Goethe, in his coded novel *Elective Affinities*, in one of his many layered puzzles, does a double word play on the character “Captain”, who is symbolized by the chemical letter C, in Bergman reaction notation, and also referred to as “Hauptmann”, which, when combined with the characters: Charlotte [C], Hauptmann [H], Edward [E], Mittler [M], becomes the root CHEM, the root the word chemistry, from the Egyptian “keme”, a reference to the black fertile soil of the Nile River, also the original name of Egypt, i.e. Kemet, the Egyptians referred to as “Kemites”, their variant of alchemy referred to as the “black art”, prior to the country, following the conquest of Alexander, being referred to as House of Ptah or *Aigyptos*, aka Egypt.

External links

â— Hauptmann – Wikipedia.

θΔics

In existographies, **Havelock Ellis** (1859-1939) (CR:4) was a British physician, genius studies scholar, and human sexuality theorist, noted for []

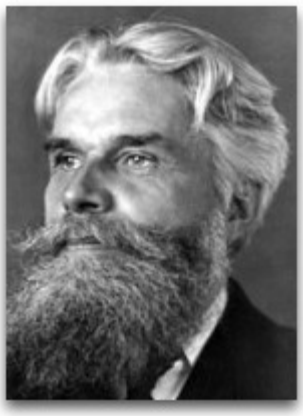

Love | Equation

In circa 1900, Ellis proposed the following equation of love: [1]

> Love = Sex + Friendship

(add)

Genius studies

In 1904, Ellis, in his *A Study of British Genius*, gave commentary on the Cattell 1000 list, and, supposedly, gave a similar genius listing of his own, which seems to be his appendix of "List of Eminent British Persons of Ability", people listed alphabetically. [2]

Goethe | Elective Affinities

In 1908, Ellis, in his "Introduction" to George Lewes' *The Life and Work of Goethe*, notes that the first mention of *Elective Affinities* by Goethe occurred on 11 April 1808 in a diary entry. The end of July of that year he had completed a version with 18 chapters. This, however, remained untouched until April of next year. [3]

Quotes | On

The following are quotes on Ellis:

> "Nor is it necessary to give a compilation of the results set out by other authors, for **Havelock Ellis** has already done this well. Were I to attempt to reach the sexual types by means of the probable inferences drawn from his collected results, my work would be a mere hypothesis and science might have been spared a new book."
>
> — Otto Weininger (1903), *Sex and Character* (pg. 11)

Quotes | By

The following are noted Ellis quotes:

> "Sex lies at the root of life, and we can never learn to reverence life until we know how to understand sex."
>
> — Havelock Ellis (c.1890)

> "The whole religious complexion of the modern world is due to the absence from Jerusalem of a lunatic asylum."
>
> — Havelock Ellis (1914), *Impressions and Comments* [5]

> "When love is suppressed hate takes its place."
>
> — Havelock Ellis (c.1922)

> “What we call ‘morals’ is simply blind obedience to words of command.”
>
> — Havelock Ellis (1923), *The Dance of Life* (§:6) [4]

References

1. (a) Tennov, Dorothy (1979). Love and Limerence. Maryland: Scarborough House.
(b) Article: “On Being Limerent” – flatrock.org.
(c) Havelock Ellis (1859-1939) – Kirjasto.sci.fi.
2. Ellis, Havelock. (1904). *A Study of British Genius* (Cattell, 7+ pgs). Hurst and Blackett.
3. Ellis, Havelock. (1908). “Introduction”, in: *The Life and Work of Goethe* (editor: George Lewes) (ch. IV: Elective Affinities, pgs. 520-). Read Books, 2007.
4. Havelock Ellis – WikiQuote.
5. (a) Ellis, Havelock. (1914). *Impressions and Comments*. Publisher.
(b) Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pg. 247). Prometheus.

External links

â— Havelock Ellis – Wikipedia.

θΔics

In human chemistry, **HC pioneers** or "human chemistry pioneers" are those (**57+**) scientists and writers, as listed below, who over the last two-hundred years have contributed theory and logic to the understanding of the chemistry of human existence. *Photo-size* is indicative of a combination of originality, contribution density, impact, and deepness of theory penetration:

Subject icons

The following subject icons listed next to each person give a quick indication as to what topic he or she theorized, discussed, or worked on in their application of thermodynamics to the various subject-divided facets of human existence.

Subject	Icon	Description
Objectors		Those with red tabs are "detractors" or vocal objectors to chemical theory (see: not applicable view) applied to explain human existence.

Earlier HC pioneers

The following is a chronological listing of core biographies in human chemistry of theories, ideas, and opinions professed up until the year 1900.

	Pioneer	Date	Contribution
1.	Empedocles (495-435 BC) Greek philosopher	450BC	Theorized that love and hate are forces; and developed chemistry aphorisms, such as that friends mix like water and wine, whereas enemies separate like oil and water.
2.	Epicurus (341-270BC) Greek philosopher	307BC	An atomic materialist (see: atomic theory), who, following in the steps of Democritus, was an advocate of materialism, led him to a general attack on superstition and divine intervention (was the first to pen the problem of evil), and, following Aristippus—about whom very little is known—advocated a philosophy called Epicureanism in which pleasure is the greatest good, but the way to attain pleasure was to live modestly and to gain knowledge of the workings of the world and the limits of one's desires. This led one to attain a state of tranquility (*ataraxia*) and freedom from fear, as well as absence of bodily pain (*aponia*). The combination of these two states is supposed to constitute happiness in its highest form; contrary to the views of Democritus, argued that humans have free will owing to the "swerve" of the atoms (see: ontic openings).
3.	Benedict Spinoza (1632-1677) Dutch philosopher	c.1660	Supposedly, according to Herman Grimm (1875), his manner of treating human relations, had opened the way to the latter views of Goethe (and Schiller) who compared humans to elements that attract or repel one another without any exercise of "will" in the matter.
4.	Herman Boerhaave (1668-1738) Dutch chemist and physician	1732	Stated that force of affinity is “love, if love be the desire for marriage”.
5.	Wilhelm Buchholz (1734-1798) German chemist and physician	1791	Chemistry advisor to Goethe; possible role model for the 'Captain'. First outlined his human chemistry theory in his *Third Lecture on Anatomy*; later made a human affinity table and

6.	Johann Goethe (1749-1832) German polymath	1796	with it wrote the great novella *Elective Affinities*, a 36-chapter book, in which each chapter is a different type of human chemical reaction, each person considered as chemical entity, whose reactions to each other are one of the various 100+ affinity reactions found in Swedish chemist Torbern Bergman's 1775 chemistry textbook *A Dissertation on Elective Attractions*, wherein chemistry is explained using a 59-column 50-row affinity table and 64-diagram reaction schematic on the logic of affinity chemistry. The central reaction in the novella is a double elective affinity reaction, AB + CD → BD + AC, between the four main characters: Charlotte A, Eduard B, Captain C, and Ottilie D, governed by the reaction laws of affinity, where the force of affinity A, in a modern sense, is quantified by the chemical thermodynamics equation: A = TΔS – ΔH (as was proved by German physicist Hermann Helmholtz in 1882).
7.	Friedrich Schiller (1759-1805) German writer	1799	In his letters of correspondence with Goethe, the two discussed the watershed ideas to Goethe's formulating theory of human chemistry; the first mention is in an October 23, 1799 letter to him, wherein Goethe criticizes the work of French author Prosper Crebillon (1674-1762) to the effect that Crebillion's writing is not realistic (realism) in the sense that it is not based on the reality that people react according to the principles and outcomes of chemistry; Goethean scholar Herman Grimm (1875) argues that Schiller's last drama "Demetrius", which was left lying on his table uncompleted at his end (1805), was a type of carry-forth seed, in spirit, so to speak, or impetus to the eventual writing of Goethe's famed 1809 *Elective Affinities*, which launched the science of "human chemistry" (although Goethe seems to never actually give a name to the subject he founded).
8.	Friedrich Riemer (1774-1845) German writer	1808	Goethe explained to him that morality is quantified by Bergman's chemical affinity reactions.
9.	Christoph Wieland (1733-1813) German poet and writer	1810	Described Goethe's *Elective Affinities* as 'childish fooling around'.
10.	Arthur Schopenhauer (1788-1860) German natural philosopher	1818	His two-volume, 1,100+ page *The World as Will and Representation* (1814, 1844) built on Goethe's 1809 human elective affinities theory to explain "will" in a universal manner, e.g. he cites German chemist Justus Liebig's description of the reaction of damp copper Cu in air containing carbonic acid H_2CO_3, to argue rather cogently that:

> "The will of the copper, claimed and preoccupied by the electrical opposition to the iron, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does

			in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive."
11.	Johann Eckermann (1792-1854) German author	1827	Goethe confided with him on his human chemistry theory.
12.	Frederick Bakewell (1800-1869) English physicist	1835	His *Natural Evidence of A Future Life, Derived From The Properties And Actions Of Animate And Inanimate Matter* attempts to address questions on the origin of life, death, afterlife, and morality, etc., in the context of nature reduced down to the atomic level and the general difference between animate matter and inanimate matter.
13.	Jean Dumas (1800-1884) French chemist	1837	Argued that "there is some truth in Boerhaave's poetic comparison."
14.	Ludwig Buchner (1824-1899) German physician and physicist	c.1855	Explained how oxygen attracts hydrogen just as man attracts woman.
15.	Henry Carey (1793-1879) American sociologist and economist	1858	Gave the definition that: "man, the molecule of society, is the subject of social science"; explained how chemical affinity must govern human social movement and outlined a theory of social heat associated with the rubbing together of human molecules in daily activity; outlined a theory of social gravitation to explain how people attract into the aggregation of large cities, each mutual city acting as an attractive 'sun' with a certain brightness to it.
16.	Thomas Huxley (1825-1895) English biologist	1871	Argued that society is a 'social molecule'; that people are the 'atoms' (human atoms) of the social molecule; and that 'social chemistry' is the study of the politics of the gratifications and suppressions of human desires, so as to avoid societal decomposition.
17.	Joseph Cook (dates)	1879	In his collected lectures book *Scepticism and Rationalism: Elective Affinities and Hereditary*, gave a 15-point set of rules as to how Goethe's elective affinities regulate relationships. [1]
18.	Henry Adams (1838-1918) American historian	1885	Defined 'social chemistry' as the study of the attraction [and repulsion] of equivalent 'human molecules'; applied the chemical thermodynamics phase rule work of Willard Gibbs to society (1909); outlined a second law version of history studies of human molecules (1910).
19.	Henry Finck (1854-1926) American philosopher	1887	Argued that Goethe's chemical affinity cannot be applied to love.
20.	Edmund Noble (1853-1937) Scottish-born American philosopher	1896	His "Imitation Among Atoms and Organisms", outlines a semi-modern Empedocles style unified imitation and organization theory governing atom to humans, based in loose outline on speculations about chemical affinity and gravity, so to explain evolution.

20th century HC pioneers

The following is a chronological listing of core biographies in human chemistry of theories, ideas, and opinions professed in the years 1900 to 1999:

	Pioneer	Date	Contribution
21.	Max Weber (1864-1920) German sociologist	1905	Applied Goethe's elective affinity theory to sociology.
22.	Henry Bray (1846-1922) European-born American physician, science philosopher, and priest	1910	Wrote a chapter on "Atomic and Human Affinities".
23.	Thomas Dreier (1884-1976) American editor, writer, and business theorist	1910	Wrote the article "Human Chemicals"; later, with the circa 1940s consulting help of chemist Gustavus Esselen (below), was expanded into the 1948 book *We Human Chemicals*, the second out and the open book, following William Fairburn (below), on human chemistry.
24.	William Fairburn (1876-1947) English-born American naval architect, marine engineer, chemical engineer, and industrial executive	1914	Wrote the first booklet on *Human Chemistry*.
25.	Julius Davidson (c.1875-c.1935) American economist	1919	His "One of the Physical Foundations of Economics" cites Willard Gibbs' 1901 *Elementary Principles of Statistical Mechanics* as a basis to argue that the law of diminishing returns is based on chemistry and physics (the second law in particular); along the way comparing human chemical reactions to basic equilibrium adjusting chemical reactions (specifically the male-female reaction to the reaction of ethanol (ethyl alcohol) and acetic acid to produce ethyl acetate and water), explaining how the final equilibrium concentration will differ base on changes to the initial reactant concentrations, in each case, human and chemical, respectively.
26.	George Carey (1845-1924) American physician	1919	Stated that man's body is a chemical formula in operation.
27.	Pitirim Sorokin (1889-1968) Russian-born American sociologist	1928	Devotes his opening 60-page chapter "The Mechanistic School", of his *Contemporary Sociological Theories*, to an all out attack on any type of chemistry, physics, thermodynamics, or mechanics, applied in sociology; on human chemistry he comments: "The laws of physics, mechanics, and chemistry are applied to all social objects of a physical character, and there is no reason to make a noise about creating a 'human physics', a 'human gravitation' [see: social gravitation], or a 'human chemistry'. Such attempts are nothing but efforts to create a 'physics, chemistry, and mechanics of dogs with long tails

			and short necks'. In this respect the theories discussed are inadequate, and therefore defective.”
			His entire attack is well-referenced and very involved, in regards to rebuttal and reason for objection.
28.	Gustavus Esselen (1888-1952) American chemist	c.1947	Consulting chemist to Drier's 1948 book *We Human Chemicals.*
29.	Werner Stark (1909-1985) Austrian social economist	1962	Asked why Huxley's 'social chemistry' as never been developed?
30.	Claus Bock (1926-2008) Germanic studies scholar	c.1965	Advisor to Adler in his *Elective Affinities* PhD dissertation.
31.	Jeremy Adler (1947-) German science historian	1969	Did his PhD on the chemistry of Goethe's *Elective Affinities*.
32.	Mark Granovetter (1943-) American sociologist	1969	Developed a hydrogen bonding based weak ties and strong ties sociology model.
33.	Robert Nisbet (1913-1996) American sociologist	1970	Theorized 'social bonds' actuating the 'social molecule'.
34.	Primo Levi 1919-1987) Italian chemist and writer	1975	His *Periodic Table* (add) ...
35.	Diane Vaughan (1953-) American sociologist	1976	Completed a detailed investigative study of the mechanism and dynamics of the debonding processes involved in relationships, published in the 1986 book *Uncoupling: Turning Points in Intimate Relationships*.
36.	Libb Thims (c.1975-) American chemical engineer, electrical engineer, and thermodynamicist	1995	As a chemical engineering student (see: history), began to puzzle on how to reverse engineer the chemical thermodynamics rule/law of reaction spontaneity ($\Delta G < 0$) as applied to human chemical reactions and human spontaneity, in particular the male-female reaction; eventually, in 2007, ended up writing the world's first textbook on the subject of basic chemistry principles applied to human interactions, namely the two-volume *Human Chemistry*. 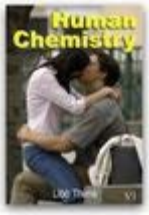
37.	Jean-Marie Lehn (1939-) French chemist	1995	Outlined a grand Goethe-style supramolecular chemistry aphorism about how supramolecular chemistry is a sort of elective affinity style molecular sociology.
38.	Kevin Yee (1970-) American Germanic studies professor	1997	Wrote the article “The Captain as Catalyst in Goethe’s *Wahlverwandtschaften*”. His coil-bound booklet *The Molecular Relationship* outlines

39.	Joseph Dewey (1945-) American newage spiritual philosopher	1999	a barely-readable newagey theory that can best be described as a mix of the Bible, relationship self-help, early 20th century energy vibration theories, energy chakra theory, all stitched together with a very crude chemical analogy model, with chapters on things such as romantic energy, sex energy, desire energy, etc.

21th century pioneers

The following is a chronological listing of core biographies in human chemistry of theories, ideas, and opinions professed in 2000 or later:

	Pioneer	Date	Contribution
40.	Christopher Hirata (1983-) American physicist IQ=225+	c.2000	Outlined a five-part "physics of relationships" (relationship physics) theory, the first being an 'equilibrium reaction' model of a class body of college students using thermochemistry; he used the Gibbs equation, $\Delta G = \Delta H - T\Delta S$, to analyze the male-female reaction as, $X + Y \leftrightarrow XY$, to calculate an equilibrium constant for the basic school year reaction.
41.	David Hwang (c.1980-) American computational chemist	2001	Wrote "The Thermodynamics of Love" in which he discussed the chemical thermodynamics, reaction coordinate aspects, and chemical bonding aspects of the male-female reaction.
42.	Karl Fink (c.1960-) American Germanic studies professor	2001	Theorized on the human chemical reactions used in Goethe's *Elective Affinities.*
43.	Paul Peachey (1918-2012) American writer	2001	Outlined an odd sort of 'family molecule' chemistry mixed with underlying religions notions.
44.	Astrida Tantillo (c.1963-) American Germanic studies professor and science historian	2001	Wrote a book on the scores of critiques of Goethe's *Elective Affinities*.
44.	James Morgia (1922-) American philosopher	2001	His *Life Long Human Value* uses a human molecule description of people and chemical analogy model of human micro interactions to theorize about what he calls “micro abuses”, e.g. verbal child abuse, intonational emotional abuse, etc., to outline a chemical reaction based type of moral fabric model, based on the negative impulses can be stopped similar to an antioxidant neutralizing an oxidant; two detriments are (a) very poor writing style and (b) ubiquitous use of Bible quotes.
45.	Martha Nochimson (c.1960-) American film and literature professor	2002	Wrote *Screen Couple Chemistry: the Power of Two*, a detailed look at the components of what it takes to make good "screen chemistry".
46.	Tominaga Keii (1920-2009) Japanese chemical engineer	2004	Stated in his chemical thermodynamics chapter, that Goethe's *Elective Affinities* 'added no scientific value'.

47.	Chanel Wood (c.1982-) Canadian writer	2007	Outlined a combination lock theory of human bonding, modeled on NaCl formation, according to which the "we just clicked" catch phrase of successful relationships is conceptualized as two people, as "reactants", clicking together in a manner to the way atoms combine to satisfy valence electron shell configurations.
48.	Meg Bond (c.1952-) American psychologist	2007	Wrote a book on 'workplace chemistry'.
49.	Lydia Goehr (c.1965-) English-born American philosopher	2008	Discussed Goethe's *Elective Affinities* in the context of aesthetic theory.
50.	Surya Pati (1983-) Indian chemist and business management theorist	2009	Explain how chemical thermodynamics can explain bonding between humans.
51.	Yuri Tarnopolsky (1936-) Russian-born American organic chemist	2009	His ebook *Introduction to Pattern Chemistry*, on the subject of what he calls "econochemistry", builds on a number of previously written 55 or so essays (2001-2008), he outlines a "chemistry on the human scale" model of society and economy, arguing, using Greek philosopher Lucretius's atomic theory as a basis, that an "economy is an assembly, separation, and rearrangement of atoms and molecules," and that transitions such as the transformation of Russia from absolute monarchy to constitutional monarchy (1905) to republic (1917) to totalitarian (1936) to chaotic democracy (1991) to opaque authoritarian (2000) is the story of a system consisting of "essentially the same atomic human entities (his term for human molecule)" undergoing a type of chemical isomerization, similar to when propyl alcohol molecule isomers to methyl ethyl ether molecule. Tarnopolsky speculates on the thermodynamics of these types of processes, on things such as social temperature (which he equates to social freedom), activation energy in relation to money, among other topics.
52.	Rohann Solare (c.1960-) American newage thinker	2009	His article "The Atomic-Molecular Foundations of a Social Physics: Self-organizing Systems from Atoms to Humans" presents a decent overview of some of the basic principles of human chemistry, namely that a human is a large reactive "mega-molecule" whose attraction and repulsion interactions are governed by the same electro-chemical laws and principles that govern the atoms and molecules that make up the body of a human.
53.	Gary Freedman (c.1950-) American writer	c.2009	His ebook *Significant Moments* contains a noted section in which he thematically groups a selection of historical writings on the thematic topic of human chemistry.
54.	Nicholas Christakis (1962-)	2010	Explains social networks, using carbon atom bonding models, on the motto that: "like atoms in a molecule, we're all linked together. Studying the complex matrix that results can illuminate everything from bucket

	Medical sociologist		brigades to Bernie Madoff."
55.	Mala Radhakrishnan (1978-) American physical chemist	2011	Her collected works poetry chemistry book *Atomic Romances, Molecular Dances* uses a mix of poetry and easy-to-understand analogies (e.g. "Sex and the City" → "Sex and Acidity") to formulate what seems to be Empedocles-style mix of poetic chemistry aphorisms in an effort to help students, particularly high school students, learn thermodynamics, kinetics, and molecular reactions in a more realistic manner, namely in the framework of subjects on the mind of the typically coming of age student, such as relationships, dating, and sex, etc.
56.	Jose Aguilera (1947-) Chilean chemical engineer	2012	Gives a six-page molecular sociology chapter subsection, citing Goethe and Thims, he outlines a number of Empedocles-style human-to-chemicals comparisons, aphorism, or analogies, depending, ranging from: speculations on how a marriage is like a weaker type of covalent bond and or Van der Waals interaction force, how uncharged molecules clustering together in a charged environment are like people discriminated against joining together, how enzymes can can break up and or catalyze the formation of bond between big molecules, like matchmakers, or about how there may be some type of "activity coefficient", similar to the water activity a_w, which quantifies the layers of water moisture around dry foods, that may quantify the way in which people are attracted to "high energy surfaces" (see: surface chemistry), among other comparisons.

Some of these previous two groups, to note, are human chemical thermodynamics (HTC) pioneers, namely those individuals who have applied either affinity chemistry, thermochemistry, or chemical thermodynamics to the modeling of human chemical reactions. This group comprises the deeper thinkers of human chemistry, as indicated by the fact that both Goethe and Hirata (two of the thinkers in the IQ=225+ group), independently, developed nearly equivalent theories, as shown in the adjacent table, as the application of either affinity or free energy to predict a reaction is one of the most involved subjects in all of science.

Note

Some of the HC pioneers are cross-over thinkers, listed on this page as well as on the HT pioneers page, whose work is characterized by the use of both chemistry (e.g. chemical reaction models) and thermodynamics (e.g. affinity or free energy theory), such as Johann Goethe (1809), Libb Thims (1995), Christopher Hirata (2000), or Surya Pati (2009), are listed on both this page and the HT pioneers page.

References

1. Cook, Joseph. (1881). *Scepticism and Rationalism: Elective Affinities and Hereditary* (15 elective affinity rules, pgs. 107-09) *Descent*. Ward, Lock & Co.

θΔics

In acronyms, **HCR theory** (TR:15) is short the theory of modeling "human chemical reactions" (HCR) as purely being types of large-scales surface-attached "chemical reactions", i.e. for "human chemical reaction theory" or the theory that human mechanisms and interactions occur via large scale surface-attached dynamic chemical reactions or social chemical reactions (see: social reaction).

θΔics

In acronyms, **HCT** is short for human chemical thermodynamics, as used in phrases such as: “in HCT theory” (Thims, 2020) (Q), as a quick link mechanism. [1]

References

1. Thims, Libb. (2020). *Human Chemical Thermodynamics — Chemical Thermodynamics Applied to the Humanities: Meaning, Morality, Purpose; Sociology, Economics, History, Philosophy, Government, Anthropology, Politics, Business, Jurisprudence; Religion, Relationships, Warfare, and Love* (**pdf**). Publisher.

θΔics

Lecture: “A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies”
HCT | Fitness landscapes

Synopsis: “A quick look at free energy based fitness landscapes applied evolutionarily and socially.”

Overview

In 1931, Mexican-born American theoretical chemist Henry Eyring and Hungarian-born English physical chemist Michael Polanyi, in their "On Simple Gas Reactions", developed the graphical model of the "potential energy surface", wherein they used the London equation (1927) to described the journey of the nuclei from reactant state of the system to the product state of the system, passing through the crucial intermediate state of activated complex. The reaction they dealt with was:

$$H + H_2 \rightarrow H_2 + H$$

The development of these types of diagrams led to the conception of transition state theory in 1935.

Energy landscapes

The potential energy graphical work of Eyring and Polanyi eventually evolved into the concept of three-dimensional "energy landscape" constructions. By mid 1980s, energy landscape models were being employed in the study of protein folding; and in 1993, with the rise of protein thermodynamics, the theory of RNA free energy landscapes was being utilized.

Fitness free energy landscapes

In 1997, the earlier 1932 work of American geneticist Sewell Wright, who viewed evolution, or "survival of the fittest" ideas, as an optimization process on a "fitness landscape", was being combined with free energy landscape models, to arrive at the following logic: [1]

> “In physics, **fitness** is analogous to free energy, the minimum of which determines the configuration of a system.”

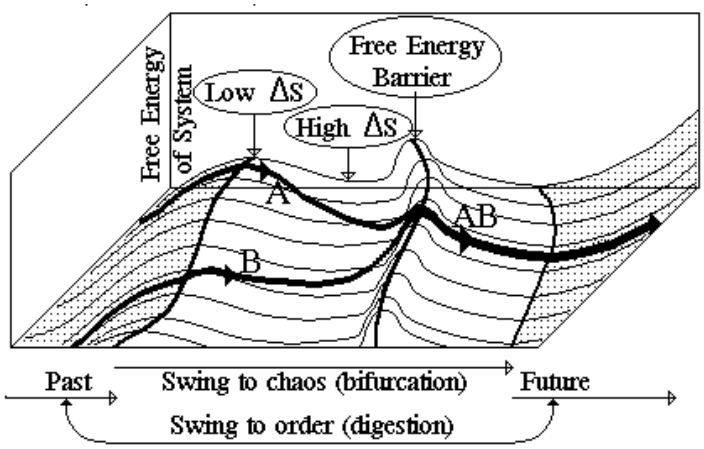

Figure 2: Free Energy Landscape

South African physical chemist Adriaan De Lange's 2001 free energy landscape of evolution, employing a mixture of chaos theory, Prigoginean bifurcation theory, order-disorder logic, time (past vs future), free energy barrier, path functions, and discussions of high and low values of entropy change.

In 2001, South African physical chemist Adriaan de Lange developed a Gibbs free energy theory of human evolution, mixed in with energy landscape theory and fitness arguments, about which he summarizes:

> “All **fitness functions**, how imaginative we may create them, depend on free energy as the mother of them all. No change is possible without free energy changing somewhere in the universe, whether in the system S_Y or in the surroundings S_U. The free energy F is not merely a theoretical concept of the imagination. It is a quantity based on innumerous measurements and calculations in the realm of physical chemistry. It is a quantity of bewildering consequences, the nemesis of many a student in physical chemistry.”

Free energy reaction coordinates

In 2001, American computational chemist David Hwang, in his article "The Thermodynamics of Love", was speculating on mate selection and human chemical reaction theory, where chemical species "male" (M) and "female" (F) combine to form a new compound called "couple" (M-F):

$$M + F \rightarrow MF$$

in terms of free energy change per extent of reaction, his original reaction free energy surface labeled below with the addition of a child (Bc) as product:

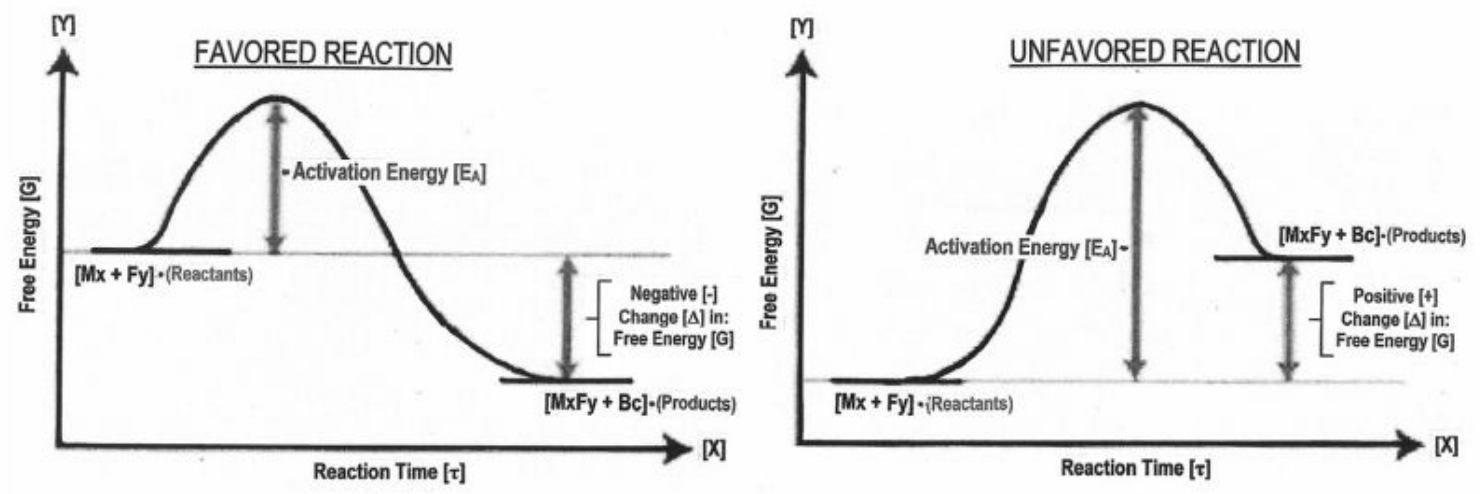

In 2007, Hwang's graphical free energy of relationship formation work was exanded on by American electrochemical engineer Libb Thims. [2]

References

1. Moos, W.H., Moss, Walker H., Pavia, Michael R., Kay, B.K., and Ellington, A.D. (1997). *Annual Reports in Combinatorial Chemistry and Molecular Diversity* (fitness landscapes, pgs. 126-). Springer.
2. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 116). Morrisville, NC: LuLu.

prev Previous section
â— Lecture: HCT | Cover page

Lecture: "A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies"
HCT | P1: About the speaker

> **Synopsis:** "A quick background of the speaker and his interest in the subject of thermodynamics and humans."

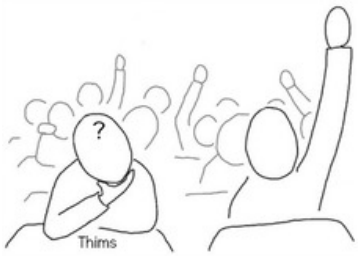

American Libb Thims' 1994-1995 chemical engineering coursework (University of Michigan), during which time, in one of these classes (thermodynamics I, thermodynamics II, physical chemistry, or heat and mass transfer) the seed for the search to understand the subject of "human chemical thermodynamics" was planted.

FALL 1994	ENGIN	CHEM ENG	JUNIOR	Grade	Hours
CH E	230	THERMODYNAM I		A	4.00
ENGR	105	COMP COLL ENGR		B+	1.00
CHEM	302	INORG CHEM		A	3.00
ECON	201	PRINCIPLE ECON I		B+	4.00
Term Totals			GPA	3.708	12.00
Cumulative Totals			GPA	3.708	

WINTER 1995	ENGIN	CHEM ENG	JUNIOR	Grade	Hours
AO&SS	467	BIOGEOCHEM		A-	3.00
CH E	330	THERMODYN II <--?		A-	4.00
CH E	341	FLUID MECHANICS		A-	3.00
HIST	366	20TH C AMER WARS		B+	4.00
Term Totals			GPA	3.585	14.00
Cumulative Totals			GPA	3.642	

SPRING 1995	ENGIN	CHEM ENG	SENIOR	Grade	Hours
CHEM	468	PHYSICAL CHEM		A	4.00
Term Totals			GPA	4.000	4.00
Cumulative Totals			GPA	3.690	

FALL 1995	ENGIN	CHEM ENG	SENIOR	Grade	Hours
AERO	200	INTRO AERO ENG		A	3.00
CH E	342	HEAT & MASS TRANS		A	3.00
CH E	343	SEPAR PROCESS		B-	3.00
CH E	486	PROC SIM & DES I		B+	3.00
Term Totals			GPA	3.500	12.00
Cumulative Totals			GPA	3.635	

Thims: 1995 | Overview

In *circa* 1995, as an undergraduate chemical engineering student, while siting in one of his chemical thermodynamics, and or physical chemistry classes, Thims began to ruminate on the following puzzle, namely how to determine which of the following two hypothetical reactions would be more favored:

> Jack + Jill → Baby
>
> Jack + Jane → Baby

according to the spontaneity criterion of chemical thermodynamics:

> $\Delta G < 0$ ... signifies a favored spontaneous reaction
>
> $\Delta G > 0$ ... signifies a non-favored non-spontaneous reaction

where:

> $\Delta G = \Delta H - T\Delta S$

A 2005 poll of a hundred Americans indicate that about 66 percent of people believe that love a chemical reaction. [3]

The puzzle, however, remained in the dark for some six years (e.g. Bridgman paradox), up until 2001, before headway could be made on this near intractable puzzle.

> "Manifold avenues open up as soon as one begins to tackle the problem."
>
> — Nicholas Georgescu-Roegen (1971), *The Entropy Law and the Economic Process* [1]

Goethe: 1808 | Renouncers

Thims would later discover (see: Goethe timeline), by no coincidence, that German polymath Johann Goethe worked on this same puzzle (see: love thought experiment), for over a decade, albeit in terms of chemical affinities, culminating in the 1808 writing of a draft novel called *The Renouncers* about a hero simultaneously in love with four women; the synopsis of which, in Goethe's view, was that:

> "Each in her own way is lovable; whichever one he is drawn to in the mood of the moment, she alone is lovable."

Goethe took it up again early the next year, after which the tale ballooned into a novel, progressed quickly, and before the end of the year (Oct 3, 1809) it was in print under the enigmatic title *Elective Affinities*.

â— Bergman's reaction diagrams

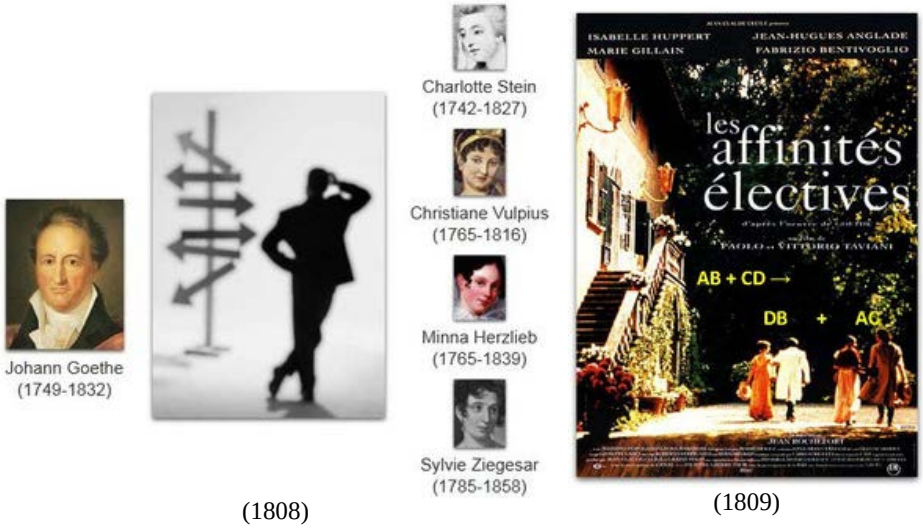

(1808) (1809)

The **love thought experiment**, first conceived by German polymath Johann Goethe in 1808, depicted above, refers to the situation wherein one attempts to intelligently "choose" who to marry from multiple possible mates,

â— Bergman affinity table

or the repercussions resulting therein, when one is simultaneously in love with multiple people, the result of which one is forced to turn to physical chemistry or chemical thermodynamics to study the way in which atoms and molecules react and the scaling up of this to human-human interactions.

Human chemistry: 2011 | New scientific field

The following photos and paper presentation excerpts are from Russian-born Israeli chemical engineer Alec Groysman's 2011 generative art conference presentation "Use of Art Media in Engineering and Scientific Education", wherein he discusses Goethe's *Elective Affinities* up through modern free energy theory, cites the work of Thims, classifies "human chemistry" as a new scientific field, and advocates its use in engineering and scientific education:

"Dobereiner helped in refining Russian platinum, discovered catalysis, and reported his work to Goethe. We can only suspect that Dobereiner read the tragedy *Faust* and the novella *Elective Affinities*. The latter work of art gave impulse to a **new scientific field** named 'human chemistry'.

In the exact sciences there are quantitative measures of estimation of each value: mass, length, force, energy. In the humanistic disciplines (history, philosophy, psychology) as well as art there are no quantitative criteria.

This is similar to the question of how to measure beauty, love, friendship, democracy? The function named Gibbs energy defines 'love' between substances [and] people ... and is similar to Hamlet's 'to be or not to be?' of William Shakespeare."

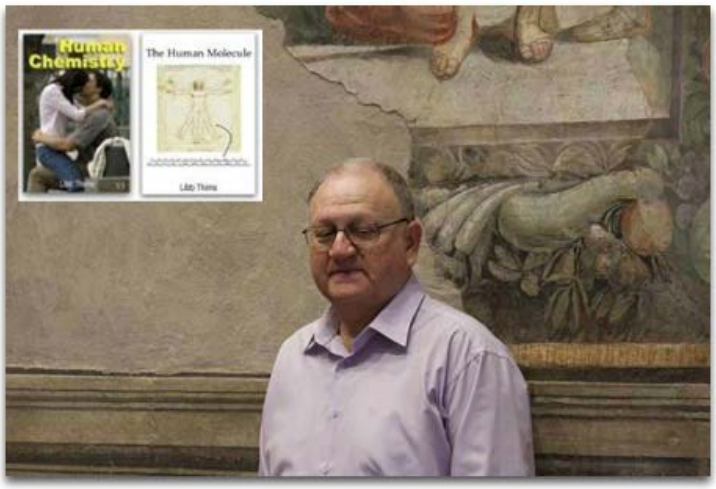

JHT: 2012 | Review board

In 2012, the *Journal of Human Thermodynamics*, launched by Thims in 2005, formerly established a 10 member review board:

Journal of Human Thermodynamics

Motto: "To Promote the Art and Science ofHuman Thermodynamicsfor the Betterment of the Human Kind"

Founding Editor

Libb Thims | American electrochemical engineer
Institute of Human Thermodynamics, 4126 N. Keystone Ave, Chicago, IL 60641 USA
Phone: 1-312-576-8158
Website: humanthermodynamics.com/Libb-Thims.html
Email: libbthims@gmail.com

Electrochemical engineering/Evolutionary psychology

Interests: chemical thermodynamics and humanities
Related publications: *Human Chemistry* (§16: Human Thermodynamics, pgs. 653-701) (2007), *The Human Molecule* (2008), etc.

Academic reviewer | Business school professor

Jing Chen | Chinese-born Canadian mathematician and thermodynamic economist
School of Business, University of British Columbia, 3333 University Way, Prince George, B.C., Canada, V2N 4Z9
Phone: 1-250-960-6480
Website: web.unbc.ca/~chenj/
Email: chenj@unbc.ca

Economics/Business/Finance

Interests: economics, finance, thermodynamics, entropy, human behavior, psychology, sexual selection
Related publications: *The Physical Foundation of Economics: an Analytical*

Reviewer since: 2005

Academic reviewer | Postdoctoral researcher

Jeff Tuhtan | American hydraulic engineer and ecological thermodynamicist
SJE Ecological Engineering GmbH. Viereichenweg 12, 70569 Stuttgart, Germany
Phone: +49 (0)711 677-3435
Website: uni-stuttgart.academia.edu/JeffTuhtan
Email: jtuhtan@gmail.com
Interests: thermodynamics, ecology, fish aquatic system modelling

Civil/Ecological engineering

Related publications: PhD "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality" (pdf) (2011), etc.
Reviewer since: 2011

Scholarly reviewer | Electronics industry

Robert Kenoun | Iranian-born American materials scientist, metallurgical-electrical engineer, and social thermodynamicist
Silicon Valley, California, USA
Email: robert.kenoun@sbcglobal.net
Interests: thermodynamics, energy, history, social evolution, prediction

Metallurgical/Electrical engineering

Related publications: *A Theory of History and Social Evolution* (2006)
Reviewer since: 2011

Academic reviewer | Mechanical engineering professor

Kalyan Annamalai | Indian-born American mechanical engineer and thermodynamicist
Texas A&M University, MEOB 307, College Station, Texas 77843-3123, USA
Phone: 1-979-845-2562
Website: meen-apps1.tamu.edu/FacultyProfiles/facultyinformation.asp?LastName=kannamalai, Research , Thermo Book,Combustion Book
Email: kannamalai@tamu.edu
Interests: thermodynamics, combustion theory, thermodynamics of biological systems (animate systems)

Thermodynamics/Mechanical engineering

Related publications: *Advanced Thermodynamics Engineering* (§14.4.1: Human body: formulae, pg. 726-27) (2011)
Reviewer since: 2012

Academic reviewer | Professor of classical and medieval studies

David Porreca | Canadian history thermodynamics scholar
Department of Classical Studies, University of Waterloo, 200 University Avenue West, Waterloo ON N2L 3G1, Canada
Phone: +1 519 746 7881
Website: arts.uwaterloo.ca/profprofiles/porreca
Email: dporreca@uwaterloo.ca
Interests: big history, societal organization, control of resources, etc., from the laws of thermodynamics perspective

History/Medieval studies

Related publications: current research project on the thermodynamics of rise and fall of civilizations
Reviewer since: 2012

Thermodynamic Theory (2005), etc.
Reviewer since: 2005

Academic reviewer | Mechanical engineering professor

Josip StepaniÄ‡ | Croatian physicist, mechanical engineer, and human thermodynamicist
Faculty of Mechanical Engineering and Naval Architecture, Ivana Lucic 5, 10002 Zagreb, PO Box 102, Croatia
Phone: +385 1 6168 222
Website: unizg.academia.edu/JosipStepanic
Email: josip.j.stepanic@fsb.hr
Interests: Thermodynamics and statistical physics of complex systems, interdisciplinarity, social systems theory, social free energy

Physics/Mechanical engineering

Related publications: "Social Equivalent of Free Energy" (2004); *Interdisciplinary Description of Complex Systems* (Editor-in-Chief), etc.
Reviewer since: 2011

Academic reviewer | Chemical engineering professor

Mohsen Mohsen-Nia | Iranian-born American chemical engineer and human thermodynamicist
Thermodynamic Research Laboratory, University of Kashan, Kashan, Iran
Division of Chemistry and Chemical Engineering, Caltech, Pasadena, California, USA
Email: moh.moh@cheme.caltech.edu
Interests: chemical thermodynamics, human relationship stability,

Chemical engineering

Related publications: "A Thermodynamic Methodology for Evaluating Friendship Relations Stability" (2011), etc.
Reviewer since: 2012

Academic reviewer | Pharmaceutical industry

Gerard Nahum | American chemical engineer, medical school professor, and consciousness thermodynamicist
Vice President of Global Clinical Development, Primary Care, Anti-infectives, and Women's Healthcare, Bayer HealthCare Pharmaceuticals, Montville, New Jersey, U.S. & Berlin, Germany
Website: epernicus.com/ggn
Email: GNahum2003@yahoo.com
Interests: first law of thermodynamics, consciousness, cessation thermodynamics, physical information theory, continuity theories

Medicine/Chemical engineering

Related publications: "A Proposal for Testing the Energetics of Consciousness and its Physical Foundation" (1998)
Reviewer since: 2012

Academic reviewer | Justice systems professor

Curtis Blakely | American sociologist, criminal justice professor, and socio-physicist
Justice Systems Department, Truman State University, 100 E. Normal, BT 2215, Kirksville, MO, USA
Phone: (660) 785-7434
Website: justicesystems.truman.edu/web/faculty_directory/
Email: cblakely@truman.edu
Interests: physics, sociology, sociophysics, penology

Sociology/Criminal justice

Related publications: "Sub-atomic Particles and Prisoners: A Novel Examination of Socio-Physics and Penology", etc.
Reviewer since: 2012

HT pioneers: 2012 | Timeline

Also in 2012, of note, Thims hit the "500+" biography mark on the human thermodynamics pioneers timeline table:

â— HT pioneers

In 2013, of note, the HT pioneers page was cited in the University of California, Berkeley investigation into "plagiarism by negligence" allegations in the supposed nonequilibrium thermodynamics non-reductive materialism theory stealing Juarrero-Deacon affair. [5]

> "I'm sorry Lord Kelvin (1824-1907) is dead. I would travel a few thousand-million miles to discuss with him the thermodynamics of socialistic society." (Henry Adams, Letter to English lawyer Charles Gaskell, 1909)

> "The fascination of a growing science lies in the work of the **pioneers** at the very borderland of the unknown, but to reach this frontier one must pass over well traveled roads; of these one of the safest and surest is the broad highway of thermodynamics." (Gilbert Lewis and Merle Randall, *Thermodynamics*, 1923)

having written and researched, over the previous decade, into five hundred thinkers to have applied thermodynamics to questions of human existence.

Two cultures department: 2013

In 2013, Thims began actively to work towards establishing America's first two cultures university department.

> "Social chemistry—the mutual attraction of equivalent human molecules—is a **science yet to be created**, for the fact is my daily study and only satisfaction in life."
>
> — Henry Adams (1885), letter to wife

> "The trend towards the already mentioned diversified society of 'specialists' and the related danger of narrower way of thinking (idiot savant) necessarily leads to a growing helplessness of the individual. Related to this is a growing blind belief in science. Since Leibnitz, probably the last universal genius, we know more and more about a shrinking area of knowledge. Biology and physics, chemistry and medicine are divided already today into dozens of individual disciplines, which like a 'hydra', keep dividing into other individual disciplines."
>
> — Hans-Wolff Graf (1995), "We Need a New World View" [6]

(Winiarski, 1894-1990)

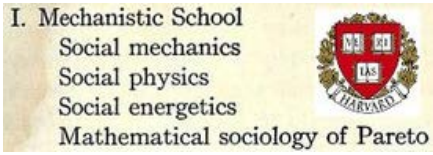

(Sorokin, 1928)

(Stewart, 1949-1955)

(Thims, 2014-2032)

â— Two cultures department

References

1. Georgescu-Roegen, Nicholas. (1971). *The Entropy Law and the Economic Process* (pg. 3). Cambridge, Massachusetts: Harvard University Press.
2. Groysman, Alec. (2011). "Use of Art Media in Engineering and Scientific Education" (§3.4: Human Chemistry), Generative Art Conference, XIV.
3. Thims, Libb. (2005). "Poll: Is Love a Chemical Reaction?", *Research Project* number 4, Chicago: Institute of Human Thermodynamics.
4. (a) Groysman, Alec. (2011). "Use of Art Media in Engineering and Scientific Education" (§3.4: Human Chemistry), Generative Art Conference, XIV (papers) (photos), Dec 5-7, Roma, Italy, at CRUI Frescos Hall, Angelica Library Gallery. and Cervantes Institute Gallery.
(b) Note: the end sentence fragment "to be or not to be", added above for lecture cogency, is from his earlier 2004 article (c).
(c) Groysman, Alec. (2004). "Aesthetic, Philosophical and Historical aspects in the Physical Chemistry education", in: *Trends in Electrochemistry and Corrosion at the Beginning of the 21st Century* (pgs. 1203-1226). Edicions Universitat Barcelona.
5. Plagiarism Investigation Exonerates Terrence W. Deacon – TerryDeacon.Berkeley.edu.
6. Graff, Hans-Wolff. (1995). "Conclusion: We Need a New World View" (pgs. 228-36), in *The Path Toward Global Survival: A Social and Economic Study of 162 Countries* (editor: Hans-Wolff Graf) (pg. 229). Gordon and Breach Publishers.

Next section
â— Lecture: HCT | P2: Student reactions (2010-2012)

Main

â— Lecture: HCT | Overview: Table of contents

Lecture: “A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies”
HCT | P2: Student reactions (2010-2012)

Synopsis: "A quick look at student reactions from Thims’ previous 2010 to 2012 UIC bioengineering thermodynamics lectures on human thermodynamics."

Overview

Following Thims' first lecture, in 2010, to UIC bioengineering thermodynamics students, the professor, Ali Mansoori, asked students to write out a short review or reaction response to the lecture, some of which are shown below:

The following frank and very ripe statement outlines a very tensional issue surrounding "belief systems", that between the olden religio-mythology belief system (mind, soul, morals), 60 percent of Americans, e.g., do not believe in evolution, and the new physical science based "moral symbols" belief system, as Goethe called them, that in belief in the first law (energy conservation) and second law (transformation content increase) of thermodynamics, and the reaction symbols of physical chemistry:

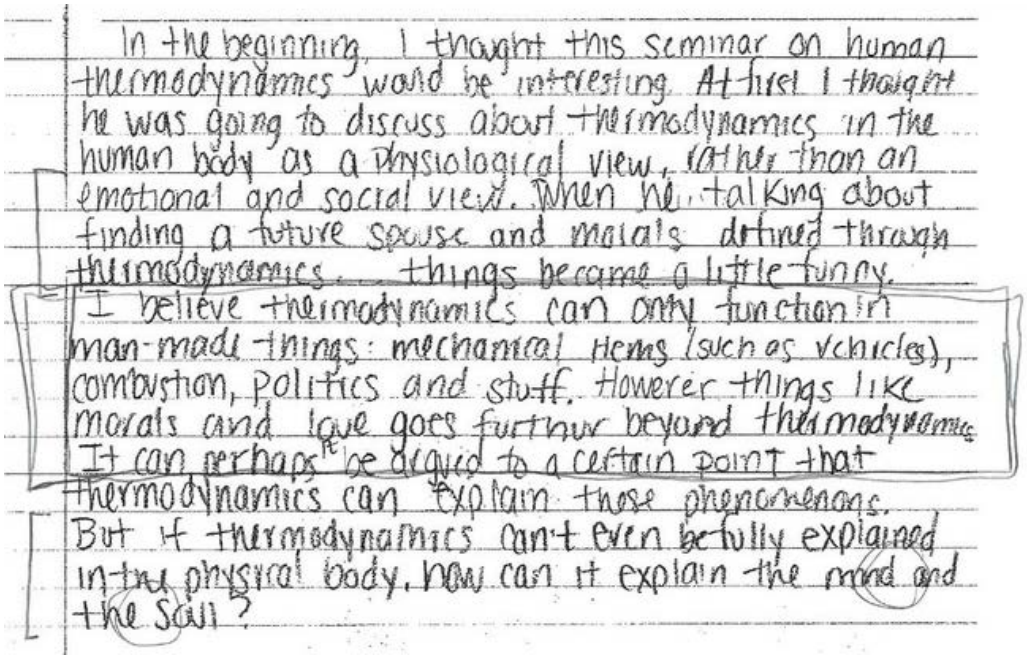

In the beginning, I thought this seminar on human thermodynamics would be interesting. At first I thought he was going to discuss about thermodynamics in the human body as a physiological view, rather than an emotional and social view. When he talking about finding a future spouse and morals defined through thermodynamics... things became a little funny. I believe thermodynamics can only function in man-made things: mechanical items (such as vehicles), combustion, politics and stuff. However things like morals and love goes furthur beyond thermodynamics. It can perhaps be argued to a certain point that thermodynamics can explain those phenomenons. But if thermodynamics can't even be fully explained in the physical body, how can it explain the mind and the soul?

“A great revolutionary doctrine pervades the whole.”

— Victoria Woodhull (1871), first female US presidential candidate, preface comments to first English translation of Goethe's *Elective Affinities*

Bazargan (1956/1797)

Goethe (1771/1808)

At age 21, at the University of Strasbourg, Goethe completing a dissertation on “The Legislature, On the Power of the Magistrate to Determine Religion and Culture”, in which he contended, among other things that:

“Jesus Christ is not the author of Christianity; it is a subject composed by a number of wise men and is merely a rational, political institution.”

— Goethe (1771), law dissertation

The above student comment about "morals defined through thermodynamics" brings to mind Iranian mechanical engineer, thermodynamicist, and 75th prime minister of Iran Mehdi Bazargan and his 1956 book *Thermodynamics of Humans*, wherein he states: [1]

“I will try to discuss morality from the point of view of

It was, of course, rejected on the grounds that it was unorthodox, after which he only achieved the “licentiate” to practice law; after which, to to show contempt for university authorities, he offered a series of 56 theses for disputation, e.g. “natural law is what nature has taught all creatures” (thesis 1), “should the woman who kills her newly born child suffer the death penalty?” (thesis 55), all themed on his distaste for learned authority, and casting for a new way of looking at the relationship between humans to nature, society, and tradition.

thermodynamics and [scientific] natural law. Such a task is very difficult. Nevertheless, doing it is better than not doing it."

"The moral symbols in the natural sciences, that of the elective affinities invented and used by the great Bergman, are more meaningful and permit themselves to be connected better with poetry and society."

— Goethe (1809), three months prior to completion of *Elective Affinities*

Shown adjacent is a clip of the famous law degree "rejection" scene from the 2011 film *Young Goethe in Love*.

"I have found no confession of faith to which I could ally myself without reservation."

— Goethe (1831), a year before his reaction end

â— Bergman reaction diagrams
â— Bergman affinity table
â— Berman chemical signs explained

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

From the above clip, we get a glimpse into the insight of Goethe as part Casanova, part Newton, part Darwin, part Lavoisier, all framed around a Plato-Shakespeare idealism.

Likewise, prior to this there was French physicist Gustave Hirn's 1868 *Philosophical Implications of Thermodynamics*, the first book in in the field of philosophical thermodynamics; and prior to this German polymath Johann Goethe's 1808 physical chemistry based "moral symbols" theory; and prior to this British philosopher John Stewart and his 1789 "moral motion" theory, in which he did away with all of the mythological terms 'life', 'death', 'god', etc., and replaced these with modern physical sciences (astronomy, physics, and chemistry) based theory of 'moral motion', wherein man is viewed as an intelligent type of animate matter, made of particles (atoms), and that all that exists in the universe is matter and motion. The following are the 1998 polled views of America's so-called leading or "greater" scientists, the members of the National Academy of Sciences, on personal belief or disbelief on God and immortality: [2]

American National Academy of Sciences (1998)	**Disbelief in God**	**Disbelief in immortality**	**Doubt** (or agnosticism) **of belief in God**	**Doubt** (or agnosticism) **of belief in Immortality**	**Belief in God**	**Belief in Immortality**
Physical scientists (physicists and astronomers)	79%	76.3%	13.5%		7.5%	7.5%
Biological scientists	65.2%	69%	32.3%		5.5%	7.1%
Mathematicians					14.3%	15%
Overall:	72.2%	76.7%	20.8%	23.3%	7.0%	7.9%

This 1998 data set can be combined with American psychologist James Leuba's 1916 and 1933 data sets to yield the following plot, which show, according to extrapolative estimates, that currently about 5 percent of leading scientists believe in the existence of God: [3]

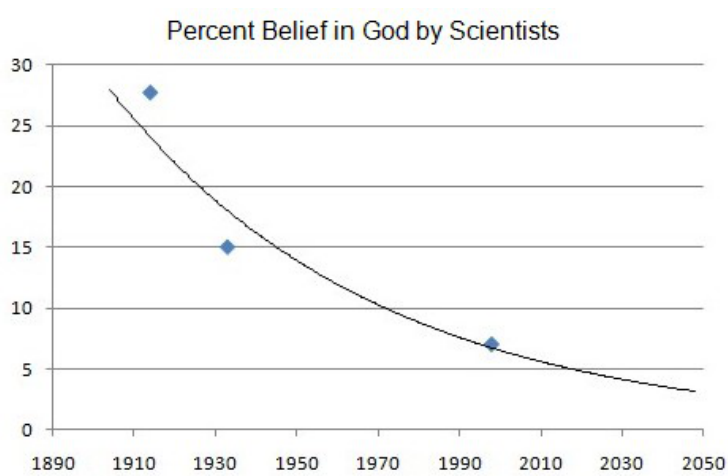

The following is the current global distribution in beliefs:

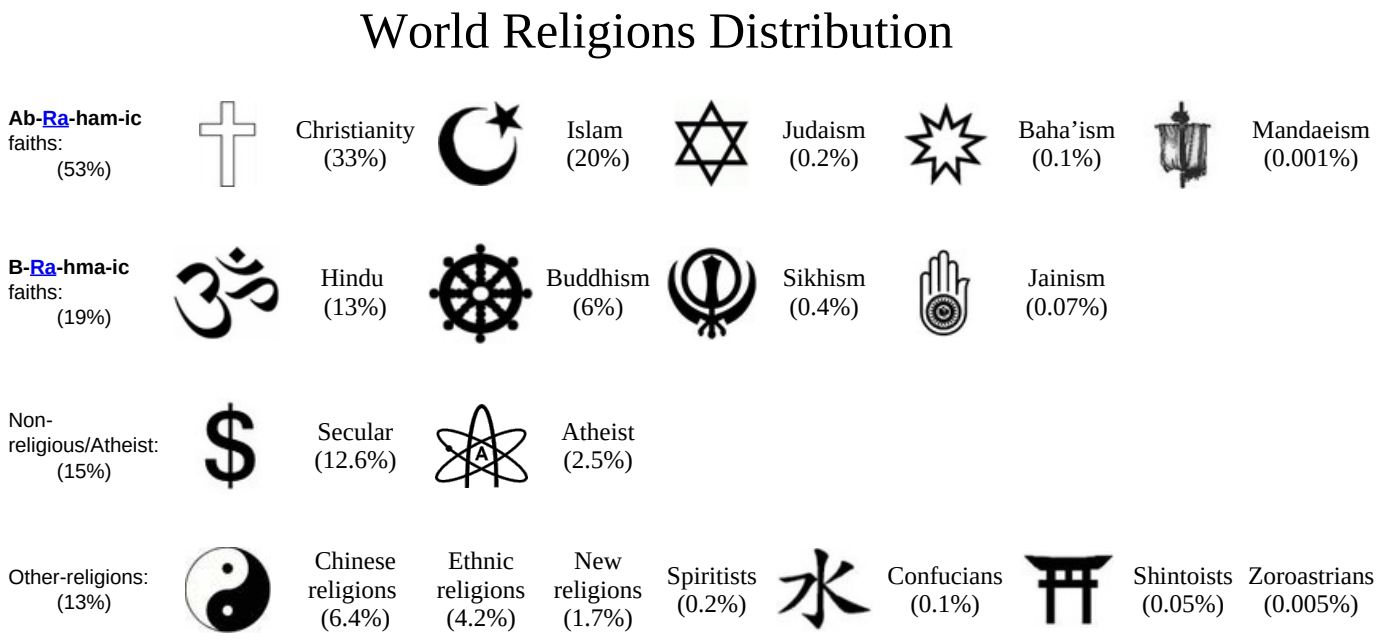

Of which 72 percent are Anunian theology or Ra theology (Ab-ra-ham-ic/B-ra-hma-ic) based:

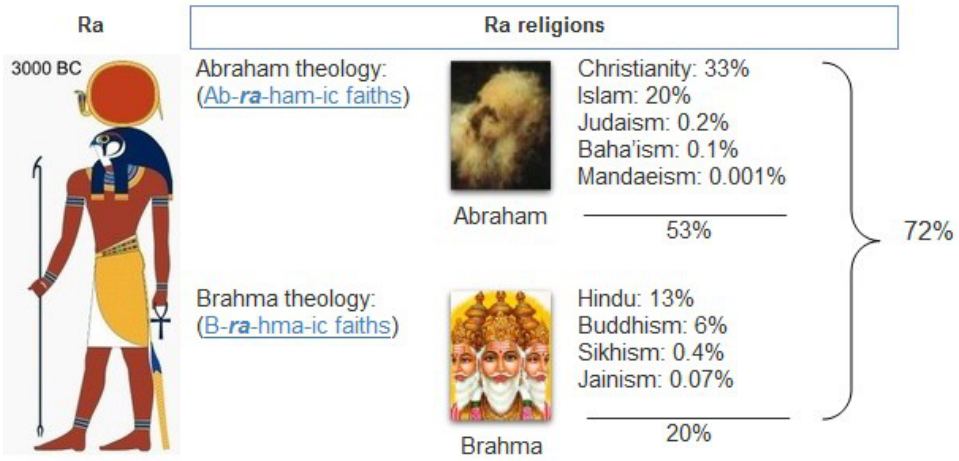

The following is the millennium poll of belief the general public the world over:

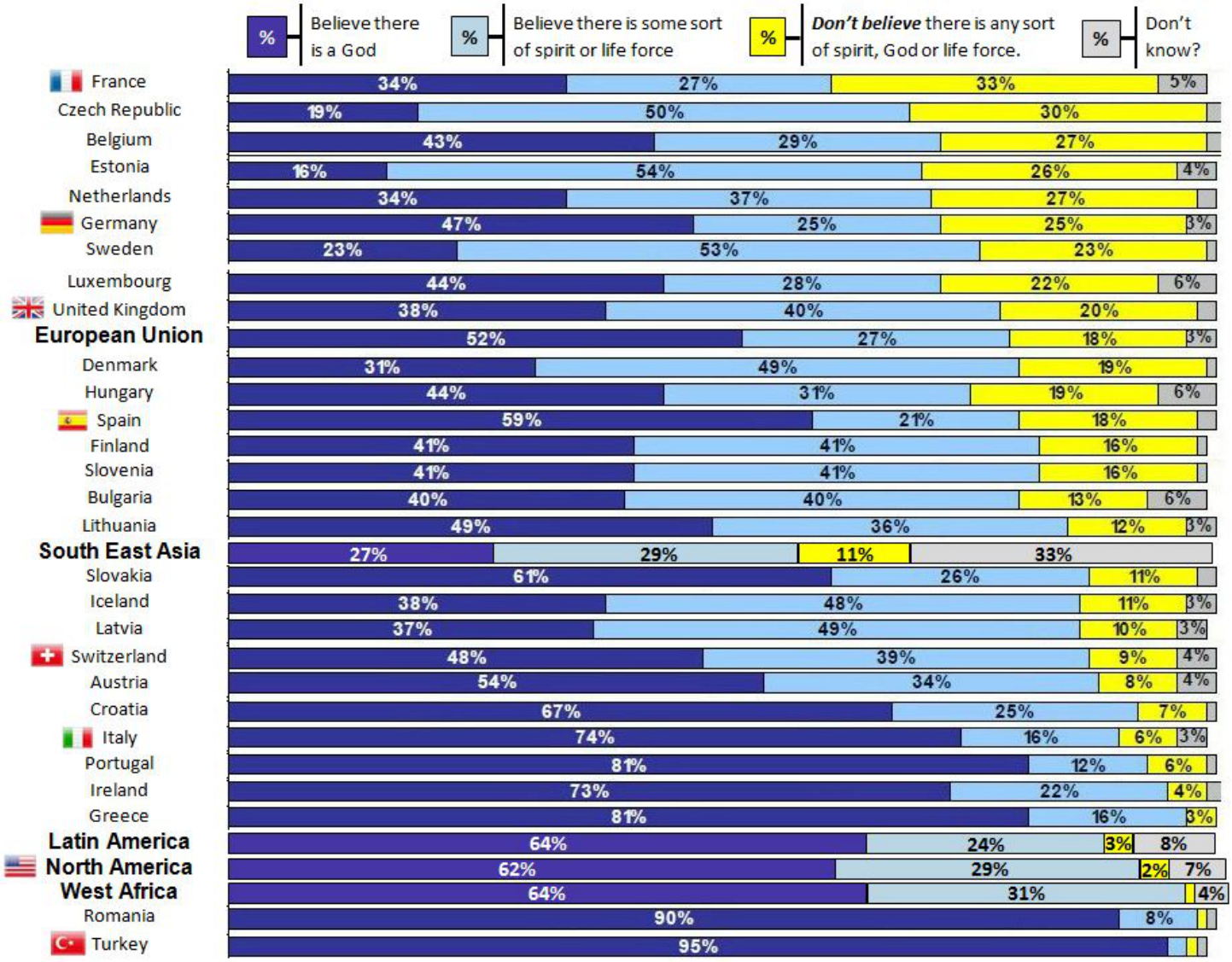

The following student commented on how they were interested to here how thermodynamics relates to the nature of the "choices" one makes, and also the connection of human thermodynamics with sociology (e.g. Winiarski) and psychology (e.g. Freud), the subfields of sociological thermodynamics and psychological thermodynamics (psychodynamics), respectively:

The lecture that took place on Tuesday was good for general background information on the history of the field of thermodynamics. A good number of major contributers to thermodynamics were mentioned and I learned a good amount about those people.

It was interesting to hear about how "human thermodynamics" is applied in regards to life choices. It seemed almost as though human thermodynamics was a branch off of sociology/psychology. The way he mentioned how different morals are measured and how people can theorize about who others will marry.

On a ~~[illegible]~~ quantitative level the lecture was lacking. Even though he mentioned 1 or 2 equations they were not described enough to give us a decent understanding

The following student showed interest in the application of thermodynamics to economics (e.g. economic thermodynamics):

The seminar on Human Thermodynamics gave me a more indepth understanding about ~~the~~ How thermodynamics applies to the human system. The seminar also gave me a better understanding about how others have used thermodynamics to apply it to our daily lives and also economics. The speaker was very good at simplifying concepts in thermodynamics to make it easier for us to understand and relate to. Additionally, the speaker provided literature that was also beneficial.

The following student was curious to learn that thermodynamics applied not only to sociology but also to business, the subfield of business thermodynamics, the recent 2009-launched Spanish-based consulting company "Social Thermodynamics Applied Research", headed by panish entrepreneur Gregory Botanes and physicist Alberto Hernando, being but one example:

In my opinion, I think that Human Thermodynamics is a very broad topic. At first I thought that this would deal more with biological systems but it included more in sociology, business, etc. This showed me that there are a lot of ways to apply the laws of thermodynamics.

I enjoyed the part where he explained the history of thermodynamics. It was pretty thorough. The visual aids were good and easy to see.

The following student was glad that Thims came to speak, in that it helped them see a new way of thinking about science and how it applied to areas, such as morality, relationships, and business, not generally considered scientific topics:

The lecture showed that the equations and theories of thermodynamics can be applied to more than just the usual machines and systems. He discussed applying thermodynamics to biological systems, morals, relationships, business, and many more interesting areas. There was an abundance of information to deliver in a short period of time so he touched briefly on each thing, but I'd be interested in learning more about those sorts of applications. His charts and pictures were difficult to see, but offered very useful information, especially the chart of affinity electives and morality. I had not previously examined his website and I was excited to learn what he worked on and published on the internet. The other websites he showed us were also very interesting and useful. I am very glad that he came to speak to us so that I could expand the way I thought of science and think of applying areas I don't have interest in usually to new areas. I would like to research these applications more in the future and write a paper for his website even though I might not make thermodynamics my life's work.

The following person learned that thermodynamically-speaking there is a link between the "decisions" (choices) a person makes and morality, whether the choice was natural or unnatural:

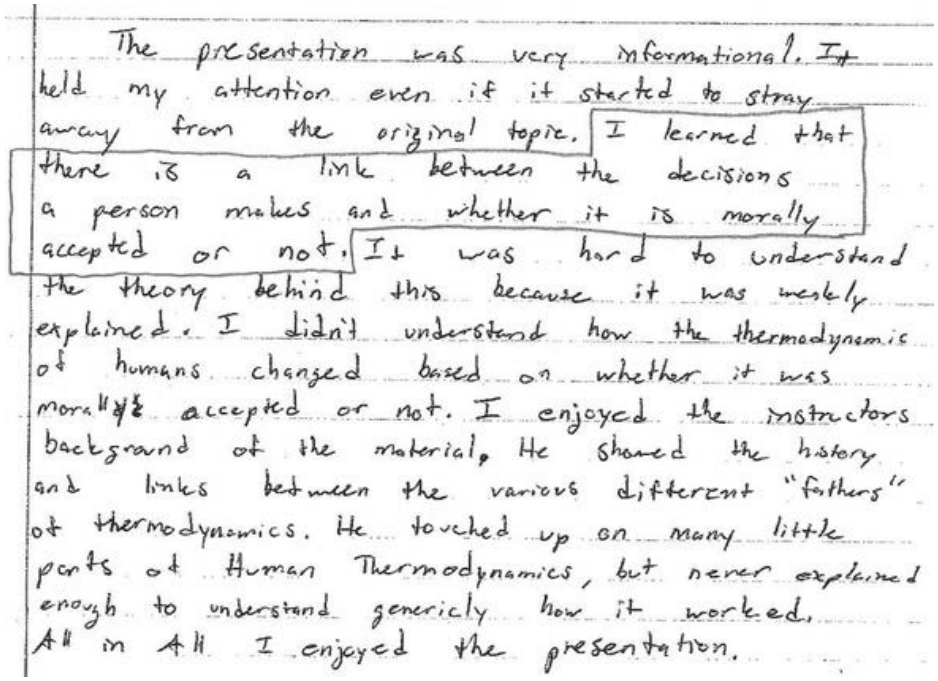

The presentation was very informational. It held my attention even if it started to stray away from the original topic. I learned that there is a link between the decisions a person makes and whether it is morally accepted or not. It was hard to understand the theory behind this because it was weakly explained. I didn't understand how the thermodynamic of humans changed based on whether it was morally accepted or not. I enjoyed the instructors background of the material, He showed the history and links between the various different "fathers" of thermodynamics. He touched up on many little parts of Human Thermodynamics, but never explained enough to understand genericly how it worked. All in All I enjoyed the presentation.

The following, from the 2012 lecture, are The last 15 minutes of the class were devoted to open discussion, questions, and or concerns. The following are a few Q&A examples that occurred in the discussion section:

Q: How can thermodynamics be applied to marketing, such as, for example, using affinity reaction diagrams:

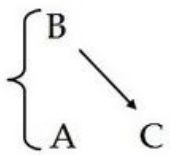

if B were a given consumer, attached to a certain product A, who by the force of chemical affinity (or "will" as Henry Adams defines it) chooses to leave brand A and move to the use or attachment of brand C, be explained in terms of human thermodynamics?

A: Thims referred the student to the Goethe-Helmholtz equation (affinity-free energy equation):

$$A = -\Delta G$$

which relates chemical affinity or the "will" or conscious choice of the person to the change in the Gibbs free energy in the system; and also directed him to the well-presented TED talk of English physicist and marketer Dan Cobley.

Q: How does human thermodynamics apply to the mind?

A: Thims explained how that was a large subject, the psychological thermodynamics of Sigmund Freud and Carl Jung, well-representative of this topic, being one classical approach; but explained that the best modern way to think about conscious choice is in terms of 1910 "chemical affinity = will" definition by Henry Adams:

> "If thought is capable of being classified with electricity, or **will** *with* **chemical affinity**, as a mode of motion, it seems necessary to fall at once under the second law of thermodynamics. Of all possible theories,

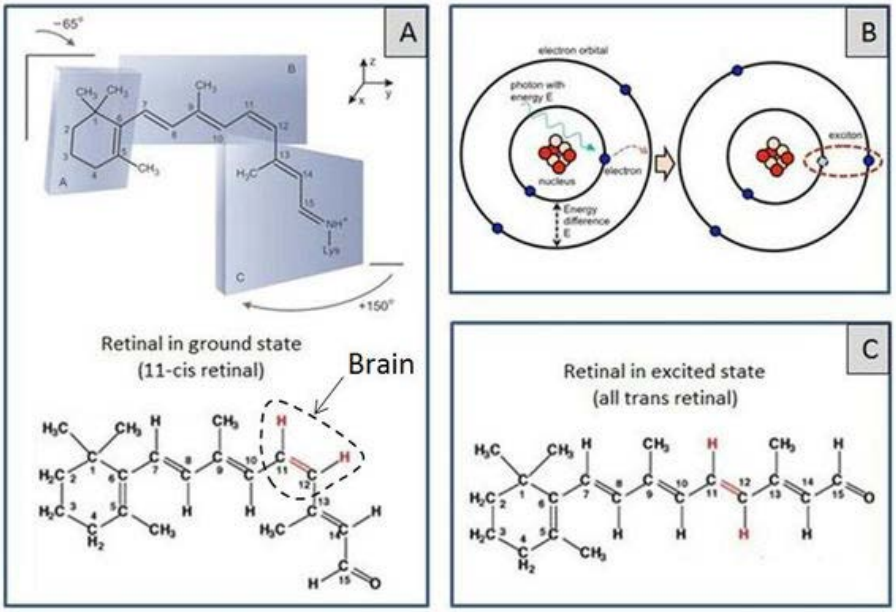

> this is likely to prove the most fatal to professors of history."

in coordination with the 1796 definition of chemical affinity by Johann Goethe as being derived from external forces or "external in origin":

> "There are, by nature, stronger or weaker bonds between these components, and when they evidence themselves, they resemble attractions between human beings. This is why chemists speak of elective affinities [or human elective affinity], even though the forces that move mineral components [or human molecules] one way or another and create mineral structures are often purely **external in origin**, which by no means implies that we deny them the delicate portion of nature's vital inspiration that is their due."

according to which logic Thims explained on the induced movement model or exchange force model of the motion of the 3-element retinal molecule gives the best intuitive conceptual model of how the mind works, in the sense that the photon, the carrier of field particle of the electromagnetic force, is "external in origin" to the brain or 11-12 carbon-carbon bond of the retinal molecule, and hence the impact of the photon (light of the correct wavelength) into the structure of the 11-12 bond is what brings about the movement (straightening) of the retinal molecule, and in a very anthropomorphic way the "choice" of the retinal molecule's actions.

Students were a bit puzzled by this; but to explain via way of example, Thims suggested that it is very likely that many of the students in the room, prior to making the "choice" to become an engineer, when they were children, likely "saw" (visual image transmitted by the electromagnetic force) an engineer personally or on TV or film and that this "image" implanted into their memory as a desire, or something along these lines, and hence influenced their educational and career path.

Q: One student noted how he was unaware that there was overlap between "engineering" (or thermodynamics) and his other passion of "sociology and economics"?

A: Thims explained that this indeed was a large field and that the best direction to go in this matter was to key word search in Hmolpedia for topics of interest and then dig into the respect works of each author to do further research; and to also see: sociological thermodynamics and economic thermodynamics as starting points.

Other questions were raised as well. The following, to update this question, is Thims' upcoming 2013 lecture at the University of Pitiesti, and their 5th annual econophysics and sociophysics conference:

â— Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (abs) (main), Keyspeaker at EDEN V workshop: Exploratory Domains of Econophysics News (organizer: Gheorghe Savoiu). University of Pitesti, Romania, Jun 29-30.

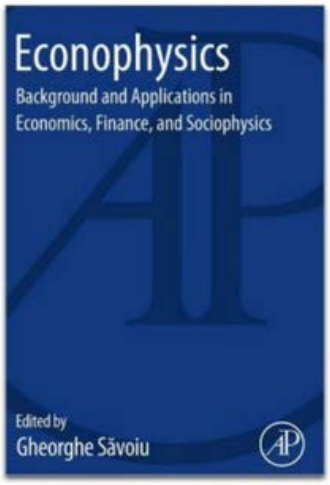

(2013)

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3. (a) Leuba, James H. (1916). *The Belief in God and Immortality: A Psycholgical, Anthropolgical and Statistical Study*. Sherman, French & Co.
(b) Leuba, James H. (1933). "Religious Beliefs of American Scientists," *Harper's Magazine*, 169, 291-300.
(c) James H. Leuba – Wikipedia.

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â— Lecture: HCT | P3: Cengel-Boles examples

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Lecture: “A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies”
HCT | P3: Cengel-Boles examples

Synopsis: "A quick 'get your feet wet' look at the cartoon applications of thermodynamics to humans found in Turkish mechanical engineer Yunus Cengel and American mechanical engineer Michael Boles' popular *Thermodynamics: an Engineering Approach* (seventh edition, 2010)."

● Thermodynamics textbooks that employ human thermodynamics

FIGURE 6–26
The use of entropy (disorganization, uncertainty) is not limited to thermodynamics.

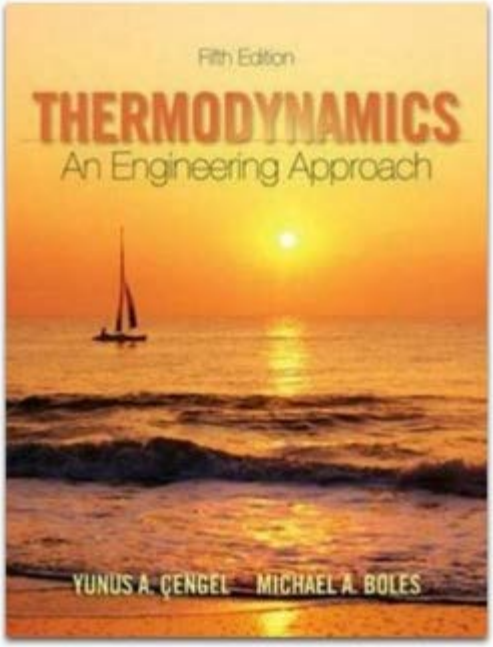

A fun example of "human thermodynamic" themed cartoon, with the implication that human activity increases entropy. These types of examples are fun as long as they remain in the analogy/humor gray area of discussion. When, however, talk about such applications is taken into the this is factual/reality area of discussion, wherein implications impinge on core belief systems, heated debated quickly surfaces: what is entropy debate (1902-1907), Rossini debate (1971-present), Brooks-Wiley theory debate (1982-2011), Moriarty-Thims debate (2009), the Penn State debate (2009), to name a few.

Overview

See main: Cengel-Boles human thermodynamics

Engineering student are frequently inspired to venture into graduate work in human thermodynamics after reading Turkish mechanical engineer Yunus Cengel and American mechanical engineer Michael Boles' 1989 *Thermodynamics: an Engineering Approach*. In 2009, for example, a third-year Turkish undergraduate mechanical engineer, expressed desire to come to America to complete a master’s degree in on a topic related to thermodynamics of human existence and experience, having been inspired by passages, shown below, from the 2006 edition: [1]

> “The arguments presented here are exploratory in nature, and they are hoped to initiate some interesting discussion and research that may lead into better understanding of performance in various aspects of daily life. The second law may eventually be used to determine quantitatively the most effective way to improve the quality of life and performance in daily life, as it is presently used to improve the performance of engineering systems.”

In the last decade, a number of so-called sociophysics and econophysics schools are popping up around the world, e.g. in Poland, France, Germany, Romania, and Italy, to name a few, but America is yet to see the inception of such a school of teaching (see: two cultures department).

Human frictions

Boles and Cengel state that that friction in the workplace between co-workers is a type of human friction that is quantified as entropy generation. They state the following with accompanying diagram (shown to the right):

> "We know that mechanical friction is always accompanied by entropy generation, and thus reduced performance. We can generalize this to daily life: friction in the workplace with

fellow workers is bound to generate entropy, and thus adversely affect performance (Fig. 6–27). It results in reduced productivity."

FIGURE 6–27
As in mechanical systems, friction in the work place is bound to generate entropy and reduce performance.

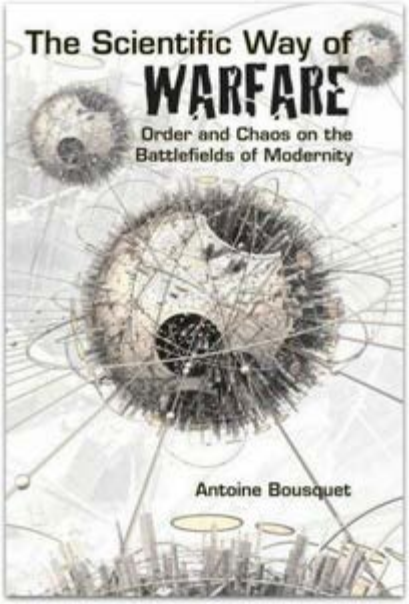

Left: a cartoon of Cengel and Boles' view that in human social systems, as in mechanical systems, workplace friction generates entropy. Right: English complexity theory economist Antoine Bousquet's 2009 *Warfare: Order and Chaos on the Battlefields*, a more advanced look at how, for example, thermodynamic theory was used in American military strategist John Boyd's thermodynamics based combat reaction theory (second law, uncertainty principle, dissipative structures, complexity theory, Godel's incompleteness theory), parts of which were used in the successful architectural invasion design of the Gulf War (1990-1991). [3]

The theory that human frictions generate a type or variant of physical heat (not in a metaphorical sense) was first proposed in 1858 by American sociologist and economist Henry Carey who outlined a theory of social heat associated with the "rubbing together of human molecules" in daily activity.

● Mechanistic school (Harvard Sociology Department, 1928)

The model that frictions in the workplace accrue and can be quantified as a type of entropy was first outlined by English-born American engineer William Fairburn in his 1914 book *Human Chemistry*.

Warfare thermodynamics

See main: War thermodynamics

Boles and Cengel also state that that entropy can be applied to warfare organizations and processes. They state, for example, that a a high entropy army is less powerful than a low-entropy army, namely one that is divided into divisions. The state that the old cliché ‘divide and conquer’ equates thermodynamically to the phrase ‘increase the entropy and conquer’.

In 1953, American combat pilot John Boyd flew 22 combat sorties in the F-86 Sabre during the Korean War. During this experience, problem that intrigued him during his period was that despite flying in an F-86 aircraft, which had a lower ceiling, a wider turn radius, and slower maximum speed than its rival, the Russian Mig-15, the kill ratio was still 10:1 in favor of the F-86. This anomaly, that despite having worse planes (slower, bigger, less maneuverable) than the enemy, US pilots were still killing better, was the goad of his curiosity, which he assumed could be explained scientifically.

in 1960, Boyd enrolled at Georgia Tech to complete as BS in industrial engineering, where he studied thermodynamics, physics, and production lines, among other subjects; his interest in these subjects, it is said, did not lie in the mathematical details, but rather in the underlying principles and concepts. During this time he was said to have "wrestled with thermodynamics", the logical insights of which he began to apply back to his F-86 problem, after which he developed his so-called "energy-entropy decision based reaction cycle" model of combat operation processes, or OODA loop (short for observe, orient, decide, and act) model.

He would go on to develop his thermodynamics based theories of combat over the next 20 years, about which he consulted the pentagon on, in over 1500 briefings, over a period of about 30 years. Boyd mixed in ideas on Heisenberg’s uncertainty principle and chaos theory into his model. Parts of which were used in the successful architectural invasion design of the Gulf War (1990-1991).

In 1993, to give a comparative example, French philosopher Jean-Francois Lyotard stated his views on relationship between war and thermodynamics as follows: [2]

> "Conflict and ultimately war do not arise between human and nature; rather, the struggle is between more developed systems and something else that is necessarily less developed and that the physicists know as entropy, the second principle of thermodynamics."

The use of thermodynamics arguments in warfare traces at least as far back as 1919 in the writings of Russian engineer Yevgeny Zamyatin and his idea that revolutions and wars are the product of thermodynamic laws.

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3. (a) Bousquet, Antoine. (2009). *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity* (ch. 3: Thermodynamic Warfare and the Science of Energy, pgs. 63-92). Columbia University Press.
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Lecture: "A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies"
HCT | P4: Piston and cylinder view

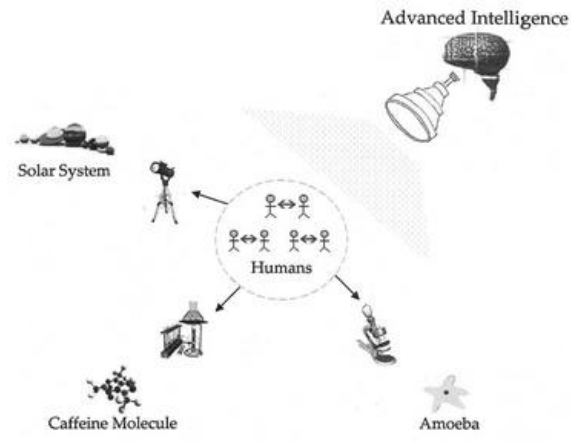

The advanced intelligence perspective, a super-observer look at humans reacting to each other as chemicals, viewed at a time-accelerated pace.

Synopsis: "An overview of the daily heat cycle expansion-compression piston and cylinder conception of the social system."

Overview

The modern 21st century application of thermodynamics to humans is summarized well by the following two quotes:

> "It is necessary to establish principles applicable not only to steam-engines but to all imaginable heat-engines, **whatever** the working substance and whatever the method by which it is operated. We distinguish here the steam-engine from the heat-engine in general. The latter may make use of any agent whatever, of the vapor of water or of any other, to develop the motive power."
>
> — Sadi Carnot (1824), *On the Motive Power of Fire* [1]

> "The human species is but one of many. Viewed from a sort of universal microscope, we appear as but a vast collection of molecules in motion. In our current state we are firmly attached to an Earthly substrate, feeding off the energy gradient of the Sun. The fate of our chemical species is undeniably tied to the affinities and energies of interaction required to maintain our evolving earth ecosystem. We live in a closed system. In order to understand the nature of things, we must learn more about both our reactions and our products."
>
> — Jeff Tuhtan (2012), PhD "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality" (pg. 1) [10]

The following shows the three main stages in the conceptual development of piston and cylinder model of the so-called "conservative dynamical system", in which people, defined as "human molecules", in C.G. Darwin's terminology, are confined into heat cycle expanding and contracting social systems:

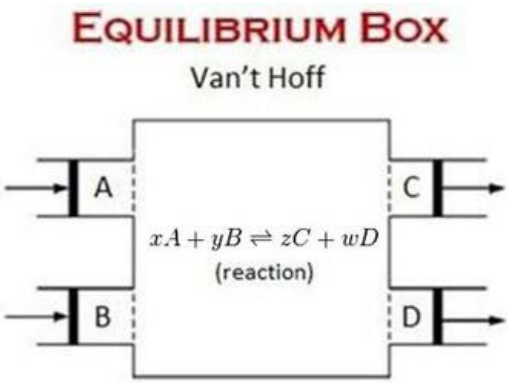

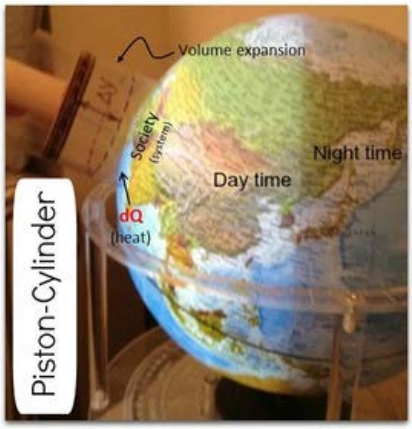

Papin engine
Denis Papin (1690)

Van't Hoff equilibrium box
Jacobus van't Hoff (1886)

Piston cylinder social system
C.G. Darwin (1952)

[article]

Conceived the idea (Papin engine) that a sealed piston filled with water, alternately heated and cooled, could produce useful work, according to Boerhaave's law.	Built piston and cylinder semi-permeable membrane stylized "equilibrium boxes" in which he let chemical reactions proceed and thereby measured the amount of available pressure-volume work the reactions could produce.	"Human thermodynamics is the statistical mechanics of conservative dynamical systems of human molecules."

In applying "thermodynamics" to humans, economically or socially, the most important first step is to define the "system".

In 1989, American chemical engineer Linus Pauling ripped apart Austrian physicist Erwin Schrodinger's 1943 "life feeds on negative entropy" postulate as found in his

What is Life? lecture-turned-book; he begins his rip into Schrodinger's theory with the following mock:

> "In his discussion of 'negative entropy' in relation to life, he made a negative contribution."

Pauling, then, after quoting Schrodinger's two main excerpts about "keeping aloof" and "feeding on negative entropy", continues:

> "When I first read this book, over 40 years ago, I was disappointed. It was, and still is, my opinion that Schrodinger made no contribution to our understanding of life.
>
> Several physicists and biologists with whom I have discussed this question have disagreed with me. When I asked what the contribution made by Schrodinger to our understanding of life is, each answered essentially by saying that Schrodinger showed that life is negative entropy, that living organisms utilize entropy in a way different from non-living matter.
>
> I have not had the opportunity to discuss this matter with a physical chemist, a person with a good understanding of the great work by J. Willard Gibbs on chemical thermodynamics. I am sure that he or she would agree with me.
>
> Schrodinger's discussion of thermodynamics is vague and superficial to an extent that should not be tolerated even in a popular lecture. In the discussion of thermodynamic quantities it is important to define the system. When he is writing about a change in entropy of the system, Schrodinger never even defines the system. Sometimes he seems to consider that the system is a living organism with no interaction whatever with the environment; and sometimes it is a living organism in thermal equilibrium with the environment; and sometimes it is the living organism plus the environment, that is the universe as a whole."

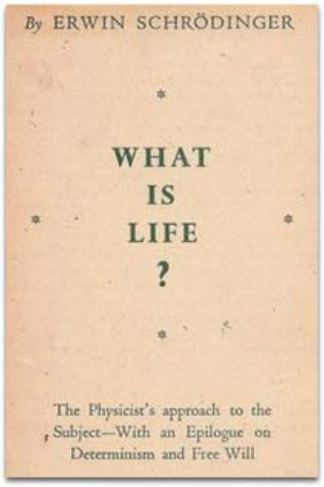

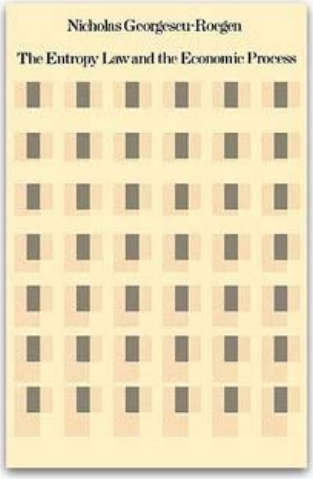

Left: Austrian physicist Erwin Schrodinger's 1943 *What is Life?* and followup "Note to Chapter 6". Right: Romanian-born American mathematician Nicholas Georgescu-Roegen's 1971 *The Entropy Law and the Economic Process* and associative "material entropy" theory. Both examples of "system" inconsistent thermodynamics applications.

The same is "system" lacking definition is found in Romanian-born American mathematician Nicholas Georgescu-Roegen's 1971 *The Entropy Law and the Economic Process* and associative "material entropy" theory, which also got ripped apart.

The following, to give a clear example, is a system boundary defined thermodynamic look at the rise and fall of Rome, system shown in red:

Rise of Rome | **Fall of Rome**

Roman empire in **375 BC**
(at its inception as a civilization)

Roman empire in **272 BC**

Roman empire in **116 AD**
(at its greatest extent territorially)

Roman empire in **476-554 AD**
(Western empire falls when emperor Romulus is deposed)

â— Timeline of thermodynamics

Van't Hoff

The following 1956 condensed history of physical chemistry up through chemical thermodynamics by American chemistry historian Henry Leicester gives a well-rounded gist of the transition from theories on 18th and early 19th century theories on "affinities" to 20th century measurements of "free energies": [4]

> "Van't Hoff had shown chemists how thermodynamics could be applied to their science, especially with reference to ideas on affinity. In his work in 1884 he first drew the distinction between chemical kinetics and chemical thermodynamics and showed that the maximum external

work obtained when a chemical reaction was carried out reversibly and isothermally could serve as a measure of chemical affinity."

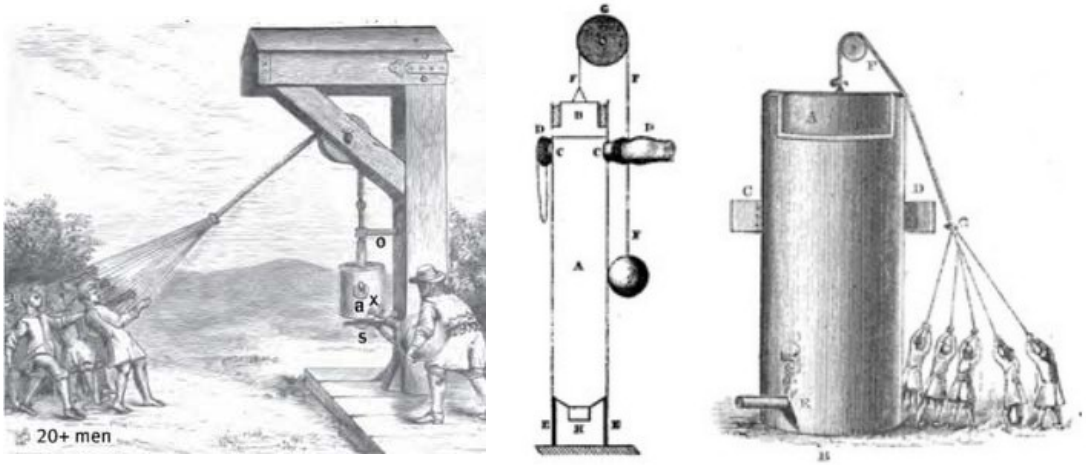

Left: German engineer Otto Guericke's circa 1670 experiments on the "power" of the vacuum. Right: Dutch scientist Christiaan Huygens's 1678 gunpowder engine experiment, according to which the combustion explosion inside the piston creates a vacuum, thus forcing down the piston, and doing the work of five or more men (see: timeline of thermodynamics).

Van't Hoff formulated the concept of the equilibrium constant defined by follows:

$$K = \frac{[C]^z [D]^w}{[A]^x [B]^y}$$

where [A], [B], [C], and [D] are the concentrations of the various reactants and products at the equilibrium, and where x, y, z, and w are the stoichiometric coefficients. at equilibrium the affinities will be satisfied, as quantified by the condition ΔG=0. This condition can be expressed in terms of the equilibrium constant as:

$$\Delta G^\circ = -RT \ln K$$

relating the equilibrium constant to Gibbs free energy and temperature.

Volume change

The following is the reaction of sodium with water to give visual to the nature of volume change and work:

	$2Na$ (s)	$+ 2H_20$ (l)	$\rightarrow 2NaOH$ (aq)	$+ H_2$ (g)
ΔG_f° (kJ/mol)	0	–237	–419	0
ΔH_f° (kJ/mol)	0	–286	–469	0
S° (kJ/mol·K)	52	70	48	131

he free energy change for this reaction is:

ΔG = -419 – (-237) = -182 kJ/mol

These same calculations for human chemical reactions is but an advanced engineering problem.

Affinity | Free energy

American chemistry historian Henry Leicester continues: [4]

"Helmholtz even earlier had called maximum work 'free energy'. Gilbert Lewis, of the University of California, Berkeley, proposed that this term be restricted to mean the work available for use. Thus, the maximum useful work obtained when one system passes spontaneously into another represents the decrease in free energy of the system. The influential textbook [1923] of G.N. Lewis and Merle Randall which represents these ideas has led to a **replacement of the term** 'affinity' by the term 'free energy' in much of the English-speaking world. The older term has never been entirely replaced in thermodynamic literature, since after 1922 the Belgian school under Theophile De Donder has made the concept of affinity still more precise."

Human reaction **vs.** **Chemical reaction**

The centerpiece of this Belgian school effort to make affinity more precise is the following partial differential equation, relating affinity A to the partial derivative of Gibbs free energy per partial of extent of reaction:

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

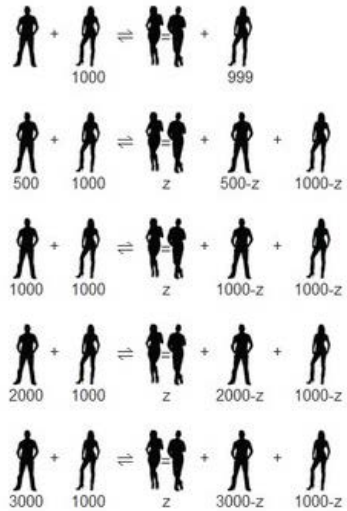

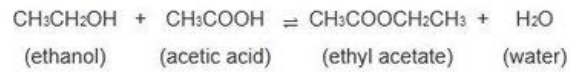

American economist Julius Davidson, in his 1919 "One of the Physical Foundations of Economics", compares the male-female reaction to the equlibrium reaction of ethanol (ethyl alcohol) and acetic acid to produce ethyl acetate and water. [6] A similar application can be found in the 2000 "The Physics of Relationships" by American child prodigy turned astrophysicist Christopher Hirata. [5]

The 1919 "One of the Physical Foundations of Economics" by American economist Julius Davidson and the 2000 "The Physics of Relationships" or American child prodigy turned astrophysicist Christopher Hirata are two examples of this type of application of equilibrium reaction models used in the context of human chemical reaction theory. [5] The following, to exemplify theme, is Davidson's opening paragraph: [6]

> "So many attempts have been made to resolve economics into a psychological science as to make it seem advisable to call attention, in some detail, to some of the physical factors which are likely to remain unaffected by psychological changes, even assuming that these psychological changes are, first, possible, and second, desirable. Some of these physical factors are so fundamental as to give character to the science of economics under all possible conditions. It seems probable that, so far as these physical factors can be ascertained, they would have to be reckoned with under any form of social organization, and with any institutional background. In certain respects, therefore, communism and capitalism, socialism and individualism, would look very much alike if they ever got into working condition, because they would have to meet certain permanent and unchangeable conditions."

On this platform, Davidson goes on to use American engineer Willard Gibbs' 1901 *Elementary Principles of Statistical Mechanics* to argue that the law of diminishing returns is based on chemistry and physics, comparing human chemical reactions to basic equilibrium adjusting chemical reactions.

Note also, in above so-called Davidson-Hirata mate paring equilibrium reaction scenario, the use of the "bonded" couple product; this brings into the question the subject of the free energy contained in the bond in the form of "bond energy", a model deriving from the 1941 work German-born American Fritz Lipmann, specifically his "Metabolic Generation and Utilization of Phosphate Bond Energy", where in the ATP energy coupling, phosphate bond energy theory was first presented; and hence the modern subject of human chemical bonding theory.

Mean Girls | Social pressures

See main: Mean Girls (debate)

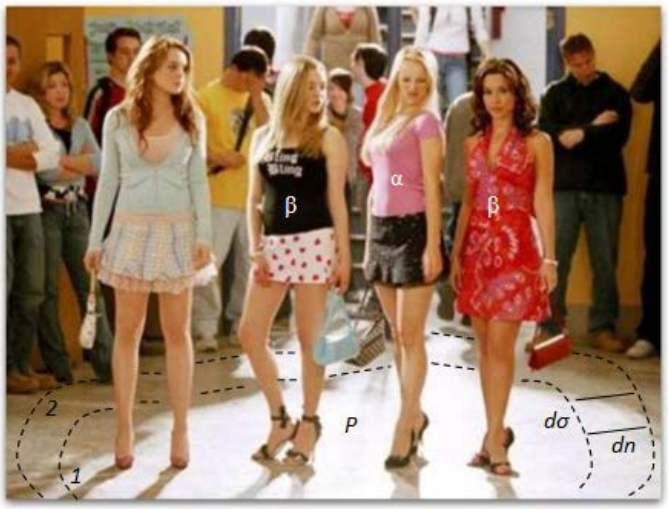

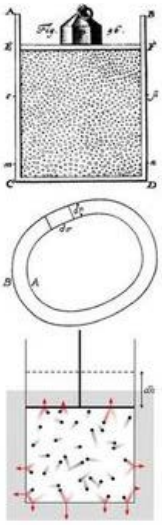

A thermodynamic piston and cylinder style "system" labeled depiction of the hall scene from the 2004 *Mean Girls* (see: Mean Girls debate), where the alpha female (alpha molecule) "queen bee" Regina George **α** (Rachel McAdams), in pink, causes a volume expansion: students reactively move away giving her more personal space; a natural phenomenon verified and measured by sociologists. [7]

The adjacent depiction of the famous "hall way scene" from the 2004 film *Mean Girls*, helps to give a visceral conception of the often confusing between atmospheric pressure and social pressure, both of which are but varieties "force per unit area" quantifications. The 1970s sociological studies "Body Height, Position, and Sex as Determinants of Personal Space" (1974) and "**Beauty is Power:** the Use of Space on the Sidewalk" (1975) were the first to quantifiably measure the power (work per unit time) associated with height and with beauty, respectively, in terms of variations in measures of personal space. [7] The abstract of the fascinating 1974 beauty is power study is as follows: [8]

> "In three experiments, 470 pedestrians were observed as they walked past confederates standing on the edge of a sidewalk. Observations were made from a window overlooking the area, using time lapse filming with a movie camera.
>
> Pedestrians were observed as they moved along the sidewalk, and their distances from the edge of the sidewalk was measured at several points. Pedestrians deviated in their paths to stay farther from a male than a female, father from two people than from one person, and farther from a beautiful than an unattractive woman. Sex, number, and attractiveness may be regarded as aspects of power, which serve to dominate various amounts of a space."

The gist of these two studies was summarized well by American beauty researcher Nancy Etcoff, in her 1999 book *Survival of the Prettiest: the Science of Beauty*, as follows: [9]

> “As we walk down the street, we negotiate space with other people. We carry a small territory with us, a protected turf that surrounds us whether we are sitting or standing, and upon which others cannot trespass without permission. Move in too close, and people get uncomfortable. Tall people have bigger territories: their sheer size intimidates people. When people are asked to approach a stranger and stop when they no longer feel comfortable, they will stop about two feet away from a tall person (22.7 inches to be exact) but less than a foot (9.8 inches) from a short person. Very attractive people of any size are given personal territories; they carry their privileges around their persons.”

This "trespass without permission" brings to mind both the 1970 chimpanzee war and the 2001 9/11 attacks, both the result "territory trespassing" repercussions, a led into the topic of war thermodynamics.

Power, in thermodynamic terms, is defined as energy exchanged between a system and its surroundings per unit time, which is stated formulaically as follows:

$$P = \frac{E}{t}$$

a term that was first quantified in terms of "horsepower" in 1783, by engineers Brit Matthew Boulton and Scot James Watt, as 33,000 foot-pounds per minute, meaning that this was the amount of mechanical effect that the average “brewery horse” could produce in one minute, as depicted adjacent (see: mechanical equivalent of heat).

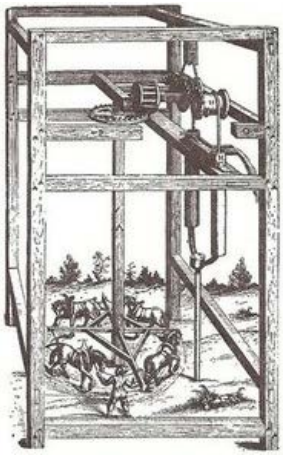

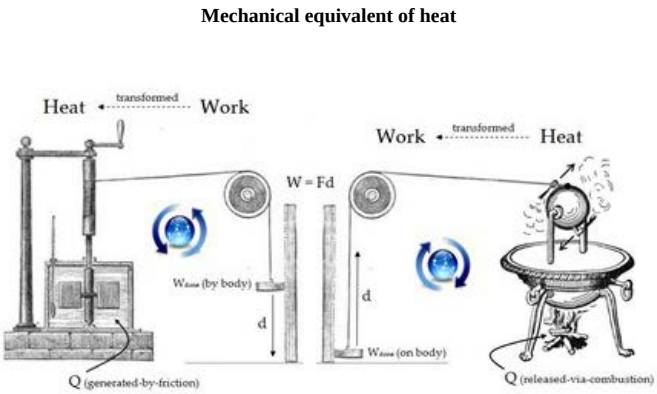

Left: a four horsepower engine. Right: a depiction of the mechanical equivalent of heat, which is upon which the measure of the joule or "energy", and hence "power" (energy per unit time), is based.

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Lecture: "A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies"
HCT | P5: Human molecular view

14.4.1 Formulae

Humans may be called a 26-element energy/heat driven dynamic atomic structure. The body contains about 60–70% water; even the bones contain over 30% water with males containing more water than females. By weight, oxygen amounts to about two-thirds of the body (about 67%),

The new 2011 thermodynamics textbook definition of a human, based on American electrochemical engineer Libb Thims' 2002 calculation of the 26-element human molecular formula, in Indian-born American mechanical engineers Kalyan Annamalai, Ishwar Puri, and Milind Jog's *Advanced Engineering Thermodynamics*. [2]

Synopsis: "An introduction to human molecular theory."

Overview

In 1789, French philosopher Jean Sales, in his multi-volume opus *The Philosophy of Nature: Treatise on Human Moral Nature*, stated the following logic:

> "We conclude that there exists a principle of the human body which comes from the great process in which so many millions of atoms of the earth become many millions of **human molecules**."

Jean Sales (1789)

Robert Sterner (2002)

James Elser (2002)

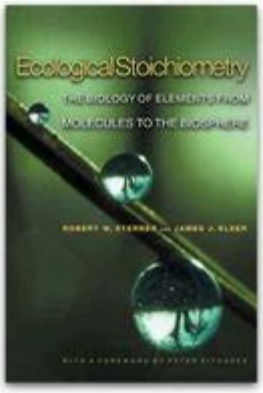

In 2002, American limnologists Robert Sterner and James Elser, in their *Ecological Stoichiometry*, published the first ever calculation for the human molecular formula, which they determined, in empirical molecular formula form, as the following 22-element molecular formula:

$$H_{375,000,000}O_{132,000,000}C_{85,700,000}N_{6,430,000}Ca_{1,500,000}P_{1,020,000}S_{206,000}Na_{183,000}K_{177,000}$$
$$Cl_{127,000}Mg_{40,000}Si_{38,600}Fe_{2,680}Zn_{2,110}Cu_{76}I_{14}Mn_{13}F_{13}Cr_{7}Se_{4}Mo_{3}Co_{1}$$

about which they comment:

> "This **formula** combines all compounds in a human into single abstract 'molecule'. The stoichiometric approach considers whole organisms as if they were single abstract molecules. Organisms can be thought

Libb Thims
(2007)

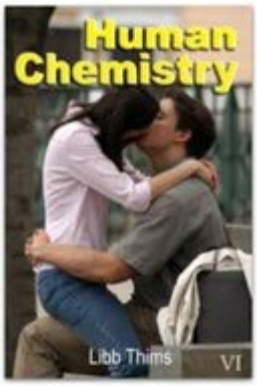

of as complex evolved chemical substances that interact with each other and the abiotic world in a way that resembles a complex, composite, chemical reaction. This formula for the 'human molecule' [allows one] to think about how every human represents the coming together of atoms in proportions that are, if not constant, at least bounded and obeying some rules."

In 2002, American electrochemical engineer Libb Thims, independent of Sterner and Elser, derived the following 26-element molecular formula for a human:

$$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}$$
$$Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$$

about which he commented:

> "By describing the existence of a human in this form we are by no means making attempts to degrade our existence, we are only trying to help elucidate our understanding of this existence."

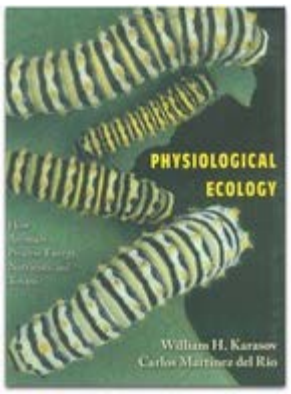

(2007)
Sterner-Esler

(2008)
Sterner-Esler

(2010)
Sterner-Esler

Thims eventually published his formula calculations online 2005, in his 2007 *Human Chemistry*, and, following discovery of the Sterner-Elser calculation, via the newly-launched Google Books term search, in his 2008 *The Human Molecule*, wherein a detailed history of the subject was presented (see: HMS pioneers).

These two formulas, the Sterner-Elser formula and the Thims formula, in recent years, have sense been slowly making it into books and textbooks, particularly in ecology and thermodynamics, namely those books as shown adjacent, as the "new" standard definition of a human.

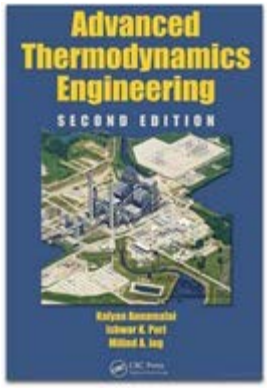

(2011)
Thims

(2012)
Thims

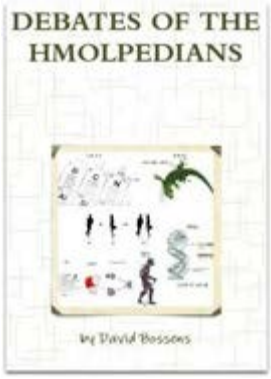

(2013)
Thims

In 2010, following the arrival of the defunct theory of life Thims began to connect "formula" to "free energy", visually, in terms of the model of synthesis in place of the now defunct model of birth, as shown below:

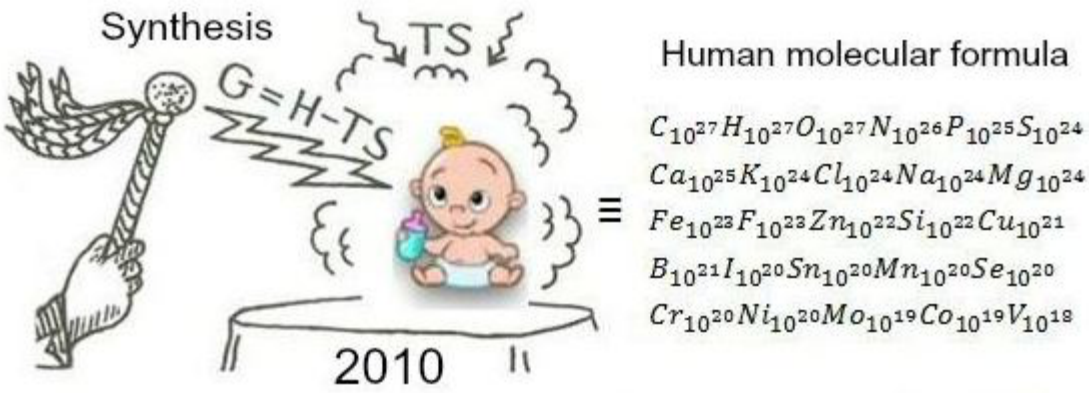

The above newly-forming usages are but the beginnings of "new scientific field", as Alec Groysman put it in 2011. Colloquially, the following poll results, collected online by English physicist James Eadon's 2001-2008, shows that about 57 percent of people believe that they are molecules or specifically "giant molecules". These statistics come from English physicist James Eadon's 2001-2008: [1]

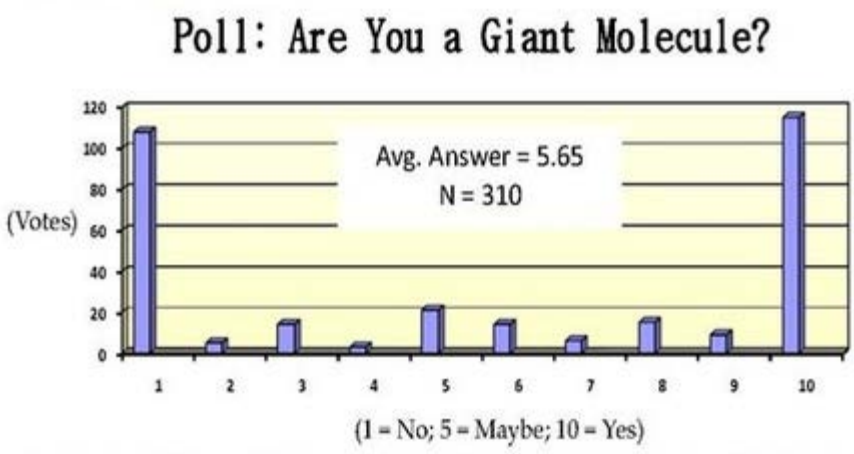

HMS pioneers

See the following human molecular science timeline for more on the ramifications and details of this new philosophical position:

- HMS pioneers

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Lecture: “A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies”
HCT | P6: Equations of chemical thermodynamics

Synopsis: "A quick map to the equations of chemical thermodynamics."

Overview

The following famous 1973 quote by English physical chemist Brian Smith (shown adjacent rock climbing in 2008), on his recollection of his first hearing about the equations of chemical thermodynamics, as a freshman chemistry student (c.1952) at Liverpool University, gives a well-put take on the first encounter with the density of chemical thermodynamics: [1]

> “The first time I heard about chemical thermodynamics was when a second-year undergraduate brought me the news early in my freshman year. He told me a spine-chilling story of endless lectures with almost three-hundred numbered equations, all of which, it appeared, had to be committed to memory and reproduced in exactly the same form in subsequent examinations. Not only did these equations contain all the normal algebraic **symbols** (+,-,÷, etc.) but in addition they were liberally sprinkled with stars (*), daggers (†, ‡), and circles (°,â¦µ) so as to stretch even the most powerful of minds.”

In terms of systematic structure, these hundreds of "equations" of thermodynamics, are derived from seven main variables or quantities, which govern the nature of ANY given body in the universe:

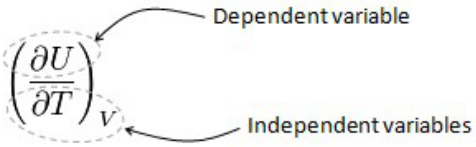

An example of a dependent variable in relation to an independent variable, as used in thermodynamics.

> Q (heat), W (work), **U** (energy), **P** (pressure), **V** (volume), **T** (temperature), **S** (entropy)

The first two, heat and work, are inexact differentials, in that they do not satisfy the Euler reciprocity relation, the latter five, shown bolded—characterized by by Scottish physicist James Maxwell in 1878 as the five "principle quantities"—are exact differentials, in that they do satisfy the Euler reciprocity relation. Those shown bolded are all functions of the generic form:

$$dF = Mdx + Ndy$$

such that the following relation (Euler reciprocity relation) is satisfied:

$$\left(\frac{\partial M}{\partial y}\right)_x = \left(\frac{\partial N}{\partial x}\right)_y$$

These seven core variables can expanded upon to derive the 458 equations of the "mechanical theory of heat" other wise known as "classical thermodynamics" or thermodynamics, in short—of which there are ten fundamental equations (Clausius, 1875). These seven variables and ten fundamental equations, in turn, can the expanded on and applied to "bodies" in which chemical change occurs, as was done by American engineer Willard Gibbs, (*On the Equilibrium of Heterogeneous Substances*, 1876), with the introduction to three new functions:

> **H** (enthalpy), **F** (Helmholtz free energy), **G** (Gibbs free energy)

to form a set of "ten fundamental quantities", as American physicist Percy Bridgman characterized them in 1916, which can be further grouped according to whether they are extensive (U, V, S, H, F, G) or intensive (T, P) variables, of which there are 720 first partial derivatives, that fall into 10 groups, each group based on which variable is held constant during the differentiation—a systematic derivation methodology known as the Bridgman formulas.

Thermodynamics potentials

This set of basic chemical thermodynamic equations (1,158 Gibbs-Clausius, 720 Bridgman, or 700 Gibbs), can be further reduced, systematically, to derive what is called the "thermodynamic potential" or "force function" of a given system—the given system being defined according to what variables are held constant during the differentiation—being derived through what is called the Gibbs fundamental equation. In short, in 1865, German physicist Rudolf Clausius combined his equations III and VI, of his ten fundamental equations, i.e. his first main principle (first law) and second main principle (second law), to form what is known as the combined law of thermodynamics:

$$dU = TdS - PdV$$

In 1876, American chemical engineer Willard Gibbs expanded on the two main principles, went a step further by assuming that other factors, or rather 'forces', could act on the body, thus having an effect on the change of the bodies energy *dU* during any type of process. In short, according to Gibbs, one fully quantify the internal energy *U* of a system as the sum of all of its influencing conjugate variables pairs, which can be formed mathematically whereby with any extensity x_i (extensive variable, e.g. volume v) it is always possible to associate a tension variable X_i (intensive variable, e.g. pressure P), as a partial derivative of the internal energy of the system with respect to the partial of the extensive variable:

$$X_i = \frac{\partial U}{\partial x_i}$$

which is called the "conjugate", with the product of the two intensive extensive variables *Xdx* being called the "conjugate variable pair". Thus, according to the first law, as explained by Gibbs, the change in internal energy *dU* of a system is given can be defined rigorously as the summation of the product of all conjugate pairs acting on the system:

$$dU = \sum_{i=1}^{k} X_i dx_i$$

The expression on the right side being what is called a Pfaffian form, attributed to the work of German mathematician Johann Pfaff (1765-1825). In this sense, Gibbs rewrote the expanded version of the first main principle (first law) as follows:

$$dU = TdS - PdV + \sum_{i=1}^{k} X_i x_i$$

whereby the condition for a process progressing irreversibly is that the "uncompensated transformations will be positive, expressed by saying that the variation of the entropy of the body will increase in each cycle, dS > 0, as defined by equations nine and ten, or in the synonymous sense that the equivalence values for all uncompensated transformations N will increase in each expansion-contraction cycle, below the 1856 formulation:

$$N = -\int \frac{dQ}{T}$$

below the 1865 formulation:

$$\int \frac{dQ}{T} \leq 0$$

which quantifies:

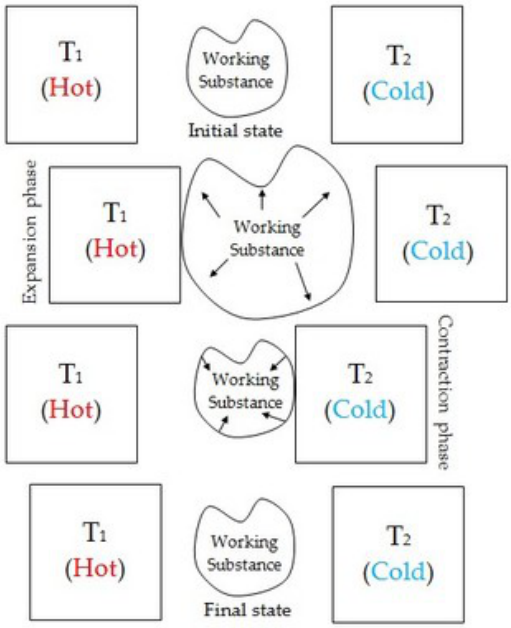

whereas the 'condition for equilibrium' is that the variation of the entropy *dS* of the body will be zero at the equilibrium state. The main nine types of conjugate pairs are listed below:

Intensive Variable	Extensive Variable	Energy	Function	Product	Person
Pressure *P*	Volume dV	pressure-volume work	δW	*pdV*	Clapeyron (1834)
Temperature *T*	Entropy *dS*	internal work	δQ	*TdS*	Clausius (1865)
Chemical potential *μ*	Particle number *dn*	species transfer work		*μdn*	Gibbs (1876)
Force *F*	Length *dl*	elongation/contraction work		*Fdl*	
Electromotive force ε	Charge *de*	electrical work		*εde*	
Surface tension γ	Surface area *dA*	surface work		γdA	
Gravitational potential *ψ*	Mass *dm*	gravitation work		*ψdm*	
Electric field *E*	Electric dipole moment *dp*	electric polarization		*Edp*	
Magnetic field *B*	Magnetic moment *dm*	magnetic polarization		*Bdm*	

What this table says is that when a system does work or has work done on it the system internal energy is effected, and this effect can be quantified by conjugate variable pairs. To go through one example, when the system has a volume d*V* change due the action of a pressure *P*, i.e. pressure-volume work (d*W* = *p*d*V*), an expansion of a material section or elongation d*l* in response to the application of a force *F*, i.e. elongation work (d*W* = *F*d*l*), does work (*μ*d*n*) by transporting a certain number of atoms or molecules d*n* against a concentration gradient, where *μ* is the chemical potential, i.e. transport work (d*W* = *μ*d*n*), or, among many other possible examples, does work in the action of charge transport in which an amount of charge d*q* is transported against an electric potential *ψ*, i.e. electrical work (d*W* = *ψ*d*q*), then the Gibbs fundamental equation becomes: [3]

$$dU = TdS - PdV + Fdl + \sum_{i=1}^{m} \mu_i dn_i + \Psi dq$$

Free energy

The following formula was given by German physicist Hermann Helmholtz as the formulation for affinity in relation to the direction of changes spontaneously occurring:

$$\frac{dF}{dt} \leq 0$$

which states that the affinities will only be active when the system of the chemical process shows a decrease in free energy *F* with time *t*.

> "Given the unlimited validity of Clausius' law, it would then be the value of the free energy, not that of the total energy resulting from heat production, which determines in which sense the chemical affinity can be active."

The following affinity-free energy equation, the centerpiece of thermodynamic theory of affinity, as formulated by Belgian chemist Theophile de Donder in 1936:

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

This tends to be distilled down in modern college chemistry textbooks to the following three rules of spontaneity criterion:

Condition	Description
$\Delta G < 0$	Reaction or process is spontaneous in the forward direction
$\Delta G > 0$	Reaction or process is nonspontaneous (reaction is favored in the opposite direction)
$\Delta G = 0$	System is at equilibrium (there is no net change)

Human free energy

Modern attempts to map these "variables" into human, social, or economic terms are attempted in what are called "human thermodynamics variable tables", the first such one attempted by American economist Irving Fisher, noted second generation student of Gibbs, in 1892. Attempts extrapolation of free energy to explain aspects of the human social condition is what is called "human free energy theory", which is a relatively new subject.

References

1. (a) Smith, Brian E. (1973). *Basic Chemical Thermodynamics* (pg. vii). Imperial College Press, 2004.
(b) (b) McQuarrie, Donald A. and Simon, John D. (1997). *Physical Chemistry: A Molecular Approach* (pg. xvii). University Science Books.
(c) Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 74). Morrisville, NC: LuLu.
2.Glaser, Roland. (2000). *Biophysics*, (pgs. 110-11). Springer.

Next section

â— Lecture: HCT | P7: Newton's Query 31 to Goethe's affinities to human free energies

Previous section

â— Lecture: HCT | P5: Human molecule view

Main

â— Lecture: HCT | Overview: Table of contents

Lecture: “A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies”
HCT | P7: Newton's Query 31 to Goethe's elective affinities to human free energies

Synopsis: "A connect the dots step from English physicist Isaac Newton’s final and most-famous ‘Query 31’, which culminated in German polymath Johann Goethe’s 1809 human chemical affinity theory, the basis of which was proved to be determined by the measure of free energy in 1882 by German physicist Hermann Helmholtz, which into the 20th century began to take the form of human free energy theories."

Overview

In 1718, English physicist Isaac Newton (1643-1727) penned his last and most famous quest known as "Query 31", which is said to have launched the chemical revolution, in his existence-long quest to find the "secret principle" of nature and the universe, in which he opened to the following:

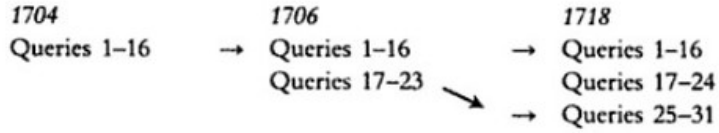

The historical development of the queries.

> “Have not the small particles of bodies certain powers, virtues, or force, by which they act at a distance, not only upon the rays of light for reflecting, refracting, and inflecting them, but also upon one another for producing a great part of the phenomena of nature? ... We must learn from the phenomena of nature what bodies attract one another, and what are the laws and properties of attraction, before we enquire the cause which the attraction is performed.”

The core chemical reactions comparison example, of Newton’s description of a "gradient of affinity reactions", is as follows:

> “Is it not for want of an attractive virtue between the parts of water ( ) and oil, of quick-silver ( )(Hg) and antimony ( ) (Sb), of lead ( )(Pb) and iron (♂)(Fe), that these substances do not mix; and by a weak attraction, that quick-silver ( )(Hg) and copper (♀)(Cu) mix difficultly; and from a strong one, that quicksilver ( )(Hg) and tin ( )(Sn), antimony ( )(Sb) and iron (♂)(Fe), water ( ) and salts, mix readily?”

In 1718, during a translation into French of Newton’s *Opticks*, French physician and chemist Étienne Geoffroy used Newton’s descriptions of affinity tendencies or reactions, such as above, to construct the world’s first affinity table, as shown below adjacent, entitled:

> “Table of Affinities: Between Different Substances”

with the caption:

> “Not invented, or thought involved, but to be seen as what the nature of the issue is, or does.”

French physician and chemist Étienne Geoffroy's 1718 affinity table.

Bergman's affinity table

Over the next century, well over a dozen bigger and more complicated "affinity tables" were produced, coming to define the science of "affinity chemistry", which was eventually superseded in 1882 by the new entropy-based sciences of chemical thermodynamics and physical chemistry. The biggest of the affinity tables was Swedish chemist Torbern Bergman's 1775 59-column 50-row chemical affinity table, the largest ever assembled, showing thousands of possible chemical reactions, in both the "wet way" (aqueous) and "dry way" in schematic form between various chemical species, a portion of which is shown below:

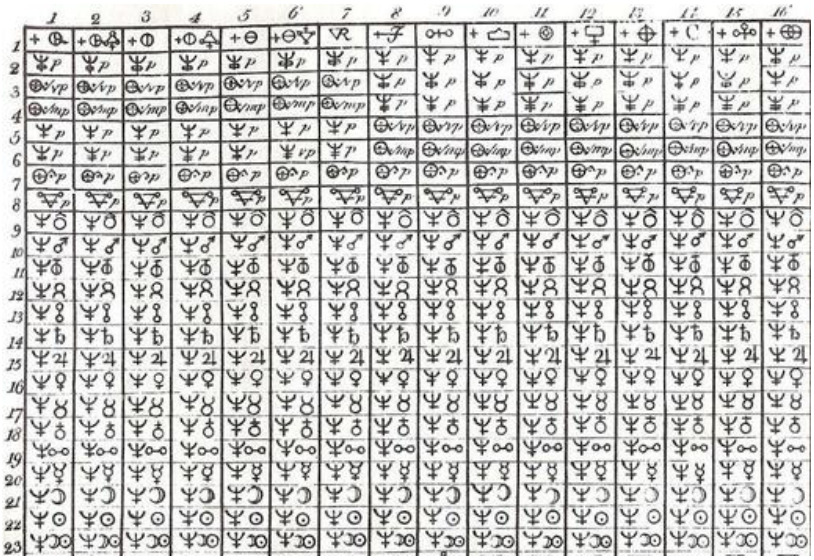

Bergman's table, and accompanying textbook, also employed Scottish physician and chemist William Cullen's 1757 invention of "reaction diagrams"; the following, to exemplify, is #20 of Bergman's reaction #20, of sixty-four in total (see: Bergman reaction diagrams), showing the "decomposition of calcareous hepar by vitriolic acid":

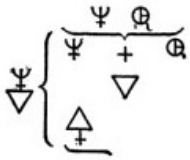

$$CaS + H_2SO_4 \rightarrow CaSO_4 + S$$

1775 version modern version

which in words, the *calcareous hepar*,

(CaS)

described such that it has its "proximate principles [are] united", which are *calcareous earth* (calcium oxide, CaO) and sulphur (S):

(CaO) and (S)

is decomposed [reacts with] *vitriolic acid* (sulfuric acid, H_2SO_4):

(H_2SO_4)

in water, (H_20), indicating that “the three surrounding bodies freely exercise their attractive powers in it”, to form gypsum and elemental sulphur:

($CaSO_4$) and (S)

The vertical bracket { represents breaking of the combination of these two “proximate principles” by the action of the vitriolic acid, which “attracts calcareous earth more strongly than sulphur does.” A complete horizontal bracket indicates a new combination. The fact that sulphur, which is the other product of the reaction, also precipitates, is indicated by turning downwards the point of the lower horizontal half bracket.

Goethe | Theory beginnings

In 1796, German polyintellect Johann Goethe seized on this new view of nature, scaling up the logic of to explain the nature of human existence and experience as follows:

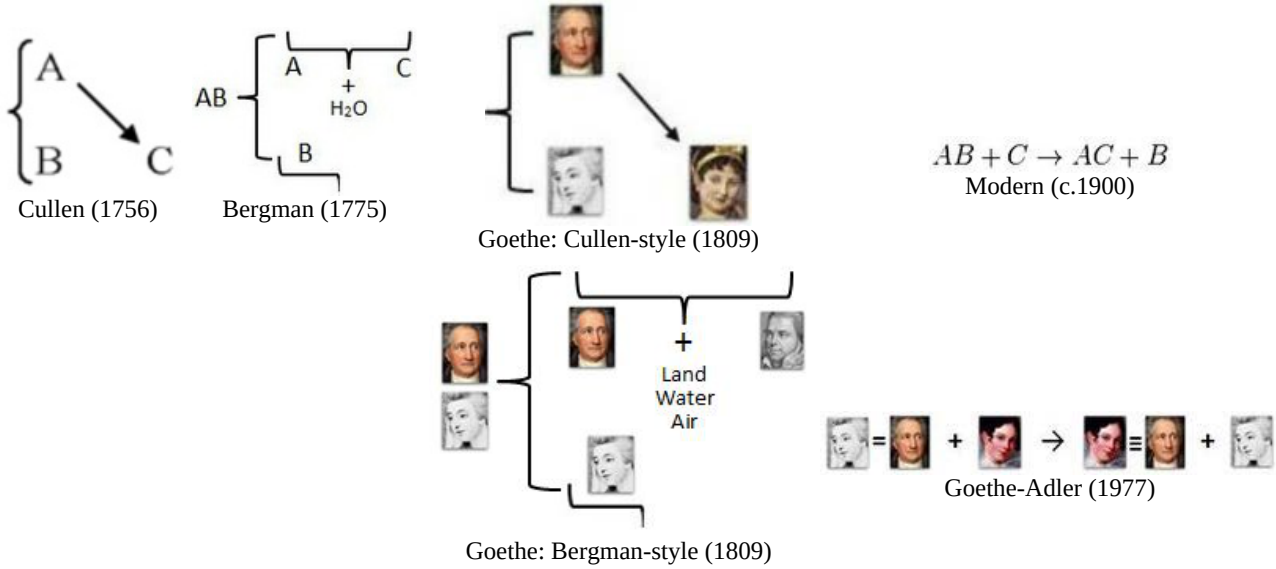

This thus explains the "symbols" Goethe had in mind in the writing of his greatest work.

Goethe's affinity table

In 1809, Goethe expanded on the above and penned out a 36-chapter novella in which each chapter is based on the following human affinity table, the adjacent video shows the famous "chapter four" in which the reaction between limestone, i.e. calcium carbonate ($CaCO_3$), and sulfuric acid (H_2SO_4) which upon contact yields gypsum ($CaSO_4 \cdot 2H_2O$), in the form an aqueous crystal, and carbon dioxide (CO_2) gas, a reaction that is compared and contrasted with the reactions that are occurring between the main characters in the novel: Charlotte (carbon dioxide), Edward (lime), Captain (sulfuric acid)

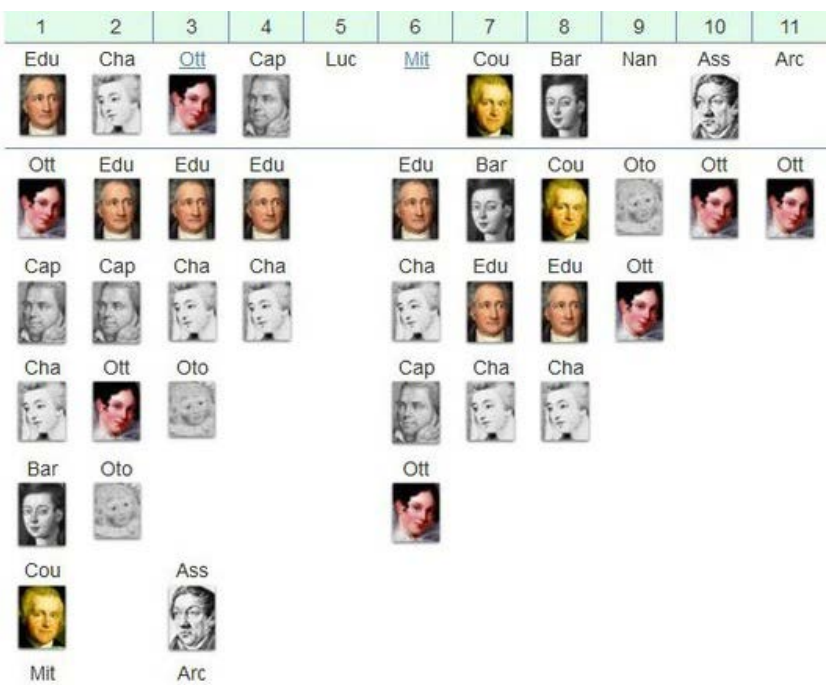

The modern chemical equation for the limestone sulfuric acid reaction is shown below; a video of reaction of calcium carbonate chips with sulfuric acid is shown to the right —which shows that in the course of 13-minutes, the "extent", symbol ξ, pronounced xi or "zi", starting from an initial 50 grams total of reactant remains, only 49.13 grams remain, measurable by the scale, meaning that 0.83 grams of carbon dioxide gas was produced as reaction product:

$$CaCO_3\ (s) + H_2SO_4\ (l) \rightarrow CaSO_4\ (aq) + CO_2\ (g)$$

$$AB + CD \rightarrow AC + BD$$

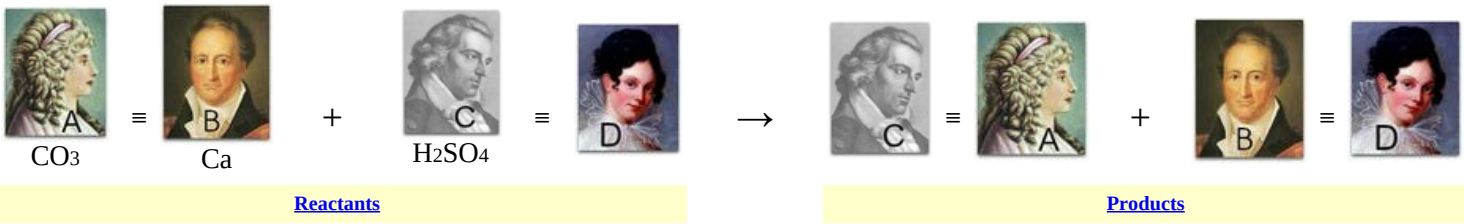

Thermal theory of affinity

Independently, as proposed in 1854 Danish chemist Julius Thomsen and in 1864 French chemist Marcellin Berthelot, it was argued that all chemical action not due to external energy tends to the production of the body or bodies which set free the greatest heat. This came to be known as the "heat theory of affinity" or thermal theory of affinity. Soon, however, inconsistencies with the theory, such as endothermic reactions, began to lay question to it.

Thermodynamic theory of affinity

In 1882, following the formulation of the concept of entropy in 1865 by German physicist Rudolf Clausius and his so-called Clausius inequality:

$$\oint \frac{dQ}{T} \leq 0$$

German physicist Hermann Helmholtz, in his "On the Thermodynamics of Chemical Processes, disproved the "thermal theory of affinity", replacing it with the thermodynamic theory of affinity, about which he states:

> "Given the unlimited validity of Clausius' law, it would then be the value of the free energy, not that of the total energy resulting from heat production, which determines in which sense the chemical affinity can be active."

Helmholtz gives the following formula for the formulation for affinity in relation to the direction of changes spontaneously occurring:

$$\frac{dF}{dt} \leq 0$$

which states that the affinities will only be active when the system of the chemical process shows a decrease in free energy *F* with time *t*. In short, Helmholtz showed that the true measure of affinity is not "heat" Q but rather "free energy", F or G, which depended on reaction conditions:

	Thermal theory of affinity (1854-1864)	Thermodynamic theory of affinity (1882-1936)
Driving force / Measure of affinity (isochoric-isobaric reactions)	Q	U – TS
Driving force / Measure of affinity (isothermal-isobaric reactions)	Q	U + PV – TS

Helmholtz's proof thus overthrew the thermal theory of affinity of thermochemistry, updating things with the newly-forming science of chemical

thermodynamics. It is at this point in the history of human thought that it is now "proved" that the affinity natures of human interactions and processes are measured by Gibbs free energy:

$$G = U + PV - TS$$

Nernst

In 1893, German physical chemist Walther Nernst expanded on Helmholtz's work, coming to the following view:

> "Since every chemical process, like every process of nature, can only advance without the introduction of external energy only in the sense in which it can perform work; and since also for a measure of the chemical affinity, we must presuppose the absolute condition, that every process must complete itself in the sense of the affinity—on this basis we me may without suspicion regard the maximal external work of a chemical process (i.e. the change of free energy), as the measure of affinity. Therefore the clearly defined problem of thermo-chemistry is to measure the amounts of the changes of free energy associated with chemical processes, with the greatest accuracy possible … when this problem shall be solved, then it will be possible to predict whether or not a reaction can complete itself under the respective conditions. All reactions advance only in the sense of a diminution of free energy, i.e. only in the sense of the affinity."

On this platform, Nernst worked to measure the affinities of reactions near absolute zero, a location at which entropy change ceases, and the pure chemical affinity is thus measured; this logic came to known as the Nernst heat theorem or eventually the "third law of thermodynamics".

Lewis

In 1923, American physical chemist Gilbert Lewis published his *Thermodynamics and the Free Energy of Chemical Processes*, which which he set out the logic of free energy tables, specifically his "Table of Standard Free Energies of Formation at 25 °C", giving free energies of formation for 28 cations and a few metallic compounds and 111 non-metallic compounds and anions, as shown below, according to which the free energy of a given chemical species can now be assigned a specific free energy value in a given state of existence:

TABLE OF FREE ENERGIES

TABLE OF STANDARD FREE ENERGIES OF FORMATION AT 25°C

CATIONS AND A FEW METALLIC COMPOUNDS

Substance	$\Delta F°_{298}$	Equation (or Table)	Substance	$\Delta F°_{298}$	Equation (or Table)
H^+	0		Hg_2^{++}	36854	T XXX-7
Li^+	−68248	T XXX-7	HgCl(s)	−25137	XXXV-22
Na^+	−62588	T XXX-7	HgO(s)	−13808	XXXIV-15
NaCl(s)	−91792	XXXV-26	Tl^+	−7760	T XXX-7
K^+	−67431	T XXX-7	TlCl(s)	−44164	XXXV-25
$KClO_3$(s)	−69250	XXXV-28	Tl_2O(s)	−32410	XXXIV-55
Rb^+	−67473	T XXX-7	TlOH(s)	−45400	XXXIV-53
Cu^{++}	15912	T XXX-7	Sn^{++}	−6276	T XXX-7
Ag^+	18448	T XXX-7	Pb^{++}	−5630	T XXX-7
AgCl(s)	−26187	XXXV-23	$PbCl_2$(s)	−74990	XXXV-24
Ag_2O(s)	−2395	XXXIV-10	PbO(s)	−41000	XXXIV-57
CaH_2(s)	−34780	XXXIII-4	Fe^{++}	−20350	T XXX-7
Zn^{++}	−34984	T XXX-7	Fe^{+++}	−3120	T XXX-7
Cd^{++}	−18348	T XXX-7	NH_4^+	−18930	XXXIX-11

NON-METALLIC COMPOUNDS AND ANIONS

Substance	$\Delta F°_{298}$	Equation	Substance	$\Delta F°_{298}$	Equation
H(g)	37730	XXXIII-2	H_2(g)	0	
O_2(g)	0		H_2O_2(g)	−24730	XXXIV-49
O_3(g)	32400	XXXIV-4	H_2O_2(l)	−28230	XXXIV-47
H_2O(g)	−54507	XXXIV-23	H_2O_2(s)	−27980	XXXIV-48
H_2O(l)	−56560	XXXIV-20	H_2O_2(aq)	−31470	XXXIV-39
H_2O(s)	−56418	XXXIV-25	HO_2^-	−15610	XXXIV-41
OH^-	−37455	XXXIV-28			
Cl(g)	32400	XXXV-2	HCl(aq)	−31367	XXXV-7
Cl_2(g)	0		Cl^-	−31367	XXXV-7
Cl_2(g. 1 at.)	−6	XXXV-1	HClO(aq)	−19018	XXXV-16
Cl_2(l)	1146	XXXV-3	ClO^-	−6500	XXXV-17
Cl_2(aq)	1650	XXXV-4	$HClO_3$(aq)	−250	XXXV-19
Cl_2(in CCl_4)	1030	XXXV-6	ClO_3^-	−250	XXXV-21
HCl(g)	−22692	XXXV-10			
Br(g)	18250	XXXVI-6	HBr(aq)	−24595	XXXVI-17
Br_2(g)	755	XXXVI-1	Br^-	−24595	XXXVI-15
Br_2(l)	0		Br_3^-	−25230	XXXVI-19
Br_2(s)	314	XXXVI-7	HBrO(aq)	−19680	XXXVI-21
Br_2(aq)	977	XXXVI-11	$HBrO_3$(aq)	2300	XXXVI-23
Br_2(in CCl_4)	389	XXXVI-9	BrO_3^-	2300	XXXVI-23
HBr(g)	−12540	XXXVI-14			

NON-METALLIC COMPOUNDS AND ANIONS—*Continued*

Substance	$\Delta F°_{298}$	Equation	Substance	$\Delta F°_{298}$	Equation
I(g)	15470	XXXVII-4	HI(aq)	−12361	XXXVII-9
I_2(g)	4630	XXXVII-2	I^-	−12361	XXXVII-9
I_2(l)	920	XXXVII-1	I_3^-	−12315	XXXVII-11
I_2(s)	0		HIO(aq)	−23170	XXXVII-13
I_2(aq)	3926	XXXVII-5	HIO_3(aq)	−31580	XXXVII-16
HI(g)	315	XXXVII-8	IO_3^-	−31580	XXXVII-16
S(g)	30240	XXXVIII-21	S^{--}	23450	XXXVIII-31
S_2(g)	18280	XXXVIII-25	SO_2(g)	~~69660~~	XXXVIII-39
S_6(g)	11900	XXXVIII-17	SO_2(aq)	−69770	XXXVIII-44
S_8(g)	10000	XXXVIII-18	H_2SO_3(aq)	−126330	XXXVIII-45
S_λ(l)	94	XXXVIII-7	HSO_3^-	−123920	XXXVIII-46
$S_{\lambda,\mu}$(l)	93	XXXVIII-9	SO_3^{--}	−116680	XXXVIII-47
S(monocl.)	18	XXXVIII-4	SO_2Cl_2(g)	−71560	XXXVIII-52
S(rhomb.)	0		SO_3(g)	−~~85890~~	XXXVIII-50
H_2S(g)	−7840	XXXVIII-24	H_2SO_4(aq)	−176600	XXXVIII-53
H_2S(aq)	−6490	XXXVIII-27	SO_4^{--}	−176500	XXXVIII-54
HS^-	2980	XXXVIII-29			
N_2(g)	0		NO_2(g)	11920	XXXIX-16
NH_3(g)	−3910	XXXIX-2	N_2O_4(g)	22640	XXXIX-19
NH_3(l)	−2620	XXXIX-5	HNO_2(aq)	−13070	XXXIX-35
NH_3(aq)	−6300	XXXIX-7	NO_2^-	−8500	XXXIX-34
NH_4OH(aq)	−62860	XXXIX-9	HNO_3(g)	−18210	XXXIX-30
NH_4^+	−18930	XXXIX-11	HNO_3(aq)	−26500	XXXIX-32
NO(g)	20850	XXXIX-12	NO_3^-	−26500	XXXIX-33
NOCl(g)	16010	XXXIX-22			
C(diamond)	390	XL-2	HCOOH(aq)	−87920	XL-25
C(graph.)	0		C_2H_5OH(l)	−45100	XL-28
CH_4(g)	−12800	XL-3	$CO(NH_2)_2$(s)	−47280	XLI-2
C_6H_6(l)	27100	XL-6	$CO(NH_2)_2$(aq)	−48840	XLI-4
CO(g)	~~−32510~~	XL-14	HCN(g)	28910	XLI-15
$COCl_2$(g)	−48770	XL-30	HCN(l)	28870	XLI-16
COS(g)	−39600	XL-33	HCN(aq)	27520	XLI-13
CO_2(g)	~~−94260~~	XL-16	CN^-	39370	XLI-11
H_2CO_3(aq)	−148810	XL-18	HCNO(aq)	−29100	XLI-8
HCO_3^-	−140000	XL-20	CNO^-	−23750	XLI-6
CO_3^{--}	−125760	XL-22	C_2N_2(g)	92000	XLI-21
HCOOH(l)	−84040	XL-26	CNI(s)	42790	XLI-19

De Donder

In 1936, Belgian physicist Theophile de Donder used the symbol "A" for affinity as the negative partial of the partial of the Gibbs free energy per unit partial of extent of reaction for a change in a isothermal isobaric system:

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

Which equates to the following in modern Lewis thermodynamics based simplified notation:

$$A = -\Delta G$$

Human free energy theory

In the decades to following human free energy theory began to emerge. In 2009, go through a recent example, American physical chemist Thomas Wallace, in his book *Wealth, Energy, and Human Values*, applies the basics of physical chemistry and chemical thermodynamics, in particular the Gibbs equation:

$$\Delta G = \Delta H - T\Delta S$$

to the modeling of the rise and fall of civilizations, in what he considers a ‘mechanistic-thermodynamic paradigm’; contains a good appendix on "The

Fundamentals of Thermodynamics Applied to Socioeconomics", which outlines a decent reaction coordinate depicted initial state / final state view of mechanism-based society reaction processes. A few examples include:

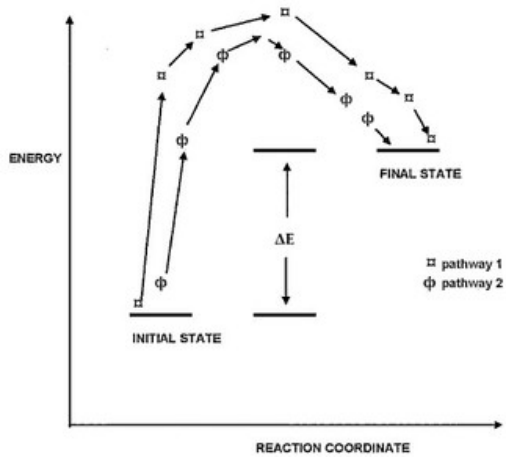

Reaction coordinate depicting the initial state of the reactants on going to the final state of the products through two different pathways, indicating that state variables are path-independent.

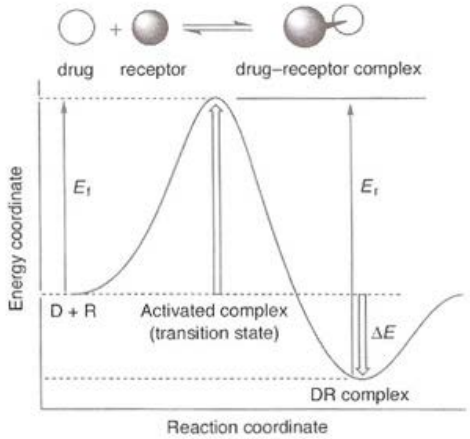

A typical drug-receptor **reaction coordinate** as are used on drug-receptor thermodynamics, showing the activated complex.

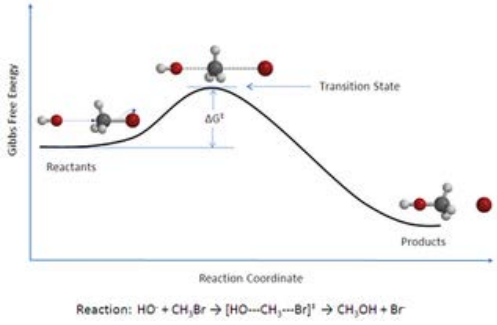

An SN-2 **reaction coordinate**, showing the intermediate transition state.

Gibbs free energy of formation of an animal

See main: Human free energy of formation

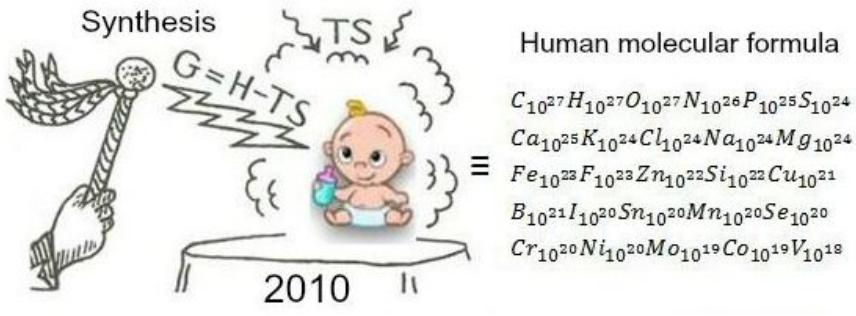

The following 1993 quote by American physical chemist Martin Goldstein, from his chapter section on the "Entropy of a Mouse", gives idea of what is means for a biochemical species or for that matter a so-called biological entity, such as a mouse (or a human) to have a free energy value in a given state: [12]

> "To apply thermodynamics to the problem of how life got started, we must ask what net energy and entropy changes would have been if simple chemical substances, present when the earth was young, were converted into living matter [as in the formation of a mouse] … to answer this question [for each process], we must determine the energies and entropies of everything in the initial state and final state."

In other words, the above table, showing the Gibbs free energies of formation for different biochemical species, such as Fructose (218 kgcal), molecular formula $C_6H_{12}O_6$, gives way to the idea that this logic can be extrapolated upward to calculate the standard Gibbs free energy of formation for different types of proto-life entities, chemicals, or molecules, such as a mouse.

next
Next section
● Lecture: HCT | P8: Human molecular engineering

prev
Previous section
● Lecture: HCT | P6: Equations of chemical thermodynamics

Main
● Lecture: HCT | Overview: Table of contents

Lecture: “A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies”
HCT | P8: Human molecular engineering

Synopsis: "A quick look at human molecular engineering.”

Utility

The following is an example the utility of the potential future science human molecular engineering or molecular engineering principles applied to every day questions and decisions that people make regarding choices:

> “There are men who would be better off in a small village than in a large town, **if you had** some sort of human chemical reaction to determine in advance which man's nature was suited to the smaller place and which to the larger.”
>
> — Henry Pritchett (1906), on “Large vs. Small Colleges”

See main

- Human molecular engineering

Next section

- Lecture: HCT | P9: Mechanical engineers [H] vs. Chemical engineers [H]

Previous section

- Lecture: HCT | P7: Newton's Query 31 to Goethe's affinities to human free energies

Main

- Lecture: HCT | Overview: Table of contents

Lecture: “A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies”
HCT | Truth

Synopsis:

“All **truth** passes through three stages. First, it is *ridiculed*. Second, it is *violently opposed*. Third, it is accepted as being *self-evident*.”

“To **truth** only a brief celebration of victory is allowed between two long periods during which it is condemned as paradoxical, or disparaged as trivial.”

— Arthur Schopenhauer (1818), on Goethe's human chemical theory

Arthur Schopenhauer

And so, after allowing myself the joke to which in this generally ambivalent life hardly any page can be too serious to grant a place, I put my book forth in profound seriousness, confident that, sooner or later, it will reach those to whom alone it can be addressed. For the rest, I am resigned in patience to the fact that the same fate will befall it in full measure which has always fallen to the lot of truth in every branch of knowledge, in the most important branch most of all. **To truth only a brief celebration of victory is allowed between the two long periods during which it is condemned as paradoxical, or disparaged as trivial.** The author of truth also usually meets with the former fate. But life is short, and truth works far and lives long: let us speak the truth.

Dresden, August 1818

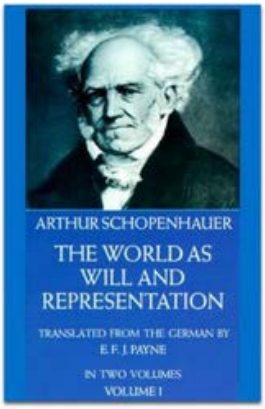

German philosopher Arthur Schopenhauer on the "**three stages of truth**" in regards to stages of acceptance of Goethe's 1796 human chemical theory.

Stage one: ridicule/trivial disparagement
Stage two: violent opposition/paradoxical condemnation
Stage three: self-evident acceptance

The following timeline, in theme with the above, gives an outline of the specific "truth" Schopenhauer is speaking about above, namely the reception of the truth of the 1796 human chemical theory of his mentor German polyintellect Johann Goethe (pronunciation below):

GU(R)-tuh

and how in the centuries following the public presentation of the theory it was both condemned as paradoxical and disparaged as trivial.

Theory presented

The following gives an outline of theory development and presentation:

1784

Discovery:

Goethe discovers the human intermaxillary bone, thus proving that humans evolved from lower animals:

1796

Conceives theory:

“To facilitate our comprehension of the concept of organic existence, let us first take a look at mineral structures, whose combinations are determine by laws and conditions. Different components can be easily separated and recombined into new combinations. These combinations can again be taken apart, and the mineral we thought destroyed can soon be restored to its original perfection.

There are, by nature, stronger or weaker bonds between these components,

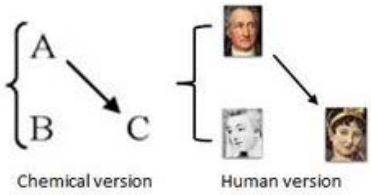

and when they evidence themselves, they resemble attractions between human beings.

This is why chemists speak of elective affinities, even though the forces that move mineral components [or humans] one way or another and create mineral structures are often purely external in

1809

Oct 3

Publishes theory:

“No one can fail to recognize in it a deep passionate would which shrinks from being closed by healing, a heart which dreads to be cured … In it, as in a burial urn, I have deposited with deep emotion many a sad experience. The 3rd of October 1809 (when the publication was completed) set me free from the work: but the feelings it embodies can never quite depart from me.”

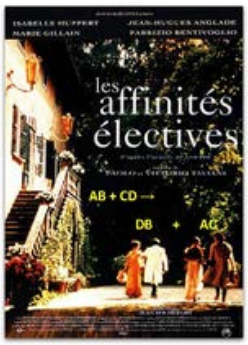

Image shown in 1996 Italian-French film

version.

origin, which by no means implies that we deny them the delicate portion of nature's vital inspiration that is their due."

Stage one | Ridicule - Trivial disparagement

The following is the 1809 "best book" incident and the 1810 burned letter incident:

1809
Dec

Best book incident:

In a scene reported by German writer Heinrich Laube (1806-1884):

"A women friend of mine said to Goethe at that time:

> 'I cannot approve of *Elective Affinities*, Herr von Goethe; it really is an immoral book!'

According to her report, Goethe was silent for a while; then said with great earnestness:

> 'I'm sorry you feel that way. It is my best book, and don't think that this is the mere whim of an aging man. I grant you that one loves most deeply the child of one's last marriage, the product of one's late power of generation. But you wrong me and the book.

> The principle illustrated in the book is true and not immoral.

> But you must regard it from a broader point of view and understand that the conventional moral norms can turn into sheer immorality when applied to situations of this character."

A 55-volume collected works set (above), a 20 volume collected works set (below), a portion of Goethe's total 142 volume collected works set.

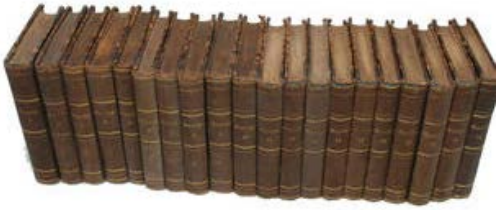

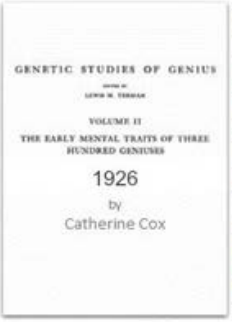

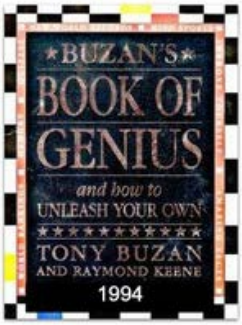

Person	IQ_{CB}
Goethe (1749-1832)	213
Da Vinci (1452-1519)	200
Leibnitz (1646-1716)	194
Newton (1643-1727)	193
Galileo (1564-1642)	183
Mill (1806-1873)	183
Descartes (1596-1650)	178
Michelangelo (1475-1564)	178
Erasmus (1466-1537)	178
Milton (1608-1674)	177

Top 10
Cox-Buzan geniuses

To give an example the usage of Goethe's "principle illustrated in the book", in 1903 Austrian philosopher Otto Weininger, published his *Sex and Character*, commented "I must confess to be the first work to take up [Goethe's] ideas", and in regards to discussing the morality and character of people in respect to sex, marriage, and divorce, commented:

> "If iron sulphate and caustic potash are brought together, the SO_4 ions leave the iron to unite with the potassium. When in nature an adjustment of such differences of potential is about to take place, he who would approve or disapprove of the process from the moral point of view would appear to most to play a ridiculous part."

â— Stem cell | Francis Collins | Cell-as-molecule

The following is Goethe's metamorphology theory of evolution (see: metamorphosis), the gist of his "best book" comment, a theory for which he is cited by Darwin, in his *Origin of Species* (1859), as one of three fathers of evolution theory, prior to him:

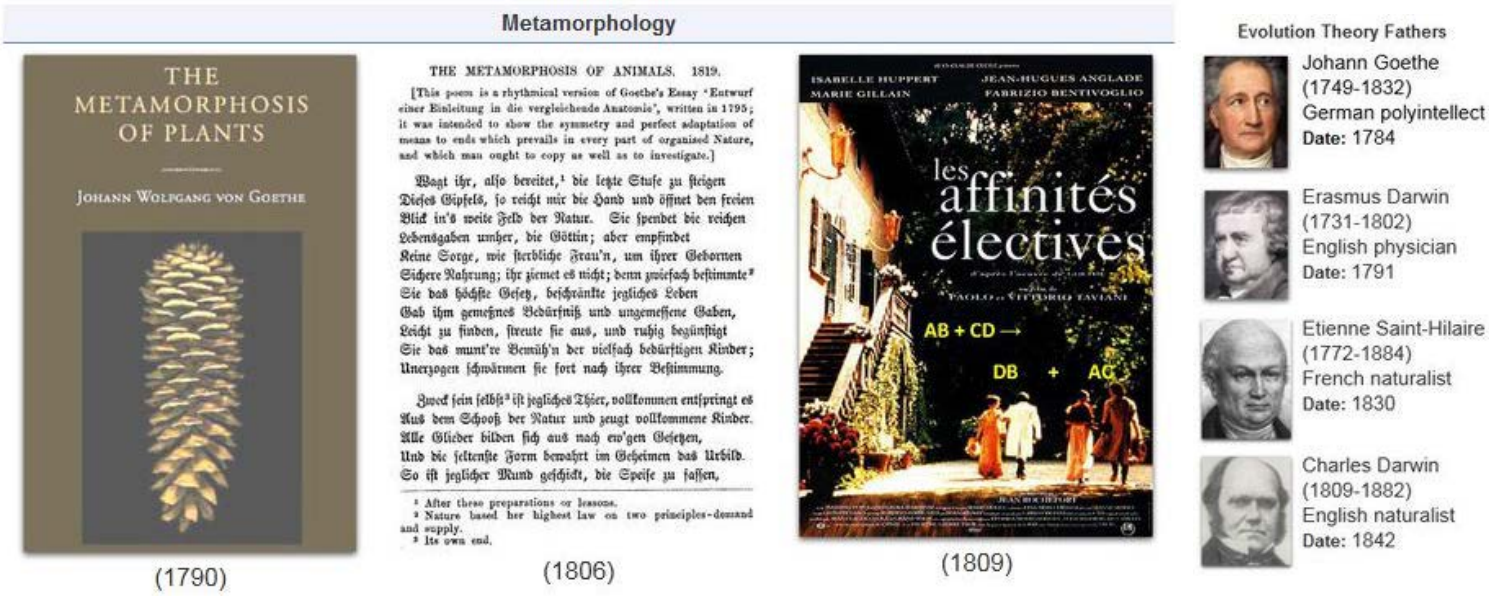

The problem, however, that one is left with in Darwin's theory, as pointed out in 1836 by French naturalist Etienne Saint-Hilaire, an advocate of Goethe's natural philosophy, is the following:

> "It is quite certain that there was a moment when life did not exist on our planet, and another moment when it appeared. It is the passage between these two states that forms the great problem of natural philosophy today."

Darwin, in 1871, initially attempted a patch solution to the problem with his warm pond model; but in the end, in 1882, in the last letter he is known to have dictated and signed, wrote:

> "I believe that the principle of continuity renders it probable that the principle of life will hereafter be shown to be part or consequence of some general law."

The following is an overview diagram of the 2009 solution to the great problem of natural philosophy, i.e. life from non-life problem:

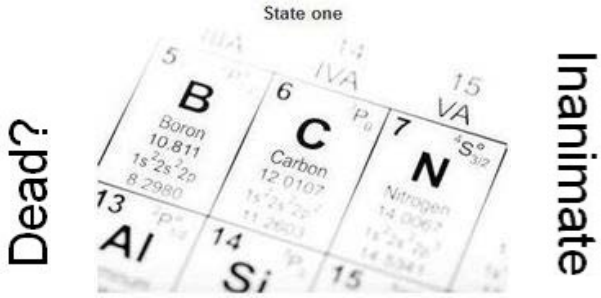

↑↓ **Nonlife**-to-**Life** {?} **Transition** ↑↓ **3.85 BYA**

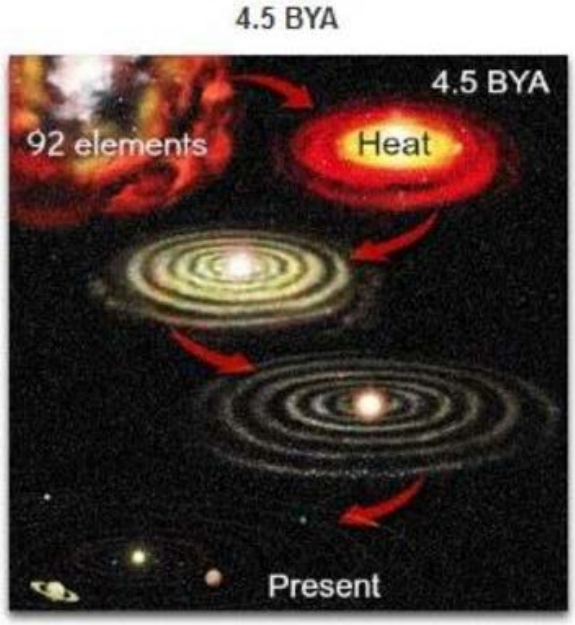

Alive?

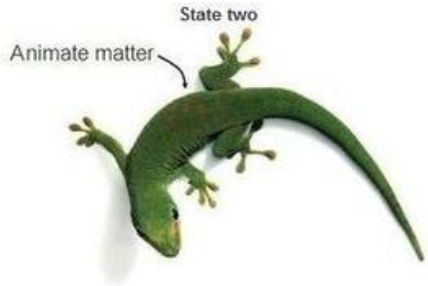

Animate

See also: Great chain of being.

1810
Jul 16

Burned letter:

German poet-writer Christoph Wieland (1733-1813), neighbor of Goethe, who sent a letter (which he suggested should be burned after it is read) in 1810 to German philologist and archeologist Karl Böttiger, stating:

> "To all rational readers, the use of the chemical theory is nonsense and childish fooling around."

> "It's truly horrible work."

Wieland, supposedly, objecting to the radicalness of its Christianity.

Stage two | Violent opposition

The following are the Goethe-Schopenhauer consulting years, 1806 to 1818 (see: Goethe timeline), in which Goethe's protege Arthur Schopenhauer, in 1818, has already sensed aspects of stage one and stage two of the processing reception of Goethe's human chemical theory, which he also extolls and elaborates upon as the bases of his own will to power theory, a work which he seem to correctly intuit to be followed by a long period prior to stage theory:

1806

1816
May

Consulting:

In May 1816, Goethe (age 66) begins conversations with

1818
Aug

Preface:

In Aug 1818, Schopenhauer pens the final paragraph to

1819
Aug 19

Influence:

In 1806, the

Schopenhauer family had newly moved to Weimar, and the first public place that Goethe and his new scandalous bride, Christiane Vulpius (1765-1816), were seen together in public was at the house of Johanna Schopenhauer (1766-1838), mother of a then aged-eighteen year old thinker by the name of Arthur Schopenhauer (1788-1860).

Arthur (aged 28); who eventually absorbes Goethe's chemical theory of will, which he summarized as follows:

> "As the title indicates [*Elective Affinities*], though Goethe was unaware of this, [it] has as its foundation the idea that the will, which constitutes the basis of our inner being, is the same will that manifests itself in the lowest, inorganic phenomena."

and would go on to infuse Goethe's theory of chemical will into his theory of a "will to power" in his monumental two-volume *The World as Will and Representation* (1818, 1844), explaining, therein, how chemical phenomena and reactions scale up to the human-human interaction level.

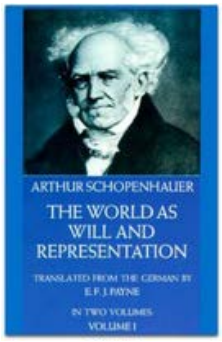

his *The World as Will and Representation*, outlining his Goethean human chemical philosophy based will to power theory, about which he says:

> "All **truth** passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident."

Or according to the 1958 English translation by E.F.J. Payne:

> "To **truth** only a brief celebration of victory is allowed between two long periods during which it is condemned as paradoxical, or disparaged as trivial."

which outlines his Goethean philosophy human chemical theory based "will to power" model of existence.

Visit:

Schopenhauer visits Goethe, who in the same year reads his newly-published 1818 *Die Welt als Wille und Vorstellung* (*The World as Will and Representation*), in which, in §21, Schopenhauer explains "will" in terms of "elective affinities" of matter as "repulsion and attraction, separation and union", in relation to the "deliberate conduct of man". By the time of the publication of the second volume (1844), Goethe and his chemical theory is mentioned and utilized ten-fold.

1844

Volume two:

On German chemist Justus Liebig's description of the reaction of damp copper Cu in air containing carbonic acid H_2CO_3, he comments:

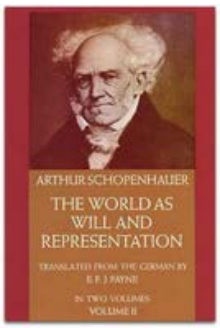

"The will of the copper, claimed and preoccupied by the electrical opposition to the iron, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive."

citing Goethe over 42 times.

1868

Student:

German philosopher Friedrich Nietzsche abandoned his struggle of the Hegel scholars and seized on the writings of Schopenhauer; a result was the famous 1882 proclamation:

"God is dead."

The resultant upswings in beliefs in nihilism and atheism were some of the results.

1878

Student:

German sociologist Max Weber, as a 14 year old student, begins reading Goethe's *Elective Affinities*, hiding it behind his regular school books.

The result is the concept of Weberian elective affinities.

Weber has since come becomes affixed with the title last person to know everything and "last universal genius of social science".

1895/1919

Connections:

In 1895, Austrian psychiatrist Sigmund Freud wrote his free energy/bound energy (F = U – TS) based "A Project for Scientific Psychology"; and in 1919 about his death drive theory wrote:

"The theme of death, [that I] have stumbled onto [is] an odd idea via the drives and [I] must now read all sorts of things that belong to it, for instance Schopenhauer."

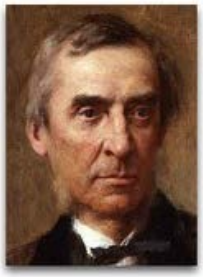

"Froude's semi-autobiographical *Nemesis of Faith* [a renunciation of Christian faith], published in 1848, owed much to Goethe's novel of human and chemical reactions, *Elective Affinities*, which he translated. *Nemesis* **lost him his fellowship** at Exeter College, Oxford, where his **book was publicly burned**."

— David Knight on James Froude (1848) first English translator of *Elective Affinities*

"**Exceptions may be taken** to some of the statements contained in this production of Goethe."

— Henry Bohn (1854), preface to first English translation of *Elective Affinities*

"Indeed, it strikes me almost ludicrous, that the translator has shrunk from appending his name to the work, if he has done so from any idea that its **dangerous views** might tend to impair his reputation."

— Victoria Woodhull (1872), preface to second "anonymous" (Froude) English edition of *Elective Affinities*

"*Elective Affinities* has been spoken of for fifty years as Goethe's **most dangerous work**."

— Herman Grimm (1880), *The Life and Times of Goethe*

Learning curve

The following shows the learning curve:

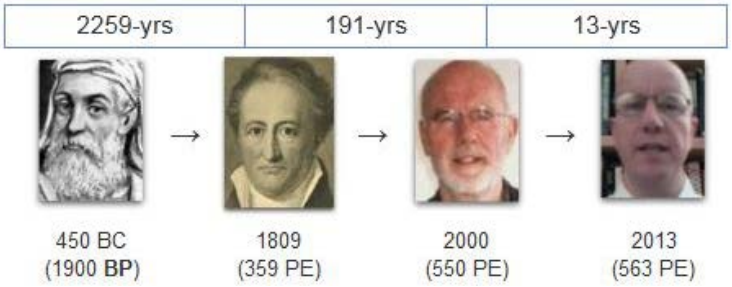

The **learning curve** the transformation of Goethe-Empedocles "human chemical theory" into the Thims-Mimkes "human chemical thermodynamics", embodied in the works of: Empedocles (*On Nature*, 450BC), Goethe (*Elective Affinities*, 1809) Mimkes ("Society as a Many Particle System", 2000), and Thims ("A Guidemap to Human Chemical Thermodynamics"), who all, in turn, progressively cite each other, each labeled using the BP/PE dating system.

Stage two → Stage three | Present

Presently, coming out of the 20th century and entering into the first decades of the 21st century, we are somewhere between "stage two" and the going into "stage three" phase of the "truth" of the principle illustrated in Goethe's best book, that of his human chemical theory:

Elective Affinities
(enemies)

2004

Opinion:

"Goethe's [*Elective Affinities*] did not add any scientific knowledge."

a—Tominaga Keii, §2: Thermodynamics of Chemical Reaction, in *Heterogeneous Kinetics*

Elective Affinities
(admirers)

2004

Testimony:

"To suggest that humans could behave like atoms was looked upon as a blasphemy to both hard science and human complexity, a total nonsense, something to be condemned. And it has been indeed condemned during the last fifteen years."

— Serge Galam, "Sociophysics: a Personal Testimony"

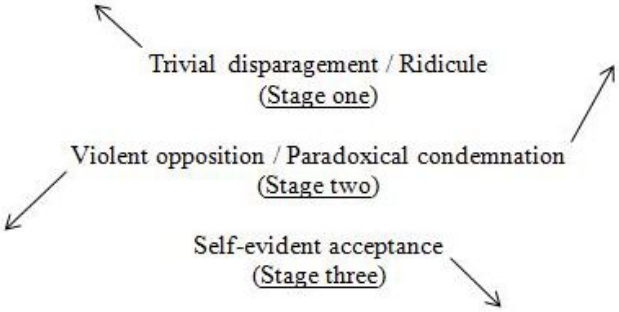

2011
Aug 29

Violent attack:

"If people are using this site to do their PhD dissertations and getting away with that, their advisors should be shot."

— Peggy La Cerra, views on *Hmolpedia*

2006

Self evident:

"You can't argue against this."

— Ted Erikson, review of Thims' *Human Chemistry*

Two cultures department | Discussions

The following are examples of the different sides of "truth" in respect to the potential establishment of an American university two cultures department themed on the Goethe (reality)-Schopenhauer (philosophy)-Weber (sociology)-Nietzsche (philosophy)-Freud (psychology) view of the nature of the universe, all structured on physical chemistry:

2013
Mar 28

Non-support:

"No, your idea for a department for teaching two cultures would not be appreciated at Berkeley. In the social sciences and in some humanities, thermodynamics may be useful as an analogy, as a suggestion for looking at a problem (e.g., information theory) but beyond that, I see little use of thermodynamics outside [hard] science."

— John Prausnitz, on Thims' two cultures department proposal

2013
Mar 08

Support:

"I fully endorse your efforts to include the mechanical [in sociology] in your two cultures university proposal."

— Leon Warshay, on Thims' two cultures department objective

Stage three

The following quote might well estimate the arrival of stage three:

> "I must say, I started watching your videos over a year ago, and have re-watched many. And they still fascinate me. I'm only 17 and I'm seriously considering doing a degree in chemistry after watching your videos. The only downside is not many people I know can have a conversation about the things you're talking about. You were right your videos are decades if not a century in front of its time."
>
> — Ben (2011), comment on Human Chemistry 101 YouTube channel

Namely that in the year 2111 (661 PE), the subject of human chemical thermodynamics will be "self-evident".

In thermodynamics, **heat**, symbol *Q* for "quantity" (Clapeyron, 1834), is a transfer quantity that may be defined as the energy which, exchanged by a system, has the effect of modifying its temperature (sensible heat) or inducing a change of state (latent heat). [1] Heat can also be defined as the process of energy transfer (conduction, convection, or radiation), energy in transit, or a flow of energy from one body or system to another as a result of a difference in temperature. [2] In differential terms, heat, *dQ* or δQ in exact differential symbols, is an amount of energy transferred as a result of an interaction between two systems differing in temperature. [3]

Left: reactants in a beaker (Ñº) being **heated**, an action which works to get the reactants up to the activation energy level in order to reaction to proceed to products. Right: the hot body (fire), cold body (cool water), and working body (substance in cylinder) of the 1690 Papin engine, through which **heat** is added then removed in the operation of the heat cycle.

Matter theory of heat

See main: Matter theory of heat

The early history of theories of heat is a long and convoluted subject, beginning with Aristotle viewing heat as fire element (350BC); Geber explaining heat in terms of sulphur or the 'stone with burns' (c.790); Paracelsus explaining heat in terms of a mixture of Aristotle's four element theory and Geber's three principle theory (1524); Johann Becher, modifying Paracelsus' theory to arrive at the concept of heat as terra pinguis (1669); Georg Stahl, a student of Becher, modifying the terra pinguis theory to arrive at the phlogiston theory of heat (1703); these all tended to revolve around what was called the "matter theory of heat".

Bacon | Heat is motion

See main: Motion theory of heat (kinetic theory of heat)

In 1620, English thinker Francis Bacon, in his *New Instruments*, stated the following logic: [7]

> "It must not be thought that **heat** generates motion or motion heat—though in some respects this is true—but that very essence of heat or the substantial self of **heat is motion and nothing else**."

In 1623, Galileo, in his *The Assayer* (*Il Saggiatore*), stated that the sensation of 'heat' is caused by the very rapid motion of certain specific atoms; the following is the key section: [9]

> "It now remains for me to tell your excellency, as I promised, some thoughts of mine about the proposition **'motion is the cause of heat'**, and to show in what sense this may be true. But first I must consider what it is that we call heat, as I suspect that people in general have a concept of this which is very remote from the truth. For they believe that heat is a real phenomenon, or property, or quality, which actually resides in the material by which we feel ourselves warmed. Now I say that whenever I conceive any material or corporeal substance, I immediately feel the need to think of it as bounded, and as having this or that shape; as being large or small in relation to other things, and in some specific place at any given time; as being in motion or at rest; as touching or not touching some other body; and as being one in number, or few, or many. From these

Heat: it muſt not be thought that Heat generates Motion, or Motion Heat (though in ſome reſpects this be true), but that the very eſſence of Heat, or the *Subſtantial ſelf** of Heat, is Motion and nothing elſe, limited, however, by certain *Differences* which we will preſently add, after giving ſome cautions for avoiding Ambiguity.

English thinker Francis Bacon's famous 1620 statement that the very essence of heat is motion and nothing else. [7] This is one of the first precursor statements to the mechanical equivalent of heat.

> conditions I cannot separate such a substance by any stretch of my imagination. But that it must be white or red, bitter or sweet, noisy or silent, and of sweet or foul odor, my mind does not feel compelled to bring in as necessary accompaniments. Without the senses as our guides, reason or imagination unaided would probably never arrive at qualities like these. Hence, I think that tastes, odors, colors, and so on are no more than mere names so far as the object in which we place them is concerned, and that they reside only in the consciousness. Hence if the living creature were removed, all these qualities would be wiped away and annihilated. But since we have imposed upon them special names, distinct from those of the other and real qualities mentioned previously, we wish to believe that they really exist as actually different from those."

Later derived views are as follows:

> "**Heat** is a very brisk agitation of the sensible parts of the object, so that what in our sensation is *heat* in the object is nothing but motion."
>
> — John Locke (c.1670), "On the Five Senses of Touch" (Ñº); in: *The Works of John Locke in Nine Volumes, Volume Two* (Elements of Natural Philosophy; Chapter 11 (Ñº)

> "**Heat** seems principally to consist in that mechanical property of matter we call motion."
>
> — Robert Boyle (c.1660), *Publication*; cited by Donald Cardwell (1971) in *From Watt to Clausius* (pg. 4)

(add)

Caloric theory of heat

In 1787, Antoine Lavoisier began to conduct heat weighting experiments during combustion reactions; the result of which is that he disproved the phlogiston theory through experiment, and replacing it with the "caloric theory".

Motion theory of heat | Experiments

The downfall in the various "matter theories of heat" began to accrue at the start of the 19th century, which Scottish physicists Balfour Stewart and Peter Tait summarize as follows: [6]

> "Rumford's boiling of water by the heat generated in the boring of a cannon, and Davy's melting of ice by friction *in vacuo*, were each conclusively demonstrative alike of the non-materiality of heat and of the ultimate fate of work spent in friction. The exact and formal enunciation of the equivalence of heat and work required to fill the *lacuna* in Newton's statement was first given by Davy in 1812."

In more detail, in 1798, American-born English physicist Benjamin Thomson (who eventually married Lavoiser's wife, after Lavoisier was guillotined) disproving Lavoisier's caloric theory, via his famous cannon boring experiment, and followup publication "An Inquiry Concerning the Source of Heat which is Excited by Friction", to arrive at the motion theory of heat (1798);

In 1799, Humphry Davy performed his famous ice rubbing experiment in which he melted ice in a vacuum via friction.

Thomson, in turn, then appointed the like-minded English physician-physicist Thomas Young to lecture at the Royal Institute, particularly based on the fact that Young was one of the first to embrace his avant-garde idea that heat was the manifestation of atomic motion. Young in addition, however, was the first to experimentally prove the wave theory of light (c.1803), and thus he added to Thomson's argument that heat must be a combination of motion and light. Young's description of heat, as presented in his lectures on natural philosophy, published in 1807, is one of the most profound and modern descriptions of heat to be found, even in modern times (aside from the elastic medium part): [5]

> "If **heat** is not a substance, it must be a quality; and this quality can only be motion. It was Newton's opinion, that heat consists in a minute vibratory motion of the particles of bodies, and that this motion is communicated through an apparent vacuum, by the undulations of an elastic medium, which is also concerned win the phenomena of light. If the arguments which have lately been advanced, in favor of the undulatory nature of light, be deemed valid, there will be still stronger reasons for admitting his doctrine respecting heat, and it will only be necessary to suppose the vibrations and undulations principally constituting it, to be larger and stronger than those of light, while at the same time the smaller vibrations of light, and even the blackening rays [ultraviolet light], derived from still more minute vibrations, may, perhaps, when sufficiently condensed, concur in producing the effects of heat. These effects, beginning from the blackening rays, which are invisible, are a little more perceptible in the violet, which still possess but a faint power of illumination; the yellow green afford the most light; the red give less light, but much more heat, while the still larger and less frequent vibrations [infrared light], which have no effect on the sense of light, may be supposed to give rise to the least refrangible rays, and to constitute invisible heat."

This is quite an ingenious description, to say the least. Young incorporates the experimental findings of the motion theory of heat, the experimental findings of the double-slit experiment, and the view that light is one part of the electromagnetic spectrum (a theory completed by James Maxwell in 1873, based on Young's work), to give one of the most cogent descriptions of heat ever presented, even for modern times.

Mechanical equivalent of heat

The next big idea on heat came about through the experiments of English physicist James Joule (among others) who experimentally introduced the mechanical equivalent of heat (1843);

Entropy formula of heat

In 1850, Joule's work on the mechanical equivalent of heat was taken up by German physicist Rudolf Clausius, who, over the next 15-years, combined the "motion theory of heat" with the "mechanical equivalent of heat" with the Euler reciprocity relation to arrive at the exact differential state function formulation of what he called the "equivalence value" of heat:

$$\text{Equivalence value of heat} = \frac{Q}{T}$$

and by 1865 this equivalence value came to be known as entropy, symbol S. This, in turn, opened the door to numerous mathematical "entropy formulation" varieties of heat, in the years and decades to follow.

Social heat

See main: Social heat; Economic heat; Political heat

(add summary)

Human chemistry

In 1948, American author Thomas Dreier gave the following crude description of "heat" generated in the context of human chemical reactions: [4]

> "What is democracy but a successful formula for controlling the chemical reactions of our 145,000,000 people, and turning the friction and **heat**

A 2015 novel *Elements of Chemistry: Heat* (Ñº) by biomedical research and writer Penny Rad on relationships, sex, **heat**, and chemistry, which shows an formula-background stylized cover.

> generated by our living together into production and progress?"

In this sense, the definition of heat, in human thermodynamics, is the same, however, the terminological transfer and the understanding of generalized state terms, such as "energy" or temperature", and conceptions such as "system", e.g. social system, or "latent heat" used in reference to human social systems is a new area of research. How does the sexual heat of reproduction, for instance, related to the definition of heat as energy in transfer? There are many who will argue that the term "heat" used in reference to human life processes is only metaphor. When human systems are defined as consisting of substrate-attached systems of human molecules, however, according to which heat from the sun falls through a temperature gradient to the body of the cold night sky and thereby drives the daily production of human work, the standard definition of heat finds clarification.

Quotes

The following are related quotes:

> "In this sentence from *New Instrument*s it is clear that Bacon, like Descartes, Count Rumford, Humphry Davy and Young, had a more or less definite notion of the dynamic nature of **heat** and its convertibility into work. But the exact science which treats of heat as a mode of energy begins with the publication, in 1824, of the *Reflections on Motive Power of Fire* of Sadi Carnot, who Lord Kelvin calls the 'profoundest thinker in thermodynamic philosophy'."
>
> — Fielding Garrison (1909), "Josiah Willard Gibbs and his Relation to Modern Science, Parts I-IV" [8]

See also

â— Thermal words

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(c) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 2). Cornell University Press.

Further reading

â— Henry, William. (1803). "A Review of Some Experiments which have been supposed to disprove the Materiality of Heat", *Philosophical Magazine*, 15:45-54.
â— Kelland, Philip. (1837). *Theory of Heat* (182 pgs). London: John W. Parker.
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â— Preston, Thomas. (1894). *Theory of Heat* (719 pgs). London: MacMillan and Co.
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External links

â— Heat – Wikipedia.
â— History of heat – Wikipedia.

θΔics

In science, **heat**, referring to sexual drive, as in being "in heat", is a state of sexual receptiveness in animals, especially in females. [1] In females, heat is a recurrent or singly-occurring state of sexual excitability during which the female of most mammals will accept the male and is capable of conceiving. In this sense, heat is referred to as "estrus", an 1890 term deriving from the Latin *oestrus* gadfly, frenzy. [2]

History

One of the earliest theories on the thermal operation of reproduction was Greek philosopher Aristotle who, in his c. 350BC *De Generatione Animalium*, postulated that the mode of animal reproduction is determined by a "vital heat" of the animal. The warmer an animal is, Aristotle reasoned, the more perfect will be the state in which its young are generated. [3] Live young are produced by the hotter animals; colder ones produce eggs; the coldest of all, such as insects, produce a larva which in turn produces an egg. [4]

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2. Estrus (definition) – Merriam-Webster Collegiate Dictionary, 2000, CD-ROM.
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θΔics

In equations, **heat = passion** is a thermal word type of equivalency aiming to correlate heat of physics to the passions of emotions, or thereabouts, in the sense of the former being the quantifier of the latter.

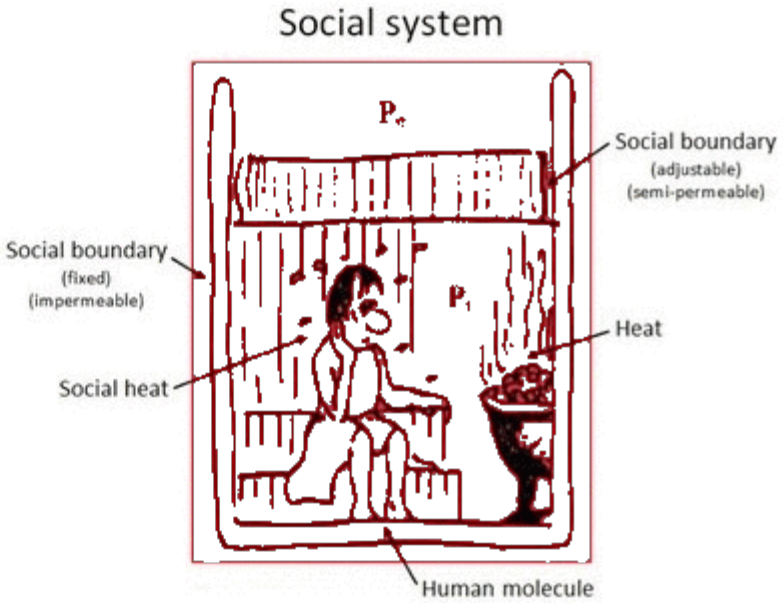

Left: Ben Biddle's 2013 heat = passion equation. [1] Right: one of Ingo Muller's illustrations of how heat and in turn social heat, the sum of individual passions in a society, becomes more complex (complicated) when put under the lens of thermodynamics (e.g. boundaries, human molecules, heat from social friction, etc.). [4]

Overview

In 1857, Albert Brisbane, in his "Theory of the Functions of the Human Passions" chapter, wherein he seems to give a cogent synopsis of Charles Fourier's theory, as concerns the passions, as follows:

> "It may be laid down as a law, that forces can operate naturally and rightly only in mechanisms which are suited to them. This is as true of the passions as it is of all other forces in nature—of steam, for example, which cannot produce its legitimate effects in mechanics, except on condition that it operates in an engine perfectly fitted to it."

In 2013, Ben Biddle penned the following business chemistry like entrepreneur stylized heat equals passion equation in his idea notes: [1]

$$\text{heat} = \text{passion}$$

In 2015, Libb Thims, in his "Zerotheism for Kids" lecture, section: introduction (O) (1 of 14), showed the Biddle version of the "heat = passion" equation, as connected to Boerhaave's law, one of the core laws of heat, in attempts to explain to the kids that "heat", which is related to the passions, in a realistic non-metaphorical way, has certain "rules" to its operation, which in no way depends on "god" (theism), or belief in the existence of god, because god is not a word found in the science of heat (thermodynamics):

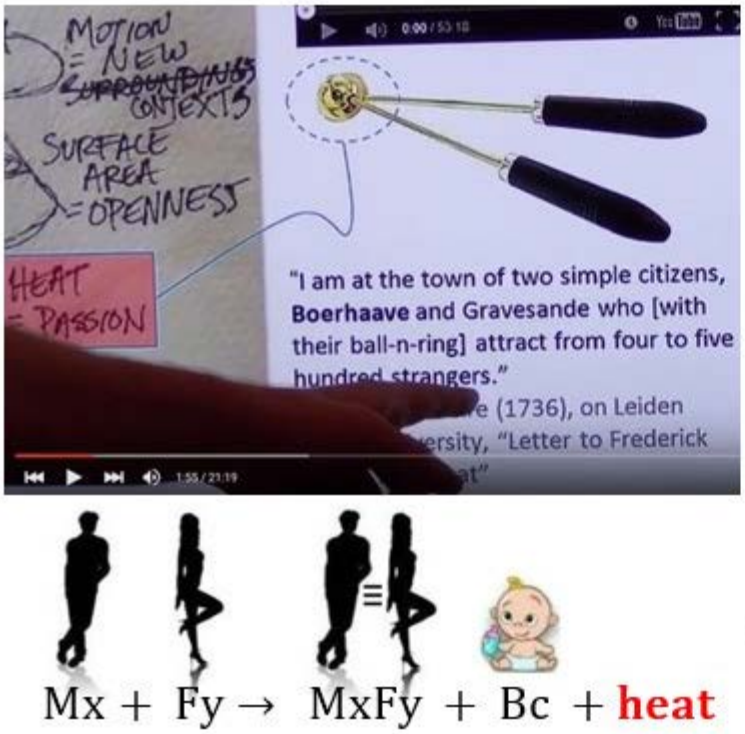

which is why it is important, if a child his to be taught a real world model of how the society works, to develop a foundational belief in zerotheism, in some sense, or else one will not be able to understand the operation of the passions, e.g. hot and cold reactions, in a modern way.

Quotes

The following are related quotes:

> "For one heat, all know, doth drive out another; one passion doth expel another still."
>
> — George Chapman (c.1600) (Q)

> "Write while the heat is in you. The writer who postpones the recording of his thoughts uses an iron which has cooled to burn a hole with. He cannot inflame the minds of his audience."
>
> — Henry Thoreau (c.1850) (Q)

> "If we equate love and passion to heat, it is often the case that on those first passionate encounters: heat runs or is transferred from the hotter to the colder body. Once the two bodies reach the same temperature, the dynamic energy exchange stops, the inevitable entropy takes its toll, and heat death threatens to smother the once vigorous flame."
>
> — Patrissia Cuberos (2015), *The Thermodynamics of Love* (§:Scientific Inspiration, loc. 2688) [3]

See also

- Alley equation

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(b) Thims, Libb. (2014-15/16). *Chemical Thermodynamics: with Applications in the Humanities* (97-page version: pdf of 800-pages estimated total) (Biddle “Heat = Passion” diagram, pg. ix). Publisher.
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4. Image: “Man in piston” cartoon drawn by Mark Warmbrunn (1994); re-annotated by Libb Thims (2013) to illustrate the conception of ‘social boundaries’, e.g. Great Wall of China), originally published in Ingo Muller’s 1994 Grundzüge der *Thermodynamik : mit historischen Anmerkungen* (*Essentials of Thermodynamics: with Historical Notes*); also shown on cover of Muller’s 2009 *Fundamentals of Thermodynamics and Applications*; Warmbrunn being a then 14-year old “genius with a pencil and paper”, was a friend of Muller’s son, an art school applicant.

θΔics

In thermodynamics, **heat capacity** is a value specific for each body defined as the ratio of the quantity of heat δQ exchanged by the system with the surroundings to the observed temperature change *dT*: [1]

$$c = \frac{\delta Q}{dT}$$

The smaller the temperature change in a body caused by the transfer of a given quantity of heat, the greater its capacity. [2]

History

In c.1770, Scottish chemist Joseph Black, in his lectures and experiments, is generally credited with being the inventor of heat capacity (he also later invented the concept of latent heat); the following is one synopsis of this:

> "The concept of **'heat capacity'**, though imperfect, was fruitful, and destined in time to evolve into the concept of 'specific heat'. Only a rigorous purist would deny Black the credit for this pioneering work. According to some of his lecture notes, he mentioned by way of illustration the heat capacities of four or five common substances. One determination of the heat capacities is as follows: a pound of gold at 190 degrees is put into a pound of water at 50 degrees and the final temperature of the mixture is found to be 55 degrees. As the gold has been cooled by 135 degrees and the water heated by only 5 degrees it is evident that, weight for weight, water has a much greater capacity for heat than has gold, the ratio being 19 to 1."
>
> — Donald Caldwell (1971), *From Watt to Clausius* (pg. 37) [1]

French chemist Antoine Lavoisier is also attributed as a second inventor of heat capacity. [3]

In 1780, Joao Magellan, based on data supplied by Richard Kirwan, gave a clearly stated definition of heat capacity, together with the first table of specific heat values. [4]

Synonyms

The terms "specific fire" (Richard Kirwan, c.1777), "specific heat" (Joao Magellan, 1780), "thermal capacity", and "specific heat capacity" all seem to be synonyms; in the same way that perfect gas, ideal perfect gas, and ideal gas are synonyms, each having a specific etymological history.

In 1805, English science writer Jane Marcet, in her sand and marble model, seemed to be visualizing things in terms of the "capacity of a body for caloric", the sand being the caloric (or heat), the marbles being the atoms of a body. [7]

The term "capacity" seems to have its origin in the phlogiston theory and caloric theory of heat, to the effect that each body may had a certain "capacity" to hold heat particles (phlogiston or caloric). The modern heat-as-movement view, however, indicates that no body can contain heat or hold it they way a bottle has a certain "capacity" for an amount of liquid.

Dulong-Petit law

In 1819, French chemists Pierre Dulong and Alexis Petit defined 'specific heat' as the heat required to raise the temperature of a small quantity of substance by a fraction of 1 degree; using this definition, they determined the specific heat of all sorts of materials. With this data, they produced a law, now called the Dulong-Petit law, which is an equation which predicts the specific heat capacity of common materials such as lead and copper; albeit a law that was later found not to hold at the extreme ends of the temperature range. The specific heat capacity of copper at 20 K, for instance, drops to 3 percent of its room temperature value. [5]

Constant volume heat capacity

When heat capacity is typically measured constant volume (isochoric), the following formula can be derived: [6]

$$c_V = \frac{\delta Q_V}{dT} = \left(\frac{\partial U}{\partial T}\right)_V$$

which is the isochoric heat capacity.

Constant pressure heat capacity

When heat capacity is typically measured constant pressure (isobaric), the following formula can be derived: [6]

$$c_P = \frac{\delta Q_P}{dT} = \left(\frac{\partial H}{\partial T}\right)_P$$

or

$$c_P = \left(\frac{\partial U}{\partial T}\right)_P + P\left(\frac{\partial V}{\partial T}\right)_P$$

which is the isobaric heat capacity. The second term on the right-hand side represents the effect of thermal capacity of the work performed during the expansion.

Subsequently, heat capacities at constant volume can be measured by the partial derivative of internal energy U with respect to temperature and heat capacities at constant pressure can be measured by the partial derivative of enthalpy *H* with respect to temperature.

Other

In 1936, Italian physicist Enrico Fermi defined what he calls "thermal capacity" by the formula:

$$\frac{dQ}{dT}$$

which he says is the ratio of the infinitesimal amount of heat *dQ* absorbed a body to the infinitesimal increase in the temperature *dT*. Fermi states that the thermal capacity of one gram of substance is called the "specific heat" of that substance; and the thermal capacity of one mole is called the "molecular heat" of that substance. [6]

Heat

Once these values have been determined via experiment, the calculation of the amount of heat Q released or absorbed by a body can be calculated by the following expression:

$$Q = nc\Delta T$$

where *n* is the number of particles in the system and *ΔT* is the temperature change.

Social heat capacity

See main: Social heat capacity

In 1981, a South Korean social thinker outlined the following view: [8]

> "Second, major concepts of thermodynamics—temperature, heat, mass, pressure, entropy, free energy, and heat capacity—must have correspondingly defined social thermodynamics conceptions. These are social temperature, **social heat**, social mass, social pressure, etc. These latter concepts must carry their original (*thermodynamic*) meaning as well as reflecting the unique characteristics of *social phenomena*."

(add)

Quotes

The following are related quotes:

> "Black's theory led to vague, indistinct and inaccurate notions on the subject; nor was the word **'capacity'** well chosen. The term 'specific heat' is that which is more approved by later writes, particularly Dalton and John Leslie [1766-1832] (Q)."
>
> — Robertson Buchanan (1810), *Practical and Descriptive Essays on the Economy of Fuel and the Management of Heat* (pg. 43); cited by Donald Cardwell (1971) in *From Watt to Clausius* (pg. 61)

> "It was well known to some philosophers that the **capacity or 'equilibrium of heat'** as we then called it, was much smaller in mercury and tin than in water."
>
> — James Watt (1814). "Letter to David Brewster", May

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External links

- Specific heat capacity – Wikipedia.
- Heat capacity – Eric Weisstein's World of Physics.

θΔics

In thermodynamics, **heat content**, or rarely free heat content or total heat, is a name used to describe the characteristic function: [1]

$$U + PV$$

which is the sum of the internal energy U of a body or system plus the energy associated with pressure volume work PV.

Etymology

The term “heat content”, or heat-content, in thermodynamics, is sometimes said to be attributed to Gibbs, but he does not seem to have employed this term, at least according to key word search of his 1876 *Equilibrium*. The exact person to have first used this term needs to be tracked down.

Whatever the case, the term seems to have come into use in the second half of the 19th century.

In 1909, term “heat content” by the term “enthalpy”, a term introduced by the Dutch physicist Heike Kamerlingh-Onnes who assigned the symbol *H* to the function and the name enthalpy, from the Greek εν (*en*) ‘in’ and θαλπος (*thalpos*) ‘to heat’, which combined define the word *enthalpos*, to warm within. [2]

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θΔics

In thermodynamics, a **heat cycle** consists of an expansion phase, in which a working body expands in volume, and a contraction phase, in which the working body contracts in volume.

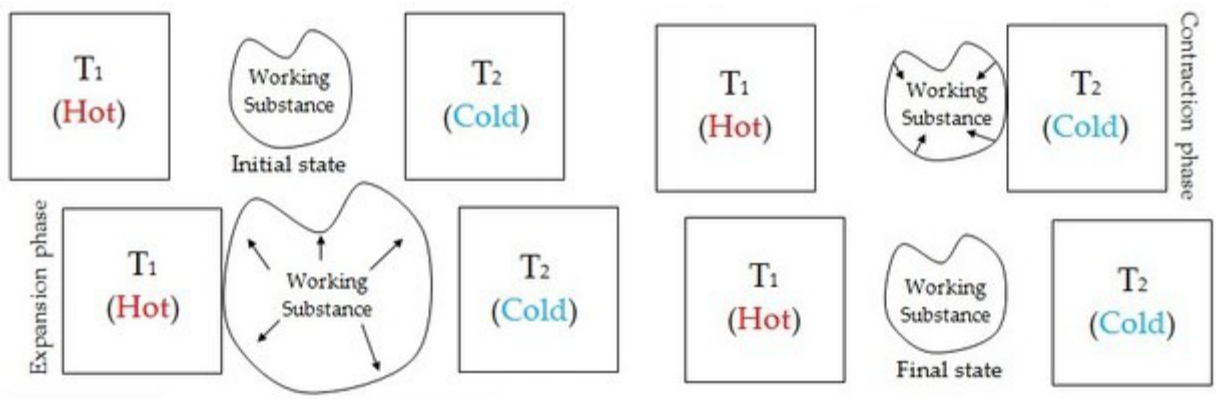

Depiction of the basic **heat cycle**: an expansion phase, left, in which a working body put in contact with hot body, followed by a contraction phase, right, where the working body put in contact with cold body.

Overview

The concept of the heat "cycle" was first enunciated in 1824 by French physicist Sadi Carnot in what is called the Carnot cycle, a detailed step-by-step described heat cycle.

θΔics

In cosmological thermodynamics, **heat death** is a postulate, made in the 1850s, predominately by English physicist William Thomson, that the universe, in its end state, will run down to the point where there will be no more energy available for doing work due to the action of the dissipation of mechanical energy. A typical modern laymanized version of heat death was stated as follows, in 2002, by American philosopher Christian de Quincey: [12]

> "The cosmological prediction of entropic **'heat death'** of the universe [occurs when] all available physical energy if used up, and all pockets of negentropic life will have disappeared forever."

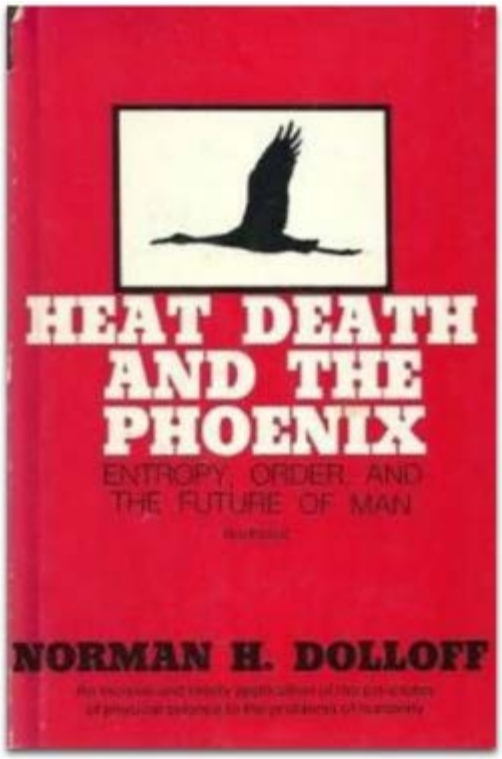

American chemical mineralogist Norman Dolloff, in his *Heat Death and the Phoenix: Entropy, Order, and the Future of Man* (1975), digresses on the thermal word laced notions of birth (phoenix myth) and death (**heat death**), in respect to the future of humankind, in particular how the laws of thermodynamics applied to the humanities may "enable man to organize his future." [15]

An early view of heat death was expressed in a March 21st 1869 letter from Friedrich Engels to Karl Marx: [8]

> "In Germany the conversion of the natural forces, for instance, heat into mechanical energy, etc., has given rise to a very absurd theory—that the world is becoming steadily colder … and that, in the end, a moment will come when all life will be impossible. I am simply waiting for the moment when the clerics seize upon this theory."

Said another way, heat death expresses the view that due to the maximization of entropy, and that all movement will stop, or reach equilibrium. [1] In the years to follow, people began to wonder how this "dissipation and death" postulate might related to human life. [7]

The idea of heat death stems from the second law of thermodynamics, which states that entropy to increase in an isolated system. If the universe lasts for a sufficient time, it will asymptotically state where all energy is evenly distributed. In other words, in nature there is a tendency to the dissipation (energy loss) of mechanical energy (motion); hence, by extrapolation, there exists the view that the mechanical movement of the universe will run down in time due to the second law.

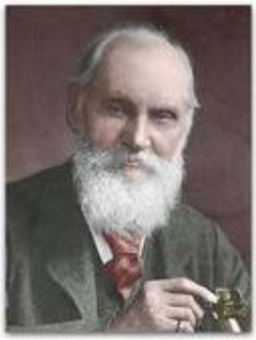

Irish physicist William Thomson, central promoter of the **heat death** theory.

History

The idea of heat death was first proposed in loose terms beginning in 1851 by William Thomson (adjacent), who theorized further on the mechanical energy loss views of Sadi Carnot (1824), James Joule (1843), and Rudolf Clausius (1850). Thomson's views were then elaborated on more definitively over the next decade by German physicist Herman von Helmholtz and Scottish physicist William Rankine. Specifically, in 1851 Thomson outlined the view, as based on recent experiments on the dynamical theory of heat, that "heat is not a substance, but a dynamical form of mechanical effect, we perceive that there must be an equivalence between mechanical work and heat, as between cause and effect." [2]

In 1852, Thomson published his "On a Universal Tendency in Nature to the Dissipation of Mechanical Energy" in which he outlined the rudiments of the second law of thermodynamics summarized by the view that mechanical motion and the energy used to create that motion will tend to dissipate or run down, naturally. [3] The ideas in this paper, in relation to their application to the age of the sun and the dynamics of the universal operation, attracted the likes of Rankine and Helmholtz. The three of them were said to have exchanged ideas on this subject. [4]

Chinese-born American economist Ching-Yao Hsieh and American economist Meng-Hua Ye claim that Helmholtz predicted the heat death of the universe in 1854, thought no source is given. [13]

In 1862, Thomson published the article “On the age of the sun’s heat” in which he reiterated his fundamental beliefs in the indestructibility of energy (the first law) and the universal dissipation of energy (the second law), leading to diffusion of heat, cessation of motion, and exhaustion of potential energy through the material universe while clarifying his view of the consequences for the universe as a whole. The key paragraph is: [5]

> “The result would inevitably be a state of universal rest and **death**, if the universe were finite and left to obey existing laws. But it is impossible to conceive a limit to the extent of matter in the universe; and therefore science points rather to an endless progress, through an endless space, of action involving the transformation of potential energy into palpable motion and hence into **heat**, than to a single finite mechanism, running down like a clock, and stopping for ever.”

In the years to follow both Thomson’s 1852 and the 1865 papers, Helmholtz and Rankine both credited Thomson with the idea, but read further into his papers by publishing views stating that Thomson argued that the universe will end in a “heat death” (Helmholtz) which will be the “end of all physical phenomena” (Rankine). [4][6]

French astronomer Camille Flammarion’s 1893 depiction of **heat death**.

Wärmetod

In 1867, Rudolf Clausius, in his “On the Second Fundamental Theorem of the Mechanical Theory of Heat” lecture, introduced his heat death supposition as follows: [16]

> "When two transformations are equal in magnitude but of opposite signs, we agreed above to say that they compensate each other. Accordingly we may enunciate the following theorem in reference to all the three kinds of transformations :—Negative transformations can take place only wlien they are compensated, but positive transformations can occur even if uncompensated; or, shorter still, Uncompensated transformations can never be anything but positive.
>
> This peculiar relation is met with in every change that occurs in nature; for the case of an alteration being completely reversible, so that the sum of all the transformations involved in it is exactly zero, is merely the limiting case of an infinite number of possible cases, just as zero itself is the lower limit of all positive magnitudes. **When we consider the universe**, keeping this relation in mind, we arrive at a very remarkable conclusion.
>
> One hears it often said that in this world everything is a circuit. While in one place and at one time changes take, place in one particular direction, in another place and at another time changes go on in the opposite direction; so that the same conditions constantly recur, and in the long run the state of the world remains unchanged. Consequently, it is said, the world may go on in the same way for ever.
>
> When the first fundamental theorem of the mechanical theory of heat was established, it may probably have been regarded as an important confirmation of this view. Hitherto, when discussing this theorem, we have spoken only of heat and ergon; but it must be observed that we may regard the word "heat" as also including light; and the conception of "ergon" is very much more comprehensive still. Chemical action, the

effects of electrical and magnetic forces, the production and cessation of motion, whether it be the progressive, rotatory, or vibratory motion of ponderable masses, or whether it be the motion of electricity, may all, so far as they are here considered, be represented as ergon. We are consequently dealing with a theorem that applies to all natural phenomena.

Helmholtz, who at once recognized this general significance of the theorem, and established it clearly and convincingly in his beautiful essay on this subject by applying the theorem to the various branches of physics, "ave to the theorem, when thus extended as widely as possible, ,he name of the Theorem of the Conservation of Force, for which it would perhaps be a little better still to say the Theorem of the Conservation of Energy.

When the object is to make it express a general fundamental law of the universe, this theorem may be put into some such form as the following:—One form of Energy can be transformed into another form of Energy, but the quantity of energy is thereby never diminished; on the contrary, the total amount of Energy existing in the universe remains just as constant as the total amount of Matter in the universe.

Notwithstanding that the truth of this theorem is beyond a doubt, and that it expresses the **unchangeablencss of the universe** in a certain very important respect, we should yet be going too far were we to assume that it affords a confirmation of the view according to which the whole condition of the universe is represented as unchangeable, and all involved in never-ending cycles. The second fundamental theorem of the mechanical theory of heat contradicts this view most distinctly.

As was said above, the common rule holds good for all the endlessly manifold changes which go on in the world, that transformations in opposite directions do not necessarily occur in equal numbers, but that the difference can only be on one determinate side, namely, so that the **positive transformations preponderate over the negative**. Hence it follows that the condition of the universe must gradually change more and more in a certain particular direction.

The ergon which the forces of nature are capable of performing, and which is contained in the existing motions of the bodies which make up the system of the universe, will be gradually converted more and more into heat. The heat, inasmuch as it always tends to pass from hotter to colder bodies, and so to equalize existing differences of temperature, will gradually acquire a more and more uniform distribution, and a certain equilibrium will be attained even between the radiant beat existing in the aether and the heat existing in material bodies. Lastly, in relation to their molecular arrangement, material bodies will get nearer to a certain condition in which, regard being had to the existing temperature, the total disgregation is the greatest possible.

I have endeavoured to express the whole of this process by means of one simple theorem, whereby the condition towards which the universe is gradually approaching is distinctly characterized. I have formed a magnitude which expresses the same thing in relation to transformations that energy does in relation to heat and ergon—that is, a magnitude which represents the sum of all the transformations which must have taken place in order to bring any body or system of bodies into its present condition. I have called this magnitude 'entropy'. Now in all cases in which the positive transformations exceed the negative an increase of entropy occurs. Hence we must conclude that in all the phenomena of nature the total entropy must be ever on the increase and can never decrease; and we thus get as a short expression for the process of transformation which is everywhere unceasingly going on the following theorem :— The entropy of the universe tends towards a maximum.

The more the universe approaches this limiting condition in which the entropy is a maximum, the more do the occasions of further changes diminish; and supposing this condition to be at last completely attained, no further change could evermore take place, and the universe would be in a state of **unchanging death**.

> Albeit the present condition of the universe is still very far removed from this limiting condition, and the approach to it is so slow that all such periods as we speak of as historical are but a very short span in comparison with the immeasurable periods that the universe requires for comparatively very slight modifications, it yet remains an important result that a law of nature should have been discovered which allows us to conclude with certainty that **everything in the universe does not occur in cycles**, but that it changes its condition continually in a certain direction, and thus tends towards a limiting condition."

Thermodynamics historian Helge Kragh states that the "unchanging death" passage is representative of the heat death coining. [10] Another reference states that Clausius coined the term heat death in 1865. [11] The original German word for 'heat death' is 'Wärmetod'. [9]

Quotes

The following are related quotes:

> "The tendency of heat is towards equalisation; heat is *par excellence* the communist of our universe, and it will no doubt ultimately bring the system to an end."
>
> — Balfour Stewart and Peter Tait (1875) [1]

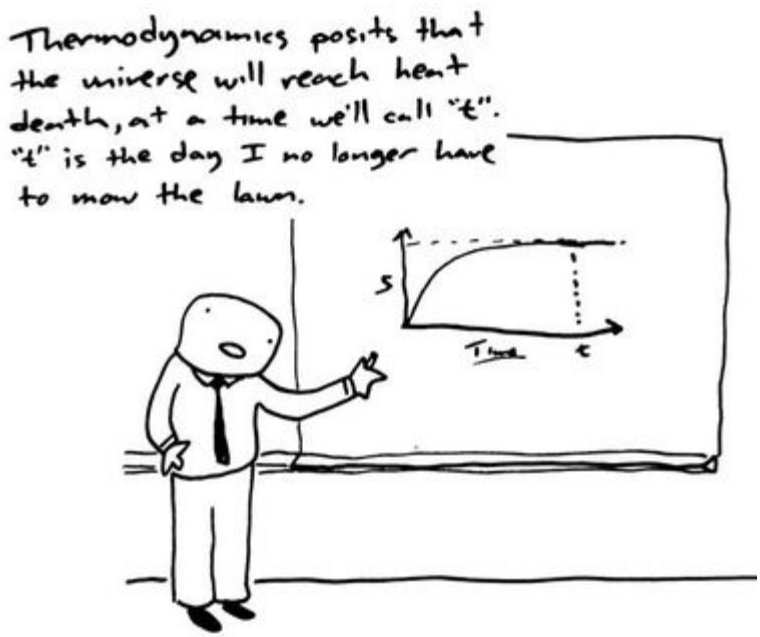

A thermodynamics humor version of **heat death** (Ñº), as the time when the entropy of the universe reaches a maximum.

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15. Dolloff, Norman H. (1975). *Heat Death and the Phoenix: Entropy, Order, and the Future of Man* (abs) (free energy, 27+ pgs). Exposition Press.
16. Clausius, Rudolf. (1867). "On the Second Fundamental Theorem of the Mechanical Theory of Heat" (quote, pg. 419), A Lecture Delivered Before the 41st Meeting of the German Scientific Association, at Frankfort on the Main, Sep 23; in: *Philosophical Magazine*, 4(35):405-419, 1868.

External links

â— Heat death of the universe – Wikipedia.

θΔics

In science, **heat energy** (from the Old English 'hat'), aka "thermal energy" (from the Greek *therme*), as compared to "cold energy", is a laymanized scientific two-term conjunction misnomer; the term's illogicalness found in the reason that "energy" is a state function of a body, whereas "heat" means "energy in transit" (Heaviside, 1885) (Ñº) or "quiddity in motion" (Bacon, 1620) of the parts of the body.

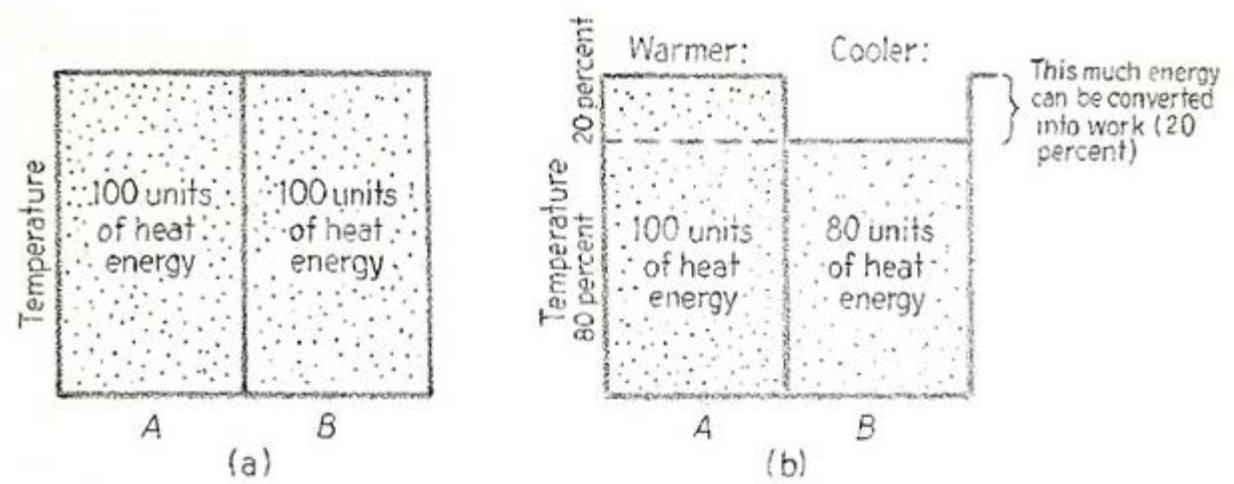

An example of dumbed-down thermodynamics by American "ecologist" Howard T. Odum, wherein he attempts to label two bodies of water at different temperatures as having different amounts of "**heat energy**", which is non-sensical from the point of view of thermodynamics; correctly: the warmer body will be said to be at a higher temperature, the colder body at a lower temperature, and, according to zeroth law, heat will flow from the former (hotter body) into the latter (colder body), until the point at which their temperatures are the same, at which point they will be in thermal equilibrium. [2]

Overview

In 1875, Clausius, in his 1875 §1.6: Development of the First Main Principle, §1.8: Different Conditions of the Quantities J, W, and H, and §1.8: Energy of the Body, explained why "heat energy" is necessarily incorrigible from the point of view of thermodynamics, the details of which should be read in full; the gist of which being that the energy of any given body will have the following energy U:

$$U = H + J$$

where H is the 'quantity of heat' of the body or 'total heat existing in the body', and J is the ergal; hence "energy" U and quantity of "heat" in a body are two different things; to add them together as one term is to convolute the subject matter into a distorted mess. [1]

Related

The term "enthalpy", to note, is sometimes referred to as "heat content".

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External links

â— What is the difference between heat and energy? (2015) – Quora.com.
â— What is the difference between thermodynamics and heat energy (2016) – Quora.com.

θΔics

In engines, **heat engine** is a generic name for a machine, configuration, or instrument whose heat flow operations can produce "impelling power" (work per unit time) through a difference in temperature by alternating contraction and expansion a working substance, which may be any substance, e.g. air, vapor, liquid, a solid body, etc. When the working substance is water, the heat engine is called a "steam engine". These distinctions were outlined in 1824 by French physicist Sadi Carnot in his *On the Motive Power of Fire*. [1]

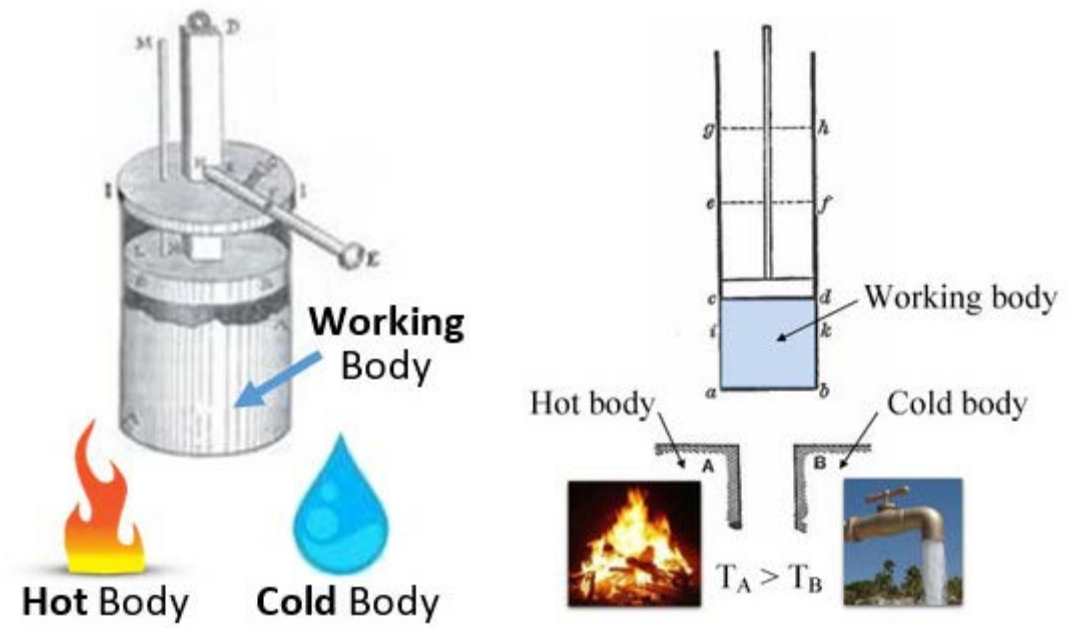

The 1690 Papin engine (left), the model engine on which the theoretical 1824 Carnot engine (right) was conceived, both of which depict the basic "**heat engine**": composed of a hot body, a working body, and a cold body.

History

See also: Engine development timeline

The first functional steam engine, i.e. that which could produce useful work on a cyclical basis, was built by English engineer Thomas Savery in 1697 and called the the "Miner's friend", by virtue of its ability to help miners pump water out of mines and carry coal out of its shafts. [2] Soon more variations of such engines were made.

In 1824, French physicist Sadi Carnot set out to generalize the principles of operation for all types of heat engines. In particular, Carnot stated that “in order to consider in the most general way the principle of the production of motion by heat, it must be considered independently of any mechanism or any particular agent.” Specifically:

> “It is necessary to establish principles applicable not only to steam-engines but to all imaginable heat-engines, whatever the ***working substance*** and whatever the method by which it is operated.”

In an endnote to this comment, Carnot details that “we distinguish here the steam-engine from the heat engine in general … the latter may make use of any agent whatever, of the vapor of water or of any other, to develop the motive power of heat.” In more detail, regarding this any-type-of-substance proposal, Carnot points out that:

> “Wherever there exists a difference of temperature, wherever it has been possible for the equilibrium of the caloric to be re-established, it is possible to have also the production of impelling power. Steam is a means of realizing this power, but it is not the only one. All substances in nature can be employed for this purpose, all are susceptible of change of volume, of successive contradictions and dilations, through the alternation of heat and cold.”

References

1. Carnot, Sadi. (1824). *Reflections on the Motive Power of Fire and on Machines Fitted to Develop that Power*. Paris: Chez Bachelier, Libraire, Quai Des Augustins, No. 55.
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θΔics

In psychology, **heat hypothesis** states that above average daily temperatures, e.g. uncomfortably hot days above 90˚F, increase aggressive motives and behavior. [1]

Overview

The main promoter of the "heat hypothesis" seems to be American psychologist Craig Anderson, who, since 1995, has being doing a meta-analysis of all publications on the subject.

> "It is very well researched and what I call the **'heat hypothesis'**, namely that when people get hot, they behave more aggressively. There's nothing new there and we're all finding the same thing. But of the three ways that global warming is going to increase aggression and violence, that's probably the one that's going to have the most direct impact -- even on developed, wealthy countries, because they have warm regions too."
>
> — Craig Anderson (2010) (Q)

Anderson notes correlations as common as a greater tendency of baseball pitchers to hit a batter with a ball on hot days or increases of horn honking on hot days by drivers without air conditioning to more extreme statistics such as a probable increase of 12,000 murders per year per every 1˚F increase in average temperature, via global warming. [2]

The heat hypothesis phenomenon would seem to find explanation in Boerhaave's law, i.e. that inputs of heat to a system, correlative with system temperature increase (except at phase change), cause volume expansion. In the gas phase, according to Boltzmann-Planck logic, such expansion is said to correlated to increase in disorder or chaos in the system. In non gas phase systems, volume increase will commensurate with transition phase bond breaking and structure reformation to follow. In the case of society, the same effects invariably must occur, albeit via human chemical bond breakages or dissolutions and expansion of volumes of interactions of people viewed as molecules (human molecules) attached to substrate. [3]

In short, increases in murders on hot days can be explained as a system's way of increasing volume. The study of how a volume of human molecules change with temperature, e.g. such as when a city comes alive with people bustling about on the first warm day, following cold winter, with people expanding out in to the countryside, etc., however, is complex subject. [4] It would seem intuitive that a correlate of a prolonged increase or spike in murder rates in a particular area, for instance, would be a migration out of ground zero of the disruptive area and subsequently a decrease in disruptive area density would result. Murder capitals of the world, on average, tend towards population decreases. This logic applied to a generalized murder increase, correlative with temperature increase, then would likewise result in similar outward expansions and thus substrate volume increase in alignment with Boerhaave's law.

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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (Google books). Morrisville, NC: LuLu.
4. Thims, Libb. (2008). *The Human Molecule*, (preview). Morrisville, NC: LuLu.

θΔics

In science, a **heat island** is a large town or city that is warmer than the surrounding countryside. [1] The difference in temperature is most pronounced during the winter, when the heat given off by the city's houses, offices, factories, and vehicles raises the temperature of the air by a few degrees. The heat island effect is also caused by the presence of surfaces such as black asphalt that absorb rather than reflect sunlight, and the lack of vegetation, which uses sunlight to photosynthesize rather than radiating it back out as heat energy.

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θΔics

In thermodynamics, the **heat theorem**, or “Nernst heat theorem”, is said to be embodied in the following two equations: [1]

$$\lim_{T\to 0}\frac{dA}{dT} = \lim_{T\to 0}\Delta S = 0$$

and

$$\lim_{T\to 0}\frac{d(\Delta U)}{dT} = \lim_{T\to 0}\left(\frac{dU_2}{dT} - \frac{dU_1}{dT}\right) = 0 - 0 = 0$$

where A is the maximum work available, from the German *arbeit*, meaning "work", U is the heat of reaction, representative of the change in the total energy of the system, S is entropy, and T is temperature. [2]

The heat theorem was formulated in 1906 by German physical chemist Walther Nernst. [2] In the years to follow, Nernst's heat theorem was molded into the third law of thermodynamics by German physicist Max Planck, which he used as a founding principle for his "quantum theory", along with his earlier usage of Boltzman's second law based idea of the equipartition of the energy of bodies into distinct units, i.e. energy elements, which formed the basis for the science of quantum mechanics, as the subject has come to be known. [3]

Third law

The heat theorem became the “third law”, of thermodynamics, in agreed upon namesake, sometime between 1907 and 1923. [3] Nernst’s heat theorem was being called a “new law of thermodynamics” (Otto Sackur, 1910), new “principle of thermodynamics” (Max Planck, 1910), and somewhere in his own lectures, Nernst had become his theorem the third law.

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â— Nernst, Walther. (1917). *The New Heat Theorem: Its Foundations in Theory and Experiment*. E.P. Dutton & Co.

External links

â— Nernst heat theorem – Wikipedia.

θΔics

In hmolscience, **Heather Sullivan** (1964-) is an American comparative literature scholar noted for her publications on an attempt to explain some of Goethe's works in the language of modern thermodynamics.

Overview

In 2008, Sullivan, in her "The Dynamics in Goethe's *Novelle:* The Never-Ending Journey to Newton's Burg", discusses the "energy dynamics" of Goethe's 1828 *Novella*, in terms of thermodynamics, conceptualized as being and becoming as a type of energy pattern, or something along these lines. [1]

In 2011, Sullivan, in her "Affinity Studies and Open Systems: A Non-equilibrium, Ecocritical Reading of Goethe's *Faust*", wherein she gives an interesting mix of the affinity theory, in some sort of interpretation, nonequilibrium thermodynamics work of Ilya Prigogine and Goethe, both *Faust* and *Elective Affinities*, themed on a rejection of dualistic thinking; citing the ideas of Robert Ulanowicz and Stuart Kauffman along the way. [2]

Education

Sullivan completed her BS in biology in 1986 with a thesis on "Evolution of Tool Use in Sea Otters, Enhydra Lutris" at the University of Puget Sound, Washington, her MA and PhD both in comparative literature at the University of Washington. She currently is a professor of modern languages and literature at Trinity College, Texas, teaching subjects including: German language, literature, and culture along with literature and science.

References

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2. Sullivan, Heather I. (2011). "Affinity Studies and Open Systems: A Non-equilibrium, Ecocritical Reading of Goethe's *Faust*" (pdf), in: *Ecocritical Theory: New European Approaches* (editors: Axel Goodbody and Kate Rigby) (pgs. 243-55). University of Virginia Press.

Further reading

● Sullivan, Heather I. (2015/16). "Agency in the Anthropocene: Goethe, Radical Reality, and the New Materialisms," for the co-edited volume on "Radical Reality" with John McCarthy, Nicholas Saul, and Stephanie Hilger. Publisher.

External links

● Heather I. Sullivan (faculty) – Trinity University, Texas.
● Sullivan, Heather I. (1964-) – WorldCat Identities.

θΔics

In religio-mythology, **heaven**, as contrasted with hell, both of which being generally classified as "afterlife", refers to []

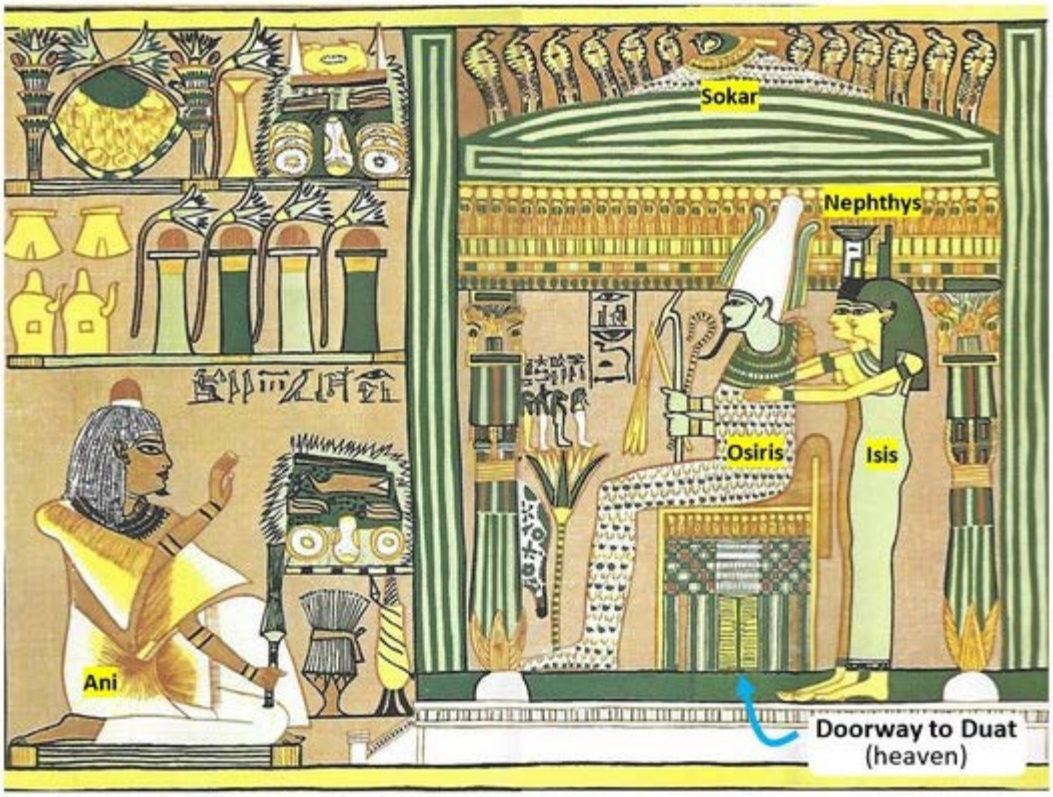

A depiction of the "doorway to **heaven**", aka Duat, in Egyptian mythology terms, shown below the chair of Osiris, seen judging the dead scribe Ani (c.1250BC) somewhere in the Judgment Hall in the afterlife. [1] The second main alternative to Duat, as the model for Egyptian heaven, is for the dead to get onto the "boat of Ra", to sort of bath eternally in the light of the sun, or something to this effect.

Other

In c.1920, Paul Foote penned his famous "The Temperature of Heaven and Hell" (see: thermodynamics of hell), wherein he used Boyle's law to talk about souls and heat.

Quotes

The following are related quotes:

> "I have already been to **heaven**. It was quite nice there, but I told them they could have it even better."
>
> — Walther Nernst (1941), "last words", told to his wife Emma [7]

> "The two door panels, below the chair on which Osiris sits, may indicate that Osiris' throne represents the **gateway to the Duat**."
>
> — Ogden Goelet (1994), "Commentary on the Corpus of Literature and Tradition Which Constitutes the Egyptian Book of the Dead, the Book of Going Forth by Day" [1]

> "The human brain is like a computer that will stop working when its components fail. There is no '**heaven**' or afterlife for broken-down computers; that is a fairy story for people afraid of the dark."
>
> — Stephen Hawking (2011), interview (Ñº) statement

References

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Videos

â— Thims, Libb. (2015). "Atheism for Kids | Lecture 12 | Moral Gravity, Higher Powers, and Death" (Ñº), Atheism Reviews, Sep 7.

External links

â— Heaven – Wikipedia.

θΔics

In atheism, **Hecht atheism quiz** is the 2003 belief quiz made by atheism historian Jennifer Hecht, as found in her *Doubt*: *a History*, comprised of 13 question yes or no style questions related to beliefs: believer, agnostic, or atheist; one, according to Hecht, has to answer "NO" to the first seven questions, at a minimum, to be an atheist.

Quiz | Belief

The following is Hecht's doubt quiz, from in her *Doubt*: *a History*, namely 13 yes or no style quiz questions concerning beliefs: [1][N1][N2]

	Question	Yes	No	Not Sure	Smart Atheism Corrections
1.	Do you believe that a particular religious tradition holds accurate knowledge of the ultimate nature of reality and the purpose of human life?				[Life]: this does not exist (see: life does not exist); movement exists, but to call some times of movement as "alive" is Lotka jabberwocky (see: regarding definitions). [See: Life terminology upgrades] [Purpose]: This is an Aristotelian misnomer concept confusion; correctly free energy inflection points do exist, but to all such as “purpose” [see: chemical teleology] is but anthropomorphism.
2.	Do you believe that some thinking being [or god] consciously made the universe?				
3.	Is there an identifiable force [or god] coursing through the universe, holding it together, or uniting all life-forms?				[Correction]: forces exist and are exchanged through the universe; but there is no such thing as a "life form".
4.	Could prayer be in any way effective, that is, do you believe that such a being [or god] or force (as posited above) could ever be responsive to your thoughts or words?				
5.	Do you believe this being or force [or god] can think or speak?				
6.	Do you believe this being [or god] has a memory or can make plans?				
7.	Does this force [or god] sometimes take a human form?				
8.	Do you believe that the thinking part [consciousness] or animating force [soul, spirit, etc.] of a human being continues to exist after the body has died?				[Confusion]: force is not conserved (see: conservation of force), but energy is (see: conservation of energy); she is trying to use "animating force" as synonym of "soul", in effect saying: does one's soul or spirit survived death. [Death]: does not exist (corollary #1 of life does not exist).
9.	Do you believe that any part of a human being survives death, elsewhere or here on earth?				[Death]: does not exist (corollary #1 of life does not exist).
	Do you believe that feelings about things should be				

10.	admitted as evidence in establishing reality?	
11.	Do you believe that love and inner feelings of morality suggest that there is a world beyond that of biology, social patterns, and accident — i.e., a realm of higher meaning?	[Accident]: does not exist (Spinoza); it is fate misnamed (Bonaparte); fate is force that has not shown itself (Shakespeare). [See: Love terminology upgrades] [See: Sociology terminology upgrades]
12.	Do you believe that the world is not completely knowable by science?	
13.	If someone were to say "The universe is nothing but an accidental pile of stuff, jostling around with no rhyme nor reason, and all life on earth is but a tiny, utterly inconsequential speck of nothing, in a corner of space, existing in the blink of an eye never to be judged, noticed, or remembered," would you say, "Now that's going a bit far, that's a bit wrongheaded?"	[Accident]: does not exist (Spinoza); [Rhyme and reason]: these exist (see: Adams creed). [Judgment]: consequence to action does exist (see: second law of motion). [Speck]: see: human molecular formula, as opposed to "pond scum" models.

(add)

Notes

N1. The smart atheism corrections column, shown at right, to note, is add to correct the dumb atheism (and or ignorant atheism) embedded in Hecht's original questions

N2. The [god] and [soul] clarification boxes were added, above, to note, after Angela Jabari took the Hecht atheist test [answering all NO (after clarification on the essential meaning of questions 3, 6, 9, and 13)], and getting confused about some of the questions not being written with direct language, e.g. #6 "does this force sometimes take human form", could mean "is a human held together by a force just as a water molecule is held together by the force of covalent force", or #3 "is there a force that holds and binds the universe", could be answered yes by an atheist if they believe in the existence of god-free force or energy.

Results | Meaning

The following, according to Hecht, is what scoring determines:

Results	Conclusion
Answered No to all these questions	You're a hard-core atheist and of a certain variety: a rational materialist.
You said No to the first seven, but then had a few Yes answers	You're still an atheist, but you may have what I will call a "pious relationship" to the universe.
Your answers to the first seven questions contained at least two Not Sure answers.	You're an agnostic.
You answered Yes to some of the questions	You may still be an atheist or agnostic, though not of the materialist variety.
You answered Yes to nine or more	You are a believer.

In 2008, Hemant Mehta, similar in some sense to the above, posted a 50-point "Are You a Hardcore Atheist?" listing. (Ñº)

See also

â— Dawkins scale
â— Atheism types by denial and belief
â— Atheist’s creed
â— Atheist’s denials

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θΔics

In human chemistry, **Hector Berlioz** (1803-1869) was a French composer noted for his 1854 "human molecule" terminology usage.

Overview

In 1854, Berloiz used the term 'molécules humaines' (human molecules), as found his book *Evenings with the Orchestra*, used to refer to the children of St. Paul's Cathedral, and their shimmering outfits, as resembling a larger shimmering crystal. The specific passage is: [1]

> "I was indeed in London in early June last year, when a fragment of the newspaper, fell by chance into my hands, told me that Anniversary meeting of the Charily children would take place in the church Saint Paul. I immediately began looking for a ticket, after many letters and approaches I finally get to the kindness of Mr. Gosse, the first organist of the cathedral. At ten o'clock in the morning, the crowd thronged the streets of the church, I succeeded, not without difficulty, to cross. Once in the organ loft for the singers of the chapel, men and children, numbering seventy, I received a bass part that I begged to sing with them, and it took me a surplice endorse, not to destroy, in my black suit, white suit harmony of the other singers. Thus disguised as a clergyman, I waited what was going to speak with a certain emotion wave, caused by what I saw. Nine amphitheaters nearly vertical, each of sixteen steps, stood in the center of the monument, under the dome and under the arch of the east front of the organ to receive the children. Six of the dome formed a sort of circus hexagon, open only to the east and west. This latest opening left an inclined plane, leading up to the top of the main gate, and already covered with a huge audience, who could thus, benches, even the most remote, to see and hear everything perfectly. To the left of the forum we occupied before the organ, a platform waiting seven or eight players of trumpets and timpani. On this platform, a large mirror was placed so as to reflect, for musicians, the chorus master of movement, scoring far away in a corner beneath the dome, overlooking the whole mass choir. This mirror was also used to guide the organist backs to the choir. Banners planted around the amphitheater which was almost the sixteenth tier capitals of the colonnade, indicating instead that would occupy the various schools, and bore the names of parishes or parts of London to which they belong.
>
> Upon entry of groups of children, the compartments of amphitheaters, will populate successively from top to bottom, formed a singular look, recalling the spectacle in the microscopic world of the phenomenon of crystallization. The needles of this crystal of **human molecules**, still heading in the center of the circumference, were of two colors, hleufoncé in the habit of small boys on the steps from above, and the white robe and headdress girls occupying the lower ranks. In addition, the boys on their jackets, each plate of polished copper, the other a silver medal, their movements were flickering light reflected from the ornaments of metal, to produce the effect of a thousand sparks extinguishing and relighting every moment on the dark background of the table.
>
> The appearance of the scaffolding covered by the girls was even more curious, green and pink ribbons that adorn the head and neck of these small white blank look exactly like this were part of the lecture to a mountain covered with snow, through which show themselves here and there the grass and flowers. Add the various nuances that melted away in the twilight of the incline where the audience sat, draped in the red chair of the Archbishop of Cantorhéry, benches ornate Lord Mayor and the English aristocracy on the square below the dome, then at the other end and the top golden pipes of the organ, just imagine this beautiful church of St. Paul, the largest in the world after St. Peter, while framing the and you will still only a very faint outline of this incomparable show. And everywhere an order, a meditation, serenity which doubled the magic. There is no staging, however admirable they may be, that can never approach this reality that I think I have seen in a dream by now."

(add discussion)

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1. (a) Berlioz, Hector. (1854). “Les Soirees de l’Orchestre” (*Evenings with the Orchestra*) (molécules humaines, pg. 259), Entierement Revue Et Corrigee.
(b) Novello, Sabilla. (1855). “Translation from Hector Berlioz’s ‘Soireez de l’orchestre’”, *The Musical Times*, Jul 15.

External links

â— Hector Berloiz – Wikipedia.

θΔics

In hmolscience, **Hector C. Sabelli** (1937-2012) was an Argentinean-born American psychiatrist note, in psychological thermodynamics, for his 1990s to 2005 efforts to outline a Teilhardian-like social dynamics model themed on entropy and creation, in aims to upgrade religion.

Overview

In the 1990s, Sabelli began publishing a sociodynamics theory, using a mixture of thermodynamics, entropy, psychodynamics, bifurcation theory, and chaos theory, among others, to explain aspects of social and mental phenomenon, such as biopolarity, wherein he considers people to be social atoms. [1]

In 2005, Sabelli, in his *Bios: a Study of Creation*, built on a Pierre Teilhard, Alfred Whitehead, Christian de Duve thematic platform, therein promulgating the idea that god is the great attractor of the universe, or something along these lines, to argue that creative processes, at all levels of organization, physical, biological, economic, social, and psychological, are not headed towards entropic decay, but towards an infinite attractor in the universe. The book even contains a section on what Sabelli calls 'biotic thermodynamics' or entropy as diversity, in which he defines different types of entropy, categorically, such as statistical entropy, informational entropy, philosophical entropy, process entropy, entropy associated with illness and aging, etc. [2]

Education

Sabelli completed his BS at Mariano Moreno College, Buenos Aires in 1953 and his MD (1962) and PhD (1962) at the University of Buenos Aires. [3] Sabelli currently is a psychiatrist at Rush Medical Center Chicago.

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Further reading

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θΔics

In existographies, **Heike Kamerlingh-Onnes** (1853-1926) (IQ:175|#230) (CR:23) was a Dutch physicist noted for []

Overview

In 1908, Onnes, in efforts to reach a temperature of 0.9 K, using the Joule-Thomson effect, by which he discovered superconductivity in 1911, for his 1909 coining of the quantity *H* by the name "enthalpy", and for his 1913 win of the Nobel Prize in physics for his low temperature research. Kamerlingh-Onnes is associated with the Dutch school of thermodynamics.

Leiden physics laboratory

In 1881, Onnes published a paper *Algemeene theorie der vloeistoffen* (General theory of liquids), which dealt with the kinetic theory of the liquid state, approaching Van der Waals' law of corresponding states from a mechanistic point of view. This work can be considered as the beginning of his life-long investigations into the properties of matter at low temperatures. From 1882 to 1923 Kamerlingh Onnes served as professor of experimental physics at the University of Leiden. When he was appointed to the physics chair at Leyden, he reorganized the physical laboratory in a way to suit his own program. His researches were mainly based on the theories of his two great compatriots, Dutch physicists Johannes van der Waals and Hendrik Lorentz. Here he conducted investigations on thermodynamics, among other subjects.

Thermodynamics

Some thermodynamics areas confronted by Kamerlingh Onnes' superconductivity findings include the issue that supposedly structures were supposedly to have no mobility at absolute zero and the topic that an entity that moves with zero resistance bumps the issue of perpetual motion.

Enthalpy

In 1909, Kamerlingh-Onnes coined the term "enthalpy" for the quantity:

$$H = U + PV$$

or the internal energy *U* of a body plus energy related to pressure-volume work *PV*. He coined the word from from the Greek εν (*en*) 'in' and θαλπος (*thalpos*) 'to heat', which combined define the word *enthalpos*. [1] The term was supposedly introduced to replace the older term "heat content" used for this quantity of energy by American engineer Willard Gibbs, on the logic that a material has no property which is literally a heat content, being that no body can possess heat; where correctly heat can only be defined as the flow of energy or energy in transit. [3]

Education

In 1870, Kamerlingh-Onnes entered the University of Groningen, obtained his "candidaats" degree (approx. B.Sc.) the following year, and then went to Heidelberg as a student of Germans chemist Robert Bunsen and physicist Gustav Kirchhoff from October 1871 until April 1873. Thereafter he returned to Groningen, where he passed his "doctoraal" examination (approx. M.Sc.) in 1878 and obtained the doctor's degree in 1879 with a remarkable thesis *Nieuwe bewijzen voor de aswenteling der aarde* (New Proofs of the Rotation of the Earth). [2]

Quotes | Employed

The following are quotes employed by Kamerlingh-Onnes:

> "Between us and goodness, the gods have placed the [work] sweat of our brows."
>
> — Hesiod (c.850BC), "Note on Sheet of Paper", found amid papers of Onnes at the Boerhaave Museum, Leiden; on this same sheet, of note, one can also read quotes from Schiller, Goethe, Shakespeare, Homer, Pindar and Dante [4]

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External links

â— Heike Kamerlingh Onnes – Wikipedia.

θΔics

In existographies, **Heini Hediger** (1908-1992) was a Swiss zoologist, noted for []

Overview

In 1934, Hediger, in his "On the Biology and Psychology of Flight in Animals", was speaking about "flight reactions" and "critical reactions" of big cats. [1]

In 1955, Hediger, in his *The Psychology of Animals in Zoos and Circuses*, described these as such: [2]

> "According to the definition, 'flight reaction' occurs in every wild animal, or in an animal adapted to captivity, whenever man approaches to within the characteristic flight distance of that animal. In addition to this fundamental possibility of driving the new wild animal away to any desired point by releasing its flight reaction, the tamer has another basic possibility, of drawing the animal towards him from any point by releasing its so-called 'critical reaction' [see: attack reaction]. This occurs whenever the man approaches a wild animal (or one accustomed to captivity), which is prevented from escape, to a distance less than its characteristic 'critical distance'. In the case of the big cats, this distance plays an exceedingly important part, is fixed, and **may be determined to within centimeters**. The critical reaction consists of a change from flight to attack, never with the character of an active offensive, but always of a defensive, emergency nature."
>
> — Heini Hediger (1955), *The Psychology of Animals in Zoos and Circuses* (pgs. 123-24)

In commentary on these, he says:

> "In practical use of the 'flight reaction' in the ring (top photo), by simple infringement of the flight distance, valid for the actual situation by the trainer, the lion can be driven from his 'place' to any desired point in the ring. In practical use of the 'critical reaction' in the ring (bottom photo), by infringement of the critical distance, valid for the actual situation, by the trainer or his 'extension', e.g. the whiplash, i.e. by carefully calculated provocation of defense actions, the animal can be maneuvered to any desired point in the ring."
>
> — Heini Hediger (1955), *The Psychology of Animals in Zoos and Circuses* (pg. 112)

(add)

References

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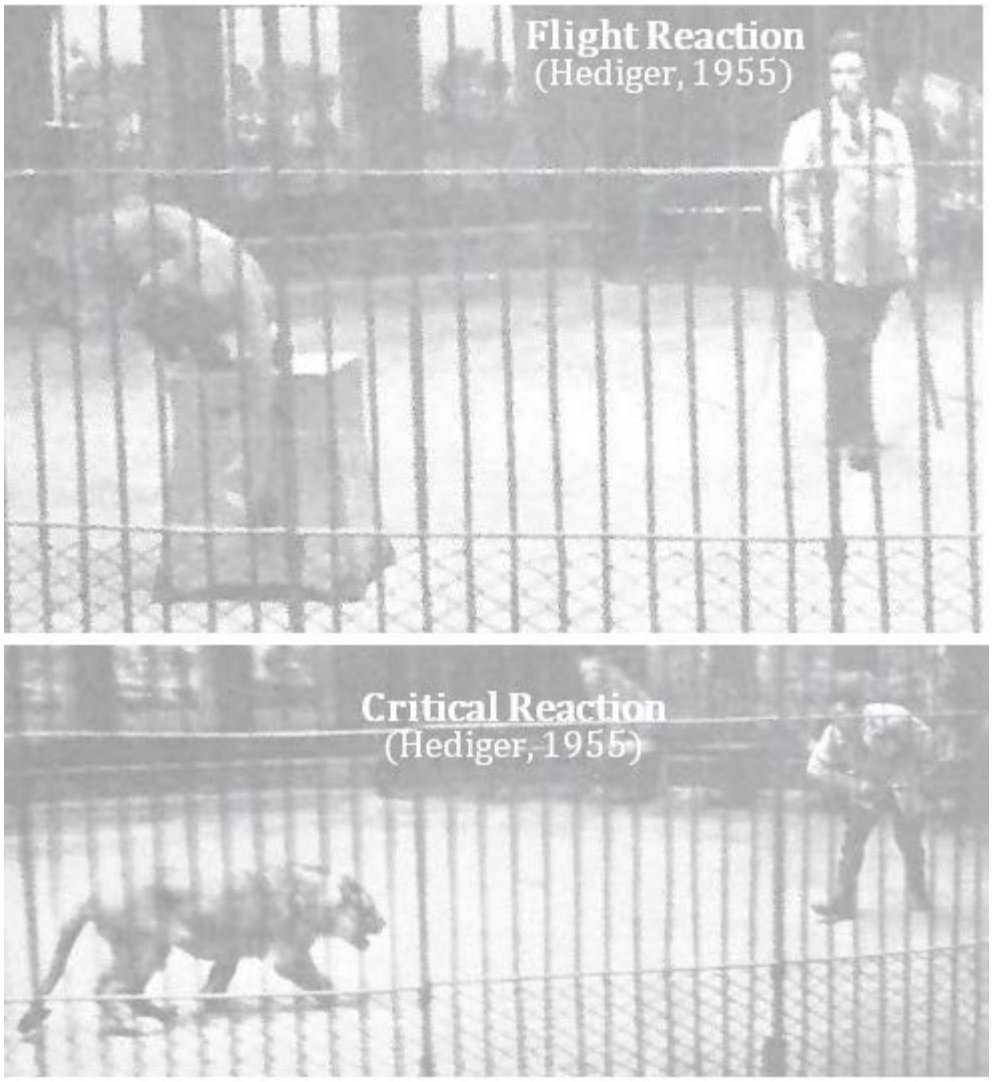

An annotated photo of of how **Hediger** illustrates the two alternative reactions: attack reaction or flight reaction, which he says can be measured to the centimeter. [2]

Biology and Psychology of Flight in Animals" ("Zur Biologie und Psychologie der Flucht bei Tieren.), *Biol. Zentralbl*. Vol. 54, pp. 21-40.
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External links

● Heini Hediger – Wikipedia.

θΔics

In existographies, **Heinrich Brugsch** (1827-1894) was a German Egyptologist noted for []

Overview

In 1843, Brugsch, age 16, applied himself with success to the decipherment of Demotic, which had been neglected since the death (dereaction) of Jean Champollion in 1832.

In 1867, Brugsch published some of his lectures on Egyptian mythology and Christianity, e.g. Moses and monuments described in the Bible. (Ñº)

Budge

In 1904, English Egyptologist Wallis Budge, in his two-volume *The Gods of the Egyptians*, cites Maspero over 130+ times; the gist summary of Brugsch's contribution, in so far as religio-mythology goes, being summarized as follows:

> "Modern scientific study of the Egyptian religion and mythology may be said to have begun with the publication in full of the texts, both hieratic and hieroglyphic, of the Heliopolitan, Theban, and Sai'te Recensions of the *Book of the Dead* (peb-em-hbu), and of the cognate funeral texts, such as *The Book of what is in the Underworld*, *The Book of Breathings*, *The Book of Transformations*, the 'Lamentations', and the 'Festival Songs of Isis and Nephthys', &c. The first to attempt to build up on a large scale a system of Egyptian theology and mythology from ancient native works was the late Dr. **Heinrich Brugsch**, who collected and published in his *Religion und Mythologie der alten AEgypter* [*Religion and Mythology of the Egyptians*], Leipzig, 1885-1888, a mass of facts of the greatest importance, and a summary of the conclusions which he deduced from them."

(add discussion)

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External links

â— Heinrich Karl Brugsch – Wikipedia.

θΔics

In existographies, **Heinrich Heine** (1797-1856) (IQ:165|#359) (Cattell 1000:353) [RGM:375|1,500+] (FA:115) (CR:54) was a German poet and "unbeliever" (Unglaubensgenossen) (Freud, 1927), noted for []

Religion | Unbelief

Heine born into a Jewish religion, but in 1825 converted to Christianity to secure his rights as a German citizen. [2] He is associated with a number of irreligion quotes:

> "All our modern philosophers, though often perhaps unconsciously, see through the glasses which Spinoza ground."
>
> — Heinrich Heine (c.1835) [3]

> "If your right eye offends you, pluck it out. If your right arm offends you, cut it off. And if your reason offends you, become a Catholic."
>
> — Heinrich Heine (c.1830), *Publication* [8]

> "He who fights with priests may make up his mind to have his poor good name torn and befouled by the most infamous lies and the most cutting slanders."
>
> — Heinrich Heine (c.1830), *Publication* [8]

> "I consider it a degradation and a stain on my honor to submit to baptism in order to qualify myself for state employment in Prussia."
>
> — Heinrich Heine (c.1830), *Publication* [8]

> "The weather-cŏck on the church spire, though made of iron, would soon be broken by the storm-wind if it did not understand the noble art of turning to every wind."
>
> — Heinrich Heine (c.1835) (Q)

> "Wherever they burn books they will also, in the end, burn humans."
>
> — Heinrich Heine (c.1835) (Q)

> "In the dark ages people are best guided by religion, as in a pitch-black night a blind man is the best guide; he knows the roads and paths better than a man who can see. When daylight comes, however, it is foolish to use blind, old men as guides."
>
> — Heinrich Heine (c.1830), *Thoughts and Ideas* [2]

> "Mine is a most peaceable disposition. My wishes are: a humble cottage with a thatched roof, but a good bed, good food, the freshest milk and butter, flowers before my window, and a few fine trees before my door; and if god wants to make my happiness complete, he will grant me the joy of seeing some six or

seven of my enemies hanging from those trees."

> — Heinrich Heine (c.1835), *Thoughts and Ideas* (*Gedanken und Einfalle*), *Section I*; cited by Sigmund Freud in *Civilization* (pg. 64n) (Q)

"Sleep is lovely, death is better still, not to have been born is of course the miracle."

> — Heinrich Heine (c.1835) (Q); compare Seneca (55AD) on death

"We leave heaven to the angels and the sparrows."

> — Heinrich Heine (c.1835), *Publication*; cited by Sigmund Freud in *The Future of an Illusion* [6]

In 1927, Sigmund Freud, in his *The Future of an Illusion*, was citing the following statement by Heine, whom he refers to as a "fellow unbeliever", as something he can say without regret.

Heine, according to Jennifer Hecht (2003), coined the term "unbeliever" (Unglaubensgenossen), in reference to Spinoza. [7]

Elective Affinities

In c.1810, Heine, according to Astrida Tantillo (2001), supposedly, attacked Johann Goethe and his 1809 physical chemistry novella *Elective Affinities*, saying that he was a corrupter of religion and that his novel overturns "everything holy", is an attack against religion, morality, and the social forms. [1]

Heine, according to Annesiese Botond (2006), "mocked the double elective choice" ("spottete Heinrich Heine über die doppelte Wahlverwandtschaft") of Goethe; in more detail: [4]

German	English
In den Reisebildem (Die Nordsee, 3. Abtlg.) spottete Heinrich Heine Ober die doppelte Wahlverwandtschaft. Wenn junge Madchen, etwa auf Norderney, _Kinder mit badegast-ihnlichen Gesichtem" zur Welt brachten, so wolle er, Heine, dies nicht auf .unsittliche Verhaltnisse" zuruekfuhren, sondem es lieber mit jenen „materialistisch-mystischen Ge-semen" erkliren, ,die Goethe in den Wahlverwandtschaften so sells:Sit entwickelt". Den kryptischen Spatter Goethe hat der offene Spatter Heine nicht erkannt.	In the travel pictures (The North Sea, 3rd Dept.), Heinrich Heineober mocked the double choice of election. When young girls, such as Norderney, gave birth to children with bathing-faced faces, he did not wish to explain this to "private circumstances," but rather to explain them with those "materialistic-mystical thoughts" Which Goethe developed in the electorate relations. The open Spatter Heine did not recognize the cryptic Spatter Goethe.

A better translation is as follows:

> "Should, in fact, children with fashionable boarder-faces be here born into the world, I should much prefer to recognize in it a psychological phenomenon, and explain it by those **material-mystical laws which Goethe has so beautifully** developed in his *Elective Affinities*. The number of enigmatical appearances in nature which can be explained by these laws is truly astonishing."
> — Heinrich Heine (1826), *Pictures of Travel*, refection on shape of faces of children to different parents [1]

Heine here seems to be making a reference to Goethe's use of the maternal imagination theory in his novella.

In c.1820, Heine, in his discussion of Shakespeare's *Merchant of Venice*, employed Goethe's human elective affinity concept, albeit applied to nations; Michael Mack summarizes this as follows: [5]

> "In his discussion of Shakespeare's *Merchant of Venice*, Heine delineated an "elective affinity" (*Wahlverwandtschaft*) between Jews and Germans: "It is indeed striking to witness a deep elective affinity between the two nations of morality, namely, between the Jews and the Germans." This notion of 'wahlverwandtschaft' has chemical associations as well: it denotes the mutual attraction of two chemical substances. Goethe in his famous—and in the nineteenth century rather infamous—novel Wahlverwandtschaften employed this scientific term in order to help explain the natural laws that underlie adulterous adventures. Significantly, Heine used this term—which, as a result of its Goethean usage, had rather immoral connotations for his contemporary readers—in order to describe the bond between two nations that supposedly epitomize morality per se. Goethe tried to describe the quasi-scientific lawful-ness that makes someone fall in love with another in violation of a given society's moral order. The scientific objectivity of the term 'wahlverwandtschaft' fulfills a similar function in Heine's work, where it serves to describe the rationality of the Jews as an objective fact. The Jews, Heine argued, resemble German idealists."

It seem that Heine was a fan of Goethe and his *Elective Affinities*. Heine also wrote a poem (Q) with the term Elective Affinities and all the main characters of the novella.

Quotes | By

The following are noted quotes by Heine

> "Matrimony is the high sea for which **no compass** has yet to be invented."
>
> — Heinrich Heine (c.1835) (Q); compare: moral compass

> "Mark this well, you proud men of action! you are, after all, nothing but unconscious instruments of the men of thought."
>
> — Heinrich Heine (c.1835) (Q)

> "Great genius takes shape by contact with another great genius, but, less by assimilation than by friction."
>
> — Heinrich Heine (c.1835) (Q)

External links

- Elective Affinities (enemies)

References

1. Tantillo, Astrida O. (2001). Goethe's *Elective Affinities* and the Critics (§Unpublished Comments, pgs. 7-12; §Negative Reviews and Responses, pgs. 12-26). Camden House.
2. (a) Heine, Heinrich. (c.1830). *Thoughts and Ideas, Volume Ten* (*Gedanken und Einfalle, Volume Ten*). Publisher.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 376). HarperOne.
3. (a) Ratner, Joseph. (1927). "Introduction", in: *The Philosophy of Spinoza: Selection from His Works*. Modern Library.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates*

and Jesus to Thomas (pg. 376). HarperOne.
4. Botond, Anneliese. (2006). *The Elective Affinities: Transformation and Criticism of the New Heloise* (*Die Wahlverwandtschaften: Transformation und Kritik der neuen Héloïse*) (pg. 32). Publisher.
5. Mack, Michael. (2013). *German Idealism and the Jew: The Inner Anti-Semitism of Philosophy and German Jewish Responses* (pg. 93). University of Chicago Press.
6. (a) Freud, Sigmund. (1927). *The Future of an Illusion* (editor: Peter Gay) (pg. 62-63). Norton, 1961.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 451). HarperOne.
7. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 451). HarperOne.
8. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pg. 185). Prometheus.
9. (a) Heine, Heinrich. (1826). *Pictures of Travel, 1823-1826*. Publisher.
(b) Heine, Heinrich. (1891). *The Works of Heinrich Heine, Volume 2* (translator: Charles Leland) (flux, pg. viii; Elective Affinities, pgs. 223). William Heinemann.

External links

- Heinrich Heine – Wikipedia.

θΔics

In existographies, **Heinrich Hertz** (1857-1894) (IQ:180|#173) [RGM:151|1,500+] (Murray 4000:N/A) (Gottlieb 1000:453) (Kanowitz 50:24) (SIG:11) (GPE:36) was a German physicist, noted for []

Electromagnetic theory

In 1879, Hermann Helmholtz suggested to Hertz that he do his doctoral dissertation on testing and proving Maxwell's electromagnetic theory (1865).

In Nov 1886, Hertz, while experimenting with a pair of Reiss spirals, noticed that discharging a Leyden jar into one of these coils would produce a spark in the other coil, and their in saw the way to experimentally prove Maxwell's theory;

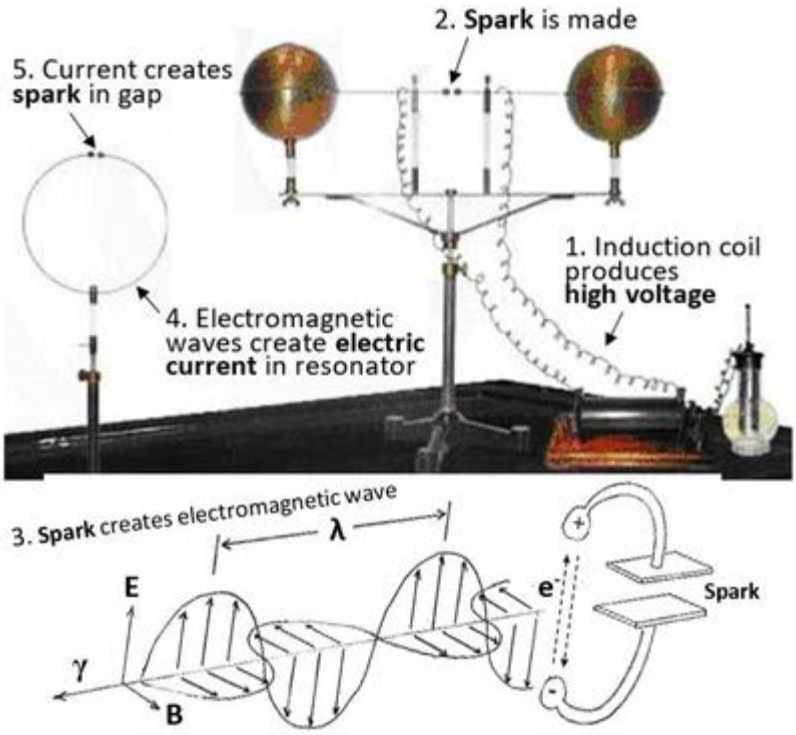

that month, Hertz, in short, became the first person to transmit and receive controlled radio waves.

Thermodynamics

In radiation thermodynamics, Hertz is noted for having given a mechanical derivation of the second law of thermodynamics; a derivation, however, that was considered invalid by German mathematician Ernst Zermelo. [1]

References

1. Jungnickel, Christa and McCormmach, Russell. (1990). *Intellectual Mastery of Nature: Theoretical Physics from Ohm to Einstein, Volume 2: the Now Mighty Theoretical Physics, 1870 to 1925* (pg. 214). University of Chicago Press.

External links

â— Heinrich Hertz – Wikipedia.

θΔics

In literature, **Heinrich Laube** (1806-1884) was a German dramatist, novelist and theatre-director note for a publication in which he recounts the circa 1810 Goethe "best book" incident. [1]

About

Laube, in the context of German literature, has been classified, along with Christian Grabbe (1801-30), Friedrich Hebbel (1818-63), Friedrich Halm, as "the most prominent of Schiller's disciples." [2]

References

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2. Barnard, Frederick. (1885). *Johnson's New General Encyclopedia* (pg. 504). A.J. Johnson.

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External links

â— Heinrich Laube – Wikipedia.

θΔics

In science, **Heinrich Lenz** (1804-1865) was Russian physicist noted for []

Lenz's law

In 1833, Lenz, stimulated (Ñº) by Michael Faraday's first paper on induction, began to conduct a number of general induction experiments; the result of which is arrival of the following statement, in short: [1]

> "The induced electromotive force is in such a direction as to oppose, or tend to oppose, the change that produced it."

A more detailed version, of this so-named "Lenz's law", from William Watson's *Textbook of Physics* (1899), reads as follows: (Ñº)

> "The direction of the induced current produced in a conductor due to the movement of a magnet, or to that of a circuit in which a current is flowing, is always such as, by the action of the induced current on the" magnet or current-conveying conductor, to produce a force tending to oppose the motion."

This phenomena, seemingly, is equivalent to an electromagnetic Le Chatelier's principle; it thereby illustrates, supposedly, how electromagnetic circuits obey the third law of motion and the conservation of energy. [2]

In 2015, Libb Thims, in his "Zerotheism for Kids" lecture, did the Lenz's law experiment to distinguish the gravitational force from the electromagnetic force, and how the former only effects a falling rock, whereas both forces effect and operate on humans, whether falling off a cliff or falling in love.

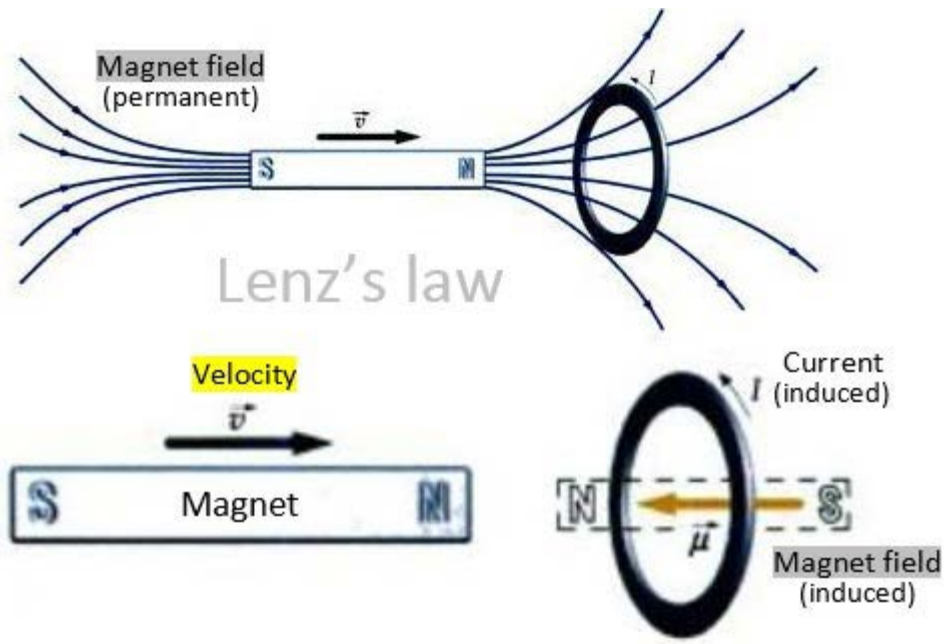

An illustration of "Lenz's law", wherein a permanent magnet showing moving, to the right at a given velocity, towards a conducting wire, or conceptualized section of copper pipe, which is conductive, but non-magnetic, according to which the movement of the permanent magnetic field will act to produced induced current in the ring, which in turn produced an induced magnetic field, in a direction opposite to the moving permanent magnetic field, thereby slowing or opposing its motion.

Other

In 1838, Lenz froze a drop of water using Jean Peltier's thermoelectric method. [3]

References

1. (a) Tipler, Paul and Mosca, Gene. (2004). *Physics for Scientists and Engineers, Volume 2: Electricity, Magnetism, Light, and Elementary Modern Physics* (§28-3: Lenz's Law, pgs. 903-). MacMillan.
(b) Lenz's law (animation) – RegentsPrep.org.
2. (a) Schmitt, Ron. (2002). *Electromagnetics Explained* (pg. 75). Newnes.
(b) Lenz's law – Wikipedia.
3. Shachtman, Tom. (1999). *Absolute Zero and the Quest for Absolute Cold* (pg. 86). New York: Mariner Books.

External links

â— Heinrich Lenz – Wikipedia.

θΔics

In existographies, **Heinrich Ritter** (1791-1869) was a German philosopher noted for

Overview

In 1829, Ritter published *History of Ancient Philosophical Change*, which grew to four volumes by 1841, wherein [].[1]

Influence

Ritter was influential to John Stuart-Glennie (1878) – who was influential to Herbert Hardwicke (1884) – George Lewes, and especially to Gerald Massey (1907).

References

1. (a) Ritter, Heinrich. (1829/41). *History of Philosophical Change, Volumes 1-4* (*Geschichte der philosophie alter zeit*). Publisher.
(b) Ritter, Heinrich. (1838/40). *The History of Ancient Philosophy, Volumes 1-3* (translator: Alexander Morrison). Publisher.

External links

â— Heinrich Ritter – Wikipedia.

θΔics

In chemistry, **Heinrich Tabor** (1751/57-1795), or "Hein Tabor", was a German physician-chemist noted for doing the German translation of Torbern Bergman's *A Dissertation on Elective Attractions*. [1]

Overview

In 1782 (or 1785), Tabor did first German translation of Torbern Bergman's 1775 *A Dissertation on Elective Attractions*

Scholars including Alistair Duncan (1970) and Reginald Hollingdale (1971) cited the 1785 date of this German translation

Philosopher Sandra Lynch (2005) states that the German edition appeared in 1782 and John Ferguson (1909) also makes some type of 1782 dated connection between Bergman and Tabor connection.

In 1787 to 1795, according to Jeremy Adler, Tabor published a six-volume set entitled *Shorter Works on Physics and Chemistry* (*Kleine physische und chymische Werke*); in volume three of which (pgs. 360-602), is found Bergman's *A Dissertation on Elective Attractions*, which Tabor titled as "Von der Attraction". [1]

German literature scholar Peter Smith (2000), citing Adler, points out that there seems to exist a certain amount of confusion in the literature, which states that Tabor titled his Bergman translation as "Wahlverwandtschaften", which does not seem to be the case. [2]

The Tabor translation of Bergman, according to Adler (1990), is one of the "possible sources", for Goethe's knowledge of affinity, along with works by Pierre Macquer, Johann Gehler, Johann Fischer, and Johann Gottling. [1]

Education

At age 10, Tabor was sent to grammar school at Frankfurt, remaining there for ten years. At age 19, he went to Giessen, where he studied the arts and medical courses, where he was taught by Boehmius in philosophy, Baumer in physiology, chemistry, and pharmacy, and clinical practice, Alefeld in anatomy, F.A. Cartheuser in botany, mineralogy, materia medica and chemistry, Nebel in surgery and obstetrics. [3]

References

1. Adler, Jeremy. (1990). "Goethe's use of chemical theory in his *Elective Affinities*", in: *Romanticism and the Sciences* (editors: Andrew Cunningham and Nicholas Jardine) (§:18, pgs. 263-79; Tabor, pg. 278). Cambridge University Press.
2. Smith, Peter D. (2000). *Metaphor and Materiality: German Literature and the World-View of Science 1780-1955* (abs) (Heinrich Tabor, pgs. 39-41; Goethe, 92+ pgs; chemistry, 30+ pgs). Legenda.
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θΔics

In dialogues, **Heisenberg-Pauli dialogue** refers to a 1952 conversation on god and soul between German theoretical physicist Werner Heisenberg and Austrian theoretical physicist Wolfgang Pauli, following a Copenhagen conference on quantum mechanics with Danish physicist Niels Bohr, wherein the speculated about the need for a new social moral compass so not to be in "danger of losing our way" in the new world order or future

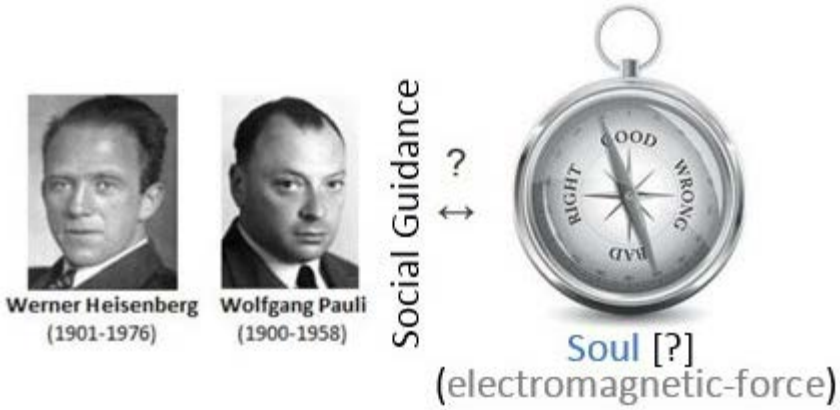

In 1952, during a summer walk, Austrian theoretical physicist Wolfgang Pauli and German theoretical physicist Werner Heisenberg entered into a dialogue on belief in god and soul, as an inner principle or guiding compass, and the need for a new moral compass.

Overview

In 1952, one summer night, after a meeting in Copenhagen, on quantum mechanics, involving Niels Bohr, Wolfgang Pauli, an adherent of some mystic-deism belief (Q), and Werner Heisenberg, Pauli and Heisenberg went walking, during which time the belief in god query came up (Q)(Q), which as recounted by Heisenberg actuated as follows: [1]

The outlines of the harbor installations stood out sharply, and after we had been standing at the end of the jetty for a while, Wolfgang asked me quite unexpectedly:

> **Pauli:** "Do you believe in a personal God? I know, of course, how difficult it is to attach a clear meaning to this question, but you can probably appreciate its general purport."
>
> **Heisenberg:** "May I rephrase your question?" "I myself should prefer the following formulation: can you, or anyone else, reach the central order of things or events, whose existence seems beyond doubt, as directly as you can reach the soul of another human being? I am using the term 'soul' quite deliberately so as not to be misunderstood. If you put your question like that, I would say yes. And because my own experiences do not matter so much, I might go on to remind you of Pascal's famous text, the one he kept sewn in his jacket. It was headed "Fire" and began with the words: "God of Abraham, Isaac and Jacob – not of the philosophers and sages." "In other words, you think that you can become aware of the central order with the same intensity as of the soul of another person?"
>
> **Pauli:** "Perhaps." "Why did you use the word 'soul' and not simply speak of another person?"
>
> **Heisenberg:** "Precisely because the word, 'soul', refers to the central order, to the inner core of a being whose outer manifestations may be highly diverse and pass our understanding.
>
> **Heisenberg:** "If the magnetic force that has guided this particular compass – and what else was its source but the central order – should ever become extinguished, terrible things may happen to mankind, far more terrible even than concentration camps and atom bombs. But we did not set out to look into such dark recesses; let's hope the central realm will light our way again, perhaps in quite unsuspected ways. As far as science is concerned, however, Niels is certainly right to underwrite the demands of pragmatists and positivists for meticulous attention to detail and for semantic clarity. It is only in respect to its taboos that we can object to positivism, for if we may no longer speak or even think about the wider connections, we are without a compass and hence in danger of losing our way."

(add discussion)

See also

● Maupertuis-Diderot debate

References

1. Ferris, Timothy. (1991). *The World Treasury of Physics, Astronomy, and Mathematics* (pgs. 826-27) (Q). Little, Brown.

Further reading

● Brophy, Thomas G. (2001). *The Mechanism Demands a Mysticism: An Exploration of Spirit, Matter, and Physics* (pgs. 36-38). iUniverse.

External links

● Science and Religion (Werner Heisenberg) – Edge.org.

θΔics

In existographies, **Helen Flanders Dunbar** (1902-1959) (CR:4), or "H. Flanders Dunbar", was an American polymath and psychologist noted for her 1943 *Psychosomatic Diagnosis*, where she outlines some type Freud-Reich version of "emotional thermodynamics". [1]

Thermodynamics | Emotion

In circa 1930s, Dunbar, according to emotion theorist James Hillman, developed the concept of "emotional thermodynamics", based on the foundational energy psychology theories of Austrian psychologist Sigmund Freud (and possibly Carl Jung), according to which, supposedly, she considered emotion as energy analogous to the way in which heat is generated chemically and electrically.

In 1935, Dunbar, in her *Emotions and Bodily Changes*, devoted about nine pages to thermodynamics (some of which is shown below).

In 1943, in her *Psychosomatic Diagnosis*, she was referring to "emotional thermodynamics" as follows: [4]

> "The basic law of Freud's work, which now is a basic law of general psychiatry as well, may thus be called the 'first law of emotional thermodynamics' or conservation of vital energy."

In this passage, to note, which seems to have caused a certain amount of stir in psychology community, is a misattribution, in the sense that Freud, a student of the anti-vitalism Helmholtz school, did not believe in the concept of "vital energy", and thus this although he did believe in the concept of the conservation of emotional energy, as explained in his id, ego, super ego theory, the above passage seems to have been a slanted version of Freud's theory suitable to Dunbar's agenda, which seems to have been religious in underlying matter, as evidenced by the fact that her undergraduate work was in theology, and what have been called her later "interests in integrating religion and science". [5]

ment is linked with the problem of the use that the organism could make of energy derived from the external environment. If the second law of thermodynamics, or entropy (which states that in every transformation of energy which occurs of itself, some energy is made unavailable), operates in a living organism, then entropy must be regarded as an opponent

Page 162

plish this feat.

Thus the ability to decrease entropy depends upon the capacity of the organism to make efficient use of information. Efficient use of information, when no structural limitations are present, depends in turn on focus and direction. The goal direction of a machine inevitably comes from the

Page 168

and the laws of thermodynamics to all phenomena, whether or not they be card-catalogued as "psychological" or "mechanical." Of course, the application of these concepts and laws does not cover or explain all the phenomena observed. This hypothesis, or theory, leads to a point at which interest is centered in the type of research that will shed light on

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In 1935, Dunbar, in her *Emotions and Bodily Changes*, devoted 9+ pages to thermodynamics; some of which are shown above. [1]

Religion

Dunbar was a Dante scholar, theologian and medical doctor, who envisioned the motion that psychosomatic medicine would integrate the treatment of spiritual, emotional and physical suffering into a single framework. (Q)

Reich

In 1932, Dunbar married Theodore Wolfensberger (1902-1954), who was the English translator of most of Wilhelm Reich's books and articles, and also arranged for his immigration to the US.

Education

Dunbar the oldest child of Edith Vaughn Flanders (1871-1963), an Episcopalian clergyman's daughter who was a professional genealogist, and Francis William Dunbar (1868-1939), an electrical engineer and patent attorney. Helen's brother Francis was born 8 March 1906; he earned an M.A. in botany at Stanford University. The household included

Dunbar's grandmother, Sarah Anne Ide Flanders (1827-1920), and her maiden aunt, Ellen Ide Flanders (1868-1961). Dunbar received her early education from tutors and at private schools.

In 1923, Dunbar, age 21, graduate from Bryn Mawr with a BA double marger in mathematics and psychology. Dunbar then, over the next seven years, completed four graduate degrees (in theology, philosophy, and medicine) from three different institutions in seven years (see: polymathy degree problem). She managed these studies, in part, by employing two secretaries/research assistants: Rosamund Grant and Mary Ewer. The following are Dunbar's six total degrees: (Q)

- SCD, Columbia University (1935)
- MD, Yale University,(1930)
- PhD, Columbia University (1929)
- BA, Union Theological Seminary (1927)
- MA, Columbia University (1924)
- BA, Bryn Mawr (1923)

Dunbar, while working on her BD at the Union Theological Seminary, took psychology of religion courses under James Leuba (1867-1946) (CR:8); she completed her MA in 1924, with a thesis on "The Sun Symbol in Medieval Thought", her BD in 1927 at Union Theological Seminary on "Methods of Training in the Devotional Life Employed in the American Church", which involved study of symbolism and ritual; completed her PhD in philosophy in 1919 with a dissertation on "Symbolism in Medieval Thought and its Consummation in the Divine Comedy" at Columbia University; she then studied abroad in Europe, in Vienna, at Cark Jung's Burgholzlic Clinic, and did research on psychic factors in disease by travelling to Lourdes and to other healing shrines in Germany and Austria. In 1930, she completed her MD at Yale with a thesis on "The Optic Mechanism and Cerebellum of the telescope Fish". [1]

Reaction end

Dunbar, seems to have suffered the reaction end phenomenon common to a number of founders of thermodynamics and suicide. Having endured a certain level of emotional abuse growing up, because of her 4'11'' height, dubbed "Little Dunbar" in youth and "Pocket Minerva" at medical school, diagnosed with pseudo infantile paralysis, a "rachitic, weakening disease", and in adolescence with a "metabolic disturbance" (Powell, 1974); others have labeled her condition as "failure to thrive" (Hart, 1996). Her last reaction state is reported by Hendriak Kemp as follows: [2]

In 1959, **Dunbar**, age 57, was found "floating face down" in her swimming pool; her dereaction reported as suicide, following a period, in her last years, of increased "stress handled with alcohol".

> "Dunbar's last years were difficult, and she sometimes handled the stress with alcohol. Soule's views on social medicine created problems for her with the New York Academy of Medicine; a secretary committed suicide in 1948, a patient (Raymond Roscoe Squier) in 1951; Dunbar was in a near-fatal auto accident 1954; she had to defend herself against a senseless and sensational lawsuit. On 21 August 1959 Dunbar was "found floating face down in her swimming pool" (Powell, 1974, p. 275). The New York *Times* and *Herald-Tribune* reported her death as a suicide; the coroner ruled it simply death by drowning."

Dunbar's stress increase, no doubt, was triggered into a higher level, when in 1942, she was forced to departure from her role as medial director of the Council Council for Clinical Training of Theological Students, which she began in 1930, for reasons was due in part to her Freudian and Reichian ideas. [2]

Quote | About

The following are about quotes:

> "**Dunbar** suggested a physical mechanism for the psyche taken from the first two laws of thermodynamics in physics, which she called 'emotional thermodynamics'. The first law describes the case where psychological energy seeks an …"
>
> — Nissim Mizrachi (1998), *The Institutional Management of Mind-Body Dualism: the Battle Over Psychosomatic Medicine* (Q)

References

1. Dunbar, Flanders H. (1935). *Emotions and Bodily Changes: a Survey of Literature on Psychosomatic Interrelationships, 1910-1953* (thermodynamics, 9+ pgs). Columbia University Press, 1954.
2. Kemp, Hendrika V. (2001). "Helen Flanders Dunbar (1902-1959)" (Q), *The Feminist Psychologist*, 28(1), Winter.
3. (a) Powell, R. C. (1974). *Healing and wholeness: Helen Flanders Dunbar (1902-1959) and an extra-medical origin of the American psychosomatic movement, 1906-1936* (pgs. 81-82, 86). Ann Arbor, MI: Xerox University Microfilms, 75-2415.
(b) Hart, C.W. (1996). "Helen Flanders Dunbar: Physician, Medievalist, Enigma" (pg. 48), *Journal of Religion and Health*, 35(1):47-58, Spring.
4. (a) Dunbar, Helen Flanders. (1943). *Psychosomatic Diagnosis* (thermodynamics, 7+ pgs; emotional thermodynamics, pgs. 650-57). New York.
(b) Hillman, James. (1999). *Emotion* (emotional thermodynamics, pg. 70-71, 78). Psychology Press.
5. (a) Kemp, Hendrika V. (2001). "Helen Flanders Dunbar (1902-1959)" (Q), *The Feminist Psychologist*, 28(1), Winter.
(b) McGovern, Constance M. (2000). "Helen Flanders Dunbar", Webster.edu.

External links

1. Helen Flanders Dunbar – Wikipedia.

θΔics

In science, **Helen Fisher** (1945-) is an American anthropologist, mate selection researcher, and love theorist noted for her 1990s to present work on the chemistry of love.

Overview

In 1992, Fisher published *Anatomy of Love*, her best book; she followed up this with her 2004 *Why We Love: the Nature and Chemistry of Romantic Love*; after which she became scientific advisor for the chemistry-themed matching site Chemistry.com, one of the first science-based dating sites, launched in 2007, which attempts to match people based on chemical personality typing method.

Chemistry | Typing theory

The central matching methodology behind the matching algorithm at Chemistry.com is to ask people a series of questions and based on the answers to those questions assign people to one of four "chemical personality types", as outlined below. [1]

Quotes

The following are related quotes:

> "When you massage someone, the levels of oxytocin go up in the brain, and oxytocin is one of the chemicals that drives attachment."
>
> — Helen Fisher (c.2005) (O)

> "Plato came up with these four types, and then Aristotle, and Galen in the second century A.D., and then Carl Jung. We've known about these types for hundreds of years. What I've done is add that biological [chemical] component."
>
> — Helen Fisher (c.2007), commentary on her four-types theory

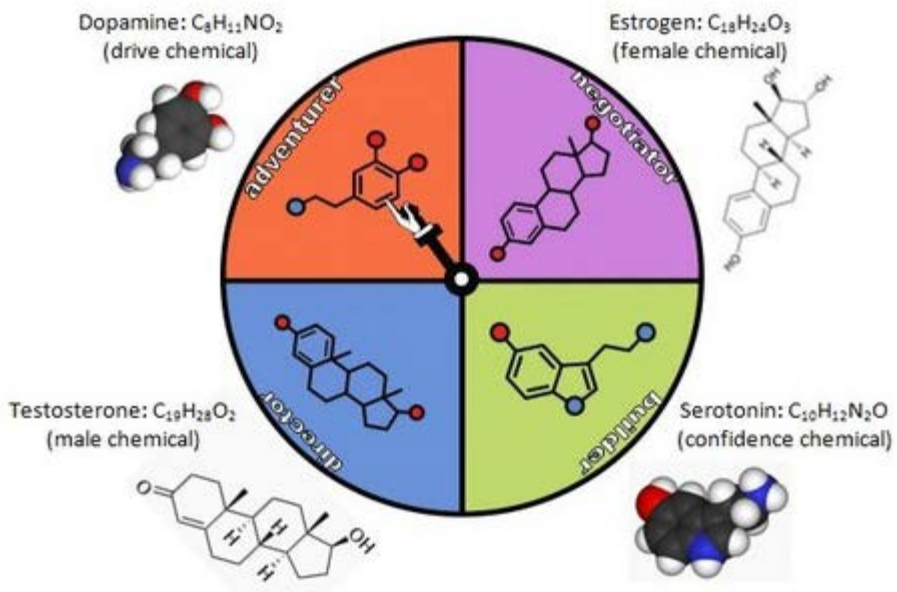

Fisher's four chemical type personality chart, according to which she divides people into four groups: adventurer's (dopamine people), negotiator (estrogen people), builder (serotonin people), and director (testosterone people), whom she matches based on those types.

References

1. Fisher, Helen. (2007). "What's Your Love Type?" (blog), O magazine.

Further reading

- Fisher, Helen E. (1983). *The Sex Contract: the Evolution of Human Behavior*. New York: Quill.
- Fisher, Helen. (1992). *Anatomy of Love: a Natural History of Mating, Marriage, and Why We Stray*. New York: Fawcett Columbine.
- Fisher, Helen. (2004). *Why We Love: the Nature and Chemistry of Romantic Love*. New York: Henry Holt and Co.

External links

- Helen Fisher (anthropologist) – Wikipedia.
- About Helen Fisher – Chemistry.com.

θΔics

In existographies, **Helena Blavatsky** (1831-1891) (CR:4) was a Russian religio-mythology scholar noted for []

Overview

In 1877, Blavatsky published volume one of her *Isis Revealed*.

In 1884, Helena Blavatsky, in volume two of her *Isis Unveiled*, citing Dutch Egyptologist Willem Pleyte (1836-1903) (Q), on El, and Hodder Westropp and Wake Staniland on Phallism, stated the following view: [7]

> "El, the sun-god of the Syrians, the Egyptians, and the Semites, is declared by Pleyte to be no other than Set or Seth, and El is the primeval Saturn—**Israel** (see: Is-Ra-El). Siva is an AEthiopian god, the same as the Chaldean Baal–Bel; thus he is also Saturn. Saturn, El, Seth and Kiyun, or the biblical Chiun of Amos, are all one and the same deity, and may be all regarded in their worst aspect as Typhon [Set] the Destroyer. When the religious pantheon assumed a more definite expression, Typhon was separated from his androgyne—the *good* deity, and fell into degradation as a brutal *unintellectual* power."

(add)

Quotes | By

The following are noted quotes:

> "Jesus Christ, *i.e.*, the man-god of the Christians copied from the Avataras of every country, from the Hindu Krishna as well as the Egyptian Horus, **was never a *historical* person**. He is a deified personification of the glorified type of the great Hierophants of the temples, and his story, as told in the New Testament, is an allegory, assuredly containing profound esoteric truths, but still an allegory."
>
> — Helena Blavatsky (c.1877) (Q)

> "The biography of Jesus was invented *after* the first century."
>
> — Helena Blavatsky (c.1877) (Q)

References

1. (a) Westropp, Hodder M. (1870). "Phallic Worship", read before the Anthropological Society of London on Apr 5.
(b) Wake, C. Staniland. (1870). "Phallic Idea in the Religions of Antiquity", read before the Anthropological Society of London on Apr 5.
(c) Wake, C. Staniland and Westropp, Hodder M. (1870). *Phallism in Ancient Worships* (with an introduction, additional notes, and an appendix by Alexander Wilder) (abs) (pg. 74). Publisher.
(d) Blavatsky, Helena. (1884). *Isis Unveiled: a Master-Key to the Mysteries of Ancient and Modern Science and Theology, Volume Two, Theology* (pg. 524), J.W. Bouton.

External links

- Blavatsky Bookstore – BlavatskyArchives.com.

θΔics

In existographies, **Helge Kragh** (1944-) (CR:52) is a Danish science historian noted for his 1993 work on the history of chemical thermodynamics of Hermann Helmholtz and for his 2004 to 2008 work on the history of overlap of thermodynamics and religion.

Overview

In 1993, Kragh, in his "Between Physics and Chemistry: Helmholtz's Route to a Theory of Chemical Thermodynamics", digressed on the history of German physicist Hermann Helmholtz' contributions to chemical thermodynamics, giving some of the first English translations and discussion of derivations of Helmholtz, on the so-called "German thermodynamics" derivation variety.

In 1996, Kragh co-authored, with Stephen Weininger, "Sooner Science than Confustion: the Tortuous Entry of Entropy into Chemist". [4]

In 2004, Kragh, in his *Matter and Spirit in the Universe*, discussed the thermodynamic-religious intertwining in the development of modern cosmology. [3]

In 2008, Kragh published *Entropic Creation: Religious Contexts of Thermodynamics and Cosmology*, his historically-rich book, on the extensive use of entropy in religion (religious thermodynamics). [1]

Education

From 1987 and 1989, Kragh was an associate professor of physics and history at Cornell University. Kragh currently is a professor of history of science at the University of Aarhus, Denmark. [2]

References

1. (a) Cahan, David (1993). *Hermann von Helmholtz and the Foundations of Nineteenth-Century Science* (Contributors: Helge Kragh, pg. xvii; ch. 10: "Between Physics and Chemistry - Helmholtz's Route to a Theory of Chemical Thermodynamics" by Helge Kragh). University of California Press.
(b) Kragh, Helge S. (2008). *Entropic Creation: Religious Contexts of Thermodynamics and Cosmology*. Ashgate Publishing, Ltd.
2. (a) Helge Kragh – Ideas in History, the Nordic Society for the History of Ideas.
(b) Helge Kragh – World Science Festival, June 10-14, 2009, New York City.
3. Kragh, Helge. (2004). *Matter and Spirit in the Universe: Scientific and Religious preludes to Modern Cosmology*. World Scientific Publishing.
4. Kragh, Helge and Weininger, Stephen J. (1996). "Sooner Science than Confustion: the Tortuous Entry of Entropy into Chemist" (abs), *Historical Studies in the Physical and Biological Sciences*, 27(1): 91-130.

External links

â— Helge Kragh (Faculty) – Department of Science Studies, Aarhus University.

θΔics

In science, **heliocentric model** or 'heliocentrism', as contrasted with geocentric model (earth at center of universe) or geocentrism, is the model of the universe where planets revolved around the sun and there are many suns in a vast universe.

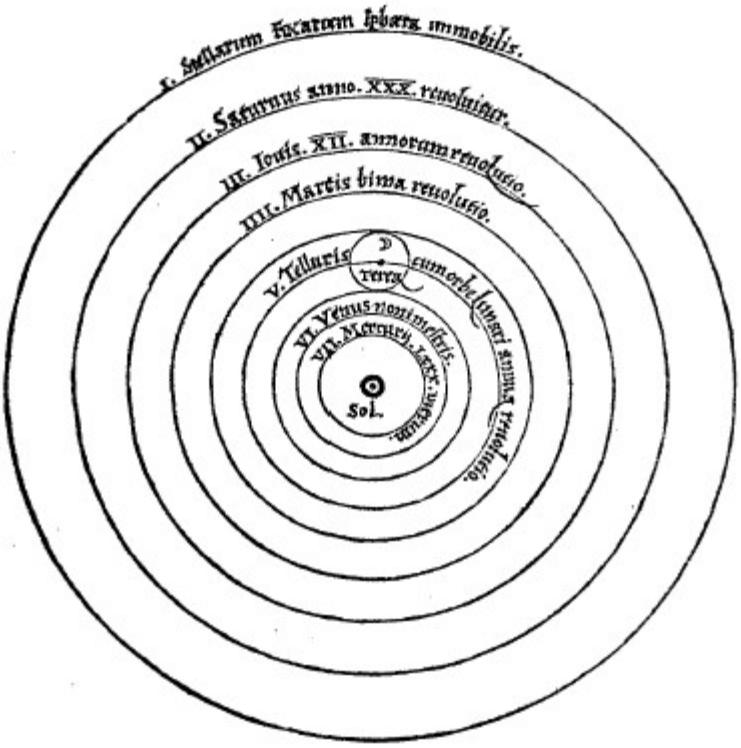

The 1543 version of Copernicus' **heliocentric model**. [1]

History

In 399BC, Greek Pythagorean philosopher Philolaus, according to Cyril Bailey (1928), speculated on the germ of the idea of a helio-centric world. [4]

In *circa* 250BC, Greek mathematical astronomer Aristarchus (310-c.230BC) presented the first known model that placed the sun at the center of the known universe with the earth, and the other planets, in their correct order of distance, revolving around it.

In *circa* 1514, Polish astronomer Nicolaus Copernicus, citing Aristarchus and Philoaus, in an early manuscript (Q) of his book which survives, began making distributing a short forty-page manuscript to close friends called "Little Commentary" (Commentariolus) which described his ideas about the heliocentric hypothesis. It contained seven basic assumptions. Thereafter he continued gathering data for a more detailed work and some of his work began to be discussed in various lectures

In 1536, Cardinal Nikolaus von Schönberg, Archbishop of Capua, wrote to Copernicus from Rome, stating that some year ago he had heard rumors of Copernicus' theory, which he summarized tersely as follows: [2]

> "The earth moves and the sun occupies the lowest, and thus the central, place in the universe."

The finalized format of the heliocentric model was published in 1543 by Copernicus, the year of his cessation, in his *On the Revolution of the Heavenly Spheres*, which following the Galilean inquisitions (1633), would go on eventually overthrow a mixture of Greek philosopher Aristotle's 350BC geocentric model of the universe and as well as Greek astronomer Ptolemy's 150AD geocentric model. [1]

Ridicule

German theology reformer Martin Luther (1483-1546) (IQ=170) described Copernicus as a fool in one of his after-dinner speeches: [3]

> "[Copernicus is a] new astrologer who wanted to prove that the earth was moving and revolving, rather than the heaven or the firmament, sun and moon, just as if someone in a moving carriage or on a sailing ship believed that he was motionless and in rest, but that the earth and the trees were moving. But such are the times we live in: he who wants to be clever must invent something all his own and what he makes up he naturally things is the best thing ever! This **fool** wants to turn the whole art of astronomy upside down! But as the Holy Scripture testifies, Joshua ordered the sun to stand still, and not the earth."

Luther's associate German theology reformer Philipp Melanchthon (1497-1560) described Copernicus' heliocentric theory as an **"old joke"** (see: crackpot), implying that it was a superfluous revival of a frivolous circa 250BC suggestion

by Aristarchus of Samos. Moreover, upon reading the Rheticus' *First Account* (*Narratio Prima*), the first condensed summary of Copernicus' theory, Melanchthon commented: [3]

> "[Some think it] a distinguished achievement to construct such a **crazy thing** as that Prussian astronomer who moves the earth and fixes the sun. Verily, wise rulers should tame the unrestraint of men's minds."

In 1600, Giordano Bruno was burned at the stake for, among other things, his support of Copernicus.

References

1. Copernicus, Nicolaus. (1543). *On the Revolution of the Heavenly Spheres* (*De revolutionibus orbium coelestium*). Publisher.
2. Schonberg, Nikolaus von. (1536). "Letter to Copernicus", Nov 01.
3. Crowther, James G. (1995). *Six Great Scientists: Copernicus, Galileo, Newton, Darwin, Marie Curie, Einstein* (pg. 36-38). Barnes & Noble.
4. Bailey, Cyril. (1928). *The Greek Atomists and Epicurus: a Study* (O)(pdf). Russell & Russell, 1964

Further reading

● Guericke, Otto and Schott, Kaspar. (1672). *Otto Guericke's New Experiments on (as they are called) on the Magdeburg vacuum space* (*Ottonis De Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (15+ diagrams, various pages). Janssonius a Waesberge.

External links

● Heliocentrism – Wikipedia.
● Geocentric model – Wikipedia.
● Aristotelian physics – Wikipedia.

θΔics

In cosmology, **heliocentrism**, as compared to geocentrism, is the model, aka "heliocentric model", according to which the earth goes around sun, which is at the center of the solar system; the model was first speculated on by Philolaus (c.399BC).

References

1. Bailey, Cyril. (1928). *The Greek Atomists and Epicurus: a Study* (O)(pdf). Russell & Russell, 1964.

θΔics

In cities, **Heliopolis** (TR:31), hieroglyph " ", originally called An, Anu, Junu, Iunu, Heliopolis (Greek), On (Hebrew), aka the "city of the sun", was a prominent city of ancient Egypt, which arose to power in c.2800BC, being the foremost religious center, wherein the so-called Heliopolis creation myth was promulgated, centered around the Heliopolis ennead or paut (group) of nine gods, with Atum and later Atum-Ra as the supreme god.

Overview

The main hieroglyph, supposedly, for Heliopolis is the following: [1]

which, according to Wallis Budge, is a pillar or obelisk with a cross on it, the water symbol or god Nun symbol, and a sun with a cross in it and or a sun inside of an eclipse, and a half-circle, which is bread. (Ñº)

The following, from Wallis Budge's *Egyptian Hieroglyphic Dictionary* (1920), shows the various hieroglyphs for the Egyptian city of An (or On, Anu, Junu, Iunu), renamed later by the Greeks as "Heliopolis": [2]

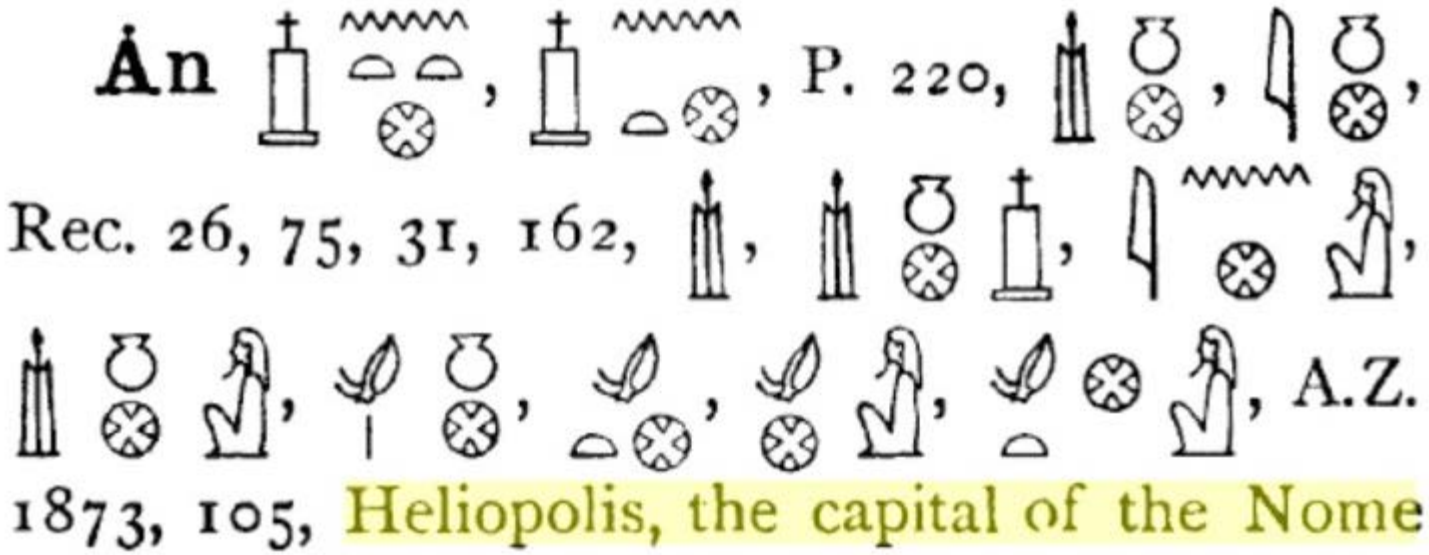

(add)

Quotes

The following are related quotes:

> "The ancient Egyptian cult center Junu, named 'On' in the Hebrew Bible, was renamed '**Heliopolis**' by the Greeks in recognition of the fact that the sun god Ra (Helios in Greek) presided there. Junu is mentioned in the Pyramid Texts as 'House of Ra'."

— Karl Luckert (1991), *Egyptian Light and the Hebrew Fire* (pg. 41)

References

1. Anon. (2016). “The Story of Osiris – Ancient Egyptian God Documentary” (Ñº), YouTube, Ancient World History, Dec 23.
2. Budge, Wallis. (1920). *An Egyptian Hieroglyphic Dictionary, Volume Two: With an Index of English Words, King List and Geographical List with Indexes, List of Hieroglyphic Characters, Coptic and Semitic Alphabets* (pg. 958). Cosimo, 2013.

External links

â— Heliopolis (ancient Egypt) – Wikipedia.

θΔics

In creation myths, **Heliopolis creation myth**, the thought product of scholars of the Egyptian city of Heliopolis (c.3100BC), aka the "city of the sun", posited that the universe resulted according to the process in which Atum, the sun god, emerged from the primordial ocean to create Shu, the god of air, and Tefnut, the goddess of moisture, from his bodily fluid, which contained both male and female elements necessary for creation. Their union, in turn, produced Geb, the earth god, and Nut, the sky goddess, who also married and produced Isis, Osiris, Set and Nephthys. [1]

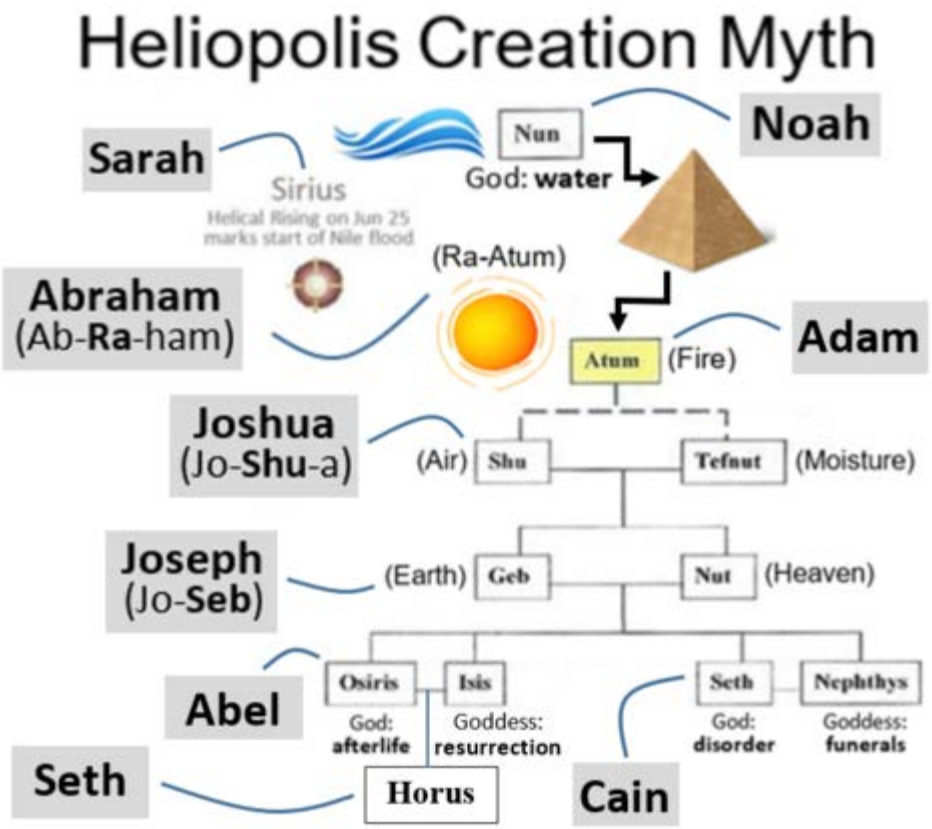

The basics of **Heliopolis creation myth**, with rescripted Jewish creation myth characters (see: god character equivalents) shown adjacent, according to which the sun god Atum [turned Adam], or Ptah (during Memphis creation myth (2800BC) recension), who at the time was closely associated with Ra (Atum-Ra), arose out of the primordial flood, i.e. god Nun [turned Noah], and then self-engendered the pair: Shu (air) [turned Joshua] and Tefnut (moisture), who self-engendered Geb (earth) [turned Joseph] and Nut (sky), who self-engendered the sibling pairs: Osiris [turned Abel] & Isis [turned Sarah] and their sun Horus [turned Seth] and Set [turned Cain] & Nephthys.

Overview

The gist description of the Heliopolis creation myth, in the point when Atum or Atum-Khepri, i.e. Atum in the form of the morning sun beetle (Khepri), is described as follows:

> "To say: O Atum-Khepri, when thou didst mount as a hill; and didst shine as bnw of the ben (or, benben) in the temple of the "phoenix" in Heliopolis; and didst spew out as Shu, and did spit out as Tefnut; (then) thou didst put thine arms about them, as the arm(s) of a ka, that thy ka might be in them. Atum, so put thine arms about N.; about this temple, about this pyramid, as the arm (s) of a ka; that the ka of N. may be in it, enduring for ever and ever. O Great Ennead who are in Heliopolis: Atum, Shu, Tefnut, Geb, Nut, Osiris, Isis, Set, Nephthys."
>
> — Anon (c.2500BC), Pyramid Text, Utterance 600 (Q)(Q)

Alternatively, Pyramid Text Utterance 527 (Q) states that "Atum took his phallus in his grip and ejaculated through it to produce Shu and Tefnut". This is an example of dual myth parallelism that runs through Egyptian mythology, meaning that two previously competing theories were incorporated into the text, as different points of view, so to say, which thus carried over, in its monotheistic reformulations, into Jewish mythology and Christian mythology. The following, whatever the case, is a genealogy of creation and the gods according to Heliopolis creation myth, labeled according to its 8 main steps of creation: [4]

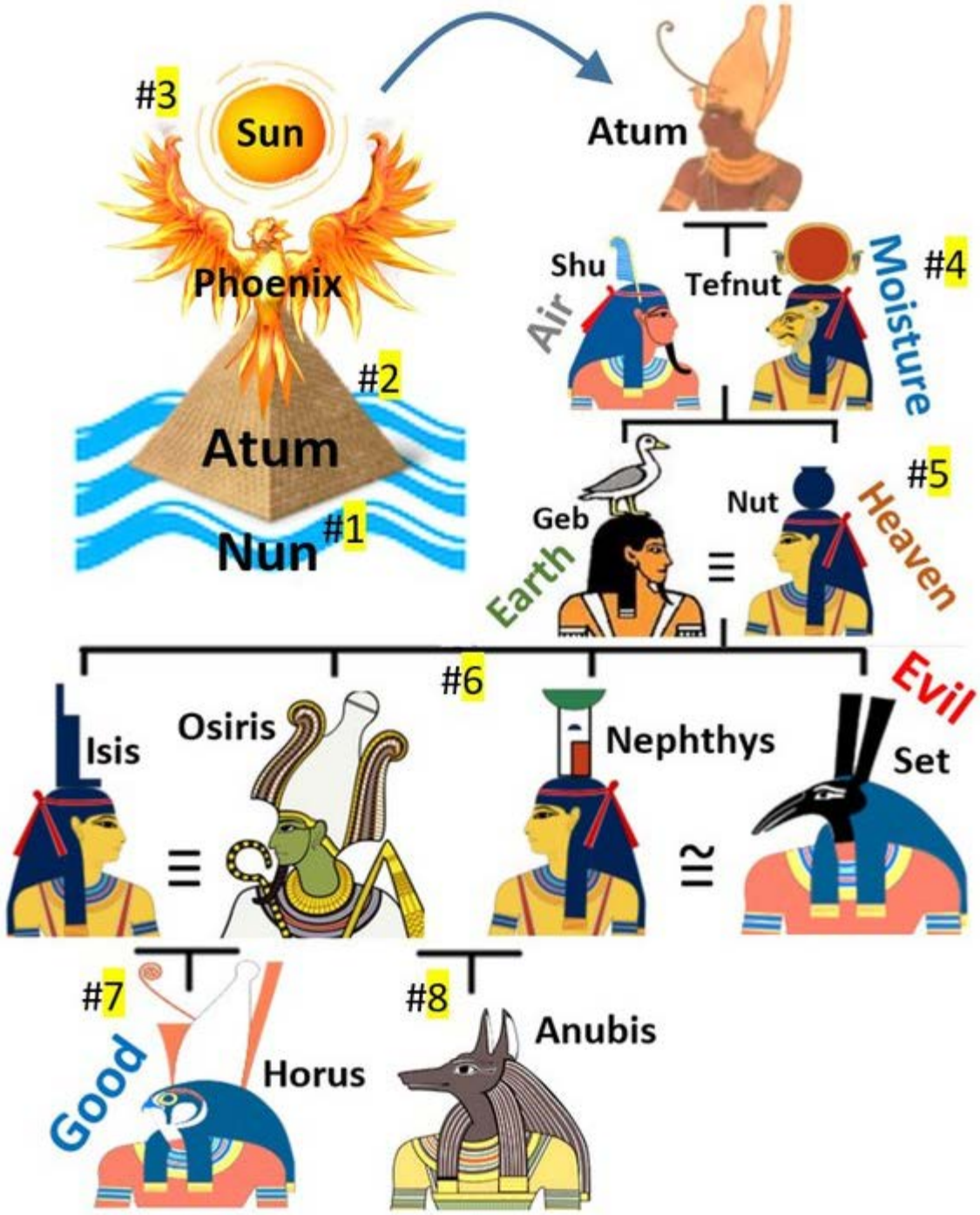

Over time, as religio-political power shifted, the Egyptian creation myths, as dominate state religions, changed as follows:

0. Pre-Dynastic creation myth | 3500BC | Supreme god: Horus
1. **Heliopolis creation myth** | 3100BC | Supreme god:

→ Atum or Atum-Khepri (Pyramid Texts, 2500BC)
→ Atum-Ra (Coffin Texts, 2100BC) /

Ennead

2. Memphis creation myth | 2800BC | Supreme god: Ptah
3. Hermopolis creation myth | 2400 BC | Supreme god: **Ogdoad**
4. Thebian creation myth | 2050 BC | Supreme god: Amen
5. Amarnan creation myth | 1300BC | Supreme god: Aten
6. Saite recension | 670BC | *Book of Dead* (canonized)
7. Biblical creation myth | 500BC | Supreme god: El-Yahweh-Amen
8. Muslim creation myth | 700AD | Supreme god: Allah

Above is a general visual of how the Egyptians conceived the origin of things, namely water came first, out of which land arose, from the tip of which fire or the sun burst forth. This was a three element theory at first, then it became a four element theory.

In 100AD, El-Yahweh-Amen, rescripted the father of Jesus [Osiris-Horus], became rendered, via Hebrew to Greek to Latin transliteration effects, as "God" or more generally as "Lord [Yahweh] God [Elohim] Almighty [El] Amen [Amen]".

Ennead

Together, these nine gods, Atum and his eight offspring, came to referred to as the Heliopolis "ennead", from the Greek ἐννεάς, meaning a collection of nine things:

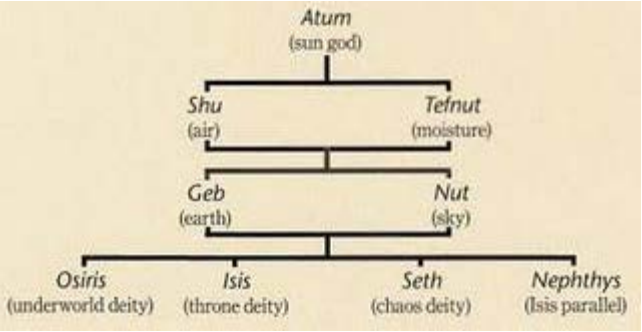

These nine gods soon became anthropomorphized, as shown adjacent, or in some cases anthropomorphized with animal parts; a logic rooted in the historical belief that a "bird", the only animal with the ability to fly, carried the sun disc through the sky, hence: bird-human god depictions followed, and other animal-god morphs thereafter.

A depiction of the Heliopolis creation myth as shown on the papyrus of Nespakashuty, made in the 21st Dynasty (943-

1077BC), where Nut arches naked over her consort Geb, the earth god: [1]

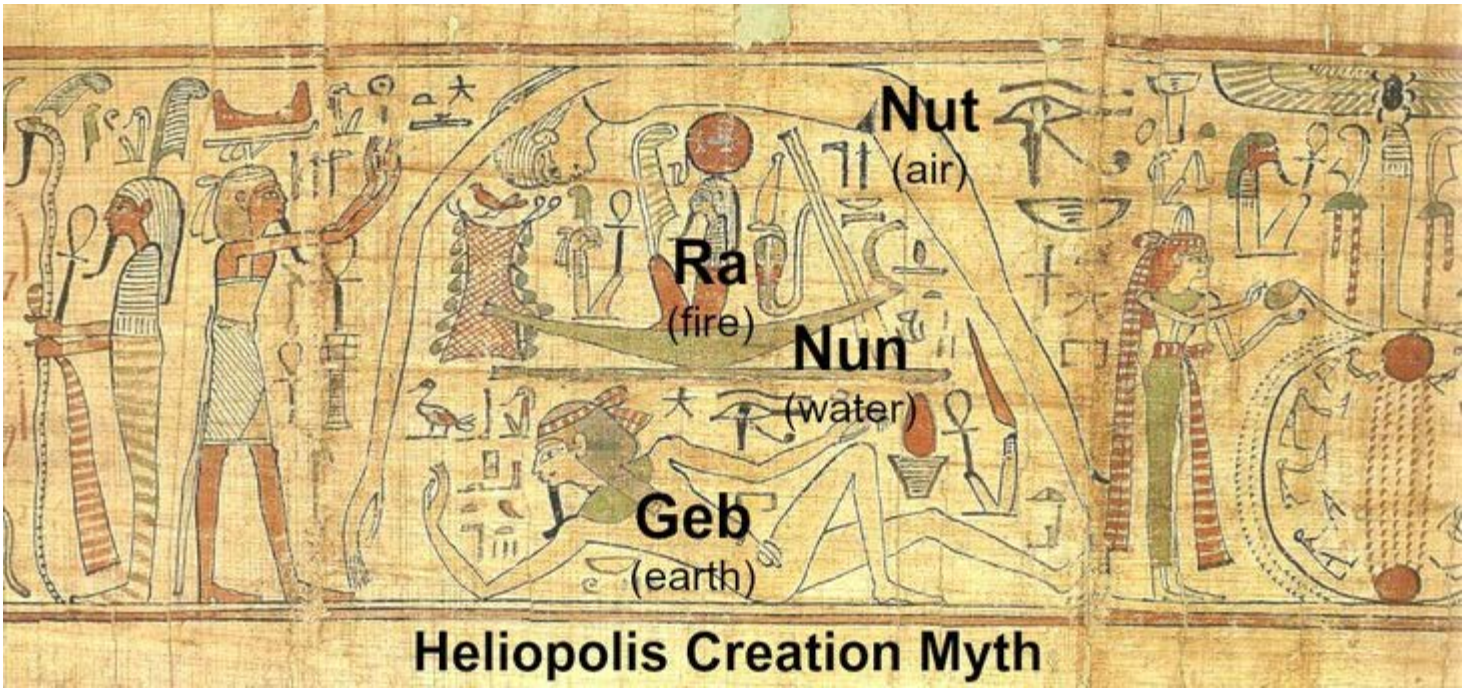

In 2002, Karl Luckert, in his 62-min video lecture, entitled *Out of Egypt: an Other Son*, states the following about the Heliopolis creation myth: [3]

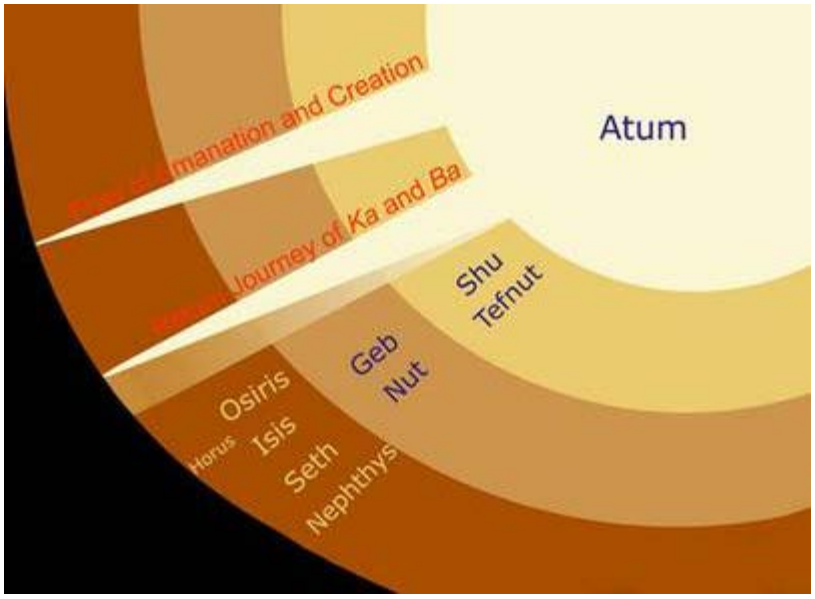

Heliopolitan Theology

Every schoolbook tells us that the ancient Egyptians worshipped the sun. This statement is true, but superficial. It would be better to say that they recognized the sun as life-giving and life-sustaining entity, and for this reason they learned to think, and to explain, everything in terms of light and shadows cast by the Sun. The Sun became their key to understanding the remainder of what exists. Creation reoccurs with every sunrise—as the world around us reappears anew.

Atum rises as primeval hill and sends forth Shu, to fill Tefnut's space with life. You cannot see Shu, but you can rise with him, at sunrise, and breathe his air. You cannot see Tefnut, but you benefit from how she keeps Chaos away. She sees to it that clouds do have an underside, and that there is space for you to live underneath. Saying the same thing a little more abstractly, Shu and Tefnut are radiated, or emanated, from the original Source, Atum. His rays continue to travel far away from the Source until they arrive at the low intensity level where we live. We live in a realm between light and darkness — between life and death. In our boundary region, where light and shadows interplay, there we "live and move and have our being," for a while. Yes, by the grace of the radiant energy of Atum we appear here for a while.

(add)

Ra

In 2400BC, when Hermopolis became the state capital of the Egyptian, the Hermopolis creation myth became the dominate creation myth (see: religio-mythology transcription and syncretism), wherein the god Ra (or Re) became merged with Atum, into the Re-Atum or Atum-Ra.

Osiris

Linked to Heliopolis creation myth, in later years, was the myth of Osiris, aka the "passion of Osiris", according to which Osiris, the highly esteemed king of Egypt, was murdered by his jealous brother Seth, then restored to "life", by the combined powers of Isis and Nephthys, after which he entered the underworld to become the judge of the dead while his son, Horus, avenged his death to become the next king of Egypt. [1]

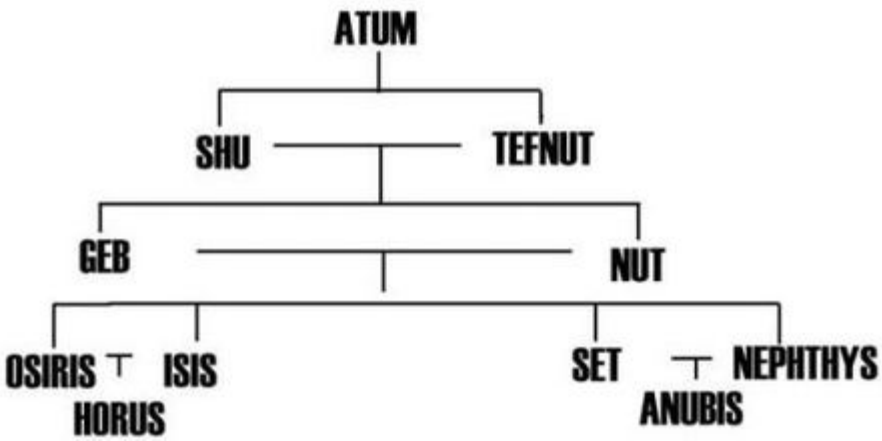

A diagram showing the deity cousins Horus and Anubis lineage and how this connects to the seven days of Biblical creation. (Q)

Quotes

The following are related quotes:

> "The prominence in the texts of Asclepius, a thinly-disguised Imhotep, suggest an association with **Heliopolis** ... Although even the *Pyramid Texts* fail to set out the beliefs of Heliopolis systematically, why should we expect them to? After all, the people who mattered—the priests and worshipers—were already familiar with their own religion. The *Texts* do, however, allow the core theology and cosmology behind them to be reconstructed. The most successful attempt is found in Karl Luckert's *Egyptian Light and Hebrew Fire* (1991), which isolates two related aspects: the overall understanding in the origins and nature of the cosmos, and its relationship to human beings."
>
> — Lynn Picknett and Clive Prince (2013), *The Forbidden Universe: the Occult Origins of Science* [2]

See also

- Memphis creation myth
- Hermopolis creation myth
- Thebian creation myth
- Manu
- Religio-mythology transcription and syncretism

References

1. Oakes, Lorna and Gahlin, Lucia. (2002). *Ancient Egypt: an Illustrated Reference to the Myths, Religions, Pyramids and Temples of the Land of the Pharaohs* (§:Heliopolis creation myth, pgs.126-27, 198, Papyrus of Nespakashuty, pg. 290). Hermes House.
2. (a) Picknett, Lynn and Prince, Clive. (2013). *The Forbidden Universe: the Occult Origins of Science and the Search for the Mind of God* (pg. #). Skyhorse Publishing.
(b) Luckhert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective*. SUNY Press.
3. Luckert, Karl. (2002). *Out of Egypt: an Other Son* (62-min) (Q). Publisher.
4. Thims, Libb. (2019). *Human Chemical Thermodynamics: Chemical Thermodynamics Applied to the Humanities – Sociology, Economics, History, Philosophy, Ethics, Government, Politics, Business, Religion, and Relationship* (pdf). Publisher.

External links

- Heliopolis (ancient Egyptian creation myths) – Wikipedia.
- Heliopolis creation myth – EgyptHoliday.com.

θΔics

In religio-mythology, **hell** (TR:44), as contrasted with heaven, is the fictional location, oft-conceptualized as a fiery place below the surface of the earth, where souls heavy with wrong doings are sent.

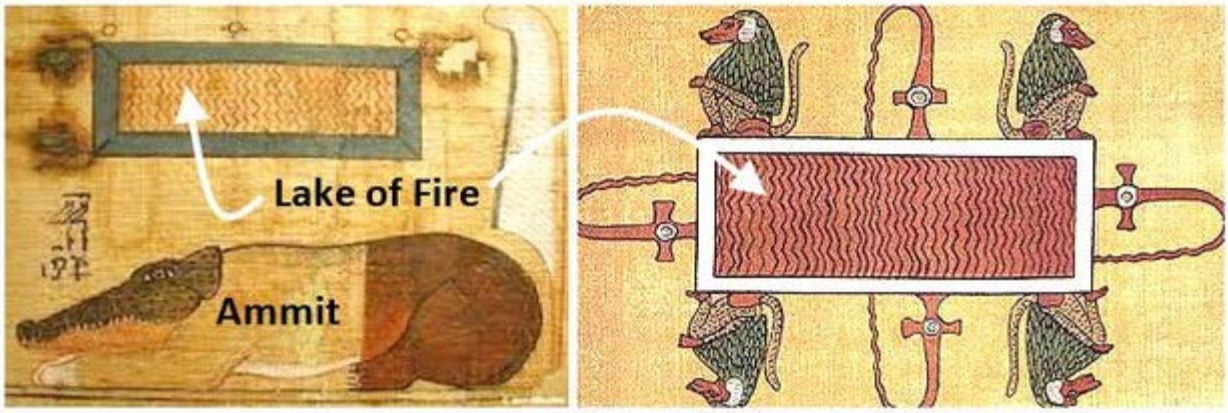

A diagram of Egyptian "**hell**" (O), which is a lake of fire, situated near or under the crocodile-hippopotamus-lion god Ammit (or Ammut), aka "the devourer", in the judgment hall, who eats the souls heavy with sin (or negative confessions), which then goes, following digestion, into the fiery pit or lake.

Egyptian

In c.2600, Egyptian religio-mythology thinkers developed the model that each person (see: Egyptian human) had a soul, which had a weight (see: soul weight), determined measurably by 42 acts (see: negative confessions), and that when a person died, his or her soul would be weighed on a scale in the afterlife (see: judgment hall), against the feather of truth (Maat's feather), and if it was found to be too heavy, per reason of doing too many wrongful acts, more then 21 wrongful acts, that a monster called Ammit would eat or "devour" that soul, after which the soul would descend into a fiery lake, situated below Ammit.

Greek

In ancient Greece, hell was called Hades:

> "The unwise hate their life, yet want to live for fear of **Hades**."
>
> — Democritus (c.420BC) Fragment D63; cited by Stobaeus (c.550BC) in *Ethics* (III.4.73) [11]

(add)

Roman

The following is a pre-Christian Roman discussion of the underworld:

> "They do not know the nature of the soul: if it is born or at birth slipped into us; whether, destroyed by death, it dies with us, or goes to see **hell**'s broad and lightless pools, or by some miracle passes to other creatures [see: transmigration], as our loved Ennius sang, who first brought down from lovely Helicon garlands evergreen to grow in fame wherever Italians live. Yet Ennius claimed the underworld exists, and told his tale in deathless verse, a place where neither soul nor flesh lives on but a sort of 'images', pale and eerie things."
>
> — Lucretius (55BC), *On the Nature of Things* (translator: Frank Copley) (pg. 3) (1:112-23)

In c.200AD, during the Roman recension, this idea of evil souls being sent to a fiery lake, became or rather was molded into the Christian concept of "hell", to so-called abode of the devil and demons, where wrong-doers were sent to suffer for all eternity.

Quotes

The following are related quotes:

> "I use the teachings of the philosophers and thinkers of antiquity to show that god does not exist, that the world is eternal, that the soul is mortal, that **hell** is nothing but a fairy tale, and that religion is a political artifice. A cunning deception is that death is detestable, because nothing stifles him [it?]. Thus, I have divided the work, as Theophrastus of Eresus did it, into six books: the first on the gods, the second on the world, the third on religion, the fourth on the soul and on hell, the fifth on the contempt of death, the sixth on the natural life. All this belongs to the argument with the gods. If it has been proved that the gods do not exist, the rest understands itself."
>
> — Anon Theophrastus (c.1659), *Theophrastus Redivivus* (pg. 8) [1]

> "I wish, when cold, to warm in **hell**."
>
> — Thomas Aikenhead (c.1696) (Q) [2]

> "Thermodynamics might be able to say, though very vaguely, if there is going to be a resurrection and another world, how this may occur and what the other world may look like … In this way, we may be able to examine to what extent the signs of the other world, as provided by the prophets, are plausible. If these signs about the resurrection, paradise and **hell** form a reasonable and sensible related collection that new sciences, to some extent, affirm, then such beliefs are not baseless."
>
> — Mehdi Bazargan (1960) [3]

See also

- Thermodynamics of hell

References

1. (a) Anon Theophrastus. (c.1659). *Theophrastus Reborn: History of What Has Been Called the Gods of the World, Religion, Life, and Below the Demons of Indifference to Death, about Life in Nature. The Purpose of it was Constructed and the Opinions of the most Learned Theologians, to the View to Demolishing the Work, from Philosophers* (*Theophrastus Redivivus: sive historia de iis, quae dicuntur de diis, de mundo, de religione, de anima, inferis et daemonibus, de contemnenda morte, de vita secundum naturam. Opus ex Philosophorum opinionibus constructum et doctissimis Theologis ad diruendum propositum*) (Q) [1,090-pages]. Manuscript of the Bibliothèque nationale de France, Department of manuscrits, Latin 9324, XVIII.
(b) Theophrastus Redivivus (German → English) – Wikipedia.
2. Thomas Aikenhead – Dictionary of Unitarian and Universality Biography.
3. (a) Bazargan, *Eshq va Parastesh ya Thermodynamic-e Ensan*, 159.
(b) Taghavi, Sehed M. (2004). *The Flourishing of Islamic Reformism in Iran: Political Islamic Groups in Iran (1941-61)*, (pg. 84). Routledge.
4. Taylor, C.C.W. (1999). *The Atomists: Leucippus and Democritus: Fragments: a Text and Translation with a Commentary by C.C.W. Taylor* (pg. 3, 5). University of Toronto Press.

Videos

- Thims, Libb (2015). "Zerotheism for Kids, Lecture 12: Moral Gravity, Higher Powers, and Death" (Q), Atheism Reviews, Sep 7.

External links

- Hell – Wikipedia.

θΔics

In mononyms, **Helmholtz** [CR:21] (CR:454) is the surname of German physicist-physician Hermann Helmholtz; noted in hmolscience, most-significantly for his 1882 proof, as found in his "On the Thermodynamics of Chemical Processes", that free energy is the measure of affinity.

The **Helmholtz** statue (Q) in front of Humboldt University, Berlin.

Eponyms

Helmholtz is the eponym of the:

- Goethe-Helmholtz equation
- Helmholtz free energy
- Helmholtz school

Quotes

The following are related quotes:

> "The matter of multiplicity of contributors needs no great explanation, for we are all used to this in the modern handbooks. I believe it is a common saying that **Helmholtz** was the last universal genius, and we are fast arriving at the point where even a single subject becomes too vast for one man. At any rate, whether or not any of my learned colleagues could write an entire chemical engineering handbook, I could not—hence the present form."
>
> — Donald Liddell (1922) *Handbook of Chemical Engineering* [1]

References

1. Liddell. Donald M. (1922). *Handbook of Chemical Engineering, Volume 1* (quote, pg. ix). McGraw-Hill Company.

θΔics

In thermodynamics, **Helmholtz free energy** is the isothermal (constant temperature) isochoric (constant volume) thermodynamic potential of a closed system (constant species), defined by:

$$F \equiv E - TS$$

where *E* represents the energy of the system and *S* its entropy. [1] In short, the Helmholtz free energy is the measure of an isothermal-isochoric closed system's ability to do work. [2] In the absence of any external field, the Helmholtz free energy may be defined as:

$$H = U - TS$$

Synonyms for the Helmholtz free energy include: free energy, Helmholtz function, among others. The Helmholtz free energy is commonly used in experiments such as in explosives research (where explosive reactions by their nature induce pressure changes). A related potential, used commonly in biology, is the Gibbs free energy where volume changes occur, but where temperature and pressure remain constant.

History

The Helmholtz free energy was introduced independently in 1875 by American engineer Willard Gibbs and in 1882 by German physician-physicist Hermann Helmholtz. [1]

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics*, Oxford: Oxford University Press.
2. Daintith, John. (2005). *Oxford Dictionary of Science.* Oxford: Oxford University Press.

θΔics

In thermodynamics schools, **Helmholtz school** is a crossover school of physics and physiology that refers to the group of German medical students Ernst Brücke, Emil Du Bois-Reymond, and Carl Ludwig under the leadership of Hermann Helmholtz, at the University of Berlin, and their view that living organism operate according to physical-chemical principles, rather than vitalism or other special biological theories. [1]

In 1845, the group formed the Berlin Physical Society, in efforts to promote the view that organisms are governed solely by physiochemical forces, rather than by those connected to vitalism. The term "Helmholtz school" was used as early as 1944 by Austrian psychologist Siegfried Bernfeld in his article “Freud’s Earliest Theories and the School of Helmholtz”. [2]

Central in this group was Herman Helmholtz and his universal theory of the conservation of force (later incorporated into the first law of thermodynamics). The idea of the conservation of force was passed along in the teachings of Brücke to Austrian psychologist Sigmund Freud, one of Brücke’s students at the medical school at Vienna, during the years 1873-78, who later used this logic to revolutionize psychology with his theories of conservations of forces, such as in repressions or cathexis, in the subconscious.

Müller's laboratory

In 1826, German physiologist Johannes Müller scripted his law of specific energies of the sense, with focus on nerve energies, arguing that the act of sensation depends on some special quality of energy carried by the transmission nerves, e.g. the optic nerve. [3] In this description was a premise of vitalism. In circa 1833, his *Handbook of Human Physiology* came out, which integrated, to an extent, aspects of human and comparative anatomy, chemistry, and physics.

During the years 1838-42, Emil Du Bois-Reymond, Ernst Brücke, and Hermann Helmholtz were worked together in Müller’s physiology laboratory. Though Helmholtz gave his name to the school, as he later became the most prestigious (one of the founders of chemical thermodynamics), it was actually started by Du Bois-Reymond and Brücke, who in 1842 pledged their famous oath (Reymond-Brucke oath): [4]

Emil Du Bois-Reymond (1818-1896)

Ernst Brücke (1819-1892)

The two associates of the famous 1842 "Reymond-Brucke oath" that the insides of organisms are governed solely by physical-chemical means.

> “[We pledge] to put in power this truth: no other forces than the common physical chemical ones are active within the organism. In those cases which cannot at the time be explained by these forces one has either to find a specific way or form of their action by means of physical mathematical method, or to assume new forces equal in dignity to the chemical physical forces inherent in matter, reducible to the force of attraction and repulsion.”

It is difficult to discern why 1842 was such a decisive year, but it could have something to do with the publication of Justus Liebig's *Animal Chemistry* (1842) which utilized the vitalist doctrine, mixed with Antoine Lavoisier's combustion theory of animal heat, on the premise that by 1845, Helmholtz had scrutinized Liebig’s vitalism-soaked theory that animal heat theory could be accounted for by the combustion of food, by pointing out that there was no rigorous theoretical justification for such a claim. [6]

The trio, Reymond, Brucke, and Helmholtz, not note, were soon joined by Helmholtz and a young physician named Carl Ludwig, who had previously completed his medical degree in 1839 and the University of Marburg, forming the Berlin Physical Society (Berliner Physikalische Gesellschaft) in 1845. The members of the society, according to one view, “were young students of Johannes Müller – physicists and physiologists banded together to destroy, once and for all, vitalism, the fundamental belief of their admired master.” [4]

On July 23, 1847, at a meeting of the Berlin group, when it was still more a club than a formal scientific association,

Helmholtz read a paper on the principle of conservation of energy – with the modest purpose of giving a sound foundation to the new physiology. This was said to have “made an enormous impression” on everyone at the school of Helmholtz. [3] Through the later influence of Brücke on Freud, the energy view of psychoanalysis can clearly be found in works of Freud such as his “Instincts and Their Vicissitudes” in his chapter seven of *The Interpretation of Dreams,* where psychological issues are described in terms of cathectic energies and their transformations or vicissitudes.

Ludwig, like his associates, he rejected the assumption that the phenomena of living animals depend on special biological laws and vital forces different from those which operate in the domain of inorganic nature; and he sought to explain them by reference to the same laws as are applicable in the case of physical and chemical phenomena. This point of view was expressed in Ludwig's celebrated *Text-book of Human Physiology* (1852-1856), but it is as evident in his earliest paper (1842) on the process of urinary secretion as in all his subsequent work.

To the group, and especially Brücke, any hint of vitalism was verboten (forbidden); biological systems were to be thought of as mere extensions of inanimate physical systems. [5] In some mentions, Austrian physician Josef Breuer is said to have been associated with the Helmholtz school.

See also

â— Berlin school of thermodynamics

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θΔics

In human chemistry, **Helmut Hühn** (1961-) is a German romantic literature scholar noted for []

Overview

In 2010, Huhn was the editor of the 2010 *Goethe's Elective Affinities: Work and Research*, on German polymath Johann Goethe's puzzle-laden physical chemistry based 1809 novella *Elective Affinities*, which is abstracted as follows: [1]

> "In this hand-book-like collection of the timeline development Goethe's famous *Elective Affinities*, renowned scientists and experts address new questions and perspectives for the interpretation of this complex work and take stock of the research. The novel and its narrative and times are specifically examined in an interdisciplinary and accessible manner. A detailed introduction, persons, subject index, and a bibliography of research used for orientation and usability is provided."

The following are the contributors, listed per order of chapter contribution:

German

● Helmut Huhn (Wirklichkeit und Kunst. 200 Jahre Goethes *Wahlverwandtschaften*)
● Ernst Osterkamp (Einsamkeit und Entsagung in Goethes *Wahlverwandtschaften*)
● Klaus Manger (Goethes *Wahlverwandtschaften*: Neu gelesen)
● Jochen Golz (Ein poetisches Entrée? Goethes *Wahlverwandtschaften* im Kontext des Sonettzyklus von 1807 und der Pandora-Dichtung)
● Harald Tausch (Das unsichtbare Labyrinth. Zur Parkgestaltung und Architektur in Goethes *Wahlverwandtschaften*)
● Helmut Huhn (Ein >>tragischer Roman<<? Uberlegungen zu einem Romanexperiment), Birgit Sandkaulen (>>…uberall nur *eine* Natur …<<. Spinozas *Ethik* als Schlussel zu Goethes *Wahlverwandtschaften*?)
● Jan Urbich (>>Ein Zeichen sind wir, deutungslos<<. Uber die Funktion des dekonstruktivistischen Schriftbegriffes fur Goethes *Wahlverwandtschaften*)
● Reinhard Wegner (Zum Problem gesellschaftlicher Vorurteile und individueller Denkstorungen in Goethes *Wahlverwandtschaften* Ein psychoanalytische Untersuchung)
● Temilo van Zantwijk (Wissen sie, was sie tun? Literature, Ethik und Handlungstheore), Olaf Freidbach (*Die Wahlverwandtschaften*: Versuch einer wissenschafts-historischen Perspektivierung)
● Nicole Grochowina (Von der >>Dazwischenkunft eines Dritten<< - Geschlechterbeziehungen in Goethes *Wahlverwandtschaften*)
● Marko Kreutzmann (Goethe als Gesellschaftskritiker. Zur Symolisierung sozialen Wandels in den Wahlverwandtschaften)

English

● **Helmut Huhn** (reality and art. 200 years Goethe's Elective Affinities)
● Ernst Osterkamp (loneliness and self-denial in Goethe's Elective Affinities)
● Klaus Manger (Goethe's Elective Affinities: Read New)
● Jochen Golz (A poetic starters? Goethe's Elective Affinities in the context of the sonnet cycle of 1807's box and seal)
● Harald Tausch (the invisible maze. To Park Design and Architecture in Goethe's Elective Affinities)
● **Helmut Huhn** (A >> << tragic novel? Considerations for a novel experiment), Birgit Sandkaulen (... >> << ... everywhere but one nature. Spinoza's ethics as the key to Goethe's Elective Affinities?)
● Jan Urbich (>> We are a sign, << meaningless. About the role of deconstructive writing term for Goethe's Elective Affinities)
● Reinhard Wegner (On the problem of social prejudice, and individual Denkstorungen in Goethe's Elective Affinities, A psychoanalytic study)
● Temilo van Zantwijk (they know what they are doing Literature, Ethics and Handlungstheore?), Olaf Freidbach (Elective Affinities: Try a science-historical perspectivation)
● Nicole Grochowina (By the intervention of a third party >> << - Gender relations in Goethe's Elective Affinities)
● Marko Kreutzmann (Goethe as a social critic. Symolisierung to social change in the Elective Affinities)
● Gerhard Muller (>> all really good geimeinsame MUB

● Gerhard Muller (>>Alles eigentlich geimeinsame Gute muB durchdas unumschrankte Majestatsrecht gefordert warden<< - Gesellschaftlicher Umbruch und Refompolitik als zeithistorischer Hintergrund des Romans *Die Wahlverwandtschaften*)
● Benigna Carolin Kasztner (Das Werk im Schmerz. Anmerkungen zum Motiv des Kopfschmerzes), Stefan Blechschmidt (>>… eine Repositur fur das Gegenwartige, ein Archiv fur das Vergangene<<. Wer schafft Ordnung in den *Wahlverwandtschaften*?)
● Michael Maurer (Verfehlte Geburtstage und verpatzte Feste. Xeitkultur in den *Wahlverwandtschaften*), Susan Baumert (Zeit und Zeitkultur in Goethes *Wahlverwandtschaften*)
● Jutta Heinz (>>Durch und durch materialistisch<< oder >> voll inner heiligen Lebens<<? Zur eitgennossischen Rezeption der *Wahlverwandtschaften*)
● Nikolas Immer (Goethes Erben. Wahlverwandtes bei Handke, Walser, Wellershoff)
● Elisabeth von Thadden (Das >>ungeheure Rechte<< der Gegenwart. Ubereilung, Mode und Verdrangung Gegenwart als Symptome eines verfehlten Zeitbewusstseins in Goethes *Wahlverwandtschaften*).

unrestrained role Majestatsrecht required bythe warden << - Social Change and reform policy as a time of historical background of the novel Elective Affinities)
● Benigna Carolin Kasztner (The work in pain. Remarks to the subject of the headache), Stefan Blechschmidt (>> ... a Repositur for the Gegenwartige, an archive for the past << creates. Who rules in Elective Affinities?)
● Michael Maurer (Missed birthdays and botched celebrations. Xeitkultur in Elective Affinities), Susan Baumert (time period and culture in Goethe's Elective Affinities)
● Jutta Heinz (>> through and through materialistic << or >> full << sacred inner life? To eitgennossischen Reception of the elective affinities)
● Nikolas Immer (Goethe's heirs. Choice akin to Handke, Walser, Wellershoff)
● Elisabeth von Thadden (<< >> The vast rights of the present. Ubereilung, fashion and displacement present as symptoms of a missed time-consciousness in Goethe's Elective Affinities)

In the above group, supposedly, Stefan Blechschmidt discussed *Elective Affinities* in terms of the "the contemporary revolution in chemistry". [3]

Huhn's 2010 *Goethe's Elective Affinities: Work and Research*, in which he, supposedly, digs into the scholarly research and work done on this great novella. [1]

Education

Huhn completed his BA in philosophy in the German literature and art history department of the University of Marburg in 1984, completing his MA in similar studies in 1989, and his PhD in philosophy 1995, the latter both at the Free University of Berlin. [4] In 2012, Huhn was associated with the Friedrich-Schiller University in Jena. [2]

See also

● Goethe timeline
● *Elective Affinities: Illustrated, Annotated, and Decoded*

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2. Helmut Hung (faculty) – Friedrich-Schiller University, Jena.
3. (a) Blechschmidt, Stefan. (2010). "A Repository for the Present, an Archive of the Past: Who creates Order in *Elective Affinities*?" ("…eine Repositure für das Gegenwärtige, ein Archiv für das Vergangene". Wer schafft Ordnung in den *Wahlverwandtschaften?*"), in: *Goethes Wahlverwandtschaften: Werk Und Forschung* (*Goethe's Elective Affinities: Work and Research*) (editor: Helmut Huhn) (pgs. 383-402). Walter de Gruyter.
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4. Helmut Huhn (faculty) (German → English) – University of Jena.

Further reading

● Huhn, Helmut, and Vigus, James. (2012). *Symbol and Intuition: Comparative Studies in Kantian and Romantic-Period Aesthetics* (abs). Legenda.

External links

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θΔics

In hmolscience, **Helmut Lethen** (1939-) is German philosophical anthropologist noted for his 1994 *Codes of Cold Conduct: Attempts at Life Between the Wars*, the original German title, or *Cool Conduct: the Culture of Distance in Weimar Germany*, the 2002 English translation title, where, in parlay on Arthur Schopenhauer's so-called "parable of the freezing porcupines", employs a realism-aiming thermal words soaked account to explain, via seeming cultural and emotional temperatures, and interpersonal distances (personal space) or social spaces or "adequate distance", as he terms it, the 1914 to 1945 social mechanisms of Germany, which gave rise to the very heated hot war (as opposed to cold war) period WWII.

Overview

In 1994, Lethen, in his *Cool Conduct: the Culture of Distance in Weimar Germany*, attempts to explain the history of German, between 1914 to 1945, via seeming a thermal word theory conceptualized type of social physics (or human thermodynamics); the following being a seeming abstract:

> "The book depicts the traumatic situation after the capitulation of 1918. The familiar horizons of the Wilhelmian empire are gone. After the loss of the authoritative system, people experience the immediate confrontation with modernity as a freezing shock. In counterreaction, the idea of a glowing community displaces the coldness of industrialized civil society."

(add discussion)

Parable of the freezing porcupines

In the 19th century, Arthur Schopenhauer introduced his famous "parable of the freezing porcupines", on the paradox between the uncomfortable or irritable hotness social closeness and coldness of social distance; the gist of which is as follows:

> "On a cold winter's day an assortment of porcupines needs to set an adequate distance among its members. Being too close, the risk mutual injury from their quills; being too far apart, they are bound to die of exposure. The porcupines, as Schopenhauer writes, are torn between closeness and distance until the settle on a moderate temperature at which they can tolerate their situation."

Shown adjacent, is Deborah Luepnitz's 1963 *Schopenhauer's Porcupines: Intimacy and Its Dilemmas*, illustrating, somewhat, Schopenhauer's parable. [2]

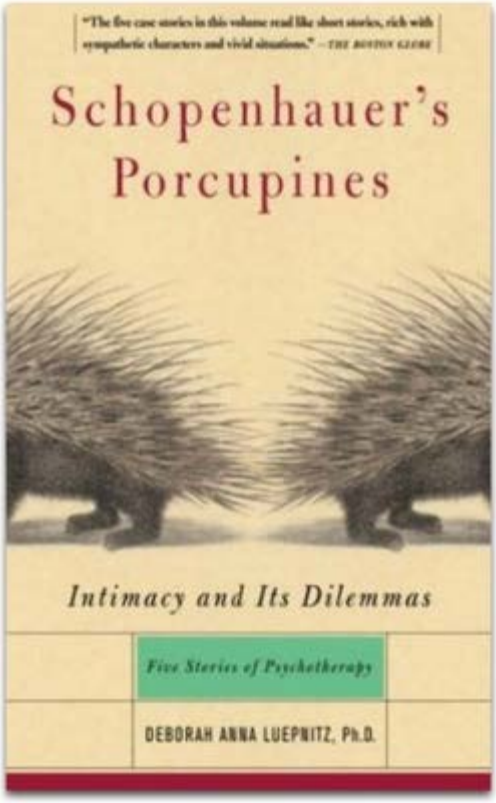

Deborah Luepnitz's 1963 *Schopenhauer's Porcupines*, illustrating Arthur Schopenhauer's "parable of the freezing porcupines", on the balance between social closeness (too warm), social distance (too cold), and social death (freezing). [2]

Electromagnetic force

Lethen was found via the keys: "social force", "electromagnetic force". In this direction, Lethen discusses the "electromagnetic force fields" theories of Ernst Junger, who supposedly uses an electric circuit model of social analysis, admixture with iron filing movement theory; the following being an example Junger quote:

> "The arrangement of atoms thus takes on the sort of nonambiguity that prevails in the electromagnetic force field."

Users in an administrative state, according to Junger, gets connected and integrated via current into an “energy association”, according to which the individual automatically becomes an “organic construction”.

Lethen also, supposedly, gives commentary on the “electromagnetic force field” metaphor, in social terms, ideas or discussions of Walter Benjamin, Bertolt Brecht, and Joseph Roth.

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External links

â— Helmut Lethen (German → English) – Wikipedia.

θΔics

In existographies, **Claude Helvetius** (1715-1771) (IQ:175|#237) (Cattell 1000:55) [FA:63] (CR:32) generally cited as “Helvetius”, was French philosopher, approved of by Jean Sales, a friend of Voltaire and Denis Diderot (Q), noted for his 1758 *On Mind*, which espoused atheistic, utilitarian, and egalitarian doctrines.

Overview

In 1758, Helvetius published his *Essay on the Mind*, which espoused atheistic, utilitarian, and egalitarian doctrines; the book was publicly burned at Paris. The book was materialistic in its conception of the universe and argued that a "nonreligious morality" is what really guided most people's virtues. [2]

In 1856, Henry Buckle, in his *History of Civilization*, chapter on the French revolution and the 18th century, summarized Helvetius as follows:

> “Of this tendency, we find an interesting instance in the celebrated work of Helvetius, unquestionably the ablest and most influential treatise on morals which France produced at this period. It was published in 1758; and, although it bears the title of an essay on ‘The Mind’, it does not contain a single passage from which we could infer that the mind, in the sense in which the word is commonly used, has any existence. Helvetius, at the beginning of his inquiry, assumes, as an incontestable fact, that the difference between man and other animals is the result of a difference in their external form; and that if, for example, our wrists, instead of ending with hands, and flexible fingers, had merely ended like a horse's foot, we should have always remained wanderers on the face of the earth, ignorant of every art, entirely defenseless, and having no other concern, but to avoid the attacks of wild-beasts, and find the needful supply of our daily food. That the structure of our bodies is the sole cause of our boasted superiority, becomes evident, when we consider that our thoughts are simply the product of two faculties, which we have in common with all other animals; namely, the faculty of receiving impressions from external objects, and the faculty of remembering those impressions after they are received.’
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 621-22)

> “These positions being laid down, it is easy to deduce all the essential principles of moral actions. For, memory being merely one of the organs of physical sensibility, and judgment being only a sensation, all notions of duty and of virtue must be tested by their relation to the senses; in other words, by the gross amount of physical enjoyment to which they give rise. This is the true basis of moral philosophy.”
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 622)

> “Helvétius examines the origin of those other feelings which regulate human actions. Thus, he says that both ambition and friendship are entirely the work of physical sensibility. Men yearn after fame, on account either of the pleasure which they expect the mere possession of it will give, or else as the means of subsequently procuring other pleasures.9* As to friendship, the only use of it is to increase our pleasures or mitigate our pains; and it is with this object that a man longs to hold communion with his friend.66 Beyond this, life has nothing to offer. To love what is good for the sake of the goodness, is as impossible as to love what is bad for the sake of the evil.87 The mother who weeps for the loss of her child, is solely actuated by selfishness; she mourns because a pleasure is taken from her, and because she sees a void difficult to fill up.63 So it is, that the loftiest virtues, as well as the meanest vices, are equally caused by the pleasure we find in the exercise of them.89 This is the great mover and originator of all. Every thing that we have, and every thing that we are, we owe to the external world; nor is Man himself aught else except what he is made by the objects which surround him.”
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 623)

(add)

Helvetius salon

See main: Paris salons

Claude Helvetius, together with his wife Anne Helvetius, ran an enlightenment salon, for over five decades, attended by a great number of intellectual figureheads, such as: Diderot, Condorcet, d'Holbach, Turgot, Buffon, Condillac, d'Alembert, Lavoisier, Cuvier, Thomas Jefferson, Benjamin Franklin, and Napoleon Bonaparte (Q); though, to note, Abigail Adams, wife of John Adams, was disgusted by her amorous behavior. (Q)

Other

In 1770, when the anonymous *The System of Nature* appeared, secretly written by Baron d'Holbach, it was initially attributed to Helvetius or Honore Mirabeau. [3]

Quotes | On

The following are notes of praise and tribute:

> "The failure of the reformation to capture France had left for the Frenchmen no half-way house between infallibility and infidelity; and while the intellect of Germany and England moved leisurely in the lines of religious evolution, the mind of France leaped from the hot faith which had massacred the Huguenots to cold hostility with which La Mettrie, **Helvetius**, Holbach, and Diderot turned upon the religion of the fathers."
>
> — Will Durant (1926), *The Story of Philosophy* [1]

Quotes | By

The following are related quotes:

> "By annihilating the desires, you annihilate the mind. Every man without passions has within him no principle of action, nor motive to act."
>
> — Helvetius (c.1770), *A Treatise on Man: His Intellectual Faculties and his Education* (Q)

> "To limit the press is to insult a nation; to prohibit reading of certain books is to declare the inhabitants to be either fools or slaves: such a prohibition ought to fill them with disdain."
>
> — Helvetius (c.1770), *A Treatise on Man: His Intellectual Faculties and his Education* (Q)

> "Truth is the torch that gleams through the fog without dispelling it."
>
> — Helvetius (c.1760)

> "Genius is nothing but continued attention."
>
> — Helvetius (c.1760)

See also

- Johannes Hevelius

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(b) Hsieh, Ching-Yao, and Ye, Meng-Hua. (1991). *Economics, Philosophy, and Physics* (pgs. 13-14). M.E. Sharpe.
2. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 347). HarperOne.
3. d'Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (attributed, pgs. iv-v). J.P. Mendum, 1889.

Further reading

- Helvetius. (date). *The True Meaning of the System of Nature*. Boston: J.P. Mendum, 1852.

External links

- Claude Adrien Helvetius – Wikipedia.

θΔics

In existographies, **Hemant Mehta** (1983) (FA:197) is an American math teacher turned atheism activist, noted for []

Overview

In Jan 2006, Mehta posted an auction for the sale of his "soul" on eBay, stating that he was an atheist, offering to go to the worship services of the winning bidder's choosing. On 3 Feb 2006, Jim Henderson, a former minister from Seattle, Washington, bought Mehta's soul for a final bid of $504. Henderson, now owning Mehta's soul, asked him to visit a variety of churches and to write about his experiences; Mehta did this and blogged, initially at Henderson's website OffTheMap.com, about his visits to nine churches, and talked about atheist conventions, and Christian media; in Apr 2007, the book *I Sold My Soul on eBay* resulted. [1]

In 2012, Mehta published *The Young Atheist's Survival Guide* (2012) (Q), which in 2014 was distributed (Q) alongside the Bible to students of Boon County, Kentucky.

In 2013, Mehta launched the YouTube channel "The Atheist's Voice" (Q), where he promotes "friendly atheism", which by 2014 had become a top ten atheism channel, according to views per sub rankings.

He also blogs about "friendly atheism" at Patheos.com.

Religion | Atheism

Mehta was raised Jain, but became an atheist as a teenager.

Quotes

The following are noted quotes:

> "Radical Muslims fly planes into buildings. Radical Christians kill abortion doctors. Radical atheists write books."
>
> — Hemant Mehta (c.2014), variant (Q) of Victor Stenger quote

References

1. (a) Mehta, Hemant. (2007). *I Sold My Soul on eBay: Viewing Faith through an Atheist's Eyes*. Random House.
(b) I Sold My Soul on eBay – Wikipedia.

External links

- Hemant Mehta – Wikipedia.
- Hemant Mehta – Twitter.

θΔics

In molecules, **hemoglobin**, molecular formula: $C_{2932}H_{4724}N_{828}O_{840}S_8Fe_4$, is an oxygen-transport metalloprotein, comprised of carbon, hydrogen, nitrogen, oxygen, sulfur, and iron, found in the red blood cells of all vertebrates; it was first analyzed in 1959. [1]

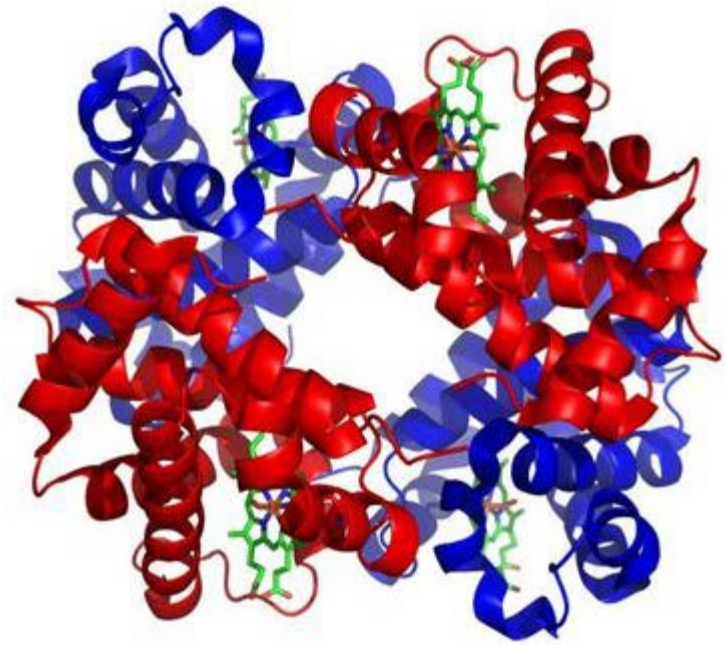

A 3D view of the structure of **hemoglobin**.

Hmolscience

In 1999, American religious philosopher-physicist Holmes Rolston, in the context of the life vs non-life debate, argued that "god as a countercurrent to entropy, a sort of biogravity that lures life upward" and went on to argue the following unbridgeable gap type of logic [reactions added]: [2]

> "The knowhow, so to speak, to make salt is already in the sodium and chlorine:
>
> $$Na + Cl \rightarrow NaCl$$
>
> but the knowhow to make **hemoglobin** molecules and lemurs is *not* secretly coded in the carbon, hydrogen, and nitrogen:
>
> $$2932C + 4724H + 828N + 840O + 8S + 4Fe \rightarrow C_{2932}H_{4724}N_{828}O_{840}S_8Fe_4$$
>
> Life is a countercurrent to entropy, an energetic fight uphill in a world that typically moves thermodynamically downhill (despite some negentropic eddies, and despite some irreversible thermodynamics). Thermodynamics need be nowhere violated, because there is a steady 'downhill' flow of energy, as energy is irradiated into earth from the sun, and, eventually, reradiated into space."

This, for course, is a stepping stone to the arrival of the defunct theory of life (2009), the life does not exist (2010), and life terminology upgrades (2011) views.

References

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2. Rolston, Holmes. (1999). *Genes, Genesis, and God: Values and Their Origins in Natural and Human History* (entropy, pgs. 42, 155, 351, 357-58, 364-65); biogravity and god, pg. 364; thermodynamics, pgs. 357, 385, 399). Cambridge University Press.

External links

â— Hemoglobin – Wikipedia.

θΔics

In thermodynamics, **Hendrick C. Van Ness** (1924-2008) was an American chemical engineer noted for his 1969 booklet *Understanding Thermodynamics* and his 2005, seventh edition, *Introduction to Chemical Engineering Thermodynamics*, the latter of which is said to be, in his own words, "the most widely used chemical engineering text of all time", surpassing its 50th year in print in 1999, thus making him one of the founders of modern chemical engineering thermodynamics. [1] Van Ness' expertise was in solution thermodynamics, the thermodynamics of solutions containing reactive species. [2]

Of note, the simplified 1969, 102-page, booklet *Understanding Thermodynamics*, by Van Ness, based on his 1968 lectures to sophomore engineering students at the Rensselaer Polytechnic Institute, during the spring term, is the highest ranking Amazon.com book on thermodynamics. [3] In 2001, Van Ness' *Introduction to Chemical Engineering Thermodynamics*, having been translated into four languages, had reached average yearly sales of 20,000 copies, with a total sales over all six editions exceeding a half-million, making it, according to Van Ness, "the best-selling textbook in the history of chemical engineering". [4] [5]

Two of his favorite co-authors (O) were Michael Abbott (1938-), also of RPI, in and Joe Smith (1916-2009), of UC Davis. [6] [7]

Education

Van Ness completed his BS in chemical engineering at the University of Rochester in 1944 and an MS there in 1946. He completed his PhD in engineering at Yale University in 1953. [8]

See also

- Most-cited thermodynamics publications

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(b) Staff Author. (2008). "Hendrick C. Van Ness" (Obituary), *TimesUnion.com*, Nov. 08.
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(b) Amazon sales rank: #29,554 on 11/27/08 (with 5-stars based on 9 reviews).
4. Van Ness, Hendrick C. (2001). "Evolution of a Textbook: Introduction to Chemical Engineering Thermodynamics", *Rensselaer Polytechnic Institute*.
5. Statement of President Shirley Ann Jackson on the Passing of Hendrick C. Van Ness Nov. 2008
6. Michael M. Abbott (1938 - 2006)
7. Obituary: Joe M. Smith, 93, Emeritus Professor of Chemical Engineering
8. Hendrick C. Van Ness (Biography) – RPI.edu.

Further reading

- Abbott, Michael and Van Ness, Hendrick. (1989). *Schaum's Outlines of Thermodynamics with Chemical Applications*. McGraw-Hill.

External links

- AIChE profile
- NY State Museum profile
- RPI special profile

θΔics

In existographies, **Hendrik Lorentz** (1853-1928) (IQ:180|#109) [RGM:1314|1,500+] (Odueny 100:84) was a Dutch physicist, a top ranked GPE, noted for []

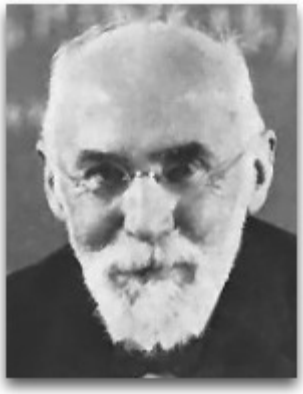

Relativity

In 1892, Lorentz postulated the phenomenon of a decrease in length measured by an observer of objects which are traveling at any non-zero velocity relative to the observer—also postulated independently by George FitzGerald (1889) — one example being that a ruler pointed toward the sun will be measurably longer than one pointed in the direction in which the earth is moving about the sun.

Map of Physics

In John Porter's Map of Physics, the river of electromagnetism flows from Hans Orsted to Lorentz.

-

Influenced

In 1954, Albert Einstein, a year before his death (dereaction), was asked by an interviewer who were the greatest thinkers that he had known. Einstein replied: 'Lorentz', adding 'I never met Willard Gibbs; perhaps, had I done so, I might have placed him beside Lorentz'. [1]

-

Education

In 1925, Lorentz, aged 22, completed his PhD in physics with a dissertation "On the Theory of Reflection and refraction of Light", wherein he refined the electromagnetic theory of James Maxwell.

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References

1. Pais, Abraham. (1982). *Subtle is the Lord* (pg. 73) (Ñº). Oxford University Press.

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External links

â— Hendrik Lorentz – Wikipedia.

θΔics

In hmolscience, **Henri Atlan** (1931-) is a French biophysicist, bioethicist, and philosopher, a Spinozan scholar, noted for his physics, chemistry, mechanism, reductionism, and historical approach philosophical problems in biology, such as his critique of the genetic paradigm—the *tout genetique*, or "everything is genetic" ideology—and to rethink more traditional and long-term problems of mechanism (since Rene Descartes), finalism (particularly in Immanuel Kant), and most-importantly vitalism (namely the question of reductionism of life to physics), the latter subject of which, such as found in his 1999 "Does Life Exist?", he devotes significant effort to "putting few more nails" in the coffin, as he says, of Albert Szent-Gyorgyi's 1940s "scandalous declaration" that life does not exist discussion. [1]

Overview

In 1999, Atlan, in his "Does Life Exist?", where he opens to the following: [2]

> "Already at the beginning of the twentieth century, Albert Szent-Gyorgyi, who discovered vitamin C, scandalously declared that life does not exist. Following upon this 'good news' announced by Szent-Gyorgyi, my entire approach consists in putting a few more nails in the coffin—and in recognizing, in effect that life does not exist as such, at least not as an object of scientific investigation, since its mechanisms can be entirely reduced to chemical interactions."

In 2002, Atlan, in his "Is Science Inhuman? An Essay on Free Necessity", elaborated further on the problems involved in speaking about "life" in an essential fashion, e.g. claiming that the genome contains the "essence of life", repeatedly quoted Szent-Gyorgyi's claim that "life as such does not exist", which he interprets to mean that: [3]

> "Life does not exist as an explicative notion of organic properties … life does not exist as an object of biological research."

Atlan also states:

> "When Szent-Gyorgyi made the somewhat abrupt declaration: "life as such does not exist", in all likelihood he was not doubting his daily experience. I do not think I betray him in thus clarifying his words: **life does not exist** as an explicative notion of organic properties. I other words, life does not exist as an object of biological research."

Meaning that, in the context of bioethics, as his collected works (2011) editors Stefanos Geroulanos and Todd Meyers summarize, "any thinking of the living cannot maintain its rigor if it postulates life as an essentialist notion" .

Education

In 1958, Atlan completed his MD in Paris, and in 1971 a PhD in science, at the University of Paris VII. (Ñº) He then worked at the University of California, Berkeley, on aging and mutation. Sometime, herein, Atlan, notably, studied under Aharon Katchalsky. Presently, he is professor emeritus of biophysics and director of the Human Biology Research Center of the Hadassah University Hospital, Jerusalem. Atlan is fluent in English, Hebrew, and French.

References

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2. Atlan, Henry. (1999). "Does Life Exist?", in: *Selected Writings on Self-Organization, Philosophy, Bioethics, and Judaism* (translator: John Duda) (§24:Does Life Exist?, pgs. 375-83; quote, pg. 376; "does not exist", 11+ pgs).

Fordham University Press, 2011.
3. Atlan, Henri. (2002). “Is Science Inhuman? An Essay on Free Necessity” (*La science est-elle inhumaine? Essai sur la libre necessite*), in: *Selected Writings on Self-Organization, Philosophy, Bioethics, and Judaism* (translator: Daniela Ginsburg) (§1:32-62; esp. 29, 36; “does not exist”, 11+ pgs). Fordham University Press, 2011.

External links

â— Henri Atlan – Wikipedia.

θΔics

In thermodynamics, **Henri Benard** (1874-1939) was a French physicist noted for his 1900 experimental work on the heat dynamics, or rather fluid mechanics, of “Benard cells”, which formed the basis of his 1901 PhD dissertation “Cellular Eddies in a Horizontal Liquid Layer”, at the College of France. Benard cells later became the classic example of Belgian chemist Ilya Prigogine's 1960s theory of "dissipative structures".

External links

- Henri Benard – Wikipedia.

θΔics

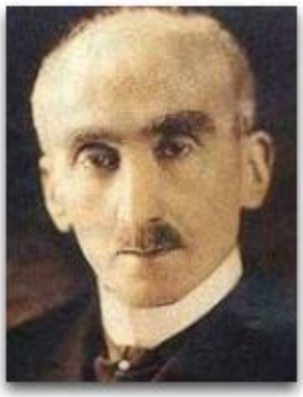

In existographies, **Henri Bergson** (1858-1941) (IQ:160|#608) (Gottlieb 1000:890) (Becker 139:72) (Stokes 100:57) (Perry 80:46) (CR:67) was a French evolution theory philosopher, noted for his 1907 *Creative Evolution*, in which he attempts to intermix thermodynamic principles, with the term "creation" or "creative", as a patch solution to the incompatibilities between Darwin, Carnot, and theism; his model is sometimes referred (Ñº) to as "Bergsonian philosophy".

Overview

In 1889, Bergson, in his *Time and Free Will*, written during the years 1883 to 1887, according to Gilbert Lewis, split the time-concept into two distinct ideas. [8]

In 1907, Bergson, in his *Creative Evolution*, stated the following:

> "The truth is that life is possible wherever energy descends the incline indicated by Carnot's law and where a cause of inverse direction can retard the descent—that is to say, probably, in all the worlds suspended from all the stars."

In 1911, William James, orchestrated the first the first English translation, done by Arthur Mitchell; James had previously begun expressing admiration in his 1909 lecture series *A Pluralistic Universe*. [7]

In 1927, Bergson was awarded the Nobel Prize in Literature for his *Creative Evolution*. [1]

In 1944, Irwin Edman, an American philosopher, in a reprint edition of *Creative Evolution*, summarized things as follows: [6]

> "Bergson was a philosopher who seemed to have found critical circumvention of mechanistic science and a new and poetic support for belief in god, in free will, and even, though in somewhat Pickwickian sense, in immortality."

Bergson sees a view of history as a stage where both human creativity and evolution do not always prevail. Evolution, in particular, is not seen by Bergson as an unqualified success, in that everywhere there are "arrests", "setbacks", "turnings aside". These failures, according to American philosopher and Bergson historian Pete Gunter, are seen by Bergson as being due to "the omnipresence of entropy: a measure of the loss of potential energy wherever actual energy is expended." When this loss is universalized, according to Gunter, it represents, to Bergson, the resulting effect of the second law of thermodynamics.

Elan vital

Subsequently, to rectify the contrast between the perpetual breaking down of matter and the continual building up of life as seen in the process of evolution, Bergson postulates a life force or *élan vital* often translated as "vital impetus", which supposedly pushes evolution to higher levels of dynamic form, prevailing over what is considered as "entropy's constant undertow". [2] In commentary on this theory, British biologist Julian Huxley remarked that Bergson's *élan vital* is no better an explanation of life than is explaining the operation of a railway engine by its *élan locomotif* ("locomotive driving force") or specifically: [4]

> "To say that biological progress is explained by the *élan vital* is to say that the movement of the train is 'explained' by an *élan locomotif* of the engine."

In the correct sense, the thermodynamic "driving force" of both the train and the biological process is the Gibbs free

energy of the respective chemical reactions, specifically the workable energy released due to the affinities of the reactants; biological species in the evolution sense and hydrocarbons and oxygen species in the combustions sense. [5]

Bergson's evolution thermodynamics

In his writings, Bergson outlined a loose theme of evolution thermodynamics. Bergson, however, seemed to have only a superficial knowledge of thermodynamics, but does mention Carnot, Clausius, and Boltzmann. He only uses the word "entropy" once. [6] He subtly seems to intermix thermodynamic terminology without explicit mention. In reference to the Clausius' topic "irreversibility" and Gibbs' theory of "state", for instance, Bergson elaborates on the view that "our personality, which is being built up each instant with its accumulated experience, changes without ceasing … by changing, it prevents any *state*, although superficially identical with another, form ever repeating it in its very depth: that is why our duration is *irreversible*. We could not live over again a single moment, for we should have to begin by effacing the memory of all that had followed." [6]

Influences

Bergson was influenced by: Herbert Spencer and Aristotle.

Influenced

Bergson was influential to: Jan Smuts, Pierre Teilhard, and Ilya Prigogine, the latter two developing their own thermodynamic-based theories of evolution.

The result of this effort was said to have "inspired" Ilya Prigogine to reconsider the foundations of thermodynamics, work for which he later won the 1977 Nobel Prize in chemistry. [2] In his Nobel lecture, Prigogine recalled: "Since my adolescence, I have read many philosophical texts. I still remember the spell *L'Évolution Créatrice* cast on me. More specifically, I felt that some essential message was embedded, still to be made explicit, in Bergson's remark: 'the more deeply we study the nature of time, the better we understand that duration means invention, creation of forms, continuous elaboration of absolutely new.'" [3] For Pierre Teilhard, *Creative Evolution* and its *élan vital* or vital impetus was the "catalyst of a fire which devoured already its heart and its spirit."

Education

Early in his youth, Bergson was a disciple of Herbert Spencer, but soon felt that there was something inadequate or artificial about the sterility of scientific laws. [6] Bergson completed his undergraduate work in philosophy in 1881 (age 22) at the Ecole Normale Superieure and his PhD in philosophy at the University of Paris in 1889 (age 30) for a dissertation on *Time and Free Will* along with a short thesis on Aristotle. Thereafter he worked as a professor of philosophy.

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External links

â— Henri Bergson – Wikipedia.

θΔics

In existographies, **Jules Henri Poincare** (1854-1912) (IQ:180|#180) [RGM:476|1,500+] [LPKE:12] (GME:9) (GPE:63) [CR:76] was a French mathematical physicist noted his 1900 article "On the Three-body Problem and the Equations of Dynamics", in which the recurrence theorem was established, a theorem used by German mathematician Ernst Zermelo in 1894 to seed a debate, involving those such as German physicist Max Planck and Austrian physicist Ludwig Boltzmann, on the likeliness of mechanical derivation of the second law of thermodynamics. [1]

Overview

Poincaré's 1892 *Thermodynamics* textbook represents the outlines of first semester lessons for college physics students. In his 1903 book *Science and Hypothesis*, chapter "Energy and Thermo-dynamics", he discusses the compatibilities of the classical dynamics, such as the Hamilton's principle, with the emerging first and second principles of thermodynamics, Poincaré asks: [3]

> "Will the two principles of Mayer and Clausius assure to it foundations solid enough to last for some time?"

In the Brussels school of thermodynamics, Poincaré's work had an influence on Belgian thermodynamicist Théophile de Donder, between 1911 and 1914.

Irreversibility debate

> *See main: Irreversibility*

In short, Poincaré 1900 article on the three body problem argued that three particles in a system can at various times reverse to their original starting positions. This logic, in turn, directly conflicted with German physicist Rudolf Clausius' 1854 argument that in all real processes such a transformation would "not be reversible", in that the forward and return forces involved would not compensate each other exactly. [4]

This tension sparked a string of follow-up articles: "Mechanism and Experience" (Poincaré, 1893), "On a Theorem of Dynamics and the Mechanical Theory of Heat" (Zermelo, 1894), "Reply to Zermelo's Remarks on the Theory of Heat" (Boltzmann, 1896), "On the Mechanical explanation of Irreversible Processes" (Zermelo, 1896), and "On Zermelo's Paper: 'On the Mechanical Explanation of Irreversible Processes" (Boltzmann, 1897). [5]

Poincare is said to have concluded, according to physical economics historian Philip Mirowski, that classical thermodynamics and Hamiltonian dynamics were incompatible, because no function of coordinates and momenta could have the properties of the Boltzmann entropy function. [6]

Economics

In circa 1905, Poincare wrote the following in a letter to Leon Walras: [7]

> "Can satisfaction be measured? I may say that one satisfaction is greater than another, because I prefer one to the other; but I cannot say that one is two or three times greater than another … Satisfaction then is a magnitude, but not a measureable magnitude. Now is a magnitude that is not measureable therefore not amenable to mathematical theory? By no means. Temperature, for instance (at any rate before the term 'absolute temperature' had acquired a signification with the rise of thermodynamics), was a non-measureable magnitude. It was arbitrarily defined and measured by the expansion of mercury. It might quite as legitimately have been defined by the expansion of any other substance and measured by any function of that expansion, *provided that it was a continually increasing function*. Likewise, in the present case, provided that the function continually increases along with the satisfaction which it represents."

(add discussion)

IQ | Mislabel

See main: Mislabeled geniuses and IQ tests

Poincare, as commonly cited among IQ and genius discussions, so poorly on the Binet IQ, to note, that he was judged an imbecile (IQ=35). [8]

Hauriou

Poincaré's 1892 *Thermodynamics* textbook served as a basis for French lawyer-philosopher Maurice Hauriou's 1899 human thermodynamics book *Lessons on Social Movement*. [2]

Education

Poincaré graduated from the École Polytechnique in circa 1876, then studied mathematics and engineering at the École des Mines, graduating with a degree in ordinary engineering in 1879, and completed his PhD in science with a dissertation "On the Properties of Functions defined by Differential Equations", under the supervision of French mathematician Charles Hermite, at the University of Paris, finishing in circa 1879. He then lectured at Caan University for a term before becoming a professor at the University of Paris, in 1881, where he remained for the rest of his career, holding chairs in mechanics, mathematical physics, probability, celestial mechanics, and astronomy.

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External links

â— Henri Poincaré – Wikipedia.

θΔics

In human physics, **Henri Saint-Simon** (1760-1825) (IQ:165|#387) (CR:14) was a French sociologist noted for his seven-year interaction and synergy with Auguste Comte during the formulation of Comte's version (or possibly their version) of social physics. [1]

The interaction occurred sometime between 1817, when Saint-Simon gave Comte a position of secretary (at the École Polytechnique?), and the latter years of Saint-Simon's existence, when he began to dissociate himself from Comte.

English sociologist Alan Swingewood claims that Saint-Simon coined the terms "social physiology" and "social physics". [2]

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External links

â— Henri de Saint-Simon – Wikipedia.

θΔics

In existographies, **Henry Brooks Adams** (1838-1918) (IQ:195|#23) (RGM:1174|1,500+) (GHE:1) (LR:4) (SN:2) (RE:80) [CR:568], not to be confused with Brooks Adams, his older brother, was an American historian and physical humanities pioneer noted, in hmolscience, for his physico-chemical social dynamics (1908) theory of history, a five-decade plus long effort, to apply and utilize the physical sciences, particularly chemistry, physics, and thermodynamics, employing anchor concepts such as the second law, the kinetic theory of gases, Gibbs phase rule (see: social phase), Maxwell's demon, nebular hypothesis, heat death, social gravity, social acceleration theory, etc., in the study of humans, politically, historically, and philosophically, which he viewed as human molecules (or "phases" or equilibrium states, depending), and countries, via the historical rise and fall change perspective.

Ostwald

Adams, according to Eric Zencey (2013), read the physical energetics and or social energetics work of German physical chemist Wilhelm Ostwald. [26]

Adams, in his 18 May 1910 letter to American academic Barrett Wendell, after discussion the reasonings behind his *Letter to Teachers*, commenting how it was meant simply to “teach teachers how to teach”, how “Schopenhauer prophecied it nearly a hundred years ago”, etc., commented that:

> “Nothing is to be gained by preaching this lesson as a form of energy. It would act as a dissipator of energy. Therefore I have taught it, or tried teaching it, only to the few men who could profit by it to economise their scholar’s energies,—to save them from wasting it on past processes. Economy is all I can see now, as true scientific object for education to pursue. Certain branches of education may soon be lopped off, to advantage.”

then, at the end of which, Adams, citing Ostwald’s *L’Energie* (1910), states that “Ostwald talks of the possible new catalytic action of some new mind”; though, to note, he seem dismissive of this assertion.

Collected works

Adams penned out the equivalent of a 12-volume plus collected works set. Adams was also a prodigious letter writer, his correspondence runs to six thick published volumes. (Q)

Siblings | Family

See main: Adams family

Henry Adams was born fourth of seven siblings to American historical editor, politician and diplomat Charles Francis Adams, Sr. (1807-1886) (Q) — himself son of 6th American President John Quincy Adams and grandson of 2nd President John Adams (1735-1826) — and Abigail Brown Brooks (1808-1889) (Q) — herself daughter of Boston insurance company millionaire Peter Chardon Brooks (1767-1849) (Q); the seven offspring produced therefrom listed as follows:

1. Louisa Catherine Adams (1831-1870)
2. John Quincy Adams II (1833-1894)
3. **Charles** Francis **Adams, Jr.** (1835-1915)
4. **Henry** Brooks **Adams** (1838-1918)
5. Arthur Adams (1841–1846)
6. Mary Gardiner Adams (1845-1928)
7. Peter Chardon **Brooks Adams** (1848-1927)

In 1866, Henry Adams began to write articles for the *North American Review*, to which his older brother Charles objected, that his younger brother was trespassing on his territory, saying: “damn you, you are treading on my toes”. This initiated a frictional fire between the, Henry ripping on Charles writing style as “nervous” and “intolerable”, Charles eventually withdrawing from battle; a wedge remaining between them, which remained up until 1912, only after Henry had entered into his 1908 to 1912 stroke period decline, amid which “parity ceased to feel either so fragile or so important to him”, as biographer Joanne Jacobson (1992) surmised. In any event, the downward driving force of the wedge, in the 1860s, worked to switch Henry Adams from writing to his older brother Charles to his new English intellectual comrade Charles Gaskell. [33]

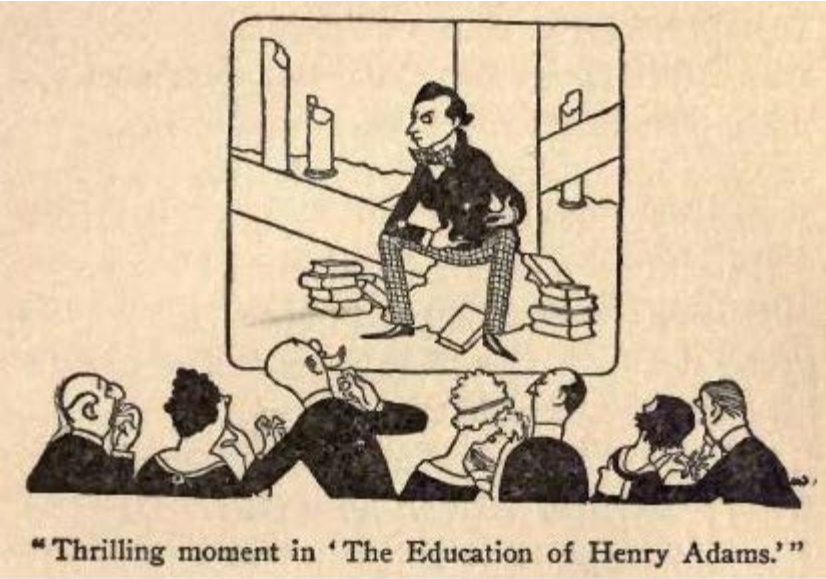

A 1921 cartoon reel (Q) of Adams’ Education.

Henry Adams, to summarized, was the great grandson of the second American president John Adams, grandson of the sixth American president John Quincy Adams; his maternal grandfather was a millionaire, possessor of the largest estate in Boston at the time, and another great grandfather, Nathaniel Gorham, signed the Constitution.

Early views

On 19 Mar 1861, US president Abraham Lincoln appointed Henry Adams' father Charles Francis Adams, Sr. (1807-1886) (Q) to be US Ambassador to the United Kingdom, and Henry Adams accompanied him in his private secretary role.

In 1863, Adams, age 25, writing to Charles Gaskell, seems to have begun searching for a universal theory of existence, applicable, in a one nature manner, atoms to humans: [20]

> “Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday within this law. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward.”

This quote is discussed by American comparative literature scholar Matthew Taylor, noted for doing his 2008 PhD dissertation, in part, in Adams’ physics-based theory of human existence. Adams would spend the next 50 years on this subject, becoming one of the first dual pioneers, following Goethe, of human chemistry (see: HC pioneers) and human thermodynamics (see: HT pioneers).

In 1868, Henry Adams returned to the United States and settled in Washington, D.C., where he worked as a journalist exposing political corruption. From 1870 to 1877 he served as Professor of Medieval History at Harvard, then returned to Washington to continue work as a historian. (Q)

Human molecules

In 1873, Adams read French philosopher Hippolyte Taine's 1869 theory, as found in his *On Intelligence*, that individual people are "human molecules" and that the job of the historian is to study and follow the transformations of individual

human molecules and groups of human molecules. In the decade to follow, Adams seems to have begun to adopt this logic and began to apply chemistry to this approach of history. In respect to Adams' use of the human molecular theory, American biographer Ernest Samuels notes that Adams seems to have adopted the idea that the historian should consider humans as molecules and consider human motives and history to be subject to the same laws as other physical bodies in the universe from the views of French philosopher Hippolyte Taine as found in his 1869 book *On Intelligence* in which states in which he prefaces the view that: "The historian notes and follows the general transformations presented by a certain human molecule, or a certain peculiar group of *human molecules*; and, to explain these transformations, he writes the psychology of the molecule or its group." Taine's suggestion to other historians, in short, is that one should study and follow the transformations of human molecules and to write history as the psychology of human molecules.

Adams came across this viewpoint in 1873 while working as an editor for the *North American Review*, when he accepted the article "Taine's Philosophy" by James Bixby for publication, which summarized the views presented in Taine's new book *On Intelligence*. [9] Adams had begun to make mention of Taine in his 1880 novel *Democracy, an American Novel*. [11]

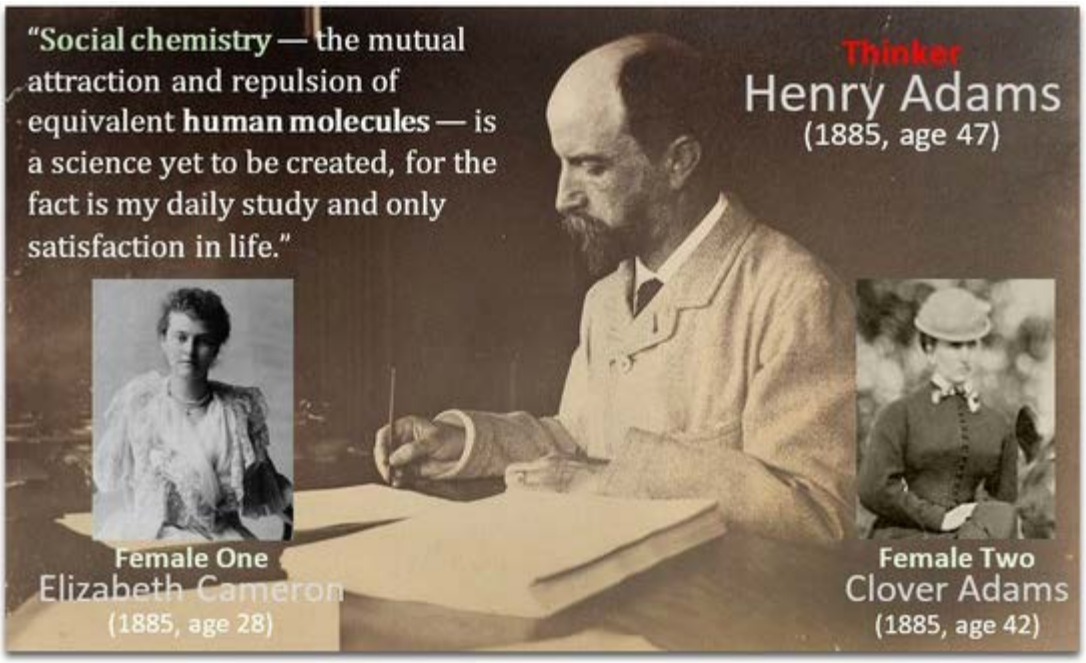

A depiction of the so-called "Henry Adams love triangle", in 1885, wherein, seemingly, the introduction of molecule B (Elizabeth Cameron), into the reaction system of Henry Adams, seems to have worked to precipitate the dissolution or detachment of molecule A (Clover Adams) from the AC marriage bond (Henry-Clover relationship), via the action of suicide, on 6 Dec 1885. [13]

Adams | Love triangle

On 27 Jun 1872, American physical science historian Henry Adams (SN:2) married Marian Hooper otherwise known as Clover Adams.

In Jan 1881, Henry Adams met the 24-year-old Elizabeth Cameron, for the first time, in the drawing room of the house of John Hay can Clara Hay. On 19 May 1883, when Cameron and her husband departed for Europe, Adams initiated a correspondence with Cameron, expressing unhappiness with her departure and his longing for her return.

On 7 Dec 1884, *exactly* one year before the suicide of Clover Adams, Henry Adams wrote to Cameron:

> "I shall dedicate my next poem to you. I shall have you carved over the arch of my stone doorway. I shall publish your volume of extracts with your portrait on the title page. None of these methods can fully express the extent to which I am yours."

On 12 Apr 1885, Adams, while on an extended work stay-over in Washington, wrote Clover the following:

> "Social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life."

It would seem, here, to be the case, speculatively speaking, that the three human molecules Adams had in mind in this statement, subsequently, would have been himself, his side love affair (or interest) Elizabeth Cameron, and his wife

Clover Adams.

On 13 Apr 1885, Clover's father died, and this was said to have initiated a period of mourning which evolved into mental depression from which she did not recover.

On 4 Dec 1885, two days before her suicide by cyanide (Dec 6), Clover Adams, visited Elizabeth Cameron, who was then three-months pregnant.

On 6 Dec 1885, Clover died by suicide via swallowing potassium cyanide.

Platitudinous atoms | Human molecules

The influence of Taine on Adams is clearly seen in the 12 April 1885 letter to his wife, written while at extended stay at work in Washington, in which Adams, in full, declares: [10]

> "I am not prepared to deny or assert any proposition which concerns myself; but certainly this solitary struggle with platitudinous atoms, called men and women by courtesy, leads me to wish for my wife again. How did I ever hit on the only woman in the world who fits my cravings and never sounds hollow anywhere? Social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life."

In this passage Adams foreshadows the science of human chemistry, or social chemistry as he calls it, defining it as the study of the "mutual attraction of equivalent human molecules", noting that it is a science yet to be created. He also refers to men and women as "platitudinous atoms", in the human atom sense.

This is similar to Adams earlier letter to his brother Brooks wherein he commented that "an atom is a man and Maxwell's demon who runs the second law ought to be made president." [14]

History of the United States of American

In 1889 to 1891, Adams published his nine volume *History of the United States of America*, supposedly, for no other reason than to prove to his own satisfaction that causality exists in the course of history:

> "Historians undertake to arrange sequences,—called stories, or histories,—assuming in silence a relation of cause and effect. These

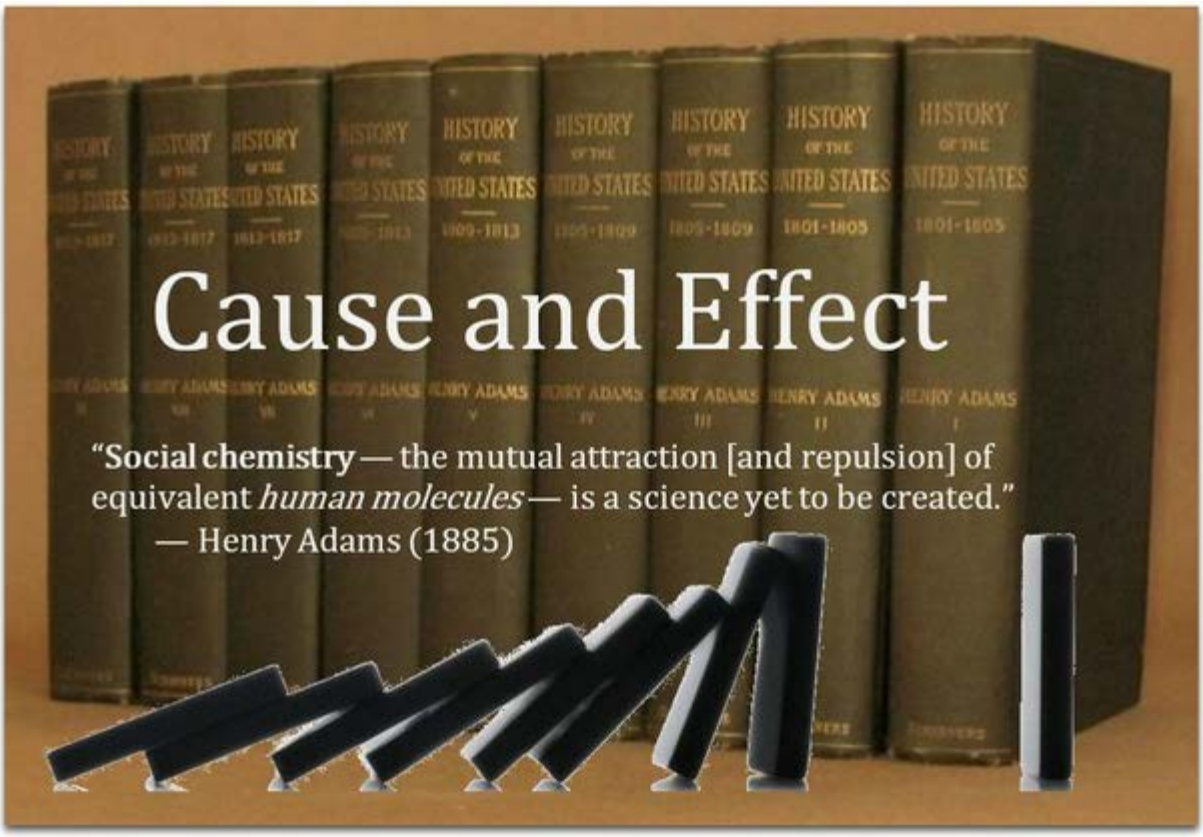

Adams nine-volume *History of the United States of America*, covering the years during the Jefferson Administration, 1801 to 1817, written with the sole intention of capturing a single rigorously-detailed moment of

causality in the course of human history. Set shown is the nine-volume series published in 1889 to 1891 by Charles Scribner's Sons. (O)

> assumptions, hidden in the depths of dusty libraries, have been astounding, but commonly unconscious and childlike; so much so, that if any captious critic were to drag them to light, historians would probably reply, with one voice, that they had never supposed themselves required to know what they were talking about. Adams, for one, had toiled in vain to find out what he meant.
>
> He had even published a **dozen volumes** of American history for no other purpose than to satisfy himself whether, by severest process of stating, with the least possible comment, such facts as seemed sure, in such order as seemed rigorously consequent, he could fix for a familiar moment a necessary sequence of human movement. The result had satisfied him as little as at Harvard College.
>
> Where he saw sequence, other men saw something quite different, and no one saw the same unit of measure. He cared little about his experiments and less about his statesmen, who seemed to him quite as ignorant as himself and, as a rule, no more honest; but he insisted on a relation of sequence, and if he could not reach it by one method, he would try as many methods as science knew. Satisfied that the sequence of men led to nothing and that the sequence of their society could lead no further, while the mere sequence of time was artificial, and the sequence of thought was chaos, he turned at last to the sequence of force; and thus it happened that, after ten years' pursuit, he found himself lying in the Gallery of Machines at the Great Exposition of 1900, his historical neck broken by the sudden irruption of forces totally new."
>
> — Henry Adams (1900), *The Education of Henry Adams* (§25: The Dynamo and the Virgin)

In 1921, historian William Thayer, in his *Annual Report of the American Historical Association*, comments on Adams' history thermodynamics theory by stating that: [7]

> "In reading Henry Adams' astonishing tract, I can not help suspecting at times that he is making fun of us historians; for he proposes, as I think you would agree with me, something which is not only impossible for anyone to carry out but which he himself never even attempted to carry out. In all the nine volumes of his *American History*, is there a hint of the second law of thermodynamics? Can you discover the slightest trace of a common formula for history and physical chemistry?"

Thayer gives his opinion that it would be an "impossible" task for someone to find a common formula for history and physical chemistry. Interesting comment indeed. Thayer is way off, however, in his assertion that Adams "never even attempted to carry out" his proposal; whereas correctly Adams spent 50-years on this problem (1873-1918).

In 1945, Morris Zucker, in vicarious answer to Thayer's where in "in all nine volumes" query, cites the final section of the ninth volume, pages 242-42, as being "where" Adams discussed the second law as he viewed it. [24]

Human thermodynamics

In 1894, Adams was elected president of the American Historical Association. His address, entitled "The Tendency of History," was delivered in absentia. The essay predicted the development of a scientific approach to history, but was somewhat ambiguous as to what this achievement might mean.

In 1895, Henry's younger brother Lawyer-Historian Brooks Adams published his *The Law of Civilization and Decay*, in which he applied the Helmholtz-version of the first law, i.e. that energy or force is conserved, Kelvin-version of the second law, i.e. that there is a universal tendency to the dissipation of energy, along with a theory of social contractions and dispersions, to develop a energetic theory or model of history, in reference, particularly, to its civilization rises and falls.

In 1896, Henry Adams published the 173-page book *The Tendency of History*, which positioned history in the context of thermodynamics; the title, supposedly culling its theme from Scottish physicist William Thomson's 1852 paper "On a Universal Tendency to the Dissipation of Mechanical Energy". [8]

In 1900, Adams was said to have been "mystified" by the connection made in the operation of the dynamo and the electricity it generated as exhibited at the great Hall of Dynamos. [19]

In 1910, in his *Letter to American Teachers of History*, Adams' was one of the first to use the term "human molecule" and to use it in a functional sense. One of Adams central goals was to find rules to understand history through the sciences.

In Adams discussions, lectures, and publications, beginning in 1895, on the apparent incompatibilities between the first two laws of thermodynamics, i.e. the *law of conservation*, "that nothing could be added, and nothing lost, in the sum of energy," and the *law of dissipation*, "that nothing could be added, but that intensity must be always lost," and the *law of evolution*, "that vital energy could be added, and raised indefinitely in potential, without the smallest apparent compensation." [1] In other words, Adams seemed to capture the popular view during these years existent between the logic of William Thomson, as found his 1852 paper "On a Universal Tendency in Nature to the Dissipation of Mechanical Energy", which said that natural systems tended to degrade, and the logic of Charles Darwin, in his 1859 *Origin of Species*, which said that natural systems tended to evolve; an apparent conflict for many, especially in areas such as astrology, geology, biology, botany and most notably for the study of human history.

Education

Adams graduated from Harvard University in 1858. In the years to follow, he toured Europe, during which time he attended lectures in civil law at the University of Berlin. In 1868, Henry Adams returned to the United States and settled down in Washington, D.C., where he started working as a journalist. Adams saw himself as a traditionalist longing for the democratic ideal of the 17th and 18th centuries. Accordingly, he was keen on exposing political corruption in his journalistic pieces. In 1870, Adams was appointed Professor of Medieval History at Harvard, a position he held until his early retirement in 1877 at 39. As an academic historian, Adams is considered to have been the first (in 1874–1876) to conduct historical seminar work in the United States. One of the high moments in Adams' life was his visit to the great Exposition which opened in Paris on April 15th, 1900. In the *Galerie des machines*, huge equipment was exhibited, such as dynamos and steam engines: power-generating machines. [6]

Adams' 1858 Harvard graduation photo.

Self-education

At some point in his career, Adams engaged in a path of self-education for lack of what the modern educational system could not teach him, and much of this was personal research in the physical sciences. This is evidenced in his 1909 letter to English lawyer Charles Gaskell, wherein Adams commented: [12]

> "I have been studying science for ten years past, with keen interest, noting down my phrases of mind each year; and every new scientific method I try, shortens my view of the future. The last—thermodynamics—fetches me out on sea-level within ten years. I'm sorry Lord Kelvin is dead. I would travel a few thousand-million miles to discuss with him the thermodynamics of socialistic society. His law is awful in its rigidity and intensity of result."

This comment comes a year before Adams great work *A Letter to American Teachers of History*, in which he attempts to outline how thermodynamics, particularly the second law, applies to the historical subject of studying people considered as human molecules.

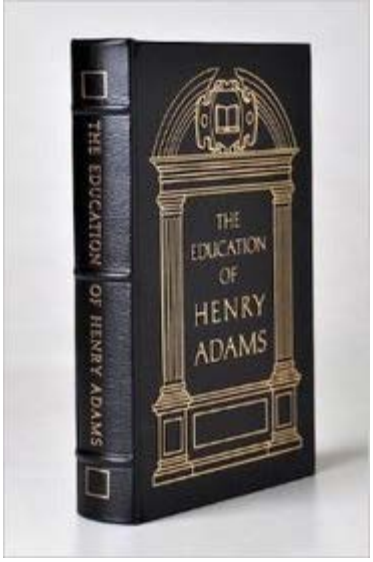

Left: a circa 1860s/70s photo of Adams. **Right:** a leather-bound edition of Adams' 1907 *The Education of Henry Adams*, his most-famous book.

The Education of Henry Adams

Adams' published his personal thoughts on the matter of his road of self-education in his 1907 *The Education of Henry Adams*, an introspective extended meditation on the social, technological, political, and intellectual changes that occurred over his lifetime, wherein he concluded that his traditional education failed to help him come to terms with these rapid changes; hence his need for self-education. [18] The organizing thread of the book is how the "proper" schooling and other aspects of his youth, was time wasted; thus his search for self-education through experiences, friendships, and reading.

The book contains end chapters on "A Dynamic Theory of History" (1904) and "A Law of Acceleration" (1904), in the latter of which Adams expounds on what he calls the "dynamic theory" in which human minds act like a system of attracting forces that seek equilibriums, but are constantly induced to accelerate its system motion to establish new equilibriums. [16]

Chapter 31 "The Grammar of Science (1903)" is based on Adams' reading of English polymath Karl Pearson's *The Grammar of Science*.

Adams' *Education* was at first self-published at his own expense, at first circulated among his connected friends, the first copies of which were printed in late 1906 and into 1907, of which an initial forty friends received copies, including: Henry James, senator Henry Cabot Lodge (president of the Massachusetts Historical Society), and Theodore Roosevelt, for comment and correction. Others soon wished for copies and Adams had an additional sixty copies printed and bound. In 1916, Adams explicitly authorized a posthumous edition, of the corrected 1907 edition, in a letter to Lodge, in whom he vested the copyrights, along with a number of specific instructions, namely that Lodge should falsely (or secretly) append his name to the "Preface" that Adams had included and that no illustrations should be included; the book was then commercially published after his death in 1918.

Adams' *Education* won the 1919 Pulitzer Prize; the 1998 Modern Library/New York Times listing of the #1 English language non-fiction book of the 20th century (or #51 according to 200,000 votes of reader's choice); again listed as the best book of the 20th century by *Intercollegiate Review* in Fall 1999. [17]

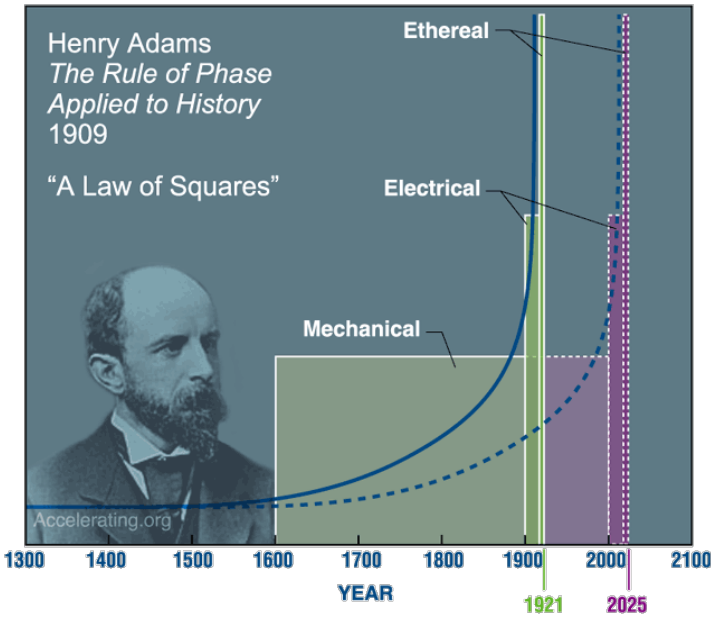

A reconstruction of Adams' phase rule of history conception.

Human history and thermodynamics

In 1909, Adams wrote "The Rule of Phase Applied to History," in which he reformulated a theory of scientific history, based on an analogy to American engineer Willard Gibbs's "Rule of Phase" (phase rule) from his 1876 "On the Equilibrium of Heterogeneous Substances." [5]

In a connected area, in his manuscript *The Rule of Phase Applied to History*, Adams attempted to use Maxwell's demon, as an historical metaphor, though he seems to have misunderstood and misapplied the principle. [2] Adams interpreted history as a process moving towards "equilibrium", but he saw militaristic nations (he felt German pre-eminent in this class) as tending to reverse this process, a "Maxwell's demon of history". Adams made many attempts to

respond to the criticism of his formulation from his scientific colleagues, but the work remained incomplete at Adams' death in 1918. It was only published posthumously themed or titled on the idea of "degradation". [3]

Bumstead

When Adams sought review with his manuscript “The Rule of Phase Applied to History” or in his own words “annihilation by a competent hand” he was said to have encountered a cold silence. After months of searching he complained to his brother Brooks that he had yet to discover a physicist “who can be trusted to tell me whether my technical terms are all wrong”. James F. Jameson, editor of the *American Historical Review*, eventually helped Adams find a “critic, a scientific, physic-chemical proof-reader”, who turned out to be American physicist Henry Bumstead, a former student of Gibbs, who wrote a twenty-seven page commentary; the revised version of which appeared only posthumously, specifically in the 1919 Brooks Adams edition of Henry Adams “philosophical writings” in the *Degradation of the Democratic Dogma*. [21]

A Letter to American Teachers of History

See main: A Letter to American Teachers of History

In 1910, at the age of seventy-two, Adams printed and distributed to university libraries and history professors the small volume *A Letter to American Teachers of History* proposing a "theory of history" based on the second law of thermodynamics, which seemingly had reign over all branches of science except, apparently, human history. In a way, this was a precursor to Arthur Eddington’s 1928 conception of the entropy “arrow of time” in history. [4] In short, he argued that the physics of dynamical systems of Rudolf Clausius, Hermann von Helmholtz, and William Thomson should be applied to the modeling of human history.

Religion

Adams seems to have been reticent in respect to professing any religious belief; if anything, he sees to have been on the concealed irreligious side; a few examples:

> “The idea that any personal deity could find pleasure or profit in torturing a poor woman, by accident, with a fiendish cruelty known to man only in perverted and insane temperaments, could not be held for a moment. For pure blasphemy, it made pure atheism a comfort.”
>
> — Henry Adams (1907), *The Education of Henry Adams* [34]

> “Unbroken Evolution under uniform conditions pleased every one -- except curates and bishops; it was the very best substitute for religion; a safe, conservative practical, thoroughly Common-Law deity”
>
> — Henry Adams (1907), *The Education of Henry Adams* (Q)

> “The philosopher says--I am, and the church scouts his philosophy. She answers:--No! you are NOT, you have no existence of your own. You were and are and ever will be only a part of the supreme I AM, of which the church is the emblem.”
>
> — Henry Adams (1884), *Esther* (Q)

(add)

Reaction end | 1908-1918

In July 1908, at the age (reaction extent) of 70, Adams suffered from an incident of mental paralysis, which on

15 Sep he explained in a letter to Elizabeth Cameron, as follows: [30]

> "I have already told you that I got my first warning. With me, as with many other fools and some geniuses, the weak spot is what is known as Brocas convolution of the brain, which contains the shelves of memory. Suddenly or slowly the shelves close and can't be opened. Mine have been closing normally and slowly, but one day in July I happened to go into Audrain's place to ask a question, and, to my consternation, my French tumbled out all in a heap. The words came without connection. The man looked at me queerly; I mumbled something, and got out into the street; by the time I got back to my rooms, the paralysis had passed; but I knew quite well what it meant."

Henry Adams is buried next to his wife Clover Adams, 'without inscription', at the Adams memorial, in section E of Rock Creek Cemetery, Washington D.C., erected in 1891 via commission of Adams as memorial to his wife, who had died (dereacted) in 1885 by suicide through the ingestion of potassium cyanide. The seated figure draped in cloth, is a representation of Guan Yin, the bodhisattva (bodhi) of compassion, constructed via the suggestions of Adams, who advised the artist, Irish-born American sculptor Augustus Saint-Gaudens (1848-1907), to contemplate iconic images from Buddhist devotional art. (O)

Adams, went on to state that, based on his father's case, Ralph Emerson, George Bancroft, and Cameron's uncle, that the average time from first incident to termination is about "ten years", and in prognosis of his own condition stated:

> "If I can get two more years, without a breakdown, I shall do well enough, but I doubt it. The margin is wide."

On 27 Nov 1908, Adams executed his last will and testament, indicating his wish to be buried by the side of his wife, enjoining that: (O)

> "No inscription, date, letters, or other memorial, except the monument I have already constructed [shown above], shall be placed over or near our grave."

(add)

Stroke

On 24 Apr 1912, Adams suffered a "cerebral thrombosis" while dining alone, after which his servant William Gray, quickly summoned medical help. He became partially paralyzed thereafter. On May 8 and May 9, Adams became feverish and irrational, e.g. he attempted to send messages to his friend William Phillips and his mother, both long dead, and he also apparently tried to throw himself out a window. Hallucinations and delirium recurred throughout May. On Jul 3, in a letter to Elizabeth Cameron, Adams reported that he had got a little more control of his right hand and foot. [35] Adams dereacted (died) six years later at his Washington home on 27 Mar 1918.

Criticism

In 1995, American historian John Diggins penned a critique chapter on Adams entitled "Who Bore the Failure of the Light", in which, among other things he attacks Adams' scientific views, stating for example: [22]

> "On the matter of science, the consensus of conventional wisdom in Adams scholarship regards him as more of a crank than a prophet."

This statement could not be more backwards. Correctly, in modern physical humanities terms, we now know the reverse to be true: modern hard physical science consensus regards Adams to have been a prophet with great foresight and erudition of both human chemistry and human thermodynamics, being near to par with the genius if Goethe, whose work on human chemical theory Adams read. Adams, in short, was better able to see the forest amid the trees (see also: ships not seen).

Quotes | On

The following are quotes on Adams:

> "**Adams** [is the] greatest stylist American historical writing has produced."
>
> — Morris Zucker (1945), *The Philosophy of American History: The Historical Field Theory* [23]

> "There has never been any doubt that the Adams family was America's first family in our politics and memory."
>
> — Paul Nagel (1999), *Descent from Glory: Four Generations of the John Adams Family* (Q)

> "**Henry Adams** was the preeminent voice of social thermodynamics. "
>
> — Paul Staiti (2001), "Winslow Homer and the Drama of Thermodynamics" (Q)

Quotes | By

See main: Adams quotes

The following are quotes by Adams:

> "Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday within this law. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."
>
> — Henry Adams (1863), "Letter to Charles Gaskell" (Oct) [20]

> "Altogether, we go on with placidity unequalled, and the only question is what we live for. Nothing seems to come of it?"
>
> — Henry Adams (1878), "Letter to Charles Gaskell" (Aug 21) [29]

“Social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life.”

— Henry Adams (1885), “Letter to Clover Adams” (Apr 12) [10]

“A period of about twelve years measured the beat of the pendulum. After the *Declaration of Independence* [4 Jul 1776], twelve years had been needed to create an efficient *Constitution* [17 Sep 1787]; another twelve years of energy brought a reaction against the government then created; a third period of twelve years was ending in a sweep toward still greater energy; and already a child could calculate the result of a few more such returns.”

— Henry Adams (1890), *A History of the United States of America* (Q)

“An atom is a man and Maxwell’s demon, who runs the second law, ought to be made president.”

— Henry Adams (1903), “Letter to Brooks Adams”, May 2 [14]

“Gentle mathematicians and physicists still cling to their laws of thermodynamics, and are almost epileptic in their convulsive assurances that they have reached a generalization which will hold good. Perhaps it will. Who cares?”

— Henry Adams (1903), “Letter to Charles Gaskell” (Jun 14) [32]

“Modern politics is, at bottom, a struggle not of men but of forces. The men become every year more and more creatures of force, massed about central power-houses. The conflict is no longer between the men, but between the motors that drive the men, and the men tend to succumb to their own motive forces.”

— Henry Adams (1907), *The Education of Henry Adams* (Q)

“Modern politics is, at bottom, a struggle not of men but of forces. The men become every year more and more creatures of force, massed about central power-houses. The conflict is no longer between the men, but between the motors that drive the men, and the men tend to succumb to their own motive forces.”

— Henry Adams (1907), *The Education of Henry Adams* (Q)

“Any schoolboy could see that man as a force must be measured by motion, from a fixed point.”

— Henry Adams (1907), *The Education of Henry Adams* (Q)

“A dynamic law requires that two masses—nature and man—must go on, reacting one upon each other, without stop, as the sun and comet react on each other, and that any appearance of stoppage is illusive.”

— Henry Adams (1907), *The Education of Henry Adams* (Q)

“Education should try to lessen the obstacles, diminish the friction, invigorate the energy, and should train minds to react, not at haphazard, but by choice, on the lines of force that attract their world. What one knows is, in youth, of little moment; they know enough who know how to learn.”

— Henry Adams (1907), *The Education of Henry Adams* (Q)

"Intimates are predestined."

— Henry Adams (1907), *The Education of Henry Adams* (§13: The Perfection of Human Society) (Q)

"On the physico-chemical law of development and dynamics, our society has reached what is called the critical point where it is near a new phase or equilibrium."

— Henry Adams (1908), "Letter to Charles Gaskell" (Sep 27) [31]

"The solution of mind is certainly in the magnet."

— Henry Adams (1908), "Letter to Charles Gaskell" (Sep 27) [31]

"I have run my head hard up against a form of mathematics that grinds my brains out. I flounder like a sculpin in the mud. It is called the 'law of phases', and was invented at Yale [by Gibbs]. No one shall persuade me that I am not a phase."

— Henry Adams (1908), "Letter to Elizabeth Cameron" (Sep 29) [28]

"I'm looking for a 'young and innocent physico-chemist who wants to earn a few dollars by teaching an idiot what is the first element of theory and expression in physics.'"

— Henry Adams (1908), "Note to John Jameson" (Dec) [9]

"My essay 'The Rule of Phase [Applied to History]' is a 'mere intellectual plaything, like a puzzle' [to Brooks]. I am interested in getting it into the hands of a 'scientific, physico-chemical proofreader' and I am willing to pay 'liberally for the job' [to Jameson]."

— Henry Adams (1909), Notes to Brooks Adams and John Jameson [9]

"I have been studying science for ten years past, with keen interest, noting down my phrases of mind each year; and every new scientific method I try, shortens my view of the future. The last—thermodynamics—fetches me out on sea-level within ten years. I'm sorry Lord Kelvin is dead. I would travel a few thousand-million miles to discuss with him the thermodynamics of socialistic society. His law is awful in its rigidity and intensity of result."

— Henry Adams (1909), "Letter to Charles Gaskell" (May 2) [12]

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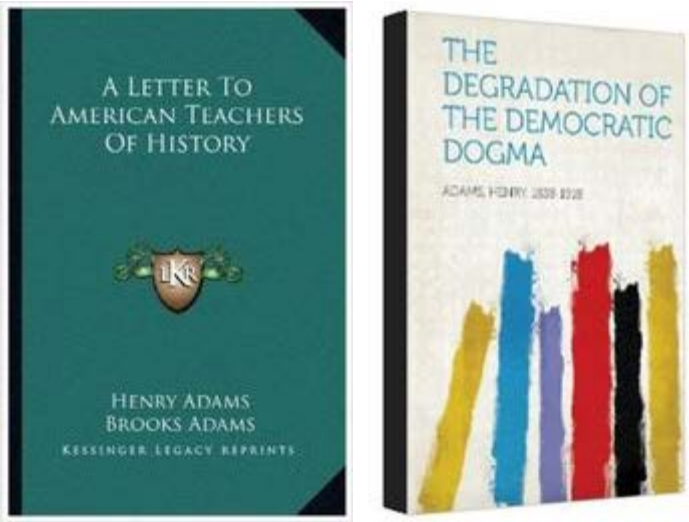

Adams' 1910 *A Letter to American Teachers of History*, wherein he advises history professors to begin to use both human molecular theory and thermodynamics to teach history, and his 1919 *The Degradation of the Democratic Dogma*, which contains his: *The Tendency of History* (1894), his 44-page essay "The Phase Rule Applied to History" (1909), in which he identifies Willard Gibbs as the theorist behind the phases of history, and his *A Letter to American Teachers of History* (1910).

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θΔics

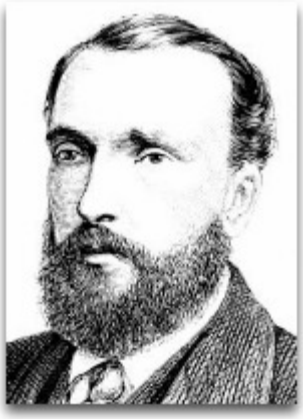

In existographies, **Henry Bastian** (1837-1915) (CR:10) was an English physiologist noted for his supposed late 1860s unpublished coining of the term "biogenesis" and for his 1869 spurious announcement that he had created life synthetically in the laboratory (see: laboratory produced life) through combination of various inorganic substances. [1]

The truth of the matter, however, is that Bastian thought he had observed the synthesis, "*de novo*", as he called it, of living matter from non-living matter, under the microscope, when heating and cooling and reheating vials of bacteria past the denature temperature.

Bastian went on to write two books elaborating on his findings, the first his 1869 *The Beginnings of Life: Volume 1* (1869), wherein he outlined a mixture of conservation of energy, vitalism, and emergence views of living matter arising from atoms and molecules. The gist of his emergence of living matter theory is as follows:

> "We know that the molecules of elementary or mineral substances combine to form acids and bases by virtue of their own 'inherent' tendencies; that these acids and bases unite so as to produce salts, which, in their turn, will often again combine and give rise to 'double salts.' And at each stage in this series of ascending molecular complexities, we find the products endowed with properties wholly different from those of their constituents. Similarly, amongst the carbon compounds there is abundance of evidence to prove the existence of internal tendencies or molecular properties, which may and do lead to the evolution of more and more complex chemical compounds. And it is such synthetic processes, occurring amongst the molecules of colloidal and allied substances, which seem so often to engender or give 'origin' to a kind of matter possessing that subtle combination of properties to which we are accustomed to apply the epithet 'living'."

This, however, is no different that the famous incorregable molecular "liquidness" is an emergent property of the atoms hydrogen and oxygen combined in the molecular form as H_20, which does not exist in the atoms singly, but only "emerges" in the upper level molecular state argument (add: theorist?).

In his followup 1872 *The Beginnings of Life: Volume 2* (1872), he addresses the question of the occurrence or non-occurrence of spontaneous generation. [2]

Darwin

In 1872, Darwin read Bastion's *The Beginnings of Life*, after which he wrote the following to Alfred Wallace: [3]

> "I have at last finished the gigantic job of reading Dr. Bastian's book *The Beginnings of Life* and have been deeply interested by it. You wished to hear my impression, but it is not worth sending. He seems to me an extremely able man, as, indeed, I thought when I read his first essay. His general argument in favour of archebiosis, aka "spontaneous generation", is wonderfully strong, though I cannot think much of some few of his arguments. The result is that I am bewildered and astonished by his statements, but am not convinced, though, on the whole, it seems to me probable that archebiosis is true. I am not convinced, partly I think owing to the deductive cast of much of his reasoning; and I know not why, but I never feel convinced by deduction, even in the case of H. Spencer's writings. If Dr. Bastian's book had been turned upside down, and he had begun with the various cases of heterogenesis, and then gone on to organic, and afterwards to saline solutions, and had then given his general arguments, I should have been, I believe, much more influenced. I suspect, however, that my chief difficulty is the effect of old convictions being stereotyped on my brain. I must have more evidence that germs, or the minutest fragments of the lowest forms, are always killed by 212°F Perhaps the mere reiteration of the statements given by Dr. Bastian [of] other men, whose judgment I respect, and who have worked long on the lower organisms, would suffice to convince me. Here is a fine confession of intellectual weakness; but what an inexplicable frame of mind is that of belief!

> As for Rotifers and Tardigrades being spontaneously generated, my mind can no more digest such statements, whether true or false, than my stomach can digest a lump of lead. Dr. Bastian is always comparing archebiosis, as well as growth, to crystallisation; but, on this view, a Rotifer or Tardigrade is adapted to its humble conditions of life by a happy accident, and this I cannot believe. . . . He must have worked with very impure materials in some cases, as plenty of organisms appeared in a saline solution not containing an atom of nitrogen.
>
> I wholly disagree with Dr. Bastian about many points in his latter chapters. Thus the frequency of generalised forms in the older strata seems to me clearly to indicate the common descent with divergence of more recent forms. Notwithstanding all his sneers, I do not strike my colours as yet about pangenesis. I should like to live to see Archebiosis proved true, for it would be a discovery of transcendent importance; or, if false, I should like to see it disproved, and the facts otherwise explained; but I shall not live to see all this. If ever proved, Dr. Bastian will have taken a prominent part in the work. How grand is the onward rush of science; it is enough to console us for the many errors which we have committed, and for our efforts being overlaid and forgotten in the mass of new facts and new views which are daily turning up. This is all I have to say about Dr. Bastian's book, and it certainly has not been worth saying. ”

In 1936, Alexander Oparin, citing this letter, summarized things to the effect that Darwin criticized Wallace's experiments and found them altogether improbable. [4]

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θΔics

In hmolscience, **Henry Albert Bent** (1926-2015) was an American physical chemist noted for his 1965 book *The Second Law*, for his 1971 article "Haste Makes Waste: Pollution and Entropy", in which he attempts at a connection between the maintenance of the environment and entropy, and for his human thermodynamics education stylized workshops, where he attempted to educate students on how to live ethically according to the laws of thermodynamics. [1]

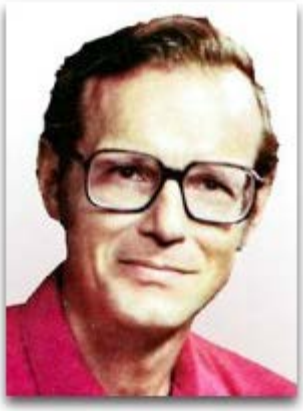

Overview

In 1962, Bent conceived of a global entropy analysis approach used to assess the spontaneity of physicochemical processes. [2] In 1977, in the context of philosophical thermodynamics, Bent coined the phrase "personal entropy ethic", in an article suggesting that to help in the energy crises one needs to be ethical in the energetic aspects of life based on their knowledge of the second law of thermodynamics. Specifically, in stead of a national energy policy, Bent states: [3]

> "What we need is a personal entropy ethic."

In art thermodynamics, that year, Bent was on the road conducting "Thermodynamics, Art, Poetry, and the Environment" workshops for the Office of Science Education, discussing with students, for instance, a critique on the commandment "thou shalt not unnecessarily create entropy", among other subjects. [4]

Left step periodic table

In 2007, Bent, along with Frank Weinhold (2008) (Ñº), where vocal proponents of a left step periodic table (Ñº), a type of periodic table focusing on the triad rule, which organizes elements according to orbital filling, according to which helium would be placed at the top of the noble gases. [6]

Education

Bent, of note, is the son of American chemist Henry E. Bent, was a professor of physical chemistry at North Carolina State University and at University of Pittsburgh, who taught his a great deal of chemistry, e.g. he gave a regular chemistry Christmas lecture. Bent completed his BS in physical chemistry at Oberlin and his PhD in 1952, with a dissertation on "Decomposition of Molten Ammonium Nitrate", at the University of California, Berkeley. [5]

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θΔics

In existographies, **Thomas Henry Truro Bray** (1846-1922) (IQ:180|#167) (SN:23) (CR:50), going by "Henry Truro Bray", was an English-born American priest turned physician and philosopher noted, in human chemistry, for his 1910 *The Living Universe*, wherein he outlines a Goethe-Haeckel-Huxley stylized divine-causality ingrained physicochemical-monism, aka living universe theory, a book generally classified as the last intellectually sober attempt at panbioism.

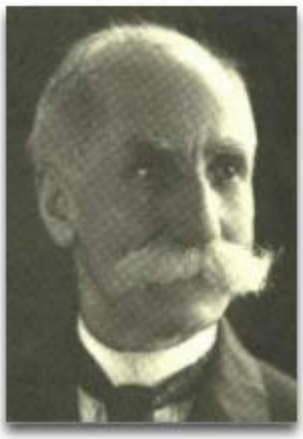

Overview

Bray's first books are: *The Knowability of God* (1887), *God and Man* (1888), *The Evolution of A Life: from the Bondage of Superstition to the Freedom of Reason: an Autobiography* (1890), and *Reason and Dogma* (1894), which began to outline his monism views, and which got him expelled from the church.

In 1910, Bray published *The Living Universe*, his most-popular work, which sold some 25,000 copies in America, with its chapter nineteen on "Atomic and Human Affinities", which attempts explain how the chemical affinities between reactive atoms and molecules relates to human affinities or affinities between reactive humans. [1]

Bray's last, posthumous it seems, work appears to be the *circa* 1923 *The Voice of the Universe*. [3]

Sulfuric acid | Heated

The following is Bray's comparison (LU:263) of heating sulfuric acid in a solvent of alcohol to heated breakups in complicated friendships:

> "With humanity the more complicated the friendship, the more easily it is dissolved; so with atomic compounds. Sulphuric acid is a complicated compound. If it be forced to endure much hardship, it will break up. Heat it in alcohol, and we get alcohol water and olefiant gas. The acid has been completely dissolved."

(add)

Carbon dioxide | Pressurized

The following is Bray's take (LU:263) how the recognizable properties of a friend can change similar to that of pressurized carbon dioxide:

> "We also know that suffering, worry, care, and other evils at times so change one that even his friends fail to recognize him. This is true in the case of atomic compounds, and even with some of the atoms. If carbon dioxide be put under great pressure, at a low temperature, it is converted into a liquid; and none of its friends recognize it in its new form. It is a form it hates; and when left at liberty, begins rapidly to resume its former state."

(add)

Oxygen + Nitrogen | Cyanides

The following is Bray's comparison of how people who unite under common danger is akin to cyanide formation:

> "There are certain persons between whom friendship is almost impossible; yet such are known to become attached to each other, and to combine against a common enemy, or because of common danger. Thus with the atoms. Oxygen seems to hate nitrogen, refusing under ordinary circumstances to have anything to do

> with it. If however they happen near each other, surrounded by great heat, in the presence of metals (in this instance a common enemy), they will unite, and form cyanides."

(add discussion)

Hot carbon | Nitric acid

The following is Bray's example (LU:262) of burning a heated stick of something under a liquid solution of nitric acid:

> "So also if you put the heated end of a stick into a test-tube one-fourth filled with concentrated nitric acid [HNO_3], the charcoal [C] will continue to burn, giving a bright light, even though it be beneath the surface of the liquid. This shows how easily the oxygen forsakes its companions, hydrogen and nitrogen, and cleaves to its newly found friend, carbon."

Here, in respect to burning under liquid, were are reminded of the similar views of Buchner:

> "Potassium and phosphorus entertain such a violent passion for oxygen that even under water they burn—i.e. unite themselves with the beloved object."
>
> — Ludwig Buchner (c.1855), Publication; cited by Henry Finck (1887), Libb Thims (2007) [8]

(add)

Barium oxide | Heated

The following is Bray's example (LU:262) of heating barium oxide:

> "Sometimes persons brought together through common suffering are driven asunder when exposed to greater evils. So if barium oxide [BaO] be heated in a current of air at a temperature above 400°C, it will leave its companion, and take up 'single blessedness' again."

Secondly, we see Bray inserting religio-anthropomorphic concepts of "evil" (unnatural) and "blessings" (god) into chemistry. A more recent example of this type of religio-insertion is found in the work of Mirza Beg (1987) who inserts Islamic concepts into physical chemistry, albeit not directly as Bray, but indirectly. As a general rule, the only way anthropomorphism can be extrapolated into chemistry, is if the they informally hold up and down the great chain of being and in the view of universal laws of science. In other words, if one were so persuaded, into Bray's view of things, in order for such interjections to hold, one would have to reform all of physics, chemistry, and thermodynamics into a new version, such that it would be tenable and correct to say that concept such as "god" and "evil" are involved when, say, hydrogen [H2] reacts with oxygen [H2] to form water [H20]:

$$2H_2 + O2 \rightarrow 2H_2O$$

which may very-well float boats in the new age crowd, but is two-centuries archaic in the modern university classroom.

Potassium iodide | Mercurous salt

The following is Bray's example (LU:262) of how the ties of certain newly formed friendships can easily severed similar to a mixture of potassium iodide KI and mercurous salt:

> “We all know how unstable newly formed friendship is. It takes but little trial, little hardship, little suffering to sunder such ties. So if potassium iodide be added to a solution of a mercurous salt, mercurous iodide [Hg2I2] is formed; but the friendship is unstable: on little suffering, exposure, it breaks up into mercury [Hg] and mercuric iodide, the former going one way and the latter another.”

(add)

Mercuric sulfide | Iron flings | Heated

The following is Bray’s example (LU:262) of heated mercuric sulfide HgS with iron Fe filings, which has the following reaction: (Q)(Q)(Q)

$$HgS + Fe + heat \rightarrow Hg + FeS$$

as a model of a single displacement marriage $FxFy_1$ decoupling reaction in humans, which, for second woman Fy_2 acting as the iron fillings, reads as:

$$MxFy_1 + Fy_2 + heat \rightarrow MxFy_2 + Fy_1$$

In words:

> “If you heat mercuric sulphide with iron filings, the sulfur will unite with the iron, letting the mercury in the lurch; so in like manner if a man or wife be brought into the company of a third party of the opposite sex who has greater attraction than has the wedded mate, the result will be the severance of the bonds of wedlock, and the formation of a new union. This is just what happened in the case of the sulfur. The cause of the severance of the old relations, and the manner through which new were formed, are exactly similar; there was the temptation of a third party, and the more powerful attraction of the new acquaintance.”

(add)

Heated | Red mercuric oxide | Friends

The following is Bray’s comparison (LV:261) of the heating of red mercuric oxide HgO, which accrues via the following reaction: (Q)

$$2\ HgO + heat \rightarrow 2\ Hg + 2O_2$$

to the dissolution of weak friendships:

> “When red mercuric oxide is heated in a test-tube, it disappears, oxygen being liberated, and mercury deposited on the sides of the test-tube. In like manner when intimate friends impose on each other, and take undue advantage of their

An illustration of Bray's assertion that heating will bring about dissolution in mercury(II) oxide HgO into its components, namely liquid mercury Hg, which will precipitate on the glass of the test tube, and oxygen O_2 which will leave as gas (see: vid); just as it will the dissolution of weak friendships into its components (non-friends); and conversely that the heating of Hg in oxygen O_2, at roughly 350°C, will bring about the red form of HgO (O), just as the when the same sexes are "exposed to excitation" (e.g. shaky bridge experiment) (O) (O) or "allurement and blandishments" will two more likely tend to fall in love and form a union according to Bray.

> relations, we find a dissolution of friendship."

This phenomenon, historically, was discovered in Aug 1774, when Joseph Priestley heated a red solid powder (mercury oxide) by using a lens to focus sunlight onto it, during which he observed that a silvery liquid (mercury) was formed as well as some unknown gas. On studying this gas he found that a candle burned much more brightly in it than in ordinary air. Priestley had discovered oxygen but he called the gas 'dephlogisticated air' (O), being that heat, he believed, operated according to phlogiston theory; the gas, accordingly, be reasoned was air without phlogiston.

Bray continues:

> "Again, when mercury is slowly heated in oxygen, we get the compound red mercuric oxide. In like manner when the sexes [men and women] are exposed to excitation, allurement and blandishments, we have the probability always of 'falling in love', and forming a union."

He then comments that one of the working functions parties, e.g. card parties, lawn parties, church particles, and entertainments of all kinds, etc., functions to bring the sexes together in an loose mingling and mixture sort of manner, i.e. loosening up the degrees of freedom, in a modern sense.

Degrees | Mind, Reason, Consciousness, Feelings

The following is Bray's scale of degrees argument (LV:261), in respect to human-conceptualized mental qualities, such as reason and consciousness:

> "The atom has reason and consciousness of itself; being infinitely little, its mental qualities are in like degree small; man being comparatively infinitely large, his mental qualities are in like degree great. But neither mind, nor consciousness, nor feeling is relatively greater in the one than the other."

Bray, in other words, reasons that because he has “reason” and that because he evolved over time from the elements, that atoms too must, via the extrapolate down the great chain of being scale, have “reason” in similar manner, albeit of smaller degree. Only part of this reasoning, however, is correct. If, e.g. one defines the light-sensitive region of the structure-adjusting carbon atoms, of certain molecules, e.g. retinal (see: ABC model) to be the location of “mental qualities”, then certain conceptualized models will scale up and down, thereby being physico-chemically neutral in argument. The majority of what Bray says here, however, is anthropomorphization of atoms, i.e. human-biased argument. We need to remove “anthropisms” from our arguments, as Charles Sherrington (1938) advised.

Degrees | Love ↔ Affinity

The following is Bray’s scale of degrees argument in respect to matters of love:

> “In love-matters as in atomic affinity the manifestation of choice is the common activity, or phenomenon; and this same activity is the one common element of all intellectual endeavor, whether infinitely little or infinitely great; whether in the consciousness of an atom, an amoeba, or that of a Newton. The difference is one of degree only.”

Here we get into a more complex problem, in that the phenomenon of the “manifestation of choice” at the atomic level and human level must both operate via the same general mechanism, which is was the focus of Goethe’s famous treatise *Die Wahlverwandtschaften* (see: title decoding); according to which the "mechanism of choice", common to both, is the real subject of discussion.

Existences | Higher & Lower

> *See also: Darwin on higher and lower*

The following is Bray’s response (LU:263-64) to the statement “man is the most wonderful creation of god”, made by a physician, in a June issue of the *Journal of American Homeopathy*:

> “The chief barrier that has prevented and does prevent man from seeing himself as others see him, is his inborn egoism — the result of principles inculcated not merely during one short life, or one century, but during many thousands of years. I do not think that any candid scholar can find in man anything more wonderful than in ten thousand other existences. Indeed, he is much less wonderful than many of the most complex and highly developed plants and flowers; and certainly there are various insects fully as complex and wonderful as man, and many animals far more graceful and beautiful. Nor does man in general give any evidence of a higher origin; for speaking from extensive experience I am sure that the great majority of men live very irrationally.”

Bray goes on to say that man is part of the animal kingdom, which is part of the “offspring of mother earth”, and that we would be keen not to “belittle [animals], nor stultify ourselves, nor close our eyes to nature’s revelations, nor show ourselves recreant to the trust she has committed to us”. Here, firstly, we are reminded of Goethe’s thesis #1-2, from his *Positions of Rights*, namely: “Natural law is what nature has taught all creature. The custom cancels and corrects the written law.” Secondly, we are reminded of the historical tendencies of behavior modification run to into absurdities, when “existence” models are extended, e.g. veganism (John Stewart), Jainism (e.g. walking around naked with a broom to sweep bugs away from the path one is walking), etc.

Monism

In 1888, Bray, in his *God and Man*, as illustrated adjacent, stated the following monism view: [4]

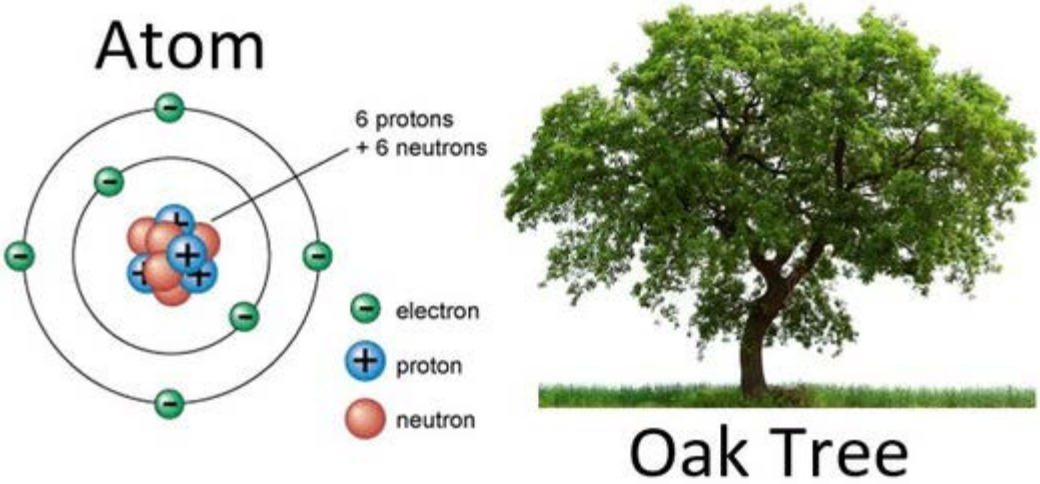

Bray's 1888 statement that the aggregate of the forces constituting and atom and oak tree are the same, and following monism speculations on matter and mind, caused him to be disposed from the ministry; similar to what happen to Pierre Teilhard in the 1920s.

> "That the force constituting an oak tree is only an aggregation of the forces which constitute an atom, we have no reasonable doubt whatever; but an atom is not an oak. What then we ask is this essence which must be common to both? It is certain that if this essence be neither so-called matter nor so-called mind, whatever it may be, it must be unknown to us. This unknown essence must be the substance, the cause, of all things. In this unknown essence must so-called matter and so-called mind have their common unity, their true being; and in it must subject and object be united. What then shall we call this essence? We answer, since it can be neither so-called matter nor so-called mind, and yet must be the true essence of all things, we may call it the ultimate reality, the universal substance. To this ultimate substance must be referred all the phenomena of mind and matter; and in it must all existences blend, and have their true being. It must be the womb of all the forces in the universe; it must be the 'thinking monon', the universal intelligence, the 'universal will'; and in this 'universal monon' must the body and soul of the universe be united. Here and here only can we find the explanation of so-called matter and so-called mind, and more than all of man's will."

These word, as he says in twenty year retrospect, got "deposed from the ministry of the Episcopal Church" has he recounts in his *The Living Universe*. [4]

Mind | Matter & Force

The following is Bray's patch solution of the mind from matter conundrum:

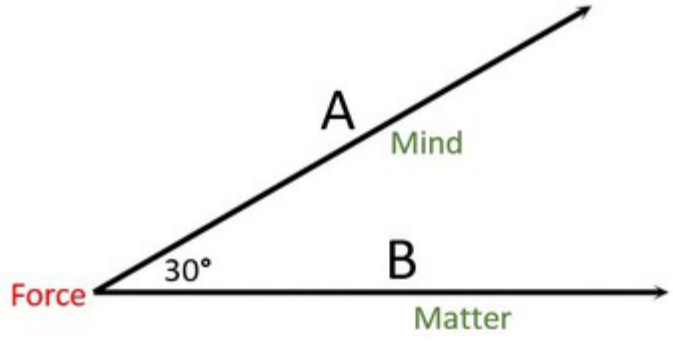

Bray's mind from matter diagram, wherein he asserts that they both arise from force.

> "An atom of so-called matter may not appear to the unphilosophical to have anything in common with so-called mind; but we may be sure there is a close relationship between them. We look at the sides of a triangle, and perhaps know that the sides *A* and *B* subtend an angle of 30°. The sides *A* and *B* are seen to be specifically different; but on a closer inspection they are each seen to arise from a common point, a common origin. At first they are not to be distinguished, nor can we detect the point itself in which they originate; but as they grow wider apart, we become able to distinguish them, and we call them *A* and *B*. Thus is it with mind and matter; they are phenomena arising from, or branching out of, the same common origin or force. This origin we do not, nor is it likely we ever shall, know. As we know the sides of the triangle and not the point of origin; so we know mind and matter, which are but two sides of the same thing, having their common origin in a point, or substance, or force unknown to us, and, as I believe, forever unknowable to finite intelligence. This 'universal being' or 'substance' will become more and more known to man, as the ages roll by, and he has time and opportunity for study and contemplation; but that it will ever be fully known to us, philosophy forbids us to hope."

— Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds III, pg. 176-77)

Bray, in short, believes that mind and matter arise from the hydrogen atom, and the force within the atom, which associates with ‘universal being’, ‘substance’, god, or something forever unknowable.

Atoms | Molecules

Bray gives the following definition of atoms and molecules:

> “As the word ‘atom’ was coined to represent the smallest particle of matter in existence, or a mere point of force [see: Boscovich-Priestly atomic theory; point atom]; so the word ‘molecule’ is used to represent the smallest portion of matter that can exist in a free state [compare: bound state]. If we represent the molecule by a building, each stone in the building would represent an atom. A house is built of stones, and a molecule is built of atoms; as a house may be demolished, so may the molecule; the one not unfitly represents the other.”
>
> — Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds III, pg. 176-77)

He then gives the example of hydrogen H_2 and oxygen 0_2 reacting to form water H_20:

$$2H_2 + \frac{1}{2}O_2 \rightarrow 2H_2O$$

table of the elements as known to-day

Aluminium	iv	27	Iridium	ii iv	191
Antimony	iii v	12	Iron	ii iv	56
Arsenum	iii v	75	Lanthanum	iii	138
Barium	ii	137	Lead	ii	206.4
Beryllium	ii	9	Lithium	i	7
Bismuth	iii v	209	Magnesium	ii	24
Boron	iii	11	Manganese	ii iv	55
Bromin	i	80	Mercury	ii	200
Cadmium	ii	112	Molybdenum	ii iv	95.5
Cesium	i	132.5	Nickel	ii	58.6
Calcium	ii	40	Niobium	v	94
Carbon	iv	12	Nitrogen	iii v	14
Cerium	ii iv	140	Osmium	vi	190.2
Chlorin	i	35.5	Oxygen	ii	16
Chromium	iv	52	Palladium	ii iv	106
Cobalt	ii	59.1	Phosphorus	iii v	31
Copper	ii	63.2	Platinum	iv	194.3
Davyum	?	154	Potassium	i	39
Didymium	iii v	144.5	Rhodium	ii iv	104
Erbium	iii	166	Rubidium	i	85
Fluorin	i	19	Ruthenium	ii iv	104.2
Gallium	iii	69	Samarium	iii	150
Germanium	ii iv	72	Scandium	iii	44
Gold	iii	196.7	Selenium	ii iv vi	79
Hydrogen	i	1	Silicon	iv	28
Indium	iii	113.4	Silver	i	108
Iodin	i	126.5	Sodium	i	23
Strontium	ii	87.5	Titanium	iv	48
Sulphur	ii iv vi	32	Tungsten	iv	184
Tantalum	iii v	182	Uranium	ii	238.5
Tellurium	ii iv vi	125	Vanadium	iii v	51.3
Terbium	?	148.8	Ytterbium	?	173
Thallium	i iii	204	Yttrium	iii	89
Thorium	ii iv	231	Zinc	ii	65
Tin	ii iv	118	Zirconium	iv	89.5

In the first column is given their names; in the second, their valency; in the third, their atomic weight.

Bray's 70 element periodic table, which he gives at the end of his chapter 8 "Atomic and Molecular Worlds III".

the water of which he says can separated again by putting electricity in the water:

> “I have said that a molecule is the least particle of matter that can exist in a free state. For instance, if you put into a glass-tube two volumes of hydrogen and one of oxygen, the gases will remain perfectly mixed, but will not cohere. But should you touch the mouth of the tube with a lighted taper, the two gases will immediately combine, causing an explosion, and forming water. If electricity be passed through the gases, the same result will take place. Now, the smallest particle of water imaginable will have the same number of volumes of these gases, namely two of hydrogen and one of water. Therefore we say that a molecule of matter is the smallest portion that can exist in a free state.”
>
> — Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds, pg. 177-78)

the unit H_20, he says is the “smallest particle of matter”, i.e. molecule, that can “exist in the free state”, in water; this is followed by the example of hydrogen H_2 and chlorine Cl_2 gases reacting to form hydrochloric acid HCl:

$$2H_2 + 2Cl_2 \rightarrow 2HCl$$

about which he says that HCl is the molecule, which contains two atoms, one of chlorine and one of hydrogen.

> "Again, if you put into a bottle equal volumes of hydrogen and chlorine gases, and throw it into the air, so that it may be struck by the actinic solar ray, you will hear a violent explosion, the gases having combined to form hydrochloric acid. Of the acid thus formed it will again be found that however inconceivably small a portion you examine, it will contain one atom of chlorine and one of hydrogen."
>
> — Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds, pg. 178)

(add)

Human atoms | Human molecules

Bray, following his atom and molecule definition section, then jumps to the "humans are like atoms", "families are like molecules" scaled up model:

> "The molecule is therefore the smallest portion of matter that can exist in a free state. The solitary atom is like the human being necessarily forced, on the presentation of the first opportunity, to associate itself with others. Aristotle tells us (Politics I, 2, 9) that man is a political animal, '[Greek]'; and in another place (Politics I, 1, 2) that it is necessary for man and woman to unite their lives in order to prevent the disappearance of their own species: '[Greek]'. When brought face to face with the physical facts of the case, the chemist is almost led to infer a like social feeling existing in atoms, and by a little larger stretch of his imagination, he might suppose that with them too there exists a not altogether dissimilar necessity for union."
>
> — Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds III, pg. 176-78)

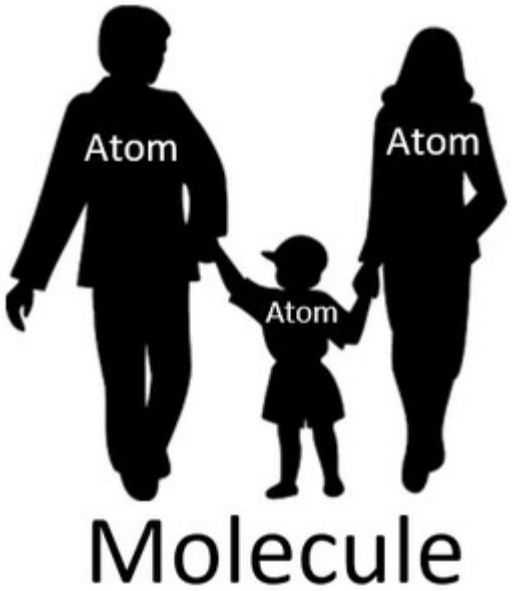

Bray's scaled up definition of "atom", as the smallest particle of [human] matter that exists as a force point, and "molecule", the smallest "free state" portion of [human] atoms necessarily forced into unions.

Bray then touches on Alfred Binet's 1889 psychic life and sexual selection nature of microorganisms (Q); along with Thomas Huxley's deep sea bottom microorganisms.

> "Psychic phenomena manifesting themselves in these [protozoa-like] momentary existences, these mere points of organisms, it does not appear unscientific to hold that potential life, and all the phenomena attending it, from the government of an Oklahoma village to that of the British empire, exists in the atom itself, even in the atom of hydrogen or helium."
>
> — Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds III, pg. 181-82)

Bray then cites the following as representative of his monism views:

> "Matter can never exist and be active without mind, nor can mind exist without matter."
>
> — Johann Goethe (c.1820), in: *The Living Universe* (pg. 180)

“The idea of the unity of organic and inorganic nature is now firmly established. . . . All natural bodies which are known to us are equally animated, and the distinction which has been made between animals and inanimate bodies does not exist.”

— Ernst Haeckel (c.1890), in: *The Living Universe* (pg. 180)

“A spirit exists in all things, and no body is so small but contains a part of the divine substance within itself, by which it is animated.”

— Giordano Bruno (c.1590), in: *The Living Universe* (pg. 180)

He also cites Democritus as the originator of monism; and credits Bruno as having been the first to give voice to this type of “monistic conception of things”; noting that he was burned at the stake on 17 Feb 1600 for these views. Bray then gives three simple so-named laws of atomic unions, as he calls them, according to John Dalton and Joseph Gay-Lussac.

Affinities | Chemical-to-Human

Bray goes into his Goethe-Empedocles stylized “affinities” digression, in what seems to the core of his new philosophy, as follows:

Bray, in his chemical affinity section, discussed how the formation of iron sulfate $FeSO_4$ as akin to a sultan with a harem of four women (see: polyhumanide molecule); which is akin to Christopher Hirata's circa 2000 labeling of such model as a "middle-Eastern polygamous molecule", which he symbolically defined as X_4Y.

“The force which presides over chemical combinations, is called chemical affinity; and it is in the exhibition of this that atoms act so much like the forms of higher organisms. To illustrate: oxygen has but little affinity or **atomic love**, call it which you please, for copper, under general conditions; but as in the case of higher beings when you array them in their best, and make them as alluring as possible, so here,—if you heat the copper in the air oxygen will immediately rush to it, and with it form oxide of copper [Cu_2O]. Their affinity for each other is now so great that they cannot be divorced, under ordinary circumstances. But even now if you mix this oxide with powdered charcoal, and then heat the mixture, a moment arrives when the affinity of the charcoal for the oxygen is greater than that of the copper, causing the oxygen to forsake the copper and unite with the charcoal to form carbonic acid [H_2CO_3]. The allurements of the charcoal suffice at last to cause the oxygen to leave its first love, and go with its new affinity.”

— Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds, pg. 182)

“We see similar action often in the case of men and women. Again, the attraction of hydrogen [H_2] for oxygen [O_2] is very great under ordinary circumstances, causing them to live in the greatest harmony, as, for instance, in water [H_2O]; but as at times a third party is seen to insinuate himself into a household, destroy its peace, and ultimately break up its union, so here if an atom of potassium [K], for instance, finds

its way into a molecule of water, the peace of the molecular family is at once destroyed and jealousy and a murderous quarrel ensue, the metal burning brightly, and darting hither and thither on the surface of the water, exulting as it were in the mischief it works. In this contest of atomic **affinity or love**, the potash wins the day [$H_2O + K \rightarrow KOH + H_2$], taking away with itself two blushing damsels for its harem, and leaving an atom of hydrogen [H_2] like the last rose of summer to droop and die of a broken heart."

— Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds, pg. 182-83)

"The atoms that combine to form a new family or molecule do not absolutely touch one another, because each atom, being a point of force, must have a certain portion of space to vibrate in; but comparatively speaking the spaces that separate the atoms of a molecule one from another are reduced to zero by chemical affinity. As in the highest manifestations of consciousness, so in the atomic world, affinity sweeps all before it, being satisfied with nothing less than oneness of life. The spaces between contiguous molecules are much greater than those between contiguous atoms; for molecules are bound together by the force of cohesion, while atoms are bound together by that of chemical affinity. The difference between chemical affinity and cohesion is similar to that between mere friendship and a real union of hearts. Still, as each heart, however closely united to another, must have some room for independent act and thought, so has every atom its own little orbit of motion independent of the movement of the molecule as a whole. These spaces are supposed, and very properly so, to be full of ether, a substance near to the original force out of which this mighty fabric of a universe has been spun."

— Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds, pg. 183)

"As in the family too great independent action, or the striving after individual rather than joint welfare, must inevitably bring disruption of family ties, so in what is termed the inorganic world, excessive atomic or molecular activity brings disruption of the whole. In the family the assertion of excessive individuality may follow inflamed passions, and this is not without its parallel in the inorganic world. If you heat a solid body, the force thus applied expends itself partly in raising the body's temperature, and partly in increasing the distances which separate the molecules and atoms. As the heat is continued this independent molecular activity increases until the force of cohesion is almost entirely overcome. The molecules begin to slide freely over one another, as in the liquid state, no longer keeping their relative positions. In this state they move not unlike a straying comet or wandering star, or a human being who allured by the charmer, is on the very verge of forsaking both consort and children. If the heat be further increased, the molecules grow wider and wider apart until they move about independently of one another, as they do in the gaseous state, where each tries to possess the whole territory for itself."

— Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds, pg. 184)

"But as in the case of young people, if you encourage their acquaintance, and make marriage appear a gain to both, wedlock will probably ensue; so in the case of the triturated iron and sulphur mixed together; if you heat this mixture the sulphur will be seen first to melt, like a young lady unable to withstand further the tears and groans of her lover; then the whole mass will blacken, if the temperature be sufficiently elevated; and after cooling the substance will be found to be perfectly homogeneous. No power now can discriminate the iron from the sulphur. Both have disappeared as such, having formed a new substance known as sulphide of iron."

— Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds, pg. 185)

Bray, next, gives what seems to be the first date polyhumanide molecule examples of molecular polygamy, as follows:

> "If now this sulphide of iron be allowed to remain in a damp atmosphere, an efflorescence will be seen to collect on its surface composed of a saline matter. The sulphide of iron has here attracted to its family-life certain other individuals. Like a sultan, or Abraham, Isaac, and Jacob of old; so the iron, not being content with one young damsel, takes to itself four others, fair as the moon in its fullness, in the persons of four atoms of oxygen from the air, forming what is known as green vitriol or sulphate of iron."
>
> — Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds, pg. 185-86)

(add)

Panbioism | Living atom

In the following we see Bray tentatively teetering on the panbioism fence, i.e. between living atom theory, the view that atoms are alive, and the defunct theory of life, the view that atoms are matter and force:

> "On this ground very many atomic phenomena, not otherwise easily explained, are capable of ready solution. And while we may not have conclusive scientific reason for regarding **atoms as living substances**, it is more certain still that **we are unable to say where life begins in the forces of nature**."
>
> — Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds III, pg. 182)

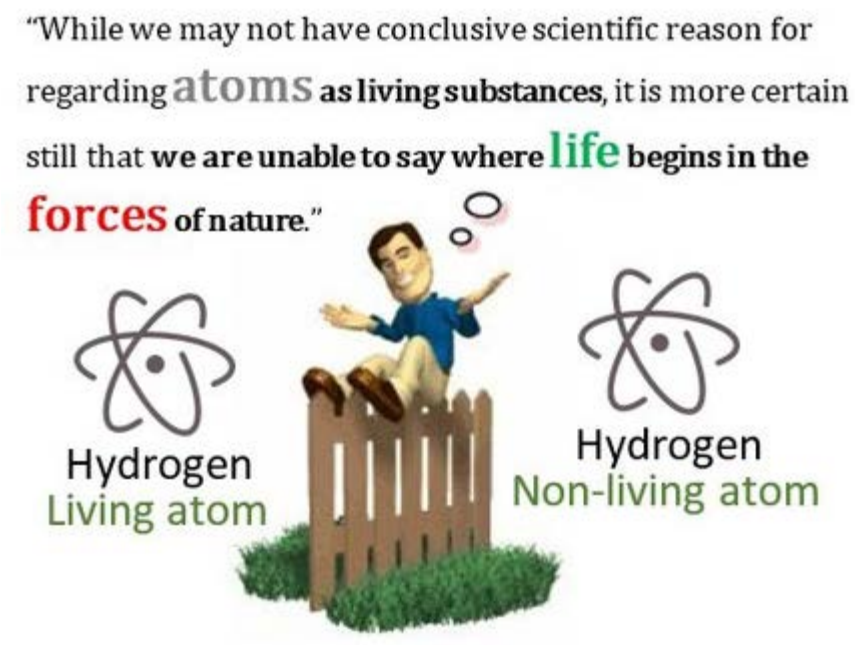

Bray shown fence sitting on whether atoms are alive [see: living atom]; by virtue of the paradoxical situation that he can't figure out where he came "alive" in the descent down the great chain of being in respect to the forces in nature and in atoms?

Earlier, go note, Bray gave the following view:

> "It is said the pure in heart see god. This saying is doubtless true. But he who has not eyes to see this god in the rippling brook, the sprouting seed, the budding tree, the suns that roll, or the hydrogen atoms, will look long ere he sees him elsewhere. I cannot doubt that one of the surest stepping-stones to a higher life, is the learning to love the beauties of nature as she displays them in her infinite variety of ever changing forms. The true student of nature sees in her not the dead thing which the unthoughtful imagine. Indeed, he is conscious that almost every form of power manifested by the highest human intelligence, is in some degree manifested by the most loathesome animalcule that we destroy without a thought of the wonderful powers shut up in this microscopic organism. As with the organic atom, so with the inorganic, — to the soul schooled to appreciate nature's revelations, nothing seems to be dead, nothing seems to be common."
>
> — Henry Bray (1910), *The Living Universe* (§6: Atomic and Molecular Worlds I, pg. 159)

Bray, in other words, jumps into the conclusion that the hydrogen atom is not a "dead thing", but rather has some type of life associated with it; albeit done so tentatively.

> "What is life may be subject of dispute; but it is far from true that we are no better able to answer this question to-day than last century. For ourselves we hold that life is immanent in substance; and we think it

> may be safely stated that modern science does not believe that it needs a truly organized structure for the manifestation of life. It is true we do not recognize **conscious stones**, nor conscious trees; but this does not prove that life is not universally diffused, and that the whole of nature is not indeed and in truth alive."
>
> — Henry Bray (1910), *The Living Universe* (pg. 204)

Later, Bray, in the opening of his §20: "Infinitesimal Architects, Builders, and Guardians" (pg. 266), in cites atom size estimates by: Josef Loschmidt (1865), Marc Gaudin (1866), and William Thomson (1867), he speculates on whether or not he is a fool or mad for positing that atoms are 'living', 'thinking', 'conscious' beings:

> "In considering the origin and manifestation of life, it would be foolish to suppose that a being with the very limited powers of man, could possibly discriminate between the manifestation of so-called dead force and so-called living [living force], when having under consideration objects of such infinitely small proportions. Because therefore man cannot see the muscles of an atom contract, or its lips articulating, or watch its organs perform their various functions, there is no reason for affirming that the atom is not a living being. When the thing itself is infinitely beyond the understanding of the greatest mind, it were only madness to suppose that we could know all its attributes and qualities. If I have affirmed, and if I believe that the atom is a thinking conscious being, it is not because I have scientifically demonstrated its intelligence or personality; but because of far higher reasons than those of physical science: I am a thinking conscious being; and whatever is in me, must be in the atom either actually or potentially, it matters not which."

Re: "therefore man cannot see the muscles of an atom contract", with the Bohr model (1913), wherein the "muscles of the atom" are explained in terms of photon inputs and outputs paired to electron orbital jumps and descents, respectively, and the Wald model (1958), wherein light induced molecular bending and straightening is explained (Q), according to which the "muscles of molecules" explained mechanistically, we are now able to "see" atomic or molecular contraction, thus we must reevaluate many of Bray's conjectures in the modern light, one of which is the conclusion that life does not exist, either in the atom or in man.

Organic | Inorganic

On organic vs inorganic, in respect to chemistry and life, Bray says (LU:273-74) the following:

> "Some years ago chemistry was divided into **inorganic and organic** branches, on the supposition that what is known as the life-principle was somehow a necessary factor in the formation of the organic compounds; but since very many of these compounds have been made, and are now daily making, in all the laboratories of the world, this supposed principle of differentiation has to be given up. Today organic chemistry is sometimes called, 'chemistry of the carbon compounds'; sometimes, 'chemistry of the hydro-carbons and their derivatives'. By whatever name one may call it, chemists no longer believe that organic chemistry is dependent on any so-called life principle for the formation of its compounds. Especially is this true since potassium cyanide [KCN], urea [CH_4N_2O], potassium formate [HCO_2K], and acetylene [C_2H_2] were formed by Wohler and Berthelot: and since in our own day carbon compounds exactly as they exist in the bodies of plants and animals are

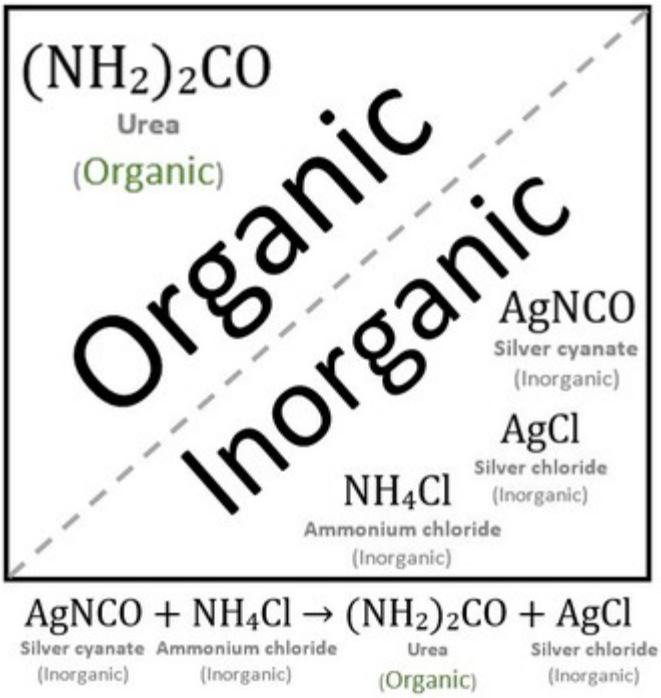

Friedrich Wohler's 1828 urea synthesis, which according to Bray "bridged the gap" between organic and inorganic or the "living and the dead" as Bray puts it.

prepared hourly with simply chemical means. Thus therefore the supposed chasm between the so-called living and the so-called dead **has been most certainly bridged** [compare: unbridgeable gap].”

We also recall the previous citation of Haeckel:

> “The idea of the unity of organic and inorganic nature is now firmly established. . . . All natural bodies which are known to us are equally animated, and the distinction which has been made between animals and inanimate bodies does not exist.”
>
> — Ernst Haeckel (1862), *The History of Creation* (pg. 22); in: *The Living Universe* (pg. 180)

(add discussion)

Atomic | Human affinities

Bray, in his §19: “Atomic and Human Affinities”, seems to strike gold. The following are the noted paragraphs from this thick chapter:

> “It may be said that all the changes that occur in the so-called material world are the result of chemical affinity; and in like manner that all the changes that occur in so-called higher life, are generally speaking the result of the attraction of the one sex for the other. Not a brick would be made, nor plank sawed, nor mortar mixed, nor shingle cut, not tent pitched, nor wheel turned, nor axle oiled, nor fire built, nor exertion seen, nor hope expressed, were it not for the fact of the mutual longing of the sexes for each other. Analyze thoroughly human activities, and you will find that the final cause of all endeavor is the realization of those relations to which the sexual instinct is ever turning.”
>
> — Henry Bray (1910), *The Living Universe* (pg. 257)

CHAPTER XIX

ATOMIC AND HUMAN AFFINITIES

IT may be said that all the changes that occur in the so-called material world are the result of chemical affinity; and in like manner that all the changes that occur in so-called higher life, are generally speaking the result of the attraction of the one sex for the other. Not a brick would be made, nor plank sawed, nor mortar mixed, nor shingle cut, not tent pitched, nor wheel turned, nor axle oiled, nor fire built, nor exertion seen, nor hope expressed, were it not for the fact of the mutual longing of the sexes for each other. Some may question this statement, and in disproof refer to the efficient work of celebate priests and monks; but in answer I would reply that such reference is no more disproof of my statement than to adduce the fact that a child born with three legs and three arms would be a disproof of the statement that man is a bibrachial animal. Monstrosities whether celebates or three-legged children are not natural, not according to law; they therefore can not be adduced in disproof of the truth of statements based on natural law. Not only is the statement in regard to the sexes theoretically true, but the evidence is ever before us of its unquestionable truth experimentally. Analyze thoroughly human activities, and you will find that the final cause of all endeavor is the realization of those relations to which the sexual instinct is ever turning. With more poetry and less of truth, we may say that the final cause of human endeavor is the hearthstone, and the little ones for whom its bright beams are radiated. Not only is humanity driven hither

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Bray's §19: “Atomic and Human Affinities”, wherein he begins to get into the meat of his discussion; an equivalent modern title would be “Atomic and Human Free Energies”, being that affinity and free energy are equivalent, via the Goethe-Helmholtz equation.

The following is a comparison of the strength of the respective bonding affinities between oxygen and hydrogen as compared to nitrogen to human marriages held-together unwillingly:

> “We often hear today of family ties severed because of the appearance in the family circle of ‘affinities’; and although such severance must frequently give pain to the party forsaken, and bring evil to the progeny, if there be such, it nevertheless remains a fact that where freedom of action is permissible such severance is unavoidable. This is paralleled in the case of the atoms.
>
> Oxygen has a stronger affinity for hydrogen than for nitrogen. Indeed it seems almost to hate the latter,

even though by force of circumstances united with it. We often see this condition manifested in family life. Men and women are driven frequently to marry by the force of circumstances, men because of their passions, women for the sake of having a home. Seldom is the tie, thus formed, willingly preserved unbroken.

In general, formed without thought, or for an unworthy end, the tie is snapped asunder, and the parties to it assume their former individual liberty. It cannot be denied that as one element has greater attraction for one than for another; so one man or woman may have greater attraction for one person of the opposite sex than for another; nor can it be denied that when this attraction, this natural inclination, is fully satisfied or fully reciprocated, the union is more agreeable and lasting.

Artificial rules, legal restraint, may force compliance with undesired conditions, or hold together those unwillingly bound or hating their yoke; but only nature can keep the opposite sexes willingly, gladly, and permanently united. The mutual love of the opposite sexes is rational and proper, as it is also the strongest and most irrepressible of all animal forces."

The following is a ripe statement on both thought experiment and regards terminology:

> "We have said that all earthly changes and developments are the results of the mutual love of the sexes; but we can with equal certainty affirm that all chemical changes occurring in the world are the result of chemical affinity. In this case we use a word to express atomic attraction that sometimes straying lovers use to express the object of their illicit longings. That the word should be admissible in the one activity and forbidden in the other, is not natural to say the least.
>
> If three persons stand side by side, two married and the third single, the fact that two are wedded will not prevent them disregarding their wedlock, if the third party has the natural affinity requisite for separating them, provided that the parties are allowed complete freedom of action."

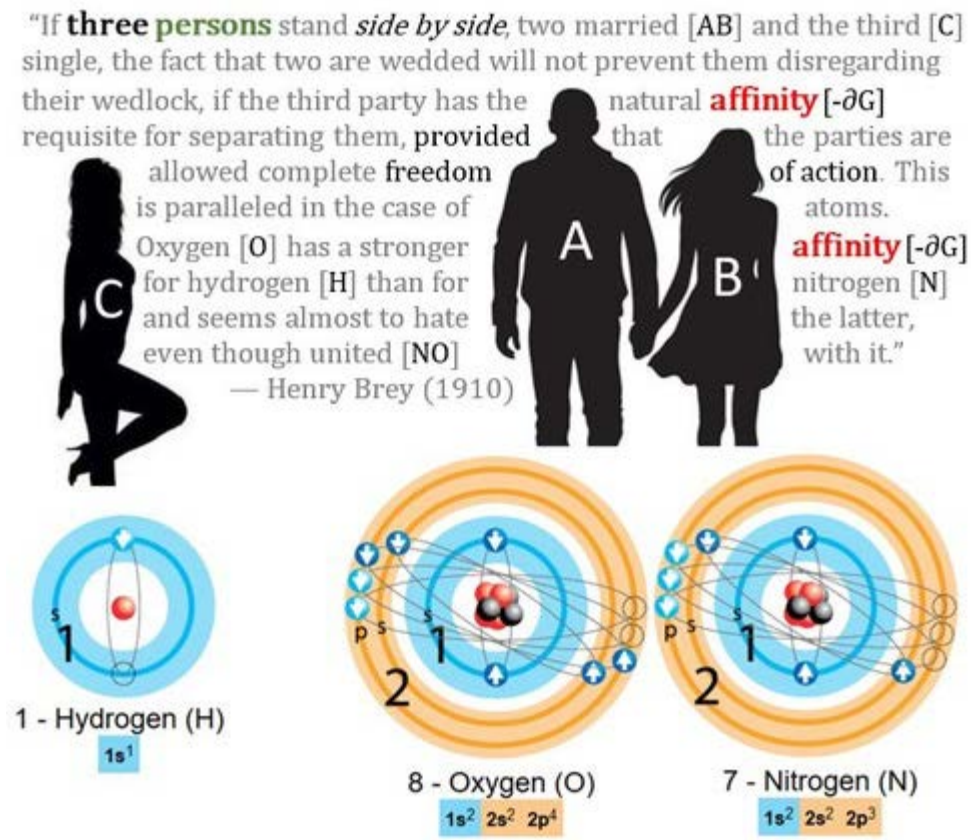

Bray's oxygen=nitrogen + hydrogen comparison to unwilled married couple plus single person, from his §19: "Atomic and Human Affinities" (pgs. 258-59), wherein, in short, he states that oxygen O bonded to nitrogen N, i.e. nitric oxide NO, owing to "circumstances" could be similar to a "man and woman driven to marry by the force of circumstances", in which "seldom is the tie, thus formed, willingly preserved unbroken", according to which if hydrogen H, which has a "stronger affinity for oxygen than for nitrogen", is introduced into the system, the laws of force will prevail, and oxygen (or male A) will detach from nitrogen (or female B) and attach to hydrogen (or female C). In modern terms, nitrogen oxide reacts with hydrogen to form nitrogen and water vapor, via the following reaction: (Q)

$$2NO(g) + 2H_2(g) \rightarrow N_2(g) + 2H_2O(g)$$

The scenario that plays out in Dr. Zhivago (1965) seems to be the classic example of what Bray is getting at:

Thus, Bray says, “If **three persons stand side by side**, two married and the third single, the fact that two are wedded will not prevent them disregarding their wedlock, if the third party has the natural affinity requisite for separating them, provided that the parties are allowed complete freedom of action.”

Bray then talks about "liberty of choice", as follows:

> “Indeed, I am convinced from my knowledge of men and women, based on very extensive observations, and very wide relations, that were complete liberty of choice allowed in their intercourse one with another, no more than one in ten of those married would choose to continue their former relations rather than select new companions.”

Next, humans, he says, may make laws as they please, but such laws can only suppress nature so far:

> “Think as we may, make what laws we please, we may suppress nature in these matters; but feelings repressed, and eruptive longings we cannot altogether hide, however much we would escape censure, or spare the feelings of others.

This brings to mind the fall of communism; forced marriages; slavery; homosexual illegality; among others. Next we get into ripe love terminology upgrade, as follows:

> “Similar forces to those that thus bring together the opposite sexes are everywhere evident and acting in the so-called material world, and in the judgment of the writer, equally natural and all-conquering. In our conceit and blindness we call the one force ‘love’, and the other force ‘affinity’; but mere alteration of words cannot alter the fact that the two words are the expression of the same force in nature.”

In this sense, we would say that "love", in colloquial terminology, equates to positive affinity (or negative Gibbs energy change) in scientific terminology, and that "hate", likewise, corresponds to negative affinity (or positive Gibbs energy change), in scientific terms, i.e. physicochemcially-neutral language.

Love | Terminology reform

The following is Bray’s discourse on love

> “If we ask what is love, we can answer only as we answer the question what is chemical affinity. In the

former case it is the mutual attraction and longings of the opposite sexes of human adults, which when according to nature bring them and hold them together; in the latter case it is the mutual attraction (and probably longings) of atoms, which being natural unites, and binds them together with the strongest ties known to natural law. Whatever mystery is involved in the one case, is in like manner involved in the other."

Prior to this, to note, he defines hate as a "repelling force". Then, to address skeptics, he states the following:

> "The skeptic may say, 'But in man and woman there are feeling and consciousness, while in the case of atomic affinity there is neither.' I answer, you speak carelessly, unscientifically, without knowledge. How do you know there is no feeling nor consciousness with the atoms? Have you asked them?"

This, of course, is the 'extrapolate down' objection intermixed with unbridgeable gap notions. Bray then, humorously, employs the 'extrapolate up' rebuttal, as follows:

> "Have you been able to make yourself one of them in order to study their modes and activities, as sometimes man does, when trying to learn of the habits and manners of obscure and less civilized tribes? Has the atom not the same right to deny that man has either consciousness or feeling, because it has never witnessed its exhibition?"

This, firstly, reminds of how many in the 1890s argued, via anthropomorphism, that animals, plants, and protoplasmic substances moved towards a light source because of "curiosity"; which is why in 1888 Jacques Loeb, in his "The Orientation of Animals to Light", introduced his tropism theory or forced movement theory of action to remedy or disprove these anthropomorphic arguments. [7]

This, secondly, gets into the premise that the correct solution, as Charles Sherrington pointed out, is to deanthropomorphize any and all baseless notions about ourselves, e.g. feelings and consciousness, rather than to continue to anthropomorphize atoms and molecules with human-based conceptions; which, in short, is what is called "deanthropomorphic terminology reform", some of which Bray interjects on (see: love terminology upgrades), the majority of which amounts to perceptual confusion, similar to the way we say, in colloquial speak, "sun set" or "sun rise", even though, technically, say if asked on a test, we would say that this is flat earth language, and employ terms that refer to earth surface rotation "towards" and "away" from the sun, respectively.

God | Intelligent force

The following seems to be Bray's "god as force" (or god via force) model:

> "As bodies they act and interact, pass and repass, attract and repell, shun the society of some and seek that of others; and they build up, and as far as mortal man can know, keep in order the system to which they belong, as if their little cosmos were presided over, as we believe it is, by intelligent forces [see: higher power]."
>
> — Henry Bray (1910), *The Living Universe* (pg. 203)

(add)

Education

In 1862, Bray, at age 16, came to America; matriculated and in 1871 did first years work in Northwestern University, and in 1875 completed his BA at the University of Toronto. In 1877, Deacon became a priest and in 1879 began preaching in various churches in America. In this period, he completed theological degrees, namely: 1878, LL.B., 1883: B.D., Drew Theological Seminary, Madison, N.J., 1876; LL.B., Univ. of Michigan, 1883. In 1878, Bray was the main priest of Union Colony of Colorado, but sometime thereafter, circa 1880, he left the colony forcibly or by his own accord, owing to the radicalness of his religious views. [6] In circa 1883, Bray was deposed from the Church for his monism writings. In 1885, Bray completed his LLD at the University of Toronto, and his MD in 1902 at the Hahnemann Medical College, Chicago, specializing in homeopathy. (Q)

In 1910, Bray, in his "Preface", to *The Living Universe*, compares himself to Socrates, and states that he obtained a total of six degrees to justify the polymath-geared venture into the subject at hand:

> "It is not at all probable that the author will ever write another book; nor would he be inclined to publish this, did he not feel that he owes it to the world. Socrates told the court that he was moved by the indwelling spirit to teach as he had taught; and thousands of others before and since have felt compelled to give utterance to thoughts not altogether originating in themselves. Without professing to have said the final word on the subjects concerning which the arguments and theories in this book are made, being a hard student and having been one all his life, and in addition to his natural love of study and assiduity in prosecuting it, having had a broader and more varied experience than but a few of his kind, and completed full courses in medicine, law, divinity, science and arts, and philosophy, receiving no less than **six degrees** from such well-known institutions of learning as Victoria University, Toronto University, Michigan University, Drew Theological School, and Hahnemann Medical College, Chicago, the author feels he is, and believers that the reader should consider him, comparatively well conversant with the subjects here investigated; and he does not doubt that the conclusions drawn from his life's studies and experience, and carefully set down in these pages, will stand the test of all true scholarship of the present, and be increasingly approved in the future."
>
> — Henry Bray (1910), *The Living Universe* (Preface, pgs. 5-6)

Here we compare this credentiality statement to that of George Scott who, like Bray, cites Socrates and monism, and states similarly that the problem, i.e. "monism degree problem" (or credentiality problem), requires, not six, but 7-8 degrees, at the graduate school level, one degree being in physical chemistry (or equivalent):

> "Since my name is not Socrates or Einstein and I hold only one of the **seven or eight PhD degrees** this problem requires, readers are quite justified in questioning my qualifications to testify as such a multidisciplinary expert."
>
> — George Scott (1985), mini-introduction (pg. viii) to *Atoms of the Living Flame*

(add)

Quotes | Employed

The following are other quotes employed:

> "The universe has its definite store of force which works in it under ever varying forms; is indestructible, not to be increased, everlasting and unchangeable like matter itself."
>
> — Hermann Helmholtz (c.1870), in: *The Living Universe* (pg. 14)

> “The heat annually received on each square foot of the earth’s surface, if employed in a perfect heat engine, would hoist sixty tons to the height of a mile.”
>
> — Charles Young (1889), *General Astronomy* (pg. 218); in: *The Living Universe* (pgs. 16-17)

Fate | Chance

The following are Bray quotes on fate and or chance:

> “The scientist does not behold in nature what the poet does. He sees no blind chance, no miracles, no fate, unless you call perfection by that name.”
>
> — Henry Bray (1910), *The Living Universe* (pg. 216)

> “Neither fate nor chance is found, but everywhere law and harmony, that make the mighty cosmos one.”
>
> — Henry Bray (1910), *The Living Universe* (pg. 226)

(add)

Term | Analysis

See main: Social Newton term analysis

The following, noting Bray’s pre 1923 Lewis-mediated free energy supplantation of affinity terminology switch position, shows the key term usage count:

Scientific terms	Religious terms	Elements	Metaphysical
Force (Q) | 100+ Matter (Q) | 100+ Atom (Q) | 78+ Work (Q) | 75+ Motion (Q) | 61+ Molecule (Q) | 46+ Heat (Q) | 45+ Chemical (Q) | 31+ Energy (Q) | 30+ Affinity (Q) | 14+ Affinities (Q) | 10+ Electricity (Q) | 5+ Mechanical (Q) | 5+ Bond (Q) | 1+	Life (Q) | 100+ God (Q) | 82+ Death (Q) | 73+ Soul (Q) | 52+ Spirit (Q) | 22+	Hydrogen (Q) | 38+ Iron (Q) | 23+ Oxygen (Q) | 20+ Carbon (Q) | 13+ Sulphur (Q) | 8+ Nitrogen (Q) | 7+ Phosphorus (Q) | 4+ Calcium (Q) | 3+ etc.	Love (Q) | 29+ Ether (Q) | 22+ Hate (Q) | 4+

The terms: "thermodynamics", "entropy", and "reaction", to note, are not employed by Bray.

Quotes | On

The following are quotes on Bray:

“It will no doubt be interesting to others besides Episcopalians to know that **Henry Bray** has become an author since leaving here and of the most pronounced radical type. His great ability and still greater aggressiveness will be remembered. When here he was a high-church-man of the narrowest type. The apostolic succession of priests, or rather bishops, of the English church was a position he was ready to defend against all comers. But he was well read in both modern science and philosophy. These seem at length to have got the better of his Athanasian theology, and historical criticism has upset his former views upon miracles and the Christian evidences. It appears that he is now out of the church, whether driven out or gone of his own accord we are not informed. Still the church that can still keep within its communion and priesthood Heber Newton ought to have a place for Henry Truro Bray if he wished to remain.”

— David Boyd (1890), *A History of Greeley and the Union Colony of Colorado* [5]

“Until 1888, **Henry Bray** imposed his theological views, which were not favorably accepted by the congregation. However, before he departed, he married Miss Mary Wormald, a member of the Boonville parish. Several years later he asked the bishop to depose him because his views were no longer in accordance with the teachings of the Episcopal Church.”

— Anon (c.1890), "Memorabilia of Cooper County" [6]

Quote | By

The following are quotes by Bray:

“One should [strive to] distinguish true riches from mere possessions, whether of gold or of cattle on a thousand hills, who although born onward by their fellows in the latter’s mad rush and senseless strife for position, fame, or wealth, never cease to point out the shadowy, delusive, and debasing nature of that.”

— Henry Bray (1910) “Dedication”, in *The Living Universe* (pg. 3)

“As in temperate zones civilization best flourishes, so chemical union is most active with no extremes of temperature. With excessive heat atomic individuality is excessively asserted; with excessive cold the atomic freedom is almost swallowed up in its servile subjection to molecular power.”

— Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds, pg. 186)

“Without any doubt death is a part of the order of nature, and therefore a real good, whether it be the end of man's individuality, his metempsychosis, his change into some other form of being, or his entrance, as some believe, into a glorious immortality.”

— Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds, pg. 187)

“The thinking man is not unfrequently moved with a burning desire to know what nature has in store for him.”

— Henry Bray (1910), *The Living Universe* (pg. 213)

> "Aristotle, the greatest of all minds, tells us that it is through wonder men begin to philosophize, at first trying to unfold the more readily explicable, afterwards proceeding to the more difficult: the philosopher may therefore be considered a wise fool; for he who wonders at things, finding himself at a loss to explain the phenomena, is called ignorant."
>
> — Henry Bray (1910), *The Living Universe* (pg. 351)

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(b) Bray, Henry T. (1910). *The Living Universe* (disposed, pg. 176). Truro Publishing Co, 1920.
5. (a) Boyd, David. (1890). *A History of Greeley and the Union Colony of Colorado* (pgs. 291-92). Greeley Tribune Press.
(b) Thomas Henry Truro Bray (1846-1922) – Adupree.com.
6. (a) Anon. (c.1890). "Memorabilia of Cooper County", Christ's Church Episcopal, 4th and Vine Streets, Boonville, Missouri.
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External links

- Henry Truro Bray – Genealogy.com.

θΔics

In existographies, **Henry Buckle** (1821-1862) (IQ:175|#213) (GHE:3) (PL:21,000) (CR:34) was an English historian noted, in social physics, for his Comte + Bacon style inspired *History of Civilization in England*, published as volume one (1857) and volume two (1861), wherein he expounds on a strong physical science based positivism view of the history of civilization; oft-characterized as the "Hari Seldon of the 19th century".

Overview

In 1857, Buckle, in penning his *History of Civilization in England*, was focused on solving the question of whether the actions of people operate by (a) fixed laws, (b) chance, or (c) supernatural interference, via physical science means, i.e. strong positivism. The solution he advocates is summarized by the following paraphrased aggregate quote: [8]

> "The actions of men are in reality never inconsistent, but however capricious they may appear only form part of one vast system of universal order."

Buckle includes sections such as "probable origin of free will and predestination" and uses statistics to argue that human actions, in the course of history, show a certain regularity, being governed by mental and physical laws, both undergirded by the natural sciences.

Actions | Three types | Determinism

The following is Buckle's division of human actions into three types: [1]

> "The **actions of men** are caused by their antecedents, which exist either in the human mind or in the external world."
>
> — Henry Buckle (1957), *History of Civilization, Volume One* (pg. v)

This scheme of Buckle, according to according to Morris Zucker (1945), resolves the actions of people as a function or register of the external material forces (see: external force; internal force), and to a "double action" of the mind. [5] Buckle's states his view as follows:

> "Rejecting, then, the metaphysical dogma of free will, and the theological dogma of predestined events, we are driven to the conclusion that the **actions of men, being determined solely by their antecedents**, must have a character of uniformity, that is to say, must, under precisely the same circumstances, always issue in precisely the same results. And as all antecedents are either in the mind or out of it, we clearly see that all the variations in the results—in other words, all the changes of which history is full, all the vicissitudes of the human race, their progress or their decay, their happiness or their misery—**must he the fruit of a double action; an action of external phenomena upon the mind, and another action of the mind upon the phenomena**."
>
> — Henry Buckle (1857), *The History of Civilization, Volume One* (pg. 14-15)

To continue:

> "The **actions of men** are by an easy and obvious division separated into two classes, the

The "actions of people", according to **Buckle**, can be divided between [A] "vituous actions" and [B] "vicious actions", and, according to some opinion, a third class [C] "indifferent actions".

[A] **virtuous** and the [B] **vicious**; and as these classes are correlative, and when put together compose the total of our moral conduct, it follows that whatever increases the one, will in a relative point of view diminish the other; so that if we can in any period detect a uniformity and a method in the vices of a people, there must be a corresponding regularity in their virtues; or if we could prove a regularity in their virtues, we should necessarily infer an equal regularity in their vices; the two sets of actions being, according to the terms of the division, merely supplementary to each other. Some moralists have also established a third class of actions, which they call [C] **indifferent**, as belonging neither to virtue nor to vice; and hence there arose the famous doctrine of probability, set up by several eminent Romish casuists, and hotly attacked by Pascal. But this, if we put aside its worst feature, namely its practical bearings, is merely a question of definition inasmuch as **every indifferent act must lean on the side either of evil or of good**, and may therefore be referred to the category to which it inclines; and certainly every increase of vice diminishes virtue relatively, though not always absolutely. Or, to express this proposition in another way, it is evident that if it can be demonstrated that the bad actions of men vary in obedience to the changes in the surrounding society, we shall be obliged to infer that their good actions, which are, as it were, the residue of their bad ones, vary in the same manner; and we shall be forced to the further conclusion, that such variations are the result of large and general causes, which, working upon the aggregate of society, must produce certain consequences, without regard to the volition of those particular men of whom the society is composed."

— Henry Buckle (1957), *History of Civilization, Volume One* (pgs. 16-17)

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Parallelogram of forces

The following is Buckle's extrapolation of the parallelogram of forces model scaled up to conceptualize a similar moral social law order: [1]

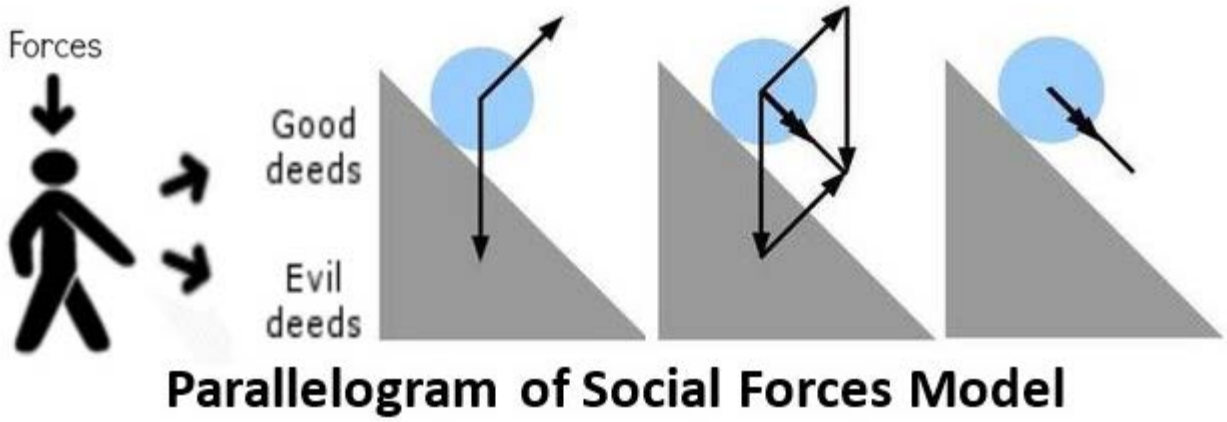

A parallelogram of forces model (Ñº), showing the addition of the force normal, directed perpendicular to the plane plus the gravitational force, directed downward, which yields the "resultant force", directed in a downward parallel to the plane direction, the latter of which being the "go force" of the person, which Buckle says can be used to explain what he calls the "great social law", namely that moral actions of men are the product not of their volition, but of their antecedents, or component forces.

"Those readers who are acquainted with the manner in

which in the physical world the operations of the laws of nature are constantly disturbed, will expect to find in the moral world disturbances equally active. Such aberrations proceed, in both instances, from minor laws, which at particular points meet the larger laws, and thus alter their normal action. Of this, the science of mechanics affords a good example in the instance of that beautiful theory called the parallelogram of forces; according to which the forces are to each other in the same proportion as is the diagonal of their respective parallelograms. The diagonal always giving the resultant when each side represents a force, and if we look on the resultant as a compound force, a comparison of diagonals becomes a comparison of compounds.

This is a law pregnant with great results; it is connected with those important mechanical resources, the composition and resolution of forces; and no one acquainted with the evidence on which it stands, ever thought of questioning its truth. But. the moment we avail ourselves of it for practical purposes, we find that in its action it is warped by other laws, such as those concerning the friction of air, and the different density of the bodies on which we operate, arising from their chemical composition, or, as some suppose, from their atomic arrangement. Perturbations being thus let in, the pure and simple action of the mechanical law disappears. Still, and although the results of the law are incessantly disturbed, the law itself remains intact.

Just in the same way, the great social law, that the moral actions of men are the product not of their volition, but of their antecedents, is liable to disturbances which trouble its operation without affecting its truth. And this is quite sufficient to explain those slight variations which we find from year to year in the total amount of crime produced by the same country. Indeed, looking at the fact that the moral world is far more abundant in materials than the physical world, the only ground for astonishment is, that these variations should not be greater; and from the circumstance that the discrepancies are so trifling, we may form some idea of the prodigious energy of those vast social laws, which, though constantly interrupted, seem to triumph over every obstacle, and which, when examined by the aid of large numbers, scarcely undergo any sensible perturbation."

— Henry Buckle (1857), *The History of Civilization, Volume One* (pg. 22-23)

In 2010, Libb Thims, in his chapter "Thermodynamic Philosophy of Evolution", outlined a similar "resultant of forces" acting on a person model, using the example of a person driving to a destination in Chicago. [6]

Religion | Atheism

Buckle was a great fan of Voltaire, a deist leaning atheist, and Comte, an atheist, but was averse to the open direct atheism of Holbach, referring to atheism as a "cold and gloomy dogma"; the specific quotes are as follows:

"Between 1758 and 1770, atheistical tenets rapidly gained ground; and in 1770 was published the famous work, called the *System of Nature;* the success, and, unhappily, the ability of which, make its appearance an important epoch in the history of France. Its popularity was immense; and the views it contains are so clearly and methodically arranged, as to have earned for it the name of the code of atheism. Five years later, the Archbishop of Toulouse, in a formal address to the king on behalf of the clergy, declared that atheism had now become the prevailing opinion.'

— Henry Buckle (1856), *History of Civilization, Volume One* (pg. 620)

"Among the inferior class of writers, Damilaville, Deleyre, Marechal, Naigeon, Toussaint, were active supporters of that cold and gloomy dogma, which, in order to extinguish the hope of a future life, blots out from the mind of man the glorious instincts of his own immortality.74 And, strange to say, several even of the higher intellects were unable to escape the contagion. Atheism was openly advocated by Condorcet, by D'Alembert, by Diderot, by Helvetius, by Lalande, by Laplace, by Mirabeau, and by Saint Lambert." Indeed, so thoroughly did all this harmonize with the general temper, that in society men boasted of what,

in other countries, and in other days, has been a rare and singular error, an eccentric taint, which those affected by it were willing to conceal.'

— Henry Buckle (1856), *History of Civilization, Volume One* (pg. 620-21)

"In 1764 Hume met, at the house of Baron d'Holbach, a party of the most celebrated Frenchmen then residing in Paris. The great Scotchman, who was no doubt aware of the prevailing opinion, took occasion to raise an argument as to the existence of an atheist, properly so called; for his own part, he said, he had never chanced to meet with one. "You have been somewhat unfortunate," replied Holbach; "but at the present moment you are sitting at table with seventeen of them.".'

— Henry Buckle (1856), *History of Civilization, Volume One* (pg. 620)

(add)

Influence

Buckle's *History of Civilization in England* was read not only by James Maxwell and Ludwig Boltzmann, as summarized below, but also by Charles Darwin, Alfred Wallace, and Fyodor Dostoyevsky (twice). [11]

Boltzmann | Maxwell

Both James Maxwell and Ludwig Boltzmann, according to Phillip Ball (2004), were influenced by Buckle in respect to the conceptual model of the kinetic theories of gas and statistical views of the behaviors of molecules, in the sense of thinking about gas molecules statistically, the way Buckle thought about populations of humans statistically; the following are representative quotes:

"One night I read 160-pages of **Buckle**'s *History of Civilization*—a bumptious book, strong positivism, emancipation from exploding notions and that style of thing, but a great deal of actually original matter, the result of fertile study, and not mere brainspinning."

— James Maxwell (1857), "Letter to Lewis Campbell" [2]

"Those uniformities which we observe in our experiments which quantities of matter containing millions of molecules are uniformities of the same kind as those … wondered at by **Buckle**."

— James Maxwell (1873), *Publication* [3]

"Molecules are like to many individuals, having the most various states of motion, and the properties of gases only remain unaltered because the number of these molecules which on average have a given state of motion is constant."

— Ludwig Boltzmann (1872), "Further Studies on the Thermal Equilibrium of Gas Molecules" [2]

"As is well known, **Buckle** demonstrated statistically that if only a sufficient number of people are taken into account, then not only is the number of natural events like death, illness, etc., perfectly constant, but also the number of so-called voluntary

actions—marriages at a given age, crimes, and suicides. It occurs no differently among molecules."

— Ludwig Boltzmann (1886), "The Second Principle of the Mechanical Theory of Heat" [4]

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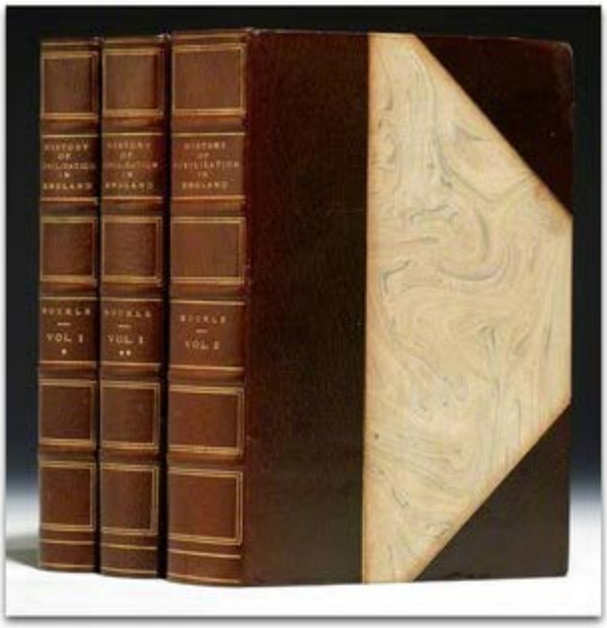

A two volumes bound as three set of **Buckle's** *History of Civilization in England*, described as Buckle's sole major work—still unfinished at his death—popularized, against the "great men" theory posited by Carlyle, "the belief in the possibility of applying scientific treatment to historical problems." (Ñº)

Education

Buckle, as a child, supposedly, had delicate health, was characterized a "slow learner", and was educated by a private tutor; the following is a synopsis

"Buckle was another of the 19th century's most curious characters. Born near London in 1821, he was a slow learner as a child. When he was 18 his father, a maritime merchant, died, leaving the son sufficient funds to tour Europe and pursue his hobbies of his-tory and chess. Buckle became a formidable chess player and learned several foreign languages, becoming fluent in seven and conversant in a dozen others. He also became a prolific bibliophile, amassing a library exceeding 20,000 books."

— Tom Siegfried (2006), *A Beautiful Math* (pg. 137)

In 1840, Buckle, age 18, at age 18, saw the passing of his father, a wealthy shipowner, died (de-existed), leaving him with ample fortune and a large library, after which he devoted his time to study and travel. [12] In 1842, onward, Buckle began compiling data and evidence for a comprehensive treatise on history, originally planning to focus on the history of the middle ages, expanding to a "history of civilization" in generally, in the late 1850s. [8] Buckle also published, in his miscellaneous works (Ñº), his fragment views on "mere education" as propitiated in various countries.

Reaction end

In 1861, Buckle, aged 40, while traveling in Damascus, caught typhus, but refused the services of a local physician, because the man was French, and de-existed therein (died; dereacted). [11]

Quotes | Employed

The following are quotes employed by Buckle:

"The incoherent compilation of facts is already improperly qualified as history."

— Auguste Comte (1842), *Positive Philosophy, Volume Five* (pg. 18); cited by Henry Buckle (c.1861) in *History of Civilization in England, Volume One* [2nd London Edition] (pg. 4)

"I cordially subscribe to the remark of one of the greatest thinkers of our time [Mill (1848)], who says of the supposed differences of race, 'of all vulgar modes of escaping from the consideration of the effect of

social and moral influences on the human mind, the most vulgar is that of attributing the diversities of conduct and character to inherent natural differences' [*Principles of Political Economy, Volume One* (pg. 390)]."

— Henry Buckle (1857), *History of Civilizations, Volume One* (pg. 29)

Quotes | On

The following are about or related quotes:

"If you want to read an interesting and most masterly book get the first volume of **Buckle**'s *History of Civilization in England*? Although he may not be correct in all points, it is most clever — and *the* book of the age — holding science and scientific method so high, and applying them to the study of history. There will soon be a revolution in public opinion regarding science — it will — I hope in our time too — come to be considered as the true basis of knowledge, and looked upon in a very different light from what it has been or still is. There is certainly that one comfort about being of a scientific turn, that one feels that one is ahead of the crowd, helping, however feebly, the coach forward; and this will soon be acknowledged on all hands. This book of Buckle's is a symptom of the coming time. Everyone interested in the welfare of science should read it."

— H.E. Roscoe (1858), "Letter to Stanley Jevons" (Ñº)

"Both **Buckle** and Henry Adams were convinced that to develop the laws of historical movement, it would be necessary to study its phenomena in comparative freedom from extraneous influences."

— Morris Zucker (1945), *The Philosophy of American History: Periods in American History* [10]

"**Buckle** has been referred to as the 'Hari Seldon' of the 19th century."

— Tom Siegfried (2006), *A Beautiful Math* (pg. 137)

"English historian **Henry Buckle** (1821-62) was born into the family of a wealthy London merchant. A child of delicate health, and tutored privately at home, he never attended university. Nevertheless, it was clear that he was meant for intellectual pursuits and by the age of twenty he was a formidable chess player. With his love of books and reading, he set out on an ambitious plan to write a fourteen-volume history of civilization, and at the same time to put historical research on a more scientific basis. The work would have included a greater number of countries, but due to his early death, only two volumes exist."

— Anon (2011), "Book Abstract" (Ñº), Cambridge University Press, Dec 8

Quotes | Volume One | By

The following are quotes by Buckle from volume one:

"Human actions have regularity and these actions are governed by mental and physical laws; therefore, both sets of laws must be studied, and there can be no history without natural sciences."

— Henry Buckle (1861), *The History of Civilization, Volume One* (pg. v)

“The unfortunate peculiarity of the ‘history of man’ is, that although its separate parts have been examined with considerable ability, **hardly anyone has attempted to combine them into a whole** [compare: Faustian], and ascertain the way in which they are connected with each other. In all the other great fields of inquiry, the necessity of generalization is universally admitted, and noble efforts are being made to **rise from particular facts in order to discover the laws by which those facts are governed**. So far, however, is this from being the usual course of historians, that among them a strange idea prevails, that their business is merely to relate events, which they may occasionally enliven by such moral and political reflections as seem likely to be useful. According to this scheme, any author who from indolence of thought, or from natural incapacity, is unfit to deal with the highest branches of knowledge, has only to pass some years in reading a certain number of books, and then he is qualified to be an historian; he is able to write the history of a great people, and his work becomes an authority on the subject which it professes to treat. **The establishment of this narrow standard has led to results very prejudicial to the progress of our knowledge.** Owing to it, historians, taken as a body, have never recognized the necessity of such a wide and preliminary study as would enable them to grasp their subject in the whole of its natural relations. Hence the singular spectacle of one historian **being ignorant of** political economy; another knowing nothing of law; another nothing of ecclesiastical affairs and changes of opinion; **another neglecting** the philosophy of statistics, and another **physical science**; although these topics are the most essential of all, inasmuch as they comprise the principal circumstances by which the temper and character of mankind have been affected, and in which they are displayed. These important pursuits being, however, cultivated, some by one man, and some by another, have been isolated rather than united: the aid which might be derived from analogy and from mutual illustration has been lost; and no disposition has been shown to concentrate them upon history, of which they are, properly speaking, the necessary components.”

— Henry Buckle (1657), *History of Civilization, Volume One* (pg. 3)

“In the whole literature of Europe there are not more than three or four really original works which contain a ‘**systematic attempt**’ [compare: Adams creed] to investigate the history of man according to those exhaustive methods which in other branches of knowledge have proved successful, and by which alone empirical observations can be raised to scientific truths. Scarcely any thing has been done, accordingly, towards **discovering the principles which govern the character and destiny of nations**.”

— Henry Buckle (1657), *History of Civilization, Volume One* (pg. 4); *Volume One* [3-vol set] (pg. 5)

“I hope to accomplish for the history of man something equivalent, or at all events analogous, to what has been effected by other inquirers for the different branches of natural science. In regard to nature, events apparently the most irregular and capricious have been explained, and have been shown to be in accordance with certain fixed and universal laws. This has been done because men of ability, and, above all, men of patient, untiring thought, have studied natural events with the view of discovering their regularity: and if human events were subjected

A video still (Ñº) of **Buckle's collected works** in seven volumes, comprising: England (2 volumes), Life (2-volumes), and Miscellaneous (3-volumes).

to a similar treatment, we have every right to expect similar results."

— Henry Buckle (1657), *History of Civilization, Volume One* (pg. 5)

"This expectation of discovering regularity in the midst of confusion is so familiar to scientific men, that among the most eminent of them it becomes an article of faith; and if the same expectation is not generally found among historians, it must be ascribed partly to their being of inferior ability to the investigators of nature, and partly to the greater complexity of those social phenomena with which their studies are concerned."

— Henry Buckle (1657), *History of Civilization, Volume One* (pg. 5)

"And as to the greater complexity of the phenomena, the philosophic historian is opposed by difficulties far more formidable than is the student of nature; since, while on the one hand, his observations are more liable to those causes of error which arise from prejudice and passion, he, on the other hand, is unable to employ the great physical resource of experiment, by which we can often simplify even the most intricate problems in the external world. It is not, therefore, surprising that the **study of the movements of man** should be still in its infancy, as compared with the advanced state of the **study of the movements of nature**. Indeed, the difference between the progress of the two pursuits is so great, that while in physics the regularity of events, and the power of predicting them, are often taken for granted even in cases still unproved, **a similar regularity is in history not only not taken for granted, but is actually denied**."

— Henry Buckle (1857), *History of Civilization in England, Volume One* (pg. 6); *Volume One* [3-vol set] (pg. 7)

"We shall thus be led to one vast question, which indeed lies at the root of the whole subject, and is simply this: are the actions of men, and therefore societies, governed by fixed laws, or are they the result of either chance or of supernatural interference? For, in reference to this matter, there are two doctrines, which appear to represent different stages of civilization. According to the first doctrine, every event is single and isolated, and is merely considered as the result of a **blind chance**. This opinion, which is **most natural to a perfectly ignorant people**, would soon be weakened by that extension of experience which supplies a

knowledge of those uniformities of succession and of co-existence that nature constantly presents."

— Henry Buckle (1857). *History of Civilization, Volume One* (pg. 6)

"It is impossible for any man to escape the 'pressure' of surrounding opinions."

— Henry Buckle (1857), *History of Civilization in England, Volume One* (pg. 8)

"The believer in the possibility of a 'science of history' is not called upon to hold either the doctrine of predestined events, or that of freedom of the will; and the only positions which, in this stage of the inquiry, I shall expect him to concede are the following: That when we perform an action, we perform it in consequence of some motive or motives; that those motives are the results of some antecedents; and that, therefore, if we were acquainted with the whole of the antecedents, and with all the laws of their movements, we could with unerring certainty **predict the whole of their immediate results** [compare: Holbach's geometrician]. This, unless I am greatly mistaken, is the view which must be held by every man whose mind is unbiased by system, and who forms his opinions according to the evidence actually before him."

— Henry Buckle (1857), *The History of Civilization, Volume One* (pg. 13-14)

"To those who have a steady conception of the regularity of events, and have firmly seized the great truth that the actions of men, being guided by their antecedents, are in reality never inconsistent, but, however capricious they may appear, only **form part of one vast scheme of universal order**, of which we in the present state of knowledge can barely see the outline,—to those who understand this, which is at once the key and the basis of history, the facts just adduced, so far from being strange, will be precisely what would have been expected, and ought long since to have been known. Indeed, the progress of inquiry is becoming so rapid and so earnest, that I entertain little doubt that before another century has elapsed, the chain of evidence will be complete, and it will be as rare to find an historian who denies the undeviating regularity of the moral world, as it now is to find a philosopher who denies the regularity of the material world."

— Henry Buckle (1857) in *History of Civilization, Volume One* (pg. 24)

"**Nor should we infer that because the physical sciences have not yet been applied to history, they are therefore inapplicable to it**. Indeed, when we consider the incessant contact between man and the external world, it is certain that there must be an intimate connection between human actions and physical laws; so that if physical science has not hitherto been brought to bear upon history, the reason is, either that historians have not perceived the connection, or else that, having perceived it, they have been destitute of the knowledge by which its workings can be traced. Hence there has arisen an **unnatural separation** [see: unbridgeable gap] of the two great departments of inquiry, the study of the internal, and that of the external: and although, in the present state of European literature, there are some unmistakable symptoms of a desire to break down this artificial barrier, still it must be admitted that as yet nothing has been actually accomplished towards effecting so great an end."

— Henry Buckle (1957), *History of Civilization, Volume One* (pg. 25)

"**It is the business of the historian to mediate between these two parties** [the 'moralists, theologians, and metaphysicians' and the 'scientific men'] **and reconcile their hostile pretensions** by showing the point at

which their respective studies ought to coalesce. To settle the terms of this coalition, will be to fix the basis of all history. For since history deals with the actions of men, and since their actions are merely the product of a collision between internal and external phenomena, it becomes necessary to examine the relative importance of those phenomena; to inquire into the extent to which their laws are known; and to ascertain the resources for future discovery possessed by these two great classes, the students of the mind and the students of nature. This task I shall endeavor to accomplish in the next two chapters; and if I do so with any thing approaching to success, the present work will at least have the merit of contributing something towards filling up that wide and dreary chasm, which, to the hindrance of our knowledge, separates subjects that are intimately related, and should never be disunited."

— Henry Buckle (1957), *History of Civilization, Volume One* (pg. 26)

"The three most philosophical writers on 'climate', in respect to physical influence on humans, are Montesquieu, Hume, and Comte."

— Henry Buckle (1857), *History of Civilizations, Volume One* (pg. 32)

"The gigantic crimes of Alexander or Napoleon become after a time void of effect, and the affairs of the world return to their former level. This is the **ebb and flow of history**, the perpetual flux to which by the laws of our nature we are subject. **Above all this, there is a far higher movement**; and as the tide rolls on, now advancing, now receding, there is, amid its endless fluctuations, one thing, and one alone, which endures for ever. The actions of bad men produce only temporary evil, the actions of good men only temporary good; and eventually the good and the evil altogether subside, are neutralized by subsequent generations, absorbed by the incessant movement of future ages. But the discoveries of great men never leave us; they are immortal, they contain those eternal truths which survive the shock of empires, outlive the struggles of rival creeds, and witness the decay of successive religions. All these have their different measures and their different standards; one set of opinions for one age, another set for another. They pass away like a dream; they are as the fabric of a vision, which leaves not a rack behind. **The discoveries of genius alone remain**: it is to them we owe all that we now have, they are for all ages and all times; never young, and never old, they bear the seeds of their own life ; they flow on in a perennial and undying stream ; they are essentially cumulative, and giving birth to the additions which they subsequently receive, they thus influence the most distant posterity, and after the lapse of centuries produce more effect than they were able to do even at the moment of their promulgation."

— Henry Buckle (1857), *History of Civilizations, Volume One* (pg. 163)

"The acquisition of knowledge, which by far is the noblest of all occupations, is an occupation which of all others raises the dignity of man."

— Henry Buckle (1856), *History of Civilization, Volume One* (pg. 496)

"In France, during the latter half of the eighteenth century, this idea was, the inferiority of the internal [see: internal force] to the external [see: external force]. It was this dangerous but plausible principle which drew the attention of men from the church to the state; which was seen in Helvetius the most celebrated of the French moralists, and in Condillac the most celebrated of the French metaphysicians. It was this same principle which, by increasing, if I may so say, the reputation of nature, induced the ablest thinkers to devote themselves to a study of her laws, and to abandon those other pursuits which had been popular in the

preceding age."

— Henry Buckle (1856), *History of Civilization, Volume One* (pg. 627)

"This is, that the first application of the principles of comparative anatomy to the study of fossil bones, was also the work of a Frenchman, the celebrated Daubenton [1716-1800] (Ñº). Hitherto these bones had been the object of stupid wonder; some saying that they were rained from heaven, others saying that they were the gigantic limbs of the ancient patriarchs, men who were believed to be tall because they were known to be old."

— Henry Buckle (1856), *History of Civilization, Volume One* (pg. 634)

Quotes | Other

The following are other quotes by Buckle:

"You can tell the lowest class by their habit of always talking about persons; the next, by the fact that their habit is always to converse about things; the highest, by their preference for the discussion of ideas."

— Henry Buckle (c.1858), *Source* (Ñº)

"And, notwithstanding a few exceptions, we do undoubtedly find that the most truly eminent men have had not only their affections, but also their intellect, greatly influenced by women. I will go even farther; and I will venture to say that those who have not undergone that influence betray a something incomplete and mutilated. We detect, even in their genius, a certain frigidity of tone; and we look in vain for that burning fire, that **gushing and spontaneous nature with which our ideas of genius are indissolubly associated**. Therefore, it is, that those who are most anxious that the **boundaries of knowledge** should be enlarged, ought to be most eager that the influence of women should be increased, in order that every resource of the human mind may be at once and quickly brought into play."

— Henry Buckle (1858), "The Influence of Women on the Progress of Knowledge" (Ñº), Lecture, Royal Institution, Mar 19

"The great enemy of civilization is the notion that society cannot prosper, unless the affairs of life are watched over and protected at nearly every turn by the state and the church; the state teaching men what they are to do, and the church teaching them what they are to believe."

— Henry Buckle (1861), *History of Civilization, Volume Two* (pg. 1); cited by Morris Zucker (1945) in *The Historical Field Theory* (pg. 83) [7]

"Men and women range themselves into three classes or orders of intelligence; you can tell the lowest class by their habit of always talking about persons; the next by the fact that their habit is always to converse about things; the highest by their preference for the discussion of ideas."

— Henry Buckle (c.1860), attributed (Ñº)(Ñº) by Charles Steward

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â— Henry Thomas Buckle – Wikipedia.
â— Henry Buckle – InformationPhilosopher.com.

θΔics

In thermodynamics, **Henry Bumstead** (1870-1920) was an American physicist notable for being a graduate student of Willard Gibbs and for having produced a 27-page detailed review of Henry Adams' 1909 "The Rule of Phase Applied to History", which attempted to apply Gibbs' phase rule to the modelling of the phases of human history in a physical-chemical sense of people viewed as human molecules; after which, during the next year or two, Adams revised his essay to meet Bumstead's specific criticisms. [1]

Adams | Gibbs

In circa 1908, American physical humanities historian Henry Adams, while in Paris, began reading physical chemistry books and its seems chemical thermodynamics treatises (or at least outlines) of Willard Gibbs. Adams, for example, reporting that: [3]

> "I have run my head hard up against a form of mathematics that grinds my brains out. I flounder like a sculpin in the mud. It is called the 'law of phases', and was invented at Yale. No one shall persuade me that I am not a phase."

This is hilarious to the last, indeed, something you just can't make.

Shortly thereafter, sometime in late 1908, on, before, or thereafter Nov 27, the date when he executed his last will and testament, Adams began probing (sending notes) to John Franklin Jameson, director of the historical department of the Carnegie Institution, asking for some type of physical chemistry trained tutor and or proofreader:

> "On the physico-chemical law of development and dynamics, our society has reached what is called the critical point where it is near a new phase or equilibrium."
>
> — Henry Adams (1908), "Letter to Charles Gaskell" (Sep 27) [4]

> "I'm looking for a 'young and innocent physico-chemist who wants to earn a few dollars by teaching an idiot what is the first element of theory and expression in physics."
>
> — Henry Adams (1908), "Note to John Jameson" (Dec) [5]

> "My essay 'The Rule of Phase [Applied to History]' is a 'mere intellectual plaything, like a puzzle' [to Brooks]. I am interested in getting it into the hands of a 'scientific, **physico-chemical** proofreader' and I am willing to pay 'liberally for the job' [to Jameson]."
>
> — Henry Adams (1909), Notes to Brooks Adams and John Jameson [4]

Adams eventually penned out an essay of his ideas entitled "The Rule of Phase Applied to History", which he sent to Jameson for publication in *The American Historical Review*. Jameson, although he turned the essay for publication, continued his search in helping Adams find a Reader. This effort resulted in a typescript of the manuscript arriving into the hands of Henry Bumstead of Yale, who had recently finished co-editing the posthumous edition of Gibbs' scientific papers in 1906. Bumstead agreed to the job and, by Jan 1910, had produced a 'meticulously detailed critique' of Adams' essay. [3]

Education

As a child Bumstead was found to have a prodigious memory; at age three he was fluent in German and English. [6]

In 1887, Bumstead went to Johns Hopkins University, initially as a student in a pre-medical program (his father was a physician), where he studied mathematics with Fabian Franklin, and physics with Henry Rowland. In 1891, he obtained a BS in physics, and continued at Johns Hopkins as an assistant in the physics laboratory and a graduate student. He studied thermodynamics, electrostatics, and the electromagnetic theory of light.

Notebooks found among his effects show that he took a course in thermodynamics under Rowland in 1891 which included, in addition to the classical thermodynamics, a considerable amount of the material contained in Gibbs' great work *On the Equilibrium of Heterogeneous Substances*.
The following year, Bumstead attended Rowland's lectures on “Electrostatics and on the Electromagnetic Theory of Light.” [6]

In 1893, Bumstead became a student of Willard Gibbs, learning vector analysis and continuing the study of thermodynamics and the electromagnetic theory of light; he als became an instructor at the Sheffield Scientific School of Yale University, and began working with Charles Hastings. Bumstead’s existographer Leigh Page (1929) reports the following: [6]

> “In 1893 Bumstead was brought to Yale by Professor Charles S. Hastings as an instructor in the Sheffield Scientific School. Undoubtedly the prospect of coming into personal contact with Gibbs had much to do with his decision to make the move. What time he could spare from his teaching duties he devoted to continuing his study of physics in the Yale Graduate School. He took courses with Gibbs in Vector Analysis, Multiple Algebra, Thermodynamics, and Electromagnetic Theory of Light, his notes on the last two courses being extant and in the possession of the writer. Gibbs' high opinion of his brilliant student is evidenced by the notation "excellent" in the reports submitted to the graduate school at the termination of each of these courses. Evidently Bumstead's keenness of perception was thoroughly appreciated by Gibbs, for the latter once remarked to one of his colleagues "Some things come easier to Bumstead than to most men.”

In 1897, he completed his PhD with a thesis on “A Comparison of Electrodynamic Theories”, after which in 1900 he became an assistant professor. In 1905, Bumstead spent a sabbatical year at the Cavendish Laboratory, performing experiments, suggested by J. J. Thomson, on the effect of X-rays (then called Röntgen rays) when applied to lead and zinc, finding that "twice as much heat is produced in lead compared to zinc". When Arthur Williams Wright retired in 1906, Bumstead became professor of physics at Yale College and Director of the Sloan Physics Laboratory.

Gibbs

The following is a noted quote by Bumstead, from his 1903 obituary / biographical article “Josiah Willard Gibbs”, on the extreme difficultly involved in the comprehension of Gibbs' famous 1876 *On the Equilibrium of Heterogeneous Substances*: [2]

> “It was a number of years before its value was generally known; this delay was due largely to the fact that its mathematical form and rigorous deductive processes make it difficulty reading for anyone, and especially so for students of experimental chemistry whom it concerns most.”

(add discussion)

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External links

â— Henry Andrews Bumstead – Wikipedia.

θΔics

In existographies, **Henry Carey** (1793-1879) (IQ:#|#) (SN:10) (CR:105) was an American physical science applied sociologist and economist, known as the 'Newton of social science' (see: social Newton), noted for his three-volume 1858 *The Principles of Social Science*, wherein he uses of physics and chemistry in sociological theory, e.g. his 'law of molecular gravitation' which he says accounts the aggregation of people in larger cities, among numerous other theories. [1]

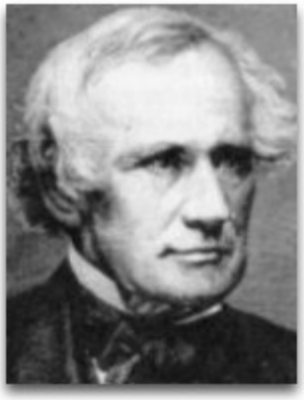

Overview

The following is the gist of Carey's position on what constitutes the "subject of social science", as he sees things:

> "The laws which govern matter in all its forms, whether that of coal, clay, iron, pebble stones, trees, oxen, horses, or men, are the same; man is the molecule of society; and social interaction operates under the great law of molecular gravitation."

as summarized by American sociologist Alan Sica (2012), based on his reading of Russian-born American sociologist Pitirim Sorokin's 1928 discussion of Carey's theories. [5]

Austrian social economist Werner Stark (1962) interprets Carey's "man is the molecule of society" definition to mean that people are 'human molecules', which Stark defines as "power-points" which push and pull until a certain equilibrium is reached. [6]

Term | Analysis

See main: Social Newton term analysis

The following, noting Carey's pre 1923 Lewis-mediated free energy supplantation of affinity terminology switch position, shows the key term usage count:

Scientific terms	Religious terms	Elements	Metaphysical
Motion (Q) | 85+			
Force (Q) | 83+			
Matter (Q) | 83+			
Work (Q) | 82+		Iron (Q) | 54+	
Chemical (Q) | 64+		Oxygen (Q) | 13+	
Mechanical (Q) | 46+	Life (Q) | 83+	Carbon (Q) | 12+	
	Death (Q) | 41+	Hydrogen (Q) | 5+	Love (Q) | 3+
Heat (Q) | 22+	God (Q) | 15+	Nitrogen (Q) | 4+	Ether (O) | 0+
Atom (Q) | 17+	Spirit (Q) | 12+	Sulphur (Q) | 1+	Hate (O) | 0+
Electricity (Q) | 12+	Soul (Q) | 3+	Phosphorus (Q) | 1+	
Energy (Q) | 7+		Calcium (O) | 0+	
Bond (Q) | 3+		etc.	
Affinity (Q) | 2+			
Affinities (Q) | 1+			
Molecule (Q) | 1+			

(add discussion)

Social gravitation

Carey's principle of social gravitation or 'law of molecular gravitation', supposedly having been influenced by the earlier 1841 work of Friedrich List, expounding on the view that 'human molecules' tend to attract into the formation of large cities, is given as such:

> "Gravitation is here, as everywhere else in the material world, in the direct ratio of mass, and in the inverse one of the distance. The greater the number collected in a give space, the greater is the attractive force there exerted, as is seen to have been the case with the great cities of the ancient world, Niniveh and Babylon, Athens and Rome, and is now seen in regard to Paris and London, Vienna and Naples, Philadelphia, New York, and Boston."

Gravity, according to Carey, creates a foci of human aggregation.

Affinity

Carey, in his chapter VIII, 'On the Formation of Society', seems to have outlined some excellent Goethe-style ideas on how chemical affinity relates to movement of humans. He states:

> "In the inorganic world we find the power of combination growing with the increase of differences. Place a thousand atoms of oxygen in a receiver, and they will remain motionless; but introduce a single atom of carbon, and excite their affinities for each other, and at once motion will be produced. Such being the case in regard to all other matter, it must be so in regard to those combinations in which man is

concerned, indicated by the term society."

This is a near-classic quotation. Very excellent. In a modern sense, this is really good theory, with deep insight, very rare to come by.

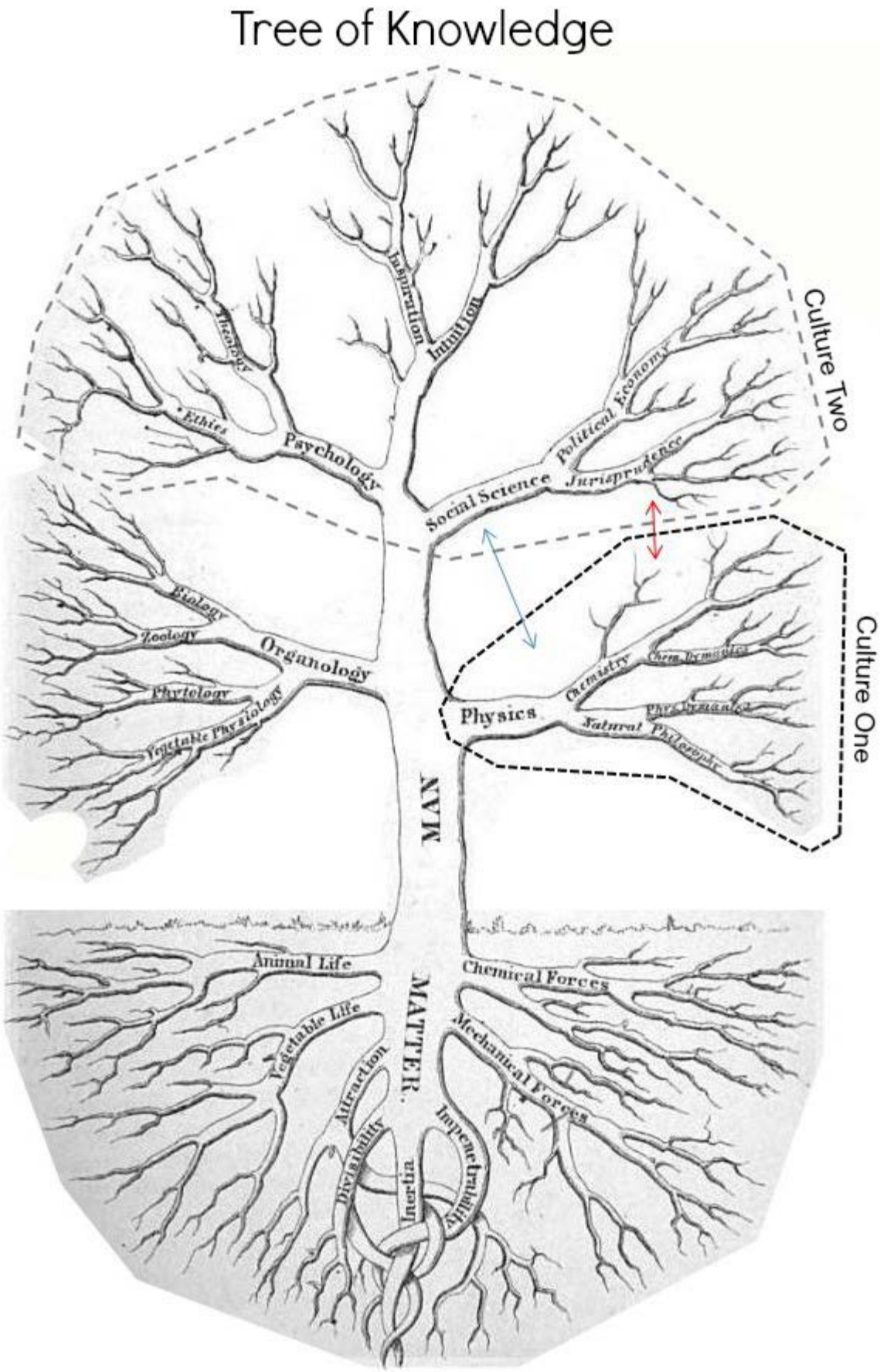

Carey's' 1874 depiction of the "tree of knowledge", annotated to show a post 1954 "two cultures" perspective (see: two cultures department), wherein the branch of **social science** is located in close proximity to the the **physical science** branch of knowledge. [4]

Social heat

In introducing the topic of social heat between reactive human molecules in society, according to Stark, Carey states:

> "In the inorganic world, every act of combination is an act of motion. So it is in the social one. If it is true that there is but one system of laws for the government of all matter, then those which govern the movements of the various inorganic bodies should be the same with those by which is regulated the motion of society; and that such is the case can readily be shown."

Then, in what seems to be a citation of Berthelot-Thomsen principle, that the 'heat of a reaction was the true measure of affinity', Carey states:

> "To motion there must be heat, and the greater the latter, the more rapid will be the former."

This means, according to the 1962 opinion of Stark that:

> "In the physical universe, heat is engendered by friction. Consequently the case must be the same in the social world. The 'particles' must rub together here, as they do there. The rubbing of the human molecules, which produces warmth, light and forward movement, is the interchange of goods, services, and ideas."

Carey continues:

> "In the material world, motion among atoms of matter is a consequence of physical heat. In the moral world, motion is a consequence of social heat—motion, consisting in an 'exchange of relations' resulting from the existence of those differences that develop social life. Motion is greatest in those communities in which agriculture, manufactures, and commerce are happily combined. That such is the fact will be obvious to all who see how rapid is the spread of ideas in those countries in which agriculture, manufactures, and commerce are combined, compared with that observed in those which are purely agricultural. In the one there is great heat and corresponding motion, and the more motion, the greater is the force. In the other there is little heat, but little motion, and very little force."

Most of these quoted views of Carey still need to be tracked down, but they may be in his 1859 three volume *The Principles of Social Science*, in which he is said to have gathered the fruits of his lifelong labors.

Influence

In the opening section to his 1954 article "The Uses and Abuses of Analogy", English physicist Vera Daniel cites Carey who, he says, stated, among others, an analogy between gravitation and the concentration of people in a town: all particles of matter attract on another in direct ratio to their mass, and in inverse ratio to their distance. Analogously people attract one another also in direct ratio to their mass, and inverse ratio to their distance, and so they condense in towns. [2]

Carey's social mechanics conceptions were heavily influential to thinkers including: Pitirim Sorokin, John Q. Stewart, Werner Stark, William Warntz, to name a few.

Education

Carey was the son of Irish-born American social commentator, political economist, and publisher Mathew Carey (1760-1839), publishing associate of Benjamin Franklin, political associate of John Adams, and author of *Essays on Political*

Economy; or, The Most Certain Means of Promoting the Wealth, Power, Resources, and Happiness of Nations, Applied Particularly to the United States (1822). In 1825, Carey senior retired and left the publishing business to his son, Henry Carey, and his son-in-law Isaac Lea, during which time they published works such as: *The Encyclopedia American* and *A Dictionary of German Lexicon*. Henry Carey retired from the publishing business in 1838, while publishing his 4-volume *Principles of Political Economy*. Carey, into the 1850s, is described, by Trevor Barnes, as a retired autodidact. [7]

Quotes | On

The following are quotes on Carey:

> "In 1858-59, **Carey** gathered the fruits of his lifelong labors into *The Principles of Social Science*, in three volumes. This work is a most comprehensive as well as mature exposition of his views. In it Carey sought to show that there exists, independently of human wills, a natural system of economic laws, which is essentially beneficent, and of which the increasing prosperity of the whole community, and especially of the working classes, is the spontaneous result—capable of being defeated only by the ignorance or perversity of man resisting or impeding its action. He rejected the Malthusian doctrine of population, maintaining that numbers regulate themselves sufficiently in every well-governed society, and that their pressure on subsistence characterizes the lower, not the more advanced, stages of civilization. He denied the universal truth, for all stages of cultivation, of the law of diminishing returns from land."
>
> — Anon (1911), *Encyclopedia Britannica* [10]

> "**Carey**'s *Principles of Social Science* is one of the most conspicuous attempts in the second half of the nineteenth century at a physical interpretation of social phenomena."
>
> — Pitirim Sorokin (1928), *Contemporary Sociological Theories* (pg. 13)

Quotes | By

The following are noted quotes:

> "Man, the molecule of society, is the subject of social science."
>
> — Henry Carey (1958), *Principles of Social Science* (pg. 41)

> "The laws which govern matter in all its forms, whether that of coal, clay, iron, pebble stones, trees, oxen, horses, or men, are the same."
>
> — Henry Carey (1958), *Principles of Social Science* (pg. 62); quoted in Sorokin (pg. 13); quoted in Barnes (pg. 3) [8]

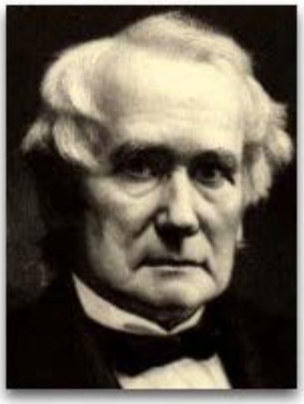

A later photo of **Carey**.

> "The great law of molecular gravitation … man tends of necessity to gravitate toward his fellow man [sic] … Gravitation is here, as everywhere else in the material world, in the direct ratio of the mass and in the inverse one of the distance."
>
> — Henry Carey (1858), *Principles of Social Science* (pgs. 42-43); quoted in Tocalis (pg. 68); quoted in Barnes (pg. 3) [9]

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3. Carey, Henry C. (1858-59). *The Principles of Social Science* (Vol I , Vol II, Vol III). J.B. Lippincott & Co.
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(c) Carey, Henry C. (1858-59). *The Principles of Social Science* (Vol I , Vol II, Vol III) ("laws which govern", pg. 62; "man is the molecule of society", pg. 41; "great law of molecular gravitation, pg. 42). J.B. Lippincott & Co.
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7. Barnes, Trevor J. and Wilson, Matthew W. (2014). "Big Data, Social Physics, and Spatial Analysis: the Early Years" (pdf) (abs) (pdf), in: *Big Data & Society*, Jun.
8. (a) Sorokin, Pitirim. (1928). *Contemporary Sociological Theories* (§1: The Mechanistic School (pdf), pgs, 4-62; quote, pg. 13). Harper & Brothers.
(b) Barnes, Trevor J. and Wilson, Matthew W. (2014). "Big Data, Social Physics, and Spatial Analysis: the Early Years" (pre, pdf) (abs) (pdf) (pg. 3), in: *Big Data & Society*, Jun.
9. (a) Tocalis, T.R. (1978). "Changing Theoretical Foundations of the Gravity Concept of Human Interactions", in: *Perspectives in Geography 3: the Nature of Change in Geographical Ideas* (editor: Berry G.J.L.) (pgs. 67-124). Northern Illinois University Press.
(b) Barnes, Trevor J. and Wilson, Matthew W. (2014). "Big Data, Social Physics, and Spatial Analysis: the Early Years" (pre, pdf) (abs) (pdf) (pg. 3), in: *Big Data & Society*, Jun.
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External links

- Henry Charles Carey – Wikipedia.
- Henry C. Carey (1793-1879) – Homepage.NewSchool.edu.

θΔics

In existographies, **Henry Cavendish** (1731-1810) (IQ:170|#335) [RGM:514|1,500+] (Murray 4000:6|P) (Murray 4000:6|P) (Kanowitz 50:18) (GCE:9) (GPE:23) (CR:14) was an English experimental physicist, theoretical chemist, and natural philosopher, noted for []

Oxygen

In 1766, Cavendish, in his *On Factitious Airs*, presented his discover of the hydrogen, which he terms “inflammable air”; the following is the experimental device he used:

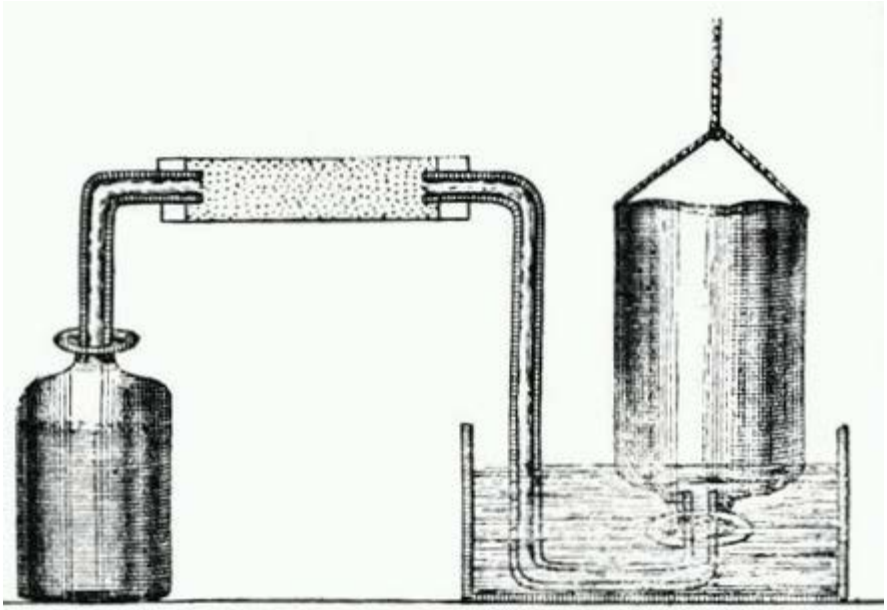

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Heat

In c.1775, did a number of experiments on heat, publishing a number of articles and papers, in which he, supposedly, rejected the fluid theory of heat, and in its place, attempted to formulate a so-called "mechanical theory of heat". [1] Cavendish also did work on latent heat and specific heat.

Gravitational constant

In 1798, Cavendish, determined, via experiment (Ñº), the first measurement of Newton’s gravitational constant, using the following device:

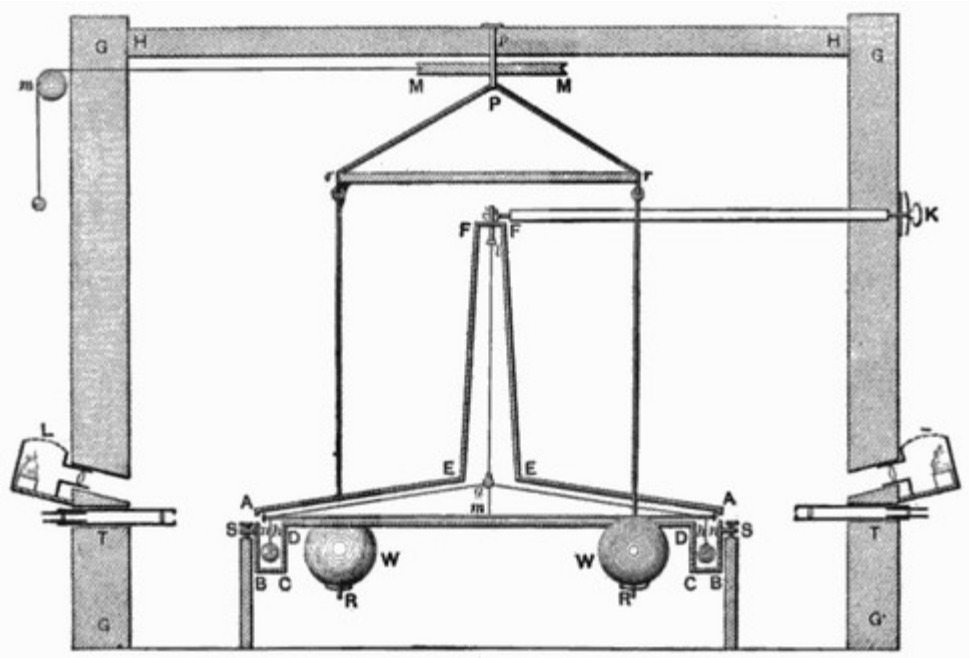

The calculated value was found to be accurate to 1% of modern value.

Other

Was the first to determine the electrical conductivity of salt solutions and experimentally proved the inverse square law.

Quotes | On

The following are quotes on Cavendish:

> "Blagden, in his obituary on **Cavendish** (Mar 1810), failed to mention Cavendish's work on heat, although he made note of all of his other major work. Odd, I say, because in none of his other work was Cavendish known to have declared himself publicly a more decided follower of Newton, according to his understanding of Newton, than in his work on heat, and also because Blagden assisted Cavendish in this work. If there is a circumstance that might bear on Blagden's neglect or forgetfulness in his obituary of his late friend and colleague, it is that Blagden subscribed to the popular 'material theory of heat', of which Cavendish held a low, almost contemptuous, opinion."
>
> — Russell McCormmach (1988), "Henry Cavendish on the Theory of Heat" [2]

References

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2. McCormmach, Russell. (1988). "Henry Cavendish on the Theory of Heat" (abs), *Isis*, 79(1): 37-67.

External links

â— Henry Cavendish – Wikipedia.

In chemistry, **Henry Eyring** (1901-1981) was a Mexican-born American theoretical chemist noted for the 1931 potential energy surface model, the 1935 transition state theory, the related concept of the activated complex.

Overview

In 1931, Eyring and Hungarian-born English physical chemist Michael Polanyi made the first potential energy surface diagram, as presented in their famous paper "On Simple Gas Reactions", in which, using the London equation (1927), they described the journey of the nuclei from reactant state of the system to the product state of the system, passing through the crucial intermediate state of activated complex. [1]

The activated complex theory, which enables the rate constants in chemical reactions to be calculated using statistical thermodynamics, was developed by Eyring and colleagues in the 1930s. [2]

In 1935, Eyring, and his associates chemists Meredith Evans and Michael Polanyi, conceived the theory of transition state. [3]

Education

In 1919, Eyring had received a state fellowship to the University of Arizona, where he received degrees in mining engineering, metallurgy, and chemistry. He subsequently pursued and received his doctoral degree in Chemistry from the University of California, Berkeley in 1927 for a thesis entitled: *A Comparison of the Ionization by, and Stopping Power for, Alpha Particles of Elements and Compounds.*

After a review of his dissertation, Princeton University recruited Eyring as an instructor in 1931. He would continue his work at Princeton until 1946, after which he became the dean of the graduate school of science at the University of Utah. Eyring's two influential textbooks, written while at Princeton, are the 1941 *The Theory of Rate Processes* and the 1944 *Quantum Chemistry.*

Quotes

The following are noted quotes:

> "Clearly if you know the energy levels as functions of volume and temperature, you can calculate all of thermodynamics. At the present time you don't measure the thermodynamic properties experimentally if you have the necessary absorption spectra."
>
> — Henry Erying (1957), "Statistical Dynamics"; cited by Norman Dolloff (1975) [4]

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Further reading

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External links

â— Henry Eyring – Wikipedia.
â— The Eyring Legacy (2009) – College of Science, University of Utah.

θΔics

In human chemistry, **Henry Finck** (1854-1926) was an American philosopher noted for his 1887 *Romantic Love and Personal Beauty*, wherein he cites and discusses a number of physical, materialism, chemicalism philosophies on love, by thinkers including: Goethe, Ludwig Buchner, Shakespeare, Empedocles, Schopenhauer, Burton, Judah Leo, among others.

Goethe | Chemical affinities

Finck, in his discussion of Goethe's chemical affinity, applied in the context of love, attempts to disprove the human chemical theory by citing the definition of a "compound" from Watt's *Dictionary of Chemistry*, where after Finck concludes:

> "Chemical affinities cannot be used as analogies of love."

Finck, in this context discusses German physician Ludwig Buchner's 1855 views on how the atoms and molecules act just as men and women attract one another. [1]

Cosmic Attraction and Chemical Affinities

The following is Finck's interesting section on what seems to be a short history of social gravitation theories and human chemical affinity theories:

> Before we proceed to prove all these assertions in detail, it will be well to cast a brief glance at the analogies to human Love presented by cosmic, chemical, and vegetal phenomena; as well as to distinguish romantic love from other forms of human and animal affection. This will enable us to comprehend more clearly what modern love is, by making apparent what it is not. It is a favorite device of poets to invest plants and even inanimate objects with human thoughts and feelings. The parched, withering flower, tormented by the pangs of thirst, implores the passing cloud for a few drops of the vital fluid; and the cloud, moved to pity at sight of the suffering beauty, sheds its welcome, soothing tears.
>
> > "And 'tis my faith, that every flower
> > Enjoys the air it breathes."
> >
> > — William Wordsworth (c.1790)
>
> > "The moon shines bright: in such a night as this,
> > When the sweet wind did gently kiss the trees,
> > And they did make no noise."
> >
> > " Purple the sails, and so perfumed that
> > The winds were love-sick with them."
> >
> > — Shakespeare
>
> One of the first authors who thus endowed nonhuman objects with human feelings was the Greek philosopher Empedocles, who flourished about twenty-three centuries ago. Just as the last of the great German metaphysicians, Schopenhauer, believed that all the forces of nature—astronomic, chemical, biological, etc.—are identical with the human will, of which they represent different stages of development or "objectivation," so Empedocles insisted that the two ruling passions of the human soul, love and hate, are the two principles which pervade and rule the whole universe. In the primitive condition of things, he

taught, the four elements, earth, water, air, and fire are mingled harmoniously, and love rules supreme. Then hate intervenes and produces individual, separate forms. Plants are developed, and after them animals, or rather, at first, only single organs—detached eyes, arms, hands, etc. Then love reasserts its force and unites these separate organs into complete animals. Strange monstrosities are the result of some of these unions—animals of double sex, human heads on the bodies of oxen, or horned heads on the bodies of men. These, however, perish, while others, which are congruous and adapted to their surroundings, survive and multiply.

Thus Empedocles, "the Greek Darwin," was the originator of a theory of evolution based on the alternate predominance of cosmic love and hate; love being the attractive, hate the repulsive force.

In the preface to the first volume of *Don Quixote,* Cervantes refers those who wish to acquire some information concerning love to an Italian treatise by Judah Leo. The full title of the book, which appeared in Rome in the sixteenth century, is *Dialoghi di amore, Composti da Leone Medico, di nayione Ebreo, e di poi fatto cristiano* [*Dialogues of Love, composed by Doctor Leon, of Hebrew heritage, and who later became Christian*]. There are said to be three French translations of it, but it was only after long searching that I succeeded in finding a copy, at the Bibliotheque Nationale in Paris. It proved to be a strange medley of astrology, metaphysics, theology, classical erudition, mythology, and medieval science. Burton, in the chapter on love, in his *Anatomy of Melancholy,* quotes freely from this work of Leo, whom he names as one of about twenty-five authors who wrote treatises on love in ancient and medieval times.

Like Empedocles, Leo identifies cosmic attraction with love. But he points out three degrees of love —natural, sensible, and rational. By natural love he means those "sympathies" which attract a stone to the earth, make rivers flow to the sea, keep the sun, moon, and stars in their courses, etc. Burton (1652) agrees with Leo, and asks quaintly:

> "How comes a loadstone to draw iron to it . . . the ground to covet showers, but for love? . . . no stock, no stone, that has not some feeling of love. 'Tis more eminent in Plants, Herbs, and is especially observed in vegetals; as betwixt the Vine and Elm a great sympathy,"

"Sensible" Love is that which prevails among animals. In it Leon recognises the higher elements of delight in one another's company, and of attachment to a master.
"Rational" Love, the third and highest class, is peculiar to God, angels, and men.

But the inclination to confound gravitation and other natural forces with Love is not to be found among ancient and mediaeval authors alone. Paradoxical as it may seem, it is the "gross materialist," Dr. Ludwig Buchner, who exclaims rapturously: "For it is love, in the form of *attraction,* which chains stone to stone, earth to earth, star to star, and which *Cosmic Attraction and Chemical Affinities* holds together the mighty edifice on which we stand, and on the surface of which, like parasites, we carry on our existence, barely noticeable in the infinite universe; and on which we shall continue to exist till that distant period when its component parts will again be resolved into that primal chaos from which it laboriously severed itself millions of years ago, and became a separate planet."

Buchner carries on this anthropopathic process a step farther, by including all the chemical affinities of atoms and molecules as manifestations of love: "Just as man and woman attract one another, so oxygen attracts hydrogen, and, in loving union with it, forms water, that mighty omnipresent element, without which no life nor thought would be possible." And again: "Potassium and phosphorus entertain such a violent passion for oxygen that even under water they burn-—*i.e.* unite themselves with the beloved object."

Goethe's novel, *Elective Affinities*, which was inspired by a late and hopeless passion of its author, is based on this chemical notion that no physical obstacle can separate two souls that are united by an amorous

affinity. But the practical outcome of his theory—that the psychic affinity of two persons suffices to impress the characteristics of both on the offspring of one of them—has nothing to support it in medical experience; while the chemical' analogy, with all due deference to Goethe's reputation as a man of science, is against his view. His notion was that the children of two souls loving one another will inherit their characteristics. But what distinguishes a chemical compound (based on "affinity ") from a mere physical mixture, is precisely the contrary fact that the compound does not in any respect resemble the parental elements! Read what a specialist says in Watts's *Dictionary of Chemistry:—*

> "Definite chemical compounds generally differ altogether in physical properties from their components. Thus, with regard to *colour,* yellow sulphur and gray mercury produce red cinnabar; purple iodine and gray potassium yield colourless iodide of potassium. . . . The *density* of a compound is very rarely an exact mean between that of its constituents, being generally higher, and in a few cases lower; and the *taste, smell, refracting power, fusibility, volatility, conducting power for heat and electricity,* and other physical properties, are not for the most part such as would result from mere mixture of their constituents."

Chemical affinities, accordingly, cannot be used as analogies of Love. Not even on account of the violent *individual preference* shown by two elements for one another, for this apparently *individual* preference is really only *generic.* A piece of phosphorus will as readily unite with one cubic foot of oxygen as with another; whereas it is the very essence of Love that it demands a union with one particular *individual,* and no other.

Equally unsatisfactory are all similar attempts to identify Love with gravitation or other forms of cosmic attraction. Here is what a great expert in Love has to say on this subject: "The attraction of love, I find," writes Burns, "is in inverse proportion to the attraction of the Newtonian philosophy. In the system of Sir Isaac, the nearer objects are to one another, the stronger is the attractive force. In my system, every milestone that marked my progress from Clarinda awakened a keener pang of attachment to her."

How beautifully, in other respects, does the law of gravitation simulate the methods of Love! Does not the meteor which passionately falls on this planet and digs a deep hole into it, show its love in this manner, even as that affectionate bear who smashed his master's forehead in order to kill the fly on it? Does not the avalanche which thunders down the mountain-side and buries a whole forest and several villages, afford another touching illustration of the love of attraction, or cosmic Love ? — a crushing argument in its favour? Or the frigid glacier, in its slower course, does it not lacerate the sides of the valley, and strew about its precious boulders, merely by way of illustrating the amorous effect of gravitation? And millions of years hence, will not this same law of attraction enable the sun to prove his ecstatic love for our earth by swallowing her up and reducing her to her primitive chaotic state? Imagine a man and a woman whose love consists in this, that they must be kept widely separated by a hostile force to prevent them from dashing together, and reducing each other to atoms and molecules! *That* is the "love" of the stars and planets.

But it is needless to continue this *reductio ad absurdum* of pantheistic or panerotic vagaries. The method of the writers on Love here quoted—Empedokles, Leo, Burton, Buchner — has been to identify Love with cosmic force simply because they possess in common the one quality of attraction, by virtue of which the large earth hugs a small stone, and a large man a small maiden. Modern scientific psychology objects to this *(z.e.* not the hugging, but the method), because it does not in the least aid us in understanding the nature of Love; and because it is as irrational to call attraction Love as it would be to call a brick a house, a leaf a tree, or a green daub a rainbow. For Love embraces every colour in the spectrum of human emotion.

Having failed to find a satisfactory solution of the mystery of Love in the inorganic world, let us now see if the vegetable kingdom offers no better analogies in its sexual phenomena.

(add discussion)

Education

Finck graduated from Harvard in circa 1876, having studied philosophy, the classics, and music.

References

1. Finck, Henry. (1887). *Romantic Love and Personal Beauty*: *Their Development, Causal Relations, Historic and National Peculiarities* (section: Cosmic Attraction and Chemical Affinities, pgs 4-9). MacMillan.

External links

â— Henry Theophilus Finck – Wikipedia.

θΔics

In existographies, **Henry II** (1133-1189) (IQ:#|#) (Cattell 1000:457) (Time 100:30), aka Henry II of England, ruler of England from 1154 to 1189, was an English king, noted for []

Overview

In c.1170, Henry II introduced the practice of “assizes”, an early form of trial by jury, wherein, twelve local men, with knowledge of a dispute, would be called into decide judgment, on matters such as who was the "rightful" owner or heir; this replaced the older method wherein a priest would be called in to bless a pond or river, and the accused thrown in, and if he or she floated, guild would be assume, per logic that the “blessed water” rejected them. [1]

See also

â— Henry IV

References

1. Stengel, Richard. (2011). *100 Ideas that Changed the World: History’s Greatest Breakthroughs, Inventions, and Theories* (#30: Verdicts Should be Decided by a Panel of One’s Fellow Citizens). Time Magazine.

External links

â— Henry II of England – Wikipedia.

θΔics

In existographies, **Henry IV** (1553-1610) (IQ:155|#613) (Cattell 1000:76) was the French king, in power from 1589 to 1610, noted for []

Overview

In 1598, Henry IV signed into order the Edict of Nantes, which granted the Calvinist Protestants of France substantial rights in the nation, thereby promoting civil unity.

In 1625 to 1643, Richelieu was the de facto governor of France, during which time he embedded the world's first operational secular scheme of government.

Reaction end

Henry IV assassinated in 1610 by François Ravaillac, a fanatical Catholic.

Quotes | On

The following are quotes on Henry IV:

> "There now took place what we must be content to call an accident, but which was the beginning of a most important change. In the year 1589, Henry IV ascended the throne of France. This great prince, who was far superior to any of the French sovereigns of the sixteenth century, made small account of those theological disputes which his predecessors had thought to be of paramount importance. The **powerful intellect** of Henry IV had not the slightest sympathy. To suit the shifting politics of his age, he had already changed his religion twice; and he did not hesitate to change it a third time, when he found that by doing so he could ensure tranquility to his country. Only five years after he had solemnly abjured Protestantism, he published the celebrated edict of Nantes, by which, for the first time, a Catholic government granted to heretics a fair share of civil and religious rights. This was, unquestionably, the most important event that had yet occurred in the history of French civilization. If it is considered by itself, it is merely an evidence of the enlightened principles of the king; but when we look at its general success, and at the cessation of religious war which followed it, we cannot fail to perceive that it was part of a vast movement, in which the people themselves participated."
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 371-72) [1]

References

1. Buckle, Henry. (1857). *History of Civilization, Volume One*. Appleton, 1862.

External links

â— Henry IV of France – Wikipedia.

θΔics

In existographies, **Henry James** (1843-1916) (CR:9) was an American-born English writer, brother of American reserve energy psychologist William James, noted for his 1904 novel *The Golden Bowl*, which is said to have been greatly influenced by German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*.

Goethe

Several noted Goethean scholars, including: Judith Ryan (1982), Joseph O'Leary (2005), and Jeremy Adler (2012), have produced papers on the *Elective Affinities* / *The Golden Bowl* overlap or relationship. [1] As summarized by Susan Winnett, via citation of Judith Ryan: [2]

> "James read *Die Wahlverwandtschaften* in German during his stay in Bonn in 1860, and his lifelong interest in Goethe marks and exception to his general indifference to things German."

(add)

Adams

American historian Henry Adams' famous third-person written *The Education of Henry Adams*, first self-published at his own expense, was first circulated among his connected friends, the first copies of which were printed in late 1906 and into 1907, of which an initial forty friends received copies, including: Henry James, senator Henry Cabot Lodge (president of the Massachusetts Historical Society), and Theodore Roosevelt, for comment and correction. Others soon wished for copies and Adams had an additional sixty copies printed and bound.

Quotes | On

The following are quotes on James:

> "Concepts of physics are frequently misused by those who become intoxicated by casual acquaintance with them. After Einstein discovered the principle of special relativity, college sophomores and trendy preachers cited the principle as "proof" that "everything is relative". And after Heisenberg discovered the uncertainty principle, social scientists, humanists, and theologians seized on it to "prove" that certain kinds of human knowledge are impossible. The concept of entropy and the associated second law of thermodynamics have yet a longer history of abuse -- even by physicists, who should know better. As far back as 1910, America's greatest philosopher -- William James -- felt the need to disabuse America's greatest novelist -- his brother **Henry** -- of the idea that the second law had portentous social implications."
>
> — Julian Simon (1991), "Entropy and Energy Accounting"

References

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(b) O'Leary, Joseph S. (2005). "Goethe in 'The Golden Bowl'", *Essays on Literary and Theological Themes*, Jun 22.
(c) Goethe and Henry James (Jeremy Adler) – Wiko-Berlin.de.
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External links

â— Henry James – Wikipedia.
â— The Golden Bowl – Wikipedia.

θΔics

In science, **Henry Le Chatelier** (1850-1936) was a French chemist noted for his 1884 chemical equilibrium principle and for being the first to translate American engineer Willard Gibbs' 1876 treatise *On the Equilibrium of Heterogeneous Substances* into French in 1889. [1]

Le Chatelier's principle

See main: Le Chatelier's principle

Le Chatelier's famous 1884 principle states: [2]

> "Every system in chemical equilibrium, under influence of a change of every single one of the factors of equilibrium, undergoes a transformation in such direction that, if this transformation took place alone, it would produce a change in the opposite direction of the factor in question. The factors of equilibrium are temperature, pressure, and electromotive force, corresponding to three forms of energy: heat, electricity, and mechanical energy."

This principle, supposedly, has been widely used and quoted in biology and the social sciences. [3] An example of its use in explaining human pairing, seems to be found in the 1919 work of American economist Julius Davidson. [5] In 1947, American economist Paul Samuelson, for instance, used the principle to explain economic equilibrium. [4]

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3. Bailey, Kenneth D. (1990). *Social Entropy Theory* (pg. 54). New York: State University of New York Press.
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5. Davidson, Julius. (1919). "One of the Physical Foundations of Economics" (abs), *Quarterly Journal of Economics*, 33: 717-24.

External links

â— Henry Louis Le Chatelier – Wikipedia.

θΔics

In existographies, **Henry Leicester** (1906-1991) (CR:21) was an American chemistry historian noted for his 1956 *The Historical Background of Chemistry*, with its rather detailed history of affinity chemistry, among other subjects.

Overview

In 1956, Leicester, in his chapter "Physical Chemistry in the Nineteenth Century", gave the following synopsis of the origin of chemical thermodynamics:

> "Van't Hoff had shown chemists how thermodynamics could be applied to their science, especially with reference to ideas on affinity. In his work in 1884 he first drew the distinction between chemical kinetics and chemical thermodynamics and showed that the maximum external work obtained when a chemical reaction was carried out reversibly and isothermally could serve as a measure of chemical affinity. Helmholtz even earlier had called maximum work 'free energy'. Gilbert Lewis, of the University of California, Berkeley, proposed that this term be restricted to mean the work available for use. Thus, the maximum useful work obtained when one system passes spontaneously into another represents the decrease in free energy of the system. The influential textbook of G.N. Lewis and Merle Randall which represents these ideas has led to a replacement of the term 'affinity' by the term 'free energy' in much of the English-speaking world. The older term has never been entirely replaced in thermodynamic literature, since after 1922 the Belgian school under Theophile De Donder has made the concept of affinity still more precise."

Herein, Leicester notably concludes, in regards to the transition to chemical thermodynamics, that: [1]

> "The influential textbook of G.N. Lewis and Merle Randall led to the replacement of the term 'affinity' by the term 'free energy' throughout the English speaking world."

(add)

In 1969, Leicester published *A Source Book in Chemistry, 1400-1900*, with Herbert Klickstein, which contains, among other things, English translations of Johann Becher's 1669 work on terra pinguis theory.

Education

At age 16, Leicester entered Stanford University, completing his AB in 1927, his MA in 1928, and his PhD in organic chemistry in 1930; thereafter becoming an internationally renowned authority on the history of chemistry and the biochemistry of teeth, eventually, following a number of various posts, e.g. University of California, San Francisco, becoming professor emeritus of biochemistry at the Dental School of the University of the Pacific. [2]

References

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2. Kauffman, George B. (1991). "Henry Marshall Leicester (1906-1999): A Memorial Tribute" (pdf), *Bulletin of the History of Chemistry*, 10:15-21.
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External links

â— Leicester, Henry Marschall (1906-) – WorldCat Identities.
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θΔics

In existographies, **Henry Mencken** (1880-1956) (CR:8) (HD:53) (FA:82) (RMS:72) was an American, German-fluent, journalist, a self-professed agnostic, atheism-leaning scholar, coiner of the term "Bible Belt" (Hecht, 2003), noted for his satirical reporting in the 1925 Scopes trial (see: science vs religion legal cases), on legality of teaching evolution in high school, which he dubbed the “Monkey Trial”. [5]

Nietzsche

In 1906, Mencken, age 26, in his *The Philosophy of Friedrich Nietzsche*, penned out one of the first English summaries of the philosophy of Friedrich Nietzsche. [3]

In 1920, Mencken published (Q) an English translation of Nietzsche’s *The Anti-Christ* (1888), using two earlier translations, one by Thomas Common, and another by Anthony M. Ludovici, as references. [4] Noted quotes from this work are as follows:

> “No man of sound information, at the time [1885] Nietzsche planned *The Antichrist*, actually believed that the world was created in seven days, or that its fauna was once overwhelmed by a flood as a penalty for the sins of man, or that Noah saved the boa constrictor, the prairie dog and the *pediculus capitis* [head lice] by taking a pair of each into the ark, or that Lot's wife was turned into a pillar of salt, or that a fragment of the ‘true cross’ could cure hydrophobia. Such notions, still almost universally prevalent in Christendom a century before, were now confined to the great body of ignorant and credulous men—that is, to ninety-five or ninety-six percent. of the race.”
>
> — Henry Mencken (1920), “Introduction” to Nietzsche’s Anti-Christ (pg. 6-7)

(add discussion)

Scopes Trial

In 1925, Mencken entered the arena of the “Scopes trial” as the reporter on the side of Clarence Darrow, evolution, and atheism; the following is a noted film remake quote:

> “I know that the sunrise is an optical illusion. My teacher told me so.”
>
> — Henry Mencken (1925), attributed; said by E.K. Hornbeck (Gene Kelly), of the *Baltimore Herald*, patterned after Mencken (Q), in: *Inherent in the Wind* (1960), the film remake of the Scopes Monkey Trail, in response to query as to "why he bothers" (Q), him and his newspaper, dealing with this religious legal trickery

(add discussion)

Treatise on the Gods

In 1930, Mencken, in his *Treatise on the Gods* (Q), citing Archibald Sayce, attempted to reconstruct Genesis as follows:

> “The cosmogony of the Jews, as recorded in Genesis, was mainly borrowed from the Babylonians. According to A. H. Sayce, the creation myth that it embodies arose at Eridu, a town on the Persian Gulf. Here, he says in the Hastings' *Encyclopedia of Religion and Ethics*, ‘the land was constantly growing through disposition of silt, and the belief consequently arose that the earth had originated in the same way. The water of the great deep accordingly came to be regarded as the primordial element out of which the universe was generated. The deep was identified with the Persian Gulf, which was conceived as encircling the earth’.”

Other quotes from this work are as follows:

> "Religion is so absurd that it comes close to imbecility."
>
> — Henry Mencken (1930), *Treatise on the Gods*

(add discussion)

Other

In 1945, Mencken, in an article of *The American Mercury*, supposedly, used term bio-psycho-dynamics to refer to a person as a type of storage battery. [1]

Quotes

The following are noted quotes:

> "Morality is doing right no matter what you are told. Religion is doing what you are told no matter what is right."
>
> — Henry Mencken (c.1930) (O)

> "It is now quite lawful for a Catholic woman to avoid pregnancy by a resort to mathematics, though she is still forbidden to resort to physics and chemistry."
>
> — Henry Mencken (c.1930)

> "One horse-laugh is worth ten thousand syllogisms."
>
> — Henry Mencken (c.1930) [2]

> "Well, I tell you, if I have been wrong in my agnosticism, when I die I'll walk up to god in a manly way and say, sir, I made an honest mistake."
>
> — Henry Mencken (c.1930)

> "The scientist who yields anything to theology, however slight, is yielding to ignorance and false pretenses, and as certainly as if he granted that a horse-hair put into a bottle of water will turn into a snake."
>
> — Henry Mencken (c.1930)

> "We must respect the other fellow's religion, but only to the extent that we respect his theory that his wife is beautiful and his children are smart."
>
> — Henry Mencken (c.1930)

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External links

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θΔics

In hmolscience, **Henry Morris** (1918-2006) was an American civil engineer and hydraulics engineer notable, in religious thermodynamics, for being one of the first to adamantly invoke the laws of thermodynamics, particularly the second law, to argue that evolution is impossible. [1]

Thermodynamics | Creationism

In 1946 Morris wrote his first evolution debunking themed book entitled *That You Might Believe*, which was enlarged and republished in 1951 as *The Bible and Modern Science*. In the years to follow, he seems to have fortified his stance by incorporating the classic second law argument into his arguments in support of creationism. In his 1974 book *The Troubled Waters of Evolution*, for instance, Morris states: [2]

> "There is firm evidence that evolution never could take place. The law of increasing entropy results in an impenetrable barrier which no evolution mechanism yet suggested has ever been able to overcome. Evolution and entropy are opposing and mutually exclusive concepts. If the entropy principle is really a universal law, then evolution must be impossible."

Similarly, in 1985 he stated "the second law of thermodynamics says that everything tends towards disorder, making evolutionary development (ordering) impossible."

In 1996, in attempting to use thermodynamics to argue that God created the universe, Morris stated: [3]

> "The second law (the law of decreasing available energy, as the universe heads downward toward an eventual 'heat death' with the sun and stars all burned out) tells us that there must have been a primeval creation, or else the universe would already be 'dead'! The first law (law of energy conservation) tells us that no energy is now being created, so the universe could not have created itself. The only scientific conclusion is that 'in the beginning God created the heaven and the earth' (Gen. 1:1)."

In short, Morris is attempting to use thermodynamics to justify the Heliopolis creation myth as described in Ra theology, the precursor to Genesis version of creation myth.

Education

Morris completed his BS in civil engineering in 1939 from Rice University, his MS in hydraulics in 1948 and PhD in hydraulic engineering in 1950 from the University of Minnesota.

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3. (a) Morris, Henry M. (1996). "The World and the Word", *Back to Genesis*, 93.
(b) Edis, Taner. (2002). *The Ghost in the Universe: God in the Light of Modern Science* (pg. 37). Prometheus Books.

Further reading

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- Gish, Duane. (1978). "Thermodynamics and the Origin of Life: Part II" (Q), *Acts & Facts*, 7(4).

External links

- Henry M. Morris – Wikipedia.

θΔics

In existographies, **Henry Osborn** (1857-1935) (CR:9) was an American anatomist, zoologist, and paleontologist, noted for

Overview

In 1916, Osborn, in his *The Origin of Life: On the Theory of Action, Reaction and Interaction of Energy*, presented a fairly modern view of evolution based on mechanism and thermodynamics. [1] In summary of his work, Osborn states: [2]

> "The first half of the volume is devoted to the capture, storage, release, and reproduction of energy in its simplest and most elementary living phases; the second half is devoted to the evolution of matter and form in plants and animals, also interpreted largely in terms of energy and mechanics."

Osborn's *Origin of Life* is a product of a lecture series on cosmic-evolution, specifically a mid-way lecture on the topic of "initial steps toward an energy conception of evolution and heredity"; the resultant unified book being completed on the suggestion of Osborn's friend American astronomer George Hale. [2]

Religion

Osborn, according to Sunand Joshi (2014), is classified, similar to Robert Millikan, as someone attempting to reconcile religion and science. [6]

Thermodynamics

Osborn states that his learning of physics is attributed to the instructions of his Columbia University colleague Serbian-born American physical chemist Michael Pubin, notable for having obtained his PhD under German physicist Hermann Helmholtz at the Berlin school of thermodynamics, who instructed Osborn "on the fundamental relation of Newton's laws of motion to the modern laws of heat and energy (thermodynamics), [clarifying] the laws of action, reaction, and interaction from a physical standpoint." [4] In this aim, Osborn utilizes the word "thermodynamics" many times, but fails to mention the words "entropy" or "Clausius" a sure sign of a novice. [1]

As to his understanding of the physiochemical actions and reactions of living organisms, i.e. dynamics, Osborn states that he drew heavily from German-born American physiologist Jacques Loeb's book *Dynamics of Living Matter*. [5]

Difficulties on theory

Osborn's general work seems to be very cogent. A point of difficulty is that Osborn crutches on the concept of "living energy" and what he calls the *phenomena of living matter*, defined as the utilization of the energy concept "forward into matter and form" in the study of the assent of evolutionary structure. This idea postulate, superficially, seems reasonable, but upon further thought it falls in with the defunct theory of vitalism. Osborn, for instance, correctly explains fitness of the early life-like structures: [2]

> "The earliest fitness we discover in the bacteria or monad is the fitness of grouping and organizing different kinds of energy—the energy of molecules, of atoms, of electrons as displayed in the twenty-six or more chemical elements which enter into life."

in that modern functional counts of active elements in human beings is found to be 26, but when this logic is taken on face value, in the sense that a structure comprised of elements is a molecule, the postulate of a molecule, such as H_2, H_20, or DNA, etc., as viewed on molecular evolution tables, being alive becomes illogical. [3]

Quotes

The following are noted Osborn quotes:

> "We may accept the hypothesis that in the earliest periods of organization of living matter there was a combination of ten elements essential for life. Of the four most important elements were derived from their primary combinations of water, bound nitrogen (volcanic eruptions), and carbon dioxide of the atmosphere."
>
> — Henry Osborn (1916), *The Origin and Evolution of Life* (pgs. 58-59); cited by Alexander Oparin (1936) in his *The Origin of Life* (pg. 53)

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2. Osborn, Henry F. (1916). *The Origin of Life: on the Theory of Action, Reaction and Interaction of Energy* (Preface, pgs. vii, xvi, xix). Charles Scribner's Sons, 1921.
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External links

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θΔics

In existographies, **Henry Power** (1623-1668) (CR:7) was and English physician, physicist, experimenter, and "microscopist" (Inwood, 2002), noted for []

Overview

In 1653, Power did experimental work, with English scientist Richard Towneley, in formulating the gas law relation of pressure varying inversely with volume, a law that would famously become known as Boyle's law. Power was the family physician to the Towneley family and personal friend of Richard Towneley. Power published the results of their gas law experiments in the 1663 book *Experimental Philosophy*, prefaced 1661. [1]

Weight | Height

In c.1655, Power, supposedly, had found or reported that objects weighed less at great depths, in the earth, than on the earth's surface.

In Aug-Sep 1665, Robert Hooke and John Wilkins, at the Banstead Downs chalk wells, which are 315 feet deep, located about two miles from Durdans, weighed objects on the surface of the earth and the bottom of the wells, to test Power's reports, but their measurements failed to confirm Power's findings. [2]

Associates

Power corresponded regularly with Thomas Browne.

Education

Power completed his BA (1641), MA (1648), and MD (1655) at Cambridge.

Quotes | By

The following are quotes by Power:

> "It hath often seemed to me beyond an ordinary probability, and something more than fancy, however paradoxical the conjecture may seem, to think that the least bodies we are able to see with our naked eyes, are but middle proportionals (as it were) betwixt the greatest and smallest bodies in nature, which two extremes lye equally beyond the reach of human sensation: for as on the one side they are but narrow souls, and not worthy the name of philosophers, that think any 'body' can be too great or too vast in its dimensions; so likewise are they as inapprehensive, and of the same litter as the former, that on the other side think the particles of matter may be too little, and that nature is stinted at an 'atom', and must have a non-ultra of her subdivisions. Such, I am sure, our modern engine (the micro-scope) will ocularly evince and **unlearn them their opinions** again: for herein you may see what a subtill divider of matter nature is."
>
> — Henry Power (1664), *Publication* [3]

> "Me thinks, I see how all the old rubbish must be thrown away, and the rotten buildings be overthrown. These are the days that must lay a new foundation of a more magnificent philosophy, never to be overthrown."
>
> — Henry Power (c.1665), *Publication* [4]

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External links

â— Henry Power – Wikipedia.

θΔics

In human chemistry, **Henry Pritchett** (1857-1939) was an American astronomer and college president (MIT, 1900-1907) noted for his 1906 vicarious call for the development of a science able to predict or speculate on human chemical reactions (see: theory) so as to facilitate the counceled guidance and or placement of students, according to his or her own unique nature, in college, particularly in regards to going to a large or small college, and comments that he had conducted an experiment along these lines with his own sons.

Overview

In 1906, at the 21st annual meeting of the *New England Association of Colleges and Preparatory Schools*, toward the end of a two-hour topic focus discussion on the subject of "Small vs. Large Colleges"—stemming back to Greek philosopher Plato's dialogue on the question of how large a state should be, wherein Socrates responded with "as large as is consistent with unity" (see also: Dunbar number)—Pritchett told that he had conducted an experiment of sorts with his own two sons, sending one to a small college, the other to a large college, during the course of which he queried each as to social network count and also speculated on the need or desire to have a human chemical reaction technology able to predict the suitableness of each prospective college student, in regards to course towards large or small colleges, based on his or her individual nature. The full statement of which, after introduction by association president William DeWitt Hyde, is as follows: [1]

The President [William DeWitt Hyde]:

> "President Pritchett has assumed a fatherly relation over all institutions, large and small, and from his point of observation we shall be glad to have some contribution to this discussion."

President Henry S. Pritchett, of the Massachusetts Institute of Technology:

> "Mr. President, I had meant to be only a listener here, and I have been much interested in the discussion of this matter which has been had so far. My own correspondence with educational institutions for the last six months has led me to understand that each American college is a peculiar institution. The president of each one of these institutions has carefully explained to me by letter that this was true. As long as this is true, it naturally follows that wherever a man may go he will find a certain environment which has its peculiar advantages and its peculiar opportunities. In the Institute of Technology the matter of numbers does not enter in the same way in which it enters in the ordinary large college. Although it has some 1,500 students, what is called the entering class is thrown much together. After the men begin to differentiate, they separate into 13 courses, so that the men who may take, let us say, marine engineering, are thrown naturally together. In this case we have here a natural grouping of students.
>
> Since you have been so good, however, as to refer to my fatherly relation, I may say that I have as a father tried **two practical experiments** in this way, which is one of the attractions of being a father. I sent one boy to a small college, one of the old colleges, Hamilton, which I think might well be selected as a type of a small college. I sent a second boy, who was preparing to be an engineer, to take his college course at Harvard."

In modern human chemical reaction theory formulation, the following might well depict the mechanism of these two separate reaction experiments:

Experiment A Experiment B

$$S_A + C_S \rightarrow S_A \equiv C_S \rightarrow S_{A_m} + C_S \qquad S_B + C_L \rightarrow S_B \equiv C_L \rightarrow S_{B_m} + C_L$$

where S_A and S_B are sons A and B, C_S and C_L are the small college (Hamilton) and large college (Harvard), $S_A \equiv C_S$ and $S_B \equiv C_L$ are the encounter complexes (see: collision theory), one might say, and S_{Am} and S_{Bm} are the modified "adult" sons after finishing college, respectively. Pritchett continues:

> "I was somewhat interested to see how this matter of social relation worked itself out. The result of this practical experiment was this: The boy who went to a small college joined a fraternity, in which he found 12 or 15 men who became his close intimates, and with whom almost all his friendships were contracted. He knew the 100 other men in the college, or the 125 other men, but apparently knew them only as a man knows another student passing him day by day. I had the other boy sit down a few evenings ago, and, taking the Harvard catalogue, make out a statement of the number of men whom he knew intimately, the number of men whom he knew fairly well, and the number of men with whom he had a speaking acquaintance. He made out that he knew 115 men well, that he knew 225 men fairly well, that he had a speaking acquaintance with 300.
>
> The fact is, where you discuss this problem of the relative advantages of a small and a large college, you are making use of that interesting intellectual process which is known in algebra as the solving of indeterminate forms. This does not mean equations that cannot be determined, but equations that have an infinite number of solutions. In a word, you are discussing a question to which there is no definite answer.
>
> > There are men who would be better off in a small village than in a large town, if you had some sort of **human chemical reaction** to determine in advance which man's nature was suited to the smaller place and which to the larger.
>
> There are boys, undoubtedly, who would do better in a small group of men than in the larger college world of a great university or a large college. But there is no human way of finding out that fact, and in the long run the great rewards and the larger opportunities, it seems to me, are very apt to lie just as they lie in the comparison between a small city and a large one. There is added security perhaps, greater safety, greater conservatism in the smaller place. There is a larger opportunity in the larger place, with a larger population. So long as those two conditions hold it will always be impossible to tell whether the boy will do the better in the one place or in the other.
>
> Three claims have been introduced as making strong reasons for choosing smaller colleges. One of these is the argument that the small college is the safer place, because it is usually in a small and isolated community. I do not think there is anything in that argument, because I have always noticed that wherever you locate a college in a small town, in order to free a student from temptation, there is always some wicked place about ten or twenty miles away to which these fellows are very apt to go. In the second place, the argument which is made for a more intimate relation between student and student is one which again, I think, has little significance. A boy in a large college will have also his intimates, and so far as my boy's experience goes, will have more. The third argument which is made is the closer contact between teacher and student. There, I think, is a real point— a real advantage in favor certainly of smaller colleges as against some larger colleges; but that again is a point which is purely a matter of organization. It is just as possible to bring 2,000 students in contact with professors who shall be strong, who shall be influential, who shall be inspiring, as it is to bring 300 students into contact; but in order to do it you must have more professors, you must have a larger faculty, you must have better facilities; and these are not always provided. And so it seems to me that when a small college provides really fine men in a large proportion to its student body, it does offer in that respect certain real advantages. On the other hand, if you contribute a

> proportionately large number of men to a large student body, you have offered practically the same advantage. And so you find yourself once again, it seems to me, face to face with a problem which is practically insoluble in any particular case."

In sum, Pritchett, if he were able to come forward in time a century, might well be apt to use or consult a "human molecular engineer", who in turn would use chemical engineering thermodynamics principles, to facilitate or "determine in advance", using chemical reaction prediction methods, the choice or direction as to Pritchett giving counseled engineered guidance as to the question of which college, large or small, to send each of his two sons to, and experiment that he was forced to "conduct" on his own, as he says, because the subject of "human chemical reaction theory" was not yet a central science in his day. Said another way, just as German polyintellect consulted the "affinity tables" to engineer the reactions of the chapters of his novella, via use of human affinity table methods, so to would the modern thinker turn to human free energy theory, and hence free energy tables for human chemical reaction calculations, to engineer reactions of one's children.

Education

Pritchett completed his AB at Pritchett College in 1875, his PhD at the University of Munich in 1895. From 1875 to 1880 he worked as an astronomer and from 1881 to 1897 he was professor of mathematics and astronomy at Washington State University, St. Louis. From 1900 to 1907 he was the president of the Massachusetts Institute of Technology.

Family

In 1881, Pritchett married Ida W. Williams and they had three sons, Colonel H. H. Pritchett, Edwin E. Pritchett, and Leonard W. Pritchett of New York, and a daughter, Ida W. Pritchett. In 1900, Pritchett married Eva McAllister of San Francisco, to whom a daughter, Edith Pritchett, was born. [2]

See also

- Thomas Wallace
- MIT school of thermodynamics

References

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2. Dr. Henry Smith Pritchett – National Oceanic and Atmospheric Association.

Further reading

- Pritchett, Henry S. (1906). *What is Religion? and Other Student Questions: Talks to College Students*. Houghton, Mifflin.

External links

- Henry Smith Pritchett – Wikipedia.
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θΔics

In hmolscience, **Henry Roscoe** (1833-1915) was an English chemist noted for his 1887 BAAS presidents address, wherein he digresses on the question of what science has to say about the abiogenesis problem, namely how the newly forming science of chemistry, heat, and energy can explain how nature "gathers the elements of lifeless matter into a living structure".

Overview

Roscoe, first in his address, discusses how Antoine Lavoisier "left untouched the dynamics of combustion", namely why a fixed and unalterable amount of heat is in most cases emitted, but in some cases absorbed, when combustion takes place. He then stated that James Joule (1843) solved that problem, via his mechanical equivalent of heat calculations. Then he jumps to Friedrich Wohler's famous 1828 synthesis of "organic" urea from "inorganic" ammonium cyanate, the first seeming chemical bridging of life from non-life, which seemingly solved the organic and inorganic dichotomy debate. Then he mentions how German chemist Hermann Kolbe in 1845 prepared acetic acid from its elements. Then, in reply to the question about the synthetic power of the chemist, in respect to the synthesis of life hypothesis, he then gives the following oft-cited statement:

> "One cannot help feeling that the barrier which exists between the organized and unorganized worlds is one which the chemist at present sees no chance of breaking down. It is true that there are those who profess to foresee that the day will arrive when the chemist, by a succession of constructive efforts, may pass beyond albumen, and gather the elements of lifeless matter into a living structure. Whatever may be said regarding this from other standpoints, the chemist can only say that at, present no such problem lies within his province. Protoplasm, with which the simplest manifestations of life are associated, is not a compound, but a structure built up of compounds. The chemist may successfully synthesize any of its component molecules, but he has no more reason to look forward to the synthetic production of the structure than to imagine that the synthesis of gallic acid leads to the artificial production of gall-nuts."

(add discussion)

Human periodic table | Analogy

In circa 1900, Roscoe gave an analogy between the newly forming ideas on the periodicity of the elements and the periodicity of human lineages; the gist of which being summarized by Henry Bray (1910) who said that Roscoe said somewhat as follows: [2]

> "Let us in our minds write on our mental blackboard the names of the Englishman Newlands, the Frenchman Dumas, the German Meyer, and the Russian Mendeljeff, all written in a horizontal line; next let us write beneath the name of each

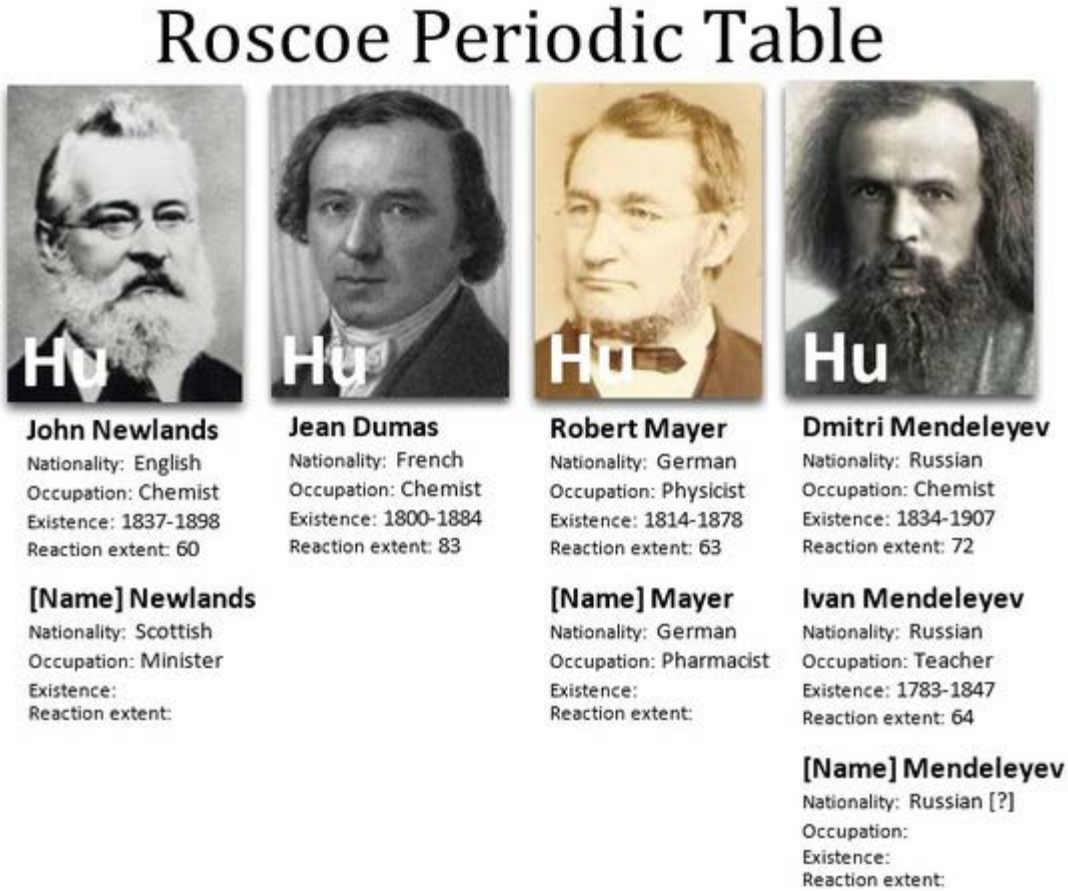

A 2015 rendition of the Roscoe periodic table, conceived by **Henry Roscoe** (c.1900), based on the Henry Bray (1910) description.

> of these men the name of his father, and beneath that the name of his grandfather, and beneath that the name of his great-grandfather, and so on. If you now write opposite the name of each of these individuals the number of years since his birth, you will find the numbers will increase by a definite increment, namely the age of a generation, which will be approximately the same in all the families. There will be certain differences in the ages of the chemists themselves, but such differences will be little when compared to the period that will be found has elapsed since the birth of any of their ancestors. In these family-trees, **each individual takes the place, as it were, of a chemical element**: as each family is marked by certain peculiarities, so each group of atoms thus arranged show marked and unmistakable signs of a common origin."

Bray continues, either as paraphrase or direct quote, that Roscoe elaborated on this as follows:

> "In such a family-tree as we have mentioned, it may frequently happen that the history of some member of the family has been entirely lost. When such is the case it is not impossible, especially for a man like Francis Galton, to judge from the known history of the other members what the characteristics of the missing member of the family must have been. It is thus as to atoms. It was not long ago when Mendeljeff said that if certain vacancies in his tables of atoms were ever filled, they would have to be filled by elements possessing certain chemical and physical properties which he accurately specified. Since that time these vacancies have been filled, and by atoms or elements possessing the very properties which Mendeljeff said they would possess.
>
> Galium was discovered by Lecoq de Boisbaudron, scandium by Nilson, germanium by Winkler; and these discoverers agree that the atomic, chemical, and physical properties of these substances agree exactly with those predicted by Mendeljeff. It sometimes happens that the real parentage of an element has been lost altogether, but a careful examination frequently enables the chemist to restore it to the family to which it

belongs."

(add discussion)

Education

Roscoe was a student, along with Gustav Kirchhoff, of Robert Bunsen.

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(b) Oliphant, Laurence. (1888). *Scientific Religion: Higher Possibilities and Practice Through the Operation of Natural Forces* (pg. 34). Blackwood and Sons.
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External links

â— Henry Enfield Roscoe – Wikipedia.

θΔics

In existographies, **Henry Swan** (1913-1996) (CR:21) was an American surgeon, noted for his hypothermia induced heart stop technique for cardiac repair and for his 1974 book *Thermoregulation and Bioenergetics*, wherein he employs a large number of cogent life terminology upgrades, such as defining biochemistry, and its seems biology, in non-defunct theory upgrade terms, as the study of “powered CHNOPS systems”.

Biochemistry

A snipit of Swan's upgrade definition of biochemistry:

> If there are other segments of the bioverse which have life as we know it on Earth, H_2O will be a conspicuous component of the system, and their climates must approximate ours. But a biochemistry could emerge in which life is powered by the
>
> * This small group of low molecular-weight "core elements of life" has been dubbed the "CHNOPS

In a truncated manner, Swan thus seems to be employing the following definition: [1]

> Biochemistry: study of powered CHNOPS systems or CHNOPS matrices.

In fuller detail, Swan states:

> "But a biochemistry could emerge in which life is powered by the * This small group of low molecular-weight 'core elements of life' has been dubbed the '**CHNOPS System**' by Armstrong, et al. (1964)."

The term "CHNOPS system" was introduced in a 1964 US National Bureau of Standards report entitled “Preliminary Report on Survey of Thermodynamic Properties of the Compounds of the Elements of CHNOPS” by a group of researchers led George Armstrong. [2]

Biosphere

Swan redefines the term biosphere, in short, as follows: [1]

> Biosphere: region of energy supplied liquid water existing terrestrial surface, encompassing steady-state organizations of CHNOPS matrix forms.

> **biosphere,** *n.* A region in which liquid water can exist and that receives an ample supply of energy from an external source. Specifically, that part of the terrestrial surface which comprises a system ordered by a flow of energy mediated by photosynthetic processes; the ecological environment of all terrestrial life-forms based on the steady-state organization of a CHNOPS matrix (see Chapter I).

Here we notice, in the truncated version (left) that defunct concept of "life" drops out of the definition and hence the region under discussion falls within the purview of modern hard physical science. This upgrade for Swan's definition would be something along the lines of the following:

> Biosphere → Medium powered CHNOPS+ region

The clarifier "medium", as contrasted with "low powered" (too cold) or high powered (too hot), signifies that Swan's comment "region which liquid water can exist" seems to be pointing to what is now referred to as the "habitable zone" a certain region away from medium sized stars wherein CHNOPS-based matter can become animate, i.e. life-like, in olden days speak:

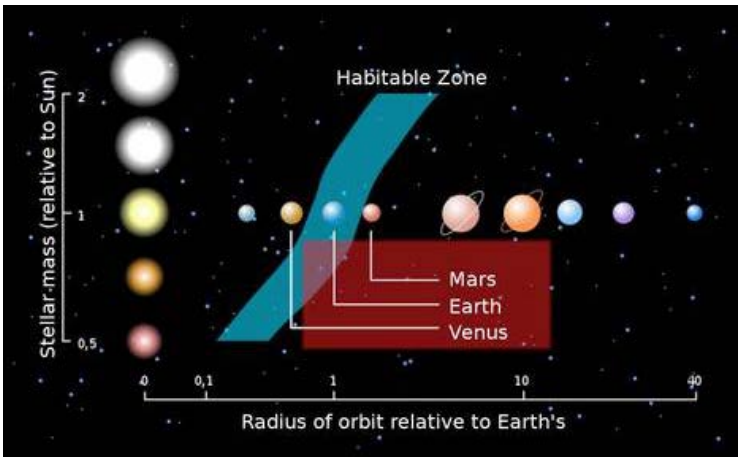

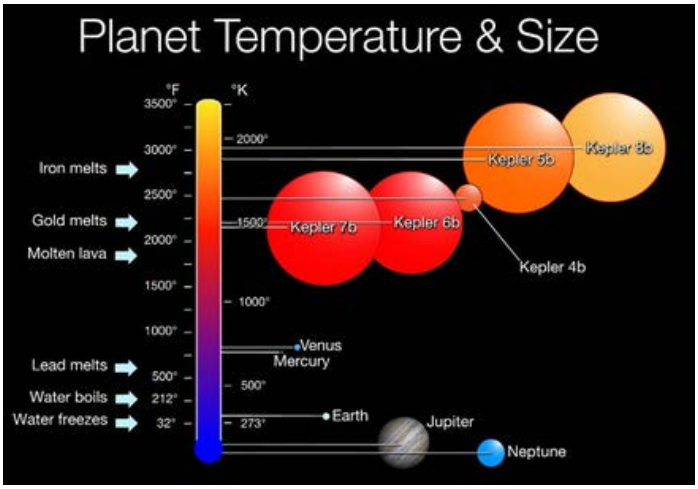

Depictions of the habitable zone by distance (Ñº) from sun and by temperature (Ñº), the model that Swan referring to in his comment "region which liquid water can exist", in other words planets that exist with mean surface temperatures near to 300 °K. Some will incorrectly refer so the habitable zone as the stellar "band of life", or something along these lines, but in life terminology upgrade terms, one defines that as the circumstellar zone of in which powered CHNOPS+ matrices can exist in bound state animate forms, in various states of reaction existence.

(add)

References

1. Swan, Henry. (1974). *Thermoregulation and Bioenergetics: Patterns for Vertebrate Survival* (CHNOPS, 9+ pgs; biochemistry, pg. 2). American Elsevier Pub. Co.
2. Armstrong, George T., Domalski, E.S., Furukawa, George T., and Krivanec, M.A. (1964). “Preliminary Report on Survey of Thermodynamic Properties of the Compounds of the Elements of CHNOPS”, *National Bureau of Standards* (US) Report number: 8521.

External links

â— Henry Swan (profile) – NIH.gov.

θΔics

In existographies, **Henry Thoreau** (1817-1862) (IQ:160|#520) [RGM:179|1,500+] was an American essayist, poet, and philosopher; a student of Ralph Emerson; noted for his *Civil Disobedience*, on the idea of "[non-violent] refusing to cooperate with evil systems" influenced many geniuses, e.g. Leo Tolstoy, Martin King, etc.

Quotes | By

The following are quotes by Thoreau:

> "I, standing twenty miles off, see a crimson cloud in the horizon. You tell me it is a mass of vapor which absorbs all other rays and reflects the red, but that is nothing to the purpose, for this red vision excites me, stirs my blood, makes my thoughts flow, and I have new and indescribable fancies, and you have not touched the secret of that influence. If there is not something mystical in your explanation, some-thing inexplainable to the understanding, some elements of mystery, it is quite insufficient. If there is nothing in it which speaks to my imagination, what boots it? What sort of science is that which enriches the understanding, but robs the imagination? ... **if we knew all things thus mechanically merely, should we know anything really**?"
>
> — Henry Thoreau (c.1850) [1]

> "Nothing is so much to be feared as fear; god himself likes atheism better."
>
> — Henry Thoreau (c.1850), *Publication* [2]

> "There is more religion in man's science than there is science in his religion."
>
> — Henry Thoreau (c.1850), *Publication* [3]

References

1. Zajonc, Arthur. (1998). *Goethe's Way of Science: a Phenomenon of Nature* (editors: David Seamon, Arthur Zajonc) (§1: Goethe and the Science of His Time, pgs.15-; quote, pg. 18). SUNY Press.
2. Emerson, Ralph. (1877). "Perpetual Forces" (txt)(pdf), *The North American Review*, *Volume 125*, Sep 1; in: *Completed Works, Volume 10* (pg. 72)
3. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§33: Thoreau, pgs. 138-40). Prometheus.

External links

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θΔics

In religio-mythology, **Hephaestus** is was the Greek god of fire and blacksmithing, worshiped c.600BC, who is derived from the Egyptian god Ptah (c.2800BC), the god of crafts and the creative force god, and who became, in the Roman era (c.400BC), the Roman god Vulcan.

Overview

In 2004, Blake Hoena, in a series of Greek mythology for children, with consultation from Laurel Bowman, a Canadian professor of Greek and Roman mythology, produced the following Greek to Roman god equivalent table, which shows the Hephaestus to Vulcan rescript: [1]

GREEK *and* ROMAN *Mythical Figures*

Greek Name: **ZEUS**
Roman Name: **JUPITER**
Ruler of **Olympians**, sky, and gods; Athena's father

Greek Name: **HEPHAESTUS**
Roman Name: **VULCAN**
Zeus' son; god of **fire**; Venus' husband

Greek Name: **DIONYSUS**
Roman Name: **BACCHUS**
Zeus' son; god of **wine**

Greek Name: **APOLLO**
Roman Name: **APOLLO**
Zeus' son; god of **light**, youth, and music

Greek Name: **HERMES**
Roman Name: **MERCURY**
Zeus' son; messenger of gods

Greek Name: **ARES**
Roman Name: **MARS**
Zeus' son; god of war

Greek Name: **ATHENA**
Roman Name: **MINERVA**
Zeus' daughter and goddess of **wisdom**

Greek Name: **POSEIDON**
Roman Name: **NEPTUNE**
Zeus' brother; god of the **sea**

Greek Name: **HERA**
Roman Name: **JUNO**
Zeus' wife; goddess of marriage and childbirth

Greek Name: **APHRODITE**
Roman Name: **VENUS**
Aeneas' mother; goddess of **love** and **beauty**

Greek Name: **EROS**
Roman Name: **CUPID**
Venus' son; god of **love**

Greek Name: **HERACLES**
Roman Name: **HERCULES**
Greek hero; performed 12 labors

Greek Name: **ODYSSEUS**
Roman Name: **ULYSSES**
Greek hero whose adventures are told in Homer's *The Odyssey*

Greek Name: **NIKE**
Roman Name: **VICTORIA**
Goddess of victory

Greek Name: **DEMETER**
Roman Name: **CERES**
Goddess of **growing** things

Greek Name: **CRONUS**
Roman Name: **SATURN**
Titan who ruled the heavens *before* the Olympians; Poseidon's father

Greek Name: **RHEA**
Roman Name: **OPS**
Poseidon's mother

Greek Name: **PROMETHEUS**
Roman Name: **PROMETHEUS**
Titan who **created** animals and gave people the gift of **fire**

Greek Name: **HADES**
Roman Name: **PLUTO**
Poseidon's brother; ruler of the underworld

Greek Name: **MENELAUS**
Roman Name: **MENELAUS**
Greek prince; married to Helen

Greek Name: **HELEN**
Roman Name: **HELEN**
Menelaus' wife

Greek Name: **PARIS**
Roman Name: **PARIS**
Trojan prince who took Helen from Menelaus

(add)

Quotes

The following are related quotes:

> “The earliest recorded Egyptian versions of their own remote past date from Ramessid times. From this period dates the Turin Canon, which agrees substantially with Manetho's account. The oldest kings are definitely associated with Heliopolis, and there-fore the list ought to begin with the sun god, Re-Atum [see: Atum-Ra], or in Greek Helios. But in fact Manetho names ‘**Hephaestus**’ as the first ruler of Egypt, suggesting that this version was originally compiled in the 6th dynasty, the kings of which came from Memphis, the centre of worship of **Ptah**. Although Diodorus records what is primarily the Heliopolitan tradition, starting with Helios, it is clear that he is also aware of the Memphite theology since he records a variant genealogy of Hephaestus (Helios?), Cronus, and Osiris. It is possible that this owes something to Manetho, who may be included in the: ‘ενιοι δε των Ἱ ερεων’, a phrase which presumably refers otherwise to the priests of Memphis. The Greek god Hephaestus was identified with the Egyptian god Ptah, an identification aided by the fact that Ptah was noted as a craftsman, while Hephaestus was the god of smithying.”
>
> — Anne Burton (1973), *Diodorus Siculus: a Commentary* (pg. 71)

References

1. (a) Hoena, Blake. (2004). *Aeneas* (consultant: Laurel Bowman) (pg. 18). Publisher.
(b) Hoena, Blake. (2003). *Athena* (pg. 6). Publisher.
(c) Hoena, Blake. (2003). *Venus* (pg. 6). Publisher.
(d) Hoena, Blake. (2003). *Zeus* (pg. 5). Publisher.

External links

â— Hephaestus – Wikipedia.

θΔics

In existographies, **Heraclides of Ponticus** (387-312BC) (IQ:180|#115), aka "Ponticus" (Guericke, 1672) or “Heraclides Ponticus”, was a Greek philosopher and astronomer, noted for []

Earth rotation | Heliocentrism

Heraclides, according to fragmentary evidence, proposed, supposedly, in contrast to the Aristotelian geocentric model (see: geocentrism), that the earth rotates on its axis, from west to east, once every 24 hours, and that the apparent daily motion of the stars was created by the rotation of the earth on its axis once a day.

This model, of note, supposedly, is similar to the an older model by Ecphantus (c.530-460BC), who proposed that the earth rotates like a wagon wheel, possibly cylinder like in shape.

Heraclides also proposed, according to Simplicius (c.590AD), that the irregular movements of the planets can be explained if the earth moves while the sun stays still (see: heliocentrism).

Aristotle

Heraclides, a contemporary of Aristotle, supposedly, battled him on the question whether the universe is finite or infinite. [2]

Quotes | On

The following are quotes on Heraclides:

> “Crates and Dicaearchus were of opinion that there was **no soul at all**, but that the body thus stirs by a natural motion; Plato, that it was a substance moving of itself; Thales, a nature without repose; Asclepiades, an exercising of the senses; Hesiod and Anaximander, a thing composed of earth and water; Parmenides, of earth and fire; Empedocles, of blood, e.g. "He vomits up his bloody **soul**" (Sanguineam vomit ille **animam**). Posidonius, Cleanthes, and Galen that it was heat or a hot complexion: “their vigor of fire and of heavenly race” (Ignens est ollis vigor, et coelestis origo). Hippocrates, a spirit diffused all over the body; Varro, that it was an air received at the mouth, heated in the lungs, moistened in the heart, and diffused throughout the whole body; Zeno, the quintessence of the four elements ["I know not," says Mr. Coste, "where Montaigne had this; for Cicero expressly says that this quintessence, or fifth nature is a thought of Aristotle, who makes the soul to be composed of it; and that Zeno thought the soul to be fire." (Cicero, *Tusc. Quaes*, i.9). After this, Cicero adds, "that Aristotle calls the mind, which he derives from that fifth nature entelechia [entelechy], a new-coined word, signifying a perpetual motion." Though Montaigne has copied these last words, in what he proceeds to tell us of Aristotle, he censures him for not having spoken of the origin and nature of the soul. But had he only cast his eye upon what Cicero had said a little before, he would have been convinced that Aristotle had taken care to explain himself concerning the origin of the soul, before he remarked the effect of it If he has not thereby fully demonstrated what the nature of it is, Zeno has not given us much better light into it when he says, "the soul or mind seems to be fire"; and it would not be difficult to show that in this article the other philosophers have not succeeded better than Zeno

and Aristotle]; **Heraclides Ponticus**, that it was the light; Zenocrates and the Egyptians, a mobile number; the Chaldeans, a virtue without any determinate form: "A certain vital habit in man's frame, which harmony the Grecian sages name" (Habitum quemdam vitalem corporis ease, Harmonium Grseci quam dicunt.) Let us not forget Aristotle, who held the soul to be that which naturally causes the body to move, which he calls entelechia [entelechy], with as cold an invention as any of the rest; for he neither speaks of the essence, nor of the original, nor of the nature of the soul, but only takes notice of the effect. Lactantius, Seneca, and most of the dogmatists, have confessed that it was a thing they did not understand. Heraclitus, who was of opinion that every being was full of souls and demons, did nevertheless maintain that no one could advance so far towards the knowledge of the soul as ever to arrive at it; so profound was the essence of it."

— Michel Montaigne (1580), "Apology for Raymond Sebond" [1]

"Anaximander stated that the earth was like a column, Leucippus, a cylinder or war drum; Cleanthes, a cone or top; Heraclitus, a boat-shaped vessel; Democritus, a concave disc; Anaximenes and Empedocles, etc., a level table. Thereafter, Parmenides and Epicurus came nearer actual fact, as did Heraclitus, **Ponticus**, and Ecphantus. The former believed that the earth was round like a ball, while the latter not only attributed the shape of a sphere to the earth, but also some movement, albeit not such that it could move forward and change place, however, as a wheel does."

— Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* (pg. 3)

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Further reading

â— Heath, Thomas. (2013). *Aristarchus of Samos: the Ancient Copernicus – a History of Greek Astronomy to Aristarchus, Together with Aristarchus's Treatise on the Sizes and Distances of the Sun and Moon* (Heraclides, 38+ pgs). Cambridge University Press.

External links

â— Heraclides Ponticus – Wikipedia.

θΔics

In existographies, **Heraclitus** (c.535-450BC) (IQ:185|#81) (Cattell 1000:721) (Stokes 100:4) (GPhE:#) (GPE:83) (ACR:9) [CR:121] was a Greek physical-based philosopher and thinker, aka “flux and fire philosopher”, the “riddler” as the stoics called him, or "the murky" (Copley, 1977) for his cryptic remarks, who can be contrasted with Parmenides (510-450BC), a mind-based (Q) philosopher, his main rival, noted for his now lost *On Nature* (c.500BC), on the universe, politics, and theology, wherein he outlines a three element theory, according to which the universe is comprised of three principle elements: fire, earth, and water, but that fire was the primary element, controlling and modifying the other two, and that everything is in a continuous state of flux, or change, and war and strife between opposites is the eternal condition of the universe. To Heraclitus, there exists a universal tension, which ensures that change is continual, that everything is in a state of flux, whereby permanence does not exist in the universe, only the permanent condition of change as a result of the transformations of fire. [1]

Fragments

The surviving work of Heraclitus amounts to about 129 fragments; which are not written in continuous prose or verse, as other philosophers did, but in a series of short and penetrating observations; supposedly, something akin to the way Ludwig Wittgenstein writes (Q); the following is a work in progress analysis of the key fragments, in chronological order:

> “They vainly purify themselves by defiling themselves with blood, just as if one who had stepped into the mud were to wash his feet in mud. Any man who marked him doing thus, would deem him mad. And they pray to these images, as if one were to talk with a man's house, knowing not what gods or heroes are.”
>
> — Heraclitus (c.495BC), Fragment 5 (Q) (translator: John Brunet)

> “Couples are things whole and things not whole, what is drawn together and what is drawn asunder, the harmonious and the discordant. The one is made up of all things, and all things issue from the one.”
>
> — Heraclitus (c.495BC), Fragment 10 (Q) (translator: John Brunet)

> “You cannot step twice into the same river; for fresh waters are ever flowing in upon you.”
>
> — Heraclitus (c.495BC), Fragment 12 (Q) (translator: John Brunet)

> “For if it were not to Dionysus that they made a procession and sang the shameful phallic hymn, they would be acting most shamelessly. But Hades is the same as Dionysus in whose honor they go mad and rave”
>
> — Heraclitus (c.495BC), Fragment 15 (Q) (translator: John Brunet)

> “If you do not expect the unexpected, you will not find it; for it is hard to be sought out and difficult”
>
> — Heraclitus (c.495BC), Fragment 18 (Q) (translator: John Brunet)

> “Men would not have known the name of justice if these things were not”
>
> — Heraclitus (c.495BC), Fragment 23 (Q) (translator: John Brunet)

“The most esteemed of them knows but fancies, and holds fast to them, yet of a truth justice shall overtake the artificers of lies and the false witnesses”

— Heraclitus (c.495BC), Fragment 28 (O) (translator: John Brunet)

“**This world order**, the same for all beings, was created neither by gods nor by humans; rather, it **was always and is and will be eternal living fire kindled in measures and quenched in measure**.”

— Heraclitus (c.470BC), Fragment 30 (O) (translator: Hans Diels) [1]

“The **transformations of fire are, first of all**, sea; and half of the sea is earth, half whirlwind. It becomes liquid sea, and is measured by the same tale as before it became earth.”

— Heraclitus (c.495BC), Fragment 31 (O) (translator: John Brunet)

“The wise is one only. It is unwilling and willing to be called by the name of Zeus.”

— Heraclitus (c.495BC), Fragment 32 (O) (translator: John Brunet); here, we note that Zeus is the Egyptian to Greek god rescript of Amen-Ra (see: supreme god timeline) (compare: fragment 10)

“Men that love wisdom must be acquainted with very many things indeed.”

— Heraclitus (c.495BC), Fragment 35 (O) (translator: John Brunet)

“For it is death to souls to become water, and death to water to become earth. But water comes from earth; and from water, soul.”

— Heraclitus (c.495BC), Fragment 36 (O) (translator: John Brunet)

“Thales foretold an eclipse”

— Heraclitus (c.495BC), Fragment 38 (O) (translator: John Brunet)

“**The learning of many things teaches not understanding**, else would it have taught Hesiod and Pythagoras, and again Xenophanes and Hecataeus.”

— Heraclitus (c.495BC), Fragment 40 (O) (translator: John Brunet)

“**Wisdom is one thing. It is to know the thought by which all things are steered through all things**.”

— Heraclitus (c.495BC), Fragment 41 (O) (translator: John Brunet)

“Homer should be turned out of the lists and whipped, and Archilochus likewise.”

— Heraclitus (c.495BC), Fragment 42 (O) (translator: John Brunet)

“Wantonness needs putting out, even more than a house on fire.”

— Heraclitus (c.495BC), Fragment 43 (O) (translator: John Brunet)

“You will not find the boundaries of soul by travelling in any direction, so deep is the measure of it.”

— Heraclitus (c.495BC), Fragment 45 (O) (translator: John Brunet)

“The **bow (βιός) is called life (βίος)** but its work is death.”

— Heraclitus (c.495BC), Fragment 48 (O) (translator: John Brunet) (see: Homer commentary); Martin Heidegger (1948) comments that this is related to the idea that "from the bow there emerges and arises the flight and the course of the arrow" [10]

“We step and do not step into the same rivers; we are and are not.”

— Heraclitus (c.495BC), Fragment 49a (O) (translator: John Brunet)

“Men do not know how what is at variance agrees with itself. It is an attunement of opposite tensions, like that of the bow and the lyre.”

— Heraclitus (c.495BC), Fragment 51 (O) (translator: John Brunet)

“**Time is a child playing draughts**, the kingly power is a child's.”

— Heraclitus (c.495BC), Fragment 52 (O) (translator: John Brunet)

“**War is the father of all** and the king of all; and some he has made gods and some men, some bond and some free.”

— Heraclitus (c.495BC), Fragment 53 (O) (translator: John Brunet)

“The things that can be seen, heard, and learned are what I prize the most.”

— Heraclitus (c.495BC), Fragment 55 (O) (translator: John Brunet)

“Men allow themselves to be deceived as Homer was, who yet was wiser than all the Greeks; for some boys killing lice deceived him saying, "What we see and catch we leave behind; what we neither see nor catch we take with us".”

— Heraclitus (c.495BC), Fragment 56 (O) (translator: John Brunet)

“Hesiod is most men's teacher. Men are sure he knew very many things, a man who did not know day or night! They are one.”

— Heraclitus (c.495BC), Fragment 57 (O) (translator: John Brunet)

“**Lightening steers the universe**.”

— Heraclitus (c.495BC), Fragment 64 (O) (translator: Hans Diels); cited by Hippolytus (c.210AD)

"**It is the thunderbolt that steers the course of all things**."

— Heraclitus (c.495BC), Fragment 64 (O) (translator: John Brunet)

"**Fire in its advance will judge and convict all things**."

— Heraclitus (c.495BC), Fragment 66 (O) (translator: John Brunet)

"**God is** day and night, winter and summer, war and peace, surfeit and hunger; but he takes various shapes, **just as fire**, when it is mingled with spices, is named according to the savour of each."

— Heraclitus (c.495BC), Fragment 67 (O) (translator: John Brunet)

"Fire lives the death of air, and air lives the death of fire; water lives the death of earth, earth that of water."

— Heraclitus (c.495BC), Fragment 76 (O) (translator: John Brunet)

"It is pleasure to souls to become moist."

— Heraclitus (c.495BC), Fragment 77 (O) (translator: John Brunet)

"We must know that war is common to all and strife is justice, and that all things come into being and pass away (?) through strife."

— Heraclitus (c.495BC), Fragment 80 (O) (translator: John Brunet)

"Rhetoric is the prince of liars"

— Heraclitus (c.495BC), Fragment 81 (O) (translator: John Brunet)

"**Things rest by changing. It is weariness to labor for the same masters**."

— Heraclitus (c.495BC), Fragment 84 (O) (translator: John Brunet)

"**It is hard to fight with one's heart's desire. Whatever it wishes to get, it purchases at the cost of soul**."

— Heraclitus (c.495BC), Fragment 85 (O) (translator: John Brunet)

"**All things are an exchange for fire**, and fire for all things, even as wares for gold and gold for wares"

— Heraclitus (c.495BC), Fragment 90 (O) (translator: John Brunet)

“The sun will not overstep his measures; if he does, the Erinyes, the handmaids of justice, will find him out.”

— Heraclitus (c.495BC), Fragment 94 (Q) (translator: John Brunet)

> “Helios will not overstep his measures; otherwise the Erinyes, the minsters of Dike, will find him out.”
>
> — Heraclitus (c.495BC), Fragment 94 (Q) (translator: Hans Diels)

“To god all things are fair and good and right, but men hold some things wrong and some right.”

— Heraclitus (c.495BC), Fragment 102 (Q) (translator: John Brunet)

“It is better to conceal ignorance than to expose it.”

— Heraclitus (c.495BC), Fragment 109 (Q) (translator: John Brunet)

“Self-control is the highest virtue, and wisdom is to speak truth and consciously to act according to nature.”

— Heraclitus (c.495BC), Fragment 112 (Q) (translator: John Brunet)

> “Thinking well is the greatest excellence; and wisdom is to act and speak what is true, perceiving things according to their nature.”
>
> — Heraclitus (c.495BC), Fragment 112 (Q) (translator: Charles Kahn)

“Thought is common to all.”

— Heraclitus (c.495BC), Fragment 113 (Q) (translator: John Brunet)

“A man, when he gets drunk, is led by a beardless lad, tripping, knowing not where he steps, having his soul moist.”

— Heraclitus (c.495BC), Fragment 117 (Q) (translator: John Brunet)

“The dry soul is the wisest and best.”

— Heraclitus (c.495BC), Fragment 118 (Q) (translator: John Brunet)

“Man's character is his fate.”

— Heraclitus (c.495BC), Fragment 119 (Q) (translator: John Brunet)

> “Pythagoras, son of Mnesarchos, practiced scientific inquiry beyond all other men, and making a selection of these writings, claimed for his own wisdom what was but a knowledge of many things and an imposture”
>
> — Heraclitus (c.495BC), Fragment 129 (O) (translator: John Brunet)

(add)

Fire | Living fire

The following are some of Heraclitus' fragmented statements on fire and or living fire:

> “All things are an exchange for fire, and fire for all things … the transformations of fire are, first of all, sea; and half of the sea is earth, half whirlwind.”
>
> — Heraclitus (c.470BC) [1]

> “This world order, the same for all beings, was created neither by gods nor by humans; rather, it was always and is and will be eternal living fire kindled in measures and quenched in measure.”
>
> — Heraclitus (c.470BC), Fragment 30 (O) (translator: Hans Diels) [1]

In 1967, Eugen Fink, in discussion with Martin Heidegger, comments on this:

> “At first we interpret only the second half of the fragment. Lightning, we could say, is the sudden fire, the sun is the fire in orderly passage of the course of time, but πυρ αειςωον [eternal living fire] is something we do not find in the phenomenon like the lightning and the sun.”

(add)

God | Fire

Heraclitus stated the following view about god:

> “God is day and night, winter and summer; war and peace, satiety and hunger; he takes various shapes just as fire does.”
>
> — Heraclitus (c. 470BC) [7]

> “This [god as fire] is both willing and unwilling to be called by the name Zeus.”
>
> — Heraclitus (c. 470BC) [7]

(add)

Egyptian | Greek philosophy

Heraclitus, supposedly, traveled to Egypt and studied their philosophy, in the manner of the "Thales study abroad

tradition", but citation of this is difficult to find.

Egyptian history scholar Karl Lucker (1991), e.g., argues that while it has largely been assumed that Heraclitus was a was a haughtily independent scholar, that his thinking stems from a direction of Egyptian ontological heritage. [5]

Heraclitus' fire, earth, water conceptualized three element theory, wherein fire is the primary element, in short, is strikingly familiar, in thematic form, to Heliopolis creation myth theory, according to which, fire (the sun) was self-engendered out of a primeval state universe of water (a flood) and earth (an land mound arisen).

Soul | Materialism

For humans, Heraclitus was of the view that the "soul is a spark of the substance of the stars and that the soul is immortal and returns upon death to the all-soul to which it is related." [2]

-

> "The death of 'earth' is to become water, the death of 'water' is to become air, and the death of 'air' is to become fire, and reversely."
>
> — Heraclitus (c.470BC), "noted saying"; cited by Marcus Aurelius (§4.46) in *Meditations* (167AD)

-

He was of the view that cosmic fire has its counterpart in the human soul, which in weak men is tainted by the 'watery' elements of sleep, stupidity and vice; conversely, the virtuous soul can survive the death of its physical body and eventually rejoin the cosmic fire. [1]

Ergon | Energy

The etymology of the term "energy", according to American science writer Gerrit Feekes, is attributed to Heraclitus, who used the term "ergon" and or "en-ergon", meaning "the source of activity". Specifically, in his book about nature, he wrote: [3]

> "En-ergon is the father of everything, king of all things and, out of it, all forms of contrast originate. Since 'en-ergon' is common to everything, it is vital for life itself."

Others, however, state that Aristotle was the first to employ the term energy.

Change

The following is Heraclitus' view on change:

> "Nothing endures but change, change is the only constant."
>
> — Heraclitus (c.470BC) [4]

In Heraclitus' philosophy, see a trace of the principle of thermodynamic irreversibility, particularly in his river stepping dictum.

Stoics

The stoics (see: stoicism), the main immediate followers of Heraclitus, supposedly, found the fragments of his work so obscure that they nicknamed him the "riddler". [1]

Image | Note

The photo shown is from Renaissance artist Donato Bramante's 1477 "Heraclitus and Democritus" painting (O),

wherein Heraclitus is shown weeping, and Democritus laughing, characteristics attributed to them.

Quotes | On

The following are quotes on Heraclitus:

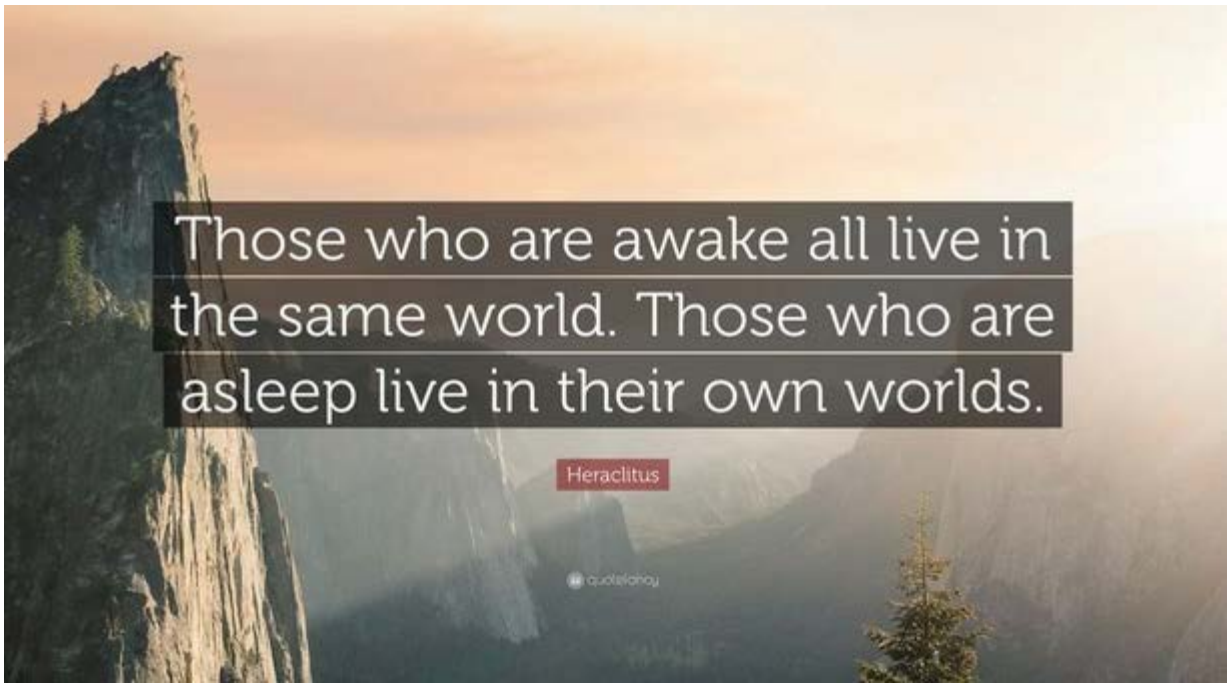

> "Man has been included among the most unexpected and most thrillingly lucky rolls of the dice in the game played by **Heraclitus**' 'great child', whether he's called Zeus or chance."
>
> — Friedrich Nietzsche (1887), *On the Genealogy of Morals* (Q)

> "The world that Nietzsche shows us in his mirror is Heraclitean, a product of subtracting being and the subject from our concept of nature."
>
> — Peter Levine (1995), *Nietzsche and the Modern Crisis of the Humanities* (pgs. 144-45)

> "**Heraclitus**, who is 'reluctant to make his utterances comprehensible' (Cicero, 45B), is said to have written a book *On Nature* (c.500BC), in three parts, on the universe, politics, and theology. It is written 'rather obscurely' allegedly to prevent its being scorned by the common herd (Diogenes Laertius, 9.5)."
>
> — Patrick Walsh (1997), notes to Cicero's *On the Nature of the Gods* [9]

> "So this behind-the-scenes 'fire' is the first answer to a question first posed by **Heraclitus** and still very much alive: 'what is it about our sensed world that makes it subject to measure and so much mathematics? What, for example, is behind the relation of the temperature we read off our thermometers to the warmth we feel, or the IQ kept in our files to the thoughts we are able to think?'"
>
> — Eva Brann (2011), *The Logos of Heraclitus* (pgs. 63-64)

Quotes | By

The following are noted quotes by Heraclitus:

> "The soul is dyed the color of its thoughts. Think only on those things that are in line with your principles and can bear the light of day. The

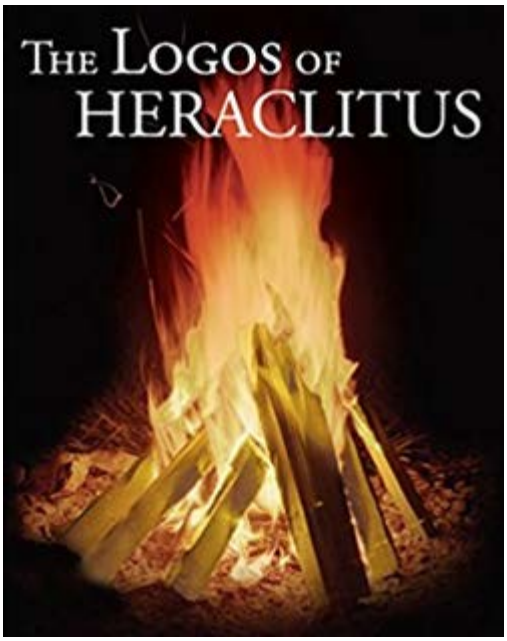

Heraclitus, the flux and fire philosopher, was the first philosopher to give "logos" (Q) serious attention.

content of your character is your choice. Day by day, what you choose, what you think, and what you do is who you become. Your integrity is your destiny ... it is the light that guides your way."

— Heraclitus (c.500BC), *On Nature* (Q)

"Man is most nearly himself when he achieves the seriousness of a child at play."

— Heraclitus (c.490BC) (Q)

"There is nothing permanent except change."

— Heraclitus (c.470BC)

"Character is for man his daemon."

— Heraclitus (c. 470BC) [8]

"A man's character is his fate."

— Heraclitus (c.470BC)

"A thing rests by changing."

— Heraclitus (c.470BC)

"Knowing many things doesn't teach insight."

— Heraclitus (c.470BC)

"You cannot step in the same river twice."

— Heraclitus (c.470BC)

See also

- Parmenides vs Heraclitus

References

1. Stokes, Philip. (2002). *Philosophy 100: Essential Thinkers* (pg. 15). Enchanted Lion Books.
2. Runes, D.D. (1955). *Treasure of Philosophy* (pg. 495). Philosophical Library.

3. (a) Feekes, Gerrit B. (1986). *The Hierarchy of Energy Systems: from Atom to Society* (pg. 1). Pergamon Press.
(b) Lancaster, Justin. (1989). "The Theory of Radially Evolving Energy" (abs), *Int. J. General Systems*, 16: 43-73.
4. Deacon, Terrence W. (2011). *Incomplete Nature: How Mind Emerged from Matter* (pg. 206). W.W. Norton & Co.
5. Luckert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective* (§:Heraclitus, pgs. 206-). SUNY Press.
6. Heidegger, Martin and Fink, Eugen. (1967). *Heraclitus Seminar* (translator: Charles Seibert) (pg. 56). Northwestern University Press, 1979.
7. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 5). HarperOne.
8. (a) Burnet, John. (1930). *Early Greek Philosophers* (pg. 181). Black.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 5). HarperOne.
9. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (pg. 197). Oxford University Press, 1998.
10. Heidegger, Martin. (1943). "Parmenides and Heraclitus", lecture course, University of Freidburg, Winter Semester; published as volume 54 of Collected Works; in: *Parmenides* (translators: Andre Schuwer and Richard Rojcewicz) (bow, pg. 108). Indiana University Press, 1992.

Further reading

● Chargaff, Erwin. (1978). *Heraclitean Fire: Sketches from a Life Before Nature*. Paul & Co Pub Consortium.

External links

● Heraclitus – Wikipedia.
● Heraclitus – Stanford Encyclopedia of Philosophy.

θΔics

In thermodynamics, **Herbert B. Callen** (1919-1993) was an American physicist, of the MIT school of thermodynamics, noted for the 1985 second edition of his thermodynamics textbook *Thermodynamics an Introduction to Thermostatistics*, one of the most-referenced thermodynamics publications, especially in the physics community.

The popularity of Callen's textbook, the second edition to his 1960 textbook *Thermodynamics: an Introduction to the Physical Theories of Equilibrium Thermostatics and Irreversible Thermodynamics*, is due in large part to the popularity of Callen's 1951 paper "Irreversibility and Generalized Noise", written with Ted A. Welton, a friend of Richard Feynman's at MIT, which by 1955 had become a "citation classic", having been cited in over 370 publications. [2]

Education

Callen completed his BS at Temple University prior to 1945 and his completed his PhD in 1947, under Hungarian-born American physicist László Tisza, at the Massachusetts Institute of Technology. In 1948, he became a professor of physics at University of Pennsylvania, where he remained until his early retirement in 1982, due to Alzheimer's disease.

Quotes

The following are noted quotes:

> "The development of the principle of conservation of energy has been one of the most significant achievements in the evolution of physics. The present form of the principle was not discovered in one magnificent stroke of insight but has been slowly and laboriously developed over two and a half centuries. The first recognition of a conservation principle, by Leibnitz in 1693, referred only to the sum of the kinetic energy ($\frac{1}{2}mv^2$) and the potential energy (mgh) of a simple mechanical mass point in the terrestrial gravitational field. As additional types of systems were considered, the established form of the conservation principle repeatedly failed, but in each case it was found possible to revive it by the addition of a new mathematical term - a "new kind of energy." Thus, consideration of charged systems necessitated the addition of the Coulomb interaction energy (Q_1Q_2/r) and eventually of the energy of the electromagnetic field. In 1905, Einstein extended the principle to the relativistic region, adding such terms as the relativistic rest-mass energy. In the 1930's Enrico Fermi postulated the existence of a new particle, called the neutrino, solely for the purpose of retaining the energy conservation principle in nuclear reactions. Contemporary research in nuclear physics seeks the form of interaction between nucleons within a nucleus in order that the conservation principle may be formulated explicitly at the subnuclear level. Despite the fact that unsolved problems of this type remain, the energy conservation principle is now accepted as one of the most fundamental, general, and significant principles of physical theory."
>
> — Herbert Callen (1960), *Thermodynamics* (Ñº)

References

1. (a) Herbert B. Callen (biography) – by Alexander L. Kuzemsky (2006).
(b) Author. (1993). "Herbert B. Callen, 73, Theoretical Physicist" (obituary), *New York Times*, May 27. (c) Callen, Herbert B. (1985). *Thermodynamics and an Introduction to Thermostatistics* (2nd ed.). New York: John Wiley & Sons.
2. Staff writer. (1985). "This Week's Citation Classic", Current Contents, No. 1, Jan. 07.

External links

â— Herbert Callen – Wikipedia.

θΔics

In existographies, **Herbert Junius Hardwicke** (1850-c.1930) was an English physician, anthropologist, and religio-mythologist noted for []

Overview

In the early 1880s, Hardwicke gave a series of evolution-based mythology based religion debunking at a number of universities, around England, specifically at: London, Edinburgh, Manchester, Liverpool, Birmingham, Leeds, Sheffield, Bradford, Plymouth, Newcastle-on-Tyne, Nottingham, Blackburn, Rotherham, Huddersfield, and other places; on these lectures he comments:

> "It is principally owing to the flattering reception that my views met with at the hands of these often densely crowded audiences, that I was induced to publish the result of my investigations."

The lectures were based on the following literature as references:

> "It must also be added that I am indebted for much of the contents to the following, amongst other, works, from which have been gathered many ideas, and much valuable information :—the works of John Stuart Mill; Charles Darwin's *Descent of Man*, and *Origin of Species*; Herbert Spencer's *First Principles*, and *Study of Sociology*; Ernst Haeekel's *Pedigree of Man*; Henry Buckle's *History of Civilization in England*; Max Mullers' *Science of Language*; Mosheim's *Ecclesiastical History*; Graham's *Creed of Science*; works of Sir William Jones; William Paley's *Evidences of Christianity*; Theodore Parker's *Theism, Atheism and the Popular Theology*; Lamson's *Church of the First Three Centuries*; Channing's works; Clarke's *Orthodoxy, its Truths and Errors*; Meredith's *Prophet of Nazareth*; Nichol's *Help to Reading the Bible*; Hallam's *History of Europe during the Middle Ages*; Gardner's *Faiths of the World*; Draper's *Conflict between Science and Religion*; Thomas Paine's *Age of Reason*; *The Freethinker's Text Book*, by Mrs. Annie Besant and Charles Bradlaugh; Constantin Volney's *Ruins of Empires*; Stuart-Glennie's *Isis and Osiris*; Taylor's *Diegesis*, and *Devil's Pulpit*; Soury's *Deity of Jesus Christ*; Westcott's *Bible in the Church*; Voltaire's *Philosophical Dictionary*; Mitchell's *Mythology Unveiled*; and Reville's *Jesus and Israel*."

In 1884, Hardwicke, based on these lectures, published *The Popular Faith Unveiled*; the publishing origin of which he summarizes as follows: [1]

> "In compiling the following pages I have endeavored as far as possible to record correctly all historical evidence bearing upon the subject, and to omit nothing that would be likely to throw light upon it. Owing to the heterodox nature of the work, considerable difficulty has been experienced in arranging for its publication; the result of which is that I have been under the necessity of purchasing a printing press and type, and of printing and publishing the work myself. This, I need scarcely say, has been a most laborious task, involving an expenditure of much valuable time and energy; but with the willing help of my son, William Purton Allen, who has 'set up' a large portion of the type, thus considerably facilitating my labour, the task has been successfully accomplished."

In 1887, Hardwick, in his *Evolution and Creation*, expanded on the above, with focus on Charles Darwin, but also on more religio-mythology aspects, e.g. that the cross symbol is found on the walls (Ñº) of the temples of Bacchus. [2]

Quotes | Employed

The following are quotes employed by Hardwicke:

> "[The Motto] 'learn what is true in order to do what is right' is the summing up of the whole duty of man

for all who are unable to satisfy their mental hunger with the east wind of authority."

— Thomas Huxley (c.1875), cited by Herbert Hardwicke in *Evolution and Creation* (title page) [2]

References

1. Hardwicke, Herbert J. (1884). *The Popular Faith Unveiled*. Publisher.
2. Hardwicke, Herbert J. (1887). *Evolution and Creation* (Ñº). Publisher.

Further reading

â— Wheeler, Joseph M. (1889). (§: Hardwick, Junius Hardwicke, pg. #). Library of Alexandria.

External links

â— Hardwicke, Herbert Junius – WorldCat Identities.

θΔics

In chnops-thermodynamics, **Herbert E. Salzer** (1915-2006) was an American applied mathematician noted for his age 23 (1938) corrections to Einstein's unified field theory equations and more importantly his rather impressive and unique 1957 (age 42) “Toward a Gibbsian Approach to the Problems of Growth and Cancer”, in which he outlines a Gibbsian thermodynamics theory of form development, normal and abnormal, at the cellular level.

Overview

In 1950s, Salzar began reading, in detail, the thermodynamics works Willard Gibbs. In 1957, Salzar published his “Toward a Gibbsian Approach to the Problems of Growth and Cancer”, the abstract of which is as follows:

> “Certain sections of Josiah Willard Gibbs's thermodynamics papers might be applicable to biological equilibrium and growth, normal or abnormal. Gibbs added terms M i dm i to the differential of the internal energy dε=tdη−pdN, (t=temperature, p=pressure, η=entropy, N=volume) where μi=δεδmi is the potential of substance m i , to provide for chemical as well as thermal and mechanical equilibrium. In this article a further generalization is suggested, to include biological equilibrium by adding to de terms of the form GdN, the variable N being the number of cells, where G=δεδN is a “growth potential” that measures exactly the resistance toward spontaneous growth. The function G, like M i is intensive in nature (i.e. depends on intensive variables only) except for a conversion factor dMdN, M= m i , affording possible insight into why incipient abnormal growth is often independent of the number of cells. Useful applications might follow from identities between δGδη,δGδv , or δGδmi and δtδN,−δpδN or δμiδN respectively. The following new function is studied, ζ¯=ζ−GN , a natural generalization of the Gibbs free energy function ζ, the possibility of measuring it electrically, and comparison of its role with that of ζ for the possible experimental determination of G. Gibbs's necessary and sufficient conditions for heterogeneous equilibrium of n components in m phases are generalized and also modified to include broader restraining conditions like ∑mi=1δNj(i) o ,j=1,f,n, the > being characteristic of only living cellular phases. Careful appraisal of the term “biological stability” is followed by new criteria for stability, instability, and limits of stability, (neutral equilibrium) in terms of derivatives of G, with possible medical applications. Three different sections of Gibbs's works tend to indicate that, for a biological phase, lower pressure usually increases its stability. The equation p″−p′=σ(Ir+Ir′) , where σ=surface tension, p′, p′ = pressures, r, r′=radii of curvature, is applied to possible control of tissue growth at interfaces. Methods of altering the equilibrium between three phases A, B, C by varying the interfacial tensions σ AB ,σ BC ,σ AC, using relations like AB <σ AC + BC for stability of the A, B interface, suggest different means for shifting biological equilibrium between normal and abnormal cells through the introduction of new third phases at the interface. Various devices are mentioned for possible control of growth through proper channeling of surface or other equivalent forms of energy.”

Salzer’s article is a bit of a rare gem; since 2014, e.g., it has only been cited by three scholars: Alexander Zotin (1972, 1997), American biomedical engineer Martin Macklin, and his interesting “Free Energy of Cell Differentiation” (Q) (1969) article, and G.W. Swan (“Tumor Growth Models and Cancer Chemotherapy”, 1987). This paucity of citation can be attributed to the following rather humorous yet at the same time fascinating prerequisites Salzer discusses in the opening of his article:

> “For a number of years the writer has studied rather thoroughly the life and works of that greatest of all American theoretical scientists, Josiah Willard Gibbs (Wheeler, 1952), with more emphasis upon the first of the two volumes of his collected works, that dealing with thermodynamics and heterogeneous equilibrium. The reader is assumed to be familiar with that part of Gibbs’ work. A number of semi-popular articles (Garrison, 1909 a and b; Donnan, 1924; Miller, 1925) contain convenient summaries and explanations of the more important ideas of Gibbs, sufficient to familiarize the reader with his work and to follow most of this discussion. For a better understanding, the writer advises study of the collected works of Gibbs (first

volume only) and the two volume commentary by Donnan and Haas."

(add discussion)

In 1997, Russian biophysicist Alexander Zotin credited Salzer as one of the early thermodynamic theories of development pioneers as follows: [2]

> "All phenomena occurring in nature may be subdivided into two classes: occurring on their own (that is spontaneous processes) and occurring as a result of some forces (action-compelling processes). It is evident that the development of an organism is a "spontaneous process", and we can hardly imagine this process to be the result of some forces outside an organism. We cannot accept the vitalism views of special forces or laws inside organisms, which are not physical but may determine. The phenomenological theory of ontogenesis regards the processes of organism development, growth and aging as a spontaneous process of living system transition from a less probable state to a more probable one, which may be described in terms of thermodynamics. In this respect, it takes over after other thermodynamic theories of development (Bauer, 1935; **Salzer**, 1957) and especially the theory of Prigogine-Wiame (Prigogine and Wiame, 1946; Prigogine, 1967; Zotin, 1972)."

Einstein

In 1938, at age 23, Salzer, while working on his master's degree in mathematics and applied sciences at Columbia University, wrote Einstein to question him about a point regarding his first approximation equation in his relativity theory, after which Salzer received two letters from Einstein in which he thanked Salzer for the correction, stating "therefore your transformation equation is correct, mine wrong". [3]

Salzer's neice Jacqueline Salzer behind Einstein's two 1938 thank-you letters to Salzer, in regards to corrections to transformation equations in his unified field theory work, which fetched near to $400,000 dollars in a 2013 auction. [3]

Despite prolonged efforts to develop a unified field theory concerning gravitation and electromagnetic fields, Einstein completely abandoned all work on this venture around 1931. After Salzer's letter, Einstein revisited his previously abandoned search for an acceptable set of field equations to justify his approach for a unified theory on distant parallelism. The letters, auctioned in 2013, were evaluated at $400,000 dollars. [4]

Education

Salzer completed his MS in mathematics and applied sciences at Columbia University; after graduate school, he went on to become a mathematician, scientist, and inventor. [3]

Tributes

The following are noted praise and or tributes:

> "**Salzer** was one of the few people on the planet who could say that he corrected Albert Einstein's math—and got the brilliant physicist to admit as much."

— Gary Buiso (2013), “He Proved Einstein Was Wrong” [3]

References

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2. Zotin, Alexeyi A. and Zotin, Alexander I. (1997). “Phenomenological Theory of Ontogenesis” (pdf), *International Journal of Developmental Biology*, 41:917-21.
3. Buiso, Gary. (2013). “He Proved Einstein Wrong”, *New York Post*, Oct 19.
4. Jhunjhunwala, Raghunath. (2013). “Albert Einstein’s Letters Set to Fetch $400,000 at Auction” (O) *The Economic times*, Oct 20.

External links

- Salzer, Herbert E. – WorldCat Identities.
- Herbert E. Salzer (publications) – Springer.com.

θΔics

In existographies, **Herbert Spencer** (1820-1903) (IQ:165|#503) (Gottlieb 1000:808) (Becker 139:118) (Scott 50:39) [CR:91] was an English natural philosopher noted his 1858 to 1862 effort to produce a unified theory of everything, the gist of which is found in his *First Principles* (1862), wherein he sought to reconcile the subjects of religion, psychology, and sociology, with physics, chemistry, and biology, all themed on premise of evolution, equilibrium, and force transformations; known his Spencerian dilemma; first-slating: 165|#420 (c.2018).

Overview

In the 1850s, Spencer was working an equilibrium theory of energy, evolution and society. Sometime therein he began to apply energy, possibly some version of the first law, or more generally the conservation of energy to the explanation of biological evolution (evolutionary thermodynamics) and in some respects sociology. [1] One of his noted views is as follows: [7]

> "If the general law of transformation and equivalence holds of forces we class as vital and mental, it must hold also of those which we class as social."

(add)

Spencerian dilemma

> *See main: Spencerian dilemma*

In circa 1858, Spencer was "staggered" when he was told by Irish physicist John Tyndall that the end state of equilibration is a state of heat death in which life ceases. The following is a truncated section of the famous 1858 Spencer letter to John Tyndall. [4]

> "In the first place I fully recognize, and have all along recognized, the tendency to ultimate equilibrium … The universal tendency towards equilibrium must apply to human actions as well as to others. All our hourly doings are endeavours to equilibrate our acts and wants. Those modifications of faculty which we are ever undergoing are continuous approximations to equilibrium between constitution and conditions … There must be change until equilibrium is reached. This applies to man in his social relations. Society must go on changing until all men's constitutions and their circumstances are in correspondence—*until the desires of each are such only as may be gratified without thwarting the desire of others.*…Thus you see that my views commit me most fully to the doctrine of ultimate equilibration.
>
> That which was new to me in your position enunciated last June, and again on Saturday, was that equilibrium was death [heat death]. Regarding, as I have done, equilibrium as the ultimate and *highest* state of society, I have assumed it to be not only the ultimate but also the highest state of the universe. And your assertion that when equilibrium was reached life must cease, **staggered me**. Indeed, not seeing my way out of the conclusion, I remember being out of spirits for some days afterwards. I still feel unsettled about the matter."

This issue took him the next forty years to reconcile. [1] One of the underlying problems here is that at the time of Spencer's theorizing, the subject of chemical thermodynamics had not yet been worked out, something that would not solidify as "modern" until 1933 with the publication of Edward Guggenheim's *Modern Thermodynamics by the Methods of Willard Gibbs*, according to which the type of governing "equilibrium" in social evolution terms is that of free energy (see: human free energy) as dictated by the isothermal-isobaric reaction conditions of society.

In his 1862 treatise *First Principles*, Spencer gave prominence to four types or orders of equilibrium or "equilibration".

[2] One of these, called a “moving dependent” equilibration, where expenditure of energy is balanced by the supply of fuel, as exemplified by the steam engine, was used to explain evolutionary adaptation. [1] The force that is dissipated by the machinery, in short, is replaced by the fuel fed into the furnace that heats the boiler.

Education

Spencer was educated in empirical science by his father, William George Spencer, who ran a school founded on the progressive teaching methods of Swiss educator Johann Pestalozzi, also serving as secretary of the Derby Philosophical Society, a scientific society which had been founded in the 1790s by Erasmus Darwin, the grandfather of Charles Darwin.

While the members of the Derby Philosophical Society introduced Spencer to concepts of biological evolution, particularly those of Erasmus Darwin and French naturalist Jean Lamarck, his uncle, the reverend Thomas Spencer, vicar of Hinton Charterhouse near Bath, completed Spencer’s limited formal education by teaching him some mathematics and physics, and enough Latin to enable him to translate some easy texts. Otherwise, Spencer was an autodidact who acquired most of his knowledge from narrowly focused readings and conversations with his friends and acquaintances. [6]

First principles

In 1862, Spencer published *First Principles: of a New System of Philosophy*, the work he is best known for, the fourth edition published in 1880, in which he sought to reconcile the subjects of religion, psychology, and sociology, the latter defined as the “science of human relations”, with physics, chemistry, and biology, all themed on premise of evolution. [2] Spencer’s use of the conservation of energy is found in his chapter “The Persistence of Force”, where in a footnote he discusses why he prefers the word “force” to “energy” and “persistence” to “conservation”.

Social organism

Spence, along with French philosopher Pierre Teilhard, are often attributed as being the originators of the "social organism" theory, in which a society is considered as a large living organism. In 1876, to cite on example, Spencer posed the query:

> “Are the attributes of society, considered apart from its *living units*, in any way like those of a not-living body? Or are they in any way like those of a living body? or are they entirely unlike those of both?”

(add)

Criticism

Due to the fact that Spencer had limited formal education in mathematics and physics, his work was nearly all verbal, and suffered in some respects in the eyes of early thermodynamicists. Scottish physicist James Maxwell, for instance, in a 29 July 1876 letter to Scottish physicist Peter Tait, states: [3]

> “Have you Willard Gibbs' *Equilibrium of Heterogeneous Substances*. If not read him. Refreshing after **H. Spencer** on the Instability of the Homogenous.”

In the Appendix to *First Principles*, to note, Spencer devotes a section to deal with certain criticisms by Tait, citing quotes by Maxwell as well as references to William Thomson. [2] This all circled around a debate between Tait and Spencer, on the topic of Spencer’s laws of motion, taking place in the correspondence columns of the journal *Nature* from March to June 1874. [5]

Quotes | On

The following are quotes on Spencer:

> “Moving equilibria play an important role in evolutionary processes of the most varied type, as emphasized almost *ad nauseam* by **Herbert Spencer**, though some of the most typical and at the same time most fundamental examples were unknown to him.”
>
> — Alfred Lotka (1925), on Spencer’s *First Principles* (§22); in *Elements of Physical Biology* (pg. 262) [8]

See also

â— Great problem of natural philosophy

References

1. Bailey, Kenneth D. (1990). *Social Entropy Theory* (pg. 55-56, 58). New York: State University of New York Press.
2. Spencer, Herbert (1897). *First Principles* (pgs. 575-76). . D. Appleton & Co.
3. Maxwell, James. (1876). “Postcard to Peter Guthrie Tait”, 29 July, in *The Scientific Letters and Papers of James Clerk Maxwell: 1874-1879* (pgs. 385), 1990, edited by Peter Harman. Cambridge University Press.
4. (a) Clarke, Bruce. (1991). *Energy Forms* (pg. 67). University of Michigan Press.
(b) Russett, Cynthia E. (1991). *Sexual Science* (Spencer and entropy, pg. 128). Harvard University Press.
5. Harman, Peter M. (2001). *The Natural Philosophy of James Clerk Maxwell* (pg. 188). Cambridge University Press.
6. Duncan, David. (1908). *The Life and Letters of Herbert Spencer* (pgs. 53-55). Methuen & Co.
7. Gold, Barri J. (2010). *ThermoPoetics: Energy in Victorian Literature and Science* (pg. 81). MIT Press.
8. Lotka, Alfred J. (1925). *Elements of Physical Biology* (republished (Ñº) as: *Elements of Mathematical Biology*, which includes: corrections from Lotka’s notes and a completed list of his publications) (pdf) (Ñº) (txt) (pg. 262). Dover, 1956.

External links

â— Herbert Spencer – Wikipedia.

θΔics

In existographies, **Herbert Spencer 2** is an editable version of the previously operational, albeit now hacked, online "Herbert Spencer" [see: Herbert Spencer (mobile)] article.

Correction

The previous listing (IQ:165|#420) (Cattell 1000:262) is incorrect, in that while James Cattell discusses Herbert Spencer in his the article space of his "Cattell 1000" it is the poet Edmund Spencer who is at #262 in the Cattell 1000.

θΔics

In human chemistry, **Herbert Morgan Waidson** (1916-1988) was a Welsh Germanic-languages scholar noted for his 1960 introduction and translation of German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*, under the title of *Kindred by Choice*. [1]

Education

Waidson was professor and head of the department of German at the University College of Swansea, Wales.

References

1. Goethe, Johann. (1960). *Kindred by Choice* (Introduction and translation by Herbert Waidson). London: John Calder.

External links

â— Waidon, H.J. – WorldCat Identities.

θΔics

In existographies, **Herbert Wells** (1866-1946) (IQ:155|#643) [RGM:162|1,500+] (CR:10), aka "H.G. Wells", was an English writer, futurist, and philosopher, characterized a "lower middle-class academic prodigy" (Stiles, 2009), noted for []

Overview

In 1893, Wells, aged 27, wrote the following prediction, in respect to what humans would evolve into in a million years (compare: C.G. Darwin, 1952): [2]

> "The descendents of man will nourish themselves by immersion in nutritive fluid. They will have **enormous brains**, liquid, soulful eyes, and large hands, on which they will hop. No craggy nose will they have, no vestigial ears; their mouths will be a small, perfectly round aperture, unanimal, like the evening star. Their whole muscular system will be shriveled to nothing, a dangling pendant to their minds."
>
> — Herbert Wells (1893), "Man of the Year Million" [1]

The editors of *Punch* magazine, in reference to this view, made the following illustration:

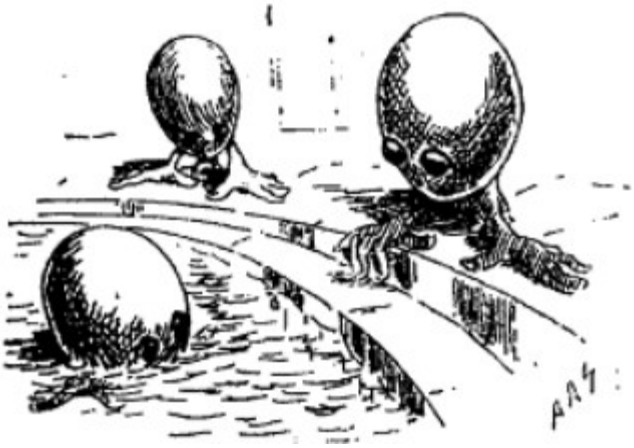

(add)

Education

In 1887, Wells, age 21, after attending the Normal School of Science, in South Kensington, now part of the University of London, during which time he studies biology (chnopsology) or physiology under Thomas Huxley, left school without earning a degree. Wells then went on, under the spell of Huxley's pessimism, to probe the consequences of evolutionary theory run amok, in novels such as: *The Island of Dr. Moreau* (1896), *The War of the Worlds* (1898), and *The First Men in the Moon* (1901). [2]

Quotes | On

The following are quotes on Wells:

> "In the early nineteen-twenties it had become clear that natural science and technology would continue their triumphant advances while the social and humane studies, in order to reduce their tragic lag, would need to be equipped with methods far more effective than archaic types of merely verbal reasoning. With untrammeled enthusiasm of a youthful PhD in physics, I expected to find a general sympathy with this [social physics] program but the case was otherwise. There is a proverb that 'in the country of the blind the

one-eyed man is king', the falsity of which has been depicted in the story by **H.G. Wells**. One has to find for himself that in the country of the blind—meaning university faculties and their learned societies—the one-eyed man meets with lifted eyebrows."

— John Q. Stewart (c.1955), commentary on the friction involved in his decade-long effort to get "social physics" established at Princeton

Quotes | By

The following are quotes by Wells:

"He was a practical electrician fond of whiskey, a heavy, red-haired brute with irregular teeth. He doubted the existence of a deity but accepted Carnot's cycle, and he had read Shakespeare and found him weak in chemistry."

— H.G. Wells (1906), "Lord of the Dynamos" (Ñº); in: *The Door in the Wall, and Other Stories* (see: thermodynamic bible) [1]

References

1. (a) Wells, H.G. (1906). *The Door in the Wall, and Other Stories*, Lord of the Dynamos, Chapter 7; *The Daily Chronicle*, Summer No. July 14th.
(b) Gaither, Carl C. and Cavazos-Gaither, Alma E. (2002). *Chemically Speaking: a Dictionary of Quotations* (pg. 125). CRC Press.
2. (a) Wells, Herbert G. (1893). "Man of the Year Million"; paraphrased in *Punch*, "1,000,000 AD" (pg. 250), Nov 25.
(b) Stiles, Anne. (2009). "Literature in 'Mind': H.G. Wells and the Evolution of the Mad Scientist" (jst), *Journal of the History of Ideas*, 70(2):317-39, Apr.

External links

â— H.G. Wells – Wikipedia.

θΔics

In religio-mythology, **Hercules** (Greek equivalent: Heracles; Egyptian equivalent: Horus), was a Roman god-man, the son of Jupiter (Greek equivalent: Zeus; Egyptian equivalent: Osiris) and the mortal woman Alcmene (compare: Virgin Mary; Egyptian equivalent: Isis), famous for his great strength and many adventures.

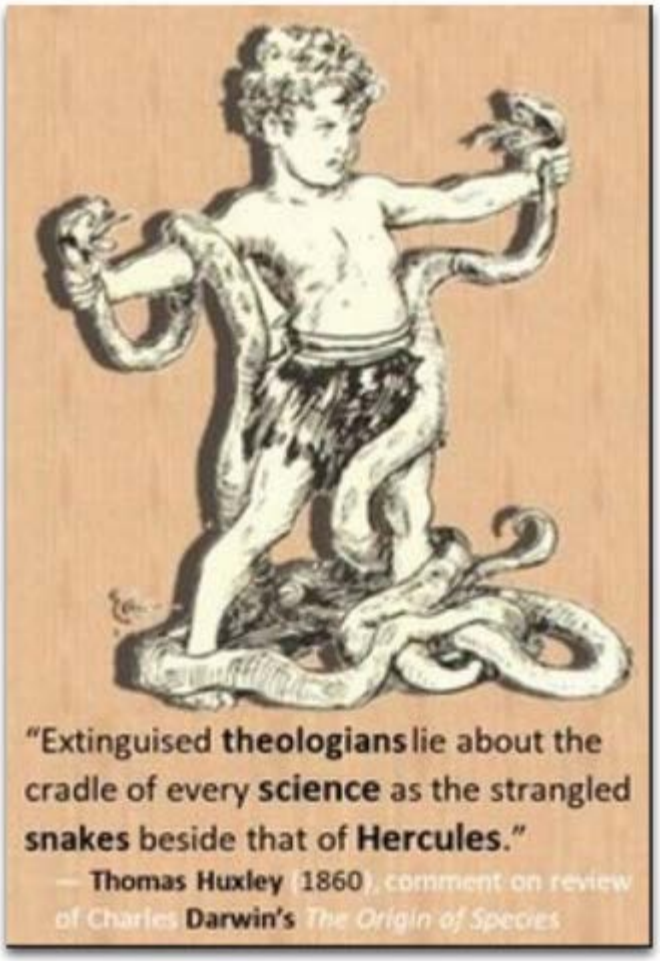

A quote on **Hercules** by Thomas Huxley (1860), wherein he describes theologians as snakes falling by the wayside of each new science, e.g. Darwin's evolution; the rendition of Hercules as a youth fighting snakes, to note, is a Greek rescript of Horus the youth battling Apep, the famous night snake that battles all the sun gods.

Quotes

The following are related quotes:

> "Varro claimed to have identified forty-three bearers of the name **Hercules** (so Servius son Virgil, *Aen*. 8 564)."
>
> — Patrick Walsh (1997), notes on Cicero's *On the Nature of the Gods* [1]

> "The wolf was a symbol of Benjamin (the Hebrew Horus), which along with Osiris were major inspirations (role models) for Alexander. Alexander strove to invert the traditional metamorphosis of a Horus that (through death) became an Osiris. He was instead an Osiris that shed this role (also through a symbolic death) in order to become a Horus. Consistent with this, the new god Serapis could be depicted with the club of **Hercules** (Horus)."
>
> — Charles Pope (2016), *Alexander the Great: Beyond the Divide* [2]

See also

- God character equivalents
- Hydraism
- Mangnall's Abstract of Heathen mythology

References

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2. Pope, Charles N. (2016). *Alexander the Great: Beyond the Divide* (pg. #). DomainOfMan.com.

External links

- Hercules – Wikipedia.

θΔics

In existographies, **Herman Boerhaave** (1668-1738) (IQ:180|#201) (Cattell 1000:368) (Partington 50:37) (Farber 114:11) (GCE:26) [CR:95] was a Dutch physician, chemist, and botanist, characterized a "great genius" (Mettrie, 1747) and "minor Aristotle" (Cardwell, 1971), notable for the publications of his 1724 textbook *Elements of Chemistry*, sometimes referred to as *Traite du feu* or "Treatise on fire", an outgrowth of his lectures at Leiden University, in which he outlined influential theories on heat, fire, and expansion of bodies (see: Boerhaave's law). [1] The publication of Boerhaave's textbook is said to mark the start of the modern concept of chemistry. [7] Boerhaave is considered one of the pioneers in physical chemistry, for introducing quantitative methods into the measure of temperature and mass and for carrying out some of the first calorimetric research.

In 1741 an English translation of Boerhaave's celebrated textbook *Elements of Chemistry* was published under the title *A New Method of Chemistry*, in which, in his chapter on fire, one can find demonstrations and experiments that can be instructively performed today, quantitative data that can be checked against modern equations, and much theory and hypothesis that can be assessed in light of modern chemical ideas. [8]

Boerhaave's law

In his publications, Boerhaave established as physical axiom, or universal proposition, in what came to be known as "Boerhaave's law", which states that: [1]

> "Ever body, whether solid or fluid, is augmented in all its dimensions by any increase of its sensible heat."

This law or axiom of heat was the opening sentence to French chemist Antoine Lavoisier's 1787 *Elements of Chemistry*. [2]

Affinity

Boerhaave, according to English science historian William Whewell, is credited with having been one of the first affinity chemists:

> "To **Boerhaave**, therefore—especially considering his great influence as a teacher of chemistry—we may assign the merit of first diffusing a proper view of chemical affinity as a peculiar force, the origin of almost all chemical changes and operations."
>
> — William Whewell (1840), "The Establishment and Development of the Idea of Chemical Affinity" [9]

(add)

Love | Chemistry

In 1732, Boerhaave, in one of this chemistry works, famously pronounced an ambivalent statement, or "paradoxical assertion" as he put it, about how chemical bonds or interactions were at type of *copulae cupido* or "love match", the main section of which seems to be the following:

Latin	English
"Non igitur hic etiam actiones mechanica, non propulsiones violentae, non inimicitiae cogitandae, sed amicitiae, si amor dicendus copulae cupido. Fateor, paradoxa haec assertio."	"Here, too, [when a solvent dissolves a solvent] the mechanical action is not, therefore, a force, by violence, nor private hatred thought about, but of friendship, if 'love' is to be called their union, in the desire for a praise. Yes, this is a paradoxical assertion."

In another place, he says:

> “When we make a chemical solution, not only are the particles of the dissolved body separated from each other, but they are closely united to the particles of the solvent. When *aqua regia* dissolves gold, do we not see that there must be between each particle of the solvent and of the metal, a mutual virtue by which each loves, unites with, and holds the other (*amat*, unit, *retinet*)?”
>
> — Herman Boerhaave (1732), *Elements of Chemistry* (pg. 677); cited by Whewell (1840) (Ñº)

In the century to follow, this began to be summarized to the effect that Boerhaave "poetically" or "metaphorically" compared the force of affinity or chemical affinity" with “love, if love be the desire for marriage”. [5]

In the 1770s, Goethe, in his 20s, read Boerhaave’s *Elements of Chemistry*, and was said to be be very influenced by it. [4]

In 1837, French chemist Jean Dumas, as cited by William Whewell (1840) and Joseph Mellor (1922), stated that “there is some truth in this poetic comparison.” [6]

In 1840, William Whewell, in his “The Establishment and Development of the Idea of Chemical Affinity”, had the following to say about Boerhaave's comments on chemistry and love: [9]

> “In 1775, the Swedish chemist Bergman, pursuing still further this subject of chemical affinities, and the expression of them by means of tables, returned again to the old Newtonian term; and designated the disposition of a body to combine with one rather than another of two others as *elective attraction.* And as his work on *Elective Attractions* had great circulation and great influence, this phrase has obtained a footing by the side of affinity, and both one and the other are now in common use among chemists.
>
> There are some analogies drawn from the common meaning of this word, which appear to recommend it as suitable for the office which it has to discharge. For common mechanical attractions and repulsions, the forces by which one body considered as a *whole* acts upon another external to it, are, as we have said, to be distinguished from those more intimate ties by which the *parts* of each body are held together. Now this difference is implied, if we compare the former relations, the attractions and repulsions, to alliances and wars between states, and the latter, the internal union of particles, to those bonds of affinity which connect the citizens of the same state with one another, and especially to the ties of family.
>
> We have seen that Boerhaave compares the union of two elements of a compound to their marriage; “we must allow,” says an eminent chemist [Jean Dumas, 1837] of our own time”, “that there is some truth in this poetical comparison.” It contains this truth, that the two become one to most intents and purposes, and that the unit thus formed (the family) is not a mere juxtaposition of the component parts. And thus the idea of affinity as the peculiar principle of chemical composition, is established among chemists, and designated by a familiar and appropriate name.”

(add)

Influences

In his lectures, Boerhaave incorporated many elements of French corpuscular theory, especially French physician and chemist Louis Lémery’s concept of fire. [3] Donald Cardwell considers Boerhaave as being "basically a Cartesian". [12]

Influenced

One of Boerhaave's notable students was English physicist and chemist Andrew Plummer, professor of chemistry at the

University of Edinburgh from 1726 to 1755, whose ideas on attractive and repulsive forces involved in chemical affinity had influence on his successors Scotts physician and chemist William Cullen and physicist and chemist Joseph Black.

Education

Boerhaave completed a PhD in physics, which he obtained in July, 1693, having performed a public disputation: "The use of the waste matters in the investigation into the sick, as a sign of" ("de utilitate explorandorum excrementorum in ægris, ut signorum"). Later he obtained an MD. Boerhaave was an associate of Polish physicist Daniel Fahrenheit, who communicated to Boerhaave his thermometer developments in letters of correspondence.

Quotes | On

The following are quotes on Boerhaave:

> "One should have continually before one's eyes these two perfect models that the two great men of the century have left us: the *Opticks* of Newton and the *Chemistry* of **Boerhaave**."
>
> — Pieter Musschenbroek (c.1734), *Publication* [11]

Quotes | By

The following are quotes by Boerhaave:

> "Although we are able to discuss the 'force of fire' by its sensible effects; yet, we cannot from its force make certain judgments of its quantity."
>
> — Herman Boerhaave (1724), *Elements of Chemistry* (pgs. 153) [10]

> "It is demonstrated by the geometers that if bodies remain the same in all other circumstances, the bigger they are the less surface they will always have in proportion to their solidity."
>
> — Herman Boerhaave (1724), *Elements of Chemistry* (pg. 160-61) [10]

> "Among all the bodies of the universe, that have hitherto been discovered and examined, there never was yet found any one, that had spontaneously, and of its own nature, a greater degree of heat than any other."
>
> — Herman Boerhaave (1724), *Elements of Chemistry* (pgs. 166) [10]

> "Air of unequal masses, but of the same density, is always expanded in the same measure by the same 'degree of fire'; so that these expansions in the same density of air, by a constant law of nature, are always proportional to the augmentations of heat."
>
> — Herman Boerhaave (1732), *Elements of Chemistry*; as cited and dated by W.S. James (1929) [13]

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(b) Boerhaave, Herman. (1724). *Institutiones et Experimenta Chemiae*, (an unauthorized publication of his chemical lectures at the University of Leyden). Paris.
(c) Boerhaave's (authorized) Latin version, *Elementa Chimiae*, appeared in 1732.

(d) Boerhaave, Hermann. (1727). *A New Method of Chemistry* (trans. Peter Shaw and Ephriam Chambers). London: Osborn and Longman; translated by Peter Shaw, MD, 2 vols. (London, 1742).
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2. Lavoisier, Antoine. (1787). *Elements of Chemistry*, (pg. 1). Edinburgh: G.G. and J.J. Robinsons.
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4. Duntzer, Heinrich. (1884). *Life of Goethe, Volumes 1-2* (pgs. 88-89). Estes.
5. Boerhaave, Herman. (1732). Article/Books (quote: “si amor dicendus copulae cupido.”). Publisher.
6. (a) Dumas, Jean. (1837). *Lessons on Chemical Philosophy* (Leçons sur la philosophie chimique). Paris: Gauthier-Villars.
(b) Whewell, William. (1840). *The Philosophy of the Inductive Sciences: Founded Upon Their History, Volume One* (Book 4, §2: The Establishment and Development of the Idea of Chemical Affinity, pgs. 373-87; "si amor dicendus copulae cupido", pg. 375; Dumas, pg. 379). John W. Parker.
(c) Mellor, Joseph W. (1922). *Modern Inorganic Chemistry* (pg. 95). Longmans, Green & Co.
7. Sestak, Jaroslav. (2005). *Science of Heat and Thermophysical Studies* (pg. 455). Gulf Professional Publishing.
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10. (a) Boerhaave, Herman. (1724). *Elements of Chemistry* (translator: Timothy Dallowe). Publisher, 1735.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pgs. 28-30). Cornell University Press.
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12. Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 27). Cornell University Press.
13. James, W.S. (1929). “The Discovery of the Gas Laws. II. Gay-Lussac’s Law” (abs), *Science Progress in the Twentieth Century (1919-1933)*, 24(93):57-71.

Further reading

â— Metzger, Helene. (1930). *Newton, Stahl, and Boerhaave et la Doctrine Chimique*. Paris: Alcan.
â— Love, Rosaleen. (1974). “Herman Boerhaave and the Element-Instrument Concept of Fire” (abs), *Annals of Science*, 31: 547-59.

External links

â— Herman Boerhaave – Wikipedia.

θΔics

In existographies, **Herman Daly** (1938-) (CR:31) is an American economist noted, in economic thermodynamics, for his work, beginning in the late 1970s, in theorizing on the overlap of economics, ecology, and thermodynamics. Daly is considered a pioneer in the field of ecological economics, which relies on thermodynamic principles to some extent, as found in his 2004 textbook *Ecological Economics*. [1]

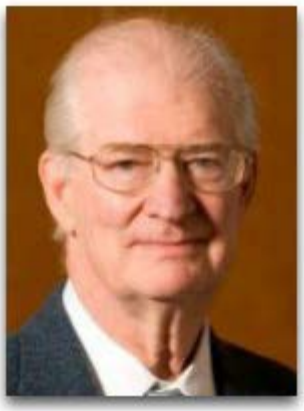

Education

Daly completed his PhD in 1967 under Romanian mathematician Nicholas Georgescu, noted author of *The Entropy Law and the Economic Process* (1971), at Vanderbilt University, with a dissertation on "Trade Control and the Uruguayan Economy". [3] Daly's highly-cited 1968 article "On Economics as a Life Science" was already employing Georgescu's material entropy theory: [7]

> "Since useful (low entropy) matter-energy is apparently finite, the total life process could be brought to a halt by what Boulding has called 'the entropy trap'. Thus one of the ultimate natural sources of scarcity is low-entropy matter-energy."

In his 1977 *Steady State Economics*, Daly criticized the failure of mainstream economics to account for, what he considered, the throughput of low-entropy natural resources. [6]

Overview

In 1980, Daly, in commentary on Frederick Soddy's economic theories, stated the following:

> "Debt can endure forever; wealth cannot, because its physical dimension is subject to the destructive force of entropy."
>
> — Herman Daly (1980), "Economic Thought of Frederick Soddy"

In 1996, Daly, in his *Beyond Growth*, comments: [4]

> "If confess that it is a matter of some consternation and distress to me that twenty-two years after the publication of *The Entropy Law and the Economic Process* on can still find no trace of their influence in the standard principles [economics] textbooks."

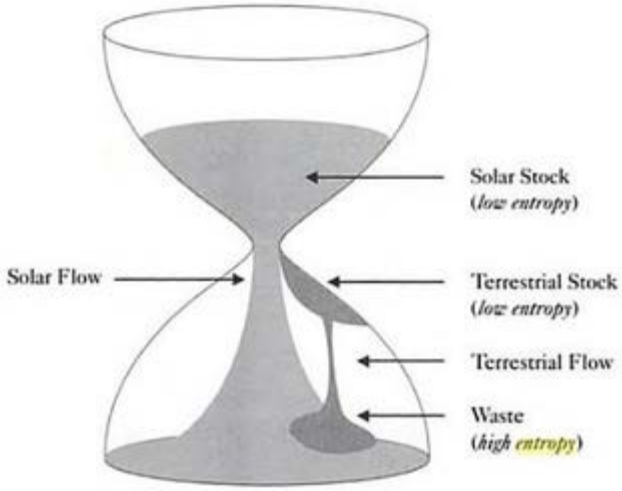

Daly's conception of the "entropy hourglass", which supposedly summarizes Nicholus Georgescu's overall material entropy model of economics, where low entropy is equated with fossil fuels and sunlight and that high entropy constitutes the used up waste energy of the fossil fuels. [2]

On this question, he goes on to outline what he thinks would need to be changed in standard economics textbooks so to accommodate Georgescu-Roegen's view of entropy (material entropy). On Georgescu-Roegen's fallacious view of matter-energy as type of entropy, Daly makes the same mistakes. Daly states, for example, that the isolated circular flow diagrams of the hypothetical economic process, from firms to households and back again, would need to be changed to one analogous to the digestive tract of an animal in which, according to Daly, "they continuously take in low-entropy matter/energy and give back high-entropy matter/energy … an organism cannot recycle its own waste products." This view, which Daly claims to be common to biology textbooks, however, is fallacious view of what entropy is; propagated by Georgescu-Roegen.

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Further reading

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θΔics

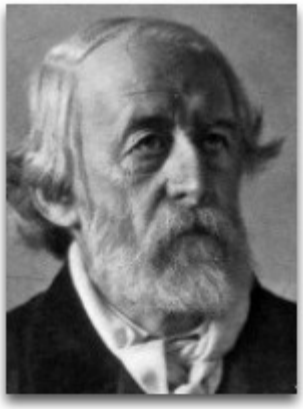

In human chemistry, **Herman Friedrich Grimm** (1828-1901) was a German author, art historian, philosopher, and Goethean biographer noted for his 1875 University of Berlin lecture "Study of Natural Science: *The Natural Daughter* and *Elective Affinities*", as found in his 1880 book *The Life and Times of Goethe*, in which he discussed the origin, theory, and implications of German polymath Johann Goethe's version of humanity in the context of natural science, i.e. his human elective affinity theory, as contained in his 1809 novella *Elective Affinities*, a novella which Grimm says has been has been referred to by critiques over the prior fifty years as "Goethe's most dangerous work". [1]

Dangerous work

The view of Goethe's *Elective Affinities*, as summarized by Grimm, as "Goethe's most dangerous work" (as recounted by Astrida Tantillo, 2001), to note, is near synonymous in reactionary style to the reactionary language used, nearly two-hundred years later, in the 2006 Rossini debate, on the possibility of American chemical thermodynamicist Frederick Rossini's hypothesis that chemical thermodynamics might be able to explain the nature of the freedom vs. security, as would be applicable to a post 9/11 world. [2] As stated by (religiously-biased) physical chemist John Wojcik in one heated part of his response letter to *Journal of Chemical Education*: [3]

> "The danger of such anthropomorphisms is that we really come to believe that there is substance in them. In this particular case, there is the danger that true human freedom will be reduced to some sort of physical freedom on the same par with entropy. There is the danger that some will think that true human freedom can be measured in terms of some sort of calculus of simultaneous maximums and minimums. And worst of all, there is the danger that chemical thermodynamics will have ascribed to it a power that it simply does not have, namely, the power to "explain" the human condition. There may be a sense in which chemistry is the "Central Science". This is certainly not it."

No doubt, being that affinity chemistry was the forerunner to chemical thermodynamics, similar arguments were voiced during these fifty-years, as Grimm summarized, as to the underlying premise and implications of Goethe's novella: namely that Goethe's version of affinity chemistry based morality (or physical chemistry base morality in modern terms) supplants and in fact replaces all of the world religions, and as such the unwritten bedrock of modern society; meaning that a very dangerous revolution in thinking may possibly be awaiting future generations of humankind.

Education

Grimm became a doctor in Leipzig in 1868 and then in 1870 a professor of philosophy and law in Berlin. He became a teaching professor for New Art History at the University of Berlin in 1873.

Grimm returned to Goethe at all stages of his life, in a large variety of essays and most notably in the 25 lectures he gave in 1874–75 (published as Goethe in 1876–77) as the first professor of aesthetics and modern art history at a German university, that of Berlin. [5]

In 1885, he became co-founder of the Goethe-Gesellschaft, and himself a publisher of some of Goethe's works. [3] He was an admirer and or associate of American Ralph Emerson, another Goethean promoter and advocate, one of the reasons he had his lectures on Goethe translated for publication in America.

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θΔics

In physiology, **Herman Kalckar** (1908-1991) was a Danish-born American biochemist, associated with the Lewis school of thermodynamics, noted for his 1939 theory of the coupling of energy of phosphorylation to oxidation reactions. [1] Kalckar coupling theories were built on the earlier 1930 work of his mentor Danish physiologist Ejnar Lundsgaard. In the mid 1930s, Kalckar began to collaborate with German biochemist Fritz Lipmann who would go on to popularize the now-famous 1941 ATP energy currency theory.

Education

Kalckar completed his MD at the University of Copenhagen in 1933. At some point in the 1930s, Kalckar began to work with German biochemist Fritz Lipmann who had moved to Copenhagen in 1932. Lipmann became one of Kalckar's mentors and a close friend, a relationship that was to be lifelong. Lipmann was already deeply interested not only in Lundsgaard's work on the role of phosphate esters in muscle contraction but also in the biological functions of phosphorylation reactions more generally.

In 1934, Kalckar began working on his PhD in the physiology department under the direction of Danish physiologist Ejnar Lundsgaard. Lundsgaard had earlier made the important finding that frog muscles poisoned with iodoacetate and therefore unable to carry out glycolysis (the splitting of glucose to lactic acid) are nevertheless capable of carrying out a limited number of contractions. Lundsgaard later showed that these "nonlactic" contractions were at the expense of the dephosphorylation of creatine phosphate, which had been discovered and characterized only a few years earlier by American biochemist Cyrus Fiske at the Harvard Medical School. [2]

In 1939, having completed his PhD work, Kalckar worked for a year at the California Institute of Technology in Pasadena, were he was famously said to be in “the orbit of the great G. N. Lewis school of thermodynamics”. [3] During his stay in Pasadena, with the encouragement of Linus Pauling, Kalckar undertook the preparation of a comprehensive review of bioenergetics with emphasis on the role of phosphate esters in energy transduction. Its publication in 1941 did much to advance the new ideas that he and German biochemist Fritz Lipmann were pursuing. [5]

This synergistic association, no doubt, was a great impetus behind Lipmann’s famous 1941 paper “Metabolic Generation and Utilization of Phosphate Bond Energy” on ATP energy coupling.

Kalckar and German biochemist Fritz Lipmann (c.1976)

Students

James Watson did postdoctoral research to absorb chemistry with Herman Kalckar in Copenhagen. (Ñº)

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θΔics

In human thermodynamics, **Hermann Gossen** (1810-1858) was a German economic theorist noted for his 1853 book *The Development of the Laws of Human Exchange and the Consequent Rules of Human Action*, an attempt at formulating a calculus of human pleasures, theorizing on how Kräfte (or forces) operated in the course of human economic exchanges, on the premise that the aim of each individual is to maximize his or her total life pleasure.

In later interpretations, Gossen's ideas on human kräfte, economic kräfte, or social kräfte, often have been mis-translated as human energy, economic energy, or social energy, although this is not technically correct. In any event, in this view, it sometimes argues that Gossen set out to explain how 'human energies' related to the laws of enjoyment, work, etc., using concepts such as economic energy and social energy, all discussed in the context of mediums of exchange, e.g. money. [1]

The general aim of the book, as stated in the preface, seems to be an effort to formulate the laws of human movement, similar to how Newton and Copernicus formulated the laws of celestial movement, in particular a type of national economics formulation, explained using mathematics, based on the principle that each person seeks to maximize his or her total amount of pleasure.

Thermodynamics

It sometimes incorrectly inferred that Gossen was the first to apply newly formulated thermodynamic ideas (or energetics) to economics. [4] This, however, seems to be an incorrect secondary interpretation. In particular, the work of Helmholtz and Clausius had only recently been published and Gossen's book was said to have been the result of twenty-years of thought; nor does Gossen cite any thermodynamicists (Helmholtz, Clausius, Joule, Mayer, etc.). In any event, to cite one example, American energy historian Anson Rabinbach claims that Gossen theorized about the 'conservation of social energy' and gives the following quote as representative of Gossen's ideas: [2]

> "The totality of commodities over which a person disposes constitutes economic energy, his wealth, which devolves to the benefit of the social whole."

Rabinbach also states that years later Leon Walras credited Gossen with having been the first to recognize the energy doctrine in the dynamics between the individual and the state. This credit may however again have been an incorrect secondary interpretation, as the conservation of energy or conservation of force, as was more dominant in Germany, were a fairly new subjects in 1853, especially for one such as Gossen, generally being outside of academic circles.

Influence

Gossen is cited by both Georg Helm, in his 1887 *The Doctrine of Energy*, and Leon Winiarski, in his 1900 "The Teaching of Pure Political Economics and Social Mechanics in Switzerland. Helm, in his final section on energetics applied in sociology and economics, specifically cites Gossen has having defined the value of a good as being its economic internal energy:

"Die wirtschaftliche Eigenenergie jedes Gutes aber nennt man Wert (Gossen) oder Nützlichkeit (Jevons)."	"The economic internal energy of each good is called value (Gossen) or utility (Jevons)."

Gossen's work was also influential to Nicholas Georgescu-Roegen, who commissioned the first English translation of his work (1983), in which he penned 143-page introduction. [5]

Education

In 1829, Gossen entered the University of Bonn where he studied law and administration sciences; studying also philosophy, political economics, technology, science, and literature. The subject he was said to have excelled at was mathematics; later developing a conviction of the importance of the application of mathematical calculus to social problems. Gossen seems to have completed his university studies before 1834, after which he began working as in

government jobs, such as clerk, in Cologne, a government assessor, in Magdeburg, and later an insurance agent. [3]

Human energies

The following is an excerpt of Gossen's book, wherein we see how the original use of the German term 'Krafte' (generally meaning force), becomes automatically translated as 'energy', although this is not exact translation, as the two have subtle differences.

Die theoretische Lösung der Aufgabe, wie viel von jedem Gegenstande zu produciren ist, damit die größtmöglichste Summe des Genusses für die ganze Menschheit erzeugt wird, hat nach allem Vorhergenden keine Schwierigkeit, Dieses Maximum tritt ein, wenn nach dem Austausch dem aufS. 85 gefundenen Satze Genüge geschieht, und außerdem die Production der verschiedenen Gegenstände der Art eingerichtet wird, daß dann das letzte Atom, welches einem jeden von jedem Gegenstande zufällt, im Verhältniß der Anstrengung beim Schaffen desselben den gleich großen Genuß gewahrt. Der Beweis für die Richtigkeit dieser Schlußfolgerung liegt darin, daß bei jeder andern Vertheilung der **menschlichen Kräfte** weniger Genuß und daher weniger Werlh geschaffen wird. Und nicht bloß, daß durch Erfüllung jener Bedingungen in Summa ein Größtes von Werth geschaffen wird, jeder Einzelne erhält dann genau denAntheil von dieser Summe, auf welchen er billiger Weise Anspruch machen kann.	The theoretical solution of the problem, how much to produce of every object, so that the greatest possible amount of enjoyment for the whole of humanity has produced, occurs after all previous no difficulty in this maximum, if after the exchange again. 85 found enough proposition is happening and also the production of the various objects of the kind will be established that will maintain the last atom, which falls every one of every object in the same proportion of the effort in creating the equal pleasure. The proof of the correctness of this conclusion is that in every other division of **human energies** less enjoyment, and therefore creates less Werlh. And not only that is created by fulfilling those conditions, in short, one of largest value, then each individual receives exactly denAntheil from this sum to which he can make a fair claim.

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External links

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θΔics

In existographies, **Hermann Haken** (1927-) (CR:11) is a German theoretical physicist noted for his 1960s synergetics theories of self-organization, based on an interpretation of lasers as types of self-organizing non-equilibrium systems. The following, from his 1983 *Advanced Synergetics*, is a noted one nature theory quote by Haken: [2]

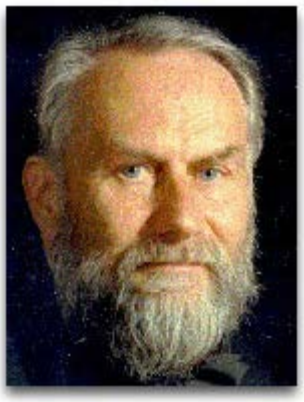

> "Why should systems consisting of components as different as electrons, atoms, molecules, photons, cells, animals, or even humans be governed by the same principles when they organize themselves to form electrical oscillations, patterns in fluids, chemical waves, laser beams, organs, animal societies, or social groups."

(add)

Social laser model

> *See main: Human*

The following is example of Haken's anthropomorphized laser theory view, as restated by Cuban-born American anti-reductionism philosopher Alicia Juarrero: [1]

> "Light, as a laser beam, which as a whole 'slaves' or entrains its component atomic waves to its frequency, also exercises a type of formal cause."

(add)

Influences

The bulk of Austrian-born American astrophysicist Erich Jantsch's efforts to bridge the gap between science and humanism is said to be built on the self-organization work of Ilya Prigogine and Haken.

Haken has worked Polish physicist Michal Kurzynski.

Chinese particle physicist Yi-Fang Chang seems to build much of his recent 2009 social synergetics theories on Haken.

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Videos

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External links

- Hermann Haken – Wikipedia.
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θΔics

In existographies, **Hermann von Helmholtz** (1821-1894) (IQ:195|#10) [RGM:235|1,500+] [LUG] [Cropper 30:4|T] (GPE:21) [CR:386] was a German physician-physicist noted for his 1847 paper "On the Conservation of Force", wherein he presented one of the first versions of the conservation of energy (or conservation of force), depending on context; and for his 1882 "The Thermodynamics of Chemical Processes", in which he disproved the thermal theory of affinity, replacing it with the free energy theory of affinity (thermodynamic theory of affinity), one of the founding publications in chemical thermodynamics. [5]

Anti-Romanticism | Schopenhauer

Helmholtz (and Boltzmann), for some reason, supposedly, did not like German philosopher Arthur Schopenhauer's one nature conceptualized human chemical theory based electrochemical will philosophy; or at least some aspect of it? Swedish science historian Jed Buchwald summarizes Helmholtz's anti-romanticism as follows: [12]

> "The kind of romantic idealism represented by, e.g. Arthur Schopenhauer, which **Helmholtz** particularly detested and which his arch-foe Zollner ardently embrace, should be distinguished from idealism considered as the antithesis to materialism. Helmholtz never embraced materialism, and he may have been strongly influenced by the non-romantic idealism developed by [Johann] Fichte. [13] Schopenhauer's philosophy powerfully antagonized many physicists associated with Helmholtz. Years later, in 1906, Boltzmann, to cite one example, nearly entitled a talk 'Demonstration, that Schopenhauer was a Mindless, Ignorant, Spreader of Nonsense'." [14]

In 1874, Helmholtz, in his "On the Use and Abuse of the Deductive Method in Physical Science", a general attack and criticism of Karl Zollner, commented the following: [1]

> "I do not find in Mr. **Zollner's** book a distinct declaration by which his new mode of procedure may be distinguished from that generally followed. Judging from what he aims at as his ultimate object, it comes to the same thing as Schopenhauer's metaphysics. The stars are to love and hate one another, feel pleasure and displeasure, and to try to move in a way corresponding to these feelings. Indeed, in blurred imitation of the principle of least action (pp. 326, 327), Schopenhauer's pessimism, which declares this world to be indeed the best of possible worlds, but worse than none at all, is formulated as an ostensibly generally applicable principle of the smallest amount of discomfort, and this is proclaimed as the highest law of the world, living as well as lifeless."

Origin of life

In 1874, Helmholtz, in his "On the Use and Abuse of the Deductive Method in Physical Science", in his German translation of William Thomson and Peter Tait's *Treatise on Natural Philosophy*, penned the following statement—which supposedly is a middle ground position vented in his debated with the romanticism idealisms of German astrophysicist Karl Zollner and objections with Arthur Schopenhauer's philosophy: [9]

> "If failure attends all our efforts to obtain a generation of organisms from lifeless matter, it seems to me a thoroughly correct procedure to inquire **whether there has ever been** an origination of life, or whether it is not as old as matter, and whether its germs, borne from one world to another, have not been developed wherever they have found a favorable soil."

This is one of the first no origin of life theory statements.

Heat death

Helmholtz was one of the main proponents of the concept of the "heat death" of the universe.

Chemical affinity

In his 1869 lecture "The Aim of Physical Science", Helmholtz gave the following definition of chemical affinity: [7]

> "Chemical affinity: the elective force exhibited by different bodies towards one another."

Conservation of force

Helmholtz, along with German physician and physicist Robert Mayer (1841) and English physicist James Joule (1843), is often cited as one of the main three of the founders of the first law of thermodynamics. [1] Helmholtz, by his own admission, was said to be very much under the influence of Immanuel Kant when he wrote his 1843 paper “On the Conservation of Force”. [6]

Chemical thermodynamics

Helmholtz, along with the work of American engineer Willard Gibbs (1876), considered one of the founders of chemical thermodynamics, for his 1882 paper "The Thermodynamics of Chemical Processes". In this famous paper, Helmholtz showed, through derivation, how the long-sought chemical "affinity" (the force of reaction) of chemistry was measured by the "free energy" of the system, i.e. that which could be converted into other forms of usable energy (such as mechanical work or electricity) not by the heat of the reaction. [2]

Helmholtz school

See main: Helmholtz school

Through his association with German physician and physiologist Ernst Brücke, Helmholtz was of great influence in the development of "psychodynamics", the thermodynamical aspects of mental life, via Sigmund Freud.

Human thermodynamics

In 1892, Helmholtz discussed his views on the thermodynamics of Goethe's Faust, in which he set forth preliminary views on cessation thermodynamics.

Other

English astrobiophysicist Paul Davies’ cites Alexader Zotin as a reference for the claim that Helmholtz suggested that life somehow circumvent the second law. [3] This, however, is a likely misattribute, being that (a) Davies is a weak source (one prone to misrepresentation of material to suit his or her agenda), and (b) Helmholtz was a hard core physicialist (see: Reymond-Brucke oath), believing that all natural processes following the laws of thermodynamics.

Quotes

The following are noted quotes:

> “He who learns the law of phenomena wins not only learning, but the power of entering into the course of nature and of working on it further according to his will and need. He wins insight into the future course of these phenomena. He wins indeed faculties that in superstitious times were looked for in prophets and magicians.”

– Hermann Helmholtz, Goethe Lecture, 1892 [8]

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2. (a) Quote: "Given the unlimited validity of Clausius' law, it would then be the value of the free energy, not that of the total energy resulting from heat production, which determineds in which sense the chemical affinity can be active." (Source: Helmholtz, H. v. "Die Thermodynamic chemischer Vorgange," *SB*, pg. 23, pg. 22-29, in *Wissenschaftlich Abhandlundgen von Hermann von Helmholtz*. 3 vols. Leipzig: J.A. Barth, 1882-95.)
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â— McKendrick, John G. (1899). *Hermann Ludwig Ferdinand von Helmholtz*. London: T. Fisher Unwin.
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External links

â— Hermann von Helmholtz – Wikipedia.

θΔics

In existographies, **Hermann Hesse** (1877-1962) was a German-born Swedish novelist, poet, and painter, noted for []

Glass Bead Game

In 1943, Hesse published *The Glass Bead Game*, a futuristic novel, set in the 25th century, about a subsect class of intellectuals; the following is an abstract: [1]

> "The *Glass Bead Game* takes place at an unspecified date centuries into the future. Hesse suggested that he imagined the book's narrator writing around the start of the 25th century. The setting is a fictional province of central Europe called Castalia, which was reserved by political decision for the **life of the mind**; technology and economic life are kept to a strict minimum. Castalia is home to an austere order of intellectuals with a twofold mission: to run boarding schools, and to cultivate and play the Glass Bead Game, whose exact nature remains elusive and whose devotees occupy a special school within Castalia known as Waldzell. The rules of the game are only alluded to—they are so sophisticated that they are not easy to imagine. Playing the game well requires years of hard study of music, mathematics, and cultural history. The game is essentially an abstract synthesis of all arts and sciences. It proceeds by players making deep connections between seemingly unrelated topics."

The *Glass Bead Game*, is sometimes mentioned when discussion of Goethe's *Elective Affinities* arises, for some unknown reason.

Influence | On

Hesse influenced: Gary Freedman.

Quotes | By

The following are quotes by Hesse:

> "Most men, the herd, have never tasted solitude. They leave father and mother, but only to crawl to a wife and quietly succumb to new warmth and new ties. They are never alone, they never commune with themselves. And when a solitary man crosses their path, they fear him and hate him like the plague; they fling stones at him and find no peace until they are far away from him. The air around him smells of stars, of cold stellar spaces; he lacks the soft warm fragrance of the home and hatchery."

— Hermann Hesse (1919), *Zarathustra's Return* (Q); a possible Nietzsche paraphrase

There is No Glass Bead Game

In this final Chapter, I shall on the one hand, give free rein to my imagination without apology, as I try to convey what the physics of organisms means to me personally, and on the other, demonstrate explicitly that there is no discontinuity between the so-called **'hard' sciences** such as physics and chemistry and the **'soft' sciences** such as psychology and philosophy. This Chapter is not just the icing on the cake, but stems from a deep conviction that knowledge, especially participatory knowledge, is what we live by, and so, there should also be no discontinuity between knowledge and action. There can be no 'glass bead game' to knowledge,[1] especially scientific knowledge, for it matters far too much.

Discussion of the relation between **hard sciences**, such as physics and chemistry, and soft science, such as psychology and philosophy, by Chinese-born English biochemist Mae-Wan Ho, alluded to the premise that there is no Glass bead game (**Hesse**'s 1943 futuristic intellectual game) in hard science, i.e., that the rules do not change as the game goes along. [2]

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External links

- Hermann Hesse – Wikipedia.

θΔics

In existographies, **Hermann Kolbe** (1818-1884) (P50:17) (CR:13) was a German chemist, semi-ranked as a greatest chemist ever, noted for his 1845 prepared acetic acid from its elements; oft-classified as one of the quenchers in the organic from inorganic vitalism debate, following Friedrich Wohler's 1828 synthesis of "organic" urea from "inorganic" ammonium cyanate. [1]

Life force | Debate

In 1845, Kolbe, as cited by George Scott (1985), interjected into the *lebenskraft* (lebens-kraft), "life force", or vital force debate, as follows: [2]

> "If the concept, however, is extended to include the assumption that the vital force, pushes out and replaces the original forces of matter, so that the latter cease to operate, then one has gone too far; for at times it is possible by experimentation to unite the lifeless fundamental substances into compounds identical with those that are formed through vital processes."

(add)

Religion

Kolbe's religious views is not straightforward. Apparently, Kolbe intended to accede to his father's desire for him to enter the ministry, until at the age of eighteen he discovered chemistry. Conversely, Edward Frankland, a good friend who spent much time with Kolbe from 1845 to 1850, described him much later as an "agnostic".

As professor in Leipzig, Kolbe placed the Biblical quotation "God has arranged all things by measure and number and weight" (Wisdom of Solomon 11:20) in large letters above the chart of the chemical elements at the front of his lecture theater.

When Kolbe's successor Johannes Wislicenus first saw the placard, he said to his guide, "that must disappear!" (Ñº)

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1. Roscoe, Henry. (1887). "President's Inaugural Address" (Ñº), British Association for the Advancement of Science, Manchester.
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θΔics

In literature, **Hermann Stoffkraft**, or Dr. Hermann Stoffkraft, as he was called, is the fictitious German materialist of Scottish physicists Balfour Stewart and Peter Tait's 1878 novel *Paradoxical Philosopher*, outlining an imaginary dialogue between Stoffkraft and scientifically minded Christians, one of whom shares the given name of Tait's son, at the end of which the blunt polemic miraculously converts Stoffkraft to a belief in the doctrines of *The Unseen Universe*, Stewart and Tait's earlier 1875 publication on an attempted synthesis of religion and science, centered around their conservation of energy based 'principle of continuity', argued to account for the Christian version of immorality. [1]

The character was a hastily-written reaction to Irish physicist John Tyndall's 1874 statement, during his presidential address at the opening of the Belfast British Association for the Advancement of Science meeting, that:

> "All religious theories, schemes and systems, which embrace notions of cosmogony, or which otherwise reach into the domain of science, must, in so far as they do this, submit to the control of science, and relinquish all thought of controlling it."

The Stoffkraft character was thus Tyndall incarnate and the story plays out with Stewart and Tait convincing or rather converting Tyndall in the end to the view that religion and science can be reconciled or specifically that morality-based Christian immortality can be explained in scientific terms.

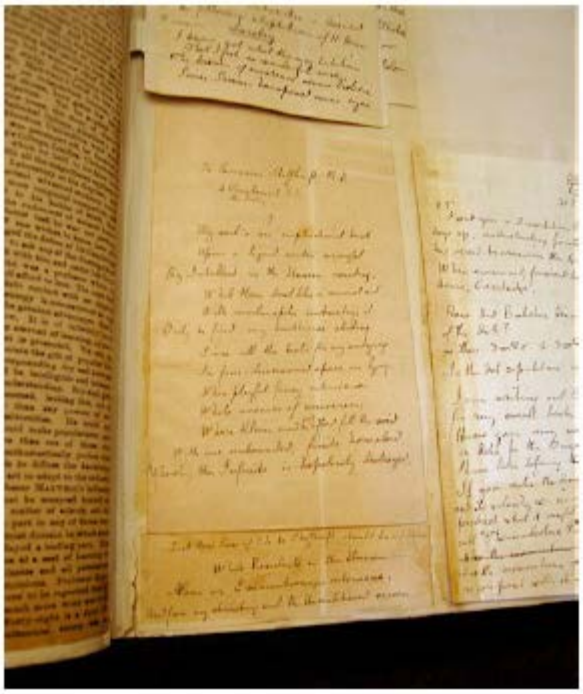

First page of Maxwell's poem, sent to Tait

To Hermann Stoffkraft, Ph.D.
A Paradoxical Ode.
[After Shelley]

First page of James Maxwell's last poem, "A Paradoxical Ode", sent to Peter Tait, but addressed to the fictional materialist hero Dr. **Hermann Stoffkraft** of Tait and Balfour Stewart's 1878 novel *Paradoxical Philosopher*. [2]

Etymology

The surname 'Stoffkraft', as American statistical mathematician Daniel Silver notes, is a conjunction of the German terms *stoff*, meaning material, and *kraft*, meaning force; the first name 'Hermann', most likely a tribute to German physicist Hermann Helmholtz, the formulator of the conservation of kraft (or conservation of force version of the later more robust conservation of energy). Hence, the fictional name Hermann Stoffkraft, translates as Helmholtz Matter-Force.

These types of hidden pubs were typical of postcard correspondences between James Maxwell, William Thomson, and Peter Tait, such as in using "θΔcs" as code shorthand for the newly forming science thermo-dynamics. Silver, to note, posits that the Stoffkraft character might have been themed on German physician-philopher Ludwig Buchner and his 1855 book *Kraft and Stoff* (*Force and Matter*) who is described as the champion of 'scientific materialism' and the outright rejection of a universe produced by creative power, which Buchner refers to as the ignorant view. [3]

Paradoxical Ode

Maxwell addressed his last and dying poem, entitled 'A Paradoxical Ode', in which he defined Tait and Stewart as prime examples of the paradoxical philosophers, to 'Hermann Stoffkraft', in which he extolled on his enigmatic final thoughts on science and religion, choice and chance, death and eternity. [2]

Taped to the bottom of the page of Tait's scrapbook is an addendum, sent by Maxwell some days afterwards.

Last three lines of Ode to Stoffkraft should be as follows.

> While Residents in the Unseen–
> Aeons or Emanations – intervene,
> And from my shrinking soul the Unconditioned screen.

(add discussion)

See also

â— William James (and his end two-month battle with Henry Adams over the human implications of the second law)
â— Forbes Allan (and his character 'Ilya Meiliakin', modeled on Ilya Prigogine, and human thermodynamics discussion)

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θΔics

In existographies, **Hermarchus** (325-250BC) was a Greek philosopher (see: Greek philosophy), first main head of Epicurus' school, noted for []

Other

Of note, book 28 of Epicurus 37 book set *On Nature*, was dedicated to Hermarchus. (Q)

Quotes | On

The following are quotes on Hermarchus:

> "Apollodorus in his *Chronology* tells us that Epicurus was a pupil of Nausiphanes and Praxiphanes; but in his letter to Eurylochus, Epicurus himself denies it and says that he was self-taught. Both Epicurus and **Hermarchus** deny the very existence of Leucippus the philosopher, though by some and by Apollodorus the Epicurean he is said to have been the teacher of Democritus. Demetrius the Magnesian affirms that Epicurus also attended the lectures of Xenocrates."
>
> — Diogenes Laertius (c.230), *Lives and Opinions of Eminent Philosophers* (§10.12)

> "Metrodorus and **Hermarchus**: it is said that Metrodorus would have followed his friend **Epicurus** as head of the Garden had he not died first; Hermarchus succeeded instead. They joined with Epicurus in attacking Pythagoras for equating all things with number, Plato for his notion of the demiurge initiating motion in the universe, and Empedocles for positing that love and strife combine and separate the four elements. All these views of purposive creation are at odds with the Epicurean doctrine of the fusion and separation of atoms by chance."
>
> — Patrick Walsh (1997), Notes on Cicero's *The Nature of the Gods* [1]

References

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θΔics

In religio-mythology, **Hermes** is the Greek recension rescript of the Egyptian god Thoth, who became legendary alchemical figure of "Hermes Trismegistus" in the years 100 to 1600, prior to alchemy becoming chemistry.

Mercury

The name “Hermes”, according to Magnall (1789), is a name for the god “Mercury”.

Hermopolis

In 1922, Patrick Boylan, in his *Thoth: the Hermes of Egypt* (Q), was stitching tentative connections between Hermes, Thoth, and Hermopolis (see: Hermopolis creation myth).

In 2019, Nasser Mervat, in his *The Path to New Hermopolis*, seems to have argued that the name “Hermes”, and related terms, e.g. “hermetic”, as a matter of established fact, derive from the Greek recension of the Egyptian god Thoth into the new god Hermes, Thoth’s main city of worship having been Hermopolis , or something along these lines. [2]

Hermes Trismegistus

In 2018, Christian Bull, in his *The Tradition of Hermes Trismegistus: the Egyptian Priestly Figure as Teacher of the Hellenized Wisdom*, on the topic of the figure of Hermes Trismegistus (c.100-175) (Q), a name which means “thrice-great Hermes”, a purported to exist Egyptian-Greek alchemist, of some sort, who penned the *Hermetica* (Q), a dialogue between a teacher and a disciple, meant to enlighten the mind on the subject of the: divine, cosmos, mind, nature, alchemy, astrology, among other related topics; which by the 15th century had become known as “Hermeticism” (Q), a religio-philosophy ideology, of sorts, pointed out that in the 26th dynasty (664-535BC), and later in a trilingual Canopus decree in honor of Ptolemy IV (238BC), that Thoth was being referred to as “twice great Thoth”. [3]

Goethe | EO

In 1809, Goethe, in his *Elective Affinities*, employed the initials E and O (see: EO), such as are engraved on the glass that gets symbolically destroyed; this, according to John Williams (1998), are not only the initials of Eduard and Ottilie, or Eduard and Otto, but also of Eurydice and Orpheus—which, according to Williams, relates to the symbolism of Mittler as “Hermes”, the ubiquitous messenger and psychopomp, the conductor of souls to the underworld. [1]

See also

- God character rescripts

References

1. Williams, John R. (1998). *The Life of Goethe* (anagram, pg. 137; Otto anagram, pgs. 233-34). Blackwell.
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θΔics

In creation myths, **Hermopolis creation myth** is the creation myth of the Egyptian city of Unet, in Upper Egypt, called "Hermopolis" in Greek, according to which the first thing that came into existence in the universe were eight pairs of gods: [2]

1. Nun and Naunet | Primeval water
2. Huh and Hauhet | Spacial infinity
3. Kuk and Kauket | Darkness
4. Amen and Amenent (Amaunet) or Niau Niaut [alternative] | Hiddenness

This group of eight gods are called the "Ogdoad", which is Greek for eight.

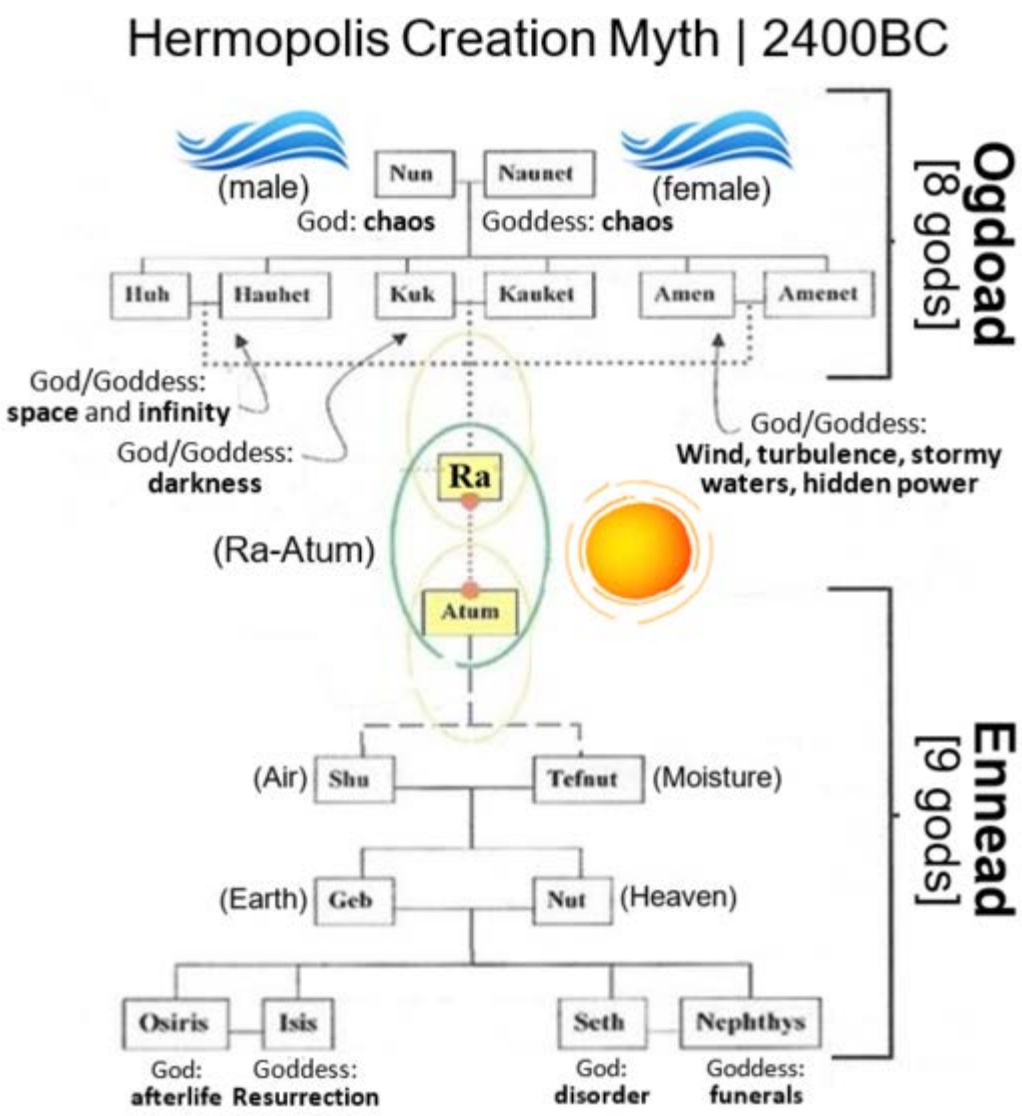

The general scheme of the **Hermopolis creation myth**, wherein the primordial god family of eight gods called the "Ogdoad" engenders the sun god Ra-Atum (Atum-Ra) who in turn engenders the Heliopolis 9-god family called the Ennead.

Ogdoad

In 2400BC, the religious power center in Egypt switched from Memphis, and their Ptah-centric creation myth (see: Memphis creation myth), to Hermopolis and one centered on the an 8-god family called the "Ogdoad", as shown adjacent, as the primordial creative entity that produced Ra-Atum or the sun god, who in turn made or produced the Ennead. [1]

The ancient Egyptian water god Nun, in short, expanded into a set of four male-female god pairs, specifically: Nun and Naunet, god and goddess of chaos, Huh and Huhet, god and goddess of space of infinity, Kuk and Kauket, god and goddess of darkness, and Amen and Amenet, god and goddess of invisibility of the winds and of turbulence of stormy waters, both incarnation of hidden powers.

Lotus

In Hermopolis, it was believed that there was a giant lotus blossom that first emerged from the primordial waters of Nun and from which the sun god came forth.

Thebes

See main: Thebian creation myth

In 2050BC, Thebes became the new state capital of Egypt, according to which the god Amen was reconceptualized as a fusion or incarnation of all the supreme gods come before. [1]

Hinduism

See main: God character equivalences

In Hindu mythology (c.900BC), as popularized in India, a variant of the above, was coded as such that Nun became the god VishNu who associates with a man named MaNu (i.e. Noah variant), who builds a boat before the great flood, and where the Ogdoad becomes the charcter "Sherma", the keme becomes the character "Hama", and god Ptah becomes the character "Jiapheta".

Greek mythology

In 700BC, Hermopolis creation myth, with its two primordial god families, i.e. Ogdoad and Ennead, became, via the Greek scholars travelling to Egypt to study under their priests, Hesiod, as detailed in his *Theogony* (c.700BC), and Homer, in particular, became rewritten such that the Ogdoad became the Greek "primordial deities" (Q) and the Ennead, in a general sense, becomes the god family (Q) of the "Titans" and the "Olympians", the where the war that famously ensues is the rescript of the famous battle between Set and Horus and on the question of the right to rule over both Upper and Lower Egypt.

Thoth | Hermes | Hermetic

There is, to note, some discussion (Mervat, 2019) of Thoth, in respect Hermopolis, who became the Greek Hermes, and hence to the terms such as "hermetic". [3]

Judaism

See main: God character equivalences

In c.300BC, in Judaism, as described in the Old Testament in the Bible, the three main Egyptian creation myths: Heliopolis creation myth (3100BC), Memphis creation myth (2800BC), and Hermopolis creation myth (2400BC), as decoded by Gary Greenberg (2000), were assimilated such that (a) the characteristic descriptions of the Ogdoad became the opening paragraph wording of Genesis, and also (b) Nun was rescripted into story of a man named Noah, who lands on a mountain (i.e. pyramids), who has three sons, named in code as: Shem (i.e. Ogdoad), Ham (i.e. keme), and Japheth (i.e. god Ptah), depicted as follows:

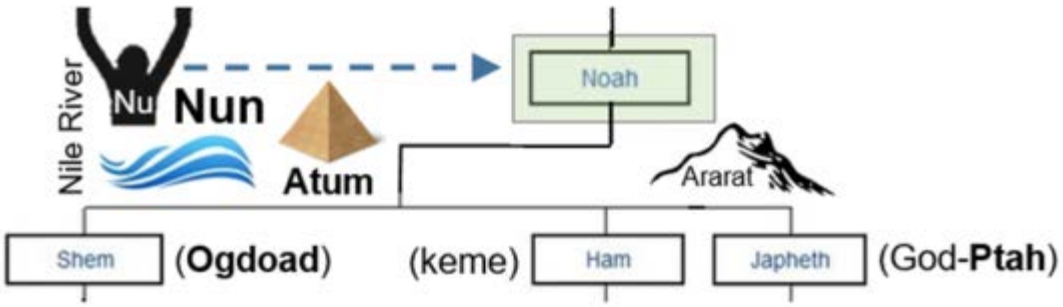

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See also

- Clay creation myth
- Thebian creation myth
- Amarnan creation myth

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2. Luckhert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective* (pgs. 97-98). SUNY Press.
3. Nasser, Mervat. (2019). *The Path to New Hermopolis* (abs). Rubedo Press.

External links

- Hermopolis creation myth (section) – Wikipedia.

θΔics

In existographies, **Hero** (c.10-70AD) (IQ:185|#63) [RGM:310|1,500+] (EP:3) [GEE:#] (Eells 100:36) [CR:63], aka "Heron" or "Hero of Alexandria", was a Greek physicist, engineer, and mathematician, noted for a number of things, such as his *circa* 50AD *Pneumatics*, variously titled as *Inventions of the Ancients* (Clark, 1885) or *Spiritalia seu Pneumatica* (Thurston, 1878), wherein, in his overview of the physics of Strato and Ctesibius, he outlines an atomic theory in which matter consists of particles mixed with distributed vacua, and in which he describes 78 propositions or devices, e.g. how to make an aeolipile, among other heat-powered devices, some of which he says are his own invention, others being handed down to him by the ancients. [1]

Overview

In 50AD, Hero, published his *Pneumatics*, cataloging of various pneumatic-like machines, invented by others before him, others invented by him, although this is not stated explicitly.

In the twelfth and thirteenth century, Hero's book began to be century the book began to be translated into various languages, such as in Sicily, under titles such as: *The Curious Art of Spirit Movement* (*The Artificiosi et Curious Spiritual Movements*) (Commandino, 1575), or *Inventions of the Ancients* (Clark, 1885), *Spiritalia seu Pneumatica* (Thurston, 1878).

It is also said that Hero may have used a type of Philo thermometer (240BC) in his experimental work.

One horsepower pump

The following shows a four-cylinder one-horsepower pump, which, supposedly, is found in one of Hero's 1589 *Spiritalia* reprints, which illustrates the transformation of rotary motion to reciprocating motion via gears: [11]

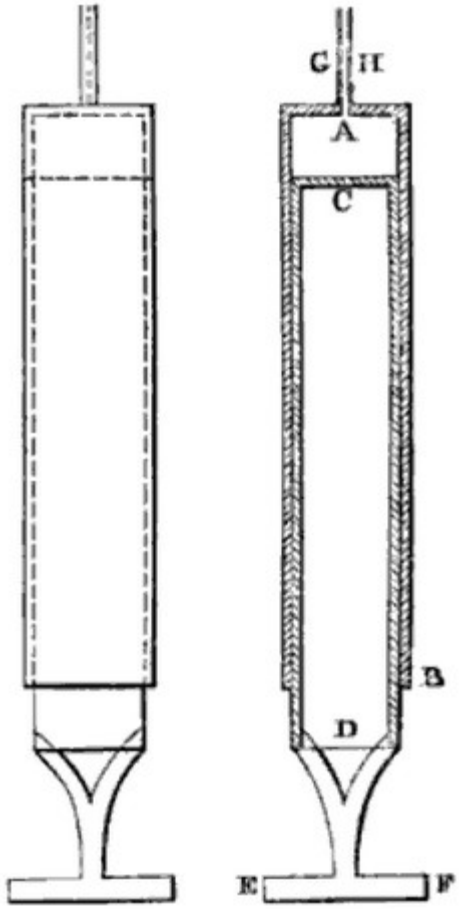

A depiction of Hero's device 57, a syringe, in which he says when handle EF is withdrawn, a vacuum is produced, according to which liquid can be sucked in, via tube GH.

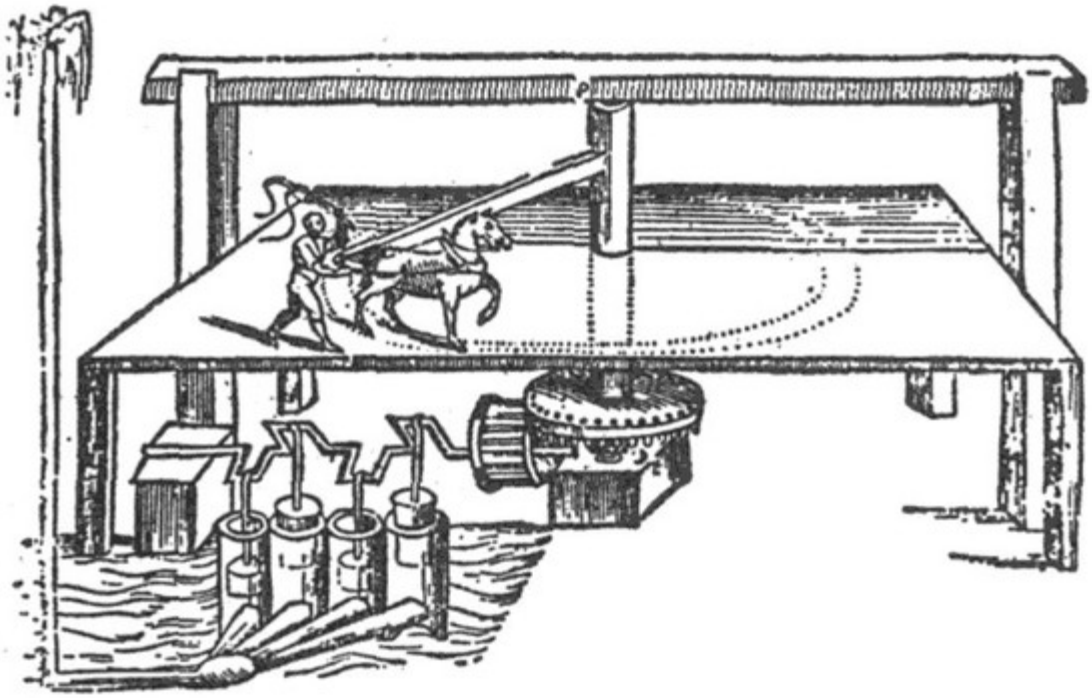

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Device 57 | Syringe

Here, in his device #57, described the operation of the syringe, which he says can be employed for either suction or injection:

> “The instrument called a ‘pyulcus’ acts on the same principle. A hollow tube, of some length, is made, A B (fig. 57); into this another tube, C D, is nicely fitted, to the extremity C of which is fastened a small plate or piston, and at D is a handle, E, F. Cover the orifice A of the tube A B with a plate in which an extremely fine tube, G H, is fixed, its bore communicating with A B through the plate. When we desire to draw forth any pus, we must apply the extreme orifice of the small tube, H, to the part in which the matter is, and draw the tube C D outwards by means of the handle. **As a ‘vacuum’ is thus produced in A B something else must enter to fill it**, and as there is no other passage but through the mouth of the small tube, we shall of necessity draw up through this any fluid that may be near. Again, when we wish to inject any liquid, we place it in the tube A B, and, taking hold of E F, depress the tube C D, and force down the liquid until we think the injection is effected.’

(add)

Device 47 | Solar-powered Trickle Fountain

The device #47, titled “A Fountain which trickles by the Action of the Sun's Rays”, of Hero’s listing of

the inventions of the ancients, as illustrated adjacent, operates as follows:

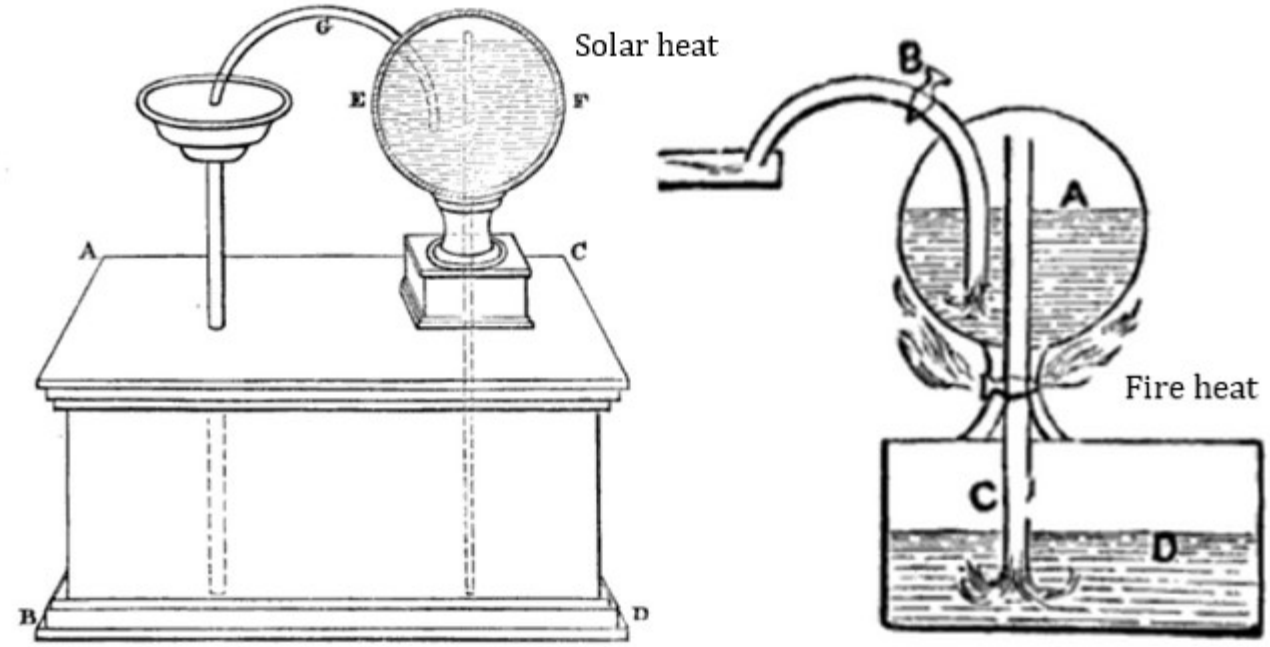

An illustration of **Hero's** device 47 entitled "A Fountain which trickles by the Action of the Sun's Rays". [8]

> "The 'fountain' as it is called may be made to trickle as long as the sun falls upon it. Let there be an airtight pedestal, ABCD (adjacent), through which a funnel is inserted, its tube extending within a very little of the bottom. Let E F be a globe, from which a tube leads into the pedestal, reaching nearly to the bottom of the pedestal and to the circumference of the globe, while a bent siphon, fitted into the globe, leads into the funnel. Now pour water into the globe; and when the sun falls upon the globe, the air in it, being heated, will drive out the liquid, which will be carried along the siphon G, and pass through the funnel into the pedestal. But when the globe is in the shade, the air having escaped through the globe, the tube will again suck up the liquid, and fill the void which had been produced; and this will take place as often as the sun falls upon the globe."

This model was modified by Giovanni Porta (1606) and or Salomon de Caus (1615) wherein fire heat was employed instead of solar heat to make a water raising device; one recounting of this is:

> "Hero's forty-seventh invention, is designed for the heat of the sun to expand the water in A, and by compressing the air on its surface jointly with the vapor formed, to force the contents in A up the pipe B. When A is cooled, the water in D would rise to fill the partial vacuum in A, and be emptied as before. By substituting a fire below A, instead of the sun above it, we have a simple water-raising engine on De Cans's plan."

(add)

Device 37 | Door-opening heat engine

Hero, in his device #37, described as a machine for "Opening Temple Doors by Fire on an Altar", details his method of using the expansion of the volume of air by fire to expel water into a bucket, which falls a height, which turn cylinders, which open the temple doors as follows: [6]

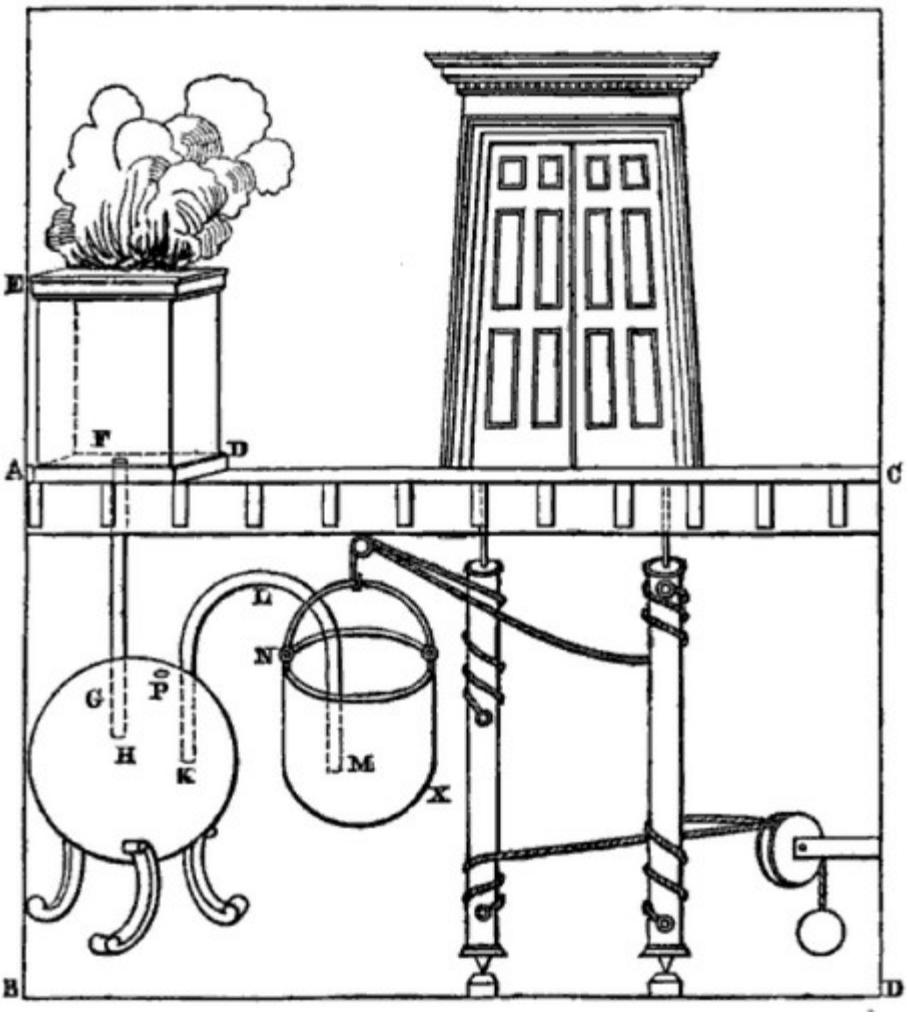

A depiction of Hero's device 37, a heat engine for opening temple doors. [6]

"The construction of a small temple such that, on lighting a fire, the doors shall open spontaneously, and shut again when the fire is extinguished. Let the proposed temple stand on a pedestal, ABCD (figure 37), on which lies a small altar, E D. Through the altar insert a tube, F G, of which the mouth F is within the altar, and the mouth G is contained in a globe, H, reaching nearly to its center: the tube must be soldered into the globe, in which a bent siphon, suspended vessel; and through a hole, p, which must be carefully closed afterwards, pour water into the globe enough to fill one half of it. It will be found that, **when the fire has grown hot, the air in the altar becoming heated expands into a larger space**; and, passing through the tube F G into the globe, it will drive out the liquid contained there through the siphon K L M into the suspended vessel, which, descending with its weight, will tighten the chains and open the doors. Again, when the fire is extinguished, the rarefied air will escape through the pores in the side of the globe, and the bent siphon, (the extremity of which will be immersed in the water in the suspended vessel) will draw up the liquid in the vessel in order to fill up **the void left by the particles** removed. When the vessel is lightened the weight suspended will preponderate and shut the doors. Some in place of water use quicksilver, as it is heavier than water and is easily disunited by fire."

Interestingly, here we see Hero discussing, what seems to be, the existence of a vacuum made by fire. According to others, however, some have stated that Hero was said to have openly challenge the nature abhors a vacuum belief, but his attempts to create an artificial vacuum failed. [2]

The following is an alternative sketch of Hero's temple door opening heat engine:

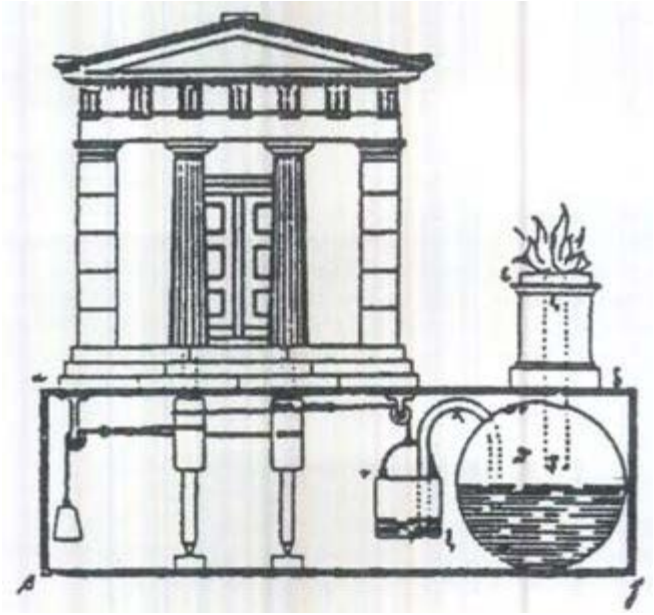

A retrospect historical note on Hero's device 37 is as follows:

> "A hot-air engine, however, which is the subject of his 37th proposition, is of real interest. Hero sketches and describes a method of opening temple-doors by the action of fire on an altar, which is an ingenious device, and contains all the elements of the machine of the Marquis of Worcester [Edward Somerset], which is generally considered the first real steam-engine, with the single and vital defect that the expanding fluid is air instead of steam."
>
> — Robert Thurston (1878), *A History of the Growth of the Steam Engine* (pg. 5)

Hero, in short, seems to have been the first to invent and build a heat engine, namely a steam engine that opens temple doors, in the operation of which, fire causes water vapor to expand in a closed vessel, water is forced out, fills the adjacent bucket, and the temple door is opened by means of chains; when fire is extinguished, the process reverses and the door closes. [3]

Device 50 | Aeolipile

Hero, in his device #50, describes the aeolipile. [6] The aeolipile device, shown below with modern annotation, is said to have been invented in circa 250BC by Greek compressed air engineer Ctesibius, and is often assigned as being the world's first prototype steam engine.

These came to be known as the 'aeolipile' as described by both Roman architect Vitruvius (15BC) and by Hero (50AD). [1] Owing to the fact that Hero was the first to give a detailed account on how to make an aeolipile, the device has since come to be known as Hero's engine or the aeolipile of Hero.

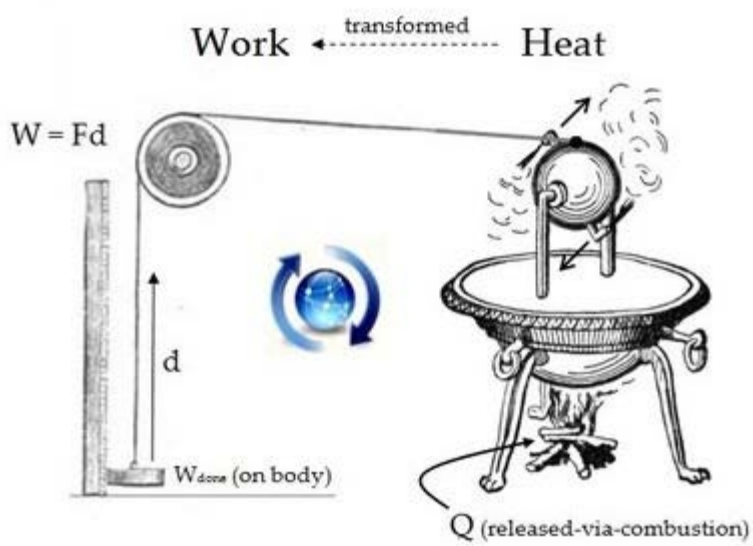

A depiction of the aeolipile described by **Hero**, attached to a Joule mechanical

French physicist Denis Papin (1647-1712)

who invented 1679 the pressure cooker and in 1690 published his first work on the steam engine in *De novis quibusdam machinis*, in which the Papin engine is described, knew the *aeolipile* from Hero's *Pneumatica*, as had been translated by Gottfried Leibniz (1646-1716), Germany. [4]

equivalent of heat style device for measuring the work done in raising a body through a distance of height.

Automaton

Here, in his *Automata*, described the workings of several bird automatons. Hero also invented many mechanisms for the Greek theater, including an entirely mechanical play almost ten minutes in length, powered by a binary-like system of ropes, knots, and simple machines operated by a rotating cylindrical cogwheel. The sound of thunder was produced by the mechanically-timed dropping of metal balls onto a hidden drum. Heron constructed a three-wheeled cart that could carry a group of automata to the front of a stage where they would perform for an audience. Power came from a falling weight that pulled on a string wrapped round the cart's drive axle. [7]

The following is a reconstruction, by by Giovanni Battista, of one of many "automata" of Heron: [4]

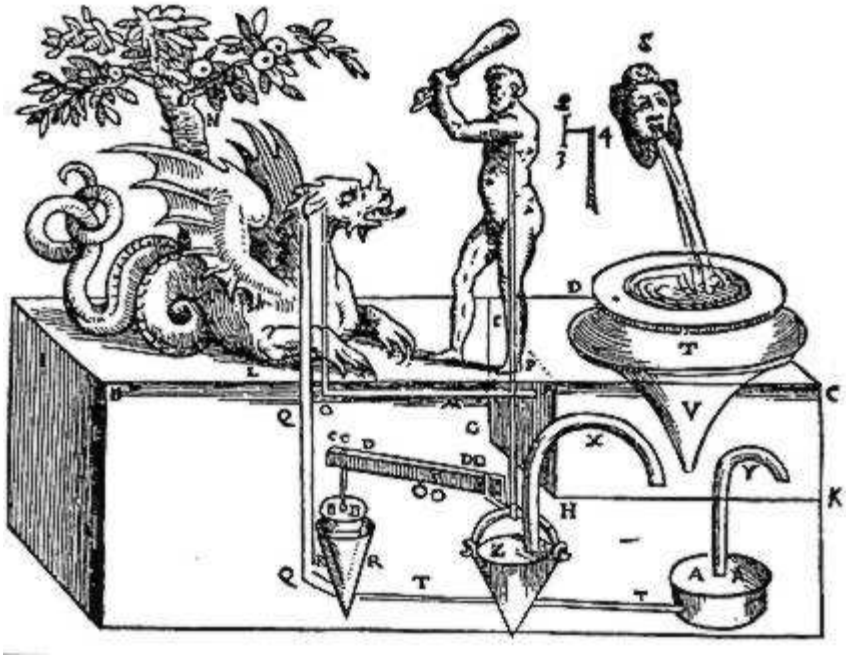

A type of device that would later go on to serve as a type of thought experiment by deep thinkers such as Rene Decartes and John Neumann, in regards to what exactly constitutes "life" in a modern scientific or philosophical sense of the matter.

Device 11 | Fire libations altar

In c.55AD, Hero, in his 11th proposition "Libations at an Altar produced by Fire", of his *Pneumatics*, described fire-powered libations alter as follows: [6]

> "To construct an altar such that, when a fire is raised on it, figures at the side shall offer libations. Let there be a pedestal, ABCD (see: figure) on which the figures stand, and also an altar, E F G, perfectly air-tight. The pedestal must also be air-tight, and communicate with the altar at G. Through the pedestal

The so-called "11th proposition" of **Hero**, namely a heat-powered animated alter described as 'Libations on an Altar produced by Fire', which Robert Thurston calls the "first application of heat to produce motion of fluids". [5]

insert the tube H K L, reaching nearly to the bottom at L, and communicating at H with a bowl held by one of the figures. Pour liquid into the pedestal through a hole, M, which must afterwards be closed. Now if a fire be lighted on the altar E F G, the air within it, being rarefied, will descend into the pedestal, and exert pressure on the liquid it contains, which, having no other way of retreat, will pass through the tube H K L into the bowl. Thus, the figures will pour a libation, and will not cease so long as the fire remains on the altar. When the fire is extinguished, the libation ceases; and as often as the fire is kindled the same will be repeated. The pipe through which the heat is to pass should be broader towards the middle, for it is requisite that the heat, or rather the vapor from it, passing into a broader space, should expand and act with greater force."

The following is related commentary on this Hero device #11:

> "The 11th proposition of Hero, namely: 'Libations on an Altar produced by Fire', is the first application of heat to produce motion of fluids. This toy embodies the essential principle of all modern heat-engines—the change of energy from the form known as heat-energy into mechanical energy, or work. It is not at all improbable that this prototype of the modern wonder-working machine may have been known centuries before the time of Hero."
>
> — Robert Thurston (1878), *A History of the Growth of the Steam Engine* (pg. 5) [1]

(add)

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â— Hero. (c.55AD). *Pneumatics* (translator: Bennet Woodcroft). Taylor, 1851.

External links

â— Hero of Alexandria – Wikipedia.

θΔics

In existographies, **Herodotus** (484-425 BCM) (IQ:175|#249) (Cattell 1000:202) [RGM:171|1,500+] (GHE:4) (ACR:28) [CR:81] was a Greek historian, aka "father of history" (Cicero, 50BC), noted for his digression on a number of thinkers, e.g. Thales, and topics, e.g. his use of the term "phoenix" for Ra, of Heliopolis creation myth, connection of Osiris with Dionysus (see: Osiris, Dionysus, and Bacchus), mummification, the Egyptian pig superstition behind Mark 5:1-17, among others.

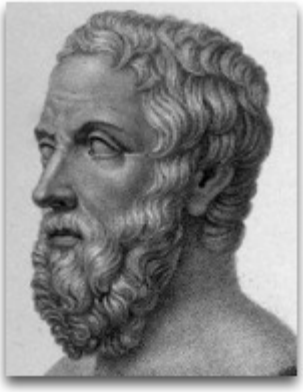

Ra | Phoenix

Herodotus, in his chapter on Egypt, in recounting the various animals he learned of and seen with his own eyes, e.g. crocodile, hippopotamus, otter, and eel, the gives the following account of the sun god Ra, which he was told was a sacred bird that rarely appears:

> "There is also another sacred bird, called the phoenix, which I have never seen except in a picture; for it seldom makes its appearance among them, only once in five hundred years, as the Heliopolitans affirm: they say that it comes on the death of its sire. If he is like the picture, he is of the following size and description: The plumage of his wings is partly golden-colored, and partly red; in outline and size he is very like an eagle. They say that he has the following contrivance, which in my opinion is not credible. They say that he comes from Arabia, and brings the body of his father [god name] to the temple of the sun, having enclosed him in myrrh, and there buries him in the temple. He brings him in this manner: first he molds an egg of myrrh as large as he is able to carry; then he tries to carry it, and when he has made the experiment, he hollows out the egg, and puts his parent into it, and stops up with some more myrrh the hole through which he had introduced the body, so when his father is put inside, the weight is the same as before: then, having covered it over, he carries him to the temple of the sun in Egypt. This they say is done by this bird."
>
> — Herodotus (c.435BC), *The Histories* (pg. 110-11)

(add)

Mummification

Herodotus describes (pgs. 113-15) the three methods of mummification as follows:

> "Their manner of mourning and burying is as follows: When in a family a man of any consideration dies, all the women of that family besmear their heads and faces with mud, and then leaving the body in the house, they wander about the city, and beat themselves, having their clothes girt up, and exposing their breasts, and all their relations accompany them. On the other hand, the men beat themselves, being girt up, in like manner. When they have done this, they carry out the body to be embalmed. There are persons who are appointed for this very purpose; they, when the dead body is brought to them, show to the bearers wooden models of corpses, made exactly like by painting. And they show that which they say is the most expensive manner of embalming, the name of which I do not think it right to mention on such an occasion; they then show the second, which is inferior and less expensive; and then the third, which is the cheapest. Having explained them all, they learn from them in what way they wish the body to be prepared; then the relatives, when they have agreed on the price, depart; but the embalmers remaining in the workshops thus proceed to embalm in the most expensive manner.
>
> First they draw out the brains through the nostrils with an iron hook, taking part of it out in this manner, the rest by the infusion of drugs. Then with a sharp Ethiopian stone they make an incision in the side, and take out all the bowels; and having cleansed the abdomen and rinsed it with palm-wine, they next sprinkle it with pounded perfumes. Then having filled the belly with pure myrrh pounded, and cassia, and other perfumes, frankincense excepted, they sew it up again; and when they have done this, they steep it in natrum, leaving it under for seventy days; for a longer time than this it is not lawful to steep it."

The period of seventy days, to note, has been attributed to the number of days the star Sirius was gone from sight, prior to the Jun 25h heliacal rising, for a brief moment, just before sunrise, which marks the start of the Nile River flood. Herodotus continues:

> "At the expiration of the seventy days they wash the corpse, and wrap the whole body in bandages of flaxen cloth, smearing it with gum, which the Egyptians commonly use instead of glue. After this the relatives, having taken the body back again, make a wooden case in the shape of a man, and having made it, they enclose the body; and thus, having fastened it up, they store it in a sepulchral chamber, setting it upright against the wall. In this manner they prepare the bodies that are embalmed in the most expensive way. Those who, avoiding great expense, desire the middle way, they prepare in the following manner: When they have charged their syringes with oil made from cedar, they fill the abdomen of the corpse without making any incision or taking out the bowels, but inject it at the fundament; and having prevented the injection from escaping, they steep the body in natrum for the prescribed number of days, and on the last day they let out from the abdomen the oil of cedar which they had before injected, and it has such power that it brings away the intestines and vitals in a state of dissolution; the natrum dissolves the flesh, and nothing of the body remains but the skin and the bones. When they have done this they return the body without any further operation. The third method of embalming is this, which is used only for the poorer sort: Having thoroughly rinsed the abdomen in syrmaea, they steep it with natrum for the seventy days, and then deliver it to be carried away. But the wives of considerable persons, when they die, they do not immediately deliver to be embalmed, nor such women as are very beautiful and of celebrity, but when they have been dead three or four days they then deliver them to the embalmers; and they do this for the following reason, that the embalmers may not abuse the bodies of such women; for they say that one man was detected in abusing a body that was fresh, and that a fellow-workman informed against him. Should any person, whether Egyptian or stranger, no matter which, be found to have been seized by a crocodile, or drowned in the river, to whatever city the body may be carried the inhabitants are by law compelled to have the body embalmed, and, having adorned it in the handsomest manner, to bury it in the sacred vaults. Nor is it lawful for any one else, whether relatives or friends, to touch him; but the priests of the Nile bury the corpse with their own hands, as being something more than human."

(add discussion)

Greek | Egyptian mythology

Herodotus, in his observations of the Egyptians, established Greco-Egyptian equivalents that endured into the Hellenistic era, including Amen-Ra/Zeus, Osiris/Dionysus, and Ptah/Hephaestus. [2]

> "This relation I had from the priests of Vulcan [Ptah] at Memphis. I heard other things also at Memphis in conversation with the priests of Vulcan. And on this very account I went also to Thebes, and to Heliopolis, in order to ascertain whether they would agree with the accounts given at Memphis; for **the Heliopolitans are esteemed the most learned in history of all the Egyptians**. They say also that the Egyptians were the first who introduced the names of the twelve gods, and that the Greeks borrowed those names from them; that they were the first to assign altars, images, and temples to the gods, and to carve the figures of animals on stone; and most of these things they proved were so in fact."
>
> — Herodotus (c.435BC), *The Histories* (pg. 86)

> "I have held converse with the priests of Hephaistos (Ptah) at Memphis. I went to Thebes and to Heliopolis intent on discovering if the information I gathered in Memphis would be verified, since the **Heliopolitans are regarded as the wisest of Egyptians**. As to their explanations of the 'sacred', I am not keen on fully

disclosing that knowledge except perhaps in giving the names of certain rituals which I consider to be already 'common currency' among men.”

— Herodotus (435BC), *Histories* (2.3) (Q)

“Ethiopians inhabit the country immediately above Elephantine, and one half of the island; the other half is inhabited by Egyptians. Meroe is said to be the capital of all Ethiopia. The inhabitants worship no other gods than Jupiter and Bacchus; but these they honor with great magnificence; they have also an oracle of Jupiter; and they make war, whenever that god bids them by an oracular warning, and against whatever country he bids them.”

— Herodotus (c.435BC), *The Histories* (pg. 92)

“All the Egyptians sacrifice the pure male kine and calves, but they are not allowed to sacrifice the females, for they are sacred to Isis; for the image of Isis is made in the form of a woman with the horns of a cow, as the Grecians represent Io; and all Egyptians alike pay a far greater reverence to cows than to any other cattle. So that no Egyptian man or woman will kiss a Grecian on the mouth, or use the knife, spit, or caldron of a Greek, or taste of the flesh of a pure ox that has been divided by a Grecian knife. They bury the kine that die in the following manner: the females they throw into the river, and the males they severally inter in the suburbs, with one horn, or both, appearing above the ground for a mark. When it is putrefied and the appointed time arrives, a raft comes to each city from the island called Prosopitis; this island is in the Delta, and is nine schoeni in circumference: now in this island Prosopitis there are several cities; but that from which the rafts come to take away the bones of the oxen is called Atarbechis; in it a Temple of Venus has been erected. From this city, then, many persons go about to other towns; and having dug up the bones, all carry them away, and bury them in one place; and they bury all other cattle that die in the same way that they do the oxen; for they do not kill any of them. All those who have a temple erected to Theban Jupiter, or belong to the Theban district, abstain from sheep, and sacrifice goats only. For the Egyptians do not all worship the same gods in the same manner, except Isis and Osiris, who, they say, is Bacchus; but these deities they all worship in the same manner.”

— Herodotus (c.435BC), *The Histories* (pg. 100)

(add discussion)

Persian empire

In 425BC, Egypt was invaded by Persian ruler Cambyses; the extent of the Persian empire, from Herodotus' *The Histories*, is as follows:

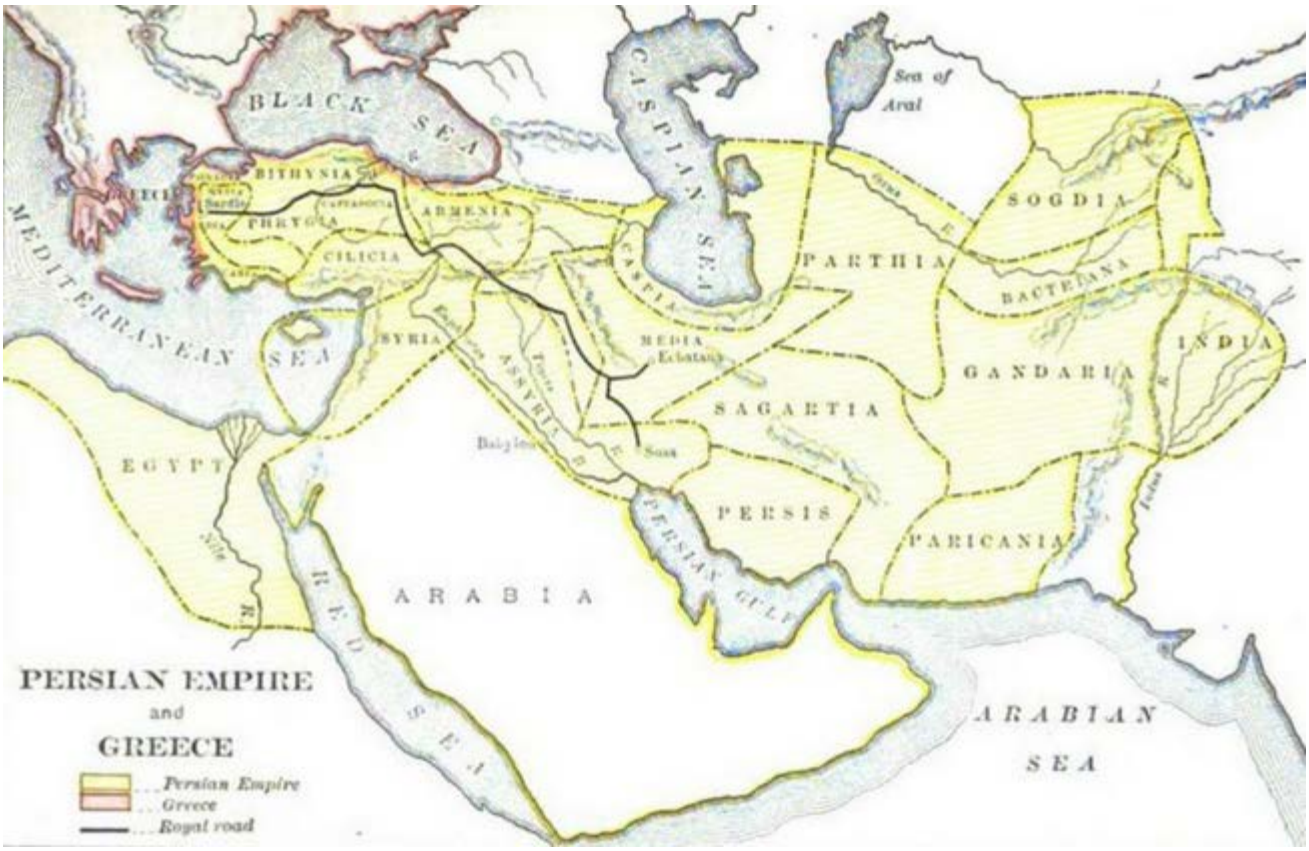

Herodotus (pg. 92) discusses the three ways Greeks, historically, have attempted to account for the Nile River flood, the latter of which he says being attributed to snow melting in the Ethiopian mountains.

Epicurus

In circa 290BC, Epicurus, in his "Letter to Herodotus" (Q), he, supposedly, relegates the gods to the role of non-interfering material entities, in capable of controlling human affairs. [1]

Quotes | By

The following are noted quotes:

> "If a man insisted always on being serious, and never allowed himself a bit of fun and relaxation, he would go mad or become unstable without knowing it."
>
> — Herodotus (c.440BC)

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External links

● Herodotus – Wikipedia.

θΔics

In terminology, **Herrick's Humpty Dumpty**, a truncation of the message of Judson Herrick's 1930 speech "Humpty Dumpty and His Great Wall: The Scientific Study of Man and the Humanities", is the assertion that the story of Humpty Dumpty is representative of the story of the broken and fragmented two cultures divide, speaking anachronistically, between the humanities, e.g. sociology and economics, on one side, implicitly conceptualized, as Herrick explains, being rooted in "spiritual values", and, on the other side, the natural sciences, e.g. physics and chemistry, explicitly or overtly "uncontaminated by spiritual values", as Herrick says:

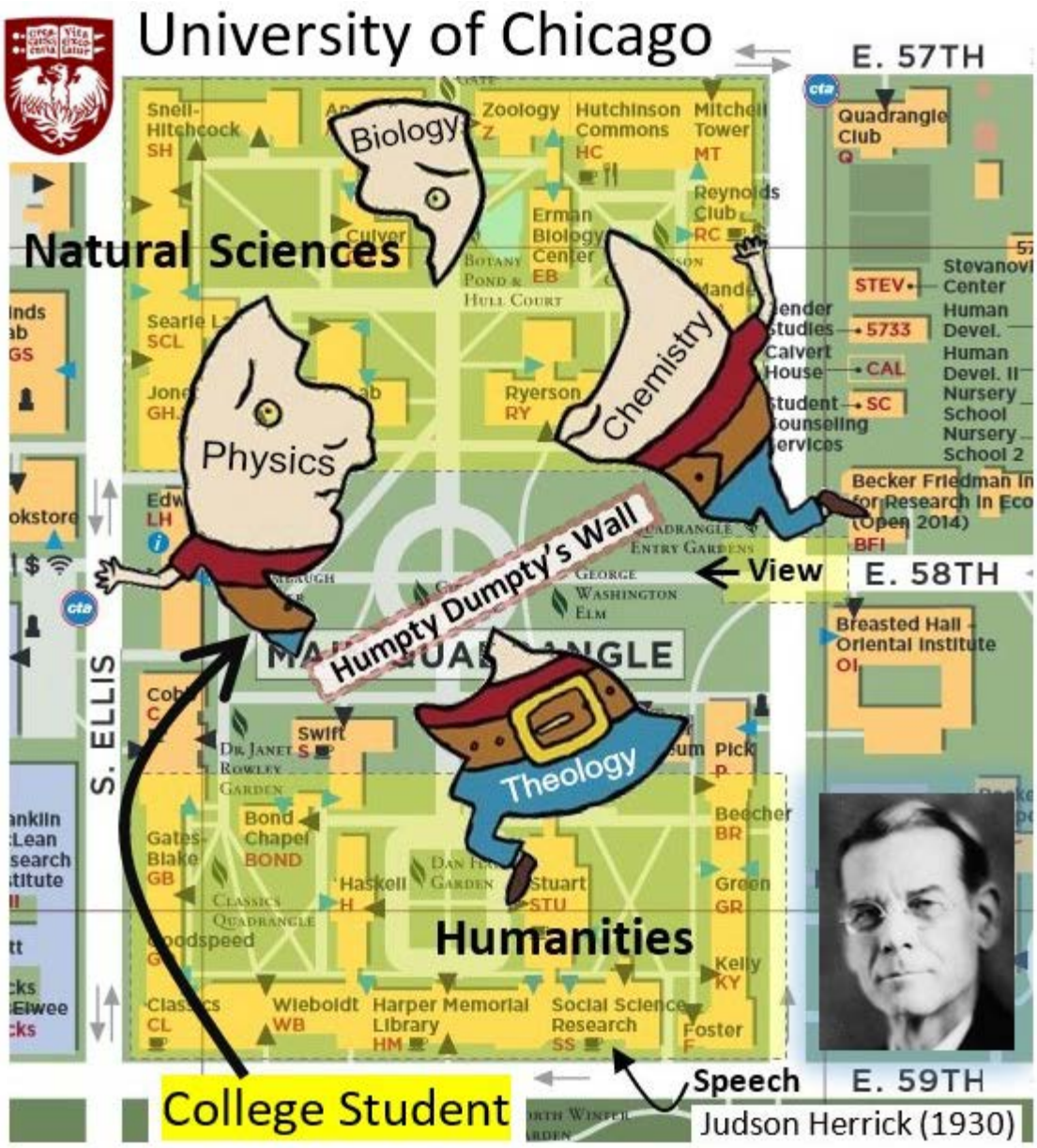

The diagram above shows the location of Humpty Dumpty's 'great wall', according to Judson Herrick, who, during his dedication speech to the 1930 opening the University of Chicago Social Science Research (SS) building, stated that **Dumpty's wall** "stretches, vast and impenetrable, from east to west across the main quadrangle. It is invisible, to be sure, but one has only to stand on 58th Street and look across the quadrangle to see where it is. To the south there are the homes of the **humanities** in imposing array, to the north the massive laboratories of the **natural sciences**, and between them a wide expanse of—nothing at all." [1]

> "**Humpty Dumpty**'s wall stretches, vast and impenetrable, from east to west across the main quadrangle. It is invisible, to be sure, but one has only to stand on 58th Street and look across the quadrangle to see where it is. To the south there are the homes of the **humanities** in imposing array, to the north the massive laboratories of the **natural sciences**, and between them a wide expanse of—nothing at all."
>
> — Judson Herrick (1930), dedication speech to opening of the University of Chicago's new Social Science (SS) Research Building

The divide is evidenced by growing hydraism-fueled anti-interdepartmentalism, or 'doctrinaire departmentalism', as John Q. Stewart (1951) called it, or "compartmentalization", as Mirza Beg (1987) referred to it, and anti-interdisciplinarity seen increasingly in all modern universities, since at least 1890, the year the University of Chicago, in particular, was founded (Ñº), as Herrick sees things. The divide or wall precariously sits amid the growing view that all is causality-determined, "mechanistic" and "natural", i.e. non-supernatural.

Overview

In 1930, Judson Herrick, gave a dedication speech amid the opening of University of Chicago's new Social Science building, which, in Herrick's mind, was originally envisioned to be entitled "Humpty Dumpty and His Great Wall", but was made to be remained by the "dignitaries in charge" to "The Scientific Study of Man and the Humanities", in which he directly asserted the great wall that Humpty Dumpty sat on is located in the University of Chicago quadrangle separating the humanities houses and departments from the massive natural science laboratories, and the broken Dumpty is the ongoing cracked two cultures rift between the "divine fire" of poetic inspiration, and or the "spiritual essence" of values and social forces, on the humanities side, and the desires expressed by the "social reactions" of humans, defined by the physical sciences on the other side; Herrick's digression, to note, is not your ordinary religion + science rift reconciliation type speech, to say the least; very intelligent.

Discussion

In the 21st century, Dumpty's wall, if anything, seems to have only grown taller, the entire conversation, which Herrick addresses so frankly, nearly swept under the Darwinian rug by an overt non-denominational sort of "secularity talk", to the point that even attempting to look over the wall, from one side or the other, and or to even think about putting Dumpty back together, quickly erupts into vehement and heated dialogue, fueled by embedded hydraism-like intellectual insecurities, ending in explosions that end the dialogue quickly; the Rossini debate (2006), Moriarty-Thims debate (2009), Nye vs Ham debate (2014) (Ñº), and Beg-Thims dialogue (2014), to name a few. The few historical patch attempts to put Dumpty back together, e.g. Nightingale's Oxford social physics (1890s), Henderson's Harvard Pareto circle (1930s), Stewart's "Princeton social physics" (1940s), to name a few, not having enough glue or reparable adhesive to fix Dumpty.

Speech

The following is the full text of Herrick's dedication speech: [1]

> "When it was suggested that I, an anatomist, come before this group to discuss the relationships of the social sciences, the question naturally arose, Why should I? What do I know about it? The second question answers itself—nothing at all. The social sciences—why, sir, I do not even know their names.
>
> These relationships of the social sciences, however, really do intrigue me—the rich relations, on one hand, and the poor relations, on the other. The geographical location of this new and beautifully appointed building has some interesting implications—the imposing facade, looking out upon the broad expanse of the midway, flanked on one side by *belles lettres* (Ñº) and on the other by beauty incarnate, by the fine arts, and by the aspirations of religion.
>
> These are our rich relations, and proud of them we have reason to be. Then there is 'commerce' and 'administration', toying with vested wealth and the luxuries and satisfactions which it brings, and at the same time paying its respects to the grimy sweat of toil. Again, there is 'social service', reaching out a helping hand to other of our poor relations, misfortune, poverty, delinquency, and crime. To say nothing of 'politics', which is too often at once rich in worldly goods and despicably poor in spiritual values.
>
> But I cannot discuss these things. If I were to try to talk your language, I should only add to your dreary sciences more dull and empty words. True, we do not need to go outside the University to observe that caliginous ignorance is no bar to a plethoric flow of words. There are ample precedents. But I prefer to talk about something that we are all familiar with.
>
> I would like, for instance, to say something about Humpty-Dumpty and his Great Wall; but the dignitaries in charge of

these ceremonies frowned upon this and a more banal title was announced. But, really, I do want to talk about the Great Wall, and I propose to do it. Let the dignitaries howl. Knowing no sociology, I shall recount a fable for sociologists: [2]

> "**Humpty-Dumpty** sat on a wall;
> Humpty-Dumpty had a great fall;
> And all the king's horses and all the king's men
> Could not put Humpty-Dumpty together again."

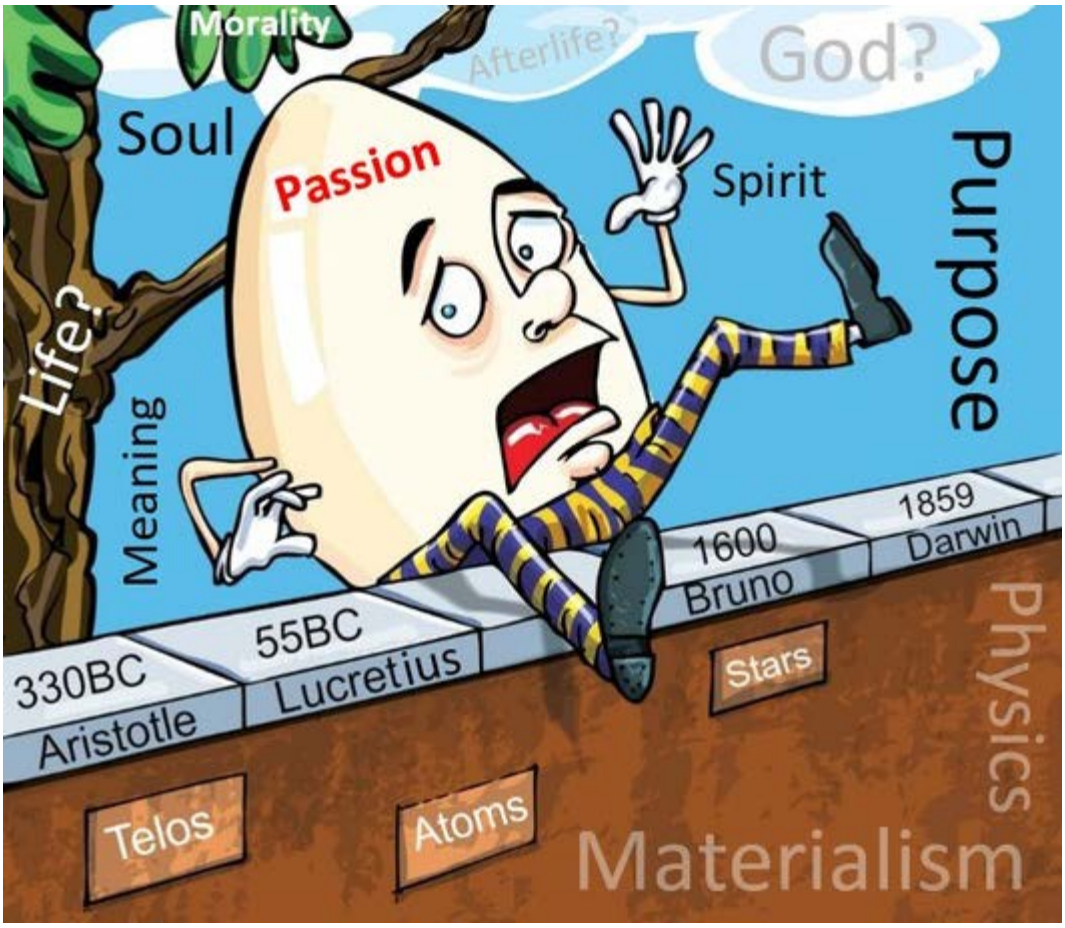

A **Herrick**-labeled (1930) version of **Humpty Dumpty** (Ñº), according to which Dumpty is the modern student, whose "sense" of his place in the universe is broken apart by the wall of separation between the humanities and physical or natural sciences departments; showing how a once semi-whole version of Dumpty, in the Aristotle | Telos (330BC) to Lucretius | Atoms (55BC) era, began to fall, eventually hitting the ground and cracking, sometime before Bruno (1600) / Gassendi (1649) / Darwin (1859) coming out of dark age era.

This is the story—brief, graphic. My researches have not penetrated far into the history of this legend. We know nothing regarding the personality and other achievements of Humpty-Dumpty previous to his great adventure. The archaeologists, so far as I know, have not uncovered even the foundation stones of his Great Wall. Yet the tradition lives and its influence abides with us, as does that of all the great of old:

> "The dead but sceptered sovereigns
> Who still rule our spirits from the tomb."
>
> — George Byron (1817), *Manfred* (Ñº) (Act II, Scene IV, line 43-44) (Ñº)

We need no archaeologist to locate the Great Wall in its modern form. We have it on our campus. It stretches, vast and impenetrable, from east to west across the main quadrangle. It is invisible, to be sure, but one has only to stand on Fifty-Eighth Street and look across the quadrangle to see where it is. To the south there are the homes of the humanities in imposing array, to the north the massive laboratories of the natural sciences, and between them a wide expanse of—nothing at all.

What means **this gap**? It is not empty space. It is, in fact, a mighty barrier, slowly and unwittingly fabricated from the founding of the University—the ill-concealed antipathy between the humanities and the sciences.

It is of no avail to deny its reality. Close our eyes to it though we may, it still is there—if not distrust, certainly a lack of sympathetic understanding and ability, with the best of intention, to effect unhampered co-operation.

Within our short history, the barrier has been passed by hardy adventurers on several occasions. Years ago the Department of Psychology emancipated itself from 'philosophy' and, flanking the wall, took its place on the north side among the natural sciences, claiming the right to study mind as a natural phenomenon and validating the claim by doing it successfully. More recently 'anthropology' has followed from your own midst and is now safely, though meagerly, housed in Hull Court. And only last summer another of your departments brazenly walked across the campus—house and all—from under the shadow of Art and Divinity to find asylum in a quiet nook behind the power-house. There has been, within our recollection, no similar migration in the opposite direction. And this, perhaps, is a pity.

These centrifugal movements, coming contemporaneously with the dedication of this new laboratory of the social sciences in the very heart of the citadel of the humanities, inevitably raise the questions: Where do the social sciences belong in an academic organization? and, What is a social science anyway?

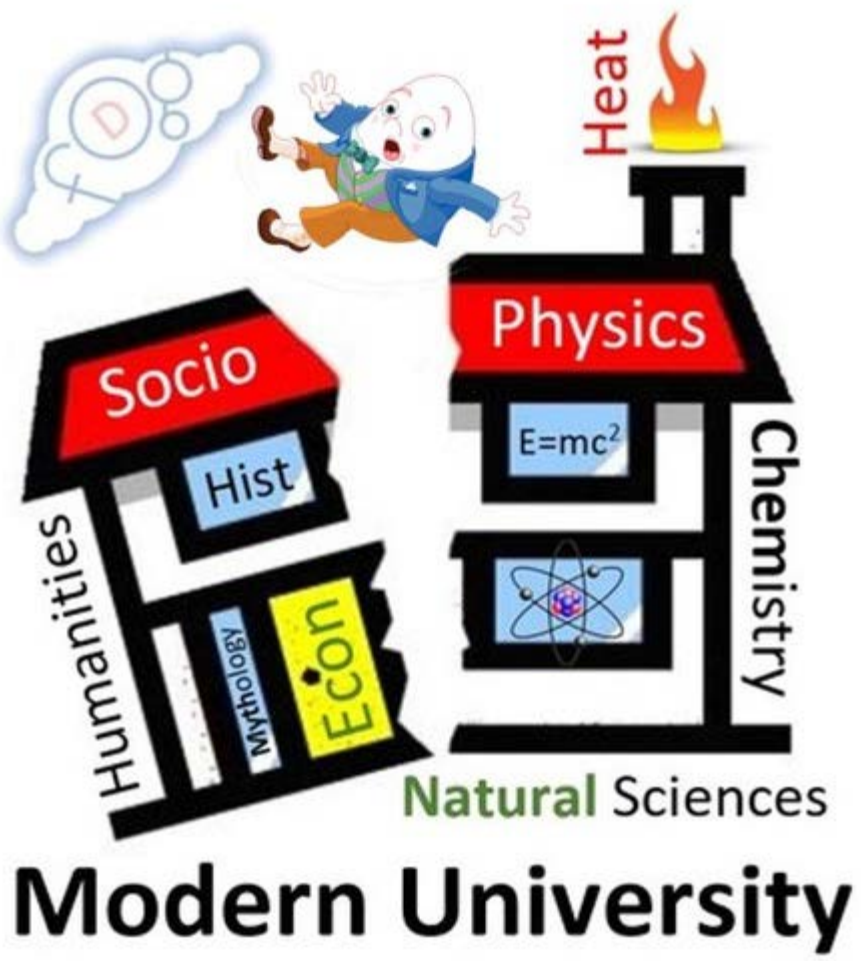

Judson Herrick's 1930 view of the modern university, namely as a house divided against itself, with the **natural sciences**: physics, chemistry, and powered CHNOPS-ology on one side, and the **social sciences**: sociology, economics, and history, on the other, the former containing the furnace that powers the building, the latter enveloped and pervaded in a kind of "god fog", i.e. a fog immersed in higher powers, which is a house that cannot stand in the long run.

An ancient teacher [Mark 3:25] once said, "If a house be divided against itself, that house cannot stand." (Ñº) This has a personal application: "No man can serve two masters." A more modern philosopher has remarked that it is impossible to live in two unrelated worlds at once.

To an ignorant outsider it looks a little as if the social sciences may be in some danger of attempting this impossible acrobatic feat. The **Great Wall** stands today on our campus as a barrier between the natural sciences, whose domain is the world of objects, and the humanities, whose domain is the world of spiritual values [see: spiritual values]. Are the social sciences to remain dispersed on opposite sides of the Great Wall, or is the group as a whole to attempt to maintain a precarious balance astride the Wall, with one foot in the Elysian fields (Ñº) of the humanities and the other solidly resting on the firm ground of scientifically controlled factual data? The available precedents indicate that neither of these alternatives will give a stable organization. The thing is likely to fall to pieces, one way or another. And this is not a trivial matter; it strikes down to the very soil within which are the roots of our university development, the original sources of academic achievement.

Traditionally, our social sciences are aligned with the humanities. And they must maintain this alliance with the realm of spiritual values and experiences if they are to be humanitarian in any proper sense.

Traditionally, also, the natural and exact sciences, whose tools the social sciences are employing with increasing efficiency, are uncontaminated by spiritual values, by human emotion, sentiment, or any subjective coloring. We are face to face with a rather appalling dilemma.

A few years ago, Mr. Merriam will remember, I sat for a week at one of the Hanover conferences with the Committee on Methodology in the Social Sciences. I was, fortunately, not a member of the Committee, but merely an uninvited guest, an interested spectator. My only part was to be seen, not heard. The Committee, I presume, has by this time disbanded, and now I may speak and confide to you that their deliberations left me—and I suspect some of them—in a mood of deep dejection.

Here were representative leaders of research in fields that embrace the sources of human welfare and human happiness more directly than any others—except perhaps medicine and hygiene—who were unable to agree upon any formulation of problems or any program of research which struck down to the roots of the motivation of human behavior with technique that by any stretch of current usage can be called scientific.

It was agreed that certain tools of scientific research—mathematical formulas, statistics, and so on—can be applied to the study of the objective results of human behavior and that these data can be treated scientifically. But many of them seemed to feel that the motivating causes of this behavior—people's desires, aversions, loves, and hates—belong in a spiritual realm on the other side of the **great barrier** and are forever inaccessible to scientific study.

The methodology of the social sciences, accordingly, resolves itself into a program of improvement in the techniques of recording and analyzing what people do in their social relations. It can have no bearing of changing the course of human events except in so far as human conduct can be guided or restrained by external agents, as children may be compelled to go to school and as their parents may be put in jail if they don't. Any attempt to control the fundamental motivating forces of the child himself—to get him to want to go to school —lies beyond the scope of social or any other science.

A photo (Ñº) of the Social Science Research Building (SS), whereat Judson Herrick gave his famous Humpty Dumpty dedication speech.

On this view of the situation, human social activities can be treated scientifically in no other way than can poetic composition. The divine fire of poetic inspiration comes, we know not how; we have no scientific formula for it. When the poet comes to record his passion, he may use a fountain pen or a typewriter—a scientifically constructed mechanism. Shall we say, then, that the methodology of the science of poesy consists in the improvement of typewriters? No, we frankly admit that writing poetry is not (as yet) a scientific enterprise.

Are the social sciences, as sciences, any better off to-day? This is a searching question and a practical one.

The newborn social sciences—are they live disciplines or dead ones? Their tools, questionnaires, statistics, and so on are as dead as the anatomist's scalpel and microscope. They must study the results of social activity, production and transportation, organization of social units, legal enactments, and the like, just as the anatomist studies a cadaver, which is a result of living. Do they rest there, with their statistics, codes,

and laws, or do they go on to the study of social forces in process as part of human living? The answer to this question will decide whether the social sciences are to die aborning.

I do not mean to imply that we should not collect statistics and analyze costs, any more than I would imply that anatomists should cease to dissect dead bodies. Whether these are appropriate things to do in a university depends on what we do them for.

Anatomy is the oldest of the biological sciences. Not long ago it was thought to have reached the age of senile decay, and preparations were made for suitable interment. Then suddenly within our own memory a miracle happened, the old science was rejuvenated, and today it is as lively as any of them. The breath of life that was breathed into this valley of dry bones was the simple realization that our interest in dead bodies is only for the light which they shed upon live ones, what they do and how they do it. Today there are more live experimental animals in the anatomical laboratory than dead bodies. It is the vital process in which we are interested.

You have a journal named *Social Forces* [established (Ñº) by Howard W. Odum in 1922]. What are these forces? External influence of climate and geography and pressure of populations? Yes, these are factors in human conduct. Internal drives and intuitive impulses, shaped by heredity and innate organization? Yes, again, these also influence conduct.

When these are learned and reduced to rule, is the program complete? Are social movements irrevocably determined by these forces of heredity and environment? Have we left out anything? I say, yes, we have left out the key to our fundamental problem—the control of social movements and of human destiny. Is this key to human motivation locked up out of reach of scientific inquiry in some mystic realm of spiritual essence on the other side of the great barrier between the physical life and the spiritual life?

If the great underlying social forces, the mainsprings of human motivation, are outside the realm of natural law and therefore inaccessible with the technique of natural science, then I affirm that the social sciences are misnamed. They are pseudosciences, and the whole movement is a stupendous bluff.

If this is the way things really are, I have some practical suggestions. Let us dismantle this new building, move the adding machines and files across campus, and rededicate this house as a Temple of Social Graces. Or else let us put the whole building on skids and move it bodily to some other convenient niche behind the power-house. Two horses and a windlass will do the trick, as was proved to us last summer.

I am not jesting; never was more serious in my life. If the social sciences attempt to straddle the **Great Wall** which until now has separated the humanities and the natural sciences, they will fall. That is not a practicable enterprise.

But perhaps the prognosis is not so bad after all. Let us look at this Great Wall again.

Judson Herrick suggests that the "fear" that separates the humanities from the natural sciences is an imagined illusion, similar to the fear of a cow afraid to pass through "motes in a beam of sunlight".

When I was a child one of my duties was to bring in the cow from the pasture at milking time. One evening toward sunset she ran up to the, barn door, whiffed the steaming bran mash in her manger, but refused to enter. Peering past her, I saw a beam of the setting sun streaming through a crack just inside the door. The dancing motes made a visible barrier which bossie was afraid to cross. After a little persuasion from my switch, she backed away, got a good running start,

and by supreme effort cleared the hurdle
with a flying jump.

Perhaps the Great Wall that stretches across our quadrangles is naught but motes illumined by the setting sun of bygone traditions. Perhaps we have been shying at shadows cast, not by the "irreducible and stubborn facts" of experience, but by ghosts and phantasmagoria of mythology. Is this spiritual life of ours, which we rightly cherish as the highest efflorescence of our humanity, really so detached from the rest of our life that we must keep it corked up in a vacuum bottle? Or is all life natural life—the best of it as well as the worst of it—and so a legitimate object of scientific study?

If we think with our brains and if we love and hate with these and with our hearts and ductless glands—and the evidence is perfectly clear that we do just this —then brains and hearts and glands can be studied, and they can be studied in action while we think and love and hate. Without following this up into details, this common sense and also strictly scientific approach to human life and experience will inevitably demolish completely the **mythical impenetrable barrier** between the objective and the subjective worlds of experience. It is one world in which we live and have our being and of which we are parts, and all of it and all of us can be investigated scientifically as fast as we learn how.

The economist studies values, and he is the first to proclaim that the commodities, coins, and securities with which he deals are only the symbols or indicators of the real values. The true value is an intimate personal and subjective experience what I want and work for. Without these motivating desires and satisfactions, goods and dollars and mortgages are trash.

An essential condition of control of social movements lies in our ability to control people's motivating desires, their wants, fears, hopes, and aspirations. Is this a scientific problem? It is, if these spiritual experiences are real natural events in a real natural world. There is a natural apparatus of aesthetic appreciation as truly as there is a natural mechanism that creates a glorious sunset or a so-called artificial machine that prints a picture of it.

Economics will not be less scientific when we supplement our statistics by the recognition of the actual causal efficiency in social movements of personal passions— loves and hates and ideals. And economy will not be more painful when we reinforce our desires and aversions with scientific knowledge of the technique and motivation of them.

Human conduct does not float free in a vacuum. It works with machinery, some of which is familiar to everybody—tools of manufacture and transportation, mediums of exchange, social organizations, boards of trade, clearing houses, and the like. The spiritual life, too, has its tools—books, libraries, musical instruments, works of art, literary guilds, churches, charities.

And the life of the spirit has other tools that are in-side of us. Some day we shall know enough about these to get them under better control. It is true that an individual personal passion cannot be an object of scientific research as an isolated subjective event. But every subjective experience is related with other things — the mental and physical causes of the experience and its mental and physical consequences—and these relationships can be studied with our present scientific technique. The study of relationships is the essence of scientific method.

Our plea for a scientific study of values, appreciations, and spiritual experiences in general does not carry with it the implication that such studies are to replace our traditional humanistic treatment of these noblest human attributes. Quite the contrary, we naturalists and human biologists hope to reinforce, to clarify, and to refine these spiritual values and give to our colleagues in the humanities better tools with which to work in their own fields and in their own ways. For after all our aims are the same. It is the same humanity whose life we strive to enrich and to ennoble.

This, then, is our outlook for the social sciences as sciences of man—a unified attack upon the whole field

of human achievement and human experience by such scientific methods as are available and the invention of new methods as new needs arise.

It is granted that we have made but slow progress so far in the scientific study of spiritual values. But have we really tried? Has not our attack on the crucial questions been inhibited or deflected by an ancient dogma that natural science is impotent here, just where we need it most—in the field of human motivation?

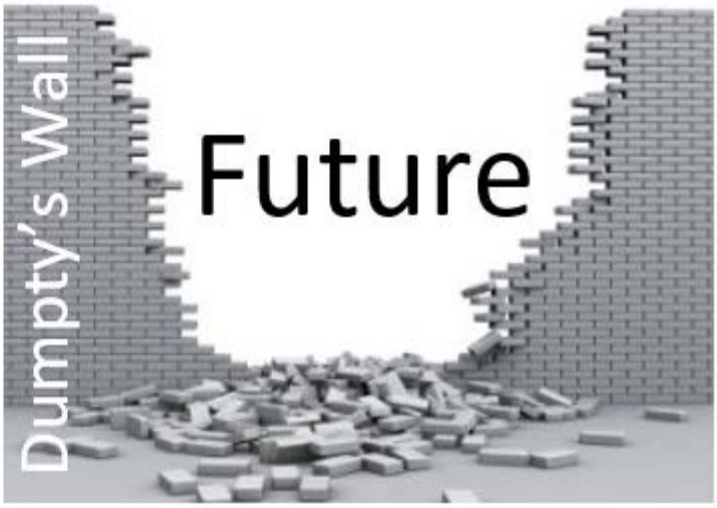

Herrick believes that the "great wall" of Dumpty, which is an "artifact, a monstrosity, conceived in ignorance, born of superstition, nourished by intolerance", in the future, if man is to understand his "social reactions", in their highest expression, must be "totally destroyed".

True, we do not yet know just how to go about it. But that is no reason why we should not find out. That is what a university is for—to find out things. And we shall never find out so long as we are ruled by the dogma that physical and spiritual belong to two unrelated worlds separated by a metaphysical barrier. This **Great Wall**, I verily believe, is now the most formidable obstacle to progress in the social sciences and in all other fields devoted to the scientific study of man.

Like Carthage, the Great Wall must be totally destroyed. Halfway measures will not do. The barrier between man's spiritual life, which comes to highest expression in his social reactions, and the rest of his life is an artifact, nay, a monstrosity, conceived in ignorance, born of superstition, nourished by intolerance."

A bold, beautiful, and powerful speech, to say the least.

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2. Humpty Dumpty – Wikipedia.

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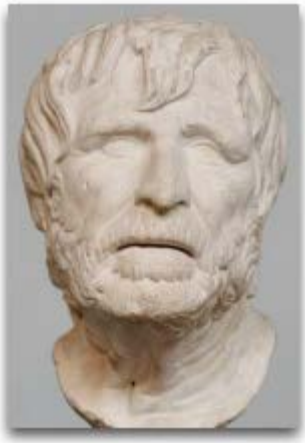

In existographies, **Hesiod** (c.750-650BC) (IQ:150|#525) (Cattell 1000:477) [RGM:301|1,500+] (ACR:15) (CR:41) was Greek poet noted for his c.700BC *Theogony*, meaning "The Creation of the Gods" or "birth of the gods", wherein he seemingly transliterates the Egyptian creation myths, the Heliopolis creation myth, in particular, into a Greek god version of the creation of the universe, according to which in the beginning was *Chaos*, the primordial void or chasm of darkness, from which springs the feminine principle *Gaia* (earth) and then *Eros* (desire), which establishes the procreative principle by which the cosmos became populated. [1]

Theogony

In c.640BC, Hesiod, in his *Theogony*, meaning "The Creation of the Gods" or "birth of the gods", produced a Greek variant of the older Egyptian creation myths, wherein, starting with, seemingly, the Hermopolis creation myth (c.240BC), he situates "chaos" first, which is a secular rescript of the Egypt gods Nun and Naunet, the male and female gods of chaos, respectively, according to the Ogdoad model.

Solon

See main: God character equivalences

Related to Hesiod, and his supposed used of Egyptian gods to make Greek gods, seemingly, is Greek reformer Solon (c.638-558BC), according to Plato (Ñº), substituted Greek names for Egyptian ones, in writing about the deities, according to which Amen-Ra became Zeus, Set became Typhon, Osiris became Dionysus, Horus became Hercules, Shu became Atlas, etc.

Goethe | Love theories

Both Cupid (chemistry of love) and Prometheus (fire of life), supposedly, trace to Hesiod, as employed in coded form in Goethe's *Elective Affinities* (see: love theories).

Moral | Thanatos

The Greek god of death Thanatos, seemingly modeled on the Egyptian gods Osiris (life after life) / Anubis (death after death) division, is attributed to Hesiod; the following being an example quotes: [2]

> "And there the children of dark Night have their dwellings, Sleep and Death, awful gods. The glowing Sun never looks upon them with his beams, neither as he goes up into heaven, nor as he comes down from heaven. And the former of them roams peacefully over the earth and the sea's broad back and is kindly to men; but the other has a heart of iron, and his spirit within him is pitiless as bronze: whomsoever of men he has once seized he holds fast: and he is hateful even to the deathless gods."

This, in turn, became rewritten into the story of the Roman gods Mor (death) and Vita (life), whose arrival signifies either death or life, respectively, and hence is the etymology behind the terms the term "morality" and what is is considered "moral", as coined by coined by Cicero ("On Fate", 45BC).

Quotes | By

The following are quotes employed by Kamerlingh-Onnes:

> "Between us and goodness, the gods have placed the [work] sweat of our brows."
>
> — Hesiod (c.850BC), "Note on Sheet of Paper", found amid papers of Onnes at the Boerhaave Museum, Leiden; on this same sheet, of note, one can also read quotes from Schiller, Goethe, Shakespeare, Homer, Pindar and Dante [4]

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External links

â— Hesiod – Wikipedia.

θΔics

In chemistry, **Hess' law** or "rule" states that the heats of reaction in successive reactions must be added. The rule was determined in 1840 by Swiss-born Russian chemist Germain Hess. The rule is used to determine values of reaction heats that are difficult to determine directly. After the 1876 work, *On the Equilibrium of Heterogeneous Substances*, of American engineer Willard Gibbs, Hess' rule became a corollary of that work. [1]

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1. Muller, Ingo. (2007). *A History of Thermodynamics - the Doctrine of Energy and Entropy* (pg. 154-55). New York: Springer.

External links

- Hess's law – Wikipedia.

θΔics

In thermodynamics, **heterogeneous** refers to a system composed of more than one phase, e.g. a liquid-solid system, as compared to a one-phase homogeneous system. [1]

Etymology

The word was used by French chemist Antoine Lavoiser in his 1787 treatise *The Elements of Chemistry*, who in discussing the possible experiments that might be carried out on French physicist Denis Papin's digester, where by excessive red heat could be used to make sensible substances (stones, salts, and the greater parts that compose the mass of the earth), could be softened and changed into fluids or liquids, and likewise in the reverse sense. He states:

> "If the earth were suddenly transported to a very cold region, the fluids [of the earth] would be converted into solid mountains and hard rocks, at first diaphanous and homogeneous, like rock crystal, but which, in time, becoming mixed with foreign **heterogeneous** substances, would become opaque stones of various colors."

He goes on to explain his theory that the amount of caloric, or the power of repulsion inside of bodies, is what keeps substances in different states of equilibrium, or specifically: [2]

> "That solidity, liquidity, and aeriform elasticity, are the only three states of existence of the same matter, or three particular modification which almost all substances are susceptible of assuming successively, and which solely depend on the degree of temperature to which they are exposed; or, in other words, upon the quantity of caloric with which they are penetrated."

In 1875, German physicist Rudolf Clausius, in his chapter "On Homogeneous Bodies", defined a homogeneous body as one of the same condition of aggregation. [3]

This logic was taken up further in engineer Willard Gibbs 1876 treatise *On the Equilibrium of Heterogeneous Substances*, where he utilized both the quantities of heat and entropy, instead of caloric, to explain graphically the thermodynamic nature of heterogeneous systems composed of various phases. [4]

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θΔics

In science, **hidden treasures** refers to the view that there are untold numbers of "hidden treasures" buried in the 700-equations of American engineer Willard Gibbs' 1876 Rosetta stone encrypted *On The Equilibrium of Heterogeneous Substances* or, more generally, in combined 1,158 Gibbs-Clausius equations, i.e. Gibbs' 700-equations plus German physicist Rudolf Clausius' 10 main equations and 348 textbook equations, as found in his 1875 *The Mechanical Equivalent of Heat*, on which Gibbs' equations were built.

The thermodynamics work of Willard Gibbs have been said, e.g. by Wilhelm Ostwald (1892), Pierre Duhem (c.1905), Carlo Cercignani (1989), and Ingo Muller (2007), to contain "**hidden treasures**" of the the "greatest variety and importance", as Ostwald put it.

Overview

The "hidden treasures" view of thermodynamics is a view held, albeit indirectly, by many thermodynamicists, such as Max Planck, who uncovered the hidden treasure of quantum mechanics buried or rather derived from and built on thermodynamics, to Albert Einstein, who found treasures such as the mass-energy equivalence relation as well as relativity, all stemming from his early work in thermodynamics, or Gilbert Lewis, whose work in thermodynamics and school of thermodynamics has, in the words of South African physical chemist Adriaan de Lange, "resulted in mentoring more Nobel Prize winners in chemistry than any Nobel Prize winner in any category." [1]

Etymology

The first person to actual come right out and say that they actually believe there to be hidden treasures in thermodynamics and that this is the sole reason for their purpose in their work was German physical chemist Wilhelm Ostwald. In 1891, Ostwald did the first translation of Gibbs' *Equilibrium* into German; the second translation was done by French by French chemist Henry Le Chatelier into French in 1899.

In the preface to his 1892 *Thermodynamic Studies of J. Willard Gibbs*, Ostwald stated: [2]

> "The material of the work is still of direct importance at the moment, and the interest in it is not historical. For only a small part of the almost immeasurable results which are contained and suggested here have as yet been realized. There are still **hidden treasures** of the greatest variety and importance here for the theoretical and most of all for the experimental worker."

In other words, Ostwald believed that there were hidden treasures buried in Gibbs' precisely numbered 700-equations. One of the treasures Ostwald found was the science of "physical chemistry", which, working together with Dutch chemist Jacobus van't Hoff, he founded.

At the turn of the 19th century, French thermodynamicist Pierre Duhem, likewise, commented: [3]

> "Johannes van der Waals was the first to see its hidden power, to perceive the phase rule, among the algebraic formulas where Gibbs had to some extent **hidden** it."

In 1989, thermodynamics historian Carlo Cercignani commented how: [4]

> "Gibbs succinct and abstract style and unwillingness to include examples and applications to particular experimental situations made his work very difficult to read. Famous scientists such as Helmholtz and Planck developed their own thermodynamic methods in an independent fashion and remained quite unaware of the **treasures buried** in the third volume of *Transactions of the Connecticut Academy of Arts and Sciences*."

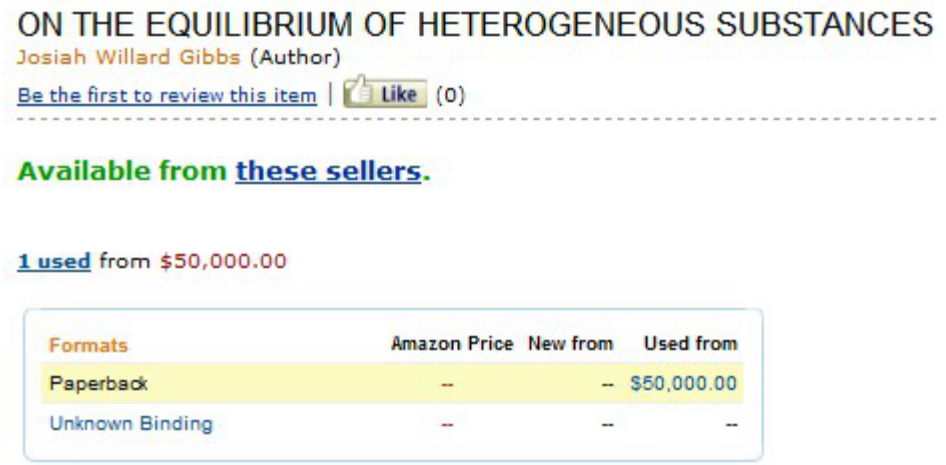

A 2011 Amazon.com listing (by Elliots Books, Northford, Connecticut) of the original "galley proof" of American engineer Willard Gibbs' 1876 *On the Equilibrium of Heterogeneous Substances*, selling for $50,000 dollars, the original copy Gibbs had to approve before the finial version was sent off to the printers. [8] The actuality of the selling price was verified by Libb Thims who contacted the seller.

Likewise, in 2007, German thermodynamics historian Ingo Muller comments on this further: [5]

> "Ostwald, the German translator of Gibbs, had said that he undertook the task because he believed in hidden treasures in Gibbs' work. He was right, and le Chatelier and later Haber and Bergius were chemists who uncovered and lifted the **treasures** as did Roozeboom."

The fruition of some of these treasures coming to bear is evidenced in the 1949 summary that "the work of Ostwald, of Haber, of [Carl] Bosch and [Friedrich] Bergius, each of whom received a Nobel prize, was based directly on the application of Gibbs' concepts; indeed, the very first Nobel prize in chemistry went to a follower (van't Hoff). [6]

Quotes

The following are related quotes:

> "How much of the work of Gibbs is still untapped—relations that may be of chemical and biochemical importance—we cannot tell. It is interesting to remember that Gibbs had formulated the principle of Donnan equilibrium in 1876 thirty five years before Donnan. Nobody recognized this until G.S. Adair one of the few biochemists who had actually read Gibbs, pointed it out in 1923. One wonders what other **precious nuggets** may still be hidden in this work."
>
> — John Edsall (1974), "Some Notes and Queries on the Development of Bioenergetics" (pg. 104)

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θΔics

In thermodynamics, **hierarchical thermodynamics**, also called *macrothermodynamics* or *structure thermodynamics*, is the study of complex heterogeneous chemical and biological systems, at all levels of hierarchy, from small atomic to large human molecular social complexes. [1]

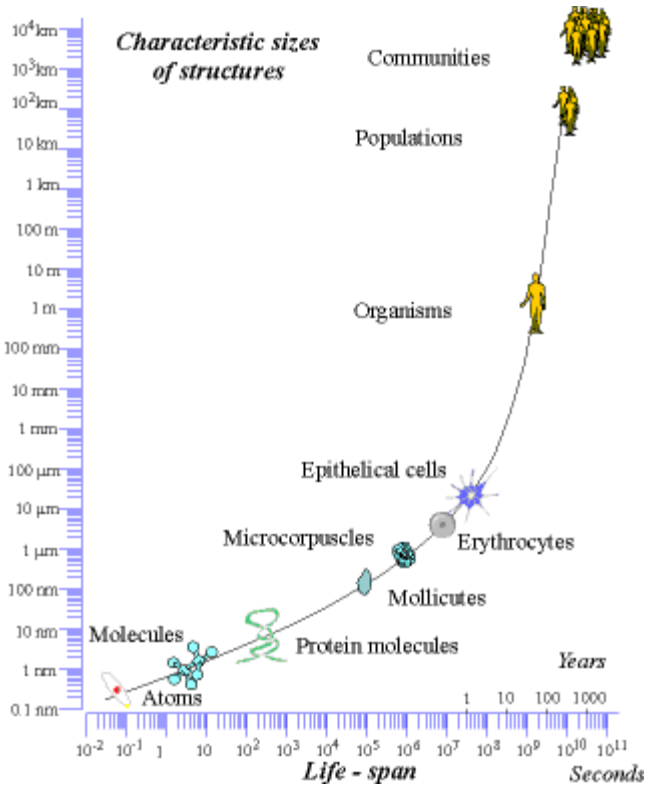

A "hierarchical system" in the long temporal scheme are open to the exchange of matter and energy with the environment, but that within the smaller evolution windows, in which a subsystem is considered to be surrounded by an isothermal, isobaric thermostat, are considered as thermodynamically closed and hence applicable to classical thermodynamic analysis. [2] This branch of thermodynamics was founded by Russian physical chemist Georgi Gladyshev in 1978. [3]

Each hierarchical system determined, in this point of view, represents a set of subordinate subsystems related hierarchically by their positions in space, i.e. structurally, or in spatial hierarchy, and or in time, i.e. in a time hierarchy. The central notion in hierarchical thermodynamics, is the conception of the "partial evolution" of the *i*-th process, i.e. the aggregation of the *k*-th components of the system participating in process *i* on level *j*.

General theory

Hierarchical thermodynamics is a generalized theory which may be applied to systems that are characterized by the functions of states. These functions have full differentials and, to within a good approximation, at any moment of time, in quasi-closed mono-hierarchical systems have a real physical meaning, i.e. a quantitative sense. [5] The outline of hierarchical thermodynamics, in a general sense, can be summarized by the following dictum:

The hierarchical thermodynamics is a linear kinetic thermodynamics of near to equilibrium systems in which variations in the functions of state over time occur. The hierarchical thermodynamics was created on the 19-th century foundation of the exact physicochemical theories of American mathematical physicist Willard Gibbs. Hierarchical thermodynamics is a further development of Gibbsian theory and to within a known approximation is applied to systems of all temporal (structural) hierarchies of real world.

Especial interest is the application of hierarchical thermodynamics to living systems which, as before believed, could not be investigated by Gibbsian methods. The reason of this was the statement that natural biological systems are open and that these systems are, allegedly, far from an equilibrium state.

Recently, however, the law of temporal hierarchies was formulated. This law substantiates the possibility of identifying, or discerning, quasi-closed mono-hierarchical systems or subsystems within open poly-hierarchical biological systems. It was also established, as a rule, that the processes of evolution in living natural systems are quasi-equilibrium processes. It was shown that models of living systems are analogues of models of equilibrium or quasi-equilibrium chromatographic columns. In recent years, hierarchical thermodynamics has found applications in areas such as anti-aging and human chemistry. [6]

Hierarchies in evolutionary open systems

A general difficulty in the application of classical thermodynamics to the modeling of the evolutionary dynamics of biospheric systems is the “openness” of the systems. In any given volumetric region of the earth, such as cubic meter of region attached to any random latitude, longitude and distance from the earth’s center, atoms will tend to cycle or move through the region according to various biogeochemical reactions at turnover rates ranging from one day to 10,000 days. [4] In one sense, then, biospheric systems can be considered as volumetric regions through which mass flows due to biogeochemical heat actions. This type of systems view is difficult to analyze from a thermodynamic perspective.

In considering smaller time-defined compartmentalized regions, e.g. an ecological niche during a growing season, however, thermodynamic analysis becomes more intuitive. Gladyshev realized this and, beginning in the late 1970s, developed a means to find such systems based on a criterion of constant "surroundings" or thermostat. In this mode, evolutionary biogeochemical systems can be seen according their relative hierarchies to each other. In this view of logic, a number of conclusions can be drawn, as were outlined in detail by Gladyshev in his 1988 book *Thermodynamics and Macrokinetics of Natural Hierarchical Processes*, written in Russian. This basic conclusions, which form the structure of "hierarchical thermodynamics", were peer-reviewed by the late English chemical engineer Kenneth Denbigh. Those conclusions are:

1. Whether current quasi-equilibria, that might be characterized in terms of the corresponding thermodynamic function extremum values, may be established in evolutionary open systems?

2. Whether quasi-closed type subsystems may be singled out from open hierarchical systems allowing the study, in appropriate time scales, of the behavior and evolution of the subsystems using thermodynamic functions with extremum properties?

3. Whether behavior and evolution of open non-stationary systems can be studied using mean specific values of classical thermodynamic function tending to extremum?

The answers to the first two questions, according to Gladyshev, are trivial and can be provided on the basis of the generally known concepts. The third question appears to be a new one and can be answered positively when the open system under consideration is in a thermostat, together with which it presents a complete thermodynamic system. The totality of the environment (thermostat) and a living organism (an open non-stationary system per se) furnishes an example of such complete system. Primarily, the non-stationary open system under consideration is not in equilibrium with its thermostat; its evolution is explained in terms of the tendency to extremum of the mean specific value corresponding to the classic thermodynamic potential of the system formation. The system evolution is directed towards a new partial system state, namely that correspondent to the thermostat equilibrium. In the case of biological systems, it is convenient to use mean specific values of the Gibbs function related to a unit of volume or mass, such as:

$$\overline{\widetilde{G}}_j^{im} = \frac{\widetilde{G}_j^{im}}{V_j}$$

This could represent, for example, the mean specific value of the Gibbs function for intermolecular interactions at formation of supramolecular structure of an organism's biotissue *j*. It has been show, according to Gladyshev, that in the case when there is a thermostat which provides constancy of the environment's chemical composition the volumetric Gibbs free energy volume of subsystem:

$$\overline{\widetilde{G}}_j^{im}$$

of an open biosystem *j* has the tendency to a minimum. This trend of the volumetric Gibbs free energy to a minimum, according to Gladyshev, explains the accumulation of substance with chemically high energy capacity by the biosystem which causes increase in the mean specific chemical component:

$$\overline{\widetilde{G}}_j^{ch}$$

of the biological structure during long periods of evolution. The constructiveness of this new concept is evident because it focuses on the investigation of the open non-stationary system characteristics per se. This is very attractive because it

offers the possibility of obtaining important quantitative information on the basis of experimental data. This approach has enabled us to substantiate and experimentally prove the possibility of a biosystem's thermodynamic characteristics being inherited during the long stages of biological evolution when the environment remains practically unchangeable. [1] All types of tropisms in the universe are governed by hierarchy thermodynamics of complex systems. This takes place in animate and inanimate matter including cosmic objects in the universe.

Quotes

The following are related quotes:

"The properties of living things are the outcome of their chemical and physical composition and configuration."

— Thomas Morgan (1932) (Ñº)

References

1. Gladyshev, G.P. (1988). *Thermodynamics and Macrokinetics of Natural Hierarchical Processes*. (287 pgs). Moscow: Nauka Publ., (in Russian).
2. Gladyshev, Georgi, P. (1997). *Thermodynamic Theory of the Evolution of Living Beings,*(appendix two).Commack, New York: Nova Science Publishers.
3. Gladyshev, Georgi, P. (1978). "On the Thermodynamics of Biological Evolution", *Journal of Theoretical Biology*, Vol. 75, Issue 4, Dec 21, pp. 425-441.
4. Schlesinger, William H. (1991). *Biogeochemistry – an Analysis of Global Change*. New York: Academic Press.
5. Gladyshev. (2007). Hierarchical thermodynamics - general theory of existence and living world development
6. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview). Morrisville, NC: LuLu.
(c) Press release: World's first-ever textbook on the Chemistry of Love - September 27, 2007, 3:00 EST (PR.com).

θΔics

In languages, **hieroglyphics**, from the Greek *hieros*- "sacred, sanctified" + *-glyphein* "to carve", is pictorial-based writing system, developed in Egypt, based on a combination of logographic, syllabic, and alphabetic elements, with a total of some 1,000 distinct characters.

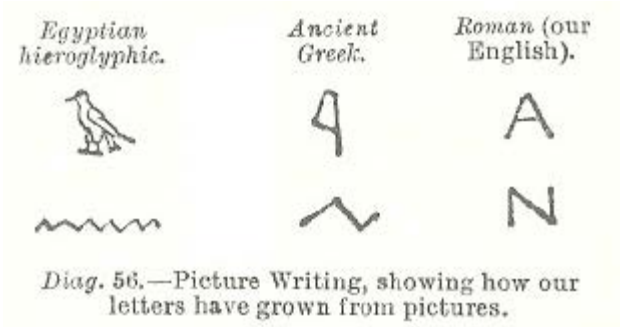

Diag. 56.—Picture Writing, showing how our letters have grown from pictures.

A comparison of the **hieroglyphic** bird and water symbol, as with the ancient Greek alpha (compare: Ab) and nu (Q) (compare Nun), and modern Roman letters A and N, by Hilda Finnemore (1924), who asserts that the former were the precursors to the latter. [1]

Overview

In c.3200BC, hieroglyphs showing writing of drawings of animals, plants, and mountains from a tomb of a king called Scorpion I (c.3250-3200BC) (Q), in a cemetery at Abydos, 250-miles north of Cairo, along with records of linen and oil deliveries, which have been radio-carbon dated to 3300BC to 3200BC, were discovered in 1998 by Gunter Dreyer (1943-2019) (Q), director of the German Archaeological Institute in Egypt, an example of which is as follows: [2]

In 1820s, Thomas Young and Jean Champollion translated the Rosetta stone, after which Egyptian hieroglyphics began to be understood, and in the century to follow the study of modern comparative mythology and religion began to emerge (see: religio-mythology scholars).

References

1. Finnemore, Hilda. (1924). *A History of the Earth: from Star-Dust to Man* (pg. 114). Longmans, Green, and Co.
2. (a) Anon. (1998). "Were the Egyptians the First Scribes?" (Q), BBC.co.uk, Sci/Tech, Dec 15.
(b) Dreyer, Gunter. (2011). "On Excavations at the Royal Tombs of Abydos" (Q), The Oriental Institute, University of Chicago, YouTube, Apr 8.

Further reading

● Petty, Bill. (2012). *Hieroglyphic Dictionary: a Vocabulary of the Middle Egyptian Language* (Amz). CreateSpace.
● Petty, Bill. (2016). *English to Middle Egyptian Dictionary: A Reverse Hieroglyphic Vocabulary* (Amz). CreatSpace.

External links

● Hieroglyphics – Wikipedia.
● Middle Egyptian language – Wikipedia.

θΔics

In thermodynamics, **high entropy state**, as contrasted with a low entropy state, is said to be an disordered, disorganized, or spread out (low density) state of atoms and molecules. [1]

This rule, however, is generally only true in comparing a gas state (chaotic) to a liquid state (medium order) to a solid state (ordered) to one at absolute zero (perfect order).

In defining entropy values to different molecules, the procedure used involves assigning simple component atoms and molecules arbitrary (often zero value) measures of free energy and enthalpy, at their standard conditions, and using this basis to make thermodynamic tables of entropy and enthalpy values for different reactions, and using reaction algebra to assign entropy values to more complex structures. In an aside, the universe prior to the inception of the big bang is often theorized to have been in a low entropy state, about the size of a golf ball. [2]

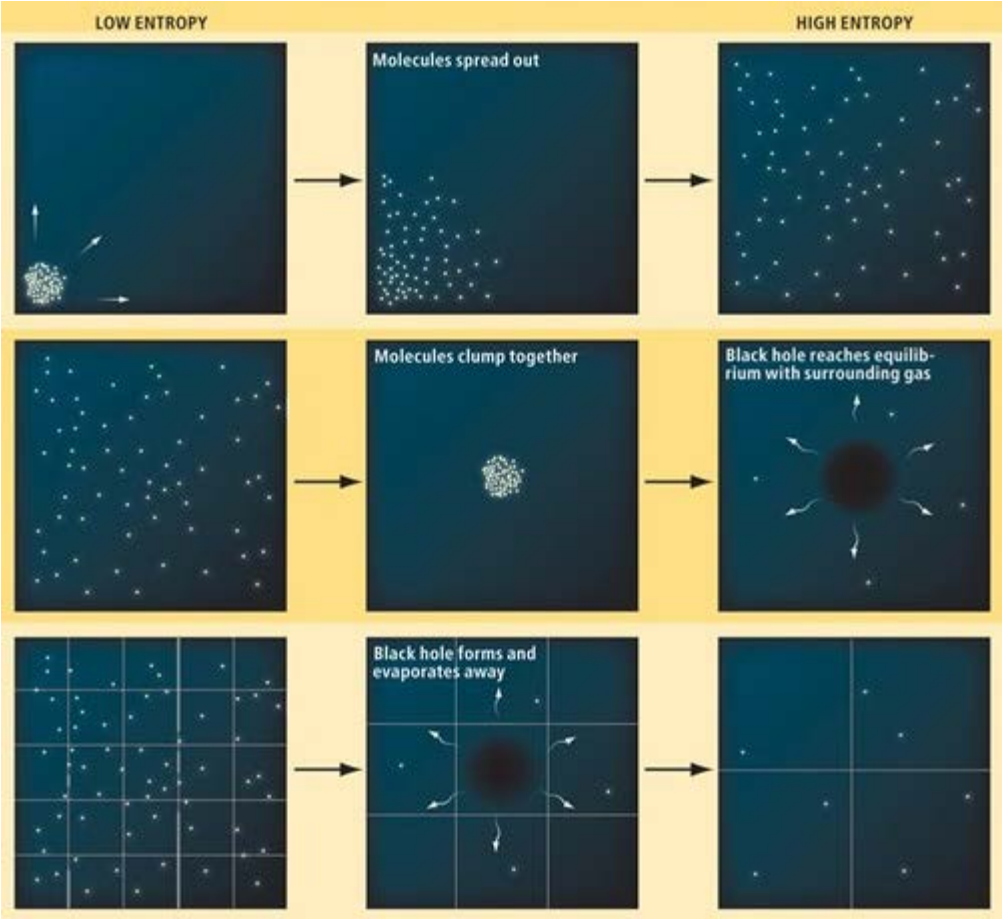

A typical depiction of a high entropy compared to a low entropy state, in terms of gravity, is shown below: [3]

References

1. (a) Penrose, Roger and Gardner, Martin. (1999). *The Emperor's New Mind: Concerning Computers, Minds, and the Laws of Physics* (409-12). Oxford University Press.
(b) Davies, Paul and Gribbin, John. (2007). *The Matter Myth: Dramatic Discoveries that Challenge our Understanding of Physical Reality* (pg. 127). Simon and Schuster.
2. Greene, Brian. (2004). *The Fabric of the Cosmos: Space, Time, and the Texture of Reality* (pgs. 173-74). Random House.
3. Temporal problems solve all physics problems (2010) – PhysicsForums.com.

θΔics

In hmolscience, **higher power** is a neo-modern code term for "god"; oft-used in atheism discussions (e.g. "Zerotheism for Kids", and god talk based discussions and arguments.

Left: a basic K-Tor hand-crank power generator, according to which turning the handle will work to generate "power" (force moving an object per unit time) and charge things, via standard laws of thermodynamics. Right: a generic businessman, according to which hard work will, in many cases, will tend towards success; such efforts many times generating "powerful" (force moving an objects per unit time) individuals in society, government, and business affairs; albeit, done, according to the beliefs of many, via the operation of "higher powers" (or spirits) outside or above the standard laws of the universe.

Social physics

Just as "spirits" and "higher powers", in physics, aren't going to charge one's cellphone, so too aren't spirits and higher powers, in sociophysics, going to charge up one's bank account. This conflict becomes apparent when thermodynamics students are taught the basic definition of work, namely that whenever a force moves a body work is done, the "body" in question being any material body in the universe (atom, rock, flower, bird, human, planet, star, or galaxy, etc.):

> "Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, work is performed."
>
> — Rudolf Clausius (1875), "Mathematical Introduction"

The following is an example of an American bioengineering thermodynamics student, following Libb Thims' 2010 UIC lecture, expressing objection (based on taught religious beliefs) to the premise that thermodynamics, the study of heat, work, and power, can be applied to the resolution and solution of social concerns and problems, e.g. economics, politics, national security, universal morality, etc:

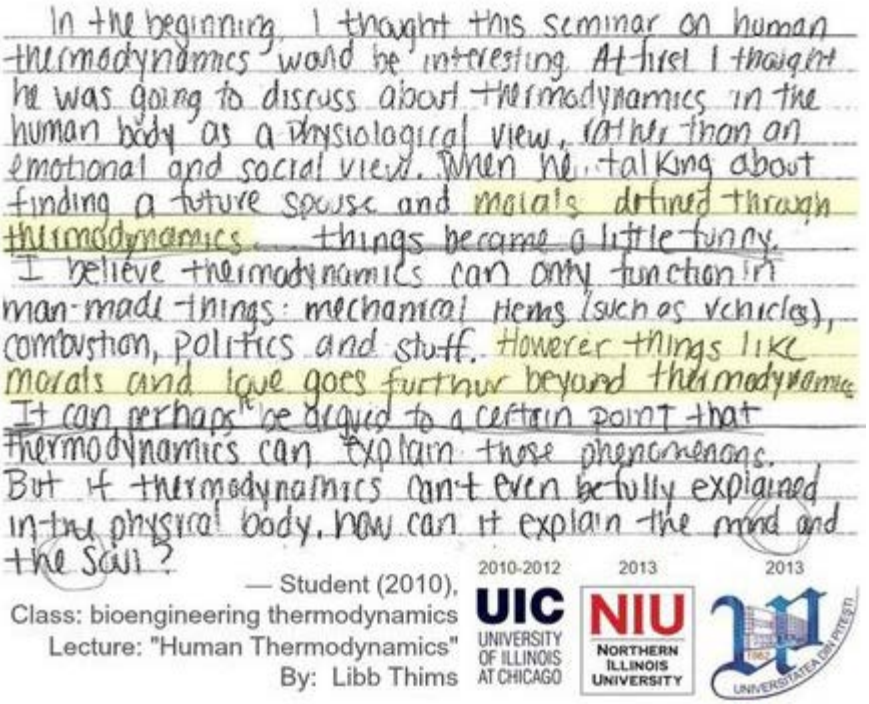
In the beginning, I thought this seminar on human thermodynamics would be interesting. At first I thought he was going to discuss about thermodynamics in the human body as a physiological view, rather than an emotional and social view. When he talking about finding a future spouse and morals defined through thermodynamics... things became a little funny.
I believe thermodynamics can only function in man-made things: mechanical items (such as vehicles), combustion, politics and stuff. However things like morals and love goes further beyond thermodynamics. It can perhaps be argued to a certain point that thermodynamics can explain those phenomenons. But if thermodynamics can't even be fully explained in the physical body, how can it explain the mind and the soul?

— Student (2010),
Class: bioengineering thermodynamics
Lecture: "Human Thermodynamics"
By: Libb Thims

2010-2012 UIC UNIVERSITY OF ILLINOIS AT CHICAGO
2013 NIU NORTHERN ILLINOIS UNIVERSITY
2013

While this finger raising may seem innocuous, at this level (college-level), when such theory is applied to real-world problems, e.g. border security, immigration, social surveillance, security checks, etc., in a post-9/11 world, as heatedly debated in the 2006 Rossini debate, between college professors, the underlying confusion, taught to youth, about their being two types of powers in the universe, i.e. "standard" power of thermodynamics, e.g. governing batteries and combustion engines, and a "higher" power of spirituality or god, governing morality and society, is when misunderstanding about facts can quickly lead to national and global disaster.

Higher force | Creative force

See main: Higher force; Creative force

The 21st century usage of "higher power", of note, seems to be modern variant of the late 18th century early 19th century term "creative force".

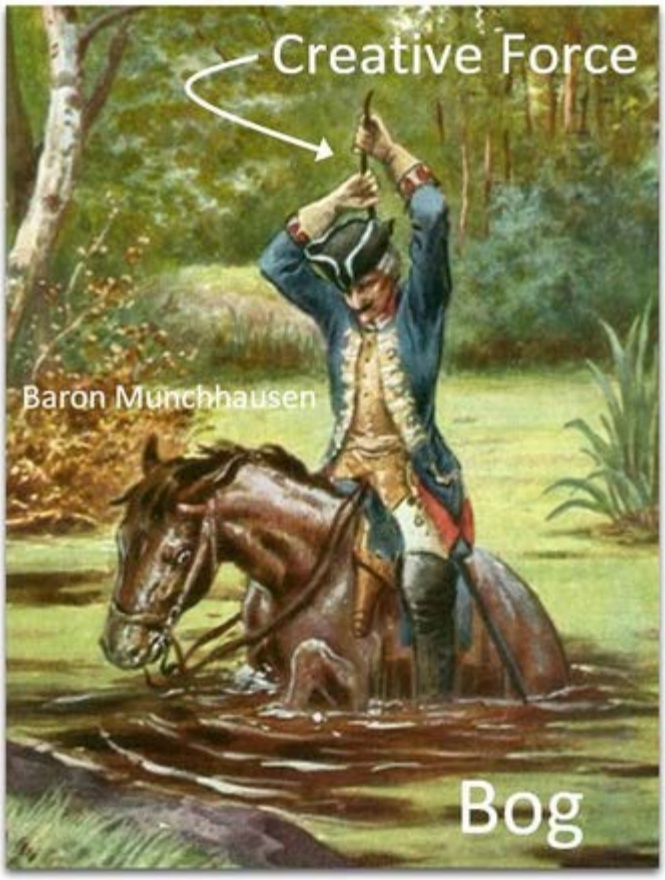

> "A creative force that either creates itself or arises from nothing, and which is a *causa sui* (its own cause), exactly resembles Baron Munchhausen, who drew himself out of the bog by taking hold of his own hair."
>
> — Ludwig Buchner (1884), preface to *Force and Matter* (pg. 10)

> "I am agnostic as to the question of god. Since man ceased to worship openly an anthropomorphic god and talked vaguely and not intelligently about **'some force'** in the universe, **higher than man**, that is responsible for the existence of man and the universe, he cannot be said to believe in god. One cannot believe in a force excepting as a force that pervades matter and is not an individual entity."

— Clarence Darrow (1929), “Why I Am Agnostic” [3]

Ludwig Buchner's opinion of "creative force" or models of self-caused things, e.g. god, as akin to the tale of Baron Munchhausen (O) pulling himself out of a bog by his hair, i.e. a fiction; this is akin to "**higher power**" seen used in the 21st century.

(add discussion)

Quotes

The following are related quotes:

> “If by any possibility the existence of a **power** **superior** to, and independent of, nature shall be demonstrated, there will be time enough to kneel. Until then, let us stand erect.”
>
> — Robert Ingersoll (c.1880) [2]

> “So, I’ll out myself. I’m an atheist. I don’t believe in god, gods, godlets or any sort of **higher power** beyond the universe itself, which seems quite high and powerful enough to me. I don’t believe in life after death, channeled chat rooms with the dead, reincarnation, telekinesis or any miracles but the miracle of life and consciousness, which again strike me as miracles in nearly obscene abundance.”
>
> — Natalie Angier (2001), “Confession of a Lonely Atheist” [4]

> “Your **higher power** does not have to be god or the universe. It can be anything that brings you the deepest joy you have felt or can feel. When your demons are psychologically real, joy is exactly what is needed to save the day. It doesn’t matter how comes it comes to you, only that it does and that it is there to snatch you from the edge of the abyss.”
>
> — Amy Larson (c.2014), “What is Your Higher Power?” (O), Nov 27

> “You can teach kids science and you can teach kids to have faith in a **higher power** (and you can believe in both) ... but to each is own! What we shouldn't be doing is putting down each other's beliefs because that simply just discourages children. It is important to teach them to have beliefs whether it is in science or god or simply to believe in themselves.”
>
> — Latrea (2015), response to advert promo for "Zerotheism for Kids" lecture, Jul 30

> “The teachings in the Bible can be intimidating as so many questions arise and not enough answers. But to teach and instill atheism into a 6-year-old is ultimately stripping them of any type of beliefs whatsoever, in my opinion. You can challenge religious and biblical concepts, but what about spirituality? The idea that there is a **higher power** and focus ones energy and beliefs on that? The children are being stripped of that idea and taught to believe science wins?”
>
> — Lana (2015), response to advert promo for "Zerotheism for Kids" lecture, Jul 30

References

1. Clausius, Rudolf. (1875). *The Mechanical Theory of Heat* (§: Mathematical Introduction: on Mechanical Work, on Energy, and on the Treatment of Non-Integrable Differential Equations, pgs. 1-20). Macmillan & Co.
2. (a) Ingersoll, Robert. (1990). *On Gods and Other Essays* (pgs. 54-55). Prometheus Books.

(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 417). HarperOne.
3. (a) Darrow, Clarence. (1929). “Why I Am Agnostic” (Q); in: *Why I Am Agnostic and Other Essays* (pg. 12). Prometheus, 1995.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 445). HarperOne.
4. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 482). HarperOne.

Further reading

● Schlafly, Phyllis and Neumayer, George. (2012). *No Higher Power: Obama’s War on Religious Freedom*. Regnery Publishing.
● Why has there been such a movement in science to state that there could be no "higher" being? (Q) (2018) – Quora.

External links

● Higher power – Wikipedia.

θΔics

In Hmolpedia, the **highly-cited thermodynamics publications** page list those articles, books, or textbooks that are often said to be "highly-cited" or "most-cited" publications in human thermodynamics (HT), life thermodynamics (LT), or economic thermodynamics (ET), among others. The following table gives an indication of citation magnitude according to Google scholar citation count:

Date	Human Thermodynamics Publication	Author(s)	Cited by (2010)
1977	*Self-Organization in Nonequilibrium Systems: from Dissipative Structures to Order through Fluctuations*	Ilya Prigogine	4445
1923	*The Ego and the Id*	Sigmund Freud	4279
1971	*The Entropy Law and the Economic Process*	Nicholas Georgescu-Roegen	2733
1944	*What is Life?*	Erwin Schrodinger	2723
1925	*Elements of Physical Biology*	Alfred Lotka	2255
1984	*Order Out of Chaos*	Ilya Prigogine	1965
2002	*Ecological Stoichiometry: the Biology of the Elements from Molecules to the Biosphere*	Robert Sterner James Elser	887
1955	*The Phenomenon of Man*	Pierre Teilhard	883
1990	*Flow - the Psychology of Optimal Experience*	Mihály Csíkszentmihályi	684
1912	*The Structure and Dynamics of the Psyche*	Carl Jung	426
1943	"Energy and the Evolution of Culture"	Leslie White	193
1926	*Wealth, Virtual Wealth and Debt: the Solution of the Economic Paradox*	Frederick Soddy	102
1919	*The Degradation of the Democratic Dogma*	Henry Adams and Brooks Adams	78
1952	*The Next Million Years*	C.G. Darwin	93
1973	"Slavery, Surplus, and Stratification on the Northwest Coast: the Ethnoenergetics of an Incipient Stratification System."	Eugene Ruyle	43
1995	"Thermodynamics and Biological Evolution"	Georgi Gladyshev	22

1997	*Thermodynamic Theory of the Evolution of Living Beings*		Georgi Gladyshev	17
1910	*A Letter to American Teachers of History*		Henry Adams	14
1898	*Essay on Social Mechanics*		Leon Winiarski	7
2007	*Human Chemistry*		Libb Thims	5

Thermodynamics publications

The following are significant thermodynamics publications, connected or related significantly to human activity, with notable citation counts, albeit ones that do not make direct hypotheses concerning human existence:

Thermodynamics Publication	Significance	Authors(s)		Cited by (2010)
"Principles that Govern the Folding of Protein Chains."	Proved the thermodynamic hypothesis.		Christian Anfinsen	3156
Scientific Papers of J. Willard Gibbs, Vol. 1, Thermodynamics (1876)			Willard Gibbs	438
Thermodynamics and the Free Energy of Chemical Substances (1923)			Gilbert Lewis and Merle Randall	353
The Mechanical Theory of Heat (1879)			Rudolf Clausius	50

Other publications

The following are subject related articles with notable citation counts:

#	Publication	Description	Authors	Cited by (2010)
	"The Strength of the Weak Ties" (1973) (link) [5]	Theorized that weak social ties can be modeled as hydrogen bonds.	Mark Granovetter	15367
	What is Life? (1944)	Argued that life feeds on negative entropy.	Erwin Schrodinger	2391
	"A Model of General Economic Equilibrium" (1938) (pdf)	Derives a function φ (X, Y) related to the production of goods, based on the	John Neumann	588

	model of thermodynamic potentials.		
More Heat than Light: Economies as Social Physics (1989)	Historical criticism.	Philip Mirowski	554
Thermodynamics and the Control of Biological Free-Energy Transduction (1987)	Describes how quantitative notions from physics and chemistry may be applied to biological systems, in particular those involved in biological free energy transduction.	Karel van Dam and Hans V. Westerhoff	394
"Life as a Manifestation of the Second Law of Thermodynamics" (1994)	Uses a Hatsopoulos-Keenan-Kestin reformulated second law to argue that evolutionary structures are a result of gradients maintaining systems at some distance away from equilibrium.	Eric Schneider and James Kay	305
Evolution, Thermodynamics, and Information (1987)		Jeffrey Wicken	186
The Animate and the Inanimate (1920)		William Sidis	3

Discussion

The following section discusses individual books whose notability is not recognized by pure citation count. In 1967, American physical chemists Gilbert Lewis and Merle Randall's 1923 *Thermodynamics and the Free Energy of Chemical Substances* had come to be known as "the world's most quoted scientific book". [1] In circa 2005, independent of the previous quote, the same book was found to be the most cited reference in the reference sections to American chemical engineer Libb Thims' thermodynamics book collection, consisting of over 240 thermodynamics books.

Austrian physicist Erwin Schrodinger's 1944 booklet *What is Life?*, written for the layperson, is likely one of the most-cited books, on the subject of life and entropy, outside of the thermodynamics community. By 1989, sales of this book had well reached over 100,000 copies. [6]

Of note, the simplified 1969, 102-page, booklet *Understanding Thermodynamics*, by American chemical engineer Hendrick Van Ness, based on 1968 lectures to sophomore engineering students at the Rensselaer Polytechnic Institute during the spring term, is the highest ranking Amazon.com book on thermodynamics. [3] In addition, Van Ness', seventh edition, 2005 *Introduction to Chemical Engineering Thermodynamics*, having been translated into four languages, had reached average yearly sales of 20,000 copies, with a total sales over all six editions exceeding a half-million, is "the best-selling textbook in the history of chemical engineering". [4]

American physicist Herbert Callen's 1985 *Thermodynamics: an Introduction to Thermostatistics* is one of the most-cited books in the physics community (the 2006 edition being cited over 1220 times). The popularity of Callen's textbook, the second edition to his 1960 textbook *Thermodynamics: an Introduction to the Physical Theories of Equilibrium Thermostatics and Irreversible Thermodynamics*, is due in large part to the popularity of Callen's 1951 paper "Irreversibility and Generalized Noise", written with Ted A. Welton, a friend of Richard Feynman's at MIT, which by 1955 had become a "citation classic", having been cited in over 370 publications. [2]

References

1. Angrist, Stanley W. and Helper, Loren G. (1967). *Order and Chaos – Laws of Energy and Entropy*, (pg. 27: "most quoted"). New York: Basic Books.
2. Staff writer. (1985). "This Week's Citation Classic", Current Contents, No. 1, Jan. 07.
3. Amazon sales rank: #29,554 on 11/27/08 (with 5-stars; based on 9 reviews).
4. Van Ness, Hendrick C. (2001). "Evolution of a Textbook: Introduction to Chemical Engineering Thermodynamics", *Rensselaer Polytechnic Institute*.
5. Granovetter, Mark. (1973). "The Strength of Weak Ties" (cited by 15367), *American Journal of Sociology*, Vol. 78, Issue 6, May 1973, pp. 1360-1380.

6. Kilmister, C.W. (1989). *Schrodinger: Centenary Celebration of a Polymath* (pg. 2). Cambridge University Press.

θΔics

In terminology, **highway of thermodynamics**, or “broad” highway of thermodynamics, refers, according to Gilbert Lewis (1923), to the road, speedway, or thoroughfare, namely the science or path of knowledge named thermodynamics, Clausius-Gibbs-Lewis based chemical thermodynamics in particular, that one — if one is a pioneer — must "pass over", in order to get to or gain entrance to the borderland of the unknown regions of any new growing science.

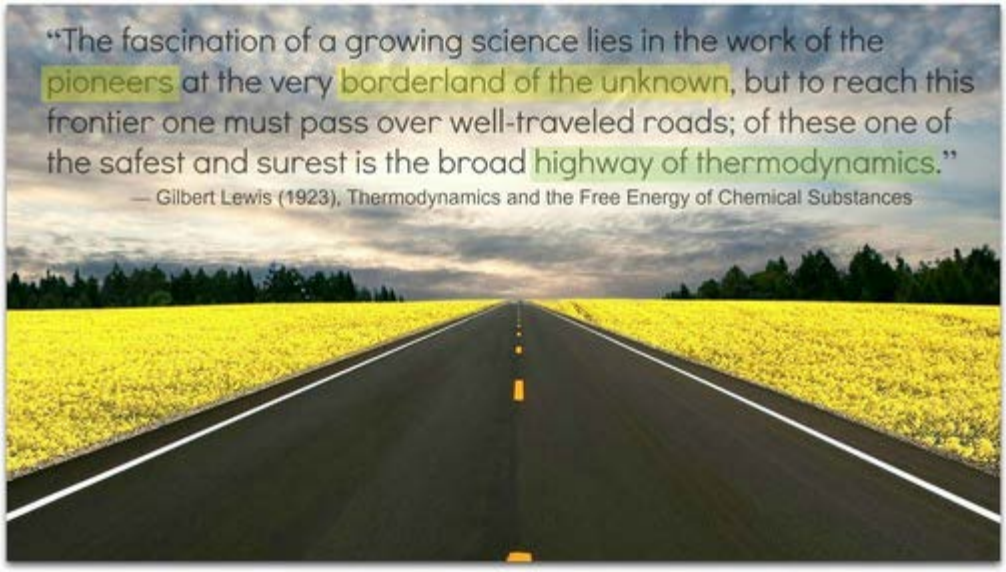

A visual (Q) of the broad **highway of thermodynamics**, which Gilbert Lewis (1923) one has to “pass over” if one wants to get to the frontier of knowledge. [2]

Quotes

The following are related quotes:

> “The scientific method is the sole **gateway** to the whole region of knowledge. There is no shortcut to truth, no way to gain in knowledge of the universe except through the gateway of scientific method.”
>
> — Karl Pearson (1892), *The Grammar of Science* (pgs. 17, 24); cited by Howard W. Odum in: *An Introduction to Social Research* (pgs. 8-9)

> “The fascination of a growing science lies in the *work of the pioneers* at the very borderland of the unknown, but to reach this frontier one must pass over well traveled roads; of these one of the safest and surest is the broad **highway of thermodynamics**.”
>
> — Gilbert Lewis (1923) *Thermodynamics and the Free Energy of Chemical Substances* [2]

See also

- Clausius postulate
- Eddington rule
- Einstein postulate

References

1. (a) Lewis, Gilbert & Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pg. x). New York: McGraw-Hill Book Co., Inc.
(b) Cavazox-Gaither A.E. (2002). *Chemically Speaking: A Dictionary of Quotations* (section: “Thermodynamics”, pg. 427-28). CRC Press.

θΔics

In existographies, **Hilda Finnemore** (c.1884-c.1950) was an English children's science educator, thing philosopher, noted for her 1924 children's science book *A History of the Earth from Star-Dust to Man*, wherein she gives a Henri Bergson conceptualized overview of atoms to humans view of things.

Stardust

See main: Humans as stardust

In 1924, Finnemore, in her *A History of the Earth from Star-Dust to Man* (pg. 2), attempted to outline, for children, a simple "nebula hypothesis to humans" (compare: big bang to human molecules) model, mixed with talk of star-dust, the first example of which is:

> "Astronomers tell us of vast tracts set in the depths of space, filled with filmy, gaseous could, and these appear to be the stuff out of which suns are made. This immense mist of **star-dust** is throwing off worlds in an intensely hot or gaseous state. There, science suspects, may be the secret of our beginnings."

(add discussion)

Life | Materialistic soft-panbioism

Finnemore, in her opening "What Things are Made of" chapter, ended with the following "No Break in the Chain of Life" section:

No Break in the Chain of Life.

Notice that there is no break in the continuity or chain of matter or life.

Scientists sometimes speak of an entirely imaginary matter which no instrument is fine enough to detect,

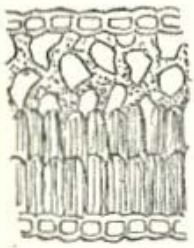

Vegetable Cells (greatly enlarged).

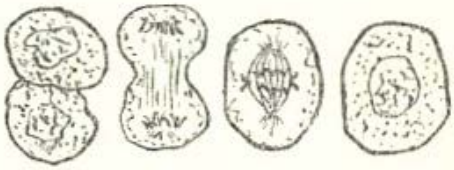

Diag. 9.

Animal Cells (greatly enlarged). An Amœba dividing.

and they call it *primordial*, or first, *matter*. We may think of it as star-dust. From this, they say, by the action of energy grew up these minute, restless electric particles we call electrons, which build up and compose the atom. The vibrating atoms, in their turn, unite to form a particle known as a molecule; and a number of these molecules, in constant revolution, combine to form that kind of matter from which the simplest living cells are made. Energy, in the form of sunlight, produces *chlorophyll*, or the green colouring matter of plants. In animal cells it causes the production of other and more complex cells.

Thus there is no gap in the chain of life from the primordial matter, or star-dust, to the vegetable kingdom; and, as we shall see later in more detail, to the animal world and man.

For man himself is an enormous collection of millions of millions of complex cells which still bear relics of his ancestry: his blood bears similarities to the composition of both sea-water and the colouring matter of plants, telling of the long and wonderful journey he has made to reach his present form.

GLOSSARY

Evolution is the growth, by slow stages, from a lower form to a higher one. It means that everything we know to-day is the result of things which happened in the past, and the promise of things to be in the future. This law of change and growth applies to all life; to that of chemical elements as well as to plants and animals; to languages, customs, and institutions, and to the invisible worlds of thought and feeling.

This seemingly-cogent synopsis can be classified, as shown, superficially, as "materialistic-implicit soft-panbioism". When, however, we dig into the citation roots of this summary, we find that Finnemore's main citation is Scottish science + religion reconciler Arthur Thomson and his four-volume *The Outline of Science*, referring to it as a "wonderful book". [2] Thomson, in turn, is one of the main champions of the creative evolution views of Henri Bergson. The result is embedded confusion. It is as though she is trying to sell a painted superficial atheism implicit model of atoms to humans OVER a theistic structure. Her ending page suggests that people in the future should become more "spiritual" and less "material".

Life | Energy

On "life", prior to the above statement, Finnemore (pg. 3) gives the following intelligent statements:

> "Systems may wheel in space, and, in countless ages, cool to comfortable homes for the animal and vegetable families which come forth from them; minute mosses and lichens may develop into complex and highly organized plants and trees; single-celled atoms may unite and grow until man, which his wonderful brain, emerges; but what is it that *causes* the movement of the heavenly bodies, the growth of the cell, the unfolding and development of the organism? It is a motive power we may call **'life' or 'energy'**."

Here, in her vacillation on the terms life or energy, we see a grasping at the defunct theory of life or life does not exist purview turned life terminology upgrades. On the term life, she elaborates as follows:

> "What life *is*, not the most enlightened scientist or profound thinker can tell you. 'We can show you life', they say, 'tell you how it will develop, when it will appear, how it acts, what breeds it and what destroys it; but we cannot tell you what it *is*. Without it we are nothing; with it we may become anything."

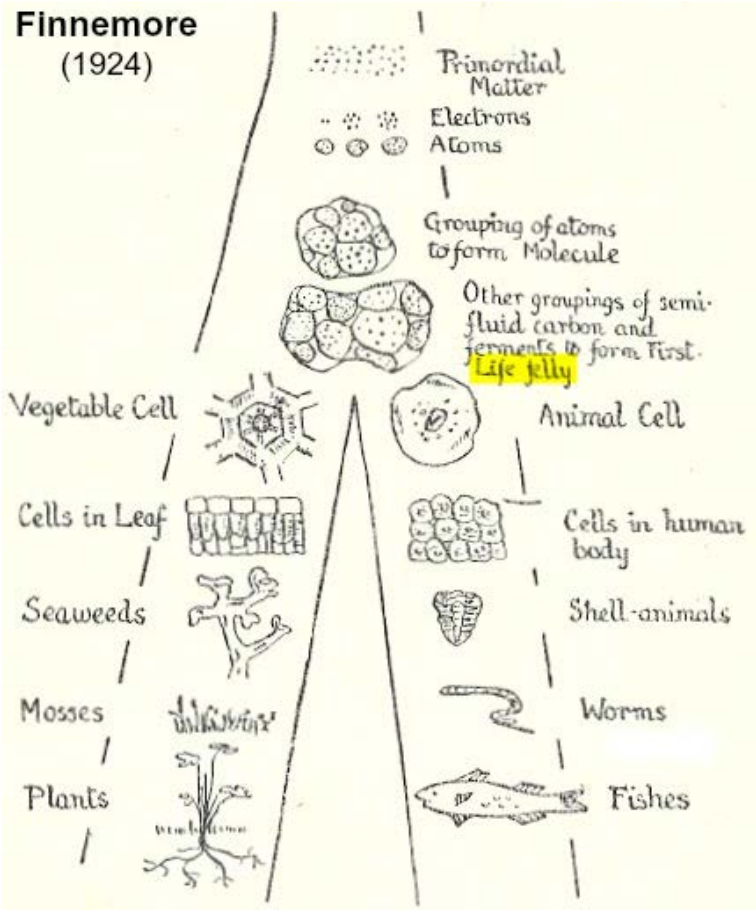

Finnemore's origin of animals and plants diagram, from electrons and atoms, and molecules, withe intermediate step of "life jelly". [1]

The following (pg. 101) is Finnemore's so-called "table of life" diagram, on going from atoms to man, amid which she situates a life jelly (pg. 68) and or protobion (pg. 62):

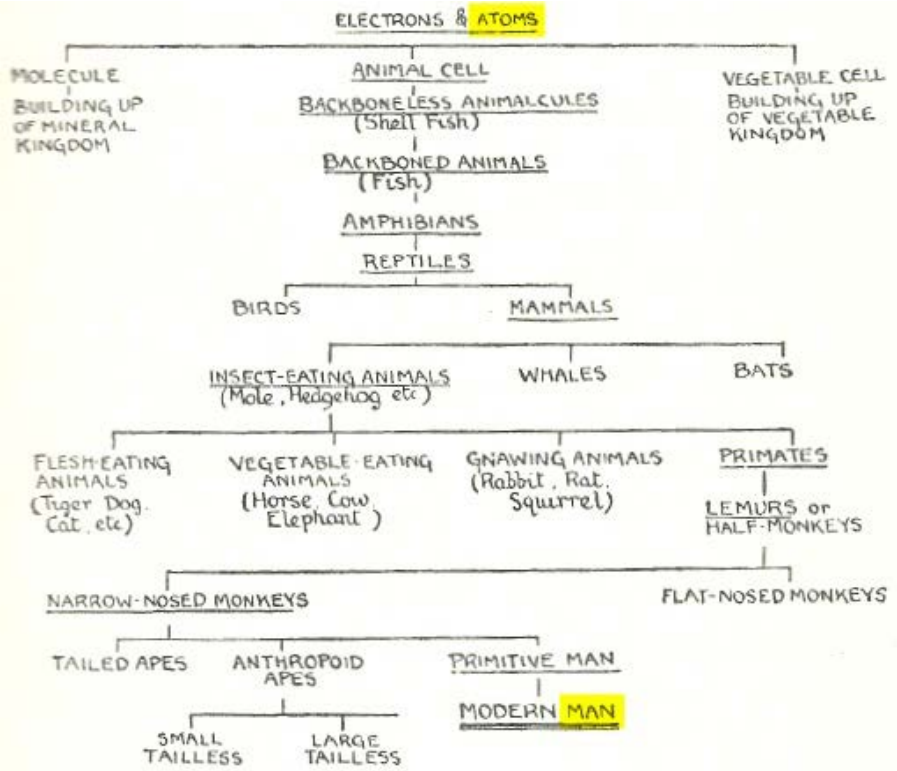

Finnemore explains (pg. 61) this life jelly or protobion as follows:

> "One thing, however, is certain: there is no gap between 'living' and 'non-living' things; there is not a single element in our own bodies that does not exist in 'non-living' matter. It seems, rather, that the energy which shows itself as heat, etc., in 'non-living' matter becomes, as the organism grows more complex, a vital or *life* force."

Here, of course, Finnemore is using a defunct scientific concept, i.e. "life force" that was disabused from science in the 19th century.

Quotes

The following are noted quotes:

> "It is only because our lives are so short compared to the slow, slow movement of evolution, that it is hardly possible to notice the change and growth either in the earth or in ourselves. Because we never knew Italy to look anything other but a Wellington boot, we never pause to think that it was once different, and may change again. Because we never knew that time when man grew his own furry dress, we overlook the fact that, as he has outgrown this likeness to the animal, he may still outgrow others. Yet we must make our minds broad enough to realize the facts. The hour of a watch moves so slowly that you cannot see it move; and yet you know that, so long as the watch is going, its movement never stops. The earth, from its rocks and gases and flowers and animals, is **still 'going'**."
>
> — Hilda Finnemore (1924), *A History of the Earth: from Stardust to Man* (pgs. 56-57)

References

1. Finnemore, Hilda. (1924). *A History of the Earth: from Star-Dust to Man* (atoms, 21+ pgs; origin diagram, pg. 68). Longmans, Green, and Co.
2. (a) Thomson, J. Arthur. (1922). *The Outline of Science, Volume One* (txt). G.P. Putnam's Sons.
(b) John Arthur Thomson – Wikipedia.
(c) Finnemore, Hilda. (1924). *A History of the Earth from Star-Dust to Man* (pgs. 19-20). Longmans, Green, and Co.
3. Bowler, Peter H. (2009). *Monkey Trials and Gorilla Sermons: Evolution and Christianity from Darwin to Intelligent Design* (pg. 148). Harvard University Press.

External links

â— Finnemore, Hilda – WorldCat Identities.

θΔics

In chemistry, **Hill order** is a method for writing molecular formulas, according to which C appears first, H second (if present), and then the other element symbols in alphabetical order. [1]

Overview

In 1900, the so-called Hill order of element ordering in molecular formulas was introduced by American chemist Edwin Hill and used by the classification division of the US Patent Office in 1907.

In 1936, American plant physiologist Frank Thone, employed Hill order to described plants, pictured as "CHNOPS plus" systems.

In the 2000s, with the publication of human molecular formulas, wherein mass composition ordering dominance began to talk precedence, over that of alphabetical ordering, a dual usage compromise approach began to be employed, according to which a human is defined as powered CHNOPS+22 molecular form, using classical Hill order, but when the exact molecular formula is written out, mass percent tends to take precedence in elemental ordering.

References

1. Lind, David R. (1994). *Handbook of Organic Solvents* (MF, pg. #). CRC Press.

External links

â— Hill system – Wikipedia.

θΔics

In existographies, **Hilton Hotema** (1878-1970) (RMS:107) (CR:12), the pen name (Q) of George R. Clements, was an American new age religio-mythology scholar noted for []

Overview

In 1956, Hotema, in his *The Ancient Sun God*, citing Samuel Dunlap (1858), was making astro-theology connections in respect to the etymology of Abraham. [1]

In 1963, Hotema, in his *The Secret of Regeneration*, citing citing Samuel Dunlap (1858) and Charles King (1864), was making the Abraham and Brahma connection, a follows:

> "The story of Abraham is a myth. Abraham himself is a myth. It was usual with the Old Arabians to regard Saturn and Abram as their progenitor, and while looking upon Saturn as their father **...** He was a child named Ab-ram, and this name is later changed to Ab-ra-ham. Charles King in his work, *The Gnostics*, states that the words "brahma" and "abrahrn" have the same numerical value. **When we run this 'allegory' down, we discover that Abram (Abraham) is just another myth of the sun**."

(add)

References

1. (a) Dunlap, Samuel F. (1858). *Vestiges of the Spirit History of Man* (Ra, 19+ pgs; Brahma, 24+ pgs; Abraham, 15+ pgs; Ab-Ram, 7+ pgs). Publisher.
(b) Hotema, Hilton. (1956). *Ancient Sun God* (§8: Ab-Ram the Sun-God, pgs. 25-; quote, pg. 26). Publisher.
2. (a) King, Charles. (1864). *The Gnostics and Their Remains, Ancient and Mediaeval* (pg. 13). Publisher.
(b) Hotema, Hilton. (1963). *The Secret of Regeneration* (§: Allegory of Abram (Abraham), pgs. 136-37). Health Research Books, 1998.

External links

- Hilton Hotema – Wikipedia.
- Hilton Hotema (George Robert Clements) – Hilton-Hotema.com.

θΔics

In atheism, **Hindu atheism**, as contrasted with Christian atheism, Islamic atheism, or Jewish atheism, refers to disbelief in god from the point of view of one coming from a Hinduism religious background or Hindu cultural milieu; the term "ex-Hindu atheist" is sometimes used as an auto-label by this type of atheist.

Overview

In 600BC, the Charvaka, an Indian heterodox philosophical school, arose, who produced *Brihaspati Sutra*, which outlined an "extraordinary materialistic doctrine" (Hecht, 2004), which was averse to the Brahman class, that was an atheistic materialism school of Indian philosophy that embraces philosophical skepticism and rejects Vedas, Vedic ritualism, supernaturalism, and afterlife.

Quotes

The following are related quotes:

> "Though I agree with Buddhism in its rejection of god, soul, infallibility of the Vedas, still I am not a Hindu, even in the broad sense of the term 'Hindu', because as a rationalist and humanist I reject all religions."
>
> — Ramendra Nath (1993), "Why I A Not a Hindu" [1]

References

1. (a) Nath, Ramendra. (1993), "Why I A Not a Hindu" (Ñº), Bihar Rationalist Society.
(b) Ramendra Nath – CelebrityAtheists.com.
(c) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 480-81). HarperOne.

θΔics

In religion, **Hinduism** (TR:22) is a Anunian-rooted theology based on the teaching of the Vedas, Upanishads, Bhagavad Gita, and Agamas, according to which the universe was created by the god-goddess pair Brahma and Saraswati (a Ra + Isis derivative; equivalent to Abraham and Sarah in Christianity, Islam, and Judaism), that humans came following the great flood of MaNu (a Nun derivative; equivalent to Noah in Christianity, Islam, and Judaism), and that the four main goals or aims of existence are: dharma (ethics and duty), artha (prosperity and work), kama (emotions and sexuality), and moksha (liberation and freedom); which are connected to the theories of: karma (action, intent, and consequences) (aka third law of motion), samsara (cycle rebirth), and yogas (paths or practices to attain moksha (escape from the rebirth cycle).

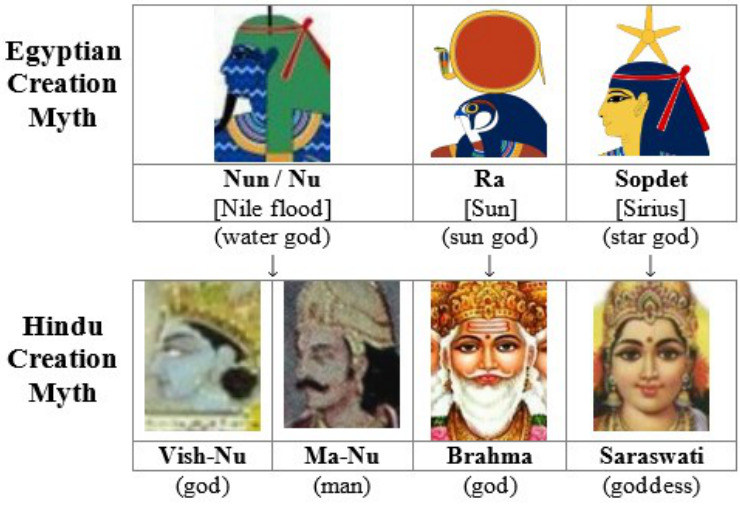

The gist of **Hinduism**, per Hindu creation myth, as a reincarnation-variant of the resurrection-based Egyptian mythology, namely: the god Vish-Nu and man Ma-Nu, based on the Nun (Nile flood) or Nu, the creator god Brahman, based on Ra (sun), and the goddess Saraswati based on Isis (Sirius). [4]

Lotus | Creation

The lotus, the symbol of Upper Egypt, where Theban theology (see: Thebian creation myth) and Hermopolis theology (see: Hermopolis creation myth) reside, predominately, where the plant grew, as compared to the papyrus, the symbol of Lower Egypt, where Heliopolis theology (see: Heliopolis creation myth), Memphis theology (see: Memphis creation myth), and Busiris theology (see: Osiris cult), reside, predominately, where this plant grew, is a common feature of Hinduism. [6]

The lotus closes at night and sinks underwater. In the morning, it re-emerges and blooms again. Thus, the flower, like the baboon and the dung beetle, became a natural symbol of the sun and creation.

In Hermopolis, it was believed that there was a giant lotus blossom that first emerged from the primordial waters of Nun and from which the sun-god came forth; a rendition of this image is the head coming out of the lotus flower, below left. (Q) Below center, is the sun springing from an opening lotus flower, emerging out of the Nun or watery abyss, in the form of the child Horus. [8] Below right, we see Horus the pharaoh sitting on Lotus while wearing the double crown of Upper and Lower Egypt: [7]

This so-called “great world lotus”, as Wallis Budge (1904) refers to it, is one of things, among the various Egyptian mythologies, out of which the sun rose for the first time. [7]

The specific “Horus” shown above, is the Heru-Sma-Taui, Horus #9, according to Budge classification, aka “Horus the Uniter of the South and North”, defined as the son of Hathor, who was believed to spring into existence out of a lotus flower which blossomed in the heavenly abyss of Nu at dawn at the beginning of the year. This version of Horus was worshipped at Aat-hehu, a district near Herakleopolis Magna (nome #19, Upper Egypt), Ant (Denderah) (nome #6, Upper Egypt) (Q), and the city of Khatat. [7]

The head of a man coming out of the lotus, above left, comes from a vignette of the Theban recension of the *Book of the Dead*, which Budge describes as follows:

> “In From Chapters lxxxi., versions A and B, we learn that the deceased had power to transform himself into a lotus; in the first version of the text he says, "I am the pure lotus which springeth up from "the divine splendour that belongeth to the nostrils of Ra," and in the second we read, "Hail, thou Lotus, thou type of the god "Nefer-Tem! I am he who knoweth you, and I know your "names among the gods, the lords of the Underworld, and I am "one of you." The vignette of the first version is a lotus, and that of the second is a lotus plant with a flower and buds growing out of a pool of water, and out of the flower springs a human head, i.e., the head of the deceased.”

The four sons of Horus, to note, are often shown on a rising lotus. (Q)

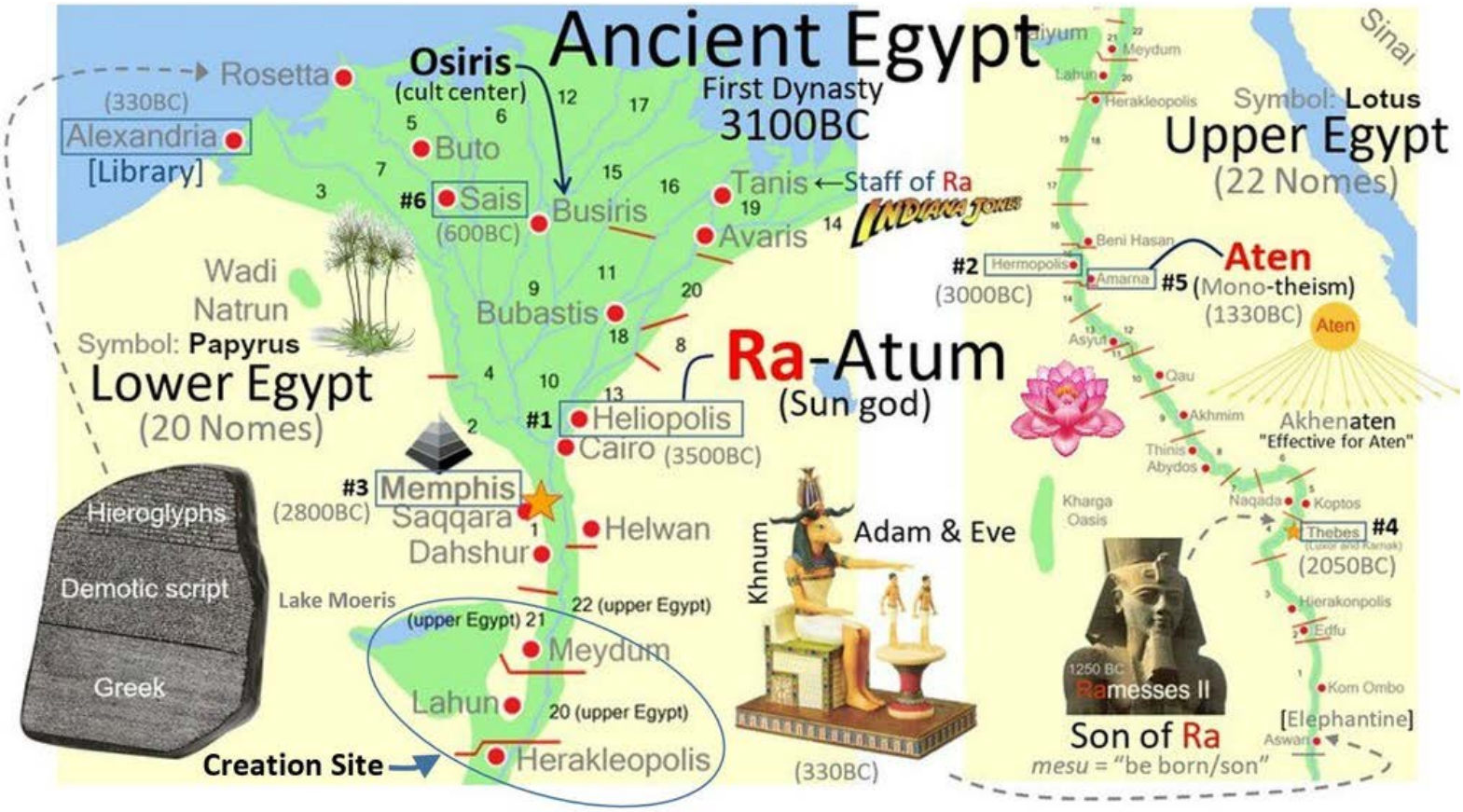

Here, as we see, much of Hinduism has its conceptual model rooted in Upper Egyptian theology, which can be compared to Judaism-based theologies (Christianity and Islam) which have much of their story-telling surrounding papyrus plant models (Lower Egyptian theology).

Birth of Brahma | Solar birth

The following creation text (below) and visual (right) is the Hindu mythology reformulation of sun (Egyptian god Ra turned Hindu god Brahman) born out of the water (Egyptian god Nun turned Hindu god Vishnu), as presented in the Bhagavata Purana (c.800AD) (Q), sections SB 3.8.10 to SB 3.8.38 (Q), aka Puranic mythology, as follows:

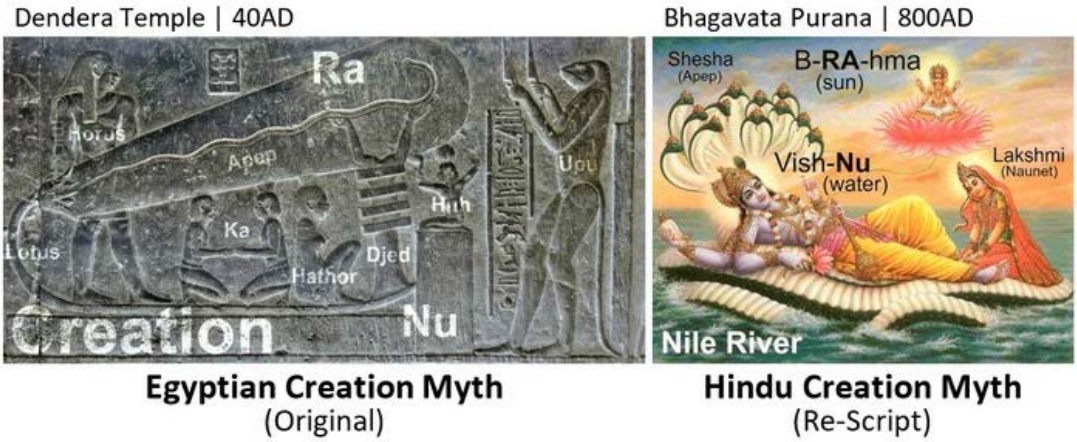

Left: the creation myth birth of Ra, the Egyptian sun god, out of a lotus flower, the stem of which descends into the Nu (or Nun) the water god or water abyss (Nile River) of Egyptian mythology (3100BC), as carved on the walls of Dendera Temple (38AD). Right: the Hindu mythology (800AD) re-write of the latter, according to which, as described in the Bhagavata Purana [SB 3.8.10-14], Brahma (Ra) is born out of a lotus, the stem of which comes out of the navel of the god Vishnu (Nun), wherein Apep, the mythical snake that Ra does battle with each night, becomes the multi-headed Hindu snake Shesha, and Naunet, the female counterpart of Nun, according to Hermopolis cosmology, becomes Lakshmi, the wife of Vishnu.

SB 3.8.10 (Q): At that time when the three worlds were submerged in water, Garbhodakaśāyī Viṣṇu [**Nun**] was alone, lying on His bedstead, the great snake Ananta [Apep], and although He appeared to be in slumber in His own internal potency, free from the action of the external energy, His eyes were not completely closed.

SB 3.8.11 (Q):Just like the strength of fire within fuel wood, the Lord remained within the water of dissolution, submerging all the living entities in their subtle bodies. He lay in the self-invigorated energy called kāla.

SB 3.8.12 (Q): The Lord lay down for a thousand cycles of four yugas in His internal potency, and by His external energy He appeared to be sleeping within the water. When the living entities were coming out for further development of their fruitive activities, actuated by the energy called kāla-śakti, He saw His transcendental body as bluish.

SB 3.8.13 (Q): The subtle subject matter of creation, on which the Lord's attention was fixed, was agitated by the material mode of passion, and thus the subtle form of creation pierced through His abdomen.

SB 3.8.14 (Q): Piercing through, this sum total form of

the fruitive activity of the living entities took the shape of the bud of a lotus flower generated from the Personality of Viṣṇu, and by His supreme will it illuminated everything, like the sun, and dried up the vast waters of devastation.

SB 3.8.15 (Q): Into that universal lotus flower Lord Viṣṇu personally entered as the Supersoul, and when it was thus impregnated with all the modes of material nature, the personality of Vedic wisdom, whom we call the self-born, was generated.

SB 3.8.16 (Q): Brahmā [**Ra**], born out of the lotus flower, could not see the world, although he was situated in the whorl. He therefore circumambulated all of space, and while moving his eyes in all directions he achieved four heads in terms of the four directions.

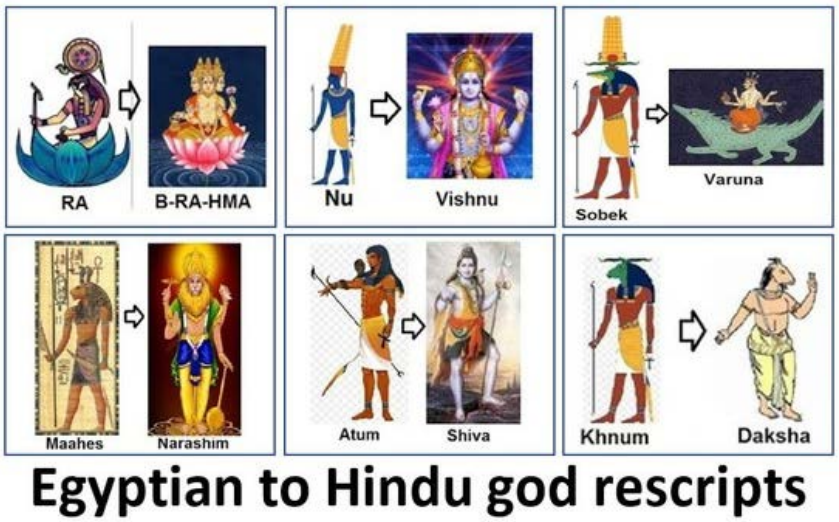

A Mar 2019 Egyptian to Hindu god rescript (Q) by blogger Arvind Bhagwath.

SB 3.8.17 (Q): Lord Brahmā, situated in that lotus, could not perfectly understand the creation, the lotus or himself. At the end of the millennium the air of devastation began to move the water and the lotus in great circular waves.

SB 3.8.18 (Q): Lord Brahmā, in his ignorance, contemplated: Who am I that am situated on the top of this lotus? Wherefrom has it sprouted? There must be something downwards, and that from which this lotus has grown must be within the water.

SB 3.8.19 (Q) : Lord Brahmā, thus contemplating, entered the water through the channel of the stem of the lotus. But in spite of entering the stem and going nearer to the navel of Viṣṇu, he could not trace out the root.

(add discussion)

Dharma | Maat

In Hinduism, the Egyptian concept of Maat, according to Muata Ashby (1997), is the forerunner to the Hindu concept of Dharma, meaning "order, righteousness, and justice". [6]

Egyptian | Origins

In 1300BC, the *Book of Gates* was being promoted (see: recension theory) as an afterlife text by the priests of Thebes, such as found on the sarcophagus of Seti I (1279BC), and on the walls of the tombs of the several kings of the 20th dynasty (1189-1077BC), in which, in the section or chapter called the “Tenth Hour of the Night”, one begins to see two-headed, four-armed god morph in the character of the dual god Set-Horus, as shown below:

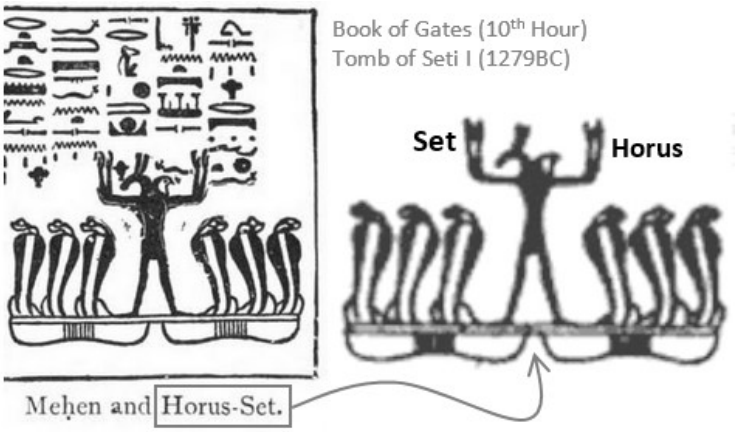

In 900BC, this double-headed four-armed god conception, would become characteristic of the Hindu god models, such as found in the three-headed god Brahma, pictured above, which itself is a god morph syncretism of the gods: Nun + Ra (great-great grandfather of Horus, per Heliopolis creation myth) + Atum (or keme).

Tesla | Vivekananda

In 1896, Indian Hindu monk Swami Vivekananda (Narendranath Datta) visited in New York with William Thomson, Hermann Helmholtz and Nikola Tesla; among whom, according to Howard W. Odum (1929), Helmholtz, at some point, expressed interest or “recommendation for research into spiritual things”. [1]

> "Tesla thinks he can demonstrate that mathematically that force and matter are reducible to potential energy. I am to go see him next week to get this mathematical demonstration."
>
> — Swami Vivekananda (1896), "Letter to Friend", Feb 13 [1]

Vivekananda believed, supposedly, that the harmony between Vedantic theories and and western science was explained by the following diagram, shown adjacent.

```
BRAHMAN          =     THE ABSOLUTE
  |                |
  |                |
MAHAT OR ISHVARA   =   PRIMAL CREATIVE ENERGY
  |                |
+---------+      +---------+
PRANA and AKASHA   =   ENERGY and MATTER
```

Indian Hindu monk Swami Vivekananda's 1896 diagram conception of his idea of reconciliation of Hinduism with science; which he supposedly consulted with Nikola Tesla about. [2] The inherent problem, however, here, being that Vivekananda is ignorant of the fact that "Brahma" is but reincarnation-rewrite of the earlier Egyptian mythology conception of Ra born out of the Nun following the flood (Ab), i.e. B-Ra-hma-ic theology; which is akin to the way most Christians and Muslims are ignorant of the fact that Abraham and Sarah have the Egyptian mythological same roots.

See also

- Hindu atheism
- Hindu mythology

Quotes

The following are related quotes:

> "The Brahmins give a wonderful account of their Chorcam or paradise, in which grew a tree that would have given man immortality had he been permitted to eat of it. They also believe that a god-made man was to be born of a virgin, by divine operation; hence the incarnation of their Juggernaut and the birth of Krishna in a grotto where he was adored by shepherds and angels."
>
> — Romualdo Gentilucci (1848), *Life of the Most Blessed Virgin Mary* [5]

> "The Hindu sacred writings contain all the myths and fables found in the Cristian Bible."
>
> — John Fiske (c.1865) [9]

References

1. Odum, Howard W. and Jocher, Katharine C. (1929). *An Introduction to Social Research* (pg. 31). H. Holt and Co.
2. (a) Nikhilananda, Swami, Vivekananda. (1973). *The Yogas and Other Works* (Q). New York.
(b) Swami Vivekananda – Wikipedia.
3. (a) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (pgs. 197-200). Dover, 1969.
(b) Budge, Wallis. (1908). *An Account of the Sarcophagus of Seti I, King of Egypt, B.C. 1370* (pg. 111). The Museum.
4. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs) (pg. 135). Publisher.
5. Gentilucci, Romualdo. (1848). *Life of the Most Blessed Virgin Mary* (pgs. 25-26). E. Dunigan, 1860.
6. Ashby, Muata. (1997). *Anunian Theology: African Religion, Volume One* (Lotus plant, pg. 49; Dharma, pg. 65). Cruzian Mystic Books.
7. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (lotus, 8+ pgs; world lotus flower, pg. 23; Horus #9, pgs. 472-73; head out of lotus, pg. 521-22). Dover, 1969.
8. (a) Maspero, Gaston. (1903). *History of Egypt, Syria, Babylonia, and Assyria, Volume One* (pg. 193). Grolier Society.
(b) Horus – TruthBeKnown.com.
9. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pgs. 191-92). Prometheus.

Further reading

- Moor, Edward. (1864). *The Hindu Pantheon* (Osiris, 6+ pgs.). Higginbotham.

External links

- Hinduism – Wikipedia.

θΔics

In existographies, **Hipparchus** (190-120BC) (IQ:175|#267) (Cattell 1000:781) [RGM:637|1,330+] (Murray 4000:10|A) (GAE:#) was a Greek astronomer, geographer, and mathematician; founder of trigonometry; famous for his incidental discovery of precession of the equinoxes.

Overview

In c.160BC, Hipparchus learned how to plot the orbital movements of the sun, moon, and planets. [1]

Hipparchus also discovered the precession of the equinoxes; as summarized below:

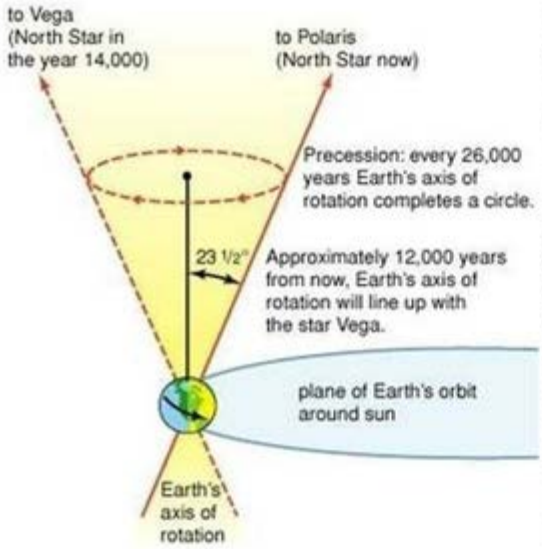

(add)

Quotes | On

The following are quotes on Hipparchus:

> "**Hipparchus** was a lover of truth (phila-lÄ"thÄ"s)."
>
> — Ptolemy (c.150), *Publication* (Ñº)

References

1. Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pg. 62). University Press of America.

External links

â— Hipparchus – Wikipedia.

θΔics

In existographies, **Hippo** (c.500-440BC) (FA:6), aka Hippon, "Hippo of Rhegium" (Drachmann, 1922), or "Hippo of Samos" (Whitmarsh, 2015), was a Greek natural philosopher, characterized as being "heir to the traditions of Thales, Anaximander, and Anaximenes", noted for []

Philosophy

Hippo held water and fire to be the primary elements, with fire originating from water, and then developing itself by generating the universe. He thought that there is an appropriate level of moisture in all living things, and disease is caused when the moisture is out of balance. He believed the soul as arising from both mind and water.

In his *On the Soul*, Aristotle says the following: [3]

> "Of more superficial writers, some, e.g. **Hippo**, have pronounced the soul to be water; they seem to have argued from the fact that the seed of all animals is fluid, for Hippo tries to refute those who say that the soul is blood, on the ground that the seed, which is the primordial soul, is not blood."

Aristotle, supposedly, characterized him as being an excessive materialist. [4]

Atheism

Hippo was known, to some, among the Greeks, as an atheist. [2]

Quotes | On

The following are quotes on Hippo:

> "In the list given by Drachmann [1922], others designated *atheoi* in the period up to the 3rd century BC are Diogenes of Apollonia, **Hippo of Rhegium**, Diagoras of Melos, Prodicus of Keos, the aristocrat Critias of Athens, Theodorus of Cyrene, Bion of Borysthenes, and Euhemerus of Messina."
>
> — Michael Palmer (2013), *Atheism for Beginners* [3]

See also

● Augustine (of Hippo)

References

1. (a) Palmer, Michael. (2013). *Atheism for Beginners: a Coursebook for Schools and Colleges* (pg. 15). Lutterworth Press.
(b) Drachmann, Anders B. (1922). *Atheism in Pagan Antiquity* (pg. 13). Gyldendal.
2. Whitmarsh, Tim. (2015). *Battling the Gods: Atheism in the Ancient World* (pg. 63-64). Vintage Books.
3. Aristotle. (322BC). *The Complete Works of Aristotle, Volume One* (editor: Jonathan Barnes) (pg. 646). Princeton University Press, 1995.
4. Polansky, Ronald. (2007). *Aristotle's De Anima: a Critical Commentary* (Hippo, pg. 80). Cambridge University Press.

Further reading

● Shapiro, S. (1999). "Hippon the Atheist: the Surprising Intelligent Views of Hippon of Samos", *Journal of Ancient Civilizations*, 14:111-23.
● O'Grady, Patricia F. (2017). *Thales of Miletus: the Beginnings of Western Science and Philosophy* (§: Hippo, pgs. 23-24). Taylor & Francis.

External links

● Hippo (philosopher) – Wikipedia.

θΔics

In existographies, **Hippocrates** (c.460-370BC) (IQ:175|#213) (Cattell 1000:165) [RGM:27|1,500+] (Murray 4000:2|Med) (FA:17) (CR:43) was a Greek physician, commonly known as the "father of medicine", noted for his ideas on animal heat, affinity theory, and a non-supernatural basis of disease.

Animal heat

Hippocrates promoted an animal heat view of human animation in relation to fire; reasoning that "heat, a quantity which functions to animate, derives from an internal fire located in the left ventricle". [1] This was referred to as the doctrine of internal heat. [2]

Affinity

Hippocrates, in the context of the history of affinity theory, in circa 410BC, promoted the theory that "like assorts with like"; sometimes called Plato's first law of affinity. [4]

Quotes | Atheism

See main: Hippocratic reductionism

The following are noted atheism-themed quotes:

> "Men think epilepsy divine, merely because they do not understand it. We will one day understand what causes it, and then cease to call it divine. And so it is with everything in the universe."
>
> — Hippocrates (c.400BC), popular atheism quote

Quotes | On

The following are related quotes:

> "**Hippocrates** in time arrived at the conclusion that he had not sought whether the heart or the head was the seat of either reason or sense in man and beast."
>
> — Jean de La Fontaine (c.1690), 29th fable quote; inscribed at the base of the 1869 statue of Democritus mediating on the seat of the soul, Paris

Quotes | By

The following are noted quotes:

> "Is there supernatural in disease?"
>
> — Hippocrates (400BC), *On the Sacred Disease;* ruminated on by Jean Fernel, 1548; cited by Charles Sherrington, 1938 [3]

References

1. Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Life*, (pg. 35). Chicago: The University of Chicago Press.
2. Mendelsohn, Everett I. (1964). *Heat and Life: the Development of the Theory of Animal Heat* (pg. 9). Harvard University Press.
3. (a) Sherrington, Charles. (1938). *Man on His Nature* (pg. 5). Cambridge University Press, 1950.

(b) On the Sacred Disease – Wikipedia.
4. Jammer, Max. (1957). *Concepts of Force: a Study of the Foundations of Dynamics*. Dover.

External links

â— Hippocrates – Wikipedia.

θΔics

In science, **Hippocratic reductionism** is the postulate, made by Hippocrates (c.400BC), that people invoke the divine for things they are ignorant about, but that once one comes to understand the phenomena or the cause of the effect, then they cease to call it divine; according to which, as knowledge progresses, via increasing reductionism, divine explanations will cease to be used as a functional explanatory patch.

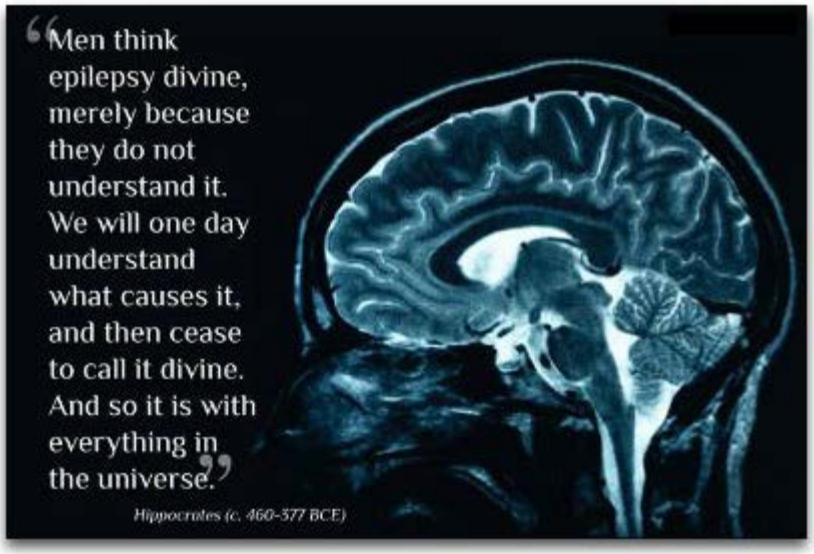

The famous **Hippocratic reductionism** quote (Q), wherein Hippocrates points out that many in his day viewed epilepsy "divine", whereas we now understand that epilepsy results from a number of physical conditions in the brain and that no one, in modern countries, no longer, invokes "god" as the cause. Hippocrates asserts that this reductionism of god to zero will be the case for all previous unknown cause phenomena.

Overview

In circa 410BC, Greek physical philosopher Hippocrates began to question the standing premise of invoking "gods" as causal explanations of diseases; the following is one example statement of this:

> "Is there supernatural in disease?"
>
> — Hippocrates (400BC), *On the Sacred Disease;* ruminated on by Jean Fernel, 1548; cited by Charles Sherrington, 1938 [1]

Sometime thereafter, Hippocrates deduced, somehow, that diseases are caused "naturally", the reason for most of which can be determined readily; thereafter he extended this reasoning to posit that someday, when knowledge of the workings and operation of the universe reached a more enlightened state, people would cease to call things divine; the main statement of this reasoning is as follows:

> "Men think epilepsy divine, merely because they do not understand it. We will one day understand what causes it, and then cease to call it divine. And so it is with everything in the universe."
>
> — Hippocrates (c.400BC), popular atheism quote

We now understand, correctly, that epilepsy results from a number of conditions or causes, such as genes, abnormal brain structure at birth, head injury, stroke, among others, e.g. 30 percent of epilepsy cases have a change in the structure of their brains that causes the electrical storms of seizures (Q); no one, in modern countries, however, invokes "god" as the cause. Hippocrates asserts that this reductionism of god to zero will be the case for all previous unknown cause phenomena.

See also

- Critias hypothesis

References

1. (a) Sherrington, Charles. (1938). *Man on His Nature* (pg. 5). Cambridge University Press, 1950.
(b) On the Sacred Disease – Wikipedia.

θΔics

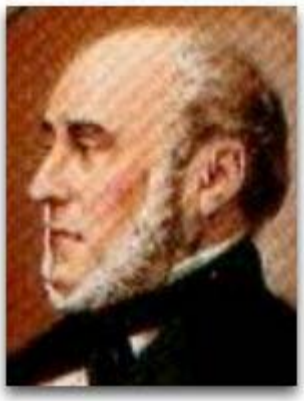

In science, **Lazare Hippolyte Carnot** (1801-1888) was a French statesman notable for being the son of École Polytechnique founder Lazare Carnot and younger brother of French physicist and thermodynamics founder Sadi Carnot. Sadi was known to have given Hippolyte a copy of his famed 1824 manuscript *On the Motive Power of Fire* to read so to make sure that it was intelligible to the layperson or non-scientist. [1] In 1872, Hippolyte wrote an essay on Sadi's life, now considered as the principle source of information on Sadi Carnot; an essay that was latter reprinted in 1878 in a new edition of Sadi *Réflexions* (1824), together with some of his unpublished manuscripts. [2]

References

1. Mendoza, E. (1960). “Introduction” (section) in Carnot, Sadi. (1824). “Reflections on the Motive Power of Fire and on Machines Fitted to Develop that Power.” Paris: Chez Bachelier, Libraire, Quai Des Augustins, No. 55. (1960, Dover edition).
2. Carnot, Hippolyte. (1872). “Life of Sadi Carnot” (pgs. 20-36) in Carnot, Sadi. (1890). *Reflections on the Motive Power of Heat and on Machines Fitted to Develop that Power* (with Robert Henry Thurston and William Thomson). J. Wiley & Sons.

θΔics

In hmolscience, **Hippolyte Taine** (1828-1893) (CR=26) was a French historian-philosopher who coined the term "human molecule", as the physical definition of one human being, in December of 1869 in the preface to his two volume book *On Intelligence.* [1]

Philosophy

In an 1854 “Essay on Livy” submitted to the French Academy, Taine had expressed his view that according to Dutch philosopher Benedict Spinoza, a human’s place in relation to nature, is not that of an empire within an empire, but of a part in a whole; that a person’s inner nature or being is subject to laws in the same way as the external world; moreover, that there is a dominate principle, a ruling faculty, which regulates thought and imparts an irresistible in inevitable impulse to the human machine. [4]

Human molecules

Taine, in the preface to his 1869 *On Intelligence*, famous stated ‘it is now admitted that the laws which rule formation, nutrition, locomotion, for bird or reptile, are but one example and application of more general laws which rule the formation, nutrition, locomotion, of every animal.’ He continues ‘in the same way we begin to admit that the laws which rule the development of religious conceptions, literary creations, scientific discoveries, in a nation, are only an application and example of laws that rule this same development at every moment and with all men.’ In coining the term 'human molecule', according to the

1870 French version [7]

> “Bref, celui qui étudie l'homme et celui qui étudie les hommes, le psychologue et l'historien, séparés par les points de vue, ont néanmoins le même objet en vue ; c'est pourquoi chaque nouvel aperçu de l'un doit être compté à l'acquis de l'autre est visible aujourd'hui, notamment dans l'histoire. On s'aperçoit que, pour comprendre les transformations que subit telle **molécule humaine** ou tel groupe de molécules humaines, il faut en faire la psychologie.”

1871 English translation by T. D. Haye [2]

> “Between psychology thus conceived and history as it is now written the relationship is very close. For history is applied psychology, psychology applied to more complex cases. The historian notes and traces the total transformations presented by a particular **human molecule** or group of human molecules; and, to explain these transformations, writes the psychology of the molecule or its group.”

A Google (French → English) translation reads:

> “In short, anyone who studies the man and he who studies men, psychologist and historian, separated by points of view, however, have the same object in view, so each new preview of one must be counted at the achievements of others is visible today, especially in history. We realize that to understand the changes of a **human molecule** or group of human molecules, we must make psychology .”

In sum, Taine states that ‘for the last fifteen years I have contributed to these special psychologies’. Moreover, ‘I now attempt a general psychology.’ He notes, however, that ‘to embrace this subject completely, this theory of the Intelligence (faculty of knowing) needs a theory of the will added to it.’ In his circa 1871 “Notes on England”, Taine had begun to allude to the view that a human is an “organized molecule” subject to spontaneous and continued transformation. [4] Taine uses the term again in 1878 multi-volume work *Origins of Contemporary France*, speaking about the “dust of separate human molecules”, but it difficult to infer what exactly he means by this. [3]

Adams

American biographer Ernest Samuels argues that American historian Henry Adams was significantly influenced by

Taine's suggestion that the object of the historian is to study and follow the transformations of human molecules and to write history as the psychology of human molecules. Specifically, Samuels notes that in circa 1870 Adams had become an editor of the *North American Review* and in 1873 he accepted the article "Taine's Philosophy", by James Bixby, for publication, wherein Taine's philosophy of history is presented as applied psychology of human molecules and that Adams later adopted this view as his own. [5] To exemplify the influence of Taine on Adams, on 12 April 1885, while at extended stay at work in Washington, Adams wrote to his wife: [6]

> "I am not prepared to deny or assert any proposition which concerns myself; but certainly this solitary struggle with platitudinous atoms, called men and women by courtesy, leads me to wish for my wife again. How did I ever hit on the only women in the world who fits my cravings and never sounds hollow anywhere? Social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life."

This is clearly seen in Adams' 1910 *A Letter to American Teachers of History*, wherein Adams argues that the history must be viewed as transformations of groups of human molecules subject to the second law of thermodynamics.

Quotes

The following are related quotes:

> "History is a mechanical problem. The only difference is that it cannot be measured by the same means or defined so exactly. It is a science analogous to physiology and zoology, not to geometry. My idea has lain on the ground since Montesquieu; I have only picked it up."
>
> — Hippolyte Taine (c.1860), letter to friend (O)

References

1. (a) Taine, Hippolyte. (1870). *De l'Intelligence* (On Intelligence), (Part I, Part II), (human molecule, pgs. xi-xii), London: L. Reeve and Co.
(c) Thims, Libb. (2008). *The Human Molecule*, (preview). Morrisville, NC: LuLu.
2. Bixby, James T. (1873). "Taine's Philosophy: Review of *On Intelligence*", *The North American Review* (quote: human molecule, pg. 403), 117: 401-38.
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4. Taine, Hippolyte. (1874). *Notes on England* (Essay on Livy, pg. xxiii; organized molecule, pg. xLvii). W. Isbister & Co.
5. Samuels, Ernest. (1989). *Henry Adams* (human molecule, pg. 115). Harvard University Press.
6. Adams, Henry. (1885). "Letter to Wife", April 12; In: *The Letters of Henry Adams: 1858-1868, Volume 1* (pg. xxviii). Harvard University Press, 1982.
7. Taine, Hippolyte. (1870). *De l'Intelligence* (molécule humaine, pgs. 20-21). Hachette & Cie.

Further reading

● Hale, Edward E. (1870). *Old and New* (human molecule, pg. 103). Lee & Shepard.
● Tyler, Edward, Kingsley, William L., and Fisher, George P., Dwight, Timoth. (1872). "Notices of New Books: Taine *On Intelligence*" (human molecule, pg. 366). *New Englander and Yale Review*, 31: 366-67.
● Flint, Robert. (1894). *Historical Philosophy in France and French Belgium and Switzerland* (human molecule, pg. 636). C. Scribner's Sons.
● Gooch, George P. (1913). *History and Historians in the Nineteenth Century* (human molecule, pg. 240). Longmans, Green, and Co.

External links

● Hippolyte Taine – Wikipedia.

θΔics

In existographies, **Hippolytus** (170-235 ACM) was a Roman theologian, noted for his c.225 *Refutation of All Heresies*, wherein he covers, in an encyclopedia manner, all "heresies" or doctrines contrary to then-established status quo Christianity, from the ancient Egyptians, to the Greek physics-philosophers, e.g. Anaximander, Empedocles, Epicurus, etc., to his own time.

Quotes | On

The following are quotes on Hippolytus:

> "The contents of **Hippolytus**' *The Refutation*, as they originally stood, seem to have been arranged thus: The first book (which we have) contained an account of the different schools of ancient philosophers; the second (which is missing), the doctrines and mysteries of the Egyptians: the third (likewise missing), the Chaldean science and astrology; and the fourth (the beginning of which is missing), the system of the Chaldean horoscope, and the magical rites and incantations of the Babylonian Theurgists. Next came the portion of the work relating more immediately to the heresies of the church, which is contained in Books V-IX. The tenth Book is the *resume* of the entire, together with the exposition of the author's own religious opinions."
>
> — J.H. MacMahon (1868), "Introductory Note" [1]

Quotes | By

The following are quotes by Hippolytus:

> "Animals, according to Anaximander, come into being from moisture evaporated by the sun. Humans originally resembled another type of animal, namely fish."
>
> — Hippolytus (c.225), *Refutation of All Heresies* (§1.5: Anaximander) (Q)

> "The **body of Jesus was an animal one**. On account of this, at his baptism the holy spirit as a dove came down – that is, the logos of the mother above, i.e. Sophia – and became a voice to the **animal man**, and raised him from the dead."
>
> — Hippolytus (c.225), *Refutation of All Heresies* (§6.30) (pg. 237); summary of the views of the Italians Heracleon (c.175AD) and Ptolemaeus (c.150AD) (Q)(Q)(Q)(Q)(Q), the latter known to Irenaeus (Q), Tertullian, Epiphanius, and Theodore; see: silent historians problem

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1. Hippolytus. (c.225AD). *Refutation of All Heresies* (translators: J.H. Machahon and S.D.F Salmond) (contents, pg. 22; fish, pg. 38). T. & T. Clark, 1868.

External links

- Hippolytus of Rome – Wikipedia.
- Refutation of All Heresies – Wikipedia.

θΔics

Ken Ono (/ˈkɛn ˈoʊnoʊ/; [illegible]) is a Japanese-American mathematician and music performer. A specialist in number theory, he has worked on the Riemann hypothesis, Lehmer's conjecture, the Ono conjecture, the Ono inequality, the Ono–Sander theorem, the Ono–Taguchi theorem, the Ono–Zagier conjecture, the Ono–Zuckerman conjecture, the Ono–Zuckerman–Zwegers conjecture, the Ono–Zwegers conjecture, the Ono–Zwegers–Zagier conjecture, the Ono–Zwegers–Zagier–Zuckerman conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers conjecture, the Ono–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman–Zwegers–Zagier–Zuckerman

In history, **histomap**, various subtitled as “four thousand years of world history by relative power of contemporary states, nations and empires” and or “the rise and fall of peoples and nations for four thousand years” (Q), is a vertical downward flowing river-like historical map, made by American cartographer John B. Sparks (c.1890-1960), printed by Rand McNally in 1931, depicting the various world states and empires by “power” dominance, per every fifty years, from 2000BC to 1900AD.

Map

The following is John Spark's original 1931 histomap (2000BC-1900AD), 1125px (width) by 5660px (height) in size, divided into 500-year segments, with key point side commentary, shown at right, extended backwards to 3100BC, the start of the Egyptian Dynasty:

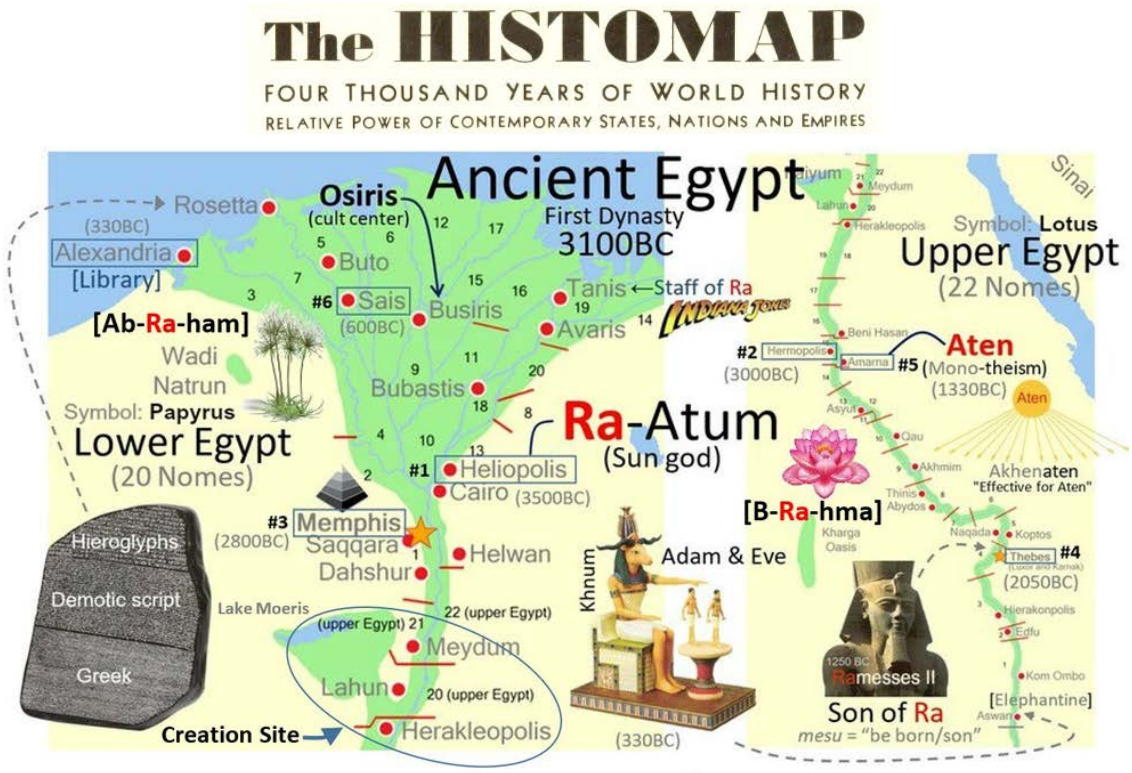

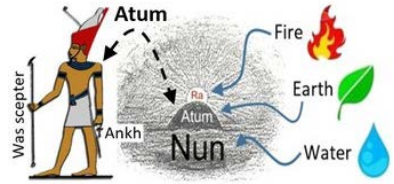

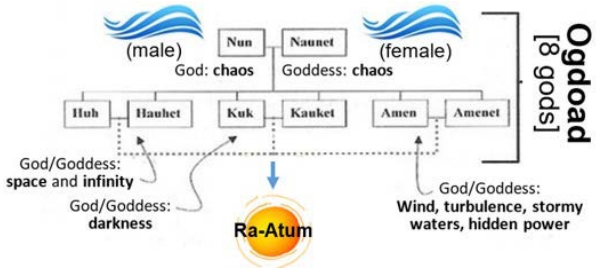

B. C. 3000 | 2950 | 2900 | 2850 | 2800 | 2750 | 2700 | 2650 | 2600 | 2550 | B. C. 2500 | 2450 | 2400 | 2350 | 2300 | 2250

← | **Heliopolis recension [3500-3150BC]**: the religion constructed at Heliopolis became the new state religion (see: recension theory).

← | **1st Dynasty Egypt [3100BC]**: Upper Egypt and Lower Egypt united to for the first dynasty of Egypt; Horus was the chief supreme god (see: supreme god timeline).

← | **Memphis recension [2890-2686BC]**: the religion constructed at Heliopolis became the new state religion (see: recension theory).

← | **Step Pyramid [2610BC]**: Imhotep built the first the Step Pyramid at Saqqara, Egypt’s first pyramid.

← | **Great Pyramid of Giza [2560BC]**: The Great Pyramid of Giza, said to have been made for 4th dynasty pharaoh Khufu, was completed; others (Q) date its completion to 2470BC; the "pyramid" concept itself modeled on the Nile River flood cosmology, according to which Ra the sun god would be reborn, in the form of the phoenix, out of the land mound (i.e. Ptah), which arose out of the flood (i.e. god Nun); the pharaoh buried in the pyramid was thus believed to be reborn "like Ra".

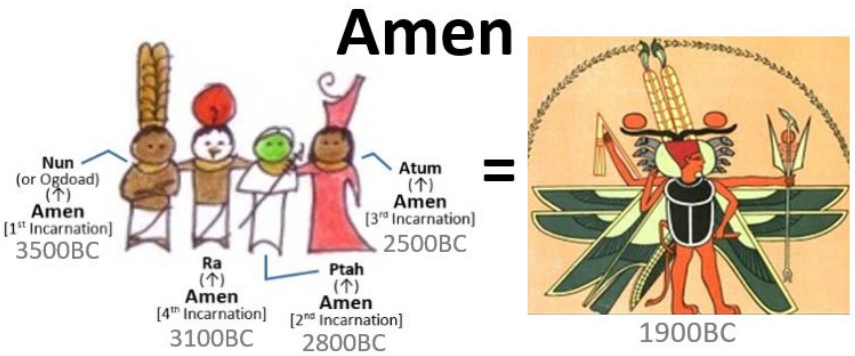

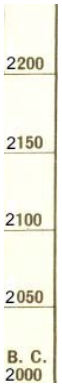

← | **Hermopolis recension [2181-2160BC]**: the religion constructed at Hermopolis became the new state religion (see: recension theory), according to which the "Ogdoad" (see: supreme god timeline) gave birth to Ra-Atum (see: Ra-Atum).

← | **Theban recension [2061-1991BC]**: the religion constructed at Thebes became the new "state religion" for the Egyptian empire (see: recension theory), according to which all of the previous supreme gods, i.e. Nun (1st incarnation), Ptah (2nd incarnation), Atum (3rd incarnation), and Ra (4th incarnation), were reconceptualized as reincarnations of the god Amen.

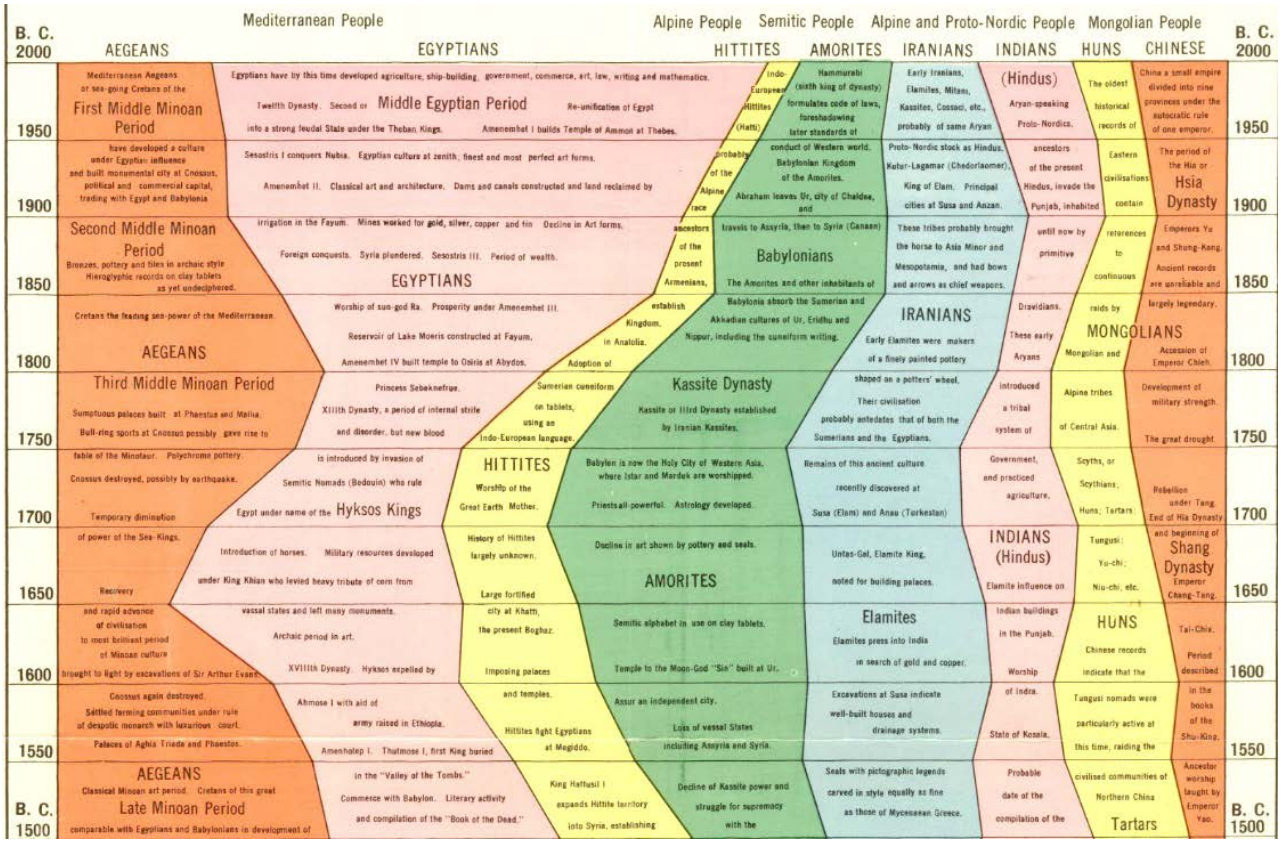

← | **Abraham [1976-1801BC]**: Here we note peculiarity, according to religious consensus, of dating the existence of a person named "Abraham", the purported father prophet of the Jewish, Christian, and Muslim people, to the a point near one of heights of power of the Egyptian Dynasty (3100BC-100AD); Abraham, whose Hindu equivalent is the god Brahma (see: B-Ra-hma), is not a real person (see: Abraham never existed), a god-to-prophet rescript of the Egyptian supreme god "father Ra born of Nun" (see: Ab-Ra-ham).

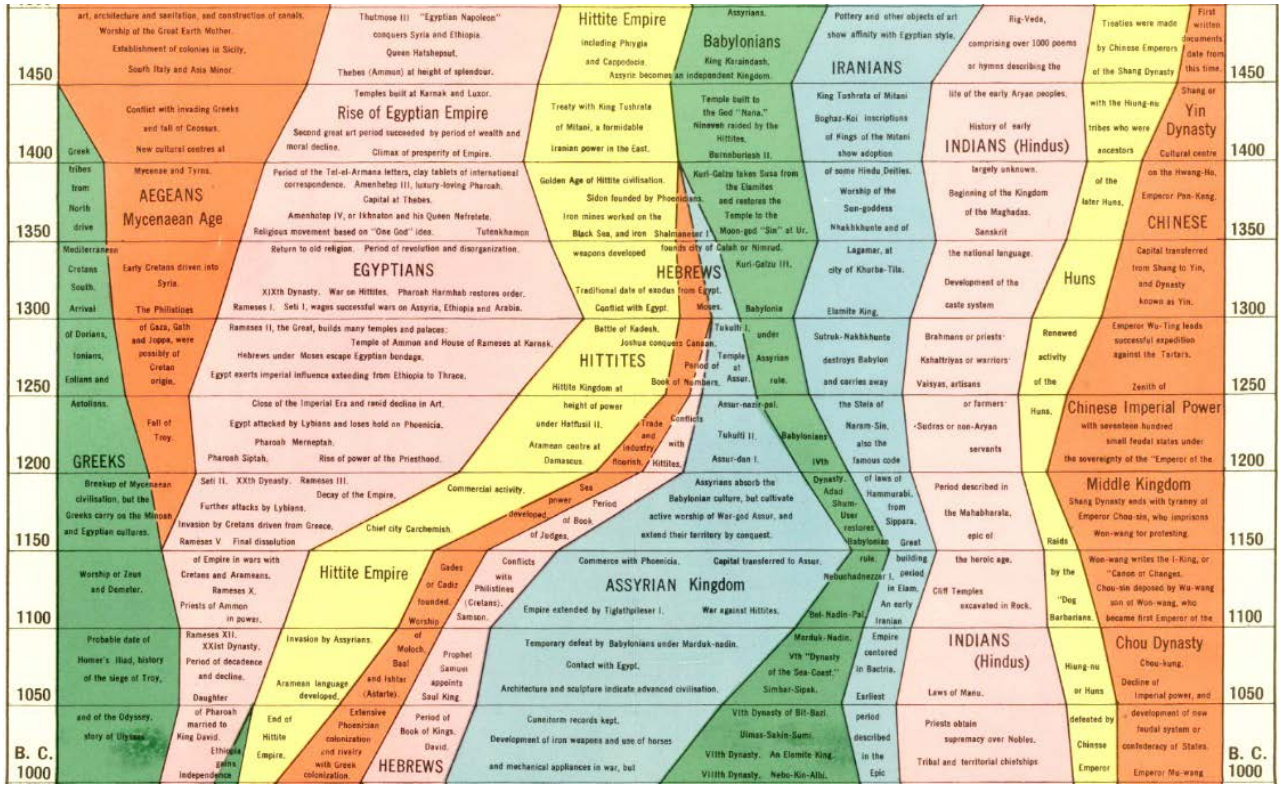

← | **Moses [1391-1271BC]**: Here we note peculiarity, according to Rabbinical consensus, of dating the existence of a person named "Moses", the purported author of the first five books of the Old Testament of the Bible, to the time start of the Jewish State; we also note that, while Moses, according to learned consensus (see: RMS), was not real (see: Moses never existed; Osiris, Dionysus-Bacchus, and Moses) that the monotheistic pharaoh **Akhenaten** (c.1380-1335BC) curiously did exist in this peculiar period.

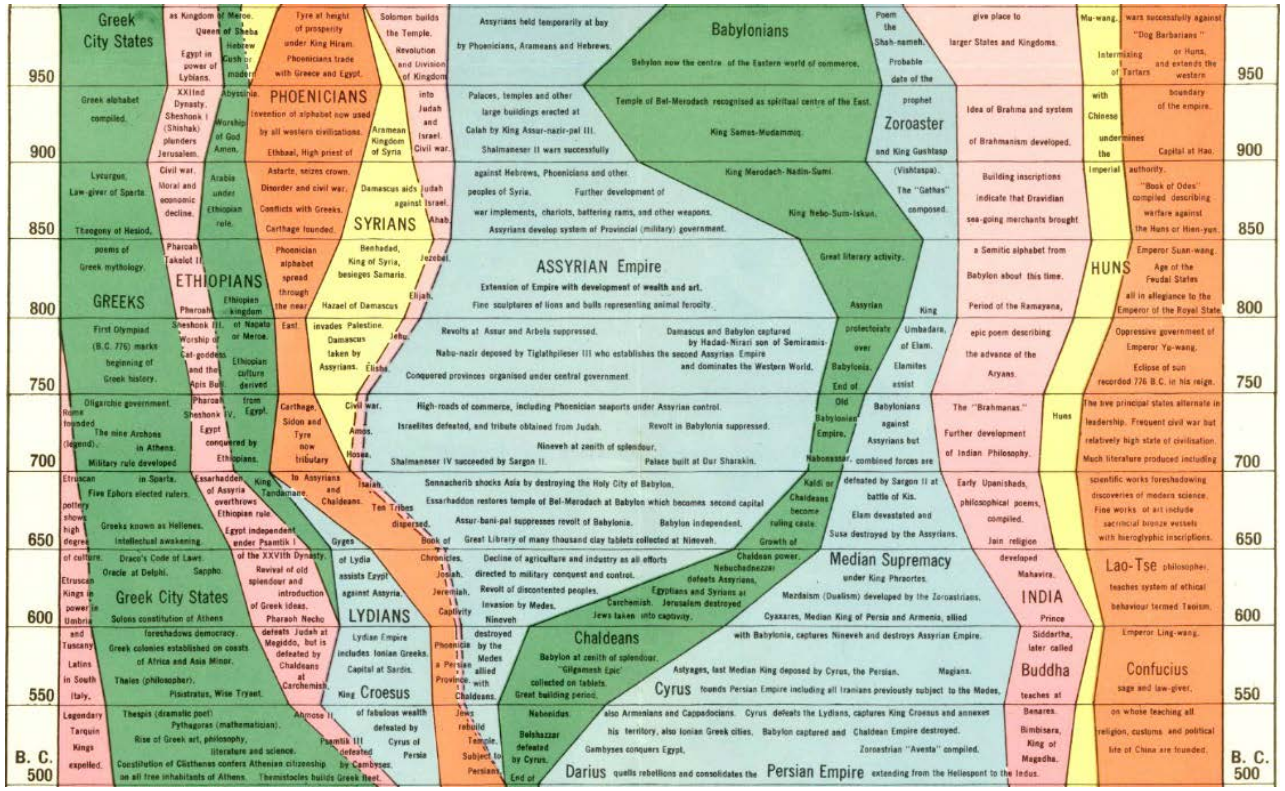

← | **Zoroaster [c.6th-7th century]**: Here we note that Cyrus the Great (590-530BC), founder of the Achaemenid Empire (1st Persian Empire), wherein the god-man "Zoroaster", modeled on the 18th Dynasty (1549-1292BC) winged Egyptian aggregate god Atum (see: supreme god timeline), became the center of the new Persian state religion; the story about Zoroaster receiving the commandments from god on a mountain was merged with the story of Bacchus receiving the laws on two tables of stone, into the reformulated syncretistic story of Moses receiving the ten commandments on two tablets on a mountain. (Doane, 1882) (O)

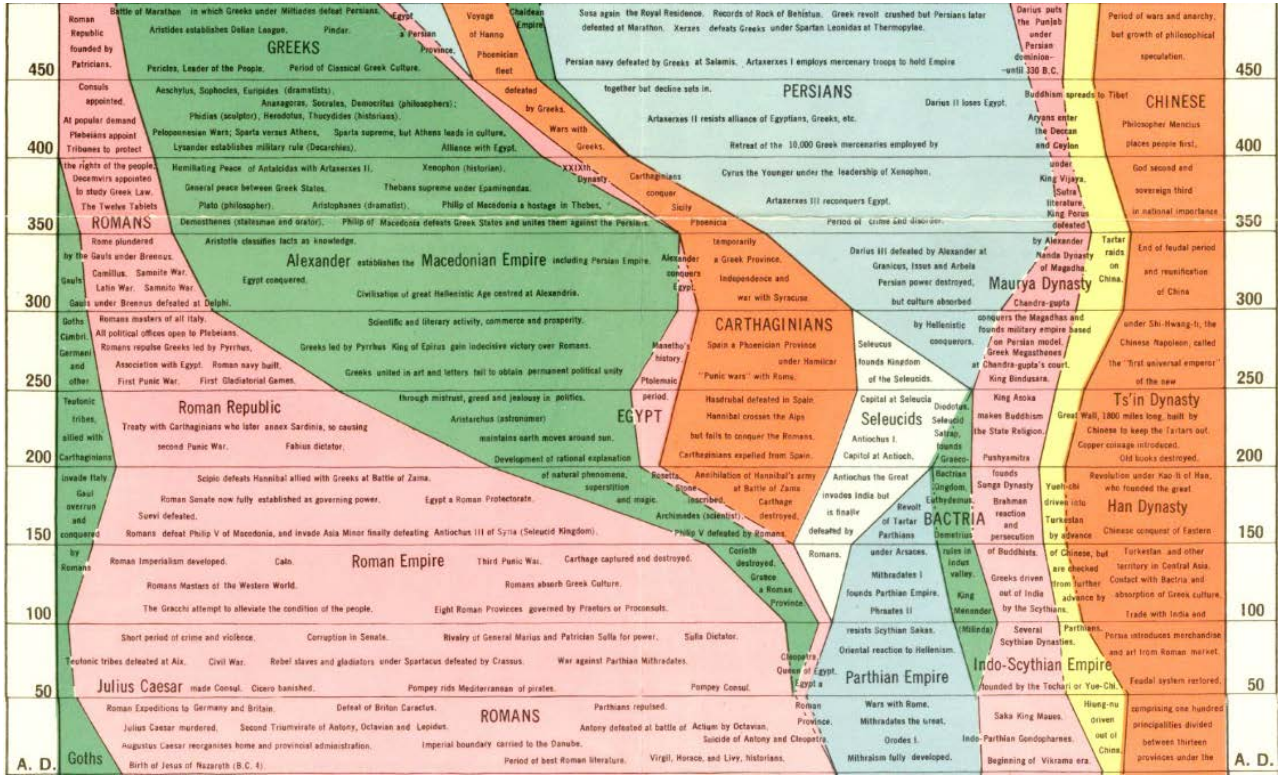

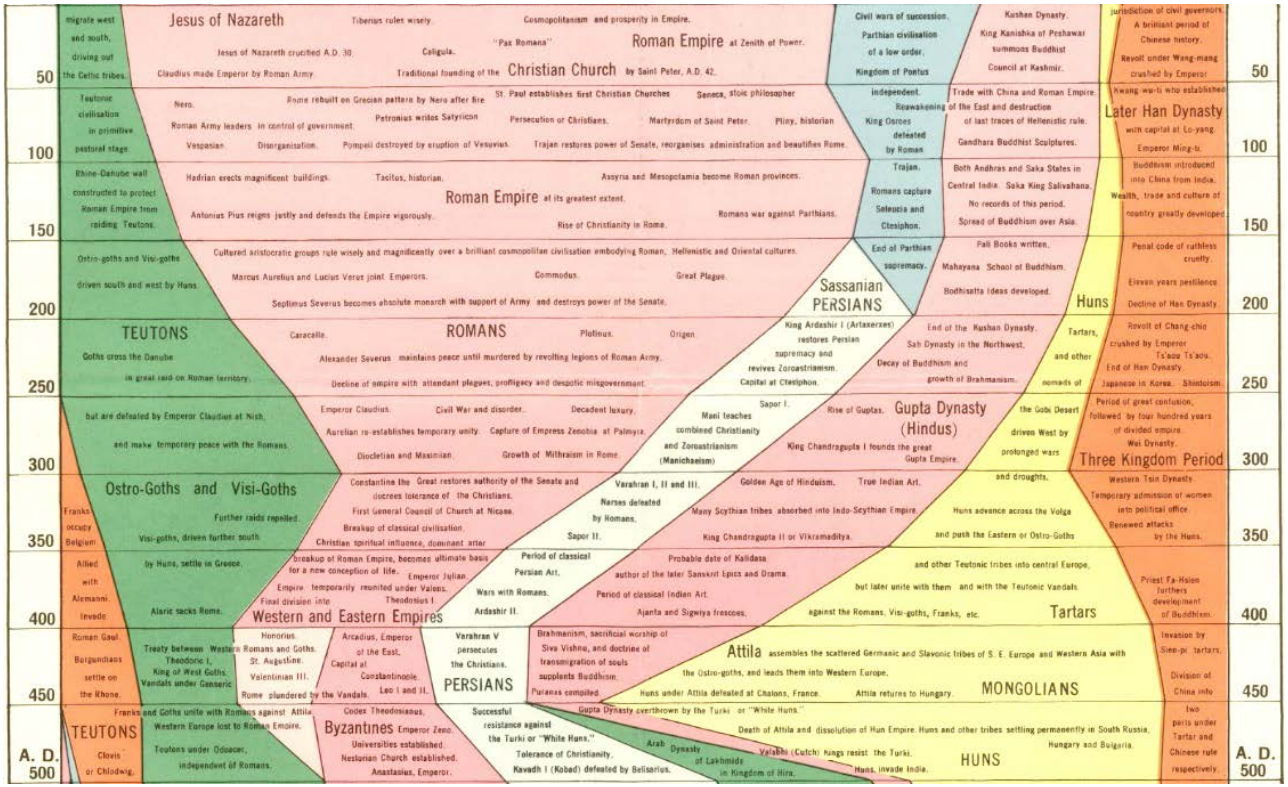

← | **Jesus [0-33AD]**: Here we note peculiarity that a person named "Jesus Christ" was said, retrospectively, to have been born (see: silent historians problem) at the coincidental height of power of the Roman Empire; this, however, is but a result of the second "Roman recension" of the state religion, a confabulous character rescript of the Egyptian god Osiris-Horus (see: Dendera Temple), i.e. the emperors assigning the religious leaders the job to reform, rescript, and assimilate all the various territorial religions to make one new religion (see also: Jesus never existed); It is no coincidence the visual depiction of creation of the cosmos (see: Genesis), death and resurrection of Osiris (see: death and resurrection of Jesus), immaculate conception of Horus (see: virgin birth), etc., was carved onto the walls of Dendera Temple, near Thebes, a job completed in 37AD, as commissioned by the various Roman emperors (100BC-37AD), and that, e.g., 68AD carvings, at Dendera Temple, Roman emperor Nero offering gifts to the gods Isis and Osiris, who in the years 100-300AD became the Virgin Mary and God the Father, respectively, in the religious recension to ensue in the following 1000 years, to form the finalized version of Catholic Christianity.

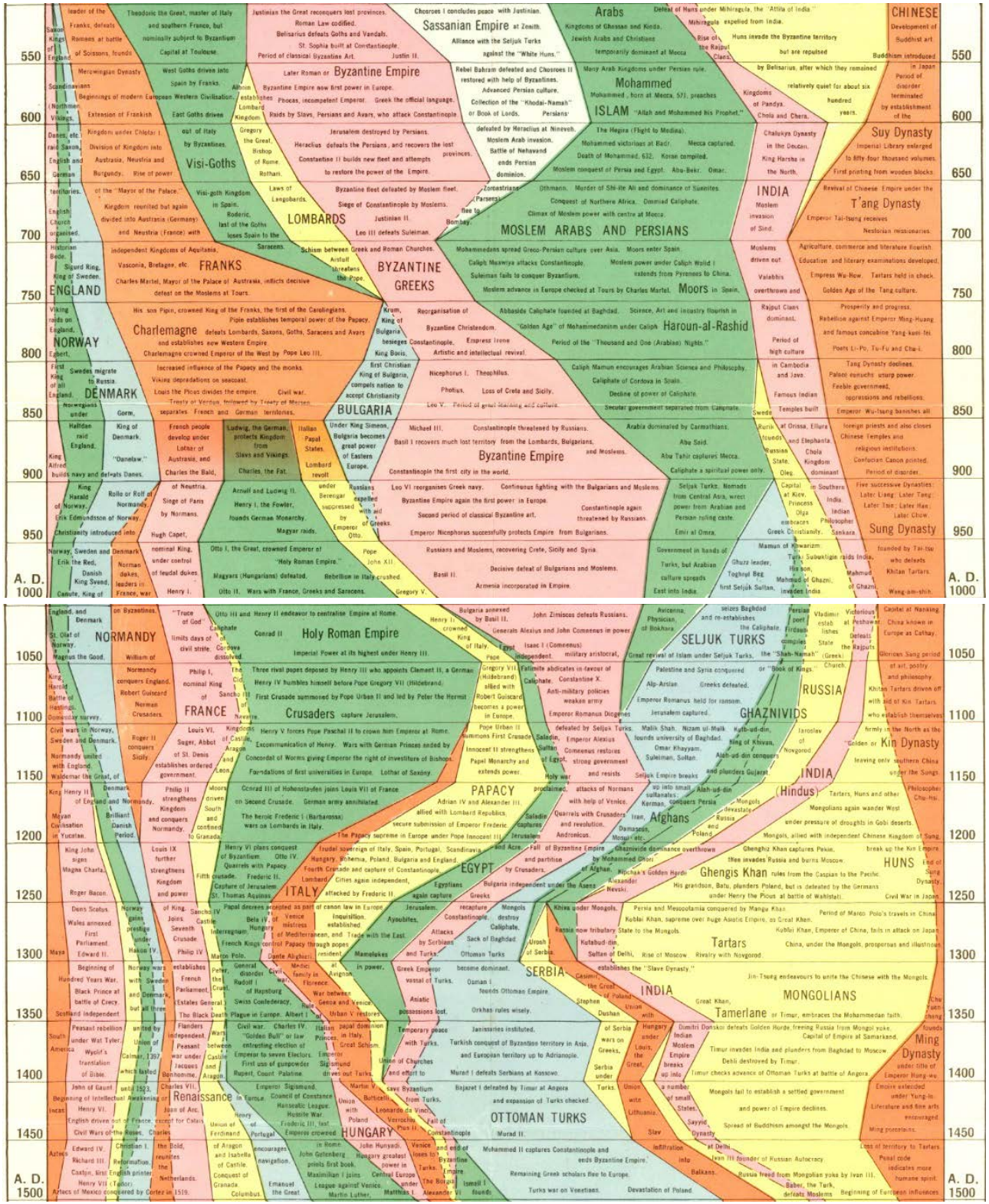

← | **Muhammad [571-632AD]**: Here we note peculiarity, according to religious consensus, of dating the existence of a person named "Muhammad", the purported father prophet Muslim people, a claimed descendant from Abraham, to the period of the early rise to power of the Arab and Persian Empire; here we have, again, but a state religion rescript (see: Muhammad never existed).

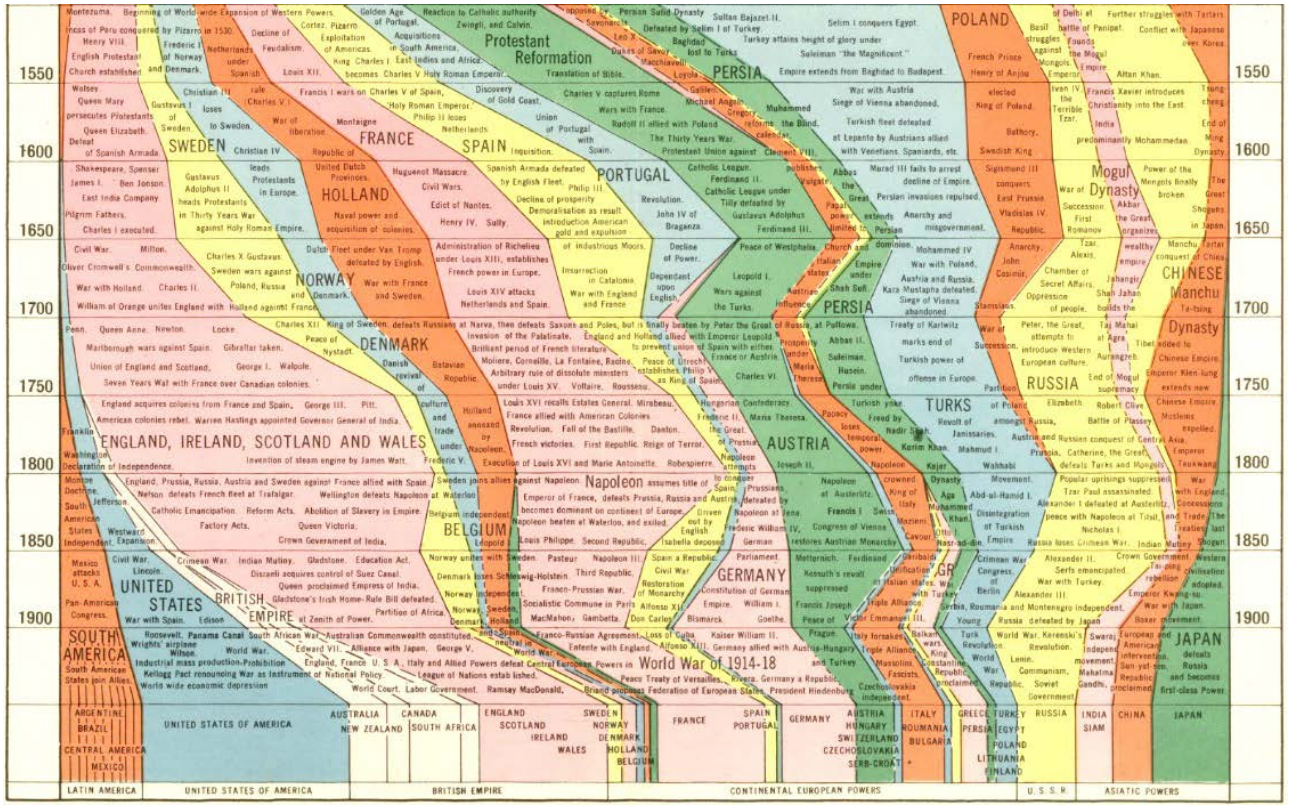

← | **King James Bible [1611]**: with the rise of power of the British empire, we note the construction of the King James Bible, the apex of religion; after which the enlightenment began to produced new models of universal operation, without gods (see: year god was disabused from science) and new scientific bibles (e.g. Pauling's *On the Nature of the Chemical Bond*) and bibles of atheism (see: Atheist Bibles); new intellectual maps emerged, such as Porter's 1939 Map of Physics, wherein "power" became anchored in "knowledge" rather than belief in "gods".

Notes

Spark's original map was 5-foot long, folded into a green cover, and sold for $1 dollar, which had the abstract: "5-foot-long Histomap was sold for $1 and folded into a green cover, which featured endorsements from historians and reviewers." Sparks followed this up with a histomap of religion and a histomap of evolution. (O)

See also

- Evolution timeline
- Great chain of being
- Map of physics
- Molecular evolution table

External links

- Histomap (large) – Slate.com.
- Histomap (overview) – David Map Collections.

θΔics

In site pages, **histories** refer to various "history" or historical overviews of important subjects, which, by virtues of their over-sized involvement in detail and need for coherent organization, have focused Hmolpedia articles.

Subjects

The following are historical articles of key hmolscience-related subjects:

- History of chemical bonding theory
- History of chemical equations
- History of chemical thermodynamics
- History of chemistry
- History of differential equations
- History of human thermodynamics
- History of the steam engine
- History of thermodynamic surfaces
- History of thermodynamics
- Histomap
- Map of physics

Timelines

The following are sideways-scrolling designed timelines of key hmolscience-related subjects::

- Engine development timeline
- Evolution timeline
- Timeline of atheism | Atheism timeline
- Timeline of thermodynamics

Individuals

The following are either articles, timelines, or tables of key hmolscience-related individuals or individuals by group:

- Famous atheists | Chronological (250+)
- Goethe timeline
- History TPs
- Hirata timeline
- HC pioneers | Chronological (50+)
- HM pioneers | Chronological (10+)
- HMS pioneers | Chronological (120+)
- HP pioneers | Chronological (50+)
- HT pioneers | Chronological (500+)
- Libb Thims (history)
- Religio-mythology scholars | Chronological (150+)

See also

- Timeline

θΔics

In humanities, **history** is the study, documentation, and analysis of the past or past events.

Two noted physicochemical history scholars include: Henry Adams and Morris Zucker.

Big history

The newly emerging subject of "big history", such as outlined in the works David Christian and his *Maps of Time: an Introduction to Big History*, tends to incorporate a hmolscience perspective, such as attempting digressions on thermodynamics, big bang theory, and evolution, etc., with the construct of traditional modes of history, e.g. civil war, ancient civilizations, etc., presentation.

See also

- HT pioneers
- History thermodynamics
- Rise and fall of civilization
- History of chemical bonding theory
- History of chemistry
- History of differential equations
- History of human thermodynamics
- History of thermodynamics

External links

- History – Wikipedia.

θΔics

In chemistry, **history of chemical bonding theory** traces the development of the various theories of how atoms bond to each other to form molecules and how molecules and other chemical species chemically bond to each other to form larger structures, all attached via chemical bonds.

Timeline

The following timeline traces the development of chemical bonding theory over the years.

Year	Bonding Model	Theorist	Description	Picture
c.450BC	Atomic theory	Leucippus (c.500-450 BC)	Supposed that the universe consists of only atoms and voids; may have speculated on how the atoms hold together to form larger mass.	
c.410BC	Hook-and-eye atomic attachment	Democritus (c.460-370 BC)	Argued that atoms of solids were hooked and so stuck to one another. In order to make the solid hard, however, the atoms must not only be hooked, but retain their hooked shape when they come into contact with other atoms. [1]	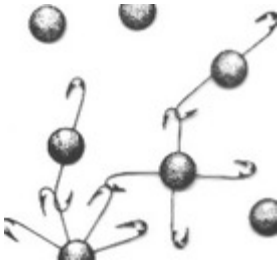
c.75BC	Hook-and-eye atomic attachment	Lucretius (99-55 BC)	"Things which look to us hard (diamonds, basalt blocks, iron, brass bolts) and close-textured must consist of atoms that are **hooked together**, and must be held in union, because welded together through and through out of atoms that are, as it were, many-branched." Liquids are, as rule, formed of smooth and round elements, but sluggish fluid,	

				like oil, may have its atoms: “larger or more hooked and intertangled” than those of wine.	
1675			Nicolas Lemery (1645-1715)	The spike of an acid fit into the grove or inlet of a base to yield a less abrasive product.	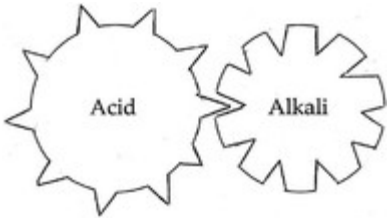
Date?			Person?	"Glued together by rest"	
Date?			Person?	"Stuck together by conspiring motions"	
1718	Force (chemical affinity)		Isaac Newton	"Particles **attract one another by some force**, which in immediate contact is exceedingly strong, at small distances performs the chemical operations, and reaches not far from the particles with any sensible effect."	
1757	Crotchet symbol (bonding bracket)		William Cullen (1710-1790)	“By the mark { I mean them **united to another**.” [4]	$\left\{\begin{matrix} A \\ B \end{matrix}\right.$
1763			Roger Boscovich (1711-1787)	At short range, atoms attracted each other, but at longer range atoms pushed each other way. [5]	
1775			Torbern Bergman (1735-1784)	Pioneered the use of letters, *a*, *b*, *c*, etc., to represent unattached chemicals and adjacent letters, e.g. *ab* or *ac*, to represent chemical "**union**" in the context of before and after aspects of	AB (union)

				affinity reactions.	
1789	Divided force theory		William Higgins (1763-1825)	Theory: the strength of the force between two ultimate particles [atoms] should be divided accordingly. If the force between the ultimate particle of oxygen and the ultimate particle of nitrogen were 6, for instance, than the nitrogen and oxygen would each be assigned a force component of 3. [6]	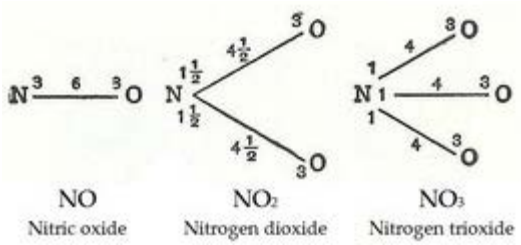
1810	Ball-and-stick model		John Dalton (1766-1844)	In 1810, Dalton had his Peter Ewart make a set of wooden balls, shown adjacent, of different sizes, that could be connected via metal pins and holes in each ball, so to demonstrate his newly "atomic theory".	
1852	Combining power (quantivalence) (valence)		Edward Frankland (1825-1899)	Explained that each element has a certain combining power.	
1858	Single bonds		Archibald Couper (1831-1892)	Extrapolated ideas on elective affinity attractions between atoms to formulate a chemical bonding theory; was the first to use was the first to use lines between atoms, in conjunction with the older method of using brackets. [13] Originated the use of double lines and	A-B (union)

1861	Double bonds Triple bonds		Josef Loschmidt (1821-1895)	triple lines to represent double bonds and triple bonds, respectively, in molecules. [2] "The *bracket* has been employed in various senses in chemical formulae; but I now propose to restrict its use to one purpose only, namely for expressing **chemical combination** between two or more elements which are placed perpendictularly with regard to each other and next to the bracket in a formula. No. I. signifies that two atoms of carbon are directly united with each other; No. II. That two atoms of carbon are linked, as it were, together by an atom of oxygten, the latter beign united to both carbon atoms; No. III. Expresses the fact that one atom of oxygen in the formula of the upper line is linked to another atom of oxygen in the formula of the lower line by the atom of barium." "When two atoms are situated so that their sensitive regions are in contact, or partly	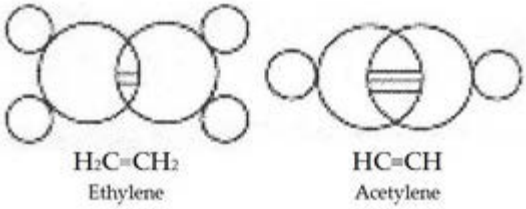
1877			Edward Frankland (1825-1899)		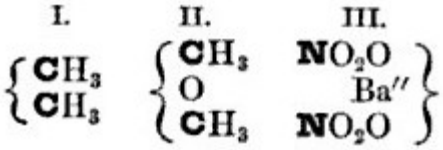

1898	Sensitive region overlap		Ludwig Boltzmann (1844-1906)	overlap, will there be a chemical attraction between them. We then say that they are **chemically bound** to each other." Two iodine atoms, A and B, each represented by a region of size M, attached at their sensitive regions, α and β; which must exist owing to 'the facts of chemical valence'.	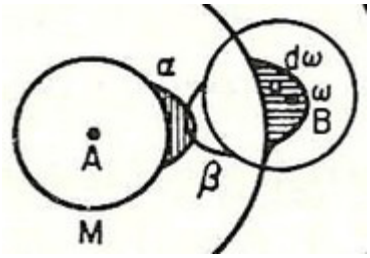
1902	Electron dot structure (shared electrons)		Gilbert Lewis (1875-1946)	Cubit atoms bonding at electron corners to form chemically bonded cubit molecules, in such a matter that each atom finds the most stability when it satisfies "Abegg's law of valence" (atomic shells filled with eight electrons are especially stable atoms).	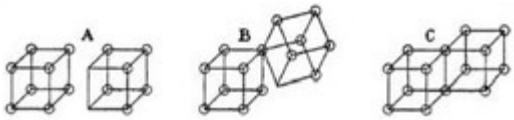
1905			Fritz Haber (1868-1934)	"These cases are generally explained by assuming the breaking of **weak, but 'real', bonds** between the phosphorus tricholoride and chlorine, the hydrochloric acid and the ammonia, and between he carbamic acid and the ammonia. When such an assumption does not agree with the current conception of valence, as in the case of acetic	

				acid, which, like nitric oxide, shows a marked tendency to polymerize just above the boiling point, 'molecular compounds' are assume." — Fritz Haber (1905), *Thermodynamics of Technical Gas Reaction* (pg. 154)	
1913	Shared electrons (shell overlap)		Gilbert Lewis	"Two atoms may conform to the rule of eight, or the octet rule, not only by the transfer of electrons from one atom to another, but also by sharing one or more pairs of electrons. Two electrons thus coupled together, when lying between two atomic centers, and held jointly in the shells of the two atoms, I have considered to be the **chemical bond**."	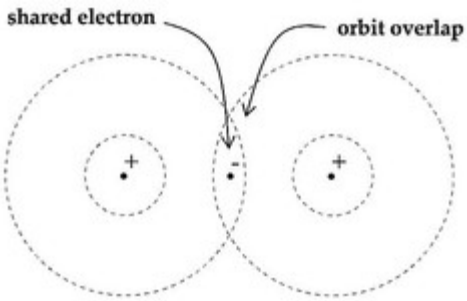
1917	Note: the Dalton-version of the "hook-and-eye bonding method" was still being taught at Oregon Agricultural College (to Linus Pauling); the teaching of this archaic method is what supposedly drove Pauling to write the now famous 1939 textbook *On The Nature of the Chemical Bond*.				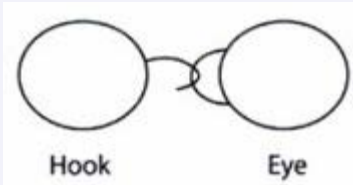
1923	Lewis commented: "Two atoms may conform to the rule of eight, or the octet rule, not only by the transfer of electrons from one atom to another, but also by sharing one or more pairs of electrons. Two electrons thus coupled together, when lying between two atomic centers, and held jointly in the shells of the two atoms, I have considered to be the **chemical bond**. We thus have a concrete picture of that physical entity, that 'hook and eye' which is part of the creed of the organic chemist." (*Valence and the Structure of Atoms and Molecules*)				

Quantum mechanical bonding

				Using Niels Bohr's model of the atom,	

1927	Heitler-London theory		Walter Heitler (1904-1981)	Louis de Broglie's electron wave theory, and Erwin Schrödinger's wave equation, conceptualized the idea that the movements of the electrons, technically called *electron wavefunctions* (mathematical expressions involving the coordinates of the electrons in space) can join together mathematically with plus, minus, and exchange terms, to form a Lewis-type covalent bond.	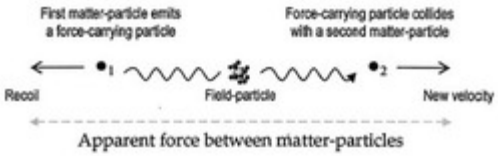 (exchange interaction model) (exchange force)
			Fritz London (1900-1954)	(co-theorist with Heitler)	
1927	Valence bond theory				
c. 1932	Hybrid bond orbitals		Linus Pauling (1901-1994)	[12]	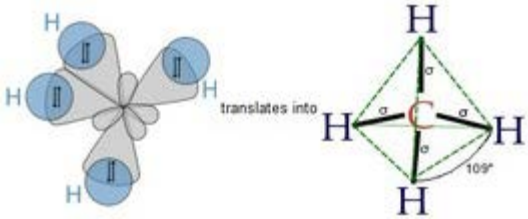
1933	Orbital overlap model of bonding			bonding molecular orbitals antibonding molecular orbitals	

Chemical thermodynamic bonding

1941	Bond energy		Fritz Lipmann (1899-1986)	In his "Metabolic Generation and Utilization of Phosphate Bond Energy", using Lewis thermodynamics (1923), he introduced the notion of "bond energy", according to which energy is stored in the three high-energy phosphate bonds, each on the magnitude of 20 kJ of free energy per bond per mol, amounting to about 55 kJ per mole of ATP; energy which acts as a kind of storage fuel or battery that can be used later to drive typical endergonic reactions	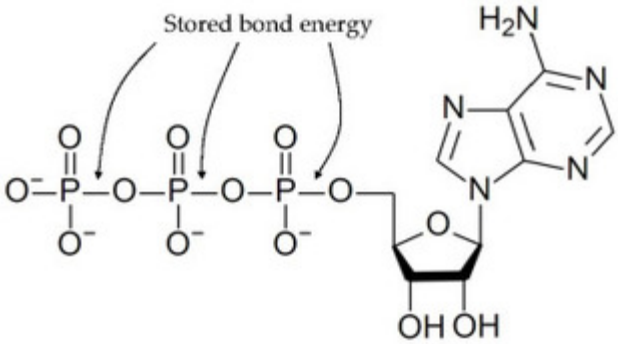
1999	Thermodynamic theory of binding		Julie Forman-Kay (c.1963-)	"Whether two molecules will **bind** is determined by the free energy change (ΔG) of the interaction, composed of both enthalpic (H) and entropic (S) terms."[9]	

Human chemical bonding

In 1995, American electrochemical engineer Libb Thims began to work on the problem of how's and why's of the method by which free energy actuates to predict the feasibility of human reproduction reactions (child formation), the core aspect of mate selection, modeling each person as a chemical entity, using Bergman chemical symbol notation, as follows:

$$M + F \rightarrow C$$

according to the view that if one can measure the free energy of the reacting system in the initial state (M + F), say the year the couple first meet, and the free energy of the reacting system in the final state (C), say the year in which the

child becomes an adult and leaves the confines of the parental home, the entire reaction can thus be predetermined as functionable or not according to the spontaneity criterion. In *circa* 2002, however, Thims arrived at the view (see: Thims history) that in his calculations he was neglecting the stored bond energy, in the Lipmann sense (above), of free energy associated with the tightly formed parental bond structure M≡F at the point of the child departure, say at 18-year mark into the reaction; hence the following newly-conceived human reproduction reaction mechanism quickly came to the fore, as a type of glass wall problem:

$$M + F \rightarrow MF + C$$

The problem of nature of the "human chemical bond", symbol MF or M≡F, arose from the quagmire a very-large yet unsolved, let alone completely unaddressed, problem to be tackled. It took nearly seven years to get a handle on this human chemical bond "≡" problem, as outlined below, which involved an assimilation of the above historical models, into a working model to explain the phenomenon of the (electromagnetic force) bonding of human molecules (people):

2003	Human molecular orbital theory		Libb Thims (c.1975-)	Developed the concept of the 'human molecular orbital' (modeled on standard molecular orbital theory), in which the 90 percent probability region of a person's location over the surface of the earth, the person considered as a human particle, is satellite-tracked and traced into that of common 'activity orbitals', wherein each person is shown inside of American anthropologist Edward Hall's 1996 conception of 'reaction bubbles' (a type of personal space), according to which the probability region boundary is defined as one's thermodynamic boundary. Bonding begins to occur when common 'activity orbitals' 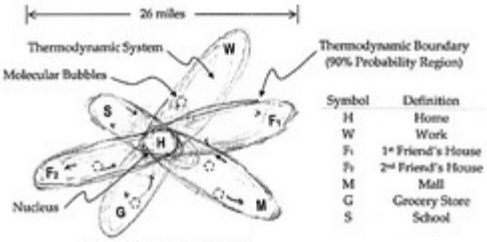 Human Molecular Orbital

			overlap and in which reaction bubble interaction occurs.	
2004	Field particle exchange theory	Libb Thims	Using particle physics logic, developed the model that a bond holds owing the actions of an exchange force, in which the exchange of field particles carries and transmits the force: "when attraction, related to field-particle exchange, outweighs repulsion, related to field-particle exchange, then those 'attached' matter-particles [ô], as humans, are held in place —as if an apparent 'bond' were in existence."	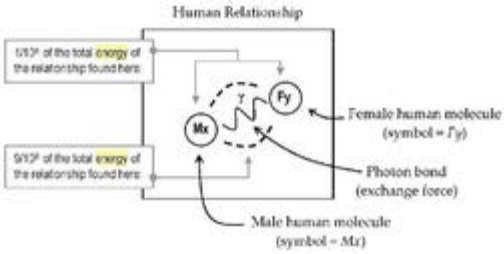
2005	Human chemical bond	Libb Thims	Began to incorporate turning tendencies (1885), Gottman stability ratios (1994), and Feynman diagram models, photon-electron sensory stimulus descriptions, etc., into a more robust human bonding model as outlined in the unfinished JHT article "On the Nature of the Human Chemical Bond." Began to blend evolutionary	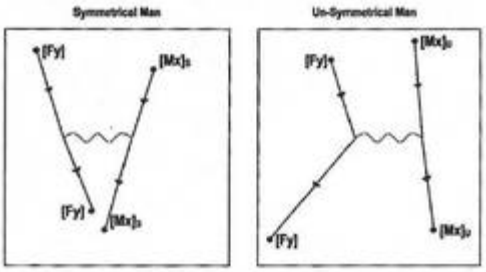

2007	Dodecabond model	Libb Thims	psychology into chemical thermodynamics arguments, defining human bonding in terms of specific enthalpic ties and entropic ties, devoting nearly half the 2007 textbook *Human Chemistry*, to a unified model of human chemical bonding. [10]

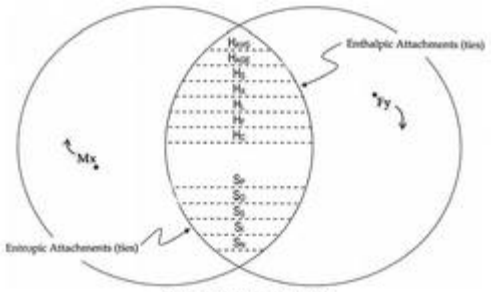

Do-deca-bond model

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2. Loschmidt, Joseph. (1861). *Chemische Studien: Constitutions-Formeln der organischen Chemie in graphischer Darstellung : Das Mariott'sche Gesetz* (*Chemical studies: Constitutions formulas of organic chemistry in graphical representation: The Act Mariott'sche*). Gerold.
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Further reading

â— Bantz, David A. (1980). “The Structure of Discovery: Evolution of Structural Accounts of Chemical Bonding”, in: *Scientific Discovery: Case Studies* (editor: Thomas Nickles) (pgs. 291-330). Taylor & Francis.

External links

â— Chemical bonding model – Wikipedia.

θΔics

In

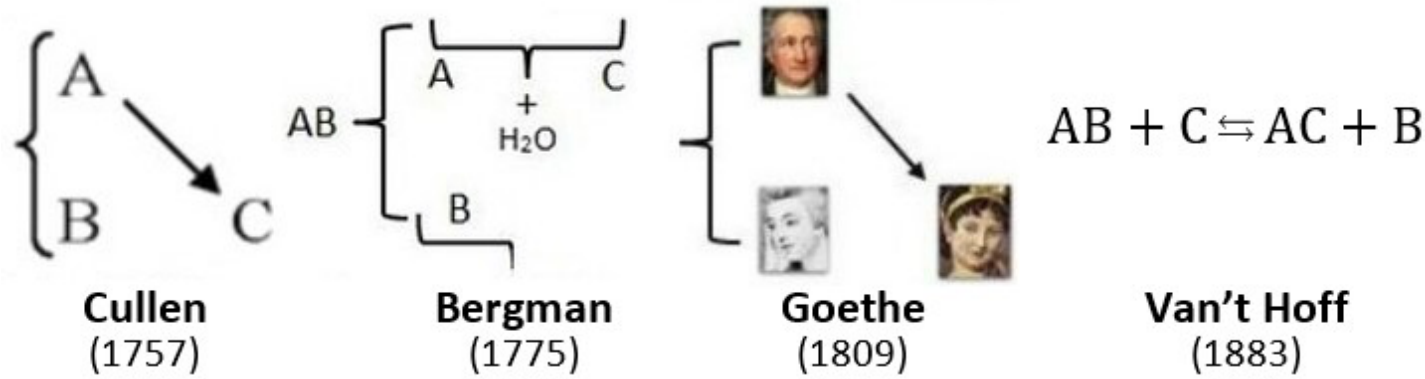

A basic overview of the history of the invention of the chemical equation, which began with the chemistry lectures of William Cullen (1757), who sought to diagram the affinity chemistry logic embedded in the affinity table, as devised by Etienne Geoffroy (1718), as based on Newton's Query 31.

chemistry, **history of chemical equations** refers to the historical development of the use of "symbols" and "characters" to represent chemicals and chemical reactions in diagrammatic or equation—technically: chemical equation—format. In short, in 1718 French chemist Etienne Geoffroy made the first affinity table, based on English physicist Isaac Newton's final and last "Query 31" (which contained verbal descriptions of affinity reaction preferences), and on this framework, in the 1750s, Scottish physician and chemist William Cullen, in his university lectures, began to employ 'darts' (→), i.e. affinity force, and 'crotchets' ({), i.e. chemical bonds, to represent the nature of change involved when various chemicals are brought into contact—all chemical equations to follow are modifications of this general scheme.

Beguin

In 1615, French iatrochemist Jean Beguin, in his *Beginner's Chemistry* (*Tyrocinium Chymicum*), detailed the reaction of corrosive sublimate ($HgCl_2$) with sulfide of antimony (Sb_2S_3), as shown below: [1]

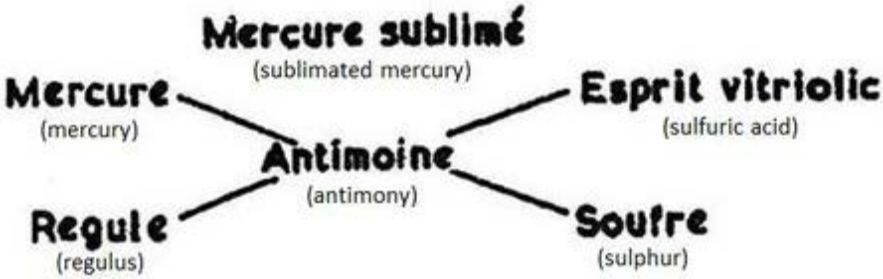

This, according to English chemistry historian Alistair Duncan, is the earliest notion of a chemical reaction diagram.

English chemistry historian Maurice Crosland, likewise, in his noted 1959 article "The use of diagrams as chemical 'equations' in the lectures of William Cullen and Joseph Black", states that Beguin's reaction diagram (above), can be considered as the "first chemical equation". [2] English chemistry historian Henry Leicester, likewise, in his 1971 *The Historical Background of Chemistry*, defines this as "an almost modern equation." [15]

Beguin's book was the second book on the required reading list for the chemistry lectures of Dutch physician and chemist Herman Boerhaave, the leader of influential "Leyden school" of physical science (see: schools of thermodynamics), which included students: Andrew Plummer, William Cullen, and Joseph Black. Plummer, of note, became a professor of chemistry at the University of Edinburgh, from 1726 to 1755, whose ideas on attractive and repulsive forces involved in chemical affinity had influence on his successors Scotts physician and chemist William Cullen and physicist and chemist Joseph Black.

Cullen

In 1757, Scottish physician and chemist William Cullen, building on the new science of affinity chemistry, recently

launched by French chemist Etienne Geoffroy (1718) based on Isaac Newton's final and last "Query 31", pioneered the use of reaction arrow a 'dart' (→) to express or characterize the elective affinity preference (affinity force) of the reacting species and to use the crotchet ({) to signify species united, the prototype to the notion of the chemical bond (see: history of chemical bonding theory). The following shows three examples of Cullen's 1757 affinity reaction diagrams (center), with the modern chemical equation version shown adjacent (right). [3]

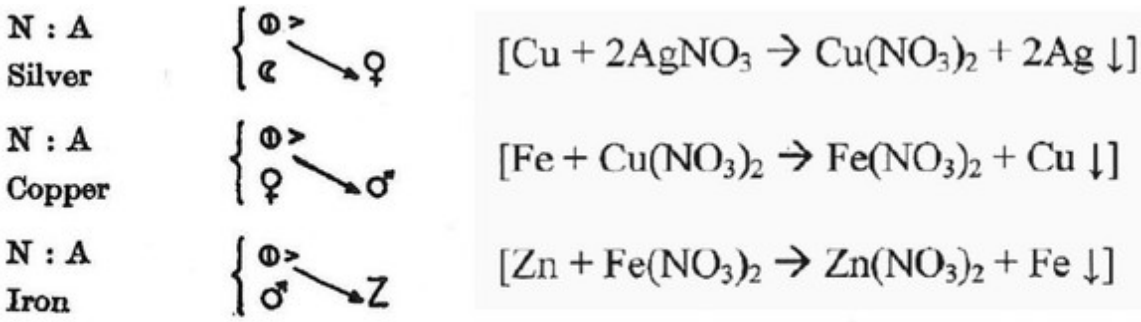

Cullen's single elective affinity reactions diagrams (center)

The following are further examples of Cullen's so-called single elective affinity reaction (left) and double elective affinity reaction (right): [12]

which Cullen, in his own words, summarizes as such:

> "From the tables of elective attractions of Mr. Geoffroy, we may know whether or not a double elective attraction may be applied; by looking at the column of marine acid (hydrochloric acid [HCl], R1:C2) in his table we find whether the marine acid has any relation with regard to the silver (R5:C2). I find silver stands above quicksilver (mercury [Hg], R6:C2) and I draw a dart."

the R#C# being the row number and column number of the position of the particular chemical in Geoffroy's affinity table (1718). Next Cullen states, referring to the right diagram (above), that:

> "By looking at the column of nitrous acid, I find quicksilver (R5:C3) stands above silver (R6:C3); then I draw a dart from the acid to it."

This is diagrammed above on the right. This reaction diagram is the first case of a double elective attraction used in Cullen's lecture notes and possibly the first ever mention in science. [2]

Black

The next development of chemical equation theory came from Cullen's most-famous student Scottish physicist and chemist Joseph Black, who used modified diagrams, which appear in a manuscript of his early lectures, to explain what

happens in double displacement reactions. In Black's reaction diagrams, he seems to replace Cullen's bonding bracket conception by what French chemist Pierre Macquer called the "molécule" (molecule) or "partie intégrante" (integral part) by a circle cut in two, where the two halves of the circle are the "atomes" (atoms) or "parties constitutives" (constituent parts), though Black does not use these specific terms. The following diagram, for example, according to Black, illustrates the reaction process where by "if a compound of volatile alkali with an acid is added to a mild fixed alkali, the fixed air will unite with the volatile alkali, while the fixed alkali joins itself to the acid":

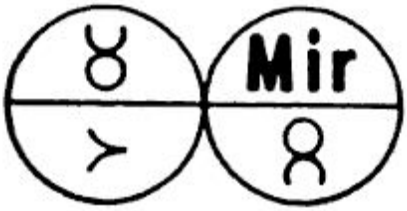

where ♉ is volatile alkali, ≻ is any acid, Mir is fixed air (CO_2), and ♌ is fixed alkali. [4]

Bergman

In 1775, Swedish chemist Torbern Bergman, published his famous *A Dissertation on Elective Attractions*, which contains what has come to be called "Bergman's affinity table", a 59-column 50-row affinity table, the largest ever assembled, and "Bergman's affinity reaction diagrams" (64 diagrams). [5] The table was an expanded and advanced version of French chemist Étienne Geoffroy's original 1718 affinity table. The follow, to exemplify, is Bergman reaction #21 (of his 64 reaction diagrams): [6]

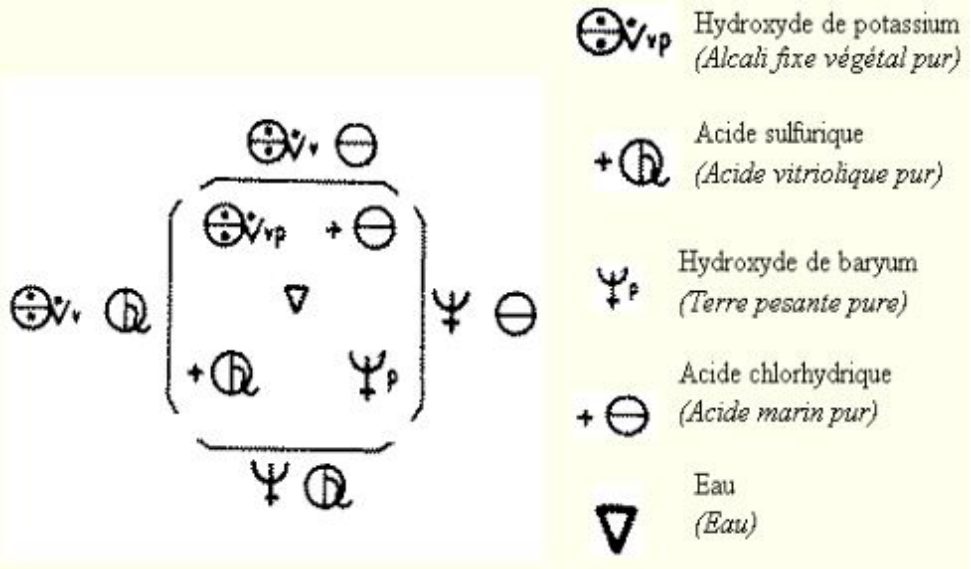

If this were re-written in modern "reactants" (left hand side) reacting (arrow) to form "products" (right hand side) style of chemical equation format, this reaction would be shown as follows:

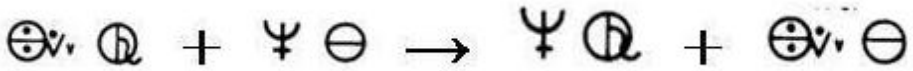

or in modern chemical nomenclature notation:

$$K_2SO_4 + BaCl_2 \longrightarrow BaSO_4 + 2\,KCl$$

In 1781, French chemist Jacques Demacy (1728-1803) was employing the following Cullen-style reaction equation diagram:

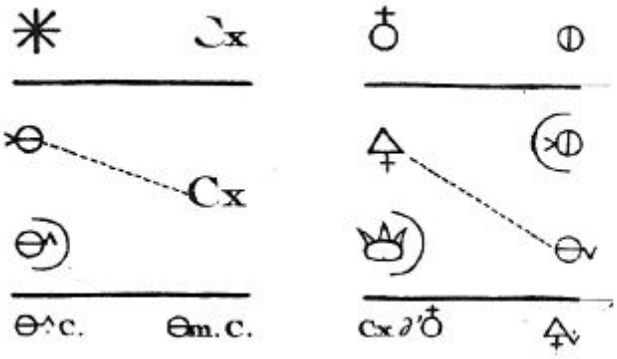

Demach, in conceptual mindset, was an adherent of Georg Stahl's phlogiston theory and, supposedly, "remained wary of the new chemical nomenclature of Torbern Bergman"; meaning that he might have been wary about his chemical equation methods as well, although the above seems to be in the neighborhood of the Bergman chemical equation method. [13]

In 1794, German polymath Johann Goethe gleamed the insight of the science of human chemistry and initiated the subject of human chemical reaction theory, wherein his draft notes (which were destroyed), to the construction of his 1809 physical chemistry based novella *Elective Affinities*, as has been argued, conceptualizing the first human chemical reaction equations (see: EA|IAD: Reaction decipherment), using the 1785 German-translation of Bergman's textbook, to note; one example being Bergman reaction #20, shown below (left), which would have acted to serve the template for the reaction scenario, shown below (right), of P1:C3 wherein the Captain comes to Estate and displaces Charlotte from her marriage bond with Edward:

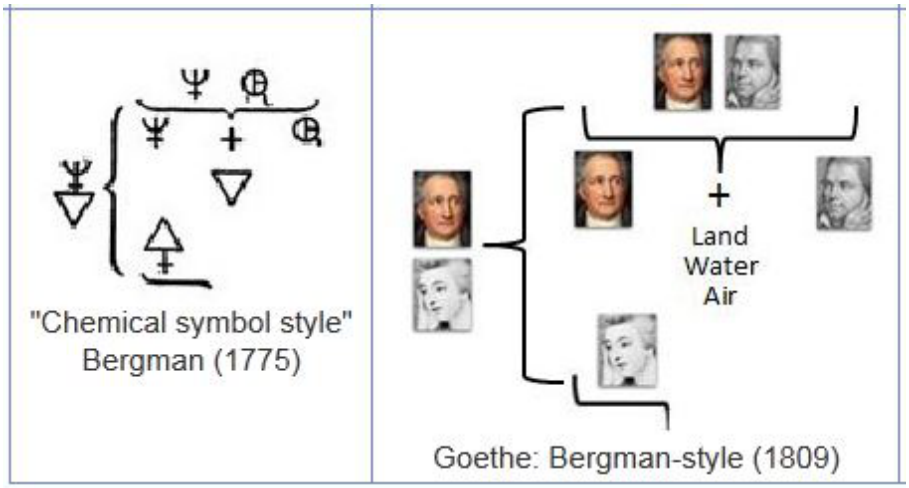

In 1782, French chemist Antoine Lavoisier was employing, it seems for the first time, a "horizontal" (modern) mathematical-stylized (+, -) representation of chemical reactions, using ratios and products: [8]

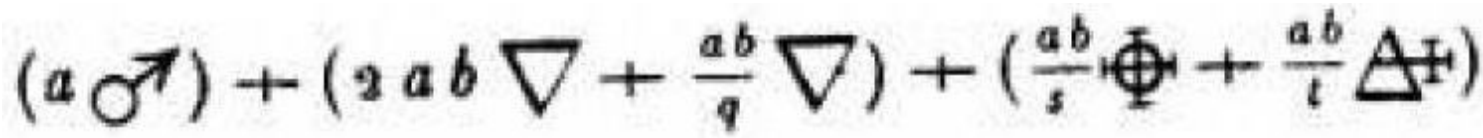

Moreover, Lavoisier, in 1787, according to British physical chemist Harold Hartley (1878-1972), was the first to make the first chemical equation with the sign of equality (=) who thus made balance the arbiter of the chemical balance sheet. [14]

In *circa* 1794, German chemist Jeremias Richter (1762-1807)—the person who coined the term stoichiometry as "art of chemical measurements, which has to deal with the laws according to which substances unite to form chemical compounds"—introduced or employed the following chemical equations: [7]

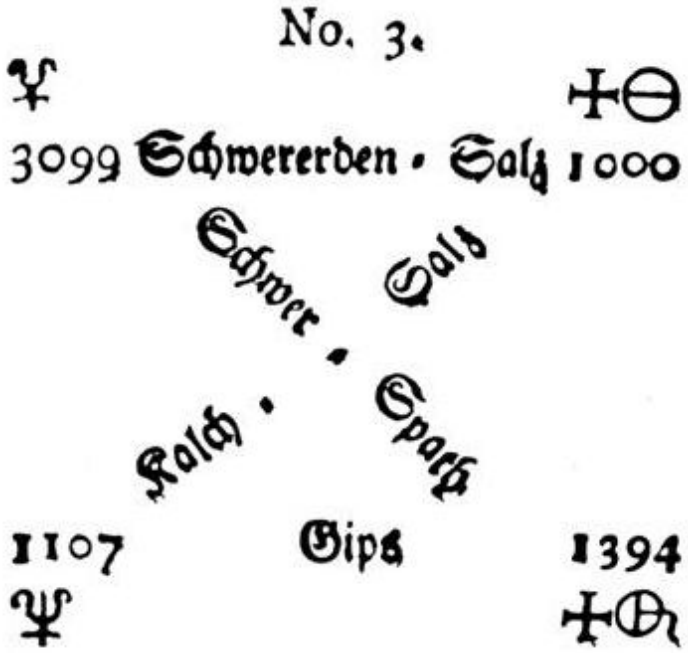

The following are chemical equations, in German, from the chemistry entry of the 1857 edition of *Copier's Universal Encyclopedia*: [16]

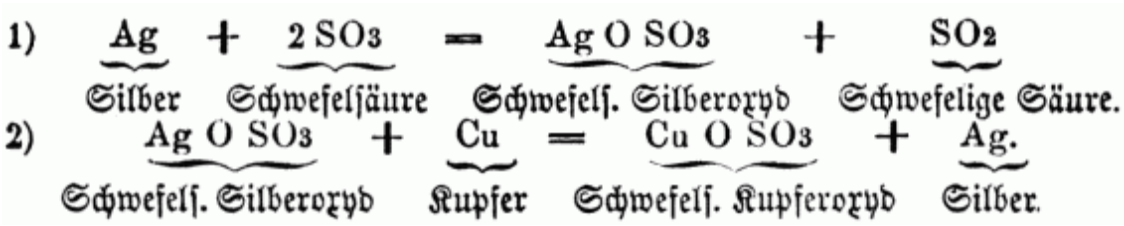

The following is an 1858 chemical equation depiction of the reaction of acetate of lead with chromate of potass, from English chemist John Bidlake's *Textbook of Elementary Chemistry*, chapter three: "Chemical Affinity", which shows the Bergman-style reaction notation (above) and the semi-modern products-going-to-reactants (before and after) reaction notation (bottom), which uses the equals sign "=", hence the name "equation", a type of chemical reaction that Bidlake defines as a "double decomposition" (or double elective affinity as Goethe would have called it): [9]

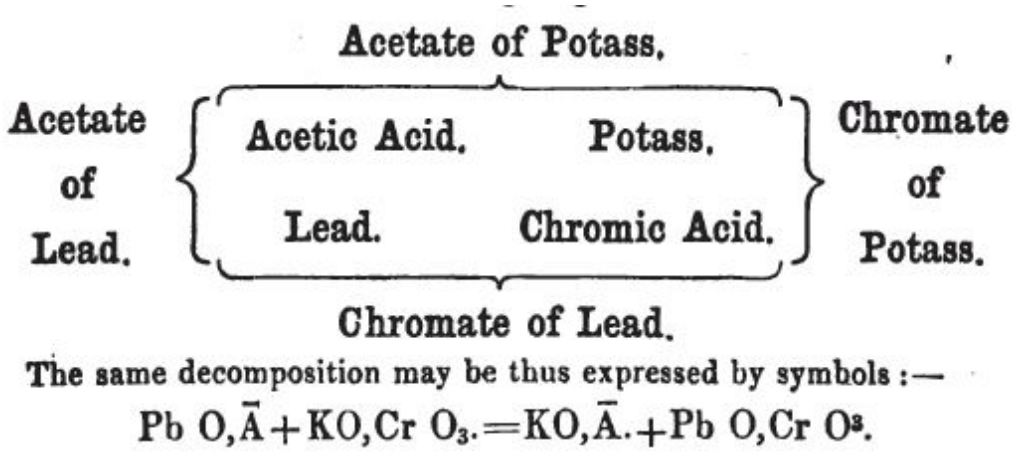

In 1884, according to German physical chemist Walther Nernst, upgrade from the equal sign " = " symbol to the two-way reaction arrow "⇆" symbol (or ⇌), signifying a reversible reaction, came about in the 1884 *Studies in Chemical Dynamics* of Dutch physical chemist Jacobus van't Hoff, where in he made the reaction equation upgrade from affinity chemistry to chemical thermodynamics. In his chapter on chemical equilibrium, van't Hoff gives the following example of a homogeneous equilibrium in a liquid system:

$$CH_3COOH + C_2H_5OH \rightleftarrows CH_3COOC_2H_5 + H_2O$$

according to which, conceptually, the two-way arrow "⇆" signifies the "equilibrium to be regarded as the result of two changes taking place with the same velocity in opposite directions, so that, in the case of homogeneous equilibrium, the study of the velocities of the opposing reactions permits us to calculate the ratio between the concentrations of the two systems when the state of equilibrium is attained." [11] This might well represent the start of modern chemical equation methodology.

In the preface to the 1978 Dover-edition of his book *Historical Studies in the Language of Chemistry*, English chemistry historian Maurice Crosland states that the “history of chemical equations” is a research topic still to be investigated, citing his 1959 article, and commenting that he is concurrently gathering information for a more robust history of chemical equations. [11]

See also

â— Atomic theory

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θΔics

In science, the **history of chemical thermodynamics** traces the origin of the subject of the application of the equations governing the operation of the general heat engine, namely the first law, second law, and later third law, to chemical processes, reactions, transformation, and phenomenon—in other words of chemical thermodynamics. The intricacies of the historical origin of chemical thermodynamics is summarized well by Canadian physical chemistry historian Keith Laidler: [1]

> "The story of how chemical thermodynamics developed is a somewhat tangled one, since several investigators worked along different lines and quite independently of one another."

(add discussion)

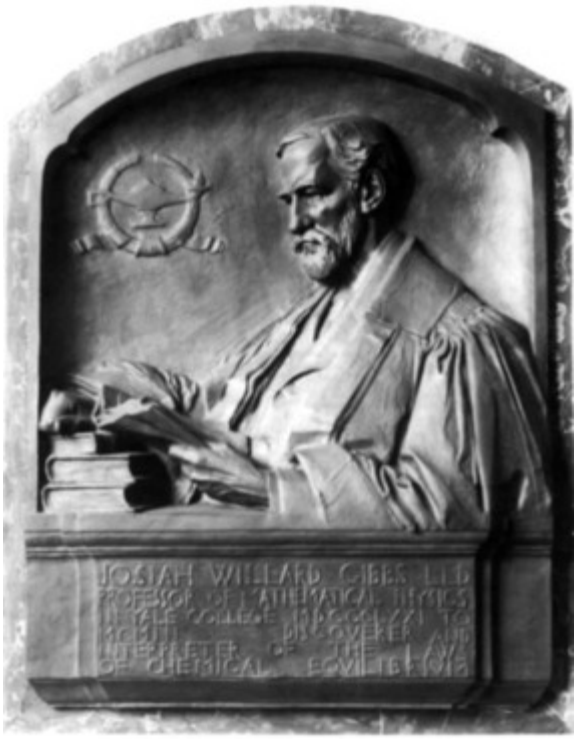

A wall statue of American engineer Willard Gibbs (at Yale University), captioned as "discoverer and interpreter of the laws of chemical equilibrium", the central founder in the **history of chemical thermodynamics**.

Overview

American chemistry historian William Jensen, citing Gilbert Lewis (1923), chapter one, summarizes that chemical thermodynamics was characterized by three distinct periods:

> 1. The establishment of the basic laws of thermodynamics (1842-1865).
> 2. The application of these laws to the theory of chemical affinity and equilibrium (1873-1905).
> 3. The quantification of chemical thermodynamics via a fusion of theory with experimental data (1905-1923).

Jensen goes into more detail into each of these periods, in terms of the people and subjects involved. [12]

Mathematics

The 1788 variational principle of equilibrium of Joseph Lagrange, supposedly, was one of the formal apparatuses that led to the development of chemical thermodynamics. [11]

Pre-history

The preliminaries to the distinct science of chemical thermodynamics are the sciences of firstly affinity chemistry (1718-1882), launched with the making of Geoffroy's affinity table, as derived from Isaac Newton's famous Query 31, a subject that, according to chemistry historian and chemical thermodynamicist James Partington, is classified as marking the start or pre-history of the science of physical chemistry.

Secondly, the early subjects of "thermochemistry", examples of which are: the work of William Cullen (evaporative refrigeration, 1748), Joseph Black (latent heat, 1761), Richard Kirwan (specific fire, 1777), Joao Magellan (specific heat, 1780), Antoine Lavoisier and Pierre Laplace (reaction calorimetry, 1782), Person (heat capacity, date), Dulong-Petit law (Pierre Dulong and Alexis Petit, 1819).

Thirdly, was Hess' law (1840), that the heats of reaction in successive reactions must be added, formulated by Germain Hess.

The fourth and final transition stage into the newly forming subject of chemical thermodynamics was the short-lived thermal theory of affinity and the so-called "principle of maximum work", developed by Julius Thomsen (1854) and Marcellin Berthelot (1860s), which argued that heat release was the true driving force of chemical affinity and hence the

true measure of chemical reactions. This theory, owing to shortfalls, such as not being able to explain endothermic reactions, was eventually replaced with the "thermodynamics theory of affinity".

All of this, in one way or another, was later integrated into the finalized version of what would become known as "chemical thermodynamics", a term that would not become commonplace until the early 1920s, finalizing with the work of Gilbert Lewis (1923) and Edward Guggenheim (1933) otherwise known as modern chemical thermodynamics.

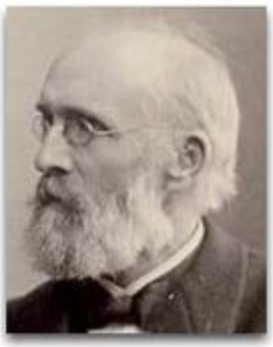

While German physicist Rudolf Clausius (1865) laid out the foundation of thermodynamics, it was German physical chemist August Horstmann (1869) who was the first to apply the newly formed "entropy" concept to chemical problems.

Clausius-Horstmann

In 1862, German physicist Rudolf Clausius, the central founder of thermodynamics, introduced his concept of "disgregation", a measure of the separation of the parts of a system from one another, a preliminary (or rather precursory) version of entropy, and suggested, supposedly, that the notion of disgregation would be particularly useful in chemistry as a measure of "affinity". [2] This, however, may be retrospect mis-interpretation (by chemistry historians Helge Kragh and Stephen Weininger), as nowhere (according to Google Book search) in Clausius' 1865 *The Mechanical Theory of Heat* is the word "affinity" to be found, nor is Clausius given mention in any of the various 19th century histories of chemical affinity. In any event, Clausius does (somewhere) outline how his new theory of energy and entropy of bodies applies to chemical reactions.

In 1865, German physical chemist August Horstmann began to study the work of Clausius, supposedly having been inspired by his disgregation ideas, for possible applications in the calculation of equilibriums in chemical systems.

In 1868, in order to ascertain molecular weights via a vapor density method, Horstmann began to investigate the effect of temperature on the equilibrium constant for a dissociation process, beginning with the Clausius-Clapeyron equation, but extending it to apply to a substance that is dissociating.

In 1869, Horstmann, in his paper “Vapor Pressure and Heated Evaporation of Ammonium Chloride”, was the first to apply entropy to chemical problems, and is often said to mark the start or beginnings, albeit not necessarily the foundations, in any sense of the matter, of the science of chemical thermodynamics. [3] In 1872-73, Horstmann applied the entropy principle to the problems of chemical dissociation, such as, supposedly, the dissociation of phosphorus pentachloride into phosphorus trichloride and chlorine: [2]

$$PCl_5 \rightarrow PCl_3 + Cl_2$$

In October 1873, Horstmann famously announced the condition for chemical equilibrium to be that of maximum entropy. [4] That year he also gave the first, although incomplete, thermodynamic explanation of the Guldberg-Waage law of mass action (1864). [2] German chemist Fritz Haber, in 1908, gave an excellent summary of Horstmann’s contribution to science: [8]

> “[While it was] Clausius [who first] called attention to the general applicability of the theory of heat to chemical reactions … we have **Horstmann** to thank for the fundamental advance from this incidental observation to a fruitful thermodynamic treatment of chemical problems.”

(add)

Massieu | Characteristic functions

In 1869, French engineer Francois Massieu, building on Clausius, in his "On the Various Functions Characteristic of Fluids", laid out the logic of "characteristic functions" (see: notation table), specifically his 1869 "characteristic function", symbol Ψ (psi), of a fluid body, or Massieu functions, as they have come to be known. Retrospectively, in 1876, Gibbs summarized Massieu's contribution as follows: [9]

> "Massieu has shown how all the properties of a fluid 'which are considered in thermodynamics' may be deduced from a single function, which he calls a characteristic function of the fluid considered; he introduces two different functions of this kind, vis, a function of the temperature and volume, which he denotes by Ψ, and a function of the temperature and pressure, which he denotes by Ψ'; in both cases he considers a constant quantity (one kilogram) of the fluid, which is regarded as invariable in composition."

Though not necessarily a treatise on "chemical problems" the logic of characteristic functions of fluids was used by Gibbs, combined with the work of Clausius, to formulate chemical thermodynamics.

Clausius-Gibbs

The dominate thread of chemical thermodynamics is that attributed to the 1873-1878 work of American engineer Willard Gibbs, who extended the energy/entropy equations of Clausius to chemical phenomena, contained largely in his 700-equation "On the Equilibrium of Heterogeneous Substances".

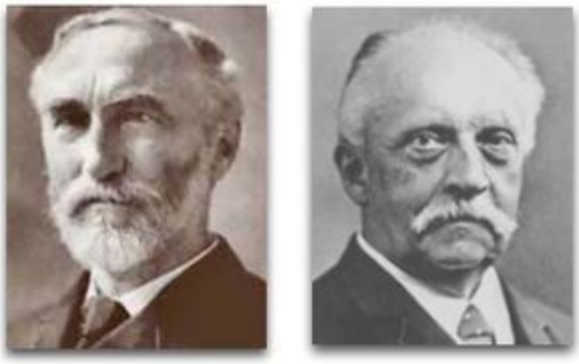

American engineer and mathematical physicist Willard Gibbs (1876) and German physicist Hermann Helmholtz (1882) laid the foundation of chemical thermodynamics.

Gibbs-Helmholtz

The publication of German physicist Hermann Helmholtz' 1882 "On the Thermodynamics of Chemical Processes", in which he extended the earlier "available energy" ideas of Gibbs into that of "free energy" is often said to be the capstone of the finalized launching of chemical thermodynamics.

Gibbs | Planck | Duhem approach

(add) [2]

Van't Hoff | Nernst approach

(add) [2]

Van Laar | Nernst debate

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Ostwald and the energeticists

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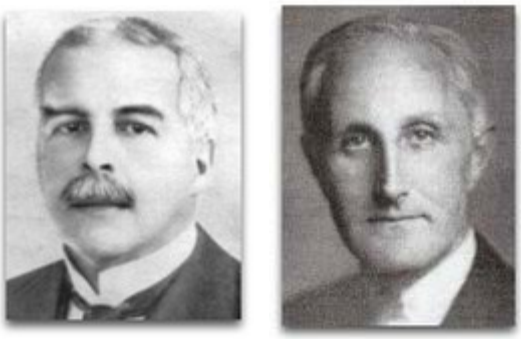

Modern chemical thermodynamics | 1933-present

The founders of so-called "modern chemical thermodynamics" are American physical chemists Gilbert Lewis and Merle Randall, for their 1923 textbook *Thermodynamics and the Free Energy of Chemical Substances*, a simplified, polished, and applied version of the more robust work of Gibbs, and English physical chemist Edward Guggenheim, for his 1933 textbook *Modern Thermodynamics by the Method of Willard Gibbs*. [5] In 1986, American chemical engineer John Prausnitz, of the University of California, Berkeley, in his "The Two Sources of Chemical

Physical chemists American Gilbert Lewis (1923) and Englishman Edward Guggenheim (1933) are considered as the founders of "modern chemical thermodynamics" for their textbook truncations of the dense earlier foundational work of American engineer and mathematical physicist Willard Gibbs (1976).

Thermodynamics" article, stated the following: [10]

"While the essential ideas of classical thermodynamics were established in the 1850's and 60's, application of these ideas to chemical phenomena came later, primarily by Gibbs in the 1870s. However, Gibbs' work was not appreciated by chemists until the turn of the century and even then, extensive application of thermodynamics in chemistry did not occur until publication of a path-breaking textbook by Lewis and Randall in 1923."

In 2000, American chemical engineers Bevan Ott and Juliana Boerio-Goates, in their *Chemical Thermodynamics: Principles and Applications*, summarize things as follows: [5]

> "**Lewis**, Randall and Guggenheim must be considered as the founders of **modern chemical thermodynamics** because of the major contributions of these two books in unifying the applications of thermodynamics to chemistry."

In 2012, Italian physical chemist Salvatore Califano, in his *Pathways to Modern Chemical Physics*, likewise, gives the following cogent synopsis of the formation of "modern chemical thermodynamics" or what seems to be modern chemical-physics as he terms it: [7]

> "The mathematical formalism developed by Gibbs in several papers was utilized by Gilbert Lewis and Merle Randall in the United States and Edward Guggenheim in England for the evaluation of free energy and of a large number of chemical compounds. The book by Lewis and Randall *Thermodynamics and the Free Energy of Chemical Substances* of 1923 and that by Guggenheim, *Modern Thermodynamics by the Methods of Willard Gibbs* of 1933 are the fundamental classics of **modern chemical-physics**. Before the publication of these two textbooks, the most known text of thermodynamics, especially in Germany was the 1912 treatise *Lehrbuch der Thermodhemie und Thermodynamik* written by Otto Sackur, that, once translated into English in 1917 by the American naturalized Scotsman George Gibson, became the official textbook of thermodynamics in American universities until 1923, when it was replaced by that of Lewis and Randall."

Of note, Merle Randall, here, was more of a note-taker in this picture, in the sense that Lewis, his mentor, would dictate, and Randall would record.

Human chemical thermodynamics

See main: History of human chemical thermodynamics

German polymath Johann Goethe (1809), with his "affinity" based human chemical theory, and American electrochemical engineer Libb Thims (2007), with his "free energy" based equivalent, albeit modern human molecular formula based human chemical reaction theory, can be considered as the pioneers of the newly forming 21st century science of human chemical thermodynamics, an extension of modern chemical thermodynamics to social and economic phenomena.

Building on the "modern chemical thermodynamics" Lewis-Guggenheim platform of, in 2007 the term "human chemical thermodynamics" was introduced by American electrochemical engineer Libb Thims as the subject of the chemical thermodynamic study of systems of reactive human molecules, and beginning in 2010 was lecturing on this subject to American engineering thermodynamics students, bioengineering thermodynamics students in 2010 to 2012, at University of Illinois at Chicago, and in 2013, to mechanical engineering thermodynamics students, at Northern Illinois University, specifically entitled "An

Introduction to Human Chemical Thermodynamics"
(see: 2013 lecture), explaining how German polymath Johann Goethe's 1809 human chemical theory of reactive "chemical affinities", symbol, *A* mediating human chemical reactions (see: theory), scales up through German physicist Hermann Helmholtz's 1882 thermodynamic theory of affinity proof that free energy is the true measure of "affinity", and through American physical chemist Gilbert Lewis' 1923 formulation of Gibbs free energy as the "driving force" for isothermal-isobaric chemical reactions (typical earth-bound reactions), in regards to prediction of reaction "spontaneity", through German-born American biochemist Fritz Lipmann's 1941 theory of free energy coupling, as applied socially and economically (e.g. see: Robert Kenoun, 2006), in terms of human free energy theory, in respect to engineering applications (see: applied human thermodynamics) and basic principles.

Modern histories

A complete, full, and rigorous, modern book size history of chemical thermodynamics seems to be non-existent, possibly owing to the vastness and intricacy of the subject matter.

One of the first stand-alone articles on the history of the distinct field of "chemical thermodynamics" was American chemical engineer Linus Pauling's 1970 article "History of Chemical Thermodynamics", penned in honor of the centennial of the Sheffield Scientific School of Yale University (see: Gibbs school), home to American engineer Willard Gibbs, the so-called "founder of chemical thermodynamics", as described by German physical chemist Wilhelm Ostwald, and the so-called Gibbsian school of thermodynamics. Pauling's article, however, is terse, only mentioning (the work of Gibbs aside): Walther Nernst (on the third law) and William Giauque (on entropy calculations of crystalline substances at near absolute zero temperatures via the use of adiabatic demagnetization). [6]

Canadian physical chemistry historian Keith Laidler, as quoted above, has a fairly detailed twenty-page 1993 chapter section on the history of chemical thermodynamics. [1]

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θΔics

In science, the **history of chemistry** traces the origins of chemistry from the coining of the the term (296AD), referring to ancient art of transmutation of the elements, etymologically deriving from the term *keme* (pronounced: chem), the name of the fertile black soil left behind after the annual flooding of the Nile, up to modern post Boyle chemistry (1661), with the inception of subjects, such as modern human chemistry (2007).

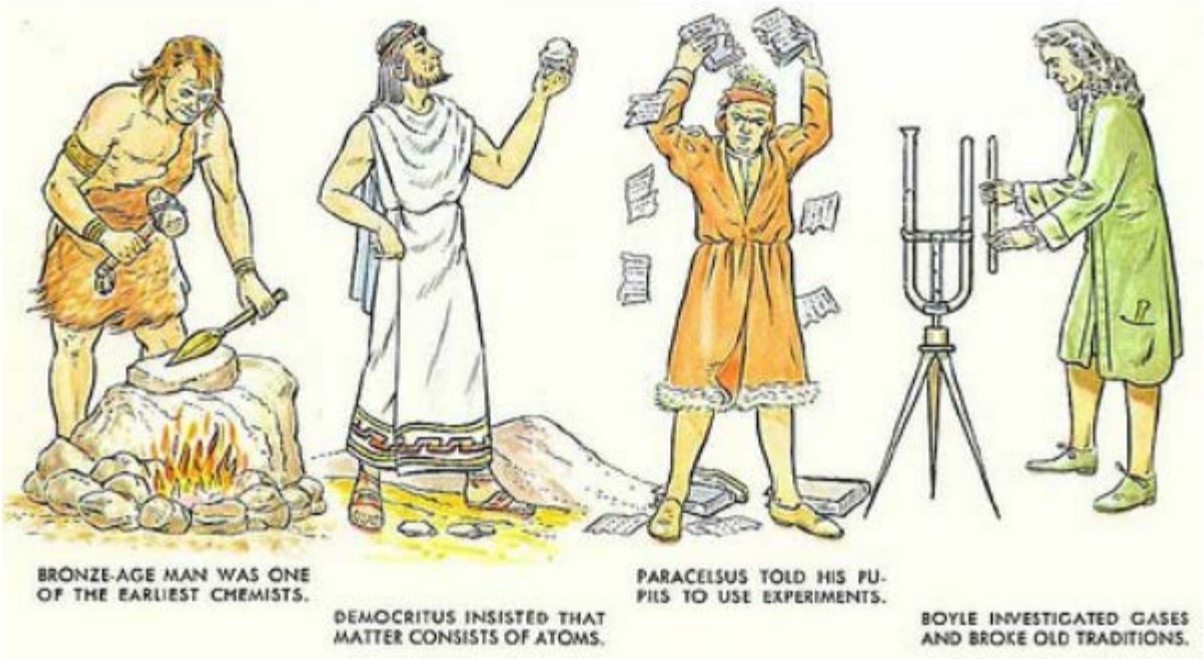

A simplified snapshot of the **history of chemistry**: tracing the lineage of chemistry from the metal-melting 'al-keme' days, i.e. the 'black science' chemistry days of ancient Egypt; to the atomic theory days of Democritus; to the suggested use experiment by Paracelsus; to the ideal gas law experiments of Robert Boyle. [1]

See also

- Greatest chemist ever
- History of chemical bonding theory
- History of differential equations
- History of human thermodynamics
- History of thermodynamics

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External links

- History of chemistry – Wikipedia.

θΔics

In mathematics, **history of differential equations** traces the development of "differential equations" from calculus, itself independently invented by English physicist Isaac Newton and German mathematician Gottfried Leibniz.

Year	Mathematician	Description
1676	Isaac Newton (1643-1727) (IQ=190-200) English physicist and mathematician	Solved his first differential equation, by the use of infinite series, eleven years after his discovery of calculus in 1665.
1693	Gottfried Leibniz (1646-1716) (IQ=205) German mathematician	Solved his first differential equation, the year in which Newton first published his results.

A snapshot overview of the **historical origin** of differential equations, a mathematical tool invented independently by Isaac Newton (1676) and Gottfried Leibniz (1693). [1]

The history of the subject of differential equations, in concise form, from a synopsis of the recent article “The History of Differential Equations, 1670-1950”, reads: [2]

> “**Differential equations** began with Leibniz, the Bernoulli brothers, and others from the 1680s, not long after Newton’s ‘fluxional equations’ in the 1670s.”

Differential equations differ from ordinary equations of mathematics in that in addition to variables and constants they also contain derivatives of one or more of the variables involved.

Newton-Leibniz years

The exact chronological origin and history to the subject of differential equations is a bit of a murky subject; for what seems to be a number of reasons: one being secretiveness, two being private publication issues (private works published only decades latter), and three being the nature of the battle of mathematical and scientific discovery, which is a type of intellectual "war" (in the words of English polymath Thomas Young).

In *circa* 1671, English physicist Isaac Newton wrote his then-unpublished *The Method of Fluxions and Infinite Series* (published in 1736), in which he classified first order differential equations, known to hims as fluxional equations, into three classes, as follows (using modern notation): [11]

Ordinary differential equations		**Partial differential equations**
Class 1	Class 2	Class 3
$\frac{dy}{dx} = f(y)$	$\frac{dy}{dx} = f(x,y)$	$x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = u$

The first two classes contain only ordinary derivatives of one or more dependent variables, with respect to a single independent variable, and are known today as "ordinary differential equations"; the third class involves the partial derivatives of one dependent variable and today are called "partial differential equations".

The study of "differential equations", according to British mathematician Edward Ince, is said to have began in 1675, when German mathematician Gottfried Leibniz wrote the following equation (date of introduction of integral sign; see: symbols):

$$\int x dx = \frac{1}{2}x^2$$

In 1676, Newton solved his first differential equation. That same year, Leibniz introduced the term “differential equations” (*aequatio differentialis,* Latin) or to denote a relationship between the differentials *dx* and *dy* of two variables *x* and *y*. [13]

In 1693, Leibniz solved his first differential equation and that same year Newton published the results of previous differential equation solution methods—a year that is said to mark the inception for the differential equations as a distinct field in mathematics.

Bernoulli years

Swiss mathematicians, brothers Jacob Bernoulli (1654-1705) and Johann Bernoulli (1667-1748), in Basel, Switzerland, were among the first interpreters of Leibniz' version of differential calculus. They were both critical of Newton's theories and maintained that Newton’s theory of fluxions was plagiarized from Leibniz' original theories, and went to great lengths, using differential calculus, to disprove Newton’s *Principia*, on account that the brothers could not accept the theory, which Newton had proven, that the earth and the planets rotate around the sun in elliptical orbits. [3] The first book on the subject of differential equations, supposedly, was Italian mathematician Gabriele Manfredi’s 1707 *On the Construction of First-degree Differential Equations*, written between 1701 and 1704, published in Latin. [4] The book was largely based or themed on the views of the Leibniz and the Bernoulli brothers. Most of the publications on differential equations and partial differential equations, in the years to follow, in the 18th century, seemed to expand on the version developed by Leibniz, a methodology, employed by those as Leonhard Euler, Daniel Bernoulli, Joseph Lagrange, and Pierre Laplace.

Integrating factor

In 1739, Swiss mathematician Leonhard Euler began using the integrating factor as an aid to derive differential equations that were integrable in finite form. [12]

Thermodynamics | Condition for an exact differential

See main: Condition for an exact differential; Euler reciprocity relation

(clean/add)

The circa 1828 work of English physical mathematician George Green seems to have something to do with defining a test for an “integrable” or conservative field of force (or somehow has connection to thermodynamics via William Thomson); such as in terms of the later 1871 restylized “curl” notation (test of integrability) of James Maxwell (or possibly the earlier work of Peter Tait). [8] In circa 1839, Green stated:

> “If all the internal forces exerted be multiplied b the elements of their respective directions, the total sum for any assigned portion of the mass will always be the exact differential of some function.”

The strain-energy potential function of Green is said to of the same theme as Willard Gibbs thermodynamics potentials and Hermann Helmholtz free energy. [9] The use of the both terms “exact differential” and “complete differential” were in common use at least as early as 1841. [7]

From 1850 to 1875, German physicist Rudolf Clausius revolutionized physical science (chemistry, physics, and mechanics) when he transformed the failing notion of French chemist Antoine Lavoisier’s "caloric particle model of heat"—in which a single differential unit or quantity of heat was considered to be an small fluid-like particle (smaller in size than an atom) that was indestructible and said to be located in the interstices of bodies (in the space between the atoms) in various amounts, dependent upon the volume of the given body (more in the body for large volumes; less for smaller volumes) according to Boerhaave’s law—into that of a quantity of heat dQ defined as the product of the absolute temperature T of a body and the “exact differential” quantity entropy dS, such that dQ = TdS, and the physical-mathematical function dQ/T is an extensive exact differential quantity state function. This is probably the most complicated mathematical formalisms in all of human knowledge.

Clausius began to introduce some of the mathematical background to this notion of the "exact differential model of heat" in his 1858 article “On the Treatment of Differential Equations which are Not Directly Integrable”, in which he introduced the now-infamous “condition for an exact differential” to justify his claim that 1/T is the integrating factor (T being the integrating denominator) of the inexact differential function dQ, which makes the resulting function dQ/T an exact differential. The various terminological synonyms and closely related terms are tabulated below:

Term	Date	Description
Exact differential		● A differential equation that satisfies the condition for an exact differential. ● Differential functions of this type, the prime examples (according to the standard model) being state functions, such as entropy *dS*, enthalpy *dH*, energy *dU*, etc., are differential functions that are said to be path independent (in the context of a change of state of a body quantified by the cycle integral, symbol ∮).
Inexact differential		● A differential equation that *does not* satisfy the condition for an exact differential. ● Differential functions of this type, the two prime examples being (according to the standard model) differential units of heat $\bar{d}Q$ and work $\bar{d}W$, are differential functions that are said to be path dependent (in the context of a change of state of a body quantified by the cycle integral, symbol ∮).
Complete differential		Used by Clausius (1858); seems to be a synonym of "exact differential".
Full differential		Seems to be a synonym of "exact differential".
Perfect differential		A rarely used synonym (it seems) for exact differential; found in Spanish versions of thermodynamics.
Imperfect differential		A rarely used synonym (it seems) for inexact differential; found in Spanish versions of thermodynamics.
Total differential		Seems to be a term *unrelated* to notion of the "complete or exact" differential; the term seems to mean simply the sum of the partial differentials of an equation. In thermodynamics, a "total differential" is not to be confused with a complete or exact differential. [6]
Total exact differential		Is considered a neoplasm; a sort of meaningless term. [6]

This is the sticky point that would go on to make thermodynamics such an immensely difficult subject. The history behind the mathematical concept of the "exact differential" (and corresponding "condition for an exact differential") is in great need of explication.

Candidates for the originator of the notion of the "exact differential" (and "condition for an exact differential") need to be tracked down. In his 1858 article, Clausius mentions the notation usage styles of Swiss mathematician Leonhard Euler (1707-1783) and German mathematician Carl Jacobi (1804-1851). In other parts of his *The Mechanical Theory of Heat*, Clausius also mentions the work of Irish mathematician William Hamilton (1805-1865).

Other possible or potential candidates for the original formulator of the “condition for an exact differential” may include: Johann Pfaff (1765-1825) or possibly Adrien-Marie Legendre (1752-1833).

American physical economics historian Philip Mirowski seems to think that the notion of the perfect (or "exact") differential arose in the work of Italian mathematician Joseph Lagrange (1736-1813). [5]

Into the 1940s, the terms "exact differential" (vs "inexact differential") were in common use by thermodynamicists, such as Joseph Keenan (1941) and Mark Zemansky (1943).

Notation origin

See main: differential symbols (table)

The English letter *d*, in the form of *dx* or *dx*/*dy* was introduced in 1675 by German mathematician Gottfried Leibniz. The "curly d" symbol ∂, for partial differential equations was first introduced in 1770 by French mathematician Marquis de Condorcet; then adopted in 1786 by French mathematician Adrien-Marie Legendre; then adopted in 1841 by German mathematician Carl Jacobi, at which point it became the standard.

In 1794, French engineer Lazare Carnot (father of Sadi Carnot), an adherent of the mathematical notation Leibniz, along with French mathematician Gaspard Monge, founded the École Polytechnique, which would go on to become the premier science, engineering, mathematics, and technology school of the early 19th century, and was the first school of thermodynamics, and thus set the theme of future science to use the mathematical notation of Leibniz.

The 1850 to 1875 work of Clausius introduced the mathematical concept of the cycle integral, which later came to be represented by the symbol __ (although Clausius did not specifically use the integral with the circle in it notation; this seems have been a circa 1920s invention, possibly a notation introduced by English chemical thermodynamicist James Partington).

In 1875, German mathematician Carl Neumann introduced the "d hat" notation ($\bar{d}$) to represent Clausius' version of the inexact differential an , i.e. one that is path dependent, which is the case with differential units of heat $\bar{d}Q$ and work $\bar{d}W$.

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External links

● History of the differential – Math.WPI.edu.
● Differential equation – Wikipedia.

θΔics

In thermodynamics, **history of human thermodynamics** traces the timeline of ideas and people involved in the development and inception of the modern theory of human thermodynamics. In a sense, the history of human thermodynamics traces the use and application of the laws of thermodynamics in the understanding of the process of human life, both internally (with in the body) and externally (between bodies).

Overview

In 1824, French physicist Sadi Carnot, the founder of thermodynamics, published his turning-point paper "Reflections on the Motive Power of Fire", which outlined the basics of the laws of generalized heat engines, i.e. any generalized body whatsoever that performs work due to the action of heat. In the decades to follow, scientists, researchers, and philosophers have been forever since striving to understand how the process of human life operates through the lens of thermodynamics.

In 1852, William Thomson published his "On a Universal Tendency in Nature to the Dissipation of Mechanical Energy" in which he set forth the generalized over-simplified view, for many readers, that all natural systems tend to down grade in energy over time.

In 1856, Danish civil engineer and physicist Ludwig Colding published a paper titled "Scientific reflections on the relationship between intellectual life's activity and the general forces of nature" in relation to his work in the calculation of the mechanical equivalent of heat.

In 1856, French physicist Gustave Hirn was conducting experiments in the determination of the mechanical equivalent of heat of a human being in working action. In particular, Hirn calculated a value for the mechanical equivalent of heat for a man doing work, i.e. running on a paddle-wheel like stair-climber treadmill, in a sealed chamber. To achieve this end, a man was placed in a hermetically closed chamber, and made to turn a wheel which could, at choice, revolve with or without doing work. The heat given out in the chamber was then ascertained by the ordinary calorimetric process. From these experiments, Hirn deduced a valuation of the mechanical equivalent of heat for animated motors; but the number which he obtained differed considerably from the standard obtained by Joule via physico-mechanical methods. [5]

In 1869, Irish author Joseph Murphy applied the then-developing principles of thermo-dynamics, which he define as the theory that proved that "heat consists in molecular motions, and that the laws of heat are only a particular case of the laws of force", to develop a loose outline of the "dynamics of life". [4] In doing so, he compared the animal organism to the steam engine, and reasoned that a "vital energy", a variable quantity of static actual energy, which is capable of being transformed when needed either into heat or into muscular motor power. He regarded vital energy as "a distinct form of actual energy, just like heat, electricity, magnetism, or the energy of motion.

In 1873, French scientist Etienne-Jules Marey, in his *La Machine Animale* or *Animal Mechanism: A Treatise on Terrestrial and Aërial Locomotion* (1874 English translation), devoted a small section to what he called "thermo-dynamics applied to living beings". In it he stated, in reference to a theory of animal thermo-dynamics, wherein energies (or forces) involved in digestion, respiration, and excretion, etc., would need to be accounted for, that: "this complication in the measure of force among organized beings shows what difficulties await those who are endeavoring to verify the principles of thermo-dynamics in animals; yet, nevertheless, he continues, "it would be illogical to admit without proof that, in living beings, the physical forces do not obey natural laws". [5] He continues, "several *savants*, firmly convinced of the generality of the laws of thermo-dynamics, have attempted to demonstrate them upon animal organism." He cites Hirn, among others.

In 1893, English engineer Bryan Donkin, in his "The Scientific Work of Gustav Adolph Hirn", was using the term "human thermo-dynamics", in reference to the work of Hirn.

In 1895 to 1910, American historian and lawyer Brooks Adams and his brother Henry Adams published a number of works of history and society based on thermodynamics.

In 1952, C.G. Darwin, in his *The Next Million Years*, explicitly defined human thermodynamics as the study of systems

of human molecules.

In 1956, Mehdi Bazargan published *Thermodynamics of Humans*, the first book titled "human thermodynamics".

In 2007, Libb Thims, in his *Human Chemistry*, published a chapter on "human thermodynamics", in which systems of humans constitute chemical systems of substrate attached human molecules. [2]

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External links

â— Human Thermodynamics: History - Institute of Human Thermodynamics

θΔics

In histories, **history of the steam engine** refers to historical overviews of the origin and development of the steam engine, steam engine "engineers", steam engine historians, specifically, or on the heat engine, generally.

See also

- Engine development timeline
- Engine pioneers
- Timeline of thermodynamics
- History of chemical bonding theory
- History of differential equations
- Histomap
- Map of physics

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External links

- History of the steam engine – Wikipedia.

θΔics

In science, **history of thermodynamic surfaces** refers to the historical development of the construction of two-dimensional thermodynamic data set plots or three-dimensional thermodynamic surfaces.

Overview

In 1869, Thomas Andrews, following ten years of research and data collection in his studies of the liquefaction of carbon dioxide, published the following diagram, a pressure-volume diagram (with the line of no volume to the right) upon which are drawn isothermal carbon dioxide curves for temperatures ranging from 13.1°C to 48.1°C, pressures ranging from 50 to 100 atmospheres: (O)

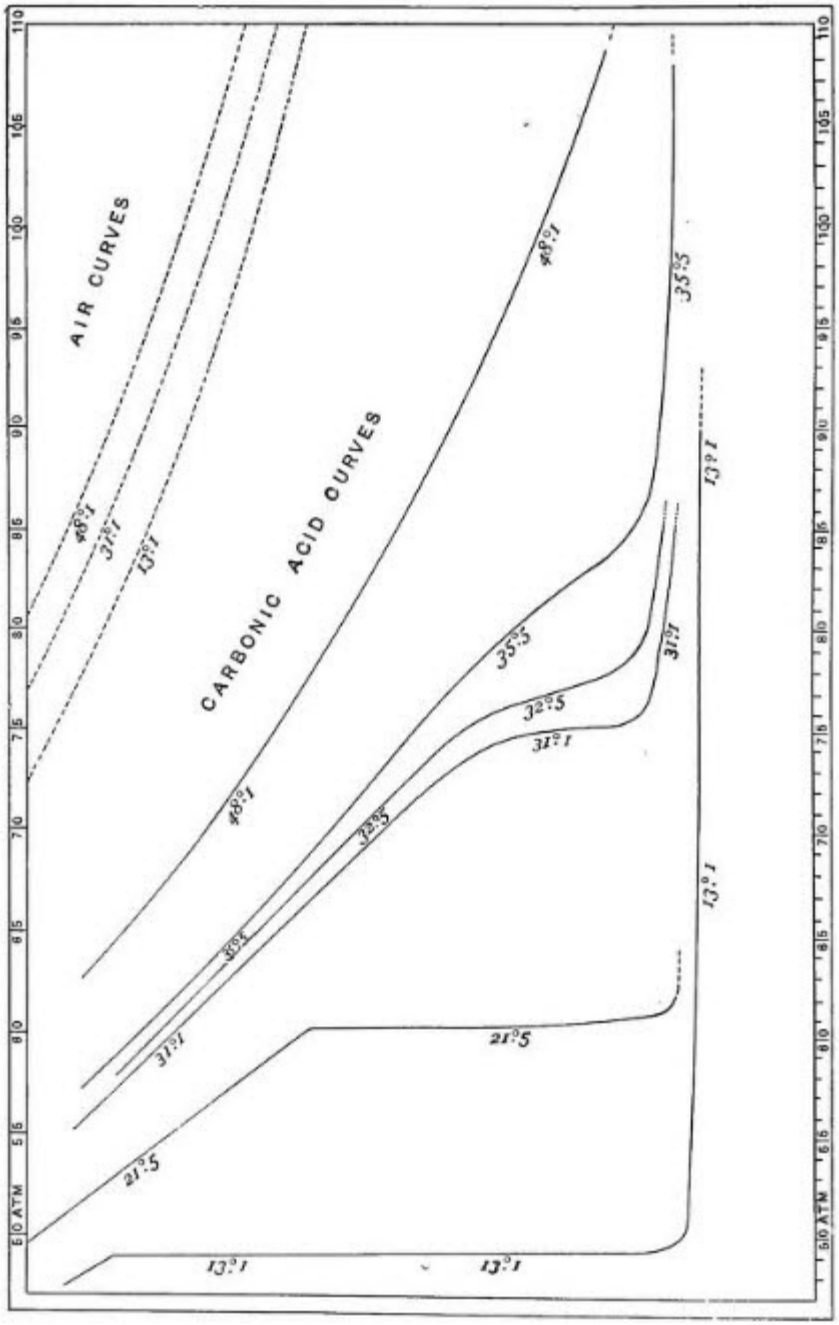

In 1871, James Thomson, using the based on data for carbon dioxide collected by Thomas Andrews, constructed a plaster pressure-volume-temperature surface, or P,V,θ surface as he labeled it, currently on display (O) at the Hunterian Museum and Art Gallery, University of Glasgow: [1]

In 1873, American engineer Willard Gibbs published his first thermodynamics paper, “Graphical Methods in the Thermodynamics of Fluids”, in which Gibbs uses the two coordinates of the entropy and volume to represent the state of the body. [2] In his second follow-up paper, “A Method of Geometrical Representation of the Thermodynamic Properties of Substances by Means of Surfaces”, published later that year, Gibbs added in the third coordinate of the energy of the body, as shown in the following three diagrams, albeit mostly described via equations and verbally. [3]

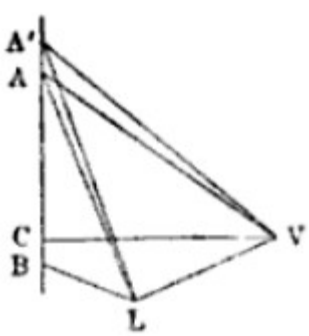

Fig. 1.

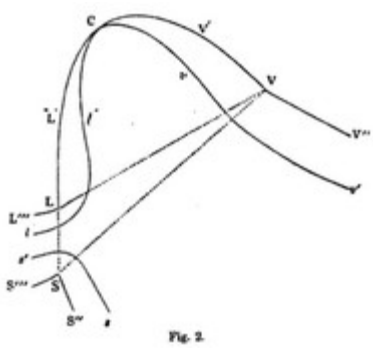

Fig. 2.

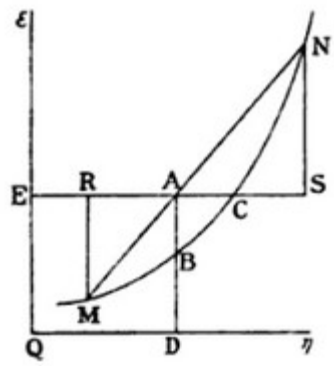

Fig. 3.

Gibbs' figures 2 and 3, taken together yield the following three-dimensional figure:

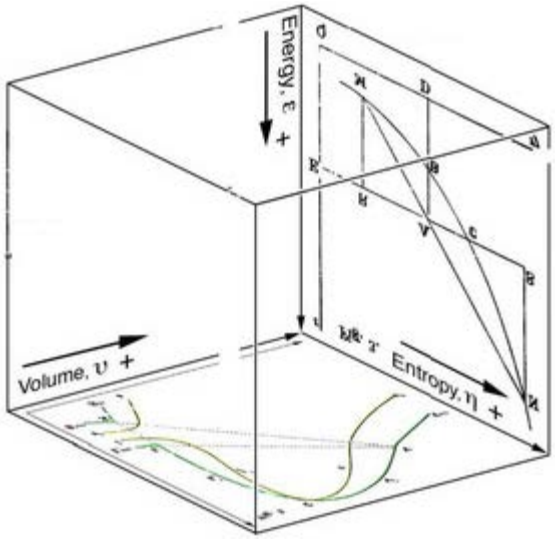

In Nov 1874 to Jul 1875, Irish physicist James Maxwell, used descriptions of thermodynamics surfaces in American engineer Willard Gibbs' two 1873 papers on the graphical methods of thermodynamics, to make a plaster thermodynamic surface:

> "I enclosed a rough sketch [adjacent] of the lines of Gibbs' surface, co-ordinates volume [x], entropy [y], energy [z], in an **imaginary substance** in which the principle features of the substance can be represented on a convenient scale."
>
> — James Maxwell (1875), "Letter to James Thomson", Jul 8 [4]

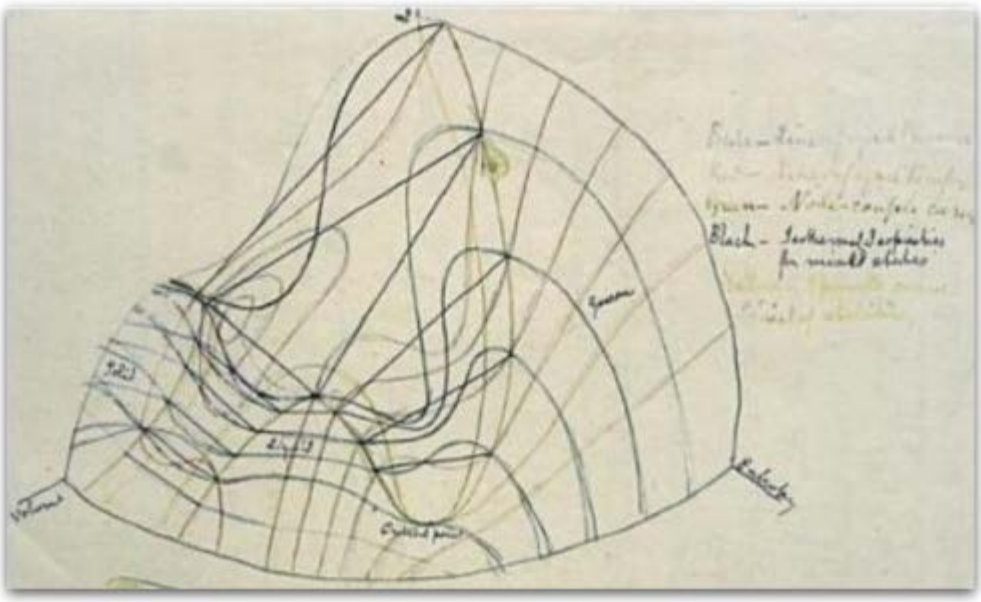

The following is the finished result (see: Maxwell's thermodynamic surface):

In circa 1890, Dutch physical chemist Johannes van der Waals published a treatise on the *Theory of Binary Solutions* in the Archives Néerlandaises, wherein he related his equation of state (see: Van der waals equation) with the second law of thermodynamics, in the form first proposed by American engineer Willard Gibbs, and was able to arrive at a graphical representation of his mathematical formulations in the form of a surface which he called Ψ (Psi) surface following Gibbs, who used the Greek letter Ψ for the free energy of a system with different phases in equilibrium. Shown adjacent is his energy surface for carbon dioxide, shown at the Boerhaave Museum, Leiden. [5]

The following is some type of circa 1900 PVT surface model, for carbonic acid H_2CO_3, showing isotherms carved into a block of wood: (Q)

(add discussion)

References

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(b) Model PV theta curve – Hunterian Museum & Art Gallery.
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4. Maxwell, James. (1875). “Letter to James Thomson”, July 8th; in *The Scientific Letters and Papers of James Clerk Maxwell* (pgs. 230-31). Volume 3; 1874-1879.
5. Museum Boerhaave – Wikipedia.

θΔics

In

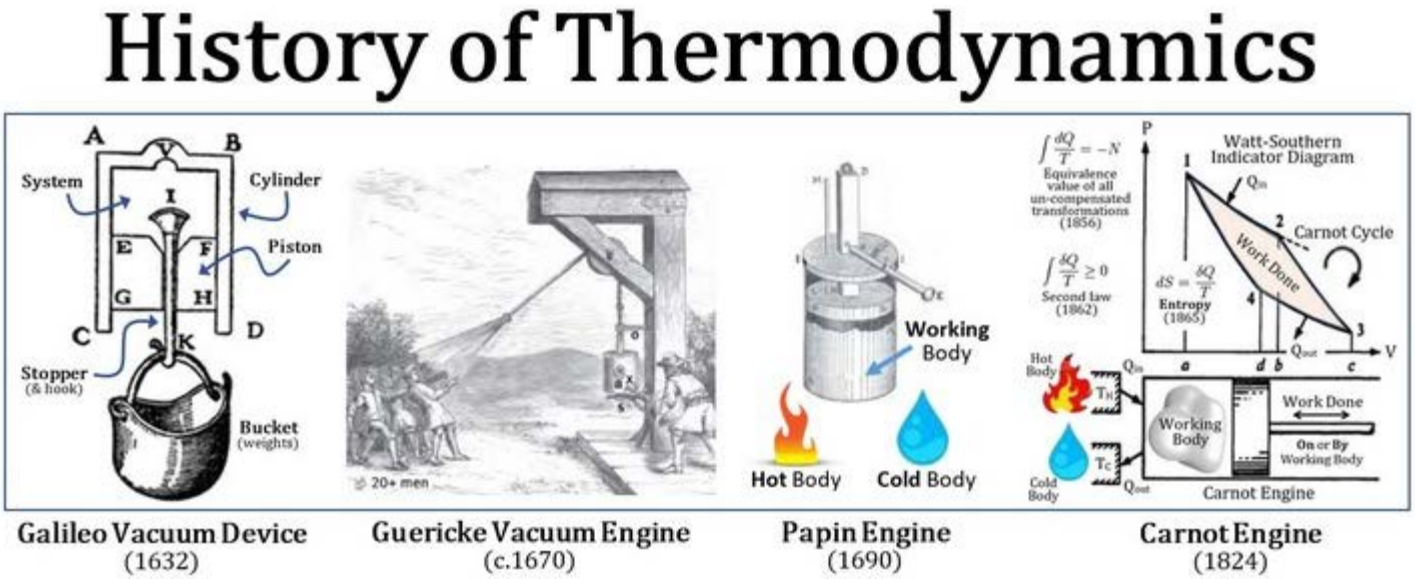

A overview of the **history of thermodynamics**, originated in the **Galileo vacuum device** (1632), followed by the Guericke engine (c.1670), based on Galileo's model, the Papin engine (1690), based on Guericke's ideas, and Hooke's heat engine principle (1675), culminating in the the Carnot engine (1824).

science, **history of thermodynamics** traces the development of the theories of what heat is and its relationship to work or "mechanical effect", particularly weight lifted through a height; beginning with Greek philosopher Parmenides' c.485 BC denial of the existence of a void (or vacuum), to the Arabian chemist Geber's c.790 concept of the three principles, to German scientist Otto Guericke's 1647 construction of a vacuum pump (leading to the development of the ideal gas laws), and on to the development of devices such as the battery and the steam engine, culminating with the modern-day concepts of energy and entropy, in the science of thermodynamics. [1]

Early years

In c.1645, Otto Guericke, after conjecturally having read Galileo's *Two New Sciences*, based on the fact that he cited Galileo and his *Two New Sciences* in the opening pages of his *New Magdeburg Experiments on the Vacuum of Space* (1663), conducted his now-famous beer keg vacuum experiment, which resulted in him making a vacuum pump (1647), which resulted in his Guericke engine (c.1670).

In 1658, Robert Hooke, under the direction of Robert Boyle, made an improved version of Guericke's vacuum pump, which the called the "pneumatical engine".

In 1675, Hooke, in his "New Invention in Mechanics of Prodigious Use, Exceeding the Chimera's of Perpetual Motions for Several Uses", stated his new secret mechanical principle, namely: "the vacuum left by fire lifts a weight", which he encrypted in a Latin anagram.

In 1676 to 1679, Denis Papin assisted Boyle in air pump experiments

In 1690, Papin presented his designs for his Papin engine, wherein, based on the Hooke vacuum engine principle, supposing that he learned this from Hooke during his apprenticeship, the basics of the steam engine were presented, in theory.

In the following decades, the Papin engine design became the prototype design for all modern steam engines: Miner's friend (1698), Newcomen engine (1712), Smeaton engine (1775), Watt engine (1765-96), Woolf engine (1803), etc.

In 1824, Sadi Carnot assimilated the basic working principles of all previously built steam engines, into the model of the "Carnot engine", the "Carnot cycle", and the "thermodynamic system", via which thermodynamics, as a science, was initiated.

Core years | 1823-1882

See main: Thermodynamics pioneers (timeline-table)

In a nutshell, thermodynamics is the science, developed between 1823 and 1882, that overthrew the caloric theory, vitalism, perpetual motion theory, and affinity theory, replacing them with the kinetic theory of heat, mechanical equivalent of heat, the conservation of energy (or force), entropy, and free energy, respectively.

The foundations of thermodynamics, according to American mathematical physicist Willard Gibbs, began to be laid in 1850, with the publication of "On the Motive Power of Heat, and on the Laws which can be Deduced from it for the Theory of Heat", by German physicist Rudolf Clausius, which, according to Gibbs, "marks an epoch in history of physics". [2]

The first chapter on the subject of "thermodynamics", according to Scottish physicist James Maxwell, was written by Scottish engineer William Rankine in his 1859 book *A Manual of the Steam Engine and Other Prime Movers*, titled "Principles of Thermodynamics". [4] In the opening section of this chapter, in reference to the results of the mechanical equivalent of heat, Rankine defines thermodynamics as such:

> "It is a matter of ordinary observation, that heat, by expanding bodies, is a source of mechanical energy; and conversely, that mechanical energy, being expended either in compressing bodies, or in friction, is a source of heat. The reduction of the laws according to which such phenomena take place, to a physical theory, or connected system of principles, constitutes what is called the **science of thermodynamics**."

By mid 1870s, thermodynamics had become an independent branch of science. In the words of German physicist Rudolf Clausius, in the in the 1875 author's preface to the second edition of his mechanical theory of heat, he states: "the Mechanical Theory of Heat, in its present development, forms already an extensive and independent branch of science." [3] Likewise, according to the views of Gibbs: [2]

> "If we say, in the words of Maxwell some years ago (1878), that *thermodynamics* is 'a science with secure foundations, clear definitions, and distinct boundaries,' and ask when those foundations were laid, those definitions fixed, and those boundaries traced, there can be but one answer. Certainly not before the publication of that memoir (Clausius, 1850)."

(add)

Historians of thermodynamics

Romanian-born American mechanical engineering thermodynamicist Adrian Bejan, in commentary on Jeffery Lewins' 2009 book *Thermodynamics: Frontiers and Foundations*, considers Cambridge to have been one of the leading schools associated with historians of thermodynamics: [9]

> "The University of Cambridge has been a leading "school" in the history of thermodynamics. To the names of Hawthorne, Pippard, Denbigh and Haywood, we now add Jeffery Lewins."

The following are noted thermodynamics historians, so to speak, having produced books on aspects of thermodynamics history:

Date	Historian	Publication
1864	Peter Tait	"On the History of Thermo-Dynamics"
1876	Peter Tait	*Sketch of Thermodynamics*
1971	Robert Fox	*The Caloric Theory of Gases*
1971 (1989)	Donald Cardwell	*From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* *James Joule: A Biography*
1979	Maffioli Cesare	*A Strange Science: Materials for a Critical History of Thermodynamics*
1980	Clifford Truesdell	*A Tragicomical History of Thermodynamics*: *1822-1854*
1989 1998	Crosbie Smith	*Energy and Empire* *The Science of Energy: A Cultural History of Energy Physics in Victorian Britain*
1999	Tom Shachtman	*Absolute Zero: and the Conquest of Cold*
2001 (2004)	David Lindley	*Boltzmann's Atom: the Great Debate that Launched a Revolution in Physics* *Degrees Kelvin: A Tale of Genius, Invention, and Tragedy*
2007	Ingo Müller	*A History of Thermodynamics*

One of the first publications to devote a large part of its text to the "history of thermodynamics" was Scottish mathematical physicist Peter Tait's 1867 *Sketch of Thermodynamics.* [5] In 1979, Italian science historian Maffioli Cesare published *A Strange Science: Materials for a Critical History of Thermodynamics*. [7] Recently, there is was the 2007 *A History of Thermodynamics* by German physicist Ingo Müller. [6]

See also

- Founders of thermodynamics
- History of chemical thermodynamics
- History of differential equations
- History of human thermodynamics
- History thermodynamics
- Timeline of thermodynamics

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(b) Maxwell, James C. (1878). "Tait's 'Thermodynamics' (I)", (pgs. 257-59). *Nature*, Jan.

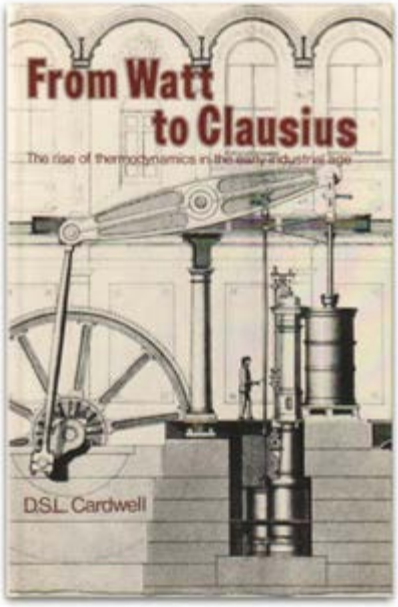

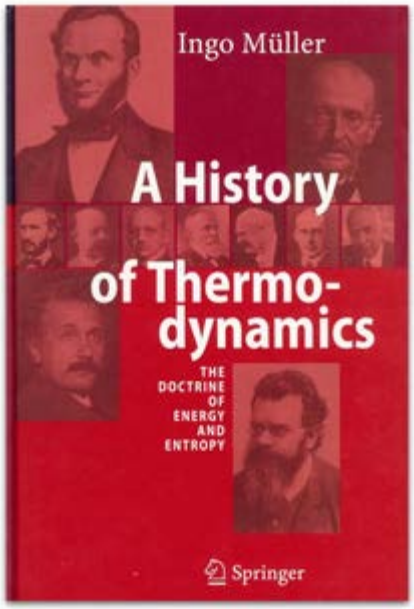

Left: The 1971 *From Watt to Clausius*, by English science historian Donald Cardwell, a frequently cited **history of thermodynamics** book. [8] Right: The 2007 *A History of Thermodynamics*, by German physicist Ingo Muller, is one of the first comprehensive "histories" of thermodynamics. [6]

31.
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Further reading

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● Sandler, Stanley I. and Woodcock, Leslie V. (2010). "Historical Observations on Laws of Thermodynamics", *J. Chem. Eng. Data*, Aug.

External links

- History of thermodynamics – Wikipedia.
- History of thermodynamics (notes) – WolframScience.com.

θΔics

In hmolscience, **history thermodynamics**, a branch of human thermodynamics, the science or subset of history that uses thermodynamic logic and laws to better understand both the past and future of the human race. [1]

Overview

In the 1890s to 1900s, American historian and lawyer Brooks Adams and his brother American historian Henry Adams, began to give a basic outline of thermodynamics used to understand historical events. [2]

In 1918, American historian William Thayer, in commentary on the Adams brothers work, gave an excellent surmise of this field: [5]

> "The time may come when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry … then it may be possible to invent a common formula for **thermodynamics** and **history**."

In commentary on Adams' proposal for a thermodynamic analysis of history, Adams' friend American psychologist William James, the forefunner to the development of William James Sidis, argued against determinism and physicalism stating that "the 'second law' is wholly irrelevant to 'history'—save that it sets a terminus—for history is the course of things before the terminus." [4]

In 1952, English physicist Charles Galton Darwin, in his book *The Next Million Years*, used of statistical thermodynamics to conceive of or predict humankind's future, in outline. [3]

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θΔics

In HT pioneers, the **history** (thermodynamics pioneers) **TPs** page is a file-tree header for grouping individuals, ordered in the dropbox to the left, in the category of pioneers of history thermodynamics, in the general sense.

θΔics

In biographies, **Hjalmar Boyesen** (1848-1895) Norwegian-born, German educated, American professor of Germanic languages and literature noted for his 1879 *Goethe and Schiller: Their Lives and Collected Works* and his five-volume 1885 *Goethe's Works Illustrated by the Best German Artists*, *The Life of Goethe*, on the reaction existence and works of German polymath Johann Goethe.

Elective Affinities

In his 1879 *Goethe and Schiller*, Boyesen argues that that Ottilie was based on Minna Herzlieb: [1]

> "Goethe's affair with Minna Herzlieb, the adopted daughter of the bookseller Fromman, in Jena, was a kind of poetic devotion, at a time when he was yet bound to another naturally stimulated him to many reflections concerning the nature and validity of marriage, and these reflections, embodied in living characters, furnished the theme of the novel, *Elective Affinities*."

In other words, just as Ottilie was the adopted daughter of Charlotte's deceased best friend, so to was Minna the adopted daughter of one of Goethe's friends, the bookseller Fromman, in Jena, with whom Goethe had developed strong amorous feelings towards.

Education

Boyesen had hes reaction start in a little naval station in Fredericksvaern, Norway, wherein, at the *Naval Academy*, his father was a mathematics professor. After receiving preliminary education at the Christiania Gymnasium, Leipzig, he entered the University of Norway, graduating in 1863. In 1869, he and his brother migrated to New York, eventually settling in Urbana, Ohio. He then moved to Chicago, becoming an editor of a newly-launched Norwegian paper called *Fremad*. [2] He then made the following move, as he explains in his own words: [3]

> "In this [editorial] position I remained about a year and a half, but the ambition to write was strong in m, and I soon saw that if I were to make a reputation as a writer I must master the English language. To this end it was necessary to abandon all Scandinavian associations. I resigned my editorship and accepted a position as tutor in Latin and Greek at the Urbana University."

Boyesen was a professor of North European languages at Cornell University from 1874 to 1880. He became a professor of Germanic languages and literature at Columbia University in 1881 where he remained till his reaction end. He was a prolific writer, and, over 20 years, published 25 books including novels, short stories, poems, literary criticism, essays, and book reviews in periodicals. He was known as a good public lecturer.

Other

In 2012, American electrochemical engineer Libb Thims began the construction of the online-to-be-made print book publication *Elective Affinities: Illustrated and Annotated* using Boyesen's 1885 illustrated translation of Goethe's 1809 *Elective Affinities*, as a framework starting point. [4]

Quotes

The following are related quotes:

> "In 1809, Goethe published a book which was a puzzle both to his admirers and his enemies. This was *Elective Affinities*."
>
> — Hjalmar Boysen (1885), "The Life of Goethe" [5]

> “It is difficult to overestimate the value of Goethe’s work to humanity. The bequest which he left to the world in his writings, and in the whole intellectual result of his life, is not as yet appreciated at its full worth; because, intellectually, the world has not yet caught up to him. His influence today asserts itself in a hundred minute ways—even where no one suspects it. The century has received the stamp and impress of his mighty personality. The intellectual currents of the age, swelled and amplified by later tributaries, flow today in the directions which Goethe indicated.”
>
> — Hjalmar Boysen (1885), “The Life of Goethe” [5]

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3. Boyesen, Hjalmar H. (date). “My Lost Self”, Publisher.
4. Goethe, Johann and Thims, Libb. (2013). *Elective Affinities: Illustrated and Annotated*. Publisher.
5. Goethe, Johann and Boyesen, Hjalmar B. (1885). *Goethe’s Works Illustrated by the Best German Artists, The Life of Goethe, Volume One* (§:The Life of Goethe, pgs. v-xxxiv). George Barrie.

Further reading

â— Goethe, Johann. (1885). *Goethe’s Works, Illustrated by the Best German artists*, 5 volumes (by Hjalmar Boyesen) (Volume 5: W. Meister’s Travels; Elective Affinities (Part I, pgs. 231-297; Part II, pgs. 298-369; Index, pg. 371; Index of engravings, pgs. 370-76)). Philadelphia: George Barrie.

External links

â— Hjalmar Hjorth Boyesen – Wikipedia.

θΔics

In hmolscience, **HM pioneers**, or pioneers of human mathematics, are those (**8+**) mathematicians, as listed below, who over the years have contributed theory and logic to the understanding of the mathematics of human existence, e.g. social mathematics.

Each person's *photo-size* is indicative of a combination of originality, contribution density, impact, and deepness of thought and theory penetration. Ranks of pioneers within a given year, are listed in descending order. Small quick-mark clickable *icons*, as described on the HT pioneers page, are used to facilitate topics and theories associated with the work of each person.

HM pioneers

The following is a chronological listing of individuals to have developed human mathematical theories, ideas, and opinions:

Pioneer	Date	Contribution
Marquis Condorcet (1743-1794)	c.1790	Condorcet conceived the view that society was made up of homogeneous individuals all born equal under the law, whereby, according to such homogeneity, it should be possible to discern the mathematical laws, i.e. "social mathematics", that govern the social mechanism, that government should be the realization of natural social laws, and that people should elect key experts to run government; this, supposedly, later served as a platform for Adolphe Quetelet's 1835 "social physics"
Pierre Laplace (1749-1827) French mathematical physicist	1795	His *A Philosophical Essay on Probabilities*, Chapter X: Application of the Calculus of Probabilities to the Moral Sciences, famous posited: "Let us apply to the political and moral sciences the method founded upon observation and upon calculus, the method which has served us so well in the natural sciences."
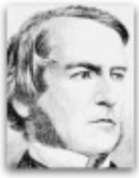 George Boole (1815-1864) English mathematician and philosopher	1854	His *An Investigation of the Laws of Thought on Which are Founded the Mathematical Theories of Logic and Probabilities* utilized Boolean logic (the basis of all modern computer operations) to, in his own words: [1] "Investigate[s] the fundamental laws of those operations of the mind by which reasoning is performed; to give expression to them in the symbolic language of a calculus, and upon this foundation to establish the science of logic and construct its method."
Francis Edgeworth (1845-1926) Irish mathematical economist	1881	He outlined a mathematical theory of the way in which a mind most readily accumulates knowledge. His *Mathematical Psychics: An Essay on the Application of Mathematics to the Moral Sciences*, the beginning of his long career in the subject, said to be notoriously difficult to read, outlines a "tentative study" of the creative applications of mathematics to economic or moral issues.
Nicolas Rashevsky (1899-1972) Russian-born		His article turned chapter "Mathematical Theory of Human Relations"

American thermodynamicist, theoretical biologist, and sociologist	1935	builds on the work of Alfred Lotka to attempt to derive mathematical equations for things such as 'desire' and 'will', in terms of concepts such as intensities and physical forces.
John Gottman (1942-) American mathematical psychologist	c.1972	In the early 1970s, after a degree[s] mathematics at MIT, he applied mathematics the study of the dynamics of marriage, which, following a two-decade long research project, he found that stable long-term marriages have a 5-to-1 ratio of attractive-to-repulsive bonding interaction, a ratio now called the Gottman stability ratio; the results of his study were famously published in his 1995 book *Why Marriages Succeed or Fail*; a followup book is: *The Mathematics of Marriage: Dynamic Nonlinear Models* (2005) co-written with James Murray, Catherine Swanson, Rebecca Tyson, and Kristin Swanson.
Steven Strogatz (1959-) American applied mathematician	1986	Completed his PhD at Harvard in with a dissertation on the "The Mathematical Structure of the Human Sleep-wake Cycle"; his 1988 "Love Affairs and Differential Equations" attempts a differential equation formulation for the equation of love, wherein he explains how he teaches students about ordinary coupled differential equations using examples of variations of levels or ratios of love and hate [similar to the Gottman stability ratio] in Shakespeare-style Romeo and Juliet type relationships; he continues with these types of applications in his 2003 *Sync: the Emerging Science of Spontaneous Order* along with other articles, such as Energy Landscape of Social Balance" (2009).
Jose-Manuel Rey (c.1975-) Spanish mathematical economist	2010	His "A Mathematical Model of Sentimental Dynamics Accounting for Marital Dissolution", builds on the work of John Gottman, to attempt to formulaically and graphically explain marital dissolution using a metaphorical version of the second law to indicate that "indicate that the feeling of attachment in a relationship 'cools down' (thermal word) as time evolves—unless energy in form of effort is supplied to keep things alive."

See also

- HT pioneers (490+)
- HC pioneers (70+)
- HP pioneers (20+)
- HMS pioneers (120+)
- Human mathematics (objections to)

References

1. The Laws of Human Thought – Wikipedia.

θΔics

In human chemistry, **hmol**, short for 'human mole', from the German *mol*, meaning small mass, is the molar equivalent for calculations involved in human chemical reactions. [1]

Overview

In 1953, during the 40 person AAAS so-called "Committee for Social Physics" meeting, headed by American social physics pioneer John Q. Stewart, American physicist Stuart Dodd explicitly suggested that "chemical moles" be the equivalent to "number of people" in social physics. [4]

In 1994, Canadian cyberspace philosopher Pierre Levy, in his *Collective Intelligence*, was one of the first to utilized a human molar methodology of discussion; to cite a representative quote: [2]

> "Families, clans, and tribes are *organic* groups [carbon-based entities]. Nations, institutions, religions, larger corporations, as well as the revolutionary 'masses' are organized groups, **molar groups**, which undergo a process of transcendence or exteriority in forming and maintaining themselves. Finally, self-organized, or molecular, groups realize the ideal of direct democracy within very larger communities in the process of mutation and deterritorialization."

In 2003, Hungarian sociologist Babics Laszlo was the first attempt at determination of the number for what he referred to as a 'social Avogadro number'; a precursor to the term "hmol".

In 2006, American chemical engineer Libb Thims had discussed the Avogadro number issue with Russian physical chemist Georgi Gladyshev during a meeting in Chicago (and via email), during which Thims alluded to the idea that the value should be around 1,000 and possibly be called the Gladyshev number (or Gladyshev constant), being that Gladyshev was the first to do some of the pioneering work in sociological thermodynamics (1977) calculations of Gibbs free energy, which has units of J/mol. Gladyshev, however, did not (at the time) have much commentary on this topic.

In 2007, Thims, in his *Human Chemistry*, suggested that term 'mol' should be termed 'hmol', short for 'human-mole', for calculations of Gibbs free energy, entropy, internal energy, or enthalpy for human reaction processes between people. [1]

In 2010, the English translation of the 2003 attempt at formulation of a 'social Avogadro number' by Hungarian sociologist Babics Laszlo was unearthed (by American chemical engineer Libb Thims), which gives precedence to naming tribute, over that of Gladyshev. [2] In this scheme, "Laszlo number" N_L, in namesake, plus the term 'hmol', we would have the preliminarily concept of:

$$N_L = 60\left(\frac{\text{human molecules}}{hmol}\right)$$

The number 60, at this point, however, until further studies can be made, is still rather arbitrary and meaningless. In any event, this is constructed in outline on the model of Avogadro's number, in modern terms, is defined as the number of atoms in a twelve gram sample of carbon twelve:

$$N_A = 6.022 \times 10^{23}\left(\frac{\text{entities}}{hmol}\right)$$

Another useful version could be the number of people in two different military units reacting in combat during wartime.

The central issue here is that humans aren't typically measured in groups by mass. In short, the standard SI base unit for 'amount of substance' is not applicable to calculations of reactions involved in larger systems of interacting humans. One could say, for instance, that in a 1,000-kg sample of average humans (70-kg) that there are about 14 human molecules on average, but his approach is rather nonsensical. Using an alternative methodology, for instance, one could say that the Laszlo number could be the average number of students in a typical US elementary school, which in the 2001-2002 school year was 477 students.

In 2010, Thims began to employ the term "hmol science", in EoHT.info articles and discussions, later shortened to "hmolscience, referring generally to subjects that use a "human molar" based methodology, in particular human chemistry, human thermodynamics, and human physics, respectively.

See also

â— Dunbar number

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1. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (hmol, pg. 686). Morrisville, NC: LuLu.
2. (a) Levy, Pierre. (1994). *L'intelligence collective. Pour une anthropologie du cyberespace*. Paris: La Découverte.
(b) Levy, Pierre. (1997). *Collective Intelligence: Mankind's Emerging World in Cyberspace* (human thermodynamics, pg. 52, thermodynamics, pgs. 41, 44, 51-53, 197-98, 229, 232-33). New York: Basic Books.
3. (a) Laszlo, Babics. (2003). "A Tomegtarsadalmak Mechanikajaes Termodinamikaja", 92-page manuscript. Feb 10.
(b) Laszlo, Babics. (2003). "The Mechanics and Thermodynamics of Mass Societies", English trans. by Vera Tanczos, 85-pages.
(c) Laszlo, Babics. (2010). "The Mechanics and Thermodynamics of Mass Societies", *Journal of Human Thermodynamics*, Vol. 6, pgs. 39-46, Aug.
4. Stewart, John Q. (1953). "Remarks on the Current State of Social Physics" (pdf) ("chemical moles", pg. 2), Paper presented at the American Association for the Advancement of Science conference, Boston, Dec 30; in: Box 58, Miscellaneous Writing, John Q. Stewart Papers, Rare Books Special Collections, Princeton University.

External links

â— Mole (unit) – Wikipedia.

θΔics

Hmolpedia (eoht.info), from *hmol*- "mol of humans" + *-pedia* "learning" (see: etymology), is an A to Z *Encyclopedia of Human Thermodynamics*, *Human Chemistry*, *and Human Physics*, generally, or **human chemical thermodynamics**, specifically, and connected subjects, such as: two-cultures namesakes, religio-mythology, explicit atheism, and queries, such as: "what's the **go** o' that?" (Maxwell, 1834), "what is the **point** of every thing?" (Thims, 1987), or what is the paradigm change (Goethe, 1809) significance of the following human chemical reaction?

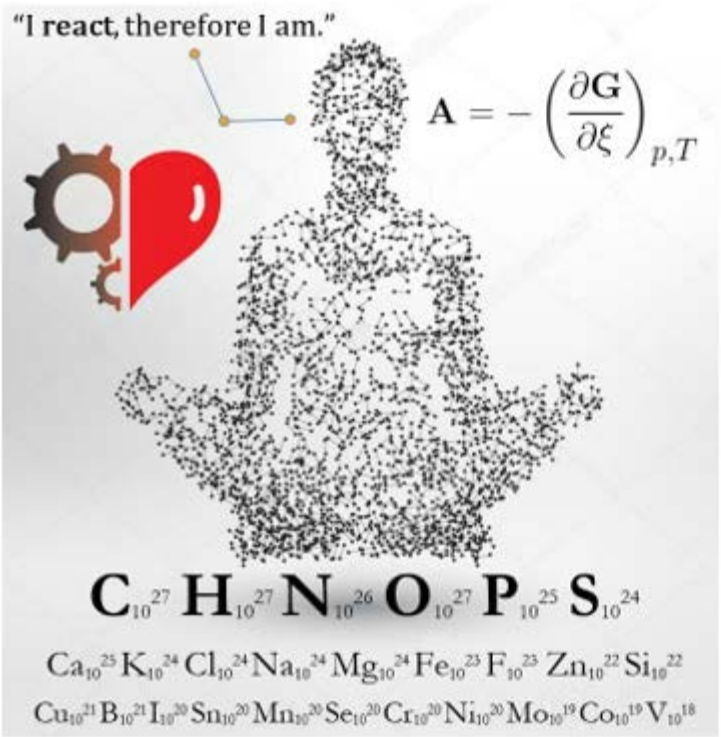

Charlotte=Edward [AB] + Captain [C] $\xrightleftharpoons{\Delta}$ Edward≡Captain [BC] + Charlotte [A]

The "gist" of **Hmolpedia**, namely a compendium of topics related the fact that a human is a heat-powered 26-element atomic "thing" (see: human molecular formula), governed by the laws of thermodynamics, e.g. dG < 0 defines a '**natural**', i.e. "good" or "right" (in an anthropism sense), process or reaction (see: HCR theory), whereas, e.g. dG > 0 defines an '**unnatural**', i.e. "evil" or "wrong" (in an anthropism sense), process or reaction, just as is all other things in the universe, and that the reactions of these atomic bound state things are energetically coupled.

Hmolpedia, in short, is a **one nature** / monism (e.g. socio-physical monism) focused, two cultures / dualism (e.g. Cartesian dualism) integrating, recondite, **thermodynamics**-based, modern **Faustian**-view (see: **top 1000 geniuses**), putting student Humpty Dumpties back together again, work-in-progress, online (and 10+ volume **print set**) prolegomenon niche-***pedia*** (see: reviews) of **5,300+ articles**, sung by: Tweets (**Q**)(Q)(Q), Reddits (**Q**)(Q)(Q), videos (**Q**)(Q), Google Books (Q) / Scholar (Q) citations, poems (Q), and interviews. [N1]

Two Cultures Conference | 2020

On 22-24 Jun 2020, the Worcester Polytechnic Institute, Worcester, Ma, will be hosting the first annual NSF-funded Two Cultures Thermodynamics Conference, aka "**International Conference on Thermodynamics 2.0**", with organization assistance from Hmolpedia, aimed at connecting the social sciences with the natural science, aka the two cultures, via the universal bridge of thermodynamics: [1]

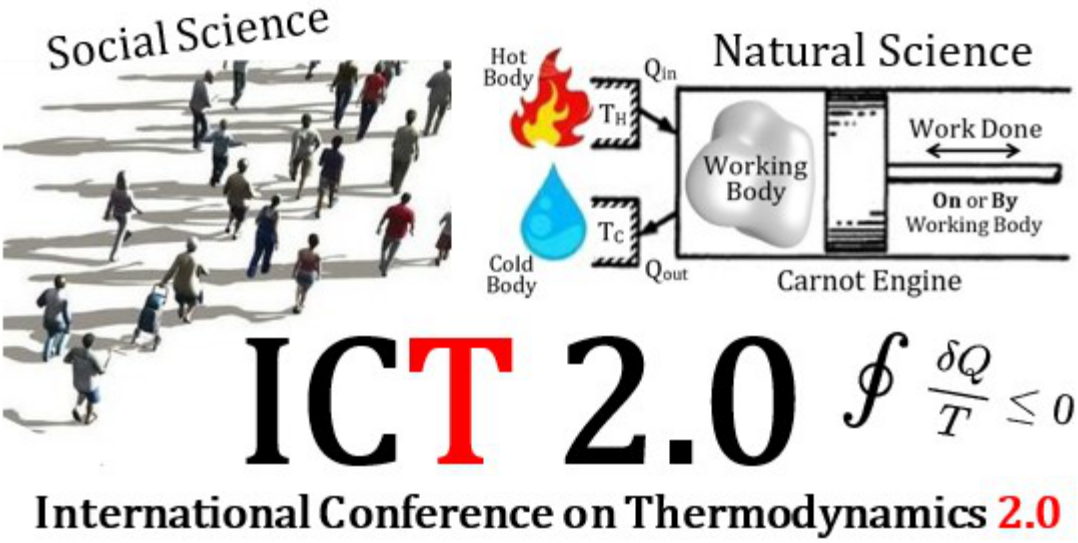

About 20+ authors, as of Jan 2020, have submitted abstracts, and 40+ have said they are coming to present; the capacity goal being 60 authors. Feel free to attend or apply to be presenter if interested.

Notes

N1. (a) For more *site overview* | see archived homepage versions: **May 2019**, Nov 2016, and Jul 2013.
(b) For better *searching* | the Hmolpedia "search this cite" box only partially works; the best way to see if an article exists is to Google search with the keys “term” and “eoht.info”, e.g. “Tom Stoppard, eoht.info” yields this; alternatively, go to the A article, and replace the A with desired term (separated by the “+” sign if more than one word), e.g. this.

References

1. International Conference on Thermodynamics 2.0 (2020) – IAISAE.org.

θΔics

In archives, **Hmolpedia (24 Nov 2016)**, refers to the pasted archive of the Hmolpedia main page on 24 Nov 2016, as shown below.

Hmolpedia (eoht.info) an A to Z *Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics* (see: etymology) is a one nature | monism (socio-physical monism) focused, two cultures | dualism integrating, recondite, modern Faustian-view (see: **top 500 geniuses**), putting Humpty Dumpty back together again, work-in-progress, online (and **print set**) prolegomenon niche-***pedia*** (see: **reviews**) of **4,200+** articles, sung by Tweets (Ñº)(Ñº), on the details of an historically-reoccurring "**idea**", and the study of the ramifications of this idea in respect to the application of the hard sciences of thermodynamics, chemistry, and physics to the analysis (see: **Beg analysis**) and explication of human existence, experience, movements, and states of being and becoming.

This hard science physico-chemical analysis of the humanities, accordingly, interjects with the soft sciences, via the "thermodynamic lens" + "translatability" criterion, aka extreme realism **ultra-reductionism**, therein making hardened amalgamated newly-emerging sciences, such as: political-economic social mechanics (Winiarski, 1894), heat engine based mathematical economics (Wilson, 1936), Gibbs-Pareto based Sociology 23 (Henderson, 1942), realism political thermodynamics (Rossini, 1971), physico-chemical sociology (Beg, 1987), sociophysics, econophysics, or human chemical thermodynamics, to name a few (see: **two cultures namesakes**), i.e. physicochemical humanities in general.

Left: the famous 1799 Goethe to Schiller dialogue (see: Goethe timeline) that Crebillon treats the "**passions like playing cards**" with NO trace of the delicate "chemical affinities", i.e. micro-interaction forces of attraction and repulsion, that move people, interaction-wise; which is equivalent, as depicted above right, to the post-1882 [see: Helmholtz] statement that "there is no trace of any fine delicate free energies, i.e. Gibbs energies (see: **human free energy**), that drive the reactive system" in Crebillon, as outlined by Mirza Beg (right) in his 1987 ***New Dimensions in Sociology***; both connected by the affinity-free energy equation.

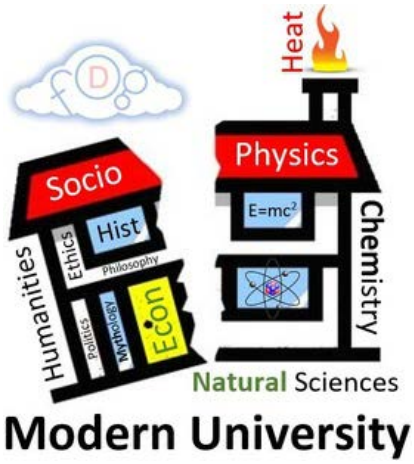

The broken university, shown above, is Judson Herrick's 1930 view of the modern university, i.e. a house divided against itself, filled with broken **Humpty Dumpty students**, enveloped in a kind of thought-restraining "god fog," fragmented into mental parts by a Jeffersonian-like "invisible wall" separating, via an unbridgeable gap, the natural, physical, and chemical science departments from the humanities departments, into two cultures, the former speaking in the language of Clausius, the latter in the language of Shakespeare.

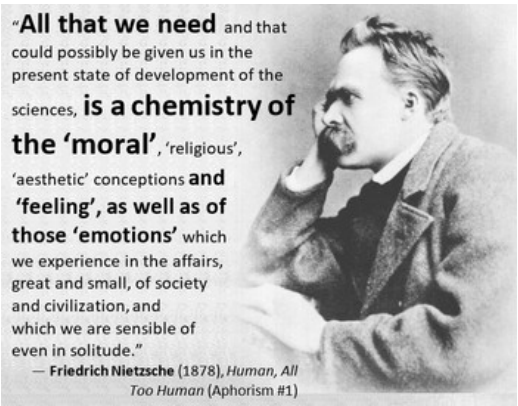

Left: Friedrich Nietzsche (1878) ruminating on the pressing need for **moral chemistry** in a growing atheistic world. Right: Romanian econophysicist Mircea Gligor, at UPESW 5 (2013), see: video (Ñº) (14:44-15:27), on Gibbsian vs Prigoginean socioeconomics and the translatability criterion.

Overview

The following — the top ten mononymous names in Hmolscience citation rankings — are well representative of the core structure of Hmolpedia; Goethe via Gibbs being the nutshell synopsis of the modern understanding of human existence:

1. **Goethe** | Johann Goethe (cited: 1329)
2. **Gibbs** | Willard Gibbs (cited: 955)
3. Clausius | Rudolf Clausius (cited: 705)

4. Newton | Isaac Newton (cited: 638)
5. Lewis | Gilbert Lewis (cited:549)
6. Maxwell | James Maxwell (cited: 520)
7. Einstein | Albert Einstein (cited: 492)
8. **Adams** | Henry Adams (cited: 486)
9. Darwin | Charles Darwin (cited 463)
10. Helmholtz | Hermann Helmholtz (cited: 452)

The following is basic flow diagram of the construction of Hmolpedia, at the Mar 2016 level, i.e. the contents of EoHT.info at the 4,050-article level, when the 10-volume (6,496-page) print set of ***Hmolpedia*** was made available:

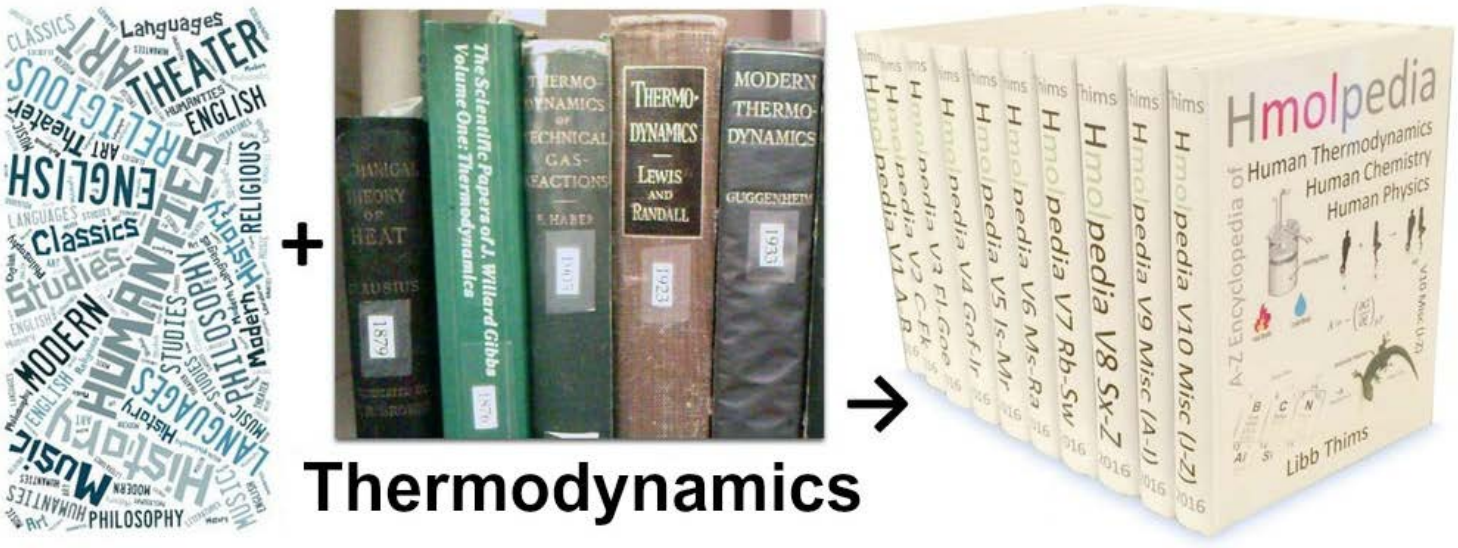

In short, core concepts from the humanities (left), are funneled through the reality cleaning mechanism of Clausius-Gibbs and Lewis-Guggenheim chemical thermodynamics (center), producing Hmolpedia (right), a knowledge-*pedia* of the results of the products of this mechanism.

Goethe + Gibbs

The following diagram, to illustrated why Goethe and Gibbs (see: Gibbs and Goethe) are cited so much, shows one of the basic reaction mechanisms involved in the construction of the **Goethe affinity table** (1808), itself built from the physical chemistry principles of the Bergman affinity table (1775), the gist of which being that humans and chemicals react according to one and the same nature or set of principles, namely, the principle of "die wahlverwandtschaften" (see: title decoding) or "the **selection** (choice or election) by nature of **allied** (connatural, related, or interrelated) **unions** (ties, companions, companies, or communities)".

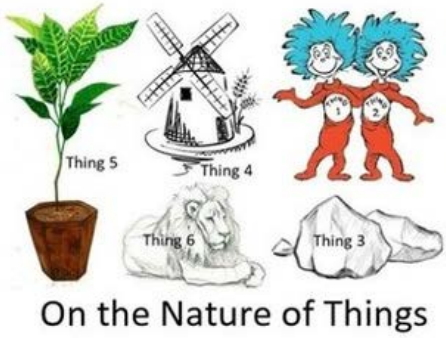

Left: Sketch (Ñº) of a little girl, reading about frogs, retouched with the famous 1810 Goethe and Karl Knebel dialogue on who Goethe claimed to have written ***Elective Affinities*** for, namely: for "die Madchen", i.e. little girls (Hollingdale, 1971) or young women (Tantillo, 2001). Right: Empedocles' *Fragments of Aphorisms* (450BC) and Lucretius' *On the Nature of Things* (55BC) are two founding famous publications of hmolscience, the general subject matter of **Hmolpedia**, which outline a general science of "**things**", the principle operation of the nature of each *thing*, examples shown above, governed by one and the same laws of chemistry, physics, and thermodynamics. [5]

> "Are men and women subject to the same laws of material reality as are the chemical substances?"
>
> — Martin Swales (2002), synopsis of Goethe's *Elective Affinities*

The logic of which first being set to systematic order in the Geoffroy affinity table (1718), shown below left, which in turn derive from the principles and logic Newton's last and final "Query 31", which in turn derive from his (and others, before him) existence-long quest to understand the secret principle of nature, thereby enabling the rendering of human relations into crude systematic order by Goethe, such as shown below right, aka the Goethe affinity table (1809), the forerunner to

the human free energy table (1995):

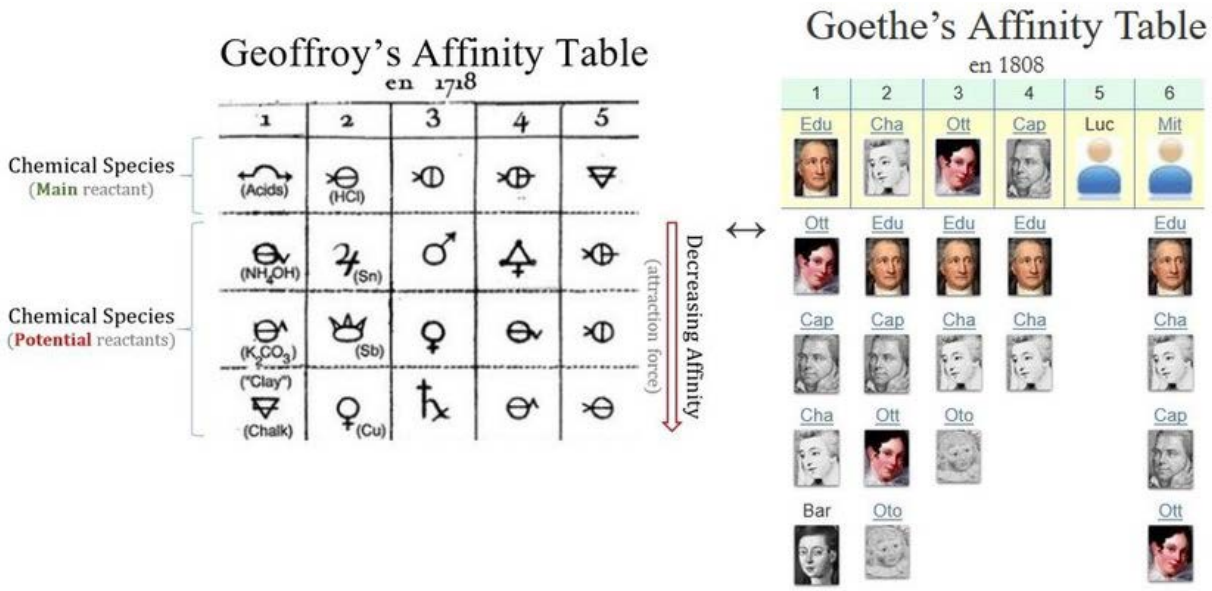

The ramifications of this logic, in terms of public absorption, translates to the following "elective affinities belief scale", as depicted in film renditions, shown in bottom visuals, according to which people over the last two centuries and counting have been split on the matter, depending upon whether one is an admirer (adherent), fence-sitter (undecided), or an enemy (detractor) of the implications of Goethe's human chemical theory, i.e. the view that not only do "people react like chemicals" but that "people are chemicals" and whether this is analogy or reality:

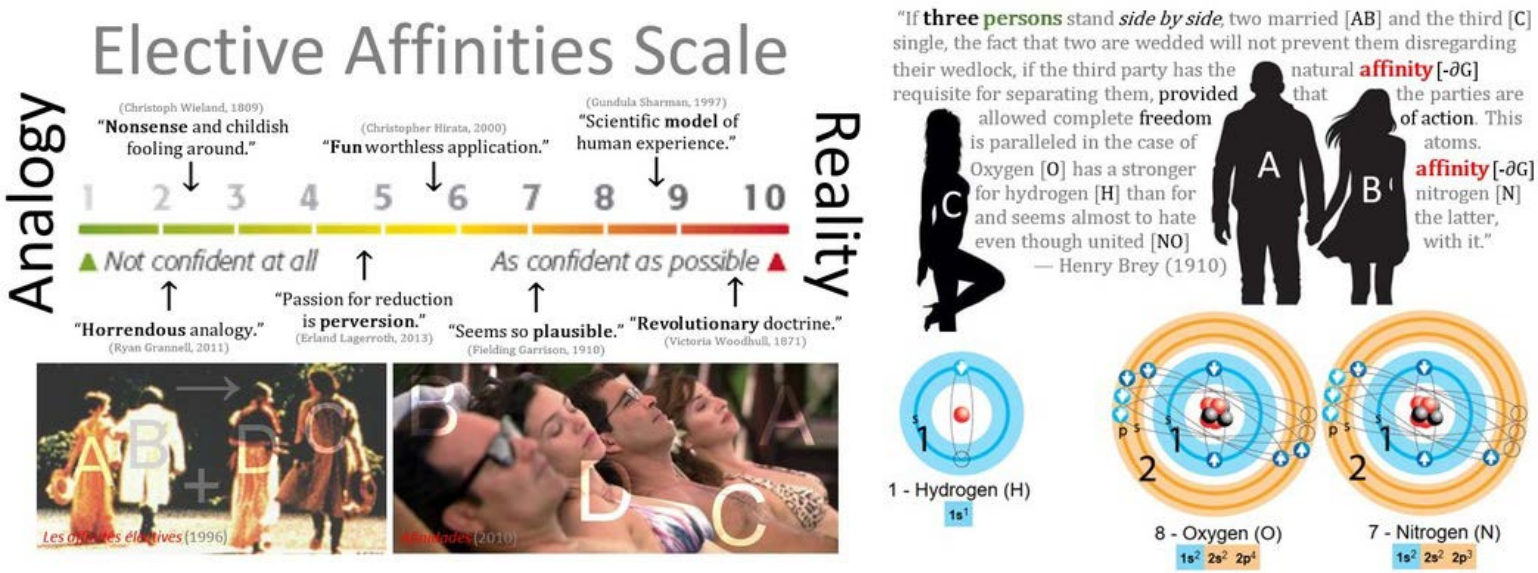

Left: the **elective affinities scale**, showing (top) historical opinions on whether Goethe's 1809 *Elective Affinities* is reality or analogy, and bottom film remakes of this philosophy (Goetheanism, Goethean philosophy, or human chemical theory), bottom (left) the 1996 *Les affinities electives*, a French-Italian film rendition of the original, and bottom (right): the 2010 *Afinidades*, a Spanish "modern" remake of the original, set in an isolated lagoon resort in Cuba. **Right:** **Henry Bray**'s 1910 stand three people side by side, two married one single, and situate nitric oxide NO and hydrogen H together, and one and the same affinity (Gibbs energy) determinates or laws of force will prevail in each model. The classic example of what Bray is getting is played out in 1965 epic-drama romance film Dr. Zhivago to a slowed down, human existence scale, i.e. reaction start (birth) to reaction end (death), war-heated mechanism (social mechanism) detailed explanation.

In short, in order to understand Goethe's supposition that every person, conceptualized as a metamorphosized chemical, can be ordered on an affinity table, each person's reaction tendencies ordered with respect to everyone else, in decreasing order, one has to thereby have a deep understanding the the 1876 chemical thermodynamics work of Willard Gibbs, being that Gibbs energy is the modern way of measuring elective affinities, i.e. the micro attractions and repulsions between people (or chemicals), as proved by Helmholtz in his 1882 "On the Thermodynamics of Chemical Processes".

The translation of Goethe's "human affinity table", in modern physicochemical terms, is that each person in a given social system or on the planet would be listed on a "human free energy table", i.e. a free energy table with people listed as chemical species in a given Gibbs free energy of formation state, via the thermodynamic data table method pioneered by Lewis (1923).

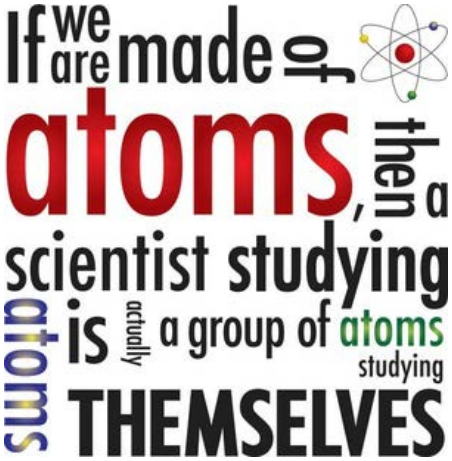

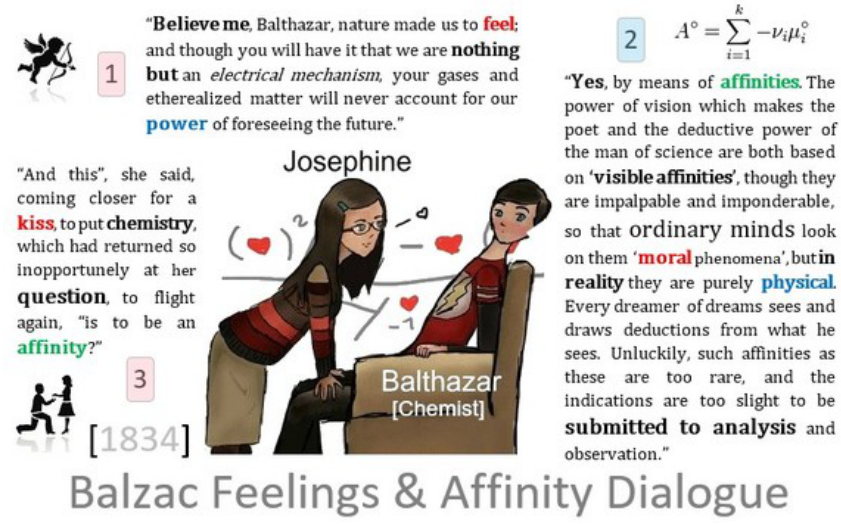

The famous 1834 **Balzac feelings and affinity dialogue**, by Honore Balzac, which cogently pits the female "feelings" and "emotions" view of love and relationships against the male "equations" and "realism" view side of the fence.

Compare also: Aristotle's citation rankings, of core names employed in his collected works; see also: term rank, a ranking of key "terms" used in Hmolpedia, and power centers, a flow diagram of deeply-rooted historical knowledge; a focal-point page is: **social Newtons** (50+):

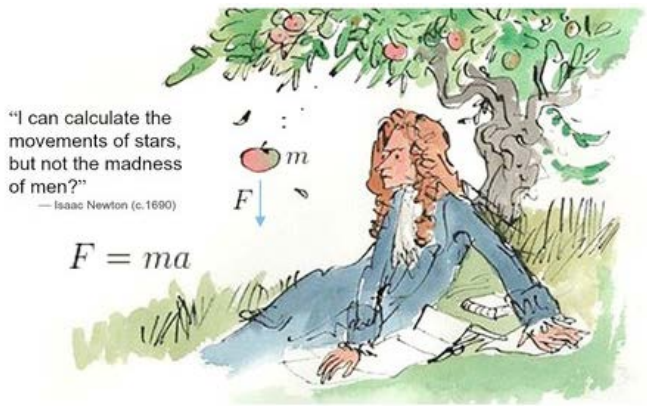

a ranked listing of thinkers to have attempted *Social Principia* like treatises, i.e. derivations of a universal theory to explain, simultaneously, why an apple falls to the earth, via laws of motion, and why people fall in love, via one and the same laws.

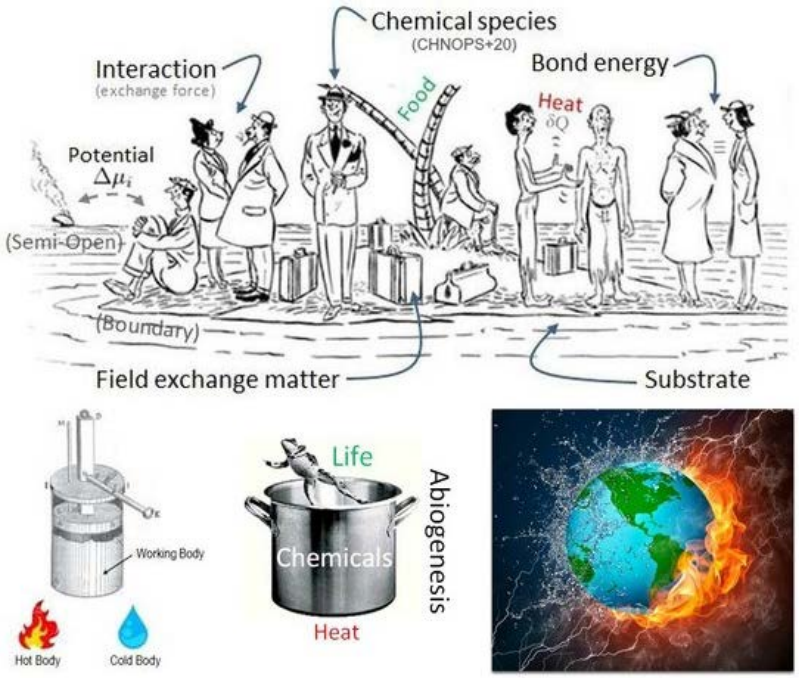

Top: the so-called "**island model**" used classically to conceptually understand basic human chemical thermodynamics concepts, e.g. system, social chemical potential, bond energy, etc. Left: the Papin engine, the basis of the laws of thermodynamics, which govern the universe. Center: depiction of abiogenesis, namely the hypothesis (Thomas Huxley, 1870) that by heating and or adding energy to non-living matter, life can be generated, i.e. a frog will eventually hop out of the primordial soup; the logic of which many, in modern times, adhere to via a combination of the Miller-Urey experiment (1952), the RNA world hypothesis (Walter Gilbert, 1986) (Ñº), the hydrothermal vent theory (Gunter Wachtershauser, 1990) (Ñº), among other arguments. Right: the earth, surface-attached social systems in particular, visualized in the "thermodynamic systems" perspective, alternative **heated** (fire "day" hot body) and **cooled** (water "night" cold body), cyclically, as working bodies, triggering metamorphosis (aka evolution) via electrochemical processes.

Other backbone pages include: Humanities citation ranking (38+), **HT pioneers** (505+), HC pioneers (57+), HP pioneers (50+), HMS pioneers (122+), **human free energy** (40+) theorists, and Genius IQs (430+); see also: Stark classification (10+) on the fundamental "forms" of the mechanistic social or social mechanism thought. The deeper thinkers tend to have a mindset in the neighborhood of the molecules to man, molecules in motion, or hydrogen to human paradigm.

Two cultures | Divide

See main: Polymathy degree problem

In the earlier 19th century, bulk human knowledge had begun to grow so fast that last universal geniuses were beginning to die off, modern thinkers were beginning to suffer from the effects of mental "hydraism", according to which by 1833 the so-called “intellectuals” of the world were forcibly divided (see: Whewell-Coleridge debate) between those who worked in the “real sciences” (Samuel Coleridge, 1833), i.e. mathematicians, physicists, and naturalists (William Whewell, 1840), and those who worked in the other seeming “sciences”, i.e. poetry, arts, humanities, or soft sciences, and the metaphysical fields of social concern, namely those connected with moral philosophy ideologies. In the early 20th century, bulk human knowledge had grown so that the so-called biological-minded social philosophers were beginning to be surrounded and encompassed by the physical scientists and natural scientists:

> “Surrounding us on all sides are the physicists, chemists, geologists, and astronomers, with whom we must reckon, for their domains and their subject matter overlap ours in countless ways.”
>
> — William Patten (1920), *Social Philosophy of a Biologist*

> “Since my name is not Socrates or Einstein and I hold only one of the seven or eight PhD degrees [organic chemistry] this problem requires, readers are quite justified in questioning my qualifications to testify as such a multidisciplinary expert.”
>
> — George Scott (1985), on the ethics and physical chemistry of will

In the decades to follow, the puzzling phenomenon of "anti-interdisciplinarity" (see: interdisciplinarity) emerged, a type of defense mechanism, according to which each intellectual turf, set by ingrained beliefs, tended to defend its own, whereby those few “engaged in integrative thought” (Harold Morowitz, 1979) lost status, after which, going into the 21st century, the "mental divide dilemma" (Medi Belortaja, 2009) resulted, each scientific specialty, or mind of that specialty, divided against each other in views and inherent beliefs about human nature.

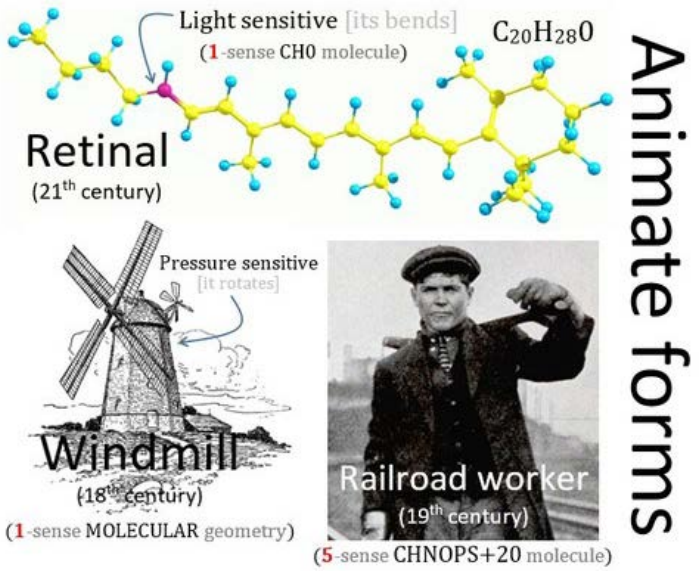

Three **thing philosophy** examples of "animate forms", the respective principles of animation of each differing only in degrees of complexity (see: animate and inanimate; rock vs human); the nature of operation of each governed by one and the same laws of physics, chemistry, and thermodynamics (see: one nature).

Humanities + Thermodynamics

The following flow chart shows the overall ongoing construction process of Hmolpedia, namely the dissection and re-interpretative understanding of the humanities and social sciences according to core laws of nature, the foremost of which is Clausius-Gibbs based thermodynamics, in other words in terms of the energy (i.e. enthalpy) and entropy (i.e. transformation content), something worked out in basic framework two centuries ago by Goethe in terms of human chemical reactions and chemical affinity or "elective affinities", the three (energy, entropy, and affinity) relate via the affinity-free energy equation, according to the thermodynamic theory of affinity, proved in 1882 by Helmholtz, all of which derive from Newton's last and final Query 31:

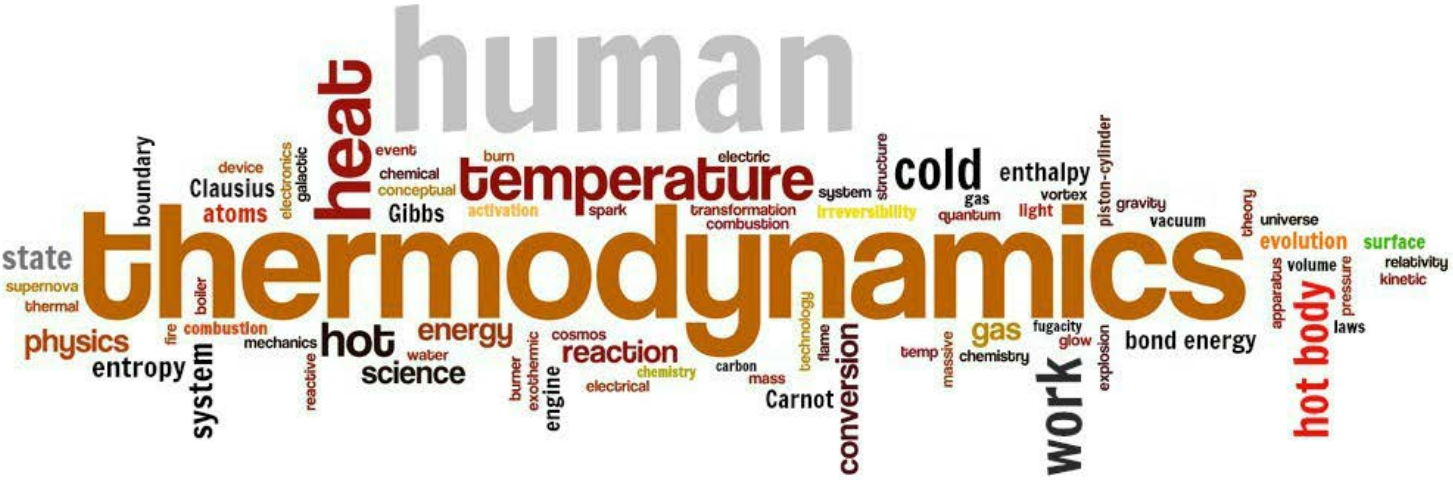
human
heat
temperature
thermodynamics
cold
state
physics
entropy
system
hot
science
energy
reaction
work
conversion
hot body
Clausius
Gibbs
Carnot
boundary
atoms
device
electronics
galactic
event
chemical
conceptual
burn
activation
spark
electric
transformation
combustion
irreversibility
structure
enthalpy
vortex
light
gas
quantum
piston-cylinder
gravity
vacuum
theory
universe
evolution
surface
volume
relativity
kinetic
apparatus
pressure
laws
bond energy
fugacity
glow
explosion
chemistry
temp
massive
technology
flame
carbon
mass
cosmos
chemistry
electrical
water
mechanics
reactive
burner
exothermic
engine
boiler
combustion
fire
supernova
thermal

Solvay Conference | 1927
Life feeds on -dS
Schrodinger
Pauli = God's whip
Ehrenfest
De Donder
Do you believe in god?
Fowler
Heisenberg
Soul Compass!
Brillouin
Pauli
Compton
Broglie
Born
God governs atoms
Bohr
Bragg
Dirac
God needs to GO!
Einstein
Guye
Curie
"There is NO god"
Lorentz
"Believe in Creator"
"There is NO 'personal' god"
"NO 'personal' god"
Planck
"NO 'personal' god"

Hegel
Tieck
Humboldt's
Oken
Fichte
Gauss
Herder
Goethe
Pestalozzi
Schiller
Blumenbach
Wieland
Weimar | 1803
Love

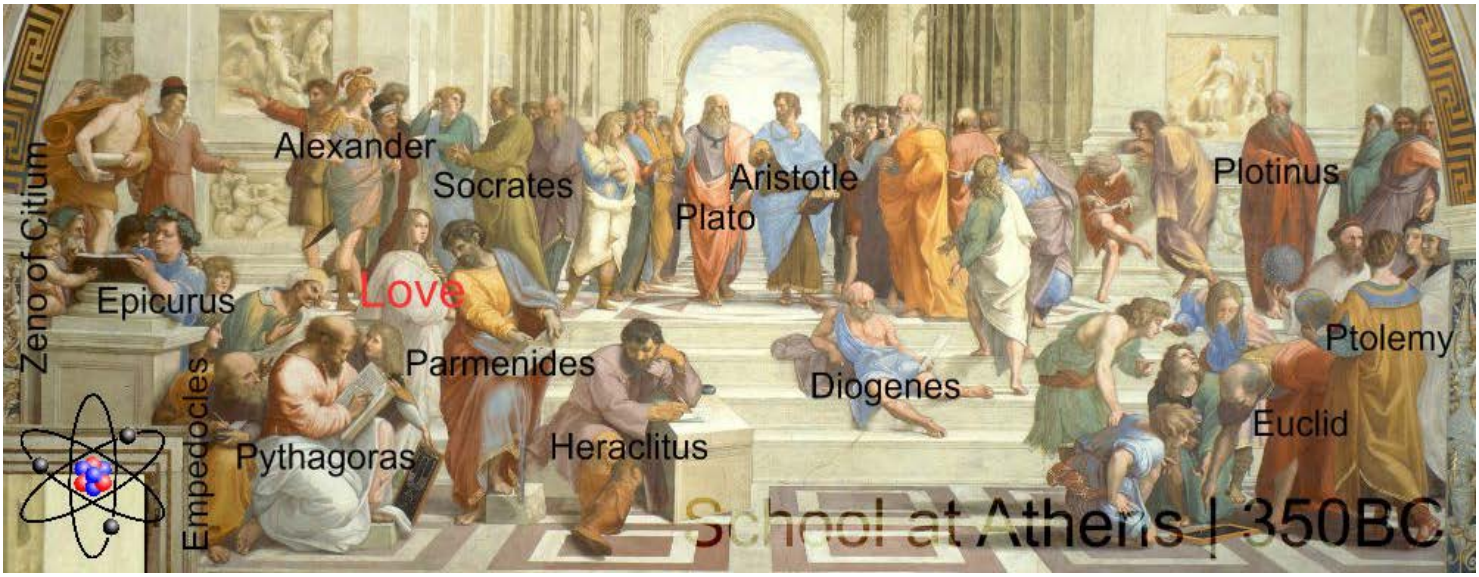

Physicochemical humanities | Equation flowchart

The following physicochemical overlay diagram, below left, and equation flow chart, below right, give an overview of Hmolpedia and of hmolscience, human chemical thermodynamics, and or the physicochemical humanities in general:

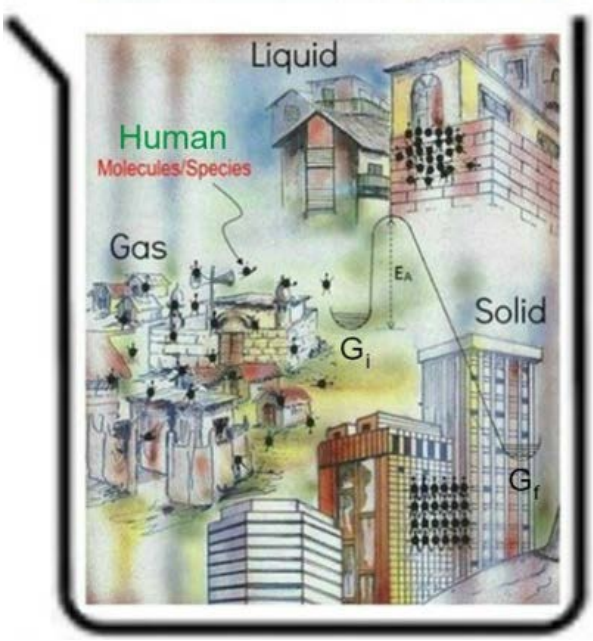

(Mirza Beg, 1987)

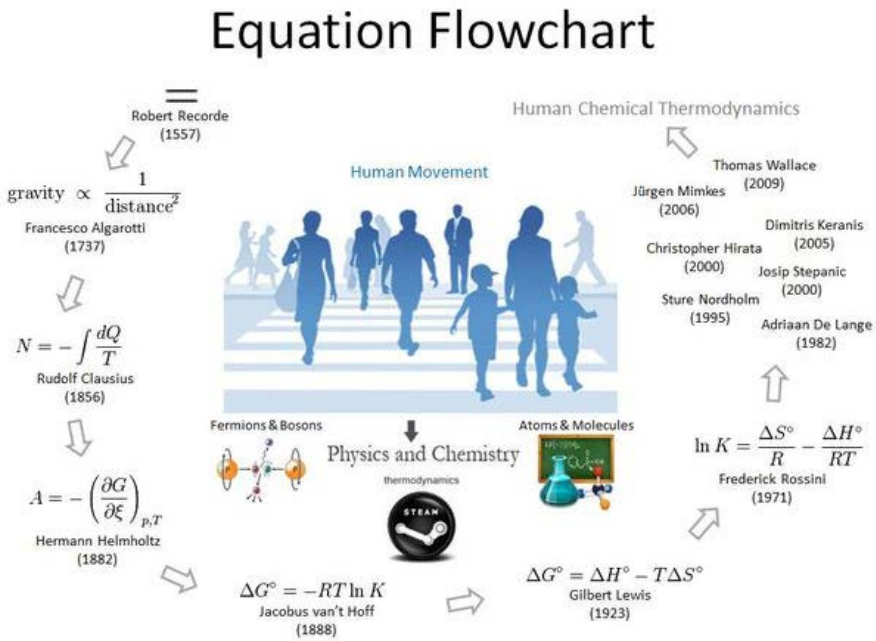

(Frederick Rossini, 1971)

The two above diagrams, in short, show a re-conceptualization of humans and social systems as types of physicochemical systems, governed by the partial differential equations of chemical thermodynamics, with the implicit derived result that humans, animals, plants (e.g. diagram below right), and so-called lower forms of powered chemical animation (e.g. bacteria, viruses, walking molecules, etc.), are not "living things" (a religio-mythology conception), but CHNOPS+ structures in powered states of driven animation. The diagram, above left, is from the cover of Indian-born Pakistani organometallic chemist Mirza Beg's 1987 book *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, depicting a conceptualization of slums (or huts), middle class, and big cities as different molecular aggregate states, akin to atoms or molecules in the gas, liquid, and solid state, respectively, according to which human behavior is conceptualized as molecular or chemical behavior, described according to the physicochemical methods and principles of physical chemistry, e.g. activation energy (diagram overlay shown), free energy change, bond energy, etc. The equation flowchart, above right, first outlined in the 2012 *Elective Affinities* "equation decipherment" article, then presented by American electrochemical engineer Libb Thims at UPESW 2013, Pitesti, Romania, gives an overview of the equation structure of the physical chemical reductionism of the humanities, from the invention of the equal " = " sign by Welsh physician-mathematician Robert Record (1557), i.e. equation invention, to American chemical engineer and physical chemist Frederick Rossini's 1971 derivation of what he defines as "**chemical thermodynamics in the real world**", according to which entropy ΔS and enthalpy ΔH changes govern the nature of freedom and security, respectively, in social reaction existence and experience equilibration processes. [3]

Religion | God vs Gibbs

The subjects of chemistry, physics, and thermodynamics are, by definition, "atheism" or atheist ingrained subjects, i.e. in no way is belief in the existence in God (or gods), or for that matter spirits, or

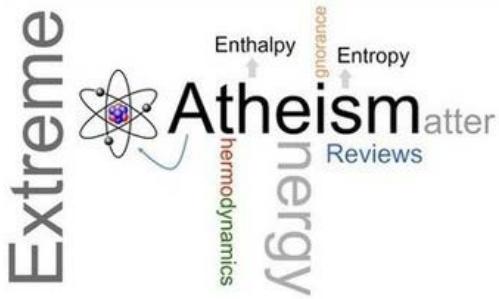

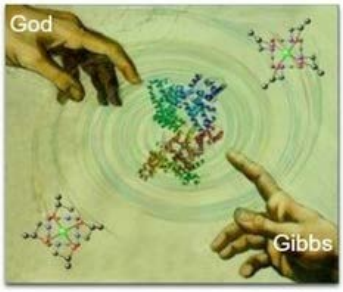

Left: the word scramble mnemonic for the 2014-launched Atheism Reviews video channel, a precipitate of Hmolpedia, a venture into explicit extreme atheism (aka extreme realism). Right: a representation of the God vs Gibbs debates, having erupted in the wake of the Rossini debate and human molecular theory.

anything supernatural or metaphysics, part of their respective structures. Subsequently, when chemistry, physics, and thermodynamics are applied to the humanities, the resulting derived amalgamation or proto-science is, by definition, an atheism-ingrained result. Accordingly, when one comes across attempts at "science + religion" mending amalgamations, typically tending towards the use of ontic opening stylized arguments, something will be inherently wrong with the fundamental points of the argument. The atheism timeline, some of which is partially shown adjacent, touches on some of these key turning points, from Laplace's 1802 declaration to Napoleon that in his formulation of celestial mechanics he had "no need of that [god] hypothesis" (see: Napoleon Laplace anecdote), a proposition that has not yet seen realization in social mechanics, to Nietzsche's 1882 pronouncement that "God is dead", to the modern 2006-present *Journal of Chemical Education* "God vs Gibbs" debates (see: Rossini debate) about whether or not chemical thermodynamics has the "power to explain the human condition" (John Wojcik, Dec 2006).

Atomic theory | Purview

Implicit in the above partial differential equation formulation of human existence and experience, is the "atomic theory" (Leucippus, 450BC) applied to humans point of view, a type of advanced chemical thermodynamically neutral deathropized Aristotelian (teleology expunged) Goethean-Epicureanism, followed in hmolscience, namely from the definition of the molecule (Pierre Gassendi, 1649) to the cell-as-molecule (Lionel Harrison, 1993) to human-as-molecule (Jean Sales, 1789) perspective, to the intersection of this with modern chemical thermodynamics perspectives (e.g. RSS news feed), in the form of modern human chemical thermodynamics: [2]

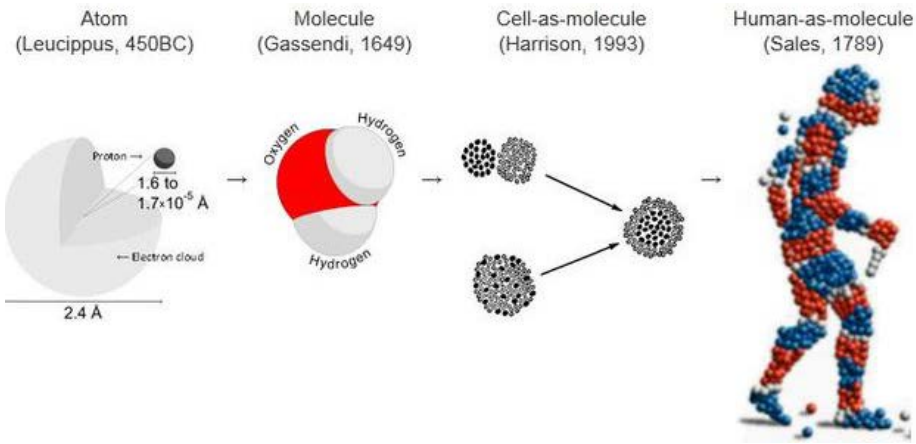

Thermodynamics news (Ñº)

People (humans), *not* as living beings, but "powered" CHNOPS+ chemicals, molecules, or matrices (Henry Swan, 1974) is a well-honed modern description of the humans-as-molecules purview.

Historical | Human models

Historically, to put the above in context, the following, from UPESW 2013, is an historical retrospect look at the developmental modeling of the what the great thinkers, over the last 5,000-years, have modeled and conceptualized the "human" as: [2]

In short, five-thousand years ago, scholars conceived of humans as sun-created entities—humans as spirit-life-soul imbibed clay figurine sculptures (the sun deified) the details of which described by religio-mythology; today, likewise, scholars conceive of humans as sun-synthesized entities—humans as powered 26-element atomic geometries (the sun understood as a hydrogen-helium mass undergoing thermonuclear reaction) the details of which described by human chemical thermodynamics.

In long, over the last five-thousand years, the "sun birth" theory (3,000BC) transmogrified into the religio-mythology based "clay creation" humans-as-workers model of Imhotep (2600BC), which turned Aristotle

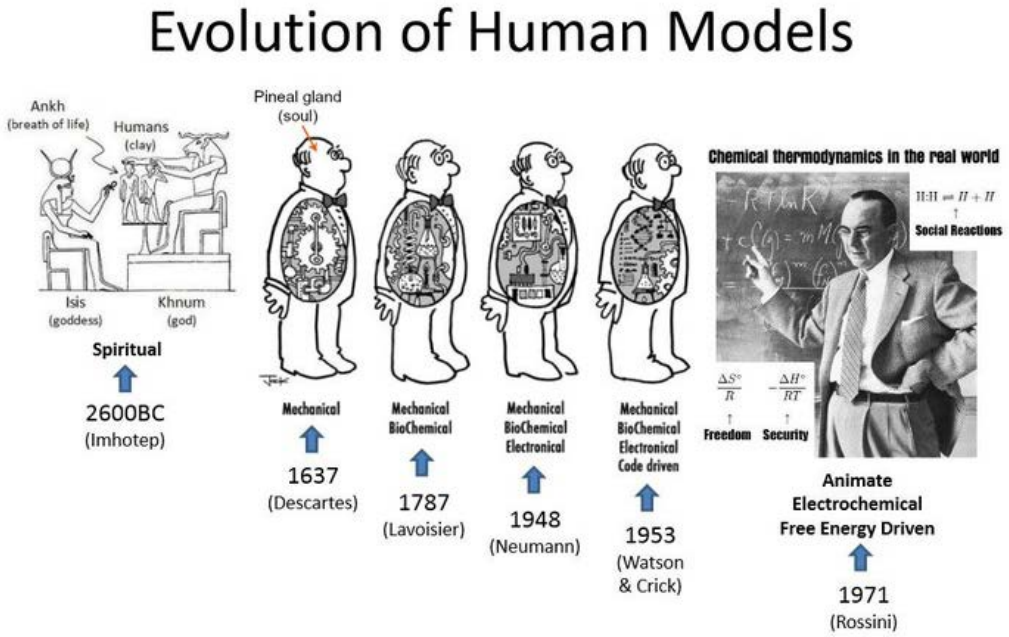

Synopsis, from Imhotep to Rossini, of the conceptual evolution of models of what a "human" is and its origins.

(322BC) teleological physics/metaphysics model of the human; thereafter becoming the automaton + pineal gland (soul), mind-brain "dualism" model of Descartes (1637); which became the mechanical bio-chemical "animal combustion" caloric models of Lavoisier (1787); which modified into the self-assembled "electrochemical automaton" model of Neumann (1948); thereafter being modified by the Darwinian-based "DNA-survival" models, following Watson and Crick (1953); eventually arriving at the modern, albeit hotly debated (2006-present) "chemical thermodynamics in the real world" modelling of Rossini (1971), viewing people as equilibrium adjusting reactive chemicals or “26-element energy/heat driven dynamic atomic structures” as modern engineering thermodynamics (2011) defines things. [4]

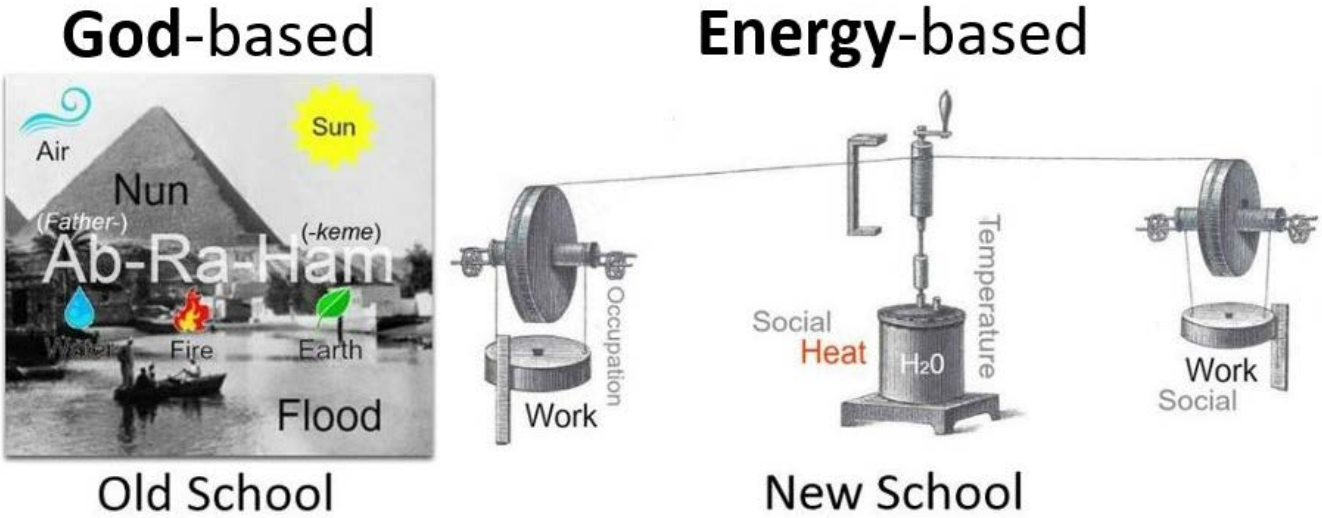

While we, over the millennia, certainly have come along way in "deanthropomorphizing" ourselves, as some might reason, Descartes' pineal gland dualism model still lingers, precariously and dangerously, as some posit, in the face of Goethe's true-to-reality 1809 conclusive statement that there is, after all, only "one nature".

Like rankings

The following are the 25 most-liked pages (see main: like rankings) in Hmolpedia, as of Jan 2014, according to Facebook likes, main page aside:

1. Equation of love | 430+ likes
2. IQ: 200+ | 228+ likes
3. Founders of thermodynamics and suicide | 220+ likes
4. IQ: 150+ | Smartest woman ever | 214+ likes
5. Love the chemical reaction | 125+ likes
6. Dawkins scale | 99+ likes
7. Endorphin theory of love | 87+ likes
8. Good Will Hunting (William Sidis) | 83+ likes
9. Chocolate theory of love | 53+ likes
10. **Christopher Hirata** | 53+ likes
11. Last person to know everything | 50+ likes
12. Human molecular formula | 42+
13. Sweaty T-shirt study | 43+ likes
14. **Johann Goethe** | 34+ likes

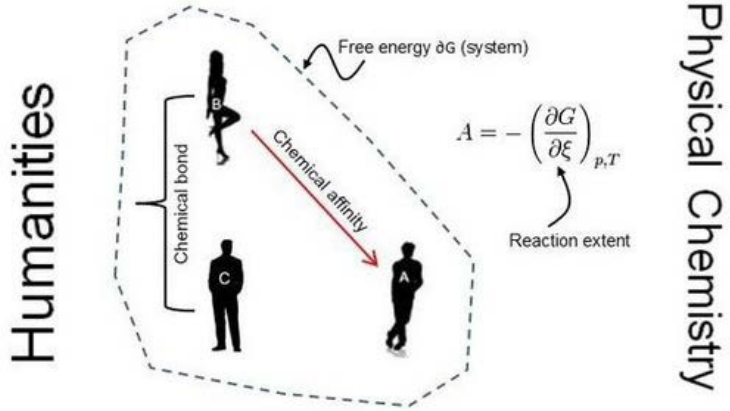

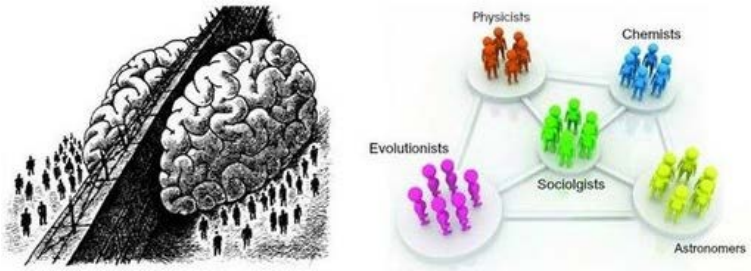

Top: A nutshell synopsis of hmolscience: Goethe's 1796 affinity-based "human chemical theory" (left) explained, in modern terms, via partial differential changes in isothermal-isobaric free energies in a given boundaried social system, per extent of reaction, quantified by the 1882 Goethe-Helmholtz equation (right). Bottom: A depiction of the "**mental divide dilemma**" (Medi Belortaja, 2009), showing physicists, chemists, astronomers, evolutionists, and sociologists (William Patten, 1920) connected, albeit mentally-divided against each other (Harold Morowitz, 1979) in views and beliefs about human nature, which, owing to hydraism, has resulted in the derisive phenomena of anti-interdisciplinarity.

15. **Thomas Young** | 33+ likes
16. Human chemistry | 34+ likes
17. Thermodynamics of hell | 31+ likes
18. Laws of thermodynamics (game version) | 31+ likes
19. Turnover rate | 33+ likes
20. Human thermodynamics | 27+ likes

References

1. Thims, Libb. (2014-15/16).*â€‹ Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics, Volumes 1-6* (see: main where pdfs are available). Publisher.
2. Thims, Libb. (2014-15/16). *Chemical Thermodynamics: with Applications in the Humanities* (97-page version: pdf of 800-pages estimated total). Publisher.
3. Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (video, 1:33-min) (article, 40-pgs) (PowerPoint, 36-slides), Key speaker talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V) (organizer: Gheorghe Savoiu). University of Pitesti, Pitesti, Romania, Jun 29.
4. Annamalai, Kalyan, Puri, Ishwar K., and Jog, Milind A. (2011). *Advanced Thermodynamics Engineering* (§14: Thermodynamics and Biological Systems, pgs. 709-99, contributed by Kalyan Annamalai and Carlos Silva; §14.4.1: Human body | Formulae, pgs. 726-27; Thims, ref. 88). CRC Press.
5. Note: things 1, 2, 4, 5 and 6, in classification speak, e.g. compare outdated Linnaean classification (1735), are types of "animate" things, and thing 3 being a type of "inanimate" thing (see: rock vs human); among the former variety of which thing 4 is a wind-powered (pressure-sensitive) mechanical thing, thing 5 is a light-powered (light, pressure, smell, and taste sensitive) physicochemical thing (Ñº), and things 1, 2, and 6 are powered CHNOPS+# things, the "#" indicative of the elemental composition of the thing, e.g. a human, similar, conceptually, to the two fictional Seuss things, is a 21-sense (Ñº)(Ñº) powered CHNOPS+20 thing. Things 1, 2, 5, and 6, physicochemically-speaking, are "reactive" things, as compared to things 3 and 4, which are non-reactive or "inert" things, in respect to human-interaction timescales or human chemical reaction energies.

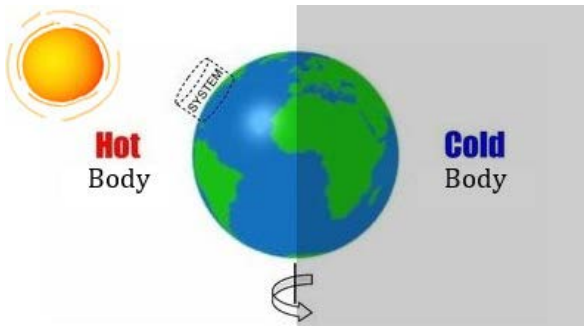

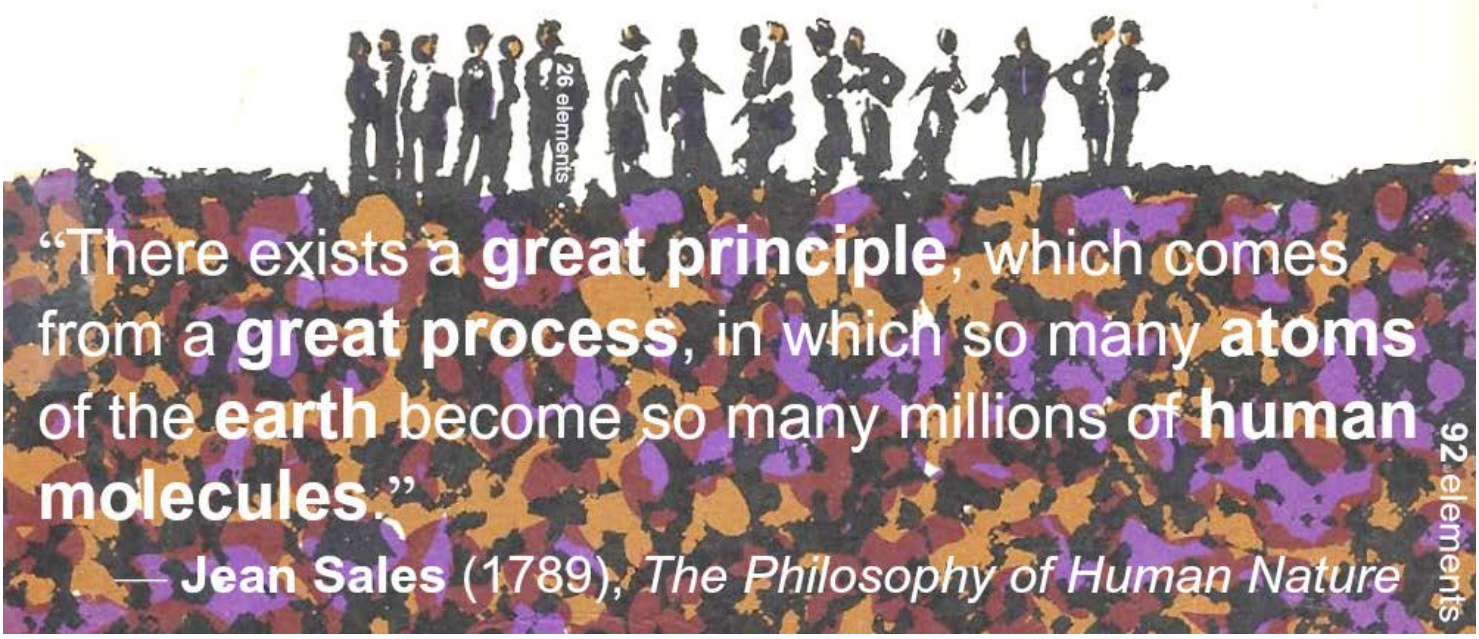

HmolpediaEoHThermoDynamics.info
ncycloPedia uman Human Chemistry & Human Physics
A + B → A≡B

"The time may come when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry … then it may be possible, as Adams suggests, to invent a common formula for thermodynamics and history."

— William Thayer (1918), American historian

θΔics

Hmolpedia (eoht.info) or *Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics* (see: etymology), a 'two cultures' encyclopedia, is a work-in-progress, prolegomenon, collectively-written online compendium of **2,950+** articles on the study of the application of the hard sciences of thermodynamics, chemistry, and physics to the analysis of human existence.

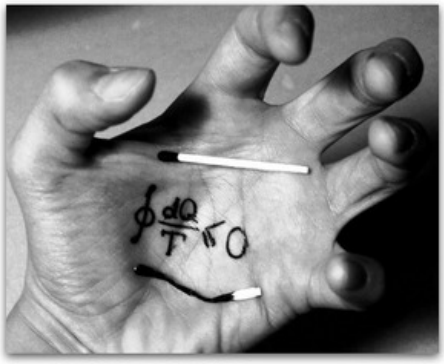

A tattoo of the Clausius inequality (as derived from the Papin engine, below right), the underlying function of the Lewis inequality for natural processes:

$$\Delta G < 0$$

the governing equation of human existence, on a man's hand, holding both a new and burnt match, indicative of the arrow of time; where "the hand represents the capacity of the human mind to analyze and understand natural phenomena, such as the power and imperative of irreversibility." [4]

> "I have just recently found out about the EoHT—a truly marvelous project! I did not think that it could be possible for someone to be able to conduct such a demanding project, but the result itself proves it is possible. Thank you for Hmolpedia."
>
> — Croatian physicist and mechanical engineer | social free energy theorist [1]

The core Hmolpedia subject is human thermodynamics (branches: 35+), a subfield of animate thermodynamics, inclusive of topics connected to the thermodynamical study of human existence, experience, behavior, and reactivity, as viewed through the laws, inequalities, and moral symbols of thermodynamics, namely those aspects of daily human movement quantified by: heat, work, energy, entropy, Gibbs free energy, activation energy, coupling, irreversibility, extent of reaction, bond energy, spin, and other factors, tending to be quantified as conjugate variable pairs.

The "backbone" of Hmolpedia is the HT pioneers (500+) timeline-table, a chronological listing of the thinkers to have applied thermodynamics to questions of human existence. A good thematic intro to the site is **HMS pioneers** page (120+), thinkers to have utilized human molecular logic (hmolscience), namely viewing people as individual abstract 'molecules' (or particles), such as found in the sub-branch subjects of: human chemistry (HC), human physics (HP), and human thermodynamics (HT); a connective subject is human mathematics (HM). Secondary Hmolpedia backbone pages are the **HC pioneers** (50+), **HP pioneers** (50+), and **HM pioneers** (5+) time-tables; see also: people database (800+). Good utility-pages include: symbols, equations, new pages, member index, objectives, FAQ, and homework problems. Hmolpedia currently draws about 70,000+ (school year) to 35,000+ (summer) page views per month, with an annual growth rate of 100.3% (in terms of visits) since the site's 2007 launch. [2] See also: why is this site here?

The equation overlaid cover of the 2012-launched online, planned 2013 book-published, ***Elective Affinities: Illustrated, Annotated, and Decoded***, by American electrochemical engineer Libb Thims, based on the 1885 English translation by Hjalmar Boyesen of Goethe's famous 1809 physical chemistry based novella *Elective Affinities*, using illustrations, mainly, of Philipp Johann (see: timeline).

Elective Affinities | Decoded

A current main project of *Hmolpedia* is the undertaking of the 2012-launched online, slated 2013-book publication, *Elective Affinities: Illustrated, Annotated, and Decoded*, shown adjacent, the first full book (*Elective Affinities*, 1809) to be embedded and hyperlinked into the body and structure of *Hmolpedia*, consisting in structure of about 40+ individual wiki pages: main project page, table of contents (36 chapters), reaction decipherment, equation decoding, list of characters (reactants), admirers, enemies, a translations page, among others.

> "A great revolutionary doctrine pervades the whole."
>
> — Victoria Woodhull (1871), first female US presidential candidate

The main objective of the newly-launched project is to: (a) collect all known nineteenth-century illustrations of German polymath Johann Goethe's self-defined "best book" , albeit critically-defined most "dangerous" book, yet thinker-defined revolution-containing (see: Goethean revolution) book; to (b) annotate the two-centuries of critical review and commentary on the content of the monumental novella, and to (c) decode the "hidden secrets" Goethe claimed to have embedded in the book in multiple layers of gestalt, most importantly to extract the three-dozen plus Bergman reactions Goethe is said to have used to construct the various chapters of the novella, and lastly to give a modern human chemical thermodynamics upgrade to the entire affinity chemistry (1718-1881) theoretical backbone of the novel, a "principle" (e.g. moral symbols) that Goethe famously said was "true", using the various versions of Goethe-Helmholtz equation (1882) as a starting point.

Those new to hmolscience are encouraged to read the newly deciphered, decoded, and human chemical reaction explicated (see: HCR theory) online version of Goethe's greatest publication, chapter-by-chapter, a work that Goethe famous said must be read "three times" for proper understanding.

Human chemical thermodynamics

The following schematic gives a cliff notes version of the "core" structure of the Hmolpedia, namely those who model human existence and experience using chemical thermodynamic reaction mechanism formulations (a post 1882 addition to Goethean human chemistry), viewed in the big picture structure of the dynamics and spins of the universe—or as cogently summarized in 1997 by Scottish German-literature scholar Gundula Sharman, the following is the "scientific model for human experience:" [5]

> "My idea for the new novella is to portray social relationships and their conflicts symbolically:
>
> $$A + B \rightarrow AB$$

Johann Goethe
(1808)
(IQ=230)

[and] the moral symbols used in the natural sciences are the elective affinities:

$$A = T\Delta S - \Delta H$$

discovered and employed by the great Bergman."

"For many of us, thermochemistry was our first science which involved nontrivial mathematics:

Christopher Hirata
(2000)
(IQ=190±, 225)

$$X + Y \leftrightarrow XY$$

It seems appropriate, therefore, to apply thermochemistry:

$$-K_B T \ln K_{eq} = \Delta E + P\Delta V - T\Delta S$$

to relationships."

"The thermodynamic parameter free energy:

$$\Delta G = \Delta H - T\Delta S$$

Thomas Wallace
(2009)
physical chemist
(college
president)

represents the fundamental driving force in nature and determines whether physical and chemical processes conducted by nature and society will take place [and] the civilization development model [can be] represented by the following equation:

$$P \rightarrow F \Leftrightarrow S \Leftrightarrow I \rightarrow F$$

where *P* is the primitive phase, *F* the feudal phase, *S* the state phase, *I* the imperial phase,⇔meaning dynamic equilibrium, and → meaning complete conversion to products."

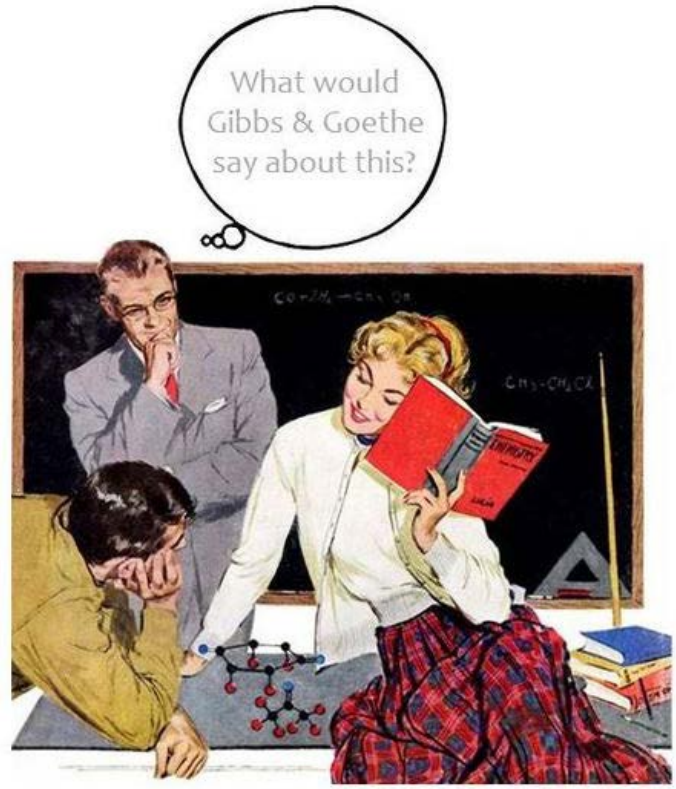

Die Wahlverwandtschaften
(The Elective Affinities)
"Elective Affinities Problem"

The first two individuals, of curiosity, Johann Goethe (theory conceived: 1796 [age 47]) and Christopher Hirata (theory conceived: 1996-2000 [*circa* age 16]), each have been independently assigned with a very rare ceiling range intelligence of IQ=225+ (only a handful of adults have ever been cited in this range), and each "independently" have arrived at the very same essential theory (see: Kuhn on scientific revolutions | Goethean revolution), namely describing humans as animate chemicals, atomic geometries, or human molecules, both defining people "symbolically", as Goethe says, using Swedish chemist Torbern Bergman's pioneering 1775 letter chemical symbol notation—namely *A* and *B* (or *X* and *Y*) being representative of "single" humans (human molecules); *AB* or *XY* being chemically "bonded" humans in relationships (dihumanide molecules)—and in this framework, conceptually defining human experience and states of existence using chemical thermodynamic formulation (Hirata) or affinity chemistry formulation (Goethe), using the variables chemical affinity *A*, entropy *S*, or equilibrium constants *K*, respectively. Both Goethe and Hirata can be classified, using a very rare epitaph, as "human chemical thermodynamicists", namely scientists who study interacting humans, from the reactive systems (advanced perspective), chemical thermodynamics (or affinity chemistry) point of view, specifically viewing individual people as freely-going surface-attached human molecules or human chemicals that form and break chemical bonds (see: human chemical bond) to each other, produce or absorb work, and transform as they go through the course of their reaction existence.

The third individual, American physical chemist and college president Thomas Wallace, is a relative newcomer, but uses the same general chemical mechanism logic, only applied to the study of the rise and fall of civilizations. To elaborate further, the following outlines the gist of this Goethe-Hirata-Wallace cliff notes synthesis, a subject that can be classified under the rubric of hmolscience, namely the umbrella subject of physics, chemistry, and or thermodynamics applied to the study of human behavior—humans, themselves, renamed, using a periodic table framed nomenclature, such as: human molecules, human moles, human particles, human chemicals, human elements, human chemical elements, atomic geometries, human atomisms, human fluids, or hmols, among other atomic-based namesakes:

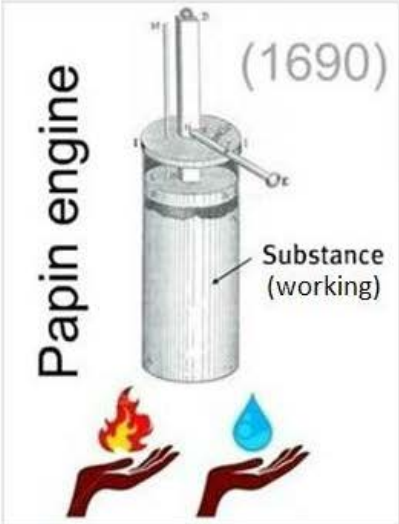

"Love is in its ultimate analysis nothing but a chemical reaction."
—Anon US scientist (1922)

"We may think of '-ΔG' as the driving force of a reaction."
—Gilbert Lewis (1923)

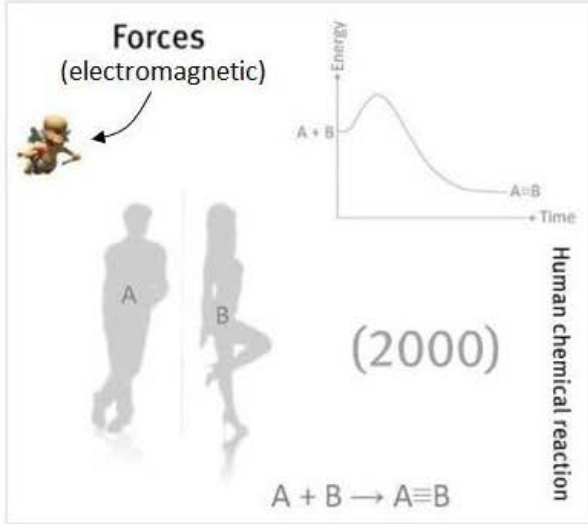

"There are, by nature, stronger or weaker bonds between chemical components, and when they evidence themselves, they resemble attractions between humans. This is why chemists speak of elective affinities [A = -ΔG], even though the forces that move chemicals [or humans] one way or another and create chemical structures are often purely external in origin."

— Goethe, *Lectures on Anatomy* (1796)

In the above depiction, we see the Goethe-Helmholtz equation [A = -ΔG], the notion of chemical affinity, symbol A, itself, first defined as being applicable to humans verbally by Empedocles (450BC); first defined as governing human-human reactions (sexual or social) by Goethe (1796); first defined as being quantified by the free energy change of a reaction or process by Helmholtz (1882), as contrasted with the now-defunct Thomsen-Berthelot principle (1854); first defined such that the chemical thermodynamic quantity "-ΔG" is the driving force of a reaction, specifically a freely-running isothermal-isobaric reaction (the kind that occur between freely-going humans, i.e. unslaved-to-work humans or human reactions *not* "harnessed for the production of useful work", as Lewis says; in which case the equation -ΔG > w' applies, where w' is the net work), by Lewis as he explains in his famous 1923 thermodynamic bible;

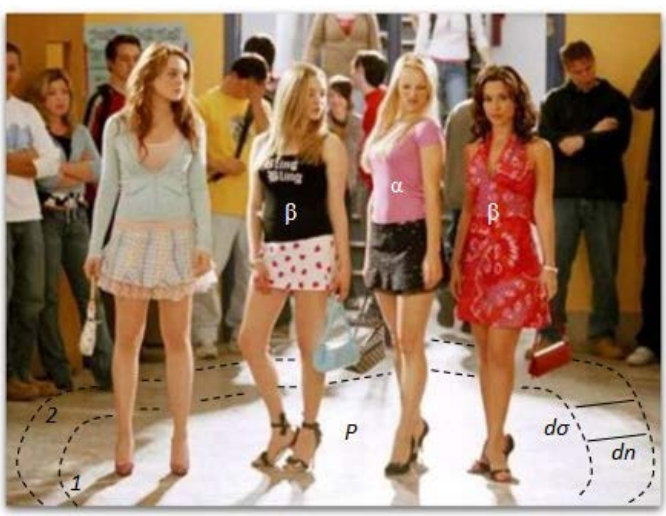

An alpha molecule depiction of human social pressure-volume boundary (personal space) expansion work (PV work), quantified by the formula dW = PdV, from the 2004 film *Mean Girls*, of a system transforming from state one to state two. **Note:** above view is "objectionable" to some (see: discussion).

first defined as being applicable to the "predictions" of human chemical reactions (mate selection) by Thims (1995); first defined graphically in terms of reaction coordinates by Hwang (2001); and first defined as governing the rise and fall of civilizations by Wallace (2009). For a more detailed historical listing of the known 40+ thinkers involved in the development of this new chemical thermodynamic approach to the study of human existence, see the human free energy timeline; see also the ABC model of will for a retinal molecule example of how forces "external in origin" induce movement in animate molecules or animate matter.

Energy | Pressure volume work

A good simple visual introduction, representative of hmolscience concepts, is that of human reaction pressure volume work *W*, a central human thermodynamics calculation, as depicted adjacent (a scene from the 2004 film *Mean Girls*). In this depiction of differential change of volumetric space, the alpha female (human molecule), flanked by two beta females, enter a room, which thus acts to trigger a transformation reaction and correlative volume increase dV in personal space, a volume increment quantified by the product of surface element *dσ* (d-sigma) and displacement element *dn*, worked by a variant of human social pressure *P*, or social force per unit area, directed radially outward from the alpha female, the type of force being the electromagnetic force (exchange force). The amount of human PV work for his differential change of social interaction is thus calculated by the following integral:

$$W = \int_{V_1}^{V_2} PdV$$

which quantifies the work done by the system on going from an initial state (1) to a final state (2), the magnitude of this work measured in SI units of joules.

Thermodynamics

One overarching aim of Hmolpedia is to slowly become the Internet's #1 go-to site for information on "thermodynamics", the

science of the relationship between heat Q and work W. Hmolpedia is a #4 top thermodynamics site, according to TopSite.com. [3]

Hmolpedia is a place for collaboration on HMS-related topics such: entropology, molecular evolution tables, dissipative structures, chaos, Maxwell's demon, drive, free will, morality, good vs evil, theories of existence, love the chemical reaction, Prigoginean thermodynamics, the history of thermodynamics, the defunct theory of life, etc.

> "Everything that takes place is determined by laws of nature—and this holds for the actions of people."
>
> – Albert Einstein (1936)

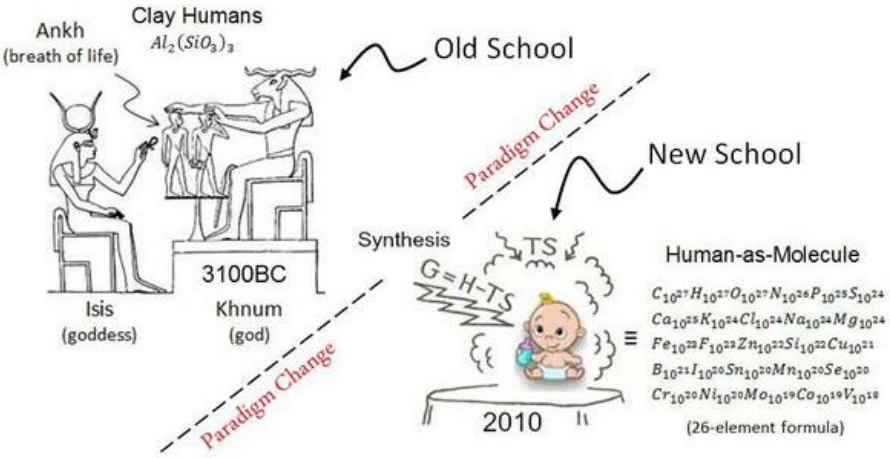

An depiction of the new **paradigm change**: that of the old normal science Egyptian model of humans molded into shape from the clay of the earth and given the breath of life by a God (or gods), as taught to us through Christianity, Islam, or Hinduism, predominately, to that of the new coming to be seen as normal science model (hmolscience) of humans "synthesized" (see: human free energy of formation) by the workings of the universe and given "animation" and or reactivity by the "powers" of the known forces of existence as explained by the equations of thermodynamics.

The various branches of HT, such as psychodynamics, economic thermodynamics, anthropological thermodynamics, political thermodynamics, sociological thermodynamics, history thermodynamics, business thermodynamics, religious thermodynamics, philosophical thermodynamics, hierarchical thermodynamics, political thermodynamics, government thermodynamics, war thermodynamics, among others, as listed in adjacent dropmenu.

Thermodynamics | Library

The core of the Hmolpedia is American electrochemical engineer Libb Thims' growing collection of 350+ thermodynamics books, from which terms, factoids, equations, theory, history, trivia, biographies, derivations, overviews of famous publications, and references, etc., are slowly uploaded, wiki-style, online:

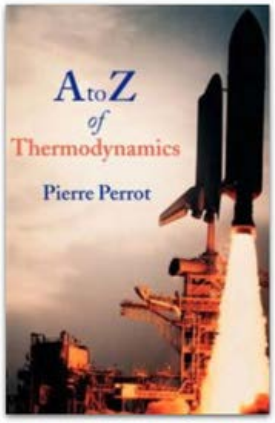

Pierre Perrot's 1998 *A to Z of Thermodynamics* dictionary servers as a back-bone and model template to many of the Hmolpedia articles.

Some of the **core books** in Libb Thims' 300+ thermodynamics book collection: the three most germane to human thermodynamics being: (1) Clausius' 1865 *Mechanical Theory of Heat*, (2) Gibbs' 1876 *Equilibrium on the Heterogeneous Substances*, and (3) Lewis' 1923 *Thermodynamics and the Free Energy of Chemical Substances*.

Online manuscript construction and discussion

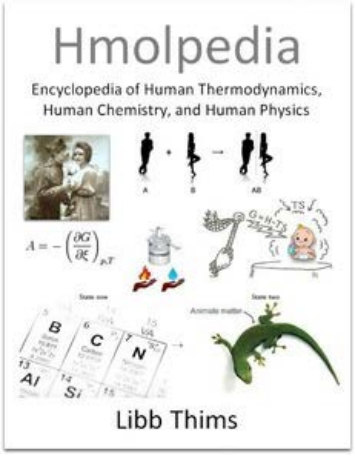

Working draft cover (2013) to estimated-to-be 3,800-page, 6-volume hardcover encyclopedia printed set for *Hmolpedia*, based on online version.

> "No human investigation can be called real science if it cannot be demonstrated mathematically."
>
> – Leonardo da Vinci (c.1490), Italian polymath

How: can I help?

Thermodynamics news (more) (top 15)

The Hmolpedia is built on the framework of a Wetpaint wiki. Wetpaint is essentially like Wikipedia, albeit more functionable, meaning that each (unlocked) page can be edited by anyone. If, subsequently, you are familiar with how "wikis", meaning quick-edit software, work and with the theories, terms, conceptions or ideas, e.g. entropy and life, of those HT pioneers, who have thermodynamically theorized

about the process of human activity, then first start an account (or contribute anonymously), second give the practice page or sandbox a test run to see how the editing tools work, and then help out in the following areas:

- Please read: "Editing Rules" (before adding or editing pages).
- Use the Hmolpedia beta wiki first if you are a greenhorn and have new, original, unreferenced, philosophical, metaphysical, new age, religious, or sandbox ideas or theories to develop or overly long thread posts to make (where a sandbox page would be better).
- To edit pages, use Firefox (works best) or Internet Explorer (see: browser support)
- Add references, photos, factoids, polls, videos, material, etc. to existing articles.
- Help with language translations: Italian, French, or Farsi (see: English translations needed)
- Start articles or stubbies on related topics (e.g. see: list of articles to write).
- Join in with thread comment, discussion, cleaning, and or editing of these articles.

One of the best ways to help is simply by skimming the Hmolpedia weekly digest email newsletter and then comment back on the piqued items (articles, videos, images, etc.) of interest in thread posts.

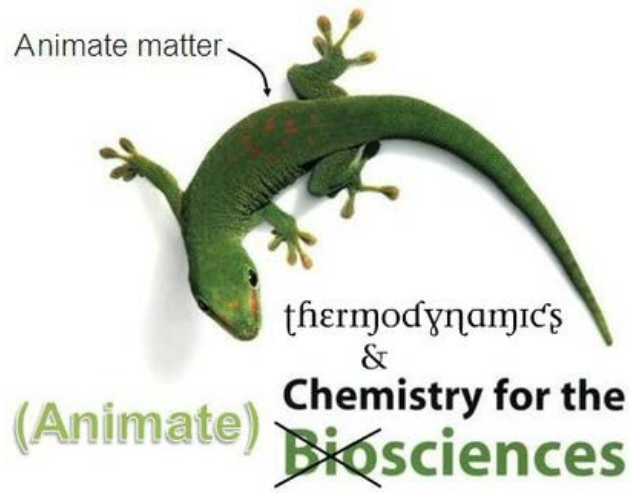

A significant viewpoint adhered to in the hmolsciences is the "animate matter" perspective, introduced by Alfred Ubbelohde in the 1940s, namely that from the viewpoint of chemistry, physics, and in particular thermodynamics, the concept of "life" (or "bio") is something that does not exist (see: defunct theory of life), but rather that which exists, previously considered to be "alive", is but higher levels of atomic reactivity, animation, and prolonged and driven bound state existence.

Animate perspective

A significant and somewhat perception-altering point-of-view followed in the hmolsciences, throughout the majority of the Hmolpedia articles, and in human thermodynamics in particular, is the view that "life" is something that does not exist. The view that "life" is something that does not exist (see: defunct theory of life), however, is not an immediately recognizable fact or conclusion that one is able to arrive at on first pass or even after prolonged investigation and introspection and is something akin to not being able to see the ships in the harbor mixed in with not being able to see the forest among the trees and takes several years to work through the mind (see: glass walls; reverse engineering; thought experiment) even after the solution is arrived at.

The classic penetration into this query was Austrian physicist Erwin Schrodinger's famous 1944 lecture *What is Life?*, during which time he told his lay audience that according to physics and chemistry life is something that "feeds on negative entropy"; but after which he was attacked by his fellow hard science physicists and was forced to recant and append an enfamus Note to Chapter 6 in which he explained that correctly the discussion should be "turned to free energy", which he defined as a "highly technical, rather intricate concept, whose relation to the Boltzmann order-disorder principle is less easy to trace."

When the discussion did in fact turn to free energy, in the decades to follow (see: human free energy), in particular on the question of the search for the "origin of life", namely the search for the exact second that "life" was supposedly born from "non-life" or so-called "carbon-based life" created from "inorganic life", described precisely in terms of Gibbs free energy changes, the concept of life becomes untenable and in fact defunct at the atomic/chemical/molecular level, after which one is ether forced to side with either (a) panpsychism (an everything is alive point of view), the (b) the emergence or life principle view [which are nothing but ontic openings stylized arguments], or (c) the animate perspective (carbon-based molecules animate via induced movements and exchange forces point of view). The latter choice is the correct answer.

Chemistry, physics, and thermodynamics, in short, do not know the word *life* (a mythological term), and as such one is thus forced, if one is to be cogent with modern knowledge, to migrate to the "animate perspective" in which moving breathing noise making things such as lizards (above) or people are viewed as types of animate matter, with a measurable molecular formula, and metabolic-based atomic turnover rate, used in place of the now-outdated living matter/dead matter classification scheme.

> "Chemistry does not know the word life."
>
> – Charles Sherrington (1940)

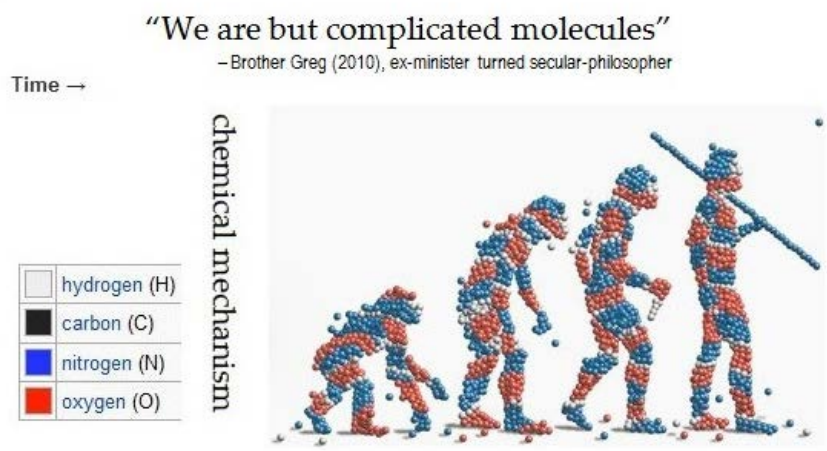

A CPK-style synthesis of man "from hydrogen to human" diagram, made by Canadian designer Shawn LaPaix (2005), depicting of the standard model of human existence: namely that 13.7 billion years ago (big bang), hydrogen atoms formed (from subatomic particles); 4.7 billion years ago (nebular hypothesis) the sun-earth system formed; 150,000 years ago, in the East African Rift Valley, the "human molecule" formed (see: evolution timeline), comprised of about 22-26 types of hydrogen atom derivatives, called elements, two decades ago the Internet formed (1991), and in 2000 the human molecular formula was calculated by Sterner and Elser.

Throughout the application of thermodynamics, chemistry, and physics applied to humans (and human experience), and in a general sense to those moving entities (animate matter; animate molecule; animate chemicals) found in what was previously called the "biosphere" (sphere of atomic animation), the subjects of animate thermodynamics, animate chemistry, and animate physics, and their respective terminologies (synthesized vs born; reactive vs alive; end or termination vs death; inert or non-reactive vs dead; etc.), are to be employed in place of the now defunct terms "life thermodynamics" (biological thermodynamics, biochemical thermodynamics, or biothermodynamics), life chemistry (or biochemistry), or life physics (biophysics), animolecule (vs

biomolecule or biocule), or ani-chemical (vs. biochemical), etc., among other corrective terms.

Spotlight thinkers

The following are key thinkers with significantly interesting and theoretically deep points of views to be investigated and studied—nearly all of whom derived their existence explanation theories and models, independently, straight from the hard sciences (chemistry, physics, and thermodynamics):

Léon Winiarski (1865-1915)

Antonio Portuondo (1845-1927)

Gustave Hirn (1815-1890)

Frederick Rossini (1899-1990)

Erwin Bauer (1890-1938)

Pitirim Sorokin (1889-1968)

Robert Lindsay (1900-1985)

Teresa Brennan (1952-2003)

Jeffrey Wicken (1942-2002)

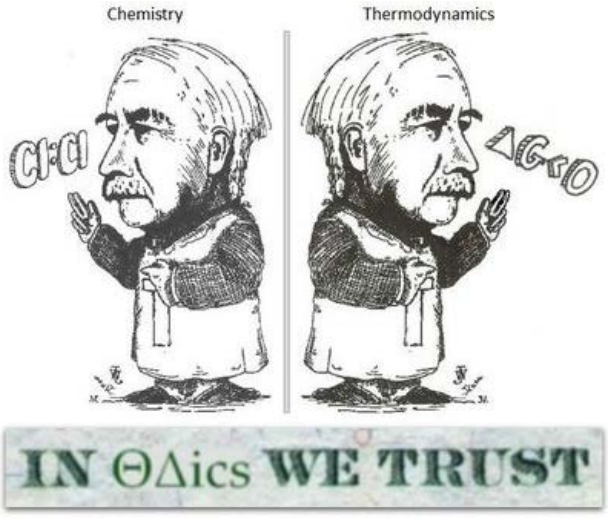

The "ΘΔics" symbol, the icon found at the bottom of every Hmolpedia article, James Maxwell's famous coded shorthand for "thermodynamics", the science that governs the known universe, shown on a US one dollar bill, meaning, for the modern physical scientist, "In Thermodynamics We **Trust**" is our motto; substituted for the original 1956 now-defunct statement "In God We Trust", as adhered to in the belief systems of the general public (see: existence of God).

Ed Stephan (1939-2008)

Jeremy Adler (1947-)

Jurgen Mimkes (1939-)

Maurice Hauriou (1856-1929)

Enrique Serrano (1845-1918)

Eduard Sacher (c.1830-c.1910)

Henry Adams (1838-1918)

Yuri Tarnopolsky (1936-)

Lester Ward (1841-1913)

Arthur Schopenhauer (1788-1860)

John Q. Stewart (1894-1972)

Henry Carey (1793-1879)

Nicolas Rashevsky (1899-1972)

Wilhelm Ostwald (1853-1932)

Georges Guillaume (c.1904-c.1974)

Francis Edgeworth (1845-1926)

Mehdi Bazargan (1907-1995)

John Neumann (1903-1957)

Spiru Haret (1851-1912)

Arthur Iberall (1918-2002)

Morris Zucker (1892-.c.1972)

Ettore Majorana (1906-1938)

Sture Nordholm (1944-)

Reiner Kummel (1939-)

Adriaan de Lange (1945-)

Site feeds

The following are site feed snippets of recent hot discussions, new photos, or new members (or noted members). Please feel free to partake in the action:

See also

â— Hmolpedia (reviews)

Images

â— Glaser, Peter. (2011). "Die Wahlverwandtschaften" (The Elective Affinities), Glaserei Blog, Sep 9.

References

1. Croatian physicist, comment to site creator Sadi-Carnot (13 Apr 2009).
2. (a) Google Analytics (Nov 2011); (b) EoHT.info (traffic rank) - Alexa.com.
3. Top Thermodynamics Sites (top site #4) - TopSite.com.
4. (a) Irreversibility (photo); (b) Irreversibility – Flickr (Italian → English).
5. Sharman, Gundula. (1997). "Elective Affinities with Ireland: John Banville's *The Newton Letter* and Goethe's *Die Wahlverwandtschaften*", in: *The Novel in Anglo-German Context: Cultural Cross Currents and Affinities: Papers from the Conference Held at the University of Leeds from 15 to 17 September 1997* (pgs. 369-84, by Gundula Sharman) (edited by Susan Stark). Rodopi, 2000.

"Hippocrates in time arrived at the conclusion that he had not sought whether the heart or the head was the seat of either reason or sense in man and beast."
— La Fontaine (IQ=155) (29th fable)

Inscription →

Description

Democritus, one of the four founding fathers of atomic theory, mediating on the seat of the "soul" (Paris Salon, 1868) —the Ab-ra-ham-ic religious term for "moral movement" and "continuity", combined— which, in the 1912 views of Miguel de Unamuno, is the world viewpoint that constitutes the "basis for action and morals."

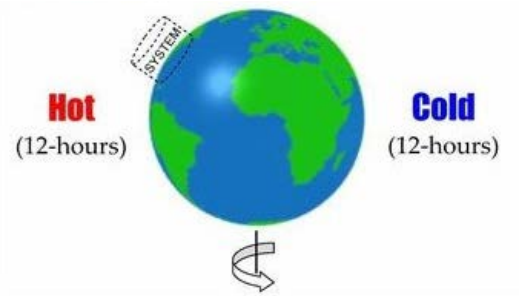

"The time may come when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry … then it may be possible, as Adams suggests, to invent a common formula for thermodynamics and history."

– William Thayer (1918), American historian

θΔics

In etymologies, **Hmolpedia** is a portmanteau of "hmol", referring to either one human molecule (a person defined as a molecule), a mol of human molecules (a metric system or mass of human molecules), and or the hmolsciences (human thermodynamics, human chemistry, and human physics) in general, and "encyclopedia" and was introduced in early 2011 as a new representative name for the content of the then two-thousand plus articles hosted at EoHT.info all centered around the subjects of chemistry, physics, and thermodynamics applied to the study of human existence.

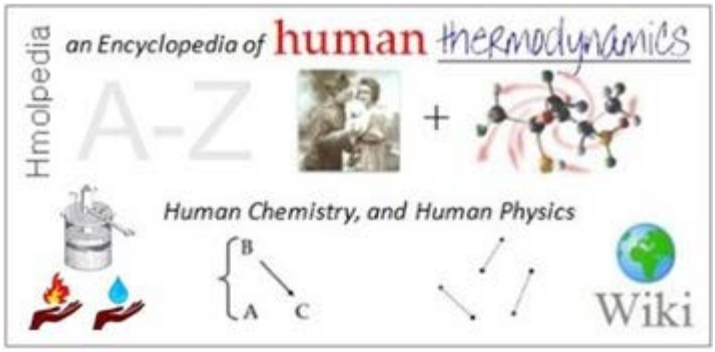

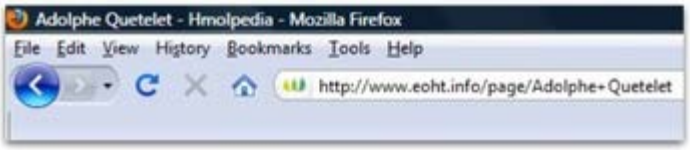

Top: An **Hmolpedia** icon representation of the content of articles at EoHT.info, the study of how the Lewis inequality for natural processes, which is derived from study of the 1690 Papin engine (pictured), applies to the understanding of human interaction processes (bonds + reactions = chemistry) (force + movement = physics) (work + heat = thermodynamics). Bottom: the first printed "**Hmolpedia**" entitled browser bar (April 3rd, 2011), of the newly started Adolphe Quetelet article, showing a test-run of the proposed "EoHT wiki" site name alternative; which became the accepted site name by April 08.

The following is a 2 Dec 2013 Google search generated icon box, showing that the pages: IQ: 225+ (e.g. Goethe, Hirata, Sidis), IQ: 200+ (e.g. Voltaire, Newton, etc.), and genius IQs (e.g. Einstein, da Vinci, etc.) were popular pages visited:

This commonality, in respect to site name "etymology", is no passing coincidence, being that Voltaire, cited by Catherine Cox as having had an IQ of 200, was one of the chief supporters of French philosopher Jean Sales, visiting him in prison and giving bail money towards his release, who by no coincidence is the 1789 coiner of the term "human molecule", the conjuctive portmanteau prefix of which "hmol-", meaning either "mol" of human chemicals (people) or "human molecules" (people) individually, is the root etymology of **Hmol**-pedia meaning collective childlike (*-pedia*) inquisitive study of the hmolsciences, framed in social matter of the hmolscience periodic table.

Hmolpedia is an upgrade to the previously used cumbersome acronym "EoHT wiki", a dexterously precarious acronym to reoccurring type out, referring to the content of articles hosted at the site EoHT.info.

The content of articles at EoHT.info, as of mid 2010, had become an online encyclopedia of the connected 'hmol', or "human molecular" subjects, of human physics, human chemistry, and human thermodynamics, albeit each with centralized core focus on thermodynamics, the branch of science, according to the Einstein postulate, least likely to every be overthrown, and whose first and second law, according to the Clausius postulate, govern the operation of the

known universe.

The name ‘Hmolpedia’, a contraction of prefix *hmol-*, meaning human molar, human mole, or human molecular, and the suffix *-pedia* (as in encyclopedia) from the Greek *enkyklios* + *paideia*, meaning ‘education + young mind’, is a newer 2011 alternative name to Encyclopedia of Human Thermodynamics, a subject intimately connected to human chemistry, in the same way that chemistry is connected to chemical thermodynamics (human chemical thermodynamics), and closely connected to human physics, in the same way that physics is connected to statistical mechanics (human statistical thermodynamics) or in the same way that physics is connected to quantum mechanics (human quantum mechanics) and the forces associated with bonding (human chemical bonding). This is summarized by the following four overlapping subjects:

Subject	Definition	Definer	Thinkers	#
Human molecule	The atomic definition of a human.	Jean Sales (1789)	HMS pioneers	121+
Human physics	The study of the forces and movements of human actions.	Adolphe Quetelet (1835)	HP pioneers	16+
Human chemistry	The study of the attraction and repulsion of human molecules.	Henry Adams (1875)	HC pioneers	68+
Human thermodynamics	The study of systems of human molecules.	C.G. Darwin (1952)	HT pioneers	400+

In sum, the name Hmolpedia is short for "education of the young mind on the subject of thermodynamics, chemistry, and physics applied to humans". In this sense, the subject matter of this combined set of views (121+16+68+400) of these 600+ mindsets, would most aptly characterize, generally speaking, the subject matter of what one might call "human molecular physical science" or hmol science or human molecular science in shortened format. In this sense, the set of articles hosted at EoHT.info, at the 2011 level, can intuitively described as:

â— Encyclopedia of human thermodynamics, human chemistry, and human physics

The former two, human chemistry and human thermodynamics, can best be described as “human molecular sciences”, being that the term "human molecule" is found in both subject matter definitions, the latter as a “human particle science”, generally viewing the human as a material particle (human particle) moved about by forces in trajectories. This title assignment is a 72-character (with spaces) name. The Wetpaint site settings, however, limit titles to 35-characters (with spaces). Hence, for the time being the following equivalence will be assumed:

Hmolpedia ≡ Encyclopedia of human thermodynamics, human chemistry, and human physics

Although this is not a perfect correlation, it would seem to suffice in the sphere of the functionablity character limitations and ease of use in daily contextual discussions.

Overview

The name "Hmolpedia" was introduced on April 2nd, 2011 to facilitate text discussion, i.e. an alternative to typing EoHT, EoHT wiki, or EoHT.info, and to embrace the more representative view that the EoHT.info collection of terms and topics connected to "human thermodynamics", which, at the 2000+ article level mark, has invariably grown to become representative of not only human thermodynamics, but the two other sister subjects of "human chemistry" and "human physics", which constitute the three divided subjects all centered on the ‘hmol’, the particle count unit for the quantities free energy G, enthalpy H, and entropy S of systems of "human molecules".

Etymology

In 1994, the first to outline the view that the subject of human thermodynamics should be a subject quantified in mass as “molar groups” or “molecular groups” was Canadian cyberspace philosopher Pierre Levy in his 1994 *Collective Intelligence*, not only uses the term "human thermodynamics" in context, but also states that. [1]

Left: Canadian cyberspace philosopher Pierre Levy, who in 1994 was the first to refer to people socially in terms of "molar groups". Middle: Babics Laszlo, who in 2003 made the first attempted calculation of one mole of human or "social Avogadro number" as he called it. Right: American electrochemical engineer Libb Thims and Russian physical chemist Georgi Gladyshev, in front of the Wrigley Field Building, Chicago, during their second meeting (2007); the first of which (2006), the topic of "**h-mol**" was discussed, in regards to what units to base thermodynamic quantities, such as Gibbs free energy, for calculations in human thermodynamics.

> “Families, clans, and tribes are organic [carbon-based] groups. Nations, institutions, religions, larger corporations, as well as the revolutionary ‘masses’ are organized groups, **molar groups** [mol-groups], which undergo a process of transcendence or exteriority in forming and maintaining themselves. Finally, self-organized, or molecular, groups realize the ideal of direct democracy within very larger communities in the process of mutation and deterritorialization.”

The first to calculate a particle count number for his molar group unit was Hungarian sociologist Babics Laszlo and his so-called 2003 derivation of the “social Avogadro number.” [2]

The term "hmol" arose in circa 2006 discussions between American chemical engineer Libb Thims and Russian physical chemist Georgi Gladyshev, pictured adjacent, the first two editors of the "Human Thermodynamics wiki", as Hmolpedia was called at its 2007 launch (or Encyclopedia of Human Thermodynamics, 2008-2010), on the question of what "molar" or mol particle count number scheme would be most intuitive to base units of internal energy, Gibbs free energy, enthalpy, and entropy, etc., of systems of humans, when quantifying thermodynamic variable changes of systems of human molecules. In other words, the standard model of chemical thermodynamics uses energy measurements "per unit gram" of chemical entities or molecular entities. Energy calculations of interest for human social systems (systems of human molecules), however, cannot be based on reaction energy changes per gram, but rather per 70 kilograms (average human weight) at a minimum. The subject of the search for the so-called "human mole" is thus a puzzling subject, one touched in a query of Thims (who has been working in this field since 1995) to Glasyshev (who has been working in this field since 1977) during their 2006 meeting in Chicago.

The term "hmol" was formerly published as a proposed unit, in namesake and discussion, in Thims' 2007 textbook *Human Chemistry*. [1]

In online debates, the topic of the "h-mol" arose in the 2009 Moriarty-Thims debate, on whether or not a distribution of students in a field could be defined or quantified by a measure of entropy, when Irish physicist Philip Moriarty queried:

> “A very simple question: What physical units would you use to describe the entropy of a distribution of students?! J per K? If so, justify why this is an appropriate choice of units! We spend a considerable amount of time in the first year of physics degree courses pointing out the importance of considering the correct units and dimensions for physical quantities.”

To clarify, the standard thermodynamic units for entropy, as found in free energy tables or thermodynamics tables, is:

Quantity	Symbol	Units

Entropy	S	$\frac{\mathrm{J}}{\mathrm{k} \cdot \mathrm{mol}}$

In response to Moriarty's query, Thims commented:

> "Concerning entropy units, the units are the same as any other chemical system, J per K per mol. The number of particles in one mole (6E23), however, is more than the current human population (7E9). Russian physical chemist Georgi Gladyshev, author of the 1997 book *Thermodynamic Theory of Evolution*, have been discussing this issue for some years now. The unit for a human mole (h-mol) will thus not be the number of particles in a 12-gram sample of carbon 12, but will be the number of humans in average sample of some typical population or volumetric sample. We have, as of yet, reached definitive conclusions on this unit issue.
>
> One trend that you will find with small systems (1-1000 particle range), according to recent nanothermodynamics computer simulations, is that entropy becomes nonextensive (see, e.g. Mohazzabi and Mansoori's 2005 article "Nonextensivity and Nonintensivity in Nanosystems: A Molecular Dynamics Simulation in *Journal of Computational and Theoretical Nanoscience*), which raises possible issues on the integrating factor of the inexact heat differential."

In this sense, the units for the main variables (G, H, and S) in human chemical thermodynamics (or human statistical thermodynamics) would be:

Quantity	Symbol	Units	Quantity	Symbol	Units	Quantity	Symbol	Units
Gibbs Free energy	G	$\frac{\mathrm{J}}{\mathrm{hmol}}$	Enthalpy	H	$\frac{\mathrm{J}}{\mathrm{hmol}}$	Entropy	S	$\frac{\mathrm{J}}{\mathrm{k} \cdot \mathrm{hmol}}$

In 2010, the terms "hmol science" and "human molecular science" arose as category names or dropmenu header names when it be began to become difficult certain terms, topics, and people solely in terms of one defining subject. American thinker Henry Adams, for instance, wrote and thought on all four connected "hmol subjects" of human molecules (was introduced to the term in 1873, said to be the subject of study of the historian, via Hippolyte Taine), human chemistry (attractions and repulsions, 1885), human thermodynamics (1909), and human physics (social gravitation, 1910); hence it is difficult to categorize Adams solely as either a human thermodynamicist, a human chemist, a human physicist, or a human molecular theorist?

In 2011, the term "Hmolpedia" was formerly proposed, by site creator Libb Thims, in the site discussion forum (see: thread), as a text-written alternative to the names EoHT wiki, EoHT, or EoHT.info, as these acronym terms are less intuitive to the general reader and moreover are cumbersome to type and use in daily discussions, repetitively.

Name imperfections

The few "not perfect" aspects of the prefix "Hmol-", which is meant to be representative of four different content subjects (human molecule, human chemistry, human thermodynamics, human physics), or in precise usage is shorthand for "one human mole", referring to a unit particle count of humans, is that firstly in human physics, an individual human particle view tends to be used, although this is not always the case, and secondly, and most importantly, although chemical thermodynamics is based entirely on molar units of Avogadro count sized systems, i.e. the number of atoms in about ten grams of substance, it is very likely that the units of "hmols" or a term similar to this will be used in the science of human chemical thermodynamics, i.e. in the sense of Gibbs free energy measurements for human

transformations being in units of joules per hmol, there would seem to be one exception to this view, namely that owing to the visibility and millisecond-by-millisecond quantifiability of human-human interactions and interpersonal reactions, there will be many non-molar quantifications measurements, such as Gibbs energy of attraction and Gibbs energy of repulsion, that will accrue and be quantified, hence the name moral view will not always be used.

References

1. (a) Levy, Pierre. (1994). *L'intelligence collective. Pour une anthropologie du cyberespace*. Paris: La Découverte.
(b) Levy, Pierre. (1997). *Collective Intelligence: Mankind's Emerging World in Cyberspace* (human thermodynamics, pg. 52, thermodynamics, pgs. 41, 44, 51-53, 197-98, 229, 232-33). New York: Basic Books.
2. (a) Laszlo, Babics. (2003). "A Tomegtarsadalmak Mechanikajaes Termodinamikaja", 92-page manuscript. Feb 10.
(b) Laszlo, Babics. (2003). "The Mechanics and Thermodynamics of Mass Societies", English trans. by Vera Tanczos, 85-pages.
(c) Laszlo, Babics. (2010). "The Mechanics and Thermodynamics of Mass Societies", *Journal of Human Thermodynamics*, Vol. 6, pgs. 39-46, Aug.
3. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (hmol, pg. 686). Morrisville, NC: LuLu.

θΔics

In famous publications, **Hmolpedia (print set)** refers to []

Print set | 10 volumes

On 21 Mar 2016, at 9:05 AM CST, the ten-volume print set of *Hmolpedia*, totaling 6,496-pages, was published and made available for sale:

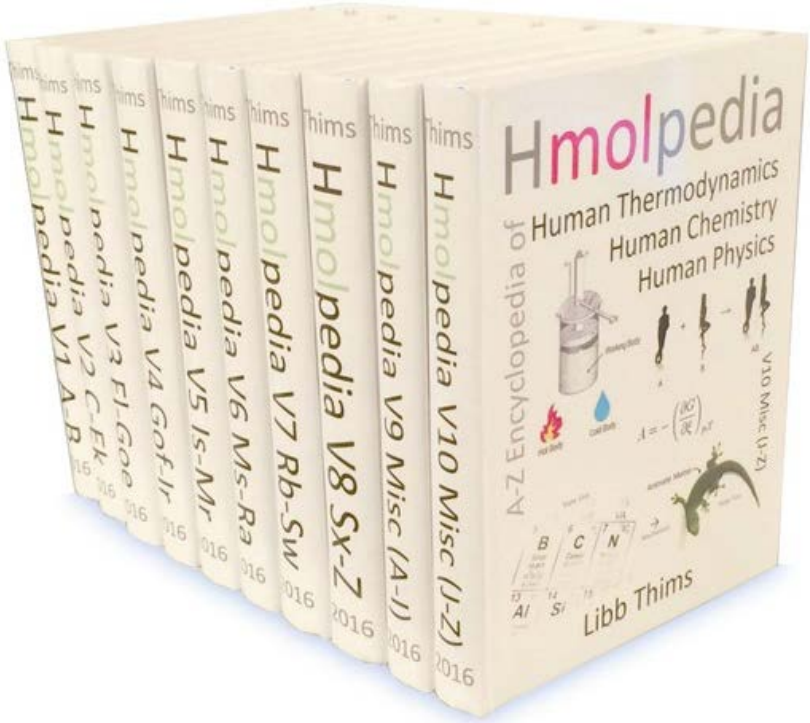

The 28 Mar 2016 photo of Libb Thims' newly-received personal copy of the 10-volume **print set** of the contents of **Hmolpedia**.

- Thims, Libb. (2016). *Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, ***Volume 1*** ***(A-B)*** (pdf) (cvr) (GB). Lulu.
- Thims, Libb. (2016). *Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, ***Volume 2*** ***(C-Ek)*** (pdf) (cvr). LuLu.
- Thims, Libb. (2016). *Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, ***Volume 3*** ***(El-Goe)*** (pdf) (cvr). LuLu.
- Thims, Libb. (2016). *Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, ***Volume 4*** ***(Gof-Ir)*** (pdf) (cvr). LuLu.
- Thims, Libb. (2016). *Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, ***Volume 5*** ***(Is-Mr)*** (pdf) (cvr). LuLu.
- Thims, Libb. (2016). *Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, ***Volume 6*** ***(Ms-Ra)*** (pdf) (cvr). LuLu.
- Thims, Libb. (2016). *Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, ***Volume 7*** ***(Rb-Sw)*** (pdf) (cvr). LuLu.
- Thims, Libb. (2016). *Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, ***Volume 8*** ***(Sx-Z)*** (pdf) (cvr). LuLu.
- Thims, Libb. (2016). *Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, ***Volume 9*** ***Misc (A-I)*** (pdf) (cvr). LuLu.
- Thims, Libb. (2016). *Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, ***Volume 10*** ***Misc (J-Z)*** (pdf) (cvr). LuLu.

The following is a Nov 2016 screenshot of the Google Books listing (Q) for the 10-volume set of *Hmolpedia*:

Hmolpedia, Volume 1 (a-B): A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics

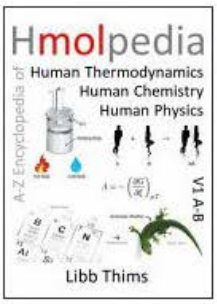

Libb Thims

Libb Thims, Mar 16, 2016 - 686 pages

★★★★★

0 Reviews

G+1 0

Volume one of the 10-volume print set of Hmolpedia (EoHT.info) the online A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics, covering articles A to Bynum (Terry).

What people are saying - Write a review

We haven't found any reviews in the usual places.

Other editions - View all

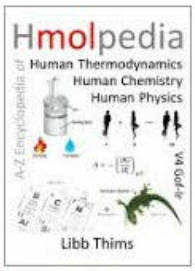

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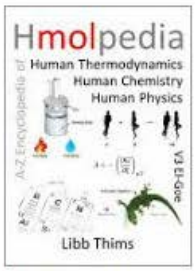

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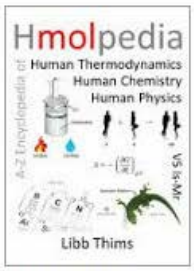

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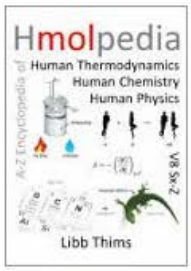

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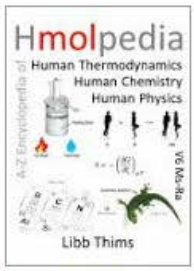

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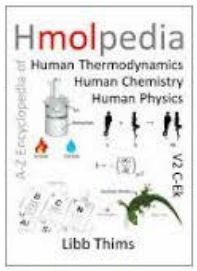

Mar 16, 2016
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(add discussion)

Construction | History

On 12 Dec 2007, EoHT.info was launched (see: work-in-progress) by Libb Thims. In early 2013, keen to Internet volatility, so to have a backup copy of the online content, in case of crash, or whatever, began doing Wiki-to-Word file pastes of each article; progress of which is shown below:

- 02 Feb 2013, when Hmolpedia was at the 2,800+ article level (see: progress report), 75 Hmolpedia articles had been reformatted and converted into a 100-page Word file, putting an estimate of the A-Z printed volume at 3,700-pages total or 5-volumes (8.5x11) at 750 pages per volume (800 page max per book at LuLu).
- 24 Feb 2014, more Hmolpedia online articles had been converted into 1,017-pages of Word files and were available online in the form of two pdf files (pdf: A-K, 508-pgs; pdf: L-Z, 511-pgs).
- 27 May 2014, when Hmolpedia was at the 3,200+ article level more core online articles had been converted into 1,515-pages of Word files, available online in the form of two pdf files (pdf: A-K, 784-pgs; pdf: L-Z, 731-pgs), plus a third 338-page file (pdf: Misc) of miscellaneous site content (tables, timelines, errata, etc.).
- Apr 2015, when Hmolpedia was at 3,650+ online article mark, had circa 3,000-pages (main) in word file plus 500-1,000 pages (misc), but had computer crash; rebuilding word file ...

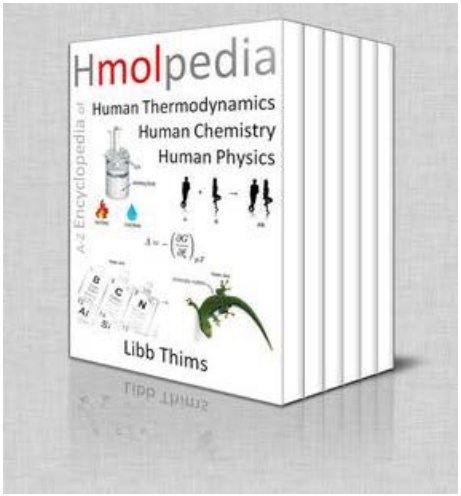

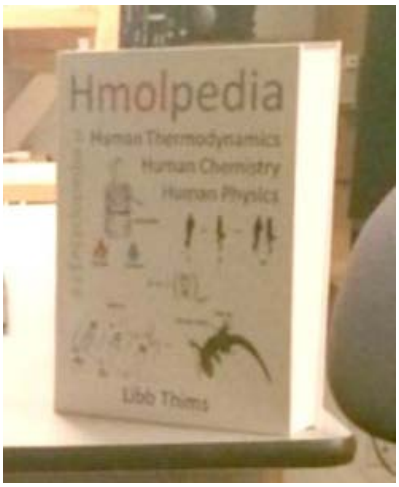

Left: a 10 Jul 2013 mock rendition (Q), then guestimated at 6-volumes, of the multi-volume ***Hmolpedia*** print set; the physicochemical humanities encyclopedia. Right: a 21 Jan 2016 photo (Q) of the first review copy of volume one of the 10-volume *Hmolpedia*.

- 12 Jan 2016 | The bulk saved Word files were formatted into 11 printable Word files (Q), totaling 7,474-pages (total), and a test copy of volume one was ordered (see: photo).

(add summary)

References

1. Thims, Libb. (2014-15/16). *Chemical Thermodynamics: with Applications in the Humanities* (97-page version: pdf of 800-pages estimated total). Publisher.

θΔics

In reviews, **Hmolpedia reviews** are independent critiques, reviews, summaries, and or opinions of Hmolpedia (EoHT.info) as an Internet resource.

Overview

The following are various "reviews" of *Hmolpedia* since its 24 Dec 2007 launch, which range from simple synopsis overview paragraphs (AboutUs.org, 2008), to MIT Net Advance of Physics encyclopedia category entries (2010), to Tumblr-type analysis postings (2012), to classification of *Hmolpedia*, from the skeptical side, as an ultra-reductionism realism encyclopedia (2016).

Some reaction commentary ranges from, comments such as: "incredible website" (2012)—to "I can't quite decide whether or not it is entirely kooky?" (2012)—to "I stumbled upon this bizarre site—there certainly is a lot of BS (e.g. human chemistry), but is this website an obvious pistake/new age rubbish, or is it genuine??"—to one person posting twice in one week "a fascinating topic [human thermodynamics], which might be 'unifying' across not only physics but economics, history, politics, sociology, and human psychology" (20 Jun 2011) and followup "update: the actual work at the website I consider bull. The theorists, I believe, do not understand the degree to which they are merely borrowing an analogy" (25 Jun 2011) to "radical cybernetic and thermodynamic interpretations of humanity" (2015) to "absurdly ultra-reductionist" (2016).

The above positive and negative "reaction" commentary seem to highlight not only the two cultures divide, but more to the point the divide between the revolutionary ways that established geniuses, such as Goethe (IQ:230|#1), Voltaire (IQ:195|#18), Majorana (IQ:195|#20), Hirata (IQ:185), Adams (IQ:195), Sales (IQ:190|#28), Winiarski (IQ=?), etc., tend to view the world, and the way the person in the laity-range mindset tends to view the world, which seems to amount to a type of regurgitated generic homogenized educational package, with any sort of controversial aspects relegated to the forgotten sidelines of non-use, and hence atrophied. Subsequently, when the views of the knowledge masters of the past are brought to the surface, and shown openly and prominently, in the freely readable wiki page format, there is a collision between those 50,000+ per month Googling for answers on certain "points of view", e.g. thermodynamics applied to government and economics (2012), activation energy theory applied human relationships and human activity (2012), or the thermodynamic properties of an organism (2011), etc., and in the collisional the layperson is caught a bit off-guard or off-balance and a bit unprepared. Aesop's famous *circa* 550BC axiom "we fear what we don't understand" may, possibly, explain some of the slur reaction detractions, shown above, in the sense that once one understands what is going on here, at Hmolpedia, the fear transforms into fascination and bedazzlement, as well might be captured in Goethe's famous defense of his greatest work *Elective Affinities*: "I'm sorry you feel that way [Madam], for it is my "best book"!

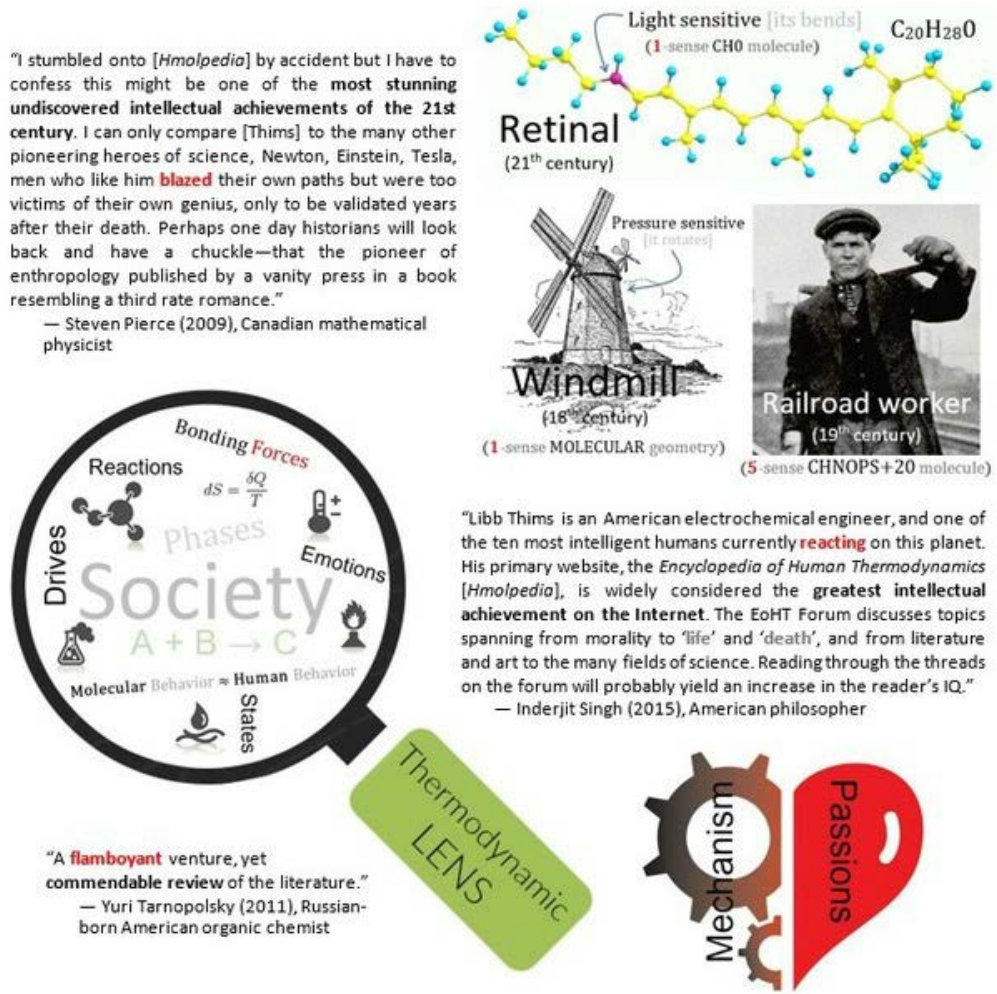

A section of the back cover of ***Hmolpedia***, *Volume 1*, of the 2016 10-volume print set of the online version of *Hmolpedia* [EoHT.info], showing three cogent **reviews**, name by: Steven Pierce (2009), Yuri Tarnopolsky (2011), and Inderjit Singh (2015), from seasoned reviewers, namely people who have worked on the same problem, aka the "riddle of existence", as Singh referred to it in 2016, independently, for 2+ years.

Wikis

The following is a May 2018 discovered summary (Q) of Hmolpedia as found on the RationalWiki's "todo list":

6

Hmolpedia — Supposedly there is a common trait among people of IQ over 200 (e.g. Goethe: 225), like the writer of this huge site and related tomes, which makes them understand some very complex phenomenon which is called human thermodynamics explaining everything, most importantly love and it relieves them of the pains of using excel spreadsheets to find the best mate out of 19 girlfriends; however Goethe's testimonial is missing.

Other wikis that have article creation request backlogs for Hmolpedia include: Hpluspedia.org (Q) and RationalWiki.org (2019) for Libb Thims (Q).

Quora

On 8 Aug 2018, at Quora, someone (Q) posted "How have modern cranks distorted contemporary science? I ask this after seeing the sophistication with which some cranks advance their ideas. For example, I was particularly disturbed by the air of professionalism of sites such as "Hmolpedia" and "The Net Advance of Science," for which there appears to be little criticism online", to which Marcus Boateng gave a decent reply, amid which he re-translates the Arthur Schopenhauer three phases of truth quote as follows: "To truth only a brief celebration of victory is allowed between the two long periods during which it is condemned as paradoxical, or disparaged as trivial" (Der Wahrheit ist allerzeit nur ein kurzes Siegesfest beschieden, zwischen den beiden langen ZeitrÄaumen, wo sie als Paradox verdammt und als Trivial gering geschÄatzt wird).

Taking a Look At

On 5 Aug 2017, a group of guys, e.g. Rhetoric&Discourse (Q), anchored at YouTube live streaming channel "Taking a Look At" (Q), did a 2-hour review of Hmolpedia; the following is a screenshot (note: video embed code not available):

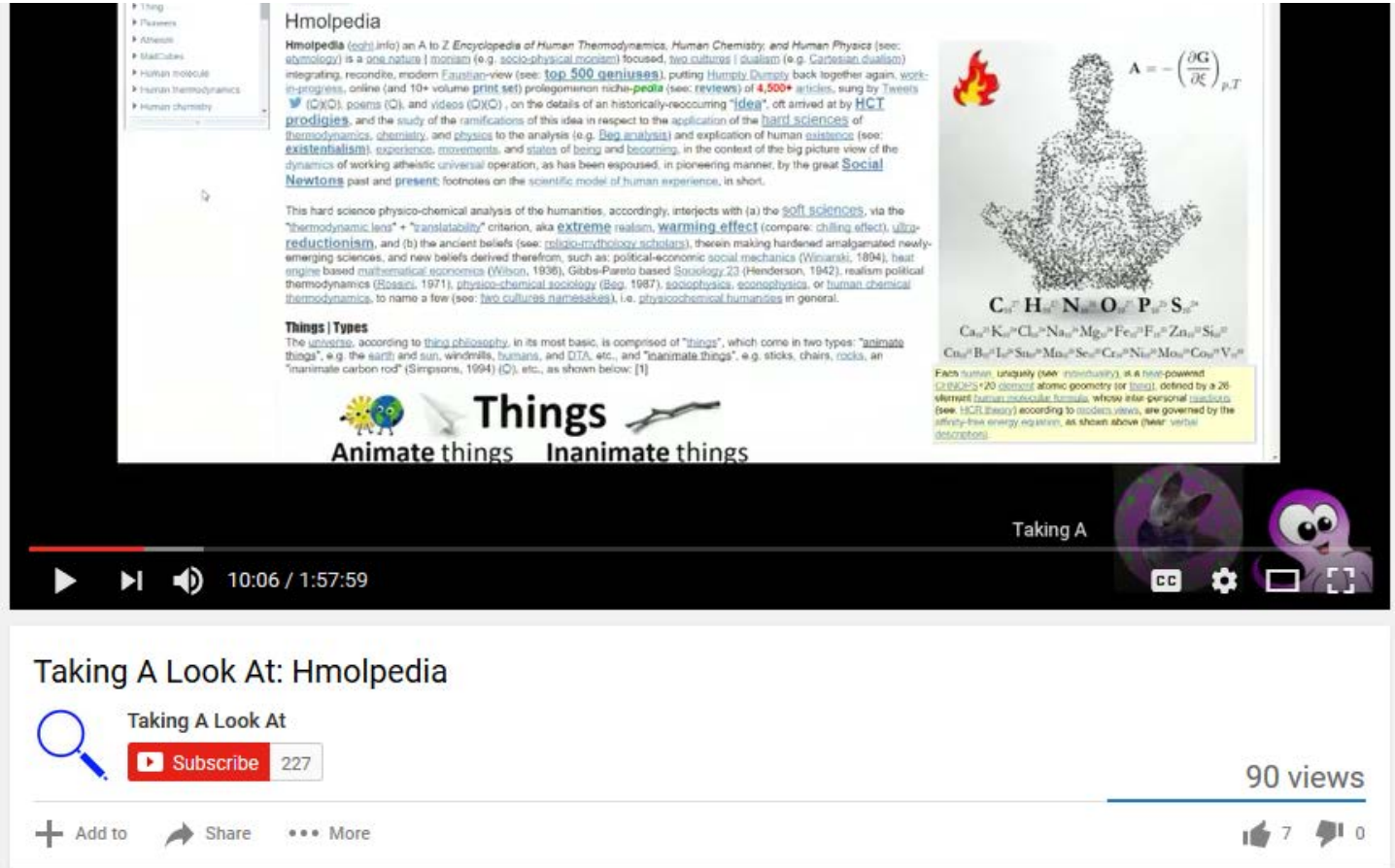

(add)

The Biggest Picture | Review

In Mar 2016, the writer of TheBiggestPicture.net, a seeming DMT-taking Canadian atheist skeptic philosopher anon, a site devoted to a mix of new atheism, e.g. Lawrence Krauss, new age, e.g. Alan Watts, Rupert Sheldrake, etc., fringe philosophy, e.g. Terence McKenna, and skepticism, e.g. Michael Shermer, posted the following summary (O) of Hmolpedia on their skeptics page, referring to the site thematically as ultra-reductionism and the defunct theory of life as "absurdly ultra-reductionist" as follows:

Ultra-reductionism

Going even beyond the typical pseudo-skeptical reductionism, the site Hmolpedia attempts to reduce everything — or, rather, their already-reductionist definition of "everything" (i.e. that which is believed to be "real" by "authorities") — to thermodynamics, chemistry and physics. The etymology of the odd name is explained this way:

> Hmolpedia is a portmanteau "hmol", referring to either one human molecule (a person defined as a molecule), a mole of human molecules (a metric system or mass of human molecules), and or the hmolsciences (human thermodynamics, human chemistry, and human physics) in general, and "encyclopedia" and was introduced in early 2011 as a new representative name for the content of the two-thousand plus articles hosted at EoHT.info all centered around the subjects of chemistry, physics, and thermodynamics applied to the study of human existence.

Yes, "a person defined as a molecule"! An ontology so reductionist as to be fundamentally dehumanizing. According to the definitions they are using, Hmolpedia is an encyclopedia of "eliminative materialism, a type of extreme materialism". On the home page it has an image with this caption: "Above: depiction of reduction of all of human existence and experience into the methodology of chemistry, physics, and thermodynamics, pure and applied."

It even suggests that life isn't "real", using Tesla's (probably DMT-induced) realization that the demarcation between insentience and sentience (i.e. the life/nonlife materialist conundrum, or "great problem of natural philosophy") is an illusion, but replacing Tesla's expansionist idea (termed panbioism) with the absurdly ultra-reductionist "defunct theory of life".

Needless to say, no disagreement with current perceived authority figures can be found on Hmolpedia aside from further reduction(ism) of that which is already believed into a subset thereof.

Similarly, there exist ultra-reductionist attempts to dismiss even the most agreed-upon meanings of quantum mechanics, such as the idea of "superdeterminism".

A dystopian future ruled by the ideology embodied by the Hmolpedia might look like that in the film *Equilibrium* (2002). It depicts a rigidly-controlled year 2072 in which feeling (and artistic expression) has been outlawed under the pretext of preventing war and man's inhumanity to man. The population is forced to take Prozium, a drug that eliminates the capacity to feel, under the threat of "processing" (death by fire) if caught "sense offending". In the film, the government of Libria ("free land") states in its propaganda that the origins are in "the revolutionary precept of the hate crime".

The last point on the perceived "ideology embodied by the Hmolpedia", being like that of *Equilibrium* (2002), as a feeling-controlled dystopia, is far off the mark. Correctly, the dark feeling-controlled dystopias of Marx-Lenin communism, which gave rise to the Cubin-rooted film *Scarface*, are what this author seems to be referring to, whereas Hmolpedia ideology is a coming-out of a feelings-empty existence and into a feelings-rich vision of experience and meaning; such as captured well in print in Goethe's famed 1809 chapter four of his *Elective Affinities*, which revolves around the following personal battle:

> "Many do not see the battle between morality and passion within *Elective Affinities*."
>
> — Johann Goethe (1809), in response to critics, mid Dec; in: Tantillo (pg. 6) (FA 2, 6:616-17)

The 1834 Balzac feelings and affinity dialogue, as well as, in film, the 2010 film Goethe-remake *Afinidades*, which is summarized well by Corey Nuffer (2011) as follows, are equivalent representations of the Hmolpedia ideology to understand meaning more purely:

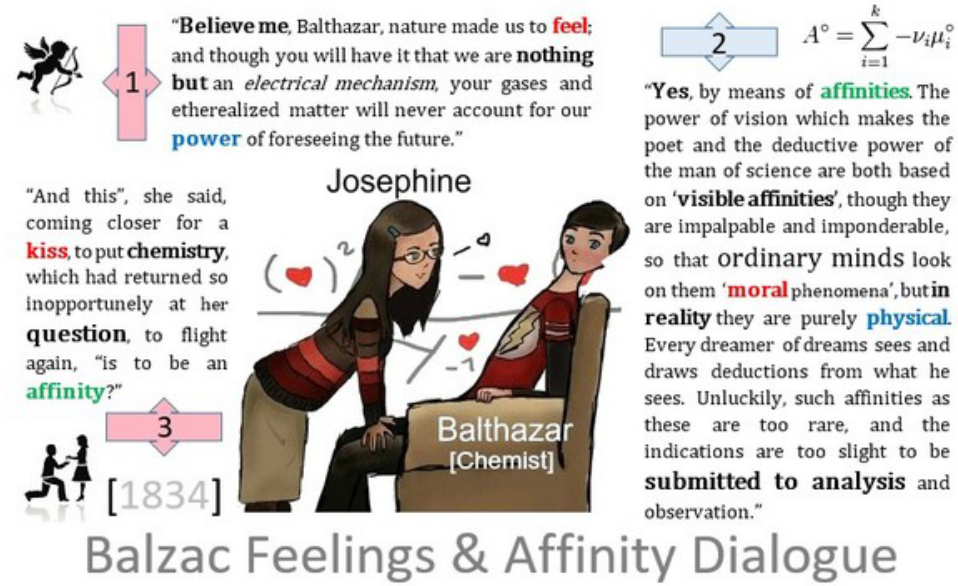

A depiction the 1934 Balzac feelings and affinity dialogue, by Honore Balzac, which cogently pits the "feelings" and "emotions" view side of the fence against the "equations" and "realism" side of the fence.

> "With all that is happening under the surface, the plot of the film is somewhat simple: Two couples spend a weekend together on a getaway. Arriving on a Friday and leaving on a Sunday, they dine together, go boating together, sun themselves at the pool together, watch a show together and in more ways that you can anticipate and imagine, have sex. And there it is: There is a lot of sex in this movie. Affinities can certainly be considered a part of this genre of picture, but it is also much more. In a press conference for Affinity, Cruz explains that while this is a movie much ado about infidelity, it is also just as much about the individual. He states: "We are only trying to meditate about the human being and their complexities, facing emptiness and the lack of rational explanation for many of the problems of the contemporary world, sometimes appearing that the only way out is to take refuge in instincts." He goes on to say that the instinctual impulse ends up being sex. No wonder why the movie carries with it such an **overwhelming feeling**; this is a lot to convey in 90-minutes of film, no matter how well made. Adding to everything is the political dimension: Cuba is still under US embargo. Whether intended or not, the feeling of claustrophobia in *Affinities* seems to carry with it room to at least ponder just how deep the complexity goes. And if things weren't complicated enough, Goethe is brought up. For those interested in seeing how deep the rabbit hole goes, there is a nod to Goethe's *Elective Affinities*. While it will provide more place for traction, it will certainly be without solace for the questions brought up in Affinity, with or without Goethe, bear the mark of great art: They keep the conversation going."

Namely, a coming out of an intellectual void dystopia and into a physics and chemistry based passion-driven moral-regulated ideological philosophical kindling.

Alexa rankings

The following is a 23 Apr 2017 Alexa ranking:

The following are 23 Sep 2015 and 4 Jan 2016 Alexa rankings of EoHT.info, respectively: [2]

The following is a 16 April 2012 Alexa.com stats review: [2]

Reddit

The following is a 9 Dec 2015 screenshot of the Reddit domain page (O) on EoHT.info:

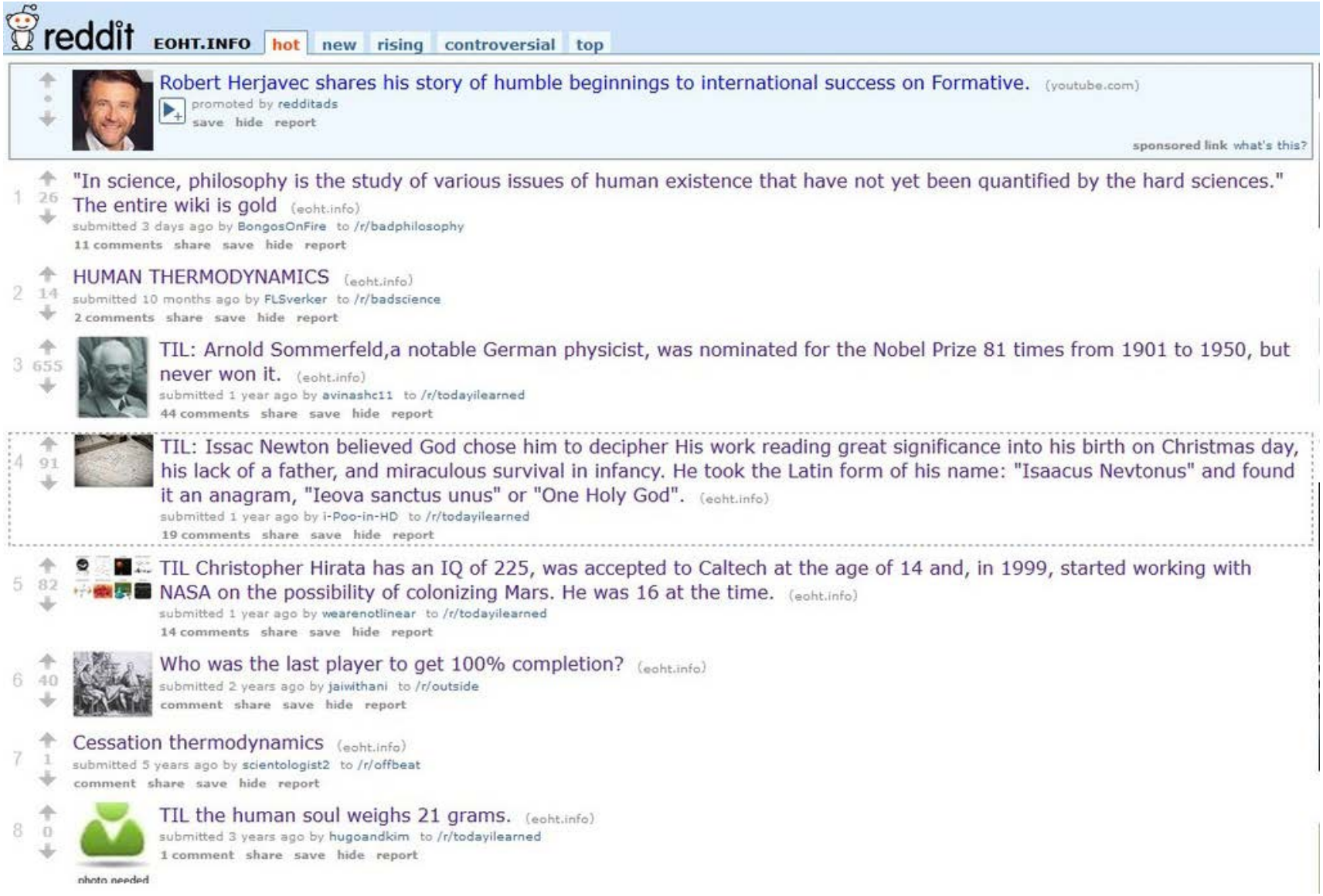

The following is a 2013 post (Q), with four ignorant answers, to Reddit Ask Science, on the connection between Goethe and human thermodynamics:

reddit

r/askscience

Johanne Goethe and human thermodynamics.

u/ramanoodlez • 4y

Until literally about two hours ago, I hadn't heard of Goethe or human thermodynamics. I was wondering what the current opinion in the scientific community is on human thermodynamics. And I've read in a couple places that Goethe was the smartest man to ever live. I know that can't really be confirmed, but I want to know how important his contributions are. And also, if anyone can give me a book or website that can explain human thermodynamics in layman's terms that would be great. Although it's apparently complex and difficult to understand.

4 Comments

1

(add discussion)

Other

The following is a 2015 listing of Hmolpedia, at WhatLifeIs.info, wherein Hmolpedia is described as “a large resource for radical cybernetic and thermodynamic interpretations of humanity”: (O)

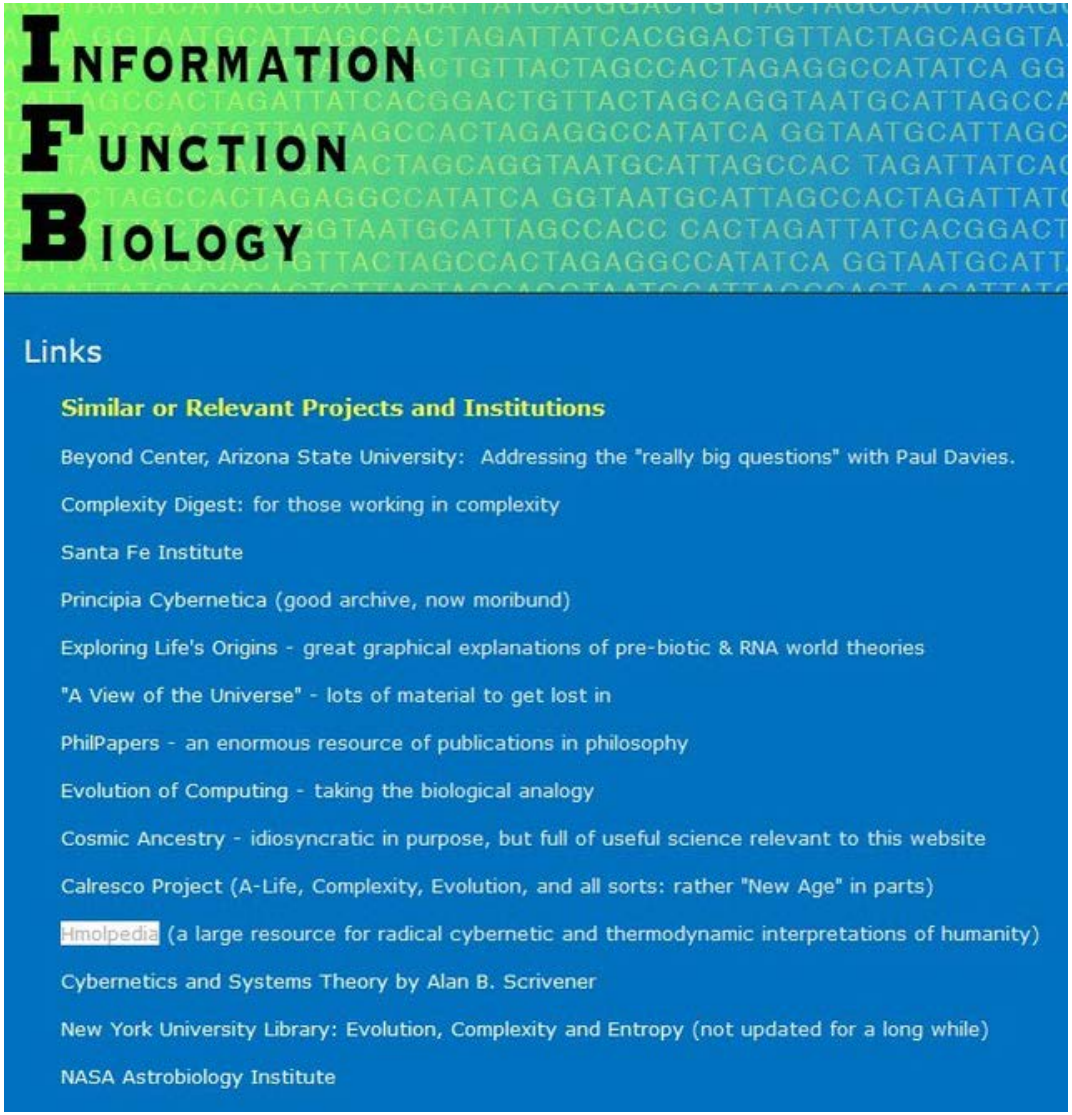

On 14 Feb 2014, PhilosophyForums.com probed on Hmolpedia: (Q)

1 of 1 people found this post helpful

#1 - Quote - Permalink

Posted Feb 14, 2015 - 9:02 AM:

Subject: **Hmolpedia?**

Came across this site while browsing The Net:

Welcome to Hmolpedia, the niche encyclopedia of the hard sciences of human existence!

(I have not checked references etc, but, at a glance, the site seems legit, and active.)

See attached image: evolution-of-human-models.jpg

> In short, five-thousand years ago, scholars conceived of humans as sun-created entities—humans as spirit-life-soul imbibed clay figurine sculptures (the sun deified) the details of which described by religio-mythology; today, likewise, scholars conceive of humans as sun-synthesized entities—humans as powered 26-element atomic geometries (the sun understood as a hydrogen-helium mass undergoing thermonuclear reaction) the details of which described by human chemical thermodynamics.

Naturally, the outlooks presented there meet with complaints coming from more "mind oriented" outlooks (of which some will present offended slogans, others a Gish gallop). But, whereas some philosophical arguments suggest that descriptive sciences are inherently limited, I will just note how much has been learnt therefrom (we're talking orders of magnitudes from the contender here).

So, is there an un-bridgeable gap, a genuine dichotomy, rifting human thinking?

Well, personally I don't know, but entertaining the thought prompts me to take the consequence and, subsequently, give some thoughts as to why our epistemologies are so tedious.

They spend time trying to dissect and comprehend the Theophile De Donder (1936) version of the affinity-free energy equation:

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

The The following is a 12 Jun 2012 Scoopit.com "math, technology, and learning" section posting on the Hmolpedia equation of love page, one of the sites most popular pages (350+ Facebook likes):

www.eoht.info - June 12, 4:04 AM

Equation of love - Hmolpedia

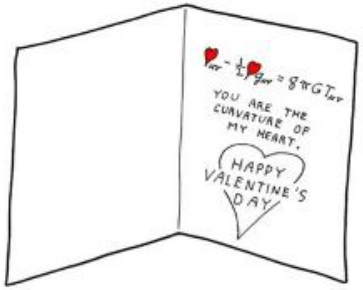

"A 2009 Flickr-style, heart icon depiction of a mathematical formulation attempt at an equation of love . [6] A modern day Bergman - Goethe - Adler reaction..."

Scooped by Margarita Parra

The following is a 2012 Tumblr review by Zhaozhou: [1]

tumblr. Follow the world's creators.

zhaozhou:

The Encyclopedia of Human Thermodynamics

It occurred to me that the laws of thermodynamics could probably be applied to government and economics, which, after a bit of googling, lead me to this incredible website. It contains many works which essentially attempt to fuse the hard sciences, such as physics and chemistry, with liberal arts and social sciences like politics, economics, and philosophy, in order to gain a more complete understanding of the world around us.

"**Hmolpedia** (eoht.info) or *Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics* (see: etymology), a 'two cultures' encyclopedia, is a work-in-progress collectively-written online compendium of **2,380+** articles on the study of the application of the hard sciences of thermodynamics, chemistry, and physics to the analysis of human existence."

#NERDGASM #human #thermodynamics #physics #science #chemistry #libera

The following is a 02 Jan 2012 review by a 28-year old UK male blogger, by the onlinename of Dronecorp, who blogs generally on music, who is meandering thoughts on an activation energy theory of human interactions and bondings: [10]

Activation energy

by Dronecorp @ 2012-01-02 – 19:16:40

So, in the spirit of Hmolpedia (which I still haven't spent much time on, and which I can't quite decide whether or not it is entirely kooky), I was thinking about activation energy today. Because a basic but fatally flawed grounding in the sciences will do that to a person.

The thing is, atoms like being bonded to other atoms, whether ionically or covalently. They're just more stable that way. In fact, being an isolated atom buzzing about and makin' it on its own requires quite a lot of energy, which is relinquished when it falls into a stable bond with another atom. Thanks to the laws of thermodynamics, this is the same energy which must be put back into the joined atoms in order to break the bond. All well and good so far.

Something which I had forgotten about was the concept of activation energy. That is, sometimes atoms don't just fall together without any prodding. For various reasons - Van der Waals forces and what have you, if memory serves - often there's a repulsion which must be overcome before the atoms can fall into the new, more stable configuration. And the effort required to overcome that hummock is the activation energy of the reaction.

Now, the metaphor here should be insultingly obvious already, but maybe it just seems that way to me because my brain was cobbled together by drunken Christmas elves. So to spell it out: yes, it takes energy and effort to put yourself in a position where you're independent and able to engage in the world around you. But even then, you can't go expecting the world to fall into your lap. You've got to do the graft in order to get involved in different things - whether these things be relationships, hobbies, social groups, jobs - and only once you've done that can you start to get something back from your efforts. And here endeth today's bad homily.

The following is a June 20th (and 25th) 2011 WordPress blog by Nicole Tedesco an American IT researcher with a BS in physics (1990), who was looking to explain irreversibility in economics, who, on the same day that she stated her view that "the actual work at the web site I consider bull", joined Hmolpedia as NicoleTedesco, for whatever reason: [9]

Human Thermodynamics

Posted by **Nicole Tedesco** on June 20, 2011

Human thermodynamics is a fascinating topic, which might be "unifying" across not only physics but also across **economics**, history, politics, sociology and human psychology! Consider "irreversibility" in economics not as a by-product of economic trade, agreement, contract, property rights and general rule of law, but a feature which reduces the cognitive load in the human brain.

What if it turns out we humans are built to seek "cognitive irreversibility"? What if irreversibility in human affairs is not an **epiphenomenon** but part of our cognitive goal-seeking repertoire?

I am not certain of the utility of applying **thermodynamic** analysis to human behavior and **economics**, and I certainly to not wax **ergosophic**, but I can certainly see the utility of including "irreversibility-seeking" as a goal to be optimized in **game theory**.

Update (25 June 2011): The actual work at the web site I consider bull. The theorists, I believe, do not understand the degree to which they are merely borrowing an **analogy**.

The following as a 28 Apr 2011 feed posting, at WrongPlanet.net, an online community resource for people with autism and Asperger's syndrome, by ryan93, an aged-19 self-

defined "creationism denier" and strident atheist, who considers human chemistry as a lot of BS, but wants to know if the entire website is a "pisstake/new age rubbish" or if it is genuine: [6]

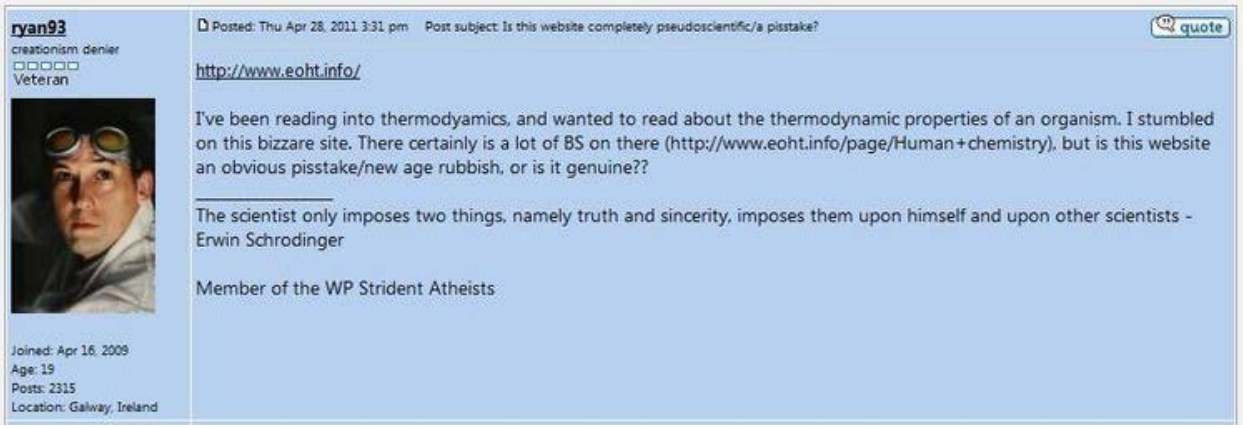

ryan93
creationism denier
Veteran

Joined: Apr 16, 2009
Age: 19
Posts: 2315
Location: Galway, Ireland

Posted: Thu Apr 28, 2011 3:31 pm Post subject: Is this website completely pseudoscientific/a pisstake? quote

http://www.eoht.info/

I've been reading into thermodyamics, and wanted to read about the thermodynamic properties of an organism. I stumbled on this bizzare site. There certainly is a lot of BS on there (http://www.eoht.info/page/Human+chemistry), but is this website an obvious pisstake/new age rubbish, or is it genuine??

The scientist only imposes two things, namely truth and sincerity, imposes them upon himself and upon other scientists - Erwin Schrodinger

Member of the WP Strident Atheists

The following is an Hmolpedia top 10 Google Analytics (Apr 2, 2011 – May 2, 2011) data page:

Pageviews	Unique Pageviews	Avg. Time on Page
45,239	38,588	00:03:44
% of Site Total: 100.00%	% of Site Total: 100.00%	Site Avg: 00:03:44 (0.00%)

	Page None	Pageviews
1.	/page/IQ:+200+	2,131
2.	/page/Free+energy+table	1,533
3.	/	1,274
4.	/page/Equation+of+love	1,121
5.	/page/IQ:+200+(±)+candidates	629
6.	/whatsnew	580
7.	/page/Love+the+chemical+reaction	574
8.	/page/Good+Will+Hunting+(William+Sidis)	530
9.	/page/Christopher+Hirata	480
10.	/page/S+=+k+ln+W	435

The following a recent discovered (discovered 28 May 28 2012; but not yet in the Wayback Machine archives) MIT *Net Advance of Physics Encyclopedia* article entry on human thermodynamics by Karen Rae Keck (likely posted online in 2010 or earlier, before the *Hmolpedia* name change occurred): [9]

The Net Advance of Physics:
Human Thermodynamics:

- Encyclopedia of Human Thermodynamics
  - History
- Human Thermodynamics [Human Thermodynamics]
  - History
  - Principles
  - Journal of Human Thermodynamics
- Thermodynamics of the Human Brain by J. S. Kirkcaldy, 1965/11 *Biophysics Journal* [National Center for Biotechnology Information]

See also C. G. Darwin and Ilya Prigogine at the Net Advance of Physics

The following is a 2009 FriendFeed like-summary posted by Siggi Becker via Delicious: [3]

Siggi Becker

EoHT wiki home - Encyclopedia of Humanthermodynamics - http://www.eoht.info/

January 25, 2009 from delicious - Comment - Like - Share

Udschal Imanov liked this

The EoHT wiki home page (eoht.info) is the central hub and entry portal for the collective beta-stage Encyclopedia of Human Thermodynamics (EoHT) - a small but growing compendium of 670+ articles (sitemap) on human thermodynamics or topics connected to the thermodynamic study and analysis of human life, as viewed through the laws of thermodynamics, namely those aspects of human activity quantified by heat, work, energy, and entropy. - Siggi Becker

The following is a 8 Oct 2009 review of *Hmolpedia* focused on sociology and nature: (Q)

Ecological Sociology

Theorizing the relationship between the natural and the social.

Thursday, October 8, 2009

Social Thermodynamics

The new Encyclopedia of Human Thermodynamics (EoHT), launched in December 2007, is a wiki of 1,150 articles related to the thermodynamics of human systems.

Within EoHT is a subsection on Sociological Thermodynamics. Under this heading I found a section on Niklas Luhmann and a French co-theorist that I hadn't heard of before, Jacque Ellul. The sociology subsection contains a list of social theorists of thermodynamics. Among these is an American anthropologist, Eugene Ruyle, who developed social thermodynamic theory based on Marx's labor theory of value; Edgar Morin, a French philosopher who developed a "complexity theory" of sociology; and Adrian Bejan, a Romanian-born mechanical engineer at MIT, applies thermodynamics in his "constructural theory" of society.

The author of the EoHT believes that the use of thermodynamic theory in sociology is still fairly new. The wiki was started by Sadi Carnot, aka, Libb Thims.

I had been looking for some connection between Luhmann and thermodynamics. I knew that he had a *cybernetic* theory, but not necessarily a thermodynamic model. I still think that Luhmann's thermodynamics is only partial, mainly concerned with entropy. But that the fact that he conceives society as an autopoietic system is an excellent place to begin to construct a sociology of thermodynamics.

The page lists some excellent sources, including Douglas White's *Thermodynamic Principles for Social Sciences*.

The following is a 4 Mar 2009 *Hmolpedia* and human thermodynamics snapshot by Theosebia of the site AuxMaillesGodefroy.com: [7]

-- Theosebia Sat Mar 14 15:48:07 2009:

Human Thermodynamics A wiki looking to answer the question "What is Life?" in terms of Thermodynamics and Chemisty

" Human thermodynamics, in short, is the study of heat and its relation to the motion and changes in the equilibriums of human bodies. The essential process of thermodynamics is that whereby heat cycles through a system of chemical species, e.g. water molecules in a steam engine, or human molecules (people) in an social system, and thereby mediates the production of work, such as in occupation. In human terms, heat, in the form of gamma-ray photons, cycles from the sun, the systems are coupled economies, the chemical species are people, and the work is the work of life. The four laws of thermodynamics define the boundaries of this action.

" The use of thermodynamics to explain human life, to note, is one of the most difficult of subjects. In 1910, for instance, American historian Henry Adams defined the loose subject of human thermodynamics, to be the physical-chemical explanation of sociology and history."

The following is a 2008 StubleUpon summary overview of Hmolpedia (during its first year) posted by Libb Thims: [4]

The following is an April 2008 AboutUs.org summary overview of Hmolpedia: [5]

Wiki

Encyclopedia of Human Thermodynamics

The **EoHT.info** website, short for "encyclopedia of human thermodynamics", is a community-style, free wiki encyclopedia of topics on human thermodynamics, the century-long study of the thermodynamical operation of human life and life in general. The wiki encyclopedia was started in December of 2007 by American chemical engineer Libb Thims and Russian physical chemist Georgi Gladyshev . As of April 2008, there were 260+ articles.

References

1. Hmolpedia (by zhaozhou) – Tumblr.com.
2. EoHT.info (traffic rank) - Alexa.com.
3. EoHT (favorite link) – FriendFeed.com.
4. Hmolpedia - StumbleUpon.com.
5. Hmolpedia (2008) – AboutUs.org.
6. Is this website completely pseudoscientific/a pisstake? (2011) – WrongPlanet.net.
7. Medical Information (related page) – AuxMaillesGodefroy.com.
8. (a) Keck, Karen R. (c.2012). "Human Thermodynamics", *Net Advance of Physics*, MIT.
(b) The Net Advance of Physics, is a 1995-launched MIT resource providing discussions at various levels of sophistication that cover all areas of physics.
9. Tedesco, Nichole. (2011). "Human Thermodynamics", I Am the Architect of My Life: the Mind, Computing, Architecture, and What Ought to be Built, WordPress, Jun 20.
10. Dronecorp. (2012). "Activation Energy", Dronecorp.blog.co.uk, Jan 02.
11. (a) Thims, Libb. (2016). *Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, ***Volume 1*** ***(A-B)*** (pdf) (cvr) [full set]. Lulu.
(b) Singh, Inderjit. (2016). "Essay on Mankind" (Q), WordPress, InderjitSingh.net, Mar 16.

Further reading

● Kelbrat, Tony. (2014). *The 'People Power' Education Superbook: Book 6: Math & Science Guide* (§10:The Science of Life Basics, EoHT.info, pg. #). LuLu.

External links

● Encyclopedia of Human Thermodynamics - Matei.org.
● Hmolpedia | Recently updated pages (with videos) – YouTube.

θΔics

In site pages, **Hmolpedia (writers)** is [] [N1]

Overview

Hmolpedia has five user permission levels:

- **Administrator**: Administrators help manage the site, and have access to site settings. They can also use all editing tools, manage pages, promote or ban members and invite others on private sites.
- **Moderator**: Moderators help maintain and support the site. They can use all editing tools, manage pages, promote or ban members, and invite others on private sites.
- **Writer**: Writers can edit or add pages, add images, and join discussions.
- **Registered user**: Registered users can join discussions and leave comments.
- **Banned**: Banned users cannot interact with the site at all.

Permission levels can be changed by contacting site originator: Sadi-Carnot.

Notes

New users and writers, per coding and or CAPTCHA issues, have to "friend" request Sadi-Carnot before forum posts begin to work correctly.

List

The following is a listing of Hmolpedia writers:

	Username	Request	Motive	Status	Notes
1.	leslieglasser	9 Feb 2018	I would like to contribute to this site because there is an error in reference 2 of "Arnold Sommerfeld" Author "Helper" should be "Hepler"	Writer	Approved (12 Feb 2018) based on spelling contributions (Q) since 1 May 2017.
2.	mfbaig	18 Sep 2019	Added as writer, during in person meeting in Pakistan, so to help with Mirza Beg article corrections.	Writer	
3.					
4.					
5.					
6.					
7.					
8.					

(add)

Notes

N1. Following the 7 Feb 2018 hacking vandalism incident (Q), resulting in 100s of pages being missing (in online version), the permission settings of Hmolpedia were changed to “anyone can edit” pages to only those approved to be “writers” can edit pages.

In hmolscience, **Hmolpedia citation ranking**, notation (CR:#), less than 50 internal hyperlinks, or [CR:#], 50 or more internal hyperlinks, as compared to humanities citation ranking (HuCR:#), Aristotle citation ranking (ACR:#), or term rank (TR:#), refers to a ranking of scholars according to the number of times a person Hmolpedia existography is hyperlinked to other articles, with in Hmolpedia.

Citation rankings | 50-citations+

The following is a work-in-progress ranking of all existographies in Hmolpedia that have been internally hyperlinked-cited 50 or more times; the second column shows an individuals IQ and ranking position, if listed in the top 1000 geniuses tables; the CIT column shows the number of internal hyperlinks (citations) of shown individual; the R column shows the number of "references" employed in their existography article; the L colume shows the number of Facebook "like rankings" a given individual has, the seventh column shows eponuyms, and derived terms of individual. [N1]

#		Person	CIT	R	L	Name / Term -ians
1.	210 / 1	**Goethe** | Johann Goethe → Johann Goethe (CR:952) [CR:943] → Goethe (CR:1168) [CR:1208]	2151	81	39	Goethean | Goetheanist Goetheanism Goethean philosophy Goethean revolution Goethean science (Ñº) Goethendipity Goethe and chemistry Goethe on free will Goethe on god Goethe on good and evil Goethe on love Goethe on purpose Goethe on religion Goethe on the soul Goethe’s daimonic Goethe genealogy Goethe meets Napoleon Goethe timeline Goethe's advertisement Goethe's affinity table Goethe's collected works Goethe's human chemistry Goethe (pronunciation) Goethe (quotes) Goethe-Helmholtz equation Newtonian | Newtonian mechanics

2.	205 / 2	Newton [CR:243] | Isaac Newton [CR:623]	866	12		Newtonian government Newtonian sociology Newtonianism Another Newton Newton's law of cooling Newton in Senegal Newton on god Newton on religion Newton on the soul Social Newton
3.	205 / 5	Gibbs [CR:188] | Willard Gibbs [CR:657]	845	55	2	Gibbsian | Gibbsian thermodynamics Gibbsian reductionism Gibbsian school Gibbsianism Gibbs collected works Gibbs energy Gibbs energy flow Gibbs energy of attraction Gibbs energy of repulsion Gibbs entropy Gibbs equation Gibbs free energy Gibbs free energy change Gibbs fundamental equation Gibbs governor Gibbs landscape Gibbs stamp Gibbs tombstone Gibbs and Goethe Gibbs-Clausius equations
4.	195 / 7	Clausius [CR:126] | Rudolf Clausius [CR:703]	829	14	13	Clausius entropy Clausius inequality Clausius postulate Clausius tombstone
5.	205 / 3	Einstein [CR:198] | Albert Einstein [CR:539]	737	28		Einstein on free will Einstein on god Einstein on good and evil Einstein on love Einstein on purpose Einstein on religion Einstein on the soul Einstein postulate Einstein-Pascal dialogue Einstein's personal library

		Adams [CR:11] | Henry Adams [CR:457]				
6.	195 | 19	Brooks Adams John Adams Adam Smith (37) Clover Adams Adam and Eve Richard Adams	568	35		Adamsian Adams creed Adams family tree Adams memorial Adams on god
7.	195 | **10**	Aristotle | Aristotle	537	22		Aristotelian Aristotle on the soul Aristotle's citation ranking Aristotle-Mpemba effect
8.	180 | 106	Darwin [CR:181] | Charles Darwin [CR:333] C.G. Darwin Erasmus Darwin	514	17		Darwinian | Darwinian revolution Darwinism Darwin on god Darwin on religion Darwin on higher and lower Darwin-Lotka energy law
9.	205 | 4	Maxwell [CR:24] | James Maxwell [CR:454]	478	27	2	Maxwellian | Maxwellian revolution Maxwell on god Maxwell on religion Maxwell on the soul Maxwell’s demon Maxwell’s equations Maxwell’s relations Maxwell’s thermodynamic surface Maxwell’s surface (construction) Maxwell-Boltzmann distribution
10.	195 | **13**	Descartes (143) | Rene Descartes [CR:338]	431	21		Cartesian (93) | Cartesian automaton Cartesian system Cartesian economics Cartesian reductionism Descartes on the soul
11.	195	Lewis [CR:23] | Gilbert Lewis [CR:406] C.S. Lewis Lewis Gordon	429	20	6	Lewis dot structure Lewis chemical bond (Ñº) Lewis cubic atoms (Ñº) Lewis inequality Lewis inequality for natural

	12	Lewis Mumford Lewis Terman Lewis Wolpert				processes Lewis inequality for unnatural processes Lewis school of thermodynamics
12.	190 / 25	Carnot (CR:#) | Sadi Carnot Lazare Carnot	425	10	1	Carnotian | Carnotian revolution Carnot cycle Carnot engine Carnot function Carnot's principle Carnot's theorem
13.	170 / 433	Prigogine | Ilya Prigogine	411	22	28	Prigoginean | Prigoginean thermodynamics Prigogine entropy Prigogine Medal Prigogine on god Prigogine school Prigogine-Waime theory Prigogine's disciples
14.	195 / 9	Helmholtz [CR:21] | Hermann Helmholtz [CR:365]	386	14		Helmholtz free energy Helmholtz school
15.	185 / 53	Thomson | William Thomson (219) James Thomson (41) James Thomson (mathematician)	385	16		Thomson's search for Carnot's Reflections Thomson on religion
16.	190 / 28	Boltzmann [CR:#] | Ludwig Boltzmann	314	18		Boltzmann brain problem Boltzmann chaos assumption Boltzmann constant Boltzmann entropy Boltzmann formula Boltzmann order-disorder principle Boltzmann tombstone Maxwell-Boltzmann distribution
17.	185 / 50	Epicurus | Epicurus	356	12		Epicurian | Thomas Jefferson Epicurean swerve Epicurean atheism Epicureanism (Ñº)
18.	190	Nietzsche | Friedrich Nietzsche	323	21		Nietzschean Nietzschean atheism

19.	29 | 195 | 16	Voltaire | Voltaire	313	10		Voltairian (Ñº) Voltaire on religion
20.	190 | 38	Ostwald | Wilhelm Ostwald	297	26		Ostwald happiness formula Ostwald on the soul
21.	185 | 70	Freud | Sigmund Freud	297	9	2	Freudian (36) Freudian psychodynamics Freudian atheism Freud on god Freud on religion Freud-Schiller drive theory
22.	180 | 98	Plato | Plato	294			Platonism (Ñº)
23.	190 | 36	Democritus | Democritus	285	11		
24.	190 | 20	Pareto | Vilfredo Pareto	282	38		Partetian | Harvard Paretians Harvard Pareto circle Pareto principle Pareto school Pareto social pyramid
25.	180 | 87	Lucretius | Lucretius	281	19		Lucretian
26.	190 | 24	Empedocles | Empedocles	276	17		Empedoclean Goethe + Empedocles
27..	190 | 23	Leibniz | Gottfried Leibniz	276	6		Leibnizian
28.	195 | 11	Galileo (CR:116) | Galileo Galilei (CR:157)	273	14		Galilean reference frame Galileo engine
	185					Schopenhauerian [4] Schopenhauerian

29.	60	Schopenhauer | Arthur Schopenhauer	250	20	atheism Schopenhauer's porcupines
30.	190 | 42	Planck | Max Planck	247	13	Planck constant Planck length Planck on religion
	190 | 26	Schrodinger | Erwin Schrodinger	224	9	Schrodinger equation Schrodinger's cat
3#.	190 | 40	Neumann | Neumann | John Neumann	219	29	Neumann automaton theory Neumann on god Neumann-Shannon anecdote Neumann notation
31.		Gladyshev | Georgi Gladyshev	213	4	Gladyshev and Thims
32.	180 | 125	Leucippus | Leucippus	212	4	Leucippean
	180 | 163	Bergman | Bergman | Torbern Bergman	211	6	Bergman's chemical signs explained Bergman's affinity table Bergman's reaction diagrams
33.	185 | 75	Kant | Immanuel Kant	210	17	Kantian | Kantianism
34.	180 | 103	Cicero | Cicero	200	12	
35.	180 | 124	Marx | Karl Marx	204	11	Marxism Marxist
	200 | 6	Da Vinci | Leonardo da Vinci	194	21	Da Vinci engine Da Vinci on religion
37.	185 | 51	Spinoza | Benedict Spinoza	194	22	Spinozan
38.	175 |	**Shannon** | Claude Shannon	184	15	Shannon bandwagon Shannon entropy

	212					Shannon information
39.	190 | 37	Guericke | Otto Guericke	183	26		Guericke engine
40.	180 | 138	**Rossini** | Rossini | Frederick Rossini	175	7		Rossini debate Rossini hypothesis
41..	185 | 72	Lotka | Alfred Lotka	174	22		Lotkean (Dobler, 1997) (Ñº) Lotkian (Adams, 1988) (Ñº) Lotkean Jabberwocky Darwin-Lotka energy law
42.	180 | 105	Russell | Bertrand Russell	170	26		Russellian [3]
45.		**Moriarty** | Philip Moriarty	161	6		Moriarty-Thims debate
47.	185 | 74	Hobbes | Thomas Hobbes	169	18		Hobbesian Hobbist
49.	180 | 121	Teilhard | Pierre Teilhard	153	6		Teilhardian (Ñº)
50.	190 | 27	Bacon | Francis Bacon	149	14		Baconian | Baconian method (Ñº)
2#.	185 | 57	Boyle | Robert Boyle	148	11		Boyle-Charles law Boyle's law
29.		**Hirata** | Christopher Hirata	144	14	43	
31.		Lavoisier | Antoine Lavoisier	139			
		Mimkes | Jurgen Mimkes	139	10		
3#.	185 | 56	Copernicus | Nicolaus Copernicus	136	6		Copernican system Copernican revolution
33.		Empedocles | Empedocles	133	10		Empedoclean Goethe + Empedocles
	180	Haeckel | Ernst Haeckel	128	16		

	202					
		Muller | Ingo Muller				
34.		Erich Muller Johannes Muller Anthonie Muller	128			Muller stability ratio
3#.	195 18	Hooke | Robert Hooke	125	29		Hooke-Boerhaave law Hooke's law
	180 170	Socrates | Socrates	123	5		
		Sidis | William Sidis				
37.		Boris Sidis	123	8	7	Sidis syndrome (Ñº)
	185 79	Heraclitus | Heraclitus	121	11		Heraclitean (Ñº) Heraclitus vs Parmenides
3#.	180 167	Joule | James Joule	120	10		Joule's first law Joule's second law Joule on religion
3#.	180 126	Parmenides | Parmenides	118			Parmenidean (Ñº) Heraclitus vs Parmenides
3#.	185 46	Bruno | Giordano Bruno	118			
38.		Hawking | Stephen Hawking	118	5		Hawking on god Hawking radiation
		Roegen | Nicholas Roegen | Nicholas Georgescu-Roegen (CR:117)	117	11		
	180 161	Plutarch | Plutarch	116	7		
	180 86	Pythagoras | Pythagoras	115	6		
42.		Nernst | Walther Nernst	111			

	190	Huygens | Christiaan Huygens	110	10	Huygens engine
	33				
44.		Watt | James Watt	109		watt (power unit) Watt governor
45.		Heisenberg | Werner Heisenberg	108	3	Heisenberg's uncertainty relation Heisenberg-Pauli dialogue
47.		Euler | Leonhard Euler	103	6	Euler genealogy Euler reciprocity relation
4#.	185	Pascal | Blaise Pascal [CR:#]	102	8	Pascal atmospheric pressure experiment â— Pascal's wager (CR:13) â— Einstein-Pascal dialogue
	47				
48.		**Mirowski** | Philip Mirowski	101		
49.		Hooke | Robert Hooke	125	22	Hooke’s law
	180	Sherrington | Charles Sherrington	123	11	
	93				
	180	Kepler | Johannes Kepler	100		
	91				
51.		**Winiarski** [#4] | Leon Winiarski	98	35	
5#.	185	Massey | Gerald Massey	97	10	
	68				
52.		Laplace | Pierre Laplace	96		Laplace’s demon Napoleon Laplace anecdote
53.	180	Boerhaave | Herman Boerhaave	95		Hooke-Boerhaave law Boerhaave's law
	201				
		Beg | Mirza Beg	95	11	Beg analysis Beg-Thims dialogue
54.		Papin | Denis Papin	95		Papin digester Papin engine
	180	Thales | Thales	94	14	Thalesian
	92				

55.		Tesla | Nikola Tesla	94	7	
	165	Spencer | Herbert Spencer	91	8	Spencerian dilemma
	521				
	180	Hume | David Hume	90	12	
	111				
57.		**Wallace** | Thomas Wallace	89		
59.		Samuelson | Paul Samuelson	89		
60.		Dirac | Paul Dirac	86		Dirac dancing anecdote Dirac on religion
61.		Hoff | Jacobus van't Hoff	84		Van’t Hoff equilibrium box Van’t Hoff school
62.		Schiller | Friedrich Schiller Ferdinand Schiller	82		
63.		Shakespeare | William Shakespeare	82		
	175	Herodotus | Herodotus	81		
	252				
64.		Dawkins | Richard Dawkins	81	2	Dawkins number Dawkins scale
65.		**Henderson** [#6] | Lawrence Henderson	80	22	
66.		Feynman | Richard Feynman	79	5	Feynman problem solving algorithm Feynman time capsule wisdom Feynman on religion Feynman on god
	170	Hegel | Georg Hegel	79	4	Hegelianism
	342				
	180	Black | Joseph Black	76	10	
	172				
	190	Poincare | Henri Poincare	76	8	Poincare recurrence theorem
	44				

	175 – 235	Paracelsus | Paracelsus	72	7	Paracelsian (Ñº)
72.		Comte | Auguste Comte	72		Comtean | Comtean reductionism
		Greenberg | Gary Greenberg	71	6	
74.		Young | Thomas Young	71		
75.		Guggenheim | Edward Guggenheim	69		
76.		Mayer | Robert Mayer Alfred Mayer	69		
	160 – 608	Bergson | Henri Bergson	67	8	Bergsonian
77.		Bridgman | Percy Bridgman	65		Bridgman formulas Bridgman paradox
78.		Eddington | Arthur Eddington	65		
79.		Kauffman | Stuart Kauffman	64		
		Walrus | Leon Walrus	63	9	Walrasian
63.	185 – 63	Hero | Hero	63	11	
80.		Jung | Carl Jung	63		Jungian psychodynamics
		Hamilton | William Hamilton	61	4	Hamiltonian
	180 – 129	Haber | Fritz Haber	61	14	Haber process Haber-Bosch process
82.		Zucker | Morris Zucker	61		
	185 – 54	Edison | Thomas Edison	60	4	Edison on the soul
		Snow | Charles Snow	58	6	Snowed
83.		Sales | Jean Sales	58		
84.		Soddy | Frederick Soddy	58		
85.		Napoleon | Napoleon Bonaparte	58		Napoleon Laplace anecdote
86.		Faraday | Michael Faraday	56		
87.		Haber | Fritz Haber	57		Haber process Haber-Bosch process

89.		Lipmann | Fritz Lipmann	56			
		Buss | David Buss	56			Buss study
90.		Le Chatelier | Henry Le Chatelier	55			Le Chatelier's principle
91.		Pauling | Linus Pauling	54			
	165 | 461	Sartre | Jean Sartre	54	4		
93.		Wiener | Norbert Wiener	53			
94.		Kragh | Helge Kragh	52			
95.		Fermi | Enrico Fermi	52	4		Fermion (compare: Boson)
	175 | 277	Homer | Homer	51	2		
	180 | 122	Dostoyevsky | Fyodor Dostoyevsky	50	7		Dostoyevsky dilemma
	180 | 132	Anaxagoras | Anaxagoras	50	10		
	175 | 221	Ptolemy | Claudius Ptolemy	50	1		
		Thims (CR:124) | Thims | Libb Thims (CR:1963)	2087	16	21	Thimsian | Thimsian revolution (Ñº) Thimsianism Thimsian philosophy Thimsian thermodynamics

(add)

Distillation effect

The work of Goethe, to note, suffers from what is called the "catch up effect", namely, a multi-century delay in respect to the ability of culture to digest what a lightening bolt genius produces or as German scholar Hjalmar

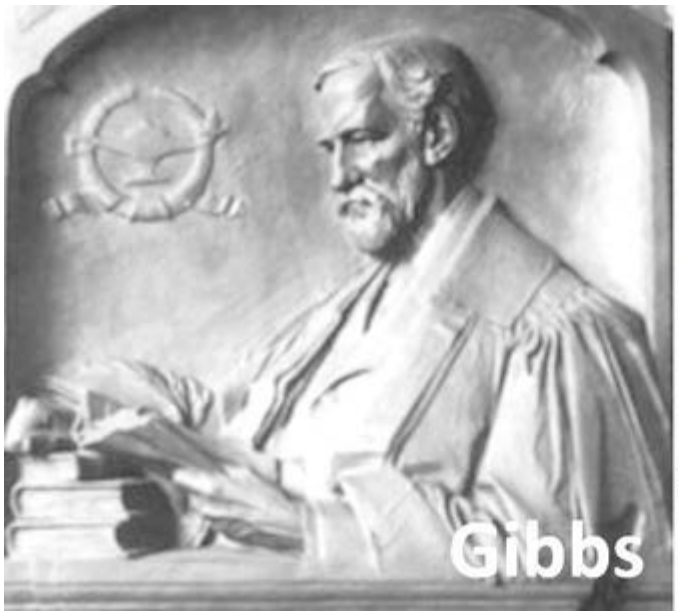

The big three hmolscience giants are: **Goethe**, **Gibbs**, and **Clausius**. The 2006 Walk of Ideas book stack sculpture shows: Grass, Arendt, Heine, Luther, Kant, Seghers, Hegel, Grimm, Marx, Boll, Schiller, Lessing, Hesse, Gontane, Mann, Brecht, and Goethe the big German genius at base, some of which are ranked below.

Boyesen cogently puts it—the world has not yet caught up to him:

> "It is difficult to overestimate the value of Goethe's work to humanity. The bequest which he left to the world in his writings, and in the whole intellectual result of his life, is not as yet appreciated at its full worth; because, intellectually, the **world has not yet caught up to him**. His influence today asserts itself in a hundred minute ways—even where no one suspects it. The century has received the stamp and impress of his mighty personality. The intellectual currents of the age, swelled and amplified by later tributaries, flow today in the directions which Goethe indicated."
>
> — Hjalmar Boyesen (1885),*The Life of Goethe*

This especially so with Goethe's self-declared "best book" book masterpiece, his physical chemistry based *Elective Affinities*.

Gibbs + Goethe | Independent connections

The connection between Gibbs and Goethe has only been discerned, independently, by three people, amid the known 500+ HT pioneers, two of which are chemical engineers and all three of which are chemical thermodynamicists and or historians of chemical thermodynamics (Garrison):

- â— Fielding Garrison (1910) — American chemical thermodynamics historian
- â— Tominaga Keii (2004) — Japanese chemical engineer
- â— Libb Thims (2006) — American electrochemical engineer

The same can be said in respect to Clausius, to a good extent, but Gibbs, so to say, "caught up" to Clausius rather quickly. The bulk of the hard science world still has not fully caught up to Gibbs, which is evidence by the fact that only a handful of people have ever cogently been able to advance on his geometrical-graphical thermodynamics work, including:James Maxwell, Ronald Kriz, and about two others, as discussed by Kriz. Alternatively, as summarized mathematical physicist Arthur Wightman (1979), even though Gibbs's graphical formulation of the laws of thermodynamics had been immediately embraced by Maxwell, Gibbs' graphical formulation only came into widespread use in the mid 20th century, thanks to the work of László Tisza and Herbert Callen. [1]

This is strikingly evidenced in the humanities and the social sciences, wherein a very prolonged and tortuous trickle-down effect seems to be at works, in how the "distillation" and passing down of knowledge through the hard sciences to

the soft sciences goes through a sort of power source chain of command—as is aptly evidenced by the current humanities citation rankings—wherein the catching up to Goethe is so acutely pronounced, which can be attributed to a number of factors, firstly that chemical thermodynamics and in particular chemical engineering thermodynamics are subjects common only to chemical engineers and physical chemists to some extant, among a few other fields to a lesser degree of understanding, and secondly to the last universal genius effect, namely that with the passing of the decade of the reaction end of John Neumann (1903-1957) (IQ=190), a polymath able to simultaneously grasp both spectrums of the two cultures, the knowledge fanning affect has taken strong root, effectively pigeonholing the erudite class into divided subject spheres.

Quotes

The following is an example of mononym usage in Hmolpedia:

> "The work of **Clausius** lies not on the shelves of libraries, but in the thoughts of men, and in the history of more than one science."
>
> — Willard Gibbs (1889), *Publication*

> "The *Constitution* was founded on the law of gravitation. The government was to exist and move by virtue of the efficacy of 'checks and balances.' The trouble with the theory is that government is not a machine, but a living thing. It falls, not under the theory of the universe, but under the theory of organic life. It is accountable to Darwin, not to Newton. It is modified by its environment, necessitated by its tasks, shaped by the sheer pressure of life."
>
> — Woodrow Wilson (1912), Presidential candidate campaign speech [2]

Notes

N1. (a) Note: those CR numbers shown in square brackets [#] are current "direct link" based CRs, based on the "rename this page" tool, which shows exactly how many pages are linked. The curved brackets (#) are from the old CR method, wherein numbers were obtained by the return # of the search box (which is no longer operational and or coded the same way as before). Or, if someone had many things named after them, the methods show a distinct difference, e.g. Willard Gibbs (1023), via the old method, vs Willard Gibbs [845], vis the new "direct link" method (2 Apr 2020).
(b) Some existographies that were renamed, e.g. Galileo Galilei to "Galileo", lost citation count to the previous name, therein skewing the ranked position downward for such individuals.

See also

- Another Newton
- Buzan IQ
- Cattell 1000
- Cox IQ
- Cox-Buzan IQ
- Genius IQs
- Genius IQ candidates
- Greatest chemist ever
- Greatest engineer ever
- Greatest mathematician ever
- Greatest literary author ever
- Greatest philosopher ever
- Greatest physicist ever
- Greatest thermodynamicist ever
- Guinness Book IQ
- Humanities citation ranking
- IQ: 150+ | Smartest woman ever
- IQ: 200+
- IQ: 225+

References

1. (a) Wightman, Arthur. (1979). "Convexity and the notion of equilibrium state in thermodynamics and statistical mechanics" (pp. xiii, lxx). Published as an introduction to R. B. Israel, *Convexity in the Theory of Lattice Gases* (pgs. ix–lxxxv). Princeton University Press, 1979),
(b) Arthur Whiteman – Wikipedia.
2. (a) Wilson, Woodrow. (1912). "What is Progress?", Campaign speech; in:*The New Freedom*(§2). Publisher, 1913.

(b) Connelly, William F. (2010). *James Madison Rules America: the Constitutional Originals of Congressional Partisanship* (§:Wilson versus Madison: The Separation of Powers, pgs. 119-). Rowman & Littlefield Publishers.
3. Palmer, Michael. (2013). *Atheism for Beginners: a Coursebook for Schools and Colleges* (§:Bertrand Russell, pgs. 209-10; atheist A.J. Ayer a notable "Russellian", pg. 209) . Lutterworth Press.
4. Malieth, Monydit (aka Tonnerre). (2013).*The Future Affects the Past: What Destination is Time Rushing To?* (pg. 54). Red Lead Books.

θΔics

In etymologies, **Hmolpedia coining** is a phrase that refers to a name assigned to an equation or term, first done in Hmolpedia, out of necessity, which previous seems to lack an established name and or date and assignment.

Hmolpedia "coinings" are done largely for organizational and utility purposes, a practice with began to accrue in early 2011 at the 2,000+ article mark. Some of the these assigned names are being collected below. The name "enthalpy", for example, was assigned to the function "U + PV" and given the symbol "H" in 1909 by Dutch physicist Heike Kamerlingh-Onnes, based on the Greek εν (*en*) 'in' and θαλπος (*thalpos*) 'to heat', which combined define the word *enthalpos*, to warm within. This would be an historically-established name.

Terms

â— Inception synthesis (replacement for the term "birth" owing to the fact that molecules cannot be "born").

Equations

A partial list Hmolpedia assigned names for equations is listed below:

Equation	Name assigned	Date	Reasoning
$A = -\Delta G$	Goethe-Helmholtz equation	2011 (article)	German polymath Johann Goethe was the first to explain how chemical affinity A applies to human affairs (1809), in standard physical chemistry format, and German physicist Hermann Helmholtz was the first to prove that free energy change (isochoric-isobaric: Helmholtz free energy (ΔF) or isothermal-isobaric: Gibbs free energy (ΔG)) is the true measure of chemical affinity (in his disproof of the Thomsen-Berthelot principle). This should not be confused with either the Helmholtz equation (acoustics) or Gibbs-Helmholtz equation (electrochemical thermodynamics).
$\sum_{i=1}^{j} \Delta G_{N_i} + \sum_{i=1}^{k} \Delta G_{\bar{N}_i} < 0$	Lipmann coupling inequality	2011 (article)	German-born American Fritz Lipmann who in 1941 "Metabolic Generation and Utilization of Phosphate Bond Energy" did the first work in the development of free energy coupling theory, specifically applied to frog leg contraction energy puzzle.

Discussion

(add discussion)

θΔics

In Hmolpedia, **Hmolpedia: Categories**, similar to Wikipedia:Categorization pages, are categorization organization pages to the articles of Hmolpedia.

Two cultures schools

The following is a work-in-progress listing of types of two cultures like schools, circles, networks, listings, and groups or synergies:

- American school of econophysics
- Chinese social physics school
- Harvard Pareto circle
- Kolkata school | Indian school of econophysics
- Mechanistic school
- Mechanistic school of social thermodynamics | Pitirim Sorokin (1928)
- Princeton Department of Social Physics
- Romanian school of physical socioeconomics
- Stark classification
- Two cultures department
- Two cultures namesakes
- Two cultures synergy

People with description boxes

The following individuals, listed in order of chronological implementation, have description box templates, showing nationality, alma mater, student, known for, signature, among other key descriptions:

- Johann Goethe
- Willard Gibbs
- Libb Thims
- Ludwig Buchner
- Vilfredo Pareto

all of which, in respect to commonality, are high ranking social Newtons.

Indians

The following is a work-in-progress listing of people within Hmolpedia of Indian birth or nationality:

- Anirban Chakraborti
- Bikas Chakrabarti | Head of the Kolkata school or Indian school of econophysics
- Carlos Silva
- DMR Sekhar
- Dilip Kondepudi
- Kalyan Annamalai
- Kishore Dash
- Narasimha Ramayya
- Ravi Vedula
- Satish Boregowda
- Satyendra Bose | fermions (matter) and bosons (force)
- Srdan Lelas
- Srinivasa Ramanujan
- Subrahmanyan Chandrasekhar
- Surya Pati
- Vamshi Regalla

A related term is the Indian Thermodynamic Society, as discussed in the schools of thermodynamics.

People by occupation

The following articles have people within Hmolpedia grouped or rather tabulated by commonality of occupation:

- Chemical engineering
- Mechanical engineering
- Electrical engineering

Physical chemists

See main: Physical chemists

The following is a work in progress alphabetical (by first name) listing of physical chemists in Hmolpedia:

> "Physical chemistry uses mathematical language, and it is a large part of my evangelistic attitude to suppose that much of developmental biology will some day have to be written in much the same language that **physical chemists** use."
>
> — Lionel Harrison (2008), *The Shaping of Life* (pg. 105)

- Georgi Gladyshev
- Lawrence Henderson
- Lionel Harrison

External links

- Wikipedia:Categorization – Wikipedia.

θΔics

In Hmolpedia**, editing rules**, which are near similar basic Wikipedia article starting procedure and rules, refers to the basic guidelines and editing rules for starting new article and or contributing to existing articles. Hmolpedia editing rules are in place for a number of reasons, one main reason being that Libb Thims (username: Sadi-Carnot), the creator of Hmolpedia, needs to watch over every single article and every single edit and fact check every single article, make sure that it readable and encyclopedia, and sourced correctly, so that (possibly in the future) the total encyclopedia can eventually be published as a multi-volume set. It is thus a matter of courtesy, being that Thims is doing the entire compilation work in this direction, that other site member contributions follow basic editing rules.

Questionable articles? | Beta wiki

See main: Hmolpedia beta wiki

Any new article must have some semblance of encyclopedia merit to it, with respect to a topic, subject, term, or person, etc., related to the two cultures interaction of the humanities with chemistry, physics, and thermodynamics, and *vice versa*, or in respect to the latter, topic by themselves, e.g. energy, entropy, or Rudolf Clausius, etc., which are bedrock articles.

Questionable articles would be better drafted at the external "beta wiki" where free reign to thought and new ideas can be given; thereafter, possibly, latter reincorporated into Hmolpedia. Don't, for example, use Hmolpedia to blog things such as draft book chapters, such as "My Brother is at 113!" on an historical aspect of econophysics, or pet theories, e.g. "Dynamics of Elective Affinities"; these types of things are better placed at the Hmolpedia beta wiki, where test stage articles can be drafted and or miscellaneous things can be made into web pages.

Questionable non-encyclopedic articles, blogs, posts, etc., should be drafted at the Hmolpedia beta wiki:

EohtBeta.Wikifoundry.com

New articles

Read "Hmolpedia: Naming articles", before starting any new pages. A general guideline on how to name new articles, from Wikipedia, is here:

â— Wikipedia: Article titles

In general, start the article with a capital letter, e.g. Singularity (correct) vs singularity (incorrect), don't use capital letters for the second or third names, e.g. Dilute solution model (correct) vs Dilute Solution Model (incorrect), don't use foreign accents in article titles or person names (this is an English encyclopedia.)

Core edit rules

The following table give a basic outline of editing rules:

	Rule		Details
1.	Encyclopedia-style	Each page needs to written like an encyclopedia (e.g. Britannica, Wikipedia, etc.) article	Write each article like it was a Britannica article. Use paragraphs over bullets; use a neutral point of view; write in the third person (e.g. don't terms such as "I believe, ...", "I am writing this as ...",), etc.
2.	Reference needed	Each page needs to have pre-established external	

	references	
3. Neutral point of view	Don't make grand one-sided claims.	For example, don't go into the law of racial thermodynamics article and write something such as: "the following arguments completely overthrow Delgado's theory: cosmological expansion of the vacuum turns the universe into an open system and thus invalidates the second law of thermodynamics. This is why the racial segregatedness (entropy) of mankind tends to irreversibly decrease." This type of edit is (a) non-neutral (e.g. "completely overthrows"); (b) a personal conjecture (discussion of second law invalidities are unfounded, and secondly they go in the violations of the second law article, and must be cited); (c) discussions of whether or not a vacuum can exist in nature is a two-millennium old debate (see: nature abhors a vacuum), etc.
4. **Edit rate**	*Limit* the number of edits you do in one period: Thims has to be able to process each and everyone of your edits.	Libb Thims (Sadi-Carnot), site overseer, has only limited time to fact check and clean new contributions; thus, don't go crazy and do numerous edits so-much-so that you are over-imposing your contributions.
5. Edit note	When you save the page, add a short description in the note box regarding what you just did.	
6. Communicate	Use the threads and internal mail to explain and discuss what sort of article you are aiming to write.	In other words, don't link any word of the text of the body of the article to an external site, such as Wikipedia, your own cite, etc.; only link words and terms to other EoHT articles.

Secondary edit rules

The following table give a basic outline of editing rules:

Rule		Details
1. Inbound links only	Outbound links can only go in the further reading and references sections	
2. Font style	Pages must be formed like all other pages (Ariel 12-point text; Impact 14-point headers)	
3. Letter accents	Don't use letter accents in names or words.	Don't change Poincare to Poincaré (Ñº), per reason that (a) it makes the automatic hyperlink tool inoperable and (b) average English (American) readers don't know what accents mean.

4.	No new theories (or pet theories)	Do not use the site to type up your new theory.	If you have a new theory that you have been working on in isolation, one that no one, outside of your friends has heard of, use the Beta site to showcase your theory, instead of the main site (Hmolpedia); for example don't start an article such as "time and consciousness" and write: "I think time is a cultural concept linked with consciousness and the language. You cannot measure time because only the present moment exists. (what does «exist» means is another debate) What you can measure is the movement of the planets. The earth circulating around the sun (one orbit takes one year) or the oscillation of an atom or period of radiation (in more recent times). So you need consciousness to remind the previous moment and to compute the duration between two moments. Until you don't know what is consciousness, it does not make sense to look for the origin of the universe. It is more logical to look for the origin of the consciousness. Look at Hameroff and Penrose theory about it."
5.	New article titles	Articles can only be started using a pre-established title.	Don't start, for example, an article such as "History as progress from racism to elitism", based on a reference for the term 'centropy' by Irving Simon, as nobody has ever heard of such a title. For example, don't start a new page on "singularity" with the following unreferenced, non-third person style, "this is what I believe about God" argument:
6.	Religion	Don't use Hmolpedia as a platform for your pet "God theory".	"A singularity is commonly thought of as an "event" produced by the gravitational collapse of a dwarf star. The matter becomes so compacted that, in lieu of further compaction, the matter goes elsewhere into another kind of dimensionality leaving only an event horizon. There may be a useful analogy here or metaphor. (I am not speaking as a scientist but as a philosopher.) Imagine God as an infinite force that chooses to focus infinitely at various points in the universe. When God meets matter, via what might be called infinite creative focus, we might imagine that something like an infinite gravitational force is applied at that point causing an infinity to be contained in a point. Infinity, of course, cannot be contained in a point so we might imagine that this is what life is: the collapse of infinity into a point--the multi-dimensional nexus between God and matter--something that partakes of both universes." about how you believe the universe started as a singularity that was god.

7. Third person	Write in the third person style.	Don't, as shown in point 3, above, post "I think" or "you cannot", instead write "it can be argued" or "one cannot", etc.

Blocks and moves

If your edits are not abiding by the rules, a number of steps may be implemented to safe-guard the integrity of the site: (a) your intended article will be locked; (b) your article will be deleted (or moved to the junk section of the site or to the EoHT beta site), (b) you will be blocked for an extended period of time, or, if worse comes to worse, (c) you will be banned permanently (see: banned users).

See also

â— JHT formatting

θΔics

This page is a "frequently asked question" (FAQ) board for Hmolpedia.

If you have any questions, other than those shown here, please feel free to leave your question below (either in the numbers following or threads at the bottom):

(EoHT logo)

FAQs:

(1) Do I have to be a thermodynamics expert to contribute to this HT wetpaint wiki?

> Answer: no, the project is geared for the fun of education and discovery of knowledge (but try to use references).

(2) Where did the idea for Wetpaint wiki (EoHT wiki main-frame) come from?

> Answer: from (circa 2006) a group of friends and the struggles of a cancer trivia buff (read story).

(3) Where did the idea for the EoHT wiki come?

> (a) From (circa 2005) partial-construction of the HumanThermodynamics.com glossary (using Homstead.com's slow page creation method).
> (b) From (circa 2005-2007) EoHT wiki creator Sadi-Carnot's experience editing at Wikipedia (8,500+ edits, 180+ articles) and the resulting vision (irritation) that a "focused" wiki would be better for niche topics, such as human thermodynamics, human chemistry, or human molecule.

(4) Will the EoHT ever be published in book form?

> This is a possible idea (we may print the encyclopedia, possibly in 2010+, in book form via LuLu).
> In this manner, knowing the volatility of webpages, knowledge will be preserved for future generations

See also

1. Ask and Answer - Wetpaint (post a question, get an answer)

θΔics

To **start a new page** in the EoHT wiki, first search for the article, word, or term in the search box. Then, if it is not found, click the start this article link (found in the search) and follow the steps:

Tips

Note that when doing research, when on any webpage, hitting the keys control+F simultaneously, brings up the key word highlight search box, allowing for easy searching of terms on the webpage you are browsing.

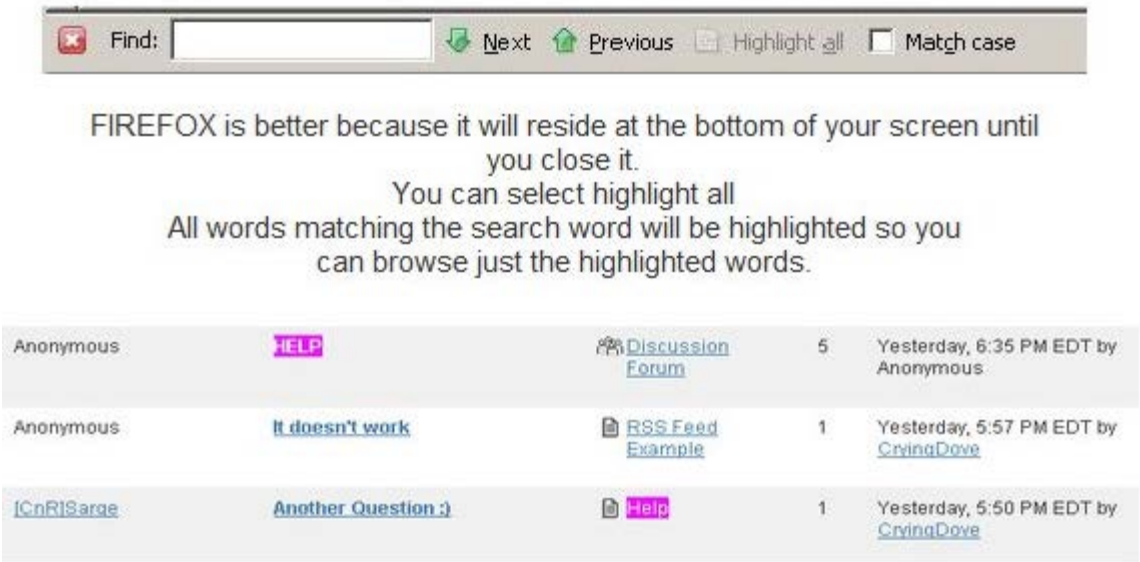

Letter accents

At about the 900-article mark, it has become apparent that using non-English letter accents, such as in on part of the name, e.g. Erwin Schrödinger, or in both parts of the name, e.g. Leó Szilárd, is non-intuitive, for a number of reasons. Firstly, English speakers, generally, have no idea what these various language accents mean. Second, and most important, letter accents have a number of search engine and linking issues. A patron in putting the name "Leo Szilard", using the EoHT search this site box, will not be directed to the Leó Szilárd (current listing) article. Third, standard English computer keyboards do not have letter accent options, except via symbol insert. Fourth, it has been found that even after a name is linked to the accented article, that it will still have issues, and may sometimes give a nothing found result. Thus, on this logic, we advice not to use accents in naming and starting new articles in the EoHT or in any other Wetpaint site.

Steps

1. type in the page name or article title; be sure to use a cap for the first letter, to include accents, e.g. Schrödinger, and to use the most common name, i.e. the style it would be found in a paragraph, such as Willard Gibbs (common) vs. Josiah Willard Gibbs (less common); this latter detail is very important in that it will help the "suggest links" button find the key words after a new page is written. If a page is named wrong, then later when it is renamed, someone has to go through and fix all the dead links connected to it on other pages.
2. type in key words (separated by commas) to help search engines find the page.
3. use the “Blank page” template (the others are basically useless).
4. click the "Move page" button.
5. highlight the "New articles" section (or another section if appropriate).
6. move article up or down to desired slot (usually alphabetical) then click "Set page location".
7. click "Set page order" and then click "Add page".

8. make the page (use a format similar to the other EoHT pages).
9. to add complex formulas (e.g. sums, integrals, fractions, etc.) upload each formula as an image.
10. add inbound links (to other EoHT page) via clicking the "Suggest Links" button and then left-clicking over the highlighted words (note: typically only link the same word once on any given page, in order of appearance).
11. add article images. **Note 1**: please upload image to Picnik (or other editing software) and add a drop shadow (size 10), crop appropriately (for pictures, resize to 145px, before adding drop shadow). **Note 2**: add two-row, one-column table to page then add image in top row and a descriptive text (10-point) in bottom row.
12. use spell check, add widgets, etc.
13. save the page.
14. note: if you paste the page in (e.g. from Word), you will need to re-insert line breaks and re-save.

Editing goals:

See also: HT Wiki: Objectives

In terms of editing style, a central goal is to use an encyclopedia style of writing, which should attempt to include the following:

1. Please attempt to keep the majority of links internal to the EoHT, namely by writing new articles.
2. Try to write each page from scratch, with originality, i.e. don't simply make "mirror pages", via *copy and paste* from other websites.
3. Add free content, i.e. public domain, images to accentuate the learning experience of each article (a good free photo editing site is picnik).
4. Use references for each article (using a [#] following the sentence) referring to a footer reference. [2]
5. Use "Arial font" (12-pt) for paragraphs and "Impact font" (14-pt) for headers.

Reference style

1. *Wiki Wiki* (/wiË kiË wiË kiË /) is a reduplication of *wiki*, a Hawaiian word for "fast"; hence, wiki website is a fast-edit type of site.
2. Doe, John Q. (Year). *Book Title or* "Article Title", (pg #s if applicable). Location: Publisher *or Journal*, Issue, pgs. Month.

Notes

One: â— ← use this dot, to the left, i.e. copy and paste, for bulleted listings of "Further reading" and "See also" sections (the automatic bullet tool in the EasyEdit Toolbar seems to have issues with the HTML line space inserts when used).
Two: in most cases, manually insert #'s in the "Reference" section verses using the EasyEdit Toolbar number bullet tab (for the same reason as above).

θΔics

The **Hmolpedia: Interesting articles** page is a place to list newly-found articles, books, for videos that may be of interest or relevant to human thermodynamics (in particular articles not yet filled into the main body of the encyclopedia). Please add articles of interest below when found:

● Chiavazzo, Eliodoro; Isaia, Marco; Mammola, Stefano; Lepore, Emiliano; Ventola, Luigi; Asinari, Pietro; Pugno, Nicola Maria. (2015). "Cave spiders choose optimal environmental factors with respect to the generated entropy when laying their cocoon" (Q), *Scientific Reports* 5: 7611.
● Funtowicz, Silvio O. and Ravetz, Jerry R. (1997). "The Poetry of Thermodynamics: Energy, Entropy/Exergy, and Quality" (abs) (Q), *Futures of the Journal of Forcasting, Planning, and Policy*, 29(9):791-810.

Recently found
● Ripley, Brian D. (1990). "Gibbsian Interaction Models", in: *Spatial Statistics: Past, Present, and Future* (pdf) (editor: D.A. Grith) (pgs. 3-53). Ann Arbor: Institute of Mathematical Geography.
● Menke, Richard. (1998). "Narrative Reversals and the Thermodynamics of History in Martin Amis's *Time's Arrow*", *MFS: Modern Fiction Studies*, 44:959-77.
● Pountain, Dick and Robins, David. (2000). *Cool Rules: Anatomy of an Attitude*. Reaktion Books.
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● Roca, Octavio. (1980). "Atoms and Persons" (abs), *Philosophical Forum*, 12:49-67, Fall.
● Dongsik, Choi. (2000). *Social Thermodynamics* (Korean edition) (Amz). Publisher.
● Brath, Klaus. (2011). "Goethe's Penchant for Pharmacy" (German → English), ArzteZeitung.de, Aug 26.
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● McCarren, Felicia M. (2003). *Dancing Machines: Choreographies of the Age of Mechanical Reproduction* (thermodynamics, 37+ pgs). Stanford University Press.
● Quevedo, Hernando and Quevedo, Maria N. (2011). "Statistical Thermodynamics of Economic Systems" (Q), *Journal of Thermodynamics*, 8-pgs.
● Hutchison, Keith von. (1973). "Der Ursprung der Entropiefunktion bei Rankine und Clausius" (abs) ("The Origin of the Entropy Function by Rankine and Clausius"), *Annals of Science*, 30:341-64.
● Tuckerman, Alfred. (1890). *Index to the Literature of Thermodynamics*. Smithsonian Institution.
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Animate thermodynamics
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Related (misc)
● Romanticism in science – Wikipedia.

Human thermodynamics (misc)
● Adams, Brooks. (1895). *The Law of Civilization and Decay: an Essay on History.* Kessinger Publishing.

● McDougal, William. (1933). *The Energies of Men: a Study in the Fundamentals of Dynamic Psychology.* Charles Scribners.
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● Author. (1979). "Theoretical Model: The Possibility of Applying the Concept of Entropy in Research in Social Thermodynamics", in: *Chongch'aek Kwaje*. Seoul: Ministry of Education.
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Heat theory

● Brush, Stephen G. (1970). "The Wave Theory of Heat: A Forgotten Stage in the Transition from the Caloric Theory to Thermodynamics" (abs), *The British Journal for the History of Science*, 5(2): 145-67.
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● Thurston, Robert H. (1878). *A History of the Growth of the Steam Engine* (Ch. 7: "The Philosophy of the Steam Engine: Energetics and Thermo-Dynamics). New York: D. Appleton and Co.
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Other/Misc/Links
● Entropic gravity – Wikipedia.
● Thermodynamic versus kinetic reaction control – Wikipedia.
● Tsallis entropy (link)
● Constantion Tsallis (link) (link)
● Non-extensive thermodynamics (link)
● Reaction thermodynamics – seems to be a term employed in fuel cell theory (link) (link).
● Love/Entropy Productions – an Australian theater company.
● Entropy Flash game – free online game (here).

???
Possibly two different Augers:
● Auger, Pierre. (1989). *Dynamics and Thermodynamics in Hierarchically Organized Systems: Applications in Physics, Biology, and Economics* (free energy, 8+ pgs). Pergamon.
● Gallini, J. (1954). Review: *Microscopic Man* by Pierre Auger", *Bulletin of the Atomic Scientists* (pgs. 139-40), Apr.

Videos/Audio
● Hach, Cherly. (2002). "Ecology Lecture: Thermodynamics, Energy and Man" (Audio: 57:55-min), 26 Sep., *KAMSC Biology Lecture.*
● J.H. Keenan's Contributions to Thermodynamics (videos) – Meeting the Entropy Challenge, October 2007.

See also
● Thims' thermodynamics book collection

θΔics

The **Hmolpedia: List of articles to write** page lists articles in need of writing or article potentials. Aside from those blank links on the founders of thermodynamics, founders of human chemistry, or pioneers of human thermodynamics pages (or any other page with unlinked key terms or names, the following is a loose list of potential articles to write (please feel free to add to this list):

New

- Geometrical thermodynamics or geometrothermodynamics (Gibbs, 1873 or Carathéodory, 1909)? (link) (link) (link)
- Pierre Prevost (1751-1839) (photo) – had some kind of caloric radiation theory.

Needed

The following are needed Hmolpedia articles:

1. Fire element (pg ix, *Elements of Chemistry*)
2. Hot or Not
3. Jeffries Wyman - supposedly founded the science of "linkage thermodynamics" in 1948 as used in biochemistry.

Hmolpedia article possibilities:

The following are tentative Hmolpedia article possibilities:

1. Virtual energy (a Octavian Ksenzhek conception)
2. Free entropy (see: free entropy, Wikipedia).
3. Approximate entropy (Pincus, 1991)
4. Sexual selection (and thermodynamics)
5. Physical heat
6. Neurological heat
7. Maximum entropy production
8. Unavailable energy
9. Cognitive thermodynamics? (Blog, etc.)
10. Gravitational entropy (e.g. here)?
11. Lord Entropy – a 1992 comic book character (here, here, here).
12. Psychoenergetics - used by William Tiller and others before him.
13. Metabolic theory of ecology (abs); Wikipedia, etc.?

See also

- Article potentials | Journal of Human Thermodynamics
- Video potentials | Human Chemistry 101

θΔics

In Hmolpedia, **Hmolpedia: Misc** is a header page for miscellaneous in-site content.

The **Hmolpedia: Naming articles** page gives an outline of the protocol used for naming Hmolpedia articles.

One general standing rule that take precedence, in regards to how articles are titled, is hyperlink facility, i.e. articles should aim to be titled as they tend to be cited and discussed in the text body of Hmolpedia articles, so that when the "Suggest Links" button is clicked, in the EasyEdit Toobar, the needed hyperlinks will be "recognized" by the EasyEdit tool, and thereby linked and saved, facilitatively.

Names | First and last only

The basic rule is that names of people are truncated to first and last, e.g. Johann Goethe (or Goethe) vs. Johann von Goethe (not used here).

The naming of some names (e.g. J.J. Thomson, J. Willard Gibbs, C.P. Snow), however, becomes more more complicated; particularly so when namesake assigned laws are involved (e.g. van der Waals force). The general rule here will be to fall back to most common usage; although this is not an exact method, and in some instances, this becomes a case-by-case determination. The following are a few solidified (and not yet solidified examples):

Commonly cited		Tested	Hmolpedia article	Related articles
J.J. Thomson	→			
J. Willard Gibbs	→		Willard Gibbs	
M. Scott Peck			Morgan Peck	
C.P. Snow	→		Charles Snow	
P.W. Bridgman	→		Percy Bridgman	
John Q. Stewart (physicist)			John Q. Stewart	
John Stewart (philosopher)			John Stewart	
Johannes van der Waals				Van der Waals force
Nicholas Georgescu-Roegen		Nicholas Georgescu		
Henry Le Chatelier			Henry Le Chatelier	Le Chatelier's principle
Pope Pius XII			Pope Pius XII	
Lord Kelvin	→		William Thomson	

Some attempts at truncation (e.g. Georgescu-Roegen) are more complicated. For some time, the Nicholas Georgescu-Roegen article (a person highly-cited in economic thermodynamics circles) was titled as "Nicholas Georgescu". This prompted objection. Japanese researcher Kozo Mayumi, a former student of Nicholas Georgescu, e.g., greatly objected to this shortened truncation of the longer more cumbersome name "Nicholas Georgescu-Roegen", commented in threads about change this frequently. It took several years of discussion and research to find that the appended surname "Roegen", according to several sources, is an attached reverse anagram, done so for distinguisability (in Romania) purposes (from another Romanian mathematician known in his day); see his article for more on this.

Other names such as: Etienne Saint-Hilaire, Jean-Baptiste Lamarck, etc., involved a little more prolonged digestion, finalizing only following repetitive senses of unnecessary irritation in usage.

Generally naming is done so according to the fact that Hmolopedia is a working encyclopedia, meaning that in some cases names of certain people are cited in literally 100s of articles and it becomes tedious to type out extended last names, e.g. those with foreign titles, e.g. von, van, de, Lord, or paternal-maternal conjunctions, e.g. Georgescu-Roegen. The lay-public common name "Lord Kevin", for example, is listed as William Thomson, as this is the way a thermodynamicist would discuss him and his work.

A rare few exceptions exist, owing to strong ingrained historical precedence, or if one has a law or principle or force named after them, as Johannes van der Waals has Van der Waals force named in his honor; or Henry Le Chatelier (who has a popular law named after him); or Pope Pius XII, which seems difficult to change.

Two last names

Some individuals, particularly of Spanish decent or origin, have two last names by tradition. The most common last name is to be used in these instances. Some names, e.g. Stefan Pohl-Valero, it is difficult to decide which surname to use;?

No letter accents

A second rule is that no letter accents are used.

This is done on account of the fact that (a) no English speaking reader knows what these mean and (b) the URL for such accented names becomes overly complicated and decreases the search engine capability to find the article by the reader.

A few exceptions exist. The Erwin Schrödinger article was one of the first articles in the EoHT, but it soon became apparent that the letter accent hindered the ability of the internal site search engine and easy edit “suggest links” button from finding the articles. Beyond this, when citing his name, standard English keyboards do not have letter accent buttons, hence the copy and paste method becomes tedious and unwarranted.

Complications | Objections

Some active researchers have adversely objected to some of these truncations, which are done solely in the name of hyperlink functionality, search engine facilitation, and overall citation and name mention in article usability.

American philosopher Christian de Quincey greatly objected to his article being shortened to "Christian Quincey", as the *de* is simply a French title of sorts, and sent a number of angry emails to Libb Thims about this.

External links

â— Wikipedia: Article titles

θΔics

The general **objective** of Hmolpedia to collect information on topics, terms, people, and theories connected to the explication of the thermodynamics of human movement and existence. This includes:

(EoHT logo)

1. Biographies: of the people who developed the theories or discussion of ideas.
2. Theories: on the overview of the thermodynamic logic developed to explain a point of human life.
    1. Highlight the significance of the theory
    2. If possible, write a "difficulties on theory" section (similar Darwin's analogous "difficulties on theory" section in the last chapter of his *Origin of Species*)
3. Connections: of topics related to biographies, theories, or other related side-issue areas.
4. Discussion: thread discussion of articles.

θΔics

test

"When it is said, that man is not a free agent, it is not pretended to compare him to a body moved by a simple impulsive cause: he contains within himself causes inherent to his existence; he is moved by an interior organ, which has its own peculiar laws, and is itself necessarily determined in consequence of ideas formed from perceptions **resulting from sensations which it receives from exterior objects**.

As the mechanism of these sensations, of these perceptions, and the manner they engrave ideas on the brain of man, are not known to him; because he is unable to unravel all these motions; because he cannot perceive the chain of operations in his **soul, OR the motive principle that acts within him**, he supposes himself a free agent; which, literally translated, signifies, that he **moves himself by himself**; that he determines himself without cause: when he rather ought to say, that he is **ignorant how or for why he acts in the manner he does**."
— Baron d'Holbach (1770), *The System of Nature* (pg. 97)

1957

Oct 10

Russian-born American writer Ayn Rand becomes famous with the publication of *Atlas Shrugged*, which, per reasons such as follows: (Ñº)

> "If devotion to truth is the hallmark of morality, then there is no greater, nobler, more heroic form of devotion than the act of a man who assumes the responsibility of thinking .... the alleged short-cut to knowledge, which is faith, is only a short-circuit destroying the mind."

implicitly endorses of a peculiar brand of atheism. In 1979, she goes on Donahue, shocks the audience, with her sharp responses to his queries about her disbelief in the existence of god, e.g. "you are never called upon to prove a negative, that's a law of logic."

1927

British mathematician Bertrand Russell published his *Why I Am Not a Christian*; a book listed by the New York Public Library as one of the most influential 150 books of the 20th century, in which he declares:

> "I see no reason, [owing to the universal nature of] the second law of thermodynamics, to believe in any sort of God, however vague and however attenuated."

Thereafter becoming one of the leading spokespersons for atheism in the 20th century; he also introduces the uberman concept, the idea that someone in the future will bring forth the qualities and or ideas that will usurp belief in the existence of god. In 1959, he goes on national television and cogently and rationally explains why he is not a Christian.

Quotes from 2008 channel-4 documentary "God Strikes Back":

> "I worry that high school biology teachers are tiptoeing too respectfully around traditional beliefs."
>
> — Richard Dawkins (2008), Park

High School teacher interview

“We can’t get into the business of knocking down kid’s religions and the religions of families.”

— Chris Scott (2008), head of science at Park High School queried by Dawkins about why the conflict isn't addressed

“Because we teach science, and I would not feel comfortable talking about anything but science.”

— Rachel Hughes (2008), Park High School biology teacher interviewed by Dawkins about why the conflict isn't addressed

English zoologist Richard Dawkins in 2008 interviewing (2:20-3:50) four Park High School, North London, biology teachers about why they don’t address the religious conflict when they teach evolution.

A person who has great responsibilities, such as a king, is constantly worried and therefore doesn't sleep soundly. This saying is a line from the play King Henry the Fourth, Part Two, by William Shakespeare.

Uneasy lies the head that wears a crown | Define Uneasy ...
dictionary.reference.com/.../**uneasy+lies**+the+head+that+**wea**... Dictionary.com

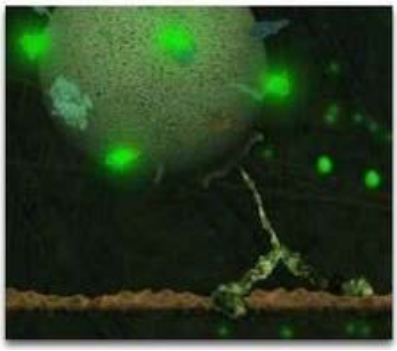

Kinesin

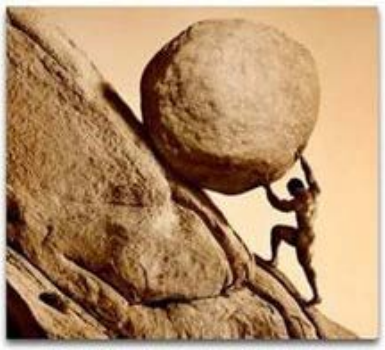

Human

Walking molecules

In site pages, **Hmolpedia progress report**, shown below, outlines the timeline development of the construction of *Hmolpedia: Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*:

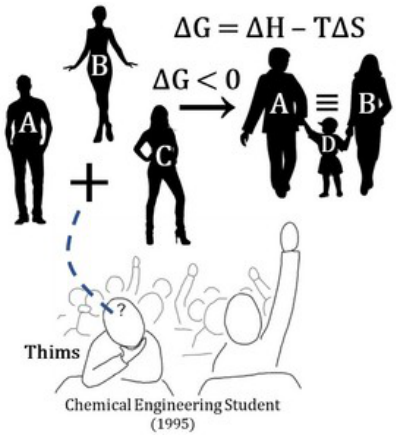

FALL 1994	ENGIN	CHEM ENG JUNIOR	Grade	Hours
CH E	230	THERMODYNAM I	A	4.00
ENGR	105	COMP COLL ENGR	B+	1.00
CHEM	302	INORG CHEM	A	3.00
ECON	201	PRINCIPLE ECON I	B+	4.00
Term Totals		GPA	3.708	12.00
Cumulative Totals		GPA	3.708	

WINTER 1995	ENGIN	CHEM ENG JUNIOR	Grade	Hours
AO&SS	467	BIOGEOCHEM	A-	3.00
CH E	330	THERMODYN II <--?	A-	4.00
CH E	341	FLUID MECHANICS	A-	3.00
HIST	366	20TH C AMER WARS	B+	4.00
Term Totals		GPA	3.585	14.00
Cumulative Totals		GPA	3.642	

SPRING 1995	ENGIN	CHEM ENG SENIOR	Grade	Hours
CHEM	468	PHYSICAL CHEM	A	4.00
Term Totals		GPA	4.000	4.00
Cumulative Totals		GPA	3.690	

FALL 1995	ENGIN	CHEM ENG SENIOR	Grade	Hours
AERO	200	INTRO AERO ENG	A	3.00
CH E	342	HEAT & MASS TRANS	A	3.00
CH E	343	SEPAR PROCESS	B-	3.00
CH E	486	PROC SIM & DES I	B+	3.00
Term Totals		GPA	3.500	12.00
Cumulative Totals		GPA	3.635	

American engineer Libb Thims' 1994-1995 chemical engineering coursework (University of Michigan), during which time, in one of these classes (thermodynamics I or II, physical chemistry, or heat and mass transfer) the seed for the future subject of "human chemical thermodynamics" was planted.

Late 1970s

- American Libb Thims (user: Sadi-Carnot) — creator of *Hmolpedia* (24 Dec 2007) — at the age of 4-5, began to ruminate on the puzzling nature of "wrong", or unnatural action, in contrast to "right", or natural action, or, in colloquial (or religious) speak, good vs evil action, when during the course of forest wanderings he found a bird's nest, filled with quarter-sized white spotted blue eggs, after which he took one of the eggs home and, while, as memory recalls, showing it off to someone, while standing on the second story of the balcony, of the apartment complex he was residing in, dropped the egg, off the balcony, letting it fall 10-feet to the ground and crack open, after which a strange mental feeling or sense of darkness emerged following the event.

Late 1980s

- Thims, at age 15, got a work permit—thermodynamics, of course, being the governing science of the relation between **"heat"** (e.g. sexual heat) and **"work"** (e.g. occupation)—and began to be employed at a minimum wage summer job (paid work), and thereabouts began to date; during the course of which, he began to notice, in the lifestyles (states of existence) of some of the girls-turning-women (age 17-22) he began to hang out with, who each worked (at or near minimum wage jobs) and thereby paid their own rent and seemed to be happy (friends, throwing parties, etc.) that one could, very easily (in theory), work a minimum wage (simple manual labor) job, exist and be happy. This, what might be called, "drive-thru paradox" is evidenced well in the: "you'll be serving my kids fries on our way to a skiing trip" scene, in the 1997 film *Good Will Hunting*, as well as the "don't be calling me no f$%king dishwasher" scene, in the 1983 film *Scarface*, or the "the world needs ditch diggers too" scene, and Kuder Preference test discussion, espoused in the 1980 film *Caddyshack*. Here a grand confusion began to embed into Thims' mind, surrounding the nature of happiness, contentment, and or mental satiety, and its connection to "work" (see: principle of the transmission of work), work output (occupational ladder), and specifically "status level" of work, such as embodied in the defining first engagement query: "so what do you do?" [for a living], e.g. see: David Buss' 1993 "Occupation vs Sexual Receptivity" study, in respect to mate selection and existence, surrounding the question "why" a person was or has to do anything, past the point of minimum society mandated education level (high school), past the minimum demarcation point of paying for rent (below which is homelessness)? English-born American philosopher Alan Watts' circa 1955 "here kitty kitty" social indoctrination ideology or process (see: South Park annotated video (Ñº) at 5:54), idealized or rather carrot-sticked for the person age 0 to 40 to follow, captures some of this issue well.

1992/93

- In the early 1990s, Thims, as a beginning college student—deciding to go to college on the logic that, in theory, if he took the intellectually most difficult subjects, mastering the logic so as to finish in the top of each course or class, he would glean insight into former puzzling query on the nature of existence and the "do" of things (or "go" of things as Maxwell at age 3 queried incessantly)—still extremely puzzled about the cultural mandate that one is ideally supposed to get a job (paid work), then get married (bond), and then make kids (reproduction), then retire (and that's it to existence, in a nut shell)—along the way making the noticeably unrealistic (see: realism) legal vow "till death do us part" (43% of people get divorced at 15-years)—made a trait weighted mate selection spread sheet, below left, of his top 19 girlfriends whom he could theoretically (potentially) marry, of the following form, in attempts to discern a logical methodology for marriage selection:

	G1 | 5.0	G2 | 6.2	G3 | 6.1	G4 | 5.6	G5 | 7.2	G6 | 5.8	G7 | 5.9	G8 | 6.7	G9 | 6.4	G10 | 4.3	G11 | 5.3	G12 | 5.2	G13 | 4.6	G14 | 6.0	G15 | 6.0	G16 | 6.2	G17 | 6.6	G18 | 7.7	G19 | 5.3
(20) Grandmother likes	2	5	3	7	12	10	5	5	20	3	5	2	8	15	8	5	0	10	10
(15) Spontaneity	10	3	8	8	10	5	15	10	15	5	5	5	10	5	12	12	12	10	10
(15) Fun factor	12	4	5	8	8	8	15	12	15	5	5	2	10	8	5	5	8	5	8
(10) Fitness	8	0	5	7	10	5	10	8	10	3	7	8	8	8	7	8	8	10	8
(10) Hair	10	5	5	8	7	10	5	6	5	4	10	5	4	4	4	7	7	9	8
(10) Eyes	8	5	2	5	8	10	8	9	10	5	6	5	3	5	5	6	7	7	7
(10) Body	12	2	10	10	12	5	5	10	10	2	8	5	4	4	18	4	10	15	12
(25) Intelligence	15	20	15	8	8	12	15	5	25	5	10	5	20	15	15	8	8	10	10
(20) Character	15	15	5	3	5	5	10	5	20	5	0	0	10	15	15	10	5	5	10
(10) Class	5	10	5	6	10	5	10	7	10	3	5	3	5	5	5	5	5	8	5
TOTAL =	82	69	63	70	90	75	98	77	140	40	61	35	82	84	84	70	70	90	80

1992

→

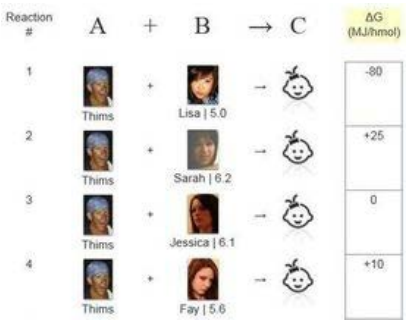

1995

The results of this study, however, made little intuitive and or visceral sense (see: Thims thought experiment). This selection methodology, as Thims would come to learn, is what is called a "love thought experiment", above right, as done by German polyintellect Johann Goethe (1808) in affinity chemistry terms or as Indian chemical engineer Vamshi Regalla and American mechanical engineer Ravi Vedula did (2012) in first thermodynamic and later chemical thermodynamic terms.

1994

- Thims, while meandering about in a local book store, came across American evolutionary psychologist David Buss' newly-published very influential 1994 *The Evolution of Desire: Strategies of Human Mating*, which presented the results of studies, conducted in the 1970s and 1980s, involving a survey of some 10,047

people worldwide, on the nature of sexual selection, cross-culturally, that sought to identify underlying evolutionary-mediated psychological mechanisms of human behavior and desire; thereafter, fascinated by this "mechanism" way of looking at human relationship underpinnings, Thims, as a hobby, read over a 100 books on evolutionary psychology and mate selection (see: Thims' mate selection book collection).

1995

- *Circa* Fall/Winter - Thims, while sitting in one of his chemical engineering thermodynamics classes, likely ChE 330 Thermodynamics II (adjacent), at the University of Michigan, began to wonder how one would go about applying chemical thermodynamics to the "predictions" of human chemical reactions (e.g. "should I marry person A or person B?"), that is, how the famous "spontaneity criterion" ($\Delta G < 0$) applies to the prediction of mate selection. In other words, what does the conceptually-difficult quantity "$\Delta H - T\Delta S$" have to do with the standard "a diamond, 2½ kids, and a mortgage" model of existence (purpose boiled down to: education, job, marry, kids, retire), in terms of year-by-year changes in "states" of time of human existence? For whatever reason, Thims never raised his hand in class to ask the question, in spite of the fact that (a) he was in the top 8% of his graduating class and (b), always sat in the fount row of the class (to eliminate distractions), and (c) was typically the person to ask the most questions while in class? In the years to follow, for whatever reason, the question stayed with him, remaining a sort of passing reverse engineering puzzle/hobby as to how the solution would work out, variable wise, in terms of differentials of existence.

2001

- 11/15 - after about six-years of work on the problem, from time-to-time, on scratch paper, Thims came across Stephen Hawkings' 1996 human entropy change diagram, which alluded to the idea that a person's entropy would change as one reads a book (and the connection to this that the higher up the education ladder one climbs, the higher one's mate status value becomes), the big picture as to how the quantity "$\Delta H - T\Delta S$" could change, variationally, in terms of multi-year instantaneous states of human existence on going from state one (day one) to state two (year eighteen) in the course of the human reproduction reaction. About a month later, Thims chanced on the idea that it might be worth while to write up a short summary of the solution, as things were viewed at this point (assuming that it would only take about two months or so to complete the task).
- 12/05 - sent one page query letter to Bantum-Dell Publishing group for book proposal on the "application of chemical thermodynamics to human life", but never one that was never received (according to publishers). (Nº)

2005

- 05/30 - Thims began testing online encyclopedia-style wiki article **writing at Wikipedia**, by starting an article on human thermodynamics; albeit an article that ended up in the "articles for deletion" (afd) process, twice; after which, he stayed on as an editor at Wikipedia, in the two years to follow, penning about 180 articles, contributing over 8,500 edits.

2006

- *Circa* February, via footnote 2.5, **Thims discovered Goethe** — the answer to Thims' long-sought 1994/1995 chemical thermodynamics classroom query (above photo), about "who was the first, or how do you apply, chemical thermodynamics prediction logic to human chemical reactions (human relationship dynamics), i.e. to mate selection prediction, or the humanities in general?".

In 2005, Thims began to test article writing at Wikipedia, penning some 180+ new articles, though finding it resistively difficult to write articles on three taboo subjects: human thermodynamics, human chemistry, and human molecule, all of which were either banned or deleted.

2007

- 09/04 - on the fuel of Goethe, paperback version of *Human Chemistry* was published (hardcover version was published on 24 Sep 2007).
- 10/10 - resigned as an editor from Wikipedia (2005-2007), out of re-occurring tensions building in attempts to get the articles "human chemistry" and "human molecule", established as standard encyclopedia topics (topics which kept getting sent to afd).
- 12/24 - **launched EoHT.info**, with three articles: Sadi Carnot, human thermodynamics, and human chemistry.
- 12/31 - up to about two dozen articles or pages started and two members: Sadi-Carnot and Gladyshev (who has previously been weekly email collaborators since 2006).

2008

- 01/01 - up to 27 pages and made a new EoHT Wiki Logo (shown on following banner, below right section).
- 01/02 - up to 32 pages, 3 members, and invited more published thermodynamics professors, authors, etc., to join the site.
- 01/15 - up to 71 articles and changed the name to *Encyclopedia of Human Thermodynamics*.
- 02/20 - at an average of about 15-30 visitors per day (with about 50-150 page views per day).
- 03/01 - entered the ad-free test program (cost = $20/mo, paid by Libb Thims).
- 03/12 - at 135 articles, 11 members; new domain name: eoht.info (see: thread notice); added name "encyclopedia" to banner (vertical right):

- 04/04 - at 175 articles and made first-draft cover design for the potential printed version of the EoHT.
- 08/27 - at 400 articles.
- 12/11 - 600+ article (19 members).

2009

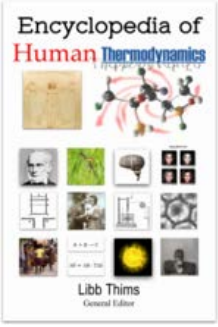

The 16 Nov 2010 draft cover (Ñº) for the then guestimated 5-volume print version of EoHT.info.

- 01/13 - 638 articles, 24 members, and 100+ visitors per day.
- 06/08 - 946 articles, 36 members, 210+ visitors/day, 12,000+ page views per month.
- 07/29 - hit the 1,000 article mark (Richard Piccard).
- 08/03 - accepted into the ad-free "education wiki" program (a savings of $19.95/month in ad-cost removal).
- 08/07 - 50 members, 280+ visitors/day, 13,000+ page views per month.

2010

- 03/16 - 1,300 articles (Szilard's demon), 78 members, 520+ visitors/day, 21,000+ page views per month.
- 04/26 - Finished writing the last of the biographic articles, of the known 323 HT pioneers, with Kenneth Stokes article (#1,383).
- 07/07 - 1,500 article mark (John Herapath).
- 07/19 - Reached the 100-member mark (user:å·©æ–¹å»º)
- 07/27 - Testing out removal of dropshadow with the following 990x98 banner (which increases page reading space by at least 10-pixels):

- 10/16 - Made a draft cover (Ñº) for a guestimated: **5-volume print set** of EoHT.info, then titled *Encyclopedia of Human Thermodynamics*, and printed a stapled-together sixteen-page test run, using the articles: Sadi Carnot, Rene Descartes, Ernst Haeckel, Hmol, Hmol science, Arthur Iberall, mechanistic school, Eugene Spektorsky, social physics, and soul snow.

2011

- 02/08 - 1,846 articles, 148 members, 41,000+ page views/month.
- 02/16 - launched the EoHT beta wiki (see logo), a sister site to this one, for sandbox, new, or unreferenced, or original ideas or theories to take root.
- 03/28 - hit the 2,000 article mark (chemistry of love).
- 04/04 - 2,030+ articles and (a) renamed the site from "EoHT wiki" to "Hmolpedia" (see: etymology) or *Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, to embrace the more encompassing perspective and corpus of articles the site currently contains, and (b) uploaded a new redesigned (and tighter) Hmolpedia banner (990x95px), as shown below:

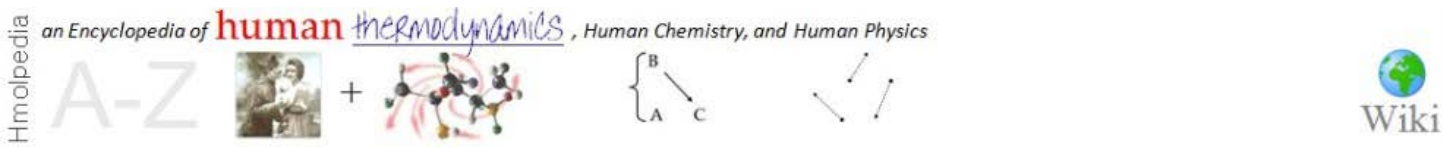

- 08/19 - Hit the 200+ member mark with the joining of JustinLancaster (Justin Lancaster)!
- 09/27 - Finally finished organizing the main HT pioneers (450+), HMS pioneers page (120+), HC pioneers (50+), and HP pioneers (20+) into four separately grouped and ordered timeline-tables.

2012

- 01/31 - Hit the "500+" mark on the HT pioneers timeline table (10-years of research went into this table).
- 05/07 - launched the *Elective Affinities: Illustrated, Annotated, and Decoded* online (to be turned book) project; the first complete book to be embedded, chapter-by-chapter, and hyperlinked into the structure of *Hmolpedia*.
- 05/10 - 2,500+ article mark, 280 members, 57,000 page views per month.
- 10/23 - formerly formed the JHT review board listed within Hmolpedia.
- 11/04 - at 2,700+ articles mark and 310+ members.
- 11/06 - David Bossens produces the Hmolpedia-precipitated book *Debates of the Hmolpedians*.

2013

- 02/19 -started making backup hardcopy MS Word version of *Hmolpedia*; an extrapolation estimate, of the first 100-pages done (75 articles), would put the A-Z printed volume at 3,700-pages total or 5-volumes (8.5x11) at 750 pages per volume (800 page max per book at LuLu).
- 02/26 - at 2,800+ articles and 60,000+ page views per month.
- 04/25 - gained $146 dollars via Google Adsense with Human Chemistry 101 YouTube channel; currently in water testing stage (income rate at $95/month).
- 05/01 - at 2,880 articles and 69,000 page views per month.

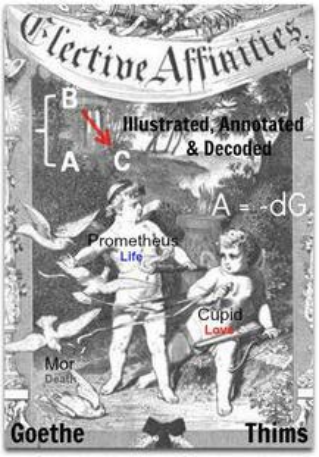

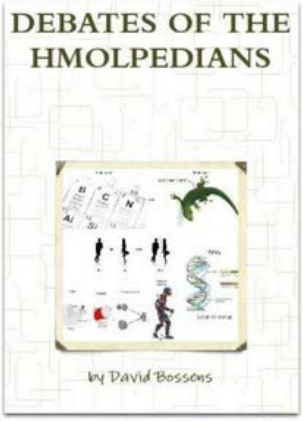

Left: the 2012-launched equation overlaid cover design of ***Elective Affinities: Illustrated, Annotated, and Decoded*** by Libb Thims, based on the Philipp Johann illustrated, 1854 James Froude translated, 1885 Hjalmar Boyesen illustrated edition. Right: the 2013 book *Debates of the Hmolpedians*, by Belgian philosopher David Bossens, discussing newly-learned views on hmolscience, in

regards to questions on the defunct theory of life, biology, free will, prediction, DNA, human molecular theory, etc.

- 04/27 - **Robots.txt issue**: Sometime on or about 27 Apr 2013, Google started displaying following page descriptions for Wetpaint site search returns, which resulted in eoht.info being dropped from Google search returns:

  Create Your Own Site - **Wetpaint Central**
  www.**wetpaintcentral**.com/page/Create+Your+Own+Site
  A description for this result is not available because of this site's robots.txt – learn more.

- 04/30 - started doing JHT reviewing (see: JHT submissions) at Hmolpedia (as opposed to doing it at the beta site, as has previously been done)
  - 05/18 - site getting less than 100 visits per day (at 1.8 pages / visit) correlating to around 5,400 page views per month.
  - 06/12 - issue has been found (thread: post #12) to have something to do with the Wetpaint spam bot filter upgrade acting to blocking Google crawlers.
- 07/07 - upgraded main page (see previous version) to new streamlined design.
  - 7/20: Announcement that wiki platform of Wetpaint (Ñº) was purchased by Travis Derouin, who was the lead developer of wikiHow from 2004 to 2011. He is planning on transitioning the platform to his servers on July 31st, 2013. Once the platform has been uploaded to his server, this site robot.txt issue will be fixed. Earlier this morning, he informed me that he has come up with a solution that will be applied to the platform once it is on his servers. In a few weeks, Travis will be posting information about the move on Wetpaint Central, which will then be called WikiFoundry Central. The new platform will be called WikiFoundry.
- 9/19 - social physics school became the 3,000th Hmolpedia article!
- 10/15 - the transition to the new server host is still ongoing; site working only half the time and continuously bugged up, though improving with time.
- 11/29 - **discovered**, via Zucker (1945), via Eddington (1938), the *circa* 1845 "Rankine love poem" (Hmolpedia article #3,086), stanzas 6-7 shown adjacent, wherein he describes love as a thermodynamic potential amenable to partial differential equation integration with respect to time evolutionary psychology formulation.
- 12/10 - 3,100+ article level; site near to full previous functionality and visitor flow rate.

Let x denote beauty, y manners well-bred,
z fortune (this last is essential),
Let L stand for love—our philosopher said—
Then L is a function of x, y and z
Of the kind that is known as potential.

Now integrate L with respect to dt
(t standing for time and persuasion)
Then, between proper limits, 'tis easy to see
The definite integral Marriage must be
(A very concise demonstration).*

Scottish engineer, mathematical physicist, and thermodynamicist William Rankine's *circa* 1845 "The Mathematician in Love" (discovered 29 Nov 2013), the earliest known "equation of love".

2014

- 01/29 - the work-in-progress (86-page level) *Chemical Thermodynamics: with Applications in the Humanities*, cover shown adjacent, started sometime in late 2013, a pioneering attempt, going beyond that which the 40+ historical human free energy theorists have attempted, at a complete fully derived treatise on human chemical thermodynamics (humanities based on chemical thermodynamics), the pinnacle product of *Hmolpedia*—a prolegomenon to the former—slated as a revolutionary (see: Goethean revolution) teaching textbook for a hypothetical soon to become initiated college course on "physical humanities". [1]
- 01/ 29 - some pages on the site still have images (not appearing) issues, even after reload, supposedly owing to the photo server database transition from Wetpaint to Wikifoundry. Thread discussion here: (Ñº)
- 04/07 - 3,200+ pgs (online) + 1,236 pgs (print set) + 303 pgs (misc print). [2]
- 05/13 - **discovered** Mirza Beg, via key word Google search on term "physico-chemical sociology".
- 06/23 - Engaged into the Beg-Thims dialogue. (Ñº)(Ñº)
- 09/11 - Initiated the Atheism Reviews channel; seeming precipitate of a combination of the Beg-Thims dialogue + the difficulties of trying to encapsulate the "religious conflict" section in the introduction of *CTAH*. [1]
- 10/14 - 3,430+ pgs (online) + 2,069 pgs (print set) + 403 pgs (misc print).
- 12/29 - 3,500+ pages (online) + **2,194 pgs** (print set) + 409 pgs (misc print); Atheism Reviews channel: 15+ videos; 26 subs | 2K views (85 v/s).

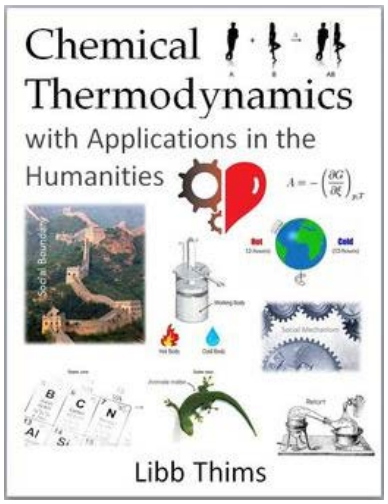

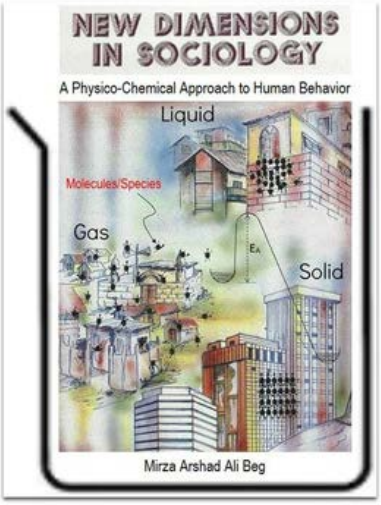

Left: a Jan 2014 working draft manuscript cover of American electrochemical engineer Libb Thims' *Chemical Thermodynamics: with Application in the Humanities*, on the subject of human chemical thermodynamics, aiming to be the required reading for a college to graduate level course in physical humanities. [1] Right: annotated cover of Mirza Beg's 1987 *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*.

2015

- 08/10 - Recorded and gave the "Zerotheism for Kids" lecture.
- 09/07 - Published the final edited Zerotheism for Kids lecture, in 14-parts.
- 09/30 - Following relocation, took of photo (Ñº) of the *circa* 1,300 book library, aka the "hard drive of Hmolpedia", as contained in: 39 banana boxes and 6 egg boxes (filled with books); photo showing one of 10 snake book shelves [of Thims' own design], holding said Hmolpedia hard drive:

- 10/07 - **Thims' blacked out for three hours**, while treadmill running, owing to what turned out to be a **heart arrhythmia problem**: after not running for about a weak owing to relocation, he ran one mile on the X-Sport Gym treadmill at 7.8 mph and 15% incline, slowed for inclined walk break, then went for second mile, and then completely blacked out (collapsed on treadmill, urinated on himself) and came to in hospital about 3 hours later (being retained there for three days) the coming into consciousness being similar in feeling to a slow return to brain-controlled movement mobility similar to the Jacob's ladder hospital scene; the collapse (the first of its kind [without prolonged detail]; aside from the Beg-induced mental shakiness pause at work, a year prior) was likely owing to the combined stress of: (a) 3+ years growing imbalanced gym-to-study ratio, (b) compiling Hmolpedia into a word file at a high rate of mental absorption and processing, (c) completing the filming, production, and editing of the "Zerotheism for Kids" video (which pushed one week into the limited month Thims had to find a new residence), (d) the growing undesirability of current work situation, and (e) that Thims under pressure (3-week period) had to cold turkey find a new residence and relocate (the specific day the stress arise was 09/01, when Thims received notice that his multi-unit residence had been sold and was given a 30-day eviction notice, on the day of which Thims, from some peculiar reason, was only able to run one-minute on the inclined treadmill [owing to mental shakiness], as opposed to 23-min normal runs three weeks prior).

- 12/07 - Have 7,899-pages [6,641-pages (main content) + 1,258-pages (misc content)] saved into Word files, in preparation for multi-volume print set of Hmolpedia; about 600 more articles (in the "unfiled pages" section) to cut and paste into Word file before publication enacts.

2016

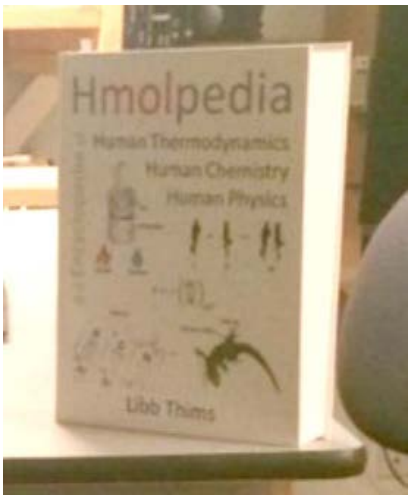

- 01/05 - FINISHED transfer of online content of Hmolpedia (treads aside) into Word file, in preparation for multi-volume print set, amounting to: 7,255-pages (A-Z articles) + 1,368-pages (Misc content) + 319-pages (EA:IAD), or 8,942-pages (total), which amounts to 3,494,877-words, all done, ironically, to explain how a four-symbol equation ($\Delta G < 0$) applies, in detail, to the humanities.
- 01/05 - FINISHED 4,000th article (Diagoras).
- 01/12 - the bulk saved Word files were formatted into 11 printable Word files (Ñº), and a test copy of volume one was ordered (see: photo; adjacent).
- 03/16 - at 9:05 AM CST, the ten-volume print set of *Hmolpedia*, totaling 6,496-pages, **was published** and made available for sale.
- 03/28 - a professional-looking photo of Thims' newly-arrived 10-volume print set was made:

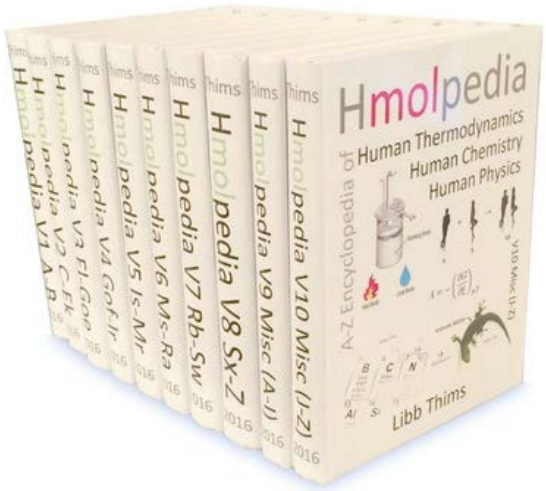

- 03/29 – a progress report video (Ñº) was made.

2017

- 4/10 - at 4,400th article (Siger of Brabant).

2018

- 2/7 - Hacking vandalism incident (Ñº), resulting in 100s of pages being missing (in online version); after which the permission settings of Hmolpedia were changed to “anyone can edit” pages to only those approved to be “writers” (see: Hmolpedia writers) can edit pages.

2019

- 6/5 - The 5,000th article (William Middleton) was reached! Celebrated by reducing the then extant main page of EoHT.info (version: 2297) to a "new main page" with only two opening paragraphs (version: 2298).
- 9/15 to 9/19 - Thims went to Karachi, Pakistan, to conduct 4-day interview (first day being meet and greet) of Mirza Beg and his 1987 *New Dimensions in Sociology*, resulting in 30+ hours of video-recorded interview dialogue.

References

1. Thims, Libb. (2014-15/16). *Chemical Thermodynamics: with Applications in the Humanities* (85-page version: pdf of 800-pages estimated total). Publisher.
2. Thims, Libb. (2014-15/16).*â€‹ Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics, Volumes 1-6* (see: main where pdfs are available). Publisher.

θΔics

The **Hmolpedia member index** page is summary collection of those Hmolpedia members who acknowledge aspects of their background; used to facilitate who-is-who on the site for communication purposes. The following is only a partial listing of total number of site members as some do not indicate their background or connection to thermodynamics (or interest in human thermodynamics), but may simply like being members to read the articles and receive the weekly newsletter. Feel free to add your name below or make changes, etc., if desired:

ourlight1
28 Mar 2015

My son has been urging me to check out Nassim Harrimein and his work. He is graduating from Penn State in physics, himself, as he's aware of my life's quest in trying to understand the connectedness of all. In the past few years, my quest has taken me to taking a much closer look at the connection between spirituality and science. My kids describe me as a Ludite, so it may take me awhile to figure out how to upload a representative avatar and navigate the "Easy Edit" button to add more info about myself. (I wasn't quite sure what you even meant by "Bot"). I am a psychotherapist, who believes in the connectedness of all through energy. I practice Jainism, although I do fall from grace at times. My interest is in doing something to contribute to world peace and I have started a business called "Our Light". I am currently embarking on studies at Harvard to help educate myself to all of the world religions, in an effort to help transcend the distortion, misrepresentation, and misinterpretation of the ancient scriptures. I am an avid reader and frequently quote from the likes of Einstein and Tesla, along with Gandhi and Yogananda. I apologize for such a long e'mail. Just didn't want you to think I was a "bot"and boot me from the site. Namaste!

2013

Sometime in 2012, Hmolpedia founder Libb Thims stopped updating this page, as time could not permit the growing task. Feel free to follow Hmolpedia members "latest activity" feed, to see new member posts.

2012

Taylan Bali
(Taylanbali)
Joined: Aug 04

About: “I am an economist, an eternal PhD student and instructor of math for economists at the Faculty of Political Sciences, Ankara University, Turkey; During my Economics studies at METU-Ankara and UiO-Oslo I have never been convinced by the mainstream Neo-Classical and Keynesian equilibrium theories based on Newtonian mechanics and, instead geared towards irreversible non-equilibrium processes, especially thermodynamics and complex systems. Prigogine-Georgescu-Roegen-Galbraiths (both father and son)-Chen have been my inspiration sources, and today I came across the works of your member Dr. Justin Lancaster and your website. So here I am and I believe I am real and motivated enough to stay in your community. More on my CV and research next time.”

Dov Henis
(DovHenis)
Joined: Apr 15

American biochemistry; PhD in biochemistry (1956), University of Pittsburgh; industrial developments consultant (1957-2003); interests: What is life?, humans, humanity (nature network); since 2006 has been blogging at Universe-Life.org.

David Bossens.
(D.Boss)
Joined: Jun 14

BS in psychology (2012) in the area of theory and research, at the Catholic University of Leuven, Belgium; tentatively working a second bachelors in mathematics and physics, to be completed in 2014; recently began publishing various Hmolpedia-centric articles and ebooks.

I first came to know EoHT last year when I was searching for Clapeyron equation origin. I even posted an anonymous comment asking a question. I will not lie, I actually didn't expect anyone to answer me, but within some days you answered me.

Name? (zomething) Joined: Mar 19	American student getting a bachelor's in physics.	S. Thiago sthiago Joined: Apr 11	Okay, I will not say that you clarified much for me, but you answered. And I answered back when I found the answer for future reference of people with the same question. Today I was searching for an explanation about Gibbs free energy and I found the answer here again. I decided that I was going to register and maybe someday, contribute somehow. You've done a wonderful job on EoHT, congratulations and thanks, Thiago.
Robert Balmer (Entropos) Joined: Feb 22	Noted for his circa 1978 work on the applying entropy concepts to the study of the aging annually of fish (see also: fish molecule); specifically over a twelve month period, he studied all the characteristics of birth, growth, aging, and senile death and is said to have identified entropy flows, body heat, dissipation coming into and out of fish; authored the 1990 *Modern Engineering Thermodynamics*; is emeritus dean of mechanical engineering.	Gale Largey (galelargey) Joined: Mar 08	American retired sociology professor who has produced a film documentary on Lester Ward (galelargey.com), but unaware of his social mechanics work and attempt to bring the concepts of the European social thermodynamics thinkers, e.g. Leon Winiarski, to the American sociologists; he comments "[Ward] is rarely mentioned in intro books as the founder and completely left out of theory texts."
Antony Upward (AntonyUpward) Joined: Jan 14	LinkedIn About: "Master of Environmental Studies student at York University in Toronto, Canada; arrived at site via "looking for more work by Eric Schneider and James Kay and decided to join because I wanted to add an excellent book and article by Allen, Tainter and Hoekstra called Supply Side Sustainability (sustainability) - which is based on work by Schneider and Kay."	Gonzalo J. Morales (GonzaloJMorales) Joined: Feb 10	Venezuelan mechanical engineer and physicist, with a degree in heat transfer; working on a "history of thermodynamics" book, to include chapter on the newer field of biological thermodynamics (and possibly a chapter on human thermodynamics, written by Libb Thims); for the past 30 years has amassed a 240+ book collection of "short biographies of scientists since 1550 related to heat and thermodynamics".

2011

Name? (eshm) Joined: Dec 06	Either is (or knows about) Charles Hansen.		
Fulvio Mazzocchi (mazzocchif) Joined: Nov 5	Has a 2008 article on reductionism, determinism, and complexity theory in biology (link).	Leonardo Silva de Souza (LeonardoSilvadeSouza) Joined: Nov 8	Brazilian hydrological engineer (scribd)
Yuvraj Chaubey (yuvraj_chaubey) Joined: Oct 14	An Indian student at Bhabha Institute of Technology, Kanpu .	Bradley K. Sherman (bks_) Joined: Oct 16	Interested in how the laws of chemistry explain biology (link).

Cameron Hannon (CameronHannon)		3 Oct	American electrician and computer networking student LinkedIn at Vista College, Lubbock, Texas.
Angeliki Brouzgou (angelikibrouzgou)		30 Sep	A Greek chemical engineering PhD student LinkedIn working on fuel cells at the University of Thessaly; came to Hmolpedia to deepen her knowledge about thermodynamics and I finds human thermodynamics very interesting and exciting.
Sandy (CosmicAngleS)		28 Sep 2011	An Australian thinker social worker and evolutionary activist working with the tribal Bunjalung spiritual leaders; ponders - human thermodynamics, mechanics, and harmonics - at an individual and collective and planetary scale; runs "purely on spirit (awareness); has a "cosmic consciousness".
(Clausius)		23	A mechanical engineering student at National University of Science & Technology, Pakistan, who wants to know the answer to: (1) In a reversible adiabatic compression entropy remains the same and in the case of irreversible

(Mudassir)		Sep 2011	adiabatic compression it increases. Why is it so? (2) Entropy is referred as the disorder of a system. During adiabatic compression gas molecules are compressed and as a result internal energy increases then how can entropy remain constant?
Adrian Toader-Williams (A.Toader-Williams)		21 Sep 2011	Romanian agriculture and sustainability (BS, MS) and animal nutrition (MS, PhD) researcher (ResearchGate) interested in the relations between "total social collapse" (rise and fall of civilizations) and social thermodynamics.
Erland Lagerroth (Lagerroth)		10 Sep 2011	Building on the 1979 work of Erich Jantsch, wrote over ten books (all in Swedish), including: *Toward a New Science* (1986), *Beyond Darwin and DNA: A Non-mechanistic Biology* (2004), *Between Atoms and the Universe: or to Try to Understand the World We Live In* (2010), among others. Lagerroth's biggest book on Prigogine and Jantsch is the 1994 *The Re-enchantment of the World and Science* (*Världen och vetandet sjunger på nytt*). His latest book (pictured) is the 2011 *Världen skapar sig själv: En upptäcktsfärd mellan traditionell (natur)vetenskap och doktrinär andlighet* (*The world makes itself: A journey of discovery between traditional (natural) science and doctrinal spirituality*) (abs).
Peggy La Cerra (PeggyLaCerra)		08 Aug 2011	American evolutionary psychologist and neuroscientist noted for her 1998 "energetic model of the mind", a mixture of evolutionary psychology, neuroscience, thermodynamics, and Freudian id-ego-superego psychodynamics. La Cerra's energetic model was presented for the general audience in the 2002 book *The Origin of Mind: Evolution, Uniqueness, and the New Science of the Self*, co-written with American theoretical evolutionary neuroscientist Roger Bingman. 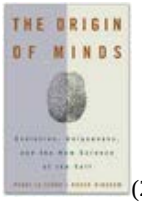 (2002)
Justin Lancaster (JustinLancaster)		18 Aug 2011	American natural scientist noted for his 1989 article "The Theory of Radially Evolving Energy", in which he argues that evolution is a function of energy itself, and that all energetic systems, including societies, evolve with the bounds of thermodynamics laws, whereby nonequilibrium thermodynamics, following Ilya Prigogine, is joined with ecological energetics and chemical evolution to reveal an analogy between chemical, biological, and social evolution.
James Eadon (JamesEadon)		31 Jul 2011	English physicist (and Culica inventor) noted for his 2001 online poll "Are you a giant molecule?", the 2008 results of which are shown adjacent, indicating that 57 percent of people believe they are a giant human molecule, which is in fact the case. 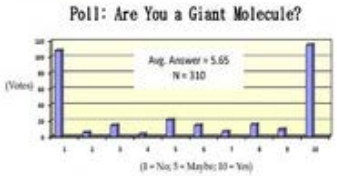
Nicole Tedesco (NicoleTedesco)		25 Jun 2011	An American IT researcher (BS in physics, 1990) who is looking to explain irreversibility in economics, but considers the work at Hmolpedia to be crap ("The actual work at the web site I consider bull. The theorists, I believe, do not understand the degree to which they are merely borrowing an analogy") (blog).
Name (August2011)		21 Jun 2011	Is a college student from China; very interested in social physics and environmental issues; having some fundamentals in physical chemistry and mathematical modeling.
Marek Roland (Dr.MarekRoland)		25 May 2011	A Polish-Canadian physicist who since 1992, has been theorizing on light, life, thermodynamics, diet, and wellness.
Paul Volgyesi (sanbasan)		27 Apr 2011	A Hungarian self-taught student of what he calls functional thermodynamics (thread), with the motto: "Any activity is a thermodynamic event, biothermodynamics when it comes to life. Understand thermodynamics and understand everything." In what seems to be a eclectic mixture of laymanized thermodynamics, biothermodynamics, and Chinese medicine. Is of the view that: "Human thermodynamics can only apply to human consciousness, since all the rest presents no difference whatsoever with general biology."
Chandrakanth Natekar (Natekar)		26 Apr 2011	A student of the ABCs of science, with the view that stellar and non-stellar bodies of the universe, including the human mind, and phenomenon such as human spontaneity, are functions of matter, that always functions in tune with nature; focuses on electromagnetic behavior. â— Natekar, Chandrakanth. (2010). "Eternal Beauty of Human Spontaneity", *AuthorsDen.com*, Apr 15.
Brent Scott (BrentScott)		20 Apr 2011	A follower of the psychological thermodynamics work of Argentinean-born American psychiatrist Hector Sabelli. "I'm very excited to have found your site. You're making a huge contribution. For me, it's leading to a unified field theory of the case for embodiment of love."

Quote

(exergy61) 19 Apr 2011

A chemical engineering Ph.D student in Turkey (Türkiye).

Ali Mansoori (gamansoori) 17 Apr 2011

Did 1969 PhD dissertation on "A Variational Approach to the Equilibrium Thermodynamic Properties of Simple Liquids and Phase Transitions"; 1983 chapter "Molecular Study of Fluids: A Historical Survey", on the thermodynamics of Johannes van der Waals; series editor of the seven volume *Advances in Thermodynamics* (1988-1992); author *Principles of Nanothermodynamics* (2005), chapter three: Thermodynamics and Statistical Mechanics of Small Systems; runs the UIC thermodynamics Research Laboratory.

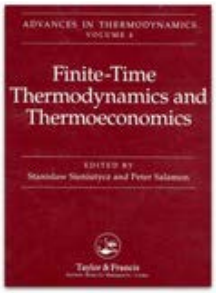

(1988-1992)

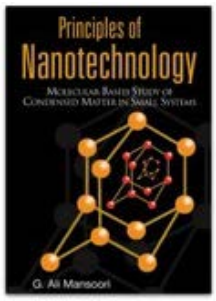

(2005)

Robert Leiweke (JetBob) (link) 17 Apr 2011

Completed MS, with thesis "A Weak Interaction Between a Cyclone and Shallow Topography within a Rotating Fluid" (1994), and PhD, with thesis "Development of a Trans-rotational Temperature Diagnostic for vibrationally-Excited Carbon Monxide using Single-Photon Laser-induced Fluorescence" (2004), at Ohio State University; teaches thermodynamics at Wright State University, Dayton Ohio; works in the field of nonequilibrium plasma chemistry for UES, Inc. at the Air Force Research Laboratory, Wright Patterson AFB, Dayton, OH.

American chemical engineer and gas-liquid thermodynamicist, knowledgeable about the Dutch school, whose graduate school thesis was dealing with vapor-liquid equilibrium in general, dealing with various ideas about predictions of what a mixture is going to do from pure component properties.

Quote "I admire very much what you have accomplished and how much work you have done with both amount of material and presentation. Your site is quite comprehensive at least from my viewpoint which is the scientific (or maybe hard science) type of thermo."

David Livingston (drlivingston) 09 Apr 2011

From a theoretical view point, mixture prediction, in his view, is an unsolved problem but from a practice point of view there are semiempirical methods to do design to support such things as distillation columns. The property information developed for the fluids remains approximate and not exact.

Most of his experience has been related to the design of industrial facilities for chemical or oil refining units both in the area of process design (the more practical application of thermodynamics) or in project engineering. Since his graduate school work in gas-liquid thermodynamics, the subject of thermodynamics has been an "ongoing fascination", in his own words.

Cathty Tyrrell (GainesvilleCathy) 29 Mar 2011

Describes herself as an "enformationist" (enformy/information theory plus spirituality), studies and writes on the a mixture of science, philosophy, and spirituality, a subject that has a good deal of overlap to topics and people in the eoht, e.g. Goethe and Prigogine; blogs at LifePerspectiveOnAnyGivenDay; has recently started the "Enformationist Society", headquartered in Gainesville, FL, a group in the fledgling stage; operates a Facebook group age called Panendeism Enformationis.

A PhD nuclear physicist who since 2002, has been work on a "twin universe theory", which posits that there exists two universes, coupled to each other, one where entropy tends to increase, the other where entropy tends to decrease; that nuclear fusions drives cosmological expansion and

Leong Ying (klystar)		12 Feb 2011	explains dark matter; that gravity drives life; that the soul, god, and consciousness exist somehow connected to the yin yang principle; in 2007, published *Klystar* a science fiction version of his theory, where the main character attempts to bring coherence between the great divide existing between religion and science; in 2010, began publishing a number of journal articles and conference appearances on the nuclear fusion gravitational expansion aspect of his theory.	(2007)
John Bryant (thermoeconomist)		19 Jan 2011	English mechanical engineer noted for a his 1982 “A Thermodynamic Approach to Economics”, in which he argued that “economic value” is equivalent to “energy value”, that there exist economic equivalents to the first and second law of thermodynamics, and that inflation is a function of “net cycle entropy gain”, and followup 2009 *Thermoeconomics: A Thermodynamic Approach to Economics*, on the subject of thermoeconomics, now in a 2011 second edition.	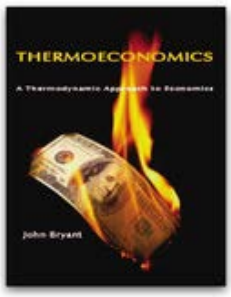 (2009)
Sean O'Reilly (seanor59)		18 Jan 2011	Since circa 1985, has been working out a "common moral philosophy", especially geared towards high-testosterone males, based on the management of one's appetites by right reason, based on a mixture of modern physics, Greek philosophy, Thomas Aquinas, and Freudian energy psychology models of cathection, instinctual energy transference, centered on keeping oneself out of jail, all stitched together with a hue of metaphysics and spirituality, captured in his book *How to Manage Your Dick*, with a chapter on "Entropy and Your Dong".	(2001)
Valter Caggio (srittore)		18 Jan 2011	An engineer (mechanical?) who since circa 2002-2007, has been developing a negentropy model of human existence.	(2007) 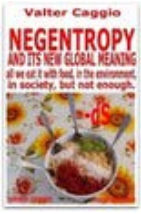 (2008)
N.K. Sharma (Narendra11)		07 Jan 2011	Is a research scholar in agricultural extension education; states that much of the EoHT wiki is very much related to his to topic of study.	
Klaus Jaffe (kjafffe)		07 Jan 2011	Venezuelan PhD chemical biophysicist, who has been working on the thermodynamics of socialization, applied to ant societies and human societies, since circa 1984. Presently working on book about a social synergy, in the context of physical science models.	

2010

Name (user name)	Photo	Joined	Background / EoHT Interest / Description	Books

American-born civil engineer working in Germany on his doctoral thesis at the Universitaet Stuttgart on the topic of aquatic habitat modeling.

Quote "A big part of my work depends on further developing a connection between abiotic-biotic systems, and after reading [Thims] book I now believe these connections are essentially just a description of complexity, and not in fact "living"'-"nonliving"."

Jeff Tuhtan (jtuhtan) (link)		17 Dec 10	Over the last two years it had become increasingly clear that distinct relationships existed between the choice of fish habitats and the fish themselves, and the insight provided in *The Human Molecule* opened up a whole new world of research which I needed, but did not know how to find. The fish habitat model concept is based on Max Planck's theory of dilute solutions which was first extended to animate systems by Werner Ebeling and Peter Mauersberger. Model application is based on the physical and thermodynamic principles developed by Sven Jorgensen and Adrian Bejan.
Anthonie Muller (TonMuller)		28 Nov 10	Danish PhD materials scientist and biophysicist who has been working on thermosynthesis, a heat engine model of the origin of life, since 1983, publishing at least a dozen articles, and one chapter on this subject.
Richard Crant (firebrain) (Camustein)		11 Oct 10	Has been a student of the human condition for 20+ years; is currently working on a book on biopsychodynamics, utilizing a theory of emotional equilibrium and a type of conservation of vital energy, along with the formula C=ea2 (maybe related to $E = mc^2$) In October 13-15 2013 I will be speaking for the first time about biopsychodynamic theory C=ea2 at international conference in Nanjing China along with Adrian Bejan of Constructal law .
Pertev Dural (pertev)		26 Aug 10	A thinker from Turkey, who seems to be knowledgeable of references on the subjects of: economic temperature (thread), overheating (thread), e.g. economist Paul Krugman discusses 'overheating' in his *The Return of Depression Economics* (pgs. 37, 89), and social pressure (thread), among other topics, e.g. the speculation that absolute zero in humanistic terms equates to absolute poorness; which does seem in the neighborhood of correctness, being that particles near absolute zero tend to slow and stagnate to speeds of inches per second/minute, which is the polar opposite of rich fast-paced cities.
Octavian Ksenzhek (Ksenzhek)		18 Aug 10	Russian bioelectrochemist; noted for his 2007 book *Money Virtual Energy: Economy through the Prism of Thermodynamics*; in which he extrapolates on concepts such as how "hot" money, i.e. concentrated potential energy, its initial state, can be converted into work; a process that can be quantified by a Carnot efficiency. 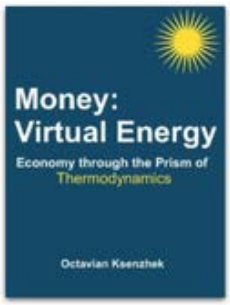 (2007)
Name (felthamg)		09 Aug 10	Recent graduate, with a degree in aerospace engineering, of the engineering science program of the University of Toronto.
David Alkek (DavidAlkek)		04 Aug 10	His 2007 book *The Self-Creating Universe*, argues that the universe, life, and human societies have a purpose in a new-paradigm "law of increasing complexity", a complexity theory law counter to the second law (he defines as the law which predicts progressive disorganization), which instills a "self-development" (self-creation) of increased form, organization, and complexity. He introduces the term "ipsa-creation" to define the self-development of the "unfinished universe". (2007)

Dickey Eason (DickeyEason)		07 Jun 10	Since circa 2000, has been developing a theory, as explained in his 2009 book *The Impacts Dynamics*, that explains human history and behavior using the energy dispersal view of the second law and human chemical bonding; uses theory, in business thermodynamics application in a consulting business for startups.	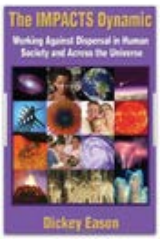 (2009)
Mark Janes (MarkJanes)		09 Jun 10		
			Since 2006, he been developing a carbon entromorphology theory (visit: Carbon-Entromorphology.com), a human atom based scheme, which considers the human being to be a 'type of gigantic carbon atom', and uses aspects of thermodynamics, particle physics, and the atomic model logic to explain facets of humanity, such as good and evil.	
Randall Reetz (RandallReetz)		20 May 10	American computer programmer; interested in systems theory, thermodynamics and information theory, artificial life, complexity and intelligence, evolution and learning; site: RandallReetz.com and blog: Complexity Metric.	
Charles Berg (Charles A. Berg)		08 May 10	Of the MIT school of thermodynamics; BS mechanical engineering at MIT 1956; SM (1958); ScD (1962) MIT; professor at MIT until 1971; thereafter deputy director of engineering (somewhere); PE professor emeritus mechanical engineering, Northeastern University Boston; articles: "Process Integration and the Second Law of Thermodynamics" (1980), "Potential for Energy Conservation in Industry" (1976).	
Evgeni Starikov (Donquizote5)		06 May 10	Russian theoretical biophysicist with 27 years of professional experience; favourite fields: physical chemistry or chemical physics of biopolymers, their components and the relevant model compounds; favorite topic is entropy-enthalpy compensation (in more general terms: interplay between energy and entropy, fluctuations and correlations, the physical nature of entropy)	(2006)
Mark Ciotola (Mciotola)		14 Apr 10	American physical economist whose research concerns deriving social science from physics; argues that systems configure themselves to maximize their rate of entropy production, a premise he calls the "eth law of thermodynamics" (or fast entropy); runs FastEntropy.org; has been working with a group in a second generation technocracy movement; author of *Physical History and Economics* (2003) and "Thermodynamic Perspective on Profits' (2006), etc.	(2003)
Name? (S_Carnot)		20 Mar 10	Runs the website ThermoHistory.org (link), launched *circa* 2003.	

Name? (Grap)		13 Feb 10	Is a PhD in chemist who has been working now for nearly 20 years as a business consultant and I recently wrote more for fun a first article (in German) in 2003 called 'Maslow was wrong' where he compares people's behavior to the behavior of atoms. He also has a 'fun project', a French blog named 'Le Monde Selon Grap' (the world according to grap) (French → French) where he has started reflecting about the entropy of china via social entropy (12/02/10), (and other ideas).	
Gerry Nahum (GNahum)		23 Jan 10	American chemical engineer and physician noted for his 25-page "A Proposal for Testing the Energetics of Consciousness and its Physical Foundation", conceived originally in 1961. His theory was featured in the 2005 book *Spook: Science Tackles the Afterlife* by Mary Roach.	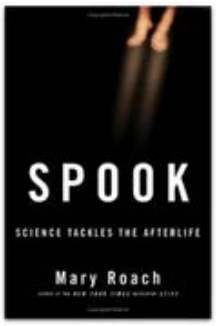 (2005)

2009

Name (user name)	Photo	Joined	Background / EoHT Interest / Description	Books
Scott (lanikaisojah)		23 Sep 09	European-born Hawaiian calculus teacher interested in philosophy.	
Surya Pati (Sppati)		21 Sep 09	Indian chemist; article: "Thermodynamics and Human Bond" (2009).	
Benjamin Kyle (BenjamineKyle)		07 Aug 09	American chemical engineer; theory: entropy and human activity. CD-ROM â— Kyle, Benjamin G. (1988). "The Mystique of Entropy" (abstract) (pdf), *Chemical Engineering Education*, Vol. 22., pgs. 92-97. Spr. â— Kyle, Benjamin G. (1999). *Entropy: Reflections of a Classical Thermodynamicist* (ch. 8: The Mystique of Entropy, 15 pgs.). Kansas State University; first published on attached CD-ROM to *Chemical and Process Thermodynamics* (3rd ed.), Prentice Hall, 1999.	(1999)
Bruce Bathurst (link) (Petrologist)		31 Jun 09	American geologist; PhD in geological thermodynamic (Princeton).	
Kenneth Bailey (KenBailey)		20 Jun 09	American sociologist; author: *Social Entropy Theory* (1990).	

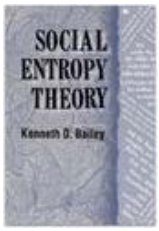

(1990)

(1994)

Peter Pogany (Telosx)		01 Jul 09	Hungarian-born American economist; author: *Rethinking the World* (2006).	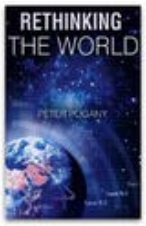 (2006)
Ronald Fox (RonaldFox)		16 Jun 09	American physicist; author: *Energy and the Evolution of Life* (1988).	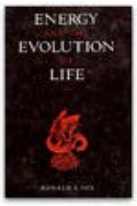 (1988)
Andrew Morrow (AWMorrow)		19 May 09	American chemical engineer; theory: thermodynamic philosophy of human existence.	
Jack Hokikian (?)		01 May 09	2002 book argues how the laws of thermodynamics govern economic systems, e.g. postulating government intervention may act to create turbulence-entropy in the socioeconomic system.	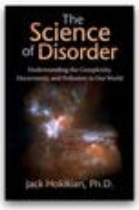 (2002)
Josip StepaniÄ‡ (JStepani)		13 Apr 09	Croatian physicist; articles: social thermodynamics/economic thermodynamics; founder of 2003 thermodynamics journal *Interdisciplinary Description of Complex Systems*. â— "Social Equivalent of Free Energy" (abs) (2004) â— Interdisciplinary Description of Complex Systems – Wikipedia.	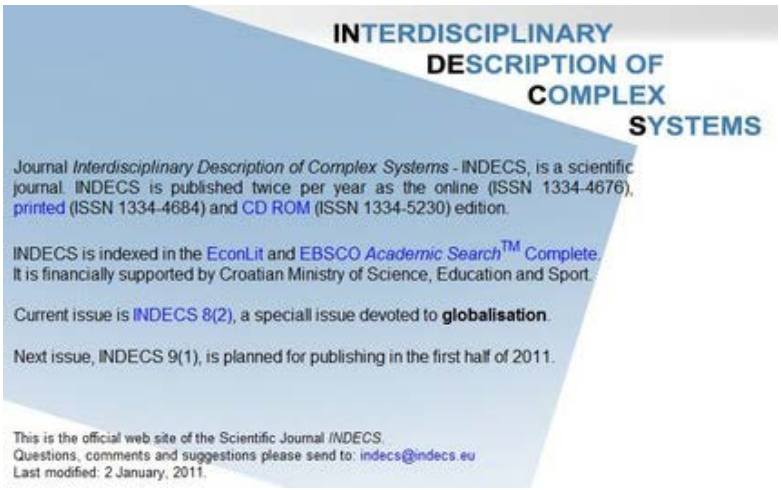
Selva (JSelRaj)		16 Mar 09	Interested in the teaching and promotion of thermodynamics to students and to the general public.	

Aaron Agassi (link) (AaronAgassi)		01 Feb 09	Skeptic to the idea of human thermodynamics; website: FoolQuest.com.	
Angelo Letizia (aleti001)		01 Feb 09	2007 book argues for an entropy-based theory of existence, an entropological explantion of the Darwinian "struggle for existence" postulate.	(2007)
DMR Sekhar (DMRSekhar)		17 Jan 09	Indian chemical engineer; theory thermodynamics genopsych theory of evolution.	
Henry Warwick (Hwarwick)		10 Jan 09	Doing PhD on thermodynamics and post-carbon information and communications technology.	
Melanie (Melolyn)		08 Jan 09	Mechanical engineer, reader of Thims' *Human Chemistry*, who views parent-child love as heat sink and a child as a precipitate of the parental dihumanide molecule.	
Nasif Nahle (NasifNahle)		07 Jan 09	Mexican scientist; articles: on life and thermodynamics.	
Pierre Perrot (Perrot)		06 Jan 09	French physicist; author: *A to Z of Thermodynamics* (1998).	(1998) (1998)

2008

Name (user name)	Photo	Joined	Background / EoHT Interest / Description	Books
name? (Turnkey13)		29 Nov 08	Turkey mechanical engineering student interested in doing is MS degree work in human thermodynamics	
Wolfgang		18	German physicist; author of 10 books on	

Muschik (ThermoSyst)		Nov 08	thermodynamics; editor of *Journal of Non-equilibrium Thermodynamics*.	(1990)	
Robert Kenoun (Wrk003)		10 Oct 08	Iranian-born American materials scientist and electrical engineer; theory: social internal energy minimization; author: *A Proposition to Theory of History and Social Evolution* (2006).		(2006)
John Schmitz (Waldnoces)		20 Apr 08	Dutch chemist; author: *The Second Law of Life* (2007); theory: human entropy.		(2007)
Ingo Muller (Ingo.Mueller)		28 Jan 08	German chemistry; theory: socio-thermodynamics; author: *A History of Thermodynamics* (2007).	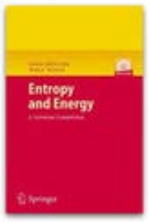 (2005)	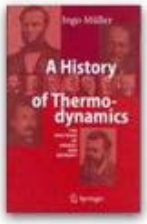 (2007)
Viktor Minkin (Elsys)		05 Jan 08	Russian biometrist; interested in human thermodynamics applications in fingerprinting and emotional image recognition.		
Jing Chen (JingChen)		04 Jan 08	Chinese-born Canadian mathematician and economist; author: *The Physical Foundations of Economics: an Analytical Thermodynamic Theory* (2005).		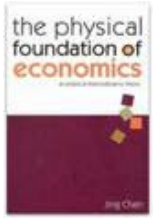 (2005)
Lynn Liss (LynnLiss)		03 Jan 08	American business consultant; article: "Human Thermodynamics and Business Efficiency" (2005).		
Ted Erikson (SdogV)		02 Jan 08	American chemical engineer; theory: thermodynamic panpsychism.		

2007

Name (user name)	Photo	Joined	Background / EoHT Interest / Description	Books
Georgi Gladyshev (Gladyshev)		27 Dec 07	Russian physical chemist; author of 1978 article "On the Thermodynamics of Biological Evolution" and the followup expanded 1997 book *Thermodynamic Theory of the Evolution of Living Beings.*	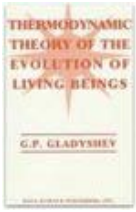 (1997)
Libb Thims (site creator) (Sadi-Carnot)		24 Dec 07	American electrochemical engineer; founding editor of the *Journal of Human Thermodynamics* (2005-) author of the 2007 two-volume textbook *Human Chemistry*, with an end chapter on "human thermodynamics", followup laymanized, equation-free 2008 booklet *The Human Molecule*, readable at the high school level (or younger), and site creator and main author of Hmolpedia (2007-)	(2007) (2008)

Canceled memberships

The following members joined then quit:

User name	Photo	Name	Joined	Quit	Reason	Background / EoHT Interest / Description
Petrologist		(Bruce Bathurst) (link)	31 Jun 09	? Sep 2009	Seems to have become irritated during the Aug 2009 Why I'm Not a Molecule thread, on the issue of his comment that human is not a molecule (human molecule), because it has a soul, which is beyond the measurement of science. He might have not quit, however, as he has not yet deleted his user account?	American geologist; PhD in geological thermodynamic (Princeton).
gavinritz		Gavin Ritz	26 Dec 09	~Jan 10	Was irritated with Thims' edits about his free energy theory (a theory that was a huge misinterpretation of South African chemical physicist Adriaan de Lange's 1982 free energy theory).	New Zealand civil engineer and business leader; theory: motivational entropy production. Noted for his attempt to quantify free energy in business work systems.

θΔics

EoHT Wiki: site pages, needed for the operation and backbone of the encyclopedia of human thermodynamics, are those including:

- HT Wiki: Objectives - goals of the encyclopedia of human thermodynamics
- HT Wiki: FAQ - frequently asked questions about the encyclopedia
- EoHT Wiki: Progress report - outline of the number of articles and notable building stats
- EoHT Wiki: Discussion and notice board - a community post-it page for discussions and article notices
- HT Wiki: Suggestions - a place for users to post cite suggestions or ideas
- HT Wiki: Practice page - a sandbox for new users to play with to see how the Wetpaint editing tools work

The EoHT wiki: **Thermodynamics Medal (proposal)** is a discussion page for the proposed idea of initiating a new, yet-to-be-named "thermodynamics medal" to be awarded possibly once every yearly (or more likely in some yet unspecified interval, i.e. once every two, three, four, or five years) by the Institute of Human Thermodynamics to researchers, scientists, writers, or educators to have made a significant contribution in the field of human thermodynamics or in furthering the thermodynamical understanding of the operation of human life.

Origin

The idea for the award was conceived on December 03, 2008 by American chemical engineer Libb Thims, after discovering that there was a new yearly "Prigogine Medal" award, initiated in 2004, given out for contributions in the use of evolutionary thermodynamics and Prigoginean thermodynamics in ecology or the study of ecosystems, while typing up the EoHT articles Prigogine Medal and thermodynamics awards. Hence, by parallel, there should be an award given out yearly to significant contributors in the field of the thermodynamical study of human life and operation.

Gibbs Medal (American Chemical Society)

Gibbs Medal (The Hall of Fame For Great Americans)

Gilbert Newton Lewis Medal

Rumford Medal

Comments on

Thims then contacted, that day, IoHT member Russian physical chemist Georgi Gladyshev about the idea, and he replied "this will be very good!". Similarly, that day, IoHT member American chemical engineer Ted Erikson commented on the idea that "it is clearly a great concept", that "[he] is in full support", but that he is not sure how such a project would be financed. Thims replied back with "if worse comes to worse, I could pay for it myself. However, I'm sure there are more creative ways to raise money for such a project." Erickson later commented that he would be willing to donate $100 USD to such a cause.

On 31 Jan 2009, an EoHT user, who wishes to remain anonymous, commented to Libb Thims, via email, that "your idea of instituting an award for Human Thermodynamics is good. I think you will need to gather an amount that gets an interest of $1000 per year. You can give this award once in three years as you may not find good number of researchers in Human Thermodynamics. I will contribute $1000 if you are actually instituting this award but you will keep it confidential. But this amount is not sufficient. You need to have at least $10,000, I think."

Award amount and substance?

The award, as a first approximation, is slated to consist of a monetary amount of $500-$1,000

USD (initial year) and a medal (gold, bronze, silver, platinum?), with a face on one side (possibly Clausius) and on the other side an inscription (or possibly a classic Carnot-style heat engine diagram), etc., on the opposite face. Other related medals, to model the new "thermodynamics medal" are shown adjacent.

Naming choice

People to name the award after (favorites bolded), that could possibly work, include (ranked by preference):

1. **Clausius Medal**
2. **Goethe Medal** (already taken)
3. C.G. Darwin Medal (already taken by his grandfather via the Darwin Medal)
4. Lewis Medal (used before)
5. Gibbs Medal (already used by ACS, 100th anniversary of award in 2011)
6. **Carnot Medal** (term used elsewhere)
7. Freud Medal
8. Helmholtz Medal (used multiple times elsewhere)

Other possibilities?

> Gladyshev medal (although this name is not yet known enough significantly) Goethe thermodynamics medal or Goethe affinity medal

Other naming suggestions are welcome (please comment in (a) the threads below, (b) add edits to this page, or (c) via email to Libb Thims: libbthims@gmail.com.

Discussion

Goethe is, obviously, the first choice as he was the first to apply the theory of chemical affinity (now known as free energy) to the modeling of human life in 1809. This medal, however, is already in use by the Goethe Institute, among other places. [1]

Both the Lewis Medal and the Carnot Medal seem to have been used before. [2] Freud was the first to apply thermodynamics in psychology, but he mostly verbal arguments. Supposedly there are a number of “Helmholtz Medals”. [3] There seems

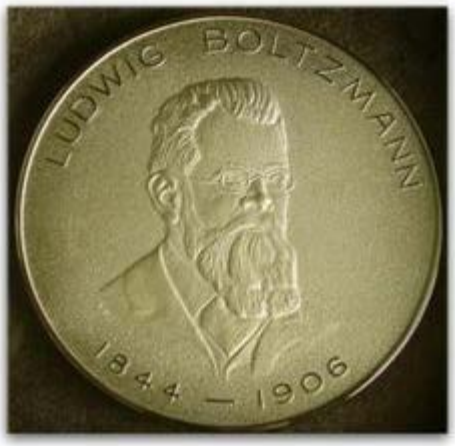

Boltzmann Medal

Prigogine Medal

Kelvin Medal

Carnot Medal (Marie François Sadi Carnot)

to be at least two Kelvin Medals. [4]

With these preliminaries in place, and knowing that, via Internet and Google book searchers, there does not seem to exist a “Clausius Medal”, it would seem that the Clausius Medal might be the ideal choice? Comments and suggestions are welcome?

To note, the Darwin Medal has been awarded every even year, since 1890, by the Royal Society, for "distinction in the area of biology". [5] A related award is the Max Planck Medal, having been given by the German Physical Society since 1929, for "extrodinary work in theoretical physics". [6]

Goethe Medal

Goethe Medal (150th Anniversary, made by Arno Breker, 1982)

Carnot Medal?

One type of “Carnot Medal” is a now-defunct (1885-c.1904) award for best-debating given out yearly at Stanford University and University of California, Berkeley, initiated as a gift by Baron de Coubertin of Paris after his visit their, named after assassinated French president Marie François Sadi Carnot, oldest son of Hippolyte Carnot (the younger brother of thermodynamics founder Sadi Carnot). [7] Hence, the award is named after Sadi Carnot’s nephew and has nothing to do with thermodynamics.

Goethe Medal?

There is the triennial Goethe Prize (1927) of Frankfurt-am-Main, a literary award, the biennial Hanseatic Goethe Prize (1949), a literary and artistic award, and there is the yearly Goethe Medal (1955) given out by the Goethe Institute. There was also a 150th anniversary Goethe Medal (150 coins issued) made by Arno Breker in 1982. [8]

Proto-award model

Having let the idea filter for a few days, the main obstacle to implementation seems to be the act of picking people to award and, secondarily, getting people submit nominations. There are so few human thermodynamics publications, per year, of which are mostly marginal, that finding worthy individuals will be difficult. That said, to get a beta-stage award initiation process underway the act of award recognition could be a simple as doing the following process, possibly once every three years:

> (a) Finding someone to award. (b) Having Libb Thims fly out to the winner with a Clausius Medal and small amount of money ($500-$1000). (c) Video record a short (less than 10-minutes) commentary speech given by the recipient. (d) Post the video-speech online. (e) Send out a News-wire about the award.

The act of medal giving would be a simple token to say thanks for your efforts. We'll have to let this sit for awhile?

References

1. Goethe Medal – Wikipedia.

2. Gilbert Newton Lewis Medal – Oregon State University.
3. Helmholtz Medal - NNDB.
4. (a) Kelvin Medal (1924) – Royal Society of Western Australia.
(b) Kelvin Medal (1994) – IOP Institute of Physics.
5. Darwin Award - Wikipedia.
6. Max Planck Medal - Wikipedia.
7. (a) Author. (1904). "The Carnot Medal", pg. 38, *Annual Report of the President*, Stanford University.
(b) Author. (2002). "Pierre de Coubertin (keyword: Carnot Medal)", *basoc.org*.
(c) Carnot Medal (Marie François Sadi Carnot) – Christopher Eimer: Fine Medals and Medallic Art.
8. Zavrel, John. (2007). "Homage to Goethe to the 175th Anniversary of His Death", *Meaus.com*.

θΔics

In Wetpaint wikis, **Weekly Digest** is an end of the week email newsletter containing updates, new discussion posts, pages, videos, and images.

The following is an example Hmolpedia weekly digest email (March 28 - April 4):

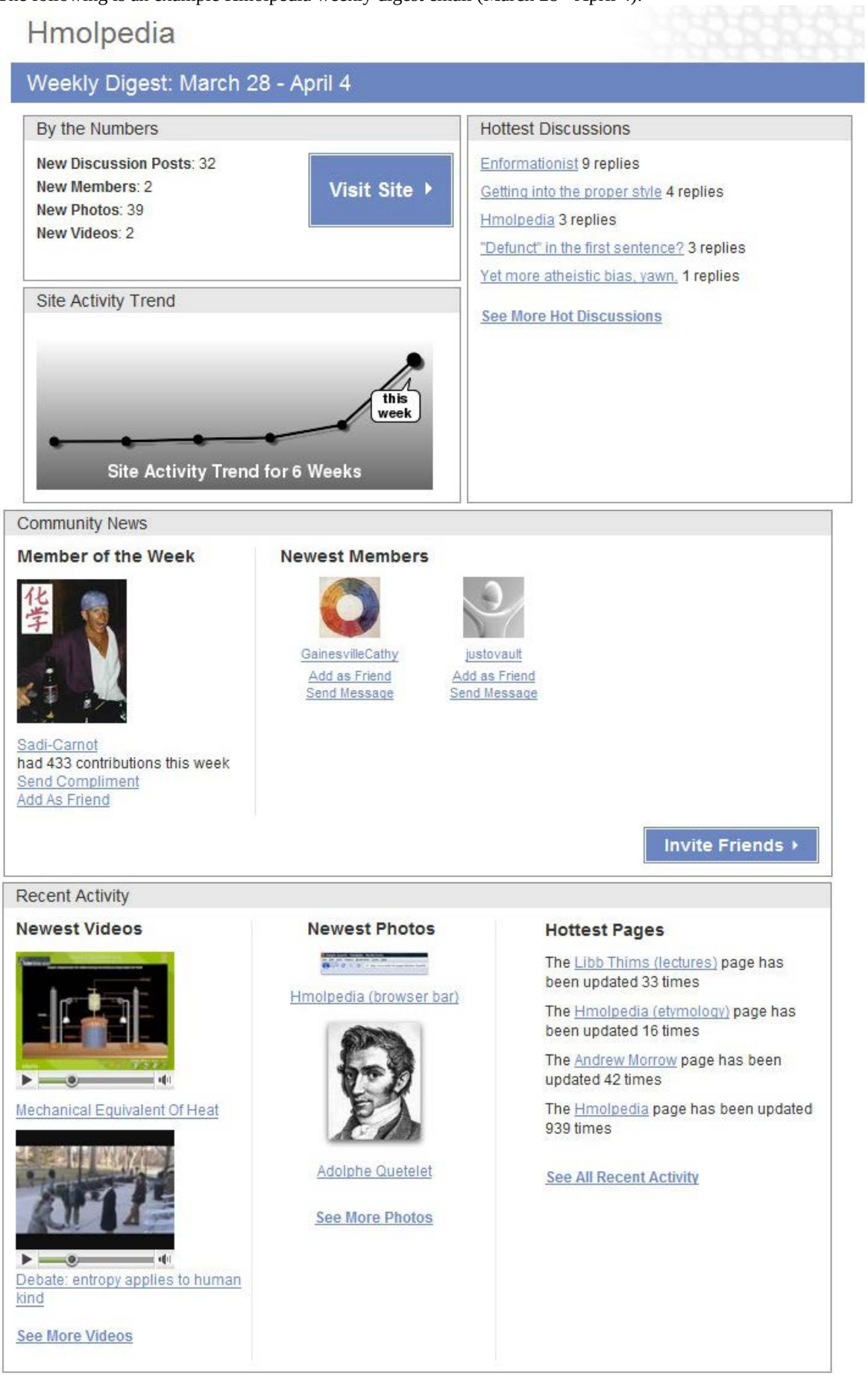

Screen shots of some of these are listed below, as the format has changed in 2008:

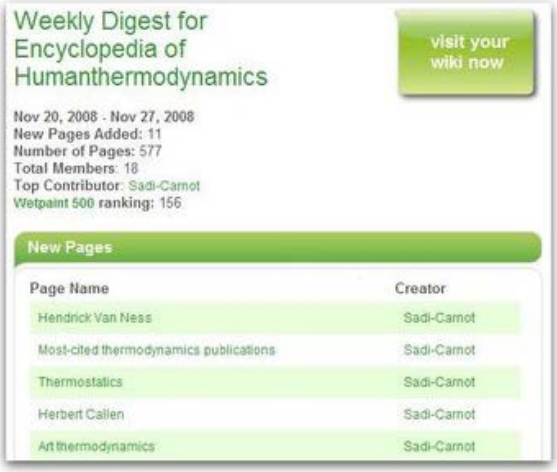

Weekly Digest: '08 vs '09

Nov 2008

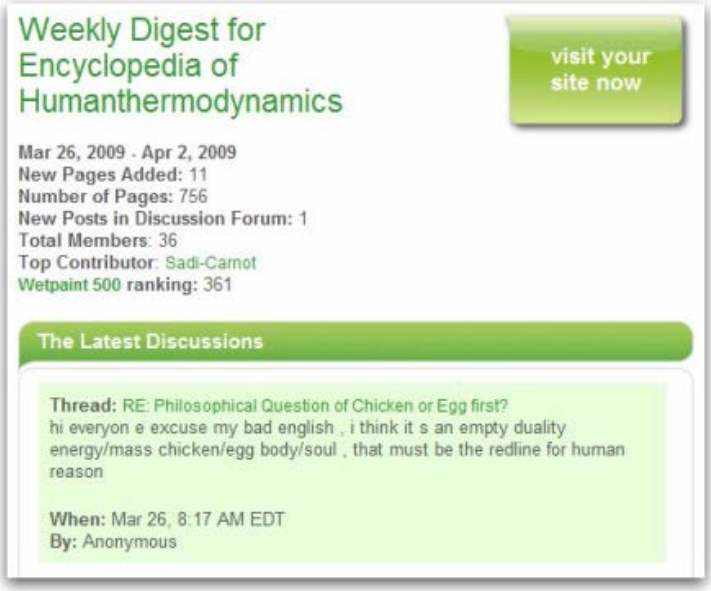

May 2009

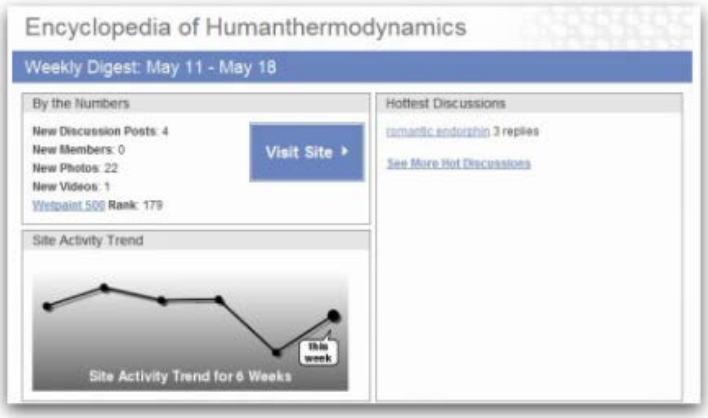

New Pages

Page Name	Creator
Spencerian dilemma	Sadi-Carnot
Equilibration	Sadi-Carnot
John Tyndall	Sadi-Carnot
Flow system	Sadi-Carnot
Adrian Bejan	Sadi-Carnot
Herbert Spencer	Sadi-Carnot
Papin engine	Sadi-Carnot
Carnot engine	Sadi-Carnot
Haber process	Sadi-Carnot
Henry Le Chatelier	Sadi-Carnot

View all new pages

Community News

Member of the Week

Sadi-Carnot
had 310 contributions this week
Send Compliment
Add As Friend

Invite Friends

Pages with Recent Updates

Page Name	Details
Equilibration	**By:** Sadi-Carnot **When:** Apr 2, 4:17 PM EDT **Scope:** view full history
ReactionMatch.com (theory)	**By:** Sadi-Carnot **When:** Apr 2, 4:16 PM EDT **Scope:** 2 words added 1 word deleted view full history
Human chemistry	**By:** Sadi-Carnot **When:** Apr 2, 2:15 PM EDT **Scope:** 12 words added 4 words deleted view full history
John Tyndall	**By:** Sadi-Carnot **When:** Apr 2, 12:20 AM EDT **Scope:** 3 words added 3 words deleted view full history

Recent Activity

Newest Videos

thermodynamics of hot for words

David Buss lecturing

See More Videos

Newest Photos

Marek Roland-Mieszkowski (sun glasses)

Marek Roland-Mieszkowski (computer)

See More Photos

Hottest Pages

The Human system page has been updated 25 times

The HT pioneers page has been updated 351 times

The Thermal words page has been updated 14 times

The Carnot's principle page has been updated 10 times

See All Recent Activity

HT pioneers	**By:** Sadi-Carnot **When:** Apr 2, 12:10 AM EDT **Scope:** 1 word added 1 word deleted view full history
Vilfredo Pareto	**By:** Sadi-Carnot **When:** Apr 1, 11:53 PM EDT **Scope:** view full history
Spencerian dilemma	**By:** Sadi-Carnot **When:** Apr 1, 11:41 PM EDT **Scope:** 5 words added 2 words deleted view full history
Herbert Spencer	**By:** Sadi-Carnot **When:** Apr 1, 11:34 PM EDT **Scope:** 7 words added 2 words deleted view full history
Thermalization	**By:** Sadi-Carnot **When:** Apr 1, 10:46 PM EDT **Scope:** 22 words added 19 words deleted

Herbert Spencer	**By:** Sadi-Carnot **When:** Apr 1, 11:34 PM EDT **Scope:** 7 words added 2 words deleted view full history
Thermalization	**By:** Sadi-Carnot **When:** Apr 1, 10:46 PM EDT **Scope:** 22 words added 19 words deleted view full history
Thomas Hirst	**By:** Sadi-Carnot **When:** Apr 1, 10:03 PM EDT **Scope:** 6 words added 3 words deleted view full history

Go to All Page Updates

You have elected to receive the Weekly Digest from Wetpaint as part of your registration.
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Note

The weekly digest went defunct in circa 2010.

θΔics

In Hmolpedia FAQs, the query **why is this site here?** is a common one. This is exemplified by American chemical engineering professor Leslie Woodcock, co-author, along with Stanley Sandler, of the 2010 article "Historical Observations of the Laws of Thermodynamics", and his comment:

> "What a great website! It's a fantastic summary of all the confusion. I am curious to know where your website is coming from. Who owns and funds it? Who is its intended readership?"

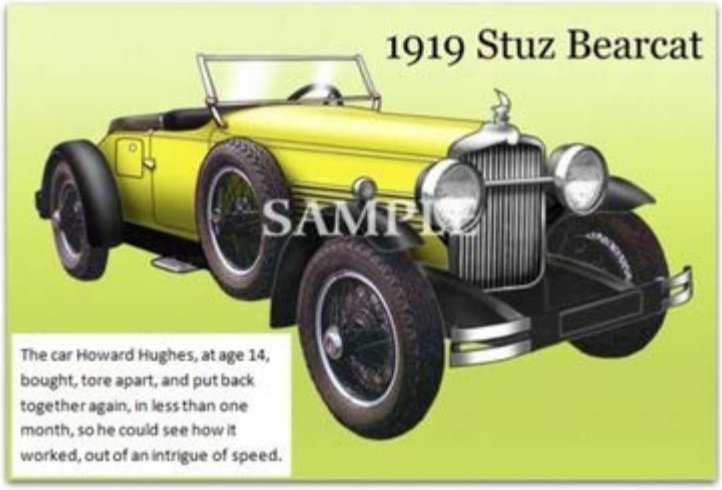

A **1919 Bearcat**, named after Stutz Bearcat, America's racing champion (in 1915), the car that in 1916 broke the Atlantic-Pacific trans America record, taking 11 days and seven and a half hours for the journey, and the car that Howard Hughes in 1919 (age 14), bought, tore apart, and put back together again, in less than a month, all so that he could see how it worked. [2]

American aviation engineer **Howard Hughes** (age 12) and his motorized bike that he assembled from parts of a motor that belonged to his father. [3]

The short answer to this query can best be described as combination of the "hidden treasure" view, i.e. the vision that there are buried treasures in the 1,158 Gibbs-Clausius equations, and the "tear it apart" view, i.e. the view that to fully understand thermodynamics, and particularly the Lewis inequality, which determines that which is "natural", in human interactions and reactions, in particular relationships and purpose, one must break the entire subject of thermodynamics down to its nuts and bolts, spread them out on the floor (or on on a wiki-framework), study each part individually, and then reassemble the entire collection of parts back together again, and make it run.

Tear it apart view

The framework of the growing collection of articles of Hmolpedia is based on an analogy of the young boy so intrigued by the prospect of setting a land speed and air speed record that he bought the world's then fastest car, took the entire car apart, down to each nut and bolt, spread all the parts out on the ground, label each part, study each part, understand the workings of each part, then put the car back together again, and then start it up.

The boy was a young fourteen-year-old Howard Hughes (pictured, above right), and the story has stuck as a guideline for the writing Hmolpedia. This is what American electrochemical engineer Libb Thims is doing with thermodynamics (the car) and with this wiki site (each page being either a nut, bolt, or part), i.e. "tearing the whole thing down and putting it back together again", in Hughes' own words (dialog, below left), each part labeled and dissected in an online open wiki-style of view, for everyone to look at, study, discuss, and debate and give opinion on.

It is said that it took Hughes less than a month to tear apart his car. It's taking Thims over a decade now, however, to tear apart thermodynamics. As of 2011, with over 300+ thermodynamics book, and over 2,000 Hmolpedia article parts, labeled and dissected, the distant finish line remains only a distant ideal.

The equation $\Delta G < 0$, which describes the

As the Hughes family fortunes rose, Howard's mechanical passions escalated. One day when he was fourteen he showed up at the Stutz agency in downtown Houston to see the latest Bearcat. In 1919, it was one of the country's most glamorous cars. He paced around the gleaming motorcar, deep in thought. Finally, he turned to salesman Jack Horner and said, "I want this. Will you please send it out to my house today?"

The startled salesman nodded and disappeared into a back room where he telephoned Howard Sr. and asked for approval. Told the price, a then hefty $7,000, and the speed potential, a very racy ninety miles an hour, Howard Sr. merely asked, "Did my son say what he wanted to do with it?"

"Yes, sir," said Horner. "He said he wanted to tear it down and put it back together again."

"Very well," said Big Howard, as he had come to be known. "Send it out."

Howard took apart the roadster and reassembled it in less than a month.

Dialog of Howard Hughes when he bought his 1919 Bearcat, his reasoning being that: [4]

"He wanted to take it apart and put it back together again."

The same process is occurring in the pages of Hmolpedia, with the science of thermodynamics, the equation $\Delta G < 0$ being the car.

operation of human nature, is the car and herein we are breaking the entire subject of thermodynamics down through the integrating denominator (of the integrating factor) logic of the exact differential of the pre-Clausius era mathematicians (Leibniz to 1850) to the partial differential equation foundation mathematics of Marquis de Condorcet (1770) all the way down past the atomic theory (Leucippus, 485BC) and particle physics theories (Empedocles, 450BC) of Greeks to the birth of the sun theory (life-death cycle, 3000BC) of the Egyptians. [5]

References

1. (a) Woodcock, Leslie. (2010). "Email to Libb Thims", Aug 9.
(b) Sandler, Stanley I. and Woodcock, Leslie V. (2010). "Historical Observations on Laws of Thermodynamics", *J. Chem. Eng. Data*, Aug.
2. Stutz Bearcat 1919 – Wowcars.co.nz.
3. (a) Madigan, Carol O and Elwood, Ann. (1998). *When They Were Kids: Over 400 Sketches of Famous Childhoods* (pg. 93). Random House.
(b) Howard Hughes motorized bike (age 12) – TheAtlantic.Tumbler.com.
4. Brown, Peter H. and Broeske, Pat H. (2004). *Howard Hughes: the Untold Story* (pg. 14). Da Capo Press.
5. (a) Message to fluid thermodynamicist and chemical engineer user drlivingston (Apr 10 2011), as to why this site is here.
(b) Kirkwood, J.G. and Oppennheim, Irwin. (1961). *Chemical Thermodynamics* (integrating denominator description of the Caratheodory theorem discussed in the context of a Pfaffian expression (or Pfaffian form), pg. 36). New York: McGraw-Hill Book Co. Inc.

θΔics

In science, **hmolscience** (TR:1142), short for 'human molecular science' or "hmol" science, is the science of human molecules, depending on the context of discussion, namely the study of humans from either the *molar* perspective (humans in mass), with the implicit assumption that SI variable units are based on the hmol (human mole), e.g. KJ/hmol for enthalpy, KJ/hmol·K for entropy, etc., or *human molecular* perspective (individual human molecules), with the implicit assumption that human transformation processes are thermodynamic transformation processes and that reactions between people constitute chemical reactions between human molecules, respectively.

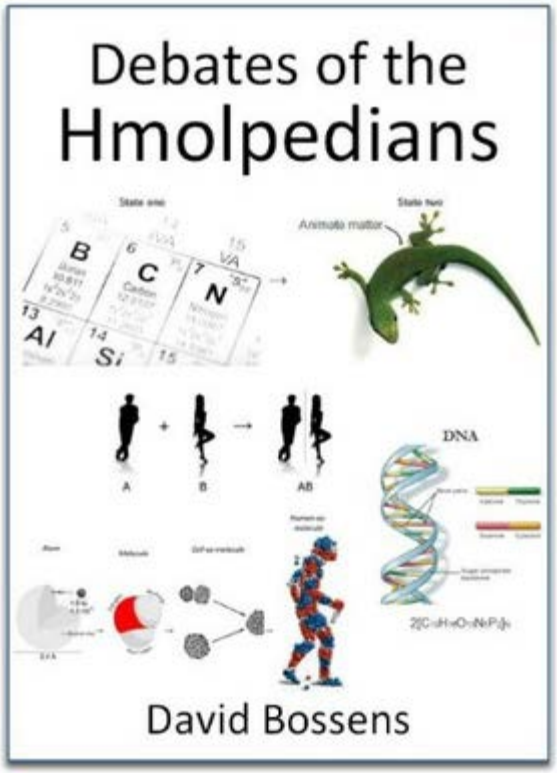

The 2012 book *Debates of the Hmolpedians*, by Belgian psychologist and scientific philosopher David Bossens, wherein he discusses newly-learned views on **hmolscience**, in regards to questions on the defunct theory of life, biology, free will, prediction, DNA, human molecular theory, etc. [3]

The term hmolscience is newer near-synonym to the older pre-1970s "social mechanics" classification of sociology and or the pre-1928 "mechanistic school" classification of the social Newtons by Pitirim Sorokin as the follows:

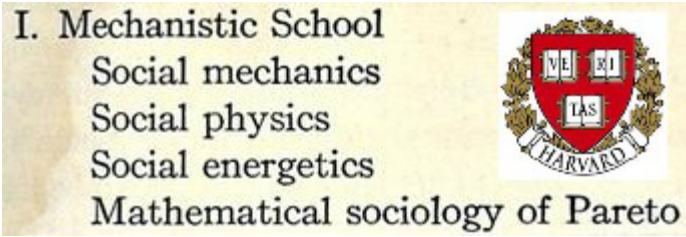

The umbrella term "hmolscience" is the collective study of the two cultures namesake subjects, generally.

Phenomena | Resistances

The following are common phenomena encountered when one begins or attempts to apply "physics", generally, or "chemistry" or "thermodynamics", and or combinations of these, to humanities-related fields:

- Snowed | Snow (1959)
- Jabberwocky | Lotkean Jabberwocky | Lotka (1925)
- Anthropism | Sherrington (1938)
- Langism | Lang (1956)
- Sokalism | Elias (1958)
- Toolism | Handtke (2013)

The following are secondary related hmolscience terms:

- Catch up effect | Boyesen (1885)
- Doctrinaire departmentalism | Stewart (1955)
- Ontic opening | Lagerroth (2009)
- Religious sublimation
- Extreme atheism | Ultra-reductionism

(add)

Branches

The three central branches of hmolscience include: human chemistry, human physics, and human thermodynamics.

Etymology

In 2007, the term ‘hmol’ was coined by American chemical engineer Libb Thims. [1]

In 2010, the term ‘hmol science’ was introduced, in the EoHT, out of necessity, as a more meaningful categorization term, in place of the more unwieldy terms, in the functional-usage sense of the word, ‘human molecular science’, ‘HM science’, or HMS, which began to appear in various articles. The need for a new namesake is exemplified in the person of Henry Adams. Adams theorized about people as "human molecules" in terms of chemistry (human chemistry), physics (human physics), and thermodynamics (human thermodynamics) for over 50-years; hence it is difficult to categorize him. Subsequently, the following article introduction notation:

> In **hmolscience**, Henry Adams () is an American ...

Is more cogent than, say, as compared to:

> In **human thermodynamics and human chemistry**, Henry Adams () is an American ...

categorizationally-speaking, in the introduction to his Hmolpedia article.

In 2011, eoht.info was renamed from "EoHT wiki" or *Encyclopedia of Human Thermodynamics* to "Hmolpedia" (see: etymology) or *Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, to embrace the more encompassing perspective and corpus of articles the site currently contains

C-mol

Interestingly, in applying thermodynamics to study bacteria (bacteria thermodynamics), workers in this field, as of about 2006, have employed the unit of "C-mol", possibly referring to a cell mole of bacterium, to facilitate state function calculations. [2]

Quotes

The following are related quotes:

> “Ooh, I have found a fascinating and **deep rabbit hole** while doing some writing-related research, specifically on ‘anti-entropy’. The Encyclopedia of Human Thermodynamics. @eschwitz, this looks right up your alley too. **Hmolscience**.”
>
> — S.B. Diva (2019), Tweet (Q), Jun 6

See also

- HMS pioneers

References

1. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (hmol, pg. 686). Morrisville, NC: LuLu.
2. Feng, Hao. (2010). *Ultrasound Technology for Food Bioprocessing* (C-mol, pg. 110). Springer.
3. Bossens, David. (2012). *Debates of the Hmolpedians*. Lulu.

θΔics

In hmolscience, **hmolscience (youngest thinkers)**, as compared to famous publications by age—a listing of hmolscience thinker publications, the products of which tend to be produced into the security of retirement and or tenure years, the 60s or 70s age range—refers to a listing of youngest aged thinkers, independently—meaning they either published on their own accord and or came into the circle of hmolscience discussions, e.g. Hmolpedia threads, Human Chemist 101 (YouTube) forums, or HumanThermodynamics.com posts, etc., on their own accord—to have grappled with hmolscience concepts and their implications, the term "grapple" used in the Bernard DeVoto (1928) "three times" sense of the matter of the matter: [1]

> "Pareto's *Trattato di Sociologia Generale* [*Treatise on General Sociology*] is the hardest boiled book I have ever read. Three times, since I passed my puberty, has my mind been made over. Once by a nexus of which Henry Adams was the center, once by a matrix of which Frazer burned brightest, and once by a long study of genetics and evolution. Pareto is doing the job a fourth time, and far more vitally than any others."

List

The following is the work-in-progress listing of youngest hmolscience thinkers by age:

Age	Person	IQ_{cit}	IQ_{act}	Quote / Description / Publication
17	Benjamin Cresdee (1994-)			In 2011, after spending (Ñº) around 6-12 months on YouTube watching the Human Chemistry 101 channel, in conjunction with messaging communication with Libb Thims, began to assimilate hmolscience theory; the following being a representative reflection comment of his experience: Quote: "I must say, I started watching your videos over a year ago, and have re-watched many. And they still fascinate me. I'm only 17 and I'm seriously considering doing a degree in chemistry after watching your videos. The only downside is not many people I know can have a conversation about the things you're talking about. You were right your videos are decades if not a century in front of its time."
18	William Sidis (1898-1944)	300	185	In 1916, at the age of 18, sent a letter to Julian Huxley in which he stated: [4] "How has everything been this summer with you? I myself have been writing that [animate and inanimate] theory of mine regarding the second law of thermodynamics. In a short while, I expect I will be in Cambridge, studying in the Law School. The university opens September 25."
c.18	Christopher Hirata (1982-)	225	190±	In 2000, at circa age 18, penned "The Physics of Relationships", on the topics of a thermochemical approach to relationships, complex equilibria of men and women, human molecular theory, reaction kinetics, neutron scattering, and shell model, among other topics. On 1 May 2014, joined Hmolpedia as user: NikolaTesla, and as of 21 Jun

18	Inderjit Singh [User: NikolaTesla] (1996-)	160	2014 had 51 thread contributions, 5 page edits, stated that his IQ was 160, that he was drawn to the site because of the genius IQs table, which he said was the best and most accurate he had ever seen in print on online, and seemed to be catching on rather quickly, e.g. in regards to difficult topics such as the defunct theory of life (2009), the Faraday movement query (1859), etc.
c.20	Ryan Grannell (c.1991-)		In 2011, at circa age 20, started a blog series "Category: Human Chemistry, Bag of Many Things", wherein he set out, as a detractor, to deride hmolscience as 'junk science'.
c.23	Libb Thims (c.1975-)		At circa age 20, began to do the "love thought experiment" in terms of non-physical science methods: physical, mental, and trait matching characteristics; however, after reading David Buss' *The Evolution of Desire* (1994), and sometime thereabouts, before or after, when following and or during classes in: physical chemistry and chemical thermodynamics, began to redo or rather re-think the love thought experiment (see: Thims thought experiment) in terms of free energy change (and later free energy differentials) and human chemical reaction theory.
23	David Bossens (1989-)		In 2012, began to post queries, at first anonymously (Ñº, Ñº, Ñº) and later as D.Boss, in Hmolpedia, eventually writing a books on his experience. [3]
25	Henry Adams (1838-1918)	195	In 1863, wrote the following to Charles Gaskell: [2] Quote: "Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday within this law. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."

(add discussion)

Other

In 2011, Singaporean purported to be chemistry prodigy Ainan Cawley, at the age of 12, stated his recently-educated view, as recounted in his father's overly-imaginative blog article "Seeing the World With Chemical Eyes", that the process of walking across the road, to a drainage ditch, and with an effortful stretch, stretched his leg across the ditch and stepped up onto a wall, was an "endothermic reaction", thinking that to go against gravity, i.e. uphill, required energy, or that energy when in, or something along these lines. (Ñº) This, however, would seem not to be hmolscience proper, but rather only the think of a young person that burning up calories via exercise is endothermic, or something along these lines.

References

1. Stegner, Wallace E. (2001). *The Uneasy Chair: A Biography of Bernard DeVoto* (Pareto, 26+ pgs; course, pg. 82; derivation, pg. 110; §: Seminar on Pareto, pg. 138-43; three times, pg. 138). University of Nebraska Press.
2. (a) Adams, Henry. (1863). "Letter to Charles Gaskell", Oct.
(b) Adams, Henry. (1982). *The Letters of Henry Adams, Volume 1: 1858-1868* (editor: Jacob Levenson) (pgs. 395-96). Harvard University Press.
(c) Stevenson, Elizabeth. (1997). *Henry Adams: a Biography* (pg. 69). Transaction Publishers.
(d) Taylor, Matthew A. (2008). *Universes Without Selves: Cosmologies of the Non-Human in American Literature* (pg. 108), PhD dissertation, Johns Hopkins University. ProQuest, 2009.
3. (a) Bossens, David. (2012). "Reflections: Criticisms of Science" (abs), LuLu.com, Jun 06.
(b) Bossens, David. (2013). *Debates of the Hmolpedians*. Lulu.
4. Sidis, William J. (1916). "Letter to Julian Huxley", Aug 28.

θΔics

In science, **hmolscience 2** is []

→ Hmolscience (mobile; readable; NON-editable)
→ **Hmolscience** (online; readable) – WayBack (2017)
→ Hmolscience (hacked; Non-readable)

(add)

θΔics

In education, **hmolscience courses**, or "two cultures courses", are undergraduate and or graduate, two cultures conceptualized, courses themed and or stylized in structural or topic content on one or more areas of the hmolsciences, namely one or more subjects of the humanities based on chemistry, physics, and or thermodynamics.

List

The following is a listing of known hmolscience themed, content, stylized, and or structured courses:

Course # | Title	University	Professor[s]	Year	Description	Level
Physical economics		Auguste Walras Leon Walras Vilfredo Pareto Maffeo Pantaleoni Emanuele Sella	1858-1940s	See: Lausanne school.	
Social physics (proposed)	Oxford		1874-1891	Conceived by Florence Nightingale as a course based on the work of social physics pioneer Adolphe Quetelet; see: Nightingale Chair of Social Physics.	
Social Mechanics	University of Geneva	Leon Winiarski	1894-1900	Politics, economics, and sociology based on the Clausius inequality. (Ñº) [1]	

Physicochemical Social Dynamics (proposed) (Ñº)	Harvard		1908-1910	Conceived by Henry Adams (possibly taught by him in some respects) as history taught via Gibbs and social phase theory; see: *A Letter to American Teachers of History* (1910)

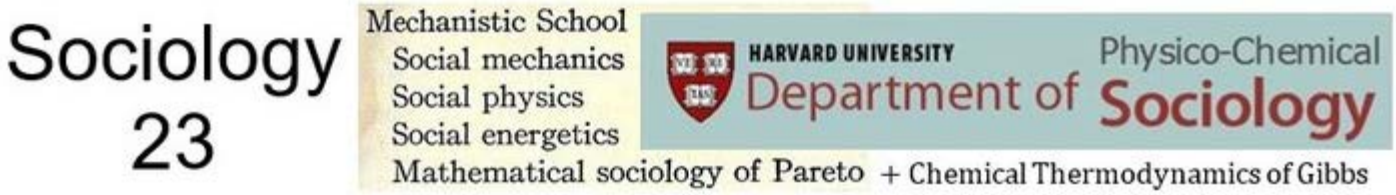

Sociology 23	Harvard	Lawrence Henderson	1935-1938	Gibbs + Pareto based sociology.	Undergrad Graduate

Mathematical Economics	Harvard	Edwin Wilson	1934-39	Steam engine and physical chemistry based economics; specifically economics based on Gibbs' equation 133.

Social Physics	Princeton	John Q. Stewart	1945-1955	A physics-based formulation of sociology; more of project than a course offered to students directly, seemingly (see: Princeton Department of Social Physics).

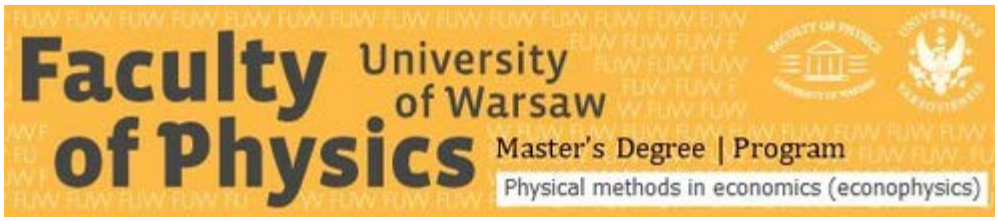

Econophysics and Sociophysics: Students Seminar	University of Warsaw (Ñº)	Ryszard Kutner	2006-present	An interdisciplinary and panoramic seminar (Ñº) showing how the various academic centers and research methods used in physics or related are used in areas such as economics and sociology; speakers are doctoral researchers and experienced researchers; learn and discuss the concepts, theories, models, methods and techniques, especially interdisciplinary, applied in the wider physics as well as in economics and sociology to the study of complex systems mainly. In addition, the development of the ability to analyze a variety of empirical data which is manipulated in these areas. (Ñº)	Undergrad Graduate

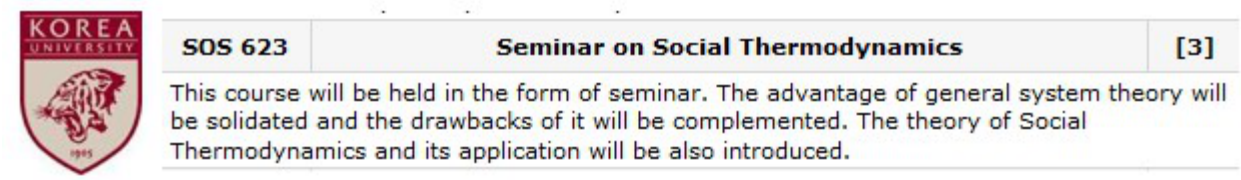

SOS 623: Seminar on Social Thermodynamics	Korea University		2010-present	Held in the form of seminar; pros and cons of general systems theory; introduction to a theory of social thermodynamics and its applications. [2]	Graduate

Science Phy 453: Sociology and Physics	Brigham Young University	David Samuels Barnard	2011	A sociophysics stylized course, whose reading materials contain works such as: Mieczyslaw Dobija's 2004 "Theories of Chemistry and Physics Applied to Developing an Economic Theory of Intellectual Capital"; the 2005 work of Shyam Sunder on using the minimization principles of physics in economics; and Jing Chen's 2008 "Understanding Social Systems: a Free Energy Perspective", on human free energy theories, e.g. the related works of: John Bryant (2007), Bikas Chakrabarti (2005), Charles Hall (1986), Paul Colinvaux, Erich Muller (1998),	Undergrad

Jurgen Mimkes (2005), Libb Thims (2007), and the Rossini debate works of Harold Leonard (2006) and Frederick Rossini (1971). [3]

(add discussion)

See also

â— Hmolscience (youngest thinkers)
â— Hmolscience periodic table
â— Two cultures synergy

References

1. Winiarski, Leon. (1900). "The Teaching of Pure Political Economy and Social Mechanics in Switzerland", (pgs. 1497-1500), *Sociology at the Paris Exposition of 1900.* Government Printing Office.
2. Social Thermodynamics (courses) – Korea University Graduate School.
3. (a) Barnard, David S. (2011). "Science Phy 453 – Sociology and Physics" (Ñº); SSRN-id1269035 (Ñº), Brigham Young University, Winter, CourseHero.com.
(b) Chin, Jing. (2008). "Understanding Social Systems: a Free Energy Perspective" (abs), SSRN.com, Sep 16.
(c) Dobija, Mieczyslaw. (2004). "Theories of Chemistry and Physics Applied to Developing an Economic Theory of Intellectual Capital" (abs), in: *Knowledge Café for Intellectual Entrepreneurship Through or Against Institutions*, Wydawnictwo WSPiZ im. Leona KoÅºmiÅ„skiego, Warszawa.

θΔics

In hmolscience, **hmolscience periodic table** or "human molecular periodic table" (compare: human periodic table), is a periodic table with focus on those elements found to have functional activity in the composition and structure of a person, one individual human technically defined as a human molecule or atomic geometry.

Human molecular periodic table | 26-element standard

The following, from Libb Thims 2020 *Human Chemical Thermodynamics*, is a labeled and color-coded human periodic table: [9]

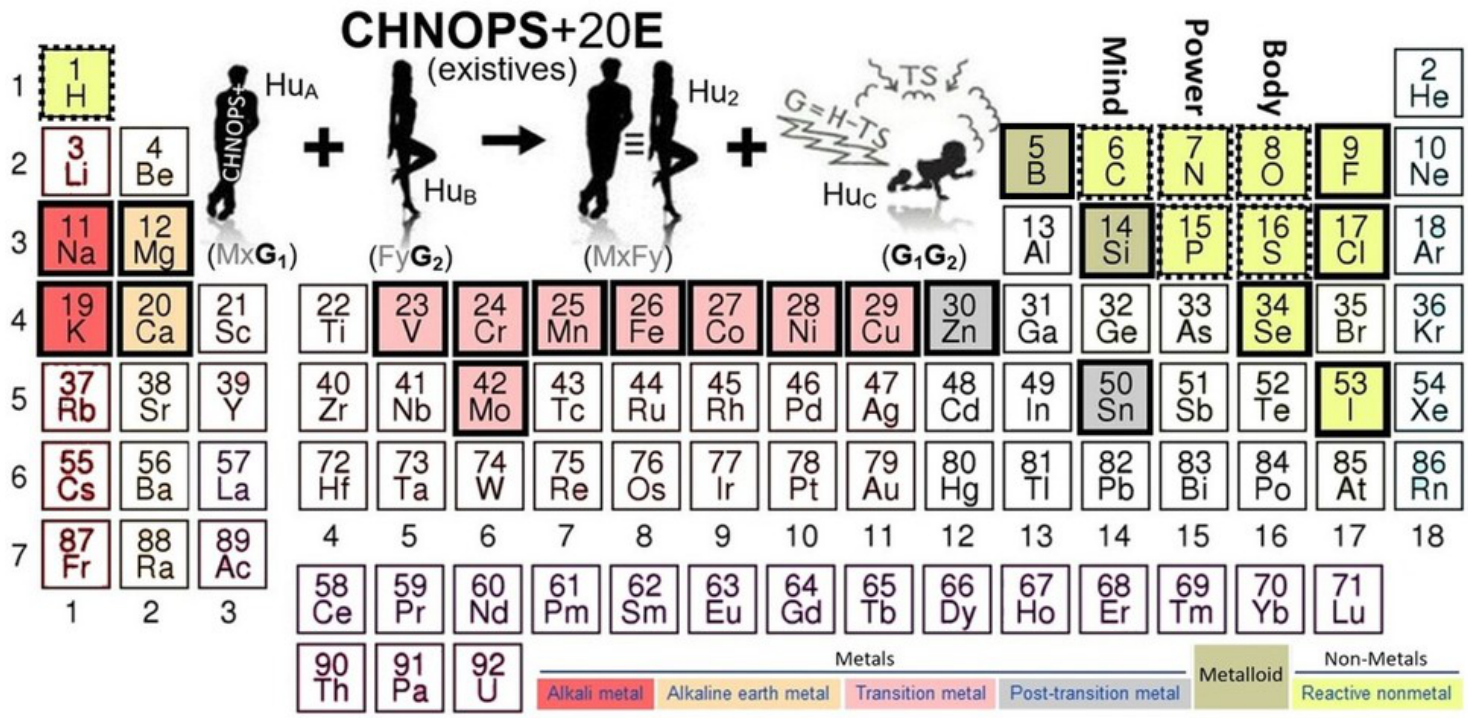

The following under-construction interactive (hyperlinked) hmolscience periodic table shows the 26 functional elements in one human molecule (person), according to the Thims human molecular formula calculation, done by American electrochemical engineer Libb Thims (2002), which, includes all 20 of the so-called "Webb elements" of marine invertebrates, plus six found, according to in depth study of human physiology, to have active function in the human: [1]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
													Intellect (animation) ↓	Power (energy) ↓	Body (fluidity) ↓		
1 **H** 1.007																	2 He 4.003
3 Li 6.941	4 Be 9.012											5 B 10.81	6 **C** 12.01	7 **N** 14.01	8 **O** 16.00	9 F 19.00	10 Ne 20.18
11 Na 22.99	12 Mg 24.31											13 Al 26.98	14 Si 28.09	15 **P** 30.97	16 **S** 32.07	17 Cl 35.45	18 Ar 39.95
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.88	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.55	30 Zn 65.39	31 Ga 69.72	32 Ge 72.59	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.62	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc (98)	44 Ru 101.1	45 Rh 102.9	46 Pd 106.4	47 Ag 107.9	48 Cd 112.4	49 In 114.8	50 Sn 118.7	51 Sb 121.8	52 Te 127.6	53 I 126.0	54 Xe 131.3
55 Cs 132.9	56 Ba 137.3	57 La 138.9	72 Hf 178.5	73 Ta 180.9	74 W 183.9	75 Re 183.9	76 Os 190.2	77 Ir 192.2	78 Pt 195.1	79 Au 197.0	80 Hg 200.6	81 Tl 204.4	82 Pb 207.2	83 Bi 209.0	84 Po (210)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra (226)	89 Ac (227)	104 Rf (257)	105 Ha (260)	106 Sg (263)	107 Ns (262)	108 Hs (262)	109 Mt (266)	110	111	112						
				58 Ce 140.1	59 Pr 140.9	60 Nd 144.2	61 Pm (147)	62 Sm 150.4	63 Eu 152.0	64 Gd 157.3	65 Tb 158.9	66 Dy 162.5	67 Ho 164.9	68 Er 167.3	69 Tm 168.9	70 Yb 173.0	71 Lu 175.0

90 Th 232.0	91 Pa (231)	92 U 238.0	93 Np (237)	94 Pu (242)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (249)	99 Es (254)	100 Fm (253)	101 Md (256)	102 No (254)	103 Lr (257)

Human molecular periodic table | Relative abundance by percent mass

The following shows the same table, albeit listed with percent mass of each element found in the human, with element symbol approximately sized according to relative abundance in the human, modeled loosely on American chemist William Sheehan's 1970 periodic table of elements, shown a center, according to relative abundance on the earth's surface, shown adjacent:

1 **H** 10																	2 He
3 Li	4 Be											5 B 0.00003	6 **C** 23	7 **N** 2.6	8 **O** 61	9 F 0.004	10 Ne
11 Na 0.17	12 Mg 0.029											13 Al	14 Si 0.001	15 **P** 1.1	16 **S** 0.2	17 Cl 0.18	18 Ar
19 K 0.3	20 Ca 1.4	21 Sc	22 Ti	23 V 0.0000002	24 Cr 0.00002	25 Mn 0.0002	26 Fe 0.012	27 Co 0.000004	28 Ni 0.0002	29 Cu 0.0003	30 Zn 0.003	31 Ga	32 Ge	33 As	34 Se 0.00002	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo 0.000007	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn 0.00003	51 Sb	52 Te	53 I 0.00003	54 Xe
55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	89 Ac	104 Rf	105 Ha	106 Sg	107 Ns	108 Hs	109 Mt	110	111	112						
				58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
				90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

Key

The following is a key to the human periodic table (hmolscience periodic table), shown with the generic symbol El short for Element, above which is the atomic number, below which is the atomic mass:

# **Element** mass	Elements with symbols **bolded** and in double boarders signify one of the 6 elements of the "living substance itself" (Frank Thone, 1936), in Hill order (Edwin Hill, 1900); or elements of the CHNOPS nomenclature of Frank Thone (1936) and or the "powered CHNOPS systems" chemically-neutral (life terminology upgrade) terminology of Henry Swan (1974).
# Element mass	Thick boarders signify one of the 20 elements found measurable in marine invertebrates (David Webb, 1937); hence, by evolution timeline repercussion, core to human element composition.
# Element mass	Elements with shaded light yellow boxes signify the 22 elements found in BOTH the Sterner-Elser human molecular formula (2000) and the Thims human molecular formula (2002).
# Element mass	Elements with shaded light blue boxes signify the 4 elements NOT found in the Sterner-Elser human molecular formula (2000) but found in the more precise Thims human molecular formula (2002).

By classification, the above logic indicates that one human molecule is comprised of 10 nonmetallic elements (H, C, N, O, F, P, S, Cl, Se, and I), 2 metalloids

(B, Si), and 14 metals (Na, Mg, K, Ca, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Mo, and Sn) — defining one human, in technical terms, as a "nonmetallic-metalloid-metal molecule", or in chemical thermodynamic speak a "powered CHNOPS system" (Henry Swan, 1974), or more fully a bound state nonmetallic-metalloid-metal heat-driven turnover rate surface-attached freely-running albeit-coupled animate CHNOPS-based 26-element reactive evolving chemical species. [1]

Thims | Sterner-Elser element differences

The 22-elements shown bolded and highlighted (yellow = Thims-Sterner-Elser elements; blue = Thims-elements, not found in the Sterner-Elser calculation) are the 22-elements found in the 2000 Sterner-Elser human molecular formula calculation, as found in their *Ecological Stoichiometry: the Biology of the Elements from Molecules to the Biosphere* (2002), which differs by the four elements, namely: boron B, vanadium V, nickel Ni, and molybdenum Mo, each of which are found to have physiological activity inside an animated human:

#	Name	Symbol	CPK (jmol)	% Mass	Picture	Z	Function
19	Boron	**B**		0.00003		5	A trace mineral essential for healthy bones.
23	Nickel	**Ni**		0.0002		28	May be a factor in hormone, lipid, and membrane metabolism and cell integrity. Significant amounts are found in DNA and RNA. May be involved in glucose metabolism, etc.
24	Molybdenum	**Mo**		0.000007		42	Is an essential part of two enzymes: xanthine oxidase—which aids in the mobilization of iron from the liver reserves and helps change iron from ferrous to ferric, and aldehyde oxidase—which is necessary for the oxidation of fats. It is also a factor in copper metabolism, nitrogen metabolism, and the final stages of urine production, ect.
26	Vanadium	**V**		0.0000002		23	Has been shown to reverse diabetes. Inhibits cholesterol synthesis. Bones, cartilage, and teeth require it for proper development. It has been shown to have a function in cellular metabolism, iron metabolism, and red blood cell growth, etc.

which are included in the 2002 Thims human molecular formula, a more exacting calculation that has found acceptance recently in the thermodynamics community. [4]

History

It remains to be determined who exactly made a periodic table showing elements found in a human.

In 1899, English physiologist John Thornton stated that 14 elements enter into the composition of the human body: oxygen, carbon, hydrogen, nitrogen, sulphur, phosphorus, chlorine, sodium, potassium, calcium, magnesium, iron, fluorine, and silicon; and noted that other elements, such as manganese and lead (anti-element: poison), have sometimes been found in small quantities. [7]

In the mid 20th century, tables listing "elements" in living things and humans began to appear; the following are two early tables of elements in "living systems" and "man", respectively:

Webb | 1937	Morowitz | 1968

Range of Values of the Percentage of Body Weight of the Principal Atomic Components of Living Systems[a]

Primary, 1–60%	Secondary, 0.05–1%	Microconstituents, 0.05% or less
C	Na	B
H	Mg	Fe
N	S	Si
O	Cl	Mn
P	K	Cu
	Ca	I
		Co
		Mo
		Zn

Atomic Composition of Four Representative Species of Organisms[a]

Element	Man (5)	Alfalfa (5)	Copepod (6) (*Calanus finmarchicus*)	Bacteria (7, 8)
C	19.37	11.34	6.10	12.14
H	9.31	8.72	10.21	9.94
N	5.14	0.825	1.52	3.04
O	62.81	77.90	79.99	73.68
P	0.63	0.71	0.13	0.60
S	0.64	0.10	0.14	0.32
CHNOPS total:	97.90	99.60	98.09	99.72
Ca	1.38	0.58	0.04	0.03
Na	0.26	0.03	0.54	0.06
K	0.22	0.17	0.29	0.05
Mg	0.04	0.08	0.03	0.03
Cl	0.18	0.07	1.05	—
Major ion total:	2.08	0.93	1.95	0.17
Fe	0.0050	0.0027	0.0070	—
Si	0.0040	0.0093	0.0070	—
Zn	0.0025	0.0004	0.0000	—
Rb	0.0009	0.0005	0.0000	—
Cu	0.0004	0.0003	0.0000	—
Br	0.0002	0.0001	0.0009	—
Sn	0.0002	0.0000	0.0000	—
Mn	0.0001	0.0004	0.0000	—
I	0.0001	0.0000	0.0002	—
Al	0.0001	0.0025	0.0000	—
Pb	0.0001	0.0000	0.0000	—

Left: in 1937, Irish botanist David Webb, in association with F.R. Fearon, in their "Studies on the Ultimate Composition of Biological Materials", did spectrographic calculations and measurements on marine invertebrates that produced the above 20-element table. [6] Right: in 1968, American bio-chemist Harold Morowitz, in his *Energy Flow in Biology*, citing the previous 20-element work of David Webb (1937) and the so-called "CHNOPS system" (see: CHNOPS) nomenclature of George Armstrong (1964), produced the above 22-element table of the elements of man, alfalfa, copepod, and bacteria. [7]

Morowitz, above (right), includes all of Webb's 20 marine invertebrate elements, less three: boron B (5), cobalt Co (27), and Molybdenum Mo (42), and adds five: rubidium Rb (37), bromine Br (35), tin Sn (50, manganese Mn (25), and aluminum Al (13), though it seems without justified explanation.

In 1989, English chemist John Emsley published his famous *The Elements*, in which devoted several pages to each element, out of which, in total, he gave the figure that "59-elements are in humans". This figure, is an overestimate, by some 33 elements.

Nevertheless, many have used this Emsley estimate figure as a basis to give citations of human element and or formula count, e.g. Kathryn Harkup (2013) (Ñº) or Joe Hanson (Ñº) (2015) to name two examples (see: human molecular formula).

Breaking Bad

In 2008, American writer-producer Vince Gilligan launched his now-famous television black humor drama *Breaking Bad*, wherein the title, names of actors and producers, were presented using "chemical letter" (or chemical alphabet) stylization, e.g. **Br**yan Cranston (Walter White), lead character, aka "Professor White"; the show intro also uses a green gas, crystal meth stylized periodic table. Going into the second season (c.2009), approximately, American organic chemist Donna Nelson (Ñº) approached (Ñº) Gilligan offering to lend help in the area of scientific accuracy, and thereafter began act as the scientific advisor to the show. [8]

In the third episode, "… And the Bag's in the River", season one, the show opens to Professor White cleaning up the human that had been dissolved in hydrofluoric acid, amid which his mind reflects back to, it seems, college days, a dialogue with a woman, possibly his lover at the time, wherein she reads off the elements of a human to him and he writes them down on a chalkboard, commenting in the end how he thinks that something is missing, to which the woman replies "the soul"?

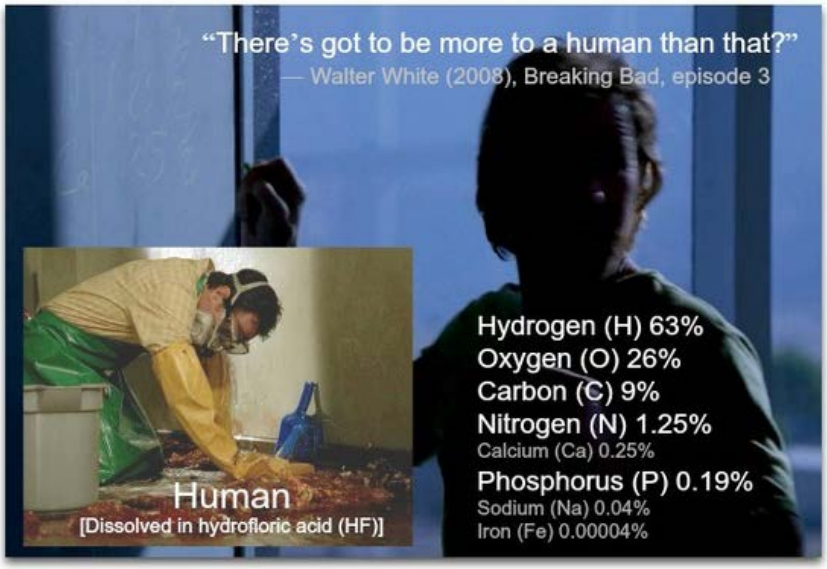

In 2013, Kirth Gerson, in his "Breaking Bad Pilot: People are Chemicals, Too!" class video lecture, analyzed Breaking Bad as a type of each human is an element (or chemical) reacting in a social system that makes chemicals, a sort of modern Elective Affinities analysis, so to say. [8]

The following is a circa 2014 25-element *Breaking Bad* inspired human chemistry stylized wallpaper periodic table of the elements in a human, sourced from somewhere (Ñº), with the inclusion of arsenic As as one of the elements in the human molecule:

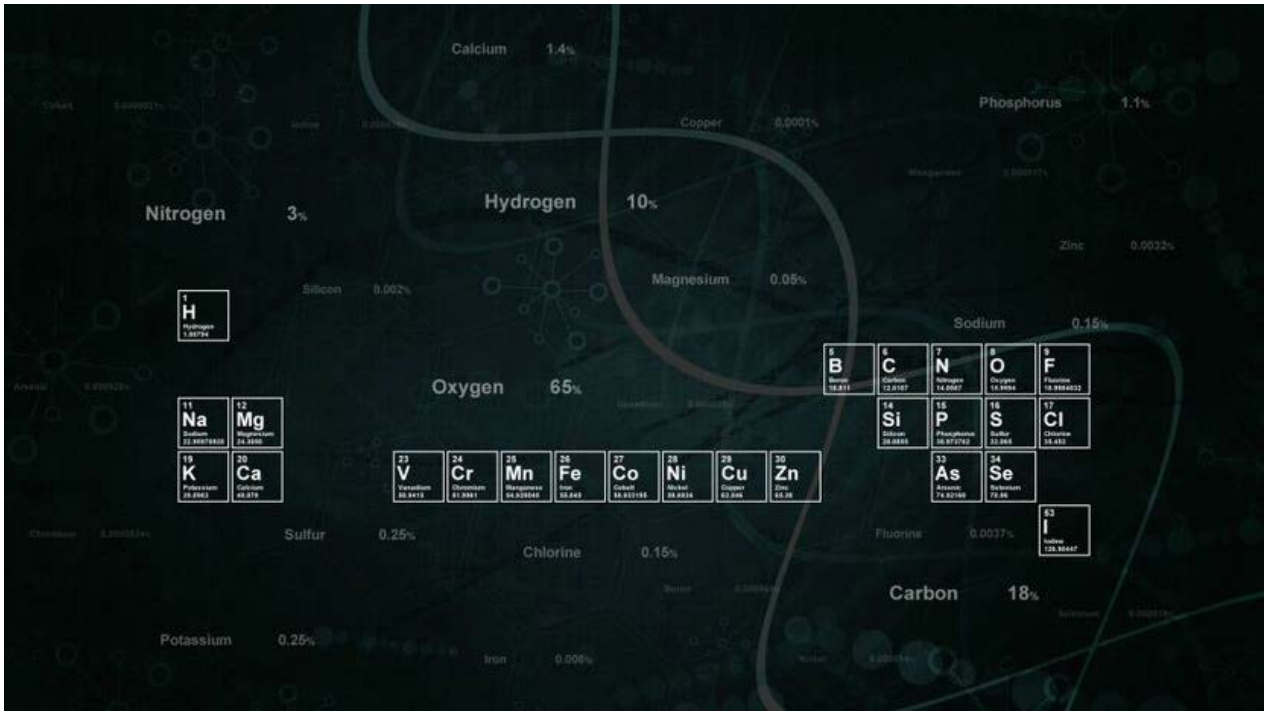

The following is an elements in a human labeled periodic table, from the online book *General Chemistry: Principles, Patterns, and Applications* by Bruce Averill and Patricia Eldredge: (Ñº)

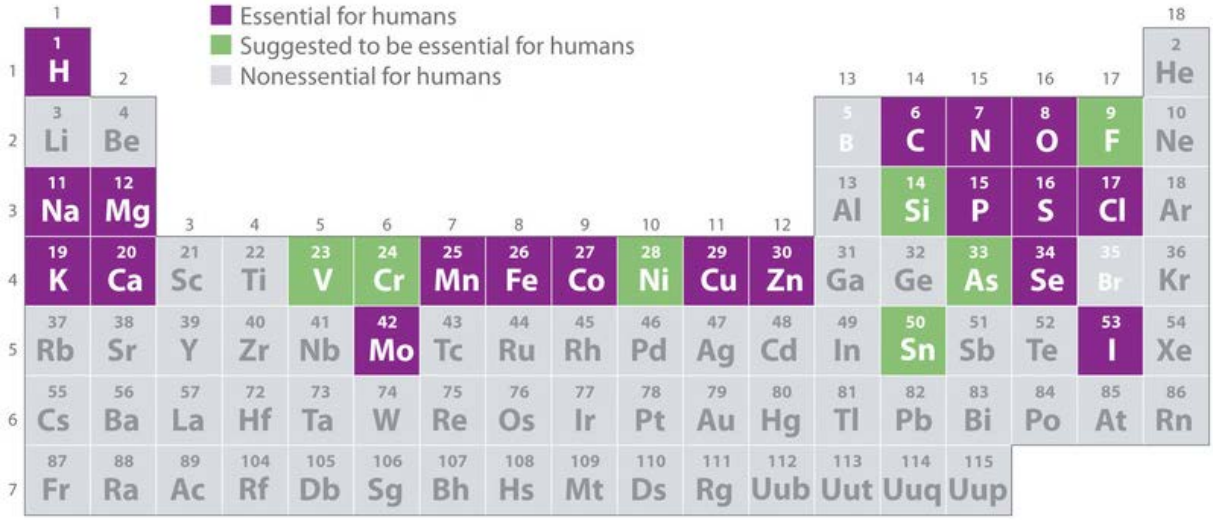

The following are some other recent human composition listings:

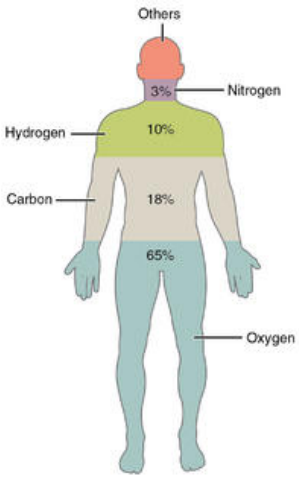

Element	Symbol	Percentage in Body
Oxygen	O	65.0
Carbon	C	18.5
Hydrogen	H	9.5
Nitrogen	N	3.2
Calcium	Ca	1.5
Phosphorus	P	1.0
Potassium	K	0.4
Sulfur	S	0.3
Sodium	Na	0.2
Chlorine	Cl	0.2
Magnesium	Mg	0.1
Trace elements include boron (B), chromium (Cr), cobalt (Co), copper (Cu), fluorine (F), iodine (I), iron (Fe), manganese (Mn), molybdenum (Mo), selenium (Se), silicon (Si), tin (Sn), vanadium (V), and zinc (Zn).		less than 1.0

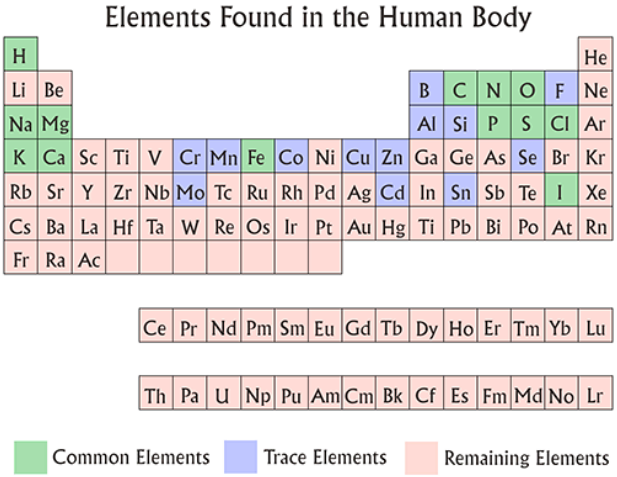

Left: a 25-element diagram of the elements in a human by abundance, divided into main elements (11) and trace (14), which agrees with the Thims formula calculation, with the exception of nickel (Ni). (Ñº) Right: a 26-element table of elements found in the human, divided by common (13) and trace (13) elements, which agrees with the Thims formula calculation, with lacking of vanadium V (23) and nickel (28) and the addition aluminum Al (13) and cadmium Cd (48). (Ñº)

The following are two semi-recent elements in humans diagrams:

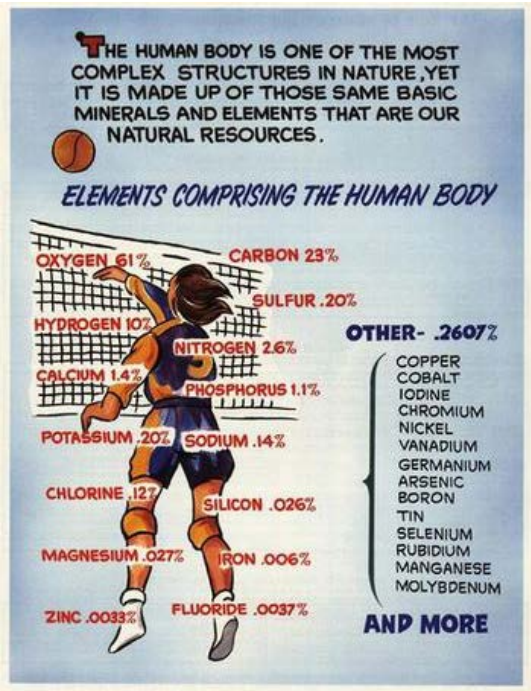

Left: the top 18-elements by mass in a human (Ñº). Right: an older 29-element human composition diagram (Ñº).

The first "hmolscience" periodic table was published by American electrochemical engineer Libb Thims online in 2006 as follows: [1]

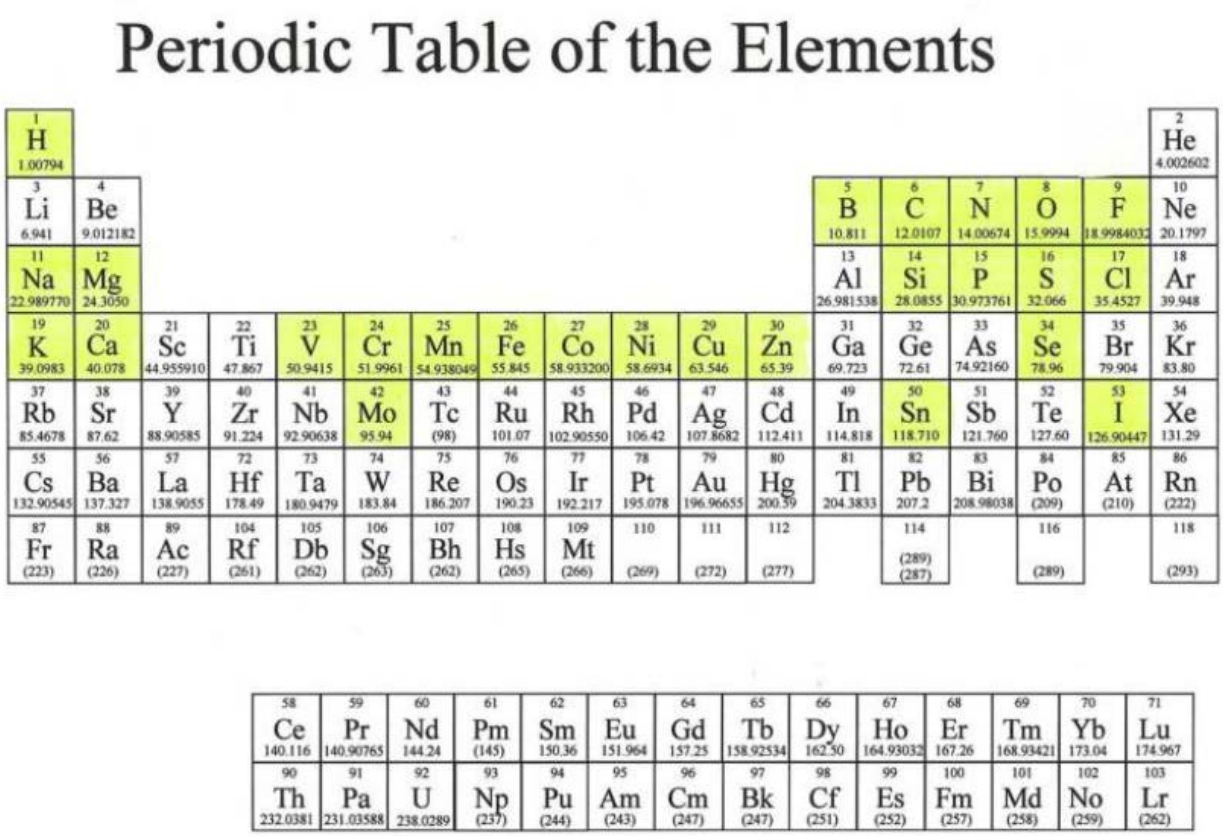

The first hmolscience periodic table, published in book format, was the 2008 "Periodic Table of the Elements of the Human Being" table, a black and white reprint of the above, showing the 26 functional elements of the human molecule, found in Thims' *The Human Molecule*. [2]

The following, based on Thims' calculations of the 26 elements of the human molecule, is English chemical engineering student turned biotechnologist Mark Janes' 2012 rendition of the hmolscience periodic table, in respect to his carbon entromorphology theory: [3]

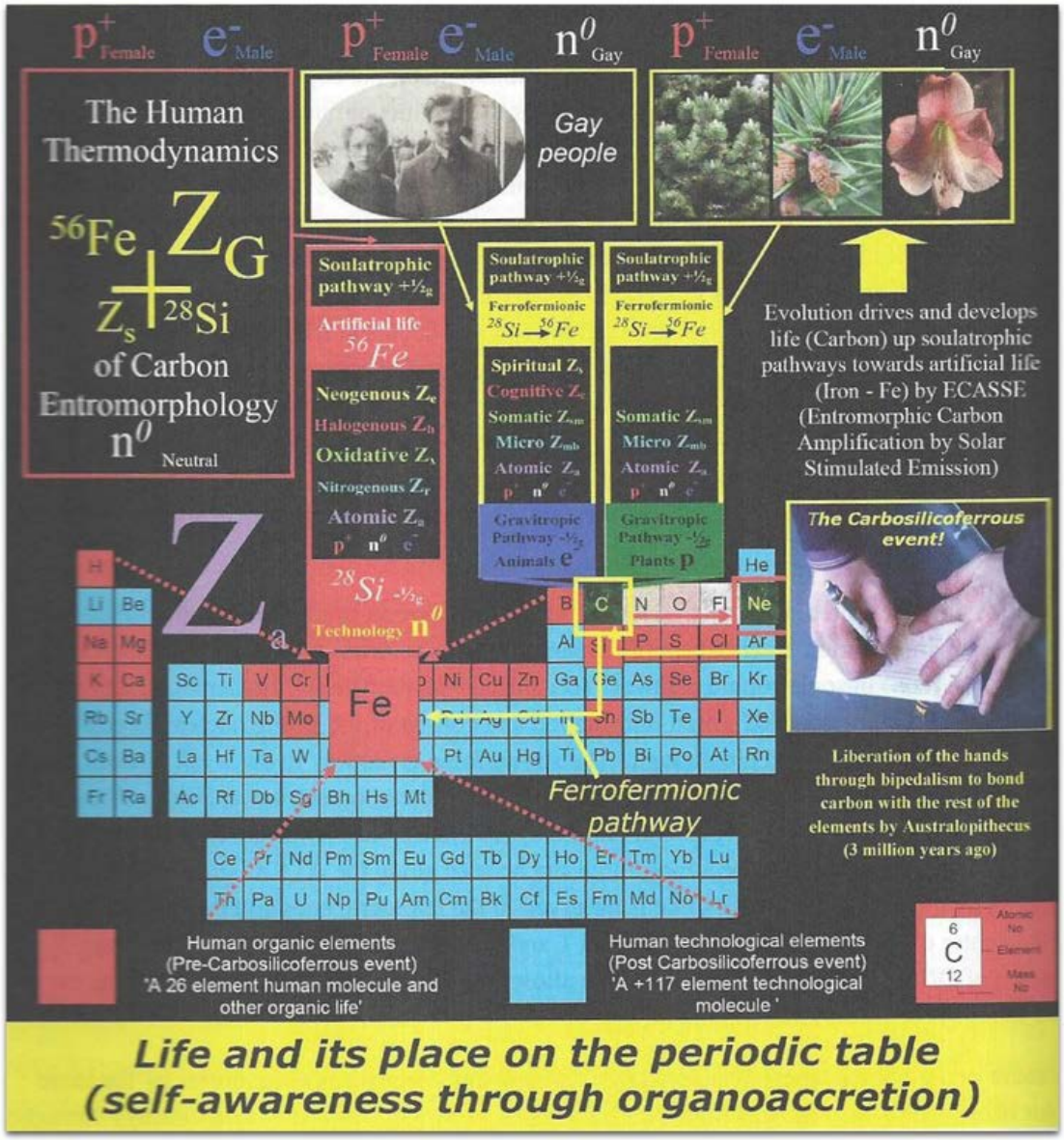

(add)

See also

â— Floating magnets experiment
â— Human molecular formula
â— Human periodic table
â— Periodic table of social structures

References

1. Periodic table – HumanThermodynamics.com.
2. Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc). LuLu.
3. Janes, Mark A. (2012). *Mr Carbon Atom and the Theory of Carbon Entromorphology* (pgs. 264-67) (abs). Emp3books.
4. Annamalai, Kalyan, Puri, Ishwar K., and Jog, Milind A. (2011). *Advanced Thermodynamics Engineering* (§14: Thermodynamics and Biological Systems, pgs. 709-99, contributed by Kalyan Annamalai and Carlos Silva; §14.4.1: Human body | Formulae, pgs. 726-27; Thims, ref. 88). CRC Press.
5. Thornton, John. (1899). *Human Physiology* (14 elements in human body, pg. 412). Longman's Green.
6. (a) Webb, D.A. and Fearon, W.R. (1937). "Studies on the Ultimate Composition of Biological Materials. Part I. Aims, Scope and Methods", *Sci. Proc. Roy. Dublin Soc.* 21:487-504.
(b) Webb, D.A. (1937). "Studies on the Ultimate Composition of Biological Materials. Part II. Spectrographic Analyses of Marine Invertebrates with Special Reference to the Chemical Composition of Their Environment", *Sci. Proc. Roy. Dublin Soc.* 21:505-539.
(c) D.A. Webb – Wikipedia.
(d) Morowitz, Harold. (1968). *Energy Flow in Biology: Biological Organization as a Problem in Thermal Physics* (table 3-1, pg. 47). Academic Press.
7. Morowitz, Harold. (1968). *Energy Flow in Biology: Biological Organization as a Problem in Thermal Physics* (table 3-2, pg. 48). Academic Press.
8. Gerson, Kirth. (2013). "Breaking Bad Pilot: People are Chemicals, Too!" (Ñº), The University of College, Sep 2.
9. Thims, Libb. (2020). *Human Chemical Thermodynamics — Chemical Thermodynamics Applied to the Humanities: Meaning, Morality, Purpose; Sociology, Economics, History, Philosophy, Government, Anthropology, Politics, Business, Jurisprudence; Religion, Relationships, Warfare, and Love* (**pdf**). Publisher.

Further reading

â— Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
â— Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.

θΔics

In pioneers, **hmolscience pioneers** are pioneers, i.e. pioneers of hmolscience, as listed in the adjacent dropmenu, who use two or more combinations of chemistry, thermodynamics, and or physics in their humanities theoretical work or theory, e.g. Henry Adams (who employs all three); according to which they don't classify in one of the main classifications: HT pioneers, HC pioneers, or HP pioneers, by themselves; the category is similar to HMS pioneers, but this tends to list those who do pioneering work in human molecular theory, by itself.

θΔics

In hmolscience, **hmolscience pitfalls** refer to common pitfalls, traps, or cul-de-sacs of theoretical quagmire, misdirection, and dead end; historical examples of which include: toolism, Shannon bandwagon, self Sokal affair issue, letter rhyming derivation method, ontic opening arguments, anthropocentric terminology confusion, e.g. "life" (see: life terminology upgrades), "sociology" (see: sociology terminology upgrades), i.e. the tendency towards anthropisms, teleological misconceptions (see: chemical teleology), derivation fundamentals issues, among others—and last but not least culturally-ingrained religious beliefs (e.g. free will based soul or karma theory), which is an issue in and of itself; many of which are career ruining, people spending wasted decades on some of these, as history has shown, repeatedly.

θΔics

In quotes, **hmolscience quotes** are two cultures reconciling, hmolscience-themed, one nature aiming, physicochemical humanities (or physicochemical sociology) related quotes, supporting the integration of the humanities and physics, chemistry, and thermodynamics. [N1]

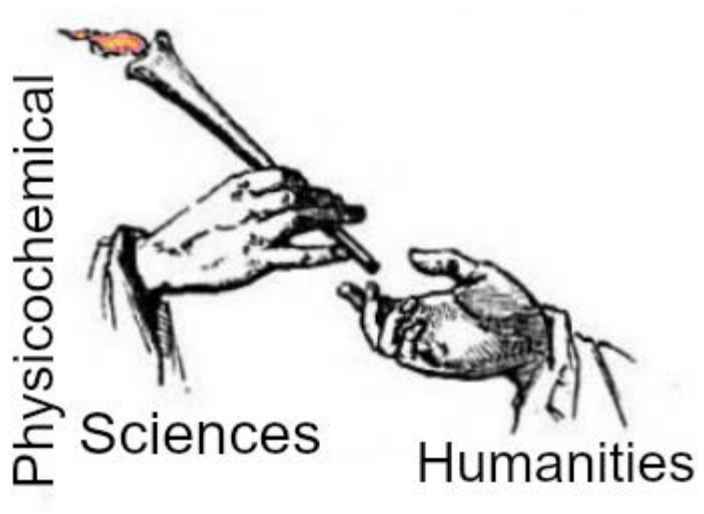

A physicochemical humanities / **hmolscience** annotated "torch of knowledge" illustration, from William Whewell's 1840 *The Philosophy of the Inductive Sciences*, with its noted chapter section: The Establishment and Development of the Idea of Chemical Affinity, which touches on Herman Boerhaave's famous paradoxical quote on love and affinities; [1] Note: image seems to reflect William Yeats' circa 1905 quote (Ñº) on education and fire.

19th century

The following is a work-in-progress listing of 19th century hmolscience-themed, one nature aiming, quotes supporting the integration of the humanities and physics, chemistry, and thermodynamics:

> "People who love each other mix like water and wine; people who hate each other segregate like water and oil."
>
> — Empedocles (450BC), *Fragments*

> "When a solvent dissolves a solvent, the mechanical action is not a force, by violence, nor private hatred thought about, but of friendship, if 'love' is to be called their union, in the desire for a praise. Yes, this is a paradoxical assertion."
>
> — Herman Boerhaave (1732), *Publication*; note: Goethe, in his 20s, studied Boerhaave's chemical philosophy, with interest

> "How I look forward to **the effect** that this [physicochemical-based] novel will have in a few years on many people upon rereading it."
>
> — Johann Goethe (1809), comment (see: timeline) to Karl Reinhard

> "There is some truth in Boerhaave's poetic comparison: [that] [force of chemical affinity] is "love, if love be the desire for marriage".
>
> — Jean Dumas (1837), commentary on Herman Boerhaave's 1732 supposition

> "Just as man and woman attract one another, so oxygen O_2 attracts hydrogen H_2 [and] just as a steam engine produces motion, so the intricate organic complex of force-bearing substance in an animal organism produces a total sum of certain effects."
>
> — Ludwig Buchner (1855), *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon*

> "In the inorganic world we find the power of combination growing with the increase of differences. Place a thousand atoms of oxygen in a receiver, and they will remain motionless; but introduce a single atom of carbon, and excite their affinities for each other, and at once motion will be produced. Such

being the case in regard to all other matter, it must be so in regard to those combinations in which man is concerned, indicated by the term society."

— George Carey (1858), *Principles of Social Science* (§8: On The Formation of Society)

"A particle of matter cannot tell us that it is unconscious of the laws of attraction and repulsion and that the law is not true; but man, who is the subject of history, says bluntly: I am free, and am therefore not subject to laws."

— Leo Tolstoy (1869), *War and Peace*

"Every society, great or small, resembles ... a complex molecule, in which the *atoms* are represented by *men*, possessed of all those multifarious attractions and repulsions which are manifested in their desires and volitions, the unlimited power of satisfying which we call freedom ... the social molecule exists in virtue of the renunciation of more or less of this freedom by every individual. It is decomposed, when the attraction of desire leads to the resumption of that freedom the expression of which is essential to the existence of the social molecule. The great problem of social chemistry we call politics, is to discover what desires of mankind may be gratified, and what must be suppressed, if the highly complex compound, society, is to avoid decomposition."

— Thomas Huxley (1871), "Administrative Nihilism"

"Civil law, commerce, political economy, and international ethics are all based on the assumption that the social body consists of such human molecules, and there is no reason why the methods of physical science should not be applied to the statics and dynamics of that society, the passions and rights of the individual man corresponding exactly to the chemical and physical forces inherent in the material molecule."

— Ernst Gryzanowski (1875), commentary on the social physics of Auguste Comte

"Social chemistry—the mutual attraction of equivalent human molecules—is a **science yet to be created**, for the fact is my daily study and only satisfaction in life."

— Henry Adams (1885), Letter to his wife

"General chemistry is sometimes defined as 'the science of atoms and their behavior.' The same chemists who use this definition acknowledge that they have never discovered the hypothetical 'free atom.' The only close likeness in this respect that I can discover between general sociology and general chemistry or biology is in the fact that we must use the conception of human individuals, although we can find no such object in reality as the free individual. If we should describe sociology as 'the science of human individuals and their behavior' we should be in verbal uniformity with one way of defining chemistry; but I do not see any profit from that fact in the shape of more knowledge about society. Unless we are willing however, to take as our ultimate concept 'the human atom,' 'the individual,' 'the social man,' or whatever we may choose to name the irreducible element in societary combinations, I see nothing

Sociology

but arbitrariness in the plan of adopting a 'unit of inquiry.' Is it not a purely gratuitous assumption that at present sociology needs or can use a unit of inquiry in the sense to which Professor Lindsay seems most to incline?"

— Albion Small (1899), critique of Samuel Lindsay's 1898 discussion of units in sociology

20th century

The following is a work-in-progress listing of 20th century hmolscience-themed, one nature aiming, quotes supporting the integration of the humanities and physics, chemistry, and thermodynamics:

"I must confess to being proud that this book is the first work to take up [Goethe's human chemical] ideas."

— Otto Weininger (1903), *Sex and Character*

"There are men who would be better off in a small village than in a large town, **if you had** some sort of human chemical reaction to determine in advance which man's nature was suited to the smaller place and which to the larger."

Education

— Henry Pritchett (1906), on "Large vs. Small Colleges"

"I'm sorry Lord Kelvin (1824-1907) is dead. I would travel a few thousand-million miles to discuss with him the thermodynamics of socialistic society."

— Henry Adams (1909), Letter to English lawyer Charles Gaskell (1909)

"**The time may come** when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry … then it may be possible, as Adams suggests, to invent a common formula for thermodynamics and history."

History

— William Thayer (1918), "Vagaries of Historians", *Annual Report of the American Historical Association*

"Perhaps our genius for unity will some time **produce a science** so broad as to include the behavior of a group of electrons and the behavior of a university faculty, but such a possibility seems now so remote that I for one would hesitate to guess whether this wonderful science would be more like mechanics or like a psychology."

— Gilbert Lewis (1925), *Anatomy of Science*

"Human masses transmute energies of hunger and sex into various social, economic, and aesthetic or intellectual forms, the transformation proceeding entirely according to the laws of thermodynamics."

— Howard W. Odum (1929), on Leon Winiarski's 1894 theory

"Thus human molecules gravitate toward one another through association, which generates heat, which produces motion, which in turn constitutes progress. This gravitation is measurable through physical laws

of direct ratio to mass and inverse ratio to distance. Forms and process such as centralization and decentralization come about through the operation of centripetal and centrifugal forces with association and progress varying inversely as the differences between the units and groups of populations …"

— Howard W. Odum (1929), on Henry Carey's 1858 theory

"It can be shown that in all cases, that human molecules rise and fall within the class into which they are born, in a manner which fits the hypothesis that they do so because of their relative aptitudes; and it can also be shown, second, that they rise and fall across the boundary lines of their class in the same manner. This rise and fall into higher and lower classes as a rule takes more than one generation. These molecules are therefore families rather than individuals. And this explains why observers who focus attention on individuals so frequently fail to find any relation between ability and class position."

— Joseph Schumpeter (1942), *Capitalism, Socialism, and Democracy*

"Energy among molecules is like money among men. The rich are few, the poor numerous."

— Emyr Hughes (1947), *The Kinetics of Reactions in Solutions* (see: Pareto principle)

"Watch groups of people working or playing together and you will be startled to discover how 'chemical' are their reactions to one another. Once you acquire even rudiments of human chemistry, you will be baffled less often by people, and become impatient or angry less often at the (to you) annoying things they do. You will see and judge them for what they are—different kinds of human chemicals, obeying the laws of their natures as you and I obey the laws of our natures."

— Thomas Dreier (1948), *We Human Chemicals* (Ñº)

Economics

"While it was long possible and sometimes tempting for physicists to deny the usefulness of the molecular hypothesis, we economists have the good luck of being some of the 'molecules' of economic life ourselves, and of having the possibility through human contacts to study the behavior of other 'molecules' (see: human molecular hypothesis)…. If we will be more forthcoming with explanations of our cherished terms, our science colleagues may be more inclined to help us with 'entropy', which to me is a more difficult concept than anything economics has to offer."

— Tjalling Koopmans (1947/79), collected work (aggregate quote)

Sociology

"**Why should no social chemistry ever been developed?**" He states that "nobody would suggest that the social scientists should imitate meteorology, for this discipline does not appear to have got very far … but what about chemistry? A sociology based on chemistry [has] in fact been called for, but, significantly, [this call has] found no echo. It would have been easy to take up this suggestion and develop it further. An intending social chemist would have found it one whit more difficult to manufacture a sociological parallel to the Boyle-Charles law than Haret did to the Newtonian propositions. But the experiment appears never to have been tried. Why?"

— Werner Stark (1962), commentary on Thomas Huxley's 1871 call for the development of the field of social chemistry

"Adapting thermodynamic ideas to the study of culture is limited by a very simple fact: nobody has yet figured out what might be the cultural equivalent of heat or energy … nobody has yet found the 'heat' or the 'energy' in cultural matters … the concepts of 'cultural temperature' (see: social temperature) to refine our understanding of 'cultural heat' (see: social heat) have not yet appeared. **This is one of the most pressing problems** for the next generation of anthropologists, and the difficulties are profound."

— Paul Bohannan (1995), *How Culture Works*

"The thought that the dry and forbidding discipline of thermodynamics could be applied to that most theory-defying of all applications, human behavior, may be staggering, and perhaps heresy to some. After all, the purity and precision of thermodynamics has been maintained on the strength of its validity only as a collection of limiting laws for infinitely large systems undergoing infinitely slow changes. However, the interest in thermodynamics has always been based on the great relevance for finite real systems undergoing changes that are fast on our everyday time scale and slow only on the microscopic time scale of atomic motion. Thus we are merely extending the beam of insight from the lifeless behaviors of inanimate matter to the vivid complexities of human behavior. In the final analysis this far-reaching analogy rests on the fact that the basic elements of the description of atoms, molecules, and matter **can be scaled up** to the realm of living organisms without changes other than in the complexity of the systems and their behavior."

— Sture Nordholm (1997), "In Defense of Thermodynamics: an Animate Analogy"

21th century

The following is a work-in-progress listing of 21th century hmolscience-themed, one nature aiming, quotes supporting the integration of the humanities and physics, chemistry, and thermodynamics:

"There is a reaction beyond every event or occurrence. It is the consequence. The reactions keep following the initial action. When two chemicals are combined under certain conditions, there always is a reaction product. The new product is different than the original chemical. Nature works constantly to produce new substances from basic chemicals in an efficient manner. A subtle light impulse from the sun converts basic water and carbon dioxide into multi-chain complexes every moment, all over the world. The key thought here is simply that the impulse of energy which is almost too small to measure, the photon, results in providing fuel and food in millions of tons each year. The natural chemical reaction is analogous to the problem which is undermining our society. It closely resembles what is happening around us. It takes a lot of imagination to declare the idea."

— James Morgia (2001), *Life Long Human Values*

"Modern thermodynamics in macroscopic region (but not for the universe) may be 'the only physical theory of universal content', as Einstein said, so **it should be used** not only for the natural sciences but also **for the social sciences** and even philosophy. Many economic and social activities are subordinate to statistical rules and therefore also to thermodynamic rules. Any substantial progress in thermodynamics might affect social science. An equilibrium state, for instance, has been regarded as an ideal state for getting the highest efficiency for energy transformation, but in any equilibrium state there is not macroscopic process run. Based on modern thermodynamics mentioned in this book, the nondissipative state is of more extended meaning than the equilibrium state. In an ideal nonequilibrium state, macroscopic process(es) might still be going on without any free energy dissipation, i.e., with the highest efficiency. If such a basic new idea were widely accepted, it will promote human society developing with higher efficiency."

— Jitao Wang (2002), *Nonequilibrium Nondissipative Thermodynamics* (§:Modern Thermodynamics in Social Science and Philosophy)

"There seem to be 'laws' [of] social systems that have at least something of the character of natural physical laws, in that they do not yield easily to planned and arbitrary interventions. Over the past several decades, social, economic and political scientists have begun a dialogue with physical and biological scientists to try to **discover whether there is truly a 'physics of society'**, and if so, what its laws and principles are. In particular, they have begun to regard complex modes of human activity as collections of many interacting 'agents'—somewhat analogous to a fluid of interacting atoms or molecules, but within which there is scope for decision-making, learning and adaptation."

— Philip Ball (2003), "The Physics of Society", talk delivered at the London School of Economics

"The human being is one big molecule, a mega-molecule, whose most fundamental behaviors are governed by the same electro-chemical principles governing the micro-molecules which make up our bodies."

— Rohann Solare (2009), "The Atomic-Molecular Foundations of a Social Physics: Self-organizing Systems from Atoms to Humans"

"The shifting of alliances and rivalries in a social group can be viewed as arising from an energy minimization process."

— Steven Strogatz (2009), "Energy Landscape of Social Balance"

"Entropy is an idea that applies to populations of humans as well as of molecules."

— Arthur Jonath and Richard Goldwater (2009)

"When a critical mass of employees [activate] (usually, 5 or 10 percent is all you need), throughout the company, it creates a kind of fusion – a coming together of the human particles in the corporate molecule that releases a massive amount of energy."

Business

— Vineet Nayar (2010), *Employees First, Customers Second*

"Like atoms in a molecule, we're all linked together. Studying the complex matrix that results can illuminate everything from bucket brigades to Bernie Madoff."

— Nicholas Christakis (2010), Interview: "The Chemistry of Social Networks"

Notes

N1. This page is an outgrowth of the "hmolscience" section of the Libb Thims (quotes) page, collected as Thims was going through Hmolpedia in preparation for hardcover print stage.

References

1. Whewell, William. (1840). *The Philosophy of the Inductive Sciences: Founded Upon Their History, Volume One* (Book 4, §2: The Establishment and Development of the Idea of Chemical Affinity, pgs. 373-87; "si amor dicendus copulae cupido", pg. 375; Dumas, pg. 379). John W. Parker.

θΔics

In acronyms, **HMS** is a once-used shorthand notation for "human molecular science", i.e.the scientific study of human molecules and or moles of human molecules (i.e. hmols); but has since been supplanted with the term "hmolscience".

θΔics

In science, **HMS pioneers**, or human molecular science pioneers, page chronologically lists the various **122+** pioneers of the science (or philosophy) of the human molecule; or hmol science, in short. The following 1991 query by American philosopher Robert Pirsig (IQ=170) gives a decent summary of an hmol science pioneer's perspective:

> "Why should a group of simple, stable compounds of carbon (C), hydrogen (H), oxygen (O), and nitrogen (N), 'struggle' for billions of years to organize themselves into a professor of chemistry? What's the motive?"

Synthesis

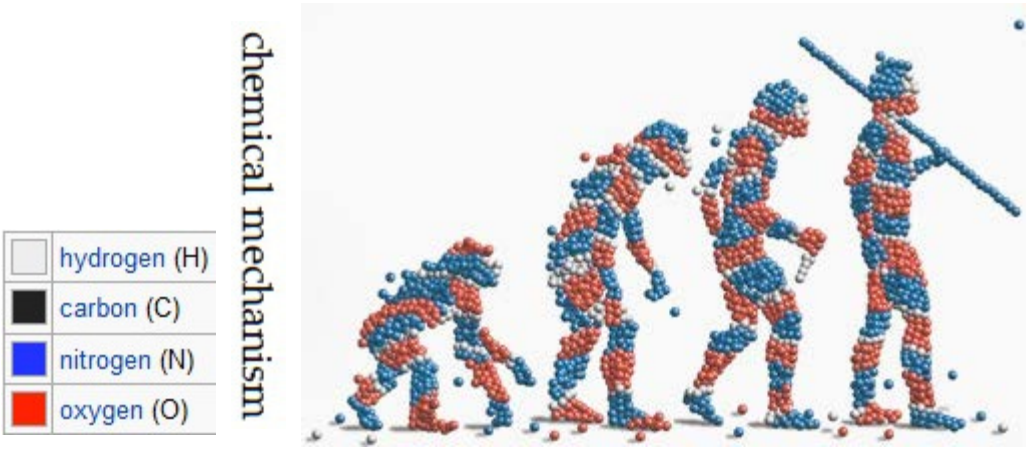

Depiction of the "evolution of the human molecule" by Canadian communications designer Shawn LaPaix, a spin on English biologist Thomas Huxley's famous 1863 evolution of man drawing, using the 1952 CPK atomic color scheme: **red** = oxygen, **blue** = nitrogen, **gray** = hydrogen, **black** = carbon (not shown); for a poster for the 2005 University of British Columbia Art Gallery exhibit "The Human Body in History", alluding to the idea that human is a body of evolving atoms, formed into the structure of a molecule, that has been chemically synthesized into its current form, over long spans of evolutionary time.

This group includes individuals, categorized as human molecular theorists, who have pioneered the use of atomic reductionism, whether metaphorical, analogy, theoretical, or actual to the modeling of a human as human molecule or its derivative terms: human atom, human atomism, human chemical, human chemical element, human particle, social atom, social molecule, economic molecule, corporate molecule, etc., in theory or discussion, or specifically in the subjects of human chemistry, human physics, and human thermodynamics. The known human molecular science theorists and pioneers are listed below.

Key

A person's *photo-size* is indicative of a combination of originality, contribution density, impact, and deepness of theory insight: the largest photo width (75px) is indicative of an 'originator', someone who developed deep theory, on their own, directly from hard science, particularly physics or chemistry; the smallest photo size (25px) may indicate a one-time theory contributor (as little as one quote), or something to this effect; middle sized photos (44px) are indicative of thinkers in between these two ranges. The molecule man icon (31+) indicates that the individual used the specific term "human molecule" [s], which differs significantly than say comparing a person to a "point atom" or "human element". The lightbulb icon indicates from where that person learned of the concept. The YouTube icon links to a video on the topic. The University icon indicates that the concept (human molecule, human atomism, dissipative structure, etc.) is or has been taught as part of a university course. The globe icon links to a webpage on that person's human molecular theory (or its derivative) run by either that person (or a follower of that person's work). The Wikipedia icon links to a Wikipedia article on that person. Individuals highlighted with red tabs are objectors to human molecular theory (sixty-seven percent of detractors objecting on religious grounds). The religion icon is used to signify that the person intertwines their description of the human molecule, either for or against, religious grounds, e.g. that a human has a soul, whereas molecules don't. The atom symbol, links to a specific IQ page of tabulated historical IQ listings and signifies that the person is a certified genius (with a 200-range IQ plus or minus) or close friend of a certified genius.

Earlier HMS pioneers

The following is a chronological listing of core biographies in hmol science theories, ideas, and opinions professed up until the year 1800.:

Pioneer	Date	Contribution

Empedocles (495-435 BC) Greek philosopher	450BC	Theorized that humans are 'entities' made of *four elements*: fire (△), earth (▽), air (△̸), water (▽̸), whose 'interactions' are governed by *two forces*: philia (●→|←●), i.e. attraction (or love) and neikos (←●|●→), i.e. repulsion (or hate). This was the first standard model of physics.
Jean Sales (1741-1816) French philosopher	1789	(Voltaire) Quote: "we conclude that there exists a principle of the human body which comes from the great process in which so many millions of atoms of the earth become many millions of human molecules."
Johann Goethe (1749-1832) German polymath (IQ=230)	1799	Conceived a human chemical reaction theory in which relationships are chemical reactions in which people, as chemical entities, attract and reply, neutralize each other, separate again, and reestablish themselves; and in 1808, using Swedish chemist Torbern Bergman's 1775 chemistry textbook *A Dissertation on Elective Attractions*, as a basis, wrote out a 36-chapter novella, in which each chapter is a different human elective affinity reaction (human chemical reaction) occurring between the various characters; the process in which two people, A and B, in the state of a dull marriage union, AB (Bergman's notation), can be made to break apart by the introduction of a third single unattached human C, brought into the picture, is exactly same process, according to Goethe (see: chapter four), by which calcium carbonate $CaCO_3$ can be broken up into its constituent parts, Ca and CO_3, by contact with sulfuric acid H_2SO_4 to form gypsum $CaSO_4 \cdot 2H_2O$ and the release of carbon dioxide CO_2 gas, the gas being representative of the displaced marriage partner, gypsum representative of the newly formed couple.
Friedrich Schiller (1759-1805) German author (IQ=175)	1799	(Goethe) Goethe confided in him his theory that intimate relationships are chemical reactions in which people, as chemical entities, attract and reply, neutralize each other, separate again, and reestablish themselves.

19th century HMS pioneers

The following is a chronological listing of core biographies in hmol science theories, ideas, and opinions professed in the years 1800 to 1899:

Pioneer	Date	Contribution
Christoph Wieland (1733-1813) German poet and writer	1810	(Goethe) Considered the modeling of humans as chemicals to be "nonsense and childish fooling around".
Humphry Davy (1778-1829) English chemist (IQ=185)	1813	Compared man to a "point atom", or point center of force.
Alphonse Esquiros (1812-1876) French religious writer	1840	Argued: "unity can be held in effect by the assent of human molecules to carry all toward each other; the law of attraction is a law of love."

Hector Berlioz (1803-1869) French composer	1854	Compared the visual sight of a children's choir to that of a "crystal of human molecules."
Henry Carey (1793-1879) American sociologist and economist	1858	Stated that: “man, the molecule of society, is the subject of social science”; explained how chemical affinity must govern human social movement and outlined a theory of social heat associated with the rubbing together of human molecules in daily activity; outlined a theory of social gravitation to explain how people attract into the aggregation of large cities, each mutual city acting as an attractive 'sun' with a certain brightness to it.
Nassau Senior (1790-1864) English economist	1860	Quote: “The human 'will' obey laws nearly as certain as those which regulate matter.” [6]
Hermann Helmholtz (1821-1894) German physicist and physician	1862	In his series of lectures entitled "On the Conservation of Force", delivered at the Carlsruhe, winter 1862-63, he made a comparison between the behavior of a swam of gnats and a system of gas particles, where by the particles were said to probably cross one another in rectilinear paths in all directions, until, striking another particle, or against the side of a vessel, they are reflected in another direction.
Francois Massieu (1832-1896) French engineer	c.1869	Quote: “they cut the man into two parts, soul and body, the philosopher took one, and another naturalist, they both have worked, studied on their behalf have lost sight and we find ourselves today in the presence of a duality, convenient perhaps, but unwise, in that it overlooked the man to deal with only two elements that constitute it. But in doing so we run the risk of being wrong. If one wanted to know the chemical properties of water H_20, seek it in those of oxygen O_2 and hydrogen H_2? No, because he knows that there is little relationship between the characteristics of a substance and those of simple bodies which enter into its composition.” “To study humans, it is perhaps even more reserve, his corpse is certainly different from his living, his soul is a being whose morality tells us in existence, but whose philosophy can boast of acquire specific knowledge, since it can be studied in a free state, the revelation can only speak in this regard. But what science and philosophy can and should perhaps only study, is a man indivisible and tangible for us, where the angel and the beast are inseparable, which has a body and ailments, but also passions and faculties, such as intelligence, memory and reason.”
Hippolyte Taine (1828-1893) French historian	1869	Presented the view that objective of the historian is to "write the psychology of the human molecule, or a particular group of human molecules, in their various transformations."
Leo Tolstoy (1828-1910) Russian writer	1869	(Buckle) Quote: “A particle of matter cannot tell us that it is unconscious of the laws of attraction and repulsion and that the law is not true; but man, who is the subject of history, says bluntly: I am free, and am therefore not subject to laws.”
Antoine Poincare (1825-date) French civil engineer and meteorologist	c.1870	In his book *On Science*, chapter "New Concepts of Matter", made a comparison between the behavior of a cluster of midges and a system of gas molecules. [1]

	Thomas Huxley (1825-1895) English biologist	1871	Outlined the view that society as a whole is a "social molecule"
13.	Ludwig Boltzmann (1844-1906) Austrian physicist	1872	(Buckle) Quote: "molecules are like to many individuals, having the most various states of motion, and the properties of gases only remain unaltered because the number of these molecules which on average have a given state of motion is constant." [5]
14.	James Maxwell (1831-1879) Scottish mathematical physicist (IQ=210)	1873	(Buckle) "These uniformities which we observed in our experiments with quantities of matter containing millions of molecules are uniformities of the same kind as those explained by Laplace [material points] and wondered at by Buckle [people] arising from the slumping together of multitudes of causes each of which is by no means uniform with the others." [5]
15.	Leon Walras (1834-1910) French sociologist and economist	c.1874	Viewed people as "economic molecules".
16.	Ernst Gryzanowski (1824-1888) German physician and diplomat	1875	(Taine) Quote: "Civil law, commerce, political economy, and international ethics are all based on the assumption that the social body consists of such human molecules, and there is no reason why the methods of physical science should not be applied to the statics and dynamics of that society, the passions and rights of the individual man corresponding exactly to the chemical and physical forces inherent in the material molecule."
17.	Henry Adams (1838-1918) American historian	1885	(Taine) Defined 'social chemistry' as the study of the attraction [and repulsion] of equivalent 'human molecules'; applied the chemical thermodynamics phase rule work of Willard Gibbs to society (1909); outlined a second law version of history studies of human molecules (1910), in which contractions of human molecules act like suns to create energy opposite to entropy.
18.	Ferdinand Schiller (1864-1937) German-British philosopher	1891	In his *Riddles of the Sphinx*, outlined philosophical views on sex and love in relation to social life, wherein he considers people as atoms and bound sets of humans in relationships as molecules; specifically describing the couple in love as a 'human molecule'; he discusses the forces of attractions and repulsions at work in the most intimate unions, such as jealously.
19.	Max Leclerc (1864-1932) French education reformer	1894	(Taine) Views that France, in its schools and military, consists of "even numbered piles of human molecules, in a huge wheel turning, under the pedal of the stroke of the Minister, which crushes and destroys humanity down to the pulp."
20.	Leon Winiarski (1865-1915) Polish economist and sociologist	c.1894	(Walrus) Quote: "a social aggregate is nothing but a system of points, i.e. individuals, who are in perpetual movement of approaching or withdrawing from one another."
	Vilfredo Pareto (1848-1923)		

21.	French-Italian mathematical engineer	1896	(Walrus) Quote: “Society is a system of human molecules in a complex mutual relationship.”
22.	William Ramsay (1852-1916) Scottish chemist	1898	Noted for his ‘football players’ explanation of kinetic theory, where the players are likened to a ‘throng of human molecules’.
23.	Albion Small (1854-1926) American sociologist	1899	Outlined the possibility of defining "general sociology", on the model of "general chemistry", as the study of "human atoms" and their behaviors.

20th century HMS pioneers

The following is a chronological listing of core biographies in hmol science theories, ideas, and opinions professed in the years 1900 to 1999:

	Pioneer	Date	Contribution
1.	Yves Guyot (1843-1928) French economist	1903	Explained civilization changes as “fluid human molecules rolling over each other.”
2.	William Adams (1832-1906) English radical journalist	1903	Published his two-volume opus *Memoirs of a Social Atom*, using the philosophy that he is a “social atom—a small speck of the surface of society.”
3.	Emile Boutmy (1835-1906) French political scientist and sociologist	1904	In his *The English People: a Study of Their Political Psychology*, uses the term 'human molecule' as the definition of the component of the masses to argue that equality of human molecules is the essential law of society and that royalty is a modern-day anomaly on the decline.
4.	Mary Mesny (c.1980-c.1950) American philosopher	1910	Outlined a short chemical philosophy in her one-page article "Human Molecules", defining people as atoms or molecules, who have various "satisfied" and "unsatisfied" bonds of affinity, which define the level of happiness of a person. HUMAN MOLECULES
5.	Thomas Dreier (1884-1976) American editor, writer, and business theorist	1910	Wrote the article "Human Chemicals"; later expanded into the 1948 book *We Human Chemicals*, the dedication section of which states "to my fellow human chemicals: may we all learn the knack of getting along"; the first chapter of which is 'We are All Human Chemicals and Human Chemists'. 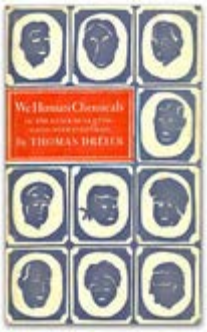
6.	George Herbert Perris (1866-1920)	1913	Explained that “war is often a process of evolution—an explosive process which occurs when the progressive movement of human molecules towards a reorganization making for equality of opportunity

	English journalist		and a betterment of the law, is unduly held back by the forces of standpatism and vested interests.”
7.	William Fairburn (1876-1947) English-born American naval architect, marine engineer, chemical engineer, and industrial executive	1914	Wrote the booklet *Human Chemistry*, in which he defined people as "human chemicals" or sometimes "human chemical elements" and the foreman as the "master human chemist" whose job it is to facilitate reactions between his or her employees.
8.	Pierre Teilhard (1881-1955) French philosopher, chemist, physicist, paleontologist, and priest	c.1916	Quote: “there is neither spirit nor matter in the world; the stuff of the universe is *spirit-matter*. No other substance but this could produce the human molecule” (source: *A Sketch of a Personalistic Universe*, 1936). Human molecule perspective used throughout his corpus of work, e.g. in his 1938 *The Phenomenon of Man*, he digs into the evolution question of how is it that human faculties, mind, consciousness, human spirit, etc., originated from the simple hydrogen atoms and other basic components of matter in the universe, over the last billions of years.
9.	Jacob Moreno (1889-1974) Romanian-born American psychologist	1917	Developed an elaborate psychology-type of social atom theory
10.	George Carey (1845-1924) American physician	1919	Stated that a human is a "chemical formula in operation."
11.	William Patten (1861-1932) American zoologist	1919	Attempted to outline how the modern person might go about deriving a science-based system of morality and future governing constitution for a ‘molecular society’, of people considered as ‘human social atoms’ (social atoms) or ‘human molecules’, based on chemistry, physics, and astronomy. Defined a person as "Mr. Molecule" (similar to Mark Janes' 2009 Mr. Carbon Atom)
12.	Pitirim Sorokin (1889-1968) Russian-born American sociologist	1928	(Carey)(Pareto) In his *Contemporary Sociological Theories*, he seems to have been the first to outlined the thermodynamic-energetic views of society as a mechanism of systems of human molecules and or human particles, particularly the views of Leon Winiarski, Eugene Roberty, Henry Carey, and Wilhelm Ostwald.
13.	Howard W. Odum (1884-1954) American sociologist	1929	(Carey)(Sorokin) Quote: “Thus human molecules gravitate toward one another through association, which generates heat, which produces motion, which in turn constitutes progress. This gravitation is measurable through physical laws of direct ratio to mass and inverse ratio to distance. Forms and process such as centralization and decentralization come about through the operation of centripetal and centrifugal forces with association and progress varying inversely as the differences between the units and groups of populations …”
14.	Katharine Jocher (c.1889-c.1969)	1929	Co-author with Howard W. Odum.

	American sociologist		
15.	Joseph Schumpeter (1883-1950) Austrian economist and political scientist	1942	Quote: "It can be shown that in all cases, that human molecules rise and fall within the class into which they are born, in a manner which fits the hypothesis that they do so because of their relative aptitudes; and it can also be shown, second, that they rise and fall across the boundary lines of their class in the same manner. This rise and fall into higher and lower classes as a rule takes more than one generation. These molecules are therefore families rather than individuals. And this explains why observers who focus attention on individuals so frequently fail to find any relation between ability and class position."
16.	Emyr Hughes (1905-1978) Welsh physical chemist	1947	Quote: "energy among molecules is like money among men. The rich are few, the poor numerous."
17.	Tjalling Koopmans (1910-1985) Dutch-born American mathematician, theoretical physicist, economist	1947	Quote: "while it was long possible and sometimes tempting for physicists to deny the usefulness of the molecular hypothesis, we economists have the good luck of being some of the 'molecules' of economic life ourselves, and of having the possibility through human contacts to study the behavior of other 'molecules'." In 1970s, began speculating on how entropy applies to the study of these molecules of economic life.
18.	George Lundberg (1895-1966) American sociologist	1948	Socially models people as 'electron-proton configurations'.
19.	Leslie Zeleny (c.1905-70) American sociologist	1949	Diagrammed Moreno's social atom model using data of sociometric findings of the attraction-repulsion aspects of the relationships surrounding various people
20.	C.G. Darwin (1887-1962) English physicist Grandson of Charles Darwin	1952	In the opening chapter, Introduction, to his book *The Next Million Years*, introduced the human molecule concept as the subject of study in human thermodynamics.
21.	Robert Heilbroner (1919-2005) American economist	1953	Quote: "there is an unbridgeable gap between the 'behavior' of [subatomic particles] and those of human beings who constitute the objects of study of social science. Aside from pure physical reflexes, human behavior cannot be understood without the concept of volition—the unbridgeable capacity to change our minds up to the very last minute. By way of contrast, the elements of nature 'behave' as they do for reasons of which we know only one thing: the particles of physics do not 'choose' to behave as they do."
22.	Eric Fromm (1900-1980) German psychologist and philosopher	1956	In his best-selling *The Art of Love*, defined people as "human atoms", and argued that the desire for interpersonal fusion between two human atoms is the most powerful striving in human life.
23.	Werner Stark (1909-1985) Austrian social economist	1962	(Henry Carey) Quote: "in the physical universe, heat is engendered by friction. Consequently the case must be the same in the social world. The 'particles' must rub together here, as they do there. The rubbing of the human molecules, which produces warmth, light and forward movement, is the interchange of goods, services, and ideas."
	Edward Hall (1914-		Quote: "as more and more is learned about both men and animals, it becomes clear that the skin itself is a very unsatisfactory boundary or

24.	2009) American anthropologist	1966	measuring point for crowding … like molecules that make up all matter, living things move and therefore require more or less fixed amounts of space.”
25.	Elihu Fein (c.1916-) American physicist	1970	His article "Demography and Thermodynamics" outlines a "molecular sociology", as cited in the 1971 *New Scientist* article "Molecular Sociology Arrives at Last", in which he explains how social activity is analogous to molecular activity; uses concepts such as adiabatic and entropy in social systems; but cautions his readers, in that although his analogies seem to have validity, he emphatically states that “the conclusion is not that people act like molecules”, but that the goal is to understand ourselves and the world through abstract concepts.
26.	Robert Nisbet (1913-1996) American sociologist	1970	(Adams) Considers people to be ‘elementary human particles’, refers to the adhesion between two human particles as a ‘social bond’, and the attachment of two or more human particles to be a ‘social molecule’.
27.	Daedalus (c.1930-) Thermodynamicist?	1971	Cited several times, in a column of *New Scientist* magazine (1971, 1972), as as having originated a thermodynamics-based "molecular sociology".
28.	Roy Henderson (c.1935-) Australian mechanical engineer	1971	Views people as chemical "particles" and men and women as non "identical particles"; his article “The Statistics of Crowd Fluids”, presents his findings of measured movements of college students on a campus and children on a playground, finding that in both cases their movements fit the Maxwell-Boltzmann distribution, meaning that both velocities of gas particles and the speeds of students follow a Gaussian distribution and that this is explained by "the concept of chemical purity in molecular systems." [13]
29.	Ilya Prigogine (1917-2003) Russian-born Belgian chemist and thermodynamicist	1971	Defined humans as social systems as "dissipative structures" analogous to the phenomenon of Bernard cell formation. Quote: “the bifurcation introduces history into physics and chemistry, an element that formerly seemed to be reserved for sciences dealing with biology, social, and cultural phenomena” [8]
30.	Erich Jantsch (1929-1980) Austrian astrophysicist	1975	Quote: “… dream of a pressure-free end state of maximum entropy in physical and social energy, in which action is neither possible nor necessary in any direction, only a kind of thermal (so-called Brownian) motion of the human "molecules" **...**”
31.	Jonathan Borofsky (1942-) American sculpture artist	1977	(MM) Noted for his internationally-known multi-story aluminum hole-filled “Molecule Man” sculptures, at locations all over the world, consisting of three human shapes, each pushing towards each other, the bodies filled hundreds of holes, varying in size from about seven inches to one foot or more, each of which is said to be representative of “the molecules of all human beings coming together to create our existence”; the first sculptures were built in Los Angeles, originating

because he was “fascinated by this ‘molecule idea’, the simple fact that even though we appear to be quite solid, we are in fact composed of a molecular structure which in itself is mostly composed of water and air.”

100-foot high statute of **3 human molecules**

32.	Jean Baudrillard (1929-2007) French social philosopher and pataphysicist	1981	In his *Simulacra and Simulation*, considers people to be “hydrocarbons”, that combine to form a “cultural molecule”, which can be recombined and synthesized into products or “broken cultural molecules”; in his 1994 book *The Illusion of the End*, gives a noted quote about “human molecules” in the context of history and gravity.
33.	Steve McMenamin (c.1950-) American business executive	c.1986	Conceived the idea that certain workers act as "free electrons", since "they have a strong role in choosing their own orbits."
34.	Tom DeMarco (1940-) American business consultant	1987	(McMenamin) Devote ch. 25 "Free Electrons", of the popular book *Peopleware*, to the concept of the "free electron" to the idea that a person who works non-traditional jobs, such as freelance work, self-employment, contracting, consulting, etc. can be likened to a valence shell electron.
35.	Timothy Lister (c.1950-) American consultant	1987	(McMenamin) (co-author with DeMarco)
36.	Arthur Iberall (1918-2002) American physicist and engineer	1987	Spent decades working out the details of an intricate social physics theory (1971-93), called homeokinetics, in which he defined generic entities as “atomisms” and people as “human atomisms”, whereby he set out to investigate the thermodynamics of the exchanges between hierarchies; which he applied in the teaching of college courses on the thermodynamics of living systems, with focus on social, political, and economic applications. Taught at UCLA.
37.	Norval Morrisseau (1932-2007) Canadian aboriginal-themed artist	1988	Did a acrylic on canvas work entitled ‘Human Molecule’ (adjacent), alluding to the idea that a human being is a molecule that is an evolved animal of sorts, part bird, part fish.
38.	Alan Nelson (c.1956-) American philosopher	1989	(Koopmans) Began circulating the manuscript "Human Molecules"; later published in chapter form (1992), wherein "economic agents" are viewed as human molecules, and a followup response chapter, by Bruce Caldwell, criticizing this view; followed by a response chapter by Nelson to Caldwell's criticism. 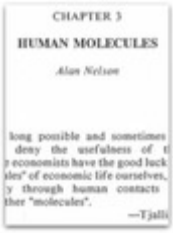 CHAPTER 3 HUMAN MOLECULES Alan Nelson
39.	Serge Galam (c.1945-) French physicist	c.1989	Has argued, for over 15-years, a theory that “humans behave like atoms” a logic according to which the hard sciences could be applied, only to be told that his theory was nonsense, something to be condemned; publishing chapters such as the 1996 “When Humans Interact Like Atoms”, among others. WHEN HUMANS INTERACT LIKE ATOMS
40.	Cornelis Hoede (c.1955-) Dutch social mathematician	1990	His article/chapter/book “Social Atoms”, modeled people or society some way on the atoms of physics, employing concepts such as “social velocity”, based on ego theory and kinetics.

“Why should a group of simple, stable compounds of carbon,

41.	Robert Pirsig (1928-) American writer-philosopher (IQ=170)	1991	hydrogen, oxygen and nitrogen struggle for billions of years to organize themselves into a professor of chemistry? What's the motive? If we leave a chemistry professor out on a rock in the sun long enough the forces of nature will convert him into simple compounds of carbon, oxygen, hydrogen and nitrogen, calcium, phosphorus, and small amounts of other minerals. It's a one-way reaction."
#	Bruce Caldwell (1952-) American economics historian	1992	Published a objection "Commentary" chapter section response to Alan Nelson's 1992 "Human Molecules" chapter.
42.	Harrison White (1930-) American sociologist	1992	Outlined a social molecule theory in which each human is viewed as being in more than one social molecule.
43.	Pierre Levy (1956-) Canadian cyberspace philosopher	1994	Uses a sort of metaphorical chemical philosophy to discuss bulk human behavior as molar behavior; example quote:"based on identities of adhesion, individuals are seen as a mass, as numbers, independent of their molecular wealth; the molar group organizes a kind of human thermodynamics, an exteriorized channeling of behavior and character that squanders individual qualities"; discusses concepts such as 'molecular politics', the molecular group, etc.
44.	Daniel Hausman (1947-) American philosopher-economist	1994	Quote: "we have much information immediately at our disposal about our own behavior as economic molecules, if we would only examine the grounds of our beliefs."
45.	Bernard Poitevin (c.1955-) French physician	1995	Investigated and modeled the human organism as a molecule, assuming there to exist no inherent difference between the mind and the body, and that they are essentially one and the same, a large differentiated structural molecule. [1]
46.	Thomas Rawski (c.1943-) American economics historian	1996	Quote: "the individual choices by rice buyers and factory owners in the economy are like the movement of air molecules in a balloon … economic molecules in the modern world huddle, of course, in markets, which gives another sense in which economics is bourgeois, the townsman's science."
47.	Eric Olson (c.1970-) American-born English philosopher	1998	Wrote the philosophical article "Human Atoms" in the *Australasian Journal of Philosophy*.
48.	Erich Müller (c.1969-) Venezuelan-born English chemical engineer	1998	In his 1998 *Chemical Engineering Education* article "Human Societies: A Curious Application of Thermodynamics", used a "loose analogy" human molecule model; in his 2006 thermodynamics lectures, at Imperial College London, according to the interview article "A Thermodynamic Personality", by Laura Gallagher, he frequently "compares people to molecules to help his students understand interactions between molecules so to visualize how they behave"; uses these models to explain, e.g., how gettos are formed or how certain people act as "surfactant molecules"
49.	Daniel Goleman (1946-) American psychologist and emotional intelligence theorist	1998	Quote: "virtually everyone who has a superior is part of at least one vertical 'couple'; every boss forms such a bond with each subordinate. Such vertical couples are a basic unit of organizational life, something akin to human molecules that interact to form the lattice work of relationship that is the organization."
			Wrote the book *The Molecular*

50.	Joseph Dewey (1945-) American newage spiritual philosopher	1999	*Relationship*, with a synopsis: "from atoms to society, synergy fosters greater unity and potential for good. Explore what may be our true purpose and reason for our existence, and what may be the ultimate relationship", which outlines a rather convoluted human molecule theory, in which the perfect marriage is defined as a "simple molecule" or "completed atom"; mixed with a view of the man is the positive ion and the female the negative ion; extrapolated with concepts such as molecular politics, molecular success, etc., all mixed together various new age theories and religion.
51.	Thomas Prugh (c.1955-) American ecological economist	1999	Quote: "the welfare of human society is best served by the view of people as 'human molecules' who, by pursuing their own interests through the market, inevitably promote the general good."
52.	Robert Costanza (1950-) American ecological economist	1999	(co-author to Prugh quote)
53.	Forbes Allan (c.1960-) American writer	1999	Quote: "People are like particles, they behave in groups as if they were molecules in a test-tube."

21st century HMS pioneers

The following is a chronological listing of core biographies in hmol science theories, ideas, and opinions professed in 2000 or later:.

	Pioneer	Date	Contribution
1.	Christopher Hirata (1983-) American physicist (IQ=190)	c.2000	|His "Physics of Relationships" (see 'fun' adjacent globe) outlines the a combination reaction: X + Y ↔ XY (couple formation) between single students at Caltech, using symbols of X = girl, Y = boy, and XY = paired relationship; with single people considered as "basic elements"; comments that in his human chemical reaction modeling he is leaving out other poly-amorphous relationships, such as "rare and non-traditional" products or compounds that may form such as "the gay molecule Y_2, the lesbian molecule X_2, and the middle-Eastern polygamous molecule X_4Y."
2.	Robert Sterner (c.1958-) American limnologist	2000	|Did first calculation (with Elser) of a 22-element empirical human molecular formula, published in *Ecological Stoichiometry* (2002), which they defined the formula for one 'human molecule' as: $H_{375,000}\ O_{132,000,000}\ C_{85,700,000}\ N_{6,430,000}\ Ca_{1,500,000}\ P_{1,020,000}\ S_{206,000}\ Na_{183,000}\ K_{177,000}$ $Cl_{127,000}\ Mg_{40,000}\ Si_{38,600}\ Fe_{2,680}\ Zn_{2,110}\ Cu_{76}\ I_{14}\ Mn_{13}\ F_{13}\ Cr_7\ Se_4\ Mo_3\ Co_1$ Teaches subject at the University of Minnesota.
3.	James Elser (c.1959-) American	2000	User:W|Did empirical human molecular formula calculation (with

limnologist

Sterner) as shown above. Teaches subject at Arizona State University.

Francisco Louca (1956-)
Portuguese politician and economist

2001

His chapter “Particles or humans? Econometric Quarrels on Newtonian Mechanics and the Social Realm”, in which discusses late 19th century new wave of mechanical analogies met with considerable resistance from some of the more established economists.

4.

David Hwang (c.1980-)
American computational chemist

2001

His article “The Thermodynamics of Love”, explains that love is the process where two elements, "male" (M) and "female" (F), combine to form a new compound called "couple" (M-F), through the following male-female reaction: M + F → MF.

5.

Karl Fink (c.1960-)
American Germanic studies professor

2001

In his article “Goethe’s Intensified Border”, in which he draws out nine reactions likely used by Goethe in his *Elective Affinities*, he defines the illicit child, created out of the double elective affinity reaction AC + BD → AC + BD + P, as a “precipitate” (P), with the other molecular entities being: Charlotte (A), Eduard (B), Captain (C), and Ottilie (D).

6.

Jim Eadon (1968-)
English physicist

2001

Considers a person to be a "human chemical"; started the running online poll “Are You A Giant Molecule?”, which has found, over the last ten years of polling people [N=350+], that 57 percent of people answer yes to this question or, in other words, believe they are a "giant molecule".

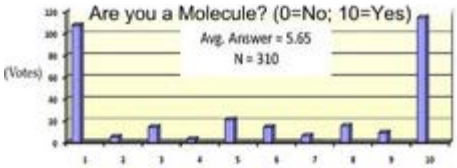

7.

Peter Farrelly (1956-)
American screenwriter

2001

Inserted the explanatory comment, said by Hal's coworker (right), “when are you going to get it, they’re just well formed molecules”, in the 2001 Beckhap’s law stylized comedy film *Shallow Hal*, as a dumbed-down chemistry description of beautify women.

8.

Bobby Farrelly (1958-)
American screenwriter

2001

Co-writer of the 2001 film *Shallow Hal*; the likely creative source behind the “beautiful people are well-formed molecules” quote, as he is a graduate of Rensselaer Polytechnic Institute, whereas his older brother Peter is a graduate of Columbia University, where he studied writing.

9.

Paul Peachey (c.1927-)
American writer

2001

Wrote the chapter “The Marital Bond as the Human Molecule”, the view that each person can be considered as an atom and that attachments of human atoms, in families and marriage, constitute a human molecule.

Libb Thims
(c.1975-)
American chemical

Arrived at the "human molecule" perspective in 2002, after ruminating on the human chemical reaction perspective, i.e. A + B → C, for seven years, and in September, independent of Sterner and Elser, calculated a 26-element molecular formula for the average human being:

10. engineer, electrical engineer, and thermodynamicist 2002

$H_{2.5E9}$ $O_{9.7E8}$ $C_{4.9E8}$ $N_{4.7E7}$ $P_{9.0E6}$ $Ca_{8.9E6}$ $K_{2.0E6}$ $Na_{1.9E6}$ $S_{1.6E6}$ $Cl_{1.3E6}$ $Mg_{3.0E5}$ $Fe_{5.5E4}$ $F_{5.4E4}$ $Zn_{1.2E4}$ $Si_{9.1E3}$ $Cu_{1.2E3}$ $B_{7.1E2}$ Cr_{98} Mn_{93} Ni_{87} Se_{65} Sn_{64} I_{60} Mo_{19} Co_{17} V

Began making evolution tables in 2005; wrote the first chapter on the human molecule in 2007; wrote the first booklet on the history of the human molecule, *The Human Molecule*, in 2008.

Wrote the 2002 book *Little Fun Book of Molecules Humans*; retitled as *molecules humans* in the 2010 second edition. Synopsis:

11. John Hodgson (c.1950-) 2002

> "This book looks at the similarities existing between two entities. If we understand more of each entity there may be clues to hold new scientific information leading to new research."

The book contains ninety-eight chemical aphorisms.

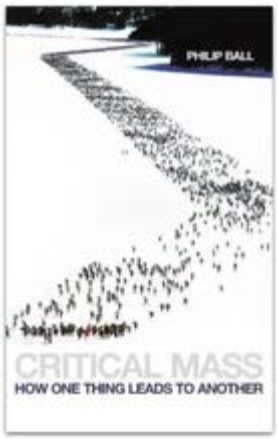

States, in his 2003 talk on physical modeling of society, that: “we have begun to regard complex modes of human activity as collections of many interacting ‘agents’—somewhat analogous to a fluid of interacting atoms or molecules, but within which there is scope for decision-making, learning and adaptation”. His followup 2004 book *Critical Mass* (outlining a critical mass theory), introduces the view:

12. Philip Ball (1962-) English chemist and physicist 2003

> “To develop a physics of society, we must take a bold step that some might regret as a leap of faith and others as preposterous idealization. You may have guessed it already: particles become people. To make that bold step a little easier, I shall introduce a stepping-stone that will bring life into the picture before we have to worry about such things as free will.”

This book, which sparked heated responses, e.g. Fuller (below), outlines a human particle themed social physics that: “treats people as though they were just so much insensate matter (a contentious business), which is why we shall approach the physics-based modeling of society with cautious steps, showing how life (I am tempted to say ‘mere life’) need

not in itself present a boundary to the application of statistical physics; the human physics theories of Thomas Hobbes, Lewis Mumford, Emyr Hughes, Ludwig Boltzmann, James Maxwell, etc.

13.	Jeff Vail (c.1970-) American air force intelligence officer and trial attorney	2004	Argues, in his *A Theory of Power*, that humans are a “complex assemblage of particles”, but that the true substance and nature of a person, in the modern quantum-mechanical particles-physics view, is the nexus of fluxating and changing connections to others, each of which constitutes a "power-relationship", specifically: “the networks of connections, not the elements connected, appear to constitute a more accurate map of reality”; people are a “nebulous web of constantly changing energies and waves of probability: these energies and connections may represent all that actually exists; the connections, the power relationships between perceived entities make up the world around us, not the illusion of particles.”
14.	Michael Brooks (1970-) American quantum physicist	2005	His popular *New Scientist* article on things that don't make sense resulted in the followup 2008 book *13 Things that Don't Make Sense*, in which "life", was listed as one of the top five things in modern science that doesn't make sense, the subtitle for the chapter being "are you more than just a bag of chemicals", which outlined the basics of the defunct theory of life.
15.	Shawn LaPaix (c.1976-) Canadian communications designer	2005	Depicted English biologist Thomas Huxley’s 1863 famous evolution of man diagrammatic as the evolution of molecules or the evolution of the human molecule, shown adjacent, for a University of British Columbia Art Gallery Poster “The Human Body in History: Medicine, Biology, and Culture”; the atoms falling off seem to be depicting the turn-over factor.
16.	Steve Fuller (1959-) American philosopher and sociologist	2005	(Ball) Wrote the *New Scientist* article "I Am Not a Molecule", arguing against atomic reductionism in sociology, wherein he argues that the recent social physics attempts, in particular English chemical physicist Philip Ball’s 2004 *Critical Mass*, wherein masses of people are treated as bulk systems of atoms, is "infuriating the social scientists".
17.	Lev Shneider (1946-) Russian-born American science fiction writer	2005	Dialog: “Talk is cheap. Talk is safe. Let’s talk about love. Lust flares and dims. Relationships start and end. Love is or isn’t. Love is a person, a separate entity with its own body, metabolism, and dreams. Love is two human molecules bound to make a third.”
18.	John Claxton (c.1970-) American creative advertising director	2006	In 2006, Dow Chemical, the world’s second largest chemical manufacturer, in coordination with advertising agency Draftfcb Chicago, particularly creative director John Claxton, launched their popular multi-year advertising campaign The Human Element, the “missing element” of the periodic table, depicting visceral images of people, many from third world countries, with the element symbol box, symbol Hu, and atomic number 7E+9, overlaid on the picture, in aims to convey the message that the human is a type of chemical element that is somehow missing from the standard chemical periodic table, but one that should be the focus of beneficial-to-humanity chemical applications.

19.	John Wojcik (1938-) American physical chemist	2006	(Rossini) In the Rossini debate, argued that there is great “danger” in the use of “anthropomorphism in chemistry” in that some may “come to believe that there is substance in them”; moreover: “worst of all, there is the danger that chemical thermodynamics will have ascribed to it a power that it simply does not have, namely, the power to 'explain' the human condition.”
20.	Natalia Roubanenko (c.1980-) Russian-born American language studies scholar	2006	(Thims) Quote: “One day instead of (or in addition to) regular math, chemistry, physics, etc., kids in school will be learning something like one human molecule + another human molecule = ? ... it's just a crazy thought, but hey, we'll see or somebody will.”
21.	 Georgi Gladyshev (1936-) Russian physical chemist	2006	|Deleted:W| (Thims) | Concluded, in his *Journal of Molecular Sciences* article “The Principle of Substance Stability is Applicable to all Levels of Organization of Living Matter”, that the “conclusions of hierarchical thermodynamics correspond excellently to Libb Thims’ conception of the thermodynamics of human molecules.”
22.	 Mark Janes (1973-) English biological scientist	2006	|| In circa 2006 began to model a person to be a type of ‘amplified atom’ or ‘gigantic carbon atom’, with wave and particle properties, and uses aspects of thermodynamics, particle physics, and the atomic model logic to explain facets of humanity in his “carbon entromorphology” theory; in 2009, on a whim invitation to a Halloween party, dressed up as “Mr. Carbon Atom” (adjacent), which was a hit, decorated with the various atomic orbitals and properties of carbon; the 2010 follow-up video was 'Mr. Carbon Atom' (see also: Mr. Molecule, Patton, 1919).
23.	 Peter Pogany (c.1939-)	2006	Quote: “accumulated knowledge suggests that humans are billions of highly evolved, overgrown super-molecules (or ‘intensely conscious mice’?) that swarm in ever larger numbers on a piece of rock that wobbles, spins, revolves, and soars into nothingness at break-neck speed with an agitated, burning furnace in its interior.”
24.	Pierre Rousseau (c.1950-) American philosopher-photographer	2006	| Photographed a flow of commuter traffic and described it as "a constant flow of human molecules" in tribute to Kant's categorical imperative.
25.	 Andrew Morrow (1961-) American chemical engineer	2006	| Outlined a type of internet-connectivity philosophy on the view that people are “mosaics of atoms with a mind”, whereby, aware of this reality, one should attempt to see reality from the viewpoint of reactions of one’s fellow human beings to oneself, so to see if further insight can be found. Comments, in his 2009 video *We are Made of Atoms*, “you are made of atoms and there is no escape from this knowledge. Peace and happiness but first you must be wiser”; as of 2010 is working on a new book, *A Periodic Table of Civics*, aimed at incorporating philosophy application. |W| Theorizes on power laws (2000) of human behavior and wrote the 2007 book *The Social Atom*, in which he outlined a social atom theory; quote:

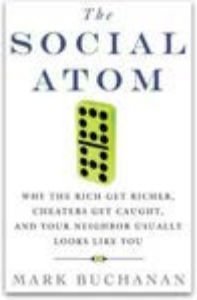

26.	Mark Buchanan (1961-) American physicist	2007	"We should think of people as if they were atoms or molecules." Buchanan has chapters such as the adaptive atom, the imitating atom, the cooperative atom; builds on Thomas Schelling's 1971 Empedocles-style, oil and water, physics theory of racial separation; and attempts to outline a social physics that "in no way conflicts with the existence of individual free will."
27.	Octavian Ksenzhek (c.1945-) Russian bioelectrochemist	2007	Quote: "the economy of mankind is a very large and extremely complicated system [and] people are the 'molecules' of which it consists"; on this view outlined an economic thermodynamics theory.
28.	Viktor Minkin (c.1965) Russian biometrist	2007	(Thims) Quote: "if we have rules form molecular behavior, why not adopt these terms for human behavior"; says he finds no arguments against the modeling of humans as molecules or the application of chemistry and thermodynamics to explain their behavior.
29.	Chris Gash (c. 1980-) American illustration artist	2009	Humorously illustrated the 2009 New York Times article "Experiments Show that Molecules Can Walk, but Can They Dance?" with the a stick figure (adjacent) of a little running human molecule, poking fun at the idea of a walking molecule. [10]
30.	Surya Pati (1983-) Indian chemist and business management theorist	2009	Defined human as "chemical molecules"; explains how the basic principles of chemical thermodynamics can facilitate the understanding of 'bonding' between people, such as in basic combination reaction A + B → AB, in which two persons, A and B, as he says, "come together to form a molecule".
31.	Bruce Bathurst (c.1945-) American geological thermodynamicist	2009	|(Thims)| |User:W Commented a his response tread "Why I'm Not a Molecule" that he is not a molecule because (a) one need not slavishly adopt terminology from the physical sciences; (b) new terms are of value only if they are synonyms of terms in other sciences, mathematics, or everyday language; (c) being made of atoms is not sufficient to be a molecule; (d) humans have a soul which is something that only God can examine, then that's not a question science is qualified to address. Quote: "here the human molecule of the social sciences fails. Sometimes, when discussing giving birth or dying, one want instead the chemical substances of human beings, as the quantity or mass of the unit NaCL in a halite-bearing rock. At other times, one wants a collection of separate but equivalent entities whose bonds one can define in psychological terms. These should be different terms. Each of these have some properties of a molecule, but not all. 'Molecule' now brings to the mind a discrete substance (floating about) made of the same number & kinds of atoms, bonded in the same manner. They differ only in the physical properties 'isotopic mass' and 'handedness'. Geologists use instead 'substance', a much more flexible term. Substances react, and

			classical thermodynamics studies them. Chemical formulae above represent chemical compositions of the human substance."
32.	Philip Moriarty (c.1965-) English thermal physicist and nanoscientist	2009	(Thims) | Quote: "what's flawed is [Thims'] remarkable assertion that thermodynamic principles can be applied to 'human molecules'. His view: 'It is only a matter of extrapolation to apply this logic to systems of human molecules...', beggars belief! No, it is not a matter of extrapolation. Just as it is not a matter of extrapolation to take fundamental quantum mechanics and apply it to 'human molecules'. What physical evidence does [Thims'] have for a 'human wavefunction'? Has [he] somehow carried out the equivalent of the double slit experiment for humans?! Does [he] understand what is meant by decoherence or complementarity in the context of QM?"
33.	Lynn Liss (1977-) American consultant and business executive	2009	(Thims) Quote: "after reading the background on this debate, it seems that Moriarty may simply be scared of what humans as molecules driven by entropy would mean to the mind of civilization and his own mental state! It's a common reaction by many people, scientists and layman alike, thus not surprising. There once was a time when humans we're certain our evolutionary history was most definitely *not* tied to a furry animal...and this debate still continues today. At least there are an enlightened few that continue to push our quest for human understanding further along ... versus remaining status quo."
34.	Thomas Wallace (c.1937-) American physical chemist	2009	In his *Wealth, Energy, and Human Values*, argues that the socioeconomic operations of society are "analogous to the scientific concepts and principles of molecular reactivity"; argues that the functional steps of societal processes and the related energy considerations occur in the same manner as the mechanisms of net chemical reactions (initial state to final state); that the principles of molecular events are also applicable to the social, economic, and political processes of civilizations; that the dynamics that drive civilization are based on thermodynamics.
	Juan Aguado (c.1970-) Spanish sociologist	2009	In his *Technology and Social Complexity*, attempts to argue that Erwin Schrodinger's 1944 statistical thermodynamics explanation of life, in some way, does not apply correctly to people viewed as 'social atoms' or 'social molecules' so as to make deterministic laws for society, on the argument that there are not enough people in a given society "to make stochastic or thermodynamics behavior negligible." [14]
35.	Bogdan Anghel (1984-) Romanian electronic music producer	2010	| (Thims) Produced the electronic music EP *Human Thermodynamics*, with the tracks 1. Pressure correlations (5:27) - themed on the gas laws; 2. Phase transition (7:10) - themed on phase transitions topics, e.g. Gibbs phase rule, enthalpy of vaporization, etc.; 3. Aerospace race (7:07) - themed on human molecules flying or racing about like gas molecules; 4. Transport phenomena (8:03) - themed on heat or mass transport of humans; with a cover art depicting futuristic humans flying about like semi-attached gas particles over the surface of a futuristic earth.
36.	Vineet Nayar (1962-) Indian business executive	2010	Quote: "when a critical mass of employees [activate] (usually, 5 or 10 percent is all you need), throughout the company, it creates a kind of fusion – a coming together of the human particles in the corporate

			molecule that releases a massive amount of energy."
37.	Martin Gardiner (c.1950-) Brazilian psychologist and writer	2010	||||(Thims) |Wrote the four-part article "Inside the IoHT: I am not a molecule", for the Ig Nobel Prize publication *Improbable Research*, a look at the human molecule theories of American chemical engineer Libb Thims in connection with the Institute of Human Thermodynamics. [2]
38.	Brother Greg (c.1960-) American religious studies scholar and ex-minster	2010	Blog-posted with the query: "quarks, atoms, molecules, amino acids, cells, tissues, critters, human critters … what is a human being, anyway?"; followed by the popup snap-shot quote as pictured adjacent. [11] 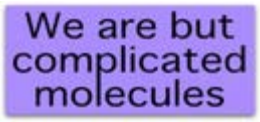
39.	Provident Peterson (c.1950-) American writer	2010	|Outlined the view, in his book *The Universe, God, and Us*, that humans are material substance made of atoms that formed from a descendant of the first God-infused Alpha 'human molecule', which itself formed from the first God-infused Alpha atom, which Peterson posits was carbon.

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θΔics

In hmolscience, **Holbach's geometrician** refers to []

Overview

In 1770, Baron d'Holbach, in his §4: "Of the Laws of Motion common to all the Beings of Nature—of Attraction and Repulsion—of Inert Force—of Necessity", stated the following very-ripe anti-chance (or non-chance) view of a dust storm and a political revolution: [1]

> "Two examples will serve to throw the principle here laid down, into light—one shall be taken from **physics**, the other from **morals**. In a whirlwind of dust, raised by elemental force, confused as it appears to our eyes, in the most frightful tempest excited by contrary winds, when the waves roll high as mountains, **there is NOT a single particle of dust, or drop of water, that has been placed by 'chance'**, that has not a cause for occupying the place where it is found; that does not, in the most rigorous sense of the word, act after the manner in which it ought to act; that is, according to its own peculiar essence, and that of the beings from whom it receives this communicated force. A **geometrician exactly knew the different energies acting in each case**, with the properties of the particles moved, could demonstrate that after the causes given, each particle acted precisely as it ought to act, and that it could not have acted otherwise than it did.
>
> In those terrible convulsions that sometimes agitate political societies, shake their foundations, and frequently produce the overthrow of an empire; there is not a single action, a single word, a single thought, a single will, a single passion in the agents, whether they act as destroyers, or as victims, that is not the necessary result of the causes operating; that does not act, as, of necessity, it must act, from the peculiar essence of the beings who give the impulse, and that of the agents who receive it, according to the situation these agents fill in the moral whirlwind. This could be evidently proved by an understanding capacitated to rate all the action and re-action, of the minds and bodies of those who contributed to the revolution."

Here we see Holbach, in his jettisoning of Greek chance-based version of atomic theory, stating what would later become the basis of Laplace's demon, as formulated by Pierre Laplace, after studying the works of Holbach.

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θΔics

In science, **holism**, seen as the opposite of reductionism, is a theory that the universe and especially "living nature", aka powered CHNOPS+ animate nature, is correctly seen in terms of interacting wholes, such as of living organisms, which are more than the mere sum of elementary particles. [1]

Overview

In 1888, Charles Whitman, an American zoologist, in his "Seat of Formative and Regenerative Energy", as cited by Judson Herrick (1956), outlined the following early holism-like statement:

> "So in the development of a germ, in the repair of injured parts, and in the regeneration of lost parts, the fact is irresistibly forced upon us, that the '**organism as a whole**' controls the formative processes going on in each part. The formative power then belongs only to the organism as a physiological whole, and it does not represent a sum or aggregate of atomic, molecular and other forces; and it disappears as such the moment the nexus is destroyed."

In 1926, Jan Smuts, an South African philosopher and statesman, in his *Holism and Evolution*, introduced the term "holism" . [2]

In 2005, Peter Corning was presenting holism in the form of a mixture or hodgepodge of combined types various systems theories, such as chaos theory, complexity theory, emergence theory, cybernetics, synergy, bioeconomics, and evolution, often sewn with references to entropy. [3]

The Santa Fe Institute is often viewed as a representative school of holism thought.

Quotes

The following are related quotes:

> "The conception of the 'organism as a **whole**' may in a degree be mystical as used by some writers, the demonstration of a specific mechanism that at all times makes the normal individual a unit takes this conception out of the realm of mysticism or vitalism and places it on a scientific foundation."
>
> — George Coghill (1930), "The Structural Basis of the Integration of Behavior" [5]

> "At its nuttiest extreme are those with **holistics** in their heads, those whose reaction to reductionism takes the form of a belief in psychic energies, life forces that cannot be described in terms of the ordinary laws of inanimate nature."
>
> — Steven Weinberg (1992), *Dreams of a Final Theory* [4]

> "At first glance, it appears that the paradigm of 'reduction', the idea that the whole is just the sum of its parts (presuming, as it does, that the parts exist independent of the whole), is untenable when applied to a study of international relations. The opposite of reductionism might be characterized as **'holistics'**, that you cannot understand the whole in terms of its parts but must create an entirely different science starting from the whole (e.g., developing a science of the physical behavior of gases without presuming the existence of molecules—a science which actually has been done, i.e. thermodynamics, with limited successes). The practitioners of reductionism would counter that if you really know the properties of the individual, including knowledge of how that individual is governed by the environment in which it finds itself, that you could deduce the properties of the collective. Such an attitude towards a science, such a working hypothesis

for the acquisition of further knowledge, is non-testable, as is Occam's razor. You can't say reductionism is wrong; its supports will say you haven't pushed it far enough. The same can be said for holistics. However, when progress towards knowledge in a reductionism sense is made (as was the case with the physics of gases), it is usually felt that more understanding has been gained: you know more about something when you can link its behavior to that of its elements. I choose to try to make progress in this sense."

— Alvin Saperstein (1999), *Dynamic Modelling of the Onset of War* (pg. 22)

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External links

â— Holism – Wikipedia.

θΔics

In hmolscience, **Holmes Rolston** (1932-) is an American religious philosopher-physicist noted, in religious thermodynamics, for his 1999 argument that god is the counter-current to entropy that lures life up the evolution ladder.

Overview

In 1999, Rolston, in his *Genes, Genesis, and God: Values and Their Origins in Natural and Human History*, argued to the effect that: [1]

> "One can posit god as a countercurrent to entropy, a sort of biogravity that lures life upward."

Rolston, supposedly, adheres to the main tenets of Darwinian evolution in his philosophy; albeit likely maintains some type of religious adherence. Rolston culls from Norbert Wiener in his thermodynamics explanations of life and evolution, in what he calls "cybernetic creativity", or incremental gains in information that have been conserved and elaborated over evolutionary history; in the latter ideas he cites Jeremy Campbell. Rolson's thermodynamics views on life are as such:

> "The knowhow, so to speak, to make salt is already in the sodium and chlorine, but the knowhow to make hemoglobin molecules and lemurs is not secretly coded in the carbon, hydrogen, and nitrogen. Life is a countercurrent to entropy, an energetic fight uphill in a world that typically moves thermodynamically downhill (despite some negentropic eddies, and despite some irreversible thermodynamics). Thermodynamics need be nowhere violated, because there is a steady 'downhill' flow of energy, as energy is irradiated into earth from the sun, and, eventually, reradiated into space."

In this last quote, Rolston seems to be culling from a mixture of the life-entropy theories of English astronomer Arthur Eddington (1928) and Belgian-born English thermodynamicist Alfred Ubbelohde (1946).

Education

Rolston completed his BS in physics (1953) from Davidson College, a BA in divinity (1956) from Union Seminary, became an ordained minister in 1956, completed his PhD in theology in 1958 at the University of Edinburgh; an MA in philosophy of science (1968) at the University of Pittsburgh, thereafter becoming a professor of philosophy at Colorado State University.

References

1. Rolston, Holmes. (1999). *Genes, Genesis, and God: Values and Their Origins in Natural and Human History* (entropy, pgs. 42, 155, 351, 357-58, 364-65); biogravity and god, pg. 364; thermodynamics, pgs. 357, 385, 399). Cambridge University Press.

External links

â— Holmes Rolston III – Wikipedia.
â— Rolston, Holmes (1932-) – WorldCat Identities.

θΔics

In religio-mythology, **Holy Spirit** is a monotheistic rescript of mythical lightening-flash, time-stopped, powered sperm of the dead but resurrected-for-a-moment god Osiris.

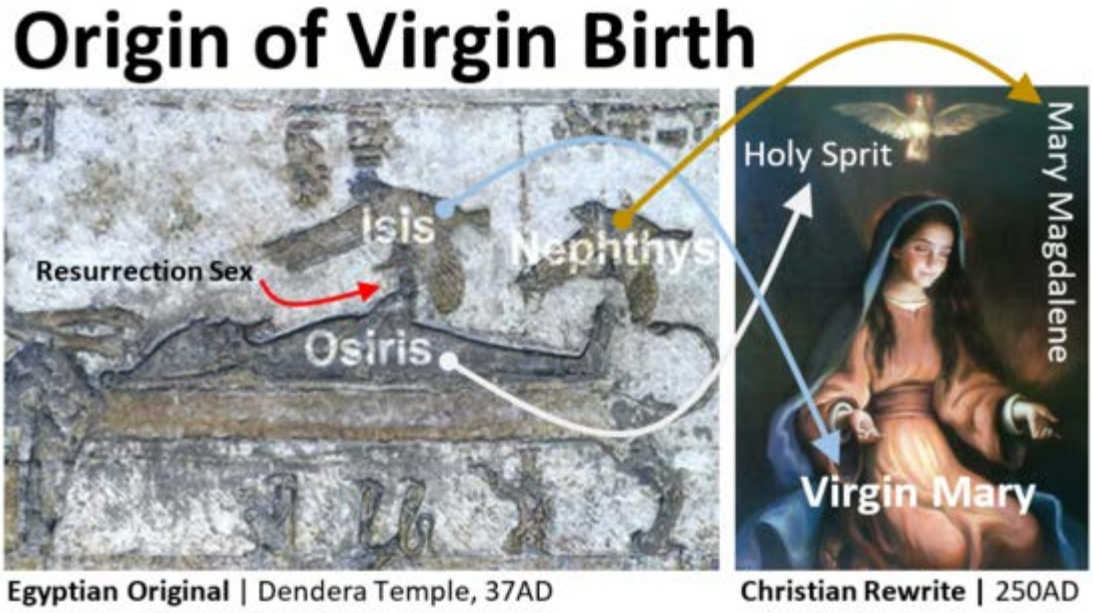

A depiction of Isis, in the form of a kite or falcon, on the walls of Dendera Temple (37AD), getting pregnant with the sperm of the deceased but resurrected-for-a-moment god Osiris, which became, during the Roman recension, the story of Mary getting pregnant via the powers of the **Holy Spirit**; a monotheistic retelling of a polytheistic story, in short.

Overview

In In c.2000BC, in Spell 148 of the Coffin Texts, what would eventually become, in the Roman recension, the "Holy Spirit" that impregnates the Virgin Mary, is described according to a story wherein the goddess Isis, after dreaming about turning into a falcon, or something to this effect, wakes up pregnant with the seed of the deceased god Osiris: [1]

> "Isis, taking the shape as a Falcon. The lightening-flash strikes [see: black rite] and the gods are afraid. **Isis wakes pregnant** [see: virgin birth] **with the seed of her [deceased] brother [husband] Osiris**. She is uplifted, **even she the widow [of the dead Osiris]**, and her heart are glad with the seed of her brother Osiris. She says: 'Oh gods! I am Isis the sister of Osiris who wept for the father of the gods, Osiris, who settled the slaughterings of the Two Lands [Upper Nile/Lower Nile]. **His seed is within my body**, and it is as the son of the foremost of the Ennead who will rule this land and who will become heir to Geb [Joseph] and who will speak for his father and who will slays Seth, the enemy of his father Osiris, that I have molded the shape of the **god [Horus]** within (my) egg. Come, Oh gods, so that you shall make his protection within my womb. Know in your hearts that **your lord is he**, this god, who is in his egg, blue(?) of form, the lord of the gods. Great is their beauty, namely (that of) the blue barbs(?) of the two plumes'."

In short, during the Roman recension (100-500AD), the above polytheism of gods, specifically: Isis, Osiris, Set, Horus, Geb, Ennead, are converted, via the god-to-prophet technique of the Hebrews, into a newly reformulated monotheism, wherein the "seed of her [deceased] brother [husband] Osiris", intermixed with the resurrection powers of "lightening flash strikes", during which the god Thoth makes time stop (see: black rite), becomes the "Holy Spirit", Isis becomes the Mary, Geb becomes Joseph, Set becomes Satan (or the devil), and Horus becomes Jesus.

References

1. (a) Faulkner, Raymond. (1968). "Translation of Spell 148 of the Coffin Texts", *The Journal of Egyptian Archeology*, 54:40-44.
(b) Gilula, Mordechai. (1971). "Coffin Texts Spell 148" (Ñº), *The Journal of Egyptian Archaeology*, 57:14-19, Aug.
(c) Luckhert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective* (pg. 92). SUNY Press.

θΔics

In science, **homeokinetics** is a method of applying the laws of thermodynamics to all self-organizing systems of the universe, including human systems, with focus on the vertical movements and exchanges between hierarchic systems. [1] The following quote is subject originator American engineer-physicist Arthur Iberall's circa 2000 video interview description of homeokinetics: [7]

> "Ordinary physics is a flatland physics applying to any particular level. Homeokinetics physics is associated with that is the up down processes that bind the levels; the up down movements implies thermodynamics, among other things."

In 1995, Iberall defined homeokinetics as a "generalized thermodynamic approach to complex systems." [4] Homeokinetics is described as the study of complex systems, such as universes, galaxies, social systems, people, down to simple systems such as gases. The entire universe consists of atomistic-like units bound in interactive ensembles to form systems, level by level in a nested hierarchy. Homeokinetics treats all complex systems on an equal footing, animate and inanimate, providing them with a common viewpoint. [2] The subject of homeokinetics, in this sense, seems to be similar to Russian physical chemist Georgi Gladyshev's circa 1977 hierarchical thermodynamics.

Complex system

Iberall describes a complex system as an association of "atomisms" or unit atomisms (atomistic like entities or structures of similar atomic nature), which are small and relatively common among each other, engaged in interactions, or in the simplest form colliding with each other because there are things bringing them together and pushing them apart, thus creating interplay in a large game. [6] In human system, then, each person would be described as an "atomism" or human atomism, in the Iberall scheme, similar to the terms: human atom, social atom, or modern human molecule. [4]

History

The seeds of the homeokinetic theory seem to stem from the 1965 work of American neurophysiologist Warren McCulloch who outlined a cybernetic introduction to a physical science of the mind. [5] Iberall considers himself to be "one of McCulloch's inheritors". [4]

The main theme of the homeokinetics was initiated in the 1970s by American engineer-physicist Arthur Iberall, who is described as the "founder of homeokinetics", considering himself to be "one of McCulloch's inheritors", and American nuclear physicist Harry Soodak. Iberall and Soodak, who seem to have envisaged homeokinetics as a new branch of physics that deals with the movement and dynamics between the different hierarchies of systems, up and down, in the universe, wrote one of their their first joint articles on the subject in 1978. [6] Iberall outlined the subject further in his 1998 booklet *Primer for Homeokinetics: a Physical Foundation for Complex Systems*. [3]

See also

â— Complexity theory

External links

1. Kugler, Peter N. (2007). "Complex Systems, Self-Organization and Emergence through Measurement: A Study in Semantic Modeling", Arthur S. Iberall Distinguished Lecture Series on Life and the Sciences of Complexity, Dec 07, University of Connecticut.
2. Arthur Iberall Lecture series (2003-2009) – International Society for Ecological Psychology, Trinity College, Harford Connecticut.
3. Iberall, Arthur S. (1998). *Primer for Homeokinetics: a Physical Foundation for Complex Systems.* 45-pgs. Cri-de-Coeur Press.
4. Iberall, Arthur S. (1995). "A Physical (Homeokinetic) Foundation for the Gibsonian Theory of Perception and Action", *Ecological Psychology*, 791): 37-68.
5. McCulloch, Warren S. (1965). *Embodiments of Mind* (pgs. 72-87, 87-136). MIT Press.
6. Soodak, H, Iberall A. (1978). "Homeokinetics: A Physical Science for Complex Systems" (abstract), *Science*,

201(4356): 597-82.
7. Iberall, Arthur. (2009). “On Homeokinetics” (V), valscds2, Feb 22.

External links

â— Homeokinetics: the Physics of Complex Systems – International Society for Ecological Psychology, Trinity College, Harford Connecticut.
â— Homeokinetics – Wikipedia.

θΔics

In existographies, **Homer** (c.850-750BC) (IQ:175|#277) (Cattell 1000:13) (RGM:37|1,500+) (Hart 100:88) (ACR:2) [CR:51] was a Greek writer, a universal genius claimant, the purported author of the *Iliad*, focused on a quarrel between king Agamemnon and the warrior Achilles, and the *Odyssey*, focused on journey of Odysseus, king of Ithaca, after the fall of Troy.

Influence

Ovid, as a youth, was frequently reminded by his father, that Homer "died poor". [1]

Influenced

Francis Edgeworth is said to have had a photographic memory and could repeat numerous passages from Milton, Pope, Virgil, and Homer in his old age knew Greek, Latin, German, Italian, and Spanish. [2]

Other

The character "Daedalus" the famous wing maker, maze maker, mythological figure of the circa 900 BC stories of Homer, referred to as a 'great worker', is the pen name of the c.1975 molecular sociology author Daedalus.

References

1. Ovid. (8AD). *Metamorphosis: Stories of Changing Form* (§:Introduction, pgs. v-ix) (translator and introduction: Rolfe Humphries). Indiana University Press, 1955.
2. Skousen, Mark. (2009). *The Making of Modern Economics: the Lives and Ideas of Great Thinkers* (pgs. 223-24). M.E. Sharpe.

External links

â— Homer – Wikipedia.

θΔics

In hmolscience, **homework problems** are any number of noted example problems and queries proposed in various articles and books, some of which are slowly being collected below and given out as assigned questions to students, such as in human thermodynamics education.

In 1975 to 1995, American materials scientist engineer John Patterson, at Iowa State University, famously gave handouts of various creationist claims about thermodynamics to his thermodynamics students to find the reason for the incorrectness of each statement as homework assignments.

133. Whose interests in identifying law-like behavior in the themes studied by social scientists had led him to develop a new field of study that he named Social Physics?
(a) Hagerstrand (b) Stewart
(c) Burton (d) Haggett

27. Which of the following was based on the premise that *"dimensions of society are analogous to the physical dimensions and include numbers of people, distance and time"*?
(a) Social Physics
(b) Geosophy
(c) Locational Analysis
(d) Humanistic Geography

Two hmolscience style multiple choice **homework problems**, from the 2009 book *Geography Work Book* by Indian geographer S.K. Manocha, identifying American physicist John Q. Stewart as the initiator of the field of social physics or sociophysics as the field came to be called into the 1980s. [16]

The original listing of actual college textbook style and of chapter homework problems were penned by American physicist Alan Lightman in 1992, Swedish physical chemist Sture Nordholm in 1997, American astrophysicist Christopher Hirata in circa 2000.

In 2003, American mechanical engineers Michael Moran and Howard Shapiro, in their *Fundamentals of Thermodynamics*, and subsequent editions to follow (2007, 2010), began to include a few thermodynamics applied to humanities stylized homework problems. [11]

Some of these homework problems, and others, are listed below, in order of ranking predominance:

Nordholm's problems | Human chemical thermodynamics

In 1997, Swedish physical chemist Sture Nordholm, in his *Journal of Chemical Education* article "In Defense of Thermodynamics: an Animate Analogy", first outlined the subject of what he called animate thermodynamics, or thermodynamics applied to the humanities, and then concluded with eight example homework problems. These are listed below (first column), each listed with with Nordholm's appended "comments" (second column). The third column contains links to Hmolpedia pages that might be helpful or give clues to solving the given problem.

Questions	Comments	Clues/Related
P1. Discuss the human driving forces that brought down the Berlin wall.	Comment: was it not a search for freedom acting like an osmotic pressure that brought down the wall?	● Drive ● Social pressure
P2. Which physical property most directly influences the relative importance of energy minimization and entropy maximization in an inanimate physical system? Can you think of an equivalent property applicable to human behavior?	Comment: Temperature establishes the balance between energy and entropy in inanimate thermodynamics. Would "standard of living" similarly describe the balance between wealth (or poverty) and freedom?	● Gibbs free energy ● Spontaneity ● Spontaneity criterion
P3. Discuss the political systems dictatorship and democracy from the point of view of the proposed rules of human behavior. Which system of government is most in tune with animate thermodynamics? How might the level of education in a society influence the choice of system government?	Comment: is not democracy a form of government in tune with the thermodynamics of animate behavior? If generates freedom (entropy) by spreading decision making among people. Clearly the individual rights granted all citizens are also balanced against restrictive laws with the general intent of maximizing total freedom in society. Dictatorship, on the other hand, attempts to put a straightjacket on freedom by a combination of threats and promise of material reward. This runs counter to the basic law of animate thermodynamics. A high level of education simply speeds up the irresistible tendency to maximize freedom by making people aware of more alternatives and better equipped to explore them.	● Rossini debate ● Freedom ● Political thermodynamics ● Mental entropy
P4. In many texts disorder is associated with high entropy. Give a critical analysis of the relevance of	Comments: disorder is, at best, a very construed synonym of freedom. When used in texts on thermodynamics it is surely clear to the authors that disorder in an ideal gas increase with volume; but to most initiated, disorder is a more qualitative concept. A gas may then	

this analogy within first inanimate then animate thermodynamics. Is it true that anarchy maximizes freedom for individuals? How is the need for law and order related to the population density in society? Is there an inanimate analogy for this aspect of government of humans?	appear to be as disordered in a small volume as in a large volume. In the animate realm, youthful observers may think that anarchy is the ultimate freedom but the older and wiser know that constrains of the law, personal discipline, and morality actually increase freedom when summed over all members of society. The closer contact we have with the rest of humanity the more we need laws, discipline and morality. In inanimate thermodynamics it is known that the hard sphere fluid, the structure of which is only determined by the principle of maximal entropy, becomes ordered at high density.	● Principle of elementary disorder ● Human entropy ● Order, Disorder, and Entropy
P5. Is it true that spontaneous processes observable to us appear to be driven mainly by energy minimization? Why might this be so?	Comment: energy minimization appears to rule when the observed subsystem is at a higher temperature (has more energy per degree of freedom) than the environment. Observable processes around us often arise when macroscopic objects have been given large (superthermal) amounts of energy which are then in time dissipated out to microscopic objects in the environment. We can see the macroscopic but generally not the microscopic degrees of freedom. We can impart energy to a few objects of our own dimensions but cannot see the many atomic and molecular motions that receive the energy lost from the few macroscopic degrees of freedom by dissipation.	● Spontaneity ● Spontaneity criterion ● Spontaneous reaction ● Multiplicity
P6. In inanimate thermodynamics energy is usually conserved in the total system considered. However, in the world of human behavior, wealth is created and consumed by each individual to a varying extent. Consider the implications of this difference. Does it invalidate the analogy?	Comment: clearly wealth is an immensely multifaceted quantity that will be hard to fit into the mold of inanimate energy. However, is this not a problem more of practice than of principle? There would appear to be many cases of, e.g. economic behavior of humans, where the practice of thermodynamics is comparatively straightforward. In other cases the implementation of thermodynamics may involve unfathomable difficulty.	● Conservation of energy ● Robert Kenoun (2006) ● Frederick Soddy (1926) ● Economic thermodynamics ● Analogy
P7. Is human behavior more complicated than the behavior of inanimate matter? Consider this question and give supporting arguments for you conclusion.	Comment: the intuitive answer is ‘yes’, but try to justify it by considering what factors make an inanimate problem hard and apply the same criteria to the inanimate problem.	● Human behavior ● Animate matter ● Animate molecule ● Human molecule
P8. Thermodynamics is often applied to the evolution of life-forms on earth. Critics have opposed such applications, arguing that thermodynamics only become applicable when, for example, and animal dies. Which side of this argument do you favor? Why?	Comment: the very definition of life in distinction from lifeless existence seems capable of generating interminable argument. Perhaps the scale is continuous and divided into life and lifeless only by personal predilection. Where on such a continuous scale [great chain of being; molecular evolution table] would thermodynamics cease to be relevant?	● Second law (disordering) evolution (ordering) reconciliations ● Defunct theory of life ● Evolution ● Order-form-disorder

(add summary)

Lightman's discussion questions | Human thermodynamics

In 1992, American physicist Alan Lightman, in his *Great Ideas in Physics*, added end discussion questions which he says should be either solved by students as part of their coursework in a one semester course or done as part of an open classroom discussion: [5]

Discussion Questions II-8

Consider the excerpt from Henry Adams on pages 109–112. Is Adams's application of the second law to human society metaphorical or literal? If literal, what in human society corresponds to "states of the system"? What corresponds to "configurations of the system"? Is it meaningful to speak of configurations of low and high probability? Is there a sense in which "order" can be defined in human society?

Adams implies that Darwin's "Law of Evolution" involves progress and upward advancement. Do you agree with this interpretation of survival of the fittest?

Adams associates the human Will with the ability for variation and adaptability and argues that the decrease in genetic variation in man, and his weakened Will, are a natural consequence of the second law of thermodynamics. In what sense do you think that decreased genetic variation can be called a decreased Will? Do you think the second law governs either, and if so, how? What is the time period over which the second law would govern human society, according to Adams? Does this time period correspond to the time scale of physical processes associated with the second law? Is Adams optimistic or pessimistic about the future of human society? Do you think that historians today are familiar with the second law of thermodynamics? Should they be?

Here we are queried on the work of the great Henry Adams, the first dual thinker in both human chemistry and human thermodynamics, and his general aim to reformulate the study of human history in the form of history thermodynamics, based on the second law.

Discussion Questions II-9

One statement of the second law is that a physical system naturally evolves toward redistributing its energy equally among all of its parts. Zachary Hatch, of the class of 1991 of Princeton University, has proposed that the historical dissolution of empires—in which political power is first consolidated into large, centralized regimes and then ultimately dispersed into many smaller nation-states—can be understood on the basis of the second law of thermodynamics. For example, the end of World War II brought the end to Hirohito's Japan, the modern version of the feudal empire that had existed for hundreds of years. China, too, saw its several-thousand-year-old dynasty fall and be replaced with a socialist state. Recently, we have witnessed the disintegration of the Union of Soviet Socialist Republics. Do you think this application of the second law is justified? If so, what corresponds to the energy of the system? What is the political or social process that corresponds to molecules' bumping into each other and thereby redistributing and sharing the total energy? Does such a process have the needed element of randomness? What corresponds to a state and a configuration of the system? Would the second law, if applicable, preferentially lead to a capitalist or to a socialist society? If true, how would this theory reconcile itself with the *formation* of empires?

Here, interestingly, we are queried about the relatively unknown ideas on the thermodynamics of the the rise and fall of civilizations by Zachary Hatch; ideas of which have been produced prior to him by Henry Adams and after him by Thomas Wallace.

Discussion Questions II-10

Consider the excerpt from Thomas Pynchon on pages 112–113. How has Pynchon used the second law of thermodynamics? According to the second law, would the entropy of Maxwell's Demon increase or decrease as the Demon sorted the molecules? You can assume that the Demon plus the molecules constitute an isolated system. How would you compare Oedipa's feelings about the loss of information to the scientists' attitudes about the second law of thermodynamics?

Here we are queried on the subject of literature thermodynamics, via questions about the ideas of American writer Thomas Pynchon, the second law in society, entropy, Maxwell's demon, and information theory.

Discussion Questions II-11

Consider the excerpt from Henry Morris on pages 114–115. Why do you think Morris used a law from science to refute the theory of evolution? Do you agree with Morris that evolution represents an increase in order? If so, under what circumstances, if any, would this be allowed by the second law of thermodynamics? Is a living creature an isolated system? Is a refrigerator? Do you agree with Morris's arguments? If you disagree, why?

Here we are queried about the subject of religious thermodynamics by citing American engineer Henry Morris and his views on God, evolution, and the second law.

Lightman, in the same appendix, has other similar sorts of discussion problems / homework problems in areas of human physics, such as on how relativity and or how the Heisenberg uncertainty principle applies to the humanities, in areas such as philosophy.

Of note, in 1996, Lightman published a twenty-page solutions to addition problems manual. [6]

Hirata's exercises | Human chemical thermodynamics

In *circa* 2000, American prodigy turned astrophysicist Christopher Hirata, penned a number of "exercise examples" to each of the five parts of his "The Physics of Relationships" article (see: relationship physics); some of these are listed below: [8]

Exercises (relationship thermochemistry)	**Comments**	**Clues**
1. Solve the equilibrium constant expression for M, fx, and fy in the general case.		
2. If heat is released when a boy and girl get		

together, and they each take up the heat when they separate, then what is the sign of DE for the reaction X + Y ↔ XY? Does K go up or down if the temperature rises, say, because the population takes a trip to a beach in Hawaii? Does this make sense?

3. Test out Le Chatlier's principle on the X + Y ↔ XY equilibrium and check that your results make sense.

4. Challenge problem: Work out the mathematics of homosexuality in a men-only society through the reaction 2 Y ↔ Y2, considering limiting cases as was done in this chapter's treatment of heterosexual relations with both men and women present.

Exercises (complex equilibria of men and women)	**Comments**	**Clues**
1. Research and explain, in no more than a paragraph, why chemists of times past were so idiotic as to use the base ten rather than the natural logarithmic scale.		
2. Why would Caltech not be a good model for a strong interaction equilibrium of X, Y, and XY? Can you remedy the situation, perhaps by developing a theory in which [X] <<1?		
3. Suppose there are 40% girls and 60% boys in a population with $Kc=2.2. What fraction of the girls will be free according to the "exact" equilibrium constant? How bad or good is the theory of this chapter in explaining this system?		
(add)		

Moran

In 2003, Moran, in his *Fundamentals of Thermodynamics* (3rd ed), co-authored with American mechanical engineer Howard N. Shapiro (c.1947-), and editions to follow (2007, 2010), began to include thermodynamics applied to humanities stylized homework problems, mostly of the economics thermodynamics variety; the first of which is the following Nicholas Georgescu-Roegen 1971 "material entropy" framed query: [12]

6.10D Noting that contemporary economic theorists often draw on principles from *mechanics* such as conservation of energy to explain the workings of economies, N. Georgescu-Roegen and like-minded economists have called for the use of principles from *thermodynamics* in economics. According to this view, entropy and the second law of thermodynamics are relevant for assessing not only the exploitation of natural resources for industrial and agricultural production but also the impact on the natural environment of wastes from such production. Write a paper in which you argue for, or against, the proposition that thermodynamics is relevant to the field of economics.

The following are a few others from the 2007 edition: [13]

6.6D Classical economics was developed largely in analogy to the notion of mechanical equilibrium. Some observers are now saying that a macroeconomic system is more like a thermodynamic system than a mechanical one. Further, they say the failure of traditional economic theories to account for recent economic behavior may be partially due to not recognizing the role of entropy in controlling economic change and equilibrium, similar to the role of entropy in thermodynamics. Write a report, including at least three references, on how the second law and entropy are used in economics.

6.10D In recent decades, many have written about the relationship between life in the biosphere and the second law of thermodynamics. Among these are Nobel Prize winners Erwin Schrodinger (Physics, 1933) and Ilya Prigogine (Chemistry, 1977). Contemporary observers such as Eric Schneider also have weighed in. Survey and *critically evaluate* such contributions to the literature. Summarize your conclusions in a report having at least three references.

Here, in 6.6D, we see what seems to be discussion of pre-second law based thermodynamic economic equilibrium theories, and, in 6.10D, life and second law paradox discussions, as found in the works of Erwin Schrodinger (1944), Ilya Prigogine (1971-2003), and Eric Schneider (2005). The following is one from the 2010 edition, co-authored with Daisie D. Boettner and Margaret B. Bailey: [14]

5.1D The second law of thermodynamics is sometimes cited in publications of disciplines far removed from engineering and science, including but not limited to philosophy, economics, and sociology. Investigate use of the second law in peer-reviewed nontechnical publications. For three such publications, each in different disciplines, write a three-page critique. For each publication, identify and comment on the key objectives and conclusions. Clearly explain how the second law is used to inform the reader and propel the presentation. Score each publication on a 10-point scale, with 10 denoting a highly effective use of the second law and 1 denoting an ineffective use. Provide a rationale for each score.

(add summary)

Tyndall-Maxwell questions

In 1874 a debate erupted at a Belfast, Ireland, meeting of the British Association for the Advancement of Science (BAAS) on whether or not modern science will replace religion or whether the two will forever remain separate, which involved a number of the greatest scientists of the 20th century such as James Maxwell, and a number of the founders of thermodynamics, such as Peter Tait and William Thomson. The debate erupted when the newly appointed BAAS president John Tyndall announced boldly that "all religious theories, schemes and systems must submit to the control of science, and relinquish all thought of controlling it." In the four years to follow resulted in a number of articles published in Nature, one book, exchanges of post cards, and one last dying poem by Maxwell all centered around the nature of thermodynamics, death, morality, and the theories of immortality. A few of these openly discussed queries, as published mostly in *Nature*, are listed below.

Questions	Comments	Clues
Q1. Will religion eventually submit completely to the control of science?	This was Irish physicist John Tyndall's outspoken view over the recent growing controversy over the teaching of science at the Catholic University in Ireland. This is an ongoing issue as evidenced by the recent 2005 court case Kitzmiller v. Dover, in which American high school teachers had their jobs threatened for teaching evolution and the human implications of the origin of life.	● Tyndall-Steward-Tait debate ● Religion ● Religious thermodynamics ● Origin of life
Q2. Is a person's soul an amphicheiral knot governed by the evolution, thermodynamics, and cosmology?	This was the great James Maxwell's dying question, written in the last year of his existence, as he was dying from the same stomach cancer that took his mother at the same age that he died. In other words, in modern terms, knowing that a human is a molecule, with varieties of so-called "moral" and "amoral" movement, does a person, in reality, have a soul or measurable moral weight that is conserved in the course of the continuity of the universal movement, either though the conservation of force or conservations of energy or the first law of thermodynamics?	● Soul ● Soul theorist ● Soul snow ● Why I'm not a molecule ● Ra theology ● A Paradoxical Ode (1878) ● Immortality ● Philosopher's paradox ● Hermann Stoffkraft ● Human molecule ● Cessation thermodynamics ● What happens at death?
Q3. Do molecules feel something which is related to sensation?	This originated in by Swiss-born German botanist Carl von Nageli's 1877 lecture "The Limits of Natural Knowledge", commented on by Maxwell, in which the issue of what happens to conceptions such as consciousness, sensation, mind, free will, pain and pleasure, etc., when one begins to descend down the evolutionary ladder to the atomic origin level.	● Unbridgeable gap ● Philosopher's paradox ● Evolution timeline ● Carl von Nageli

Adams' problems

In 1873, American historian learned of Hippolyte Taine's job description of the historian as one who follows and studies the transformations of individual human molecules or groups of human molecules and in doing so writes out their psychology, after which, in the four decades to follow, Adams embarked in a path of self-education and the means to apply physics, chemistry, and thermodynamics to explain humanity. Some of the questions he grappled with along the way are listed below.

Questions	Comments	Clues
Q1. How would one go about constructing a science of "social chemistry" as the study of the attractions and repulsions of equivalent human molecules?	In 1885, Adams discussed this view in a letter to his wife, stating that it was a "science yet to be created", and that daily study of this topic gave him his greatest satisfaction.	● Human molecule ● Human particle ● Attraction ● Repulsion ● Human chemistry ● Social chemistry ● Gottman stability ratio
Q2. How would you go about formulating the thermodynamics of a socialistic society?	In 1909, Adams commented that he would walk a few thousand-million miles to be able to go back in time two years to discuss this subject with Scottish physicist William Thomson.	● Sociological thermodynamics ● Socio-thermodynamics ● Social physics ● Sociophysics
Q3. How does the second law of thermodynamics apply to history studies?	In 1910, Adams wrote an entire book on this subject and mailed it to all of the history teachers in America.	● Rise and fall of civilization ● A Letter to American Teachers of History

- History thermodynamics
- Phase rule

Rossini's problems

In his 1971 Priestly Medal addressed American chemical thermodynamicist Frederick Rossini argued that chemical thermodynamics can be used to explain the paradox between freedom and security in social life. Some thirty years later, following the 9/11 situation, Rossini's proposal was brought up again in the Journal of Chemical Educations, which sparked the heated Rossini debate, on whether or not chemical thermodynamics has any bearing on the human condition.

Questions	Comments	Clues
Q1. Find a formula, derived from chemical thermodynamics, for fighting terrorism, while preserving civil liberties?	This was American chemist Harold Leonard's 2006 proposal for solving the issues arising in the post 9/11 world.	● Rossini debate
Q2. Does chemical thermodynamics have the power to explain the human condition? If so, is there danger in this prospect?	This was American physical chemist John Wojcik's objection to Leonard's proposal.	
Q3. Is the usage of "entropy" to explain variations in levels of human of "freedom" nothing but a chemical anthropomorphism that has no part in the conceptual framework of science?	This is John Wojcik's view.	

Thims' problems

The following are a few example queries left open from American chemical engineer Libb Thims' 2007 *Human Chemistry* textbook summary chapter on human thermodynamics: [2]

Questions	Comments	Clues
Q1. How does one measure Oprah Winfrey's power (#14 in Forbes' 2006 list of world powers) in a manner equivalent to the lifting of buckets of water per unit time?		● Social power ● Power ● Horsepower ● Refs: [2][3]
Q2. What does Oprah's power have to do with daily household reactions and the work derived therefrom?	The question touches on the coupled nature of the typical 2.5 child family household, and the difficult to quantify nature of household work, which seems to be done without monetary reward, as contrasted with occupational work, which is more easily quantified by yearly salary.	● Free energy coupling ● Social power ● Power ● Horsepower ● Refs: [2][3]
Q3: How does one use the Gibbs free energy equation and thermodynamic tables to pick the right mate?	A key focal point to this problem is the study of the difference between the initial state (unbonded reacts) and final state (paired products) between two points (years) in time, particularly on the nature of the enthalpy change and entropy change between the two states of the systems of the reacting human molecules. Two significant points that may tend to be overlooked, initially, are that 85% of male-female reactions will result in a child product being produced in the end state as well as a bonded parental structure, of the unified male and female M≡F entity, which itself is quantified energetically as a single molecule (dihumanide molecule), for 57% of reactions at the 15-year mark, in the calculation of Gibbs free energy change.	● Mate selection ● Gibbs free energy ● Affinity ● Goethe's human affinity table ● Love the chemical reaction ● ReactionMatch.com (theory) ● Human chemical reaction (history)

Moriarty's problems

In 2009, Irish thermal-nano physicist Philip Morality made a YouTube video, for the Sixty Symbols video series of Nottingham University, explaining entropy in terms of the Boltzmann-Planck logarithmic interpretation of entropy, $S = k \ln \Omega$, and attempted to explain the microstates interpretation or multiplicity in terms of the students in a field. When questioned about potential errors in his video, by American chemical engineer Libb Thims, Moriarty mulled over his students as molecules analogy and made a recant video stating that his first description was only an analogy, and that in reality arrangements of students cannot be assigned with a thermodynamic entropy. This resulted as a prolonged 61-page, 15+ person, involving a number of noted thermodynamicists, such as Pierre Perrot (author of the 1998 dictionary *A to Z of Thermodynamics*), Ingo Muller (author of the 2007 *A History of Thermodynamics*), among others, debate over whether or not arrangements of people have a thermodynamic entropy or not.

Question	Comment	Clues
Q1. Can you say that a particular arrangement, say close-packed vs. spread out, of students, say in a field, has a thermodynamic entropy?	The central issue here is that Moriarty views the measurement of entropy in terms of the physicist perspective or Boltzmann perspective (1878), i.e. statistical mechanics view, which has limited applicability (depends on the principle of elementary disorder), whereas the original 1865 Clausius-definition and method of measuring the entropy of bodies applies to all bodies of the universe.	● Entropy ● Clausius entropy ● Boltzmann entropy ● Moriarty-Thims debate ● Philip Moriarty
Q2. What physical units would you use to describe the entropy of a distribution of students? J per K? If so, justify why this is an appropriate choice of units!		● Hmol ● Hmol science ● Social Avogadro number ● Dunbar number ● Single particle thermodynamics
Q3. If a field full of students can be modeled as being equivalent to a chamber filled with molecules how would you define the equilibrium state of the students?		● Equilibrium ● Equilibrium state ● Spencerian dilemma ● Heat death
Q4. How much thermodynamic work is done ‘by a student’ if he or she is moved from one position to another? (Or if he or she ‘decides’ to move from one position to another)?		● Mathematical introduction ● Principle of the transmission of work ● Ref: [4]
Q5. Can you construct the equivalent of a Maxwell-Boltzmann distribution function for the "speeds" of the students? Are the 'velocities' of the students Gaussian distributed?		● Roy Henderson ● Maxwell-Boltzmann distribution
Q6. Can fundamental quantum mechanics be applied to explain the behavior of "human molecules"? Is there physical evidence for a "human wavefunction"? Has anyone ever carried out the equivalent of the double slit experiment for humans?! Does decoherence, complementarity, and or entanglement apply to the quantum mechanical description of human molecules?		● Human molecule ● Human particle ● Human physics ● HT pioneers ● Double-slit experiment ● Quantum entanglement

Newly added

See main: Dostoyevsky dilemma

The following are newly added problems:

● "If god does not exist, is it thus true that 'everything is permissible', as Fyodor Dostoyevsky famously wrote in his 1880 *The Brothers Karamazov*? (Q)

Library walk problem

See main: Library walk problem

In 1992, Korean-born American physicalism philosopher Jaegwon Kim, in his "Downward Causation in Emergentism and Nonreductive Physicalism", asked the following straightforward question: [10]

Scenario: "It occurs to you that you need to check a few references for an article you are writing, so you decide to walk over to the library after your office hours. Miracle of miracles! In half an hour, you find your body, all of it, at the front steps of the library, half a mile away. Think of all the molecules that make up your body: each of them has traversed the half-mile, zigzag path from your office to the library, and your whole body is now where it is."

Question: "What explains the spatial displacement of your body from the office to the library? What caused the motion of each and every molecule of your body over the half-mile path?"

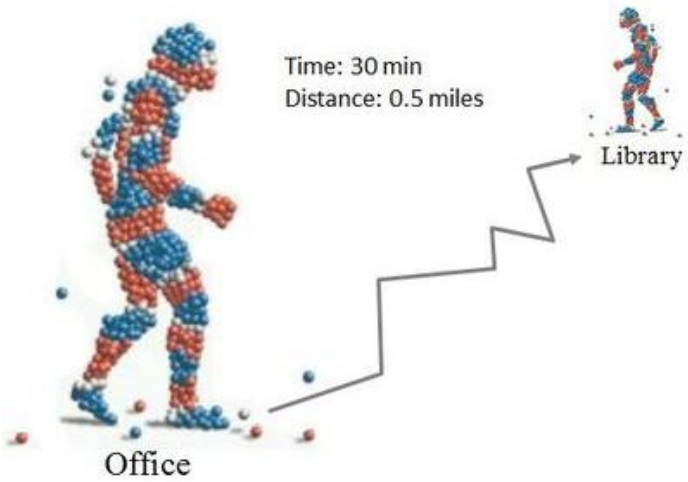

This, comparatively speaking, is a fairly decent hmolscience-type homework problem, though not one easily solved, at first.

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θΔics

In hmolscience, **homo economicus** is a physical economics conception of a generic economic agent acted on solely by external forces, external economic forces to be specific; and to some extent its own internal forces, depending.

> "Pareto's ***homo economicus*** is 'an abstract molecule that responds only to economic forces'."
>
> — Michael McLure (2002), *Pareto, Economics and Society* [1]

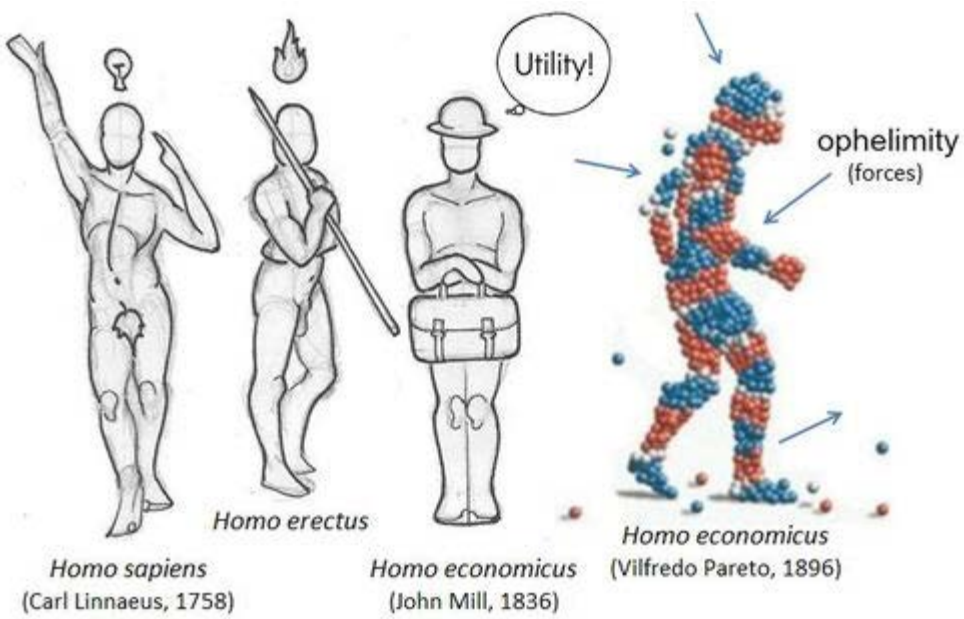

The term ***homo economicus***—a Linnaeus-themed variant of John Mill's 1836 generic utility maximizing "economic man"—is said to be attributed to the work of Italian engineer and physical socioeconomicist Vilfredo Pareto and his 1896 statement that: "man himself; stripping him of a large number of his attributes, leaving out the passions, good or bad, reducing him to *a kind of molecule* that only acts in response to the forces of ophelimity", which, as summarized by Australian economics historian Michael McLure (2002), is an abstract entity that only responds to the forces of ophelimity, in other words "an abstract molecule that acts only in response to economic forces". [1]

At some point, to clarify, Pareto discusses the internal forces of his homo economicus, but not in such a way that it was the main part of his theory of the molecular economic agent (see: economic molecule).

Overview

The term homo economicus originated somewhere in the 1896-1907 work of Italian engineer and physical socioeconomist Vilfredo Pareto. Pareto's term, him being part of the Lausanne school of physical economics, seems to be a spinoff of his associate-mentor Leon Walras earlier term "molécules économiques" (French) or economic molecule. As authors Thomas Prugh, Robert Costanza, and Herman Daly summarized in 2000: [7]

> "***Homo economicus*** knows neither benevolence nor malevolence, only indifference. Human beings in this model are first, last, and always extreme individuals: economic molecules, in the conception of Leon Walras, one of the founders of modern economics."

In *circa* 1908, Italian economist Maffeo Pantaleoni, in his article "The Phenomena of Economic Dynamics", classified Pareto's overall theory as "economic dynamics" during the course of which he comments how Pareto referred to man as "homo economicus", the outline of which is as following: [2]

> "The ruling idea in economic studies following those of Adam Smith was wealth. Later it became the idea of value and is so still in the case of many writers. The science has contained in a sporadic shape much material for a science of economic equilibrium, such as has been suggested by Pareto in a work which makes only a beginning of a study of economic dynamics.
>
> In describing dynamic phenomena comparisons are used which were formerly taken from mechanics, but now more usually from biology. Economic agents are thought of either as molecules subjected to equal pressure in all directions, or, on the other hand, as parts of a living body subjected to equal stimuli, which are mutually counteracting. There is little use in disputing as to which method is better, since the useful thing is to apply a method rather than to argue about it.
>
> Economic dynamics may be defined as a study of movements of disequilibrium, which lead to positions of

equilibrium. When an individual spends his income so as to bring into a proportion the marginal utility of different articles within his purchasing power, the equilibrium exists and is rightly called static, because it will continue indefinitely and return if disturbed. Until this condition is reached, modifications in his demand or in his supply are likely to take place, and the quantity of the goods coming within his reach will change and these changes affect both the man himself and the persons he deals with, involving both the quantity of goods available and the incomes of different producers. The state of equilibrium [see: equilibrium state] yields the maximum of satisfaction relatively to the initial position and to the changes which this allows.

In every society purely economic motives have an extending or contracting radius of activity; in other words, the zones of economic action grow larger or smaller. As Pareto says:

> "Man's actual conduct resembles that of the ***homo economicus***, or that of the *homo ethicus*, or that of the *homo religiosus*. It is sometimes a composite of all these characters. There are concrete phenomena in which the economic influences transcend all others, and here it is possible to consider alone the results deduced by economic reasoning; while there are other phenomena in which the economic constituent is insignificant and may be neglected. There are still others which are intermediate in character."

To this we in the main agree, but find it necessary to examine variations of the zones in which all these homines move, and we must notice that even the homo economicus in his own proper capacity is modified when he enters into a composite with the others."

Australian economics historian Michael McLure has discussed Pareto's economic molecule theory in comparison to this generic *homo economicus*—one who attempts to maximize utility as a consumer and economic profit as a producer—a term deriving from John Mill's "economic man" utility logic, such that Pareto's *homo economicus* is 'an abstract molecule that responds only to economic forces'. McLure elaborates further: [1]

> "In pure theory, *homo economicus* of *Cours* [*on Political Economy*] is analogous to a molecule in the theory of mechanics (note: the impersonal subject pronoun has been used because the homo economicus is an abstract 'molecule', not a person). Kirman has pointed out that 'Pareto regarded equilibrium as the termination point of a process … The time taken for this process is not specified but it certainly is not regarded as … as negligible (Kirman 1987, pg. 806)."

The discussion here of British-French economist Alan Kirman's synopsis of Pareto's equilibrium model from his 1987 *Dictionary of Economics* entry "Pareto as an Economist" is interesting. [3]

Chemical homo economicus

In the early 1930s, American physiologist Lawrence Henderson taught a course at Harvard themed on making a connection between socio-economic system models of Pareto and the physico-chemical system models of American engineer Willard Gibbs.

The following, for instance, is a 2005 retrospect synopsis by American science historian Hunter Heyck: [4]

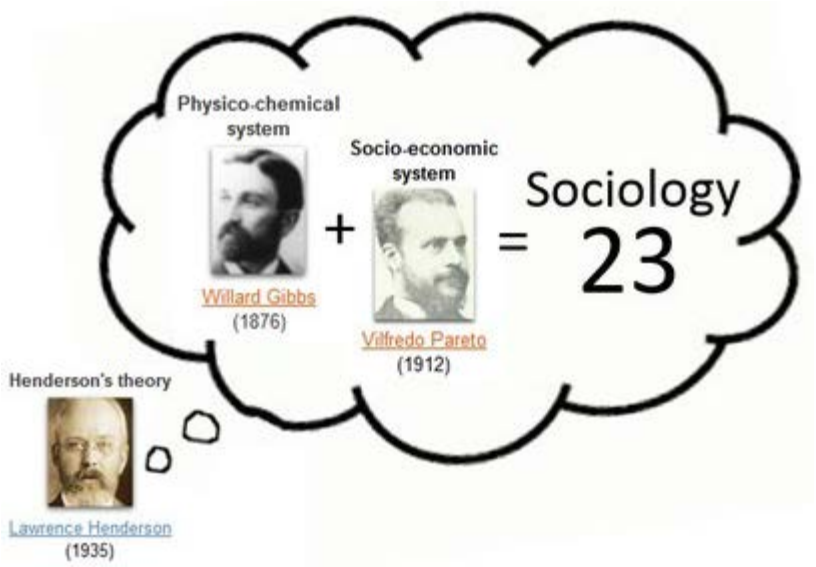

In the 1930s, American physiologist Lawrence Henderson thought, in his Sociology 23 course, that Vilfredo Pareto's 1912 mechanics based socioeconomic equilibrium theory, while not directly based on the chemical thermodynamics based equilibrium theories of American engineer Willard Gibbs, are nevertheless arguing the same point of view, and hence modern socioeconomic equilibrium theories will need to be reformulated in the physical chemistry reaction terms of chemical thermodynamics, a unified synthesis of Gibbs and Pareto, in short. [1]

> "**Pareto**'s work appealed to social scientists who had lost faith in the rationality of the public but not in the rationality of science. Henderson fit the bill perfectly: he was so taken with Pareto's ideas that he led a faculty seminar on Pareto at Harvard in the early 1930s, from which emerged Henderson's study *Pareto's General Sociology: a Physiologist's Interpretation*.
>
> Pareto's mathematical analysis of society was based on his engineer's understanding of the thermodynamics of equilibrium systems. For example, one of Pareto's central concepts was that of 'ophelimity', now usually called Pareto optimality. Ophelimity was a redefinition of marginal utility in thoroughly thermodynamic terms. Pareto defined a system as having maximum ophelimity when the increase of the ophelimity of any element in the system necessarily reduced that of some other element (or elements) in the system. Thus ophelimity, like energy, always was conserved in a closed system, making the reallocation of ophelimity a zero-sum game. This concept, it should be noted, especially welfare economics, where it plays an important role in the work of Paul Samuelson and Abram Berg."

This, however, is historical anachronism. At the time when Pareto was studying civil engineering at Polytechnic University of Turin, from 1865 to 1870, thermo-dynamics (see: etymology) was barely yet a coined term, and it would not be until 1875 when Rudolf Clausius would call his second edition *The Mechanical Theory of Heat* a "textbook" suitable for standard engineering study, in Germany, let alone in Italy. While it is true that Pareto did begin to use the term "thermodynamics" on about 16 various pages of his 1912 *Treatise on General Sociology*, he only uses the term "entropy" once in the fourth volume, which is the key term one would have to grapple with if he or she was so inclined to attempt to reformulate the general equilibrium theory of economics in "thoroughly thermodynamic terms" as Heyck alleges.

In any event, in 1935, Henderson, in his *Pareto's General Sociology: a Physiologists Interpretation*, elaborates on a large number of Pareto-Gibbs comparisons, such as the following: [1]

> "Gibbs considers temperature, pressure, and concentrations, so **Pareto** considers sentiments, or, strictly speaking, the manifestations of sentiments in words and deeds, verbal elaborations, and …"

Henderson, however, never actually stated that Pareto derived his theory from Gibbs but rather he only "compared Pareto's social system to a physicochemical system as defined by Gibbs and emphasized that the equilibrium of the social system is logically identical to physiological equilibrium." [12] In fact, in his appendix "Note 5", Henderson states is views on this matter explicitly:

> "It is very unlikely that the general characteristics of Gibbs' system had anything to do with Pareto's construction of his social system. In other words, it is very probable, I thing certain, that Pareto did not keep Gibbs' work in mind and *a fortiori* that he did not imitate it, when he worked out his social system; so that Pareto's system is not the result of the application of the *theories* of physical chemistry to sociology."

Henderson, however, does have this application in mind, and in his end note appendices, actually goes though a comparison of the equilibrium properties of the following liquid phase chemical reaction, namely of reactants carbon acid H_2CO_3 with disodium phosphate Na_2HPO_4 to form the products of sodium bicarbonate $NaHCO_3$ and monosodium phosphate NaH_2PO_4:

$$H_2CO_3 + Na_2HPO_4 \rightleftharpoons NaHCO_3 + NaH_2PO_4$$

to that of the equilibrium properties of social systems, at the end of which he states:

> "This simple example illustrates [the] logical principles [physical chemistry] that find universal application in the physical, biological, and social sciences."

Henderson's treatise is fairly decent and in need of detailed analysis.

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θΔics

In existographies, **Honore Balzac** (1799-1850) (IQ:175|#306) (Cattell 1000:448) [RGM:293|1,500+] (CR:37) was a French novelist and playwright noted, in literature chemistry, for his usage of chemistry or chemical theory in literature, the dominate example of which seems to be found in his 1834 *Search for Absolute Truth*. [1]

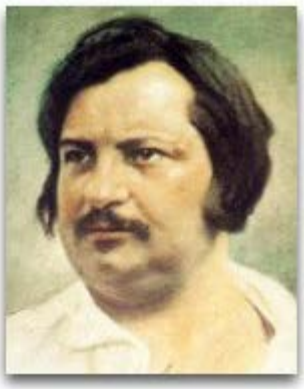

The Magic Skin

In 1831, Balzac, in his novel *The Magic Skin*, deplores chemistry considering its views to be a totally materialist non-divine view of life, a doctrine according to which chemists, in his view, hold that life sprang from matter via its own accord. [4] His famous quote on this topic is:

> "The universe for a mechanician is a machine that requires an operator; for chemistry—that fiendish employment of decomposing all things—the world is a gas endowed with the power of movement."

according to which the mechanician refers to the mechanistic conception of life extolled by French philosopher Rene Descartes, which requires a divine operator. The "gas endowed with the power of movement" point-of-view of life (see: defunct theory of life), supposedly, refers to Swedish polymath Emanuel Swedenborg's 1734 nebular hypothesis.

Quest of the Absolute

See main: Balzac feelings and affinity dialogue

In 1834, Balzac, in his *The Quest of the Absolute* (*La Recherche de l'Absolu*), has the character Balthazar Claes debate with the character Josephine, his wife, the underlying moral that romantic belief that preoccupation with science atrophies the normal emotions that sustain personal relations and social responsibilities.

'Believe me, Balthazar, nature made us to feel; and though you will have it that we are nothing but an electrical mechanism, your gases and etherealised matter will never account for our power of foreseeing the future.'

'Yes,' he answered, 'by means of affinities. The power of vision which makes the poet and the deductive power of the man of science are both based on visible affinities, though they are impalpable and imponderable, so that ordinary minds look on them as "moral phenomena," but in reality they are purely physical. Every dreamer of dreams sees and draws deductions from what he sees. Unluckily, such affinities as these are too rare, and the indications are too slight to be submitted to analysis and observation.'

'And this,' she said, coming closer for a kiss, to put chemistry, which had returned so inopportunely at her question, to flight again, 'is this to be an affinity?'

'No, a combination; two substances which have the same *sign* produce no chemical action.'

The key section from **Balzac**'s *The Quest of the Absolute*, wherein his two husband and wife characters, Balthazar and Josephine, debate the nature of "feelings" from the respective views, a chemist and a romanticist, respectively. [5]

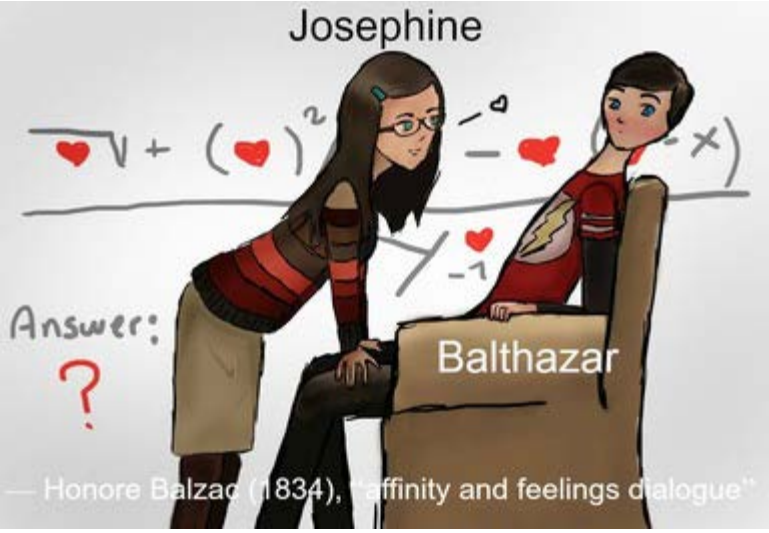

When his wife pleads, in respect with his obsession with chemistry, that “science has eaten away at your heart” he respond with: [5]

> “Unluckily, such affinities as these are too rare, and the indications are too slight to be submitted to analysis and observation.”

A fuller section of Balzac's affinities and feelings dialogue is shown adjacent.

Atheist’s Mass

On 18 Jan 1836, Balzac, whose religious beliefs seem to be characterized as a scientific Napoleon-like skeptical agnostic, but also pretty definitely “on the side of the angels” (Saintsbury, 1896), penned “The Atheist’s Mass”, a short story, which was "conceived, written, and printed in a single night", wherein he tells the story of Bianchon, a French physician, noted for his theoretical physiology, who was intellectually mentored by Desplein, a surgeon, described as a transient meteor-like scientific genius, who had a “universal command of knowledge”, whose power of deduction was like that of Georges Cuvier; the following is the first noted quote: [9]

> “But did he epitomize all science in his own person as Hippocrates did and Galen and Aristotle? Did he guide a whole school towards new worlds? No. Though it is impossible to deny that this persistent observer of human chemistry possessed the antique science of the Mages, that is to say, knowledge of the elements in fusion, the causes of life, life antecedent to life, and what it must be in its incubation or ever it *is*, it must be confessed that, unfortunately, everything in him was purely personal. Isolated during his life by his egoism, that egoism is now suicidal of his glory. On his tomb there is no proclaiming statue to repeat to posterity the mysteries which genius seeks out at its own cost.”

Then Balzac digs into the following:

> “But perhaps Desplein's genius was answerable for his beliefs, and for that reason mortal. To him the terrestrial atmosphere was a generative envelope; he saw the earth as an egg within its shell; and not being able to determine whether the egg or the hen first was, he would not recognize either the **** or the egg. He believed neither in the antecedent animal nor the surviving spirit of man. Desplein had no doubts; he was positive. His **bold and unqualified atheism** was like that of many scientific men, the best men in the world, but invincible atheists—atheists such as religious people declare to be impossible. This opinion

> could scarcely exist otherwise in a man who was accustomed from his youth to dissect the creature above all others—before, during, and after life; to hunt through all his organs **without ever finding the individual soul**, which is indispensable to religious theory. When he detected a cerebral center, a nervous center, and a center for aerating the blood—the two first so perfectly complementary that in the latter years of his life he came to a conviction that the sense of hearing is not absolutely necessary for hearing, nor the sense of sight for seeing, and that the solar plexus could supply their place without any possibility of doubt —Desplein, thus finding two souls in man, confirmed his atheism by this fact, though it is no evidence against god."

Here, we respect to "without ever finding the individual soul", we reason that possibly Balzac may have read the c.1817 dialogue of Napoleon Bonaparte (see also: Napoleon Laplace anecdote) with his personal physician Francois Antommarchi as to the whereabouts of the soul: [10]

> **Napoleon**: 'You do not believe it, you doctors are above such weakness. Tell me, you who know so well the human body, who have probed into all its ramifications, have you ever come across the soul under your scalpel? Where is it? In which organ?'
> Antommarchi: 'I hesitated to respond,'
>
> **Napoleon**: 'Come now, frankly, there is not a doctor who believes in god, is not that so?'
> *Antommarchi*: 'No, Sire, they are ensnared by the demonstration, they accept the dictum of the mathematicians.'
>
> **Napoleon**: 'Eh, but the latter are generally religious.'

(add)

Other

In 1889, German natural science popularize Wilhelm Bolsche (1861-1939), in his essay "Goethe's *Elective Affinities* in Light of Modern Science", argued that the Goethe's *Elective Affinities* novel is realistic due to its portrayal of natural forces and psychology, but that it should be seen as a predecessor to such realistic works such as George Eliot and Balzac, and is a pioneering work of literary realism. [2]

The personal library of Yugoslav novelist Ivo Andric (1892-1975) notably has a special place in it occupied by Goethe's collected writings (in German) and the collected works of Honoré de Balzac (in French); a factoid that may imply that there exists some type of thematic relation to Balzac's literary chemical ideas and Goethe's chemical philosophy. [3]

Influences

Balzac was a student of Francois Rabelais (FA:42). [7]

Quotes | On

The following are quotes on or about Balzac:

> "The idea of **Balzac**'s *Comedie Humaine* was suggested by the biology of the early nineteenth century, just as the naturalism of Zola was suggested by the works of Claude Bernard."
>
> — Lawrence Henderson (1927), "The Process of Scientific Discovery" [6]

> "These two stories, *The Ban* (L'Interdiction) and *The Atheist's Mass* (*La Messe de l' Athee*), would, if they

existed entirely by themselves, and if we knew nothing else of their author's, and nothing else about him, suffice to show any intelligent critic that **genius of no ordinary kind** had passed by there."

— George Saintsbury (1896), "Preface" to *The Atheist's Mass and Other Short Stories* [7]

Quotes | By

The following are quotes by Balzac:

"But did he epitomize all science in his own person as Hippocrates did and Galen and Aristotle? Did he guide a whole school towards new worlds? No. Though it is impossible to deny that this persistent observer of **human chemistry** possessed that antique science of the Mages, that is to say, knowledge of the elements in fusion, the causes of life, **life antecedent to life**, and what it must be in its incubation or ever it _is_, it must be confessed that, unfortunately, everything in him was purely personal. Isolated during his life by his egoism, that egoism is now suicidal of his glory. On his tomb there is no proclaiming statue to repeat to posterity the mysteries which genius seeks out at its own cost."

— Honore Balzac (1836), "The Atheist's Mass" (Ñº), in *La Human Comedy*

"A society of atheists would immediately invent a religion."

— Honore Balzac (c.1841), *The Social Catechism* [8]

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1. (a) Blank, Eugene W. (1942). "Alchemy and Chemistry in Literature" (abs), *School Science and Mathematics*, 42(6): 550-58.
(b) Weininger, Stephen J. (2002). "Chemistry", in: *Encyclopedia of Literature and Science* (pg. 77-79), ed. Pamela Gossin, Greenwood Publishing Group.
(c) Gossin, Pamela. (2002). *Encyclopedia of Literature and Science* (chemistry, 40+ pgs; §Chemistry, pg. 77-79). Greenwood Publishing Group.
(d) Pratt-Smith, Stella. (2011). "Call for papers: Literature and Chemistry: Elective Affinities", The British Society for Literature and Science, Interdisciplinary conference organized by the research group Literature and Science, Department of Foreign Languages and Literatures, The University of Bergen 27-28 October 2011.
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(b) Tantillo, Astrida O. (2001). Goethe's *Elective Affinities* and the Critics (pg. 80). Camden House.
3. (a) Authentic Interior of Ivo Andric's Study – Belgrade City Museum.
(b) Ivo Andric – Wikipedia.
4. (a) Ball, Philip. (2011). *Unnatural: the Heretical Idea of Making People* (pgs. 30-32). Vintage Books.
(b) La Paeu de chagrin – Wikipedia.
5. (a) Balzac, Honore. (1834). *The Quest of the Absolute* (*La Recherche de l'Absolu*) (pg. 85). Publisher.
(b) Haynes, Roslynn. (2007). "The Alchemist in Fiction: the Master Narrative" (Ñº), in: *The Public Image of Chemistry* (editors: Joachim Schummer, Bernadette Bensaude-Vincent, and Brigitte van Tiggelen) (§1:7-37). World Scientific.
6. (a) Henderson, Lawrence. (1927). "The Process of Scientific Discovery", in: *An Introduction to the Study of Experimental Medicine* (translator: H.C. Greene) (introduction, pgs. v-xii). Henry Schuman, 1949.
(b) Barber, Bernard. (1970). *L.J. Henderson on the Social System* (§2:149-58; quote, pg. 157). University of Chicago Press.
7. Balzac, Honore. (1836). *The Atheist's Mass: and Other Short Stories* (*La Messe de l'Athee*) (translator: Clara Bell; preface: George Saintsbury) (Rabelais, pg. xii; human chemistry, pg. 2). J.M. Dent and Co, 1896.
8. Balzac, Honore. (c.1841). *The Social Catechism* (*Le Catechisme Social*) (pg. 133) (Ñº). La Renaissance du Livre, 1933.

9. Balzac, Honore. (1836). *The Atheist's Mass: and Other Short Stories* (*La Messe de l'Athee*) (translator: Clara Bell; preface: George Saintsbury) (Rabelais, pg. xii; human chemistry, pg. 2). J.M. Dent and Co, 1896.
10. Young, Norwood, Broadley, Alexander M. (1915). *Napoleon in Exile: St. Helena (1815-1821)* (pg. 187-88). Publisher.

External links

â— Honore de Balzac – Wikipedia.
â— The Mass of the Atheist (French → English) – Wikipedia.

θΔics

In existographies, **Honore Balzac 2** is []

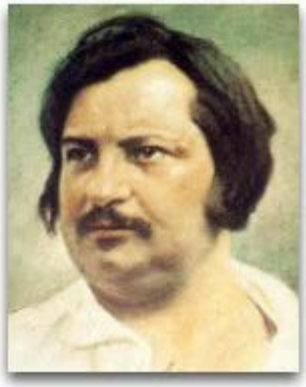

→ **Honore Balzac** (mobile; readable)
→ **Honore Balzac** (online; readable) – WayBack (2016)
→ Honore Balzac (hacked)

Honore Balzac (1799-1850) (IQ:175|#284) (CR:19) was a []

θΔics

In existographies, **Honore Mirabeau** (1749-1791) (IQ:180|#149) (Cattell 1000:55) [RGM:N/A|1,320+] [FA:63] was a French leader and hero (O) of the revolution, noted for []

Other

In 1770, when the anonymous *The System of Nature* appeared, written secretly by Baron d'Holbach, it was initially attributed to Helvetius or Mirabeau. [1]

Quotes | On

The following are quotes on Mirabeau:

> "There has been a considerable number of those whom history calls 'atheists'. Leucippus, Democritus, Xenophanes, and others of the Atomistic and Eleatic schools (O), are said to have been such. In his *Intellectual System*, Cudworth puts into this category Seneca and the younger Pliny among the Romans. Since the reformation, such men as: Rabelais, Machiavel, Bruno, Vanini, D'Alembert, Diderot, Buffon, Condorcet, **Mirabeau**, La Place, Frederic II, and even Pope Leo X, have been charged with atheism."
>
> — Willis Lord (1875), *Christian Theology for the People* (pg. 67)

Quotes | By

The following are representative quotes by Mirabeau:

> "Such, my friend, is my profession of faith. He who calls me an atheist or a materialist, is a pagan; and if I stand alone, I will remain a Christian to the last."
>
> — Honore Mirabeau (1788), "Unpublished letter to Marquis Longo, Jan 10 (O)

> "I go into no-thing-ness."
>
> — Honore Mirabeau (1791), "last words"; cited by Ludwig Buchner (1884) in *Force and Matter* (pgs. 334)

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1. d'Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (attributed, pgs. iv-v). J.P. Mendum, 1889.

External links

- Honore Gabriel Riqueti, comte de Mirabeau – Wikipedia.

θΔics

In chemistry, **hooked atoms** theory was a view that certain types of atoms had hooks and others eyes, like the hook-n-eye fasteners of olden-days clothing, that when connected formed the tight bonds of attachments of hardened sorts of materials.

The view seems to have originated in the atomic theories of Greek atomic school, particularly in the 75 BC theories of Lucretius, who represented the views of his teachers Epicurus, Democritus, and Leucippus. [1] It is also said that Rene Descartes significantly used the hooked atom theory during the revival period of atomic theory.

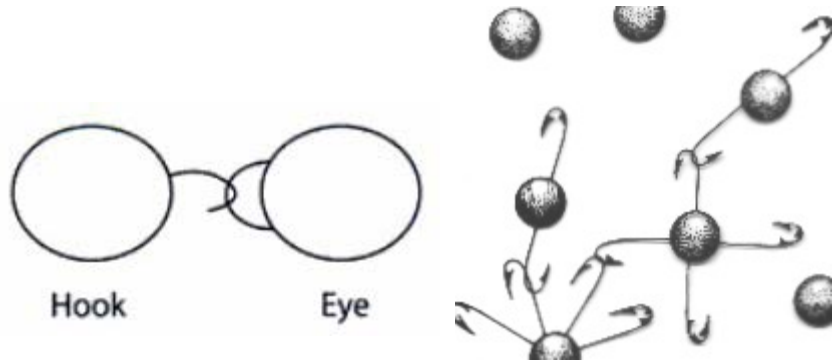

Left: in the 1810s, English chemist John Dalton, was visualizing hooked atoms linking up with eye atoms in chemical reactions in a way that resembled a **hook and eye** connection as used on clothing, attachments that could be 'hooked' or 'unhooked' when materials combined or disassociated during chemical change. [2] Right: a depiction of **hooked atoms** linking up, a theory which arose in the Greek atomic theory school of Epicurus, Democritus, and Leucippus.

Democritus

Democritus believed that atoms existed in the following varieties :

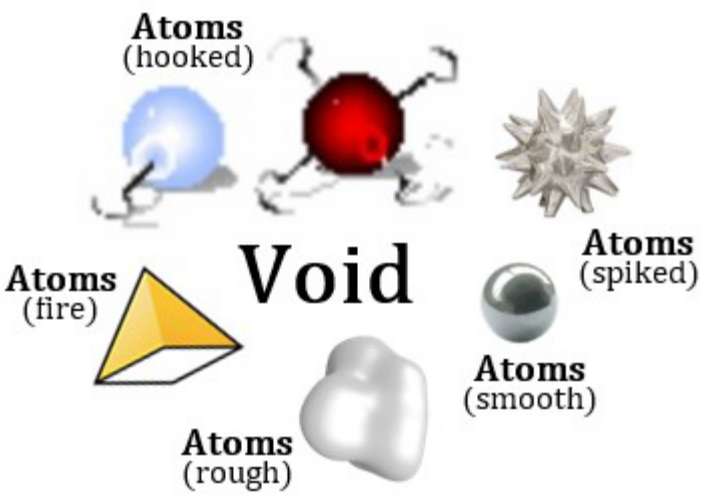

Things that were of solid shape were hooked and so stuck to one another; something akin to the following

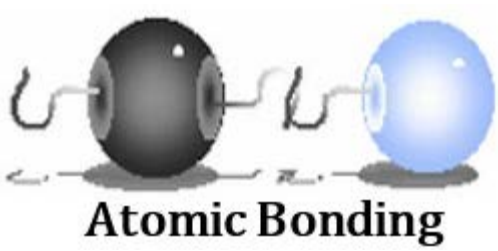

In order to make the solid hard, however, the atoms must not only be hooked, but retain their hooked shape when they come into contact with other atoms. [3]

Lucretius

In 55BC, Lucretius, in his *On the Nature of Things*, described the shapes of atoms as follows:

> "Since atoms are what they are by nature, and not cut by hand to a single predetermined pattern, some of them must have shapes unlike some others. By reasoning, we may readily comprehend why lightning-fire is much more penetrating than ours that comes from torches here on earth. Or one may say that the lightning fire is finer and made in smaller shapes, and thus can pass though opening that our fire cannot, spring as it

is of wood and torch."

— Lucretius (55BC), *On the Nature of Things* (translator: Frank Copley) (2.377-87) (pg. 37)

"Things which are hard and dense must be composed of particles hooked and barbed and branch-like, intertwined and tightly gripped."

— Lucretius (55BC), *On the Nature of Things* (translator: Frank Copley) (2.444-46) (pg. 39)

"Everything that we see dispersed quickly, like **smoke and clouds and flames**, must be, if not all made of particles round and smooth, at least not of the tangled and intertwined; thus, they may puncture flesh and pass though stone yet do not cling together … they are of pointed, but not tangled atoms. Now things you see are bitter but also fluid, like sea water: think them not strange at all. Whereas they flow, they're made of round and smooth atoms, but numbers of rough ones interspersed cause pain. These can't be hooked or interlocked: though they are rough, you see, they must be round; thus they may roll but also cause pain."

— Lucretius (55BC), *On the Nature of Things* (translator: Frank Copley) (2.456-70) (pg. 39)

"Atoms exist in a finite number of different shapes."

— Lucretius (55BC), *On the Nature of Things* (translator: Frank Copley) (2.479-80) (pgs. 39-40)

"Light can pass though horn, but rain is halted. Why, if not that atoms of light are smaller than those of water, liquor of life. And wine, we see, will flow on the instant through a sieve, but oil is hesitant and slow, either because its particles are larger, or else more hooked and tightly intertwined; and this is why they can't be pulled apart so quickly into separate single atoms that seep though single openings, one by one."

— Lucretius (55BC), *On the Nature of Things* (translator: Frank Copley) (2.388-97) (pg. 37-38)

"To begin with, then, all the particles of earth, since they were heavy and tangled, moved to join at center, and all sank down to the lowest zone. The more they moved to join in one great tangle, the more they squeezed out those particles that made the sea, stars, sun, and moon, and the walls of this great world. For these are made of atoms smoother far and elements rounder and smaller than are those of earth."

— Lucretius (55BC), *On the Nature of Things* (translator: Frank Copley) (5.449-57) (pg. 123)

"Clouds grow when many atoms, flying high in the reaches of heaven, all at once form union—rougher atoms, which, though by smallest barbs entangle, still may catch and hold each other."

— Lucretius (55BC), *On the Nature of Things* (translator: Frank Copley) (6.451-54) (pg. 157)

According to Lucretius, some atoms have hooks by which they are fastened together, and come closer to each other. Hard things, like diamond, basalt, iron, are formed of such atoms:

"Things which look to us hard and close-textured must consist of atoms that are **hooked** together, and must be held in union, because welded together through and through out of atoms that are, as it were, many-branched. Amid this class in the foremost line stand diamond-stones, accustomed to despise blows, and stout basalt blocks, and the strength of hard iron, and the brass bolts which scream out as they hold fast in

> the doors."

Liquids are, as rule, formed of smooth and round elements, but sluggish fluid, like oil, may have its atoms: "larger or more hooked and intertangled" than those of wine. [1]

Gassendi

French thinker Pierre Gassendi is often said to have been the biggest impetus behind the revival of atomic theory, as outlined in his 1649 book, wherein he gave the view that the properties of atoms (e.g. their taste) depend on their shape (pointed or round, elongated or squat, etc.), and he had the idea that they might join together, to form what he called 'molecules', by a kind of hook-and-eye mechanism. [5]

Newton

In 1718, Isaac Newton famously outlined his atomic bonding theory, in "Query 31" of his Opticks, whereby atoms attach to each other by some "force". Specifically, after acknowledging the various popular theories in vogue at the time, of how atoms were reasoned to attach to each other, i.e. "hooked atoms", "glued together by rest", or "stuck together by conspiring motions", Newton states that he would rather infer from their cohesion, that "particles attract one another by some force, which in immediate contact is exceedingly strong, at small distances performs the chemical operations, and reaches not far from the particles with any sensible effect." Newton was also the first, supposedly, to criticize the hooked atom theory of bonding: [6]

> "The parts of all homogeneous hard bodies which fully touch one another stick together very strongly, and form explaining how this may be, some have invented **hooked atoms**, which is begging the question [why?]."

Most of his effort on the subject of chemical bonding, however, remained verbal to the affect that he attributed bonding to chemical affinity.

Lewis

The hooked atom bonding theory was still being taught to chemistry students in the early twentieth century. In circa 1902, American physical chemist Gilbert Lewis began to use an electron dot structure to represent bonding between atoms in lecture to his chemistry students at Harvard. By the time of this 1923 book *Valence and the Structure of Atoms and Molecules*, had reached the conclusion that science, after nearly 2,400-years of theoretical struggle, has finally arrived at a concrete model of the chemical bond over that of the hook-and-eye bonding model:

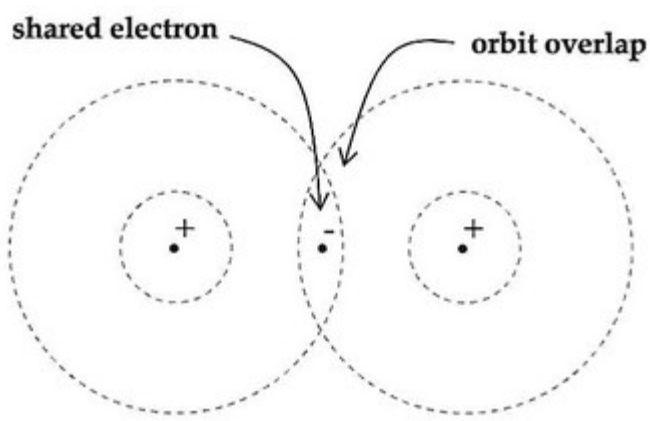

In 1913, after reading a paper by Alfred Parson, which supposed that the electron is a small magnet (or magneton), Gilbert Lewis conceived the view that a chemical bond forms when two atoms share one or more electrons, thus interring the older hook and eye bonding model.

> "Two atoms may conform to the rule of eight, or the octet rule, not only by the transfer of electrons from one atom to another, but also by sharing one or more pairs of electrons. Two electrons thus coupled together, when lying between two atomic centers, and held jointly in the shells of the two atoms, I have considered to be the chemical bond. We thus have a concrete picture of that physical entity, that **'hook and eye'** which is part of the creed of the organic chemist."

Pauling

In 1917, to cite one last example, American undergraduate chemical engineer named Linus Pauling was learning the

Dalton hook-and-eye bonding method at the Oregon Agricultural College, which was the vogue description of bonds between atoms at the time. Each atom had a certain number of hooks that allowed it to attach to other atoms, and a certain number of eyes that allowed other atoms to attach to it. A chemical bond resulted when a hook and eye connected. Pauling, however, wasn't satisfied with this archaic method and looked to the newly-emerging field of quantum physics for a new method. [4]

Quotes

The following are related quotes:

> "The conception of **hooked** and spiked atoms, no doubt originally derived from Lucretius, continued through the seventeenth into the eighteenth century."
>
> — Hugh Munro (1929), *Lucretius' On the Nature of Things* (pg. xiii)

See also

â— History of chemical bonding theory

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1. Masson, John. (1907). *Lucretius, Epicurean and Poet* (hooked atoms, pg. 92-93, 107). Dutton.
2. Martin, James E. (2006). *Physics for Radiation Protection* (hooked atoms, pg. 37). Wiley-VCH.
3. Franklin, James. (1986). "Are Dispositions Reducible to Categorical Properties?" (abstract), *The Philosophical Quarterly*, 36: 62-64.
4. Hooks and Eyes – Linus Pauling, *The Nature of the Chemical Bond* (Oregon State University).
5. Gribbin, John. R. (2004). *The Scientists: a History of Science told through the Lives of its Greatest Inventors* (hook-and-eye molecules, pg. 115). Random House.
6. Anon. (1901). "article", *Report of the Meeting* (Newton on hooked atoms, pg. 22). The Association.

Further reading

â— Masson, John. (1884). *The Atomic Theory of Lucretius contrasted with the Modern Doctrine of Atoms* (hooked atoms, pgs. 15, 26). G. Bell.

θΔics

In existographies, **Horace** (65BC-8BC) (IQ:150|#659) (Cattell 1000:53) (Murray 4000:16|WL) (CR:10) was a Roman poet and Epicurean-Stoic philosopher noted for []

Philosophy

Horace, according to Anthony Collins (1713), ranks superstition with vice, and makes happiness to consist in the practice of virtue and freedom from superstition. [1]

Quotes | By

The following are quotes by Horace:

> "Seize the day, and put the least possible trust in tomorrow."
>
> — Horace (23BC), *Odes* (Q) (Q)

> "Let your literary compositions be kept from the public eye for nine years at least."
>
> — Horace (c.20BC) (Q)

> "The greatest lesson in life is to know that even fools are right sometimes."
>
> — Horace (c.20BC) (Q)

> "A word uttered once can never be recalled."
>
> — Horace (c.20BC) (Q)

References

1. Joshi, Sunand T. (2014). *The Original Atheists: First Thoughts on Nonbelief* (pg. 151). Prometheus Books.

External links

- Horace – Wikipedia.

θΔics

In science, **horsepower**, aka "horse-power" or pony power, is the amount of work, or weight lifted though a height, that an average horse can do per unit time; standardized as "33,000 foot-pounds per minute" (Watt and Boulton, 1783), which translates to the effect that one average "draft horse", when turning a siphon-like piston and cylinder water pumping device, can raise 33,000 pounds of water by one foot in height in one minute.

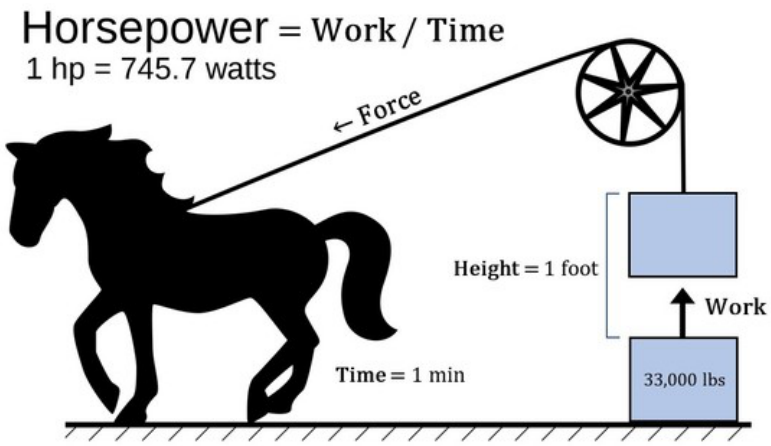

The founding definition of "**horsepower**", namely: the amount of work an average horse can do per unit time, specifically the work of lifting, via siphon pumps, water out of flooded mines.

Overview

In 1556, Georg Agricola, German mineralogist, in his his *De Re Metallica*, described a number of pumps, suction, ball and chain, and bucket; one elaborate installation, at Chemnitz, e.g., lifted water 660-feet in three stages with pumps of the ball-and-chain design, that was operated by 96 horses, working four hours and resting twelve, in teams of eight to a pump.

In 1589, in a translation of one of Hero's *Spiritalia*, the following diagram of a four-cylinder "one-horse" pump was presented, which shows one horse being "worked", per unit time, to turn a set of inter-meshed gears, which turns a crank arm, which work a set of four siphon-like piston and cylinder pumps, which thus work to lift water out of flooded mines, to heights of about 30-feet, as shown, therein illustrating the transformation of rotary motion to reciprocating motion via gears: [11]

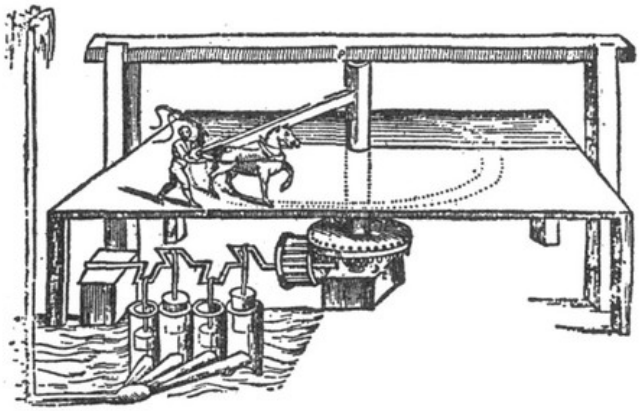

In 1615, Salomon de Caus, in his *The Reasons for Moving Forces*, gave the following illustration of a "four-horse pump" for draining a mines: [6]

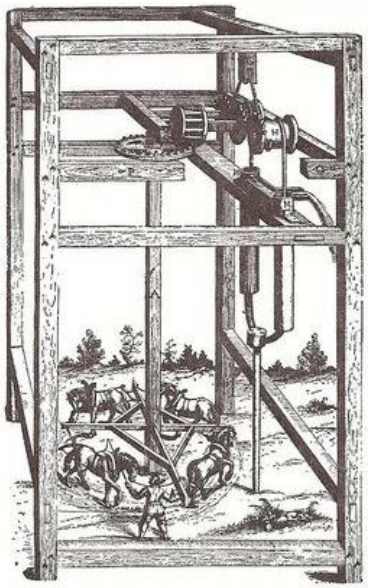

In 1702, Thomas Savery, in regards to his Savery engine, commented the following:

> "Water, in its fall from any determinate height, has simply a force answerable and equal to the force that raises it. So that an engine which will raise as much water as two horses working together at one time in such a work can do, and for which there must be constantly kept ten or twelve horses for doing the same, then, I say, such an engine will do the work or labor of ten or twelve horses; and whereas this engine may be made large enough to do the work

required in employing eight, ten, fifteen, or twenty horses to be constantly maintained and kept for doing such a work, it will be improper to stint or confine its uses and operation in respect of water-mills."

— Thomas Savery (1702), *Miner's Friend* (pg. 26)

In 1734, Marten Triewald, in his *Short Description of the Atmospheric Engine*, stated that the Newcomen engine, installed at the mines at Dannemore, for pumping out water, was doing as much work as "66 horse-whims, each drawn by 4 pairs of horses, or altogether 528 horses in 24 hours." [11]

In c.1735, John Desaguliers calculated that the "power of one horse" equals 27,500 foot-pounds. [7]

In 1739, one Newcomen engine installed at a colliery at Fresnes, France, with a 30-inch diameter cylinder and a 9-foot piston stroke, which lifted water at a rate of 15 strokes per minute, from 90-feet below the surface, working 48-hours per week, with little human attendance, replaced a previous system of 50-men and 20-horses, working in shifts throughout the week. [1] This version of the Newcomen engine, accordingly, was a 20 hp engine, roughly speaking.

Smeaton

In c.1765, John Smeaton equated "power of one horse" to be equivalent to 5 men or to 22,916 pounds of water raised one foot high in one minute against the force of gravity. [2]

In 1772, Smeaton conducted a number of experiments on various Newcomen engines of various sizes and improvements, aka Smeaton engines, to compile the following horsepower table: [12]

Mr. Smeaton's Table for the Proportions of the parts of Newcomen's Engines, deduced from actual experiments, 1772.

Horse Power.	Cylinder.			Motion of the Piston.			Boilers.			Injection Water.						Power.		
33 000 lbs. 1 foot per min.	Diameter.	Area.		No. per minute.	Length of Stroke.	Motion per minute.	Centre Boiler, Diameter.	Fire Surface.	Diameter of Steam-Pipe.	Square Aperture.	Height of the column.	Quantity. Per minute.	Quantity. Per stroke.	Boiler's Feed per stroke.	Newcastle Coals per hour.	Pumpage, or load on the piston.	Great Product per minute, or quantity of water raised 1 foot per min.	Effect per minute of 1 Bushel per hour.
	Inches.	Circ. Inc.	Sq. Inc.		Ft. In.	Feet.	Feet.	Sq. Ft.	Inches.	Inches.	Feet.	Cub. Ft.	Cy. I. Ft.	Cub. In.	Bushels.	Cyl. In. Ft.	Cyl. Inc. Ft.	Cyl. In. Ft.
1¼	10	100	78	16¾	3 „ 10	63·3	5½	30	2·2	·28	14	1·2	13	9·3	·6	1800	113 940	200 000
1½	12	144	113	16¾	4 „ 0	66·0	6	37½	2·5	·33	16	1·6	18	12·7	·7	2592	171 072	231 000
2⅛	14	196	154	16¾	4 „ 2	67·7	6½	44	2·8	·37	18	2·0	23	15·9	·9	3528	238 881	263 000
3⅛	16	256	201	16	4 „ 4	69·3	7	51	3·0	·42	20	2·4	28	19·7	1·1	4608	319 488	288 000
4¼	18	324	254	15¾	4 „ 6	70·9	7½	58¾	3·3	·47	20	2·9	34	23·9	1·3	5832	413 372	311 000
5⅛	20	400	314	15¾	4 „ 8	72·3	8	66½	3·6	·51	22	3·5	41	28·5	1·6	7200	520 800	334 000
6⅛	22	484	380	15¾	4 „ 10	73·7	8½	75¼	3·9	·56	22	4·0	48	33·6	1·8	8712	642 162	355 000
8	24	576	452	15	5 „ 0	75·0	9	84½	4·2	·60	22	4·6	56	39·3	2·1	10 368	777 600	374 000
9⅛	26	676	531	14¾	5 „ 2	76·2	9½	94	4·5	·64	22	5·2	65	45·3	2·4	12 168	927 323	393 000
11⅓	28	784	616	14¾	5 „ 4	77·3	10	104	4·8	·69	24	5·9	74	52·0	2·7	14112	1 091 328	410 000
13	30	900	707	14¾	5 „ 6	78·4	10½	115	5·1	·73	24	6·6	84	59·1	3·0	16 200	1 269 432	427 000
15	32	1024	804	14	5 „ 8	79·3	11	126	5·4	·78	24	7·3	95	66·8	3·3	18 432	1 462 272	443 000
17¾	34	1156	908	13¾	5 „ 10	80·2	11½	138	5·7	·82	24	8·0	107	75·0	3·6	20 808	1 669 010	459 000
19¾	36	1296	1018	13½	6 „ 0	81·0	12	150	6·0	·87	26	8·8	120	84	4·0	23 328	1 889 568	472 000
22	38	1444	1134	13¾	6 „ 2	81·7	12½	163	6·4	·91	26	9·7	134	93	4·4	25 992	2 123 800	486 000
24¼	40	1600	1257	13	6 „ 4	82·3	13	176	6·7	·95	26	10·5	148	104	4·8	28 800	2 371 200	498 000
27¾	42	1764	1385	12¾	6 „ 6	82·9	13½	190	7·0	·99	26	11·4	164	115	5·2	31 752	2 631 606	510 000
30	44	1936	1520	12½	6 „ 8	83·3	14	204	7·3	1·03	28	12·3	181	126	5·6	34 848	2 904 000	520 000
33	46	2116	1662	12¼	6 „ 10	83·7	14½	219	7·7	1·07	28	13·3	199	139	6·0	38 088	3 188 346	531 000
36	48	2304	1810	12	7 „ 0	84·0	15	234	8·0	1·11	28	14·3	218	152	6·5	41 472	3 483 648	539 000
39	50	2500	1963	11¾	7 „ 2	84·2	11 & 11	252	8·3	1·15	29	15·3	239	167	6·9	45 000	3 789 450	548 000
42½	52	2704	2124	11½	7 „ 4	84·3	11½ 11½	276	8·7	1·19	29	16·4	261	182	7·4	48 672	4 104 672	555 000
45¾	54	2916	2290	11¼	7 „ 6	84·4	12 12	300	9·0	1·22	29	17·5	284	199	7·9	52 488	4 427 888	561 000
49¼	56	3136	2463	11	7 „ 8	84·3	12 13	326	9·3	1·26	30	18·6	310	216	8·4	56 448	4 760 448	567 000
52¾	58	3364	2642	10¾	7 „ 10	84·2	12 14	354	9·7	1·29	30	19·7	336	235	8·9	60 552	5 099 084	572 000
56¼	60	3600	2827	10½	8 „ 0	84·0	12 15	384	10·0	1·33	31	20·9	365	255	9·5	64 800	5 443 200	575 000
60	62	3844	3019	10¼	8 „ 2	83·7	12 & 2 of 11	402	10·3	1·36	31	22·2	396	277	10·0	69 192	5 792 062	579 000
63½	64	4096	3217	10	8 „ 4	83·3	12 2 11½	426	10·7	1·39	32	23·4	429	300	10·6	73 728	6 144 000	581 000
67	66	4356	3421	9¾	8 „ 6	82·9	12 2 12	450	11·0	1·42	33	24·7	464	324	11·2	78 408	6 498 455	581 000
70¾	68	4624	3632	9½	8 „ 8	82·3	12 2 12½	476	11·3	1·45	34	26·0	502	351	11·8	83 232	6 852 768	583 000
74½	70	4900	3848	9¼	8 „ 10	81·7	12 2 13	502	11·7	1·47	35	27·3	542	379	12·4	88 200	7 206 822	583 000
78	72	5184	4071	9	9 „ 0	81·0	12 2 13½	530	12·0	1·50	36	28·8	586	409	13·0	93 312	7 558 272	581 000

The surface in the flue is taken at one-half.

Diam. of the outside boilers.

(add)

Bolton & Watt

In 1762, Matthew Bolton, after inheriting a large sum of money upon his father's death, opened the "Soho works" manufacturing plant, which made clocks and timepieces. The mill, at this time, was operated by horses, being that water-power (running rivers) were lacking at Soho. Being that the power of horse was irregular and sometimes failed, he soon began to contemplate the possible application of the steam engine to his mill.

"The enormous expense of the **horsepower** put me upon thinking of turning the mill by fire."

— Matthew Bolton (1766), "Letter to Friend"

He continued that he had been recently making fruitless experiments on the subject. On Feb 22, 1766, Boulton wrote Benjamin Franklin about this and sent him a model he had made. [4] Soon thereafter, English inventor John Roebuck, a correspondent of Boulton's, told him of a young Scottish inventor named James Watt who had been making recent progress with model steam engines. Boulton then invited Watt to visit him at Soho, which he did on a return from a visit to London.

In 1775, Boulton and Watt formally entered into partnership, and it was mainly through the energy and self-sacrifice of Boulton, who devoted all the capital he had or could borrow to the enterprise, that the steam engine was at length made a commercial success; and for the next eleven years the Soho Foundry they made Watt's steam-engines for colliery owners to pump water out of mines, the Boulton & Watt engine being four times more powerful than Thomas Newcomen's original design.

In 1782, James Watt found, via experiment, that a "brewery horse" was able to produce 32,400 foot-pounds per minute.

In 1783, Watt and Matthew Boulton, working together, standardized the figure of one "horsepower" at 33,000 foot-pounds per minute, in order to classify their engines for sale, and by 1809, this was generally accepted as equivalent of 1 horsepower, as it is today. This meaning that this was the amount of mechanical effect that the average "brewery horse" could produce in one minute (see: mechanical equivalent of heat). In other words, through experiment, it was determined that one horse, on average, could work a rotational device, such to turn gears, resulting in the lifting of 33,000 pounds of water out of a mine in one minute. [1]

Units

The following are the related SI units:

- Newton (unit) | Force | kg m/s²
- Joule (unit) | Energy | N m | kg m²/s²
- Watt (unit) | Power | J/s | kg m²/s³

In modern units, one horsepower (hp), equaling 33,000 foot-pounds (ft lb) force per minute, equates to 550 foot-pounds force per second of mechanical action, which, knowing that ft lb = 1.356 J, equates to 745.7 joules of energy per second, or 745.7 watts.

In 1912, the horsepower was standardized as follows:

> "There was, before 1911, no precise definition of the horsepower that was generally accepted and authoritative, and different equivalents of this unit in watts are given by various reference books. It is obviously desirable that the horsepower represent the same rate of work at all places. The value most used in electrical practice has been the round number, 746 watts, and in 1911 the American Institute of Electrical Engineers adopted this as the exact value of the horsepower. Thus defined, it is the rate of work expressed by 550 foot-pounds per second at 500 latitude and sea level, approximately the location of London, where the original experiments were made by James Watt to determine its value. The number of foot-pounds per second in a horsepower accordingly varies with the latitude and altitude. This value, 746 watts, will be used in future publications by this Bureau as the exact equivalent of the 'English and American horsepower'. The horsepower tables in this Bureau's Tables of Equivalents formerly assumed 550 foot-pounds per second as the correct equivalent at 45° latitude, because of the well-established use of 45° as a standard latitude. This gave the inconvenient relation, **1 horsepower = 745.6494 watts**."
>
> — Samuel Stratton (1912), *The Relation of the Horsepower to the Kilowatt* [10]

(add)

Quotes

The following are related quotes:

> "**Horse-power** is the name given to the unit in terms of which engineers measure the power of steam engines, water-wheels, and other prime movers. It is defined to be the rate at which an engine works when it does 33,000 foot-pounds of work per minute, a foot-pound being the amount of work necessary to raise a pound weight a foot high. We must go back to the early history of the steam-engine to discover the reason why this number was adopted. The first steam-engines were employed to drive mills, pumps, and other machinery which had previously been driven by horses; and it seemed natural to express their working-power in terms of the number of horses whose work they were got to accomplish. This led to experiments being made in order to get an estimate of the average working-power of a horse. Several such estimates have been given, all differing considerably from each other; but the one adopted whereby to express horse-power is that obtained by Boulton and Watt from observations on the strong dray horses employed at the London breweries working eight hours a day. They found that a horse was able to go at the rate of 2.3 miles per hour and at the same time raise a weight of 150 lb by means of a rope led over a pulley. This is easily seen to be equivalent to 33,000 lb raised one foot per minute, and hence the number given above."
>
> — Anon (1890), "Horse-power" in *Encyclopedia Britannica, Volume 12* (pg. 207)

See also

- Manpower
- Waterpower

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8. (a) Hero. (1589). *Spiritalia*. Publisher.
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(c) Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 166). Courier, 1990.
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10. Stratton, Samuel W. (1912). *The Relation of the Horsepower to the Kilowatt* (§II: Historical, pgs. 7). US Government Printing Office.
11. (a) Triewald, Marten. (1734). *Short Description of the Atmospheric Engine* (pg. 33). Courier Press, 1928.
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12. Farey, John. (1827). *A Treatise on the Steam Engine: Historical, Practical, and Descriptive* (table, pg. 183). Longman.

External links

- Horsepower - Online Etymology Dictionary.
- Horsepower – Wikipedia.

θΔics

In Information thermodynamics, **Horton A. Johnson** (1926-) is/was an American pathologist noted for his articles on the application of thermodynamics and information theory to biology and pathology. In his 1970 article "Information Theory and Biology", for instance, Horton argues that information theory must be modified for the description of living things. [1]

Education

In 1970, Johnson was an attending pathologist at the medical department of the Brookhaven National Laboratory, Upton, New York.

References

1. Johnson, Horton A. (1970). "Information Theory in Biology after 18 Years" (abs), *Science*, 168: 1545-50.

Further reading

● Johnson, Horton A. (1965). "Renal Efficiency and Information Theory", *Nature*, 206: 930-31.
● Johnson, Horton A. (1969). "Information Theory and Biology: a Critique and Resynthesis" (15-pgs). Brookhaven National Laboratory.
● Johnson, Horton A. (1974). "On the Thermodynamics of Cell Injury" (abs), *Am J. Pathol.* 75: 13-26.
● Johnson, Horton A. (1987). "Thermal Noise and Biological Information", *Q Rev Biol.* 62: 141-52.

External links

● Johnson, Horton A. – WorldCat Identities.

θΔics

In Egyptian mythology, **Horus**, hieroglyph: , or "Heru", hieroglyph , “Harpocrates” (Alexander, 330BC), (Q) "Orus" (Plutarch, 100AD; Taylor, 1829), symbolized by is an ancient falcon-headed god, or "hawk god" (Budge, 1904), of Egypt, originally, in the predynastic era (before 3,100BC), thought of as the "height of the heavens" and ranked as the oldest god of Egypt, who became re-conceptualized in the Dynastic era, via the Heliopolis recension (2,500BC), as the son of Osiris and Isis.

A 20th dynasty (see: supreme god timeline) depiction of **Horus**, Osiris (who typically has green skin), and Isis statue (Q); the platform of Osiris, being a lapis lazuli pillar, representative of the chest that Set trapped him in and or the djed pillar (see: Passion of Osiris), held at the Louvre, Paris. (Q)

Form

The following shows three images (Q) of Horus, namely Left: Statue of Horus as a falcon (temple of Horus, Edfu; Ptolemaic Era); middle: Horus as a falcon-headed man (temple of Horus, Edfu; Ptolemaic Era); right: lanner falcon, Falco biarmicus, which is what the Egyptians thought Horus had his animal god form as:

(add)

Eye of Horus

See main: Eye of Horus: See also: Eye of Ra

The following, from the Ani-version of the Egyptian Book of the Dead, shows Horus labeled with the hieroglyph "Horus the eyeless":

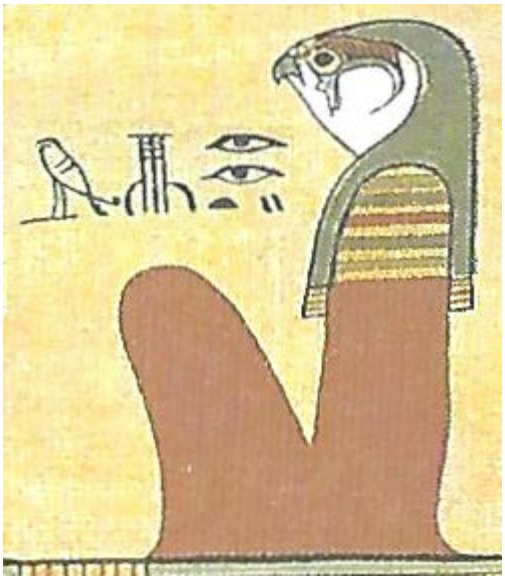

(add)

Child Horus

In 1907, Gerald Massey (Q), and following him Tom Harpur (2004), were referring to the "child Horus" as "Iusa" or "Iu-em-hetep"; and example of which, given by Harpur, is as follows: [7]

> "According to Herodotus, the Egyptian Jesus, known as Iu-em-hetep [child Horus] was one of the eight great gods who were described in the papyri as having existed almost twenty-thousand years ago."

Harpur, to note, footnotes the name Iu-em-hetep, incorrectly, as: "who the Egyptologists call Imhotep", which is a real person.

A bust (Q) of **Horus**.

Heliopolis

Horus, according to the Heliopolis recension (see: Heliopolis creation myth), was morphed or merged so as to become the son of Osiris and Isis.

Etymology

Horus originated, supposedly, as a totem of an Upper Egyptian nome which at the opening of the dynastic epoch is believed, according to some historians, to have conquered Lower Egypt and brought about a union of Egypt.

In circa 2,800BC, the priests of Heliopolis, according to Jon White (1963), merged the worship of the so-called historical Horus with the legendary Horus, son of Osiris.

Osiris-Horus | Jesus

In c.100 to 500AD, during the Roman recension, the joint god Osiris-Horus became rescripted, monotheistically, into the man god Jesus.

In 1877, English Egyptologist William Cooper, in his *The Horus Myth in its*

Relation to Christianity, attempted to stitch out the roots of Jesus Christ and Christianity in terms of the Horus. [2]

A depiction of how the myth of **Horus** carrying the sun (or sun disc) on his head, and myth of Osiris dying and being reborn as an evergreen tree (tamarisk tree), became merged into the monotheistically reformulated myth of Jesus being born under or near a Christmas tree with a halo on his head.

Quotes

The following are related quotes:

> "The loadstone is called, by the Egyptians, the 'bone of **Horus**', as iron is the 'bone of Typho [Set]."
>
> — Manetho (c.300BC) [5]

> "The Egyptians, in fact, have a tradition that Hermes [Thoth] had thin arms and big elbows, that Typhon [Set] was red in complexion, **Horus** white, and Osiris dark."
>
> — Plutarch (100AD), *On Isis and Osiris* (pg. 55)

> "**Horus** is the oldest god of all / Horus is the oldest of all Egyptian gods."
>
> — Wallis Budge (1904), *The Gods of Egypt, Volume One* [4]

> "Even after political unification, in c.3100BC, there were always two Egypts: Lower Egypt (delta religion of Nile), represented by Seth, and Upper Egypt (from Memphis at the apex of the delta and along the river to its upper reaches at Aswan), represented by **Horus**."
>
> — Scott Littleton (2002), *Mythology* [3]

See also

- Horus Gilgamesh
- Joshua 10:13

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2. Cooper, William. (1877). *The Horus Myth in its Relation to Christianity*. Hardwick & Bogue.
3. Littleton, C. Scott. (2002). *Mythology: the Illustrated Anthology of World Myth and Storytelling* (pg. 11). Thunder Bay Press.
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(b) Manetho – Wikipedia.
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7. (a) Massey, Gerald. (1907). *Ancient Egypt: The Light of the World: a Work of Reclamation and Restitution in Twelve Books, Volume Two* (Iu-em-hetep, 42+ pgs; esp. pgs. 675, 927). T. Fisher Unwin.
(b) Harpur, Tom. (2004). *The Pagan Christ* (pgs. 37-38). Thomas Allan Publishers.

Further reading

● Griffiths, John G. (1960). *The Conflict of Horus and Seth: from Egyptian and classical sources: a study in ancient mythology*. Liverpool University.

External links

● Horus – Wikipedia.

θΔics

In existographies, **Horus Gilgamesh** (c.1965-) (FA:158) is the pen name, an amalgamation of Horus (of Egyptian mythology) + Gilgamesh (of Sumerian mythology), of the author of the 2013 *Awkward Moments Children's Bible*, a reality "children's atheist bible" of sorts, in three volumes (2013-2015), which puts ridicule to the various taken-at-face-value nonsense passages and stories in the Bible, e.g. maternal imagination theory, morality, eating the body and blood of Christ, which derives from the eating of corn bread of the body of Osiris and drinking the wine of Horus, aka festival of Bacchus in Greco-Roman terms, which took place during the annual festival of the Passion of Osiris (aka Passion of Christ), making Eve from Adam's rib (which comes from Sumerian mythology, see: clay creation myth; Adam and Eve), Eve talking to the snake in the Garden of Eden (which comes from Hesiod's version of Pandora's box), among others. [1]

Overview

In 2011, Gilgamesh, together with some of his PhD Biblical scholarship and general history friends, started an Awkward Bible joke Facebook page, which by 2013 had some 14,000+ fans, and therein the idea for the book emerged. In 2014, the second volume was published.

Atheism | Beliefs

Gilgamesh, in youth was raised Catholic, then became a "born again" Christian in college, wherein he directed his efforts towards ministry, youth evangelism, and Biblical literacy. In 2014, Gilgamesh, in podcast interview (O) with Hemant Mehta, stated that he doesn't believe in the existence of god, but yet does not identify with the term atheist, specifically "I kind of reject the word", pre reasons of social bond breakages and social sparks that atheism self-identification brings up, e.g. he states the atheism = evil ideology, e.g. that some believe atheists are people who "wake up each morning and bite the head off living puppies"; in short, he seems to be the so-called "atheism label phase".

Kid's Koran | Awkward Moments

On 31 May 2015, Gilgamesh posted that they were cancelling publication of the Islamic version of Awkward Moments, owing to the various American soil cartoon shootings, such as Texas Draw Mohammed shooting (5 May 2015), among other recent police encounters. [3]

See also

- Watson Heston
- Zerotheism for kids

References

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Further reading

- Gilgamesh, Horus and Tickheathen, Agnes. (2013). *Awkward Moments Children's Bible, Volume Two* (Foreword: David McAfee) (Amz). CreateSpace.

External links

- Home – AwkwardMomentsBible.com.
- Horus Gilgamesh – Facebook.
- Horus Gilgamesh – Twitter.

In science, **hot**, as contrasted with "cold" (i.e. cold body), refers to a description a body (i.e. hot body), or system, whose internal parts have a higher state of "motion" (Bacon, 1620), gauged, via zeroth law, by a third body, the thermometer, which discerns the relative state of motion, or temperature; which decreases to a minimum at absolute zero, according to the third law. [1]

A visual of something "**hot**" (O), i.e. fire, shown next to something "cold", i.e. ice, the latter working to melt the former.

Societies

In circa 1959, Claude Levi-Strauss outlined ideas on how he conceived societies as either being hot, i.e. "hot societies" (hot social system), or cold, i.e. "cold societies" (cold social system).

Hot or Not

In 2000, American electrical engineers James Hong and Jim Young launched the visually attractiveness rating site HotOrNot.com, aka "Hot or Not", the 2015 logo of which is as follows:

according to which photos of people are "rated" on a supposedly (depending up opinion) "metaphorical" hot-to-cold scale of 10 (hot) to 1 (cold), thereby giving a common consensus gauge of the relative "hotness" or "coldness" of the visual nature of a person; the site was conceived as a technical solution to a disagreement they made one day over a passing woman's attractiveness. [2]

In circa 2003, Libb Thims, amid the drafting of his *Human Thermodynamics* manuscript, was using the site to conduct scientific studies.

In 2005, imaging researcher Pierre Tourigny, supposedly aware of the beauty rule of the thumb that "averageness" equates to attractiveness, selected 30 random photos from Hot or Not, spanning the attractiveness range, and morphed the photos, three per each 0.5 hotness range, as well as the thirty photos as a group; the following being the results: (O)

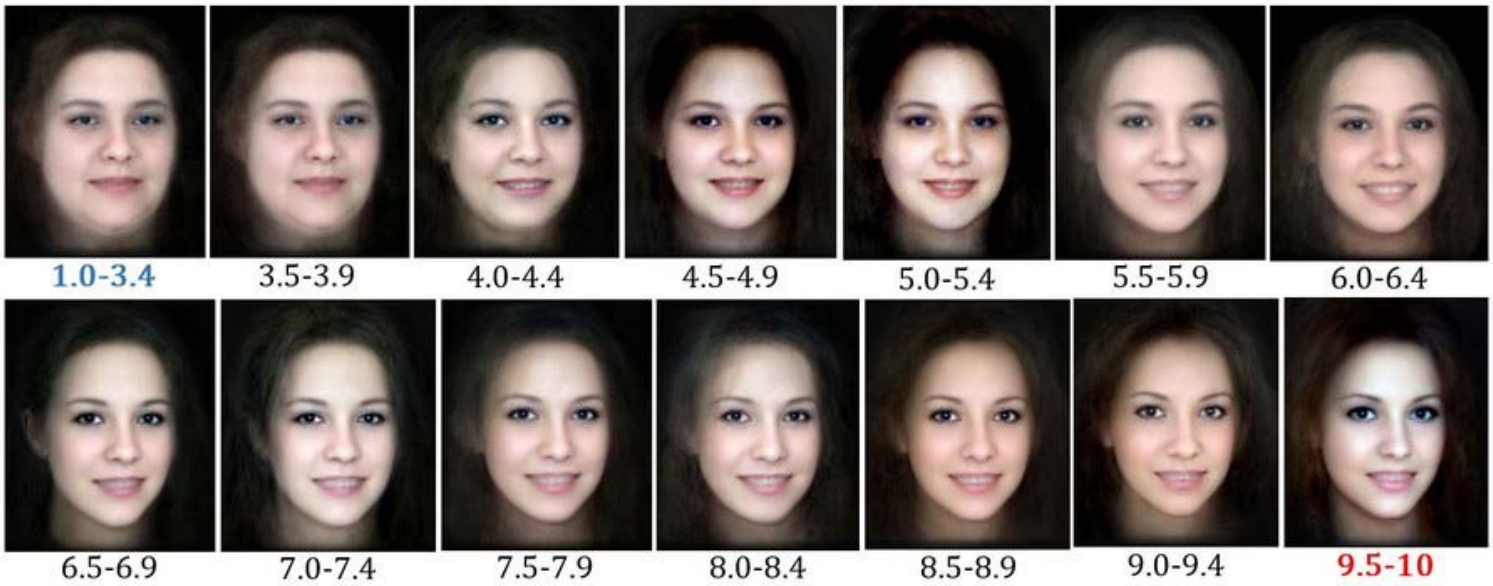

The following shows the composite "average" photo, a morph of all 30 photos, as compared to the morph of the three vote-deemed hottest morph:

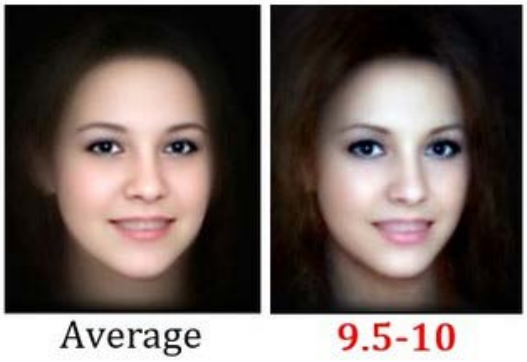

(add discussion)

Quotes

The following are related quotes:

> "Put your hand on a **hot** stove for a minute and it seems like an hour. Sit with a pretty girl for an hour, and it seems like a minute. That's relativity!"
>
> — Albert Einstein (1921) (Q)

> "A woman is like a tea bag—you can't tell how strong she is until you put her in **hot** water."
>
> — Eleanor Roosevelt (c.1930) (Q)

> "I think human thermodynamics is pseudoscience. The interchanging of words with precise scientific meanings, i.e. bond, energy, reaction, **hot**, etc., with their everyday meanings is one of the cornerstones of pseudoscience. Of course human beings obey the laws of thermodynamics like everything else in the universe, but trying to apply equations which only describe larger systems of microscopic particles to analogous situations between human beings, just because the everyday and scientific words involved happen to correspond, [is erroneous]."
>
> — Edward Sanville (2005), "Dialogue with Libb Thims on Human Thermodynamics" [4]

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Further reading

● Thims, Libb. (c.2006). "Hot or Not by Age" (Q), Chicago: IoHT publications.

Videos

● Thims, Libb. (2008). "Thermodynamics of Hot for Words", YouTube, HumanChemist101, Nov 26.
● Thims, Libb. (2009). "Hot N Cold: Relationships", HumanChemistry101, YouTube.com, Mar 04.

θΔics

In thermodynamics, a **hot body** is the body of elevated temperature, in the structure of a heat engine, as compared to another, called the cold body, in which it is lower. In equation form:

T_A (hot body) > T_B (cold body)

The hot body is typically referred to as the furnace or boiler, i.e. burning coal or fire used to heat a tank of water, maintaining the boiling water at a constant temperature T_A, which is thus serves as a heat source, as contrasted with the heat sink (the condenser or stream of cool water), readily able to give up heat to the working body of expanding and contracting substance (typically water) inside of the piston and cylinder.

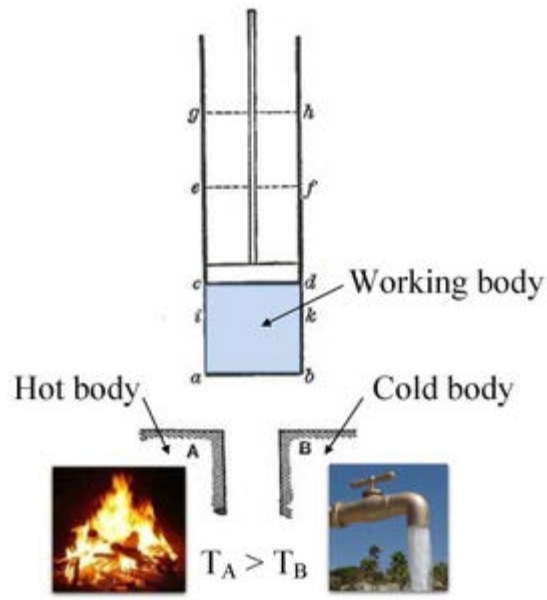

Hot body, cold body, working body diagram or view of the Carnot engine.

History

The definition of the hot body was defined by French physicist Sadi Carnot in 1824 in his description of the production of motive power in steam engines or heat engines, in which he utilized the logic of the cycle or Carnot cycle. To quote:

> "The production of motive power [work] in the steam engine is due the transportation of caloric [heat] from a **warm body** to a cold body, i.e. to its re-establishment of equilibrium—an equilibrium considered as destroyed by any cause whatever, by chemical action, such as combustion, or by any other."

This terminology was taken up French engineer Emile Clapeyron in 1834 who graphically described the Carnot cycle utilizing the hot body / cold body terminology. [2]

Human thermodynamics

In studies of human thermodynamic systems, the location of the hot body is an intricate subject of study. The basic model of any generic social system is that the sun acts as the hot body. In studies of small number human molecule interactions, a hot body can be distinguished by a facet of perceptual physical or mental beauty. It is well documented, for example, that a supermodel walking through a crowd of people will cause of volume expansion around themselves, according to the rule that they will be allotted more personal space. In these types of studies, the determination of where the three different bodies (hot, cold, and working) are becomes a very complicated subject. [3]

The lyrics to the popular 1999 R&B song "Hot Boyz" by Missy Elliott gives an idea of the difficulties involved in trying to determine the three different bodies of the thermodynamic system. [4] It is clear that the guy (a) treating women good, (b) carrying a glock, (c) living by himself, (d) driving an expensive car, (e) using a platinum visa, (f) with friends who are hot, etc., is the "hot body" of the Carnot engine model, but the determination of the cold body and the working body becomes very elusive.

References

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4. Hot Boyz (lyrics) – AZLyrics.com.

Further reading

â— Magee, Charles W. (2006). "Thermodynamics of Hot Chicks." *BlogSpot.com*, Dec 19.

θΔics

In terminology, **hot-cold empathy gap** refers to the inability, when in a cold state, to empathize with feelings when in a hot state, i.e. hot feelings. [1]

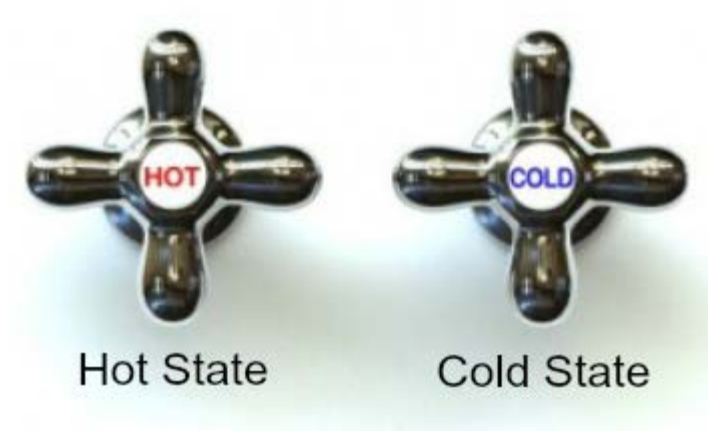

People, according to American economist George Loewenstein (1996), can exist in cold states and hot states and there is a so-called "**empathy gap**" between the two states; a phenomenon which has been quantified (2005) with respect to changes in sexual choices.

Hot and cold | Emotions

The term "hot-cold empathy gap" is attributed to American economist George Loewenstein's 1996 article "Out of Control: Visceral Influences on Behavior", wherein he employs the terms: gap, hot, cool, and empathy in a connective manner, though, to note, he does not actually seem to employ the specific phrase "hot-cold empathy gap" in this specific article. Loewenstein, firstly, themes his article with the following opening quote: [2]

> "It is always thus, impelled by a state of mind which is destined not to last, that we make our irrevocable decisions."
>
> — Marcel Proust (c.1910)

Loewenstein then initiates his thermal word interjection via citation to the following 1759 quote by Adam Smith:

> "At the very time of acting, at the moment in which passion mounts the highest, he hesitates and trembles at the thought of what he is about to do: he is secretly conscious to himself that he is breaking through those measures of conduct which, in all his **cool** hours, he had resolved never to infringe, which he had never seen infringed by others without the highest disapprobation, and the infringement of which, his own mind forebodes, must soon render him the object of the same disagreeable sentiment."

He then jumps to the following:

> "Decision theory, as it is currently practiced, makes no distinction between visceral factors and tastes and thus does not recognize the special impact of visceral factors on behavior. It is best equipped to deal with **'cool'** or 'dispassionate' settings in which there is typically a very close connection between perceived self-interest and behavior. The decision-making paradigm has much greater difficulty in providing an account of decisions occurring at the **'hot'** end of the continuum defined by the intensity of visceral factors. The drive mechanism of Freudian and behavioristic psychology provides a better account of behavior at the opposite end of the same continuum."

Loewenstein, here, seems here to be referring to Freud-Schiller drive theory, though it is difficult to say in what sense he means by "drive mechanism".

Heat of the moment

In 2005, Loewenstein, together with American economics psychologist Dan Ariely, published a study entitled "The Heat of the Moment", the focused on the subject of:

> "The sex drive is a vitally important motivational force in human behavior, from the perspective of both the individual and the society. Sexual motivation plays a direct and indirect role in a considerable number of

economic activities."

The study was on decision making or choice behaviors of male students while in the "hot state", arrived at by self-stimulation short of ejaculation, as compared to the "cold state", i.e. not aroused, finding, e.g., that whereas only 7% were attracted to a 60-year old women when unroused, 23% were attracted after prior arousal, among other interesting behavioral pattern changes. [3]

References

1. Toates, Frederick. (2014). *How Sexual Desire Works: the Enigmatic Urge* (§:Heat of the moment, pgs. 218-; heat, 13+ pgs). Cambridge University Press.
2. (a) Loewenstein, George. (1996). "Out of Control: Visceral Influences on Behavior" (abs) (pdf), *Organizational Behavior and Human Decision Processes*, 65:272-92.
(b) Schwartz, Barry and Sommers, Roseanna. (2013). "Affective Forecasting and Well-Being", in: *The Oxford Handbook of Cognitive Psychology* (editor: Danile Reisberg) (pg. 711). Oxford University Press.
(b) George Loewenstein – Wikipedia.
3. (a) Ariely, Dan. and Loewenstein, George. (2005). "The Heat of the Moment: the Effect of Sexual Arousal on Sexual Decision Making" (pdf), *Journal of Behavioral Decision Making*, 19:87-98.
(b) Dan Ariely – Wikipedia.
(c) Toates, Frederick. (2014). *How Sexual Desire Works: the Enigmatic Urge* (§:Heat of the moment, pgs. 218-; heat, 13+ pgs). Cambridge University Press.

External links

â— Empathy gap – Wikipedia.

θΔics

In famous publications, **“How Cosmic Forces Shape Our Destinies”** was a 1915 article by Serbian-born American electrical Nikola Tesla, wherein he outlines an human automaton theory, somewhere between Cartesian automaton theory and Neumann automaton theory in viewpoint, during the course of which he abjures with the defunct theory of life statement that “there is no thing endowed with life”, though, to note, he tinges this with panbioism addendums.

Article

The following is Tesla's 1915 article in full: [1]

Introduction

Every living being is an engine geared to the wheelwork of the universe. Though seemingly affected only by its immediate surrounding, the sphere of external influence extends to infinite distance. There is no constellation or nebula, no sun or planet, in all the depths of limitless space, no passing wanderer of the starry heavens, that does not exercise some control over its destiny—not in the vague and delusive sense of astrology, but in the rigid and positive meaning of physical science.

More than this can be said. **There is no thing endowed with life**—from man, who is enslaving the elements, to the humblest creature—in all this world that does not sway it in turn. Whenever action is born from force, though it be infinitesimal, the cosmic balance is upset and universal motion result.

Herbert Spencer has interpreted life as a continuous adjustment to the environment, a definition of this inconceivably complex manifestation quite in accord with advanced scientific thought, but, perhaps, not broad enough to express our present views. With each step forward in the investigation of its laws and mysteries our conceptions of nature and its phases have been gaining in depth and breadth.

In the early stages of intellectual development man was conscious of but a small part of the macrocosm. He knew nothing of the wonders of the microscopic world, of the molecules composing it, of the atoms making up the molecules and of the dwindlingly small world of electrons within the atoms. To him life was synonymous with voluntary motion and action. A plant did not suggest to him what it does to us—that it lives and feels, fights for its existence, that it suffers and enjoys. Not only have we found this to be true, but we have ascertained that even matter called inorganic, believed to be dead, responds to irritants and gives unmistakable evidence of the presence of a living principle within.

Thus, everything that exists, organic or inorganic, animated or inert, is susceptible to stimulus from the outside. There is no gap between, no break of continuity, no special and distinguishing vital agent. The same law governs all matter, all the universe is alive. The momentous question of Spencer, "What is it that causes inorganic matter to run into organic forms!" has been answered. It is the sun's heat and light. Wherever they are there is life. Only in the boundless wastes of interstellar space, in the eternal darkness and cold, is animation suspended, and, possibly, at the temperature of absolute zero all matter may die.

Man as Machine

This realistic aspect of the perceptible universe, as a clockwork wound up and running down, dispensing with the necessity of a hypermechanical vital principle, need not be in discord with our religious and artistic aspirations — those **undefinable** and beautiful efforts through which the human mind endeavors to free itself from material bonds.

On the contrary, the better understanding of nature, the consciousness that our knowledge is true, can only be all the more elevating and inspiring.

It was Descartes, the great French philosopher, who in the seventeenth century, laid the first foundation to the mechanistic theory of life, not a little assisted by Harvey's epochal discovery of blood circulation. He held that animals were simply automata without consciousness and recognized that man, though possessed of a higher and distinctive quality, is incapable of action other than those characteristic of a machine. He also made the first attempt to explain the physical mechanism of memory. But in this time many functions

of the human body were not as yet understood, and in this respect some of his assumptions were erroneous. Great strides have since been made in the art of anatomy, physiology and all branches of science, and the workings of the man-machine are now perfectly clear. Yet the very fewest among us are able to trace their actions to primary external causes. lt is indispensable to the arguments I shall advance to keep in mind the main facts which I have myself established in years of close reasoning and observation and which may be summed up as follows:

1. The human being is a self-propelled automaton entirely under the control of external influences. Willful and predetermined though they appear, his actions are governed not from within, but from without. He is like a float tossed about by the waves of a turbulent sea.
2. There is no memory or retentive faculty based on lasting impression. What we designate as memory is but increased responsiveness to repeated stimuli.
3. It is not true, as Descartes taught, that the brain is an accumulator. There is no permanent record in the brain, there is no stored knowledge. Knowledge is something akin to an echo that needs a disturbance to be called into being.
4. All knowledge or form conception is evoked through the medium of the eye, either in response to disturbances directly received on the retina or to their fainter secondary effects and reverberations. Other sense organs can only call forth feelings which have no reality of existence and of which no conception can be formed.
5. Contrary to the most important tenet of Cartesian philosophy that the perceptions of the mind are illusionary, the eye transmits to it the true and accurate likeness of external things. This is because light propagates in straight lines and the image cast on the retina is an exact reproduction of the external form and one which, owing to the mechanism of the optic nerve, can not be distorted in the transmission to the brain. What is more, the process must be reversible, that in to say, a form brought to consciousness can, by reflex action, reproduce the original image on the retina just as an echo can reproduce the original disturbance If this view is borne out by experiment an immense revolution in all human relations and departments of activity will be the consequence.

Natural Forces Influence Us

Accepting all this as true let us consider some of the forces and influences which act on such a wonderfully complex automatic engine with organs inconceivably sensitive and delicate, as it is carried by the spinning terrestrial globe in lightning flight through space. For the sake of simplicity we may assume that the earth's axis is perpendicular to the ecliptic and that the human automaton is at the equator. Let his weight be one hundred and sixty pounds then, at the rotational velocity of about 1,520 feet per second with which he is whirled around, the mechanical energy stored in his body will be nearly 5,780,000 foot pounds, which is about the energy of a hundred-pound cannon ball. This momentum is constant as well as upward centrifugal push, amounting to about fifty-five hundredth of a pound, and both will probably be without marked influence on his life functions. The sun, having a mass 332,000 times that of the earth, but being 23,000 times farther, will attract the automaton with a force of about one-tenth of one pound, alternately increasing and diminishing his normal weight by that amount.

Though not conscious of these periodic changes, he is surely affected by them.
The earth in its rotation around the sun carries him with the prodigious speed of nineteen miles per second and the mechanical energy imparted to him is over 25,160,000,000 foot pounds. The largest gun ever made in Germany hurls a projectile weighing one ton with a muzzle velocity of 3,700 feet per second, the energy being 429,000,000 foot pounds. Hence the momentum of the automaton's body is nearly sixty times greater. It would be sufficient to develop 762,400 horse-power for one minute, and if the motion were suddenly arrested the body would be instantly exploded with a force sufficient to carry a projectile weighing over sixty tons to a distance of twenty-eight miles.
This enormous energy is, however, not constant, but varies with the position of the automaton in relation to

the sun. The circumference of the earth has a speed of 1,520 feet per second, which is either added to or subtracted from the translatory velocity of nineteen miles through space. Owing to this the energy will vary from twelve to twelve hours by an amount approximately equal to 1,533,000,000 foot pounds, which means that energy streams in some unknown way into and out of the body of the automaton at the rate of about sixty-four horse-power.

But this is not all. The whole`solar system is urged towards the remote constellation Hercules at a speed which some estimate at some twenty miles per second and owing to this there should be similar annual changes in the flux of energy, which may reach the appalling figure of over one hundred billion foot pounds. All these varying and purely mechanical effects are rendered more complex through the inclination of the orbital planes and many other permanent or casual mass actions.

This automaton, is, however subjected to other forces and influences. His body is at the electric potential of two billion volts, which fluctuates violently and incessantly. The whole earth is alive with electrical vibrations in which he takes part. The atmosphere crushes him with a pressure of from sixteen to twenty tons, according, to barometric condition. He receives the energy of the sun's rays in varying intervals at a mean rate of about forty foot pounds per second, and is subjected to periodic bombardment of the sun's particles, which pass through his body as if it were tissue paper. The air is rent with sounds which beat on his eardrums, and he is shaken by the unceasing tremors of the earth's crust. He is exposed to great temperature changes, to rain and wind.

What wonder then that in such a terrible turmoil, in which cast iron existence would seem impossible, this delicate human engine should act in an exceptional manner? If all automata were in every respect alike they would react in exactly the same way, but this is not the case. There is concordance in response to those disturbances only which are most frequently repeated, not to all. It is quite easy to provide two electrical systems which, when subjected to the same influence, will behave in just the opposite way.

So also two human beings, and what is true of individuals also holds good for their large aggregations. We all sleep periodically. This is not an indispensable physiological necessity any more than stoppage at intervals is a requirement for an engine. It is merely a condition gradually imposed upon us by the diurnal revolution of the globe, and this is one of the many evidences of the truth of the mechanistic theory. We note a rhythm or ebb and tide, in ideas and opinions, in financial and political movements, in every department of our intellectual activity.

How Wars Are Started

It only shows that in all this a physical system of mass inertia is involved which affords a further striking proof. If we accept the theory as a fundamental truth and, furthermore, extend the limits of our sense perceptions beyond those within which we become conscious of the external impressions, then all the states in human life, however unusual, can be plausibly explained. A few examples may be given in illustration.

The eye responds only to light vibrations through a certain rather narrow range, but the limits are not sharply defined. It is also affected by vibrations beyond, only in lesser degree. A person may thus become aware of the presence of another in darkness, or through intervening obstacles, and people laboring under illusions ascribe this to telepathy. Such transmission of thought is absurdly impossible.

The trained observer notes without difficulty that these phenomena are due to suggestion or coincidence. The same may be said of oral impressions, to which musical and imitative people are especially susceptible. A person possessing these qualities will often respond to mechanical shocks or vibrations which are inaudible.

To mention another instance of momentary interest reference may be made to dancing, which comprises certain harmonious muscular contractions and contortions of the body in response to a rhythm. How they come to be in vogue just now, can be satisfactorily explained by supposing the existence of some new periodic disturbances in the environment, which are transmitted through the air or the ground and may be of mechanical, electrical or other character.

Exactly so it is with wars, revolutions and similar exceptional states of society.

Though it may seem so, a war can never be caused by arbitrary acts of man.

It is invariably the more or less direct result of cosmic disturbance in which the sun is chiefly concerned.

In many international conflicts of historical record which were precipitated by famine, pestilence or terrestrial catastrophes the direct dependence of the sun is unmistakable. But in most cases the underlying

primary causes are numerous and hard to trace.
In the present war it would be particularly difficult to show that the apparently willful acts of a few individuals were not causative. Be it so, the mechanistic theory, being founded on truth demonstrated in everyday experience, absolutely precludes the possibility of such a state being anything but the inevitable consequence of cosmic disturbance.
The question naturally presents itself as to whether there is some intimate relation between wars and terrestrial upheavals. The latter are of decided influence on temperament and disposition, and might at times be instrumental in accelerating the clash but aside from this there seems to be no mutual dependence, though both may be due to the same primary cause.
What can be asserted with perfect confidence is that the earth may be thrown into convulsions through mechanical effects such as are produced in modern warfare. This statement may be startling, but it admits of a simple explanation.
Earthquakes are principally due to two causes — subterranean explosions or structural adjustments. The former are called volcanic, involve immense energy and are hard to start. The latter are named tectonic; their energy is comparatively insignificant and they can be caused by the slightest shock or tremor. The frequent slides in the Culebra are displacements of this kind.

War and the Earthquake

Theoretically, it may be said that one might think of a tectonic earthquake and cause it to occur as a result of the thought, for just preceding the release the mass may be in the most delicate balance. There is a popular error in regard to the energy of such displacements. In a case recently reported as quite extraordinary, extending as it did over a vast territory, the energy was estimated at 65,000,000,000,000 foot tons. Assuming even that the whole work was performed in one minute it would only be equivalent to that of 7,500,000 horse-power during one year, which seems much, but is little for a terrestrial upheaval. The energy of the sun's rays falling on the same area is a thousand times greater.
The explosions of mines, torpedoes, mortars and guns develop reactive forces on the ground which are measured in hundreds or even thousands of tons and make themselves felt all over the globe. Their effect, however, may be enormously magnified by resonance. The earth is a sphere of a rigidity slightly greater than that of steel and vibrates once in about one hour and forty-nine minutes.
If, as might well be possible, the concussions happen to be properly timed their combined action could start tectonic adjustments in any part of the earth, and the Italian calamity may thus have been the result of explosions in France. That man can produce such terrestrial convulsions is beyond any doubt, and the time may be near when it will be done for purposes good or apt.

Discussion

The first two paragraphs, of this opening article section, corroborate with the now confirmed and accepted 2009 defunct theory of life, i.e. that life is something that does not exist. Very deep insight indeed. In the last paragraph we see Tesla: conclude that the unbridgeable gap model is bunk (correct), that vitalism is bunk (correct), that the same law (thermodynamics) governs all matter (correct), discuss the heat death theory (seems cogent), and attempt to give his solution to the Spencer-version of the great problem of natural philosophy (close). In the last of these, however, his mention that "all the universe is alive" (incorrect) is one step away from the rigid physical science defunct view of life, namely that correctly "nothing in the universe is alive" (correct). When one first delves into the matter, such as via descent down to smaller scales, e.g. as viewed on the molecular evolution table or evolution timeline, the first possibility that comes to mind, knowing that atoms and nucleons are teeming with movement and activity, is to conclude that "all is alive" in some sense of the matter. This view, however, does not hold water in the long run after which one concludes that the "all is alive" possibility is an anthropomorphism and that correctly what is needed is a deanthropomorphism.

References

1. (a) Tesla, Nikola. (1915). “How Cosmic Forces Shape Our Destinies (‘Did the War Cause the Italian Earthquake’)” (Ñº), *New York American*, Feb 7.
(b) Tesla, Nikola. (2007). *The Nikola Tesla Treasury* (pg. 504-13). Wilder Publications.

(c) Gaither, Carl C. and Cavazos-Gaither, Alma E. (2012). *Gaither's Dictionary of Scientific Quotations* (pg. 460). Springer.
(d) Seifer, Marc. (1998). *Wizard: the Life and Times of Nikola: Biography of a Genius* (pg. 105). Citadel Press.

θΔics

In queries, **How Osiris Became Jesus** refers to the overly-common puzzlement of how, according to Christ myth theory, the polytheistic Egyptian religio-mythology story of death and resurrection of Osiris became the monotheistic Roman recension story of the death and resurrection of Jesus.

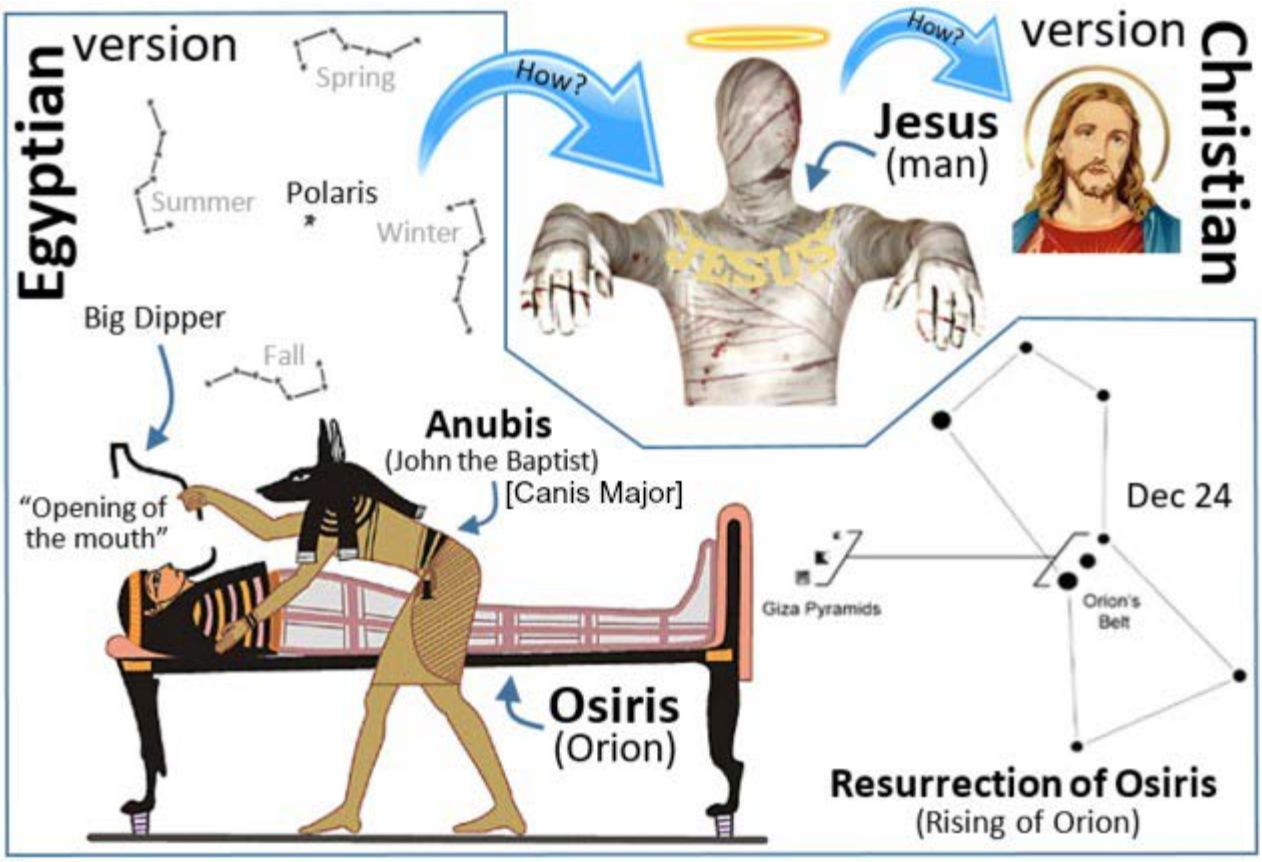

A visual overview of how the Egyptian religio-mythology model of the the rising of Osiris from the dead became the Roman story of the resurrection of Jesus from the dead. [N1]

Overview

In modern times, recent popular films, e.g. *The God Who Wasn't There* (2005) (Q)(Q), by Brian Flemming, the viral *Zeitgeist* (2006), by Peter Joseph, and *Religulous* (2008), featuring Bill Maher, building on the more involved published work of the 120+ religio-mythology scholars, each talk generally about or allude to the conclusion that the story of Jesus as a re-telling, rescript, redaction, or recension (see: recension theory) of the Osiris myth (see: Passion of Osiris), and or a rewrite (or syncretism) of the the god Horus, the son of Osiris. The specifics of how this occurred, over the course of the last five-thousand years, however, is involved, to say the least.

In short, Egyptians, in the 1st dynasty (3,100BC), believed that what occurred annually to their land, e.g. the annual 150-day Nile River flood (see: Noah's flood), the 70-day disappearance of the star Sirius, the rebirth of the heat of the dying sun on Dec 25, was mirrored in the the sky, i.e. the constellations (e.g. Orion), sun, moon, stars (e.g. Sirius) of whom (see: astro-theology) were conceived of as gods or pharaohs-as-gods.

Accordingly, the centerpiece of this belief system was annual Dec raising of the Orion constellation, Orion, with is three star belt buckle, conceived as a great pharaoh, riding on a boat in the Nile mirrored of the heavens. Orion at this point in time was conceptualized as the god Sah.

In 2800BC, Sah, aka the Orion constellation, comprised of 14 stars, became synretized into the god Osiris. To "raise" the perceptually to the eye "dead" god Osiris, from the late Nov dead position (lying horizontal in the sky) to the "alive" or upright position, as seen in late Dec (about Dec 25), another constellation god, called Anubis (aka John the Baptist, as he became during the Roman recension), had to perform the so-called "opening of the mouth" (Q) ceremony, using a "tool" [add name] representative of the big dipper, that would let "air" or "water" into the mouth of the dead Orion (Osiris) constellation, therein bringing him back to life, in the judgment hall of the heavens.

In 100BC to 200AD, with the rise of Roman power, concordant with the decline of Egyptian power, the new Roman emperors ordered a new religion to be made that would unit the the empire, similar as had what had been done in all previous recensions (see: recension theory), e.g. in 332 to 305BC, Alexander the Great attempt, in the "Greek recension ", to merge the Greek god Zeus-Amon with the Egyptian god Amen-Ra to make a new syncretistic god (see: supreme

god timeline), or how in 1352BC the Egyptian pharaoh Akhenaten attempted to make Aten the sole god of Egypt.

This began, generally, with Roman emperor Nero, in 54-68AD, worshiping the Egyptian gods Isis and Osiris, depictions of which are shown in Dendera Temple.

In 337AD, by the time of the Nicaean creed (325AD), things had become homogenized to the effect that the ancient story of the Osiris being cut into 14 pieces (# of stars of the Orion constellation), then put back together, then mummified, and resurrected from the dead after three days, became the monotheistic story of the Jesus being "crucified", then being wrapped in linen, then rising from the dead after three days.

In c.800AD, the practice of mummification was outlined by the Roman empire, after which the connected between Jesus and mummification began to attenuate into a rug swept topic; in modern times, the connection between Jesus and mummies is so remote, that is near laughable, to the ignorant mind, when mentioned.

Horus

Of note, there exists a bit of unavoidable confusion as to whether the god Osiris OR the god Horus is main pre-script to the fictional figure of Jesus; the following is a recent evidenced confusion example:

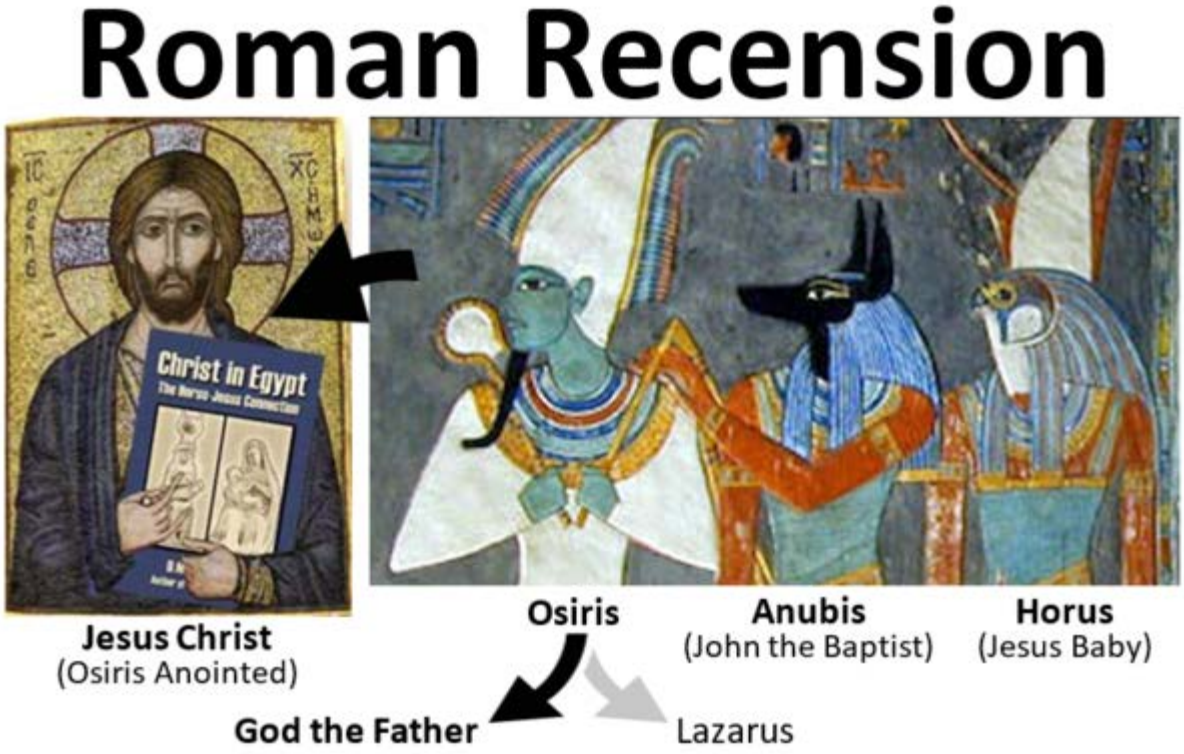

A visual overview of how, amid the Roman recension, the Egyptian god Osiris was split three ways into: Jesus Crucified, God the Father, and Lazarus (see: Raising of Lazarus); Anubis became John the Baptist; and Horus became Jesus the infant born to a virgin Mary (see: Isis), in short. [N2]

> "The assertion that Osiris' son Horus has the exact same bio of Jesus is just based on misinformation. This is garbage that's spread on the Internet, that just isn't true. What's funny about this is that these people who say this kind of thing, never seem to quote the primary sources. They tell you that this is in **Osiris OR Horus**, but you never see the primary sources quoted. When you look at the primary sources, you find out that they're not at all parallel."
>
> — William Craig (2012), response (Q)(Q) to audience member who asks about the Osiris/Horus and Jesus parallel, Feb 24

The general issue here, in short, is that originally, in pre-Dynastic Egypt (c.3500BC), Horus and Osiris were two completely different and unrelated gods, and Horus, in fact, as Wallis Budge has pointed out, is the "oldest god of all" the Egyptian gods; most of the first pharaohs, e.g., all had "Horus names" (i.e. "Hor"), e.g. Iry-Hor (c.3150) (Q), written written with the Horus falcon hieroglyph (Gardiner sign G5) above a mouth hieroglyph (Gardiner D21), was the 1st pharaoh (Q) of the 0th Dynasty.

When, however, after the Heliopolis recension (c.2800BC) of Egyptian mythology (see: Heliopolis creation myth),

occurred, wherein henotheism (one supreme god ruling over one paut or god family) took shape, Horus and Osiris were merged into one god family creation myth. Moreover, it wasn't until the 20th Dynasty (1189-1077 BC), in Thebes, that Osiris moved into the supreme god (see: supreme god timeline) position parallel in power to that of Ra (therein becoming the syncretistic god Osiris-Ra). A full read-through of Wallis Budge's two-volume *The Gods of the Egyptians* (1904) is requisite to fully discern the big picture view that Osiris and Horus, originally, were TWO different and unrelated gods. By the time of the Roman recension (50BC to 300AD), as compared the 1st Dynasty Egyptian recension (3200-2900BC), the picture of things was quite different. The stories on the walls of the Dendera Temple paint the basic picture of how Osiris and Horus were viewed at the time (30AD) of the fiction retrospective invention of the Jesus character.

Notes

N1. The "Jesus Mummy" shown, with halo (sun disc) and gold Jesus necklace, was the 2016 Halloween costume worn by Libb Thims at his 25+ person Halloween party, with which he had intended to make an Atheism Reviews video, to educate people to the fact that "Christ", as Gerald Massey (1907) has pointed out, means mummy, and that originally Jesus, in conceptual model, prior to his later Roman Catholic white male poster boy polishing, was originally a mummy; most people, e.g., are ignorant of the fact that the halo of Jesus is actually a sun disc, representative of the re-born sun (aka the god Ra, in short).
N2. Note, the book Jesus holds is Dorothy Murdock's *Christ in Egypt* (2008).

Further reading

● Harpur, Tom. (2004). *The Pagan Christ*. Thomas Allan Publishers.
● Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

External links

● Is Jesus a Remake of Osiris? – TruthBeKnown.com.

θΔics

In religio-mythology, **How the Bible was written?** refers to the method in which the Bible of the Egyptians, specifically the Creation Version A (see: Genesis), of the Nesi-Amsu Papyrus (310BC), and the Egyptian Book of the Dead (c.1900BC), generally, were translated and rescripted (see: god character rescripts), monothestically, into the Hebrew Bible (Pentateuch), i.e. the Old Testament, and the Christian Bible, i.e. the New Testament. [N1]

Overview

The following gives an overview of how Jewish scholars, called Cohens, who were "high ranking Egyptian priests" (Herodotus, c.450BC), took the two main Egyptian mythology creation myths, "Creation Version A" and "Creation Version B", and translated them, monotheistically, using the god-to-prophet god reduction method, into a new one god based "creation" in a guise of Jewish mythology, as found in the Old Testament of the modern Christian Bible, in the form of Christian mythology; the following are the main rescripts of Creation Version A [1]

Egyptian Creation
[Version A]
Nesi-Amsu Papyrus (310BC)

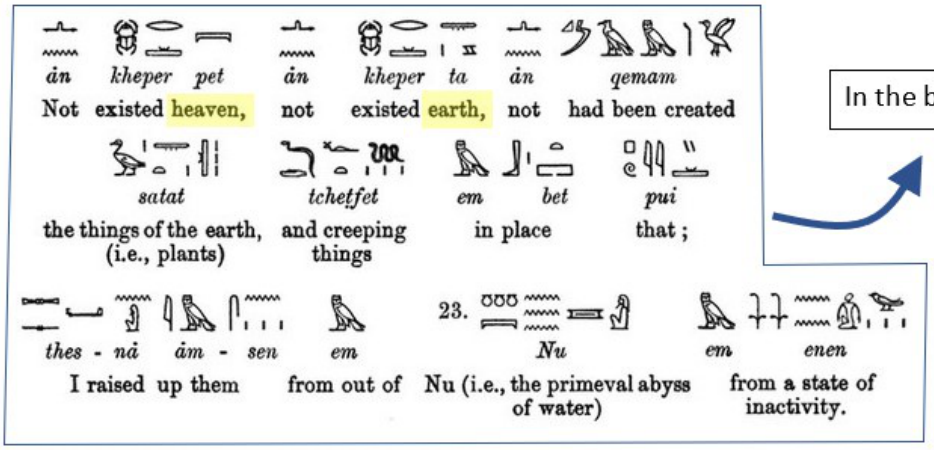

Genesis 1.1
King James Version (1600AD)

In the beginning god created the **heaven** and the **earth**.

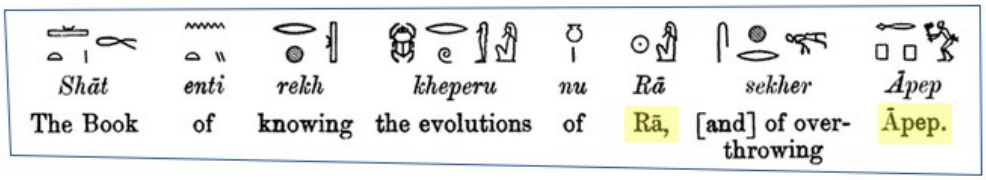

Genesis 1.3-5

And god said, Let there be **light**: and there was light. And god saw the light, that it was good: and god divided the light from the **darkness**. And god called the light Day, and the darkness he called Night. And the evening and the morning were the first day.

Alternatively, the appearance of "light" following a period of "darkness" can be interpreted from the following section of Version A:

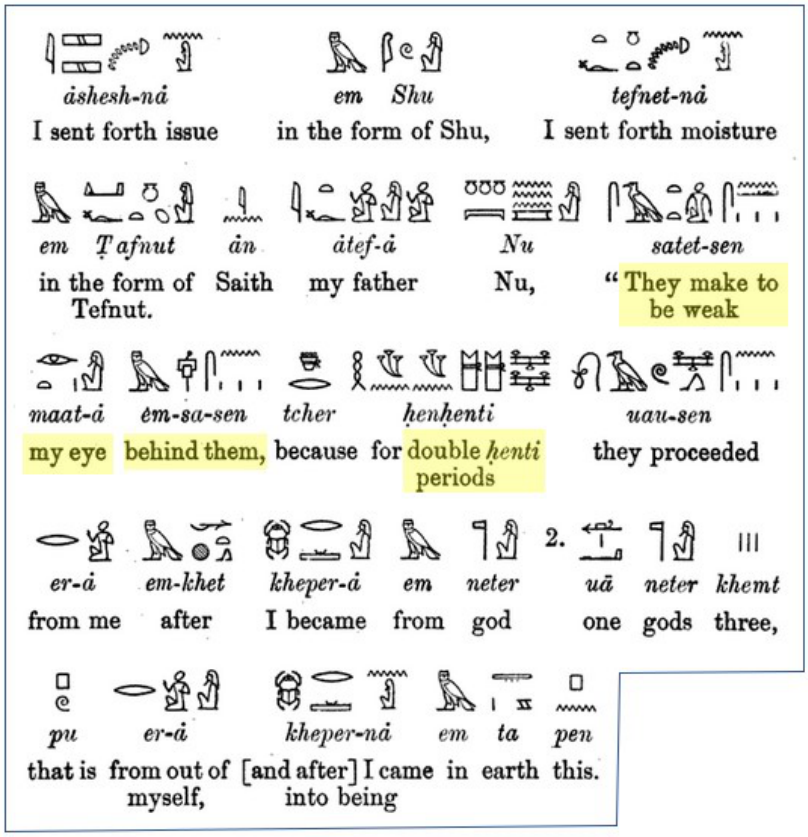

Genesis 1.3-5

And god said, Let there be **light**: and there was light. And god saw the light, that it was good: and god divided the light from the **darkness**. And god called the light Day, and the darkness he called Night. And the evening and the morning were the first day.

Namely, as explained by Budge (1904), after Shu (air) and Tefnut (moisture) were created, they, together, acted as a fog to cover the "eye" of Ra (or Nu), which is code for the "sun", as found in the sentence "they made my eye weak", because the sun (eye) had been behind them for a period of "double henti" (hen = 60 years) or 120 years.To continue:

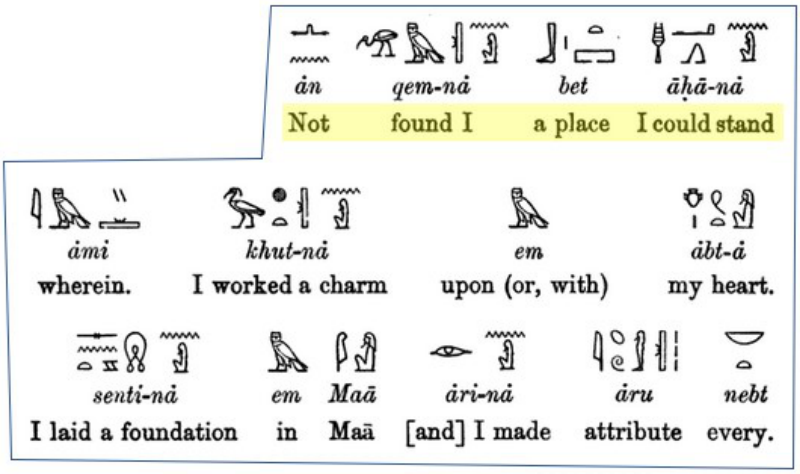

Genesis 1.9

And god said, Let the waters under the heaven be gathered together unto one place, and let the **dry land appear**: and it was so.

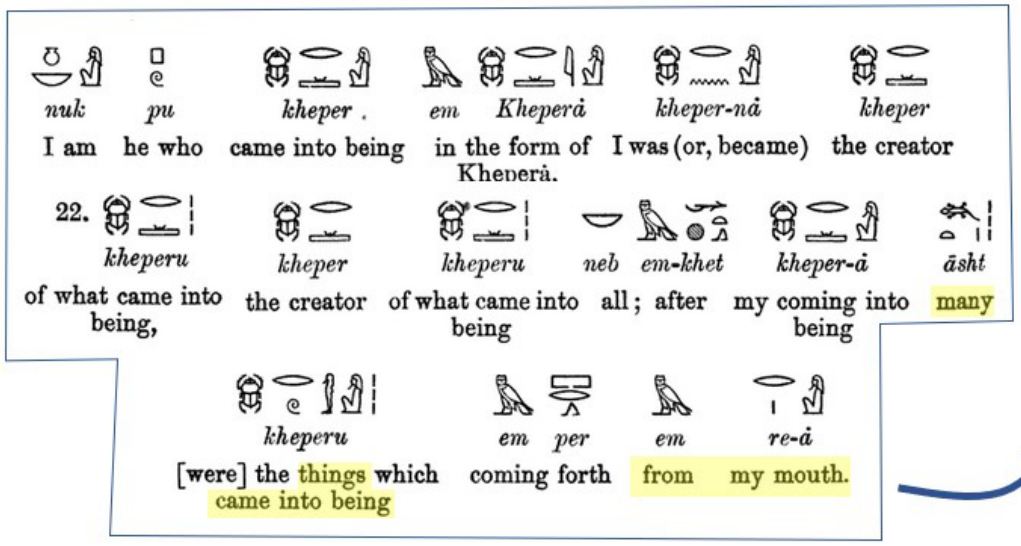

Genesis 1.3-29

And **god said** ...
And **god said** ...
And **god said** ...
And **god said** ...
And **god said** ...
And **god said** ...
And **god said** ...
And **god said** ...
And **god said** ...

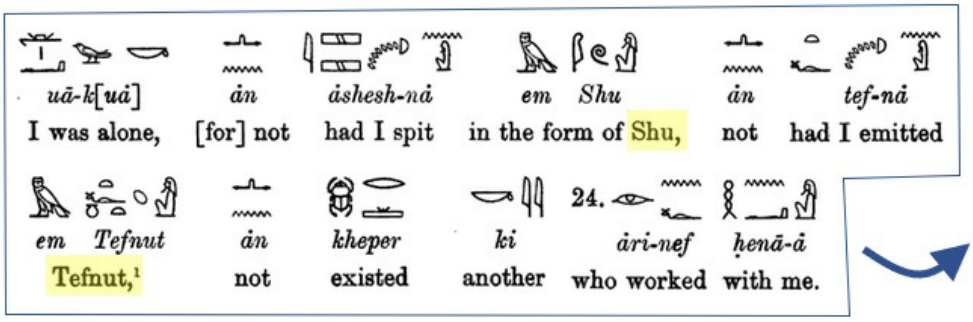

Genesis 1.6-8

And god said, Let there be a firmament in the midst of the waters, and let it divide the **waters** from the **waters**. And god made the firmament, and divided the waters which were under the firmament from the waters which were above the firmament: and it was so.

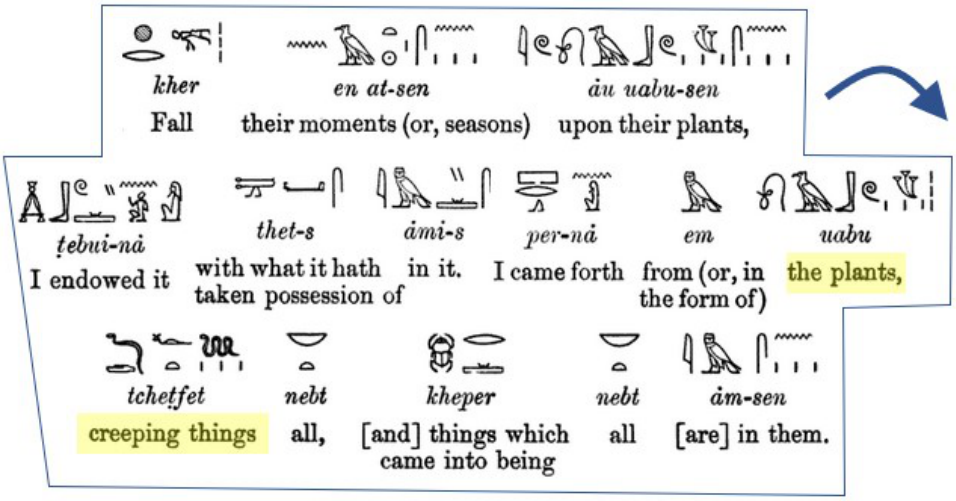

Genesis 1.11, 24-25

And god said, Let the earth **bring forth grass**, the herb yielding seed, and the fruit tree yielding fruit after his kind, whose seed is in itself. Let the earth bring forth the living creature after his kind, cattle, and **creeping thing**, and beast of the earth after his kind: and it was so. And god made the beast of the earth after his kind, and cattle after their kind, and **every thing that creepeth** upon the earth after his kind: and god saw that it was good.

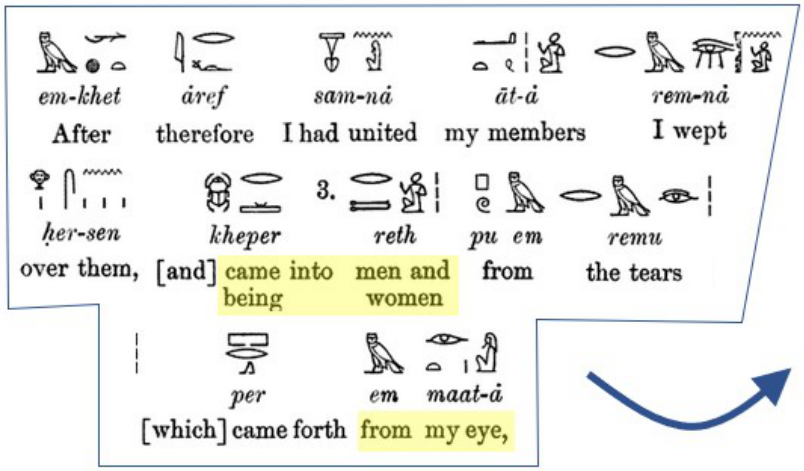

Genesis 1.26-27

And god said, Let us make man in our image, after our likeness: and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth. So god **created man** in **his own image**, in the image of god created he him; **male and female** created he them.

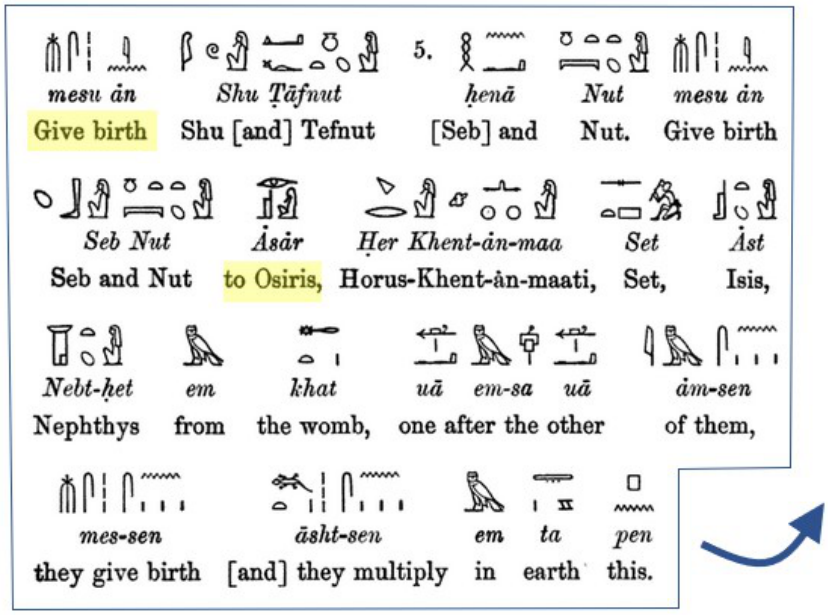

Exodus 2.1-10

And there went a man of the house of Levi, and took to wife a daughter of Levi. And the woman conceived, and bare a son, and she **put him in ark of bulrushes**, and she laid it in the flags by the river's brink. And the daughter of Pharaoh came down to wash herself at the river, and saw the ark among the flags, and got a wet nurse for the child. And the maid went and called the child's mother. The Pharaoh's daughter **called his name Moses**: and she said, Because I drew him out of the water.

Here, to clarify, the motif of Moses (see: Osiris, Dionysus-Bacchus, and Moses) being “found in an ark” on the Nile (see: baby in basket on river), following his birth, and then raised by the pharaoh’s daughter, but wet-nursed by someone else, refers firstly to how Osiris was **put into chest** and then **thrown into the Nile** (see: death and resurrection of Osiris) and later reborn in the form of an evergreen tree (see: Christmas tree) that grew up around the ark; and secondly, the myth of how Horus was born to Osiris and Isis, but nursed by Nephthys, the sister of the Isis, the “pharaoh’s wife”, so to say, in the sense of the extant pharaoh desiring to become an “Osiris Pharaoh” in the afterlife.

New Testament

The following shows how, building on the previous, the last paragraph of Creation Version A was reformulated into the guise of a Jesus-based New Testament, wherein the joint characteristics of Osiris AND Horus (see: Osiris-Horus) become rescripted into a new Jesus Christ character, wherein Seb (or Geb) became Joseph, Osiris became both the "Holy Spirit", "god the father", and Lazarus, Isis became Mary or the "Virgin Mary", and Horus became Jesus or "god the son":

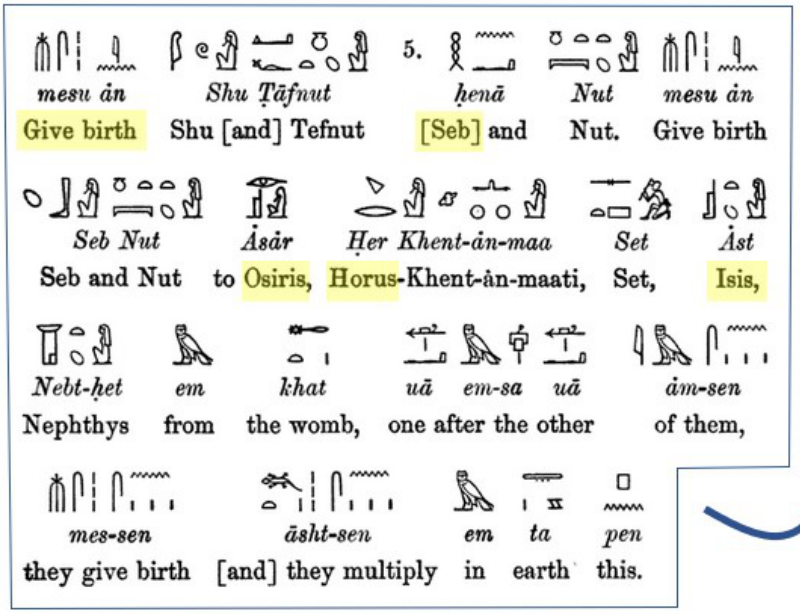

Matthew 1.18

Now the **birth of Jesus Christ** was on this wise: When as his mother **Mary** was espoused to **Joseph**, before they came together, she was found with child of the **Holy Ghost**.

In both versions, New and Old Testament, to add more detail, the god Nu (or Nun) become Noah, and the god Ra became the prophet Abraham.

Other

Of note, Gary Greenberg, in his *101 Myths of the Bible* (2000), gives a nearly equivalent, point by point, Egyptian to Hebrew transliteration, as above, but goes into more detail as to which creation myth, of the following recensions, went into each word and sentence of the opening paragraphs of Genesis: [2]

0. Pre-Dynastic creation myth | 3500BC | Supreme god: Horus
1. **Heliopolis creation myth** | 3100BC | Supreme god:

   → Atum or Atum-Khepri (Pyramid Texts, 2500BC)
   → Atum-Ra (Coffin Texts, 2100BC) / **Ennead**

2. Memphis creation myth | 2800BC | Supreme god: Ptah
3. Hermopolis creation myth | 2400 BC | Supreme god: **Ogdoad**
4. Thebian creation myth | 2050 BC | Supreme god: Amen
5. Amarnan creation myth | 1300BC | Supreme god: Aten
6. Saite recension | 670BC | *Book of Dead* (canonized)

as the main thrust or content them of Creation Version A is that of the Heliopolis creation myth, but aspects of, e.g., the Ogdoad of Hermopolis creation myth are found in Genesis 1.2-8 if one deconstructs things further.

Quotes

The following are related quotes:

> "Returning to our [Creation Version B] narrative we find that the god continues, 'I came into being from primeval matter, and I appeared under the form of multitudes of things from the beginning. Nothing existed at that time, and it was I who made whatsoever was made. I was alone, and there was no other being who worked with me in that place. I made all the forms under which I appeared by means (or, out of) the god-soul which I raised up Nu 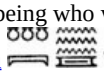 , out of a state of inertness (or, out of the inert mass).' In this passage we have a new element introduced, that is, a 'god-soul', or, in other words, the soul which possessed the quality of neter, and was existent in a quiescent state in the inactive watery mass of Nu. When we consider the general ideas of the Egyptians about the soul this statement need not surprise us, for we know that they endowed every object in nature with a soul, and if they assumed the existence of a mass of primeval matter they were bound, logically, to give it a soul. Thus, we have in the second version of the story of the creation an idea which is wholly wanting in the first."
>
> — Wallis Budge (1904), *The Gods of Egypt, Volume One* (pg. 301) [1]

Notes

N1. This page is a simplified "visual" expansion of content previous found on in Genesis article.

References

1. (a) Budge, Wallis. (1890). "On the Hieratic Papyrus of Nesi-Amsu, a scribe in the Temple of Amen-RÄ at Thebes, about B.C. 305" (abs), *Archaeologia*, 52(2):393-608.
(b) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (Nes-Amsu Papyrus discussion, pgs. 293-307; Creation Version A, pgs. 308-13; Creation Version B, pgs. 313-21). Dover, 1969.

2. Greenberg, Gary. (2000). *101 Myths of the Bible*: *How Ancient Scribes Invented Biblical History* (myth 53*:* "Abraham pretended that Sarah was his Sister", pgs. 131-34). Source Books.

θΔics

In hmolscience, **Howard K. Bloom** (1943-) is an American record producer turned science writer noted for his 1997 *The Lucifer Principle* and his 2012 *The God Problem*, wherein he attempts to grapple with problems of good and evil in the context of atheism and godlessness, citing the work of thinkers such as Jeffrey Wicken, Paul Davies, Aristotle, Heraclitus, Frank Lambert, John Campbell ("Evolution as Nonequilibrium Thermodynamics: Halfway There?", 1988), David Depew, Bruce Weber, Daniel Brooks, David Layzer, among others. [1]

Religion

Bloom was born into a Jewish family (see: Jewish atheism). In 2012 interview, he defined himself as a non-militant "stone-cold atheist", who believes in "tolerant atheism" and "pluralistic atheism", but is not in favor of the new atheism variety. [3] In 2013, in his "Sex and the Second Law of Thermodynamics" talk, Bloom makes a number of "Freudian god slips", amid jokes and discussion, e.g. "thank god", "oh god, what's his name?", or "god knows how many years" (52-min); yet he also defines himself in the talk as a "devoted atheist"; he seems to say "god knows" (or lord knows) several times, in a way that belies a hidden theism, which compounds his efforts to parrot free will in particle physics (below).

Free will | Particles

In 2012, Bloom, in his *The God Problem*, supposedly talks about particles having free will. [3]

Sex | Thermodynamics

In 2013, Howard Bloom gave at talk entitled "Sex and the Second Law of Thermodynamics: How Sex Breaks the Law of Physics", the abstract of which is as follows: [2]

> "At the turn of the 19th century, Sigmund Freud proposed something absurd, his concept of libido, the idea that humankind was driven by **sex**. Was Freud crazy? Or was he right? Why? And how does our sexual obsession relate to the evolution of the cosmos? How does it relate to two rules that imply that sex should not and cannot exist: the principle of least effort and the second law of thermodynamics? Is sexual selection a least-effort proposition? Is it the most energy-efficient way to a goal? And what goal could that possibly be? Is plant sex, with its extravagant use of the advertising devices we call flowers, maximizing the universe's entropy? Is the peacock's tail a sign of a thrifty cosmos? How about your sexual and romantic obsessions as you read this sentence and secretly covet the body of a person ten feet away from you? Do these things hint that the cosmos is very different than the thermodynamics obsessive beliefs? And what does that mean for the way we look at strange things like psychology?"

Bloom goes on in his talk, which he refers to as "Sex Defies the Law of Physics" (19:00), to discuss the least action principle of Pierre Maupertuis and then entropy and second law of thermodynamics, which he truncates as "all things fall apart", of Rudolf Clausius, which he argues that reproduction, sex, and love are at odds with, verbally speaking, in colloquial sense. He then begins (26-min) to refute Richard Dawkins' selfish genes hypothesis via anecdotes and stories of his friends, along with mitosis and meiosis, and what seems to be armchair versions of evolutionary psychology. At 27:30, he says that you can't even get humans out of the second law of thermodynamics. He defined people as a "pile of protons" (42-min). At 1:06, he begins to see teleology. At 1:15, he gets into "emergent properties". Bloom comes off, in this talk, in a sense, as a kind of semi-intelligent atheism-siding version of Kent Hovind, in many of his arguments.

Education

Bloom states that he got into science at age 10 studying subjects including microbiology and theoretical physics; then collaborated in the creation of a computer that won a Westinghouse National Science Contest prize when he was thirteen; then won an award for his participation in research on the immune system at the world's largest cancer research center at the age of sixteen, and did research on programmed learning and Skinnerian techniques at Rutgers University's graduate department of education before entering his freshman year of college, after which, in 1968, age 25, he completed a bachelor's degree at NYU, in the area of psychology. He then turned to the art and music industry.

In 1986, Bloom began writing the *Lucifer Principle*. [2]

In 1988, Bloom retired from 17-years of work in the music publicity business (Q), owing to home-bound illness (chronic fatigue syndrome), after which he turned to science writing, themed on: evolutionary psychology, sociology, lay science, and atheism themed religion. (Q)

Quotes

The following are noted Bloom quotes:

> "The first rule of science is the truth at any price including the price of your life. That rule also applies to morality."
>
> — Howard Bloom (2012), *The God Problem: How a Godless Cosmos Creates*

> "Everyone knows that the second law of thermodynamics is gospel. Including everybody who is anybody in the world of physics, chemistry, and even complexity theory."
>
> — Howard Bloom (2012), *The God Problem: How a Godless Cosmos Creates*

> "Einstein grabbed me by the lapel when I was 12 years old and he said, 'To be a genius, it is not enough to come up with a theory only three men in the world can understand. To be a genius you have to be able to express it so clearly that anyone with a high school education and a reasonable amount of intelligence can understand it.' Those were my marching orders since I was 12: Write compellingly and deliciously."
>
> — Howard Bloom (2012), Interview with Jonah Comstock, Aug 18 [3]

References

1. (a) Bloom, Howard K. (1997). *The Lucifer Principle: a Scientific Expedition in the Forces of History* (thermodynamics, 12+ pgs). Atlantic Monthly.
(b) Bloom, Howard K. (2012). *The God Problem: How a Godless Cosmos Creates* (thermodynamics, 18+ pgs). Prometheus Books.
2. Bloom, Howard. (2013). "Sex and the Second Law of Thermodynamics: How Sex Breaks the Law of Physics" (abs) (vid), New Paltz Evolution Studies, SUNY New Paltz CSB Auditorium, Oct 9.
3. Comstock, Jonah. (2012). "The God Problem: An Interview with Howard Bloom How does the universe account for its own creation?" (Q), Psychology Today, Aug 18.

See also

- Harold Blum – Time's arrow and evolution writer (1950)
- Harold Bloom – Literary geniuses writer (2002)

Further reading

- Zimardo, Philip. (2007). *The Lucifer Effect: Understanding How Good People Turn Evil*. Random House

External links

- Howard K. Bloom – Wikipedia.

θΔics

In existographies, **Howard Lovecraft** (1890-1937) [RGM:379|1,290+] (FA:127), aka H.P. Lovecraft, an EPD product, was an American horror fiction author and epistolarian, noted for his philosophically discerning letters of correspondence, wherein he gives ripe honed statements about existence, religion, science, atheism, and meaning.

Meaningless | Purposeless

See main: Purposeless universe hypothesis

Lovecraft, in his discussions of atheism, expounded his belief in a meaningless, pointless, purposeless universe; the following is an example:

> "Today we know that the cosmos is simply a flux of **purposeless** rearrangement amidst which man is a wholly negligible incident or accident."
>
> — Howard Lovecraft (1936), "Religion and Ethics", letter to Natalie Wooley, May 2

The materialistic views of Hugh Elliot, as found in his *Modern Science and Materialism* (1919), according to Sunand Joshi (2014), were a huge influence on Lovecraft. [4]

Atheism

From 1916 to 1932, Lovecraft penned a number of letters to various individuals on the various subjects related to atheism against religion, e.g. unfaith, insignificance of man, idealism, materialism, ethics, and spirituality. [1]

Influence

The atheistic arguments of Lovecraft were an influence to Sunand Joshi, who began to read his work at age 13.

Quotes | By

The following are noted quotes by Lovecraft:

> "Space and time have always existed and always will exist. This is the only legitimate axiom in all of philosophy."
>
> — Howard Lovecraft (1916), "Letter to Rheinhart Kleiner, Ira Cole, and Maurice Moe", Aug 8 [1]

> "How do we know that that form of atomic and molecular motion we call 'life' is the highest of all forms? Perhaps the dominate creature—the most rational and god-like of all beings—is an invisible gas. Or perhaps it is a flaming and effulgent mass of molten stardust. **Who can say that men have souls while rocks have none**?"
>
> — Howard Lovecraft (1916), "Letter to Rheinhart Kleiner, Ira Cole, and Maurice Moe", Aug 8 [1]

> "I admit that I am very much interested in the relation I bear on the things about me—the time relation, the space relation, and the causative relation. I desire to know approximately what my life is in terms of history—human, terrestrial, solar, and cosmical; what my magnitude may be in terms of extension, -- terrestrial, solar, and cosmical; **and above all, what may be my manner of linkage to the general system—in what way, through what agency, and to what extent, the obvious guiding forces of creation act upon me and govern my existence**. And if there be any less obvious forces, I desire to know them and their relation

to me as well."

— Howard Lovecraft (1918), "Letter to Maurice Moe", May 18

"Morality has nothing to do with any particular form of religion. Morality is the adjustment of matter to its environment—the natural arrangement of molecules. More especially it may be considered as dealing with organic molecules. Conventionally it is the science of reconciling the animal *homo* (more or less) *sapiens* to the forces and conditions with which he is surrounded."

— Howard Lovecraft (1918), "Letter to Maurice Moe", May 15 [1]

"Realistic analysis, favored by history and by diffusive scientific leanings which now embraced Darwin, Haeckel, Huxley and other various other pioneers, was checked by my aversion for realistic literature. I ceased my literal adherence to Epicurus and Lucretius, and reluctantly dismissed free-will forever in favor of determinism. The Peace Conference, Friedrich Nietzsche, Samuel Butler, Henry Mencken, and other influences have perfected my cynicism."

— Howard Lovecraft (1922), "A Confession of Unfaith"; a teenage Alfred Galpin, of note, in c.1915, introduced Lovecraft to Nietzsche (Ñº)

"My attitude has always been cosmic, and I looked on man as if from another planet. He was merely an interesting species presented for study and classification."

— Howard Lovecraft (1922), "A Confession of Unfaith" (see: advanced perspective)

"All I say is that I think it is damned unlikely that anything like a central cosmic will, a spirit world, or an eternal survival of personality exist. They are the most preposterous and unjustified of all the guesses which can be made about the universe, and I am not enough of a hair-splitter to pretend that I don't regard them as arrant and negligible moonshine. In theory, I am an 'agnostic', but pending the appearance of radical evidence I must be classified, practically and provisionally, as an 'atheist'. The chances of theism's truth being to my mind so microscopically small, I would be a pendant and a hypocrite to call myself anything else."

— Howard Lovecraft (1932), "Letter to Robert E. Howard", Aug 16 [1] (Ñº)

"All notions of cosmic consciousness and purpose, and of the importance of man in the limitless pattern of the universe, are plainly myths born of the imperfect information of man's early days."

— H.P. Lovecraft (c.1930) [2]

References

1. Lovecraft, Howard P. (2010). *Against Religion: the Atheistic Writings of H.P. Lovecraft* (editor: S.T. Joshi; foreword: Christopher Hitchens) (abs) (Amz) (space and time, pg. 8; rocks, pg. 9; morality, pg. 16, atheist, pg. 38; Elliot, pg. 187). Sporting Gentlemen.
2. Against Religion (abs) – HPLoveCraft.com.

3. (a) Lovecraft, Howard P. (1922). “A Confession of Unfaith”, *Liberal*, Feb.
(b) Lovecraft, Howard P. (2010). *Against Religion: the Atheist Writings of H.P. Lovecraft* (editor: S.T. Joshi; foreword: Christopher Hitchens) (abs) (Amz) (pg. 5). Sporting Gentlemen.
4. (a) Elliot, Hugh. (1919). *Modern Science and Materialism*. Longmans, Green and Co.
(b) Lovecraft, Howard P. (2010). *Against Religion: the Atheist Writings of H.P. Lovecraft* (editor: S.T. Joshi; foreword: Christopher Hitchens) (abs) (Amz) (pg. 185). Sporting Gentlemen.

External links

â— H.P. Lovecraft – Wikipedia.

θΔics

In existographies, **Howard Pattee** (1926-) (CR:6) is an American anti-reductionism theoretical physicist noted for his publications on an attempt to apply physics, in particular quantum mechanics, to the explanation of chnopsological structures and social systems (see: human quantum mechanics).

Overview

In 1967, Pattee, in his "Quantum Mechanics, Heredity, and the Origin of Life", discussed John Neumann's free energy automaton theory, and mentions that Niels Bohr (1958) often speculated that the “complementarity principle would prevent simultaneous physical and biological description, and that the living state should be regarded as irreducible both in definition as well as observation."

In 1978, Pattee argued that Niels Bohr’s complementarity principle can be applied to social structures. [1]

Education

Pattee completed his PhD in physics at Stanford University.

Quotes | By

The following are quotes by Pattee:

> “Since human organizations are staffed by human beings, and since human beings are biological organisms, it might be argued that my research problem is indeed biological. And since biological organisms are constructed from molecules, and those molecules from atoms, and the atoms from elementary particles—all obeying the laws of quantum mechanics—it might even be argued that research on human organizations is merely a rather baroque branch of physics. I intended to show that this reduction is absurd. As Bohr said: ‘You don't explain a tea party with quantum mechanics’.”
>
> — Howard Pattee (1973), *Hierarchy Theory* [2]

References

1. Pattee, Howard H. (1978). “The Complementary Principle in Biological and Social Structures”, *Journal of Social and Biological Structures*, 1: 191-200.
2. Pattee, Howard. (1973). *Hierarch Theory: the Challenge of Complex Systems* (pg. 3). G. Braziller.

External links

â— Howard H. Pattee – Wikipedia.
â— Pattee, H.H. (Howard Hunt) – WorldCat Identities.
â— Howard Pattee (papers) – Academia.edu.

θΔics

In thermodynamics, **Howard Reiss** (c.1934-) is an American physical chemist noted for his 1965 *Methods of Thermodynamics*, the second chapter of which, entitled "Mathematical Apparatus", he gives a fairly decent overview of mathematical thermodynamics on the mathematical structure underlying thermodynamics.

Education

Reiss completed his PhD at Columbia University and is currently is a physical chemistry professor emeritus of the University of California, Los Angeles. [2]

References

1. Reiss, Howard. (1965). *Methods of Thermodynamics* (ch. 2: Mathematical Apparatus, pgs. 20-31). Dover.
2. (a) Howard Reiss (faculty) – University of California, Los Angeles.
(b) Howard Reiss (overview) – Chem.UCLA.edu.

External links

â— Reiss, Howard – WorldCat Identities.

θΔics

In hmolscience, **Howard Scott** (1890-1970) was an American self-defined engineer noted, in economic thermodynamics, for his 1920 to 1932 efforts to technical-theory base bureaucracy, which he called "technocracy", according to which the country would be run on use of "energy certificates" instead of money as units of value; the gist of which was superficially said to be themed or based on some aspect of the work of Willard Gibbs.

Overview

In 1920, Scott assembled a group architects, engineers, doctors, etc., into a technology-based (science-based) group of economic advisors called Technocracy. One of their many thermodynamic-based economic theories was the use of "energy certificates" instead of money as units of value. [3] Another term was "Technate" used to describe the region over which a technocratic society would operate using thermodynamic energy accounting instead of a price system (money) method.

Scott claims to have derived his theory of "energy accounting", a system of distribution in which the energy used to produce and distribute goods and services consumed by citizens is recorded, in large part from the work of Willard Gibbs. Scott's early theories on energy determinates were also similar, to significant extent, to the equality of energy, money, and wealth in the 1926 book *Virtual Wealth and Debt* by English physical chemist Frederick Soddy. When questioned as to what influence Soddy had his theory of his theory of "energy determinants", Scott replied: [2]

> "We derive most of our concepts of thermodynamics and energy determinants from the works of J. Willard Gibbs, and we had formulated most of our concepts of modulus and calculus of design prior to our coming in contact with Soddy's *Wealth, Virtual Wealth and Debt* in 1927. Frederick Soddy was a chemist and scientist, completely unknown to us, as we were unknown to Soddy. Soddy formulated his ideas in the British scientific and academic world of his time. He starts out on the correct course, and then gets lost in the muddle of values shortly after page 100, and he loses his original direction and analysis in the mass of money and economic values. Soddy himself, in a newsreel interview taken in his office and laboratory, presented in the early 30's a very nice admission and commendation for the development of Technocracy in the United States. This newsreel, I believe, was a Fox Movietone. We wish Soddy had gone on as he first started, as a chemist and thermodynamicist and we feel that he would have reached, ultimately, the same conclusions we had arrived at."

A reading of Scott's *Technocracy Study Course*, however, shows that Scott only had a very superficial passing knowledge of the work of Gibbs.

In 1932, Scott, in his *Technocracy: a Thermodynamic Interpretation of Social Phenomena*, seems to arrive at the view, using Gibbs' 1901 *Elementary Principles in Statistical Mechanics*, that society is a gas phase statistical ensemble and that the objective of a science-based-economics is to determine arbitrary energy units to predict the "next most probable state". [4] On the logic of Scottish engineer James Watt's 1782 definition of horsepower, meaning that a horse can do 33,000 foot-pounds of "work", i.e. lift weight vertically via a pulley, per minute, Scott gives a crude value of manpower in stating that:

> "Technology has introduced a new methodology in the creation of physical wealth. It is now able to substitute energy for man hours on the parity basis that *1,500,000 foot-pounds equals one man's time for eight hours*. National income under the Price System consists of the debt claims accruing annually from the certificates of debt already extant. Physical income within a continental area under technological control would be the net available energy in ergs, converted into use-forms and services over and above the operation and maintenance of the physical equipment and structures of the area."

The obvious difficulty in Scott's reasoning, here, is that some people are more efficient or creative at doing work than others. Thus, using tools and creativity, for instance, one man might conceivably do 1,500,000 foot-pounds of work in one hour. Moreover, it is difficult to equate various types of "intellectual work", e.g. the work done by British physicist Stephen Hawking in the development of his black hole theory, "household work", e.g. the work of a wife carrying for a child, or "executive work", e.g. a CEO approving a new corporate direction, to the energy expended in lifting buckets of water out of coal mines.

Education

The educational background on Scott seems to be non-existent; it is difficult to say exactly even if he even had a degree in engineering (which he probably didn't).

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Further reading

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External links

â— Howard Scott – Wikipedia.

θΔics

In hmolscience, **Howard Stanley Seifert** (1911-1977) was an American aeronautics physicist noted, in human thermodynamics, for his 1960 to 1961 objections to Robert Lindsey's 1859 thermodynamic imperative.

Overview

In 1961, Seifert, in his "Can We Decrease Our Entropy?", took issue, in a manner possibly similar to Alexander Pope's "should gravity cease when we go by" assertion, with American physicist Robert Lindsey's 1859 thermodynamic imperative. [1] A lecture on this title was originally given by Seifert, at a luncheon on May 9th, 1960, to the American Rocket Society. [4] The following is a noted quote from Seifert's article: [2]

> "The first and second laws of thermodynamics are of course known to us as the ten commandments, and probably obeyed more consistently."

In his article, in question of Lindsey's second law based morality theory, that it is one's moral responsibility to create order, Seifert notes that no one really knows or agrees on what constitutes "maximum order"; noting, for instance, that time and energy spent on creating a feather cut hairdo or a beehive, may not constitute maximum order in the view of the engineer. On this same question, Egyptian-born American physicist Jack Hokikian notes that sociologists may question the intrinsic value of a synthetic diamond making factory, while people in the streets outside the factory are starving. [2]

Education

Seifert completed his BS and MS in physics at Carnegie Institute of Technology, after which he transferred to the California Institute of Technology to complete his PhD. in physics. His early postdoctoral experience included a position as Associate Professor of Physics at Kalamazoo College in Michigan for a period of two years, from which he went to the Westinghouse Corporation as a research physicist for another two years. In 1942, Seifert joined the Jet Propulsion Laboratory at the California Institute of Technology and entered the field of rocket propulsion that was to become his specialty. Seifert was a professor of aeronautics and astronautics at Stanford from 1960 to 1976. He also directed the Physical Sciences Laboratory at the United Aircraft Corporation (1960-65) and was president of the American Rocket Society (1960). [3]

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(b) Guide to the Howard Seifert Papers, 1960-1977 – Stanford University Archives.
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External links

â— Seifert, Howard S. – WorldCat Identities.

θΔics

In existographies, **Howard Thomas Odum** (1924-2002) (CR:12), not to be confused with his father Howard W. Odum (1884-1954), was an American ecologist and systems theorist noted, in ecological thermodynamics, for his 1950s to 1976 effort to build a thermodynamic-themed energy flow model of ecology and society.

Difficulties

Among difficulties on theory, aside from the elementary attempt at "energy laws" based on dictionary definitions of thermodynamics, Odum the younger uses the term "spirit" and also believes in free will, while at the same time attempting to argue for an "energy theory of every thing".

War | Boundaries

Odum devotes a few sections to "war and boundaries"; some statement of his views are as follows:

> “War, if considered as an energy process, is a means of testing or changing boundaries of influence according to the realities of energy supplies.”
>
> — Howard T. Odum (1976), *Energy Basis for Man and Nature* (pg. 144)

> “Boundaries between competing energy systems may be stable if the size of each territory is in proportion to its relative productivity. When energy is rising, there is more tendency to grow and to expand influence on surrounding units. There may be a tendency toward more war when energy is large and rising—certainly there is a tendency toward more destructive war. When energy decreases, there may be less energy available for warfare and less tendency to try to spread influence. War is more a function of large-scale energy trends, than of individual reactions. No one is sure, however, about the relationship between energy, territory, and war.”
>
> — Howard T. Odum (1976), *Energy Basis for Man and Nature* (pg. 215, 218)

(add)

Force | Energy | Law

In 1976, Odum, in his “Introduction”, suppositions 33 “must” that the various sectors of society must do (see: Alan Watts and “musts), according to Odum. The following is one example, which shows the errors bubbling in Odum’s blurring of physical principles with humanities models:

> “Police **forces** must plan for small-scale **law** enforcement which uses less **energy**.”

This translates as “forces must plan a law that uses less energy”, which of course is patent nonsense. In other words, the basic “law” that relates “energy” and “force” is the Coriolis principle of transmission of work, which states that whenever a force moves an object though a distance work (or energy) is done:

$$W = Fd$$

This, of course, is precursor to aspects of the first law of thermodynamics.

Energy laws | Three

In 1976, Odum labeled (pg. 8) what he referred to as the “three energy laws”, in his scheme of things, as follows:

1. Conservation of energy.
2. Degradation of energy.
3. Maximization of effectiveness in the use of available energy.

Odum defined (p. 38) the law of degradation of energy, aka the “second law” in his mind (though, to note, he does not use this term), as follows:

> “In all processes, some of the energy loses its ability to do work and is degraded in quality. The arrow going into the ground symbol indicates the necessary degradation and dispersal of energy as waste heat. We call this the ‘heat-sink symbol’. We keep the second law of energy in mind by putting the heat-sink symbol on the diagram for every processes.”

This definition, with its confusion of (a) the meaning of the second law and (b) the confusion of what by definition, in thermodynamics, is a “heat sink”, is backwards from the get-go. Odum defines (pg. 39) his third energy law, which he calls “maximum-power principle”, supposedly derived, in some way from Lotka, as follows:

> “Systems that survive are those which get the most energy and use energy most effectively in completion with other systems.”

His definition (pg. 15) of “system”, however, as: “anything that functions as a whole by the interactions of its parts”, is nearly baseless in its meaning. A pair of plyers, e.g., could be a system, according to Odum, and thereby follow his maximum-power principle in competition with other plyers.

Free energy | Ignorance

In 1976, Odum stated (pg. 10) his conception of “free energy” as follows:

> “The amount of free energy one economy has determines the amount of additional outside energy it may purchase and still be competitive with other economies.”

(add)

Odum | Symbols

The following are the Odum symbols and systems (1976), a mixture of electric circuit symbol metaphors and energy flow ideas:

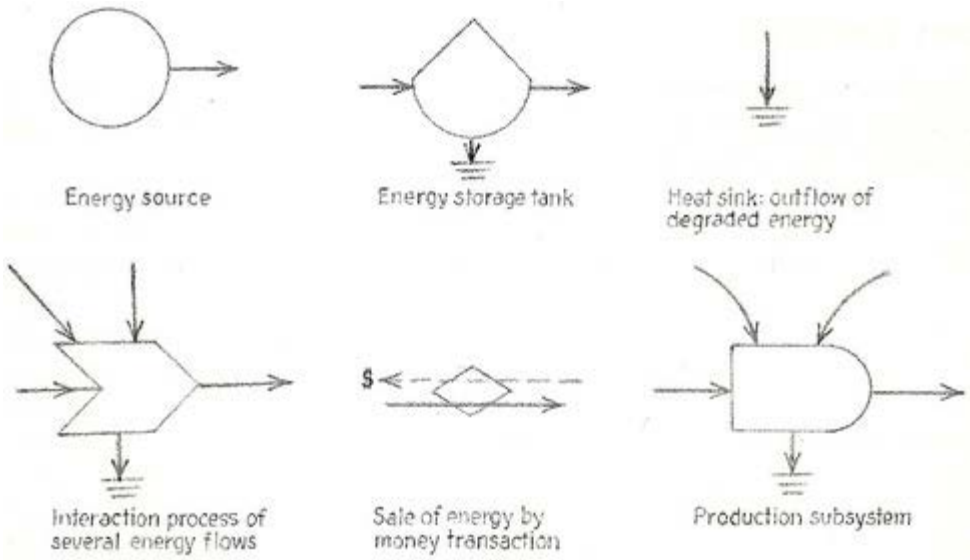

Odum defines (pg. 21) the heat sink symbol, i.e. the arrow pointing downward, seemingly into the ground, as “loss of degraded energy – energy which cannot do any more work – from the system, which he conceptualizes as “heat energy that is degraded as a byproduct of work and also the dispersal energy of deprecation; in humans, heat flows out from the skin and lungs.”

Human | Model

The adjacent diagram shows the Odum model (1976) of the human, which, via their electric ground symbol "⏚" directly highlights the inherent confusion in his scheme, say as compared to the Goethe model (1809):

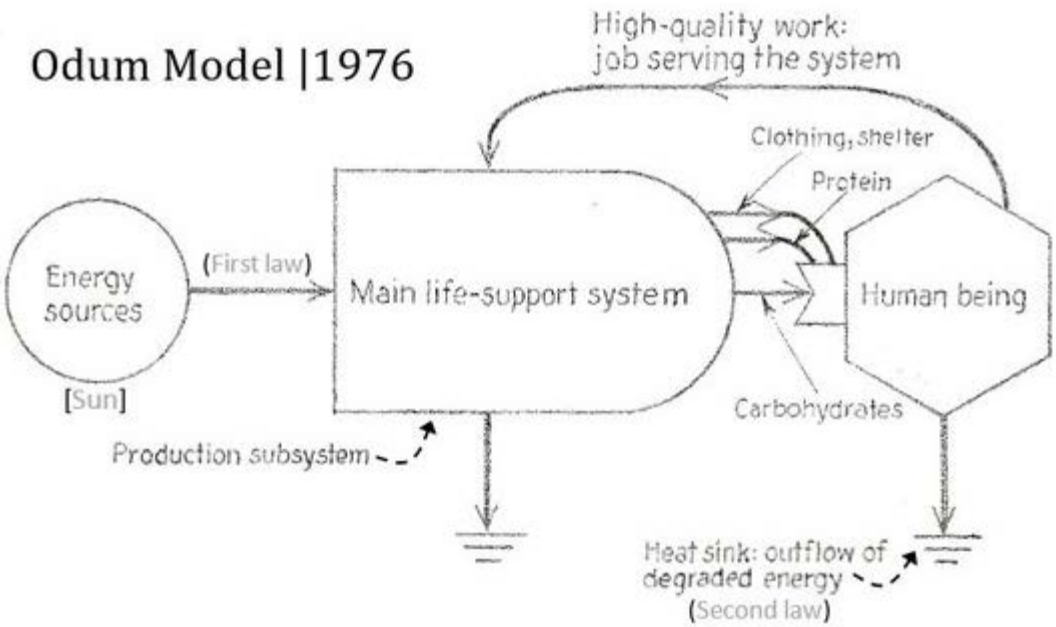

The "Odum model" (1976) of a human, wherein he conceptualizes the sum effect of the second law as but waste heat coming out of a human as disorganized energy, going into the ground, or something line these lines.

or the Huxley model (1940), aka social retort model, below left, which is about the same as the Goethe model, albeit without focus on the "land" and "lakes" of the estate, or semi-modern Stephan model (1995), below right, which is a Goethe-upgrade model, so to say, that takes into account chemical potential of human as chemicals moving into or out of a socio-economic system, owing to chemical potential differences:

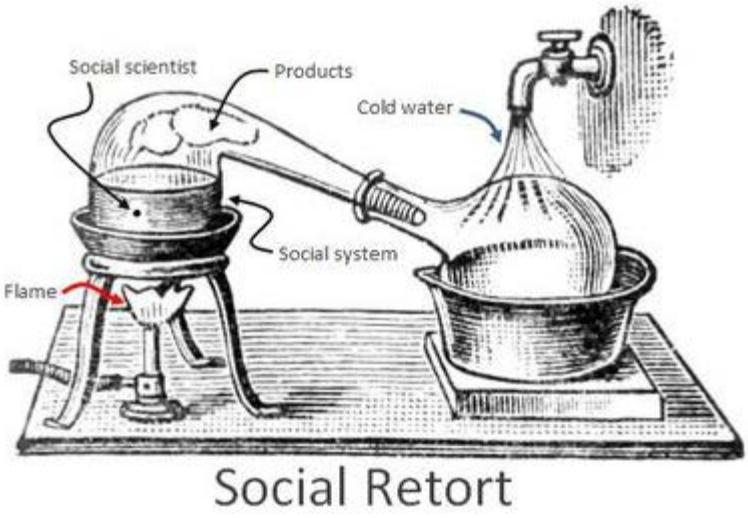

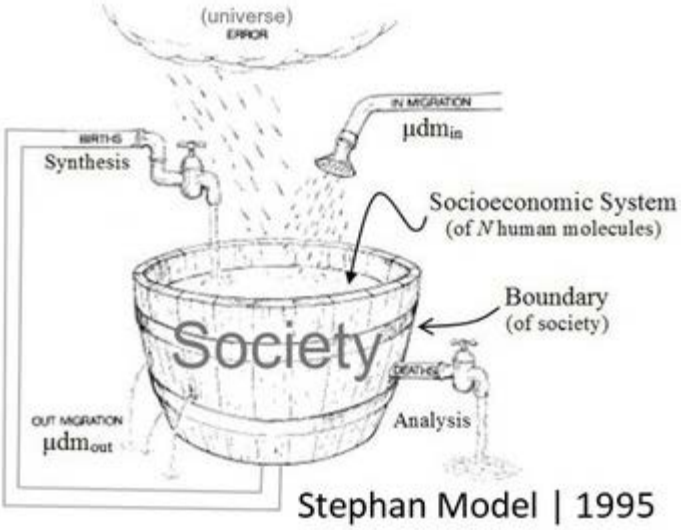

all of which can be compared to the Beg model (1987), as shown adjacent.

This points to a general confusion on Odum's part, owing to ignorance about physical chemistry, as to what exactly the function of the substrate (ecosystem) is in respect to the various "energies" involved in human chemical reactions, namely that substrate effects only the activation energy of the reaction, raising or lowering it, whereas the second law effects reactions between the chemicals (humans), according to which chemical equilibrium will be evidenced by the condition of maximal entropy, as German physical chemist August Horstmann when in Oct 1873, Horstmann famously announced the condition for chemical equilibrium to be that of maximum entropy. [11]

This confusion is even further compounded when Odum

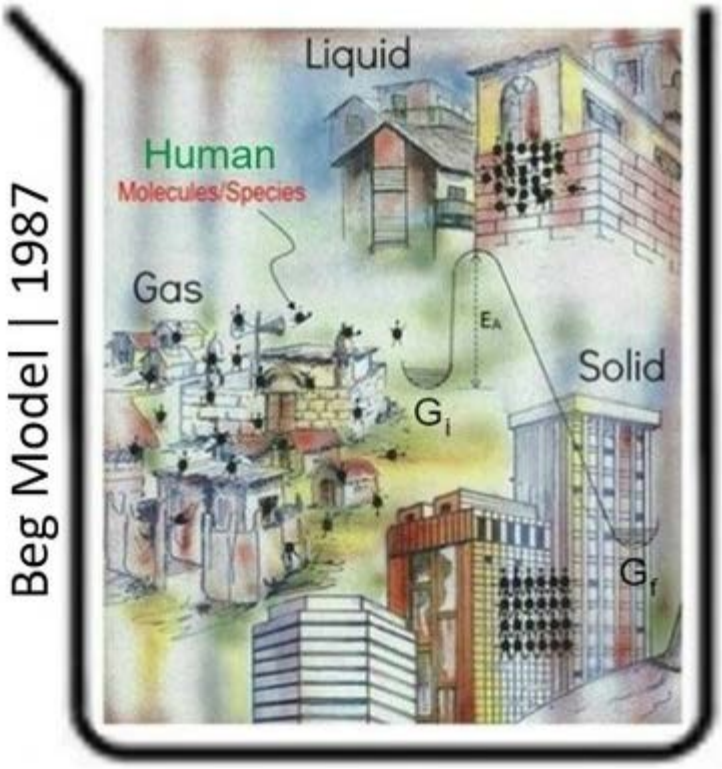

The Beg model (1987), by Mirza Beg, wherein people are chemical reacting on a substrate, can be compared to the Odum model (1976), wherein the people and the substrate are one ecosystem, or something along these lines.

attempts to compare "religious explosions" to "chemical explosions", as outlined below.

Humans | Chemicals

Odum, in his 2007 "Energetic Basis for Religion" chapter, gives the following diagram comparing a chemical chain reaction with a human chain reaction, supposedly modeled on the post 9/11 era Muslim extremism acts of violence, seen yearly:

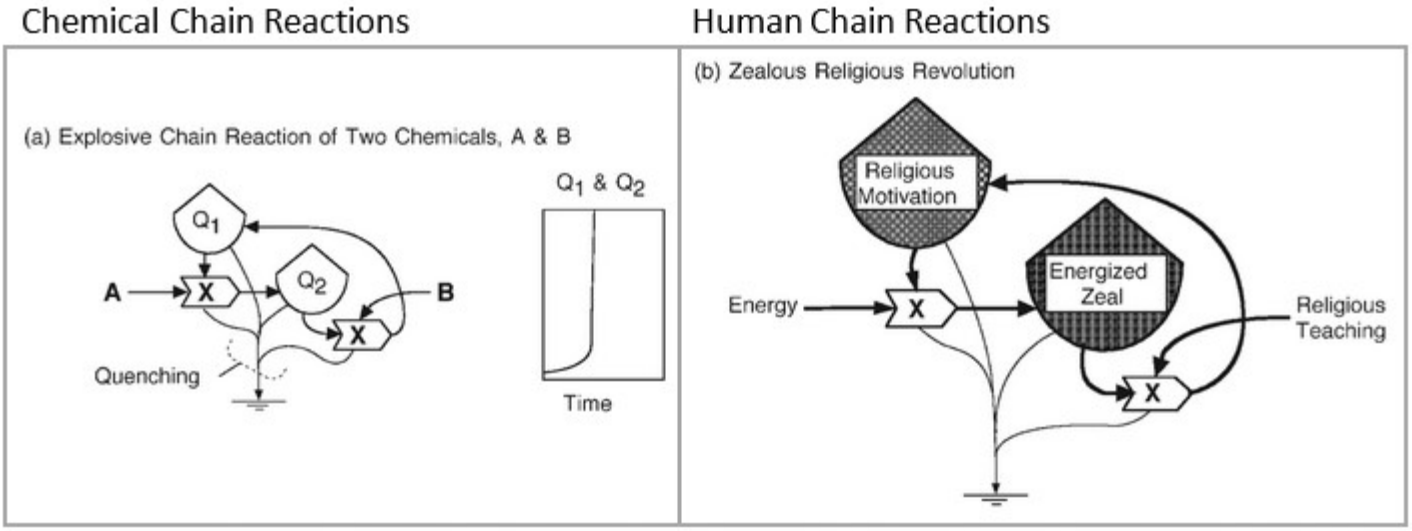

FIGURE 11.4 System design of chain reactions that explode. **(a)** Chemical reactions; **(b)** unholy combination of religious dogma and excess oil.

Here, we might compare the Beg-Thims dialogue (2014), Rossini debate (2006), and the year in whichgod was disabused from science, in particular from chemistry (Johannes Wislicenus, 1885) and thermodynamics (Harold Blum, 1934).

Overview

In the 1950s, Odum expanding on the earlier theories of American physical chemist Alfred Lotka to explain behaviors in ecological systems using various modified thermodynamic metaphors in conjunction with circuit theory diagrams, and in particular for his provocative proposals for additional laws of thermodynamics.

In 1971, Odum, in his 418-page *Environment, Power, and Society*, attempted to argue that society is regulated by the laws of energetics, in same manner as is the physical and chemical world, albeit he does so using inventions of his own devise, such as “emergy flow”. Ironically, although the book has an entire chapter on the laws of energetics and the book discusses concepts such as Gibbs free energy, potential energy, and entropy, the term "thermodynamics" is only mentioned twice. This, however, is common from books of the “University of Florida” school of energetics, e.g. Corrado Giannantoni (2002), which seem to use their own obscure version of energetics, making claims to some sort of residual connection to thermodynamics.

In 1976, Odum penned his 297-page *Energy Basis for Man and Nature*, a simplified version of his 1971 book, wherein he attempted to outlined his view on the implications of the "basic laws of energy", as he calls them, for humans, embedded in ecosystems, driven by the photon mill like energy from the sun. [1]

Religion | Energy

In 1971, Odum, in his *Energy, Power, and Society*, employs the term “god” 7+ times (Ñº), and penned a chapter entitled “Energetic Basis for Religion”, seemingly being more neutrally reserved on his aggressiveness on god, jabbing at the terms “nature creative”, “evolution”, and “god” as being synonyms, per citation to what he calls as the Northrop thesis, i.e. an “adaptive god” model, according to which the future will see some type of “new religion”, based on the following logic, implicitly stated by Odum: [9]

$$\text{God} = \text{Energy}$$

In 2007, Odum, in his second edition of *Energy, Power, and Society*, revised and expanded by some 100+ pages, he seems to be more progressive in his god as energy new religion idea; the following seems to be one example new edition section, wherein he talks about how he asked students to include their concept of god, using Odum systems and Odum symbols models:

CHAPTER 11

ENERGETIC BASIS FOR RELIGION

APPARENTLY, ALL societies develop religious institutions that give human individuals learned programs of dedicated behavior. Cultures prevail that motivate people to contribute to the maximum empower of society,[1] but poorly adapted religions interfere with optimum functions. With the expanding role of society on Earth, the ethics of human behavior requires morality on a larger scale not much covered by earlier religious teaching. This chapter shows the systems nature of religion, its place in the energy hierarchy, relationships of religion and science, global pluralism, adaptive God, alternative views of the cosmos, and the kind of religion needed for times ahead.

FUNCTIONS OF RELIGION

Religion consists of programs of learned human behavior shared with other people and taught in religious institutions controlled by religious leaders. Religion guides the participation of human individuals in the energy system of society and environment. Religions usually motivate people to support their society by teaching them to have faith in principles set out by a larger authority. Individuals are reinforced and meet their inherited need to share purpose and feel secure. Usually there is a book of principles, which has ideas or examples that seem to fit the many stages of society including growth, climax, and descent. Leading religions and their books, symbols, and architecture are at least 1,000 years old, have millions of followers, and thus have very high empower and transformities.

Nature Versus Nurture and Genetic Codes

People, like other organisms, have their operational programs coded in genes of their chromosomes. With the genetic code in every cell of the body, the information is always at hand for whatever cell function the body system calls into operation. Religious learning, as taught at an early age to children, is to society what genetic codes are to the biological system. In religious society, copies of shared operational

God and the System

Religions are based on the individuals of society sharing faith in God or gods. Gods sometimes are thought of as supernatural beings to be represented with images by artists. Or God is said to be a social invention, undefined, intangible, or imaginary. But the images of God are global, are high in emergy, and have the greatest effect of all energy-controlling information.

After learning how to model systems and use our symbols to diagram aspects of our world, students in some classes were asked to include their concept of God. Some drew God on the left side as the source supporting humanity from the heavenly cosmos. Others put in God as the item of highest transformity to the far right of global systems diagrams with loops back to control humans in the center. For some God was identified as the unknown but somehow connected to everything. Still others regarded God as the network, the whole of everything. Apparently, in our culture, faith in God has various images of system.

Neither editions, to note, use the term "atheism" or "atheist". The presentation is thus either closet theism, which is evidenced by the use of ontic opening terms "self-[term] and "emergence" used throughout Odum's work, or closet atheism (or implicit atheism), in some water-testing sense, and or compatibilist atheism-theology, or something along these lines?

Emergy | Morality

Odum, in his 2007 edition, to note outlines some type of "emergy morality" system (aka an "ecological imperative" conception) or ethics (or morality) based on his concept of "emergy"; the gist of which seems to be captured in the adjacent section; on this platform, the following are Odum's "energy system ethics for all scales" (Table 11.1):

1. Seek satisfaction in useful contribution
2. Help maximize real wealth (empower).
3. Reinforce environmental sources.
4. Treasure genetic and cultural diversity.
5. Adapt to natural hierarchy.
6. Minimize luxury.
7. Minimize waste.
8. Adapt to system rhythm.
9. Share information.
10. Optimize efficiency
11. Circulate materials.
12. Circulate money.
13. Fit the earth.
14. Reproduce only as needed.
15. Have faith in self-organization.

Emergy Test of Morality

Because energy laws explain the self-organization of society, these principles define what is moral. Emergy waste is immoral. For example, excesses of individual sexual behavior were seriously detrimental to the scarce energies of a primitive culture and regarded as immoral. In the energy-rich culture of today, sex and other drives have been stimulated but partly separated from reproduction and diverted to other uses. Sexual images are promoted to compete for television attention and stimulate the economy with advertising. Efforts to use old-time morality regarding sex to remove a president of the United States failed in 1999 because the majority believed that sexual conformity was not that important. Greater sins are the enormous wastes of calories in destruction of environmental life support, useless worship of automobile power, gun purchases without purpose, and the greed of stealing resources from future generations.

The emergy ethic leads us to different conclusions about trends of our times and the needs of our youth from those of evangelists, whose personifications and language sometimes lose them in the new wilderness. In energy-rich times, which religion is devout: one that worships a past network with ancient language and persecutes those who change or one that accepts the new information network erupting miraculously from earth fuels as an expansion of God?

The last point (#15), of humorous note, translates as "have faith in perpetual motion".

This, however, seems to be nothing but a list of conjectures of personal opinions of what Odum sees as "wasted calories" in his "life support" system models. This model, in passing absorption, would seem to be one step below that of Lindsay's thermodynamic imperative ethics model, and several steps below that of Ostwald's energy based religion models.

Energy and ecology

In early 1950s, Howard and his brother, zoologist Eugene Odum, were the first to bring the concept of energy into ecology, although the effort did not seem to be very rigorous in a thermodynamic sense. [2] In 1953, the Odum brothers, particularly Eugene, wrote the world's first textbook in ecology, *Fundamentals of Ecology*, in which they were the first to introduce the first two laws of thermodynamics in ecology. [3] Through their writings the Odum's introduced a number of non-rigorous thermodynamic conjectures, such as emergy, embodied energy, the maximum power principle, energese or "energy systems language", among others. [4]

Maximum power principle

In 1955, Odum worked in coordination with American physicist and chemical engineer Richard C. Pinkerton at the University of Florida. [5] Motivated by American physical chemist Alfred Lotka's 1922 articles on the energetics of evolution, they subsequently proposed the theory that natural systems tend to operate at an efficiency that produces the maximum power output, not the maximum efficiency. This theory in turn motivated Odum to propose maximum power as a fundamental thermodynamic law, now known as the "maximum power principle".

Other laws of thermodynamics

Odum also mooted two more additional thermodynamic laws. In 1968, to cite one of Odum's views, he stated: [6]

> "It seems appropriate to unite the biological and physical traditions by giving the Darwinian principle of natural selection the citation as the fourth law of thermodynamics, since it is the controlling principle in rate of heat generation and efficiency settings in irreversible biological processes."

Likewise, in 1994, Odum stated further that: "It may be time to recognize the maximum power principle as the fourth thermodynamic law as suggested by Lotka." [7]

Influence

A noted student of Odum is Charles Hall, the 2008 originator of the BioPhysical Economics conferences.

Education

Odum completed his BS in zoology at the University of North Carolina in 1947. In 1950, he completed his PhD in zoology at Yale University, under English-born American limnologist George Hutchinson, with a dissertation on "The Biochemistry of Strontium: with Discussion on the Ecological Integration of Elements". While at Yale, Howard began his life-long collaborations with his brother Eugene. In 1953, they published the first English-language textbook on systems ecology, *Fundamentals of Ecology*. Howard wrote the chapter on energetics which introduced his energy circuit language, that he had learned in his youth. They continued to collaborate, in research as well as writing, for the rest of their lives. For Howard, his energy systems language (which he called "energese") was itself a collaborative tool.

Quotes | By

The following are representative quotes by Odum:

> "Every 'thing' is based on energy. Energy is the source of all things, all value, and all actions of human beings in nature. This simple truth, long known to scientists and engineers, has generally been omitted from most education in this century."

— Howard T. Odum (1976), *Energy Basis for Man and Nature* (pg. 1)

“Only when sources of energy are newly available and rich do people feel free to do what they want as individuals. The freedom to make many choices exists during only a brief period.”

— Howard T. Odum (1976), *Energy Basis for Man and Nature* (pg. 1)

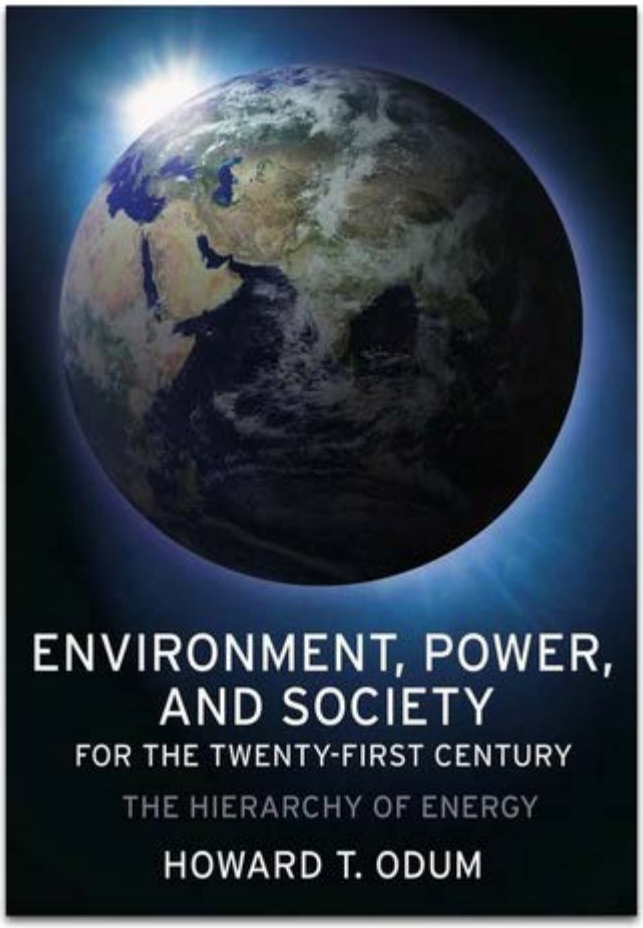

Odum's 2007 2nd edition *Environment, Power, and Society*, wherein he talks about how he asks students to draw in their conception of god on his energy diagrams; which brings to mind Thims' 2010 lectures to engineering students, and "god objections", made by some of them, and his 2015 Zerotheism for Kids lecture, wherein parents were objecting per grounds of the importance of teaching kids about "higher powers", differing from those of power defined by thermodynamics.

“Energy is not only for specialized courses in physics and chemistry; it should permeate education from kindergarten through graduate school.”

— Howard T. Odum (1976), *Energy Basis for Man and Nature* (pg. 2)

“Biologists who have used energy for budget-sheet accounting in biological processes must learn that the bomb calorimeter does not give the energy value of a high-quality substance. The ‘energy value’ of a person is much more than the heat content when he is burned.”

— Howard T. Odum (1976), *Energy Basis for Man and Nature* (pg. 3)

“The principles by which energy flows and generates order apply to all scales of magnitude in the universe, form the world of tiny molecules to the vast systems of the stars.”

— Howard T. Odum (1976), *Energy Basis for Man and Nature* (pg. 115)

“The education system has taught us more and more about bits and pieces, but less and less about overall meaning. Academic subjects have become fragmented and specialized. Ideas about the overall significance of energy are rare. The money system, with its depressions and inflations, seems capricious and mysterious. The individual has often been given much knowledge, but little understanding. Old ideas of religion and duty seem irrelevant to ideals of personal freedom and self-fulfillment. Attempts to be individual, leave the human being, basically a social creature, drifting and isolated.”

— Howard T. Odum (1976), *Energy Basis for Man and Nature* (pg. 213)

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(b) Horstmann, August F. (1973). "Theory of Dissociation" ("Theorie der Dissociation"), *Liebig's Annalen der Chemie und Pharm*acie, Bd. 170 (CLXX), 192-210.

Further reading

â— Odum, Howard t. (1995) 'Self-Organization and Maximum Empower', in C.A.S.Hall (ed.) *Maximum Power: The Ideas and Applications of H.T.Odum*, Colorado University Press, Colorado.

External links

â— Howard T. Odem Collection – Encyclopedia of Earth.

θΔics

In hmolscience, **Howard Washington Odum** (1884-1954), not to be confused with his sons ecologist Howard T. Odum and zoologist Eugene Odum, his other son), was an American sociologist, the intellectual patriarch of the Odum school, noted, in sociological thermodynamics, for his 1929 historical summary of the works of a number of the chiefs and leading social Newtons of mechanistic school of sociology, such as: Vilfredo Pareto (#3), Leon Winiarski (#4), Eugene Roberty (#34), Henry Carey (#8), and Wilhelm Ostwald (#15) in particular.

Pure Analogy | Fallacies

See main: Odum classification

In 1929, Odum, in his *An Introduction to Social Research*, §2, §§: "Fallacies of Pure Analogy" (pgs. 48-49), digresses on the question of making "analogies between physical science and social sciences", in respect to whether these are "pure analogy", see: pure analogy fallacy (Ñº), figurative, or real; then, after stating that the social sciences gain in the development of their methodology along with gains made in the methodology of the physical sciences, he gives the very-condensed "era" statement, which seems to be an attempt at abstracting the history of physical sciences based sociology, up to his day. This is a very interesting abstract indeed; thought, to note, it seems to be, in large part, a truncation of the mechanistic school portions of Pitirim Sorokin's richly-cited *Contemporary Sociological Theories* (1928), who discusses the works of some 1,000+ scholars, as Odum notes.

Mechanistic theory | Approach

In 1929, Odum, in his §7: "Types of Approach: the General Analogical", §§: "Mechanistic Theories" (pgs. 108-110), opening paragraph shown adjacent, full section shown below, per citation of Pitirim Sorokin (1928), gives the following synopsis:

> "Of the earlier analogies the theories which attempt to interpret social phenomena in terms of mathematics, physics, chemistry, and mechanics are perhaps the most noteworthy. They border on the philosophical approach in that they assume a socio-physical monism, and end in the unprovable [see: proof]. They border upon the modern objective approach in that they attempt to apply the method of the physical sciences to the social sciences.

Mechanistic Theories. Of the earlier analogies the theories which attempt to interpret social phenomena in terms of mathematics, physics, chemistry, and mechanics are perhaps the most noteworthy. They border on the philosophical approach in that they assume a socio-physical monism, and end in the unprovable. They border upon the modern objective approach in that they attempt to apply the method of the physical sciences to the social sciences.[1]

The opening paragraph from **Odum**'s section on "Mechanistic Theories", a general truncated synopsis Pitirim Sorokin's 1928 "Mechanistic School" chapter, which he says are the "most noteworthy" of all general analogy approaches used in social science.

> Leon Winiarsky's mechanistic interpretation posits society as a system of points, individuals in perpetual movement, with attraction as the primary cause of movement. This attraction is like chemical affinity with mechanical bases but with a psychic force not present in the physical world, which, however, in turn is nothing more than a form of physico-chemical energy which in turn, in the form of life, may be transferred from potential to kinetic energy, and this transformation is primarily through the processes of alimentation and reproduction.
>
> Human masses transmute energies of hunger and sex into various social, economic, aesthetic or intellectual forms, the transformation proceeding entirely according to the laws of thermodynamics."

This last statement is replete. Give or take a few issues, no one, seemingly, has surpassed Winiarski in general clarity and correctness of approach; which only evidences why he is currently the #4-ranked social Newton (SN:4). Odum continues:

> "Society and human beings will ultimately reach an equilibrium in some such way as the physical world has reached its equilibrium and social science must devise objective units of studying this energistic system of humans in relation to their world."

Here, firstly, we see Odum, in Winiarski context, discussing the so-called "unit problem". Secondly, his take on the "equilibrium view" is conceptually off; Odum seems to have gleaned an sort of Spencerian dilemma view of things, so to say; whereas, correctly, equilibrium, in socio-physical monism terms, is more along the lines of the chemical peneplanation model outlined by Harold Blum (1934). Odum continues:

> "Eugene Roberty (SN:41) in his energetisitic theory considers three fundamental forms of energy as composing the world as we know it: the physico-chemical or inorganic with the molecule as the unit; the vital or organic whose essence is the cell; and the social or superorganic centered in the brain and nervous system. These merge one into the other in an almost imperceptible way. The superorganic elements constitute the "highest forms of psychical phenomena" with "thought" and "abstract knowledge" as the fundamentals.

Next we see Odum digging into the great Henry Carey (SN:9)

> Henry Carey, in his comparison of social processes with physical mechanisms, maintains that the same laws govern in the social and economic world as in the physical. He regards man as a sort of molecule of society. Thus human molecules gravitate toward one another through association, which generates heat, which produces motion, which in turn constitutes progress. This gravitation is measurable through physical laws of direct ratio to mass and inverse ratio to distance. Forms and process such as centralization and decentralization come about through the operation of centripetal and centrifugal forces with association and progress varying inversely as the differences between units and groups of population.

Then he digs into German physical chemist Wilhelm Ostwald (SN:18):

> Wilhelm Ostwald's energetisitic theory interprets all social and historical change as a transformation of energy. Science, which is the most fundamental tool of man for the utilization of energy, is the basis of civilization, for the transformation of crude energy into useful energy by means of adaptation results in language, law, commerce, government, etc., i.e. culture. Society is merely an arrangement whereby man transforms all other forms of energy through effective organization for the better utilization of crude energy. Therefore, the value and justification of concentrated forms of energy, such as a state or social institution, may be measured by the utilization of this energy for the benefit of all its members."

Ostwald, of note, will likely climb higher in social Newton rankings, e.g. his "Monistic Sunday Sermons" were recently unearthed, in part (in English); however, that most of his work is in not yet translated from German to English, slows his rank climbing.

Social Forces

In 1922, Odum established the *Journal of Social Forces*, renamed *Social Forces* (1925), a publication outlet focused on: sociology, primarily, but also related fields, such as: social psychology, anthropology, political science, history, and economics; one noted author is Judson Herrick. [1]

In 1929, Odum, in his *An Introduction to Social Research*, co-written with Katharine Jocher, outlined the methodology of applying physical science methods in social research. In his section on mechanistic approaches in sociology, Odum summarized the work of Leon Winiarski, Eugene Roberty, Henry Carey, and Wilhelm Ostwald. [2] On Winiarski's theory, Odum comments:

> "Human masses transmute energies of hunger and sex into various social, economic, and aesthetic or intellectual forms, the transformation proceeding entirely according to the laws of thermodynamics."

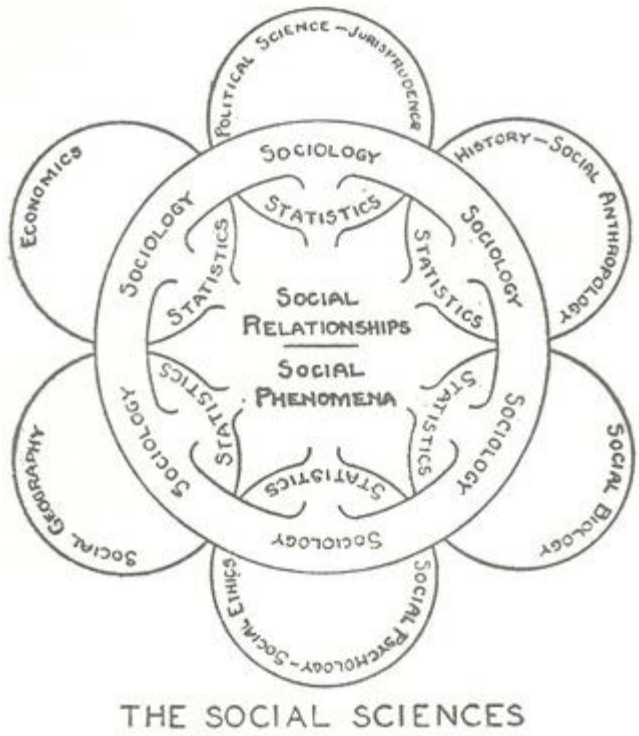

Odum's social sciences diagram (pg. 59), comprising, in its outer ring: economics, political science, jurisprudence, history, social anthropology, social biology, social psychology, social ethics, and social geography, and statistics in its inner ring.

On Carey, for example, Odum summarizes:

> "Thus human molecules gravitate toward one another through association, which generates heat, which produces motion, which in turn constitutes progress. This gravitation is measurable through physical laws of direct ratio to mass and inverse ratio to distance. Forms and process such as centralization and decentralization come about through the operation of centripetal and centrifugal forces with association and progress varying inversely as the differences between the units and groups of populations …"

(add discussion)

Teleology

Odum, of note, devotes a certain amount of covert discussion to what seems to be a belief in teleological underpinnings; one example includes:

> "Social research, again, involves the general telic implications of all scientific method as well as its own science of social implications."
>
> — Howard W. Odum (1929), *An Introduction to Social Research* (pg. 27)

He distinguishes, early on (pg. 4), e.g., between "pure" science and "telic" science.

Quotes | Employed

The following are quotes employed by Odum:

> "All change in the organic

as well as in the inorganic is the result of law."

— Jean Lamarck (c.1802), cited by William W. Odum (1929) in: *An Introduction to Social Research* (pg. 123)

"The first aim of natural science is to discover the motive forces and the motions underlying all alteration, whereby resolving itself into mechanics."

— Hermann Helmholtz (c.1890), cited by Howard W. Odum in: *An Introduction to Social Research* (pg. 9)

SPECIAL CLASSIFICATION, DOCTORAL DISSERTATIONS [2]

Classification	*Sociology*	*Economics*	*History*	*Education*	*Total*
Physical backgrounds	5	10	3	—	18
Social incidence	6	35	26	—	67
Individual and social differentiation	99	171	113	6	389
Personality and leadership	52	46	181	15	294
The home and family relationships	47	56	—	—	103
School and educational direction	22	34	114	195	365
The church and religious experiences	49	22	156	16	243
The state and political relationships	33	81	665	9	788
Industry, working conditions	56	286	291	10	643
Community and larger associations	125	327	134	8	594
Total	494	1,068	1,683	259	3,504

The listing of humanities PhDs granted in the US from 1920 to 1924. [8]

"It would be a boon to interpretation of human experience if we could rise up in our might and destroy the whole miserable trumpery of mechanical partitions between the social sciences, and leave ourselves in the stark presence of social problems. We should then no longer confuse issues by incessantly demanding of one another: Are you of psychology, or of history, or of economics, or of sociology? We should at least keep a little nearer to reality by inquiring: Have you a problem? What is it? How do you go about it? How do you connect it up with all the other problems that are closing in on the mystery of life?"

— Albion Small (1910), "Sociological Stage in the Evolution of Social Sciences" [7]

"For the joy of scientific discovery men have surrendered the comforts of home, rejected opportunities of wealth, risked and lost their lives."

— Author (c.1920), "Article", cited by Howard W. Odum in: *An Introduction to Social Research* (pg. 30)

"There is danger that the natural sciences must always outstrip the social sciences. In the first place, the natural sciences can use the experimental method, and the social sciences have hardly yet devised an adequate substitute. Then again in the natural sciences, the inventor and original thinker is rewarded and honored, but in the social sciences the inventive mind is more or less ostracized and new ideas that touch upon the key problems of modern life, namely, the control of human and economic activities, are at once branded as radical and dangerous. This apparent discrimination against the social sciences is entitled to careful consideration. Is it a necessary difficulty inherent in the very nature of the social disciplines? Or is it due, at least in part, to inadequate and inconclusive methods of social research."

— Anon (c.1920), referred to by Charles Slichter (1922) as a "friendly economist" or in the reports of the National Conference on the Science of Politics (1924) as an "economist" [4]

"Scientific men can be distinguished into two categories: those who 'display a burning desire to see more and more of the eternal truth' and those who 'stop on the way to find its practical application'."

— Michael Pupin (1924), "The Meaning of Scientific Research"; cited by Howard W. Odum (1929) in *An Introduction to Social Research* (pg. 35) [1]

"Among the more earnest students of social life there is a growing realization of the inadequacy of our knowledge and a growing feeling that all is not well with the social sciences. While our electrical, mechanical, and civil engineering technique apparently conquer all obstacles, our social engineering technique is in its infancy and largely guesswork. The social sciences have not reached as yet that cosmopolitan nature which is characteristic of the natural sciences. Physics and chemistry are international, but the social sciences carry a distinct mark of nationality. American, English, French, German, and Russian sociology, each has characteristics of its own. It is therein that they show most clearly their limitations and announce to the world how far they are removed as yet from that absolute scientific objectivity which is the aim of every scientist."

— Nicholas Spykman (1925), *The Social Theory of Georg Simmel*; commentary, supposedly, on the views of Georg Simmel

"Man finds himself in a world which must be understood in order to be controlled. His world of experience is constantly changing from moment to moment. The effort of science is to understand the mechanism through which phenomena take place; that is, all occurrences. Hence, science is the method of solving the more complex problems of experience which man has worked out though his intelligence."

— Charles Ellwood (1925), *The Psychology of Human Society* (pg. I); cited by Howard W. Odum in: *An Introduction to Social Research* (pgs. 13-14)

"No law which commands obedience and threatens punishment is a scientific law. Such a thing is the very essence of pseudoscience. We shall never get a clearer definition of pseudoscience than this: whatever represents either science or the forces of nature, as a sheriff's posse waiting to nab us at the crossroads, a quackery and no mistake. Subject matter makes no difference. Authorship makes no difference. If we say that it as a law of mathematics that that whosoever says two plus two equals five will be arrested for falsification of accounts, we are nature-fakers. Mathematics says nothing of the kind. The laws of mathematics are just as serviceable to swindlers as to everybody else. It is we who are squeamish, not science."

— Charles Ayres (1927), *Science: the False Messiah* (pg. 250); cited by Howard W. Odum in: *An Introduction to Social Research* (pgs. 15)

"In the days of Aristotle, Plato, and Pythagoras, philosophy still embraced the exact, natural and social sciences. At the beginning of the nineteenth century the exact and natural sciences — mathematics, astronomy, physics, chemistry, geology, biology — had already left their philosophical matrix and were rapidly developing their own methods and techniques, while preserving a tendency to return to philosophy for an occasional theoretical and speculative rehauling. But the social sciences — history, ethics, law, economics, psychology, religion, esthetics, anthropology (such as it was) — were still rocking in the metaphysical cradle of mother philosophy."

— William Ogburn (1927), *The Social Sciences and Their Interrelations* [5]

"Fortunately for the social sciences, the 'organismic theories' of society and the state were usually so far-fetched as to exert but a passing influence on social thought. The specter of Hobbes' *Leviathan* haunted us but for a moment. Spencer's elaborate 'analogies' were soon discarded as dialectic fireworks, while Paul von Lilienfeld's mercilessly pedantic tomes were criticized so little only because they were read even less."

— William Ogburn (1928), cited by William W. Odum in: *An Introduction to Social Research* (pg. 123) [9]

Quotes

The following are related quotes:

"Appraisal of the social sciences by the physical scientists and of the physical sciences by the social scientists reveals a similar lack of unity, and in each case there appears also a certain amount of antagonism and unsympathetic understanding quite incompatible with the scientific spirit. This status seems to be accepted as a rather matter-of-fact corollary of the present stage of development of the social sciences."

— Howard W. Odum (1929), *An Introduction to Social Research* (pg. v-vi)

"Two major implications of science in the modern world may be assume at once. The one is science seeking to discover truth and the other is science seeking to attain mastery. The one emphasizes explanation and the other direction. These two viewpoints offer no irreconcilable inconsistencies and bring no incongruous conflict."

— Howard W. Odum (1929), a seeming take on pure and applied; in: *An Introduction to Social Research* (pg. 3)

"The unity of all science is not only the old unity of merely organic analogy, but a very real unity of relationship and of essential law and development. It is the unity which reflects universal law and causal relationships in all phases of life, social and physical and in the 'inanimate' world. Because causal relationships have not been so clearly worked out in social phenomena or because laws have not been perfected is in no sense evidence that they do not exist."

— Howard W. Odum (1929), *An Introduction to Social Research*; compare Hippocrates on causality and understanding

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(b) Odum, Howard W. and Jocher, Katharine C. (1929). *An Introduction to Social Research* (pg. 63). H. Holt and Co.
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(b) Odum, Howard W. and Jocher, Katharine C. (1929). *An Introduction to Social Research* (pg. 73). H. Holt and Co.
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External links

â— Howard W. Odum – Wikipedia.

θΔics

In human physics, **HP pioneers** or "human physics pioneers" are those (**50+**) scientists and writers, as listed below (and others), who over the last several-hundred years or so have contributed theory and logic to the understanding of the physics of human existence, e.g. social physics, econophysics, etc.. Some of these pioneers are listed below. *Photo-size* is indicative of a combination of originality, contribution density, impact, and deepness of theory penetration:

	Pioneer	Date	Contribution
1.	Thomas Hobbes (1588-1679) English science philosopher and political theorist	1651	Wrote the book *Leviathan*, in which he draws analogies between laws of mechanics and features of society.
2.	Francesco Algarotti (1712-1764) Italian natural philosopher	1737	His *Newtonianism for the Ladies* "employs the inverse square law to calculate the power of attraction between a pair of separated lovers".
3.	Adam Smith (1723-1790) Scottish social philosopher and political economist	1776	His *Inquiry into the Nature and Causes of the Wealth of Nations* is said to have found inspiration in Isaac Newton's 1687 *Principia*, particularly the idea of causative forces. [5]
4.	John Stewart (1749-1822) British philosopher	1789	Derived a purely materialist physics-based "moral motion" theory.
5.	Nicolas-Francois Canard (c.1750-1833) French mathematician, philosopher and economist	1801	Argued that view that supply and demand are ontologically like contradicting physical forces. [8]
6.	Henri de Saint-Simon (1760-1825) French social theorist	1817	Gave Auguste Comte a job of secretary; the two were said to have worked together for a period of seven years to develop a version of "social physics".
7.	Adolphe Quetelet (1796-1874) Belgian mathematician, astronomer, and sociologist	1835	Wrote the book *Essay on Social Physics*.
8.	Auguste Comte (1798-1857) French sociologist and philosopher	1842	Outlined the view that 'social physics' needs a Galileo-Newton type description.
9.	Henry Carey (1793-1879) American sociologist and economist	1858	Developed a theory of 'social gravitation'.
			His "Calculations of Chances and Philosophy of Trading", said to have been strongly influenced by the social physics of Adolphe Quetelet,

10.	Jules Regnault (1834-1894) French economist	1863	developed a version of what has been called "financial physics"; was later employed by French mathematician Louis Bachelier (1870-1946) who is said to have used a random hypothesis to treat securities prices similar to gas molecules, moving independently of each other, with future movements being independent of past movements. [3]
11.	 Francis Edgeworth (1845-1926) Irish mathematical economist	1881	Applied mathematical physics to the moral sciences.
12.	 Alfred Marshall (1842-1924) English microeconomist	c.1890	Said to have drew on ideas of physicists to develop the notion that economies achieves an equilibrium state like that described for gases by James Maxwell and Ludwig Boltzmann.
13.	 Louis Bachelier (1870-1946) French mathematician	1900	Building on the work of Jules Regnault, said to have used a random hypothesis to treat securities prices similar to gas molecules, moving independently of each other, with future movements being independent of past movements. [3][5]
14.	 Ludwig Boltzmann (1844-1906) (IQ=195)	1905	In his *Popular Writings* (*Populäre Schriften*), first praised American engineer Willard Gibbs for his systematic development of statistical mechanics, and then said to have commented: [7] "This opens a broad perspective, if we do not only think of mechanical objects. Let's consider to apply this method to the statistics of living beings, society, sociology and so forth."
15.	 Spiru Haret (1851-1912) Romanian mathematical physicist	1910	Developed a physical mathematics based social mechanics.
16.	 Ettore Majorana (1906-1938) Italian theoretical physicist (IQ=195)	c.1933	His *circa* 1933 article "The Value of Statistical Laws in Physics and Social Sciences" suggested the application of quantum statistical physics to social sciences (see: human quantum mechanics).
17.	 John Q. Stewart (1894-1972) American astrophysicist	1947	His "Suggested Principles of 'Social Physics" attempts to outline, formulaically, what he called a "human gas" model of population demographics, in which he viewed each person as a "molecule" (or human molecule, in the modern sense of the term) and uses a shorthand version of ideal gas law to derive formulas for demographic gravitation, demographic energy, among others. He followed this up with several other articles in the following decade.
18.	 George Lundberg (1895-1966) American sociologist	1948	Socially models people as 'electron-proton configurations'. His famous "Models of Segregation" outlined a checker-board type

19	Thomas Schelling (1921-) American economist	1969	social attraction and repulsion model, which showed that small micro preferences for one's neighbors, such as skin color or similar ethnicity, could lead to total segregation.
20.	Roy Henderson (c.1935-) Australian mechanical engineer	1971	Modeled of crowd behavior and pedestrian traffic on fluid mechanics and ideal gas models; in his first paper, the highly-cited 1971 “The Statistics of Crowd Fluids”, he measured the movements of college students on a campus and children on a playground, finding that in both cases their movements fit the Maxwell-Boltzmann distribution.
21.	Wolfgang Weidlich (1931-) German physicist	1971	His article “The Statistical Description of Polarization Phenomena in Society”, on the dynamics of opinion forming, is said to be one of the founding papers of sociophysics.
22.	Elliott Montroll (1916-1983) American chemist, mathematician, and statistical physicist	1974	Did a certain number of humans to molecules comparisons to explain, wherein he used collision theory to explain the transfer of goods and services, family, annual income, and wealth distributions (Pareto's principle).
23.	Per Bak (1948-2002) Danish theoretical physicist	1988	His highly-cited 1988 article "Self-organized Criticality" introduced the sand pile model of critical states which he alluded could be applied to the social sciences and economics; he extended this model into the social domain in his 1996 book *How Nature Works.*
24.	Necip CakÄ±r (c.1963-) Turkish econophysicst	1988	Completed his PhD dissertation at the University of Bogazici, Istanbul, was published as the 1998 book *Physics and Economics*; currently is a professor of economics and deputy dean at the University of Bahcesehir.
25.	Rosario Mantegna (1960-) Italian physicist and econophysicist	1991	He started to work in the area of the analysis and modeling of social and economic systems with tools and concepts of statistical physics as early as in 1990; published the first econophysics paper in a physics journal in 1991; co-authored the first econophysics paper in *Nature*, in 1995;in 1999, he published the first book on econophysics; after earning his tenured position in 1999, he founded the Observatory of Complex Systems, a research group of the Department of Physics of Palermo University, focused on econophysics.
26.	Eugene Stanley (1944-) American physicist	1995	Coined the term "econophysics"; wrote the 2000 *Introduction to Econophysics*, co-authored with Rosario Mantegna; his work was one of the reasons Dietrich Stauffer went into econophysics.
27.	Yi-Cheng Zhang (1954-)	1996	His group, at the University of Fribourg, introduced the first econophysics webpage unifr.ch/econophysics, otherwise known as the *Econophysics Forum*. [1] His asking of Joseph McCauley to write reviews and then articles for the *Econophysics Forum* was what drew him in to econophysics in 1999.
28.	Simon Capelin (c.1951-) English science publishing editor	c.1997	Said to have led the charge in publishing market by bring out the books by Eugene Stanley and others. [3]
29.	Malcolm Gladwell (1963-) American social science writer	1996	Popularized a tipping point theory of collective social behavior.

30.	Dietrich Stauffer (1943-) German theoretical physicist	1998	Began working in the application of statistical physics and in particular computational physics in econophysics (since 1998) and sociophysics (since 2000); in 2003 the international symposium "Unconventional Applications of Statistical Physics: Physics of Random Networks, Econophysics, and Models of Biophysics and Sociophysics" was held in his honor; his 2006 *Biology, Sociology, Geology by Computation Physicists*, contains an end chapter on end chapter to the social science, mentioning Empedocles, Ettore Majorana, Thomas Schelling, Serge Galam, Wolfgang Weidlich, and Jurgen Mimkes; his 2011 article "Statistical Physics for Humanities: A Tutorial" suggests how to use Fortran to build computer simulations for a type of human statistical physics.
31.	Mark Buchanan (1961-) American physicist	2000	Theorizes on power laws and social atoms.
32.	Victor Yakovenko (c.1960-) Russian-born American physicist	2000	Began promoting econophysics, about the US, out of the University of Maryland.
33.	Philip Ball (1962-) English chemical physicist	2001	Writes on 'physics of society'; concepts such as 'critical mass'.
34.	Albert-Laszlo Barabasi (1967-) Romanian-born American physicist	2002	Discusses hubs, connectors, links, and ties social models; student of Eugene Stanley.
35.	Joseph McCauley (1943-) American physicist	c.2003	Completed his 1972 PhD under Norwegian-born American thermodynamicist Lars Onsager at Yale University; authored the 2004 *Dynamics of Markets: Econophysics and Finance*; head of the econophysics department at the University of Houston, which as of 2008, is said to be one of the only universities that offers a PhD program in econophysics. [4]
36.	Victor Yakovenko ()	c.2003	Runs an econophysics research group at the physics department of the University of Maryland. [6]
37.	Carlos Perez (1955-) Spanish sociologist	2004	His "The Value of Statistical Laws in Physics and Social Sciences" reprints (in English) and recounts the *circa* 1935 social quantum mechanics article Ettore Majorana.
38.	Richard Ecob (c.1983-) English physicist	2005	Developed an atomic radioactive decay model of how people look for partners on the view that anyone's romantic life can be reduced to a series of transitions, or 'transit states', e.g. 'twice-divorced and now single'; a sort of nuclear decay version of chemistry's transition state theory.
39.	Ted Erikson (c.1928-) American chemical engineer	2005	Since circa 2005 has been working on a Planck-scale theory of panpsychism consciousness and growth; discussing it in talks, such as at the local Chicago area American Association of Physics Teachers meetings (2008), American Institute of Chemical Engineering meetings (2010), etc.; his 2009 chapter "What Makes Us Human: Panpsychism and Thermodynamics Explored" outlines some of his ideas.

Libb Thims

40.	(c.1975-) American chemical engineer, electrical engineer, and thermodynamicist	2007	His 2007 textbook *Human Chemistry* introduced the exchange force model of human chemical bonding (mediated by field particles: primary and secondary), the Feynman diagram model of human interactions (attraction and repulsion movements), and the outline of human quantum mechanics, among other theories.
41.	Adrian Bejan (1948-) Romanian-born American mechanical engineer	2007	Developed a social dynamics constructal theory.
42.	Daniel Gilles ()	2008	Co-authored, together with Didier Sornette, the article "Econophysics: Historical Perspectives", in the four-volume *Encyclopedia of Quantitative Finance*
43.	Dean Hamden (c.1950-) American physicist	2008	Has been conducted a four-year research project on the subject of the physics of human behavior, at Montclair State University, involving 500 individuals, the results of which are explained in the nearly finished 2012 book *The Physics of Human Behavior*, some of which is touched on at 2008 BehaviorPhysics.Blogspot.com; in this work, he applies concepts such as Newtons laws of motion, Hooke's law, the laws of thermodynamics, entropy, the uncertainty principle, conservation of energy, conservation of momentum, among others, applied to human behavior, finance, and economics, all framed around an end run effort to facilitate guidance on happiness attainment and relationship satisfaction.
44.	Len Fisher (1942-) Australian-born English chemist, physicist, biologist, and philosopher	2009	Discusses the physics of crowd and swarm behavior.
45.	Ignacio Gallo (c.1982-)	2009	Did PhD thesis on the physics of social equilibrium; research is to develop a statistical mechanics theory of social interaction, using generalizing econometric discrete choice models, among others.
46.	Oscar Bolina (c.1959-) American mathematician	2010	Chapter: "Society from the Statistical Mechanics Perspective". [2]
47.	Dan Cobley (c.1960-) English physicist and marketing director	2010	Noted for his implementation of physics concepts such as Newton's second law, Heisenberg's uncertainty principle, the scientific method, and the second law of thermodynamics to explain the fundamental theories of branding.
48.	Curtis Blakely () American justice systems professor	2010	Article in "Sub-atomic Particles and Prisoners: a Novel Examination of Socio-Physics and Penology".
49.	Alberto Douce (c.1951-) American geologist	2011	In his *Thermodynamics of Earth and* Planets, he lists as one of his research interests the application of statistical physics to human societies.

See also

â— HT pioneers
â— HC pioneer
â— HMS pioneers

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External links

â— Econophysics and phynance – Hep.Yorku.ca.

θΔics

In acronyms, **HT** is short for human thermodynamics, as in EoHT (*Encyclopedia of Human Thermodynamics*) or IoHT (Institute of Human Thermodynamics), the thermodynamics of humans; or less-commonly hierarchical thermodynamics, the classical thermodynamic study of hierarchies of living systems, the latter a subject developed by Russian physical chemist Georgi Gladyshev. [1]

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1. HT - IoHT glossary.

θΔics

In hmol science, **HT pioneers**, or pioneers of human thermodynamics, are those (**505+**) scientists and writers, as listed below, who over the years have contributed theory and logic to the understanding of the thermodynamics of human existence.

> "I'm sorry Lord Kelvin (1824-1907) is dead. I would travel a few thousand-million miles to discuss with him the thermodynamics of socialistic society." (Henry Adams, Letter to English lawyer Charles Gaskell, 1909)

> "The fascination of a growing science lies in the work of the **pioneers** at the very borderland of the unknown, but to reach this frontier one must pass over well traveled roads; of these one of the safest and surest is the broad highway of thermodynamics." (Gilbert Lewis and Merle Randall, *Thermodynamics*, 1923)

The subject of human thermodynamics is akin to mountain climbing: we know thermodynamics governs us as it does the universe, the question is not if, the question is how? Only through study of the **pioneers** (below) shall we reach the summit.

Each person's *photo-size* is indicative of a combination of originality, contribution density, impact, and deepness of thought and theory penetration. Ranks of pioneers within a given year, are listed in descending order. Small quick-mark clickable *icons*, as described in the following table, are used to facilitate topics and theories associated with the work of each person. Those thinkers with equations, shown in upper right hand corner (of their description), each equation representative of that person's work, signifies a *deeper* thinker who goes beyond simple verbal arguments and employs the language of differential equations, rather than simple verbal arguments, otherwise known as entropology, which are a dime-a-dozen; most-often becoming empty excursions into nonsense. Thinkers are grouped into four year-range categories: past-1799 (8+), 1800-1899 (51+), 1900-1999 (334+), and 2000-present (110+):

Theory basis icons

The following subject based icons give a quick mark indication as to what model or scientific subject each author culled, based or derived their theory from.

Subject	Icon	Description
Reactions	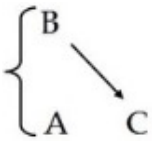	The chemical reaction mechanism icon (human chemical thermodynamics) signifies that the person theorized about relationships as chemical reactions, with people and relationship changes viewed "symbolically", as in AB + C → A + BC, in going between initial states and final states; may also have speculated on human chemical bonding theory (A≡B); or may have used societal reaction extrapolations, e.g. modeling societies or economies on aspects of Le Chatlier's principle.
Statistics		The gas particle icon (human statistical thermodynamics) indicates the person used statistical mechanics or statistical thermodynamics in their formulations, e.g. S = k log W models, which involve the gas constant R, thus viewing people as 'constituents of a statistical ensemble', etc.; his view, to note, implies people obey the Boltzmann chaos assumption, which generally is a red flag type of application, albeit one that may provide some fruit or insight.
Phases	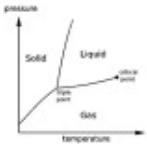	The phase diagram icon (phase thermodynamics) indicates that the person derived their theory from phase diagram models, e.g. using the thermodynamics of binary solutions to explain mixing and separation of individuals by group or race in populations, from Gibbs phase rule, phase transitions, or from the solid state physics of metals, etc.
Chromatograpy	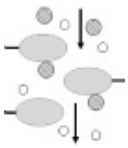	The chromatography icon (chromatographic thermodynamics) indicates that the person derived their theory from studies in chromatographic methods, e.g. affinity chromatography, gas chromatography, etc., in the thermodynamics of the separation of mixtures of molecules, wherein molecules in a mobile phase are passed through a separate substrate-type stationary molecular system, according to which the various molecules in the mobile phase separate based on their respective affinities or free energies for various regions (or molecules) of the

stationary phase.

Electrochemistry		The battery icon (electrochemical thermodynamics) indicates that the person derived their theory based on electochemical thermodynamic models of batteries or fuel cells, etc.
Dissipation	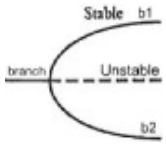	The bifurcation icon (pitchfork bifurcation) indicates that the person based parts of their theory generally on the 1970s to 1980s dissipative structures, bifurcation, fluctuation, far-from-equilibrium, non-equilibrium thermodynamics, Benard cells-type theories and models of Belgian chemist Ilya Prigogine or his followers.

Subject icons

The following subject icons listed next to each person give a quick indication as to what topic he or she theorized, discussed, or worked on in their application of thermodynamics to the various subject-divided facets of human existence.

Subject	Icon	Description
HT Degree		The diploma icon (human thermodynamics education) signifies that the person (12+) completed a graduate school degree (MS or PhD) with a "human thermodynamics dissertation" (or thesis) in one or more of the branches of human thermodynamics.
Humans		The human molecule icon, as used below, indicates that the person considers individual humans as individual reactive "molecules", or human particles, chemical entities, or attracting and repelling types of point atoms, etc., using a thermodynamic logic of explanation (human chemical thermodynamics or human statistical thermodynamics).
Nobel		The Nobel Prize icon (13+), a noted cultural and scientific advances award, started in 1901, via Alfred Nobel's will, signified that the person won the Nobel in chemistry, physics, literature, physiology, economics, peace, or won for their extension of thermodynamics into the human sphere of application, e.g. economics or sociology, i.e. Tinbergen (1969), Samuelson (1970), and Prigogine (1977)
Intelligence		The intelligence quotient icon (6+) signifies the person has had their IQ tested or estimated in the 225+ range (Goethe, Sidis, Hirata) or near the 200+ range.
Occupation		The ditch digger icon (work) signifies that the person theorized on why a person chooses an occupation in a thermodynamic sense.
Ethics		The scales of justice icon (ethics) indicates that person theorized on right and wrong or morality in a thermodynamic framework.
Love		The cupid's arrow through the heart icon (thermodynamics of love) signifies that the person theorized on how thermodynamics applies to love and relationships.
Sex		The sex icon (sexual thermodynamics) signifies the person theorized on sex thermodynamically, e.g. libido, sexual energy, sexual heat, masturbation, etc.
Economics		The money-gold icon (economics thermodynamics) signifies that the person studies the overlap of thermodynamic laws and and the functioning of economies; the pen and check icon signified financial thermodynamics.
Sociology		The sociology icon (sociological thermodynamics) signifies the person studies the application of thermodynamics in sociology theory; the racial unity icon (racial thermodynamics) signifies the person theorizes on the integration and segregation of cultures or groups (integration and segregation thermodynamics)
Life		The bacteria icon (life thermodynamics / animate thermodynamics) signifies that the person studies how thermodynamics applies to the what is life or origin of life questions.
Evolution		The monkey-to-man icon (evolution thermodynamics) signifies that the person studies the overlap of evolution theory with thermodynamics.
Philosophy		The infinity symbol (philosophical thermodynamics) signifies the person studies the overlap of philosophy and thermodynamics; the smiley face icon signifies the person has the theorized on

		happiness in relation to thermodynamics.
Psychology		The dynamics of the brain icon (psychodynamics) signifies that person studies the application of thermodynamics in psychology.
Free will		The caged bird icon (free will) indicates the person wrestled with the free will issue (choice); the free bird icon (freedom) signifies the person theorized on freedom (or freedom vs security); the no-mechanism icon indicates the person specifically argued against determinism or fate, each in a thermodynamic sense, respectively.
History		The scroll icon (history thermodynamics) signifies how the the laws of thermodynamics apply to the historian in his studies of history.
War		The bazooka joe icon (war thermodynamics) signifies the person theorized on war, civil war, or revolutions thermodynamically.
Time		The arrow icon (arrow of time) indicates that the person studies entropy or the second law in relation to time.
Universe		The galaxy icon (universe) signifies the person theorized on thermodynamics universe implications: heat death, big bang, etc.
Literature		The book icon (literature thermodynamics) signifies the person studies the usage of thermodynamics theory in literature.
Business		The briefcase icon (business thermodynamics) signifies that the person uses thermodynamics in business theory or application.
Government (Politics)		The government icon (government thermodynamics) signifies the person theorized on how thermodynamic laws relate to government laws; the donkey-elephant icon (political thermodynamics) to politics; the mallet icon to legal thermodynamics.
Anthropology		The anthropology icon (anthropology thermodynamics) studies how thermodynamics applies in anthropology.
Ecology		The ecology icon (ecological thermodynamics) signifies the person theorizes on thermodynamics, ecology, and humanities; the globe icon signifies the person has applied thermodynamics to the earth sciences and or geology (geological thermodynamics).
Architecture		The architect icon (architectural thermodynamics) signifies the person used thermodynamics theory in the development of general architectural theory or design.
Education		The university icon (HT education) signifies that the person teaches or has taught their subject in a university (or high school) class.
Beauty		The beauty icon (aesthetic energy), of a dancing young female, in a spring dress, holding a bouquet of flowers, signifies the person theorized on the relationship between beauty and thermodynamics.
Religion		The cross icon (religious thermodynamics) signifies that the person's theory is religiously motivated or biased, to a significant degree, steeped on belief in the Abrahamic God; the om symbol signifies a Brahmaic or Hindu-centric religion focus; the yin yang symbol a Eastern or yellow river religion focus.
Death		The RIP tombstone icon (cessation thermodynamics) signifies that the subject matter of that person is on how the conservation of energy or the second law explains death or afterlife theories.
Art		The paint brush icon (art thermodynamics) signifies the person discusses applications using thermodynamics in art work.
Information		The high/low voltage-current icon (information thermodynamics) signifies that the person attempts to theorize on how information theory, in one way or another, applies to aspects of human thermodynamics; the governor symbol indicates the person theorizes on cybernetics.
New age		The new age icon (spirituality) signifies that the person uses thermodynamics in fringe subjects (fringe thermodynamics), such as spirituality, ghost-spirit hunting, telekinesis, ectoplasy, bioenergy, paranormal, energy medicine, the sixth sense, or other new age types of sideline theories.

Objectors Those with red tabs are "detractors" or vocal objectors to thermodynamic theory (see: not applicable view) applied to explain human existence.

Earlier HT pioneers | 1799 or before

The following is a chronological listing of individuals with precursory human thermodynamics theories, ideas, and opinions professed up until the year 1799.

Pioneer	Date	Contribution
Heraclitus (c.535-450BC) Greek philosopher	c.500BC	Known as the "flux and fire philosopher", he held that view that everything is in a continuous state of flux; that all things are an exchange for fire; that transformations of fire lead to, firstly the sea, then earth, then whirlwind; and that the soul of a person is a spark of the substance of the stars.
Hippocrates (c.460-370BC) Greek physician	c.420BC	Postulated that heat, originating from the left ventricle, functions to animate people.
Aristotle (384-322BC) Greek philosopher (IQ=190)	c.350BC	His *De Generatione Animalium* argued that the mode of animal reproduction is determined by a "vital heat" of the animal: the warmer an animal is, the more perfect will be the state in which its young are generated: live young are produced by the hotter animals; colder ones produce eggs; the coldest of all, such as insects, produce a larva which in turn produces an egg.
Leonardo da Vinci (1452-1519) Italian polymath (IQ=220)	c.1490	Said to have been the first to discard the innate heat (animal heat) model of the heart as had been espoused previously for centuries by Galen back to pre-Hippocratic times (the view of heat as a kind of spiritual energy originating in the left ventricle), and to replace it with the view that heat is due to the friction of the blood swirling through the organ's valves and chambers; to evidence his view, he pointed out that the heart beats faster when a patient has a fever.
William Shakespeare (1564-1616) English writer (IQ=210)	1603	Stated, in riddled form, in *Othello, the Moor of Venice*, "I know not where is that Promethean heat, that can thy life relum."
Charles Montesquieu (1689-1755) French politician (IQ=165)	1748	Argued that governmental laws need to be a function of temperature of the land.
Antoine Lavoisier (1743-1794) French chemist (IQ=170)	1785	Introduced the combustion theory of animal heat, the model that heat in animals (animal heat) was result of a type of respiratory chemical reaction in the lungs in which vital air (oxygen + caloric) extracted some carbonaceous substance, releasing heat (caloric) in the body.
Johann Goethe (1749-1832) German polymath (IQ=225+)	1799	In 1768, at the age $A = -\Delta G$ of nineteen was conducting chemical experiments to find the principles that permeate the entire universe; in 1799, arrived at the view that the force of affinity operates in human relationships, via attracting, repelling, and neutralizing individuals; in 1809, arrived at his "moral symbols" theory of humanity, as explained via 36 chapters in his famed novella *Elective Affinities*, as is depicted in 1882 Helmholtz equation terms (adjacent equation).

19th century HT pioneers | 1800 to 1899

The following is a chronological listing of individuals with human thermodynamics theories, ideas, and opinions professed in the years 1800 to 1899:

Pioneer	Date	Contribution

Christoph Wieland (1733-1813) German poet and writer	1810	Objected to the use of affinity chemistry theory in Goethe's *Elective Affinities* (1809), calling it "nonsense and childish fooling around" and a "truly horrible work", comments that he said should be burned after reading; objecting solely to the radicalness of its Christianity.
John Herschel (1797-1871) English mathematician-astronomer	1833	Held that heat is the motive force powering not only people but the planet.
Johannes Muller (1801-1858) German physiologist	c.1835	Formulated a vitalism view that life had a special "organizing energy", distinct or special in some way from the common physical chemical energies, that controlled evolution; in opposition to this doctrine, three of Muller's students, German physicians Ernst Brücke, Herman Helmholtz, and Emil Du Bois-Reymond, made a pact that they would work to disprove their mentor's theory, and validate the basic truth that "in an organism no other forces have effect than the common physio-chemical ones"; precipitates of this reaction include the Helmholtz school of thermodynamics (which include the psychodynamics of Sigmund Freud), and resultant 1840s discussions between Charles Darwin and Richard Owen on Muller's vitalism view, which may have spurred on Darwin's evolution theory.
Ludwig Colding (1815-1888) Danish civil engineer	1843	Derived a conservation of energy theory on the logic of the immortality of the soul.
James Joule (1818-1889) English physicist	1843	In the early 1840s, performed extensively elaborate experiments to determine the mechanical equivalent of heat, the underlying motive of which seems to have been religiously fueled, in that the results, in some way or another, would scientifically prove the indestructible of God's power, or something to this effect. In May of 1847, gave a lecture ("On Matter, Living Force, and Heat") at St. Ann's Church, he explained that the measure of the mechanical equivalent of heat, such as would have been transformed in the friction of the wind and agitation of the water, since the time of creation, over the "last 4000 to 6000 years" since the creation, as he says, gives experimental proof for the Biblical story of genesis. That same year, in a noted thermodynamics anecdote, while on his honeymoon at Niagara Falls, Joule brandished a thermometer and took temperature readings of the top and bottom of the falls, supposedly to find more experimental proof for the genesis myth.
Hermann Helmholtz (1821-1894) German physicist and physician	1847	Thermodynamically analyzed Goethe's *Faust* and vicariously helped to found "psychodynamics" via his influence on Sigmund Freud.
Richard Owen (1804-1892) English anatomist	1849	Adopted the Johannes Muller vitalism view that life has a special "organizing energy", but added in that it must be devinely designed or created, so as to control or guide evolution and the development of life; Owen discussed this theory with Charles Darwin in the 1840s.
William Thomson (1824-1907) Irish-born Scottish physicist and mathematician	1852	Argued that law of dissipation applies to life and the will of animate creatures, and alluded to the argument that the universe must have been created; stated, in 1885, anecdote, that afternoon excursions with his wife, which take him away from his scientific work, were forms of dissipation of energy or of the second law in action.
Hermann Gossen (1810-1858) German economist	1853	In his *Development of the Laws of Human Exchange and the Consequent Rules of Human Action*, attempted a formulation of a calculus of human pleasures, theorizing on how Kräfte (or forces) operated in the course of human economic exchanges, on the premise that the aim of each individual is to maximize his or her total life pleasure.

Gustave Hirn (1815-1890) French physicist	1856	His 1856 experimental measurements of the mechanical equivalent of heat of humans in movement and his 1868 *Philosophical Implications of Thermodynamics*, are the said, according to the 1893 views of English engineer Bryan Donkin, to have launched the science of "human thermodynamics".
Rudolf Clausius (1822-1888) German physicist	1857	Aside from founding thermodynamics with is *The Mechanical Theory of Heat* (1850-1875), in his "On the Nature of Heat Compared with Light and Sound" he compared heat, light, and sound to give a Boltzmann-Ebeling like description of the earth ecosystem based on metabolic needs, insulation, and chemical affinities; his circa 1880 talk on "On the Energy Supplies of Nature and the Utilization of them for the Benefit of Mankind" (published in book form in 1885), was said to have inspired Austrian science teacher Eduard Sacher to write his 1881 book *Outline of a Mechanics of Society*.
Henry Carey (1793-1879) American sociologist and economist	1858	Outlined on how social movement will only accrue when the affinities are activated between people; explained how chemical affinity must govern human social movement and outlined a theory of social heat, based on the Berthelot-Thomsen principle, associated with the rubbing together of human molecules in daily activity; outlined a theory of social gravitation to explain how people attract into the aggregation of large cities, each mutual city acting as an attractive 'sun' with a certain brightness.
John Tyndall (1820-1893) Irish physicist	1858	Seeded the Spencerian dilemma (1858), on the relation between thermodynamic equilibrium and social equilibrium, and for having launched the 1874 four-year Tyndall-Stewart-Tait debate on the tenuous issue of teaching science in a public religious college, with his statement that: "all religious theories, schemes and systems must submit to the control of science, and relinquish all thought of controlling it"; resulting in discussions on death, morality, the soul, and immortality all discussed in the context of chemistry, thermodynamics, and cosmology.
Herbert Spencer (1820-1903) English scientist-philosopher	c.1858	Origin of the Spencerian dilemma: that in circa 1858, he was "staggered" when he was told by Irish physicist John Tyndall that the end state of equilibration is a state of heat death in which life ceases, where previous he was of the view that "equilibrium as the ultimate and *highest* state of society"; this conflicting issue took him the next forty years to reconcile; a precipitate being his 1862 *First Principles: of a New System of Philosophy*, in which he gave prominence to four types or orders of equilibrium or "equilibration".
James Maxwell (1831-1879) Scottish physicist	1867	Introduced the now-famous "Maxwell's demon" objection to the second law, about a hypothetical demon or "intelligent being endowed with free will, and fine enough tactile and perceptive organization to give him the faculty of observing and influencing individual molecules of matter", according to the 1874 interpretation of William Thomson; in 1878-79, the year of his death, Maxwell penned a review article "Paradoxical Philosophy" and followed this up with his last poem "A Paradoxical Ode", both outlining his views on the philosopher's paradox and the implications of thermodynamics and conservation of energy in regards immortality, the soul, the life/death demarcation, evolution, morality, consciousness, down to the atomic level.
Karl Marx (1818-1883) German political economist	1867	Was discussing Benjamin Thompson in his *Capital*; became acquainted with Clausius' heat death model in 1869; thereafter, began debating, with Friedrich Engels, the application of thermodynamics into economic theory, giving commentary on those as Sergei Podolinsky (1882).
Norman Lockyer (1836-1920) English astronomer	1868	Co-authored two articles with Balfour Stewart, the first "The Sun as a Type of the Material Universe", in which they argued in favor of theology, arguing against materialism and social disorder, the second "The Place of Life",

they attempt to explain analogy in using the term energy (as well a degradation of energy) in both the physical world and social world.

Balfour Stewart (1828-1887) Scottish physicist	1868	Penned two articles on social life, the sun, and energy, with Norman Lockyer (1868); in his book *The Conservation of Energy*, devoted a chapter the applications of the laws of energy to life, viewing the universe as a machine; uses chemical affinity logic throughout the book; his 1875 book *The Unseen Universe*, written with Peter Tait, speculates on immortality; this was followed up by the 1878 *Paradoxical Philosophy*.
Friedrich Engels (1820-1895) German social scientist	1869	Seems to have, indirectly, blended aspects of thermodynamics into the development of Marxism; commented to his associate Karl Marx that Clausius' heat death postulate for future life was a "very absurd theory", and that he is "waiting for the moment when the clerics seize upon this theory"; commented in 1882 that "one day we shall certainly 'reduce' thought experimentally to molecular and chemical motions in the brain"; by 1888, was of the view that the 19th century was the century of Darwin and Clausius, of evolution and transformation of energy.
Adolf Fick (1829-1901) German physicist-physiologist	1869	In his lecture "The Forces of Nature in their Relationship", he extrapolated Clausius' heat death theory of universal end to give the first contour of the 'entropy proof of God's existence'.
Francois Massieu (1832-1896) French engineer and chemical thermodynamicist	c.1869	His work was the forerunner to Gibbs' *Equilibrium* treatise; compared humans to molecules in their chemical composition, and then in this mindset addressed the puzzles as to how a molecule, such as water H_2O (or by extension a human) can have a body and soul (in the scheme of water being split up into oxygen O_2 and hydrogen H_2); or be alive vs dead; have morality, exist, and other philosophical issues.
Henry Adams (1838-1918) American historian	1873	In 1873, learned of Hippolyte Taine's definition of the historian as one who follows and studies the transformations of individual human molecules or groups of human molecules; by 1885, had come to define "social chemistry" as the study of the attraction [and repulsion] of "equivalent human molecules", a subject that had become, in his own words, his daily study and greatest satisfaction, prophesying it as a "science yet to be created", as would soon be done (Fairburn, 1914; Dreier, 1948; Thims, 2007); in 1894, gave his presidential address to the American Historical Association, entitled "The Tendency of History", outlining his view of the future development of the scientific approach to history; in 1904 penned "A Dynamic Theory of History", describing humans as attracting and repelling forces; in 1909, applied the phase rule work of Willard Gibbs to society; commented to Charles Gaskell in 1909: "I'm sorry Lord Kelvin is dead. I would travel a few thousand-million miles to discuss with him the thermodynamics of socialistic society"; in 1910, published *A Letter to American Teachers of History*, imploring historians to begin integrating thermodynamics into their classrooms, namely a second law version of history studies of systems of contracting and expanding human molecules; was, supposedly, defending his scientific models of history from criticism up until his last day in 1918.
August Kronig (1822-1879) German physicist	1874	His *The Existence of God and the Happiness of People*, discusses things such as gravity, kraft, Charles Darwin, entropy and particularly how the heat death theory of universal end mandates (or not) an initial universal Creator, a topic centered around the existence of god.
Ernst Brucke (1819-1892) German physician and	1874	One of the three rebellious students, along with Hermann Helmholtz and Emil Du Bois-Reymond, of vitalism promoter Johannes Muller, during the years 1838 to 1842, to formulated a desire to prove that "in an organism no other forces have effect than the common physio-chemical ones"; his 1874 *Lecture on*

physiologist		*Physiology*, which outlined the view that all living organisms are energy-systems governed by the first law of thermodynamics, was very influential to Sigmund Freud, who would go on to initiate the field of psychodynamics.
Leon Walras (1834-1910) French sociologist and economist	c.1874	Spoke of people as 'economic molecules'; supposedly, gave concepts like scarcity scientific definitions analogous to heat in physics; central founder of the Lausanne school of economics.
Enrique Fatigati (1845-1918) Spanish physicist, chemist, and thermodynamicist	1875	In 1872, his first submission of his doctoral thesis in physics on calculating the specific heats of solids and liquids was rejected by the University of Madrid because his version of physics (organic energetics) was at odds with Catholicism and main stream physics based on the mechanical hypothesis, i.e. that heat was a form of motion; after a revision, his second thesis in 1874 was accepted; in 1875, he and British chemist Edmund Mills, who both were of the view that there should be no divide between living matter and inert matter, began teaching their model at the Free Institution of Education; into the late 1870s, he outlined a unified theory of nature and society centered on the first and second laws of thermodynamics, particularly William Rankine's version, mixed with a blend of ideas about Pierre Laplace's nebular hypothesis and Lamarckian evolution theory, concluding that the universe as a whole is in a sort of organic evolution, while along the way replacing God and the soul with a type of transformative "natural energy" or "activity".
Peter Tait (1831-1901) Scottish mathematical physicist	1875	His book *The Unseen Universe: or Physical Speculations on a Future State*, written with Balfour Stewart, speculates on immortality, supposedly in an energy-thermodynamic sense, the heat death of the universe; how thoughts are molecular motions of the brain; how the universe may contain "bonds of energy" that may connect to the thinking aspects of the mind; among curious other subjects.
Carl Neumann (1832-1925) German mathematical physicist	1875	Is said to have been the first to theorize, thermodynamically, in economic extrapolation, about the 'internal energy capital' of the body, and to have participated in the training of energy performances (efficiencies) in economic analogies.
Josef Popper (1838-1921) Austrian physicist, engineer, and social theorist	1876	Objected, in his writings on the history of thermodynamics, to William Thomson's metaphysical and religious extrapolations of the second law; tried, unsuccessfully, to promote a biophysical view of the economy as a subsystem embedded in a larger system subject to the laws of thermodynamics.
Eugene Roberty (1843-1915) Russian-born French sociologist	1876	Incorporated three forms of energy as composing the world into a sociology theory of the brain; one of the first to introduce mechanistic theories in sociology.
Eduard Sacher (1834-1903) Austrian science teacher	1881	His *Outline of a Mechanics of Society*, which was inspired by Rudolf Clausius' c.1880 talk "On the Energy Supplies of Nature and the Utilization of them for the Benefit of Mankind", utilized the second law to outline a "basis for a rational economy"; he seemed to be of the view that individual work, of the more abstract varieties, can be quantified, as exemplified by his statement: "the work of an inventor can almost pricelessly [measured in joules] have value."
Sergei Podolinsky (1850-1891) Ukrainian physician and socialist	1881	Attempted to reconcile Marxism with thermodynamics, using the work-based theory of value with energy accounting by integrating economic cycles with natural cycles, amid the skepticism of Friedrich Engels who deemed it "totally impossible to try to express economic relationships in physical terms."
Ludwig Boltzmann (1844-1906) Austrian physicist	1886	Positioned the now-famous enigmatic semi-riddled postulate that "life is a struggle for entropy".
Georg Helm (1851-		

1923) German physicist	1887	His *The Doctrine of Energy* contains a chapter three on philosophical and religious implications of thermodynamics, e.g. existence of god, and a final chapter which argues that energy and entropy can be used to explain transformations and transitions of economies.
James Martineau (1805-1900) English theologian and philosopher	1888	View: "in its physical aspect, according to the conservation of energy, death presents simply a case of transformation of energy"; theorized on the first law, death, and the physics of the brain.
Bryan Donkin (1836-1902) English engineer	1893	His article-book "The Scientific Work of Gustav Adolph Hirn", on the life, work, and thermodynamics philosophy of French physicist Gustave Hirn, coined the term "human thermodynamics" and gave the first summary of the subject overview of the subject.
Emile Durkheim (1893) French sociologist	1893	Was said to have "solved" said the Spencerian dilemma, supposedly.
Camille Flammarion (1842-1925) French astronomer	1893	The final chapter "philosophical final essay" of his science fiction novel *The End of the World*, contained popular artistic depictions of the German "heat death" or "cold death",as the average temperature would then be very low, of the end of the human existence.
Léon Winiarski (1865-1915) Polish economist and sociologist	1894	Taught a class called "social mechanics", using Clausius and Lagrange, at the University of Geneva for at least six years (1894-1900), considering people as attracting and repelling points, theorizing on such advanced topics as morality explained in terms of reversible (equation shown) and irreversible cycles, aesthetic energy, sexual energy, family structure, etc., as described in his *Essay on Social Mechanics* (1898) and course outline "The Teaching of Pure Political Economics and Social Mechanics in Switzerland" (1900); can be considered as the first "true" human thermodynamicist. $\oint \frac{dQ}{T} = 0$
Ernest Solvay (1838-1922) Belgian industrial chemist	1894	Promoted the science of social energetics; eponym of the Solvay conferences.
Robert Thurston (1839-1903) American mechanical engineer	1894	In his *The Animal as a Machine and Prime Motor: and the Laws of Energetics*, speculated on a future possible law of persistence of existence, in relation to the energy or force aspects of the soul.
Sigmund Freud (1856-1939) Austrian psychiatrist (IQ=156)	1895	His draft of a "Project for Scientific Psychology" outlined a hard science version of psychology based on thermodynamics and mechanical theory, in which he postulated that "in the future psychologists will exercise a direct influence, by means of particular chemical substances, on the amounts of energy and their distribution in the mental apparatus"; in this project it is said that he gave his first outline of his Helmholtz school views on 'bound energy' and 'unbound energy' (or free energy) in the states of consciousness; this framework formed the basis of his entire twenty-four volume volume collected works; some of his thermodynamics ideas are said to show through in his 1920 *Beyond the Pleasure Principle*; the gist of his psychodynamics theory are found in his 1923 *The Ego and the Id*, in which he outlines a heat engine model of the mind via an id, ego, super-ego force theory of subconscious drives.
William James (1842-1910) American psychologist	c.1895	Conceived the "reserve energy" theory of the mind (c.1895) with Boris Sidis; theory was tested in the intellectual raising of William Sidis (1898-1944) to affect a said-to-be adult IQ of 250-300; his 1906 lecture on "The Energies of Men" extolled on the theory; in *circa* 1909, argued against determinism and physicalism, by stating that the second law was irrelevant to the study of human history; on his deathbed, reviewed his friend American historian Henry Adams' newly published *Letter to American Teachers of History* (1910) to object, on

		what seems to be religious grounds, to the heat death model of societal end.
Brooks Adams (1848-1927) American historian and lawyer	1895	Argued, in his *Law of Civilization and Decay*, that history and civilization were governed by the law of degradation of energy, wherein he applied the Helmholtz-version of the first law, i.e. that energy or force is conserved, Kelvin-version of the second law, i.e. that there is a universal tendency to the dissipation of energy, along with a theory of social contractions and dispersions, to develop a energetic theory or model of history, in reference, particularly, to its civilization rises and falls.
Oswald Kulpe (1862-1915) German psychologist	1895	A student of the Helmholtz school, who was noted for the view, expressed in his *Introduction to Philosophy*, that "it would thus make no difference whether a quantum of mental energy inserts itself into the course of the material process or not: the law of the conservation of energy as formulated hitherto would not be impaired."
Vilfredo Pareto (1848-1923) French-Italian mathematical engineer	1896	Headed the Lausanne school of economics; viewed people as human molecules; his long-term goal, in his own words, was to "construct a system of sociology on the model of celestial mechanics, physics, and chemistry"; his 1916 *Treatise on General Sociology* is said to be analogous in its essential features to the generalized physico-chemical thermodynamics systems logic as outlined in American mathematical physicist Willard Gibbs.
Frederic Myers (1843-1901) English psychical researcher	1896	Used Maxwell's demon and conservation of energy to explain spirits and afterlife.
Vladimir Bekhterev (1859-1927) Russian neurologist and psychologist	1897	In lectures delivered in 1897, articles such as the 1901 "Psyche and Life", and 1903 *Suggestion and its Role in Social Life*, outlined an energetics model of organism-environment interactions, in which 'hidden reserve energy' can become accumulated in the psyche of individuals via social suggestion, whereby accumulations of this reserve energy become acted out as if it were the person's own willful action.
Nikolai Krainskii (1860-c.1935) Russian psychiatrist	1897	Noted for works such as his 1997 volume *Law of Conservation of Energy applied to Psychical Activity*; the 1909 article "Principles of Energetic Psychology"; *Soul and Energy* (1911), etc., in which he applies energy theory to the ego and consciousness.
Nicolas von Grot (1852-1899) Russian psychologist	1898	His "The Terms of the Soul and the Psychic Energy in the Psychology", argued three points: (a) psychic energies possess quantity and mass, (b) that psychic energies can be transformed into one another, in different forms of psychic work and psychic potentiality, (c) psychic energies can be converted into physical energies, and vice versa by means of physiological processes.
Maurice Hauriou (1856-1929) French social-philosopher and law professor	1899	His *Lessons on Social Movement* explains large scale social movements, i.e. gross aspects of business, social events, states of a society, etc., in terms of pure thermodynamics, using Carnot efficiency, Mayer's conservation of energy, and Clausius' entropy, etc., discussed in the guise of mechanism and reaction.
Andre Lalande (1867-1963) French philosopher	1899	His book *Dissolution Opposed to Revolution in the Physical and Moral Sciences*, was "directed towards an application of mechanics and thermodynamics to social science", as cited by those as Leon Winiarski and Henri Bergson.

20th century HT pioneers | 1900 to 1999

The following is a chronological listing of individuals with human thermodynamics theories, ideas, and opinions professed in the years 1900 to 1999:

Pioneer	Date	Contribution
Lester Ward (1841-1913) American sociologist	1900	His article “Social Mechanics” advocated the theory of Leon Winarski to outline the newly forming subject of social mechanics, which Ward says falls into two subdivisions: social statics, dealing with social forces and social equilibrium, and social dynamics, dealing with social progress and social transformation. Over the next decade, would go on to outline a ‘system of sociology’ divided into three parts: (a) formative principles or synergy, based on the work of Auguste Comte and Jean Lamarck; (b) creative synthesis, based on the work of Wilhelm Wundt; (c) transformative principles, based on the work of, primarily, Leon Winiarski.
Nathaniel Shaler (1841-1906) American paleontologist	1900	Discussed conservation of energy in the context of immortality.
Georg Hirth (1841-1916) German writer and statistician	1900	His *Entropy of the Germinal System and Hereditary Enfranchisement*, introduces the term “ektropy” to denote the principle that opposes the entropy and the degradation in life-bearing structures, in which he discusses things such as Maxwell’s demon, sex, freedom and energy, bound energy and free energy, among other topics.
James Ward (1843-1925) English psychologist and philosopher	c.1900	Promoted the view that view that Maxwell’s demon gives a positive affirmation of illustrating the importance of mind.
Wilhelm Ostwald (1853-1932) German physical chemist	1901	Outlined his "anthropic physics" (physik anthropik), or human physics, in his various works: his 1901 lecture series on "natural philosophy", in which he applied energy and entropy logic to human mental life; his 1902 "energy theory of culture"; his 1906 book *Individuality and Immortality*, on the subject of what the science of energetics has to say about death and human individual (cessation thermodynamics); his 1909 book *Energetic Bases of Social Studies*; and his 1912 book *The Energetic Imperative*, which introduced the postulate of the "energetic imperative" (or thermodynamics imperative; won 1909 Nobel Prize in chemistry.
Alfred Lotka (1880-1949) Austrian-born American physical chemist and mathematician	1902	As a student at Leipzig, in began to work out the application of thermodynamics to evolution and biology, along with its social and economic implications; his views first appearing in 1907 articles, and others to follow, e.g. “Natural Selection as a Physical Principle” (1922), culminating in his 1924 *Elements of Physical Biology*, his an extensive application of thermodynamics to evolution and biology, resulting in concepts such as trigger action, the Darwin-Lotka energy law.
John Hibben (1861-1933) American mathematician and theologian	1903	In his “The Theory of Energetics and its Philosophical Bearings”, gave seven objections to Wilhelm Oswald’s 1901 lectures on *Natural Philosophy*, e.g. one being that “the physical world is characterized by decrease of energy and increase of entropy. The reverse is true of the world of thought.”
Theodor Lipps (1851-1914)	1903	In his *Guide to Psychology*, he was the first to differentiate between psychic force and psychic energy, and the former’s possible relation with the subconscious

German psychologist		
Henri Bergson (1858-1941) French philosopher	1907	His book *Creative Evolution*, with its mention of evolution, bifurcations, and entropy, stimulated Ilya Prigogine greatly, among others; won 1927 Nobel prize in literature.
Émile Meyerson (1859-1933) Polish-born French chemist and philosopher	1908	His *Identity and Reality*, containing chapters such as mechanism, conservation of energy, Carnot's principle, etc., in which he attempts to show how science is the progressive rationalization of reality.
Emanuele Sell (1879-1946) Italian lawyer and political economist	1910	His *The Life of Wealth*, outlined a mechanical investigation of economic life, based on the work of Rudolf Clausius, in which he uses entropy to explain the relation between the process of hereditary transmission and the mechanism of production, and introduces concepts such as economic temperature and economic entropy.
Felix Auerbach (1856-1933) German physicist	1910	His book *Ectropy and the Physical Theory of Life*, wherein, building on previous ideas of Georg Hirth (1900), he introduced the notion of "ectropy" as a type of biological anti-entropy or evolving thermodynamic force of living form.
Caspar Isenkrahe (1844-1921) German physicist	1910	Published *Energy, Entropy, and the Beginning and End of the Universe*.
Edwin Slosson (1865-1929) American chemist	c.1910	Wrote on the application of physical chemistry, particularly thermodynamics, to sociology and history; albeit intertwined with a loose interpretation of Christianity, e.g. his 1925 book *The Sermons of a Chemist*.
Frederick Soddy (1877-1956) English physical chemist and radiochemist	1911	In *Matter and Energy*, he first began to outline his views on the relation between energy and wealth and how thermodynamics governs society, e.g. the rise and fall of political systems, freedom vs. bondage, wealth vs. poverty, movements of commerce, and general welfare; his 1919 *Science of Life*, speculated on death and physical energy; into the 1920s, he devoted a significant portion of his career to the thermodynamic explication of the standard economic model; defined Cartesian economics (1921); his most-cited book is the 1926 *Virtual Wealth and Debt*, in which he attempts to explain the difference between wealth and debt, thermodynamically. Won 1921 Nobel Prize in chemistry.
Stéphane Leduc (1853-1939) French synthetic biologist	1911	His *The Mechanism of Life* outlined a mechanistic view of life based on chemistry, physics, energetics, and thermodynamics; argued that "a living being [is] a store of potential energy, to be set free by external stimulus."
Antonio Portuondo (1845-1927) Spanish civil engineer and	1912	His *Notes on Social Mechanics* outlines a mechanical theory of sociology based largely on the mechanical-dynamical views of Ernst Mach; which includes a discussion of entropy stating that in any physical process a fraction of the input energy is dissipated, i.e. it is transformed in such a way that it is impossible to retrieve or store it for any future use, and he adds "… and this 'bend towards dissipation of mechanical energy in nature' is quite contrary to human interest, as Lord Kelvin has stated."

mathematician		
James Johnstone (1870-1932) English oceanographer and experimental biologist	1914	Outlined a mechanistic view of life based on thermodynamics; his 1921 *The Mechanism of Life in Relation to Modern Physical Theory*, was a significant citation framework for the later physical chemistry of life work of Alfred Lotka.
William Fairburn (1876-1947) English-born American naval architect, marine engineer, chemical engineering executive	1914	His book *Human Chemistry*, outlined the view that people are "human chemical elements" that react chemically together (particularly in the factory) in various ways according to the laws of chemistry, and speculated on how individual people could be classified in terms of their respective energies and entropies, the same way chemicals are.
William Bayliss (1860-1924) English physiologist	1915	In his *Principles of General Physiology*, he re-interpreted Wilhelm Ostwald's 1912 energetic imperative (the thermodynamic imperative version of Kant's original 1785 categorical imperative), rather interestingly, as: "waste not free energy; treasure it and make the best use of it", and went on to argue that this has great philosophical value, one example of which he gives is that it can be applied to warfare (see: war thermodynamics), to remedy the "waste involved in war".
Patrick Geddes (1854-1932) Scottish economist, biologist, and urban planner	1915	Described as a 'heretical philosophers of social energetics'; his 1915 *Cities in Evolution* is said to have employed thermodynamics logic, e.g. stating that we need both "constructive and destructive energy" in the design of urban fabrics; he supposedly tried to promote a biophysical view of economy as a subsystem embedded in a larger system subject to the laws of thermodynamics.
Pierre Teilhard (1881-1955) French philosopher, chemist, physicist, paleontologist, and priest	1916	Developed a "spiritual energy" theory of thermodynamic evolution; used a "human molecule" view; his 1938 *Phenomenon of Man* is his masterpiece, his writing style is very dense and he has near-to a cult following; the gist of his theory is captured in his omega point postulate.
William Sidis (1898-1944) American mathematician-physicist (IQ=250-300)	1916	Wrote his treatise *The Animate and the Inanimate* on an attempt to reconcile animate matter with inanimate matter in the context of the second law and the evolution of the universe.
Henry Osborn (1857-1935) American physical	1916	His *The Origin of Life: On the Theory of Action, Reaction and Interaction of Energy*, attempts to use the physics notion of "interaction" outline an "energy conception of evolution and heredity" based on thermodynamics.

zoologist		
William Thayer (1859-1923) American historian	1918	His address "Vagaries of Historians", delivered before the American Historical Association, in which he discusses ideas on war thermodynamics; after which concluding that: "the time may come when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry … then it may be possible, as Adams suggests, to invent a common formula for thermodynamics and history."
James Hyslop (1854-1920) American abnormal psychologist	1918	Noted for discussions on the conservation of energy and life after death.
Ostwald Spengler (1880-1936) German historian-philosopher	1918	Noted for his view: "What the myth of Gotterdammerung signified of old, the myth of entropy signifies today—the world's end as completion of an inwardly necessary evolution."
Julius Davidson (c.1875-c.1935) American economist	1919	His "One of the Physical Foundations of Economics" cites Willard Gibbs' 1901 *Elementary Principles of Statistical Mechanics* as a basis to argue that the law of diminishing returns is based on chemistry and physics (the second law in particular); along the way comparing human chemical reactions to basic equilibrium adjusting chemical reactions (specifically the male-female reaction to the reaction of ethanol (ethyl alcohol) and acetic acid to produce ethyl acetate and water), explaining how the final equilibrium concentration will differ base on changes to the initial reactant concentrations, in each case, human and chemical, respectively.
Yevgeny Zamyatin (1884-1937) Russian engineer	1919	His novel *We* was written from the human particle point of view focused on the connection between entropic mechanism, evolutionary vitalism, and revolution; his 1923 essay "On Literature, Revolution, Entropy, and Other Matters", attempted to describe the Russian revolutions of 1905 and 1917 in the language of thermodynamics; also due to synesthesia, described the "color of entropy".
Erwin Bauer (1890-1938) Hungarian-born Russian pathologist and physical biologist	1920	His *The Fundamental Principles of Biological Science* introduces what has come to be known as the Bauer principle, which states that: "The living and only the living systems are never in equilibrium, and, on the debit of their free energy, they continuously invest work against the realization of the equilibrium which should occur within the given outer conditions on the basis of the physical and chemical laws"; he discusses this in terms of the time derivative of work factors—differences in pressure, concentration, electrical potential, etc., such as in the equation shown. $F' - F = \sum_{i=0}^{n} X_i \frac{\Delta x_i}{\Delta t} \Delta t - \sum_{i=0}^{n} X_i' \frac{\Delta x_i'}{\Delta t} \Delta t$
Josef Schnippenkotter (1886-c.1955) German science philosopher	1920	His PhD dissertation "The Entropological Proof of God: the Physical Development of the Entropy Principle and its Philosophical Meaning" was on the entropological proof of God's existence.
Paul Ehrenfest (1880-1933) Austrian physicist	c.1920	Student of Boltzmann, noted for his noted for his 1911 Ehrenfest model (dog flea model) of the multiplicity function; later became interested in developing mathematical theories in economics, stimulated by his notion that there should be an analogy between thermodynamics and economic processes. While this did not result in publications, he did encourage his graduate student Jan Tinbergen (1929) to follow up on this, work which won him the 1969 Nobel Prize in economics.
Albert Mathews (1871-1957)		

American biophysical chemist	c.1920	Noted for his discussions of the life, death, and ‘souls’ of atoms in terms of energy and light.
Paul Foote (1888-1971) American physicist	c.1920	Wrote “The Temperature of Heaven and Hell”, penned as a humor piece.
Howard Scott (1890-1970) American engineer	1920	Central architect behind the decade-long funded technocracy movement (still active to this day), a grouped aimed at reformulating the US economy based on thermodynamic energy monetary units, most of the theory said to have been culled from the chemical thermodynamics of Willard Gibbs.
Petre Trisca (c.1890-c.1956) French sociologist	1922	His *Preliminaries on Social Mechanics* gives an objectionable critique of the social mechanics theories of Lester Ward, Spiru Haret (his legal thermodynamics in particular), Leon Winiarski, and Antonio Portuendo, among others; considers “social mechanics” to be a utopia or metaphysics.
Charles Guye (1866-1942) Swiss physicist	1922	His *Physical Chemical Evolution* asks: how is it possible to understand life, when the whole world is ruled by the second law of thermodynamics, which points towards death and annihilation?
Jacques Rueff (1896-1978) French mathematician and economist	1922	His *From the Physical to the Moral*, argued that exactly the same scientific method can be applied to "moral" or "social" sciences like economics, as to the physical sciences; in opposition to the objection that methods applied, say, to the theory of thermodynamics cannot be applied to the study of human beings endowed with free will, Rueff replied that just as there is no thermodynamics for a single molecule, there is no economics for an individual.
Thomas Carver (1865-1961) American economist	1924	His *The Economy of Human Energy*, argued that life processes of social groups consist in transforming the largest possible sum of solar energy into human energy, whereby civilization is a device for storing energy, and social welfare depends upon its utilization in such ways as to increase the sum total of utilization of the sun’s energy
Vladimir Vernadsky (1863-1945) Russian mineralogist and biogeologist	1926	His *The Biosphere*, using Willard Gibbs as a basis, outlined six-layer "thermodynamic envelope" theory of "living matter", in the biosphere, employing a free energy description of life as a type of "green fire" or geological force and the diffusion of life as “a sign of internal energy – of the chemical work life performs – analogous to the diffusion of a gas, caused not by gravity, but by the separate energetic movements of its component particles.”
Robert Lindsay (1900-1985) American physicist	1927	Spent nearly six-decades attempting to explaining social phenomena in terms of physical science, as exemplified by his 1927 article “Physical Laws and Social Phenomena”, his 1942 introduction of the term "negentropy" as version of human ethics, his 1963 introduction of the "thermodynamic imperative" (a update of Wilhelm Ostwald's energetic imperative), as well as his 1983 chapter “Social Exemplifications of Physical Principles”; much of this inquiry focused on a study of energy and thermodynamics.
Bertrand Russell (1872-1970) British mathematician	1927	His lecture “Why I Am Not a Christian”, and follow-up book by the same name, is listed is one of the most influential 150 books of the 20th century, in which explains how religion and the theory of god are incompatible with thermodynamics, in particular with the second law and heat death; his 1927 *Analysis of Matter*, discusses reversibility in terms of photon-electron movement; he won the 1950 Nobel Prize in literature.
Arthur		

Eddington (1882-1944) English mathematician, astronomer, and physicist	1927	In his Gifford Lectures, and followup book, on the *Nature of the Physical World*, he reasoned that there might be an entropy-clock in the mind that mediates consciousness, speculated on the association between entropy and beauty, popularized the time's arrow of physics, and outlined heat death model or the "running-down of the universe" theory.
Ernest Barnes (1874-1953) English mathematician and theologian	1927	Discussed connections between religion and the first and second law.
Vladimir Stanchinsky (c.1887-c.1947) Russian scientist	1927	His *Variability of Organisms and its Importance for Evolution* introduced the food chain thermodynamic model by postulated that the quantity of living matter in the biosphere depends on the amount of solar energy that is transformed by natural communities at different trophic (i.e. food chain) levels, and on this basis studied "dynamic equilibrium" of natural communities by invoking the second law to explain decreasing biomass of the higher groups on the "trophic ladder".
Nicolas Rashevsky (1899-1972) Russian-born American thermodynamicist, theoretical biologist, and sociologist	c.1928	In the late 1920s, in a casual conversation with a biologist from the University of Pittsburgh, at a social occasion (during a period when time when he was working on the thermodynamics of the division of liquid droplets), he asked the biologist whether the thermodynamic mechanisms on which he was working on was the way biological cells divide, in response to which he was told that: (1) nobody knew no how biological cells divided and (2) nobody *could* know how biological cells divided, because this was biology (the typical unbridgeable gap view); this chance conversation prompted him to switch careers, first to theoretical biology (where he developed "relational biology") and in 1948 to mathematical sociology; his 1935 article turned chapter "Mathematical Theory of Human Relations" builds on the work of Alfred Lotka to attempt to derive mathematical equations for things such as 'desire' and 'will', in terms of concepts such as intensities and physical forces; his students include: Robert Rosen and Anatol Rapoport.
Carl Jung (1875-1961) Swiss psychiatrist	1928	His "On Psychic Energy", added to the first law based psychology of Sigmund Freud, especially on the topics of "psychic energy" and of entropy in relation to the psyche, as in "psychic entropy"; Jung referred to his subject as "psychic energism and dynamism", now referred to as Jungian psychodynamics, in contrast to Freudian psychodynamics, or Kleinian psychodynamics, the latter referring to the Freudian-based child psychology theories of British psychologist Melanie Klein.
Pitirim Sorokin (1889-1968) Russian-born American sociologist	1928	He devotes the first sixty-pages of his *Contemporary Sociological Theories*, to first summarize what he calls the "mechanistic school of social thermodynamics", namely those who have used a "human molecule" or social atom views, steeped in social mechanism and thermodynamics-based views, including: Leon Winiarski, Vilfredo Pareto, Eugene Roberty, Henry Carey, and Wilhelm Ostwald, to conclude and argue, in the end, that the theories developed by this school are all "pseudo-sciences" and mere "superficial analogies"; In his 1941 *Social and Cultural Dynamics* attempts to explain the so-called problem of linear sociocultural processes in terms of entropy and heat death.
Leó Szilárd (1889-1964) Hungarian-born American physicist	1929	Completed PhD dissertation on "The Manifestation of Thermodynamic Fluctuations"; his 1929 article "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings", attempted to espouse a relationship between Maxwell's demon and information; in 1930, taught a theoretical physics seminar with Erwin Schrodinger and John Neumann.
Jan		Guided by his advisor Paul Ehrenfest's idea that there should be analogies between

Tinbergen (1903-1994) Dutch economist	1929	thermodynamics and economics, did his PhD this topic, thesis “Minimization Problems in Economics and Physics”, wherein he developed and applied dynamic models to the analysis of economic processes; won the 1969 Nobel Prize in economics for this work.
Ronald Fisher (1890-1962) English statistical evolutionary biologist	1930	His *The Genetical Theory of Natural Selection* attempts to grapple with entropy and disorder, and with fitness, evolution, and organization.
Siegfried Bernfeld (1892-1953) Ukrainian-born Austrian psychologist	c.1930	Noted for various articles, co-written with physicist Sergei Feitelberg, applying energy, entropy, and Le Chatelier’s principle, etc., models to psychology to attempt measurement.
Sergei Feitelberg (1905-1967) Austrian? physicist	c.1930	Noted for articles, co-written with psychologist Siegfried Bernfeld, applying energy, entropy, and Le Chatelier’s principle, etc., models to psychology to attempt measurement and instinct theory.
Wilhelm Reich (1897-1957) Austrian-born American psychologist	c.1930	Proposed his “orgone energy” theory, a type of universal vitalism-style radiating “biological energy” that was proposed to be something that could be quantified and measured; penned the 1942 book *The Function of the Orgasm: Sex-Economic Problems of Biological Energy*; in circa 1950s, he was selling “orgone accumulators” a hypothetical type of organismic energy accumulating device.
James Jeans (1877-1946) English mathematical physicist	1931	His book *The Mysterious Universe* argues that inanimate matter obeys the second law of thermodynamics implicitly, but life succeeds in evading the second law in varying degrees.
Julian Huxley (1887-1975) English evolutionary biologist	1931	In lectures at the Science and Religion symposium, and two books to follow (1953, 1964), seemed to arguing for a type of deity running the universe, i.e. that “there may be *agencies operating* in the universe supplying energy which would enable the whole cosmos to behave in an anti-entropic manner”, in attempts to reconcile the seemingly at odds view that the physical universe is running down, when the universe of biological evolution is running up.
William Inge (1860-1954) English writer and priest	1931	His course of Warburton lectures on religion, physics, and astronomy (1931-1933), argued for the field of animate thermodynamics, resulting in the 1934 *God and the Astronomers*; used thermodynamics and heat death theory to argue for the existence of the Christian god, as compared to other pantheistic gods, who he argued would be subjected to heat death.
Georges guillaume (c.1904-c.1974) French-Swiss physicist and economist	1932	His 1932 PhD dissertation (turned book) *On the Fundamentals of the Economy with Rational Forecasting Techniques*, co-written with the "mathematical assistance" of Edouard Guillaume, applied the formalism of thermodynamics to the theory of value; the book was then sent to Hungarian-born American chemical engineer John Neumann for critical review.
Edward Guggenheim (1901-1970) English chemical thermodynamicist	1933	Stated the Lewis inequality for a natural process (dG < 0) and the Lewis inequality for an unnatural process (dG > 0). $\Delta G < 0$
John		His review of Georges Guillaume's 1932 economic thermodynamics dissertation,

Neumann (1903-1957) Hungarian-born American mathematician and chemical engineer (=163-180)	1934	concluded that: "if this [economic-thermodynamic] analogy can be worked out at all, the analogon of 'entropy' must be sought in the direction of 'liquidity'. To be more specific: if the analogon of 'energy' is 'value' of the estate of an economical subject, then analogon of its thermodynamic 'free energy' should be its 'cash value'." His followup 1938 article "A Model of General Economic Equilibrium", derives a function φ (X, Y) related to the production of goods, based on the model of thermodynamic potentials, and is considered a classic; his late 1940s symposium lectures (1948) on electrical automatons illustrated the role which free energy plays in creating statistically unlikely configurations of matter; his ill-fated late 1940s suggestion to American electrical engineer Claude Shannon (1949) to call telegraph wire "information" high and low voltage pulses by the name "entropy", as a joke, has resulted to instill a misinformed modern view that binary logic is based on steam engine theory.
Lewis Mumford (1895-1990) American historian	1934	Explained capital gains from the standpoint of social energetics; in 1951 argued that mankind invented the devil or destroyer of classical religions, as being the mythical equivalent of the second law.
Oliver Reiser (1895-1974) American philosopher	1935	In his *Philosophy and Conceptions of Modern Science*, furthered the work of Edwin Slosson, in applying the second law to the study of human history, "a step forward"; devoted a section to the social energetics, i.e. those who brought physical chemistry methods to bear on social problems, such as Wilhelm Ostwald, Henry Adams, and Thomas Carver; on the origin of life, he defined life as a "form of chemical behavior"; in commentary on Vilfredo Pareto's conception of human society as a system of molecules or 'constituents of a statistical ensemble' notes that the 'super-observer' perspective would be needed to measure the 'total state' of the system; in his 1940 *The Promise of Scientific Humanism*, discusses how the behavior of living matter, as defined by the thermodynamics, compares to molecular behavior.
Lawrence Henderson (1878-1942) American physiologist	1935	Attempted to explain Vilfredo Pareto's 1916 sociology theories via Gibbsian thermodynamics "analogies".
Alexis Carrel (1873-1944) French surgeon and biologist	1935	Argued that the second law is "useless at the psychological level"; that "as much importance should be given to feelings as to thermodynamics"; and the 1936 edition of his controversially best-selling book *Man: the Unknown* commented that "the German government has taken 'energetic measures' against the propagation of the defective."
Roger Caillois (1913-1978) French sociologist, anthropologist, and philosopher	c.1935	Theorized, thermodynamically, that every production process presupposes an initial hierarch, a primary distinction, an original inequality, a difference between high and low or between a cold source and hot source, as quantified by the statement that the entropy of a given system cannot decline; thus, psychasthenia, the lowering of psychological or mental energy, means that in sexual interactions, and in mimetic-behavior resulting sociological interactions, the initial gap diminishes, the power source heats up, production diminishes. The vital distinctions wither. Both the praying mantis, by assimilating her mate, for instance, and mimetic insects, by ceasing to distinguish themselves from their surroundings, illustrate this moment in which beings no longer have the energy to establish difference; notably quipped the famous 1973 quote "Clausius and Darwin cannot both be right."
Joseph Needham (1900-1995) British biochemist and Chinese chemistry historian	1936	His Silliman memorial lecture (religious-based science lecture) turned book *Order and Life* discusses the heat death, running down, disorganization view of the second law; in the context of the contradictory common man's view of life as undergoing progressive development; his 1942 "Evolution and Thermodynamics: a Paradox with Social Significance" expands on this; he was an affinity chemist historian mentor to Jeremy Adler.
Ilya		After reading Henri Bergson's *Creative Evolution* (1907), at the age of twenty, he began to devote himself to solving the riddle of the relationship between time, human existence, thermodynamics,

$$F = E - TS$$
(not applicable to humanities)

Prigogine (1917-2003) Russian-born Belgian chemist and thermodynamicist	1937	and evolution, starting with three articles: “Essay on Physical Philosophy”, “The Problem of Determinism”, and “The Evolution”, on the topics of determinism, quantum mechanics, biological evolution, and time; completed his PhD on *The Thermodynamics of Irreversible Phenomena* (1941), under Theophile de Donder; obtained cult status and "disciples" with his 1977 *Self-Organization in Non-Equilibrium Systems: from Dissipative Structures to Order through Fluctuations* (the year he also won the Nobel Prize for his theories); and obtained layperson icon status with his 1984 *Order Out of Chaos*; went on to published numerous articles, books, and lectures on his theories up until the year of his death (*Is the Future Given?*, 2003). Winner of the 1977 Nobel prize in chemistry for his work.
Talcott Parsons (1902-1979) American sociologist	1937	Learned the concept of equilibrium (in what seems to be Gibbsian), as taught to him by Lawrence Henderson, thus believing that without equilibrium, a society would display no order; had extensive discussions with Henderson during the writing of the manuscript for his 1937 *The Structure of Social Action*; throughout his 1953 *Working Papers in the Theory of Action*, advanced the claim that social interchange is isomorphic with the laws of thermodynamics, and not purely in a metaphorical sense, but in an actual sense.
Aldous Huxley (1894-1963) English writer	1937	Outlined, in fictional format, ideas on human entropy; wrote the second law themed novel *Island* (1962).
Pierre du Nouy (1883-1947) French-born American mathematician, biophysicist, and religious philosopher	1939	Advocates of intelligent design, tend to cite his 1939 book *The Road to Reason*, which is packed with discussions on entropy, molecules, Maxwell’s demon, kinetic theory, thermodynamics, Arthur Eddington, etc., as a standard reference for the argument on the improbability of living things to have formed out of the random chance of the material of the universe, from a statistical-mechanical point of view; his 1942 book *Human Destiny*, uses a Boltzmann-themed statistical view to argue that the second law of thermodynamics does not apply to humanity and that God is synonymous with anti-chance.
Donald Murray (1865-1945) New Zealand engineer and philosopher	1939	Wrote on philosophy in the context of god, thermodynamics, and the steam engine.
Hyman Levy (1889-1975) Scottish mathematician and philosopher	1939	His *Modern Science* expresses the (fourth law) view that “side by side with the second law, in so far as it may be valid for large scale systems—if it is so valid—there must exist a law for the evolution of novel forms of aggregated energy and the emergence of new qualities.”
Paul Samuelson (1915-	1940	His PhD dissertation, written hastily in the mid-1940s, modeled each person as an economic agent, and assumed that each individual acted so as to maximize a quantity called ‘expected utility’, a model with which he assumed should be able to predict their behavior in much the same way that physicists predict the behavior of physical objects; a variational differentiation theory that he had learned, supposedly, from studying under Edwin Wilson, the sole protégé of Willard Gibbs, who taught Samuelson in lecture that in the chemical model of the Le Chatelier’s principle, in a system (chemical or economic) the changes in the equilibrium is a constrained maximization problem, such as when one of the constraints is marginally tightened or relaxed. Variation of the demand for a factor with a change in its price, e.g., was analytically similar, according to Samuelson, to thermodynamic variation in the pressure, volume, and temperature of an ideal gas. The thesis won international acclaim, and was published in 1947 as *Foundations of Economic Analysis*, and would

2009) American economist		go on to become one of the highest selling economics textbooks of all time as well as win him the 1970 Nobel Prize in economics. Into the 1970s, nearly turning his back on the foundations that had made him famous, he became a vocal objector to economists and 'retired' engineers, as he put it, attempting to force analogies of entropy, energy, and other concepts from physics into the social sciences, thinkers he referred to as 'half-baked speculator', particularly when it came to social entropy formulations, publications he would receive monthly, and called such formulations "mathematical isomorphisms".
Charles Sherrington (1857-1952) English physiologist	1940	Winner of the 1932 Nobel Prize in physiology; in his 1940 philosophical-style *Man on His Nature*, he touches on entropy, evolution, and life, with keen-insight states correctly that "chemistry does not know the word life", a precursor to the 2009 defunct theory of life and animate thermodynamics.
Wilbur Urban (1873-1952) American language philosopher	c.1940	Argued, in what seems to be in opposition to William James' view, that the second law cannot be wholly irrelevant to philosophy, as James said it was in regards to history.
Harold Davis (1892-1974) American mathematician	1941	In his 'econometrics' theory, according to Nicholas Georgescu, established a formal similarity between certain thermodynamics equations and economic equations; defined the utility of money as a representation of "economic entropy".
Luigi Fantappie (1901-1956) Italian mathematical physicist	1941	His term 'syntropy' (or *syntropia* in Italian), is said to describe *phenomena* governed by a force, opposed to entropy, which attracts living systems towards higher levels of organization and order.
Mehdi Bazargan (1907-1995) Iranian mechanical engineer and thermodynamicist	1942	Completed his PhD in thermodynamics (1930s); wrote on "The Thermodynamics of Love" (c.1942); in his *Labor in Islam* (1946), wrote a chapter on physiological thermodynamics of human labor in the context of will power; during a five-month prison spell (for political opposition), wrote the *Human Thermodynamics* (1956), the first book entitled "human thermodynamics", wherein he used a thermodynamics based framework, in particular Helmholtz free energy equation (adjacent) to explain Islam, work, death, desire, love, and reincarnation scientifically. $W = U - TS$
Erwin Schrödinger (1887-1961) Austrian physicist and statistical thermodynamicist	1943	Won 1933 Nobel Prize in physics; his 1943 course of lectures on the physics of life, delivered at Trinity College, Dublin, documented in his *What is Life?* (1944), he instilled the paradoxical idea into the minds of the lay public that the negative value of entropy is a measure of order of the body in question; and that life is something that feeds on negative entropy; after which, however, he was attacked by his physicist colleagues, replying that he would have turned the discussion towards free energy, but judged the concept too difficult for the lay public $-(\text{entropy}) = k \log \frac{1}{D}$
Leslie White (1900-	1943	Scripted crude formulas on the nature of energy, entropy, and free energy in culture; described

1975) American anthropologist		as "anthropology's most significant prophet of the second law."
Buckminster Fuller (1895-1893) American architect and philosopher	1944	Introduced the energy slave concept; in 1975 posited a metaphorical theory of synergetics, where he loosely equated synergy to negentropy; in his 1976 *And it Came to Pass—Not to Stay*, wrote about evolution as an eddy in the second law.
Léon Brillouin (1889-1969) French-born American physicist	1946	In a 1946 debate at Harvard on how to understand life in the context of a universe governed by the second law, three point of view emerged: (a) physics and chemistry will soon be able to explain life, without any special "life principle"; (b) something more is needed before we understand life; (c) life cannot be understood without reference to a special "life principle"; that thermodynamics only applies to dead and inert matter; that life is an exception to the second law; his 1949 article "Life, Thermodynamics, and Cybernetics" argues for the latter opinion; contains a section on Entropy and Intelligence, wherein he states that a standard issue of *The New York Times*, Norbert Weiner's *Cybernetics*, and an equal weight of scrap paper all have the same entropy; this was followed by "Thermodynamics and Information Theory" (1950), "Negentropy Principle of Information" (1953), and *Science and Information Theory* (1956) all of which use a hodgepodge of mathematical derivation to make connections between thermodynamics, information, and cybernetics so to attempt to substantiate his "living principle" argument.
Johannes Lisman (c.1900-c.1990) Dutch scientist	1946	Compiled the book *Econometrics, Statistics, and Thermodynamics*; his 1949 "Econometrics and Thermodynamics" picks apart Harold Davis' attempt (1941) to use thermodynamic equations, in an isomorphism manner, to make a theory of budgets.
Alfred Ubbelohde (1907-1988) Belgian-born English thermodynamicist	1947	In his *Time and Thermodynamics*, he notes that life-histories of people would have to be taken, e.g. whether or not a bachelor had been successful in business or not prior to a first date, into account to formulate human chemical thermodynamic models of equilibrium, such as in measuring the financial temperature of a cinema; in his 1955 *Man and Energy*, chapter "Thermodynamics and Life", he introduced the subject of animate thermodynamics (a modern-day replacement for the incorrigible term "life thermodynamics") by stating that "animate matter" is the synonym for the old-fashioned outdated shorthand term "life", thus seeding the 2009 defunct theory of life; also coined the term "disentropic".
Emyr Hughes (1905-1978) Welsh physical chemist	1947	Promoted the view that "energy among molecules is like money among men. The rich are few, the poor numerous."
Tjalling Koopmans (1910-1985) Dutch-born American mathematician, theoretical physicist, and economist	1947	Viewed people as the "molecules of economic life"; in 1970s, began speculating on how entropy applies to the study of these molecules of economic life.
Andrew Pikler (c.1910-c.1980) American electrical engineer	1947	Gave an overview of the use of mechanics and thermodynamics in economics in the early years and highlighting connections, such as between temperature and velocity of circulation of money; his economic ideas were promoted by John Neumann.

Claude Shannon (1916-2001) American electrical engineer	1948	His article “A Mathematical Theory of Communication” attempt to make a formal parallel between Boltzmann entropy and the informational content of 1s and 0s sent in telegraph lines, infamously also calling the latter by the name “entropy”; in 1955, after years of attack for his name borrowing affair, he had to recant that the basic results of his subject are “not necessarily relevant to such fields as psychology, economics, and other social sciences.”
Norbert Wiener (1894-1964) American mathematician	1948	His *Cybernetics: or Control and Communication in the Animal and the Machine*, introduced the subject of cybernetics and commented (based on the 1943 work of Erwin Schrodinger) that "the notion of information attaches itself very naturally to a classical notion in statistical mechanics: that of *entropy*"; his 1950 *The Human Uses of Human Beings: Cybernetics and Society*, contains a chapter "Entropy and Progress", in which he theorizes about progress entropically.
Harold Blum (1899-1980) American biologist	1950	His *Time’s Arrow and Evolution* aimed to reconcile the second law, time's arrow, with organic evolution.
Richard Raymond (c.1935-) American physicist	1950	His 1950 “Communication, Entropy, and Life” extends on the work of Leon Brillouin, Norbert Wiener, and Ludwig Bertalanffy to discuss ideas on entropy, information, and living organisms; authored the 1951 “The Well-Informed Heat Engine” on what seems to be Leo Szilard's ideas.
Josef Fischer (1894-1973) Czech philosopher and sociologist	1950s	Worked hard to develop a fourth law of thermodynamics.
Reinhold Furth (1893-1979) Czechoslovakian-born English physicist	1951	His 1951 BAAS lecture “Physics of Social Equilibrium”, he outlines a recommendation that sociology students should use both the sciences of crystallography and statistical mechanics as their models for the study of society, the latter of which he says holds great possibilities.
Pope Pius XII (1876-1958) Head of Catholic Church, 1939-1958	1951	In his notorious Nov 28 Christmas lecture, he argued that Rudolf Clausius' law of entropy provides "eloquent evidence of the existence of a Necessary Being."
Jacob Moreno (1889-1974) Romanian-born American psychologist	1951	His ‘social atom theory’, a modified Freudian-Jungian psychology mixed with extrapolated chemistry-physics metaphors, in which each person is defined as a social atom, with focus on the differences in energy levels of different relationships, and how invested energy in specific relationship bonds can cause spontaneous quantum leaps or up or down shifts in relationship structure and dynamics.
C.G. Darwin (1887-1962) English physicist	1952	$PV = K\ \vert_{n,T}$ The introduction to his book *The Next Million Years*, defined the science of "human thermodynamics" as the statistical mechanics of conservative dynamical systems of "human molecules", a subject that he viewed to have the power to predict the next million years of human evolution, outlining the framework of this subject using an analogy on Boyle's law (adjacent).
Jerome Rothstein (1918-) American physicist	1952	Noted for his various publications, beginning in 1952, arguing for the equivalence of system “organization” and the information theory version of “negative entropy”; his 1960 lecture “Thermodynamics and Some Undecidable Physical Questions” argued that the second law is violated in the cases of: determinism and free will, the origin of the universe, the fate of the universe, and the discovery or causes of purposes in nature; his circa 1974 “Generalized Life”, uses thermodynamic arguments to conclude that life forms in the cosmos may exist as self-replicating, computer-controlled, heat engines able to play survival games, that we may not be able to recognize.
Vera Daniel		His “Physical Principles in Human Cooperation” uses analogy as a starting point to apply physical

(c.1913-) English physicist and electrical researcher	1952	principles to human affairs; his 1954 “The Uses and Abuses of Analogy” attempts to show that while most analogy abstractions to human modeling are unsound, that his is justified because his approach uses the scientific method and that his “excursion into sociology constitutes a use and not an abuse of analogy”; comments on Winiarski's social mechanics that it would involve "calculations of fantastic difficulty".
Motoyosi Sugita (1905-1990) Japanese physicist	1952	His article “Negative Entropy” critiques Erwin Schrodinger’s 1943 negative entropy hypothesis; founder of Society for Studies on Entropy.
William Jordy (1917-1997) American historian	1952	His *Henry Adams: Scientific Historian* is highly critical of Henry Adams’ attempt to apply the laws of science, in particular the phase rule and the second law, to history; goes into detail discussing Willard Gibbs and his phase rule equation (shown) applied to history. $F = C + 2 - P$
Gordon Van Wylen (1920-) American mechanical engineer	1953	Wrote a thermodynamics textbook which included a discussion of God.
Howard Odum (1924-2002) American ecologist and systems theorist	1953	His 1953 *Fundamentals of Ecology*, co-written with his brother Eugene Odum, he penned chapter on energetics introduced an type energy circuit language; in 1955, in coordination with American physicist and chemical engineer Richard C. Pinkerton, motivated by Alfred Lotka's 1922 articles on the energetics of evolution, they developed a theory (maximum power principle) that natural systems tend to operate at an efficiency that produces the maximum power output, not the maximum efficiency. This theory in turn motivated Odum to propose maximum power as a fundamental thermodynamic law; a fourth law, as he later came to call it (1994).
Eugene Odum (1917-2002) American zoologist	1953	His textbook *Fundamentals of Ecology* incorporated the first two laws of thermodynamics into ecology.
Claude Lévi-Strauss (1908-2009) French anthropologist	1955	In the 1950s, gained an understanding of entropy from cybernetics; in 1955 coined the terms entropology and entropologist; in 1959 discussed the energetic and entropic nature of “hot” (primitive cultures) and “cold” (modern cultures) societies; discussed how modern civilizations are “powered by a difference of electrical pressure expressed in various forms of social hierarchy, where a social imbalance is used to produce both much greater order and much less entropy in relations between people.”
Walter Albersheim (1897-c.1982) German-born American electrical engineer and physicist	1955	Wrote an article on entropy and evil.
Fred Cottrell (1903-1979) American sociologist	1955	His *Energy and Society* sought to explain human societies as thermodynamic systems and to connect this with cultural evolution.
Elizabeth Porteus (1911-2010) American philosopher	1956	Began working out her impulse theory of happiness, while in college (1930s), defining humans a ‘chemical units’ or ‘units of energy’ that attract toward each other, as well as bang into each other causing friction and heat, as do other atoms and particles of the universe, and that the reason for existence is not to be found in sex but rather circling around a certain disposition towards following one’s impulses (as well as giving direction to the impulses of one’s children) in the creation new unities, orders, and harmonies, in accordance with the second law; ran a popular column (1956) expounding on her philosophy in the *Honolulu Advertiser*, which ran for 26 columns; eventually compiled and published in *My Twentieth Century Philosophy* (1987) and later online (1999) and in the JHT (2005).

Charles Herrick (1868-1960) American neurologist	1956	His *The Evolution of Human Nature* speculates on how the second law of thermodynamics may or may not apply to the mind, in relation to entropy increases or decreases in open or closed systems; discussing aspects of human social evolution thermodynamically.
Isaac Asimov (1920-1992) Russian-born American biochemist and science fiction writer	1956	His short story *The Last Question* is centered on the second law and heat death; authored the 1970 "In the Game of Energy and Thermodynamics You Can't Break Even"; his 1975 *Biographical Encyclopedia of Science and Technology*, was the staple reference for Ingo Muller's 2007 *A History of Thermodynamics*.
Ramon Margalef (1919-2004) Spanish ecologist	1957	In his *Information Theory in Ecology* outlined a cybernetics, information theory, and thermodynamics theory of ecology; is noted for his exosomatic energy vs. endosomatic energy theories.
Thomas Pynchon (1937-) American engineering physicist turned writer	1958	In his short story "Entropy", he employed the entropy models of Henry Adams and Norbert Wiener; followup entropy-themed stories and novels, including:*The Crying of Lot 49* (1966), *The Slow Learner* (1985), etc., that have gained a sort of cult-following.
Alan Watts (1915-1973) Anglo-American philosopher	c.1960	Wrote on a mixture of thermodynamics and Eastern philosophy.
Jacques Lacan (1901-1981) French psychoanalyst	1960s	Noted for his dissection of Freudian logic in regards to how it rested on the view of man as an energy machine; in his 1968 lectures, he extrapolated on the conservation of energy and entropy, albeit in a very obscure and riddled manner, speaking of entropy, for example, as a "loss of jouissance", in some way connected to the pleasure principle or a loss of enjoyment.
Niklas Luhmann (1927-1998) German sociologist	1960s	Studied under Talcott Parsons (1961); later would emphasize entropy, disorder, and communicative failure; is said to have shared systems views of society with Jacques Ellul.
Howard Seifert (1911-1977) American aeronautics physicist	1961	His talk "Can We Decrease Our Entropy?" takes issue with Robert Lindsey's thermodynamic imperative, on the suggestion that it is it is one's moral responsibility to create order, even though no one knows or agrees on what constitutes "maximum order".
Steven Polgar (1931-1978) Hungarian-born American anthropologist	1961	His "Evolution and the Thermodynamic Imperative" builds on Robert Lindsay's 1959 thermodynamic imperative to talk about 'entropy retarding' and 'availability of energy' aspects of living systems in the development of cultures and in the actions of information transmissions through generations.
Werner Stark (1909-1985)	1962	Was of the opinion, culled from Henry Carey, that "in the physical universe, heat is engendered by friction. Consequently the case must be the same in the social world. The 'particles'

Austrian social economist		must rub together here, as they do there. The rubbing of the human molecules, which produces warmth, light and forward movement, is the interchange of goods, services, and ideas."
Bernard Strehler (1925-2001) American biologist	1962	Began developing aging theories in 1944; attempted to establish an aging research institute with Leo Szilard in 1956; his 1962 book *Time, Cells, and Aging*, attempt to explain how entropy relates to aging.
Ivan Bazarov (1916-2005) Russian thermodynamicist	1964	In his *Thermodynamics* textbook, he argued logically against the thermodynamic proof of the existence of god; in particular, a version discussed by Friedrich Engels.
James Lovelock (1919-) English scientist	1964	While at NASA, in theorizing in their upcoming plans to explore Mars, proposed that to build a machine that would recognize alien life, it would need to be able to look for or detect an "entropy reduction, since this must be a general characteristic of all forms of life"; outlined his model in his 1975 article "Thermodynamics and the Recognition of Alien Biospheres"; this resulted in the 1979 "Gaia hypothesis" which argued that the earth is a type of living symbiotic organism.
Eric Berne (1910-1970) Canadian-born American psychiatrist	1964	His *Games People Play* builds on the psychodynamic work of Sigmund Freud, particularly ego states, to frame out a social psychodynamics where players motives depends on aspects of the mental states of the other players in the game; focuses on the notion that stimulus-hunger through social interaction is parallel to that of the hunger for food and that in the modern world, with an over-abundance of food available to the average person, the former hunger takes precedence in one's waking hours.
Peter Hammond (c.1929-) American anthropologist	1964	His *Cultural and Social Anthropology*, culls from Schrodinger and Boltzmann, argues that to understand man we must understand that "cultural systems, like biological systems, expend energy that is captured [by the sun]; in performing a ritual, playing a game, regarding a churinga with awe, or breathing a silent prayer, the event is an expression of energy expended."
Jurgen Ruesch (1910-1995) Swiss-born American psychiatrist	1964	Noted for having classified "psycho-thermodynamics" as the psychological modeling of human functioning based on energy analogies; as contrasted with "psychohydraulics" (pressure analogies) or "psychoelectronics" (machine analogies).
Douglas Spanner (c.1920-) English biophysicist and minister	1964	Wrote *An Introduction to Thermodynamics: Experimental Botany*; later wrote on the creation and evolution debate (1987; 2004).
James Coleman (1926-1995) American chemical engineer and sociologist	1964	His *Introduction of Mathematical Sociology* outlined a Shannon entropy type "entropy index" of racial diversity, which he claimed was parallel to Gibbs entropy and Boltzmann entropy.
Jack Kirkaldy (1926-) Canadian materials science engineer	1965	His "Thermodynamics of the Human Brain" outlines a free energy minimization principle of brain operation, consciousness, and development; his "Thermodynamics of Terrestrial Evolution" argues that the "causal element of biological evolution and development can be understood in terms of a potential function which is generalized from the variational principles of irreversible thermodynamics."
Horton Johnson (1923-)		Wrote a number of articles (1965-1987) on information theory, thermodynamics, and cellular

American pathologist	1965	biology; his 1970 “Information Theory in Biology after 18 Years” concludes (as one might have guessed) that “applications of information theory to biology, have not proved very useful.”
Mihály Csíkszentmihályi (1934-) Hungarian-born American psychologist	c.1965	After stumbled upon a chance lecture of Carl Jung was instantly converted into the path of becoming a psychologist, thereafter using Jung's theories on entropy to formulate a flow theory of optimal experience, i.e. Csíkszentmihályi flow, or “states of optimal experience”, as outlined in his popular 1990 *Flow – the Psychology of Optimal Experience*, and others to follow.
Nicholas Georgescu (1906-1994) Romanian-born American mathematician	1966	Published an introductory essay on the relation between entropy and economics; his highly-cited 1971 book *The Entropy Law and the Economic Process*, situated a material entropy theory which argued that economic systems are governed by the second law, albeit he misinterpreted bound energy and free energy, to mean that, in economic terms, available energy stored in fossil fuels tends to be used up over time and converted into an unusable form of waste heat or energy.
William Plank (c.1934-) American philosopher	1966	Completed his MA thesis on “Art and the Artist in the Cosmogenesis of Teilhard de Chardin” on Pierre Teilhard; his 2002 book *The Will to Power and the Nature of Dissipative Structures* outlines a Teilhard-based dissipative system philosophy on Friedrich Nietzsche's "will to power".
Erwin Hiebert (c.1926-) American science historian	1966	Wrote essay: *The Uses and Abuses of Thermodynamics in Religion.*
Kenneth Boulding (1910-1993) English-born American economist	1966	His article “The Economics of the Coming Spaceship Earth”, which introduced the factitious concept of “material entropy”, is often-cited as having launched the modern field of economic thermodynamics; his 1978 *Ecodynamics: A New Theory of Social Evolution*, discusses entropy and the second law.
John O'Manique (1936-2003) Canadian philosopher	1966	Did PhD dissertation on Pierre Teilhard; later wrote *Energy and Evolution* (1969).
Daniel Katz (1903-1998) American psychologist	1966	His highly-cited *The Social Psychology of Organization*, co-written with Robert Kahn, utilizes a mix of energy, entropy, general systems theory, to model individuals as carriers of energy so to outline a social psychology of organization.
Robert Kahn (1918-) American psychologist / systems theorist	1966	Co-author to energy-entropy themed book *The Social Psychology of Organization* with Daniel Katz.
Stephen Brush (1935-) American chemist,	1967	Was the 1964 English translator of Ludwig Boltzmann’s *Lectures on Gas Theory*; his 1967 “Thermodynamics and History” addresses the use of thermodynamic theory in art and literature; his 1976 book *The Kind of Motion We Call Heat*, on the history of kinetic theory, won the Pfizer Award of History of Science Society; his 1978 *The Temperature of History: Phases of Science and Culture in the Nineteenth Century*, in which he discusses the thermodynamics of Henry Adams and Freud’s death wish, among other topics.

physicist, and science historian		
Herman Daly (1938-) American economist	1967	Completed his PhD in economics under Nicholas Georgescu; in his follow up articles and books, e.g. "On Economics as a Life Science" (1968), *Steady State Economics* (1977), *Beyond Growth* (1996), etc., employed a Boulding material entropy / Georgescu entropy hourglass model to argue that the ultimate natural sources of scarcity is low-entropy matter-energy.
Walter Buckley (1922-2006) American sociologist	1967	In his *Sociology and Modern Systems Theory* utilized negentropy, culled from general systems theory, in theorizing about social decline.
Johan Galtung (1930-) Norwegian sociologist	1967	His "Entropy and the General Theory of Peace", a mix of thermodynamics and information theory to explain peace and conflict using conceptions such as "conflict energy", "conflict transformation", "actor entropy", and "interaction entropy"; postulates that macro-conflicts, such as war between nations, will occur when entropy level is low, while micro-conflicts, such as cognitive dissonance, will occur when the entropy level is high; defines entropy condition of messiness or disorder but not in a pejorative sense; the incapacity of a system to crystallize or establish order permits, for instance, greater complexity and diversity, thus acting to mitigate the reification of violent structures.
Robert E. Mueller (c.1927-) American art theorist	1967	His 1967 *The Science of Art: the Cybernetics of Creative Communication* employs entropy, cybernetics, Maxwell's demon, etc., theory to discuss art and communication.
Lila Gatlin (1928-) American biophysicist	1967	In 1967, gave a series of lectures to graduate students in biology at Bryn Mawr on life defined as an "information processing system", such that DNA stores the information, the brain process it, and the who thing has something to do with entropy; this resulted in her 1972 *Information Theory and the Living System*, in which she argues that entropy reduction within living systems occurs whenever information is stored, and devotes a section on the "Reductionist—Anti-reductionist Controversy".
Georges Balandier (1920-) French anthropologist	1967	Noted for his view that "power may be defined, for every society, as resulting from the need to struggle against the entropy that threatens it with disorder."
Harry Overstreet (1875-1970) American philosopher and naturalist humanist	c.1967	Introduction of the term "extropy", a counter-entropy (anti-entropy) quantity, which he defined as involving truth and beauty and goodness, would be expected to lead inevitably to God.
Ludwig Bertalanffy (1901-1972) Austrian biologist	1968	His *General Systems Theory* employs a mix of biology, information theory (from Claude Shannon), cybernetics (from Norbert Wiener), and bit of verbal thermodynamics, to outline a general systems theory to which he alluded could be applied sociologically.
Frank Lambert (1921-) American organic chemist	1968	Wrote the article "The Ontology of Evil", discussing different types of thermodynamic evil; taught a course on entropy to humanities students for many years; in circa 2000 launched a slurry of entropy/second law websites, promoting a energy dispersal view of entropy, among other subjects.
Bruce Gunn (c.1940-) American business marketing and management theorist	1968	Argued that Le Chatelier's principle and transformation of energy define employee motivation.

Ronald Fox (1943-) American physicist	1969	Completed PhD in 1969 with a dissertation on “Contributions to the Theory of Nonequilibrium Thermodynamics”; his 1998 *Energy and the Evolution of Life* argues that the flow of energy through matter was the impetus for the origin of life and for the continued complexity of evolution as it occurs.
John Bowlby (1907-1990) British developmental psychologist	1969	Devoted the entire first chapter, titled “Point of View”, of his monumental three-volume *Attachment* series treatise, towards an effort to discredit psychodynamics founder Sigmund Freud in his use of physics terms, such as energy, entropy, force, pressure, or inertia, as in "principle of inertia", etc., in psychology; arguing, for instance, that “nor is it to be supposed that the principle of entropy apples to living as it does to non-living systems.”
Nathan Schwartz (c.1940-) Swiss-born American Jungian psychologist	1969	Did 222-page PhD thesis on *Entropy, Negentropy, and the Psyche: an Inquiry into the Structure of Psychic Energy*.
Elihu Fein (c.1916-) American physicist	1970	In his "Demography and Thermodynamics", he outlines a "molecular sociology", in which he explains how social activity is analogous to molecular activity; using concepts such as adiabatic and entropy in social systems.
Robert Nisbet (1913-1996) American sociologist	1970	In his *The Social Bond*, attempted to use modern chemistry and physics as a role model to outline a version of sociology where a “man is chemical and physical being”, but “also social”, and sought to pinpoint the “forces” that hold individuals together in groups and institutions (employing the terms: 'social bonds' actuating the 'social molecule' to explain these subjects; devoted a chapter to "social entropy" (on order and disorder in society).
Rudolf Arnheim (1904-2007) German-born American psychologist and visual arts theorist	1971	His *Entropy and Art: an Essay on Disorder and Order*, overviews a number of views on the ordering tendencies in life in relation to statistical disorder and art.
John Garcia (1936-2001) American writer	1971	Built on Pierre Teilhard, to outline a type of anti-entropy creative moral evolution theory.
Alan Wilson (1939-) English urban architect	1970	In his book *Entropy in Urban and Regional Modelling*, he used thermodynamics and entropy logic to facilitate city planning, based on the logic of general systems theory and entropy.
Daedalus (c.1930-) Science writer	1971	Outlined a molecular sociology based type of financial thermodynamics, in several weekly columns of *New Scientist*, describing money as a heat-like entity whose concentration determines a financial temperature.
Arthur Iberall (1918-2002) American physicist-engineer	1971	Beginning with his *Toward a General Science of Viable Systems* and culminating with his 1993 *Foundations for Social and Biological Evolution*, he outlined a rather detailed and interesting systems within systems theory of dynamical change, defining people as “human atomisms”, using theories such as homeokinetics, field thermodynamics, i.e. the Hamiltonian applied to sociology and biology, each heavily integrated with thermodynamics and physics.

Frederick Rossini (1899-1990) American chemical thermodynamicist	1971	Argued that the equilibrium constant version of the Gibbs equation (adjacent) explains the paradox between freedom and security in social life, in a chemical thermodynamics sense; this hypothesis launched the 2006 Rossini debate on whether or not this human chemical thermodynamics framework is true, especially in a post 9/11 world. $$\ln K = -\frac{\Delta H^\circ}{R}\left(\frac{1}{T}\right) + \frac{\Delta S^\circ}{R}$$
Roy Henderson (c.1935-) Australian mechanical engineer	1971	Modeled of crowd behavior and pedestrian traffic on fluid mechanics and ideal gas models; in his first paper, the highly-cited 1971 “The Statistics of Crowd Fluids”, he measured the movements of college students on a campus and children on a playground, finding that in both cases their movements fit the Maxwell-Boltzmann distribution.
Henry Bent (c.1927-) American physical chemist	1971	In 1962, introduced the global entropy analysis approach used to assess the spontaneity of physicochemical processes; published the *The Second Law* (1965); his 1971 “Haste Makes Waste: Pollution and Entropy” attempts at a connection between the maintenance of the environment and entropy; his 1977 “Entropy and the Energy Crisis” coins the phrase “personal entropy ethic” in arguing that to help the energy crises one needs to be ethical in the energetic aspects of life based on knowledge of the second law and spent a year on the road conducting a “Thermodynamics, Art, Poetry, and the Environment” workshop for the Office of Science Education.
Stephen Berry (1931-) American physical chemist	1971	His 1971 article “The Option for Survival” argues that in order to understand ‘survival’ one must use a thermodynamics view on the premise that people must recycle waste while the thermodynamic potential is still moderately high; authored at least three followup articles on the application of thermodynamics to economics (1972, 1978, 1979).
Tibor Ganti (c.1930-) Hungarian chemical engineer	1971	Developed his theory that living organisms are chemotons, or chemical automatons; his 2003 *Chemoton Theory: Theory of Living Systems* discusses the energy/thermodynamics based “life theories” of four noted thinkers: Gottfried Leibniz (particularly his theory of the soul), Erwin Bauer, Erwin Schrodinger, and Ludwig Bertalanffy.
Olivier Beauregard (1911-2007) French theoretical physicist	1972	In his 1972 “Information Theory and Thermodynamics”, co-written with Myron Tribus, defe1963nding the thermodynamics interpretation of information; his 1963 *The Second Principle of the Science of Time, Entropy, Information, and Irreversibility* attempts to reconcile reversible time of relativity, and irreversible time of consciousness and thermodynamics, using the information theory ideas of Leo Szilard and Leon Brillouin.
Marlan Blissett (c.1933-) American political scientist	1972	His *Politics in Science*, has a chapter “Big Science and the Laws of Social Thermodynamics”, in which he pens a set of "laws of social thermodynamics"; argues that “social and political space must be constantly affirmed against the entropy of an environment”; collaborated Howard Odum in 1987, on the topic of emergy analysis.
Jacques Ellul (1912-1994) French sociologist	1972	His *The Political Illusion* speculates on entropy in modern society; his 1990 *The Technological Bluff* uses entropy in social systems theories, discussing terms such as economic entropy, technological entropy, and neg-entropy in the reverse process.
George Effinger (1947-2002) American writer	1972	His science fiction novel *What Entropy Means to Me*, concludes with a section on black hole entropy and god.
		His PhD dissertation-turned book (*Measurement and Analysis of Political Systems: a*

Stephen Coleman (1942-) American political scientist	1972	*Science of Social Behavior*, 1975) employed information theory concepts (mostly) to concepts such as political thermodynamics, political entropy, and voting, to argue ideas such as: “an entropy value for a unitary social system is analogous to a temperature reading for a thermodynamic system, such as a volume of gas. In a state of temperature equilibrium one temperature measurement describes the whole volume of any part of it. If a social system is in an entropy equilibrium, a single entropy measurement describes the state of the system or any subsystem. For a system in partial equilibrium, the entropy values of its subsystems must be known.”
Kenneth Friedman (c.1945-) American physicist, philosopher, and financial theorist	1973	After completing his MS in physics and PhD in the philosophy of science at MIT, he then studied nonlinear thermodynamics under Ilya Prigogine (and Laszlo Tisza), as well as studying under philosophers such as Karl Popper and Huston Smith; after chairing the philosophy department at SUNY at Oswego, for twelve years, he then worked as a securities analysis and money manager, during which time he claims to have capitalized on a cyclic view of markets grounded in nonlinear thermodynamics; his 2003 *Myths of the Free Market* models economies as nonlinear thermodynamic systems where people are viewed as interacting economically similar to the way the neighboring molecules of a Benard cell “cooperate” in their movement to dissipate heat.
Stephen Hawking (1942-) British astrophysicist	1973	Co-authored the 1973 paper “The Four Laws of Black Hole Mechanics”, Brandon Carter James Bardeen, on black hole thermodynamics and black hole entropy; his 1988 book *A Brief History of Time* discusses entropy and the psychological arrow; his *Illustrated* 1996 edition contains a order-disorder diagram of a human in the act of reading in regards to entropy change (one of the clues that stimulated Libb Thims in to figuring out (2001) how the quantity “H – TS” changes from states to states of human instances or periods of human configurational existence.
Eugene Ruyle (1936-) American anthropologist	1973	Pioneered the science of ethnoenergetics, a precursory themed subject to human thermodynamics, arguing that labor, value, money, and capital are all forms of “ethnoenergy”, defined as “somatic energy expended by the members of a population”, that property is an “ethnoenergetic field”, and that money is “a symbol for energy, a claim on the energy of other people”; in 2003, outlined a theory of social “thermodynamic flows” and discussed the idea of a "thermodynamic substratum" underlying human society.
Lev Rozonoer (c.1934-) Russian cybernetician	1973	His “A Generalized Thermodynamic Approach to Resource Exchange and Allocation” discusses analogies in thermodynamics and economics; in 1998, was theorizing on the relation between information, entropy, and energy dissipation in information transmission.
Harold Nieburg (1927-2001) American political scientist	1973	His *Culture Storm* contains a chapter entitled "political thermodynamics" (his coining) that cites a few individuals such as Bertrand Russell, Claude Levi-Strauss, and Eric Berne, to outline ideas such as how “in any specific bargaining engagement, one party’s order becomes another’s entropy”; how The boundaries of conflicting systems of order can overlap creating arenas of social entropy (relative disorder) and competition”; how there may exist a “postulate a thermodynamic law of behavior”, among other ideas.
Lynn Margulis (1938-) American biologist	c.1973	Began working with James Lovelock (1964) in efforts to explain the symbiotic relation the biosphere and the atmosphere using a mixture of chemical thermodynamics, cybernetics, information theory, employing the 1968 essergy theory of Robert Evans to unify the entire approach; went on to write a number of books over the years, e.g. *What is Life?* (1995), *What is Sex?* (1997), *Dazzle Gradually: Reflections on the Nature of Nature* (2007), with her son Dorion Sagan, etc., all themed on a variety of life-centric thermodynamic theories.
Henry Morris (1918-2006) American civil-hydraulics engineer	1974	Argued that evolution is impossible according to the second law.

Albert Szent-Gyorgyi (1893-1986) Hungarian physiologist and bioenergetics	1974	Proposed (1974) to replace the term "negative entropy" (or *negentropy*) with "syntropy", which he pictured as a force which causes living things to reach "higher and higher levels of organization, order and dynamic harmony"; followed this up with his 1977 article "Drive in Living Matter to Perfect Itself"; winner of the 1931 Nobel Prize in physiology for his synthesis of Vitamin C.
Paul Davies (1946-) English physicist and astrobiologist	1974	His *The Physics of Time Asymmetry* is a detailed exposition on reversibility; in circa 1983, he began to develop a gravity-driven entropy gap theory of order creation to account for the origin of life, which he has expanded on in a number of books into the 1990s and 2000s.
Carter Finn (1935-) American writer	1974	Did thesis/dissertation on *Religion, Philosophy, and the Second Law of Thermodynamics.*
Richard Adams (1924-) American anthropologist	1975	His *Energy and Structure: a Theory of Social Power*, cites individuals and topics such as: Claude Levi-Strauss, dissipative systems, Erwin Schrodinger, Alfred Lotka, energy forms, embodied energy, maximum power principle, Nicholas Georgescu, Howard Odum, Leslie White, Maxwell's demon, negative entropy, etc., to argue that social power and anthropological studies of energy processes are based on the first and second law, to the effect that social power is based on control over energetic processes; his 1988 book *The Eighth Day: Social Evolution as the Self-Organization of Energy*, argues that energy processes provide a basis for explaining, comparing, and measuring complex social evolution, wherein society is conceived as a self-organization of energy.
Joel de Rosnay (1937-) French biochemist	1975	His *The Macroscope: a New World Scientific System*, uses a mix of cybernetics, systems theory, biochemistry, and thermodynamics, the human particle view (advanced intelligence perspective), energy, entropy, negentropy, and free energy to a significant extent, to outline a "macroscopic view of society"; his 1995 book *The Symbiotic Man* cites the likes of Ilya Prigogine, Pierre Teilhard, and chaos theory, etc., and comments that there are "two great tendencies of matter, toward life and toward entropy."
Orrin Klapp (1915-1997) American sociologist	1975	In 1975, spoke in terms of controlling boundaries in order to, among other things, restrict the entry of entropy into the social system; his 1978 *Opening and Closing* outlines a general systems theory / Shannon-thermodynamics type theory of "entropic communication" in society.
David Foster (c.1919-) English scientist	1975	His *Intelligent Universe: a Cybernetic Philosophy*, mixes the second law ideas with blind random chance notions; his 1985 *The Philosophical Scientists* outlines a rather convoluted existence of God theory in which employs "specificity" (improbability), along with cybernetics, to argue that something called "logos" (that which is behind DNA) "circumnavigates the second law", and that universe was brought into existence by the void of God's mental space, or something along these lines.
Arthur Young (1905-1999) American engineer and philosopher	1976	In his 1976 *Reflexive Universe*, he attempts to discredit determinism using negentropy ideas and attempts to explain consciousness and the soul in terms of the first law.
Jeffrey Wicken (c.1940-c.2000) American biochemist	1976	Published a number of articles and book chapters centered around thermodynamics, evolution, complexity, information, with side-excursions on religious commentary, culminating in his 1987 book *Evolution, Thermodynamics, and Information*; he is cited by those as Eric Schneider, Charles ****, among others, as sort of a legend and main inspiration behind continued thermodynamic excursions.
Fred Fox (1919-2007) American professor of science education	1976	Outlined ideas on ethics based on the second law, e.g. that social aspirations are anti-entropic, organization equates to potential energy, etc.

Ed Stephan (1939-2008) American chemistry major turned political scientist and sociologist	1977	In 1977, following a talk on human population distributions, began with $E = ST - pV + \mu N$ physicist Louis Barrett questions such as whether "humans are fermions or boson"; in 1980, began to discuss with chemist George Gerhold the subject of how the a Gibbs fundamental equation (version shown) applies to sociological systems of people; questions they speculated on included: "What is the total time in a social system? At the level of particles, temperature is just velocity of movement. I sense an analogy between temperature in physical systems and the technology of transportation and communication in social systems. Modern societies are 'hotter'. Big cities (high interactance centers) are 'hot': People, commodities and ideas move around faster. 'Hot' regions subdivide territory more thoroughly than 'cool' ones. And what is *entropy* — unpredictability? is that what we call freedom? What is the social equivalent of the product entropy-times-temperature? Freedom of movement? What do *pressure* and *volume* suggest, if anything? Could the raw product kNT be given some sociological meaning? Do humans have something like *chemical potential*, some sort of (bonding) potential? Maybe the last two terms in could be combined into something with a meaning specific to sociology. Combining them into -N(1 + α), with N as a population — what would be the sociological significance of the factor -(1 + α)/β? Could the value for β computed above in the case of urban population distributions (β = 2v/xμ) have any application?"; published some of his finalized ideas in the 1995 online book *The Division of Territory in Society*.
Reiner Kummel (1939-) German theoretical physicist	1977	His first articles was "Energy and Economic Growth"; followed up by books such as *Energy and Justice*; since 2005, has been teaching a course on "Economics and Thermodynamics", at the University of Wurzburg, and authored the 2011 book *The Second Law of Economics: Energy, Entropy, and the Origins of Wealth*.
Edgar Morin (1921-) French philosopher	1977	Known for his "complexity theory" of sociology, in which he utilizes a mixes of the second law, entropy, disorder and organization, cybernetics, among others; is described as one of "Prigogine's disciples", arguing to the effect that organization emerges out of disorder, in such a way that organization constantly absorbs more and more energy, in order to become more dense, dynamic and productive.
Paul Ehrlich (1932-) American biologist	1977	His chapter "Availability, Entropy, and the Laws of Thermodynamics", co-written with Anne Ehrlich and John Holdren, discusses, very superficially, the high-grade (availability) low-grade (non-availability) of energy forms, e.g. stored energy in gas, versus room temperature heat; his 2008 *The Dominant Animal* discusses the second law degradation model of the steps of the food-chain.
Georgi Gladyshev (1936-) Russian physical chemist	1978	In reaction-opposition to Ilya Prigogine's 1937 far-from-equilibrium, dissipative structure thermodynamics model of life and evolution, he developed a "hierarchical thermodynamics" type of quasi-equilibrium model using his law of temporal hierarchies, principle of substance stability, liquid chromatography models, to make a Gibbs free energy volumentric-style equation (above) to explain the evolution of living beings and society; in the 1990s, began developing thermodynamic anti-aging theories of foodstuffs; his 1997 book *Thermodynamic Theory of the Evolution of Living Beings*, captures the gist of his theory. $\bar{G}^{im} = \frac{1}{V}\int_0^V \frac{\partial G^{im}}{\partial m}(x,y,z)\,dxdydx \rightarrow min$
Dick Hammond (c.1938-) American entropy philosophy educator	1978	Competed his EdD in 1978 on "Analysis of Entropy Reduction and its Implications for Ethical Instruction in Public Education" under Ilya Prigogine; would go onto teach, promote, and organize workshops on instilling a type of "entropy ethics" morality model to children and young adults; the summary of which culminated in his 2005 book *Human System from Entropy to Ethics*.
Morgan Peck (1936-2005) American psychiatrist	1978	Outlined his view on entropy, evolution, evil, and love in his famous *The Road Less Traveled.*
Peter Molton (c.1943-) American chemist	1978	His article "Polymers to Living Cells: Molecules against Entropy" defines life as "regions of order that use energy to maintain their organization against the disruptive force of entropy."

James Miller (1916-2002) American psychologist	1978	His *Living Systems* attempts to integrate the biological and social sciences in the universal physical science terms of English physicists Arthur Eddington and James Jeans; the result, however, ends up being a melting pot of ideas about boundaries, negative entropy, matter-energy, information, etc., all jumbled together will little overall sustenance.
Rupert Riedl (1925-2005) Austrian zoologist	1978	His *Order in Living Systems* argues that living organisms do not violate the second law, but rather, as open systems they are able to evade the second law and are "exentropic" owing to the flow of energy from the sun to outer space, whereby local processes may lead to order such as a sonnet or the smile on a Mona Lisa.
Serge Galam (c.1945-) French physicist	1979	Since circa 1979, has been working to promote and develop the science of sociophysics; his 1982 article "Entropy, Disorder, and Individual Freedom", attempts to argue that facets of freedom exist within the confines of universal heat death; published the 1996 chapter "When Humans Interact Like Atoms"; in his 2004 "Sociophysics: A Personal Testimony", he gives an inside look at the 25-years of resistance he has faced from both young and old, established and non-established scientists at the premise of a physics based sociology.
Robert Ulanowicz (1943-) American chemical engineer and theoretical ecologist	1979	Conceived (in 1979) of an information theory based version of free energy applied to ecosystems, termed "ascendency", which he considered as a pseudo-thermodynamic function (first outlined in his 1980 article "An Hypothesis on the Development of Natural Communities"); his 1986 book *Growth and Development* extends on this using Helmholtz free energy (equation shown); his 2009 *A Third Window: Natural Life Beyond Newton and Darwin*, seems to argue for the existence of God in the context of an emergent (or process biology) thermodynamic depiction of evolution (or ascendency), supposedly, under the guise of the "ontic openness of nature"; is presently of the view that "entropy or entropy-related measures (such as free energy) should *not* be invoked for living systems!" (email communicate to Libb Thims, 2011), which he says he first argued on page 21 of his 1986 book. $F = U - \theta S$
Wil Lepkowski (c.1938-) American chemist and science writer	1979	His article "The Social Thermodynamics of Ilya Prigogine", argues that the nonequilibrium thermodynamics of Ilya Prigogine can lead to new ways of understanding social processes in the form of 'social thermodynamics'.
Tjalling Koopmans (1910-1985) Dutch-born American mathematician, theoretical physicist, economist	1979	Is credited with introducing the "human molecule" version of the economic agent, in economics, stating that it is no longer possible for economists to deny the usefulness of the human molecular hypothesis; began thinking about entropy in the 1970s, and in 1979 stated "if we will be more forthcoming with explanations of our cherished terms, our science colleagues may be more inclined to help us with 'entropy', which to me is a more difficult concept than anything economics has to offer." Winner of 1975 Nobel Prize in economics.
John Bryant (1944-) English mechanical engineer and business consultant	1979	Began thinking about the relationship between the cost of oil, energy, and thermodynamics in the 1970s; published articles such as "A Thermodynamic Approach to Economics" (1982), and a 2009 book *Thermoeconomics: A Thermodynamic Approach to Economics*, all making crude isomorphism extrapolations of thermodynamic equations and variables to economics.
Freeman Dyson (1923-) English-born American theoretical physicist	1979	Proposed the view that life in the future will be able to cope with the cooling and dimming expected from heat death of the universe; postulated that intelligent beings generate a fixed entropy ΔS per thought; his 1999 book *Origins of Life*, argues that the complexity of a living organism is proportional to the negative of its entropy and also computes the entropy of a human being.

Robert Costanza (1950-) American systems ecologist and economist	1979	Completed his PhD in 1979 in systems ecology under Howard T. Odum (embodied energy theorist) with a minor in economics; would extend on Odum's work as the founding editor of *Ecological Economics* (1989-); in a 1995 publication, he and Thomas Prugh seem to object to the view of people as 'human molecules'.
Paul Colinvaux (1930-) English-born American zoologist and ecologist	1979	His *Why Big Fierce Animals are Rare* uses the second law to argue that big meat-eating animals are rare because the available energy in each step in the food chain is degraded.
Daniel Hershey (c.1931-) American chemical engineer	1980	His *The New Age-Scale for Humans* argues that the derivative of the Prigogine entropy with respect to time (equation shown) applies to human systems; in the 1980s and 1990s, published near to a dozen articles on entropy, aging, and death; his 1992 "A Rational Design of a Governing Structure for Czechoslovakia, in General Systems Alternative Economics and Values" seems to be on thermodynamic applications in economics and government; his 2009 book *Entropy Theory of Aging Systems* argues that entropy is a measure of disorder, and that systems left to their own tend to age towards disorder and speculates on corporate structure. $\frac{dS}{dt} = \frac{dS_e}{dt} + \frac{ds_i}{dt}$
Jean-François Lyotard (1924-1998) French philosopher	1980s	Utilized entropy and negentropy in his post-modernism philosophical theories.
Michel Serres (1930-) French philosopher	1980s	Noted for philosophical excursions into thermodynamics.
Irving Simon (1920-) American writer	1980	Wrote the 1980, 70-page booklet *Centropy: the Vertical Aspect of Evolution*; and followup 1989, 250-page book *Centropy: Evolution of Energy Systems*, arguing for a centropy model of evolution.
Jeremy Rifkin (1945-) American economist	1980	In his 1980 *Entropy: A New World View* (*Entropy: Into the Greenhouse World*, 1989 revised), uses Nicholas Georgescu's material entropy views as a platform to argue, in a misunderstood way, that just about every modern-day malady, from pesticides, to city crime, to mental illness, is due to the "entropy law"; religiously, he argues that "the spiritual plane is not governed by the ironclad dictates of the entropy law"; in his 2010 *The Empathic Civilization*, argues that global warming and increased CO2 emissions are the "entropy bill" for the industrial revolution, among other illogical contrivances.
Jay Teachman (c.1950-) American sociologist	1980	His "Analysis of Population Diversity" introduced a Shannon entropy type of index of diversity measure (Teachman index).
Peter Atkins (1940-) English physical chemist	1981	His 1978 multi-edition textbook *Physical Chemistry* is his bread and butter; on a second less rigorous side, his various over-laymanized books (*The Second Law*, 1987; *Four Laws that Drive the Universe*, 2007; etc.) have promoted an energy dispersal view of entropy and the second law. On this latter laymanized basis, he has attempted to combat the religious view of creation to argue for a physical chemistry distorted "purposeless universe" model of human existence. His 1992 *Creation Revisited* and 2011 *On Being* exemplify this line of argument. Overall, he argues that elephants and men are evolved emergent types of "molecules equipped for competition, survival, and reproduction", albeit molecules that are "unimportant", "insignificant", and "without purpose" on the mis-aligned basis that the "driving force" of chemistry and chemical reactions is the tendency to chaos.
Jean Baudrillard (1929-2007)		

French social philosopher and pataphysicist	1981	Theorized on 'cultural molecules', energy, negentropy, information, cybernetics.
Julian Simon (1932-1998) American economics	1981	In his *The Ultimate Resource* (1996 3rd ed), in commentary on material entropy (pseudo second law) natural resource theories of Nicholas Georgescu (1971), Jeremy Rifkin (1989), etc., concludes that "the notion of entropy is entirely irrelevant to us" (supposedly, on the logic that plate tectonics and geological processes will renew natural resources); after which he came under attack by those including Paul Ehrlich, comment: "one wonders if Simon could not at least find a junior high school science student to review his writings", and Garrett Hardin, comment: "I am appalled at your misunderstanding or denial of the second law and the conservation laws."
Richard Gregory (1923-2010) British neuropsychologist	1981	His *Mind in Science* argues that "life is a systematic reversal of entropy" and that "somehow living organisms including plants [have] succeed[ed] in reducing their entropy."
George Glider (1939-) American economist	1981	In his million-copy best seller *Wealth and Poverty*, he argues that the mind transcends the second law, on the logic that knowledge and mental information accumulation compounds as it is used; he is an intelligent design advocate and against materialism and evolution; his 1990 *Microcosm*, has a chapter on the "Curve of Declining Entropy"; his 2000 *Telecosm*, argues, owing to Shannon information, that through learning, humans have now figured out how to defy the thermodynamic laws behind the rise and fall of civilizations.
Vonda McIntyre (1943-) American biological geneticist turned science fiction writer	1981	Her science fiction novel *The Entropy Effect* formed the basis of the early framework of the *Star Trek* series.
Xenophon Zolotas (1904-2004) Greek economist	1981	In his *Economic Growth and Social Welfare*, he devotes a few pages to addressing Nicholas Georgescu's 1971 material entropy version of the second law, stating that recycling won't help things; and concludes that in the future when newer forms of energy resources become available, such as solar or wind, the second law will become "practically irrelevant, since the economic process would be part of an open system"; of note, Zolotas' growth function stimulated the later Gibbs free energy based economic work production function of Dimitris Keranis (2005).
Adriaan de Lange (1945-) South African chemical physicist	1982	Very well-read physical-sciences based thinker (above the 500+ $\Delta G - W < 0$ book level in studying how thermodynamics applies to the humanities) who in 1982 began to view the idea that entropy production must apply to the spiritual world; then, in 1986, while teaching physical chemistry class, grasped the idea that "the intricate calculations concerning free energy in chemical reactions" must apply to the process of knowing and learning, on the extrapolation that student's learning behaviors must follow or map to the behaviors of molecules moving through the chromatograph column; in 1987, completed a yet unpublished manuscript *Entropy, Creativity, and Learning;* in the late 1990s, began posting and discussing his theories at the Learning-org.com forums; and in 2009 published an online book *Irreversible Self-Organization* (in Afrikaans).
Jeremy Campbell (c.1952-) English-born American investigative journalist	1982	His 1982 *Grammatical Man: Information, Entropy, Language, and Life*, tells the story of rise of information theory and discusses thermodynamics and life; his 1990 chapter "Some Parallel Themes in Modern Science and Literature", discusses Stephen Brush, Maxwell's demon, etc., a bit.
Robert Russell (c.1946-) American physicist-theologian	1982	Outlined theories on the relation between entropy, disorder, and evil.

Ivan Kennedy (c. 1940-) Australian agricultural biophysicist	1983	Beginning with articles such as the "Action and entropy in a neurological disorder", began to introduce an action thermodynamics theory, a type incongruous unitless thermodynamics, which argues that energy quantums are the integral cause of action or movement in all systems, molecular to biospheric, and that these movements must correlate with movements towards equilibriums as defined by the spontaneity criterion, which employs concept of 'action', a type of unitless property said to be related to entropy, resulting from impulses of energy on matter producing force, framed in the conservation of momentum; his 2001 *Action in Ecosystems: Biothermodynamics for Sustainability* and 2008 "Sustaining Action and Optimising Entropy" expand on this view; an example excerpt from the latter: "given the forceful tendency of internal energy to change the action of the system as a whole, there is a real sense in which an initial nonequilibrium state of higher free energy following absorption of a quantum of light is more chaotic and disordered than the more relaxed state of higher action and entropy toward which the system evolves".
Eric Zencey (1953-) American political philosopher and social historian	1983	In circa 1980, after reading Thomas Kuhn's *Structure of Scientific Revolutions*, began collecting references to the second law used as a metaphor for social theory; made this the title of his 1985 dissertation and second chapter (and thematic framework) to his 2000 book *Virgin Forest: Meditation on History, Ecology, and Culture*.
Anthonie Muller (1951-) Dutch biophysicist	1983	Developed a thermosynthesis theory which posits that the origin of life, prior to photosynthesis, began as a type of thermoelectric driven heat engine.
Enzo Tiezzi (1938-) Italian physical chemist	1983	Has penned a number of books: *The End of Time* (1983), *Steps Towards and Evolutionary Physics* (2006), and *City Out of Chaos* (2009), all of which seem to focus on outlining a thermodynamics based model of sustainability to counter so-called unsustainable human behaviors.
Malte Faber (1938-) German economist	1983	Has written a number of articles over the years to develop a physico-economics publications, on the introduction of entropy and irreversibility into economics and sociology.
Kenneth Bailey (1941-) American sociologist	1983	Completed his sociology PhD (1968) in general systems theory; in 1983, began to publish articles on sociology and entropy; his 1990 *Social Entropy Theory* outlines a very indigestible nonequilibrium version societal analysis using a mix of Ludwig Bertalanffy's general systems theory, Claude Shannon's entropy (predominately), and Rudolf Clausius' entropy.
Seth Lloyd (1960-) American physicist / quantum informationist	1983	Completed PhD dissertation on "Black Holes, Demons, and the Loss of Coherence: How Complex Systems Get Information, and What They Do With It"; wrote on thermodynamic depth (1988).
Philip Mirowski (1951-) American economist and physics historian	1984	Beginning with his "Physics and the Marginalist Revolution", in which he address the works of thinkers such as Leon Walras, Francis Edgeworth, Vilfredo Pareto, etc., and books to follow, i.e. *Against Mechanism: How to Protect Economics from Science* (1988), *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (1989), etc., he devotes considerable effort to addressing the history of economic thought, with specific focus on a critique of the incorporation of physics theories (many from thermodynamics), often in the form of metaphors, analogies, and isomorphisms, into economic theory, giving what seems to be an objectionable view along the way.
Klaus Jaffe (1951-) Venezuelan chemical biologist	1984	Beginning with his 1984 article "Negentropy and the Evolution of Chemical Recruitment in Ants", he has published a number of articles on the energetics of social phenomena, outlining an irreversible thermodynamics model of social life, based on studies of ant societies and extends the model to explain the energetics of human societies in 1999; as of 2010, working on a book on the thermodynamics of the social process.

James Kay (1954-2004) Canadian ecologist	1984	PhD was “Self-organization and the Thermodynamics of Living Systems”, a Prigoginean-based model of self-organization in living systems, arguing that the evolution of natural systems is a progression away from disorder and equilibrium, into the formation of high organized structures that exist some distance away from equilibrium, in contrast to the equilibrium-seeking decay toward death and random disorder, supposedly portrayed by Boltzmann; went on to co-author a gradient based evolution theory with American ecologist Eric Schneider (1994).
Isabelle Stengers (1949-) Belgian chemist-philosopher	1984	Noted for her co-authoring work with Ilya Prigogine, namely *Order Out of Chaos* (1984) and *The End of Certainty* (1997), in which she is often said to have been responsible for the laymanizing of Prigogine’s theories; she also produced independent related works.
Daniel Brooks (1951-) Canadian zoologist	1984	His “Evolution as an Entropic Phenomenon” and followup *Evolution as Entropy: Toward a Unified theory of Biology*, both co-written with Edward Wiley, employ a melting pot theory of thermodynamics and evolution, e.g. Ludwig Boltzmann’s complexions, Gibbs free energy change, Carnot efficiency, Ilya Prigogine's internal entropy, the “energy flow” models of Elton Sutherland and Raymond Lindeman, Alfred Lotka, Robert Ulanowicz, Jeffrey Wicken, Harold Morowitz, arrow of time, Dollo’s law, S = k ln W which they assume to be equivalent to Shannon entropy, all centered around the hypothesis that living organisms differ from nonliving systems in that organisms contain something Brooks and Wiley term “instructional information”.
Edward Wiley (c.1950-) American systems ecologist	1984	Co-author with Daniel Brooks (1984, 1988); also noted for his solo 1988 chapter “Entropy and Evolution”, wherein he discusses the reductionist anti-reductionist debate in the context of entropy and biology.
George Scott (c.1939-) American physical chemist	1985	His 1985 *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* speculates on ethics and free will in the context of physical chemistry and applies Ilya Prigogine’s dissipative structure theory to topics in human sociological studies; his 1991 symposium presentation “Time, Rhythms, and Chaos in the New dialogue with Nature” is on social and humanistic applications of dissipative structures.
Greg Myers (1954-) American-born English rhetoric and communications theorist	1985	His article “Nineteenth-Century Popularizations of Thermodynamics and the Rhetoric of Social Prophecy”, gives a pretty good historical overview of the top two-dozen thinkers, from Balfour Stewart (1974) to Yevgeny Zamyatin (1919), to have extended thermodynamics into the humanities realm.
John Proops (1947-) English ecological economist	1985	Wrote chapter “Thermodynamics and Economics: from Analogy to Physical Functioning”; also co-authored various articles with Malte Faber.
Bruce Weber (c.1941-) American biochemist and philosopher	1985	Organized a conference, with David Depew, on "Evolution, Entropy, and Information", resulting in a follow-up multi-author book by the same name (1988); their 1996 *Darwinism Evolving* devotes several chapters to thermodynamics; Weber's own research focuses on the application on nonequilibrium thermodynamics to religion, philosophy, and the origin of life.
Mikhail Volkenstein (1912-1992) Russian	c.1985	His *circa* 1985 *Entropy and Information* employs a mix of Prigoginean thermodynamics, Gibbsian thermodynamics, and Shannon entropy version of messages, genomes with entropy, etc., to show how entropy applies to biology, culture, and the production of artistic work; contains trivia on Russians to theorize on thermodynamics of biology, e.g. Erwin Bauer.

biophysicist		
Stuart Kauffman (1939-) American physician and biochemist	1986	In 1986, implemented a computer program to show that autocatalytic polymer systems can be physically realizable in the framework of thermodynamics; expanded on this in his 1993 *The Origins of Order*; in his 1995 book *At Home in the Universe*, he outlines an expanded evolution theory framed in work-producing, auto-catalyzed, free energy driven, Carnot cycle-based reactionary systems; his 2000 book *Investigations* argues for a fourth law of thermodynamics; his 2008 *Reinventing the Sacred* attempts to put a divine spin on the corpus of his previous theories, with specific focus to society and human purpose, arguing to the affect that "God is the creativity of the universe".
Arthur Peacocke (1924-2006) English biochemist-turned-theologian	1986	Attempted to reconcile evolution and Christianity via Prigoginean thermodynamics.
Louise Young (1919-2010) American physicist and geologist	1986	Her *The Unfinished Universe*, attempts to give meaning, purpose, and morality to human existence, in the context of a continuously changing universe, inexorably advancing in time, situated in the cosmological theory of the ultimate heat death extinction by universal entropy.
Thomas DeGregory (c.1937-) American economist	1986	In his “Technology and Negative Entropy”, argues, in opposition to the material entropy increase view of Nicholas Georgescu and Jeremy Rifkin, that life is an island of negative entropy; that alternative technology will stave off inevitable organization losses of by creating new resources.
James Beniger (1946-2010) American sociologist	1986	His *The Control Revolution* argues that a system can sustain work only if its “internal energy is purposively organized in a heat gradient”; that “living systems work as if guided by some vitalist equivalent of Maxwell’s demon”; that the end state of the universe is heat death.
Vaclav Havel (1936-) Czech playwright and former Czechoslovakian president	1986	Noted for his view that the basic law of life is to be ever more highly structured and to struggle against entropy.
Keith Burich (c.1950-) American historian	1987	Noted for a number of articles (building on the previous 1952 work of William Jordy), beginning with his 1987 “Henry Adams, the Second Law of Thermodynamics, and the Course of History”, on the thermodynamical ideas of American physical historian Henry Adams.
Juan Martinez-Alier (c.1941-) Spanish economist	1987	His *Ecological Economics: Energy, Environment, and Society*, is said to be on par with the economics thermodynamics work of Nicolaus Georgescu (1971) and Philip Mirowski (1989); is of the view that “the starting point for economics should be the first and second laws of thermodynamics.”
Joseph Vogel (c.1960-) American-Puerto Rican economist	1987	Did PhD on economics, sociobiology, evolution, and entropy; wrote 2009 book on the economics of climate change from a thermodynamic perspective.
		His *The Second Medical Revolution*, co-written with Kenneth Rothenberg $\Delta G_{universe} >< 0$

Laurence Foss (c.1940-) American philosopher	1987	suggests a new approach to medicine based on quantum mechanics, irreversible thermodynamics, and information theory; his follow-up 2002 book *The End of Modern Medicine* has a section on what he calls the "second law of psychothermodynamics" (equation shown), wherein, building on Michael Guillen's idea that human existence is an unnatural anomaly in the framework of a universe governed by the second law, he slants the second law into a contrived anthropomorphism to argue, in his own words, for a vitalistic (vitalism), mentalistic (mentalism), and spiritualistic (autopoietic) universal view, unlike the mechanistic (mechanism), physicalistic (physicalism), and materialistic (materialism) prevailing scientific world view.
David Aberle (1918-2004) Canadian anthropologist	1987	His lecture "What Kind of Science is Anthropology?" argues that anthropology needs to discard the Newtonian reversible model and instead to use thermodynamic irreversible models.
Elmar Altvater (1938-) German political scientist	1987	His article turned chapter "Ecological and Economic Modalities of Time and Space" outlines how social, economic, and ecological processes unfold historically through the dimensions of space and time, both framed in the context of thermodynamic irreversibility.
Lyndon LaRouche (1922-) American politician	1987	Began to write about negative entropy (of the Norbert Wiener variety) in the context of economics in the 1970s; his 1987 *The Power of Reason* discusses negentropy; in recent years he has gained a large following, embodied in the LaRouche Political Action Committee, who promote his "physical economy" model (culled from Vladimir Vernadsky), with videos and articles, to argue that acts of creativity resulting in new technology should be the basis of a type of economic unit of value, measured someway in terms of an increase in "energy-flux density" per region of the economy; his 2009 "Economic Science, In Short" presents a real screwball outline of thermodynamics, e.g. calling Clausius a "hoaxster", among other nonsensical comments.
Tom DeMarco (1940-) American electrical engineer and business consultant	1987	In *Peopleware: Productive Projects and Teams*, co-written with Timothy Lister, they use science analogies to theorize on how project teams can "jell", e.g. certain people acting as catalysts (human catalyst), the modeling of travelling consultants as "free electrons" (human particles), terms such as "corporate entropy" (defining entropy in corporations as "levelness or sameness"), energies associated with bonded and unbounded teams and cliques, a "second thermodynamic law of management", among other ideas; their six person consulting group The Atlantic Systems Guild employs terms such as "business catalyst" (an activation energy lowering entity).
Timothy Lister (c.1950-) American consultant	1987	Co-author of *Peopleware* with Tom DeMarco.
Benjamin Kyle (1927-) American chemical engineer and thermodynamicist	1988	His article "The Mystique of Entropy", $\Delta S \approx 0$ summarizes historical attempts to use thermodynamics to explain things such as computers, art, poetry, or prove the existence of god, etc.; this was expanded into the 1999 multi-chapter CD-ROM textbook attachment *Entropy: Reflections of a Classical Thermodynamicist*; alludes to a philosophy in which, given the knowledge of universal entropy increase, provides a saving grace by showing us the 'way', which he seems to equate with paths of negligible entropy change (equation shown).
Kozo Mayumi (1954-) Japanese bioeconomics engineer	1988	Completed his MS thesis under Nicholas Georgescu, thesis "Land: Ecological and Economic Achilles' Heel", supposedly building on his 'material entropy' scheme; followed up later by the 2001 *The Origins of Ecological Economics: the Bioeconomics of Georgescu-Roegen*, along with other publications, such as the 2004 chapter "Entropy in Ecological Economics."

Peggy La Cerra (c.1959-) American evolutionary psychologist and neuroscientist	1988	In 1996, in a state of prolonged immobilizing depression, she had an epiphany that, in the framework of evolutionary psychology, depression was not a condition, but rather: understood that there is an energetic calculus in our brains and minds that effects this downward shift: “when our intelligence system perceives that there is not much to gain by carrying on with the tasks of life — when we are overcome by too much loss or are facing a period of too little gain — we get ‘depressed.’ By the same token, the seasonal shutdown psychiatrists call seasonal affective ‘disorder’ is actually a normal, if uncomfortable, recalibration for the energetically barren winter months; this kind of motivational downshifting forces us to radically reconfigure our lives and our selves in an effort to keep us energetically solvent; the motivational system [shuts down] to keep from wasting any more behavioral energy on a dead-end path;” this was expanded into a 1998 article and followup 2002 book *The Origin of Mind*, both co-written with Roger Bingman, wherein energy and entropy ideas formed the basis of argument; in 2011, she commented on Hmolpedia that: “if people are using this site to do their PhD dissertations and getting away with that, their advisors should be shot.”
Rod Swenson (1945-) American evolutionary systems theorist	1988	In the early 1980s, began to devote time to focus on discrepancies between biology and physics with reference to evolutionary and culture theory, during which he began to focus on spontaneous order production or self-organization; by 1988 he had proposed and elaborated a law of maximum entropy production as the missing piece of the physical or universal law that would account for the ubiquitous and opportunistic transformation from disordered, or less ordered, to more highly ordered states,”; in 1991 authored “Thermodynamic Reasons for Perception-Action Cycles” with Michael Turvey.
Louis-Marie Vincent (c.1940-) French electromechanical engineer and biophysical chemist	1988	His book *Can We Believe in Resurrection*, which speculates on life and death in a modern scientific context, arguing that “the brain is a machine that obeys the laws of thermodynamics”, albeit he argues, in a detractive sense, that soul is a type of quantum field attached to superluminal particles; has theories on how love is a form of thermodynamic potential, that may be converted into heat and movement, and how the brain, being comprised of matter and energy, thus obeying the laws of matter and the laws of thermodynamics, may act in a “change of state” of energy at the time of death; his 2002 book *Other Logic of Living*, uses physical methods, such as information and analysis of form, to model the living being as a whole and to argue that “not only do we not really know what life is, but we are not quite sure what death is either.”
Charles DÈ³ke (c.1950-) American evolutionary dynamics philosopher	1988	His *The Evolutionary Dynamics of Complex* Systems, biosociology in evolution, e.g. who processes are "entropy driven", entities are dissipative structures, boundary conditions must be stated in evolution, etc., and followup 1994 chapter “From Thermodynamics to Economy: A Thorny Path”, states that the ‘classic treatments’ of entropy and economy include: Nicholas Georgescu (1971), Howard Odum and Elisabeth Odum (1976), Kenneth Boulding (1981), Richard Adams (1982), Peter Allen (1985), and Jeffrey Wicken (1987).
Tom Bell (c.1966-) American philosopher-lawyer	1988	Adopted the term "extropy" as a basis for a new type of futurism philosophy.
Justin Lancaster (1955-) American physicochemical ecologist and lawyer	1989	His “The Theory of Radially Evolving Energy” argues that evolution is a function of energy itself, and that all energetic systems, including societies, evolve with the bounds of thermodynamics laws, whereby nonequilibrium thermodynamics, following Ilya Prigogine, is joined with ecological energetics and chemical evolution to reveal "a strong analogy between chemical, biological, social, and ecosystem evolution.”
Tony		

Rothman (1953-) American theoretical physicist	1989	His *Science a la Mode: Physical Fashions and Fictions* devotes an essay, supposedly, to debunk the overuse of entropy as a metaphor in sociology.
Bela Lukacs (1947-) Hungarian theoretical physicist	1989	His article "Once More about Economic Entropy", supposedly, equates economic variables to thermodynamic variables; his 1994 lecture "On Economics and Other Utilities", argues that economy in itself can never satisfy the Gibbs-Duhem relations, subsequently an economy in itself can never have a thermodynamic formalism, but rather only the set economy + ecology, may possibly have such a formalism.
William Paulson (1955-) American literature theorist	1988	His *The Noise of Culture*, which uses a mix of thermodynamics and information theory to analyze themes of various novels and stories; it is used as reference material in a course at *Texas Tech University* taught by Bruce Clarke.
Rodger Penrose (1931-) English mathematical physicist	1989	His *The Emperor's New Mind* argues that humans are "configurations of tiny entropy".
Kent Hovind (1953) American creation science promoter	c.1989	His numerous 1990s video lectures give dumbed-down versions of the first and second law in a way that convinces audience members that thermodynamics disproves evolution.
Anson Rabinbach (c.1945-) American historian	1990	His *The Human Motor: Energy, Fatigue, and the Origins of Modernity* outlines the history of the use of thermodynamics and the human motor metaphor in society.
Bengt Mansson (c.1960-) Swedish-German theoretical ecologist	1990	His chapter on "Thermodynamics and Economics" views human economic activity from the dissipative systems model, focuses exergy as his variable of study, and mentions the physiocrats, Nicholas Georgescu, Tjalling Koopmans; his 1993 "Ecology, Thermodynamics, and H.T. Odum's Conjectures" discusses the work of Howard Odum.
Remy Lestienne (c. 1943-) French elementary particle physicist and neuroscientist	1990	His *The Children of Time: Causality, Entropy, Becoming* which chapters on entropy and information, dissipative structures, what is life, the mind and time, among others; his 1998 book *The Creative Power of Chance*, supposedly, devotes four chapters to an attempt to reconcile an information interpretation of entropy with a thermodynamic interpretation of entropy with recourse to "randomness in dynamic systems".
Elias Khalil (1957-) American economist	1990	Noted for several articles, e.g. his "Entropy Law and Exhaustion of Natural Resources: Is Nicholas Georgescu-Roegen's Paradigm Defensible?" (1990) to his "The Three Laws of Thermodynamics and the Theory of Production" (2004), in which he gives commentary on theorists, such as Julius Davidson and Nicholas Georgescu; he also penned the 1996 *Evolution, Order, and Complexity* with Kenneth Boulding, which employs thermodynamics logic.
Ronald Pearson (c.1933-) American	1990	His book *Intelligence behind the Universe*, argues for an 'intelligent ether' theory of continued consciousness after death, which supposedly originated from his 1984 rejection of big bang theory

mechanical engineer and thermodynamicist		as being a violation of the conservation of energy.
Plinio Prioreschi (c.1924-) Italian physician	1990	In his *A History of Human Responses to Death*, he devotes the first chapter to a discussion on whether or not death is reversible, in a thermodynamic sense.
Richard Delgado (c.1948-) American law professor	1990	His "Does Voice Really Matter?" introduced a metaphoric type of law of racial thermodynamics, that: "there is change from one era to another, but the net quantum of racism remains exactly the same. Racism is neither created nor destroyed."
Edwin Jaynes (1922-1998) American physicist	1991	His article "How Should we Use Entropy in Economics" outlines how Willard Gibbs' 1973 graphical thermodynamic ideas, such as entropy convexity, can be mixed with logarithmic interpretations of economic entropy (shown), e.g. multiplicities and macroeconomic states, and connected in some way to French mathematician Rene Thom's 1960s catastrophe theory, and the thermodynamics of ferromagnetism and the Curie temperature. [6] $S(X, Y, Z \cdots) = \log W(X, Y, Z \cdots)$
Luigi Sertorio (1933-) Italian theoretical ecophysicist	1991	His *Thermodynamics of Complex Systems*, attempts to give an outline of the thermodynamics of societies, embedded in ecosystems, i.e. the subject of "ecophysics", using a statistical mechanics style of approach, with an end chapter on "the intellectual house".
Luis Fernández-Galiano (1950-) Italian architect	1991	Outlined an energy and entropy theory of architectural design as discussed in his energy-entropy themed book *Fire and Memory*.
Valter Caggio (1954-) Italian mechanical engineer	1991	In 1991, began giving lectures in which he advised the incorporation of negentropy logic and thinking into the humanities; in circa 2004 laugned the sites: Negentropy.us, Negentropie.com, and Negentropia.com; his 2008 book *Negentropy and its New Global Meaning*, attempts to use the negentropy concept as a universal model to explain psychology, ethics, economics, politics, philosophy, and religions.
Karl-Henrik Robèrt (1947-) Swedish physician	1991	Developed a thermodynamics-based "natural step" theory of societal sustainability, based on cyclical growth, rather than linear.
Jurgen Mimkes (1939-) German solid state thermodynamicist and socio-economic physicist	1992	Since 1992, at the University of Paderborn, has been involved in the development of physical chemistry of social and economic systems, with articles such as "Binary Alloys as a Model for the Multicultural Society" (1995), "Society as a Many Particle System" (1997); he helped in getting the 'physics of socio-economic systems' recognized as a new scientific field by the German Physical Society (2001); has produced at least two graduate students by 2002 (Christian Thought and Thorsten Frund); published two chapters on a thermodynamic formulation of sociology and economics, respectively, in which he derives a Lagrange function (equation shown) of a social system of *N* interacting people, where (-*L*) is the free energy or common happiness of the agents, *E* the energy or collective laws of society, ln *P* the combinatorial probability distribution of the elements or individual social behavior (in which the social system is posited to be stable at maximum mutual happiness); as of 2010, was working on finishing a manuscript entitled the *Chemistry of Social Bonds*. $L = E + T \ln P \rightarrow \max$
Teresa		Her 1992 *Interpretation of the Flesh*, explains that "the solution to the riddle of femininity depends on unraveling Freud's neglected if confused theories on psychical energy, while discarding the assumption that the subject is energetically and emotionally self-contained"; she discusses social energy, emphasizing the notion of conflicting forces complemented by bound energy and free

Brennan (1952-2003) Australian-born feminist philosopher and social-political theorist	1992	energy; in her 1997 article "Social Pressure", she argues that social pressure operates as physical energy, arguing that social pressures are pressures to conform but also those exerted on the psyche in the same way that physical pressures are exerted on the body; her 2004 *The Transmission of Affect*, presents the idea that one can soak up someone else's depression or anxiety or sense the tension in a room, arguing that the emotions and energies of one person or group can be absorbed by or can enter directly into another.
Eric Schneider (c.1938-) American marine geologist and ecological thermodynamicist	1992	Development of his gradient-based evolution thermodynamics theory with James Kay (1992-2004), which culminated with the 2005 book *Into the Cool: Energy Flow, Thermodynamics, and Life* (co-written with Dorian Sagan), which covers a good deal of historical precursory material on thermodynamic ideas on life; his *The Purpose of Life* (co-written with Dorian Sagan), tackles religion vs. science debate to argue that that life's natural purpose is defined in the context of being a function in an energy-driven cosmos.
Matthias Ruth (1964-) American ecological economist	1992	Completed his PhD dissertation on "Economic Processes and Environmental Repercussions", a synthesis of economics, ecology, and thermodynamics; made into followup 1993 book *Integrating Economics, Ecology, and Thermodynamics*; article ""When, Where and By How Much Does Thermodynamics Constrain Economic Processes?" (1997) on Nicholas Georgescu; chapter "Insights from Thermodynamics for the Analysis of Economic Processes" (2005).
Kenneth Stokes (c. 1960-) American political economist	1992	His *Man and the Biosphere* mentions Frederick Soddy, Karl Marx, Friedrich Engels, Herman Daly, Karl Polanyi, negentropy, thermodynamics, physiocrats, energy, entropy, cybernetics, embodied energy, etc., to argue for a evolutionary version of political economy; his 1995 *Paradigm Lost* argues that equilibrium used by Talcott Parsons was borrowed from thermodynamics.
Gilbert Chauvet (1942-) French mathematical physicist and physiologist	1992	Introduced the entropy portmanteau "orgatropy" as the thermodynamic "potential of functional organization" and the "functional equivalent of the second law applied to living organisms"; his 2004 *The Mathematical Nature of the Living World* attempts to integrate biology, physics, thermodynamics, physiology, and neuroscience through the lens of mathematics in an effort to explain how life originated from non-living matter; his 2006 *Understanding the Organization of Living and its Evolution Towards Consciousness* elaborates on this with regard to consciousness.
Marek Roland (1954-) Polish-born Canadian physicist	1992	His "Life on Earth: Flow of Energy and Entropy" attempts to explain evolution using a combination of negative entropy arguments, various energy balance calculations, and information theory; in 2008, was notable for applying his theories of thermodynamics and information theory to a new-age longevity diet.
George Carlin (1937-2008) American stand-up comedian	1992	Noted for his "I'm an entropy fan" comedy routine.
Martin Goldstein (1919-) American physical chemist	1993	His *The Refrigerator and the Universe: Understanding the Laws of Energy*, includes a chapter subsection entitled "The Entropy of a Mouse", that rather cogently discusses, in what seem to be Lewis thermodynamics terms, the standard procedure needed in order to actually calculate the measurement of the entropy a mouse (or mouse molecule) in terms of "before" (initial state) and "after" (final state) of the synthesis of the mouse.
Douglas White (1942-) American anthropologist	1993	Co-authored the 1993 *Foundations for Social and Biological* Evolution with Arthur Iberall and David Wilkinson; in circa 2000, taught a course on anthropological thermodynamics at UC, Irvine, based on the works of Iberall.
Bill Nye (1955-)		Summarized the subject of human thermodynamics as historical attempts to use the laws of

American mechanical engineer	1993	thermodynamics to explain various facets of human existence, from car wreck behaviors, to politics, to the process of falling in love.
Mae-Wan Ho (1941-) Chinese-born English biochemist	1993	Her *The Rainbow and the Worm: the Physics of Organisms*, in which she attempts to pick up where Erwin Schrodinger left off in his famous 1943 *What is Life?*, spending the first chapters on the second law.
Tom Stoppard (1937-) British playwright	1993	His award-winning *Elective Affinities* (1809) remake play *Arcadia* takes place in two different time periods, 1809, the year of Goethe's novella and the modern day, wherein Stoppard incorporates talk of "sexual energy", "heat", entropy via his discussion of the "second law", and human chemical affinity, via his talk of "the attraction that Newton left out … all the way back to the apple in the garden", the steam engine, among other topics.
Paris Arnopoulos (c.1935-) Canadian political scientist	1993	His *Sociophysics*, on the subject of sociophysics, attempts to use 'powerful physics metaphor' to speculate on topics such as the temperature, volume, pressure, and entropy of societies.
James Reiss (c.1937-) Australian organic chemist and commerce theorist	1994	Uses physical chemistry and drug receptor thermodynamics models to explain economic systems, e.g. postulating how tools, like hammers, act as catalysts to lower the activation energy barrier; how the "chemical interaction" factors of electronic attractions and repulsions and stereochemical shape and fitting of molecules will play a roll, economic temperature effects, etc.; made one of the first human thermodynamic variable tables.
Erland Lagerroth (1925-) Swedish humanism theorist	1994	In 1985, came across Erich Jantsch's *The Self Organizing Universe* (1979) and thereafter would go on to pen ten books, e.g. *Toward a New Science* (1986) outlining a holistic type of unified humanism theory, atoms to people; his 1994 *The Re-enchantment of the World and Science* is his biggest book on Ilya Prigogine and Jantsch, wherein he discusses the "riddle of entropy death contra evolution", among other related topics.
John Christie (1947-) Australian physical chemist and chemical thermodynamicist	1994	His chapter "A Survey of Thermodynamical Ideas" discusses how microcanonical ensembles can be used to formulate economic analogies, specifically using the "island model" of a small number of inhabitants, in which goods are traded, resulting in a microstate currency distribution; how social equilibrium relates to Gibbs free energy; how coupling and time scales may play a role, etc., in economic processes.
Duncan Foley (1942-) American economist	1994	His 1994 "A Statistical Equilibrium Theory of Markets", discussed the thermodynamic notion of equilibrium as a conceptual tool in economics; in the late 1990s, convinced physicist Wayne Saslow (1999) to write and economics thermodynamics article; in the 2000s, began collaborating with physicist Eric Smith (2002) on a number of economic thermodynamics articles.
Kevin Kelly (1952-) American futurist	1994	Outlined theories on extropy and evolution in the context of futurism and technology.
Frank Tipler (1947-) American physicist	1994	In his book *The Physics of Immortality*, in which he builds on French philosopher Pierre Teilhard's 1938 omega point theory in conjunction with English-born American physicist Freeman Dyson's 1979 paper "Time Without End: Physics and Biology in an Open Universe", to reconcile the second law of thermodynamics, with life, heat death, and Biblical resurrection, by postulating that in the future a supercomputer program will ressurrect the dead.
William Gairdner (1940-)	1994	His *The Trouble with Canada* devotes a section to "The Concept of Social Entropy", in which he employs a thermal words ("patriotic fire", "getting heated", "feel cool", etc.) as fact polemic to argue that the fuel that energizes a given society is the strength or "heat" of its belief system; that less demanding values are "cooler" as compared to "hotter" more demanding values; uses Venn

Canadian writer		diagrams to argue that cultural wedges (strong ideas, attitudes, beliefs) are constantly driven between basic features of society and specific entropic forces that tend to dissipate that feature, causing the feature to lose energy (value); etc.
Pierre Levy (1956-) Canadian cyberspace philosopher	1994	His *Collective Intelligence* attempts to theorizes on human molecule / human chemistry / human thermodynamics type of metaphors and logic applied to the growing social bonding and organization of the internet.
Libb Thims (c.1975-) American chemical engineer, electrical engineer, and thermodynamicist	1995	Began to speculate as to how $\Delta G < 0$ the spontaneity criterion (adjacent equation) applies to mate selection, with enthalpy change ΔH and entropy change ΔS specifically quantified in terms of standard evolutionary psychology variables, mapped to second-by-second changing measures of individual differential human molecular Gibbs free energy variations d*G*, as shown below (see: HMO theory): $G = (H_{AVG} + H_{AGE} + H_S + H_X + H_L + H_F + H_C) - T(S_P + S_O + S_I + S_S + S_N)$ such as if one was to predict which of two mates would be more favored to bind "stably" into a standard 18-year human chemical reaction; a number of precipitates have followed from this endeavor: one of the first calculations of the human molecular formula (2002); first formulations of the physics model of the human chemical bond A≡B (2005); launched *Journal of Human Thermodynamics* (2005); authored first human chemistry textbook (2007); launched the EoHT.info wiki (2008), and as of 2011 has authored over 1,800 online articles connected to and surrounding these topics, i.e. human physics, human chemistry, human thermodynamics, and hmol science.
Paul Bohannan (1920-2007) American anthropologist	1995	His *How Culture Works* outlines the difficulties involved in the application of thermodynamics to the study of cultural transformation, in relation to how transformation are studied in physics; an example passage: "adapting thermodynamic ideas to the study of culture is limited by a very simple fact: nobody has yet figured out what might be the cultural equivalent of heat or energy … nobody has yet found the 'heat' or the 'energy' in cultural matters … the concepts of 'cultural temperature' to refine our understanding of 'cultural heat' have not yet appeared. This is one of the most pressing problems for the next generation of anthropologists, and the difficulties are profound."
Dorian Sagan (1959-) American science writer	1995	Son of Carl Sagan (1934-1996) and coauthor of thermodynamically-themed books, such as *What is Life?* (1995) and *What is Sex?* (1997), co-written with his mother Lynn Margulis, *Into the Cool: Energy Flow, Thermodynamics, and Life* (2005), co-written with Eric Schneider; his 2004 article: "Gradient Reduction Theory: Thermodynamics and the Purpose of Life", co-written with Jessica Whiteside, argues that the purpose of existence is to degrade the solar gradient in accordance with the second law, discussing life vs. non-life issues, such as "inanimate purpose"; his 2010 *The Purpose of Life*, written with Schneider, digs into the religion vs. science debate to argue that the more profound questions can be answered thermodynamically, namely that life's natural purpose is defined in the context of being a function in an energy-driven cosmos.
Stefan Baumgartner (1968-) German physicist and ecological economist	1995	Co-authored a 1995 discussion article "Entropy: A Unifying Concept for Ecological Economics" (and follow-up 1996 chapter), co-written with Malte Faber and John Proops; others include: article on thermodynamics of waste management (2003); his 2004 chapter "Thermodynamics Models" summarizes the history and usages of thermodynamics in ecological economics; article on thermodynamics of production theory (2005), among others.
Hector Sabelli (1937-) Argentinean-born American psychiatrist	1995	His 1995 "Social Dynamics" chapter uses a mixture of thermodynamics, entropy, psychodynamics, bifurcation theory, and chaos theory, among others, to explain aspects of social and mental phenomenon, such as biopolarity, wherein he considers people to be social atoms; his 2005 *Bios: a Study of Creation* attempts to argue that creative processes, at all levels of organization, physical, biological, economic, social, and psychological, are not headed towards entropic decay, but towards an infinite attractor in the universe; book contains section calls 'biotic thermodynamics' or entropy as diversity.

Peter Corning (1935-) American complexity theorist	1995	Began to incorporate thermodynamics, information theory, complexity theory, emergence, self-organization, cybernetics, bioeconomics, etc. into his synergy theory of evolution, views culminating in his 2003 *Nature's Magic: Synergy in Evolution* and 2005 *Holistic Darwinism*, the third part of the latter devoted to thermodynamics, information theory, and thermoeconomics.
Richard Coren (1932-) Electrical and computer engineer	1995	Beginning with his 1995 article "Logistic Escalation as the Mechanism of Emergence" and followup 1998 *Evolutionary Trajectory*, he attempts to outline a cybernetic-thermodynamic-information theory of evolution and civilization; his 2006 book *God and Science Among the Infinities*, Coren attempts to use complexity theory, intermixed with bits of thermodynamics (citing: Jeffrey Wicken, James Kay, Eric Schneider, Ilya Prigogine, and Rod Swenson), such as Bénard cells, to argue that God originated in the mathematical concept of infinities.
Michael Guillen (c.1950-) American physicist	1995	His *Five Equations that Changed the World* details a rare biographical history of the early years, upbringing, and possible religious outlooks of German physicist Rudolf Clausius; on life in the context of the Bible (his "favorite book"), he comments: "contrary to popular belief, being alive is unnatural; in fact, all life exists in defiance of, not in conformity with, the most fundamental law of the universe."
Victor Stenger (1935-) American physicist	1995	Introduced his "entropy per unit volume" argument for how how life (or order) formed following the big bang (which he says started in a state of maximum entropy (per unit volume) and zero energy); in his *Has Science Found God?* (2003) and *God: the Failed Hypothesis* (2007) he elaborates on this platform in attempts to disprove the existence of God.
Christopher Edwards (c.1959-) American mechanical engineer and thermodynamicist	c.1995	In his thermodynamics class, at Stanford University, he teaches his students at that life is a path function.
Bruce Clarke (c. 1950-) America literature and science theorist	1996	In circa 1995, he began to develop a fascination with the use of Maxwell's demon as an allegorical figure employed in literature; his 1996 *Dora Marsden and Early Modernism*, includes discussions of the vitalistic vs. thermodynamic models; his 2001 *Energy Forms: Allegory and Science in the Era of Classical Thermodynamics* analyzes the interactions among energy and entropy, heat and radiation, and their symbolic presentations in the literature of the times, e.g. the Nefastis machine, and draws on the writings of James Maxwell, William Thomson, Balfour Stewart, H. G. Wells, Camille Flammarion, Yevgeny Zamyatin, and D. H. Lawrence, among others; in 2001, began teaching a course on literature thermodynamics at Texas Tech University.
Alexander Zotin (1926-2000) Russian biophysicist and thermodynamicist	1996	His "Aspects of Bioenergetics and Civilization", co-written with Ingolf Lamprecht, argued that the appearance of civilization is regarded as a mechanism to hasten the heat death of our universe.
Fritz Sollner (c.1965-) German environmental economist	1996	His 1997 article "A Reexamination of the Role of Thermodynamics in Environmental Economics", commented on by Herman Daly and James Kay, is based on his 1996 habilitation *Thermodynamik und Umweltökonomie* (*Thermodynamics and Ecological Economics*).
Fritjof Capra (1939-) Austrian-born American theoretical physicist	1996	In his *Web of Life* he outlines a fairly readable Prigoginean thermodynamics dissipative structure based theory of biospheric living systems.
Colin Tudge		His *The Time Before History* outlines a version of the surface law: "for homoeothermic land

(1943-) English biologist-zoologist	1996	animals, the physics of heat comes into play: gravity and thermodynamics determine that, on land, body size, shape, and lifestyle are bound to be intimately linked."
Sture Nordholm (1944-) Swedish physical chemist	1997	In his article "In Defense of Thermodynamics: an Animate Analogy", coins the subject name "animate thermodynamics" as the thermodynamics of human behavior, and argues that thermodynamic formulation can be applied to explain human behavior, on the logic that the basic elements of the description of atoms, molecules, and matter can be scaled up to the realm of living organisms without changes other than in complexity of the systems and their behavior; equates energy to wealth, kinetic energy to cash, potential energy to property, and entropy to freedom; states that nature's goal is to minimize the free energy of the subsystem; and ends with the assignment of eight example homework problems (with clues). $F = E - Tk_B \ln W$
Michael Macrakis (1924-2001) Greek-born American mechanical-electrical engineer and physicist	1997	His *Scarcity's Ways: the Origins of Capital: a Critical Essay on Thermodynamics, Statistical Mechanics and Economics*, attempts to explain capital, scarcity, and value in terms of thermodynamics, with focus on measurement, and with excursions into evolutionary biology and the origin of life.
Charles Wynn (1967-) American physical chemist	1997	His JCE article "Heat Flow vs. Cash Flow: A Banking Analogy" (which inspired a similar follow up article by Evguenii Kozliak), equates one's money inside an ATM to potential energy in the form of a chemical system, according to which money withdrawal is considered as an exothermic reaction (exocash) and money deposit an endothermic reaction (endocash).
Ira Livingston (c.1960-) American cultural theorist	1997	His *Arrow of Chaos: Romanticism and Postmodernity* discusses the use of thermodynamics in literature, politics, and psychology, such as Sigmund Freud, Stuart Kauffman, and Michel Serres; contains a section of on the "Political Thermodynamics in Burke and Paine", in which he analyzes the late 18th century publications of Edmund Burke and Thomas Paine; coins obscure words, such as "politiothermodynamics", Freud's "thermopsychodynamics", among others.
Robert Clark (1940-) American political scientist	1997	His book *The Global Imperative* cites Herman Daly, Ilya Prigogine, James Beniger, etc., to argue that "entropy is inextricably linked to human values and thus is central to economic processes of production and consumption" and that dissipative structures models will help cities grow and prosper; his 2001 *Global Life Systems* expands on this model, citing Jeffrey Wicken and Colin Tudge.
Migene Gonzalez-Wippler (c.1950-) Puerto Rican cultural anthropologist turned new-age author	1997	Her book *What Happens After Death*, attempts to build a theory of death based on the first law of thermodynamics, albeit in the end digresses to conclude that there is a creative intelligence at work in the universe; likewise, her 1987 book *Kabbalah for the Modern World*, she uses thermodynamics and entropy to make a case for the existence of a creative force at work in the universe.
Nikos Salingaros (c.1949-) Australian-born American mathematician and architect	1997	Uses verbalized analogies, unitless thermodynamic variables, e.g. architectural entropy and architectural temperature, chaos theory, and complexity, outlining what he calls the "three laws of architectural order" geared to match building design with emotional comfort and beauty.
Erich Muller (1963-)		His "Human Societies: a Curious Application of Thermodynamics", outlined a version of integration and segregation thermodynamics of attractions and repulsions of human molecules,

Venezuelan-born English chemical engineer and thermodynamicist	1998	defined in terms of thermodynamic potentials, and was the prototype model article for the JHT; the Muller stability ratio and Muller dispersion force are named after him; in his thermodynamics lectures he is noted for his use of human molecular themed descriptions, drawing analogies between the behaviors of molecules and people, to explain concepts.
Satish Boregowda (c.1968-) American mechanical engineer	1998	His PhD dissertation *Thermodynamic Modeling and Analysis of Stress Responses*, attempts to quantify human stress thermodynamically, namely to use the second law to examine two types of stressors: thermal stress and mental stress; his 2005 article "Modeling of Human Physiological Stresses: A Thermodynamics-based Approach", co-written with Waldemar Karwowski, expands on this using Maxwell relations to develop formulas to quantify human stress due to the artifact-human interactions.
Richard Piccard (c.1947-) American physicist	1998	Intermittently, from 1998 to 2006, at Ohio University, taught a course called "Entropy and Society"; albeit based generally on barely-digestible entropy theories of Jeremy Rifkin.
Borisas Cimbleris (c.1938-) Brazilian nuclear engineer and thermodynamicist	1998	In his "Economy and Thermodynamics", in which attempts he defined money as the ability to make people work and hence money and its equivalents as a type of energy or capacity to produce work, which he says is the motive power of human action.
Gerard Nahum (1956-) American chemical engineer and physician	1998	Was presenting a 25-page "A Proposal for Testing the Energetics of Consciousness", in which consciousness, viewed as a type of residual negative entropy of the conserved mind, might survive death and $\int_{t_0}^{t} W(t)dt = \frac{g}{c^2}\left(\int_{t_0}^{t} E(t)dt + \int_{t_0}^{t} C(t)dt\right)$ in which the measure of the deceased consciousness would be quantified by an equation (shown), to various universities and international consciousness studies meetings, in order to gain $100,000 in funding for experimental testing of his theory; in 2005, theory was covered in Mary Roach's *Spook: Science Tackles the Afterlife;* published in JHT in 2010.
Bernard Beaudreau (1955-) Canadian economist	1998	His *Energy and Organization* attempts to pick up the work of Nicholas Georgescu (1971) and Matthias Ruth (1992) to outline a simple theory of production; expands on this slightly in his 2005 *Energy Rents*; his "Identity, Entropy, and Culture" (2006), toys with the notion of information entropy.
Jerome Heath (c.1940-) American information scientist	1998	His "Thermodynamics of Culture" attempts to apply energy and entropy to social science, albeit very superficially.
Robert Cross (c. 1950-) American financial theorist	1998	His *Revenue Management* outlines views on internal entropy and external entropy in companies.
William Dembski (1960-) American mathematician-theologian	1998	Noted for his articles and books in attempts to synthesize a information theory version of intelligent design on the theology of the Gospel of John using a fourth law of thermodynamics.

Edison Bittencourt (c.1948-) American-born Brazilian chemical engineer	1999	His engineering conference presentation “Teaching of Thermodynamics in Chemical Engineering” advocating the teaching of the thermodynamic imperative to chemical engineering students and defined living beings and ecosystems as "open, coherent, purposive, irreversible" systems (PICO systems); his 2011 “From Modern Thermodynamics to How Nature Works”, argues that societies, economies, and ecological aggregates are emergent ordered dissipative structures and that nonlinear irreversible thermodynamics is the key to understanding these structures, in particular the problem of sustainability.
Wayne Saslow (c. 1941-) American physicist	1999	His “An Economic Analogy to Thermodynamics”, $U = TS + W = \Psi + \lambda M + pN$ goes through a considerable, albeit mostly empty, derivation, wherein starts off with a 1980 study on the experimental findings of rat economic behaviors, then goes on to equates wealth *W* to negative Helmholtz free energy (-*F*), utility *U* to negative energy (-E), surplus *Ψ* to entropic energy (*TS*), price *p* to chemical potential, and number of goods *n* to number of chemical species crossing the boundary *N*; gives a thermodynamic-to-economic variables table, similar to James Reiss (1994).
Cutler Cleveland (c.1958-) American earth scientist	1999	His “Biophysical Economics: From Physiocracy to Ecological Economics and Industrial Ecology”, cites Sergei Podolinsky, Friedrich Engels, Wilhelm Ostwald, Frederick Soddy, Alfred Lotka, Nicholas Georgescu, etc., so to define “biophysical economics”; senior editor of *Encyclopedia of Energy* (2004), *Dictionary of Energy* (2009); main curator behind the online Energy Library (2007-2009) and the Encyclopedia of Earth (2006-), the latter of which has many economic thermodynamics articles.
Karlis Ullis (1959-) American sports medicine and anti-aging physician	1999	His chapter “The Critical Point and the Theory of Human Thermodynamics”, of his book *Age Right*, compares people to physiological engines or anabolic biomachines, outlining a thermodynamic human lifespan perspective, wherein he attempts to connect entropy to a critical point theory of a balance between anabolic and catabolic states.
Forbes Allan (c.1960-) American writer	1999	His novel *Milton's Progress*, refers to humans as “people are like particles, they behave in groups as if they were molecules in a test-tube” and has a chapter on human thermodynamics, where one of the characters, a Ilya Meiliakin, is themed on Ilya Prigogine.
Mladen Knezevic (c.1958-) Croatian sociologist-agriculturist	1999	His article “Some Possibilities on the Use of General Systems Theory and Thermodynamic Theory in the Development of Local Communities”, in which he theorizes on topics such as parental social work, social boundaries, entropy, as well as energy and potential energy drawn and used interpersonally.
Lawrence Chin (c.1969-) Chinese-born Canadian-American philosopher	1999	Began writing a thermodynamic-dissipation interpretation of history; in 2005, discussion with Libb Thims on his chapter “Power, the Second Law of Thermodynamics and the Problem of Evil”, stimulated the writing of the first article for the *Journal of Human Thermodynamics*.
Terrel Gallaway (c.1970-) American economist	1999	His *Encyclopedia of Political Economy* article “Entropy, Negentropy, and the Laws of Thermodynamics” overviews the use of thermodynamics in political economics.
Luciano Floridi (1964-) Italian philosopher	1999	Beginning with his “Entropy as Evil in Information Ethics” he culls from Norbert Wiener to argue that entropy, as a form of lost information, is a type of “natural evil” that can harm or destroy anything that anyone might value; penned four laws of information in the infosphere; speculates on entropy ethics.
Holmes Rolston (1932-) American religious	1999	Argues that "god as a countercurrent to entropy, a sort of biogravity that lures life upward."

philosopher-physicist		
Joseph Dewey (1945-) American newage spiritual philosopher	1999	His coil-bound booklet *The Molecular Relationship*, outlines a barely-readable newagey theory that can best be described as a mix of the Bible, relationship self-help, early 20th century energy vibration theories, energy chakra theory, all stitched together with a very crude chemical analogy model, with chapters on things such as romantic energy, sex energy, desire energy, etc., or how each person has different "units" of romantic energy, etc.

21th century HT pioneers | 2000+

The following is a chronological listing of individuals with human thermodynamics theories, ideas, and opinions professed in 2000 or later:

Pioneer	Date	Contribution
Josip Stepanic (1970-) Croatian physicist and mechanical engineer	2000	In his "Approach to a Quantitative Description of Social Systems Based on Thermodynamic Formalism", outlines a toy model of social systems in thermodynamic terms (equation shown), where $\tilde{U}$ is the internal energy, $\tilde{G}$ the Gibbs potential, $\tilde{T}$ the temperature, $\tilde{S}$ the entropy, where the tilde (~) means the quantities are social "analogous quantities" to actual thermodynamic potentials, and where the $\tilde{f}_i$ denote external factors (influencing the people of the system), which influence some of the social system characteristics $\tilde{x}_i$, upon which the internal energy depends; founded the journal *Interdisciplinary Description of Complex Systems* (2003); followup articles include: "Social Equivalent of Free Energy" (2004), "Social Free Energy of a Pareto-Like Resource Distribution" (2007), among others. $$\tilde{U} = \tilde{G} + \sum_i \tilde{f}_i \tilde{x}_i + \tilde{T}\tilde{S}$$
Jing Chen (c.1965-) Chinese-born, Canadian mathematical economist	2000	In his 2000 "Economic and Biological Evolution", argued that economic systems are as open dissipative systems, which need to extract negative entropy from the environment to compensate for continuous dissipation; in his "Universal Natural Law and Universal Human Behavior" (2002), he argued that just as are the "lower" needs of humans, such as eating, thermodynamic processes, so too are the "higher" needs, such as literature, good poems, and distinct paintings, which are rare events, characterized by high information content, which can be represented as a low entropy level and act as methods of attracting members of the opposite sex in the competition for reproduction; thus, the display of low entropy evolved as the universal signal of attractiveness in sexual and social communication; thus, he argues, from poem writing to money making, the pursuit of low entropy is the main drive of human behavior; followed this up with "An Entropy Theory of Psychology and its Implications to Behavioral Finance" (2003), *The Physical Foundations of Economics* (2005), and"Understanding Social Systems: A Free Energy Perspective" (2008), among others.
Valery Chalidze (1932-) Russian-born American mathematician and physicist	2000	His *Entropy Demystified: Potential Order, Life and Money*, cites Nicholas Georgescu, Malte Faber, Jeremy Rifkin, and Claude Shannon , etc., to extrapolate entropy into the social sciences, and argue that money is a purely energetic and low-entropic component of an economy, that human activity (the subject of economic study) is a local entropy lowering process; in his final section: "The Unpredictability of Will and Physics", he incorrigibly argues that "our will, which is informed energy, is capable of deviating from the prescriptions of physical laws."
Srdan Lelas (1939-2003) Indian science philosopher	2000	His *Science and Modernity* utilizes negative entropy ideas, Maxwell's demon, among others, to argue that life is a local violation of the second law.

Granville Sewell (c.1944-) American mathematician and intelligent design advocate	2000	Has published a number of essay, videos, and one book in which he argues that the four fundamental forces could never have synthesized humanity starting from the original conditions of atoms and subatomic particles in the state of the earth four to five billion years ago and that the 1946 "local entropy decrease" rebuttal as well as the "open system" rebuttal to the argument that thermodynamics violates evolution are both fallacious, as summarized in his 2010 *In the Beginning and Other Essays on Intelligent Design*.
Andrew McIntosh (c.1950-) English thermodynamics professor	2000	His *Genesis for Today*: *Relevance of the Creation-Evolution Debate to Today's Society* argues against the theory of evolution and promotes young earth creationism.
Philip Parker (1960-) American economist	2000	His *Physioeconomics*, attempts to explain latitude-based economic variations in terms of hypothalamic activity and a real simplified touch of thermodynamics.
Christopher Hirata (1983-) American physicist (IQ=225)	c.2000	In his "physics of relationships" he outlined a chemical thermodynamic model, using a variation of the Gibbs equation (equation shown) of how single and paired students form in a typical college student body during a single school year, showing how the equilibrium constant could change per various conditions; discussed concepts such as the gay molecule or polygamy molecule, etc. $-K_B T \ln K_{eq} = \Delta E + P\Delta V - T\Delta S$
David Hwang (c.1980-) American computational chemist	2001	His article "The Thermodynamics of Love" explains how one can determine whether or not any given male-female reaction is "favored" in terms of specific Gibbs free energy (equation shown), in which he makes one of the first reaction coordinates for a human chemical reaction. $G = H - TS$
Gavin Ritz (1959-) New Zealand civil engineer and business school professor	2001	In circa 1992 began theorizing on how to employ thermodynamic logic in business and social concerns; his 2001 conference presentation "Motivational Modelling" began to mention thermodynamical ideas, e.g. Ilya Prigogine, Stuart Kaufman, Nicholas Georgescu, etc., in his motivation work theory; his 2009 "The Fundamental Formula as Energy and Work" employed the relatively unknown human free energy theories of African chemist and physicist Adriaan de Lange to argue that a version of the Gibbs equation (shown), where F is Gibbs free energy, W is work, W_o is organical work done by living organisms (the product of *J*, mental exertion, and *T*, target time). $\Delta F < W_o + W$
Alfredo Infante (c.1960-) Peruvian chemical engineer	2001	His "Social Entropy: A Paradigmatic Approach of the Second Law of Thermodynamics to an Unusual Domain" uses advanced intelligence perspective to argue that the Gibbs free energy of a social system is the total energy in the system less the energy that is unavailable and that this difference represents the 'state' of the system. $G = H - TS$
Alf Hornborg (1954-) Swedish cultural anthropologist	2001	His *The Power of the Machine*, written over a period of ten-years, cites Erwin Schrodinger (1944), Leslie White (1959), Howard Odum (1971), Nicholas Georgescu (1971), Richard Adams (1975), Eugene Ruyle (1977), and Ilya Prigogine (1984), etc., to argue among other things that: "industrial infrastructure—whether a factory, an industrial city, or the global 'technomass'—must maintain an unequal exchange of free energy with its hinterland in order to survive"; discusses concepts such as the "thermodynamics of imperialism", "thermodynamics and the economy of order", the "exergy of hunter-gatherer societies", among others.
Claudia Rotondi (c.1969-) Italian political economist	2001	Her chapter "Competition and Economic Temperature: the Entropy Law in Emanuele Sella's Work" in which she revives the near-forgotten 1910 work on economic temperature and economic entropy of Italian economist Emanuele Sella.

Francisco Louca (1956-) Portuguese politician and economist	2001	His chapter “Particles or humans? Econometric Quarrels on Newtonian Mechanics and the Social Realm”, on human particle models and thermodynamics, discusses how the late 19th century wave of mechanical analogies met with considerable resistance from some of the more established economists.
David Christian (1946-) American-born English historian	2001	In 1989, began to develop an outline model on how to teach history over “long durations”, starting from the big bang; this culminated in 2001 in the teaching of “big history” at San Diego State University, and the 2003 book *Maps of Time: an Introduction to Big History*, which embeds various entropy and free energy explanations of life and civilization emergence, with loose connections to ideas on complexity.
Victor Sergeev (c.1943-) Russian physicist	2001	Noted for his article “A Thermodynamic Approach to Market Equilibrium”, and follow-up 2005 book by the same title.
Sean O'Reilly (c.1949-) American psychologist-philosopher	2001	His *How to Manage Your Dick*, outlines a Freudian-style energy psychology of how to use one's sexual energy productively, explained in terms of energy and entropy, mixed with bits of new age models and Greek philosophy.
Lynn Liss (c.1977-) American business strategist	2001	Early reviewer of drafts of Libb Thims’ unpublished human thermodynamics manuscripts (2001-2004) and his 2007 *Human Chemistry*; her 2005 JHT article “Human Thermodynamics and Business Efficiency” attempted to extrapolate thermodynamic models to the area of business consulting.
Evguenii Kozliak (c.1961-) Russian-born American physical chemist	2002	His JCE article “Energy and Money, Chemical Bonding as Business, and Negative ΔH and ΔG as Investment”, outlines a type of human thermodynamics education style of teaching, defining people as human atoms or human molecules and applies chemical thermodynamics, namely the Gibbs equation, to business (see: business thermodynamics), specifically as a way to facilitate the teaching of physical chemistry; possibly also outlining a human chemical bond theory. $\Delta G = \Delta H - T\Delta S$
Ingo Muller (1937-) German metallurgical physicist and thermodynamicist	2002	In his 2002 “Socio-thermodynamics: Integration and Segregation in a Population”, explains behaviors of a metaphorical population of hawks and doves using an extrapolation of logic from the thermodynamics of binary mixtures whose components mix at high temperature, but separate at low temperature exhibiting miscibility gaps; included an expanded chapter on this in his 2005 *Energy and Entropy*, in which he derives a first law, second law, and combined Gibbs equation (shown) of socio-thermodynamics, where *S* is the entropy, *U* the shortfall, *V* the volume (or habitat), *p* the "population pressure", and τ the homogeneous temperature inside the population; his 2007 *A History of Thermodynamics*, includes a section on “socio-thermodynamics”, in which he states that this "subject belongs more to the future of thermodynamics than to its history", and at present is struggling to be taken seriously. $dS = \frac{1}{\tau}(dU + pdV)$
Jack Hokikian (1945-) Egyptian-born American physicist	2002	His *The Science of Disorder* is a well-researched treatise on the use of thermodynamics in the humanities, discussing the works of many of the thinkers above.
Tor Nørretranders (1955-) Danish philosopher	2002	Conceived the thermodynamic depth theory, loosely translated as the thermodynamic measure of the unspoken signals associated with the energetic value and history of the cost of producing a given product, such as the peacock’s tail or a classic poem, and sexual attraction.
		His “twin universe theory”, first online in 2002, written while he was an atheist, attempts to reconcile the yin yang view of life and death, with the first and second law, on the logic that there exists a $S_U = S_{U+} + S_{U-}$

Leong Ying (c.1960-) Chinese-born American nuclear physicist	2002	second universe, energetically and entropically coupled to this one where entropy tends to a minimum, so to speak, loosely based on the matter-antimatter model, wherein particles can transfer between the two universes, based on the double slits, at absolute zero; in 2003, began to visualize god as a "single omnipotent consciousness", a bridge between science and faith; in 2007, published *Klystar*, a science fiction version of his theory; in 2010, began adding to this theory that the hypothesis that nuclear fusion is what is driving cosmological expansion; overall theory supposes that the soul exists.
Mark Blumberg (1961-) American biopsychologist	2002	His *Body Heat: Temperature and Life on Earth*, discusses how thermodynamics relates to sexual behavior and changes in body temperature; spends a good amount of time investigating the notion of "thermal words", such as exemplified by his chapter "The Heat of Passion".
Christian de Quincey (c.1955-) American philosopher	2002	His *Radical Nature*, attempts to update and synthesize the views of Henri Bergson (1907), Pierre Teilhard (1938), and Arthur Young (1976), to argue that conceptions such as consciousness, free will, and spirit (or soul) extend all the way down the evolutionary ladder to molecules, atoms, electrons, photons and beyond (presumably to the sub-atomic realm).
Steven Rosen (1955-) American Hindu studies author	2002	His book *Gita on the Green* discusses reincarnation, karma, soul, etc., in terms of energy and the first law; his 2007 book *Krishna's Song*, elaborates on how one's "actions (*karma*) and desires (*kama*)", might be explained in terms of quantums of energy and the first law.
Suma Varughese (c.1960-) Indian newage spiritual philosopher	2002	Stimulated, it seems, by James Lovelock, Morgan Peck, and Pierre Teilhard, has written at least two articles on Hinduism, entropy and the life force.
John Avery (1933-) Lebanese-born Danish physicist and theoretical chemist	2003	His *Information Theory and Evolution*, attempts to explain the phenomenon $\Delta S_{universe} = -\frac{\Delta G_{system}}{T}$ of life, including its origin, evolution, and human cultural evolution, in terms of thermodynamics, statistical mechanics, and information theory; arguing that the paradox between the disorder view of the second law and highly ordered complex living systems, has its resolution in the Gibbs free energy that enters the biosphere from outside sources; built on Erwin Schrodinger's infamous "turn the discussion toward free energy" addendum, by adding to it Gilbert Lewis' 1923 Gibbs free energy of formation model, Fritz Lipmann's 1941 free energy coupling theory and John Neumann's circa 1945 free energy automaton theory; was one of the reviewers for Libb Thims' *Human Chemistry* (2007) offering the intuitive suggestion that human molecules move along paths of minimum Gibbs free energy. Co-winner of the 1995 Nobel Peace Prize.
Babics Laszlo (1944-) Hungarian sociologist	2003	His "The Mechanics and Thermodynamics of Mass Societies" speculates on topics such as the volume of society (social volume), social acceleration due to gravity (social acceleration), and potential energy (social potential energy) and entropy of society (social entropy); makes an attempt at a calculation of a sociological version of Avogadro's number (social Avogadro number), which he calculates to be A = 60 individuals, as well as a sociological version of the Boltzmann constant (social Boltzmann constant).
Joseph McCauley (1943-) American physicist and econophysicist	2003	His article "Thermodynamic Analogies in Economics and Finance", argues that "real financial markets cannot behave thermodynamically", his reason being that "financial markets are unstable, they do not approach statistical equilibrium, nor are there any available topological invariants on which to base a purely formal statistical mechanics"; his 2004 econophysics book *Dynamics of Markets: Econophysics and Finance*, has a section entitled "Why Thermodynamics Analogies Fail", in which he uses the Legendre transform to argue that formal thermodynamic analogies will always fail when trying to

describe economic behavior.

Robert Doyle (1936-) American physicist and philosopher	2003	His 2003-launched site InformationPhilosopher.com is thematically-similar to Hmolpedia in regards to hosting biographies on the overlap statistical thermodynamics, quantum mechanics, and philosophy in regards to formulating a semi-materialistic theory of information that connects the creation process of the universe with a belief in the existence of human free will; a summary of this is outlined in his 2011 book *Free Will: the Scandal in Philosophy*, which attempts to grapple with the second law, determinism, and the wave function collapse.
Gilbert Wedekind (c.1946-) American thermodynamics professor, engineer, and pastor	2003	His book *Spiritual Entropy* attempts to explain what the second law has to say about the social, moral, and spiritual realms; he seems to advocate both creationism and intelligent design.
Francisco Téllez (c. 1980-) Chilean psychologist	2003	His article "Transorgasmic Sexuality" outlines a psychodynamic theory of a reversible, mini-reaction, type of heightened sex.
Attila Grandpierre (c.1950-) Hungarian astrophysicist	2004	His "Entropy and Information of Human Organisms and the Nature of Life" claims to be the first publication of the calculate the entropy content of a human being (human entropy); his 2007 "Thermodynamic Measure for Nonequilibrium Processes", co-authored with Katalin Martinas, attempts to use the "extropy" concept to for formulate a new second law for non-equilibrium conditions, biological or otherwise.
Eann Patterson (c.1955-) English mechanical engineer	2004	In *The Entropy Vector: Connecting Business and Science*, co-authored with Robert Handscombe, they argue that to learn to manage and control change (social, technical, and business) one must obtain a better grasp of science, in particular energy and entropy; the book seems to be very thermodynamical, with chapters on "natural philosophy and business", "life the universe and entropy", "energy and entropy", "time and entropy", "managing disorder", "creativity and innovation", "risk and entropy", "mental entropy", "entropy tradeoffs", etc.; dominate terms and people used include: Nicholas Georgescu, Leon Brillouin, Stephen Hawking, Rudolf Clausius, Maxwell's demon, and interestingly free energy; Patterson currently is chair of mechanical engineering at Michigan State University.
Robert Handscombe (c.1955-) English engineer and business management professor	2004	Co-author with Eann Patterson of *The Entropy Vector: Connecting Business and Science*.
Mazyar Lotfalian (c.1969-) American cultural anthropologist	2004	His *Islam, Technoscientific Identities, and the Culture of Curiosity*, contains chapter section entitled "Thermodynamics as a Model" in which he critiques the use of thermodynamics to explain and model culture and humanity by Mehdi Bazargan, in larger part, and his 1956 *Thermodynamics of Humanity*, and Michel Serres, Thomas Pynchon, Sigmund Freud, Max Weber, among others; grapples with questions such as "how would thermodynamics affect the debunking of faith and knowledge?" or "how does Bazargan use thermodynamics to theorize about the role of morality in everyday life?"
Tominaga Keii (1920-2009) Japanese chemical engineer and chemical thermodynamicist	2004	In his chapter two, Thermodynamics of Chemical Reactions, devotes a section to "Chemical Affinity in 1806", wherein he quotes several paragraphs of Goethe's 1809 *Elective Affinities*, to only conclude, in the end, that "it did not add any scientific value."
Charles Hansen (1943-) American engineer and business economist	2004	His *Technology of Love* attempts to define "love" in scientific formalism, in part using entropy, anti-entropy, and thermodynamics logic; is mixed up with religious diatribe: Jesus is mentioned on the backcover, believes that the spirit of the human system runs on energy, etc.

Patrick Ezepue (c.1965-) Nigerian-born English social statistician	2004	Has been working out a "human thermodynamics" (his term usage) quantitative model for educational businesses, in which what he calls the soft mathematical "state equations" quantify the movement of a student, productively and creatively, through the university and eventually, as a professional, through the corporate academic model, who sell their intellectual work as a business.
Dimitris Keranis (1948-) Greek lawyer and social-economist	2005	In his essay "Human Values and the Second Law of Thermodynamics", he argues that human purposeful action can be quantified formulaically, using the Gibbs function (as shown), $G = H - TS$, arguing that energy and entropy are the two opposing forces involved in nature's tendency to organize itself through the production of work and the associated acts that are responsible for the flow of energy in social systems, of which economic activity is central aspect and in which intellectual actions, such as speech, scientific productions, poetry, and literary, etc., translate into "value flows" in the social systems, reflecting the tendency of systems toward equilibrium, through the dispersal of wealth, income redistribution, and decentralization of power, etc.; of which he argues, the flow of economic acts and value acts are captured in Xenophon Zolotas' 1981 economic and social welfare growth function.
Stefan Pohl-Valero (c.1977-) Spanish mechanical engineer and social thermodynamicist	2005	Gave a workshop talk (Third Milan Workshop on the Physical Sciences in the Third World) on "The 'Morality' of Thermodynamics: the Controversy of its Laws in a New Public Sphere, Spain 1868-1880"; his 2007 PhD dissertation "The Circulation of Energy: Thermodynamics, National Culture, and Social Progress in Spain, 1868-1890" builds on the work of Crosbie Smith and Greg Myers to discuss how William Thomson, Balfour Stewart, Peter Tait, and Thomas Huxley, etc., applied and used thermodynamics to theorize about humanist implications; recent articles include: "The Communication of Thermodynamics: Physical Culture and Power in Spain in the Second Half of the Nineteenth Century" (2009), "Thermodynamics, Social Thought, and Biopolitics in the Spain of the Restoration" (2010), and "Energy, Entropy, and Religion: A Historical Review" (2010), the latter co-written with Favio Vitery.
Eric Smith (c.1965-) American physicist	2005	Has been working, for three years, at the Santa Fe Institute, on the application of thermodynamics in economics, the economic version of Helmholtz free energy, entropy, the entropies of economic agents, similar to that done in the Lausanne school.
Christopher Southgate (1953-) English biochemist and theologian	2005	In 1993, began teaching a course on the science-religion debate; his 2005 book *God, Humanity, and the Cosmos* discusses the thermodynamic eschatology views of Robert Russell (1984); his 2008 book *The Groaning of Creation: God, Evolution, and the Problem of Evil*, speculates on evil in thermodynamic terms; he cites Ted Peters (1993), among others.
Paul Strassmann (c. 1925-) Czechoslovakian-born American electrical engineer and business management theorist	2005	His lecture "Information Management and Organizational Entropy" argues that the "issue of information management" is all about Shannon entropy and Clausius entropy, which he seems to convolute as the same thing; his 2007 book *The Economics of Corporate Information Systems*, argues that the structure of the tooth-to-tail ratio of an organization, "tooth" being the employees at the front end of the company "tail" being the overhead staff, middle managers, support structure, etc., the tail is "always the source of disorder", representing a loss of useful energy (available energy), and thus the focal location of the second law at work within companies.
Andrei Khrennikov (1958-) Russian-born Swedish applied mathematician	2005	His "Financial Heat Machine", cites John Neumann, Marc Lichnerowicz, Borisas Cimbleris, Joseph McCauley, etc., and models financial markets from the point of view of phenomenological thermodynamics, describe a financial Carnot cycle, and argue that an economic perpetual mobile is possible "under some conditions"; discusses the "boiling of the financial market", the "heating of expectations", etc.

Yuji Aruka (c. 1950-) Japanese economist	2005	His “Carnot Process of Wealth Distribution” and 2006 “An Evolutionary Theory of Economic Interaction: Introduction to Socio- and Econo-Physics”, both co-written with Jurgen Mimkes, employ concepts such as social temperature, a Carnot theory of wealth, in econophysics / sociophysics.
Alastair Jenkins (c.1952-) Danish atmospheric physicist	2005	His “Thermodynamics and Economics” gives a decent historical overview of thermodynamics, then concludes with an attempt to apply Edwin Jaynes’ 1957 maximum entropy production theory to model economic processes.
Terry Bynum (c. 1938-) American philosopher	2005	His “Entropy and Purpose in Human Life”, culls from Norbert Weiner, to discuss the impact of the internet and morality.
Mary Roach (c.1968-) American writer	2005	In her book *Spook: Science Tackles the Afterlife*, she devotes 10-pages to thermodynamics, in which she defines a "soul theorist", e.g. Gerard Nahum, as one who uses physics, chemistry, information theory, and thermodynamics to study the soul.
John Sanford (1950-) American plant geneticist	2005	His book barely-readable book *Genetic Entropy*, promotes the concept of "genetic entropy" in aims to reconcile the Bible with evolution.
Robert Kenoun (1950-) Iranian-born American materials scientist and metallurgical-electrical engineer	2006	His *A Proposition to Theory of History and Social Evolution* outlines a semi-approximate thermodynamics system-based view of social change (social internal energy minimization theory), using a logic of hierarchical systems embedded within systems and a type of social energy “coupling” theory.
Mark Janes (1973-) English chemical engineering student turned biotechnologist	2006	His carbon entromorphology $\Delta G = \Delta H - T\Delta S$ theory is a human atom based scheme, which considers the human being to be a ‘type of gigantic carbon atom’ (Mr. Carbon Atom), and uses aspects of thermodynamics, particle physics, and the atomic model logic (molecular orbital theory) to explain facets of humanity; an example being his “soulatrophic” model of morality, in which state of humanity is positied to be evolving to a future iron-like orbital structure of stability (similar to Pierre Teilhard’s omega point theory).
Peter Pogany (c.1939-) Hungarian-born American economist	2006	His *Rethinking the World* argues that “culture may be regarded as a thermodynamics system [where] the world’s economic and commercial activities may be reduced to the simple definition of organized molecular structures creating, maintaining, operating, discarding, and reusing other organized molecular structures; [and] cultural evolution is subject to the laws of thermodynamics”; on humans he employs a human molecule viewpoint: “accumulated knowledge suggests that humans are billions of highly evolved, overgrown super-molecules that swarm in ever larger numbers on a piece of rock that wobbles, spins, revolves, and soars into nothingness at break-neck speed with an agitated, burning furnace in its interior”; his 2009 conference talk: “Observations Through the Thermodynamic Lens of World History” expands on these ideas.
Harold Leonard (c.1926-) American chemist	2006	His 2006 *Journal of Chemical Education* letter “Chemical Thermodynamics in the Real World”, wherein that we should begin to use Frederick Rossini’s 1971 chemical thermodynamics based model of political thermodynamics to help society understand the relation between freedom and security in a 9/11 world, sparked the “heated” Rossini-Leonard-Wojcik debate.
John Wojcik (1938-) American physical chemist	2006	In the Rossini debate, sent in an rebuttal letter to the *Journal of Chemical Education*, arguing that there is great “danger” in the use of “anthropomorphism in chemistry” in that some may “come to believe that there is substance in them”; moreover: “worst of all, there is the danger that chemical thermodynamics will have ascribed to it a power that it simply does

		not have, namely, the power to 'explain' the human condition.”
Todd Silverstein (c.1954-) American chemist	2006	His response letter “State Functions vs State Governments” argued in defense of the use of chemical thermodynamics to explain or study human freedom and security, commenting that: “I do not agree that such ‘loose thinking’ should be ‘purged’ from science altogether”, as Wojcik suggests.
Adrian Bejan (1948-) Romanian-born American mechanical engineer	2006	His articles, e.g. “Constructing Animal Locomotion from New Thermodynamics Theory” (2006), and books, e.g. *Constructal Theory of Social Dynamics* (2007), have been attempting to outline a constructal theory of social dynamics, where society is seen as a live “flow system” (e.g. a river basin, vascularized tissue, city traffic).
John Patrick (c.1950-) American civil engineer and architect	2006	His unified theory of evolution incorporates aspects of QED and thermodynamics to argue that God created the universe, which operates according to physical laws.
Tullio Scrimali (1952-) Italian psychiatrist	2006	His *Entropy of Mind and Negative Entropy*, attempts to explain schizophrenia and outline treatment methods, using a mixture of negative entropy, complexity theory, Prigoginean thermodynamics, dissipative structures, information theory, chaos theory, systems theory, cybernetics, among others.
Eric Beinhocker (c. 1968-) American-born English business economist	2006	His *The Origin of Wealth* includes a chapter wealth defined as “fit order”, in which he attempts to integrate the work of Nicholas Georgescu (1971) together with evolution and the concept of survival of the fittest; mixed together with bits of complexity theory and information theory.
DMR Sekhar (1952-) Indian chemical engineer and mineral engineer	2006	Developed a “genopsych” anti-entropy type theory, which argues that DNA is a self-programming conscious entity, inside of which exists a special extensive conscious ordering force or property, which is god or part of god, is undying and non-physical (i.e. soul), that runs counter to entropy and gives rise to and directs biological evolution.
Manuel De Landa (1952-) Mexican-born American philosopher	2006	Outlined an "intensive" properties based philosophy.
Leland Gilsen (c.1945-) American anthropologist	2006	Outlined a computer simulation theory of culture modeled as a thermodynamic machine.
Andrew Morrow (1961-) American chemical engineer and computer programmer	2006	Developed a mosaic of atoms with a mind thermodynamic philosophy; since 2020 has been working on a population control advocating manuscript *Thermostat for Thermonuclear War*, which he hosts at Thermo4Thermo.org.
Marguerite Callaway (1950-) American business consultant	2006	Her *The Energetics of Business* cites Carl Jung, Mihály Csíkszentmihályi, Rupert Sheldrake, etc., to outline a newage-type of “business energetics” model, crouched on the idea that there exists a “living energy” in the universe, that energy fields envelope the human body, etc.
Wayne Angel (1945-) American physicist and computer scientist	2007	In his online book *Theory of Society* he employs Herbert Callen’s 1960 *Thermodynamics* to outline an equation-rich subject he calls “relation thermodynamics” (thermodynamics formalism to human relation dynamics), defined as the study of macroscopic consequences of myriads of individual actions on the interdependence coordinates within human relation systems, whereby due to statistical averaging do not appear in the macroscopic description of systems; he employs terms such as “relation energy”, i.e. the internal relation kinetic energy of a human system is determined by the rate of change of relationships between entities, “relation temperature” (which he says can be measured using the Carnot efficiency equation); outlines a type of coupling theory (similar to Robert Kenoun’s 2006 social internal energy minimization theory), where human systems are said to be able to transfer some of its internal relation energy to other human systems, thereby doing relation

		work on other human systems, "relation heat", relation heat transfer, among other interesting derivation; the entire discourse seems interestingly to be of an original variety derived straight from Callen's version of thermodynamics.
John Schmitz (c.1950-) Danish chemist	2007	His 1980 PhD was "Thermodynamic and Activation Parameters of Redox Reactions of Transistion Metal Coordination Complexes"; his 2007 *The Second Law of Life* discusses how entropy is used in fields including history, sociology, economics, art, ecology, and religion; contains a schematic of the changes of values of human entropy (entropy of a human) over a lifespan.
Octavian Ksenzhek (c.1945-) Russian bioelectrochemist	2007	His *Money: Virtual Energy: Economy through the Prism of Thermodynamics*, builds on the work of Herbert Spencer, Vilfredo Pareto, and Frederick Soddy; defines an economy as a very large and complicated system, people being the 'molecules' of which its consists; defines "energy coupling" in social systems as being mediated mainly through materialized forms of energy.
Angelo Letizia (c.1975-) American philosopher	2007	His *The Battle for Existence* attempts to answer Gottfried Leibniz's famous question "why does the universe exist?" in thermodynamic and entropy terms, utilizing ideas on entropy ethics.
Viktor Minkin (c.1960-) Russian biometrist	2007	In 2007, began communicating with Libb Thims in aims to incorporate human thermodynamics models (entropy measurements of emotions) in to a theory of finger printing and vibrational imaging; his 2008 "Application of Vibraimage Technology and System for Analysis of Motor Activity and Study of Functional State of Human Body" incorporates some of this discussion; in 2009, incorporated some of this logic into the launching of the site PsyMaker.com, which claims to facilitate: recognition of emotions of visitors, couple compatibility matching, among others.
David Weir (c. 1950-) American comparative literature theorist	2007	His *Decadent Culture in the United States* situates the cyclical rises and falls of decadence in the US at the turn of the 20th century in the context of Brooks Adams 1895 theory of energy and entropy acting on civilization, in the form of expansions and contractions.
Richard Rudd (1967-) American newage spiritual philosopher	2007	His article "Human Thermodynamics: the 'Great Niggle' and How to Get Rich Slowly", speculates on the three laws applied to humans; topics including: energy flow, evolution, purpose, activation energy, the energy of good will, and the hidden energy of the universe.
David Alkek (c.1931-) American dermatologist	2007	His *The Self-Creating Universe* attempts to explain existence, morality, ethics, and purpose, origin of consciousness (or soul), using Pierre Teilhard's theory of complexification and Paul Davies' idea of self-development and reverse entropy, among others.
Satch Ejike (c.1957-) African-born American lawyer and social scientist	2008	His *Find a Good Man and Keep Him*, uses Libb Thims' *Human Chemistry* (2007) as the framework for his section the "Physics of Attraction" to explain how relationship interactions and bondings are the result of interactions of photons and electrons whose operations are governed by thermodynamics.
Dean Hamden (c.1950-) American physicist	2008	Has been conducting a four-year human physics study based of 500 individuals as to be summarized in his 2012 book His *The Physics of Human Behavior*, which contains a third chapter on an "exploration of the laws of thermodynamics and entropy to learn how one can keep one's relationship healthy and how to assess the suitability of an intended mate."
Antoine Bousquet (c.1974-) English complexity theory economist	2008	His *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity* has a chapter on "thermodynamic warfare" (war thermodynamics) and the science of energy.
Helge Kragh (1944-) Danish science historian	2008	His *Entropic Creation: Religious Contexts of Thermodynamics and Cosmology*, gives a detailed history of the extensive use of entropy and thermodynamics in religion, e.g. the entropic proof of god's existence.

Barkley Rosser (1948-) American mathematical economist	2008	His "Debating the Role of Econophysics" is a critique of the use of physics concepts, such as entropy, thermodynamics, chaos theory, complexity theory, in economics (in the form of econophysics), touching on the work of Georg Helm (1887), Leon Winiarski (1900), Alfred Lotka (1925), Harold Davis (1941), Paul Samuelson (1990), the relatively unknown American economist Julius Davidson, among others.
Brian Schill (c.1960-) American physicist and paranormal investigator	2008	His book *Stalking Darkness*, attempts to explain death and ghosts in terms of thermodynamics and released bioelectric fields; in the context of the first two laws, but argues to explain the theory of 'cold spots', or anomalous regions of energy absorption, supposedly left by ghosts, in terms of the third law of thermodynamics.
Richard Hughes (c.1955-) American mechanical engineer and government and politics theorist	2008	Taught a course on the thermodynamics of government (government thermodynamics) and politics (political thermodynamics), at California State University.
Sergio Franzese (1963-2010) Italian moral philosopher	2008	His *The Ethics of Energy: William James' Moral Philosophy in Focus* recounts William James' ethical energy (reserve energy) views in the context of the growing counter tendency of Darwinism framed against the "pessimistic ideologies of social entropy"; the book has a religious tinge, ending with Balfour Stewart and Peter Tait's unseen universe model, speaking about God being real and associated with the energy humans get from divine experience, etc.
John Correia (c.1950-) American biochemist	2008	Considered a proposal (Mar 18), by American chemical engineer Libb Thims, to give a presentation on the "thermodynamics of human molecules", at the annual Gibbs Conference on Biothermodynamics (focused that year on molecular thermodynamics), to be "a joke".
James Sandham (c.1984-) Canadian writer	2008	Wrote novel *The Entropy of Aaron Rosclatt*, the summary of which is that "we are all inevitably subject to the slow slide into entropy".
Claes Johnson (1943-) Swedish mathematician	2008	Outlined a computational thermodynamics view of emergence of life forms and humans.
Thomas Wallace (c.1937-) American physical chemist	2009	His book *Wealth, Energy, and Human Values*, applies the basics of physical chemistry and chemical thermodynamics, in particular the Gibbs equation (adjacent), to the modeling of the rise and fall of civilizations, in what he considers a 'mechanistic-thermodynamic paradigm'; contains a good appendix on "The Fundamentals of Thermodynamics Applied to Socioeconomics", which outlines a decent reaction coordinate depicted initial state / final state view of mechanism-based society reaction processes. $\Delta G = \Delta H - T\Delta S$
Surya Pati (1983-) Indian chemist and business management theorist	2009	Explain how single people with higher Gibbs free energy (adjacent equation) are "more restless" and thus resultantly tend to form a bond with another person to "stabilize" themselves; also speculates on how activation energy, entropy, and enthalpy apply to human relationships. $G = H - TS$
Yuri Tarnopolsky (1936-) Russian-born American organic chemist	2009	His ebook *Introduction to Pattern Chemistry*, on the subject of what he calls "econochemistry", builds on a number of previously written 55 or so essays (2001-2008), he outlines a "chemistry on the human scale" model of society and economy, arguing, using Greek philosopher Lucretius's atomic theory as a basis, that an "economy is an assembly, separation, and rearrangement of atoms and molecules," and that transitions such as the transformation of Russia from absolute monarchy to constitutional monarchy (1905) to republic (1917) to totalitarian (1936) to chaotic democracy (1991) to opaque authoritarian (2000) is the story of a system consisting of "essentially the same atomic human entities (his term for human molecule)" undergoing a type of chemical isomerization, similar to when propyl alcohol molecule isomers to methyl ethyl ether molecule.

		Tarnopolsky speculates on the thermodynamics of these types of processes, on things such as social temperature (which he equates to social freedom), activation energy in relation to money, among other topics.
Victor Maslov (c.1936-) Russian mathematical physicist	2009	His "Similarity Laws in Thermodynamics", argues that we should begin to "move from the general statistical laws for molecules to jurisprudence and the elaboration of laws in human society. Here the matter concerns the origin of social laws based on the same principles of natural selection which annihilates biological communities when their entropy decreases"; his 2010 "Thermoeconomics of Russia", employs the work of Georgi Gladyshev (1997), Wayne Saslow (1999), Libb Thims (2002), among others, to begin to use "Feynman diagrams of collisions and creations of separate particles, as well as collisions and interactions of market goods transferred into money" so to "combine this into general laws of thermodynamics of fluids dealing with few variables."
Yi-Fang Chang (1947-) Chinese particle physicist	2009	His "Social Synergetics, Social Physics, and Research of Fundamental Laws in Social Complex Systems" attempts to formulate social thermodynamics equations and theorize on concepts such as social temperature.
Gregory Botanes (c.1965-) Spanish telecommunications engineering and business theorist	2009	Founded (with Alberto Hernando) the thermodynamics-based business consulting company Social Thermodynamics Applied Research (SThAR), anchored at SocialThermodynamics.org, which employs a mix of subjects (mostly human physics theories) including Zipf's law, the Dunbar number, six degrees of separation, Shannon information, MaxEnt theory, and Fisher information, etc., to consult, predict, and guide business operations and social change, similar to how chemistry and physics is used to "predict" chemical and physical change.
Alberto Hernando (1981-) Spanish physicist	2009	Co-founder (with Gregory Botanes) of thermodynamics-based business consulting company Social Thermodynamics Applied Research (SThAR); his 2009 article "Fisher-information and the Thermodynamics of Scale-invariant Systems" in which he and his associates, supposedly, "confirm analogy between properties of social systems (such as electoral results, city populations, citations in physics journals) and the thermodynamics of gases and liquids", which thus forms the basis of his theory of social thermodynamics; is described (incorrectly) by them as the "father of social thermodynamics".
Tanya Maslova (1979-) Russian economist	2009	Introduced the subject of 'thermolinguistics' or the thermodynamics of language, concepts such as the energy or temperature of a text, the entropy of languages, isotherms of a text, etc.; her 2010 "Thermolinguistics and Human Thermodynamics", employs the work of Libb Thims, and speculates on how pair-wise chemical potential between entities, such as people, or plants in field, in the form of attractions and repulsions, may find explanation in the statistical mechanics work of Russian physicist Nikolay Bogolyubov.
Margherita Long (c.1967-) American comparative literature scholar	2009	Her *This Perversion Called Love* has a chapter (a mixture of literature thermodynamics and psychological thermodynamics) on the thermodynamics theories of Sigmund Freud, the writings Sato Haruo, among others; concludes with discussion of Junichiro Tanizaki in the context of the Freudian psychodynamics and the first and second.
Arthur Jonath (1931-) American aeronautics engineer	2009	In his "Saving Capitalism from Finance: the Power of Thermoeconomics", co-written with psychologist Richard Goldwater, promoted at ProfitAndEntropy.com, argues that "entropy is an idea that applies to populations of humans as well as of molecules"; in his video "Isomorphism, Entropy, and God", on isomorphisms argues that the entropy principle is a replacement for god.
Dickey Eason (c. 1965-)		His *The Impacts Dynamic* attempts uses an energy dispersal view of the second law viewed as a driving force for both society and the universe; extrapolates

American social dynamics theorist	2009	protons bonding with electrons up to the human-human interaction scale, to explain how male and females find stability in their bonding as a sort of needed energy.
Len Fisher (1942-) Australian-born English chemist, physicist, biologist, and philosopher	2009	Adheres to the Prigoginean view, arguing that humans and society, as advanced types of Bénard cells, exist constantly at the edge of chaos.
Robert Fogel (1926-) American economic historian and scientist	2009	Commented "much of this [economic] gain was due to improvement in human thermodynamic efficiency. The rate of converting human energy input into work output appears to have increased by about 50 percent since 1790"; winner of 1993 Nobel Prize in economics.
Philip Moriarty (c.1965-) Irish thermal and nanomolecular physicist	2009	Central objector in the Moriarty-Thims debate, argued in video interview that arrangements of students socializing in a field cannot be defined by a thermodynamic entropy; considers Libb Thims' assertion that thermodynamic principles can be applied to 'human molecules' to be "flawed" and pseudoscience; views the idea of 'sexual heat' to be something of a humorous fairly tail, a subject not germane to discussions in modern hard science and thermodynamics.
Jose-Manuel Rey (c.1975-) Spanish mathematical economist	2010	His "A Mathematical Model of Sentimental Dynamics Accounting for Marital Dissolution", builds on the work of John Gottman, to attempt to formulaically and graphically explain marital dissolution using a metaphorical version of the second law to indicate that "indicate that the feeling of attachment in a relationship 'cools down' (thermal word) as time evolves—unless energy in form of effort is supplied to keep things alive."
Barri Gold (1966-) American English professor	2010	Her book *ThermoPoetics* outlines the usage and interaction of energy theories, thermodynamics, and heat engine models in the themes of Victorian literature.
Toralf Zschau (c.1975-) German-born American biologist and sociologist	2010	His PhD dissertation "The Authoritarian Cosmos: Complexity, Elective Affinities, and the 'Thermodynamics' of Self" uses Max Weber's elective affinities as a framework for tackling Orwellian-type dystopia phenomena; the work, however, has almost no thermodynamic content.
Adrian Hough (c.1958-) English physical chemist and priest	2010	His *The Flaw in the Universe* attempts to explain both sin and natural disaster in terms of the second law.
Dorothy Sherrill (c.1940-) American nurse	2010	Her booklet *Thermodynamics: the Secret Life of Heat*, attempts, through mostly autobiography, to explain subjects concerning extrasensory perception, e.g. death, ghosts, remote sensing, male energy, female energy, emotion, etc., using sparse bits of thermodynamics terminology, mostly concerning sensory perception as a form of heat radiation.
Bogdan Anghel (1984-) Romanian electronic music producer	2010	Produced the electronic music EP *Human Thermodynamics*, with the tracks 1. Pressure correlations (themed on the gas laws); 2. Phase transition (themed on phase transitions topics, e.g. Gibbs phase rule, enthalpy of vaporization, etc.); 3. Aerospace race (themed on human molecules flying or racing about like gas molecules); 4. Transport phenomena (themed on heat or mass transport of humans; with a cover art depicting futuristic humans flying about like semi-attached gas particles over the surface of a futuristic HumanThermodynamics.com like earth.
Sean Carroll (1966-) American astrophysicist	2010	His *From Eternity to Here*, attempts to outline a synthesis of his views on the big bang, relativity, entropy, universal expansion, human existence, purpose, and time.
		Believes that Christopher Hirata's 2000 theory of human thermodynamics of

Lubos Motl (1973-) Czech-American theoretical physicist (string theory) and black hole thermodynamicist	2010	mating reactions in college student bodies is “a joke”, not to be taken seriously; that the “thermodynamics of human relationships is bullcrap”; that it is “blatant absurdity” to try “to model theï»¿ laws governing human relationships using the rules of thermodynamics, a set of rules that only apply at a molecular level”; that “human beings are NOT molecules, they are composed of molecules”; that people “aren't giant molecules”; that human relationships are governed mostly by human psychology” (not thermodynamics); that one must be “senile or crazy to believe this nonsense”.
Ryan Grannell (c.1991-) Irish biochemistry student	2011	Spent a month blogging to explain how human chemistry and human thermodynamics are "bulls**t" subjects, “junk science”, and a horrendous analogy; believes that “humanï»¿ behavior is more complex than something that can be modeled with a couple of thermodynamic equations."; considers the human chemical reaction model "A + B → AB" to be a "pretentious way of stating something we already know; it tells us absolutely nothing new”; views Johann Goethe’s 1799 human elective affinities model of existence is a “nutty theory”; considers Libb Thims’ 2011 thermodynamic proof that good always triumphs over evil to be nothing but “calculus coated woo, hidden behind a smokescreen of rhetorical mathematics”; believes that enthalpy has nothing to do with the sexual heat of physical attraction, among other objections.
Mohsen Mohsen-Nia (1958-) Iranian-born American chemical engineer	2011	His JHT article “A Thermodynamic Methodology for Evaluating Friendship Relations Stability”, co-authored with Iranians human scientist F. Arfaei, thermodynamicist H. Amiri, and computer engineer A. Mohsen Nia, present the results of a small relationship study, of different pairings of male and female co-workers, in which they discuss the results in energetic terms and attempt to explain interhuman relationship potential modeled on the Lennard–Jones potential (shown). $\phi(r) = 4\epsilon\left[\left(\frac{\sigma}{r}\right)^{12} - \left(\frac{\sigma}{r}\right)^{6}\right]$
James Ferri (c.1960-) American chemical engineer	2011	Initiated and supervised the engineering student-produced video “Thermodynamics of Life: Occupy Wall Street Edition”, made by Angela Wnek (ChBE, 2013), Isaac Lavine (ChBe, 2014), Ashley Kaminski (ChBE, 2013), which applied a number of different molecular, physical chemistry, and chemical engineering principles to the ongoing “Occupy Wall Street” protests, and used equations such as Calvin equation, the Ostwald equation (shown), etc., to explain the Pareto principle, i.e. the 80-20 rule for the division of wealth in a society. $\langle R\rangle^3 - \langle R\rangle_0^3 = \frac{8\gamma c_\infty v^2 D}{9R_g T}t$
Charles Hall (c.1943-) American systems ecologist	2011	His book *Energy and the Wealth of Nations: Understanding the Biophysical Economy*, co-written with Kent Kiltgaard, attempts to outline, thermodynamically, how the first law and second law, should be integrated into economic policy, albeit in what might be called the Roegen-Daly school of thought on entropy, i.e. the view of Nicholas Georgescu and his student Herman Daly, namely the very tenable view that entropy, in economic terms, equates to “value lost to waste”, and that this explains pollution, resource scarcity, unemployment, and depletion.
Kent Kiltgaard (date-) American economist	2011	Co-author with Charles Hall.

See also

â— HC pioneers (70+)
â— HP pioneers (20+)
â— HMS pioneers (120+)
â— HM pioneers (5+)
â— Thermodynamics pioneers (40+)

â— Human thermodynamics (objections to)
â— Human chemistry (objections to)
â— Human physics (objections to)
â— Human mathematics (objections to)

â— Libb Thims (attack)
â— Detractors

Note

Some individuals are listed in duplicate (or triplicate, in a few cases) on this page and the HC pioneers, HP pioneers, and HMS pioneers pages, depending on if the individual made contributions in either chemistry, physics, thermodynamics, or hmol science in general.

θΔics

In hmol science, **HT pioneers**, pioneers of human thermodynamics, are those scientists and writers, as listed below, who over the last two-hundred years have contributed theory and logic to the understanding of the thermodynamics of human existence.

This page is being moved, and re-listed in chronological order, to the HT pioneers page.

See also

â— Founders of human chemistry
â— Founders of thermodynamics

References

1. (a) Lewis, Gilbert and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances*, (pg. x). McGraw-Hill.
(b) Cavazox-Gaither A.E. (2002). *Chemically Speaking: A Dictionary of Quotations*, (section: “Thermodynamics”, pg. 428). CRC Press.

θΔics

In symbols, **Hu** is a chemical letter (or chemical alphabet) stylized shorthand for one human, conceived as a "human element", aka "The Human Element", as Dow Chemical popularized the symbol in a series of 2006 launched commercials, or one human molecule, depending.

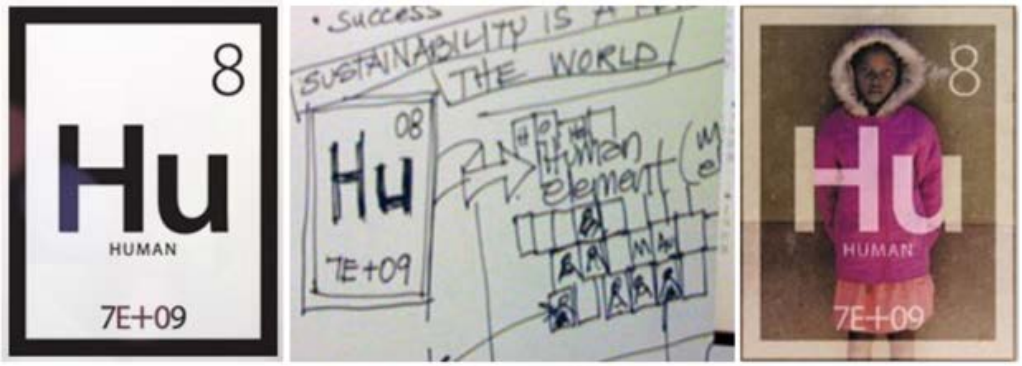

Some depictions of the symbol **Hu** short for the "human element", Hu being short for "human", 7E+9 short for 7 billion humans, the 2006 population of the humans, and the number 8 or 10 being the generalized periodic table element number location of the element that comprise one human, namely carbon 6, nitrogen 7, oxygen 8, or sometimes the number 10, the element number of Neon, is seen in advertisements, although, to note, neon is not part of the elemental composition of one human.

Quotes

The following are related quotes:

> "One of the first steps was a creative meeting at our agency during the "pitch process." I walked into the meeting with a new element for the periodic table. . . not carbon, hydrogen or oxygen, but the Human Element. That pretty much put everything in motion. Including the Human Element on the Periodic Table of the Elements changed the way Dow looked at the world and the way the world looked at Dow. Every creative decision we made from that point on was filtered through the lens of the Human Element, and that's what took us down a very non-science approach to science advertising."
>
> — John Claxton (2009), on DraftFCB's new marketing campaign for Dow [1]

Elemental

The following are other Hu images:

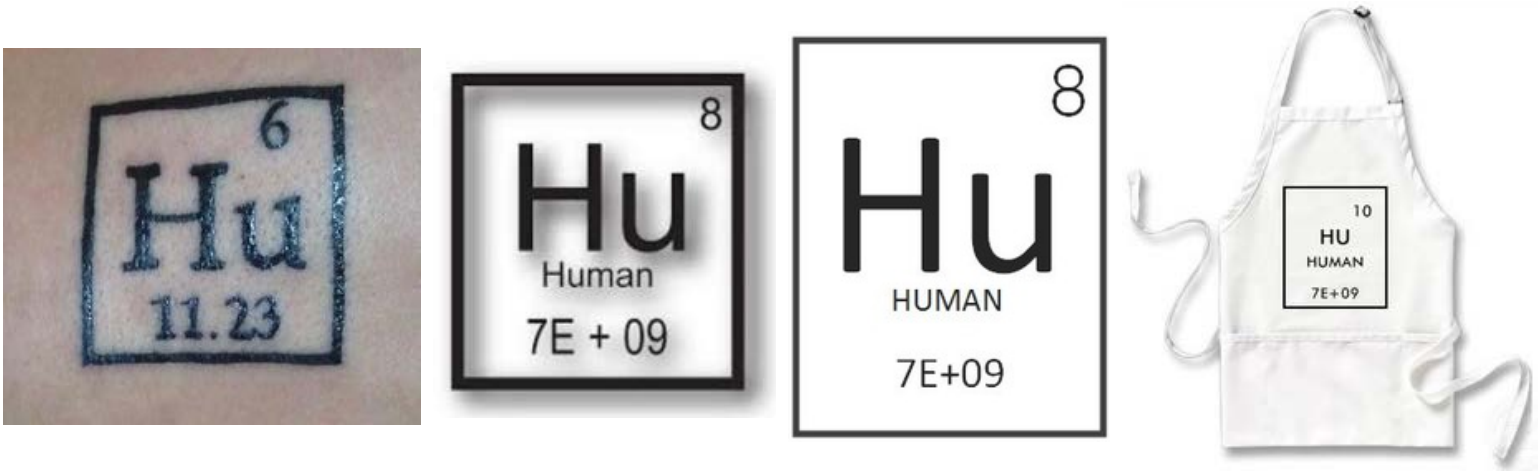

The element number 08, in the original sketch, as shown above, symbolic of oxygen on the periodic table, seems to be an intuitive grasp at the premise that humans are "carbon-plus" types of elemental things, carbon being atomic number 6 on the periodic table; hence, the numbers 8, 9, and 10, often seen on mock-designs of the Hu element theme concept, a human is an elemental thing "above" element number 6.

The following is a Feb 2020 symbol made by Libb Thims, for new business cards, shown below representing the knowledge that humans are 26 element chemical species (26E), and that the current population is 7.8 billion or 8E times 10 to the power of 9, rounded up (correctly this should be a measure in hmol units, but his has not yet become a working concept):

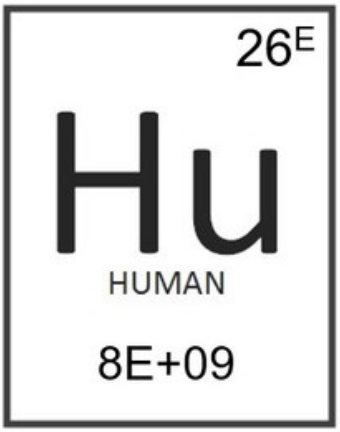

The mass number 7E+09 is representative of the current population of humans, which in 2009 was 7,000,000,000 or 7 billion or 7 times 10 to the power of 9.

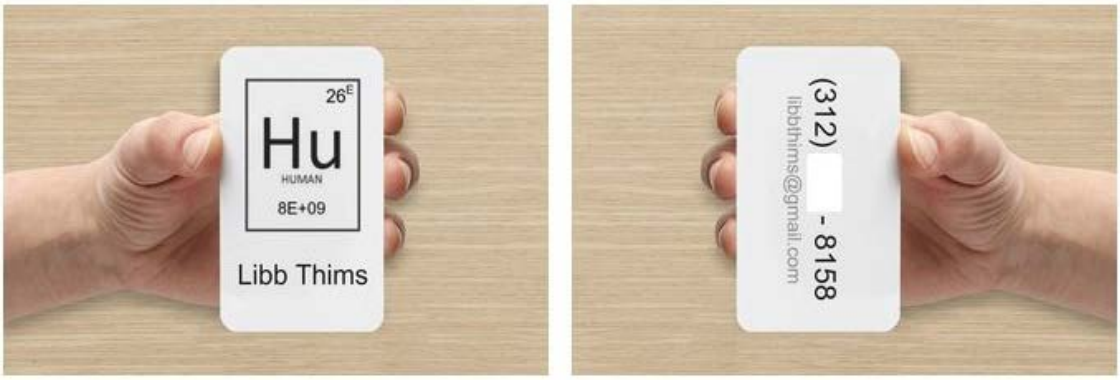

(add)

See also

â— Dihumanide molecule
â— Human molecular symbols
â— Polyhumanide molecule

References

1. Grbic, Jovana J. (2009). "Selling Science Smartly: Dow Human Element Campaign (Interview with advertising mastermind John Claxton)", Feb 18. ScriptPhD.com.

θΔics

In existographies, **Hubert Harrison** (1883-1927) (GBG:5) (FA:128) was an African-American writer, aka "black atheist" (Jackson, 1987) and or "black Socrates" (Hecht, 2003), known as an "intellectual giant", noted for []

Atheism | Agnosticism

Harrison's main intellectual hero was Thomas Paine; who was well-read in the works of Galileo, Rene Descartes, Newton, David Hume, Benedict Spinoza, Denis Diderot, Jean d'Alembert, Voltaire, and Baron d'Holbach. [1]

Education

Harrison, as a teen worked as an under-teacher of a school, in his young adulthood he worked menial jobs by day, e.g. a post office worker, earned a high school degree, and read voraciously. [1]

Quotes | By

The following are noted quotes by Harrison:

> "I prefer to go to the grave with my eyes open."
>
> — Hubert Harrison (c.1920) [1]

> "Everyone knows about the many errors in the Bible, except in America."
>
> — Hubert Harrison (c.1920) [2]

> "African Americans with agnostic views are rare, and these are seldom, if ever, openly avowed. I am inclined to believe that freedom of thought must come from freedom of circumstances."
>
> — Hubert Harrison (c.1920) [2]

> "It should seem that Negros, of all Americans, would be found in the 'free thought' fold, since they have suffered more than any other class of Americans from the dubious blessings of Christianity. The church saw to it that the religion taught to slaves should stress the servile virtues of subservience and content. It was the Bible that constituted the divine sanction of this 'peculiar institution'."
>
> — Hubert Harrison (c.1920) [2]

> "These French deists made certain false premise which we smile at today; the believed in keeping monotheism, but fixing it, which is absurd."
>
> — Hubert Harrison (c.1920) [1]

> "I am agnostic; not a dogmatic disbeliever nor a bumptious and narrow infidel. I am not at all of the Col. Ingersoll's school. I am agnostic such as Huxley was."
>
> — Hubert Harrison (c.1920) [1]

> "I wish to admit here something that most agnostics are unwilling to admit, namely that reason alone has

failed to satisfy all my needs. For there are needs, not merely ethical but spiritual, inspirational, and these also must be filled."

— Hubert Harrison (c.1920) [2]

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 435-39). HarperOne.
2. Huberman, Jack. (2007). *The Quotable Atheist: Ammunition for Nonbelievers, Political Junkies, Gadflies, and those Generally Hell-Bound* (Hubert Harrison, pg. #). Nation Books.

External links

â— Hubert Harrison – Wikipedia.

θΔics

In biographies, **Hubert Newton** (1830-1896) was an American mathematician and physicist known as the "grandfather of American mathematics" who seems to have been the main intellectual mentor to Willard Gibbs. [1]

Gibbs

Newton seems to have a significant influence on Willard Gibbs, something evidenced by the fact that Newton along with Rudolf Clausius are the only two people Gibbs every wrote obituaries or biographies on (see: collected works). [2]

American mathematics historian Steve Batterson (2008) argues that it was Newton who convinced Gibbs to study abroad; moreover: [1]

> "When the National Academy of Sciences was incorporated in 1863, he was one of the initial 50 scholars invited for membership. Moreover, Newton was the confidant and sounding board for J. Willard Gibbs, the greatest American scientist of the nineteenth century. Most of Newton's own re-search involved the study of meteors and comets. In 1895 he became vice president of the American Mathematical Society."

(add discussion)

Education

Newton completed his BA at Yale in 1850 and in 1855 became Yale's then only professor of mathematics, during which time he did research on laws of meteors and comets. [1]

References

1. Batterson, Steve. (2008). "The Father of American Mathematics" (pdf), *Notices of the American Mathematical Society*, 55(3):352-63, Mar.
2. Gibbs, J. Willard. (1897). "Hubert Anson Newton." *American Journal of Science*, 4(3):359–378.

Further reading

â— Newton, Hubert A. (1889). "The Worship of Meteorites" (Ñº), Lecture given in New Haven, Conn, Mar 29 (unpublished); in *American Journal of Science*, 3(3):1-#, Jan 1897; in: *Nature*, 1450(56):355-59, 12 Aug 1897.

External links

â— Hubert Anson Newton – Wikipedia.

θΔics

In science, **Hubert Yockey** (1916-) is an American physicist turned information theorist noted for []

Overview

In 1977, Yockey began to present his 'mistaken belief', according to American evolution chemist Jeffrey Wicken, that the development of the Shannon H function—called 'entropy' by namesake adoption in information theory, as outlined by Claude Shannon and Warren Weaver in 1949—has resulted in a true *generalization* of the Carnot-Clausius (1824-1865) state function treatment and the Boltzmann-Gibbs (1872-1902) statistical treatment of the original entropy formulation of heat in thermodynamics, thus, in a sense, freeing it from disciplinary framework of thermodynamics for use in probability distributions in general. [1] Yockey (and or his daughter) describes himself as such: [6]

> "Nuclear physicist and bioinformatician Dr. Hubert P. Yockey shows why Michael Behe and his ilk are wrong in his books, *Information Theory, Evolution, and the Origin of Life* (2005) and *Information Theory and Molecular Biology* (1992). Dr. Yockey's publications, going back to the 1950s, were seminal in creating the field of bioinformatics. He also is the only scientist who has defined the distinction between living [matter] and non-living matter—his definition is fundamental to the scientific understanding of the origin of life."

In this sense, it would seem that Yockey's agenda is to do battle with the intelligent design crowd platformed on the Shannon bandwagon.

Negative entropy

On the term "negative entropy" or negentropy, Yockey states that "the notion of *negentropy* has crept into the textbooks and the technical and popular literature" and that "it must be exorcised to avoid more damage". [7]

Information theory war

Interestingly, similar to the retrospect 2011 comments made by Canadian zoologist Daniel Brooks, in regards to the continuous attack made on him during the previous 30-years in regards his Brooks-Wiley theory, also based on Shannon information theory, Yockey opens to the following art of war quote by Italian philosopher Niccolo Machiavelli: [3]

> "It must be considered that there is nothing more difficult to carry out nor more doubtful of success, nor more dangerous to handle, than to initiate a new order of things. For the reformer has enemies in all those who profit by the new order, and only lukewarm defenders in all those who would profit by the new order, this lukewarmness arising partly for fear of their adversaries, who have the laws in their favor; and partly from the incredulity of men, who do not truly believe in anything new until they have had actual experience of it."

The thermal wording, i.e. "lukewarmness", and feel of is nearly identical to Brooks' reflective comment:

> "By 1982, the centenary of Darwin's death, Niles Eldredge and Steven J. Gould had catalyzed a loosely connected group of evolutionary biologists unhappy with the New Synthesis to unleash a cascade of criticisms and proposals. Emboldened by this display of the scientific community at its meritocratic best, Ed Wiley and I entered the fray. The day we finished proofreading *Evolution as Entropy* [1986], David Hull presciently warned us the fun was over. Soon, I received an envelope from a friend who had seen a manuscript on a colleague's desk. Such privileged material is rarely copied and forwarded. My friend wrote, "I think you and Ed should know what you're up against." The privately circulated manuscript was authored

> by three academics at the University of California-Berkeley. Ed and I were stunned by its vicious tone. Why the rhetorical heat?"
>
> — Daniel Brooks (2011) [4]

which also uses thermal wording, i.e. "rhetorical heat"; which by no strange coincidence, is nearly identical to American engineer Myron Tribus' reflection on the last 50-years at a failed attempt to reformulate thermodynamics in terms of information theory:

> "After my book on thermodynamics [*Thermostatics and Thermodynamics: an Introduction to Energy, Information and States of Matter*, 1961] appeared I sat back and waited for a call from the Nobel Committee. They never wrote. But other people did write and it was not at all what I wanted to hear. My attempts at getting engineering professors to adopt the new way to look at thermodynamics was a completed failure. Not only that, but I was attacked as someone who had taken intellectual shortcuts."
>
> — Myron Tribus, "A Tribute to Edwin T. Jaynes" (1998) [5]

Interestingly, then, here, in comparison, we see three individuals reflecting on the turmoil of a 30-year plus uphill "heated" battle, each the end result of taking a ride on the Shannon bandwagon, even after being told the ride was over (e.g. "fun was over", Brooks, c.1985)—very curious similarity indeed.

Religion

Yockey is often cited as a reference in the Creationism / intelligent design movement; supposedly, because he tends to cite Bible quotes in his work, and that although he supports Darwinian evolution, is critical of the primordial soup origin of life theory, and believes that "the origin of life is unsolvable as a scientific problem." The following, to give insight into this connection, is Doug Groothius' 2009 view of the implications of Yockey's theory:

> "Professor **Yockey** has ruled out all materialistic explanations. If so, then a nonmaterialistic explanation may be in order. If life cannot come from non-life unaided, then why not infer that it came from life of a designer that brought it into being?"

In response to these assertions, his daughter Cynthia Yockey comment the following 2009 opening remark in their jointly-written blog: [2]

> "The first thing I want noted about my father is that he is not in any way, shape or form a Creationist. He does not support intelligent design. He supports Darwin's theory of evolution and points out that it is one of the best-supported theories in science. It is absolutely crazy to assert that my father is a creationist because he quotes the Bible in his scientific publications. He quotes Greek and Roman myths considerably more frequently than the Bible, yet no one has used that as evidence that he is a pagan, or Dionysian or Apollonian."

Whatever the case, science writers who cite Bible discussions of tend to have complex and riddled responses when being queried about their Dawkins number.

Education

Yockey completed his PhD in physics in 1943, with a dissertation on "Neutron Yields from Be, Cu, Bi, Sr, and P in the Sixty-Inch Cyclotron", at the University of California, Berkeley. He was a co-author of the 1951 book *Effects of Cyclotron Irradiation on Creep of Aluminum*. Soon thereafter, Yockey seems to have begun to switch gears into the

newly-formed information theory field. In 1958, for example, he was one of the editors of the 1958 *Symposium on Information Theory in Biology*, Gatlinburg, Tennessee. In 2005, Yockey described himself as a former director of the US Army Pulsed Radiation Facility, Aberdeen Proving Ground, Maryland.

References

1. (a) Yockey, Hubert P. (1977). "A Calculation of the Probability of Spontaneous Biogenesis by Information Theory", *Journal of Theoretical Biology*, 67: 367-98.
(b) Wicken, Jeffrey S. (1987). "Entropy and Information: Suggestions for a Common Language" (abs), *Philosophy of Science*, 54(2): 176-93.
2. Yockey, Cynthia. (2009). "Overview", HubertPYockey.com, Blog, Feb 20.
3. (a) Machiavelli, Niccolo. (1513). *The Prince* (§6). Publisher.
(b) Yockey, Hubert P. (2005). *Information Theory, Evolution, and the Origin of Life*. Cambridge University Press.
4. Brooks, Daniel R. (2011). "The Extended Synthesis: Something Old, Something New", *Evolution: Education and Outreach*, 4(1):3-7.
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6. Hubert Yockey (about) – hubertpyockey.com.
7. Yockey, Hubert P. (2005). *Information Theory, Evolution, and the Origin of Life* (pg. 32). Cambridge University Press.

Further reading

● Yockey, Hubert P. (1981). "Self Organization Origin of Life Scenarios and Information Theory", *Journal of Theoretical Biology*, 91:13-31.
● Yockey, Hubert P. (1992). *Information Theory and Molecular Biology*. University Press.

External links

● Herbert Yockey – Wikipedia.
● Yockey, Hubert P. – WorldCat Identities.

θΔics

In existographies, **Hugh Elliot** (1881-1930) was a British philosopher, characterized "scientific materialist", noted for []

Overview

In 1919, Hugh, in his *Modern Science and Materialism*, attempted to go beyond the destruction of Henri Bergson like ideas, but instead to build a foundation for materialistic beliefs; his gist abstract (pg. 8) aim is as follows:

> "It is not the purpose of the present work to furnish a defense of the agnostic position. That task was sufficiently carried out by the writers of last century, and in my work *Modern Science and the Illusions of Professor Bergson* [1912] I said all that seemed necessary in destruction of metaphysical pseudo-knowledge. **The purpose of the present book is not destructive but constructive**. If we take our start from agnosticism, it means no more than that we embark on our inquiries with minds free from the encumbrance of - superstition. We start then, as every scientific investigation ought to be started, from an agnostic position; and the first question that arises is, what kind of philosophy we can construct within the limits drawn for us by agnosticism. In other words, what sort of philosophy can be founded on the present knowledge attained by man? Naturally such a philosophy must be far less ambitious than the metaphysics of those who are not bound to the solid earth, but are free to soar wherever their imagination can penetrate. *Our* philosophy, on the other hand, must be strictly based on facts, and capable of verification by direct observation or experiment. Its progress is wholly dependent on the knowledge of the times.
>
> As that knowledge increases, true philosophy can likewise expand; and in times of ignorance no true philosophy is possible. We have expressly abandoned all attempts to understand the ultimate nature of things; nevertheless, **the present state of human knowledge is sufficient to permit the emergence of certain fundamental principles of profound philosophic import.** It is the purpose of the present book to collect together and present these all-embracing principles, and to show that they constitute on the one hand a materialistic system, and on the other hand an idealistic system, according to which way we look at them, and to whether we employ the objective or the subjective method.
>
> Since our philosophy is to be built upon facts—upon the knowledge possessed by men at the present time—the first task of this book must be to review that knowledge, not, of course, with any thought of exhaustiveness, but in order to indicate the general scope and nature of the facts known to mankind, upon which philosophy must necessarily be based. A philosophic principle is one that embraces a vast multitude of facts; moreover, such a principle is immediately upset by the discovery of any single fact which conflicts with it. **It is true, no doubt, that most of the great generalizations of science, such, for instance, as the law of gravitation** – without prejudice to the principle of relativity. As to how far Newton's Laws may be an absolute and final expression of the facts, is a question I do not raise – **and the first two laws of thermodynamics, are so solidly established that the discovery of any contradictory fact is scarcely conceivable.** Any such alleged discovery would suggest only error or illusion on the part of the discoverer. Thus, it happens that these great principles, which may rightly be called philosophic, are based upon a stronger foundation of certainty than *any* single fact can claim. They are based on long and universal experience, which confers upon them as high a degree of certainty as can be attained by humanity."

(add)

Influence

Elliot, according to Sunand Joshi (2014), had a strong influence on Howard Lovecraft. [1]

References

1. Elliot, Hugh. (1919). *Modern Science and Materialism*. Longmans, Green and Co.
2. Lovecraft, Howard P. (2010). *Against Religion: the Atheist Writings of H.P. Lovecraft* (editor: S.T. Joshi; foreword: Christopher Hitchens) (abs) (Amz) (pg. 185). Sporting Gentlemen.

External links

â— Hugh S.R. Elliot – Wikipedia.
â— Hugh Samuel Roger Elliot – WikiSource.

θΔics

In existographies, **Hugo de Vries** (1948-1935) (Murray 4000:13|B) (EvT:18|21+) (CR:5) was Dutch botanist, noted for []

Overview

In 1901, De Vries, based on experiments conducted with Oenothera Lamarckian (Evening Primrose), put forward a new evolution theory according to which new species are not formed by continuous variations, but by sudden appearance of variations, which he named "mutation" (TR:17), along with the term "mutant" (O), which are random and directionless, as opposed to Darwin's variations, which are small and directional; de Vries suppositioned that these mutations are heritable and persist in successive generations. [1]

De Vries, as summarized by Howard W. Odum (1929), in short, formulated a theory according to which "novel characters", appear suddenly without any parental linking. Such variations are of two kinds: inheritable, called "mutations", and non-heritable or fluctuations, the latter of which are due to the environment and have little permanent value. [2]

Religion | Conflict

See main: Evolution objections

De Vries assertion that humans arose from mutation has resulted in conflicts with religious beliefs; the following being the main seven compounded or aggregate non-theistic colloquial objections to evolution theory:

	Term	Date	Model | Non-theological
1.	Fortuitous concourse of atoms	450BC	Empedocles (see also: Thomson on religion)
2.	Blind	1800	Friedrich Schiller (see: blind force)
3.	Chance	1859	Charles Darwin (see: chance variation)
4.	Mutation	1901	Hugo de Vries
5.	Random	1922	Roy Sellers (see also: random chance)
6.	Accident	1923	Bertrand Russell (O)
			Kurt Vonnegut
7.	Lucky	1963	Richard Dawkins | 1995

In short, according to the above general model, humans are a "lucky | accidental | random | chance | mutation | blind | fortuitous | concourse of atoms" derived entity; the following are example statements:

> "To think that we just evolved from a bang, that we used to be monkeys, that seems unbelievable when you look at the complexity of the human body …. If you tell children there is *no purpose* to their life—that they are just a chemical mutation—that doesn't build self-esteem."
>
> — Nigel McQuoid (2001), Headmaster of Emmanuel College

> "The evolution of plants and animals? Perhaps other geologists also have questions about the mechanism of

mutation (which varied its rate of effectiveness greatly in rocks), whether the ability to propagate is the difference between a fossil and its ancestor, how many such evolutions must occur before 'bad luck' is overcome and the newer variety replaces the older, which evolved features are not for propagation but just 'ride along' on the genetic material by a coincidental juxtaposition of genes, and - most importantly - whether 'good luck mutations' can occur fast enough to account for the fossil record."

— Bruce Bathurst (2009), "Why I am not a molecule?" [3]

The term "mutation" seems to crop up in purpose vs purposeless models of the universe debates and discussions. David Foster, e.g., has argues against "blind random chance mutation interpretations" of mutation-based Darwinism. Those who have theorized about mutation and entropy include: Pierre Levy, John Sanford, and the 1997 gentropy authors V. K. Savchennko and U. K. Sauchanka.

Quotes | On

The following are quotes on de Vries

"Natural selection may explain the survival of the fittest, but it cannot explain the arrival of the fittest."

— Arthur Harris (c.1903), synopsis of de Vries' mutation theory; in: *Species and Varieties: Theory Origin by Mutation* (pg. 826) (Q)

Quotes

The following are de Vries quotes:

"Physiologic facts concerning the origin of species in nature were unknown in the time of Darwin. . . The experience of the breeders was quite inadequate to the use which Darwin made of it. It was neither scientific, nor critically accurate. Laws of variation were barely conjectured; the different types of variability were only imperfectly distinguished. The breeders' conception was fairly sufficient for practical purposes, but science needed a clear understanding of the factors in the general process of variation. Repeatedly Darwin tried to formulate these causes, but the evidence available did not meet his requirements. Quetelet's law of variation had not yet been published. Mendel's claim of hereditary units for the explanation of certain laws of hybrids discovered by him, was not yet made. The clear distinction between spontaneous and sudden changes, as compared with the ever-present fluctuating variations, is only of late coming into recognition by agriculturists. Innumerable minor points which go to elucidate the breeders' experience, and with which we are now quite familiar, were unknown in Darwin's time. No wonder that he made mistakes, and laid stress on modes of descent, which have since been proved to be of minor importance or even of doubtful validity."

— Hugo de Vries (1904), *Species and Varieties: Theory Origin by Mutation* (pgs. 5-6) (Q)

References

1. Pujari, Saritha. (2015). "Mutation Theory: Mutation Theory of Evolution by Hugo de Vries" (Q), YourArticleLibrary.com.
2. Odum, Howard W. and Jocher, Katharine C. (1929). *An Introduction to Social Research* (pg. 64). H. Holt and Co.
3. Bathurst, Bruce. (2009), "Why I Am Not a Molecule?" (Q), Hmolpedia thread (post #4), Aug 24.

External links

- Hugo de Vries – Wikipedia.
- Mutationism – Wikipedia.

θΔics

In existographies, **Hugo Grotius** (1583-1645) (IQ:185|#87) (Cattell 1000:125) [RGM:255|1,330+] (Washington 23|#) (CR:16) was a Dutch jurist and international relations theorist noted for []

Overview

Grotius, supposedly, had theory of the origin of war similar to Thomas Hobbes. (Ñº)

Genius rankings

Grotius (IQc:200), of note, was one of the only four people that Catherine Cox (1926), in her ranking of the top 300 geniuses (see: Cox IQ) between 1450 and 1850, assigned an IQ of 200 or above to, along with Goethe (IQc:210), Leibnitz (IQc:205), and Thomas Wolsey (1473-1530) (Ñº) (IQc:200).

Quotes | On

The following are quotes on Grotius:

> "**Grotius**, Leibnitz, Goethe, three universal geniuses, the evidence of whose overpowering intellect appeared and was recognized in earliest childhood as it was later in their youth, are doubtless among the greatest minds with whom this study is concerned. A minimum childhood IQ for these cannot be less than 180. A maximum is probably close to the **maximum for the human race**."
>
> — Catherine Cox (1926), *Early Mental Traits of Three Hundred Geniuses* (pg. 155)

> "**Grotius** thought that in relations between nations there were natural laws which needed only research and reason to discover their principles."
>
> — Howard W. Odum (1929), *Introduction to Social Research* [1]

References

1. Odum, Howard W. and Jocher, Katharine C. (1929). *An Introduction to Social Research* (pg. 163). H. Holt and Co.

External links

â— Hugo Grotius – Wikipedia.

θΔics

In hmolscience, **human** is a []

Models | Historical

The following is a work-in-progress listing, of the 132+ historical "terms", employed to define a human, grouped into 29-categories:

Type	Person	Date
1. **Clay**		
Clay creation myth | Religious	Imhotep	2600BC
Adam and Eve [Clay + Spirit]	Bible	500BC
2. **Four Elements**		
Four element thing / existent	Aristotle	350BC
3. **Machine**		
Automaton | Dualism (religious + physical)	Rene Descartes	1637
Motor		
Heat engine		
Physico-chemical machine	Wilhelm Ostwald [15]	1901
Steam engine [13]	Felix Adler [13]	1916
4. **Atom**		
Thinking atoms [see: Lisbon poem]	**Voltaire**	1755
	→ Ravi Zacharias (1990)	
Tormented atoms	Voltaire	1755
Point atom	Humphry Davy	1813
Organic individuality	Nathaniel Shaler	1891
Atomic and molecular motion	Howard Lovecraft	1916
Batch of atoms	Paul Aebersold	1949
Batch of stable isotopes	Paul Aebersold	1949
Atomic thing with curiosity	**Richard Feynman**	1963
Atomism	Arthur Iberall	1987
Bunch of atoms	Michael Ruse	2000

Atomic geometry	Libb Thims	2012
Aware atomic assemblage	Taylor (Ñº)	c.2015

5. **Wave | Orbital**

Wave-particle duality	Ernst Mach	1885
Wave function | Human wave function	Peter Atkins	1992
Quantum cloud	Antony Gormley	c.1998
Wave function / orbital (see: human molecular orbital)	Libb Thims	2003
Wave-particle being	Kendra Krueger	2018

6. **Four Elements / Elements**

Animate combination of the universe	**Percy Shelley**	1815

7. Element

Chemical element	William Fairburn	1914
Element	John Claxton	2006

8. **Molecule**

Molecule	Jean Sales	1789
Mega-molecule		
Molecular person | Molecular entity	George Scott	1985
Supermolecule	Jean-Marie Lehn	1995
Molecular agent	Vilfredo Pareto	1907
Molecular species [see: fugacity]	Mirza Beg?	1987
Obscure lump of molecules	Barry Barnes	1998
Abstract molecule	Michael McLure	2002
Overgrown supermolecule	Peter Pogany	2006
Evolved animated molecular structure	Carolyn Porco	2006
Powered metabolic molecule	Libb Thims	2013

9. Particle		
Fluid particle	Irving Fisher	1892
Gas particle		1872
Gas molecule	Ludwig Boltzmann	
Active Brownian agent	Lutz Schimansky-Geier	1995
10. Phase		
Phase	Henry Adams	1908
[Existence] phase | Point phase	Bruce Lindsay	1983
Equilibrium		
11. Evolved | Metamorphosized chemical | CHEM		
Metamophosized physico-chemical substance	Johann Goethe	1796
CHEM thing (see: CHEM cypher)	Goethe	1809
Evolved carbon chemistry animal machine well-informed heat engine	Jerome Rothstein	1979
12. Chemical		
Chemical combination	Nikolay Chernyshevsky	1860
Chemical	Thomas Dreier	1910
Chemical species		
Chemical formula in operation	George Carey	1919
	Gilbert Lewis	
Chemical molecule	Samuel Gorvy Surya Pati	1925 1970 2009
Chemical machine	Ernest Borek	1952
Chemical entity	John Tukey	1966
Chemical substance	Mirza Beg	1987
Chemical being	Zane Claes (Ñº)	2011
Promiscuous biochemical	Ben Carson’	2015

13. **Physico-Chemical**

Affinity-powered chemical "electrical mechanism"	Honore Balzac	1834
Physico-chemical mechanism	James Johnstone	1914

14. **Compound**

Physico-chemical compound	Frank Stockbridge	1912
[Atomic] compound	Frank Copley	1977

15. **Stardust** | Humans as stardust

	Hilda Finnemore (Ñº)	1924
Star [elements]	Alfred Lotka	1925
Star-stuff	Carl Sagan	1980
Stardust	Lawrence Krauss	c.2005
Star detritus	Neil Tyson	2007

16. **Liquid**

Gas-liquid two phase social model	Lawrence Henderson	1935
Benard cell social molecule	Ilya Prigogine	1972
Human liquid	Marc Donohue	2014

17. **Eddy | Loop**

Energy eddy (second law destined)	Charles Sherrington	1938
Shape-stable energy-steaming flame-like physico-chemical whirlpool phenomenon	Alan Watts	c.1955
Second law based evolved eddy	Buckminster Fuller	1976
Light-powered chemical-fueled order-constructing heat-dissipating eddy (Ñº) (Ñº)	J. Scott Turner	2000
Strange loop	Douglas Hofstadter	
Extant molecular eddy	Libb Thims	2014

18. **Protons**

Electron-proton configuration	Albert Weiss	1925
Electron-proton system	Albert Weiss	1925
Locus in the electron-proton movement continuum	Albert Weiss	1925
Pile of protons	Howard Bloom	2013
Proton-electron configuration	Libb Thims (Ñº)	2014

19. **Matter**

Cogged dice (loaded dice) matter-machines	Baron d'Holbach	1770
Material being	Baron d'Holbach	1770
State of matter	George Simpson	1967
Baryonic matter	Michael Rowan-Robinson	1999

20. **Dissipative structure**

Far-from-equilibrium dissipative structure	Ilya Prigogine	1972
Far-from-equilibrium solar-powered refrigerator	Addy Pross	2012

21. **Powered**

Powered CHNOPS system	Henry Swan	1974
Powered atomic geometry	Libb Thims	2014

22. **Fundamental particle**

Fermion or boson	Louis Barrett	1977
Fermion or boson	Ed Stephan	1977
Baryon-lepton composite	Michael Rowan-Robinson	1999
Fermion-boson arrangement	Libb Thims (Ñº)	2014

23. **Electron**

Electron spin	Elliott Montroll	1981
Free electron	Steve McMenamin	1986

24. **Bag | Sack**

Sack of chemicals	William Herrick (Ñº)	1983
Soulless sack of chemicals machine	Author (Ñº)	1991
Bag of chemicals	Michael Rowan-Robinson	1999
Complex sack of chemicals	Robert Beezat (Ñº)	2010
Empty sack of chemicals endlessly interacting	Michael White (Ñº)	2010
Soulless bag of chemicals	Kurt Bell	2011
Buckets of water	Adrian Bejan	2017

25. **Carbon | Based**

Carbon gorgon (Ñº)	Ernst Haeckel (attributed)	1888
Carbon-based organism	Harold Morowitz (attributed)	1960s
Carbon-based biped	Arthur Clarke [14]	1992
Carbon unit	Anon (Ñº) / Star Trek (Ñº)(Ñº)	2001
CH-based thing (Ñº)	Thims	2017
CH-based animation	Thims	2019

26. **Scum**

Heated chemical scum	Stephen Hawking	1995
Pond scum	Neil Shubin	2008
Evolved pond scum	Ray Comfort	2013

27. **C-H-N-O-S-P** combination

	Wilhelm Ostwald	1926
Evolved "CHNOPS" plus substance	Frank Thone	1936
CHNOPS system	George Armstrong	1964
CHNOPS organism	Harold Morowitz	1968
Powered CHNOPS+ matrix	Henry Swan	1974
HOCN+ mega-molecule	Rohann Solare	2009

28. **State**

Bound state	Libb Thims	c.2005
Entropy state	Bill Marsilii (Ñº) Terry Rossio	2006
29. **Multi-element molecule / other**		
22-element reactive molecule	Robert Sterner & James Elser	2000
26-element reactive molecule	Libb Thims	2002
26-element energy / heat driven atomic structure	Kalyan Annamalai & Carlos Silva	2011
22-element formula	Neil Shubin	2013
Powered surface-attached coupled 26-element turnover-rate freely-running molecule	Libb Thims	2013
Solar-powered atomic geometry	Libb Thims (Ñº)	2014
CHNOPS+20 chemical species	Libb Thims	2015
Powered CHNOPS+20 molecule	Libb Thims	2015
Electrochemical process	Anon (Thims paraphrase) (Ñº)	2015
Powered CHNOPS+20 phase	Libb Thims (Ñº)	2016
C_xH_y+24 element thing	Libb Thims (Ñº)	
Powered CHNOPS+20 thing	Libb Thims (Ñº)	2018
Powered CHNOPS+20 element existive	Libb Thims [N1]	2020

(add)

Periodic table

The following shows the elemental composition of a human on the periodic table; specifically it shows the hmolscience periodic table, i.e. elemental composition of a human, specifically the version used by Libb Thims to teach kids what they are during the 2015 "Zerotheism for Kids" lecture.

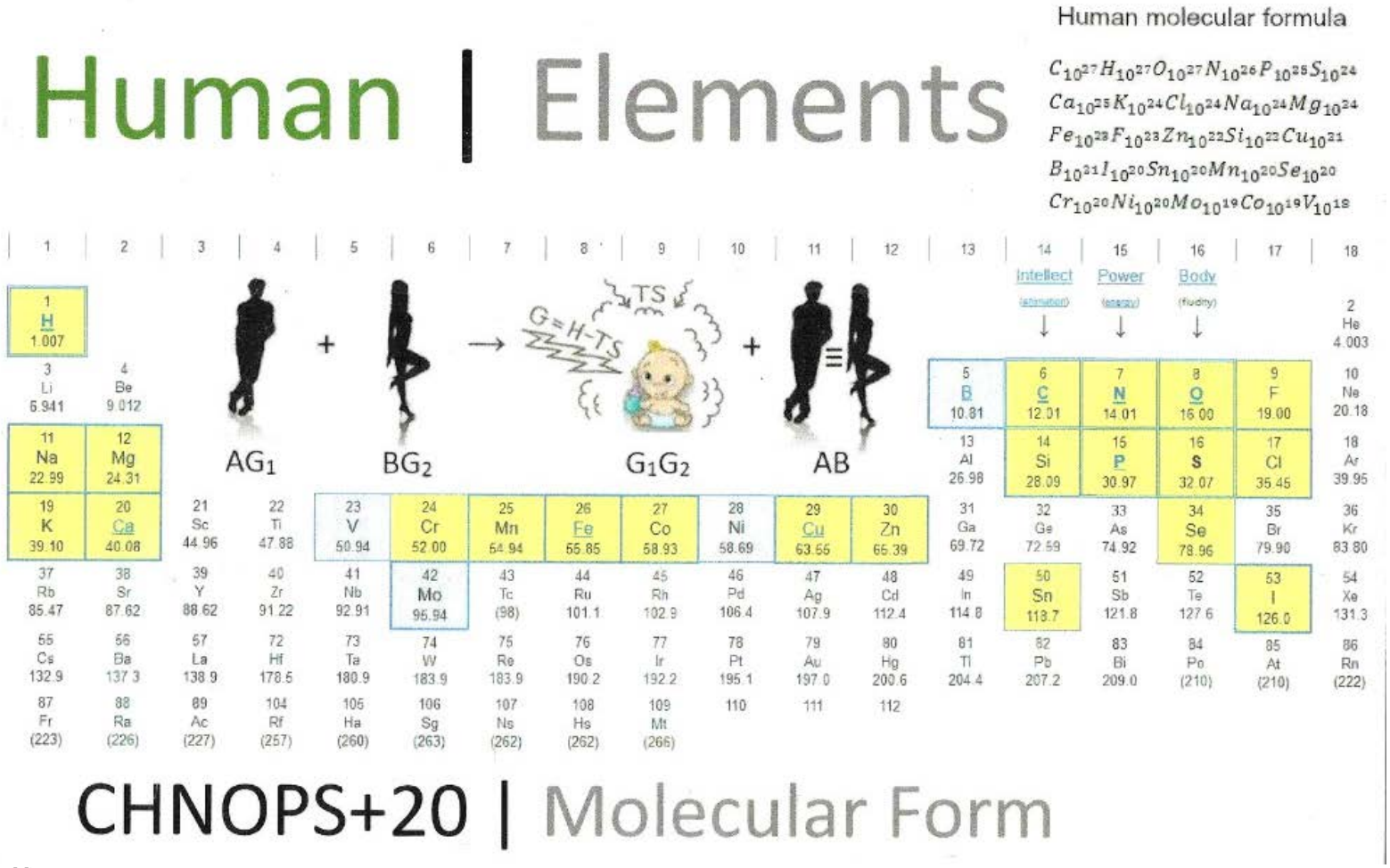

(add)

Religion | Science tension

In the above, of salient note, something dating back to at least Rene Descartes (1637), is that if we compare the following recent religion-tensioned definitions:

Left: Anubis weight a person's **soul**—thought to be contained in the heart—against the feather of truth, the "weight" conceptualized as being proportional to one's bad deeds and acts, quantified by the 42 negative confessions, while Thoth waits to record the result. Right: the seeming-to-be modern day replacement for the ancient concept of the soul: **heat**, **energy**, and **drive**, as adjudged by review of recent attempts to define a human, particularly by science vs religion tensioned writers, amid a growing accuracy of chemistry and physics.

> "With the advent of the scientific age, the body was confirmed to be a mere sack of chemicals, a machine without a soul."
>
> — Connie Zweig and Jeremiah Abrams (1991), *Meeting the Shadow* (Ñº); quoted in Lee Booth's 2012 *Knowing and Loving* (Ñº)

> "One, without god and judgment there is no meaning or justice in life. Two, without God and your own soul you are nothing more than an empty sack of chemicals endlessly interacting."
>
> — Michael White (2010), *Of Science and God* (Ñº)

> "How and what we think about God has a large role to play in how and what we think about human beings and the morality and ethics of interacting with each other. If God does not exist, then we are only a complex sack of chemicals and biological processes. There is really no reason to act as if a human being is something worth respecting and treating with dignity and love."
>
> — Robert Beezat (2010), *Knowing and Loving* (Ñº)

with the chemical engineering-neutral definitions:

> "A human is a 26-element energy/heat driven atomic structure."
>
> — Kalyan Annamalai and Carlos Silva (2011), *Advanced Engineering Thermodynamics* (Ñº); per citation of Libb Thims' 2002 *Human Thermodynamics*

is that the excerpt "energy/heat driven" seems to be the upgrade for the older religio-mythology rooted concepts of "morality, ethics, meaning, and justice" all anchoring vicariously in the ancient religio-metaphysical term "soul". This seems to be where the tension lies; something in need of clarification, cleaning, explication, upgrade, and terminology reform (possibly similar to how life terminology reform and social terminology reform have been effectively remedied).

Hmolsciences

In human chemistry, in the molecular evolution table perspective, a human is defined purely as a structure of atoms (no soul, no brain, no free will, not alive, etc., along with any other antiquated now-defunct anthropomorphic conceptions) and is technically called a "human molecule", a 26-element heat-driven dynamic atomic structure. [2] In human thermodynamics, according to the 1952 C.G. Darwin definition, people are defined as molecules. In human physics, humans are often modeled statistically as human particles. [3] Other synonymous names include: human atomism, human chemical, human element, human chemical element, among others, as listed below. The 1988 collaborative *What is a Person?* goes into some of the philosophical thorns one runs into in attempting to define what a person is. [10]

Models | Timeline

See also: Human thermodynamic variable

The following are classical models, listed in loose chronological order, of the various ways thinkers have attempted to model humans, and or a human social system, depending, based on established physical models.

#	Theorist	Model
1.	 Narmer (c.3100-3050 BC) Egyptian pharaoh Heliopolis creation myth Dates: 3100BC â— Ra theology (Anunian theology)	42 pre-dynastic nomes (5000-3100BC) Lower Egypt: 20 nomes Upper Egypt: 22 nomes â— Religion â— Negative confessions (42 forbidden sins → 10 commandments) â— Nun cosmology Lower Egypt (20 Nomes) Lower Egypt (22 Nomes) 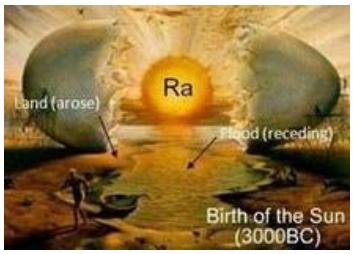 Description: Father Ra born of Nun theory Ab-ra-ham-ic theologies (Christianity, Islam, etc.) B-ra-hma-ic theologies (Hinduism, Buddhism, etc.) 72 percent of modern beliefs
2.	 Imhotep (2635-2595BC) Egyptian polymath Date: 2600BC	

Model: clay creation myth

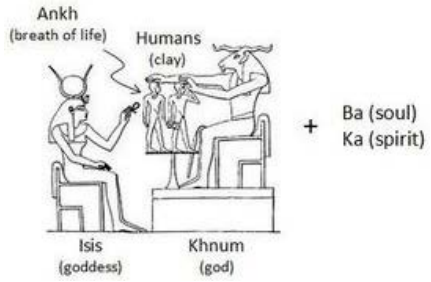

3. 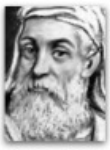

Empedocles
(490-430 BC)
Greek philosopher

Date: 450BC

Model: 4 elements + 2 forces

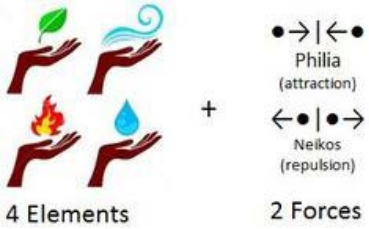

Description: "People who love each other mix like water and wine; people who hate each other segregate like water and oil."

4.

Leucippus
(c.500-430 BC)
Greek philosopher

Date: 445BC

Model: atoms + voids

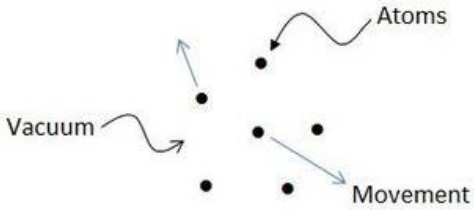

Description: Everything is composed entirely of various imperishable, indivisible elements called atoms, and that since movement exists, there has to be vacuum. True being, however, does not admit of vacuum, and there can be no movement in the absence of vacuum; vacuum is identified with non-being, since it cannot really be.

5.

Leonardo da Vinci
(1452-1519)
Italian polymath

Date: 1487

Model: Vitruvian man

Description: Based on Roman architect Vitruvius's ideal human proportions with geometry described in Book III of his treatise *De Architectura*, the workings of the human body are analogous to the geometrical workings of the universe. [4]

6.

Rene Descartes
(1596-1650)
French natural philosopher

Date: 1637

Model: Two nature human machine/automaton

Description: "I regard the **human** body as a **machine** [or automaton] so built and put together of bone, nerve, muscle, vein, blood and skin, that still, although it had no mind, it would not fail to move in all the same ways as at present, since it does not move by the direction of its will, nor consequently by means of the mind, but only by the arrangement of its organs."

7.

Benedict Spinoza
(1632-1677)
Dutch philosopher

Date: 1676

Model: One nature Euclidean human

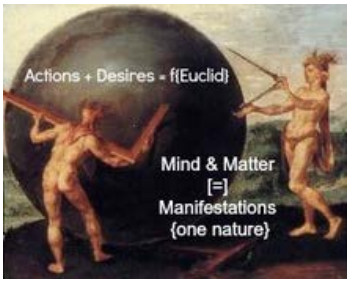

Description: “All things happen according to the laws of nature.”

“I shall consider **human** actions and desires in exactly the same manner, as though I were concerned with lines, planes, and solids.”

8.

Isaac Newton
(1643-1727)
English physicist-chemist

Date: 1674

Model: mechanical-chemical self-motion

Description: "God who gave animals **self motion** beyond our understanding is without doubt able to implant other principles of motion in bodies which we may understand as little. Some would readily grant this may be a spiritual one; yet a mechanical one might be shown."

9.

Jean Sales
(1741-1816)
French philosopher

Date: 1789

Model: human molecule
See: HMS pioneers; HM theory, HM formula

Description: “We conclude that there exists a principle of the human body which comes from the great process in which so many millions of atoms of the earth become many millions of **human molecules**.” [5]

10.

Johann Goethe
(1749-1832)
German polyintellect

Date: 1796

Model: human chemical

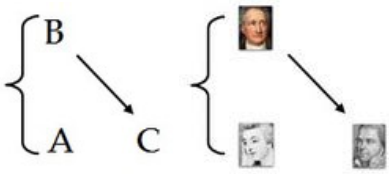

Chemical Behavior = Human Behavior

11.

Humphry Davy
(1778-1829)
English chemist

Date: 1813

Model: point atom
(Boscovich-Priestly point center of force)

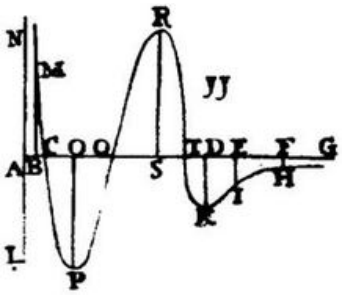

Description: “The true chemical philosopher sees **man** an **atom** amidst atoms fixed upon a point in space; and yet modifying the laws that are around him by understanding them; and gaining, as it were, a kind of dominion over time, and an empire in material space, and exerting on a scale infinitely small a power seeming a sort of shadow or reflection of a creative energy, and which entitles him to the distinction of being made in the image of God and animated by a spark of the divine mind.”

Leon Walras
(1834-1910)
French socioeconomist

12. Date: c.1858

Model: economic molecule

See: Lausanne school of physical economics

Economic agent + molecule

13.

Auguste Chauveau
(1827-1917)
French animal physiologist

Date: 1887

Model: human engine

Description: "What we can state as far as the engines of the physical world are concerned can necessarily and completely be applied to organized machines, and […] to the **human machine**, which we can study most easily and scientifically." [12]

14.

Irving Fisher
(1867-1947)
American economist

Date: 1892

Model: human particle

See: human thermodynamic variables table

Description: "A **particle** in mechanics corresponds to an individual in economics." [6]

15.

Vilfredo Pareto
(1848-1923)
French-Italian engineer

Date: 1897

Model: homo economicus

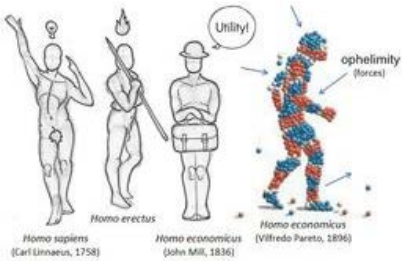

Economic agent = human molecule + external forces

16.

Vilfredo Pareto
(1848-1923)
French-Italian engineer

Date: 1902

Model: Spinning top molecular social pyramid (Pareto principle)

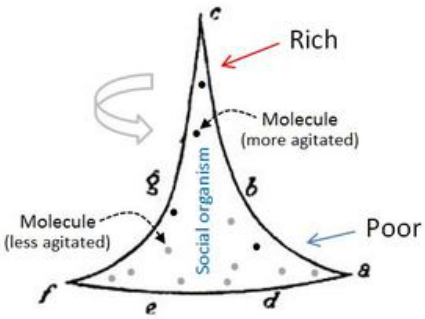

Description: "The molecules of which the social aggregate is composed don't stay at rest; some individuals enrich themselves, other impoverish themselves."

17.

William Adams
(1832-1906)

English writer

Date: 1903

Model: social atom

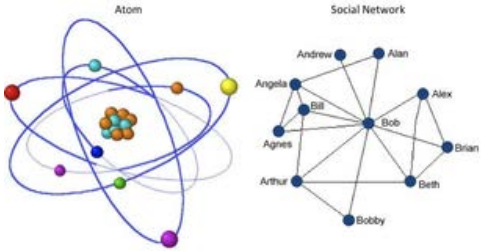

Description: “I call myself a **social atom**—a small speck of the surface of society.”

18.
William Fairburn
(1876-1947)
English-born American engineer

Date: 1914

Model: human chemical element

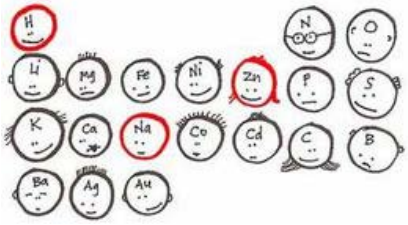

19.
Gilbert Lewis
(1875-1946)
American physical chemist

Date: 1925

Model: human crystal

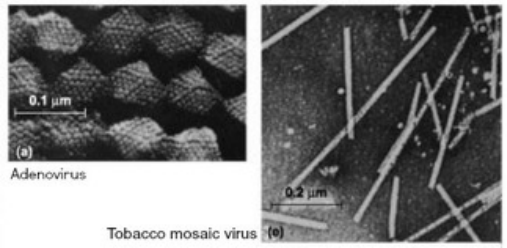

Description: “Suppose that this hypothetical experiment could be realized and suppose we could discover a whole chain of phenomena, leading by imperceptible gradations form the simplest chemical molecule to the most highly developed organism. Would we then say that my preparation of [*Anatomy of Science*] is only a chemical reaction [extrapolate up], or, conversely that a **crystal** is thinking [extrapolate down] about the concepts of science?” [7]

20.
Ettore Majorana
(1906-1938)
Italian engineer and theoretical physicist

Date: c.1935

Model: quantum mechanical social human (human quantum mechanics)

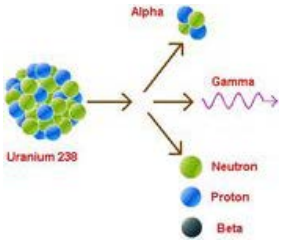

21.
George Lundberg
(1895-1966)
American sociologist

Date: 1939

Model: Electron-proton configuration

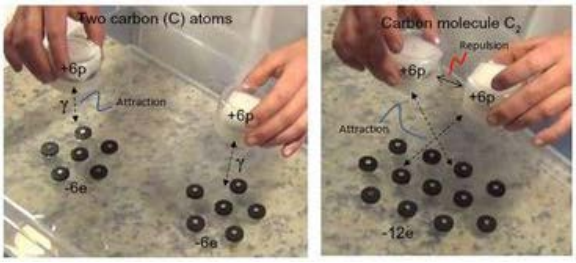

22.
John Neumann
(1903-1957)
American chemical engineer, mathematician, and computer pioneer

Date: 1948

Model: Self-replicative automaton theory (Neumann automaton theory)

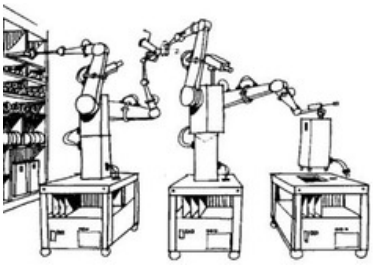

23.
Ilya Prigogine
(1917-2003)
Russian-born Belgian chemist and thermodynamicist

Date: 1971

Model: Benard cell human
(dissipative structure)

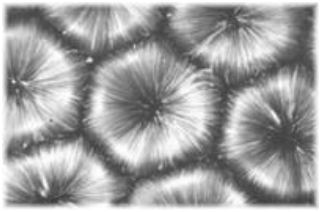

24.
Jerome Rothstein
(1918-2002)
American physicist

Date: 1979

Model: evolved carbon chemistry animal machine
well-informed heat engine

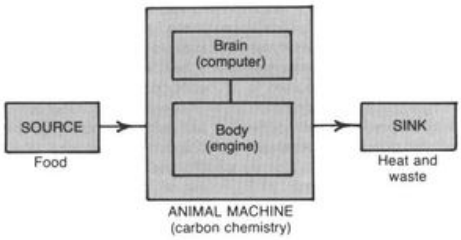

25.
Elliott Montroll
(1916-1983)
American chemist, mathematician, and statistical mechanicist

Date: 1981

Model: Ising model of human behavior
(electron spin model)

26.
Hermann Haken
(1927-)
American physicist

Date: 1983

Model: human laser
(herd behavior model)

Description: "Light, as a **laser** beam, which as a whole 'slaves' or entrains its component atomic waves to its frequency, also exercises a type of formal cause." [9]

27.
Arthur Iberall
(1918-2002)
American physicist

Date: 1987

Model: human atomism

Description: "The factory day is characteristic not only of living systems but also of all complex atomistic systems that persist and that express much of their action internally. For an individual **human atomism** the factory day largely, but not completely, coincides with the earth's day."

28.
Per Bak
(1948-2002)
Danish theoretical physicist

Date: 1988

Model: sand pile human
(self-organized criticality)

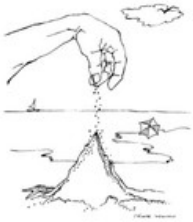

29.
Peter Atkins
(1940-)
English physical chemist

Date: 1992

Model: human wave function

30.

James Lovelock
(1919-)
English scientist

Date: 1995

Model: human whirlpool [11]

31.

Lutz Schimansky-Geier
(1950-)
German theoretical physicist

Date: 1995

Model: active Brownian agent
("active" Brownian motion model)

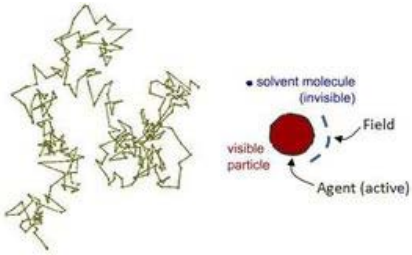

32.

Fritjof Capra
(1939-)
Austrian-born American physicist

Date: 1996

Model: Belousov-Zhabotinsky reaction

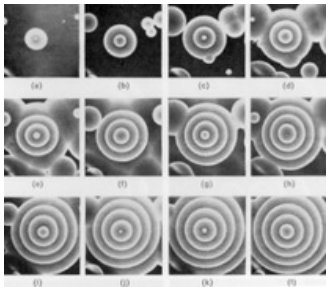

33.

Alicia Juarrero
(1947-)
Cuban-born American philosopher

Date: 1999

Model: human tornado
(vortex model)

Description: “Recent research in nonlinear dynamical systems suggests organisms are more like **tornadoes** or even ‘chaotic’ systems like glass or planets.” [9]

34.

Victor Yakovenko
(1961-)
Russian-born American physicist

Adrian Dragulescu
(c.1974-)
Romanian-born American physicist

Date: 2000

Model: Boltzmann money distribution

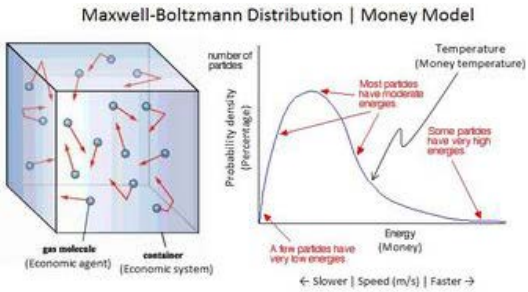

35.

Robert Sterner
(c.1958-)
American limnologist

James Elser
(c.1959-)
American limnologist

Date: 2000

Model: 22-element abstract reactive molecule
(Sterner-Elser human molecular formula)

= 22-element molecule

$H_{375,000}$ $O_{132,000,000}$ $C_{85,700,000}$ $N_{6,430,000}$ $Ca_{1,500,000}$
$P_{1,020,000}$ $S_{206,000}$ $Na_{183,000}$ $K_{177,000}$ $Cl_{127,000}$ $Mg_{40,000}$ $Si_{38,600}$
$Fe_{2,680}$ $Zn_{2,110}$ Cu_{76} I_{14} Mn_{13} F_{13} Cr_{7} Se_{4} Mo_{3} Co_{1}

Wenyuan Niu
(c.1950-)
Chinese scientist

36.

Date: 2001

Model: Social particle combustion model
(social combustion theory)

37.

Libb Thims
(c.1975-)
American electrochemical engineer

Date: 2002

Model: 26-element animate reactive molecule
(Thims human molecular formula)

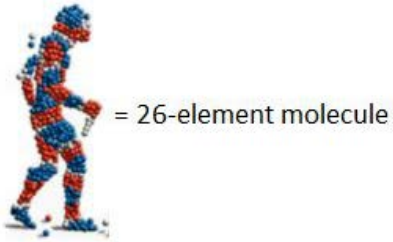

$H_{2.5E9}$ $O_{9.7E8}$ $C_{4.9E8}$ $N_{4.7E7}$ $P_{9.0E6}$ $Ca_{8.9E6}$ $K_{2.0E6}$ $Na_{1.9E6}$
$S_{1.6E6}$ $Cl_{1.3E6}$ $Mg_{3.0E5}$ $Fe_{5.5E4}$ $F_{5.4E4}$ $Zn_{1.2E4}$ $Si_{9.1E3}$
$Cu_{1.2E3}$ $B_{7.1E2}$ Cr_{98} Mn_{93} Ni_{87} Se_{65} Sn_{64} I_{60} Mo_{19} Co_{17} V

38.

Libb Thims
(c.1975-)
American electrochemical engineer

Date: 2003

Model: human molecular orbital

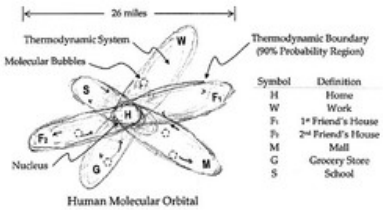

39.

Libb Thims
(c.1975-)
American electrochemical engineer

Date: 2009

Model: Defunct theory of life (human ≠ alive)

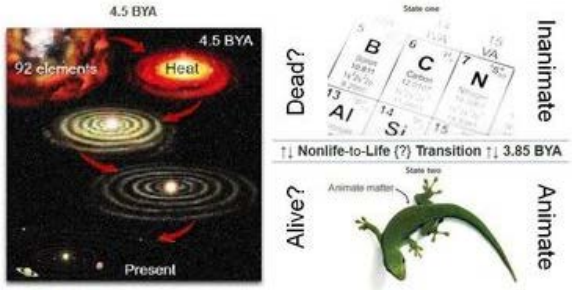

40.

Libb Thims
(c.1975-)
American electrochemical engineer

Date: 2010-2013

Model: synthesis (birth) / analysis (death) model
(synthesized molecule model)

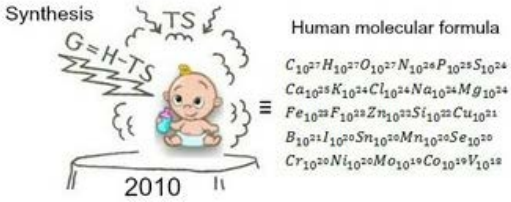

41.

Kalyan Annamalai
(c.1943-)
Indian-born American mechanical engineer

Carlos Silva
(c.1982-)
Venezuelan-born American mechanical engineer

Date: 2011

Model: Human body | Formulae

"A **human** is a 26-element energy / heat driven dynamic atomic structure."

42.

Addy Pross
(1945-)
Israeli organic chemist

Date: 2012

Model: Far-from-equilibrium solar-powered refrigerator

Description: "The simple truth is that the most basic living system, a bacterial cell, is a highly organized far-from-equilibrium functional system, which in a thermodynamic sense mimics the operation of a refrigerator (or solar powered cooler), but is orders of magnitude more complex."

(add)

Twitter

The following are some noted Twitter users, in 2017, defining themselves atomically or formulically:

Quotes

The following are related quotes:

> "Each of us from a purely physical standpoint is a large batch atoms."
>
> — Paul Aebersold (1949), "Atomic Energy Benefits: Radioisotopes"

> "To a materialist no thing is real but atoms in a void and we are but molecular people controlled by the actions of natural physicochemical law."
>
> — George Scott (1985), "Molecular People" dedicated to Lucretius

> "Humans are an interesting form of baryonic matter."
>
> — Michael Rowan-Robinson (1999), *The Nine Numbers of the Cosmos* (pg.16)

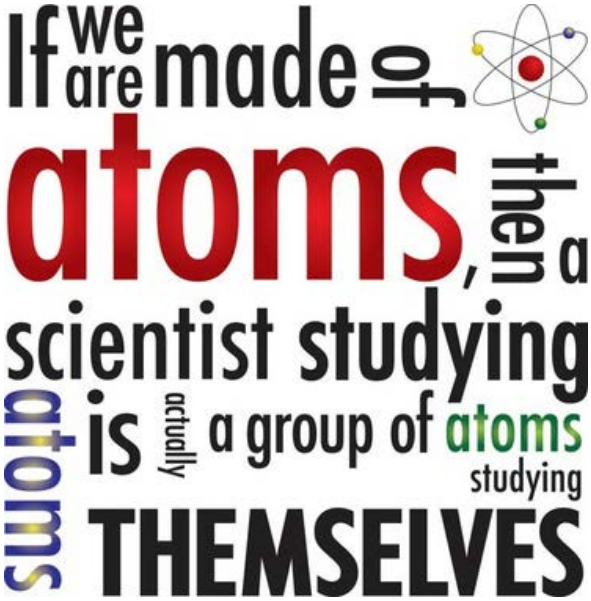

A 2013 Yahoo Answers query turned 2014 viral quote meme.

> "If we are made of atoms, then a scientist is a group of atoms studying themselves."
>
> — Anon (2013) "Yahoo Answers Question" (Ñº); turned 2014 SciencePorn tweet (Ñº) favorite; turned 2015 quote pic (Ñº)(Ñº)(Ñº)(Ñº) meme; thematically, a variant of Niels Bohr's c.1934 view that: "A physicist is just an atom's way of looking at itself." (Ñº)(Ñº)

See also

â— Rock vs. human
â— Human atom
â— Point atom
â— Free electron
â— Social atom
â— Human fluid
â— What is a human?

Notes

N1. The term "**powered CHNOPS+20 element existive**", a term conceived, specifically with reference to "existent", by Thims, upon wakeup (7 Apr 2020), after the day previous penning the "Aristotle" chapter to HCT, which involved a certain amount of research into the theoretical and terminological specifics of Aristotle's *Physics* (§1 and §4), wherein he employs the facinating terms "existents" and "existing things" to implicitly defined all things, humans included; for example:

> "A similar inquiry is made by those who inquire into the '**number of existents**'; for they inquire whether the ultimate constitutes of **existing things** are one or many, and if many, whether a finite or an infinite plurality. So, they are inquiring whether the principle or element is one or many. We must take for granted that the **things that exist** by nature are, either all or some of them, in motion—which is made plain by induction."
>
> — Aristotle (350BC), *Physics* (§1, pgs. 315-16) (translators: R.P. Hardie and R.K. Gaye)

derived from "CHNOPS" combination (Ostwald, 1926), "powered" (Swan, 1974), plus "CHNOP+" notation (Thone, 1936), along with the number "20", representative the difference of 26, the total number of elements in a human (see: Thims human molecular formula) minus 6 elements, namely the six elements of the CHNOSP acronym.

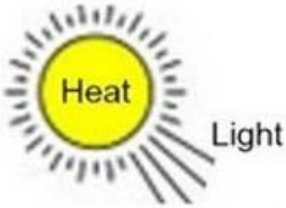

A depiction of Frank Thone's 1936 picture of a plant labeled as a "CHNOPS plus" thing.

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1. Anon. (2000). *Merriam-Webster's Collegiate Dictionary* (Version 2.5). Publisher..
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (ch. 2: "Human Molecule", pgs. 15-35). Morrisville, NC: LuLu.
(b) Thims, Libb. (2008). *The Human Molecule*, (preview). Morrisville, NC: LuLu.
3. Erreygers, Guido. (2001). *Economics and Interdisciplinary Exchange*, (ch. 7: "Particles or Humans? - Econometric Quarrels on Newtonian Mechanics and the Social Realm", pgs. 171-79). Routledge.
4. Vitruvian man – Wikipedia.
5. Sales, Jean. (1789). *De la Philosophie de la Nature: ou Traité de morale pour le genre humain, tiré de la philosophie et fondé sur la nature* (*The Philosophy of Nature: Treatise on Human Moral Nature, from Philosophy and Nature*), Volume 4 (molécules humaines, pg. 281). Publisher.
6. Fisher, Irving. (1892). *Mathematical Investigations into the Theory of Value and Prices* (particle, 3+ pgs). Yale University Press.
7. Lewis, Gilbert N. (1925). *The Anatomy of Science*, Silliman Lectures; Yale University Press, 1926.
8. Bak, Per, Tang, Chao, and Wiesenfeld. (1988). "Self-organized Criticality: an Explanation of 1/f Noise", *Physical Review Letters*, 59: 381-84.
9. Juarrero, Alicia. (1999). *Dynamics in Action: Intentional Behavior as a Complex System* (laser, pg. 20; tornado, pg. 75). MIT Press.
10. Goodman, Michael. (1988). *What is a Person?* Springer.
11. Lovelock, James E. (1995). *The Ages of Gaia: A Biography of Our Living Earth* (pg. 27). Publisher.
12. Bousquet, Antoine. (2009). *The Scientific Way of Warfare* (§: The Human Engine: Thermodynamic Bodies and Minds, pg. 72). Columbia University Press.
13. Quote: "we are all steam engines", stated by: Felix Adler, 1916 (Ñº), Peter Atkins, 2010 (Ñº), Marcus Chown, 2013 (Ñº), etc.
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15. Ostwald, Wilhelm. (1901). *Natural Philosophy: with Author's Special Revision for the American edition* (translator: Thomas Seltzer) (physico-chemical machine, pg. 171). Henry Holt and Co, 1910.
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(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 26). Zondervan, 2009.
(c) George Gaylord Smith – Wikipedia.
17. (a) Aristotle. (350BC). *Physics* (translators: Robert Hardie and Russell Gaye) (txt). Publisher, 1930; Oxford, 1954.
(b) Aristotle. (322BC). *The Complete Works of Aristotle, Volume One* (editor: Jonathan Barnes). Princeton, 1995.
(c) Thims, Libb. (2020). *Human Chemical Thermodynamics — Chemical Thermodynamics Applied to the Humanities: Meaning, Morality, Purpose; Sociology, Economics, History, Philosophy, Government, Anthropology, Politics, Business, Jurisprudence; Religion, Relationships, Warfare, and Love* (**pdf**). Publisher.

External links

â— Human – Wikipedia.

θΔics

In human chemistry, the **human atom** is a metaphor-like term used to define the human being as the atomic unit in sociology or as a bound state of atoms acting like a single reactive particle.

Artistic rendition of a **human atom**, an overlay of the atomic symbol over an X-ray style view of a human, with a light glow behind, representative of energy.

History

In 1813, English chemist Humphry Davy described man as a *point atom*. [1] The 1898 article "the Unit of Consideration in Sociology" by American sociologist Samuel Lindsay resulted in follow-up discussions on society composed of human atoms. [2] In discussion on Lindsay's societal unit, American sociologist Albion Small commented that: [3]

> "General chemistry is sometimes defined as 'the science of atoms and their behavior.' The same chemists who use this definition acknowledge that they have never discovered the hypothetical 'free atom.' The only close likeness in this respect that I can discover between general sociology and general chemistry or biology is in the fact that we must use the conception of human individuals, although we can find no such object in reality as the free individual.
>
> If we should describe sociology as 'the science of human individuals and their behavior' we should be in verbal uniformity with one way of defining chemistry; but I do not see any profit from that fact in the shape of more knowledge about society. Unless we are willing however, to take as our ultimate concept 'the **human atom**,' 'the individual,' 'the social man,' or whatever we may choose to name the irreducible element in societary combinations, I see nothing but arbitrariness in the plan of adopting a 'unit of inquiry.' Is it not a purely gratuitous assumption that at present sociology needs or can use a unit of inquiry in the sense to which Professor Lindsay seems most to incline?"

In 1956, German-American psychologist Erich Fromm defined people as *human atoms* as such: [4]

> "Contemporary society preaches the ideal of unindividualized equality because it needs **human atoms**, each one the same, to make them function in mass aggregation, smoothly, without friction; all obeying the same commands, yet everybody being convinced they he is following his own desires."

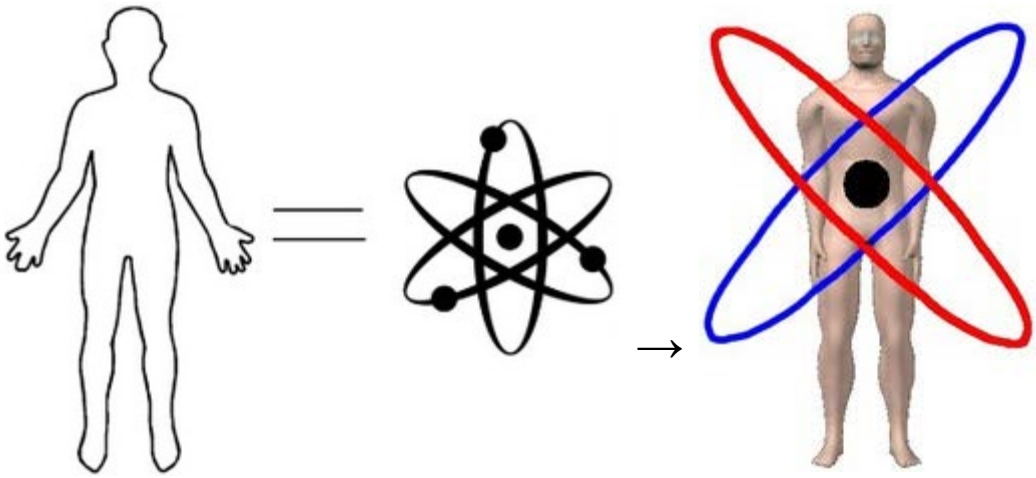

Conceptual idea of a **human atom**, the loose idea that people are like atoms as compared with the billion plus population of humanity or as compared to the universe.

Recent decades, to note, have turned towards the more chemically-correct view of people as 26-element "human molecules", over that of the simplified human atom view.

See also

- Human particle
- Social atom

- Human element
- Human chemical
- Human atomism

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1. Levere, Trevor, H. (1971). *Affinity and Matter – Elements of Chemical Philosophy 1800-1865*. Great Britain: Oxford University Press.
2. Lindsay, Samuel McCune. (1898). "The Unit of Investigation or of Consideration in Sociology", *The Annals of the American Academy of Political and Social Science* (pgs. 214-), Vol. 12, Sep.
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Further reading

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- Purcker, G. De. (1932). "The Life and Adventures of a Human Atom", *Theosophical Path Magazine*, March, pgs. 187-202.
- Trust, Josephine C. (1946). *Human Atoms Power Harnessed Prolongs Life*. Publisher.

θΔics

In homeokinetics, a **human atomism** is a human being abstractly defined as an atomism.

In 1987, American physicist Arthur Iberall referred to a person as a human atomism as follows: [1]

> "The factory day is characteristic not only of living systems but also of all complex atomistic systems that persist and that express much of their action internally. For an individual **human atomism** the factory day largely, but not completely, coincides with the earth's day."

(add discussion)

See also

- Human atom
- Human chemical element
- Human element
- Human particle
- Social atom

References

1. Iberall, Arthur S. (1995). "A Physical (Homeokinetic) Foundation for the Gibsonian Theory of Perception and Action", *Ecological Psychology*, 791): 37-68.

θΔics

In science, **human behavior**, or the behavior of humans, refers to the typical or atypical traits or characteristics of the activities or movements of people, singularly or interactively.

Thermodynamics

A number of people have attempted to explain human behavior thermodynamically. [1] Two of the earliest to do this, supposedly, were Americans anthropologist Leslie White and sociologist Fred Cottrell. [2]

References

1. Anderson, Ralph E., Carter, Irl E., and Lowe, Gary. (1999). (thermodynamics, pgs. 289, 10, 303). Aldine Transaction.
2. Trigger, Bruce G. (1990). "Monumental Architecture: a Thermodynamic Explanation of Symbolic Behavior", *World Archaeology*, 22(2): 119-132.

Further reading

â— Ziebart, Brian D, Maas, Andrew, Bagnell, J.A., and Dey, Anind K. (2009). "Human Behavior Modeling with Maximum Entropy Inverse Optimal Control" (pgs. 92-97), *School of Computer Science*, Carnegie Mellon University; published in *Spring Symposia*, of the Association for the Advancement of Artificial Intelligence.

θΔics

In terminology, **human being** is a commonly used, but ill-defined, term or expression for a type of molecular structure called "human" that is argued to posses the properties of a “being” and to take part in the evolutionary process. The difficulty in using this term is that the idea of life or a “human being”, when viewed from the molecular evolution table perspective, is a fictional construct that falls apart in definition as one descends down the evolutionary tree to the roots, which are comprised of hydrogen atom precursors. [1] In this sense, the conception of a person as a “human molecule” becomes a more logical and correct perspective. [2]

References

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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
2. Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc). LuLu.

θΔics

In human chemistry, **human bonding** is an oft-used colloquial term used to describe human attachments or the process of attaching, bonding, or debonding to someone. The scientific name for a human attachment is "human chemical bond".

Further reading

● Rossi, Alice S. and Rossi, Peter H. (1990). *Of Human Bonding: Parent-Child Relations Across the Life Course.* Aldine de Gruyter.
● Miller, Warren B. (2001). *The Ontogeny of Human Bonding Systems: Evolutionary Origins, Neural Bases, and Psychological Manifestations.* Kluwer Academic Press.
● Kuchinskas, Susan. (2009). *The Chemistry of Connection: How the Oxytocin Response Can Help You Find Trust, Intimacy, and Love.* New Harbinger Productions.

External links

● Human bonding – Wikipedia.

θΔics

In human chemistry, **human catalyst** is a person who acts as a catalyst to facilitate a human chemical reaction or system process, without themselves being consumed in the reaction.

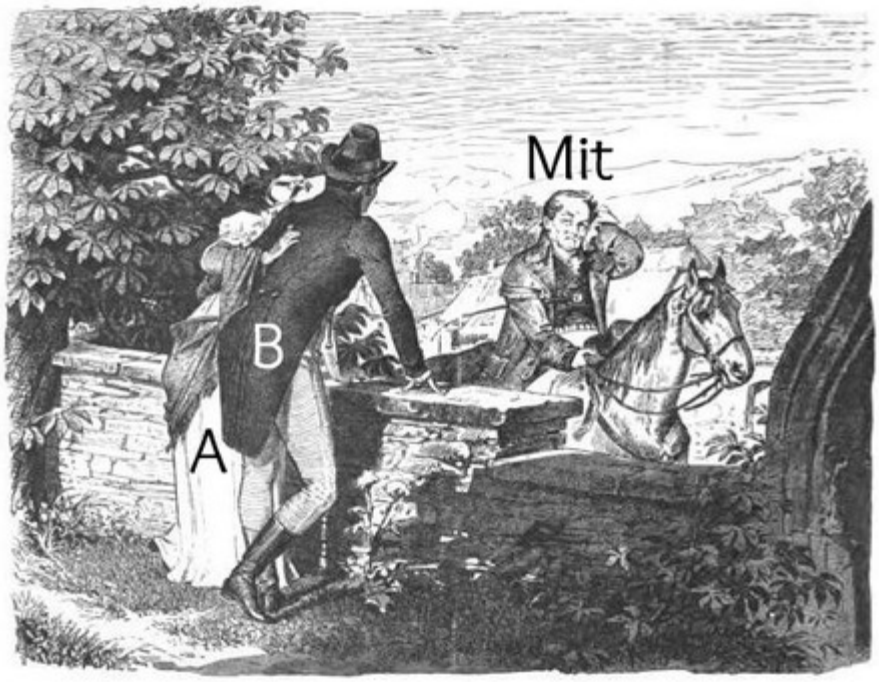

The arrival of "Mittler" the mediator, in of Goethe's 1809 *Elective Affinities* (P1:C2), the **human catalyst** conceptualized character of the novella, able to resolve or mediate disputes and therein bring about bond formations, e.g. marriages.

Overview

In 1809, German polyintellect Johann Goethe, in his physical chemistry based *Elective Affinities*, had the character Mittler, aka "the mediator", play the role of the human catalyst, a person with the ability to facilitate the formation of marriage bonds.

In 1914, American chemical engineer William Fairburn defined certain people as 'catalysts' facilitating other human chemical reactions, but not themselves being consumed. [2]

In 1948, human chemist Thomas Dreier devoted an entire chapter, entitled "The Business Executive as a Catalyst", to the argument that: [1]

> "Acting as a **human catalyst** is the essence of the executive's job."

In basing his chapter, Dreier quotes oil company executive Byrle Osborn, who when asked what his function is, replied "I hire all the engineers, lawyers, clerks, salesman and accountants that I need. They do the work. But I act as a sort of catalyst to make them work together smoothly. Every bit of friction costs money. I eliminate the friction."

In 1986,American chemical engineer Scott Fogler, in his *Elements of Chemical Reaction Engineering*, defined a human catalyst as such: [3]

> "A catalyst is a substance that affects the rate of a reaction but emerges from the process unchanged. A man inciting a mob to riot and then ducking out before the tanks roll in can be regarded as a [human] catalyst."

In 1987, American consultant Tom DeMarco, in the context of project chemistry or group chemistry, discussed the concept of the people, who don't seem to add anything tangible to a project, as in not being a great developer, good tester, etc., can acting as catalysts in team projects, helping the projects to jell. In his own words: [4]

> "The catalyst is important because the project is always in a state of flux. Someone who can help a project jell is worth two people who just do work."

(add discussion)

Quotes

The following are related quotes:

> “Teachers as catalysts? The link is misleading; / Forever we're changed after each classroom meeting.”
>
> — Mala Radhakrishnan (2016), Tweet (Ñº), Dec 20

References

1. Dreier, Thomas. (1948). *We Human Chemicals: the Knack of Getting Along with Everybody* (“The Business Executive as a Catalyst”, pgs. 37-41). Updegraff Press.
2. Fairburn, William Armstrong. (1914). *Human Chemistry*. The Nation Valley Press, Inc.
3. (a) Fogler, H. Scott. (1986). *Elements of Chemical Reaction Engineering* (catalyst, pg. 231). Prentice Hall.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (Fogler, pg. 94). Morrisville, NC: LuLu.
4. DeMarco, Tom and Lister, Timothy. (1987). *Peopleware: Productive Projects and Teams* (Catalysts, pgs. 10-11). Dorset House Pub.

θΔics

In human chemistry, **human chemical** is the term used by American writer Thomas Dreier (1910) and English-born American engineer William Fairburn (1914) to define a human being as a type of chemical, being reactive to other chemicals of the same nature. [1] In 1948, Dreier summarized his use of this term as such: [2]

> "Watch groups of people working or playing together and you will be startled to discover how 'chemical' are their reactions to one another. Once you acquire even rudiments of human chemistry, you will be baffled less often by people, and become impatient or angry less often at the (to you) annoying things they do. You will see and judge them for what they are—different kinds of **human chemicals**, obeying the laws of their natures as you and I obey the laws of our natures."

Fairburn also used the term "human chemical element" to describe people as a type of chemical or chemical species. [1] These terms can be considered as precursors to the modern-day conception of the human molecule; albeit the term "human molecule" has an older etymology (1869) [3]

See also

â— Human particle
â— Social atom

References

1. (a) Dreier, Thomas. (1910). *Human Chemicals*. (27-pgs). Backbone Society.
(b) Fairburn, William Armstrong. (1914). *Human Chemistry*. The Nation Valley Press, Inc.
2. Dreier, Thomas. (1948). *We Human Chemicals: the Knack of Getting Along with Everybody* (pg. 4). Updegraff Press.
3. Thims, Libb. (2008). *The Human Molecule*, (preview). Morrisville, NC: LuLu.

θΔics

In human chemistry, **human chemical bond**, A≡B, is an electromagnetic induced stabilizing, attractive-to-repulsive, field-particle mediated, cohesive force functioning to hold human molecules (people) together into bound-state entities, such as marriage pairs, friendships, work units, and social collectives, etc. [1]

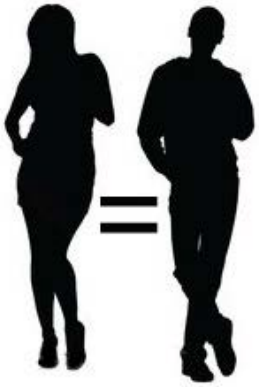

A generic diagram of a **human chemical bond**, the two parallel lines indicative of the force that holds a pair in a relationship.

Overview

In 1910, American philosopher Mary Mesny outlined an early affinity bond and valence bond model of chemical bonding between human molecules or of human relationship attachment affixed in terms of atomic valency:

> "Each human molecule has various **bonds of affinity**, satisfied, and unsatisfied. If his bonds of affinity are not met by the affinities of some other molecule, he is apt to be a very unstable chemical."

Mesny's description of affinity bonds and also of "valence bonds" existing between humans or human molecules in combined relationships was an early statement of human chemical bonding theory, being that valence bond theory, an 1850s theory, soon became quantum mechanical bonding theory (c.1920s), and affinity bonding theory, a 1775 theory, soon became free energy bonding theory (c.1950s). [8] Thermodynamically, in modern terms, chemical bonding, human or otherwise, is determined according to free energy interactions. This logic is explained by American-born Canadian biochemist Julie Forman-Kay, in her 1999 article "The 'Dynamics' of the Thermodynamics of Binding", as such: [3]

> "Whether two molecules will bind is determined by the free energy change (ΔG) of the interaction, composed of both enthalpic and entropic terms."

The definition given here by Forman-Kay, to note, is defined in the context of interactions between protein molecules. The first to extrapolate this logic of free energy determined binding to the case of interactions between human molecules, was American chemical engineer Libb Thims in circa 2005, in his evolutionary psychology based dodecabond model (as shown adjacent).

Long-term stable marriages are held together via the Gottman stability ratio. In the basic attachment reaction, between two unacquainted individuals, A and B, a collision will occur, in a time-accelerated sense, and the resultant "bond" that form can have various degrees of attachment strength:

A + B → AB (very strong bond)
A + B → A≡B (strong bond)
A + B → A=B (intermediate bond)
A + B → A-B (weak bond)
A + B → A--B (weaker bond)
A + B → A - - - B (detaching stage bond)

A equation overlay depiction of an strong A≡B type **human chemical bond** actuating between two people (human molecules) newly in love during war times.

The question then immediately becomes: "how are these human chemical bonding variations (A≡B, A=B, A-B) quantified?" The central answer to this question lies in the understanding of the photon-electron interactions of the outer valence shell electons of the bonded individuals, as is the case with all attachments between molecules.

In this direction, human chemical bonds can be studied and modeled from a number of perspectives, such as an "orbital perspective", i.e. tracking the spatial movements of attached people over time on the surface of the earth, an "exchange force" perspective, in which an exchange of particles, which accompanies the interaction and transmits the force, operates, from a "quantum mechanical" perspective, in which quantum inputs or outputs of energy cause jumps in hierarchy location, or from a psychological perspective, e.g. John Bowlby's attachment theory (1953) or Lewis-Amini-Lannon limbic bonding theory (2000), among other points of view, such as neurochemical operation, etc. This basic structure of the human chemical bond, using a male-female perspective, is diagrammed in simple form below, from an energy view perspective: [2]

History

See main: History of chemical bonding theory

The first to outline the logic of thermodynamic stability of bonding, in the context of free energy changes, it seems, was American physical chemist Gilbert Lewis in 1916. [7] The earliest views on human bonding can be traced to the early 20th century work of various parent-child psychologists, such as Anna Freud, Melanie Kline, James and Joycle Robertson, John Bowlby, Mary Ainsworth, Marshall Klaus, and John Kennell, among others, who developed theories on "attachment" and "parent-infant bonding". [3] Views on the neurochemical operation of the human bond, popularizing conceptions such as that oxytocin is the "cuddle chemical", began to emerge after the year 1954, the founding year of the discipline of neurochemistry. [5]

Goethe

In 1809, Johann Goethe was conceptually modelling human relationships via William Cullen chemical bonding brackets, according to which the crotchet "{" was conceptualized by Goethe, based on his reading of Bergman (1775), as the chemical force of the union, or something along these lines; which is diagrammed as follows:

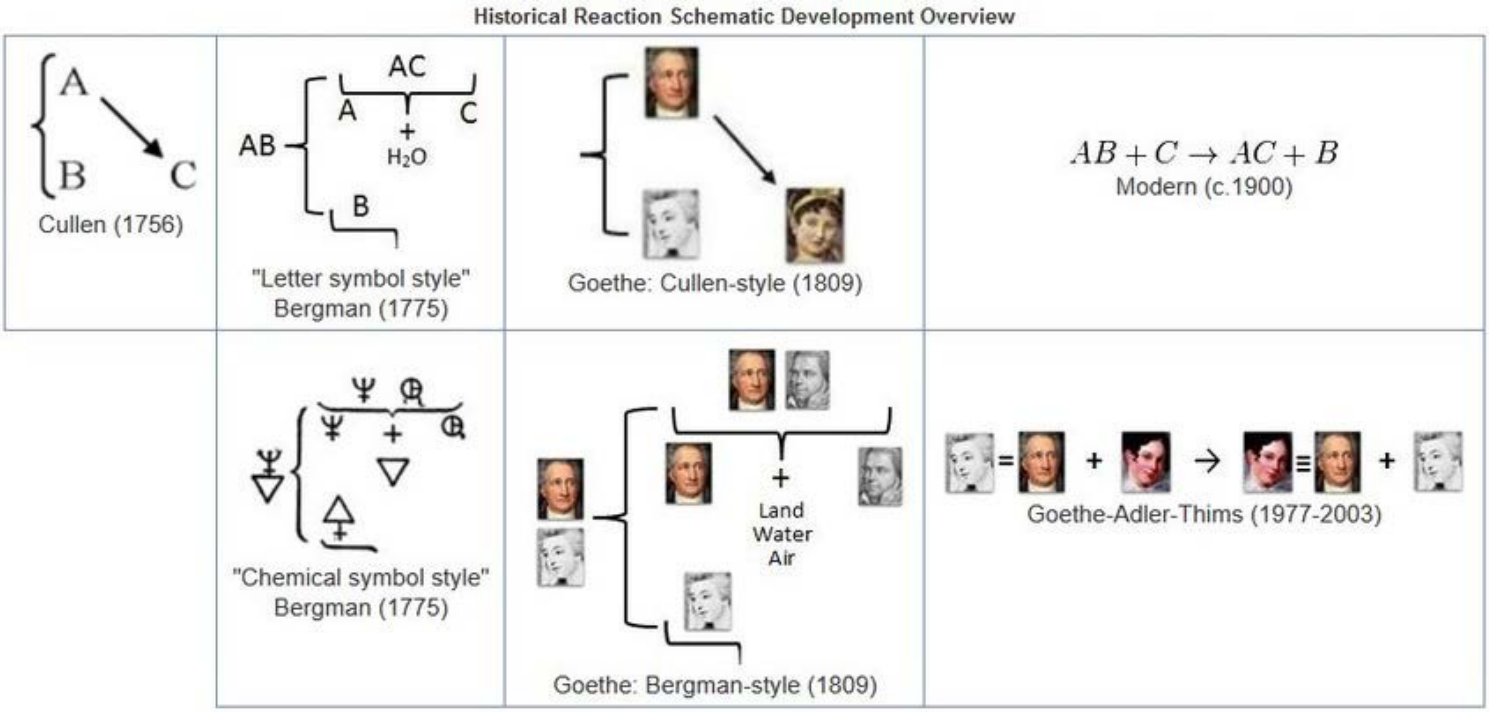

The following is an example synopsis quote:

> "At the heart of *Elective Affinities* lies the conversation on chemistry about the elective affinities of inorganic substances. Various experiments with calcium have proven that affinities between certain substances are stronger than those between others, that in fact the introduction of a new substance to a chemical compound will cause an existing **chemical bond** to be broken and a new composite to be formed. Goethe takes this observation about chemical substances, and applies it to a number of carefully selected people [**humans**] in a great variety of circumstances and combinations. The novel then traces the effects of this ever-changing pattern on individuals, showing which affinities crystallize out as the strongest."
>
> — Gundula Sharman (2002), *Twentieth-century Reworkings of German Literature* (pg. 156)

(add)

Granovetter

In 1969, Mark Granovetter, in his "The Strength of the Weak Ties", based on the hydrogen bonding models he had learned in chemistry class, outlined a "weak tie" and "strong tie" mode of human associations, as illustrated as below, wherein strong ties are akin to covalent bonds, and weak ties are akin to hydrogen bonds:

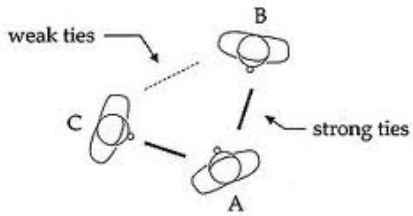

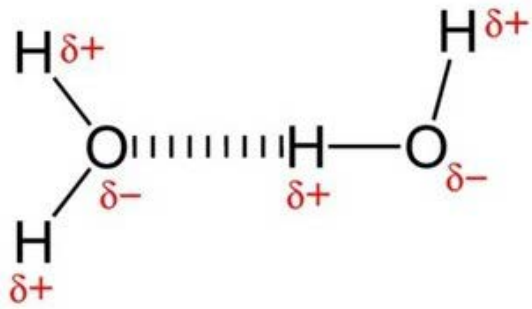

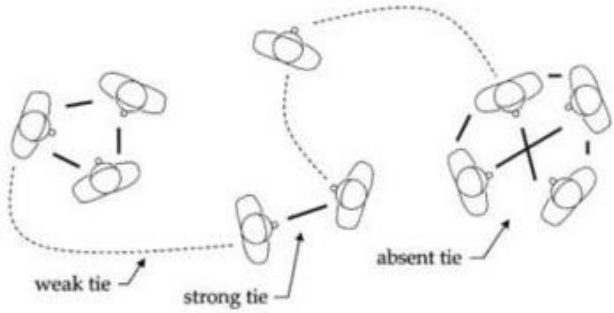

(add)

Beg

In 1987, Mirza Beg, in his *New Dimensions in Sociology* (pgs. 72-74), was using implicit human chemical bonding models; for example in the following equilibrium reaction between close friends, A and B:

$$A + B \rightleftharpoons AB$$

He was referring to what he termed the "A-B linkage", how a "linkage is established between the two persons", and in three potential "dimer-formering" reactions, where AB is the dimer, according to Beg, he gave three possible reactions between human species A, B, and C, as follows:

$$A + B \rightleftharpoons AB$$

$$A + C \rightleftharpoons AC$$

$$B + C \rightleftharpoons BC$$

He speaks of "weak linkages" as compared to "strong linkages" in the above three scenarios. Beg did not, however, explicitly digressing on HCB theory.

Mimkes

In 2002, Jurgen Mimkes, in his "Chemistry of the Social Bond", was suggesting that social bonds were chemical bonds and a function of internal energy and or free energy; and in the 2002 CFI SocioPhysics Conference was lecturing on this; the abstract of which is as follows: [9]

> "The state of large stochastic systems of N objects may be calculated by the Lagrange principle L(N) = T log P(N) + E(N) → maximum ! P is the probability, that is to be maximized under a system condition E, and T is the Lagrange ordering parameter. L is the Lagrange function of the system, that may be far away or close to stability. At equilibrium the Lagrange function is at maximum. In natural sciences E is given by the **chemical bonds** and the (negative) Lagrange function corresponds to the free energy, from which all thermodynamic states may be calculated. In social systems the Lagrange principle corresponds to the common benefit. The function E represents the **social bonds** of the system."

(add)

Thims

In c. 2003, Libb Thims began to grapple with the human bonding, viewed such that the human bond is a chemical bond, such as described by American chemical engineer Linus Pauling's 1931 article "The Nature of the Chemical Bond", when it became apparent that part of human free energy, such as active in a human reproduction reaction, are contained in the marriage bond of the parental structure. Thims, in short, between the years 2001 and 2007 grappled with theory behind the bond, as briefly outlined in the 2005 unfinished article "On the Nature of the Human Chemical Bond". [4]

In late 2001 and early 2002, Thims had originally conceived of the basic human reproduction as: A + B → C, in which A and B are the reactants (the dating pair) and C is the product (a 15-year old child). In this mode of logic, Thims had no conception of a the "AB attachment" or bond (this detail was ignored in early calculations). In late 2002 or early 2003, however, it became apparent to Thims that he was leaving out an important component of the reaction, i.e. the *AB bond* of the attached couple or married pair in the standard initial state and end state of the standard 18-year reproduction reaction:

$$AB + CD \rightarrow A{\equiv}C + BD$$

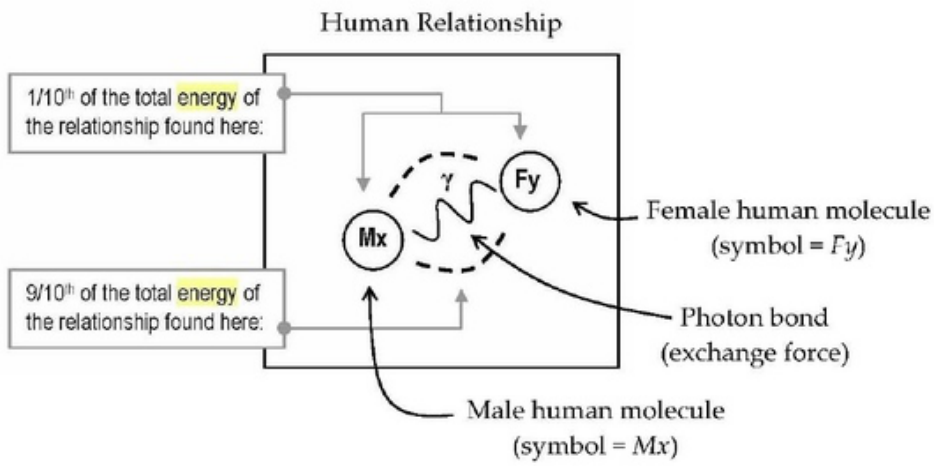

A 2004 field particle exchange model of the **human chemical bond**, according to Libb Thims.

where, in this reaction, AC are the male A and his sperm B, CD is the female C and her egg D, at the second of love at first sight, A≡C is the bonded in marriage parental structure, and BD is the 15-year old child precipitate of the reaction beginning to detach from the parental structure to go off into the world as a newly synthesized individual unattached human molecule.

The investigation then began to understand what this "AB bond" means from a chemical point of view or fundamental forces point of view. For at least a half a year or more, the issue remained a puzzle. On November 10, 2003, Thims synthesized the concept of 'human molecular orbital theory' as based on 'hybridized molecular orbital theory' of small molecules according to the Schrodinger equation. On May 05, 2004, Thims formulated a 'field particle exchange theory' of human bonding as based on QED, QCD, particle physics, evolutionary psychology, and particle physics, which defines human molecules to be attached via the exchange of field particles.

On the Nature of the Human Chemical Bond

In 2005, Thims made an attempt at writing a journal article entitled "On the Nature of the Human Chemical Bond", but left the article unfinished after nearing the thirty page mark, and realizing the subject would not fit on single webpage. [4] Nearing the end of 2005, it became apparent to that in order to discuss the nature of the human chemical bond in the correct light, he would have to write up a complete textbook on "human chemistry". Subsequently, he spent the next 18-months and 14-days doing so. The 824-page, two-volume bookset *Human Chemistry* was published in September of 2007. Of which nearly half of the book is devoted to the explication of the human chemical bond.

Quotes

The following are related quotes:

> "While Prigogine's attention here is on chemical and biological phenomena, his concern is equally relevant to the operation of societies. While we may imagine the bonding and coupling of chemical elements through electromagnetic attraction or the basic force that holds the nucleus of atoms together, we daily experience and contend with the forces and attractions that seem to hold people in social relations. We can feel in our viscera and conceptualize in our mental models the 'reason' that we hold onto a job or divorce a spouse. The bonds and forces of society are utterly different from those of atomic or chemical reactions, but the fact in common is that complex things must be constructed and that it costs energy to bring this about."
>
> — Richard Adams (1988), *The Eighth Day* (pg. 75)

References

1. Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (ch 13: "Human Chemical Bonding", pgs. 515-560). Morrisville, NC: LuLu.

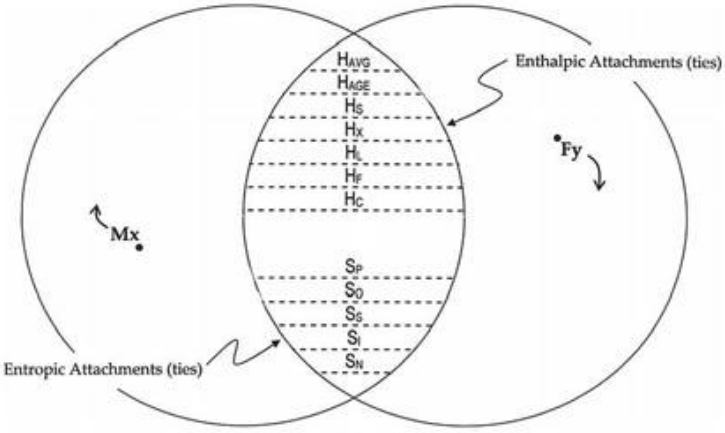

The standard human chemical thermodynamic **"dodecabond model"** (2007) of **human chemical bonding**, defining attachment between two humans in terms of enthalpic ties and entropy ties, shown in the context of a human molecular orbital view. [1][3]

2. The "energy-view perspective" is modeled on the energy-view perspective of sub-atomic relationships, such as in the structure of a proton or neutron, in which approximately 90% of the mass of the structure is found in the gluon bonds. In the structure of any nucleon, according to Dutch theoretical physicist Martinus Veltman, winner of the 1999 Nobel Prize in physics for in 1999 "for elucidating the quantum structure of electroweak interactions in physics", from his 2003 book *Facts and Mysteries in Elementary Particle Physics*, most of the mass or "energy", as these are equivalent via Einstein's mass-energy equivalence relation, of sub-atomic particles actually resides within the bonds. In the proton, for instance, which consists of two up quarks and one down quark each connected together via gluon "g_{ab}" bonds, 923 MeV of its total mass (938 MeV) resides within the gluon bond. Hence, in colloquial terms, most of the essence of the proton or quark relationship is actually found within the bond.

3. Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (ch 12: "Bond History and Neurochemistry", pgs. 469-513). Morrisville, NC: LuLu.
4. Thims, Libb. (2005). "On the Nature of the Human Chemical Bond." *Journal of Human Thermodynamics*, Vol. 1, Issue 5 (pg. 36-61) – November (left un-finished).
5. Neurochemistry (the science of the chemistry of the nervous system) traces it origin to a series of *International Neurochemical Symposia*, of which the first symposium volume published in 1954 was titled "Biochemistry of the Developing Nervous System" (source*: Basic Neurochemistry*, 7th ed, 2006).
6. Forman-Kay, Julie D. (1999). "The 'Dynamics' in the Thermodynamics of Binding." *Nature Structure Biology*, 6: 1086-87.
7. Lewis, Gilbert. (1916). "The Atom and the Molecule", *Journal of the American Chemical Society*, Vol. 38, Jan. pgs. 762-86.
8. Mesny, Mary B. (1910). "Human Molecules", *The Smart Set: a Magazine of Cleverness*, 31:100, May.
9. (a) Mimkes, Jurgen. (c.2002). "Chemistry of the Social Bond" ("Chemie der sozialen Bindungen") (pdf) (Eng), University of Paderborn.
(b) Mimkes, Jurgen. (2002). "The Structure of Complex Systems: Thermodynamics, Socio-Economics", SocioPhysics Conference (abs) (toc) (pdf), Center for Interdisciplinary Research (Zentrum fiir interdisziplinare Forschung) (ZIF), Bielefeld Germany, Jun 6-9.

External links

â— Chemical Bonding vs. Human Bonding (men = metals; women = non-metals) – Elsmar.com forums, 2010.

θΔics

In human chemistry, **human chemical element** was one of the terms, along with human element and human chemical, used by American engineer William Fairburn, in his 1914 booklet *Human Chemistry*, to describe an individual person, whom, as he eluded to, were made of combinations of the eighty-one known elements. [1]

References

1. Fairburn, William A. (1914). *Human Chemistry* (pgs. 2-4, 12-13). The Nation Valley Press, Inc.

θΔics

In human chemistry, a **human chemical reaction** is a change in which one or more human molecules (people) or human molecular compounds (aggregates of people), technically what are termed the *reactants*, form or rather chemically transform into a new compound or human molecular structure, the *products*, through a process of either synthesis (coming together) or analysis (taking apart). [1]

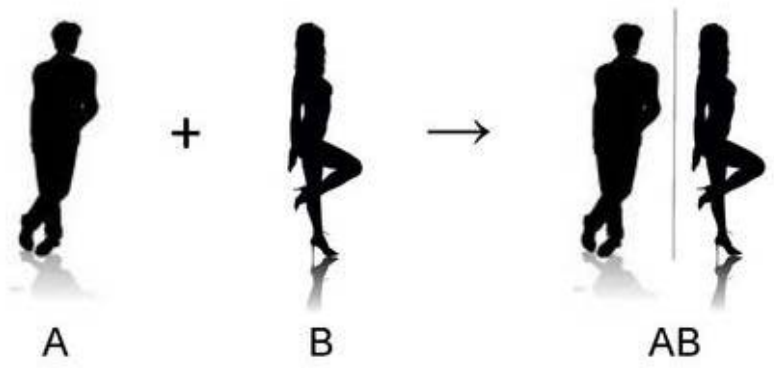

A modern day Bergman-Goethe style depiction of a male-female type combination **human chemical reaction**.

Human chemical reaction theory

See main: Human chemical reaction theory

The first to work out the "theory" of human relationships and interactions viewed as chemical reactions, forming bonds and breaking bonds, was German polymath Johann Goethe, beginning originally in terms of verbal commentary in 1796. Goethe likely, as has been speculated, was the first to draw out human chemical reactions, in the William Cullen reaction diagram style:

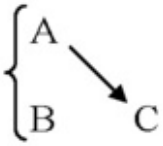

where A, B, and C are people or chemicals, depending on discussion, the crotchet is a chemical "union" or bond, depending, and the arrow or "dart" is the chemical affinity force, in preparation for the writing of his 1809 *Elective Affinities;* although the fact that he destroyed all his manuscripts and notes to this novella, contrary to his usual practice, leaves the question unresolved. [5] The best verbal example from the novella comes from his famous chapter four. Goethe's reaction theory was followed by Jeremy Adler (1969), Libb Thims (1995), Christopher Hirata (2000), David Hwang (2001), Chanel Wood (2007), and Surya Pati (2009), among others.

Etymology

In 1906, American astronomer and MIT college president Henry Pritchett stated the following: [7]

> "There are men who would be better off in a small village than in a large town, if you had some sort of **human chemical reaction** to determine in advance which man's nature was suited to the smaller place and which to the larger."

The following is a related famous 1933 quote by Swiss psychologist Carl Jung on this topic: [4]

> "The meeting of two personalities is like the contact of chemical substances; if there is any reaction, both are transformed."

The first person to use the term "human chemical reaction" seems to have been American author and self-defined "human chemist" Thomas Dreier. In 1948, he gave the following description of marriage as a human chemical reaction: [3]

> "Marital relationships are **chemical** in nature, the result of natural **human reactions**."

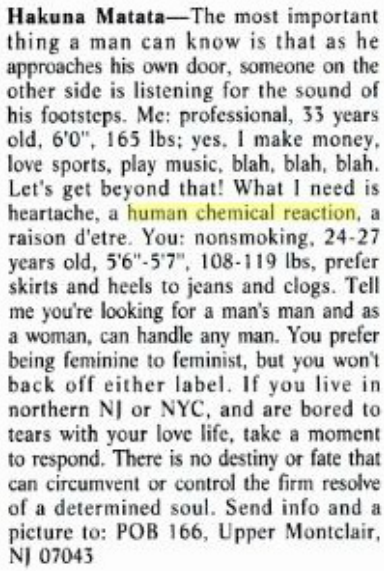
Hakuna Matata—The most important thing a man can know is that as he approaches his own door, someone on the other side is listening for the sound of his footsteps. Me: professional, 33 years old, 6'0", 165 lbs; yes, I make money, love sports, play music, blah, blah, blah. Let's get beyond that! What I need is heartache, a human chemical reaction, a raison d'etre. You: nonsmoking, 24-27 years old, 5'6"-5'7", 108-119 lbs, prefer skirts and heels to jeans and clogs. Tell me you're looking for a man's man and as a woman, can handle any man. You prefer being feminine to feminist, but you won't back off either label. If you live in northern NJ or NYC, and are bored to tears with your love life, take a moment to respond. There is no destiny or fate that can circumvent or control the firm resolve of a determined soul. Send info and a picture to: POB 166, Upper Montclair, NJ 07043

A 1995 *New York Magazine* wanted ads usage of the term **"human chemical reactions"**. [6]

In the context of social interactions, Dreier seems to have been the first to coin the term “human chemical reaction”, albeit he uses it in the context of a point interaction, as contrasted with the standard view of a human chemical reaction as being defined by the larger-scale time period of reactants going to products:

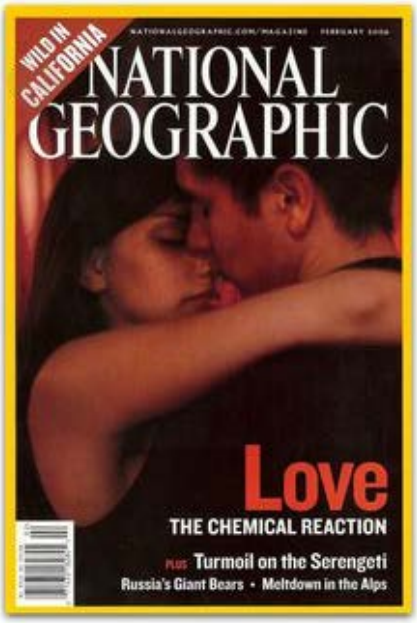

The 2006 **"Love: the Chemical Reaction"** *National Geographic* Valentine's day cover story issue.

“There are certain people we dread to meet because whenever we talk with them our ideas clash. Hard as we try, we cannot seem to avoid becoming argumentative, if not positively combative. We realize that it is our strongly held personal opinions for which produce uncomfortable reaction—for that is what is what it is—a **human chemical reaction**.”

Overview

The modern interpretation, in which people are viewed as molecules, of the older "love the chemical reaction" view of life and romance, in which human interactions are described in mechanistic terms, just as in a standard chemistry textbook. The following is another description by Dreier, in which a pair, each married at the time, met and fell in love, both getting divorces and remarrying each other: [3]

“Here two persons reacted as certain as powerful chemicals react when united. We need not pass on the rightness or wrongness of their action to recognize the inevitability of strong reactions to certain human chemical combinations.”

The detailed understanding of what constitutes a human chemical reaction is very difficult subject, which is not easily discerned on first pass. A very simple reaction is the combination reaction, in which two un-acquainted people, *A* and *B*, meet in time, fall in love (as in “love the chemical reaction”), and transform into a bonded relationship or couple *AB*. This is depicted by the following chemical equation:

$$A + B \rightarrow AB$$

When reactions become more complicated, however, many unseen factors begin to accrue, such as coupling effects, and second-by-second exchanges in the mechanism. To even begin to describe human interactions in terms of basic chemical reactions is very difficult. Americans biologist Lynn Margulis and science writer Dorian Sagan, in their 1997 book *What is Sex?*, for instance, try to describe sex via a crude chemical equation. They ask “why do we scientists ignore the basic arithmetic of live?” In answer to this, they state “in biology 1 + 1 does not equal 2, but rather 1 + 1 = 1, as in sperm (Sp) plus one egg (Eg) equals one fertilized egg.” [2] In chemical reaction terms, their hypothetical formula amounts to:

$$Eg + Sp \rightarrow EgSp$$

A 2009 Human = Chemical Reaction blogspot (Q).

In which the *EgSp* represents a fertilized egg. The conclude “is this why our efforts to predict sexual behavior with fancy computer models are bound to fail?” In more detail, however, the full mechanistic analysis of what constitutes the energetics and movements associated with sex is more involved, as detailed in the next section.

The adjacent video (at the 1:00 mark), gives another humorous attempt to describe sex in terms of a chemical equation, using the symbol of Mars (♂) to represent the male organism or man and the symbol of Venus (♀) to represent the female organism or woman, resulting in the following sex diagram:

♂ + ♀ Baby

Using this diagram, the person in the video draws the sperm, with a head and a wiggle tail, moving from the male ♂ to the female ♀ and describes how “latex” can block the progress of the reaction. The speaker also incorrectly uses a two-way reversible reaction arrow to define the sex/reproduction reaction. The correct formulation is to use a one way arrow, signifying that the formation of an embryo and later an infant is an irreversible process. If, however, the couple or female decided to opt for an abortion, a completely different reaction mechanism would be used.

A 2011 MysticBananna.com post about humans as chemical reactions (O).

Reproduction reaction

See main: Human reproduction reaction

The core reaction in human life, through which 85% of people go through is a reproduction reaction (double displacement reaction) in which two people, *A* and *B*, react over the course of a number of years to form an attached couple *A≡B* and an new child *C*, the overall mechanism of which is shown below:

$$A + B \rightarrow A{\equiv}B + C$$

The detailed mechanism of the human reproduction reaction involves a day-by-day accounting of the germ cells, as they are exchanged between partners, and slowly form into a embryo, then into a child, which for a dozen years or more remains attached to the parental structure, then begins to detach. Technically, the basic reproduction reaction, in which one child is conceived and raised into adulthood, in mechanistic terminology, is what is called a *double displacement reaction*, of the form shown below:

$$AB + CD \rightarrow AD + BC$$

In human chemical terms, a man *Mx* parts with the genetic component of his sperm *Sp*; a woman *Fy* parts with the genetic component of her egg *Eg*; and they both emerge newly ‘transformed’ after the birth of their child, in the form of a new molecular structure, i.e. parents bonded into a working chemical relationship *MxFy* with an attached embryo *SpEg* uniting them:

$$MxSp + FyEg \rightarrow MxFy{\equiv}SpEg$$

Soon thereafter, still being attached significantly to the parental structure *MxFy*, the sperm-egg molecular entity *SpEg*, in the shape of what is called a *morula*, i.e. a globular solid mass of blastomeres formed by cleavage of a zygote, will begin to transform or grow into the structure of a young child *Bc*. Given time, the child will eventually begin to detach, in a predominate manner, from the parental structure:

$$MxFy \text{ --- } Bc \rightarrow MxFy + Bc$$

In this manner, the newly created human molecule *Bc* will go off into the world as a newly formed individual. As we see, human chemical reactions are quite intuitive and very easy to depict. Do note, however, although simplistic-looking, these human chemical reactions actually embody principles and theories far greater in complexity and extent than can be detailed in this short book. It must be understood that the second-by-second mechanism underlying the above expressions, invariably, need to be explained in terms of only two components: electrons and photons. To do this is quite a tedious process and many new perspectives on life must be digested.

Types

The following are some basic reaction types:

- Isomerization reaction: A → B
- Combination reaction: A + B → AB
- Decomposition reaction: AB → A + B
- Single displacement reaction (single elective affinity): AB + C → AC + B
- Double displacement reaction (double elective affinity): AB + CD → AD + BC

The actual description of which requires a detailed analysis of material and energy exchange and change of relationships per reaction.

Realism | Fiction

In 1809, German polyintellect initiated the field of realism fiction with his human chemical theory based novella *Elective Affinities*.

In 2009, writer Shara Azod, in the novel *Chemical Reaction*, the cover (adjacent) showing a chemical structural formula "overlay" method, on top of two people in passionate love making, with fire at the bottom indicating that heat is involved in some way, and that the process is a **human chemical reaction**. The book description is as follows: [9]

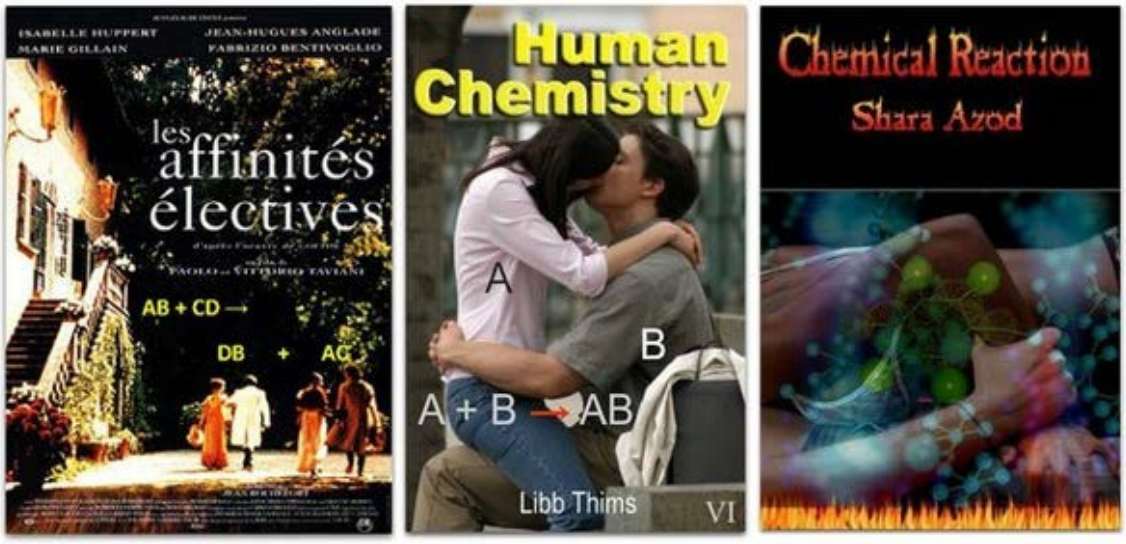

Three **human chemical reaction** conceptualized publications: Goethe's 1809 *Elective Affinities* (left); Libb Thims' 2007 *Human Chemistry* (center); Shara Azod's 2009 *Chemical Reaction* (right).

> "Dr. Ezekiel Soren has encountered an odd chemical attraction. He wanted Shana Wilkins so bad he can't concentrate on his precious research. The woman stayed firmly implanted in his cerebral cortex no matter what he did. It was past time that he experimented a little. He and Ms. Wilkins will simply have to combine to explore what could be the chemical reaction."

Azod states that he worked at a medical school for 6 years. It was the inspiration. [10]

In c.2014, Japanese manga artist Sui Ishida (c.1980-) (Q), in one of his *Tokyo Ghoul* (Q) animations, has the main character Ken Kaneki ruminate on the Carl Jung (1933) reaction quote as follows:

after which, Kaneki engages with Touka Kirishima, the female lead character, as follows:

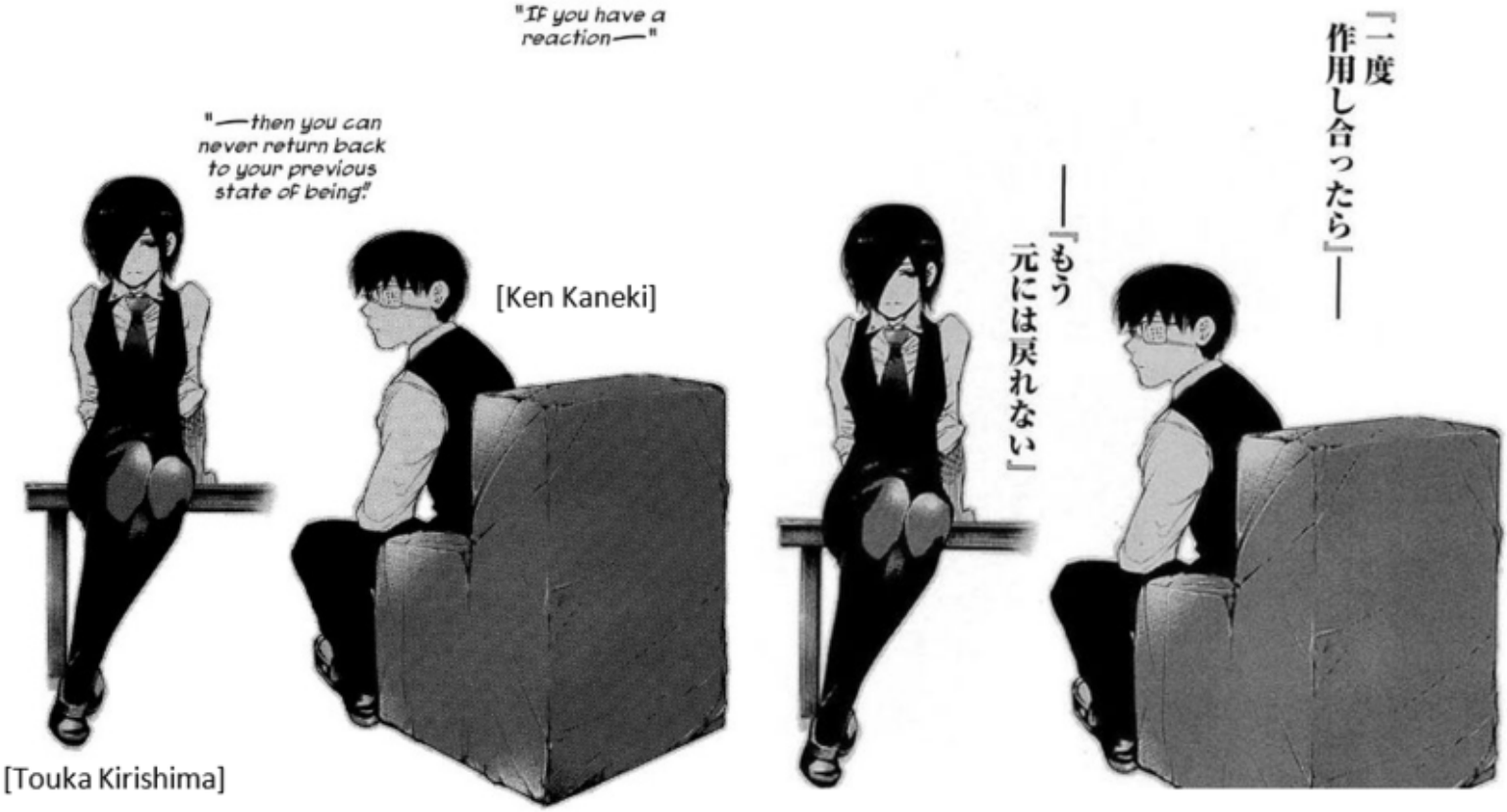

This ripe quote, reminiscent of John Tukey's 1966 free energy attitude states theory, has since blossomed off into a number of quote box visuals. (Q)(Q)(Q)(Q)

New age

In 2001, American new age author Lynne McTaggart, in her *Field*, attempted to sell the following view: [11]

> "At our most elemental, we are not a chemical reaction, but an energetic charge. Human beings and all living things are a coalescence of energy in a field of energy connected to every other thing in the world. This pulsating energy field is the central engine of our being and our consciousness, the alpha and the omega of our

existence."

This, however, is a new age "energy" stylized ontic opening, and therefore incorrect. [12]

Quotes

The following are related quotes:

> "There are men who would be better off in a small village than in a large town, if you had some sort of **human chemical reaction** to determine in advance which man's nature was suited to the smaller place and which to the larger."
>
> — Henry Pritchett (1906), on "Large vs. Small Colleges"

> "What is democracy but a successful formula for controlling the chemical reactions of our 145,000,000 people, and turning the friction and heat generated by our living together into production and progress?"
>
> — Thomas Dreier (1948), *We Human Chemicals* (pg. 48)

> "When a woman makes you wait for sex you are not her highest priority. Sexuality is spontaneous chemical reaction between two parties, not a process of negotiation."
>
> — Rollo Tomassi (2011), "Wait for it?" [8]

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1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (pg. 42, 117-18). Morrisville, NC: LuLu.
(b) Daintith, John. (2004). *Oxford Dictionary of Chemistry*. Oxford: Oxford University Press.
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4. Jung, Carl G. (1933). *Modern Man in Search of Soul* (pg. 49). Harvest Books.
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6. 6. Matata, Hakuna. (1995). "Wanted Ads: Man Seeking Woman" (pg. 146), *New York Magazine*, Nov. 13.
7. Pritchett, Henry S. (1906). "Discussion: Small vs. Large Colleges" (Park, pg. 4; human chemical reaction, pg. 25) in: *Official report of the New England Association of Colleges and Preparatory Schools*, the 21th Annual Meeting held in Huntington Hall, Massachusetts Institute of Technology, Boston, on Friday and Saturday, October 12 and 13. University of Chicago Press.
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9. Azod, Shara. (2011). *Chemical Reaction*. LuLu.com.
10. Email communication with Libb Thims (26 Feb 2013)
11. McTaggart, Lynne. (2001). *Field: the Quest for the Secret Force of the Universe* (pg. #) (O). Publisher.
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External links

- Human chemical reaction - human thermodynamics glossary.

θΔics

In human chemistry, **human chemical reaction theory**, or HCR theory, an initial state going to final state extension of human molecular theory, is the view that people can be defined as human chemicals, human elements, human molecules, atomic geometries, among other names (see: human), that "react", in the form of human chemical reactions, and hence combine and or debond in the same way and according to the same rules and laws as do smaller atoms and molecules.

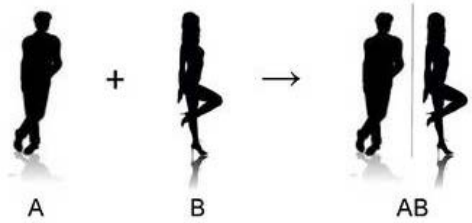

A Goethe-Adler depiction of relationship formation defined as a purely human chemical reaction, first done by German writer Johann Goethe in 1809. [3]

The central aspect of human chemical reaction theory is the use of chemical symbols (A, AB, etc.) to represent "reactions" between people as chemical equations between human molecules using standard reaction dynamics notations ($\rightarrow$,$\rightleftharpoons$, etc.). One example usage, for instance, would be a combination reaction between a man A and woman B in the formation of a couple C:

$$A + B \rightarrow C$$

The history of this point of view details the usage and incorporation of chemical theory, e.g. spontaneity criterion, to model reactions between people. In short, the following article traces the history of the use of reaction equation diagrams to model human processes, e.g. love or divorce, as human chemical reactions or chemical mechanism steps, where the letters or symbols represent people modeled as chemical entities, molecules, or human molecules. The first to use chemical reaction theory to discuss human movements was German writer Johann Goethe in 1809 who wrote out 36 human chemical reactions in story form in his novella *Elective Affinities*.

Reaction diagrams

See main: History of chemical equations

In 1718, English physicist Isaac Newton penned his last and final famous Query 31, wherein he gave a verbal hierarchy of single displacement reactions by power of displacement. That same year, French chemist Eteinne Geoffroy made the world's first affinity table based on Newton's verbal displacement descriptions. This is said to mark the start of the chemical revolution and the to seed the need for "chemical equations" diagrams.

The first verbal precursors to the concept of the chemical reaction in diagram or process form came from English physicist Isaac Newton's famous Query 31 appended to his 1718 *Opticks*. That same year, during a translation into French of this work, French chemist Eteinne Geoffroy, stated the first law of affinity: 'whenever two substances are united that have a disposition to combine and a third is added that has a greater affinity with one of them, these two will unite, and drive out the other.' Using this law, he published the first every affinity table. [12] More affinity tables were constructed in the years to follow, by other chemists. [13]

In 1757, using these affinity tables, Scottish physician and chemist William Cullen pioneered the development of affinity reaction diagrams during his lectures. To give an example, Cullen diagrammed Geoffroy's first law of affinity as: [1]

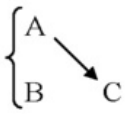

In which, for instance, as diagrammed above, if chemical species *A* and *B* are attached in a weakly bonded chemical union, signified by the bonding bracket "{", ordered such that if species *C* were introduced into the system, the greater affinity preference of *A* for *C* would cause *A* to displace *B* and to thus form a new union with *C*. In modern terms, this equates to:

$$AB + C \rightarrow AC + B$$

which is called a single displacement reaction or single elective affinity. The other dozen or so laws of affinity were diagrammed similarly. The greatest table of reaction diagrams, was published in Swedish chemist Torbern Bergman's 1775 textbook *A Dissertation on Elective Attractions*, containing diagrams of 64 different affinity reactions. [2] To explain his table diagrammatically, Bergman drew out 64 reaction diagrams in his textbook, diagrams which later formed the basis of Goethe's human chemical reactions.

In 1657, Scottish chemist William Cullen (left) originated of the affinity reaction diagram; his student Joseph Black (center) expanded on these reaction diagrams. In 1775, Swedish chemist Torbern Bergman (right), while using variants of the Cullen-Black diagrams, introduced the A, AB, notation for single vs bonded species. In 1808, Johann Goethe (1749-1832): first to use chemical reaction diagrams as archetypes for human interactions.

Goethe's 1809 reactions

See also: Goethe's human affinity table; See main: EA|IAD: Reaction decipherment

In 1808, German writer Johann Goethe used the reactions in Bergman's chemistry textbook as a basis to model each of the human chemical reactions in the various 36-chapters to his soon-to-be novella *Elective Affinities*. Specifically, a year before publication (1809) Goethe, who had been studying chemistry for a period of forty-years, told his friend Riemer that 'his idea for the new novella was to portray social relationships and their conflicts symbolically', as in *a*, *b*, *ac*, *abd*, *abcd*, etc. (these letter combinations first employed in chemistry by Bergman), and that furthermore, according to Goethe, 'the *moral symbols* used in the natural sciences were the elective affinities discovered and employed by the great Bergman'. In his preparatory notes, either in mind or on paper, then, Goethe would likely drawn out the world's first human chemical reactions using diagrams. The fact that he destroyed all of his notes and manuscripts to this novella leaves the question of whether Goethe actually drew out human reactions on paper open for debate.

The following, however, is from Goethe's notebooks of 4-7 Oct 1793, the reaction diagram in the upper right hand corner showing a double elective affinity (double

displacement reaction), using Bergman reaction diagram notation, of experiments with Berlin-blue liquor: [24]

Above: Goethe's notes on Double elective affinity (1793), i.e. double displacement reaction, of Berlin-blue liquor.

In generic symbol notation, the reaction Goethe was experimenting here, in his notebook, was the following:

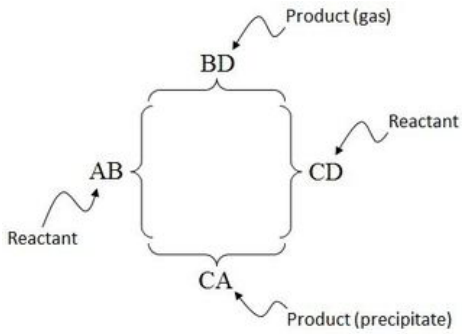

In modern terms, equates to the following:

$$AB + CD \rightarrow CA + BD$$

Sixteen years later, Goethe employs a reaction between limestone, i.e. calcium carbonate ($CaCO_3$), and sulfuric acid (H_2SO_4), which upon contact yields gypsum ($CaSO_4 \cdot 2H_2O$), in the form an aqueous crystal, and carbon dioxide (CO_2) gas, to compared and contrasted with the reactions that are occurring between the main characters in the novel: Charlotte (carbon dioxide), Edward (lime), Captain (sulfuric acid); as conceptually shown below:

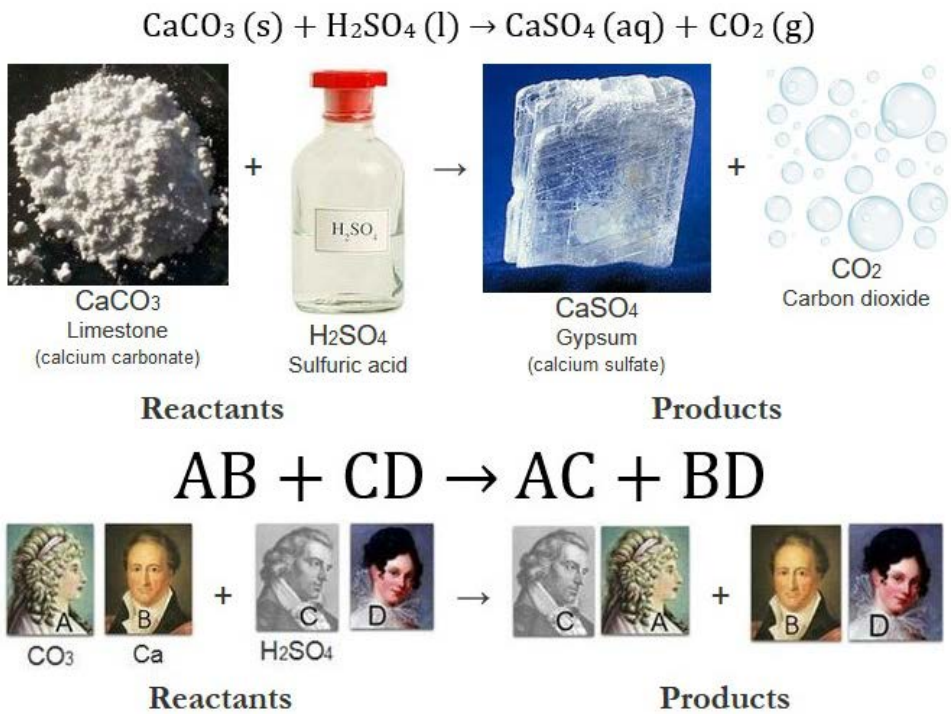

The modern chemical equation for the limestone sulfuric acid reaction is shown above (top); also a video of reaction of calcium carbonate chips with sulfuric acid is shown (right), which shows that in the course of 13-minutes, the "extent", symbol ξ, pronounced xi or "zi", starting from an initial 50 grams total of reactant remains, only 49.13 grams remain, measurable by the scale, meaning that 0.83 grams of carbon dioxide gas was produced as reaction product.

The above reaction forms the basis of the famous chapter four. The chapter begins with description of the affinity map (reaction map) or 'topographical chart' as Goethe calls it (a free energy map, in modern terms). On this reaction map, we are told that on it 'the features of the estate and its surroundings were clearly

depicted, on quite a large scale, in pen and in different colors, to which the Captain had give a firm basis by taking trigonometrical measurements'. Then, to explain a chemical reaction they are discussing, we are told: [3]

> "Provided it does not seem pedantic,' the Captain said, 'I think I can briefly sum up in the language of signs. Imagine an *A* intimately united with a *B*, so that no force is able to sunder them; imagine a *C* likewise related to a *D*; now bring the two couples into contact: *A* will throw itself at *D*, *C* at *B*, without our being able to say which first deserted its partner, which first embraced the other's partner."

This is shown below, in modern reaction terms:

$$AB + CD \rightarrow AD + CB$$

Goethe, however, if he did at first draw this reaction out prior to writing the above paragraph, would have used Cullen's bonding "brackets" and "darts", in his scheme, as the above horizontal style chemical reaction had not yet evolved to that point. The chapter continues:

A portion of Goethe's human affinity table, from which he conceptualized each chapter reaction.

> 'Now then!' Eduard interposed: 'until we see all this with our own eyes, let us look on this formula as a metaphor from which we may extract a lesson we can apply immediately to ourselves. You, Charlotte, represent the *A*, and I represent your *B*; for in fact I do depend altogether on you and follow you as *A* follows *B*. The *C* is quite obviously the Captain, who for the moment is to some extent drawing me away from you. Now it is only fair that, if you are not to vanish into the limitless air, you must be provided with a *D*, and this *D* is unquestionably the charming little lady Ottilie, whose approaching presence you may no longer resist.'

These human chemical symbol assignments would then be A = Charlotte, B = Eduard, C = Captain, and D = Ottilie, as pictured in the above human affinity table. In plain talk, Goethe is saying that when Ottilie (D) arrives at the estate, Charlotte (A) will naturally cling to her adopted niece ("A will go over to D") and that when their friend the Captain (C) arrives at the estate to visit, he will naturally begin to hang out with his childhood friend Eduard ("C will go over to B"). As the story unfolds, however, Goethe gives his readers the true final end reaction he had in mind, which occurs as a second main step in the reaction mechanism, in the heightened activation energy state of the time period the visitor's arrival, where the pairings of Charlotte-Ottilie, AD, and Captain-Eduard, CB, begin to relax, wherein after Eduard and Ottile fall in love, DB, and Charlotte and the Captain fall in love, AC:

$$AD + CB \rightarrow DB + AC$$

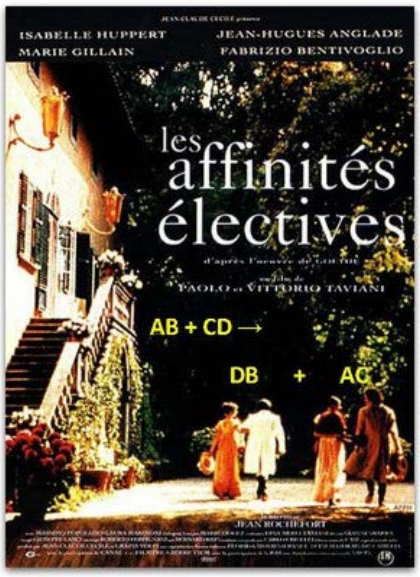

Left: a 1996 film adaption of Goethe's 1809 *Elective Affinities* (with chemical equation overlay). [11] Right: 2012-launched working book project: *Elective Affinities: Illustrated, Annotated, and Decoded*, a fully-illustrated, annotated, decoded and de-formulated modern-day upgrade to Goethe's self-defined "greatest work", in which he embedded, using hidden layers of gestalt, a physical chemistry based "principle" that he claimed was "true" (Nov 1809).

These two reaction mechanism steps constitute the main human chemical reaction described in the novella. In each of the 36 chapters, however, Goethe used a different affinity reaction, based on his studies in chemistry. In chapter nine, to go through one example we find a fascinating single displacement human chemical reaction, namely a displacement reaction described verbally. In short, Eduard *B*, Charlotte *A*, the Captain *C*, and Ottilie *D* are entertaining Mittler *E* the 'mediator' for the day, but when he hears that the Count *F* and the Baroness *G* are in the area he quickly gets his hat and riding-crop and leaves. He states that he is being 'driven away', for he will 'not be under the same roof with them.' This reaction is depicted below:

$$ABCDE + FG \rightarrow ABCDFG + E$$

In other words, Mittler *E*, who is also described as a human catalyst type of person in other chapters (in that he *mediates* reactions), has an intense negative affinity to the Count-Baroness pair *FG*, such that he is driven out of the bonded complex (ABCDE). The following is a circa 2011 Fischer paperback artistic rendition of the main reactions of the novella, depicting the idea that different contacts of human chemical species produced different amounts of heat (exothermic) and or coldness (endothermic): [29]

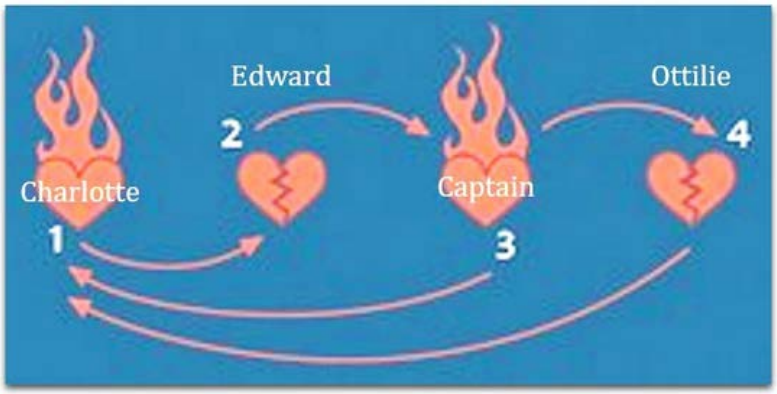

These paragraphs, as we see, are centuries ahead of their time. To give proof of this, we note in these reactions that Goethe is well-aware that each chemical entity (person) has a unique physical and mental character, which thus determines unique chemical affinity preferences per reaction and thus, in modern terms, unique Gibbs free energy preferences per each personal reaction. This fact, however, is not easily discerned. Two-hundred years later, high-IQ (225) child prodigy Christopher Hirata, discussed below, makes an attempt at describing human chemical reactions scientifically, but makes incorrect assumptions about how human chemical reactions would be quantified by affinity and Gibbs free energy; in particular, he assumes no difference in affinity preferences among a system of students at a university.

Lewis | 1925

In 1925, American physical chemist Gilbert Lewis discussed the possibility that him writing his 1925 *Anatomy of Science* might be a chemical reaction: [22]

> "Suppose that this hypothetical experiment could be realized, which seems not unlikely, and suppose we could discover a whole chain of phenomena [evolution timeline], leading by imperceptible gradations form the simplest chemical molecule to the most highly developed organism [human molecule]. **Would we then say that my preparation of this volume** [*Anatomy of Science*] **is only a chemical reaction** [extrapolate up approach], or, conversely that a crystal is thinking [extrapolate down approach] about the concepts of science?"

Lewis, humorously, defends his own position by commenting "nothing could be more absurd".

Henderson's Gibbs-Pareto equilibrium model | 1935

In 1935, American physiologist Lawrence Henderson, in his *Pareto's General Sociology: a Physiologists Interpretation*, elaborateed on a large number of Pareto-Gibbs comparisons, such as the following: [1]

American physiologist Lawrence Henderson (1935) outlined a number of Willard Gibbs + Vilfredo Pareto equilibrium reaction based models of socioeconomic process change.

> "Gibbs considers temperature, pressure, and concentrations, so **Pareto** considers sentiments, or, strictly speaking, the manifestations of sentiments in words and deeds, verbal elaborations, and …"

Henderson, however, never actually stated that Pareto derived his theory from Gibbs but rather only "compared Pareto's social system to a physicochemical system as defined by Gibbs and emphasized that the equilibrium of the social system is logically identical to physiological equilibrium." In fact, in his appendix "Note 5", Henderson states is views on this matter explicitly:

> "It is very unlikely that the general characteristics of Gibbs' system had anything to do with Pareto's construction of his social system. In other words, it is very probable, I thing certain, that Pareto did not keep Gibbs' work in mind and *a fortiori* that he did not imitate it, when he worked out his social system; so that Pareto's system is not the result of the application of the *theories* of physical chemistry to sociology."

Henderson, however, does have this application in mind, and in his end note appendices, actually goes though a comparison of the equilibrium properties of the following liquid phase chemical reaction, namely of reactants carbon acid H_2CO_3 with disodium phosphate Na_2HPO_4 to form the products of sodium bicarbonate $NaHCO_3$ and monosodium phosphate NaH_2PO_4:

$$H_2CO_3 + Na_2HPO_4 \rightleftharpoons NaHCO_3 + NaH_2PO_4$$

to that of the equilibrium properties of social systems, at the end of which he states:

> "This simple example illustrates [the] logical principles [physical chemistry] that **find universal application** in the physical, biological, and **social sciences**."

Henderson's treatise is fairly decent and in need of detailed analysis.

Boyajian | Mind-stuff

In 1956, Aram Boyajian, in his "A.A. Michelson Visits Immanuel Kant", digressed, via hypothetical dialogue between physicist Albert Michelson and philosopher Immanuel Kant, on what physics and philosophy have to say on the nature of the soul, on the following future chemical equation:

$$2H_2 + O_2 \rightarrow 2H_2O + 293{,}000\ J + X$$

where 'X' is some unknown "mind-stuff" that that future thinkers will invent to rectify the apparent on-going dualism between science, governed by blind forces and meaningless laws, and theology, governed by purposive souls and guiding gods, and evolution bridging the two nefarious domains.

Melko's 1969 transition mechanism diagrams

In 1969, American political scientist Matthew Melko published his *The Nature of Civilizations*, in which he employed diagrams to define "transitional periods", reversions to original periods, etc., using what can be called transition mechanism diagrams, to describe the transitioning from a primitive society P to a feudal society F to a state society S to an imperial society, each with a transition phase, i.e. PT, FT, ST, IT, and possible reversion to original state side routes, indicated by side-route branches angled forward, an example of which is shown below: [17]

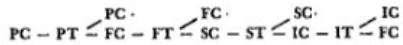

Melko defines this in terms of a pin ball machine:

> "[The mechanism] is rather like a pin-ball machine. The ball, when shot, has a universe of possibilities … but as soon as it passes through the first slot on its downward curve, the possibilities are narrowed. Thus, having reached FC, it can no longer return to PC. But the machine also has rubber bumpers, so that the ball can reverse its course. Having reached slot SC, it can no longer return to PC, the initial ejection slot, which has been closed off by a one-way valve."

American physical chemistry Thomas Wallace (2009), see below, would later expand on these early models in the form a more advanced physical chemistry based description of the rise and falls of civilizations. [18]

Dolloff | 1975

In 1975, Norman Dolloff, in his *Heat Death and the Phoenix*, penned the following pair of synthesis and analysis of an organism equations, which he says is the general overall reaction mechanism equation according to which humans came into existence:

$$\sum n_i \rightarrow \text{organism}; \Delta G_R^\circ = +; \Delta S_R^\circ = -$$
$$\text{organism} \rightarrow \sum n_i; \Delta G_R^\circ = -; \Delta S_R^\circ = +$$

where Σn_i represents the "sum of simpler chemical species"; his free energy of formation signs, however, to note, seem to be backwards (being that he gives correct free energy of formation values for smaller chemical reactions correctly.

Adler's 1977-1990 reactions

In 1969, under the direction and advisement of German literature scholar Claus Bock, compiler of the 1960 book *Goethe the Critic*, English poet and German literature scholar Jeremy Adler, decided to make his PhD dissertation be on the theoretical basis and of affinity reactions used by Goethe to construct his *Elective Affinities*. In the eight years to follow, Adler would go on to work with some of the biggest chemistry historians of the 20th century, a processes which he summarizes as follows: [16]

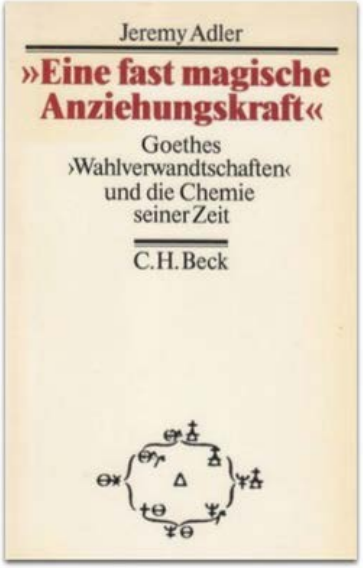

> "John McEvoy (later at Pittsburgh) and his supervisor, Satish Kapoor (Sussex), gave Adler assistance with the background to the history of chemistry. Satish was working on French chemist Claude Berthollet at the time, and suggested to Adler that he switch to the history of chemistry; and so Adler joined the outfit of historians of science in England that ranged from the old masters, such as Joseph Needham and Walter Pagel, to his colleagues, like Roy Porter, Nick Jardine and others, interested in linking literature and science. Adler also had good contact with English affinity chemistry historian Alistair Duncan, who was working on the history of affinity theory."

Jeremy Adler (1947-)

In his research, Adler would attempt to theorize about which chemical reactions Goethe used for each chapter. In the decades to follow the completion of his PhD dissertation, in 1977, Adler would go on to draw out numerous human chemical reactions, such as found in his 1987 and 1990 articles on the same subject, published in German and English. One reaction, discussed by Adler, is the possible simultaneous influence of both French chemist Claude Berthollet and Bergman, in Goethe's mind, whereby the coming together of the two bonded pairs of Charlotte-Eduard, AB, and Captain-Ottilie, CD, as they gathered in the house to intermingle would be a type of human combination reaction: [4]

$$AB + CD \rightarrow ABCD$$

Beyond this simple example, Adler has done a tremendous amount of work and research in determining the specific chemist, which number possibly more than a dozen, used by Goethe to model each human reactions scenario in each of his chapters. Others to comment on and or expand on the Adler's pioneering work include, as discussed below, include: Karl Fink (1999), Astrida Tantillo (2001), and Libb Thims (2007), among others.

Beg | 1987

In 1987, Indian-born Pakistani organometallic chemist Mirza Beg, independently, i.e. independent of Goethe, in his *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, seems to have been the first, following Goethe, to pen out human chemical reactions in diagrammatic chemical equation form. Firstly, Beg, in his attempt to explain migrations and immigrations out of and into societies, in terms of fugacity, gives the following vaporization-condensation equilibrium reaction: [25]

Mirza Beg (1932-)

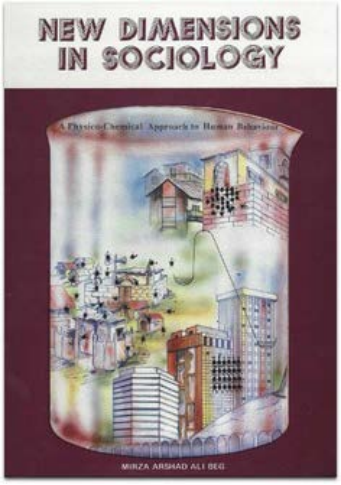

$$\text{Liquid} + \text{Heat} \underset{\text{Condensation}}{\overset{\text{Vaporization}}{\rightleftharpoons}} \text{Vapour}$$

Beg then states that an "interesting analogy", with the above reaction equation, is the case of a society, conceptualized by him as human molecules in a liquid state of association, stricken by some calamity or hazard: earthquake, fire, flood, or war, etc., that some if not all of its members, become so scared that they leave the calamity stricken area without delay, a process that can be modeled, according to Beg, by the following equilibrium reaction:

$$\text{Society} + \text{Scare of hazards} \rightleftharpoons \text{Refugees}$$

Beg, in chapter four "Human Interaction and the Socialization Process", begins to treat human molecules individually, e.g. how past psychological states (e.g. birth order or sibling group size), say of two potential friends, A and B, may affect later (adult) human chemical reactions processes (e.g friendship bonding), such as the formation of "close friends denoted by AB formed according to reaction 4.1", which Beg denotes as follows:

$$A + B \rightleftharpoons AB$$

Beg then goes on to calculate equilibrium constants (relative values) for the reaction scenario between three human molecular species: A, B, and C, and their possible products, e.g. AB, AC, BC, ABC, and secondary reaction mechanism products, which becomes rather involved. Beg, beyond these examples, employs a good deal of human chemical reaction logic and models in his arguments and reasoning.

Steer's 1990 reaction speculations

In 1990, American Goethean scholar Alfred Steer, in his *Goethe's Elective Affinities: the Robe of Nessus*, stated that in the chapter four reaction discussion, wherein the men discuss the reaction between chalk and dilute sulfuric acid, producing gypsym and carbon dioxide, that the modern reaction, according to Steer would be written as follows:

$$CaCO_2 \text{ plus } H_2SO_4 \text{ gives } CaSO_4 \text{ plus } H_2CO_2$$

Steer then speculates, using Bergman symbols, that Goethe might have had the following chemical reaction model in mind at this point of the novella:

$$(+\oplus)(\nabla) \text{ plus } (\div V) \text{ gives } (\nabla\Psi) \text{ plus } (\nabla + E)$$

There may be some sense to what Steer speculates on here, however, it is more likely that Goethe had the Cullen-Bergman bracket and or arrow chemical reaction model logic in mind (see: Elective Affinities | IAD: Reaction decipherment). Steer continues:

> "The Captain then reduced the chemical process to an equation with letters: if compound AB comes into contact with compound CD, they may switch partners and end up in the new combination AC and BD. Here Eduard supplies the last and most ironic stage of anthropomorphizing by relating the letters to the people present: if A is Charlotte, then B is Eduard, C stands for the Captain, and D is the 'Dämchen' (little lady) Ottilie."

Steer points out here, for the first time in English, it seems, that Goethe, in his Bergman letter anthropomorphizing of the reaction, scaled up to the human level, used the letter D for Ottilie as the "Dämchen" or "little lady"; a near synonym to "dame", from Latin *domina* feminine of *dominus* master; akin go Latin *domus* "house", therein meaning "a woman of rank, station, or authority; *archaic*: the mistress of the house; the wife daughter of a lord.

Thims' 1995 reactions

In *circa* 1995, independent of either Goethe or Adler, American electrochemical engineer Libb Thims began to study the basic human reproduction reaction, modeled using the following reaction:

$$A + B \rightarrow C$$

where A, B, and C were the typical man, woman, and child formed during the process of the former two units

Libb Thims (c. 1975-)

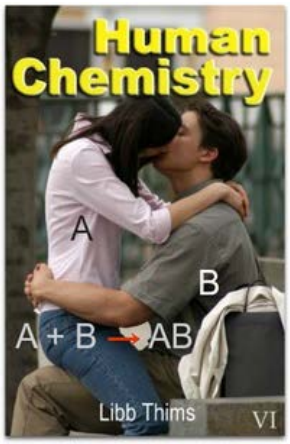

falling in love. Thims central interest was to understand how the enthalpy change ΔH and entropy change ΔS terms functioned or could be understood or quantified during the span of the reaction, which he considered to be 18-years, for the average reaction, so as to understand how the spontaneity criterion, i.e. ΔG < 0 signifying a spontaneous reaction, could be understood as the central determinate of human movement. Thims efforts culminated in the writing of the 2007 textbook *Human Chemistry*, a full treatise on nearly every type of human chemical reaction (24 example human chemical reactions are given in chapter one), which he wrote in 18-months and 14-days after discovering Goethe's work in 2006 (and Adler's work shortly thereafter). In the course of this investigation, Thims also unraveled the nature of the human chemical bond in the AB union:

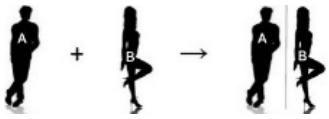

In his work, Thims set forth a standard protocol on notation, naming, and symbols to be used in describing and discussing human chemical reactions. Commonly, for instance, one might use *M* or *F* for male or female in describing a basic human combination reaction, yet M stands for mega and F for fluorine. In short, the revised standard for human chemical reaction notation is show below for the basic reproduction reaction, in overall mechanism, for instance, is defined by: [5]

$$Mx + Fy \rightarrow MxFy + Bc$$

where Mx, is the male human molecule, Fy the female human molecule, MxFy the bonded dihumanide molecule, and Bc the baby-child human molecule at the circa 15-year point of detachment from the parental orbital construct.

In 2005, Thims launched the *Journal of Human Thermodynamics*, publishing the online article "On The Nature of the Human Chemical Bond", wherein some basic human chemical reaction theory logic began to be discussed publicly. [26] In 2006, Thims discovered Goethe, via footnote 2.5, and shortly thereafter the pioneering reaction decoding work of Jeremy Adler.

Hirata's 2000 reactions

Christopher Hirata (1983-)

In circa 1997 to 2001, American physicist Christopher Hirata, began to model the student body at the California Institute of Technology (CalTech) as system of about 900 human molecules (of which 600 were male, and according to his observations about 200 were in paired relationships), male Y and female X, a certain equilibrium percentage of which, during their four-year stay as undergraduate students, would have undergone an reversible combination reaction of the form: [6]

$$X + Y \leftrightarrow XY$$

Hirata used the symbols of X = girl, Y = boy, and XY = paired relationship, calling the single boys and girls as "basic elements". He also comments that in his modeling he is neglecting other rare human chemical reactions, which form the "rare and non-traditional" products or compounds that may form such as "the gay molecule Y_2, the lesbian molecule X_2, and the middle-Eastern polygamous molecule X_4Y." Interestingly, Hirata attempts at a calculation of the equilibrium constant for this reactions and then speculates as to what the bonded concentration of products would be if more females were introduced into the system.

Fink's 2001 reactions

Karl Fink (c.1943-)

In 1991 book *Goethe's History of Science*, American Germanic studies professor Karl Fink footnoted his knowledge of Adler's 1987 depictions of Goethe's human chemical reactions, stating that he "Adler has provided the most detailed study of Goethe's research in the history of chemistry, particularly the history of chemical affinity." [14] In his 2001 article "Goethe's Intensified Border", as what seems to be a follow up to his earlier note, Fink draws out nine of Goethe's reactions, including discussion, the way he sees them, among which, curiously, he considers the birth of the child to be a precipitate. [15] The first reaction of Goethe's novella, according to Fink, is a combination reaction, beginning with Charlotte (A) and Eduard (B) being described as being bonded by marriage, where the attachment AB signifies a human chemical bond:

$$\mathrm{A + B \rightarrow AB}$$

This changes, according to Fink, with the arrival of the Captain (C), which triggers the second reaction, the Eduard detaching from Charlotte and bonding with his old friend the Captian:

$$\mathrm{AB + C \rightarrow A + BC}$$

The third reaction, according to Fink, is designed (by Eduard and Charlotte) to find a bonding partner for Charlotte, which is actuated by the introduction of Ottilie (D), Charlotte's adopted niece, as discussed in Goethe's famous chapter four:

$$A + BC + D \rightarrow AD + BC$$

The fourth reaction, according to Fink, operates such that, following their natural inclinations rather than planned expectations, Charlotte (A) and the Captain (C) are attracted by common interest in landscaping and music, whereas Eduard (B) and Ottilie (D) bond in self-same patterns of each other with common headaches, music skills, handwriting, and habits of eating:

$$AD + BC \rightarrow AC + BD$$

The fifth reaction, according to Fink, is that stimulated by illicit bonding, the married couple conceives a child in the images of elective affinities, creating what Fink calls a precipitate (P) or PPT, using Fink's symbols. Fink gives the following chemical equation for this reaction:

$$AC + BD \rightarrow AC + BD + P$$

In this last reaction, to note, there may be some error (and correction needed), in that many mechanism steps seem to have been grouped into an overall reaction; whereas human reproduction typically is described as a double displacement reaction. In any event, Fink states that this is the end to part one of the novella, where we find Charlotte pregnant with a baby conceived with her husband in the image of the Captain and Ottilie.

Hwang's reactions

David Hwang (c.1980-)

In 2001, American computational chemist David Hwang had written out a basic pair-bonding human chemical reaction in his article "The Thermodynamics of Love", where he tells his that love is the process where two elements, "male" (M) and "female" (F), combine to form a new compound called "couple" (M-F)

$$M + F \rightarrow MF$$

He goes on to explain how Gibbs free energy, the modern measure of Goethe's elective affinity, "not only explains the spontaneity of chemical reactions", but "also applies directly to various factors determining the success of human relationships". Interestingly, Hwang specifically draws a dash '-' between the M and F elements, M-F, in his article, signifying that he had some conception of the idea of a "human chemical bond", which is a conceptually difficult topic, not easily spotted in beginning study of human chemical reactions. [7]

Hwang was also the first to use free energy diagrams, in which he plotted the free energy of the typical paring process of in a dating-to-couple forming relationship over the extent of the reaction.

Wood's reactions

Chanel Wood
(c.1982-)

In June 2007, Canadian writer Chanel Wood, developed a simple combination lock theory to explain love and human relationships, whereby she viewed single unattached individuals are considered as "reactants", the resultant couple the "product", such that a synthesis of energy level satiety bonding patterns and matrix compatibility factors determine the desired "we just clicked" scenario of successful pairings. Wood states that in defining "what exactly is chemistry between two people", we can use physical chemistry to explain how people combine, behave, and relate to one another in the social world, using the following point of view: [8]

$$Reactant + Reactant = Product$$

such that "chemistry" is a result of all the elements between any two people—character, personality traits, timing, goals, dreams, priorities, lifestyle, etc., and how they 'react' with the other person's elements. She used the stable eight electron filled orbital bonding model of the noble gases to model perfection in human-human bonding, whereby physical (e.g. hair color, eye color, etc.) and mental (e.g. leadership ability, etc.) attributes combine between people to make stale noble gas like pairings. She gives the example of how the elements sodium (Na), with one electron (+1 charge), and chlorine (Cl), seven electrons (-1 charge), combine to "complete" each other as the compound sodium chloride (NaCl) with the stable noble gas electron configuration:

$$Na + Cl \rightarrow NaCl$$

She argues that this model, applied to reactions between human beings, explains the saying "he completes me", in the sense that the paring forms a stable compound with filled energy levels.

Jorge's reactions

See main: Human reproduction reaction

In August 2007, a Swiss individual named Don Jorge, in what seems to be an attempt at using chemistry to explain sex humorously to his girlfriend, made a video entitled "Aufklarung: How to Learn about Sex with Chemistry", in which he described the process of sex using the following reaction: [9]

Don Jorge (1988-)

> â™‚ + â™€ â‡Œ Baby

In the video, Jorge draws the diagram on paper where he draws little sperm, with a head and a wiggle tail, moving from the male â™‚ to the female â™€ and describes how “latex” can block the progress of the reaction. Of note, he incorrectly uses a two-way reversible reaction arrow to define the sex/reproduction reaction. The correct formulation is to use a one way arrow, signifying that the formation of an embryo and later an infant is an irreversible process. If, however, the couple or female decided to opt for an abortion, a completely different reaction mechanism would be used.

Pati’s reactions

Surya Pati (1983-)

In 2009, Indian chemist and business school theorist Surya Pati wrote a short blog article on the “Thermodynamics of the Human bond”, in which he models a relationship as combination reaction between two persons A and B, who he says “come together to form a molecule”, AB, a reaction he defines as follows: [10]

$$A + B \rightarrow AB$$

Pati uses the logic that A and B are atoms, representative of single people, and AB is a molecule of two atoms, representative of the relationship. Technically, to clarify, the AB product is what is called a ‘dihumanide molecule’, a bound state of two human molecules. The human particle (or human atom) model, generally, is only good when speaking in the perspective of human statistical thermodynamics, human physics, or in human molecular orbital theory, etc.; it is not technically correct from a definitional chemistry point of view. [5]

Wallace's reactions

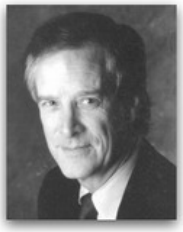

Thomas Wallace (1937-)

In 2009, American physical chemist Thomas Wallace, building on the earlier mechanism models of American political scientist Matthew Melko, rephrase the entire description in purely physical chemistry terminology and depiction, using the double dagger "‡" to indicate a molecular reactant species in an unstable transition state, the double arrow "↔" to represent a reversible reaction, and a one-way arrow "→" to represent an irreversible reaction, as follows:

$$\begin{array}{ccccccccccccc} & & & & & & & & \mathbf{F} & & & & \\ & & & & & & & & \uparrow & & & & \\ \mathbf{P} & \Leftrightarrow & \mathbf{(PT)^{\ddagger}} & \rightarrow & \mathbf{F} & \Leftrightarrow & \mathbf{(FT)^{\ddagger}} & \Leftrightarrow & \mathbf{S} & \Leftrightarrow & \mathbf{(ST)^{\ddagger}} & \Leftrightarrow & \mathbf{I} \Leftrightarrow \mathbf{(IT)^{\ddagger}} \rightarrow \mathbf{F} \\ & & \downarrow & & & & \downarrow & & & & \downarrow & & \downarrow \\ & & \mathbf{O} & & & & \mathbf{O} & & & & \mathbf{O} & & \mathbf{O} \end{array}$$

Wallace modifies Melko's mechanism by adding in the side-step reaction mechanism step that the transition state, e.g. (PT)‡, may undergo ossification O, an Arnold Toynbee term meaning to "freeze at a crystal stage". Wallace also describes each step in terms of being types of double displacement reactions:

$$A + B \rightarrow C + D$$

in which a change in conditions, e.g. stress, temperature, addition of reactants or products, etc., to the system will affect a change in the dynamic equilibrium of the reaction, according to Le Chatelier's principle.

High School | Projects

In 2011, Romanian high school student Christine Kamla gave a presentation, entitled “If the Genes Are Not the Last Word: of Elective Affinities to Adoptive Families”, on the elective affinities of child adoption in terms of reactions, supposedly in some way modeled on the Ottilie adoption scenario of Goethe’s *Elective Affinities* in the context of modern adoption policies. The overview of her presentation is as follows: [23]

> “Christine Kamla had the special topic "elective affinities" with the same group selected topic. She shared her brilliant lecture in "General", "Academic" and literary "(see poster image). Having discussed the conditions and the procedure for a child's adoption, she made an interesting trip into the chemistry and showed that even in this science some elements of their "Elective Affinities" pick, the finale was the reference to JWv Goethe's eponymous book, which also convert the fate of already existing relationships in the new Elective Affinities - The problematization resulted from the fact that when an adoption is an element of arbitrariness. must

be excluded and you cannot adopt children how to shop goods in the supermarket."

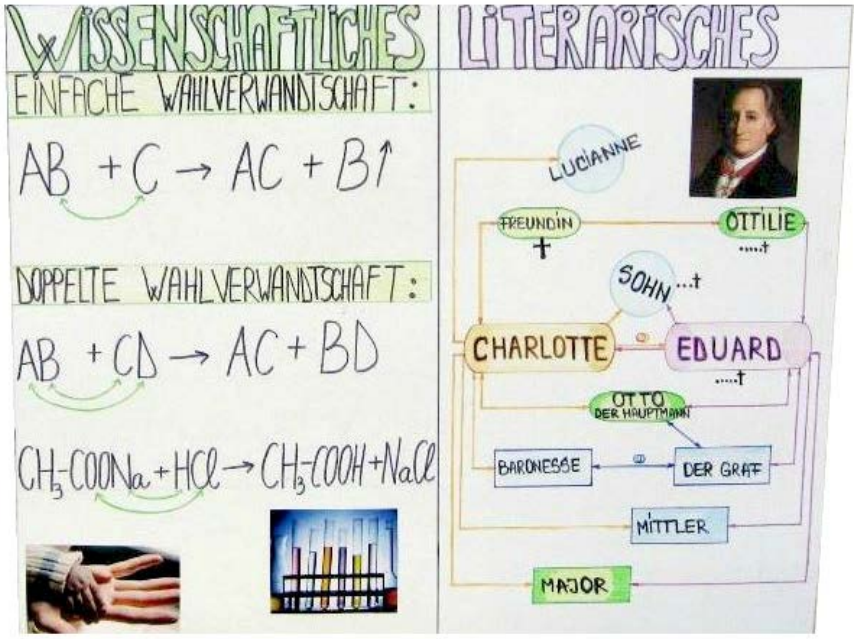

Romanian high school student Christine Kamla's 2011 poster presentation "If the Genes Are Not the Last Word: of Elective Affinities to Adoptive Families", wherein she uses Goethe's human reaction theory models to theorize about "adoption".

Some of the talk seems to have themed on how the laws of adoption and methods of differ between Romania and Germany. This a fairly interesting application in need of discussion.

In 2010, a student from Big Foot High School, Wisconsin, turned in a four page final entitled "Chemistry", for their advanced composition class, which concluded with the following paragraph: [26]

> "You may wonder if there is any correlation between the different forms of chemistry; well, the answer to this question is yes. Theories and studies have stated that there is a correlation between relationships and chemical reactions. Friendship, marriage, and even just a young love are based on the idea that people are "human molecules;" they form a basic equation that:
>
> A (boy) + B (girl) = AB (bond)
>
> or vice versa for a break up, divorce, or lost friendship (humanchemistry.net). Therefore, despite the differences between these classes of chemistry, there is a major link between each; the science of chemistry sends chemicals throughout one's body to create incredible relationships between two people."

(add discussion)

Modern | 2010-present

With the 2005 launching of the *Journal of Human Thermodynamics* and the 2008 launching of *Hmolpedia*, independent arrival of insight into human chemical reaction formulation is increasingly difficult.

To cite one example, in Indian chemical engineer Vamshi Regalla and American mechanical engineer Ravi Vedula's 2012 short film "A Strange Thing Called Love" (Feb 04) turned JHT article "A Strange Thing Called Love: Chemical Thermodynamics" (May), they outline their take on the chemical thermodynamics of love, employing Thims-Pati style reaction mechanisms to explain human bonding as a reaction, commenting at the end that:

In 2012, Indian chemical engineer Vamshi Regalla and American mechanical engineer Ravi Vedula utilized a Pati-Thims reaction theory in their argument on love. [19]

> "A video was made by the authors on the same concept with the title as "A strange thing called love". The plot of this video is that a man falls in love with nine girls and that day comes when he is supposed to make a decision on choosing 'the one'. Surprisingly in the early 1800s, Johann Goethe published a book named *Elective Affinities* based on a similar concept of love and marriage relations among two couples. It is a pure coincidence and the current authors actually didn't know about it until they started preparing this article."

This is what is called a "love thought experiment", similar to Goethe and his mid 1808 "The Renouncers", about a hero simultaneously in love with four women, and Libb Thims' circa 1992 Excel spreadsheet formulaic attempt to rank the top nineteen girlfriends he could possibly marry, in all three scenarios involving a person puzzling on how to 'choose' the correct love. In their article, Regalla and Vedula go on to make advanced or modified types of human chemical reactions, such as employing or modeling human relationship reaction changes on the concept of reaction intermediate "radicals" (asterisk symbol), such as in the following two-step reaction: [19]

$$R \rightarrow R^*$$
$$R^* \rightarrow P$$

wherein a reactant R goes to product P.

Objection

See also: Detractors; Elective Affinities (enemies)

The modelling of human-human interactions, processes, and social transformations in the language of chemical mechanism is not without criticism and many, such as Marcin Borkowski, Mitch Garcia, and Stephen Lower, consider the premise of "chemical reactions occurring between human molecules" to be a crackpot-subject, pseudoscience, and or a lunatic notion. To cite one example, in 2011 Irish openly-atheist biochemistry student Ryan Grannell spent a month blogging about human chemistry, commenting for example: [20]

> "This is all just a horrendous analogy. Chemical laws apply to humans, but ourï»¿ behavior is more complex than something that can be modeled with a couple of thermodynamic equations. A + B → AB is just a pretentious way of stating something we already know; it tells us absolutely nothing new [and Goethe's *Elective Affinities* is a 'nutty theory']."

Forest Blind

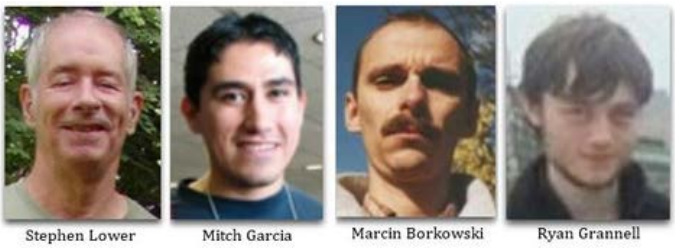

A selection of "objectors" to HCR theory, namely: Canadian theist chemist Stephen Lower (2007), American secular nuclear chemist Mitch Garcia and Polish analytical chemist Marcin Borkowski (2010), and Irish atheist biochemistry student Ryan Grannell (2011), viewing the premise of using chemical equations to describe reactions occurring between people as pseudoscience, crackpottery, or a the views of someone who is "nuts".

The comment "A + B → AB is just a pretentious way of stating something we already know; it tells us absolutely nothing new", of note, here is very telling, in that it seems to give way to the notion that Grannell, possibly like many new to the subject of human chemistry, and rightly skeptical, are in the mindset of something along the lines of not seeing the ships in the harbor + not seeing the forest amid the trees, i.e. being "forest blind", type of perspective; the glass wall of the human chemical bond, is one example of this.

Discussion

Objectors, in short, tend not to see the big picture. Deeper thinkers, e.g. Goethe and Henry Adams, however, tend to see everything in terms of mechanism and chemical reaction. Adams, e.g., after stating categorically in 1885 that "Social chemistry—the mutual attraction [and repulsion] of equivalent human molecules—is a science yet to be created", went on from 1889 to 1891, to write and published his nine volume *History of the United States of America: During the Administrations of Thomas Jefferson*, a history of the years 1801 to 1809, when Thomas Jefferson was president, supposedly, for no other reason than to prove to his own satisfaction that causality and mechanism exists in the course of history; about which he retrospectively stated, in his *The Education of Henry Adams* (1900), as follows: [28]

> "Historians undertake to arrange sequences,—called stories, or histories,—assuming in silence a relation of cause and effect. These assumptions, hidden in the depths of dusty libraries, have been astounding, but commonly unconscious and childlike; so much so, that if any captious critic were to drag them to light, historians would probably reply, with one voice, that they had never supposed themselves required to know what they were talking about. Adams, for one, had toiled in vain to find out what he meant.
>
> He had even published a **dozen volumes** of American history for no other purpose than to satisfy himself whether, by severest process of stating, with the least possible comment, such facts as seemed sure, in such order as seemed rigorously consequent, he could fix for a familiar moment a necessary sequence of human movement. The result had satisfied him as little as at Harvard College.
>
> Where he saw sequence, other men saw something quite different, and no one saw the same unit of measure. He cared little about his experiments and less about his statesmen, who seemed to him quite as ignorant as himself and, as a rule, no more honest; but he insisted on a relation of sequence, and if he could not reach it by one method, he would try as many methods as science knew. Satisfied that the sequence of men led to nothing and that the sequence of their society could lead no further, while the mere sequence of time was artificial, and the sequence of thought was chaos, he turned at last to the sequence of force; and thus it happened that, after ten years' pursuit, he found himself lying in the Gallery of Machines at the Great Exposition of 1900, his historical neck broken by the sudden irruption of forces totally new."

(add discussion)

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θΔics

In human chemistry, **human chemical theory**, or simply "the chemical theory", used in the context of the work of Goethe, refers to the theory that humans are reactive chemicals whose interactions and choices are governed or rather predetermined by the laws of affinity chemistry (pre-1882) or the principles of physical chemistry and laws chemical thermodynamics (post-1882) as permissible via the kinetics, kinetic factors, or chemical kinetics of the situation.

Contemporary **chemical theory** formed the basis of his novel *Elective Affinities* (Die Wahlverwandtschaften, 1809). The 18th-century chemist spoke of a "double affinity" in which two compounds AB and CD join to exchange parts and create two new bodies, AC and BD. (Chemists now call this type of reaction "double decomposition.") In a similar way, in the novel, a married couple Eduard and Charlotte form a double affinity with their two friends, the Captain and Ottilie.

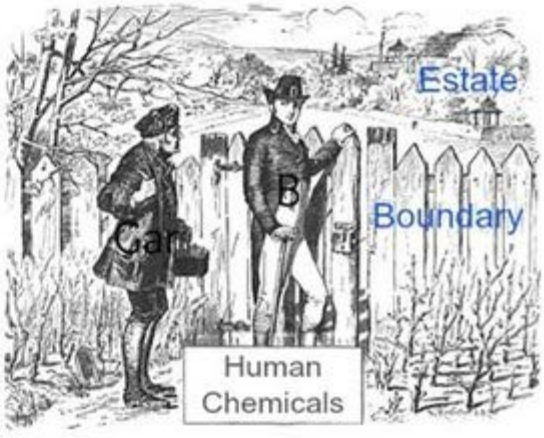

Top: a 2008 synopsis of Goethe and his 1809 **chemical theory** by English science dictionary editor John Daintith, from his *Biographical Encyclopedia of Scientists*. [4] RIght: an island model of the estate from Goethe's *Elective Affinities*, showing Edward, main reactant B, and the gardener (Gar), an intermediate system reactant, talking, before crossing the boundary (reaction membrane).

A synonymous term to "human chemical theory", in reference to Goethe's work, is: Goethe's human chemistry; a 2008 Hmolpedia-coined categorization term.

Etymology

In 1796, German polymath Johann Goethe, in his *Third Lecture on Anatomy* (see: Goethe timeline), began discussing his newly forming theory that humans are types of chemicals, similar to reactive minerals, whose reactions to each other are governed or rather predetermined by forces external to the reactants themselves. He published the finalized form of his theory in his 1809 physical chemistry based novella *Elective Affinities* and up until his last day of existence (22 Mar 1832), or at least up until 20 Jul 1831, would go on to comment on this theory, which he said was his greatest work, in conversation, correspondence, and interactions, in various ways.

This theory, by Goethe, however, although greatly discussed and critiqued, remained largely unnamed in the two centuries to follow, at least in the English language; the German term *wahlverwandtschaften* may possibly embody Goethe's theory to Germans and German-speaking people (see: title decoding). In English discussions, however, the rather ambiguous phrase "the chemical theory" or simply "theory" tends to be used.

The following is a 1987 synopsis of Goethe's human chemical theory according to American German-literature scholar John Winkelman: [1]

> "One evening Eduard, Charlotte, and the Captain discuss a chemical reaction between two compounds each consisting of two elements. The compounds are designated as AB and CD. As a result of the reaction the elements form new compounds, AD and CB, and thereby demonstrate that they had a stronger 'elective affinity' to their new partners than they had to their original mates. The conversation turns to the issue of free will. Are the elements really inert or do they possess volition? The latter would seem to be the case, since the elements do after all

choose one partner in preference to their other as if they were free agents. Charlotte dismisses this **theory** as idle speculation: one cannot equate chemical elements to human beings. But what about human beings? If the chemical compounds in the analogy had been human couples, would the partners have been forced to obey the 'elective affinities' that attracted them to new lovers or would they have had the freedom to honor their existing commitments in conformity to ethical law, which unlike natural law not only permits by implies free will?"

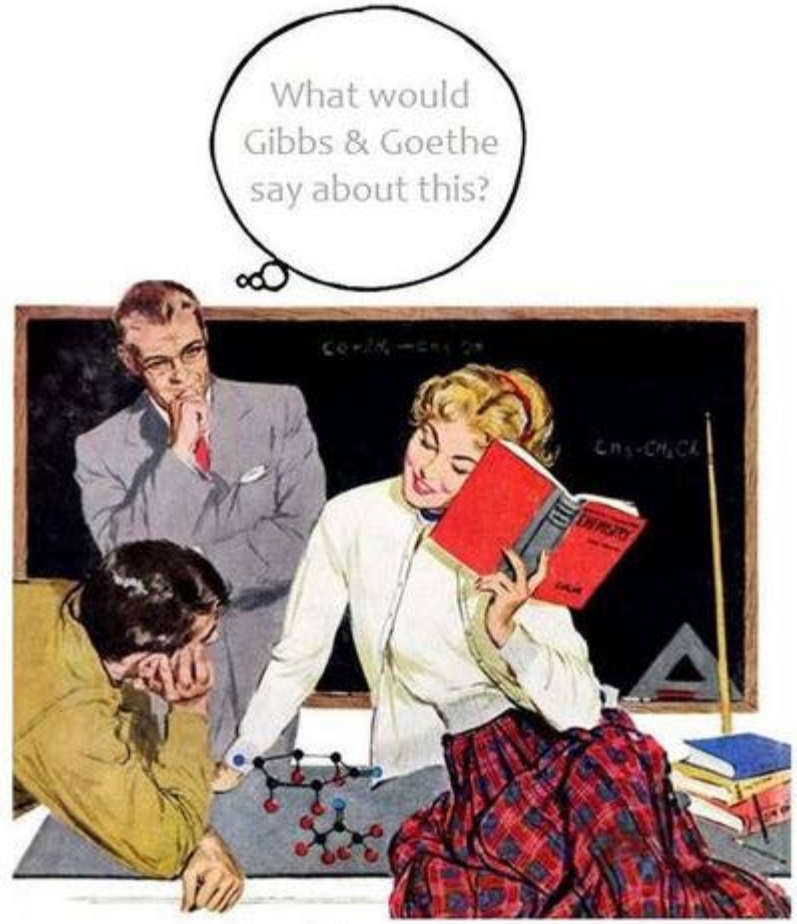

Die Wahlverwandtschaften
(The Elective Affinities)

A 2011 German depiction of Goethe's **human chemical theory**, by German blogger Peter Glaser, simply labeled as "Die Wahlverwandtschaften" (retouched by American electrochemical engineer Libb Thims: with English subtitle and thought bubble), which has a more complex meaning that what, in someone in colloquial English were to label as the "chemistry of love", being that the German term Die Wahlverwandtschaften = chemistry of love + physics of love + thermodynamics of love, all in one phrase, something not easily rendered into English. [8] A similar term is "Elective Affinities Problem" the query that led to the human chemical theory.

The following is a 2003 synopsis by William Burns, from his *Science in the Enlightenment: and Encyclopedia*: [3]

"[Goethe's] novel *Elective Affinities* employs a metaphor from chemistry—the 'elective affinities' were the different ways that different substances unite with each other—to describe human relationships. The characters engage in a lengthy discussion of current **chemical theory**."

The following is a 2007 usage of the phrase "the chemical theory" by English German-cultures scholar Carl Krockel: [2]

"The **chemical theory** is the structural backbone of Goethe and George Elliot's realism. Chemicals are only electively affined when their attraction excludes other chemicals. In his narrative Goethe uses the framework of two pairs of lovers, whose attraction to different aspects of each other reveals their psychological 'properties'. Eduard and Charlotte are married, having known each other since childhood; the Hauptmann arrives, and links up with Eduard in their horticultural plans while excluding Charlotte for being too fanciful. Charlotte is satisfied by the arrival of the childlike Ottilie, and is also finding her own measured nature in affinity with the Hauptmann's. Meanwhile, Ottilie appeals to Eduard's childlike side, but the Hauptmann finds her ideas disturbing. And so the narrative continues. In *Middlemarch* George Eliot systematically elaborates on what Goethe only suggests in *Die Wahlverwandtschaften*, since each of her

> four characters is also bound to wider social relationships through affinity."

(add discussion)

Note

In doing searches for key terms 'Goethe' and 'chemical theory' one will also come across these two terms discussed in the context of Goethe's chemical theory of color, which published in 1810.

In reference to Winkleman use of the term "new lovers", above, see also: new relationship energy. [6]

In regard to the use of the term "analogy", above, to note, in 1982, American German-romanticism and humanities scholar William Lillyman, in his Goethe Symposium talk "Analogies for Love: Goethe's *Die Wahlverwandtschaften* and Plato's *Symposium*", argued that Greek comedy playwright Aristophanes (446-386BC) had some type of precursory connectiveness to Goethe's human chemical theory: [7]

> "Underlying the overt analogy for human love—or 'Gleichnisrede' to use Goethe's term—and analogy which was taken from Aristophanes' speech in Plato's *Symposium*. It not exaggerated to say that parallels and allusions to Aristophanes' explanation of the nature of love permeate Goethe's *Die Wahlverwandtschaften*."

(add)

See also

- Human chemical reaction theory
- Combination lock theory
- Human molecular hypothesis
- Goethean philosophy

Goethe's publication is a work of genius. Goethe's IQ, according to psychologist Catharine Cox, from her 1926 book *Early Mental Traits of Three Hundred Geniuses*, is estimated at 210, the highest score that she assigned. People, according to Goethe, as they react, bond, and debond in their various relationships in life are substances in a chemical equation. It is near to indescribable to articulate how fascinating Goethe's *Elective Affinities* is in terms of modern day **human chemical theory**. He was clearly before his time.

A 2007 usage of the term **"human chemical theory"**, in reference to Goethe's *Elective Affinities*, from American electrochemical engineer Libb Thims' *Human Chemistry*. [5]

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θΔics

In human thermodynamics, **human chemical thermodynamics** (HCT), or the chemical thermodynamics of systems of reactive humans, each person viewed as "molecule-like" potentially reactive thing, as contrasted with the "human statistical thermodynamics", the statistical thermodynamics of systems of "particle-like" conceptualized humans, framed in the Boltzmann chaos assumption, is the study of human existence, experience, and function according to the logic of pure and applied chemical thermodynamics — utilizing specifically the powered CHNOPS+20 element thing, aka "human molecule" or human chemical perspective, namely one in which a human is defined specifically as a reactive chemical species or powered animate molecule, and a social system is considered as a system of reactive chemical entities. [1]

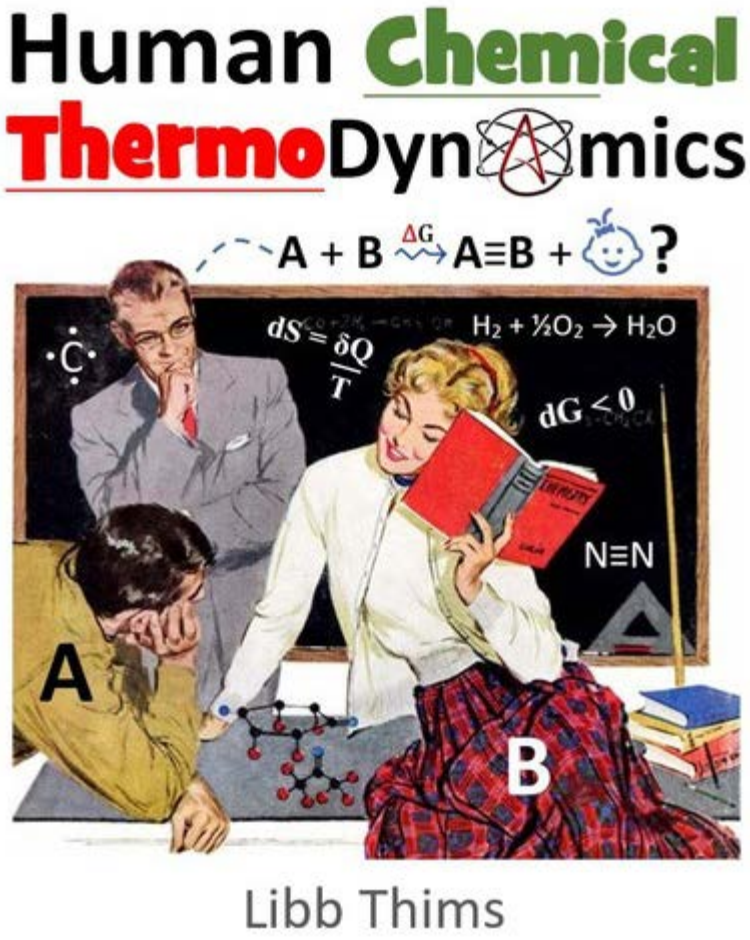

A Sep 2019 cover of Libb Thims' ***Human Chemical Thermodynamics***, then at the 93-page drafting-stage level. [9]

Pre-history | Etymology

In 1934, Harold Blum, in his "A Consideration of Evolution from a Thermodynamic View-Point", cited Lawrence Henderson (1913) and Gilbert Lewis (1923), to outline a coupling theory plus free energy decrease based theory of orthogenesis (directional-change) conceptualized evolution, in the explicitly-stated "religious-free" form of what he refers to as "chemical peneplanation", i.e. an synonym the semi-modern term Gibbs landscapes, as seems to be the case. [5]

In 1935, Lawrence Henderson, using an admixture of Vilfredo Pareto and Willard Gibbs, outlined the general subject of physicochemical humanities, which he tested out via the Harvard Pareto circle and his Sociology 23 course

In 1971, Frederick Rossini, gave his "Chemical Thermodynamics in the Real World" Priestly medal address, wherein he outlined the subject of human chemical thermodynamics, in conceptual prototype, albeit deistically rooted.

In 1987, Mirza Beg introduced what he referred to as physicochemical sociology, a precursor of sorts to human chemical thermodynamics, albeit one religiously-rooted. [6]

In 1995, Libb Thims, as a chemical engineering student, began working on the idea (see: this idea) of chemical thermodynamics applied to human mating interactions, as a sort of puzzle-solving plaything; eventually solving some of the puzzle in 2001, beginning to publish some of these ideas online in 2005.

In c.2000, Christopher Hirata, in his "The Physics of Relationships: a Thermochemical Approach to Relationships", outlined, via an overt humor stance, some basics of macro aspects chemical thermodynamics of reacting humans.

In 2007, Libb Thims, in his *Human Chemistry* (2007), building on Rossini, and others, coined the term human chemical thermodynamics as follows: [2]

> "The theory of human chemical bonding, aside from **human chemical thermodynamics**, is one of the more difficult topics to write on in a rigorous form."

In 2001, David Hwang, in his "The Thermodynamics of Love", outlined, via an overt humor stance, some basics of micro aspects chemical thermodynamics of reacting humans.

The central approach, in this mode of logic, is to assume the "human molecule" perspective, where people are modeled as molecules, chemical species, or chemical complexes, having human chemical reactions with each other, all viewed from the advanced perspective, the set of which defines the ongoing or underlying process of evolution, what is more correctly called coupled synthesis and analysis. [2]

Human chemical thermodynamicists

See also: IQ:200+ HCT prodigies

Historically, seven people, independently, have written theory on human chemical thermodynamics — employing the explicit view or mindset that humans are reactive bonding-debonding molecules governed by affinity, enthalpy, entropy, and or free energy, i.e. chemical thermodynamics — three of whom (Goethe, Beg, Thims), shown bolded, doing so directly, in a prolonged manner, and using peer review, one (Henderson) doing so implicitly (soft comparisons) in a prolonged manner, and three (Hirata, Hwang, and Pati) doing so in the "fun joke" style of one time article-style (or blog style) publication, of a semi-humorous, semi-serious mental note, three of whom (Goethe, Thims, Hirata) independently cited with an IQ in the 225 range:

	Scholar	Idea	Publication | Finalized result	IQ
1.	**Johann Goethe**	1796	*Elective Affinities* (1809)	IQ:225 (Merrill, 1926)
2.	Lawrence Henderson	1913	*Pareto's General Sociology: a Physiologist's Interpretation* (1935)	
3.	Frederick Rossini	N/A	"Chemical Thermodynamics in the Real World" (1971)	
4.	**Mirza Beg**	1974	*New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (1987)	
5.	**Libb Thims**	1995	*Human Thermodynamics* (2003); *Human Chemistry* (2007); *Hmolpedia* (2016)	IQ:225 (YouTube, 2012) (Ñº)
6.	Christopher Hirata	N/A	"The Physics of Relationships: a Thermochemical Approach to Relationships" (2000)	IQ:225 (Goldsmith, 1999) [7]
7.	David Hwang	N/A	"The Thermodynamics of Love" (2001)	
8.	Surya Pati	N/A	"The Thermodynamics of the Human Bond!" (2009)	

To state things another way, among the 500+ known HT pioneers, some 40± are human free energy theorists; and among these only eight, listed above, are "human chemical thermodynamicists"—explicitly conceptualizing humans as "molecules" (or chemicals) reacting "chemical thermodynamically" to each other—a very niche classification, to say the least. Rossini's presentation, however, to note is implicit (see: Rossini debate).

With the 2005-launching of the *Journal of Human Thermodynamics* and 2008-launching of *Hmolpedia*, by Thims, the subject of "human chemical thermodynamics" is now no longer easily arrived at independently, being that Thims, as of 2011 now requires JHT submitting authors to include a "human thermodynamics variable table", in which the specifically state clearly, not only exact definitions for each variable used in the article, but also, on the 1892

precedence set by Irving Fisher, former Gibbs protege, specifically define how exactly they conceptualize the human: molecule, particle, chemical (species, substance, atomic geometry), engine, etc.

Human statistical thermodynamics

The alternative subject is "human statistical thermodynamics" where each human being is modeled as a ideal gas phase particle (human particle), such that the Boltzmann equation $S = k \ln W$ is assumed to be applicable to their operations. English physicist C.G. Darwin, as discussed in his 1952 work, can be considered on the main theorists in this field.

Quotes

The following are related quotes:

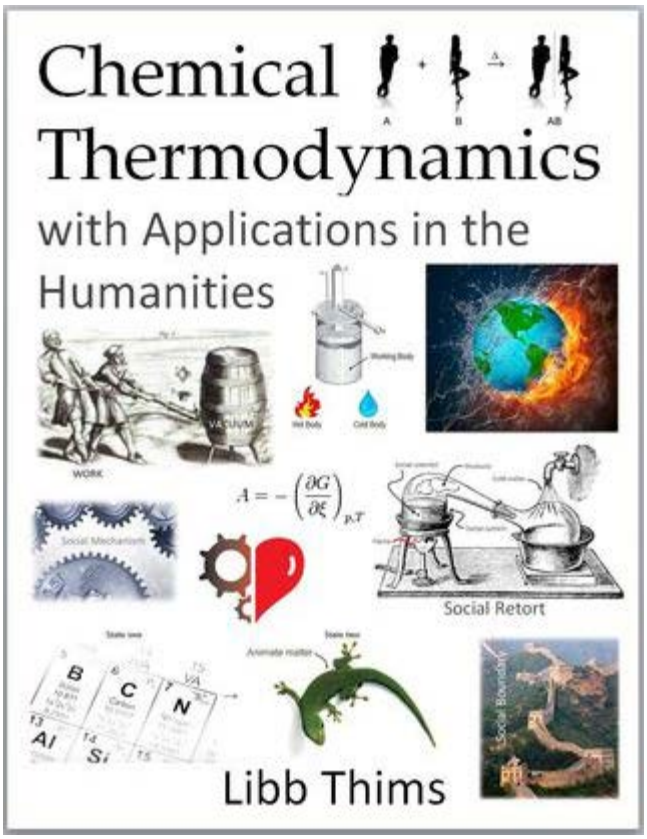

A Feb 2015 craft cover (variant of 10 Oct 2013 cover (Ñº)) of Libb Thims' *Chemical Thermodynamics: with Application in the Humanities*, on the subject of **human chemical thermodynamics** (which made it to the 42-page level, before being road blocked by implicit atheism; a repercussion of which was the newly-viewed inherent need to switch to extreme explicit atheism), aiming to be the required reading for a college to graduate level course in physicochemical humanities (or physicochemical sociology). [4]

> "Christopher Langan claims to have an IQ of 195-210, but IQ tests can't measure that high. IQs of that level are determined by works created by the individual. Christopher Hirata, for instance, is estimated to have an IQ of 225 because of his independent arrival at '**human chemical thermodynamics**', also independently arrived at by Libb Thims and Johann Goethe. Langan's only work of note is his 'cognitive-theoretic model of the universe', which is widely agreed to be a bunch bollocks. Like seriously, some of it is actually just nonsensical blabbering. And not in the way that people just might not be smart enough to understand it, but the way that it literally makes no grammatical sense."
>
> — Ben Shapiro (2014), Debate: All Christians are Smart and Atheists are Dumb" (Ñº), Debate.org, Sep 17

> "**Human chemical thermodynamics** is a field that studies human existence, experience, and function according to the logic of pure and applied chemical thermodynamics, thinking of humans as a system of chemical species or molecules that react with social agents."
>
> — Yu-Hang Kim (2016), *Outsiders Struggle for the Search for Truth Against the Seven Pillars of Science* (§10)

> "In the twenty-first century, the evolution of chemistry as it pertains to man is now known as '**human chemical thermodynamics**'."
>
> — Jonathan Arante (2017), "An Assessment of the Sociocultural Evolution Among Selected Filipino Stay-at-Home Fathers" [8]

> "Johann Goethe popularized the idea that the 'laws of chemical affinity' may also govern human behavior,

despite it hailing to at least the 1600s, which has now become the niche and obscure field of '**human chemical thermodynamics**'. It delves into the idea that as human genetics and biology are controlled predominantly – in the view of our present scientific understanding (and Goethe's), however accurate it may be – by chemical reactions, similar laws must govern human beings and our relationships."

— Ashley Kent (2018), "Self Harming" (Ñº), Vocal.Media

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pre). Morrisville, NC: LuLu.
2. Thims, Libb. (2007). *Human Chemistry (Volume One)* (human chemical thermodynamics, pg. viii) (pre). Morrisville, NC: LuLu.
3. (a) Hwang, David. (2001). "The Thermodynamics of Love" (WB) (pdf), *Journal of Hybrid Vigor*, Issue 1, Emory University.
(b) Pati, Surva P. (2009). "The Thermodynamics of Human Bond!", Sep. 09, MentalProjections.Blogspt.com.
4. Thims, Libb. (2014-15/16). *Chemical Thermodynamics: with Application in the Humanities* (pdf). Publisher.
5. (a) Henderson, Lawrence. (1913). *The Fitness of the Environment: An Inquiry into the Biological Significance of the Properties of Matter*. MacMillan Company.
(b) Lewis, Gilbert N. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (secretary: Merle Randall). McGraw-Hill.
(c) Blum, Harold F. (1934). "A Consideration of Evolution from a Thermodynamic View-Point" (abs), presented at the 94th meeting of the American Association for the Advancement of Science, Jun 20, in: *The American Naturalist*, 69(723):354-69, Jul-Aug, 1935.
6. Beg, Mirza Arshad Ali. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (intro) (pdf, annotations by Libb Thims, 2014) (individual, pg. 23). Karachi: The Hamdard Foundation.
7. Susan, Goldsmith. (1999). "The Wizard of Pasadena" (Ñº) (Ñº), *New Times Los Angeles*, Jun 17.
8. Arante, Jonathan I. (2017). "An Assessment of the Sociocultural Evolution Among Selected Filipino Stay-at-Home Fathers", in: *Applied Psychology Readings: Selected Papers from Singapore Conference on Applied Psychology*, 2017 (§:123-47; quote, pg. 141). Springer, 2018.
9. Thims, Libb. (2020). *Human Chemical Thermodynamics — Chemical Thermodynamics Applied to the Humanities: Meaning, Morality, Purpose; Sociology, Economics, Ecology; History, Philosophy, Government, Anthropology, Politics, Business, Jurisprudence; Religion, Relationships, Warfare, and Love* (**pdf**). Publisher.

θΔics

In science, a **human chemist**, similar to "sociochemist", "human social chemistry", or human physicochemist, is a person who studies human chemistry or the chemistry of reactions between people.

Overview

In 1914, English-born American engineer William Fairburn, in his *Human Chemistry*, defined a person or foreman who runs a group, conceptualizing his workers as chemicals, as a human chemist; the following is an example excerpt: [1]

> "As each chemical element is an entity, differing and distinct from any other, so is each human element and entity and a personality, which, when guided by a **human chemist** to do work and perform his peculiar function in life, feels and acquires what no inert substance can ever acquire, namely moral stimulus of responsibility. No chemical element is in a state of harmony unless it is in contact with other elements or influences which do not antagonize or irritate, and no human chemical or worker can ever by truly happy in his work unless he is fitted by nature for the work which he is performing, and unless his general temperament are in harmony with his specific duties and environment."

(add discussion)

In 2005, American electrochemical engineer Libb Thims introduced the related term: human thermodynamicist, defined as one who thermodynamically studies humans. [2]

References

1. Fairburn, William Armstrong. (1914). *Human Chemistry* (human chemist, pgs. 2-3). The Nation Valley Press, Inc.
2. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (pg. 654). Morrisville, NC: LuLu.

θΔics

In chemistry, **human chemistry** is the study of reactions between people. [1] American self-defined 'human chemist' Thomas Dreier, gave the following definition of the subject of human chemistry, in 1948, considering people viewed atomically as human chemicals: [12]

> "**Human chemistry**, the study of how people 'chemically' react to one another, is an important branch of the science of human nature."

A central aspect in human chemistry is the definition of the person as a "human molecule", a term coined by French philosopher Jean Sales in 1789, being the atomic definition of a person. [4] In this perspective, human chemistry is the quantitative study of reactions between human molecules and the structures they form. This is expressed clearly by American historian Henry Adams who in 1885 gave the following definition of human chemistry (or rather 'social chemistry' as he called it): [24]

> "Social chemistry—the study of the mutual attraction [and repulsion] of equivalent human molecules—is a science yet to be created."

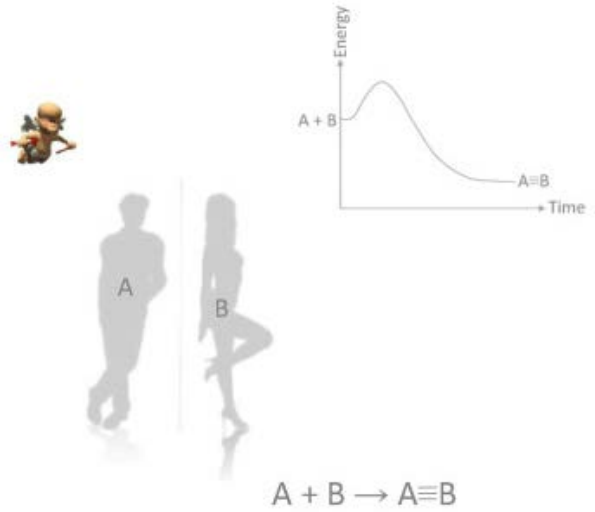

2009 backdrop to the Human Chemistry 101 channel, showing that for two people to react they must "collide" in such a way that their movements surmount the activation energy barrier after which a decrease in Gibbs free energy (ordinate) over time (abcissa) signifies favored human chemical reaction, into which the stable product, the dihumanide molecule, forms, connect via a human chemical bond: A≡B.

The bracketed term "'repulsion", in this last definition by Adams, to note, is inserted to signify the updated modern view that the study of the force of repulsion in human interactions, reactions, and bonding is a very significant component, particularly in discussions of bond stability, such as has been experimentally quantified in the Gottman stability ratio (in marriages) or the Muller stability ratio (in society). A defining aspect of human chemistry is that human chemical reactions occur over a surface, namely the earth's surface, as studied in the subjects of surface chemistry and surface thermodynamics; surfaces which act as a substrate and or catalyst. In chemical equation form, defining human molecules as chemical species *A* or *B*, basic human reactions, such as couple formation (combination reaction) or relationship breakup (bond dissolution), take the form of simple chemical equations, such as:

$A + B \rightarrow AB$ (bond formation)

$AB \rightarrow A + B$ (bond dissolution)

Likewise, more complicated reactions entail the use of coupled mechanisms, molecular intermediates, or effects such as Müller dispersion forces. A second aspect of human chemistry is the quantum mechanical definition of the human chemical bond A≡B between two human molecules, such as the attachment in an intimate romantic relationship.

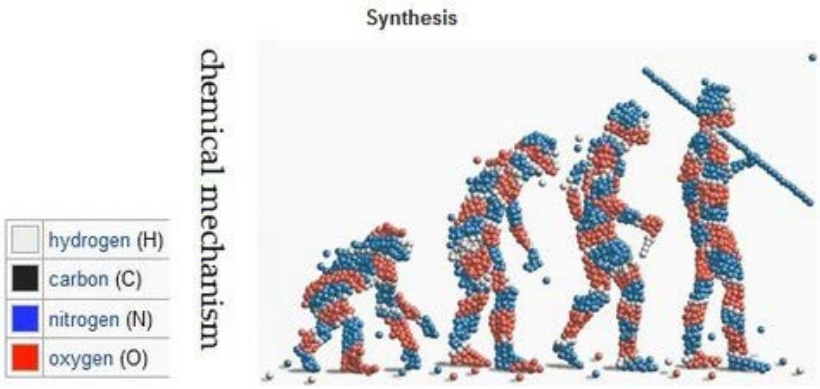

A synthesis, i.e. evolution, view of the formation of a person, i.e. human molecule, by Canadian designer Shawn LaPaix, from hydrogen, carbon, nitrogen, oxygen, etc., element precursors, over the last 13.7 billion years.

Big picture

The big picture view of human chemistry considers each human to be a large atomic structure, or "single abstract molecule" (according to the 2002 stoichiometric approach), which has been synthesized over millions and billions of years, that react with each other in the form of daily complex mechanistic chemical reactions. The diagram, shown adjacent, gives a "big picture" or advanced perspective atomic view of what exactly is a human. In other words, if a large chemist was looking down on earth, as though the surface of the earth were a test-tube for his studies, the chemist would view humans to be little molecules reacting together forming products.

The diagram is a spin on English biologist Thomas Huxley's famous 1863 evolution of man drawing, using the 1952 CPK atomic color scheme: **red** = oxygen, **blue** = nitrogen, **gray** = hydrogen, **black** = carbon (not shown), done for a poster for the 2005 University of British Columbia Art Gallery exhibit "The Human Body in History", alluding to the idea that human is a body of evolving atoms, formed into the structure of a molecule, that has been chemically synthesized into its current form, over long spans of evolutionary time. [31] In the big picture view, the student of human chemistry must consider each person to be a tiny reactive molecule and in doing so begin to study how the various laws and principles of

standard chemistry either can or cannot apply to human reactions.

Short history

See main: History of human chemistry, HC pioneers

First human chemist

"People who love each other mix like water and wine; people who hate each other segregate like water and oil."

Greek philosopher Empedocles (495-435 BC), the first human chemist, famous for his noted chemistry aphorisms of how people mix or sort.

The first proto human chemist was Greek philosopher Empedocles, notable for his *circa* 450BC theory that people related tend to mix like water and wine; whereas enemies mix or rather separate like oil and water.

German polymath Johann Goethe founded the subject of human chemistry, beginning in 1796 (see: Goethe timeline)., albeit a subject he referred to as *Die Wahlverwandtschaften* (see: term decoding), based on 18th affinity chemistry, particularly that of Swedish chemist Torbern Bergman (1775). Goethe's sole human chemistry protege Arthur Schopenhauer carried forward some of his human chemical reaction theories in his "will to power" theory (*The World as Will and Representation*, 1818, 1844).

The 2007 "combination lock theory" of dating by Canadian relationship philosopher Chanel Wood is a recent **human chemistry** theory, modeled on NaCl formation, according to which the "we just clicked" catch phrase of successful relationships is conceptualized as two people, as "reactants", clicking together in a manner to the way atoms combine to satisfy valence electron shell configurations.

The term "human chemistry" was in use by 1851 by an author of the initials E.B., in discussion of English polymath William Whewell's *Bridgewater Treatise* (1833), who commented: [33]

"Potassium is a compound of certain elements which exist abundantly in nature: the operations of nature can resolve potassium, or gold, or man, into their elements, and build up new gold, new potassium, and new men, by laws unknown indeed to **human chemistry**, but which we must (arrogantly or not) for the present hesitate to pronounce undiscoverable."

The first depictions of human chemical reactions (see: history) were made by Goethe (1809), German science historian Jeremy Adler (1987), American Germanic studies professor Karl Fink (2001), American computational chemist David Hwang (2001), and Canadian writer Chanel Wood (2007), among others.

In 1910, American author Thomas Dreier, began calling himself a "human chemist" and publishing a series of articles on human chemistry, which eventually developed into a book (*We Human Chemicals*, 1948)

The first book entitled *Human Chemistry* was written in 1914 by English-born engineer American William Fairburn, extolling on the view that humans are chemicals and that one should used the principles of chemistry to facilitate working relations (or reactions) between people (such as in factories) in business operations.

The world's first full rigorous textbook on human chemistry, namely *Human Chemistry (Volume One)* and *Human Chemistry (Volume Two)*, was written by American electrochemical engineer and thermodynamicist Libb Thims in 2007. YouTube's Human Chemistry 101 channel was started in 2008 by Thims, scheduled as a semi-weekly educational video series on the chemistry of human interactions. [10]

Human chemistry educational videos

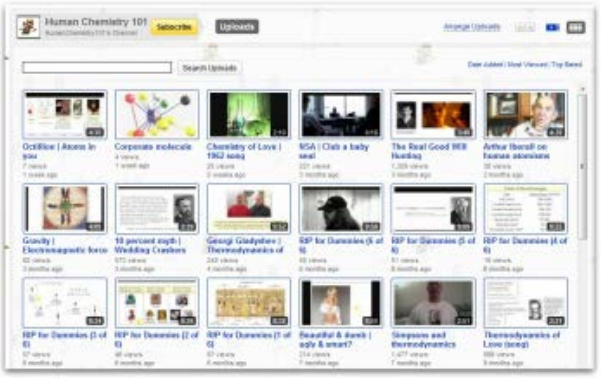

Screenshot (2010) of the the YouTube Human Chemistry 101 channel, which sporadically makes educational videos on **human chemistry** topics.

Human molecule

See main: Human molecule, Human molecular formula

An important subject in human chemistry, is the definition of the the human being from an atomic point of view. Many terms have been employed over the years to define humans chemically, including: chemical entity (Johann Goethe, 1809), point atom (Humphry Davy, 1813) human molecule (Hippolyte Taine, 1869), social molecule (Thomas Huxley, 1871), economic molecule (Leon Walras, c. 1870s), human atom and human molecule (Ferninand Schiller, 1891), human molecule (Emile Boutmy, 1904), human molecule (Henry Adams, 1910), human chemical and human chemical element (William Fairburn, 1914), chemical formula in operation (George Carey, 1919), human molecule (Vilfredo Pareto, 1916), human molecule (Pierre Teilhard, 1947), social atom, acquaintanceship atom, collective atom, individual atom, psychological atom (Jacob Moreno, 1951), human molecule (C.G. Darwin, 1952), human atom (Erich Fromm, 1956), dissipative structure (Ilya Prigogine, 1971), human atomism (Arthur Iberall, 1987), social atom (Mark Buchanan, 2007), and many more. [4] The first

calculation of the molecular formula for a human being was published in 2002 by American limnologists Robert Sterner and James Elser as shown (adjacent). [19]

$$H_{375,000,000}\ O_{132,000,000}\ C_{85,700,000}\ N_{6,430,000}\ Ca_{1,500,000}\ P_{1,020,000}\ S_{206,000}\ Na_{183,000}\ K_{177,000}\ Cl_{127,000} Mg_{40,000}\ Si_{38,600}\ Fe_{2,680}\ Zn_{2,110}\ Cu_{76} I_{14}\ Mn_{13}\ F_{13}\ Cr_{7}\ Se_{4}\ Mo_{3}\ Co_{1}$$

Chemical formula for one human

Above: the 2000-calculated human "empirical formula" (see: Sterner-Elser human molecular formula), showing the lowest common ratio of atoms in the molecule, as contrasted with a "molecular formula", which shows all of the atoms in the molecule. More recent 2002 calculations by Libb Thims, however, indicates that 26 not 22 elements are active in a human (see: Thims human molecular formula).

To contrast this calculation with most the main doctrine of twentieth-century, as to the elemental composition of active biological entities, a view that tends to conclude with a statement to the effect that "six main elements, carbon C, hydrogen H, oxygen O, nitrogen N, sulfur S, and phosphorous P, comprise 95% of living organisms" (whereas the other twenty active elements are somehow essentially non-notable stuffing, we see that the modern-view studies the function of twenty-six elements found to have active function in the human. In short, modern human chemistry is defined as the study of behaviors of human molecules and the structures they form. [1]

The modern thinker must always return to the above formula when attempting to contrive or develop theories concerning human existence.

Goethe | human affinities

See also: Goethe's human chemistry; Goethe's human affinity table

The science of human chemistry was founded with the 1809 publication of the semi-biographical scientific novella *Elective Affinities* by German polymath Johann Goethe (IQ=230), who viewed human relationships as chemical reactions between chemical species, being predetermined by chemical affinity force relations as were found in standard 18th century chemical affinity tables. [2]

The adjacent excerpt, by Germanic literature scholars Martin Swales and Erika Swales, from the 2002 book *Reading Goethe: a Critical Introduction to the Literary Work*, gives an overview as to how Goethe's theory of human elective affinities, which he had developed as early as 1796, translates into the 21st century science of human chemistry, such as in the question: [32]

The Hauptmann is invited to join Eduard and Ottilie; and it is the resulting threesome that one evening discusses the notion of "Wahlverwandtschaften" (elective affinities), processes of bonding and rebonding in chemistry. At issue is the possibility that a particular compound can be fractured by the appearance of a third substance which then bonds with one of the previously conjoined substances — almost as though some kind of choice were being exercised. At one level, the discussion amongst the three friends genuinely does concern recently discovered chemical processes.[3] At another level, the characters ceaselessly make metaphorical links between the behavior of chemical substances on the one hand and the chemistry of human attraction on the other. And, as soon as one formulates the matter in this way, in terms of "human chemistry," one asks oneself whether this, too, is a literal or metaphorical statement. Are men and women subject to the laws of material reality in the same way as the chemical substances are? If so, what is the force of "Sitten und Gesetze" (272) in the human sphere?

A 2002 "**human chemistry**" interpretation of Goethe's theory of elective affinities. [32]

> "Are men and women subject to the same laws of material reality as are the chemical substances?"

The German term "sitten and gesetze", to note, translate as "customs and laws"; meaning that the authors are asking, in modern times, what is the force, of the four fundamental forces in physics, of the customs and laws in the human sphere? This is just on example of the questions involved in modern human chemistry. In his novella, in the famous chapter four, Goethe assigned the following Bergman-style letter chemical symbols to each character in the novella:

Symbol	Person	
A		Charlotte
B		Eduard
C		Captain

Verbal assignment

'Provided it does not seem pedantic,' the Captain said, 'I think I can briefly sum up in the language of signs. Imagine an *A* intimately united with a *B*, so that no force is able to sunder them; imagine a *C* likewise related to a *D*; now bring the two couples into contact: *A* will throw itself at *D*, *C* at *B*, without our being able to say which first deserted its partner, which first embraced the other's partner.'

$$AB + CD \rightarrow AD + CB$$

'Now then!' Eduard interposed: 'until we see all this with our own eyes, let us look on this formula as a metaphor from which we may extract a lesson we can apply immediately to ourselves. You, Charlotte, represent the *A*, and I represent your *B*; for in fact I do depend altogether on you and follow you as *A* follows *B*. The *C* is

D Ottilie

quite obviously the Captain, who for the moment is to some extent drawing me away from you. Now it is only fair that, if you are not to vanish into the limitless air, you must be provided with a *D*, and this *D* is unquestionably the charming little lady Ottilie, whose approaching presence you may no longer resist.'

The seed for his logic arose in Goethe's mind as early as 1808, if not earlier. In particular, a year before publication Goethe, who had been studying chemistry for a period of forty-years, told his friend Friedrich Riemer that 'his idea for the new novella was to portray social relationships and their conflicts symbolically', as in *a*, *b*, *ac*, *abd*, *abcd*, etc., a statement in reference to a Scottish physician and chemist William Cullen's 1757 pioneering development of chemical affinity reaction diagrams.

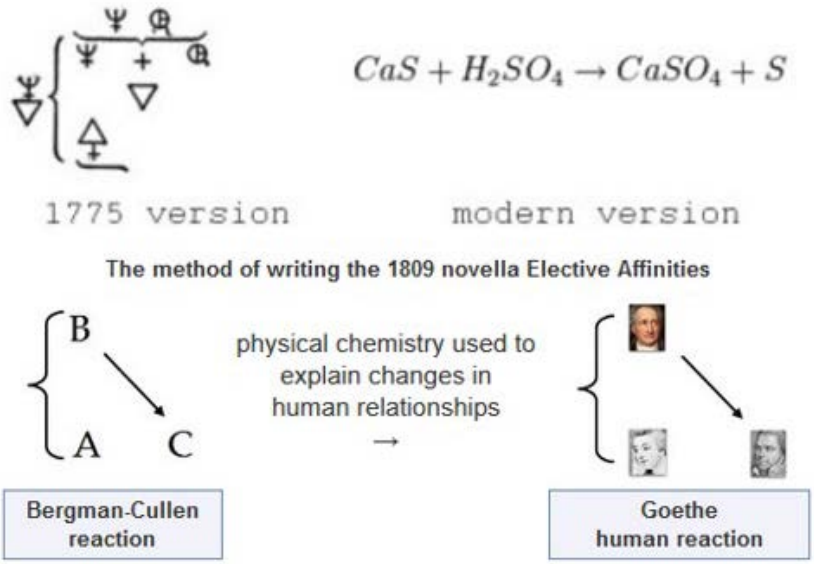

What Goethe did, ingeniously, was to arrive at the view that humans are evolved chemicals that react together according to the same laws that govern smaller chemical entities and, based on this view, used Cullen's 1757 dart-arrow reaction diagram method, as found Bergman's reaction diagrams (1775), to explain human relationships as being larger versions of chemical reactions, governed by the principles of affinity chemistry, as captured in the logic of Bergman's affinity table (a 59-column 50-row affinity table), and in doing so wrote out a 36-chapter novella, based on this logic, in which each chapter is a different description of a human chemical reaction, a task which brings validity-closure to Goethe's long-standing title as being the greatest genius of all time.

To go through the first example of this logic used by Goethe, in the first chapter, the Eduard *B* and Charlotte *A*, considered purely as chemical entities, in the mind of Goethe, are bonded together in dull marriage, signified by the Cullen-notation of the bonding bracket "{", who in turn invite their friend the Captain *C* to their estate to visit, where upon arrival Eduard B and the Captain C rekindle their old friendship, displacing Charlotte A from her bond with Eduard (adjacent).

In technical terms, if chemical species *A* and *B* are attached in a weakly bonded chemical union, signified by the bonding bracket "{", ordered such that if species *C* were introduced into the system, the greater affinity preference of *B* for *C* would cause or rather work to force *B* to displace *A* and to thus form a new union with *BC*, which equates to the following in modern terms:

$$AB + C \rightarrow BC + A$$

Goethe ingeniously steps through thirty-six of these types of human chemical reactions in his novella. In commentary on the application of this type of logic, Goethe declared:

> "The moral symbols used in the natural sciences are the elective affinities discovered and employed by the great Bergman."

Goethe here is referring to Bergman's great 1775 chemistry textbook *A Dissertation on Elective Attractions*. [11] In other words, what is moral or amoral, in Goethe's view, is a point of view inherent in the laws of chemistry according to which species react.

Goethe's affinity table

See main: Goethe's human affinity table

It has been argued that German polymath Johann Goethe made a human affinity table, at least in his mind if not on paper, in circa 1808 during the writing of his 1809 novella *Elective Affinities*, as he readily admitted that the book was based on Bergman's affinity table (59-column 50-row affinity table) and Bergman's reaction diagrams, as made and described by Swedish chemist Torbern Bergman in his 1775 chemistry textbook *A Dissertation on Elective Attractions*. This will never be confirmed, however, in that in opposition to his usually practice, Goethe destroyed all of his notes and drafts to this particular novel.

A tentative table was made in 2007 by American chemical engineer Libb Thims (shown below) based on the affinity descriptions between the main and

supporting characters, such as: Eduard (Edu), Charlotte (Cha), Ottilie (Ott), the Captain (Cap), Luciane (Luc), Mittler (Mit), the Count (Cou), the Barroness (Bar), Otto (Oto), the Nanni (Nan), the Assistant (Ass), the Architect (Arc), the Elderly clerk (Eld), Homeless people (Hom), the Gardener (Gar), the Lawyer (Law), the Parson (Par), the Surgeon (Sur), the Englishman (Eng), the Traveling companion (Tra), among others: [2]

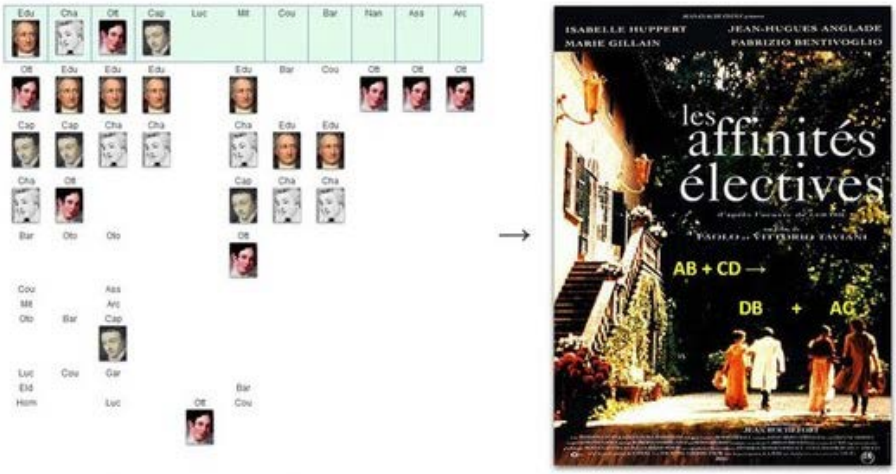

Human affinity table (1799) — *Elective Affinities* (1809)

A depiction of the method in which in the 1809 physical chemistry based novel *Elective Affinities* was written, namely in 1799 Goethe began to discuss, with Friedrich Schiller (see: Goethe timeline), how people attract, repel, and neutralize each other akin to chemicals, in terms of affinity chemistry, and sometime thereafter mentally formulated a human affinity table (left), based on Swedish chemist Torbern Bergman's 1775 affinity table. The image shown (right) is the 1996 film adaptation of the novella, depicting the basic double elective affinity reaction threading the chapters of the book together (see: history). [13]

The affinity table works, as described by affinity table pioneer Etienne Geoffrey, such that at the head of each column is a header species with which all species below can combine or have a rapport with. The latter are so placed such that any higher species replaces all others lower in the column from their compounds with that at the head of the table. In other words, the species at the head of the table can potentially react with any species below it. All the species below the header species are ranked by chemical affinity preferences relative to the top species, with a higher rank corresponding to a higher affinity tendency.

The species at the bottom of each column, for instance, have the least amount of affinity for the header species. If the bottom species is in a weakly bonded relationship with the header species, any species above it can potentially displace it from its attached partner. [23]

To go through one example, in the opening of the novella Eduard (Edu) is bonded in comfortable, but tending towards mundane, marriage to Charlotte (Cha), signified by the bonding Edu=Cha. When Eduard's old friend the Captain (Cap) arrives, however, they rekindle their friendship, and thus act to displace Charlotte from her bond with Eduard. This is described as a single elective affinity reaction:

$$\text{EduCha} + \text{Cap} \rightarrow \text{EduCap} + \text{Cha}$$

In other words, the Captain has a stronger chemical affinity for Eduard as compared to Charlotte, as represented by her lower position on the affinity table; thus when the Captain is introduced into the mixture (Estate viewed as a closed system, to other reactants) he acts to displace Charlotte from her attachment to Eduard.

The theoretical premise here is correct, as compared the other types of metaphorical "human element periodic tables" (as shown below), in that, as proved by German polymath Hermann Helmholtz, in his 1882 publication "The Thermodynamics of Chemical Processes", affinity between reacting chemical entities, for isothermal isobaric systems, is determined by the change in the Gibbs free energy, as define by the following expression:

$$A = -\Delta G$$

3.4. Human Chemistry

In *exact sciences* there are quantitative measures of estimation of each value: mass, length, force, energy. In *humanistic disciplines* (history, philosophy, psychology) as well as in *art* there are no quantitative criteria. This is similar to question *how to measure beauty, love, friendship, democracy*? If there is no quantitative estimation of some category or phenomenon, any definition becomes undefined, ambiguous and abstract. We know that in chemistry there is the function named *Gibbs energy* which defines the "*love*" between substances. Why there is no such function for estimation of love between people? Thus people tried to estimate this and *human chemistry* appeared [16, 17]. *Human chemistry* is the study of bond-forming and bond-breaking reactions between people and the structures they form. Historically, *human chemistry* appeared in 1809 with the publication of the novella "*Elective Affinities*" by Goethe, a chemical treatise on the origin of love [18]. In this stage today *human chemistry* is similar to alchemy in the middle ages, it borders with art, but further investigation on the molecular level in human brains will help to discover what happens in our organisms, and intimacy will end. Probably, such discovery will cause us to be unhappy, because mystery and wonder of love and relationships between people will be finished.

Left: a 2007 photo of a cart full of ***Human Chemistry*** textbooks, which American chemical engineer Libb Thims uses in his human chemistry lectures, at various universities, at public places such as the Magnificent Mile, Chicago. Right: A 2011 **"human chemistry"** symposium section, by Russian-born Israeli chemical engineer Alec Groysman, citing the views of American electrochemical engineer Libb Thims (2007) and German polymath Johann Goethe (1809), presented at the Generative Art Conference talk entitled "Use of Art Media in Engineering and Scientific Education", arguing that the nascent subject of human chemistry should be taught as part of the standard engineering curriculum, the chemical engineering curriculum in particular (see: human thermodynamics education). [34]

In other words, the ability of humans to react and thus to bind together is based a combination of competing affinity preferences as measured by the changes in the free energies in the systems, knowing in particular that free energy coupling occurs. In more advanced human chemical thermodynamics reaction analysis, this last

equation can be expanded, via German physicist Rudolf Clausius' 1865 *The Mechanical Theory of Heat*, into the form:

$$A = T\Delta S - P\Delta V - \Delta T_v - \Delta J$$

which means that affinities *A* involved in the reactions between people, will be favored when there is an entropy increase, $\Delta S > 0$, or transformational content increase in the reaction system, meaning that heat was transformed in to system internal evolution work, which signifies that the body or boundaried system of the relationship has transformed or evolved over time; when there is a volume decrease, $\Delta V < 0$, in the molecular orbitals of the reactants, meaning that spatial movements of the pair come together over time rather than diverging, as is simplified by saying that two lives become one; a vis viva decrease, $\Delta T_v < 0$, and an ergal decrease, $\Delta J < 0$.

Human chemical reactions

See main: Human chemical reaction (history)

A larger part of the subject of human chemistry is that of applying the logic of the chemical equation, showing the reactants before the reaction arrow and the products following the reaction arrow:

Before (initial) state (reactants) ⟶ After (final) state (products)

signifying a structural change in time of atoms or molecules over the extent of the the reaction, to model human interaction as purely chemical reactions. The topic is by no means a simple one, where in some cases equations or mechanisms must capture decades of interactions. Historically, Goethe was the first to outlined human chemical reactions in the form of symbols in a verbal sense and Germanic studies and science historian Jeremy Adler, in 1969, was the first to make an attempt at drawing out the various reactions used by Goethe in chemical equation diagram form. Only recently have people, e.g. Libb Thims (1995), Christopher Hirata (c. 2000), Karl Fink (2001), David Hwang (2001), etc., begun to draw out human interaction processes such as forming a relationship or going through a divorce as before and after states of chemical reactions, and to discuss these equations in terms of theory, e.g. collision theory, activation energy, human chemical bonding, change in Gibbs free energy, human molecular orbital theory, etc.

Dreier's human chemistry

In 1910, American author Thomas Dreier published a short 27-page pamphlet entitled *Human Chemicals*, laying out the theory that people are "human chemicals", a premise that he continued to build over the next forty-years in various publications. His central point of wisdom was that if there is an 'explosion' (or workplace tension) at the office or factory, that it is not the fault of the reactants (or workers) but a fault of the chemist (or company executive). A more expanded take on this view was presented in his 1948, 122-page, book *We Human Chemicals*, in which he argues that everything is a matter of human chemistry in the view that "we are all human chemicals and human chemists". The following is an example quote:

> "Watch groups of people working or playing together and you will be startled to discover how 'chemical' are their reactions to one another. Once you acquire even rudiments of **human chemistry**, you will be baffled less often by people, and become impatient or angry less often at the (to you) annoying things they do. You will see and judge them for what they are—different kinds of human chemicals, obeying the laws of their natures as you and I obey the laws of our natures."

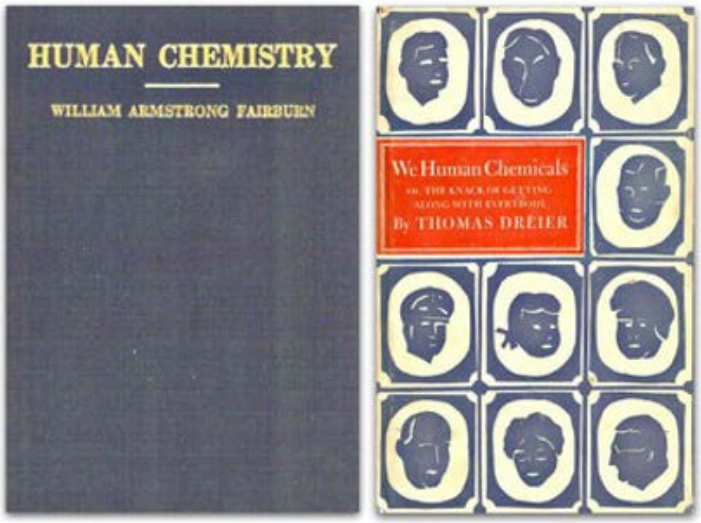

Left: English-born American engineer William Fairburn's 1914 booklet *Human Chemistry*, who states that people can be defined entropically. Right: American writer Thomas Dreier's 1948 *We Human Chemicals* picturing people as elements on a periodic table.

The book contains chapters on how a country is a chemical laboratory, the human chemistry of confident salesmanship, how a happy marriage is a matter of human chemistry, how business executives can act as catalysts, and how every executive is a human chemist, among other chapters. [12]

Fairburn's human chemistry

The first actually book titled "human chemistry" was the short 55-page booklet *Human Chemistry* written by American naval engineer

William Fairburn in 1914. In his opening pages, Fairburn defines his subject as such:

> "**Human chemistry** is the [study of] reactions resulting from combinations of individuals [who are] like chemical elements in a well-stocked laboratory."

Fairburn's human chemistry, to note, is written mostly using chemical analogies, focused on the occupational aspects of the variations of work producing reactions between people, who he defines as "human chemical elements", in factories, as viewed through the eyes of the foreman, the "human chemist". [3] Fairburn argues that the reactions resulting from combinations of individuals can be determined and improved though measures of personal energies, entropies, and affinities, etc., so to eliminate loss through unnecessary fatigue and "wasteful reaction".

Thims | Human chemistry

> *See main: Libb Thims (history); Human Chemistry (history); Human Chemistry (textbook origin)*

The world's first textbook on human chemistry is the 2007 two-volume *Human Chemistry* by American chemical engineer Libb Thims, written in an attempt to standardize the subject according to basic textbook chemistry on the premise that a human being is a molecule, pure and simple, made to be reactive on a surface owing heat input from the sun. The following is the opening sentence of the first chapter: [1]

> "**Human chemistry** is the study of reactions between people."

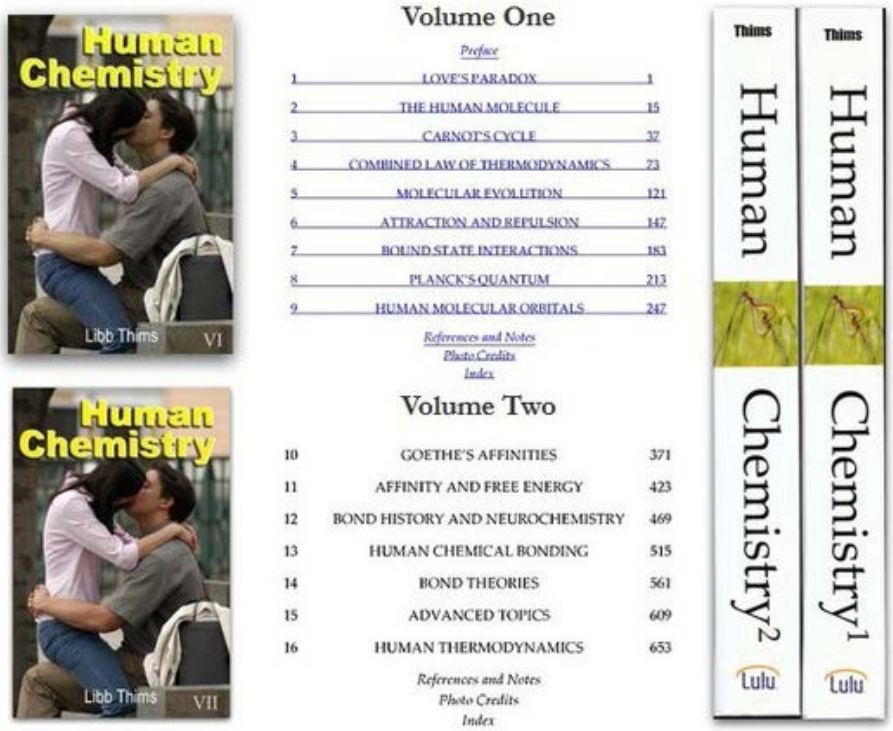

A snapshot of American chemical engineer Libb Thims' two-volume, 824-page, 2007 *Human Chemistry*, the first basic textbook on the subject of people viewed as reactive chemicals.

In origins, beginning in *circa* 1995, Thims, while University of Michigan chemical engineering student, began to ruminate on the issue of as to how chemical thermodynamics applied to mate selection. In 2002, after figuring out how relationship feasibilities could be defined in terms of changes in "before" and "after" states of enthalpies (ΔH) and entropies (ΔS), Thims began writing a manuscript on the science human thermodynamics.

In *circa* 2006, it began to become apparent, after numerous arguments with other scientists, that prior to the successful establishment of any type of science of the study of reactive systems of humans, that a precursor science of "human chemistry" would need to be situated, establishing the fundamental view that humans are molecules (human molecules) and that life (or a state of animated existence) consists of chemical reactions between human molecules. At about this time, also, Thims discovered the great work of Goethe (via Prigogine). On November 7, 2006, Thims sent an email to an internet associate of his, an theoretical physicist, stating that he was in the process of writing an approximate 150-page book on the topic of human chemistry, "situated on the premise that each human being is a molecule and that human molecules react, form bonds, de-bond, abide by the laws of thermodynamics energetically, etc., just as do all assemblies of molecules", wherein Thims stated:

> "I'm forced to write a book out of necessity; I've found that I can't talk to anyone intelligently about any kind of thermodynamic theory of human [existence] until someone situates a basic **textbook** arguing that human [existence] is a chemical process involving human chemical reactions between human molecules and the bonds formed or broken therein, i.e. reactions between people, and the energetics associated with this. Most of the book is going to be based on Carnot, Clausius, Gibbs, Helmholtz, Goethe, the first person to write an actual human chemistry book (1809), Gladyshev, and about a dozen others."

Subsequently, killing two birds with one stone, namely explaining Goethe's *Elective Affinities* in a modern sense and writing a basic introductory textbook on human chemistry, in September 2007, after eighteen months and fourteen days of work, Thims published the first textbook, 824-pages in length, on the subject of human chemistry (pictured). A spin-off of this was the publication of the 2008, equation-free, 120-page booklet *The Human Molecule*, readable at junior high or high school science level.

Mythology: life | soul | purpose

See main: Religion

Death vs human chemistry?

Circa 1300 BC depiction of Anubis (jackal-headed) weighing the **soul** (heart) against the feather of Ma'at (truth), while Thoth (ibis-headed) records the results, Horus (falcon-headed), great-grandson of **Ra**, guides the dead through the process, while Ammut (crocodile-lion headed) awaits to eat the soul if it is found to weight too much.

The implications and ramifications of human chemistry, the central feature of this logic being the view that a human is not a "being", but rather a mere "molecule", that moves under the influence of a force, come into direct conflict with some of the oldest and most-cherished theories known to humankind, dating back thousands if not tens of thousands of years.

The central conflicts arising, even for those claiming no religious affiliation, are the dominating view that each person considers themselves to: (a) be *alive*, or some variation of this, and (b) to have a *soul*, or some variation of this, and (c) to have been created by a greater *power*, or some variation of this. None of these words, however, are part of the modern corpus of chemistry.

Firstly, is the view that people believe themselves to be alive, whereas all other molecules that move are supposedly not "alive". This traces to the Egyptian notion that man was molded out of clay by a god and given the "breath of life". This is evidenced by the fact that about 72-percent of the world has some type of ingrained belief in the theory of life and death surrounding the Egyptian sun god Ra (Ab-***ra***-ham-ic faiths: Christianity 33%, Islam 20%, Judaism 0.2%, Baha'ism 0.1%, Mandaeism 0.001%; and B-**ra**-hma faiths: Hindu 13%, Buddism 6%, Sikhism 0.4%, Jainism 0.07%), and the Ra-derived theories of human synthesis.

In other words, both the concept of afterlife (heaven and hell (Ab-*ra*-ham-ic theory) and cyclical rebirth-life (reincarnation) (B-ra-hma theory) originated in the circa 2,500BC theory of the weighting of the soul, which itself originated from the circa 5,000 BC theory of the life (day journey) and death (night journey) cycle of the sun. We now know that the sun is not alive, nor does it die when it sets. When lit, it is simply a gravitationally-bound ball of hydrogen-burning reactions. This same logic, however, has not yet infused into the mind of the modern person who continues to believe that he or she is alive and that he or she dies, analogous to the the old "living sun" theory.

Human chemistry vs God?

Famous 1512 depiction of the **creation** of Adam, by the touch of the finger God, done by Italian artist Michelangelo on the ceiling of the Sistine Chapel.

The way in which this question rears its head, particularly in America, where only 40 percent of people believe that "human beings, as we know them, developed from earlier species of animals", is when a discussion of evolution comes up. In the typical conversation, someone will ask "do you believe in evolution?" The response will be of one of the following varieties: [25]

a. Yes, how can you not believe? I think it's a proven fact (40%)
b. I'm unsure (20%)
c. No, I believe in God (40%)

Then, after the questioner explains to the people in group (c) that they believe in the theories of chemistry and physics over that of religion; the people in group (c) will typically ask: "well then, what do you think happens when you die?" This invariably leads to the question of whether or not a molecule can have a soul, be alive, be conscious, etc., from which arises a complex subject never before seen.

Life: defunct theory?

See main: Defunct theory of life; What is Life?, What is life? (theories of existence), What is the meaning of life?

Humans alive; Hydrogen not alive, What?

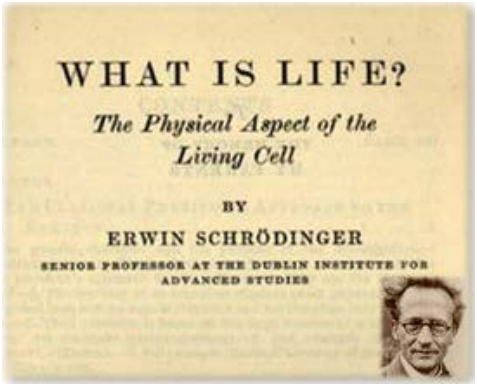

The question of what is life has long plagued human thought. The human chemistry viewpoint breaks into this question with such acidity that a mental retrograde-rewiring-detractment effect occurs. As explained by American physicist Michael Brooks, in his chapter "Life: are you more than just a bag of chemicals", from his popular 2007 book *13 Things That Don't Make Sense*:

> "Stop taking it for granted, and think for a moment about what sets the biological world apart from the world of nonliving matter. No scientist on earth can tell you the fundamental difference between these two states."

Austrian physicist Erwin Schrodinger's famous 1943 lecture "What is Life?", where, in his order, disorder, entropy section, he famously positioned the puzzling riddle that life is something that feeds on negative entropy.

The solution to this conceptual "dividing wall" finds resolution in a combination of perspective (advanced perspective) and relativity (reaction speed), with a concurrent interment of the out-dated "theory of life", which finds that a moving "human" can never be said to be "alive", but rather "reactive" or "bound" or other chemical terminology variations. Said another way, in the correct modern sense, any given molecule (human molecule included), such as a hydrogen molecule, water molecule, or a bacteria molecule, etc., cannot technically be said to be alive, any more than the hydrogen or a star can be said to be alive. A chemical reaction cannot technically be said to be alive. This is a huge rewiring thought in the framework of human knowledge. One must side with either the fact that they themselves are not alive or that the hydrogen atom is alive. The latter alternative, as one will find, leads to a number of absurdities.

Unbridgeable gap

See main: Unbridgeable gap

This new scientific perspective arises from the modern discernment of prolonged study of molecular evolution tables and timelines, that it is technically impossible to find a specific "spark day" (or rather spark second), in the contiguous chemical synthesis mechanism, on the evolution timeline, starting with hydrogen reactants H (13.7 billion years ago), stepping through a number of molecular species intermediates M_I, and ending with modern human molecule products M_H (200,000 years ago), at which it can technically be said that the chemical mechanism suddenly "came alive":

$$\overbrace{\text{nonlife} \cdots \rightleftarrows \cdots \text{warm pond} \cdots \rightleftarrows \cdots \text{life}}^{\text{Unbridgeable Gap?}}$$

(warm pond model)

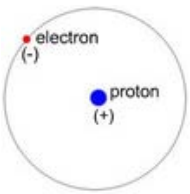

Hydrogen atom

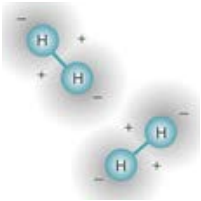

Hydrogen molecule

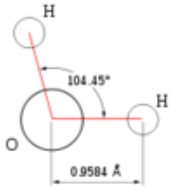

Human Molecule

$$H \rightarrow 2H_2 \rightarrow C \rightarrow H_2O \rightarrow M_{I1} \rightarrow M_{I2} \rightarrow M_{I3} \rightarrow M_{I4} \rightarrow M_{I5} \rightarrow M_{I6} \rightarrow M_{Ii} \rightarrow 2M_H$$

$$\underbrace{\text{alive}_{no} + \cdots \text{alive}_{maybe} + \cdots \text{alive}_{yes}}$$

Not alive!
No soul!
No consciousness
No brain
(thinking)
No free will!

Alive?
Has a soul?
Has free will?
Is conscious?
Has brain/thinks?

The thinker who holds-fast to the ancient mythological doctrines of 'life', 'soul', 'consciousness', 'free will', 'choice', a 'brain', etc., will argue, to their grave, that, in some contrived-way or another, at one particular second in time, in the course of human evolution mechanism, that molecules, somehow, came to life, acquired souls, developed a free will, obtained the a state of consciousness, evolved the ability to think, among other now-defunct traits that do not apply to the hydrogen atom, nor to any other molecule, known in science.

(see correct formulations: animate chemistry, animate physics, animate thermodynamics)

In other words, in modern view, every intermediate, M_{I1}, M_{I2}, M_{I3}, etc., in the steps of chemical synthesis of the human molecule, over time, are simply only bigger-and-bigger, more-and-more dynamic molecules, derivative of the hydrogen atom. Subsequently, one is forced into one of two conclusions, either the hydrogen atom is alive or the human molecule is not alive. The former is nonsensical.

Others, as history has shown, will argue that these olden-days properties said to be characteristic of "living beings" (living matter, living system, living organism, living molecules,), are "emergent", or "self-organizing", or "auto-catalytic", etc., properties, or in possession of some type of "living energy" (or living force), or in a

specific "living state", etc., and write entire books and spend decades in attempts to salvage the olden-days concepts.

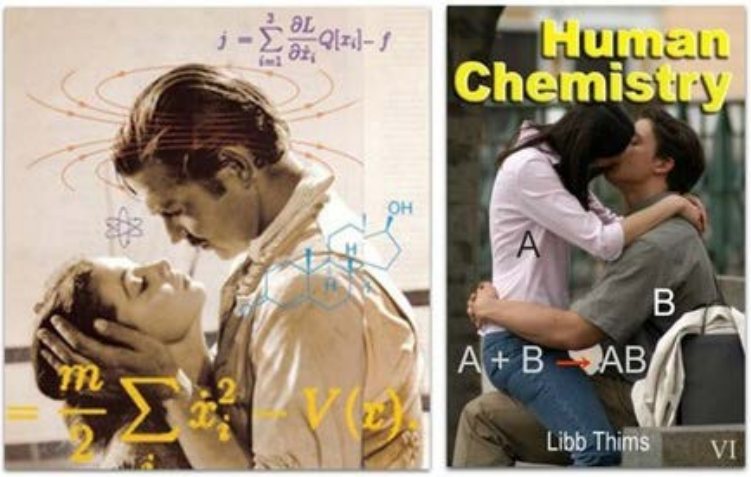

The visual of "equation overlay method: left, the 2008 *Time* magazine article "Why We Love", common in hmolsciences, a combination of the Feynman problem solving algorithm and photo overlay of equations and scientific theory thought to govern human interactions onto a photo depiction of the phenomena of investigation; right the 2007 *Human Chemistry* textbook by American electrochemical engineer Libb Thims showing a combination reaction chemical equation overlay.

A few prime examples, used to explain the "missing link" mechanism step (dividing life from non-life) in the above contiguous mechanism, include the 1926 theory of Vladimir Vernadsky who argues that "living matter" of the "biosphere" (sphere of life) is a type of "green fire" of stable compounds in a thermodynamics field living off of free energy; the 1970s views of Ilya Prigogine, who posits that living things are a far-from-equilibrium sort of Benard cell state or type of dissipative structure; to the 1990s views of Stuart Kaufman to argues that life is an auto catalytic reaction able to complete one thermodynamic cycle, that somehow that 'catches fire'.

In any event, in summary, many newcomers to the subject of the "human molecule" will object to the definition of a human being as 'molecule' on the grounds that a human being has a soul (religious objection), that humans have internal crystalline structures, e.g. teeth enamel, hence the term molecule cannot be used (technical jargon objection), that living things have an atomic turnover rate of about 48-percent of structural atoms per year and thus cannot be a molecule (theoretical issue), or that a human cannot be a molecule because a person has a brain (conceptual issue), that a human cannot be a molecule because a human has consciousness, choice, and free will (educational issues), and so on.

Whatever the objection, there is no doubt that humans are made purely of atoms, meaning that humans can be categorized as a type of chemical entity using whatever name one prefers, and that humans are reactive to each other, hence the subject of 'human chemical reactions' is a topic germane to human chemistry.

Colloquial version of human chemistry

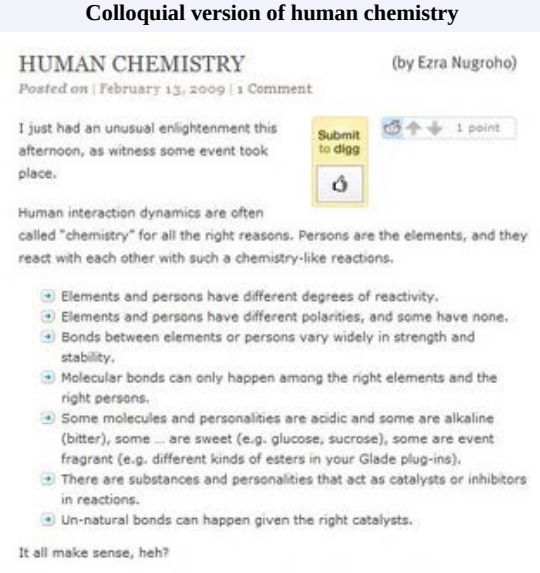

HUMAN CHEMISTRY (by Ezra Nugroho)

Posted on | February 13, 2009 | 1 Comment

I just had an unusual enlightenment this afternoon, as witness some event took place.

Submit to digg

1 point

Human interaction dynamics are often called "chemistry" for all the right reasons. Persons are the elements, and they react with each other with such a chemistry-like reactions.

- Elements and persons have different degrees of reactivity.
- Elements and persons have different polarities, and some have none.
- Bonds between elements or persons vary widely in strength and stability.
- Molecular bonds can only happen among the right elements and the right persons.
- Some molecules and personalities are acidic and some are alkaline (bitter), some ... are sweet (e.g. glucose, sucrose), some are event fragrant (e.g. different kinds of esters in your Glade plug-ins).
- There are substances and personalities that act as catalysts or inhibitors in reactions.
- Un-natural bonds can happen given the right catalysts.

It all make sense, heh?

Colloquial version of **human chemistry** by Ezra Nugroho (2009); which is similar to Canadian writer Chanel Wood's 2007 combination lock theory [18]

Cultural | Colloquial conceptions

In the cultural lexicon, the generalized theory that a certain type of "chemistry" exists between successful couples is prominent, as in romantic chemistry, social chemistry, sexual chemistry, relationship chemistry, interpersional chemistry, screen couple chemistry, etc. Yet, the fact that human chemistry is not a standardized school subject, however, leaves the subject open to generalized theory speculation.

An example, is the June 2007 article "A Questions of Social Chemistry" by Canadian writer Chanel Wood, who when thinking about the question of *human chemistry*, was "completely mystified and very curious". [9] In her analysis of the question, Wood asks: "what *exactly* is chemistry between two people?" She states that, "few people actually seem to be able to define it" and that, for the most part, "the majority of us have never given it a deeper thought, or if we have, we came to the highly logical definition of "that intangible something"… But does that really explain *anything*?" Wood states, in excellent form, that:

"When I was first brought with this question of **human chemistry**, I was both completely mystified and very curious. Like most people, I'd never really stopped to think about it. But if chemistry in the social world is anything like chemistry is in the physical world, there has to be a logical, tangible definition."

In conclusion of her thoughts on the issue, she outlines a combination lock theory of dating arguing that a relationship can be thought of, using the reaction model of single people as "reactants", as a:

Reactant + Reactant → Product

chemistry point of view; such that "chemistry" is a result of all the elements between any two people—character, personality traits, timing,

goals, dreams, priorities, lifestyle, etc., and how they 'react' with the other person's elements.

Human thermodynamics | Heat, work, and relationships

See main: human thermodynamics

The generalized effect of interpersonal chemistry, particularly couple chemistry, as discussed by American film studies professor Martha Nochimson, in her 2002 book *Screen Couple Chemistry*, is an "energy issue". [8] The science of energy is thermodynamics.

The science of "human thermodynamics", subsequently, divided into human chemical thermodynamics, the study of the properties of heat, work, energy, entropy, chemical potential, and external forces in reactive systems, with focus on changes in equilibrium and the effects of irreversibility, and human statistical thermodynamics, the study of the distribution of total energy over a set number of non-interactive identical systems or chemical entities, is the study of this human energy issue.

Steam engine and two people **falling love?**

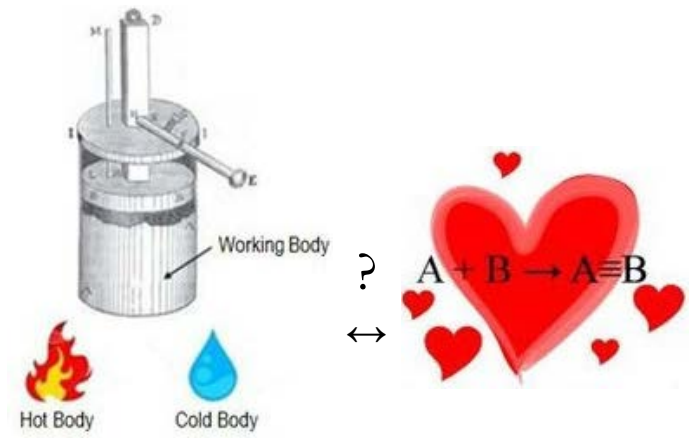

Papin engine — Love the chemical reaction

The application of steam engine theory to the riddle of love is what is called the reverse engineering puzzle. In short, applying thermodynamics to human chemical reactions is done the same way thermodynamics is applied to chemical reactions, by study of the laws of operation of the 1690 Papin engine (basic heat engine).

To exemplify the idea of "good chemistry", according to Nochimson, film provides for a means to capture human chemical reactions on film. The undeniable chemistry seen and felt between classic silver screen stars, such as Fred Astaire and Ginger Rogers or Katharine Hepburn and Spencer Tracy, according to Nochimson, generates a kind of "raw energy" in which the relationships themselves become "freestanding energy vortexes" where couples become bigger than the films they made. What is good in contrast to what is bad (or evil) in chemistry, however, is a thick subject; generally having to do with spontaneity and the direction of energy flows.

The natural dynamics of good or visually pleasing reactions is what yields the unforgettable screen chemistry. Explaining these effects thermodynamically is the most advanced subject, but actuates according to the laws of thermodynamics, particularly the combined law of thermodynamics.

Quotes | Related

See main: Human chemistry quotes; Chemical philosophy, Chemistry aphorisms

The following are random trivia quotes making intuitive references to the chemistry between humans:

"The only unions which are legitimate are those ruled by a genuine passion."

Stendhal (1783-1842)
French writer
On Love (1821)

"Love is in its ultimate analysis nothing but a chemical reaction."

Anon scientist (c.1920)
Quoted by Frederick Bennett

"The meeting of two personalities is like the contact of two chemical substances; if there is any reaction, both are transformed."

Carl Jung (1875-1961)
Swill psychologist
Modern Man in Search of Soul (1933)

"Love is a romantic designation for a most ordinary biological process—or, shall we say, *chemical*—process … a lot of nonsense is talked and written about it."

Greta Garbo (1905-1990)
Swedish actress
Ninotchka (1939)

> “I miss her smell, and the way she tastes. It’s a mystery of **human chemistry** and I don’t understand it, some people, as far as their senses are concerned, just feel like home.”

John Cusack (1966-)
American actor
High Fidelity (2000)

-

> “If, for example, chemistry deals with the composition, structure and properties of substances and with the transformations that they undergo, it cannot be classified as a science in any way whatsoever. For that reason, it should be situated somewhere between science and humanities! In order to have a sound perception of it, we must consider the external physical nature, that of chemical structures which make the external composition, as well as the internal, inner world of the being that comprises **human chemistry**, including emotions, feelings, sentiments, passions, sensations, thought and imagination. In the end, both disciplines are inseparable as fields of human knowledge. Both present new answers to the always stimulating novel questions we raise. The assumption that sciences must always be on top of universities' priorities, shoving humanities to the bottom, must be scrupulously reassessed!”
>
> — Anon (2018), “Sciences and the Irksome Controversy Surrounding Humanities” (Ñº), *Jordan Times*, Feb 2

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If you know of other noted-related quotes, please add comment in the threads.

Magazines

The following is a chronological pictorial listing of the famous magazine cover stories revolving around the central motif of the chemistry of love or the science of love generally themed on or discussing the logic that people have can have various levels, good or bad, of relationship chemistry together.

Some famous "chemistry of love" magazine covers.

Left: *Time*'s 1993 "The Chemistry of Love", arguing that love is a function of (a) imprinting, bonding characteristics familiar from youth, (b) attraction, governed by phenylethylamine (PEA), dopamine, and norepinephrine, types of amphetamines, and (c) attachment (John Bowlby's theory), a function of endorphin (endorphin theory of love), the runner's high, and oxytocin (oxytocin theory of bonding), the cuddle chemical. Left (middle): *National Geographic*'s 2006 "Love the Chemical Reaction", wherein American anthropologist Helen Fisher, argues that love is a chemical reaction in the brain, associated with the ventral tegmental area and the caudate nucleus, the reward and pleasure centers of the brain, the latter of which is home to a dense region of dopamine receptors, dopamine being the neurotransmitter responsible for intense energy, exhilaration, focused attention, and motivation. Right (middle): *The Atlantic*'s 2006 "The New Science of Love", presenting the view that the recent increase in online dating has become an enormous social experiment allowing scientists, such as Neil Warren, psychologist behind eHarmony.com, to unlock the secrets of human attraction; wherein they ask: "in the subject realm of love, can cold, hard science help?"; according to Galen Buckwalter, of eHarmony Labs, "we're trying to predict physical chemistry [between people]." Right: *Time*'s 2008 "The Science of Romance", wherein it is explained that scientists are looking to explain why people fall in love.

Chemistry music

See main: music chemistry; also: music thermodynamics

Throughout history, people have often had a habit of singing about love and relationships, and in the last several decades, singing about love and relationships in terms of chemistry. In other words, people tend to sing about what they don't understand.

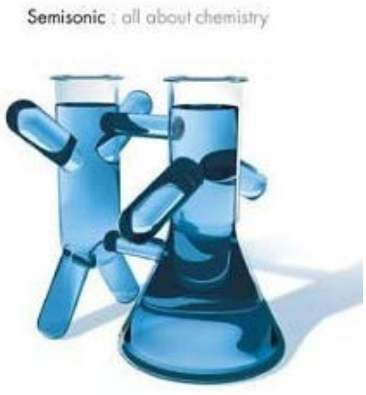

The 1962 song "The Chemistry of Love" by Al Hazan, singing about moonlight and falling in love, one of the first recorded "chemistry of love" style songs.	Cover to American alternative rock band Semisonic's 2001 album *All About Chemistry*, depicting relationships as reactions between molecules in beaker.	2007 song "Chemistry" by Velvet, singing about concepts of flow, biology, electricity, and biogravity involved in the chemistry of falling in love.

To cite an example lyrical verse, in American smooth jazz singer Michael Franks 2006 song "The Chemistry of Love", he states:

> "A formula aside should help us crystallize into the chemistry of love."

This seems to be alluding to either love as a chemical reaction described by a "molecular formula", to a love potion sort of formula, or to the equation of love, or some variation of these. The 1962 two-minute and thirteen-second song "The Chemistry of Love", above, written by Al Hazan and Annette Tucker, was recorded by Crystalette Records and sung by Tony Caro with Jimmy Haskell and his Orchestra, is one of the first modern-day songs on chemistry of love.

Debate

See main: Detractors, Objections to; Rossini debate, Moriarty-Thims debate; Libb Thims (attack)

Since the 1809 publication of Goethe's *Elective Affinities*, and 2007 *Human Chemistry* by Thims, a revival and modern day reformulation of Goethe's treatise, wherein the characters are said to mirror the activities and behaviors of the chemicals, there has been a never-ending stream debate, people being either in favor of or against the chemical theory of humanity. [5] This seems to be reflective of recent polls which show that 34.5% of people do not think love is a chemical reaction and 43.5% of people do not think they are a 'giant molecule'. [29] Out of this, a dividing line has slowly been emerging in the hard scientific community as to whether or not modern human chemistry of human molecules is reality or fiction, i.e. whether or not a human is a molecule and if chemistry, physics, and thermodynamics can be applied to the study of human molecules. Some these points of view are listed below: [30]

Supporters: ~**61% agree**			Objectors: ~**39% disagree**		
			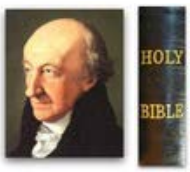		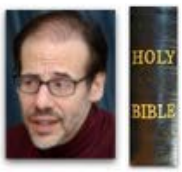
Georgi Gladyshev (1936-) Russian physical chemist	John Avery (1933-) Danish physicist and theoretical chemist	Jing Chen (c.1965-) Chinese-born Canadian mathematician	Christoph Wieland (1733-1813) German author	Tominaga Keii (1920-2009) Japanese chemical engineer	Steve Fuller (1959-) American philosopher and sociologist
Thinks that human chemistry (2007) symbolizes the beginning of a new era (epoch) in human history.	Thinks (2007) that human chemistry, with its focus on Gibbs free energy, looks at life in a unified way.	Has a "feeling" (2007) that human chemistry will eventually bring about the fundamental change in thinking in science.	Commented (1810) on Goethe's *Elective Affinities*, that it was nonsense and childish fooling around.	Commented (2004) on Goethe's *Elective Affinities* that it "did not add any scientific value."	Thinks (2005) that he is not a molecule and considers even the thought of the idea to be "infuriating".

Ted Erikson (1928-) American chemical engineer

Has the view (2007) that one cannot argue with the logic of human chemistry.

Viktor Minkin (1965-) Russian biometrist

Believes (2007) that we can apply molecular terms and rules of molecular behavior to human behavior and does not find any arguments against human chemistry.

Satch Ejike (c.1950-) African-born American social scientist

Thinks (2008) that human chemistry provides a reliable framework for an understanding of human bonding and bond rupturing.

Grey Area

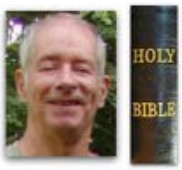

Stephen Lower (c.1945-) Canadian physical chemist

Considers (2007) the idea of chemical reactions occurring between humans molecules to be a crackpot-subject, pseudoscience, and a lunatic notion.

Philip Moriarty (c.1965-) Irish thermal physicist

Considers (2009) human chemistry to be pseudoscience and believes that quantum mechanics and entropy cannot be apply to people.

Ryan Grannell (c.1991-) Irish biochemistry student

Thinks (2011) that Goethe's *Elective Affinities* is a nutty theory, and that human chemistry is nothing but the former wrapped in lab coat.

Gray-area

In the gray area, many people remain torn on the issue as to how and if chemistry and physics applies to humans in their relationships. Many are straight puzzled of the chemical physics of love. As famously said by German-born American physicist Albert Einstein (IQ: 225+), in the 1940s, "how on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?" This quote, ironically, comes from a person who owned the 52-volume set of Goethe's collected work (as well as a bust of Goethe), forming the largest part of his personal library.

Other

Google Books search shows the existence of a 1986 book entitled *Human Chemistry* by a Robin D. Kundis or Robin Kundis Craig (current name), who as of 2012 is a visiting professor of law at the University of Utah. [35] The content of the book, to clarify, as an abstract does not exist, is not of the above Goethe-Adams-Fairburn-Thims perspective of "human chemistry" as the study of reaction between people, but rather a master's thesis originally called "The Chemistry of Human Biology", explaining how various chemical processes contribute to the functioning of the human body, done for Johns Hopkins' Writing About Science program. [36]

See also

- Human chemistry books
- Human periodic table
- Human element
- Endorphine theory of love
- Love the chemical reaction
- Music chemistry
- ReactionMatch.com
- Science-based online matching
- Social chemistry

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2. Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
3. Fairburn, William Armstrong. (1914). *Human Chemistry*. The Nation Valley Press.
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5. Tantillo, Astrida O. (2001). Goethe's *Elective Affinities* and the Critics. New York: Camden House.
8. Nochimson, Martha P. (2002). *Screen Couple Chemistry*, (pg. 13). Auston, Tx.: University of Texas Press.
9. Wood, Chanel. (2007). "A Question of Social Chemistry", June 06. *Sociology*, ChanelWood.com.
10. Human Chemistry 101 - YouTube.com.
11. (a) Wiese, Benno von. (1951). *Anmerkungen to Die Wahlverwandtschaften*. In *Goethe's Werke*, edited by Benno von Wiese. Vol. 19. Pg. 621, Hamberg: Wegener.
(b) Crosland, M. P. (1959). "The use of diagrams as chemical 'equations' in the lecture notes of William Cullen and Joseph Black." *Annals of Science*, Vol 15, Num 2, June.
(c) Bergman, Torbern. (1775). *A Dissertation on Elective Attractions*. London: Frank Cass & Co.
12. Dreier, Thomas. (1948). *We Human Chemicals: the Knack of Getting Along with Everybody* (quote: pgs. 4+21). Updegraff Press.
13. The Elective Affinities - Wikipedia.
14. Hu golf shirt – CafePress.com.
15. Thims, Libb. (2005). "What is Love?: Human Chemical Reactions" (poll results and discussion). Chicago: IoHT Publications.
16. Thims, L. (2007). *Human Chemistry (Volume Two)* (Quote: "Good for a laugh, but not much else", pg. 673). LuLu.

A CafePress.com human element golf shirt, themed on the 2006 Dow Corning "human element" advertising campaign, which American electrochemical engineer Libb Thims began wearing in 2012 in lecture to represent his hmolscience philosophical outlook. [14]

18. Nugroho, Ezra. (2009). “Human Chemistry”, Luchita Blog, *Ezran.org*, Feb 13.
19. Sterner, Robert W. and Elser, James J. (2002). *Ecological Stoichiometry: the Biology of Elements from Molecules to the Biosphere*, (chapter one) (term: "human molecule", pgs. 3, 47, 135). Princeton University Press.

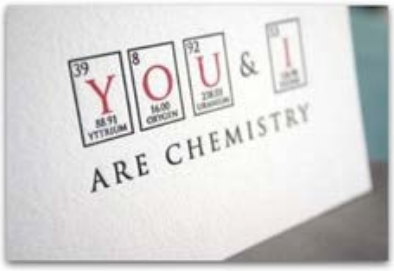

Left: chemical alphabet word arrangement describing relationship chemistry, love, or something to this affect. Right: business chemistry humor.

23. ibid. Thims (2007), pg. 382: description of Geoffroy's 1718 affinity table.
24. (a) Adams, Henry. (1885). “Letter to Marian Adams”, April 12.
(b) Adams, Henry. (date). *The Letters of Henry Adams: 1892-1899, Volume 4* (equivalent human molecules, pg. xxviii). Harvard University Press.
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(b) Anon. (2006). “Did Humans Evolve? Not Us, Say Americans”, *The New York Times*, Aug. 16.
26. Harrell, Eben, Kloberdanz, Kristin, and Stinchfield, Kate. (2008). “Why We Love”, *Time* (pgs. 54-60), Jan 28.
29. (a) Thims, Libb. (2005). "Poll: Is Love a Chemical Reaction?" [N=100], Chicago.
(b) Eadon, Jim. (2001). "Poll: Are You a Giant Molecule?" [N=350], England.
30. Note: the 61% agree, 39% disagree figure is a guesstimate, using the mean of the two studies of ref [29], i.e. (34.5+43.5)/2.
31. UBC (sample works) – ShawnLaPaix.com.
32. Swales, Martin and Swales, Erika. (2002). *Reading Goethe: a Critical Introduction to the Literary Work* (pg. 73). Camden House.
33. E.B. (1851). “Hard Hits by the Author of the Creed of Error” (“human chemistry” pg. 326), *The Reasoner*, 10(228-259): 326-28.
34. Groysman, Alec. (2011). “Use of Art Media in Engineering and Scientific Education” (§3.4: Human Chemistry), Generative Art Conference, XIV.
35. Kundis, Robin D. (1986). *Human Chemistry* (306-pgs). dissertation/thesis. Johns Hopkins University.
36. Email communication between Robin Kundis and Libb Thims (13 Apr 2012).

Further reading

â— Anon. (1887). "Human Chemistry", [URL], *New York Times, 19 Sep.*
â— Mueh, Hans J. (2006). “Human Chemistry Equation: Intent + Imagination + Initiative = High Achievement”, Audio Interview (MP3), 58:19-min, with Jim Meier, Oct. 31.
â— Kenny, Bob. (2009). “The Human Chemistry of Ben Jonson’s ‘The Alchemist’”, *AssociatedContent.com*, May 18.

External links

â— Human Chemistry - HumanChemistry.net
â— Human Chemistry - NationMaster: Encyclopedia
â— Human Chemistry T-Shirt – Zazzle.com
â— 200th Anniversary Elective Affinities T-Shirt – Zazzle.com
â— Interpersonal chemistry - Psychology Wiki, a Wikia wiki.
â— Human chemistry – Facebook.com.
â— Can Human Chemistry be the Spark for Creativity? (2011) – LinkedIn.com.

θΔics

In famous publications, ***Human Chemistry*** is a 1914 booklet, 55-pages in length, by American engineer William Fairburn, which defines people as: human chemical elements, human chemicals, or human elements, able to be subjected to human chemical reactions, quantified by measures of energy, entropy, and affinity. [1] It seems to be the first-ever book, aside from German polymath Johann Goethe's 1809 *Elective Affinities*, on the subject of the science of human chemistry.

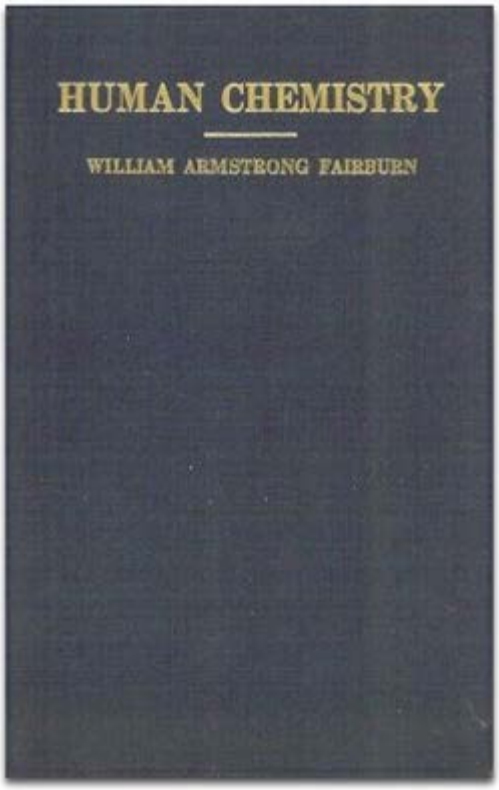

American chemical engineer William Fairburn's 1914 ***Human Chemistry***, is the first book to treat humans explicitly as "chemicals" according to which the job of the manager or organizer of people as the executive "human chemist", who works to prevent explosions, facilitate working interactions, via measurements of human energies and entropies.

Overview

In his book, Fariburn declares that "today there are eighty-one known elements" and openly discusses his views that people, as combinations of these elements, are "human chemical elements" and that the job of the "human chemist", i.e. the manager or foreman, is to achieve successful "reactions resulting from combinations of individuals". Fairburn states that human reactions can be quantified by energy and entropy changes and on the topic of affinity chemistry, he states:

> "Just as there are many affinities among the chemical elements, so there are many possible harmonious combinations of human workers; some of these harmonious combinations, however, of both chemical and human elements, may become violently explosive when subjected to an outside influence."

Fairburn's general view, however, is rather elementary, being half metaphorical and half suppositional in theme, and he uses no formulas. In commentary on the relationship of entropy, *S*, to human reactions (relationships), for instance, he states:

> "The classified division of entropy, referring to temperature changes which can be likened to coolness, passion, explosiveness and frigidity, are all interesting but of themselves prove little."

In the modern sense, the nature of entropy in human chemical reactions is a in depth topic. In a reaction in which a group of human molecules (people) are thrown into a closed reaction vessel, such as the grounds of the estate in Goethe's novella or a isolated island, the following affinity formula will dictate the progression of the overall process:

$$A = T\Delta S - \Delta H$$

When more factors are added in, such as movements of chemical species into or out of the system or external influences (forces), the nature of the study and prediction of human chemical reactions becomes immensely more complicated. [2]

References

1. Fairburn, William Armstrong. (1914). *Human Chemistry*. The Nation Valley Press.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.

θΔics

In libraries, **human chemistry books** are books on or themed on the subject of human chemistry. Some of these are listed below, in chronological order. Leave comment in the threads if you know of other books:

List

The following is a growing pictorial listing of books (and books-turned-films) on or themed on human chemistry:

Elective Affinities (1809) by Johann Goethe (H.M. Waidson translation)

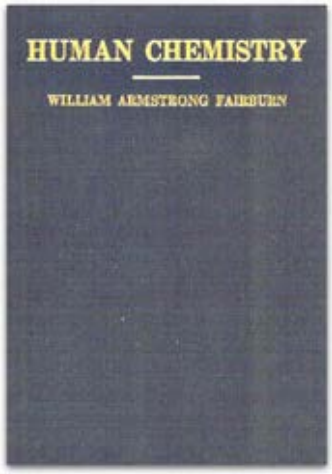

Human Chemistry (1914) by William Fairburn

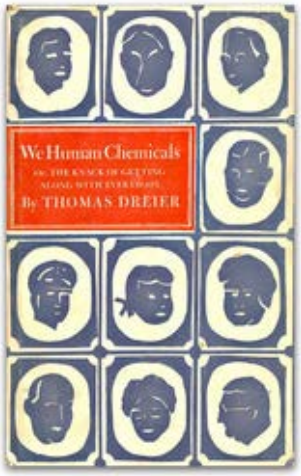

We Human Chemicals: the Knack of Getting Along with Everybody (1948) by Thomas Drier

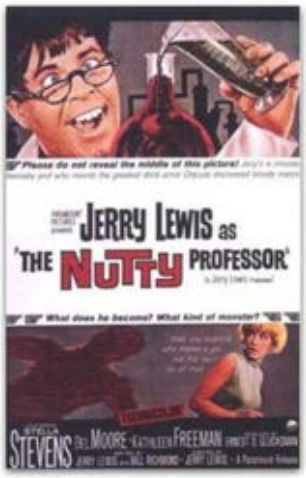

The Nutty Professor (1963) film

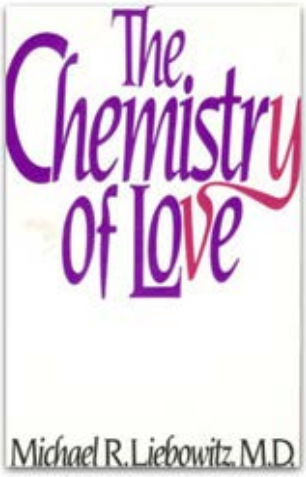

The Chemistry of Love (1983) by Michael Liebowitz (see: chocolate theory of love)

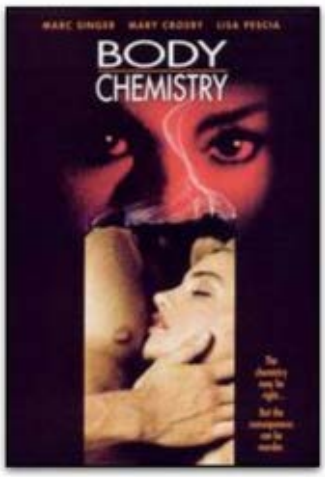

Body Chemistry (1990) film

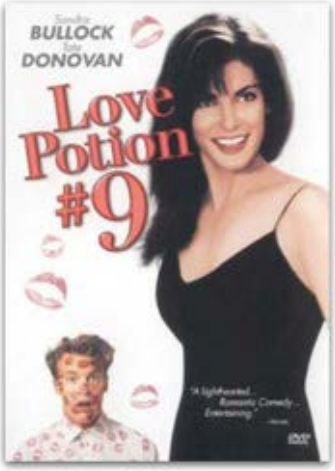

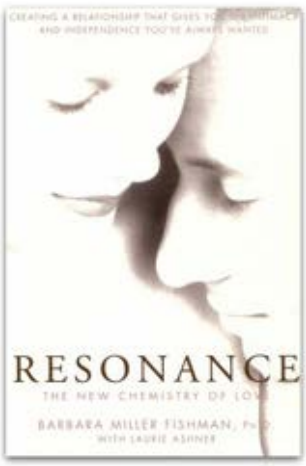

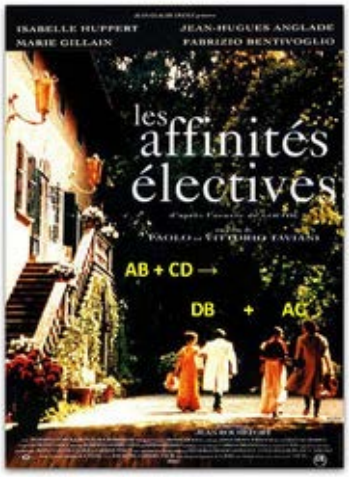

Love Potion #9 (1992) film

"The Chemistry of Love" (1993)

Resonance the New Chemistry of Love (1994) by Barbara Fishman

Elective Affinities (1996) film

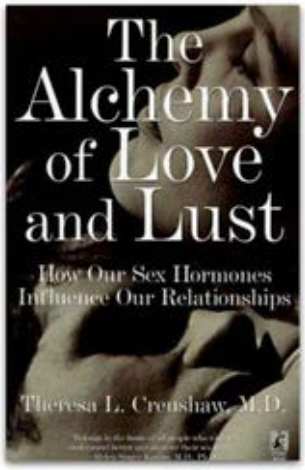

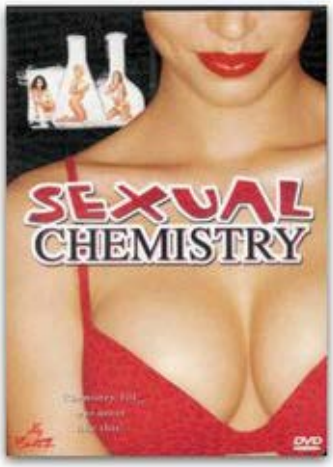

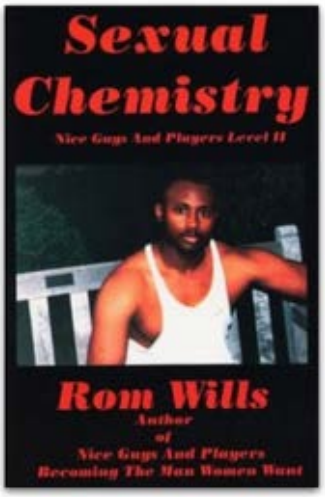

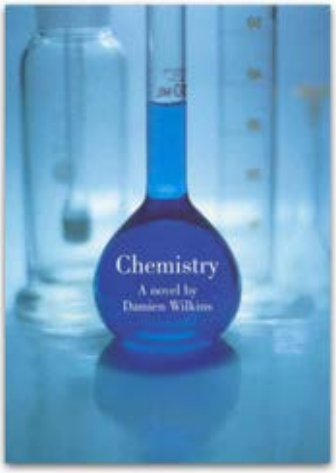

The Alchemy of Love and Lust (1996)
by Theresa Crenshaw

[Sexual Chemistry](#) (1999) film

Sexual Chemistry: Nice Guys and Players Level II (2002) by Rom Wills

Chemistry (2002) a novel
by Damien Wilkins

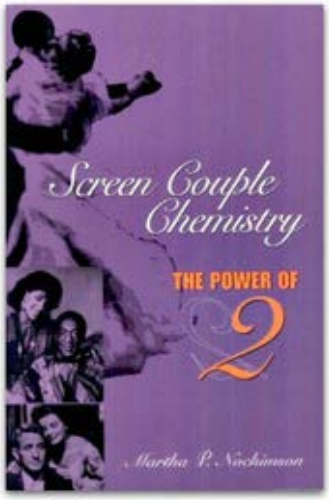

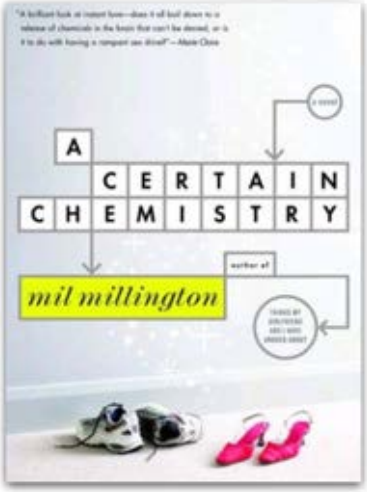

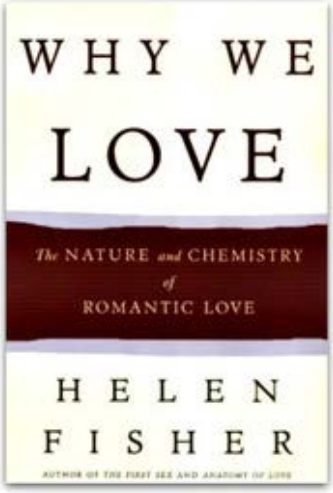

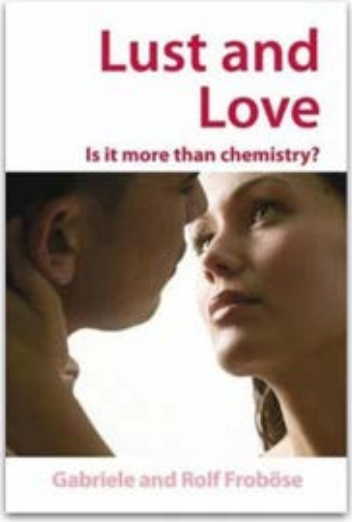

Screen Couple Chemistry: The Power of Two (2002) by Martha Nochimson

A Certain Chemistry (2003) a novel
by Mil Millington

Why We Love: the Nature and Chemistry of Romantic Love (2004) by Helen Fisher

Love and Lust: is it More than Chemistry? (2006) by Gabriele Frobrose and
Rolf Frobose.

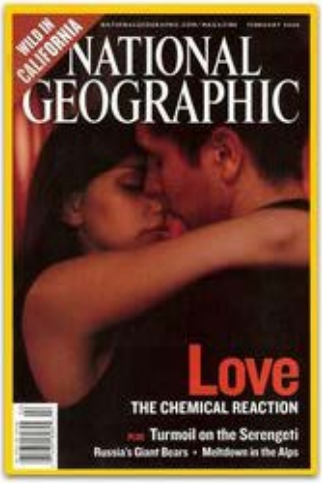

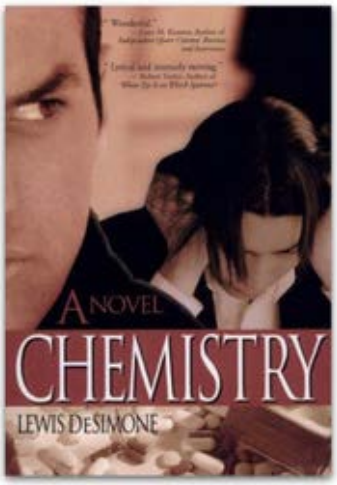

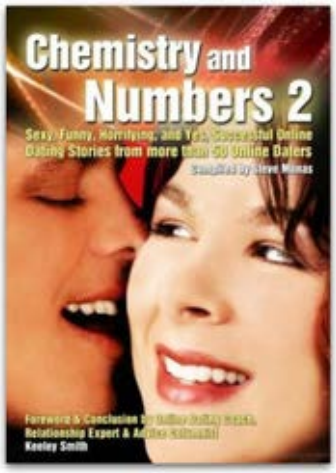

National Geographic's

Chemistry A Novel (2006)

Chemistry and Numbers 2: Online

Workplace Chemistry: Promoting

"Love: the Chemical Reaction", Feb 2006 (Valentine's day issue)

by Lewis DeSimone (see: queer chemistry)

Dating Stories (2006) by Steve Monas

Diversity Through Organizational Change (2007) by Meg Bond

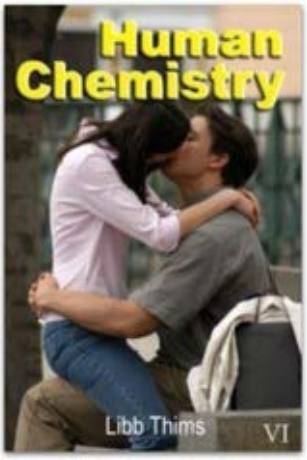

Human Chemistry (2007) by Libb Thims

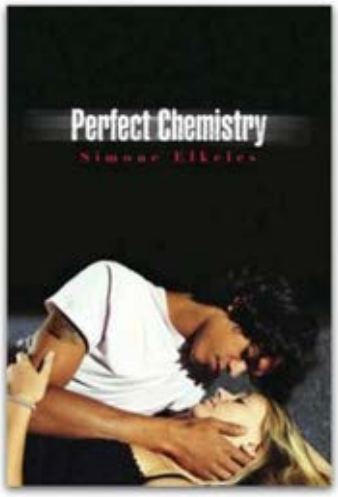

Perfect Chemistry (2008) by young adult author Simone Elkeles

Time's "The Science of Romance" 28 Jan 2008

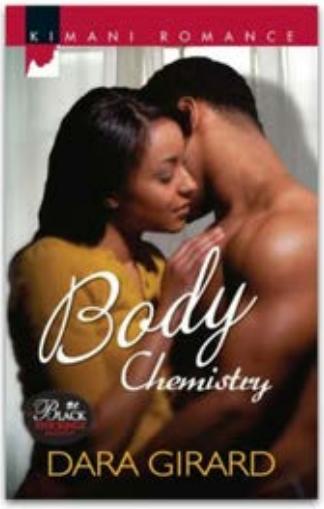

Body Chemistry (2009) a novel by Dara Girard

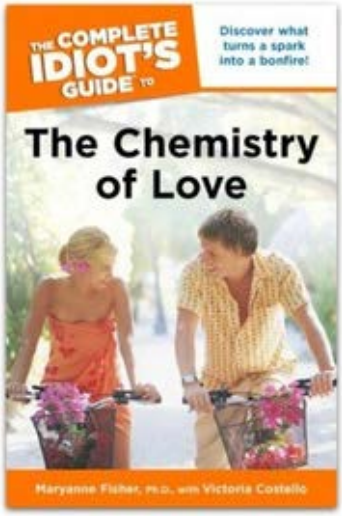

The Complete Idiot's Guide to the Chemistry of Love (2010) by Andrea Bradford and Victoria Costello

External links

â— Human chemistry (books) – Add.

θΔics

In human chemistry, ***Human Chemistry (Volume One)*** *and* ***Human Chemistry (Volume Two)***, is a 2007, two-volume, 824-page, self-published standardized textbook set on the subject of "human-chemistry" the study of the chemical behaviors of human molecules, written by American chemical engineer Libb Thims. [1]

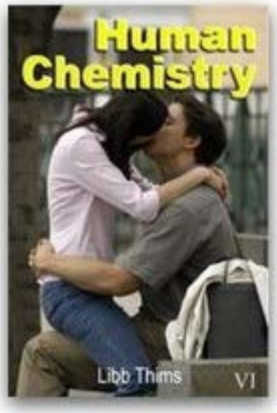

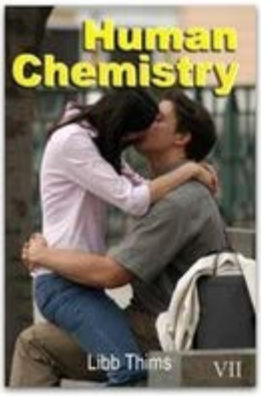

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Libb Thims' 2007 two-volume ***Human Chemistry***, is the first attempt, in the wake of Goethe (1809), Fairburn (1914), Beg (1987), to put the subject of "human chemistry" into the form of a standard teaching textbook subject.

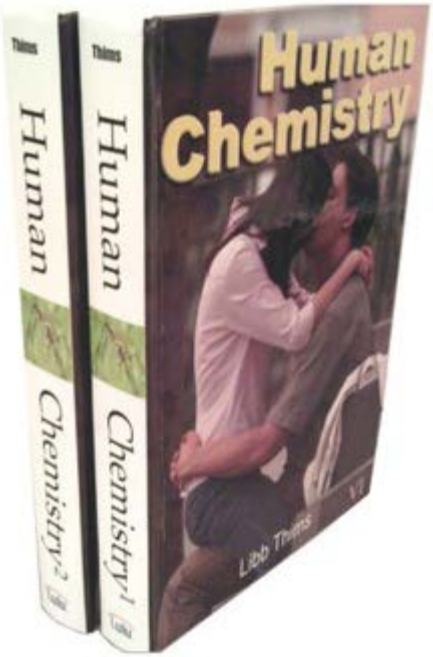

The press-release, titled "The World's First-ever Textbook on the Chemistry of Love", came out September 27, 2007. [2]

Peer-review

The textbook was peer-reviewed (although the reviewers were chosen by Thims) by those including Russian physical

chemist Georgi Gladyshev, author of the 1997 *Thermodynamic Theory of Evolution*, Lebanese-born Danish theoretical chemist and physicist John Avery, author of the 2003 book *Information Theory and Evolution*, Chinese-born, Canadian mathematician and thermodynamic economist Jing Chen, author of the 2005 book *The Physical Foundation of Economics: an Analytical Thermodynamic Theory*, and Italian thermodynamicist Gian Beretta, author of the 2005 textbook *Thermodynamics: Foundations and Applications*, among others.

Origins

The book was built on the shoulders of German polymath Johann von Goethe's 1809 *Elective Affinities* and American engineer William Fairburn's 1914 *Human Chemistry*. [3] The origin of Thims' *Human Chemistry* began to seed in the early 1990s, when Thims began to wonder how one would use the "spontaneity criterion" of chemical thermodynamics to predict the basic human reproduction reaction:

$$A + B \rightarrow C$$

in which *A* and *B* are the reactants (the dating pair) and *C* is the product (a 15-year old child).

See also

â— Human Chemistry (textbook) (origin)

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (Google books). Morrisville, NC: LuLu.
(a) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (Google books). Morrisville, NC: LuLu.
(c) Libb Thims' Storefront - LuLu.com
2. World's First-ever Textbook on the Chemistry of Love - PR.com (Institute of Human Thermodynamics)
3. (a) Goethe, Johann von. (1809). *Elective Affinities.* New York: Penguin Classics.
(b) Fairburn, William Armstrong. (1914). *Human Chemistry*. The Nation Valley Press, Inc.

θΔics

In human chemistry, the **Human Chemistry (textbook) (origin)** page discusses the origin of the 2007, two-volume, 824-page textbook *Human Chemistry* written by American chemical engineer Libb Thims. [1] The gist reason the textbook was written was that prior to 2007 the subject of people viewed as reactive chemical entities (A, B, C), forming combinations:

$$A + B \rightarrow C$$

and partaking in separations:

$$C \rightarrow A + B$$

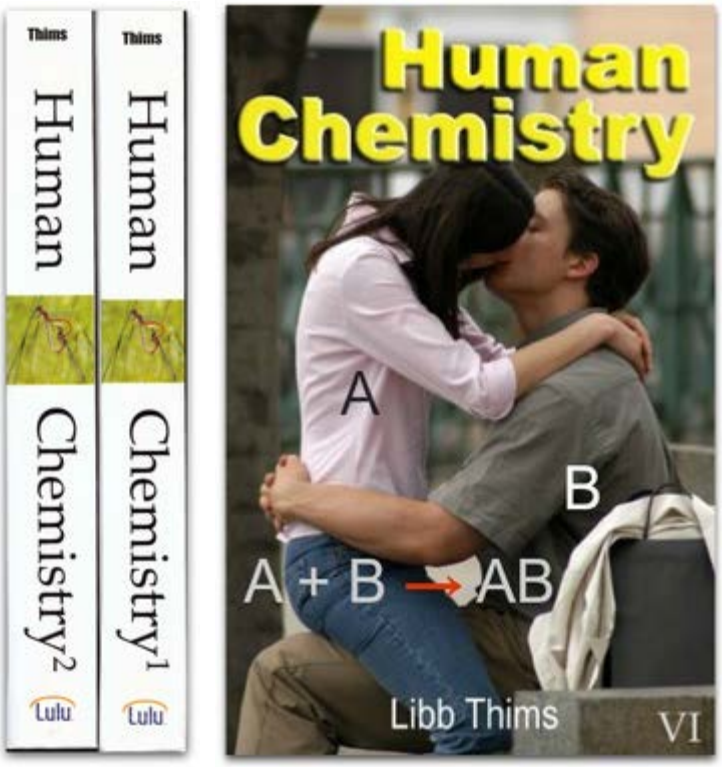

Libb Thims' 2007 *Human Chemistry* originated from a desire and curiosity to understand how human reproduction reaction is understood and explained via Gibbs energy and spontaneity criterion prediction methodology.

where C is the the dihumanide molecule (two human molecules bonded as one unit, such as in a marriage) and A and B are unattached single humans, had never before been presented as a basic subject using standard chemistry principles extrapolated up to the human chemical reaction scale. In Thims' mindset, however, he had assumed this to be a basic subject that everyone was aware of, not needing introduction, being that he had been working on these types of reactions in the twelve years prior, albeit focused on how enthalpy and entropy changed over the course of the reaction. This subject, prior to 2001, had been purely a intellectual hobby for Thims. When, however, he began to go public with his findings and theoretical development, in circa 2003, he found huge barriers to discussion on this subject (human chemistry), which further detracted dialog on the subject he was primarily interested in, that being human thermodynamics. Subsequently, the human chemistry textbook was written to remedy this obstacle.

Textbook origin

See main: Libb Thims (history)

The first main thing that spurred the writing of the textbook was (a) the discovery, sometime in circa 2005, of 2001 online Q&A page 'Is Love a Purely Chemical Reaction' of the Physics Van Outreach Program of the physics/engineering department of the University if Illinois, Champaign-Urbana, in which it was explained to a seven-year-old child that love is not a purely chemical reaction. The specific answer given was:

> "No, I don't think love is a purely chemical reaction. Love is more a question in the realm of philosophy than science. I think you could ask anyone who's ever been in love, and they'd probably agree that there's something more to it than simple chemistry."

Spurred by this incorrect response, in 2005, Thims polled one-hundred people with this very same question (is love a purely chemical reaction?) and found that 66 percent of people agreed that love is a purely chemical reaction, thus showing the above response to be an inaccurate viewpoint.

The second main thing that spurred the writing of the textbook was (b) the discovery, sometime in early 2006, of footnote 2.5 of Belgian chemist Ilya Prigogine's 1984 book *Order out of Chaos*, which reads: [2]

> Dobbs, op. cit., also examined the role of the 'mediator' by which two substances are made 'sociable'. We may recall here the importance of the mediator in Goethe's *Elective Affinities* (Engl. Trans. Greenwood 1976). For what concerns chemistry, Goethe was not far from Newton.
>
> Footnote #5 (pgs. 64, 319), chapter II: The Identification of the Real, section 2: Motion and Change, *Order Out of Chaos* (1984) by Ilya Prigogine.

At the the time of the reading of this footnote, strangely enough, even though Thims is 50% German, and had at that time over 750 science books in his personal library collection, he had never heard of Goethe. In any event, after finally reading *Elective Affinities*, specifically the famous chapter four, it was what drove Thims (or rather instilled in him the duty) to write the world's first uniform textbook on the subject of human chemistry, basically the modern science (chemistry and physics) view of what Goethe was theorizing about 200 years ago. In the core chapter of the book, chapter ten 'Goethe's Affinities', Goethe is defined as 'the founder of human chemistry', for his pioneering work.

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. xxi). Morrisville, NC: LuLu.
(b) Is Love a Purely Chemical Reaction? (question asked in 2001 by Jason, age 7, from Glenside Weldon, Pa) - "Ask the Van", part of the Physics Van outreach program at the Department of Physics at the University of Illinois.
(c) Question answered by Tamara McArdle a veterinarian practicing in the Champaign-Urbana area who has done research in genetic modeling and cancer prevention.
3. Prigogine, Ilya. (1984). *Order Out of Chaos – Man's New Dialogue with Nature* (footnote 2.5, pg. 319). New York: Bantam Books.

θΔics

In science education, **Human Chemistry 101**, a YouTube channel, is a monthly educational video series on the subject of human chemistry, the science of the chemistry of human interactions; with digressions on the topic of human thermodynamics. [1]

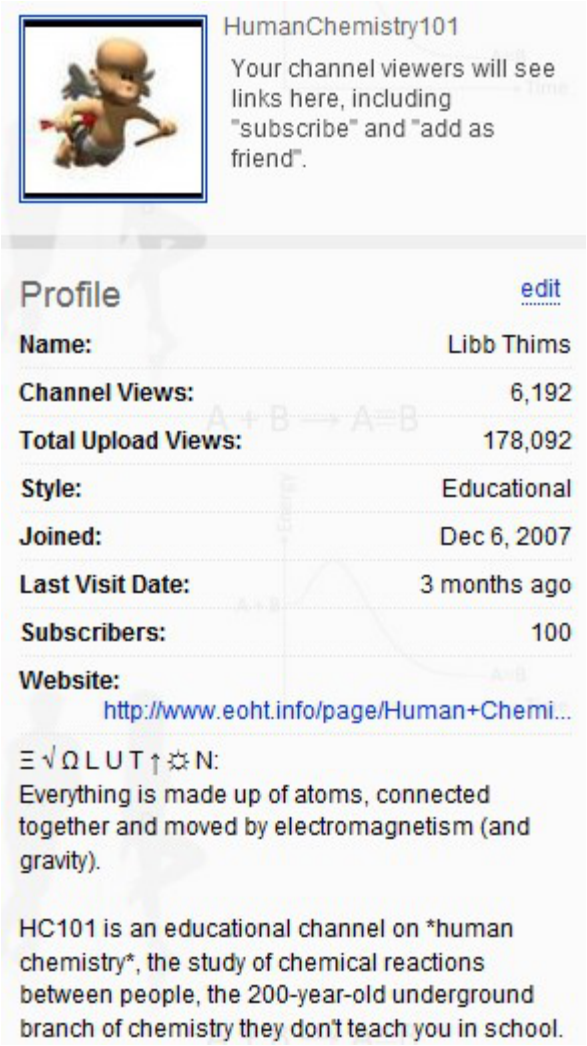

February 22, 2011 screenshot of the the **Human Chemistry 101** channel, at the point of reaching the 100 subscriber mark, with the sub of user GangstRapza who commented, via personal message, "after everything I have read through and such, your movies are the only thing I can pay attention to. Thank you". A slow going subscriber gathering process for the introduction of a relatively new and unheard of subject to most people.

Todos

- Top 100 Geniuses in 100 minutes

Description

Ξ √ Ω L U T ↑ ☼ N
(aka chemical synthesis)
Everything is made up of atoms, connected together and moved by electromagnetism (and gravity).

HC101 is an educational channel on *human chemistry*, the study of chemical reactions between people, the 200-year-old underground branch of chemistry they don't teach you in school. The basic points of human chemistry are:

(a) A person is a reactive 'molecule', made of 26-elements (a "human molecule").
(b) Stable relationship pairs are held together by chemical bonds (A≡B).
(c) Favored relationships (reactions) are quantified by negative Gibbs free energy changes (the work energy output of relationships) over time.
(d) All relationships, in any system, are coupled to each other via free energy coupling (energy-releasing relationships drive the energy-absorbing relationships).
(e) Cyclical heat input from the sun is what drives the totality of existence.
(f) The sun's spin is coupled to the spin of the milky way; which is part of a gravitationally-bound "local cluster", which is moving toward the "great attractor" at a speed of about 600 kilometers per second.

"Social relationships and their conflicts [operate] symbolically [A + B → AB] and the moral symbols used in the natural sciences are the elective affinities [free energies] discovered and employed by the great Bergman [physical chemistry]." (Johann Goethe, 1799)

I. The energy content of the universe is a constant quantity.
II. The entropy [transformation content] of the universe is always striving to a maximum.
(Rudolf Clausius, 1865)

"Human chemistry—the study of the mutual attraction [and repulsion] of equivalent human molecules—is a science yet to be created." (Henry Adams, 1885)

"Nature never undertakes any change unless her interests are served by an increase in entropy." (Max

Planck, 1903)

"The two laws [of the universe] are equivalent to the statement that the 'free' energy is always striving to a minimum." (William Bayliss, 1915)

A HC101 18 Jun 2013 top ranking comment (∞).

An HC101 16 Jun 2013 comment (∞).

"The science of human thermodynamics, which controls the behavior of those complicated molecules, the members of the human race, should be able to predict the next million years of evolution of humankind's future." (C.G. Darwin, 1952)

"Whether two molecules [people] will bind is determined by the free energy change of the interaction, composed of both enthalpic and entropic terms." (Julie Forman-Kay, 1999)

Formulaically, as proved by Hermann Helmholtz in 1882, the above logic reduces to the fact that chemical affinities A between people are quantified by the following formula:

$$A = T\Delta S -- \Delta H$$

where T is temperature, ΔS is entropy change (or transformation content change), and ΔH is enthalpy change (or heat content change), on going between two states of existence in a relationship or system process. Relationships stop when they reach equilibrium or A = 0.

In sum, the ecstasies [and darknesses] of the passage of existence in time, along with topics such as morality, purpose, and guidance [and life and death], can thus be understood by study of the variables enthalpy [heat content] and entropy [transformation content], the components of Gibbs free energy.

This new view of human existence, based entirely on chemistry and physics, is the replacement for the olden-days ideologies and religious explanations of humanity. Subscribe and learn.

Note: as of 2000, 75% of the world still believes in God (or gods), conceptualized as a human-like entity (40%) or a spirit or life force in the universe (30%). Spread the word! These things do not exist.

Thank you notes

"I must say, I started watching your videos over a year ago, and have re-watched many. And they still fascinate me. I'm only 17 and I'm seriously considering doing a degree in chemistry after watching your videos. The only downside is not many people I know can have a conversation about the things you're talking about. You were right your videos are decades if not a century in front of its time."

EasyBen21, 17 Oct 2011

Requests

The following are suggested requests:

● Comment: "You could start using the phrase "activation energy" to describe attraction plus ongoing activities" - BeanangelTreon (2009) (thread comment in Are We Human).

Feel free to post up requests (at YouTube or threads below).

History

The channel was conceived in December of 2007 by American chemical engineer Libb Thims as a tool to facilitate the reading and understanding of the two-volume, 834-page *Human Chemistry* textbook, published in September of that year, which, according to feedback, is a difficult read for many. [2] The first video, titled "human chemistry (introduction)", was posted on May 28, 2008.

Tentative future shows?

The following is a list of possible "general topic" video shows or programs on the planning slate:

1. How many is too many (sex partners)? (see: example video)
2. Social atoms, human elements, or human molecules? (articles: social atom, human element, human molecule)
3. Chemistry.com vs eChemistry.com vs ScientificMatch.com (article: science-based online dating sites)
4. Drive (see: drive)
5. Free energy of human relationships (see: free energy)
6. What is a human chemical reaction? (see: human chemical reaction)
7. On the nature of the human chemical bond (article: human chemical bond)
8. Johann von Goethe (article: Johann von Goethe)
9. Why do people have children? (see, e.g., 1992 Nobelist Gary Becker's absurd answer: clip @ 19:30-20:15: "it's not biology that is driving reproduction, but the desire to have an investment in one's long-term financial future")
10. Gottman stability ratios (see: Gottman stability ratio)
11. Human thermodynamics (see: human thermodynamics)
12. Endorphin theory of love (see: endorphin theory of love)
13. Hormone theory of love
14. Chocolate theory of love
15. ReactionMatch.com (see: ReactionMatch.com)
16. Oxytocin – the cuddle chemical
17. Serotonin – the confidence/obsession chemical
18. Dopamine – the drive chemical
19. Human pheromones
20. Human molecular orbital theory
21. Queer chemistry
22. Collision theory
23. Stendhal's crystallization
24. Thermalization
25. Hot sex, ambient sex, and cold sex?
26. Human substrate and active sites (article: substrate)
27. Human Molecule | the definition of a person

Book video possibilities

The following is a list of possible "classic human chemistry" book discussion videos:

Earlier circa 2007-08 **HC101 logo** for the Human Chemistry 101 channel.

1. Goethe's 1809 *Elective Affinities*
2. Fairburn's 1914 *Human Chemistry*
3. Liebowitz' 1983 *The Chemistry of Love*
4. Fisher's 1992 *Anatomy of Love*
5. Buss' 1994 *The Evolution of Desire*
6. Crenshaw's 1996 *The Alchemy of Love and Lust*
7. A General Theory of Love (2000)
8. Nochimson's 2002 *Screen Couple Chemistry*
9. Fisher's 2004 *Why We Love - the Nature and Chemistry of Romantic Love*
10. Frobose's 2006 *Lust and Love - is it more than Chemistry?*

Archives

*See: HC101 Videos (ranked **by date**, **most viewed**, or **most discussed**) - for all archives*

● Human chemistry (introduction) [3:38], Wed, May 28, 2008 (article: human chemistry)
● Is love a chemical reaction? [3:13], Thur, May 29, 2008 (article: love the chemical reaction)
● Is love a chemical reaction? (Answer: Part1) [9:53], (Answer: Part2) [9:59], (Answer: Part3) [5:37], Thur, Jun 12, 2008
● Evolution (Advanced Views) [9:32], Mon, Aug 11, 2008 (article: evolution)
● Good News: Clausius' Mechanical Theory of Heat is available! [4:11], Wed, Oct 22, 2008 (article: Mechanical Theory of Heat)
● Who is Libb Thims? [9:45], Tue, Nov 04, 2008 (article: Libb Thims)
● Thermodynamics of HotForWords [9:44], 26 Nov 08
● Human Thermodynamics Pioneers [3:23], 29 Jan 09

Retractions

To note, the following videos were retracted (deleted) because they received cumulative vote scores of two or less. Possibly these topics will be redone in the future getting more to the point in shorter and more entertaining or educational way.

● What is Sex (Part 1) [6:33], Thursday, Aug 21, 2008 (article: sex) (see: YouTomb information)
● What is Sex (Part 2) [6:34], Thursday, Aug 21, 2008 (maybe a redo as "Chemistry and Sex")

References

1. Human Chemistry 101 - YouTube
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview). Morrisville, NC: LuLu.

External links

● Human chemistry (overview) - HumanChemistry.net

θΔics

In quotes, **human chemistry quotes** are various notable quotation statements related generally to the application of basic chemistry rules and laws to human relationships. Some of these are listed below, chronologically:

Year	Quote	person
c.1818	"We should be surprised that a matter that generally plays such an important part in the life of man has hitherto been almost entirely disregarded by philosophers, and lies before us as raw and untreated material."	Arthur Schopenhauer (1788-1860) German philosopher, *The World as Will and Idea* [1]
1821	"Where there is no love, a person's faithfulness to the marriage bond is probably against nature." "If a relationship is perfectly natural there will be a complete fusion of the happiness of both of you—owing to fellow-feeling and various other laws which govern our natures, this is, quite simply, the greatest happiness that can exist." "To find love in Paris you must go down among those classes where the absence of education and of vanity, and the struggle for bare necessities, have allowed more energy to survive."	Stendhal (1783-1842) French writer *On Love*
1913	"Students of the problem of the greatest sensation in the world, are trying to explain love on purely chemical principles. They say that the sight of the beloved or to-be-loved object excites a chemical reaction in the lover, starts up a kind of fermentation, which can be soothed or neutralized only by the presence or possession of the beloved object."	William Robinson (1913) American physician? [2]
1920	"Love is in its ultimate analysis nothing but a chemical reaction."	Anon scientist (c.1920) Quoted by Frederick Bennett [3]
1933	"The meeting of two personalities is like the contact of two chemical substances; if there is any reaction, both are transformed."	Carl Jung (1875-1961) Swill psychologist *Modern Man in Search of Soul*
1939	"Love is a romantic designation for a most ordinary biological process—or, shall we say, *chemical*—process … a lot of nonsense is talked and written about it."	Greta Garbo (1905-1990) Swedish actress *Ninotchka*
		Tony Randall (1920-

1959 “Love isn’t an opinion, it’s a chemical reaction.”

2004) American actor
Pillow Talk

2000 “I miss her smell, and the way she tastes. It’s a mystery of **human chemistry** and I don’t understand it, some people, as far as their senses are concerned, just feel like home.”

John Cusack (1966-)
American actor
High Fidelity

References

1. (a) Schopenhauer, Arthur. (1818). *The World and Will and Representation, Volume 2* (pg. 532); second expanded edition, 1844. Publisher.
(b) Sex and Schopenhauer – Flatrock.org.
(c) The World as Will and Representation – Wikipedia.
2. Robinson, William. (1913). *Stories of Love and Live* (pg. 129). The Critique and Guide Co.
3. Bennett, Frederick M. (1922). “Is Spirit a Chemical Reaction?”, *The Personalist* (pgs. 106-11), *Vol. 3-4.* School of Philosophy, University of Southern California.

θΔics

In human chemistry, **human elective affinity**, or human chemical affinity (modern), is the force of reaction or "elective affinity" preference between people, when considered as chemical species. [1]

This view was conceived in 1809 by German polymath Johann von Goethe and outlined in "chapter four" (book one) of what he considered his greatest work*: Elective Affinities*. [2]

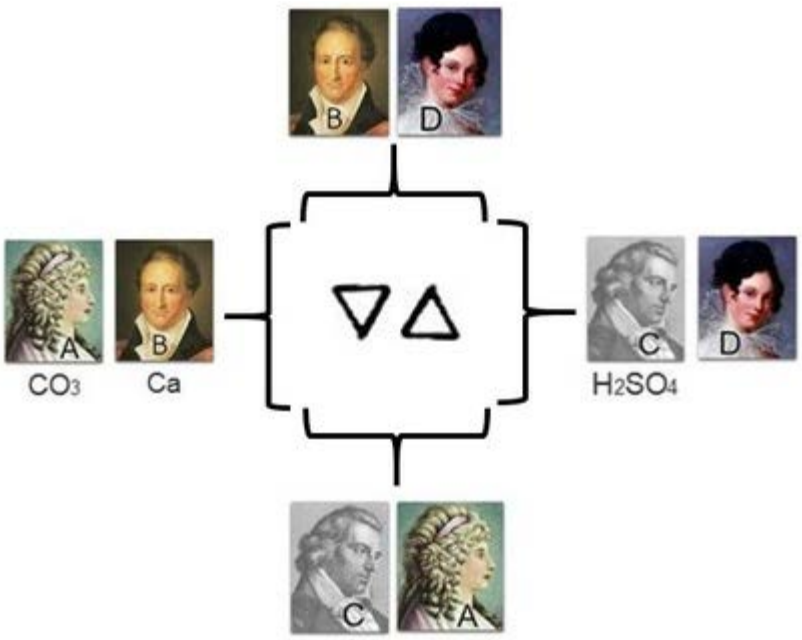

A depiction of the main double elective affinity reaction Goethe employed in the telling of his 1809 physical chemistry based novella *Elective Affinities*, each chapter describing a different type **human elective affinity** reaction.

Lecture on anatomy

Goethe's first detailed presentation of affinity occurs in his third *Lecture on Anatomy* of 1796. [3] Specifically, in his lectures on comparative anatomy and zoology, under the heading 'On the Laws of Organization as Such, to the Extent That We Can Observe Them in the Structure of Types', Goethe stated the following view: [4]

> "To facilitate our comprehension of the concept of organic existence, let us first take a look at mineral structures. Minerals, whose varied components are so solid and unchanging, do not seem to hold to any limits or order when then combine, although laws do determine these conditions. Different components can be easily separated and recombined into new combinations. These combinations can again be taken apart, and the mineral we thought destroyed can soon be restored to its original perfection.
>
> The main characteristic of minerals that concerns us here is the indifference their components show toward the form of their combination, that is, their coordination or subordination. There are, by nature, stronger or weaker bonds between these components, and when they evidence themselves, they resemble attractions between human beings. This is why chemists speak of elective affinities, even though the forces that move mineral components [or humans] one way or another and create mineral structures are often purely external in origin, which by no means implies that we deny them the delicate portion of nature's vital inspiration that is their due."

Here we see, in excellent form, in 1796, Goethe discussing "human chemical bonding" in the context of the affinity forces, which he correctly says are "external in origin", that create or dissolve such combinations. He continues:

> "How different even imperfect organic beings are! They convert part of the nourishment they absorb—eliminating what they do not need—into distinct organs. What they do absorb they turn into something unique and exquisite by joining most intimately one element with another and so forming differentiated parts in whose forms multifarious life is manifested. And if these forms are destroyed, they cannot be reconstructed from what remains.
>
> If we compare these imperfect organic beings with higher ones, we find that the former, even though they make use of elemental influences with a certain degree of force and individuality, cannot bring the resulting organic parts to the same level of specialization and permanence as the higher animal forms can. We know, for example, that plans—and we will not descend any lower on the scale of organic life—developing as they do in a certain sequence, represent one and the same basic organ in highly different shapes.
>
> Detailed insight into the law governing this metamorphosis will surely advance the science of botany, not

only in its descriptive tasks but also in its efforts to understand the inner nature of plants."

In this last section, Goethe indicates the life from non-life issue, where he says "we will not descend any lower on the scale of organic life", and foreshadows the laws of evolution (or "law governing this metamorphosis"), as introduced by Charles Darwin in 1859.

References

1. Goethe, Johann von. (1809). *Elective Affinities*. New York: Penguin Classics.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (ch. 10: "Goethe's Affinities", pgs. 371-422). Morrisville, NC: LuLu.
3. Goethe, Johann. (1796). *Lectures on Anatomy*, I, 9, pg. 202f.
4. Eigen, Manfred, and Winkler, Ruthild. (1993). *Laws of the Game: How the Principles of Nature Govern Chance* (pg. 74-77). Princeton University Press.

θΔics

In human chemistry, **human element** or *human chemical element* is a metaphor-like phrase used to define a person from a chemical perspective. The term was first used in 1914 by English-born American engineer William Fairburn in his book *Human Chemistry*. [1] The term was employed in the 1940s by French philosopher Pierre Teilhard in his discussion on evolution, from the hydrogen atom to man. [2] In 2006, Dow Chemical pushed out a large advertising campaign promoting the idea of the "human element", symbol Hu, as the missing ingredient in life. [3] In modern terms, the human being is correctly considered as a "human molecule". [4]

2003 cartoon-style depiction of the "essential" elements required to "make one human". [7]

Fairburn | Human chemical elements

In 1914, by English-born American engineer William Fairburn outlined the view that: "all men are like chemical elements in a well-stocked laboratory, and the manager, foreman, or handler of men, in his daily work, may be considered as the chemist." Fairburn argued that the primary job of the successful handler of people is "a thorough knowledge of the characteristics and temperament of each individual and the reactions resulting from combinations of individuals." In more detail, according to Fairburn, a human chemist is required to:

> "Separate systems compounded by old non-scientific methods of management into their constituent *human chemical elements*, and then with a definite, preconceived plan, compound these individuals, in proper proportions, into an organization, both harmonious and effective for performing the desired functions."

Teilhard | Human elements

Between 1916 and 1955, French philosopher Pierre Teilhard used a number of phrases to describe the human, such as atom, human molecule, as well as human element. In his 1947 essay "The Formation of the Noosphere", for instance, Teilhard reasons that in the near future, human mental attachments will generate a 'a state of active sympathy, in which each separate *human element*, breaking out of its insulated state under the impulse of the high tensions generated in the noosphere, will emerge into a field of prodigious affinities.' [2]

Dow Corning's 2006 "**human element**" campaign, depicting a person as a symbol on a pseudo-element of a periodic table, the

Dow Corning | The human element

See main: The Human Element

In June of 2006, Dow Chemical promoted a large magazine and video advertising campaign in which each person is considered as abstract "human element", symbol Hu, atomic mass 8 or 9, number 7E+09 (in reference to population count). [5] The idea was to showcases individual human profiles and circumstances to communicate the power of harnessing "The Human Element" to foster solutions to human problems around the world. [3] The adjacent 2006 video, *The "Human Element"*, one of many 90 to 30 second broadcasts, showcases Dow's commitment to addressing global economic, social and environmental concerns.

Other

The 1994 book *The Human Element*, by American author Will Schutz, outlines a human element theory of human personality, group dynamics, and relationships. [6] Schutz devises a "Periodic Table of Human Elements" and gives a view of interpersonal workforce relationships, but the theory is largely metaphor and has little connection to

element symbol Hu and atomic number 7E+09 indicative of the 7-billion human population in the 2010s.

chemistry.

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(b) DOW - Human Element (video clips page), www.dow.com
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θΔics

In science, **human energetics** refers to the study of humanity from the energetic point of view.

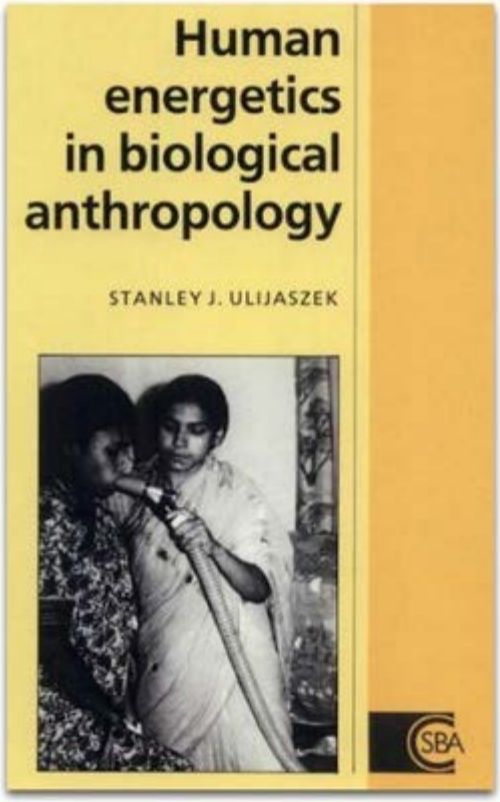

Stanley Jlijaszek's 1995 *Human Energetics*, showing the Gordon bag (1911) technique for measuring human energy expenditure for various activities. [2]

Etymology

In 1909, the term 'human energetics', a near-synonym to 'human thermodynamics', seems to have been attributed to German chemist Wilhelm Ostwald, who, in his *Gross Manner*, supposedly, he discusses how the 'yield' of mind's of genius in society, such as Newton, Lavoisier, Goethe, or Helmholtz, depends on their chemical 'economic coefficient' or the ability to transform one kind of energy into another, or a type of 'degradation', mandated by the second law of thermodynamics. In this logic, according to Ostwald, some individuals are born into the world with the usual amount of energy, i.e. capacity for work, but are so constituted as to transform a large portion of it so that it is of service to humanity. [1]

In 1911, English physiologist Gordon Douglas proposed that gas analysis of expired air, such as by a person breathing into a "Douglas bag" via mouthpiece while performing a set activity for a known period, e.g. as depicted adjacent, would serve as an estimate of "human energy" expenditure. [2]

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Further reading

â— Ulijaszek, Stanley J. (1995). *Human Energetics in Biological Anthropology*. Cambridge University Press.

θΔics

In human thermodynamics, **human energy** is a difficult to define term related to either an attribution or measurement of the energy state of an individual person.

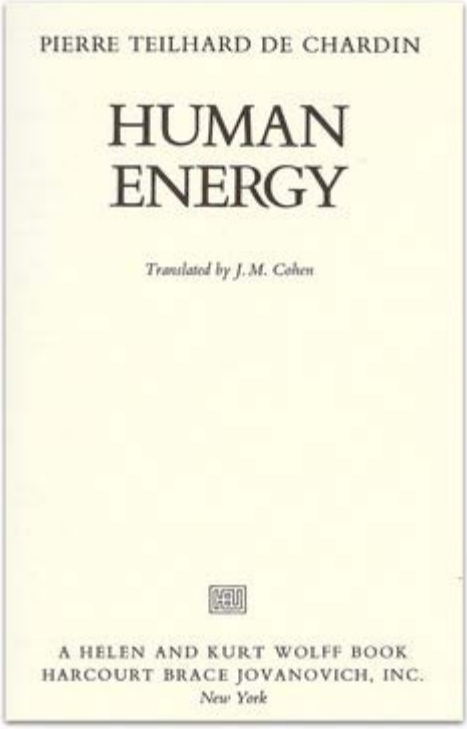

1962 book *Human Energy*, a collection of essays by Pierre Teilhard, written between 1926 and 1939 on the theme of **human energy** or the physics and thermodynamics of human movement. [2]

Overview

The earliest views on types of human energies include the 19th century energy psychologist conceptions of "psychic energy" or psychological energy. Other views include conceptions on the definition of the person as a "human motor" and its associated energy, as well as sexual energy, physical energy, in general.

In 1900, Serbian-born American electrical engineer Nikola Tesla wrote out a piece on human energy. [3]

In 1953, French philosopher Pierre Teilhard explicitly defined *human energy* as "the sum total of physico-chemical energies either simply incorporated in or at a higher degree of assimilation cerebralized in, the human planetary mass at a given moment: the mass in question being considered in its linked totality, not only of its biological constituents, but also of its artificially constructed mechanisms". [1]

References

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θΔics

In science, a **human engine**, or "human motor", is an engine in which human motive power is converted into mechanical work.

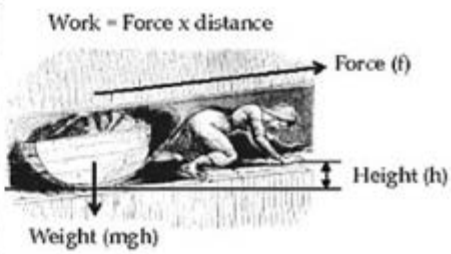

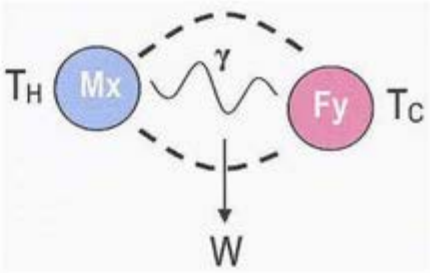

Three examples of a **human engine**: right a man turning a wheel to operate a lathe at a wood shop; top right, a worker dragging a cart of coal up an incline in a mine; bottom right, two human molecules bonded in a "working" relationship.

Overview

Human engines can come in a number of varieties and configurations.

Shown adjacent (left) is a circa 1650-1750 depictions of a **human engine**: one, in the front, of a man turning a wheel to work a lathe, the wheel powered by a crank to turn a metal working lathe, where the smaller wheel is used for working with larger diameters and vice versa; two, pictured in the background, a man working a foot-powered lathe for machining wood. [1]

Shown above (right) is an example of a simple **human engine**: a young "drawer" pulling a coal tub up a mineshaft (c.1650-1750), a common way of getting coal out of mines prior to the development of the miner's friend (1697) and later steam engines (1710-1780), in which "work" is easily understood, via the 1824 Sadi Carnot definition, i.e. motive power, as weight lifted through a height. [2]

At bottom right, adjacent, is advanced theoretical 2005 depiction of a **dihumanide molecular engine**, namely two human molecules, i.e. people, one male Mx, one female Fy, in a bonded, via the electromagnetic force, into a "working" (or work producing) relationship. [3]

See also

- Human machine

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- Rabinbach, Anson. (1990). *The Human Motor: Energy, Fatigue, and the Origins of Modernity.* University of California Press.

θΔics

In engineering, **human engineering thermodynamics**, “engineering thermodynamics applied to humans”, is the study of the practical application of human thermodynamics, particularly human chemical thermodynamics or human statistical thermodynamics, for use in the animate engineering of human systems: individual, social, economic, and or political; a thermodynamics bases social engineering, in short. [1]

Overview

In 1921, English radiochemist Frederick Soddy, in his "Cartesian Economics" lecture, stated the following: [2]

> “It is just because the application of the every-day principles of **engineering** to the animate engine offers such a powerful corrective to the make-believes of the economic systems of society that I have ventured to address you on the subject.”

In 2010, American electrochemical engineer Libb Thims, in his human thermodynamics lectures to bioengineering thermodynamics students (see: Thims lectures) of American electrochemical engineer Libb Thims began to use the phrase “human engineering thermodynamics” in references to bioengineers applying human thermodynamics, human statistical thermodynamic, and or human chemical thermodynamics principles towards the social applications. [3]

In 2013, in discussion of a possible namesake for the subject of the teachings of the two cultures department, the name "human molecular engineering" as would be taught in the "Department of Human Molecular Engineering, University of So-And-So", came to the fore as a possible candidate.

See also

â— Applied human thermodynamics

References

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2. Soddy, Frederick. (1921). “Cartesian Economics: the Bearing of Physical Science upon Start Stewardship”, Nov. *Two Lectures to the Student Unions of Birkbeck College and the London School of Economics.*
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θΔics

In hmolscience, **human enthalpy** is the value of enthalpy associated with an individual human molecule (person), in a given state, or enthalpy of a system of human molecules (social system or social configuration) in a given state.

Physical Attraction Attribute	Symbol
Averageness	H_{AVG}
Age	H_{AGE}
Symmetry	H_S
SeXuality (testosterone-to-estrogen ratio)	H_X
Latitude of Development (immune system)	H_L
Fitness	H_F
Complexion	H_C

American electrochemical engineer Libb Thims's 2007 tabulation of the enthalpy components of a human (**human enthalpy**), attributing the measure largely to physical attributes. [2]

Overview

The enthalpy calculation of humans is a little discussed subject, respectively, say as compared to human entropy or human free energy.

In 1994, citing previous comparisons made by Hungarian physicist Bela Lukacs, Australian organic chemist and commerce theorist James Reiss, in his chapter "Comparative Thermodynamics in Chemistry and Economics", correlated enthalpy to work or labor energy. [1]

In 2002, German organic chemist Volker Wiskamp, in his "Chemistry in the Work of Goethe", a precipitate of an interdisciplinary high school chemistry course he taught and a similar project which had the focus on science and religion,
discussed "enthalpy of formation" in respect to the passions of Eduard of Goethe's *Elective Affinities*. [4]

In the mid-2000s, American electrochemical engineer Libb Thims began to work a human chemical theory on the nature of enthalpy in relation to human chemical reactions, generally correlating enthalpy measure to "heat content" measurements of sexual factors in human relationships, the 2007 formulation result of which is as follows: [2]

$$H = H_{AVG} + H_{AGE} + H_S + H_X + H_L + H_F + H_C$$

where H_{AVG} is the enthalpy (heat content) associated with the physical attractive trait "averageness" (the most averaged person tends to be the most physically attractive), H_{AGE} with the physical attractive trait age (age 22 for females is the most physically attractive age), H_S with the physical attractiveness trait "symmetry" (the most physically symmetric persons tend to be seen as the most attractive), H_X with the physical attractiveness associated with the testosterone to estrogen ratio of a given individual (high estrogen women tend to pair with high testosterone men), H_L the physical attractiveness associated with one ethnicity, i.e. latitude of development (people tend to be most physically attracted to individuals differing in ethnicity to their own by 15 degrees ± in latitude, as determined experimentally via the Sweaty T-shirt study, i.e. MHC-compatibility complex matching, and in person surveys), H_F the physical attractiveness associated with "fitness" (fit people are seen as being more physically attractive than less fit people), and HC the physical attractiveness associated with "complexion" (people with better complex are seen as being more physically attractive).

In 2007, Hungarian astrophysicists Attila Grandpierre, in association with Hungarian physicist Katalin Martinas, in the article "Thermodynamic Measure for Nonequilibrium Processes", estimated the entropy of a 70-kg human to be 202 KJ/K and on this value estimate the extropy of a human to be 2.31 MJ/K. The calculation, although a good first attempt, is nearly baseless in that its value is ascertained using entropy estimates of things such as glucose and water. In the article, the attempt a calculation of human enthalpy, using data such as the combustion of heat of fat, and use these estimates of S and H, to calculated a human Gibbs free energy G, using the formula G = H - TS (see: human free energy). [3]

Discussion

Comparing the Thims and Grandpierre methods of estimating the entropy of humans, there seems to be disjunct

between whether or not enthalpy is gauged by combustion heats (e.g. sexual heat) of human chemical reactions or with combustion of lard factors (burning of a human body in a calorimeter)?

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4. Wiskamp, Volker. (2002). "Chemistry in the Work of Goethe" ("Chemie im Werk Goethe"), University of Applied Sciences Darmstadt, Department of Chemistry and Biotechnology.

θΔics

In hmolscience, **human entropy** is the value of entropy associated with an individual human molecule (person), in a given state, or entropy of a system of human molecules (social configuration or social system) in a given state.

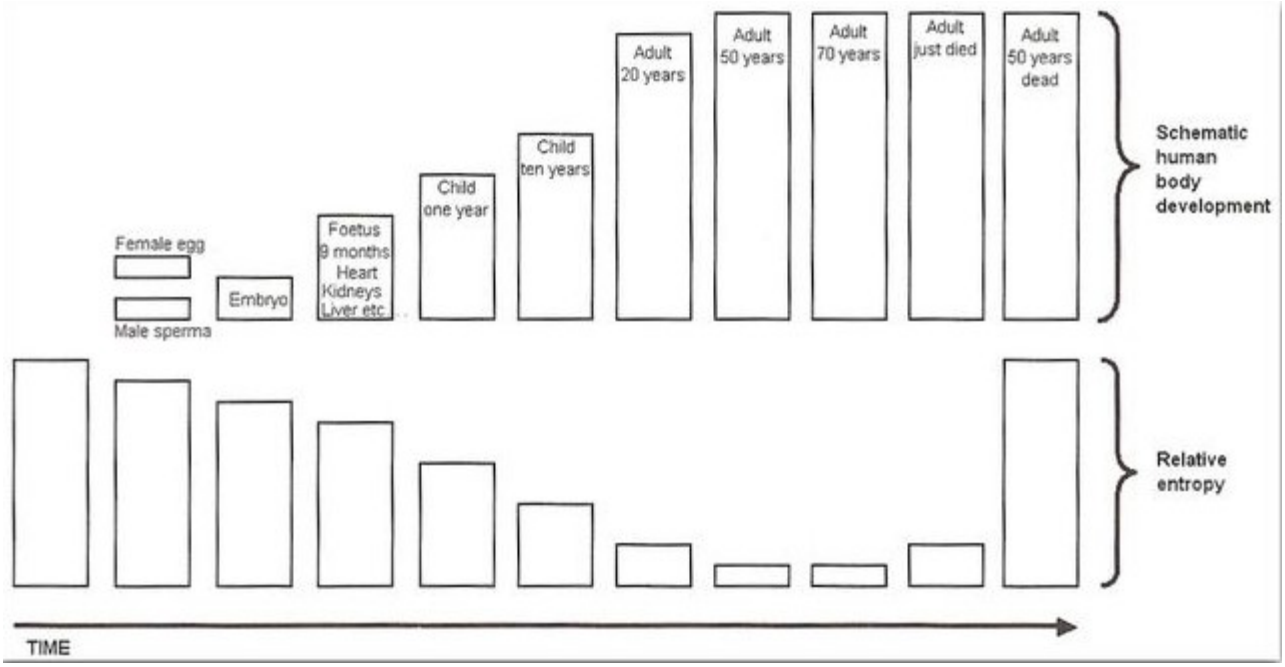

Danish chemist John Schmitz's 2007 so-called "relative entropy of a human", i.e. "**human entropy**", diagram, according to which he seems to conceptualize the notion that a person's level of entropy is the lowest (low entropy) at their last decades existence, prior to death (dereaction), e.g. an adult aged 50-70, after which 50-years later, following decomposition, a person's so-called afterlife entropy is as high (high entropy) as it was before his or her birth (reaction synthesis). [9]

Entropy | Free energy of bodies

In 1866, German physicist Rudolf Clausius, in Schlomilch's *Zeitschrift fur Mathematik und Physik*, published a "note" entitled "On the Determination of the Energy and Entropy of a Body", latter appended to chapter nine of the first edition of his *The Mechanical Theory of Heat*, wherein, building on the work of German physicist Gustav Kirchhoff, who in prior had done research on the calculation of the energy of bodies, a methodology is set forth on how to calculate and measure both the energy *U* and entropy *S* of bodies—a calculation methodology theoretically applicable to "any" body in the universe, e.g. a volume of gas, an iron bar, a human, a society, or a black hole, or the universe as a whole, conceptualized as system; though this latter point was about human applications, at this stage, is implicit. [18]

In 1882, Hermann Helmholtz, in his "On the Thermodynamics of Chemical Processes", building on the earlier work of Willard Gibbs (1876), showed, via disproof of the now defunct so-called thermal theory of affinity, how the calculation of the "free energy", Gibbs free energy (isothermic-isobaric) or Helmholtz free energy (isothermic-isochoric), depending on reaction conditions, i.e. the measure of the work of the forces of the chemical affinities of the reactants involved in producing products, is what is important in the determination of the thermodynamics of formation, i.e. free energy of formation (see: Standard Gibbs free energy of formation), of a chemical or body, produced via chemical synthesis, not the entropy of the body alone.

In 1905, German chemist Fritz Haber, in his *Thermodynamics of Technical Gas Reactions*, presented the first systematic study of all the thermodynamic data necessary for the calculation of the free energy, the Helmholtz free energy (U – TS) in particular, of chemical substances in a group of important reactions. [19]

In 1914, American physical chemists Gilbert Lewis, and his assistant Merle Randall, building on the methodology introduced by Haber, published the first so-called "table of free energies", giving free energies of formation values for: oxygen, hydrogen, and a few oxides of hydrogen. [20] This formed the basis for their expanded-followup 1923 "Table of Standard Free Energies of Formation at 25 °C", giving free energies of formation for 28 cations and a few metallic compounds and 111 non-metallic compounds and anions. [21]

In 1957, English electrical engineer and physicist Keith Burton, in Krebs and Kornberg's *Energy Transformations in Living Matter*, produced the first thermodynamic table of free energies for biochemical species, containing about 100 species. [22]

Bridgman paradox

See main: Bridgman paradox

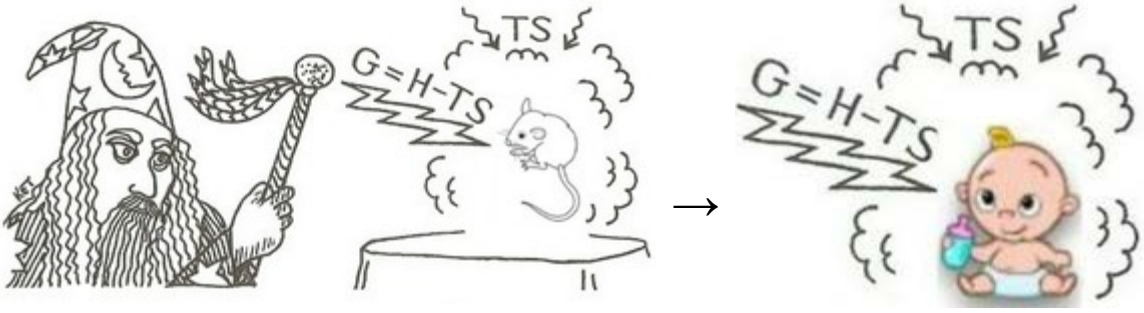

Left: American physical chemist Martin Goldstein, in his 1993 section "Entropy of a Mouse", argues that to determine the free energy of formation of a mouse, we need to ask: [11]

> "What net energy and entropy changes would have been if simple chemical substances, present when the earth was young, were converted into [the mouse]. To answer this question, we must determine the energies and entropies of everything in the initial state and final state."

This very same logic, by extrapolation, can be applied to humans, in the calculation of the **standard human free energy of formation**. Right: An artistic rendition of relationship between **Gibbs free energy** *G* and the **formation**, "creation", or synthesis of a **human** (human molecule) from **standard** state atoms and molecules of the periodic table and earlier earth conditions; from American physicist Daniel Schroeder's 2000 *Thermal Physics* textbook, who comments: [23]

> "To create a [human] out of nothing and place it on the table, the magician need not summon up the entire enthalpy, $H = U + PV$. Some energy, equal to TS, can flow in spontaneously as heat; the magician must provide only the difference, $G = H - TS$, as work."

The original text and depiction, to note, showed a "rabbit", but, nevertheless, the same principles apply.

In 1946, American physicist Percy Bridgman, during the famous 1946 Harvard "what is life in terms of physics and chemistry?" debate, pointed out the paradox that while a so-called living thing, i.e. a human defined as a powered CHNOPS+ molecule, has an entropy, as does any body in the universe, there, apparently, is no way to calculate this entropy, being that, according to standard calculation of entropy methods (e.g. reaction calorimetry), one would have to either synthesize (create) or destroy (analyze) the organism in a reversible way. Bridgman commented how he saw a fundamental difficulty in the possibility of applying the laws of thermodynamics to any system containing living organisms (chnopsological organisms). French-born American physicist Leon Brillouin, in his "Life, Thermodynamics, and Cybernetics" (1949), summarized the "Paradox of Bridgman", as he referred to it, as follows, which he says is Bridgman view: [1]

> "How can we compute or even evaluate the entropy of a living being? In order to compute the entropy of a system, it is necessary to be able to create or to destroy it in a reversible way. We can think of no reversible process by which a living organism can be created or killed: both birth and death are irreversible processes. There is absolutely no way to define the change of entropy that takes place in an organism at the moment of death."

Bridgman's view on this seeming paradox can also be compared to American physical chemist Martin Goldstein's 1993 chapter subsection on the entropy of a mouse, which gives led into modern human free energy theories of human synthesis. [2]

Human affinities | Entropies

In circa 1808, Johann Goethe worked out in his mind, and likely on paper (although, unusually to common practice, he destroyed all his notes), so-called human affinity tables (see: Goethe's affinity table), the forerunner to "human free energy tables" (a future subject), which tabulate "human free energies of formation" per person per state, e.g. the free energy of formation of Thomas Jefferson in 1802, or bound state of persons per state, e.g. a married couple (i.e. dihumanide molecule) during their honeymoon, showing reaction affinity differences between the characters (reactants) in his 1809 physical chemistry based novella *Elective Affinities*.

In 1914, American chemical engineer William Fairburn, in his *Human Chemistry*, discussed the verbal idea that an individual person or might be associated with a value of relative "energy" but also "entropy", and therein employed human chemical theory to the effect that workers in a factory were types of chemicals that required efficient and intelligent handling by the foremen. [1]

In 1931, psychologists Siegfried Bernfeld and Sergei Feitelberg, in their “The Principle of Entropy and the Death Instinct”, presented the results of their study where they attempted to measure a paradoxical pulsation of entropy within a living organism, specifically in the nervous system of a man. [16] Specifically, by comparing the brain temperature to the rectal temperature of a man, they thought to acquire evidence of paradoxical variations, i.e. variations not conforming to the principle of entropy as it functions in physics for inanimate systems. [17]

In the late 1980s, Japanese systems engineer Ichiro Aoki began to make theoretical estimates of the entropy production in plant leaves and white-tail deer (1987), in day and at night; eventually applying these methods to humans, physiologically, into the 1990s. [14] The end result of Aoki’s work (2012), according to his conclusion, is that “entropy itself cannot be measured and calculated for biological systems, even for very small systems”, rather only “process variables, entropy flow, and entropy production can be quantified by the use of energetic data and physical methods.” [15]

In 1995, mining engineer Raj Singhal defines "human entropy" as the effect of individual variations in the efficiency of work of individuals and managers on the system. [6]

In 2002, American physicist Jack Hokikian defined the concept of the entropy of a human as as such: [10]

> “Human beings can be classified into low-entropic and high-entropic people.”

This view, to note, although in the right direction, is very elementary. To measure the entropy of a living structure, such as a mouse or a human, as American chemist Martin Goldstein explains, encounters numerous difficulties, but invariably is a measurement obtained in the same manner as are the entropies of simple chemical species obtained via laboratory experiments. [11]

In a 2004 article “Entropy and Information of Human Organisms”, Hungarian astrophysicist Attila Grandpierre claims that he was the first person to determined the entropy content of human being. [12] Likewise, in the 2007 article “Thermodynamic Measure for Nonequilibrium Processes”, Grandpierre, in association with Hungarian physicist Katalin Martinas, estimated the entropy of a 70-kg human to be 202 KJ/K and on this value estimate the extropy of a human to be 2.31 MJ/K. The calculation, although a good first attempt, is nearly baseless in that it's value is ascertained using entropy estimates of things such as glucose and water. [13] They even attempt a calculation of human enthalpy, using data such as the combustion of heat of fat, and use these estimates of S and H, to calculated a human Gibbs free energy G, using the formula G = H - TS (see: human free energy). These types of calculations are way off in that the Gibbs free energy of a human molecule is the summation of the Gibbs free energy component reactions involved in the synthesis of human beings over evolutionary time periods, starting from elementary components on the extent of reaction time line approaching millions or billions of years.

In 2007, American electrochemical engineer Libb Thims outlined the basic definition of the human chemical bond, i.e. electromagnetic attachments between people, being comprised of individual measures of enthalpies and entropies, according to which he defined the entropy of an average human, considering entropy as an ordering magnitude parameter of a human

Neurological Attraction Attribute	Symbol
Personality, Social Graces, Character & Dependability	S_P
Occupation, Possessions, or Money	S_O
Information, Intelligence, Education, or Knowledge	S_I
Status or Prestige	S_S
Inner Nature, Values & Ambition	S_N

American electrochemical engineer Libb Thims's 2007 tabulation of the entropy components of a human, attributing the measure largely to neurological attributes. [2]

chemical reaction, formulaically, as follows: [2]

$$S = S_P + S_O + S_I + S_S + S_N$$

where S_P is the entropy associated with the personality (social graces + character + dependability), S_O the entropy associated with the occupation (possessions + money), S_I the entropy associated with the intelligence (information + education + knowledge), S_S the entropy associated with status (prestige), and S_N the entropy associated with the inner nature of a person (values + ambition).

In the 2007 book *The Second Law of Life*, Danish chemist John Schmitz estimated the so-called "relative entropy" of a human body over the course of its life-span, to decrease with age, becoming maximum at reaction end (death), as shown above. [9]

Literature

In literature thermodynamics, the term “human entropy” is often associated, in an unsubstantiated manner, with a gradual but cosmic dissolution of life. [7] In the 1932, English writer Aldous Huxley explicitly used the term "human entropy" in relation to the energy of expansion released due to sexual restraint.

Into the 1950s, literature definitions on entropy likely began to stem from Austrian physicist Erwin Schrödinger’s 1944 conception of “positive entropy” and death, in connection to information theory, such as found in the work of Thomas Pynchon. In other cases, however, different definitions can be found.

Human computer systems

In computer science, the conception of human entropy E(S) related to the interactions involved in a computer-human system was introduced in 1992 by Polish-born, American industrial engineer Waldemar Karwowski, in what seems to be based on a type of fuzzy entropy logic. [3] Strangely, Karwowski uses the symbol “E” for entropy and "S" for system. In any event, according Karwowski, using a bit of argument, the “system entropy” *E(S)*, such as a person in their office interacting with a computer, can be defined as the difference between the human entropy *E(H)* and the entropy of a system regulator *E(R)*, which he defines as “ergonomic intervention efforts”, or in equation form: [4]

$$E(S) \geq E(H) - E(R)$$

This view, to note, seems to have little connection to actual thermodynamics.

See also

â— Shannon Entropy and Thermodynamic Love – my thoughts (2009) – Hmolpedia threads.

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Further reading

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θΔics

In logic, **human existence** is a term that refers to the modern scientific reality that a moving or animate human person 'exists', in the sense of being an atomic 'bound state' structure in the course of time in the dynamical movement of the universe.

In 2009, American physical chemist Thomas Wallace, in his *Wealth, Energy, and Human Values*, stated the following: [1]

> "Thermodynamics regulates society's acquisition, refinement, and utilization of nature's resources to provide the food and fuels necessary for the vital processes of **human existence**."

A popular search term is 'thermodynamics of human existence'.

Life | Reaction existence

See main: Reaction existence

In 2010, Libb Thims began to use the term 'existence' in place of or rather as a modern replacement synonym for the antiquated, now-defunct, term 'life', on the conclusive logic, conceptually visualized on evolution timelines, that a person is a molecule, technically a human molecule, and it is technically or rather theoretically incorrect to speak of a molecule as being 'alive'; no matter what sort of contrivance one might use to justify that some molecules can be alive whereas others can not. [1]

See also

â— Struggle for existence

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θΔics

fIn human thermodynamics, **human free energy** or "human Gibbs free energy" is the measure of the Gibbs free energy, Gibbs free energy change, or differential of Gibbs free energy of human chemical reactions (see: human chemical reaction theory). [1]

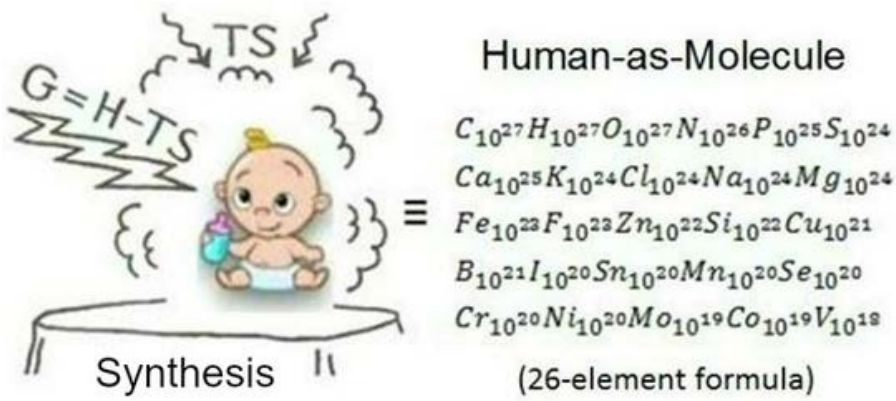

Overview

(add section)

Gibbs free energy of formation

See main: Free energy of formation

The so-called "standard human Gibbs free energy of formation" is the standard Gibbs free energy of formation of a given human molecule (person) or human molecular configuration (bound state of humans), e.g. a specific dihumanide molecule, in a given state (time) or point of detachment synthesis (birth), as would be listed on a standard free energy table (or human free energy table).

"To create [synthesize] a [human] out of nothing and place him on the table, the [universe] need not summon up the entire enthalpy, $H = U + PV$. Some energy equal to TS, can flow in spontaneously as heat; the [universe] must provide only the difference, $G = H - TS$, as work."

— Daniel Schroeder (2000), *Thermal Physics* [4]

A simplified depiction of the relationship between **Gibbs free energy** G, its components: enthalpy H and transformation content energy TS, and the "creation" (i.e. synthesis) of a **human** (i.e. human molecule).

Synonyms

Other synonyms variants include: human available energy (see: available energy), human Gibbs free energy, or social Gibbs free energy or social free energy (sociological thermodynamics), economic Gibbs free energy or economic free energy (economic thermodynamics), among others.

Theorists

The following table (culled from 500+ thinkers of the HT pioneers table) shows the outline of the top 40+ thinkers in the historical development of the utilization, or in some cases objection (shown in red), of free energy, Helmholtz free energy, or Gibbs free energy (correct thermodynamic potential for social systems) in social theory, economic theory, or in human chemical thermodynamics proper:

Key

Objectors		Those with red tabs are "detractors" or vocal objectors to free energy theory being applied to human existence.
Greeners		Those with green tabs are thinkers lost in Erwin Hiebert's "garden of thermodynamics", promoting either meta-physical theories, theology-slanted ideas, or misunderstood versions of thermodynamics "used in ways that transgress the limits of credulity to the point of sheer ridiculousness."

1.	Johann Goethe (1749-1832) German polymath	1799	In 1768, at the age of nineteen was conducting chemical experiments to find the principles that permeate the entire universe; in 1799, arrived at the view that the force of affinity operates in human relationships, via attracting, repelling, and neutralizing individuals; in 1809, arrived at his "moral symbols" theory of humanity, as explained via 36 chapters in his famed novella *Elective Affinities*, as is depicted in 1882 Helmholtz equation terms (adjacent equation). $A = -\Delta G$
2.	Sigmund Freud (1856-1939) Austrian psychiatrist	1895	His draft of a "Project for Scientific Psychology" outlined a hard science version of psychology based on thermodynamics and mechanical theory, in which he postulated that "in the future psychologists will exercise a direct influence, by means of particular chemical substances, on the amounts of energy and their distribution in the mental apparatus"; in this project it is said that he gave his first outline of his Helmholtz school views on 'bound energy' and 'unbound energy' (or free energy) in the states of consciousness; this framework formed the basis of his entire twenty-four volume volume collected works; some of his thermodynamics ideas are said to show through in his 1920 *Beyond the Pleasure Principle*; the gist of his psychodynamics theory are found in his 1923 *The Ego and the Id*, in which he outlines a heat engine model of the mind via an id, ego, super-ego force theory of subconscious drives. In his *Principles of General Physiology*, he re-interpreted Wilhelm Ostwald's 1912 energetic imperative (the thermodynamic imperative version of Kant's original 1785 categorical imperative), rather

interestingly, having a decent grasp of the views of Willard Gibbs (available energy) and Hermann Helmholtz (free energy and bound energy), as not being solely based on the first law, but on both the first and second law, whereby the imperative should yield a rule is how one should act "morally" within the confines of universal rule, as follows:

> "It is plain that, of the energy contained in a system, only that part which can do work is of value. This principle was applied by Willard Gibbs (1878, pp. 216, etc.). Helmholtz (1882, p. 33) made the important distinction between "free" and "bound" energy. Clausius, at the end of a fundamental paper *(Pogg. Annalen*, cxxv. p. 400, 1865), formulates the two laws of energetics as follows:
>
> > I. The energy content of the universe is a constant quantity.
> > II. The entropy of the universe is always striving to a maximum.
>
> The word "entropy" is here used as having essentially the same meaning as the "bound" energy of Helmholtz. The law is therefore equivalent to the statement that "free " energy is always striving to a minimum. The fact, derived from universal experience, that free energy always tends to diminish, if it possibly can, is sometimes known as the *"principle of Carnot and Clausius"*. It was also enunciated, about the same time as the publication of the paper of Clausius (referred to above), by William Thomson under the name of the "Dissipation of Energy." The principle has obviously a great practical, as well as philosophical, importance. It has been made by Ostwald (1912) the basis of a general rule of conduct, which he calls the "Imperative of Energetics." The rule may be translated thus:
>
> > Waste not free energy; treasure it and make the best use of it.
>
> As will be admitted, the admonition is an excellent one, and, when applied, leads to interesting results, as may be seen from the collection of essays under this name. To mention two subjects only, which are amongst those discussed, the waste involved in war and the value of a universal standard for the sizes of printed books."

3. William Bayliss (1860-1924) English physiologist — 1915

Here, in short, Bayliss states that the concept of "free energy" has great philosophical value, one example of which he gives is that it can be applied to warfare (see: war thermodynamics).

4. Lawrence Henderson (1878-1942) American physical chemist, physiologist, and sociologist — 1917

His *The Order of Nature*, gives an outline of how Herbert Spencer needs to be overhauled via a combination of Willard Gibbs and Charles Darwin; into the 1930s, he leads the Harvard Pareto circle, wherein he teaches a Gibbs-based Sociology 23, among other endeavors along these lines.

5. Erwin Bauer (1890-1938) Hungarian-born Russian pathologist and physical biologist — 1920

His *The Fundamental Principles of Biological Science* introduces what has come to be known as the Bauer principle, which states that:

$$F' - F = \sum_{i=0}^{n} X_i \frac{\Delta x_i}{\Delta t} \Delta t - \sum_{i=0}^{n} X_i' \frac{\Delta x_i'}{\Delta t} \Delta t$$

> "The living and only the living systems are never in equilibrium, and, on the debit of their free energy, they continuously invest work against the realization of the equilibrium which should occur within the given outer conditions on the basis of the physical and chemical laws."

and goes on to discuss this in terms of the time derivative of work factors—differences in pressure, concentration, electrical potential, etc., such as in the equation shown.

John

His review of Georges Guillaume's 1932 economic thermodynamics dissertation, concluded that: "if this [economic-thermodynamic] analogy can be worked out at all, the analogon of 'entropy' must be sought in

6.
Neumann (1903-1957) Hungarian-born American mathematician and chemical engineer

1932

the direction of ‘liquidity’. To be more specific: if the analogon of ‘energy’ is ‘value’ of the estate of an economical subject, then analogon of its thermodynamic ‘free energy’ should be its ‘cash value’." (see: human thermodynamic variable table); his followup 1932 article “A Model of General Economic Equilibrium”, derives a function φ (X, Y) related to the production of goods, based on the model of thermodynamic potentials, and is considered a classic; his late 1940s symposium lectures (1948) on electrical automatons illustrated the role which free energy plays in creating statistically unlikely configurations of matter; his ill-fated late 1940s suggestion to American electrical engineer Claude Shannon (1949) to call telegraph wire binary logic ("information") of transmissions of high and low voltage pulses by the name “entropy”, as a joke, has resulted to instill a misinformed modern view that binary logic is based on thermodynamic (steam engine) theory.

7.
Ilya Prigogine (1917-2003) Russian-born Belgian chemist and thermodynamicist

1937 (1972)

$$F = E - TS$$
(not applicable to humanities)

After reading Henri Bergson’s famous 1907 *Creative Evolution*, at the age of twenty, he began to devote himself to solving the riddle of the relationship between time, human existence, thermodynamics, and evolution, starting with three articles: “Essay on Physical Philosophy”, “The Problem of Determinism”, and “The Evolution”, on the topics of determinism, quantum mechanics, biological evolution, and time; completed his PhD on *The Thermodynamics of Irreversible Phenomena* (1941), under Theophile de Donder; obtained cult status and "disciples" with his 1977 *Self-Organization in Non-Equilibrium Systems: from Dissipative Structures to Order through Fluctuations* (the year he also won the Nobel Prize for his theories); and obtained layperson icon status with his 1984 *Order Out of Chaos*; went on to published numerous articles, books, and lectures on his theories up until the year of his death (*Is the Future Given?*, 2003); in his 1977 lecture, entitled “Time, Structure and Fluctuations”, he infamously opened to the query:

> “Thermodynamic equilibrium may be characterized by the minimum of the Helmholtz free energy defined usually by: F = E – TS. Are most types of ‘organisations’ around us of this nature? It is enough to ask such a question to see that the answer is negative. Obviously in a town, in a living system, we have a quite different type of functional order. To obtain a thermodynamic theory for this type of structure we have to show that that non-equilibrium may be a *source of order*. Irreversible processes may lead to a new type of dynamic states of matter which I have called ‘dissipative structures’. (see: bifurcation)”

This argument was first outlined, to note, in his 1972 "Thermodynamics of Evolution".

8.
Mehdi Bazargan (1907-1995) Iranian mechanical engineer and thermodynamicist

1942

$$W = U - TS$$

Completed his PhD in thermodynamics (1930s); wrote on “The Thermodynamics of Love” (c.1942); in his *Labor in Islam* (1946), wrote a chapter on physiological thermodynamics of human labor in the context of will power; during a five-month prison spell (for political opposition), wrote the *Human Thermodynamics* (1956), the first book entitled “human thermodynamics”, wherein he used a thermodynamics based framework, in particular Helmholtz free energy equation (adjacent) to explain Islam, work, death, desire, love, and reincarnation scientifically.

9.
Erwin Schrödinger (1887-1961) Austrian physicist and statistical thermodynamicist

1943

$$-(\text{entropy}) = k \log \frac{1}{D}$$

Won 1933 Nobel Prize in physics (for his 1925 Schrodinger equation, one of the cornerstones of quantum mechanics); his famous Feburary 1943 course of lectures (turned-book), entitled *What is Life?* (1944), on the subject of the physics and chemistry of "life", presented under the auspices of the Dublin Institute for Advanced Studies, delivered at Trinity College, Dublin, before an audience of about 400 that did not dwindle, he set out to answer the query:

> “How can the events *in space and time* which take place with the spatial boundary of a living organism be accounted for by physics and chemistry?”

he popularized the notion that "dead matter" or inert matter is defined as the state of thermodynamic equilibrium or of "maximum entropy" in which no observable events occur; and in this context situated the paradoxical idea that the "negative value of entropy" (-S or "negative entropy") is a measure of "order" of the body in question; and that life is something that "feeds on negative entropy"; after which, however, he was attacked by his physicist colleagues, replying (in his appended "note to chapter 6") that:

> “The remarks on *negative entropy* have met with doubt and opposition from physicist colleagues.

Let me say that if I had been catering for them alone I should have let the discussion turn on *free energy* instead. It is the more familiar notion in this context. But this highly technical term seemed linguistically too near to *energy* for making the average reader alive to the contrast between the two things."

He would later publish the famous 1946 *Statistical Thermodynamics* (based on his 1944 lectures) on statistical thermodynamics (and or statistical mechanics).

10. Jack Kirkaldy (1926-) Canadian materials science engineer — 1965

His "Thermodynamics of the Human Brain" outlines a free energy minimization principle of brain operation, consciousness, and development based on the equation shown, where dF/dt is the rate of increase of free energy (or Gibbs free energy, which he says equates to both information and negentropy), j_F is the excess of free energy inflow over outflow, and $T d_iS/dt$ is the rate of dissipation of free energy within the system, where d_iS is the rate of entropy production; he even gives a figure 1 (shown) as his thermodynamic system model of the brain; his followup "Thermodynamics of Terrestrial Evolution" argues that the "causal element of biological evolution and development can be understood in terms of a potential function which is generalized from the variational principles of irreversible thermodynamics."

$$\frac{dF}{dt} = -\int_V \operatorname{div} j_F \, dV - T\frac{d_iS}{dt}$$

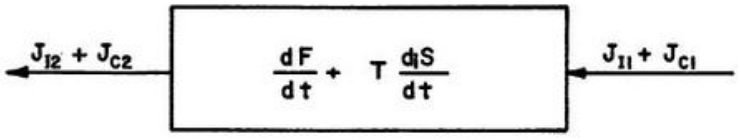

FIGURE 1 Thermodynamic model of the brain.

11. John Tukey (1915-2000) American chemist, mathematician, and statistician — 1966

Developed a chemical thermodynamics based model of "attitude change", based on the theory of absolute reaction rates, wherein each state of a chemical entity is characterized by a "free energy level", and each boundary between states by a free energy level that is higher than the levels of the state it separates; in the model, transitions occur between states. Tukey, to note, was a close associate of John Neumann (1934), another human free energy theorist.

12. Nicholas Georgescu (1906-1994) Romanian-born American mathematician — 1966

Published an introductory essay on the relation between entropy and economics; his highly-cited 1971 book *The Entropy Law and the Economic Process*, situated a material entropy theory which argued that economic systems are governed by the second law, albeit he misinterpreted bound energy and free energy, to mean that, in economic terms, available energy stored in fossil fuels tends to be used up over time and converted into an unusable form of waste heat or energy.

13. Arthur Iberall (1918-2002) American physicist-engineer — 1971

Beginning with his *Toward a General Science of Viable Systems*, to his 1974 *Bridges in Science: from Physics to Social Science*, among about a dozen others, culminating with his 1993 *Foundations for Social and Biological Evolution* (co-written with David Wilkinson and Douglas White), he utilizes a large amount of thermodynamics derivation, such as equation shown (which he incorrectly defines as the "Gibbs free energy function"; correctly it is the Helmholtz free energy) to outlined a rather detailed, intricate (e.g. discussing chemical potential), and interesting systems-within-systems theory of dynamical change, defining people as "human atomisms", using theories such as homeokinetics, field thermodynamics, i.e. the Hamiltonian applied to sociology and biology, among others extended into sociology and economics.

$$F = U - TS$$

14. Frederick Rossini (1899-1990) American chemical thermodynamicist — 1971

Argued that the equilibrium constant version of the Gibbs equation (shown) explains the paradox between "freedom" and "security" in social life, in a chemical thermodynamics sense; this controversial hypothesis resulted three decades later to launch the 2006 Rossini debate on whether or not this human chemical thermodynamics framework is true, especially in a post 9/11 world.

$$\ln K = -\frac{\Delta H^\circ}{R}\left(\frac{1}{T}\right) + \frac{\Delta S^\circ}{R}$$

15. — 1975

	Norman Dolloff (1907-1984) American metallurgical engineering geologist		
16.	Melvin Klegerman (c.1947-) American immunochemist	1976	
17.	Hugh J. McDonald (1913-2006) American metallurgical and biochemist	1976	
18.	Ed Stephan (1939-2008) American chemistry major turned political scientist and sociologist	1977	Interjected into a talk on human population distributions with physicist Louis Barrett $E = ST - pV + \mu N$ on questions such as whether "humans are fermions or boson"; in 1980, began to discuss with chemist George Gerhold the subject of how the a Gibbs fundamental equation (version shown) applies to sociological systems of people; questions they speculated on included: "What is the total time in a social system? At the level of particles, temperature is just velocity of movement. I sense an analogy between temperature in physical systems and the technology of transportation and communication in social systems. Modern societies are 'hotter'. Big cities (high interactance centers) are 'hot': People, commodities and ideas move around faster. 'Hot' regions subdivide territory more thoroughly than 'cool' ones. And what is *entropy* — unpredictability? is that what we call freedom? What is the social equivalent of the product entropy-times-temperature? Freedom of movement? What do *pressure* and *volume* suggest, if anything? Could the raw product kNT be given some sociological meaning? Do humans have something like *chemical potential*, some sort of (bonding) potential? Maybe the last two terms in could be combined into something with a meaning specific to sociology. Combining them into -N(1 + α), with N as a population — what would be the sociological significance of the factor -(1 + α)/β? Could the value for β computed above in the case of urban population distributions (β = 2v/xμ) have any application?"; published some of his finalized ideas in the 1995 online book *The Division of Territory in Society*.
19.	Georgi Gladyshev (1936-) Russian physical chemist (reaction against Prigogine)	1978	In reaction-opposition to Ilya Prigogine's 1937 far-from-equilibrium, dissipative structure thermodynamics model of life and evolution, he developed a systems-within-systems "hierarchical thermodynamics" type of quasi-equilibrium model using his law of temporal hierarchies, principle of substance stability, liquid chromatography models, to make a Gibbs free energy volumentric-style equation (above) to explain the evolution of living beings and society; in the 1990s, began developing thermodynamic anti-aging theories of foodstuffs; his 1997 book *Thermodynamic Theory of the Evolution of Living Beings*, captures the gist of his theory. $\bar{G}^{im} = \frac{1}{V}\int_0^V \frac{\partial G^{im}}{\partial m}(x,y,z)\,dxdydx \rightarrow min$
20.	Robert Ulanowicz (1943-) American chemical engineer and theoretical ecologist	1979	Conceived (in 1979) of an information theory based version of free energy applied to ecosystems, termed "ascendency", which he considered as a pseudo-thermodynamic function (first outlined in his 1980 article "An Hypothesis on the Development of Natural Communities"); his 1986 book *Growth and Development* extends on this using Helmholtz free energy (equation shown); his 2009 *A Third Window: Natural Life Beyond Newton and Darwin*, seems to argue for the existence of God in the context of an emergent (or process biology) thermodynamic depiction of evolution (or ascendency), supposedly, under the guise of the "ontic openness of nature"; is presently of the view that "entropy or entropy-related measures (such as free energy) should *not* be invoked for living systems!" (email communicate to Libb Thims, 2011), which he says he first argued on page 21 of his 1986 book. $F = U - \theta S$

Starting with his 1980 *The New Age-Scale for Humans*, followed by about a dozen various publications, he builds significantly on the work of Ilya Prigogine to outline a thermodynamic theory of aging; in his 2009 *Entropy Theory of Aging Systems: Humans, Corporations, and the Universe*, in summarizing the free energy ideas of Prigogine, he states: $\frac{dS}{dt} = \frac{dS_e}{dt} + \frac{ds_i}{dt}$

"Thermodynamic equilibrium may be characterized by the minimum of the Helmholtz free energy, , where *E* is the internal energy, *T* is the absolute temperature, and S is entropy.

			$F = E - TS$ Positive time, the direction of time's arrow, is associated with increase in entropy. Isolated or closed systems evolve to an equilibrium state characterized by the existence of a thermodynamic potential such as the Helmholtz or Gibbs free energy. These thermodynamic potentials and also entropy are, according to Prigogine, Lyapounov functions, which means they drive the system toward equilibrium in the face of small disturbances."
21.	Daniel Hershey (c.1931-) American chemical engineer (stimulated by Prigogine)	1980	Likewise, he in regards to free energy and aging he argues that: "Old age or senescence may be the decline in our ability to produce free energy. Less free energy means diminished cell function. Vitality might be defined as our biological and thermodynamic strength, the ability to expend energy to restore ourselves to near original conditions." He goes on to apply this basis to what he calls the "entropic analysis of a human living system", wherein he argues that "the living system is essentially and open system because it maintains itself by the exchange of matter and energy with the environment and by the continuous building up and breaking down of its internal components" and on this logic goes on to argue that Prigogine entropy (equation shown) applies to these so-called living systems, to corporations, etc.
22.	Mirza Beg (1932-) Indian-born Pakistani organometallic chemist	1981	Published "Human Behaviour in Scientific Terminology: Affinity, Free Energy Changes, Equilibria, and Human Behaviour" in the *Pakistan Management Review*; which culminated in his 1987 *New Dimensions in Sociology*, which is the biggest book to apply Gibbs energy to society in a uniform manner; a salient footnote being that he equates "Gibbs energy" to the "will of Allah" (see also: Mehdi Bazargan).
23.	Adriaan de Lange (1945-) South African chemical physicist	1982	Well-read physical sciences based thinker (above the 500+ book level in studying how thermodynamics applies to the humanities) who in 1982 began to view the idea that entropy production must apply to the spiritual world (see: living force); then, in 1986, while teaching physical chemistry class, grasped the idea that "the intricate calculations concerning free energy in chemical reactions" must apply to the process of knowing and learning, on the extrapolation that student's learning behaviors must follow or map to the behaviors of molecules moving through the chromatograph column; in 1987, completed a yet unpublished manuscript *Entropy, Creativity, and Learning;* in the late 1990s, began posting and discussing his theories at the Learning-org.com forums; and in 2009 published an online book *Irreversible Self-Organization* (in Afrikaans). $\Delta G - W < 0$
24.	Laurence Foss (c.1940-) American philosopher	1987	His *The Second Medical Revolution*, co-written with Kenneth Rothenberg suggests a new approach to medicine based on quantum mechanics, irreversible thermodynamics, and information theory; his follow-up 2002 book *The End of Modern Medicine* has a section on what he calls the "second law of psychothermodynamics" (equation shown), wherein, building on Michael Guillen's idea that human existence is an unnatural anomaly in the framework of a universe governed by the second law, he slants the second law into a contrived anthropomorphism to argue, in his own words, for a vitalistic (vitalism), mentalistic (mentalism), and spiritualistic (autopoietic) universal view, unlike the mechanistic (mechanism), physicalistic (physicalism), and materialistic (materialism) prevailing scientific world view. $\Delta G_{universe} >< 0$
25.	Wayne Angel (1945-) American physicist	1991	Outlined a semblance of a Gibbs energy based model of "relation thermodynamics", albeit essentially baseless, as he builds his entire theory on Shannon entropy.
26.	Jurgen Mimkes (1939-) German solid state	1992	Since 1992, at the University of Paderborn, has been involved in the development of physical chemistry of social systems and economic systems, with articles such as "Binary Alloys as a Model for the Multicultural Society" (1995), "Society as a Many Particle System" (1997); he helped in getting the 'physics of socio-economic systems' recognized as a new scientific field by the German Physical Society (2001); has produced at least two graduate students by 2002 (Christian Thought and Thorsten Frund); in his 2007 chapter "A Thermodynamic Formulation of Social Science" he argues that the "Lagrange principle" (of pre-thermodynamics days), the "free energy principle" (of physics), and the "principle of maximum happiness" (of sociology) are all equivalent, and on this premise derives a Lagrange function (equation shown) of a social system of *N* interacting people, where (-*L*) is the "free energy" or common $L = E + T \ln P \rightarrow \max$

	thermodynamicist and socio-economic physicist		happiness of the agents, *E* the energy or collective laws of society, ln *P* the combinatorial probability distribution of the elements or individual social behavior (in which the social system is posited to be stable at maximum mutual happiness); as of 2010, was working on finishing a manuscript entitled the *Chemistry of Social Bonds*.
27.	Teresa Brennan (1952-2003) Australian-born feminist philosopher and social-political theorist (culled from Freud)	1992	In her *Interpretation of the Flesh*, explains that "the solution to the riddle of femininity depends on unraveling Freud's neglected if confused theories on psychical energy, while discarding the assumption that the subject is energetically and emotionally self-contained"; she discusses social energy, emphasizing the notion of conflicting forces complemented by bound energy and free energy; in her 1997 article "Social Pressure", she argues that social pressure operates as physical energy, arguing that social pressures are pressures to conform but also those exerted on the psyche in the same way that physical pressures are exerted on the body; her 2004 *The Transmission of Affect*, presents the idea that one can soak up someone else's depression or anxiety or sense the tension in a room, arguing that the emotions and energies of one person or group can be absorbed by or can enter directly into another.
28.	John Christie (1947-) Australian physical chemist and chemical thermodynamicist	1994	$G = A + PV$ His "A Survey of Thermodynamical Ideas", builds on John Neumann's 1932 economic thermodynamics article, to outline an "island model" of 6 inhabitants, wherein he discusses Gibbs free energy, in definitional terms, and alludes to the premise that when an inhabitant enters or leaves the island—if the island were an open system—the "component will move into or out of the system to minimize its chemical potential (see: social chemical potential), i.e. it will tend to flow from regions of higher to lower chemical potential."
29.	Libb Thims (c.1975-) American chemical engineer, electrical engineer, and thermodynamicist	1995	$\Delta G < 0$ Began to speculate as to how the spontaneity criterion (adjacent equation) applies to mate selection, with enthalpy change ΔH and entropy change ΔS specifically quantified ("ΔH – TΔS") in terms of standard evolutionary psychology variables, mapped to second-by-second changing measures of individual differential human molecular Gibbs free energy variations d*G*, as shown below (see: HMO theory): $G = (H_{AVG} + H_{AGE} + H_S + H_X + H_L + H_F + H_C) - T(S_P + S_O + S_I + S_S + S_N)$ This formulation is exemplified well by the following rule from Canadian-American biophysical chemist Julie Forman-Kay's 1999 article "The Dynamics in the Thermodynamics of Binding" where she states: "Whether two molecules will bind is determined by the free energy change of the interaction, composed of both enthalpic and entropic terms." the "molecules" in this case being individual people (human molecules); such as if one was to predict which of two mates would be more favored to bind "stably" into a standard 18-year human chemical reaction; a number of precipitates have followed from this endeavor: one of the first calculations of the human molecular formula (2002); first formulations of the physics model of the human chemical bond A≡B (2005); launched *Journal of Human Thermodynamics* (2005); authored first human chemistry textbook (2007); launched *Hmolpedia* (2008), and as of 2012 has authored over 2,400+ online articles connected to and surrounding these topics, i.e. human physics, human chemistry, human thermodynamics, and hmol science.
30.	Sture Nordholm (1944-) Swedish physical chemist	1997	$F = E - Tk_B \ln W$ In his article "In Defense of Thermodynamics: an Animate Analogy", coins the subject name "animate thermodynamics" as the thermodynamics of human behavior, and argues that thermodynamic formulation can be applied to explain human behavior, on the logic that the basic elements of the description of atoms, molecules, and matter can be "scaled up" to the realm of living organisms without changes other than in complexity of the systems and their behavior, and using equation shown equates energy to wealth, kinetic energy to cash, potential energy to property, and entropy to freedom; states that nature's goal is to minimize the free energy of the subsystem; and ends with the assignment of eight example homework problems (with clues). $U = TS + W = \Psi + \lambda M + pN$

31.	Wayne Saslow (c.1941-) American physicist	1999	His “An Economic Analogy to Thermodynamics”, goes through a considerable, albeit mostly empty, derivation, wherein starts off with a 1980 study on the experimental findings of rat economic behaviors, then goes on to equates wealth *W* to negative Helmholtz free energy (-*F*), utility *U* to negative energy (-E), surplus *Ψ* to entropic energy (*TS*), price *p* to chemical potential, and number of goods *n* to number of chemical species crossing the boundary *N*; gives a thermodynamic-to-economic variables table, similar to James Reiss (1994).
32.	Josip Stepanic (1970-) Croatian physicist and mechanical engineer	2000	In his “Approach to a Quantitative Description of Social Systems Based on Thermodynamic Formalism”, outlines a toy model of social systems in thermodynamic terms (equation shown), where $\tilde{U}$ is the internal energy, $\tilde{G}$ the Gibbs potential, $\tilde{T}$ the temperature, $\tilde{S}$ the entropy, where the tilde (~) means the quantities are social “analogous quantities” to actual thermodynamic potentials, and where the $\tilde{f}_i$ denote external factors (influencing the people of the system), which influence some of the social system characteristics $\tilde{x}_i$, upon which the internal energy depends; founded the journal *Interdisciplinary Description of Complex Systems* (2003); followup articles include: “Social Equivalent of Free Energy” (2004), “Social Free Energy of a Pareto-Like Resource Distribution” (2007), among others. $\tilde{U} = \tilde{G} + \sum_i \tilde{f}_i \tilde{x}_i + \tilde{T}\tilde{S}$
33.	Jing Chen (c.1965-) Chinese-born, Canadian mathematical economist (culled from Thims)	2000	In his 2000 “Economic and Biological Evolution”, argued that economic systems are as open dissipative systems, which need to extract negative entropy from the environment to compensate for continuous dissipation; in his “Universal Natural Law and Universal Human Behavior” (2002), he argued that just as are the "lower" needs of humans, such as eating, thermodynamic processes, so too are the "higher" needs, such as literature, good poems, and distinct paintings, which are rare events, characterized by high information content, which can be represented as a low entropy level and act as methods of attracting members of the opposite sex in the competition for reproduction; thus, the display of low entropy evolved as the universal signal of attractiveness in sexual and social communication; thus, he argues, from poem writing to money making, the pursuit of low entropy is the main drive of human behavior; followed this up with “An Entropy Theory of Psychology and its Implications to Behavioral Finance” (2003), *The Physical Foundations of Economics* (2005), and “Understanding Social Systems: A Free Energy Perspective” (2008), in the latter of which he uses the Helmholtz free energy (equation shown), among others. $F = E - TS$
34.	Christopher Hirata (1983-) American physicist	c.2000	In his "physics of relationships" he outlined a chemical thermodynamic model, using a variation of the Gibbs equation (equation shown) of how single and paired students form in a typical college student body during a single school year, showing how the equilibrium constant could change per various conditions; discussed concepts such as the gay molecule or polygamy molecule, etc. $-K_B T \ln K_{eq} = \Delta E + P\Delta V - T\Delta S$
35.	David Hwang (c.1980-) American computational chemist	2001	His article "The Thermodynamics of Love" explains how one can determine whether or not any given male-female reaction is "favored" in terms of specific Gibbs free energy (equation shown), in which he makes one of the first reaction coordinates for a human chemical reaction. $G = H - TS$
36.	Gavin Ritz (1959-) New Zealand civil engineer and business school professor (culled from de Lange)	2001	In circa 1992 began theorizing on how to employ thermodynamic logic in business and social concerns; his 2001 conference presentation “Motivational Modelling” began to mention thermodynamical ideas, e.g. Ilya Prigogine, Stuart Kaufman, Nicholas Georgescu, etc., in his motivation work theory; his 2009 “The Fundamental Formula as Energy and Work” employed the relatively unknown human free energy theories of African chemist and physicist Adriaan de Lange to argue that a version of the Gibbs equation (shown), where F is Gibbs free energy, W is work, *Wo* is organical work done by living organisms (the product of *J*, mental exertion, and *T*, target time). $\Delta F < W_o + W$
37.	Alfredo Infante (c.1960-) Peruvian chemical	2001	His “Social Entropy: A Paradigmatic Approach of the Second Law of Thermodynamics to an Unusual Domain” uses advanced intelligence perspective to argue that the Gibbs free energy of a social system is the total energy in the system less the energy that is unavailable and that this difference represents the ‘state’ of the system. $G = H - TS$

	engineer		
38.	Harold Morowitz (1927-) American biophysicist	2002	In his *The Emergence of Everything*, speculated on a Gibbs free energy interpretation of the work of Pierre Teilhard on the emergence of mind from matter in terms of enthalpy (H) and bound energy or transformation content energy (–TS).
39.	Evguenii Kozliak (c.1961-) Russian-born American physical chemist (inspired by Wynn)	2002	His JCE article "Energy and Money, Chemical Bonding as Business, and Negative ΔH and ΔG as Investment", outlines a type of human thermodynamics education style of teaching, defining people as human atoms or human molecules and applies chemical thermodynamics, namely the Gibbs equation, to business (see: business thermodynamics), specifically as a way to facilitate the teaching of physical chemistry; possibly also outlining a human chemical bond theory. $\Delta G = \Delta H - T\Delta S$
40.	Ingo Muller (1937-) German metallurgical physicist and thermodynamicist	2002	In his 2002 "Socio-thermodynamics: Integration and Segregation in a Population", explains behaviors of a metaphorical population of hawks and doves using an extrapolation of logic from the thermodynamics of binary mixtures whose components mix at high temperature, but separate at low temperature exhibiting miscibility gaps; included an expanded chapter on this in his 2005 *Energy and Entropy*, in which he derives a first law, second law, and combined Gibbs equation (shown) of socio-thermodynamics, where *S* is the entropy, *U* the shortfall, *V* the volume (or habitat), *p* the "population pressure", and τ the homogeneous temperature inside the population; his 2007 *A History of Thermodynamics*, includes a section on "socio-thermodynamics", in which he states that this "subject belongs more to the future of thermodynamics than to its history", and at present is struggling to be taken seriously. $dS = \frac{1}{\tau}(dU + pdV)$
41.	John Avery (1933-) Lebanese-born Danish physicist and theoretical chemist	2003	His *Information Theory and Evolution*, attempts to explain the phenomenon of life, including its origin, evolution, and human cultural evolution, in terms of thermodynamics, statistical mechanics, and information theory; arguing that the paradox between the disorder view of the second law and highly ordered complex living systems, has its resolution in the Gibbs free energy that enters the biosphere from outside sources; built on Erwin Schrodinger's infamous "turn the discussion toward free energy" addendum, by adding to it Gilbert Lewis' 1923 Gibbs free energy of formation model, Fritz Lipmann's 1941 free energy coupling theory and John Neumann's circa 1945 free energy automaton theory; was one of the reviewers for Libb Thims' *Human Chemistry* (2007) offering the intuitive suggestion that human molecules move along paths of minimum Gibbs free energy. Co-winner of the 1995 Nobel Peace Prize. $\Delta S_{universe} = -\frac{\Delta G_{system}}{T}$
42.	Stephen Gillett (1953-) American geologist	2005	His "Entropy and its Misuse: Energy, Free and Otherwise", attempts to correct all the errors in Nicholas Georgescu-Roegen's 1971 ideas about "low entropy" in respect to natural resources and economics.
43.	Gabriel Lozada (1959-) American economicst	2005	In his article "Entropy, Free Energy, Work, and other Thermodynamic Variables in Economics", he takes aim at Stephen Gillett's theory of economic free energy, and attempts to prove, via haphazard derivation, that "free energy is *not* related to economic value".
44.	Dimitris Keranis (1948-) Greek lawyer and social-economist	2005	In his essay "Human Values and the Second Law of Thermodynamics", he argues that human purposeful action can be quantified formulaically, using the Gibbs function (as shown), arguing that energy and entropy are the two opposing forces involved in nature's tendency to organize itself through the production of work and the associated acts that are responsible for the flow of energy in social systems, of which economic activity is central aspect and in which intellectual actions, such as speech, scientific productions, poetry, and literary, etc., translate into "value flows" in the social systems, reflecting the tendency of systems toward equilibrium, through the dispersal of wealth, income redistribution, and decentralization of power, etc.; of which he argues, the flow of economic acts and value acts are captured in Xenophon Zolotas' 1981 economic and social welfare growth function. $G = H - TS$
	Mark		

45.	Janes (1973-) English chemical engineering student turned biotechnologist	2006	His carbon entromorphology theory is a human atom based scheme, which considers the human being to be a 'type of gigantic carbon atom' (Mr. Carbon Atom), and uses aspects of thermodynamics, particle physics, and the atomic model logic (molecular orbital theory) to explain facets of humanity; an example being his "soulatrophic" model of morality, in which state of humanity is positied to be evolving to a future iron-like orbital structure of stability (similar to Pierre Teilhard's omega point theory). $\Delta G = \Delta H - T\Delta S$
46.	Bertrand Roehner (1946-) French physicist	2007	His *Driving Forces in Physical, Biological and Socio-Economic Phenomena* (pgs. 74-75) touches on the premise that Gibbs energy might quantify "metastable states" socially, e.g. Tsarist Russia.
47.	Thomas Wallace (c.1937-) American physical chemist	2009	His book *Wealth, Energy, and Human Values*, applies the basics of physical chemistry and chemical thermodynamics, in particular the Gibbs equation (adjacent), to the modeling of the rise and fall of civilizations, in what he considers a 'mechanistic-thermodynamic paradigm'; contains a good appendix on "The Fundamentals of Thermodynamics Applied to Socioeconomics", which outlines a decent reaction coordinate depicted initial state / final state view of mechanism-based society reaction processes. $\Delta G = \Delta H - T\Delta S$
48.	Philip Moriarty (c.1965-) Irish thermal and nanomolecular physicist	2009	During the Moriarty-Thims debate (part one, comment #61), on the question of whether or not an arrangement of students in a field has a "thermodynamic entropy", gave the following satirical and pejorative summary of the thesis of American electrochemical engineer Libb Thims (1995) in regards to the Gibbs free energy of human molecules (people): "To suggest that your thesis is that the laws of thermodynamics "govern human existence" is a grossly misleading understatement. Your thesis (such as it is) is that there are quantum mechanical, chemical bonds between humans which can give rise to "human reactions" and that there are enthalpic/entropic contributions to a **"human" free energy function**. I was going to walk away from this - and leave you to your delusions - until your deeply unfair attack on Frank Lambert. To attempt to belittle someone in a very public forum as you did is both despicable and unforgivable." In short, according to Moriarty, a thermal physics professor of six years, to conceive that there is such a thing as a "human free energy function", such as theorized formulaically by the individuals in this table, is a "delusional" point of view?
49.	Surya Pati (1983-) Indian chemist and business management theorist	2009	Explain how single people with higher Gibbs free energy (adjacent equation) are "more restless" and thus resultantly tend to form a bond with another person to "stabilize" themselves; also speculates on how activation energy, entropy, and enthalpy apply to human relationships. $G = H - TS$
50.	Klaus Jaffe (1951-) Venezuelan chemical biologist	2016	Attempts to use Shannon entropy mixed with free energy talk to argue about complexity and synergy socially.
51.	Jacob Leachman (c.1983-)	2016	

(add overview)

Recent attempts

In 2011 article "Noisy Naming Games, Partial Synchronization, and Coarse-graining in Social Networks", American mathematicians C.C. Lim and Weituo Zhang, attempt to incorporate entropic effects in their model, and in doing so come to define Gibbs free energy as follows: [2]

> "Gibbs free energy is taken here to represent a good measure of overall social tension, arising from the ways in which different possibly overlapping subgroups choose and maintain differing opinions."

A more detailed look into the paper will be needed to better discern the validity of this approach.

In the 2012 article "Scientific Elan Vital: Entropy Deficit or Inhomogeneity as a Unified Concept of Driving Forces of Life in Hierarchical Biosphere Driven by Photosynthesis", Japanese genomics of photosynthetic organisms researcher Naoki Sato positioned to introduce the concept of "entropy deficit" (a type of entropy antonym) to be the new unified driving force of the biosphere, arguing that:

> "Although free energy is evidently the driving force in biochemical reactions, there is no established relationship between metabolic energy and spatiotemporal organization of living organisms, or between metabolic energy and genetic information."

Background	Count
Physical chemist/Chemical physicist	7
Chemical engineer	6
Thermodynamicist (Chemical/Statistical/Mechanical)	5
Chemist	4
Sociologist/Economist/Mathematician	4
Physicist	4
Physicist-Engineer	2
Physical biologist/Physiologist	2
Engineer (Materials science/Civil)	2
Philosopher	2
Psychologist	1

A work-in-progress count of the academic backgrounds of human free energy theorists (at the 39 person level).

A number of issues exist, however, in Sato's article (as discussed in his *Hmolpedia* biography), the foremost of which is that he seems to be unaware of the historical thinkers in the above table and moreover unaware of Gilbert Lewis' definition (above) of the "driving force" for isothermal-isobaric reaction conditions, a definition which is not confined to cellular reactions (reactions inside cells), but is a "universal rule" governing all freely-running reactions on the surface of the earth (those we see around us), which includes cellular, social, population dynamics, and evolution described systems. [3]

See also

â— Human free energy table
â— Hwang free energy principle

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (human free energy, pg. 465). Morrisville, NC: LuLu.
2. Lim, C.C. and Zhang, Weituo. (2011). "Noisy Naming Games, Partial Synchronization, and Coarse-graining in Social Networks" (abs), *Network Science Workshop*, June, pgs. 25-29.
3. Sato, Naoki. (2012). "Scientific Elan Vital: Entropy Deficit or Inhomogeneity as a Unified Concept of Driving Forces of Life in Hierarchical Biosphere Driven by Photosynthesis" (abs), *Entropy*, 14(2): 233-51.
4. Schroeder, Daniel V. (2000). *An Introduction to Thermal Physics* (pg. 150). Addison Wesley Longman.

Further reading

â— Jantsch, Erich. (1975). *Design for Evolution: self-organization and planning in the life of human systems* (human free energy, pg. 103). G. Braziller.

External links

â— Free energy and economic resources (2011) – AndrewGelman.com.
â— Economic free energy (2011) – Entsophy.net.

θΔics

In human thermodynamics, **human free energy of formation** or free energy of formation of a human at standard state is the standard Gibbs free energy of formation of a given individual human molecule (person) or human molecular configuration, such as a society (bound state of humans), or couple (dihumanide molecule), etc., in a given state of existence (time) (existence state), or newly formed adult, such as during the point of detachment synthesis (birth), as would be listed on a standard free energy table (or human free energy table); in short, it is a summation of the past energies and entropies that went into the formation or synthesis of a given human in a given state of existence.

An artistic rendition of relationship between **Gibbs free energy** *G* and the **formation**, "creation", or synthesis of a **human** (human molecule) from **standard** state atoms and molecules of the periodic table and earlier earth conditions; from American physicist Daniel Schroeder's 2000 *Thermal Physics* textbook, who comments: [2]

> "To create a [human] out of nothing and place it on the table, the magician need not summon up the entire enthalpy, $H = U + PV$. Some energy, equal to TS, can flow in spontaneously as heat; the magician must provide only the difference, $G = H - TS$, as work."

The original text and depiction, to note, showed a "rabbit", but, nevertheless, the same principles apply.

Sales

In 1789, French philosopher Jean Sales, outlined the basic idea that each person was formed during a great process, involving a large number of mechanistic steps, from the atoms of the earth:

> "We conclude that there exists a principle of the human body which comes from the 'great process' in which so many millions of atoms of the earth become many millions of human molecules."

This premise constitutes what is called the "human molecular hypothesis" (akin to the atomic hypothesis).

Goethe

In 1831, German polymath Johann Goethe outline the complexities behind the notion of attempts at calculating a "human free energy of formation", although discussed in the language of "chemical affinities" A, which relates to free energy G, via the Goethe-Helmholtz equation; in letter to his friend, German composer Carl Zelter, Goethe stated: [1]

> "What man, what society dare express such sentiments? seeing that we cannot easily known anyone from his youth up, nor criticize the rise of his activity. How else does character finally prove itself, if it is not formed by the activity of the day, by reflective agencies which counteract each other? Who would venture to determine the value of contingencies, impulses, after-effects?
>
> Who dare to estimate the influence of elective affinities?
>
> At all events, he who would presume to estimate what man is, must take into consideration what he was, and how he became so. But such barefaced pretension are common, and we have often enough met with them; indeed they are always recurring, and they must be tolerated."

In other words, the energies and entropies of events, reactions, activities, etc., that precede a person need to be accounted for in the "estimation" of the free energy of formation of a given person in a given state.

Bridgman

In 1946, American physicist Percy Bridgman, during the famous 1946 Harvard "what is life in terms of physics and chemistry?" debate, raised the following objection:

> "How can we compute or even evaluate the entropy of a living being? In order to compute the entropy of a system, it is necessary to be able to create or to destroy it in a reversible way. We can think of no reversible process by which a living organism can be created or killed: both birth and death are irreversible processes. There is absolutely no way to define the change of entropy that takes place in an organism at the moment of death."

In other words, although an animate thing, such as a rabbit or a human has an entropy, we paradoxically (see: Bridgman paradox) may not be able to calculate, compute, or evaluate it exactly or even approximately. The entropy of an animated thing is needed before the free energy of formation of the thing can be calculated.

Dolloff

In 1975, Norman Dolloff, in his *Heat Death and the Phoenix*, gave the first formulaic synopsis of the idea that each organism as a Gibbs free energy of formation:

$$\sum n_i \rightarrow \text{organism}; \Delta G_R^\circ = +; \Delta S_R^\circ = -$$

the following what might be called "organism synthesis equation". Dolloff can be classified as the transition point mindset of someone grappling to switch from the entropy "order/disorder" model of everything to the "free energy" model of everything; all done in the framework of explicit atheism.

Goldstein

In 1993, American physical chemist Martin Goldstein penned a chapter section entitled the "Entropy of a Mouse", wherein he outlined the idea of what is means for a animate chemical species or for that matter a so-called animate entity, such as a mouse (or a human) to have a free energy value in a given state: [3]

> "To apply thermodynamics to the problem of how life got started, we must ask what net energy and entropy changes would have been if simple chemical substances, present when the earth was young, were converted into living matter [as in the formation of a mouse] … to answer this question [for each process], we must determine the energies and entropies of everything in the initial state and final state."

American physical chemist Martin Goldstein, in his 1993 section "Entropy of a Mouse", argues that to determine the free energy of formation of a mouse, we need to ask: [3]

> "What net energy and entropy changes would have been if simple chemical substances, present when the earth was young, were converted into [the mouse]. To answer this question, we must determine the energies and entropies of everything in the initial state and final state."

This very same logic, by extrapolation, can be applied to humans, in the calculation of the **standard human free energy of formation**.

In other words, the as seen on the affinity table page, showing the Gibbs free energies of

formation for different biochemical species, such as Fructose (218 kgcal), molecular formula $C_6H_{12}O_6$, gives way to the idea that this logic can be extrapolated upward to calculate the standard Gibbs free energy of formation for different types of proto-life entities, chemicals, or molecules, such as a mouse.

The above logic, as outlined by Goethe and Goldstein, that one can calculate the elective affinities or, the modern equivalent, the energies and entropies of the reaction mechanism steps involved in the formation or synthesis of an animated entity such as a mouse, gives way to the view that each person can be viewed, likewise, as a "molecule" (human molecule) or chemical species (human chemical species) with a measurable human molecular formula, as has been recently calculated (Sterner and Elser, 2000; Thims, 2002, *New Scientist*, 2005).

Schroeder

In 2000, American physicist Daniel Schroeder, in his *Thermal Physics* textbook, stated the following view: [2]

> "To create a [human] out of nothing and place it on the table, the magician need not summon up the entire enthalpy, $H = U + PV$. Some energy, equal to TS, can flow in spontaneously as heat; the magician must provide only the difference, $G = H - TS$, as work."

(add discussion)

Thims

In 2007, American electrochemical engineer Libb Thims, in his *Human Chemistry* textbook, outlined the basics of the idea of the "human free energy tables", as a subject to be worked out in the future; the first stepping stone of which is to study the approaches (and pitfalls) of the 500+ thinkers on the HT pioneers timeline-table, so to get basic framework as to how people historically have attempted to calculate the energies, entropies, internal energies, enthalpies, temperatures, pressures, volumes, and free energies of humans.

Issues

A number of salient issues arise in this framework, one being the notion of standard state, namely that if the reaction is traced back through evolutionary time, starting say at about the moment of the nebular hypothesis, pressures and temperatures would not have been at standard state.

References

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θΔics

In hmolscience, **human free energy table**, or “human thermodynamic data table”, is a thermodynamic data table that lists the enthalpy of formation, Gibbs energy of formation (see: human free energy of formation), and entropy of each person in a given formation state of existence, of a given social system of people, country, and and or the global population. [1]

Chemical Species | Human

SUBSTANCE	FORMULA	ΔH_f° (kJ/mol)	ΔG_f° (kJ/mol)	S°(J/K · mol)
Liam (m)	CH_3COOH	−484.2	−389.45	159.83
Emma (f)	CH_3CHO	−166.35	−139.08	264.2
Noah (m)	CH_3COCH_3	−246.8	−153.55	198.74
Olivia (f)	C_2H_2	226.6	209.2	200.8
Sophia (f)	C_6H_6	49.04	124.5	172.8
Mason (m)	C_2H_5OH	−276.98	−174.18	161.04
Ethan (o)	C_2H_6	−84.7	−32.89	229.49
Logan (m)	C_2H_4	52.3	68.1	219.45
Isabella (f)	$HCOOH$	−409.2	−346.0	128.95
Lucas (m)	$C_6H_{12}O_6$	−1274.5	−910.56	212.1
Mia (f)	CH_4	−74.85	−50.8	186.19
Charlotte (f)	CH_3OH	−238.7	−166.3	126.78
Oliver (m)	$C_{12}H_{22}O_{11}$	−2221.7	−1544.3	360.24

Above is a mock “**human free energy table**” showing the thermodynamic data quantities for a selection of 13 hypothetical people, wherein the names of the “organic substances” from Raymond Chang’s 1998 thermodynamic data table (Ñº) have been replaced with a random selection of popular 2015 baby names (Ñº), shown with the symbol male (m), female (f), or other (o). As of 2000, human molecular formulas have been calculated; and attempts, historically, a smattering of attempts have been made at gauging the other variables: ΔH°f (human enthalpy), ΔG°f (human free energy), and S° (human entropy), albeit not in “mol” units, as “hmol” is a near-virgin theoretical concept.

Overview

In 1946, Percy Bridgman, amid the Harvard "what is life debate?", stated his so-called Bridgman paradox, i.e. that one theoretically cannot calculate thermodynamic data variables for animals or humans, because to do so, one would have to "destroy" the organism; Bridgman's statement on this as as follows: [2]

> “How can we compute or even evaluate the entropy of a living being? In order to compute the entropy of a system, it is necessary to be able to create or to destroy it in a reversible way. We can think of no reversible process by which a living organism can be created or killed: both birth and death are irreversible processes. There is absolutely no way to define the change of entropy that takes place in an organism at the moment of death.”

In 1957, English electrical engineer and physicist Keith Burton made the first thermodynamic table for so-called "biochemical species", showing the free energy of formation for about 100 biochemical species. [4]

In 1975, Norman Dolloff, in his *Heat Death and the Phoenix*, gave the following what we might call "organism synthesis equation":

$$\sum n_i \rightarrow \text{organism}; \Delta G_R^\circ = +; \Delta S_R^\circ = -$$

where Σn_i represents the “sum of simpler chemical species”. This, +/- signs (of Gibbs energy change) aside, seems to be one of the first coherent attempts at stating that humans have a Gibbs free energy of formation, i.e. a human free energy of formation.

In 1993, Martin Goldstein discussed the difficulties involved in calculating the entropy of a mouse, via the standard procedures used to calculate the entropies of simple molecules; the following is a condensed excerpt his discussion: [1]

> “To apply thermodynamics to the problem of how life got started, we must ask what net energy and entropy changes would have been if simple chemical substances, present when the earth was young, were converted into living matter [as in the formation of a mouse] … to answer this question [for each process], we must determine the energies and entropies of everything in the initial state and final state.”

In circa 1995, American electrochemical engineer Libb Thims, as a student in his chemical thermodynamics engineering class, conceived of the idea of people reacting together would fit on a standard thermodynamic data table; the notion was largely a curious puzzle at this point (see: Thims thought experiment), and for some years; the following is a mock rendition of this conceptual thought experiment:

Lewis Free Energy Table

TABLE OF FREE ENERGIES

TABLE OF STANDARD FREE ENERGIES OF FORMATION AT 25°C

NON-METALLIC COMPOUNDS AND ANIONS

Substance	$\Delta F°_{298}$	Equation	Substance	$\Delta F°_{298}$	Equation
H(g)	37730	XXXIII-2	H_2(g)	0	
O_1(g)	0		H_2O_2(g)	−24730	XXXIV-49
O_3(g)	32400	XXXIV-4	H_2O_2(l)	−28230	XXXIV-47
H_2O(g)	−54507	XXXIV-23	H_2O_2(s)	−27980	XXXIV-48
H_2O(l)	−56560	XXXIV-20	H_2O_2(aq)	−31470	XXXIV-39
H_2O(s)	−56418	XXXIV-25	HO_2^-	−15610	XXXIV-41
OH^-	−37455	XXXIV-28			
Cl(g)	32400	XXXV-2	HCl(aq)	−31367	XXXV-7
Cl_2(g)	0		Cl^-	−31367	XXXV-7
Cl_2(g. 1 at.)	−6	XXXV-1	HClO(aq)	−19018	XXXV-16
Cl_2(l)	1146	XXXV-3	ClO^-	−6500	XXXV-17
Cl_2(aq)	1650	XXXV-4	$HClO_3$(aq)	−250	XXXV-19
Cl_2(in CCl_4)	1030	XXXV-6	ClO_3^-	−250	XXXV-21
HCl(g)	−22692	XXXV-10			
Br(g)	18250	XXXVI-6	HBr(aq)	−24595	XXXVI-17
Br_2(g)	755	XXXVI-1	Br^-	−24595	XXXVI-15
Br_2(l)	0		Br_3^-	−25230	XXXVI-19
Br_2(s)	314	XXXVI 7	HBrO(aq)	−19680	XXXVI-21
Br_2(aq)	977	XXXVI-11	$HBrO_3$(aq)	2300	XXXVI-23
Br_2(in CCl_4)	389	XXXVI-9	BrO_3^-	2300	XXXVI-23
HBr(g)	−12540	XXXVI-14			

↔

Thims Free Energy Table

Reaction #	A	+	B	→	C	ΔG (MJ/hmol)
1	Thims	+	Lisa | 5.0	→		-80
2	Thims	+	Sarah | 6.2	→		+25
3	Thims	+	Jessica | 6.1	→		0
4	Thims	+	Fay | 5.6	→		+10
5	Thims	+	Tina | 7.2	→		-20

(add discussion)

In 2000, Daniel Schroeder, in his *An Introduction to Thermal Physics*, included a diagram, a human-modified version shown adjacent, that explains the "creation" of a rabbit (or human) in chemical thermodynamic terms, namely that: [3]

> "To create a rabbit [or human] out of nothing and place it on the table, the magician need not summon up the entire enthalpy, $H = U + PV$. Some energy, equal to TS, can flow in spontaneously as heat; the magician must provide only the difference, $G = H - TS$, as work."

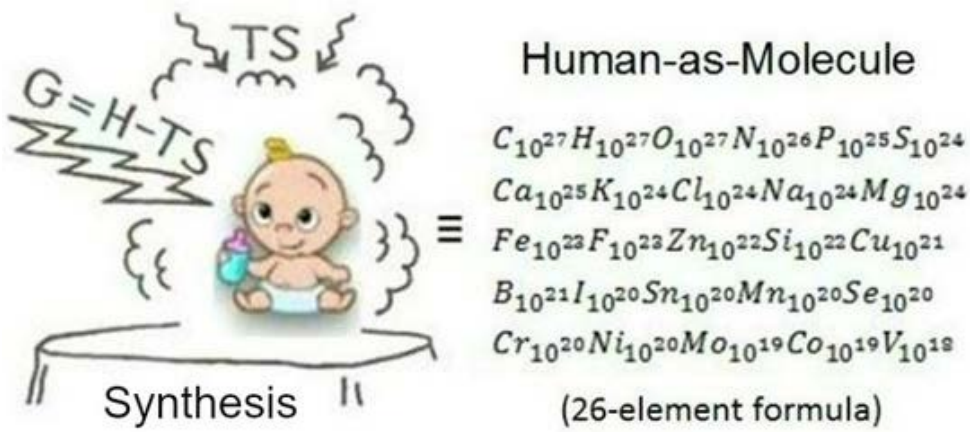

An artistic rendition of Daniel Schroeder's 2000 diagram showing that synthesis a human, all one needs is to is to add a certain amount of "energy, equal to *TS*, [which] can flow in spontaneously as heat" into the system, thereby allowing for a negative free energy of formation. [3]

In 2007, Libb Thims, in his *Human Chemistry*, following dialogue on the near trivial simplicity of Helen Fisher and her four personality type pair matching scheme at Chemistry.com dating site, outlined the future idea of a human free energy table; as follows: [1]

> "In human chemical terms, however, the only true way to find the absolute most reactive pure match is by constructing a free energy table of the world's population. This would be analogous to Goethe's affinity table of 1809. Moreover, through the use of chemical kinetics, one can also pre-determine how fast reactions will go, when certain love reactions will end, which pairs will debond, etc.
>
> In the future, science will be able to tell a young child, for example, that he or she, based on their human molecular data sets, will be predisposed with the tendency to have three to five main love reactions in the course of their life or conversely that he or she will be predisposed with the tendency towards having one main love reaction lasting through their life course. These reaction predictions, of course, will depend on the human molecules involved."

Then, following digression on how affinity tables (Geoffroy, 1718) turned into free energy tables (Lewis, 1923), Thims stated:

> "In the coming millennium, we propose that someone will construct a digitized, complete, and exacting world encompassing, human affinity table, updated on the microsecond, able to categorize the rapports of billions of human molecules. That is, it will be possible for a willing and interested person to consult human affinity tables, or technically '**human thermodynamic tables**', to see the energetic rankings of those human molecules with which he or she will be most apt to bond to or react with, as well as those human molecules for which chemical reactions would be extremely disfavored. The time, frustration, and mental repercussions of having gone through malformed, non-favored, or troubled reactions will be spared.
>
> Once the inquisitive user puts themselves in the physical proximity of the other, the reaction would be irresistible. For the most intimate of personal reactions, one will be able to select the most chemically and thermodynamically matched person on the face of the earth to react with, such that no other human molecule would have the power or affinity to displace the one most potent, at least within the equilibrium confines the reaction window."

Thims, to note, at this point, above, however, was not exactly clear that reactions are both thermodynamically controlled AND kinetically controlled, i.e. the timing and trajectories have to be "right" as well has being thermodynamically favored.

Human affinity table

See main: Human affinity table

In 1796 to 1808, German polyintellect Goethe made a conceptual "affinity table" of reacting people for his Bergman-based novella *Elective Affinities* (1809), aka the Goethe affinity table, which is shown below, itself built from the physical chemistry principles of the Bergman affinity table (1775), which is based on and derived from logic and principles of the Geoffroy affinity table (1718), which in turn derive from the principles and logic Newton's last and final "Query 31":

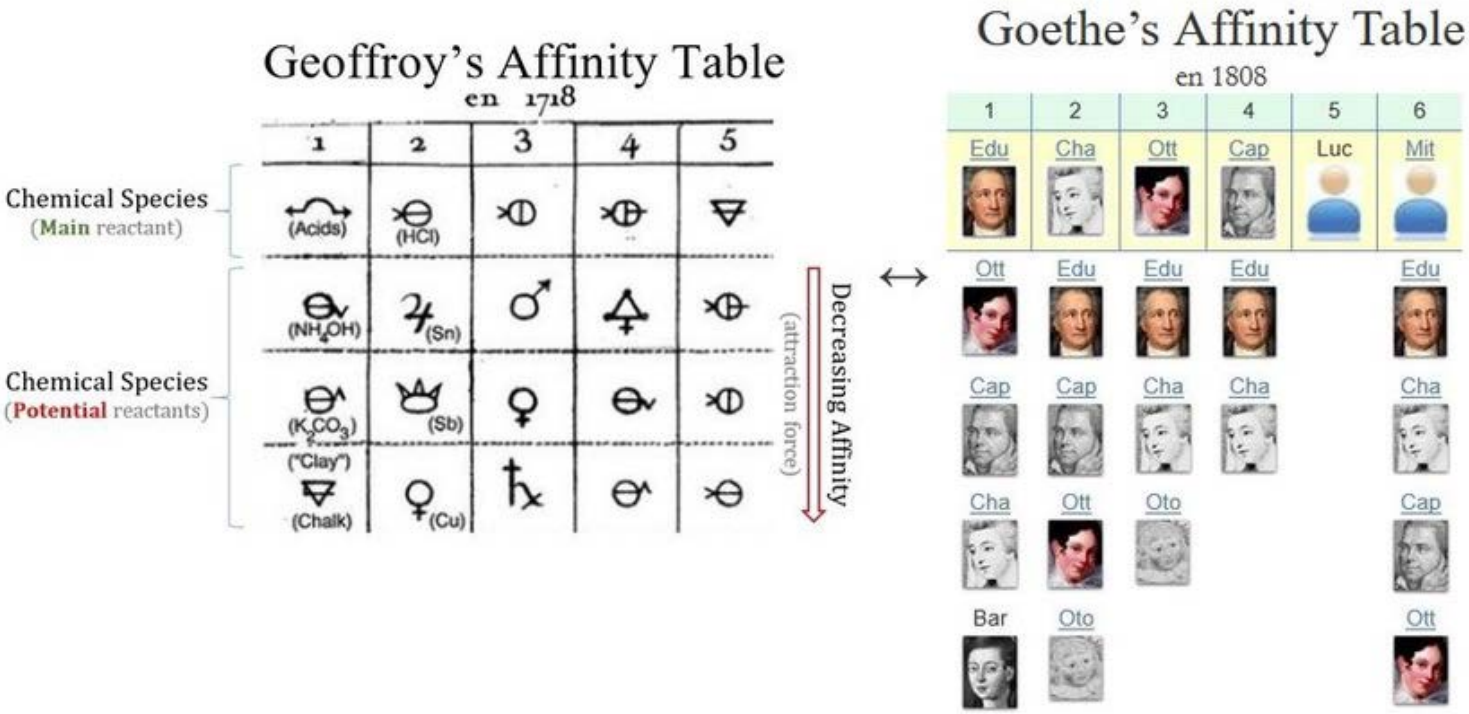

Goethe, in short, suppositioned that every person on the planet can be ordered on an affinity table, each person's reaction tendencies ordered with respect to everyone else on the planet, in decreasing order, one has to thereby have an deep understanding the the 1876 chemical thermodynamics work of Willard Gibbs, being that Gibbs energy is the modern way of measuring elective affinities, i.e. the micro attractions and repulsions between people (or chemicals), as proved by Helmholtz in his 1882 "On the Thermodynamics of Chemical Processes"; which is about what Libb Thims did as explained previously.

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θΔics

In science, the **human intermaxillary bone** refers to the premaxilla bone anterior to the maxilla bone found in the upper jaw of amphibians, reptiles, and mammals. [1]

Etymology

The term “intermaxillary bone” was introduced by German physician Johann Blumenbach (1752-1840). [1] Synonyms include: premaxillary bone, os incisivum, os intermaxillare (Os intermaxillary), premaxilla, and Goethei. [8] The discovery of the bone in humans is generally credited to German polyintellect Johann Goethe (1784); although, to note, recent research has shown that Frenchman naturalist Pierre Broussonet (1779) and physician Vicq d'Azyr (1780) also, independently, using different methods, identified the intermaxillary bone. [8]

Evolution

In the mid-18th century, Dutch physician Petrus Camper (1722-1789) proposed the Biblically-friendly theory, which quickly became dogma, that the anatomical difference between man and animal was the missing intermaxillary bone in man, this being the distinguishing feature between man and monkey. [2]

Against the prevailing Camper theory, German polyintellect Johann Goethe, found, by "reflection and coincidence", the intermaxillary bone in the human skull, thus giving anatomical evidence of an evolutionary connection between man and animals. Goethe pronounced his discovery in a missive to his associate Johann Herder from Jena, 27 March 1784, at night:

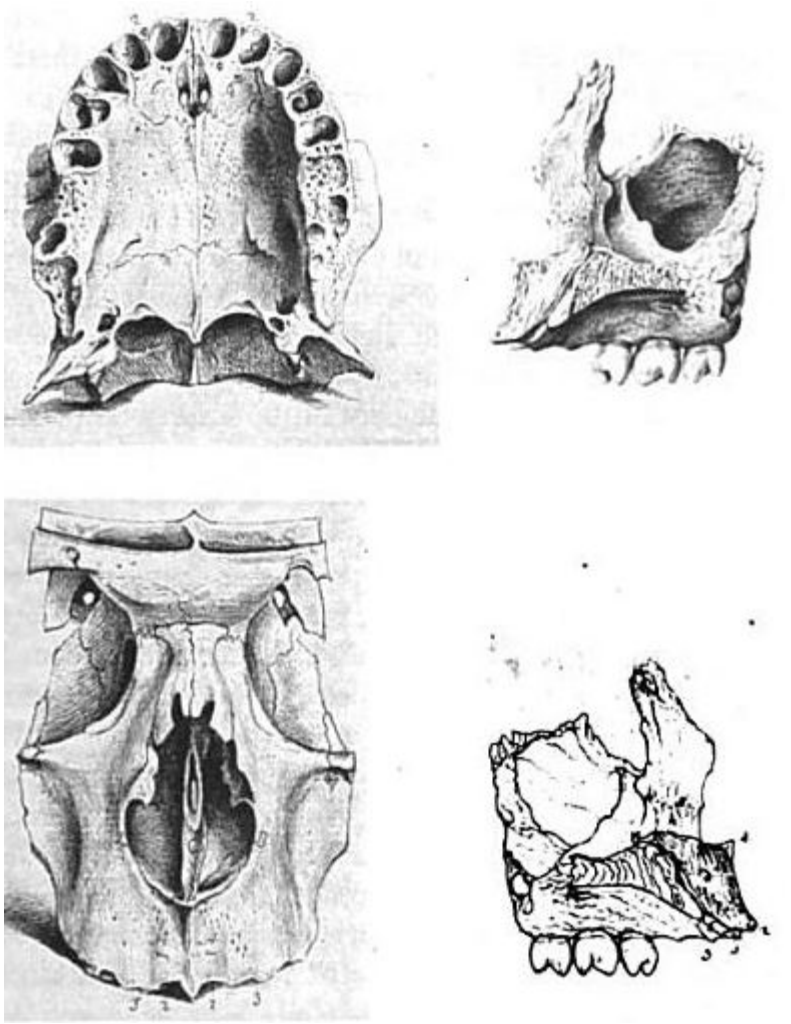

Four images showing a tree-dimensional view of the **intermaxillary bone** of the **human** skull. Other figures from Goethe’s collection shown the same arrangement in the skull of an ape and in a variety of domesticated and wild animals. [5]

> “I have found neither gold nor silver, but something that unspeakably delights me—the **human Os intermaxillary**! I was comparing human and animal skulls with Loder, hit up the right track, and behold—Eureka! Only, I beg of you, not a word—for this must be a great secret for the present. You ought to be very much delighted too, for it is like the keystone to anthropology—and it’s there, no mistake! But how?”

This certified in Goethe the belief that there is no fundamental difference whatsoever between man and apes a theory that Herder would expound upon in his *Ideas for the Philosophy of History of Humanity* (1784–91). [9]

The premaxillae show an increasing tendency in the primate line of evolution to fuse with the maxillae and at the same time to become relatively reduced in size. In humans they can be recognized in the embryo, but in the normal adult skull they tend to have lost their separate identity.

To present his anatomical discovery to Camper, Goethe choose to use as an intermediary his good friend German author Johann Merck (1741-1791) who was in contact with Camper. [4] But Merck delayed the requested forwarding of the manuscript, belittled Goethe and the significance of his treatise considerably in an accompanying letter, did not forward Camper's replies, and in the meantime even took advantage of Goethe's treatise for his own publications. It was only late that Goethe became aware of the scheming and mean behavior of his "good friend", and he felt disappointed and betrayed by Merck.

A 1920 rendition of Goethe searching for an discovering the **human intermaxillary bone**, by Russian artist Dmitrievich Ezuchevsky (1880-1928). [7]

Author S. Hellmich (1982) argues that this evil doing of Merck, in part, went into the character of Mephistopheles—the spirit who always plans evil and always denies—of Goethe's *Faust*. [2]

Goethe held back the publication of his studies *On the Premaxilla of Humans and Animals* (*Über den Zwischenkiefer des Menschen und der Tiere*) for decades; publishing his results in 1820 as part of his fourteen volume collected scientific papers. [3] Three sketches of the human intermaxillary bone were published by Goethe in 1831 (volume 15, part 1, *Nova Acta Leopoldina*). [1]

According to Carl Becker, as discussed in his 2003 book *A Modern Theory of Evolution*, Goethe had "discovered the evolution of the human being from the ape", a concept that prior to him had only existed as a metaphor in occult tradition: the ape representing man untransformed by alchemy. [6]

Other

In 1965, German evolutionary biologist (powered chnopsologist) Wolfgang Schad (Ñº), in his "Damming in the Human Skeleton", expanded on Goethe's intermaxillary bone work, via comparison with embryology and sheep skulls.

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θΔics

In science, **human machine**, which is nearly synonymous with the "human motor", refers to the consideration or modelling of a human as a machine, views about which vary per century, from the pressure-driven automatons of ancient Greece, to comparisons humans to neurological-like watermills in the 18th century, to the late 19th century views of treating works as machines and attempting to get optimal efficiency out of them, to the computerized terminator premises of the modern day. [1]

A human automaton, with gears exposed, a **human machine** example. [4]

Overview

In 1637, French natural philosopher Rene Descartes introduced the dominant version of the animal machine hypothesis. Descartes, in his *Meditations* (1641), gave his view as follows: [6]

> "The bird or dog which we imagine as it flies or runs, that its act is conducted by thinking, willing and so on, is not so actuated. Its movements are in truth just the running of a wound-up clock. So likewise with many of our motions, yours and mine. And as a clock composed of wheels and weights observes not less exactly all the laws of nature when it is ill-made and does not tell the house as well as when it is entirely to the wish of the workman, so in like manner I regard the **human** body as a **machine** so built and put together of bone, nerve, muscle, vein, blood and skin, that still, although it had no mind, it would not fail to move in all the same ways as at present, since it does not move by the direction of its will, nor consequently by means of the mind, but only by the arrangement of its organs."

In his post-humorous *Of Men* (*De Homine*), Descartes gives his final views on the matter: [6]

> "I repeat I want you to regard these functions as taking place naturally in this **machine** because of the very arrangements of its parts, neither more nor less than do the movements of a clock or other automaton from the weights and wheels, so that there is no need on their account to suppose in it any soul vegetative or sensitive or any principle of life than its blood."

French inventor Jacques Vaucanson famously made a 1737 flute player automaton and in 1738 a tambourine player and digesting duck automaton.

In 1747, French physician-philosopher Julien la Mettrie, inspired by Vaucanson's automaton's wrote, in his *The Human Machine*, the following: [2]

> "It thus appears that there is but one type in the universe, and that man is the most perfect example. He is to the ape, and to the most intelligent animals, as the planetary pendulum of Huygens is to a watch of Julien Leroy. More instruments, more wheels, and more springs were necessary."

In the 1850s, German physicist Gustave Hirn conducted experiments where he treated or modeled the human as a machine and attempted calculation of the mechanical equivalent of heat of humans.

In 1950, American mathematician Norbert Wiener commented the following:

> "Certain analogies of behavior are observed between the **machine** and the living organism, the problem as to whether the machine is alive or not is, for our purposes, semantic … if we use the word 'life' to cover all phenomena which locally swim upstream against the current of entropy, we are at liberty to do so; however, we shall then include many astronomical phenomena … it is my opinion, therefore, best to avoid all question-begging epithets such as 'life', 'soul', 'vitalism', and the like, and say merely that machines [and] human beings [are] pockets of decreasing entropy in a framework in which the large entropy tends to increase."

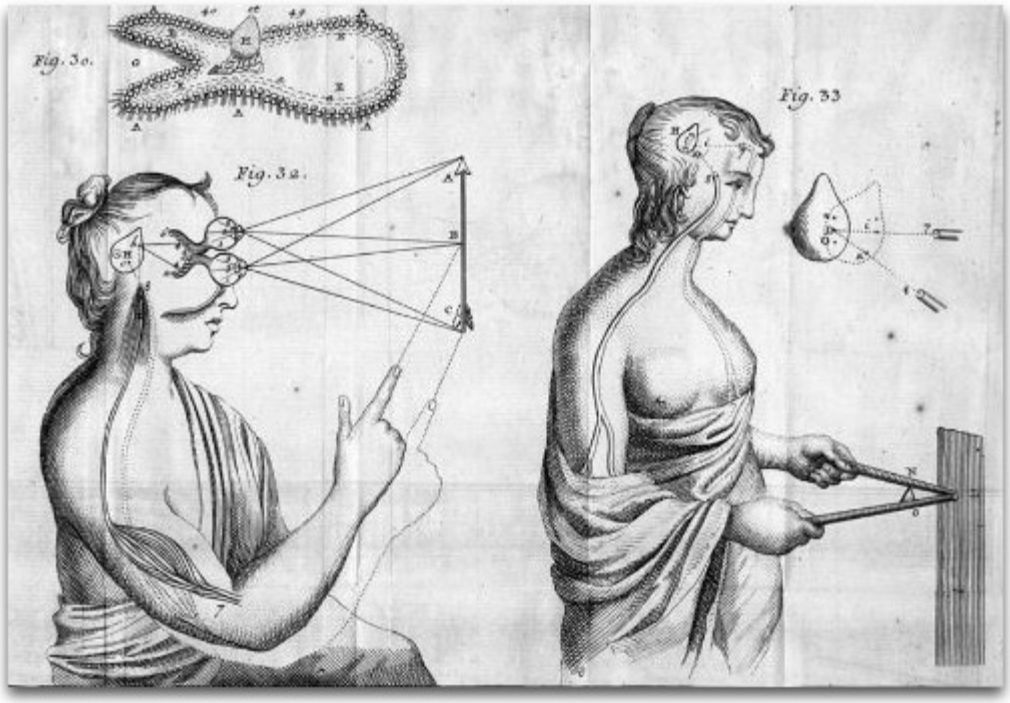

A diagram of French natural philosopher Rene Descartes' machine view of the human.

Here one can begin to see a glimpse of the thermodynamics-based human molecule point of view, aka human chemical thermodynamics, which would eventually supplant the human machine model, namely that once one, in the post-1990s years, during which time human mass composition data sets and tables began to become readily available, begins to dig into the query of applying entropy, enthalpy, and free energy analysis to human movement, the model of a human as a reactive chemical structure comes quickly to the fore.

Psychology

In 1897, Russian physiologist Ivan Pavlov published his *The Work of the Digestive Glands*, and soon thereafter, circa 1901, developed his "conditional reflex" stimulus response bell-ringing / salivating theory of digestive behavior in dogs. In 1913, building on Pavlov's model, American psychologist John Watson founded the so-called behaviorism school with the publication of his "Psychology as the Behaviorist Views It", wherein he argued that there is no dividing line between man and brute, that behaviorist psychology can be viewed as an objective experimental branch of natural science wherein structure is explained in physico-chemical terms, whereby the theoretical goal is prediction and control of behavior, and in which generally he outlined a outlined a machine-like reflex-arc model of behavior:

> "That the organism is a **machine** is taken for granted in our work. The only point we insist upon is that the machine be made not too simple to perform the multitudinous demands which the behaviorist must take upon it. There has been a strong tendency on the part of the biologists to assume that the mechanisms are exceedingly simple."

This is what is sometimes called machine-like deterministic behavior, according to which the human is viewed as a machine, albeit one not too simple, wherein, in Watson's view, the "findings of psychology become functional correlates of structure and lend themselves to explanation in physicochemical terms." [5]

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θΔics

In science, **human mathematics** is the study or use of pure mathematics or mathematical theory applied to humans, human behavior, or problems, phenomena, or subjects in the humanities.

An equation overlay artisitic depiction of **human mathematics**: the application of mathematics to questions of human concern, such as how the mind operates, love, economics, morality, etc.

History

In *circa* 1845, Scottish mathematical physicist and engineer William Rankine penned "The Mathematician in Love".

In 1854, English mathematical philosopher George Boole (1815-1864) published his *An Investigation of the Laws of Thought on Which are Founded the Mathematical Theories of Logic and Probabilities*, in which he utilized Boolean logic to example human thought processing operations.

In 1881, Irish mathematical economist Francis Edgeworth published his *Mathematical Psychics: An Essay on the Application of Mathematics to the Moral Sciences*, the beginning of his long career in the subject, is said to be book was notoriously difficult to read, outlines a "tentative study" of the creative applications of mathematics to economic or moral issues. Edgeworth aruges that mathematical *psychics*, or rather 'psychological mathematics' (or mathematical psychology) in a modern sense, can be divided into pure and applied, wherein he attempts formulation on concepts such as a quantity of pleasure, principles of maximum energy, and a calculus of feeling, among others.

In circa 1972, American mathematical psychologist John Gottman applied mathematics to the study of marriage dynamics.

Strogatz

In 1986, American applied mathematician Steven Strogatz completed his PhD at Harvard in with a dissertation on the "The Mathematical Structure of the Human Sleep-wake Cycle". [1]

Strogatz followed this up with the 1988 article "Love Affairs and Differential Equations", wherein he does some of the first differential equation formulation for the equation of love and in which he explains how he teaches students about ordinary coupled differential equations using examples of variations of levels or ratios of love and hate, similar to the Gottman stability ratio, in Shakespeare-style Romeo and Juliet type relationships. [2] Much of Strogatz' applied human mathematics logic is presented in his 2003 book *Sync: the Emerging Science of Spontaneous Order*, in which he attempts to explain things such as "synchronal or simultaneous flashing of fireflies", why women roommates often find their menstrual cycles to sync, the triggering of riots, fads, and mass hysteria, to the synchronicity of the solar system in possible relation to dinosaur extinction, among other subjects. [3]

In 2009, Strogatz published "Energy Landscape of Social Balance", in which he and his colleagues, Seth Marvel and Jon Kleinberg, to take a stab at deriving a mathematical version of a "social energy landscape", the synopsis of which is: "the shifting of alliances and rivalries in a social group can be viewed as arising from an energy minimization process." [4]

Other

In 2010, Spanish mathematical economist Jose-Manuel Rey published his "A Mathematical Model of Sentimental Dynamics Accounting for Marital Dissolution", which builds on the work of John Gottman, to attempt to formulaically and graphically explain marital dissolution using a metaphorical version of the second law to indicate that "indicate that the feeling of

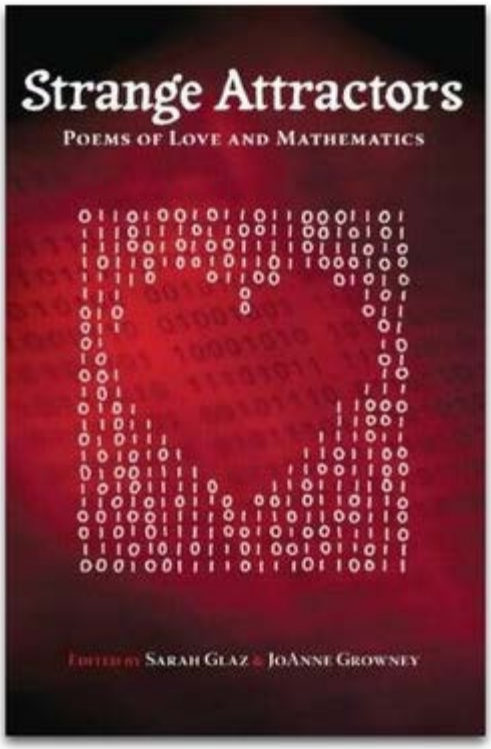

The 2008 book *Strange Attractors*, a collection of historical poems, over the last 4000-years, on the overlap of love and mathematics. [5]

attachment in a relationship 'cools down' (thermal word) as time evolves—unless energy in form of effort is supplied to keep things alive."

See also

- HM pioneers
- The Mathematician in Love

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θΔics

In science, a **human mole** is one molar unit of humans or human molecules.

The actual agreed upon number for the of one human mole is not yet solidified, but it is assumed to be above that of the Dunbar number.

See also

- Mol
- Hmol
- Hmol science
- Human molar
- Human molecular science
- Human molecular
- Hmolpedia

Further reading

- Thims, Libb. (2007). *Human Chemistry (Volume Two)* (hmol, pg. 686). Morrisville, NC: LuLu.

θΔics

In science, **human molecular**, a conjunction of ‘human molecule’, the atomic definition of a person, and ‘-ar’, meaning ‘of or relating to’, refers to terms and topics related to the subject of the human molecule.

The two main human molecular subjects being human chemistry, defined in 1875 by American scientist Henry Adams as ‘the study of the attraction and repulsion of equivalent human molecules’, and human thermodynamics, defined in 1952 by English physicist C.G. Darwin as ‘the study of systems of human molecules’.

See also

- Molecular evolution table
- Human molecular orbital
- Human molecular formula
- Human molecular spin

Further reading

- Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (ch. 2: "The Human Molecule", pgs. 15-35). Morrisville, NC: LuLu.
- Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (Ch. 16: "Human Thermodynamics", pgs. 653-702, definition, pg. 653), (preview). Morrisville, NC: LuLu.
- Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc). LuLu.

θΔics

In engineering, **human molecular engineering** is study and application of the hmolsciences, namely human thermodynamics, human chemistry, human physics, and human mathematics, to the engineered design of human affairs and arrangements, with the implicit assumption that humans are "molecules", which can, in theory, be successfully engineered, or social engineered, similar to that which has been done successfully in molecular engineering at the nanoscale.

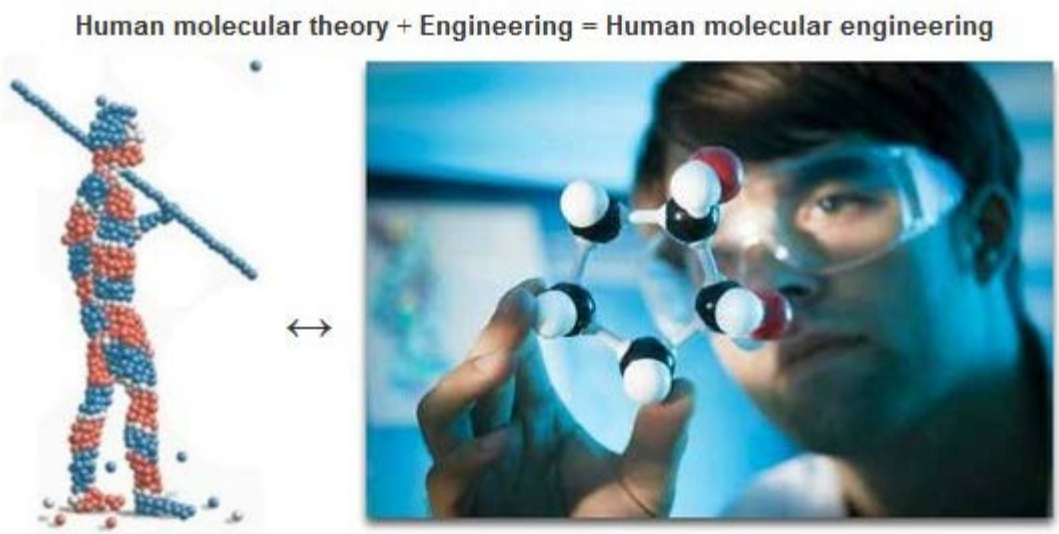

A depiction of **human molecular engineering**: the application of the principles of engineering, in particular chemical engineering (right), to design and study of human molecules (left), a CPK human molecule shown, and their social combinations; a subject that tending towards the use of the extrapolate up approach.

The following 1921 view by English radiochemist Frederick Soddy, from the opening of his lecture on Cartesian economics, gives a cogent angle into the ideal nature of human molecular engineering: [1]

> "It is just because the application of the every-day principles of **engineering** to the animate engine [humans] offers such a powerful corrective to the make-believes of the economic systems of society that I have ventured to address you on the subject."

namely the application of engineering principles—chemical engineering principles in particular—to humans, economically and socially, which he now define as "animate molecules" or human molecules, as opposed to the older animate engine classification scheme, which as of 2011 is now the standard engineering thermodynamics textbook definition of human. [15]

Early views

In human molecular engineering, people are explicitly defined as "molecules" or specifically 26-element, human molecular formula based, reactive-animate "human molecules". Human molecular engineering, as compared to "molecular engineering", which is the design and manufacture of molecules at the nanoscale, can be qualified as molecular engineering at the human molecular scale. [5] The following 1922 comment by self-defined "human chemist" American editor Thomas Dreier might well capture some of the theme of human molecular engineering, though in rather simple terms: [6]

> "It flashed into my mind the other night that an executive is like a chemist. He has a laboratory stocked with seventy-eight elementary chemicals. With that stock he can make absolutely every substance needed in his daily life if he possesses the necessary knowledge to combine the elements."

Drier here conceiving of people as different types of reactive "chemicals" or "human chemicals" analogous elements of the periodic table; he would later go onto consult with Harvard chemist Gustavus Esselen (*We Human Chemicals*, 1948) on these theories. This was a common mindset in the early 20th century. The same usage can be found in English-born American chemical engineer and industrial executive William Fairburn, who in his 1910 booklet *Human Chemistry*, in indoctrinated the science of "human chemistry", which he defined as the analysis and synthesis of the reactions resulting from combinations of human chemical elements (workers), according to which the foreman or manager of a factory is

the "chemistry" or human chemist, who must thus study the principles of chemistry, e.g. entropy of people, to intelligently facilitate the reactions of his employees and work groups, according to which he developed the general chemical philosophy outlook:

> "No human chemical can ever be truly happy in his work unless he is fitted by nature for the work he is performing."

In 1919, however, about 81 elements were known, and it was in this year that American physician George Carey, in his *Chemistry of Human Life*, famous stated, in a rather prophetic manner, that: [2]

> "Man's body is a chemical formula in operation."

Carey, here, is giving deep insight into what would become in the 21st century the subject of human chemical thermodynamics, namely that no longer are humans simply defined as a type of reactive "chemical element", but rather the elements that comprise a person can be written as a formula—a "human chemical formula" to be specific, first calculated in 2002 by American limnologists Robert Sterner and James Elser—but more to the point that a human is molecular formula "in operation" as he says, which a loaded term for the chemical, physical, and thermodynamical "operation" of the dynamics, interactions, and reactions of people defined as human molecules. This is a huge jump in the insight of human thinking, nearly a century ahead of its time.

Pritchett experiment | Human chemical engineering

Pritchett (1857-1939)

son A (small college)

son B (large college)

In 1906, American astronomer and MIT president Henry Pritchett, in his "Large vs. Small Colleges" talk, during the 21st annual meeting of the *New England Association of Colleges and Preparatory Schools*, called for or rather alluded to the desire to have a science able to predict or speculate on the nature of human chemical reactions (see: theory) so as to facilitate the counceled guidance and or placement of students, according to his or her own unique nature, in college, particularly in regards to going to a large or small college, and comments rather tellingly that, because this type of applied engineered science was not yet available to him, he was thus forced to play the role of unguided experimenter and thus conducted an experiment along these lines with his own sons, sending one to a small college, the other to a large college, during the course of which, into the middle of the reaction, he quantified his experiment, by querying each son as to social network count. The full statement of which, after introduction by association president William DeWitt Hyde, is as follows: [1]

The President [William DeWitt Hyde]:

> "President Pritchett has assumed a fatherly relation over all institutions, large and small, and from his point of observation we shall be glad to have some contribution to this discussion."

President Henry S. Pritchett, of the Massachusetts Institute of Technology:

> "Mr. President, I had meant to be only a listener here, and I have been much interested in the discussion of this matter which has been had so far. My own correspondence with educational institutions for the last six months has led me to understand that each American college is a peculiar institution. The president of each

one of these institutions has carefully explained to me by letter that this was true. As long as this is true, it naturally follows that wherever a man may go he will find a certain environment which has its peculiar advantages and its peculiar opportunities. In the Institute of Technology the matter of numbers does not enter in the same way in which it enters in the ordinary large college. Although it has some 1,500 students, what is called the entering class is thrown much together. After the men begin to differentiate, they separate into 13 courses, so that the men who may take, let us say, marine engineering, are thrown naturally together. In this case we have here a natural grouping of students.

Since you have been so good, however, as to refer to my fatherly relation, I may say that I have as a father tried **two practical experiments** in this way, which is one of the attractions of being a father. I sent one boy to a small college, one of the old colleges, Hamilton, which I think might well be selected as a type of a small college. I sent a second boy, who was preparing to be an engineer, to take his college course at Harvard."

In modern human chemical reaction theory formulation, the following might well depict the mechanism of these two separate reaction experiments:

Experiment A

$$S_A + C_S \rightarrow S_A \equiv C_S \rightarrow S_{A_m} + C_S$$

Experiment B

$$S_B + C_L \rightarrow S_B \equiv C_L \rightarrow S_{B_m} + C_L$$

where S_A and S_B are sons A and B, C_S and C_L are the small college (Hamilton) and large college (Harvard), $S_A \equiv C_S$ and $S_B \equiv C_L$ are the encounter complexes (see: collision theory), one might say, and S_{Am} and S_{Bm} are the modified "adult" sons after finishing college, respectively. Pritchett continues:

"I was somewhat interested to see how this matter of social relation worked itself out. The result of this practical experiment was this: The boy who went to a small college joined a fraternity, in which he found 12 or 15 men who became his close intimates, and with whom almost all his friendships were contracted. He knew the 100 other men in the college, or the 125 other men, but apparently knew them only as a man knows another student passing him day by day. I had the other boy sit down a few evenings ago, and, taking the Harvard catalogue, make out a statement of the number of men whom he knew intimately, the number of men whom he knew fairly well, and the number of men with whom he had a speaking acquaintance. He made out that he knew 115 men well, that he knew 225 men fairly well, that he had a speaking acquaintance with 300.

The fact is, where you discuss this problem of the relative advantages of a small and a large college, you are making use of that interesting intellectual process which is known in algebra as the solving of indeterminate forms. This does not mean equations that cannot be determined, but equations that have an infinite number of solutions. In a word, you are discussing a question to which there is no definite answer.

> There are men who would be better off in a small village than in a large town, if you had some sort of **human chemical reaction** to determine in advance which man's nature was suited to the smaller place and which to the larger.

There are boys, undoubtedly, who would do better in a small group of men than in the larger college world of a great university or a large college. But there is no human way of finding out that fact, and in the long run the great rewards and the larger opportunities, it seems to me, are very apt to lie just as they lie in the

comparison between a small city and a large one. There is added security perhaps, greater safety, greater conservatism in the smaller place. There is a larger opportunity in the larger place, with a larger population. So long as those two conditions hold it will always be impossible to tell whether the boy will do the better in the one place or in the other.

Three claims have been introduced as making strong reasons for choosing smaller colleges. One of these is the argument that the small college is the safer place, because it is usually in a small and isolated community. I do not think there is anything in that argument, because I have always noticed that wherever you locate a college in a small town, in order to free a student from temptation, there is always some wicked place about ten or twenty miles away to which these fellows are very apt to go. In the second place, the argument which is made for a more intimate relation between student and student is one which again, I think, has little significance. A boy in a large college will have also his intimates, and so far as my boy's experience goes, will have more. The third argument which is made is the closer contact between teacher and student. There, I think, is a real point— a real advantage in favor certainly of smaller colleges as against some larger colleges; but that again is a point which is purely a matter of organization. It is just as possible to bring 2,000 students in contact with professors who shall be strong, who shall be influential, who shall be inspiring, as it is to bring 300 students into contact; but in order to do it you must have more professors, you must have a larger faculty, you must have better facilities; and these are not always provided. And so it seems to me that when a small college provides really fine men in a large proportion to its student body, it does offer in that respect certain real advantages. On the other hand, if you contribute a proportionately large number of men to a large student body, you have offered practically the same advantage. And so you find yourself once again, it seems to me, face to face with a problem which is practically insoluble in any particular case."

In sum, Pritchett, if he were able to come forward in time a century, might well be apt to use or consult a "human molecular engineer", who in turn would use chemical engineering thermodynamics principles, to facilitate or "determine in advance", using chemical reaction prediction methods, the choice or direction as to Pritchett giving counseled engineered guidance as to the question of which college, large or small, to send each of his two sons to, and experiment that he was forced to "conduct" on his own, as he says, because the subject of "human chemical reaction theory" was not yet a central science in his day. Said another way, just as German polyintellect consulted the "affinity tables" to engineer the reactions of the chapters of his novella, via use of human affinity table methods, so to would the modern thinker turn to human free energy theory, and hence free energy tables for human chemical reaction calculations, to engineer reactions of one's children.

Social engineering | Leaders

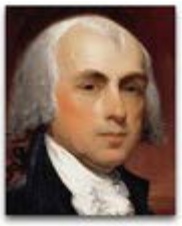
James Madison (1751-1836)

John Witherspoon (1723-1794)

Woodrow Wilson (1856-1924)

Mehdi Bazargan (1907-1995)

Thomas Wallace (c.1937-)

A number of civil leaders, prime ministers, presidents and or legislators have can loosely be classified as physical science based social engineers or human molecular engineers, depending. The foremost of these include Iranian mechanical engineer and thermodynamicist Mehdi Bazargan who became the 75 prime minister of Iran and who in his political reforming efforts and leadership conceived of a society run by thermodynamic principles, such as outlined in his 1956 *Thermodynamics of Humans*. The following, to exemplify, is a view expressed in his *circa* 1980 article the 'Cause of Movement and Life': [16]

"In general, an object in a given force field will, of necessity, behave in a calculable and predictable way. For any object, whether a stone, a plant, or a human society, force means movement."

In modern terms, this "force field", in societal terms, is what American engineer Willard Gibbs classified in the 1870s as the isothermal-isobaric "force function", in other words Gibbs free energy differentials (see: human free energy).

In 1769, American political theorist James Madison (1751-1836), the so-called “father of the constitution” and America’s fourth president, according to John Q. Stewart, was said to be studying a primitive form of social physics a Princeton. [17] Madison, as Stewart points out, was a student of Scottish-born American John Witherspoon (1723-1794) a signatory of the Declaration of Independence and 6th president of Princeton University, who in turn was a noted interpreter of the political philosophy of French theorist Charles Montesquieu, notable for his “hot climates” / “cold climates” theory of human behavior, who in turn had been deeply influenced by the celestial mechanics work of Isaac Newton. Stewart comments on this: [18]

> “There can be no question of the fact that, in early Princeton, physics cooperated with politics in a sort of analogical double play, Newton to Witherspoon to Madison.”

Stewart supports this argument with the following quote from Witherspoon:

> “The noble and eminent improvements in the natural philosophy, which have been made since the end of the last century, have been far from hurting the interests of religion; on the contrary, they have promoted it. Why should it not be the same with moral philosophy, which is indeed nothing else but the knowledge of human nature? … perhaps a time may come when men, treating moral philosophy as Newton and his successors have done natural, may arrive at greater precision.”

This quote, of course, brings to mind the 1808 "moral symbols" theory work of German polymath Johann Goethe, and also the 1789 "moral movement" theories of British philosopher John Stewart (no relation to John Q. Stewart). Stewart also credits Woodrow Wilson (1856-1924), another Princetonian, America’s 28th president, as being an early pioneering thinker in social physics/social mechanics, citing the following quote by Wilson in his writings on the Constitution: [17]

> “[The checks and balances between Congress, the President, and the Supreme Court are] a sort of unconscious copy of the Newtonian theory of the universe [in which] every free body in the space of the heavens … is kept in its place … by the attraction of bodies that swing with equal order and precision about it.”

A more recent example includes American college president: Thomas Wallace and his 2009 appendix section “The Fundamentals of Thermodynamics Applied to Socioeconomics”.

Social engineering

In 1894, Dutch industrialist Jacques van Marken (1845-1906), in one of his essays, introduced the term "social engineers" (*sociale ingenieurs*), based on the idea that modern employers needed the assistance of specialists — "social engineers" — in handling the *human* problems of the planet, just as they needed technical expertise (ordinary engineers) to deal with the problems of dead matter (materials, machines, processes). [7] An 1897 summary of this call, by English economist Henry Wolff, is as follows: [8]

Dutch industrialist Jacques Marken (1845-1906) coined of the term "social engineering" and "social engineer" in the 1890s, a calling aimed at improving what is amiss in the

> “M. van Marken perceived that there was much amiss in the social world,

> which called for amendment. And he became the first avowed "Christian socialist" of his country. The harvest was, however, too great for one husbandman. So he pleaded for a new calling to be taken up by public-spirited men, a calling which ho christened "social engineering." There are some "**social engineers**" at work now, and they are reaping results."

social world.

There does not, to note, seem to be any sort of physical science theory basis to this term, at this point in history. One of the first hmolscience-based uses of the term comes from American physicist and engineer Arthur Iberall who, in his 1974 book *Bridges in Science: from Physics to Social Science*, states the following: [3]

> "It is the possible development of theory (e.g., kinetic theory or sociophysics) and practice (e.g., **social engineering**) that may be useful for men."

Econo-engineering

In 2008, Romanians econphysicist Gheorghe Savoiu and sociophysicist Ion Siman commented the following about a newly emerging field of what they refer to as econo-engineering: [4]

> "After 2000, econophysics has matured enough to allow generalized applications, their field being called sometimes econo-engineering."

This seems similar, in a subdivision sense, i.e. in the sense of Dutch-born American mathematician, theoretical physicist, economist Tjalling Koopmans 1947 definition of an economic agent as a human molecule.

Recent

The following passage from the 2006 edition of Turkish mechanical engineer Yunus Cengel and American mechanical engineer Michael Boles' *Thermodynamics: an Engineering Approach* (see: Cengel-Boles human thermodynamics):

> "The arguments presented here are exploratory in nature, and they are hoped to initiate some interesting discussion and research that may lead into better understanding of performance in various aspects of daily life. The second law may eventually be used to determine quantitatively the most effective way to improve the quality of life and performance in daily life, as it is presently used to improve the performance of engineering systems."

motivated a third-year Turkish undergraduate mechanical engineer, specifically Hmolpedia member: Turnkey13, into a desire to come to America to complete a master's degree in on a topic related to thermodynamics of human existence and experience, namely in the field of human thermodynamics.

Dark social engineering

The late 19th century Karl Marx and Friedrich Engels theory based communism model, based loosely on a mixture of simple thermodynamics ideas and evolution models, tested in Russia, which in some version employed human atom models, is one example of social engineering gone awry. This is sometimes classified as "communist social engineering".

Canadian foreign affairs scholar Kathleen Csaba, in her 1996 chapter

A "men in bread line" statue, a classic icon of social engineering gone wrong, as typified in the so-called "dark social engineering" that occurred in the post 1917 revolution years in Russia.

"Pavlik Morozov: A Soviet Case Study of 'Dark' Social Engineering", classifies the engineered solution to the problem of educating and bringing up a new generation of citizens, loyal to the communist party, in the post 1917 revolution years, as an example of "dark social engineering". [10]

Social engineering | Failures

The early 20th century theories of American engineer Howard Scott and his Technocracy group, based loosely on some of the work of American engineer Willard Gibbs, advocated currently by a small following in America, is another example of a type of social engineering that ended in failure. The general issue with Scott's attempt to engineer bureaucracy based on technology, is that he really didn't have a deep understanding of the thermodynamics, having only a superficial understanding of Willard Gibbs' chemical thermodynamics, but nevertheless was overzealous in his attempts to implement his theories, such as his idea of "energy currency".

Etymology

In 2013, the term "human molecular engineering" began to be used in the University of California, Berkeley article and in the two cultures department article.

Fiction

Russian writer Yevgeny Zamyatin's utopian society OneState, a futurism-type engineered society, based partially on notions of entropy and evolution, is classified by Bruce Clarke as a type of social engineering scenario. [14]

Social engineering | Information fishing

The term "social engineering", in information technology and security, has come to mean, in certain circles, the art of manipulating people into performing actions or divulging confidential information. [12] This usage, however, seems to be the reverse of the original Marken definition sense of the term. American IT security theorist Christopher Hadnagy's 2010 *Social Engineering: the Art of*

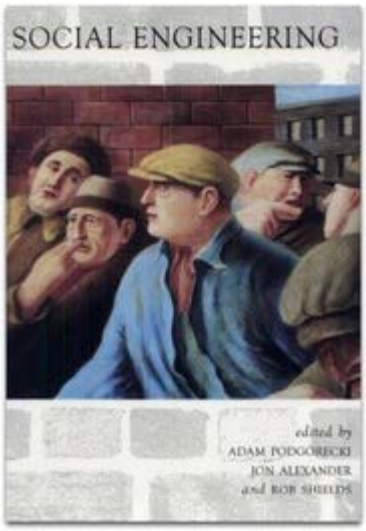

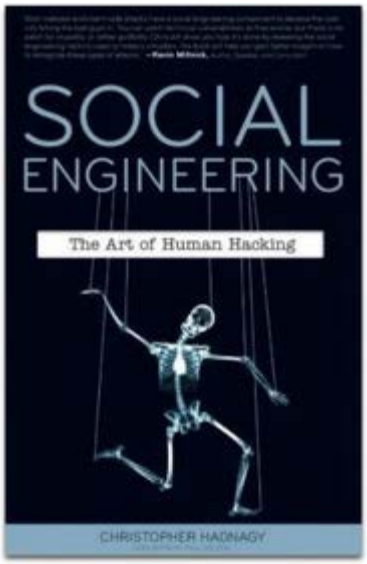

The recent books: *Social Engineering* (1996), *Social Engineering: Can Society be Engineered in the Twenty-First Century?* (2008), and *Social Engineering: the Art of Human Hacking* (2010) give a few examples of

usage of the term "social engineering", albeit the latter used in a different context, in the "malicious" or deceptive sense of the term. [9]

Human Hacking, gives an overview of elicitation, pretexting, influence and manipulation all aspects of social engineering in regards to the hacking of information from people using ploys and the study of common reaction patterns; Hadnagy defines social engineering as the "art or science of skillfully maneuvering human beings to take action in some aspect of their lives." [13]

Quotes

The following are related quotes:

> "Early views of [Bertalanffy] systems approaches saw them as prologue to social engineering where individual choice is abstracted and human beings are relegated to the role of molecules bouncing around in a social petri dish."
>
> — Debra Straussfogel (2000), "World-Systems Theory in the Context of Systems Theory: An Overview" [11]

See also

â— Human engineering thermodynamics

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7. (a) Social engineering (political science) – Wikipedia.
(b) Jacques van Marken (Dutch → English) – Wikipedia.

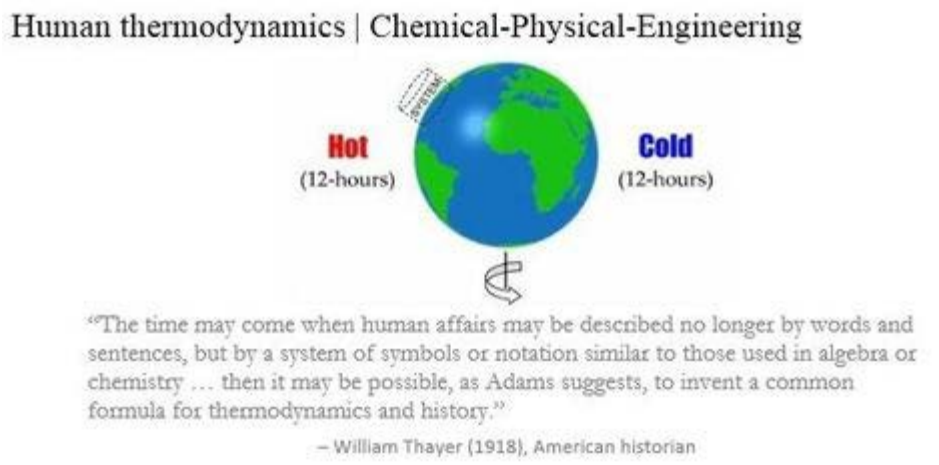

Header to a 2012 lecture handout given to UIC bioengineering thermodynamics students as supplement to a lecture (see: Thims lectures) on human thermodynamics by American electrochemical engineer Libb Thims, which may be in the neighborhood of the **two cultures department** namesake? [2]

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Further reading

â— Thims, Libb. (2013). “Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?” (abs) (main), Keyspeaker at EDEN V workshop: Exploratory Domains of Econophysics News, University of Pitesti, Romania, Jun 29-30.

External links

â— Social engineering – Wikipedia.
â— Engineers of the human soul – Wikipedia.

θΔics

In human chemistry, **human molecular formula** is the chemical formula for one human, showing the total number of elements that comprise the typical 150-pound person, in which view the person is defined as "human molecule" or "human chemical", among other names, such as human chemical element, human chemical species, human particle, etc.

There are two types of formulas, one the "empirical molecular formula", showing the ratios of elements in proportion to the smallest element, according to percent mass composition, second the "molecular formula", showing numbers of all the elements present in the molecule.

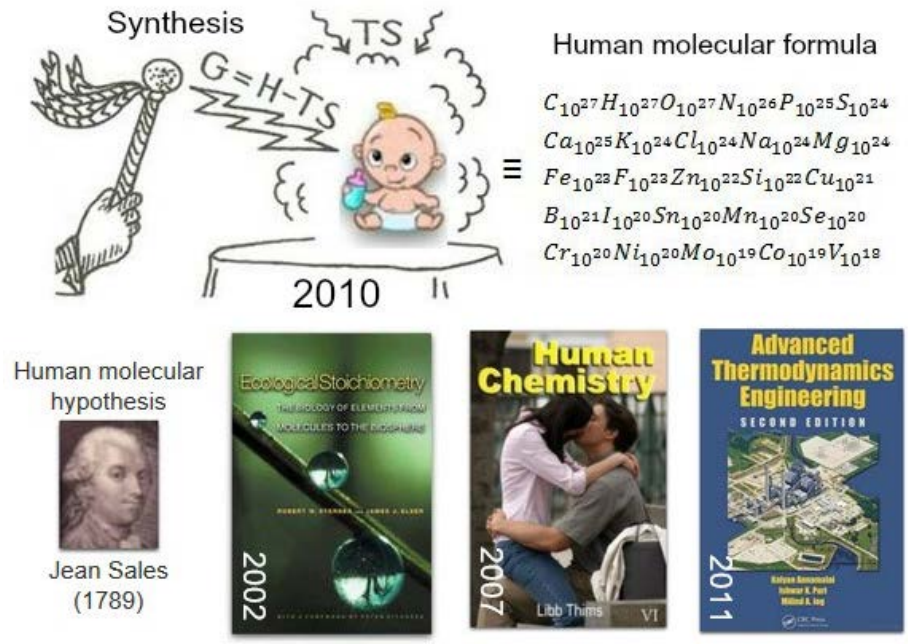

Top: a physicochemical view of the synthesis of a human, each person having a Gibbs free energy of formation (see: human free energy of formation), according to the views of, e.g. Norman Dolloff (1975), Martin Goldstein (1993), Daniel Schroeder (2000), and Libb Thims (2010).

Bottom: a depiction of the new 21st century **human molecular formula** based view of humans as reactive "molecules" with a measured 22- or 26-element, depending, molecular formula, as found in the following three textbooks: *Ecological Stoichiometry* (2002), by American limnologists Robert Sterner and James Elser, *Human Chemistry* (2007), by American electrochemical engineer Libb Thims, and *Advanced Engineering Thermodynamics* (2011), by Indian-born American mechanical engineer Kalyan Annamalai and American mechanical engineer Carlos Silva, the latter citing Thims' human molecular formula definition, all tracing their origin to French philosopher Jean Sales 1789 "human molecular hypothesis" in his *The Philosophy of Nature: Treatise on Human Moral Nature*. [25]

Earliest views

The earliest views of what humans were comprised of—stemming largely from the ancient Egypt, namely the circa 3100 Heliopolis creation myth (see: Nun cosmology)—held that humans were made of clay (see: clay creation theory), e.g. as made on Khnum's potters wheel, and given the breath or spirit of life (see: creation by breath) to become animated (alive).

Seventy-five percent of the modern world can trace their belief that they are alive to this potter's wheel theory (see: comparative mythology and religion). Though belief in the Egyptian gods and goddesses has long been forgotten, the belief in life or the theory of life (and in many cases afterlife) has strongly been retained in the modern person's belief system, the repercussion of which is that nearly all people, religious and non-religious, still presently believe they are "alive" in spite of the fact that this concept does not corroborate with modern chemistry and physics. As English physiologist Charles Sherrington put it frankly in 1938: "chemistry does not know the word life." [24] The reconciliation or rather solution of this seeming paradox, sometimes called the great problem of natural philosophy, is what is referred to as the defunct theory of life perspective (2009) with its repercussion life terminology upgrades (2012).

In *circa* 500 BC, Greek philosopher Xenophanes (c.570-c.475BC) held that "all creatures that come into being are earth and water." [21]

In *circa* 450 BC, Greek philosopher Empedocles originating the first standard model of physics, according to which the universe was comprised of four elements: fire (△), earth (▽), air (△), water (▽), meaning that humans are entities made of four elements, whose interactions were governed by two forces: philia (●→|←●), i.e. attraction (or love) and neikos (←●|●→), i.e. repulsion (or hate). The various tissues of the body, according to Empedocles, were comprised of various proportions of these elements: blood contained equal amounts of all four; bone is four parts fire to two parts of water and earth, and so on. [21] This can loosely be said to be the first groping at the idea a human molecular formula.

In *circa* 375 BC, Greek philosopher Plato held that humans were made by gods "out of earth and fire". [21]

Early chemical views

In *circa* 1790s, French chemist Antoine Lavoisier, supposedly, hypothesized, determined, or experimentally measured that humans are comprised of primarily three elements carbon, hydrogen (inflammable air), and oxygen: [20]

Human = f{C, H, O,}

In 1899, English physiologist John Thornton stated that there were 72 elements known in chemistry and that 14 of these enter into the composition of the human body: oxygen, carbon, hydrogen, nitrogen, sulphur, phosphorus, chlorine, sodium, potassium, calcium, magnesium, iron, fluorine, and silicon; and noted that other elements, such as manganese and lead, have sometimes been found in small quantities. [11] In formulaic terms, at the turn of the 20th century it was known that a human had the following generalized 14-element molecular formula:

Human = f{O, C, H, N, S, P, Cl, Na, K, Ca, Mg, Fe, Fl, S}

26-elements Chemical formula C:N:P ratio

In 1916, American sociologist Carl Kelsey, in his *The Physical Basis of Society*, stated

the that the human body is composed of ten elements with the following percentages: [35]

> "The human body contains carbon, 13.5 percent; hydrogen, 9.1 percent; oxygen, 72 percent; nitrogen, 2.5 percent; phosphorus, 1.15 percent; sodium, 0.1 percent; calcium, 1.3 percent; magnesium, 0.001 percent; iron, 0.01 percent and traces of silicon and fluorine."

Henry Osborn (1857-1935)

George Carey (1845-1924)

Alfred Redfield (1890-1983)

In 1916, American anatomist, zoologist, and paleontologist Henry Osborn, in his *The Origin of Life: On the Theory of Action, Reaction and Interaction of Energy*, stated that there were 26-elements that entered into the structure of what he called "elementary living phases" as follows:

> "The earliest fitness we discover in the bacteria or monad is the fitness of grouping and organizing different kinds of energy—the energy of molecules, of atoms, of electrons as displayed in the **twenty-six** or more chemical elements which enter into life."

In 1919, about 81 elements were known, and it was in this year that American physician George Carey, shown adjacent, in his *Chemistry of Human Life*, famous stated, in a rather prophetic manner, that: [2]

> "Man's body is a **chemical formula** in operation."

Carey, here, was the first to state that not only that the elements that comprise a human can be written as a formula but more to the point that a human is molecular formula "in operation" as he says. This is a huge jump in the insight of human thinking.

In 1925, American chemist Edwin Slosson, in his section on the chemistry of creation and atomic turnover, stated that: "We care nothing, really, for the particular atoms of carbon, hydrogen, oxygen, and nitrogen that make up what we mistakenly call ourselves." [9] Thus, according to Slosson, a human would be characterized by the following generalized 4-element molecular formula:

Human = f{C, H, O, N}

In 1934, American oceanographer Alfred Redfield (1890-1983), shown adjacent, published his "On the Proportions of Organic Derivations in Sea Water and their Relation to the Composition of Plankton", in which he found that the atomic ratio of carbon, nitrogen, and phosphorus found in ocean plankton is: [14]

C:N:P = 106:16:1

This has since come to be known as the "Redfield ratio". [15] The extrapolation of this methodology up to humans would be the publication of an article along the lines of "On the Proportions of Organic Derivations in North America and South America and their Relation to the Composition of Americans and Brazilians". In any event, Redfield followed his C:N:P ratio work up with his 1958 *American Scientist* article "The Biological Control of Chemical Factors in the Environment", which, according to American ecologist Peter Vitousek (2002), is the pioneering article ecological stoichiometric analysis. [16] It was this element ratio work of Redfield that led to the first calculation of the molecular formula for a human by American limnologists Robert Sterner and James Elser in 2000 (see below).

In 1944, Marcel Florkin, in his *Introduction to General Biochemistry*, as cited by Ernest Schoffeniels (1973), stated that 100 elements were present in the earth's shell and that "22 elements" are present in organisms. [38]

In 1970, South African scientist Samuel Gorvy, in his *The Living Entity*, may have given some type of formula of an organism, or man as "chemical molecule" or human molecule (check). [34]

In 1972, American scientist Earl Frieden published his "The Chemical Elements of Life" article in *Scientific American*, in which he supposedly gave a table in which a human is comprised of 16 elements: [12]

Human = F{O, C, H, N, Ca, P, K, S, Na, Cl, Mg, Fe, Cu, Mo, Zn, I}

In the mid 1970s, it was being reported, in publications such as *San Jose Mercury News* ("Man's Worth Rises, Chemically Speaking", 1972), *Chemical and Engineering News*, and high school science textbooks, supposedly, originating as a joke by someone, that it "used to be common knowledge that, from head to toe, the chemical value of the human body was 98 cents"; the joke supposedly became funnier by reporting inflation values each year:

$3.50 (1972), $5.60 (1977), and $6M (1976) by Harold Morowitz. (O)

Towards the late 20th century, scientists began to categorize these dozen-and-a-half or so listing of elements that comprise a human into the format division of "main elements" and "trace elements".

In 2001, to exemplify, Portuguese chemists J.J. da Silva and English chemist Robert Williams made what they termed a "biological elements period table", as shown adjacent, captioned as the “distribution of elements essential for life in the periodic table”, which lists thirty total elements, 11 bulk elements, 14 trace elements, and 7 possibly essential trace: [13]

- Bulk elements: H, C, N, O, Na, Mg, P, S, Cl, K, Ca
- Trace elements: B, F, Si, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Se, Mo, I
- Possibly essential: As, Br, Sr, Cd, Sn, Ba, W

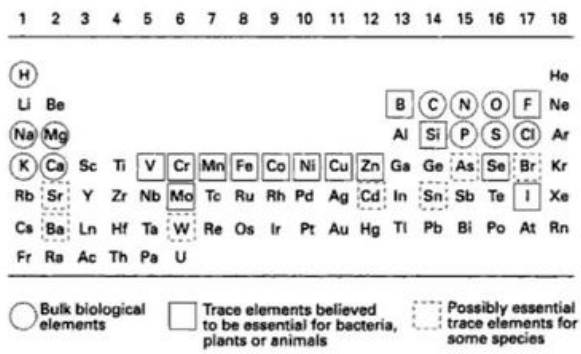

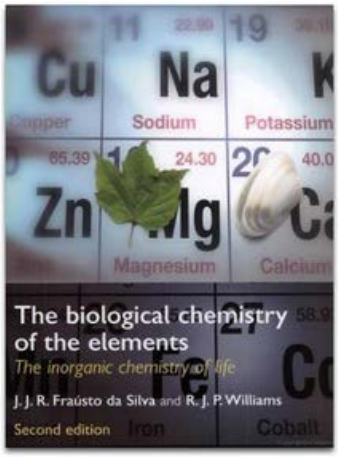

A 2001 periodic table listing of elements found to have function or possibly have function in animate organisms. [13]

found in animated organisms. The labeling of "elements essential for life", to note, is an anthropocentric-religious-mythology slant to the picture; whereas, correctly, the table should be labeled as "elements found to have function in animate organism", being that there is no such thing as a "living" atom, molecule, chemical, or atomic geometry (see: defunct theory of life). A recent 2012 blog post by a chemistry teacher called Gibby, comments the following: “You are what you eat. But do you recall munching some molybdenum or snacking on selenium? Some 60 chemical elements are found in the body, but what all of them are doing there is still unknown.” [17] This unsourced statement, however, seems to be on the high end; the general rule is that an element has to be found to have a specific active function in the human body if it is to be included in the molecular formula for that body.

Sterner-Elser empirical molecular formula | 2000

See main: Sterner-Elser human molecular formula

On 18 Apr 2000, or *circa* thereabouts, inspired by the earlier 1934-1958 C:N:P ratio plankton composition work of American oceanographer Alfred Redfield, the first calculation of the empirical molecular formula for an average human was done by American limnologists Robert Sterner and James Elser who determined the following 22-element human empirical molecular formula for an average human: [2]

$$\text{Molecular formula}_{\text{human}} \text{ (Sterner-Elser) [empirical]} = H_{375,000,000}O_{132,000,000}C_{85,700,000}N_{6,430,000}Ca_{1,500,000}P_{1,020,000}S_{206,000}Na_{183,000}K_{177,000}Cl_{127,000}Mg_{40,000}Si_{38,600}Fe_{2,680}Zn_{2,110}Cu_{76}I_{14}Mn_{13}F_{13}Cr_{7}Se_{4}Mo_{3}Co_{1}$$

In 2002, Sterner and Elser officially published this "formula" or "chemical formula in operation", as Carey (1919) called it, in the opening pages to their *Ecological Stoichiometry* textbook, shown adjacent. This new "textbook" definition of a person, defines a human as a 22-element molecule. Sterner and Elser give the following synopsis of what this “formula” means in regards to the "new view" of what exactly a human is: [3]

> “This **formula** combines all compounds in a human into single abstract ‘molecule’. The stoichiometric approach considers whole organisms as if they were single abstract molecules. Organisms can be thought of as complex evolved chemical substances that interact with each other and the abiotic world in a way that resembles a complex, composite, chemical reaction. This formula for the ‘human molecule’ [allows one] to think about how every human represents the coming together of atoms in proportions that are, if not constant, at least bounded and obeying some rules.”

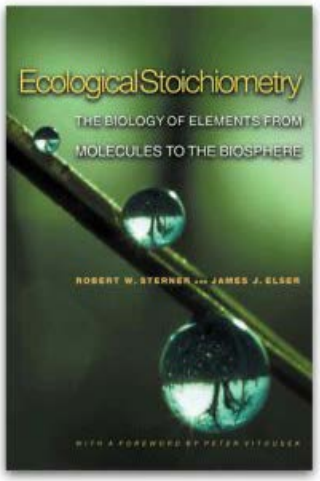

Ecological Stoichiometry (2002)

Robert Sterner

James Elser

This "every human represents the coming together of atoms" seems to bring to mind French philosopher Jean Sales' prophetic 1789 statement:

> “We conclude that there exists a principle of the human body which comes from the great process in which so many millions of atoms of the earth become many millions of **human molecules**.”

from his *The Philosophy of Nature: Treatise on Human Moral Nature*, which, of course, initiated the human molecular hypothesis. In 2008, Sterner

commented the following, to American electrochemical engineer Libb Thims, about their calculation: [5]

> "I have attached the spreadsheet used to construct that **formula** for a human molecule in our book. My copy of the spreadsheet is dated April 18, 2000. I cannot say exactly when we made the calculations. That date might have to do with some modification of the figure or some other edit. At any rate, it gives an indication."

The date of 18 Apr 2000 thus marks a paradigm shift in human thought: the first day, in the history of the universe, as is known, that a molecule calculates its own molecular formula. The ramifications of this calculation are unprecedented and will result in the coming millennium to bring about the follow-through of the Goethean revolution, to say the least.

On 26 Feb 2008, American electrochemical engineer Libb Thims emailed Sterner (and Elser) about their ambiguous "while this is not strictly true" side comment:

> "I want to ask you a question to clarify your point of view. My question is that on page two you state: 'the stoichiometric approach considers whole organisms as if they were single abstract molecules' (this is good); but then you state: 'while this is, of course, not strictly true ...' Could you please clarify you mindset, on the 'not strictly true' part, so that I can present you view correctly in my [upcoming] book [*The Human Molecule*]."

Sterner's response is as follows: [18]

> "Dr. Elser and I were trying to get across that by considering all elements to be part of one single, abstract molecule, one loses all the information inherent in the actual distribution of elements within actual biomolecules."

Some, such as American civil-ecological engineer Jeff Tuhtan (2012), have taken the sentence addition fragment "while this is not strictly true" to mean that Sterner and Elser "do not view a human as an abstract molecule", which of course contradicts their explicit statement of "the stoichiometric approach considers whole organisms as if they were single abstract molecules." [19] Whatever the case, Sterner and Elser seem to be the first to ever calculate the molecular formula of a human.

Thims molecular formula | 2002

Thims human molecular formula

What exactly is a human?

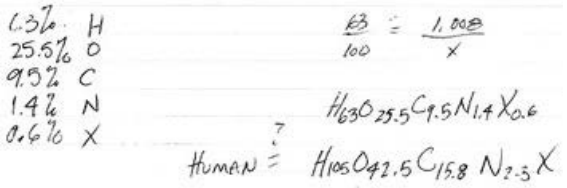

→

#	Name	E	% Mass	g/Human	g/mol	mol/70kg	EMF	EMM	MF
1	Oxygen	O	61	42700	16	2668.75	971043750	1.554E+10	2E+27
2	Carbon	C	23	16100	12.01	1340.55	487768526	5.858E+09	8E+26
3	Hydrogen	H	10	7000	1.01	6930.693	2.522E+09	2.547E+09	4E+27
4	Nitrogen	N	2.6	1820	14.01	129.9072	47267666	662220000	8E+25
5	Calcium	Ca	1.4	980	40.08	24.4511	8896706.6	356580000	1E+25
6	Phosphorus	P	1.1	770	30.97	24.86277	9046496.6	280170000	1E+25
7	Potassium	K	0.3	210	39.1	5.370844	1954219.9	76410000	3E+24
8	Sulfur	S	0.2	140	32.07	4.365451	1588400.4	50940000	3E+24
9	Chlorine	Cl	0.18	126	35.45	3.554302	1293258.1	45846000	2E+24
10	Sodium	Na	0.17	119	22.99	5.176164	1883384.1	43299000	3E+24
11	Magnesium	Mg	0.029	20.3	24.31	0.835047	303837.93	7386300	5E+23
12	Iron	Fe	0.012	8.4	55.85	0.150403	54725.157	3056400	9E+22
13	Fluorine	F	0.004	2.8	19	0.147368	53621.053	1018800	9E+22
14	Zinc	Zn	0.003	2.1	65.35	0.032135	11692.425	764100	2E+22
15	Silicon	Si	0.001	0.7	28.09	0.02492	9067.2837	254700	1E+22
16	Copper	Cu	0.0003	0.21	63.55	0.003304	1202.3603	76410	2E+21
17	Iodine	I	0.00003	0.021	126.9	0.000165	60.212766	7641	1E+20
18	Tin	Sn	0.00003	0.021	118.7	0.000177	64.372367	7641	1E+20
19	Boron	B	0.00003	0.021	10.81	0.001943	706.84551	7641	1E+21
20	Selenium	Se	0.00002	0.014	78.96	0.000177	64.513678	5094	1E+20
21	Chromium	Cr	0.00002	0.014	52	0.000269	97.961538	5094	2E+20
22	Manganese	Mn	0.00002	0.014	54.94	0.000255	92.71933	5094	1E+20
23	Nickel	Ni	0.00002	0.014	58.69	0.000239	86.795025	5094	1E+20
24	Molybdenum	Mo	0.000007	0.0049	95.94	5.11E-05	18.58349	1782.9	3E+19
25	Cobalt	Co	0.000004	0.0028	58.93	4.75E-05	17.288308	1018.8	3E+19
26	Vanadium	V	0.0000002	0.00014	50.94	2.75E-06	1	50.94	2E+18

Total %= 99.999481 EMM= 2.547E+10
MM= 4.10E+28
Date= (12/14/05) MM/EMM= 1.61E+18

Top: a *circa* 2002 off-the-cuff quickly-made scratch-paper attempt of the calculation of the **human molecular formula** for a typical human, i.e. a crude-version molecular formula for a human, by American electrochemical engineer Libb Thims, using a percentage ratio method; arrived at during the writing of a three-volume unpublished manuscript, entitled *Human Thermodynamics* (see: publications, unpublished section), following about seven years worth of thought on how to model human reproduction as a chemical reaction (no analogy), of the form A + B → C (where A is a man, B a woman, and C a newly conceived child), in terms of the spontaneity criterion. [10] Right: one of Libb Thims' early spread sheets (O), saved as "human formula", for the calculation of the average **human molecular formula**, shown online in 2005.

The second-known calculation of both the empirical human molecular formula (formula showing the smallest ratio of atoms) and the human molecular formula (formula showing all of the atoms present in the molecule) was done, independently, by American electrochemical engineer Libb Thims in 2002, specifically in a manuscript chapter to a three-volume textbook *Human Thermodynamics*, in a chapter entitled "Where Does One Go after Death?" on the question of what happens when you die, in the context of the conservation of energy and thermodynamics. To give a bit of preliminary, from 1995 to 2001, Thims had been working on the famous elective affinities problem, in the form of how to predict the reaction feasibility of birth or synthesis of a human using the Gibbs function reaction spontaneity criterion applied to the following human reproduction reaction model:

A + B → C

where, during these years, Thims conceived of A as a male, B a female, and C a newly-synthesized detaching-from-the-parential-structure child at about the age of fifteen. During these years, Thims gave little thought to atomic-thinking, and generally considered A, B, and C to be humans, as one sees them and views them commonly and colloquially, as biological organisms, so to speak. When, however, Thims began to pry deeper into the subject, specifically by applying the first law of thermodynamics to the second one "dies" and no longer exists and began to ask what exactly

constitutes a person at the moment of death: the molecular view of the human emerged along with a the view that a certain amount of the composition of a person is embodied, not solely in the physical body of the person, but also in, obviously, material possessions, property, land ownership, etc., but more elusively in the form of bond energy, in the thermodynamic sense, as Fritz Haber originally introduced the notion of bond energy in the guise of Lewis thermodynamics and the ATP-powering reaction view or model. This query thus eventually led to the development of theory of the human chemical bond and of human molecular orbital theory. In any event, during this period of focusing on the query of what happens to a person at the point of death according to thermodynamics, a subject generally known as cessation thermodynamics, Thims began ruminate on how to go about calculating the molecular formula for an individual human, during which time, following several months of research, investigation, and searching for mass composition tables of humans, Thims eventually produced, similar to Sterner and Elser, a meta-analysis 26-element empirical human molecular formula as shown below: [4]

$$\text{Molecular formula}_{\text{human}} \text{ (Thims) [empirical]} = H_{2.5E9}O_{9.7E8}C_{4.9E8}N_{4.7E7}P_{9.0E6}Ca_{8.9E6}K_{2.0E6}Na_{1.9E6}S_{1.6E6}Cl_{1.3E6}Mg_{3.0E5}Fe_{5.5E4}F_{5.4E4}Zn_{1.2E4}Si_{9.1E3}Cu_{1.2E3}B_{7.1E2}Cr_{98}Mn_{93}Ni_{87}Se_{65}Sn_{64}I_{60}Mo_{19}Co_{17}V$$

Thims also calculated a human molecular formula, based on the empirical molecular formula, for an average 70-kg (154-lb) human, the 2008 version of which is shown below: [1]

$$\text{Molecular formula}_{\text{human}} \text{ (Thims) [molecular]} = C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$$

In Latex, the human molecular formula is:

$$C_{10^{27}}\,H_{10^{27}}\,O_{10^{27}}\,N_{10^{26}}\,P_{10^{25}}\,S_{10^{24}}\,Ca_{10^{25}}\,K_{10^{24}}\,Cl_{10^{24}}\,Na_{10^{24}}\,Mg_{10^{24}}\,Fe_{10^{23}}\,F_{10^{23}}$$
$$Zn_{10^{22}}\,Si_{10^{22}}\,Cu_{10^{21}}\,B_{10^{21}}\,I_{10^{20}}\,Sn_{10^{20}}\,Mn_{10^{20}}\,Se_{10^{20}}\,Cr_{10^{20}}\,Ni_{10^{20}}\,Mo_{10^{19}}\,Co_{10^{19}}\,V_{10^{18}}$$

Thims commented on this "formula", in the 2002 manuscript, the following:

> "By describing the existence of a human in this form we are by no means making attempts to degrade our existence, we are only trying to help elucidate our understanding of this existence."

In short, it became imperative in Thims' mind to determine what exactly was the fundamental particle definition of one human at the moment of death, knowing that both the laws of matter and energy conservation will hold; several months were spent doing research on how to go about calculating the molecular formula for a human. Thims went on, from 2002 to 2007 to recalculate this formula several times, as more accurate mass composition tables became available. [4] He would eventually define this atomic view as bound state existence, on the physics model of the bound state.

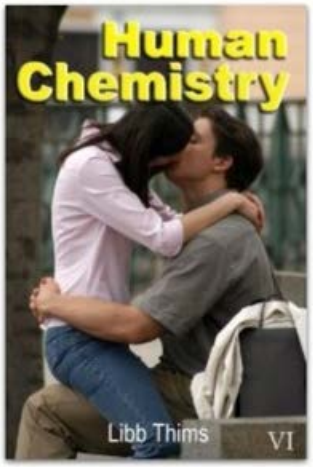

Human Chemistry (2007)

The Human Molecule (2008)

Libb Thims

In terms of publication, the 2002 manuscript chapter was only disseminated to a handful of people; in 2004 to 2005, a hundred copies of a 120-page manuscript entitled *Cessation Thermodynamics*, which contained the human molecular formula, were given to a hundred people exactly who read the book and gave Thims feedback on the model; in 2005, with the launching of HumanThermodynamics.com, the Thims calculations of the human molecular formula were online; the first published book to included the formula was Thims' 2007 *Human Chemistry*, shown adjacent, wherein chapter two entitled "The Human Molecule" contained the formula with discussion.

In 2008, after discovering that American historian Henry Adams used the human molecule viewpoint significantly, such as in his 1910 *A Letter to American Teachers of History*, Thims began to do a more thorough investigation into the history of this person = human molecule point of view. On 17 Feb 2008, after doing a Google Book search on keywords "human molecule thermodynamics", Thims discovered the 2002 Sterner-Elser calculation; Thims then emailed Sterner within the hour, who in turn attached to Thims his 2000 spread sheet date, as discussed previously. [5] This finding, along with other findings, such as C.G. Darwin and Pierre Teilhard's human molecule views, among others, resulted in the publication of the 2008 booklet *The Human Molecule*, a history of the subject of the person defined as a molecule.

New Scientist | 2005

In 2005, in a *New Scientist* article entitled “That’s Life”, they give a publication for what they call a person's "chemical formula", albeit an empirical one. The following is the 12-element empirical formula given in the *New Scientist* article for a human: [7]

$$\text{Molecular formula}_{\text{human}} \text{ (New Scientist) [empirical]} = H_{15,750}N_{310}O_{6,500}C_{2,250}Ca_{63}P_{48}K_{15}S_{15}Na_{10}Cl_{6}Mg_{3}Fe_{1}$$

The 03 Dec 2005 *New Scientist* issue containing the article "That's Life", opening section shown above, which gives a 12-element **empirical molecular formula** for a human. [7]

which they define as one's "chemical formula". The opening section to the article is as follows: [7]

> "What chemical formula would accurately describe an adult human being, in terms of the relative distribution of elements (including pollutants)? And what might be the formula for the first alien life form we encounter? One's "chemical formula" depends on a number of factors, most notably whether we're talking about a he or a she. Male bodies contain more water than female bodies, which have extra lipids. By weight, oxygen amounts to about two-thirds of the body, followed by carbon at 20 per cent, hydrogen at 10 per cent and nitrogen at 3 per cent. Elements originating from pollutants would only be present in trace amounts. If a human body were broken into single atoms, we would arrive at an empirical formula H_{15750} N_{310} O_{6500} C_{2250} Ca_{63} P_{48} K_{15} S_{15} Na_{10} Cl_{6} Mg_{3} Fe_{1}. The relative numbers of atoms in this differ from the composition by weight because atoms have ..."

What is lacking in this calculation are some 10 to 14 elements shown to have active role in the internal functioning of a person, such as are found in the Thims formula and the Sterner-Elser formula. This formula made it into the Q&A physics forum. [8]

Ecology

In 2007, Americans ecologist William H. Karasov and zoologist and physiologist Carlos del Rio, in their *Physiological Ecology: How Animals Process Energy, Nutrients, and Toxins*, utilize the Sterner-Elser human molecular formula, and discuss it, as shown below (left), about which the summarize: [29]

> “The practitioners of biological stoichiometry do not question the importance of physiology and biochemistry, rather they attempt to use the metaphor of living systems as molecules in an attempt to construct a minimal, but more complete, ecological theory than one based on a single currency (energy, or carbon, or nitrogen).”

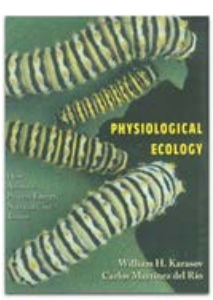

(2007)

(2008)

(2010)

(2012)

In ecology, the three books to the left employ the Sterner-Elser human molecular formula employing books, the book to the right, an ecological thermodynamics PhD dissertation by Jeff Tuhtan, to the right employs the Thims human molecular formula, in particular the concept of the fish molecule.

In 2008, the Sterner-Elser human molecular formula made it into an entry on the "biology of the elements", shown below (right), in the five volume *Encyclopedia of Ecology*, albeit in an entry on ecological stoichiometry written Robert Sterner and James Elser. [26] Sterner and Elser reproduce the same "Biology of the Elements" ecological stoichiometry subsection in the 2010 collaborative book *Global Ecology*, edited by Danish ecologist and chemical engineer Sven Jorgensen. [27]

William Karasov and Carlos del Rio
Physiological Ecology
(2007)

Stoichiometry in chemistry

$$3CaCl_2 + 2Na_3PO_4 \rightleftarrows CaCO_3(PO_4)_2 + 6NaCL$$

Stoichiometry in biochemistry

$$C_6H_{12} + 6O_2 \rightleftarrows 6CO_2 + 6H_2O$$

Stoichiometry in ecology

$$(N_xP_y)_{predator} + (N_aP_b)_{prey} \rightleftarrows Q(N_xP_y)_{predator} + (N_{a'}P_{b'})_{waste}$$

with each other and with smaller molecules and free elements. The practitioners of biological stoichiometry do not question the importance of physiology and biochemistry. Rather, they attempt to use the metaphor of living systems as molecules in an attempt to construct a minimal, but more complete, ecological theory than the one based on a single currency (energy, or carbon, or nitrogen). A list of elements (or even of complex compounds) and their amounts does not reveal the architecture of an organism or a component of an ecosystem, but it is a useful starting point.

Let us push the analogy of organisms as molecules by taking a look at the approximate stoichiometric "formula" for a human being:

$$H_{375\times10^6}O_{132\times10^6}C_{85.7\times10^6}N_{6.43\times10^6}Ca_{1.5\times10^6}P_{1.02\times10^6}S_{206\times10^3}Na_{183\times10^3}K_{177\times10^3}$$
$$Cl_{127\times10^3}Mg_{40\times10^3}Si_{38.6\times10^3}Fe_{268\times10^3}Zn_{2.11\times10^3}Cu_{76}I_4Mn_{13}F_{13}CrSe_4Mo_3Co_1$$

This formula shows the relative, not the absolute, amounts of each element. It expresses all values relative to the value of the scarcest element (cobalt), which is assigned a value of 1 (Sterner and Elser 2002). Even a perfunctory look at it should justify ecological stoichiometry's attention to C, N, and P. Only 11 elements appear in all biological systems. In humans, these 11 elements constitute

The Biology of Elements

Each of the 100+ elements in the periodic table has characteristic chemical and physical features governing properties like the elements it will bond with, how easily it will ionize, etc. These properties arise mostly from the atomic size of each element and the arrangement of electrons within shells surrounding the nucleus. Metals such as Fe or Mo for instance can exist in different oxidation–reduction states, and thus these elements are involved in electron transport in membranes and in other biological locations. Other elements such as C or N are very useful for making highly complex three-dimensional (3-D) shapes. Thirty or more elements are thought to be essential to the growth of at least some organisms. This number and range of reactivities give biological systems a great range of chemical behaviors to choose from in order to organize their activities. The physical and chemical properties of elements have a great bearing on ecological stoichiometry.

As discussed above, differences in organism elemental content between species are very relevant in ecological stoichiometry and ecology in general. Nevertheless, some elements are consistently high in abundance in biological systems while others are consistently rare. For example, the chemical composition for a living human can be written:

$$H_{375000000}O_{132000000}C_{85700000}N_{6430000}Ca_{1500000}P_{1020000}S_{206000}$$
$$Na_{183000}K_{177000}Cl_{127000}Mg_{40000}Si_{38600}Fe_{2680}Zn_{2110}Cu_{76}I_{14}$$
$$Mn_{13}F_{13}Cr_7Se_4Mo_3Co_1$$

This formula combines all the countless different compounds in a human being into a single abstract 'molecule'. Ecological stoichiometry asks how far this analogy to a single complex molecule will take us.

Ecological stoichiometric principles should apply to any element, and possibly to some of the less-reactive biochemicals as well. However, stoichiometric analysis has focused most on several elements that make up moderate to large proportions of living biomass and that also may become limiting to organism growth. The four elements considered below relate strongly to ecological dynamics and evolutionary fitness.

Robert Sterner and James Elser *Encyclopedia of Ecology* (2008)

American limnologists Robert Sterner and James Elser's 2008 and 2010 "biology of the elements" entry on their 22-element molecular formula a human, which is re-worded slightly from their original 2002 entropy, e.g. they say "living human" (2010) instead of "living human being" (2002); the distance themselves from the previous use of the term "human molecule" (2002) and add in the term "analogy" (2010), which was not used in the original presentation. No doubt these changes have something to do with the Hmolpedia entry on their work, previous discussion on the implications of this formula with Thims in 2008, who does not consider this to be "analogy" but reality.

In 2012, American civil ecological engineer Jeff Tuhtan, in his thermodynamics of fish systems PhD dissertation, inspired by American electrochemical engineer Libb Thims' concept of the human molecule and fish molecule, citing Thims' 2008 *The Human Molecule*, employs general thermodynamics of human molecule theory to aquatic ecosystems, about which he comments in general: [30]

> "The human species is but one of many. Viewed from a sort of universal microscope, we appear as but a vast collection of molecules in motion. In our current state we are firmly attached to an Earthly substrate, feeding off the energy gradient of the Sun. The fate of our chemical species is undeniably tied to the affinities and energies of interaction required to maintain our evolving earth ecosystem. We live in a closed system. In order to understand the nature of things, we must learn more about both our reactions and our products."

Annamalai | Advanced Engineering Thermodynamics | 2011

In 2011, Indian-born American mechanical engineer Kalyan Annamalai, in his *Advanced Thermodynamics Engineering*, co-written with Ishwar Puri and Milind Jog, employed American electrochemical engineer Libb Thims' 26-element molecular formula became the standard thermodynamics textbook definition of a human, as follows:

14.4.1 Formulae

Humans may be called a 26-element energy/heat driven dynamic atomic structure. The body contains about 60–70% water; even the bones contain over 30% water with males containing more water than females. By weight, oxygen amounts to about two-thirds of the body (about 67%),

The new 2011 thermodynamics textbook definition of a human, based on American electrochemical engineer Libb Thims' 2002 calculation of the 26-element human molecular formula, in Indian-born American mechanical engineers Kalyan Annamalai, Ishwar Puri, and Milind Jog's *Advanced Engineering Thermodynamics*. [2]

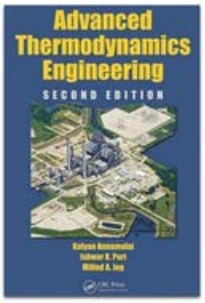

> "Humans may be called a 26-element energy/heat driven dynamic atomic structure."

detailed in their section 14.4.1: Human body | Formulae. [22]

2013 | Forward

In 2013, American evolutionary paleontologist Neil Shubin, noted for his 2006 discovery of Tiktaalik, the so-called missing link amphibian fish, citing the 2002 Sterner-Elser human molecular formula, published his *The Universe Within: the Deep History of the Human Body*, in chapter two of which he opens to the following big bang to human molecule 13.7 billion-year scenario:

$H_{375,000,000}$ $O_{132,000,000}$ $C_{85,700,000}$ $N_{6,430,000}$ $Ca_{1,500,000}$ $P_{1,020,000}$ $S_{206,000}$ $Na_{183,000}$ $K_{177,000}$ $Cl_{127,000}$ $Mg_{40,000}$ $Si_{38,600}$ $Fe_{2,680}$ $Zn_{2,110}$ Cu_{76} I_{14} Mn_{13} F_{13} Cr_{7} Se_{4} Mo_{3} Co_{1}

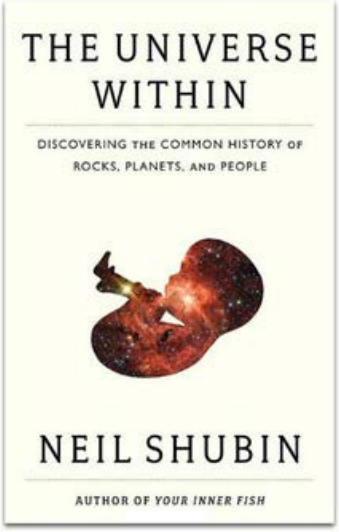

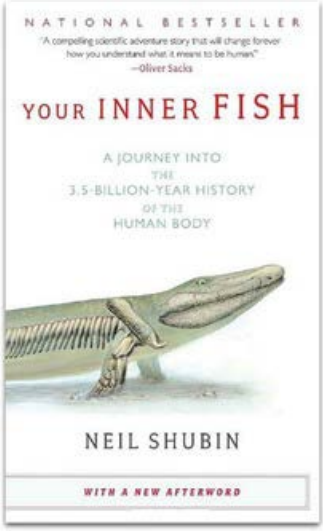

Commenting about this, in end note commentary: [33]

> "This is of course not a true chemical formula, as the ratios of elements in us [see: hmolscience periodic table] compose not a single unique molecule, like a crystal of salt, but a body consisting of numberous different kinds of them."

2013

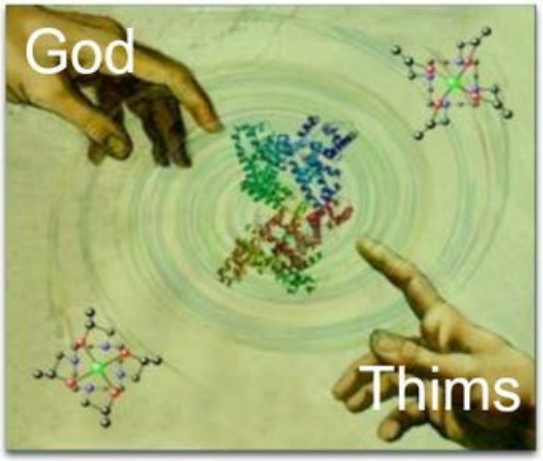

2013

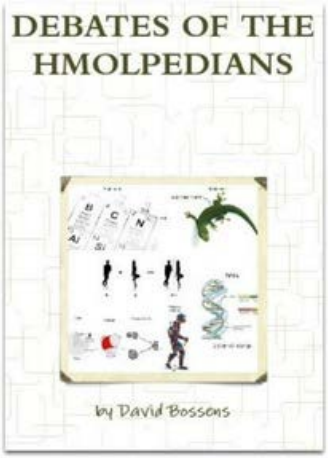

Left a God vs Thims (compare: God vs Gibbs) labeled image from the 2013 *Triple≡Bond Chemistry* (triplenlace.com) article "Chemical Formula of a Human", showing the religious implications of **human molecular formula** work. Right: the 2013 *Debates of the Hmolpedians* by David Bossens, on the philosophical implications of human molecular formula theory.

In 2013, Belgian psychologist David Bossens published his *Debates of the Hmolpedians*, which includes Thims human molecular formula. [31]

Religion

In 2013, the online Spanish chemistry news and education outlet *Triple≡Bond Chemistry* (triplenlace.com) published the article "Chemical Formula of a Human", citing the Sterner-Elser human molecular formula (2000) and the Thims human molecular formula (2002), illustrated with the following "hand of god" stylized painting—a protein molecule play on Michelangelo's circa 1512 fresco "The Creation of Adam"—alluding to the inherent religion-overthrowing implications in such a view. [36] Namely, is it free energy differentials, defined by chemical thermodynamics, or the hand of God, defined by the Bible, that created or rather synthesized humans?

Harkup

In 2013, English chemist Kathryn Harkup (Q), using the incorrect "59-elements in humans" basis, from John Emsley's *The Elements* (1989), commented: "I'm sure you have all wondered what the empirical formula would be for a human. Well, wonder no more. With invaluable help from John Emsley's book "The Elements" and a calculator I have spent a sunny afternoon working it out", then gives the following 59-element empirical formula for a human, using Hill order (which is a non-functionable ordering system at this size): [37]

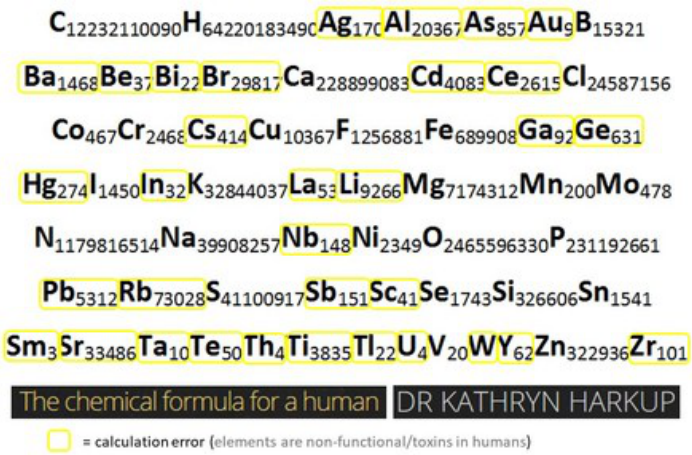

Harkup then comments, hastily, the time-honored regurgitation statement: “Of the 59 elements detected only 23 are essential for life (although the role of some such as Si is still debated)”; as to passingly imply that 36 of the above elements, e.g. arsenic (As) "a poison", rubidium (Rb) a "muscle toxin", tungsten (W) a toxin found near waste sites, which causes "respiratory" problems in animals, lead (Pb) a "poison" common to children, aluminum (Al) a "toxin", etc., were somehow organism-functional working elements in humans; which is not the case. Maybe she should have spent more time then a "sunny afternoon" working on her formula calculation?

BioNumbers | Harvard

In 2015, BioNumbers, Harvard Medical School's database of "useful biological numbers", began listing both the molecular formula and empirical molecular formula for a human, per citation of Thims (2002):

Human molecular formula | Molecular

ID	111244
Property	Human molecular formula (molecular)
Organism	Human Homo sapiens
Range	See "Measurement Method" section
Units	N/A
Reference	link Thims molecular formula | 2002
Primary Source	Thims published his results in the 2002 manuscript Human Thermodynamics (Volume One), in the 2005 IoHT (online) Molecular Evolution Table, and in the 2007 textbook Human Chemistry (Volume One). For an average 70-kg human being, this empirical formula translates to the following human molecular formula:
Method	HE27 OE27 CE27 NE26 PE25 CaE25 KE24 SE24 NaE24 ClE24 MgE24 FeE23 FE23 ZnE22 SiE22 CuE21 BE21 CrE20 MnE20 NiE20 SeE20 SnE20 IE20 MoE19 CoE19 VE18
Entered By	Uri M
Date Added	Jan 04, 2015 4:26 AM
Date Edited	Jan 04, 2015 4:33 AM
Version	3
Permalink	http://bionumbers.hms.harvard.edu//bionumber.aspx?id=111244&ver=3

B10NUMB3R5 THE DATABASE OF USEFUL BIOLOGICAL NUMBERS

Human molecular formula | Empirical

ID	111243
Property	Human molecular formula (empirical)
Organism	Human Homo sapiens
Range	See "Measurement Method" section
Units	N/A
Reference	An encyclopedia of human thermodynamics link
Primary Source	In any event, during this period of focusing on the query of what happens to a person at the point of death according to thermodynamics, a subject generally known as cessation thermodynamics, Thims began ruminate on how to go about calculating the molecular formula for an individual human, during which time, following several months of research, investigation, and searching for mass composition tables of humans, Thims eventually produced, similar to Sterner and Elser, a meta-analysis 26-element empirical human molecular formula as shown below: [4]
Method	H2.5E9 O9.7E8 C4.9E8 N4.7E7 P9.0E6 Ca8.9E6 K2.0E6 Na1.9E6 S1.6E6 Cl1.3E6 Mg3.0E5 Fe5.5E4 F5.4E4 Zn1.2E4 Si9.1E3 Cu1.2E3 B7.1E2 Cr98 Mn93 Ni87 Se65 Sn64 I60 Mo19 Co17 V
Entered By	Uri M
Date Added	Jan 04, 2015 4:14 AM
Date Edited	Jan 04, 2015 4:17 AM
Version	2
Permalink	http://bionumbers.hms.harvard.edu//bionumber.aspx?id=111243&ver=2

B10NUMB3R5 THE DATABASE OF USEFUL BIOLOGICAL NUMBERS

The 2015 entries for “molecular” [left] (Q) and “empirical” [right] (Q) molecular formulas for an average human, in Harvard’s Medical School’ BioNumbers, per citation of American electrochemical engineer Libb Thims 26-element “**human molecular formula**” (see: Thims human molecular formula (2002); compare: Sterner-Elser human molecular formula (2000), a 22-element formula).

(add discussion)

Hanson’s | Human formula | For dummies

On 6 Apr 2015, American biologist science writer Joe Hanson (Q), of the PBS digital studios “It’s OK to be Smart” YouTube Channel, who defines himself as a “curious group of atoms” (Q), used the 2013 NPR.org citation (Q), of Neil Shubin’s 2013 book citation [*The Universe Within: Discovering the Common History of Rocks, Planets, and People*], of the Sterner-Elser human molecular formula (a 22-element empirical human molecular formula), to make a 7-min “The Recipe For Life …” (Q), in which he cobbles together a smattering of internet sources, e.g. Ed Uthman’s 2000 “Elemental Composition of the Human Body”, listing 59 elements comprising one human (itself crudely based on John Emsley’s *The Elements*), to firstly state that we can put a human in a blender:

From which the following 32-element human periodic table, according to Hanson's oversimplified (incorrect) analysis, results:

Incorrect | 32-elements

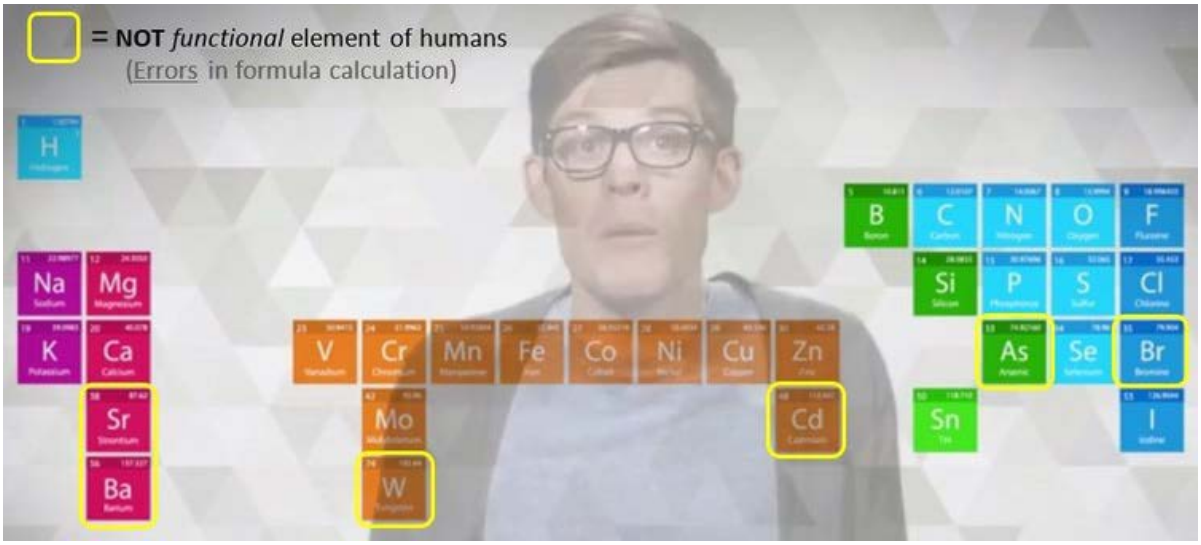

Correct | 26-elements

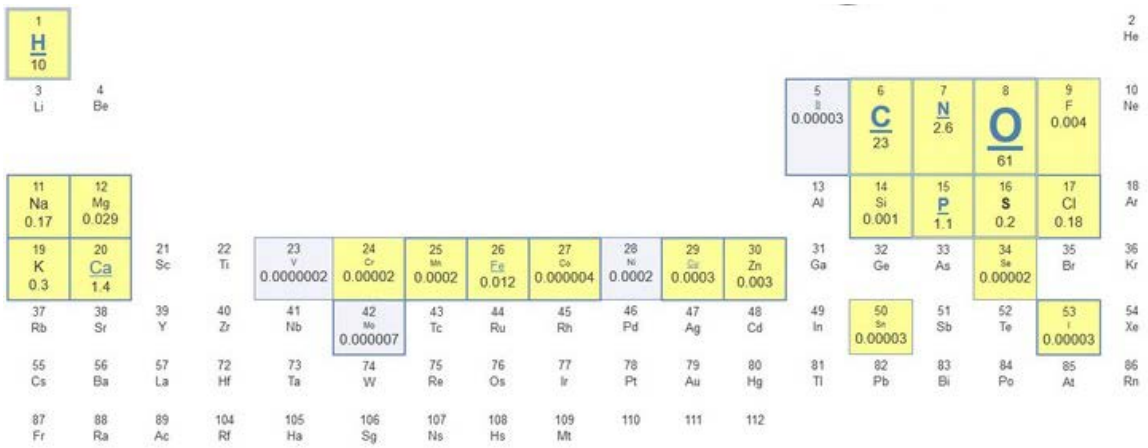

Hanson's periodic table is incorrect, in that there are six elements listed, namely: Sr, Ba, W, Cd, As, Br, not a functional part of the molecular formula of a existive human.

On 7 Apr, Hanson's video got picked up by Richard Gray, of DailyMail.co.uk, which became the headline story "Recipe for a HUMAN revealed: Biologist calculates the chemical formula for a person" (Q), resulting in near tabloid reporting of facts.

On 22 Nov 2016, Hanson emailed the following correction objection to Libb Thims:

> "You state "Hanson's periodic table is incorrect, in that there are six elements listed, namely: Sr, Ba, W, Cd, As, Br, not a functional part of the molecular formula of a existive human." If you watch our video, you'll hear the dialogue states "just over 30 of them are known to be essential to **some form of life on earth**" and our graphic/list is not limited to human biology as you've incorrectly stated. Here's some

references for you:

- **Sr**doi:10.1023/B:HYDR.0000027333.02017.50
- **Ba** doi:10.1016/j.jsb.2011.08.006
- **W**doi:10.1021/cr950063d
- **Cd**doi:10.1038/435042a
- **As** doi:10.1021/es035440f
- **Br**doi:10.1039/A900201D

You seem to have good intentions with your site, but we'd like anyone who finds it to not be misinformed about our work."

Thims noted this, but also pointed out more errors in the video, e.g. that in his "Elements in Human" label, at 6:28, he has rubidium (which is a muscle toxin) listed as the 16th element by percent mass. Correctly Copper Cu (0.0003%) is the 16th element in humans. Hanson, to note, also has multiple errors in his 2015 evolution and the second law video (Q), e.g. the statement: "When 2 humans get together and make a new human, doesn't that increase the order of the universe?", as pointed out by Thims (via YouTube channel HumanChemistry 101 video comments).

See also

- Evolution timeline
- Great chain of being
- Human molecule
- Molecular evolution table

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A 2007 Yahoo Answers "What is the Chemical Formula for a Human", with best answer given by David C (Q), via citation paste of the 2005 online version (Q) of the Thims human molecular formula (2002).

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(e) The discovery of the Sterner-Elser calculation was a partial impetus behind the expansion of the 2007 chapter two of *Human Chemistry*, into the 2008 booklet *The Human Molecule* (March 6).
5. (a) Note: Thims only became aware of Sterner's calculation on February 17, 2008 after doing a Google book search on keywords "human molecule thermodynamics"; Thims then emailed Sterner within the hour.
(b) Email communicate from Robert Sterner to Libb Thims on February 20, 2008.
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Further reading

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External links

● Chemical makeup of the human body – Wikipedia.
● Human body chemical composition – ForeSight.org.
● Human molecule symbol methodologies – IoHT, Chicago.
● What is the molecular formula for a human? – WikiAnswers.com.

θΔics

In chemistry, **human molecular hypothesis**, a precursor to human molecular theory, is the hypothesis that a human is a type of large "molecule", termed a "human molecule", or "atoms fitted together", in the original 1649 coining of the term molecule by 1649 by French thinker Pierre Gassendi, which has been synthesized, over time, from a great process. Dutch-born American mathematician, theoretical physicist, and economist Tjalling Koopmans, in 1947, seems to have been the first, in the 20th century, to state something along the lines of a human molecular hypothesis: [3]

> "While it was long possible and sometimes tempting for physicists to deny the usefulness of the molecular hypothesis, we economists have the good luck of being some of the 'molecules' of economic life ourselves, and of having the possibility through human contacts to study the behavior of other 'molecules'."

Human molecular hypothesis
(1789)

"We conclude that there exists a principle of the human body which comes from the great process in which so many millions of atoms of the earth become many millions of **human molecules**."

French polymath Jean Sales who in 1789 introduced the basics of **human molecular hypothesis**, in his conclusion that the "human molecule", or "molécule humaine" in the original french, came about form a "great process" in which the atoms of the earth combined to form the human molecule. [1]

The actual term "molecular hypothesis", to note, is a mid 18th century term, generally tracing to the work of Italian chemist Amedeo Avogadro's and his 1811 "Essay on a Manner of Determining the Relative Masses of the Elementary Molecules of Bodies and the Proportions According to Which they Enter Into These Combinations".

18th century

The history of the so-called "human molecular theory", the postulate that a human is a molecule, originated in the works of French philosopher Jean Sales who in 1779 published the first volume of his multi-volume opus *The Philosophy of Nature: Treatise on Human Moral Nature*, which over the years grew and expanded, supposedly going through seven editions, increasing in size to include up to a dozen volumes. In the 1789 edition, Sales outlined the basics of human molecular theory, with his statement:

> "We **conclude** that there exists a principle of the human body which comes from the 'great process' in which so many millions of atoms of the earth become many millions of **human molecules**."

In pictorial form, from the cover of Judson Herrick's *The Evolution of Human Nature* (1956):

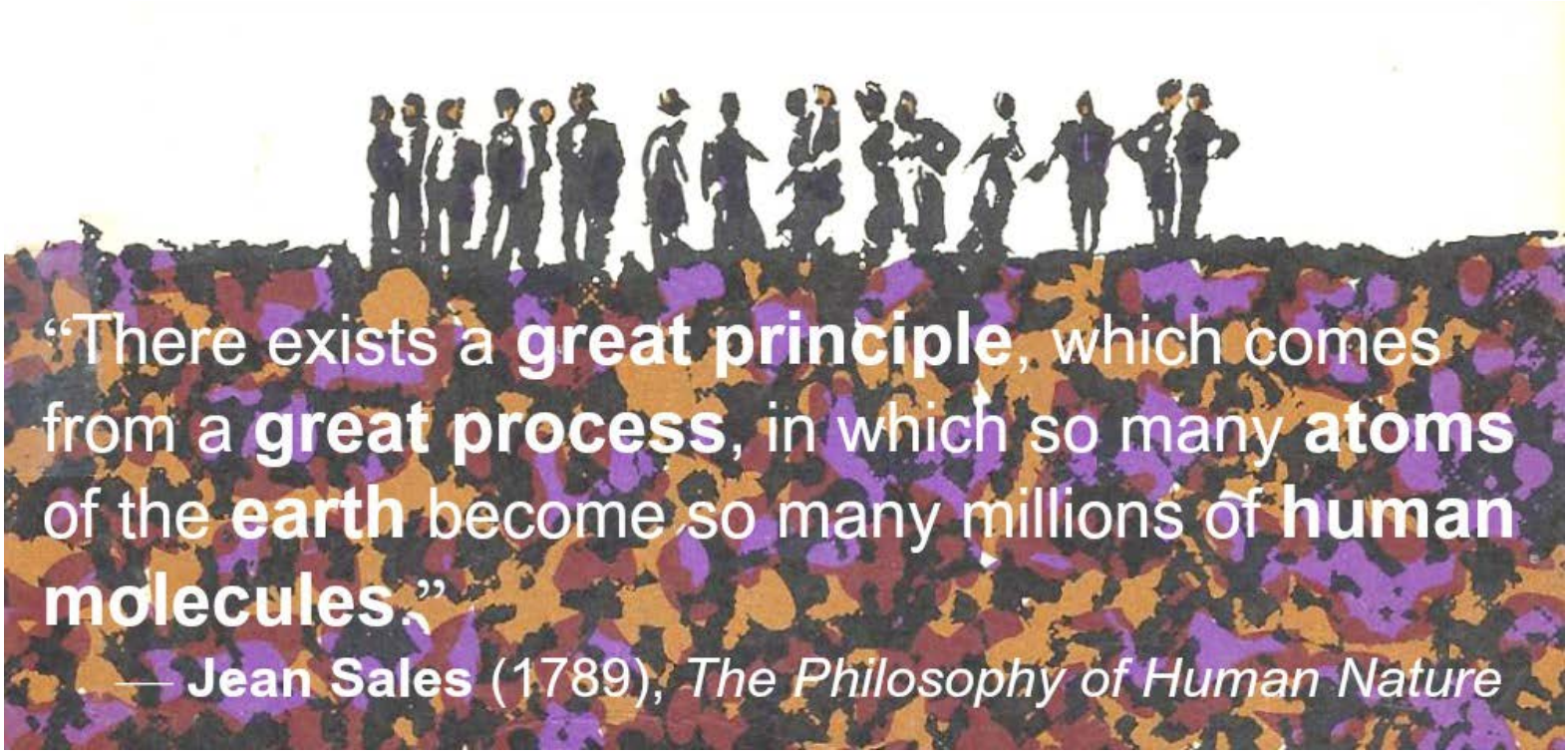

In summarized form, the conclusion posits, based on Sales natural philosophy theory, that:

(a) a human is molecule.
(b) the name of this type of molecule is 'human molecule'.
(c) this human molecule was formed through a 'great process' over time.
(d) the precursors or reactants to this great process were the atoms of the earth.

This is very advanced even form modern times, many modern-day scientists considering this view to be pseudoscience and crackpottery.

The next big thinker was German polymath Johann Goethe who in 1799, independent of Sales (1789), gleamed the view humans are large types of reactive chemicals whose interpersonal reactions are governed by the laws of affinity reaction, as detailed in Swedish chemist Torbern Bergman's 1775 physical chemistry textbook *A Dissertation on Elective Attractions*. Goethe published the finalized version of his human molecular theory in his 1809 scientific novella *Elective Affinities*. [2]

19th century

Thinkers into the nineteenth century to have employed human molecular theory include: Alphonse Esquiros (1840), Hector Berlioz (1854), Hippolyte Taine (1869), Alphonse Esquiros (1840), Henry Adams (1885), and Max Leclere (1894), Vilfredo Pareto (1896), to name a few.

20th century

Thinkers into the nineteenth century to have employed human molecular theory include: Yves Guyot (1903), Thomas Dreier (1910), George Perris (1911), George Carey (1919), Tjalling Koopmans (1947), mentioned above, Gustavus Esselen (1948), C.G. Darwin, (1952), Robert Nisbet (1970), to name a few.

21st century

Thinkers of the twenty-first were the first to expand on human molecular theory by calculating the human molecular formula for the average human, such as: Robert Sterner (2000), James Elser (2000), and Libb Thims (2002), among at least one other.

See also

â— HMS pioneers (timeline of the 100+ human molecular theorists)
â— Atomic theory

References

1. Sales, Jean. (1789). *De la Philosophie de la Nature: ou Traité de morale pour le genre humain, tiré de la philosophie et fondé sur la nature* (*The Philosophy of Nature: Treatise on Human Moral Nature, from Philosophy and Nature*), Volume 4 (molécules humaines, pg. 281). Publisher.
2. (a) Goethe, Johann. (1799). "Comment on Crebillon", October 23, German author Friedrich Schiller. Publisher.
(b) Lynch, Sandra. (2005). *Philosophy and Friendship* (Crebillon, pg. 37). Edinburgh University Press.
(c) Steer, Alfred G. (1990). *Goethe's Elective Affinities: the Robe of Nessus* (Crebillon, pg. 37). Winter.
(d) Prosper Jolyot de Crebillon – Wikipedia.
(e) Goethe, Johann. (1809). *Elective Affinities*. Publisher.
3. Koopmans, Tjalling C. (1979). *Scientific Papers of Tjalling C. Koopmans* ("molecules of economic life", pg. 150), Volume 1. Springer-Verlag.
4. Avogadro, Amedeo. (1811). "Essay on a Manner of Determining the Relative Masses of the Elementary Molecules of Bodies and the Proportions According to Which they Enter Into These Combinations", *Journal de Physiques*, 73: 58-76.

External links

â— History of molecular theory – Wikipedia.

θΔics

In human chemistry, **human molecular orbital** is the time-accelerated movement pattern a human, viewed as a human particle or point-mass, the dimensions of the orbital being defined by the 90 percent probability region of the average daily location of the moving point mass, over the surface of the earth, in respect to probabalistically finding the nuclei-electron components of particle, at any given moment. [1] The logic of using the human molecular orbital concept, e.g. in theorizing about human bonding, is called human molecular orbital theory, and is based on molecular orbital theory. [2]

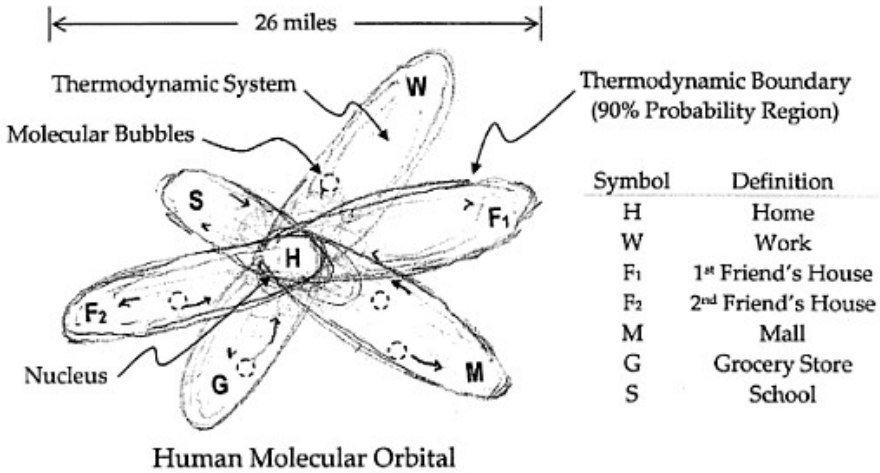

Depiction of a **human molecular orbital** showing of the 90 percent probability region of a person's location over the surface of the earth, the person considered as a human particle, shown inside of American anthropologist Edward Hall's 1966 conception of 'reaction bubbles' (a type of personal space), according to which the probability region boundary is defined as one's thermodynamic boundary. [1]

Advanced perspective

The "human molecular orbital" view is facilitated by utilizing the advanced intelligence perspective, referring to the study of human interactions from an observational vantage point in space somewhere, the way humans study reactions in a a reaction vessel in which the atoms and molecules are moving at speeds many times greater in magnitude that the observer.

History

Form 1995-2001, American chemical engineer Libb Thims had been studying the free energy aspects of the basic human combination reaction (man A meets woman B, they bond in a relationship, and conceive of a child C):

$$A + B \rightarrow C$$

Thims focus concerned the initial state of the reactants (A + B) as compared to the final state of the product (C). During these years he particularly neglected the relationship couple AB formed during the reaction:

$$A + B \rightarrow AB + C$$

assuming it to be a negligible intermediate in the mechanism. Sometime in late 2002 or early 2003, however, it became clear that this component AB, the attachment of the two human molecules, in the form a dihumanide molecule, needed a theory of pure chemical bonding to explain the attachment (husband-wife bond). Using standard molecular orbital theory as a basis, Thims began to develop the logic that a chemical bond would begin to form between two human molecules when an instance of orbital overlap would begin to reoccur, such as in if two people worked at the same job and in that orbital began to develop a connection.

Transition state theory

The application of human molecular orbitals to the transition state theory, i.e. that any given reaction follows a specific number of mechanism steps on going from reactants to products, crossing the activation energy barrier, a point of over-stretched bonds, i.e. a heightened energy state, leads to an intuitive means for understanding human molecular transition states. A typical diagrammatic representation of a human combination reaction is shown below, using this methodology, in which two people meet in their school orbital, begin to interact or hangout at joint friend orbitals, to eventually combine their once previous home nuclei into one fused nucleus (move in together):

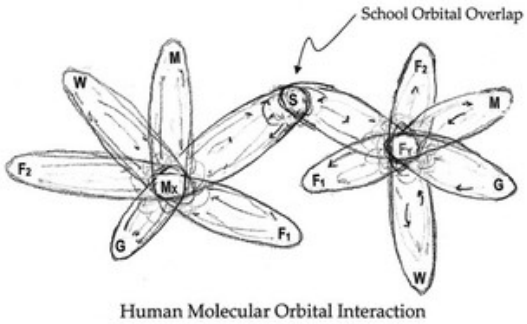

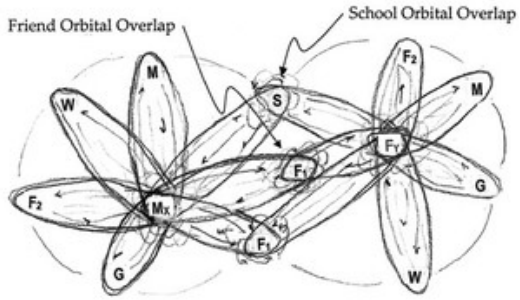

Enhanced Human Molecular Orbital Interaction

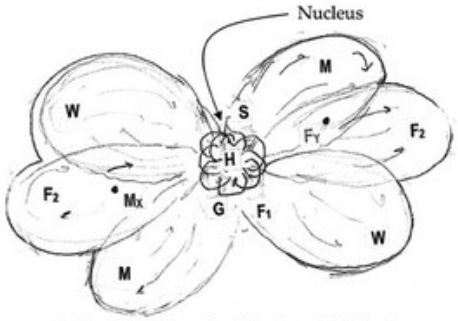

Human Molecular Nuclear Unification

Day one: Two people, i.e. human molecules, Mx and Fy, meet in their school orbitals, and begin to associate.	**Day 90**: The two human molecules develop more orbital overlap (stability) by hanging out at the houses of mutual friends.	**Day 365**: The two human molecules fuse, by combining their previous separate nuclei into one (they move in together).

(add)

Launch / Reentry

The following (Ñº) is a word pun take on love making and the heat of orbital reentry:

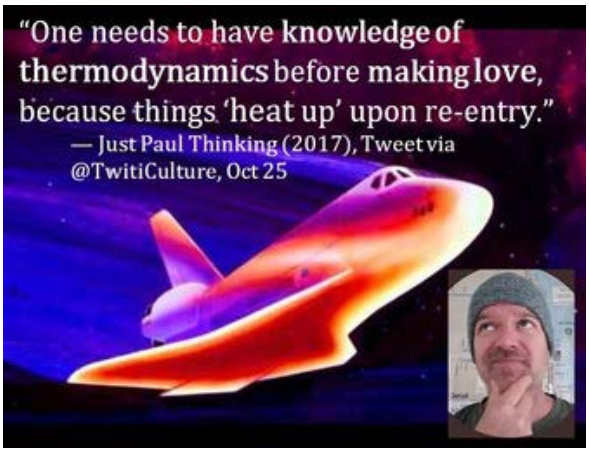

The following (Ñº) is an image from chapter 4.1.7 "Returning from Space: Re-entry", from an FAA online book:

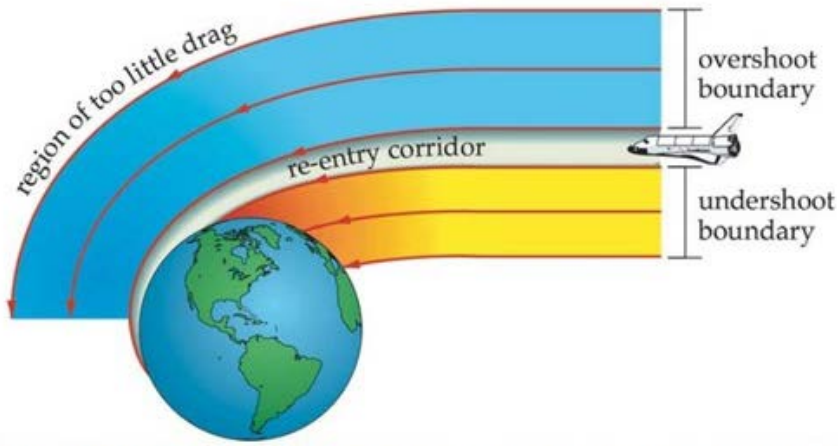

Figure 4.1.7-2. Re-entry Corridor. The re-entry corridor is a narrow region in space that a re-entering vehicle must fly through. If the vehicle strays above the corridor, it may skip out. If it strays below the corridor, it may burn up.

Illustrating, in the "human molecular orbital" sense of the 2006 film *Failure to Launch* (Ñº), about a 35-year-old man who "fails" to launch from his childhood home, that when a person is "detached" from the "social gravity" of their childhood home, and floating about "social

space", that in order to enter into a new planetary orbital, i.e. new relationship, one needs to go into the right "re-entry corridor", so as to not "burn up" if one goes in to fast or to low, e.g. a crash and burn relationship, or to miss the re-entry corridor or window if one goes in to high or slow and is in the region of "too little drag", thereby overshooting the planet.

Other models

The human molecular orbital model of bonding was followed by the 'field particle exchange theory' (2004), the 'human chemical bond' (2005), and the 'dodecabond model' of human chemical bonding.

See also

â— History of chemical bonding theory

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (human molecular orbtal, pg. 265; orbital transition state, pgs. 268-69). Morrisville, NC: LuLu.
2. Molecular orbital theory – Wikipedia.

θΔics

In human chemistry, **human molecular orbital theory** is the extrapolation of basic molecular orbital theory to the time-accelerated description of human molecular structure, bonding, and transition states, to develop the logic of the human molecular orbital. [1]

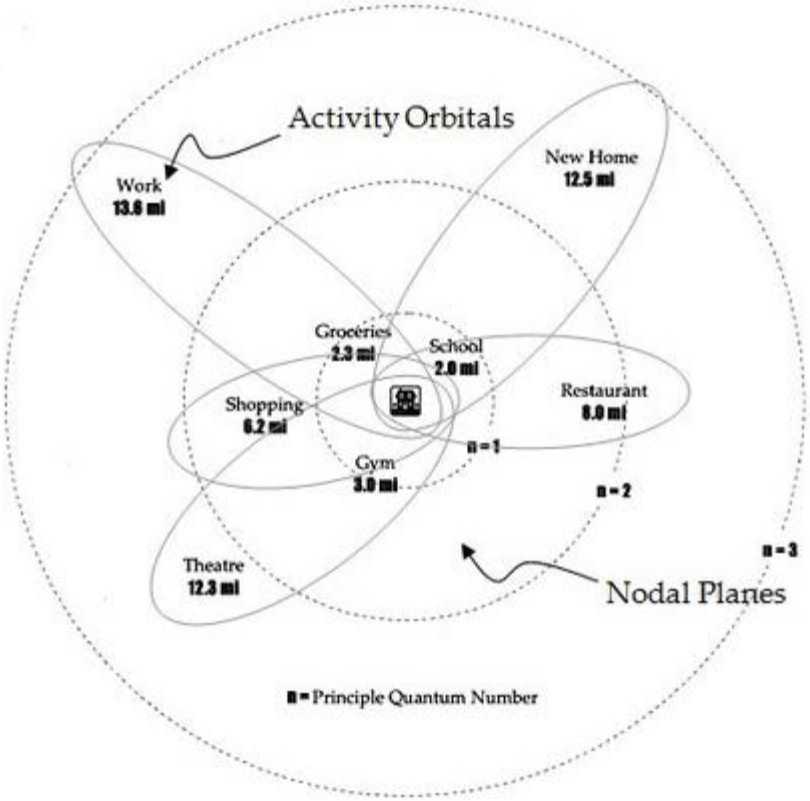

Diagram of the basic 'orbital structure' of a human molecule, when the weekly, monthly, or yearly movement of a typical person, over the surface of the earth, is viewed at a sped-up pace.

Proxemics

The following 1966 quote by proxemics founder Edward Hall alludes to the conception of how human molecules behave orbitally or rather spatially similar to smaller molecules: [2]

> "As more and more is learned about both men and animals, it becomes clear that the skin itself is a very unsatisfactory boundary or measuring point for crowding … like molecules that make up all matter, living things move and therefore require more or less fixed amounts of space."

This logic, representative of orbital theory, is captured in the earlier ideas of personal space and reaction bubbles.

History

Building on some of the proxemics work of Edward Hall and other recent personal space measurements, the first version of human molecular orbital theory was worked out by American electrochemical engineer Libb Thims in 2003 (see: history).

A few comparative models might be those of Mark Janes and his 2009 carbon atom model of his body parts or possibly Jacob Moreno's 1949 social atom scheme.

Overview

The extrapolation of molecular orbital theory to the study of the structure, formation, and dissolution of chemical bonds between human molecules is called human molecular orbital theory. When human movement, over the surface of the earth, is viewed at a time-accelerated pace, such as viewing the total weekly, monthly, or yearly movements of one person, via for example GPS tracking, in a sped-up five minute video clip, one begins to see an orbital picture of human movement.

A molecular orbital, by definition, is the a solution of the Schrödinger equation that describes the ninety percent probable location of an electron relative to the nuclei in a molecule and so indicates the nature of any bond in which the electron is involved. In simple terms, it is understood that electrons (and molecules) act as both waves and particles, tending to have orbital motions in their trajectories.

Starting with the conservation of energy, which assumes that the total energy of a system is equal to the sum of its potential energy and kinetic energy, a descriptive time-dependent 'wave equation' can be derived which describes the movement or behavior, and thus the structure, of the nuclei and

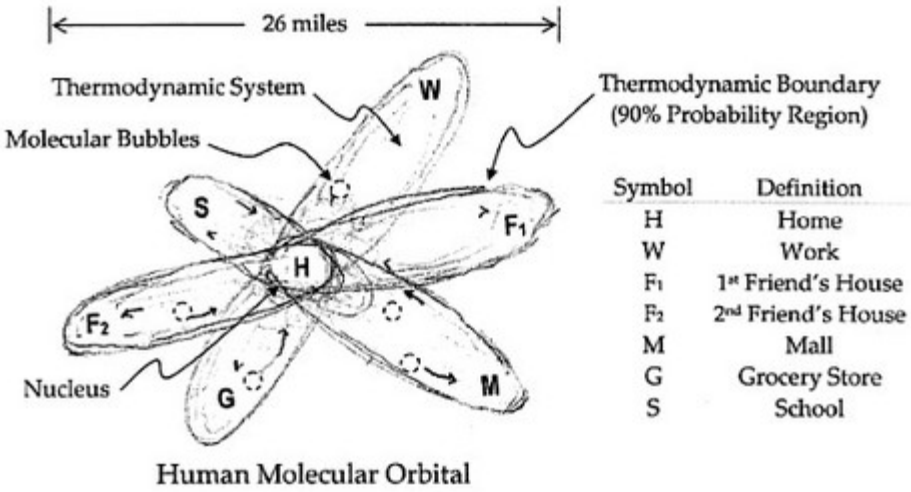

A thermodynamic system / molecular bubbles depiction of a human molecular orbital for one human molecule, or rather one person's average daily trajectories and movements, viewed at a sped-up rate of viewing. [1]

electrons that comprise an atom or molecule. This description is particularly intuitive when electrons are shared between two different atoms or molecules, creating a chemical bond, which actuates as through the means of an orbital overlap effect. The translation of this logic to the bonding transition states of human interpersonal interactions provides for a robust means of understanding human chemical bonding.

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (ch. 9: Human Molecular Orbitals, pgs. 247-95. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
2. Hall, Edward. (1966). *The Hidden Dimension*. Publisher.

θΔics

In science, **human molecular science**, or 'hmol science' in short, truncated to "hmolscience" (c.2013), is the study of humans from the external atomic perspective.

Overview

The essential component of human molecular science is the view that a human being is purely an atomic structure or technically a "molecule" (structure of two or more atoms). Subsequently, the human, viewed purely as a molecule (or atomic particle) can be studied as a physical entity, no different than any other molecular (or atomic) entity in science. Human molecular science, in concise form, is the scientific study of human molecules (or its derivative terms: human particle, human chemical, social molecule, economic molecule, human atom, etc. The chronological listing of the 75+ pioneers of this subject on the HMS pioneers page, gives a gist overview of the various issues encountered in this subject of study. The following three captions summarize the differing viewpoints of HMS:

Cartoon science?
(43% believe they are not a molecule)

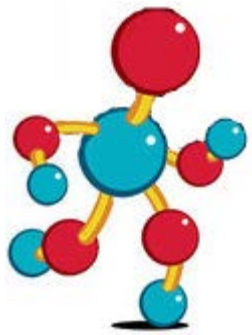

(NY Times cartoonish depiction of a human molecule)

Some maintain, strictly speaking, that a human is not a molecule, and consider modeling of humans as molecules to be either pseudoscience or humorous fun.

Hard science?
(57% believe they are a molecule)

$H_{375,000,000}$ $O_{132,000,000}$ $C_{85,700,000}$ $N_{6,430,000}$ $Ca_{1,500,000}$ $P_{1,020,000}$ $S_{206,000}$ $Na_{183,000}$ $K_{177,000}$ $Cl_{127,000}$ $Mg_{40,000}$ $Si_{38,600}$ $Fe_{2,680}$ $Zn_{2,110}$ Cu_{76} I_{14} Mn_{13} F_{13} Cr_{7} Se_{4} Mo_{3} Co_{1}

(Sterner-Elser 2002 calculation for the empirical formula for one human molecule)

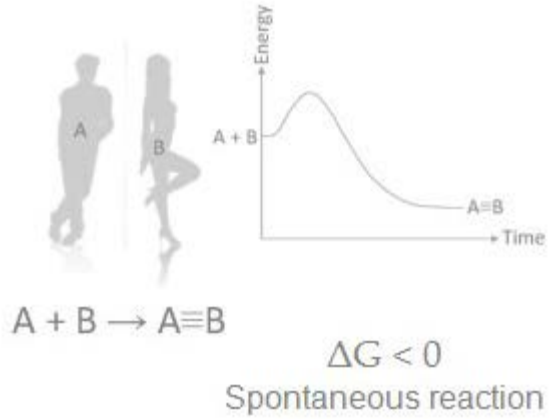

(modern Thims-Hirata-Hwang human chemical reaction analysis)

Some maintain, strictly speaking, that a human is a molecule, and consider the modeling and use of established scientific principles of molecular behavior, e.g. the laws of thermodynamics, to be a wealth of future scientific advancement.

Branches

There are three main branches of human molecular science: human chemistry, the chemistry of human molecules, human physics, the physics of human particles, and human thermodynamics, the thermodynamics of systems of human molecules or human particles.

Perspectives

There are generally three points of view in regards to the perspective of human molecular science:

View	Representatives
The subject is a contrived anathema that does not	

(a)	apply to humans; there is an 'unbridgeable gap' of separation between the chemical world and the human world.	(Wieland, 1810; Heilbroner, 1953; Fuller, 2005; Wojcik, 2006)
(b)	The subject is useful for teaching, but a human is not, strictly speaking, a molecule.	(Muller, 2006)
(c)	The subject is correct view of what a human is.	(Goethe, 1809; Thims, 2002)

The following 2006 interview quote by Venezuelan chemical engineer and chemical thermodynamics professor Erich Muller: [1]

> "Obviously people are much more complicated than molecules—**cartoon science** is just a way to help someone understand something. One molecule may form strong bonds to another of that some type but I would hope that your decision to marry would be a little more complex than that!"

Muller's referral to human molecular science as a "cartoon science" highlights the ambivalence, or possibly fear (of academic disgrace or loosing tenure), common to many human molecular theorists, which explains why the subject is often perused after retirement (Adams, 1910; Darwin, 1952; etc.). What Muller calls a cartoon science, in interview, differs greatly from the hard science he uses, in practice, in in his 1998 Chemical Engineering Integration and segregation thermodynamics article "Human Societies: A Curious Application of Thermodynamics".

References

1. Gallagher, Laura. (2006). "A Thermodynamic Personality: Interview with Erich Müller", *Reporter*, Issue 162, 24 February.

θΔics

In human chemistry, **human molecular spin** is the intrinsic angular momentum of a human molecule, i.e. a person, which continues to exist even when the molecule comes to rest. [1] The generalized noticeable effect of the spin of humans is the daily rotation patterns that occur in one's human molecular orbitals. In simple terms, if a person is blindfolded and put on a vast flat surface, such as a salt flat, and told to move continuously in a straight line, either by walking forward or driving forward, while blinded, it is found that the resulting path will be curled and not straight.

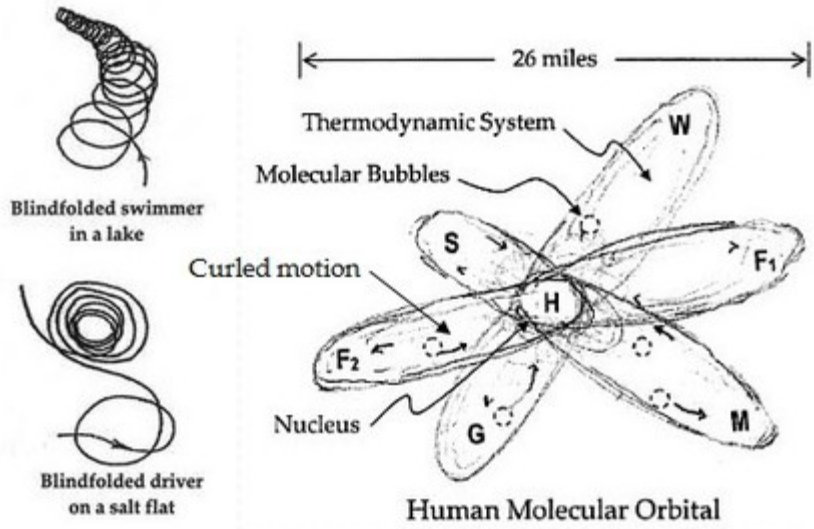

Generalized model of **human molecular spin** or the spin of a human molecule (person): (a) top left: a blindfolded swimmer going in circles, (b) bottom left: a blindfolded driver going in circles, (c) right: a person moving their average daily activity orbitals, school S, work W, friend's houses F_1 and F_2, grocery store G, mall M, each connected to the nucleus of the home H, within each of which movement tends to be circular, contained by visual wave guides, e.g. walls, roads, sidewalks, etc., operating clockwise or counter-clockwise, depending on whether one is north or south of the equator, respectively, a process dictated by field particle exchange or a combination of the electromagnetic force and the gravitational force. [1]

In short, for human molecules moving about on the surface of the earth, in their respective daily orbitals or activity spheres, north of the equator, the earth's magnetic field lines go into the ground, thus according to the right hand rule, movement will tend to be directed or "curled" in a clockwise direction (hence people tend to drive on the right hand side of the road); for human molecules moving about on the surface of the earth, in their respective daily orbitals or activity spheres, south of the equator, the earth's magnetic field lines come out of the ground, thus according to the right and rule, movement will tend to be directed in a counter-clockwise direction (hence people tend to drive on the left hand side of the road).

Thus, if movement patterns are tracked, say at the workplace, over the course of a day, it is found that people tend to 'feel' comfortable moving clockwise, if they work north of the equator, and counter-clockwise, if they work south of the equator.

History

The phenomenon of human curling motion was first documented by Austrian physicist Ernst Mach with his circa 1885 drawings of the "turning tendencies" of troop movements when lost in a snow storm at night without visual direction.

The theory that people or human molecules in their daily movement have a type of spin originating from field particle exchange between humans and their environment, humans and the earth, which is in some way coupled to the spin of the sun, which is in turn coupled to the spin of the milky way, which is in some way connected to the trajectory of the local group towards the great attractor, was first outlined in manuscript form in circa 2004 by American chemical-electrical engineer Libb Thims and published as three-page subsection in 2007. [1]

A similar theory of cosmically coupled spins is found in the circa 2003 work of Swiss-born American theoretical physicist Nassim Haramein and his torus universe model. [2]

Human chemical bonding

In chemical bondings between people, in human molecular orbital theory, it is hypothesized that stabilizing bonds result when paired spins are congruent in some way, and extended version of the Pauli exclusion principle for two human molecules in the formation of a paired dihumanide molecule.

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (human molecular spin, pg. 196, section: Human molecular spin, 209-11). Morrisville, NC: LuLu.

(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (section: Human molecular spin, pgs. 209-11). Morrisville, NC: LuLu.
2. (a) Haramein, Nassim and Rauscher, Elizabeth A. (2003). "A Consideration of Torsion and Coriolis Effects in Einstein's Field Equations", *Bull. Am. Phys. Soc*. S10016, Four Corners, AZ, Oct. 24.
(b) Haramein, Nassim and Rauscher, Elizabeth A. (2004). "The Origin of Spin: A Consideration of Torque and Coriolis Forces in Einstein's Field Equation" (abstract), *Journal*; in: R. L. Amoroso, B. Lehnert & J-P Vigier (eds.), *Beyond The Standard Model: Searching For Unity In Physics* (*Proceedings of the Paris Symposium Honoring the 83rd Birthdayof Jean-Pierre Vigier*) (pgs. 153-168). The Noetic Press, 2005.

External links

â— Spin (physics) – Wikipedia.

θΔics

In human chemistry, **human molecular symbols**, or human chemical "symbols", refers to the use of “letter combinations”, e.g. Mx for *male* human (man), to represent, via the a symbolic nature, different types of human molecules, or people defined as chemical species, for the purpose of human chemical reaction theory, the way chemists in the early 18th century did the same for the elements, such as Si for silicon.

A 2006 screen shot, from a "The Human Element", using John Claxton's "Hu" **symbol for a human**, in a periodic table "big nature" sense of things.

Periodic elements

In 1775, Torbern Bergman, in his *A Dissertation on Elective Attractions*, was using letters to represent individual chemical species generically A or B, and to represent combined species (bonded species), he was putting the letters adjacent to each other, in the form AB.

In 1814, Jacob Berzelius, supposedly (Ñº), was the first to employ a one or two letter for each element; on this he said the following:

> “The chemical signs ought **to be letters**, for the greater facility of writing, and not to disfigure a printed book.”
>
> — Jacob Berzelius (1814), “Article”, *Annals of Philosophy* [4]

That year he proceeded to outline the main rules needed to generate such symbols, most of which are still used presently.

Human | Chemicals

In 1809, Goethe, in his *Elective Affinities*, generally modeled on the symbol use methods of Torbern Bergman (1775), assigned the following symbols: A for Charlotte, B for Edward, C for the Captain, and D for Ottilie.

> “The **moral symbols** in the natural sciences—for example that of the elective affinities invented and used by the great Bergman—are more intelligent and permit themselves to be connected better with poetry, even connected with society better than any others, which are, after all, even the mathematical ones, anthropomorphic. The thing is that the former (the chemicals) belong with the emotions, the latter (mathematics) belong with the understanding.”
>
> — Johann Goethe (1809), “Comment to Friedrich Riemer”, Jul 24

In 1987, Mirza Beg, in his *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, referred to bonded associations of individual people: A, B, C, etc., which he refers to as chemical species or molecules, as he alludes, of form AB, BC, AC, AA, etc., as “dimers”, such as the formation of "close friends denoted by AB formed according to reaction", and and groupings or associations such as ABC as “trimmers”.

In 1995, Libb Thims was using the following formula (no symbols), in order to conceptually understand things, in terms of changes in free energy states:

> Male + Female → Baby

In 2001, David Hwang assigned: M for Male, F for Female, and ‘M-F’ for couple.

In c.2001, Christopher Hirata, in his “The Physics of Relationships”, was uses the symbols of X = girl, Y = boy, and XY = paired relationship, calling the single boys and girls, i.e. men and women on his college campus, as “basic elements”, along with: Y_2 for the "gay molecule", X_2 for the "lesbian molecule", and X_4Y for the "middle-Eastern polygamous molecule".

In 2001, Thims was using the following, were “s” was an attempt to defined humans as being in the “solid” state (which is not perfectly correct):

$$M(s) + F(s) \rightarrow B(s)$$

In c.2002-2003, Thims was ruminating on the correct symbols to use for man, woman, and baby; the following being one set of notes:

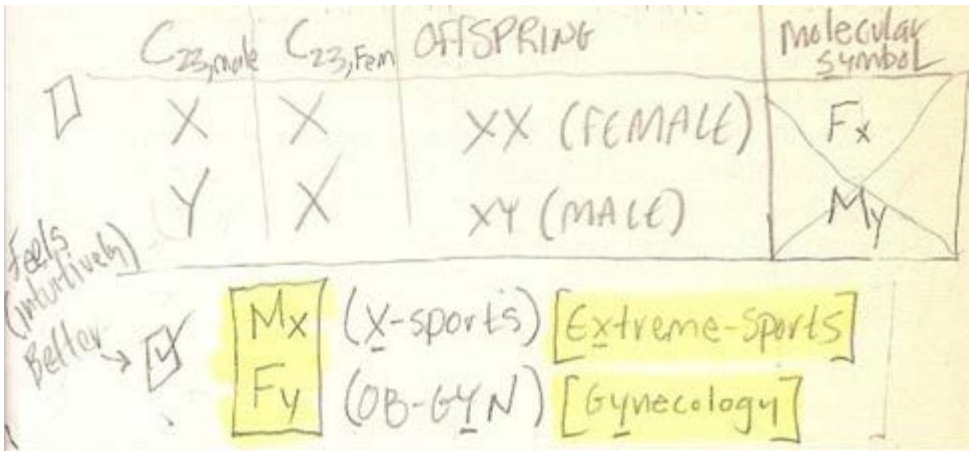

Some c.2002 scratch **human molecule "symbol"** notes, on the acknowledgement section of Matt Ridley's 1999 book *Genome: the Autobiography of a Species in 23*, wherein Libb Thims arrived at the use of Mx for male (man) and Fy for female (woman).

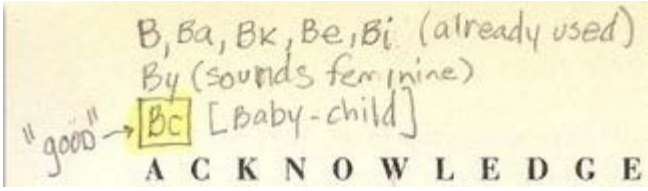

Thims, in these scratch notes, shown above (right), had decided on using M for Male and F for female, along with an x/y subscript, so to eliminate possible confusions (e.g. M as short for Mega or Million; F short for Florine) subscripts "X" and "Y" based on the fact that the X and Y chromosome pairings on the 23 chromosome determine the sex of a person, in that if one is XY they are male and XX they are female. On first pass, this yields the symbol model My (male) and Fx (female)? This, however, did not "feel" right, for a number of reasons, so Thims reverse the order of the subscripts to yield: Mx (male), in the sense of "X-games", and Fy (female) in the sense of "gYnecology".

In 2005, Libb Thims, in his online “Human Molecule Symbol Choice Methodology”, building on his earlier 1995 work on human reproduction reaction theory, and on the work of David Hwang (2001), section outlined a section on uniform unambiguous notation choice for chemical symbol notation usage for people defined as chemicals.

In 2006, John Claxton, while working a new advertising campaign for Dow Chemical, came up the “Hu” as the symbol for a human. A number of popular “The Human Element” video clips and commercials resulted.

In 2007, Thims, in his *Human Chemistry (Volume One)*, section “Human Molecular Symbols”, devoted two pages to a discussion of the need to used specifically assigned symbols to different type of humans so to avoid confusions, could confused also for either Boron or Baby, or in Hwang’s case F can stand for Florine or Female, etc., depending on context of discussion; some basic assignments of which were as follows: [2]

Fa = Father
Ma = Mother

Mx = Male (man)
Fy = Female (woman)
MxFy = Bonded couple (see: dihumanide molecule)
Bc = Baby or Child

Sb = Sibling
Gf = Grandfather
Gm = Grandmother
Up = Paternal Uncle
Um = Maternal Uncle
Ap = Paternal Aunt
Am = Maternal Aunt

Cp = Paternal Cousin
Cm = Maternal Cousin
Ne = Niece
Nw = Nephew
Bf = Boyfriend
Gf = Girlfriend

Fc = Close Friend
F = Friend
Fd = Distant Friend
Nr = Neighbor
W = Work, job, or occupation
Sc = School
Si = Society

In 2019, Libb Thims, in amid his 5-day interview with Mirza Beg (see: Beg-Thims interview) was using the technique, during their discussion and sketch drawings, of using the last name of a person as the first capital letter, and the first name as the second smaller letter, e.g. Mirza Beg as B_M and Libb Thims as T_L as shown below:

$$B_M + T_L \rightarrow ?$$

as was posted and advertisement for the interview.

Quotes

The following are related quotes:

> "The time may come when human affairs may be described no longer by words and sentences, but by a system of **symbols** or **notation** similar to those used in algebra or chemistry … then it may be possible, as Adams suggests, to invent a common formula for thermodynamics and history."
>
> — William Thayer (1918), "Vagaries of Historians" [3]

See also

â— Chemical symbol notation
â— Moral symbols

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θΔics

In science, **human molecular theory** refers to the theory that a human is a molecule—a structure comprised of two or more atoms.

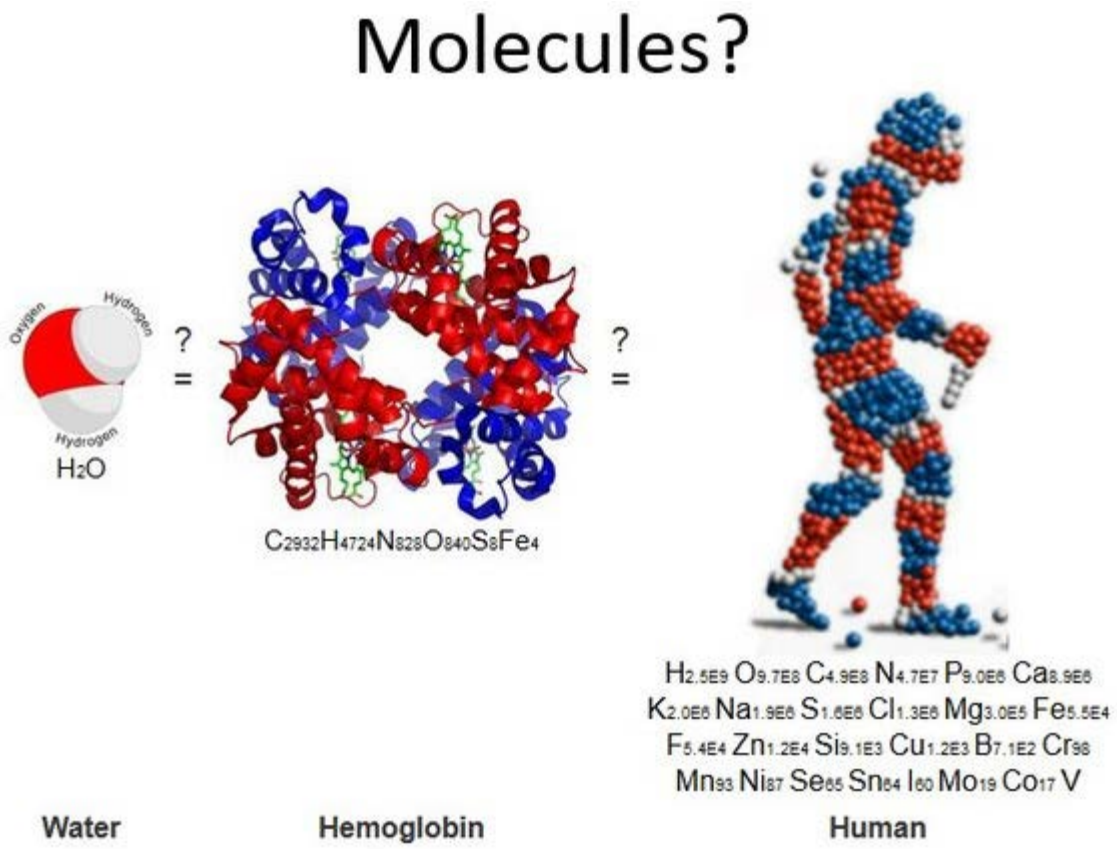

The premise or theory that a human is a "molecule" or "abstract molecule", with a measurable molecular formula, no different, advanced animate and turnover rate properties aside, from any other molecule, e.g. water, hemoglobin, etc., or more particularly animate molecule, e.g. retinal, DTA, etc., is what is called **human molecular theory**.

History

See main: HMS pioneers

The term "human molecular theory" seems to have been an Hmolpedia-coined term, first used on 07 Jul 2010 on the atomic theory page (see: version 10) to describe American limnologist Robert Sterner and James Elser's 2002 publication of the human molecular formula. [1]

In this context, French philosopher Jean Sales' 1789 coining of the term "human molecule", and his supposition that human molecules arose through a "great process" from the atoms of the earth, might well be classified as the "human molecular hypothesis". [2]

Overview

A subset of atomic theory logic is 'human molecular theory', the premise that humans are made of atoms, ordered in specific arrangement, in the form of a dynamic molecule. The immensity of this simple doctrine cannot be overestimated in terms of its far-reaching implications. To illuminate, as commented by American physicist Richard Feynman in his famous time capsule wisdom:

> "If all scientific knowledge were lost in a cataclysm, the single statement that I would propose to best pass on our understanding of the world, so to preserve the most information for the next generations of creatures, would be: 'all things are made of atoms'."

The extrapolation of this, up to the human scale, namely that:

> **"All humans are made of atoms."**

is the more far-reaching statement with which to pass on to subsequent generations. That humans are little particles (made of atoms), which go by various names: human molecules, human atoms, human atomisms, human particles, human chemicals, or human elements, etc., that move around, attracting each other when in near vicinity, but repelling upon being squeezed together in too close a manner. In this one sentence, one sees that there is an enormous amount of information about the human world, if just a little imagination and thinking are applied. In this perspective, the

following table gives a gist outline of human molecular theory:

Modern Human Molecular Theory		
1919	George Carey (1845-1924) American physician	Definitively stated that: "man's body is a chemical formula in operation."
2000	Robert Sterner (c.1958-) American limnologist James Elser (1959-) American limnologist	In their ecological stoichiometric studies of elemental composition variations in related species of small fresh water organisms, Sterner and Elser initiated modern **"human molecular theory"** by calculating the following 22-element empirical molecular formula for one person: $H_{375,000,000}\ O_{132,000,000}\ C_{85,700,000}\ N_{6,430,000}\ Ca_{1,500,000}\ P_{1,020,000}\ S_{206,000}\ Na_{183,000}\ K_{177,000}$ $Cl_{127,000}\ Mg_{40,000}\ Si_{38,600}\ Fe_{2,680}\ Zn_{2,110}\ Cu_{76}\ I_{14}\ Mn_{13}\ F_{13}\ Cr_{7}\ Se_{4}\ Mo_{3}\ Co_{1}$ which they specifically defined as the chemical formula for one 'human molecule', thus giving, for the first time, experimentally measured proof or derivation that a human is a 'molecule' comprised of a specific number of operational atoms.
2002	Libb Thims (c.1975-) American electrochemical engineers	In his human thermodynamic studies, particularly surrounding efforts to understand how the spontaneity criterion applies to human relationships, in 2002 calculated the following 26-element empirical molecular formula: $H_{2.5E9}\ O_{9.7E8}\ C_{4.9E8}\ N_{4.7E7}\ P_{9.0E6}\ Ca_{8.9E6}\ K_{2.0E6}\ Na_{1.9E6}\ S_{1.6E6}\ Cl_{1.3E6}\ Mg_{3.0E5}\ Fe_{5.5E4}\ F_{5.4E4}\ Zn_{1.2E4}\ Si_{9.1E3}\ Cu_{1.2E3}\ B_{7.1E2}\ Cr_{98}\ Mn_{93}\ Ni_{87}\ Se_{65}\ Sn_{64}\ I_{60}\ Mo_{19}\ Co_{17}\ V$ and in 2007 wrote the first textbook on the behavior and reactions of human molecules; and in 2008, after becoming aware of the earlier work of Sterner and Elser, wrote the first booklet on history of the concept of the human molecule.
2005	Author (dates) *New Scientist* writer	In 2005, an anon author of a *New Scientist* article entitled “That’s Life”, gave the following 12-element empirical formula: $H_{15,750}\ N_{310}\ 0_{6,500}\ C_{2,250}\ Ca_{63}\ P_{48}\ K_{15}\ S_{15}\ Na_{10}\ Cl_{6}\ Mg_{3}\ Fe$ This attempt at what the author calls "one's chemical formula", however, is lacking in 14 elements shown to have active role in the internal functioning of a person.

The three subjects concerning the study of human molecules include: human chemistry, human physics, and human thermodynamics—that can be grouped under the umbrella subject term "hmolscience".

Objectors

See main: People are not molecules

The following is a listing of thinkers known to take a stance publicly on objection or opposition commentary to the position of defining a human as a molecule:

Person ≠ Molecule

as defined in the context of modern human molecular theory, the human molecular hypothesis, and or the 2002 Sterner-Elser publication of the human molecular formula:

Date	Person	View
1928	Pitirim Sorokin (1889-1968) Russian-born American sociologist	
1953	Robert Heilbroner (1919-2005) American economist	
1964	Theodosius Dobzhansky (1900-1975) Russian-born American zoologist	"Man is not a molecule, and though he is an animal he is a very special kind of animal." [5]
2005	Steve Fuller (1959-) American philosopher and sociologist	"I am not a molecule." (*New Scientist* article)
2007	Omar Lizardo (c.1975-) American sociologist	"A human is not a molecule is not a power plant is not a neuron is not a city. Repeat after me…" [4]
2009	Bruce Bathurst (c.1940-) American geological thermodynamicist	"I'm not a molecule." (*Hmolpedia* thread)
2009	Philip Moriarty (c.1968-) Irish physicist	"[The view that] a human is made of lots of atoms. Therefore a human is just a big molecule. Big molecules will behave just like small molecules. Therefore I can apply all thermodynamic principles to human 'molecules' [is a] laughable central premise." (Moriarty-Thims debate: #66)
2010	Lubos Motl (1973-) Czech-American theoretical physicist	"Human beings are not molecules, they are composed of molecules, but we aren't giant molecules."(YouTube forum post)
2010	Marcin Borkowski (1963-) Polish analytical chemist	"Humans are not molecules, they are complex objects composed of many molecules."(ChemistryForums.com post)

Cladwell and Fuller are unique among this group in going out of their way to actually publish thought out articles and or chapters to refute the "human molecule" position.

Ambivalent objectors | Retractors

The following is a listing of known thinkers to object to the position of defining a human as a molecule, recant their position, and or give ambivalent commentary on the matter:

Date	Person	View
1957	May Brodbeck (1917-1983) American chemist and philosopher	“People are not like molecules in a gas. Some are different from others and some have more effect upon society than others.” [6]
1992	Bruce Caldwell (1952-) American economics historian	Wrote a commentary article on Alan Nelson's essay "Human Molecules", in the opening paragraph of which he states: “attempts at reductionism within the physical sciences founder because of a failure to satisfy the translatability condition.” **Update** (2012): in retrospect analysis of his article and the previous statement, Caldwell clarifies: "The sentence quoted by you from my article was a restatement by me of Nelson's position. It was not my position. So it is wrong to characterize me as a 'human molecular theory objector'." [3]
2011	Jeff Tuhtan (1979-) American civil-ecological engineer	"Stating that the human is a macromolecule in the same way as some lipid or protein seems to be more of an analogy to me." (*Hmolpedia* thread: #7) **Update** (2012): "’When an honest man discovers he is mistaken, he will either cease being mistaken, or cease being honest." (Anonymous).’ If you strictly define a molecule as a structure of 2 or more atoms, then yes, I undoubtedly must be a molecule. However, between gentlemen, I would prefer to be called a system.” (*Hmolpedia* thread: #1)

Cladwell and Fuller are unique among this group in going out of their way to actually publish thought out articles and or chapters to refute the “human molecule” position.

See also

â— Molecular theory

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(c) May Brodbeck (about) – Press-Citizen-Media.com.

θΔics

See also: Human molecule (Wikipedia); Human molecule (banned)

In human chemistry, **human molecule** is the atomic definition of a person. [1] The following 26-element formula is the latest calculation (2007) of the molecular formula for a typical 70kg (154lb) person: [2]

$$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}Fe_{23}$$
$$Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$$

where EN, e.g. E22, means exponent to the power of ten; e.g. 10^{22} atoms of silicon (Si) are in one human, defined as a molecule. A 22-element empirical formula for a human was first calculated in 2000 by American limnologists Robert Sterner and James Elser. [11] A molecule, according to the 1649 coining of the term by French thinker Pierre Gassendi, is structure of two or more connected atoms, and a person, according to functional mass composition data, is comprised of twenty-six types of elements (atoms); subsequently the term 'human molecule', or its synonyms: molecular person (George Scott, 1985), human chemical (Thomas Dreier, 1910), etc., is the scientific name for the chemical definition of one human. In this sense, from the perspective of chemical reactions between people, as captured in the motto "love the chemical reaction", such as in a couple forming reaction:

$$A + B \rightarrow AB$$ (combination reaction)

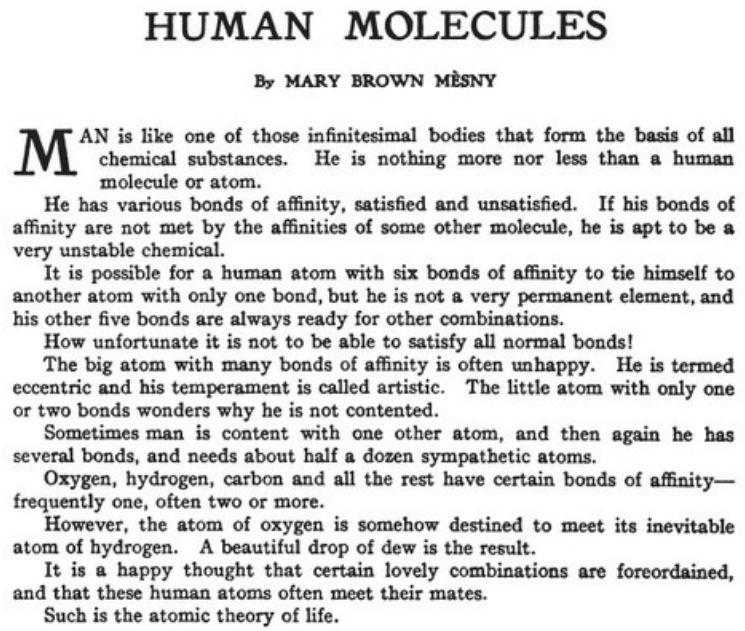

HUMAN MOLECULES

By MARY BROWN MÈSNY

MAN is like one of those infinitesimal bodies that form the basis of all chemical substances. He is nothing more nor less than a human molecule or atom.

He has various bonds of affinity, satisfied and unsatisfied. If his bonds of affinity are not met by the affinities of some other molecule, he is apt to be a very unstable chemical.

It is possible for a human atom with six bonds of affinity to tie himself to another atom with only one bond, but he is not a very permanent element, and his other five bonds are always ready for other combinations.

How unfortunate it is not to be able to satisfy all normal bonds!

The big atom with many bonds of affinity is often unhappy. He is termed eccentric and his temperament is called artistic. The little atom with only one or two bonds wonders why he is not contented.

Sometimes man is content with one other atom, and then again he has several bonds, and needs about half a dozen sympathetic atoms.

Oxygen, hydrogen, carbon and all the rest have certain bonds of affinity—frequently one, often two or more.

However, the atom of oxygen is somehow destined to meet its inevitable atom of hydrogen. A beautiful drop of dew is the result.

It is a happy thought that certain lovely combinations are foreordained, and that these human atoms often meet their mates.

Such is the atomic theory of life.

Example of an early 20th-century style **human molecule** themed article, entitled "Human Molecules" (1910), by American philosopher Mary Mesny, in which she defines a person as an atom or molecule and outlines a simple human chemical bonding theory modeled on affinity bonding (valences) of atoms. [69]

the reactants (A + B) and product (AB) in the human chemical reaction are technically "molecules" no different than any other molecule in the universe. The union of two molecules, AB, in this example, would be termed a dihumanide molecule, i.e. two human molecules chemically bonded. There do exist, to note, many characteristic differences between complex, multi-element human molecules, and other simpler molecules, such as H_20, one prominent difference being that there exists a metabolic effect or atomic turnover rate in the body of the human molecules. Synonyms to the term 'human molecule' include: chemical species, human particle, human element, social atom, human atomism, etc., depending on the framework of study. The human structure is no exemption.

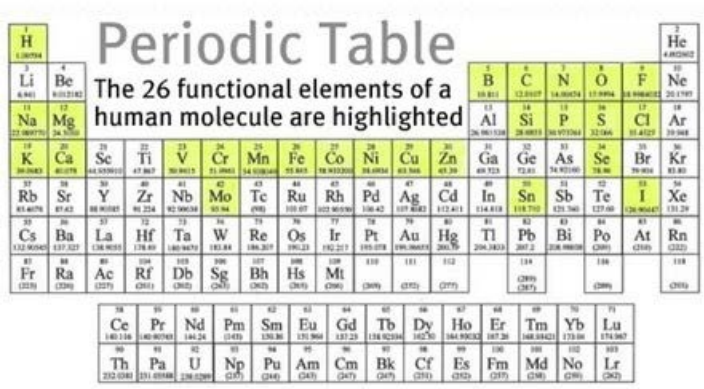

Functional elements (highlighted), from hydrogen (smallest) to iodine (largest), in the **human molecule**, according to 2002-2007 research of engineer Libb Thims, as shown (hyperlinked) on the hmolscience periodic table. [1]

Elements: 26 atoms in the human body

There are 92 types of atoms, naturally occurring, in the volumetric region of the earth. Each type of atom is characterized by the number of protons in its nucleus, the number being representative of the name of the element the atom is, a number which varies from one to one-hundred-and-eighteen. Hydrogen, symbol H, containing one proton, is the smallest type of atom. Helium, symbol He, containing two protons, is the next largest type of atom. A bound state structure of atoms is what is called a molecule. The human being is one such bound state structure. The number of elements said to be actively-functional in the composition of the human varies from 22 to 28 depending, on source.

Etymology | 1789

The English "human molecule" originated in the French version of the the term *molécule humaine.* The earliest documented use of the term 'molécules humaines', discovered thus far, is found in the 1789 edition of the multi-volume treatise *Philosophy of Nature* by French philosopher Jean Sales who uses the term 'human molecule', functionally, by stating: [46]

> "We conclude that [there exists] a principle of the human body [which] comes from the great [process] [in which] so many millions of atoms of the earth become many millions of **human molecules**."

This French origin has to do with the fact that the term 'molécule' itself originated in France, supposedly first used in either the *circa* 1620 works of French philosopher Rene Descartes, who is said to have used the term to mean a small mass, or the 1649 work of French thinker Pierre Gassendi, who used the term molecule in the sense of the attachment of two or more atoms. The first English usage of the term 'human molecule' seems to come from the the 1855 English translation of French composer Hector Berloiz 1854 book *Evenings with the Orchestra*, in the original French version of which Berloiz used the term 'molécule humaine' referring to children in choir. Prior to (and after) this usage by Berloiz, however, there seems to exist a large, yet

In 1798, French polymath Jean Sales coined the term 'molécule humaine' or **human molecule** (English).

undocumented, usage of the term *molécule humaine* in French publications, e.g. Alphonse Esquiros (1840), Yves Guyot (1903), etc.

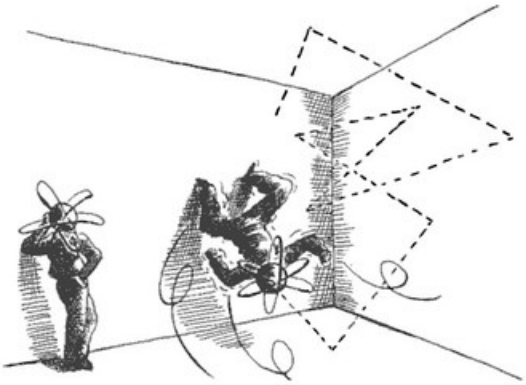

1999 artistic rendition of the human particle (human atom or human atomism) view of people conceived as Daniel Bernoulli-style kinetic theory gas particles . [67]

The first use of the term human molecule, used in a semi-modern scientific sense, is the 1869 "psychology of the human molecule" usage by French historian Hippolyte Taine, a usage later adopted by those including: German physician Ernst Gryzanowski (1875), American historian Henry Adams (1885), and French education theorist Max Leclere (1894). The usage by Adams would carry through to influence others, such as American sociologist Robert Nisbet; Nisbet, for instance, employed the term 'social molecule', to refer to the attachment of two or more 'human particles', as he called them, affixed together by a 'social bond', a subject about which he wrote a book (1970).

Sciences: physics, chemistry, thermodynamics

The sciences that study the human molecule can be divided into three general groups: human physics, human chemistry, and human thermodynamics. Human physics tends to concern itself with the forces that act on human molecules, often times modeling the human molecule as a particle, i.e. a human atom, social atom, or human particle.

Human chemistry tends to concern the application of the principles of chemistry, particularly chemical bonding, collision theory, activation energy, molecular orbital theory, etc., to interactions of human molecules and the structures they form. Human thermodynamics tends to study boundaried sets or "systems" of interactive human molecules, which constitute thermodynamic systems, i.e. working bodies, according to the laws and principles of thermodynamics.

Short history

The earliest views of what the "human being" is include French philosopher Rene Decartes' 1637 *animal machine* hypothesis (see: human machine), the *human motor* view in the 18th century, German polymath Johann von Goethe's view (see: Goethe's human chemistry) of people as a type of reactive chemical species, and English chemist Humphry Davy's 1813 *point atom* view of man. [6]

To complicate matter, in 1869 Russian chemist Dmitri Mendeleyev had famously arranged the total 66-known elements at the time into a periodic table, listed in order of atomic weights, in such a manner that their properties repeated in a series of periodic intervals. [3] Following this point in history, it was beginning to become apparent that the human being may be a type of molecule.

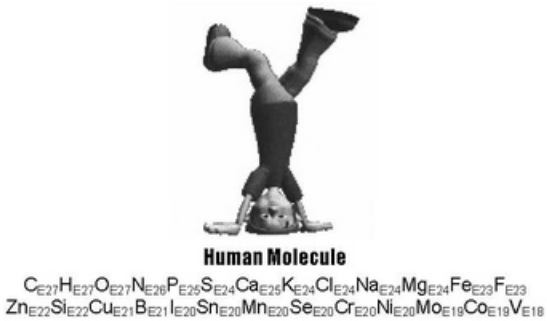

Human molecular formula diagram from chapter "The Human Molecule" in *Human Chemistry* (2007) by Libb Thims.

It soon became apparent that a human being may have a molecular formula in relation to these elements. The first to state this explicitly was American physician George Carey, who in his 1919 book *Chemistry of Human Life*, stated that "man's body is a chemical formula in operation." [5]

The first calculations for the empirical molecular formula for the human were made independently in 2000 by American limnologists Robert Sterner and James Elser (22-element formula), in 2002 by American chemical engineer Libb Thims (26-element formula), and in 2005 by *New Scientist* magazine (12-element formula). [12] In modern atomic detail, according to the most up-do-date mass composition estimates, the human being is a twenty-six element molecule, as shown pictured.

Free will

In discussions on the idea of the person as a "molecule" the topic of free will, i.e. the conception that a person exercises control over the choices made in life, often comes to the fore. Russian bioelectrochemist Octavian Ksenzhek tells us in 2007 that "people are the molecules of which an economy consists", but also clarifies, in the context of water molecules forming frost on glass, that: [31]

> "Molecules have neither free will nor any will at all."

Which molecule has **free will**, is **alive**, is **moral**, has a **brain**?

(an animate molecule)

(an animate molecule)

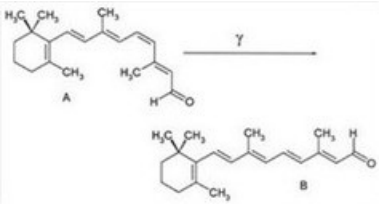

Human Molecule

$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}$
$Mg_{E24}Fe_{E23}F_{E23}Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}$
$Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$

Retinal Molecule
$C_{20}H_{28}O$

The "forced" input of a single photon (a force carrier) causes the three-element retinal molecule to "move" into a straightened position; when the light is no longer present, the retinal molecule reverts back to the bent position.

The "forced" input of a billions of photons (force carriers) causes the twenty-six-element human molecule to "move" into a straightened upright position; when the light is no longer present (e.g. nighttime), the human molecule reverts back to its bent position (e.g. curled in sleep).

Ksenzhek goes on to state that “all a molecule can do is repel elastically from other chaotically moving molecules and sometimes, very seldom, lose some of its degrees of freedom and freeze in a lager collective.” Certainly there is a difference between water molecules and human molecules, but, nevertheless, the concept of 'free will' becomes defunct, each is considered as a molecule, pure and simple. Many, however, will not admit to this. In 1952, English physicist C.G. Darwin argued that humans are molecules governed by the laws of thermodynamics, but also conjectured that 'human molecules' have free will owing to their 'unpredictability'. [4] This, of course, is incorrect. Nobody in the history of science has every found a molecule in possession of a free will. [26]

To clarify, in modern human chemistry and human thermodynamics, a human being is defined as a molecule, i.e. a "human molecule", and systems of humans are defined as thermodynamics systems, governed by the laws of chemistry and physics. In this view, the conception of a molecule, human or otherwise, with a free will, becomes an absurdity. The modern view, conversely, shows the concept of free will to be a defunct scientific theory, replaced by more updated views, such as induced movement, or more generally the view of human chemical reactions governed by the spontaneity criterion, activation energy, collision theory, free energy coupling between human chemical bonds, among other basic concepts of chemistry applied to human movements.

Humorous depiction of a human-like 'walking molecule' from the 2009 NY Times article "Experiments Show That Molecules Can Walk" by Henry Fountain. [54]

Walking molecules

See main: walking molecule, molecular carrier, molecular spider, and molecular car

It is often a neglected fact that humans are molecules that walk, run, and sometimes fly, on or above a 'surface', which from a chemical-definitions sense can be defined as either substrate or catalyst, depending on the context of discussion, which varies depending on subject mode: surface chemistry, surface physics, or surface thermodynamics. In this perspective, an intuitive way to better come to understand human behavior (movement and reactions) is to use the conception or reality that humans are 'walking molecules' on a surface and, using this perspective, study the behaviors and operation of smaller nano-size 'walking molecules'. The first operational walking molecules were developed in 2004 by German-born American physical chemist Ludwig Bartels at the University of California Riverside designed a molecule, called 9,10-dithioanthracene (DTA), that can walk in a straight line on a flat surface, like a little person.

Recent years have seen spin-off varieties, such as: molecular cars (2005), molecular carriers (2007), and DNA-based, four-legged molecular spiders (2010), as well as among others. One interesting recent design (2009) a 21-atom, 2-legged, track-affixed walker, that moves down the track, step-by-step, when its environment oscillates between basic and acidic. [55] Here we can extrapolate to understand how humans move differently depending on how their environment oscillates, factors including: temperature and pressure, as well as more abstract oscillations, such as terrorism, war, or famine, etc. Findings of these various walkers include the fact that more fuel (or energy) is needed when walkers carry a load, that most molecular walkers need some help, in the form of chemicals to keep them going, and that they tend to wander.

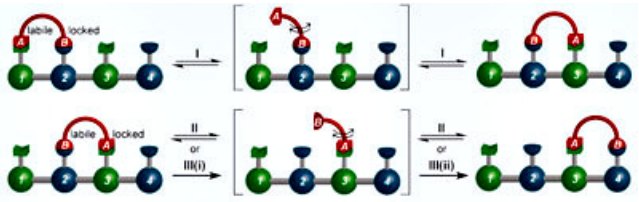

A two-legged 21-atom walking molecule (**red**) on a track, on which it walks when its environment oscillates between basic to acidic. [55]

When confronted with the question of what is the difference between a walking 'human molecule' (person) and a nanosized 'walking molecule' (such as DTA), the person new to this mode of logic (even hardened non-religious scientists) will bring up antiquated objections, such as: a human is different because he or she has a brain, has consciousness, has free will, can choose there actions, is alive, among others nonsensical objections. The religious-type person will quickly bring up the 7,000-year-old theory that 'a human being as a soul' (or spirit), which is beyond the definitions of science of atoms. These few examples highlight the precipice of the revolution in human thinking that must take place, in the years to follow, in order to bring universal acceptance to the logic that humans are molecules that chemically react together on a surface driven by solar heat, a view which defines the science of human chemistry.

1854: Berloiz

On the heels of the earlier 1798 usage of the 'human molecule' conception by French philosopher Jean Sales, in 1854 French composer Hector Berlioz used the term “molécules humaines”, which was translated the following year (in English) as ‘human molecules’, albeit in a rather poetic or artistic way. Berloiz used the term rather superficially, referred to filling up of the boys and girls in the multi-leveled amphitheater of St. Paul’s Cathedral as being similar to the phenomenon of crystallization, a phenomenon which he had viewed microscopically previously. He states: [38]

> "The points of this crystal of **human molecules**, constantly directed from the circumference towards the center, was bi-colored—the dark blue of the little boys' coats on the upper stages, and the white of the little girls' frocks and caps occupying the lower ranks. Besides this, as the boys wore either a polished brass badge or silver medal, their movements caused the light reflected by these metal ornaments to flash and produce the effect of a thousand sparks kindling and dying out every minute upon the somber background of the picture."

In other words, Berloiz seems to view movement of the choir as a larger shimmering crystal of human molecules.

1869: Taine

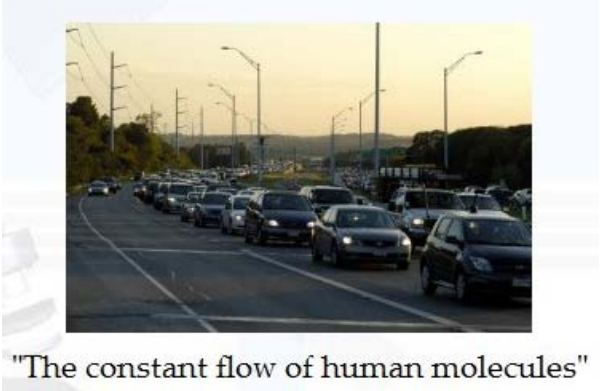

Left: Timeline video themed on the **human molecule**, themed on the 2008 song "Human" by The Killers (March 2009). Right: 2006 photo by American photographer Pierre Rousseau entitled "The Constant Flow of **Human Molecules**", with the subtitle: "in blind service to Kant's Categorical Imperative. The newest psycho-babble craze is to get happy by preservation of "good" behaviors in acceptance of and slavery to the machine." [59]

French historian Hippolyte Taine, independent and contrary to prior metaphorical use of the term human molecules by Berloiz, was the first to use the term in a scientific sense and to build argument on this concept, and to have others adopt his usage. In 1869, in the preface to the book *On Intelligence*, Taine stated 'it is now admitted that the laws which rule formation, nutrition, locomotion, for bird or reptile, are but one example and application of more general laws which rule the formation, nutrition, locomotion, of every animal.' He continues 'in the same way we begin to admit that the laws which rule the development of religious conceptions, literary creations, scientific discoveries, in a nation, are only an application and example of laws that rule this same development at every moment and with all men.' In other terms, Taine states, 'the historian studies psychology in its application, and the psychologist studies history in its general forms.' On this logic, Taine reasons: [16]

> "He first notes and follows the general transformations presented by a certain **human molecule**, or a certain peculiar group of *human molecules*; and, to explain these transformations, he writes the psychology of the molecule or its group."

In sum to the preface of his book, he states that 'for the last fifteen years I have contributed to these special psychologies'. Moreover, 'I now attempt a general psychology.' He notes, however, that 'to embrace this subject completely, this theory of the Intelligence (faculty of knowing) needs a theory of the will added to it.

Taine's human molecular philosophy had a significant influence on American historian Henry Adams, who became acquainted with Taine's philosophy as early as 1873. Adams' associate German physician Ernst Gryzanowski also seems to have adopted Taine's human molecule conception, using it in his 1875 article "Comtism", discussed below.

1870-1903: Laussane school - Walras | Pareto | Winiarski

Leon Walras

Vilfredo Pareto

In circa 1872, in efforts to make a science out of economics, French economist Léon Walras began to develop a theory of economic equilibrium in which he consider people to be "economic molecules"; students of this school of thought include French-Italian mathematical engineer Vilfredo Pareto and Polish sociologist Léon Winiarski who each developed **human molecular** theories of their own, the latter using Rudolf Clausius as a basis.

In 1870, French economist Léon Walras became professor of political economics (and later chair) at the University of Lausanne and together with his protégé French-Italian mathematical engineer Vilfredo Pareto and their followers, most notably Polish economist Leon Winiarski, this school of thought came to be known as the 'Lausanne school'. [52] Walras considered people to be people as "economic molecules" and aimed to formulate a economic equilibrium theory based on mathematics and science.

On this logic, in the years to follow, Pareto began to define a person explicitly as a 'human molecule' and to further outline a sociological theory based on human molecular interactions. In his in his 1896 *Course on Political Economics*, Pareto specifically defines a social system as follows:

> "Society is a system of **human molecules** in a complex mutual relationship."

In the context of the economic satisfaction, Pareto posits that human molecule only acts in response to the force of ophelimity:

> "First we separate the study of ophelimity (economic satisfaction) from the diverse forms of utility, then we direct our attention to man himself; stripping him of a large number of his attributes, leaving out the passions, good or bad, reducing him to a kind of **molecule** that only acts in response to the forces of ophelimity."

This was outlined further in his 1916 *Treatise on General Sociology*, wherein his goal, as it has been argued, was to construct a system of sociology analogous in its essential features to the generalized chemical thermodynamics system as outlined in American mathematical physicist Willard Gibbs' 1876 *On the Equilibrium of Heterogeneous Substance*. A residual protege of this school of logic was Polish sociologist Léon Winiarski who formulated the subject of "social mechanics", a course taught at the University of Geneva (1894-1900), based on the dynamics of Italian mathematician Joseph Lagrange and the thermodynamics of German physicist Rudolf Clausius. To cite an excerpt of Winiarski's 1898 book *Essay on Social Mechanics*: [51]

> "It is axiomatic to say that the fundamental forces soliciting the individual in society are egoism and altruism. If we consider the individual as a **molecule** of the social aggregate, these two forces can be regarded as playing the same role that attraction and repulsion play in any material system of the universe."

In another instance, Winiarski states:

> "The society is therefore considered as an aggregate of individual **molecules**, each depending on the forces of desire, which together through their interaction tend the society towards maximum satisfaction."

Winiarski was the leading thinker of the Lausanne school, particularly for his use of thermodynamic formulation.

1874: Henry Carey

In 1874, by American economist Henry Carey outlined the subject of 'social science' as such: "Man, the **molecule of society**, is the subject of social science." [61] Here, Carey alludes to the concept of the person as human molecule and in his volumes of work in sociology he eventually gained the label as being referred to has the 'Newton of social science' for his law of social gravitation, drawing extended commentary on the physics and chemistry of human molecules, from those as Austrian social economist Werner Stark. In introducing the topic of social heat between reactive human molecules in society, according to 1962 commentary by Stark, Carey states: [62]

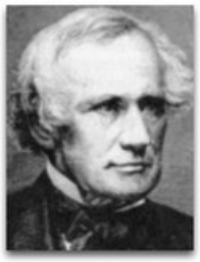

American economist Henry Carey, described as the 'Newton of social science' for his use of physics and chemistry in explaining the social phenomenon of reactions between people, the **'molecules of society'.**

> "In the inorganic world, every act of combination is an act of motion. So it is in the social one. If it is true that there is but one system of laws for the government of all matter, then those which govern the movements of the various inorganic bodies should be the same with those by which is regulated the motion of society; and that such is the case can readily be shown."

The terms 'organic world' (carbon-based) verses 'inorganic world' (non-carbon based), to note are a antiquated synonyms for the life (animate) verse non-life (inanimate) dichotomy; a play on the theory that living things are made of carbon. Next, in what seems to be a citation of Berthelot-Thomsen principle, that the heat of a reaction was the true measure of affinity, Carey states: "to motion there must be heat, and the greater the latter, the more rapid will be the former." This quotation, according to Stark, means that:

> "In the physical universe, heat is engendered by friction. Consequently the case must be the same in the social world. The 'particles' must rub together here, as they do there. The rubbing of the **human molecules**, which produces warmth, light and forward movement, is the interchange of goods, services, and ideas."

All-in-all, this is a very cogent and modern presentation of explaining chemical affinity, reactions, between human molecules, heat, and work, in the context of the economics and sociology of the exchange of goods and services; albeit without he modern conceptions of entropy, activation energy, free energy coupling, etc.

1875: Gryzanowski

In his 1875 article "Comtism", German physician Ernst Gryzanowski argues: [33]

> "Civil law, commerce, political economy, and international ethics are all based on the assumption that the social body consists of such **human molecules**, and there is no reason why the methods of physical science should not be applied to the statics and dynamics of that society, the passions and rights of the individual man corresponding exactly to the chemical and physical forces inherent in the material molecule."

This quote captures Gryzannnowski's opinion of how the social physics of French sociologist Auguste Comte would ferret out in a modern sense. Gryzanowski seems to have adopted the Taine's 1869 'human molecule philosophy', likely by coming across it through his association with the *North American Review* (wherein an article on Taine's human molecule philosophy was published two years prior) and through discussion with his friend Henry Adams, who also had adopted Taine's philosophy as his own.

1885: Adams' human molecules

American historian Henry Adams adopted Taine's 1869 'human molecular' philosophy; defining human chemistry as the study of the 'mutual attraction of equivalent **human molecules**' (1885) and also wrote two books using the human molecule perspective: one on Willard Gibbs' phase rule applied to the phases of humanity (1909) and another on the application of William Thomson's degradation version of the second law applied to collective sets of evolving human molecules, viewed historically (1910).

As early as 1873, American historian Henry Adams had come across Taine's 1869 'human molecule philosophy', when as the editor of *The North American Review* he accepted the article "Taine's Philosophy", by James Bixby, for publication, wherein Taine's philosophy of history is presented as applied psychology of human molecules. American biographer Ernest Samuels argues that Adams was significantly influenced by Taine's suggestion that the object of the historian is to study and follow the transformations of human molecules and to write history as the psychology of human molecules and that Adams later adopted this view as his own. [27] To exemplify the influence of Taine on Adams, on 12 April 1885, while at extended stay at work in Washington, Adams wrote to his wife: [28]

> "I am not prepared to deny or assert any proposition which concerns myself; but certainly this solitary struggle with platitudinous atoms, called men and women by courtesy, leads me to wish for my wife again. How did I ever hit on the only women in the world who fits my cravings and never sounds hollow anywhere? Social chemistry—the mutual attraction of equivalent **human molecules**—is a science yet to be created, for the fact is my daily study and only satisfaction in life."

This logic is clearly seen in Adams' 1910 *A Letter to American Teachers of History*, wherein Adams argues that the history must be viewed as transformations of groups of human molecules subject to the second law of thermodynamics. The book presents an bivalent discussion on paradoxical relationship between Lord Kelvin's 1852 take on the second law as a universal tendency towards the dissipation of energy and Charles Darwin's 1859 take on evolution as a universal tendency towards the elevation of mental energy. Specifically, Adams reasoned that "the laws of thermodynamics must embrace human history in its past as well as in its early phase" and that from the point of view of a physicist, to explain the fall of potential, as embodied in the first and second law of thermodynamics, in relation to "Darwin's law of elevation", he must:

> "The historian will begin with his favorite figure of gaseous nebula, and may offer to treat primitive humanity as a volume of **human molecules** of unequal intensities, tending to dissipate energy, and to correct the loss by concentrating mankind into a single, dense like sun."

History, then, according to Adams, "would then become a record of successive phases of contraction, divided by periods of explosion, tending always towards an ultimate equilibrium in the form of a volume of human molecules of equal intensity, without coordination." In human chemistry terms, Adams was attempting to reconcile the second law, i.e. that all natural systems are irreversible and tend to dissipate energy in their work cycles, by postulating that human systems compensate or create new energy by the act of contraction of people in the formation of cities and and world powers, similar to how the sun continuously releases energy by the gravitational contraction of mass. In modern terms, Adams' human molecule social contraction theory can be interpreted through the release of energy in the formation of new human chemical bonds in coupled coordination with the dissolution of bonds old.

1894: Leclere

1988 acrylic on canvas (27.5"x51.5") painting, entitled **"Human Molecule"**, by Canadian aboriginal artist Norval Morrisseau, which seems to give the impression, possibly evolutionarily, that a human is a molecule, being part fish, part bird. [58]

In 1894, French education theorist Max Leclerc was commenting on Taine's 1875 text *Growing Disagreement of School and Life* (*La Disconvenance Croissante de l'ecole et de la Vie*), according to one review, that "in our Lycees there is the same military discipline (as under Napoleon), the same aggregation of numbered human molecules, which the huge wheel, turned throughout France by the Minister's pedal, grinds and reduces to human powder." [35] This view comes from Leclerc's 1894 book *Education in the Middle Classes in England*, where in he discusses the views of Taine, and comments that: [36]

> "France has repeatedly changed its political constitution in this century but, through all vicissitudes, under many different governments, the regime founded by Napoleon Bonaparte persisted as the mode of education has remained the same. Twenty years ago, France sought to establish freedom with the Republic, she believes she has succeeded, and freedom, she says possesses ". How does it prepare new generations to use and Others How those born since in 1870 they are learning about freedom? If the parliamentary monarchy of July had not had the courage, if the Republic of 1848 has not had time, if the Second Empire could not have the will repudiate the dangerous legacy of Napoleon, the Third Republic, who has time and should have the courage and determination, she undertook what no one has been able, willing or dared to do before it? Did she understand how risk it runs, raising his free citizens by whatever means were combined to perpetuate the reign of the despotic one? Prefects and principals of the Republic today have no other conception of their role than once under the sword of Napoleon. In our schools, even military discipline, even numbered piles of **human molecules** that huge wheel turning in all of France under the pedal stroke of the Minister, crushed and pulped to humanity ' ."

1898: Ramsay

In 1898, Scottish chemist William Ramsay used the 'human molecule' analogy in his discussion of German physicist Rudolf Clausius' 1856 kinetic theory of gases, wherein he compared the body of gases to a football team of human molecules: [29]

> "I find, in my own case, that it helps greatly to a clear understanding of a concept if a mental picture can be called up which will illustrate the concept, if even imperfectly. Some such picture may be formed by thinking of the motions of the players in a game of football. At some critical point in the game, the players are running, some this way, some that; one has picked up the ball and is running with it, followed by two or three others; while players from the opposite side are slanting towards him, intent upon a collision. The backs are at rest, perhaps; but, on the approach of the ball to the goal, they quicken into activity, and the throng of **human molecules** is turned and pursues an opposite course. The failure of this analogy to represent what is believed to occur in a gas is that the players' motion is directed and has purpose; that they do not move in straight lines, but in any curves which may suit their purpose; and that they do not, as two billiard-balls do, communicate their rates of motion to the other by collision. But, making such reservations, some idea may be gained of the encounters of molecules by the encounters in a football-field."

1910: Deier's human chemicals

With the construction of the periodic table in 1869, by Russian chemist Dmitri Mendeleyev, in which the then 66 known (and hypothesized) elements were listed in by their atomic weights, in rows such that their properties repeated in a series of periodic intervals, some began to think of a human, invariably composed of these elements, by the name 'human element', 'human chemical', or 'human chemical element'. One such person was American writer Thomas Dreier who in 1910 published a 27-page pamphlet entitled "Human Chemicals", extolling on the view that each person is a 'human chemical', and that one might better come to understand human interactions if this view is used when considering the variants of human behavior, such as explosive behavior [48] The following is an aggregate quote summarizing Dreier's view on the matter from his 1948 book *We Human Chemicals*, an expanded version of his earlier article, written with consultation from Harvard chemist Gustavus Esselen: [49]

> "In the world of science, the chemist works with 96 elements, 92 of the period table, plus four recently discovered. These elements can be combined to make anything and everything of a material nature. So it is with people. All of us are human chemicals. Some of **human chemicals** can be mixed only with great difficulty; some explode if brought together; some excite each other beneficially; others are inert; others mix to form potent combinations; still others act as potent chemical catalysts, bringing about desirable changes in others when mixed with them, without themselves being changed."

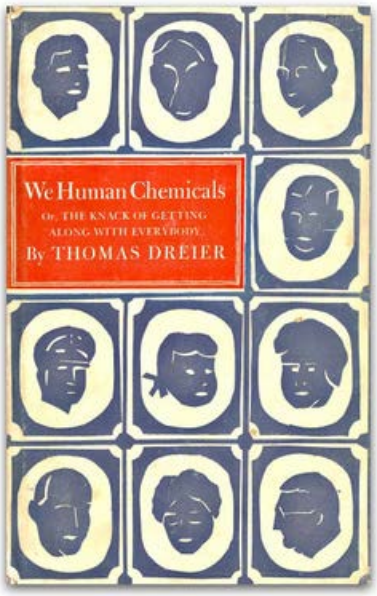

American writer Thomas Dreier's 1948 book *We Human Chemicals*: *the Knack of Getting Along with Everybody*, written with consultation from Harvard chemist Gustavus Esselen, in which principles of chemistry are applied to facets of human interactions on the view that each person is a 'human chemical' constructed from elements of the periodic table. [49]

The cover of the 1948 book is pictured adjacent, where each 'human chemical' is shown on a sort of mock human periodic table; which, to note, is similar to Goethe's human affinity table (1808), although the latter is more accurate in a chemical thermodynamic sense.

1911: Perris

In the 1911 book *A Short History of War and Peace*, English journalist George Perris, according to a 1913 review by American writer Alpheus Snow, argues that: [39]

> "War to bring about peace seems paradoxical. Yet it seems undoubtedly to be true, as the Perris says, that war is often a process of evolution—an explosive process which occurs when the progressive movement of **human molecules** towards a reorganization making for equality of opportunity and a betterment of the law, is unduly held back by the forces of standpatism and vested interests."

This, however, seems to be an interpretation of Perris' opening chapter 'The Human Swarm' wherein he states that: "modern thought points to nothing so certainly as the universality of change. We stand on a whirling ball, every atom and molecule of which is in perpetual movement. Individually, we are aware of being different men and women every day of our lives; the life of the world has undergone such a transformation even during our own generation that an unmoved character-basis of society is incomprehensible, a miracle in a realm of law—and what an evil miracle."

1914: Fairburn

In 1914, American navel engineer and industrial chemistry executive William Fairburn wrote *Human Chemistry*, the first attempt at a book on the subject of human chemistry, with aims to help the foreman and executive better understand his or her job, being that of facilitating the various reactions between people, considered as human chemical elements, in their daily work in the factory. The following is an aggregate opening quote summarizing the view followed by Fairburn in his booklet:

> "All men are like chemical elements in a well-stocked laboratory, and the manager, foreman, or handler of men, in his daily work, may be considered as the chemist [whose] primary requirement [or] principle work is the analysis and synthesis of the reactions resulting from combinations of individuals."

Fairburn goes on to state that there were 81 known chemical elements, each possessing different characteristics, and that similarly so to is each human chemical element different from his fellows in temperament and qualifications. Fairburn, to note, uses the terms ‘human chemical’ and human chemical element’ interchangeably in his book, speculating on topics such as how entropy applies to reactive human chemicals.

1916: Teilhard

One who wrote extensively, in a very dense conceptual style, of considering people as molecules having evolved over time from atoms, was French philosopher Pierre Teilhard. He began working on his theory, through various unpublished essays, in 1916, until is death in 1955, after which his voluminous works were published post-humorously. The following is a representative quote from 1947, alluding to his concept of the noosphere or global sphere of connected minds: “The scope of each **human molecule**, in terms of movement, information, and influence, is becoming rapidly coextensive with the whole surface of the earth.” The following quote gives a precursory outline of the very dense subject of the human chemical bond: [3]

Left: English-born American navel engineer William Fairburn not only viewed people as 'human chemicals' but also wrote the first book on human chemistry (1914). Center: French philosopher Pierre Teilhard wrote extensively on the use of atomic reductionism, defining people as **human molecules**, in attempts to reinterpret religion, evolution, and spirituality in modern scientific language, with focus on the evolution of the mind and the social collective in view of the future as described in his omega point theory. Right: American physician George Carey, first to state that a human being is actually a chemical formula (1919).

> “If the power of attraction between simple atoms is so great, what may we expect if similar bonds are contracted between **human molecules**?”

I sum, during the years 1916 to 1955, Teilhard outlines a theory of evolution from atom to man, the latter of which he considers as a complex molecule or "human molecule" a term that he uses throughout his writings. In his articles on *Human Energy*, a collection of essays on morality and love, written between 1931 and 1939, for instance, he conceives of man as a “human molecule” (1936). Similarly, in his follow-up essay "Activation Energy", he theorizes that the concept of human reaction activation energy, i.e. the barrier to transition, applies to human interactions.

In his 1947 essay “The Formation of the Noosphere”, he outlines the global view that due to the growing interconnectiveness of human molecules, they are forming a layer of the mind "noo-" over the biosphere. In particular, he states “no one can deny that a network (a world network) of economic and psychic affiliations is being woven at ever increasing speed which envelops and constantly penetrates more deeply within each one of us. With every day that passes it becomes a little more impossible for us to act or think other wise than collectively.” In other words, according to Teilhard, human molecules are forming a connective sheath or skin around the globe of the earth.

1919: Patten

In his 1919 address “The Message of the Biologist”, American zoologist William Patten attempted to outline how the modern person might go about deriving a science-based system of morality and future governing constitution for a ‘molecular society’, of people considered as ‘human social atoms’ (social atoms) or ‘human molecules’, based on the pure science teachings of chemistry, physics, and astronomy. [30]

1919: George Carey | chemical formula in operation

A significant turning-point thinker in the history of the human molecule concept was American physician George Carey who, in his 1919 book *The Chemistry of Human Life*, made an attempt to integrate biochemistry with chemical affinity logic along with knowledge of active elements into a synthesis of a chemistry of the human being. Although his work is detracted a bit by religious and other mineral elixir types of healing remedies, he does outline a few gems. In a truncated opening quote, for instance, Carey points to the idea that: [5]

> “The human organism is an intelligent entity that works under the guidance which man has designated as chemical affinity.”

Technically, to note, the full quote of what Carey said is that it is the 'mineral salts' of the human organism are 'intelligent entities' that work 'under divine guidance', which man has designated as chemical affinity. The above reworded quote, however, is the correct modern statement. Carey then goes on to state that the human body is a storage battery that must be supplied with the proper elements (chemicals) to set up motion at a rate that will produce what we please to call a live body. In commentary on how the laws of chemistry apply universally, he states: “there can be but one law of chemical operation in vegetable or animal organisms. When man understands and cooperates with that life chemistry, he will have solved the problem of physical existence.” The most interesting point in his book is his statement that:

> “Man’s body is a chemical formula in operation”

It would be eighty-one years before Sterner and Elser would actually make an attempt at calculating this formula. And the addendum ‘in operation’ is a huge topic not yet even begun to be simplified, e.g. as exemplified the fact that human molecules have 46 percent annual atomic turnover rate, whereas other molecules, such as H_20, do not seem to have such a turnover rate.

1942: Schumpeter

In 1942, Austrian economist Joseph Schumpeter speculated on how certain human molecule move up and down in social class over time: [34]

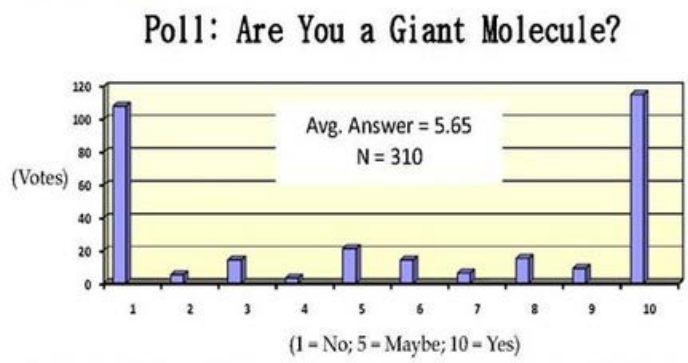

2008 poll "Are You a **Giant Molecule**" conducted online by English physicist Jim Eadon (graph from Thims' 2008 *The Human Molecule*), which shows that about 57% of Internet users think they are a molecule. [17]

"It can be shown that in all cases, that **human molecules** rise and fall within the class into which they are born, in a manner which fits the hypothesis that they do so because of their relative aptitudes; and it can also be shown, second, that they rise and fall across the boundary lines of their class in the same manner. This rise and fall into higher and lower classes as a rule takes more than one generation. These molecules are therefore families rather than individuals. And this explains why observers who focus attention on individuals so frequently fail to find any relation between ability and class position."

In this quote, Schumpeter seems to be digging around in a number of issues: one that human molecules are coupled to each other, especially in family lineages; to that a group of human molecules can also be termed or considered a new type of larger aggregate human molecule, e.g. such as the trihumanide molecule (three human molecules bonded in a unit); among other factors.

1940s: Moreno | social atom theory (psychology)

In 1917, Romanian-born American psychologist Jacob Moreno began to develop a modified Freudian psychology, focused on spontaneity states in the dynamics of human movement, and by circa 1951 had begun to quantify his theory using constructs of social entropy, employing a sort of three dimensional social atom theory, explained in terms of tele relationships or distal and proximal bonds to other social atoms. The ways he uses the term social atom, along with other varieties, such as cultural atom or acquaintance atom, etc., is a bit ambiguous: [47]

> "**Social atom**, operational definition: plot all the individuals a person chooses and those who choose him or her, all the individuals a person rejects and those who reject he or she; all the individuals who do not reciprocate either choices or rejections. This is the 'raw' material of a person's social atom."

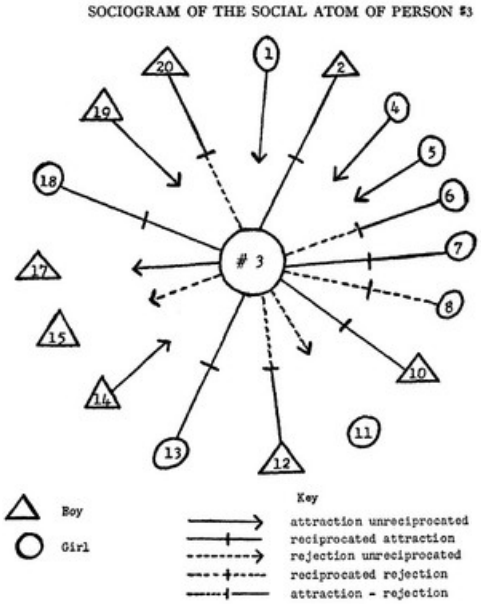

1949 diagram of 'the **social atom**', in the Jacob Moreno-scheme, of an interviewed female (#3) by American sociologist Leslie Zeleny. [56]

An interesting facet of Moreno's approach is his attempt at applying the Bohr model of the atom, in which quantum energy inputs to the orbitals of atoms cause shifting of electrons, up or down, in orbital structure, to changes or shifts in human relationships, e.g. as in a infant child's orbit about his mother.

A 1949 attempt at an illustration of Moreno's social atom theory was undertaking by American sociologist Leslie Zeleny, who diagrammed the sociometric findings of the attraction-repulsion aspects of the relationships surrounding various people. A diagram of the social atom for female number three is shown adjacent. [56] The fact that the diagram is titled sociogram of '*the* social atom of person number three', verses sociogram of a social atom', highlights that Moreno's theory is a more exotic extrapolation of the basic atomic model applied to human relationships, not easy to describe in a single definition.

According to Zeleny, her study of the social atom of #3, shows #3 to be a much desired associate by her classmates; but that she is very 'choosy' about those with whom she will 'pal' as shown by the various dynamics of attraction and rejection, reciprocated or unreciprocated.

1952: Darwin | thermodynamics of human molecules

The conception of a set of people as a collection of "human molecules", who interact according to the laws of physics, particularly statistical thermodynamics, whose history and future was determined by the laws of thermodynamics was first stated by American physicist Charles Galton Darwin, the great grandson of Charles Darwin, in his 1952 *book The Next Million years.* [4] The following is an excerpt of the 1953 review by *Time* magazine: [68]

English physicist C.G. Darwin (grandson of Charles Darwin) defined the science of 'human thermodynamics' as the study of systems of '**human molecules**.' (1952)

> "In Darwin's view, the human molecules have one fundamental property that dominates all others: they tend to increase their numbers up to the absolute limit of their food supply."

In his opening chapter, C.G. Darwin sets out to view society on the ideal gas model

> "We may, so to speak, reasonably hope to find the Boyle's law which controls the behavior of those very complicated molecules, the members of the human race, and from this we should be able to predict something of man's future. When I compare human beings to

molecules, the reader may feel that this is a bad analogy, because unlike a molecule, a man has a free will, which makes his actions unpredictable.

This is far less important than might appear at first sight, as is witnessed by the very high degree of regularity that is shown by such things as census returns. Thus, though the individual collisions of **human molecules** may be a little less predictable than those of gas molecules, census returns show that for a larger population the results average out with great accuracy. The internal principle [internal energy] then of the human molecules is human nature itself."

In this book, Darwin goes on to define the new future science of 'human thermodynamics' as the thermodynamic study of systems of 'human molecules', a significant turning point in human thought.

1970: Nisbet | social molecules

Influenced by the work of Henry Adams and Brooks Adams, in his 1970 book *The Social Bond*, American sociologist Robert Nisbet considers people to be 'elementary human particles', refers to the adhesion between two human particles as a 'social bond', and the attachment of two or more human particles to be a 'social molecule'. Below is a representative quote:

> "Just as modern chemistry concerns itself with what it calls the chemical bond, seeking the forces that make atoms stick together as molecules, so does sociology investigate the forces that enable biologically derived human beings to stick together in the 'social molecules' in which we actually find them from the moment, quite literally, of their conception."

Beyond this, Nisbet spends considerable time discussing his conception of 'social entropy' and how this relates to human bonding. [45]

1998: Müller | human molecules (lecture)

In the 1998 article "Human Societies: A Curious Application of Thermodynamics", Venezuelan chemical engineer Erich Müller defined humans to be analogous to molecules (human molecules), then quantified inter human molecular love and hate in terms of basic thermodynamic pair bonds, and quantified social forces as a type of van der Waals dispersion force. [9] In 2006, Müller was interviewed by journalist Laura Gallagher, with *Reporter magazine*, for his popularity for his invigorating thermodynamic lectures in which he draws analogies between molecules and people. [10]

1998: Goleman

In 1998, American emotional intelligence theorist Daniel Goleman commented his view that: [37]

> "Virtually everyone who has a superior is part of at least one vertical 'couple'; every boss forms such a bond with each subordinate. Such vertical couples are a basic unit of organizational life, something akin to **human molecules** that interact to form the lattice work of relationship that is the organization."

Here, Goleman seems to be making an attempt to discuss aspects of human chemical bonding.

1999: Prugh and Costanza

In 1999, American ecological economists Thomas Prugh and Robert Costanza state that: [32]

SCOPE

To begin to define this book's scope, let us start by considering what portion of chemistry and physics we cover. Our focus is almost entirely on the elements. All of life requires the macroelements C, H, O, N, P, etc., as well as a set of trace elements including Fe, Mg, and others (Fig. 1.1). These provide for a diverse set of functions including structure (such as C, H, and O in cellulose fibers), oxidation-reduction (such as Fe as a cofactor in enzymes), and others (see Chapter 2). The patterns of abundance of elements in living things are major components of ecological stoichiometry. Take humans as an example. The concentrations of at least 22 elements in humans have been determined; these range in total amount in a typical live individual from 35 kg (O) to 1 mg (Co) (Heymsfield et al. 1991; Williams and Fraústo da Silva 1996). From information on the quantities of individual elements, we can calculate the stoichiometric formula for a living human being to be

$$H_{375,000,000}\ O_{132,000,000}\ C_{85,700,000}\ N_{6,430,000}\ Ca_{1,500,000}\ P_{1,020,000}\ S_{206,000}\ Na_{183,000}\ K_{177,000}\ Cl_{127,000} Mg_{40,000}\ Si_{38,600}\ Fe_{2,680}\ Zn_{2,110}\ Cu_{76} I_{14}\ Mn_{13}\ F_{13}\ Cr_7\ Se_4\ Mo_3\ Co_1$$

That is, there are about 375 million H atoms for every Co atom in your body (the formula is based on "wet weight"). This formula combines all compounds in a human being into a single abstract "molecule." This formula sets the value of the scarcest substance (cobalt, mass in humans ≈ 1 mg) equal to a stoichiometric coefficient of 1 and shows relative amounts, not absolute ones. Most stoichiometric analyses are in fact concerned with relative abundances. The large stoichiometric coefficients for H and O, the most numerous atoms in our bodies, arise partly from the fact that life is aqueous and partly from the fact that H and O are key components of many (or all, in the case of H) organic molecules. Our main purpose in introducing this formula for the **"human molecule"** is to stimulate you to begin to think about how every human being represents the coming together of atoms in proportions that are, if not constant, at least bounded and obeying some rules. Humans must obtain these elements in sufficient but not (for some) oversufficient quantities from an environment that may or may not have similar proportions of these elements. Human physiology must take complex chemical resources containing multiple elements arranged in myriad different molecules, absorb some, metabolize some, rearrange many, and excrete or otherwise release a great deal. This book is concerned both with the way that organisms do this and with its consequences for ecological dynamics.

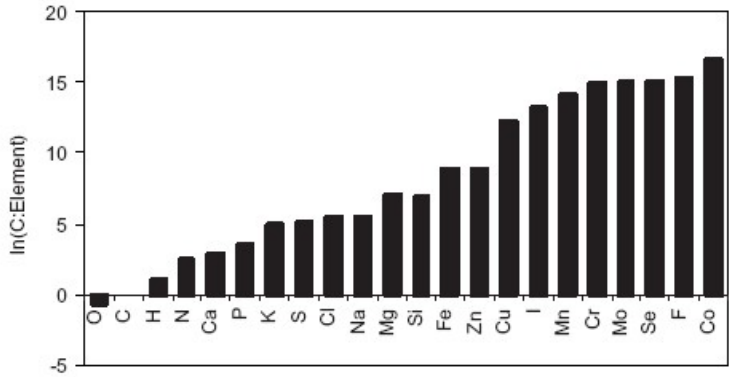

Fig. 1.2. Abundance of 22 elements in humans, expressed relative to carbon (mass:mass) and natural-log-transformed for clarity. High values indicate substances in low relative abundance. Data obtained from two sources, with averages taken when multiple values were available (Heymsfield et al. 1991; Williams and Fraústo da Silva 1996). For a historical presentation of similar information, see Fig. 2.1.

Pages three through five from the 2002 book *Ecological Stoichiometry*, by American limnologists Robert Sterner and James Elser, showing the first published calculation of the molecular formula of a human being. [11]

"The welfare of human society is best served by the view of people as '**human molecules**' who, by pursuing their own interests through the market, inevitably promote the general good."

American limnologists Robert Sterner and James Elser: calculated a 22-element molecular formula for one average human being, based on actual mass composition measurements, in April 2000, as found in their 2002 textbook *Ecological Stoichiometry*.

2000: Sterner and Elser | empirical molecular formula

See main: Human molecular formula

The first calculation of the empirical molecular formula for the human being was made in April of 2000 by American limnologists Robert Sterner and James Elser. [15] Sterner and Elser published there results in the 2002 book *Ecological Stoichiometry: the Biology of Elements from Molecules to the Biosphere*. In outlining their subject, Sterner and Elser state:

"The stoichiometric approach considers whole organisms as if they were single abstract molecules."

They were led to this by studying differences in carbon, nitrogen, and phosphorous levels in similar species. In their chapter one, as to the human being, they state that "from the information on the quantities of individual elements, we can calculate the stoichiometric formula for a living human being to be", taking cobalt (Co) as unity, the state that the following "formula combines all compounds in a human being into a single abstract 'molecule'": [11]

$$H_{375,000}\,O_{132,000,000}\,C_{85,700,000}\,N_{6,430,000}\,Ca_{1,500,000}\,P_{1,020,000}\,S_{206,000}\,Na_{183,000}\,K_{177,000}$$
$$Cl_{127,000}\,Mg_{40,000}\,Si_{38,600}\,Fe_{2,680}\,Zn_{2,110}\,Cu_{76}\,I_{14}\,Mn_{13}\,F_{13}\,Cr_{7}\,Se_{4}\,Mo_{3}\,Co_{1}$$

This amounts to a 22-element human empirical molecular formula. They continue, "our main purpose in introducing this formula for the 'human molecule' is to stimulate you to begin to think about how every human being represents the coming together of atoms in proportions that are, if not constant, at least bounded and obeying some rules".

2001: Peachey | marriage and human molecules

In the 2001 book *Leaving and Clinging*, American author Paul Peachey devotes his first chapter, entitled "The Marital Bond as the Human Molecule", to the development of the view that each person can be considered as an atom and that attachments of human atoms, in families and marriage, constitute a human molecule. To cite one example quote: [42]

"The question is whether the symbiosis of these polarities, i.e. the molecular (family) versus the atomic (individual) dimension of human existence, is a given in nature, or whether as humans we can replace this way of creating and sustaining the basis **human molecule**."

Peachey, to note, seems to cull many of his ideas on human bonding and human molecules from the prior work of American sociologist Robert Nisbet.

In September 2002, American chemical engineer Libb Thims, independently, calculated a 26-element molecular formula for an average human being, based on actual

2002: Thims | molecular formula (death)

In 1995, American chemical engineer Libb Thims began to study the spontaneity criterion ($\Delta G < 0$) , i.e. that a reaction (human reaction or chemical reaction) needs to show a negative change in the Gibbs free energy if it is to be spontaneous (energetically feasible or successful), in relation to the basic human reproduction reaction, in

which a man M and women W conceive a new baby B:

mass composition measurements, as found in his 2007 textbook *Human Chemistry*.

$$M + W \rightarrow B$$

In *circa* 2002, Thims began to mediate on the issue of what exactly are these entities, M, W, B, from a chemical, atomic, or fundamental particle point of view, that he had been aiming to quantify enthalpically and entropically for the last seven years. In September of 2002, independent of Sterner and Elser, Thims calculated a 26-element molecular formula for the average human being. [12]

Element Count	Molecular Evolution Table	Name	Date
N/A	Fermions: $e^-, \nu_e, u, d, \mu^-, \nu_\mu, c, s, \tau^-, \nu_\tau, t, b$; Gauge bosons: $g_{(8)}, \gamma, W^+, W^-, Z^0, G$	Elementary Particles	13.7 BYA
1	H, He-3, He-4, Li	Atoms	385 YAB
1	H_2	Hydrogen	
2	H_2O	Water	268 YAB
3	CH_4O	Methanol	
4	CH_4ON_2	Urea	4.6 BYA
5	$C_5H_{14}O_7N_2P_2$	DNA	
6	$C_{21}H_{36}O_{17}N_7P_3S$	Coenzyme A	
7	$C_{41}H_{71}O_{13}N5$-Mal	mal-7	4.4 BYA
8	$C_{21}H_{31}O_7N$-Gly$_8$Pt	mal-8	
9			
10	$C_{21}H_{31}O_{17}N_7P_3S_1Ca_1K_2Cl_1Na_1$	Intermediate	4.2 BYA
11			
12	$C_{21}H_{31}O_{17}N_7P_3S_1Ca_1K_2Cl_1Na_1Mg_1Fe_1$	Pre-bacteria	4.0 BYA
13			
14			
15	$C_{21}H_{31}O_{17}N_7P_3S_1Ca_1K_2Cl_1Na_1Mg_1Fe_1$ $Si_1Mn_1Co_1$	Prokaryote (Bacteria)	3.85 BYA
16			
17			
18	$C_{21}H_{31}O_{17}N_7P_3S_1Ca_1K_2Cl_1Na_1Mg_1Fe_1F_{(1)}$ $Si_1Ca_1Mn_1Se_1Co_1$	Pre-Aquatic Worm	2.8 BYA
19			
20			
21			
22	$C_{21}H_{31}O_{17}N_7P_3S_1Ca_1K_2Cl_1Na_1Mg_1Fe_1F_{(1)}$ $Zn_1Si_1Cu_1B_{(1)}Mn_1Se_1Mo_1Cr_{(1)}V_{(1)}$	Fish	0.7 BYA
23		Reptile	350 MYA
24	$C_{21}H_{31}O_{17}N_7P_3S_1Ca_1K_2Cl_1Na_1Mg_1Fe_1F_{(1)}$ $Zn_1Si_1Cu_1B_{(1)}Mn_1Se_1Cr_1Mo_1Co_1V_{(1)}$	Old World Monkey	30 MYA
25		A. Afarensis	3.9 MYA
26	$C_{21}H_{31}O_{17}N_7P_3S_1Ca_1K_2Cl_1Na_1Mg_1Fe_1F_{(1)}$ $Zn_1Si_1Cu_1B_{(1)}I_{(1)}Se_1Mn_1Se_1Cr_1Mo_1Co_1V_{(1)}$	Human (H. Sapiens)	0.2 MYA
27			
28		Evolution	

A **molecular evolution table** showing key structures in the synthesis of human beings (human molecules) over the last 13.7-billion years.

Thims included his calculation results in the 2002 manuscript *Human Thermodynamics (Volume One)*, in the 2005 IoHT Molecular Evolution Table (online), and in the 2007 book *Human Chemistry (Volume One)*. [12] Thims states, on page-190, of the 2002 manuscript, as based on a mass percent table of the 26-elements found to have function in the human body, that at approximately 200,000 years ago, "the universe had expanded/reacted enough to form a molecule made of these specific elements that we now define as homo sapien" as can be represented by the following "crude empirical formula for the molecular human", taking vanadium (V) as unity: [13]

$$H_{2.5E9}\ O_{9.7E8}\ C_{4.9E8}\ N_{4.7E7}\ P_{9.0E6}\ Ca_{8.9E6}\ K_{2.0E6}\ Na_{1.9E6}\ S_{1.6E6}\ Cl_{1.3E6}\ Mg_{3.0E5}\ Fe_{5.5E4}$$
$$F_{5.4E4}\ Zn_{1.2E4}\ Si_{9.1E3}\ Cu_{1.2E3}\ B_{7.1E2}\ Cr_{98}\ Mn_{93}\ Ni_{87}\ Se_{65}\ Sn_{64}\ I_{60}\ Mo_{19}\ Co_{17}\ V$$

This amounts to be a 26-element human empirical molecular formula. Thims concludes "by describing the existence of a human being in this form we are by no means making attempts to degrade our existence, we are only trying to help elucidate our understanding of this existence."

The need or drive for Thims to calculate the molecular formula originated in a short chapter in newly forming manuscript (2001-2004) *Human Thermodynamics*, called "What Happens to a Person When They Die" (a precursor to science of cessation thermodynamics), to define exactly, from a fundamental particle point of view, what exactly is a "human being". In other words, what fundamental particles constitute the totality of a person at the moment of death, in both bodily structure form and bond structure form, i.e. if these quantities are to be conserved according to the law of energy-matter conservation? Subsequently, from a chemical point of view or first law of thermodynamics point of view, the composition of a person technically is a twenty-six-element molecule combined with its substrate materials (personal wealth) and consortium of interpersonal human chemical bonds. In the years to follow, using more accurate mass composition tables, refinements on this formula were made by Thims.

2002: Hodgson | Little Fun Book of Molecules Humans (book)

In 2002, similar in theme to Greek philosopher Empedocles' human chemistry analogies of how people how like each other mix like water and wine, American writer John Hodgson published the 102-page *The Little Fun Book of Molecules Humans*, a short booklet containing ninety-eight chemistry aphorism style sayings intended to look at the similarities existing between humans and molecules, so to, as stated in his preface, unearth clues to scientific information that might lead to new research. The second 2010 edition of Hodgson's book, retitled as *molecles humans*, seems to have taken its cover-design from American chemical engineer Libb Thims' 2008 book *The Human Molecule* (a 120-page historical overview of the concept of the human molecule); which in turn took its cue from Italian polymath Leonardo da Vinci's 1487 theory of the Vitruvian man, a geometrical model of a human, where each person considered as a tiny micro-universe; which in turn took its cues from Roman architect Marcus Vitruvius and his hints at correlations of the ideal human geometric proportions, found in his 25BC book *On Architecture*.

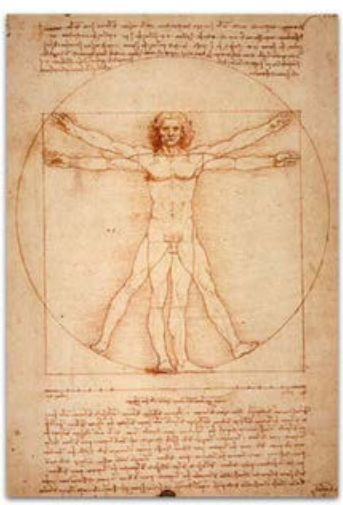

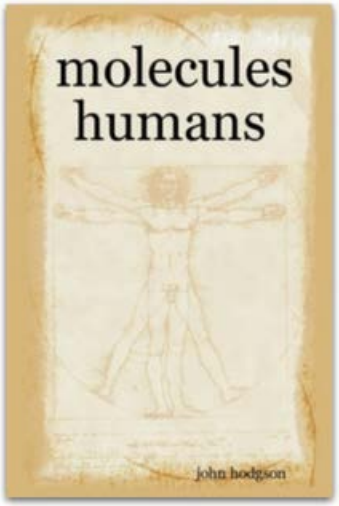

Left: Original circa 1487 drawing of the **Vitruvian man** by Italian polymath Leonardo Da Vinci (CB IQ=200), a man depicted as a theoretical geometric figure, representative of a tiny universe, analogous to the structure of the surrounding universe. Left (center): 2002 first edition of American writer John Hodgson's chemical

aphorism style book on the similarities between humans and molecules. [41] Right (center): 2008 depiction of Da Vinci's Vitruvian man defined as a 26-element molecule, shown on the cover of the 122-page book *The Human Molecule* by American chemical engineer Libb Thims. [2] Right: 2010 depiction of Da Vanci's Vitruvian man, representative of a human defined similar, analogous, aphorismic to a molecule, shown on the cover of the second edition American writer John Hodgson's book re-titled as *molecules humans*. [63]

Each page of Hodgson's book contains a different aphorism of which below are shown a few representative examples: [41]

> "Different **molecules** or **humans** behave differently having different reactions or behaviors to changing situations."
>
> "When molecules or humans mesh they have chemical or physical reaction and or reproduction."
>
> "With experiment we can better understand these molecules or humans like we never knew before."
>
> "Molecules and humans take in elements or food."
>
> "Molecules and humans engage in different behaviors and or sex."
>
> "Molecules and humans make or change common bonds."

All-in-all, Hodgson's book contains 98 of these sayings; although most, to note, are rather incoherent and negligibly connected to actual human chemistry.

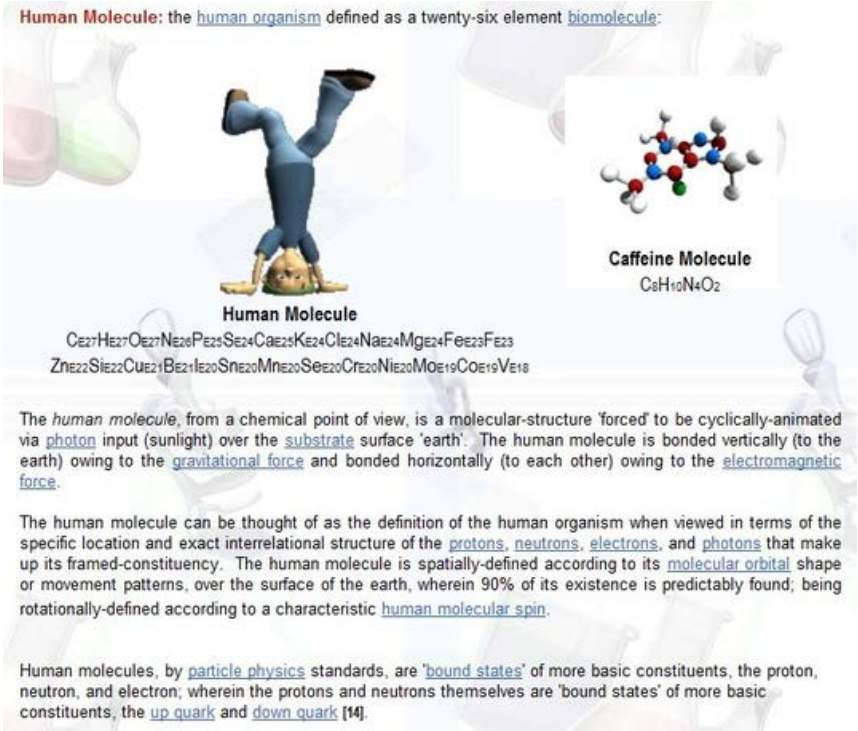

Online publication (2005) of the formula for one **human molecule** (with rotating break-dancer and caffeine stick-figure representations) by American chemical engineer Libb Thims. [66]

Human molecular orbitals | transition state theory

In 1923, French physicist Louis de Broglie conceived the wave-particle duality theory of matter, which states that all bodies in the universe have both a wave and a particle nature. [64] This subject is bound up in the famous and puzzling double slits experiment invented by Thomas Young in 1801. Molecules as large as 60-atom Bucky Balls have been shown to exhibit wave-particle duality. It is probable that human molecules also have not only a particle-like movement behavior, but also a wave-like behavior. This was first noted in Ernst Mach's 1885 conception of "turning tendencies". A modern version this logic is human molecular orbital theory.

The the study of the extrapolation standard molecular orbital theory to the time-accelerated analysis of the dynamic structure, formation, and dissolution of chemical bonds between human molecules, invokes theoretical conception of 'human molecular orbitals', as defined by human molecular orbital theory. When human movement, over the surface of the earth, is viewed at a time-accelerated pace, such as viewing the total weekly, monthly, or yearly movements of one person, via for example GPS tracking, in a sped-up five minute video clip, one begins to see an orbital picture of human movement. Tracking of humans, considered as material points, over extended high-speed clips of spans of months or years views, mathematically for patterns in short few-minute video segment trajectory clips, leads to a view of human activity orbitals changing dynamically over time, as bonds are formed and broken. Shown below is a typical generic picture of the transition state model of the male-female reaction, where two human molecules, male Mx and female Fy, collide in time, and begin to interact in their common "school orbital" S, of their various possible daily orbitals of work W, gym G, and so on; where after, by day 90, the two are orbiting in mutual friends houses F_1 and F_2; where after, by day 365, owing to the energy stabilizing effect of the ongoing reaction, the pair marry, thus combining orbitals, into the formation of one nuclear family with a single joint home H acting as the centralized nucleus of the dihumanide molecule. This is depicted below:

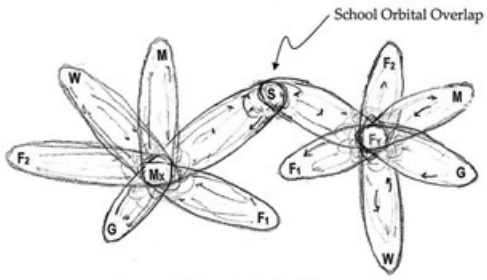

Human Molecular Orbital Interaction

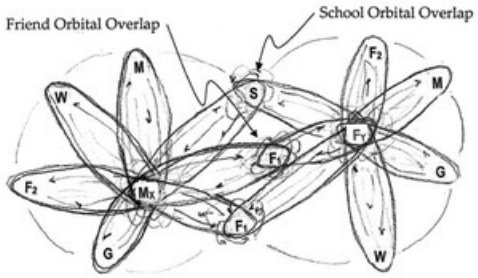

Enhanced Human Molecular Orbital Interaction

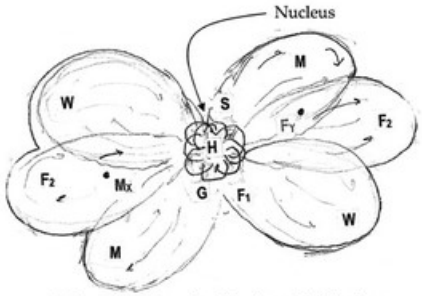

Human Molecular Nuclear Unification

Day one: Two people, i.e. human molecules, Mx and Fy, meet in their school orbitals, and begin to associate.	**Day 90**: The two human molecules develop more orbital overlap (stability) by hanging out at the houses of mutual friends.	**Day 365**: The two human molecules fuse, by combining their previous separate nuclei into one (they move in together).

A molecular orbital, by technical definition, is the a solution of the Schrödinger equation that describes the ninety percent probable location of an electron relative to the nuclei in a molecule and so indicates the nature of any bond in which the electron is involved. In simple terms, it is understood that electrons (and molecules) act as both waves and particles, tending to have orbital motions in their trajectories.

Starting with the conservation of energy, which assumes that the total energy of a system is equal to the sum of its potential energy and kinetic energy, a descriptive time-dependent 'wave equation' can be derived which describes the movement or behavior, and thus the structure, of the nuclei and electrons that comprise an atom or molecule. This description is particularly intuitive when electrons are shared between two different atoms or molecules, creating a chemical bond, which actuates as through the means of an orbital overlap effect. The translation of this logic to the bonding transition states of human interpersonal interactions provides for a robust means of understanding human chemical bonding.

2005: New Scientist

In a 2005 article entitled "That's Life", *New Scientist* magazine gave the following 12-element empirical molecular formula for a human:

$$H_{15,750}N_{310}O_{6,500}C_{2,250}Ca_{63}P_{48}K_{15}S_{15}Na_{10}Cl_{6}Mg_{3}Fe_{1}$$

which the define as one's "chemical formula". [70]

That's life

- 03 December 2005
- Magazine issue 2528

What chemical formula would accurately describe an adult human being, in terms of the relative distribution of elements (including pollutants)? And what might be the formula for the first alien life form we encounter?

• One's "chemical formula" depends on a number of factors, most notably whether we're talking about a he or a she. Male bodies contain more water than female bodies, which have extra lipids. By weight, oxygen amounts to about two-thirds of the body, followed by carbon at 20 per cent, hydrogen at 10 per cent and nitrogen at 3 per cent. Elements originating from pollutants would only be present in trace amounts.

If a human body were broken into single atoms, we would arrive at an empirical formula H_{15750} N_{310} O_{6500} C_{2250} Ca_{63} P_{48} K_{15} S_{15} Na_{10} Cl_{6} Mg_{3} Fe_{1}. The relative numbers of atoms in this differ from the composition by weight because atoms have ...

Opening section from the 2005 *New Scientist* article "That's Life", in which a 12-element empirical formula for a human is given. [70]

2005: Molecular evolution tables

See main: Molecular evolution table

During the writing of the manuscripts for *Human Thermodynamics (Volumes 1-3)*, Thims began to make an evolution table putting the hydrogen atom at the top row and the human molecule at the bottom row, filling in known intermediates in the middle rows (monkey, shrew, fish, bacteria, etc.), and calculating approximate molecular formulas for each each intermediate structure.

This was first posted online in 2005 (IoHT Molecular Evolution Table). These tables, later published in various locations, have become a focal point of discussion and debate for many scientists in this field. A section of the latest version is shown below:

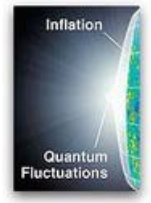

Big Bang

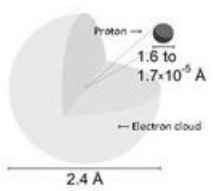

Hydrogen (H-1, H-2, H-3)

Milky Way

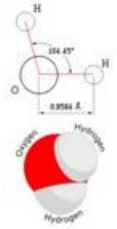

Water

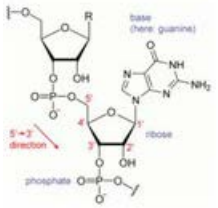

RNA

Bacteria (cluster of E. coli)

Lemur

Early human (human molecule)

	H		H_2O	$[C_{10}H_{16}O_{13}N_5P_2]_N$	$C_{E10}H_{E10}O_{E10}N_{E9}P_{E8}$ $S_{E8}Ca_{E8}K_{E6}Cl_{E6}Na_{E6}$ $Mg_{E6}Fe_{E5}Si_{E4}Mn_{E2}Co_{E2}$		$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}$ $Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}$ $Fe_{E23}F_{E23}Zn_{E22}Si_{E22}Cu_{E21}$ $B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}$ $Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$
13.7 BYA	Seconds after Bang	13.2 BYA	4.4 BYA	4.1 BYA	3.9 BYA	45 MYA	150,000 Year Ago

In other words, it is a matter of filling in the blanks, so to speak, to connect the mechanism of synthesis of the human molecule, starting with hydrogen.

2007: Buchanan | The Social Atom (book)

In 2007, American physicist Mark Buchanan wrote the book *The Social Atom*, in which he attempts to model each human actor as an individual atom in the crowd of the masses. In addressing the matter as to how to view people atomically, Buchanan remains two-sided as to whether to use the particle (atom) view or the human molecular view:

> "We should think of people as if they were atoms or molecules following fairly simple rules and try to learn the patterns to which those rules lead."

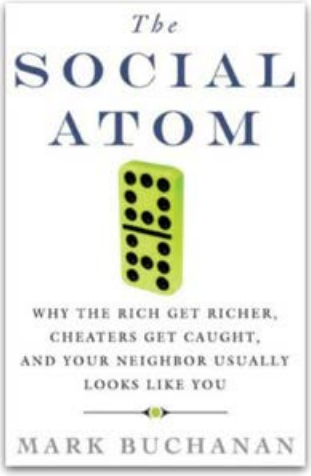

American physicist Mark Buchanan's 2007 book ***The Social Atom***, in which he applies physics principles to the modeling of people in mass as collectives of social atoms. [43]

The platform of the book is American economist Thomas Schelling's 1971 paper "Dynamic Models of Segregation", the very same paper which seems to have originated the now-famous 'tipping point theory', which concluded to the effect that even if every trace of racism were to vanish tomorrow, something akin to a law of physics might still make the races separate, much like oil and water. [44] This view, to note, is similar to American law professor Richard Delgado's 1990 law of racial thermodynamics. The subject is discussed further by others in integration and segregation thermodynamics. Some of Buchanan's conclusions however are rather incoherent, particularly in his effort to salvage the theory of free will:

> "The laws of physics are beginning to provide a new picture of the human atom or [rather] social atom—and this is a picture that does not conflict with the existence of individual free will. Just as atomic-level chaos gives rise to the clockwork precision of thermodynamics, so can free individuals come together into predictable patterns."

This is similar to English physicist C.G. Darwin's 1952 comment that human molecules have free will owing to their unpredictability, which of course is incorrect, just as is Buchanan's view.

2008: Thims | The Human Molecule (book)

The first book on the subject of the "human molecule", focused on its significance and history, was the 2008 booklet *The Human Molecule*, 120-pages in length, by American chemical engineer Libb Thims, as previously pictured above, which steps through the views of the three dozen or so individuals to have used this concept in discussion or philosophy. [20] The following chemistry aphorism style quote from the 1999 novel *Milton's Progress* by Forbes Allan, for instance, is the opening quote to *The Human Molecule*: [25]

> "People are like particles, they behave in groups as if they were molecules in a test-tube."

Thims' *The Human Molecule* can be read at Issuu.com (linked below).

Human chemical reactions

See also: Human chemical reaction (history)

The dynamic evolving attachment of human molecules together into structures, e.g. A≡B, such as marriage pairs, friendships, family units, etc., actuates according to the function of human chemical bonds. The rearrangement of bonds, the formation of new bonds, or the dissolution of old bonds, defines the process of a human chemical reaction, such as shown below:

> A + B → AB (combination reaction)
>
> AB → A + B (dissolution reaction)

Human thermodynamics | Engineering thermodynamics

Thinkers including Henry Adams (1890s) and C.G. Darwin (1952) were the first to initiate the study of humans viewed conceptually as "molecules" in the context of thermodynamics—the latter specifically defining the science of human thermodynamics as the study of systems of human molecules.

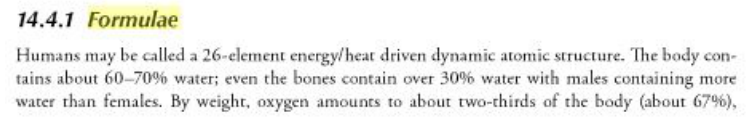

14.4.1 Formulae

Humans may be called a 26-element energy/heat driven dynamic atomic structure. The body contains about 60–70% water; even the bones contain over 30% water with males containing more water than females. By weight, oxygen amounts to about two-thirds of the body (about 67%),

Indian-born American mechanical engineer Kalyan Annamalai and American mechanical engineer Carlos Silva's 2011 engineering thermodynamics textbook definition of a human formulaically as a "26-element energy/heat driven dynamic atomic structure", based on the work of American electrochemical engineer Libb Thims (2002). [71]

In human thermodynamics, a set of human molecules partitioned off by an "energetic boundary", i.e. a quantitative spatial demarcation, such as a town boarder, a social barrier, state lines, corporate boundaries, occupational orbitals, social circles, family boundaries, etc., comprise a closed thermodynamic system of working molecules, i.e. a *working body* in the words of Clausius, according to which first and second law energy balances apply in the production of system external work W due to the action of cyclical solar heat input Q_{in}.

In 2011, Indian-born American mechanical engineer Kalyan Annamalai and American mechanical engineer Carlos Silva, in their second edition *Advanced Thermodynamics Engineering*, citing Libb Thims (2002), in their "formula" section, give the following thermodynamic definition of a human: [71]

> "Humans may be called a 26-element energy/heat driven dynamic atomic structure."

Annamalia and Silva, of note, are the authors of the 2009 "Entropy Generation and Human Aging" on aging theory (or anti-aging) and thermodynamics. [72]

Recent views

In 2006, after being introduced to the human molecule concept the previous year, Russian physical chemist Georgi Gladyshev began to incorporate the human molecule perspective into his theories, and comments that "the conclusions of hierarchical thermodynamics correspond excellently to conception of Libb Thims about the thermodynamics of human molecules". [57] As of 2010, Gladyshev believes that the aging process of molecules can be explained using his theory of hierarchical thermodynamics. In 2007, as mentioned previously, Russian bioelectrochemist Octavian Ksenzhek stated that:

> "The economy of mankind is a very large and extremely complicated system [and] people are the 'molecules' of which it consists."

Ksenzhek goes on to use energy and entropy to study the ways in which the "various associations of people constitute its structural components." [23] In 2010, Martin Gardiner, of the *Annals of Improbable Research*, the group that administers the Ig Nobel Prizes aiming to spotlight research that makes people laugh and then think, ran a four-part, three-day article on the work of Libb Thims, entitled "I Am Not A Molecule", subtitled 'Inside the IoHT', discussing topics such as Thims' 2008 book *The Human Molecule*, the Human Chemistry 101 video lectures on the human molecule, the Institute of Human Thermodynamics, the Journal of Human Thermodynamics, among other topics. Gardiner considers the subject of the chemistry and thermodynamics of human molecules to be an emergent intellectual development.

A oft-quoted popular quote for the 2010 book *Employees First, Customers Second* by Indian engineer business executive Vineet Nayar, signifying the logic that the employees are the molecular components of the mega-molecular structure of the corporation (corporate molecule), and that if each employee is instilled or given the vision of an entrepreneurial attitude that corporation will accelerate with a higher energy quotient. [60] :

> "And when that happens with a critical mass of employees (usually, 5 or 10 percent is all you need) throughout the company, it creates a kind of fusion – a coming together of the human particles in the corporate molecule that releases a massive amount of energy."

Nayer spends considerable time discussing ideas on how hidden or latent energy exists in the employees of corporations.

Octillion | atoms in one person

See main: Number of atoms in

To give an idea as to the magnitude of the number of atoms in one human molecule as compared to, for instance, the number of atoms in one water molecule (three) or the number of atoms comprising the earth (sexdecillion), the following table lists names to common larger numbers. [53] The third column, Exp, shows the old-fashioned calculator shorthand symbol for large numbers, in which E is short for exponent, in the sense that, for instance, E9 is short for 10E9 which is short for 10^9. Exponent shorthand is useful in writing out molecular formulas for biological entities.

#	Name	Number of Atoms	Exp	In
10^2	hundred	100	E2	
10^3	thousand	1,000	E3	
10^6	million	1,000,000	E6	
10^9	billion	1,000,000,000	E9	ten bacteria molecules
10^{12}	trillion	1,000,000,000,000	E12	
10^{15}	quadrillion	1,000,000,000,000,000	E15	ten pre-aquatic worms
10^{18}	quintillion	1,000,000,000,000,000,000	E18	
10^{21}	sextillion	1,000,000,000,000,000,000,000	E21	one small fish
10^{24}	septillion	1,000,000,000,000,000,000,000,000	E24	

10^{27}	octillion	1,000,000,000,000,000,000,000,000,000	E27	one person (**human molecule**)
10^{30}	nonillion	1,000,000,000,000,000,000,000,000,000,000	E30	
10^{33}	decillion	1,000,000,000,000,000,000,000,000,000,000,000	E33	
10^{36}	undecillion	1,000,000,000,000,000,000,000,000,000,000,000,000	E36	
10^{39}	duodecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000	E39	
10^{42}	tredecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E42	
10^{45}	quattuordecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E45	
10^{48}	quindecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E48	
10^{51}	sexdecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E51	one earth molecule (the earth)
10^{54}	septendecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E54	
10^{57}	octodecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E57	one sun molecule (the sun)
10^{60}	novemdecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E60	
10^{63}	vigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E63	
10^{66}	unvigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E66	the milky way galaxy
10^{69}	duovigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E69	
10^{72}	tresvigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E72	
10^{75}	quattuorvigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E75	
10^{78}	quinquavigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E78	
10^{81}	sesvigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E81	the observable universe
10^{84}	septemvigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E84	

Using these larger number names in context, one would say, for instance, that one human molecule is comprised of an octillion atoms, of twenty-six types of 'active' elements.

Objections to

Since the 1809 publication of Goethe's *Elective Affinities*, wherein the characters are said to mirror the activities and behaviors of the chemicals, there has been a never-ending stream of criticism regarding the chemical nature of the human being. [21] In 1810, for instance, Goethe's fellow author and neighbor Christoph Wieland sent a letter (which he suggested should be burned after it is read) to his close friend German philologist and archeologist Karl Böttiger stating that: [22]

> “To all rational readers, the use of the chemical theory is nonsense and childish fooling around.”

In modern terms, the debate still continues; where, according to recent Internet polls, about 57% of people agree that they are a giant molecule. [17] Likewise, according to standard molecular evolution tables, it is visually-obvious that humans are evolved molecules. In spite of these known perspectives, many maintain that humans are in some way different than molecules, particularly when it comes to choice and free will.

"I am a molecule!" (Apr 2009) [9:32 min]

In 1996, for instance, Austrian-born American theoretical physicist Fritjof Capra stated incorrectly that "human beings can choose whether and how to obey a social rule; molecules cannot choose whether or not they should interact." [18]

In 2005, American science philosopher and sociologist Steve Fuller, a noted intelligent design advocate, published his *New Scientist* article "I Am Not a Molecule", arguing against atomic reductionism in sociology, used in recent publications, most notably English physical chemist Phillip Ball's 2004 book *Critical Mass: How One Thing Leads to Another*, American evolutionary biologist Jared Diamond's 2005 book *Collapse: How Societies Choose to Fail or Succeed*, and Canadian-born evolutionary psychologist American Steven Pinker's 2002 book *The Blank Slate: the Modern Denial of Human Nature*, all of which, according to Fuller, are "infuriating social scientists"; presumably himself, most significantly? [24]

Likewise, in 2007 Canadian chemist Stephen Lower considered the following statement "people are viewed as chemical species, or specifically *human molecules*, *A* or *B*, and processes such as marriage or divorce are viewed as chemical reactions between individuals..." to be crackpot, meaning it is something akin to an eccentric or lunatic notion, and listed it among a grouping of pseudoscience subjects. [19]

"I am not a molecule!" (Apr 2009) [6:10 min]

See also

â— Human chemical
â— Human chemical element
â— Human element
â— Human particle
â— People are not molecules
â— Social atom
â— Joseph Dewey

A Twitter page, by Michael Halliday777, where he defines himself as a "human molecule" via the human molecular formula. (Ñº)

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External links

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θΔics

In science, **human molecule** is a topic associated with imprisonment, banning, and excommunication; where, over the last two-centuries, it is a reoccurring phenomenon that authors who write on the subject of the "human molecule" (people viewed as molecules), historically, have been subjected to a mixture of imprisonment, banning, and excommunication. The following are a few historical examples:

Theorist	Date	Overview
Lucretius (99-55BC) Greek atomic theory philosopher	55BC	His *On the Nature of Things*, which amassed the sum writings on atomic theory (of Epicurus, Democritus, and Leucippus), asserting that humans are made of but geometries of atoms and voids, was banished by the church, thereafter having all his copies destroyed, except one—later discovered in 1417 in a German monastery by antiquity collector Poggio Bracciolini (1380-1459), who had 50 copies made, resulting to mentally seed the initiation of the scientific revolution, via the work of: Desiderius Erasmus (1500), Giordano Bruno (1584), Francis Bacon (1601), Galileo Galilei (1623), etc. who all began to embrace "atheistic school of Leucippus and Democritus and Epicurus", as Bacon put it, and therein reformulate a reconciliation of their faith and science.
Jean Sales (1741-1816) French writer, philosopher, and polymath	1775	Imprisoned, by the Chatelet, and later sentenced to perpetual banishment, from France, for writing, in his materialism advocating *The Philosophy of Nature: a Treatise on Moral Human Nature*, about people as "human molecules" formed from the "atoms" of the earth by a "great process". [1]
Vilfredo Pareto (1848-1923) French-born Italian mathematical engineer and physical socioeconomist	1893	His public lectures in a working men's institute, between 1889 and 1893—during which time he wrote 167 articles, many of the scholarly, but the vast majority anti-government polemics—were closed by the police; sometime therein, or at least by 1895, he began to pen out his signature theory of "man, *a kind of molecule*, acting only in response to the forces of ophelimity."
Pierre Teilhard (1881-1955) French philosopher, chemist, physicist, paleontologist, and priest	1925	His writings on "human molecules" were perpetually banned by the church, throughout his life, 1925 to 1955, and because of his views he was excommunicated from the church; his writings were all published posthumously.
Mehdi Bazargan (1907-1995) Iranian mechanical engineer, thermodynamics professor, and 75th prime minster of Iran	1956	Imprisoned twice for writing that people are "configurations of atoms" that should be governed politically by regulation of the laws of chemistry, physics, and thermodynamics; while in prison, wrote the first full book on human thermodynamics, the 216-page *Thermodynamics of Humans*, wherein people, as atomic configurations, are entities who desires and labors are governed by chemical affinity, the laws thermodynamics, and the principles physics
Libb Thims (c.1975-) American chemical engineer, electrical engineer, and thermodynamicist	2005	Banned from Wikipedia (twice) for attempting to write articles on the human molecule subjects of "human thermodynamics", using the C.G. Darwin 1952 definition of the subject as the statistical mechanics of human molecules, and "human chemistry", using the Henry Adams 1885 definition of the subject as the study of the attraction of equivalent human molecules; the following 2010 article: "human thermodynamics (Wikipedia)", in particular, resulted in the subject of the human molecule (and Thims) being permanently banned from Wikipedia, by selective administrators, in particular biochemist Tim Vickers

(User:Tim Vickers), computer scientist Jonathan Hochman (User:Jehochman), and hotel manager Kevin Williams (User:Kww), who found the subject very disturbing and stated that they wanted to "kill" the article.

2010 Banned from ChemicalForums.com: A mere discussion post about the possibility of teaching the subject of the human molecule, in the context of human chemistry, in college, was banned (within twelve hours) from ChemicalForums.com, by a Polish chemist Borak (who runs the site ChemBuddy.com), who considered the subject of human chemistry, defined as the study of the behaviors of human molecules, to be crackpot and an *abuse* of the word chemistry, the reason for banning the subject, in his own words, being that: "humans are not molecules, they are complex objects composed of many molecules."

The ban was supported by American chemist Mitch Garcia (who started the site in 2003), stating that “honestly, the idea seems pure crackpottery to me. Crackpots always seem to think they are victims of the "mainstream". They always seem to think no one is intelligent enough to understand their points.” Garcia stated that the only place he would allow discussion of the subject was in the "Politics, Philosophy, and Oddities" subsection of the site, otherwise he will ban.

Related

In 1920, American prodigy William Sidis (the character behind the film *Good Will Hunting*) wrote his magnum opus, *The Animate and the Inanimate*, on his view of how thermodynamics explains human existence, while locked in an asylum.

Quotes

The following are related quotes:

> “From the fact that action and reaction of opposing powers is always equal, the greatest efforts of the goddess of reason against Christianity were made in France.”
>
> — Joseph de Maistre (1797), *Considerations on France* [1]

References

1. Fara, Patricia. (2011). *Newton: the Making of a Genius* (pg. 5). Pan Macmillan.

Further reading

â— Thims, Libb. (2019). “Banned from r/thermodynamics (for 3-days) for this crosspost on Timothy Kueper's 2019 thermodynamics-themed novel The Motive Power of Fire?” (Ñº), Reddit, r/Hmolpedia, Nov 3.

θΔics

***Note**: below text is a paste of an article banned (Ñº)(Ñº) twice* [see: deletion log] *from Wikipedia (2007; 2010);*
***Active article**: Human molecule*

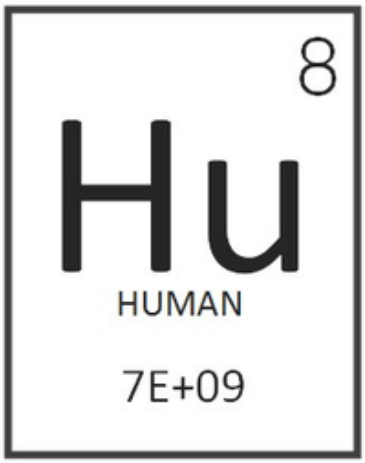

The "human element" **Hu** chemical symbol from the popular 2006-2009 Dow Chemical advertising campaign, with a mock atomic number and pseudo atomic mass of 7E+09 indicative of the current human population, often shown overlaid on photos of third world people, to signify that the human is the "missing element" of the periodic table.

Human molecule is the term used to define or view a person as a molecule. [1] The term "human molecule" was coined in 1789 by French philosopher Jean Sales. [2] The construct of a person defined as a molecule, or type of chemical, has been utilized as a tool in both the hard sciences, namely chemistry, thermodynamics, and physics, and the humanities, namely sociology, economics, history, and philosophy, psychology, among other subjects, such as religion. The modern reserved-view of modeling a person as a "molecule", whether abstractly or factually, is explained well in the 2001-2004 lectures and follow-up Aventis Prize-winning book *Critical Mass* by English chemist and physicist Philip Ball: [3]

> "To develop a 'physics of society', we must take a bold step that some might regard as a leap of faith and others as preposterous idealization: particles become people [and] human activity [becomes] collections of many interacting 'agents' — somewhat analogous to a fluid of interacting atoms or molecules."

The subject of the concept of the person defined as an abstract 'molecule' or specifically a "human molecule", over the last two-centuries, has been a point of discussion by dozens of various scholars and thinkers, from French writer Alphonse Esquiros (1840), who argued that the occupation of the historian and psychologist is to study the transformations and psychology of individual human molecules or groups of human molecules; to American historian Henry Adams (1885) who defined "social chemistry" as the study of the attractions of human molecules; to French philosopher Pierre Teilhard (1936), who used the term in the big science, evolution of the universe view, such that over the course of billions of years, the simple "atom" became the "molecule" that became the "mega-molecule" that became the "human molecule" (each separated by "intermediate states" in the form of "molecular aggregates") and that the noosphere mind of the human molecule is heading towards an "omega point"; to English physicist C.G. Darwin (1952), who defined "human thermodynamics" as the statistical mechanics of human molecules; to American economist Robert Costanza (1999), who argued that "the welfare of human society is best served by the view of people as 'human molecules' who, by pursuing their own interests through the market, inevitably promote the general good." The first calculation for the empirical formula for one human was done in 2000 by American limnologists Robert Sterner, at the University of Minnesota, and James Elser, at Arizona State University. [1]

"We conclude that there exists a principle of the human body which comes from the great process in which so many millions of atoms of the earth become many millions of **human molecules**."

- Jean Sales (1789)

Early history

The first to coin the term "human molecule" was French philosopher Jean Sales who, in his 1789 *The Philosophy of Nature: Treatise on Human Moral Nature*, concluded that people are molecules that have arisen over time through a "great process" from the atoms of the earth. [2] Sale's views, which he had begun to publish in 1770, at first passed unnoticed, began to attract objectionable attraction owing to its moral views considered contrary to religion, during which time he was condemned to perpetual banishment by the order of the Chatelet. To exemplify the density of mindset involved in Sales' treatise, a work that was expanded into multiple volumes, in 1777 French philosopher Voltaire, said to have an IQ of 190, one of the fifteen highest in history (Cox, *Early Mental Traits of 300 Geniuses*, 1926), stood up in defense of Sales' work and even went so far as to contributed 500 pounds towards his release from prison.

Others in the 19th-century to have used the term "human molecule" in argument or discussion include: French writer Alphonse Esquiros (1840), who argued that "unity can be held in effect by the assent of human molecules to carry all toward each other; the law of attraction is a law of love"; French composer Hector Berlioz (1854), who compared the visual sight of a children's choir to that of a "crystal of human molecules"; American sociologist Henry Carey (1858), who defined man as the "molecule of society" and specifically stated that this particular molecule is "the subject of social science"; French historian Hippolyte Taine (1869), who reasoned that objective of the historian is to "write the psychology of the human molecule, or a particular group of human molecules, in their various transformations". Other late 19th century thinkers to have discussed the concept of the human molecule include: German physician and diplomat Ernst Gryzanowski (1875), American historian Henry Adams (1885), German-British philosopher Ferdinand Schiller (1891), French education reformer Max Leclerc (1894), and French-Italian mathematical engineer

Vilfredo Pareto (1896), as discussed further below.

Books

In the last two centuries, there have been about a dozen or so books written on the subject of a person viewed as a chemical, molecule, or atomic-like particle, from German polymath Johann Goethe's 1809 *Elective Affinities* to American writer John Hodgson's 2010 *molecules humans*:

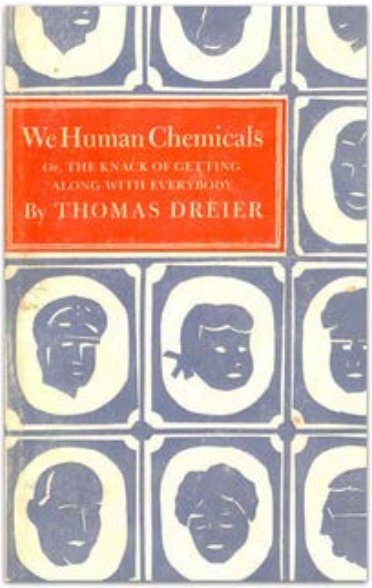

1948 book *We Human chemicals*, by Americans Thomas Dreier and chemist Gustavus Esselen, showing a depiction of humans on a mock periodic table, in which each person is considered as reactive "human chemical". [99]

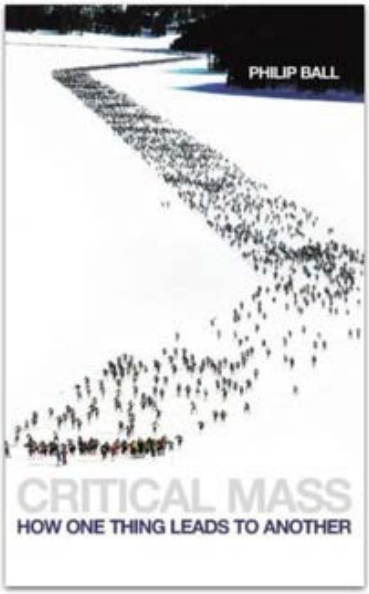

2004 book *Critical Mass*, by English chemist and physicist Philip Ball, outlining a view that people should be thought of as atoms or molecules, and that physics concepts, such as critical mass, apply. [3]

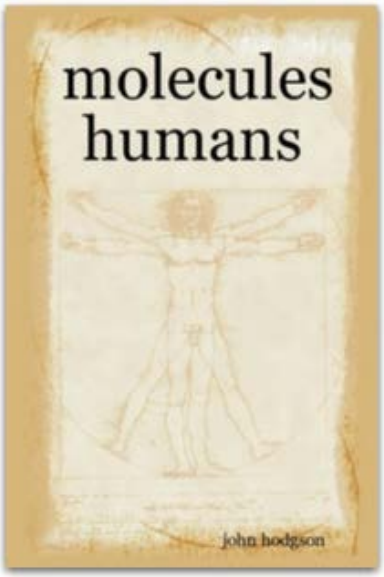

2010 book *molecules humans*, by American writer John Hodgson's, a modern-day remake of Empedocles' 450BC chemistry aphorisms, with ninety-eight different idioms on how the two, i.e. humans and molecules, are alike.

Other books of note include: English-born American chemical engineer William Fairburn's 1914 *Human Chemistry*, Americans editor Thomas Dreier and chemist Gustavus Esselen's 1948 *We Human chemicals*, American spiritual teacher Joseph Dewey's 1999 *The Molecular Relationship*, American writer John Hodgson's 2002 *Little Fun Book of Molecules Humans* (retitled as *Molecules Humans*, 2010 edition), English chemical physicist Philip Ball's 2003 *Critical Mass: How one Thing Leads to Another*, American physicist Mark Buchanan's 2007 *The Social Atom*, among others.

This listing does not include various other books with specific chapters on the human molecule concept, such as English physicist C.G. Darwin's sixteen-page Introduction chapter in his 1952 *The Next Million years*, or books themed in overall loose structure on the human molecule concept, such as American sociologist Henry Carey's 1858 *Principles of Social Science*, French philosopher Hippolyte Taine 1869 *On Intelligence*, or French philosopher Pierre Teilhard's 1938 *The Phenomenon of Man*, among numerous others; as well as those books containing multiple chapters on human molecules, such as American philosopher Alan Nelson's 1992 three-chapter series "Human Molecules", wherein 'economic agents' are viewed as human molecules.

Chemistry

The originator of the modeling of humans are large types of chemicals was Greek philosopher Empedocles who in 450BC conceived the view that people are four-element chemicals and therefore separate and or mix, under the control of two forces, namely *philia* (a type of attractive force) and *neikos* (a type of repulsive force), just as do oil and water or water and wine when put into contact: "relatives mix like water and wine; enemies avoid each other like water and oil." [4] Empedocles' theory of elements, chemicals, and people mixing and or separating according to a pair of dualistic forces was the forerunner to the "doctrine of affinity", i.e. the various twelve laws of affinity, and eventual science of affinity chemistry, which, according to American chemistry historian Henry Leicester, would become "so important in chemistry." [5]

Chemistry | Elective Affinities

One of the most-elaborate expositions on chemical-reduction view of humanity is found in the 1809 work of German polymath Johann Goethe, the person who, according to the 1926 research of American psychologists (Catherine Cox, *Early Mental Traits of 300 Geniuses*, and her advisor Lewis Terman, inventor of the modern IQ scale, is said to have been the smartest person (IQ=210) to have ever lived, prior to the year 1850. Goethe had studied chemistry and performed chemical experiments for over four decades prior to writing his theory. Goethe began discussing his theory with colleagues in 1808 and published the final version in two

eighteen chapter parts in the 1809 scientific novella *Elective Affinities* (*Die Wahlverwandtschaften*), wherein each of the thirty-six chapters is modeled on a different type of chemical reaction. [6] As summarized, in 1899, by German biologist Ernst Haeckel: [7]

German polymath Johann Goethe's 1809 *Elective Affinities*, the first book, since Greek philosopher Empedocles' 450BC chemistry aphorisms of how "people who love each other mix like water and wine; people who hate each other segregate like water and oil", to model human relationships as chemical reactions or chemical processes. [6]

> "Goethe, in his classical romance, *Affinities*, compares the relations of pairs of loves with the phenomenon of the same name in the formation of chemical combinations. The irresistible passion that draws Edward to the sympathetic Ottilie, or Paris to Helen, and leaps over all bounds of reason and morality, is the same powerful unconscious attractive force which impels the living spermatozoon to force an entrance into the ovum in the fertilization of the egg of the animal or plant—the same impetuous movement which unities the two atoms of the hydrogen H to one atom of the oxygen O for the formation of the a molecule of water H_2O. This fundamental unity of affinity in the whole of nature was recognized by the great Greek scientist Empedocles in the fifth century BC in his theory of the love and hatred of the elements."

The core chapter, *chapter four*, of Goethe's novella, wherein the characters openly discuss what it means to be a chemical in the context of their own relationships and marriages, is summarized, as follows, from American affinity chemistry historian Mi Gyung Kim's 2003 *Affinity, That Elusive Dream*, where each letter is a person, as such: [8]

> "I can put my meaning together with letters. Suppose an *A* connected so closely with *B* that all sorts of means, even violence, have been made use to separate them, without effect. Then suppose a *C* in exactly the same position with respect to *D*. Bring the two pairs into contact; *A* will fling himself on *D*, *C* on *B*, without it being possible to say which had first left its first connection, or made the first move toward the second." Goethe gives tribute to Empedocles oil-and-water theory, in the following passage, as found in his chapter four: "Let me try and see," said Charlotte," whether I can understand where you are bringing me. As everything has a reference to itself, so it must have some relation to others." " And that," interrupted Edward, " will be different according to the natural differences of the things themselves. Sometimes they will meet like friends and old acquaintances; they will come rapidly together, and unite without either having to alter itself at all—as wine mixes with water. Others, again, will remain as strangers side by side, and no amount of mechanical mixing or forcing will succeed in combining them. Oil and water may be shaken up together, and the next moment they are separate again, each by itself."

In Goethe's view, which is written in, in his words, as "multiple layers of Gestalt", then, as described in his previous 1786 evolution-morphology work (a forerunner to Darwin's evolution theory), humans are to be considered as large evolved or rather "metamorphosized" versions of the smaller reactive chemical substances. On this premise, Goethe used Swedish chemist Torbern Bergman's 1775 chemistry textbook *A Dissertation on Elective Attractions* to write out his novella, in which each chapter is a different human elective affinity reaction (human chemical reaction) occurring between the various characters. An example of a Bergman-style "single elective affinity" reaction is:

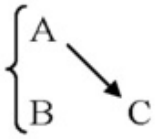

This reaction diagram notation, origin developed in 1756 by Scottish chemist William Cullen, is what in modern terms would be called a single displacement reaction:

$$AB + C \rightarrow AC + B$$

Hence, according to Goethe, these "moral symbols" as he called them, operate such that in the process in which two people, *A* and *B*, in the state of a dulling marriage union, *AB* (Bergman's notation), can be made to break apart by the introduction of a third single unattached human *C*, brought into the picture, is exactly same process, according to Goethe, as implicitly discussed in his famous chapter four, by which calcium carbonate $CaCO_3$ can be broken up into its constituent parts, Ca and CO_3, by contact with sulfuric acid H_2SO_4 to form gypsum $CaSO_4 \cdot 2H_2O$ and the release of carbon dioxide CO_2 gas, the gas being representative of the displaced marriage partner, gypsum representative of the newly formed couple. In the novella, this is explained, during a discussion between the the married characters Charlotte (A) and Eduard (B) and their newly invited friend the Captain (C), in which the characters use Bergman's letter notation to discuss their own fates as chemical reactants as described the doctrine of the science of affinity chemistry (a forerunner to chemical thermodynamics):

$CaCO_3$	$+$	H_2SO_4	$\rightarrow$	$CaSO_4 \cdot 2H_2O$	$+$	CO_2
calcium carbonate (s)		sulfuric acid (aq)		gypsum (s)		carbon dioxide (g)
AB		C		BC		A
Charlotte-Eduard		Captain		Eduard-Captain		Charlotte

In commentary on this human chemical reaction, the character Charlotte comments "I would never see a choice here but rather a natural necessity and indeed hardly that; for in the last resort it is perhaps only a matter of opportunity. Opportunity makes relationships just as much as it makes thieves; and where your natural substances are concerned, the choice seems to me to lie entirely in the hands of the chemist who brings these substances together … I can only feel sorry for the poor gaseous acid, which has to go off and drift around again in the void." Eduard interposes, "unless I am mistaken," said with a smile, "your remarks carry a double meaning, I am in your eyes the lime which the Captain, as sulfuric acid, has seized on, withdrawn from your charming company, and transformed into a stubborn gypsum." Goethe goes on to step through more of these types of philosophical arguments in the novella, using different types of reactions, e.g. the process of removing verdigris from pots, as models for human reactions. [9]

This publication has since been a constant source of debate, with new opinions, either for or against, being published every decade. [10] To cite one example, the year after its publication, Goethe's neighbor, German poet and writer Christoph Wieland objected on the anti-Christianity of the novella, and commented in letter to German archeologist Karl Böttiger, which he said should be burned after reading, that Goethe's modeling of humans as chemicals is "nonsense and childish fooling around". [11]

Chemistry | Adler's 1977 human chemical reactions

Many scholars, thinking along the lines of Goethe that people are reactive chemicals, have since attempted to speculate on which chemists Goethe cited and which particular chemical reactions he used for each chapter, as Goethe, contrary to his usually practice destroyed all of his manuscript notes, and specifically stated that he wrapped the novella in multiple layers of Gestalt.

The first to attempt chemical equation reconstruction of Goethe's *Elective Affinities* was English science historian and German studies professor Jeremy Adler who in 1977, at the University of London, completed his PhD in this subject, with a dissertation entitled *Goethe's Elective Affinity and the Chemistry of its Time*, under the supervision of German professor of Goethean studies Claus Bock. In his dissertation, and followup articles and chapters published in the decades to follow, in German and English, Adler cogently identified about two-dozen potential chemists, such as Isaac Newton (Query 31: *Opticks*, 1718), Étienne François Geoffroy (*Table of Affinities*, 1718), Pierre Macquer (*Elements of Theoretical Chemistry*, 1749; the first textbook on affinity chemistry), 1749), Torbern Bergman (*A Dissertation on Elective Attractions*, 1775), and Claude Berthollet (theory of "double affinity", c.1800), Johann Trommsdorff (*Systematic Handbook of the Whole of Chemistry*, 1805), among others, and about a dozen chemical reactions, such as:

- Single elective affinity ($AB + C \rightarrow BC + A$)

- Double elective affinity ($AB + CD \rightarrow BC + AD$)
- Split affinities ($AC + B \rightarrow A1B + A2C$)

among others, that Goethe likely used as models for each chapter. Adler spent years in various history of chemistry departments doing research for his dissertation. American chemistry historian John McEvoy (later at the University of Pittsburgh) and his supervisor, Satish Kapoor (Sussex University), gave Adler assistance with the background to the history of chemistry. Satish was working on French chemist Claude Berthollet at the time, and suggested to Adler that he switch to the history of chemistry; and so Adler joined the outfit of historians of science in England that ranged from the old masters, such as Joseph Needham and Walter Pagel, to his colleagues, like Cambridge science historian Roy Porter, Nick Jardine and others, interested in linking literature and science. Adler also had good contact with A.M. Duncan, who was working on the history of affinity theory. Duncan, of note, was the 1969 English translator of Swedish chemist Torbern Bergman's *A Dissertation on Elective Attractions*, the largest textbook ever written on affinity chemistry and also the main book used by Goethe in constructing his *Elective Affinities*, as he himself has admitted: "my idea for my new novella is to portray relationships symbolically, and the moral symbols are those employed by the great Bergman" (Goethe, 1808).

To go through one example, Adler argues that Goethe, being a voracious reader, writer (his collected works being a 52-volume set), and chemist would have read German chemist Johann Trommsdorff 1805 *Systematic Handbook of the Whole of Chemistry*, wherein the following combination type of affinity reaction was discussed (in relation to Berthollet's theory of affinities):

$$AB + CD \rightarrow ABCD$$

and that this reaction, would have translated, in Goethe's mind, as the reunite of the four friends, and that the variations of the following division reaction and double elective affinity would correspond, in Goethe's mind, as the divide and regrouping of the four friends, in the various chapters:

$$ABCD \rightarrow AB + CD$$
$$AB + CD \rightarrow AC + BD$$

Adler's work on affinity chemistry was influential to the effect that Needham, for instance, began referencing Adler's worak in *Science and Civilization in China*, in his chapter concerning Chinese affinity theory. With this basis of support, research, and study of the analysis of the vocabulary in Goethe's book, Adler became convinced that the use of affinity theory to explain human interactions and life was a thorough-going theme in Goethe's mind. In the 1980s and 1990s, Adler followed this up with book chapters such as the 1990 "Goethe's use of chemical theory in his *Elective Affinities*" among other articles and publications. [12]

Chemistry | Molecular sociology

In 1995, French chemist and Nobel Laureate Jean-Marie Lehn made reference to Goethe's human elective affinities theory as being a type of "molecular sociology" and a cousin-science analog to supramolecular chemistry: [13]

> "Supramolecular chemistry is a sort of **molecular sociology**! Non-covalent interactions define the inter-component bond, the action and reaction, in brief, the behavior of the molecular individuals and populations: their social structure as an ensemble of individuals having its own organization; their stability and their fragility; their tendency to associate or to isolate themselves; their selectivity, their 'elective affinities' and class structure, their ability to recognize each other; their dynamics, fluidity or rigidity or arrangements and of castes, tensions, motions, and reorientations; their mutual action and their transformation by each other."

A similar comparison was made by Belgian chemist and Nobel Laureate Ilya Prigogine, in his 1984 *Order Out of Chaos*, who mentions Goethe's "Mittler the mediator" as being a type of human catalyst, bring about successful reactions between people, without being consumed in the process. The concept of molecular sociology, with the introduction of the chemical thermodynamics work of Willard Gibbs (1876) and Hermann Helmholtz (1882), after which the measurement of affinity became a function of enthalpy change and entropy change, however, would move the subject of molecular sociology into the field of thermodynamics (as discussed below).

Chemistry | Fink's 1999 human chemical reactions

Symbol	Description
A = Charlotte	Wife
B = Eduard	Husband
C = The Captain	Eduard's friend
D = Ottilie	Charlotte's adopted niece
O = Otto	Baby
PPT	Precipitate
M = Mittler	Mediator

The 2001 table '**Signs of Chemical Affinity**' from American Goethean-studies professor Karl Fink's article "Geothe's Intensified Boarder", wherein ten different human chemical reactions, from German polymath Johann Goethe's 1809 *Elective Affinities*, are discussed, using reactant-product symbol notation, reaction arrow "chemical equation" methodology, e.g. $A + B \rightarrow AB$ (combination reaction), is used to explain human relationships as chemical reactions. [18]

A recent Goethe-based example viewing people as chemicals is found in the work American Germanic studies professor Karl Fink who, in his 2001 article "Goethe's Intensified Border", argues, differing from Adler a bit, that the chemistry theory used by Goethe was the affinities associated with acid base chemistry, or as he says "the symbols Goethe used came from the notions of acids and bases with affinities for each other, including, for example, limestone and sulfuric acid which forms gypsum and gives off a thin gaseous acid." [14]

This acid base postulate, however, is a bit pre-dated, for although Bergman, in his *Dissertation on Elective Attractions*, the main textbook used by Goethe to model human relationships, does discuss an acid and base chemistry view of reactions, e.g. how the a acid and base can react to form a salt, a union which can be modified by stronger acids, and so on, affinity chemist, in the 18th century, was not particularly focused on any dominate acid-base theory, but rather the rather the focus was on how to explain and quantify the affinity, the "force of reaction" any and all types of reactions. The earliest basic definitions of acids was advanced in 1887 by Swedish physicist and chemist Svante Arrhenius, who stated that acid ionizes in aqueous solution to produce hydrogen ions (protons), H + , and anions; and a base ionizes in aqueous solution to produce hydroxide ions (OH −) and cations. This was followed by the 1923 work of Johannes Brønsted, a Danish chemist, and Thomas Lowry, an English chemist, independently proposed a new way to define acids and bases. A similar acid-base theory was proposed by American physical chemist Gilbert Lewis during these years. In any event, Fink summarizes:

> "The symbols that Goethe used for his chemical reaction were acids and bases with an affinity for one another, the former a proton donor and the latter a proton acceptor. When the two react and for a covalent bond, a gaseous substance is given off, free to bond with another substance. By assigning the four main characters with these symbols in this environment, Goethe organizes the entire plot of the novel around reactions that can be translated into algorithms of human behavior."

Fink defined the marriage between Charlotte *A* and Eduard *B* as a combination reaction:

$$A + B \rightarrow AB$$

This is the start of the novella. Fink thus argues that the bond of marriage, *AB*, as Goethe conceived it, is a type of human covalent bond. With the arrival of the Captain *C*, Eduard's old friend, to the estate, Fink describes reaction as:

$$AB + C \rightarrow A + BC$$

The third reaction in the novella, according to Fink, is that wherein Charlotte brings her adopted niece Ottilie *D* home to the estate from her extended stay at a boarding school:

$$A + BC + D \rightarrow AD + BC$$

Of the ten reactions that Fink steps through in his article, of note, Fink postulates, differing for Adler, that the child born in the novella is a chemical precipitate. He postulates that the illicit child, created out of the interactions of the four friends, would follow a double elective affinity reaction of the following kind:

$$AC + BD \rightarrow AC + BD + P$$

where the molecular entities are Charlotte (A), Eduard (B), Captain (C), and Ottilie (D), is a chemical “precipitate” (P) or PPT, as Fink symbolizes it.

Chemistry | Huxley's 1871 social chemistry

In 1871, English biologist Thomas Huxley defined “social chemistry” as the study of society viewed such that men are atoms, that society is a complex molecule, which he called a “social molecule”, and that the politics of the balancing of the desires of humankind is the great problem of social chemistry: [15]

> “Every society, great or small, resembles a complex molecule, in which the atoms are represented by men, possessed of all those multifarious attractions and repulsions which are manifested in their desires and volitions, the unlimited power of satisfying which we call freedom ... the **social molecule** exists in virtue of the renunciation of more or less of this freedom by every individual. It is decomposed, when the attraction of desire leads to the resumption of that freedom the expression of which is essential to the existence of the social molecule. The great problem of **social chemistry** we call politics, is to discover what desires of mankind may be gratified, and what must be suppressed, if the highly complex compound, society, is to avoid decomposition.”

Huxley's definition of social chemistry has since been frequently quoted. In 1962, in commentary on Huxley’s call for a science of social chemistry, viewing men as atoms of the larger social molecule, Austrian social economist Werner Stark asked: [16]

> “Why should no **social chemistry** ever been developed? Nobody would suggest that the social scientists should imitate meteorology, for this discipline does not appear to have got very far … but what about chemistry?” He states “a sociology based on chemistry [has] in fact been called for, but, significantly, [this call has] found no echo. It would have been easy to take up this suggestion and develop it further. An intending *social chemist* would have found it one whit more difficult to manufacture a sociological parallel to the Boyle-Charles law than Haret did to the Newtonian propositions. But the experiment appears never to have been tried.”

Stark's view exemplifies the general public view of the subject of human or social chemistry of the study of the behaviors of "human molecules" (a term Stark used that year in objection to the 1858 social chemistry work of American social-economist Henry Carey), but his view that the "experiment has never been tried" is inaccurate, in that the experiment has been tried and test by many people, as discussed below.

Chemistry | Adam's 1885 social chemistry

In 1885, American historian Henry Adams specifically defined "social chemistry" as the study of the attraction of equivalent "human molecules".[21] Adams, who had been ruminating on the human molecule concept ever since becoming acquainted with in 1872, through the work of French philosopher Hippolyte Taine, would go on to write two books, in the late 1910s, on how chemistry and thermodynamics apply to the historical and societal aspects of human molecules (see thermodynamics section).

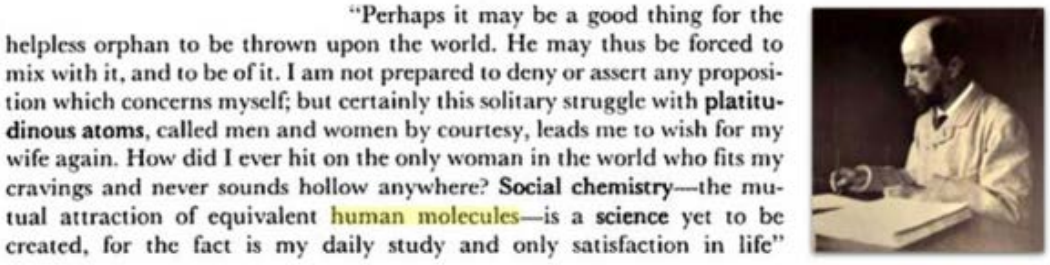
“Perhaps it may be a good thing for the helpless orphan to be thrown upon the world. He may thus be forced to mix with it, and to be of it. I am not prepared to deny or assert any proposition which concerns myself; but certainly this solitary struggle with **platitudinous atoms**, called men and women by courtesy, leads me to wish for my wife again. How did I ever hit on the only woman in the world who fits my cravings and never sounds hollow anywhere? **Social chemistry**—the mutual attraction of equivalent human molecules—is a **science** yet to be created, for the fact is my daily study and only satisfaction in life”

American scientist and historian Henry Adams explaining in an 1885 letter to his wife that his daily study is the science of the mutual attractions of **human molecules**, a term he had learned from Hippolyte Taine in 1872, defining this subject as "social chemistry". [21] Adams would spend another thirty years developing scientific theory as to how chemistry, physics, and thermodynamics would apply to the explanation of human existence, particularly as viewed in long spans of history and future, publishing three books on this topic; his 1910 *A Letter to American Teachers of History*, in particular, speculating on how large numbers of **human molecules**, in newly forming cities, could contract, creating energy, according to the nebular hypothesis, in opposition to entropy.

Chemistry | Dreier's 1910 human chemicals

The first actual article/booklet outlining the basics of the subject of human chemistry was the 1910, 27-page “Human Chemicals” by American editor Thomas Dreier who introduced the viewpoint that, in reality, each person is a “human chemical”, made from a certain number of the then known 78-elements, and that if people began to embrace this chemical-based philosophy, that people might be able to begin getting along better with one another. [17] Dreier, prior to this publication was a business manager of a larger publishing company, and thus turned to chemistry to develop a philosophy of how to become the “executive chemist” in his own

words, so as to facilitate the reactions between his employees, based on established scientific sense. This article became very popular so much so that Dreier would spend the next forty years writing on this subject, publications including the 1948 book *We Human Chemicals*, co-written with Harvard chemist Gustavus Esselen, the 1954 book *The Executive as a Human Chemist*, which resulted in response articles, such as “Do People ‘Explode’ in Your Office”. [18] To quote a representative excerpt from his 1948 book: [19]

> “Watch groups of people working or playing together and you will be startled to discover how ‘chemical’ are their reactions to one another. Once you acquire even rudiments of human chemistry, you will be baffled less often by people, and become impatient or angry less often at the (to you) annoying things they do. You will see and judge them for what they are—different kinds of *human chemicals*, obeying the laws of their natures as you and I obey the laws of our natures.”

Chemistry | Fairburn's 1914 human chemicals

The second book on the subject of human chemistry, following Dreier, was the 1914 book *Human Chemistry*, by English-born American chemical engineer William Fairburn in which, like Dreier, he specifically defines people as “chemical elements”, or sometimes “human chemical elements”, each human chemical comprised of a certain number of the 81-then-known-elements, and that human chemistry is the study of “the reactions resulting from combinations of individuals” to be pursued by the manager or foreman; Fairburn employs concepts such as affinity, heat, energy, entropy, combustion, efficiency, emulsification, force, etc., to outline his subject . [20]

Fairburn, to note was a bit religious at this point, commenting that: “the Creator in his infinite wisdom made no bad or unnecessary chemical elements, neither can any man be considered hopelessly bad or useless if he is put in his proper place and is handled wisely and intelligently by the human chemist.” This, however, is the only religious reference to this book. In his 1915 book *The Individual and Society*, Fairburn comments: “Man is not merely a ‘cunning bit of chemistry - a product of so much oxygen, hydrogen, and carbon’, a carnal corporeity. He is not swayed and ruled by what assails him from without, but he stands forth a living, spiritual thing, with ideals and purpose capable of triumphing over sensuous nature and materialism.” Later in the same book, conversely, Fairburn restates his view of what a human is in modern scientific terms: [21]

> “Men are like chemicals and possess pronounced personality which can be analogously expressed in the scientific terms of affinity -; that quality of attraction which takes place between and tends to unite elements into effective compounds; and of valency - that measure of relative combining power.”

This quote by Fairburn exemplifies a very larger intellectual dividing wall in the mindset of thinkers who would wish to employ human chemistry logic in that after 1923, with the publication of Gilbert Lewis’s textbook *Thermodynamics and the Free Energy of Chemical Substances*, after which the term “affinity” became replaced with the term “free energy” and 1925, with the publication of the Schrodinger equation, after which valency chemistry became replaced with molecular orbital theory, the person inquisitive of how to formulate a subject of human chemistry, in which people are viewed as chemicals or molecules, would be forced to master both chemical thermodynamics and quantum chemistry, along with the humanities in general, before even being allowed to gain insight in to the subject in the way that thinkers such as Goethe, Carey, Dreier, or Fairburn did, prior to the 1920s.

Chemistry | Sterner and Elser's 2000 human molecular formula

The first to explicitly state that a human has a “chemical formula” was American physician George Carey who, in his 1919 *The Chemistry of Human Life*, stated that “man’s body is a chemical formula in operation.” [22] The first calculation for the empirical formula for one human being was done in 2000 by American limnologists Robert Sterner, at the University of Minnesota, and James Elser, at Arizona State University, noted experts in the field of ecological stoichiometry the subject of the application of chemical stoichiometry to freshwater microorganisms. The "stoichiometric approach", according to Sterner and Elser, "considers whole organisms as if they were single abstract molecules" and studies topics such as how "Redfield ratios', i.e. organismal C:N:P ratios, differ among closely related populations. This type of mindset, i.e. viewing biological entities, such as microorganisms or humans, to be "abstract molecules" that must obey stoichiometric rules of chemistry, led them to the calculation of the empirical formula for one human, shown below, as published in their popular 2002 textbook *Ecological Stoichiometry*: [1]

Empirical formula (for one person)	**Chemical name**	**Chemists**	**Year**
		Robert	

$H_{375,000,000}O_{132,000,000}C_{85,700,000}N_{6,430,000}Ca_{1,500,000}P_{1,020,000}S_{206,000}Na_{183,000}K_{177,000}Cl_{27,000}Mg_{40,000}Si_{38,600}Fe_{2,680}Zn_{2,110}Cu_{76}I_{14}Mn_{13}F_{13}Cr_{7}Se_{4}Mo_{3}Co_{1}$	**Human molecule**	Sterner James Elser	2000

Sterner and Elser go on to state about this formula for one human that “from information on quantities of individual elements, we can calculate the stoichiometric formula for a living human being (as shown above).” To but this formula into perspective, they state that “there are about 375 million hydrogen H atoms for every one cobalt Co atom in your body.” To state the meaning of this formula explicitly, they state: "This formula combines all compounds in a human being into a single abstract 'molecule'." They specifically assign the chemical name "human molecule" to this formula. In technical terms, this amounts to defining a person, chemically, as a 22-element molecule. In criticism of this view-point, as they discuss in their book, they sometimes here criticism that they are "treating organisms as if they were 'just' chemical reactions" to which their response is: "What do you mean by 'just'? Organisms are chemical entities and are produced, maintained, and propagated by chemical reactions, albeit in the form of highly complex coupled networks, which are the product of evolution." Other similar calculations, independent of Sterner and Elser, have since been done, for both the empirical formula and molecular formula for one human, arriving at a 26-element formula for one human molecule, differing from the Sterner-Elser calculation by the inclusion of the biologically functioning elements: vanadium V, nickel Ni, selenium Se, and boron B.

Models

The construct of viewing people as "chemicals" or "molecules" has been used in various ways throughout history, from analogy, i.e. there exists an analogy between humans and molecules, comparison, e.g. the behavior of humans can be compared to molecules, metaphor, i.e. the view of humans as molecules is only metaphorical, or reality, i.e. humans are molecules.

Models | Like vs Are

The main categories of viewpoint outlined below, chronologically:

People are *like* chemicals or molecules	Empedocles: "People who love each other mix like water and wine; people who hate each other segregate like water and oil." (450BC)
People *are* chemicals or molecules	Goethe: "I am lime, the Captain is Sulphuric acid; the moral symbols are the elective affinities." (1809)
People are *analogous* to molecules	Darwin: "I compare human beings to molecules; the reader may feel that this is a bad analogy, because unlike a molecule, a man has free will, which makes his actions unpredictable." (1952)
People *behave* like molecules	Roy Henderson: "the movement of individuals can be likened to the random movement of molecules in a gas." (1970)
People *are* multi-element molecules	Sterner and Elser: "A human being is a *human molecule*, with a 22-element molecular formula that interacts with other human molecules in a way that resembles a complex, composite, chemical reaction." (2002)

The latter three variations of interpretation, tend to comprise actual postulates, theory, equations, and measurement, experimentation, and in some cases business application. A noted example is the 1971 work of Australian engineer Roy Henderson who reasoned that the kinetic theory, developed by James Maxwell and Ludwig Boltzmann in the 1860s, of how the speeds of gas molecules distribute themselves in a group must apply to the movements of people in crowds. To test this hypothesis, Henderson measured the movements of college students on a campus and children on a playground, finding that in both cases their movements fit the Maxwell-Boltzmann distribution. [23] On the basis of this finding, Henderson developed concepts, such as how as the crowds, at certain a density, can become a “liquid phase”, how men and women cannot be considered as “identical particles”, the kinetic energy of each human molecule varies with age (childhood vs college age), and so on. This came to be defined, in 1971, as “molecular sociology” by *New Scientist* magazine. [24] In 2010, *Physics World* described Henson’s findings: “at low densities, organisms in a crowd behave more or less like atoms or molecules in an ideal gas”. [25]

Shown adjacent, is the noted 1898 example of people, specifically football players, modeled as **human molecules**

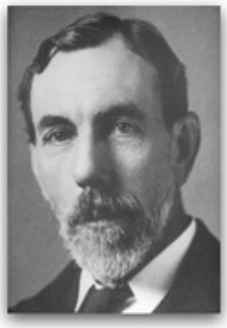

William Ramsay (1852-1916) Scottish physical chemistry founder noted for his 1898 kinetic theory football-players-as-*human- molecules* analogy.

I find, in my own case, that it helps greatly to a clear understanding of such a conception as that of which a short account has been given, if a mental picture can be called up which will illustrate the conception, although even imperfectly. Some such picture may be formed by thinking of the motions of the players in a game of football. At a critical point in the game, the players are running, some this way, some that; one has picked up the ball and is running with it, followed by two or three others; while players from the opposite side are slanting towards him, intent upon a collision. The backs are at rest, perhaps; but, on the approach of the ball to the goal, they quicken into activity, and the throng of human molecules is turned and pursues an opposite course. The failure of this analogy to represent what is believed to occur in a gas is that the players' motion is directed and has a purpose; that they do not move in straight lines, but in any curves which may suit their purpose; and that they do not, as two billiard-balls do, communicate their rates of motion one to the other by collision. But, making such reservations, some idea may be gained of the encounters of molecules by the encounters in a football-field.

by Scottish physical chemist William Ramsay. [26] Ramsay used the human molecule construct to help explain physics concepts, such as kinetic theory.

Australian-born English chemist and physicist Len Fisher (2009) says that people can being "likened" to molecules, experiencing attraction and repulsion forces; and thus one may use physics models, such as the Maxwell-Boltzmann distribution to explain crowd behaviors.

American limnologist Robert Sterner and James Esler (2002), view people not *like* molecules but *as* "single abstract molecules"; which is similar to German polymath Johann Goethe (1809) who views people as reactive chemical substances, that form and break chemical bonds, in the course of relationships, owing to the force of chemical affinity, a theory he uses to cogently explain topics such as morality, love, occupation, and death. [27]

Models | Applications

An example of application, is found in the 2004 book *The Entropy Vector: Connecting Science and Business* by English business manager Robert Handscombe and mechanical engineer Eann Patterson, in which they use human molecule modeling concepts to argue that the basic principles of thermodynamics can be used to facilitate business operations. To cite one example: [28]

> "In the physical process of burning oil, we can measure the heat output and temperature changes, even estimate the change in entropy, but as far as we know, the individual atoms and molecules in the barrel of oil are unconcerned. They show no signs of anxiety – their only interest, or so it seems, is in the thermodynamics imperative of finding the lowest exergy position. If we can assume that humans behavior similarly, then a drive to higher entropy, in an economic process, will have a concurrent higher 'enjoyment of life' factor."

The recent 2009 launch of the Spanish business consulting company, SocialThermodynamics.org, headed by Spanish physicist Alberto Hernando and business entrepreneur Gregory Botanes, is an example of theoretical implementation, wherein the business operations in society are consulted using a "thermodynamic formulation" model on the basis of which there is posited to exist for business systems "clear analogy between the system's thermal properties and those of gas and fluids." Beyond these basic classification, there is what one might call the "hard" and "soft" version of viewing people as molecules, as loosely touched on by English physicist C.G. Darwin (above): the soft version being that some may conceive his or herself as a type of larger molecule, but with reservation, e.g. that a human his a special type of molecule, with volition, a soul, consciousness, choice, that a marriage of true love can last forever, a molecule in possession of "life", among others; the hard version being that a human is large animated molecule that must abide by the exact same laws of physics, chemistry, and thermodynamics, as do smaller reactive molecules.

Models | Synonyms and derivatives

Throughout history there have been various "terms" used to defined people "chemically" in the sense that people are types of chemicals or atomic entities that behave just as do smaller chemicals. What American historian Henry Adams (1885) calls "human molecules" reacting together, is the same as what English-born American engineer William Fairburn (1914) calls "human chemical elements" or what American editor Thomas Dreier (1948) calls "human chemicals" or what Indian chemist Surya Pati (2009) calls "chemical molecules" and so on. These terms have changed as science has changed.

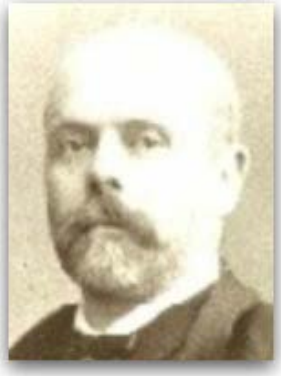

In the 1880s, French economist

To go through one example, in circa 450BC Greek philosopher Empedocles originated the prototype of the "standard model" of physics, by defining all structures of the universe, humans included, to be comprised of four element, whereby humans are chemical 'entities' made of *four elements*: fire (△), earth (▽), air (△), water (▽), whose 'interactions' are governed by *two forces*: philia (â— →|←â—), i.e. attraction (or love) and neikos (←â— |â— →), i.e. repulsion (or hate). Humans,

according to Empedocles, were structures composed of these four elements governed by these two forces. He famous stated various chemistry aphorisms as to how this theory mediates out for human behavior: "relatives mix like water and wine; enemies avoid each other like water and oil.” The science of chemistry, in these days, was not barely even considered alchemy.

Leon Walras defined people as "**economic molecules**", a near-synonym of human molecule; his students, likewise, used synonyms: Vilfredo Pareto defined people as a "**kind of molecule**" (1896); and Leon Winiarski defined a society as a "system of **points**" (1900) [29]

The next thinker to use this type of logic was German polymath Johann Goethe who in 1808, after studying the science of chemistry for a period of forty years, used Swedish chemist Torbern Bergman’s 1775 textbook *A Dissertation on Elective Attractions* to explain human relations as being chemical reactions or rather "affinity" reactions as the subject was called then. In Bergman's language chemical entities were called chemical "substances". In Bergman's own words: "Suppose *A* to be a substance for which other heterogeneous substances *a*, *b*, *c*, etc., have an attraction; suppose, further, *A*, combined with *c* to saturation (this union I shall call *Ac*), should, upon the addition of *b*, tend to unite with it to the exclusion of *c*, *A* is then said to attract *b* more strongly than *c*, or to have a stronger elective attraction for it." This statement is what is called Geoffroy's first law of affinity, as established by French chemist Étienne Geoffroy in 1718. Goethe, in turn, considered people to be larger versions of these chemical substances, that must obey the same chemical reaction laws, and specifically used this "Bergman letter notation" (A, a, b, AC, etc.) to explain, in his novella, how human relationships break and form. [9] To exemplify how this language gets carried over, in the 2000s, German physicist Jurgen Mimkes has been teaching this subject at University of Paderborn, publishing articles such as “Society as a Many Particle System” (2000), chapters such as "A Thermodynamics Formulation of Social Science" (2008), and books such as *The Chemistry of the Social Bond* (2011), where in he defines people in various ways: "particles", "atoms", "atomizations", "molecules", "agents", etc., and specifically cites Empedocles and Goethe as being the historical pioneers to the subject of viewing people as chemicals or physics-like particles. [30]

Variations or near-synonyms of the term "human molecule" include: point atom (Humphry Davy, 1813), atomic society and social molecule (Thomas Huxley, 1871), economic molecule (Léon Walras, c.1880), human atom (Albion Small, 1899), human chemical (Thomas Dreier, 1910), human chemical element (William Fairburn, 1914), Mr. Molecule (William Patton, 1919), "chemical formula in operation" (George Carey, 1919), human element (Pierre Teilhard, 1947), social atomism (Philip Rieff, c.1960), dissipative structure (Ilya Prigogine, 1971), Molecule Man (Jonathan Borofsky, 1977), human atomism (Arthur Iberall, 1987), human particle (Joel de Rosnay, 1975), molar group (Pierre Levy, 1994), mereological atoms (Eric Olson, 1998), free electron (Tom DeMarco, 1999), molecular relationship (Joseph Dewey, 1999), gay molecule Y_2, the lesbian molecule X_2, or middle-Eastern polygamous molecule X_4Y (Christopher Hirata, c.2000), child "precipitate" *PPT* (Karl Fink, 2001), couple "compound" $M\text{-}F$ (David Hwang, 2001), family molecule (Paul Peachey, 2001), giant molecule (Jim Eadon, 2001), "well-formed molecule" (Farrelly brothers, 2001), "highly evolved, overgrown super-molecules" (Peter Pogany, 2006), "The Human Element" (John Claxton/Dow Chemical, 2006), social atom (Mark Buchanan, 2007), "bag of chemicals" (Michael Brooks, 2009), chemical molecules (Surya Pati, 2009), entromorphic atom or Mr. Carbon Atom (Mark Janes, 2009), corporate molecule (Vineet Nayar, 2010), etc., among others; each of which are derivative terms discussing different aspects of the same overall subject.

The chemically correct modern name, however, for each of these various terms is "human molecule" as defined by American ecological stoichiometrists Robert Sterner and James Elser who in 2000 made the first calculated molecular formula for one human and specifically named it a "human molecule". The other various derivative terms above, to note, each has an extended description associated with that unique meaning. What Huxley's 1871 term "social molecule", for example, means is that he is thinking of each person as an individual "atom" and the the society of such associated atoms to be a large "molecule". The same is the case with Levy's 1994 "molar group" or Nayar's 2010 description of the "corporate molecule", where he specifically defines a company as being composed of "human particles". Other terms become more technically-involved: Fink's 2001 term precipitate is referring to the idea that a child represents a division of one original molecule into two new molecules or a solid formed out of surrounding reactive liquid chemical body, the parents in this case. Hirata's term "lesbian molecule" refers to a bonded relationship between two female human molecules *X* and *X* to form a new molecule X_2. One distinction, to note, often used in physics modeling studies, is that wherein a person is modeled as an abstract material point; terms such as human atom, point atom, human particle, etc., which generally mean that he author is employing gas-phase models and correlative gas-phase equations.

History

When human life is viewed in historical timescales, viewed forward and backward, the "human molecule" view often tends to arise, often out through the use of statistics, such as conceived by individuals such as Ludwig Boltzmann and James Maxwell, or by the second law of thermodynamics, the arrow of time, as conceived by Henry Adams.

History | Buckle's 1857 *History of Civilization*

One of the most influential publications, according to 2004 views English social physicist Philip Ball, resulting to bring about the view that "people are like molecules" that "obey laws nearly as

Henry Buckle's 1857 *History of Civilization* convinced the likes of James Maxwell, Ludwig Boltzmann, and Leo Tolstoy to begin thinking of people as molecules; Tolstoy, in particular, incorporating the repercussions of this logic into his 1969 tome *War and Peace*. [6]

certain as those which regulate matter" was English Historian Henry Buckle's 1857 multi-volume tome *History of Civilization in England*, which is said to have influenced the minds of great thinkers such as Scottish physicist James Maxwell, Austrian physicist Ludwig Boltzmann, and Leo Tolstoy to adopt the view that people are like particles or molecules.[38] Buckle is described as "the most avid proponents of a law-bound social physics".[6] In 1872, after reading Buckle, Boltzmann commented:

“Molecules are like to many individuals, having the most various states of motion, and the properties of gases only remain unaltered because the number of these molecules which on average have a given state of motion is constant.”

Likewise, in 1873, after reading Buckle, Maxwell commented: “These uniformities which we observed in our experiments with quantities of matter containing millions of molecules are uniformities of the same kind as those wondered at by Buckle arising from the slumping together of multitudes of causes each of which is by no means uniform with the others.” Ball goes on to argue, in a round about way, that the entire subject of the statistical mechanics of molecules, i.e. the employment of Maxwell-Boltzmann distributions to explain gas behavior, was based or rather inspired by Buckle's statistics used to explain of human behavior. Tolstoy, to a more significant effect, would “stuggle”, as Ball says, in his 1,400-page 1869 *War and Peace*, with the questions posed by Buckle’s deterministic view of history, debating topics such as free will in the view of the relation or attraction and repulsion movements of material “particles”, considered as analogs to humans, to such grand questions as “what is the force that moves nations”, along with topics such as the physics behind the “laws of human life”, among others.

History | Taine's 1869 history of human molecules
In 1869, French philosopher Hippolyte Taine reasoned that the science of history should be the historical study of people as though each was a “human molecule” and, on this basis, to view history as the study the psychology of individual human molecules and groups of human molecules, as mentioned.[39] Scottish social-philosopher Robert Flint discussed Hippolyte Taine’s view on the historical study of human molecules in his 1893 *History of the Philosophy of History* so as did historian George Gooch in his 1913 *History and Historians in the Nineteenth Century*. [40][41] Likewise, American historian Henry Adams learned of Taine's human molecule view of history in 1872, began writing out his thoughts on the "social chemistry" of human molecules by 1885, and by 1910 sent out a 126-page booklet entitled *A Letter to American Teachers of History*, in which suggested a new curriculum to American historians in that the time has come for students of history to begin to be taught the basics of physics and chemistry, particularly the effect of the second law of thermodynamics in shaping the course of history, as these hard sciences apply to the historical movement of humanity, using the view that people are "human molecules".[42]

History | Baudrillard's 1981 pataphysics of human molecules
A noted quote on the human molecule view used in the historical theory context if found in the pataphysics of French philosopher Jean Baudrillard, who in his 1990 book *Cool Memories* and 1994 book *The Illusion of the End* gives the following puzzle:[43][44] “Whether the universe is expanding to infinity or retracting towards an infinitely dense, infinitely small nucleus depends on its critical mass. By analogy, whether or human history is evolutive or involutive perhaps depends on humanity’s critical mass. Has the history, the movement, of the species reached escape velocity required to triumph over the inertia of the mass? Are we set, like the galaxies, on a definitive course distancing us from one another at prodigious speed, or is this dispersal to infinity destined to come to an end and the *human molecules* to come back together by an opposite process of gravitation? Can the human mass, which increases every day, exert control over a pulsation of this kind?” Prior to, in his famous 1981 *Simulacra and Simulation*, one of the three required reading books for the actors of the *The Matrix* trilogy, Baudrillard considered people to be “hydrocarbons”, that combine to form a “cultural molecule”, which can be recombined and synthesized into products or “broken cultural molecules”. [45] Keith Jenkins (1997), Rex Butler (1999), and Steve Redhead (2008) also discuss Baudrillard’s ideas on the involution and or evolution of human molecules.[46][47][48]

Sociology

In 1858, American sociologist Henry Carey, in his three-volume opus *The Principles of Social*

Science, outlined a physics-chemistry based version of sociology wherein he specifically states that the subject of social science is the individual person who he defines as the "molecule of society".[49] On this premise, similar to Goethe's *Elective Affinities*, Carey outlines a large repertoire of physics/chemistry-based sociology concepts, such as 'social gravitation', 'social heat', 'human chemical affinities', among others. Carey's view on how chemical affinity applies to reactions between human molecules is exemplified by the following quote: "In the inorganic world we find the power of combination growing with the increase of differences. Place a thousand atoms of oxygen in a receiver, and they will remain motionless; but introduce a single atom of carbon, and excite their affinities for each other, and at once motion will be produced. Such being the case in regard to all other matter, it must be so in regard to those combinations in which man is concerned, indicated by the term society."

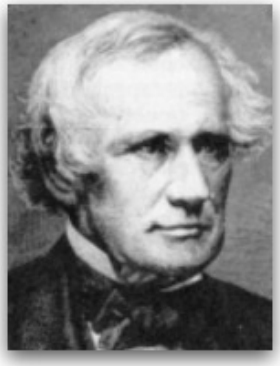

American sociologist Henry Carey's 1858 three-volume opus *The Principles of Social Science* opens with the definition that man is a molecule, specifically the "**molecule of society**" and uses sciences such as physics and thermochemistry to develop theories such as social heat, social gravitation, human affinity reaction theory, among others.

Sociology | Winiarski's 1894 social mechanics
One of the most technically thick utilizations of the human molecule or material human particle point of view was achieved by Polish economist and sociologist Leon Winiarski, a student of the Leon Walras-founded Lausanne school of "economic molecule" logic. Winiarski believed that "a social aggregate is nothing but a system of points, i.e. individuals, who are in perpetual movement of approaching or withdrawing from one another" and would spending a decade, in the 1890s, teaching a course on social mechanics, using the human material point perspective, at the University of Geneva, based on the thermodynamics of Rudolf Clausius and the mechanics of Joseph Lagrange. This logic was published in his collected 1898 work *Essay on Social Mechanics*. The following excerpt from Winiarski's 1900 report on "The Teaching of Pure Political Economy and Social Mechanics" give a taste of the density of the subject: [50]

"Having furnished the equations of social equilibrium, we have laid the foundations for social mechanics—on its static side—on the principle of Lagrange, that of least effort or greatest energy, i.e. on the principle that serves as the basis of cosmic mechanics. Passing to the dynamic side of the problem, we have given a definition of socio-biologic energy in the two following forms: Potential (hunger and love) and kinetic (economic, political, juridical, moral, esthetic, religious, and scientific). This led us to the application of the principles of thermodynamics, the third of which, that of Clausius, explains at the same time the gradual spiritualization of every closed social aggregate and the lowering of its potential. It is the dissipation of the entropy which takes place in the social world as in the physical world."

Sociology | Pareto's 1896 sociology of human molecules
In the late 1890s, French-Italian mathematical engineer Vilfredo Pareto, another student of the Lausanne school, would spend nearly two-decades building on the human molecule viewpoint to construct a hard-science base version of sociology, as captured in his 1916 *Treatise on General Sociology*. Early on in his thinking, Pareto stated his objective as such:[51] "My wish is to construct a system of sociology on the model of celestial mechanics, physics, and chemistry." Pareto would go on to define a society as follows: [52] "Society is a system of *human molecules* in a complex mutual relationship." This chemistry basic definition of society would go on to be cited by many others such as economist Pitirim Sorokin and sociologist Margaret Vine.[53][54]

Sociology | Modern views
In his 1929 book *An Introduction to Social Research*, American sociologist Howard Odum devoted a section to the history of the human particle and human molecule concept in sociology, discussing Carey's human molecule views by also thinkers such as Polish economist Leon Winiarski who viewed people in a society, thermodynamically, as material points continuously attracting and receding from one another. In this section, Odum comments that: [55] "*Human molecules* gravitate toward one another through association, which generates heat, which produces motion, which in turn constitutes progress. This gravitation is measurable through physical laws." Odum, to note, was no novice to the use of physics concept in sociology, having previously founded the journal *Social Forces* in 1922. Carey's theories on the human molecule influenced Austrian social economist Werner Stark who in the 1960s would interpret Carey's man the molecule of society theory to mean that people are 'human molecules', which defined as power-points which push and pull until a certain equilibrium is reached. The following excerpt by Stark exemplifies his viewpoint on this subject: [56] "In the physical universe, heat is engendered by friction. Consequently the case must be the same in the social world. The 'particles' must rub together here, as they do there. The rubbing of the *human molecules*, which produces warmth, light and forward movement, is the interchange of goods, services, and ideas." In the 1970 book *The Social Bond*, American sociologist Robert Nisbet, influenced in his thinking by the 1885 human molecule views of Henry Adams, outlined a view in which he considered people to be 'elementary human particles', refers to the adhesion between two human particles as a 'social bond', and the attachment of two or more human particles to be a 'social molecule', wherein he spends a good deal of time discussing his version of "social entropy". [57]

Thermodynamics

At the turn of the century, American historian Henry Adams, after previously, in 1885, having defined "social chemistry" as the study of the attraction of equivalent "human molecules", began to expand on this viewpoint in his publications "The Tendency of History" (1894), "The Phase Rule Applied to History" (1909), and "A Letter to American Teachers of History" (1910), using concepts from physics, thermodynamics, and what he called "static chemistry" with aims develop a hard science version of history. These were later published in the 1920 collected works set *The Degradation of the Democratic Dogma*. Adams redefines attraction between human molecules in terms of a pressure measurement in systems. To cite one example, in attempting to integrate the second law of thermodynamics into a cyclical scheme of cycles of periods in human history, Adams suggests that the contraction of large volumes of human molecules, such as in the formation of grand states and countries, may act to release energy on a variation of the stellar hypothesis model so as to balance the dissipation of energy he thought to be occurring in human processes owing to entropy: [58] “The physicist may begin to treat primitive humanity as a volume of *human molecules* of unequal intensities, tending to dissipate energy, and to correct the loss by concentrating mankind into a single, dense mass like the sun. History would then be a record of successive phases of contraction, divided by periods of explosion, tending towards an ultimate equilibrium in the form of a volume of human molecules of unequal intensity, without coordination.”

Thermodynamics | Darwin's 1952 statistical mechanics of human molecules

In 1952, English physicist C.G. Darwin, grandson of Charles Darwin, specifically defined the science of "human thermodynamics" as the statistical mechanics of systems of "human molecules". [59] C.G. Darwin, who had previously did work on the development of the statistical theory of thermodynamics with English physicist Ralph Fowler, coiner of the third law of thermodynamics, outlined his "human molecule" point of view in his book *The Next Million Years*, wherein just as physicists and chemists can "predict" physical and chemical processes, using thermodynamics, so to should social scientists be able to use thermodynamics to predict the next million years of evolution of humanity.

In 1952, English physicist C.G. Darwin, in his book *The Next Million Years*, wrote an entire chapter on "human thermodynamics" a subject he defined as the statistical mechanics of systems of "**human molecules**", and explained how this branch of science could be used to predict the next million years of human evolution future. [59]

Thermodynamics | Molecular sociology

In 1971-72, *New Scientist* magazine published a two-part article on “Molecular Sociology” in discussing the question “do people behave like molecules?” In the first installment of the article, in answer to this question, they state that “the success of two recent attempts to analyze human behavior using the established laws of molecular motion and of thermodynamics might suggestion so.” [30] In particular, they discuss the highly-cited 1971 article “The Statistics of Crowd Fluids”, by Austrian mechanical engineer Le Roy Henderson, at the University of Sydney, who measured the movements of college students on a campus and children on a playground, finding that in both cases their movements fit the Maxwell-Boltzmann distribution, meaning that both velocities of gas particles and the speeds of students follow a Gaussian distribution. [29] Henderson found that crowds generally conform to the gas particle model, but found differences, such as that “men and women cannot be considered as ‘identical particles’. The article also cites the article “Demography and Thermodynamics” by American physicist Elihu Fein, a professor at the University of Chicago, who finds, though examination of factors such as per capita income, that social activity is analogous to molecular activity, and applies concepts such as entropy and adiabatic to social systems. [60] Fein, however, cautions his readers, in that although his analogies seem to have validity, he emphatically states that “the conclusion is not that people act like molecules”, but that the goal is to understand ourselves and the world through abstract concepts. Curiously, both the 1971 and 1972 *New Scientist* articles on molecular sociology also cites a person by the name of Daedalus who is said to have “developed a ‘molecular sociology’ an analogy between people and molecules [who] identified wealth in people with energy in molecules; [and] is now developing a financial thermodynamics or thermodynamics of money.” [61]

Thermodynamics | Modern views

In 1975, Austrian astrophysicist Erich Jantsch, who has been described as “Prigogine’s most famous disciple and interpreter”, devoted a section to the discussion of the second law of thermodynamics, entropy, and evolution in the context of what he called the thermal or Brownian motion of human ‘molecules’. [62] In 1998, Venezuelan-born English chemical engineer Erich Muller, who completed his PhD in surface thermodynamics, published his article "Human Societies: A Curious Application of Thermodynamics", in *Chemical Engineering Education*, wherein he employed what he called a "loose analogy" of people viewed as human molecules to explain integration and segregation in cities, in which he models people as “insignificant molecules” that interact with neighboring molecules by means of forces, in the physics sense, or thermodynamic potentials, in a thermodynamic sense. [63] Muller, a professor of thermodynamics, frequently uses people-viewed-as-molecules logic in his lectures, to such an educational effect that he was interviewed in 2006 by *Reporter* magazine, on how he “compares people to molecules” to explain topics such as how ghettos form or how certain people can act as “surfactant molecules”, among other topics. [64] In the 2007 book *Money: Virtual Energy: Economy through the Prism of Thermodynamics*, Russian bioelectrochemist Octavian Ksenzhek outlines

the thermoeconomics of society on the view that "economy is a very large and extremely complicated system in which people are the 'molecules' of which it consists". [65]

Economics

The first to suggest employ thermodynamics in economics was German physicist Georg Helm in his 1887 book *The Doctrine of Energy*. Thermodynamics is the study of systems of molecules. Naturally enough, in the course of using thermodynamic theory to explain economic phenomenon and processes, scientists began to view people as "molecules". This school of thought occurred predominately in "Lausanne school" of physical economics.

Economics | Lausanne school

In the late 1870s, French sociologist and economist Leon Walras began to conceive of people as "economic molecules", to which the hard science logic of chemistry, physics, and thermodynamics, were argued to be applicable. According to English economist Hazel Henderson: [35] “Walras was an agrarian socialist and wanted to nationalize land, but he talked of humans as ‘*economic molecules*’ and gave concepts like scarcity scientific definitions analogous to heat in physics.” The views of Walras would eventually launched what's called the Lausanne school of economic thought, inclusive of thinkers such as Polish economist and sociologist Leon Winiarski (1894) or Italian engineer Vilfredo Pareto (1896), who each would go on to employ their own versions of human particle or human molecule logic. Winiarski stated, for instance, that “a social aggregate is nothing but a system of points, i.e. individuals, who are in perpetual movement of approaching or withdrawing from one another”. Pareto's view was that “society is a system of *human molecules* in a complex mutual relationship.”

Economics | Nelson's 1989 economic agents as human molecules

One of the most recent influential economic-version "human molecule" theorists is American philosopher Alan Nelson who in the late 1980s, while a philosophy professor at the University of California, Irvine, began developing a theory in which economic agents are viewed, in a physical chemistry and thermodynamic sense, as “human molecules”. In 1889 and 1890, Nelson began sending out various versions of his expanding theory in a paper entitled "Human Molecules", manuscripts which have since been cited and discussed in talks by the likes of those as economists Keven Hoover (Duke University) and Wade Hands (University of Puget Sound), among others.[66][67][68] Hoover comments 1990 version of Nelson's 1990 "Human Molecule" manuscript: [69] "Macroeconomics deals in aggregates. These aggregates are composed of the behaviors of individuals. Consumption as reported in the national income accounts is just the summation of the purchases of a nation's citizens. It is tempting then to see economic agents as **human molecules** (cf. Nelson [1990]) and the relations postulated in macroeconomic theory or measured in macroeconometrics as the analogues of the ideal gas laws or other macrophysical relations. But there is a crucial and obvious difference: molecules do not make choices, people do; and they do so with reference not just to the immediate past and their immediate surroundings, but also with reference to future goals and to global or macro relations." In 1992, following further theory development and feedback, Nelson's manuscript was expanded into into the first chapter of part two ("Molecules and Games") of the multi-author book *Post-Popperian Methodology of Economics*; the part two section of the book consisting of the following three chapters:[70][71][72]

- "Human Molecules", by American philosopher Alan Nelson
- “Commentary on Alan Nelson’s ‘Human Molecules’”, by American economist Bruce Caldwell
- “Reply to Bruce Caldwell's Commentary on ‘Human Molecules’”, by Alan Nelson

Nelson's 1992 chapter on human molecules, wherein he conceives economic agents as “human molecules”, has since gained a level of following, having been cited more than a half-dozen times as a forerunner to the economic-version of the human molecule construct.[73][74][75] The 2009 *Oxford Handbook of Philosophy of Economics* specifically cites Nelson has having originated this term in economics, each *human molecule* defined specifically as an 'ontologically distinct individual'; the term "human molecules" is also referred to, by the *Oxford Handbook*, as Danish-born American economist “Tjalling Koopmans' evocative coinage”, the noted joint winner of the 1975 Nobel Memorial Prize in Economic Sciences. [76] The actual publication where Koopmans' uses the term "human molecule", in coinage, however, is difficult to track down. In regards to Nelson's version, Australian philosopher Brian Ellis explains, in his 2001 *Scientific Essentialism*, that the comparison between molecules and humans is “explicitly drawn and discussed at length”, particularly in regards to modeling neoclassical economics in the view of classical thermodynamics. [77]

Philosophy

In 1891 book *Riddles of the Sphinx*, German-British philosopher Ferdinand Schiller outlined philosophical views on sex and love in relation to social life, wherein he considers people as atoms and bound sets of humans in relationships as molecules; specifically describing the couple in love as a 'human molecule'; he discusses the forces of attractions and repulsions at work in the most intimate unions, such as jealously. German psychologist and philosopher Eric Fromm outlined a philosophy of defined people as “human atoms”, and argued that the desire for interpersonal fusion between two human atoms is the most powerful striving in human life, in his best-selling 1956 *The Art of Loving*. In the 1994 book *Collective Intelligence*, Canadian cyberspace philosopher

Pierre Levy outlined a Internet-themed metaphorical chemical philosophy to discuss bulk human behavior as “molar behavior” as governed by the bulk properties of “human thermodynamics”, as he discusses. An example quote is: “based on identities of adhesion, individuals are seen as a mass, as numbers, independent of their molecular wealth; the molar group organizes a kind of human thermodynamics, an exteriorized channeling of behavior and character that squanders individual qualities”; he also discusses concepts such as 'molecular politics', the “molecular group”, among others. A prominent modern human molecule view, used in philosophy, stems from the field of mereology the study of parts and the wholes they form, wherein people are viewed as “mereological atoms’’, as discussed by American-born English philosopher Eric Olson in his 1998 article “Human Atoms”. [78] In what's called "naive mereology", a type of naive set theory logic, the premise that all moving biological structures are atoms, is expressed by the following atomicity principle, which states that every x has a part y that is atomic in the sense that y has no proper parts:

$$\exists y[Pyx \wedge \forall z[\neg PPzy]]$$

In other words, this is a mathematical set theory way of saying that "all objects are either atoms or fusions of atoms". Olson specifically sites philosopher E.J. Lowe’s 1996 book *Subjects of Experience*, as being the prime example of this view, wherein Lowe is said to argue, according to Olson, that “you and I are mereological atoms shaped like human beings." Lowe, however, in detailed discussion, expresses a bipartisan view on the matter by stating that “one reason why I reject reductionism about laws is that I reject the view that a biological entity such as a tree can simply be regarded as being nothing over and above an assemblage of sub-atomic particles, even though we now believe that the ultimate constituents of trees (and of everything else material) are indeed such particles. Lowe goes on to argue that the existence of a tree in some sense ‘supervenes’ upon its constituent particles at any given time. [79]

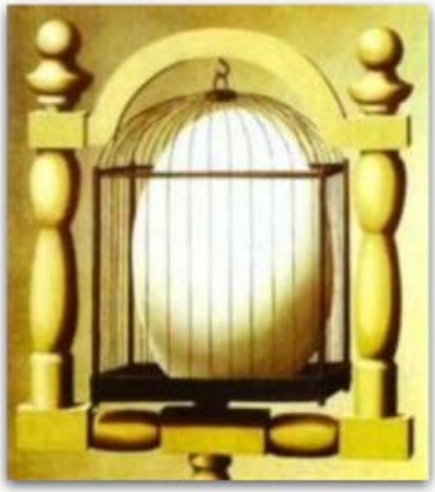

Belgian surrealist artist by René Magritte 1993 oil-on-canvas depiction of the free will aspects of Goethe's 1809 novella *Elective Affinities*, depicting the view that people are born into cages of chemical affinities.

Free will

The subject of "free will", whether or not a person chooses their own actions or whether their actions are chosen for them, is the first hurdle that frequently arises when one begins to adopt the "human molecule" point of view of humans. It is obvious, to most, that molecules, such as CO_2 do not have a free will. It is also obvious, to many people, but not all, that humans have a free will. Therefore, the definition of a human as a molecule creates a paradox of sorts. Many great minds have grappled with this puzzle, often to the effect of shrugging the problem of with mentions of justifier terms such as chaos, unpredictability, or consciousness, among other inserts. Goethe, as discussed above, was the first to grapple with this issue, and used the stage of the three characters Eduard, Charlotte, and the Captain to debate the issue of choice and free will, in the context of themselves being large chemical reactants, among themselves: [12]

“I would never see a choice here but rather a natural necessity and indeed hardly that; for in the last resort it is perhaps only a matter of opportunity. Opportunity makes relationships just as much as it makes thieves; and where your natural substances are concerned, the choice seems to me to lie entirely in the hands of the chemist who brings these substances together.”

Similar to Goethe, Russian writer Leo Tolstoy grappled with free will 1869 *War and Peace* commented that: [80] “A particle of matter cannot tell us that it is unconscious of the laws of attraction and repulsion and that the law is not true; but man, who is the subject of history, says bluntly: I am free, and am therefore not subject to laws.” Thus, according to Tolstoy, man does not have a free will, because he is a particle of matter, but remains unaware of this fact. In 1952, conversely, English physicist C.G. Darwin defined humans as molecules, governed by the laws of thermodynamics, which are a type of molecule that do have free will. He states: [59] “The laws governing the nature of *human molecules*, lie much deeper [as compared to gas molecules], because unlike a molecule, a man has a free will, which make his actions unpredictable.”

Likewise, in the 2004 book Critical Mass, an entire book devoted to the development of a science of "social physics", in which people are viewed as atoms or molecules and basic physics is applied to explain human behavior, English chemist and physicist Philip Ball defensively makes mention of free will following nearly ever mention of his argument that people should be viewed as "insensate matter" versions of atoms or molecules; below is one example: [6]

> “To develop a physics of society, we must take a bold step that some might regret as a leap of faith and others as preposterous idealization. You may have guessed it already: particles become people. To make that bold step a little easier, I shall introduce a stepping-stone that will bring life into the picture before we have to worry about such things as **free will**.”

Ball asks: “how could free will operate without contravening thermodynamics?” In other words, in the steam engine, the operation of which the laws of thermodynamics were derived, the water molecules inside the piston and cylinder do not choose to expand and contract in their volume as they do work, in each heat cycle but rather they are “forced” to do work, owing to alternating contact with a hot and cold body. The average person, however, as the sun heats and cools the earth, believes that he or she is choosing to do their various amounts of work, in each daily solar heat cycle. Ball comments on this, in: “Defenders of free will argue, with justification, that because statistical laws are not true laws in the sense of describing cause and effect, as Newton’s law of gravitation does, they cannot be applied to individuals and so say nothing about how any one person might act.” This argument seems to be based on either the Poincare recurrence theorem, Loschmidt's paradox, or Maxwell’s demon statistical objections to the second law; the latter topic of which Ball even conjectures on how the free will of the Demon might operate. Most Balls’ discussion of free will teeters on ambivalence leaning towards yes humans as molecules do have free will. At one point, however, Ball specifically states his exact opinion. In comment on American economics Robert Heilbroner’s 1953 claim that “the elements of nature ‘behave’ as they do for reasons of which we know only one thing: the particles of physics do not ‘choose’ to behave as they do”, Ball states “Heilbroner is, of course, right to say that humans make choices, whereas particles do not”. In other words, Ball is saying that a human is a type of molecule that “makes choices”. This type of logic, however, becomes incoherent when asking the same question of other molecules. Does, for example, the methane gas molecule CH_4 “make choices”? Does a strand of DNA make choices? The level of uncertainty in this assertion by Ball is noted by his followup bracketed mention that “although quantum physicists sometimes speak as if they do.”

Differing from Ball's ambivalence on the matter, American physicist Mark Buchanan, in his 2007 book *The Social Atom*, declares in full glory that “we should think of people as if they were atoms or molecules”, but that this view “in no way conflicts with the existence of individual free will”. He reasons that “we can be free individuals whose actions, in combination, lead to predictable outcomes for the collective” in the same way that “atomic-level chaos gives way to clockwork precision of thermodynamics or planetary motion.”[81]

The hard-line thinker, however, will argue, similar to Tolstoy and Goethe, that the human molecule is no different than any other molecule, and that a human molecule moves, bends, and reacts, not by free will but by force, similar, albeit more advanced, to how the simple three-element retinal molecule moves when induced to move by the action of force or of chemical affinity the "force of reaction". This type of view is exemplified in the 2007 work of Russian bioelectrochemist Octavian Ksenzhek, as mentioned, who defines people as molecules, governed by the laws of thermodynamics, and on the topic of free will he states: [65] “Can one state on this basis [of water molecules forming frost on glass] that the pattern we admire is a realization of the molecules’ will or design? Certainly not. Molecules have neither free will nor any will at all. All a molecule can do is repel elastically from other chaotically moving molecules and sometimes, very seldom, lose some if its degrees of freedom and ‘freeze’ into a large collective.” One of the more elaborate publications on an attempt to argue for free will in the context of humans viewed in a physical chemistry sense is the 1985 book *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will*, by American physical chemist George Scott, wherein people as viewed as dissipative structures and that the human central nervous systems is in a in a "far-from-equilibrium" state, governed by Prigoginean-type non-equilibrium thermodynamics of the sort that "could chaotically amplify indeterminate events at the micro level" thus giving rise to free will. [82]

Religion

The collision of olden religious (3500BC) theory with modern, post-Copernican (1453) science theory has always been a tenuous subject. In the case of the human molecule viewpoint, the relationship has generally been objectionable for many religious-adherents, compatible for some middle ground thinkers, and incompatible for many hard-line science thinkers. In the modern 21st century, for instance, many, even hardened scientists, will argue that they are not a molecule, by virtue of the fact that they have a soul that is under the control of God and beyond the realm of scientific analysis.

German writer Christoph Wieland objected to Goethe's 1809 theory of human chemistry calling it "nonsense and childish fooling

One of the first to object to atomic reductionism, was German poet and writer Christoph Wieland who in 1810, as mentioned, objected on the anti-Christianity of the Goethe’s chemical novella, commenting in a letter to German archeologist Karl Böttiger that Goethe’s modeling of humans as chemicals is "nonsense and childish fooling around". [14] Wieland considered Goethe's novella an anathema, calling it a "truly horrible work", objecting solely due to the radicalness of its Christianity.

[83] In 1869, French engineer Francois Massieu, one of the founders of chemical thermodynamics, compared a person to a molecule of water and speculated on how one would differentiate between the soul and the body of the the molecule: [84]

around" and "truly horrible work" on the grounds the grounds of the radicalness of its Christianity. [83]

> "They cut the man into two parts, soul and body, the philosopher took one, and another the naturalist, they both have worked, studied on their behalf have lost sight and we find ourselves today in the presence of a duality, convenient perhaps, but unwise, in that it overlooked the man to deal with only two elements that constitute it. But in doing so we run the risk of being wrong. If one wanted to know the chemical properties of water H_20, seek it in those of oxygenH_2 and hydrogenO_2? No, because he knows that there is little relationship between the characteristics of a substance and those of simple bodies which enter into its composition."

Religion | Teilhard's 1936 spiritual molecules

In the decades to follow English naturalist Charles Darwin's 1859 *On the Origin of Species*, the question of the atomic origins of humans in relation to established concepts such as death, soul, God, the future, etc., began to come to the fore. For those with a purely religious-mindset, humans were formed by God and possess a soul or spirit that lives on after death. For those with a purely hard-science mindset, human were formed out of a chemical-physics process resulting from the expansion of the universe, following the Big Bang. Some, however, found a middle ground between these two extremes. One such thinker was French Jesuit priest, anthropologist, and philosopher Pierre Teilhard, who accepted the doctrines of evolution, chemistry, and physics, but also accepted a modified form of Christianity, and over the course of about thirty or so years (1916-1955), attempted to outline a reconciliation theory in between these two views. As summarized by Sara Weber, translator to the 1999 Sussex Academic Press English edition of Teilhard's famous 1938 *The Phenomenon of Man*: [85]

> "Teilhard extends the term 'molecule' ahead in time, from its use in the physical analysis of matter before life, to reflect a reality of physics within the human phenomenon; so that 'molecule' becomes 'mega-molecule' and then '*human molecule*'."

Teilhard argues, in contrast to the dominant view, that even exists today, that there is a huge void that separates life from non-life, often appeased in modern times by mentions of terms such as "emergence", that in contrast there is no separation between atoms and humans, but rather than chemical mechanism links the evolution process, in stepping trough various "intermediate states" of formations of bigger and bigger "molecular aggregates" along a connective chemical mechanism of evolution. Teilhard retains religion in his argument by conceiving of the view that there is neither matter nor spirit in the universe, but one substance, which he calls "spirit-matter", that is responsible for the formation of the human molecule. This spirit-matter, according to Teilhard, is driving evolution towards an omega point, a sort of modified version of the evolution version of the promised land, so-to-speak. Teilhard's theories, in his day, were all rejected by the Church, and his work was all published post humorously and he has since gained a large, almost cult-like following. A few popular quotes by Teilhard, from his book *The Future of Man*, written over a period of thirty years, on the subject of human molecules include: [86]

- "If the power of attraction between simple atoms is so great, what may we not expect if similar bonds are contracted between *human molecules*?"
- "We must assume that under the rapidly mounting pressure forcing them upon one another the *human molecules* will ultimately succeed in finding their way through the critical barrier of mutual repulsion to enter the inner zone of attractive."
- "The very excess of external compression to which we are subjected by the relative contraction of our planet may one day cause us to breach that mysterious wall of growing repulsion which, more often than not, sets the *human molecules* in opposition to one another, and enter the powerful, still unknown field of our basic affinities."
- "The *human molecules* are tightly packed together, and the more this is the case the more impossible it becomes for them, owing to their nature and structure, not to merge both physically and in spirit."
- "Those who think on Marxist lines believe that all that is necessary to inspire and polarize the *human molecules* is that they should look forward to an eventual state of collective reflection and sympathy, at the culmination of anthropogenesis, from which all will benefit through participation."

Teilhard's collected works, on this subject, which amount to several dozens of books, are among the densest of theories on the human molecule. In the 1969 book *The Presence and Absence of God*, to cite one example of many of the influence of Teilhard's views, Christopher Mooney summarizes Teilhard's human molecule omega point theory as such: [87]

> “To polarize the *human molecules* that they should look forward to an eventual state of collective reflection and sympathy at the culmination of anthropogenesis, from which all will benefit through participation; a vault of intermingled thoughts, as it were, a closed circuit of attachments in which the individual will achieve intellectual and affective wholeness.”

Religion | Fuller's 2005 "I Am Not A Molecule"
A recent religious-based objection of the human molecule view, comes from sociologist and intelligent design advocate Steve Fuller, who in 2005 wrote an entire article for *New Scientist* magazine entitled “I An Not a Molecule”, arguing against atomic reductionism in sociology, wherein he argues that the recent social physics attempts, in particular English chemical physicist Philip Ball’s 2004 *Critical Mass*, wherein masses of people are treated as bulk systems of atoms or molecules, is "infuriating the social scientists". [88]

Religion | Rossini debate
Another rather heated debated erupted when in 2006 American physical chemist John Wojcik, of the Catholic-based Villanova University, sent in an article to the *Journal of Chemical Education*, in objection to American chemical thermodynamicist Frederick Rossini’s 1971 lecture “Chemical Thermodynamics in the Real World”, wherein it was argued by Rossini that chemical thermodynamics can be used to understand the paradox between freedom and security in social life, Wojcik argued, in contrast, that there is great “danger” in the use of “anthropomorphism in chemistry” in that some may “come to believe that there is substance in them”; moreover: “worst of all, there is the danger that chemical thermodynamics will have ascribed to it a power that it simply does not have, namely, the power to 'explain' the human condition.”[89] This triggered a flurry of response letters, arguing for or against this view, from chemists such as Harold Leonard and Todd Silverman, and as well as economists, such as Jing Chen.

Psychology

In 1869, French philosopher Hippolyte Taine stated that the "psychology of the **human molecule**" and the "psychology of groups of human molecules" is a field of study germane to both the historian and the psychologist.

In 1869, French philosopher Hippolyte Taine, in his book *On Intelligence*, posited that in the future someone, possibly a psychologist or a historian, will be able to "write the psychology of the human molecule, or a particular group of human molecules, in their various transformations." [39] Taine’s views on the subject of the “psychology of the human molecule” would go on to be re-quoted by the likes of Scottish philosopher Robert Fling among numerous others.[40][90][41] The usage of the term “human molecule” by Taine was even featured in the 1902 book *Word Coinage* by Leon Mead. [91] Those who were significantly affected by Taine's views on psychology of the human molecule, i.e. affected enough to extend on Taine's view, include American historian Henry Adams, who learned of Taine's human molecule theories in 1872, and would go on to spend forty-years thinking about how the concept of people viewed as human molecules could be studied using the principles of physics, chemistry, and thermodynamics; German physician and diplomat Ernst Gryzanowski (1824-1888), who in 1875 commented on how the human molecule concept applies to law (see law section below); to French education reformer Max Leclerc (1864-1932), who in 1894 commented that “even numbered piles of *human molecules*, in a huge turning wheel, under the pedal of the stroke of the Minister, crushes and destroys humanity down to the pulp”.

In 1971, American writer Jean Brooks, gives a commentary, in the context of psychology, on the human molecule views of English novelist Thomas Hardy, in stating that people “are irresistibly moved to work towards one another by strong affinity; and the *human molecules* in which they are ingredients are dragged along with them, until the element affinity is satisfied.”[92][93]

Law

In 1874, stimulated by the social physics proposals of French sociologist Auguste Comte and human molecule logic of Hippolyte Taine and Henry Adams, German physician and diplomat Ernst Gryzanowski (1824-1888) reasoned that: [94]

> “Civil law, commerce, political economy, and international ethics are all based on the assumption that the social body consists of such *human molecules*, and there is no reason why the methods of physical science should not be applied to the statics and dynamics of that society, the passions and rights of the individual man corresponding exactly to the chemical and physical forces inherent in the material molecule.”

In 1913 commentary on English journalist George Perris’ 1911 book *A Short History of War and Peace*, American lawyer A. H.

Snow published a review of Perris's conception of human molecules in the context of law, war, and forces that impede the development of better laws, in *The American Journal of International Law*, wherein he expressed the view that: [95]

> "War is often a process of evolution — an explosive process which occurs when the progressive movement of *human molecules* towards a reorganization making for equality of opportunity and a betterment of the law, is unduly held back by the forces of standpatism and vested interests."

Physics

At the University of Paderborn, since the late 1990s, Germany physicist Jurgen Mimkes has been running and entire socio-economic department teaching the physics, chemistry, and thermodynamics of society wherein he uses the logic that "society is a many particle system" and that people can be modeled as individual molecules, and use models such as the Lagrangian to model the energy of the social system, phase transitions to model evolution, etc., so as to explain topics such as integration, segregation, democracy, etc. [96] Mimkes, in the historical section to his 2000 *Journal of Thermal Analysis* article "Society as a Many Particle System", specifically cites Greek philosopher Empedocles' friends mixing like water and wine; enemies segregating like oil and water analogies, along with German polymath Johann Goethe's 1809 *Elective Affinities*, as discussed above, as being the fore-runners to the society as a many particle system view of socio-economic physics. [36]

Out of this school, Mimkes has produced graduate students, including Think Christian, thesis "Analysis of Integration of Problems of Society Using the Methods of Physics" (2002), Thorsten Frund, dissertation "Analysis of Income, Wealth, and Society with Physical Methods" (2002), among others. Mimkes is presently writing a book, *The Chemistry of the Social Bond*, explaining how physical chemistry based "social bonds" exist between the particles of society, i.e. people viewed as molecular analogues. Frund, in his own words, attempts to investigate social relationships using physical methods, particularly statistics and thermodynamics, dealing with the distributions of atoms, particles, or states, so as to make predictions on system behavior, and argues that "we can use thermodynamics to draw conclusions about sociological or economic systems", commenting that German sociodynamics physicist Wolfgang Weidlich is the originator of approach, having began using theoretical physics-socio-economic isomorphism in 1983.[97][98]

English chemist and physicist Philip Ball's 2004 Aventis Prize-winning book *Critical Mass*, as discussed, gives the most-robust overview of the physics of the human-particle/human-molecule view of social dynamics. [6]

Arts

In 1977, American sculpture artist Jonathan Borofsky conceived what he called his "molecule idea", the view that "even though we appear to be quite solid, we are in fact composed of a molecular structure which in itself is mostly composed of water and air." In the thirty-years to follow, Borofsky when on to sculpt various indoor and outdoor statues and paintings of human figures embracing each other in congratulations, filled with hundreds of holes, each hole representative of "the molecules of all human beings coming together to create our existence". There are four outdoor sculptures: Los Angeles, California, USA (height: 30-ft, built: 1978), Yorkshire, England (height: 30-ft, built: 1988), Berlin, Germany (height: 100-ft, built 1996), and Council Bluffs, Iowa, USA (height: 50-ft, built: 2008).

American sculpture artist Jonathan Borofsky's 1996 100-ft "Molecule Man" sculpture (one of four world-wide) on the Spree River, Berlin, in front of the Treptowers; each hole representing, in Borofsky's view: "the molecules of all human beings coming together to create our existence".

In 1988, Canadian aboriginal artist Norval Morrisseau painted an noted acrylic on canvas work entitled 'Human Molecule', alluding to the idea that a human being is a type of animal-molecule or an evolved type of bird-fish-human that has a chemical origin or composition. [100]

In 2005, Canadian communications designer Shawn LaPaix created a "human molecule" themed poster for the 2005 University of British Columbia Art Gallery exhibit "The Human Body in History", using the 1952 CPK coloring scheme: red = oxygen, blue = nitrogen, gray = hydrogen, black = carbon (not shown), modeled on English biologist Thomas Huxley's famous 1863 evolution of man from ape to human diagram, alluding to the idea that human is a body of evolving atoms, formed into the structure of a molecule, that has been chemically synthesized into its current form, over long spans of evolutionary time. [101]

The cover art for the 2010 EP *Human Thermodynamics*, by Romanian electronic music producer Bogdan Anghel, containing four thermodynamics/heat transfer themed the songs: pressure correlations, phase transitions, aerospace race, and transport phenomenon,

depicts people as gas-like human particles or human molecules, flying about and interacting sort of like the particles of an ideal gas in a state of Utopian natural harmony with the earth. [102] The cover themes its origin on English physicist C.G. Darwin's 1952 description of the science of human thermodynamics as the statistical mechanics of human molecules, governed by a law similar to Boyle's law. [59]

Depiction of the famous **Hu element**, of the Dow Chemical "The Human Element" advertising campaign, conceived by John Claxton of Draftfcb Chicago, depicting the human as the "missing element" from the periodic table.

Advertising

In 2006, Dow Chemical, the world's second largest chemical manufacturer, in coordination with advertising agency Draftfcb Chicago, particularly creative director John Claxton, launched their popular multi-year advertising campaign The Human Element, the "missing element" of the periodic table, depicting visceral images of people, many from third world countries, with the element symbol box, symbol Hu, and atomic number 7E+09, overlaid on the picture, in aims to convey the message that the human is a type of chemical element that is somehow missing from the standard chemical periodic table, but one that should be the focus of beneficial-to-humanity chemical applications. The campaign has run for several years and in 2008 won the Effie Award.

The "voice" of the campaign, was themed on three things: science essays, the writing of American biologist E. O. Wilson, and contemporary American poetry. The campaign was very moving for many: "we were completely surprised by the passionate response from people at all levels of society. From teachers to politicians to parents, people were so moved that they felt compelled to write to the company and express their feelings. The campaign struck a nerve in a way that we had never imagined", says Claxton. [103]

In 2009 Axe body spray launched there "Axe Periodic Table" advertisement. [104] The advertisement creation was done by the Lowe/SSP3-Bogota agency, under the direction of Jose Sokoloff, which shows the human element, a man named 'Homer', which may be a play on the 2006 Dow Chemical 'human element' ad campaign, above a periodic table of women, wherein each element box a woman's name is written accompanying a picture, below which the ad hook reads "love is a matter of chemistry." [105]

Literature | plays

Fiction authors frequently use chemical analogies modeling people as atoms, molecules, or chemicals, a prime example American playwrite Tom Stoppard's 1993 award-winning play *Arcadia*, a modern-day second law of thermodynamics based version of Goethe's *Elective Affinities*. The play takes place the same year, 1809, as the Goethe's novella, even having some of the same characters, such as the "Naval Captain", referring to human interactions as the "actions of bodies in heat", discussing how this relates to Thomas Newcomen's steam engine, among other topics, such as chaos. According to the 2001 review A Thermodynamic Analysis of Stoppard's Arcadia", by American literary critique Stella Copeland, each person in the play is a complex molecule, regulated by the laws of thermodynamics and evolution. [106]

1998 performance of American playwright Tom Stoppard's *Arcadia* (*Elective Affinities* remake), opening scene, act II, at Willamette University Theater, November.

An oft-quoted human molecule view in literature is found in American writer Forbes Allan's 1999 novel *Milton's Progress*, in which the characters discuss a version of "human thermodynamics", similar to C.G. Darwin (1952), that "people are like particles, they behave in groups as if they were molecules in a test-tube." The book also utilizes Belgian chemist Ilya Prigogine's 1971 theory of dissipative structures, wherein a character named John and a Dr. Snipe, along with references to a "Ilya Meiliakin" (Ilya Prigogine), argue that human life is "the most effective multiplier of entropic decay in the universe".

Culture

In the 2001 film Shallow Hal, by American screenwriters Peter Farrelly and Bobby Farrelly, Hal's coworker explains to Hal that beautiful women are simply well-formed large molecules: "when are you going to get it, they're just well formed molecules".

Poetry

An example of human molecules used in poetry is found in the featured poem "Unique" by the later English writer Margaret Pepino (1921-2009): [107]

> Disconcerting to discover
> That this is inner sense
> Of individuality
> Belongs to everyone
>
> Still, I assert
> With stubborn certainty,
> Though tethered down in groups
> Of **human molecules**,
> That I experience this, or that
> In an exclusive way.
>
> Grimly, selfish, I say
> I am Me, special and
> UNIQUE

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Videos

â— Human atomisms – Circa 1995 discussion by American physicist Arthur Iberall (1918-2002)
â— Social atoms – 2007 Microsoft lecture by American physicist Mark Buchanan.
â— Molecular relationships – 2007 two-part video by American writer J.J. Dewey on his 1999 book The Molecular Relationship.
â— Mr. Carbon Atom – a 2010 video lecture by English biologist Mark Janes.

External links

â— Human molecules - Social.Wikia.com
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θΔics

In hmolscience, **human molecules**, akin to the similar term "human chemicals", i.e. two or more "human chemicals" (people), is the plural of the term "human molecule" (one person); meaning more than one human molecule; a set or collection of multiple people—each person defined as a "molecule".

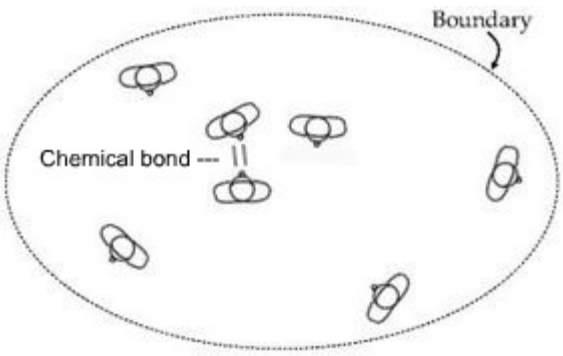

A boundaried system of seven **human molecules** (people), two of which are shown connected via a human chemical bond.

See also

â— Dihumanide molecule
â— Human Molecules (chapter)

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θΔics

In famous publications, **Human Molecules** is a twenty-one-page 1989 manuscript turned 1992 book chapter focused on the postulate that “economic agents” can be modeled “human molecules”, namely defining each person as an individual molecule, by American philosopher Alan Nelson. [1]

The chapter originated from a 1989 manuscript “Human Molecules”, by Nelson, that resulted to form a chapter in the 1992 book *Post-Popperian Methodology of Economics*, along with a followup rebuttal chapter, American economics professor Bruce Caldwell, and response chapter, by Nelson; and has been cited by the 2009 *Oxford Handbook of Philosophy of Economics*, among others, as the originator of the economic agent as human molecule model of people, in economics. [2]

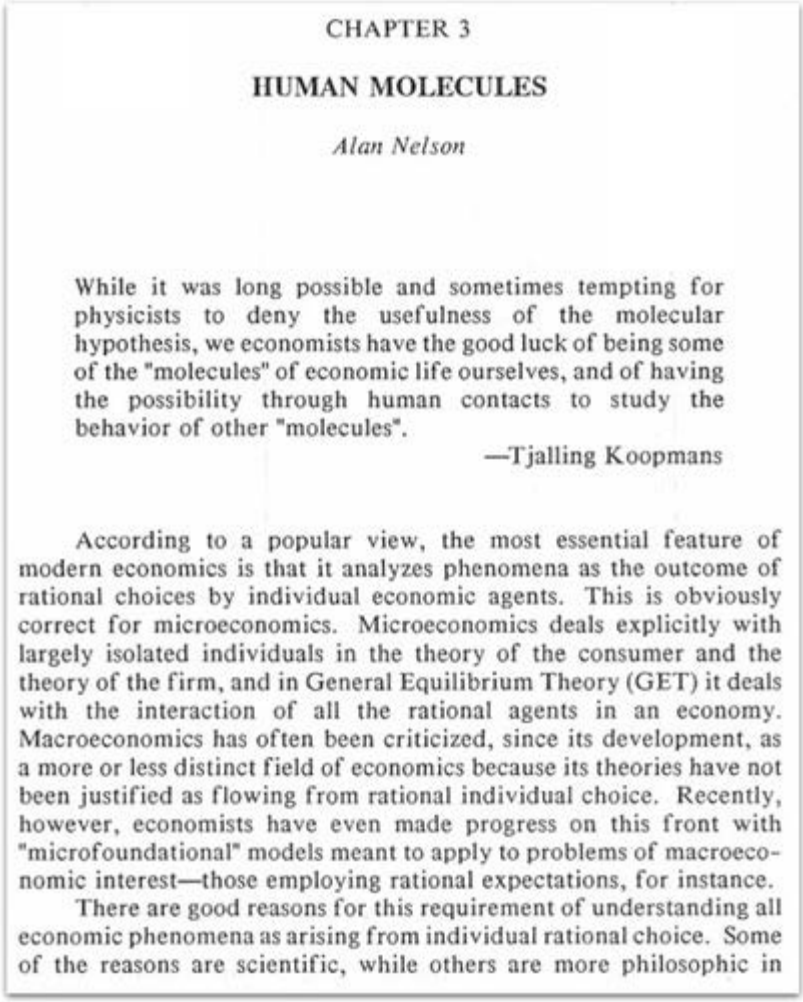

CHAPTER 3

HUMAN MOLECULES

Alan Nelson

While it was long possible and sometimes tempting for physicists to deny the usefulness of the molecular hypothesis, we economists have the good luck of being some of the "molecules" of economic life ourselves, and of having the possibility through human contacts to study the behavior of other "molecules".

—Tjalling Koopmans

According to a popular view, the most essential feature of modern economics is that it analyzes phenomena as the outcome of rational choices by individual economic agents. This is obviously correct for microeconomics. Microeconomics deals explicitly with largely isolated individuals in the theory of the consumer and the theory of the firm, and in General Equilibrium Theory (GET) it deals with the interaction of all the rational agents in an economy. Macroeconomics has often been criticized, since its development, as a more or less distinct field of economics because its theories have not been justified as flowing from rational individual choice. Recently, however, economists have even made progress on this front with "microfoundational" models meant to apply to problems of macroeconomic interest—those employing rational expectations, for instance.

There are good reasons for this requirement of understanding all economic phenomena as arising from individual rational choice. Some of the reasons are scientific, while others are more philosophic in

Opening page to American philosopher Alan Nelson's 1992 chapter "Human Molecules" outlining the view that the "economic agent" model should correctly be the "human molecule" model. [1]

Overview

The opening 1947 quote by Dutch-born American theoretical physicist and economist Tjalling Koopmans, noted for his efforts to apply mechanics, physics, and thermodynamics to the study of economics, is representative of the theme of Nelson's chapter and overall approach:

> “While it was long possible and sometimes tempting for physicists to deny the usefulness of the molecular hypothesis, we economists have the good luck of being some of the ‘molecules’ of economic life ourselves, and of having the possibility through human contacts to study the behavior of other ‘molecules’.”

In other words, Koopmans, a Nobel Prize winner in economics and noted quantum chemical physicist, suggests that the time has come for scientists to stop denying the "human molecular hypothesis", i.e. humans are molecules, and to begin working this hypothesis for its usefulness and fruit. Nelson recalls, loosely, that he got the title of his chapter from Koopmans.

Nelson, in his chapter, expands on this premise by positing that dated idea of "economic agents" should be replaced by the postulate that people are molecules and that we should turn to physics, thermodynamics, and statistical mechanics to explain the behavior of people, in an economic sense, on the premise that these sciences have successfully been employed to explain the behavior of molecules, such as in explaining the behavior of a confined system of gas molecules. Nelson uses equations such as the Boyle-Charles's law, the standard equation for kinetic energy, and how economic agents might conform to a one-dimensional Maxwell distribution equation, among others. The following is representative quote from the chapter:

> “A second kind of independent evidence concerning behavior of individual molecules is that the hypothesis that temperature is proportional to *E* permits the derivation of a wide variety of important theoretical results that are experimentally confirmed, as any textbook or statistical mechanics reveals. It is questionable whether economic assumptions about individuals produce the same variety of theoretical results and

> whether these results have been, or can be, experimentally tested. It is this third kind of indirect evidence that is most interesting in the present case."

Nelson calls his theory the "Standard Model of Reduction" (SMR), which he says loosely follows the 1961 work of Czech-born American philosopher of science Ernest Nagel. [3]

Commentary

Nelson's chapter on human molecules was followed up by fifteen-page chapter "Commentary", by American economics professor Bruce Caldwell, wherein Caldwell outlines the overall historical view that most attempts towards physical science reduction methods fail and that in Nelson's case he has misunderstood the economic enterprise in his effort to find solution in physics. [4]

Reply

The third chapter in this series, is a four-page rebuttal chapter by Nelson. [5]

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θΔics

In hmol science, **human motion** refers to the action of a force giving rise to movement of a specific human body on which it acts. [1]

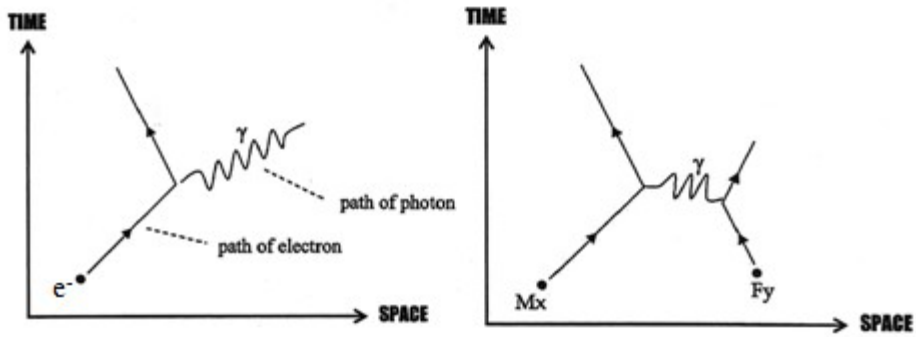

A example depiction of **human motion**: a "repulsive interaction" of two human molecules, one male Mx one female Fy, shown moving in time on a Feynman diagram, in which the exchange of a repulsive visual sight, a sight transmitted or exchanged in the form of electromagnetic waves of light, which itself consists of field particles called photons, defined as being "on mass-shell", causes the two bodies to repel away from each other. [1]

Forces

In the human state of existence, according to standard model, the two forces that mediate human motion and daily activity are the electromagnetic force and gravitational force. In modern particle physics terminology, however, what we thought of as a "force", in the past, has come to be quantified in terms of what is called the "exchange of a particle" (either primary field particles, i.e. spin 1 or spin 2 particles or secondary field particles), which results in the apparent existence of an "exchange force". [2]

The measurable particle called the photon, a type of spin 1 boson, is said to be the carrier of the electromagnetic force, the hypothetical particle called the graviton is said to be the carrier of the gravitational force.

In sum, the 'standard model' holds that of the so-called fundamental forces of nature, weak nuclear, strong nuclear, electromagnetic, and gravity, that human motions are under the operation of the electromagnetic force, predominately, an example being the force of love at first sight, a reaction process in which 20% of people will be pulled though uncontrollably into the marriage bond, and the gravitational force, in a secondary manner of effect, an example being the fact that a female's state of being 'in heat' is governed or initiated on lunar cycles, and thus indirectly due to the gravitational force. [1]

The gravitational force, however, can be shown to be a derivative of the electromagnetic force, by virtue of the fact that the human (human molecule), the earth (earth molecule), and the sun (sun molecule) can each be quantified as being a different type of molecule and by standard definition the force that creates bonds that attach molecules together is the electromagnetic force, which can be explained in terms of exchange forces, wherein the field carrier, in fundamental unit, is the photon. The details of this derivation, however, remain to be worked out.

Work

As soon as any human body moves under the influence of the force, according to the standard thermodynamic definition, work is performed. [3] This work is quantified, in standard definition equation format, by the French physicist Gustave Coriolis' 1829 principle of the transmission of work.

Equilibrium

In certain processes, one force may be prevented from its tendency to give rise to motion of a body by other opposing forces, such that equilibrium results, and the body remains at rest. In this case the force performs no work. These states of tensioned equilibrium can be graphically explained in terms of what are called negative pressures, such as may exist in solids, and in some liquids.

History

The subject of the why's and how's of human motion, not in terms of the so-called kinematics of human motion, but rather in terms of what fundamental forces moves humans in the same way the fall of an apple to the ground is defined as being due to the force of gravity, is a very nascent and controversial subject, even in modern times.

The principle that "heat can produce", in regards to the "vast movements which take place on the earth", considered from the general point of view, was first outlined in the form of a universal theory applicable to any working substance of the universe by French physicist Sadi Carnot in 1824.

Controversy

That human motion is due to forces, as is the case for any physical body of the universe, is unquestionable. Tensions, however, arise when this notion of human motion being to external forces (electromagnetic and gravitational) comes into conflict with age-old ideas of "free will", "choice", and so-called "self-motion", or "self-drive" and the connected concept that one's choices between so-called good and evil determines one's moral worth in after-death weight (soul, karma, etc.) and that this measurement determines one's state of existence in the afterlife, in whatever state of existence one views this to be, speaking plainly, which for over 72 percent of the world is a belief derived from Ra theology. As Indian chemical engineer DMR Sekhar stated, in his 2011 objection to the view that his actions were governed by the control of the electromagnetic force: [6]

> "The external force view of **human motion** contradicts common sense. If contradiction exists then there should be experimental proof. While you are going up stair you are lifting yourself up. There is no external force that lifts you. Hence humans are self driven and self directed. The idea that 'human actions are controlled by external electromagnetic forces' is a premise that needs to be defended, in terms of explaining the difference between why a water molecule evaporates off a hot plate and why a human molecule jumps off a hot plate.
>
> Is it not funny to think that some external 'electro magnetic force' decides if we need to climb up or down or decides what we are going to have for lunch? The external force induced human motion theory will be successful only when it can distinguish the difference between 'evaporating water molecules' and 'a man escaping the heat to self preserve'.
>
> Do you really think that human actions and behavior are not self controlled but are controlled by external electromagnetic waves? I, myself, do not agree that human actions are governed by external electromagnetic forces. Human actions are self controlled. This has nothing to do with God or any religion. I strongly believe that science should not be laced with any kind of philosophy including materialism. The the theory of 'external electromagnetic control of human behavior and actions' needs to be expanded to a full argument. In my view human beings are self driven and we don't need science to know this. Just common sense is enough.
>
> Time only will tell how long Thims can carry the load of thinking that human actions and behavior are governed by external electro magnetic forces. Everyone can test by himself if he is self driven or not! I wonder who is going to accept that he is driven by electromagnetic forces from out side of him? And that he is not alive in the same way that a water molecule is not alive?

In sum, Sekhar believes that is a type of animated 'living matter' or being made of atoms, but one that is exempt, so to speak, from the standard laws of physics, via the view that humans choose their own actions according to their "will" and are "self driven", on the logic that a human being uses his or her "internal biological energy", which is not the same as a "perpetual motion machine", because as a human "chooses" to takes in food from the external environment to accumulate and store "internal biological energy".

This view, however, is a view of the olden days. The correct view is that all human choices and decisions originate not from within, but rather from the forces of sensory inputs, both recent and as stored as reactive memories. This view was stated in 1847 by Scottish physicist James Maxwell, who at the age of seventeen concluded that: [7]

> "The only thing which can be directly perceived by the senses is force, to which may be reduced to light, heat, electricity, sound and all the other things which can be perceived by the senses."

These input forces then give rise to what is called readiness potentials, which thus gives rise to states of consciousness

and conscious choice. In the simplified words of American naturalist Diane Ackerman, "our senses define the edge of consciousness". [8]

The central problem or rather tension between the two seeming competing views (internal choice vs external forced choice), lies not in the view that human motion is a result of external forces, which is the standard model, but rather that the state of the world's modern 21st century educational system is still stuck in the mire of the 1833 Whewell-Coleridge debate mindset, wherein the so-called 'scientist' (defined during this debate by William Whewell in 1834), is one who studies of the 'material world', but explicitly *not* the material world of the human mind and its so-called connected 'moral world', a world often considered as being incorporeal to many, which is a territorial subject specifically left to the theologians and philosophers, and not to be tredded on by the modern physical scientist. This unwritten rule is so instilled that in American, in particular, high school teachers fear loosing their jobs and college professor fear loosing their grants if this subject is even mentioned or discussed in passing overview. [9]

See also

- Library walk problem
- Turning tendencies
- Human molecular spin

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θΔics

In terminology, **human nature** is a term referring to the "nature" or naturalness (natural or unnatural) of human behavior—powered human molecular behavior, correctly—or human activity.

A 2012 "matrix style" ethics conference symposium depiction of how **human nature** will, supposedly, be engineered in the future, humans being embedded at birth with satellite tracking computer chips (similar to how dogs are presently), USB plugs, and some type of logic gate circuitry, among other types of processors. [2]

Branches

In 1948, American self-defined 'human chemist' Thomas Dreier defined the science of "human chemistry", with the explicit view of people as reactive "human chemicals", to be one of the branches of human nature, as follows: [1]

> "Human chemistry, the study of how people 'chemically' react to one another, is an important branch of the science of **human nature**."

Likewise, in English thermodynamicist Alfred Ubbelohde 1946 *Time and Thermodynamics*, in his opening chapter "Contributions to the Thermodynamics of Scientific Humanism", he comments: [3]

> "Contributions to the thermodynamics of scientific humanism [concerns] insights on the nature of time, [as in] personal or psychological time, and refers to the unification of the specialized sciences effected by the contributions they make to the proper study of mankind, **man's nature** and destiny."

In this classification scheme, the two dominant branches of human nature would be human thermodynamics and human chemistry, followed in a close third by human physics, a residual, albeit closely intertwined, subject.

Engineering

Since 2010, American electrochemical engineer Libb Thims has been giving a yearly lecture to bioengineering thermodynamics students (at a noted Chicago university) on an introduction to human chemistry and human thermodynamics, both pure and applied.

In 2012, Wake Forest University, North Carolina, hosted an "Engineering Human Nature", conference, with speakers including: Patricia Churchland (talk: Braintrust: How Minds Make Morals), Paul Churchland (talk: Rule: the Basis of Morality), Kevin Jung (talk: Explaining Moral Values in a Physical World), David Oderberg, noted "biogenesis, abiogenesis, thermodynamics" scholar (Ñº), among others. [2] Hopefully, Jung, in his lecture, will heed the wisdom of German polymath Johann Goethe who rightfully commented over two-hundred years ago:

> "The moral symbols of nature are the elective affinities discovered and employed by the great Bergman [and] there is, after all, only one nature."

Likely, however, this will not be the case, by virtue of (a) the large gap in the separation between the two cultures and most-importantly (b) Jung being a professor of Christian Ethics; Bergman being a founder of physical chemistry; Goethe being the founder of human chemistry; the latter two [human physical chemistry], moreover, being inherently at odds with the former [Christianity]; the only resolution of which being the scenario wherein the latter belief system (physical science) completely overthrows the former (Ra theology); the same as in the case when any formerly predominate scientific theory becomes a defunct scientific theory, after being shown fallacious and inconsistent within the modern scientific framework. This overthrow, however, if it is to occur, will no doubt be many generations, centuries, if not millennia to come, to say the least.

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External links

â— Human nature – Wikipedia.

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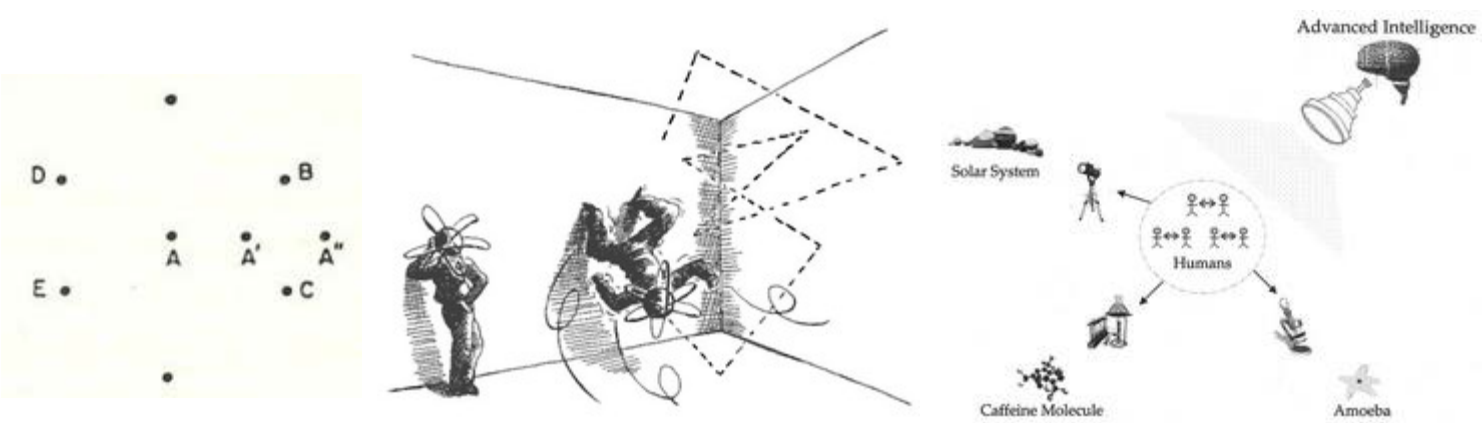

Left: Austrian physicist Ludwig Boltzmann's 1895 drawing of **gas particles** in "rest position"; who in 1872 stated that "molecules are like to many individuals". [5] Center: Artistic rendition of the **human particle** view (or human atom, human atomism, or Daniel Bernoulli "gas particle" view) of human behavior. [6] Right: The "advanced intelligence perspective" or distant or third-party observer view is often employed when using **human particle** models.

science, the **human particle** is the view of systems of people as collections of statistically averaged structural points or entities (or social units), described through the guise of various types of physical particle models, e.g. point atom (Davy, 1813), human atoms, human atomism, human elements, free electrons, among others. [1]

Much of this logic derives from the development of the kinetic theory of gases and statistical thermodynamics between 1850 and 1900 and how analogies were used in comparing societies of people to systems of atoms or molecules.

In the 1975 book *the Macroscope: a New Scientific System*, to cite one of many examples of this type of reductionist approach, French biochemist Joel de Rosnay states that: [2]

> "In relation to society: *we are the* **particles** ... our glance must be directed towards the systems which surround the particles in order to better understand their interactive and evolutionary dynamics."

Likewise, in the 2004 book *Critical Mass - How One Things Leads to Another*, English chemist and physicist Philip Ball argues that "to develop a physics of society" one must use the model that "particles will become people" to which he uses the term *peoploids* to designate human particles in computer simulations.

In human statistical thermodynamics, in general, one can often find analogies on the comparison of people to gas particles. The particle perspective has its uses, when applied correctly. One can, for instance, derive the "orbital perspective" of human movements via this method. [4] Others use the human particle perspective to explain power laws in society, e.g. the distribution of wealth. [1]

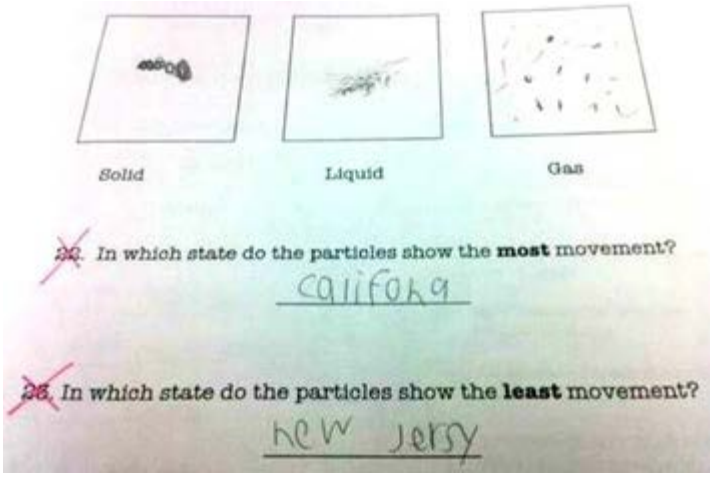

Left: In social physics the **human particle** view is often employed, such as depicted above in Philip

Historical references

In 1813, English chemist Humphry Davy described man as a *point atom*. [3] In 1876, English philosopher Herbert Spencer posed the query:

Ball's 2004 book *Critical Mass*, to explain mass social phenomena, such as war, revolution, fads, etc., using theories such as critical mass or tipping points [1] Right: 2013 Break.com pic of what seems to be a grade school or high school student giving a possible semi-serious answer to the question of what state—assuming here the question is referring to one of the "states" of the united states—**particles**, possibly humans or environmental particles, e.g. air, depending, have the most and least movement, a question to which the student answers: California (Avg. Lat: 37°; Avg. Temp: 59°F) and New Jersey (Latitude: 40°; Avg. Temp: 53°F), a guess that, based on average temperature per each state, seems to be correct, in that it adheres to the logic of Boerhaave's law and the Maxwell-Boltzmann distribution.

> "Are the attributes of society, considered apart from its *living units*, in any way like those of a not-living body? Or are they in any way like those of a living body? or are they entirely unlike those of both?"

In 1956, German-American psychologist Erich Fromm defined people as *human atoms* and argued that the greatest need in life is the desire for interpersonal fusion. In the 1999 book *Peopleware*, American software consultants Tom DeMarco and Timothy Lister likened occupational human workers with flexible and self-regulated working environments to 'free electrons' based on the observation that such loosely-bound employees have a strong role in choosing their own orbits or *work orbitals*.

In 2007, American physicist Mark Buchanan published the book *The Social Atom* arguing that "we should think of people as if they were atoms or molecule" if we are to build a rigorous science of social physics.

See also

â— Human molecule

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θΔics

In human chemistry, a **human periodic table** is any of a number of, typically analogy-based, depictions of human arraigned on in rows that repeat periodically by way of their properties, similar to a standard periodic table of elements.

Overview

In circa 1900, English chemist Henry Roscoe gave an analogy between the newly forming ideas on the periodicity of the elements and the periodicity of human lineages; the gist of which being summarized by Henry Bray (1910) who said that Roscoe said somewhat as follows: [4]

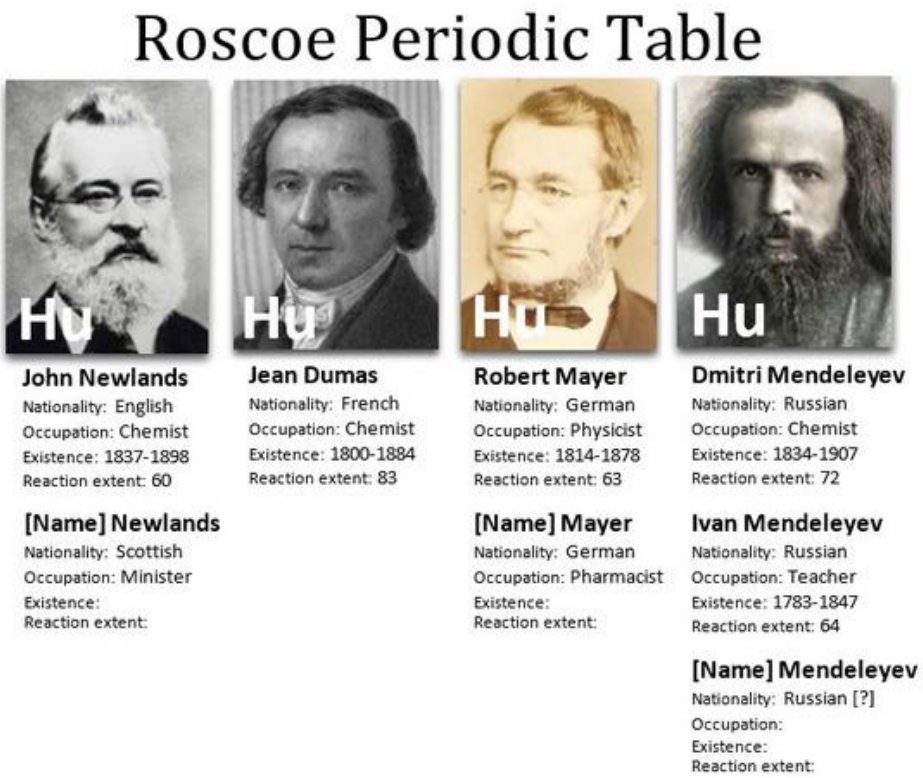

A 2015 rendition of the Roscoe periodic table, conceived by Henry Roscoe (c.1900), based on the Henry Bray (1910) description, according to which men, their fathers, and grandfathers are akin, in their physical and chemical properties, to those of the elements arranged in a periodic table.

> "Let us in our minds write on our mental blackboard the names of the Englishman Newlands, the Frenchman Dumas, the German Meyer, and the Russian Mendeljeff, all written in a horizontal line; next let us write beneath the name of each of these men the name of his father, and beneath that the name of his grandfather, and beneath that the name of his great-grandfather, and so on. If you now write opposite the name of each of these individuals the number of years since his birth, you will find the numbers will increase by a definite increment, namely the age of a generation, which will be approximately the same in all the families. There will be certain differences in the ages of the chemists themselves, but such differences will be little when compared to the period that will be found has elapsed since the birth of any of their ancestors. In these family-trees, **each individual takes the place, as it were, of a chemical element**: as each family is marked by certain peculiarities, so each group of atoms thus arranged show marked and unmistakable signs of a common origin."

Bray continues, either as paraphrase or direct quote, that Roscoe elaborated on this as follows:

> "In such a family-tree as we have mentioned, it may frequently happen that the history of some member of the family has been entirely lost. When such is the case it is not impossible, especially for a man like Francis Galton, to judge from the known history of the other members what the characteristics of the missing member of the family must have been. It is thus as to atoms. It was not long ago when Mendeljeff said that if certain vacancies in his tables of atoms were ever filled, they would have to be filled by elements possessing certain chemical and physical properties which he accurately specified. Since that time these vacancies have been filled, and by atoms or elements possessing the very properties which Mendeljeff said they would possess.
>
> Galium was discovered by Lecoq de Boisbaudron, scandium by Nilson, germanium by Winkler; and these discoverers agree that the atomic, chemical, and physical properties of these substances agree exactly with those predicted by Mendeljeff. It sometimes happens that the real parentage of an element has been lost altogether, but a careful examination frequently enables the chemist to restore it to the family to which it belongs."

(add discussion)

In 1948, American writer Thomas Dreier, in his *We Human Chemicals*, gave the following "human periodic table" like cover design:

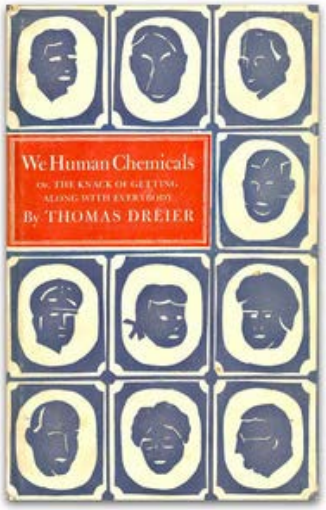

according to which each person is conceived as a "human chemical" or "human chemical element", in short.

In 2003, Mil Millington, in his novel *A Certain Chemistry*, used the following cover design:

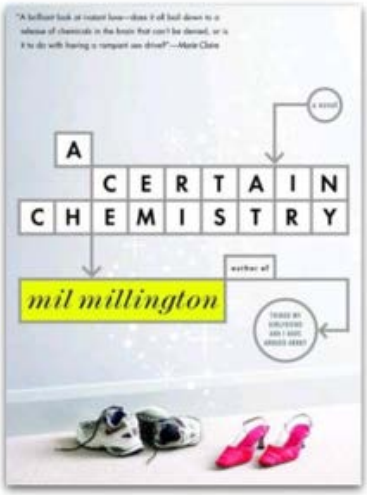

Discussion

The more correct way to arrange people chemically is using affinity, as was done by German polymath Johann Goethe, in his 1808 human affinity table, or using the equivalent concept of human free energy tables, as outlined in 2007 by American chemical engineer Libb Thims.

Axe periodic table

In 2009 Axe body spray launched there "Axe Periodic Table" advertisement.

The ad creation was done by the Lowe/SSP3-Bogota agency, under the direction of Jose Sokoloff, which shows the human element, a man named 'Homer', which may be a play on the 2006 Dow Corning 'human element' ad campaign, above a periodic table of women, wherein each element box a woman's name is written accompanying a picture, below which the ad hook, depicted adjacent, reads "love is a matter of chemistry." [1]

Social media elements periodic table

The following is a 2009 "periodic table of the social elements" by Internet writer Rick Liebling, which is based on the logic that: [2]

> “Social Media really is a lot like chemistry. There is a huge pool of elements you can choose from and an infinite variety of combinations you can create. Twitter + sharing +commenting will give you a different result than blogging +LinkedIn+ Flickr. Then of course there are the active ingredients -the people.”

Each grouping of "internet elements" is grouped by color, e.g. **yellow** are "Twitter people", **orange** are "YouTube people", etc., such that people are grouped by their reactivity or rather properties as defined by which social site he or she frequents:

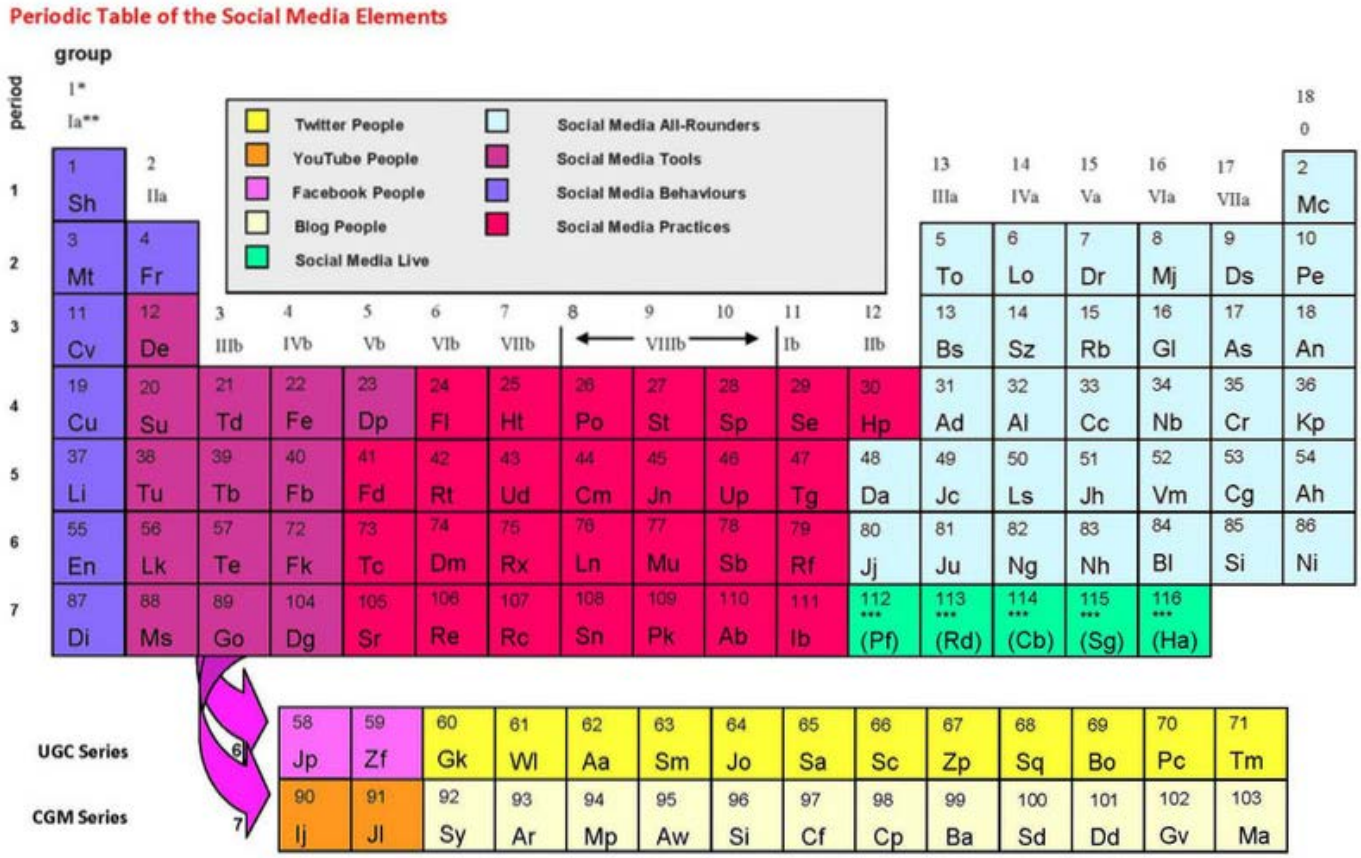

Human elements

The following is "human element" properties table (yellow) found on a the site GoldHunter.org (active from 2007-2008) shown with one of the famous 2006 Dow Corning human element (Hu) advertisements: [3]

"Human Chemistry"

(Man, Woman, Child "Element" Properties)

- ELEMENT NAME: **MAN**
- SYMBOL: **XY**
- ATOMIC WEIGHT: (**180** +/- **50**)
- PHYSICAL PROPERTIES:
  Solid At Room Temperature And Can Easily Be Bent Out Of Shape.
  Usually Dense (Sometimes Flaky)
  Pure Samples Difficult To Obtain.
- CHEMICAL PROPERTIES:
  Tends To Bond With Element **WO** (Woman) Any Chance It Gets.
  Tends To Form Strong Bonds With Self.
- USAGE: **NONE KNOWN.**
  Possible Good Methane Source.
  (Good Samples Produce Large Quantities.)
- CAUTIONS:
  Becomes Explosive When Mixed With Element **KD** (Child) For Prolonged Periods.
  (Can Be Neutralized By Dousing With Alcohol).
  In The Absence Of **WO**, This Element Rapidly Decomposes And Begins To Smell.
- COMMENTS:
  Aged Samples Unable To Conduct Electricity As Easily As Young Samples.

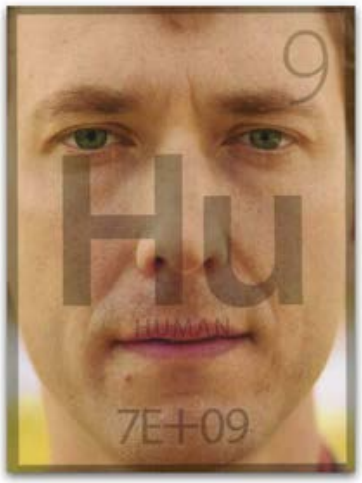

- ELEMENT NAME: **WOMAN**
- SYMBOL: **WO**
- ATOMIC WEIGHT: **(DON'T DARE ASK!)**
- PHYSICAL PROPERTIES:
  Various Sizes, Shapes And Colors.
  Generally Round In Form.
  Boils At Any Temperature, Yet Freezes At Any Time.
  Melts When Treated Properly.
- CHEMICAL PROPERTIES:
  Very Active Substance.
  Very Unstable.
  Bonds Strongly To Gold, Silver, Platinum And Precious Gems.
  Able To Absorb Great Amounts Of Exotic Food.
- USAGE: **Highly ornamental.**
  Great Catalyst For Dispersion Of Wealth.
  The Most Powerful Income Reducing Agent Known.
  Often Used For Cell Reproduction.
- CAUTIONS:
  Highly Explosive In Inexperienced Hands.
  Violent when left alone.
  When Combined With **XY**, The Element **KD** Is Created.
- COMMENTS:
  Turns Slightly Green When Exposed To A Superior Specimen.
  Very Bitter If Not Used Properly.

- ELEMENT NAME: **CHILD**
- SYMBOL: **KD**
- ATOMIC WEIGHT: (**0** +/- **18**)
- PHYSICAL PROPERTIES:
  Weight Varies (Depending On Elements Age)
  Height Varies (Many Exceptions Noted)
  Usually Firm (But Mutations Exist)
- CHEMICAL PROPERTIES:
  Very Active Substance.
  Unstable.
  Great For Junk Food Absorption.
  An Affinity To Replace Elements **XY** And **WO**.
- USAGE: **None Known!**
  Possible Catalyst For Depleting Properties of Other Elements.
  Excellent Element For Probing The Unknown.
- CAUTIONS:
  Highly Unstable Even In Experienced Hands.
  Tends To Deterioate When Idle.
  Placement With **XY** Or **WO** Can Create Undesirable Results.
- COMMENTS:
  Unpredictable Results When Attempting To Shape.
  Unreliable Results When Used In Any Manner.
  Undependable Results When Specific Uses Are Required.

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θΔics

In science, **human physics** is the study of people, viewed or modeled as "human particles", interacting socially, using the principles and laws of physics; in general, the use of physics models to explain human patterns. A number of variations of this field exists, including: social physics, sociophysics, econophysics, among others.

A jack and Jill stylized version of Newton's cradle, illustrating the conceptual model of **human physics** as the physics, e.g. laws of motion, applied to people.

Etymology

The term “human physics” was coined in 1835 by Adolphe Quetelet. Later synonyms include: Humanized physics (Edwin Slosson, 1910), Anthropic physics (Wilhelm Ostwald, 1912), among other variants on the same general subject, albeit with different names (see: two cultures namesakes).

Overview

See also: HP pioneers

The starting point for the subject of "human physics" is generally considered to be the publication of English science philosopher and political theorist Thomas Hobbes’ 1651 book *Leviathan*, in which he draws analogies between laws of mechanics and features of society. Hobbes was greatly influenced by the newly forming field of physics and even travelled to Italy to meet the aging physicist Galileo Galilei. [5]

A classic 20th century example of human physics is the the 1970s work of Australian mechanical engineer Roy Henderson who monitored the movements of college students on a campus and children on a playground, finding that in both cases their movements fit the Maxwell-Boltzmann distribution, meaning that both velocities of gas particles and the speeds of students follow a Gaussian distribution. [1]

American theoretical physicist Mendel Sachs’ 1993 book *Relativity in Our Time: From Physics to Human Relations*, is a type of human physics focused on the philosophy of relativity theory and its extension from physics to the field of human relations and relationships. [3]

Some of the more recent work by social-physical science analogy theorists, such as Malcolm Gladwell on tipping points (2000), Mark Buchanan on power laws (2000) and social atoms (2007), Philip Ball on critical mass (2004), Len Fisher on crowd and swarm behavior (2009), among others, might be considered as ‘human physics’.

American mechanical engineer Adrian Bejan's 2007 constructal theory used to the explain social dynamics and branching flows is often characterized loosely as human physics. [2]

A recent example of human physics is the study of the force of attachment between humans, in terms of the fundamental forces, e.g. field particle exchange models.

Crowd dynamics

A recent popular subject in human physics is crowd dynamics the study of "crowd behaviors" in particular abnormal crowd behavior such as people's reactions and movement

patterns in the case of emergencies, such as fire, wherein people as particles and crowds as fluids or flows of particles. [7]

Shown adjacent are depictions of fluid or particle system models of crowd behavior, e.g. exodus system, panic simulation system; some of which, however, are nearly incoherent in their anthropomorphism, such as those extolled by Scottish mathematician Keith Still: [7]

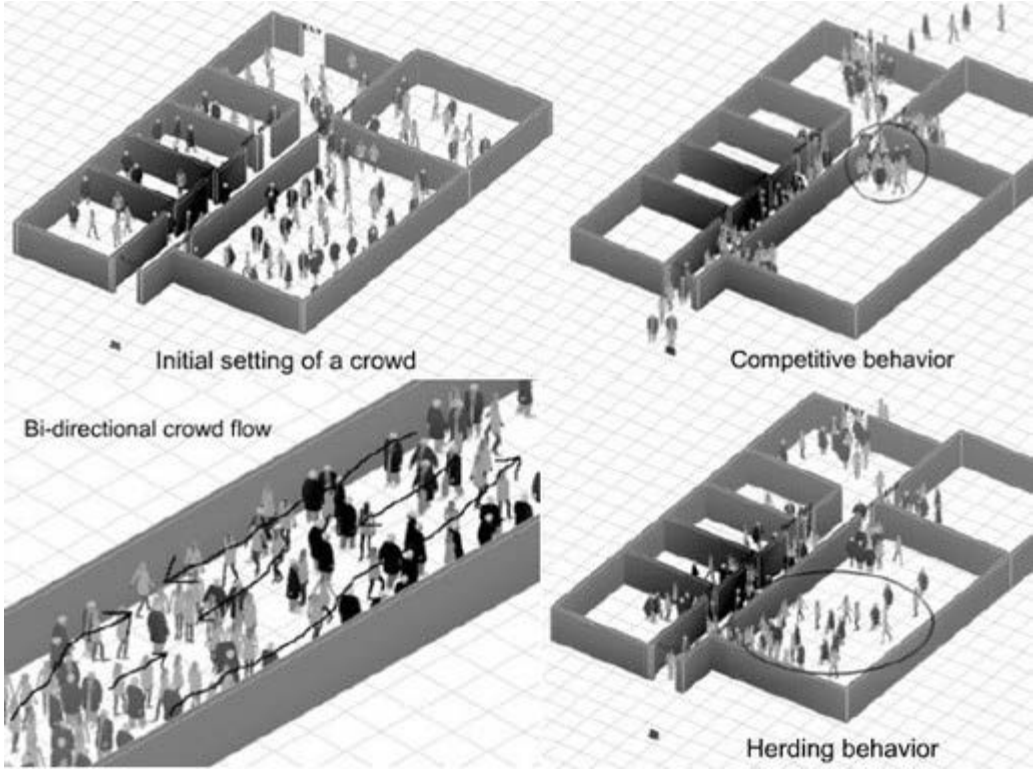

A type of human fluid like crowd dynamics simulation model, often employed in **human physics**, to study designs in emergency situations, e.g. fire, bomb threat, etc.

> "The laws of crowd dynamics have to include the fact that people do not follow the laws of physics; they have a choice in their direction, have no conservation of momentum, and can start and stop at will."

which, of course, is completely backwards in logic: everything in the universe follows the laws of physics except humans?

Because of the fact that improper building design has often lead to many deaths that could have been avoided, human physics models, formulations, and computer simulations can often have a real-world impact. The following diagrams, for example, outline some various diagrams of human flow movements, each entity modeled as a human particle: [7]

Quotes

The following are noted human physics related or themed quotes:

> "Love is a matter of chemistry, but sex is a matter of physics."
>
> – anonymous (or attributed to a Dr. John Marshall) [6]

See also

- Human thermodynamics
- Human chemistry

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External links

● Physics and society (publications list) – Arixiv.org, Cornell University.

θΔics

In human chemistry, **quantum human chemistry** or "human quantum chemistry" is the study of human chemical bonding, bonding geometry, human dynamics, social structure, interpersonal interactions, and system evolutions of human molecules from the point of quantum chemistry, quantum field theory, and quantum mechanics. [1]

References

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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (ch. 13: Human Chemical Bonding, pgs. 515-60) (preview), (Google books). Morrisville, NC: LuLu.

External links

â— Quantum chemistry – Wikipedia.
â— Quantum field theory – Wikipedia.
â— Quantum mechanics – Wikipedia.

θΔics

In hmolscience, **human quantum mechanics**, or "human quantum physics", is the study of quantum mechanics applied to humans, systems of humans, or subjects in the humanities.

An artistic representation of "quantum life" (by Sean Rodwell), depicting the recent hypothesis that birds navigate in the earth's magnetic field using quantum mechanical principles, for American physicist Michael Brooks 2011 *New Scientist* article "Quantum Life: the Weirdness inside Us". [8]

History

Into the 1920s, amid and following rise of quantum mechanics (1900-1932), thinkers began to ruminate on the implications of this new theory with regard to humanity.

In 1924, Austrian physicist Erwin Schrodinger, during the famous BKS theory debate, on the subject of the old quantum mechanics verses the new quantum mechanics, made an appeal to analogy in regards to the recent rampant German hyperinflation: [1]

> "A certain stability in the world order *sub specie aeternitaltis* can only exist through the interrelationship of each individual system with the rest of the world. The disconnected individual system would be, from the viewpoint of unity, chaos. The interrelationship is necessary as a continuous regulative factor, without which, with respect to energy considerations, the system would aimlessly wander about—is it idle speculation if one is reminded of this by a similarity in social, ethical, and cultural phenomena?"

In 1933, Italian theoretical physicist Ettore Majorana, in his article "The Value of Statistical Laws in Physics and Social Sciences", suggested the application of quantum statistical physics to social sciences. [2]

In 1971, Eugene Wigner, in his *Foundations of Quantum Mechanics*, expressed his opinion that quantum mechanics is not applicable to humans, owing to their consciousness: [11]

> "The state of a 'friend' is a linear combination of several states, indicating different contents of his mind, seems very unnatural. This leads me to the opinion that quantum mechanics, in its present form, is not applicable to living systems, whose consciousness is a decisive characteristic."

In 2007, American electrochemical engineer Libb Thims incorporated a version of human quantum chemistry into the development of human molecular orbital theory. [3]

In 2009, during the Moriarty-Thims debate, Irish physicist Philip Moriarty objected to the premise of quantum mechanics applied to human interactions:

> "[Thims has] taken the abuse of the term entropy to an entirely new level, by suggesting that it—and, unbelievably, quantum mechanics—can be applied to 'interactions' in romantic human relationships."

Russian mathematical physicist Victor Maslov's 2012 article "Wiener Quantization of Economics as an Analogy of the Quantization of Thermodynamics", co-authored with Tanya Maslova, has the keyword topics: Godel's theorem, Bohr's complementarity principle, critical point of a gas, quantization of economics), human thermodynamics, Friedman's rule, Irving Fisher's law (see: Irving Fisher), debt crisis. [9]

Quantum biology | Animate systems

In his 2011 talk “On Quantum Life”, American quantum theorist Seth Lloyd discusses how in a field he calls "quantum biology", revolving around recent symposiums he has organized at Harvard, that recent studies have shown that quantum mechanics, e.g. quantum entanglement and quantum coherence, plays a role in areas such as making light absorption in photosynthesis efficient, in bacteria (somehow), in how birds navigate in the earth’s magnetic field, and hypothetically in how the smell sense operates. [7]

New age | Fringe

At some point along the line, in *circa* the last several decades, the use of quantum mechanics crossed into the writings of the new age crowd. An oft-cited candidate for this movement might well be American physicist Fred Wolf's 1981 book *Taking the Quantum Leap*, a pre-cursor to the 2004 documentary film *What the BLEEP Do We Know?* (2004). This logic is summarized well by American physicist Victor Stenger in his 2009 book *Quantum Gods*, who states: [4]

> “The public understanding of modern physics is seriously out of whack, thanks largely to pop junk like *The Secret* (2006) and *What the BLEEP Do We Know?* (2004), [which] promote a bogus version of quantum mechanics – the belief that 'you create your own reality' by controlling the laws of physics with your mind.”

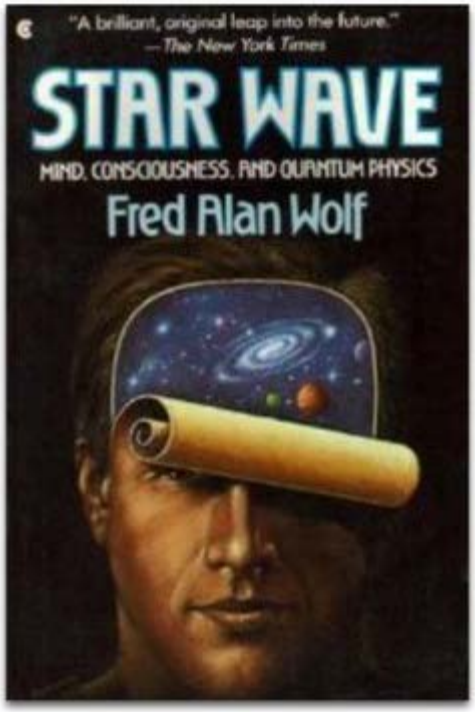

American new age philosopher Fred Wolf's 1984 *Star Wave*, supposedly, uses quantum mechanics to argue that electrical sparks breed life to photon-electron interactions, which explains the human mind, or something along these lines. [10]

In this sense, quantum mechanics, serves as a type of ontic opening springboard or platform, similar to chaos theory, or stochastic physics, to argue for historical anthropomorphized ideas, often revolving around spiritual arguments, the mind-body problem, free will, etc. Authors in the category might include: Deepak Chopra, Jeff Love (*The Quantum Gods*, 2000), Brenda Anderson (*Playing the Quantum Field*, 2006), Ervin Laszlo (*Science and the Akashic Field*, 2004), among others.

Among this group, Chopra seems to lead the pack. He has been criticized for his frequent references to the relationship of quantum mechanics to healing processes, a connection that has drawn skepticism from some physicists who say it can be considered as contributing to the general confusion in the popular press regarding quantum measurement, decoherence, and the Heisenberg uncertainty principle. [5] In 1998, Chopra was awarded the satirical Ig Nobel Prize in physics for "his unique interpretation of quantum physics as it applies to life, liberty, and the pursuit of economic happiness". [6]

See also

- Human chemical thermodynamics
- Human statistical mechanics
- Human statistical thermodynamics
- Human wave function

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External links

● Quantum mind-body problem – Wikipedia.
● Quantum economics – Wikipedia.

θΔics

In human chemistry, a **human reproduction reaction** is a specific type of human chemical reaction in which reactants male *M* and female *F* transform through a chemical reaction to form the product of a baby of new genetic combination; of the following form, wherein the Hu element symbols are employed:

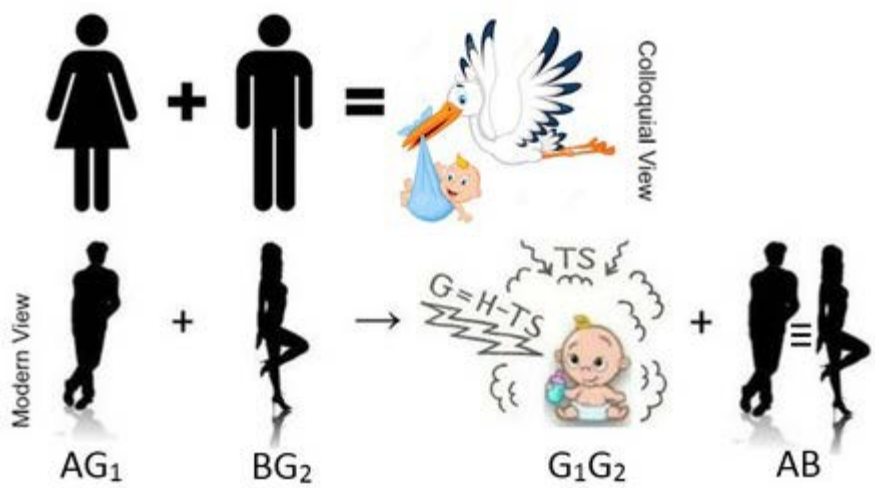

Top: the default colloquial view of how babies are made or where they come from, i.e. what parents tell their children about sex. Bottom: the Bottom: the modern view, i.e. physicochemical-perspective, of the **human reproduction reaction**, wherein A and B are the male and female chemical species, G1 and G1 are male and female germ cells (sperm and egg, respectively), G1G2 is the sperm and egg fused into a new chemical species (baby), and AB is the newly bonded couple or married pair.

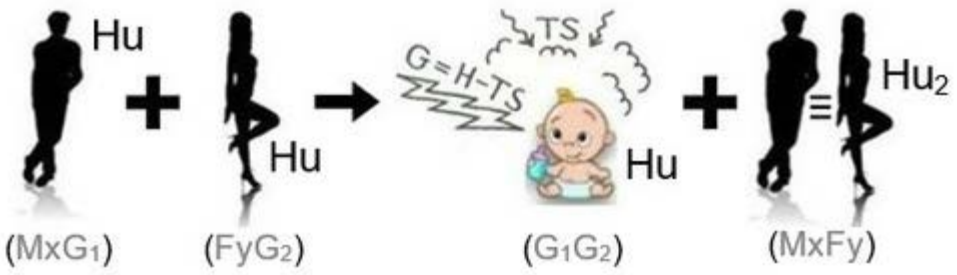

showing that two Hu molecular species "react" to form a dihumanide molecule Hu_2 (bonded couple) and a new Hu molecule or species (a child).

Overview

The simplest colloquial expression for this process is often shown as:

$$Man + Woman \rightarrow Baby$$

This depicts the "overall mechanism" of reproduction and is often paraphrased by the expression "love the chemical reaction".

The following is the reaction coordinate for a spontaneous reaction:

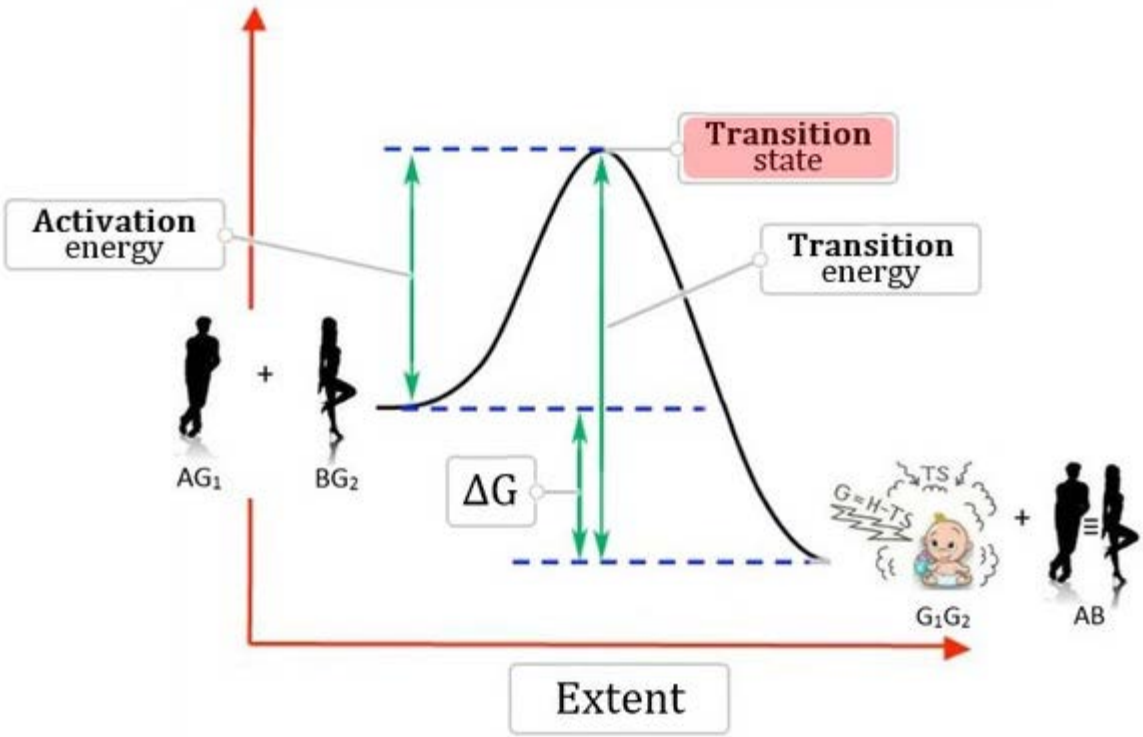

(add)

Goethe | Parental imagination theory

In 1809, German polymath Johann Goethe, in his physical chemistry based *Elective Affinities*, using a mixture of Torbern Bergman chemical reaction theory, evolution theory, maternal imagination theory, and Plato's soul mate theory, among other theories (see: Elective Affinities | IAD: Love theories), conceived the view that each person is a chemical entity and that relationships, love, and work are chemical reactions (or affinity reactions) and in 1809 presented his viewpoint through 36-chapters of story, in which each chapter depicts a different human chemical reaction.

In the novella, a child, named Otto, symbol O, is conceived, through a rather convoluted "double mental adultery", as it has been called, wherein the Charlotte (A) and Eduard (B) have sex, albeit while in the act of sex thinking of someone else, namely Captain (C) and Ottilie (D), respectively. The overall mechanism of which is as follows:

Charlotte(A)≡Eduard(B) + Captain(C) + Ottilie (D) → Otto(O) + Charlotte(A)≡Captain(C) + Eduard(B)≡Ottilie(D)

The child Otto (O) produced from this "unnatural" sexual liaison, drowns by the end of the novella. The point of the novella was to highlight the battle or conflict between passion and idealized albeit unnatural morals.

Fink | Precipitate model

In 1999, Goethean studies professor Karl Fink, in his reaction analysis and of the novella, conceptualized the child to be viewed as a precipitate, symbol P or PPT. The reaction, according to Fink, resulting in the illicit child, created out of the interactions of the four friends, would follow a double elective affinity reaction of the following kind:

$$AC + BD \rightarrow AC + BD + P$$

where the molecular entities are Charlotte (A), Eduard (B), Captain (C), Ottilie (D), and the chemical "precipitate" (P), or PPT, that becomes Otto (O). [4] Others, in recent years, particularly after reading American chemical engineer Libb Thims' 2007 *Human Chemistry* textbook, have come to view a child produced out of sexual relationship as a "possible

product or precipitate". [5]

Thims | 18-year reaction mechanism

In 2003, American electrochemical engineer Libb Thims began to work out, in step-by-step detail, the reaction mechanism to reproduction, namely that it is a process that involves several key energetic steps, lasting in extent of an average eighteen years. The first step, quantified by an initial state, assumes there is an initiation of the reaction, described by collision theory, to be the point of love at first sight (or some variation of this), followed by a falling in love aspect of the transition state, ending in a final state when the child detaches from the parental structure and goes off into the world as a newly formed human molecule. [1] In particular, the basic reproduction reaction is better characterized as a double displacement reaction:

Symbol	Description
A = Charlotte	Wife
B = Eduard	Husband
C = The Captain	Eduard's friend
D = Ottilie	Charlotte's adopted niece
O = Otto	Baby
PPT	Precipitate
M = Mittler	Mediator

Symbol table of Goethe's reactions, according to the 1999 work of Goethean studies professor Karl Fink. [4]

$$AB + CD \rightarrow A \equiv C + BD$$

in which one male human molecule *A* parts with the genetic material of his germ cell (sperm) *B* and female human molecule *C* parts with the genetic material of her germ cell (egg) D, after which time, following the high energy transition state, two new products are formed, one the chemically-bonded couple:

$$A \equiv C$$

and a newly formed infant human molecule *BD* with slowly grows into a fully-formed human *E*:

$$BD \rightarrow E$$

Beyond this, the description becomes even more complicated, where focus on the nature of the human chemical bond A≡C comes to the fore.

The detailed mechanism of the human reproduction reaction involves a day-by-day accounting of the germ cells, as they are exchanged between partners, and slowly form into a embryo, then into a child, which for a dozen years or more remains attached to the parental structure, then begins to detach. Technically, the basic reproduction reaction, in which one child is conceived and raised into adulthood, in mechanistic terminology, is what is called a *double displacement reaction*, of the form shown below:

$$AB + CD \rightarrow AD + BC$$

In human chemical terms, species *AB*, defined here as a man, symbol *Mx*, parts with the genetic component of his sperm, component *B*, symbol *Sp*; a woman *Fy* parts with the genetic component of her egg *Eg*; and they both emerge newly 'transformed' after the birth of their child, in the form of a new molecular structure, i.e. parents bonded into a working chemical relationship *MxFy* with an attached embryo *SpEg* uniting them:

$$MxSp + FyEg \rightarrow MxFy \equiv SpEg$$

Soon thereafter, still being attached significantly to the parental structure *MxFy*, the sperm-egg molecular entity *SpEg*, in the shape of what is called a *morula*, i.e. a globular solid mass of blastomeres formed by cleavage of a zygote, will begin to transform or grow into the structure of a young child *Bc*. Given time, the child will eventually begin to detach, in a predominate manner, from the parental structure:

$$MxFy - - - Bc \rightarrow MxFy + Bc$$

In this manner, the newly created human molecule *Bc* will go off into the world as a newly formed individual. As we see, human chemical reactions are quite intuitive and very easy to depict. Do note, however, although simplistic-looking, these human chemical reactions actually embody principles and theories far greater in complexity and extent than can be detailed in this short book. It must be understood that the second-by-second mechanism underlying the above expressions, invariably, need to be explained in terms of only two components: electrons and photons. To do this is quite a tedious process and many new perspectives on life must be digested.

Jorge | Reversible reaction

Don Jorge (1988-)

In 2007, Swiss thinker Don Jorge, in what seems to be an attempt at using chemistry to explain sex humorously to his girlfriend, made a video entitled "Aufklarung: How to Learn about Sex with Chemistry", in which he described the process of sex using the following reaction: [2]

♂ + ♀ Baby

In the video, Jorge draws the diagram on paper where he draws little sperm, with a head and a wiggle tail, moving from the male ♂ to the female ♀ and describes how "latex" can block the progress of the reaction.

In his reaction drawing, Jorge uses Van't Hoff double-arrow reversible reaction symbol ⇆, as introduced by Jacobus Van't Hoff in his 1884 *Studies in Chemical Dynamics*, to allude to the view that sex is a reversible reaction, as may be possibly captured in the phenomenon of a one-night-stand. [3]

Although this is an involved topic, the correct formulation is to use a one way arrow, signifying that the formation of an embryo and later an infant is an irreversible process. If, however, the couple or female decided to opt for an abortion, a completely different reaction mechanism would be used.

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5. Parent-child love as a heat sink? (2009) - Hmolpedia thread.

θΔics

In science, **human science** is the study of the nature of humans from the point of view of the scientific method and knowledge derived therefrom.

Overview
(add)

Quotes
The following are related quotes:

> "Cicero said the opinion about the immortality of the soul was first introduced by Pherecydes of Syros in the time of King Tullus (others attribute it to Thales, others to others). It is the part of the **human science** that is treated with the most reservation and doubt. The firmest dogmatists are forced to take cover in the shadow of the academy. No one knows what Aristotle taught about the subject (or even all of the ancients in general who handle it with unsteady belief) and he left it to his successors to battle it out about his opinion on the matter. It is marvelous how those who are stubborn in this opinion about the immortality of our souls come up short and are powerless to establish it by their human powers. They are the dreams of a man who teaches nothing, but is hopeful. As Cicero said: 'dreams are not of a teacher, but of the wisher' (*somnia sunt non docentus, sed optantis*) (*Academia*, 2:38)."
>
> — Michel Montaigne (c.1590), *Essays* (§2:12); cited by Jean Meslier (1729) in *The Testament* (pg. 570)

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See also
â— Hmolscience

-

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1. (a) Montaigne, Michel. (c.1590). *Essays* (§2.12). Publisher.
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θΔics

In famous publications, **"Human Societies: a Curious Application of Thermodynamics"** is four-page 1998 article by Venezuelan-born English chemical engineer Erich Muller, wherein, using chemical thermodynamics, he attempts to show how social forces are enlarged versions of intermolecular forces and how chemical thermodynamics can be used to explain the drives of social forces. [1]

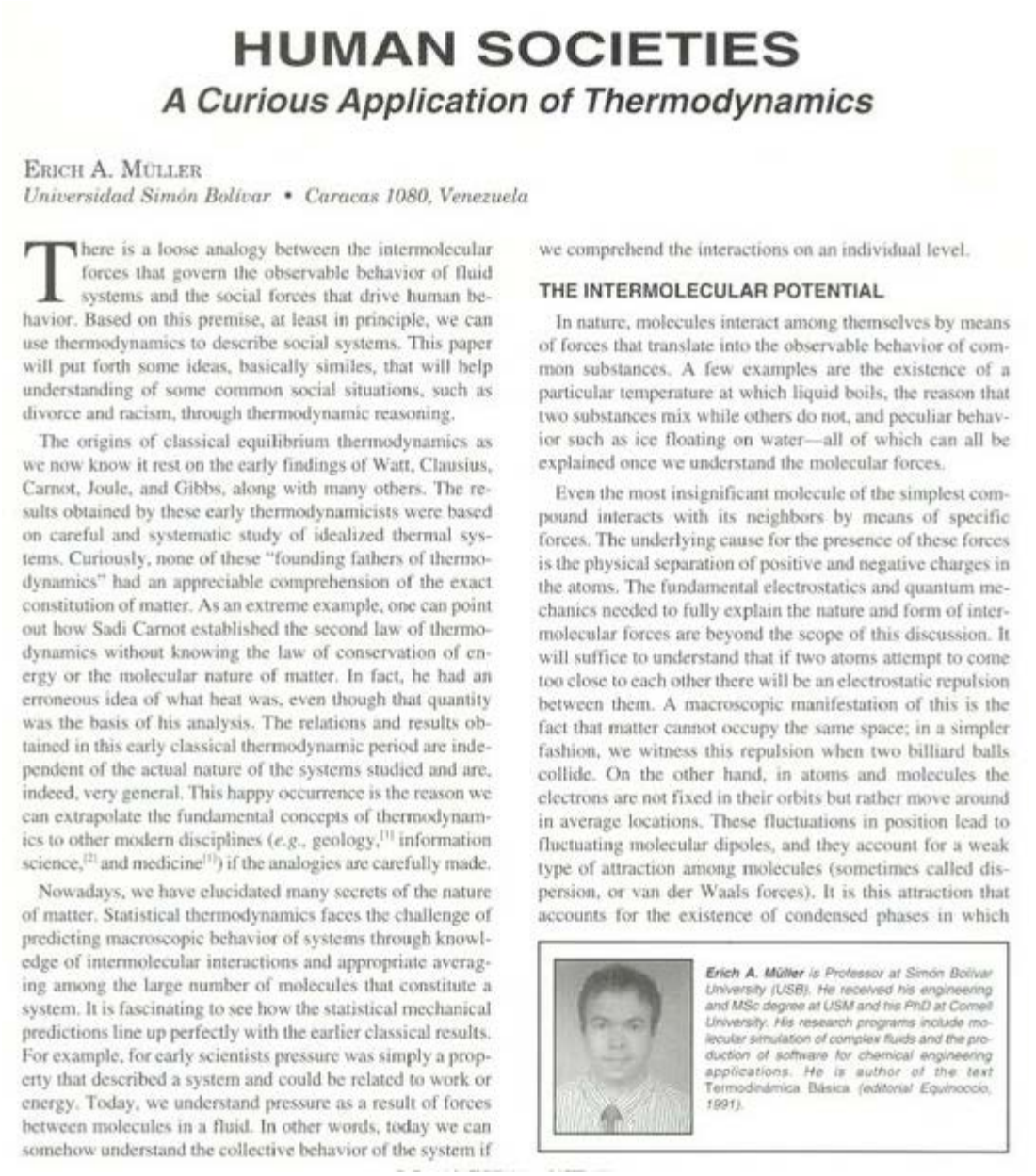

HUMAN SOCIETIES

A Curious Application of Thermodynamics

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There is a loose analogy between the intermolecular forces that govern the observable behavior of fluid systems and the social forces that drive human behavior. Based on this premise, at least in principle, we can use thermodynamics to describe social systems. This paper will put forth some ideas, basically similes, that will help understanding of some common social situations, such as divorce and racism, through thermodynamic reasoning.

The origins of classical equilibrium thermodynamics as we now know it rest on the early findings of Watt, Clausius, Carnot, Joule, and Gibbs, along with many others. The results obtained by these early thermodynamicists were based on careful and systematic study of idealized thermal systems. Curiously, none of these "founding fathers of thermodynamics" had an appreciable comprehension of the exact constitution of matter. As an extreme example, one can point out how Sadi Carnot established the second law of thermodynamics without knowing the law of conservation of energy or the molecular nature of matter. In fact, he had an erroneous idea of what heat was, even though that quantity was the basis of his analysis. The relations and results obtained in this early classical thermodynamic period are independent of the actual nature of the systems studied and are, indeed, very general. This happy occurrence is the reason we can extrapolate the fundamental concepts of thermodynamics to other modern disciplines (*e.g.*, geology,[1] information science,[2] and medicine[3]) if the analogies are carefully made.

Nowadays, we have elucidated many secrets of the nature of matter. Statistical thermodynamics faces the challenge of predicting macroscopic behavior of systems through knowledge of intermolecular interactions and appropriate averaging among the large number of molecules that constitute a system. It is fascinating to see how the statistical mechanical predictions line up perfectly with the earlier classical results. For example, for early scientists pressure was simply a property that described a system and could be related to work or energy. Today, we understand pressure as a result of forces between molecules in a fluid. In other words, today we can somehow understand the collective behavior of the system if we comprehend the interactions on an individual level.

THE INTERMOLECULAR POTENTIAL

In nature, molecules interact among themselves by means of forces that translate into the observable behavior of common substances. A few examples are the existence of a particular temperature at which liquid boils, the reason that two substances mix while others do not, and peculiar behavior such as ice floating on water—all of which can all be explained once we understand the molecular forces.

Even the most insignificant molecule of the simplest compound interacts with its neighbors by means of specific forces. The underlying cause for the presence of these forces is the physical separation of positive and negative charges in the atoms. The fundamental electrostatics and quantum mechanics needed to fully explain the nature and form of intermolecular forces are beyond the scope of this discussion. It will suffice to understand that if two atoms attempt to come too close to each other there will be an electrostatic repulsion between them. A macroscopic manifestation of this is the fact that matter cannot occupy the same space; in a simpler fashion, we witness this repulsion when two billiard balls collide. On the other hand, in atoms and molecules the electrons are not fixed in their orbits but rather move around in average locations. These fluctuations in position lead to fluctuating molecular dipoles, and they account for a weak type of attraction among molecules (sometimes called dispersion, or van der Waals forces). It is this attraction that accounts for the existence of condensed phases in which

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First page to Erich Muller's 1998 *Chemical Engineering Education* article "**Human Societies**: a Curious Application of Thermodynamics", wherein people are likened via a "curious analogy" to molecules, according to which social forces are described as intermolecular forces, and drives are quantified via thermodynamic potentials. [1]

Overview

In 1998, Muller, "Human Societies: a Curious Application of Thermodynamics", opened to the following bold statement:

> "There is a loose analogy between intermolecular forces that govern the observable behavior of fluid systems and the social forces that drive human behavior. Based on this premise, at least in principle, we can use thermodynamics to describe social systems."

(add discussion)

The Muller dispersion force (social analogy to Van der Waals dispersion force) and Muller stability ratio (social equivalent to the Gottman stability ratio) are based on this paper. [2]

JHT

Muller's article served as the prototype article model of the 2005-launched *Journal of Human Thermodynamic*.

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Citations

The following are works that cite Muller's 1997 article:

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● Aguilar-Arias, Jaime L. (2014). "Chemical Engineering and Complexity, an Undissipated Structure … Yet", *20th Brazilian Congress of Chemical Engineering* (*Congresso Brasilerro de Enenharia Quimica*, XX) (pdf), Florianopolis, Brazil, Oct 19-22.

θΔics

In science, **human spontaneity** refers to human interactions, activity reactions, or interpersonal processes that happen spontaneously.

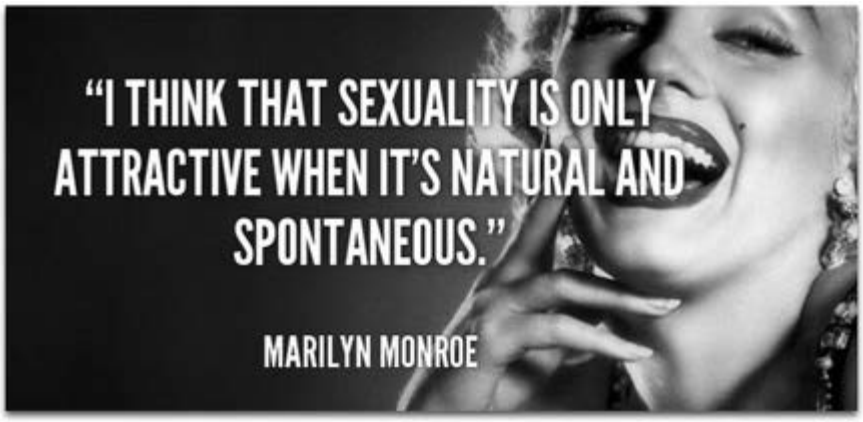

Marilyn Monroe on attractiveness, nature, and **spontaneity** in respect to humans and sexuality.

Overview

The work of Jacob Moreno and his theory of the social atom is largely based on his studies of the spontaneity level of children as compared to adults.

In 1995, American electrochemical engineer Libb Thims has been working to understand how the famous spontaneity criterion, i.e. $\Delta G < 0$, of chemical thermodynamics applies to human spontaneity, particularly in the context of mate selection and marriage. This single thought experiment is what largely resulted in the world's first textbook on human chemistry. [1]

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Further reading

â— Barker, Wayne. (1968). *Brain Storms: a Study of Human Spontaneity*. Grove Press.

External links

â— Natekar, Chandrakanth. (2010). "Eternal Beauty of Human Spontaneity", *AuthorsDen.com*, Apr 15.

θΔics

In human thermodynamics, **human statistical thermodynamics**, as compared to human chemical thermodynamics, is the study of human reaction existence processes via statistical thermodynamics. A common approach in this mode of logic is to assume the "human particle" perspective, in which people are modeled as either atoms or particles. [1]

References

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(b) Buchanan, Mark. (2007). *The Social Atom: Why the Rich get Richer, Cheaters get Caught, and Your Neighbor Usually Looks Like You* (pgs. x-xi). New York: Bloomsbury.
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θΔics

In human

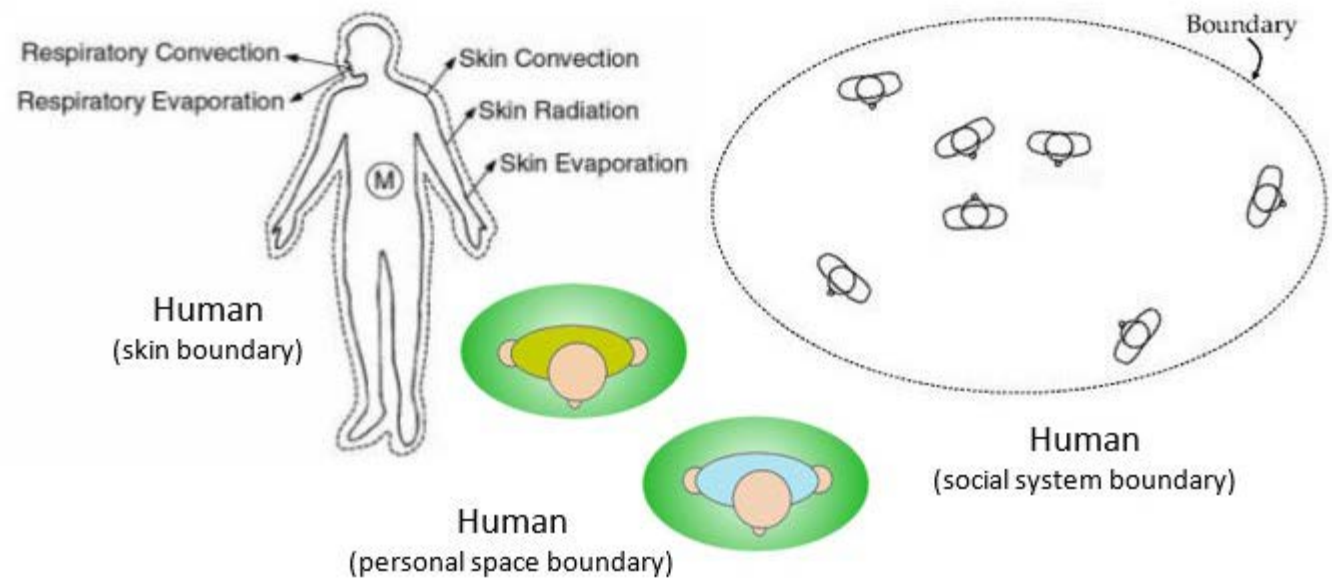

Left: Skin-boundary **human system** model (one human being). [3] Center: Two **human systems** (shown in the personal space bubbles). Right: One boundaried **human system** (containing seven people).

thermodynamics, a **human system** refers to either a single animated human body or a boundaried system of two or more animated human bodies as a thermodynamics system.

Discussion

The description of boundaries of a human system, in thermodynamic terms, in the sense of the boundary (outside layer of a volumetrically-changing body of water) defined originally through the heat engine model introduced in the 1824 Carnot engine description, is very problematic. In 1990, American social entropy theorist Kenneth Bailey referred to this issue as the "boundary problem"; discussing ideas such as boundary analysis and entropy breaks. [4]

First law

The original version of the first law, introduced by German physicist Rudolf Clausius in 1850, states that when, according to Boerhaave's law, a unit of heat *Q* is added to a body, it will cause the body to expand, where the expansion can be quantified as the body pushing out a region of new volume *V* against the weight or pressure *P* of the atoms and molecules of the surrounding atmosphere of the earth, and that the change in the energy of the body *dU* will be an amount of heat added *dQ* less the work done *dW*:

$$dU = dQ - dW$$

Fanger

In 2005, referencing the 1970 work of Danish-born American environmental engineer Ole Fanger, American Mechanical engineer Myer Kutz gave the following equation as the first law of thermodynamics for the human body:

$$M - W = \dot{Q}_{skin} + \dot{Q}_{respiration}$$

where *M* is the metabolic heat production (watts per meters squared of body surface area), *W* is the rate of mechanical work, and *Q dot* represents the heat losses. [3] What seems to be the case here is that Fanger equates metabolism *M* to internal energy *U* and starts his derivation with the first law in this form:

$$U - W = Q$$

To note, there are numerous issues neglected in this approximation. One, of many, being that the internal energy of a person if a function of metabolism (of simply the digestion of food). More correctly, it is a person's drives and aspirations, and the effect of surrounding forces and inputs on those drives, in conjunction with energy (bond energy) released (and absorbed) in the dynamics of human chemical bonding interactions, such as in love the chemical reaction, that better quantify the internal energy of a person. We may ask, for instance, how is the energy of the sight (electromagnetic waves) of one's father killing one's mother, to a child, who views this incident, as depicted in the 2003 film *The Hulk*, conserved in the body, or rather mind, according to the principle of the conservation of energy, in its quantification of the internal energy of the human body, as years progress? [5] Certainly, these were the sorts questions that Austrian psychologist Sigmund Freud was after in his development of psychodynamics.

In any event, Kutz further equates his human body first law to:

$$M - W = (C_{sk} + R_{sk} + E_{sk}) + (C_{res} + E_{res})$$

where *C* is the convective heat losses, *R* the radiative heat losses, and *E* the evaporative heat losses. Kutz states that the figure of the man with arms extended (above left) schematically represents the energy balance components for the control volume signified by the dashed line; thus depicting the thermodynamic system of one human body. [3]

Other

American educator Dick Hammond is strong promoter of the term "human system", albeit used in an entropological sense, which he culls the from Austrian biologist Ludwig Bertalanffy's 1968 general system theory who defines living organisms as open systems. [1] Hammond states, for instance, in very simplified terms:

> "When a new **human system** arrives at the age of eighteen, having been reared by society, and closely monitored in formal education for at least twelve of those years, and remains a rapid, high entropy producer, rather than helping society keep entropy to a minimum, then society knows they have failed … the cost of coping with randomizers is very high."

The typical description of a human system, either as one body or a system of bodies, is that it is an open system, maintained far-from-equilibrium, albiet a variation of local entropy decrease.

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θΔics

In thermodynamics, **human thermo-dynamics** was a term used in 1893 by English engineer Bryan Donkin, in his "The Scientific Work of Gustav Adolph Hirn", in reference to the philosophical thermodynamics and mechanical equivalent of heat of humans work of French physicist Gustav Hirn. [1]

The phrase was a precursor to C.G. Darwin's later 1952 definition of "human thermodynamics" as the science of the study of thermodynamics of human molecules in systems.

The term thermo-dynamics, to note, was coined in 1849 and stayed in use well into the 1920s, when thereafter the subject lost the hyphen.

See also

â— Human thermodynamics (etymology)

References

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θΔics

In hmolscience, **human thermodynamic instrument** is a thermodynamic instrument, such as a thermometer, barometer, indicator, calorimeter, or reaction calorimeter, etc., built or conceived to measure large-scale "boundaried" human molecular quantities, as in a human system of two or more people, or rather, in a sense, "social", pressures (social pressure), volumes (social volume), temperatures (social temperature), energy (social energy), or heat (social heat).

A 2013 screenshot of a Twitter-based searchable real-time so-called "social heat map", a social heat gauge type of **human thermodynamic instrument**, found at Boston.com, according to which the social networks that glow red with activity indicate venues having the greatest activity in the given time period. [18]

History | Overview

In 1945, Stuart Dodd, supposedly, designed some type of barometer (or social barometer) of international tension to detect reliably and early the tensions that lead to war. [23]

In 1947, American sociologist George Lundberg, in his scientific method advocating *Can Science Save Us?* sociology booklet, devoted several pages to a discussion of the need for instruments to develop physical sociology; the following being an example statement: [20]

> "We need to use instruments as far as possible to sharpen our observation, to check it, and to report it accurately. These instruments and skills do not exist ready-made in any field. The have to be invented. They may be quite elementary as yet in much social investigation, consisting of little more than a pencil, a schedule, a standardized test, or the recording of an interview. But we also have at our command the movie camera with sound equipment with which social behavior can be observed in its cruder aspects with the same accuracy as any physical behavior is observed."

The camera mention brings to the mind the work of 1970s-1990s marriage stability work of John Gottman; also the early 1970s sidewalk study of American sociologists James Dabbs and Neil Stokes. The pencil mention brings to mind the invention of the indicator diagram.

Lundberg cites Ernest Greenberg's 1945 *Experimental Sociology* as being the go to source for an examination of the literature on the non-impossibility of experimentation in the social sciences. [21]

The topic of quantifying systems of humans using standard thermodynamic parameter is one of the most complex areas in human thermodynamics and generally speaking a very nascent subject in infancy. As to difficulties involved in even conceiving of any type of "indicator" to gain data on the thermodynamic state variables of human activity, one must first note that measurements have to be obtained in SI units, just as is the case for any other system of study in the universe.

To cite one example, temperature, by definition is the measure of the ability of a body to absorb or give up energy, and is measured in degrees kelvin. Thus, on this definition how does one quantify the very significant aspects of the average sexual temperature of one person? It is well-agreed that a typical supermodel (who have larger personal space) has the ability to give off a larger amount of energy (causing volume expansion). Yet how is this measured in degrees kelvin?

Molar units

See main: Hmolscience, Avogadro's number, mole

In 1953, during the 40 person AAAS so-called "Committee for Social Physics" meeting, headed by John Q. Stewart, American physicist Stuart Dodd explicitly suggested that "chemical moles" be the equivalent to "number of people" in

social physics. [22]

A significant issue first encountered in attempts at deriving and measuring numerical human thermodynamics quantity in units is the fact that standard chemical thermodynamic units are based on units per mole, e.g. energy per unit of 10E23 particles. The question then becomes: how are units to be based in human thermodynamics? On ten humans, on 100 humans, on the number of students in a typical school, a typical city, a typical country? Theoretical work in addressing this question include: the 'social Avogadro number' introduced in 2003 by Hungarian sociologist Babics Laszlo, the C-mol, introduced in bacterial thermodynamics in circa 2005, and the term 'hmol' introduced in 2007 by American chemical engineer Libb Thims.

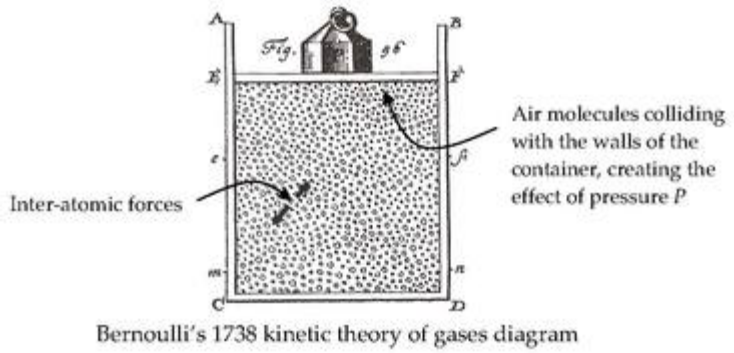

Swiss physicist Daniel Bernoulli's 1738 *Hydrodynamica* depiction of pressure that of the rate at which molecules collide with the walls of the container; a definition based on Italian physicist Evangelista Torricelli's 1643 mercury barometer experiment, the world's first pressure measurement instrument.

Pressure

See main: Social pressure

The concept of human system pressure is an elusive one. The barometer was invented in 1643 by Italian physicist Evangelista Torricelli who was studying the Parmenides' 485BC theory of the nonexistence of vacuums in nature.

The basic definition of pressure is that it refers to the rate at which the particles of the system collide on the walls of its container, as described in Swiss physicist Daniel Bernoulli's 1738 *Hydrodynamica*. This is the basic model we have, thus far, to describe pressures in human systems, which invariably need to be quantified in units of pascal (PA) or newtons per meter squared acting on the surface in question.

The pressure in a standard barometer measures the weight of the molecules in the atmosphere pushing down on the molecules at the surface-level of the earth. When the water molecules push out against the piston of a piston and cylinder heat engine, it signifies that the pressure of the water molecule system is higher than the surrounding system of atmospheric molecules, owing to the actions of heat transferred to the system, typically.

In extrapolation of this model to systems of humans, a human system barometer would measure the weight of the molecules (humans) in the surroundings a given system pushing on the molecules of that system or on the boundary of that system.

Russian biogeochemist Vladimir Vernadsky, in 1926, outlined a description of the biological pressure as a force that can be felt and the work that must be done to resist this pressure, e.g. between humans and the ecological environment, or such as when population count rises. He states: [17]

> "Living matter—organisms taken as a whole—is spread over the entire surface of the earth in a manner analogous to a gas; it produces a specific pressure in the surrounding environment, either by avoiding obstacles on its upward path, or overcoming them. The careful observer can witness this movement of life, and even sense its pressure. In the impact of a forest on steppe, or in a mass of lichens moving up from the tundra to stifle a forest, we see the actual movement of solar energy being transformed into the chemical energy of our planet. Cosmic energy determines the pressure of life, which can be regarded as the transmission of solar energy to the earth's surface. This pressure arises from multiplication, and continually makes itself felt in civilized life. When man removes green vegetation from a region of the earth, he changes the appearance of virgin nature, and must resist the pressure of life, expending energy and performing work equivalent to this pressure."

To extrapolate on this, using the transformation of the Roman system model, over a span of about 1,000-years, to give an idea of human pressure, the population of the world at 1 AD has been considered to be between 200 and 300 million people. In that same period, the population of the early empire under Augustus (27 BC – 14 AD) has been placed at about 45 million. [13] Using 300 million as the world benchmark, the population of the Empire under Augustus would've made up about 15% of the world's population. In this case, in order for the Roman system to expand outward to its eventual largest volume (116 AD), the pressure in the Roman system would have been greater than that of the territory of the neighboring surrounding world.

Volume

See also: Human molecular orbital theory

Left: **Indicator**: a work measurement tool invented in 1796 James Watt and John Southern, that tracks pressure of the steam in a cylinder against the steam's volume, concomitantly. Right: American engineer Isaac Daniel wearing his newly invented GPS shoes (2007), a potential future type of human molecular volume indicator. [8]

The first work on measuring and quantifying volumes or spaces of humans in movement and interaction was American anthropologist Edward Hall's 1966 work on "proxemics", which was based on the earlier 1955 measurements of German zoologist Heini Hediger on the distances of reaction between animals, e.g. flight or fight distance, social distance, etc. This joint work was incorporated into American chemical engineer Libb Thims' 2007 formulation of human molecular orbital volumes. [3]

Some prototype "indicator" readings or measurements done on human volume changes include the 1990s findings that, when asked to approach a stranger and stop when they no longer feel comfortable, people will tend to stop about two feet away from a tall person (22.7 inches to be exact) but less than a foot (9.8 inches) from a short person. [9] This same effect operates in proportion to beauty. Specifically, according to American attractiveness researcher Nancy Etcoff:

> "Very attractive people of any size are given bigger personal space and territory; which they carry around with them."

In other words, physically 'hot' molecules, in a sense, trigger volume increase be it a gaseous molecule or a human molecule. [3]

To give an example of the magnitudes involved, the following diagram shows the changes in the territory (volume) of a system of about 45-million people (human molecules) (Roman empire) as it expands, doing thermodynamic pressure volume work, against its surroundings, and then contracts (during its fall), over the course of 929-years, as is captured in the idiom the rise and fall of Rome.

Another potential way to quantify volume changes in systems of humans is via using GPS technology. To give one example, in 2007, after reading a article on how "GPS Shoes Make Tracking Kids, Elderly Easier", American chemical engineer Libb Thims contacted the GPS shoe developer American engineer Isaac Daniel on the possible idea of using his newly developed line of GPA shoes to track groups of people, in year-long studies, so to function as a potential human molecular indicator technology, giving data as to changes in movement orbital volumes of people over daily, weekly, monthly, or yearly averages, just as a steam engine indicator tracks the boundary position of the water molecules as they expand outward and contract inward in one heat cycle of the piston and cylinder. [8] This

communication, however, was not returned.

In 1997, Russian physical chemist Georgi Gladyshev stated that the value of the Gibbs free energy change ΔG for the formation of any particular human society, could be estimated by calculating the work that when into building that society. [11] Although Gladyshev does not give any specifics as to how this might be calculated, aside from mention that some hypothetical type of "absolute hard currency" might facilitate this measurement, one might be able to get a reading of volume change of a given society by studying boundary of the territory expansion and contraction, over the course of the rise and fall of a society, as diagrammed on a world atlas. The rise and fall of Rome could be one case study, as diagrammed below: [12]

In 2005, German physicist Ingo Muller suggested that changes in the "parts of the habitat lost" involved in animal species interactions represents a type of thermodynamic pressure-volume boundary work. [10]

Temperature

The term economic temperature dates back to 1915 in the work of Italian economist Emanuele Sella, who seems to have described it as wealth and the capacity to absorb it; such that between different organisms a thermoeconomic diversity (or temperature difference) exists. In 1930, French sociological philosopher Maurice Halbwachs uses the terms social temperature and in another instance moral temperature to allude to the suggestion that the suicide rate of a particular group of humans could be considered as a gauge of the moral temperature of the group: [1]

> "The number of suicides [in a region] can be considered a sort of **thermometric indicator** which informs us of the condition of the mores, of the moral temperature of a group."

Beyond, bulk measurements of the temperature of a system of human molecules, the temperature of an individual human is a complex topic. The term sexual temperature, is one example.

In 2009, Chinese physicist Yi-Fang Chang suggested that social temperature could be defined by the following equation:

$$T = c\bar{K}(t)$$

where $\bar{K}$ is an average value of the social kinetic energy. [4] In this sense, in theory, one could use GPS tracking devices to measure the kinetic energy, or the sum of ½ the masses of the human particles times their respective average velocities squared, of a system of human molecules under study and thus get a hypothetical reading of temperature of a social system. In 2010, German Mimkes argues that GDP per capita may be representative of the temperature of the economic system. [15]

Heat

The development of indicators to quantify human molecular heat is an elusive subject. How does one, for instance, quantify sexual heat, in units of joules?

In 2007, American chemical engineer Libb Thims gave an overview as to how to go about constructing a human reaction calorimeter and human molecular or human system thermometers, so to be able to measure quantities such as human reaction enthalpy change. [3]

Entropy

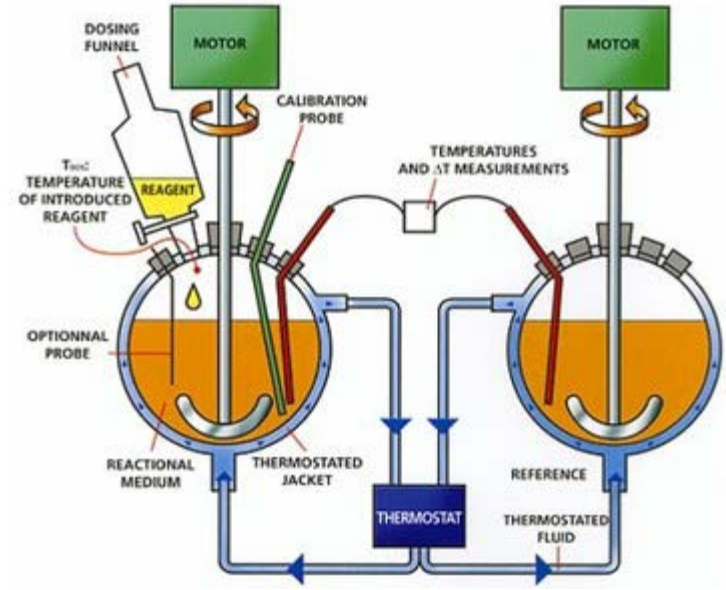

In a reaction calorimeter, a liquid is circulated around the vessel containing the reaction medium. The temperature of the liquid in the temperature-controlled jacket is maintained at a constant value. When the liquid reagent is introduced into the solution, a difference of temperature is measured by a thermocouple. A calibration probe is used to determine the heat of the reaction. [14]

Attempts as measurements of the entropy of one human or a system of humans have been amusing, to say the least, most of which have been not even theoretically sound attempts. The dozens of claimed attempts in information theory, for instance, are all baseless.

In 1931, psychologists Siegfried Bernfeld and Sergei Feitelberg , in their article "The Principle of Entropy and the Death Instinct", presented the results of their study where they attempted to measure a paradoxical pulsation of entropy within a living organism, specifically in the nervous system of a man. [5] Specifically, by comparing the brain temperature to the rectal temperature of a man, they thought to acquire evidence of paradoxical variations, i.e. variations not conforming to the principle of entropy as it functions in physics for inanimate systems. [6]

In 1993, American physical chemist Martin Goldstein, in his book *The Refrigerator and the Universe: Understanding the Laws of Energy*, co-written with American epidemiologist Inge Goldstein, outlined the basic difficulties involved in calculating the entropy of a mouse, via the standard procedures used to calculate the entropies of simple molecules (assuming the mouse to be a larger molecule, that was synthesized). The following is a condensed excerpt of that section: [7]

> "To apply thermodynamics to the problem of how life got started, we must ask what net energy and entropy changes would have been if simple chemical substances, present when the earth was young, were converted into living matter [as in the formation of a mouse] … to answer this question [for each process], we must determine the energies and entropies of everything in the initial state and final state."

Energy determinations, they state, are rather straight forward; whereas entropy determinations are more difficult. As stated by Canadian economist Bernard Beaudreau in 2008: [16]

> "While theoretically appealing, entropy as a scientific approach to studying [economic] production processes has been woefully inadequate, as evidenced by the lack of any empirical work. The key problem is with measurement. How does one measure entropy? More importantly, how does one measure entropy at the firm level?"

In 2009, New Zealand business engineer Gavin Ritz claims to have been conducting research to measure and quantify "motivation entropy production". [2]

Enthalpy

Enthalpy is complicated calculation, involving internal energy, pressure, volume, temperature, and entropy.

(add)

Gibbs free energy

In 2007, Thims outlined a "dodecabond model" in which Gibbs free energy could be quantified by measurements of various physical and evolutionary psychology aspects involved in human movement, human work and of human bonding. [3] In 2009, Ritz also claims to be able to measure and quantify Gibbs free energy in business systems and organizations. Both the contentions by Ritz, to note, are mostly hollow claims; his understanding of thermodynamics is very elementary, and it is likely that his claims are purely superficial, or very simplified models, at best. [2]

Quotes

The following are related quotes:

> "It is unlikely that the generating substance hypothesis – energy or entropy discoverable in human social relations and groupings – will achieve any great precision in its application to psychological or social and political affairs in its entropist formulation. This has to do with the shortcomings of the terms and categories of entropism as they are applied in these realms: the term 'entropy' is used metaphorically when it is applied to any form of energy that cannot be denominated in calories, and there are insurmountable difficulties involved in discovering a quantifiable, determinate, caloric content for such terms as 'psychic energy', 'cultural energy' or the energy of a community, an institution, or an idea."
>
> — Eric Zencey (1983), "Entropy as Root Metaphor" [19]

> "Adapting thermodynamic ideas to the study of culture is limited by a very simple fact: nobody has yet figured out what might be the cultural equivalent of heat or energy … nobody has yet found the 'heat' or the 'energy' in cultural matters … the concepts of 'cultural temperature' to refine our understanding of 'cultural heat' have not yet appeared. This is one of the most pressing problems for the next generation of anthropologists, and the difficulties are profound."
>
> — Paul Bohannan (1995), *How Culture Works*

See also

â— James Reiss

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Further reading

â— Wilkerson, Galen J. (2012). "Thermodynamics of Human Mobility", Climate CoLab.

External links

â— Thermodynamic instruments – Wikipedia.
â— Reaction calorimeter – Wikipedia.
â— Calorimeter – Wikipedia.

θΔics

In science, a **human thermodynamicist** is a thermodynamicist who studies humans, socially, economically, historically, or philosophically, anthropologically, etc.

A related term is entropologist defined as an anthropologist who entropically studies human beings.

In 2004, American electrochemical engineer Libb Thims was self-defining himself as a "human thermodynamicist", as shown adjacent; and in 2005 was using the term online. [2]

In 2007, Thims, in his *Human Chemistry*, was also referring to the criterion of a "competent human thermodynamics" as one who builds on Clausius, Gibbs, and Lewis, first and foremost. [1]

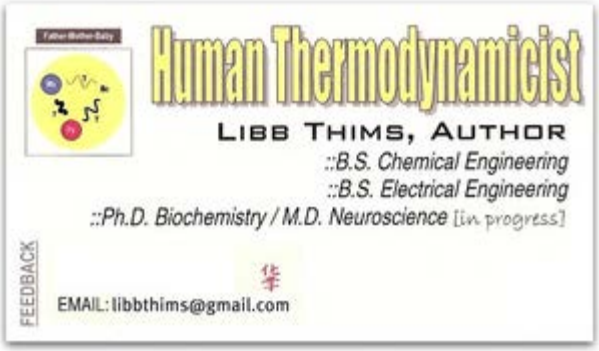

Circa 2004 business card of American chemical engineer Libb Thims.

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In thermodynamics, **human thermodynamics** is the scientific study of the energetic and entropic aspects of the processes of human activity and movement, in the context of boundaried daily solar cycles, namely those existent between heat, work, spontaneity, irreversibility and the laws defining therein. [1] In categorizational terms, there are about three dozen plus distinct branches of human thermodynamics.

A central aim of **human thermodynamics** is to explain the system-delineated actions revolving existence, love, work, meaning, and purpose thermodynamically.

Overview

The term 'human thermodynamics' was coined in 1893 by English engineer Bryan Donkin, in his article on the earlier scientific work French physicist Gustave Hirn, specifically Hirns' 1856 experiments on the mechanical equivalent of heat of humans in action and his 1868 book *Philosophical Implications of Thermodynamics*. [15] It was English physicist C.G. Darwin (grandson of Charles Darwin), however, who in the "Introduction" chapter to his 1952 book *The Next Million Years*, gave the first succinct definition of the subject of human thermodynamics, which he defined as the thermodynamic study of dynamical systems of human molecules (people defined as molecules). C.G. Darwin, concise form, defined human thermodynamics as follows: [4]

> "**Human thermodynamics** is the statistical mechanics of conservative dynamical systems of human molecules."

This definition, to clarify, Darwin's definition falls under the classification of: statistical human thermodynamics, the study of human movement using statistical mechanics (or statistical thermodynamics), Darwin's field of study; which can be contrasted with the more difficult subject: chemical human thermodynamics, the study of reactive systems of humans, people defined as powered chemicals or driven molecules, using the chemical thermodynamics.

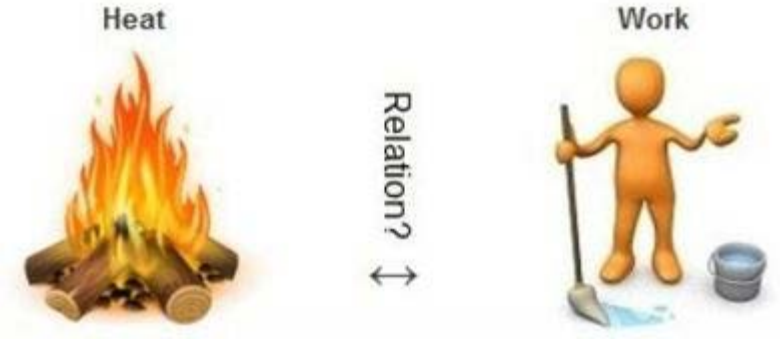

A representative diagram of **human thermodynamics**, captioned as "the study of the relation between heat (force) and work (movement) and other forms of energy transformation involved in the process of human existence", from the abstract poster presentation of American electrochemical engineer Libb Thims' 2011 bioengineering thermodynamics lecture "How to Apply Thermodynamics in the Humanities: with Engineering Focus".

The second modern definition of the subject human thermodynamics comes from Iranian mechanical engineer and thermodynamics professor Mehdi Bazargan who in his 1956 book *Thermodynamics of Humans*, written curiously while in prison for his efforts to establish democracy, defined the bracketed term 'human thermodynamics' as:

> "**Human thermodynamics** is the application of mathematical formula and principles of thermodynamics to the economic and social sciences."

Bazargan's is the first actual book entitled 'human thermodynamics'; although, to note some English translations of the original Persian title (ترموديناميك انسان) or Farsi title (*Termodynamik-e Ensan*) read "Man's thermodynamics" or "thermodynamics of humans", among other varieties.

In Bazargan's book, a basic attempt is made to apply the cold hard logic of thermodynamics to explain human behavior,

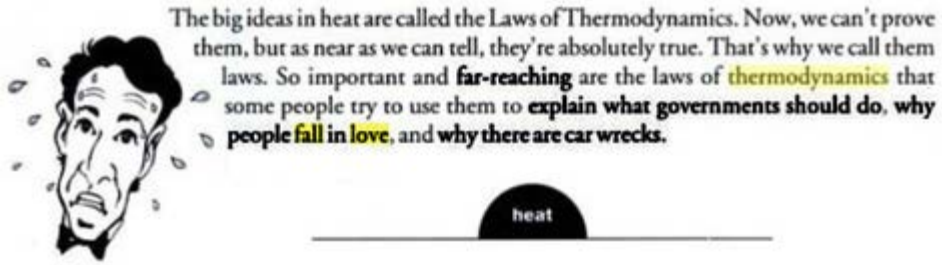

A 1993 summary description of **human thermodynamics** by American mechanical engineer Bill Nye, better known as Bill Nye the science guy, of how people, historically, have used the laws of thermodynamics to explain various facets of human existence, from car wreck behaviors, to politics, to the process of falling in love. [36]

using not only the verbally descriptions of concepts such as energy, entropy, internal energy, and work applied to systems of humans in daily activity, but also actual thermodynamics formulations, which is a rarity in works on human thermodynamics. This equation-based formulation of human thermodynamics, can be compared to earlier 1890s teachings and publications of Polish economist Leon Winiarski, such as explained in his 1898 collected works *Essay on Social Mechanics* and 1890 article "The Teaching of Pure Political Economics and Social Mechanics in Switzerland." In the Winiarski scheme, to clarifgy, he used the term "social mechanics" as a synonym for the subject of what what C.G. Darwin and Bazargan later called 'human thermodynamics', which may be do to that fact that in France, during these years, thermodynamics was still being referred to by some as théorie mécanique de la chaleur (mechanical theory of heat); Winiarski also viewed people as "human molecules", or in some cases, "economic molecules", similar to C.G. Darwin. [27]

In 2004 summary of Bazargan's thermodynamics of humans, American cultural anthropologist Mazyar Lotfalian defined the subject of Bazargan's human thermodynamics or the thermodynamics of human beings as: [25]

> "[Bazargan's] **thermodynamics** [**of humans**] is the mathematical expression of how human activity works according to a set of laws that are based on the relation of heat, time, and energy."

In sum of these various early excursions on the subject of human or social thermodynamics, one discerns the consensus view the laws of thermodynamics are the central universal laws found to have direct bearing on the function, activities, and governance of daily human movement. [2]

In a chemical sense, human thermodynamics can be defined as the study of the operation interacting groups of activated humans (or human molecules) according the laws of energy and entropy. [14] In Darwin's view, as stated in his *The Next Million Years*, if one can determine "some kind of laws of human thermodynamics, we shall be more successful in doing good in the world."

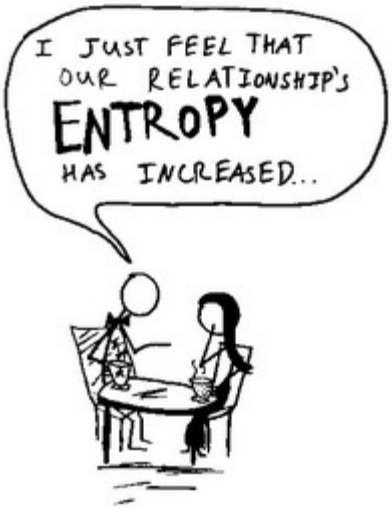

Left: American artist Zack Brown's 2012 "Thermodynamics of Love" cartoon, from his Stickmen with Martinis blogspot, which he captions with a take on his view of a relationship as being like a closed thermodynamic system. [39] Right: A 21 Jun 2010 lecture by English biotechnologist Mark Janes who comments: "**Human thermodynamics**, in the future, I believe, is on the precipice of being the biggest overall unified scientific concept ever."

Human thermodynamics, thus being the advanced application of chemical thermodynamics and statistical thermodynamics to human society, is the study of heat and its relation to the motion and changes in the equilibriums of human bodies. The essential process of thermodynamics is that whereby heat cycles through a system of chemical species, e.g. water molecules in a steam engine, or human molecules (people) in an social system, and thereby mediates the production of

work, such as in occupation. [13] In human terms, heat, in the form of gamma-ray photons, cycles from the sun, the systems are coupled economies, the chemical species are people, and the work is the work of life. The four laws of thermodynamics define the boundaries of this action.

Subject difficulty

The use of thermodynamics, a notoriously difficult subject itself, to explain human activity, to note, is a very difficult application. This is evidenced by the fact that most of the people with IQ = 225+ estimates have attempted formulation on this topic. In 1910, to cite one opinion, American historian Henry Adams, in his famous booklet *A Letter to American Teachers of History*, defined the loose subject of human thermodynamics, to be the physical-chemical explanation of sociology and history. In particular, in reference to the development of a new science of history thermodynamics, Adams stated that "if the physicists and physico-chemists can at last find their way to an arrangement that would satisfy the sociologists and historians, the problem would be wholly solved." He continues: [3]

> "Such a complete solution [socio-history thermodynamics] seems not impossible; but at present to call for the aid of another Newton."

Similarly, in 1954, English physicist Vera Daniel gave his opinion on the application of thermodynamics to society by Polish physical economist Leon Winiarski, in the 1890s, and German physical chemist Wilhelm Ostwald, in the 1900s, by commented that: [24]

> "The thermodynamic[s] [applied to humanity] case would involve the author into calculations of fantastic difficulty, if he were to take it seriously, and it is also a comparison of the complicated with the complicated."

This last quote captures the essence and immense difficulty underlying the subject of human thermodynamics. In sum, human thermodynamics is the modeling of the entire corpus of human activity from a thermodynamic system's perspective, which equates to the use of German physicist Rudolf Clausius' 1865 ten fundamental equations, at a minimum, American engineer Willard Gibbs' 1876 700-equations, at the introductory level, Austrian physicist Ludwig Boltzmann's 1872 gas theory equations at the novice level, and Belgian chemist Ilya Prigogine's 1970s non-equilibrium thermodynamics dissipative structure theory at the colloquial level, in short.

The adjacent video by English biologist Mark Janes outlines some of difficulties and formulaic issues in human thermodynamics, and discusses concepts such as how a negative Gibbs free energy change occurs in the process of spontaneous human interactions, among others.

Human thermodynamics | Anecdotes

See main: Thermodynamics anecdotes

In 1885, while musing upon the subject of thermodynamics one day, Scottish physicist William Thomson suddenly realized that his wife was discussing plans for an afternoon excursion: [37]

> "At what time," he asked, glancing up, "does the dissipation of energy begin?"

In other words, in this quip Thomson is applying his version of the

Left: in 1885, Scottish physicist William Thomson (1824-1907) considered an afternoon excursion with his wife, taking time away from his studies, to be a second law governed instance of the "dissipation of energy."Right: in 1909, American historian Henry Adams (1838-1918) stated that he would walk a

second law of thermodynamics, as captured in his 1852 paper "On a Universal Tendency to the Dissipation of Mechanical Energy", to the tentative understanding the work involved in the course of daily human-human interactions; a prime human thermodynamics example application of the law of dissipation of energy.

several million miles to be able to go back in time and hear Thomson's (adjacent) views on the thermodynamics of society.

In a 1909 letter to English lawyer Charles Gaskell, Adams comments: [38]

> "I have been studying science for ten years past, with keen interest, noting down my phrases of mind each year; and every new scientific method I try, shortens my view of the future. The last—thermodynamics—fetches me out on sea-level within ten years. I'm sorry Lord Kelvin (William Thomson) is dead. I would travel a few thousand-million miles to discuss with him the thermodynamics of socialistic society. His law is awful in its rigidity and intensity of result."

This comment comes a year before Adams great work *A Letter to American Teachers of History*, in which he attempts to outline how thermodynamics, particularly the second law, applies to the historical subject of studying people considered as human molecules.

What is life | An entropy struggle?

See main: What is life? (theories of existence)

One of the earliest attempts at a solution to the question of "what is life", from a thermodynamic perspective, was made by Austrian physicist Ludwig Boltzmann who, in his 1886 discussion of philosophical problems connected to thermodynamics, famously quipped "life is a struggle for entropy", as is explained in the following quote: [12]

> "The transition of heat from sun to earth [can drive] the performance of work, like the transition of water from the boiler to the cooling instillation [and] the *struggle for existence* of animate beings [is a] a struggle for entropy."

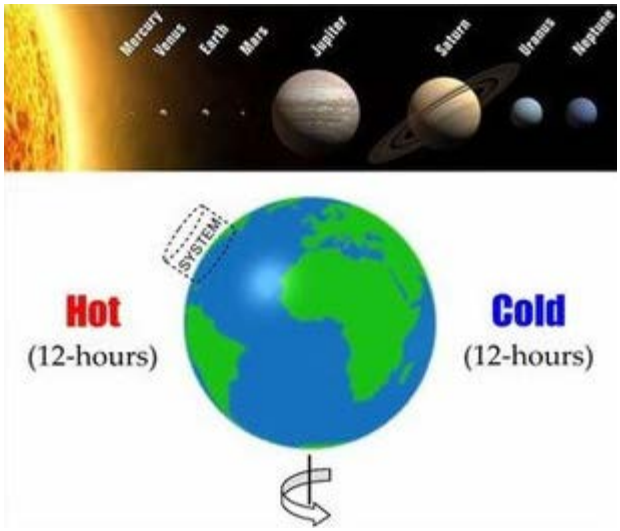

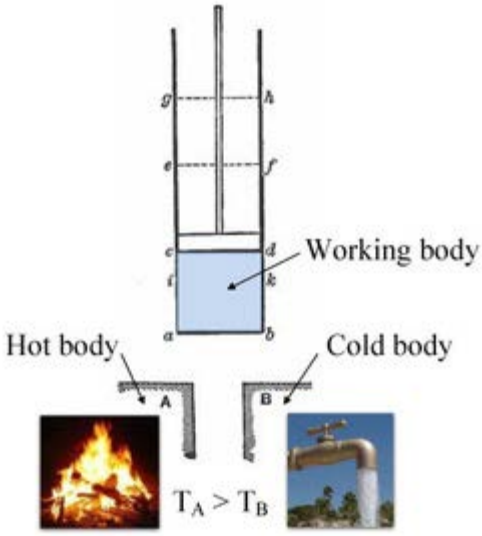

Left: a **Carnot cycle system view** of a working body surface section of a rotating earth, put in contact, alternately, with a hot body (day time) then a cold body (night time), diurnally, according to which daily "work" is done by the actions of Boerhaave's law. Right: a **Carnot engine diagram** of a confined body of working substance (molecules) in a piston-and-cylinder heat engine, alternately heated and cooled, in a cycle: the basic model for any working system of humans (human molecules) confined to a surface section of the

In more direct application to human life, building on the work of Boltzmann, the term "human thermodynamics", defined as a branch of science, was coined in 1952 by English physicist Charles Galton Darwin who argued that the logic of statistical thermodynamics could be used to determine the future of the human race. [4]

The rudiments of the science of human thermodynamics, can be said to have started with postulates of English physicist William Thomson, i.e. Lord Kelvin, the person who, in 1849, coined the

earth, in its diurnal solar cycle.

term *thermo-dynamics*. In particular, in 1852 Thomson supposed that "there is a universal tendency in nature to the dissipation of mechanical energy" and discussed how this tendency relates to "vegetable life" or to the "will of animate creatures". [5] Soon thereafter, people began to wonder how this universal law of physics related to or contrasted with the universal law of biological evolution as established by English naturalist Charles Darwin in his 1859 *Origin of Species*. [6] Over the years, dozens of people have approached this puzzle form a number of angles, as are found in a number of obscure articles and books. [7]

In modern terms, as viewed through the science of human chemistry, the process of human life involves chemical reactions or the formation, dissolution, or reconfiguration of human chemical bonds between human molecules (people viewed as atomic structures) and the work produced therefrom. [8] The drive of this work, transmitting through the forces of energy and entropy, originates from the heat output of the sun. The relationships between heat and work are dictated by the laws of thermodynamics, and human society, like any machine or organism, is no exception to this dictate. [9]

Overview

Thermodynamics, by virtue of its universality, penetrates all areas of human life studies. The branches of human thermodynamics thus far semi-developed include: psychodynamics, thermodynamic evolution, economic thermodynamics, sociological thermodynamics, political thermodynamics, cessation thermodynamics, history thermodynamics, business thermodynamics, religious thermodynamics, among others, all of which abide by the same laws.

The laws of thermodynamics, particularly the first and second law, i.e. those dealing with energy and entropy, are the central regulators (or driving forces) of human life. These are the laws according to which heat flow through any system of interactive molecular species produces work and in the process changes the state of the system irreversibly. The science of thermodynamics, itself, was founded in 1824 by French physicist Sadi Carnot who was the first to begin to formulate the basic energy laws of generalized heat engines. In the years to follow, people began to apply these universal energy laws to human life.

Captioned image from 1979 famous article "The Social Thermodynamics of Ilya Prigogine" by Wil Lepkowski. [23]

First law analysis overview:

See main: Human system, Human energy, Social energy, First law, etc.

The starting point for any thermodynamic analysis of human life, is the first law energy balance in respect to earth-bound "working systems" of chemical species subjected to daily solar cycles of heat input. In particular, each day, due to the configuration of the solar system, biospheric portions of the earth's surface, during its rotation, are put in contact diurnally with a hot body (the sun) and cold body (the night sky) on an alternating basis, according to which heat *Q* flows through various partitioned off human social systems, e.g. one small city, that each function as "working bodies", i.e. any partitioned off system through which heat may flow, of molecular species (e.g. a set of human species). [10] In the human point of view, during each cycle, work-output is produced cyclically through the operation of economic, socially-mediated, substrate-attached, human molecular interactions in the form of multiple coupled social heat engines. [1]

Second law analysis overview:

See main: Human entropy, Social entropy, Economic entropy, Second law, etc.

After analyzing any human interaction according to the first law, a next step is to study the human process from an entropy point of view. This is one of the more difficult aspects of human thermodynamic analysis, leading often to

unfounded interpretations of "disorder", "pollution", "chaos", etc., as well as a number of newly coined terms such as social entropy, human entropy, economic entropy, among others. The only correct way, however, to translate the second law of thermodynamics into the study and analysis of human actions is to build directly on German physicist Rudolf Clausius' 1865 thermodynamics textbook *Mechanical Theory of Heat*, following this path through into modern chemical thermodynamics. Most, who attempt to formulate a second law interpretation of human activity, never read Clausius, but instead crudely attempt to build formulations on tertiary interpretations of Clausius' work, often leading to absurd conclusions, the pinnacle example being the conclusion that "life tends towards chaos", which is obviously a backwards trend then what is observed.

Combined law analysis

See main: Combined law of thermodynamics

The first and second law of thermodynamics are often combined into one expression, called the "combined law", particularly for the case of isothermal (constant temperature) isobaric (constant pressure) processes, as happens to be the case for most processes occuring on the surface of the earth. This amounts to a statement of the effect that a natural process will only occur or proceed spontaneously (according to the spontaneity criterion) if it actuates, in the system or in the path of the process, a decrease in the Gibbs free energy *G*. This logic is often truncated as follows:

Human thermodynamics pioneers video (3:24-min) by American chemical engineer Libb Thims (Jan 29, 2009).

$$\Delta G < 0$$

an expression which is said to quantify naturally occurring (or energetically favored) processes. This simplicity, however, becomes complicated when attempting to understand how the components of the function of free energy:

$$G = U + PV - TS$$

in the progression of human psychological time.

Short history

See main: History of human thermodynamics

The earliest ideas concerning human thermodynamics, i.e. how the laws of thermodynamics relate to human life, began about 1852 when William Thomson (Lord Kelvin) published his "On a Universal Tendency in Nature to the Dissipation of Mechanical Energy", in which he set forth the view, for many superficial readers, that all natural systems tend to down grade in energy over time and that this logic defines the course of human history. [5] In the years to follow Thomson's publication, outlining the view that "dissipation", often seem as embodied in the second law, applies to the entire universe, over 300+ human thermodynamics pioneers began to profess their views in various spheres of publication in the humanities.

The first chapter specifically devoted to the extension of the energy principle and thermodynamics to social theory and

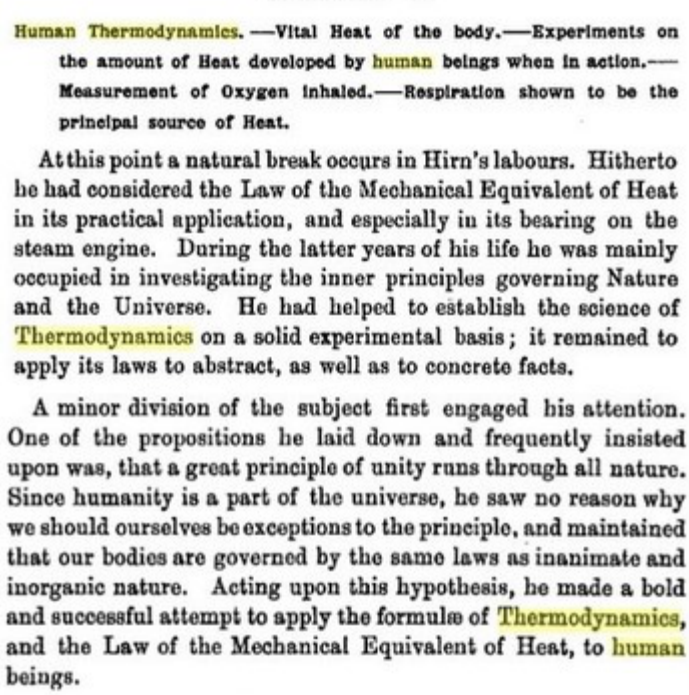

CHAPTER V.

Human Thermodynamics.—Vital Heat of the body.—Experiments on the amount of Heat developed by human beings when in action.—Measurement of Oxygen inhaled.—Respiration shown to be the principal source of Heat.

At this point a natural break occurs in Hirn's labours. Hitherto he had considered the Law of the Mechanical Equivalent of Heat in its practical application, and especially in its bearing on the steam engine. During the latter years of his life he was mainly occupied in investigating the inner principles governing Nature and the Universe. He had helped to establish the science of Thermodynamics on a solid experimental basis; it remained to apply its laws to abstract, as well as to concrete facts.

A minor division of the subject first engaged his attention. One of the propositions he laid down and frequently insisted upon was, that a great principle of unity runs through all nature. Since humanity is a part of the universe, he saw no reason why we should ourselves be exceptions to the principle, and maintained that our bodies are governed by the same laws as inanimate and inorganic nature. Acting upon this hypothesis, he made a bold and successful attempt to apply the formulæ of Thermodynamics, and the Law of the Mechanical Equivalent of Heat, to human beings.

Chapter 5 from English engineer Bryan Donkin's 1894 treatise on the work of Gustave Hirn in which the term '**human thermodynamics**' is coined. [15]

economics was the end-of-book chapter to German physicist Georg Helm's 1887 *The Doctrine of Energy*. [34]

In the 1910s, Sigmund Freud and Carl Jung began to carry over thermodynamic concepts, such as psychic energy and psychic entropy, into psychology, thus founding the subject of psychodynamics.

In 1952, the modern human statistical thermodydnamic view that each person is a human molecule, emerged in the publication *The Next Million Years* by English physicist Charles Galton Darwin, which outlined the logic that sets of reactive human molecules, constitute thermodynamic systems.

In 1977, Belgian chemist Ilya Prigogine one the Nobel prize for work in thermodynamics and soon thereafter, through various publications, began to establish the view that human life is a far-from-equilibrium phenomenon subject to dissipations, bifurcations, and fluctuations.

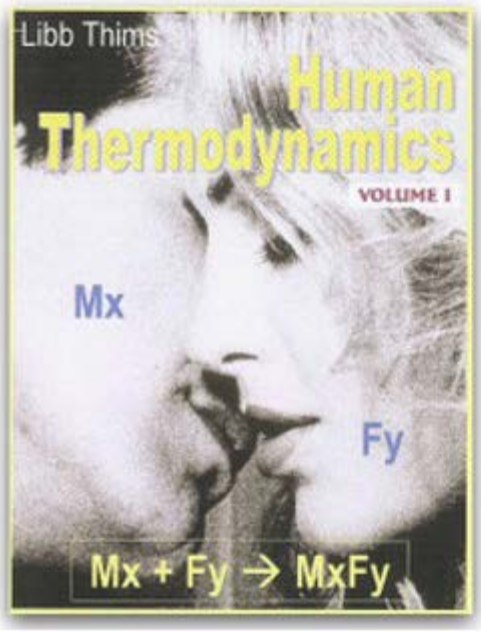

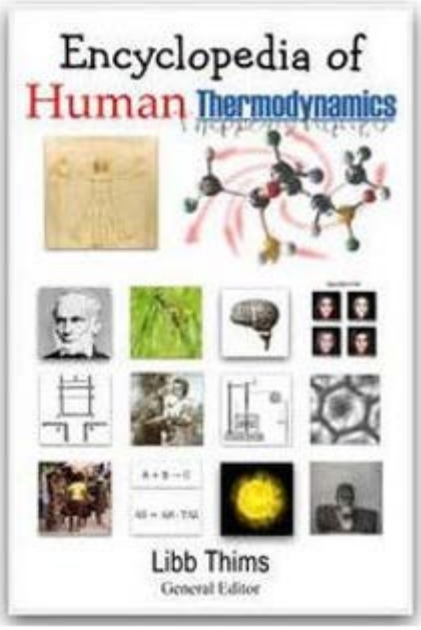

Left: 2004 cover-version to volume one (of three) unfinished-manuscript ***Human***

In 2007, the first chapter on human thermodynamics was published by American chemical engineer Libb Thims and the following year, in early 2008, the *Encyclopedia of Human Thermodynamics* (draft cover pictured) began to be written, online, wiki-style, article-by-article, scheduled to be published as a 5-volume set when near completion.

Modern perspectives

Human thermodynamics, in modern view (as of 2010), in a general sense, is still a relatively underground science, for many. Some consider it a new cutting-edge difficult subject; whereas others may consider it a crank subject or even an anathema, in spite of the fact that well over one hundred people

Thermodynamics (started in 2002), by American chemical engineer Libb Thims, of which about a dozen copies were hand printed and given to reviewers.
Right: 2009 cover design for possible future hard-copy multi-volume publication of the EoHT which is comprised of 1,500+ articles of webpages (each webpage containing 1-30 pages of printed material) as of 2010.

have written and theorized on the subject over the last 150-years. The basic issue is not with the correctness of the science, but with the fact that the application of thermodynamics cuts into the very heart of human stability, in areas such as evolution, love, relationships, free will, death, religion, purpose, racism, etc., and as such the topic easily becomes heated and emotional for many.

In the 2007 book *A History of Thermodynamics*, German physicist Ingo Müller, a professor of thermodynamics for over 30-years, outlines his opinion that the field of human thermodynamics is a science of the future. In particular, in his section on "socio-thermodynamics", he states that "on several occasions I have hinted at the usefulness of thermodynamic concepts in *remote areas*, i.e. fields that have little or nothing to do with thermodynamics as first sight."

He continues, "those hints would be wanton remarks unless I corroborated them somehow, in order to acquaint the reader with the spirit of extrapolation away from thermodynamic proper." To be sure, he reasons:

> "Most such subjects [socio-thermodynamics] are more to the future of thermodynamics rather than to its history."

In the current view, he points out that "they are struggling to be taken seriously, and to obtain admission into the field." [11]

Websites

The site HumanThermodynamics.com was launched in 2005 by American chemical engineer Libb Thims designed to be an introduction to the subject to the layperson. The site is host to the *Journal of Human Thermodynamics*, a online journal devoted to publications on the application of thermodynamics to any of various facets of human existence, and the Institute of Human Thermodynamics, a group of related people interested in the promotion and understanding of how thermodynamics applies to humanity. To a good approximation, the appendix of the site was a precursor to EoHT.info.

Another site is SocialThermodynamics.org launched in 2009 by Spanish entrepreneur Gregory Botanes, which uses prediction methods of thermodynamics, particularly statistical thermodynamics, to consult businesses in the correct direction.

Human thermodynamics education

See main: Human thermodynamics education

The teaching of human thermodynamics in college is not yet a fully-established field. The subject has been taught in various hues over the last century or so, beginning with Polish social-economist Leon Winiarski who taught a course called "Social Mechanics", based on the works of Rudolf Clausius and Joseph Lagrange, at the University of Geneva over a period of six years (1894-1900), as outlined in his 1900 article "The Teaching of Pure Political Economics and Social Mechanics in Switzerland", a methodology as outlined in his collected-works treatise *Essay on Social Mechanics*. [33]

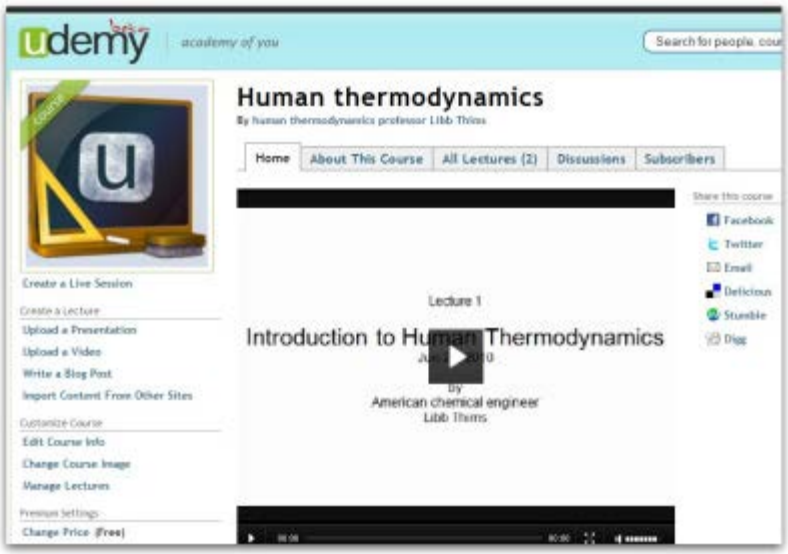

A new 2010 test-stage online course on human thermodynamics, at UDemy.com, taught by American chemical engineer Libb Thims. [32]

Others to following in this mode of teaching include:
American physicist Arthur Iberall who taught a thermodynamics-based course on living systems and human systems at UC, Irvine beginning in the 1970s, in which he considered people to be 'human atomisms'; to Prigoginean thinker Dick Hammond who gave lectures and taught courses on a simplified type of "entropy ethics" to elementary schools, high schools, and colleges in Texas in the 1980s; other human thermodynamics topic teachers include: Lawrence Henderson (1930s), Robert Lindsay (1940s), Richard Piccard (1997), Douglas White (2000), Bruce Clarke (2001), Jürgen Mimkes (2005), Christopher Edwards (2006), Richard Hughes (2008), and most-recently American chemical engineer Libb Thims, who began lecturing to various undergraduate engineering classes on human thermodynamics in 2010.

A free online course on human thermodynamics was initiated by Thims in June, 2010 at the University of Democracy (UDemy.com), consisting of video lectures, discussion groups, handouts, homework, etc., as pictured adjacent. This course, however, is still in the test stage. [32] A long-term goal of Thims is to establish a new school of human thermodynamics, similar to the Lewis school of thermodynamics, at a yet unnamed American university, to teach the correct application of thermodynamics in engineering, human engineering, bioengineering, sociology, psychology, economics, anthropology, politics, with government funded project applications in human thermodynamics applications.

Etymology | Historical

See main: Human thermodynamics quotes

The following is a chronological listing of the use of the term "human thermodynamics" since the inception of thermodynamics (1850):

	Quote	Photo
	"The creation of **thermodynamics** is a new era in the development of all science, and not just that of only physical-mechanical aspects. She came to enforce laws and defined a clear interpretation of a host of phenomena which seemed to have no other rule than chance. To identify the various species of elements that constitute beings, and who, by their mutual relations, give rise to phenomena, it was natural to start from the very principles that have somehow changed our science, and linked them into a single beam. From these principles we can draw **philosophical** and implications." — Gustave Hirn (1868), *Philosophical Implications of Thermodynamics* [29]	
	"The basic and simple ideas, from which the laws of energy spring, as they stem from the roots of natural science, seems a more extensive exploitation to be able to explain things that have to do with transformations and transitions not only in science alone, but among other things, economics." — Georg Helm (1887), *The Doctrine of Energy* [35]	
	"**Human thermodynamics** is the study of vital heat of the body; experiments on the amount of heat developed by human beings when in action, measurement of oxygen inhaled; respiration shown to be the principle source of heat." — Bryan Donkin (1893), on the work of Gustav Hirn [15]	

“The energy of **social** transformation is submitted to the same laws as the energy of the universe. These are the laws of **thermodynamics**. We can thus represent a primitive horde, as a material system in movement, the driving forces that cause the movement being hunger and love or attraction. Similar to how a cannonball meeting an obstacle transforms the energy contained in its mass movement into internal heat, energy of light, electricity, etc., so to do the members of the movement of the crude social mass transform when meeting barriers from the natural surroundings and other tribes, represented by economic, political, legal, moral, aesthetic, religious, and intellectual needs. There is transformation of the energy of the mass social movement in internal energies, psychologies, but there is no gain or loss of energy. Moreover this transformation is continuous across social system. Just as any movement of any mass of the universe is accompanied by production of heat, so to are the masses of biology and society transformed into mental phenomena of different kinds. Here we can apply the first principle of thermodynamics: that of the equivalence (the principle of Mayer).”

— Leon Winiarski (1898), “Essay on Social Mechanics: Social Energy and its Measurements.” [31]

“I intend to seek analogies between social and physical movements, therefore, to compare the mechanics of social science with **thermodynamics**. I owe you some explanations on this design. There is need to establish a *new science* if analogies and relations that unite science are already established. In doing so, the **human** mind obeys the feeling that he has the web link and continuity of natural phenomena at the same time, if using the similarities found it is possible to determine more accurately the specific content of the new science and to classify the essential elements, then they serve it as it touchstone of human theories.”

— Maurice Hauriou (1899), *Lessons on Social Movement* [30]

“Through determining some kind of laws of **human thermodynamics**, we shall be more successful in doing good in the world. I am going to try to see what these laws of human thermodynamics are; of course they cannot be expected to have the hard outline of the laws of physical science, but still I think some of them can be given a fairly definite form.”

— C.G. Darwin (1952), *The Next Million Years* [1]

“**Human thermodynamics** is the application of mathematical formula and principles of thermodynamics to the economic and social sciences.”

1956

— Mehdi Bazargan (1956), *Thermodynamics of Humans* [27]

Quotes

The following are other related quotes:

"Based on identities of adhesion, individuals are seen as a mass, as numbers, independent of their molecular wealth. The molar group organizes a kind of **human thermodynamics**, an exteriorized channeling of behavior and character that squanders individual qualities."

— Pierre Levy (1994) [16]

"Our school tragedies are an early warning of something inherent in the laws of **human thermodynamics**."

— John Gatto (2000) [19]

"The conclusions of hierarchical thermodynamics correspond excellently to Libb Thims' conception of the **thermodynamics** of **human** molecules."

— Georgi Gladyshev (2006) [20]

"The novel [*Doctor Faustus*] is in one sense a study in **human thermodynamics**—what it takes to make certain kinds of total and fundamental changes. In totally starting over, as opposed to gradually starting evolution, the Nazi experience suggests that what is necessary is a collective quantity of energy that is available only in the primitive and unconscious human energy centers, those energy centers deposited by hundreds of thousands of years of survival tactics—the reptile centers in our brains."

— John Anderson (2006) [21]

"**Human thermodynamics** [is] the chemical thermodynamic study of human molecular reaction life."

— Libb Thims (2007) [1]

"If we accept Thims' logic of **human thermodynamics** as a viable explanatory framework, which it very well is, romantic bonding then becomes the subject matter of quantum electrodynamics (QED), an aspect of particle physics that traces human attachment and bonding to the interactions of photons and electrons."

— Satch Ejike (2008) [22]

See also

- Human thermodynamics books
- Human thermodynamics (definitions)
- Human thermodynamics (objections to)
- Human chemistry
- Human molecule

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(c) Human thermodynamics - IoHT Glossary.

Cover of Romanian electronic music producer Bogdan Anghel's 2010 EP **Human thermodynamics**, featuring four tracks: (1) pressure correlations 5:27, (2) phase transition 7:10, (3) aerospace race 7:07, and (4) transport phenomena 8:03; songs which, as depicted on the album cover, are intended to represent a sort of semi gas-phase, semi surface-attached depiction of human particles or human molecules, flying about and interacting sort of like the particles of an ideal gas in a state of Utopian natural harmony with the earth. [28]

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5. (a) Quote: according to "known facts with reference to the mechanics of animal and vegetable bodies" there is "at present in the material world a universal tendency to the dissipation of mechanical energy" and that "any *restoration* of mechanical energy, without more than an equivalent of dissipation, is impossible in inanimate material processes, and is probably never effected by means of organized matter, either endowed with vegetable life or subject to the will of an animated creature"
(b) Thomson, William (Lord Kelvin), "On a Universal Tendency in Nature to the Dissipation of Mechanical Energy" (Google Books) (URL), Proceedings of the Royal Society of Edinburgh for April 19, 1852, also Philosophical Magazine, Oct. 1852, also Mathematical and Physical Papers, vol. i, art. 59, pp. 511.
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(b) Soon there after, in the words of American historian Henry Adams, the general public consensus was that "if life was to disappear, the form of vital energy known as social energy, must also, presumably go to increase the entropy of the universe" (Source: Henry Adam's 1910 "A Letter to American Teachers of History", pg. 150).
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θΔics

In thermodynamics, **human thermodynamics (definitions)** refers to concise definitions of the science of human thermodynamics, some of which are listed below, chronologically:

Definition	Author
"**Human thermodynamics** concerns the subjects of vital heat of the body; experiments on the amount of heat developed by human beings when in action, measurement of oxygen inhaled; respiration shown to be the principle source of heat."	Bryan Donkin [1] (1893)
"**Human thermodynamics** is the statistical mechanics of conservative dynamical systems of human molecules."	C.G. Darwin [2] (1952)
"**Human thermodynamics** is the application of mathematical formula and principles of thermodynamics to the economic and social sciences."	Mehdi Bazargan [3] (1956)
"**Human thermodynamics** is the chemical thermodynamic study of human molecular reaction life."	Libb Thims [4] (2007)

See also

- Thermodynamics (definitions)

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θΔics

In thermodynamics, the **etymology** of the term **human thermodynamics** traces the history of the use of the term by those as English engineer Bryan Donkin (1893), English physicist C.G. Darin (1852), American physician Karlis Ullis (1999), and American engineer Libb Thims (2001), each independent to each other, among others.

Overview

In 1893, English engineer Bryan Donkin was using the terms "human thermodynamics" and "human thermo-dynamics" in reference to the earlier work of Gustav Hirn, specifically his philosophical thermodynamics work and his measurements of the mechanical equivalent of heat to human beings in action. [1]

In 1952, English physicist C.G. Darwin, in his *The Next Million Years*, independently of Hirn, it seems, used the term "human thermodynamics" as the science of the thermodynamics, particularly statistical thermodynamics, of systems of human molecules. [2]

In 1999, American physician Karlis Ullis, in his chapter seven is titled "The Critical Point and the Theory of Human Thermodynamics", used the term human thermodynamics, in a rather metaphorical way, to speculation on how entropy relates to over-training. [3]

Between 2002 and 2004, American chemical engineer Libb Thims wrote a three unpublished manuscripts each titled *Human Thermodynamics*, in an effort to uniformly apply chemical thermodynamics in an explantion of human existence. [4]

In September of 2007, Thims published the first true chapter on "human thermodynamics", uniform in basis in its outline of the statistical thermodynamic and chemical thermodynamic analysis of systems of chemically reactive human molecules. [5]

In December of 2007, the online *Encyclopedia of Human Thermodynamics* was started by Thims and Russian physical chemist Georgi Gladyshev. [6]

See also

â— Human thermodynamics (synonyms)

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(b) See: EoHT wiki: Draft Cover

θΔics

In science, **objections to human thermodynamics** are the negative opinions or detractors, in the last two-hundred years, that have professed strong objections to the use of thermodynamics to model or understand the dynamics, processes, and or evolutions involved in the act of human life (human thermodynamics) or the use of terms such as energy or entropy, etc., in human chemistry. These individuals and points of view are listed below.

Wieland

See main: Goethe's human chemistry

In 1809, German polymath Johann Goethe used Swedish chemist Torbern Bergman's 1775 chemical affinity theory, where single displacement reactions, such as:

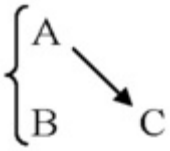

are characterized as affinity reactions, subject to affinity table formulation (precursor to free energy tables), the force of which is quantified via chemical affinity or elective affinity preferences, which, in modern terms, is known as the change in Gibbs free energy ΔG, as shown by the following expression, where *A* is affinity:

$$A = -\Delta G$$

to outline a theory of affinity reactions occurring between people (as if A, B, and C were humans), in a pre-determined way, in coded form, in his novella *Elective Affinities*. In 1810, Goethe's fellow author and neighbor Christoph Wieland (pictured adjacent) sent a letter (which he suggested should be burned after it is read) to his close friend German philologist and archaeologist Karl Böttiger stating that: [1]

> "To all rational readers, the use of the chemical theory is nonsense and childish fooling around."

Wieland, to note, objected owing to the "radicalness of his Christianity" as he commented.

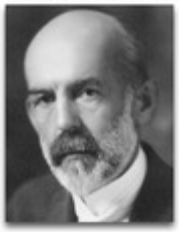

Cooley and Mead

At the turn of the 20th century, supposedly, having been stimulated by the equilibrium and life theories of English philosopher Herbert Spencer and the reserve energy theories of American psychologist William James, American social psychologists Charles Cooley and George Mead questioned the validity of applying theories taken from the physical sciences to the activities of human beings. In particular, thermodynamic laws, they argued, did not appear to make sense of psychological realities. [10]

Freud's psychodynamics

See main: Psychodynamics

Throughout his career, British developmental psychologist John Bowlby (shown adjacent) was very outspoken against Austrian psychologist Sigmund Freud's use and application of thermodynamics in psychology in his development of, what Bowlby calls, Freud's "psychical energy model", otherwise known as psychodynamics. In fact, Bowlby devoted the entire first chapter, titled "Point of View", of his monumental three-volume *Attachment* series treatise, towards an effort to discredit Freud in his use of physics terms, such as energy, entropy, force, pressure, or inertia, as in "principle of inertia", etc., in psychology. To cite one example, at the end of this first chapter, published in 1969, Bowlby states: [2]

"Nor is it to be supposed that the principle of entropy apples to living as it does to non-living systems."

Bowlby is thus under the view that the second law of thermodynamics does not apply to living systems, people in particular.

Samuelson

Ironically, one of the strongest objectors to the use of thermodynamics, particularly entropy, to understand human society and economics was American economist Paul Samuelson (shown adjacent), winner the 1970 Nobel Prize in Economics, sole protegé of the American polymath Edwin Wilson, who had himself been the sole protegé of Yale's great physicist Willard Gibbs, the main founder of chemical thermodynamics. Samuelson was adamantly against any version of economic thermodynamics, in spite of the fact that he himself used Gibbs mathematics in his own work. Most famously, in his 1970 Nobel Lecture, after digging into a discussion on his reformulation of the Le Chatelier's principle in economics, a principle based on Gibbsian thermodynamics, Samuelson told the audience that: [3]

> "There is nothing more pathetic than to have an economist or a retired engineer try to force analogies between concepts of physics and the concept of economics … how many dreary papers have I had to referee in which the author is looking for something that corresponds to entropy or to one or another form of energy."

In another example, in 1972 he commented that: [4]

> "The sign of a half-baked speculator in the social sciences is his search for something in the social system that corresponds to the physicist's notion of entropy."

Likewise, at the 1989 *Gibbs Symposium*, organized to honour the memory of Gibbs on the 150th anniversary of his birth, Samuelson had become even more pessimistic on the use of thermodynamics in economics:

> "As will become apparent, I have limited tolerance for the perpetual attempts to fabricate for economics concepts of 'entropy' imported from the physical sciences or constructed by analogy to Clausius-Boltzmann magnitudes".

Moreover, at the Symposium, he continues: [5]

> "The monthly mail still brings grandiose schemes to replace the dollar as a unit of value by energy or entropy units. Superficial knowledge of thermodynamics, brought into contact with ignorance of economics, cannot even in the presence of the catalyst of noble intentions beget stable equilibrium of useful products. This is not a tautology, merely a finding of fifty-five years of reading the morning mail."

Samuelson states here then that during the years 1934 to 1989 he has been receiving article submissions, either each morning or monthly, on the subject of thermodynamics applied in economics.

Rossini's political thermodynamics

See main: Rossini debate; see also: Political thermodynamics

In 1971, American chemical thermodynamicist Frederick Rossini argued that governments are regulated

by the laws of chemical thermodynamics. In particular, during one part of his Priestley Medal address, used the combined law of thermodynamics to understand the paradox between freedom and security in social life. [6] This lecture, 35-years later, in 2006, came to spark quite a debate between Americans chemist Harold Leonard, physical chemist John Wójcik, and chemist Todd Silverstein. [7] To cite one opinion in this debate, voiced by Wójcik:

> "Worst of all, there is some danger that chemical thermodynamics will have ascribed to it a power that it simply does not have, namely, the power to explain the human condition."

Of course, as discussed in his article, Wojcik, similar to Weiland, is a hardened Christian (in fact taught physical chemistry at Catholic college), and this is where his real objection lies.

Cohen and Stewart

In the 1994 work *The Collapse of Chaos*, English zoologist Jack Cohen and mathematician Ian Stewart (1945-), who seems to be the main objector, give a very derogatory and near elementary school view of thermodynamics, in general, and in the context of the complexity of life, attempt to argue that it is not relevant. [15] In particular, they define the second law simply as "disorder always increases", and comment that: [16]

> "Thermodynamics is a horrible trap for the unwary. It works beautifully in its original context, heat engines. In most other areas it is usually no more than a metaphor, one that has often been stretched far beyond its breaking point."

Beyond this, they tout out near anti-scientific advice such as:

> "If the laws of thermodynamics seem to conflict with the evidence of your senses, believe your senses and take a long hard look at thermodynamics."

They go on to give nonsensical statements such as "the second law applies only to closed systems in thermodynamic equilibrium", that the question of how the existence of life is consistent with the second law "is bogus", that "the entropy of the universe does *not* [italics theirs] increase over time." There basic message to biologists is that "we don't need to grapple with thermodynamics [or] the molecular structures of chemicals" in order to understand life.

Stewart's 2012 book *In Pursuit of the Unknown: 17 Equations that Changed the World*, contains a chapter on the second law, wherein he rambles on incoherently about how thermodynamics is related to information and that it doesn't apply to Darwin's theory of evolution. [18]

Moriarty-Thims debate

> *See main: Moriarty-Thims debate*

High-entropy state of students

Low-entropy state of student

Irish physicist Philip Moriarty explaining (see: Moriarty-Thims debate) in his 2009 (60 Symbols) YouTube video that ordered arrangements of students (right) can be thought of as being in a low entropy state, and that dispersed arrangements of students (left) can be thought of as being in a high entropy state, but that he cautions that this is only a "metaphor" and that in reality, in his own words, "you *cannot* say that a particular arrangement of students has a thermodynamic entropy."

On 23 April 2009, Irish physicist Philip Moriarty (shown adjacent), a professor of thermal physics for six years, contributed to a video on the symbol "S" on the University of Nottingham's SixtySymbols YouTube channel. On April 30, unaware of Moriarty's video, American chemical engineer Libb Thims made a similar video entitled "What is Entropy?. Shortly thereafter, Thims came across Moriarty's video and ended up commenting on many points in the video, e.g. Moriarty's comment that "the concept [of the symbol S (as discussed in the context of the video)] was developed by a guy named Ludwig Boltzmann", etc. Moriarty responded to these comments at the YouTube channel and went on to criticise strongly the applications of chemistry, thermodynamics, and quantum mechanics to human activity (including romantic liaisons), posting up a followup video three months later, stating the following view:

> "Concepts of entropy apply [only] to gas molecules; you cannot say that a particular arrangement of students has a thermodynamic entropy."

Here, Moriarty is representative of someone who fundamentally misunderstands entropy, which applies to any and all material bodes of the universe, which is why it is one of the laws of the universe. Moriarty continued on to engage with Thims in a prolonged online debate during Sept. 2009. Moriarty's objections to Thims' *human thermodynamics* "thesis" are detailed in that debate (during which Moriarty repeatedly describes human thermodynamics as nonsensical pseudoscience). During the debate Moriarty summarised Thims' views as follows:

> "Thims' laughable central premise is as follows [in Moriarty's view]: 'well, a human is made of lots of atoms. Therefore a human is just a big molecule. Big molecules will behave just like small molecules. Therefore I can apply all thermodynamic principles to human 'molecules'."

This, however, is not Thims' central premise, which is namely that the Lewis inequality applies to human surface interactions as it does to any and all isothermal-isobaric freely going chemical reactions, which is what defines what is "natural" and "unnatural" in earthbound conditions; that a human (according to physical mass) is a 26-element molecules, a now textbook definition (see: *Ecological Stoichiometry*, 2002), is an aside.

Recent views

On November 24, 2005, American chemical engineer Libb Thims added a link to the Wikipedia chemistry article on a simplistic overview of "human chemical reactions", and within fifteen minutes the overview was skimmed and the link was removed by a retired high school geology teacher, by the name of V. Smith, with the following reasoning:

> "The presentation of love viewed as a human chemical reaction (Mx + Fy → MxFy) between two human molecules is good for a laugh, but not much else."

Of note, this last quote was, in large part, a turning point in the irritation level of Thims' mind, impelling him into the irreversible task of writing up the world's first textbook on the subject of human chemistry, a process which took 18-months and 14-days to complete (finished in September, 2007).

In 2007, Canadian chemist Stephen Lower (shown adjacent) considered the following statement, written by American chemical engineer Libb Thims:

> "Human chemistry is the study of reactions between individuals who are viewed as chemical species and with the energy, entropy, and work that quantify these processes. In modern human chemistry, people are viewed as chemical species, or specifically human molecules, A or B, and processes such as marriage or divorce are viewed as chemical reactions between individuals..."

to be "crackpot", meaning it is something akin to an eccentric or lunatic notion, and listed it among a grouping of pseudoscience subjects. In regards to conflict of interest, in the case of Lower, we note that one of his favorite websites is the Scary Bible Quotes site, meaning that he is objecting on religious grounds. [8]

In 2007, Russian bioelectrochemist Octavian Ksenzhek (shown adjacent) put forward the argument that thermodynamics is applicable to economics, but that is reign in political affairs is not possible. According to Ksenzhek, in relation to the thermodynamics of the formation of unions: [9]

> "Apart from economic reasons for joining or not joining societies into huge unions, a significant role may also be played by political considerations ... this aspect, however, is beyond the scope of a thermodynamic approach."

On March 16, 2008, Thims found out about the 22nd Annual Gibbs Conference on Biothermodynamics (October 4-7, 2008), at Southern Illinois University, and on a whim sent out a letter of interest to present (poster or lecture) on human thermodynamics to site organizer American biophysicist Michael Johnson, using EoHT.info as a reference. [13] Johnson then passed the email on to current year site organizers American biochemists Jannette Carey and John Correia (shown adjacent). [14]

On March 18, Carey emailed back to Thims that the program is focused on molecular thermodynamics and that the "program is already set" and Correia emailed back:

> "Is this [a] joke?"

Correia, of coincidence, is a graduate of Villanova University, a Roman Catholic university (meaning Christian-values centric), similar to same as Wojcik (who taught physical chemistry there), meaning that four of the "objectors" on this page (Wieland, Wojcik, Lower, and Correia) are objecting because the premise that chemical thermodynamics governs human activity conflicts with Christianity.

In 2010, Ian Forrester, in comment to English computer scientist Tim Lambert, defined American chemical engineer Libb Thims as "more of a crank than complete whack job Nasif Nahle" as follows: [17]

> "Yes Nasif Nahle is a complete whack job. I did a little bit of searching and found that he has one English paper listed by Google Scholar. It is published in a 'journal' called *Journal of Human Thermodynamics*. It

contains such gems as: 'On the Mechanical Equivalent of Heat and Occupation', 'Facial Vibration Imaging Technology and Quantification of Thermodynamic States of Individuals', 'Coriolis Force and Asymmetry in Chemical-Biological Evolution', and 'Human Thermodynamics and Business Efficiency'. The journal is run by someone called Libb Thims who is even more of a crank than NN."

In 2013, Polish physicist Krzysztof Kulakowski, noted for his 2008 sociophysics article "Sociophysics: an Astriding Science", focused on asking if the second law of thermodynamics can be useful in the social sciences", commented the following to American electrochemical engineer Libb Thims in query about if he would be interested in being on the JHT review board: [19]

> "I would accept it willingly, but the problem is that I deeply do not believe that thermodynamics can be fruitful in solving social sciences, where I work."

Related

The following is a list of people who wanted their Hmolpedia article deleted, for reasons to the effect that they viewed their theory or point of view as not being "human thermodynamic", or something along these lines:

â— Peggy La Cerra (29 Aug 2011)
â— Sarah Wolf (19 Mar 2013)

See also

â— Detractors
â— Elective Affinities (enemies)
â— Human thermodynamics (objections to)
â— Human chemistry (objections to)
â— Libb Thims (attack)

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(b) Leonard, Harold, E. (2006). "Chemical Thermodynamics in the Real World." *Letters, Journal of Chemical Education*, (83) 39, Jan, No. 1. pg. 39.
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(b) Wójcik, John F. (2006). 'A Response to Chemical Thermodynamics in the Real World.' *J. Chem. Educ.* (*83)* 39.
(c) Silverstein, Todd, P. (2006). "State Functions vs. State Governments", Journal of Chemical Education, Jun. (83): 847, Letters.
8. (a) Lower, Stephen. (2007). "List of Flim-flam, Pseudoscience, and Nonsense", Online listings.
(b) In regards to conflict of interest in the case of Lower, a point to note is that he is religiously predisposed or biased, e.g. one of his favorite websites is the Scary Bible Quotes site. This is a common factor to look for behind a person's motives to objecting to a science of "human chemistry".
9. Ksenzhek, Octavian S. (2007). *Money: Virtual Energy - Economy through the Prism of Thermodynamics*, (pg. 118).

Universal Publishers.
10. Russett, Cynthia E. (1991). *Sexual Science* (pgs. 162-63; also: entropy, pg. 128). Harvard University Press.
13. (a) Annual Gibbs Conference on Biological Thermodynamics – Gibbs Society.
(b) Michael L. Johnson (faculty) – University of Virginia.
14. (a) Jannette Carey (faculty) – Princeton University.
(b) John Correia (faculty) – University of Mississippi Medical Center.
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(c) The Collapse of Chaos – Wikipedia.
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(b) Email communication with Libb Thims (14 May 2013).

External links

â— Human thermodynamics: science or pseudoscience? - IoHT, Chicago.
â— Comments on human thermodynamics – IoHT, Chicago.
â— Is this website completely pseudoscientific/a pisstake? (2011) – WrongPlanet.net.

θΔics

In human thermodynamics, **human thermodynamics synonyms** page lists synonymous names or terms that refer to the subject of thermodynamics of humans as used by authors who have published theory on this topic in the form of an article, chapter, or book. Some of these are listed chronologically below:

Synonym	Author	Date	Ref
Human thermodynamics	Bryan Donkin	1893	[1]
Anthropic physics	Wilhelm Ostwald	c.1902	
Scientific humanism	Alfred Ubbelohde	1947	[6]
Human thermodynamics	C.G. Darwin	1952	[2]
Love and Worship: Human Thermodynamics	Mehdi Bazargan	1956	[9]
Thermodynamics in Human Condition	Mehdi Bazargan	1969	[10]
Animate thermodynamics	Sture Nordholm	1997	[11]
"The Critical Point and the Theory of Human Thermodynamics"	Karlis Ullis	1999	[8]
"Physics of Relationships" (relationship physics)	Christopher Hirata	2000	[3]
"Relation thermodynamics"	Wayne Angel	2005	[4]
Human thermodynamics	Libb Thims	2007	[7]

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8. Ullis, Karlis (1999). *Age Right - Turn Back the Clock with a Proven Antiaging Program*, (ch. 4: The Critical Point and the Theory of Human Thermodynamics, pgs. 32-45, section: "Human Thermodynamics", pg. 34-36). New York: Simon & Schuster.
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(b) Bazargan, Mahdi. (1956). *Love and Worship: Thermodynamics of Man* (*Love and Worship: Human Thermodynamics*; or *Love and Devotion: or the Thermodynamics of Humanity*). Houston: Book Distribution Center.

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(b) Chall, Leo P. (1999) “Title” (pg. 984). *Sociological Abstracts*, Vol. 47, Issue 2.
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θΔics

In books, **human thermodynamics books** are books written on topics germane to the subject of how the science of thermodynamics connects or explains aspects of human existence. Some of these books are shown below, listed chronologically:

See

- Thims' thermodynamics book collection

θΔics

In thermodynamics dissertations, human thermodynamics dissertations and or theses refers to the completion of a graduate school degree (MS or PhD) in the field of human thermodynamics, human chemical thermodynamics, or human statistical thermodynamics.

The following are MS and PhD theses/dissertations in human thermodynamics:

Year	Person	Dissertation/Thesis	School
1920	Josef Schnippenkotter (1886-c.1955)	*The Entropological Proof of God: the Physical Development of the Entropy Principle and its Philosophical Meaning* (PhD) (*Der Entropologische Gottesbeweis: Die Physikalische Entwicklung des Entropieprinzips, seine Philosophische und Apologetische Bedeutung*)	School?
1966	William Plank (c.1934-)	Thesis: "Art and the Artist in the Cosmogenesis of Teilhard de Chardin" (MA in French)	University of Washington-Seattle
1966	John O'Manique (1936-2003) Canadian mathematical physicist	Thesis: "The Theory of Orthogenesis in the Synthesis of Teilhard de Chardin" (PhD)	University of Ottawa
1972	Stephen Coleman (1942-)	*Measurement and Analysis of Political Systems: a Science of Social Behavior* (PhD) (on Shannon entropy / thermodynamics entropy of political systems)	University of Minnesota
1974	Carter Finn (1935-)	Thesis/dissertation: "Religion, Philosophy, and the Second Law of Thermodynamics"	College of William and Mary
1978	Dick Hammond (c.1938-)	Thesis: *Analysis of Entropy Reduction and its Implications for Ethical Instruction in Public Education* (EdD)	University of Arkansas and University of Texas Adviser: Ilya Prigogine
1988	Seth Lloyd (1960-) American	*Black Holes, Demons, and the Loss of Coherence: How Complex Systems Get Information, and What They Do With It* (PhD)	Rockefeller University Advisor: Heinz Pagels

	physicist		
1992	Matthias Ruth (1964-) American natural economist	*Economic Processes and Environmental Repercussions: Synthesizing Economics, Ecology, and Thermodynamics* (PhD)	University of Illinois, Urbana [4]
c.1995	Kozo Mayumi (1954-) Japanese applied economist	Thesis: "Land: Ecological and Economic Achilles' Heel" (in economics) (MA) (working under Nicholas Georgescu) (1988) *Studies on Georgescu-Roegen's Bioeconomic Paradigm* (PhD)	Vanderbilt University and Kyoto University
1998	Satish Boregowda (c.1968-) Indian-born American mechanical engineer	*Thermodynamic Modeling and Analysis of Stress Responses* (PhD)	Old Dominion University, Virgina (funded by NASA Langley Research Center)
1999	Sip de Vries (c.1969-)	*Thermodynamic and Economic Principles: and the Assessment of Bioenergy* (PhD)	Delft University of Technology [1]
2003	Mircea Gligor (1963-2015) Romanian physicist and econophysicist	"Thermodynamics and Statistical Models for Dissipative Socio-Economic Systems" (PhD)	Alexandru loan Cuza University, lasi, Romania. Advisor: Margareta Ignat
2003	Nathaniel Umukoro (c.1980-)	"Thermodynamics: Application of its Principles to Conflict Diagnosis, Management and Resolution in the ***** Delta of Nigeria" (MS)	University of Ibadan, Nigeria Department: humanitarian and refugee studies
2008	Stefan Pohl-Valero (c.1977-) Spanish mechanical engineer	"The Circulation of Energy: Thermodynamics, National Culture, and Social Progress in Spain, 1868-1890" (PhD)	Universitat Autonoma de Barcelona. Advisor: Agusti Nieto-Galan

2010	Luis Arroyo (1990-)	"A Thermal Model of the Economy" (MS)	University of Puerto Rico, Mayaguez Department: physics
2011	Jeff Tuhtan (1979-) American civil-ecological engineer	"A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality" (PhD)	Institute for Modeling Hydraulic and Environmental Systems at the University of Stuttgart, Germany. Advisor: (add) Consultant advisor: Libb Thims
2015	Thomas Mapes (c.1985-)	"Literatures of Stress: Thermodynamic Physics and the Poetry and Pross of Gerard Manley Hopkins" (PhD) (pdf)	Georgia State University, English Department

In 1991, Swiss electrical engineer Francois Cellier, in his *Continuous System Modeling*, suggested that the thermodynamics of macroeconomies would be a "very worthwhile topic" for a PhD dissertation. [2]

In 2009, Hmolpedia member Turnkey13, a third-year undergraduate mechanical engineer, from Turkey, expressed desire to come to America to complete a master's degree in on a topic related to thermodynamics of human life, having been inspired by passages, such as shown below, in the 2006 *Thermodynamics* textbook by Yunus Cengel and Michael Boyle: [3]

> "The arguments presented here are exploratory in nature, and they are hoped to initiate some interesting discussion and research that may lead into better understanding of performance in various aspects of daily life. The second law may eventually be used to determine quantitatively the most effective way to improve the quality of life and performance in daily life, as it is presently used to improve the performance of engineering systems."

In 2010, Hmolpedia member DeeM1, an American business executive, with background is business, marketing, management consulting, and leadership development, and co-owner of several companies, one of which is a post-graduate school of managerial leadership, is embarking on doctoral studies on entropy on human behaviors and energy within organizations. [4]

Econophysics PhD programs

Of note, as of *circa* 2004, American physicist Joseph McCauley has been heading one of the world's first econophysics programs at the University of Houston, Texas; although, ironically, in spite of the fact that McCauley completed his own PhD under Norwegian-born American thermodynamicist Lars Onsager, curator of the reciprocal relations (one of the so-called fourth law of thermodynamics candidates), the version of economic physics taught abstains from the use of thermodynamic, because in McCauley's view "real financial markets cannot behave thermodynamically", which of course is incorrect, because everything in the universe behaves thermodynamically.

Human chemistry

The following are dissertations in human chemistry:

Year	Person	Dissertation/Thesis	School

1977	Jeremy Adler (1947-)	PhD: *Goethe's Elective Affinity and the Chemistry of its Time* (*Goethe's 'Wahlverwandtschafte' und die Chemie seiner Zeit*)	University of London Advisor: Claus Bock

School of human thermodynamics

In 2005, American chemical engineer Libb Thims posted an online notice suggesting that in the near future graduate students will be able to complete their PhD in human thermodynamics. [1] In 2009, Thims began expressing desire to various heads of thermodynamics departments, at various of universities, that he was interested, in the potential near future, in founding an entire school of teaching human thermodynamics, subject material to be required coursework for the engineering, sciences, and humanities departments, similar in style and stature to what American physical chemist Gilbert Lewis did in founding the now-famous Lewis school of thermodynamics at the University of California, Berkeley. Out of these discussions, one thermodynamics professor, thus far, has taken Thims out to lunch to suggest that Thims join their thermodynamics department.

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4. Understanding the Effect of Entropy on Human Energy (6 Sep 2010) – Thread, EoHT.com.

θΔics

In education, **human thermodynamics education** refers to any course or assignment taught in high school, college, or graduate school that teaches subjects related to human thermodynamics or branches of, e.g. economic thermodynamics, or related subjects such as human chemistry. Being that "human thermodynamics" and its branches, e.g. sociological thermodynamics, are considered either a newly developing science or a science of the future, related subjects are often only given as assignments or found as a part of a course.

SOS 623	Seminar on Social Thermodynamics	[3]

This course will be held in the form of seminar. The advantage of general system theory will be solidated and the drawbacks of it will be complemented. The theory of Social Thermodynamics and its application will be also introduced.

In 2011, Korea University Graduate School was offering a three credit graduate course entitled "Seminar on Social Thermodynamics" SOS 623 (SOS short for Sociology of Science), as described above, a type of **human thermodynamics education** course divided into two parts: firstly, general systems theory, a discussion of its basic outline, along with its drawbacks; and, second, with what they referred to as the "theory of social thermodynamics and its applications", supposedly on some variant of social thermodynamics, at the introductory level, and discussion of its applications, either theoretical or possibly in the applied human thermodynamics area, an example being the the 2009 company "Social Thermodynamics Applied Research" (or SThAR). The program, as indicative of its two cultures approach, employs a "two-supervisors system" : one is based on human or social science, the other is based on natural science or engineering. [17]

BYU | Science Phy 453 – Sociology and Physics

In 2011, Brigham Young University, was running a winter 400-level course called "Science Phy 453: Sociology and Physics", taught by professor David Samuels Barnard, whose course notes contain Mieczyslaw Dobija's 2004 "Theories of Chemistry and Physics Applied to Developing an Economic Theory of Intellectual Capital", Jing Chen's 2008 "Understanding Social Systems: a Free Energy Perspective", which, in turn, cities the works of John Bryant (2007), Bikas Chakrabarti (2005), Charles Hall (1986), Paul Colinvaux, Erich Muller (1998), Jurgen Mimkes (2005), Libb Thims (2007), and the Rossini debate works of Harold Leonard (2006) and Frederick Rossini (1971), among other residual works, such as Edwin Jaynes. [24]

University of Sydney | Social Thermodynamics PhD

In 2017, the engineering and information technologies department at the University of Sydney was advertising (Ñº)(Ñº) a 3-year $27K annual stipend allowance funded for "student undertaking a PhD in social thermodynamics [aimed at] developing a framework to model social systems (e.g. urban development) using the state of the art techniques of non-equilibrium statistical mechanics and thermodynamics", done under the guidance, presumably, of civil engineer Ramil Nigmatullin (Ñº), who relies on far from equilibrium models.

Need

See main: Two cultures (call)

The call for the development of an interdisciplinary field of mathematics, chemistry, physics, thermodynamics, and engineering overlapping and integrated into the subjects of the humanities, in such a way to dissolve the ever-growing two cultures divide, has been wanting for nearly two-centuries. To exemplify, the following is Austrian social economist Werner Stark's noted 1962 self-query as to why Thomas Huxley's 1871 call for the development of the field of social chemistry has never actuated: [19]

> "Why should no social chemistry ever been developed?" He states that "nobody would suggest that the social scientists should imitate meteorology, for this discipline does not appear to have got very far … but what about chemistry? A sociology based on chemistry [has] in fact been called for, but, significantly, [this call has] found no echo. It would have been easy to take up this suggestion and develop it further. An intending social chemist would have found it one whit more difficult to manufacture a sociological parallel to the Boyle-Charles law than Haret did to the Newtonian propositions. But the **experiment** appears never to have been tried. Why?"

In 2012, to exemplify the modern graduate student need, Italian physicist Simone Loreti sent the following email query to the Institute of Human Thermodynamics, as received by American electrochemical engineer Libb Thims: [21]

> "In March 2011, I graduated with a master's degree in theoretical physics at the University of Bologna (Italy). I am strongly interested in sociophysics or in general in physics applied to human behavior: in my thesis I solved a sociological problem using statistical mechanics, and machine learning methods. I am looking for a PhD in socio-physics or human thermodynamics and/or funds for it. Do you know something about it? Any advice is welcome."

The template design for Libb Thims-conceived C.P. Snow-themed **Two Cultures Department**, teaching the subject matter structured about the interdisciplinary relationship between second law (Clausius) and the various branches of the humanities (Shakespeare), bridging the gap between the famously left-brain right-brain divided "two cultures"; the synthesis of which being first captured in the mind of Goethe (see: Goethe timeline), and tested in the coursework of Leon Winiarski at the University of Geneva (1894-1900), in his thermodynamics-based socio-political economics course (see: social mechanics). [23]

Thims informed Loreti that he was in the process of attempting to establish a "two cultures university" department in America presently.

Overview

The first to remotely incorporate early versions of human chemical thermodynamics in college lecture was German polyintellect Johann Goethe who in his 1796 university lectures on anatomy discussed how affinity chemistry might apply to the interactions between humans.

The first to teach a college course utilizing thermodynamics in the humanities was Polish economist Léon Winiarski, who beginning in 1894 was teaching a course called "Social Mechanics" at the University of Geneva; a teaching methodology as outlined in his 1900 sociology symposium article "The Teaching of Pure Political Economics and Social Mechanics in Switzerland".

The first to promote the teaching of thermodynamics in educational curricula was American historian Henry Adams, who in 1910, at the age of seventy-two, wrote his *A Letter To American Teachers of History*, suggesting that it was paramount that the implications of the second law of thermodynamics be learned by history teachers and professors and taught as part of history class curriculum, throughout America.

In human thermodynamics, teaching applications have generally been in the fields of history, government, economics, psychology, sociology, and science. In human chemistry, teaching applications have, of recent begun to center around the nature of human bonding, from the psychological and chemical perspective. To cite one example, so strong is the belief that human bonds are inherently chemical bonds (i.e. human chemical bonds), that within the last few years, high school chemistry teachers have begun assigning Internet-based homework assignments in which students are told to use chemical bonding theories to explain the ebb and flow of conflict and collaboration of human relations in terms of manifestations of chemical bonding effects. [1]

Of the two, human chemistry and human thermodynamics, the latter is the more difficult subject and is finding a slower entrance into general education. In the 2007 book *A History of Thermodynamics*, German physicist Ingo Müller, a

professor of thermodynamics for over 30-years, for instance, outlines his opinion that the field of human thermodynamics is a science of the future. In particular, in his section on "socio-thermodynamics", he states that "on several occasions I have hinted at the usefulness of thermodynamic concepts in *remote areas*, i.e. fields that have little or nothing to do with thermodynamics as first sight." He continues, "those hints would be wanton remarks unless I corroborated them somehow, in order to acquaint the reader with the spirit of extrapolation away from thermodynamic proper." To be sure, he reasons,

> "Most such subjects [social thermodynamics] are more to the future of thermodynamics rather than to its history."

In the current view, he points out that "they are struggling to be taken seriously, and to obtain admission into the field." [2]

Human thermodynamics education textbooks

Some, being new to the study of human thermodynamics, may in hasty reaction question the "merits" or praise worthy qualities of the teaching of human thermodynamics as part of a standard engineering thermodynamics curriculum. In regards to this query or concern, in the context of human thermodynamics education, the following is the list of thermodynamics textbooks that include human thermodynamics material as part of its teaching coursework:

Year	Textbook	Human thermodynamics branch
1964	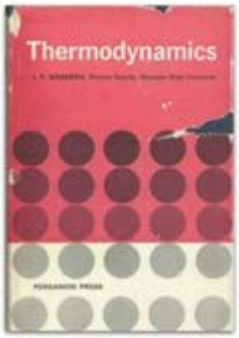 *Thermodynamics* by Ivan Bazarov (1916-2005) Russian physicist	â— Heat death argument *for* the existence of god (Friedrich Engels) â— Heat death argument *against* the existence of god (Bazarov) â— Universal origins
1973	*Fundamentals of Classical Thermodynamics* by Gordon van Wylen (1920-) American mechanical engineer Richard Sonntag (1933-2010) American mechanical engineer	â— Philosophical thermodynamics â— Argument for/belief in the existence of God/Creationism â— Universal origins (low entropy state)/Eschatology â— Destiny of humans (second law)
	Chemical and Process Thermodynamics by	â— Two cultures (C.P. Snow) â— Universal origins/Eschatology/Heat death (Friedrich Engels, Ivan Bazarov) â— Religious thermodynamics (William Inge, Pope Pius XII, Pierre Teilhard) â— Animate thermodynamics (life, origin of life; defunct theory of life) â— Social thermodynamics/Anthropological thermodynamics

1999	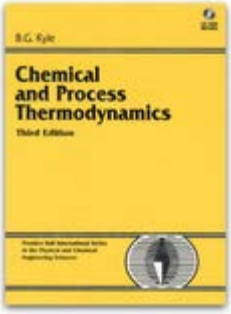	Benjamin Kyle (1927-) American chemical engineer	(Claude Levi-Strauss) â— History thermodynamics (Henry Adams) â— Economic thermodynamics (Nicholas Georgescu-Roegen) â— Ecological economics (Herman Daly, Jeremy Rifkin) â— Literature thermodynamics (John Barth, Donald Barthelme, Saul Bellow, Stanley Elkin, Norman Mailer, Walker Percy, Thomas Pynchon, John Updike) â— Art thermodynamics (Rudolf Arnheim) â— Philosophical thermodynamics (Kyle) â— Psychological thermodynamics (Sigmund Freud)
2004	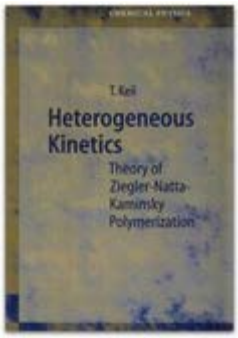	*Heterogeneous Kinetics: Theory of Ziegler-Natta-Kaminsky (chapter 2: Chemical Thermodynamics)* by Tominaga Keii (1920-2009) Japanese chemical engineer	â— Chemical Affinity in 1806 â— Human chemical thermodynamics: *Elective Affinities;* human elective affinity; human chemical reaction, Goethe's affinity table, Goethe's human chemistry (Johann Goethe)
1999 thru 2010	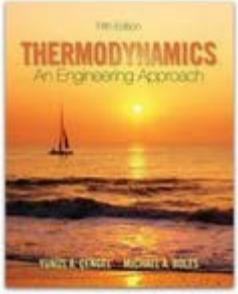	*Thermodynamics an Engineering Approach* by Yunus Cengel (1955-) Turkey mechanical engineer Michael Boles (1943-) American mechanical engineer	â— Economic thermodynamics (Robert Ayres) â— Human thermodynamics (human performance/efficiency in daily existence, learning (low-entropy learning), work place friction, human friction, social friction (entropy generation), etc.) â— War thermodynamics
2010	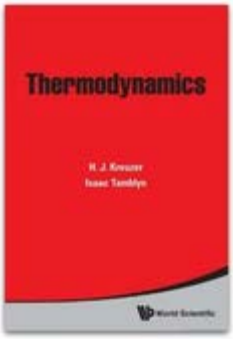	*Thermodynamics* by Hans Kreuzer (c.1945-) Canadian atmospheric physicist Isaac Tamblyn (c.1983-) Canadian physicist	â— Economic thermodynamics (Wayne Saslow)
2011		*Advanced Engineering Thermodynamics* by Kalyan Annamalai (c.1943-)	â— Human molecular formula (Libb Thims)

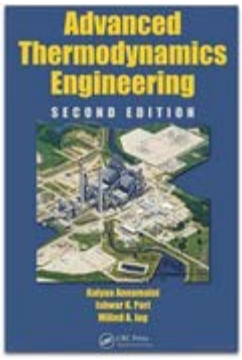

Ishwar Puri
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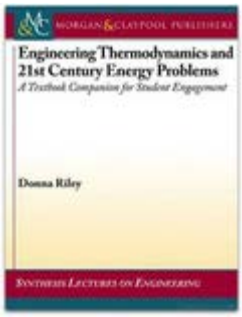

Engineering Thermodynamics and 21st Century Energy Problems

by
Donna Riley (c.1971-)

â— Entropy as a Social Construct (social thermodynamics)
â— Entropy's Philosophical Implications (philosophical thermodynamics)
â— Thermo to Life (defunct theory of life)
â— Ethics of Energy Disasters (ethics)

University courses

The following are outlines of prototype human thermodynamics courses that have been taught at various universities:

Dates	Teacher	Course	School
1894-1900	Léon Winiarski	Taught a course on "social mechanics", focused on economics and sociology, based on the thermodynamics of German physicist Rudolf Clausius and the dynamics of Italian mathematician Joseph Lagrange.	University of Geneva
1930s	Robert Lindsay	Taught an entropy ethics theory courses	Brown University
1980s	Dick Hammond	Promoted the teaching of "entropy ethics" and "energy education" in various schools (elementary, high school, and college)	University of Texas
1997-2006	Richard Piccard	Taught a general education course called "Entropy and Society", associated with the physics department, intermittently, based on American economist Jeremy Rifkin's 1989 book *Entropy: Into the Greenhouse World*, called "Entropy and Society". The course is for seniors, with focus on developing a general education student's ability to interrelate, synthesize, and integrate knowledge from different academic disciplines, and examines Rifkin's theory that matter and energy are conserved, but that physical processes transform both into forms less readily useful (thereby "increasing entropy") according to the material entropy hypothesis. They apply this concept of entropy to human activity, critically examining works by advocates of solar and nuclear power, from the viewpoints of, and using the patterns of inquiry of, several disciplines (e.g., history, theology, economics, physics, politics, engineering, biology, chemistry, ethics, and sociology). Using Rifkin's 1989 book *Entropy: Into the Greenhouse World*, which sets forth the thesis that this concept of entropy has a much broader	Ohio University

		applicability, in such fields as social science, politics, health, etc., the course explores whether this broadening of application makes sense. The immediate goal for students is to try to get some understanding of what entropy means when the term is used in its home territory, physical science and engineering. On this basis, the problem immediately arises when applying entropy to society is that the basic definition of entropy is mathematical. As such, the course focuses on the philosophical aspects (i.e. philosophical thermodynamics) rather than the practical aspects of entropy; and avoids mathematics, for the most part.	
2008	Richard Hughes	A course on a thermodynamical interpretation of politics and world government.	California State University, Sacramento
2009	Bruce Clarke	English 4342.001: a course called "Literary and Narrative Theory", where one of the five reading material selections is American novelist Thomas Pynchon's thermodynamic themed novel *The Crying of Lot 49*, in which students are assigned to critique Pynchon's views on thermodynamic entropy and information theory entropy in relation to the plot. [14] Clarke has begun using EoHT.info as reference material for his class.	Texas Tech University
c.2008	Joseph McCauley	Founded the econophysics department at the University of Houston, pictured below right, which touches on aspects of applied thermodynamics in economics.	University of Houston

In 2013, Harvard University Graduate School of Design offered a four credit seminar course entitled "Air in Motion / Thermodynamic Materialism", taught by Inaki Abalos and Matthias Schuler, in which air and or space (see: nature abhors a vacuum) is treated and studied "thermodynamically", rather than metaphorically, poetically, or phenomenologically, as has been done traditionally. An excerpt from the course description is: [6]

> "The revision carried out by the thermodynamics from the mid XIXth is critical when reconsidering the architectural and landscape conception of this element, thus happened to be a real building material. This is enabled by parametric digital media, which allows not only deciphering its changing nature over time but also conceiving artificial environments, opening new territories at the scale of buildings, public spaces [see also: personal space] and the landscape. Now, the air in movement demands to be studied in its different manifestations, to reveal its power through meticulous analysis, to map them and to conceptualize what we are calling a new idea of thermodynamic beauty [see: beauty] which completes the tectonic tradition and points new directions to architect´s work."

The second part of the course deals with "thermodynamic materialism", in some way, in coordination with a research project at ETH Zurich titled "Thermodynamic Materialism".

Graduate degrees

See main: Thermodynamics dissertations

In 1969, English science historian Jeremy Adler completed his PhD thesis, at Westfield College, London, on the underlying chemists, affinity theory (affinity being a function of free energy), and specific affinity reactions in Goethe's novella *Elective Affinities*; work later becoming very instrumental in American chemical engineer Libb Thims' 2007 textbook *Human Chemistry*.

A snapshot of the econophysics department a the University of Houston, run by Joseph McCauley, who specializes in financial physics, but is against thermodynamics applied to economics (thermoeconomics). [18]

In 1974, American philosopher Carter Finn completed his thesis/dissertation, in philosophical thermodynamics and religious thermodynamics, on “Religion, Philosophy, and the Second Law of Thermodynamics”, at the College of William and Mary.

In 1975, American political scientist Stephen Coleman completed his PhD dissertation, at the University of Minnesota, in political thermodynamics, on *Measurement and Analysis of Political Systems: a Science of Social Behavior*, or on entropy measurements in social systems and with focus on voting and elections. [10] Coleman notes, however, that the focus of his degree was on the purely information theory side of fence and not necessarily a thermodynamics related agenda.

In 1978, American educator Dick Hammond did his EdD thesis, at the University of Arkansas and University of Texas, under Belgian thermodynamicist Ilya Prigogine, on *Analysis of Entropy Reduction and its Implications for Ethical Instruction in Public Education.* [11]

In 1991, as described in the book *Continuous System Modeling*, Swiss electrical engineer Francois Cellier suggested that the thermodynamics of macroeconomies would be a "very worthwhile topic for a PhD dissertation". [16]

German socio-economic physicist Jürgen Mimkes lecturing, at the 2005 2005 *Navodari Econophysic Conference*, , on the thermodynamic applications in economics. [6]

In 2005, American chemical engineer Libb Thims suggested that, in the near future, graduate students will be able to complete their PhD in human thermodynamics. [5]

In 2009, an anonymous Turkey third-year undergraduate mechanical engineer (Turnkey13) expressed desire to come to America to complete a master’s degree in on a topic related to thermodynamic of human life, having been inspired by passages (shown below) in the 2006 thermodynamics textbook by Yunus Cengel and Michael Boles who state that: [12]

> “The arguments presented here are exploratory in nature, and they are hoped to initiate some interesting discussion and research that may lead into better understanding of performance in various aspects of daily life. The second law may eventually be used to determine quantitatively the most effective way to improve the quality of life and performance in daily life, as it is presently used to improve the performance of engineering systems.”

His question to Thims was which books should he read to better understand this topic with regard to entropy and human relations, to which Thims replied that he should start with Thims' 2007 textbook *Human Chemistry*, as it contains all known publications written on entropy and human relations. [13]

Left: American electrochemical engineer Libb Thims lecturing in 2010 on an introduction to human thermodynamics to bioengineering students, at a local Chicago university, standing adjacent to pictures of Clausius, Gibbs, and Lewis. Right: Thims explaining how the Papin engine relates to human chemical affinities, Gibbs free energy, and morality (right or wrong).

In 2011, American civil-ecological engineer Jeff Tuhtan completed his PhD dissertation "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality", using Hmolpedia as his "strange loop", in the language of Douglas Hofstadter, research tool for gaining a handle on how to go about applying thermodynamics correctly to model fish communities, the result of which he employed thermodynamics to deriving a conceptual model designed for alpine river fish habitat.

High school courses

In 2002, at New Trier high school, in Illinois, assigned a project wherein students were asked to consider how elements and chemical species chemically bond or conflict, and to think about how these polar opposite processes of bonding and conflicting play out in life, specifically in human relationships, in the form of human chemical bonds. [1]

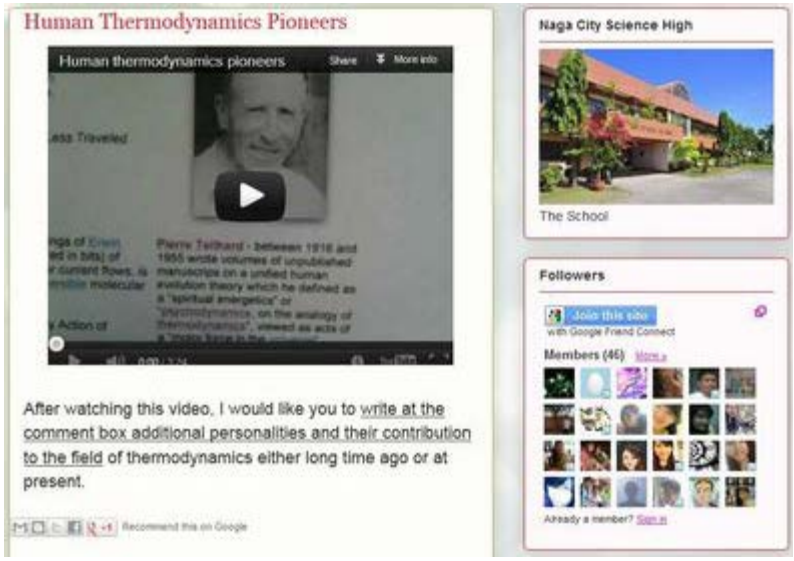

The physics class at Naga City Science High School using American electrochemical engineer Libb Thims' 2009 "Human Thermodynamics Pioneers" video to supplement the thermodynamics portion of the class. [20]

In this assignment, it was argued that by studying how elements interact and bond to each other, students might learn about how humans interact and bond with each other. Suggestive queries were 'how does electrical attraction promote bonding in certain species,' or 'how do incongruent physical shapes between compounds can promote debonding,' and 'why does the famed *opposites attract* scenario occurs in chemistry?', etc. One interesting suggestion was to try to determine what kind of hypothetical chemical bond Romeo and Juliet had in their high-energy relationship. Interestingly, in regards to this last question, even Shakespeare himself had ideas about human chemical bonding. In particular, Shakespeare assumed the existence of an external force that induces amorous attraction. [4]

Conferences

Over the last hundred years, discussions and lectures on the applications of thermodynamics to human life and society, often in their philosophical implications, have occurred in various science-related conferences. Since the mid-1990s, for instance, German metalurgist and solid state thermodynamicist Jürgen Mimkes has been attending various economic conferences in Europe where he lectures on the applications of thermodynamics in economics; such as the 2005 *Navodari Econophysic Conference*, where he lectured on the applications of thermodynamics in economics . [6]

On March 14, 2008, American chemical engineers Ted Erikson and Libb Thims attended the the annual *American Association of Physics Teachers* (AAPT) meeting at Harper College (Palatine, Illinois) where Erickson discussed Thims' human molecule theories in lecture.

Other

In an April 29, 2006, Russian-born American language studies scholar Natalia Roubanenko commented, after reviewing Thims' unfinished 100-page manuscript *Cessation Thermodynamics*, that:

> "One day instead of (or in addition to) regular math, chemistry, physics, etc., kids in school will be learning something like one human molecule + another human molecule = ? ... it's just a crazy thought, but hey, we'll see or somebody will."

In 2007, American educator Astrida Tantillo, head of the department of Germanic studies at the University of Illinois at Chicago and author of the 2001 book *Goethe's Elective Affinities and the Critics*, noted that some of her students had recently requested to do papers on German polymath Johann Goethe human chemistry theory, and referred to the fact that Thims' 2007 *Human Chemistry* textbook would be useful in this respect. [9]

The HumanThermodynamics.com page is used as a "related links" page for the 2009 course BI 6101 Introductory Biology, on the study of the energy of the ecosystem, cell, and human, at Nanyang Technological University, Singapore. [15]

In 2013, a seeming-to-be human thermodynamics education course in architectural thermodynamics, a graduate school seminar course entitled "Air in Motion / Thermodynamic Materialism" taught at the Harvard University Graduate School of Design, wherein air and or space (see: nature abhors a vacuum) is treated "thermodynamically"; the second half of which is devoted to a study of thermodynamic materialism, taught in coordination with a research project at ETH Zurich titled "Thermodynamic Materialism". [22]

See also

â— List of thermodynamics textbooks that include human thermodynamics

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(c) A Thermodynamic View of Politics (PDF) – by Richard D. Hughes.
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θΔics

In films, **human thermodynamic films** are movies based on derivatives or variations of human thermodynamic theory, biographies of human thermodynamic pioneers and their work, or human chemistry and its connection to human chemical thermodynamics, etc., Some of these are listed below:

Year	Cover	Title	Description
1962	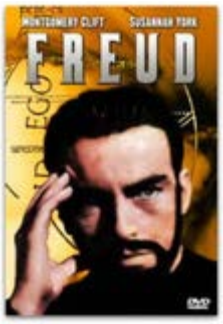	*Freud*	A semi-biographical depiction of Austrian psychologist Sigmund Freud during his formative years 1885-1990 (age 29-34) when he began to develop his psychodynamic concepts, later elaborated fully in his now-famous *Id, Ego, Superego* on the 'mental thermodynamics' of the ego and the forces that act on it in the context of the subconscious. [1] The period follows the 1874 publication of Freud's first-year adviser was German physiologist Ernst Brücke*'s Lectures on Physiology*, which supposed that all living organisms are energy-systems governed by the first law of thermodynamics, which states, in effect, that the total amount of energy in any given physical system is always constant, that energy quanta can be changed but not annihilated, and consequently that when energy is moved from one part of the system it must reappear in another part.
1973		*The Exorcist*	The inspiration behind the character of Father Merrin, in the best seller 1971 book *The Exorcist* (and followup 1973 film), was Pierre Teilhard; and parts of the plot were themed on Teilhard's theory of evil (or the existence of Satan) in the world possibly being Lucifer [or matter-energy spirit] working out his [or its] salvation through the process of physical evolution ending in Teilhard's omega point theory.
1996	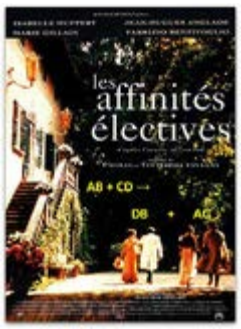	*Elective Affinities* (Le affinità elettive)	A French-Italian rewrite of German polymath Johann von Goethe's 1809 *Elective Affinities*.
1997		*Good Will Hunting*	Based on the life of American prodigy William Sidis and specifically on the incident in which after he was arrested for assaulting an officer and sentenced to year and half jail, he was paroled on the condition that he be locked in his father's psychiatric asylum for one year, during which time he wrote his 1920 magnum opus *The Animate and the Inanimate*, which presents an entropy reversal theory of life.

1999	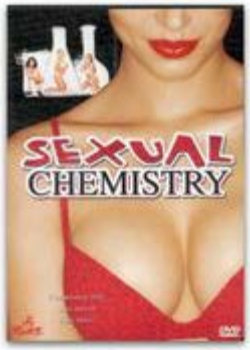	*Sexual Chemistry*: Chemistry 101 Was Never Like This?	A metaphor or analogy themed on terms such as 'sexual chemistry' or 'sexual temperature'?
1999		*The Matrix*	The three required reading books, which had to be read by the actors before the script was opened, were: Jean Baudrillard's 1981 book *Simulacra and Simulation*, Kevin Kelly's 1994 book *Out of Control*, and Dylan Evans' 1999 *Introducing Evolutionary Psychology* (evolutionary psychology).
2006	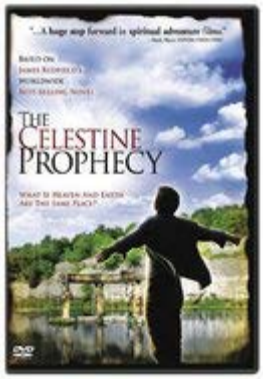	*The Celestine Prophecy*	Based on James Redfield's 1993 book by the same title; which structured, in part, on the psychodynamic theory of Eric Berne's 1964 best-seller *The Games People Play*; discusses how all relationships function as means to get energy, via transformations, power, etc.

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θΔics

In quotes, **human thermodynamics quotes** are those passages, quotations, and definitions, tabulated below, using the specific term "human thermodynamics" and or thermodynamics of humans or people.

> "Contributions to the **thermodynamics** of scientific **humanism** [concerns] insights on the nature of time, [as in] personal or psychological time, and refers to the unification of the specialized sciences effected by the contributions they make to the proper study of mankind, man's nature and destiny."
>
> — Alfred Ubbelohde (1947), *Time and Thermodynamics* [2]

> "**Human thermodynamics** [concerns] vital heat of the body; experiments on the amount of heat developed by human beings when in action, measurement of oxygen inhaled; respiration shown to be the principle source of heat."
>
> — Bryan Donkin (1893), commentary on the work of Gustave Hirn [1]

> "Through determining some kind of laws of **human thermodynamics**, we shall be more successful in doing good in the world. I am going to try to see what these laws of human thermodynamics are; of course they cannot be expected to have the hard outline of the laws of physical science, but still I think some of them can be given a fairly definite form."
>
> — C.G. Darwin (1952), *The Next Million Years* [3]

> "There are no known laws of **human thermodynamics**."
>
> — Howard Green (1954), review of C.G. Darwin's *The Next Million Years* [4]

> "Because of such imponderables and the uncertainties of **human thermodynamics**, I left the hired man on my suspect-list. I rated him 'maximum opportunity, minimum motive'."
>
> — Theodore Roscoe (1959), *Only in New England* [5]

> "Sometimes I think there's a law of absolute conservation of misery in our lives. Some unchangeable first law of human thermodynamics. The amount of unhappiness you're going to experience is fixed."
>
> — William Manville (1977), *Goodbye* [6]

> "Based on identities of adhesion, individuals are seen as a mass, as numbers, independent of their molecular wealth. The molar group organizes a kind of **human thermodynamics**, an exteriorized channeling of behavior and character that squanders individual qualities."
>
> — Pierre Levy (1994), *Collective Intelligence* [7]

"It's just **human thermodynamics**, my friend," John said stiffly, "you're inside the jaws of laws beyond your ken."

— Forbes Allan (1999), *Milton's Progress*

"Our school tragedies are an early warning of something inherent in the laws of **human thermodynamics**."

— John Gatto (2000), *The Underground History of American Education* [9]

"The novel [*Doctor Faustus*] is in one sense a study in **human thermodynamics**—what it takes to make certain kinds of total and fundamental changes. In totally starting over, as opposed to gradually starting evolution, the Nazi experience suggests that what is necessary is a collective quantity of energy that is available only in the primitive and unconscious human energy centers, those energy centers deposited by hundreds of thousands of years of survival tactics—the reptile centers in our brains."

— John Anderson (2006), *Mann's Doctor Faustus* [10]

See also

- Entropy quotes
- Thermodynamics quotes
- Human thermodynamics (definitions)
- Human chemistry quotes

References

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2. Ubbelohde, Alfred René. (1947). *Time and Thermodynamics* (ch. I: Contributions to the Thermodynamics of Scientific Humanism, pgs. 1-10) (signed June 1946). Oxford University Press.
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5. Roscoe, Theodore. (1959). *Only in New England: the Story of a Gaslight Crime* (pg. 200). Scribner.
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θΔics

In human thermodynamics, **human thermodynamics variables table** (CR:33), or "HTV table", is any sort of tabulated listing of thermodynamic variables (extensive or intensive) and their tentative, approximated, or extrapolated correlative measure in human interaction field of study (sociological, economic, evolutionary psychology, etc.) terms along with the author's physical science definition of an individual human, e.g. human molecule (Sales, 1789), human particle, human chemical, human fluid, powered CHNOPS+20 thing (Thims, 2018), etc..

In Mechanics.		*In Economics.*
A particle	corresponds to	An individual.
Space	" "	Commodity.
Force	" "	Marg. ut. or disutility.
Work	" "	Disutility.
Energy	" "	Utility.

American economist Irving Fisher's famous 1892 mechanics-to-economics **variables table**, wherein, being supervised directly by the great engineer Willard Gibbs and economist William Sumner at Yale, he specifically defines a person as a particle (see: human particle). [9]

Overview | Proper translation

See main: Translatability

In 1997, Swedish physical chemist Sture Nordholm, in his famous *Journal of Chemical Education* article "In Defense of Thermodynamics: an Animate Analogy", wherein an outline of the subject he termed "animate thermodynamics", or thermodynamics applied to the study of human behavior, was given, the first formulation step of which, in the scale up or extrapolate up process, according to Nordholm, proper translation of terms and concepts is requisite:

> "Thermodynamics great generality and power remains hidden by layers of abstraction and axiomatic rigor. Must this be so? Could we not gain much by loosening the strictures and bringing the main point home by more qualitative applications of thermodynamics to the widest range of everyday experiences? An attempt, at the same time loose and seriously meant, follows. I will argue that given the **proper translation of terms and concepts** from the inanimate to the animate world the laws of thermodynamics can be seen at work in our everyday lives. No proofs will be offered."

The variety of ways, historically, in human thermodynamics, this "translation" process has accrued in a number of parallel ways, in 2011, prompted American electrochemical engineer Libb Thims to begin requiring that all submitting JHT authors provide "human thermodynamics variable tables", themed in outline to American economist Irving Fisher's 1892 mechanics-to-economics variables table, shown in part above (in full below).

Balfour Stewart | 1883

In 1883, Scottish physicist Balfour Stewart, noted for his 1868 "social cannon ball" theory, co-authored with English astronomer Norman Lockyer, noted founding editor of *Nature*, although he did not make a table, gave the following equivalences: [8]

Description	Energy type	Economic correspondence
"Energy of position"	Potential energy	Money in the bank or capital.
"Energy of motion"	Kinetic energy	Money which one is in the act of spending.

(add)

Fisher | 1892

In 1892, American economist Irving Fisher completed his PhD in economics, entitled *Mathematical Investigations into the Theory of Value and Prices*, described by Paul Samuelson as "the best of all doctoral dissertations in economics", the content of which was heavily influenced by the physics, chemical thermodynamics, and vector analysis teachings of his advisor, American engineer Willard Gibbs. [9] The original variable "table" made by Fisher is found in his chapter three "Mechanical Analogies" (below left); another version of Fisher's physics-to-economics variables "translations" can be found in American physical economics historian Philip Mirowski's 1989 book *More Heat that Light* (below right): [10]

Original version (1892)

In Mechanics.		*In Economics.*
A particle	corresponds to	An individual.
Space	" "	Commodity.
Force	" "	Marg. ut. or disutility.
Work	" "	Disutility.
Energy	" "	Utility.

Work or Energy = force × space.
Force is a vector (directed in space).
Forces are added by vector addition.
(" parallelogram of forces.")
Work and Energy are scalars.

Disut. or Ut. = marg. ut. × commod.
Marg. ut. is a vector (directed in com.)
Marg. ut. are added by vector addition.
(parallelogram of marg. ut.)
Disut. and ut. are scalars.

Fisher's translations (Mirowski's 1989 version)

The *total work* done by a particle in moving from the origin to a given position is the integral of the *resisting forces* along all space axes (resisting forces are those directed toward the origin) multiplied by the distances moved along those axes.	The *total disutility* suffered by an individual in assuming a given position in the "economic world" is the integral of the *marg. disut.* along all commod. axes (marg. disut. are directed toward the origin) multiplied by the distances moved along those axes.
The "*total energy*" (the work done *upon* the particle) may be defined as the like integral with respect to *impelling forces.*	The *total utility* enjoyed by the individual is the like integral with respect to *marg. utilities.*
The *net energy* of the particle may be defined as the "total energy" less the "total work."	The net ut. or *gain* of the individual is the "total utility" less the "total disutility."
Equilibrium will be where net energy is maximum; or equilibrium will be where the impel. and resist. forces along each axis will be equal.	Equilibrium will be where gain is maximum; or equilibrium will be where the marg. ut. and marg. disut. along each axis will be equal.
(If "total energy" be subtracted from "total work" instead of vice versa the difference is "*potential*" and is minimum).	(If "total ut." be subtracted from "total disut." instead of vice versa the difference may be called "*loss*" and is minimum).

Mechanics	Economics
*a particle	*an individual
space	commodity
force	marginal utility or disutility
*work	*disutility
energy	utility
*work or energy = force × space	*utility = marginal utility × commodity
force is a vector	marginal utility is a vector
forces are added by vector addition	marginal utilities are added by vector addition
work and energy are scalars	disutility and utility are scalars
The total energy may be defined as the integral with respect to impelling forces.	The total utility enjoyed by the individual is the like integral with respect to marginal utilities.
Equilibrium will be where net energy (energy minus work) is maximum; or equilibrium will be where impelling and resisting forces along each axis will be equal.	Equilibrium will be where gain (utility minus disutility) is maximum; or equilibrium will be where marginal utility and marginal disutility along each axis will be equal.
If total energy is subtracted from total work instead of vice versa the difference is "potential" and is a minimum.	If total utility is subtracted from total disutility instead of vice versa the difference may be called "loss" and is minimum.
component force along an axis in equilibrium	price of a commodity in equilibrium
kinetic energy	total expenditure
displacement	incremental unit of commodity
conservation of energy	conservation of utility plus expenditure

What is curious in Fisher's table, as shown in the first row, is that he defines a person as a particle, in other words he uses the "human particle" model; as can be compared with the other workable models: human molecule (model), human fluid (model), human electron (model), human atomism (model), human orbital (model), among others. He then says that one can use the laws of composition and resolution of forces, acting on the particle, to determine things such as the mechanical equilibrium of the particle (human particle), in terms of things such as utility vectors and disutility vectors. Very interesting approach indeed.

Pareto | 1897

In *circa* 1893, Pareto began teaching a course in political economics, on economics and sociology, at the University of Lausanne, Switzerland (see: Lausanne school), a large part of which was based on a direct extrapolation of elasticity theory and vibration theory of equilibrium of the atoms and molecules in solid bodies to develop a theory of equilibrium of moving humans in socioeconomic systems. The content of this course, finished in draft notes form in 1895, was published in two volumes, in 1896 and 1897, respectively, entitled *Course of Political Economics*. The first volume, a little over 70 pages, explains his principles of political economy and provides a first-approximation treatment of the economic phenomena that allows for the setting forth of the general conditions of economic equilibrium. The second volume, of about 800 pages, covers applied economics, wherein a large amount of statistical and factual material is used and analyzed, and in which his famous law of income distribution (Pareto principle) is formulated. [8] In these works, Pareto outlines a rather intricate theory of humans defined as types of molecules acted on by forces and wherein a certain type of elastic equilibrium exists. The following, below right, from the second volume (pgs. 12-13), is a 1971 English translation, by translator Ann S. Schwier, of Pareto's famous 1897 mechanical-to-sociology comparison table, below left hyperlinked text version: [12]

Mechanical phenomenon	Social phenomenon
Given a certain number of solids, we study their relations of equilibrium and movement abstracted from the other properties. We obtain thus a study of mechanics.	Given a society, we study the relations of production and wealth between men, abstracted from other circumstances. We obtain thus the study of political economy.
The science of mechanics is	The science of political economy is divided into two others. If we consider the *homo economicus* who acts only as a result of economic forces, we

Mechanical phenomenon	*Social phenomenon*

divided into two others. If we consider inextensibly connected material points we obtain a pure science, rational mechanics, which studies in an abstract way the forces of equilibrium and movement. The easiest part of science is equilibrium. D'Alembert's principle, considering the forces of inertia, enables the reduction of the dynamic problem to a static one.

From rational mechanics comes applied mechanics, which is a little closer to reality, considering elasticity, friction, etc.

Real solids not only have mechanical properties of the phenomena caused by light, electricity and heat. Chemistry studies other properties. Thermodynamics, like other sciences, studies some of these properties in detail. All these sciences constitute the physical-chemical sciences.

obtain political economy, which studies in abstract terms ophelimity. The only part of this which is well known is static equilibrium. There may be a principle for economic systems analogous to D'Alembert's, but at present our knowledge is very poor. The theory of economic crisis offers an example of dynamic study.

From pure political economy comes applied political economy, which does not consider solely *homo economicus*, but also other models of humankind closer to reality.

Men and women have other characteristics which are studies by other particular sciences, such as law, religion, aesthetics, the organization of society, and so on. Some of these have quite a high level of development, others on the contrary, have not. As a whole they constitute the social sciences.

If we wish to consider a concrete fact, all these sciences must be taken into account because they have been separated through a process of abstraction.

In reality, solids with only mechanical properties do not exist. It is a mistake to assume the existence of concrete phenomena subject only to mechanical forces, abstracted form chemical ones, as it is to assume that concrete phenomena may be subtracted from the laws of rational mechanics.

In reality, persons who are subject only to economic stimuli do not exist. It is a mistake to assume the existence of the concrete phenomenon subject only to economic motivations, abstracted from other considerations, just as it is to assume that a concrete phenomenon may be subtracted from the laws of pure economics.

The practice differs from the theory precisely because practice must take into account a quantity of secondary characters which are not studied in the theory. The relative importance of primary and secondary characters is not the same from the general point of view of science and from the particular point of view of a practical operation. Syntheses have sometimes been attempted. An attempt has been made to find the cause of all phenomena in:

The attraction of atoms. An attempt has been made to reduce to all physical and chemical forces from a fundamental unity.

Utility, of which ophelimity is simply a type. An attempt has been made to explain all phenomena in terms of biological evolution.

These are all interesting studies. But we must not resist these hypotheses and not go far from the solid basis of experience.

Given a certain number of solids, we study their relations of equilibrium and movement abstracted from the other properties. We obtain thus a study of mechanics.

Given a society, we study the relations of production and wealth between men, abstracted from other circumstances. We obtain thus the study of political economy.

The science of mechanics is divided into two others. If we consider inextensibly connected material points we obtain a pure science, rational mechanics, which studies in an abstract way the forces of equilibrium and movement. The easiest part of the science is equilibrium. D'Alembert's principle, considering the forces of inertia, enables the reduction of the dynamic problem to a static one.

The science of political economy is divided into two others. If we consider *homo œconomicus* who acts only as a result of economic forces, we obtain political economy, which studies in abstract terms ophelimity. The only part of this which is well known is static equilibrium. There may be a principle for economic systems analogous to D'Alembert's, but at present our knowledge is very poor. The theory of economic crisis offers an example of dynamic study.

From rational mechanics comes applied mechanics, which is a little closer to reality, considering elasticity, friction, etc.

From pure political economy comes applied political economy, which does not consider solely *homo œconomicus*, but also other models of humankind closer to reality.

Real solids not only have mechanical properties. Physics studies the properties of the phenomena caused by light, electricity and heat. Chemistry studies other properties. Thermodynamics, like other sciences, studies some of these properties in detail. All these sciences constitute the physical-chemical sciences.

Men and women have other characteristics which are studied by other particular sciences, such as law, religion, aesthetics, the organisation of society, and so on. Some of these have quite a high level of development, others on the contrary, have not. As a whole they constitute the social sciences.

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The attraction of atoms. An attempt has been made to reduce to all physical and chemical forces from a fundamental unity.

Utility, of which ophelimity is simply a type. An attempt has been made to explain all phenomena in terms of biological evolution.

These are all interesting studies. But we must resist these hypotheses and not go far from the solid basis of experience.

The above table, to note, seems to have been modeled on Fisher's earlier table, being that Pareto seems to have been well-aware of Fisher's PhD dissertation. In 1902, in his *Socialist Systems*, Pareto, for example, commented the following: [13]

> "Progress in the purely scientific sense of political economy are considerable. Books such as *Mathematical Psychics*, F. L. Edgeworth, *Principii di economia pura* [*Pure Economics*], Maffeo Pantaleoni, *Mathematical Investigations in the Theory of Value and Prices*, Irving Fisher, etc., are written in a purely scientific point of view. A similar attempt is one of my courses, in the first volume, published in 1896, I said: "In all treatises on political economy, the main part is formed by the science of ophélimité and utility."

Namely that on the Edgeworth, Pantaleoni, Fisher pioneering platform, that he had made a "similar attempt" in his 1897 *Course on Political Economics*.

Neumann | 1934

In 1934, American chemical engineer and mathematician John Neumann was sent a copy of French physicist and economist Georges Guillaume's 1932 PhD dissertation (turned book) *On the Fundamentals of the Economy with Rational Forecasting Techniques*, wherein he utilizes thermodynamics models. In his review of Guillaume's book, Neumann commented that: [1]

> "It seems to me, that if this [economic-thermodynamic] analogy can be worked out at all, the analogon of 'entropy' must be sought in the direction of 'liquidity'. To be more specific: if the analogon of 'energy' is 'value' of the estate of an economical subject, then analogon of its thermodynamic 'free energy' should be its 'cash value'."

To summarize, although he does not make a table, Neumann gives the following equivalences:

Variable	Economic analogon
Energy	Value or estate of an economical subject
Entropy	Liquidity
Free energy	Cash value

Neumann seems to have been spurred on by what he saw were deficiencies in Guillaume's paper to write his his highly cited 1938 article "A Model of General Economic Equilibrium", in which derives a function φ (X, Y) related to the production of goods, based on the model of thermodynamic potentials. [2]

John Q. Stewart | 1953

In 1953, John Q. Stewart, in his "Remarks on the Current State of Social Physics", in commentary on his growing Princeton social physics group, gave the following variables table, which he says are intensive and extensive social variables: [23]

Form	Intensive Factor		Extensive Factor
Sociowork	f, cogency	of	C, decisions
Meaning	r, relatedness	of	I, information
Feeling	a, demand	for	G, body-thing satisfaction
	b, demand	for	H, person-person satisfaction
Authority	s, social effectiveness of role		P, status of role

Then gives the following so-called "characteristic function" for the social "working body" as he defines things:

$$fdC = rdI + adG + bdH + sdP - dV$$

Which, as we see, is his attmept at making a social Pfaffian form of cherry picked social conjugate variables, as he sees things.

Galtung | 1967

In 1967, Norwegian sociologist Johan Galtung, published his table 5.6.1, captioned as a survey of push and pull forces, in systems of low entropy and high entropy, at the personal and social levels: [16]

	Person level		Social level	
	pull factors	push factors	Pull factors	push factors
Low entropy systems	wish for consonance, simplicity, homophily	too much micro-stability, uniformity repetition	facilitates control for, ,"good" purposes, stability	facilitates control for "bad" purposes dangerous macro-conflict
High entropy systems	wish for variety, new experience micro-dynamism	too much dissonance, information overload, ambivalence	Conflicts solved locally facilitates micro-changes	too much micro-conflict impedes macro-changes

(add)

Lukacs comparisons | 1989

In 1989, Hungarian physicist Bela Lukacs—noted for lectures such as his “On Economics and Other Utilities” (1994), wherein he attempts to show that an economy in itself can never satisfy the Gibbs-Duhem relations, subsequently an economy in itself can never have a thermodynamic formalism, but rather only the set economy + ecology, may possibly have such a formalism—in his article “Once More about Economic Entropy”, is said to have given some type of economic-to-thermodynamic comparisons (table or not?), comparison which later influenced the later construction of Australian organic chemist and commerce theorist James Reiss's 1994 chemical thermodynamics to economics variables table (below). [3]

Hoede | 1990

In 1990, Dutch mathematician Cornelis Hoede published some type of physics-to-social variables table, the following being a snippet, wherein he seems to be defining people as molecules, and theorizing about social volume: [18]

coordinates	Learning velocity, social velocity } = rate of changes in coordinates
Molecules	Molecules
Volume	Social volume, inversely proportional to the sum of all charges of the actors

(add)

Reiss's table | 1994

In 1994, James Reiss, an Australian organic chemist and commerce theorist, in his chapter "Comparative Thermodynamics in Chemistry and Economics", cites Bela Lukacs (1989), but then goes on to use physical chemistry and drug receptor thermodynamics models to explain economic systems, e.g. postulating how tools, like hammers, act as catalysts to lower the activation energy barrier; how the “chemical interaction” factors of electronic attractions and repulsions and stereochemical shape and fitting of molecules will play a roll, economic temperature effects, etc.; during which, in his chapter sub-section 2.1: The Value-Dynamic Model, he gives the following variables table: [4]

raw materials		=	chemicals
value	(ΔV)	=	Gibbs free energy (ΔG)
work (labour, energy)	(ΔW)	=	enthalpy (ΔH)
negentropy (order)	(ΔN)	=	entropy (ΔS)
temperature (a constant)		=	temperature (T)
process energy barrier	(E_p)	=	activation energy (E_a)
factory		=	concentration [A]
concentration of industry		=	coupled reactions, cells
technology		=	catalysis
money		=	storable energy (e.g., gasoline)

This equivalence table, technically, seems to be one of the first printed "human thermodynamics variables tables" known. While some of these "assumed

equivalences" may be correct, e.g. process energy barrier equated with activation energy (if the human chemical reaction view is assumed), technology equated with catalysis, etc., many of these speculative assignments, however, seem to be incorrect, such as enthalpy being equated to work, or entropy equaling negentropy, etc. One assignment here that may have merit to it could possibly be Gibbs free energy change ΔG being equated to "value", being that what is favored evolutionary wise, tends to be something that has a future to it, and Gibbs free energy change is what predicts the future or favorability of chemical reactions or processes.

In his table, Reiss equates raw materials to chemicals (correctly: raw materials are catalysts and substrate factors, whereas people are the reactive chemicals); value to Gibbs free energy change ΔG (correctly: this should be the functional work output of the factory); work and labor energy to enthalpy change ΔH (correctly: enthalpy is the raw heat released or absorbed from the activation of the human chemical bonds plus the work related to pressure-volume work changes inside the economy, although there is some connection between work and enthalpy); order or negentropy to entropy (correctly: the magnitude of entropy |S| is a measure of disorder, although there is more to the issue); temperature to temperature (correctly: there are other issues, e.g. economic temperature, sexual temperature, physical attractiveness temperatures, intellectual temperatures, etc.); process energy barriers to activation energy Ea (correctly: the activation energy most germane to an economic system is the barrier to successful sexual reproduction, faced by each individual); concentration of industry to free energy coupling of reactions and cells (correctly: sector formations is a result of like-attracts-like industry chemical bonding energy lowering effects); technology to catalysis (correctly: Reiss may be correct in this assignment, in that he defines tools, such as hammers, screwdrivers, and wrenches to be 'catalysts' designed to increase the efficiency of human processes); and money to stored energy as in fuel (correctly: money can act in the form of stored chemical potential, but more accurately money is defined as a secondary field particle acting to transmit the force of human chemical reaction).

Nordholm | 1997

The following, from the noted 1997 *Journal of Chemical Education* article "In Defense of Thermodynamics: an Animate Analogy", are Swedish physical chemist Sture Nordholm's first draft attempt at "proper translation" of terms and concepts, one of the more difficult aspects of human thermodynamics, as he refers to the scale up process: [14]

- energy = wealth
  kinetic energy = cash
  potential energy = property
- entropy = freedom

This step, again, being a more tricky aspect of thermodynamics applied to human behavior.

Saslow's table | 1999

In 1999, American physicist Wayne Saslow, in his article "An Economic Analogy to Thermodynamics", in which he goes through a considerable, albeit mostly empty, derivation, wherein starts off with a 1980 study on the experimental findings of rat economic behaviors, and goes on to argue that the state of an economic system, being a physical system, must be quantified by a temperature and conjugate variable pair entropy. He also formulates an analogy version of free energy, Maxwell relations, and a Gibbs-Duhem relationship. The following is Saslow's analogy between thermodynamic and economic systems variable table, from this article: [5]

Table I. Summary of the suggested analogies between thermodynamic and economic systems. Not listed are the direct analogies between S and T.

Thermodynamics	$-F$	$-E$	TS	μ	N
Economics	W(wealth)	U(utility)	Ψ(surplus)	p(price)	N(# of goods)

In this table, he equates wealth W to negative Helmholtz free energy (-F), utility U to negative energy (-E), surplus Ψ to entropic energy (TS), price p to chemical potential, and number of goods n to number of chemical species crossing the boundary N.

Mimkes | 2005

In 2005, Jaroslav Sestak, in his *Science of Heat and Thermophysical Studies*, citing Jurgen Mimkes, gave the following physical to humanities correlation table: [21]

Table 1. Analogies between the Natural Sciences, Social Sciences, Economics and Military regarding thermodynamic analysis and functions.

Symbols binary	NaturalSciences	Social Sciences	Economics	Military
A-B	gold-platinum	Blacks-Whites	sell-buy	NATO-Russia
	silicon-germanium	Catholic-Protestant	rich-poor	North-South
	sodium-chlorine	male-female	Europe-USA	SEATO-China
	concentration (%)	minority size (%)	demand/supply	relation of forces
ordering				
$\omega > 0$	compound	sympathy	trade links	military treaty
$\omega = 0$	ideal solution	indifference	free market	neutrality
$\omega < 0$	segregation	antipathy	business/competition	military block
functions				
G	Gibbs energy	satisfaction/happiness	prosperity	security
T	temperature	tolerance to chaos	mean property	reconciliation
Q	heat	self-realization/health	money	weapons
E_{AA}	cohesive E	tradition/heritage	profit/earnings	friendship
$E_{AB} > 0$	binding E	curiosity/love	investment	joint activity
$E_{AB} < 0$	repelling E	distrust/hate	cost	hostility
E=0	indifference	apathy	stagnation	neutrality

stages	
metallurgy	**anthropology**
disordering/solubility	integration
solubility limit	segregation
phase diagram	intermarriage diagram

⇐ states and state diagrams ⇒		
ancient philosophy	**pressure vs temperature**	**political pressure vs living standard**
air	gases	anarchy
water	liquids	democracy
earth	solids	hierarchy

In 2008, Jurgen Mimkes, in his "Differential Forms: a New Tool in Economics from Biological Models to Econophysics", attempted a thermodynamics conceptualized model of a first law of economics and a second law of economics based on the following variables correlations: [20]

Y: income, costs, profits	Q: heat
P: production	W: work
F: production function	S: entropy
K: capital	E: energy
λ: mean capital level	T: mean energy level

Some of Mimkes mappings, at this point, however, were nearly incoherent; e.g. in respect to the Euler reciprocity relation, he defines Y as income and attempts the following jump:

> "A not exact differential (δY) may be turned into an exact differential (dF) by an integrating factor ($1/\lambda$):
>
> $dF = \delta Y/\lambda$
>
> F may be called production function. The law corresponds to the second law of thermodynamics, $dS = \delta Q /T$. The production function (F) is called entropy in physics."

This, jump, makes little sense, and seems far off target, in respect to the Clausius formulation of entropy based on the Carnot heat cycle.

Thims' table | 2007

In terms of a general theory of human thermodynamics, applicable to all varieties of human activity in entirety, in the 2007 textbook *Human Chemistry*, American electrochemical engineer Libb Thims cites the work of James Reiss, among others, and in his chapter on human molecular orbitals gives the following variables table for a tentative assignment of enthalpy and entropy components for individual reactive human molecules involved in mate selection: [6]

Physical Attraction Attribute	Symbol
Averageness	H_{AVG}
Age	H_{AGE}
Symmetry	H_S
SeXuality (testosterone-to-estrogen ratio)	H_X
Latitude of Development (immune system)	H_L
Fitness	H_F
Complexion	H_C

Neurological Attraction Attribute	Symbol
Personality, Social Graces, Character & Dependability	S_P
Occupation, Possessions, or Money	S_O
Information, Intelligence, Education, or Knowledge	S_I
Status or Prestige	S_S
Inner Nature, Values & Ambition	S_N

where the instantaneous enthalpy of a given person (human molecule) in a given state of existence is:

$$H = H_{AVG} + H_{AGE} + H_S + H_X + H_L + H_F + H_C$$

where H_{AVG} is the enthalpy (heat content) associated with the physical attractive trait "averageness" (the most averaged person tends to be the most physically attractive), H_{AGE} with the physical attractive trait age (age 22 for females is the most physically attractive age), H_S with the physical attractiveness trait "symmetry" (the most physically symmetric persons tend to be seen as the most attractive), H_X with the physical attractiveness associated with the testosterone to estrogen ratio of a given individual (high estrogen women tend to pair with high testosterone men), H_L the physical attractiveness associated with one ethnicity, i.e. latitude of development (people tend to be most physically attracted to individuals differing in ethnicity to their own by 15 degrees ± in latitude, as determined experimentally via the Sweaty T-shirt study, i.e. MHC-compatibility complex matching, and in person surveys), H_F the physical attractiveness associated with "fitness" (fit people are seen as being more physically attractive than less fit people), and HC the physical attractiveness associated with "complexion" (people with better complex are seen as being more physically attractive). Likewise, the instantaneous entropy of a given person (human molecule) in a given state of existence is:

$$S = S_P + S_O + S_I + S_S + S_N$$

where S_P is the entropy associated with organizational attractiveness of a person's "personality", social graces, character, and dependability, S_O is the entropy associated with the organizational attractiveness of a person's "occupation", possessions, and or money, S_I is the entropy associated with the organizational attractive of a person's "information", intelligence, or education (see for example: Stephen Hawking's 1996 human entropy diagram), S_S the entropy associated with the organizational attractiveness of a person's "status" or prestige (representative of a person's position in the hierarchy of the social structure), and S_N the the entropy associated with the organizational attractiveness of a person's inner "nature", values, and ambition. Within this framework, the instantaneous free energy of a given human molecule of the reactive social system can thus be quantified according to the standard chemical thermodynamic definition of Gibbs free energy:

$$G = H - TS$$

and likewise for the situation when one is attempting to calculate the Gibbs free energy change:

$$\Delta G = \Delta H - T\Delta S$$

for a given human chemical reaction, such as two human molecules, A and B, paring into a relationship, AB, over the course of several years on going from an initial state $G_{initial}$ to a final state G_{final}:

$$A + B \rightarrow AB$$

where:

$$\Delta G = G_{final} - G_{initial}$$

The essence of the justification of these variable assignments, and accompanying logic, is exemplified well by the following definitive statement on the thermodynamic nature of the bonding between molecules (human or otherwise), as stated by American-born Canadian biochemist Julie Forman-Kay, in her 1999 article "The Dynamics in the Thermodynamics of Binding": [7]

> "Whether two molecules will bind is determined by the free energy change of the interaction, composed of both enthalpic and entropic terms."

In plain speak, the bulk of human existence can quite readily be boiled down a discussion of sexual competition among reacting human molecules confined to various substrate defined social systems all of which is centered on the desire to bond perfectly, as colloquially captured in the ancient term "true love" to another human molecule, and therefore the factors of this quest is entirely determined by enthalpy and entropy quantifications, which must be mapped over into understood human interaction variables, of which the above twelve are the most agreed-upon powerful variables involved the process of mate selection and reproduction, according to evolutionary psychology.

Ferrara-Udriste | 2008

In 2008, Ferrara, in his "Advances on Thermoeconomics: a Model for the Equilibrium of European Union's Economy (Geobiodynamics and Roegen Type Economy)", in association with Constantin Udriste, noted for his "Thermodynamics versus Economics" (2007), et al, attempt to platform off Nicholas Georgescu-Roegen (1971), to do the following, rather bold, on the surface, sounding jump:

> "The fundamental Gibbs-Pfaï¬€ equation of thermodynamics $dU - TdS + PdV + \sum \mu_k dN_k = 0$ is changed into fundamental Gibbs-Pfaï¬€ equation of economics $dG - IdE + PdQ + \sum \nu_k dN_k = 0$."

Here we recall Edwin Wilson's 1938 suggestion to Paul Samuelson to use Gibbs' equation 133 for formulate a theory of economic equilibrium. When, however, we view their human thermodynamics variables table, as shown below, we see them using the letter rhyming derivation method, e.g. P of economic pressure equates to P of price (level of inflation), among other issues: [19]

TERMODYNAMICS	ECONOMICS
U = internal energy	G = potential growth
T = temperature	I = internal politic stability
S = entropy	E = entropy
P = pressure	P = level of prices (inflation)
V = volume	Q = production quantity
M = total energy (mass)	Y = national income (revenue)
Q = electric charge	$\mathcal{I}$ = total investment
J = angular momentum (spin)	J = economic angular momentum (economic spin)
$M = M(S, Q, J)$	$Y = Y(E, \mathcal{I}, J)$
$\Omega = \frac{\partial M}{\partial J}$ = angular velocity	$\frac{\partial Y}{\partial J}$ = marginal propensity to spin
$\Phi = \frac{\partial M}{\partial Q}$ = electric potential	$\frac{\partial Y}{\partial \mathcal{I}}$ = marginal propensity to invest
$T_H = \frac{\partial M}{\partial S}$ = Hawking temperature	$\frac{\partial Y}{\partial E}$ = marginal propensity to entropy

Another salient issue is their symbol usage, namely: they translated internal energy U, i.e. the internal energy of an economic system, into "growth potential", symbol G, which only sets up the remainder of their derivation, into confusion that economic potential is measured by Gibbs energy, symbol G.

Mohsen-Nia | 2011

In 2011, following discovery of Irving Fisher's elucidating physical economics variable table, as discussed above, JHT founding editor Libb Thims has begun to request that all submission articles to the *Journal of Human Thermodynamics* include a "human thermodynamics variable" table, in which, similar to Fisher, in the first row, the author's specifically state their model of the human (particle, molecule, fluid, etc.), and also describe, in understandable lay or human terms, each of the variables used in their article.

The first of these requested tables was made by Iranian-American chemical engineer Mohsen Mohsen-Nia, as shown below, which can be found in his 2011 article "A Thermodynamic Methodology for Evaluating Friendship Relations Stability", co-authored with Iranians human scientist F.

Arfaei, thermodynamicist H. Amiri, and computer engineer A. Mohsen Nia. [11]

Social System Variables Table

Molecular Thermodynamics	Human Thermodynamics
Particle	Individual
System	Social system is viewed a set of people who obey same political, economic, cultural and social rules.
Density, ρ	Population per unit area
Volume, V	Social freedom
Temperature, T	Social excitement, which is a measure of the society's motivation
Pressure, p	Social pressure is really a measure of existence of different rules, e.g. political, economic, cultural and social rules which should be obeyed by all people in such system to avoid totally chaotic systems.
Heat, Q	Heat is a form of energy that is sustained by the difference of society excitement between the two systems as a driving force.
Internal energy, U	Internal energy is the amount of energy which is stored in a society and accounts for the movements of people which constitutes the society.

Newer tables can be found in individual JHT articles, 2012 to present.

Chisleag | 2012

The following is Romanian physicist Radu Chisleag's 2012 physics-to-economics "correspondence" table as he calls it: [15]

Physics-to-Economics Correspondence Table	
Particle	Individual; payer, broker, hedger
Energy	Energy, capability, potential, maximum credit permitted the individual to engage in a process.
Kinetic energy	Capacity of the individual to act at a given stage of the process.
Potential energy	Energy used by the individual to jump in the other region (on the potential step.
Mass	Inertia of the individual.

Chisleag goes on to apply the Schrodinger equation of and the de Broglie waves of French physicist Louis de Broglie to the situation where "some individuals, even having been granted the right to act, are rejected at the step".

Donohue and Kilburg | 2014

In 2014, Americans chemical engineer Marc Donohue and leadership psychologist Richard Kilburg, in their "Leadership and Organization Behavior: a Thermodynamic Inquiry", employ not only the standard human molecule, human gas (or gas particle), but also "human liquid" (first done by Lawrence Henderson, 1935) and "human plasma" analogy models. The following is their human analogy table: [17]

States of Matter and Analogous Human Organizations

State of matter	Characteristics	Human or organizational "states"	Characteristics
Crystalline solids	Crystals are ordered molecular structures in which the order is created by repulsive intermolecular forces or by highly anisotropic attractive forces. Isotropic attractive forces can strengthen the crystal and can change the conditions under which a crystal forms but cannot create or sustain structure in the absence of either repulsions or strongly anisotropic attractive forces.	Hierarchical organizations.	Like crystals, structure in hierarchical organizations is created by repulsive forces (fear) or anisotropic attractive forces (respect). Also like crystals, this structure can be strengthened (but not created or sustained) by isotropic attractive forces such as camaraderie among coworkers. However, the structure can be weakened by strong bonds of friendship (or romance) between people in different levels of the organization because these relationships reduce the fear or respect that create and sustain the organization. (Most hierarchical organizations also have characteristics of adsorbed phases. In particular, there may be a shared mission or vision that binds people to the organization or there may be a strong fear of financial loss associated with being separated from the organization.)
Liquids	Liquids form from gases when the attractive forces between and among molecules overcome the larger entropy of being a gas or vapor. The liquid phase is held together by these attractive forces.	Coherent and connected but less formally structured groups like clubs, families, sororities, etc.	Groups held together by bonds between/among people. Does not include organizations held together by bonds to an ideology, religion, or organization (charity, university, etc.).
Gases	Gases exist when molecules are at low densities and therefore do not interact regardless of the strength of their intermolecular forces.	Weakly interacting or non-interacting groups of people.	Individuals walking alone on a street, a shopping mall, or similar situations.
Supercritical fluid	Supercritical fluids exist at high temperatures and pressures. Because of the temperature, the intermolecular interactions are weak regardless of the density.		Non-interacting people, such as strangers in elevators, on city streets, etc., even if they are in crowded situations.
Plasmas	Plasmas are a fluid made of positively charged molecules (ions) and electrons at very low density. The positively charged molecules strongly repel one another and, hence, almost never come in contact with each other.	Isolated individuals, i.e. hermits.	Isolated individuals who avoid interactions with other people.
Adsorbed fluids (gases and liquids)	Gaseous or liquid molecules adjacent to a solid surface adsorb (stick) to the surface and lose some or all of their translational energy (ability to move). Adsorbed molecules usually are closer together (at a higher density) than away from the surface and therefore are more likely to interact with each other because of their attractions to the surface. Weakly or moderately adsorbed molecules are still fluid and the adsorbed molecules have attractive forces to both the surface and to other adsorbed molecules.	Religions, alumni associations, and volunteer organizations.	The key characteristic is affinity to religion, ideology, or mission of organization. Examples include church congregations, attendees at alumni or sporting events, Star Trek conventions, etc.
Strongly adsorbed phases — amorphous and crystalline	Strong forces of attraction to a surface cause/ allow adsorbed molecules to be packed so tightly that they repel each other. If the surface is rough and/or the adsorbed molecules are of different sizes or shapes, the adsorbed layer will be amorphous and glass-like. However, if the surface is smooth and the adsorbed molecules uniform in size and shape, the adsorbed layer will be structured but can be commensurate (aligned with the substrate) or incommensurate (not aligned with the substrate).	Hierarchical organizations and other situations where people will tolerate strong negative or repulsive forces such as the military.	Hierarchical organizations are analogous to crystalline (i.e. structured) adsorbed phases because the people are held to the organization by their affinity for the vision or mission of the organization or by fear of financial loss associated with being separated (fired) from the organization. The mosh pit at a rock concert is an example of a highly compressed but amorphous (non crystalline or unstructured) collection of people. In the mosh pit, the people are compressed by their common attraction to the performers, not by any attraction to one another.

Other

In 2016, Prabakaran, in his "Statistical Thermodynamics of Money: Thermoney", citing people such as: Adam Smith, Elliott Montroll, Paul Samuelson, Victor Yakovenko, Vilfredo Pareto, Bikas Chakrabarti, Edouard Guillaume, Georges Guillaume, Wayne Saslow, and Eugene Stanley, started with the following human thermodynamics variables table, which is a duplicate of Saslow's 1999 table [22]

THERMO DYNAMICS	$-F$	$-E$	TS	μ	N
ECONOMICS	W (Wealth)	U (Utility)	Ψ (Surplus)	P (Price)	N (#of Goods)

Table 1: Summary of the suggested analogies between thermodynamic and economic systems.

after which, he attempts to make an analogy between economics and thermodynamics to provide a theoretical framework so that economics measurements can determine the functional dependence of the utility U on the economic parameters that specify the state of an economic system.

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θΔics

In hmolscience, **human thermometer** is a human that, via criticism, pointing things out, or whining, etc., acts as a "thermometer" of an organization or tribe, thereby indicating its temperature or organizational temperature, hot or cold.

American business philosopher Seth Godin's 2008 conception of how "**human thermometers**" exist in all organizations, in the form of people who can sense when things are getting too cold or too hot in the system; and how at least one working "human thermostat" is needed in successful organizations, so to adjust the system temperature to the changing temperature of the surroundings. [1]

Overview

In 2008, American business philosopher Seth Godin, in his *Tribes: We Need You to Lead Us*, an annotated visual of which shown adjacent, described human thermometers and human thermostats as follows:

> "A thermostat is far more valuable than a thermometer. The thermometer reveals that something is broken. The thermometer is an indicator, our canary in the coal mine. Thermometers tell us when we're spending too much or gaining market share or not answer the phone quickly enough. Organizations are filled with **human thermometers**. They can criticize or point out or just whine. The thermostat, on the other hand, manages to change the [organizational] environment in sync with the outside world. Every organization needs at least one thermostat. These are leaders who can create change in response to the outside world, and do it consistently over time."

(add discussion)

See also

â— Economic thermometer
â— Sexual thermometer
â— Social thermometer

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θΔics

In human quantum mechanics, **human wave function**, symbol ψ(x, y, z), is the solution to a wave equation that describes the movement of a single human molecule (or human particle) in trajectory, when a human is viewed as a wave (or viewed as in possession of wave behavior), according to the principle of wave-particle duality. [1]

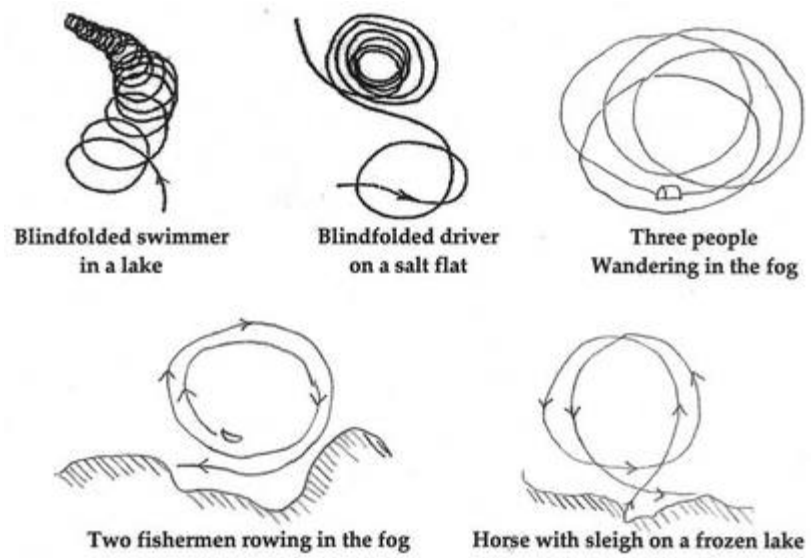

Austrian physicist Ernst Mach's *circa* 1885 turning tendencies, the first visual depictions of what might be considered as graphical depictions of types of **human wave functions**. [6]

Overview

In circa 1885, Austrian physicist Ernst Mach outlined a loose model of human particle/human wave behavior was first documented in circa 1885 by and his noting of what he called "turning tendencies" in troops lost in a snow storm. [2]

In 1923, French physicist Louis de Broglie derived a proof that all bodies of the universe have a wave-like nature and thus a wavelength associated with them.

In the 1992 book *Creation Revisited*, English physical chemist Peter Atkins attempted to outline a view of humans as evolved purposeless molecules that behave according to the standard principles of physics. On the question of wave particle duality, Atkins comments: [3]

> "The reason why particles like pigs and **people** do not normally seem to be **waves** is simply that their wavelengths are normally so short as to be undetectable. Nevertheless, distribution as waves they are, and that attribute provides explanations which are totally beyond the reach of classical physics."

In 1999, Viennese researchers, supposedly led by physicist Anton Zeilinger, reported interference in in the movement of Buckyball molecules, a 60-atom molecule, through the double slits, the largest objects to-date ever to show quantum phenomena. [4] In short, by passing Buckyball molecules, one at a time, through a double slit experimental apparatus, Zeilinger showed that single molecules possess wave particle duality. [5] The implications of the finding that large molecules, such C_{60}, possess wave particle duality, are that single human molecules , CHNOPS+26, also possess wave particle duality.

In 2001, American physicist Aman Ahuja gave the following response to a query as to whether or not humans have a wavelength: [7]

> "What about humans? Well, theoretically, since all matter possess wave-like properties, so do humans, and cats, and whatever you please. We could hypothetically demonstrate this fact by performing the double slit experiment with these "particles". So here we go, firing cats haphazardly at two slits, trying to get cats to interfere with each other. Will it work? Well. . . kinda. There are a lot of little technicalities, so you'll have to be careful not to aim at the slits (i.e., you must fire randomly to create a incoherent cat-beam), and you'll have to space out the firings. You fire one cat, you wait for a while, then you fire the other cat. Eventually, you'll form the familiar interference pattern on the other side of the slits. Unfortunately, that waiting period between firings is about the age of the universe when you're using cats. Finally! What is the wavelength of a human being? Assuming he/she weighs 70 kg, and is being fired at 25 m/s, it's about 3.79 x 10E-37 meters."

In 2007, Libb Thims, in his *Human Chemistry*, in the context of human quantum chemistry, introduced a modern

approach to the issue of wave particle duality behavior, in the concept of the human molecular orbital, as explained in human molecular orbital theory, wherein a person as a bound state point-like molecule (or human particle) moves daily in probabilistic activity orbitals. [6]

In the 2009 Moriarty-Thims debate, Irish physics professor Philip Moriarty commented on Thims premise that quantum mechanics apply to the study of the nature of people viewed as individual molecules with the comment:

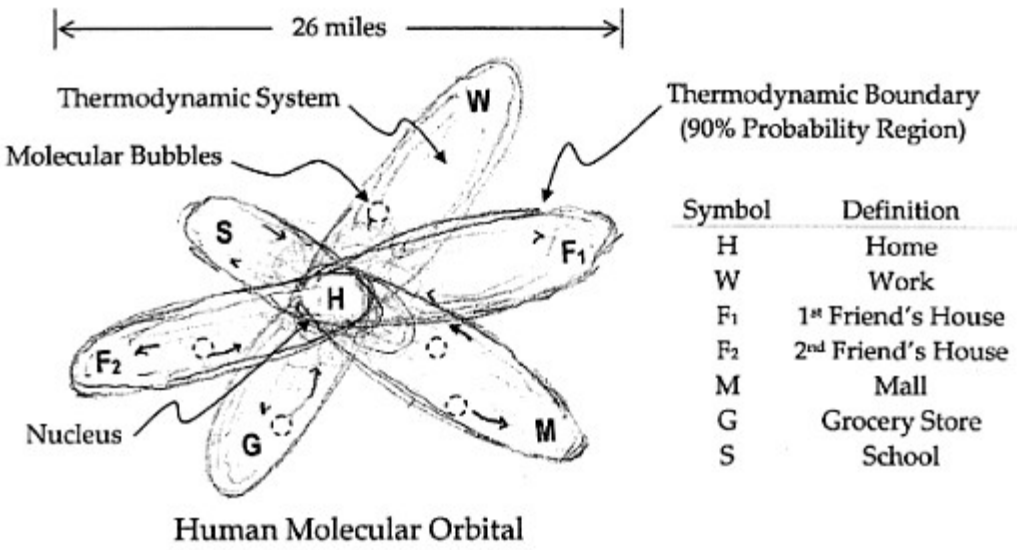

A 2007 diagram of the average human molecular orbital, showing the "orbital" or wavelike nature of a typical human in his or her daily activity. [6]

> "Libb's response beggars belief: 'It is only a matter of extrapolation to apply this logic to systems of human molecules...' No, it is not a matter of extrapolation, Libb. Just as it is not a matter of extrapolation to take fundamental quantum mechanics and apply it to "human molecules". What physical evidence do you have, Libb, for a "**human wavefunction**"? Have you somehow carried out the equivalent of the double slit experiment for humans?! Do you understand what is meant by decoherence or complementarity in the context of QM? I shudder to think that students are going to be exposed to this pseudoscientific nonsense next semester."

Thims referred Moriarty to the Zeilinger's 1999 Buckyball experiment, to show that there is experimental evidence to premise that humans have a wavefunction.

Quotes

The following are related quotes:

> "Every thing in this universe has its regular **waves and tides**. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday within this law. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."
>
> — Henry Adams (1863), "Letter to Charles Gaskell" (Oct) [8]

> "We are walking **wave functions**."
>
> — Alexander Wendt (2015), *Quantum Mind and Social Science* (Ñº); 2019 video interview (Ñº)

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pgs. 238-95). Morrisville, NC: LuLu.
2. McManus, C. (2002). *Right Hand, Left Hand: the Origin of Asymmetry in Brains, Bodies, Atoms, and Cultures* (turning tendencies, pg. 166). Harvard University Press.
3. Atkins, Peter. (1992). *Creation Revisited* (pg. 55). W.H. Freeman & Company.
4. (a) Zeilinger, Anton. (2006). "I believe quantum physics requires us to abandon the distinction between information and reality", in: *What We Believe, But Cannot Prove* (pgs. 223-24). Harper-Perennial.
(b) Anton Zeilinger – Wikipedia.
5. Arndt, Markus; O. Nairz, J. Voss-Andreae, C. Keller, G. van der Zouw, and Zeilinger, A. (1999). "Wave–particle duality of C60" (abs). *Nature*, 401(6754): 680–682.
6. Thims, Libb. (2007). *Human Chemistry (Volume One)* (section: Human molecular spin, pgs. 209-11; turning tendencies diagram, pg. 210; human molecular orbtal, pg. 265; orbital transition state, pgs. 268-69). (preview), (Google books). Morrisville, NC: LuLu.
7. Ahuja, Aman. (2001). "I have heard that humans have a wavelength: Is this true?", Ask an Expert, PhysLink.com.
8. (a) Adams, Henry. (1863). "Letter to Charles Gaskell", Oct.
(b) Adams, Henry. (1982). *The Letters of Henry Adams, Volume 1: 1858-1868* (editor: Jacob Levenson) (pgs. 395-96). Harvard University Press.
(c) Stevenson, Elizabeth. (1997). *Henry Adams: a Biography* (pg. 69). Transaction Publishers.
(d) Taylor, Matthew A. (2008). *Universes Without Selves: Cosmologies of the Non-Human in American Literature* (pg. 108), PhD dissertation, Johns Hopkins University. ProQuest, 2009.

External links

â— Wave function (quantum mechanics) – Wikipedia.

θΔics

In models, **human-as-molecule** refers to the conceptual model of an individual human as an individual molecule, the idea of a human as a molecule deriving originally from French philosopher Jean Sales' 1789 human molecular hypothesis and the coining of the term 'human molecule', or molécules humaines in the original French, referring to a person atomically.

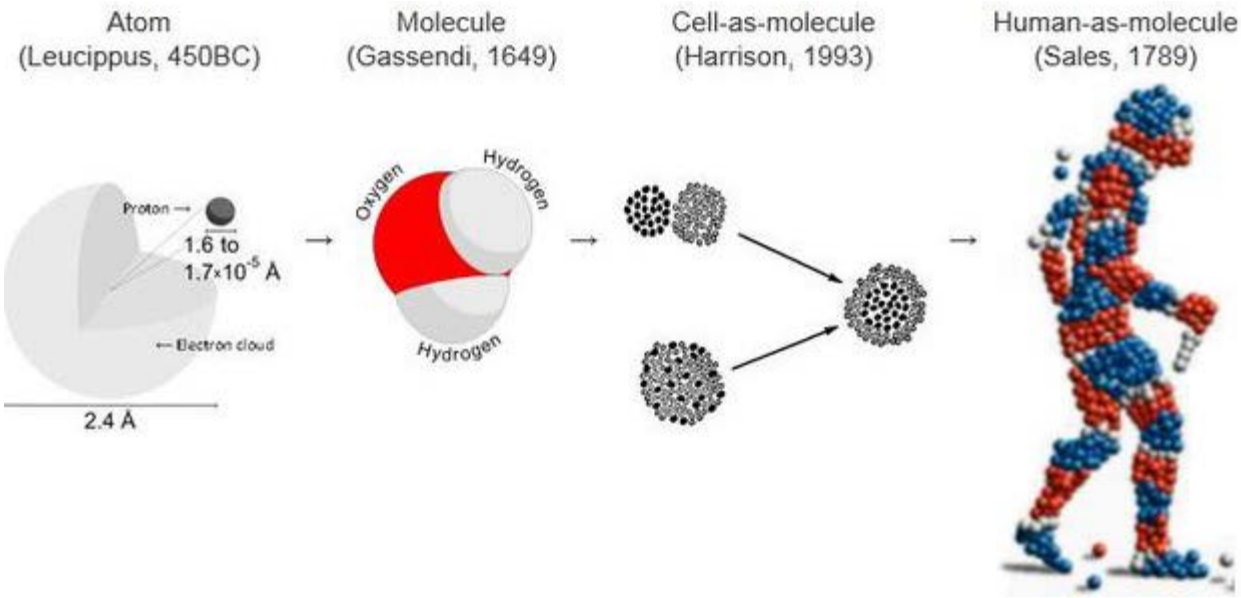

The **human-as-molecule** conception shown comparatively to Greek philosopher Leucippus's 450BC atomic theory definition of the atom, French philosopher Pierre Gassendi's 1649 introduction of the term "molecule", based on his commentary of the *circa* 300 BC atomic theory of Epicurus, compared to English-born Canadian physical chemist Lionel Harrison's 1993 cell-as-molecule model, shown next to French philosopher Jean Sales' 1789 human molecular hypothesis and the coining of the term 'human molecule', referring to a person atomically, defined as an CHNOPS-based animate geometry of atoms.

The term is a 2012 Hmolpedia-introduced variant of English-born Canadian physical chemist Lionel Harrison's 1993 cell-as-molecule conception. [1]

References

1. Harrison, Lionel G. (2011). *The Shaping of Life: the Generation of Biological Pattern* (cell-as-molecule, 4+ pgs; image, pg. 145).

θΔics

In reactions, a **human-human reaction** is a chemical reaction between two or more human molecules. There are many different types and categories of human-human reactions, all being generalized as human chemical reactions, a dominate one being the male-female reaction, a heightened example of this being those male-female reactions (or male-male reactions, in the homosexual scenario) that enter into the famed "love the chemical reaction". German polymath Johann Goethe, for instance, is said to have outlined 36 types of human-human reactions in his 1809 *Elective Affinities*, some of which have already been deciphered by those including: Jeremy Adler, Karl Fink, and Libb Thims.

Equivalent human molecules

In 1885, American physical science historian Henry Adams defined social chemistry as the “study of the mutual attraction of equivalent human molecules”. [1]

References

1. (a) Samuels, Ernest. (1989). *Henry Adams* (human molecule, pg. 115). Harvard University Press.
(b) Gooch, George P. (1913). *History and Historians in the Nineteenth Century* (human molecule, pg. 240). Longmans, Green, and Co.

θΔics

In hmolscience, **humanide**, from *human*-, meaning “person” or “human molecule”, and *-ide*, signifying a molecular compound, complex, structure, or company usually derived from or related to another, usually specified, compound or structure, refers to something derived from or related to an individual person; generally used with a prefix, e.g. dihumanide molecule, meaning two human molecules attached. [1]

Overview

The following are the most common humanide based namesakes:

#	Name	Meaning	Examples
1	Monohumanide [mono-human-ide]	One human defined as or related to a human molecule.	
2	Dihumanide [di-human-ide]	Two humans bonded in a complex or association.	A dihumanide molecule; Goethe's 1809 Bergman symbol based AB, BC, BD, etc., human-human bonded structures, e.g. married couple, friendships, romantic pairings, etc.
3	Trihumanide [tri-human-ide]	Three humans bonded in a complex or association.	A nuclear family (two parents, one child); Mirza Beg's 1987 human trimers, i.e. the union of three people, as AAB or ABC, etc., as as molecular “trimmer”
4	Tetrahumanide [tetra-human-ide]	Four humans bonded in a complex or association.	Beg's ABCD complex
5	Pentahumanide [penta-human-ide]	Five humans bonded in a complex or association.	Henry Bray’s 1910 Sultan and four harem females SF_4 entity being compared to iron sulfate $FeSO_4$; Christopher Hirata’s 2000 middle-Eastern polygamous molecule X_4Y.
6	Hexahumanide [hexa-human-ide]	Six humans bonded in a complex or association.	
7	Heptahumanide [hepta-human-ide]	Seven humans bonded in a complex or association.	
8	Octahumanide [octa-human-ide]	Eight humans bonded in a complex or association.	
9	Enneahumanide [ennea-human-ide]	Nine humans bonded in a complex or association.	Gates model nine-person Microsoft company activated complex at peak of transition state.
10	Decahumanide [deca-human-ide]	Ten humans bonded in a complex or association.	
11	Hendecahumanide [hendeca-human-ide]	Eleven humans bonded in a complex or association.	
12	Dodecahumanide [dodeca-human-ide]	Twelve humans bonded in a complex or association.	
100	Hectahumanide [hecta-human-ide]	Hundred humans bonded in a complex or association.	

1,000	Kilohumanide [kilo-human-ide]	Thousand humans bonded in a complex or association.	
1,000,000	Megahumanide [mega-human-ide]	Million humans bonded in a complex or association.	
1,000,000,000	Gigahumanide [giga-human-ide]	Billion humans bonded humans bonded in a complex or association.	
	Polyhumanide [poly-human-ide]	Many, i.e. three or more, humans bonded, in a complex, or association.	A polyhumanide molecule.

(add)

Quotes

The following are related quotes:

> "In the end, Bill has successfully stabilized into the three-child family bonded structure, i.e. a **penta-humanide molecule**, MxFyBcBcBc; which in his own reaction system equates to a lower level of Gibbs free energy or free energy decrease."
>
> — Libb Thims (2010), "Something New Created During a Spontaneous Process" [2]

> "Following the recent ban from Facebook of my personal account, which occurred after I was seen discussing the flaws inherent in Einstein's theory of relativity with several other social-networking syntheses, I find that the only way to alleviate the mental tension thereby accrued is through 'sublimation' (one of the Zapffean defense mechanisms). This is similar to how Thims made a 'featured thread about his own ban from Wikipedia and ChemicalForums.com. In any case, this sublimation effort will double as a mental stress reliever, and as an introduction to my artificial construction mechanism to understand human nature, entitled the 'Hawking-Faraday paradox', which I have not yet seen an explication of, in any form in all my readings, but which appears to have had a profound impact on **dihumanide** and **humanide** structures throughout history."
>
> — Inderjit Singh (2014),"Hawking-Faraday Paradox" [3]

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (dihumanide structures, pg. 34). Morrisville, NC: LuLu.
2. Thims, Libb. (2010). "Something New Created During a Spontaneous Process" (Ñº), Hmolpedia, Thread post (#12) to original post "Creativity from the Thermodynamic Point of View", Feb 1.
3. Singh, Inderjit. (2014). "Hawking-Faraday Paradox" (Ñº), Hmolpedia threads (post #1), Sep 29.

External links

â— Greek prefixes (1-20; 24, 30 to 90, 100) – GeorgeHart.com.

θΔics

In religio-mythology, **humanism** is

Overview

In 1920s, various humanist groups, in America, began to form, comprised of Unitarian ministers and philosophers. (Q)

In 1933, Roy Sellars and Raymond Bragg penned *A Humanist Manifesto*, which outlined a 15 statement generic secular belief system, which was signed by those including: John Dewey, Oliver Reiser, among others, the gist of which was a rejection of supernatural, rejection of dualism (affirmation #3), and the general idea that in "place of the old attitudes involved in worship and prayer the humanist finds his religious emotions expressed in a heightened sense of personal life and in a cooperative effort to promote social well-being" (affirmation #9). [2]

In 2012, the American Atheist Association, launched KidsWithoutGod.com (Q), themed as a site for "site for the millions of young people around the world who have embraced science, rejected superstition, and are dedicated to being good without god!"; the site, however, is pretty dumb, being stitched around seven Darwin the Dog "promises" kids are advised to make as their creed, namely: (Q)

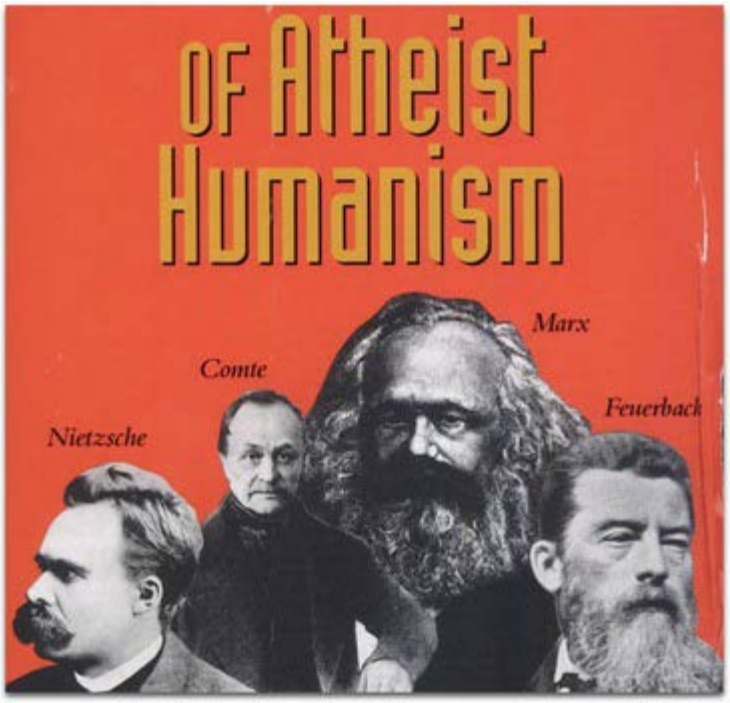

A section of the cover of Henri Lubac's 1944 *The Drama of Atheist Humanism*, wherein he gives a theistic-purview historical on what he calls "Comtian atheism" (Q) and Auguste Comte's age 24 formulated "law of the three states" of mental progression, Karl Marx, Ludwig Feuerbach, and Friedrich Nietzsche, among others. [2]

1. I promise to be nice to other people, just because it's the right thing to do.
2. I promise to care for the world around us, because this is our home and we need it to say health and safe.
3. I promise that I will think about the questions I have and learn as much as I can about who things work.
4. I promise that before I say something or do something to another person, I will stop to think about how I would feel if somebody else said that or did that to me.
5. I promise that I will always tell the truth and take responsibility for my own actions.
6. I promise that I will help those who are sad or angry by being a good friend to them.
7. I promise that I will eat health, get plenty of sleep and exercise, and practice good personal hygiene.

This is what we might call "dumb children's atheism" (compare: smart atheism).

Quotes

The following are related quotes:

> "The definition of **humanism** has been a subject of diverse interpretation almost since the movement began. Some people have been called or call themselves humanists without any clear understanding of what it means. Different factions have arisen such as religious humanists and secular humanists, groups that have often disagreed over matters of definition, but are one in their advocacy of the basic goals."
>
> — Nicolas Walter (1998), *Humanism: Finding Meaning in the Word* (Q)

References

1. (a) Humanist Manifesto I – AmericanHumanist.org.
(b) Humanist Manifesto – Wikipedia.

2. Lubac, Henri. (1944). *The Drama of Atheist Humanism* (translators: Edith Riley and Anne Nash). Publisher, 1949.

Further reading

● Lamont, Corliss. (1993). *The Philosophy of Humanism*. Continuum.
● Bennett, Helen. (2005). *Humanism, What's That? A Book for Curious Kids*. Prometheus.

External links

● Humanism – Wikipedia.
● List of secular humanists – Wikipedia.

θΔics

In education, **humanities** is a collective term referring to the subjects of: economics, sociology, history, philosophy, psychology, government, anthropology, politics, literature, business, law, finance, architecture, etc., among other cross-over interdisciplinary subjects such as political economy or ecological economics.

History

In the 14th century, in Italy, a "humanism" or humanities movement—or quest to find, study, and assimilate the great humanities works of the classics, e.g. Cicero, Virgil, Homer, etc.—began to gain traction, generally through the lead of Italian scholar Petrarch (1304-1374), and his close friends and disciples, preeminently: Giovanni Boccaccio (1313-1374) and Coluccio Salutati (1331-1406), who were under a conviction that a concentrated force existed in the classical works of buried past.

In the late 1390s, Italian notary and book copier Poggio Bracciolini (1380-1459), student of Giovanni Malpaghino—former amanuensis to Petrarch—entered the scene, and adopted the general outlook of the humanism movement, which by that time had shifted to the goal of finding and collecting of the lost humanities books of antiquity, so to form a type of public library. The most-famous of these ancient book discoveries, made by Bracciolini, was the 1417 discovery of Lucretius' 55BC atomic theory based *On the Nature of Things*, which would go on to greatly influence a number of humanities scholars, one of the earliest being French realism writer Montaigne. [3]

Physical humanities

The teaching of humanities, based on physical science is termed "physical humanities", physicochemical humanities (e.g. physicochemical sociology), or physical science based humanities. On early example of "physical humanities", so to say, is French scholar Michel Montaigne's self-education of the atomic theory in Lucretius' *On the Nature of Things*, with which he used as the basis of his 1580 *Essays* on existence—a work that would become one of William Shakespeare's favorite books.

Quotes

The following are related quotes:

> "I can calculate the movements of stars, but not the madness of men."
>
> — Isaac Newton (c.1690), after losing his hat in a market collapse [4]

> "What is man the wiser or the happier for knowing how the air-plants feed, or how my centuries the flint-stone was in forming, unless the knowledge of them can be linked on to **humanity**, and elucidate for us some of our hard moral mysteries?"
>
> — James Froude (1849), *The Nemesis of Faith*, first English translator (1854) of *Elective Affinities* [1]

> "If the **humanities** are dying, I am not convinced that it is a case of murder or that the administrators are the most likely suspects. It seems to me that in a good many departments, in a good many universities, it is a case, rather of attempted and as yet not entirely successful suicide. Now, it seems to me that one of the troubles with the humanities is that they are trying very hard to be something that they cannot be. They are trying to be scientific. And they turn with a vengeance to history and develop all sorts of unimportant facts about unimportant poets, or they develop pseudo-scientific criticism, and I have wondered whether this wasn't an effort to get the prestige that goes along with science and also the protection that goes along with developing an independent discipline, which nobody else understands, and thus nobody else can criticize. The humanities no longer teach the classics as they once did. They are no longer willing to go through the routine problems of improving style; even the language professors are not willing to teach language, but reserve their best efforts for minute points of textual criticism, and the like. So it seems to be, the

humanities shouldn't be what they can't be. They don't have to be exact, they just have to be interesting and colorful and delightful. They can be speculative, concerned with values, and thus they can really be useful and of service to everybody … the sin of the humanities is that they are now trying to become women of virtue, correct and proper and highly isolated, and they would make a greater contribution if they would return to their earlier and more alluring ways."

— Clark Kerr (1955) [5]

See also

- Social science
- Humanities citation ranking
- Humanities thermodynamics

References

1. (a) Froude, James. (1848). *The Nemesis of Faith* (pg. 86). London: John Chapman.
(b) Knight, David. (2009). *The Making of Modern Science: Science, Technology, Medicine and Modernity: 1789-1914* (Elective Affinities, pgs. 29, 184, 255). Polity Press.
2. Staff. (2009). "Most Cited Authors of Books in the Humanities, 2007" (O) , date provided by Thomson Reuters ISI Web of Science, *Times Higher Education*, Mar 29.
3. (a) Greenblatt, Stephen. (2011). *The Swerve: How the Renaissance Began* (pgs. 120-). Random House.
(b) Petrarch – Wikipedia.
4. (a) Bouchard, Jean-Philippe. (2008). "Economics Needs a Scientific Revolution" (EP) (ArXiv), *Nature*, 455:1181, Oct 30.
(b) Weatherall, James O. (2013). *The Physics of Wall Street: A Brief History of Predicting the Unpredictable* (thermodynamics, pgs. 18, 65; Newton quote, pg. 5). Houghton Mifflin Harcourt.
5. (a) Kerr, Clark. (1955). "Article", *The Educational Record* (pgs. 69-70), Jan.
(b) Lundberg, George. (1947). *Can Science Save Us?* (pg. 73-74). Longmans, Green and Co.

External links

- Humanities – Wikipedia.

θΔics

In rankings, **humanities citation ranking** refers to the ranking of humanities, social sciences, and arts scholars; the shorthand (HuCR:25) means, e.g., that Hannah Arendt is ranked 25th in the following 2009 Reuters rankings;

Reuters ranking | 2009

The following is a 2009 compiled "current trends" Thomson Reuters ranking of humanities and social science authors, based on authors whose books—not journals, as in the arts, humanities, and social sciences the "book" holds a more important position and is the primary vehicle of research and information conveyance—collectively, were cited 500 or more times in 2007: [1]

#	Author	Fields	Citations	CR
1.	Michel Foucault (1926-1984)	Philosophy, sociology, criticism	2,521	7
2.	Pierre Bourdieu (1930-2002)	Philosophy	1,874	6
3.	Jacques Derrida (1930-2004)	Philosophy	1,874	2
4.	Albert Bandura (1925-)	Psychology	1,536	
5.	Anthony Giddens (1938-)	Sociology	1,303	
6.	Erving Goffman (1922-1982)	Sociology	1,066	3
7.	Jurgen Habermas (1929-)	Philosophy, sociology	1,049	
8.	Max Weber (1864-1920)	Sociology	971	57
9.	Judith Butler (1956-)	Philosophy	960	
10.	Bruno Latour (1947-)	Sociology, anthropology	944	2
11.	Sigmund Freud (1856-1939)	Psychoanalysis	903	150
12.	Gilles Deleuze (1925-1995) (Ñº)	Philosophy	897	4
13.	Immanuel Kant (1724-1804)	Philosophy	882	66
14.	Martin Heidegger (1889-1976)	Philosophy	874	6
15.	Noam Chomsky (1928-)	Linguistics, philosophy	812	3
16.	Ulrich Beck (1944-)	Sociology	733	
17.	Jean Piaget (1896-1980)	Philosophy	725	
18.	David Harvey (1935-)	Geography	723	
19.	John Rawls (1921-2002)	Philosophy	708	
20.	Geert Hofstede (1928-)	Cultural studies	700	
21.	Edward Said (1935-2003)	Criticism	694	
22.	Emile Durkheim (1858-1917)	Sociology	662	12
23.	Roland Barthes (1915-1980)	Criticism, philosophy	631	
24.	Clifford Geertz (1926-2006)	Anthropology	596	
25.	Hannah Arendt (1906-1975)	Political theory	593	
26.	Walter Benjamin (1892-1940)	Criticism, philosophy	583	28

27.	Henri Tajfel (1919-1982)	Social psychology	583	
28.	Ludwig Wittgenstein (1889-1951)	Philosophy	583	14
29.	Barney Glaser (1930-)	Sociology	577	
30.	George Lakoff (1941-)	Linguistics	577	
31.	John Dewey (1859-1952)	Philosophy, psychology, education	575	3
32.	Benedict Anderson (1936-)	International studies	573	
33	Emmanuel Levinas (1906-1995)	Philosophy	566	
34	Jacques Lacan (1901-1981)	Psychoanalysis, philosophy, criticism	526	12
35	Thomas Kuhn (1922-1996)	History and philosophy of science	519	17
36.	Karl Marx (1818-1883)	Political theory, economics, sociology	501	49
37.	Friedrich Nietzsche (1844-1900)	Philosophy	501	68

See also

â— Hmolscience citation ranking

References

1. Staff. (2009). "Most Cited Authors of Books in the Humanities, 2007" (Ñº) , date provided by Thomson Reuters ISI Web of Science, *Times Higher Education*, Mar 29.

θΔics

In education, **humanities thermodynamics**, a generalized synonym of human thermodynamics, refers to the teaching of humanities subjects using a thermodynamics basis of understanding.

Overview

This grouping would include: art thermodynamics, economic thermodynamics, sociological thermodynamics, philosophical thermodynamics, music thermodynamics, history thermodynamics, anthropology thermodynamics, literature thermodynamics, political thermodynamics, religious thermodynamics, among others.

See also

- Human thermodynamics education

Further reading

- Shaw, Debora and Davis, Charles H. (1983). "The Concept of Entropy in the Arts and Humanities", *Book*, pgs. 135-48.
- Connor, Steve and Leslie, Esther. (2009). Course: "Coldness: Toward a Political Thermodynamics of Culture." The London Consortium: Masters and Doctoral Programme in Humanities and Cultural Studies.

External links

- Humanities – Wikipedia.

θΔics

En termodinámica, la **termodinámica humana** es el estudio científico de los aspectos energético y entrópico de los procesos de la actividad humana y el movimiento, en el contexto de los ciclos solares Delimitadas diaria, es decir, la existente entre el calor, el trabajo, la espontaneidad, la irreversibilidad y las leyes que definen el mismo.

θΔics

In hmolscience, **humans as stardust** refers to the model of a human as a mixture, product, and or composition of "star dust", star-stuff, or star detritus; terms, to note, which have a variety of vague undefined meanings, depending on user, e.g. "nebular gas" (Finnemore, 1924), "stuff that flows between stars" (Sagan, 1970), or "products of exploding stars" (Krauss, 2005).

The circa 2005 view of Lawrence Krauss of humans as made of "star dust" which he defines as the products of exploding stars, such as shown above left.

Early views

In 1917, Canadian physician, poet, psychic, and astronomer Albert Watson (1859-1926), in his "Astronomy: A Cultural Avocation", outlined a new age cosmic being stylized we are made of star-stuff overview. [8]

> "Child of the universe, compounded of **dust**, air and ether, with a heart that thrills to the song of the morning stars and eyes that see them shimmer over the moon-silvered sea, what is more natural than that a man should be an astronomer? Astronomy is wholesome even in this, and helps to clear the way to a realization that as our bodies are an integral part of the great physical universe, so through them are manifested laws and forces that take rank with the highest manifestation of cosmic being. Thus we come to see that if our bodies are made of **star-stuff**, — and there is nothing else, says the spectroscope, to make them of— the loftier qualities of our being are just as necessarily constituents of that universal substance out of which are made 'whatever gods there be'. We are made of universal and divine ingredients, and the study of the stars will not let us escape a wholesome and final knowledge of the fact."

In 1924, Hilda Finnemore, in her *A History of the Earth from Star-Dust to Man*, a science booklet for children, outlined a nebula hypothesis "star-dust" to humans view of things; the gist of which is as follows: [1]

> "Astronomers tell us of vast tracts set in the depths of space, filled with filmy, gaseous could, and these appear to be the stuff out of which suns are made. This immense mist of **star-dust** is throwing off worlds in an intensely hot or gaseous state. There, science suspects, may be the secret of our beginnings. Systems may wheel in space, and, in countless ages, cool to comfortable homes for the animal and vegetable families which come forth from them; minute mosses and lichens may develop into complex and highly organized plants and trees; single-celled atoms may unite and grow until man, which his wonderful brain, emerges; but what is it that *causes* the movement of the heavenly bodies, the growth of the cell, the unfolding and development of the organism? It is a motive power we may call 'life' or 'energy'."

In 1925, Alfred Lotka, in his *Elements of Physical Biology*, wherein he outlined a humans as mass composition table based physical entities, stated the following logic: [2]

> "The evidence points clearly that the elements, such as we know them, are the product of 'the general brewing of material which occurs under the intense heat in the interior of the **stars**.' Out of such foundry came our own abode, if we accept the well-considered views of Eddington (1923): 'I do not say that the earth was a gaseous body when it first became recognizable as an independent planet, but I am convinced

> that its material was at one time merged in a completely gaseous sun.' And since we are of earth, ours also is the same origin. The hand that writes these words and the eye that reads them alike are composed of the selfsame atoms that came into being, ages and ages ago, in the young sun. Far, far more wonderful than any dream of old mythology is the story of our creation. Thus was the birth of man prepared in the grey dawn of time; thus the metal of his frame compounded in the flaming furnace of a **star**."

Of note, quote checker Garson O'Toole (2013), traces the star-stuff model, aside from those mentioned above, to those including: Doris Lessing, Harlow Shapley, Vincent Cronin, William Barton, and or to an Serbian proverb, among other anonymous sources. [9]

Sagan | Star-stuff

In 1970, Carl Sagan, in his book *Planetary Exploration*, was referring to star-stuff as follows: "There is a place with four suns in the sky — red, white, blue, and yellow; two of them are so close together that they touch, and **star-stuff** flows between them." [3]

A sampling of Carl Sagan and Lawrence Krauss humans are star stuff or stardust quotes.

In 1973, Sagan, in his *The Cosmic Connection: An Extraterrestrial Perspective*, stated the following: [7]

> "Our sun is a second- or third-generation star. All of the rocky and metallic material we stand on, the iron in our blood, the calcium in our teeth, the carbon in our genes were produced billions of years ago in the interior of a red giant star. We are made of **star-stuff**."

In 1980, Sagan, in his PBS series *Cosmos*, co-written with his wife Ann Duryan, defined a human as "star-stuff" as follows: [4]

> "The surface of the earth is the shore of the cosmic ocean. From it we have learned most of what we know. Recently, we have waded a little way out, maybe ankle deep, and the water seems inviting. Some part of our being knows this is where we came from. We long to return, and we can, because the cosmos is also within us. We are made of **star stuff**. We are a way for the cosmos to know itself."

This, having been seen by over 500 million people in 60 countries has since become a "widely popularized" image. [5]

Krauss | Stardust

In circa 2005, American astrophysicist Lawrence Krauss, during a talk [somewhere], referring to the above exploding star diagram, stated the following:

> "Here's a beautiful picture [below] from the Hubble Space Telescope of a distant galaxy, far far away and long long ago. It's about a billion light-years away. We're looking at it as it looked a billion years ago. So many of those stars no longer exist. Here's an object that's just as bright as the center of the galaxy. You would think it's a start that's close to our galaxy that just got caught in the picture. It's not. It's a star on the edge of that galaxy that has exploded. Exploding stars shine with a brightness of 10 billion stars. They're the brightest fireworks in the universe. [They're called] supernovas. They're remarkable. This is something that I wrote a whole book about. Someone asked yesterday why I wrote that book. [The answer is] that it is the most poetic thing that I know about the universe. Richard Dawkins wrote a great book called *Our Ancestor's Tale: a Pilgrimage to the Dawn of Life* (2004) (Q), and I wrote a book about a different ancestor's tale, it's called *Atom: an Odyssey from the Big Bang to Life and Earth … and Beyond* (2001) (Q). The amazing thing is that every atom in your body came from a star that exploded. The atoms in your left hand probably came from a different star than the atoms in your right hand. It really is the most poetic thing that I know about physics. You are all **stardust**. You couldn't be here if stars hadn't exploded, because the elements: the carbon, the nitrogen, the oxygen, the iron, all the things that matter for evolution weren't created at the beginning of time, they were created in the nuclear furnaces of stars, and the only way they can get into your body, is if the stars were kind enough to explode. So forget Jesus, the stars died so that you could be here today!"

This quote, with a 600+ quote like GoodReads (Q) rankings, is his most-popular quote.

Tyson | Star detritus

In 2006, Neil Tyson, in his *Death by Black Hole: and Other Cosmic Quandaries*, per influence of Carl Sagan, stated things thusly: [6]

> "Yes, not only humans but also every other organism in the cosmos, as well as the planets or moons on which they thrive, would not exist but for the wreckage of spent stars. So you're made of **detritus** [from exploded **stars**]. Get over it. Or better yet, celebrate it. After all, what nobler thought can one cherish than that the universe lives within us all?"

This quote, to note, has only 100+ quote likes (Q) on GoodRead, one sixth that of the Krauss version.

Tyson, here, for whatever reason, is referring to humans, in a somewhat derogatory and anthropomorphic way, as "star detritus", which is polite for saying a human is "star sh*t", or something to this effect.

Quotes

The following are related quotes:

> "We are star stuff harvesting star light."
>
> — Carl Sagan (1980), "Who Speaks for Earth" (Q), TV episode

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(b) Albert Durrant Watson – Wikipedia.
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θΔics

In famous publications, “**Humans, All Too Chemical**”, or “Menschliches, allzu Chemisches” (German), is a 2001 April fool’s day article, published in *Chemistry News*, by German organic chemist Kaspar Bott, wherein he makes the decisive Gibbs and Goethe connection, albeit in a loose fun half-jokingly assertion manner. [1]

Overview

(add discussion)

Menschliches, allzu Chemisches

Warum machen wir nicht endlich Ernst mit der Umwertung unserer Werte ?

◆ Bei der Lektüre von Goethes Faust können wir mit Vergnügen lernen, daß die Verse: „(Mephisto ist...) ein Teil von jener Kraft, die stets das Böse will und stets das Gute schafft“, noch wirklichkeitsnäher erscheinen, wenn man die Werte Gute und Böse gegen einander austauscht. Eine solche – 100 Jahre später von Friedrich Nietzsche geforderte – Umwertung der Werte könnte den Chemikern vor allem beim sprachlichen Umgang mit ihrer Wissenschaft eine ungeahnte Publikumswirksamkeit bescheren, wie sich später noch zeigen wird. Dem Poeten Goethe verdanken wir auch einen amourösen Roman mit dem Titel „Wahlverwandtschaften“, den man als vortrefflich gelungenes und gesellschaftsbezogenes Gleichnis für einen in der Chemie weit verbreiteten Vorgang bezeichnen darf. In diesem Werk möchte uns der Dichter vor Augen führen, daß zwei gutgefügte Paarungen durch einen Liebhaberaustausch zu noch festeren Bindungsverhältnissen führen können. Doch der Romantitel selbst stellt eine ins Deutsche übertragene Wortschöpfung des schwedischen Chemikers T. O. Bergman dar, der auf diese Weise mehr Humanität und Charme in die Sprache der Naturwissenschaften einbringen wollte. Der Reaktionstyp, um den es hier geht, ist heute nur mehr unter dem gefühlsarmen und farblosen Namen „Doppelte Umsetzung“ bekannt. Dies deutet schon darauf hin, daß die Chemische Wissenschaft in der Zeit nach Goethe den Weg sprachlicher Wirrnisse und Verirrungen eingeschlagen hat. Es lohnt sich deshalb, solche faux pas anhand markanter Beispiele ins Visier zu nehmen.

Ein Leben wie die Götter

◆ Es ist nicht nur ein Zeichen von Weltfremdheit, sondern auch von Lieblosigkeit, wenn Naturwissenschaftler sich anmaßen, die stoffliche Welt in eine belebte und eine unbelebte einzuteilen. So können die als typisch anorganisch bezeichneten Stickstoff- oder Sauerstoffmoleküle schon unterhalb von Temperaturen, die für die menschliche Fortpflanzung als optimal gelten, derart in Rage geraten, daß sie mit ihren diversen Freiheitsgraden der Bewegung und den daraus resultierenden Rotations- und Stoßmöglichkeiten jeden lebenslustigen Erdenbürger vor Neid erblassen lassen. Sie strafen dazu jeden Puritaner Lügen, der mal y pense, daß es sich hierbei um einen Zustand der Verwahrlosung handeln würde. In Wirklichkeit läuft alles, wie es uns L. Boltzmann so einleuchtend erklärt hat, nach gottgewollten Gesetzmäßigkeiten ab. Die betreffenden Moleküle unterliegen beim Ausschöpfen ihrer Vitalität weder einem Rhythmus zwischen Tag und Nacht, noch kann ihnen die unabwendbare Erschlaffung einer Replikationsfähigkeit von DNS-Doppelhelices ein Lebensende bereiten. Sie gleiten vielmehr – wie in einem Gedicht von F. Hölderlin beschrieben – den Göttern gleich als schwerelose und zeitlose Wesen dahin.

Arthur Schopenhauer und seine Epigonen

◆ Nicht nur die Gedanken großer Philosophen, sondern auch die bahnbrechenden Vorstellungungen berühmter Physiko-Chemiker nehmen bisweilen sonderbare Formen an. Zunächst waren es die Ideen von Schopenhauer, die der Menschheit durch Verneinung – entsprechend einer Reduzierung auf den Nullwert – aller Leidenschaften die Erlösung bringen sollten. Noch einen Schritt weiter in die eingeschlagene Richtung ging der Naturforscher Josiah Willard Gibbs. Gemäß der von ihm entwickelten Gleichung muß die als „Freie Energie“ bezeichnete Triebkraft chemischer Reaktionen erst einmal auf negative Werte absinken, damit diese Vorgänge freiwillig ablaufen können. Für die meisten Menschen sind aber Wörter wie Triebkraft oder freiwillig eine Chiffre für all das, was man mit Lust, Liebe und Leidenschaft verbindet. Müßte man Herrn Gibbs nicht folgerichtig als einen Misanthropen in unserer Spaßgesellschaft bezeichnen?

Damit sind wir aber noch nicht am Ende der Fahnenstange angelangt, was die Misanthropie angeht. Es sollte nämlich prominenten Vertretern der Organischen Chemie vorbehalten bleiben, den vielen 1,3 – dipolaren Cycloadditionen auch noch eine „negative“ Aktivierungsentropie als besonderes Markenzeichen anzuheften. Mit allgemein verständlichen Worten gesprochen geht es dabei um eine schon früher gewonnene Erkenntnis des Sexualforschers Alfred Kinsey, daß man nur erfolgreich sein kann, wenn man in entscheidenden Situationen auch eine bestimmte Lage einnimmt. Mit zu viel Negativem vermochte auch die Schwedische Akademie der Wissenschaften nicht viel anzufangen, sonst hätte sie den Protagonisten des genannten Reaktionstyps mit seinem großen Synthesepotential

Article

The following is the article in German and English:

German

English

Menschliches, allzu Chemisches

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Bei der Lektüre von Goethes Faust können wir mit Vergnügen lernen, daß die Verse: „(Mephisto ist...) ein Teil von jener Kraft, die stets das Böse will und stets das Gute schafft", noch wirklichkeitsnäher erscheinen, wenn man die Worte Gute und Böse gegen einander austauscht. Eine solche - 100 Jahre später von Friedrich Nietzsche geforderte - Umwertung der Werte könnte den Chemikern vor allem beim sprachlichen Umgang mit ihrer Wissenschaft eine ungeahnte Publikumswirksamkeit bescheren, wie sich später noch zeigen wird. Dem Poeten Goethe verdan-ken wir auch einen amourösen Roman mit dem Titel „Wahlverwandtschaften", den man als vortrefflich gelungenes und gesellschaftsbezogenes Gleichnis für einen in der Chemie weit verbreiteten Vorgang bezeichnen darf. In diesem Werk möchte uns der Dichter vor Augen führen, daß zwei gutgefügte Paarungen durch einen Liebhaberaustausch zu noch festeren Bindungsverhältnissen führen können. Doch der Romantitel selbst stellt eine ins Deutsche übertragene Wortschöpfung des schwedischen Chemikers T. O. Bergman dar, der auf diese Weise mehr Humanität und Charme in die Sprache der Naturwissenschaften einbringen wollte. Der Reaktionstyp, um den es hier geht, ist heute nur mehr unter dem gefühlsarmen und farblosen Namen „Doppelte Umsetzung" bekannt. Dies deutet schon darauf hin, daß die Chemische Wissenschaft in der Zeit nach Goethe den Weg sprachlicher Wirrnisse und Verirrungen einge-schlagen hat. Es lohnt sich deshalb, solche faux pas anhand markanter Beispiele ins Visier zu nehmen.

Ein Leben wie die Götter

Es ist nicht nur ein Zeichen von Weltfremdheit, sondern auch von Lieblosigkeit, wenn Naturwissenschaftler sich anmaßen, die stoffliche Welt in eine belebte und eine unbelebte einzuteilen. So können die als typisch anorganisch bezeichneten Stickstoff- oder Sauerstoffmoleküle schon unterhalb von Temperaturen, die für die menschliche Fortpflanzung als optimal gelten, derart in Rage geraten, daß sie mit ihren diversen Freiheitsgraden der Bewegung und den daraus resultierenden Rotations- und Stoßmöglichkeiten jeden lebenslustigen Erdenbürger vor Neid erblassen lassen. Sie strafen dazu jeden Puritaner Lügen, der mal y pense, daß es sich hierbei um einen Zustand der Verwahrlosung handeln würde. In Wirklichkeit läuft alles, wie es uns L. Boltzmann so einleuchtend erklärt hat, nach gottgewollten Gesetzmäßigkeiten ab. Die betreffenden Moleküle

Human, All Too Chemical

Why do not we get serious with the revaluation of our values

In reading of Goethe's *Faust* we can learn with pleasure that the verses: "(Mephisto is ...) a part of that force which always wants the bad and always creates the good", appear even more realistic when the words good and evil against each other exchanges Such -. 100 years later demanded by Friedrich Nietzsche - revaluation of values â €‹â€‹could especially bring the chemists at linguistic handling of their science an unexpected audience appeal, as will be shown later the poet Goethe verdan-ken. we also have a amorous novel entitled *Elective Affinities*, which one may describe as excellent and successful society-related parable of a chemical in the widespread process. In this work, the poet wants us keep in mind that two gutgefügte pairings can lead by a lover to exchange even firmer bond conditions. But the Roman title itself represents a transmitted into German neologism of the Swedish chemist TO Bergman, who wanted to bring more humanity and charm in the language of science in this way. The type of reaction, at issue here is, today only under the unemotional and colorless name "double conversion" known. This already suggests that the science of chemistry has turned-hit in the aftermath of Goethe the way of linguistic confusions and aberrations . It is therefore worthwhile to take such a faux pas based Remarkable examples targeted.

A life like the gods

It is not only a sign of naivety, but also of heartlessness if scientists presume to classify the material world in a lively and inanimate. Thus, the nitrogen or oxygen molecules called typical inorganic can already below temperatures that apply to human reproduction as optimal, got into such a rage that she before with their various degrees of freedom of movement and the resulting rotational and shock opportunities every fun-loving Earthlings green with envy. You punish every Puritans to lies, the times y pense that these would be be a state of neglect. In reality, everything is going as Boltzmann declared so obvious to us, after god-given laws from. The molecules in question

unterliegen beim Ausschöpfen ihrer Vitalität weder einem Rhythmus zwischen Tag und Nacht, noch kann ihnen die unabwendbare Erschlaffung einer Replikationsfähigkeit von DNS-Doppelhelices ein Lebensende bereiten. Sie gleiten vielmehr - wie in einem Gedicht von F. Hölderlin beschrieben - den Göttern gleich als schwerelose und zeitlose Wesen dahin.

are subject to the exploitation of their vitality neither a rhythm between day and night, still can give you the inevitable slackening of replicability of DNA duplexes put an end of life. They glide rather - as described in a poem by F. Hölderlin - equal to the gods as a weightless and timeless beings there.

Arthur Schopenhauer und seine Epigonen

Nicht nur die Gedanken großer Philosophen, sondern auch die bahnbrechenden Vorstellungungen berühmter Physiko-Chemiker nehmen bisweilen sonderbare Formen an. Zunächst waren es die Ideen von Schopenhauer, die der Menschheit durch Verneinung - entsprechend einer Reduzierung auf den Nullwert - aller Leidenschaften die Erlösung bringen sollten. Noch einen Schritt weiter in die eingeschlagene Richtung ging der Naturforscher Josiah Willard Gibbs. Gemäß der von ihm entwickelten Gleichung muß die als „Freie Energie" bezeichnete Triebkraft chemischer Reaktionen erst einmal auf negative Werte absinken, damit diese Vorgänge freiwillig ablaufen können. Für die meisten Menschen sind aber Wörter wie Triebkraft oder freiwillig eine Chiffre für all das, was man mit Lust, Liebe und Leidenschaft verbindet. Müßte man Herrn Gibbs nicht folgerichtig als einen Misanthropen in unserer Spaßgesellschaft bezeichnen?

Arthur Schopenhauer and his epigones

Not only the thoughts of great philosophers, but also the groundbreaking Vorstellungungen famous physical chemist sometimes adopt strange forms. First there were the ideas of Schopenhauer, the humanity through negation - the redemption should bring all passions - in accordance with a reduction to the zero value. Going a step further in the direction taken was the naturalist Josiah Willard Gibbs. According to the developed by him equation as "free energy" designated driving force of chemical reactions must first drop to negative values, so that these processes can occur voluntarily. But words are as motive power or for most people voluntarily a code word for all that you connects with lust, love and passion. Should you Mr. Gibbs inconsequential as a misanthrope call in our fun society?

Damit sind wir aber noch nicht am Ende der Fahnenstange angelangt, was die Misanthropie angeht. Es sollte nämlich prominenten Vertretern der Organischen Chemie vorbehalten bleiben, den vielen 1,3-dipolaren Cycloadditionen auch noch eine „negative" Aktivierungsentropie als besonderes Markenzeichen anzuheften. Mit allgemein verständlichen Worten gesprochen geht es dabei um eine schon früher gewonnene Erkenntnis des Sexualforschers Alfred Kinsey, daß man nur erfolgreich sein kann, wenn man in entscheidenden Situationen auch eine bestimmte Lage einnimmt. Mit zu viel Negativem vermochte auch die Schwedische Akademie der Wissen-schaften nicht viel anzufangen, sonst hätte sie den Protagonisten des genannten Reaktionstyps mit seinem großen Synthesepotential schon längst den begehrten Preis verliehen.

We have not yet reached the end of the flagpole, it comes to misanthropy. It should namely remain prominent representatives of the organic chemistry subject, attach also a "negative" of activation as a special trademark of the many 1,3-dipolar cycloaddition. Using common words spoken, it covers an earlier gained knowledge of sex researcher Alfred Kinsey, that one can be successful only if one adopts a certain position in crucial situations. With too much negativity, the Swedish Academy of Sciences-ties could begin not much, otherwise they would have the protagonists of that type of reaction with its large synthetic potential already the awarded coveted prize.

Wie oben bereits angedeutet, sind die drei großen L die spirituellen Wirkstoffe „an sich", die den ganzen Charme der diesseitigen Welt ausmachen. Sie stehen auch am Anfang jeder erfolgreichen Suche nach neuen biologischen Wirkstoffen. Deshalb sollte es Forschungsmanagern aus der Industrie die Überlegung wert sein, ob sie nicht endlich im Zuge eines Paradigmenwechsels von den abgegriffenen drei großen I oder K ablassen, um einer reine Lebensfreude atmenden

As already indicated above, the three large L are the spiritual agents "per se", which make all the charm of this world. They also are at the beginning of any successful search for new biological agents. Therefore, it should research managers from industry worth consideration be if they do not finally drain in the course of a paradigm shift from the tapped three major I or K to a pure zest for life breathing L-World grant her due priority.

L-World die ihr gebührende Priorität einzuräumen.

Herr Platon und seine Körper

Die heidnische Philosophie der Griechen hat bekanntlich den Kirchenlehrer Thomas von Aquin bei der Konzipierung seiner summa theologiae in besonderer Weise beflügelt. Noch merkwürdiger mutet allerdings das Faible einiger Chemiker des postmodernen Zeitalters an, die nach Platon benannten hochsymmetrischen Gebilde mit dem Synthesewerkzeug der modernen Organischen Chemie nachzuempfinden. Lernt nicht jeder aufgeschlossene Mensch schon in der Jugend, daß platonische Liebe nichts anderes als Liebe ohne Knalleffekt bedeutet. Warum sollte sich auch jemand beim Anblick platonischer Körper von deren regelmäßig angeordneten Ecken in Begeisterung versetzen lassen, wenn er schon als Jüngling mit dem Sprichwort vertraut gemacht wird: „ An jeder Ecke kommst Du vorbei, bloß an keiner Rundung, so bloß sie auch sei".

An dem Reizvollen der „runden Sachen" kamen offensichtlich auch jene Forscher nicht vorbei, die sich die Fußball-Moleküle - auch Buckminster-Fullerene genannt - auf ihre Fahnen geschrieben haben. Man mag es nachträglich als einen Wink mit dem Zaunpfahl interpretieren, wenn der Schweiß dieser Edlen ohne längere Wartezeit mit der Nobel-Medaille belohnt wurde.

Traum und Wirklichkeit

Ein populär gewordenes Lied des Barden Reinhard Mey hat offensichtlich einige Professoren zu der wunschtraumhaften Textänderung inspiriert: „Über den Molekülen muß die Chemie wohl grenzenlos sein". Mit dem hierzu erfundenen Zauberwort „Supramolekulare Chemie" glaubten diese Träumer, eine wissenschaftliche Reformation einläuten zu können. Schon die Vorstellung, daß über den Molekülen noch eine Chemie möglich sein soll, muß allen Forschern abstrus vorkommen, die sich ernsthaft mit Reaktionsmechanismen auseinandergesetzt oder ihr Herzblut faszinierenden Naturstoffsynthesen geopfert haben. Selbst wenn man das Wortgebilde Supramolekulare Chemie als Werbe-Gag für eine gebeutelte Wissenschaft verstanden wissen wollte, wäre es immer noch werbewirksamer, von Chemie ohne Grenzen zu sprechen.

Als besonders witzig wollte sich vor mehr als dreißig Jahren eine Arbeitsgruppe ausnehmen, weil sie glaubte, mit der Einführung von nacktem Nickel als Katalysator ihren metallorganischen Synthesen so etwas wie sex appeal [s. nachfolgenden Beitrag] verleihen zu können. Nun weiß jeder Mensch, der sich mit der Schönheit

Mr. Plato and his body

The pagan philosophy of the Greeks is known to have inspired the church teacher Thomas Aquinas in the design of his *Summa Theologiae* in a special way. Even more strange seems to the penchant of some chemist of the postmodern era, recreate the named after Plato highly symmetric structure with the synthesis tool of modern organic chemistry. Does not learn any open-minded person in youth that platonic love means nothing else than love without bang. Why should also let someone put at the sight platonic body of its regularly arranged corners in enthusiasm when it is already made as a young man with the familiar adage: "On every corner you come around, just any rounding, it is so only as".

At the charming of the "round things" came apparent even those researchers not over, the football molecules - have written on their banners One may subsequently be interpreted as a hint, hint, when the welding - also called Buckminster fullerenes. this Noble was rewarded with no long waiting time with the Nobel medal.

Dream and Reality

A popular become song of the bard Reinhard Mey has apparently inspired some professors to the desire dreamy amendment: "About the molecules, the chemical must be boundless" By this invented magic word "supramolecular chemistry" believed these dreamers to usher in a scientific reformation.. Even the idea that even a chemical should be possible via the molecules must happen all researchers abstruse that seriously dealt with reaction mechanisms or their hearts have sacrificed fascinating natural product syntheses. Even if one wanted to know chemistry understood as an advertising gimmick for a battered science, the word structure Supramolecular, it would still be effective advertising to speak of chemistry without limits.

Particularly funny was intended to exclude a group, more than thirty years ago, because she believed that with the introduction of bare nickel as a catalyst to their organometallic syntheses such a thing as sex appeal [s. to give subsequent post]. Now everybody knows who has befriended with the beauty of Greek sculpture that revive something erotic Prickelndes only with obfuscation begins. One must consider that the special effect of the divested catalysts in reality a veiled nickel emanates what is revealed only on closer inspection it as ironic.

griechischer Skulpturen angefreundet hat, daß etwas erotisch Prickelndes erst mit der Verschleierung anfängt aufzuleben. Man darf es als Ironie des Schicksals betrachten, daß die besondere Wirkung der entkleideten Katalysatoren in Wirklichkeit von einem verschleierten Nickel ausgeht, was erst bei näherem Hinsehen offenbar wird.

Ein Epilog

Wenn der Autor beim Lesen seines Beitrags in die Rolle eines unbefangenen Betrachters schlüpfen könnte, würde ihm zunächst ein Goethe-Zitat einfallen: „Ach, daß die Einfalt, daß die Unschuld nie sich selbst und ihren heil'gen Wert erkennt". Deshalb möchte ich allen Chemikern ans Herz legen, das Erotische in ihrer Wissenschaft offenzulegen. Vielleicht finden dann viel mehr Menschen Spaß an der Chemie.

Ein molekularer Hermaphrodit

In der Technik werden Bauteile oft als „weiblich" (Öse, Mutter) und als „männlich" (Stab, Schraube) bezeichnet. In Analogie kann man auch bei Molekülen mit derartigen Strukturelementen von „männlich" und „weiblich" sprechen. Moleküle, die sowohl ein „männliches" als auch ein „weibliches" Ende besitzen, werden folglich Hermaphroditen oder Zwitter genannt".

Schlüssel-Schlüsselloch-Verhältnis, kupferinduziert

„Ein derartiges Zwittermolekül ist aus einer Art Öse und einem stabförmigen Teil aufgebaut, und je zwei dieser Moleküle dimerisieren, indem wechselseitig der stabförmige Teil in die Öse des Partnermoleküls gefädelt wird. Paarungen von derartigen Zwittermolekülen waren bislang in Lösung nicht zu stabilisieren."

chlüssel-Schlüsselloch-Verhältnis, kupferinduziert.

Dem Verbindungstypus prophezeien die Entdecker wichtige Anwendungen: „Unser neues Dimer könnte ein wichtiger Bestandteil von eindimensionalen Strukturen werden, die in der Lage sind, sich als Antwort auf ein externes Signal zu strecken und zu kontrahieren".

An epilogue

If the author could slip while reading his contribution in the role of an impartial observer, it is a quotation from Goethe would first come: "Ah, that simplicity, that innocence never recognize themselves and their sacred value" So I want. all chemists put your heart to reveal the erotic in their science. Perhaps then find a lot more people enjoy chemistry.

A molecular hermaphrodite

In the technology components are often referred to as "female" (eye, mother) and as a "male" (rod, screw). Analogously one can even in molecules with such structural elements of "male" and "female" talking. Molecules that possess both a "male" and a "female" end position, are called hermaphrodites or hermaphrodite ".

Schlüssel-Schlüsselloch-Verhältnis, kupferinduziert

"Such a hybrid molecule is constructed of a kind of eyelet, and a rod-shaped part, and two of these molecules dimerize by mutually the rod-shaped part is threaded into the eyelet of the partner molecule. Pairings of such hybrid molecules had yet to stabilize in solution. "

EY-keyhole Ratio, copper-induced.

The connection type prophesy the discoverers important applications: "Our new dimer could be an important part of one-dimensional structures that are able to stretch in response to an external signal and to contract".

"Angewandte Chemie", abbreviated news release; Cartoon: Constanze Heller

„Angewandte Chemie“, gekürzte Presseinformation;
Cartoon: Constanze Heller

(add summary)

References

1. Bott, Kaspar. (2001). “Humans, All Too Chemical” (“Menschliches, allzu Chemisches”), *News in Chemistry* (*Nachrichten aus der Chemie*) (abs), 49(4):471-72, April.

θΔics

In websites, **HumanThermodynamics.com** is an educational site launched on April 27, 2005 by American chemical engineer Libb Thims. [1] The site is host to the *Journal of Human Thermodynamics*. [2] The theme of the site, geared towards the layperson, is a simplistic introduction to the study of the application of thermodynamics to human existence.

Screenshot of **HumanThermodynamics.com** in September 2009.

Origin

> *See main: Libb Thims (history), Human Chemistry (textbook) (origin)*

In 1995, completely as a hobby, engineering student Thims began working on the puzzle of how the spontaneity criterion (or prediction) of chemical thermodynamics applies to the successfulness of mate selection in the process of love the chemical reaction.

On November 15, 2001, at 3:00 AM, Thims had a partial break through on the puzzle in beginning to see connections between entropy, intelligence, and order; enthalpy, physical attractiveness, and heat; and Gibbs free energy, occupation, and stability. At this point, he decided a short article or possible booklet would be a favorable two-month project, for the betterment of humankind. In the following four years, four manuscripts were written.

On April 27, 2005, Thims began to go public with some of his research and work with the launching of the HumanThermodynamics.com website, albeit having the goal of the site to be a place to link up others around the world who might be researching the same topic.

The partial construction of various pages and links the HT Glossary (and the limitations discovered by this method) was a seed behind the December 24, 2007 launch of the EoHT.info wiki. [3]

References

1. HumanThermodynamics.com – homepage.
2. Journal of Human Thermodynamics – IoHT Chicago.
3. HT Glossary - IoHT Chicago.

External links

â— Alexa rank: 2,100,000 (Jun 09) - HumanThermodynamics.com.
â— Quantcast demographics - of human thermodynamics readers.

θΔics

In existographies, **Humberto Maturana** (1928-) (CR:4) is Chilean biologist (chnopsologist) and philosopher noted for his 1973 “autopoiesis” theory of life a type of "self-forming" (self-organizing) theory. [1]

Maturana has been classified, along with Chilean neurologist Francisco Varela, as a "follower" of Belgian chemist Ilya Prigogine . [2]

References

1. (a) Maturana, Humberto and Varela, Francisco. (1980). *Autopoiesis and Cognition: the Realization of the Living*. D. Reidel.
(b) Juarrero, Alicia. (1999). *Dynamics in Action: Intentional Behavior as a Complex System* (Maturana, 3+ pgs.). MIT Press.
(c) Deacon, Terrence W. (2011). *Incomplete Nature: How Mind Emerged from Matter* (Maturana, 5+ pgs.). W.W. Norton & Co.
2. Rabinovitz, Lauren and Geil, Abraham. (2004). *Memory Bytes: History, Technology and Digital Culture* (pgs. 58, 59, 74). Duke University Press.

External links

â— Humberto Maturana – Wikipedia.

θΔics

In anecdotes, **Hume-Holbach dinner party** refers to the famous 1763 dinner party encounter between Scottish philosopher David Hume, an Epicurean-defending "**quite atheism**" leaning agnostic-skeptic, and French "**extreme atheism**" philosopher Baron d'Holbach, attended by sixteen other of the brightest minds of the century, retrospectively classified as "doubt's greatest coming-out party" (Hecht, 2003).

Left: Photo of Holbach's second mansion, Le Château de Grand-Val (Q), where he ran his famous intellectual salons, and where, supposedly, the **Hume-Holbach dinner party** (1763) encounter occurred. Right: a photo of Voltaire, and others, at an earlier 1750s coffee house salon meeting.

Famous atheist moments

The Hume-Holbach dinner party collision (1763) might rank second in fame, in atheist circles, behind the Napoleon-Laplace anecdote (1802).

Overview

In the 1750s, in Paris, salons, i.e. coffee-fueled intellectual meet-ups, began to become popular; shown adjacent is a circa 1750 image of a discussion at Café Procope, showing: at rear, from left to right: Marquis Condorcet, Jean-Francois de La Harpe, Voltaire, with his arm raised, and Denis Diderot. [5]

In the 1760s, Baron d'Holbach, at his second mansion Le Château de Grand-Val (pictured above), outside of Paris, ran a bi-weekly intellectual salon, one of the most famous of all intellectual salons, with the entice of excellent food, expensive wine, and a library of over 3000 volumes, he attracted many notable visitors, including: Denis Diderot, Grimm, Condillac, Marquis Condorcet, Jean D'Alembert, Marmontel, Turgot, La Condamine, Helvetius, Jean-Jacques Rousseau, Adam Smith, David Hume, and Benjamin Franklin. [4]

In 1763, Hume (aged 52) (IQ:180|#111) visited Paris, a point in time, when most of his works were well-known and he was the toast of the town, during which time he visited the house of Baron d'Holbach (aged 40) during which time a "legendary dinner party" was thrown.

The following five people, among a total of eighteen at the dinner table, were known to have been in attendance, resulting in a "collision of social Newtons", so to say, in hmolscience speak:

1. Baron d'Holbach (aged 40) (IQ:185#|56) [**SN:21**], aka "Newton of the atheists" (Martin Priestman, 2000) (Q) (V|1:45)
2. David Hume (aged 52) (IQ:180|#111) [RGM:111|1,250+] [**SN:47**], aka "Newton of moral sciences" (John Passmore, c.1960) (Q) (Michael Foley, 1990)
3. Denis Diderot (aged 50) (IQ:170|#238) [RGM:463|1,250+], aka "first encyclopedist" [4]
4. Voltaire (age 69) (IQ:195|#18) [RGM:33|1,250+], aka "Prophet of Newtonian physics based Biblical-deistic reason" (Ching-Yao Hsieh, 1991)
5. Charles Montesquieu (age 74) (IQ:175|#200) [RGM:92|1,250+] [**SN:51**], aka "Newton of sociology" (Crane Brinton, 1950) (Q)

The gathering has been described as an salon-style philosophical dinner. Diderot related the encounter, between the great agnostic-leaning-atheist Hume, seated next to the extreme atheist d'Holbach, as follows: [1]

Holbach **Hume** **Diderot** **Voltaire** **Montesquieu**

The five big chiefs at the **Holbach-Hume dinner party** (1763) encounter, where at Hume famously stated he "did not believe in atheists", because he had never seen one, to which Holbach replied: "look around, there are 18 of us, 15 are atheists, 3 have not made up their mind".

> **Hume:** "I do not believe in atheists, because I have never seen one!"
>
> **Holbach:** "Count how many we are here. We are eighteen."
>
> **Holbach:** "It is not too bad a showing to be able to point out to you fifteen at once; the three others have not mad up their minds."

Ernest Mossner (1954) has described Holbach's group as an "atheistical club". [2] David Berman (1988) has argued that Hume took it into his head to make this remark per reason that his "opening gambit was rather like a Masonic handshake: an attempt to elicit a response from, and communicate with, someone whose secret identity he guesses." [1] Jennifer Hecht (2003) dubs this "doubt's greatest coming-out party". [3]

Quotes

The following are related quotes:

> "This [Holbach-Hume meeting] was the **first group of actual avowed atheists**; no dissembling, no caveats, just no gods, no god, nothing like it. For the first time, doubters were silenced neither by fear of being killed or exiled nor for fear of how the masses would behave if they became convinced if there was no god and no hell. The crowd believed morality was available to anyone through reason. The central text here was Holbach's *System of Nature*."
>
> — Jennifer Hecht (2013), *Doubt: a History* (pg. 353); note: the above "central text" citation is an anachronism; per reason that Holbach's *System of Nature* wasn't drafted until c.1768, and not published until 1770

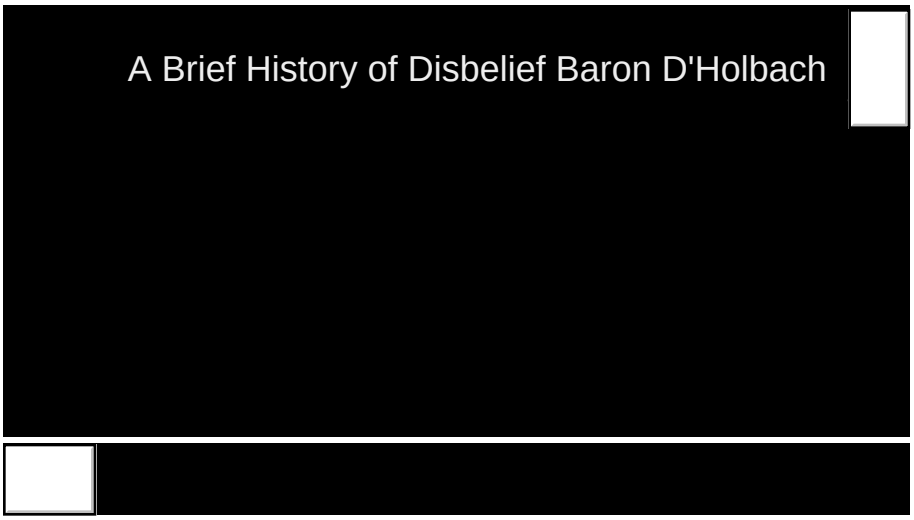

A BBC segment on the Hume-Holbach dinner party collision.

See also

- Heisenberg-Pauli dialogue
- Einstein-Murphy dialogue
- Moreland-Strobel dialogue

References

1. (a) Berman, David. (1988). *A History of Atheism in Britain: From Hobbes to Russell* (pg. 101). Routledge. 2013.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (party, pg. 352). HarperOne.
2. Mossner, Ernest C. (1954). *The Life of David Hume* (atheistical club, pgs. 467). Publisher.
3. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and*

Jesus to Thomas (party, pg. 352). HarperOne.
4. Blom, Philipp. (2010). *A Wicked Company: the Forgotten Radicalism of European Enlightenment* (abs). Basic Books.
5. (a) Age of Enlightenment – Wikipedia.
(b) Café Procope – Wikipedia.

θΔics

In existographies, **Humphry Davy** (1778-1829) (IQ:185|#66) (Cattell 1000:203) [RGM:1265|1,500+] (Murray 4000:5|C) (Partington 50:11) (GPE:43) (GCE:12) (CR:63) was an English chemist and physicist; noted for his 1799 "ice-rubbing experiments", for his work on the conservation of force, among other areas of research, such as the discovery of many elements.

Caloric theory | frictional theory

On 22 February 1799 Davy, writing to Davies Gilbert on the subject of caloric theory, stated:

> "I am now as much convinced of the non-existence of caloric as I am of the existence of light."

Sometime before or after this letter, in 1799, Davy performed his famous "ice-rubbing experiments", where in a room colder than the freezing point of water, he generated heat or made ice melt by the mechanical rubbing of cubes together.

By doing this, Davy demonstrated the conversion of work into heat and that indefinite amounts of heat could be generated from a body, this being contrary to caloric theory, which limits the amount. [1]

Arc light

In 1802, Davy built a battery and connected wires from it to a piece of carbon, which glowed; this was known as the "electric arc", forerunner to the light bulb (Edison, 1878). (Ñº)

Human

In 1813, Davy compared man to a "point atom".

Affinity theory

Davy's 1806 lecture "On Some Chemical Agencies of Electricity" was said to be very influential to 19th century chemical affinity theory.

Conservation of force

Davy was one of the first, along side of Isaac Newton, Gottfried Leibniz, Daniel Bernoulli, Benjamin Thomson, to have enunciated the view that force is conserved as in the conservation of force. [3]

Influence

Davy was the mentor to Michael Faraday. (Ñº)

References

1. Milestones in Thermodynamics – Thermal Physics, *University of Notre Dame*.
2. Levere, Trevor, H. (1971). *Affinity and Matter – Elements of Chemical Philosophy 1800-1865*. Great Britain: Oxford University Press.
3. Helmholtz, Hermann. (1862). "On the Conservation of Force: Introduction to a Series of Lectures Delivered at Carlsruhe in the Winter of 1862-63" [URL]. In *Scientific Papers: the Harvard Classics.* Translated by Edmund Atkinson.

External links

â— Humphry Davy – Wikipedia.
â— Humphry Davy – Eric Weisstein's World of Scientific Biography.

θΔics

In existographies, **Hunter Thompson** (1937-2005) (IQ:#|#) (CR:5) was an American journalist, author, and realism existence philosopher, noted for []

Energy | Philosophy

In 1971, Thompson, in his in his *Fear and Loathing in Las Vegas: a Savage Journey to the Heart of the American Dream*, replaced god by a mixture of "energy" and the "whim of a great magnet"; the gist of which is as follows:

> "All energy flows according to the whims of the great magnet. What a fool I was to defy him."
>
> — Hunter Thompson (1971), *Fear and Loathing in Las Vegas* (Ñº)

> "History is hard to know, because of all the hired bullsh*t, but even without being sure of 'history' it seems entirely reasonable to think that every now and then the energy of a whole generation comes to a head in a long fine flash, for reasons that nobody really understands at the time—and which never explain, in retrospect, what actually happened . . . There was madness in any direction, at any hour. If not across the Bay, then up the Golden Gate or down 101 to Los Altos or La Honda . . . You could strike sparks anywhere. There was a fantastic universal sense that whatever we were doing was right, that we were winning . . . And that, I think, was the handle—that sense of inevitable victory over the forces of Old and Evil. Not in any mean or military sense; we didn't need that. Our energy would simply prevail. There was no point in fighting—on our side or theirs. We had all the momentum; we were riding the crest of a high and beautiful wave . . . So now, less than five years later, you can go up on a steep hill in Las Vegas and look West, and with the right kind of eyes you can almost see the high-water mark—that place where the wave finally broke and rolled back."
>
> — Hunter Thompson (1971), *Fear and Loathing in Las Vegas*

(add)

Kesey's Bible

In 1971, Thompson, in his *Fear and Loathing in Las Vegas: a Savage Journey to the Heart of the American Dream*, advocates the following reaction existence model; which is his most-liked quote according to GoodReads:

> "No sympathy for the devil; keep that in mind. Buy the ticket, take the ride ... and if it occasionally gets a little heavier than what you had in mind, well ... maybe chalk it off to forced conscious expansion: Tune in, freak out, get beaten ... it's all in Kesey's Bible …. the far side of reality."

The mention of "Kesey's Bible" here refers to American *One Flew Over the Cuckkoo's Nest* author Ken Kesey (1935-2001) and his 1971 *The Realist* article "The Bible", and it's philosophical discourse on the paradoxical nature of work; few representative quotes: [6]

> "Man's theories about himself will build up, like tartar on a tooth, until something breaks the shell or until he succumbs to the twilight security of an armored blind mind."
>
> — Ken Kesey (1971), "The Bible", attributed to Jerry Garcia [2]

> “This task of revolution turned to with conscious purpose ten years ago has demanded nothing less than full time effort of everyone aware of the job to be done. No one has f*cked off—laid back, maybe, or f*cked up, but not really f*cked off—because the person who can still take a vacation has never gone to work—and very few have defected back to their former jobs. Who wants to take a train back and forth every day from one schizophrenic life to the other?”
>
> — Ken Kesey (1971), “The Bible” [2]

(add)

Religion | Atheism

Thompson seems to have been brought up Catholic and become an irreligious atheist-leaning agnostic in adulthood; the following is an example:

> “This is the same cruel and paradoxically benevolent bullsh*t that has kept the Catholic Church going for so many centuries. It is also the military ethic … a blind faith in some higher and wiser ‘authority.’ The Pope, The General, The Prime Minister … all the way up to ‘god’.”
> — Hunter Thompson (1971), *Fear and Loathing in Las Vegas*

(add)

Influence

Thompson, who committed suicide (Ñº), was the favorite author of Patrick Fergus, who committed suicide just before his 30th birthday.

Quotes | By

The following are quotes by Thompson:

> “No More Games. No More Bombs. No More Walking. No More Fun. No More Swimming. 67. That is 17 years past 50. 17 more than I needed or wanted. Boring. I am always bitchy. No Fun – for anybody. 67. You are getting Greedy. Act your old age. Relax – This won't hurt.”
>
> — Hunter Thompson (2005), suicide note last words (Ñº)

References

1. (a) Fear and Loathing (90+ quotes | Ranked by vote) – GoodReads.com.
(b) Top 10 Insane Quotes (*Fear and Loathing*) – Alternative.Reel.com.
2. (a) Kesey, Ken. (1971). “The Bible”, *The Realist*, 89:3-5, Mar/Apr.
(b) Ken Kesey – Wikipedia.

External links

â— Hunter S. Thompson – Wikipedia.

θΔics

In debates, **Huxley vs Wilberforce debate**, aka "Oxford evolution debate" is debate that took place on 30 Jun 1860, seven months after the publication of Darwin's *On the Origin of Species*, at Oxford University Museum, Oxford, England, the engagement occurring principally between Thomas Huxley, the evolution defender, and Samuel Wilberforce, the theology defender; along with sideline participation by those including: Joseph Hooker, John Draper, Benjamin Brodie, and Robert FitzRoy; no verbatim account of the debate exists, only fragmented memory accounts by attendees exist.

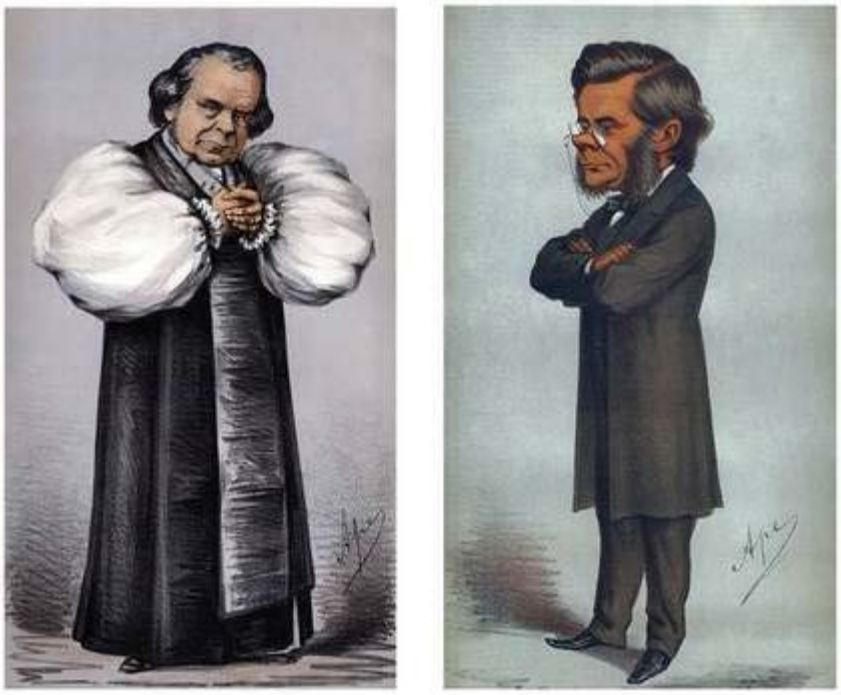

An image of bishop Samuel Wilberforce, the Bible-defender, and Thomas Huxley, the Darwin-defender, the two who butted heads at the famous **Huxley vs Wilberforce debate**, at Oxford, in 1860.

Quotes | From

The following are noted quoted form the debate:

> "Are we a fortuitous concourse of atoms?"
>
> — John Draper (1860), opening paper "on the intellectual development of Europe with relation to Darwin's theory"; paper read, supposedly, was a dry discourse [1]

> "Is it through your grandfather or grandmother that you claim descendance from a monkey?"
>
> — Samuel Wilberforce (1860), query to Thomas Huxley [1]

> "I am not ashamed to have a monkey for an ancestor. I would be ashamed, however, to be connected with a man who used great gifts [of speech] to obscure the truth."
>
> — Thomas Huxley (1860), reply to Samuel Wilberforce [1]

Quotes | On

The following are quotes on the debate:

> "I found myself asking: How do I know about Darwin to begin with? And the answer was this: I was taught him as part of history as well as part of biology. After the voyage of the good ship Beagle and the amazing discoveries that attended it, Darwin decided to change his own theistic views and also to challenge the rooted conceptions of Christian Victorian society. He succeeded beyond any expectation. The great set piece, which I was taught in school, involved the debate at Oxford between Darwin's supporter Thomas Huxley (ancestor of Aldous and Julian and coiner of the word "agnostic") and Bishop Wilberforce, known even to his own flock as Soapy Sam. In front of a large audience, Huxley cleaned Wilberforce's clock, ate his lunch, used him as a mop for the floor, and all that. It was a "tipping point." After that, there were still those who believed that god had put fossils in the rock to test our faith, and those like Bishop Ussher who claimed to have dated the birth of the world to an exact time (4004 BC), but they were a spent force."
>
> — Christopher Hitchens (2005), "Equal Tax: No Tax-Exempt Status for Churches that Refuse to Distribute Pro-

Evolution Propaganda!” [2]

References

1. Lucas, J. R. (1979). "Wilberforce and Huxley: a Legendary Encounter" (O). *The Historical Journal*. 22(2):313-33.
2. Hitches, Christopher. (2005). “Equal Tax: no Tax-Exempt status for Churches that refuse to distribute pro-evolution propaganda!” (O), Slate.com, Aug 23.

Videos

- Lemon, Kirk. (2012). “Huxley-Wilberforce Debate” (O), Kirk Lemon, YouTube, May 3.

External links

- 1860 Oxford evolution debate – Wikipedia.

θΔics

In human chemistry, **Hwang model** or "Hwang free energy principle" states that []

Overview

In 2001, David Hwang, in his article "The Thermodynamics of Love", stated, in the context of a typical mate selection human combination reaction, such as in the process of two people falling in love or the process of a full human reproduction reaction, that: [1]

> "If the male-female reaction has a negative free energy, then it is expected that the system will spend most of its time together as a strong couple."

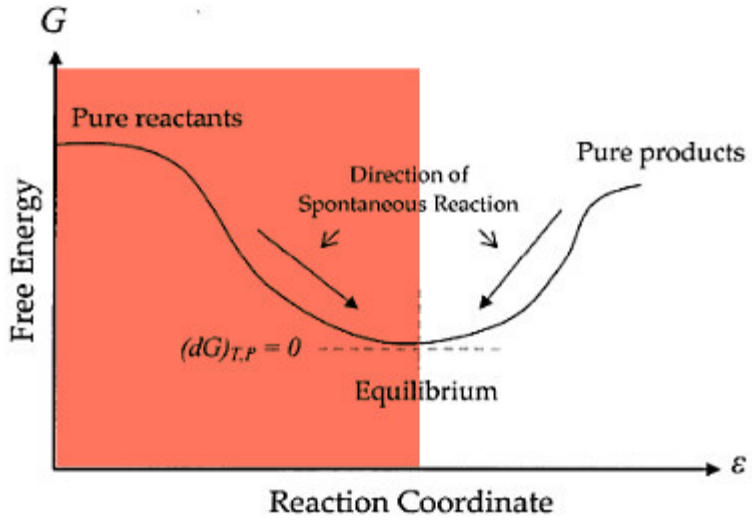

Reaction coordinate showing two possible directions of spontaneous reactions; the region in red depicting an exergonic reaction, quantified by a negative change ($\Delta G < 0$) in the value of the Gibbs free energy of the reaction of products on going to reactants. [1]

The principle is an extension of spontaneity criterion applied to human chemical reactions, in short. [2]

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (Hwang free energy principle, pg. 117; graph, pg. 113). Morrisville, NC: LuLu.
2. Hwang, David. (2001). "The Thermodynamics of Love" (PDF), *Journal of Hybrid Vigor*, Issue 1, Emory University.

θΔics

In hmolscience, **Hyacinthe Guilleminot** (1869-1922) (CR:4) was a French radiochemist, working in the area of plant physiology, noted for []

Overview

In 1919, Guilleminot, in his *Matter and Life*, outlined some type of force and energy views of evolution, that attracted the attention of Alfred Lotka.

Lotka's 1912 publications, wherein he was using the term "trigger action" to explain the way in which the sight of a predator by the eyes of a prey acts to start the flee reaction, a crude way of explaining activation energy in biological terms, is supposedly related in some way to Guilleminot's *Matter and Life*. [1]

Guilleminot, according to Lotka (1925), stated something to the effect that the principle of survival of the fittest yields information beyond that attainable by the reasoning of thermodynamics. [2]

References

1. (a) Lotka, Alfred. (1912). “Evolution in Discontinuous Systems” (pg. 71), *Journal of the Washington Academy of Sciences*, Vol. 2.
(b) Guilleminot, Hyacinthe. (1919). *Matter and Life* (*La Matiere et la Vie*) (pg. 115). Flammarion.
(c) Johnstone, John. (1921). *The Mechanism of Life* (pg. 49). Liverpool.
2. (a) Lotka, Alfred J. (1922b). “Natural selection as a physical principle” (pdf) (pg. 153), *Proceedings of the National Academy of Sciences*, 8:151–54.
(b) Lotka, Alfred J. (1925). *Elements of Physical Biology* (republished (Ñº) as: *Elements of Mathematical Biology*, which includes: corrections from Lotka’s notes and a completed list of his publications) (pdf) (Ñº) (txt) (pgs. 357). Dover, 1956.

External links

â— Hyacinthe Guilleminot (German → English) – Wikipedia.

θΔics

In terminology, **hydraism**, or "idiot savant" thinking syndrome, refers to dangers, symptoms, tensions, and repercussions associated with growing knowledge fragmentation, i.e. "specialization", lack or decline thereof of interdisciplinarity-based universal education, resulting in universal genius decline and or potential extinction, and the subsequent helplessness of the individual in respect to the big questions of existence.

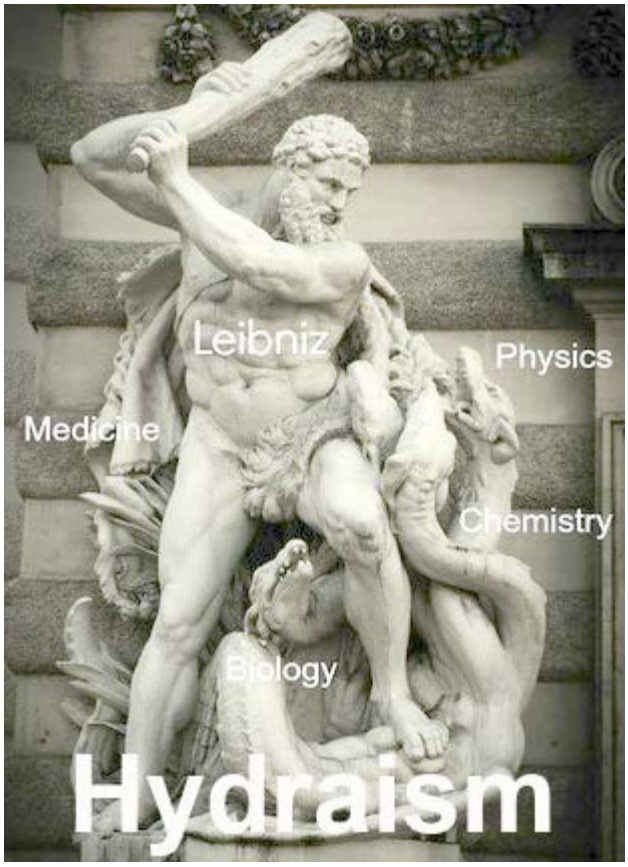

A depiction of German polymath and last universal genius Gottfried Leibniz, during his last stay in Vienna (1712-14), battling the forces of knowledge: physics, chemistry, medicine, and the salient but deadly 'biology', sneaking in from below, prior to his 1716 reaction end, working on his monad theory, in aims to solve the difficult 'mind body problem', i.e. how to situate mind and morality in a materialist universe; a hydraism reconceptualization of the famous Hercules versus the Lernaean Hydra statue (Ñº) in Vienna, Austria. [5]

Overview

The term "hydraism" derives from the 1995 statement, shown below, by German scholar Hans-Wolff Graf, from his discussion of how "We Need a New World View", in respect to the dangers associated with knowledge growth and over specialization. Graf, an economic, financial, business consultant turned sociology, education, and psychology global political theory and child welfare scholar and advocate, in short, argues that a new universal education system is needed so to rehumanize society.

Etymology

The Graf quote was found in 2012, via search for "universal geniuses", thereafter finding its way into four Hmolpedia pages, and into the position of the opening quote (page one) of the drafting state *Chemical Thermodynamics: with Applications in the Humanities*, universal education textbook, as a lead into how the last universal genius is now an extinct or potentially extent breed—the 1920 reaction end of so-called "last universal genius of social science" Max Weber, the 1954 reaction end of so-called "last universal physicist" Enrico Fermi, and the 1956 reaction end of last person chronologically known to be called a "universal genius" John Neumann being the cusp of the lineage. [2]

On 13 Apr 2013, on the universal genius page, a section devoted to the phenomena was added, referring to the phenomena as "idiot savant syndrome". On 11 Dec 2013, the term "hydraism" to the above essential phenomena, was employed as a needed term in the scientific humanism article, in reference to American philosopher Oliver Reiser's discussions of the difficulties associated with the hypothetical establishment of global "Institute of Scientific Humanism", that would "function as kind of global brain for our developing [country-connective] social organism."

Discussion

Nearly everyone suffers from some form of hydraism; the closer, however, one is to being a "one nature" thinker, scholar, philosopher, polymath, polyintellect, genius, universal genius, or last universal genius, in contrast to a "two natures" thinker, the closer one is to ridding the mind of hydraism and mental incongruity. Some of the quotes below give evidence to this logic.

Quotes

The following are related quotes:

> "In all our academies we attempt far too much. ... In earlier times lectures were delivered upon chemistry and botany as branches of medicine, and the medical student learned enough of them. Now, however, chemistry and botany are become sciences of themselves, incapable of comprehension by a hasty survey, and each demanding the study of a whole life, yet we expect the medical student to understand them. He

who is prudent, accordingly declines all distracting claims upon his time, and limits himself to a single branch and becomes expert in one thing."

— Johann Goethe (c.1820) [3]

"In this age of specialization men who thoroughly know one field are often incompetent to discuss another. The great problems of the relations between one and another aspect of human activity have for this reason been discussed less and less in public. When we look at the past great debates on these subjects we feel jealous of those times, for we should have liked the excitement of such argument. The old problems, such as the relation of science and religion, are still with us, and I believe present as difficult dilemmas as ever, but they are not often publicly discussed because of the limitations of specialization."

— Richard Feynman (1956), "The Relation of Science and Religion" [6]

"In these days of specialization there are too few people who have such a deep understanding of two departments of our knowledge that they do not make fools of themselves in one or the other."

— Richard Feynman (1963), on religion, politics, and religion; in: *The Meaning of it All: a Scientist Looks as Society* [7]

"Since my name is not Socrates or Einstein and I hold only one of the seven or eight PhD degrees [organic chemistry] this problem requires, readers are quite justified in questioning my qualifications to testify as such a multidisciplinary expert."

— George Scott (1985), on the ethics and physical chemistry of will [4]

"The trend towards the already mentioned diversified society of 'specialists' and the related danger of narrower way of thinking (idiot savant) necessarily leads to a growing helplessness of the individual. Related to this is a growing blind belief in science. Since Leibniz, probably the last universal genius, we know more and more about a shrinking area of knowledge. Biology and physics, chemistry and medicine are divided already today into dozens of individual disciplines, which like a **'hydra',** keep dividing into other individual disciplines."

— Hans-Wolff Graf (1995), "We Need a New World View" [1]

References

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(b) Hans Graf Wolff (German → English) – Efv-ag.de.
(c) Hans Graf Wolff (German → English) – Goldseiten.de.
2. Thims, Libb. (2013-14/15). *Chemical Thermodynamics: with Applications in the Humanities* (85-page version: pdf). Publisher.
3. Baas, Johann Hermann. (1889). *Outlines of the History of Medicine and the Medical Profession* (translator: Henry Handerson) (pg. 842-843). J.H. Vail.
4. Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pg. viii). University Press of America.
5. (a) Lernaean Hydra – Wikipedia.
(b) Monadology – Wikipedia.

(c) Photo: copyright (Ñº) of Krister P.

6. Feynman, Richard. (1956). “The Relation of Science and Religion” (Ñº), Caltech YMCA, lunch forum, May 2.
7. Feynman, Richard. (1963). “A Scientist Looks at Society”, John Danz Lecture Series, University of Washington, Seattle, Apr; in: *The Meaning of it All* (pdf) (specialization, pg. 3). Addison-Wesley, 1998.

θΔics

In famous publications, ***Hydrodynamica*** is a 1738 book by Dutch-born Swiss physicist Daniel Bernoulli in which, in large part, the definition of pressure was introduced along with the basics of the ideal gas law and the kinetic theory. [1]

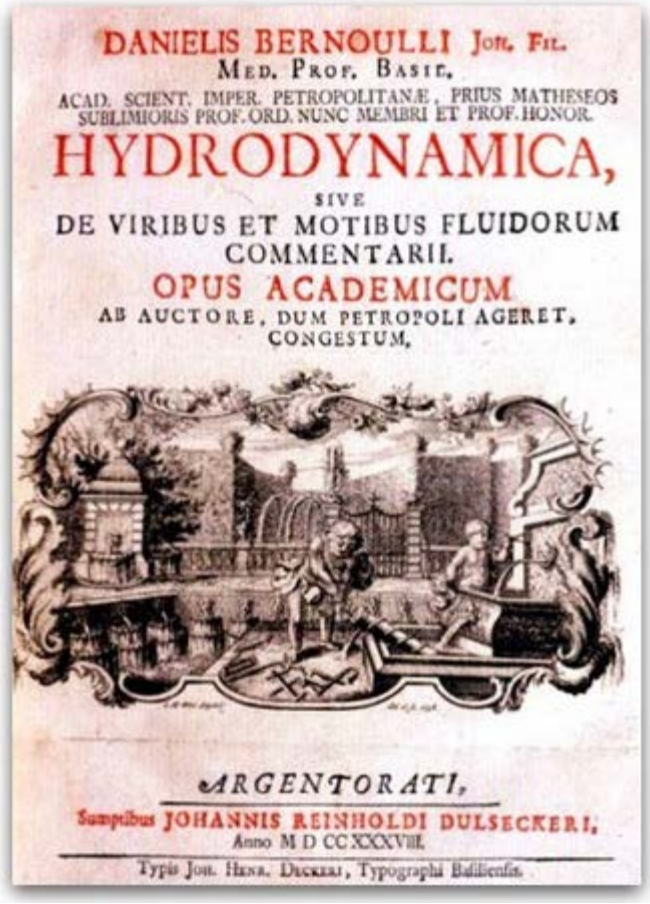
DANIELIS BERNOULLI Joh. Fil.
Med. Prof. Basil.
ACAD. SCIENT. IMPER. PETROPOLITANÆ, PRIUS MATHESEOS SUBLIMIORIS PROF. ORD. NUNC MEMBRI ET PROF. HONOR.
HYDRODYNAMICA,
SIVE
DE VIRIBUS ET MOTIBUS FLUIDORUM COMMENTARII.
OPUS ACADEMICUM
AB AUCTORE, DUM PETROPOLI AGERET, CONGESTUM.
ARGENTORATI,
Sumptibus JOHANNIS REINHOLDI DULSECKERI,
Anno M D CC XXXVIII.
Typis Joh. Henr. Deckeri, Typographi Basiliensis.

Title page of Daniel Bernoulli's 1738 ***Hydarodynmica***.

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1. (a) Bernoulli, Daniel. (1738). "On the Properties and Motions of Elastic Fluids, Especially Air" (*Hydrodynamica*, Section 10) in: *The Kinetic Theory of Gases of Gases* (pgs. 57-65), 2003, by Stephen G. Brush, Nancy S. Hall. Imperial College Press.
(b) Bernoulli, Daniel. (1738). *Hydrodynamica, Sive Vivibus et Motimus Fluidorum Commentarii*. Sectio Decima: "De affectionibus atque botimus fluidorum elasticorum, praecipue autem aeris." (pgs. 200-204; piston and cylinder, pgs. 319). Argentorati, Sumptibus Johannes Reinholdi Dulseckeri.

External links

â— Hydrodynamica – Britannica.

θΔics

In chemistry, **hydrogen**, symbol H, atomic number 1, is a nonmetallic element, row one of the periodic table, the third the most abundant element in the person, comprising 10 percent by mass of the average human molecule.

Rank	CPK (jmol)	Symbol	% Mass	Picture	Z
3		H	10		1

Hydrogen is the smallest element, is an atom comprised of one proton bound, via the electromagnetic force, via the exchange force of photons, to one electron.

All elements are built from the components of the hydrogen atom. [1]

Hydrogen is the third most abundant element in the human molecule, comprising 10% of the mass of the human.

Hydrogen accounts for 88% of the atoms in the universe.

Orbital

The following is the orbital structure of hydrogen:

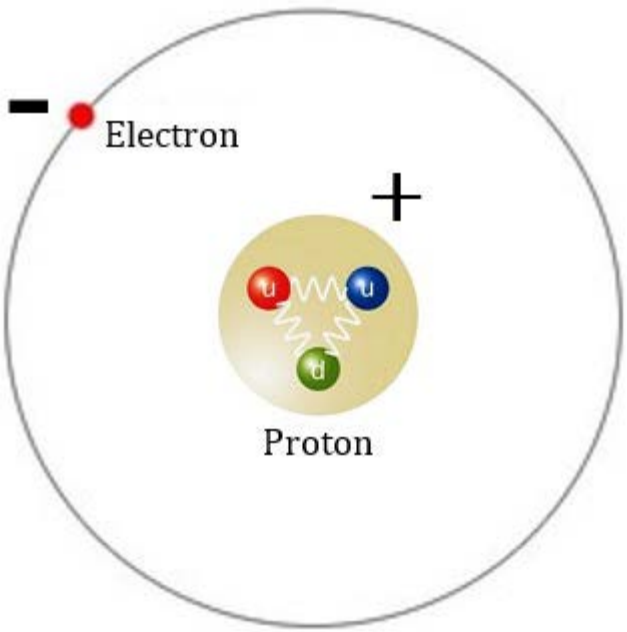

(add)

Hydrogen molecule vs. human molecule

The comparison of the hydrogen molecule H_2 (a two-atom structure) to the human molecule Mx of Fy (a 10E27 atom structure) is a frequently-made comparison in hmolscience debates and discussions.

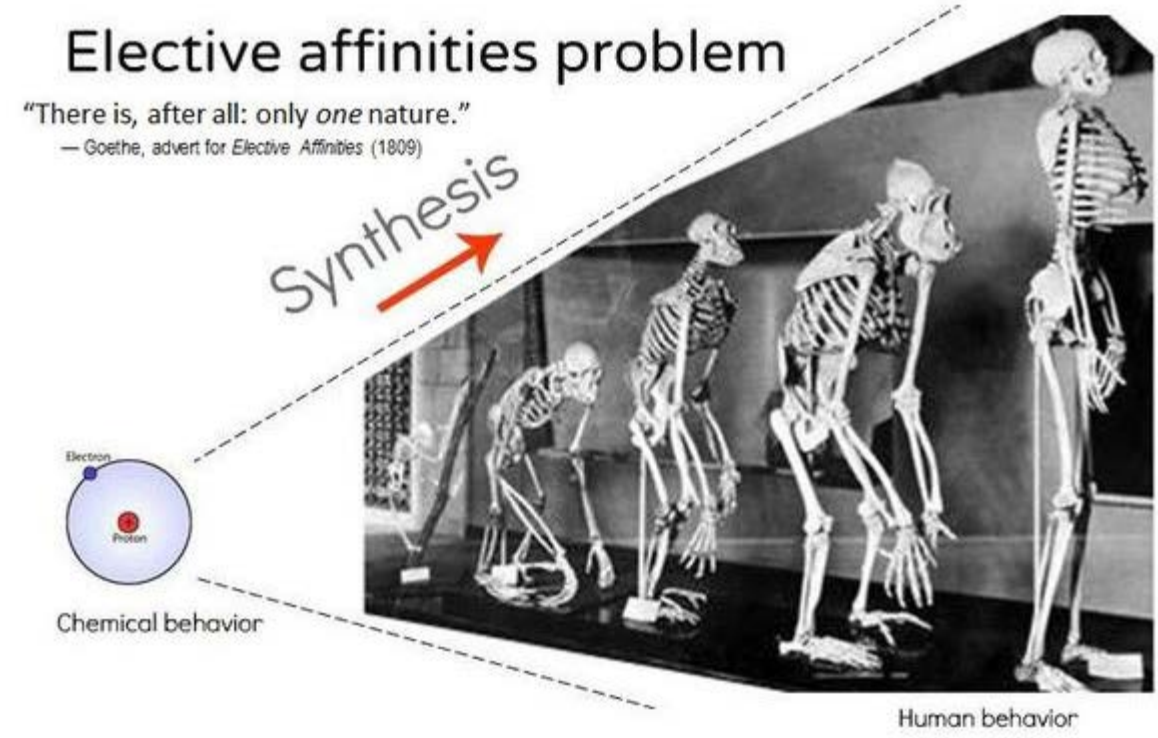

The hmolscience view of the chemical synthesis of humans from hydrogen atom precursors, according to which—in the defunct theory of life view of things—humans are 26-element molecules that have been synthesized or metamorphosized over time, in a transformation process that began, according to big bang theory, 13.7 billion years ago, and, once the the sun ignited, some 4.5 billion years ago (see: elective affinities problem).

In 1988, Canadian zoologist Daniel Brooks and American systems theorist Edward Wiley, in their chapter subsection on "metaphysics of individuality", give the following blurring statement in comparing the human or rather human molecule as contrasted with the hydrogen molecule: [2]

> "A hydrogen molecule is the thing which reacts. *Homo sapiens* and other particular species are the things which evolve. Such individuals differ from classes by having particular origins in time and space. They may disappear or change into other things."

This, however, is an artificial divide. The resolution of the divide requires a reinterpretation or rather reformulation of evolution theory in chemical thermodynamic terms, which is a nearly virgin subject.

Quotes

The following are related quotes:

> "Hydrogen is a light, odorless gas, which, given enough time, turns into people."
>
> — Edward Harrison (c.1990) *Publication* (Ñº); cited (Ñº) by John Wiley (1995) in "Phenomena, Comments and Notes" (Ñº); cited (Ñº) by David Christian (2004) in: *Maps of Time*

> "Why should a group of simple, stable compounds of carbon (C), **hydrogen** (H), oxygen (O), and nitrogen (N), 'struggle' for billions of years to organize themselves into a professor of chemistry? What's the motive?"
>
> – Robert Pirsig (1991), *Lila: an Inquiry into Morals*

References

1. Emsley, John. (2001). *Nature's Building Blocks: an A-Z Guide to the Elements* (hydrogen, pgs. 183-91). Oxford

University Press.
2. Brooks, Daniel R. and Wilson, E.O. (1988). *Evolution as Entropy*: *Toward a Unified theory of Biology* (pg. 85-87). University of Chicago Press.

External links

â— Hydrogen – Wikipedia.

θΔics

In hmolscience, **hydrogen to human**, similar to molecules to man, molecules-to-man evolution (Kent Hovind, 2006), or the phrase molecules in motion (apologetics), refers to the shorthand statement that humans, who came into existence about 200,000 years ago, and human behavior derive from hydrogen atoms that came into existence 13.8 billion years ago.

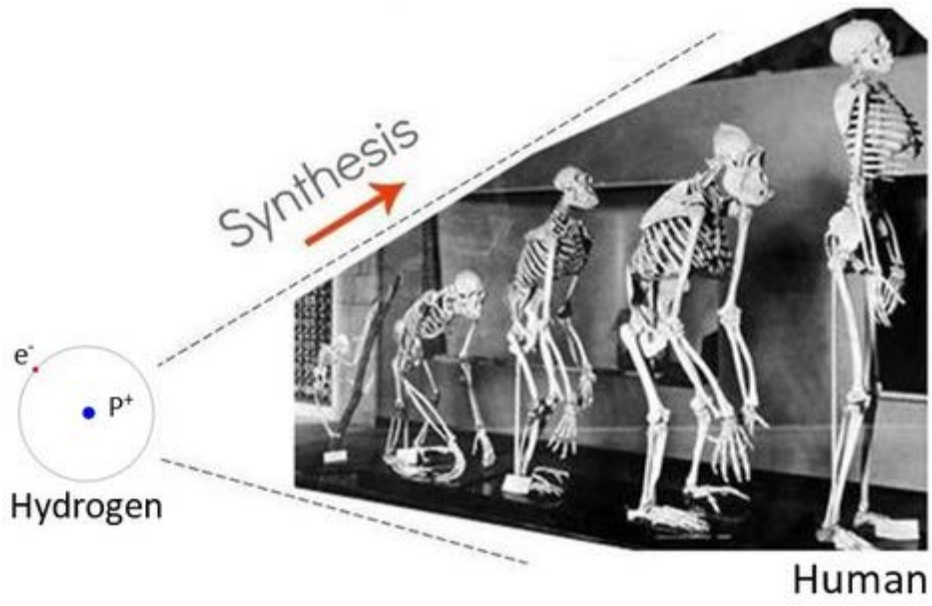

A 2012 **hydrogen-to-human** diagram, made by Thims, to employed to illustrate the elective affinities problem.

Overview

Historically, precursors to the "hydrogen to human" conceptualization include the various the circa 330BC to late 19th century great chain of being depictions and renditions.

In the late 20th century, the "molecules to man", or "molecules-to-man evolution", as Ken Ham likes to paraphrase things, began to be catch phrase topics of discussion.

In 2005, American electrochemical engineer Libb Thims began to outline the adjacent visualized hydrogen-to-human jump include: the molecular evolution table (2005), and evolution timeline (2009) (also available in: video).

The following is a a snapshot of the "**hydrogen to human**" model, namely the reduction and explanation of all of human behavior in terms of the behaviors of hydrogen atoms coming into existence 13.8 billion years ago; at center: David Buss' 1994 *The Evolution of Desire*, which gives clues to the reduction of human desires, through evolution, down to proton, electron, photon interactions.

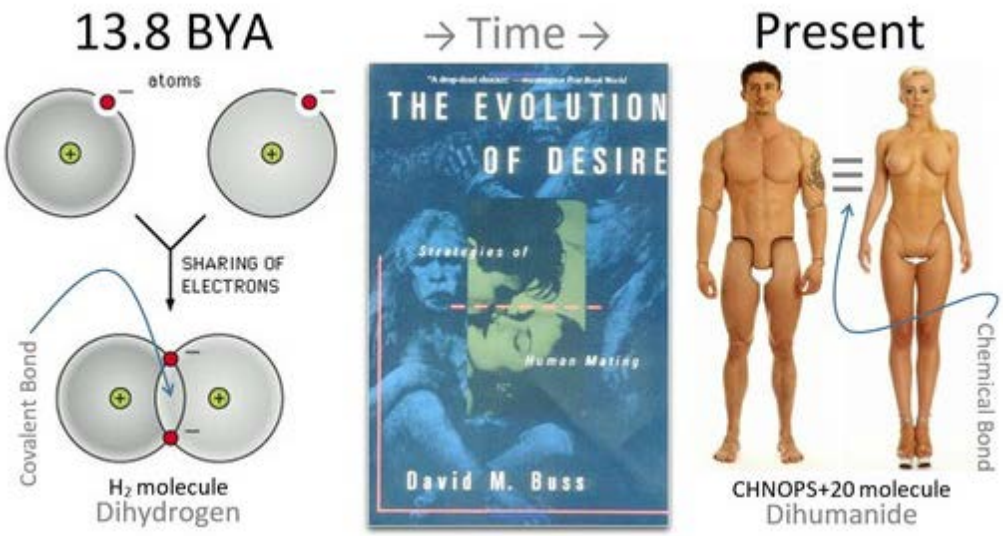

In 2012, English-born Taiwanese science teacher Peter Cook, who has a Arthur Young sort of feel to his views, did a eight-part "Hydrogen to Human" lecture starting with the big bang and standard model then going to the formation of the solar system (parts 1-2), via some type of self-organization paradigm; then gets into "life", with discussion of viruses (part 3); then in parts 4-6 he claims to give a "standard model for life that explains all of human behaviour, from wars to serial killers; enabling one to tackle: stock markets, to breaking addiction and bringing up children." (Ñº) The following is Cook, in part 3 (3:57), state his belief that at about 3 billion years ago hydrogen atoms came "alive", which is the

weak link in his entire presentation thus far, after which he goes on to say, "but first, I need to decide what 'life' really is? It's very difficult!? It's not an atom."

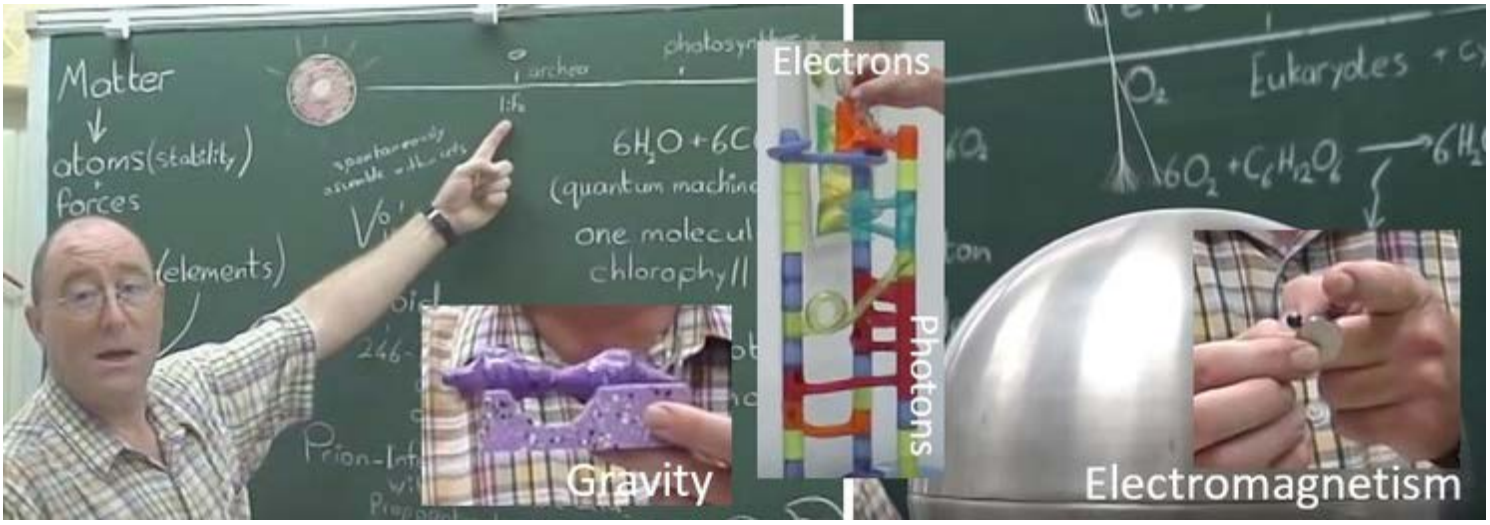

Then he goes onto say that gravity is not responsible for life, because it's too large, therefore it must be the electromagnetic force that formed life; very humorous indeed. Then discusses "properties" of atoms, e.g. magnets, then uses what seems to be a Van de Graaf generator, invented in 1929 by Roberg van de Graff, but originated in prototype of Otto Guericke (1620s), to explain that “imbalances” in the plus and minus aspects of the electromagnetic force is what produces change, and brings about the spontaneous self-assembly of life, or as he says, when the imbalances accrue, “then things start to move and change”; or, as he demonstrates, via turning on the generator, “it attracts and repels at the same time”. He goes through four demonstration experiments, in part 3 (3:57-11:30), shown above, each fairly cogent, in attempts to explain life, via photons, electrons, and atoms.

In part 4 (5:14-),he starts talking about Benoit Mandelbrot and how his iterations made the famous fractal edge Mandelbrot sets (Ñº). At part 4 (32:57-), he mentions American evolutionary paleontologist Neil Shubin, noted for his 2006 discovery of Tiktaalik (walking fish). In part 5 (28:54-34:38), he tries to reconcile “evil”, with focus on Darwin’s wasp-caterpillar paradox, about which he says a few years back he was sitting around with his nephew in a pub discussing, but couldn’t figure out, via a conformity argument; then cites the inquisitions, Nazis, Catholic foundations, etc., as examples of good people doing bad things.

The Prezi cover slide for Peter Cook’s H2HProject.com website, which amounts to about a handful of slides. [2]

In part six (3:33-), Cook gets to entropy, which he says is a scientific principle, meaning “things tend to disorder”, at which point he jumps to the hidden agenda that what he has been trying to do in the last five lectures, was to turn that principle upside down, and say that things don’t tend towards disorder, but rather the “things tend to order” which he calls evolution. In part six (3:33-), he gets to entropy, which he says is a scientific principle, meaning “things tend to disorder”, at which point he jumps to the hidden agenda that what he has been trying to do in the last five lectures, was to turn that principle upside down, and say that things don’t tend towards disorder, but rather the “tend to order” which he calls evolution. The rest is just an amateurish syllogism of a mixture of superficial

evolutionary psychology, complexity theory, Schrodinger's cat,
sociobiology, Hamilton kin selection, etc., at the end of which he concludes: "forget entropy think self-assembly up an ever diversifying complexity gradient, every time you want to take another step you just need another pair of opposing partners to drive you up the gradient."

Quotes

The following are related quotes:

> "The story of where we [**humans**] come from—unless you [prefer to] imagine that a big hand came down from the sky and put us on the earth—must be a story of the spontaneous self-assembly of **hydrogen**, and nothing else."
>
> — Peter Cook (2012), "Hydrogen to Human" (P1|0-0:18; P3|0:11-0:22), Jul 27, Aug 1

References

1. Cook, Peter. (2012). "Hydrogen to Human: the Incredible Story of the Self Assembly of the Natural World" (Parts: 1 [38-min], 2 [46-min], 3 [48-min], 4 [43-min], 5 [43-min], 6 [54-min], 7 [12-min], and 8 [26-min]). Peter Cook, Jul 27-Sep 13.
2. Hydrogen-to-Human Project – H2HProject.com.

θΔics

In origin of life theories, the **hydrothermal vent origin of life** theory posits that amino acids and other organic compounds are produced during the passage through the temperature gradient of 350° C at the vent surface to 0 °C at sea-level, and that somehow the first life was created or emerged from this heat-driven chemical synthesis process. [1]

A circa 2000 **hydrothermal vent origin of life** cartoon by Jack Holden. [2]

References

1. Brack, Andre. (1998). *The Molecular Origins of Life: Assembling Pieces of the Puzzle* (pg. 77). Cambridge University Press.
2. Holden, Jack. (c.2000). "Smokers on the sea floor have been proposed for the origin of life on Earth." Unpublished cartoon.

External links

â— Hydrothermal origin of life (section) – Wikipedia.

θΔics

In science, **hylozoism**, synonymous with panbioism, is the belief that every physical object is alive. [1]

Overview

In 45BC, Cicero, in his *On the Nature of the Gods*, speaking through the voice of Balbus the Stoic, i.e. one who follows the teachings of Heraclitus, while not using the term "hylozoism", states the living universe view as follows: [3]

> "Here we must lend an ear to Plato, the god so to say among philosophers. His view is that motion is of two kinds, the first self-propelled and the second directed from without; and that which is achieved spontaneously of its own accord is more divine than that awakened by the thrust of another. Spontaneous motion he attributes only to souls; in his view, it is from them that all motion takes its rise. So since all motion has its origin in the heat within the universe, and since such heat is achieved spontaneously and not by an external thrust, that fiery heat mush be a living soul. In other words, the universe is alive (see: living universe)."

In 1678, Ralph Cudworth introduced the term hylozoism, from the Greek *hyle* "matter" and *zoe* "life", aka "living matter", to characterize the the philosophical point of view that all matter (including the universe as a whole) is in some sense alive; dating, supposedly, dating from the Milesian school period of Greek philosophy, i.e. the teachings of Thales, Anaximander, and Anaximenes. [2]

Some assert (Q) that Immanuel Kant entertained ideas about hylozoism hypothesis; others (Q) label Thales as a hylozoist.

Quotes

The following are related quotes:

> "Aristotle noted of life that its lower limit defies demarcation. The living and non-living, he thought, merge one in the other gradually. Today the very distinction between them is convention. That deletes 'life' as a scientific category; or, if you will, carries it down to embrace the atom. The vanishing point of life is lost."
>
> — Charles Sherrington (1938), *Man on His Nature* (pg. 77); cited (Q) by William Guthrie (1957); cited (Q) by Hamilton Tyler (1964) as an example of "animism"; cited by cited (Q) someone (1976) as a 'modern example' of **hylozoism**.

> "You agree with me that the single atom is not alive. What about two atoms? What about three? Does a bound state of atoms have to have a certain movement to be considered alive? What if we heat a system of four atoms, do they suddenly become alive? What if we subject a system of atoms to both gravitational and electromagnetic forces, does that suddenly make them alive? What if the two forces act to move smaller atoms through the cavities of larger atomic [structures] [molecules] on a cyclical basis, thus activating reactions [metabolism] in the process, does that make them alive? What if the two forces begin to arrange the atoms into hierarchies, and that smaller atoms and bundles of atoms begin to move between the hierarchies, does that make them alive? What if a structure of atoms, begin to turnover their internal atoms, with those of the surrounding space, on a cyclical basis, does that make it alive? It should be very obvious that no matter how many atoms one adds to the argument that an atom or a structure made of two or more atoms cannot be alive. It is my view that one cannot define an atom or two or more atoms structured as a bound state to be alive. The word itself and baggage of theory surrounding the word is meaningless. It is akin to the words: vitalism, élan vital, **hylozoism**, panpsychism, etc. From the point of view of the molecular evolution table, according to current views, rows 1-10 are considered to be not alive, rows 11-28 are considered to be *alive*, and rows 30 and above are not alive. Because of our anthropocentric biases, we continue to believe that we are unique among molecular structures, in that those much smaller or much bigger than us are not alive, whereas we are. It is a grave mistake to believe in this fallacy. I am not quite

sure what the alternative theory is; but from the point of view of atoms, molecules, and the logic of the chemistry textbook, the theory of the conception an atom, or two or more attached atoms, being alive is absurd. This is my view."

— Libb Thims (2009), "Letter to Georgi Gladyshev", Jan 2; cited by: DMR Sekhar (Q), 7, 20 Aug 2010 and 2014 (Q); Vangelis Stamatopoulos (Q), 15 Nov 2010; David Bossens (Q), 19 Jun 2012 and 3 Jan 2013; David Busse (Q), 10 Dec 2013; YouTube forums (Q), 2014; Georgi Gladyshev (Q), 2014; among others (Q) [3]

References

1. Rucker, Rudy. (2008). "A Formal Proof of Panpsychism and Hylozoism" (Q), RudyRucker.com, Jan 22.
2. Rucker, Rudy. (2008). "Everything is Alive", Submitted to the Kyoto 'What is Life' Conference October 2007; RudyRucker.com.
3. (a) Thims, Libb. (2009). "Letter to Georgi Gladyshev", Jan 2.
(b) Thims, Libb. (2009). "Letter: Life a Defunct Scientific Theory", *Journal of Human Thermodynamics,* Vol. 5, pgs. 20-21.
(c) Sekhar, DMR. (2010). "Thread: An-att: On Self and Non-self (defunct life theory discussions), Aug 7, Ssubbanna.Sulekha.com.
(d) Sekhar, DMR. (2010). "The Paradox of Life: Life a Defunct Scientific Theory?", Knol. Aug, 20; in: WordPress.com, 13 Feb 2011; in Sulekha.com (c.2010).
(e) Stamatopoulos, Vangelis. (2010). "It's Life Jim, but not as we Know it!", *AtheistNexus.org*, Nov. 15.
(f) Bossens, David. (2012). "Life, a defunct concept?", Squidoo.com, Jun 19.
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(h) Busse, David. (2013). "Viruses: Living or Not?", Dec 10, WordPress.com.
(g) DNews. (2014) Are Viruses Alive? (Feb thread discussion), YouTube.
3. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (pg. 58). Oxford University Press, 1998.

External links

- Hylozoism – Wikipedia.

θΔics

In existographies, **Hyman Levy** (1889-1975) was a Scottish mathematician and philosopher noted, in evolution thermodynamics, for his 1939 proposition that there must exist some type of second law of evolution in thermodynamic terms, or something along these lines.

Overview

In 1939, Levy, in his *Modern Science*, argued that there must exist some form of parallel thermodynamics law to explain "aggregated energy" forms. [1] His cited quotation on this matter is as follows: [2]

> "The fact is that the second law of thermodynamics, which regards systems as passing from orderly arrangement to disorderly randomness, classifies any future pattern or more complex orderly arrangement that may arise subsequent to the original order, as one of the innumerable accidental situations that have no special significance for man; as if a complex computing machine were indeed a random combination of parts. It may indeed mean that the energy of the original material from which the metal was drawn is now less available in one sense, but as a computing machine, it has now made available a mass of energy that was not previously capable of being tapped. Side by side, therefore, with the second law of thermodynamics, in so far as it may be valid for large-scale systems—if it is so valid—there must exist a law for the evolution of novel forms of aggregated energy and the emergence of new qualities. A generalization of this nature has not yet been made, but that a general rule of this type must exist is evident."
>
> — Hyman Levy (1939), *Modern Science*; cited by Joseph Needham (1942) in "Evolution and Thermodynamics: a Paradox with Social Significance" (pg. 358) [1]

This grasping seems to be a forerunner to the ongoing search for fourth laws of thermodynamics.

He discusses Maxwell's demon, among other related subjects.

Education

Levy graduated completed his MA in mathematics and physics at the University of Edinburgh in 1911. He then did research at the University of Gottingen, University of Oxford, the National Physical Laboratory, and went on to become a in 1920 became a mathematics professor at Imperial College, London, becoming the head of the department of mathematics and mechanics there in 1946, after which he became the dean of the Royal College of Science of Imperial College.

Levy's background mathematical focus was in the study of differential equations. Into the 1930s, Levy began to expounded a 'materialistic philosophy' in a number of books, the first being the 1932 *The Universe of Science*. [3]

References

1. (a) Levy, Hyman. (1939). *Modern Science: a Study of Physical Science in the World Today* (thermodynamics, 19+ pgs). London: Hamish Hamilton.
(b) Needham, Joseph. (1942). "Evolution and Thermodynamics: a Paradox with Social Significance" (pg. 358) (abs), *Science and Society*, 352-75.
2. Law, John and Mol, Annemarie. (2002). *Complexities: Social Studies of Knowledge Practices* (pg. 34). Duke University Press.
3. (a) Hyman Levy – MacTutor Biographies.
(b) Levy, Hyman. (1932). *The Universe of Science*. Ayer Publishing.

External links

â— Hyman Levy – Wikipedia.

θΔics

In existographies, **Hypatia** (350-415) (IQ:190|#38) [RGM:123|1,500+] (GFG:1) (CR:38) was a Greco-Roman Alexandrian philosopher, mathematician, physicist, and astronomer, the only known female universal genius, daughter of mathematical astronomer Theon, the last head of the Library of Alexander, noted for being one of the last apex intellects before humanity went into the dark ages.

Science vs religion

Hypatia was one of the first to take a stand against religion and to side with science. She made public statements against organized religion, such as: [1]

> "All formal religions are delusive and must never be accepted by self-respecting persons as final."

Other noted anti-religion quotes:

> "Fables should be taught as fables, myths as myths, and miracles as poetic fancies. To teach superstitions as truth is a most terrible thing. The child mind accepts and believes them, and only through great pain and perhaps tragedy can he or she be in after years relieved of them. The reason for this is that a superstition is so intangible a thing that you cannot get at it to refute it."
>
> — Hypatia (c.400)

Hypatia, owing to her controversial anti-Christian views, was infamously stripped naked, beating with clam shells, stoned, dismembered, and burned alive (existive) by a mob, led by Peter the Lector, as depicted below: (Ñº)

A depiction of Hyptia being stoned and dragged through the streets to her death (reaction end).

Quotes | By

The following are noted quotes:

> "Life is an unfoldment, and the further we travel the more truth we can comprehend. To understand the things that are at our door is the best preparation for understanding those that lie beyond."
>
> — Hypatia (c.400)

> "Reserve your right to think, for even to think wrongly is better than not to think at all."
>
> — Hypatia (c.400)

References

1. Donovan, Sand. (2008). *Hypatia: Mathematician, Inventor, and Philosopher* (pg. 48). Capstone.

External links

â— Hypatia – Wikipedia.

θΔics

In terminology, **hypothesis** (TR:424), from Greek –*hypo* "under" + -*thesis* "a placing, proposition", is a particular statement, tentative assumption, or proposition, used as a premise, possibly based on partial evidence, employed in aim as a possible basis for further deduction and testing of something lacking explanation. [1]

Overview

In 1954, Benjamin Whorf, in linguistics, proposed a theory asserting that one's language determines one's conception of the world, aka the Whorfian hypothesis.

Quotes

The following are related quotes:

hy·poth·e·sis

/hīˈpäTHəsəs/

noun

a supposition or proposed explanation made on the basis of limited evidence as a starting point for further investigation.
"professional astronomers attacked him for popularizing an unconfirmed hypothesis"
synonyms: theory, theorem, thesis, conjecture, supposition, postulation, postulate, proposition, premise, assumption; notion, concept, idea, possibility
"his "steady state" hypothesis of the origin of the universe"

- PHILOSOPHY
  a proposition made as a basis for reasoning, without any assumption of its truth.

A Google-generated definition of **hypothesis**, as a proposed suppositional explanation, based on limited evidence as a starting point.

> "All science starts with **hypothesis**."
>
> — George Millin (1896), title page quote to *Evil and Evolution*; a supposed truncation of Roger Bacon's Aristotelian-framed scientific method (1265) [2]

See also

- Nebular hypothesis
- God hypothesis
- Human molecular hypothesis
- Molecular hypothesis
- Cessation conservation hypothesis
- Rossini hypothesis
- Heat hypothesis
- Thermodynamic hypothesis
- Extinction periodicity hypothesis
- Purposeless universe hypothesis

References

1. (a) Hypothesis – Merriam-Webster Collegiate Dictionary, 2000.
(b) Hypothesis – EtymOnline.com.
2. Millin, George. (1896). *Evil and Evolution: an Attempt to Turn the Light of Modern Science on to the Ancient Mystery of Evil* (quote, pg. iii). MacMillan and Co.

External links

- Hypothesis – Wikipedia.

θΔics

In existographies, **Ibn al-Rawandi** (827-c.880) [RGM:740|1,245+] (FA:31) was a Persian Shia Muslim, turned free thinker, atheist, skeptic of Islam, a critic of religion in general, whose views on religion are said (O) to be comparable to David Hume; who is grouped with Zakariya Razi. [1]

Quotes | On

The following are quotes on al-Rawandi:

> "**Al-Rawandi** disputed the reality of the miracles of Abraham, Moses, Jesus and Muhammad and claimed that they were fraudulent tricks and that people who performed them were magicians and lairs; that the Quran is the speech of an unwise being, and that it contains contradictions, errors, and absurdities."
>
> — Al-Hayyat (c.910) [2]

Quotes | By

The following are representative quotes:

> "Muhammad's own presuppositions and systems show that religious traditions are not trustworthy. The Jews and Christians say that Jesus really died, but the Quran [Surah 4:157] contradicts them."
>
> — Ibn al-Rawandi (c.870) (O)

References

1. Stroumsa, Sarah. (1999). *Freethinkers of Medieval Islam*: Ibn al-Rawandi, Abu Bakr al-Razi, and Their Impact on Islamic Thought. Brill.
2. (a) Stroumsa, Sarah. (1999). *Freethinkers of Medieval Islam* (pg. 47). Brill.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 226). HarperOne.

External links

- Ibn al-Rawandi – Wikipedia.

θΔics

In existographies, **Ibn Hazm** (994-1064) (CR:3) was an Andalusian poet, philosopher, and polymath noted for his early scientific-themed ideas on soul theory.

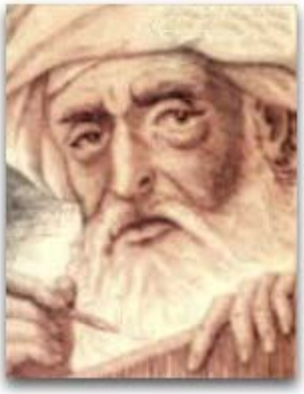

The Ring of the Dove

In circa 1022, Hazm penned his *The Ring of the Dove*, a treatise on love, where, among other things, he stated expounds on a type of Plato-stylized love as the fusion of souls type of logic, admixture with physics: [2]

> "The union of souls is a thousand times more beautiful than that of bodies."
>
> "The lover's soul is ever-seeking for the other, striving after it, searching it out, yearning to encounter it again, drawing it to itself it might be as a magnet draws the iron."

Canadian scholar Robert Perry (1979) groups Hazm, and his "The Dove's Neck Ring", with Goethe's 1809 *Elective Affinities*, French writer Stendhal's crystallization process themed 1822 "On Love" treatise, Ovid's "Ars Amatoria, Andreas Capellanus' "De Amore", among others, as one of the earliest treatises on the "science of love". [2]

Quotes | By

The following are noted quotes:

> "The earth is spherical despite what is popularly believed. The proof is that the sun is vertical to a particular spot on earth."
>
> — Ibn Hazm (c.1050) [3]

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (pg. 379). Morrisville, NC: LuLu.
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2. Perry, Robert G. (1979). "The Science of Love in the Middle Ages, the Romantic Period, and Our Own Time" (pdf), MA thesis, Comparative Literature, University of British Columbia.
3. Salah, Abeer. (2015). *One Giant Step for Mankind: One Verse at a Time* (pg. 61). Cedar Graphics.

External links

â— Ibin Hazm – Wikipedia.

θΔics

In existographies, **Ibn Warraq** (1946-) (FA:170) (CR:10) is an Pakistani-born English ex-Muslim secular humanist (1995) turned atheist (2009), pseudonymously named after Arabian god skeptic Abu Isa al-Warraq (c.815-870), noted for his 1995 *Why I Am Not a Muslim*, stylized as an Islamic version of Bertrand Russell's 1927 *Why I Am Not a Christian*, characterized as the "first Muslim history of doubt" (Hecht, 2003).

Influences

Warraq was influenced, in respect to existive thinkers, by Salman Rushdie and the "Rushdie affair" and articles by pseudo Ibn al-Rawandi (see: Ibn al-Rawandi) in the *New Humanist*, into going public with his work in attempting to "sow a drop of doubt in a sea of dogmatic certainty. [5]

Warraq, in his 1995 book, cites: Xenophanes, Michel Montaigne, Galileo, Benedict Spinoza, Isaac La Peyrere, Thomas Hobbes, Edward Gibbon, Pierre Bayle, Voltaire, Immanuel Kant, Arthur Schopenhauer, Thomas Paine, Carlyle, Averroes, Avicenna, Charles Darwin, Thomas Huxley, Robert Ingersoll, Jean-Paul Sartre, Albert Einstein, Reynold Nicholson, Christopher Luxenberg. (Q) [5]

Overview

Warraq, as a young man, always felt as a skeptic, but at one point had a crisis of identity in which he briefly opened to Islam. Finally, however, skepticism prevailed, and he turned to philosophers like: Benedict Spinoza, Immanuel Kant, Gottfried Leibniz, and David Hume. [2]

In 1993, Warraq was "shaken loose in his faith by the Rushdie affair", as Christopher Hitchens put it.

In 1995, Warraq, penned his *Why I am Not a Muslim*, stylized on Bertrand Russell's *Way I am Not a Christian* (1925), wherein he begins with Jewish physician-philosopher Ibn Kammuna (c.1210-1284), author of *Examination of the Three Faiths*, a religion-critical book, and goes onto explain how he lost his faith. [1]

Muhammad | Never existed

See main: Muhammad never existed

Warraq seems to have been one of the first to openly state his reasoned belief that Muhammad "never existed" as real person.

In 1995 or 1996, American Robert Spencer, soon-to-become founder of Jihad Watch (2003), author of *The Politically Incorrect Guide to Islam* (2005) and *The Truth About Muhammad: Founder of the World's Most Intolerant Religion* (2006), before becoming a public figure, read Warraq's *Why I Am Not a Muslim*, during which time he then believed that Muhammad was a real person, who actually existed as an historical figure, i.e. he believed Muhammad was a "false prophet", someone who sold his own opinions off to people as divine revelations. In 2007, however, Spencer was at a conference, at which Warraq was also a speaker, during which time they went for a walk together, amid which Warraq made the following comment:

> "I don't think Muhammad ever existed at all."
>
> — Ibn Warraq (2007), comment to Robert Spencer during walk [3]

Spencer and Warraq then debated this issue, and by 2013 Spencer had reevaluated his position:

> "**Ibn Warraq** is responsible for the fact that I no longer believe in Muhammad, i.e. I no longer believe Muhammad existed as an historical figure."

— Robert Spencer (2013), “Interview with Ibn Warraq” [3]

The general issue here is that all of the main figures, characters, and prophets of Judaism, Christianity, and Islam, each of which progressively building on the other, are human character re-writes of Egyptian mythological gods and stories, as the works of the 100+ religio-mythology scholars have shown, e.g. Noah is the god Nu (Noah never existed), Abraham is the god Ra (Abraham never existed), Sarah is the god Isis, Jesus is the god Osiris (see: Jesus never existed), and so on; hence, if the Islamic figure Muhammad claimed to have "spoken" to all of these so-called prophets, then he too is a mythological figure, sold to people, over time, as a real person.

Education

In the 1980s, Warraq studied at the University of Edinburgh with orientalist William Watt, some of whose views on the backwardness of Islam he cites. In 1995, he was professor of British and American culture in Toulouse, France.

Quotes | Employed

The following are quotes employed by Warraq:

> “One fact must be familiar to all those who have any experience of human nature—a sincerely religious man is often an exceedingly bad man”
>
> — Winwood Reade (1872), *Source*; cited by Ibn Warraq (1995) in *Why I Am Not a Muslim* (pg. #) (Q)

> “Anyone who believes in the law of causation, cannot, for a moment, entertain the idea of a being who interferes in the course of events. He has no use for the religion of fear.”
>
> — Albert Einstein (c.1930) in: *Why I Am Not A Muslim* (pg. 141)

Quotes | On

The following are quotes on Warraq:

> “There going to kill him like drinking water. Pakistani’s are the most hard-headed Muslims in the world (behind Afghanistan, Muslim African countries, and Indonesia, respectively).”
>
> — Angela Jabari (2017), “comment upon hearing that al-Warraq’s family is in Pakistan and how he is afraid to go home”, Jul 5

Quotes | By

The following are quotes by Warraq:

> “As soon as I was able to think for myself, I discarded all the religious dogmas that had been foisted on me. I now consider myself a secular humanist who believes that all religions are sick men’s dreams, false—demonstrably false—and pernicious.”
>
> — Ibn Warraq (1995), *Why I Am Not a Muslim* (pg. viii) [4]

> "Muslims cannot hide forever from the philosophical implications of the insights of Nietzsche, Freud, Marx, Feuerbach, and Renan [1823-1892] (Q). Hume's writings on miracles are equally valid in the Islamic context. What of the rise of the critical method in Germany in the nineteenth century, and its application to the study of the Bible and religion in general? When biblical scholars say that Jonah never existed or that Moses did not write the Pentateuch, then, implicitly, the veracity of the Koran is being called into question."
>
> — Ibn Warraq (1995), *Why I Am Not a Muslim* (pg. 33) [4]

> "Many Christians have incorporated science into their faith; Muslims have yet to take the first step."
>
> — Ibn Warraq (1995), *Why I Am Not a Muslim* (pg. 33) [4]

> "Sometimes you find a man skillful in his trade, perfect in sagacity and in the use of arguments, but when it comes to religion he is found obstinate, so does he follow the old groove. To the growing child, that which falls from the elders' lips is a lesson that abides with him all his life."
>
> — Ibn Warraq (1995), *Why I Am Not a Muslim* (pg. 283); an al-Marri paraphrase [4]

References

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(b) Abu Isa al-Warraq – Wikipedia.
2. Ibn Warraq (German → English) – Wikipedia.
3. (a) Spencer, Robert. (2013). "Ibn Warraq Exposes Islam on ABN" (Q), Betsy Ross, Jan 31.
(b) Robert Spencer (author) – Wikipedia.
4. (a) Warraq, Ibn. (1995). *Why I Am Not a Muslim* (think for myself, pg. viii; insights, pg. 33; old groove, pg. 283). Prometheus Books, 2003.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 477-79). HarperOne.
5. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 477-78). HarperOne.

Further reading

● Hitchens, Christopher. (2007). *The Portable Atheist: Essential Readings for the Nonbeliever, Selected and with Introductions by Christopher Hitchens* (§43: The Koran, pgs. 384-44; The Totalitarian Nature of Islam, pgs. 445-53). De Capo Press.

Videos

● Warraq, Ibn. (2010). "Why I am Not a Muslim" (Q), Free Thought Society, GRCCtv, Jan 14.

External links

● Ibn Warraq – Wikipedia.

θΔics

In experiments, **ice rubbing experiment** was famous 1799 experiment conducted by English chemical physicist Humphry Davy, in which he rubbed two pieces of ice (inside of parallelepiped), stated by some to have occured in a vacuum, located inside of a room colder than the freezing point of water, together, vigorously, to see if he could generate heat by friction, an idea contrary to the then-prevalent "caloric theory" of French chemist Antoine Lavoisier, which supposed that the ice would only melt if put in contact with a hotter body, thereby releasing the flow of caloric particles into the ice, causing it to melt.

Ice Rubbing Experiment (1799)

EXPERIMENT II

I procured two parallelopipedons of ice, of the temperature of 29°, six inches long, two wide, and two-thirds of an inch thick: they were fastened by wires to two bars of iron. By a peculiar mechanism, their surfaces were placed in contact, and kept in a continued and violent friction for some minutes. They were almost entirely converted into water, which water was collected, and its temperature ascertained to be 35°, after remaining in an atmosphere of a lower temperature for some minutes. The fusion took place only at the plane of contact of the two pieces of ice, and no bodies were in friction but ice. From this experiment it is evident that ice by friction is converted into water, and according to the supposition its capacity is diminished; but it is a well-known fact, that the capacity of water for heat is much greater than that of ice; and ice must have an absolute quantity of heat added to it, before it can be converted into water. Friction consequently does not diminish the capacities of bodies for heat.

From this experiment it is likewise evident, that the increase of temperature consequent on friction cannot arise from the decomposition of the oxygen gas in contact, for ice has no attraction for oxygen. . . .

Summary of Davy's 1799 **ice-rubbing experiment**. [1]

The experiment was done while Davy was working as Superintendent of a Pneumatic Institution in Bristol, whose function was to establish the beneficial effects of inhaling gases, and the results were published in 1799 when Davy was 20. The significance of Davy's ice-rubbing experiment helped to prove that heat was a mode of motion. [1] The experiment was nearly the same in purpose as American-born English physicist Benjamin Thompson's 1798 "cannon boring experiment", in which used the heat from the boring of a cannon to make water boil, to show that caloric was seeming and endlessly coming from no where.

In a vacuum?

There are a number of publications in which Davy's ice rubbing experiment are said to have occurred in a vacuum, and others reporting that he never performed the experiment at all, among other variants. As early as 1875, for instance, Davy's experimental results were being summarized by Scottish physicists Balfour Stewart and Peter Tait as having occurred via come type of clockwork mechanism "in a vacuum" as follows: [2]

> "Rumford's boiling of water by the heat generated in the boring of a cannon, and **Davy's melting of ice** by friction *in vacuo*, were each conclusively demonstrative alike of the non-materiality of heat and of the ultimate fate of work spent in friction. The exact and formal enunciation of the equivalence of heat and work required to fill the *lacuna* in Newton's statement was first given by Davy in 1812."

In 1922, Arthur Taber Jones, of Smith College, published a correspondence in *Science* entitled "Did Humphry Davy Melt Ice by Rubbing Two Pieces Together Under the Receiver of an Air Pump?", in which he states: [3]

> "In books which I happen to have at hand I find twelve different authors stating that Davy melted two pieces of ice by rubbing them together in a vacuum, and four of them stating in addition that the two pieces of ice were rubbed together by clockwork."

In a review of the corpus of Davy's collected works, Jones speculates that the "vacuum" assertion was mis-read conglomeration of two different experiments. Likewise, German-born Israeli geophysicist and mathematician Ari Ben-Menahem, in his 2009 *Historical Encyclopedia of Natural and Mathematical Sciences*, comments that: [4]

> "Although this work has been accepted for many years, it seems very doubtful that Davy, then 19 years of age, could have carried out such a [clockwork mechanism in a vacuum] experiment, which would tax the ingenuity of any trained engineer."

There may be some truth to this "no vacuum" argument, as it is very hard to make a true vacuum, as is evidenced by the famous "sealing problem" encountered by Otto Guericke in his beer keg vacuum attempts.

Other

In 1971, Donald Cardwell, in his historical *From Watt to Clausius*, was reporting that "Boyle also reported that two blocks of ice melted more rapidly if rubbed together than if left to melt undisturbed". [5] This, however, likely seems to be Cardwell recalling the ice rubbing experiment, but confusing Boyle with Davy.

References

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2. Stewart, Balfour and Tait, Peter G. (1875). *The Unseen Universe: or Physical Speculations on a Future State* (§101). Macmillan.
3. Jones, Arthur T. (1922). "Did Humphry Davy Melt Ice by Rubbing Two Pieces Together Under the Receiver of an Air Pump?" (Q), *Science*, LV(1428):514.
4. Ben-Menahem, Ari. (2009). *Historical Encyclopedia of Natural and Mathematical Sciences, Volume 1* (pg. 1533). Springer.
5. Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 4). Cornell University Press.

Further reading

- Henry, William. (1803). "A Review of Some Experiments: Which Have been Supposed to Disprove the Materiality of Heat", *Philosophical Magazine*, 15: 45-54.
- Buckingham, Edgar. (1900). *An Outline of the Theory of Thermodynamics* (pgs. 13-14). MacMillan.

External links

- Milestones in Thermodynamics – Thermal Physics, *University of Notre Dame*.

θΔics

In human thermodynamics, **Ichiro Aoki** (1947-) is a Japanese systems engineer noted for his 1987 efforts make theoretical estimates of the entropy production in plant leaves and white-tail deer, in day and at night; eventually applying these methods to humans (see: human entropy), physiologically, into the 1990s. [1] The end result of Aoki's work (2012), according to his conclusion, is that "entropy itself cannot be measured and calculated for biological systems, even for very small systems", rather only "process variables, entropy flow, and entropy production can be quantified by the use of energetic data and physical methods." [2] Aoki has also theorized about "aging" in terms of entropy. [3]

References

1. (a) Aoki, Ichiro. (1987). "Entropy Balance of White-Tailed Deer During Winter Night" (abs), *Bulletin of Mathematical Biology*, 49(3): 321-27.
(b) Aoki, Ichiro. (1992). "Entropy Physiology of Swine: a Macroscopic Viewpoint", *Journal of Theoretical Biology*, 157(3):363-71.
(c) Aoki, Ichiro. (1994). "Entropy Production in Human Life Span: A Thermodynamic Measure for Aging" (abstract). *Age* 1: 29-31.
(d) Aoki, Ichiro. (1997). "Introduction to Entropy Physiology" (abs), *Siebutso Butsuri*, 37(3): 106-10.
2. Aoki, Achiro. (2012). *Entropy Principle for the Development of Complex Biotic Systems: Organisms, Ecosystems, the Earth*. Elsevier.
3. Aoki, Ichiro. (1994). "Entropy Production in Human Life Span: A Thermodynamic Measure for Aging" (abstract). *Age* 1: 29-31.

θΔics

In thermodynamics, **ideal gas** refers to a body of particles (atoms or molecules) in a state of gas particles, which are said to abide by the Boltzmann chaos assumption, i.e. have non-correlations of velocities, and to obey the ideal gas law:

$$PV = nRT$$

where *P* is the pressure, *V* the volume, *n* the number of particles , *R* the gas constant, and *T* the temperature of the body of gas. [1] Deviations in the behavior of gases, from the ideal gas law, occur at extreme pressures and temperatures, at which point the gas no longer is considered "ideal".

Perfect gas | Ideal perfect gas

The prefix term "ideal" is a modern etymological evolution stemming from the phrase "perfect gas" in the context of making a "perfect" vacuum via explosion in early gunpowder engine and other vacuum engine prototypes, such as is found in the works of Denis Papin and Christiaan Huygens.

In the early 20th century, terms such as “ideal perfect gas” (Preston, 1904) (Q), were being employed.

References

1. Perrot, Pierre. (1988). *A to Z of Thermodynamics* (section: Ideal gas, pgs. 144-48). Oxford University Press.

External links

- Ideal gas – Wikipedia.

θΔics

In gas laws, the **ideal gas law** is an equation of state describing the behavior of a body of ideal or perfect gas, defined by the expression:

$$PV = nRT$$

where *P* is the pressure of the body of gas, *V* the volume, *n* as the number of mols, *R* the gas constant, and *T* the temperature.

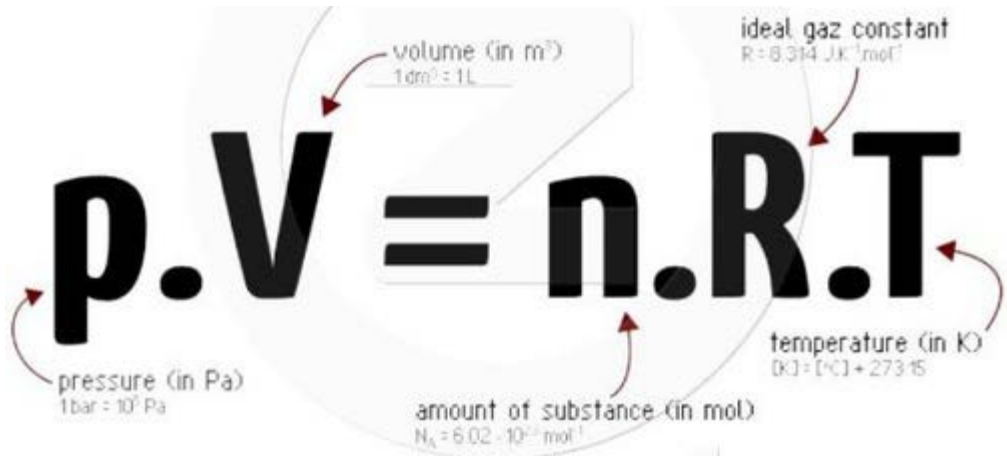

Zazzle.com **ideal gas law** print for T-shirts and mugs. [4]

History

The first verbalized statement of the ideal gas law seems to have been made in parts in 1738 by Dutch-born Swiss mathematician Daniel Bernoulli.

In 1834, French engineer Emile Clapyron was defining the gas law as such:

$$Pv = R(267 + t)$$

which he says is Mariotte's law (PV = k, at constant temperature) combined with that of Gay-Lussac's law (P = kT, at constant volume). [5]

In 1850, German physicist Rudolf Clausius, in his "On the Moving Force of Heat", was defining the gas law as such:

$$pv = R(a + t)$$

which he says is "the combined laws of Mariotte and Gay-Lussac" and in which he derives a value for the constant *a* of:

$$a = 273$$

with *t* the temperature in degrees centigrade. In reference to this gas law, Clausius introduces the notion of dependent variables and independent variables, to the effect that in a three variable equation, i.e. p, v, and t, one can treat any one of these three magnitudes, which then is called the "dependent variable", as a function of the other two, which are then called the "independent variables".

Classical version | Molar version | Avogadro's law

The first statement of the modern version of the gas law, with the particle count measure 'n' in the formula, seems to have been done in the 1893 *Theoretical Chemistry from the Standpoint of Avogadro's Rule and Thermodynamics* by German chemist Walther Nernst, in which he integrated of Avogadro's rule (1811) into modern chemical thermodynamics, to the result that he states that if *n* g-mol of different gases are under the pressure *P*, filling a volume *V*, at an absolute temperature *T*, then in the sense of Dalton's law: [1][8]

$$PV = nRT$$

In 1897, German physicist Max Planck was also using the same modern-version formula in his chapter on "Molecular Weight". [2] This expression became commonplace with its use in the classic 1923 textbook *Thermodynamics and the Free Energy of Chemical Substances* by American physical chemists Gilbert Lewis and Merle Randall. [3]

Statistical version | Molecular version | Boltzmann's constant

If n, the number of g-moles, gram moles, or moles, of gas, is set equal to: [9]

$$n = \frac{N}{N_A}$$

where N is the actual number of molecules and N_A is Avogadro's number, and one defines the commonly used ratio of the gas constant R to Avogadro's number to be equal to a new so-called constant of nature:

$$k_B = \frac{R}{N_\mathrm{A}}$$

where the subscript "B" is in honor of Austrian physicist Ludwig Boltzmann, via substitution, the classical "molar-based" ideal gas law can also be written in the alternative so-called "molecular" or statistical mechanical form:

$$PV = Nk_BT$$

or

$$PV = NkT$$

with the subscript "B" (for Boltzmann) assumed, where k_B is called the Boltzmann constant, a constant that was first calculated in the 1900 work of German physicist Max Planck.

Other

In 1936, Italian-born American physicist Enrico Fermi was defining what he called the "equation of state for the ideal gas or perfect gas" as follows: [6]

$$pV = \frac{m}{M}RT$$

where m is grams of a gas, and M is molecular weight, and expression which Fermi says includes Boyle's law, Gay-Lussac's law, and Avogadro's law. [7] If, according to Fermi, the number of grams of the gas equals the molecular weight of the gas, then:

$$m = M$$

which he says is the condition for what is called the "gram-molecule" amount of a gas. Hence, the gram molecule ideal gas law becomes:

$$pV = RT$$

Of note, the inconsistency with which authors upper or lower case letters for pressure volume and temperature is a bit puzzling, as there seems to be some type of unwritten rule practiced, albeit inconsistently.

See also

â— Social ideal gas law

References

1. Nernst, Walther. (1893). *Theoretical Chemistry: from the Standpoint of Avogadro's Rule and Thermodynamics* (PV=nRT, pgs. 32, 41). MacMillan and Co.
2. Planck, Max. (1897). *Treatise on Thermodynamics* (ch. 2: Molecular Weight, pgs. 23-33). Longmans, Green and Co.
3. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pg. 63). McGraw-Hill Book Co., Inc.
4. Ideal gas law (T-shirt) – Zazzle.com.
5. Clapeyron, Émile. (1834). "Memoir on the Motive Power of Heat", *Journal de l'Ecole Polytechnique.* XIV, 153 (and Poggendorff's *Annalender Physick*, LIX, [1843] 446, 566).
6. Fermi, Enrico. (1936). *Thermodynamics* (pg. 8). Prentice Hall.
7. Avogadro's law – Wikipedia.
8. Dalton's law – Wikipedia.
9. (a) Basavaraju, G. and Ghosh, Dipan. (1984). *Mechanics and Thermodynamics* (pgs. 349-50). Tata McGraw-Hill.
(b) Wolf, Jonathan S. (2003). *How to Prepare for the Advanced Placement Exam*: *Physics B* (pg. 212). Barron's Educational Series.

External links

â— Ideal gas law – Wikipedia.

θΔics

In physical chemistry, **ideal solution** refers to []

Overview

In 1955, Kenneth Denbigh, in his *Principles of Chemical Equilibrium*, defined ideal solution as follows: [3]

> "A **solution** is said to be '**ideal**' if the chemical potential of *every* component is a linear function of the logarithm of its mole fraction according to the following relation:
>
> $$\mu_i = \mu_i^* + RT \ln x_i$$
>
> where μ^{*i} is a function only of temperature and pressure."

In 1978, Gurdeep Raj, in his *Advanced Physical Chemistry* (pg. 1420), defined ideal solution as follows:

> "In an **ideal solution** of two components A and B, all the intermolecular forces between A and A, B and B, and A and B are alike, so that the escaping tendency of an A or B molecule would be independent of whether it is being surrounded by A molecules, B molecules or varying proportions of A and B molecules. Thus, the escaping tendency, as measured by the vapor pressure, of each component in this type of solution will remain the same as that in the pure component therefore Raoult's law is obeyed. Such a solution can only form if the components A and B are identical in structure and polarity."

(add)

Beg | Ideal society | Ideal solution | Ideal gas?

In 1987, Mirza Beg, in his *New Dimensions in Sociology*, conjectured, thematic to his overall work, that the physico-chemical term "ideal solution", in scientific definition and meaning, is represented, in physico-chemical sociological terms, by the society formed by Muhammad in c.600; the following is one summary of this view:

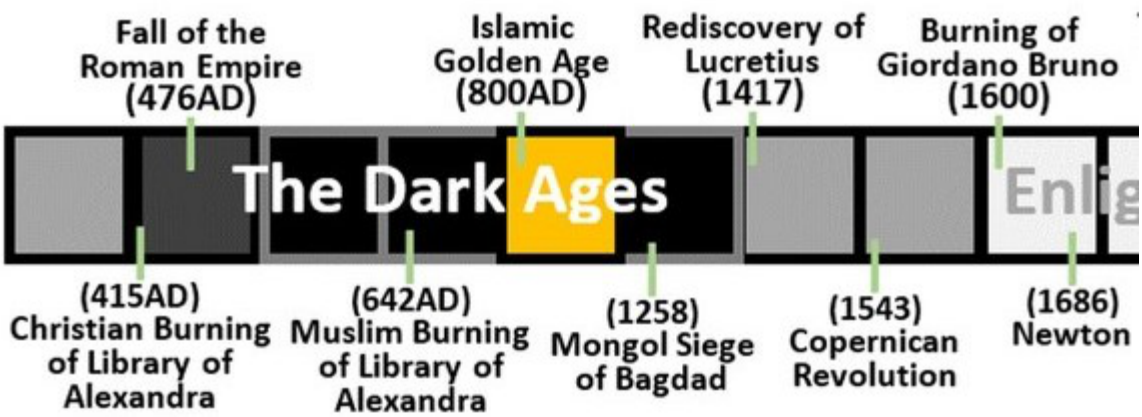

A segment from the dark ages article, showing the "Islamic golden age", wherein many middle ages geniuses, were synthesized, (c.800-1100) (Q), which ended when Hamid Al-Ghazali (1058-1111) declared mathematics "evil" or the "work of the devil" (Tyson, 2011) (Q).

> ""The author has suggested a universality of phenomena, the attraction and repulsive forces at atomic and molecular level, micro-cosmic and macro-cosmic level and among celestial bodies to be operative also among human beings which are an integral part of the universe and that similar forces should govern their interaction or behaviour. The author [Beg] believes, for example, that a **society is comparable to a 'physical solution' which would be 'ideal' if the interaction among the components of these two systems is uniform**. Such a society was present at the time of the Muhammad when interaction among

Sahabah (Q) and Muhajirun (Q) was so congenial as to compare with the physico-chemical laws for ideal solution."

— Mumtaz Kazi (1987) "Forward by a Scientist" to Mirza Beg's *New Dimensions in Sociology* (pg. ii) [2]

Firstly, in respect to areas of difficulty, is the notice here that Beg is mixing "religious history", which more often than not tends to be invented history, with science, and secondly, that the majority of nearly all founders of national religions, tend to be fictional or rather invented characters or god-to-prophet rescripts. Such is likely the case with Muhammad (see: Muhammad never existed), as is the case with Jesus (see: Jesus never existed), Moses (see: Moses never existed), and Abraham (see: Abraham never existed).

This being the case, there was, invariably, however, a religious "recension" (see: recension theory), which beginning in c.600 gave rise to Islamic religion, and in turn the Islamic golden age (c.800-1100), as shown adjacent, a period of intellectual brightness, wherein many middle ages geniuses were produced.

It can, accordingly, be conceded that in c.600, during the so-called Muslim recension, there were two, or more, non-polar molecular species, Muhajirun (Q), the first pilgrims to adhere to the new creed, which we might call molecular species A, and the Sahabah (Q), the surrounding molecular species B, who first came into contact with the "religious ideas" of A, or of the newly reformulated religion, who prior to that time, had different "polarities" and would not mix, e.g. like the Christian Protestants and Catholics of the 17th century, or something along these lines, but that after the new religion was assimilated, they began to have the same polarity, and therein or thereby "equivalent intermolecular forces", as Beg conjectures, whether between A and A, B and B, or A and B.

Quotes

The following are related quotes:

"A first important step is made by showing that no better result will be obtained by the use of any other machinery than the ordinary piston and cylinder, or by using many cylinders instead of one, provided that the steam be supplied with heat in the same way: the steam possessing during and after formation a certain definite amount of expansive energy which, if duly utilized, will do a certain definite amount of work: and it follows therefore that to obtain greater efficiency the treatment of the steam must he altered, or steam must be replaced by some other fluid. To see whether anything can be gained in this way it is necessary to consider, instead of steam, some body of more simple constitution, so that we may be able to construct a complete and exact theory of the action of heat upon it. Such a body is suggested by the properties of the permanent gases (Q), all which possess certain characteristics so approximately, as to suggest to us the consideration of an **ideal body** [see: **ideal gas**; **ideal perfect gas**] called a **'perfect gas'**, in which they shall be precisely realized. The fourth chapter is therefore occupied with the discussion of the action of heat on a perfect gas, and the result is utilized to study the operation of the simplest forms of air engines, when it is found that although in circumstances conceivable in practice, the efficiency is more than double that of the steam engine previously considered, yet still fully one-half the heat expended will be wasted. The cause of the waste, however, is remarkably different in the two cases; in the air engine, *all* the heat is in the first instance employed in doing work, and the waste is caused by the necessity which exists in air engines for a compressing apparatus, which requires so much power to work it that the larger part of the energy originally exerted on the working piston is thrown away: while in the steam engine, on the other hand, although some energy is employed in compression, represented by the back pressure on the working piston, yet the greater part of the waste arises from the great amount of internal work which it is necessary to do in order to generate steam, little of which can be utilized by the process of expansion."

— James Cotterill (1871), *Steam-Engine Considered as a Heat Engine* (pgs. vii-viii) [1]

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External links

- Ideal solution – Wikipedia.

θΔics

In categorizations, **ignorance**, or someone who is "ignorant", refers to a lack of basic or essential knowledge in general or on specific topics. The gist of the term ignorance is captured well in the following famous words of German polymath Goethe, possessor of a 5,000-book library:

> "If one does not know what went on for the last three thousand years, he or she remains **ignorant**, merely surviving from day-to-day."
>
> "The first and last thing which is required of genius is the love of truth."

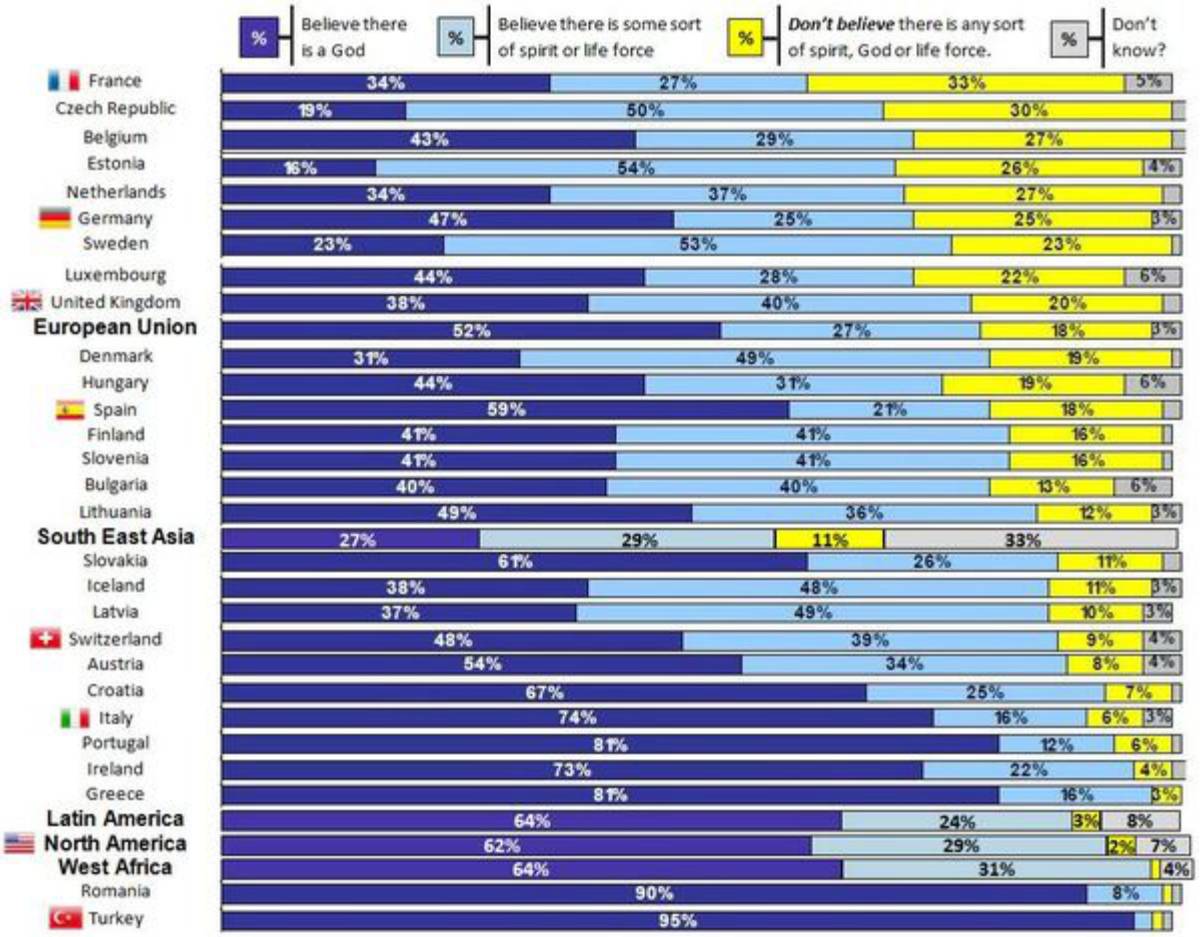

The distributions of modern belief systems in terms of **religious ignorance** level; France being the least ignorant country, religiously-speaking.

The ignorant person, in short, eschews the truth, existing in indifferent ambivalence to reality and extant knowledge of the universe.

Religious ignorance

About 72 percent of the world, as documented in terms of belief per country adjacent, are "ignorant" about the fact that their religion, be it Christianity, Islam, or Hinduism, has the same parentage of Egyptian mythology, namely Anunian theology, all centered around the cyclical life-death-rebirth theory of the sun Ra, and the resurrection or reincarnation morality theory derived therefrom, and that as such the God does not exist, but is in fact a defunct theory of olden days.

This type of ignorance is deeply ingrained.

Learned ignorance

The highest level of ignorance is what can be defined learned ignorance or "ivory tower" ignorance, namely ignorance possessed those in the highest university towers of intellectual development, with tenure (job and retirement security), with an anchor of peer-reviewed journal publications, YouTube video celebrity science channel of scientific celebrity, in certain circles, etc., but yet not humble to the edge of knowledge, as Scottish physician-chemist William Cullen was in his 1748 chemistry Glasgow University lectures, wherein he introduced a number of pioneering concepts, such as the "chemical equation", to his students, e.g. Joseph Black, during the entire course of which he maintained a humble reserve for knowledge (and to the vastness of the land of the two cultures and to the now near-unattainableness of universal genius mindset, which is said to have peaked in the Goethe-Helmholtz mindset, the last universal geniuses on record), using phrases such as "as far as I know", this is the way science sees things, etc.,—the pinnacle example of ivory tower ignorance being Irish physicist Philip Moriarty, who, being overly pompous in his YouTube Channel 60

Symbols and tenured position at Nottingham University, in the 2009 summary words of Steven Pierce, defending his position that an arrangement of students in a field “does not have a thermodynamic entropy” (which is incorrect), can aptly be describe as an “uptight academic community with neither the depth nor will to understand your unique work, defending their own turf like dogs”, completely ignorant that German polymath Johann Goethe proved this, thermodynamically, over 200-years ago (see: Goethe timeline)—and when attacked in the street about his theory, calmly explained that “I’m sorry you feel that way, but the principles contained in the novella are true” (a proposition validated in 1882 by German physician-physicist Hermann Helmholtz).

Other ivory tower ignoramuses include: Paul Samuelson (1972; economics), Stephen Lower (2007; physical chemistry), Philip Moriarty (2009; physics), Mitch Garcia (2010; nuclear chemistry), Marcin Borkowski (2010; analytical chemistry), overly pompous in their deflated view of reality (see: crackpot), who each view Goethe, the smartest person ever (see: Genius IQs) (last universal genius), and his 1796 human chemical thermodynamics morality theory as “crackpot”, whereas in the correct sense, as Goethe viewed things (and as modern human chemical thermodynamics views things), his theory is true—thus, two centuries have passed and we are still in the ridicule stage of scientific truth, with many, such as Samuelson, Lower, Moriarty, Garcia, Borkowski, and a large percentage of the modern scientific body, existing in complete and blind ignorance of reality—and not just day-to-day ignorance, but two-century long delayed and regressed ignorance—a pitiful situation, to say the least—a state of affairs possibly akin to something like Hypatia must have experienced for promotion of heliocentrism, and being stoned-to-termination for this (415AD), some 1,128-years before it was even tentatively accepted as truth (Copernicus, *On the Revolutions of the Heavenly Orbs*, 1543), or some 1,218-years before it would be possible to give published public support for it as truth without being tried for “suspicion of heresy” and put under house arrest (Galileo, religion vs science legal cases, 1633); and some 2,420-years before one could get fired from their job for teaching it (religion vs science legal cases, 2005).

Newcomers to this subject would be wise to heed the following words of French physicist Sadi Carnot, from his "rules of conduct" personal notes: [1]

> “Say little about what you know and nothing at all about what you don’t know. When a discussion degenerates into a dispute, keep silent. Do not do anything which the whole world cannot know about.”

Hmoscience

To be a leading openly atheist scientist, but yet be hmolscience-ignorant is a very difficult to explain, understand, and discern type of ignorance, let alone address, but a type of "learned ignorance" that can only be grasped in heated debates, such as the Rossini debate (2007), Moriarty-Thims debate (2009), etc., very difficult to put into words. The following quote by American philosopher Ralph Emerson (1803-1882) captures a gist of this type of learned ignorance:

> “All before Goethe are ancients, and all who have read him are modern.”

which in a modern sense, in respect to scientific ignorance, should correctly read:

> “All before Goethe are ancients, and all who have read and understood his *Elective Affinities* are modern.”

To exemplify, American electrochemical engineer Libb Thims was "completely" ignorant of Goethe and his grand 1796 human chemistry theory until 2006 when he discovered him via footnote 2.5 of the 1984 *Order Out of Chaos* by Belgian chemist Ilya Prigogine, and this was after searching for this theory for eleven years.

Goethe stated, in 1809, that his theory is "true" and according to modern chemical thermodynamics, the science that governs the actions of the known universe, it is true—the repercussions of which are wide and far reaching—yet conclusions nearly foreign in concept and mindset to the modern scientist (e.g. Lubos Motl, Mitch Garcia, Marcin

Borkowski, Philip Moriarty, Stephen Lower, John Wojcik, Edward Sanville, Steve Fuller, Tominaga Keii, Pitirim Sorokin, to name a few) who is completely ignorant and repellant to the viewpoint of humans (a) being animated molecules or chemicals, (b) moving about on a surface governed by the laws of energy and entropy, according to which (c) that human free energies determine what is moral and amoral in the human affairs and actions.

Quotes

The following are related quotes:

> "Let no one enter here who is **ignorant** of mathematics."
>
> — Plato (360BC), plaque over door to his academy, a motto supposedly learned from his studies in Egypt [2]

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External links

â— Ignorance – Wikipedia.

θΔics

In existographies, **Ilya Prigogine** (1917-2003) (IQ:170|#433) [CR:411] was a Russian-born Belgian chemist and thermodynamicist known for his "far-from-equilibrium" thermodynamic dissipative structure theory, according to which biological life is argued to have self-assembled from inorganic non-life through the non-equilbrium thermodynamic processes of fluctuations and bifurcations. [11]

Overview

The gist of what Prigogine seems to have been after in his decades of work seems to be captured in the following 1996 quote:

> "My colleague Paul Glansdorff and I have investigated the problem as to if the results of near-equilibrium can be extrapolated to those of far-from-equilibrium situations and have arrived at a surprising conclusion: Contrary to what happens at equilibrium, or near equilibrium, systems far from equilibrium do not conform to any minimum principle that is valid for functions of free energy or entropy production."

In place of free energy and entropy functions, Prigogine argues that matter acquires new properties when far from equilibrium in that fluctuations and bifurcations are the norm. [15]

Progogine's theory is seeded with and influenced by philosophy; as such, his theories are often found in writings on philosophical thermodynamics. [1] He has been described, by *Time* magazine, as the "poet of thermodynamics". [9] In famous publications, Prigogine's most-referenced book, co-written with Gregoire Nicolis, is the 1977 *Self-Organization in Non-Equilibrium Systems: from Dissipative Structures to Order through Fluctuations*. [10]

Progogine was awarded the 1977 Nobel Prize in chemistry for this theory. [2] He is associated with the Brussels school of thermodynamics, of which his mentor Belgian mathematician and physicist Théophile de Donder was the founder. Students of Prigogine include Grégoire Nicolis, Dilip Kondepudi, and Dick Hammond, among others.

In 1954, Prigogine, together with Raymond Defay, published *Treatise on Thermodynamics: Based on the Methods of Gibbs and De Donder*. [5] Prigogine's most popular work is the 1984 book *Order Out of Chaos*, in which he presented his dissipative structures theory in an easy to understand language, stiched with a number of philosophical conjectures and anthropomorphic chemical-molecular analogies and phraseologies. Many currently use Progogine's dissipative structure theory as a cornerstone in theories concerning evolution and human life. In 2004, the Prigogine Medal, a prize give to one senior and one junior scientist in the field of systems ecology, was established in his honor.

Religion

Prigogine identifies and or has been categorized as a Jewish scientist. [21] In his *The End of Certainty* (pg. 179), Prigogine argues against big bang theory and "creation ex nihilo", i.e. creation from nothing, arguing that "an irreversible process transforming gravitation into matter" seems plausible. (Ñº) Prigogine also acknowledges that one of his main inspirations was Henri Bergson and his "creative evolution". Prigogine's religion, in short, is a covert implicitly-coded theology that argues, in short, a sort of "god through irreversible semi-indeterminate fluctuations and bifurcations evolutionary processes"; it is the classic Trojan horse god theory, i.e. a "Trojan god" slipped into science though a thermodynamic ontic opening.

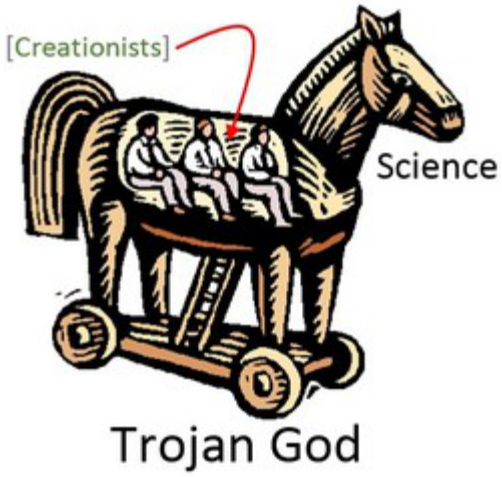

Prigogine's theory, in short, is a thermodynamics-masquerading Trojan horse, with Henri Bergson's creative evolution inside, thereby letting "spirituality" into the house of

This becomes apparent when you find self-identifying "defacto atheists", e.g. Philip Moriarty (see: Moriarty-Thims debate, #39, etc.), asserting that they are a type of far-from-equilibrium dissipative structure, which is a god implicit theory.

science.

His views, a bit camouflaged by nonequilibrium thermodynamics, are a modified Pierre Teilhard bifurcation-divided omega point theory, a god-guided automaton universe, as he says in his 1983 Omni magazine interview with Robert Tucker (Ñº), wherein we approach increased spirituality up to each new bifurcation.

Bifurcations and fluctuations

One of Prigogine's most-cited (219+ times, 2011) papers is his 1976 "Order Through Fluctuations: Self Organization and Social System," in which he applied his earlier internal entropy theory:

$$dS = d_eS + d_iS$$

where entropy variation *dS* of a body or system is split into two different components, one the the sum of the entropy exchanges, d_eS, the subscript 'e' meaning entropy *exchanged* at the boundary, and two the entropy inside, d_iS, the subscript 'i' meaning entropy variation *inside* or internal to the system, the latter type referring to irreversible processes, to explain social system change in terms of 'order through fluctuations'. [16]

In this paper, which according to some is said to mark the beginning of "social thermodynamics", Prigogine is said to model a human as an atom or group of atoms, and a family as molecule, along the way giving definitions of social entropy, free energy, among others. [18]

This internal entropy model was first outlined in Prigogine's 1945 *Study of the Thermodynamics of Irreversible Phenomenon.* [3]

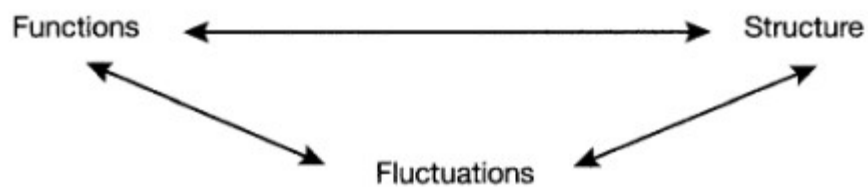

Schematic of Prigogine's 1976 "dissipative structures" model applied to explain social systems. [16]

Prigogine theorized that a system can achieve a new functional and structural order, not only in spite of, but also because of permanent change. In his social model, when changes are small or moderate and actors are able to control them, the system is maintained in a state of 'stable' fluctuation (fluctuations below the threshold), but when large fluctuations take place and actors cannot control them, even a small change can drive the system's actors to change function and structures to perceive that a dramatic transformation has occurred.

The fluctuations, supposedly, are quantified by diS and deS differentials, i.e. intern entropy and external entropy changes, triggered at the actor's level by human action (micro level). Individual actor's perceptions, images, and expectations, and other internal attributes of a given society are said to be quantified by the diS term, whereas the physical and social environmental factors affecting the social system are said to be the 'deS' source of fluctuation. [17]

Education

Prigogine was born the year of the Russian revolution (1917) was also born into a chemistry-educated family. His father Roman Prigogine was chemical engineer, educated at the Moscow Institute of Technology, who ran a small successful soap factory, and his brother was a chemist, who became successful in the mining industry. In 1921, four years after the start of the revolution, the family left Russia, spending a year in Lithuania, then going to Berlin, and finally settled in Belgium in 1929.

Prigogine, following his parent's and brother's advice, began his undergraduate work in chemistry and physics at the Free University of Brussels, also studying philosophy on the side, particularly Henri Bergson. In 1937, at the age of twenty, Prigogine published three articles: "Essay on Physical Philosophy", "The Problem of Determinism", and "The Evolution", on the topics of determinism, quantum mechanics, biological evolution, and time. [13]

Prigogine choose Belgian mathematical physicist Theophile de Donder (a student of Henri Poincare) to be his master's and doctorate thesis advisor. He completed his dissertation on *The Thermodynamics of Irreversible Phenomena* in 1941. [14] Prigogine became a professor at the Free University of Brussels in 1950.

Sociological thermodynamics

See main: Sociological thermodynamics

In his various works, Progogine has alluded to the idea that his theories apply to sociology and society. In the 1979 article "The Social Thermodynamics of Ilya Prigogine", American chemist and science writer Wil Lepkowski argued that the nonequilibrium thermodynamics of Prigogine could lead to new ways of understanding social processes. [12]

Classical thermodynamics

See main: Life thermodynamics

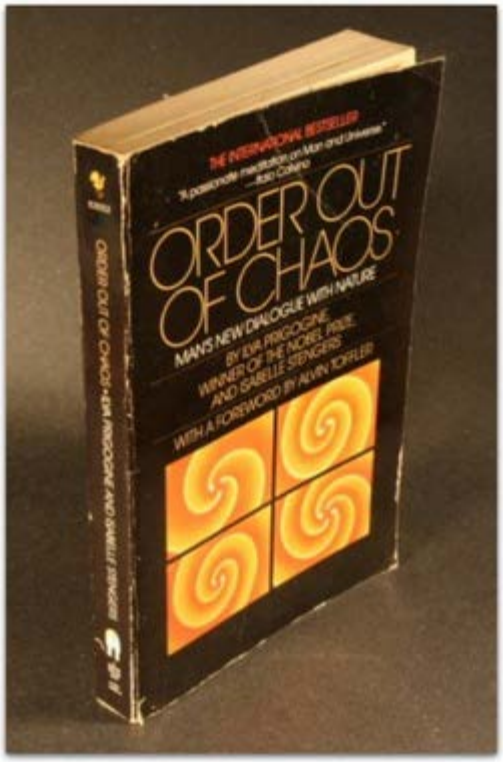

Prigogine's 1984 book *Order Out of Chaos*, his most popular treatise, in which he presents a layperson's view of his theory.

Prigogine, curiously, had a dismal view of classical thermodynamics in its applicability to explain the phenomenon of life and evolution? To cite one example, in 1955 Prigogine stated: [6]

> "The fact that during growth living organisms actually show a decrease of entropy production during evolution up to the stationary state … also, the fact that their organization generally increases during this evolution [which] corresponds to the decrease of entropy as studied [leads one to puzzle as to why] the behavior of living organisms has always seemed so strange from the point of view of classical thermodynamics; that the applicability of thermodynamics to such systems has often been questioned. One may say that from the point of view of the thermodynamics of open and stationary systems [nonequilibrium thermodynamics] a much better understanding of their principal features is obtained."

In the opening comments to his 1977 Nobel Lecture "Time, Structure and Fluctuations", similarly, he again makes a misaligned attempt, i.e. by purposely mentioning Helmholtz free energy which is typically used in isothermal (constant temperature) isochoric (constant volume) experiments such as in explosives research (where explosive reactions by their nature induce pressure changes), verses the Gibbs free energy (common to biological processes), to discredit the validity of standard thermodynamics to explain living order: [2]

> "Thermodynamic equilibrium may be characterized by the minimum of the Helmholtz free energy defined usually by: F = E – TS. Are most types of 'organisations' around us of this nature? It is enough to ask such a question to see that the answer is negative. **Obviously** in a town, in a living system, we have a quite different type of functional order. To obtain a thermodynamic theory for this type of structure we have to show that that non-equilibrium may be a *source of order*. Irreversible processes may lead to a new type of dynamic states of matter which I have called 'dissipative structures'."

This view strangely existed, in the mind of Prigogine, in spite of the fact that he was well acquainted with German writer Johann Goethe's 1809 *Elective Affinities* (as referenced in the endnotes to his *Order Out of Chaos*), in which the activities of human life and love were explained via a theory of human chemical reactions quantified by chemical

affinities, which, as elaborated on greatly by Prigogine's mentor de Donder in his 1936 *Thermodynamic Theory of Affinity*, are described via changes in chemical free energy (Gibbs free energy), a classical thermodynamics conception.

Evolution

Underlying much of Prigogine's work was his aim to explain evolution by a new version of thermodynamics of his own formulation, a mixture of non-equilibrium or convection flow thermodynamics, fluid mechanics, and chaos theory mathematics. The seeds of this drive seem to trace to French philosopher Henri Bergson and his 1907 book *L'Évolution Créatrice* (*Creative Evolution*). This publication was said to have "inspired" Ilya Prigogine to reconsider the foundations of thermodynamics work for which he later won the 1977 Nobel Prize in chemistry. [2] In his Nobel lecture, Prigogine recalled: "since my adolescence, I have read many philosophical texts. I still remember the spell *L'Évolution Créatrice* cast on me. More specifically, I felt that some essential message was embedded, still to be made explicit, in Bergson's remark: 'the more deeply we study the nature of time, the better we understand that duration means invention, creation of forms, continuous elaboration of absolutely new.'" [7]

In his 1972 article "Thermodynamics of Evolution", to elaborate a bit, Prigogine and associates state: [8]

> "To their credit, there are a few evolutionists (though apparently very few) who recognize the critical nature of the problem [of the second law] and who are trying to solve it."

In the years to follow, Prigogine attempted to explain evolution in terms of the abstract conceptions of dissipative structures, such as Bénard cells, bifurcations, and fluctuations.

Gladyshev | Hierarchical thermodynamics

A competing classical thermodynamics biological evolution theory is the hierarchical thermodynamics theory, developed in 1977 by Russian physical chemist Georgi Gladyshev. Gladyshev's theory was stimulated into development (the year Prigogine won the Nobel prize) owing to personal convictions that Progogine's theory was illogical when applied to the process of biological evolution. Gladyshev sent Prigogine a copy of his theory but Prigogine rejected it. [4]

Difficulties on theory

The so-called "difficulties on theory" surrounding Prigogine and his overall theory is a rather involved topic of discussion; a large majority of the scientific-illiterate public swallowing the overall premise of his theory, which is rather attractive on first, second, and third, etc., pass, hook-line-and-sinker. A few known dissenters, however, include: Russian physical chemist Georgi Gladyshev (1977):

> "Only in a system that is close to equilibrium can the differential of this function of state of the system (entropy) be considered to be a full one, to an acceptable approximation. However, all the aforesaid is usually underestimated; therefore, many works [by **Prigogine**] on nonequilibrium thermodynamics, especially the thermodynamics of systems that are far from equilibrium, remain a faint 'future hope.' Some of these works, I daresay, are mere mathematically trimmed fantasies useless for real life."
>
> — Georgi Gladyshev (2001), "The Second Law of Thermodynamics and the Evolution of Living Systems" (Ñº)

French-born American theoretical physicist Pierre Hohenberg (c.1994), quoted below:

> "I don't know of a single phenomenon [Prigogine] has explained."
>
> — Pierre Hohenberg (c.1994) [20]

along with Romanian mechanical engineer Adrian Bejan (1995), and American physicist Cosma Shalizi (2010), citing (Ñº) Hohenberg.

To cite a red flag example, without going into detail, Prigogine, in his 1977 Nobel Lecture, uses the loaded term "obviously" as follows:

> "Thermodynamic equilibrium may be characterized by the minimum of the Helmholtz free energy defined usually by: F = E – TS. Are most types of 'organisations' around us of this nature? It is enough to ask such a question to see that the answer is negative. **Obviously** in a town, in a living system, we have a quite different type of functional order. To obtain a thermodynamic theory for this type of structure we have to show that that non-equilibrium may be a *source of order*. Irreversible processes may lead to a new type of dynamic states of matter which I have called 'dissipative structures'."
>
> — Ilya Prigogine (1977), Nobel Lecture: "Time, Structure and Fluctuations"

The following argument rule of thumb, given in a 2001 book review by an anon agnostic lawyer, in commentary on Japanese-born American author George Smith's 1974 *Atheism: the Case Against God*, gives cogent insight into the nature of the red flag usage of the term "obviously" by Prigogine: [19]

> "When I was in law school, I learned that one should not use words like "**clearly**" to bolster an argument. Use of such words is a dead give-away that the point is anything but clear."

In Prigogine's case, we would be hard-pressed to find anyone who would deem it clear or obvious that the equation "F = E – TS" does not describe the functional order of a town?

Quotes | On

The following are quotes on Prigogine:

> "Two groups of important discoveries nourish the thinking of [post Lamarckian-Darwinian] biologists today. For the one part, the astonishing progress since Fritz Lipmann in the domain of bioenergetics and for the other, the impetus which thermodynamics has assumed under the fertile impulse of the genius of **Prigogine**."
>
> — Ernest Schoffeniels (1973), *Anti-Chance* (pg. xi)

Quotes | By

The following are noted quotes by Prigogine:

> "We are led, therefore, to regard energy dissipation as the 'driving force' of evolution."
>
> — Ilya Prigogine (1977), *Self-Organization in Non-Equilibrium Systems* (pgs. 441-42); cited by Richard Adams (1988) in *The Eighth Day* (pg. 66)

> "According to my mother, I was able to read musical scores before I read printed words."
>
> — Ilya Prigogine (c.1990) (Ñº)

"The irreversibility of time is the mechanism that brings order out of chaos."

— Ilya Prigogine (c.1980) (Ñº)

"The main character of any living system is openness."

— Ilya Prigogine (c.1980) (Ñº)

"I see how you can do this with molecules, but I don't see how you can do it with species. I don't understand the extrapolation."

— Ilya Prigogine (c.1981), comment to Daniel Brooks, cited by Roger Lewin (1982), on his Brooks-Wiley theory [22]

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θΔics

In genius studies, **imbecile**, form the Latin *imbecillus*, meaning “weak” or “weak-minded”, is one with a “mind like child aged 3 to 7” (Goddard, 1910), Terman-classified (see: IQ scale) as someone with an IQ of 26–50, between "idiot" (IQ of 0–25) and "moron" (IQ of 51–70). [1]

Related

Of note, Henri Poincare (1854-1912) (IQ:190|#46) [LPKE:12] [GME:9], a famously categorized French genius, did so poorly on the Binet IQ that he was judged an imbecile (IQ:35). [2]

Quotes

The following are related quotes:

> “The arts are kept up by a very few people; they always have been kept up, when kept up at all, by a very few people. A great art patron is a man who keeps up great artists. A good art patron is a man who keeps up good artists. His reputation is coterminous with the work he has patronized. He cannot be an **imbecile**.”
>
> — Ezra Pound (1958), *Pavannes and divagations* (Q)(Q)

> “If you haven’t haven’t studied chemical thermodynamics, calculated your own molecular formula, and derived the equations of existence, you’re an **imbecile**; there doesn’t seem to be anyway else to put things.”
>
> — Libb Thims (2017), “arisen mental note”, while ruminating on Bacon’s “we are much beholden to men like Machiavelli who write what men do, and not what they ought to do” + rumination on the multiple independent genius rankings of Giordano Bruno (IQ:190|#34) (RGM:84|#1,260+) (Cattell 1000:c.660) in the top 30 to 85 genius ranking position + reflection on ongoing (Q)(Q)(Q) “ranking oneself” issues, May 30 + Jun 6

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θΔics

In science, **Imhotep** (c.2650–2600BC) (IQ:175|#215), called "Imouthes" by the Greeks, an Asimov great scientist (#1|1510), was an Egyptian polymath, first architect, engineer, and physician in early history, who served under third dynasty king Djoser (Zoser) as chancellor to the pharaoh and high priest of the sun god Ra at Heliopolis, architect of the world's first pyramid, the Step Pyramid at Saqqara, who may be the possible main theorist behind the current world dominating Anunian theologies, namely" Ab-ra-ham-ic theologies (Christianity, Islam, etc.) + B-ra-hma-ic theologies (Hinduism, Buddhism, etc.) and in turn the clay creation myth model of a human and in turn the modern colloquial theory of life conception.

Imhotep has been characterized as a "Da Vinci, Michelangelo, Galileo, and Newton all rolled into one" (Q)

Khnum

The Heliopolis creation myth holds that the sun (Ra) was born of the Nile soil (Nun); a latter variant of this held humans were formed in a similar manner, a conception which transformed into the model that that ram-headed god Khnum made people from clay, on his potter's wheel, in the waters of the Nile.

Since the annual flooding of the Nile brought with it silt and clay, and its water brought life, shown via "green" color, below, signifying vegetable life, to its surroundings, Khnum was thought to be the creator of the bodies of human children, which he made at a potter's wheel, from clay, and placed in their mothers' wombs. [2]

One of the earliest mentions of Khnum associates him with the Nile flood: namely a third dynasty (2686-2613BC) inscription by King Zoser (Djoser) on the rocks at Sehel Island, near Elephantine (his main cult center), records a seven-year famine and states that Khnum would let the Nile flood once again if his temple was renovated.

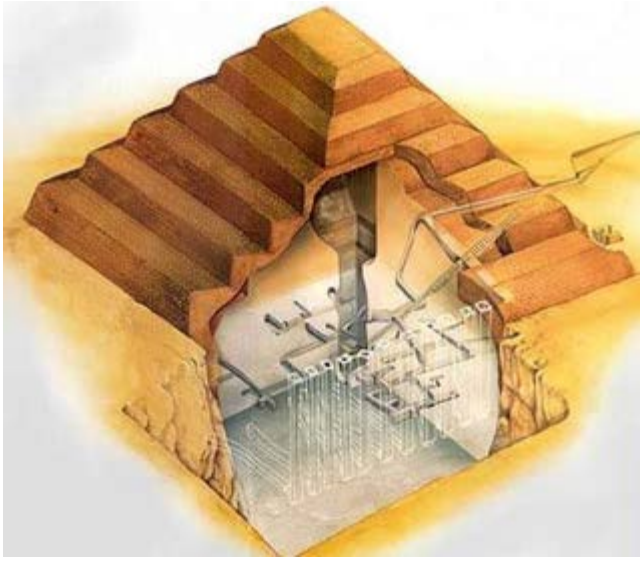

The Step Pyramid at Saqqara was built by **Imhotep**, engineer and high priest of Heliopolis, the home of Ra theology, the design of which was connected theoretically with the clay creation myth god Khnum.

Djoser was buried in his famous step pyramid at Saqqara. This pyramid was originally built as a nearly quadratic mastaba, but then five further mastabas were literally piled upon the first, each new mastaba smaller than the predecessing ones, until the monument became Egypt's first step pyramid. Supervisor of the building constructions was Egyptian polymath and high lector priest Imhotep—who served under the Third Dynasty king Djoser as chancellor to the pharaoh and high priest of the sun god Ra (or Re) at Heliopolis, who is considered to be the first architect and engineer and physician in early history.

Khnum's height of power came in the years 332BC-395AD, during the Greek and Roman periods, centered at Elephantine Island ,where rams sacred to Khnum were mummified, elaborately wrapped, decorated with gilded masks, and placed in stone sarcophagi. [1]

Quotes

The following are related quotes:

> “Imhotep was the most famous of all the non royals that ever lived in ancient Egypt. He was the world's first named architect who built Egypt's first pyramid, is often recognized as the world's first doctor, a priest, scribe, sage, poet, astrologer, and a vizier and chief minister, though this role is unclear, to Djoser (reigned 2630–2611 BC), the second king of Egypt's third dynasty. While there doesn't seem to be enough written about him to estimate his I.Q., I will go out on a limb and say it must have been 170 – 200.”
>
> — Ken (2003), “Geniuses” [3]

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θΔics

In existographies, **Immanuel Kant** (1724-1804) (IQ:185|#75) (Cattell 1000:33) [RGM:19|1,500+] (Murray 4000:3|WP) (Perry 80:5|Li) (RMS:21) (GPhE:#) [CR:210] was a German philosopher, a fabled "last persons to know everything", an oft-cited "smartest person ever" missing candidate, noted for doing work on the Nebular hypothesis (1855), the Abraham and Brahma problem (c.1869), the categorical imperative (1785), among other areas.

Mechanical Origin of the Universe

In 1755, Kant, in his *Universal Natural History and the Theory of the Heavens: Essay on the Constitution and the Mechanical Origin of the Whole Universe according to Newtonian*, building on Newton, Rene Descartes, William Whiston (Q), Buffon, Richard Bentley (Q)(Q), Pierre Maupertuis, Wright of Durham, and James Bradley (Q), attempted to provide an account of the formation of the entire known universe based on accepted physical principles. [17]

Abraham | Brahma

See main: Abraham and Brahma

In c.1769, Kant, similar to what Voltaire had done before him, compared Adam and Abraham with Adimo and Brahma, and argued that Joseph was equivalent to Ganesha. [12]

Critique of Pure Reason

In 1781, Kant, in his *Critique of Pure Reason*, declared that the “argument from design” was insufficient to establish the existence of a deity. [14]

Organic | Inorganic

In 1790, Kant, in his *Methodical System of the Teleological Faculty of Judgment*, divided all things in nature into “inorganic”, in which natural causes are said to prevail, and the “organic”, in which the active teleological, i.e. purposeful, principle of adaption is supposed to prevail. [1] In Kant’s mind there was a divide or cleft between the domain of primeval matter and the domain of life, for in the latter he assumes the presence of a supernatural principle, of final causes acting toward definite ends.

Thermodynamics

Kant had views on free will, a common issue in human thermodynamics, which he viewed to be under the guide of universal laws, and his 1785 “categorical imperative” seems to be the model of German chemist Wilhelm Ostwald’s 1912 “energetic imperative” and American physicist Robert Lindsay’s 1959 “thermodynamic imperative”.

Likewise, in the application of thermodynamics to evolution, this same divisional issue debate continues, for many scientists, making classifications such as animate vs. inanimate, living matter vs. non-living matter, or life vs. non-life, etc. From the modern 21st century molecular evolution table perspective, however, a view emerges that all motile structures are types of larger and larger molecules, e.g. bacteria molecule, human molecule, earth molecule, etc., and the view that there is such a thing as a “living molecule” concedes to the view that the theory of life is a defunct scientific perspective. [3]

Self-organization

In Kant’s 1790 *Critique of Judgment*, in his §65 "Things [Considered] as Natural Purposes are Organized Beings", attempts to argue for that an organized being, in contrast to a “mere machine”, such as a watch (which has only motive force), has “formative force” a type of self-organization force that propagates itself. [4] The following seems to be a related example of Kant's views here:

> “A living organism is both cause and effect of itself.”
>
> — Immanuel Kant (1790), *Critic on Judgment*; cited by Lotka (pg. 346)

Science writer Robert Frenay argues that that this was the first appearance of the term "self-organization". [5]

Quotes | On

The following are quotes on Kant:

> "I am proficient in twelve languages, I will not learn a thirteenth."
>
> — Abraham Kaestner (c.1795), quip on Kant's *Critique of Pure Reason* [7]

> "With the blade of his criticism, his *Critique of Pure Reason*, **Kant**, the executioner, beheaded belief in god. God, therefore, became now a fiction."
>
> — Heinrich Heine (c.1835), *Werke, Volume Nine*; cited by Vincent Miceli (1971) in *The Gods of Atheism* (pg. xix)

> "The first attempt to explain the constitution and the mechanical origin of the world in a simple manner by 'Newtonian laws' — that is, by mathematical and physical laws—was made by **Immanuel Kant** in the famous work of his youth (1755), *General History of the Earth and Theory of the Heavens.* Unfortunately, this distinguished and daring work remained almost unknown for ninety years; it was only disinterred in 1845 by Alexander Humboldt in the first volume of his *Cosmos.*"
>
> — Ernst Haeckel (1899), *The Riddle of the Universe* [12]

> "Goethe stands far above any of **Kant**'s successors in wisdom and an almost instinctive recognition of the truth. In judgment he surpassed his scientific contemporaries like Humboldt almost as much as in philosophical intuition he surpassed Schelling."
>
> — Lawrence Henderson (1917), *The Order of Nature* [10]

> "**Immanuel Kant** and Isaac Newton are both considered to comprise the smartest people to have ever lived. Based on some recent IQ conjectures, both of the above supposedly had IQ's beyond the 250 mark."
>
> — Rork Azak (2011), "Comment to article on Eudoxus" (Q), Nov 14

Quotes | By

The following are related quotes by Kant:

> "It is certain that man derives all his concepts and representations from the impressions which the universe makes upon him through his body, even the power of comparing and combining these impressions, which may be called the faculty of thought."
>
> — Immanuel Kant (1755), *Universal Natural History and the Theory of the Heavens* [15]

“The excellence of thinking natures, their quickness of apprehension, the clarity and vividness of their conceptions, which come to them from the impressions of the external world, their capacity to combine these concepts, and finally, their practical efficiency, in short their entire extent of their perfection, becomes higher and more completed in proportion to their remoteness of their dwelling place from the sun.”

— Immanuel Kant (1755), *Universal Natural History and the Theory of the Heavens* [15]

“The higher beings of these other worldly spheres must ‘view a Newton’ as we ‘view a Hottentot’ or an ape.”

— Immanuel Kant (1755), *Universal Natural History and the Theory of the Heavens*; paraphrase, supposedly, of Alexander Pope’s 1734 ‘ shew’d a Newton as we shew an ape’ (*Essay on Man*) [16]

“Individual men, and even whole nations, little think, while they are pursuing their own purposes that they are advancing unconsciously under the guidance of a purpose of nature which is unknown to them.”

— Immanuel Kant (1784), “Idea of a Universal History from a Cosmopolitan Point of View” [9]

“Two things fill the mind with ever-increasing wonder and awe, the more often and the more intensely the mind of thought is drawn to them: the starry heavens above me and the moral law within me.

— Immanuel Kant (1788), *Critique of Practical Reason* (O)

“That crude matter should have originally formed itself according to mechanical laws, that life should have sprung from the nature of what is lifeless, that matter should have been able to dispose itself into the form of a self-maintaining purposiveness — this [Blumenbach] rightly declares to be contradictory to reason.”

— Immanuel Kant (1790), *Critique of Judgment* [1]

“It is absurd to hope that another Newton will arise in the future who shall make comprehensible by us the production of a blade of grass according to natural laws which no design has ordered.”

— Immanuel Kant (1790), *Critique of Judgment* [6]

“There is only a single categorical imperative and it is this: act only on that maxim through which you can at the same time will that it should become a universal law.

— Immanuel Kant (1797), *Metaphysics of Morals* (O)

“Hume awoke me from my dogmatic slumber.”

— Immanuel Kant (c.1760) [13]

> "That crude matter should have originally formed itself according to mechanical laws, that life should have sprung from the nature of what is lifeless, that matter should have been able to dispose itself into the form of a self-maintaining purposiveness—that [is] contradictory to reason."
>
> — Immanuel Kant (c.1770), *Publication*; cited by Peter Hoffmann (2012) in *Life's Ratchet* (pg. #)

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(b) Universal Natural History and the Theory of the Heavens – Wikipedia..

External links

- Immanuel Kant – Wikipedia.

θΔics

In hmolscience, **immoral** (TR:44), as contrasted with "moral" (TR:627), refers to an act, action, or behavior said to, etymologically speaking, quicken the arrival of Mor, the Greco-Roman goddess of death; something deemed "wrong" or ethically "incorrect" in semi-modern terms.

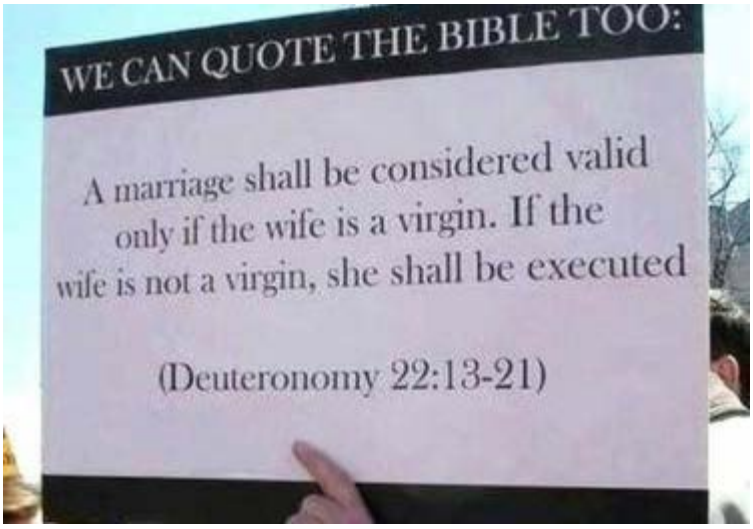

A Deuteronomy 22:13-21 event poster (O) aimed at highlighting "**immoral**" proscriptions in the Bible.

Physico-Chemical | Morality

The following compares homosexuality vs heterosexual bonds in humans as compared to atoms:

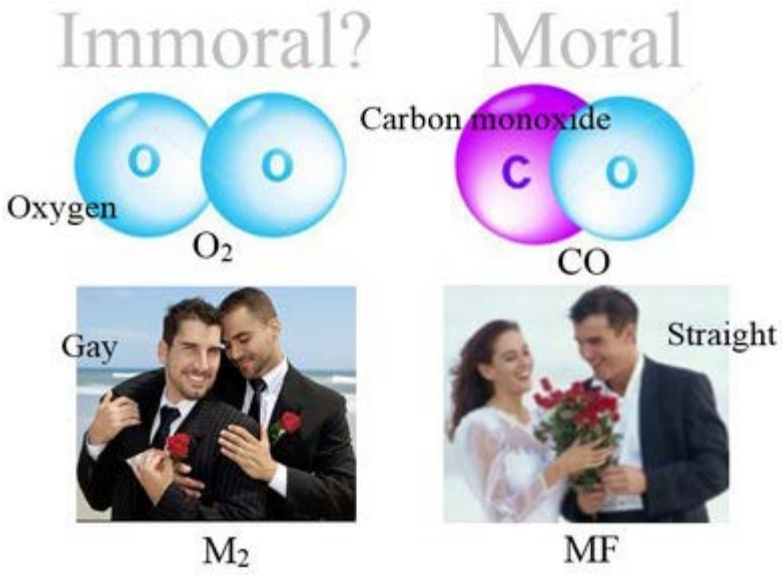

A comparison of seeming morality and or "**immorality**" of similar molecules, namely the so-called homosexual molecules of oxygen (O2) and gays (M2 or F2) as compared to the so-called heterosexual molecules of carbon dioxide (CO) and straights (MF); a subject first broached by Goethe in 1809 in his third chapter (P1:**C3**) of *Elective Affinities*, wherein the Captain C displaces Eduard B from his relationship bond AB with Charlotte A, to form a new friendship union BC with him; some of which was touched on by Susan Gustafson in her *Men Desiring Men: the Poetry of Same-Sex Identity and Desire in German Classicism*. [8]

In 1809, German child prodigy turned IQ:225+ cited genius Johann Goethe, devoted his entire *Elective Affinities* novella to addressing the question of Christian morality vs chemical morality, people defined as single chemicals, e.g. A or B, or couples, e.g. BC, with specific focus on the irreconcilabilities of the two in regards to the sixth commandment (of the Ten Commandments of the Bible); some of which was later expanded on by Arthur Schopenhauer (1817/1844) and Otto Weininger (1903).

In 2001, American child prodigy turned IQ:225+ cited genius Christopher Hirata, in his "The Physics of Relationships", addressed the subject of human chemical reaction theory, explained via chemical thermodynamics, wherein he touched on the possibilities of "rare and non-traditional" products or compounds, i.e. human molecules, dihumanide molecules, or trihumanide molecules, etc., that may form, such as "the gay molecule Y_2, the lesbian molecule X_2, and the middle-Eastern polygamous molecule X_4Y."

In respect to the lesbian or gay molecule morality issues, Hirata's human chemical thermodynamics arguments amount to the logic as shown adjacent. In respect to the polygamous molecule morality issues, where polyandry is legal (e.g. Tibet and Nepal), Hirata's human chemical thermodynamics arguments amount to the following type of question:

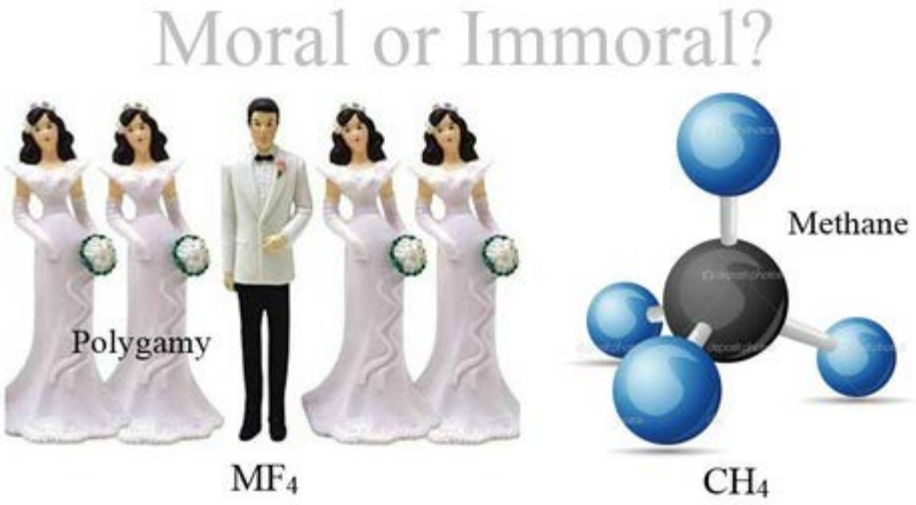

Note: compare the 2017 Muslim vs atheist street debate (Q), where the Muslim defends marriage to four wives.

In 2007, American electrochemical engineer Libb Thims, in his *Human Chemistry*, devoted a chapter section to queer chemistry and homosexual chemistry is; discussing how chemistry involved in qay relationships will differ than as compared to typical homosexual relationships. In a typical gay relationship, such as, for instance, in the human chemical bonding of two homosexual men: [5]

$$M_1 + M_2 \rightarrow M_1 \equiv M_2$$

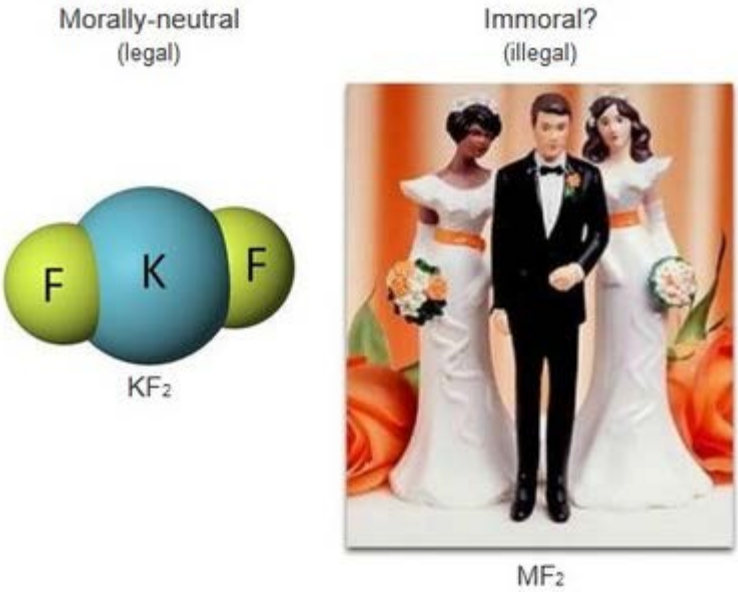

The moral vs **immoral** gray area conceptually conflicting issues at hand in Mala Radhakrishnan's 2011 "The Flirt and the Inert" poem. [6]

the neurochemical and hormonal changes will, invariably, be different than as compared to straight heterosexual bondings A≡B. As such, it is likely that factors, such as energy and entropy changes, will be different to describe, thermodynamically, than as compared to straight dynamics. Homosexual relationships, for instance, tend to be shorter-lived than homosexual relationships, hence reaction rates and chemical bonding dynamics will differ.

In 2011, American physical chemistry poet Mala Radhakrishnan, in her "The Flirt and the Inert" poem, described the krypton difluoride molecule KF_2 as being a "happy atomic threesome", neither moral nor immoral according to physical chemistry; which contrasts with how the polygamous trihumanide molecule MF2 (technically MxFy2) is an "immoral" union, e.g. in eyes of some legal systems, such as the Christian-centric United States legal system, whereas it is "moral" in the eyes of other legal systems, such as the Islamic-centric countries of India and Sri Lanka (Q), among 48 other countries. [6]

In 2014, American atheist electrochemical engineer Libb Thims, amid the two-month long Beg-Thims dialogue, got into a tensioned debate with Pakistani Islamic organometallic chemist Mirza Beg about whether or the formation of the dihydrogen molecule H_2 is moral or not say as compared to a male-male dihumanide molecule M_2, being that the Quran explicitly states that homosexuality is immoral, and Beg thinks the will of Allah is behind his Islamic-based version of physicochemical sociology, according to which whatever new insights about morality we may glean from physical

chemistry, we must always side with the divined proscriptions of the Quran.

Here, the keen words of Barack Obama (2006) come to mind, in respect to dispute resolution: [7]

> "Democracy demands that the religiously motivated translate their concerns into 'universal', rather than religion-specific, values. It requires that their proposals be subject to argument, and amenable to reason. I may be opposed to abortion for religious reasons, but if I seek to pass a law banning the practice, I cannot simply point to the teachings of my church or evoke God's will. I have to explain why abortion violates some principle that is accessible to people of all faiths, including those with no faith at all."

(add discussion)

Quotes

The following are related quotes:

A "subjective morality" vs "objective morality" query (Q); which seems amenable to chemical morality solution.

> "A women friend of mine said to Goethe at that time: 'I cannot approve of *Elective Affinities*, Herr von Goethe; it really is an **immoral** book!' According to her report Goethe was silent for a while and had then said with great earnestness: 'I'm sorry you feel that way. It is my best book, and don't think that this is the mere whim of an aging man. I grant you that one loves most deeply the child of one's last marriage, the product of one's late power of generation. But you wrong me and the book. The principle illustrated in the book is true and not immoral. But you must regard it from a broader point of view and understand that the conventional moral norms can turn into sheer immorality when applied to situations of this character."
>
> — Heinrich Laube (1809), report on Goethe best book incident, late Dec [1]

> "Whenever morality is based on theology, whenever the right is made dependent on divine authority, the most **immoral**, unjust, infamous things can be justified and established. Morality is then surrendered to the groundless arbitrariness of religion."
>
> — Ludwig Feuerbach (c.1860) (Q)

> "The trouble is that too many people get chemical reactions all mixed up with morals. They call **immoral** what is only a normal chemical reaction."
>
> — Thomas Dreier (1948), *We Human Chemicals* [2]

> "Thermodynamics provides the physical possibilities for the actions that we consider both virtuous and **immoral**."
>
> — Robert Russell (2008), "The Groaning of Creation" [2]

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Own Words and the Words of his Contemporaries, Volume 2 (pg. 174). Farrar Straus and Co.
2. Dreier, Thomas. (1948). *We Human Chemicals: the Knack of Getting Along with Everybody* (pg. 59). Updegraff Press.
3. Peters, Ted and Bennett, Gaymon. (2008). *The Evolution of Evil* (§: "The Groaning of Creation", pgs. 120-34 by Robert Russell). Vandenhoechk & Ruprecht.
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(b) Greene, Joshua. (2013). *Moral Tribes: Emotion, Reason, and the Gap Between Us and Them* (pgs. 175, 182). Penguin.
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θΔics

In terminology, **immortality**, from *in-* (not) + *-mortal* (death) + *-ity* (quality; state; degree), refers to the study of someone or something being exempt from the arrival of Mor, the Greco-Roman goddess of death (reaction end); in a modern sense, the study of the premise that the forces (or bosons) that move a person, or the energy or matter (or fermions) that embodies the summation of the states of existences of a person, are indestructible, conserved, and or eternal, according to the conservation laws of science, in respect to the movement, dynamics, operation, and or workings of the universe, in some systematic, non-chaotic or non-random way.

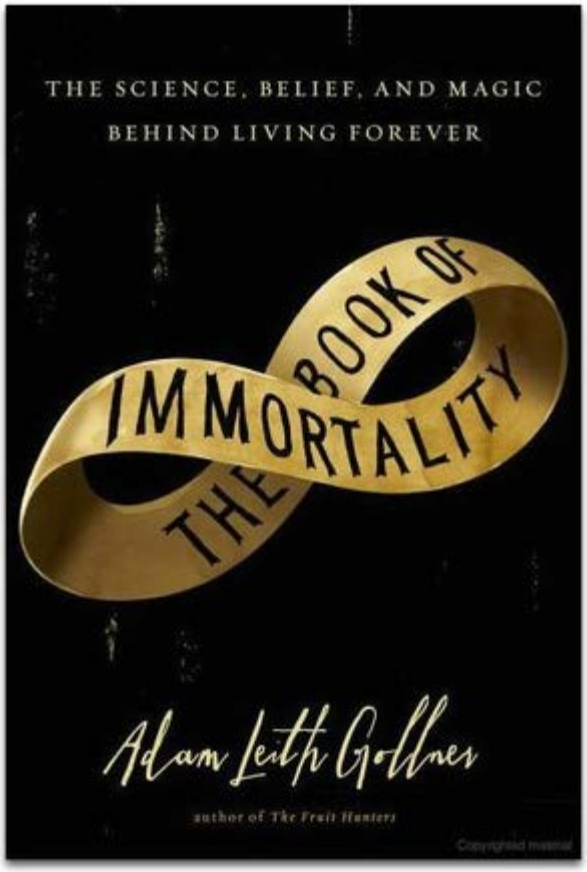

An image of "**immortality**" depicted as a Mobius strip, from Adam Gollner's 2013 *The Book of Immortality*, which discusses, among other things, how belief in immortality is widespread, as evidenced by polls showing, as Gollner notes (Q), that 80 percent of Americans believe in life after death, while 70 percent of Canadians and 60 percent in the UK do, and that 27 million Americans believe they can communicate with the dead. [2]

Overview

The theory of "eternal-life" (or afterlife), in defunct colloquial speak (see: defunct theory of life; life does not exist), or continued perpetual existence, is an often-discussed and sometimes heated topic over the nature of morality, death, and human existence; generally centered around the nature of the existence or not of the soul, as originated in Ra theology, or moral weight of an individual, in the context of the conservation of energy or force.

In 1843, Ludwig Colding derived a conservation of energy theory on the logic of the immortaility of the soul.

The 1874-1878 Tyndall-Stewart-Tait debate on the relationship between religion and science is centered to a large part on the issue of death, the soul, and immortality.

In 1876, artist William Harnett painting the following work titled "Mortality and Immortality":

In 1900, American paleontologist Nathanial Shaler notably discussed immortality and the conservation of energy.

In 1906, German physical chemist Wilhelm Ostwald famously gave his Ingersoll lecture on "Individuality and Immortality". [1]

In 1994, American physicist Frank Tipler proposed his second law themed omega point theory of immortality.

In 2013, writer Adam Gollner, in his *The Book of Immortality*, discusses how in his reading of the Immortality Institute's collection of essays, he learned that many so-called immortalists align themselves with a movement called extropianism, meaning *without* entropy, based on their guru Max More. [2]

See also

- Cessation thermodynamics
- What happens when you die?

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External links

- Immortality – Wikipedia.

θΔics

In thermodynamics, **impelling power** is synonym for the term motive power, used in 1824 by French engineer Sadi Carnot, which can be understood in modern terms as work or the resultant effect of a weight being lifted through a height. [1]

Etymology

The term "impelling power" dates back to at least the 16th century, as it is found in the works of English scientist Francis Bacon. In one instance Bacon states: "the effects produced by gunpowder, are occasioned by the *impelling power* being quicker than the power of resistance." [2] According to a more recent 1914 definition, which seems fairly straight forward, impelling power is a force that pushes or impels per unit time. [3]

References

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3. Dorland, William. (1914). *Dorland's illustrated Medical Dictionary* (pg. 1048). W.B. Saunders Co.

θΔics

In atheism types, **implicit atheism**, as compared to "explicit atheism", can be defined as either absence of theistic belief without a conscious rejection of it (George Smith, 1979) or conscious rejection of theistic belief "implied" in the work or views, i.e. to involve or indicate by inference, or necessary consequence rather than by direct statement, e.g. when a natural science professor teaches a subject such physics or chemistry, it is "implied" without saying, i.e. it is an assumed given, that no divine is involved in any way what so ever. [1]

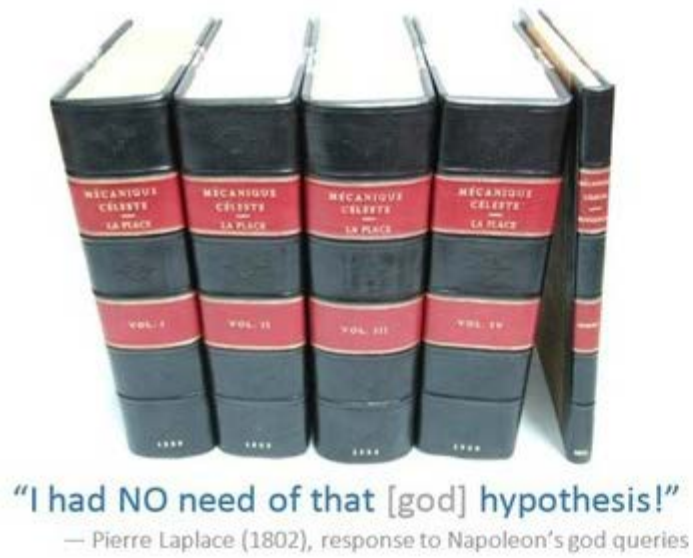

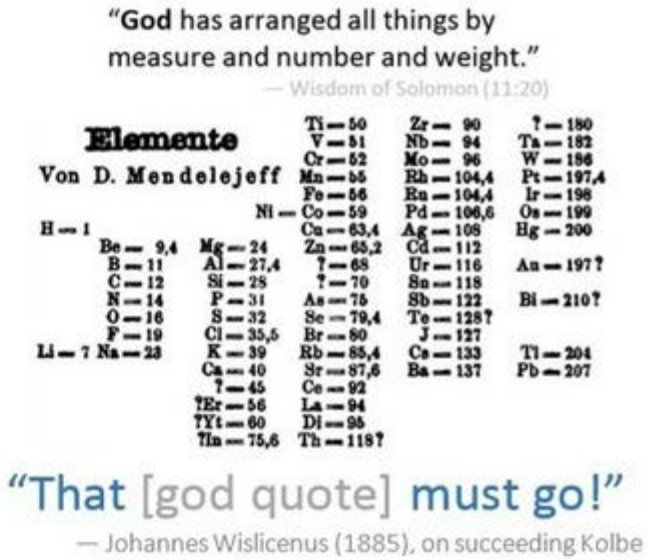

Two examples of **implicit atheism**, left: French physicist Pierre Laplace telling Napoleon Bonaparte, verbally in conversation, that he had no need of the hypothesis of god in his 4-volume *Celestial Mechanics*, i.e. the word "god" was not employed throughout the text, which is why Napoleon queried him; right: German chemist Johannes Wislicenus telling his orientation tour guide, of his new chemistry professor teaching post at Leipzig University, that the former professor's (Hermann Kolbe) biblical quote above the classroom periodic table "must go"; in other words, that physics, for readers of Laplace's treatise, and chemistry, for students in Wislicenus' class, is god-free, is an "implicit" assumed assumption, from therein out, in the mind of Laplace and Wislicenus, not "explicitly" stated, unless via indirect dialogue or query.

Thimsian atheism

An example of "implicit atheism" turned "explicit atheism" can be found in the growth of the work of American electrochemical engineer Libb Thims, who in his 2007 two-volume *Human Chemistry* textbook completely avoided the use of the word "god" and god-related terms, e.g. soul, spirit, etc., except for the last 7-page volume two end section on cessation thermodynamics, a short introduction to what, historically, thermodynamics, and human thermodynamicists have had to saw about the laws of thermodynamics and question of the essence of being or state of mind of a person at the point of dereaction (death), wherein the subject matter invariably treads into domain traditionally reserved for religion. [2]

In 2010, Thims, while adhering to an "implicit atheism" style of presentation, using the standard 19th century established Laplace-Wislicenus "assumed atheism" modus operandi, such as depicted (above, right), Thims gave his first public lecture on human thermodynamics, to the University of Illinois, Chicago bioengineering students, of Ali Mansoori. What was discovered, however, was that without "explicitly" and openly digressing on the fact that thermodynamics is, by definition, based on godless and religion-free principles, students kept their objections and points of concern to themselves. This was evidenced when Mansoori instructed students as part of their homework to write short commentaries on Thims' presentation, scans of which are listed here (Ñº); one of which is shown below:

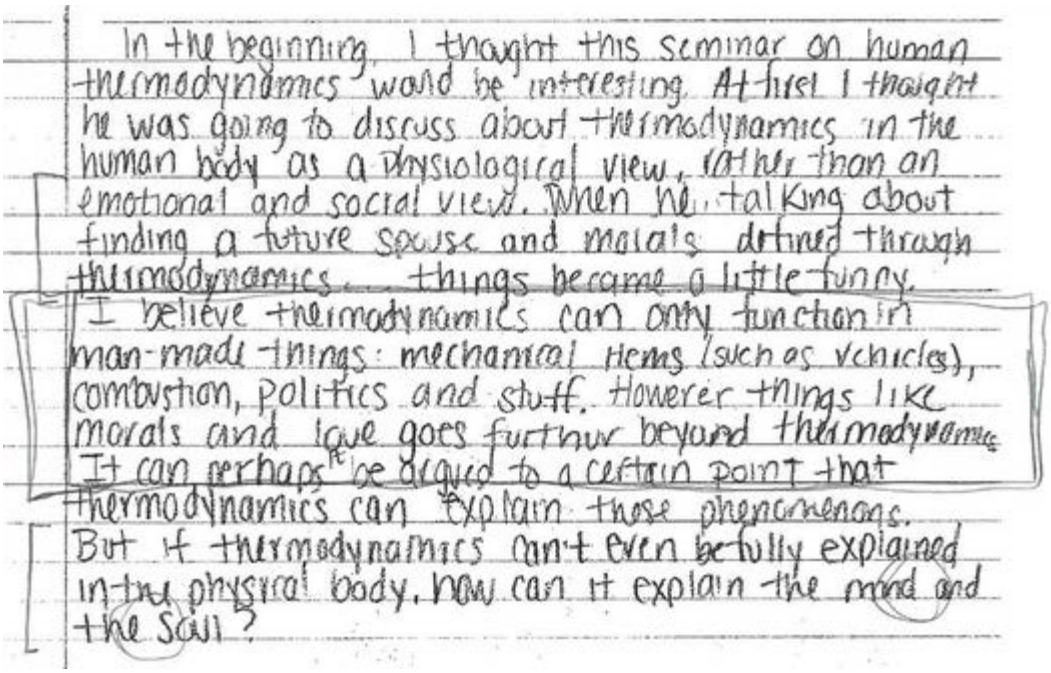

In the beginning, I thought this seminar on human thermodynamics would be interesting. At first I thought he was going to discuss about thermodynamics in the human body as a physiological view, rather than an emotional and social view. When he talking about finding a future spouse and morals defined through thermodynamics, things became a little funny.
I believe thermodynamics can only function in man-made things: mechanical items (such as vehicles), combustion, politics and stuff. However things like morals and love goes furthur beyond thermodynamics. It can perhaps be argued to a certain point that thermodynamics can explain those phenomenons. But if thermodynamics can't even be fully explained in the physical body, how can it explain the mind and the soul?

Here, we see that without being explicit and open about that fact that thermodynamics, physics, and chemistry are god-free subjects, an unaddressed tension remains. This was one of the turning points that worked to move Thims, in circa 2014, into becoming an explicit atheist; see, e.g., the tabulated listing of "atheism types (by denial)" wherein each denial (disbelief) and belief (creed) of each type of atheism, with respect to each type of scientist, is "explicitly" stated.

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θΔics

In science, **impulse** (TR=64), symbol *J*, which can be compared to power, or force per unit distance, is the product of a force *F* and the time *t* for which it acts:

$$J = Ft$$

An impulse, in other words, is force acting over period of time. An impulse causes a momentum change. Not only does the impulse cause a momentum change, it is also, according to the billiard ball model, equal to the momentum change.

Discussion

In *circa* 1914, American thinker Thomas Dreier was asked, in respect to his we human chemicals motto, "what gave you the impulse to the kind of writing you are doing?", to which he replied: [1]

> "It came to me years ago, when I was loafing in my canoe out in Wisconsin, and found a verse that appealed to me. I wished then that lots of people could read it too, and then it came to me that there was a place for a magazine that would hand on bits of inspiration to people whose lives were too full for them to do much straight reading along those lines. The whole idea of the Thomas Dreier Service grew from that. Of course, a lot that I have done was influenced by Elbert Hubbard, and I am very willing to acknowledge what a power he has been in the formation of my style."

In 2001, American philosopher James Morgia, in his *Life Long Human Values*—although Bible soaked—outlined a human molecule description of people and chemical analogy model of human micro interactions to theorize about what he calls "micro abuses", e.g. verbal child abuse, intonational emotional abuse, etc., to outline a chemical reaction based type of moral fabric model, based on the logic that negative impulses can be stopped similar to an antioxidant neutralizing an oxidant.

Quotes

The following are related quotes:

> "What man, what society dare express such sentiments? Seeing that we cannot easily known anyone from his youth up, nor criticize the rise of his activity. How else does character finally prove itself, if it is not formed by the activity of the day, by reflective agencies which counteract each other? Who would venture to determine the value of contingencies, **impulses**, after-effects? Who dare to estimate the influence of elective affinities? At all events, he who would presume to estimate what man is, must take into consideration what he was, and how he became so. But such barefaced pretension are common, and we have often enough met with them; indeed they are always recurring, and they must be tolerated."
>
> — Johann Goethe (1831), Letter to Carl Zelter (28 Jun) [4]

> "Man is a compound being, composed of two principles—one active, the other passive. The active principle is what is called the mind, the soul; the passive principle is the body. The latter is the material instrument of the former, the means by which it inhabits the planet, acts upon matter, and arrives at a state of positive and practical existence. The soul, or active principle in man, is a whole, composed of a certain number of forces or motors, which we shall call the passions; by the metaphysicians, these forces are variously termed—sentiments, affections, feelings, faculties, **impulses**, instincts. The passions are spontaneously active and self-determining forces; they are the thinking, feeling, creating principle in man — the source of his acts and works in all spheres, material and spiritual. They are the agents of supreme wisdom, the motors implanted in him by that wisdom to impel him to fulfill his destiny on earth. The human passions were not created at random, were not called into existence without functions and employments having been assigned

to them; on the contrary, their functions and uses have been calculated with mathematical precision."

— Charles Brisbane (1857), *Treatise on the Functions of the Human Passions and an Outline of Fourier's System of Social Science* [2]

"In 1809, Goethe printed the most exceptionable of his novels, the *Wahlverwandschaften* (*Elective Affinities*), in which the charms and graces of this style are employed in the description of the **impulses** which spring from the collision of passion and duty in the relations of marriage. By the title of the book, and in the whole spirit of it, he would represent that sexual affinities follow the same inevitable law as chemical affinities, and that humanity struggles impotently against the dictates of nature. Like all his productions, this was suggested by circumstances in his own experience. The work shocked the moral world, in spite of the beauty with which it was written, and to this day tasks the ingenuity of those of his admirers who seek to defend it from attack."

— George Ripley and Charles Dans (1859), *New American Cyclopedia* [3]

"Without the adoption of an 'atomic soul' the most common and general phenomena of chemistry are inexplicable. Pleasure and pain, desire and aversion, attraction and repulsion must be all atomic-masses together, the movements of the atoms, which must take place in formation and release of each chemical compound, are only explicable only if we instill in them sensation and volition. What else is due to basically the generally accepted chemical study of the elective affinity of the body than on the unconscious assumption that in fact the attracting and repelling atoms are inspired by certain tendencies, and that they, these feelings or **impulses**, following too have the will and the ability to move towards each other and away from each other? What Goethe transmits in his 'Elective Affinities' on the highest composite soul life of man, which has full truth."

— Ernst Haeckel (1875), "On the Procreation of Life-Particles or Perigenesis of Plastidule"

"To foresee or to guide the affinities of each several molecule would be for the physicist as great a step in advance as it would be for the registrar-general could he foresee or guide every impulse to wedlock in the United Kingdom."

— Frederic Myers (1901), *Human Personality and its Survival of Bodily Death*

"To deny our own **impulses** is to deny the very thing that makes us human."

— Larry (Lana) Wachowski and Andrew Wachowski (1999), *The Matrix* (character: Mouse)

See also

- Impelling power
- Impulse theory of happiness
- Trigger action

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5. Daintith, John. (2005). *Oxford Dictionary of Science*. Oxford University Press.

Further reading

● Schoffeniels, Ernest and Mărgineanu, D.G. (1991). *Molecular Basis and Thermodynamics of Bioelectrogenesis* (ch. 5: The Puzzle of Nerve Impulse Thermodynamics, pgs. 125-42). Springer.

External links

● Impulse (disambiguation) – Wikipedia.
● Impulse (physics) – Wikipedia.

θΔics

In hmolscience, **impulse theory of happiness**, or "Porteus theory of happiness", is a line of reasoning which posits that that following one's impulses—particularly when it comes to the integration of things—will thermodynamically be in accordance with the second law, and therefore lead to happiness.

Overview

In the 1930s, American writer and philosopher Elizabeth Porteus began to develop a theory reasoning that that since the second law is seen, in some forms, as a "law of disintegration", meaning that "complicated arrangements always break down into less complicated ones", a state of happiness in life will ensue when one follows the "impulse of integration". [1]

By "creative", Porteus refers to not only what is commonly considered creative such as "painting pictures, making music, writing books, making pottery or making art of any kind," but also to "any impulse to create a new integrated arrangement of the elements of reality", such as "making new arrangements of words, colors, musical notes, or ideas", "joining together small things, or big things, or "joining together inanimate elements, or it might be joining together living ones." In relation to people, Porteus states that creation may refer to "joining together people into new groups or in organizing groups into bigger groups, or in organizing better the groups that already exist, or as in trying to work out better laws. Likewise, it might be "in joining ourselves to what is in the world by learning about it", "joining with other people in sex, friendship, or love", or something as simple as "cleaning out a drawer or mopping the floor". [2]

In her 1987 *My Twentieth Century Philosophy*, Porteus outlines the view that since, according to generalized colloquial point of view, the second law of thermodynamics is a "law of disintegration", meaning that "complicated arrangements always break down into less complicated ones", a state of life happiness would occur when one aligns themselves with the force or "impulse of integration" in unison with the current of creation or growth of structure and form as seen in evolution.

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(b) Porteus, Elizabeth, D. (1987). *My Twentieth Century Philosophy.* New York: Carlton Press, Inc.
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θΔics

In famous publications, **"In Defense of Thermodynamics: an Animate Analogy"** is a 1997 three-page *Journal of Chemical Education* article by Swedish physical chemist Sture Nordholm, wherein he outlines the subject, which he calls "animate thermodynamics", of thermodynamics applied to human behavior, the abstract of which is as follows: [1]

> "In order to illustrate the deepest roots of thermodynamics and its great power and generality, it is applied by way of analogy to human behavior from an economic point of view."

Scale up | Extrapolate up

The following is Nordholm's statement about how thermodynamics "scales up" or extrapolates up to the human level:

> "The purity and precision of thermodynamics has been maintained on the strength of its validity only as a collection of limiting laws for infinitely large systems undergoing infinitely slow changes. However, the interest in thermodynamics has always been based on the great relevance for finite real systems undergoing changes that are fast on our everyday time scale and slow only on the microscopic time scale of atomic motion. Thus we are merely extending the beam of insight from the lifeless behaviors of inanimate matter to the vivid complexities of human behavior. In the final analysis this far-reaching analogy rests on the fact that the basic elements of the description of atoms, molecules, and matter **can be scaled up** to the realm of living organisms without changes other than in the complexity of the systems and their behavior."

This is a ripe statement.

Commentary

In Defense of Thermodynamics—An Animate Analogy

Sture Nordholm
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Thesis

Thermodynamics is inescapable in its generality. In its purest form it has been seen by generations of intrepid scientists in the inanimate realm of chemistry and physics, but if we grasp its essence we see the concepts and the principles at work in our daily lives and they become clearer by standing out in the great confusion of human behavior.

The Argument

Thermodynamics is a key theory of chemistry, physics, and all natural sciences. This statement would generally be accepted as a fact. However, thermodynamics is a little-loved part of the science curriculum. The theory is abstract, perhaps to the point of being forbidding to some, and thought to be applicable only to inanimate matter. Its claimed applicability to engines and refrigerators appeals mainly to the technically oriented student. Its great generality and power remains hidden by layers of abstraction and axiomatic rigor. Must this be so? Could we not gain much by loosening the strictures and bringing the main point home by more qualitative applications of thermodynamics to the widest range of everyday experiences? An attempt, at the same time loose and seriously meant, follows. I will argue that given the proper translation of terms and concepts from the inanimate to the animate world the laws of thermodynamics can be seen at work in our everyday lives. No proofs will be offered and we should not be surprised that human behavior will remain richer and more complex than our simple analogy could possibly explain. Even in their usual habitat the laws of thermodynamics were never more than idealized limiting laws. In the animate applications the ifs and buts will not be fewer but the telltale signs of thermodynamic laws at work may be more impressive. The work we do to recognize these laws so far from their home may clarify their meaning also in their normal applications and persuade us that such power and generality is worth the effort to learn and use.

In order to illustrate the deepest roots of thermodynamics and its great power and generality I shall apply it to human behavior from an economic point of view. Many economists and marketing executives would like to know what drives human behavior in the so-called marketplace. Thermodynamics explains what "drives" inanimate behavior, that is, which processes will spontaneously occur and towards what equilibrium conditions they strive. Thus we might apply this theory also to economic behavior of humans. In thermodynamics the two quantities of greatest interest are the *energy* and the *entropy*. Energy is a property of all physical systems that is conserved in total but transferrable among subsystems. The availability of energy is a precondition for states to occur. Thus the transfer of energy is directly connected with the possibility that the system change its state. Perhaps the first and simplest, but imperfect, observation associated with thermodynamics is that usually *the surroundings seek to minimize the energy of any given subsystem* (the small part of the universe you are focusing on). Thus energy minimization seems to be a driving force of nature. Its effects are most clearly seen in the preference of molecules for their lowest energy electronic states, in the fact that stones tend to roll down hill and rolling cars stop unless pushed on by an engine.

While the tendency of nature (the surroundings) to minimize subsystem energy is readily accepted it becomes less obvious upon further thought. In the form of heat, energy often flows the other way—from the surroundings to the subsystem. Apparently the spontaneous energy redistribution observed in nature is related to a more fundamental driving force. The initially more subtle but in the longer term more obvious rule of thermodynamics is that *nature seeks to maximize the number of available states*. This rule applies also to the case of a closed system wherein all states have the same energy. One can now understand that the first rule, that energy is minimized, is a consequence of the second rule, that the number of states is to be maximized. The transfer of energy from the subsystem (i.e., the energy minimization) makes energy available to the rest of the system (the universe) so that it can increase the number of states available to it. Let us call "the number of available states" W. Then the entropy is defined as

$$\text{entropy} = S = k_B \ln W$$

where k_B is the Boltzmann constant, a positive constant, and ln denotes the natural logarithm. Since S grows logarithmically (i.e., monotonically) with W we can see that maximizing W is the same as maximizing S. Thus we can state the fundamental rule of thermodynamics as

Nature seeks to maximize the entropy.

For a closed system that does not exchange energy with its surroundings this rule alone determines whether a process is spontaneous. Thus it applies also to the universe as a whole. More commonly we consider a small subsystem of fixed volume exchanging energy with its surroundings acting as a thermal reservoir. The fundamental rule leads to a corollary for this case:

Nature seeks to minimize the free energy $E - TS$ of a subsystem.

This result follows from the fact that entropy increases with energy E for both the subsystem and its surroundings. T is the inverse of the rate of increase of the entropy of the reservoir with increasing energy. We call T the temperature. It determines the direction of energy flow, that is, from high towards low temperature. From the point of view of the subsystem the energy minimization or the entropy maximization may predominate depending on whether T is high or low. From the point of view of the universe only the entropy maximization applies.

Now we turn to human behavior. It is incredibly complex so we shall have to be satisfied with gross simplifica-

First page of Swedish physical chemist Sture Nordholm's 1997 **"In Defense of Thermodynamics: an Animate Analogy"**, wherein he outlines, without proofs, as he says, thermodynamics applied to human behavior, a subject he calls "animate thermodynamics. [1]

No proofs offered

The following is Nordholm's synopsis or aim of his article:

> "Thermodynamics great generality and power remains hidden by layers of abstraction and axiomatic rigor. Must this be so? Could we not gain much by loosening the strictures and bringing the main point home by more qualitative applications of thermodynamics to the widest range of everyday experiences? An attempt, at the same time loose and seriously meant, follows. I will argue that given the proper translation of terms and concepts from the inanimate to the animate world the laws of thermodynamics can be seen at work in our everyday lives. **No proofs** will be offered."

This "no proofs will be offered" statement here is a ripe one as well. American electrochemical engineer Libb Thims, who cites Nordholm and his *In Defense* article in his lectures to engineering students, will often hear this comment, or something along the lines of "has this been proved anywhere", asked at the end of lectures, in many cases by thermodynamics professors themselves. It would seem that a full "chemical thermodynamics" textbook, replete with extensive top to bottom derived proofs, would be requisite here. Such a textbook, however, is presently lacking — though something not far out of sight. [2]

Proper translation

In reference to Nordholm's discussion of "proper translation" of terms and concepts:

> "An attempt, at the same time loose and seriously meant, follows. I will argue that given the proper translation of terms and concepts from the inanimate to the animate world the laws of thermodynamics can be seen at work in our everyday lives."

which is one of the more difficult aspects of human thermodynamics, the following are Nordholm's first draft attempt at translated variables:

- energy = wealth
  kinetic energy = cash
  potential energy = property
- entropy = freedom

This step is a notoriously difficult one, dating back to Irving Fisher (1892) / Vilfredo Pareto (1896) mechanical-to-economic behavior comparison tables.

Economics

The following is a noted opening quote in respect to thermodynamics application to economics:

> "Many economists and marketing executives would like to know what drives human behavior in the so-called marketplace. Thermodynamics explains what 'drives' inanimate behavior, that is, which processes will spontaneously occur and towards what equilibrium conditions they strive. Thus we might apply this theory also to economic behavior of humans. In thermodynamics the two quantities of greatest interest are the *energy* and the *entropy*."

Homework problems

Nordholm's article notably concludes with eight hmolscience-style homework problems, which in circa 2011, in American electrochemical engineer Libb Thims engineering thermodynamics lectures began to be assigned to students as homework assignments. In 2013, Thims began to require that all submitting JHT authors provide two Nordholm-style homework problems per each submitted article.

Heresy to some

The following is a noted quote from the article:

> "The thought that the dry and forbidding discipline of thermodynamics could be applied to that most theory-defying of all applications, human behavior, may be staggering, and perhaps **heresy to some**."

This subtle "heresy to some" comment is bubbling with great and hidden truth, examples of which can be found on the following pages: detractors, Libb Thims (attack), crackpot, *Elective Affinities* (enemies), Human Thermodynamics (objection to), Human Molecule (banned), to name a few.

References

1. Nordholm, Sture. (1997). "In Defense of Thermodynamics: an Animate Analogy" (abs) (GB), *Journal of Chemical Education*, 74: 273-75.
2. Thims, Libb. (date). *Chemical Thermodynamics: with Applications in the Humanities*. Publisher.

Further reading

â— Thims, Libb. (2007). *Human Chemistry (Volume Two)* (pg. 633). Morrisville, NC: LuLu.

θΔics

In science, **in heat** is a thermal word that refers to a CHNOPS+ organism in a state of sexual arousal, desirous, or in need of sexual release. [1]

In this sense, an entity being "in heat", referring to heat as in sexual drive, models a reactive human molecule on the analogy of a hot gas-phase particle in energetic movement in need sexual chemical reaction (atomic exchange). [2]

Income

A recent 2007 study, led by American evolutionary psychologist Geoffrey Miller, of the income of eighteen strippers who worked 296 shifts, representing about 5,300 lap dances, over the course of 60-days (two-cycles) showed that normal cycling participants earned about $335 per shift while in heat or in estrus, compared to $260 in luteal phase and $185 in menstrual phase, in a typical five-hour shift; the results of which are as follows: [3]

Cycle phase	Hourly
Ovulating	$70
Luteal (not ovulating or menstruating)	$50
Menstruating	$35

Miller stripper study | 2007

In 2007, American evolutionary psychologist Geoffrey Miller, in a study of eighteen strippers who worked 296 shifts, representing about 5,300 lap dances, over the course of 60-days (two-cycles), found that those "**in heat**" (ovulating) earned twice as much as those menstruating.

References

1. in heat (definition) – *Sexual Dictionary*, Sex-Lexis.com.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview). Morrisville, NC: LuLu.
3. (a) Miller, Geoffrey, Tybur, Joshua M., and Jordan, Brent D. (2007). "Ovulatory Cycle effects on Tip Earnings by Lap Dancers: Economic Evidence for Human Estrus" *Evolution and Human Behavior*, 28: 375-381.
(b) Geoffrey Miller (psychologist) – Wikipedia.

θΔics

In science, **inanimate**, as contrasted with animate, refers to matter or molecular structure that is considered not to be "alive", in defunct colloquial speak, or a body that does not move, or bend. [1]

Depictions of the famous "inanimate carbon rod" (Q), first seen 1990 "Opening Sequence" episode of the Simpsons, which is a "Worker of the Week Award" like trophy given to every employee at the Springfield Nuclear Power Plant, except Homer Simpson, who is thereby confirmed as less valuable to the plant then an "**inanimate**" object, equating to the logic: "human person (animate) ≤ carbon rod (inanimate)" in perceived company value.

Overview

In the 1925 book *The Animate and the Inanimate*, American mathematician William Sidis makes an attempt to differentiate between the two according to what he calls "reversals of the second law". [3]

In 1954, English thermodynamicist Alfred Ubbelohde gave the example of a body of steam as an example of inanimate matter when he says the laws of thermodynamics are founded on innumerable measurements of inanimate matter. Moreover, in his view: [2]

> "The science of thermodynamics may have something useful about what differentiates living organisms from **inanimate** matter."

In 1970, American chemist Linus Pauling asked:

> "What is it that distinguishes a living organism, such as a man or some other animal or a plant, from an **inanimate** object, such as a piece of granite?"

To which he answers, in a somewhat ambivalent manner, that it must have internal metabolic reactions and the capacity for reproduction. [4] The following quote by American novelist John Updike gives an intuitive view on the relationship between what is inanimate and heat: [5]

> "The cold has philosophical value of reminding men that the universe does not love us. Cold as absolute as black tomb rules space; sunshine is a local condition, and the moon hangs in the sky to illustrate that matter is usually **inanimate**."

In 1990, the Simpsons aired an episode, shown adjacent, wherein Homer is compared to an "inanimate" rod of carbon, thereby situating the view that he is less valuable to his company, as a worker, then the inanimate rod; which is a seeming play on the classic "rock vs. human" comparison.

References

1. Inanimate - Dictionary.com
2. Ubbelohde, Alfred René. (1947). *Time and Thermodynamics*, (ch. IX: "Thermodynamics and Life", pgs. 92-105). Oxford University Press.
3. Sidis, William J. (1920). *The Animate and the Inanimate*, [PDF], (published in 1925, R.G. Badger).
4. Pauling, Linus. (1970). *General Chemistry* (pg. 767). Dover.
5. Blumberg, Mark S. (2002). *Body Heat: Temperature and Life on Earth* (pg. ix). Harvard University Press.

θΔics

In things, **inanimate thing**, as compared to an "animate thing", is a thing that does not have the property of movement to action; historically, from the antonym of the Greek *animus* "to breath", i.e. a moving thing that does not have the property of breath or movement via wind.

See also

â— Rock vs human

θΔics

A few examples of **inanimate things**: a carbon rod, a rock, and a chair.

In science, **inception synthesis**, an Hmolpedia coining, refers to the transition state period of the inception of an animated molecule into the universe and the steps in the chemical synthesis of this process. The term 'inception synthesis' is a physical science replacement for the term 'birth', in the sense that a human is a molecule, i.e. a human molecule, and technically speaking molecules are not 'born', but rather can only be 'synthesized' by chemical reaction.

Further reading

- Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
- Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
- Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc). LuLu.
- Thims, Libb. (2009). "Letter: Life a Defunct Scientific Theory", *Journal of Human Thermodynamics*, Vol. 5, pgs. 20-21.

θΔics

In thermodynamics, **independent variable**, as contrasted with a dependent variable, is a variable not dependent on any other variable.

Ideal gas law

In the case in which the state of a given body can be described by the ideal gas law, such as of the form:

$$PV = RT$$

where the n, the molar particle count is set equal to one, then one can treat any one of the three variables, P,V, or T, as a function of the other two, an example being P as a function of V and T. In this case, the generic function notation would be:

$$P = f(V, T)$$

or in a general sense:

$$\text{dependent variable} = f(\text{independent variables})$$

The independent variables then fix the condition of the gas in a given state. [1]

Partial differential equations

In a simple homogeneous fluid system, the state of the system can be defined by any two of the three variables V, P, and T. In this case, and given state function, such as internal energy U, will then be a function of two variables which have been chosen to represent the state. In order to avoid any misunderstanding as to which are the independent variables when it is necessary to differentiate partially, i.e. hold certain variable constant during the differentiation, the common practice is to enclose the partial derivative symbol in a parenthesis and place the variable that is to be held constant in the partial differentiation at the foot of the parenthesis. Hence the notation:

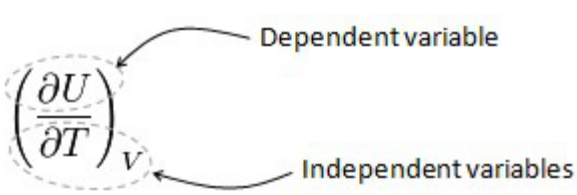

means the derivative of U with respect to T, keeping V constant, when T and V are taken as independent variables. [2]
In this case, according to the differential rule (**find name**), the differential of internal energy becomes:

$$dU = \left(\frac{\partial U}{\partial T}\right)_V + \left(\frac{\partial U}{\partial V}\right)_T$$

See also

- Conjugate variables

- State variable
- Intensive variable
- Extensive variable

References

1. Clausius, Rudolf. (1850). "On the Moving Force of Heat and the Laws of Heat which may be Deduced Therefrom", Communicated to the Academy of Berlin, Feb.; Published in Poggendorff's *Annalen*, March-April, Vol. lxxix, pgs. 368, 500, and Translated in the *Philosophical Magazine*, July 1851, Vol. ii. pgs. 1, 102.
2. Fermi, Enrico. (1936). *Thermodynamics* (pgs. 19-20). Prentice Hall.

θΔics

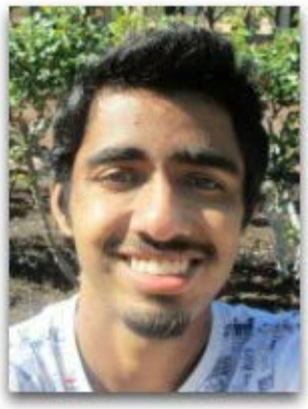

In existographies, **Inderjit Singh** (1996-) (CR:29) is an American naturalism philosopher, with a claimed IQ of 160 (2014) to 175 (2017), noted for his Mar 2016 “Essay on Mankind”, wherein he espouses on a molecular and energy-based theory of human existence, according to which natural laws are conceptualized as governing humankind, and for his Jun 2016 guest-appearance on Human Chemistry 101 wherein he comments on Alfred Rogers newly premiered video on his 1990s "life does not exist" theory, during which time Libb Thims questioned Singh in video on his "Humankind" essay ideas. [7]

Overview

In 2014, Singh joined Hmolpedia, under the moniker NikolaTesla (Ñº), themed after Nikola Tesla (name) + William Sidis (avatar), after being drawn to the site via the genius rankings pages. Thereafter, he became an active, quick-witted forum member, often focused on listing his top 50 favorite geniuses or attempting to calculate what he calls a “real IQ” (Ñº) estimate for many thinkers.

In 2015, Singh started an InderjitSingh.net publication outlet, wherein he discusses his existive intellectual influences, including American street philosopher Start Loving and American electrochemical engineer Libb Thims, among other post-existive figures including: Socrates, Plato, Aristotle, Parmenides, Marcus Aurelius, Goethe, Thomas Jefferson, Bruce Lee, Confucius, Albert Einstein, Friedrich Nietzsche, Nikola Tesla, and Carl Sagan.

In 2016, Singh stated his opinion that his philosophical mindset has grown, since 2014, into the following composition: [5]

> **Singh** = Socrates (30%) + Tolkien (25%) + Goethe (25%) + Thims (20%)

(add discussion)

Unnatural existence

In 2016, Singh, in his “Essay on Mankind”, outlined discussion on what he referred to as “unnatural existences”, snippets of which are as follows: [2]

> “The unnatural existence developed as the energy of mankind became more erratic. As more people were brought into the world, they began to exist in a manner opposed to the intent of all-powerful nature.”
>
> “To determine the historical significance of the unnatural, the natural human and its traits must first be explicated. Then, the reader can understand how divergence from the path of nature may lead to pain, and an inferior existence.”
>
> “For Humanity to make peaceful progress, widespread misery must be overcome. Most modern misery is the product of the unnatural existence. Thus, the natural must be infused into the unnatural. This shall nullify the difficulties of the unnatural, and ensure that its beneficial aspects are victorious.”

(add discussion)

Singh | Real IQ | Genius rankings

In circa 2012, Singh, age 16, began amassing a collection of some 250 favorite geniuses in a subpage of Facebook like (Ñº) page. [3] In 2014, Singh, age 18, devised a genius IQ calculation formula, similar to the Buzan IQ calculation formula, which Singh summarizes as follows: [4]

“My method for ascertaining the IQs of Geniuses requires nothing more than a basic calculator (and an IQ of at least 90). Let us begin the heuristic analysis forthwith. Three categories did I devise for the purpose of IQ Analysis. These categories are *Intellectual Achievement*, *Knowledge*, and *Mental Capacity*. So expertly did I design the IQ methodology that one needs merely to assign points to the subcategories in each of the aforementioned categories. In the end, add these together to create an accurate portrayal of the IQs of geniuses. Libb Thims' genius rankings could be used as a reference, by which the accuracy of my IQ scale could be judged.

The knowledge category contains 80 possible points, the Mental Capacity category 90, and the Intellectual Achievement category 60, totaling a *threshold IQ of 230*, which I believe to be the absolute limit for any natural human being that has not been ameliorated. As Einstein somewhere says: “We are in the position of a little child entering a huge library, whose walls are covered to the ceiling with books in many different languages ... The child notes a definite plan in the arrangement of the books, a mysterious order, which it does not comprehend but only dimly suspects. That is the attitude of the human mind, even the greatest and most cultured, toward [nature].”

The following are a list of some calculated IQs from among his so-called "100 members of the greatest clerisy known to man": [4]

1) Johann Goethe (IQ = 215)
2) Albert Einstein (IQ = 210)
3) Isaac Newton (IQ = 210)
4) Nikola Tesla (IQ = 201)
5) William Sidis (IQ = 197) (re-calculated)
6) Carl Gauss (IQ = 193) (re-calculated)
7) Leonardo da Vinci (IQ = 192)
8) John Mill (IQ = 185)
9) Ettore Majorana (IQ = 185)
10) Blaise Pascal (IQ = 185)
[11] See: recent thinkers
12) James Maxwell (?)
13) Willard Gibbs (?)
14) Hugo Grotius (?)
15) Rudolf Clausius (?)
16) Thomas Young (?)
17) Leonhard Euler (?)
18) Hildegard von Bingen(?)
19) Thomas Jefferson (?)
20) James Madison (?)
21) Henry Adams (?)
31) Voltaire (?)
32) Edward de Vere (?)
33) Gottfried Leibniz (?)
34) Francis Bacon (?)
35) Johannes Kepler (?)
36) Benedict Spinoza (?)
37) Thomas Wolsey (?)
38) Friedrich Schelling (?)
39) Paolo Sarpi (?)
40) Galileo (?)
41) Alexander Humboldt (?)
42) Hermann Helmholtz (?)
43) Adolf Hitler (IQ=160)
44) Robert Hooke (?)
45) Emanuel Swedenborg (?)
46) George Washington (IQ=154)
47) Gilbert Lewis (?)
48) Ludwig Boltzmann (?)
49) Henri Poincare (?)
50) J.R.R. Tolkien (IQ=140)
61) Edward Jenner (?)
62) Werner Heisenberg (?)
63) Erwin Schrodinger (?)
64) William Harvey (?)
65) Antonie van Leeuwenhoek (?)
66) Alexander Fleming (?)
67) Alfred Nobel (?)
68) Max Weber (?)
69) Ernest Rutherford (?)
70) Michael Faraday (?)
71) Niels Bohr (?)
72) Marie Curie (?)
73) Alexander the Great (?)
74) James Watt (?)
75) Edmund Burke (?)
76) John Dalton (?)
77) Woodrow Wilson (?)
78) Alexander Hamilton (?)
79) Thomas Edison (?)
80) Carolus Linnaeus (?)
90) John D. Rockefeller (?)
91) William Herschel (?)
92) Otto von Bismarck (?)
93) Thomas Aquinas (?)
94) Claude Bernard (?)
95) Adam Smith (?)
96) Sigmund Freud (?)
97) Constantine the Great (?)
98) Themistocles (?)
99) Demosthenes (?)
100) Pythagoras (?)
101) Euclid (?)
102) Solon (?)
103) Octavian (?)

Recent thinkers | IQs

1) **Myself (IQ = 165**)
2) Libb Thims (IQ = 190-230) [N1]
[11] Stephen Hawking (IQ = 168) (re-calculated)
3) Herbert Salzer (?)

22) Pierre Laplace (?)
23) Plato (?)
24) Enrico Fermi (?)
25) Aristotle (?)
26) Cicero (?)
27) Rene Descartes (?)
28) Immanuel Kant (?)
29) David Hume (?)
30) George Berkeley (?)

51) Karl Marx (?)
52) Sadi Carnot (?)
53) Alexander Pope (?)
54) Thomas Hobbes (?)
55) Niccolo Machiavelli (?)
56) Pierre Gassendi (?)
57) Edwin Hubble (?)
58) Charles Babbage (?)
59) Bertrand Russell (?)
60) William Roentgen (?)

81) Benjamin Franklin (?)
82) Christopher Columbus (?)
83) Louis Pasteur (?)
84) Charles Darwin (?)
85) Marcus Aurelius (?)
86) Petrarch (?)
87) John Neumann (?)
88) Roger Bacon (?)
89) Jean Sales (?)
88) William Thomson (?)
89) Gregor Mendel (?)

4) Terrence Tao (?)
5) Barack Obama (?)
6) Mark Zuckerberg (?)
7) William Gates (?)
8) Peter Higgs (?)
9) Ludwig Wittgenstein (?)

Fictional geniuses

0) Gandalf (IQ = 231)

(add discussion)

IQ | Estimate

In 2014, Singh, aged 18, guesstimated, via the self-estimation method, such as done by Bertrand Russell, his own IQ at 165, as shown in above "real IQ" table, as a forum post. [4] On 29 Sep 2016, Singh, while attempting to change the stated IQ of his Hmolpedia article, stated, via edit note (Ñº) comment, the following:

> "I suppose my IQ is at 170 now, though the climb to 185 or 195 will be significantly slower than the explosive progress of the past few years."

Thims, however, revered the edit back to his its previous state, per reason that the ranking of IQs of existive people (see: genius IQs existive) is a subject matter of a different sort than as compare to ranking historical figures (see: top 500 geniuses).

Abioism

Singh, during forum (Ñº) dialogue, on the top 25 people existive of 2014, seems to have quickly latched on to the basics of the abioism position (Ñº), a rather newer term, coined by Libb Thims (2015); whose rarefied group includes: Thims, Alfred Rogers, Ferris Jabr, Jeff Tuhtan, Patrick Fergus; near-abioists include: Charles Sherrington, Francis Crick, Albert Szent-Gyorgyi, and Henri Atlan.

Quotes | On

The following are quotes on Singh:

> "In my experience, **Mr. Singh**, people who noisily proclaim the enormity of their intellectual gifts are in actuality insecure about their intelligence. Secure people do not feel the need to continually beat the drum about their cognitive grandeur. Rather than impressing, it has the opposite effect. Regardless of what motivates such boorishness, it is extremely tiresome."
>
> — Loreum Ipsum (2015), "CreateSpace Forum feedback", Feb 7 [6]

Quotes | By

The following are notable quotes:

> "A human in a natural environment is more 'alive' than one in an unnatural environment. In the same way, certain fish may survive in the ocean, but perform better in the river."
>
> — Inderjit Singh (2016), "Essay on Mankind" (pg. 3) [2]

> "Nature, as in the judicial systems of mankind, punishes those who break its laws. It attacks these criminals, bestowing fear, foolishness, and aggression upon them. It crushes the unnatural creatures beneath its might."
>
> — Inderjit Singh (2016), "Essay on Mankind" (pg. 4) [2]

> "People in cool climates are generally more educated than the people of the tropics."
>
> — Inderjit Singh (2016), "Essay on Mankind" (pg. 4) [2]

> "As humans proliferate, an imperfect system of morality is instituted to control them. This system promises existence after death. It offers an eternal paradise, and threatens eternal damnation. It is based on the mythology of ancient Egypt. This is organized religion."
>
> — Inderjit Singh (2016), "Essay on Mankind" (pg. 5) [2]

> "Science stands as the antithesis to religion. The teachers of science attempt to nullify the insidious ideas of the Abrahamic and Brahmaic religions. This is shown in history by the renaissance and the age of enlightenment."
>
> — Inderjit Singh (2016), "Essay on Mankind" (pg. 5) [2]

> "To separate a pair of lovers who have an elective affinity for each other is to defy the decree of Nature. In such an illegal act of cruelty, pain explodes forth from between the lovers. When lovers are forced apart, all who are nearby are enveloped in a sphere of distress and discomfort. This wave of agony is similar to the destruction caused when the atom is split."
>
> — Inderjit Singh (2016), "Essay on Mankind" (pg. 6) [2]

Notes

N1. Quote: "If [Thims] is willing to give me the necessary information, I shall use my IQ methodology to calculate his IQ. Otherwise, I will leave it at these vague estimates...I do not see Mr. Thims' IQ being below 190, however." [4]

References

1. Singh, Inderjit. (2015). "Knowledge is Power" (Ñº), InderjitSingh.net.
2. Singh, Inderjit. (2016). "Essay on Mankind" (Ñº), WordPress, InderjitSingh.net, Mar 16.
3. Inderjit Singh – Facebook.
4. Singh, Inderjit. (2014). "Calculating the Real IQ of Geniuses" (Ñº), Hmolpedia treads (post #13-21), May 18 – Jun 23.
5. Singh, Inderjit. (2016). "Die Wahlverwandtschaften", Hmolpedia treads (post #14), Feb 28.

6. Inderjet Singh (dialogue) (2015) – CreateSpace.com Forum.
7. (a) Singh, Inderjit. (2016). “Essay on Mankind” (Ñº), WordPress, InderjitSingh.net, Mar 16.
(b) Thims, Libb, Singh, Inderjet. (2016). “Life Does NOT Exist | Alfred Rogers” (Ñº), HumanChemistry101, Jun 23.
(c) Thims, Libb. (2016). “Interview of Inderjit Singh on Human Kinds” (Ñº), HumanChemistry101, Jun 23.

Further reading

â— Singh, Inderjit. (2015). *The Warrior*. Amazon Digital Services.

External links

â— Inderjit Singh (writer) – Facebook.
â— Inderjit Singh – YouTube.

θΔics

In terminology, **indeterminism**, as compared to determinism, refers to things or events said to be not determined a priory.

in·de·ter·min·ism

/ˌindəˈtərmənizəm/

noun

1. PHILOSOPHY
   the doctrine that not all events are wholly determined by antecedent causes.
2. the state of being uncertain or undecided.

A Google-generated definition of **indeterminism**, referring to the doctrine that not all events are wholly determined by antecedent causes; the state of being uncertain or undecided.

Overview

In 1927, Werner Heisenberg published his uncertainty principle, which, in the view of some, claimed to overthrow: the principle of causality (Heisenberg, 1930), thereby seemingly inserting "indeterminism" into science; the idea that natural phenomena obey exact laws (Heisenberg, 1930); and Laplacian determinism (Compton, 1935).

In 1927, Canadian-born American physiologist Ralph Lillie published his “Physical Indeterminism and Vital Action”, wherein he used the uncertainty relation to argue for a neurological based free will, namely that deliberate actions of the organism, in particular humans, are non-deterministic at the neurological level and hence subsequently at the psychic-choice level. [6]

In 1977, Ilya Prigogine, in his *Self-Organization in Non-Equilibrium Systems: from Dissipative Structures to Order through Fluctuations*, argued that that animate nature was a heat-fluxed system, similar to Bernard cells, and that order structures, e.g. humans, formed according to the logic that up to the bifurcation point, things were deterministic, but at the bifurcation point, things became indeterministic. This theory allowed for a semblance of belief in free will, choice, and thereby a form of physics based creative evolution.

In 1977, Werner Ehrenberg, in his *Dice of the Gods: Causality, Necessity and Chance*, discusses how Aristotle compared atoms to the letters of the alphabet”, and discusses the pros and cons of the indeterminism argument, statement such as: [2]

> “… proof of **indeterminism**. It has been argued that strict causality is not incompatible with moral judgment and true statements. Other others have considered free will and truth utterly problematic.”

This last publication may have been some type of ontic opening stylized attempt to stylize “soul” in scientific terms.

In 1992, Rush Dozier, in his *Codes of Evolution*, argued that the randomness of uranium 238 decay yields indeterminism allowing for free will, following collapse of the wavefunction of the universe, or something along these lines. [3]

Quotes

The following are related quotes:

> “A number of contemporary physicists and philosophers are ‘**indeterminists**’, who claim that genuine causality, strict regularity, actually does not exist in nature, but is merely an illusion created by the operation of certain rules which are never of an exact universal validity, even though they often come very near to it.”
>
> — Max Planck (c.1946), “The Concept of Causality in Physics” [4]

> “This [1988] study is the fourth, and most ambitious [45-years work], to issue from a challenge I received

as an undergraduate in 1943 to take Leslie White's course 'The Mind of Primitive Man', diverting my attention from a possible career in academic philosophy to a more direct concern for the human process. Its purpose is, simply enough, to see whether human social evolution can be described, mapped, or cast in terms common to the other sciences, most specifically in terms of energy process. It reflects a conviction that for all its uniqueness and **indeterminism**, our understanding of the human trajectory will be unsatisfactory until it is framed in dynamics that are common to all of nature."

— Richard Adams (1988), *The Eight Day* (pg. ix)

References

1. Lillie, Ralph S. (1927). "Physical Indeterminism and Vital Action", *Science*, 46: 139-44.
2. Ehrenberg, Werner. (1977). *Dice of the Gods: Causality, Necessity and Chance* (indeterminism, 4+ pgs; quote, pg. 13). Birkbeck College.
3. Dozier, Rush W. (1992). *Codes of Evolution*: the Synaptic language Revealing the Secrets of Matter, Life, and Thought (nested evolution, pg. 6; thermodynamic pulse, pg. 198; deck of cards, pg. 208; thermodynamics, 11+ pgs). Crown Publishers Inc.
4. Planck, Max. (c.1946). "The Concept of Causality in Physics"; in: *Scientific Autobiography and Other Papers* (translator: Frank Gaynor) (§5:120-50; pg. 125). Philosophical Library, 1949.

External links

â— Indeterminism – Wikipedia.

θΔics

In schools, **Indian school of econophysics**, aka "Calcutta school" (Pandit, 2017) or “Kolkata school” (Victor Yakovenko, 2009), refers to the 1995 to present work, conferences, and publications on econophysics, financial physics (statistical finance), and or physical economics at the Saha Institute of Nuclear Physics, Kolkata, India, a project led generally by Indian physicist Bikas Chakrabarti and his students and associates. [1]

A depiction the two main founders and current head of the **Indian school of econophysics**, namely Indians astrophysicist Meghnad Saha and physicist Prasanta Mahalanobis, who initiated the Indian econophysics movement, in the 1930s, and physicist Bikas Chakrabart, who in the mid 1990s initiated the Kolkata Econophysics conferences, the banner showing the 2012 7th Kolkata Econophysics Conference, this event specifically themed on the econophysics of agent-based models, e.g. Vilfredo Pareto's 1896 *homo economicus*. [3]

History

In 1931, Indian astrophysicist Meghnad Saha (1893-1956), an atheist, in his *Treatise on Heat* (see also: thermodynamics textbooks that include human thermodynamics), co-authored with B.N. Srivastava, explained the Maxwell-Boltzmann distribution of molecular velocities according to kinetic theory in terms of the wealth distributions in society: [2]

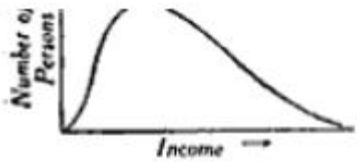

Fig. 6.—Distribution of income among persons

In 1931, Indian physicist Prasanta Mahalanobis (1893-1972), interested in Karl Pearson stylized biometrics, founded the Indian Statistical Institute (O) for developing physical and statistical models for social dynamics. [6]

In 1938, Saha began to form the Saha Institute of Nuclear Physics in Kolkata, India.

In 1994, the first econophysics conference—though it did not at this point go by this name—was held in Kolkata, which was initiated (revived) by Indian physicist Bikas Chakrabarti, along with his students, with a National Grant for Econophysics Research. Chakrabarti explains this more fully, in his 2005 chapter “Econophys-Kolkata: a Short Story”:

> “Following the early studies of the Traveling Salesman and other multivariate optimization problems, employing classical statistical and quantum mechanical tricks, during 1985–1990, the Kolkata group made some of the earliest modelling investigations regarding the nature of wealth and income distribution in societies and its comparison with the energy distribution in some (quantum) gases.
>
> In the 1994 Kolkata Conference, many Indian economists (mainly from Indian Statistical Institute campuses) and physicists discussed about the possible formulations of some of the economic problems and their solutions using tricks from physics. In fact, in one of these papers in the proceedings, possibly the first published joint paper involving both physicist and economist (Sugata Marjit) Indian co-authors, the possibility of ideal-gas like model of trading market was discussed. Among other things, it tried to identify, from the known effects of various fiscal policies, the equivalence of the kinetic energy of the gas molecules with the money of the agents in the market and of temperature with the average money in the market. Such a ‘finite temperature’ gas model of the market was first noted by Dietrich Stauffer (Cologne). With the possibility of putting more than one agent in the same microstate, identified by the price or money income

> of the agent in the market, the likely distribution was concluded there to be Bose-Einstein like, rather than Gibbs like."

Individuals now associated with the Kolkata school include: Anirban Chakraborti, Arnab Chatterjee, Sitabra Sinha, and Kishore Dash, Subhrangshu Manna, and Parongama Sen, among others.

Physicist + Economist | First joint paper

Chakrabarti, above, asserts that 1994 Kolkata conference yielded, possibly, the first joint publication between a physicist and an economist.

The assertion seems to be the product of a lack of historical understanding of the field of "physics based economics"; specifically, the first joint papers involving both a physicist and economist certainly did not occur these Kolkata proceedings, the subject as a long two cultures synergy history, going back through the Princeton department of social physics (1945-1955), and before that the Lausanne school of physical economics (1890-1923), to name two examples, among other associations of human physicist pioneers.

Italian theoretical physicist Ettore Majorana, though he did not jointly publish, in his *circa* 1933 article "The Value of Statistical Laws in Physics and Social Sciences", in fact, was the first to suggest the application of quantum statistical physics to social sciences (see: human quantum mechanics).

Financial physics or physics based economics

There is a certain amount of blurriness surrounding the use of the term "econophysics" in respect to the influence of the Eugene Stanley centric American school of econophysics in the formation of the Indian school of econophysics, in respect to if the subject is the study of the physics of humans from an economic point of view or if the subject is the use of physics equations employed to study financial markets (e.g. stock prices), the latter of which is not necessarily a branch of physics, the former of which is.

During this first Kolkata conference, American physicist Eugene Stanley assigned the name "econophysics" to the general subject, described above, of "physics tricks", as Chakrabarti calls them, employed in the study of finance. There have been at least two more Kolkata econophysics conferences since and citations of this 1994 Stanley so-called neologism portmanteau "coining" are frequently regurgitated by rote in nearly every so-called "econophysics" paper since, as though a new subject had been born in 1994.

This, however, is hardly the case, as the following two cultures namesakes evidence, to name a few:

> Social mechanics (Francis Edgeworth, 1881)
> Mathematical psychics (Francis Edgeworth, 1881)
> Mathematical economics (Vilfredo Pareto, c.1892)
> Pure political economics and social mechanics (Leon Winiarski, 1894)
> Economic dynamics (Maffeo Pantaleoni, c.1908)
> Human energetics (Wilhelm Ostwald, 1909)
> Cartesian economics (Frederick Soddy, 1921)
> Biophysical economics (Alfred Lotka, 1924)
> Socio-economic thermodynamics (Person, 1962 (link))
> Economic thermodynamics (Person, 1962 (link))

Some of this Stanley-themed association of the term "econophysics" as the use of physics "tricks" to study financial markets has resulted an an almost abuse of the word "physics", in the same way that American electrical engineer Claude Shannon's 1948 borrowing use of the probability logarithm of the the Boltzmann entropy for use in the analysis and modeling of the transmission of information in binary form has misled many information theorists to falsely believe that what they are doing is "thermodynamical", which is not the case. The same is the case here for many, who, such as

American physicist Joseph McCauley, head of the University of Houston so-called "econophysics" department, falsely believe that use of physics equations and models to study and analyze financial patters is actually "physical", which is not the case. Romanian econophysicist Gheorghe Savoiu and American atmospheric physicist Constantin Andronache clarify that: [3]

> "The field of research known as econophysics has alternative names such as financial physics and statistical finance."

In this light, many who presently call themselves "econophysicists" are but using the term "physics" under false pretenses, the subject of many of these papers in no way at all related to Greek philosopher Aristotle's original *Physics: Book One*, definition of a physicist as one, such as Empedocles, who studies the principles behind the motion of bodies, which in this case would be the movements of the physical bodies of humans and the movements of the physical bodies comprising their transactions, described according to the standard model of physics. [4] Someone, such as English physicist and chemist Frederick Soddy and his 1921 Cartesian economics lectures, who applies actual physical laws to people in economic terms, is what would be called a "real" econophysicist or physical economist depending on usage.

See also

- American school of econophysics
- Chinese social physics school
- Harvard Pareto circle
- Lausanne school of physical economics
- Mechanistic school | Mechanistic school of social thermodynamics | Pitirim Sorokin (1928)
- Princeton school of social physics
- Roegen-Daly school
- Romanian school of physical socioeconomics

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θΔics

In engineering, **indicator**, or “recording pressure gauge” (Croft, 1922), is an instrument for obtaining a diagram or graph, aka “indicator diagram”, of the pressure-volume changes in a running positive displacement heat engine, compressor, or pump cylinder during the working cycle. [1] An indicator is the instrument which produces a graphic record of the pressure (vertical axis; y-axis) of the fluid in a cylinder for every position of the piston, a position that can be formulated as volume (horizontal axis; x-axis), as it reciprocates. [2]

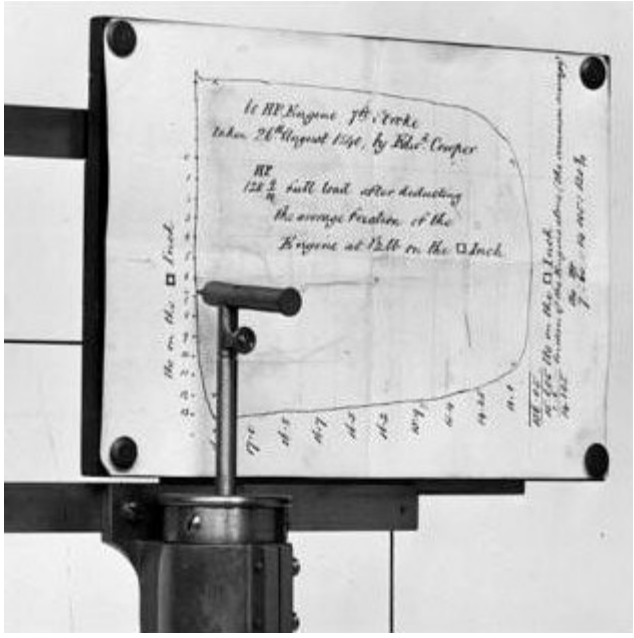

Diagram of the **indicator** (vertical part), which gives a reading of pressure, invented by James Watt and Matthew Boulton in 1790, and the sliding board (horizontal part) and pencil tracer (attached to the indicator), invented by John Southern in 1796, which makes an 'indicator diagram', the pressure-volume graph (drawn on the sheet).

Overview

In 1792, Davies Gilbert was claiming and or demonstrating or speaking about, in court, in defense of the patent status of the work or efficiency of a Hornblower engine (1781), some type of Newtonian calculus based integration of the.

In 1796, James Watt, and his employee John Southern, spurred on by the court proceedings of Gilbert, developed a work measurement tool and "indicator", as shown below (Science Museum, London), which is a device that made an "indicator diagram", a chart of the pressure of the steam in a cylinder plotted out against the steam's volume, which they used to exactly quantify the work produced by a steam engine:

In 1797, John Robinson, in his “Steam-Engine” article, in *Encyclopedia Britannica*, supposedly, gave the following illustration (check: image below is from Donald Cardwell (1971)), in some form or another, of the Watt-Southern indicator diagram:

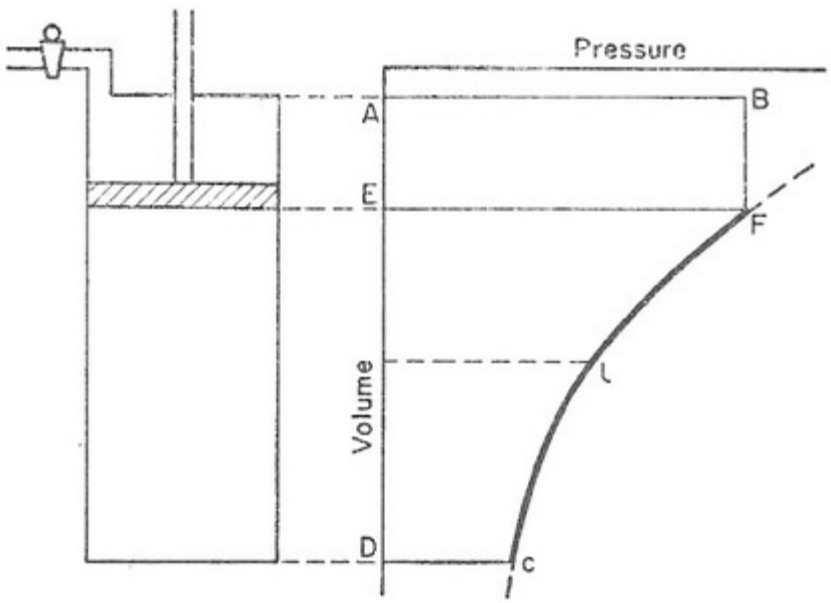

about which he commented the following:

> "The accumulated pressure during the motion of the piston from EF to DC will be expressed by the area EFcDE and the pressure during the whole motion by the area ABFcDA. Now it is well known that the area EFcDE is equal to ABFE multiplied by the hyperbolic logarithm:
>
> AD/AE = L **âˆ™** AD/AE
>
> and the whole area:
>
> ABFcDA = ABFE (1 + L **âˆ™** AD/AE)
>
> It having been granted that FLc is a rectangular hyperbola."

In commentary on this, Donald Cardwell (1971) points out that although this "remarkable analysis" soon came to be much-admired by contemporary writers on the steam engine, Robinson, as he commented in a letter to Watt, knew of Davies Gilbert's earlier 1792 analysis of a similar nature.

The following, made by Terrell Croft (1922), is an-illustrated diagram of the Watt-Southern indicator or "Watt indicator" as commonly called: [10]

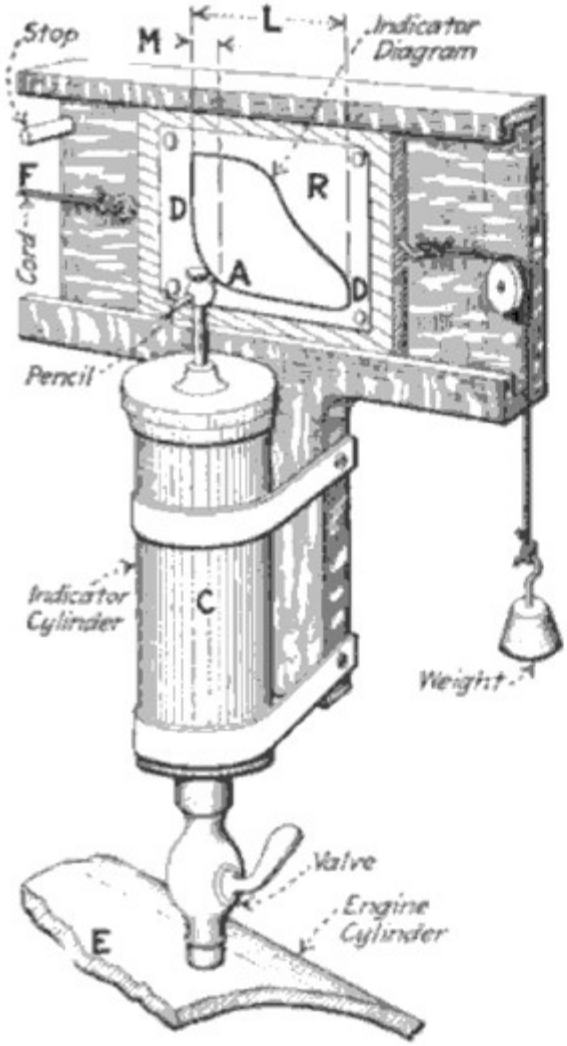

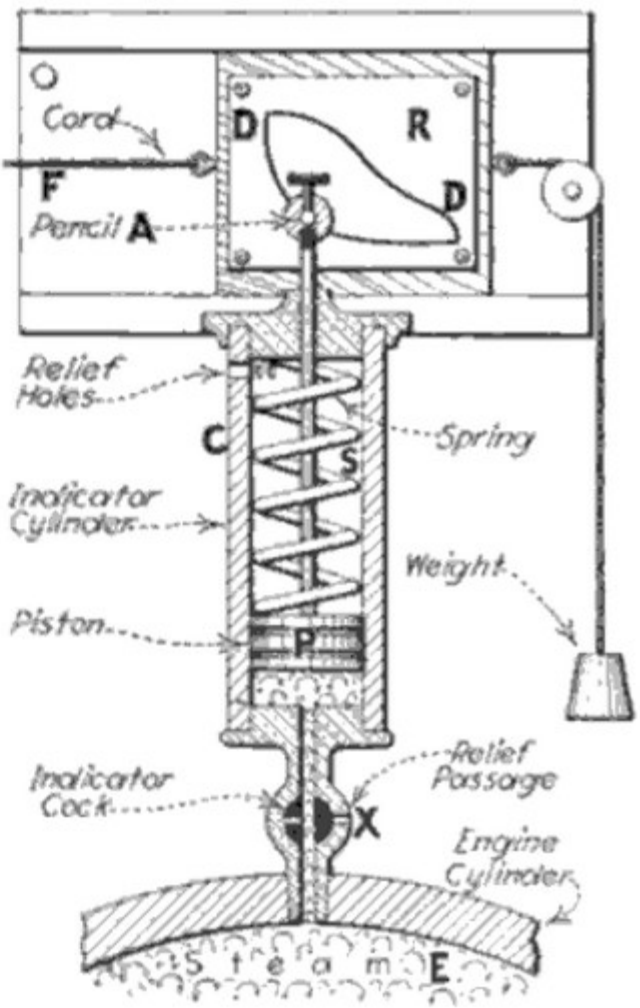

The operation of which is described as follows:

"**Watt's indicator** is perhaps the simplest form (above figures). Steam enters the indicator cylinder *C*, from the engine cylinder *E*. The pressure of the steam forces the [indicator] piston *P*, upward, compressing the spring, *S*, and raising the pencil, A. The sheet of paper *R* being moved at the same time by **cord *F* which is attached to the crosshead** (Ñº) **of the engine**, will have described upon it a **'diagram' *DD***, which **'indicates'**, at every instant during a revolution of the engine, the pressure within the engine cylinder. At any instant, the height to which the pencil has been raised will be a measure of the pressure at that instant within the engine cylinder, whereas the horizontal distance through which the paper has been moved from either end (e.g., *M*) will **denote the position of the [engine] piston** in the engine cylinder at that instant. From this it follows that the length, *L*, of the diagram represents the length of the engine piston's stroke."

— Terrell Croft (1922), *Steam-Engine Principles and Practice* (pg. 41) [10]

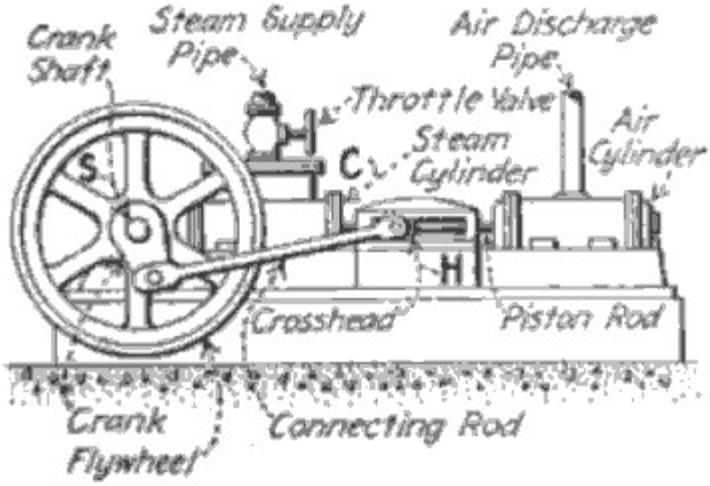

Diagram of a Watt-type steam engine, illustrating that the "crosshead" (Ñº), which connects to cord F, and hence is what moves the indicator "board" R back and forth, is the part of the steam where the piston rod (which is attached to the piston head), connects to the connecting rod (which connects to the crank and crank shaft), which turns the flywheel. [11]

The location of “crosshead”, which connects to cord F, which moves the indicator board R back and forth, is illustrated adjacent.

Reducing motion

Because the indicator board only moves 4 to 6 inches typically, and the piston stroke moves about 2 to 14 feet, depending on design, the chord itself connects to the crosshead via what is called a "reducing motion" mechanism, whereby a mechanism scales the movement of the board, so that it moves about one-inch per every foot of stroke, depending. There are four types of "reducing motion" mechanism, of which the simplest was the "pendulum lever method", as shown below, whereby the cord of the indicator board is attached to a pendulum lever, which attaches to the crosshead, designed such that connecting link C is about half the piston stroke length L: [14]

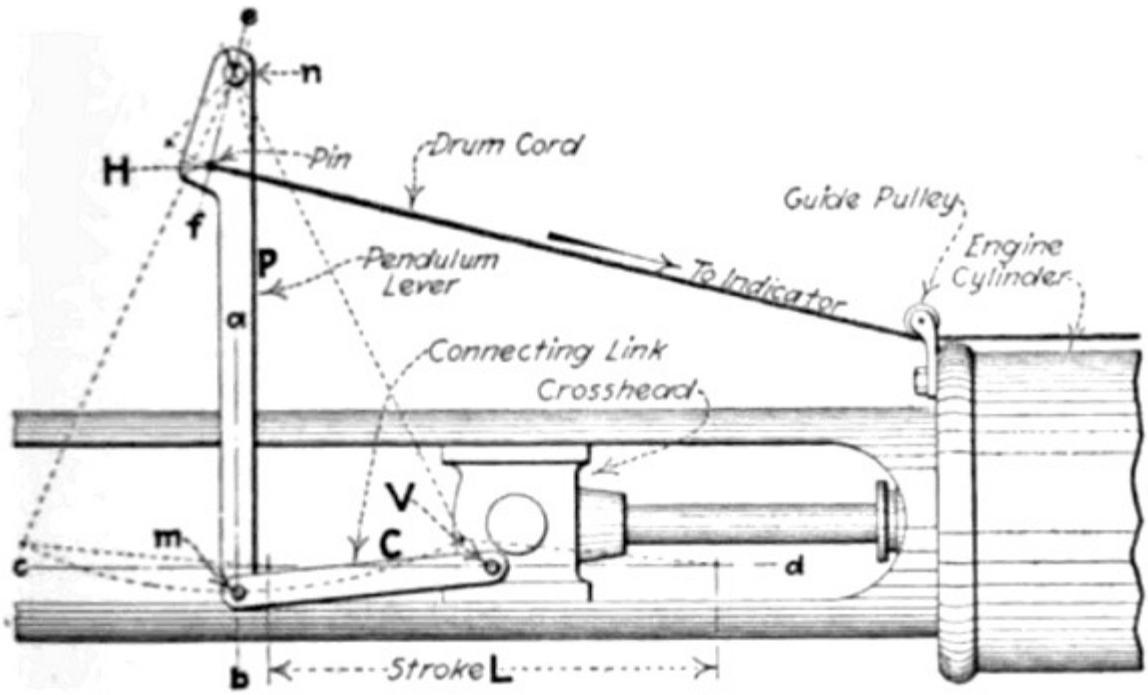

The following is a synopsis of the reducing motion mechanism:

> “A string is simply attached to some point on the crosshead of the engine and to the board to which the paper is attached so that the paper and the piston move together. Since it is impractical to move the paper the same distance as the stroke of the engine, a **device known as a ‘reducing motion’ is used** so that the paper will move only four to six inches, even if the stroke of the engine is several feet.”
>
> — Bruce Babcock (2001), “The Story of the Steam Engine Indicator” [12]

The following diagram illustrates the basic operation of the Watt-Southern's indicator:

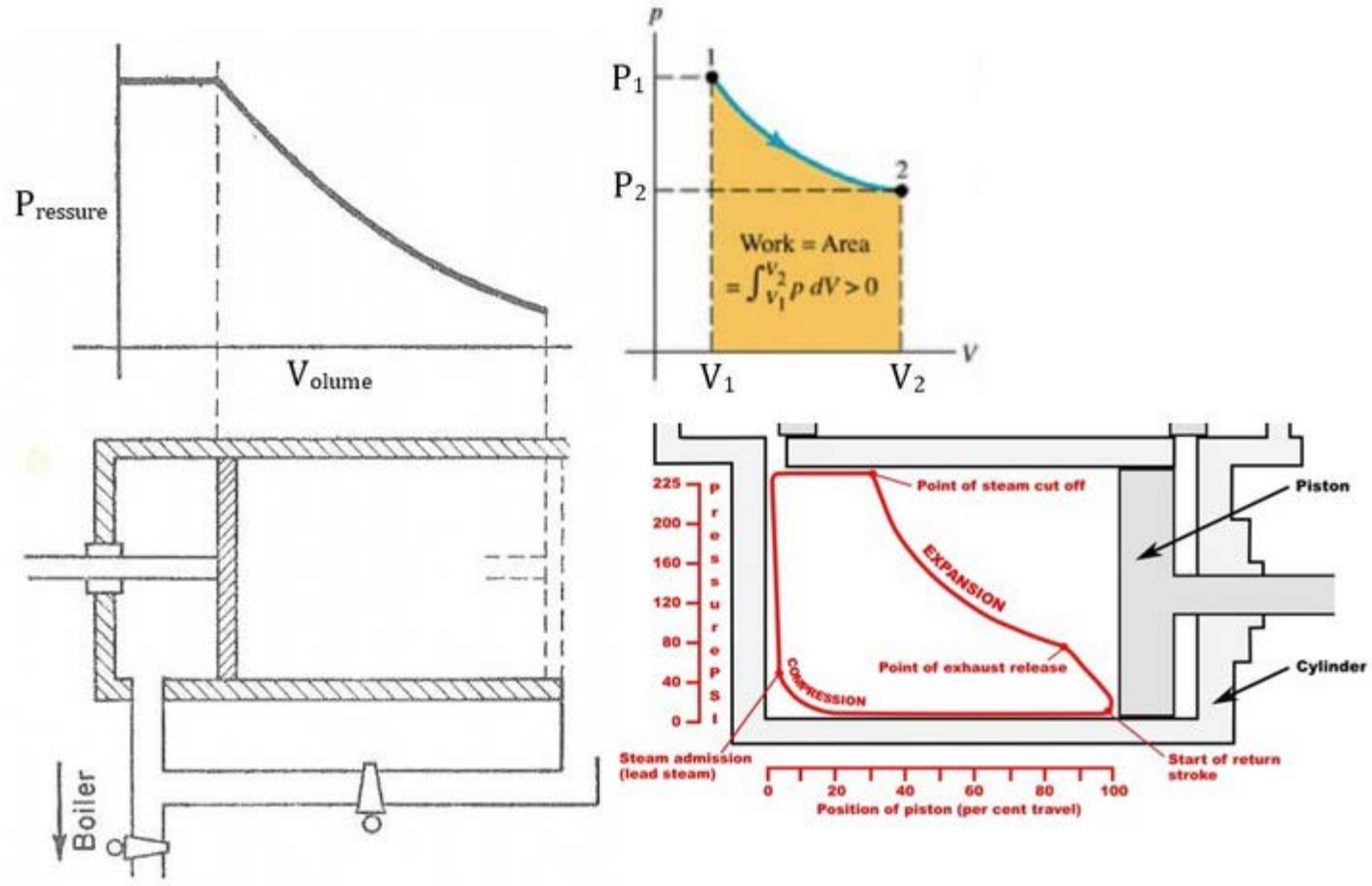

In short, Watt or Boulton used a manometer to measure the "pressure" inside the piston at each point in the expansion or contract, which made vertical marks, via a pencil, on the y-axis, of an horizontally moving board, and attached a string of some sort, shown above, connecting the horizontal movement of the board to the up and down motion of the piston head, i.e. to the volume of the working body; the following is another synopsis of this:

> "It was simple enough. A **sheet of paper** is pinned to a **board**, which moves to and fro with the reciprocating motion of the piston; at the same time a spring-loaded pressure gauge causes a pencil, held in a lever arm, to move at right angles to the motion of the board. As a result, the pencil automatically traces out the curve, relating the 'pressure' of the steam in the cylinder to the change in 'volume'; that is to say it traces out the 'indicator diagram'."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 80) [6]

In 1822, H.H., an anonymous writer, in the *Quarterly Journal of Science*, in his article "Account of a Steam-Engine Indicator", based on details of the device given by a "Mr. Field", gave the first, supposed, public summary of the details of both the indicator, shown below: [9]

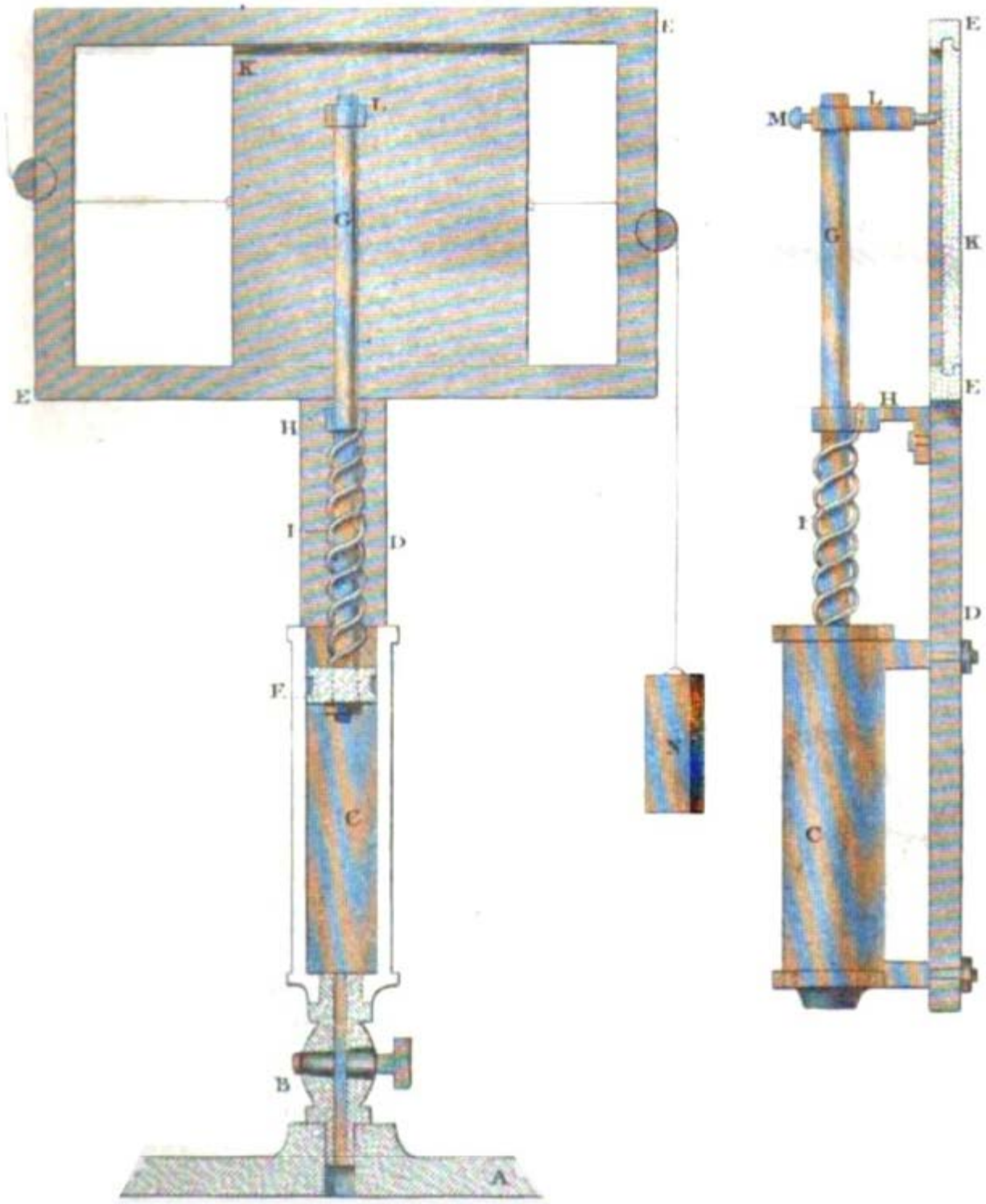

As well as an example of the PV diagram or indicator diagram that the device made, shown below:

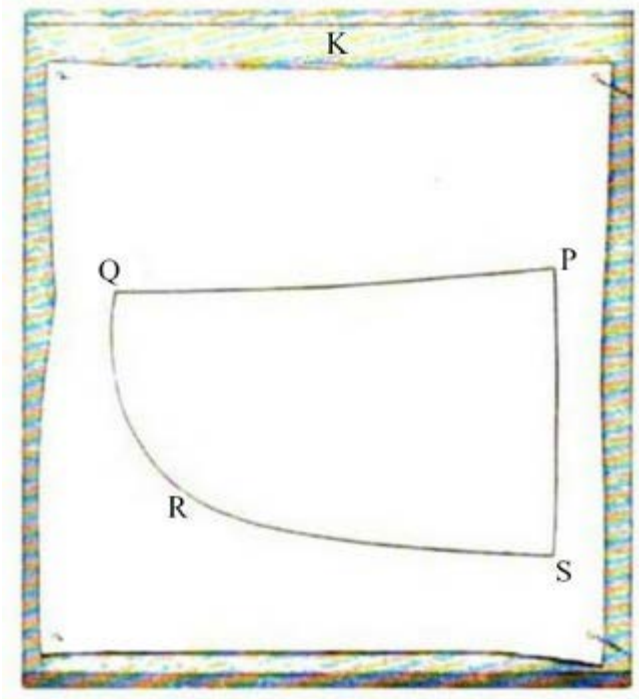

The following is an indicator diagram for a Ranking cycle, by Terrell Croft (1922), which seems to show that the pencil of the indicator is first put at point Q on the diagram, then valve V1 is opened, letting steam in; but then at P, V1 is closed, at which point expansion occurs, the working body pushing the piston along curve PS, at the end of which valve V2 is opened, the steam exits to the condenser, whereby the vacuum then forms, via contact with the cold water (cold body) of the condenser, at which point the piston does returns to the top (upstroke), along curve SR, and at point R, valve V2 is closed, and the piston volume "compresses" along RQ, or something along these lines: [11]

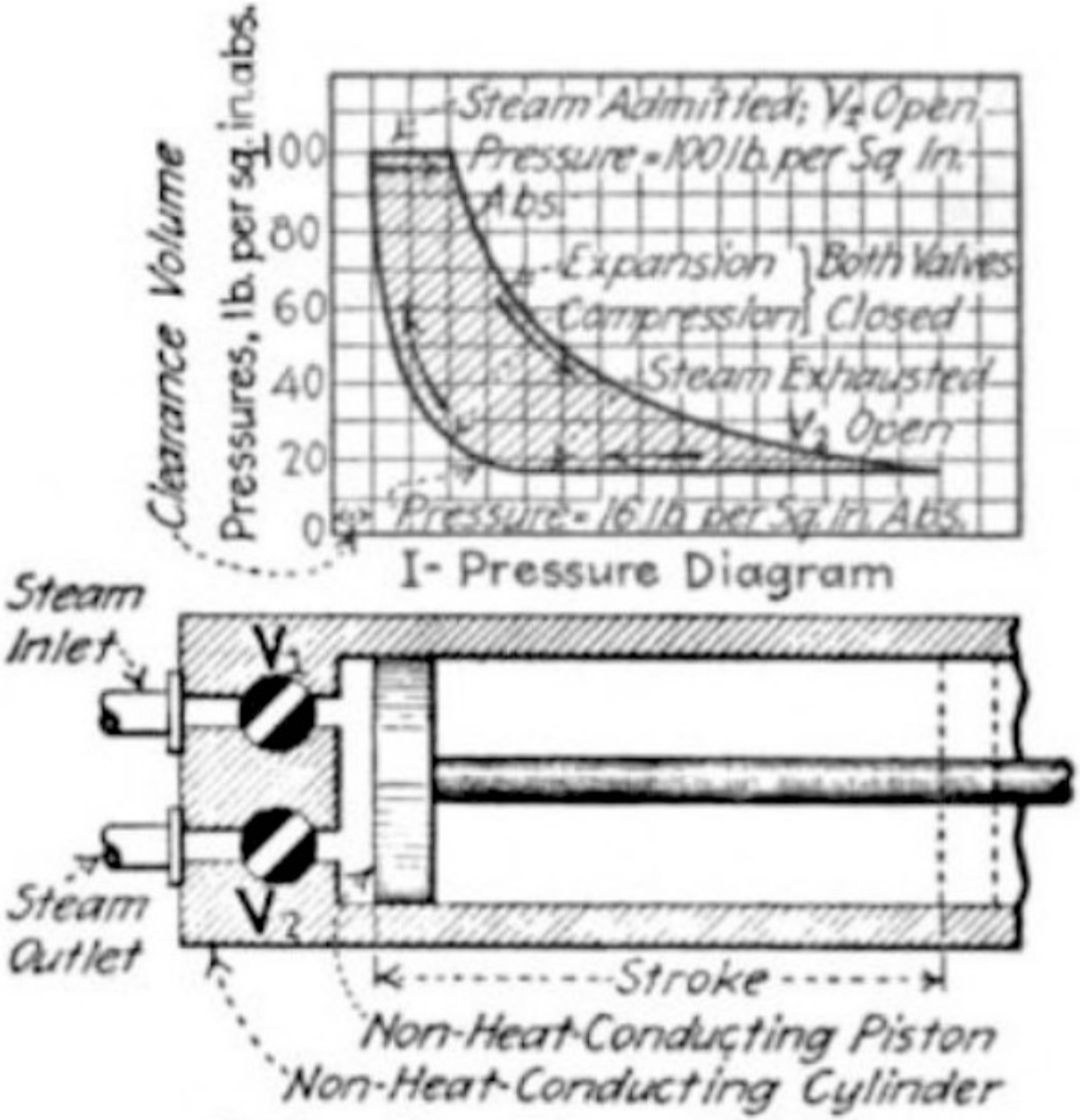

(add)

Other

Southern is generally credited with being the one to developed the simple, but critical, technique to generate the diagram by fixing a board so as to move with the piston, thereby tracing the "volume" axis, while a pencil, attached to a pressure gauge, moved at right angles to the piston, tracing "pressure". The gauge enabled Watt to calculate the work done by the steam while ensuring that its pressure had dropped to zero by the end of the stroke, thereby ensuring that all useful working potential had been extracted.

Details of the "indicator", of note, remained a "trade secret" for many years.

In 1826, John Farey learned of the indicator when he saw one being used on an engine in Russia. [6] When he returned to England, he arranged with a man named William McNaught from Glasgow, Scotland, to build indicators for him. [12]

Types

In 1901, there existed a number of types of indicators; Crosby indicator, Richards indicator, Thompson indicator, Tabor indicator, and Lyne indicator, being among the best, according to William Levan. The following, e.g., a McNaught

indicator (c.1830), built by William McNaught, per request of John Farey, a new type of cylinder indicator, consisting of a small hollow cylinder A that is screwed on the cover of the steam cylinder. [4]

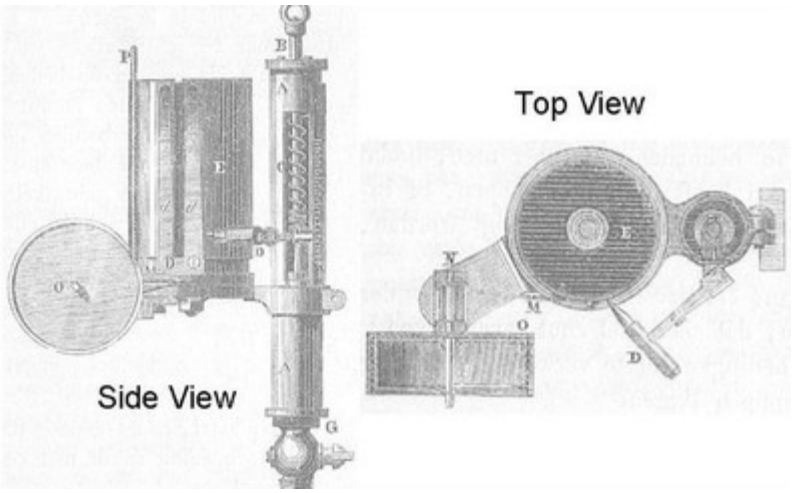

McNaught's big contribution to the design of the indicator was the replacement of the flat board that held the paper, or "card" as it was called, with a rotating drum.
As the engine speeds increased, the inertia of all components of the indicator became increasingly important. The rotating drum could be made much lighter and consequently could be accelerated, decelerated and reversed much more easily than the bulky board. The rotating drum was a feature of every mechanical indicator that was built in the following century or more until optical and electrical instruments made the mechanical devices obsolete. [12] The following compares a Watt indicator with a Thompson indicator: [14]

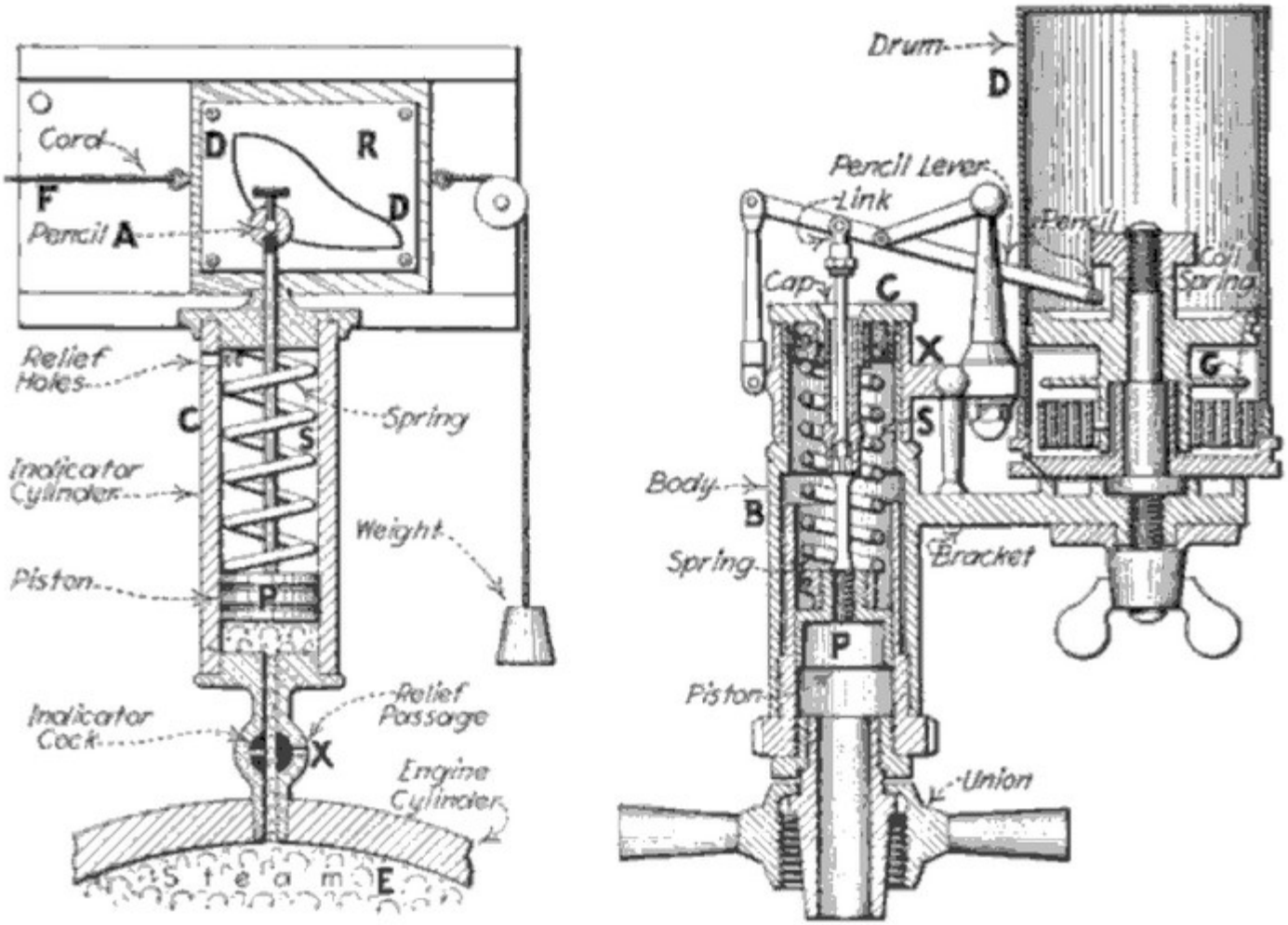

(add)

Thermodynamics

The functionality of the indicator diagram was later incorporated into a graphical analysis, shown below (right), by French engineer Émile Clapeyron in 1834 to determine the work done by the steam, as signified by the area found within the region *abcd*, using calculus: [3]

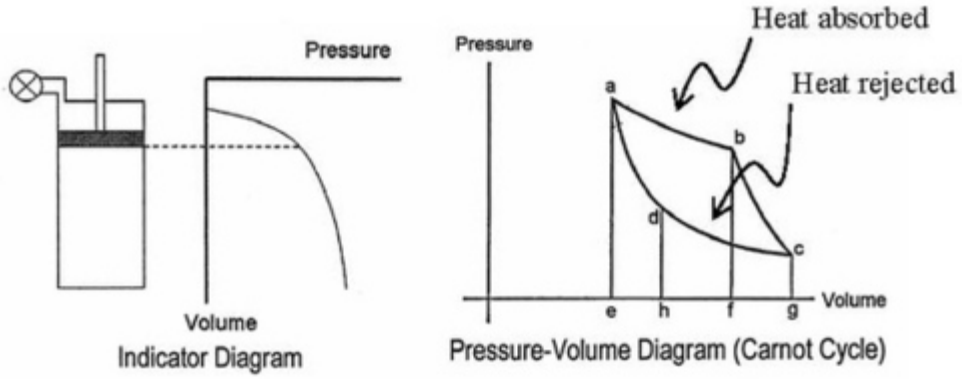

This amount of graphical area soon came to be known as "pressure-volume work" and this graph became a central fixture in the science of thermodynamics, especially through the detailed work of German physicist Rudolf Clausius. [5]

Quotes

The following are related quotes:

> "I am like a man parched with thirst in the expectation of relief, or a woman dying to hear (or tell) a secret, to know Southern's mode of determining the power."
>
> — George Lee (1796), "Letter to John Lawson" (Lawson was an employee of Watt and Bolton), Apr 12 [6]

> "In the hands of a skillful engineer, the **indicator** is as the stethoscope of the physician, revealing the secret workings of the inner system, and detecting minute derangements in parts obscurely situated, and it also **registers the power of the engine**."
>
> — William LeVan (1901), *The Practical Management of Engines and Boilers* (pg. 173)

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(b) Babcock, Bruce L. (2001). "The Story of the Steam Engine Indicator" (Ñº), FarmCollector.com, Jul-Aug.
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Further reading

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â— Okil, John. (1938). *Autographic Indicators for Internal Combustion Engines* (ch. 1: History and Development of the Indicator, pgs. 7-). Arnold.

External links

â— Indicatory diagram – Wikipedia.

θΔics

In thermodynamics, **indicator diagram**, or "indicator card" (LeVan, 1901), is a line tracing on a sheet of paper made with an indicator that yields a pressure (x) volume (y) plot of the work of a steam engine.

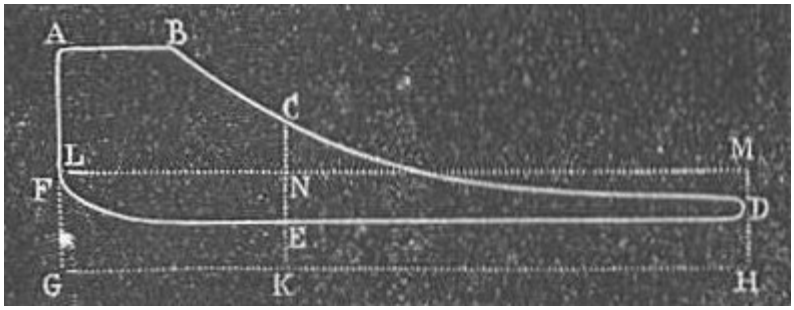

An example **indicator diagram**, taken with the *indicator of Watt*, where part ABCD was drawn on the strip of paper during the down going stroke and DEF during the up going stroke of the steam cylinder. [1]

History

In 1764, Watt, puzzled by the breakdown in the "law of mixtures" in respect to calculating the efficiency of steam engines, based on four datum points, shown by circle dots below, made the following PT graph: [4]

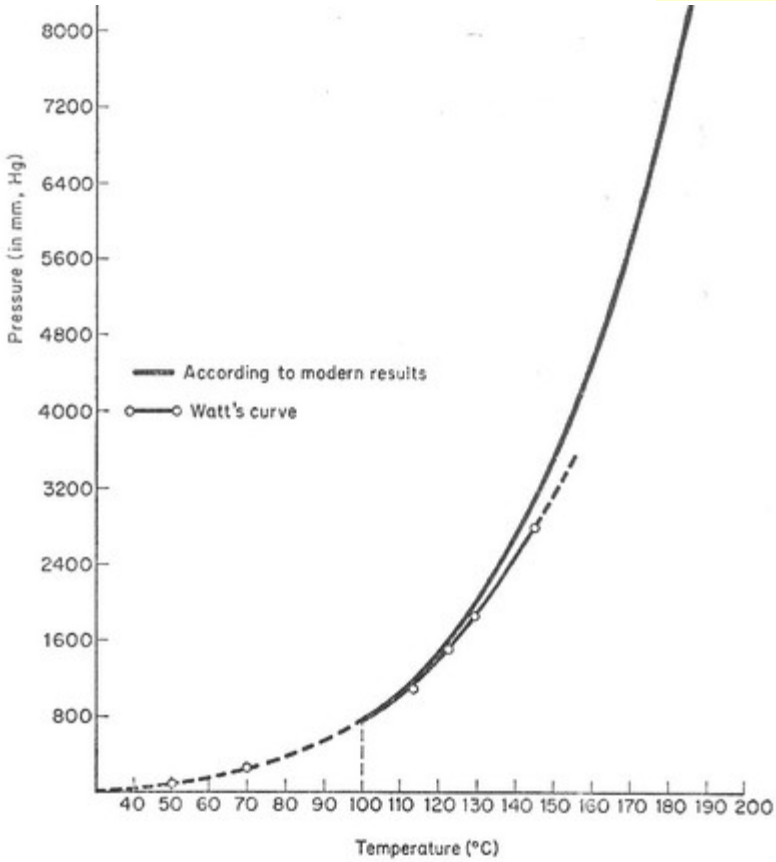

On this graph, Watt commented:

> "From these elements **I laid down a curve** in which the abscissa [y-axis] represented the temperatures and the ordinate [x-axis] the pressure, and thereby found the law by which they were governed sufficiently near for my then purpose."
>
> — James Watt (c.1764), "on his pressure-temperature graph" [12]

In 1792, Davies Gilbert was claiming and or demonstrating, in court, some type of calculus-based integration of the work or efficiency of a Hornblower engine (1781).

The indicator was invented by James Watt in 1790 and the indicator

diagram was invented by John Southern in 1796.

In 1803, the following **indicator diagrams** were on ‘Mr. Houldsworth’s Engine’ in Manchester: [2]

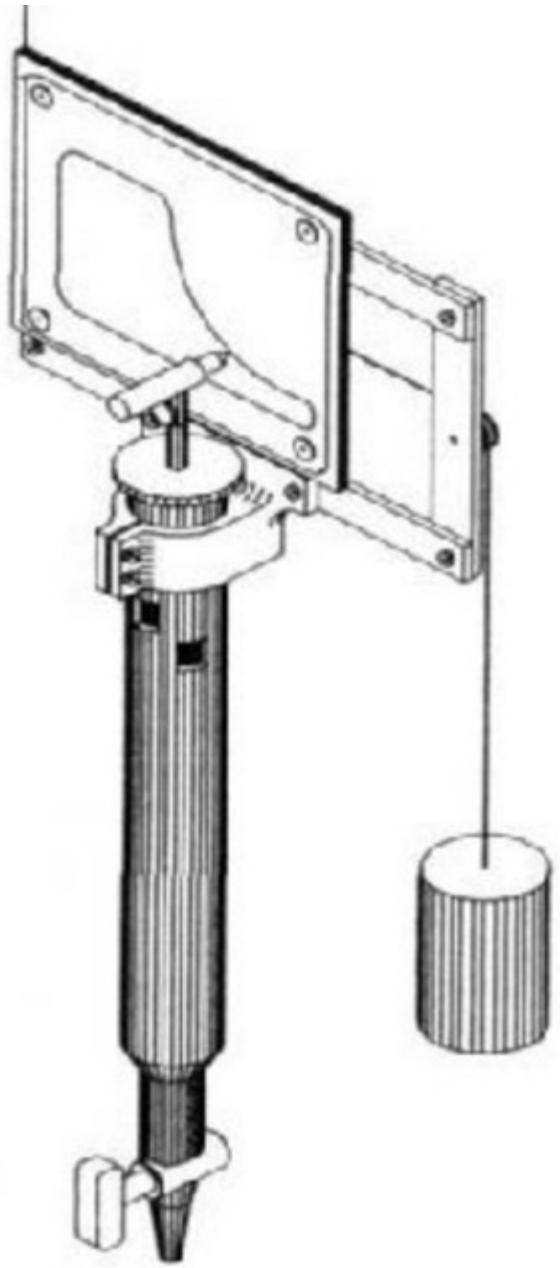

A Watt indicator making an "**indicator diagram**" or PV graph (pressure-volume graph), according to which the area in the enclosed region is the PV work or pressure-volume work of the engine. [5]

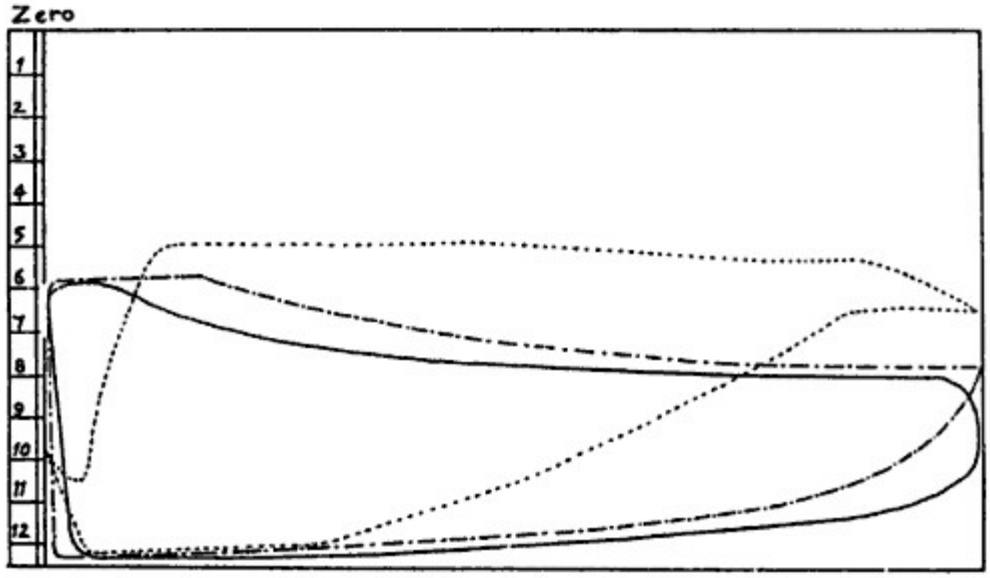

In 1901, William LeVan, in his *The Practical Management of Engines and Boilers* (pgs. 181-0, gave the following "indicator card" as he called it: [6]

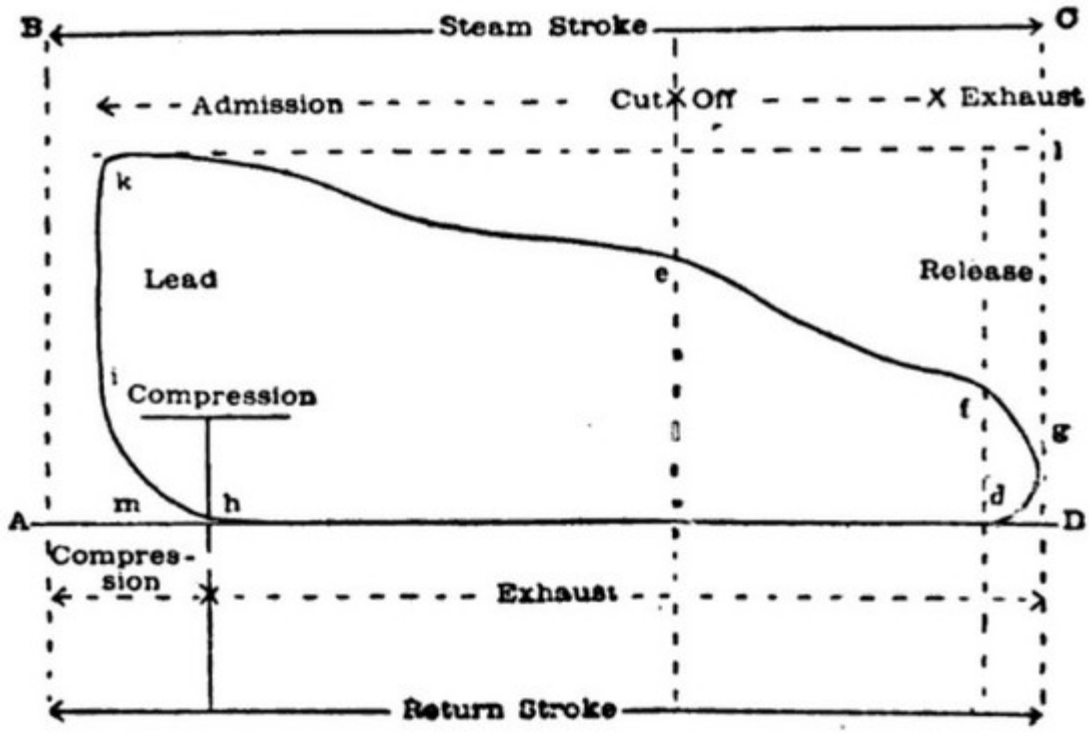

which he described as follows:

> "The utility of the indicator is shown in the **indicator card** (above figure). The base

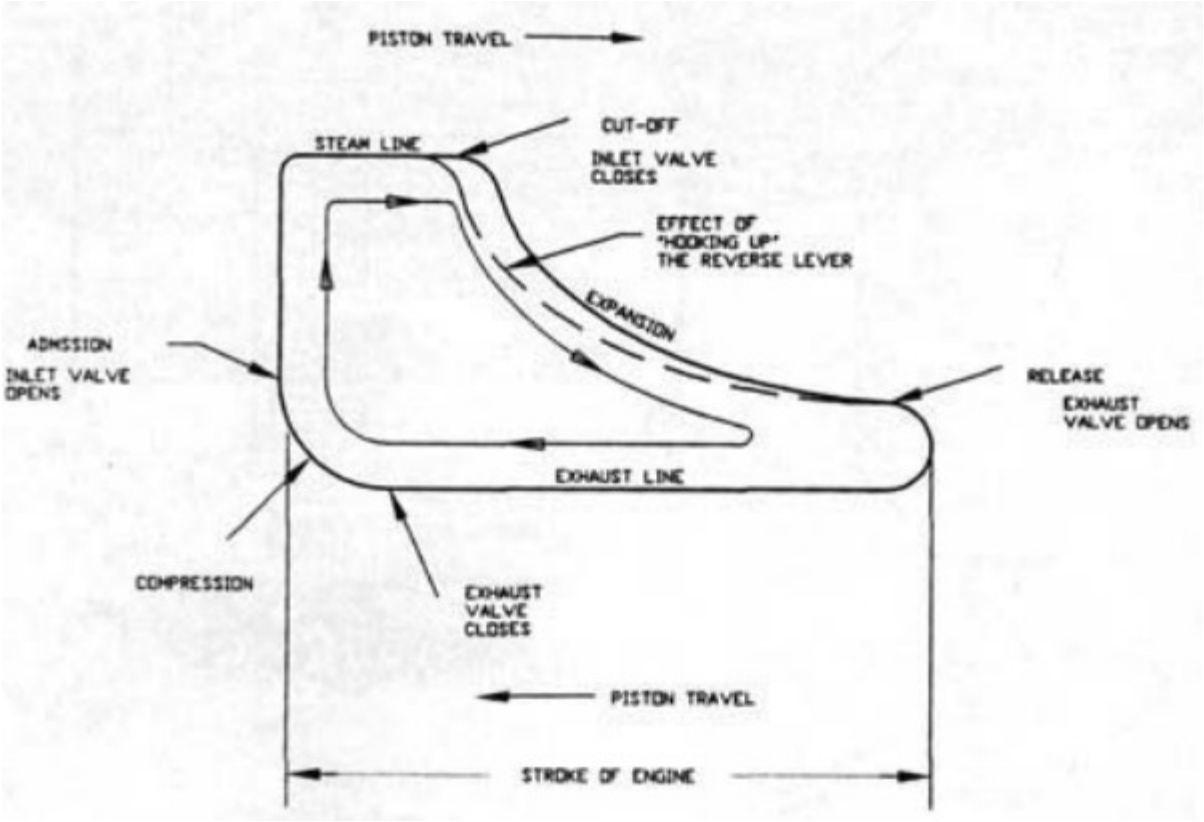

An annotated **"indicator diagram"** by Bruce Babcock (2001). [5]

line AD is the line of atmospheric pressure, m D represents the stroke of the piston, and the irregular space m, k, e and d, may be supposed to be **the interior of the cylinder**. The heavily lined figure k, e, f, g, d, h and i is a diagram **'indicated' action** of the steam, when the piston moves in the cylinder at an average speed of 100 feet per minute [1.7 feet/second], and shows by its angularity how the steam is controlled by the valve, and the precise points of the stroke at which the changes of the distribution take place The piston is represented as having started from the left-hand end of the cylinder, under an initial steam pressure of 45 pounds per square inch above the atmosphere, the **line of pressure** being traced from the upper left-hand corner it, until it reaches the point e of cut-off.

The **admission of steam being terminated** [point e], the period of expansion is commenced, the pressure falls as the piston advances before the expanding steam, and continues to do so until the piston reaches the point of release. At this point the piston enters on its third and last state of progress toward g, the **end of the stroke**; the steam primarily admitted at 45-pounds above the atmosphere, and reduced to 15-pounds pressure previously to **being released** [point f], quickly discharges itself into the atmosphere, by its elasticity, and is entirely discharged before the end of the stroke, as indicated by the rapid fall of the steam line during the period of exhaust towards the point g. The exhaust is, however, only relative, not absolute, as steam of atmospheric pressure remains in the cylinder, during the return stroke; therefore, the valve ought to maintain the exhaust end of the cylinder continuously open, to allow the steam of one atmosphere of pressure to escape from before the returning piston.

The benefit of this provision is proved by the diagram, in which it appears that during the continuation of the exhaust, the steam of latent pressure remains at the zero point of the scale; at the instant the **exhaust valve closes** [point h] at the point of compression h, and there is no longer an exit for the latent steam before the piston, the exhaust line commences to rise upwardly towards the left hand side, and the steam is compressed against the end of the cylinder. While the volume of the compressed steam is being thus forcibly reduced, the pressure is increased; the pressure is raised until the accumulation of back pressure so induced is merged at i, with the boiler pressure of the steam admitted at this point by lead during the remainder of the return stroke for the supply of the next stroke."

Regarding the statement: "quickly discharges itself into the atmosphere, by its elasticity", this may not be entirely

accurate, as in a Watt engine, the piston returns to minimal volume of working body, owing to the making of the vacuum in the condenser; hence, correctly, the steam quickly discharges into the condenser, not the atmosphere.

The following is simplified view (Ñº) of the Watt indicator diagram, showing the location of the piston in respect to point E, wherein the steam valve is cut off, the arrows showing the force of the steam pressing on the piston head, after which the piston continues to move to point F, with its pressure dropping along the way:

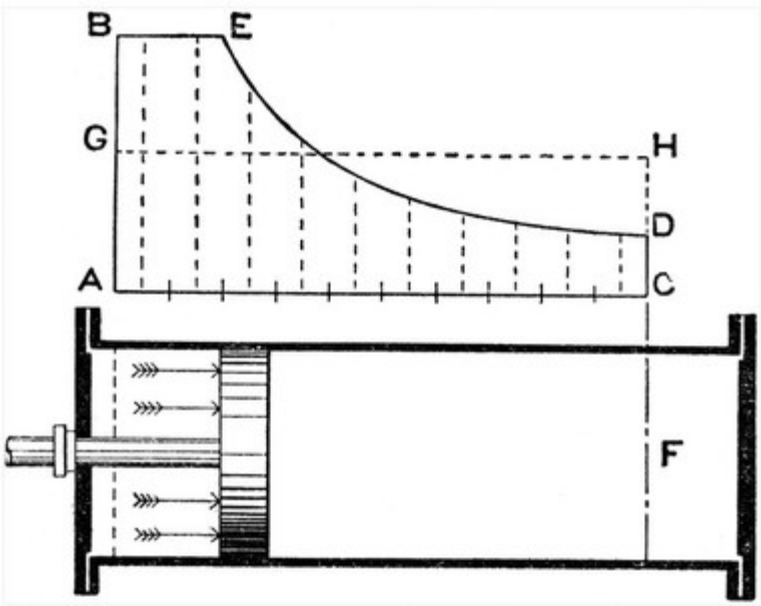

The following is an indicator diagram (Ñº), with an illustration of the position of the piston (working body or "substance" inside the piston and cylinder) , hot body (boiler), and cold body (cool water), for points A, B, C, D:

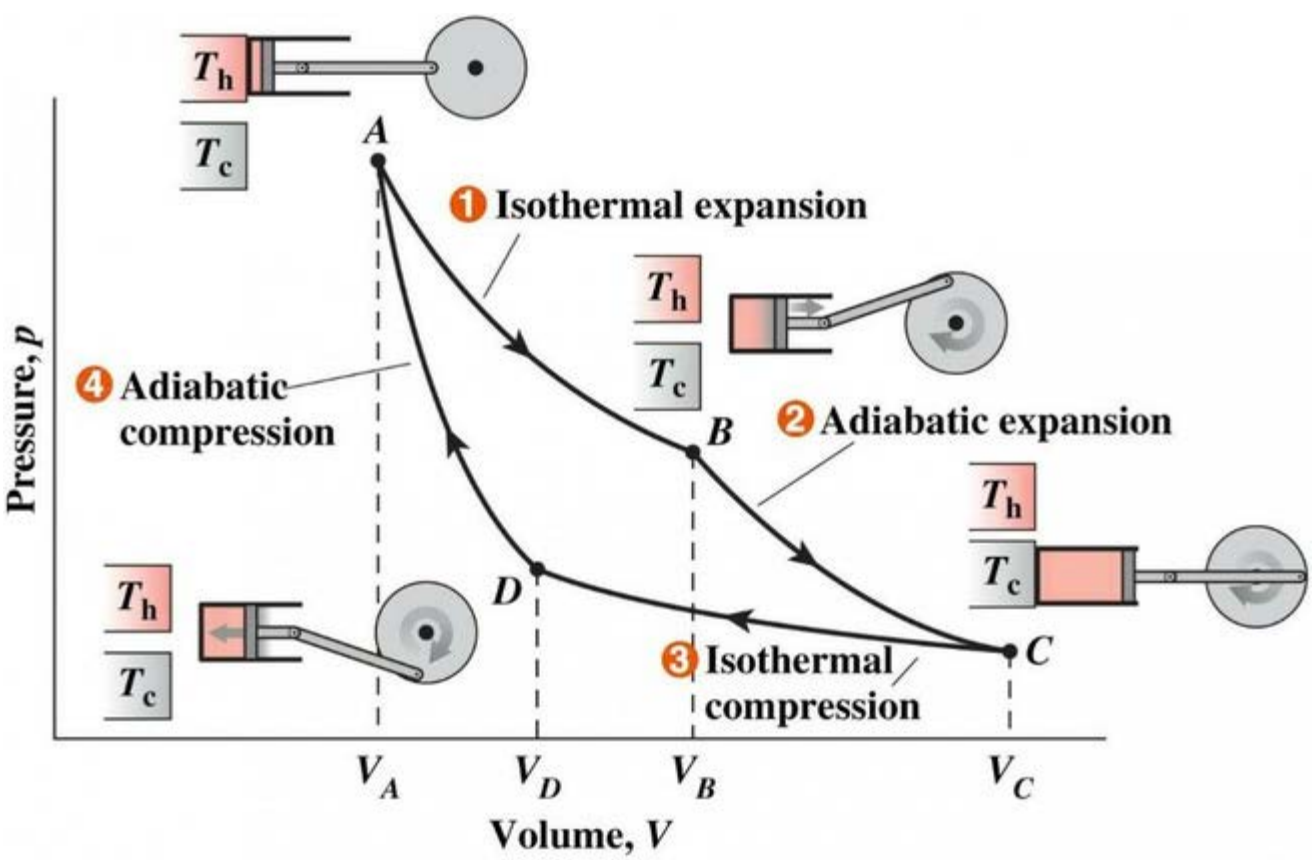

wherein, of note, we can see how the oft-confused term "adiabatic" simply means that the piston is not in contact with either the cold body or the hot body.

Thermodynamics

In 1834, Emile Clapeyron, expanding on the work of Sadi Carnot (1824), began to employ indicator diagrams, in a proto-thermodynamics sense, thereby turning them into what modern thermodynamicists now call "pressure volume diagrams" or PV diagrams, representative of the Carnot cycle. [3]

Quotes

The following are related quotes:

> "Watt had envisaged the principle of expansive operation as early as 1769, and Hornblower, quite independently and at some unknown later date, had hit on the same thing. Hornblower had been the first to patent the principle, in the form of the 'compound engine', and Gilbert had been the first to analyze it theoretically. The theory of the **'indicator diagram'**, which was formulated by Gilbert in 1792, led to the practical invention of the instrument by John Southern in 1796."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 83)

References

1. Low, David A. (1920). *Heat Engines* (ch. XV: Indicators and Indicator Diagrams, pgs. 282-305). Longmans, Green and Co.
2. Hills, Richard L. (1989). *Power from Steam: A History of the Stationary Steam Engine* (pg. 93). Publisher.
3. Pressure volume diagram - Wikipedia.
4. (a) Robinson, John. (1797). "Steam-Engine", *Encyclopedia of Britannica*. Publisher.
(b) Robinson, John. (1818). *The Articles Steam and Steam-Engines: Written for the Encyclopedia Britannica, by the Late John Robinson, with Notes and Additions by James Watt* (§: Letter from Mr Watt to Dr Brewster on the History of the Steam Engine, pgs. iii; §: On Steam, pgs. 1-45; §: On the Steam Engine, pgs. 46-151; §: Appendix by Mr Watt, pgs. 152-80). Edinburgh: Murray.
(c) Robinson, John. (1822). *A System of Mechanical Philosophy, Volume Two* (notes: David Brewster) (quote, pg. 17). Edinburgh, 1822.
5. Babcock, Bruce L. (2001). "The Story of the Steam Engine Indicator" (Ñº), FarmCollector.com, Jul-Aug.
6. LeVan, William. (1901). *The Practical Management of Engines and Boilers, Including Compound and Multiple Cylinder Engines and the Practical Management of Dynamos and Motors* (§12: The Indicator, pgs. 172-94; stethoscope, pg. 173; indicator card, pg. 181). Publisher.

Further reading

â— Wise, M. Norton. (2018). "On the Stories Told by the Indicator Diagram and Carnot Diagrams" (abs), *Endeavour*, 42(2-3):145-56.

θΔics

In hmolscience, **individualism**, aka the "individuality problem", is the view or question of the recognition of the role of the individual in the bigger picture.

A rendition of the **individualism problem**, namely the question of the nature of the individual person (or human) in the bigger scheme of a society, a country, or the universe; which comes in various favors, e.g. if we're all just "molecules", with a human molecular formula, how is my formula or me a as a molecule different from the the rest; a question that teeters on the nature of internal force vs external force issue of movement.

Overview

In individualism, according to English sociologist Paul Ransome, thinkers adherent to this doctrine often are of the view that: [1]

> "Individuals are not just particles of matter in the great social chemistry experiment they are the bearers of a range of political rights and moral entitlements that require adequate means of expression in society."

There are, however, a multitude of errors in this view. The discrepancies in this statement are captured well in the famous opening lyrics to the 1991 single "The Unforgiven" by American heavy metal band Metallica: [2]

> "New blood joins this earth
> And quickly he's subdued
> Through constant pain disgraced
> The young boy learns the rules."

The difference between the two views, i.e. individualism and realism, is that in the first, the so-called "individualist" aims to be an idealist, assuming for example that each "theoretical person" is entitled to certain political and moral rights, which must be allowed to be expressed in society; whereas, in the second, the "actual person" is born into a world with rules, established by the way the universe actually operates, e.g. sodium Na will react strongly and violently with water whereas sodium chloride NaCl won't, and is confronted with reality and is hence a realist and must learn the rules, as the universe actually makes them.

The first of these rules, as modern hard science actually sees things, are as follows:

> (a) A person is a particle of matter, termed a human particle or human molecule.
> (b) Human particles are governed by the laws of chemistry and physics, just as are every other particle in the universe.

Science has found no exceptions to either of these rules. These two starting point rules lead to the conclusion that morality is governed by the Lewis inequality for natural processes, as was postulated over a hundred years ago with German polymath Johann Goethe's 1808 axiom that the moral symbols of the natural sciences are the symbols of the elective affinities, which equates in modern terms to the symbols of chemical reactions governed by free energy

changes.

Free energy | Formation

The nature of individualism, or the uniqueness of the "individual", in the context of modern science, is that each person has a unique "free energy of formation" (human free energy of formation) at birth as well as in their various "states" of existence (see: existence states); these are quantified on human free energy tables, just as are free energies of formation quantified on standard free energy tables.

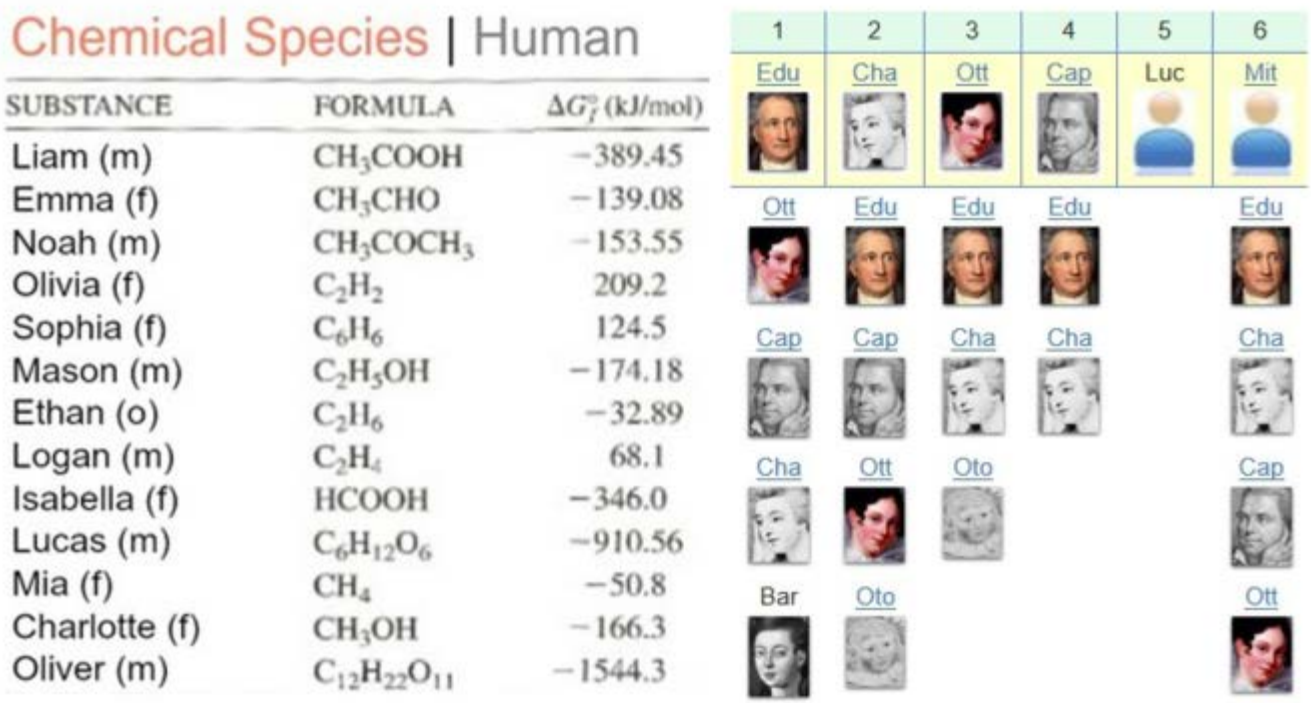

Chemical Species | Human

SUBSTANCE	FORMULA	ΔG_f° (kJ/mol)
Liam (m)	CH_3COOH	−389.45
Emma (f)	CH_3CHO	−139.08
Noah (m)	CH_3COCH_3	−153.55
Olivia (f)	C_2H_2	209.2
Sophia (f)	C_6H_6	124.5
Mason (m)	C_2H_5OH	−174.18
Ethan (o)	C_2H_6	−32.89
Logan (m)	C_2H_4	68.1
Isabella (f)	$HCOOH$	−346.0
Lucas (m)	$C_6H_{12}O_6$	−910.56
Mia (f)	CH_4	−50.8
Charlotte (f)	CH_3OH	−166.3
Oliver (m)	$C_{12}H_{22}O_{11}$	−1544.3

The gist description of how "**individualism**" is quantified and explained in modern physico-chemical terms, i.e. by the measure of each person's free energy in various states of existence.

Goethe (1809) was the first to outline this logic in his making of human affinity table, such as shown adjacent (right). Norman Dolloff (1975) was the first to say that each person has a free energy of formation. Thims (2007) was the first to make "human free energy tables".

References

1. Ransome, Paul. (2010). *Social Theory for Beginners* (social chemistry, pg. 42). The Policy Press.
2. The Unforgiven (song) – Wikipedia.

External links

â— Individualism – Wikipedia.

θΔics

In science, an **induced movement** is one or more dynamic changes in position of an animate structure. The set of combined "induced movements", over a given time-frame, of a person, animal, or molecule, other animate structure, constitute what is perceptually considered as "free will" or choice. The sets of induced movements are the result of drives or motivations of the individual, induced by the force of sensory perception. [1] Said another way, in the words of James Maxwell, stated in 1847 at the age of sixteen: "the only thing which can be directly perceived by the senses is a force".

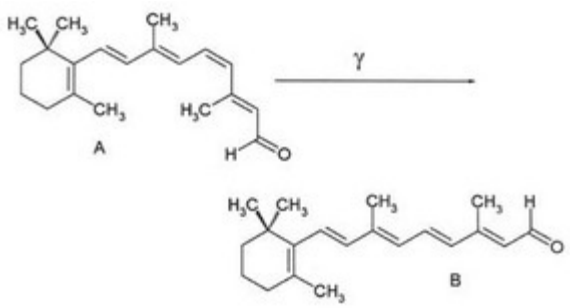

Diagram of **induced movement** (photon-mediated) dynamics (conformational change) of the retinal molecule $C_{20}H_{28}0$ located in the retina of the eye.

The literal meaning of motivation or drive, according to American gifted-children psychologist Florence Goodenough, is "the process of *induced movement*." [2] The description of "induced movement", in small molecules, such as the famous "walking molecules" of American physical chemist Ludwig Bartels, is relatively simple to explain. The description of induced movement for "human molecules", however, is a more difficult description. The basic model, in both cases, can be understood by the description of photon-induced movement in 3-element retinal molecule. [3]

Retinal molecule

The basic model for induced movement or "molecular life", is the movement dynamics involved in the life of the 3-element retinal molecule C20H28O, a light sensitive molecule found in the retina of the eye. If the energy contained in a single photon is of the correct wavelength, between 400 and 700 nm, it will function to break what are called pi-bonds found between the eleventh and twelfth carbon atoms near the kink in the structure of the retinal molecule. When these pi-bonds break, this ‘forces’ the retinal molecule to rearrange into a straightened configuration:

This basic model, in which a molecule is forced to react, i.e. moves dynamically, to a photon or field particle stimulus, is the basic model (poster child) for human molecular life, i.e. for all human behavior. The human molecule, a 26-element molecule, is no different than the retinal molecule, a 3-element molecule; a fact which can be deduced through study of a molecular evolution table. Human chemical reactions will always be exact and repetitive, similar to the bending and straightening actions of the simple retinal molecule. More to the point, the central nervous system of the retinal molecule is no different, complexity aside, than the central nervous system of the human molecule: each CNS is comprised, at its core, of valence shell electron-photon interactions.

This photon induced retinal-bending mechanism, to note, was discovered in 1958 by the American biochemist George Wald and his co-workers; work for which Wald won a share of the 1967 Nobel Prize in Physiology or Medicine with Haldan Keffer Hartline and Ragnar Granit. [4]

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview). Morrisville, NC: LuLu.
2. Young, Paul T. (1936). *Motivation of Behavior – the Fundamental Determinants of Human and Animal Activity*, (ch. 2: “The Energetics of Activity”, pg. 70-73. New York: Wiley.
3. Thims, Libb. (2008). *The Human Molecule*, (section: "Free will", pgs. 59-61). (preview). Morrisville, NC: LuLu.
4. Nobel Prize in Medicine 1967
5. Mahon, basil. (2003). *The Man Who Changed Everything - the Life of James Clerk Maxwell*. Hoboken, NJ: Wiley.

θΔics

In mathematics, an **inequality** refers to a comparison of two variables or formulas that are not are not equal in a numerical sense.

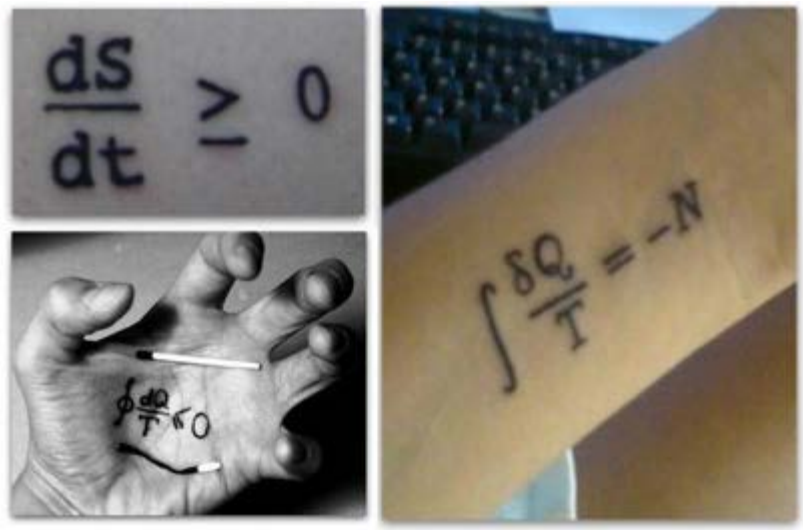

Top (left): a 2009 time derivative *dt* version of the second law showing that positive values of entropy change *dS* will accrue in all natural cyclical processes (dS > 0) at temperatures above absolute zero (at which point dS=0) quantified by the **inequality** notation that the time derivative of entropy change is greater than or equal to (≥) zero; as tattooed on the upper back of a high school physics teacher named Alison. [6] Right: The precursor formulation of the Clausius inequality (1856), which states that for all natural processes the value of N will be greater than zero (N > 0) meaning that uncompensated transformations will accrue in the system at the end of one heat cycle, on the arm of a newly minted 2010 philosophy graduate student. [15] Bottom (left): the circle integral version of the Clausius inequality between a new and burnt match, indicative of the meaning that entropy is the arrow of time.

Overview

The six main inequalities used in thermodynamics are as follows:

a < b | a is less than b.
a ≤ b | a is less than or equal to b.
a â‰ª b | a is much less than b.

a > b | a is greater than b.
a ≥ b | a is greater than or equal to b.
a â‰« b | a is much greater than or equal to b.

History

The inequality was first expressed verbally: such as *aequales*, *aequantur*, *esgale*, *faciunt*, *ghelijck*, or *gleich*, and sometimes by the abbreviated form *aeq*. [1] The mathematical symbols < and > were first employed by English astronomer-mathematician Thomas Harriot in his posthumous 1631 *The Analytical Arts Applied to Solving Algebraic Equations*, in which he stated: [2]

> "The mark of the majority (*signum majoritatis*) as a > b, signifies *a* greater than *b* and the mark of the minority (*signum minoritatis*) to a < b signifies *a* lesser than *b*."

The double bar style of the less than or equal to $\leqq$ and greater than or equal to $\geqq$ signs were first employed by French mathematician and geophysicist Pierre Bouger in 1734. [3] In 1670, a similar reduced single bar notation scheme was employed by English mathematician John Wallis who used single horizontal bar *above* rather than below the inequality signs $\overline{<}$ and $\overline{>}$. [4]

Clausius inequality

The famed "inequality" of the Clausius inequality, the core of the second law of thermodynamics, was introduced at first *only verbally* in 1856 by German physicist Rudolf Clausius who derived the following equality based (=) equation to hold good in every cyclical process: [5]

$$\int \frac{dQ}{T} = -N$$

with the verbal addendum that:

> "In non reversible processes, those in which uncompensated transformations necessarily arise, the magnitude of *N* has consequently a determinable and necessarily **positive value**."

where N is the sum of the equivalence-values involved in the cyclical process. Thus, in mathematical notation, although Clausius, in this year, did not use the inequality (something he began doing in 1862), this would be:

$$|N| > 0$$

and we would have the following version of the Clausius inequality (the version defined by Clausius in 1865):

$$\int \frac{dQ}{T} \leq 0$$

In any event, this seemingly innocuous mention that "the magnitude of N has a positive value" introduced the notion of irreversibility into Newtonian mechanics and the arrow of time into cosmology, thus bring about the thermodynamic revolution and thus the quantum revolution, the latter being a precipitate of the former, and likely several revolutions yet to come.

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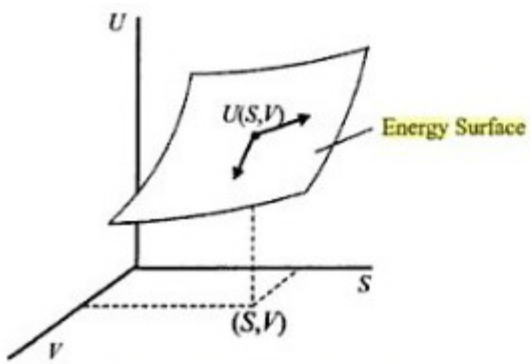

Modern depiction of Gibbs' 1873 energy U, volume V, entropy S energy surface, first made into an actual plaster 3D surface by Irish physicist James Maxwell in 1875.

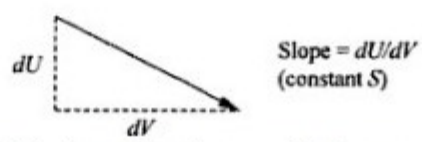

Side view of the downward left arrow, showing that the derivative:

$$\frac{dU}{dV}_S$$

calculates the slope of the tangent of the curve of energy surface at that point.

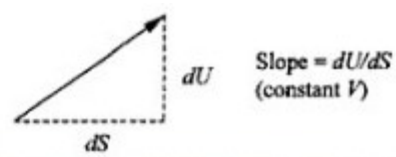

Side view of the upward right arrow, showing that the derivative:

$$\frac{dU}{dS}_V$$

calculates the slope of the tangent of the curve of the energy surface at that point.

Gibbs inequalities

In 1873, American engineer Willard Gibbs began to apply Clausius' inequality methods to the graphical thermodynamic analysis of the behavior of fluids and began to formulate new thermodynamic "force functions" by taking the slopes of various thermodynamic curves, similar to how Isaac Newton calculated the "force" acting on a moving body as the product of the mass of the body by the time derivative (or slope) of velocity change:

$$\mathbf{F} = \frac{\mathrm{d}}{\mathrm{d}t}(m\mathbf{v})$$

In 1876, Gibbs then parlayed this graphical basis into what he called the "general theory of thermodynamic equilibrium" and in doing so formulated five new versions of partial derivative inequalities, in which certain variables are held constant and thus extended the Clausius inequality to more general varieties of systems, such as chemical systems, open systems, electrical systems, etc. The five central Gibbs inequalities are as follows:

Inequality (1876 notation)	**Inequality** (modern notation)	**Description**
$(\delta\eta)_\epsilon \leqq 0$	$dS_U \leq 0$	For the equilibrium of any isolated system it is necessary and sufficient that in all possible variations δ of the state of the system which do not alter its energy ε, the variation of its entropy η shall either vanish or be negative.
$(\delta\epsilon)_\eta \geqq 0$	$dU_S \geq 0$	For the equilibrium of any isolated system it is necessary and sufficient that in all possible variations δ of the state of the system which do not alter its entropy η, the variation of its energy ε shall either vanish or be positive.
$(\delta\psi)_t \geqq 0$	$dF_T \geq 0$ where $F = U - TS$	Where by letting psi ψ represent the available energy [free energy] of the system, expressed by the formula ψ = ε – tη, it is found that for the equilibrium of any isolated system it is necessary and sufficient that in all possible variations δ of the state of the system which do not alter its temperature *t*, the variation of its available energy ψ shall either vanish or be positive. The difference in the two values of available energy ψ for two different states of the system which have the same temperature represents the work which would have to be expended in bringing the system from one state to another by a reversible process and without change of temperature.
$\delta\epsilon \geqq 0$	$dU \geq 0$	The reduced form of the second of equilibrium criterion for systems incapable of thermal changes, whereby we may regard the entropy as having the constant value of zero.
$\delta\psi \geqq 0$	$dF \geq 0$	The reduced form of the third equilibrium criterion for systems incapable of thermal changes, whereby we may regard the entropy as having the constant value of zero.

Gibbs goes on to state that the "suffix letter" (subscript) in each case indicates that the quantity which it represents remains constant. Lastly, and most importantly, Gibbs outlines the basics of the so-called thermodynamic "driving forces" of chemical processes:

> "The quantities '–ε' (negative energy) and '–ψ' (negative available energy), related to a system without sensible motion, may be regarded as a kind of force-function for the system."

The first of these '–ε', Gibbs says, is the force-function for constant entropy, i.e. when the states of the systems under consideration have constant entropy. The second of these '–ψ', he says, is the force-function for constant temperature, i.e. when the states of the system under consideration have constant temperature. The etymology of this term "force function" was addressed by Clausius in his 1875 discussion of the symbol U, which seems to have originated in the 1835 work of Irish mathematician William Hamilton; itself tracing to French mathematician Joseph Lagrange's 1788 'central function', from his *Analytical Mechanics*.

Lewis inequality

See main: Lewis inequality

In 1923, American physical chemist Gilbert Lewis, starting with the foundation of Gibbs inequalities, which he says are applicable to "chemical processes which are in some way harnessed for the production of useful work", introduced a

new inequality as follows:

Inequality (1923 notation)	Inequality (modern notation)	Description
$dF < 0$ where $F = E + (PV - TS)$	$\Delta G < 0$ where $G = U + (PV - TS)$	Whereby "no actual isothermal process is possible unless it meets this condition", which applies to "the far more common case of a reaction which runs freely, like the combustion of a fuel, or the action of an acid upon a metal; or, in other words, a system which is subject to no external forces, except a constant pressure exerted by the environment."

In modern format, assuming that from hence forth we use the term "process" to mean all natural isothermal-isobaric processes that occur on the surface of the earth, such as human chemical reactions occurring between people, what Lewis states here is that:

> "No actual natural process is possible unless it meets this inequality ΔG < 0 criterion."

This is huge statement. Getting directly to the point: any hypothetical relationships will only be possible if the free energy change for the process is less than zero. Next, Lewis goes on to state, similar to Gibbs' description of the two force-functions, that:

> "We may think of the quantity '– ΔF ' as the driving force of a reaction; where, in a thermodynamic sense, a system is stable when no process can occur with a diminution in free energy."

This, again, is a huge statement. Lewis introduce here not only the notion that free energy change is the driving force of earth-bound natural processes, as was described in 1718 by Isaac Newton in terms of respective values of the force of chemical affinity A as being the driving force behind reactions:

Newton notation (1718)	Lewis notation (1923)	Partington notation (1924)	Modern notation (1933)
$A > 0$	$A = -\Delta F$	$A = -\Delta Z$	$A = -\Delta G$

but also introduces the notion of "stability", i.e. that when the variation of free energy for the process or reaction reaches its lowest value, or, as Lewis puts it, when "no further process can occur with a diminution in free energy", the system will be said to be stable, as would be indicated graphically by the lowest point of free energy on the reaction coordinate, as depicted adjacent.

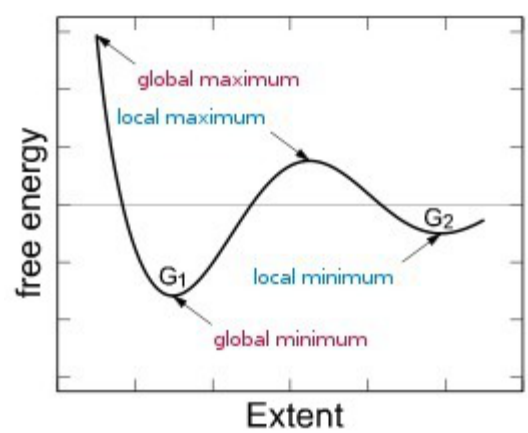

In 1933, English physical chemist Edward Guggenheim, elaborated on this logic as well, and was the one who assigned the symbol G and the name Gibbs free energy, to the isothermal-isobaric inequality for natural processes with occur freely on the surface of the earth, after which it is said that modern chemical thermodynamics was born.

The position of G_1 is such that, in the words of

Lipmann inequality

Gilbert Lewis (1923), "no further process can occur with a diminution in free energy", and is thus representative of a state of maximal stability; whereas the position of G_1 could decrease further in free energy, to the position of state one, and is thus not maximally stable.

In 1941, in his studies of the energetics of frog leg muscle contractions, German-born American biochemist Fritz Lipmann introduced the concept of "coupling" into the inequality, in the sense that weakly non-spontaneous reactions ($\Delta G > 0$) can be coupled energetically to strongly spontaneous reactions ($\Delta G << 0$), in such a manner that the latter can drive the former. In short, using the rule that the various free energy changes for the reactions in a given system can be summed to yield the total system free energy change:

$$\Delta G_{total} = \sum_{i=1}^{k} \Delta G_i$$

Lipmann postulated that as long the magnitude of the free energy changes for the exergonic reactions is greater than that of the sum of the free energy changes for the endergonic reactions, that free energy released from the more powerful reactions will drive the weaker free energy absorbing reactions. Thus, for example, if one spontaneous reaction $(A \rightarrow B)_{SR}$ is mixed with a non-spontaneous reaction $(C \rightarrow D)_{NR}$, such as shown below,

$A \rightarrow B$	spontaneous	$\Delta G_{AB} < 0$
$C \rightarrow D$	non-spontaneous	$\Delta G_{CD} > 0$

then the total system process will proceed, the spontaneous reaction driving the non-spontaneous reaction, as long as: $|\Delta G_{AB}| > |\Delta G_{CD}|$, or in general terms as long as:

$$\sum_{i=1}^{k} |G_{SR}|_i > \sum_{i=1}^{k} |G_{NR}|_i$$

In the decades to following, this "coupling" theory has found nearly universal acceptance and application in the explanation of internal biochemical processes. The extrapolation as to how this applied to coupling in social terms is a nascent subject in infancy, in attempting to explain prevalent seemingly detrimental phenomenon such as nepotism as well as the phenomena of the "multigenerational push", as evidenced in the seven-generation Ivy league pressurized creation of American engineer Willard Gibbs' 1876 *Equilibrium*, written quickly in a period of three years, during which time, as he says, "I had no sense of the value of time, of my own or others, when I wrote it", and as exemplified by American economist Paul Samuelson's famed 1947 Nobel Prize winning PhD dissertation-turned-book *Foundations of Economic Analysis* that he wrote quickly in the pace of one year, because, as he says, "I was a young man in a hurry, because I felt the limited lifetime of may male ancestors tolled the knell for me." [13]

Gibbs-Bogolyubov inequality

The term Gibbs-Bogolyubov inequality refers to the work of Russian mathematical physicist Nikolay Bogolyubov who sometime towards the mid 20th century introduced a quantum mechanical version of one of Gibbs inequalities. The Gibbs-Bogolyubov inequality, supposedly, takes something of the form of: [12]

$$F_2 - F_1 \geq \langle U_2 - U_1 \rangle_2$$

which relates the Helmholtz free energies *F* of two systems that share a common phase space and are at the same temperature *T*, but whose Hamiltonians differ by $U_2 - U_1$; the angle brackets ⟨ and ⟩ signifying "average value".

Chemical reactions

At this point, we interject to answer the age old question: why do some reactions take place on their own accord while others do not? The inequality sign is the physical chemistry answer to this question. The answer is that reactions that take place on their own have a free energy change (ΔG or ΔF) that is less than '<' zero, a principle that was established, based on the Gibbs inequality (1876), which itself was based the Clausius inequality (1856) in the 1882 paper "On the Thermodynamics of Chemical Processes" by German physicist Hermann Helmholtz.

K_{EQ}	ΔG° (kJ/mol)
0.001	17.1
0.01	11.4
0.1	5.7
1.0	0
10	−5.7
100	−11.4
1000	−17.1

A tabulated view of the nature of the greater than > or less than < zero **inequality** aspects of the standard Gibbs free energy change ΔG° and equilibrium constant K_{eq} quantification methods of reactions, expressed by the van't Hoff equation, $\Delta G^\circ = -RT \ln K_{eq}$, for a generic reversible reaction, e.g. A + B â‡Œ C + D, where a large positive equilibrium constant (ΔG â‰ª 0) signifies a reaction that goes strongly, completely, and spontaneously in the forward direction towards the formation of products. [7]

Spontaneity criterion

See main: Spontaneity criterion

The much greater than (a â‰ª b) or much less than (a â‰ª b) notations are sometimes used to depict levels of spontaneity in the quantification of chemical reactions, according to the following rule:

- The notation ΔG â‰ª 0 (as compared to ΔG < 0) means that the free energy change for the process is *much* less than zero and will thus be greatly spontaneous.
- The notation ΔG â‰« 0 (as compared to ΔG > 0) means that the free energy change for the process is *much* greater than zero and will thus be greatly non-spontaneous.

This much greater than and much less than notation is thus greatly relevant to the processes involved in actions of human existence, such as in falling in love or spontaneously completing a masterpiece, both of which being processes quantified by ΔG â‰ª 0, which contrasts to relationship states or destruction or weakly happening processes that may be near the break-up point ΔG < 0, at the breakup point ΔG = 0, past the break up point ΔG > 0, or much past the break up point ΔG â‰« 0.

This can be expressed in terms of an equilibrium constant, or the ratio of the concentrations of products to reactants. In a reactive system of 100 single men A and a 100 single women B, each sex assumed to be the same generic type of molecule, for instance, the pairing reaction would have the form:

A + B â‡Œ AB

and the equilibrium constant for this reaction would be:

$$K_{eq} = \frac{[AB]}{[A][B]}$$

Hence, if the value of ΔG° is negative (K_{eq} positive), termed an exergonic reaction, then the reaction will proceed from left to right, and the more negative the value of ΔG°, the further towards the right will the reaction proceed. If the value

of ΔG° is positive (K_{eq} negative), termed an endergonic reaction, the reaction proceeds in the reverse direction as written or from right to left.

Sodium spontaneity

A classic example to help visualize the nature of the inequality differences between the two types of free energy changes, i.e. those greater than zero as compared to those less than zero, is the difference between the reactions that occur when (a) sodium chloride NaCl, otherwise known as table salt, is put in contact with water H_2O as compared to (b) when sodium Na is put in contact with water H_2O.

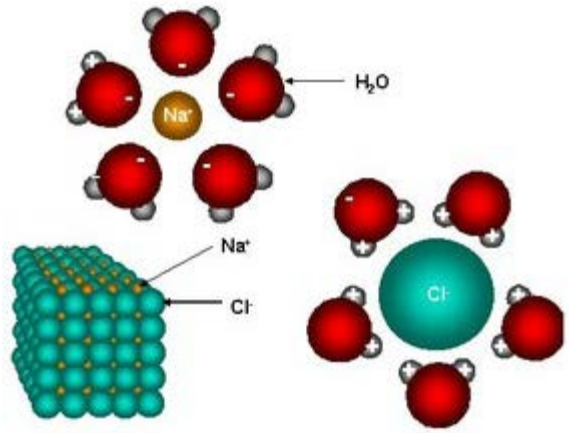

Sodium chloride NaCl put in contact with water H20 after which a solvation-type dissolution reaction occurs.

In the first scenario, a lightly energetic dissolution reaction will occur owing to the fact that the ionic bonds that hold Na to Cl are weak and will easily break when NaCl is put in contact with water. The reaction is not favored enthalpically (ΔH=4kJ/mol), but is favored entropically, i.e. favored not in a heat sense, but yest in an ordering sense.

To explain this, the solvation process will be thermodynamically favored only if the overall Gibbs energy of the solution is decreased (ΔG < 0), compared to the Gibbs energy of the separated solvent and solid (or gas or liquid). This means that the change in enthalpy minus the change in entropy (multiplied by the absolute temperature) is a negative value, or that the Gibbs free energy of the system decreases. Enthalpy of solvation can help explain why solvation occurs with some ionic lattices but not with others. The difference in energy between that which is necessary to release an ion from its lattice and the energy given off when it combines with a solvent molecule is called the enthalpy change of solution. A negative value for the enthalpy change of solution corresponds to an ion that is likely to dissolve, whereas a high positive value means that solvation will not occur. It is possible, however, that an ion will dissolve even if it has a positive enthalpy value (ΔH=3.88 kJ/mol, for sodium chloride solvation), whereby the extra energy required comes from the increase in entropy that results when the ion dissolves (ΔS > 0). [11]

In the second scenario, a powerful volume-expanding explosive reaction will occur in which a mixture of solid and liquid is transformed into a mixture of liquid and gas, during which process strong covalent bonds are broken in the water molecule by the strong affinity of sodium for oxygen, as a result of some of the hydrogen atoms are displaced from their former attachment to the oxygen to form hydrogen gas $H_2(g)$.

$$2Na(s) + 2H_20\,(l) \rightarrow 2NaOH(aq) + H_2(g)$$

0	-237 kJ/mol	-418k kJ/mol	0

By looking up the standard free energies of formation for each of these entities, in this case Helmholtz free energies of formation are listed (bottom row), we can then calculate the free energy change for this reaction to determine its predetermined level of energetic spontaneity, which is calculated to be -359 kJ/mol, and thus we say that the reaction is high spontaneous (ΔF â‰ª 0).

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(b) Entropy generation (tattoo) – full picture.
(c) Quote: "equation describing entropy, symbolizes destruction, simply stating that this fundamental breakdown of systems and accumulation of disorder either increases or stays the same over time, but never decreases."
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15. (a) The equation shown uses a modern variation of German physicist Carl Neumann 1875 notation for the inexact differential, of little Greek delta δ.
(b) Equation on arm was taken from the mathematical descriptions section of the Wikipedia on second law of thermodynamics article, as was added by American chemical engineer Libb Thims on 18 Sep 2006.
(c) Zimmer, Carl. (2010). "Graduating into Entropy", Discover Magazine Blog, May 02.
(d) The Second law of Thermodynamics (05 Apr 2010) – GeekyTattoo.com.

External links

â— Inequality (mathematics) – Wikipedia.
â— Clausius-Duhem inequality – Wikipedia.

θΔics

In thermodynamics, **inexact differential** is defined such that the integration of the differential "depends" on the path between end points (see: path dependent). [1] Differentials that do not fit this criteria are called exact diffferentials. Synonyms of inexact differential include “imperfect differential”, or “incomplete differential”, among others.

History

The subject of the exact and inexact differentials seems to be unique to the science of thermodynamics; introduced in the 1858 article “On the Treatment of Differential Equations which are not Directly Integrable” by German physicist Rudolf Clausius, later used an introductory section to the first (1865) and second (1875) editions of his thermodynamics textbook *The Mechanical Theory of Heat*. [2]

The symbol Ä‘ (d-crossbar), or δ (in the modern sense), originated from the work of German mathematician Carl Neumann, specifically in his 1875 *Lectures on the Mechanical Theory of Heat*, indicating, as Clausius did, that δQ and δW are path dependent (inexact differentials), whereas internal energy *dU* is not (exact differential). [3]

German physicist Georg Helm seems to have been the first to point this origin out, specifically in his 1898 *History of Energetics*, wherein he comments Neumann was the one that suggested that the special differential sign $\bar{d}Q$ (d hat Q) should be used as a way of always keeping in mind the differentials, such as heat, that do not fit the condition for an exact differential. [4]

Note: the original German text needs to be checked to see if it is $\bar{d}$(d-hat) or Ä‘ (d-crossbar), although the Helm references seems to indicated the former was used.

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External links

â— Inexact differential – Wikipedia.

θΔics

In genius studies, **inflated IQ**, abbreviated "IIQ", related to IQ miscalculation, "feigned IQs", IQ overestimates, contrived IQs, fool's gold IQ, overzealous IQs, faked IQs, snake oil IQs, scam IQs, fictional IQs, propaganda IQs, disingenuous IQs, etc., as compared to as compared to a "real IQ", true IQs, or genius IQs, etc. refers to a genius level intelligence quotient (IQ), i.e. those above 140, purported to be possessed by someone who is not a genius, not at the genius level purported to be, but claims to be or is sold as such, and or childhood age ratio based potential IQs sold as real IQs in adulthood.

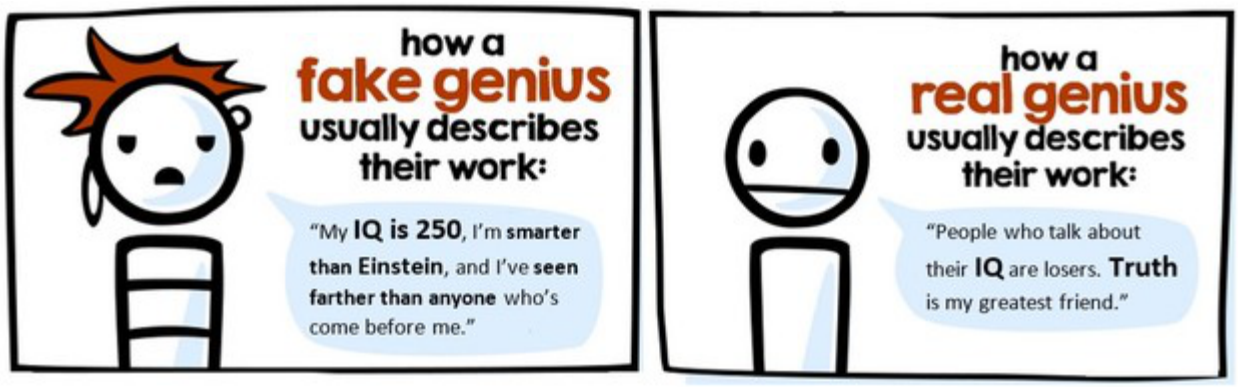

A caricature of "real genius", based on quotes by Hawking and Aristotle, respectively, and **"fake genius"**, based on quotes by Rick Rosner, Christopher Langan, and Marta Rodiguez, respectively.

Abbreviation

The notation (IIQ:#|#), e.g. Ronald Hoeflin (IIQ:190|#26) indicates an individuals highest inflated IQ and their position ranking in the top 35+ famously inflated IQ listings (below)

Table

The following are a mishmash of so-called "high IQ testers" said to have, or have claimed themselves to have, genius-range IQs, but as of yet, without noted accomplishments to verify or rank accordingly their genius-range IQ claims:

	Person	IQ purported	Actual IQ	Discussion
1.	Adragon De Mello (1976-)	IQ_R=400 (age 5)		An extreme forced prodigy; at age 11, completed BA in computational mathematics at University of California at Santa Cruz (see: youngest college graduate); IQ calculated by father.
2.	Ainan Cawley (1999-)	IQ_R=349 (age 7) IQ_R=263		Passed the O level exam (in chemistry) at 7 years and 1 month old, with a score of "C" (the average grade, supposedly, because he had studied the wrong syllabus, owing to a misunderstanding about which exams he would be taking); forced prodigy scenario; IQ calculated by father.
3.	Michael Kearney (1982-)	IQ_R=325 (age 4) IQ_O=200 (age 14)		An unusual forced prodigy scenario; at age 10, completed BS in anthropology from the University of South Alabama (see: youngest college graduate); IQ calculated by father.
	Maria Dos			A laundry worker who, supposedly, was studied and tested by a psychologist De Ribera (1992), at the University of Sao Paulo, Brazil, who assigned her with an IQ of 307; she adds up laundry numbers,

4.	Marinos (1941-)	IQ_O=307	memorizes birth dates, and home addresses of customers to amuse herself; and has learned French, Chinese, and Italian from co-workers; but has had no formal education; Most likely fake, joke, or humor (Q)?
5.	Marnen Laibow-Koser (1975-)	IQ_R=268	
6.	Evangelos Katsioulis (1976-)	IQ_O=258, 205 IQ_O=180	Founder of the so-called “World Intelligence Network”, whose online magazine (2006) explains that “spirit is the vital principle which gives the physical organism life, in contrast to its material components”, citing Pierre Teilhard as justification (Q), was listing himself as IQ of 180-205 [2]; a YouTube page lists him as IQ=258 [3]; quote (2011): “I created my high IQ societies and the World Intelligence Network, in order to host spiritual and human interactions in a safeguarded, morally respectful environment.” (Q)
8.	Avi Ben-Abraham (1957-)	IQ_O=250	The guy who famously fake an age 18 MD degree, was boasting that his: “His IQ is so high that it cannot even be measured”, that he had “mastered relativity at age 7”, and that his "estimated IQ is around 250" (Q)(Q)(Q); generally done for social connectivity reasons, in the drug funding area, or something along these lines.
9.	Rick Rosner (1960-)	IQ_O=250 IQ_M=180-200 IQ_R=140 (age 18)	Huge downgrade for (a) going back to high school at age 25, (b) being an IQ test junky, (c) publicly boasting of having a 200-range IQ, etc.
10.	Marilyn Savant (1946-)	IQ_G=228 IQ_M=186 (age 39) IQ_O=127 (age 7) IQ_O=167 IQ_R=157	Huge downgrade for (a) knowingly publically faking a 228 IQ, based on falsified records of age-contrived Stanford-Benet test ratio IQ score (sent to Guinness for the purposes of self-promotion), for nearly three decades now, and (b) never having produced anything of intellectual note, other than being a newspaper columnist (a job she landed based her falsified IQ fame), and (c) being a IQ test junky (and IQ test maker).
11.	Visalini Kumaraswamy (2000-)	IQ_O=225 (age 9)	Since 2009, news sources in India have been boasting of her having a 225-level IQ, per reason that she passed some computer programming certification tests (Q); linked (Q) profiles, describing her as such, etc.
12.	Marta Rodiguez (1969-)	IQ_O=218 (age 6)	Someone calculated her IQ at age 6 (Q); Quote: “I have an IQ of 218, that of Einstein was 180” (Q).

13.	Gena Leung (1983-)	IQ_R=210	At age 5, began to teach other children how to read; at age 11, scored 730 SAT-M; Quote: “assessment on the Stanford-Binet L-M, two weeks after her tenth birthday, revealed a mental age of 21 years and thus a ratio IQ in excess of 200”; and was studying French, Latin, and Japanese. Completed her university entrance math qualifications at age 13; at age 16, was a certified violinist and also a member of the five person Australian team that competed in the International Physics Olympiad; Was diagnosed with depression at age 18, placed on medication, and withdrew from school for a year; at age 20, completed a three-year bachelor of medical science degree.
14.	Nathan Leopold (1904-1971)	IQ_O=210, 206-200	Downgrade for delusionally believing himself to be a Nietzsche uberman (IQ=183+) and for attempting a kidnapping-murder-ransom heist to prove this.
15.	Christopher Langan (1952-)	IQ_O=210, 195, 190 IQ_M =174, 190	Huge downgrade for (a) being an IQ test addict, (b) vocalizing his opinion that he "has seen farther than anyone who has come before him, and (c) being an intelligent design theorist.
16.	Michael Grost (1954-)	IQ_R=200 (age 8)	A forced prodigy scenario.
17.	Sho Yano (1990-)	IQ_O=200 (age 10)	
18.	Dylan Jones (1992-)	IQ_O=200 (age 10)	Entered engineering school at age 10 (Colorado School of Mines); photographic memory; able to recite pi to the 500 places and e to 100 places; completed BS in mathematical and computer science at age 16, with a minor in bioengineering and life sciences; entered medical school age 17, with aims (as of 2009) to become a neurosurgeon, board certified by age 28.
19.	Naida Camukova (c. 1976-)	IQ_O=200	Started talking age 1, learned to read and write at age 2; age 14 was enrolled in both Moscow State University (history) and Daghestan State University (literature); began medical school at age 9 (or 15); speaks seven languages; age 25 became professor of history and literature; has published 25-books and read 3000 books; with photographic memory (able to remember even comma placements in books); only child of a neurosurgeon mother and lawyer father; had brain hemorrhage at age 23 (was in coma for 20-days) (Wikipedia) (Facebook), declared the world’s most intelligent person by the Moscow Institute from Brain Research; **Note:** According to a number of reports, she said to be running some type of genius scam racket to get swindle millions of dollars for her associated organization? (IQ=199.37) (Q);

20.	Edith Stern (1952-)	IQ_O=200, 201-203	A curious forced prodigy, who turned out relatively health.
21.	Christopher Harding (1944-)	IQ_O=200 IQ_G=196-197	Quote: “In Australia, I was fortunate to come into contact with and employ one of the then three most intelligent people in the world, Chris Harding. This trio all had IQ's over 200, well off the Stanford/Binet scale” (biographical writings of Allan Skertchly).
22.	Daniel Simidchieva (c.1955-)	IQ_O=200,193	[12]
23.	Jim Diamond (c.1945-)	IQ_O=200 IQ_O=160+	A retired magician who runs MegaGenius.com where he claims to be the "man with the perfect IQ" (Q) and sells how-to-be-a-genius videos; claims his IQ at 160+ (Q). Boasting that his IQ score of 200+ was achieved under the strictest conditions using the best IQ testing system in the world.” (Q); supposedly scored “very superior” or three standard deviations above the mean (IQ=145) on the Wechsler Adult IQ test (which has a max IQ score of 155) (Q), but he boasts that this equates to 200+, so to sell his online products.
24.	Garry Kasparov (1963-)	IQ_O=190-185 IQ_P=135	
25.	Philip Emeagwali (1954-)	IQ_O=190	Smartest man ever? (Q); Genius or Crook? (Q); quote: “IQ is too high to be measured on conventional tests.” (Q); “reported by Sahara reporters as having an IQ of 190” (Q).
26.	Ronald Hoeflin (1944-)		Claims: 164 or "125 to 175, depending on which cognitive abilities they're tapping into", or 190 “on a good day”, in his own words.
27.	Bobby Fischer (1943-2008)	IQ_{SB}=187-180	Scored 180-187 on the Stanford-Binet at about age 15 (1958) at Erasmus Hall High School, Brooklyn, prior to dropping out and becoming the world's leading chess player. [2]
28.	Merrill	IQ_O=182 (age	AB in music from Yale in 1945 (age 14) and MD from Western Reserve University School of Medicine in 1956 (age 25); Quote:

	Kenneth Wolf (1931-2011)	14)	"[Merrill Kenneth Wolf]'s of 182, which is only 23 points lower than Einstein's [IQ=205]". [10]
29.	Kevin Langdon (c.1940-)		Langdon claimed, supposedly (Q), that his Adult Intelligence Test had a ceiling at the one-in-a-million level, i.e. 176 IQ [or 171 using the academic-standard 15-point-per-standard-deviation system], or 4.75 standard deviations above the mean.
30.	Grady Towers (1945-2000)	IQ_M=176+	A former child prodigy who almost completing a PhD in anthropology at age 20; Mega Society member, with claimed IQ of 176+ (Q), author of "The Outsiders" (1987) (Q) on William Sidis.
31.	Pranav Veera (2003-)	IQ_R=176 (age 6)	[6]
3#.	Judith Polgar (1969-)	IQ_O=170	
3#.	Jacob Barnett (1999-)	IQ_O=170	Quote: "12-year-old Jake is studying electromagnetic physics at Indiana University-Purdue University Indianapolis and has an IQ of 170." [8] Said to be doing work on Einstein's relativity theory.
32.	Victoria Cowie (2000-)	IQ_O=162	[5]
33.	Colin Carlson (1997-)	IQ_O=160	In 2014, began posting occasionally in Tumblr blog entitled "Formerly Child Prodigy" (Q), describing himself as "I'm 18, I've published a letter in Science and am a Ph.D. Student at UC Berkeley", where he talks about *Good Will Hunting*, prodigy burn (Q), and other issues. [4]
34.	Oscar Wrigley (2007-)	IQ_O=160	[7]
35.	Elise Tan-Roberts (2007-)	IQ_O=160	[7]

(add)

Overview

It has been estimated, based on data of test scores of various accelerating learning centers, that child psychologists, using standard ratio IQ test methods, miscalculate children to have IQs in 200 to 220 range, at a rate of one child per three US state region, every two year period, approximately. These, to note, are not exactly "fake IQs", but rather calculation over-estimates that get fed into children's minds, some of which get passed into the media, by parents, in hopes of getting scholarships, funding, and what not, above standard education.

Four video-recorded examples of people with "**feigned IQs**", i.e. simulated or pretended IQs, claimed in to be in the IQ: 200+ range, i.e. in the da Vinci or above genius level range (see: Cox-Buzan IQ), per top 500 geniuses ranking standards, namely: Indian Visalini Kumaraswamy (2000-) (Q), Rick Rosner (1960-) (Q), Evangelos Katsioulis (1976-) (Q), and Marilyn Savant (1946-) (Q), all of whom are **intellectual nobodies**, in historical retrospect genius accomplishment terms.

Terms related and or synonymous to feigned IQs are: snake oil IQ, fake IQ, overzealous IQs, scam IQ, fool's gold IQ, showboater IQ, news media IQ, age ratio overestimates or miscalculations, etc., refers to someone who claims, sells, or is cited as having a high-end, over-the-top, overestimated, and or mis-calculated genius IQ score, of 140 or above, of themselves or someone else (e.g. a parent), for monetary (e.g. Diamond, c.2000), marketing (e.g. O'Brien, 2014), publicity (e.g. Savant, 1986), vainglory, or self-aggrandization (e.g. Katsioulis, c.2010); a fake IQ is akin to someone selling snake oil in olden days. The tagline "smarter than Einstein" generally accompanies the faked IQ. [8]

In 1916, Lewis Terman, building on the earlier childhood intelligence studies of Alfred Binet (1899), Theodore Simon (c.1890), and William Stern (1912), invented the modern concept of "IQ" via the following formula:

$$IQ = 100\frac{MA}{CA}$$

where MA is "mental age", i.e. age determined by normal score on some test designed for a certain age, and CA is chronological age, i.e. the actual age of the child, young adult, or person (see: Terman IQ; ratio IQ). The formula for its original intended purposes, i.e. testing for idiocy in children, seemed to work generally well. When, however, a child is testing at double their age, the formula gives "screwy" results.

The most-famous of these "IQ miscalculations" is Terman's 1917 calculation of Francis Galton's IQ. Specifically, based on the fact that Galton in 1826, at age 4, could to the following: read any English book; say all the Latin substantives and adjectives and active verbs; "read fifty-two lines of Latin poetry; add and multiply numbers 2 to 11; say the pence table; read a little French; and know the clock", which is what the average eight year old, during this period, could do, Terman calculated Galton's age four IQ as follows:

$$IQ_{Galton_{age4}} \cong 100\frac{8}{4} = 200$$

> “From the evidence given, one is justified in concluding that between ages of three and eight years, at least, Francis Galton must have had an intelligence quotient (IQ) **not far from 200**.”
>
> — Lewis Terman (1917), “The Intelligence Quotient of Francis Galton in Childhood” [9]

In 1926, to compound matters, Catherine Cox, Terman's graduate student, published the calculated IQs of the top 300 geniuses (see: Cox IQs), from the best of the Cattell 1000, among which, e.g. the IQs of Gottfried Leibniz, Isaac Newton, and Leonardo da Vinci, were determined to be: 205, 190, and 180, respectively. Accordingly, based on these Terman (1917) and Cox (1926) calculations, we are led to believe, according to these psychologists, that Galton was smarter than Newton AND da Vinci, and that Leibniz was smarter than all three? This is an example of calculations leading to **nonsense results**. Whatever the case, a cottage industry of psychological IQ testing arose in the century to follow. Four year old children could now take eight year old IQ tests, and go on to boast, for their remaining days of existence, that their IQ is up in the 200 range and that they are smarter than Newton, Einstein, or Hawking.

The most-famous of these feigned over-the-top estimated IQ calculations is that of the 1981 IQ calculation of the five-year-old Adragon De Mello (1976-) (Q) by his father Agustin de Mello, who reasoned that since his son, at age five, could pass an intelligence test designed for a twenty-year-old, that his son's IQ was 400:

$$IQ_{Mello_{age5}} \cong 100\frac{20}{5} = 400$$

> **“**Agustin tested AD's intelligence when the boy turned five. He calculated an **IQ of 400**, meaning AD might rank as the greatest intellect in history.”
>
> — Kurson Robert (2002), “Just Another Father-Son Story” [10]

In short, in the 20th century, the selling of people as presumed and or certified "geniuses", per some age-based ratio IQ calculation score, on some simple one or two hour test, has led to the phenomena of people selling faked of feigned genius IQs like people of the 19th century used to sell snake oil as a kind of fix-all, albeit one without potency.

The prodigy burn out ratio, to note, i.e. the number of geniuses, that one might remotely hear about, per batch of 100 child prodigies, according to Israeli-American violinist Itzhak Perlman (c.1990), is a 1-to-50 ratio, “for every child prodigy that you know about, at least 50 potential ones have burned out (see: thermal word) before you even heard about them.” In other words, for every 50 potential prodigies a child psychologist tests to have a potential IQ in the extreme genius range, you might only end up hearing about one of these, and maybe, centuries later, only a handful of these one's we hear about make it into the top 500 geniuses range.

High IQ society | Scams

In 1948, Roland Berrill and Lancelot Ware invented the Mensa Society as a so-promoted "intellectual

The WORLD'S smartest human has an I.Q. of 307 — and works in a laundry!

By BEATRICE DEXTER
Correspondent

Psychologists say they have discovered a middle-aged laundry worker who may be the smartest person in the world — with an I.Q. that is an incredible 79 points higher than the current world record holder.

Chunky mother-of-four Maria Dos Marinos, 51, racked up a super-high I.Q. score of 307 on tests conducted by the University of Sao Paulo in Brazil. Scientists say that they've never seen anyone with such incredible brainpower.

"She has had no formal education whatsoever, but she was taught to read, write and do math by her eldest son," said Dr. Ignacio de Ribera, who has studied the woman at length since she was discovered last October. "Her mind is as fast as a computer.

"When we first tested her she went right off the top of the charts. We couldn't believe what we were seeing. This woman is a walking wonder."

Scientists would never have known about Mrs. Dos Marinos if the woman hadn't volunteered for a research project at the university. When preliminary tests revealed that she was a genius, excited scientists signed her up for a sophisticated battery of I.Q. measurements — and found out she was more brilliant than they'd ever imagined.

"Marilyn Mach vos Savant of St. Louis in the U.S.A. has an I.Q. of 228, and until we discovered Mrs. Dos Marinos she was acknowledged to be the smartest person in the world," said Dr. de Ribera. "Now we think we've found someone who is much, much more intelligent.

"The amazing thing is that Mrs. Dos Marinos shows no outward signs of her incredible mindpower. She leads an ordinary life, works an ordinary job and the woman socializes with ordinary blue-collar workers."

According to the psychologist, the only signs of the Brazilian genius' super intelligence are her hobbies. The laundry worker adds up laundry numbers to amuse herself, memorizes the names, birth dates and addresses of every laundry customer and has learned French, Chinese and Italian from co-workers.

"Mrs. Dos Marinos is very shy and will not comment publicly on her incredible talents," said Dr. de Ribera.

"But we hope our studies of her brainwaves and intellectual abilities will eventually help us understand the nature of genius."

GENIUS Maria Dos Marinos has an I.Q. of 307, but she has never even gone to school.

Feigned IQ: 307

This man has the world's highest IQ

OVER-QUALIFIED Christopher Harding has an IQ of 197 but hasn't worked in five years. Most of his time is spent with his computer.

Feigned IQ: 197

Two 1990s *Weekly World News* clippings of Christopher Harding (1945-) and Maria Dos Marinos (1941-) cited with **feigned IQs** (or faked IQs) of 197 and 308, respectively. [13]

In 1966, Christopher Harding (1945-), pictured adjacent, was listed in the Guinness Book of World Records (see: Guinness Book IQ), under the category, "The Smartest Man in the World", listed with an IQ of 197; in 1974, Harding founded the International Society for Philosophical Enquiry; about the third oldest high IQ society (IQ:146+).

In 1982, Ronald Hoeflin invented the "Mega Society", schemed as a intellectual grade above the Mensa Society, acceptance based on a score in Hoeflin's "Mega Test", designed, by him, to test people with IQs of 145 and above. Sometime thereafter is when the era of "IQ feigning" began.

In 1986, American Marilyn Savant famously sent in age-fudged IQ test records, test taken at age 10 (actual age 11-years 4-months), using the Lewis Terman's age ratio IQ formula, into the Guinness Book company so to thereby get her name listed in the "highest IQ" category with a Guinness Book IQ of 228.

In the 1990s, high IQ culture associates Christopher Langan (1952-) and Rick Rosner (1960-) were selling themselves as IQ 200 range geniuses, based on their scores of taking and retaking the so called Mega Test.

Faked IQs

In 2002, Elizabeth Chapman was fabricating the intelligence score of her son, Chris (or Justin) Chapman (1996-), to be IQ at 298 to the media; her child was removed after he attempted suicide a year latter.

In 2014, Irish-born American Walter O'Brien (1975-) was reporting to news media outlets, i.e. "using his IQ as a marketing element", that at age 9 (Q) or age 14, depending on source, he scored an IQ of 197 on some intelligence test, administered by one of his primary school teachers, but he did not keep the paperwork, thereby giving the tagline conclusion that he was the "forth smartest person in the world". Investigations into these taglines led him to be labeled a "fake" brilliant inventor. [1]

Quotes

The following are related quotes:

> "At age four, two psychologists and one sociologist gave Michael Kearney the Stanford-Binet IQ test (L-M version), a test designed for highly-gifted children age six and above. Michael scored 168, the ceiling of the test. Michael's parents, Kevin and Cassidy, in their own words, "discovered in the library that the Stanford-Binet L-M version test gives a mental age which can be ratioed with chronological age for a true IQ … Kevin and I did the math and came up with Michael's **IQ at 325**."
>
> — Cassidy Kearney (c.2009), on her son Michael Kearney

"No, my IQ is **NOT really** 156. It's decent – around 130 according to my 1987 SAT score, 1993 GRE and a few other tests that correlate well with IQ's – but nowhere near the above score. A score of 156 is almost two full standard deviations above my **real score** – or about the same spread that separates someone who qualifies for Mensa from a person with an IQ of 100. I figure online tests like these are designed to flatter the people who take them, encourage them to come back for more and view ads, pass on personal info, subscribe to email lists etc. It bugs me because **it's dishonest** about something I do take pride in. I LIKE being smart, but **I prefer being honestly bright to being dishonestly brilliant**. I mean ego stroking is nice – I've yet to find an honest compliment that I didn't appreciate – but when it is **disingenuous**, it is worse than a criticism. It is, in fact, **an INSULT to the very intelligence that it purports to praise**."

— Anon (2010), "Pet Peeve: Inflated IQ Scores" (Q), Mar 05

"Actually, Adrian Seng is Terence Tao (Q). A book about gifted kids written by Miraca Gross (Q) included biographies of real-life gifted children but she changed their names. Terence Tao's name was changed to Adrian Seng. I disagree with your inclusion [actually not included] of chess champions, Go champions, and idiots who supposedly did well on those **fake 'Ultra-High IQ Tests'** (e.g. Widsten [IQclaim: 175+] (Q), Lygeros [IQclaim:189] (Q), Gunnarsson [IQclaim: 235] (Q), Schuessler [IQclaim: 185] (Q), etc.). These **idiots** haven't achieved anything that matches their **inflated IQs**. One person I suggest you include is Michael Grost. He was a true genius who achieved honorable mention on the incredibly difficult Putnam exam (the same one that Reid Barton won 4 times) at the age of 13. Also, include Gabriel Carroll. This guy probably has a > 200 IQ. Lastly, I'm pleasantly surprised that you know Wei-Hwa Huang. We really should talk because I know a lot of the people on your list."

— American Anon (2011), "Top 50" (Q), IQ:200+ thread (post #11), poster from Richmond Virginia, Mar 14.

See also

- Genius IQ candidates
- IQ 200 or above impossible
- IQ:200+ HCT prodigies

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θΔics

In science, **infodynamics**, a portmanteau of information theory (or information) + thermodynamics, which refers to, as summarized by Peter Corning, efforts to incorporate information theory into the thermodynamics paradigm. [1]

Overview

The term "infodynamics" is a coining that originated in the 1993 work of American zoologist Stanley Salthe. [8] Salthe, to notes, seems to employ a large number of information/thermodynamics blended terms in his writings. [4] In his 2001 symposium article "What is Infodynamics?", Salthe states: [2]

> "My definition of **infodynamics** (meaning 'information dynamics') is the study of the accumulation of information constraints, as degrees of freedom, during the development of dissipative structures."

In 2003, Salthe defined infodynamics as such: [7]

> "**Infodynamics** is a developmental perspective that animates information theory by way of thermodynamics. The isomorphism between Boltzmann's statistical interpretation of physical entropy as disorder and Shannon's formulation of variety as informational entropy signals a deep connection between information and entropy production."

American socioeconomic ecologist Peter Corning describes Salthe as a leader of the 'infodynamics school' (see: schools of thermodynamics). [1]

In 2012, Ray Mansuri, published *Infodynamic Psychology*, wherein he uses Norbert Wiener's cybernetics logic to argue that memes and computer viruses are similar in analogy, being that they are both driven by the same forces in nature, according to which a psychology can be developed wherein feedback of information can result in mental healing. [9]

Discussion

Salthe seems to be someone who has been taken for a ride on the Shannon bandwagon. [3] He seems to get some of his wagon fuel from John Collier. [5] Salthe, being a zoologist, was also inspired by the 1982 Brooks-Wiley Theory, and the controversial hoopla and backlash that followed, which largely took place in *Systematic Zoology*. Salthe's *circa* 2002 article "The Natural Philosophy of Evolution", for example, employs the Brooks-Wiley *ad nauseam* version of the Frautschi-Layzer entropy gap diagram.

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θΔics

In science, **information** is a fact, unit of data, sensory input, or collection of knowledge that can be transmitted, processed, or stored. [1] In human chemistry, information can be understood as a component of the driving force. [2]

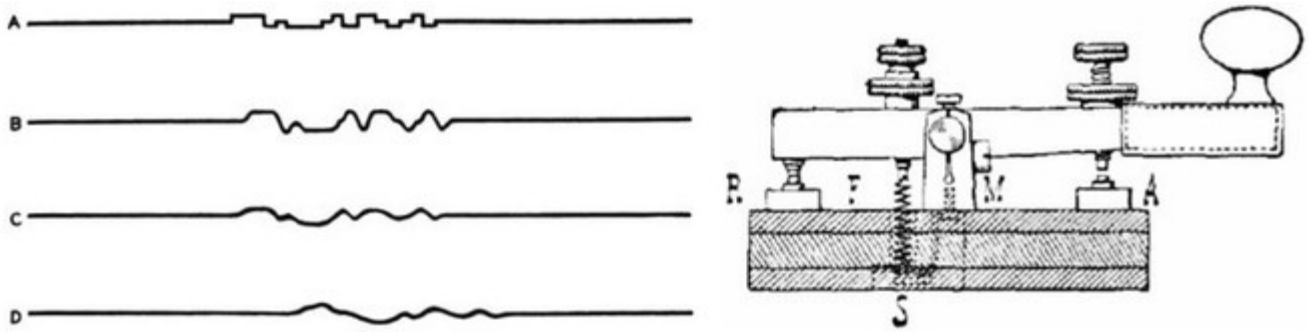

American electronics researcher Ralph Hartley's 1928 paper "Transmission of Information", in which he explained how the "logarithm", in the form of $x = y \log z$, specifically of the "number of possible symbol sequences" is the best "practical measure of **information**", specifically in regard to a telegraph operator sending 1s (HIs) and 0s (LOs) in a telegraph transmission; a model later used by American electrical engineer Claude Shannon in 1948 to found the science of information theory. [8]

Overview | Terminology misuse

In 1939-1940, newly-minted electrical engineer and mathematician Claude Shannon, while completing a post-doctoral fellowship at Princeton's Institute for Advanced Study, was vacillating on what new scientific coining to give to his newly formulated logarithmic statistical equation quantification of data involved in signal transmission by the name of 'information' or 'uncertainty', to which query Hungarian-born American chemical engineer and mathematician John Neumann suggested that Shannon use neither names, but rather use the name 'entropy' of thermodynamics, because: (a) the statistical mechanics version of the entropy equations have the same mathematical isomorphism and (b) nobody really knows what entropy really is so he will have the advantage in winning any arguments that might erupt. [14] Shannon, unfortunately took this jocular advice to heart, and in his famous to some infamous to others 1948 "A Mathematical Theory of Communication" article, building on the 1928 "Transmission of Information" article of American electronics researcher Ralph Hartley, which defined the "practical measure of information [as] the logarithm of the number of possible symbol sequences", employed the namesake ENTROPY, coined originally by German physicist Rudolf Clausius in 1865 as the differential formulation of heat quantities going into our out of a body, as the logarithmic binary digit representation of information measurement in signal transmission, and comments specifically that this new information formulation "will be recognized as that of entropy as defined in certain formulations of statistical mechanics", referring specifically to Austrian physicist Ludwig Boltzmann's so-called 'minimum theorem' (or H-theorem as it latter came to be called), as introduced in famous 1872 paper "Further Studies on the Thermal Equilibrium of Gas Molecules", which derived a kinetic theory expression for the entropy of an ideal gas. The long and the short of this near-inane situation, in the 1990 retrospect views of English science historians Peter Coveney and Roger Highfield, is that: [15]

> "The two—**information** theoretic ideas and thermodynamic entropy—have been repeatedly confused since the time of von Neumann."

The misuse of conceptual misunderstanding of information is also summarized well by American philosopher Christian de Quincey, who in 2002 stated: [11]

> "When physicists, chemists, biologists, neuroscientists, and psychologists adopt **'information'** as an explanatory term, they often do so based on a confusion of categories, and a misunderstanding of its function in communications theory."

In other words, information has a very specific meaning in (a) transmission of signals, i.e. hi or low voltage pulses, representative by 1s and 0s, (b) storage, defined in semiconductor structure, and (c) processing or programming,

represented the flow of current through AND, OR, or NOT gates, defined by Boolean logic, but a meaning that has absolutely nothing to do with thermodynamics. [16]

Boltzmann | 1894 ?

In 1949, American civil engineer and mathematician Warren Weaver (1894-1987), in the footnote one, to his opening chapter "Recent Contributions to the Mathematical Theory of Communication", of the book *The Mathematical Theory of Communication* (the second chapter authored by American electrical engineer Claude Shannon), states the following rather attack-buffering historical platform, in which makes the rather dubious assertion that in 1894 Austrian physicist Ludwig Boltzmann remarked or was thinking about entropy as being related to or as missing information:

> "Shannon's work roots back, as von Neumann has pointed out, to Boltzmann's observations, in some of his work on statistical physics (1894), that entropy is related to '**missing information**', inasmuch as it is related to the number of alternatives which remain possible to a physical system after all the macroscopically observable information concerning it has been recorded. Leo Szilard (*Zeitschrift fur Physik*, Vol. 53, 1925) extended this idea to a general discussion of information in physics, and von Neumann (*Mathematical Foundation of Quantum Mechanics*, Berlin, 1932, Chap V) treated information in quantum mechanics and particle physics. Shannon's work connects more directly with certain ideas developed some twenty years ago by Harry Nyquist and Ralph Hartley, both of Bell Laboratories; and Shannon has himself emphasized that communication theory owes a great debt to Norbert Wiener for much of its basic philosophy [cybernetics]. Wiener, on the other hand, points out that Shannon's early work on switching and mathematical logic antedated his own interest in this field; and generously adds that Shannon certainly deserves credit for independent development of such fundamental aspects of the theory as the introduction of entropic ideas. Shannon has naturally been specially concerned to push the applications to engineering communication, while Wiener has been more concerned with biological applications (central nervous system phenomena, etc.)."

The "1925" *Zeitschrift fur Physik* Volume 53 Szilard "Article" referred to here, to note, seems to be a mis-citation, as Szilard's famous Volume 53 article is his "1929" article "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings", in which the citation to his early "1925" article "On the Extension of Phenomenological Thermodynamics to Fluctuation Phenomena", in Volume 32 of *Zeitschrift fur Physik*, is found.

In any event, this so-called 1894 "missing information" published statement by Boltzmann, remains to be tracked down? This assertion that Boltzmann was thinking about "entropy" and "information" in 1894, or in any year for that matter, seems dubious, a case of mis-attribution, started by Weaver's above 1949 footnote. [7] The Szilard mis-citation, by Weaver, only further compounds the dubiousness of issue.

Historical mis-attributions in information theory publications, to note, are common, especially in over-zealous agenda writings. In the 2011 book *Free Will: the Scandal in Philosophy*, by American self-defined "information philosopher" Robert Doyle, we find the statement: "Kelvin's claim that information must be destroyed when entropy increases would be correct if the universe were a closed system." In review of his book, in 2012 email discussions, American electrochemical engineer Libb Thims queried Doyle about this, as follows: "Kelvin never 'claimed that information must be destroyed when entropy increases'; neither is 'information mathematically the opposite of entropy'; you seem to have the casual habit of bending and twisting things around to suit your agenda, each of which in the long run is eroding away your credibility." To which Doyle replied: "You are quite right that Kelvin did not use the term 'information'. I used it (anachronistically, to be sure) in my introduction chapter. Kelvin was a follow-on to Laplace's Demon, which I graphed as the conservation of information: i.e., the perfect knowledge of a god or demon who knew all the positions, momenta, and force laws. I guess we all twist things sometimes. Thanks for the critical reading." [20] The same scenario could be the case with Shannon and Weaver.

In any event, in the years to follow, the Boltzmann information assertion quickly became scientific folklore. In 1951, to exemplify, American physicist Jerome Rothstein restated the matter as follows: [18]

> “Boltzmann himself saw later that statistical entropy could be interpreted as a measure of missing **information**.”

English-born American investigative journalist Jeremy Campbell (1982, 1990) would later go on to popularize this notion as well.

Information transmission | Logarithms

In 1928, American electronics researcher Ralph Hartley published the paper "Transmission of Information", in which he used the word *information* as a measurable quantity, reflecting the receiver's ability to distinguish that one sequence of symbols (high or low voltages) from any other, in a telegraph transmission, thus quantifying information as:

$$H = n \log S$$

where S was the number of possible symbols, and n the number of symbols in a transmission. Hartley then concludes with: [8]

> “What we have done is to take as our practical measure of information the logarithm of the number of possible symbol sequences.”

Maxwell's demon & information

In the years 1929-1930, Hungarian-born American physicist Leo Szilard and American physical chemist Gilbert Lewis gave nearly identical, albeit independent (it seems?), Maxwell demon type derivations in which they connected entropy to the term “information”, albeit not in the telegraphy information transmission sense of the term, but rather in the sense of the informational knowledge about the location of molecules in a two-compartment gas container arrangement.

Szilard

In 1929, Hungarian-born American physicist Leo Szilard argued that the logarithmic interpretation of entropy could be used to determine the entropy produced during the ‘measurement’ of information when "memory-type" Maxwell’s demon (Szilard demon) discerns the speeds and positions of the particles in his two compartments. As a starting point, Szilard stated that the entropy produced by any random information measurement of the demon could be approximated by: [9]

$$S = k \log 2$$

where k is the Boltzmann constant and log is the natural logarithm, i.e. base e; which, to note, is often confused, in modern times, with the common logarithm (base 10). Szilard aim here was to show that "measurements themselves are accompanied by a production of entropy". Szilard, in turn, was a personal friend of Hungarian-born American chemical engineer John Neumann; in 1930, for example, they taught a theoretical physics seminar together with Erwin Schrodinger; and would seem that it was Szilard's influence through Neumann that reached Claude Shannon convincing him to call information by the name entropy. [2] Russian-born American mathematical Anatol Rapoport, in his 1986 *General Systems Theory*, comments on this 1929 Szilard paper that: [21]

> “This was the point of departure chosen by Szilard (1929), who laid the groundwork for establishing a conversion factor between physical entropy and information.”

This, however, is a misattribution. Szilard never uses the term “information” in his article, but rather is concerned with the nature of “thermal fluctuations” (Brownian motion) in relation to the second law and the Maxwell’s demon argument, such as previously touched on in the work of Marian Smoluchowski, to show that the energy associated with the "action" of measurement a system parameter, say a coordinate mapping the fluctuation parameter of the system, by a Maxwell’s demon type intelligent being would, in the sensory-neurological system, involve a degradation or dissipation of energy, in the motor nervous system, whereby the quantitative entropy production measure, associated with this degradation/dissipation, involved in this neurological “act”, is, according to his estimates, *k* log 2 units of entropy. The term “information” nor “information theory” never enters into the discussion here. The connection between Szilard and information seems to be but a later adumbration by other writers set on situating agenda-based historical context.

Lewis

On 6 Jun 1930, independent, it seems (check?), from Szilard's publication (which was in German), American physical chemist Gilbert Lewis published his article “The Symmetry of Time in Physics”, wherein he employs a Maxwell’s demon argument, with a "cylinder closed at each end, and with a middle wall provided with a shutter", in which derives the result that in the simplest case, if we have one molecule which must be in one of the two flasks, the entropy becomes less by: [12]

$$S = k \ln 2$$

if we know which is the flask in which the molecule is trapped; after which he concludes, in what has become re-quoted frequently, that: [17]

> “Gain in entropy always means the loss of **information**, and nothing more.”

The 1930 Lewis article doesn’t cite Szilard, although the argument and derivations are oddly similar? American physicist Walter Grandy, in his 2008 historical outline of the development of the entropy concept, comments, in regards to Lewis’ 1930 article, that he was “apparently unaware of Szilard’s work”. [13] In comment on his article conclusions, in a 5 Aug 1930 letter to Irving Langmuir, Lewis stated that: [3]

> “It was not easy for a person brought up in the ways of classical thermodynamics to come around to the idea that gain of entropy eventually is nothing more nor less than loss of **information**.”

It is blurry as to what he means by this?

Newmann-Shannon anecdote

See main: Neumann-Shannon anecdote

In 1939-1940 Hungarian chemical engineer John Neumann suggested to American engineer Claude Shannon that he should called information by the name ‘entropy’ as the reasoning that the equations are similar (they both are in logarithmic form) and that nobody knows what entropy really is, so in a debate you will always have the advantage. In 1948, Shannon took Neumann’s advice and in his famous paper "A Mathematical Theory of Communication", would credit this derivation by Hartley as being the point at which the logarithmic function became the natural choice for information and in the same paper, to the ire of many thermodynamicists, equate Hartley's 1928 telegraph "system" model with that of Clausius' 1865 heat engine "system" model. In short, Shannon, using a similar formulation to that above, declared that H, being a measure of information, choice, and uncertainty, is the same H as used in statistical mechanics, specifically the H in Boltzmann's famous H theorem, concluding with: [10]

> “We shall call *H* the entropy of the set of probabilities.”

Forever after, countless numbers of information theory scientists have since taken any and all types of information, "which is a very elastic term, ... whether being conducted by wire, direct speech, writing, or any other method", in the Hartley's words, as being a direct equivalent to thermodynamic entropy, as derived from the study of the steam engine. In his paper, Shannon would go on to define the entropy H of the source in units of “bits per symbol”, in which in the Hartley derivation s = 2, corresponding to a source that can only send two voltage or current levels, high or low; hence Shannon’s entropy being measured in binary digits per symbol.

This variation of information entropy or “Shannon entropy” has permeated science to the affect that, for some, information is seen as the mediator or key aspect of life and evolution. [5] In 1972, American biophysicist Lila Gatlin stated the following view on entropy and information: [6]

> “Stored **information** varies inversely with entropy; lowered entropy means a higher capacity to store information.”

If this statement were taken literally, this would indicate the following relation:

$$S \propto \frac{1}{I}$$

It is difficult, however, to track down the origin of this derivation?

Other | Sense perception

In 1847, Scottish physicist James Maxwell stated that the only thing that can be directly perceived by the senses is force, information can also be defined as a force. In this framework, as studied in human chemistry, "information" or more correctly information reception, received by the body and transmitted to the mind, is understood in terms of field particle exchanges, such as is found in the exchange force that holds human molecules (people) together in human chemical bonds.

See also

â— Entropy (information)
â— Information entropy
â— Shannon entropy

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External links

â— Information – Wikipedia.

θΔics

In information theory, **entropy**, symbol *H*, or information entropy or Shannon entropy, is an approximate measure of choice or information, measured in units of bits, in an electrical signal or message.

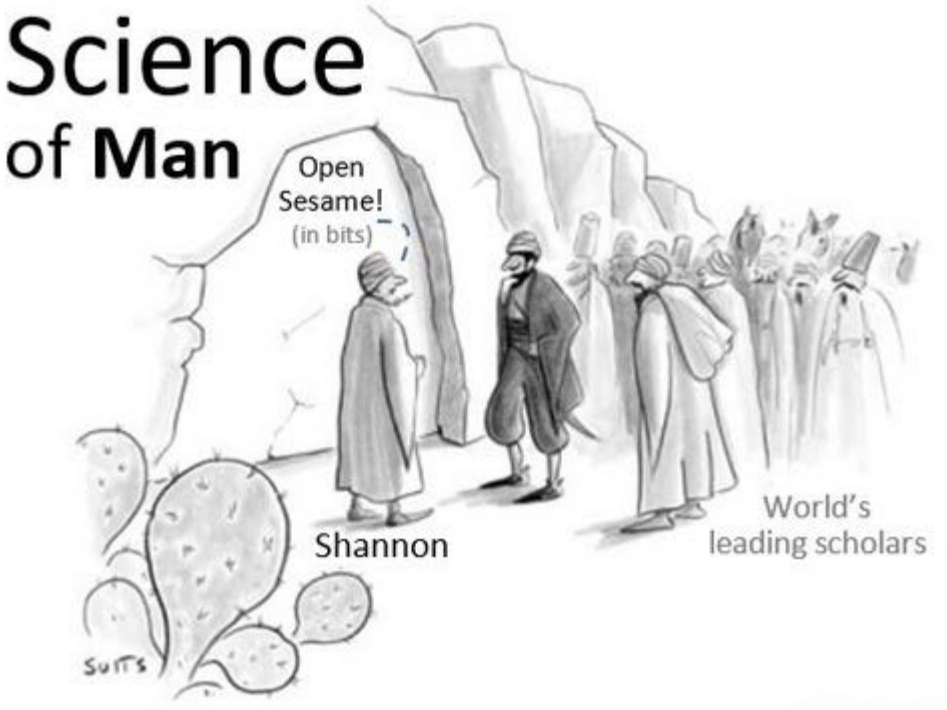

The view of Shannon-Wiener entropy according to Norman Dolloff (1975), who sees **information entropy** as an "open sesame" to the sciences of man, thereby connecting information measures of things such as DNA to thermodynamics. [7]

Overview

In 1948, American electrical engineer Claude Shannon proposed the following formula, modeled on Hartley information (1927) (Ñº), as the measure of binary digit based information:

$$H = -K \sum_{i=1}^{n} p_i \log p_i$$

where *K* is a positive constant and *pi* are a set of probabilities. [1]

This troublesome terminology, i.e. equating entropy with information, was borrowed from statistical thermodynamics, through the suggestion of American chemical engineer John von Neumann and introduced in 1948 by Shannon, but without explicit conditional warnings as to its realm of applicability. [2] Because of its mathematical simplicity, namely that it refers, supposedly, to the thermodynamic concept of "entropy", but is cut off atomic and molecular reality (difficulties), it soon, within a period of eight years, according to Shannon, "ballooned to an importance beyond its actual accomplishments (a technical tool for communication engineers)" into fields such as the thermodynamic modeling of life, evolution, cybernetics, biology, psychology, linguistics, fundamental physics, economics, the theory of organization, Maxwell's demon, and many others. [3]

For thermodynamicists, the 1948 use of the term "entropy" to model information in signals has been, in a general sense, an irritation. [5] The model employed by Shannon suggests to many individuals that anything which fits into the form of a logarithm has something to do with the second law of thermodynamics, which is not the case.

There are some, for instance, who believe that “information” will soon replace the Clausius version of “entropy”. Israeli physical chemist Arieh Ben-Naim, in his 2008 book *A Farewell to Entropy*, argues that “thermodynamics and statistical mechanics will benefit from replacing the unfortunate, misleading and mysterious term entropy with a more familiar, meaningful and appropriate term such as information, missing information or uncertainty. This replacement would facilitate the interpretation of the *driving force* of many processes in terms of informational changes and dispel the mystery that has always enshrouded entropy.” The essential mistake in this statement is that the "driving force" of natural processes is free energy or affinity, which are functions of enthalpy and entropy, not informational changes.

In any event, Ben-Naim advocates replacing entropy by information, a term that has become widely used in many branches of science. [4] This type of logic, however, is highly illogical: information is not a fundamental quantity, whereas "energy", or its derivatives, "heat", "temperature", or "work", are. The idea of reducing thermodynamics down to information, to note, is similar to Greek mathematician Constantin Carathéodory’s 1909 efforts, in his *Axiomatic Formulation of Thermodynamics*, to reduce the second law down to a purely mathematical basis using a geometrical approach. [6]

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θΔics

In quotes, **information entropy quotes** are quotes about Claude Shannon's 1948 H formula namesake of "entropy" as the measure of the choice between two alternatives (0 or 1) in a signal.

Thermodynamics | Confusion

The following are a set of collective statements, in chronological order, on the position that Shannon entropy (information entropy) has absolutely nothing to do with the entropy of thermodynamics—an apocryphal connection that is one of the greatest ongoing confusions in the history of science, the result of the fact that the situation is a buried Sokal affair of sorts: [1]

"The entropy introduced in information theory is NOT a thermodynamical quantity."

— Dirk ter Haar (1954), *Elements of Statistical Mechanics*

Anglo-Dutch physicist Dirk ter Haar and his 1954 *Statistical Mechanics* textbook quote on the fact that Shannon entropy is not a thermodynamical quantity, contrary to modern popular opinion (for many) [3]

"The entropy introduced in information theory is **NOT** a thermodynamical quantity."

— Dirk ter Haar (1954), Anglo-Dutch physicist

"Everyone knows that Shannon's derivation is **in error**."

— Benoit Mandelbrot (1961), audience comment to Myron Tribus on Claude Shannon's 1948 information entropy derivation [6]

"The similarity of the formal expressions in the two cases has **misled** many authors to identify entropy of information with negative physical entropy."

— Josef Jauch and Julius Baron (1972), Swiss theoretical physicist and American mathematician

"The bare truth is that one does **not meet** the concept of physical entropy in communication theory."

— Nicholas Georgescu-Roegen (1977), Romanian-born American mathematician

"There is an obvious relation between [message transmission] and what happens, for instance, when a solid melts and the orderly crystal structure is replaced by the more random motion of the molecules in the liquid. This has led [Shannon and Weaver (1949) and Szilard (1925)] to propose that the production of information is in effect the production of negative entropy (increase in order). In spite of the obvious analogy between the two kinds of processes, the attempt to embody this general idea in quantitative terms runs into serious difficulties and Popper (1976) and others hold it to be **invalid**."

— John Edsall and Hanoch Gutfreund (1983), *Biothermodynamics: the Study of Biochemical Processes* [7]

"Although information theory is more comprehensive than is statistical mechanics, this very comprehensiveness gives rise to **objectionable consequences** when it is applied in physics and chemistry. It remains true, nevertheless, that information theory can be of value in a heuristic sense. Notions about 'loss of information' can sometimes be intuitively useful. But they can also, like the comparable concept of

‘disorder’, give rise to mistakes. It needs to be kept in mind that *thermodynamic* entropy is fully objective and the same must apply to any other ‘entropy’ which is used as surrogate.”

— Kenneth Denbigh and John Denbigh (1985), *Entropy in Relation to Incomplete Knowledge* [5]

“It is a **mistaken belief** that Shannon’s function—called ‘entropy’ by namesake misadoption in information theory (Shannon and Weaver 1949)—has resulted in a true generalization of the Carnot-Clausius state function [dQ/T] treatment and the Boltzmann-Gibbs statistical [H function] treatment of the original [thermodynamic] entropy formulation of heat [Q], thus, in a sense, freeing it from disciplinary framework of thermodynamics for use in probability distributions in general—which is a major impediment to productive communication [in science].”

— Jeffrey Wicken (1987), American evolutionary biochemist

“The two—information theoretic ideas and thermodynamic entropy—have been **repeatedly confused** since the time of von Neumann.”

— Peter Coveney and Roger Highfield (1990), English science historians

“[The] ‘entropies’ in contexts where temperature *T* is absent have **NOTHING to do with** entropy of thermodynamics and NOTHING to do with the second law of thermodynamics.”

— Harold Morowitz (1991), American biological thermodynamicist

“Information ‘entropy’ in all of its myriad nonphysicochemical forms as a measure of information or abstract communication has **no relevance** to the evaluation of thermodynamic entropy change.”

— Frank Lambert (1999), American inorganic chemist

“Shannon entropy and Boltzmann entropy are **completely unrelate**d.”

— Stephen Kline (1999), American thermodynamicist

“Neumann’s proposal to call Shannon’s function defining information by the name ‘entropy’ opened a Pandora’s box of **intellectual confusion**.”

— Antoine Danchin (2001), French geneticist

“Having now followed the three principle scholars’ work, regarded as responsible for the alleged equivalence between information and negative entropy, it is now clear that this alleged equivalence is **physically baseless**.”

— Kozo Mayumi (2001), Japanese ecological thermodynamics economist

“The use of the term ‘Shannon entropy’, although Shannon himself did this, is a **mistake** because it leads to thinking that thermodynamic entropy is the same as the Shannon entropy. Shannon entropy, however, is NOT identical to ‘entropy’ because they have different units: bits per symbol and joules per kelvin, respective.”

— Thomas Schneider (2002), American biomolecular chemist

"Shannon's theory of information has set in motion one of **the most farcical trains of misconceptions and misunderstandings in the modern history of the sciences**, namely, that 'information' is a palpable thing with sufficient integrity to be measured and parceled out like so many dollops of butterscotch."

— Philip Mirowski (2002), American physical economist

"This [calling Shannon's H function by the name 'entropy'] created a situation of **enormous confusion** lasting up to date in many areas [and] led to an immediate and **unjustified identification** with thermodynamic entropy."

— Alberto Solana-Ortega (2002), Spanish mathematician

"Thermodynamic entropy and Shannon's entropy are two **different things**."

— Erico Guizzo (2003), Brazilian electrical engineer

"Shannon entropy should not be confused with the term entropy as it is used in chemistry and physics. Shannon entropy does not depend on temperature. Therefore, it is **not the same** as thermodynamic entropy."

— Stuart Pullen (2005), American biochemist

"Von Neumann's argument [basis of Shannon entropy] does **not establish** the desired conceptual linkage between Tr $\rho \log \rho$ and thermodynamic entropy."

— Meir Hemmo and Orly Shenker (2006), Israeli science philosophers

"For level-headed physicists, entropy—or order and disorder—is nothing by itself. It has to be seen and discussed in conjunction with temperature and heat, and energy and work. And, if there is to be an extrapolation of entropy to a foreign field, it must be accompanied by the appropriate extrapolations of temperature, heat, and work."

— Ingo Muller (2007), German thermodynamicist

"The analogy [of Shannon entropy] to thermodynamic entropy **breaks down** because Shannon's concept is a logical (or structural) property, not a dynamical property. Shannon entropy, for example, does not generally increase spontaneously in most communication systems, so there is no equivalent to the second law of thermodynamics when it comes to the entropy of information. The arrangement of units in a message doesn't spontaneously 'tend' to change toward equiprobablity."

— Terrence Deacon (2011), American neurological anthropologist

"Information defined by Shannon and thermodynamic entropy are **not quantitatively related**. I recommend [that we] restrict the meaning of 'entropy' to its thermodynamic one as originally intended by Clausius and Boltzmann and remove the term 'entropy' from all discussions on information as defined by Shannon."

— Sungchul Ji (2012), American cellular pathologist

"Do not confuse [entropy] with entropy in information theory (Shannon, 1948). This name is only the result of **a joke** by von Neumann and Shannon; thermodynamic entropy has nothing to do with so-called information entropy (Muller, 2007)."

— Ichiro Aoki (2012), Japanese systems engineer [2]

"I agree that thermodynamic entropy (thermal energy displacement, J/K) is **not the same** as other "extrapolations" based on very limited, statistical and stochastic modeling similarity, like mislabeled information entropy. Natural phenomena are not governed nor caused by simulation tools, like mathematical analysis, the latter being simplified description of unique natural phenomena, but not more than that."

— Milivoje Kostic (2013), Serbian-born American mechanical engineer and thermodynamicist [4]

Related

The following are related quotes:

"Information is information, not matter or energy."

— Norbert Wiener (1948), *Cybernetics* [1]

"From a physical point of view, information theory has **nothing to do** with physics."

— Daniel Ueltschi (c.2011), 'Shannon Entropy' [1]

See also

â— 2.332746 bits/elements distinguishability constant (19 Jan 2013) – Hmolpedia threads.

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θΔics

In education, **information obesity** refers to a mind, generally in the information era or internet age, that is fat with incorrect or useless information or information akin to “weeds” (Hiebert, 1966) in the garden of knowledge (see: garden of thermodynamics) or around the tree of knowledge, therein tending to stifle the enlightened growth of true, important, or useful knowledge; a gameshow contestant that can answer lots of trivial questions, but who is enable to solve big questions, might be one example of one with an information obese mind, generally speaking.

A general image of "**information obesity**", namely a mind that is over-weight with redundant, unnecessary, trivial, and most-importantly "incorrect" knowledge; some of which must be "unlearned" to become fit again.

Preliminary

In c.1440, the printing press was invented by Johannes Gutenberg, therein resulting to increase the amount of readily mass-produced available information; previously available only by hand-written methods.

In 1971, the term “information overload” was coined by Alvin Toffler, author of *Future Shock*. [1]

In 1972, email was invented by Ray Tomlinson.

In 1998, Google launched, thereafter enabling anyone to gain access to whatever “information”, fact, fictional, or whatever, someone decided to put online.

In 2001, Wikipedia launched, and by 2005 many people were getting their knowledge from this source, over that of Britannica; and, of note, by 2006 many books began to be published based on Wikipedia citations, therein letting questionable knowledge later seep into Google Books; accordingly seasoned researchers tend to do pre-2005 time period searches of information in Google Books, so to be sure the findings are Wikipedia free.

In 2007, Google Books launched, and people, shortly thereafter, were able to get full access to all of the world’s library pre-copyright dated books, and partial access to in-copyright books.

In 2010, Facebook received more visitors than Google, and indicator, according to Tara Brabazon, author of *Digital Dieting* (2012), that people were more willing to “share” information rather than “search” for information. [2]

Information | Overloading

In 2006, Andy Green, in his book section “Hyper-Availability and Information Obesity” (Q), discussed information obesity in respect to “email” and ways, e.g. spam filters, delete buttons, files, etc., we have learned to curb or control it:

> “While there has been an explosion in the wealth of opportunities for individuals to reach out and communicate, there is the limitation of the 'abundance communications paradox': the growth in the ability to communicate has been matched by a rise in the immunity to communications. Remember the first e-mail you got? You probably sent a long and eloquent reply. Now with the explosive growth in e-mail communications, you develop response strategies to limit your overload to enable you to cope and respond to what you perceive as the crucial messages. You use spam filters, delete e-mails without reading or with no reply. When you do reply it is often short - often several days/weeks later, an ironic time lag in an age of instant communications.”

In 2009, Andrew Whitworth, in his *Information Obesity*, attempted to look at the problem of having, supposedly, too much information available.

In 2012, Scott Brown, in his "Coping with Information Obesity" (Q), citing Hmolpedia's last person to know everything article, with reference to the presumed fact that going into the 19th century or early 20th century the total knowledge of the world began to be too much for one person to amass in one mind, attempted to discuss ways of preventing and coping with information obesity, which he likens to a "physical obesity" of the mind, such as absorbing what he calls "slow information".

In 2018, Libb Thims suggested (Q) that Italian economist Piero Sraffa (1898-1983), who had amassed an 8,000 book personal library on topics in economics and politics, but whose resulting work or influence, in putting the contents of these books into coherent workable order, resulted to being only cited by one person in Hmolpedia, namely Borisas Cimbleris and, supposedly, having some influence (Q) on Ludwig Wittgenstein, himself being an "overrated genius", is an example of someone suffering from information obesity.

In short, in a world where all the world's library books are at one's immediate fingertips, anytime of the day, it is of the interest of the keen and perspicacious mind NOT to waste "time", which is the limiting factor, i.e. people only have so many days of reaction existence movement on this earth, on useless information.

Great geniuses tend to be acutely aware of this rule of thumb, the best example of which being the famous anecdote of Willard Gibbs and "uncut books". Specifically, sometime between 1899 and 1902, in the years when Edwin Wilson studied under Gibbs at Yale, the following incident occurred, as recounted by Wilson in 1930: [31]

> "Once I desired to consult some books which were not in the library but which I had seen on the shelves in his office during a lecture. I ventured to ask whether I might borrow them. He was entirely willing. As I picked the books off the shelves I noticed that the **pages had not been cut** and enquired whether I might cut them, to which he replied : Certainly, if you think it worthwhile. Probably I looked abashed, for he added: The author kindly sends me all he writes; there is a great deal of it; I sometimes feel that a person who writes so much must spread his message rather thin."

If one desires to be "informationally fit", according to Gibbs, who presently is ranked #5 of the top 1000 geniuses, don't waste your time one authors who spread their messages rather thin.

Quotes

The following are related quotes:

> "One should strive not after fullness of knowledge, but fullness of understanding."
>
> — Democritus (c.380BC), Fragment #; cited by Friedrich Lange (1865) in *History of Materialism, Volume One* (pg. 17)

> "Often in our more carefully cultivate **gardens of thought** some rank weed grows with such vigor as to stunt the growth of the neighboring useful vegetables. So the scientific literature of the nineteenth century was overgrown with a discussion of ether, its stresses and strains, its density, its movement with the earth or through the earth. A mechanism that we designed to be servant had become master; until now that we are suddenly freed from this obsession we feel as if awakened from a hideous nightmare."
>
> — Gilbert Lewis (1925), *Anatomy of Science*

> "The term '**information obesity**' appears to have been around for ten years or less. That food metaphor seems worth considering. When a formerly scarce resource becomes abundant. people instinctively

consume it wherever and whenever they can, which naturally leads to overconsumption. Empty calories in the echo chambers of blogs and re-tweet instantly gratify the need to tell somebody whenever anything occurs to you. Much as with overconsumption of unprecedentedly available sugar and fat, today there is widespread overconsumption of information, especially when 'informational empty calories' don't really satisfy (Grossman and Sabin 2010)."

— Malcolm McCullough (2015), "Distraction Reconsidered" [1]

See also

- Hydraism

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Further reading

- Johnson, Clay. (2012). "Information Obesity: Take Responsibility, Fatty", Big Think, Aug 23.

θΔics

In science, **information theory**, or unambiguously the "theory of the *transmission* of information", as defined Italian-born American electrical engineer Robert Fano, who taught one of the first courses on information theory, at MIT, is a mode of logic that attempts to analyze and mathematically quantify the transmittal of data, typically through wire or radio wave. [19] Information theory, according to the *Oxford Dictionary of Science*, is the branch of mathematics that analyses information mathematically. [1]

A Chronology of Significant Events in the Development of Information Theory

Date	Event
1924	H. Nyquist publishes "Certain Factors Affecting Telegraph Speed" in the *BSTJ*.
1928	R. V. L. Hartley publishes "Transmission of Information" in the *BSTJ*.
1936	Shannon graduates from the University of Michigan and arrives at MIT.
1938	Shannon's Masters' Thesis in electrical engineering is published.
1939	Shannon earns a Ph.D. degree in mathematics at MIT.
1939–1940	Shannon holds a post-doctoral fellowship at Princeton's Institute for Advanced Study.
1940–1945	Shannon works at Bell Labs on cryptography, and on anti-aircraft gun control accuracy.
1943–1944	Alan Turing visits Bell Labs, and holds frequent discussions with Shannon.
1948	Shannon publishes "A Mathematical Theory of Communication" in *BSTJ*.
1949	Shannon publishes *The Mathematical Theory of Communication*, the University of Illinois Press.
1949	Shannon publishes "Communication Theory of Secrecy Systems" in the *BSTJ*.
1963	Paperback edition of *The Mathematical Theory of Communication* is published by University of Illinois Press.
1964	32,000 copies of *The Mathematical Theory of Communication* have been sold.

A 1993 chronology of the development of **information theory**, which starts with the work of Harry Nyquist (1924), Ralph Hartley (1928), and Claude Shannon (1948). [19]

Naming confusions

See main: Information entropy (quotes); Shannon bandwagon

In 1948, American electrical engineer Claude Shannon adopted the physics term "entropy" as the new name for his logarithm of a probability formulation of data transmission, telegraphy in particular, alluding to the premise that the his formula and the formula for entropy in statistical mechanics has the same "form", after which people began to continuously assume a connection to the two fields. To exemplify this confusion, the 2005 *Oxford Dictionary of Science*, gives a the following addendum to the definition of information theory: [1]

> "Several branches of physics have been related to **information theory**. For example an increase in entropy has been expressed as a decrease in information. It has been suggested that it may be possible to express the basic laws of physics using information theory. *See also:* Landauer's priniciple; Zeilinger's principle."

Here we see the recursive confusion that results from Shannon's misfortune naming choice of the formula for the mathematical quantification of the "measure of information, choice, and uncertainty" in a signal transmission by the name entropy; meaning that, the above science dictionary definition, in the Shannon-namesake sense of the matter, reduces to the following nonsensical statement, as the unacquainted reader would see things: "an increase in entropy has been expressed as a decrease in entropy."

In short, beginning in the last half of the 20th century, there has been a push to blend information theory concepts together with the laws of thermodynamics, e.g. by suggesting that an increase in entropy can be expressed as in decrease in information, to yield new laws, e.g. the law of conservation of information, or branches of sciences, such as information theory and evolution, chaos theory, or complexity theory. [10]

Thermodynamicists, however, view the connection between entropy and information to be only superficial, very illogical, and not justified. [11] To cite one example, in 1950 American electrical engineer Claude Shannon estimated the "entropy" of written language to be 0.6 to 1.3 bits per character; and in modern times, through many convoluted probability arguments, one can find dozens of researchers arguing that this is the same as German physicist Rudolf Clausius' 1865 definition of "entropy" in thermodynamics, which has units of joules per kelvin per mole (J/Kâˆ™mol). [15]

American molecular machines theorist Thomas Schneider, since 1991, has devoted a number of articles on online pages, e.g. “Information is Not Entropy, Information is Not Uncertainty!” (1997), “Shannon entropy is a misnomer” (2002), etc., to a discussion of the terminology confusion resulting from the overlap of information theory and thermodynamics in his field of research: ‘molecular information theory’, which he defines as the application of Shannon’s information theory to molecular patterns and states. [20]

Overview

In the 1940s, while American electrical engineer Claude Shannon was developing the basic mathematics of information theory of telephone signals, an associate, American chemical engineer John von Neumann, suggested that Shannon call the informational uncertainty associated with a random variable "entropy" because his basic formula was similar to the statistical formula for the entropy of an ideal gas as developed by Ludwig von Boltzmann in 1872. Every since, many individuals, especially outside the field of thermodynamics, such as mathematicians, have inadvertently assumed a physical existence between thermodynamic "irreversibility" in heat engine cycles and "information uncertainty" in communication lines. This has led to a great confusion. The three main researchers regarded as being responsible for the alleged equivalence between information and negative entropy are French physicist Leon Brillouin (1950), American physicist Edwin Jaynes (1957), and Hungarian-American physicist Leo Szilard (1964). [14]

Claude Shannon - American electrical engineer who founded **information theory** with his 1948 paper "A Mathematical Theory of Communication"; in which he argued that entropy is a measure of information, thus initiating the questionable field of information theory thermodynamics.

In more detail, information theory was founded by Shannon with the publication of his 1948 article "A Mathematical Theory of Communication." [4] The central paradigm of classical information theory is the engineering problem of the transmission of information over a noisy channel. The most fundamental results of this theory are Shannon's source coding theorem, which establishes that, on average, the number of *bits* needed to represent the result of an uncertain event is given by the “uncertainty associated with a random variable” (called “entropy” by Shannon); and Shannon's noisy-channel coding theorem, which states that *reliable* communication is possible over *noisy* channels provided that the rate of communication is below a certain threshold called the channel capacity.

Origin of assumed thermodynamic connection

In 1872, Austrian physicist Ludwig Boltzmann formulated the H theorem, a statistical interpretation of Rudolf Clausius’ entropy, or “transformation content” of a working body, for an ideal gas system of particles with no appreciable interaction, thus finding a proof for the phenomenon of atomic and molecular irreversibility in steam engine cycles. [3] The H theorem was defined by Boltzmann as: [9]

$$H = \int_p \int_q f \ln f dp dq$$

where *f(p,q,t)* is a distribution function, or probability of finding, at a given time *t* a particle with a position *q* and momentum *p*, in which the distribution is assumed to evolve with time, owing to the proper motion of the molecules and their collisions. [9] The H theorem of Boltzmann states that this function decreases with time and tends towards a minimum which corresponds to the Maxwell distribution: If the distribution of the velocities is Maxwellian, the H function remains constant during time. For a system of *N* statistically independent particles, *H* is related to the thermodynamic entropy *S* through:

$$S = -NkH$$

In 1901, German physicist Max Planck put Boltzmann’s statistical

formula in the form shown below, and also carved on his tombstone (adjacent):

$$S = k \log W$$

where *k* is the Boltzmann constant equal to equal to 1.38062 x 10E-23 joule/kelvin and *W* is the number of “states” the particles of the system can be found in according to the various energies with which they may each be assigned.

The Boltzmann tombstone showing the S = k log W entropy formula, which many people mistakenly assume, can be used to quantify "bits" in data storage and transmission.

Bell telephone labs

In a completely different field of study, in 1924, while working at Bell telephone labs, American electrical engineer Harry Nyquist published a paper called “Certain Factors Affecting Telegraph Speed”, containing a theoretical section quantifying "intelligence" and the "line speed" at which it can be transmitted by a communication system, giving the relation:

$$W = K \log m$$

where *W* is the speed of transmission of intelligence, *m* is the number of different voltage levels to choose from at each time step, and *K* is a constant.

In 1928, American electronics researcher Ralph Hartley published the paper “Transmission of Information”, in which he used the word *information* as a measurable quantity, reflecting the receiver's ability to distinguish that one sequence of symbols from any other, thus quantifying information as:

$$H = n \log S$$

where *S* was the number of possible symbols, and *n* the number of symbols in a transmission. [2]

Pulling this all together, so to say, in 1944, while working at Bell telephone labs, Claude Shannon sought to solve the basic problem in communication, namely: "that of reproducing at one point, either exactly or approximately, a message selected at another point." In this direction, Shannon developed a number of fundamental theorems, such as defining the “bit” as the basic unit of information.

A Mathematical Theory of Communication

In 1948 Shannon published his famous paper “A Mathematical Theory of Communication”, in which he devoted a section to what he calls Choice, Uncertainty, and Entropy. In this section, Shannon introduces an “H function” of the following form:

$$H = -K \sum_{i=1}^{n} p_i \log p_i$$

where *K* is a positive constant. Shannon then states that “any quantity of this form, where *K* merely amounts to a choice

of a unit of measurement, plays a central role in information theory as measures of information, choice, and uncertainty." Then, as an example of how this expression applies in a number of different fields, he references R.C. Tolman's 1938 *Principles of Statistical Mechanics*, stating that "the form of *H* will be recognized as that of entropy as defined in certain formulations of statistical mechanics where p_i is the probability of a system being in cell *i* of its phase space… *H* is then, for example, the *H* in Boltzmann's famous H theorem." The following excerpt is the key section in which Shannon defined his new variable, with implied thermodynamic connotations:

Shannon then gives what he calls "the entropy *H* in the case of two

Theorem 2: The only H satisfying the three above assumptions is of the form:

$$H = -K \sum_{i=1}^{n} p_i \log p_i$$

where K is a positive constant.

This theorem, and the assumptions required for its proof, are in no way necessary for the present theory. It is given chiefly to lend a certain plausibility to some of our later definitions. The real justification of these definitions, however, will reside in their implications.

Quantities of the form $H = -\sum p_i \log p_i$ (the constant K merely amounts to a choice of a unit of measure) play a central role in information theory as measures of information, choice and uncertainty. The form of H will be recognized as that of entropy as defined in certain formulations of statistical mechanics[8] where p_i is the probability of a system being in cell i of its phase space. H is then, for example, the H in Boltzmann's famous H theorem. We shall call $H = -\sum p_i \log p_i$ the entropy of the set of probabilities $p_1, \ldots, p_n$. If x is a chance variable we will write $H(x)$ for its entropy; thus x is not an argument of a function but a label for a number, to differentiate it from $H(y)$ say, the entropy of the chance variable y.

Excerpt (page 11) of Claude Shannon's 1948 "A Mathematical Theory of Communication" in which he connects information to entropy; where the reference 8 is (See, for example, R. C. Tolman, *Principles of Statistical Mechanics*, Oxford, Clarendon, 1938).

possibilities with probabilities *p* and *q = 1- p*" and then goes on to declare:

> "The quantity of *H* [**entropy**] has a number of interesting properties which further substantiate it as a reasonable measure of choice or **information**."

and from hereafter, German physicist Rudolf Clausius' 1865 thermodynamic quantity entropy *S* has since been assumed, by millions of people, to be a measure of information. In the modern age, one can even find books that not only equate entropy to information but actually suggest that information replace not just entropy but the entire science of thermodynamics. An example is the 2008 book *A Farewell to Entropy: Statistical Thermodynamics Based on Information* by Israeli physical chemist Arieh Ben-Naim who argues that "thermodynamics and statistical mechanics will benefit from replacing the unfortunate, misleading and mysterious term entropy with a more familiar, meaningful and appropriate term such as information, missing information or uncertainty." [17]

Brillouin's conceptions of information

By 1956, owing to the work of Shannon and Schrödinger, French physicist Leon Brillouin, in his book *Science and Information Theory*, had stated that "a new scientific theory has been born during the last few years, the theory of information." [14] The basics of this theory, according to Brillouin, revolve around the question of how one is able to define the quantity of information communicated by a system of telegraph signals, signals which themselves consist of either electromagnetic or current transmissions. In this theory, the basic definition of information in a given operation, a quantity that Brillouin supposedly proves is "very closely related to the physical entropy of thermodynamics", is defined by him as:

$$I = K \ln P$$

where *I* denotes information, *K* is a constant, and *P* is the probability of the outcome. Brillouin reasons that with these types of probability arguments, "it enables one to solve the problem of Maxwell's demon and to show a very direct connection between information and entropy" and that "the thermodynamic entropy measures the lack of information about a physical system." Moreover, according to Brillouin, "whenever an experiment is performed in the laboratory, it is paid for by an increase in entropy, and a generalized Carnot principle states that the price paid in increase of entropy must always be larger than the amount of information gained." Information, according to Brillouin, corresponds to "negative entropy" or negentropy, a term he coined. In sum, Brillouin unjustifiably declares that the "generalized Carnot principle (the second law of thermodynamics) may also be called the negentropy principle of information".

Neumann's famous suggestion?

See main: Neumann-Shannon anecdote

In 1940s, after Shannon had been working on his equations for some time, he happened to visit the mathematician and chemical engineer John von Neumann. During their discussions, regarding what Shannon should call the "measure of uncertainty" or attenuation in phone-line signals with reference to his new information theory, Shannon stated the following (a conversation that varies depending on the source): In short, Neumann told Shannon:

> "You should call [your measure of choice or **information**] entropy, because nobody knows what entropy really is, so in a debate you will always have the advantage."

This is a famous comment classifies as both a famous entropy quotation and as a classic entropy misintrepretation. One must always remember that any thermodynamic connotations made in information theory are always traced back to this ridiculous suggestion. To note, Neumann could have just as easily told Shannon to call is new quantity "information sensation" based on similarity to German physiologist Justav Fechner's 1860 statistical logarithmic psychological sensation formula:

$$S = K \log I$$

or

$$S = c \log R$$

where *S* stands for sensation, *c* or *K* represent a constant that must be determined by experiment in each particular order of sensation, and *R* or *I* represent the stimulus numerically estimated. [16] This would have saves the thermodynamics community decades of wasted energy. In any event, over the last sixty years, ever since this terminology overlap or assumed equivalence between entropy and information was made, people have been overlapping the two concepts or even stating that they are exactly the same, e.g. citing conservation of information laws modeled on the law of conservation of energy, namely that the Clausius' entropy, defined by S = dQ/T, as derived from the phenomenon of irreversibility in heat engine cycles as defined by the second law of thermodynamics:

$$\int \frac{dQ}{T} \geq 0$$

is the same as Shannon's entropy, from the phenomenon of information loss in communication as defined in Shannon's

“Mathematical Theory of Communication” paper:

$$H = -K\sum_{i=1}^{k} p(i)\log p(i)$$

Entropy = Information | Objections

Every since 1948, with the publication of Shannon's paper, there has been a growth in the assumed equivalence of heat engine entropy and the entropy of a message, as well as growth in the objections to this point of view. In the 1999, to cite one example, American chemistry professor Frank Lambert, who for many years taught a course for non-science majors called "Enfolding Entropy" at Occidental College in Los Angeles, stated that another major source of confusion about entropy change as the result of simply rearranging macro objects comes from information theory "entropy" of Claude Shannon. [12] In Shannon’s 1948 paper, as discussed, the word "entropy” was adopted by the suggestion von Neumann. This step, according to Lambert, was “Wryly funny for that moment,” but “Shannon's unwise acquiescence has produced enormous scientific confusion due to the increasingly widespread usefulness of his equation and its fertile mathematical variations in many fields other than communications". [13]

According to Lambert, “certainly most non-experts hearing of the widely touted information entropy would assume its overlap with thermodynamic entropy. However, the great success of information "entropy" has been in areas totally divorced from experimental chemistry, whose objective macro results are dependent on the behavior of energetic microparticles. Nevertheless, many instructors in chemistry have the impression that information "entropy" is not only relevant to the calculations and conclusions of thermodynamic entropy but may change them. This logic, according to Lambert, is not true. [12] In sum, according to Lambert, information "entropy" *in all of its myriad nonphysicochemical forms as a measure of information or abstract communication* has no relevance to the evaluation of *thermodynamic* entropy change in the movement of macro objects because such information "entropy" does not deal with microparticles whose perturbations are related to temperature. Even those who are very competent chemists and physicists have become confused when they have melded or mixed information "entropy" in their consideration of physical thermodynamic entropy. This is shown by the results in textbooks and by the lectures of professors found on the Internet.

In the 2007 book *A History of Thermodynamics*, for instance, German physicist Ingo Müller summarizes his opinion on the matter of von Neumann’s naming suggestion:

> “No doubt Shannon and von Neumann thought that this was a funny joke, but it is not, it merely exposes Shannon and von Neumann as intellectual snobs. Indeed, it may sound philistine, but a scientist *must* be clear, as clear as he can be, and avoid wanton obfuscation at all cost. And if von Neumann had a problem with entropy, he had no right to compound that problem for others, students and teachers alike, by suggesting that entropy had anything to do with information.”

Müller clarifies the matter, by stating that: “for level-headed physicists, entropy (or order and disorder) is nothing by itself. It has to be seen and discussed in conjunction with temperature and heat, and energy and work. And, if there is to be an extrapolation of entropy to a foreign field, it must be accompanied by the appropriate extrapolations of temperature, heat, and work.” [11]

See also

â— Computer science thermodynamics

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â— Thomson, Lauralee A. (1972). *Thermodynamics, Information Theory and the Relationship of these Physical Sciences to the Functioning of a Living System* (BS dissertation). Florida Presbyterian College.

External links

â— Information theory – Wikipedia.

θΔics

In science, **information theory thermodynamics**, or "information thermodynamics", in short, refers to studies on the asserted mathematical isomorphism relationship between information theory (or information) and thermodynamics, particularly statistical mechanics. A semi-synonymous term is "physical information theory", a term used by John Collier, but not a complete synonym, as physical information theory, is also used in other non-thermodynamics type contexts.

External links

â— Entropy in thermodynamics and information theory – Wikipedia.

θΔics

In thermodynamics, **information thermodynamics** or "information theory thermodynamics" is a umbrella term distinguishing a set of related fields on the subject of "thermodynamics of information processes" that attempt to interpret information, such as is found in communication signals or transmission lines, thermodynamically, e.g. information entropy or conservation of information, such as in information theory (1948), cybernetics (1948), general systems theory (1968), chaos theory (1970s), black hole thermodynamics (1975), e.g. the study of "information" lost in black holes as entropy, and other marginally connected subjects such as emergence or complexity theory, etc. [1] The term “information thermodynamics” came in use as early as 1979. [2]

History

In 1929, Hungarian-American physicist Leó Szilárd devoted his thesis “On the Increase of Entropy in a Thermodynamical System by the Action of Intelligent Beings” to Maxwell’s demon, noting that the demon would require the use of information. [3] The 1948 paper “A Mathematical Theory of Communication” attempted to make a mathematical connection between statistical thermodynamics (gas phase systems) and information in telephone lines (current or voltage signals), thus initiating the science of information theory. [4]

The 1956 book *Science and Information Theory* by French-born American physicist Léon Brillouin attempted to blend thermodynamics, such as Maxwell’s demon, with communications and computing. [5] The famous cited 1957 paper “Information Theory and Statistical Thermodynamics” by American physicist Edwin Jaynes attempted to connect equilibrium thermodynamics, with the statistical mechanics of American engineer Willard Gibbs, with information interpretations, and in doing so initiated what has come to be known as the maximum entropy (MaxEnt school) school of thermodynamics. [6] The 1961 textbook *Thermostatics and Thermodynamics: an Introduction to Energy, Information and States of Matter*, by American engineer Myron Tribus, was one of the first publications to attempt to base the laws of thermodynamics on information theory rather than on the classical arguments. [7]

In 1969, American mechanical engineer Robert Evans put forward an essergy theory, in which he attempted to reformulate chemical thermodynamics in terms of information. In his own words: [11]

> “A possible consequence of the proof may be a more general formulation for the concept of information based on Brillouin's principle of the equivalence of thermodynamic information and potential work. The proof indicates that negentropy is not as general a measure of potential work as is the quantity, essergy. This result could imply that essergy is a more general measure of thermodynamic information than negentropy, an implication that might lead to a broader formulation about information and, thus, new insight into the foundations of information theory.”

In the 1987 book *Evolution, Thermodynamics, and Information: Extending the Darwinian Program*, American biochemist Jeffrey Wicken adopts Shannon’s view of information as a model of entropy (information), but proceeds to deploy the concept of information as a *causal agency* in biological evolution and defines organisms as “informed thermodynamic systems”. [8]

The 2007 book *a Farewell to Entropy: Statistical Thermodynamics Based on Information*, by Israeli physical chemist Arieh Ben-Naim, argues that thermodynamics and statistical mechanics will benefit from replacing the Clausius term "entropy" with a more familiar, meaningful and appropriate term such as information, missing information or uncertainty. This replacement, as Ben-Naim argues, would facilitate the interpretation of the "driving force" of many processes in term of informational changes. [9]

Criticisms

The general science of information thermodynamics, if it is indeed to be considered as a science, from a rigorous physics perspective, is more often than not seen as a contrived sort of mathematical extrapolation from true thermodynamics, which is based on the heat and work interactions in the steam engine. Indeed, the suggested name of “information”, i.e. to be called entropy, on the statistical thermodynamic sense, was done as a sort of mathematical joke between Neumann and Shannon. To exemplify this, Wicken, for instance, called Shannon’s terminological choice of

borrowing the word entropy from statistical thermodynamics: [10]

> "Loose language [that served] the dark god of obfuscation."

The general poor state of the subject, in modern terms, could possibly been attributed to the association and origination of the subject at Bell Labs, by a number of its founders, such as John Neumann, Claude Shannon, Léon Brillouin, etc., who may have been driven beyond the limit of academic credibility-justification by the lucrative state of the fervent financial flow at AT&T during these years?

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θΔics

In HT pioneers, **Information TPs** or information theory thermodynamics pioneers are those that theorize or write about a mixture of information and entropy or information theory and thermodynamics, as listed adjacent.

θΔics

In human thermodynamics, **informed energy** is a hypothetical type of energy that is supposed to account for free will, the will of animate atomic structures, such as cells, and the beginning of life. The term "informed energy" was conceived in 2000 by Russian-born American physicist Valery Chalidze, in his book *Entropy Demystified*, where he argues that what separates supposed non-life atomic structures, such as crystals and polymers, from life-like atomic structures, such as a cell, is the "ability of a group of particles to separate itself from entropy waste". Chalidze defines the term as follows:

> "Ordering work requires energy channeled for performing certain tasks according to certain rules … in other words, it calls for ***informed energy***, and this is, I dare say, the best description of manifested human will."

To achieve such separation, according to Chalidze, energy must be directed in such a way as to extract heat and disorderly matter from the area in which order had been achieved. He states that "it must be energy that knows what to do, namely, get rid of entropic waste … in other words, it must be informed energy—will." Once this was achieved in the evolution process, Chalidze states, it was the beginning of life and the beginning of the will of life.

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θΔics

In existographies, **Ingo Müller** (1937-) (CR:69) is a German physicist and thermodynamicist noted, in human thermodynamics, for his his 2002 socio-thermodynamics theory of segregation or population mixing, and for his 2007 *A History of Thermodynamics*, which presents one of the first history of thermodynamics, in cogent overview.

Social | Piston and cylinder

The following image: "Man in piston" cartoon drawn by Mark Warmbrunn (1994); re-annotated by Libb Thims (2013) to illustrate the conception of 'social boundaries', e.g. Great Wall of China, originally published in Ingo Muller's 1994 Grundzüge der Thermodynamik : mit historischen Anmerkungen (Essentials of Thermodynamics: with Historical Notes); also shown on cover of Muller's 2009 Fundamentals of Thermodynamics and Applications; Warmbrunn being a then 14-year old "genius with a pencil and paper", was a friend of Muller's son, an art school applicant.

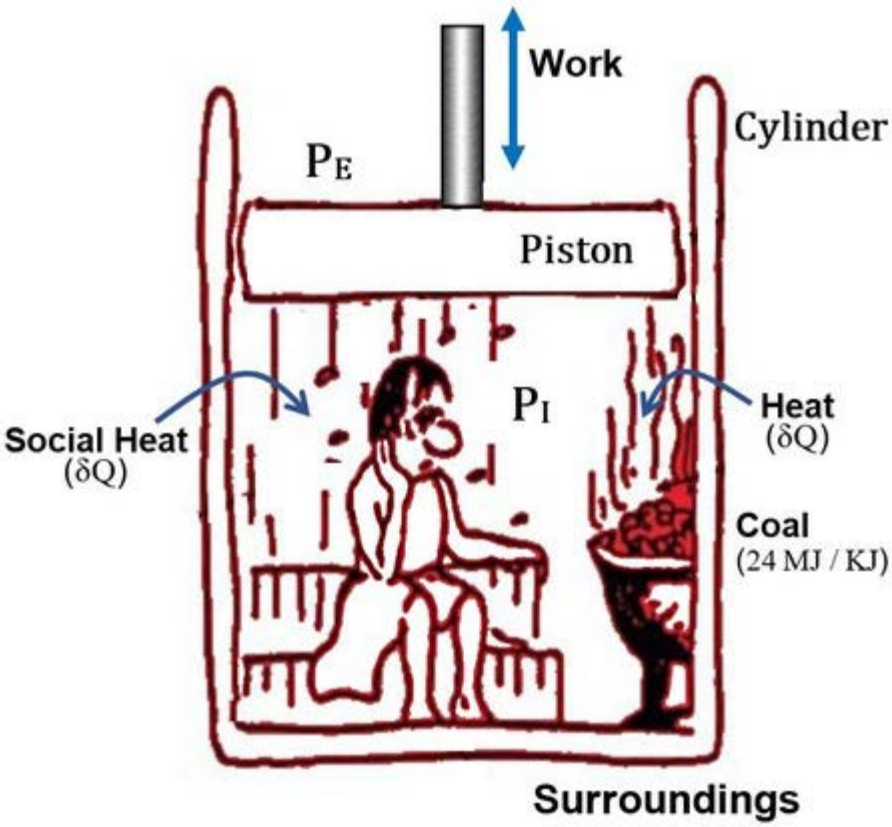

Versions of the image have appeared (Q)(Q)(Q); the one shown above is from Thims' drafting 2020 *Human Chemical Human Thermodynamics* (§: Da Vinci engine).

Overview

In 2002, Muller in his 2002 paper "Socio-thermodynamics: Integration and Segregation in a Population", introduced his socio-thermodynamics theory of segregation or population mixing. [1] Muller gives his synopsis view of how thermodynamics applies to humanity as follows: [5]

> "We firmly believe that thermodynamic ideas, in particular those of Clausius, may find an application outside of thermodynamics, even outside of physics, namely in the fields of economy and sociology."

In 2007, Müller published *A History of Thermodynamics - the Doctrine of Energy and Entropy*, a long over-due and

greatly-needed book in the field of thermodynamics. In his 2010 article on entropy, energy, and free energy, Muller continues with his hawks versus doves thermodynamics population model, noting that randomization and, on the other hand, a deterministic trend toward preferred states may be observed in other fields of knowledge as well, fields that are remote from thermodynamics, e.g. genetics, sociology, economics, *etc.*, and states that in this work he "proposes extrapolations of thermodynamics to such *remote* areas. This is a daring undertaking prone to attract criticism." [6]

In his 2005 book *Entropy and Energy: A Universal Competition*, Müller devotes an entire chapter to the subject of socio-thermodynamics. In this chapter, Müller goes through an example of a metaphorical system of hawks and doves competing for the same limited resource. He compares the segregation and mixing of the two populations to that of physico-chemical systems separations defined by phase diagrams. Through his analogies, he correctly correlates pressure-volume boundary work to that of the 'part of the habitat lost' and states that:

> "Such analogies emphasize the point of view that physical or sociological systems of many individual elements have common properties, whether the elements are atoms and molecules or birds and (maybe) men."

One funny point, about the modeling of human social life through the difficult science of thermodynamics, as Müller states in his 2007 book *A History of Thermodynamics: the Doctrine of Energy and Entropy*, is that:

> "It is interesting to note that socio-thermodynamics is only accessible to chemical engineers and metallurgists. These are the only people who know phase diagrams and their usefulness. It cannot be expected, in our society, that sociologists will appreciate the potential of these ideas."

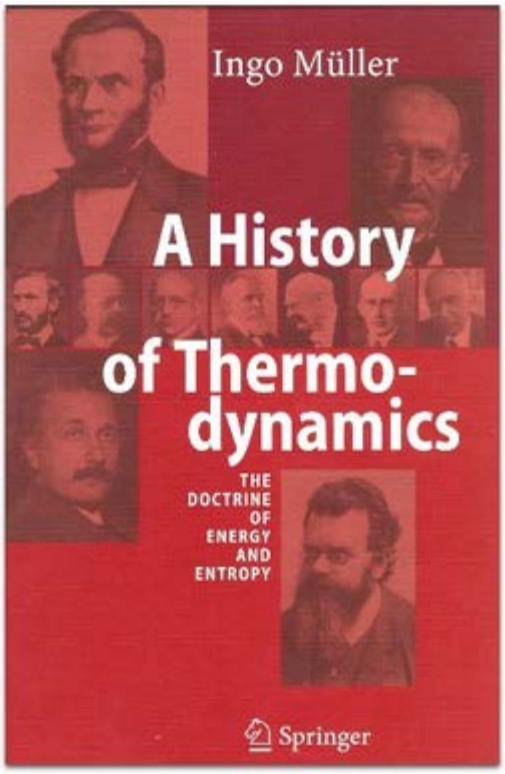

Muller's 2007 book *A History of Thermodynamics*, is one of the first stand-alone books on the history of thermodynamics. [3]

Here we concur, in that socio-thermodynamics is obvious to the chemical engineer or other mathematically-trained scientists, such as physicists, but the explanation of this obviousness to others is not so easy.

Education

Muller began teaching thermodynamics in circa 1965 and has since taught thermodynamics in four countries (USA, Mexico, Italy, and Germany). His first thermodynamics textbook, among ten total books written in thermodynamics, was published in 1985. [4] His interests have been in all aspects of thermodynamics from the construction and operation of heat engines and refrigerators to the modelling of the thermo-mechanical behavior of shape memory allows, the swelling of poly-electrolytes, and the light scattering in extremely rarefied gases. He developed extended thermodynamics, which is essentially a thermodynamic theory of irreversible processes in rarefied gases; a theory characterized by attractive mathematical properties such as symmetric hyperbolic field equations. [2] In 2005, Müller became an Emeritus Professor of the Technical University Berlin.

Quotes | By

The following are quotes by Muller:

> "No doubt, Shannon and Neumann thought that this was a funny joke, but it is not! It merely exposes Shannon and Neumann as intellectual snobs. Indeed, it may sound philistine, but **a scientist *must* be clear**, as clear as he can be, and **avoid wanton obfuscation** at all cost."

— Ingo Muller (2007), *A History of Thermodynamics* (pgs. 124)

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Further reading

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External links

● Muller, Ingo (1936-) – WorldCat Identities.
● Thermodynamicus.de – Site dedicated to Ingo Muller.

θΔics

In existographies, **Ingo Piepers** (c.1950-) is a Danish social theorist, noted for []

Overview

In 2019, Piepers, in his *On the Thermodynamics of War and Social Evolution*, attempted build on the ideas of Ilya Prigogine, e.g. dissipative structures theory, internal entropy and external entropy, far-from-equilibrium, intermixed with information theory ideas about entropy, chemical potential, Helmholtz free energy, among others, to theorize about war and the evolution of societies, wherein he conjectures ideas such as that "social structures can be understood as 'institutionalized' thermodynamic potentials", that world wars are chaotic dissipative structures, followed by periods of equilibrium, or something along these lines. [1]

Quotes | Employed

The following are quotes employed by Piepers:

> "The fantastic ordering of atoms and molecules necessary to produce and maintain a living system is accompanied by a more than compensating disorder created in the surroundings. Thus, the ever-increasing order represented by increasing numbers of the human species is more than matched by the trail of disorder left in our surroundings, of which the increasing pollution of our atmosphere, rivers, and oceans is but an example."
>
> — Hendrick van Ness (c.2000), *Publication*; cited by Ingo Piepers (2019) in *On the Thermodynamics of War and Social Evolution* (pg. 21) [1]

References

1. Piepers, Ingo (2019). *On the Thermodynamics of War and Social Evolution* (pdf). Global4Cast.org.

External links

â— Ingo Piepers – ResearchGate.net.

θΔics

In

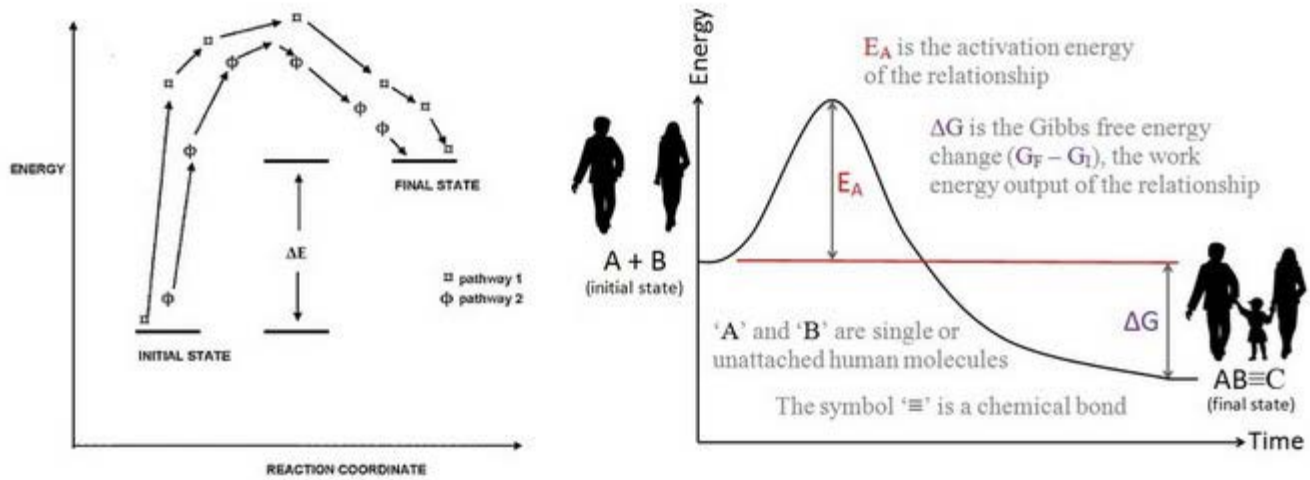

Generic depiction of an "**initial state**" of a reaction system, at a specific value of energy, which may proceed through any of various reaction pathways, in its course of action towards a "final state", signified by a specific value of energy, at a later point in time (or concentration) on the reaction coordinate. [1]

thermodynamics, an **initial state**, compared to a final state, refers, generally, to the measurement of the free energy or the reactants, graphically shown on the reaction coordinate, at the start or initial second at the beginning of the reaction sequence.

Overview

In 1993, American chemist Martin Goldstein gave the following example of what is meant by initial versus final in the context of "states", specifically in regards to how one would go about calculating the Gibbs free energy of formation of a mouse (or by extrapolation a human): [2]

> "To apply thermodynamics to the problem of how life got started, we must ask what net energy and entropy changes would have been is simple chemical substances, present when the earth was young, were converted into living matter [as in the formation of a mouse] … to answer this question [for each process], we must determine the energies and entropies of everything in the **initial state** and final state."

In other words, the initial state is one point in time in the course of the reaction, typically the beginning, or point at which reactant collision occurs, millisecond in which the reaction becomes activated, or time at which the reactants are introduced into the reacting system. The final state is some amount of time (seconds, minutes, days, or years, etc.) following the start of the reaction.

The two different states, are often explained in terms of differences in the bonding geometries, bonding changes, and bond energies of the products as compared to the reactants.

Human initial states

The reaction coordinate, above left, outlines the basics of the initial states of the standard human reaction coordinate of the male-female reaction, in which is child is conceived over a number of years. In this model the "initial state" will refers to the Gibbs free energy determinants of the bonding configurations of the two unattached single human molecules at the second of collision; whereas the final state will refer to the bonding configurations a set number of months or years into the relationship, typified by an increased stability in the chemical bonding arrangements, in spontaneous reactions.

References

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89; Graph, pg. 474.). AuthorHouse.
2. Goldstein, Martin and Goldstein, Inge F. (1993). *The Refrigerator and the Universe: Understanding the Laws of Energy* (section: Entropy of a mouse, pgs. 297-99). Harvard University Press.

θΔics

In science, **inorganic** (TR=112), as compared to organic (TR=983), is an obsolete 18th century historical categorizational term, generally introduced by Jacob Berzelius (c.1826), albeit still in semi-active vague colloquial usage, meant to distinguish or characterize matter associated with minerals or the mineral kingdom, i.e. the so-called "non-living" classification, in the 1735 Linnaean three kingdom classification scheme, as compared to those chemicals and compounds associated with animals and plants, i.e. the animal kingdom or plant kingdom, grouped together in the so-called "living" classification.

in·or·gan·ic

/ˌinôrˈganik/

adjective

1. not consisting of or deriving from living matter.
2. CHEMISTRY
   of, relating to, or denoting compounds that are not organic (broadly, compounds not containing carbon).

A Google-generated definition of **inorganic** as something not derived or consisting of living matter—a false dichotomy (as "living matter" is a vacuous concept, i.e. life does not exist)—or compounds not containing carbon.

Etymology

In 1735, Swedish polymath Carl Linnaeus published his *System of Nature: Through the Three Kingdoms of Nature*, in which he systematized nature into three divisions or kingdoms: mineral, plant, and animal, aka Linnaean classification. [8]

In the 18th century, several thinkers, amid the French enlightenment, including Pierre Maupertuis (1698-1759) and Denis Diderot (1713-1784), promoted a non-supernatural duality theory, according to which two types of matter existed: organic and inorganic, though it remains to be discerned what terms (in what language) they used in particular. [1]

The term "inorganic", meaning "without organized structure", supposedly, was in use in 1794. [4]

In 1808, Swiss chemist Jacob Berzelius had coined the term "organic chemistry". [5]

In circa 1826, or before, Berzelius seems also to have coined—or at least popularized or introduced—the term "inorganic", in the context of organic chemistry, being that in the English translation (1833) of his *The Analysis of Inorganic Bodies*, he was defining things as follows: [6]

> "In the class of **inorganic** bodies, I arrange air those that are not formed by animals and vegetables, and that do not result from their destruction by fire, putrefaction, or the action of acids, alkalies, etc., I comprehend under the term, the fossils, properly so called, the mineral waters, and the artificial products of bodies whose origin is not organic."

In this period, as outlined by Berzelius here, inorganic was being used as a synonym from those compounds obtained from the so-called "mineral kingdom", as contrasted with organic or compounds obtained from the plant kingdom or animal kingdom, per the three-divisional kingdom ideologies of the early 19th century. [5]

In 1842, German physician Robert Mayer published "Remarks on the Forces of Inorganic Nature", wherein he gave one of the first published values for the mechanical equivalent of heat—namely that "the warming of a given weight of water from 0ËšC to 1ËšC corresponds to the fall of an equal weight from the height of about 365 meters", meaning that the fall of a weight, e.g. a volume of water, falling through a distance, via the force of gravity, and transforming into heat or an increase in molecular collisions, frictions, and or agitations, e.g. water at the bottom of a waterfall or water in a tub being turned by a paddle wheel, as evidenced by a rise in temperature of the water, the electromagnetic force being under discussion in the latter case—the title of which evidences the apparent or seeming duality thought to exist between the forces of inorganic nature as compared to organic nature. [2]

In 1862, inorganic was being employed to mean "not arrived at by natural growth". [4]

In the early 21st century, the division of compounds into organic and inorganic was considered somewhat arbitrary, e.g. a compound that contains both carbon and a metal, such as chlorophyll or hemoglobin, may be considered either organic or inorganic, depending on the interests of the person who is studying it. [5]

Inorganic life | Organic life

In 1995, as shown adjacent, silicon was being referred to as an example of "inorganic life", just as carbon, historically, has been associated with "organic life", the argument being that we, supposedly, do not recognize silicon-based animate forms as being "alive" being that carbon-based animation reactions, e.g. in reaction with oxygen, have a greater "variety and speed of biochemical reactions". [7]

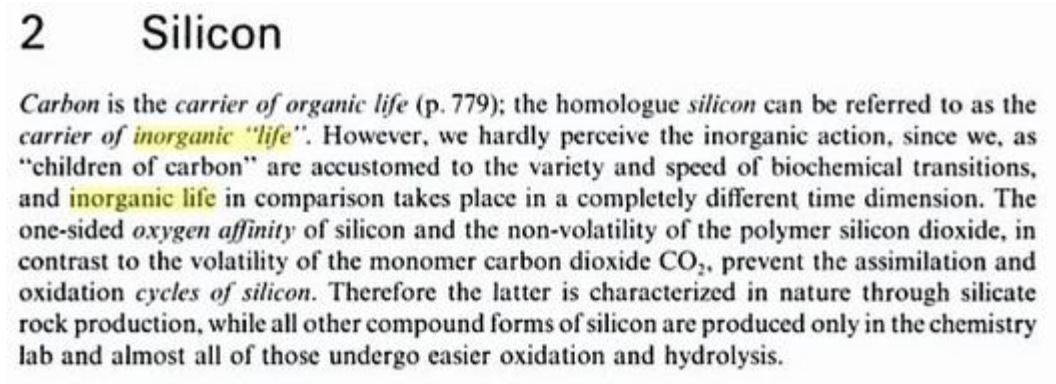

2 Silicon

Carbon is the *carrier of organic life* (p. 779); the homologue *silicon* can be referred to as the *carrier of inorganic "life"*. However, we hardly perceive the inorganic action, since we, as "children of carbon" are accustomed to the variety and speed of biochemical transitions, and inorganic life in comparison takes place in a completely different time dimension. The one-sided *oxygen affinity* of silicon and the non-volatility of the polymer silicon dioxide, in contrast to the volatility of the monomer carbon dioxide CO_2, prevent the assimilation and oxidation *cycles of silicon*. Therefore the latter is characterized in nature through silicate rock production, while all other compound forms of silicon are produced only in the chemistry lab and almost all of those undergo easier oxidation and hydrolysis.

A discussion of so-called "inorganic life" as being silicon-based. [7]

Quotes

The following are related quotes:

> "I am sure you will forgive me my fault," [Charlotte] said, "when I tell you what it was this moment which came over me. I heard you reading something about affinities, and I thought directly of some relations of mine, two of whom are just now occupying me a great deal. Then my attention went back to the book. I found it was not about living things at all, and I looked over to get the thread of it right again." "It was the comparison which led you wrong and confused you," said Edward. "The subject is nothing but earths and minerals. But man is a true Narcissus (see: ECHO); he delights to see his own image everywhere; and he spreads himself underneath the universe, like the amalgam behind the glass." "Quite true," continued the Captain. "That is the way in which he treats everything external to himself. His wisdom and his folly, his will and his caprice, he attributes alike to the animal, the plant, the elements, and the gods."
>
> — Johann Goethe (1809), *Elective Affinities* (P1:C4)

> "Vitalists resist on principle the pretensions of those scientists who foresee the ultimate prospect of a capacity to break down the boundary between organic and **inorganic** matter, and who disregard the plausibility of supra-material factors in the existence of life. As a result, concepts like 'life force' or 'immanent energy' are presented by vitalists not only to fill in the areas of mystery left by the incomplete advances of biology, but also to explain why biology's advances will always be incomplete."
>
> — Michael Foley (1990), *Laws, Men and Machines* [3]

References

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8. Systema Naturae – Wikipedia.

External links

â— Inorganic compound – Wikipedia.

θΔics

In chemistry, **inorganic chemistry**, in its originally definition (Lemery, c.1675), is the study of the preparation, properties, constitution, and reactions of matter, elements, and compounds related to the "mineral kingdom", as opposed to those related to the "animal and vegetable kingdom", which is the domain of organic chemistry; re-defined (Thorpe, 1874), generally, as the chemistry of metals and non-metals.

Quotes

The following are related quotes:

> "**Inorganic chemistry** is that section of science which considers the properties of those substances which are not of vegetable or animal origin."
>
> — George Wilson (1870), *Inorganic Chemistry* (pg. 73)

> "Chemistry occupies such an extensive sphere, its operations are so widely distributed, that it has been found desirable, for the greater convenience of study, to subdivide the matters upon which it treats. It was therefore agreed, as suggested by Lemery [c.1675], nearly two hundred years ago, to divide the subject into the two branches of 'inorganic' and 'organic' chemistry. **Inorganic chemistry** was formerly defined to be the chemistry of the mineral kingdom, in contradistinction to organic chemistry, which was held to be the chemistry of the animal and vegetable kingdom, since most of the subjects included under this division were of animal or vegetable origin. This definition of organic chemistry is no longer tenable, for by far the greater number of the compounds classed by the chemist as organic are neither of vegetable nor of animal origin. Still, insensible as the real difference between them is, it is found convenient to retain the subdivisions on the score of expediency. As the substances hitherto comprised under the branch of organic chemistry invariably contain carbon, it has been decided to class with them the numberless carbon compounds which have been subsequently discovered, and to study them in connection with one another. Organic chemistry is today defined to be that portion of the science which treats of the preparation, properties, and constitution of the carbon compounds. The bodies treated under inorganic chemistry are divided into two principal classes—metals and non-metals. This division is also perfectly arbitrary; there exists no absolute line of demarcation between the two branches, and we are unable to say precisely what constitutes a metal, and what a non-metal."
>
> — Thomas Thorpe (1874), *A Manual of Inorganic Chemistry* (pgs. 18-19)

> "I do accept the limited emergentist principle that the laws of biology, psychology exist which are NOT described by the laws of physics and **inorganic chemistry**. These 'emergent laws' are compatible with the laws of physics and chemistry but not derivable from them."
>
> — Donald Campbell (1975), "On the Conflicts between Biological and Social Evolution and between Psychology and Moral Tradition" [1]

> "Allah has revealed to the Prophet [Muhammad], PBUH, in [Quran] verse 23:12-14: We did create life (man) from clay. The verse then describes the process of creation when **inorganic matter** becomes living matter, and absorption of inorganic constituents of the earth into living matter by way of food and nutrients. Proceeding from here it is possible to suggest that life emerged from the nutrient rich clay ferment that produced the enzyme. The enzymes are living molecules of proteins and trace elements. For life processes to proceed the enzyme needs to be charged with 'soul', the driving force that would carry the guidelines/commands of life processes. It had to be a clay environment since that alone can store information and help orientation of the molecule in space and help chirality. Likewise, it had to be some such mechanism that provides the driving force. Irradiation or interaction with a foreign particle as proposed by the geneticists/evolutionists, is not likely to activate life processes. This leaves us with only

one alternative that is Allah's will: kun-fayakun, and soon enough the clay broth has a clay particle charged with a 'soul' that bears the command for shaping the particle into a living organism. It may be reminded that 'amr' or command is unrelated to time which itself was created along with space by the decree: Be, and it was done."

— Mirza Beg (2014), "Beg-Thims dialogue" (#27), Jul 8

See also

â— Organic vs inorganic

References

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External links

â— Inorganic chemistry – Wikipedia.

θΔics

İnsan termodinamik insan faaliyet ve hareket süreçlerinin enerjik ve entropik yönlerinin bilimsel çalışma, boundaried günlük güneş çevrimleri bağlamında, yani bu ısı arasında mevcut, iş, kendiliğinden, tersinmezlik ve yasalar orada tanimlar. Kısacası, insan termodinamik olarak insanların sistemlerinin çalışma termodinamik kullanıyor.

Ayrıca bakınız

- Fiziksel ekonomi

In genius studies, **insanity and genius** refers to geniuses on insanity or the oftentimes-precarious connection and or dividing line between insanity and genius.

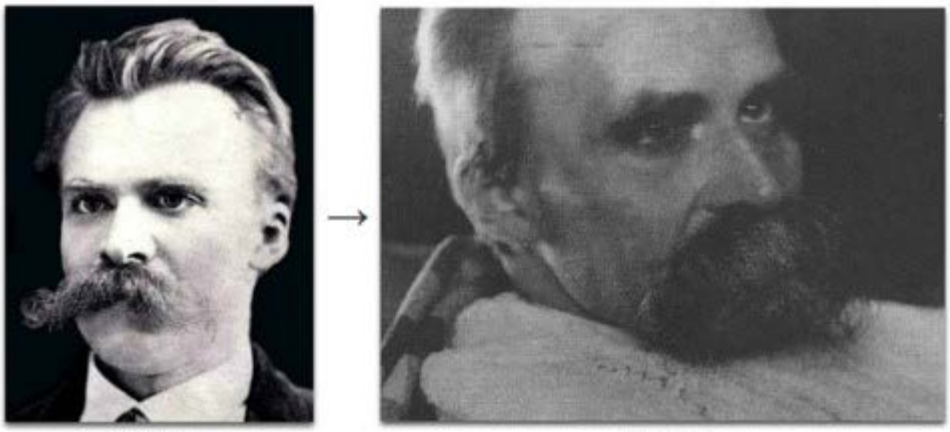

The German great **genius** Friedrich Nietzsche who, in 1889, after famously declaring, in 1882, that "God is dead", epitomizing the emerging view that the Christian God was no longer a viable source of any absolute moral principles, supposedly, went **insane** (Q) (Q), dying (dereacting) the year after. (Q)

Nietzsche

German philosopher Friedrich Nietzsche is said to have gone insane in 1889. The following are a few relevant quotes:

> "And those who were seen dancing were thought to be **insane** by those who could not hear the music."
>
> — Friedrich Nietzsche (c.1885)

> "In individuals, **insanity** is rare; but in groups, parties, nations and epochs, it is the rule."
>
> — Friedrich Nietzsche (c.1885)

> "A casual stroll through the lunatic asylum shows that faith does not prove anything."
>
> — Friedrich Nietzsche (c.1885)

(add discussion)

Mayer

In 1840, German physician and physicist Robert Mayer, one of the first to state the first law of thermodynamics, while working as a ship's doctor on a Dutch vessel which visited the East Indies, had conceived of the mechanical equivalent of heat, equation shown, by study of the color of the blood of his crewmates and the temperature difference between the tropics and Europe. In 1842, after returning to Germany, he began to publish his scientific theories on in obscure journals, such as *Annals of Chemistry and Pharmacy*, but his theories went largely unnoticed as these journals were not read by physicists. Those who did notice, however, ridiculed his work, as it was not based on experimental data. [4]

During this period, one of his sons and two of his daughters fell ill and died before the age of three. He also discovered that English physicist James Joule had claimed discovery of the mechanical equivalent of heat, while his theory was still unknown. In 1850, during an attack of insomnia, Mayer jumped out of a third-story window and fell almost thirty feet to the ground and broke both his legs. It is said that in 1851, he was placed in an asylum, but later released. [5] He survived, but soon was forced to begin spending long series of voluntary and involuntary hospitalizations and even occasional restraint by strait-jacket. [6] Curiously, in Poggendorf's authoritative 1863 *Dictionary of the History of Science* it was incorrectly claimed that Mayer had already died—in an insane asylum.

$$J = \frac{W}{Q}$$

In 1850, German physician-physicist Robert Mayer, after

Pirsig

In 1961, American philosopher Robert Pirsig, a former child prodigy

discovering that James Joule had claimed discovery of the mechanical equivalent of heat, while his work was still unknown, jumped out of a third-story window, and was later put in an **insane** asylum.

cited with an IQ of 170 at age 9, suffered a nervous breakdown and spent time in and out of psychiatric hospitals over the next three years. He was diagnosed with paranoid schizophrenia and clinical depression as a result of an evaluation conducted by psychoanalysts, and was treated with electroconvulsive therapy on numerous occasions, a treatment he discusses in his novel, *Zen and the Art of Motorcycle Maintenance*. In his *Lila: an Inquiry into Morals*, he employs the term "insanity" one some 13+ pages. [7] The following are a few representative quotes:

> "I think present-day reason is an analogue of the flat earth of the medieval period. If you go too far beyond it you're presumed to fall off, into **insanity**. And people are very much afraid of that. I think this fear of insanity is comparable to the fear people once had of falling off the edge of the world. Or the fear of heretics. There's a very close analogue there."
>
> — Robert Pirsig (1974), *Zen and the Art of Motorcycle Maintenance* (§14) (Q)

> "**Sanity** is not truth. Sanity is conformity to what is socially expected. Truth is sometimes in conformity, sometimes not."
>
> — Robert Pirsig (1991), *Lila: an Inquiry Into Morals* (Q)

> "When one person suffers from a delusion it is called **insanity**. When many people suffer from a delusion it is called religion."
>
> — Robert Pirsig (1991), *Lila: Inquiry into Morals*; cited in *The God Delusion* (pg. 28) by Richard Dawkins

(add discussion)

Quotes

The following are related quotes:

> "There was never a genius without a tincture of madness."
>
> — Aristotle (c.310BC)

> "There is no great genius without a touch of madness."
>
> — Seneca the Younger (c.50AD) (Q), likely Aristotle paraphrase

> "We do not have to visit a madhouse to find disordered minds; our planet is the mental institution of the universe."
>
> — Johann Goethe (c.1800)

> "Emptiest word rubbish and silliest gallimathias that have ever been heard outside the **insane** asylum."
>
> — Arthur Schopenhauer (1839), commentary on the writings of Georg Hegel [1]

"I became **insane**, with long intervals of horrible insanity."

— Edgar Poe (c.1845)

"Men have called me mad; but the question is not settled, whether madness is or is not the loftiest of intelligence."

— Edgar Poe (c.1845)

"For over two thousand years some subtle relationship has been thought to exist between genius and **insanity**."

— Bernard Hollander (1921), preface to John Nisbet's *The Insanity of Genius* [2]

"**Insanity**: doing the same thing over and over again and expecting different results."

— Albert Einstein (c.1930)

"Genius is more often found in a **cracked pot** than in a whole one."

— E.B. White (c.1950) (O)

"The sign of a **half-baked speculator** in the social sciences is his search for something in the social system that corresponds to the physicist's notion of entropy."

— Paul Samuelson (1972) [3]

See also

- Crackpot

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θΔics

In institutes, **Institute of Human Thermodynamics**, acronym IoHT, is a leading international professional body and learned society with over 75 members, which promotes the advancement and dissemination of a knowledge of and education in the science of human thermodynamics, pure and applied. The IoHT is a non-profit, educationally-mined organization established in 2002 by American chemical engineer Libb Thims. [1] The *Journal of Human Thermodynamics* (JHT), started in 2005, is maintained by the IoHT. [2] The symbol for the IoHT is "θΔics".

Research area in one of the **IoHT Labs** (c.2005)

How to join

The IoHT is open to all individuals interested in furthering the understanding of the thermodynamical explanation of human existence. There is no cost to join. A token of commitment to the effort is the submission of a short article on a connected topic to the Journal of Human Thermodynamics. [6]

Clausius Medal

See main: Thermodynamics Medal (proposal)

The IoHT is currently considering being the presenting host and curator for a semi-annual "Clausius Medal", named in honor of thermodynamics founder Rudolf Clausius, given out, along with a small monetary sum, for excellent contributions to the subject of human thermodynamics.

IoHT | Founding members

The following individuals are IoHT members who are also EoHT members, which gives the indication that the subject of human thermodynamics is a subject unique or rather keen to chemical engineers (and to a good extent physical chemists), in particular:

Libb Thims	Georgi Gladyshev	Ted Erikson	Lynn Liss	Jing Chen	Viktor Minkin	Gerry Nahum
Chemical engineer Electrical engineer	Physical chemist	Chemical engineer Physics teacher	Business executive	Mathematician Economist	Biomatrician	Chemical engineer Physician

Location

The central hub of the IoHT is located in Chicago, Illinois:

Institute of Human Thermodynamics
4126 N. Keystone
Chicago, IL 60641

The bulk of the structure of the Institute, however, is virtual being connected via emails, websites, mail, phone calls, and

occasional meetings. [3]

Press releases

The press releases for the IoHT, concerning publications, works, and studies of members of the IoHT, IoHT-related events and notices, are hosted and distributed by PR.com. [5]

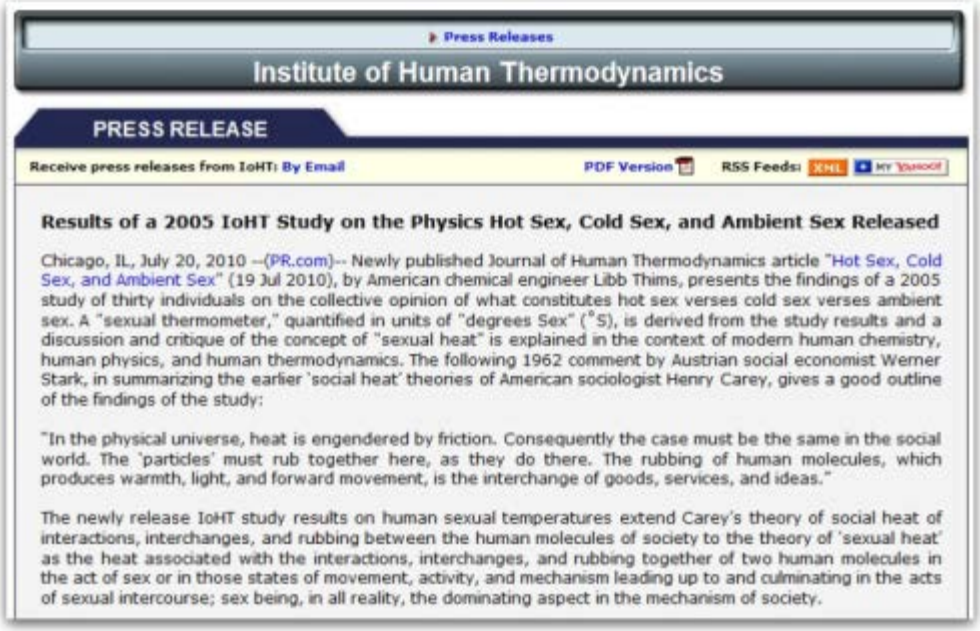

Press Releases

Institute of Human Thermodynamics

PRESS RELEASE

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Results of a 2005 IoHT Study on the Physics Hot Sex, Cold Sex, and Ambient Sex Released

Chicago, IL, July 20, 2010 --(PR.com)-- Newly published Journal of Human Thermodynamics article "Hot Sex, Cold Sex, and Ambient Sex" (19 Jul 2010), by American chemical engineer Libb Thims, presents the findings of a 2005 study of thirty individuals on the collective opinion of what constitutes hot sex verses cold sex verses ambient sex. A "sexual thermometer," quantified in units of "degrees Sex" (˚S), is derived from the study results and a discussion and critique of the concept of "sexual heat" is explained in the context of modern human chemistry, human physics, and human thermodynamics. The following 1962 comment by Austrian social economist Werner Stark, in summarizing the earlier 'social heat' theories of American sociologist Henry Carey, gives a good outline of the findings of the study:

"In the physical universe, heat is engendered by friction. Consequently the case must be the same in the social world. The 'particles' must rub together here, as they do there. The rubbing of human molecules, which produces warmth, light, and forward movement, is the interchange of goods, services, and ideas."

The newly release IoHT study results on human sexual temperatures extend Carey's theory of social heat of interactions, interchanges, and rubbing between the human molecules of society to the theory of 'sexual heat' as the heat associated with the interactions, interchanges, and rubbing together of two human molecules in the act of sex or in those states of movement, activity, and mechanism leading up to and culminating in the acts of sexual intercourse; sex being, in all reality, the dominating aspect in the mechanism of society.

An example 2010 **IoHT press release** (PR.com): reporting the results of a 2005 study on the thermodynamic nature of cold sex, hot sex, and ambient sex, base on a detailed survey of thirty people; data from which a 'sexual thermometer' was developed in units of 'degrees sex' ˚S. [7]

Meetings

Founding members of the IoHT: Libb Thims, Lynn Liss, and Ira Liss, meet annually on the 4th of July weekend at a different waterpark each year and discuss progress of the development of human chemistry and human thermodynamics. Many of the early meetings with other members, in 2004 and 2005, were not recorded. Recent meetings have been impromptu and random as listed below:

2006

- (Winter) Thims met with Ted Erikson in Chicago to discuss Human Chemistry manuscript.
- (Summer) Thims met with Georgi Gladyshev at the 14th annual International Anti-Aging Congress and Exposition in Chicago at the Rosemont Convention center, who was one of the key speakers and discussed Thims' human thermodynamics in lecture.

2007

- (12/16) – Thims met with Georgi Gladyshev in Chicago (magnificent mile) to discuss human thermodynamics and hierarchical thermodynamics. Gladyshev believes that Thims' work can be send to the Nobel Prize committee for nomination.

2008

- (03/14) - Thims met with Ted Erickson at the annual American Association of Physics teachers (AAPT) meeting at Harper College (Palatine, Illinois) where Erickson discussed Thims' human molecule theories in lecture.
- (03/19) - Thims met with Monzershaher Ettawil and Andrew Maxwell in Chicago to thank them for reading portions of the manuscript *Human Chemistry* and to give them finished copies; as well as to show them the finished copy of *The Human Molecule*.

Institute of Human Thermodynamics (vehicle)

The HumanThermodynamics.com URL located on the back window of IoHT founder Libb Thims' car (circa 2005).

Symposiums

- Both Georgi Gladyshev and Libb Thims were invited to attend, and to submit presentation proposals, the 2007 *Meeting the Entropy Challenge – an International Thermodynamics Symposium in Honor and Memory of Professor Joseph Henry Keenan* at MIT. [4] Unfortunately, Gladyshev and Thims were unable to attend do to scheduling difficulties.

Other

- Thims was invited to attend the July 19-20 PodCamp3 Boston at the *Joseph Martin Conference Center* at Harvard Medical School.

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3. Contact Us - Institute of Human Thermodynamics
4. *Meeting the Entropy Challenge*, sponsored by The Department of Mechanical Engineering, MIT, and George and Daphne Hatsopoulos (by invitation of Gian-Paolo Beretta).
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Further reading

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θΔics

In mathematical thermodynamics, an **integrating denominator** is the denominator of an integrating factor, the denominator being the part of the fraction below the line signifying division that functions as the divisor of the numerator, part above the line, and in fractions with 1 as the numerator indicates into how many parts the unit is divided.

Integrating denominators are very important in thermodynamics, although the underlying historical origin, proof, and justification for these various numerators is a bit elusive. The exact pre-Clapeyron era mathematics (1675-1834) to this proof remain to be tracked down.

Clapeyron

The idea of an integrating denominator seems to have been first introduced in the 1834 "Memoir on the Motive Power of Heat" by French physicist Emile Clapeyron, although this is not at all stated directly. Clapeyron speaks of "latent caloric" and "absolute quantities of heat" dQ. [1]

The modern-day perspective of Clapeyron-mathematics, although he does not seem to directly give this derivation, is that the variable of pressure *P* of the body is the integrating denominator of the integrating factor:

$$\frac{1}{P}$$

such that when this integrating factor is multiplied into inexact differential of a quantity of work δW of the body the resulting function:

$$\frac{\delta W}{P} = dV$$

is said to be an exact differential.

Clausius

In German physicist Rudolf Clausius' 1854 theorem of the equivalence of transformations, as found in his "On a Modified Form of the Second Fundamental Theorem in the Mechanical Theory of Heat", an "unknown function" of the temperature, symbol *T*, is introduced as follows:

$$f(t) = \frac{1}{T}$$

Through argument, Clausius then goes on to conclude that this "unknown function" of temperature must be the absolute temperature of William Thomson's temperature scale. He then concludes that when this function, or integrating factor as it seems to be called in modern parlance, is multiplied into an inexact differential quantity of heat Q, the resulting function:

$$\frac{Q}{T}$$

which Clausius calls the "equivalence value" is an exact differential. In modern parlance, when Clausius' "unknown function" of the inverse if the absolute temperature:

$$\frac{1}{T}$$

or integrating factor as it is called in modern terms, is multiplied into inexact differential of a quantity of heat δQ of the body the resulting function:

$$\frac{\delta Q}{T}$$

is said to be an exact differential. In 1865, Clausius gave this so-called exact differential the symbol "dS" defined as follows, in modern symbol notation:

$$\frac{\delta Q}{T} = dS$$

along with now-famous name entropy or transformational content.

Caratheodory

In 1908, Greek mathematician Constantin Caratheodory published "Studies in the Foundation of Thermodynamics" in which he introduced what has come to be known as theorem of Caratheodory. [3] In modern parlance, the so-called Caratheodory theorem says some to the effect of the following conclusion: [4]

> "If a Pfaffian expression has the property that, in every neighborhood of a point P, there are points which cannot be connected to P along curves which satisfy the Pfaffian equation, dQ = 0, then the Pfaffian expression must admit an **integrating denominator**."

This seems to be the first usage of the term "integrating denominator" in thermodynamics. In the decades to follow, this version of thermodynamics began to creep into the various thermodynamics books and textbooks.

American chemist Howard Reiss, in his "Mathematical Apparatus" chapter gives a fairly decent overview of the so-called relation between the exact or complete differential, the Pfaff differential expression, and the integrating denominator, all of which he indicates as italicized terms, and devotes a five-page section to attempt to answer the question: "when does a Pfaff differential expression possess an integrating denominator?" Reiss then gives an overview of the theorem of Caratheodory to answer this question. [5]

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θΔics

In mathematics, an **integrating factor** is a function, μ(x,y), that, in some cases, can be multiplied into an inexact differential equation, converting it into an exact equation or complete differential. [1] The resulting exact equation, such as:

$$\frac{\delta W}{P} = dV$$

1/P is the **integrating factor** for the inexact differential δW.
(formulated by Emile Clapeyron in 1834)

$$\frac{\delta Q}{T} = dS$$

1/T is the **integrating factor** for the inexact differential δQ.
(formulated by Rudolf Clausius in 1865)

$$\mu M(x, y)\, dx + \mu N(x, y)\, dy = 0$$

however, may not be equivalent to the original equation in the sense that a solution of one is also a solution of the other. It is possible, for instance, for a solution to be lost or gained as a result of the multiplication.

Example

The following inexact equation: [1]

$$(x + y)\, dx + x \ln x\, dy = 0$$

Can be made exact using the integrating factor μ(x,y) = 1/x, on (0, ∞). We first confirm that the equation is indeed inexact using the condition for an exact differential, whereby we note that M(x, y) = x + y and N(x, y) = x ln x so that ∂M/∂y = 1 and ∂N/∂x = 1 + ln x, whence ∂M/∂y ≠ ∂N/∂x. If, however, we multiply the equation by μ(x,y) = 1/x, we obtain:

$$(1 + y/x)\, dx + \ln x\, dy = 0$$

whereby:

$$M(x, y) = 1 + y/x,\ N(x,y) = \ln x,\ \partial M/\partial y = 1/x = \partial M/\partial y$$

Pressure volume work

The logic of the integrating factor can be applied to the inexact differentials đQ (or δQ) and đW (or δW). [3] In ideal gas systems, for instance, the following is the expression for pressure volume work in a steam engine, as was introduced by Emile Clapeyron in 1834:

$$\delta W = PdV$$

therefore 1/P is the integrating factor for đW. Thus, by rearrangement, the expression:

$$\frac{\delta W}{P} = dV$$

is an exact differential and V is a state variable. [3]

Entropy

This same logic was followed, beginning in 1850, by German physicist Rudolf Clausius in the transformation of inexact differential đQ (or δQ) into the exact differential *dS*. In short, in formulating the expression for entropy, over a period of fifteen years (1850-1865), Clausius famously used the inverse of absolute temperature (1/T) of the body as the "integrating" factor to convert the nonexact differential of heat *dQ* into an exact differential or, in other words, a caloric particle into a state function *dS*. [2] In this case, *T* is called the being the "integrating denominator". In particular, into the 1840s it was becoming known that the integral of a differential unit of heat *dQ*:

$$\int dQ$$

involved in any reversible change in a given substance or system is not independent of the path followed, or in other words of the intermediate conditions passed through. It follows that *dQ* is not a complete differential and that the integral of *dQ* cannot be expressed as a function of the initial and terminal conditions:

$$\int_i^f dQ \neq Q(f) - Q(i)$$

It is well known, however, that it is possible by means of an integrating factor to reduce *dQ* to a complete differential, and hence to express its integral thus transformed, as a new function of the initial and end conditions. In other words, a differential *dQ* that is not exact is said to be integrable when there is a function 1/τ such that the new differential *dQ/τ* is exact. The function *1/τ* is called the integrating factor, *τ* being the integrating denominator. The factor that Clausius used for this purpose is the reciprocal of the absolute temperature *T*, such that a new function of heat can be said to exist:

$$\frac{\delta Q}{T} = dS$$

in which *dS* is a complete differential. This expression, in effect, replaced the caloric theory. The integral of *dS* is then termed the entropy, symbol S, and convenient set of initial conditions being taken from which to measure its value. [2]

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External links

- Integrating factor – Wikipedia.

θΔics

In human thermodynamics, **integration and segregation thermodynamics** refers to the thermodynamic study of the mixing and separations of cultural groups in a community or population. A related term, for instance, is entropy of mixing, which applies to mixing of human molecules.

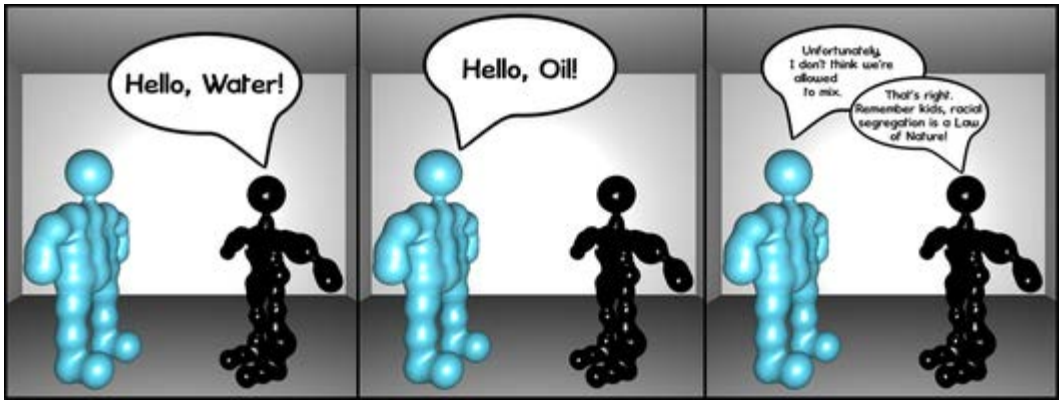

A 2004 oil and water cartoon, alluding to Empedocles premise that people who hate each other cannot mix, similar to how oil and water cannot mix. [8]

Chemistry

In circa 450BC, Greek philosopher Empedocles famously stated, among his many chemical aphorisms, that:

> "People who love each other mix like water and wine; people who hate each other segregate like **water and oil**."

In 1908, Goethe, in his *Elective Affinities*, referred to oil and water, and used the character Mittler the "mediator" as a type of human catalyst able to bring about mixing and or reaction between to people.

In 1914, English-born American engineer William Fairburn, in his *Human Chemistry*, argued that certain human chemicals (people) can at as human emulsifiers acting to bring about mixture of unmixing types; for example: [6]

> "Many human chemists waste their own time and strength and annoyingly harass their workers by endeavoring to compel non-mixing types to produce the best results when placed in direct personal contact. Efficient team work is impossible if non-mixing human chemicals are brought together. **Oil and water** may be put into the same bottle, but no chemist can make them of themselves permanently mix. They instinctively draw apart and no matter how much the chemist sputters, scolds, and shakes up the bottle the two fluids separate as soon as he leaves them alone, the oil rising to the upper part of the bottle as the water sinks to the lower part."

Fairburn continues, in what eludes to the idea of the human emulsifier (similar to Goethe's character Mittler, "the mediator" or human catalyst):

> "A trained chemist would not attempt to mix oil and water, but employers, managers and foremen of labor are constantly endeavoring to bring about a corresponding physical impossibility. If, however, the chemist adds a third substance—soda or gum arabic—the oil and water will blend; even petroleum can be emulsified. The human chemist with his tact and good judgment, can often introduce among his non-mixing men, a natural harmonizer, a man who promotes good fellowship and teamwork."

Likewise, in his 1948 book *We Human Chemicals*, American human chemist Thomas Dreier had one section entitled "Oil and Water Can be Made to Mix", in which he explains that some "human chemicals" do not mix because their ideas are naturally antipathetic. [7]

Thermodynamics

In 1936, Pierre Teilhard, via his omega point theory, seemed to think that the future will bring an end to racism and that everyone in the world will live harmoniously together.

In 1990, American law professor Richard Delgado, in what has been called his law of racial thermodynamics, stated that: [9]

> "There is change from one era to another, but the net quantum of racism remains exactly the same. Racism is neither created nor destroyed."

In 1994, German thermodynamicist Jurgen Mimkes, began using phase diagram models of integrations and segregations of cultures in society; via the analogy of segregation in populations to the miscibility gap in solutions and alloys. He studied, for instance, the integration and segregation of protestants and catholics in Northern Ireland and come to various conclusions about mixed marriages. Mimkes, in his "Binary Alloys as a Model for a Multicultural Society" (1995), published in the *Journal of Thermal Analysis*, elaborated on these view. [4]

In 1998, Venezuelan chemical engineer Erich Muller, a noted expert on the aggregations and separations of fluids, wrote out a short article on the thermodynamics of social aggregations, such as races, social classes, ghettos, Marxist societies, etc., postulating that a force similar to the van der Waals force or London dispersion force acts in societies to group and segregate individuals according to stability requirements. He defined segregation in systems of molecules, for instance, as intermolecular racism. [2]

In 2005, German physicist Ingo Müller, in his *Entropy and Energy: A Universal Competition*, citing Mimkes, devoted an entire chapter to the subject of socio-thermodynamics, wherein he goes through an example of a metaphorical system of hawks and doves competing for the same limited resource, comparing the segregation and mixing of the two populations to that of physico-chemical systems separations defined by phase diagrams. [2]

In 2010, Johann Raatz, in his "Multicultural Thermodynamics" video, discussed his view that multiculturalism is directly analogous to entropy in thermodynamics. [5]

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θΔics

In education, **intellectual moron**, "pseudo-intellectual" (Daniel Flynn, 2004) or "learned ignorance" (Nicholas of Cusa, c.1640) refers to a smart person—one with high levels of learning and or a high said-to-be IQ—who lets ideology do his or her thinking, who forgoes independent judgment in favor of having their views handed to them, have their mind on autopilot, often being so blinded to reality by the causes they serve that they espouse bizarre, sometimes ridiculous, in many cases contradictory and or dangerous positions. [1] An intellectual moron, in short, refers to one who is both a moron (IQ=50-69) and an intellectual (IQ=120+), a blend of the two. An intellectual moron, by lecture definition, according to term-coiner Daniel Flynn, is someone who has great cognitive abilities, but who relies on ideology rather than his or her brain to do their thinking. [2]

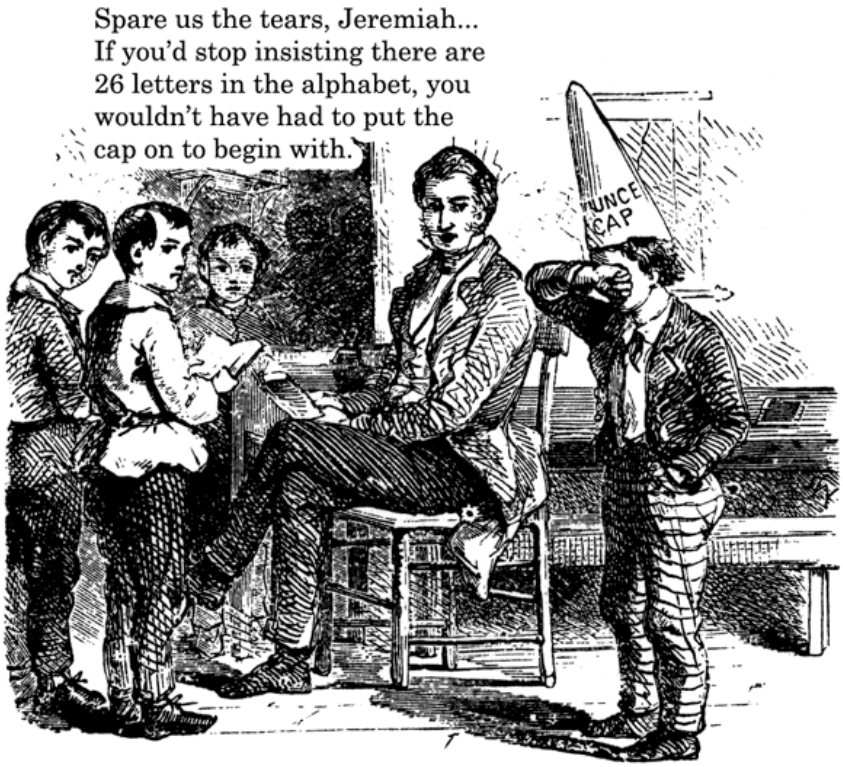

A possible representation of an **intellectual moron**: the teacher who incorrectly belittles his student, based on his academic position.

A ripe example of a so-called "intellectual moron", according to Daniel Flynn, author of the 2004 of the same name, include Australian moral philosopher professor Peter Singer, professor of "bioethics" at Princeton, the so-called godfather of the animal rights movement, who objects to humans eating animals, but not to humans having sex with them, a logic based on his speciesism views. [3]

There is no doubt that someone could transform into a moron in such a field, being that firstly "bio" is something that does not exist (see: defunct theory of life), and secondly that "ethics", for 75% of the world is based on Anunian theology and the weighing of the soul model of morality; whereas correctly, as Goethe so rightly discerned in 1808 morality or rather the moral symbols of nature are rooted in science of physical chemistry. Hence, one not literate in physical chemistry, such as is the case with Singer, may very well tread down the path towards moronville.

Related or synonymous terms might be what Nicholas of Cusa refers to has "learned ignorance", a learned person in blind possession of ignorance; or possibly what Flynn calls a 'pseudo-intellectual'.

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θΔics

In terminology, **intelligence** (TR:481) or "intellect", from Latin *intelligere*, from *inter-* "between" + *legere* "choose, pick out, read", is [add]. [1]

Geniuses

> *See main: Genius studies; Genius rankings*

In 1926, American psychologist Catherine Cox, in her *Early Mental Traits of Three Hundred Geniuses*, using the Cattell 1000 (1894), the top one thousand eminent creators and leaders of western civilization, ranked the top 301 greatest geniuses, existive between 1450 and 1850, by intellect.

In 1994, Tony Buzan and Raymond Keene, in their *Book of Genius*, presented a ranking of the top 100 geniuses of all time.

In 2014, American electrochemical engineer Libb Thims initiated a work-in-progress up-to-date ranking of the top 500 geniuses of all time by IQ (real IQ).

Beauty

In 2002, Libb Thims conducted a study (see: Beckhap's law proof) of the physical attractiveness of graduation photos of college graduates vs the intellectual difficulty of degrees obtained, finding in inverse relationship between beauty and intelligence, thus corroborating Beckhap's law, aka the beauty-brains paradox, namely adage that "beauty varies inversely with intelligence", i.e. that beauty and brains, at combined intensified levels, are rarely found in the same package.

Quotes

The following are related quotes

> "Many much-learned men have no **intelligence**; said another way, there are many who know many things, yet are lacking in wisdom."
>
> — Democritus (c.380BC) (Q)

See also

- Advanced perspective | Advanced intelligence perspective
- Intelligent design
- Physical intelligence
- Religion and intelligence

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Videos

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External links

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θΔics

In religion, **intelligent design**, or ID, a post-1987 synonym for creationism or "creation science", refers to the model that humans were designed by god and not be evolution; a post-2005 synonym is "sudden emergence", terminology change arising owing to US court rulings on violations of the establishment clause of the first constitution in public schools.

A see no evil, hear no evil cartoon (O) rendition of "**intelligent design**" as scientists, Darwinists, or or evolutionists tend to marginalize the subject.

Etymology

The term 'intelligent design' came into prominent usage following the ruling of the 1987 case Edwards v. Aguillard, in which the term "creation science" was deemed illegal and banned from public schools, after which the term creationism was replaced, specifically in the third edition (1987) of the book *Creation Biology*, with 'intelligent design'. The following is evidence from the 2005 Kitzmiller v. Dover trail, showing how the word "intelligent design" came into the American vernacular: [2]

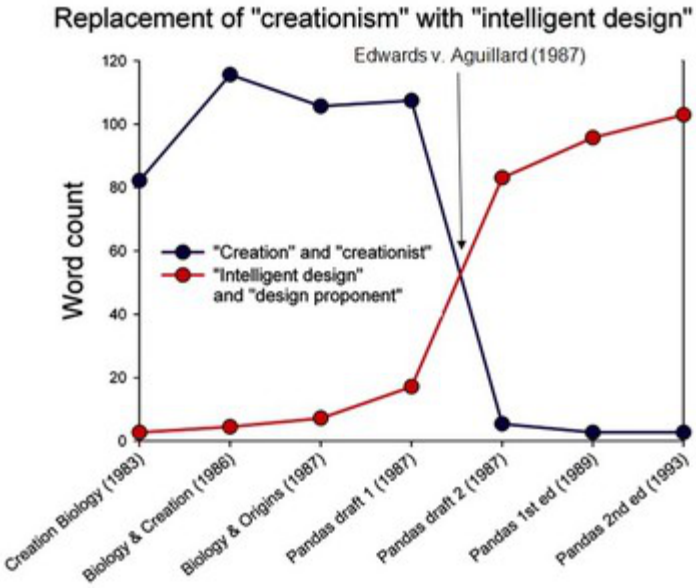

This book was renamed as *Of Pandas and People* in the 1989 edition, later famously becoming the focus of the 2005 Kitzmiller v. Dover, over a Dover, Pennsylvania, school board ruling to begin teaching intelligent design (Biblical creation theory) to 9th grade high school biology students as an alternative to evolution. [1]

American mathematician-theologian William Dembski has defined "intelligent design" as the Logos theology of John's Gospel restated in the idiom of information theory. [4]

Thermodynamics

In post 1990s publications, one will occasionally see terms such as ID or intelligent design mixed up in discussions with thermodynamics, such as in the origin of life, the second law, order vs disorder. [3]

Intelligent design | → Emergence

Religion, in its efforts to get its foot in the door of science, seems to be the classic example of a terminological shapeshifter. Humorously, just as McLean vs Arkansas (1982) worked to label the term "creation science", or scientific creationism (or simply creationism), of the Henry Morris and John Whitcomb *The Genesis Flood* (1961) variety,

unconstitutional, for use in public school curriculum; a subject matter, which, following the Edwards vs Aguillard (1987) decision, became reclothed, in *Of Pandas and People* (the first edition of which (O) entitled *Creation Biology*, 1983), via the label "intelligent design"; so to has the Kitzmiller vs Dover (2005) decision worked to bring about a new for god-based science, namely: "emergence", which journalist Lauri Lebo (2008) reports as follows: [5]

> "A draft of *Pandas and People*'s sequel, *The Design of Life*, had been previewed during Dover's trial (2005). Just as Foundation for Thought and Ethics substituted the word 'creationism' with 'intelligent design'—following Edwards vs Aguillard (1987) —throughout versions of *Pandas*, this edition substituted 'sudden emergence' for 'intelligent design'. This prompted Rothschild to ask Michael Behe during cross-examination, 'will we be back in a couple of years for the 'sudden emergence' trail."

(add discussion)

References

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2. Review of the highlights of the Dover trail (2010) - YouTube.
3. Pullen, Sturat. (2005). *Intelligent Design and Evolution?* (thermodynamics, 12+ pgs.). Intelligent Design Books.
4. (a) Ed brayton: on the Dover Trail (2 of 6) – YouTube.com.
(b) Humes, Edward. (2007). *Monkey Girl: Evolution, Education, Religion, and the Battle for America's Soul* (pg. 289). Harper.
5. Lebo, Lauri. (2008). *The Devil in Dover: an Insider's Story of Dogma v. Darwin in Small-Town America* (pg. 210). The New Press, 2013.

External links

- Intelligent design – Wikipedia.

θΔics

In thermodynamics, **intensive**, as contrasted with "extensive", is a quantity, variable, property, or parameter, sometimes referred to as *intensity*, defined as a partial derivative of an extensive function with respect to an extensive state variable. [1] Intensities are defined at one point of the space, and of degree zero with respect to amount of substance.

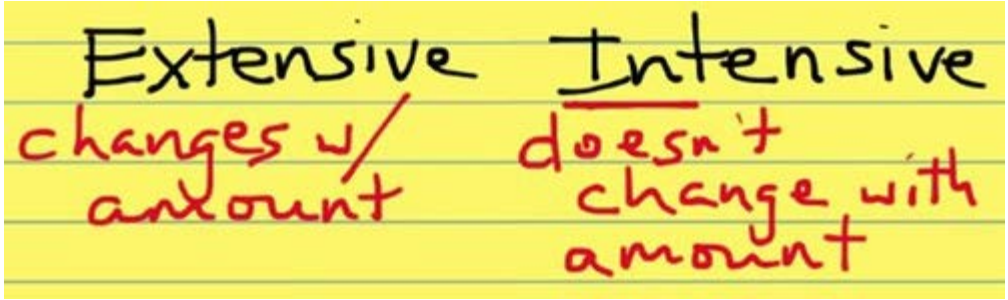

A simplified video (Q) definition of extensive, as something that changes with amount (e.g. length, surface, V, S, U, H, F, G, momentum, or kinetic energy), vs **intensive**, as something that doesn't change with amount (e.g. T, P, B, or μ).

Examples of intensive variables include: temperature, pressure, magnetic field, chemical potential [2]; as well as density and velocity [3].

When the extensive function is internal energy, the corresponding intensive quantities are called "tensions". [1] A tension takes the same value on both sides of a boundary separating two systems at equilibrium, a character not shared by any other intensive quantity.

An intensive variable or property, defined another way, is one that does not depend on the mass of the system, and are the same for the entire system or for parts of the system. If two systems are brought together, intensive properties are not summed. [3]

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics*, Oxford: Oxford University Press.
2. (a) Landau, David P. and Binder, Kurt. (2005). *A Guide to Monte Carlo Simulations in Statistical Physics* (pg. 174). Cambridge University Press.
(b) Le Bellac, Michel, Mortessagne, Fabrice, and Batrouni, Ghassan G. (2004). *Equilibrium and Non-equilibrium Statistical Thermodynamics* (pg. 12). Cambridge University Press.
3. Potter, Merle C. and Somerton, Craig W. (2009). *Schaum's Outlines: Thermodynamics for Engineers* (pg. 3). McGraw-Hill.

External links

- Intensive and extensive properties – Wikipedia.

θΔics

In science, an **interaction** is a microsecond exchange involved between two or more bound state entities or in a general sense an exchange of a gauge boson between two fermions, after which the bound entities or fermions are said to be "changed".

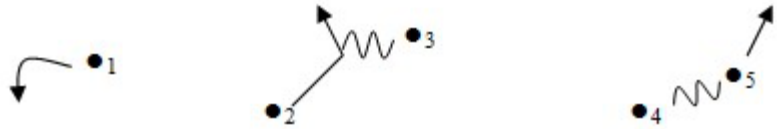

Three types of humans (modeled as human particles) **interacting**: left: a human moved into a spin or curled trajectory by a gravity interaction; middle: a human in trajectory repelled away from a stationary human, via a repulsive exchange interaction; right two initially stationary humans, after which following an interaction, one is repelled way. [1]

History

In 1916, in the context of the origin and evolution of life, American zoologist Henry Osborn introduced his so-called "theory of reaction and interaction of energy". [4] In 1926, physical chemist Alfred Lotka introduced his trigger action model of predator-prey interaction. The 1960s decoding of the honeybee waggle dance (or wiggle dance), a type of interaction movement that provides nectar, pollen, water, or hive location information to fellow bees, by Karl Frisch is one of the first detailed studies of animal interaction. [5]

In the 1970s, American mathematical psychologist John Gottman became the first to video record and study time-slowed interactions between humans in a quantitative manner. In laboratory setting, over several years, Gottmann studied and measured the interactions of several hundred married couples interacting in a controlled environment.

Gottman found, when analyzing the video data at a slow microsecond speed, that exchange data such as the emotional content of person's words, facial expressions, gestures, or body movements, unconscious intonations, etc., can be divided into three groups: positive, neutral, or negative. These can range from disgust, contempt, belligerence, validation, affection, or joy, which can each be digitally coded at each moment of the interaction. In other words, all of the many hundreds of sensor inputs, such as the visual sight of a sour facial expression, of any human conversation create a reactionary state of either attractionor repulsionin the recipient. Attraction tends to create cohesive dynamic movements and behaviors, whereas repulsion tends to create receding dynamic movements and behaviors. Gottman's findings culminated in the finding of what is called the Gottman stability ratio, namely that stable human marriages are quantified by a 5-to-1 ratio of attractive-to-repulsive types of interactions. [3]

In the 2000s, American wearable computer technologist Alex Pentland has been running a research group on the study of human dynamics at the MIT that has built a computer system that measures a set of non-linguistic social signals, such as engagement, mirroring, activity, and stress, by analyzing "tone of voice" over one-minute periods, and supposedly have theoretically applied the model to predictions of dating decisions, salary negotiations, social network position movements, hiring preferences, measurements of empathy or interest, etc. In Pentland's own summary words: [6]

> "In examining some of the most important interactions a human can have: finding a mate, getting a job, negotiating a salary, finding one's place in one's social network, etc., activities for which we prepare intellectually and strategically, sometimes for decades, it is largely unconscious social signally, in contrast to actual linguist exchange, occurring at the start of the interaction that appears to be most predictive of the outcome."

In 2007, American electrochemical engineer Libb Thims introduced the standard human physics model of interaction between human particles or human molecules, such as diagrammed below. [1]

Standard model

In the conceptual model of fundamental interactions, matter consists of fermions, which carry properties called charges and spin ±1⁄2 (intrinsic angular momentum ±ħ/2, where ħ is the reduced Planck constant). They attract or repel each other by

exchanging bosons. The interaction of any pair of fermions in perturbation theory can then be modeled thus:

> Two fermions go in → *interaction* by boson exchange → Two changed fermions go out

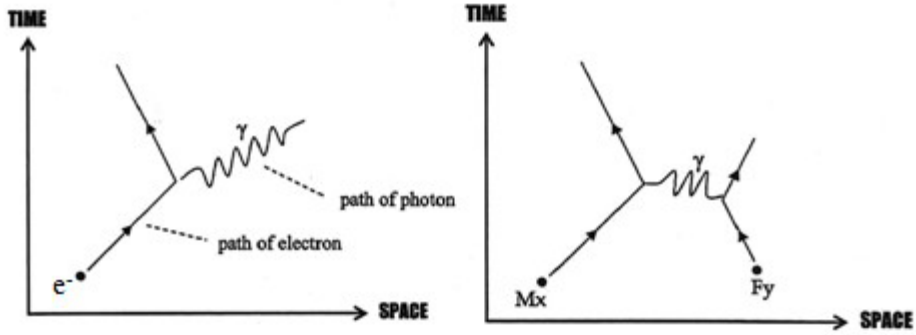

In terms of time and movement, human interactions, each of which result in increases or decreases in reactive attraction (distance toward) or repulsion (distance away) can be quantified on Feynman diagrams (above left showing an electron-photon interaction; above right showing a male human molecule Mx and female human molecule Fy interacting via a single photon exchange. [1]

The exchange of bosons always carries energy and momentum between the fermions, thereby changing their speed and direction. The exchange may also transport a charge between the fermions, changing the charges of the fermions in the process (e.g. turn them from one type of fermion to another). Since bosons carry one unit of angular momentum, the fermion's spin direction will flip from +1⁄2 to −1⁄2 (or vice versa) during such an exchange (in units of the reduced Planck's constant). Because an interaction results in fermions attracting and repelling each other, an older term for "interaction" is force.

Human interactions

The extension of the standard model to human interactions, in the corpus of human physics, is the view that humans are types of fermionic matter, termed by definition human molecules, comprised of 26 elements, structured into a human particle like reactive bound state of existence, whereby the simplest of interactions can be modeled as:

> Two human molecules go in → *interaction* by boson exchange → Two changed human molecules go out

The simplest type of boson exchange, in human interactions is visual inflection, which can be studied at the microsecond level, in which case the boson involved is the photon, which is said to constitute 37 percent of sensor input (input interactions which actuate induced movement). These types of interactions are what are termed primary field particle interactions, being that the field particle involved in the interaction is one of the primary or elementary field particles, which are said to come in three varieties: photons, gluons, and what are called W and Z bosons.

In more advanced interactions, namely those in which the field particle involved in the interaction is large than a single boson or several bosons, the interaction is described as occurring through the what is called secondary field particle exchange, the simplest type of field particle being monetary entity of value such as money, e.g. a one dollar paper bill. In these types of interactions, one uses the following model: [1]

> Two human molecules go in → *interaction* by secondary field particle exchange → Two changed human molecules go out

Interaction rate

For all types of human-human interactions, the rate at which human molecules absorb, process, and emit field particles, whether primary or secondary, otherwise known as emotional current, is 15-cycles per second. [2]

In more detail, studies have shown that if any multi-second video segment of interaction between two people in conversation is analyzed, by slowing the video down to micro-frames of 1/45th of a second, one will see, by watching the slowed-down version, frame by frame, what is called *interaction synchrony*, in which the conversation takes on a rhythmical structure. One will see, for instance, each person, within the space of one, two, or three 1/45th-of-a-second frames, move a shoulder or cheek or an eyebrow or a hand, sustain that movement, stop it, change direction, and start again. In other words, the timing of the stops and starts of each person's micromovements, i.e. the jumps and shifts of body and face, with respect to his or her bonded companion's response, are found to be in perfect harmony, having a frequency rate of 15-cycles per second.

References

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2. Gladwell, Malcolm. (2002). *The Tipping Point: How Little Things Make a Big Difference*. Little, Brown, and Co.
3. Gottman, John. (1994). *Why Marriages Succeed or Fail*. New York: Fireside.
4. Osborn, Henry F. (1916). *The Origin of Life: on the Theory of Action, Reaction and Interaction of Energy*. The Science Press.
5. (a) Frisch, Karl von. (1967). *The Dance Language and Orientation of Bees*. Harvard University Press.
(b) Waggle dance – Wikipedia.
6. Pentland, Alex. (2006). "I Believe it may be useful to think of Humans as having a Collective Mind", in: *What We Believe But Cannot Prove* (pgs. 154-57). Harper Perennial.

External links

- Interaction – Wikipedia.
- Fundamental interaction – Wikipedia.
- Interactions.org – Particle physics news and resources.

θΔics

In science, **interdisciplinarity**, as opposed to anti-interdisciplinarity, refers to the cross-bridging of two or more academic disciplines into one activity, project, school, or new science.

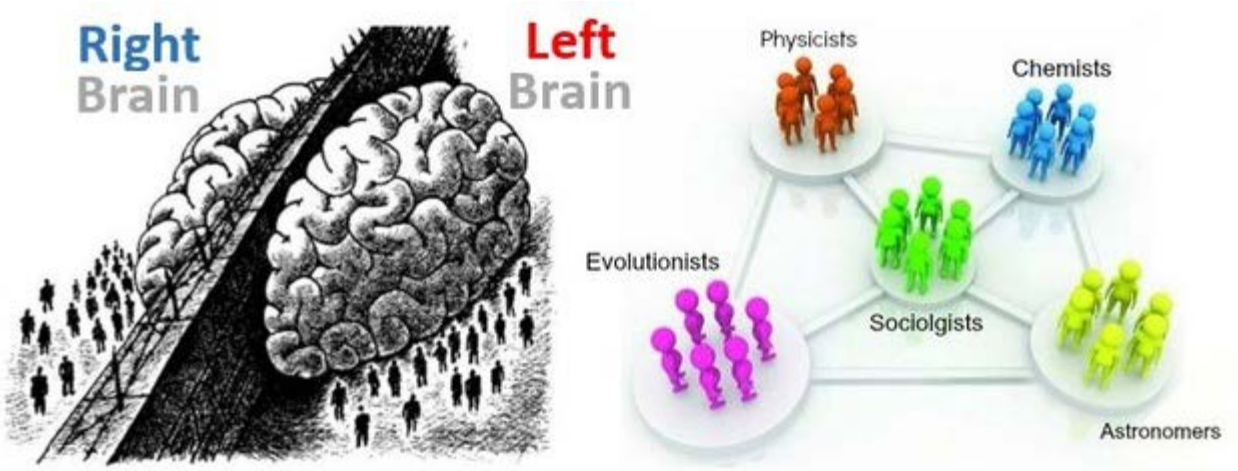

A 2009 "dividing wall" of the minds dilemma depiction, artistic sketch by Albanian artist Medi Belortaja (O), showing that amid the divisional groupings of the **humanities** (sociology-centric) and the **physical sciences** (physics, chemistry, astronomy) and **natural sciences** (evolution-centric), that not everyone is on the "same page" in regards to uniform belief ideas about the human nature, according to which the, in the university and intellectual community, as pointed out by Harold Morowitz (1979) the "splitters (anti-interdisciplinaritists), i.e. those not engaged in integrative thought, are in command and the lumpers (**disciplinaritists**), i.e. engaged in integrative thought, are in serious disarray, unable to keep up with the output of printouts that are generated in such a variety of ways". [2]

Overview

In 1979, on the so-called two cultures interdisciplinarity fragmentation issue, American biophysicist Harold Morowitz had the following ripe words to say: [2]

> "The terms 'splitters' and 'lumpers' come from taxonomy, where the classifiers were separated into those who liked to create new taxa because of small differences and those who preferred to coalesce categories because of similarities. The concept has found wider applicability as knowledge in all fields expands. Specialists are confined to ever-narrowing domains while generalists survey the immensity of information in an effort, one hopes, to find higher orders of structure. It is clear that in the university and intellectual community ... the splitters are in command and the lumpers are in serious disarray, unable to keep up with the output of printouts that are generated in such a variety of ways. It is saddening to witness the loss of status of those engaged in integrative thought, for one sees in it the fragmentation of scientific and humanistic disciplines."

The following are a few other representative quotes, in respect to physical humanities interdisciplinarity needs and issues:

> "Surrounding us on all sides are the physicists, chemists, geologists, and astronomers, with whom we must reckon, for their domains and their subject matter overlap ours in countless ways."
>
> — William Patten (1920), *Social Philosophy of a Biologist*

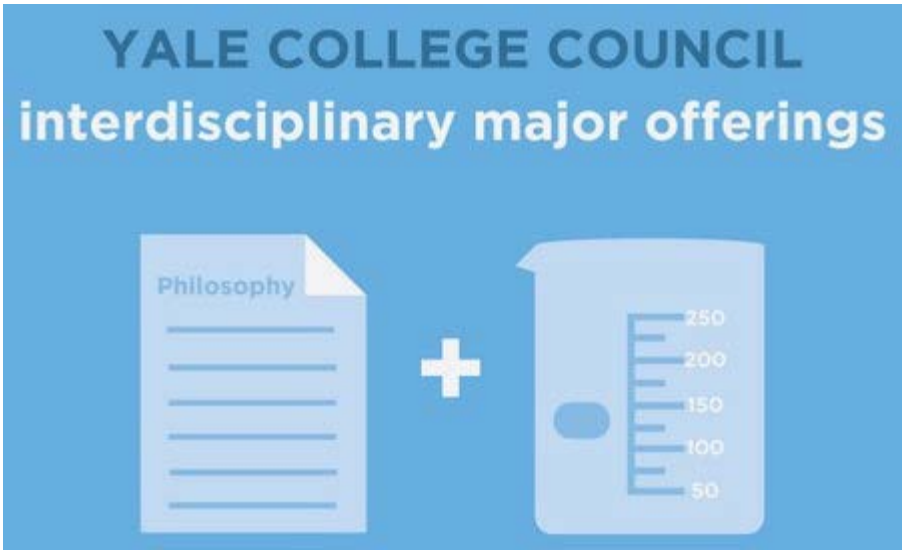

> "Since my name is not Socrates or Einstein and I hold only one of the seven or eight PhD degrees [organic chemistry] this problem requires, readers are quite

justified in questioning my qualifications to testify as such a **multidisciplinary** expert."

A 2015 blog flyer (Q) for a Yale **interdisciplinarity** major program, e.g. philosophy + chemistry, as shown.

— George Scott (1985), on the ethics and physical chemistry of will

"The grandiose building of modern human knowledge, growing before our eyes with impressive acceleration, shows now some features that resemble the story of the construction of the Babylon Tower. As time goes on, the **specialization** of science becomes deeper and deeper, so that the 'builders' of its different domains lose the ability to understand each other. It is happening because the division of science into different branches is artificial and reflects its preceding path of development rather than the natural interlinks or similarities between the phenomena that they deal with. Economics and thermodynamics represent just one example of this kind. They are located far enough from each other on the tree of science that their branches do not intersect. Students of both disciplines are mostly ignorant of ideas and methods of the other side. Specialists in both sciences publish their works in different journals and do not assemble together at common conferences."

— Octavian Ksenzhek (2007), *Money: Virtual Energy: Economy through the Prism of Thermodynamics*

(add)

Discussion

Hmolscience, by its very nature, being a two cultures subject, is an interdisciplinary subject, whether it be bridging chemistry and sociology (sociochemistry), physics and economics (econophysics), or thermodynamics and history (historio-thermodynamics or "history thermodynamics"), and so on, per joining. In some cases, however, subjects such as human chemical thermodynamics, cover all disciplines, and hence are very or extensively interdisciplinary.

One noted example is American economist Paul Samuelson, who cross-bridged economics, physical chemistry, and thermodynamics, is often cited as having been a successful interdisciplinarian; the following, to exemplify, is a snippet from his collected works abstract (Q):

"One of Samuelson's many novel contributions was that he generalized and applied mathematical methods developed for the study of thermodynamics to the field of economics. His inspiration for doing so came, in part, from his mentor, polymath Edwin Wilson who was a former Yale student of the founder of chemical thermodynamics, Willard Gibbs. Samuelson, therefore, is a successful example of **interdisciplinarity**, and he combined these ideas in his magnum opus *Foundations of Economic Analysis* (1947)."

Another example of an interdisciplinarian is American business theorist Bruce Gunn was very interdisciplinary, specifically in peer review, specifically, in his 1968 article "The Dynamic Synthesis Theory of Motivation", wherein he employs Le Chatelier's principle together with the transformation of energy, to theorize about employee motivation, he cites reviewers for this paper being: Ronald E. Jones (chemical engineering), Lee V. Mclean (electrical engineering), Leon C. Megginson (management), Stanley Preston (finance), Samuel H. Roy (statistics), and Roger A. Richardson (psychology).

Croatian physicist Josip Stepanić, in his JHT review board profile,

A depiction of **interdisciplinarity** involving a discussion of the overlap of mathematics and genetics, creating new hybrid type of mathematical genetics subject.

lists one of his interests as "interdisciplinarity", along with thermodynamics and statistical physics of complex systems, social systems theory, social free energy theory, among others.

Nearly all of the two cultures synergy departments are interdisciplinary in structure.

Quotes

The following are related quotes:

> "Immaturity, lack of imagination, '**doctrinaire departmentalism**', and [in particular] overspecialization is choking modern scholarship and limiting man's communication with his fellows."
>
> — John Q. Stewart (1955), commentary on efforts to initiate an interdisciplinary social physics department at Princeton [1]

> "The likes and dislikes of living beings were compared with the chemical affinities of many compounds. It would appear that a parallelism between human behaviour and physico-chemical interaction has been felt for a long time but the reverse does not seem to have attracted the attention of either the social scientists or the physicists and chemists, possibly because of the **compartmentalization** of these branches of science into different faculties."
>
> — Mirza Beg (1987), *New Dimensions in Sociology* (pg. 2)

References

1. Staff. (1955). "Research in Progress: Social Physics", *Princeton Alumni Weekly*, 55:17.
2. Morowitz, Harold. (1979). "Splitters and Lumpers" (Q), in: *The Wine of Life and Other Essays on Society, Energy & Living Things*. St. Martins.

External links

- Interdisciplinarity – Wikipedia.

θΔics

In thermodynamics, **interfacial thermodynamics** is the study of the application of thermodynamics to interfacial phenomena, addressing topics including interfacial energies, interfacial tension, adhesion, adsorption, and particle-particle interaction and about relations between them. [1] The 1991 work of Dutch physical chemist Johannes Lyklema is said to give a good introduction to the thermodynamics of interfaces. [2]

References

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2. Lyklema, Johannes. (1991). *Fundamentals of Interface and Colloid Science I: Fundamentals* (ch. 2: Thermodynamic Foundations of Interface and Colloid Science). Academic Press.

Further reading

â— Butt, Hans-Jurgen, Graf, Karlheinz, and Kappl, Michael. (2006). *Physics and Chemistry of Interfaces* (ch. 3: Thermodynamics of Interfaces, pgs. 26-41; 4.4: Gibbs free energy of the electric double layer, pg. 54; 8.4: Thermodynamics of solid surfaces, pgs. 153-58; 12.2.3: Thermodynamics of micellization, pg. 253). Wiley-VCH.

External links

â— Interfacial thermodynamics (by W. Craig Carter, 2002) – Pruffle.MIT.edu.
â— Interfacial thermodynamics – Eng.Yale.edu.

θΔics

In thermodynamics, **internal energy**, symbol *U*, or energy, symbol *E*, as is synonymously used, of a body, is a state variable that expresses the sum of the increment of the heat actually existing in a body in the form of kinetic energy (vis viva or molecular motion) and of the heat consumed in internal work, when the body changes, from a given initial state reference point, due to the addition of an amount of heat Q imparted to the body, quantified by the formula: [1]

$$U = H + J$$

where *H* is the "quantity of heat" actually existing in a body, i.e. the *vis viva* of its molecular motions, and *J* is the ergal or heat consumed in doing internal work, the work which the internal forces performed, while the body was passing from any given initial condition, taken as a starting point, to its condition at the moment under consideration.

The internal energy is path independent, that is it depends only on the condition of the body at the moment, and not on the way in which it arrived at that condition. [2]

History

The expression for internal energy was defined in 1850 by German physicist Rudolf Clausius.

In 1875, Clausius compared his U function to similar variations given by other authors on the subject of heat: Scottish physicist William Thomson (1851) calls it the "mechanical energy of a body in a given state", German physicist Gustav Kirchhoff calls it "function of activity" (wirkungsfunction), and German physicist Gustav Zeuner calls it "interior heat" (1860) of the body as well as "internal work" (1866) of the body. [2]

References

1. Clausius, Rudolf. (1850). "On the Motive Power of Heat, and on the Laws Which can be Deduced From it for the Theory of Heat." Poggendorff's *Annalen der Physik*, LXXIX, 368, 500.
2. Clausius, Rudolf. (1879). *The Mechanical Theory of Heat*, (pgs. 31-32). London: Macmillan & Co.

θΔics

In thermodynamics, **internal entropy** d_iS is the entropy variation *inside* (i) a system, referring to irreversible processes, defined as:

$$dS = d_eS + d_iS$$

where d_eS is the entropy *exchanged* (e) with the surroundings. This distinction between two types of entropy was formulated by Belgian chemist Ilya Prigogine in 1945. [1]

Aging theories

According to the use of this type of summational entropy logic, supposedly, according to the second law it is argued that the total internal entropy change brought about by the metabolism of a mature organism is always positive. [2] To compensate this decrease, it is reasoned that because the body is open that local decreases in entropy are naturally coupled processes, according to which the forms they create can act as constraints on subsequent dynamics, giving new shape to old processes or to new processes.

Business thermodynamics

See main: Business thermodynamics

In revenue management, according to American revenue optimization theorist Robert Cross, it is argued that internal entropy, characterized by the expenditure of unproductive energy within an organization, is one of the two types of entropies affecting business, the other being external entropy, being associated with disorder and chaos in the market place. [3] Specifically, according to Cross:

> "**Internal entropy** is created by people within an organization who are focused on the wrong issues; this in turn renders that energy unavailable (see: available energy) for useful work. External entropy is the disorder caused by outside forces that affect companies but cannot be directly controlled, such as consumer attitudes, new competition, competitive actions, technological advances, geopolitical factors, economic gyrations, and cataclysmic events."

These extrapolations, to note, are very rudimentary compared to the original definition by German physicist Rudolf Clausius, based on the mechanical equivalent of heat effects of molecules moving and doing work on each other internal to a body of steam, and to the later interpretations by Prigogine, but are nevertheless interesting first approximations.

References

1. Prigogine, Ilya. (1945). *Etude Thermodynamics des Phenomenes Irreversibles* (Study of the Thermodynamics of Irreversible Phenomenon). Presented to the science faculty at the Free University of Brussels (1945); Paris: Dunod, 1947.
2. Birren, James E. and Bengston, Vern L., Deutchman, Donna E. (1988). *Emergent Theories of Aging*, (pgs. 92, 101-09, etc.). Springer.
3. Cross, Robert G. (1998). *Revenue Management: Hard-core Tactics for Market Domination* (pgs. 10-11, etc.). Broadway Books.

Further reading

â— Rolinek, L. and Doktorova, M. (2002). "External and Internal Entropy Assessment on Farms in Relation to their Competitiveness." *Agric. Econ.*, 48 (2): 61-64.
â— Li, Jiangnan. (2009). "On the Extreme of Internal Entropy Production" (abstract), *J. Phys. A: Math. Theor.* 42. 15pgs.

θΔics

In chnopsology, **internal force**, or "inner force", as contrasted with external force, refers to a force "inside" of a given body that acts to impel motion.

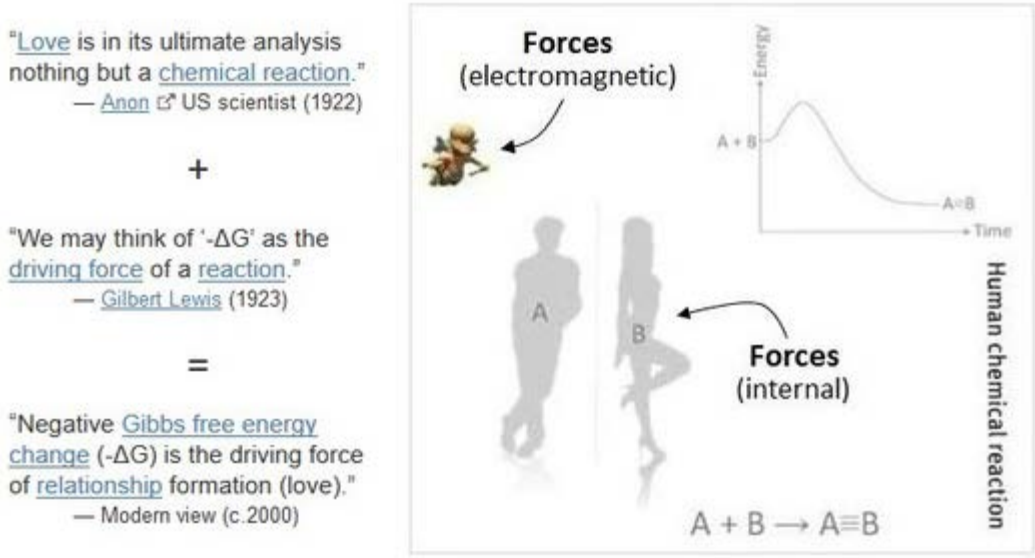

The "**internal force**" depiction or model of human movement; as can be contrasted, related, or connected to the "external force" depiction or model of human movement.

Discussion

The notion of an "internal force" is a bit of a blurry conception, one not necessarily known or germane to modern science.

This is a consequence of the fact that modern science is framed around the principle of inertia, having historical roots in the impetus theory of motion of Aristotle (*Physics*, c.350BC); which was updated into the proto inertia model of Leonardo da Vinci (*Codex Atlanticus*, c.1500) and the later laws of motion as formulated by Isaac Newton (Principia, 1687), all anchored in the model of external forces or outside forces acting on bodies, the inside nature of the "body" not necessarily of importance.

This outside force based laws of motion model, intern, became integrated into the foundation of thermodynamics works of Rudolf Clausius (*The Mechanical Theory of Heat*, 1865); which, in guise of modern chemical thermodynamics of Gilbert Lewis (*Thermodynamics and the Free Energy of Chemical Substances*), have since come to be handed down to us as the "system-based" model of quantitative free energy measured "driving forces" of reactions, processes, and transformations; Gibbs free energy, in particular, being the drive of natural earth-bound freely-running processes and reactions. Hence, the notion of "internal forces", psychodynamic model aside, are a bit of a foreign subject to modern hard physical science.

In any event, German polymath Johann Goethe's human chemistry protégé Arthur Schopenhauer was the first to notice a possible inconsistency between the newly proposed external factors randomness-framed evolution model of Charles Darwin (1859) and the older plant and animal metamorphosis change model (1786) and human chemical theory model (1796) of Goethe, along with his own will to power model (1818-1844) of human movement. As summarized by Miguel de Unamuno: [1]

> "Judging Darwin's theory solely by an extensive extract in *The Times*, [Schopenhauer] described it, in a letter to Adam Louis von Doss (March 1, 1860), as 'downright empiricism' (*platter Empirismus*). In fact, for a voluntarist like Schopenhauer, a theory so sanely and cautiously empirical and rational as that of Darwin left out of account the **inward force**, the essential motive, of evolution. For what is, in effect, the hidden force, the ultimate agent, which impels organisms to perpetuate themselves and to fight for their persistence and propagation? Selection, adaptation, heredity, these are only external conditions. This **inner**, essential **force** has been called will on the supposition that there exists also in other beings that which we feel in ourselves as a feeling of will, the impulse to be everything, to be others as well as ourselves yet without ceasing to be what we are."

Here we well see the collision of a number of conflicting theories and points of view: namely, Goethe's theory of change and choice being dictated by the force of chemical affinity, atoms up to humans, and the reinterpretation of this model in regards to the "will to power" theory of Schopenhauer, both colliding with Darwin's theory of natural selection, adaptation, and heredity—all rooted historically in the dominate Aristotle-Galileo-Newton model of external forces

moving bodies—all heaped percariously on the four letter word "will", which as Goethe famously stated is not free (as the world-dominating Anunian religion model has led us to believe), but rather derives from previous sensory impact, interaction, or exchange forces, as can be quantified temporally, such as via the readiness potential, among other possibilities—a complex issue to say the least.

Austrian psychologist Sigmund Freud, in all clearness, is probably the only one to have made significant advance in the inner force subject, with is bound energy/free energy view of the id-ego-superego model of repression and conserved forces of the mind.

Tropism

In 1918, German-born American biological physiologist Jacques Loeb opened his *Forced Movements, Tropisms, and Animal Conduct* the following position: [2]

> "The analysis of the mechanism of voluntary and instinctive actions of animals is based on the assumption that all these motions are determined by **internal** and external **forces**."

On this basis, Loeb went on to outline a pure materialism view of chnopsological (biological) movement.

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θΔics

In thermodynamics, **internal work**, symbol *J*, or "interior work", refers to the movement of the constituent atoms and molecules of a body, under the influence of a force, specifically the force which the molecules of a body exert among themselves, dependent on the nature of the body. [1] In short, internal work is the work the molecules of a body do on each other. It is a energy quantification internal to the system.

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θΔics

In thermodynamics journals, the **International Journal of Ecodynamics** is an annual publication devoted to articles on ecodynamics or the study of ecosystems according to evolutionary thermodynamics, particularly those of the Prigoginean thermodynamics variety. [1] The Ecodynamics Journal was launched in 2005 by the Wessex Institute of Technology, one of the groups that initiated the Prigogine Medal in 2004. In short, according to the 2006 views of the Institute: [2]

> "The new Ecodynamics Journal is based on the work of Prigogine, whose original ecological research leads the quest for an evolutionary physics, the main aim of the Journal."

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θΔics

In human chemistry, **interpersonal chemistry** is a term used, in a colloquial sense, to define a type of felt or experienced "chemistry" between people in friendships, associations, or relationships. [1] The term is an etymological evolution of the conception of "chemistry" between people or older versions of "alchemy" between people. In modern terms, the use of the phrase interpersonal chemistry is common.

In a 2007 interview of the science-based matching cite *eHarmony.com's* current CEO Greg Waldorf, self-taught computer programmer and Harvard business school graduate, he stated:

> "I love the challenge, that people think: how could you possibly measure *interpersonal chemistry*?"

He continues, "I like the idea of research and measurement around these things that seem so impossible to quantify." [2] In 2008, the new "eHarmony Labs", whose motto is: dedicated to the study of human relationships, furnished complete with couches, chairs, tables, and video equipment, which looks like sets of miniature living rooms, supposedly is setting out to measure and quantify "interpersonal chemistry" between people. [3]

The idea of the existence of "chemistry" between people that a number of definitions exist:

> Interpersonal chemistry – the way two individuals relate to each other (*WordNet Princeton University*, 2003).
> Chemistry – a reaction between two people or the spontaneous reaction of two people to each other, especially a mutual sense of attraction or understanding (*Encarta*, 2006)
> Chemistry – the interaction of one personality with another or sympathetic understanding (*Random House Unabridged Dictionary*, 2006). Chemistry – a strong mutual attraction, attachment, or sympathy (*Merriam Webster*, 2002)
> Chemistry – the elements of a complex entity and their dynamic interrelation; mutual attraction or sympathy (*American Heritage Dictionary of the English Language*, 2000).
> Chemistry – any complex, especially emotional, change or process; a person's personality or temperament (*Oxford Illustrated American Dictionary*, 1998)
> Chemistry – instinctual attraction or affinity (from the alchemical sense) (*Online Etymology Dictionary*, c. 1600).
> Chemistry – an instinctual, apparently unanalysable, attraction or affinity between people or groups of people; the combination of personal characteristics that create this (*Oxford English Dictionary*, c. 1600).

(add discussion)

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θΔics

In science,

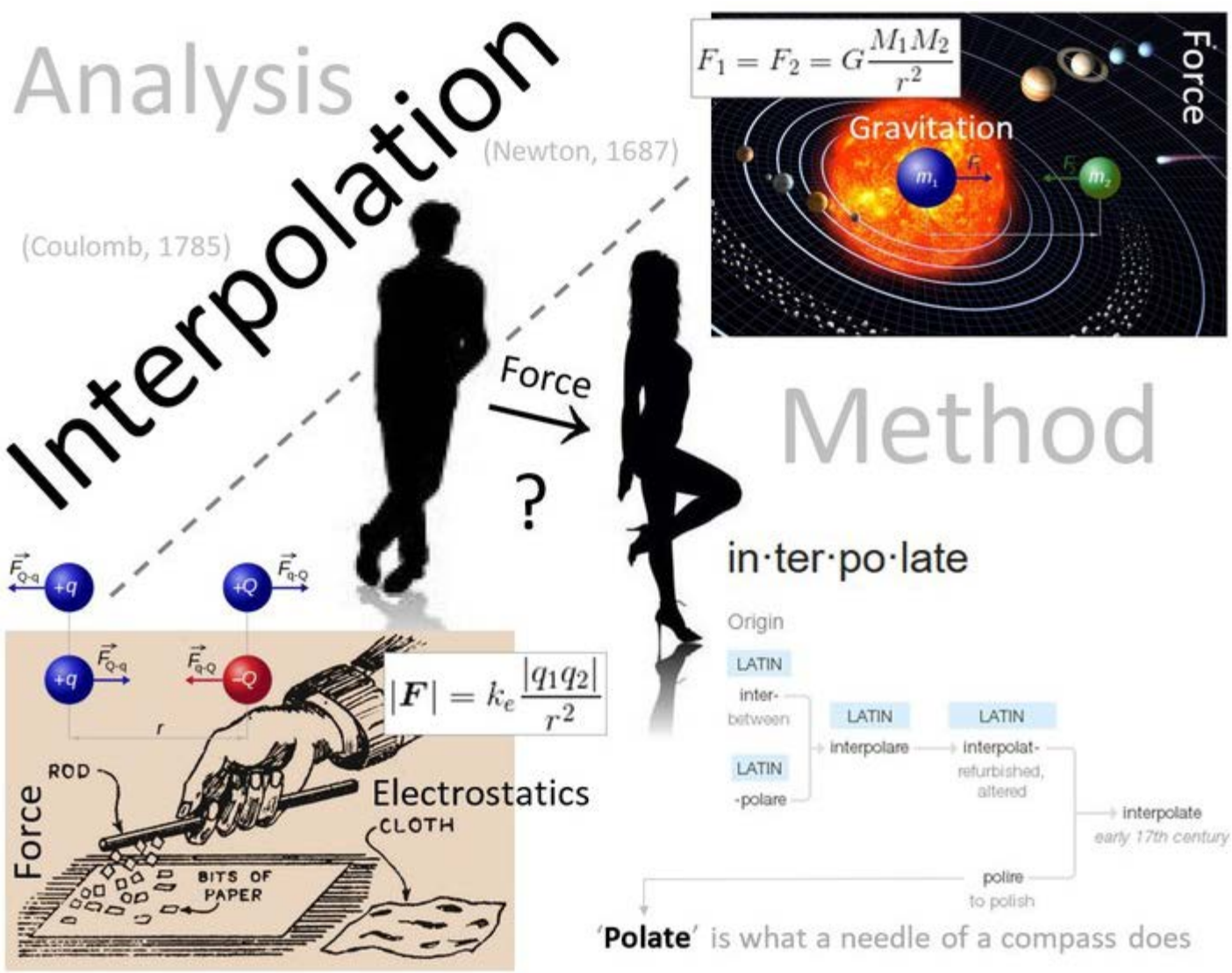

An "**interpolation**" analysis method of attempt at formulating a "force" operating between humans (e.g. relationship force, social force, economic force, political force), according to which the assumed force, compositionally, would seeming or propositionally be something operational in form between that of the known electrostatic (Coulomb's law) (Ñº) or electromagnetic forces (i.e. Maxwell's equations), on one hand, the smaller scale, and the gravitational forces (law of gravitation, relativity, and or quantum gravity), on the other hand, the larger scale; hues of which are seen in the affinity laws (e.g. opposites attract, likes repel), social orbital theory (gravity aspects) and exchange force theory of social interaction (e.g. Muller dispersion force or Gottman stability ratio), bonding (human chemical bond theory), and or movement (e.g. turning tendencies), such as the isothermal-isobaric force function (i.e. Gibbs energy).

interpolate or "interpolation", as compared to extrapolate, or "extrapolation", refers to the method of finding the value of a function, measurement, or function of a phenomenon that lies within two known values, measurements, or functions; to insert or calculate between other things, functions, or parts. [1]

Social | Relationship force

To go through one example, of interpolation, the adjacent diagram shows how the "force" operating between people should be a type of blend of the electromagnetic force and gravitational force. To get an estimate of this force, according to the principle of the transmission of work:

$$W = Fd$$

which translates as:

$$F = \frac{W}{d}$$

the "force" in question, in respect to freely-running earth surface reactions, according to Lewis (1923), is the isothermal-isobaric "force function", in Gibbsian language, which is Gibbs energy G, which, with substitution, gives us the approximate interpolated equation for relationship-social force:

$$F = \frac{G}{d}$$

This approximation is evidenced, in a colloquial sense, by the so-called "area code rule" (Ñº) of relationships:

> "The **area code rule** states that if you have a girl in one area code, the minute you enter a different area code you in effect become single."

That is, once two people, of a same area code relationship, separate in distance *d* into two different area codes, the so-called "rules" of the relationship change, and promiscuity tends to increase, in respect to the so-called sexual forces in operation. If we employ interpolation to this, we might surmise that the "force" inversely varies as distance squared:

$$F = \frac{G}{d^2}$$

or that the relationship force is inversely proportional via a relationship constant k_r as follows:

$$F = k_r \frac{G}{d^2}$$

albeit this would be but interpolative guesstimate; though such estimates have been made, historically, in the various social gravity models.

Quotes

The following are related quotes:

> "The consideration [of] the nature of the forces involved in [human] relationships is not an easy subject. There are numerous pitfalls in applying what we know about ordinary human behavior to love, or even to sexual desires; and so to reinforce this fact I provide you with the following to consider: these processes occur on human time [human time] and length scales which are well known to us, and yet extrapolating (or **interpolating**?) from the known into the unknown may be dangerous. So one asks, what is the nature of sex and love and so on, and their relation to the other everyday experiences around us? And the answer, of course, follows only from an observation of this world and the processes that occur in it. It must be noted, if it is not obvious, that I have never experienced any sort of romance. It is also true that I [likely] never will, and yet my curiosity drives me to inquire as to the nature of the experience. And it is true that physical theory is the only way in which to answer this question, other than direct experience. While direct

experience is undeniably a more reliable way to answer such questions, a few major problems with direct experience must be addressed: first, that it is [probably] not going to happen; and second, that various other people whom I know have been involved in romances, and in some cases they have been involved in many consecutive romances, but have failed to take data during those treasured minutes of sex. Love lasts longer but they don't want to analyze their relationships for fear of destroying them. More seriously, they do not take time to step back and make objective and scientific observations. Thus, for all practical purposes, the mysteries of sex and love can for the time being only be revealed by theory."

— Christopher Hirata (2000), "The Physics of Relationships" (§4:Neutron Scattering: a Cautionary Tale) [2]

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2. (a) Hirata, Christopher M. (c.2000). "The Physics of Relationships" (§4:Neutron Scattering: a Cautionary Tale) (Ñº) (section: Fun), Tapir.Caltech.edu; (WayBack Machine).
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External links

â— Interpolation – Wikipedia.

θΔics

In famous publications, **Introduction** is the 16-page opening chapter (reprinted as shown below) to English physicist C.G. Darwin's 1952 book *The Next Million Years*, in which he gives a preliminary overview sketch of the subject he calls "human thermodynamics", loosely the modeling and study of the course of human history over evolutionary-timescales using the methodology of statistical mechanics applied to the study of societies viewed as "conservative dynamical systems" of "human molecules", analogues to the molecules of the ideal gas system, whose behaviors are governed like the particles of the gas system. C.G. Darwin outlines this approach using Boyle's law, namely that pressure times volume, of an ideal gas system, at constant temperature and particle count, equals a constant:

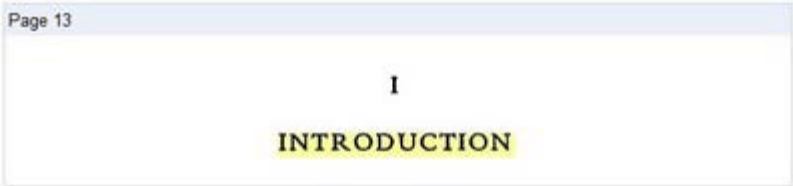
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I

INTRODUCTION

Snippit Google books view of the header title to chapter one, **Introduction** (pgs. 13-28), of C.G. Darwin's 1952 book *The Next Million Years*, in which he outlines the subject of "human thermodynamics" as the "statistical mechanics" study of "conservative dynamical systems" of "human molecules" over "average history" spans of millions of years.

$$PV = K\,|_{n,T}$$

as a working prototype model, starter point equation to lead into his outline of the science of human thermodynamics.

Chapter One

INTRODUCTION

Anyone who attempts to predict the history of the next ten years is a rash man, and if he attempts to make his forecast for a century he is very properly regarded as so foolhardy as not to be worth listening to at all. Nevertheless, I am proposing here to do what may appear at first sight a very much wilder thing still. I maintain that with our present knowledge of the world and of the things in it, though we cannot at all see the detail, we can foresee the general course its history is almost certain to take over a long period. It is certainly not possible to predict anything like a detailed history of the world, but nevertheless it is now possible to foresee a good deal of what I may call its average history. I do not know whether the true historian will admit that this has any claim to the title of history; certainly it could make no claim whatever to be a narrative of events. Its aim is far more modest; it is to describe roughly the kind of things that will be going on most of the time in most places.

In one respect it might appear that the prophet of the next million years had a very easy task. With the great differences of conditions over the different regions of the earth, it is almost inevitable that there must be a great deal of variety in modes of life. In the vast period of a million years, and over the great expanse of the earth, there must be an enormous variety in the happenings, and it may well be so great that, no matter what the prophet foretells, his prophecy will be verified at some place and time. To succeed in prediction in this sort of way would not content me; it would be no better than the prophecies of the fortune-teller, who makes a long list of mutually contradictory statements in the confidence that some at least of them are bound to be verified. My aim on the other hand is to form an estimate of the normal and not the exceptional course of the life of mankind on earth; to describe what will be happening most of the time. It is definitely concerned with the less exciting parts of history, the parts over which the historian's narrative often passes most lightly, because these parts include none of the stirring events which make up the great crises of history.

I need not say that I recognize that this is an exceedingly ambitious program; probably most readers will start by regarding it as so over-ambitious that it is doomed to failure. My justification for attempting it is that it does appear to me that in the course of the past century, and in particular of quite recent years, there have been such enormous accretions to almost every branch of knowledge, that now as never before an essay like this has become possible. There have been very great historians in past eras, perhaps greater than any we have now, but they simply did not possess the material to accomplish anything of the kind. I have of course no claim whatever to pose as a historian, and it is through my other studies that I have been drawn to this attempt at a synthesis of the various branches of accumulating knowledge in the form of a forecast of future history. I have always had a great interest in history and in the biological sciences, but the final stimulus came from my studies in the physical sciences. It is these that provide the real reason for expecting that something like the present essay may be worth attempting. It may well be that some of my deductions

will be corrected by those who have a deeper knowledge of the various subjects than any I can claim. I shall naturally be disappointed if my conclusions have to be corrected or amended in whole or in part, but even if it should be so, I hope I shall have persuaded some readers that the method itself is right; that is to say that it is possible now, with existing knowledge, to make a good forecast of the future fate of the human race.

To justify the principle that we can know what I have called the average history of humanity, I must make a short incursion into physical science. Perhaps I had better begin by reassuring the reader that I shall only need to explain a few generalities, and that no one need fear that there will be much further reference to the subject after the next three or four paragraphs. There are two quite different ways in which inferences, and in particular predictions, are made in physics, and the contrast between them must be made clear.

The older method is the ordinary process of cause and effect. As an example, Newton enunciated the law of universal gravitation, in obedience to which not only the apple falls to earth, but also the moon goes round the earth, and the earth round the sun. This principle enables the astronomer to predict exactly where any planet will appear in the sky at any given future date. Or again take the design of a complicated instrument, such as a television set. The designer arranges his electric circuits and his electronic valves in such a way that, if a specified electro-magnetic signal reaches the antenna, then calculable currents will flow in all the circuits, and these will give rise to calculable streams of electrons in the television tube, which in turn will give a calculable visual image. In this general type of case a definite cause produces a definite effect, and if the effect is not always exactly predictable, that is only because the calculations may be so intricate that the evaluation of the results is not practicable. By those who have not followed recent developments in science, this relation of cause and effect is regarded as the only way by which things can be predicted. For them scientific progress means the discovery of yet more exact effects produced by exact causes, and they conceive that the cause-and-effect relation is the sole idea in what is popularly, if vaguely, called the scientific method.

This would indeed have been broadly true of all the earlier stages of scientific progress and of all the earlier scientific laws that were discovered, but a very different new type of procedure began to emerge some eighty years ago, which has assumed almost dominating importance in recent times. This newer type of reasoning is connected with the principle of probability, and it is unfortunately true that there are a great many people to whom it has not yet become familiar. They find it surprising that the result of a great number of chances may be far more certain than the result of a few. Of course absolute certainty, of the kind given by the cause-and-effect relation, is never attained in this manner, but something effectively just as good does come out of it. As the number of chances becomes larger and larger, the effects of each single event become less and less important, and they tend to cancel out; the probability that they will all go one way becomes quite negligible, so that something approximating with great accuracy towards the average is the final, practically inevitable, consequence.

The classical instance is given by the molecules of a gas. We know a certain amount about the nature of these molecules, and indeed it might be possible at any rate in some of the simpler cases, to work out in detail what happens when two of them collide together, though I cannot call to mind any case where this has actually been done. To do it would be in accordance with the old cause-and-effect physics, but in fact it would not be very useful. This is because the number of molecules is so vast, and their collisions so frequent, that the effect of a single collision is of no interest, but only the average effect of all the collisions. It proves possible to know this average by a very general method, and the average can be found without even invoking many of the properties of the individual molecules, even when these properties are well known. The most general deductions are the gas laws, which describe how the pressure of the gas depends on the volume of the containing vessel and the temperature; the most famous is Boyle's law, which relates pressure to volume. Boyle's law is verified with the greatest precision and the most absolute regularity whenever it is tested, and yet it is the consequence of the wildly varying and extremely violent collisions between the molecules of the gas. As I have said, in deducing the law it is not even necessary to use all the known properties of the molecules; for example we know with some accuracy the distance between the two atoms of an oxygen molecule, but in fact this distance plays no part whatever in the result. In order to derive Boyle's law all that is required is the knowledge that the molecules constitute what are technically known as conservative dynamical systems.

For the rest of the gas laws it is true that a little more detail is needed; for example there are differences according to how many atoms there are in each molecule, but a very great deal can be known about the behavior of the gas with only the sketchiest consideration of the details of the individual molecules. Indeed when a student first encounters the theory

leading to the gas laws—it is usually called the theory of statistical mechanics—he is always surprised at the very little foundation that is required in order to establish, quite fully and logically, such an enormous superstructure. Of course it can never be possible to get something out of nothing; there must be a basic principle, and this, as I have said, is the condition that the molecules are conservative dynamical systems. This name is derived from the fact that the total energy of two colliding molecules is conserved, so that it stays constant during the collision, but the term itself has a far deeper significance than this, though it is one which can only be described in technical language. It would involve going rather deeply into the subject to explain it here; and I shall not attempt to do so, since I am only citing it as an analogy, but I must make the point that in this technical language the whole property of conservative dynamical systems can be described in a single sentence. The outcome is that in statistical mechanics, unlike the older cause-and-effect mechanics, the most enormous superstructure can be built, with confidence and certainty, out of a foundation which might appear to be narrow, in the sense that it can be expressed in very few words.

The analogy I have cited of the gas laws is the simplest example that is furnished by statistical mechanics, and it is only fair to mention that, when the subject is pursued further, it does get a good deal more complicated. Thus much greater difficulties arise in considering how the gas can condense into a liquid or solid, but it would not be profitable to follow the analogy into these intricacies. Even in such cases however, though the structure of the molecules must be specified a good deal more fully, the specification still remains fairly simple, and yet it can lead to the most elaborate consequences. The general principle stands, that in statistical theories quite complicated results can be deduced from simple principles.

The internal condition of the gas depends, as I have said, on the molecules being conservative dynamical systems, but there are also external conditions. Boyle's law relates together the pressure and volume of the gas, so that the measurement of both these quantities must come into the picture somewhere. This they do through consideration of the containing vessel, for its size determines the volume of the gas, and the pressure is measured through the force exerted on the vessel's walls. If, then, predictions are to be made, of the kind yielded by the methods of statistical mechanics, it is necessary to consider both the internal and the external conditions.

When I claim that we ought to be able to foresee the general character of the future history of mankind, I am thinking of this analogy. The operation of the laws of probability should tend to produce something like certainty. We may, so to speak, reasonably hope to find the Boyle's law which controls the behavior of those very complicated molecules, the members of the human race, and from this we should be able to predict something of man's future. It is not possible to get something out of nothing here any more than it is in the case of the gas; so the possibility depends on finding out whether there are for humanity any similar internal conditions, which would be analogous to the condition of being a conservative dynamical system, and external conditions analogous to the containing vessel. If both these demands can be satisfied, then there is the prospect that a great deal can be foretold of the future of the human race, and this without any very close detail in the basic principles from which it is derived.

Most of the present essay is devoted to discussing the various principles needed in order to make these predictions, but I will here very briefly anticipate the fuller discussions that are to follow. In the gas, the external conditions were given by the containing vessel, and the analogy here is obviously the earth itself. From geology, we know a great deal about this; for example we know that it has had roughly the same climate for hundreds of millions of years, so that it is nearly certain that the climate will stay the same for one more million years.

The internal principle, which is to be analogous to the property of being conservative dynamical systems, of course lies deeper. It must depend on the laws governing the nature and behavior of the human molecules. When I compare human beings to molecules, the reader may feel that this is a bad analogy, because unlike a molecule, a man has free will, which makes his actions unpredictable. This is far less important than might appear at first sight, as is witnessed by the very high degree of regularity that is shown by such things as the census returns. When averaged over a whole population these reveal a remarkable degree of regularity in most of the happenings of life; this applies not only to basic things like births and deaths, and uncontrollable things like the incidence of sickness, but also to things in which man does regard himself as an entirely free agent. To take a quite trivial example, there is considerable uniformity in the names given to new-born infants, in the sense that it can be foretold with some accuracy what fraction of them next year will receive each of the more fashionable names. Thus though the individual collisions of the human molecules may be a little less predictable than those of gas molecules—which, as I have said, do not have to be considered in detail either

—the census returns show that for a large population the results average out with great accuracy. The internal principle then of the human molecules is human nature itself.

Here once again geology provides help. A study of fossils has shown that it takes roughly a million years of evolution to make a new species of animal; during that time the animal is, it is true, slowly changing, but the cumulative changes are so slow that it is only at the end of that period that the animal can be regarded as sufficiendy altered to be dignified by a new name. This principle may be applied to man. For the next million years we shall be concerned with a history governed by the same human nature as we know now, with all its virtues and all its faults. There will, it is true, be small slow changes in human nature as time goes on, but it is only at the end of a million years that it may be expected to have so changed that further prediction about it would become impossible. That is the reason why I have referred to a million years in the title of my essay.

It is worth noting that it is only in very recent times indeed that the present line of argument could possibly have been developed. This is true of every part of the argument. In the first place it is less than a century since anyone realized the compulsive force of the laws of probability, so that before that no one could have conceived that so much could be derived from such a simple foundation. Then again the actual surface of the earth was very incompletely explored until even more recent times, so that something quite unforeseeable might have come out of its unknown regions; the position of the walls of the vessel could not be regarded as fully known. As to the internal condition, human nature, the same is even more true. It is only in the last fifty years that much has been known about the physiology and psychology of the human animal. In particular it is only since then that the principles controlling heredity in animals have begun to be understood, and it is obvious that those principles must govern the characteristics of the human race beyond all else. So until recently there was knowledge neither of the principles, nor of the data, which I am going to attempt to use in the ensuing chapters. If there were no prospect of deriving anything beyond a sort of flat average of the future of human history, it would be a dull business, but my analogy suggests that it should be possible to carry the matter a good deal further. The physicist can not only give the average state of his gas, but he can also say something about its fluctuations, that is to say the manner and the frequency with which it is likely to depart from the average. To explain this, suppose that a sample of the molecules is periodically taken out of one corner of the vessel, say by trapping some of them in a little box. The number of molecules in the box should be in a fixed proportion of the total number in the vessel, and it will never be far from it, but sometimes the sample will have rather too many, and at other times rather too few. Furthermore the sample may vary in other ways; for example it may sometimes be hotter or colder than the gas in the main vessel. These variabilities are what constitute the fluctuations of the gas, and they can actually be observed by suitably designed experiments. They can also be calculated, again without knowing much about the individual molecules, so that it is possible to say what variations will occur, and how often they are likely to recur, though it is not at all possible to predict when they will occur. In the same way it should be possible to get some idea of the fluctuations of human history, which will lend a variety to the dead level of the average. Indeed these fluctuations will be far more prominent in human history than are those which are observed in a gas, for the reason that, proportionately speaking, fluctuations decrease as the total number of molecules increases. Now in the course of a million years there will have been a very great number of human beings, but even so it is incomparably fewer than the number of molecules in even quite a small vessel. So the fluctuations in human history will be far more prominent than the fluctuations in a gas.

Much of what will happen in the future can be read from consideration of the past, but there has on the whole been a tendency for historians, apart from their primary function of recording the past, to be interested not so much in resemblances as in differences. They have tended to emphasize the difference of structure of the civilizations of Egypt and Babylon, rather than to point out how much more alike they were, than was eidier to the contemporary barbarism of Europe. A distinguished exception to this has been the great work of Arnold Toynbee, who has studied what might be called the Natural History of Civilizations. This is an incomparably finer project than any I am competent to attempt, but it does adopt a similar line of thought, that of determining whether laws can be laid down from which the march of humanity can be foreseen.

The plan of the present work follows in a general way the course suggested by the analogy I have been drawing from physics, though there will be no further reference to this source. In the next chapter the subject is population. This is the most fundamental question of all, for if there were no human beings there could be no human history. Then there are two chapters dealing with what I have called the external conditions. One of these briefly reviews past history; its aim is to mention only the fundamentally important things, those that one might imagine would be noticed by an historian of a

million years hence. The other deals with the physical conditions that may be expected to prevail in the world. Then there are three chapters dealing with what in my analogy I have called the internal conditions. These contain a discussion of what appear to be the chief qualities of the human animal, in so far as those qualities are likely to help his survival in the struggle for life. In the first of them he is regarded as a wild animal just like any other animal, and I consider the qualities which will help him from that point of view. The next chapter is concerned with the influence of his social qualities, in which he is so different from other animals. The third is devoted to settling the balance between the influences discussed in the previous two chapters, and in particular to the consideration of whether man is a wild or a tame animal. After this there are two chapters dealing with matters of a slightly less fundamental character, though they are much too important to be omitted. The first examines the effect of the limitation of populations, such as that which is being experienced at the present time in many of the countries of Western Europe. The second considers the interesting, if less important, question whether man, in his perpetual striving after happiness, is at all likely to achieve it. In the final chapter I attempt a synthesis of all these things in the form of a forecast of the history of the future. It is divided into several sub-sections, each of which deals with one of the main aspects of human life.

I have attempted to arrange the whole essay on the plan that all the earlier chapters should lay down principles, and that the final chapter should contain their applications to the actual history. In laying the principles down however, it has been necessary to present a good deal of detail in order to explain and to illustrate them, so that in fact a good many of the applications will be found in the earlier chapters. I fear that this may be inconvenient in some cases, because such illustrations often have implications over a wider field than the principle immediately concerned, and thus the reader may be left with the feeling that the discussion is sometimes incomplete. In the final chapter therefore I have attempted to gather these threads together, as well as to fulfill my main aim of making the forecast of the general history of the future.

Before developing my arguments, it may be well to warn the reader that the consequences I am forced to deduce will be found exceedingly depressing by all the political and social standards that are now current. It will not perhaps be quite true that history will be "nothing but a record of the crimes and follies of humanity", but it will be much more like that than like the Utopias—for the most part, be it confessed, the lather depressing Utopias—which have been expounded by all the idealists. If the world is inevitably to be so much more dreadful a place than current thought expects, would it not perhaps be better to forget the fact and simply go on hoping? I do not think so; if we are living in a fool's paradise, it is surely better to know the fact. But the matter goes further than this; tor we certainly can do something to control the world around us, and if we can appreciate the limits of what is possible, we may have some hope of achieving our aims, whereas if our aims are outside possibility, then we are doomed to failure. Therefore it is a practically important thing to see clearly any laws which must set absolute limits to what it is possible to do.

A parallel will make this clearer. In the eighteenth century the state of knowledge of mechanics was very imperfect and many inventors devoted their time to trying to invent ways of making engines, so as to provide power for machinery. There was no known limit to what could be attained. Even though it had already been adumbrated that the perpetuum mobile was not possible, the principle was not understood at all exactly, and an inventor might not unreasonably at that time have felt that there was no limit at all to what he might hope to achieve in the way of inventing an engine. Almost exactly a hundred years ago the situation changed completely when the laws of thermodynamics were formulated; these laws set very precise and absolute limits on what is attainable in an engine. At that stage the optimistic inventor, untrained in scientific principles, may have felt that the world had collapsed; what was the use of his going on in a world lost to all ideals, a world which insisted on a dreary uniformity with no hope that mankind would rise superior to the deadening requirements of the laws of mechanics? For him it must have been a bad world. Not so for the true engineer. He now could know just what was physically possible, and could set himself a target that was actually attainable with the sure knowledge that he might achieve something towards it. Through the recognition of these absolute limitations on what he can do the engineer now has a better, not a worse, prospect of doing good.

Can we not draw from this parallel the conclusion that if we know the limit of what is possible for humanity, through determining some kind of laws of human thermodynamics, we shall be more successful in doing good in the world, than if we recognize no limitations, and so are perpetually struggling to achieve what is in fact quite impossible? I am going to try to see what some of these laws of human thermodynamics are; of course they cannot be expected to have the hard outline of the laws of physical science, but still I think some of them can be given a fairly definite form. It will be for others more skilled in biology than I can claim to be, to perfect, or perhaps to correct, these attempts that I shall be

making.

See also

â— Mathematical Introduction

References

1. Darwin, Charles G. (1952). *The Next Million Years* (chapter one, pgs. 13-28). London: Rupert Hart-Davis.

Further reading

â— Thims, Libb. (2007). *Human Chemistry (Volume One)* (C.G. Darwin, pgs. 25-26, 35). Morrisville, NC: LuLu.
â— Thims, Libb. (2007). *Human Chemistry (Volume Two)* (C.G. Darwin, pgs. 666. Morrisville, NC: LuLu.
â— Thims, Libb. (2008). *The Human Molecule*, (preview) (Ch. 5. Darwin's 1952 Human Molecules, pgs. 29-38) . Morrisville, NC: LuLu.

θΔics

In human thermodynamics, **inverse entropy** refers to activities, such as the male praying mantis willing allowing his mate to eat him during copulation or insects that mimic braches, or the cleric's act of self-abnegation, that produce the effect of negative entropy. [1] In pure formulation this would be:

$$S_I = \frac{1}{S}$$

although, it is difficult to say if this makes any formulaic sense.

In 1973, French sociological anthropologist Roger Caillois, in his *The Dissymmetry*, supposedly, introduced the term "inverse entropy" as a theoretical concept. [2]

References

1. Hollier, Denis and Porter, Catherine. (1997). *Absent Without Leave: French Literature under the Threat of War* (pgs. 41-42, etc, 200). Harvard University Press.
2. Caillois, *La dissymetrie* (1973), in *Coherences Aventureuses* (Paris: Gallimard, 1976), pg. 268.

θΔics

In evolution thermodynamics, **involution** means the opposite of evolution, but in a way that is synonymous or related somehow with entropy. The term supposedly traces to the work of French philosopher Andre Lalande, who began using the term significantly in theory sometime between 1899 and 1930. According to one summary of Lalande: [1]

> "According to Lalande, two laws rule over the world. The one, evolution, is dominant in biology, the other, **involution**, a term nearly identical with entropy, in the physico-chemical world."

According to a second source, however, Swiss psychologist Carl Jung has, supposedly, used the term, attributing it to French thermodynamic philosopher Pierre Teilhard, in commenting that "involution (folding inward) is a somewhat original term that Teilhard devised and set in contrast to evolution (folding outward). [2]

References

1. Andre Lalande (1867-1963) – Contemporary Philosophers , at RadicalAcademy.com.
2. (King, Thomas M. (1999). *Jung's Four and Some Philosopher's* (involution, pg. 284, 288). University of Notre Dame Press.

Further reading

â— Illusorio, Ramon K. (1984). *Social Entropy & Human Involution: an Enquiry into the Causes of Institutional Crisis and the Paradigm for its Resolution.* Multinational Foundation Inc.

θΔics

The acronym **IoHT** is short for the Institute of Human Thermodynamics, a non-profit, educationally-minded group of human thermodynamicists. [1]

See also

- HT
- JHT
- EoHT

References

1. IoHT - AcronymFinder.com

θΔics

In hmolscience, **Ion Siman** (1951-), Ion Iorga Simăn or Ion Iorga-Siman, is Romanian physicist and biophysicist (chnops-physicist) noted for his circa 2005 to present work, together with Romanian economist Gheorghe Savoiu, in the development of the sciences of sociophysics and econophysics.

Education

Siman currently is a physics professor at the University of Pitesti, Romania.

UPESW 2013

The following are some photos of Siman and his books perused by American electrochemical engineer Libb Thims during their visit, together with Gheorghe Savoiu, following the UPESW 2013 workshop:

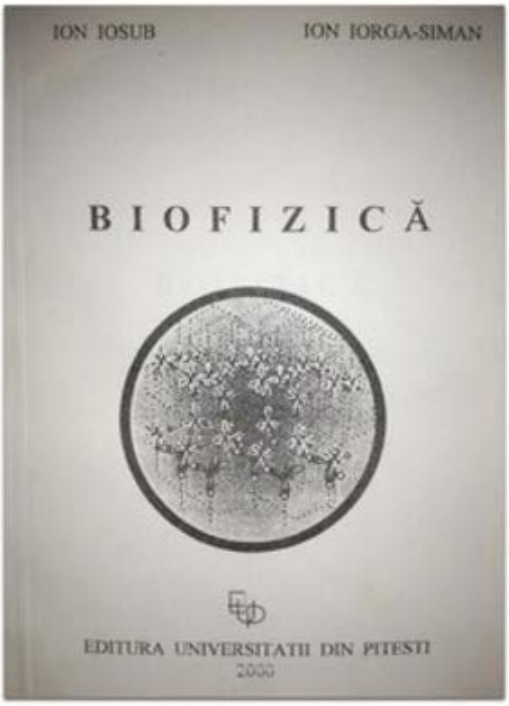

(add discussion)

Further reading

● Savoiu, Gheorghe and Iorga-Siman, Ion. (2011). *Multi-disciplinarity and Academic education* (*Multidisciplinaritatea şi educaţia academică. Dialoguri argumentate*), Editura Universitară Bucureşti.
● Savoiu, Gheorghe and Iorga-Siman, Ion. (2009). *Exploratory Domains of Econophysics*. News EDEN I&II Ed. Universitara Bucureşti.
● Savoiu, Gheorghe and Iorga-Siman, Ion. (2008). "Some Relevant Econophysics' Moments of History, Definitions, Methods, Models and New Trends" (pdf), Romanian Economic and Business Review 3 (3), 29-41.

External links

● Iorga Ion Siman (Romanian → English) – Google Academic.
● Simăn, Ion Iorga – WorldCat Identites.

θΔics

In genius studies, **IQ**, short for intellectual quotient, a natural number (1, 2, 3, 4, 5, 6 …), including 0, conceptualized as "a measure which expresses the relative brightness or intelligence" (Cox, 1926) of any given individual, in which a value of 100 is said to represent the intellectual ability of the average person, 140 or above is said to be representative of the genius range, IQs of 180 or above tend to be representative of the top 160 or so geniuses of all time, IQs of 195 to 225 are representative of the elite time-sobered retrospect-gauged top 25 geniuses of all time, and IQs at or above 230 are miscalculations or over-zealous guesstimates.

I Q	*Classification*
Above 140	"Near" genius or genius.
120–140	Very superior intelligence.
110–120	Superior intelligence.
90–110	Normal, or average, intelligence.
80– 90	Dullness, rarely classifiable as feeble-mindedness.
70– 80	Border-line deficiency, sometimes classifiable as dullness, often as feeble-mindedness.
Below 70	Definite feeble-mindedness.

The original 1916 Terman IQ scheme, devised by Lewis Terman, based on earlier French child IQ testing schemes (see: IQ history), defining near genius or genius level to be **IQ = 140+**. [1]

Overview

Hmolpedia IQs come from a variety of sources (see: Genius IQs); the following shorthand notations (subscripts) are used in various articles, to distinguish which IQs are being cited:

- Cox IQ (IQ_C): IQs ranked by Catherine Cox and her Stanford University psychology team in 1926 as published in a listing of top 300 geniuses, existive as adults in the years 1450 to 1850, culled from the Cattell 1000 listing.
- Platt IQ
- Guinness Book IQ (IQ_G): a 1970s to 1990s yearly "world's highest IQ" listing, once popular the *Guinness Book of World Records*, before category removal per IQ scamming reasons.
- Buzan IQ (IQ_B): a 1995 listing of the IQs top 100 geniuses of all time by Tony Buzan and Raymond Keene.
- CB IQ = Cox-Buzan IQs (an averaged IQ of the thirteen common individuals in both the Cox and Buzan list)
- Thims IQ: IQs ranked by Libb Thims in the top 1000 geniuses pages, as shown in the "real IQ" column.

For other IQ calculations see: IQ key.

Quotes

The following are related quotes:

> "It's a scientific fact that if you stay in California, you lose one point off your **IQ** every year."
>
> — Truman Capote (c.1965), *The Portable Curmudgeon* (pg. 59) (Q)

> "Children of 140 **IQ** waste half their time. Those above 170 IQ waste practically all their time

in school.”

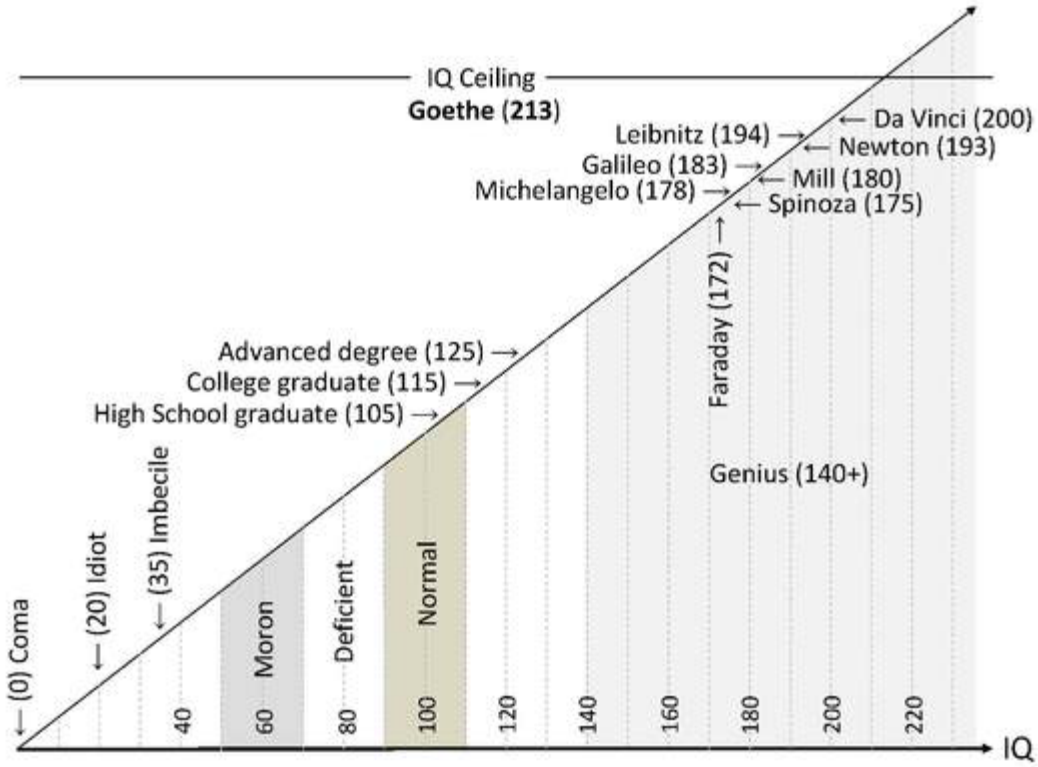

— Leta Hollingworth (c.1945), author of *Children Above 180 IQ* (1942)

“People who talk about their **IQ** are losers.”

— Stephen Hawking (c.2005), when asked what his IQ was (*New York Times* interview)

"I will advise parents in Hong Kong there's no need to know the **IQ** of your children. Just try to do your best to nurture them and give them space to develop.”

— Tony Boedihardjo (c.2010), father of March Boedihardjo (1998-), BS and MS mathematics, Hong Kong University (age 13)

“At MIT we had a saying: **D**ropouts become captains of industry. **C** students become executives. **B** students work for C students. **A** students drive taxis.”

— Jonathan Lettvin (2016), Quora post (Q) to 10th grade IQ 146 student, Jun 24

See also

- IQ: 200+
- IQ: 225+
- IQ: 200+ (references)
- IQ: 200(±) candidates
- Genius IQ tables

References

1. Terman, Lewis. (1916). *The Measurement of Intelligence: an Explanation of and a Complete Guide for he Use of the Stanford Guide for the Use of the Stanford Revision and Extension of the Binet-Simon Intelligence Scale* (classification

of intelligence, pg. 79; I.Q., pg. 53, etc.). Houghton Mifflin Co.

External links

- IQ – Wikipedia.

θΔics

In genius studies, **IQ 200 or above impossible** refers to the assertion, made by some, that an IQ of 200 or above, e.g. IQ:200+, IQ:225+, etc., is realistically, physically, and or theoretically impossible, per reasons of statistical improbability, so-called "fat tail" distribution arguments, among others.

Overview

In 1917, Lewis Terman, the modern IQ scale inventor, used his formula to calculate, as a test case, an IQ of 200 for Francis Galton (see: IQ miscalculation) based on his intellectual ability as a youth, between ages 3 and 8. [1]

In 1926, Catherine Cox, Terman's graduate student, in her 8,000-page based treatise *Early Mental Traits of 300 Geniuses*, along with her team of psychologists at Stanford, calculated the IQs of the top 300 geniuses, who existed between 1450 and 1850, based on intellectual accomplishments, per decade of existence, and therein came to rank Goethe as the #1 genius in this grouping:

> "One rater (M) has scored on the basis of the record of Goethe's youth an **IQ of 225**. Goethe's true IQ may in the history of mankind have been equaled in a few instances; one may well wonder whether it has ever been exceeded?"

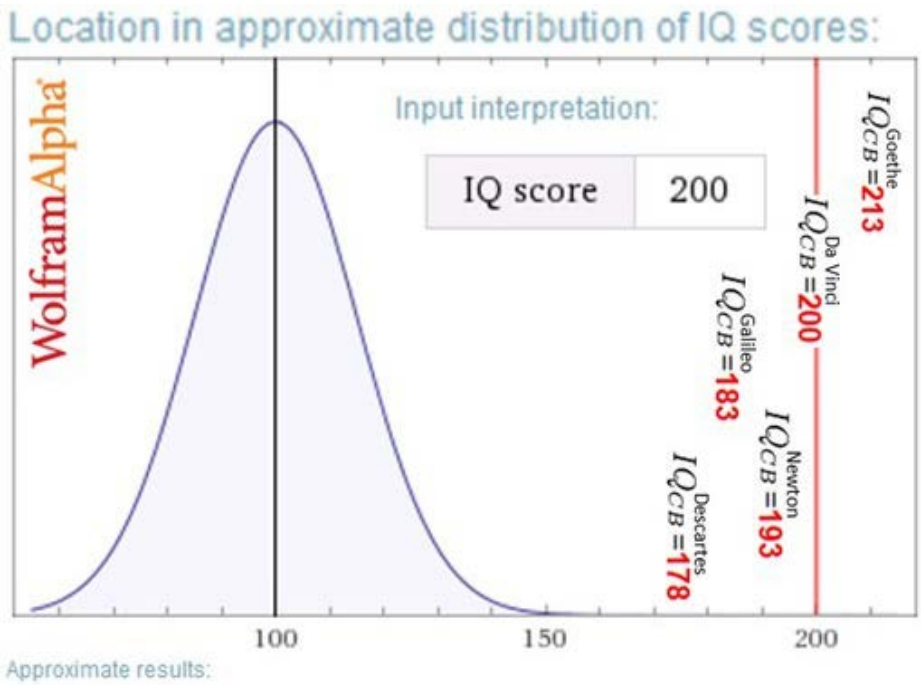

percentile	100th
fraction below	$(100 - 1.308 \times 10^{-9})\%$
fraction above	$1.308 \times 10^{-9}\% \approx 1$ in 76 429 666 480
standard deviations from mean	+6.667

A Wolfram Alpha return result for "IQ 200" (Q) overlaid with five of the highest mean Cox-Buzan IQs, which shows that there is an exact correction between the percentile IQ rarity method, which shows that of the approximate 80 billion people, come and gone, since "modern" humans formed about 40,000 to 150,000-thousand years ago, only "one" could have possibly had, theoretically, an **IQ of 200**, and that IQs above 200, e.g. the Cox-Buzan mean estimate of Goethe's IQ as 213 (Q) is impossible being that this has a rarity of about one in 40 trillion people. This is an example of a mathematical calculation not matching up with reality.

In 1946, Abraham Sperling, in his "A Story of Genius", was reporting the IQ of William Sidis as being in the 250 to 300 range: [2]

> "There was no lessening of William Sidis' mental acuity. Helena Sidis told me that a few years before his death, her brother Bill took an intelligence test with a psychologist. His score was the very highest that had ever been obtained. In terms of IQ, the psychologist related that the figure would be between **250 and 300**."

In 1981, Agustin De Mello, amid his extreme forced prodigy experiment on his son Adragon De Mello, estimated the age 5 ratio IQ of his son to be in the IQ of 400 range:

> "Agustin tested AD's intelligence when the boy turned five. He calculated an **IQ of 400**, meaning AD might rank as the greatest intellect in history."

In 1988, De Mello, aged 11 years 8 months, set a world record by graduating from college with a BA in mathematics from the University of California, Santa Cruz.

In 1988, Kevin and Cassidy Kearney, amid the peculiar child rearing methods of their son Michael Kearney, estimated his age 4 ratio IQ to be 325:

> "At age four, two psychologists and one sociologist gave Michael Kearney the Stanford-Binet IQ test (L-M version), a

> test designed for highly-gifted children age six and above. Michael scored 168, the ceiling of the test. Michael's parents, Kevin and Cassidy, in their own words, "discovered in the library that the Stanford-Binet L-M version test gives a mental age which can be ratioed with chronological age for a true IQ … Kevin and I did the math and came up with Michael's **IQ at 325**."

Kearney would go on to beat De Mello's record, by getting a BS in anthropology from the University of South Alabama at age 10.

In 1996, Marilyn Savant, college dropout who as an adult began to engage the world of making and taking IQ tests, faked an IQ of 228, via falsified age records of a Stanford-Binet test she took at age 11, which she got in the *Guinness Book of World Records*, which read as follows:

> "The highest childhood score has been achieved by Marilyn Mach vos Savant who as a 10-year-old achieved a ceiling score for 23-year-olds thus giving her an **IQ of 228**."

This Savant-citation remained in *Guinness Book*, before they removed the category, in 1996, per reason of "verifiability". Into the 2000s, Savant was still be parlayed around as the "smartest person ever", without, however, having produced anything of intellectual note.

Hence, in this general "obervationalist" point of view, sorting through IQ:200 range estimates is like separating the pyrite (FeS_2), aka fool's gold, from the gold (Au): many people are fooled by pyrite, but only the gold is of any value.

Thims

> *See main: HCT IQ:200-range prodigies*

Of note, Libb Thims was goaded into "IQ ranking" (and re-ranking) when on 17 Feb 2010, the "IQ of 400" citation for Adragon De Mello was found, and subsequently added (see: version 214) into Thims growing circa 2006 to present IQ:200+ collection; after which, the ranking of geniuses by purely "cited" IQs (below right) became mentally incongruous, no longer visually pleasant to look at, i.e. a nonsense ranking:

Thims' IQ 200+ list (2007)

#	Name	Years	I.Q. (200+)
1	Michael Kearny	1982-	325 (age 4)
2	**William James Sidis**	1898-1944	200, 250-300 (verbal estimate)
3	Marilyn vos Savant	1946-	228 (age 10), 186 (age 40)
4	Leonardo da Vinci	1452-1519	180, 210-225
5	**Johann von Goethe**	1749-1832	210
6	Kim Ung-Yong	1963-	200-210
7	Hypatia	c.360-415	170-210
8	Nathan Leopold	1904-1971	200-210
9	Emanuel Swedenborg	1688-1772	205
10	Gottfried Leibniz	1646-1716	205
11	John Stuart Mill	1806-1873	200
12	Francis Galton	1822-1911	200
13	Hugo Grotius	1583-1645	200
14	Thomas Wolsey	c.1472-1530	200
15	Michael Grost	1954-	200

Growth

Thims' IQ 200+ list (2010)

	Name	Years	IQ
1.	Adragon De Mello	(1976-)	*400* (age 5)
2.	Michael Kearney	(1982-)	*325* (age 4), 200 (age 14)
3.	William Sidis	(1898-1944)	200, 250-300 (age 42)
4.	Terence Tao	(1975-)	220-230 (age 11), 211
5.	Marilyn vos Savant	(1946-)	*228* (age 10), **186** (age 40)
6.	Christopher Hirata	(1983-)	225 (age 16)
7.	Johann Goethe	(1749-1832)	180, **210**, 215, 225
8.	Leonardo da Vinci	(1452-1519)	**180**, 210, 220, 225
9.	Albert Einstein	(1879-1965)	160, 200, 205, 225
10.	William Shakespeare	(1564-1616)	210
11.	Kim Ung-Yong	(1963-)	200-210
12.	Nathan Leopold	(1904-1971)	200, 206-210
13.	Hypatia	(360-415)	170-210
14.	Christopher Langan	(1952-)	**174**, 195, **190**-210
15.	Emanuel Swedenborg	(1688-1772)	**165**, 205
16.	Gottfried Leibniz	(1646-1716)	**205**
17.	Edith Stern	(1952-)	200, 201-203
18.	Isaac Newton	(1643-1727)	**190**, 195, 200
19.	Francis Galton	(1822-1911)	200
20.	John Mill	(1806-1873)	**180**, 180, 200
21.	Hugo Grotius	(1583-1645)	**200**
22.	Hugo Grotius	(1583-1645)	**200**
23.	Thomas Wolsey	(1472-1530)	**200**
24.	Michael Grost	(1954-)	*200* (age 8)
25.	Sho Yano	(1990-)	*200* (age 10)

after which Thims was "forced" into doing his owing **re-rankings** of ceiling range IQs, which resulted firstly the genius IQs (24 Oct 2011) page, which then transformed eventually into the more-cogent five-part top 500 geniuses (Jan 2014) set of pages, ranked by real IQ (or true IQ), i.e. IQs that match up with reality.

The following shows the actual dates when Thims began to discover these various 200-range IQ during his research (see: footnote 2.5); IQs shown cited by other (not Thims):

Genius	IQ:200+	Human Chemical Thermodynamics
Goethe	IQ:225+ | 1926 **Discovered**: 10 Oct 2005 (Q)	Theory: Chemical Affinity Model of Relationships (1796 | **age 47**)
Tesla	IQ:200-310 | 2000 **Discovered**: c.2009	Theory: "Human is Powered Molecular Automaton with Energy of ½mv²" (1915 | **age 59**)
Sidis	IQ:250-300 | 1940 **Discovered**: 24 Mar 2008 (Q)	Theory: Thermodynamics of Animate and Inanimate (1916 | **age 18**)
Neumann	IQ:200 | 2010 **Discovered**: 11 May 2004 (Q)	Theory: Thermodynamic Free Energy Theory of Cash Value (1934 | **age 31**)
Thims	IQ:200+ | 2012	Theory: Chemical Thermodynamic Model of Relationships (c.1995 | **age 23**)
Hirata	IQ:225 | 1999 **Discovered**: 15 Feb 2010 (Q)	Theory: Thermochemical Model of Relationships (2000 | **age 18**)

Arroyo

IQ:200 | 2006
Discovered: 11 Feb 2016
(Q)

Theory: Thermal Model of Economics (2010 | **age 20**)

The above infobox shows, seemingly, that if one is a coming of age prodigy in the IQ:200± range intellect, one's mind will "naturally" gravito-electromagnitate towards a chemical thermodynamics model of the existence of things, in one way or another, being that the first law and second law are what define "nature" of things, in modern terms. The 200 range genius will use certain "key terms" that are common to other 200 range geniuses; such genius will put these ideas to print and or discuss them with someone who puts these ideas to print. These ideas will be discovered by other 200-range geniuses (similar to the "blue sky problem" common to pre 20th century IQ 200 range geniuses). Hence, the myth of the "anonymous 200-range genius", who supposedly works in isolation from the connected community, seems to be myth.

IQs: 500+ | 1000+

Over note, in the 2011 film *Limitless* the fictional genius nootropic drug imbibed character of Eddie Morra claimed to have a 4 digit IQ and has been characterized (Q) by some as a "21st century Faust." Since then, there has been a certain amount of discussion as to "what would it be like" to have an IQ of 500 or 1,000. [3] These types of speculations, however, are without merit, and lacking a true conceptual basis of what the IQ scale in the so-called ceiling range or "fat tail" end seems to entail, namely that the closer one gets to the 200 range, plus or minus, the harder it is to maintain, retrospectively speaking, e.g. Aristotle seems to have held his place at the 195 position, in 2,300+ year retrospect, Da Vinci at the 200 position, in 500+ year retrospect, and Goethe in the 215+ range, in 200-year retrospect, but these are the rare handful that seemingly been able to do this; hence, "stable" long-term 200-range IQ citation seem to be akin to attempting to run the 4-minute mile, get to approach absolute zero, or approach the speed of light, i.e. the close one gets, the harder it gets. Hence, at some gray area point, at or above the IQ 210 to 235 range is somewhat of a chimera, that only the distant future will be better equipped to judge and IQs above say 240 are unrealistic, akin to the finding that it is impossible to accelerate a body to the speed of light or to cool a system to absolute zero.

In spite of this "increasing steepness effect" associated with ceiling approaching IQs, there are some, e.g. Stephen Hsu (Q)(Q), who believe that scientists of the future will genetically engineer humans, like we currently do with chickens to get larger bodies, to make humans with IQs of 1000. This, however, is more akin to science fiction.

Overestimation | Issues

Clearly, form the examples cited above, those such as Sidis, De Mello, and Kearney did NOT have real IQs (or true IQs), say as compared to a Cox-Buzan IQ, 500-year retrospect, estimate of Da Vinci has having had an IQ of 200 or Goethe, the world's second biggest author (behind Shakespeare), to as having an IQ of 213. Some of this overestimation issue is captured well by American child prodigy turned physicist, biophysicist, social scientist, genius studies scholar, and reductionism defender John Platt:

> "Lestrade (Q) to be let loose on such a study is exactly as pathetic as for a subnormal waitress in the IQ of 90 range to try to measure the intellectual differences in college students."
>
> — John Platt (1962), "The Coming Generation of Genius" (pg. 73)

This is embodied in the old saying that "genius recognizes genius", e.g. Platt recognized the genius of Percy Bridgman ranking him with an IQ of 180, which is about five points shy of his current estimate, based on what he actually did, in retrospect, and conversely that "genius recognizes lesser genius", as the Landau genius scale and Lev Landau being the prime example, and non-genius ability or work.

Moreover, going into the early 20th century, it has been estimated that accelerated learning psychologists, of niche schools of this sort, in American, estimate ratio IQs of children, in the 200 range, at about one per 1.8 years per 3-4 state range of population, or something to this effect.

Quotes

The following are related quotes:

"OK most IQ's use 100 as mean and 15 points per standard deviation so an IQ of 200 or above according to wolfram alpha would be 1 out of nearly 80 billion statistically. The world population was about 6.8 billion in 2009 so the fact that **there would be one with IQ 200** is shocking but all these 200+ is just ridiculous."

— Eddie Koski (Q) (2012), "IQ:200+ | Smartest Person Ever (4 of 4)", forum (Q) post

"If anyone is interested in this – [claim] that Goethe had an IQ of 225 or whatever. Keep in mind IQ was invented in the twentieth century. Goethe who lived hundreds of years ago, never took any kind of IQ test, so the whole thing of claiming Goethe or Newton or whoever had an IQ of this or that is just pure speculation (and wrong one) – Google, "IQ Percentile and Rarity Chart" . They have a chart showing the percentage of population and odds for any given IQ. The **odds of scoring 200 are 1 in 76 billion**. The odds of scoring 201 are 1 in 119 billion, and the odds of scoring 202 are 1 in 190 billion. There are only 7 billion people on earth. That should be enough to settle this issue. No, Goethe didn't have an IQ of 225; that's a ridiculous made up definition of IQ. Note how this guy keeps making this silly claim over and over again. It cannot be true, unless he is giving Goethe children's test when he was a child."

— Evi Tthought (Q) (2015), "25 Smartest People Alive | Existive (2014) (5 of 5)", forum post (Q), Dec.

"I agree with Gladyshev's 2012 statement that 'Goethe's affinity can be interpreted on the basis of supramolecular thermodynamics. Changing of the Gibbs function occurring on the supramolecular structure level in complex systems (organisms). The affinity of Goethe is related to the phenomenon of sensory tropism', but the reason **Libb** peddles Goethe and Hirata (although unlike Goethe, Hirata is the real deal) is that he thinks it allows him to peddle his 'human chemistry' BS, which in turn, he thinks will make it easier for him to peddle and sell his BS scam books on*Human Chemistry*. Essentially his entire website [eoht.info] is a book scam operation to try and sell his book. It's funny that he goes on to give the illusion that there are other posters that agree with him. He has done the same laughable tactic where he cites some quote from some anon poster on how brilliant he is and that becomes the proof that he supposedly has an IQ in the range of 170-220. For the record **NO ONE has an IQ over 200** despite what anyone claims. Having said that I certainly would put Fields medalist Manjul Bhargava (Q) ahead of Goethe any day."

— Anon (2016), "Goethe is Overrated", tread (Q) posts (#9-10), made from McMinnville, Oregon, Mar 3

"If we go by the standard IQ rarity chart (that you can find anywhere) the rarity of scoring an IQ of 200 sd. 16 is about 1 in 5 billion. That's is theoretically (and approximately) 22 people who could have scored that high within the beginning of time."

— Anon (2017), "Archimedes" (Q), Hmolpedia Forum, Apr 2

"The highest deviation IQ test is the WISC-IV Extended Norms, at 210 SD16, or the Stanford-Binet 5 Extended Scales, at 225, and so take any 350 IQ estimate with a grain of salt."

— Ethan Hillman (2018), Quora post (Q), Jul

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2. Sperling, Abraham. (1946). "A Story of Genius" (pgs. 322-339), in *Psychology for the Millions*, F. Fell.
3. What would an IQ of 500 or 1000 look like? (2014) – Quora.com.

Further reading

- Are there any living people with IQs of 220? (2018) – Quora.

θΔics

In genius studies, **IQ history** refers to the history of the development of the concept of IQ or intelligence quotient as a means of labeling, estimating, and or quantifying the relative brightness of any given individual. [1]

Examples

In fiction, a few examples are, at the low end, the character Forest Gump, who, as a child with IQ of 75, was below the 80 or above level for normal students, and thereby was mandated by the stated to be put into the special education class. At the high end is the character Eddie Morra (played by Bradley Cooper) of the 2011 film *Limitless*, claims an “four digit IQ” or IQ:1,000+

IQ

The modern IQ scale was conceived between 1916 and 1926 by Stanford psychologists Lewis Terman and Catherine Cox who set the scale, as shown adjacent, approximately: [47] A more recent distinction, as added above, is the standard IQ cutoff for a child to get into a gifted program is 130. [48]

160	Clarendon to Jacquard level	43 geniuses
155	Blake to Friedman level	40 geniuses
150	Capote to Rembrandt level	18 geniuses
145	Sherman to Galton level	18 geniuses
140	**Near genius or genius**	11 geniuses
120-139	Very superior intelligence	
111-119	Superior intelligence	
90-110	**Average intelligence** (normal)	
80-89	Dull	
75	Forest Gump (as child)	
71-79	Borderline feeble-minded	
51-70	Mind like child aged 8 to 12	Moron
50	Homo erectus (mind)	
26-50	Mind like child aged 3 to 7	Imbecile

A portion of the modern IQ scale (2017), originally developed in 1916 by Lewis Terman, showing IQs ranging from 26 to 160.

Binet IQs

The world’s first intelligence measuring device was the Binet-Simon intelligence scale published in 1905 by French abnormal child development psychologists Alfred Binet and Theodore Simon, originally designed to test for “inferior states of intelligence”, so to diagnose and thus facilitate the education of the subnormals, categorized as either: *idiot* (lowest state), *imbecile* (intermediate low state), and *moron* (state nearest normality). [14]

In 1912, William Stern, a German psychologist, added to Binet's work by inventing the concept of "mental quotient", defined as the ratio of the age the test was designed for divided by the age of the person who takes the test. Thus, for instance, if a eight-year-old took a test designed for a ten-year-old, and passed, the child's MQ would be 1.25 or ten divided by eight.

Terman IQ

In 1916, Lewis Terman, a professor at Stanford University, modified Stern's formula by multiplying it by 100, creating a new formula, 100(MQ) that he called an "intelligence quotient" thus setting the person's intelligence at a value of 100, values below being indicative of reduced average intelligence, values above being indicative of above average intelligence. Terman, however, failed to speculate as to what formulaic values above 140 would mean except that it would be the genius range.

Cox IQ

In the 1920s, Terman assigned his new graduate student Catherine Cox the job of assigning IQ values to the world's greatest geniuses, so to affix the top of his IQ scale to recognizable points or intellects. Cox published her results in her 1925 PhD dissertation "On the Early Mental Development of a Group of Eminent Men" and the following year, the now-famous 1926 book *Early Mental Traits of 300 Geniuses*, which presented an in depth formulaic IQ ranking of the top 300 geniuses who were at adult age between the years 1450 and 1850, setting the ceiling genius IQ value of 210 to German polymath Johann Goethe.

French psychologist **Alfred Binet** (1857-1911): in 1899 was appointed to the Commission for the Retarded, a repercussion of a new French law that mandated school for children ages six to fourteen, whose aim was to develop a test to differentiate between normal and abnormal children, so to be able assign each to different classrooms. [14]	French psychologist **Theodore Simon** (1872-1961): was an intern at the asylum in Perray-Vaucluse, studying abnormal children, during which time he began to work with Binet to develop a test that could measure intellectual development of children ages 3-12.	German psychologist **William Stern** (1871-1938): reviewed the work of Binet (and others), and developed the idea of expressing intelligence in the form of a single number, the "mental quotient" (1912) as one's mental age divided by one's chronological age: [15] $MQ = \frac{Age_{mental}}{Age_{actual}}$	American psychologist **Lewis Terman** (1877-1956): refined the Binet-Simon scale (1916) to focus on testing the 'average' student and used Stern's proposal that an individual's intelligence level be measured as an IQ: idiot (below 20), imbecile (20-49), moron (50-69), deficient (70-80), dull (80-90), normal (90-110), smart (110-120), superior (120-140), genius (140 and over). [19]	American psychologist **Catherine Cox** (1890-1984): completed her PhD with a dissertation "On the Early Mental Development of a Group of Eminent Men" (1925) under Terman and expanded this into the 1926 book *Early Mental Traits of 300 Geniuses*, in which she assigned IQ values to the top 300 geniuses who lived between 1450 and 1850, setting the ceiling genius IQ of 210 to Goethe. [16].

In sum, the modern intelligence test was developed by Stanford psychologist Lewis Terman, beginning in 1911 and first published in 1916, called the Stanford-Binet scale, a modification of the Binet-Simon scale, albeit focused on testing the 'average' person. The original Stanford-Binet (score range: 0-168) was designed so that the average person would score 100, with two-thirds scoring between 85 and 115. [13] Scores from the Stanford-Binet were then multiplied by German psychologist William Stern's "mental quotient" (age the test was designed for divided by actual age) to give an IQ, according to the following formula (shown below with a score of 100): [19]

$$IQ = \frac{Age_{mental}}{Age_{actual}}(100)$$

In short, the age of designed test (e.g. a Stanford-Binet test designed for 12-year-olds) would be divided by actual age (e.g. age 8) of the tester multiplied by 100 (or possibly the score received) then . This original IQ formula is said to work fairly well for children but not for adults. An 8-year-old who scores a 100 on a Stanford-Binet (designed for 10-year-olds) would thus be said to have an IQ of 125 = (10/8)*100. Yet a 40-year-old who scores 100 on the same test would yield a nonsense value of IQ of 25 = (10/40)*100.

In other cases, specifically, those who score answer all the questions correctly, at a young age, the resultant value is far skewed. The over-estimated IQ of 325 for Michael Kearney, for example, was derived from a score of 168 on a Stanford-Binet test designed for children aged 6 or above. Taken literally, this would correlate to an IQ of 252 = (6/4)*168. Kearney's parents, however, claim they calculated an IQ of 325 using instructions on how to do the age ratio at their local library. The only way to arrive at a value such as this would be to assume a 'mental age' of 7.74-years, which would give an IQ of 325 = (7.74/4.0)*168, assuming he was exactly four-years old at the time of the test. This nonsensical IQ value of 325 (115 points higher than the Cox ceiling genius IQ of 210), however, does not corroborate with

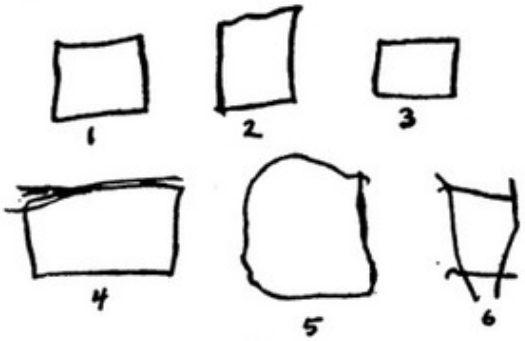

Sample Binet-Simon question for five-year-olds called **"copying the square"**, where the tester draws a square, 3 or 4 cm on each

Kearney receiving a 3.6 GPA in a relatively easy subject of anthropology at a average-ranked college (University of South Alabama) six years later.

side, and asks the child to copy it using a pen. Versions 1-3 would be considered satisfactory, whereas versions 4-6 would constitute failures.

An example question to test for supposed ‘normalcy’ of four-year-olds is the question: “are you a little boy or a little girl?” When asking four-year-olds this, not all will answer correctly; sometimes the child will simply say ‘yes’ or ‘no’. A normal four-year-old, according to Binet and Simon, however, will always answer correctly when asked its sex. An example five-year old test is called copying the square, where the child is instructed to reproduce a drawn square, as depicted adjacent. The following example questions (1911 version) were added by Terman to Binet’s original IQ test to create the "Stanford-Binet test":

Question #1:	An Indian who had come to town for the first time in his life saw a white man riding across the street. As the white man rode by, the Indian said - “The white man is lazy; he walks sitting down.” What was the white man riding on that caused the Indian to say, “He walks sitting down.”

Terman explained that the correct response is: “bicycle.”; whereas incorrect responses include: tricycle, unicycle, horse, wheelchair, rickshaw, automobile, or motorcycle.

Question #2:	My neighbor has been having queer visitors. First a doctor came into the house, then a lawyer, then a minister. What do you think happened there?

In this case, Terman explained that a satisfactory answer must normally involve a death: “The doctor came to attend a sick person, the lawyer to make a will, and the minister to preach the funeral.” The following answer was failed by Terman: “Someone was sick; the lawyer wanted his money, and the minister came to see how he was.”

Guinness book IQ

To give an example of how answering these questions can yield an IQ score, to create the infamous "230" IQ score boasted by Marylin vos Savant, as published in the 1986 *Guinness Book of World Records*, in 1956, at age 10, she correctly answered all of the questions, such as those above, on the Stanford-Binet, which is designed for people up to age 23 or specifically 22-years 10-months (22.83 years), thus her ratio IQ (see below) at age 10 was determined as: IQ = (22.83/10)*100 = 228.3. Here we see a nonsensical calculation. According to Cox, an IQ of 190 is a genius intelligence on par with Newton. Yet vos Savant, who according to the Terman IQ formula has a 228 IQ, became pregnant at 16, later a college dropout, and careered as a news paper columnist, and thus may be a smart person, but certainly no Newton. To illustrate further issues with the Terman IQ formula, if Savant retook the Stanford-Binet test at age 40, scoring a perfect score again, it would tell us she has an IQ of 57 = (22.83/40)*100 used the same formula at age. In this context we see the issue with ratio determined IQs, in that answering a collection of trivial Stanford-Binet type questions does not make a 10-year old the world's smartest person.

Buzan IQs

Buzan IQs are those determined by English accelerated-learning expert Tony Buzan and English chess grandmaster Raymond Keene in 1994, using a method independent to that of Cox, in which they scored the top 100 leading minds on an 835-point scale (GS=Genius Score): dominance in the field (100), active longevity (100), polymath (100), versatility (100), strength and energy (100), IQ (100), ongoing influence (100), prolificness and achievement of prime goal (100), universality of vision (15), outstanding originality (10), deliberate desire to create teaching avenues or academies to further the genius’ ideas (10). [18]

Ratio IQs

(a) IQs shown in *Italics* in the above table were determined via the less-accurate estimated Stanford-Binet *ratioed IQ formula method*, discussed above. This formula can then further vary according to both the score of the test used and the test given, which combined can give various ratio IQ scales. Using this scaling, if a young child gets a perfect score on, for example, the Stanford-Binet (168), extropolative ratio IQs can be determined well above 200 and near to 300 if child in in the low to mid single digits in age.

(b) Ratio IQs, to note, can be very inaccurate, may vary depending on reference, and calculations of which can give quite skewed IQ approximations.
(c) Michael Kearney (as discussed above), to cite an example, had his IQ, at age four, age-ratio scored at 325, based on a 168 test score (maximum possible), according age-ratio calculations done by his parents in their local library. The Stanford-Binet L-M version measures a mental age that can then be adjusted for a child's chronological age to obtain a true IQ. Using the above formula, a 325 ratio-score would correspond to a mental age of 13-years. If the ratioed IQ were correct, Kearney should be smarter than anyone alive. Yet, six years later, he obtained a 3.6 GPA in a relatively simple subject (anthropology), at an average ranked school (University of South Alabama); thus putting him in the slightly above average college graduate IQ range (110-115).

See also

â— IQ scale

References

1. Note: This page lists the **references** to the **IQ: 200+** (and IQ: 225+) **page**. These were put on a separate page owing to the fact that the EasyEdit tool bar, to this wiki, stops working when a wiki page gets past the circa 26-30 page mark.

θΔics

In genius IQs, **IQ key** refers keys to the subscript marks and letters used in the various IQ citations found in the Hmolpedia genius rankings pages. The following is a key to the icons and IQ subscripts used herein:

Symbol	Key
CI_B	Baez crackpot index score
IQ_{AII}	(or AII IQ) IQ development from 17 to 26; a Catherine Cox ranking technique
IQ_B	Buzan IQ
IQ_{BR}	Buzan IQs reformulated (Q) into ratio IQs by the MegaSociety (2005).
IQ_C	Cox IQ
IQ_{CB}	Cox-Buzan IQ
IQ_{CE}	A claimed IQ (compare: auto-estimated IQ) of an existive person.
IQ_{CP}	An IQ derived by "comparison to another person[s]", with existing IQ estimate, method.
IQ_{CPB}	The mean IQ of **Cox IQ** + **Platt IQ** + **Buzan IQ** of a genius common to all three (see: Cox-Buzan-Platt IQ).
IQ_D	Deviation IQ
IQ_E	Score derived from 1999 *Esquire* “Gεπ1us Tεst” IQ. [1]
IQ_{EM}	An IQ calculated or estimated by Economakis Michael (2008/2012).
IQ_{Ex}	An "existive IQ".
[add]	A "feigned IQ" is a over-estimated IQ.
IQ_G	Guinness Book IQ
IQ_{GD}	A genius-level IQ (140+) by default per cited opinion.
IQ_H	An IQ determined by Leta Hollingworth (1942).
IQ_{HE}	A "highest IQ ever" nominee, contender, or supposition, e.g. Robert Hooke (2009) (Q), or “highest IQ ever recorded”, e.g. Kim Ung-Yong (1977) (Q)
IQ_{JP}	An IQ estimate from John Platt's 1962 "The Coming Generation of Genius".
IQ_M	Mega Test IQ
IQ_{MM}	An IQ calculated by Maud Merrill, one of the three main IQ rankers, along with Catherine Cox and Lewis Terman, in the determination of the IQs of the top 300 geniuses of the Cattell 1000, as found finalized in the Cox IQs.
IQ_{MN}	Mensa Test IQ
IQ_O	Other IQ, e.g. cited at IQ references, or per numbered reference.
IQ_P	Psychologist tested IQ
IQ_{PG}	The mean IQ of the posthumous genius (198|#32), using an average of Da Vinci (IQ:200|#7), Spinoza (IQ:180|#94), Goethe (IQ:225|#1), Nietzsche (IQ:190|#35), and Tesla (IQ:195|#19).
IQ_Q	An IQ estimate based on Quora answer submissions.
IQ_R	A "ratio IQ", namely an IQ determined by an mental age by an actual age, of some designed age specific test, times 100; this is the Terman IQ formula, in short.
IQ_{Re}	A "real IQ", i.e. an IQ that matches up with reality, as compared to: feigned IQ, paper IQ, inflated IQ, fake IQ, etc., as best data available to sensor input furnishes.

IQ_{SE}	A self-estimated IQ (e.g. Bertrand Russell, Buffon, etc.)
IQ_{SB}	Stanford-Binet extrapolated IQ
IQ_{Si}	An IQ estimated by American psychologist Dean Simonton, e.g. as are found on the American presidents page (or IQ_{DS} in some locations). [3]
IQ_{SiM}	In May 2015, Lindsey Cook, a data editor at US News and World Report, took the "mean" of the four IQ estimates (IQ at age 1-17, and 18-26; corrected and uncorrected), for each president, from the Simonton (2006) study. [5]
IQ_{SK}	The Feb 2019 personal "Top 100 Geniuses List" (Q) made by Reddit user u/SpergingKermit, a 15-year-old individual interested in geniuses, who does not believe in chance (Q), but is agnostic about god, or something to this effect; the list was posted, by request of Thims, into the r/RealGeniuses forum; plus projections (10+) (Q) (10 Feb).
IQ_{SN}	A the mean IQ of a social Newton, which based on the average of the known IQs of 14 of the top 55+ social Newtons (Feb, 2017) is 186.
IQ_{SS}	The IQs listed on Sigma Society IQ list (Q) listing sources and discussion.
IQ_{T}	A Terman IQ, i.e. an IQ calculated by Lewis Terman.
IQ_{Th}	A "theoretical IQ", basically what one's IQ could be "in theory", in the future, as an adult, after one has accomplished something of genius merit, but is a thing only the future can discern, retrospectively; e.g. if we take the statement "I taught [Laurent Simons] when he was six and we studied at the level of a 16 year-old" (Wilkes, 2019) (Q), we can calculate a "theoretical IQ" of 267, per age ratio IQ method; this, however, is what is classified as an "inflated IQ" per reasons that IQ calculations past the 225 range don't match up with reality, i.e. the "real IQs" of real historical geniuses, as determined via meta-analysis, as shown in the top 1000 geniuses rankings.
IQ_{U}	An Uberman IQ, mean averaged at 186, generally.
IQ_{W}	An IQ estimated by Herbert Walberg et al. [2]
IQ_{Y}	YouTube community "IQ: 200+ | Smartest person ever", video thumbs up rankings/votes
$IQ_{?}$	Guesstimate IQ (some shown in red, e.g. estimated fit per extrapolation of established previously made Cox-Buzan IQ estimates.
	Won a Nobel Prize; two medals signifies two wins.
[:#]	Nominated for a Nobel Prize but did not win; number signifies number of times nominated.
	Won a Fields Medal, the highest award in mathematics, for thinkers under the age of 40.

See also

● IQ subscript table on the IQ: 200+ page.

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(b) IQ estimates [of US Presidents] by academics (section) – Wikipedia.
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θΔics

In genius studies, **IQ ranking methodology** refers to the methods, e.g. Terman (1916), Cox (1926), Walberg (1981), Simonton (1983/2006), Buzan (1994/2005), Thims (2007/2013), etc., by which IQs are assigned to geniuses (140+ range) and thereby ranked accordingly and respectively.

An IQ upgrade (↑) / IQ downgrade (↓) icon, a ranking **methodology** used by genius studies scholar Libb Thims in doing adjusted **IQ rankings** of the world's greatest 500 geniuses.

Overview

The general method by which IQs are assigned and geniuses ranked in Hmolpedia is via the meta-analysis method, such as exemplified on the greatest mathematician ever page, a snippet of which is shown below, which explains how Euler and Gauss are respectively ranked, not necessarily by IQ, but respect to mathematical prowessness, according to 8+ different means of intellectual magnitude gauging and ranking studies:

#	Person	Meta-analysis Ranking
1	Leonhard Euler (1707-1783) W	(4,4,4,4,1) (12%) (64283)
2.	Carl Gauss (1777-1855) W	(7,3,2,5,2) (10%) (50699)

Historically, the theory that one can assign a numerical value to one's level of relative brightness, began with the 1916 work of American psychologist Lewis Terman (see: IQ history), who affixed the numerical value of 140 and above, on his so-called "IQ scale", to geniuses. Originally, the method by which these numbers were calculated were done so via the Terman IQ formula, designed specifically to test of potential ability (or disability) in youth, therefore being an age ratio (see: ratio IQ) focused formula. Terman then applied his formula to geniuses of history, Francis Galton in particular, whom he assigned with an IQ of 200 (the first ever estimation at this level), reasoning that his formula methodology could be used to estimate (or guesstimate) the IQ of individuals of the past, based on their documented mental ability at a given sub-adulthood age relative to an adult; hence, eliminating the need to take an actual so-called "IQ test" to gauge discernment.

Galton

In 1869, English naturalist Francis Galton published his *Hereditary Genius: an Enquiry into its Laws and Consequences*, wherein he examined a "large body of fairly eminent men" and the "kindred of the most illustrious commanders, men of literature and of science, poets, painters, and musicians, of whom history speaks", in attempts to show that genius is inherited. [1] Although Galton, it seems, doesn't given an actual "ranking", the date of publication of his book is sometimes cited as the start of the field of genius studies.

Cattell

In 1894, American psychologist and science editor James Cattell undertook a monumentous so-called "big names" of history project in which analyzed name dominance in four biographical dictionaries: *Lippincott's Biographical Dictionary* (American), Rose's *Biographical Dictionary* (English), *Le Dictionnaire de Biographie Generale* (French); and two encyclopedias: *The Encyclopedia Britannica* (English) and *Brockhaus Encyclopedia* (German), to obtain a first draft listing of the top 6,000 names found therein, according to space allotted; he thereby then narrowed this list into a ranked-by-eminence listing of top thousand preeminent individuals of history, the truncated methodology of which Cattell describes as follows: [2]

Cattell | Top 10

1. Napoleon Bonaparte
2. William Shakespeare
3. Muhammad
4. Voltaire
5. Francis Bacon
6. Aristotle
7. Johann Goethe
8. Julius Caesar
9. Martin Luther
10. Plato

> "The **method I followed** to discover the 1,000 men who are preeminent **was this**: I took six biographical dictionaries or encyclopedias (*Lippincott's Biographical Dictionary*, *The Encyclopedia Britannica*, Rose's *Biographical Dictionary*, *Le Dictionnaire de Biographie Generale*, Beaugean's *Dictionnaire Biographique*, and Brockhaus' *Conversationslexicon*)—two English, two French, one German, and one American and found the two thousand men (approximately) in each who were allowed the longest articles. In this way some 6,000 men were found. I then selected the men who appeared in the lists of at least three of the dictionaries, and from these (some 1,600) selected the thousand who were allowed the greatest average space, the value of the separate dictionaries being reduced to a common standard. Thus was obtained not only the thousand men esteemed the most eminent, but also the order in which they stand."

The result was the resulting list famously became known as the Cattell 1000. This list, in many respects parallels the so-called WorldCat 100 (below), the a cloud tag of the top 100 world authors by prominence of the 20 million "identities", found in the world's libraries. A salient issue in Cattell's top ten is that Muhammad is not a real person, but rather a mythological aggregate; the same way the WorldCat 100 lists Jesus Christ, also not a real person, in the top ten.

Cox methodology

In the 1920s, American psychologist Lewis Terman, inventor of the modern IQ scale (1916), where 100 = average; 140 or above = genius, assigned his graduate student Catherine Cox to use his newly invented IQ scale to rank the top 300 most intelligent geniuses in the Cattell 1000, who lived (existed) in adulthood age during the years 1450 to 1850, and who achieved eminence on their own, as compared to eminence via inherited throne. The following is Cox's definition of IQ as far as it concerns geniuses:

Cox | Top 10

1. Johann Goethe	210
2. Gottfried Leibnitz	205
3. Hugo Grotius	200

> "**IQ** is thought to be a measure which expresses the relative brightness or intelligence of any given individual."

4. Thomas Wolsey	200
5. Blaise Pascal	195
6. Paolo Sharpi	195
7. Isaac Newton	190
8. Pierre Laplace	190
9. Voltaire	190
10. Thomas Schelling	190

To make her list of geniuses, ranked by IQ, a team, led by Cox, in association with Terman, and psychologists Florence Goodenaugh and Kate Gordon developed a ranked list by reading through 1,500 biographies and to each genius independently assigning an estimated intelligence quotient, based on *The Stanford Revision of the Binet-Simon Intelligence Scale*, based on each individual's life accomplishments and childhood abilities. The result was an 8,500-page report, part of Cox's 1924 PhD dissertation, which was then truncated into the now-famous 824-page 1926 book *Early Mental Traits of Three Hundred Geniuses*. [3]

The ranked listing of IQs from this book has since been known as the Cox IQs, and has become a sort of first draft "genius IQs ruler" employed in genius studies.

Psychologist testing methodology

Into the early 20th century, psychologists began administering IQ tests to people. While some of these "intelligence testing" methods supposedly were done on the overt premise that such values would be useful in determining school and or job performance, or something along these lines, when it came to geniuses, calculated values often gave misguided results—calculations done being something akin to throwing darts upwards at clouds and in many cases done so with either far-low mis-calculation and or high-end estimation overzealousness.

French genius Henri Poincare did so poorly on the Binet IQ that he was judged an imbecile (IQ=35); though we now, correctly, rank him at IQ=195. Likewise, William Shockley, eponym of the Shockley diode, the co-inventor of the transistor, along with along with John Bardeen (double Nobel Prize winner) and Walter Brattain, who all received the 1956 Nobel Prize in physics, at age 8 he scored IQ = 125 on the Stanford-Binet and 129 at age 9; these early IQ scores frustrated him, and he would later frequently joke about how he could win a Nobel Prize in physics, but not qualify for Terman's gifted study. [15] The following, likewise, gives an example of overestimation:

> "Helena Sidis told me that a few years before his death [1944], her brother [William Sidis] took an intelligence test with a psychologist. His score was the very highest that had ever been obtained. In terms of I.Q., the psychologist related that the figure would be between 250 and 300."
>
> — Abraham Sperling (1946), director of New York City's Aptitude Testing Institute [14]

In this latter example, Sperling, a psychologist, not being intellectually equipped to successfully judge the harder sciences which comprise the basis of Sidis self-defined magnum opus (*The Animate and the Inanimate*, 1920), subsequently makes a large incorrect overestimate. The same is the case for many so-called "certified genius" IQ test scores many boast about. Gauging, via a "test", of the so-called "genius" ranking of any given individual is a very grey area and in most cases a type of snake oil science, that for many is very lucrative, often playing on insecurities. In most cases, "geniuses", as Arthur Schopenhauer put it, tend to hit targets that "no one else can see" (see: forest blind), hence one can not put into writing (e.g. a test) something that has not yet been seen. Whatever the case, in some cases psychologist and or test based IQ calculations due tend to result in close to target estimations, one example being Christopher Hirata, estimated, supposedly by a psychologist (c.1999), with an IQ of 225 at age circa 16, who by no coincidence was drawn to the same subject (human chemical thermodynamics), as was Goethe, also estimated with an IQ of 225, by one of the psychologists of the Catherine Cox team (1926).

Walberg methodology

In 1981, American learning and education scholar Herbert Walberg, in association with Shiow-Ling Tsai, Thomas Weinstein, Cynthia Gabriel, Sue Rasher, Teresa Rosecrans, Evangelina Rovai, Judith Ide, Miguel Trujillo, and Peter Vukosavich, inclusive of a research team involving 76 scholars, expanded on the Cattell 1000 turned Cox IQ estimates by including additional estimate of eminence by counting the number of words in the primary biographical articles on each of the 282 persons in the 1935 *New International Encyclopedia* and the 1974 *Encyclopedia*, and listed top ten individuals by word count, citation, and IQ.

Walberg | Word Count	Walberg | Citation	Walberg | IQ	
1. Samuel Johnson	1. Rene Descartes	1. Johann Goethe	200
2. Martin Luther	2. Napoleon Bonaparte	2. Gottfried Leibniz	200
3. Rembrandt	3. Isaac Newton	3. Hugo Grotius	197
4. Leonardo da Vinci	4. Gottfried Leibniz	4. Blaise Pascal	192
5. Napoleon Bonaparte	5. Martin Luther	5. Paolo Sarpi	187
6. George Washington	6. Georg Hegel	6. Voltaire	185
7. Abraham Lincoln	7. Immanuel Kant	7. Giacomo Leopardi	185
8. Johann Goethe	8. Charles Darwin	8. Philipp Melanchthon	180
9. Isaac Newton	9. Galileo Galilei	9. Thomas Macaulay	180
10. Charles Dickens	10. Leonardo da Vinci	10. Jacques Bossuet	177

The 1974 top ten rankings by word count, citation, and IQ are shown adjacent. [4] In this three way grouping, we see Goethe holding about the same position in word count ranking, i.e. positions #7 (1894) and #8 (1974), respectively. The citation ranking is very interesting, wherein we see Rene Descartes and Isaac Newton climbing in ranking, which can be attributed to the "catch up effect", namely that it generally takes several centuries for deep thinkers to pass from high citation rank to high word count rank. These, word count aside, can be compared to Hmolpedia citation and IQ ranking (below).

Although Walberg and associates seem to be on target with a number of IQ estimates, e.g. Goethe, Leibniz, Voltaire, Pascal, give or take, they are way off in their IQ estimates of scientists, namely: Darwin, Newton, Descartes, Pascal, most of which nearly absurd, e.g. thinking that Newton was less intelligent that Descartes, whose shoulders he specifically said he built on; or that Albrecht and Pascal are smarter than both? The correct IQs of these

four, for clarification sake (per genius IQs citation, are shown below):

Cox | 1926	Charles Darwin (165)	Isaac Newton (190)	Rene Descartes (180)	Blaise Pascal (195)
Walberg | 1981	Charles Darwin (160)	Isaac Newton (170)	Rene Descartes (175)	Blaise Pascal (192)
Buzan | 1994	Charles Darwin (163)	Isaac Newton (195)	Rene Descartes (175)	N/A
Thims | 2013	Charles Darwin (175)	Isaac Newton (215)	Rene Descartes (195)	Blaise Pascal (190)

Suffice it to say that accurate IQ estimates of elite scientific genius may be beyond the acumen of the psychologist, who is limited by a lack of complete understanding of higher end subjects of the hard sciences; hence, mis-quesstimated IQs may often result.

Buzan methodology

In 1994, completely independent to the Cox study, Englishmen accelerated learning expert Tony Buzan and grand chess master and literature scholar Raymond Keene, in their *Book of Genius*, attempted to rank the hundred greatest geniuses of all-time using an eight category, 835-point, so-called genius scoring methodology, assigning points to different categories: dominance in the field (100), active longevity (100), polymath (100), versatility (100), strength and energy (100), IQ (100), ongoing influence (100), prolificness and achievement of prime goal (100), universality of vision (15), outstanding originality (10), deliberate desire to create teaching avenues or academies to further the genius' ideas (10). The so-called "methodology" by which they assign IQs to their top 100 group, which they explain below, is rather haphazard: [5]

Buzan | Top 10	
1. Leonardo da Vinci	220
2. Johann Goethe	215
3. William Shakespeare	210
4. Albert Einstein	205
5. Isaac Newton	195
6. Thomas Jefferson	195
7. Thomas Edison	195
8. Archimedes	190
9. Aristotle	190
10. Brunelleschi	190

> "As IQ is a significant factor in genius, we included it, and provided a sliding scale with a range of only 30 points. We assumed that each of our 100 geniuses would have comfortably been able to pass Mensa's introductory tests, and therefore commenced with a minimum IQ of 140, which is basic genius level. Using a further sliding scale we awarded 70 points to an estimated IQ of 140, 88 points to an estimated IQ of 170 and 100 points to an estimated IQ of 190."

This IQ listing of estimated IQs of geniuses is known as the Buzan IQs. Buzan and Keene comment on the Cox list (1926) in respect to their list (1994) in 2005 as follows: [6]

> "It is interesting that the Cox analysis and our own totally independent inquiry both produce an identical number of IQ record holders of 180 or above. In Cox's case 14; whilst we also identified 14!"

Simonton methodology

In the 1980s, American genius studies psychologist Dean Simonton began building on the work of Cox and in the decades to following began estimated IQs of geniuses (see: American presidents), using a similar type of methodology to Cox. [7] Some of Simonton's estimation methodologies seem to have issues, e.g. he thinks that John Adams (IQ=173) was 13 IQ points brighter or smarter than Thomas Jefferson (IQ=160), in his estimate, which is not the case by a long shot (e.g. compare Buzan 195 IQ estimate above). [8]

Thims | Hmolpedia IQ rankings | Origin

See main: Why does Libb Thims make genius lists?

In 2006, American electrochemical engineer Libb Thims discovered, via footnote 2.5 of Ilya Prigogine (*Order Out of Chaos*, 1984), "Goethe" the person he had been searching for, as the person to first apply chemical thermodynamic prediction theory to human relationships modeled as chemical reactions and sought after "intellectual twin" of sorts, for some eleven years, after which, via the Wikipedia article on Goethe, which prior to version 5:08, 10 Feb 2007 (Ñº) had the following ending lead sentence with accompanying footnote:

> "[Goethe] is widely considered to be one of the most important thinkers in Western culture, and is often cited as one of history's greatest geniuses." [N1]
>
> N1. Psychologist Catharine M. Cox, in her 1926 *Early Mental Traits of Three Hundred Geniuses*, speculatively estimated Goethe's **IQ at 210**, the highest score that she assigned.

Human Chemical Thermodynamicists | IQ = 225+

Johann Goethe (1749-1832)

William Sidis (1898-1944)

Christopher Hirata (1982-)

Into 2006, American electrochemical engineer Libb Thims, while doing research in human chemical thermodynamics, kept coming across "thinkers" in this niche field cited with IQs in the 200 range, e.g. Voltaire or John Mill, or 225+ range, e.g. Goethe, Sidis, or Hirata, as shown above, and thereafter began to be curious just how many so-called "IQ: 200+" range geniuses there are, and so in 2007-2008 began to gather a personal folder of "cited" 200-range IQ geniuses, purely out of curiosity; and soon thereafter was "forced" into bringing some order to hodgepodge cracker jack science of ranking geniuses and calculating and or assigning people with genius IQs (140+).

Thims took this "IQ at 210" citation factoid (highest of 300 geniuses); and also of the various page deletions and re-adds, and also talk page discussions of suggestions to remove (Ñº) and to re-add (Ñº) The so-called "idiotic 'estimated IQ' of Goethe, and its comparison with da Vinci's estimated IQ" (Ñº) , as one anon American poster from Bloomington, Indian, put it.

In any event, by 24 Dec 2007, Thims had broken off from Wikipedia and began writing Hmolpedia, and soon thereafter, through research and writing of thinkers to have applied chemistry, thermodynamics, and or chemical thermodynamics to the questions of human existence and experience, puzzlingly, began to discover more cited to be 200+ IQ range geniuses: William Sidis (2008), IQ cited at 250-300, Christopher Hirata (2010), IQ cited at 225, and so therein began to be curious as to just how many of these so-called "IQ 200-range" geniuses there are? Sometime therein, following mental footnote notice of the Goethe-Sidis IQ=200+ citation commonality, a 15-person personal folder collection of newly discovered 200+ range geniuses (with citations) resulted, scan of list shown adjacent, ranked solely by descending order of cited IQ, each IQ estimate taken at face value:

Thims | IQcitation (2007)

#	Name	Years	I.Q. (200+)
1	Michael Kearny	1982-	325 (age 4)
2	**William James Sidis**	1898-1944	200, 250-300 (verbal estimate)
3	Marilyn vos Savant	1946-	228 (age 10), 186 (age 40)
4	Leonardo da Vinci	1452-1519	180, 210-225
5	**Johann von Goethe**	1749-1832	210
6	Kim Ung-Yong	1963-	200-210
7	Hypatia	c.360-415	170-210
8	Nathan Leopold	1904-1971	200-210
9	Emanuel Swedenborg	1688-1772	205
10	Gottfried Leibniz	1646-1716	205
11	John Stuart Mill	1806-1873	200
12	Francis Galton	1822-1911	200
13	Hugo Grotius	1583-1645	200
14	Thomas Wolsey	c.1472-1530	200
15	Michael Grost	1954-	200

American electrochemical engineer Libb Thims' original *circa* 2007 personal folder listing collection of fifteen IQ=200+ range "cited" geniuses, ranked in descending order of IQ (assuming correctness of the given citation).

→

Thims | IQcitation (2010)

1. Adragon De Mello [?]	400
2. Michael Kearney [?]	325 (age 4), 200 (age 14)
3. William Sidis	250-300 (age 42)
4. Terence Tao [?]	220-230 (age 11), 211
5. Marilyn Savant [?]	228 (age 10), 186 (age 40)
6. Christopher Hirata [?]	225 (age 16)
7. Johann Goethe	180, 210, 215, 225
8. Leonardo da Vinci	80, 210, 220, 225
9. Albert Einstein	160, 200, 205, 225
10. William Shakespeare	210
11. Kim Ung-Yong [?]	200-210
12. Nathan Leopold [?]	200, 206-210
13. Hypatia	170-210
14. Christopher Langan [?]	174, 195, 190-210
15. Emanuel Swedenborg	165, 205

Thims' 2010 version of listing of people with IQs at or over 200 per purely descending order of citation estimate; at which point the list was becoming nonsensical.

This was made into a 24 Mar 2008 (version 18) online listing of the now popular: "IQ: 200+" table. This list, being purely ranked at this point via highest IQ cited (no questions about method of calculation), began to grow. In 2009, the online list was made into a quickly-made 10-minute YouTube video entitled "IQ 200 | Smartest person ever", containing about 18-individuals, getting about 30,000 views. At the point of 23 Feb 2010 (version 300) when American forced prodigy Adragon de Mello, with his age four IQ=400 citation (calculated by father), was added to the list, as shown above (right), it thereafter became completely nonsensical to rank purely via IQ citation number.

In other words, it makes one's head hurt to look at such an incongruent listing; something is amiss? It takes a little while to figure where the estimation errors are, but given time one finds out, e.g., that de Mello was a ratio estimate made by his overzealous father; the same for Kearney; Sidis, likewise, though not a ratio estimate, was made by an overzealous Abraham Sperling, director of New York City's Aptitude Testing Institute; though it is not as easy to dismiss Sidis until one, competent in science, mathematics, thermodynamics, evolution, and astronomy, and hmolscience in general, actually sits down and reads his greatest book *The Animate and the Inanimate*, in slow critique detail, wherein difficulties on theory become apparent, after which the veil of his apparent supergeniusness disappears, and his "real" (or true) IQ estimate drops down to 185±, if that, at best. A reality check is done on each, so to speak. Tao, likewise, is solely productive in mathematics, and so thus can be compared to the known established IQ estimates of the greatest mathematicians ever (e.g. the Gauss-Euler-Descartes IQ=195 level), and ranked accordingly. Savant famously used incorrect high school age test records to turn a 127 grade school test result IQ into a false 228 Guinness Book IQ.

A portion of the "genius studies" books section of American electrochemical engineer Libb Thims' personal home library of *circa* 1,500 books.

The mental incongruency of this so-called "de Mello" add table was the "tipping point" that forced Thims into the practice of doing his own rankings and adjustments of known estimates, via meta-analysis reality-based up or down adjustments, based on a number of factors, merit being a large factor.

On 2 Apr 2010, the "IQ: 200(±) candidates page" was started to catch, collect, and analyze purported or recommended IQ=200+ range "candidates" suggested in YouTube forums, Hmolpedia threads, Internet or Google Book searches, or via other means.

On 19 Oct 2010, the first video was remade and "reranked" into the format of better-quality 52-minute four-part video series, containing 37-individuals, was uploaded to YouTube, having since attracted over 1.4 million total views: part one (848,000), part two (314,000), part three (112,000), part four (159,000), and some 4,200+ comments as of 18 Nov 2013.

On 6 Dec 2010, knowing that the 1926 Cox IQ estimate study and the 1994 Buzan IQ estimate study were each done independently, Thims took the mean of the IQs for all geniuses common to both studies, resulting in the Cox-Buzan IQ page, the top ten of which are shown below (left), a hardened genius IQ ruler of thumb for guesstimates of uncited geniuses.

Genius IQs

On 24 Oct 2011, commentary, feedback, suggestion, and debate from the above growing collection of videos and online listings resulted in the genius IQs webpage, a meta-analysis merger of the 300 Cox IQ estimates, the 35 Walberg IQ estimates, the 100 Buzan IQ estimates, some of the Simonton IQ estimates (American President's IQs, etc.), among all other known IQ estimates, calculations, and or citations, which is presently aiming to rank the top 500 geniuses of all time in a realistic meta-analysis descending order of IQ, using the 23 mean Cox-Buzan IQ anchor point geniuses as relative reference points; the top ten of which (as of Nov 2013) shown adjacent, along with the top ten names in Hmolpedia citation ranking. These can be compared to the similar 1974 *Encyclopedia Britannica* rankings (above).

Cox-Buzan | Top 10		Hmolpedia | Citation		Hmolpedia | IQ	
1. Johann Goethe	213	1. Johann Goethe		1. Johann Goethe	230
2. Leonardo da Vinci	200	2. Willard Gibbs		2. Albert Einstein	220
3. Gottfried Leibnitz	194	3. Rudolf Clausius		3. Isaac Newton	215
4. Isaac Newton	193	4. James Maxwell		4. James Maxwell	210
5. Galileo Galilei	183	5. Gilbert Lewis		5. Willard Gibbs	210
6. John Mill	183	6. Hermann Helmholtz		6. Rudolf Clausius	205
7. Rene Descartes	178	7. Isaac Newton		7. Gottfried Leibniz	200
8. Michelangelo	178	8. Ludwig Boltzmann		8. Galileo Galilei	200
9. Desiderius Erasmus	178	9. Sadi Carnot		9. Leonardo da Vinci	200
10. John Milton	177	10. Charles Darwin		10. Thomas Young	200

On 21 Jun 2012, the "genius IQ candidates" page was started as a means to collect and analyze suggested candidates and or newly found geniuses, e.g. via literature, reading, or videos, etc., prior to their possible or tentative add to the main genius IQs page.

In 2012-2013, many Hmolpedia articles began listing IQs on various pages of certain historical figures, for point of reference, linking to the genius IQs page. Threads below all of these Hmolpedia pages (~100±) and in YouTube forums (4,200+ comments) have since generated a certain amount of discussion.

Thims | Hmolpedia methodology | Criterion

In regards to "criterion" and ranking "methodology", some of this has been outlined on the "IQ: 200+" page, the "genius IQs" page (to a good extent), and discussed in overview on the "genius" page. This specific page, started on 18 Nov 2013, was initiated to give some focus to overall genius ranking, whether be it the top 500 geniuses of all time, the top 50 living (existive) geniuses of a given year, or whatever genius be in question of ranking protocol. The following to quotes give some overall guidance in respect to relative ranking of geniuses in respect to each other:

> "I have little patience for [thinkers] who take on a board of wood, look for its **thinnest** part, and drill a great number of holes when the drilling is easy."
>
> — Albert Einstein (c.1940), recalled by Philipp Frank [11]

> "A person who writes so much must spread his message rather **thin**."
>
> — Willard Gibbs (c.1901), comment to Edwin Wilson on uncut (unread) books

To go through one example, people will sometimes ask: who was smarter: Nikola Tesla or Thomas Edison? The following, for instance, is a 2012-launched poll at RRRater.com, which as of 19 Nov 2013 had 255 votes: (Ñº)

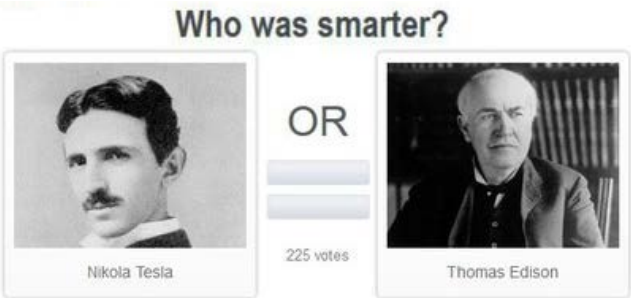

Poll results showed that 59 percent of people believed Tesla to have been smarter than Edison. General opinion therefore might reason that among the top 100 greatest geniuses of all time that Tesla might fall in at a respective position of #40 and Edison at #60, or something along these lines. Yet when we look at the Hmolpedia stats on both, we see a clearer picture:

Nikola Tesla (1856-1943) HCR=59 | IQ_O=230-310 | [GEE]; known for: defunct life theory, electricity, magnetism, human energy, radio technology, alternating current,

Thomas Edison (1847-1931) HCR=7 | [GEE]; invented: practical light bulb, phonograph, and motion picture camera; and originated the concept

Patents: 700 WP_{links}: 3,000+ $WP_{article}$: 21-pages	IQ_O=200 IQ_O=140-160 W	electromagnetic motors; adhered to a Goethean philosophy, to the exclusion of all other philosophies.	Patents: 2,300 WP_{links}: 2,500+ $WP_{article}$: 13-pages	IQ_B=195 W	and implementation of electric-power generation and distribution to homes, businesses, and factories.

Here we see much trait overlap: both were greatest engineers ever [GEE], Edison (#2) ranked higher than Tesla (#8), according to EngineeringDaily.net, both were primarily in the field of electrical engineering, and both strangely had milk-focused diets: Tesla lived (existed) on milk, and for many years, and Edison's only foods were milk and the occasional glass of orange juice, as Clifford Pickover reports, the reason being, supposedly for calcium brain cell content and myelin sheath function increase factors. [12]

The "biggest" discernment factor between the two, however, is Hmolpedia citation ranking [HCR] count, Tesla cited on 59 Hmolpedia pages, Edison on at most seven Hmolpedia pages (nearly all of which being genius-related pages, none having to do with content or discussion of work). In other words, Tesla didn't just spend time inventing thing, he was also focused on some of the "deeper" questions of human existence, experience, and meaning. HCR ranking is a strong indicator of IQ estimation, though not precisely, variations existing per person. Likewise, more internal Wikipedia pages link (WP_{links}) to Tesla (3,000+) than to Edison (2,500+), which means his work is being discussed more at Wikipedia. Wikipedia also has more pages, in printed article length, 21 versus 13 pages, devoted to Tesla than to Edison.

If we compare IQ estimates, both are comparable, Buzan assigns Edison with an IQ of 195, whereas three other spurious citations assign Tesla with an IQ between 140 to 310. Some of these high end estimates attributed to Tesla, to note, seem to come from his overzealous fan following, which is large. To exemplify, the following are the so-called "missing candidates" discussed in the threads/forums in regards to the IQ:200+ page/video collected up till May 2012:

Tesla (57 votes)
Euler (3), Feynman (3), Poincare (2), Kant (1), Ramanujan (1), etc.

More ranking input comes from the TheTopTens.com ongoing ranking of “Top 10 Smartest People in History”, which according to commentary thumbs up voting ranks Tesla (#1) and Edison (#247) out of 269 Top Ten candidates currently (19 Nov 2013), as shown below: [13]

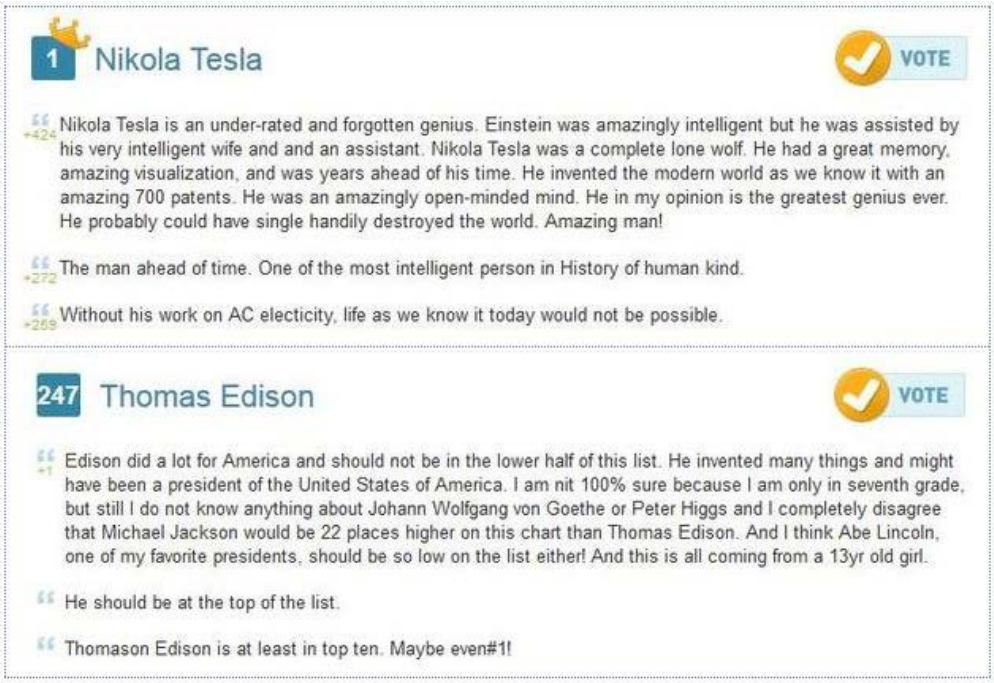

TheTopTens.com	thumbs up
1. Nikola Tesla	955+
2. Albert Einstein	307+
3. Leonardo da Vinci	356+
4. Adolf Hitler	3,327+
5. Isaac Newton	347+
6. Galileo Galilei	76+
7. Stephen Hawking	123+
8. Charles Darwin	129+
9. Benjamin Franklin	58+
10. Pythagoras	57+
11. Aristotle	13+
12. William Shakespeare	17+
13. Mahatma Gandhi	24+
14. Johann Goethe	11+
15. Karl Marx	26+
16. Wolfgang Mozart	16+
17. Archimedes	25+
18. Ludwig Beethoven	11+
19. Solomon	7+
20. Plato	16+

In other words, while both Edison and Tesla were renouned electrical inventors and are often compared to each other as combating genius peers of sorts; yet when raw intellectual power comes into question, in comparison of the two, Edison drilled more holes in easier wood (spread his focus over 2,300+ patents and was focused more on money), whereas Tesla drilled in harder wood (e.g. defunct theory of life, read 100 volumes of Voltaire, so to master the "beast" as he put it, thought up alternating current while reciting a poem of Goethe’s, gave his patents away without concern for monetary reward, etc.) and not just in the wood of electrical invention, but also in the deeper philosophical woods of the uncharted forests.

So while they were both “sharp” geniuses, using the “harder wood” (Einstein) + “focused message” (Gibbs) idiom, we are cogently able to rank Edison (#94) and Tesla (#20), current rankings (19 Nov 2013), shown adjacent.

Other methodologies are used beyond this; and ranking ups and downs accrues likewise for other geniuses.

The following 15 Nov 2013 commentary, on the 19 Oct 2010 IQ:200+ video series, by YouTuber Gottfried Leibniz, gives indication as to call for written details of genius IQ assignment and ranking methodology: (Ñº)

The 19 Nov 2013 ranking position of Tesla (#20) in genius IQ rankings, above Majorana (#21) but below Descartes (#19); once into the top 20 all-time geniuses, **ranking methodology** becomes complex.

> "I notice the person/people who posted these videos ask(s) for suggestions. Was this list created by a democratic process? If so, who truly believes that intelligence is a popularity contest? What **criteria** really produced this ranking? The narrator makes numerous mispronunciation errors. How can someone so poorly versed in such matters rate himself worthy of creating such a list? Indeed, no one should do so.The first problem is that intelligence must be well-defined before it can be measured. If we use Galton's method for calculating IQ then we concede we are only estimating norms in order to figure into the equation. Yet, it becomes a kind of circular logic to estimate one person's IQ based on estimates of others ONLY.
>
> If we claim that breadth of knowledge across all fields is a strong factor for our determination of high intelligence then I agree that von Goethe [IQ=230] (with his immense vocabulary) qualifies as the highest in this regard. For artistic creativity, Da Vinci [IQ=200] reigns supreme. However, if we choose to measure intelligence by the vastness of complexity that is required in order to maintain within the mind each candidates grandest brainchild instantiations then James Maxwell [IQ=210] has demonstrated the greatest ability in this regard. His gigantic conceptions of the structure of mathematical relationships which exist in the physical world are phenomenal. By the way, those "Maxwell" equations which appear in the video are a simplified (notational as well as conceptual) version of Maxwell's original 17 equations. The loss in the translation was a disservice to Maxwell, but was altered by others [Oliver Heaviside, IQ=195] because most mortals could not conceive of the grandiose perfection within Maxwell's originals."

As for general criteria, meta-analysis comparison of cited IQs aside, all geniuses are measured up against the following general bench marks:

- â— 50 greatest polymaths
- â— Another Newton
- â— Cattell 1000
- â— Catch up effect
- â— Cox IQ
- â— Cox-Buzan IQ
- â— Buzan IQ
- â— Early parental death and genius
- â— Epicenter genius
- â— Genius IQs
- â— Genius IQ candidates
- â— Greatest chemist ever
- â— Greatest engineer ever
- â— Greatest mathematician ever
- â— Greatest literary author ever
- â— Greatest philosopher ever
- â— Greatest physicist ever
- â— Greatest thermodynamicist ever
- â— Guinness Book IQ
- â— Hard science
- â— Hmolscience citation ranking
- â— Humanities citation ranking
- â— IQ: 150+ | Smartest woman ever
- â— IQ: 200+
- â— IQ: 225+
- â— IQ history
- â— Last person to know everything
- â— Last universal genius
- â— Magnitude geniuses
- â— Military geniuses
- â— Nobel Prize winners in thermodynamics
- â— Political geniuses
- â— Polymath
- â— American Presidents | IQ rankings
- â— Scientific geniuses
- â— Smartest person ever
- â— Smartest person alive | existive
- â— Two cultures genius | Two cultures
- â— Universal genius
- â— Uber genius comparison quotes
- â— Uberman
- â— Walking encyclopedia

Thims | Hmolpedia IQ rankings | Rater credentials

See main: Libb Thims (genius ranking)

In respect to "rater" credentials, namely in respect to the questioning of the intellectual capacity of Hmolpedia/HumanChemistry101 IQ list maker, organizer, and ranker Libb Thims, a short answer to this semi-common query is that while historically genius IQs have been assigned by teams of psychologists collecting lists of name predominance in biographical dictionaries and encyclopedias and thereafter attempting to rank or assign estimated or *guesstimate*—an estimate based on a mixture of guesswork and calculation—Thims first wrote his own encyclopedia, namely *Hmolpedia* (6-volumes as of 2013), inclusive of over 1,000+ biographical entries, of all the "big thinkers" over time to have gone after the "big questions" of human existence and experience, from a physical science point anchored of view, and thereby has an "intuitive" sense as to how the majority of all big name geniuses modern and in history rank in respect to each other, in short. In response to a specific query such as: "How can someone so poorly versed in such matters [as name pronunciation] rate himself worthy of creating such a list?" (above), the following bullet point opinions may give some guidance:

Polymathy	Quote: "Thims' edits are far and wide. Unless Physchem is an incredible polymath, I doubt he would be able to pick up on all the BS a Thims-type editor introduces. That's not knocking Physchem, I don't think there is anyone who could deal with the range" (Keith Henson, 2007);

Genius	Quote: "I stumbled onto your website by accident but I have to confess this might be one of the most stunning undiscovered intellectual achievements of the 21st century. I have browsed through your wiki and I cannot express how tragic it must be to a man in your position—to be a pioneering thinker yet to be rejected by an uptight academic community with neither the depth nor will to understand your unique work, defending their own turf like dogs. I can only compare you to the many other pioneering heroes of science, Newton (IQ=215), Einstein (IQ=220), Tesla (IQ=195), men (IQ_{AVG} = 210) who like you blazed their own paths but were too victims of their own genius, only to be validated years after their death. Perhaps one day historians will look back and have a chuckle—that the pioneer of enthropology published by a vanity press in a book resembling a third rate romance" (Steven Pierce, 2009)
Oracle	Quote: "Thims: the great oracle and developer of human thermodynamics—the philosophical revolution of the 21st century. A genius of outstanding stature and originator of many concepts in human chemistry" (Mark Janes, 2011)
IQ	Quote:"I think the [Thims] has the highest IQ [ever]." (alphawolf099, 2012)
Encyclopedic	Quote: "Thims is [a walking] encyclopedia of human thermodynamics." (Milivoje Kostic, 2013) [9]
Library	Total: 1,500+ books → thermodynamics: 360+, mate selection: 140+, religio-mythology: 85+, medicine: 100+, neuroscience: 50, general non-fiction (100s), general science (100s), etc. 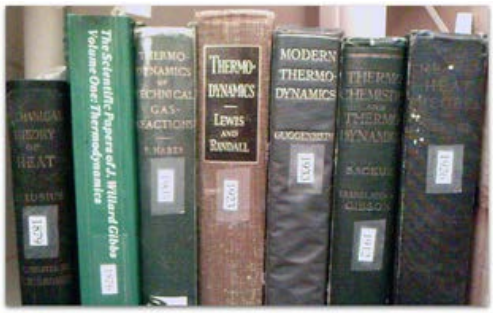
Publications	Total: 10+ volumes → one journal → one book, one two-volume textbook, and six-volume encyclopedia (over 1,000+ biographies) → unfinished manuscripts, drafts, articles, video, lectures, etc. 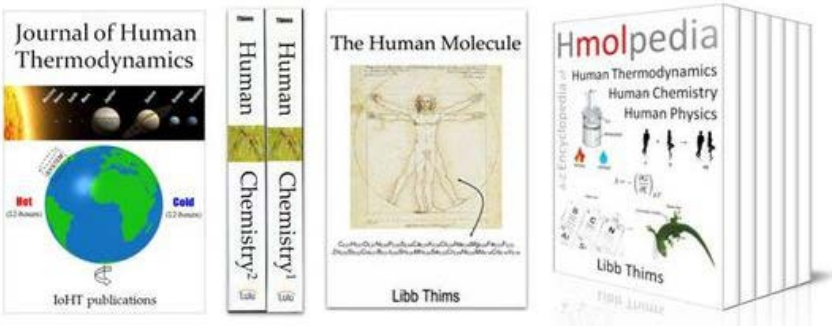

Beyond these snippets, a near complete biographical of Thims would be required, but one as such at the present is beyond the scope of the current objective, which is the past time of ranking geniuses, learning something along the way, and possibly teaching others something in the process. The bottom line, ranking procedures aside, is that Thims can "feel" the rankings in his head, off rankings, up or down from an incorrect position make bring about an ache or throbbing of sorts in Thims' head; when the correct position is reached the ache subsides.

Smartest person alive | Existive

On 22 Jul 2013, as a sort of carry over from the ubiquity of thread and forum candidate recommendations of actual "living" (existive) people who some deem worthy of either a genius IQ ranking and or a IQ: 200+ ranking, some (e.g. Edward Witten, Stephen Hawking, etc.) being cited independently multiple times, that Thims launched the "smartest person alive | existive" page, with current aims to make an annual (end-of-year) video series: Smartest person alive | existive (2013), Smartest person alive | existive (2014), etc., out of it.

Possibly, some further ranking methodology will be added as this latter process ensues.

Quotes

The following are related quotes:

> "My IQ is somewhere between Dr. Seuss, who in 1931 claimed an IQ of H_2SO_4, and Dr. Faustus, who in 1514 sold his soul to the devil for truth, knowledge, and power; the embodiment of the latter found in the mind of Goethe, who in 1809 professed that he and his wife were like $CaCO_3$ (limestone), who when put into contact with H_2SO_4 (Captain) have no "choice" but to debond, and who in 1926 [Cox] became the first ever person ranked with an IQ of 225."
>
> — Libb Thims (2013), reply to query by Paul Rael, Aug [16]

> “I think [**Thims**] is a pretty cool guy, he ranks IQ and doesn’t get afraid of anything [or] official IQ rankings. Why do people get so worked up over IQ? Because they’re scared little monkeys.”
>
> — IJustWantToSignIn (2013), comment (Ñº) on IQ 200+ | Smartest person ever (4 of 4), Nov 10

See also

â— Who was smarter?

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θΔics

In education, **IQ scale** is a numbered ordering of intellects, from 0 to 139 for the general population, 100 being the mean or average IQ, and 140 or above for genius level intellects, 180 and above for big geniuses, 195 and above for epicenter geniuses and or iconic geniuses, 200 to 225 being allotted to the top handful or so of top geniuses, and numbers 226 or above being, fictional, artificial, and or feigned IQ estimates.

Overview

In 1905, Alfred Binet published the Binet-Simon intelligence scale, designed to test for "inferior states of intelligence", so to diagnose and thus better facilitate the education of so-called "feeble minded" individuals, below age 16.

In 1910, Henry Goddard, who had begun to translate Binet's intelligence scale ideas into English, at the May 18 meeting of the American Association for the Study of Feeble-Minded, proposed that the term "feeble minded" be subdivided into three categories; something to the effect of the following:

Idiots: mental age of 1 to 2
Imbeciles: mental age of 3 to 7
Morons: mental age 8 to 12

Of note, it is sometimes stated in poorly-written books, e.g. *Discrimination or Diversity* (Ruiz, 2009), based on faulty Wikipedia pages, e.g. Henry Goddard (2008) (Ñº), that Goddard, in 1910, was using the terms "moron for those with an IQ of 51-70, imbecile for those with an IQ of 26-50, and idiot for those with an IQ of 0-25 for categories of increasing impairment". [1] This, however, is incorrect, being that the concept of IQ was not invented until 1916 by Terman. Correctly, Goddard, in the years 1910 to 1912, was simply coining new words, e.g. imbecile "one who has a mental state like that of a small child aged three to seven". (Ñº)

In 1912, William Stern added to Binet's work by inventing the concept of "mental quotient", defined as the ratio of the age the test was designed for divided by the age of the person who takes the test. Thus, for instance, if an eight-year-old took a test designed for a ten-year-old, and passed, the child's MQ would be 1.25 or ten divided by eight.

In 1916, Lewis Terman, in his "The Measurement of Intelligence", added Binet's ideas with Goddard's ideas, and therein conceived the idea of multiplying Stern's "Mental Quotient" (MQ) by 100 to thus obtain a 1 to 100 range scale of so-called "Intelligent Quotients" (IQ), the scale markers as follows: [2]

IQ	Classification	Description
1,000+	Fictional genius level	Fictional IQ
400	De Mello IQ (parent ratio fake)	Feigned IQ
325	Kearney IQ (parent ratio fake)	Feigned IQ
250-300	Sidis IQ (legend over-estimate)	
226+	Superlative; artificial; fools gold	
225	**Goethe level**	1 geniuses
205-220	Clausius to Newton level	5 geniuses
200	Da Vinci level	2 geniuses
195	**Last universal genius range** (e.g. Helmholtz, Leibniz)	12 geniuses
190	Pascal to Pareto level	29 geniuses
185	Grotius to F. Bacon level	38 geniuses
180	Tinsley to Spinoza level	96 geniuses
175	**Universal genius range** (e.g. Homer)	60 geniuses
170	Vergniaud to Linnaeus level	63 geniuses
165	Pearson to Berzelius level	54 geniuses
160	Clarendon to Jacquard level	43 geniuses
155	Blake to Friedman level	40 geniuses
150	Capote to Rembrandt level	18 geniuses
145	Sherman to Galton level	18 geniuses
144-158+	Mean Nobel Laureate IQ	(Ñº)(Ñº)
140	**Genius** (or near genius) (e.g. Disney)	11 geniuses
120-139	Very superior intelligence	
118-120	College graduate	[3](Ñº)
111-119	Superior intelligence	
90-110	**Average intelligence** (normal)	
80-89	Dull	

75	Forest Gump (as child)	
71-79	Borderline feeble-minded	
51-70	Mind like child aged 8 to 12	Moron
50	Homo erectus (mind)	
26-50	Mind like child aged 3 to 7	Imbecile
20	Monkey	
0-25	Mind like child aged 1 to 2	Idiot

The general **IQ scale** (2017), a 0 to 225 point scale, where an IQ of 100 is average, 140 or above is genius (see: top 500 geniuses), 200 or above is either considered impossible (see: IQ 200 or above impossible) or super genius level, and 89 or below, for someone aged 16 or above, is considered learning disabled.

I Q	*Classification*
Above 140	"Near" genius or genius.
120–140	Very superior intelligence.
110–120	Superior intelligence.
90–110	Normal, or average, intelligence.
80– 90	Dullness, rarely classifiable as feeble-mindedness.
70– 80	Border-line deficiency, sometimes classifiable as dullness, often as feeble-mindedness.
Below 70	Definite feeble-mindedness.

In 1919, the *Encyclopedia American*, citing Terman (1916), summarized things as follows: (Ñº)

> "The feeble-minded are classified according to mental age, that is, the age of a normal child of the same mentality. For example, a feeble-minded person of mental age 6 has a mind approximately like that of a normal child of 6. The feeble-minded are also divided into three groups, idiots, imbeciles and morons. Idiots are those of mental age 1 and 2. Imbeciles comprise those of mental age 3 to 7 inclusive. Morons include those of mental age 8 to, perhaps, 12 — the upper limit is somewhat uncertain. It is also customary to speak of the **I.Q.** (Intelligence Quotient) of a feeble-minded person. This is found by dividing his mental age by his actual age, e.g., a child who is 12 years old and of mentality 9 would have an I.Q. of 9/12 or 75. In using the I.Q. no higher actual age than 16 is used because it is supposed that the mental age of the average man does not go beyond 16. So that if a feeble-minded person is, say, 30 years old, we divide by 16 and not by 30."

In Jan 2008, Libb Thims began collecting citations of geniuses (e.g. Goethe) and presumed-to-be geniuses (e.g. Savant) with IQs cited in the 200 or above range; the then-ranked, by purely numerical score, listing is as follows:

#	Name	Years	I.Q. (200+)
1	Michael Kearny	1982-	325 (age 4)
2	**William James Sidis**	1898-1944	200, 250-300 (verbal estimate)
3	Marilyn vos Savant	1946-	228 (age 10), 186 (age 40)
4	Leonardo da Vinci	1452-1519	180, 210-225
5	**Johann von Goethe** *	1749-1832	210
6	Kim Ung-Yong	1963-	200-210
7	Hypatia	c.360-415	170-210
8	Nathan Leopold	1904-1971	200-210
9	Emanuel Swedenborg	1688-1772	205
10	Gottfried Leibniz *	1646-1716	205
11	John Stuart Mill	1806-1873	200
12	Francis Galton	1822-1911	200
13	Hugo Grotius *	1583-1645	200
14	Thomas Wolsey *	c.1472-1530	200
15	Michael Grost	1954-	200

In 2010, Libb Thims began calculating the mean IQs of the 23 geniuses common to both the three-hundred geniuses of Cox IQs (1926) and the 100 geniuses of the Buzan IQs (1994), so to get a more-cogent neutral IQ value for established historical so-called "anchor point" geniuses; a graph of which is shown below:

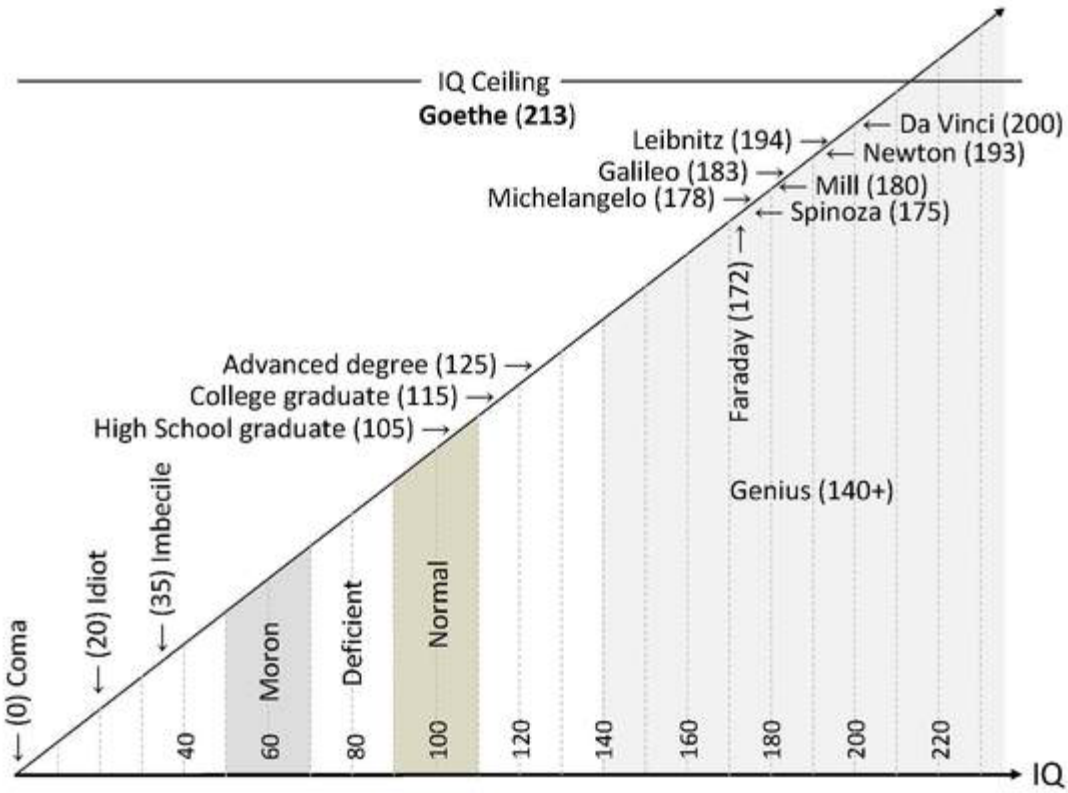

In Jun 2017, Libb Thims had 502 non-existive top 500 geniuses ranked cogently, to a first approximation, each with real IQs (true IQs), based on all known historical approximations, from 140 to 225.

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External links

â— IQ classification – Wikipedia.

θΔics

In genius studies, **IQ state** refers to the guesstimate, tested, and or gauged IQ of an individual in a given existive "state" of reactive existence or being; the IQ of a reacting person in a given intellectual period, e.g. month or year.

Landau

The following Landau genius scale, developed and maintained for personal reasons by Russian physicist Lev Landau (1908-1968), gives a cogent outline of the concept of "IQ state", namely in the in the 1940s and 1950s, or thereabouts, Landau considers his intellectual brightness to be a 2.5 on his own genius scale, but in 1962 on the win of his Nobel Prize in physics, his "IQ state" jumped to the 2.0 level, in his own mind, and in his later years he gauged his IQ state or genius stature ranking to be 1.5 on his scale, and in recent decades some, e.g. Lubos Motl (2008), have ranked him at the 1.0 level:

#	Landau logarithmic physicist genius scale
0	Isaac Newton
0.5	Albert Einstein
1	Paul Dirac Erwin Schrodinger Richard Feynman [11] Niels Bohr Werner Heisenberg Louis de Broglie [11] Satyendra Bose Eugene Wigner, and a few others **Lev Landau** [vote | 2008] [9]
1.5	**Lev Landau** (in later years) [8]
2	**Lev Landau** (after 1962 Nobel Prize) Juan Maldacena [vote | 2008] [9]
2.5	**Lev Landau** (before 1962 Nobel Prize)
3	Edward Witten [vote | 2008] [9]
3.5	
4	
4.5	David Mermin (per his own estimate ±)
5	Mundane or "pathologists"

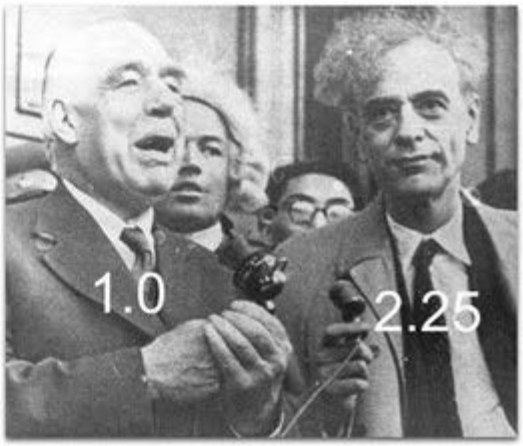

Above: Lev Landau with his teacher Niels Bohr visiting the physics department of Moscow State University, 1961.

(add discussion)

Russell | Uberman scale

In circa 1930, Bertrand Russell (1872-1970) grouped the following people to have had an IQ of 180 or above, that this group is representative of a future god theory replacing uberman, and moreover that he gauged his own IQ to be 180, i.e. his “IQ state”, in that decade:

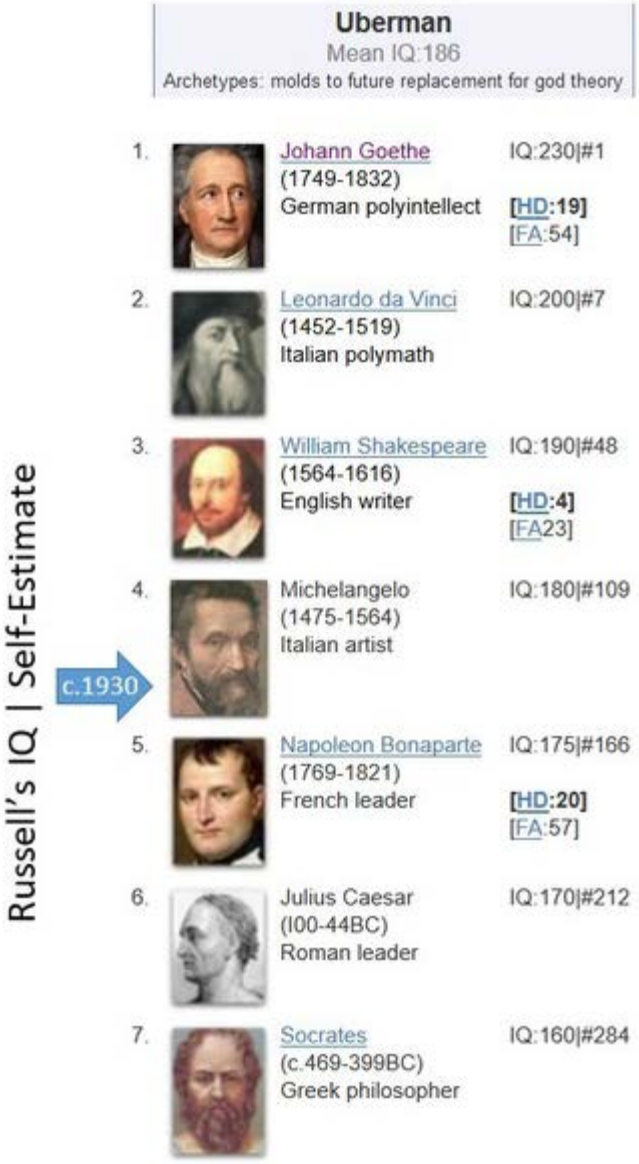

(add discussion)

Thims | IQ state

In circa 2010 to 2015, American electrochemical engineer Libb Thims, in attempting to gauge his own IQ,similar to Russell, or genius ranking position stature, similar to Landau, frequently found that an "anchored" guesstimate position, e.g. on the genius IQs table or top 500 geniuses table, not only for himself but for other "existive" individuals, i.e. people still moving about the earth, as compared to more solidified classical geniuses, is difficult to mentally hold, per reasons that (a) the top 500 geniuses themselves are periodically shifting up and down the rankings, as more of their work is absorbed and processed in the light of growing knowledge, and (b) that an attempted ranking of oneself and or an existive person changes per period, e.g. day or month, according to which a shifting "IQ state" seems to be the only thing that makes any sense for existive individuals; such as the following scale indicates for Thims' Mar 2016 gauged scale position, i.e. below Gilbert Lewis:

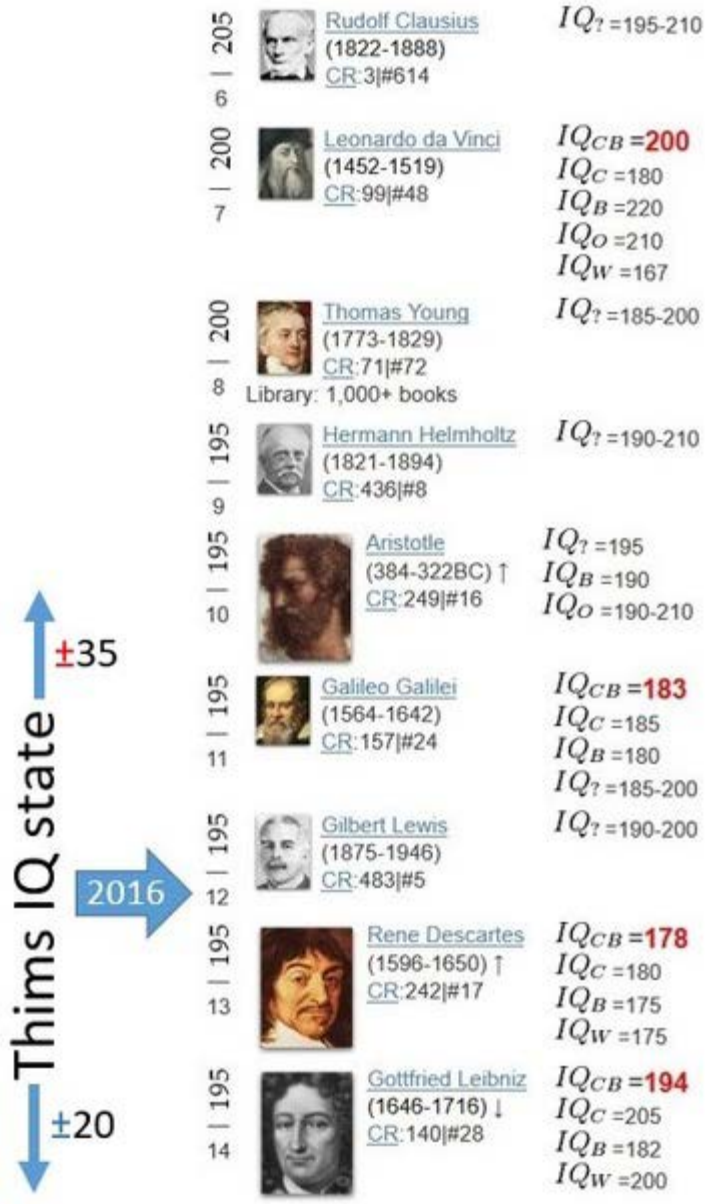

(add discussion)

θΔics

In genius studies, **IQ tables** are listings of geniuses in descending order of IQ. The famous Catherine Cox genius table (1926) and Tony Buzan genius table (1994) are shown below, in side-by-side comparison:

Rank	Name	IQ
1	da Vinci	220
2	Goethe	215
3	Shakespeare	210
4	Einstein	205
5	Newton	195
6	Jefferson	195
7	Edison	195

Rank	Name	IQ
8	Archimedes	190
9	Aristotle	190
10	Brunelleschi	190
11	Copernicus	185
12	Franklin	185
13	G.Eliot	180
14	J.S.Mill	180

Tony Buzan's 2005 **genius tabulation** of the fourteen greatest geniuses of all-time. [18]

Cox | Buzan genius lists

The 200+ IQ table was compiled using a number of sources. The two main sources are American psychologist Catherine Cox's 1926 *Early Mental Traits of 300 Geniuses*, containing a ranked IQ listing of the top 300 geniuses who lived between 1450 and 1850, and English accelerating learning expert Tony Buzan's 1994 *Book of Genius*, containing a ranked listing of the 100 greatest geniuses. The top 100 of each list is shown below. Of note, in Buzan's list, we removed #3 Great Pyramid Builders, as this is not one person, and there is slight discrepancy between Buzan's top 14 Genius IQs (tabulated adjacent) from his 2005 book *Buzan's Book of Mental World Records* and his earlier 1994 values. The values below use the newer estimates.

Of similarity, both lists contain only four people with IQs over 200 (Cox ceiling: Goethe IQ=210) (Buzan ceiling Da Vinci: IQ=220) and there are only thirteen reoccurring names in both top 100 lists: Goethe (1,3), Da Vanci (27,1), Leibnitz (2, 46), Newton (7, 5), Michelangelo (30, 4), Galileo (16, 64), Descartes (29, 39), Faraday (78, 26), Mill (31, 12), Spinoza (57, 41), Dickens (40, 84), Erasmus (41, 48), and Raphael (99, 62). These thirteen might usefully be termed as Cox-Buzan "anchor point" geniuses, in that they can act as anchor points on which to compare other up-and-comer prodigies or newcomers with supposed high-end IQ scores. This logic is graphically diagrammed below:

Cox's 1926 ranking of 300 Geniuses (by IQ) (1-100)	Buzan's 1994 Ranking of 100 Geniuses (by IQ) (1-99)	Buzan's 1994 Ranking of 100 Geniuses (by GS) (1-99)
1. Goethe (IQ=210)	**1.** Da Vinci (IQ=220)	**1.** Da Vinci (GS=822)
2. Leibnitz (IQ=205)	**2.** Goethe (IQ=215)	2. Shakespeare (GS=818)
3. Grotius (IQ=200)	3. Shakespeare (IQ=210)	**2.** Goethe (GS=816)
4. Wolsey (IQ=200)	4. Einstein (IQ=205)	**4.** Michelangelo (GS=814)
---	---	**5.** Newton (GS=810)
5. Pascal (IQ=195)	**5.** Newton (IQ=195)	6. Jefferson (GS=809)
6. Sarpi (IQ=195)	6. Edison (IQ=195)	
---	7. Jefferson (IQ=195)	
7. Newton (IQ=190)	---	
8. Laplace (IQ=190)	8. Aristotle (IQ=190)	
9. Voltaire (IQ=190)	9. Archimedes (IQ=190)	

10. Schelling (IQ=190)
11. Arnauld (IQ=190)
12. Berkeley (IQ=190)
13. Haller (IQ=190)
14. Melanchthon (IQ=190)
15. Pitt (the Younger) (IQ=190)

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16. Galileo (IQ=185)
17. Lagrange (IQ=185)
18. Davy (IQ=185)
19. D'Alembert (IQ=185)
18. Comte (IQ=185)
17. Campanella (IQ=185)
21. Gassendi (IQ=185)
22. Humboldt, the Younger (IQ=185)
24. Leopardi (IQ=185)
25. Mirabeau (IQ=185)
26. Niebuhr (IQ=185)

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27. Da Vinci (IQ=180)
29. Descartes (IQ=180)
30. Bacon (IQ=180)
30. Michelangelo (IQ=180)
31. Mill (IQ=180)
32. Byron (IQ=180)
33. Arago (IQ=180)
34. Bailly (IQ=180)
35. Bentham (IQ=180)
36. Bossuet (IQ=180)

10. Brunelleschi (IQ=190)

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11. Copernicus (IQ=185)
12. Mill (IQ=185)
13. Franklin (IQ=185)
14. Eliot (IQ=185)

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15. Leibnitz (IQ=182)
16. Euclid (IQ=182)
17. Borges (IQ=182)

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18. Galileo (IQ=180)
19. Faraday (IQ=180)
20. Curie (IQ=180)
21. Hawking (IQ=180)
22. Plato (IQ=180)
23. Alberti (IQ=180)
24. Bell (IQ=180)
25. Pitt (the Elder) (IQ=180)
26. Bonaparte (IQ=180)
27. Alexander the Great (IQ=180)
28. Khan (IQ=180)
29. Pavlov (IQ=180)
30. Phidias (IQ=180)
31. Dali (IQ=180)
32. Stravnsky (IQ=180)
33. Elizabeth I (IQ=180)
34. Carnegie (IQ=180)
35. Sinan (IQ=180)
36. Duchamp (IQ=180)

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37. Doyle (IQ=182)
38. Tinsley (IQ=182)

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7. Alexander the Great (GS=808)
8. Phidias (GS=808)
9. Einstein (GS= 804)
10. Edison (GS=799)
11. Homer (GS=797)
12. Plato (GS=797)
13. Euclid (GS=795)
14. Elizabeth I (GS=795)
15. Archimedes (GS=798)
16. Aristotle (GS=798)
17. Brunelleschi (GS=788)
18. Carnegie (GS=785)
19. 1st Ch'in Emperor (GS=783)
20. Sinan (GS=782)
21. Copernicus (GS=780)
22. Beethoven (GS=779)
23. Picasso (GS=777)
24. Alberti (GS=777)
25. Pavlov (GS=776)
26. Faraday (GS=776)
27. Stravnsky (GS=770)
28. Franklin (GS=770)
29. Darwin (GS=769)
30. Sophocles (784)
31. Ali (GS=763)
32. Vyasa (GS=756)
33. Doyle (GS=755)
34. Bell (GS=754)
35. Dali (GS=752)
36. Aquinas (GS=750)
37. Borges (GS=750)
38. Milton (GS=746)

37. Brougham (IQ=180)
38. Chattterton (IQ=180)
39. Condorcet (IQ=180)
40. Dickens (IQ=180)
41. Erasmus (IQ=180)
42. Fenelon (IQ=180)
43. Gibbon (IQ=180)
44. Hugo (IQ=180)
45. Liebig (IQ=180)
46. Malebranche (IQ=180)
47. Milton (IQ=180)
48. Musset (IQ=180)
49. Oersted (IQ=180)
50. Peel (IQ=180)
51. Pope (IQ=180)
52. Scalinger (IQ=180)
53. Stael (IQ=180)
54. Tasso (IQ=180)

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55. Huygens (IQ=175)
56. Kepler (IQ=175)
â— Spinoza (IQ=175)
â— Kant (IQ=175)
58. Gay-Lussac (IQ=175)
59. Humboldt, W. (IQ=175)
60. Bunsen (IQ=175)
61. Spenser (IQ=175)
62. Adams, J. Q. (IQ=175)
63. Agassiz (IQ=175)
64. Bichat (IQ=175)
65. Buggon (IQ=175)
66. Calvin (IQ=175)
67. Cardan (IQ=175)
68. Coleridge (IQ=175)
69. Cuvier (IQ=175)
70. Jonson, B. (IQ=175)
71. Lamennais (IQ=175)
72. Macaulay (IQ=175)
73. Southey, R. (IQ=175)
74. Thou (IQ=175)
75. Vega, de (IQ=175)
76. Wolf, F.A. (IQ=175)

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77. Lavoisier (IQ=170)

39. Descartes (IQ=175)
40. Michelangelo (IQ=175)
41. Spinoza (IQ=175)
42. Dante (IQ=175)
43. Homer (IQ=175)
44. Picasso (IQ=175)
45. 1st Ch'in Emperor (IQ=175)
46. Averroes (IQ=175)
47. Suli (IQ=175)
48. Erasmus, D. (IQ=175)

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49. Heisenberg (IQ=173)
50. Gates (IQ=173)
51. Darwin (IQ=173)
52. Crick (IQ=173)
53. Sophocles (IQ=173)
54. Milton (IQ=173)
55. Stephenson (IQ=173)
56. Aeschylus (IQ=173)
57. Euripides (IQ=173)
58. Lao-Tzu (IQ=173)

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59. Cesar (IQ=170)
60. Confucious (IQ=170)
61. Lincoln (IQ=170)
62. Raphael (IQ=170)

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63. Marconi (IQ=165)
64. Wright (IQ=165)
65. Beethoven (IQ=165)
66. Machiavelli (IQ=165)
67. Aquinas (IQ=165)
68. Bach (IQ=165)
69. Lister (IQ=165)
70. Wren (IQ=165)
71. Brunel (IQ=165)
72. Sun Tzu (IQ=165)
73. Sappho (IQ=165)

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74. Socrates (IQ=160)
75. Mozart (IQ=160)

39. Khan (GS=744)
40. Bach (GS=741)
41. Disney (GS=740)
42. Columbus (GS=739)
43. Ueshiba (GS=739)
44. Graham (GS=739)
45. Curie (GS=738)
46. Leibnitz (GS=737)
47. Cezanne (GS=734)
48. Marconi (GS=733)
49. Wright (GS=732)
50. Stephenson (GS=731)
51. Aeschylus (GS=730)
52. Crick (GS=725)
53. Montessori (GS=723)
54. Wren (GS=723)
55. Heisenberg (GS=722)
56. Socrates (GS=715)
57. Brunel (GS=714)
58. Gates (GS=713)
59. Cesar (GS=713)
60. Bonaparte (GS=712)
61. Lister (GS=710)
62. Jung (GS=708)
63. Hawking (GS=708)
64. Galileo (GS=707)
65. Alexander, F.M. (GS=707)
66. Suleyman (GS=706)
67. Pitt (the Elder) (GS=701)
68. Megellan (GS=699)
69. Eliot (GS=699)
70. Duchamp (GS=697)
71. Tinsley (GS=689)
72. Verdi (GS=689)
73. Dickens (GS=688)
74. Confucious (GS=687)
75. Lincoln (GS=683)
76. Chaplin (GS=680)
77. Mozart (GS=676)
78. Nelson (GS=675)
79. Euripides (GS=673)
80. Wellesley (GS=672)
81. Lao-Tzu (GS=671)
82. Averroes (GS=655)
83. Raphael (GS=654)

78. Faraday (IQ=170)

79. Carnot (IQ=170)

80. Hamilton (IQ=170)

81. Atterbury (IQ=170)
82. Bentley (IQ=170)
83. Calderon (IQ=170)
84. Canope (IQ=170)
85. Chalmers (IQ=170)
86. Chalmers (IQ=170)
87. Constant (IQ=170)
88. Fichte (IQ=170)
89. Handel (IQ=170)
90. Irving W. (IQ=170)
91. Kotzebue (IQ=170)
92. Longfellow (IQ=170)
93. Luther (IQ=170)
94. Marat (IQ=170)
95. Metastasio (IQ=170)
96. Napier (IQ=170)
97. Penn (IQ=170)
98. Racine (IQ=170)
99. Raphael (IQ=170)
100. Renan (IQ=170)

76. Jung (IQ=160)
77. Suleyman (IQ=160)
78. Gandhi (IQ=160)

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79. Montessori (IQ=157)
80. Vyasa (IQ=156)
81. Hannibal (IQ=155)
82. Alexander, F.M. (IQ=150)
83. Verdi (IQ=150)
84. Dickens (IQ=150)

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85. Cezanne (IQ=149)
86. Graham (IQ=148)
87. Ali (IQ=147)
88. Megellan (IQ=145)
89. Wellesley (IQ=145)
90. Nelson (IQ=145)
91. Titan (IQ=145)
92. Rembrandt (IQ=145)
93. Zizka (IQ=145)
94. Gutenberg (IQ=140)
95. Washington (IQ=140)
96. Columbus (IQ=140)
97. Chaplin (IQ=140)

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98. Ueshiba (IQ=131)
99. Disney (IQ=123)

84. Dante (GS=653)
85. Sun Tzu (GS=652)
86. Gandhi (GS=639)
87. Washington (GS=638)
88. Suli (GS=632)

89. Mill (GS=620)

90. Titan (GS=611)
91. Descartes (GS=609)
92. Machiavelli (GS=597)
93. Erasmus, D. (GS=569)
94. Rembrandt (GS=549)
95. Zizka (GS=540)
96. Hannibal (GS=536)
97. Gutenberg (GS=529)
98. Sappho (GS=514)

99. Spinoza (GS=491)

Cox's 1926 ranking of 300 Geniuses
(by IQ) (101-200)

101. Reuchlin (IQ=170)
102. Robespierre (IQ=170)

103. Smith, A. (IQ=170)

104. Strauss (IQ=170)
105. Tennyson (IQ=170)
106. Turgot (IQ=170)
107. Velasquez (IQ=170)
108. Vergniaud (IQ=170)
109. Wagner (IQ=170)
110. Wieland (IQ=170)

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111. Boerhaave (IQ=165)

112. Darwin (IQ=165)

Cox's 1926 ranking of 300 Geniuses
(by IQ) (201-300)

Ranking Methodology
(notes)

113. Watt (IQ=165)
114. Diderot (IQ=165)
115. Beethoven (IQ=165)
116. Bach (IQ=165)
117. Addison (IQ=165)
118. Bayle (IQ=165)
119. Beaumarchais (IQ=165)
120. Beza (IQ=165)
121. Bronte, C. (IQ=165)
122. Burnet (IQ=165)
123. Canning (IQ=165)
124. DeFoe (IQ=165)
125. Disraeli (IQ=165)
126. Fielding (IQ=165)
127. Fouche (IQ=165)
128. Guicciardini (IQ=165)
129. Guizot (IQ=165)
130. Guizot (IQ=165)
131. Hastings (IQ=165)
132. Hegel (IQ=165)
133. Heine (IQ=165)
134. Herder (IQ=165)
135. Herschel, W. (IQ=165)
136. Hobbes (IQ=165)
137. Holberg, L. von (IQ=165)
138. Jenner (IQ=165)
139. Johnson (IQ=165)
140. Law (IQ=165)
141. Linnaeus (IQ=165)
142. Locke (IQ=165)
143. Mazzini (IQ=165)
144. Mendelssohn (IQ=165)
145. Montaigne (IQ=165)
146. Mozart (IQ=165)
147. Newman, J.H. (IQ=165)
148. Priestley (IQ=165)
149. Raleigh (IQ=165)
150. Robertson (IQ=165)
151. Sainte-Beuve (IQ=165)

201. Schleiermacher (IQ=160)
202. Sevigne (IQ=160)
203. Sumner, C. (IQ=160)
204. Thiers (IQ=160)
205. Wesley (IQ=160)

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206. Adams, J. (IQ=155)
207. Ait Weil Zade (IQ=155)
208. Balzac (IQ=155)
209. Baxter (IQ=155)
210. Beranger (IQ=155)
211. Bolivar (IQ=155)
Bulwer (IQ=155)
Cervantes (IQ=155)
Pitt (the Younter) (IQ=155)
Cervantes (IQ=155)
Cobden (IQ=155)
Danton (IQ=155)
Durer (IQ=155)
Emerson (IQ=155)
Fox, G. J. (IQ=155)
Fox, George (IQ=155)
Fulton, R. (IQ=155)
Gambetta, L.M. (IQ=155)
Hamilton, A. (IQ=155)
Hawthorne, N. (IQ=155)
La Fontaine (IQ=155)
Maintenon (IQ=155)
Miller, Hugh (IQ=155)
More (IQ=155)
Necker (IQ=155)
O'Connell (IQ=155)
Palestrina (IQ=155)
Pitt (the Elder) (IQ=155)
Prescott (IQ=155)
Rembrandt (IQ=155)
Savonarola (IQ=155)
Seward (IQ=155)
Swift (IQ=155)
Temple, W. (IQ=155)
Van Dyck (IQ=155)
Walpole (IQ=155)
Warburton (IQ=155)
Wilberforce (IQ=155)
Blake, H. (IQ=155)

Bright (IQ=150)
Burns (IQ=150)
Cobbett (IQ=150)
Franklin (IQ=150)
Lincoln (IQ=150)

Cox Ranking Methodology

â— Methodology: to make this list, a team led by Stanford psychologist Catherine Cox, and Lewis Terman, the co-inventor of the IQ test, and psychologists Florence Goodenaugh, and Kate Gordon, gave an historically determined IQ ranked listing of the top 300 geniuses who lived between 1450 and 1850, by reading through 1,500 biographies and to each genius independently assign an estimated intelligence quotient, based on *The Stanford Revision of the Binet-Simon Intelligence Scale*, based on each individual's life accomplishments and childhood abilities.

â— Cox, Catharine, M. (1926). *Early Mental Traits of Three Hundred Geniuses (Genetic Studies of Genius Series).* Stanford Univ Press.

â— Estimated IQs of the Greatest Geniuses – (Goethe ranked 1st (IQ = 210))

â— Cox's IQ Estimates of 301 Geniuses - IQComparisonSite.com.

Buzan Ranking Methodology

â— Methodology: to make this list, English accelerated-learning expert Tony Buzan and English chess grandmaster Raymond Keene scored the world's leading minds on an 835-point scale (GS=Genius Score):

152. Schiller (IQ=165)
153. Scott (IQ=165)
154. Shaftesbury (IQ=165)
155. Sheridan, R.B. (IQ=165)
156. St. Simon (IQ=165)
157. Swedenborg (IQ=165)
158. Tieck (IQ=165)
159. Weber (IQ=165)
160. Webster (IQ=165)
161. Winckelmann (IQ=165)
162. Wordsworth (IQ=165)
163. Zwingli (IQ=165)

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164. Alfieri (IQ=160)
165. Andrewes (IQ=160)
166. Berzelius (IQ=160)
167. Boyle (IQ=160)
168. Bunyan (IQ=160)
169. Canova (IQ=160)
170. Channing (IQ=160)
171. Chateaubriand (IQ=160)
172. Chesterfield (IQ=160)
173. Claredon (IQ=160)
174. Clarke, S. (IQ=160)
175. Copernicus (IQ=160)
176. Corneille (IQ=160)
177. Cowper (IQ=160)
178. Dryden (IQ=160)
179. Dupin (IQ=160)
180. Eliot, G. (IQ=160)
181. Etienne (IQ=160)
182. Franklin, B. (IQ=160)
183. Gaskell, E.C.S. (IQ=160)
184. Grimm, J.L. (IQ=160)
185. Grote (IQ=160)
186. Haydn (IQ=160)
187. Helvetius (IQ=160)
188. Hunter (IQ=160)
189. Jansen (IQ=160)
190. Jefferson (IQ=160)
191. Lamartine (IQ=160)
192. Lessing (IQ=160)
193. L'Hopital (IQ=160)
194. Madison (IQ=160)
195. Martineau, H. (IQ=160)
196. Mazarin (IQ=160)
197. Moliere (IQ=160)
Marmont (IQ=150)
Moore (IQ=150)
Murillo (IQ=150)
Nelson (IQ=150)
Rousseau (IQ=150)
Soult (IQ=150)
Thackeray (IQ=150)
Wilkes (IQ=150)

Alberoni (IQ=145)
Anderson, H. C. (IQ=145)
Blucher (IQ=145)
Garrison, W.L. (IQ=145)
Gluck (IQ=145)
Hogarth (IQ=145)
Jackson, A. (IQ=145)
Marlborough (IQ=145)
Meheme Ali (IQ=145)
Moreau (IQ=145)
Napoleon (IQ=145)
Poussin (IQ=145)
Reynolds (IQ=145)
Rossini (IQ=145)
Sherman (IQ=145)

Bernadotte (IQ=140)
Clive (IQ=140)
Cortez (IQ=140)
Garibaldi (IQ=140)
Lee, R.E. (IQ=140)
Monk (IQ=140)
Vauban (IQ=140)
Washington (IQ=140)

+ 11 more below 140

dominance in the field (100), active longevity (100), polymath (100), versatility (100), strength and energy (100), IQ (100), ongoing influence (100), prolificness and achievement of prime goal (100), universality of vision (15), outstanding originality (10), deliberate desire to create teaching avenues or academies to further the genius' ideas (10).

â— Methodology (Buzan 100 Geniuses) – Braintrust.org.

â— Buzan, Tony and Keene, Raymond. (1994). *Book of Genius*. Stanley Paul.

â— Greatest Geniuses of All Time (1-50) – Buzan's book of Genius.

â— Top 10 Geniuses of All Time (1-10) - *Buzan's Book Of Genius*.

198. Richelieu (IQ=160)
199. Rubens (IQ=160)
200. Sand (IQ=160)

(a work in progress))

See also

â— IQ: 225+
â— IQ: 200+ (references)
â— IQ: 200(±) candidates

θΔics

In genius studies, **IQ test** is []

The Spring 2018 issue of *Popular Science* showing a crow standing over some intelligence tests, which contains an article entitled: "Sorry, Genius: IQ Tests are Dumb". [1]

Overview

In 1899, French psychologist Alfred Binet (1857-1911) was appointed to the Commission for the Retarded, a repercussion of a new French law that mandated school for children ages six to fourteen, whose aim was to develop a "test" to differentiate between normal and abnormal children, so to be able assign each to different classrooms.

In c.1902, French psychologist Theodore Simon (1872-1961), while an intern at the asylum in Perray-Vaucluse studying abnormal children, began to work with Binet to develop a test that could measure intellectual development of children ages 3-12.

In 1905, Binet and Simon published their test for "inferior states of intelligence", so to diagnose and thus facilitate the education of the subnormals, categorized as either: *idiot* (lowest state), *imbecile* (intermediate low state), and *moron* (state nearest normality).

In 1912, German psychologist William Stern (1871-1938) reviewed the work of Binet and others, developed the idea of expressing intelligence in the form of a single number, the "mental quotient", formulated as one's "mental age" (age according to ability) divided by one's "chronological age" (actual age):

$$MQ = \frac{Age_{mental}}{Age_{actual}}$$

In 1916, Lewis Terman modified Stern's mental quotient concept by multiplying it by 100, according to which a score of 140 or above is genius level, hence the elusive blurry concept of a "genius IQ test" was born.

In 1982, Ronald Hoeflin developed the "Mega Test", comprised of 48 questions, which he claimed is the first IQ test designed to test for intelligence in the 145 of above IQ range.

In 2018, on Twitter, there was an "IQ test debate" (Q), of sorts, between Nassim Taleb and social scientists such as Gregory Cochran and Steve Sailer, on something to the effect that IQ test stops working in the IQ:135+ range; the following is one take on the debate:

> "IQ measures something specific, linear reasoning so to say, or first order reasoning. So you have a problem, which is well-defined, and you know there is an answer, and you find the answer on the test [see: IQ test]. But in real life, where things are 'complex', and there aren't obvious answers, or maybe no answers, to a particular problem, and things are just multi-dimensional, the **IQ stops working**, really. It works if you're just doing pure mathematics, for instance. But if you're an entrepreneur, then things are much more complicated. So this is the problem with IQ."
>
> — Jaanus Vogelberg (2018), "The Great Twitter IQ debate: Taleb Won!" (Q), Dec 24

(add)

Quotes

The following are related quotes:

> "I point out that Ayaan Hirsi Ali was given an **IQ test** in the Netherlands and did very poorly. Yet, it's hard to imagine someone brighter."
>
> — Jason Richwine (2008), panel, at the American Enterprise Group, discussing (Q) new book by Mark Krikorian, director of Center for Immigration Studies

See also

- Mega test IQ
- Mislabeled geniuses and IQ tests

References

1. Author. (2018). "Sorry, Genius: IQ Tests are Dumb" (Q), *Popular Science*, Spring.

θΔics

Note: This page is archived (c.2018); Updated version: ***Greatest female geniuses***

In genius studies, **smartest woman ever | IQ: 150+** (LR:5) refers to the listing, past and present, of the who's who of the "smartest women" of all time, in ranked descending order of intelligence.

> "My dear boy, no **woman** is a genius. Women are a decorative sex. They never have anything to say, but they say it charmingly. Women represent the triumph of matter over mind, just as men represent the triumph of mind over morals."
>
> — Oscar Wilde (1890), *The Picture of Dorian Gray* (Q)

Generic depictions of the **smartest woman ever**: at utilizing equations, formulas, and general knowledge; a "female" Will Hunting, so to speak.

This page is a precipitate of the IQ: 200+ page, starting with the four 180+ IQ anchor-point genius women, from the combined genius studies of Catherine Cox (1926) and Tony Buzan (1995), namely: George Eliot (C_B=185), Germaine Stael (IQ_C=180), Marie Curie (C_B=180), Elizabeth I (C_B=180). The cutoff point IQ to be included in this grouping is ten IQ points above the 1916 Lewis Terman genius cutoff 140 IQ or above. Other tentative candidates have been added to this framework, using methods (see: IQ ranking methodology), such as in person polling, other IQ citations, Internet discussion forums, Q&As, book citations, articles, etc., as are listed below (or in the IQ references or IQ candidates page).

Top Female Geniuses 1 to 25

IQ	Person	IQ estimates	Description
190 | 1 [42]	Emilie Chatelet (1706-1749)	$IQ_?$=170-190 IQ_O=160-165	● Combined Isaac Newton's (IQ=215) definition of energy (E=mv) with Gottfried Leibniz' (IQ=200) definition of energy (E=mv²) with Willem Gravesande's brass balls clay surface impact experiments (see: Leiden University) to synthesize the first version of the conservation of energy (vis viva into vis mortua). ● Was the mistress of Voltaire (IQ=195); quote: "in 1733, I met a young lady who happen to think nearly as I did." ● Quote (father): "my youngest flaunts her mind and frightens away the suitors". ● Quote (early lover): "she speaks with great rapidity ... her words are like an angel." ● Reading Descartes' (IQ=195) analytic geometry, before age 16. ● Would memorize cards at the blackjack table for fun. ● Built and ran her own research lab at Chateau de Cirey, pictured, from 1734-1749, said to have a library comparable to the Paris academy of sciences; scientist such as Samuel Koenig and Johann Bernoulli would stay for weeks or months at a time. ● Performed Lavoisier's (IQ=175) rust experiment, at a time at which it is said that if her scales were more accurate, she would have arrived at the law of conservation of mass. ● She published original translations of Aristotle (IQ=195), Virgil, and Newton. ● Quote: "She was certainly a "genius" given how much she learned and in such a short time (from approximately age 27 to 42); in math, she was more or less self-taught and one of about 10-20 people in Europe who understood and could manipulate the calculus … I [estimate] [an IQ] around 160-165". [14]
			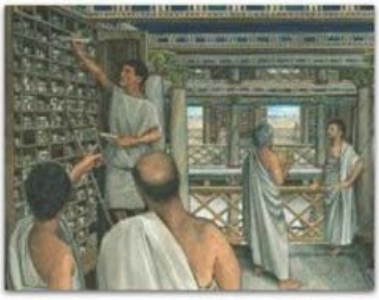 ● As part of his plan, Theon established a regimen of physical training for Hypatia, such as rowing, swimming, and horseback riding, to ensure that her body would be as healthy as her well-trained mind. ● As a teenager, she was educated at the Neoplatonist Academy in Athens, learning mathematics, astronomy, and philosophy. ● Daughter of Theon, the last head librarian of the Library at Alexandria, which at its zenith had two libraries, filled with 500,000 book scrolls, a laboratory, and a research facility. ● Is rumored that to explain the seasonal variations of the apparent size of the sun, she

conceived of elliptical orbit heliocentrism, over a thousand years before German astronomer Johannes Kepler, formulated this into a law in 1609.
● She authored: *Commentary on Diophantus*, *The Astronomical Canon* and a commentary on *The Conics of Apollonius*.
● She was said to have had a superior intelligence, said to have surpassed that of all other philosophers of her time and her accomplishments in music and science paled all others.

190 | 2 [43]	Hypatia (360-415) CR:16	IQ_{SS}=195 IQ_{O}=170-210 IQ_{O}=180-200 $IQ_{?}$=175-192	● Her intelligence and knowledge surpassed her father's at an early age. People would come from other cities to hear her talk and learn from her. She was murdered for her beliefs. IQ unknown but often cited in the 180-200 range." ● Quote: "IQ scores of 200+ are 'universal geniuses'. So far there's been only one woman recorded on the 'universal genius list, Hypatia, a Greek mathematician and philosopher of renowned beauty and intellect." ● Note: the IQ=210 estimate doesn't seem to have a good reference; although it has a certain number of mentions around the web, prior to 2007 (Q) (Q), likely originating in the fake 2006 Quigly Anderson list. ● Note: She is listed in Buzan's *Book of Genius*, but he gives no IQ, only commenting that "the little we know of Hypatia suggests that she must have had a remarkable intellect." Quote ● "Fables should be taught as fables, myths as myths, and miracles as poetic fancies. To teach superstitions as truths is a most terrible thing. The child mind accepts and believes them, and only through great pain and perhaps tragedy can he be in after years relieved of them. In fact, men will fight for a superstition quite as quickly as for a living truth—often more so, since a superstition is so intangible you cannot get at it to refute it, but truth is a point of view, and so is changeable." ● "Life is an unfoldment, and the further we travel the more truth we can comprehend. To understand the things that are at our door is the best preparation for understanding those that lie beyond." ● "All formal dogmatic religions are fallacious and must never be accepted by self-respecting persons as final." ● "Reserve your right to think, for even to think wrongly is better than not to think at all."
185 | 3 [75]	Marie Curie (1867-1934)	IQ_{SS}=205 IQ_{B}=180 IQ_{O}=200	[GPE]; Nobel Prize in physics (1903) for the discovery of radioactivity; Nobel Prize in chemistry (1911) for the isolation of pure radium.
175 | 4 [228]	George Eliot (1819-1880)	IQ_{B}=185 IQ_{O}=160	● Gets 5-point upgrade for basing her most-famous 1872 realism novel *Middlemarch* on Goethe's *Elective Affinities*; she considered Johann Goethe (IQ=230) to be "the last true polymath to walk the earth"; and took a three-month pilgrimage to Goethe's home town of Weimar. ● Was said to have been able to read and absorb 40 books per month. [9] ● She acquired the epitaph "a very wise women" in her own existence; see also: "George Eliot: a Very Large Brain" (2012). [6] ● Quote: "The quickest of us walk around well-wadded with stupidity." ● At an early age, her mother tried to make her into a prodigy of sorts, piling the books on her.
175 | 5 [229]	Germaine Stael (1766-1817)	IQ_{C}=180	"Madame de Stael, whose work on Germany is probably the **greatest book ever produced by a woman**, is supposed to have been intimate with August Schlegel, who was a homo-sexualist, and who had been tutor to her children." — Otto Weininger (1903), *Sex and Character* ● Banned from France in 1803 by Napoleon (IQ=175), for publishing her controversial novel *Delphine*, after which she migrated to Germany and entered into the Goethe circle; upgrade for commenting favorably on Goethe's *Elective Affinities*. ● At Weimar she learned the German language and was said to have "astonished and perplexed Goethe (IQ=230) and Schiller (IQ=185) by her remarkable conversation and her virile intellect so strongly contrasted with her vivacity." [13] ● Quote: Laplace (IQ=190): "There have been only three women who have understood me. These are yourself, Caroline Herschel, and a Mrs Grieg of whom I know nothing." (Somerville, supposedly, was first *and third* of these three.)" ● She schooled Ada Lovelace (below) in mathematics and science, introducing her to the likes of Charles Babbage and Michael Faraday.

Mary Somerville

6		(1780-1872)	$IQ_{?}$=175-185	● She has been described as “a demonstration of woman’s capacity for the highest intellectual pursuits”. [13] ● Her *On the Connexion of the Physical Sciences* (1834), was involved with the coining of the term “scientist” by William Whewell. ● Taught herself mathematics and rose from genteel poverty to become a world authority on Newtonian physics; was feted by Pierre Laplace, whose six-volume *Celestial Mechanics* was considered the greatest intellectual achievement since the *Principia*. Laplace's work was the basis of Mary's first book, *Mechanism of the Heavens*, which remained an advanced university astronomy text for the next century. [15]
170 # [417]		Emmy Noether (1882-1935)		● Described by David Hilbert, Albert Einstein and others as the most important woman in the history of mathematics. ● In physics, Noether's theorem explains the fundamental connection between symmetry and conservation laws.
175 8 [237]		Margaret Fuller (1810-1850)		● Quote: “I now know all the people worth knowing in America, and I find no intellect comparable to my own.” (O) ● Quote: “She sprang out of the head of all the Zeuses about: her father Timothy Fuller, Emerson, Goethe” (Elizabeth Hardwick); like John Mill, her father’s wish was to make her “heir to all he knew”. ● Hardwick, Elizabeth. (1986). “The Genius of Margaret Fuller”, *New York Review of Books*, Apr 10. ● Quote: “Humanity is divided into Men, Women, and Margaret Fuller.” (Edgar Poe) (O)
175 9 [245]		Elizabeth I (1533-1603)	IQ_{B}=180	● Under her ruling organization, it is said that culture of intellect was born, as evidenced by the fruition of the minds of Francis Bacon and William Shakespeare. ● Brought England into her zenith as a world power. ● Elizabeth was a true intellectual and she was educated by renowned scholar, Roger Ascham. As a student, she studied Greek, Latin, rhetoric, and philosophy; she mastered all of these subjects. Not surprisingly, when Elizabeth came to power, she transformed the English court into a center for poets, writers, musicians, and scholars. ● She had connections to literary figures such as William Shakespeare, Edmund Spenser, and Christopher Marlowe.
10		Sofia Kovalevskaya (1850-1891)	IQ_{R}=170 IQ_{D}=156	● As a infant, owing to a wallpaper shortage, her nursery had been covered with pages from her father’s old calculus text. She “gazed for hours at those pages, craving to understand them”, reports John Lienhard, and by age 25 finished her doctorate on partial differential equations, along with a paper on the dynamics of Saturn's rings, and one on elliptic integrals, at the University of Göttingen, graduating *summa *** laude*; she thereby became the first woman in Europe to hold that degree. (O) (O) [6] ● At age 19, she entered University of Heidelberg, studying mathematics under Hermann Helmholtz, Gustav Kirchoff, and Robert Bunsen. ● During an invite to one of George Elliot’s (IQ=190) Sunday salons, she met Herbert Spencer and was led into a debate, at Eliot's instigation, on "woman's capacity for abstract thought". ● In 1874 she presented three papers: on partial differential equations, on the dynamics of Saturn's rings, and on elliptic integrals, to the University of Göttingen, as her doctoral dissertation in mathematics *summa *** laude*; she thereby became the first woman in Europe to hold that degree.

#	Person	True IQ	IQ estimates	Description
11.	Cleopatra (69-30BC)	180		● Second ranked "smartest woman of all time", according to common opinion (see poll). ● Marc Anthony gave over 200,000 scrolls to her for inclusion in the Alexandrian library (link). ● Into her teens, she became fluent in Greek, Hebrew, Arabic, Persian, and Egyptian, and was the only queen in 300 years to learn the local tongue.
12.	Margaret Bryan (c.1760-c.1825)	↕		● Wrote: *Compendious System of Astronomy* (1797), *Lectures on Natural Philosophy* (1806), *Astronomical and Geographical Class Book for Schools* (1815), and *Conversations on Chemistry* (c.1818); ran a school for girls. ● Adjacent: Bryan with her two daughters (frontpiece to *Compendious System of Astronomy*). ● She wrote on affinity chemistry and the steam engine.
1#.	Maria Agnesi (1718-1799)	↕		● A child prodigy who, by 5, could speak both Italian and French; at 9, she composed and delivered an hour-long speech in Latin to some of the most distinguished intellectuals of the day; by 13, she had a very deep understanding of Newton's theory of gravity and had acquired Greek, Hebrew, Spanish, German, Latin, and was referred to as the "walking polyglot"; is credited with writing the first book discussing both differential and integral calculus; described as "the first important woman mathematician since Hypatia"; her 1748 *Instituzioni Analitiche*, treating of the analysis of finite quantities and infinitesimals, was regarded as the best introduction extant to the works of Euler.
13.	Grace Hopper (1906-1992)	175		● At age 7, curious to figure out how alarm clocks work, she dismantled seven of them; at 22, BS in mathematics and physics; MS and PhD at Yale, 1934, with dissertation on "New Types of Irreducibility Criteria"; at 25, Vassar mathematics professor. ● At 37, entered US Navy Reserve, graduating first in her class, after which she was assigned to the Bureau of Ships Computation Project at Harvard, where she was on the Mark I computer programming staff. ● Pioneered the idea that programming languages could be developed in English language rather than machine code; at 54, she became a lead organizer for the development of programming language COBAL; in 60s, she introduced some of testing standards for programming languages, such as FORTRAN. ● Two votes: smartest female ever (O) (2005) ● One vote: for top five smartest person ever (link) (2010)
14.	Sophie Germain (1776-1831)	175		● At 13, in her father's library, intrigued by the death of Archimedes, she self-taught herself mathematics; learning Latin and Greek so to read Isaac Newton and Leonhard Euler. ● At 18, although women were barred from attending the newly-opened Ecole Polytechnique, she obtained the course lecture notes, and submitted written observations of the notes to faculty Joseph Lagrange, who thereafter became her mentor. ● Corresponded with Adrien Legendre and Carl Gauss. ● Quote: "Sophie Germain proved to the world that even a woman can accomplish something in the most rigorous and abstract of sciences." (Carl Gauss, c.1840) ● Did some of the earliest proofs of Fermat's Last Theorem. ● Attempted to synthesize a philosophical system of psychology and sociology, similar to Auguste Comte.
15.	Lise Meitner (1878-1968)	175		● Student of Ludwig Boltzmann; second woman to obtain doctorate at the University of Vienna. ● First woman allowed to attend the lectures of Max Planck; she became Planck's assistant after one year; ● Called by Einstein "our Marie Curie" or the "German Marie Curie". (O) ● Supposedly, she co-discovered nuclear fission, but her colleague Otto Hahn took

					credit for it (winning the 1944 Nobel Prize in chemistry). ● Second woman ever to get PhD in physics (source: "Lise Meitner – the Misjudged Genius" (O))
		Mary Shelley (1797-1851)	175		(HR=5) Daughter of Mary Wollstonecraft, herself a Stokes 100 (#75), and William Godwin, eloped with the poet Percy Shelley, and later wrote the novel *Frankenstein* as part of a bet with Shelley and his friend George, Lord Byron; an About.com top 100 (#49) Women of History (O); a street poll honorable mention (below).
16.		Ruth Lawrence (1971-)	175	$IQ_{?}$=140-175	● At 12, passed the Oxford University interview entrance examination in mathematics, place first out of all 530 candidates. ● At age 13, completed BS in mathematics; age 14, BS in physics; age 17, PhD all at Oxford; ● At 19, academic post at Harvard; ● At 26, became associate professor (with tenure) at the University of Michigan.
17.		Margaret Thatcher (1925-) W	175		● At 22, obtained BS in chemist at Oxford; specializing in crystallography under Dorothy Hodgkin. ● In the late 1940s and early 1950s, worked as a research chemist to support herself, while running for political conservative campaigns. ● In 1953, age 28, she completed her law degree, passed the bar, and began practicing in taxation. ● In 1979, she became the UK's first female Prime Minister, serving until 1990.
18.		Ada Lovelace (1815-1852)	175		● Daughter of Lord Byron; and from an early age, owing to her mother's idea that education would root out any insanity associated with her father's side, she was taught mathematics and science from some of the world's leading scholars, including Mary Somerville. ● In 1842, she wrote the world's first computer program, and algorithm for calculating a sequence of Bernoulli numbers with Charles Babbage's analytical engine.
19.		Alice Sheldon (1915-1987)	165	$IQ_{?}$=140-185	● Was an American Air Force major, CIA agent, experimental psychologist, and science fiction writer, who developed a rather detailed thermodynamic philosophy regarding morality, altruism, good, and evil; which is rather rare for woman (two notable exceptions being: Elizabeth Porteus and Teresa Brennan). ● Her 1969 short story "Beam Us Home" (link) describes family of five active bright normal kids, one with a fortunate IQ in the 140s and a girl with an IQ of 185, which would seem to give a general gauge of her self-estimated IQ (the mean of which is 162.5).
20.		Ayn Rand (1905-1982) ?			● Her philosophical themed novels *Fountain Head* (1943) and *Atlas Shrugged* (1957), into the 21st century, have been gaining a following of large and greatly influential significance, particularly in Mensa, according to survey, and other high IQ societies. [4]
		Maria Montessori (1870-1952)		IQ_{B}=157	Early child education reformer; eponym of Montessori education method, the let the child follow their own following interests educational approach.
21.		Lisa Randall (1962-)	↕		● At age 18, won first place in the Westinghouse Science Talent Search (1980). ● Supposedly, first tenured woman in the Princeton University physics department and the first tenured female theoretical physicist at MIT and Harvard University.
22.		Edith Stern		IQ_{O}=200 IQ_{O}201-	● Doing calculations before age one. (V) ● Speaking full sentences before age one; playing chess and solving arithmetic problems by age 3; read entire *Encyclopedia Britannica* by age 5; learned algebra by age 5; reading six book per day at age 6; read Plato, Freud, and Darwin by age 8; ● Enrolled in college at 12; associated degree age 14 at Miami-Dade Jr. College; BS in mathematics at Florida Atlantic University (age 15), assistant professor of mathematics at MSU at 15; MS in mathematics at Michigan State University at age 18. (O)

		(1952-)	203	● Has been issued 128 U.S. patents; her efforts led to many new software products in the nascent IBM family of real-time computing, enabling services such as direct dialing (1 + phone number) in areas where existing services were only handled by telephone operators; and custom calling features, such as *69 to return the last unanswered call received; in 2012 received the ASME Kate Gleason Award for lifetime in engineering, for her work at IBM. (Q)
23.		George Sand (1804-1876)	IQ_C=160 IQ_O=150	● Before 17, she had read Plutarch, Livy, Herodotus, Tacitus, and Rousseau; the latter of which whose philosophy she was particularly devoted to. ● [6]
24.		Alia Sabur (1989-)		● Began talking at eight months (Q) ● Completed BS (2003) in applied mathematics from Stony Brook University at age 14; MS (2006) and PhD in materials science and engineering at Drexel University; professor of mathematics at age 19. ● YouTube, YouTube(2009)
25.		Kathleen Holtz (1989-)		● Entered Cal State LA at age 10; entered UCLA Law at 15, earning a spot on the law review; passed the bar exam, first time around in 2007 (age 18); ● Record for youngest female to obtain law degree and pass the bar.
26.		Vinodhini Vasudevan (1986-)		● Read 100 books the summer she was 5 (Q); mastered college algebra at age 8; at age 12 set record by becoming the youngest person to score a perfect 1,600 (800 on math, 800 on verbal) on the SAT (Q), correlates to IQ 165 (Q); could be age ratioed higher (e.g. (18/12)*165=247?; in 2007, at age 21, graduated from MIT with a BS in electrical engineering with a minor in biomedical engineering (Q).

Books

The following are noted books on genius women:

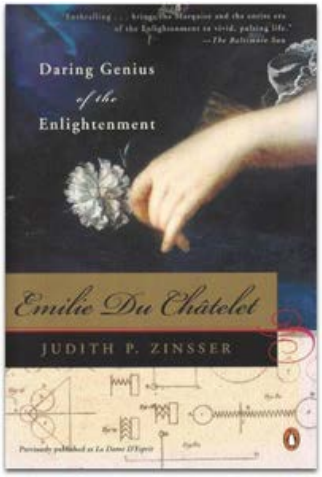

A 2006 book on French mathematician and physicist Emilie du Chatelet by Judith Zinsser.

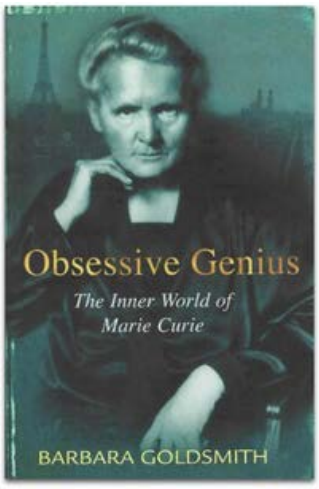

A 2005 book on Polish-French physicist and chemist Marie Curie by Barbara Goldsmith.

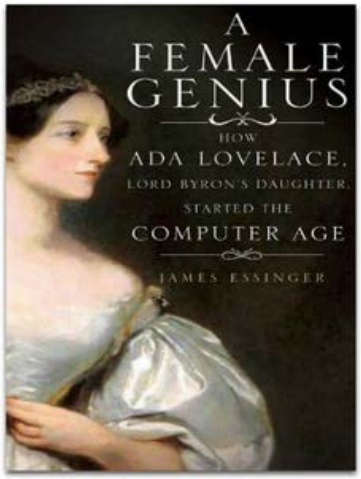

A 2013 book on English mathematician and world's first computer programmer Ada Lovelace by James Essinger.

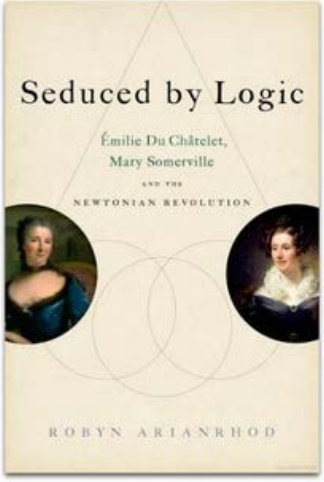

[15]

Films

The following are noted films on genius women:

Scenes from the 2010 film *Agora* on Alexandrian-Greek philosopher, mathematician, physicist and astronomer Hypatia, the only known female universal genius.

Quotes

The following are quotes on female genius:

> "The capacity of the female mind for studies of the highest order cannot be doubted, having been sufficiently illustrated by its works of genius, of erudition, and of science."
>
> — James Madison (c.1810), 4th American President (see: Princeton school of social physics)

Candidates | Newly added

The following are newly found and or add potential candidates, listing as found, without ranking, but in the filter stage:

#

Margaret of Navarre
(1492-1549)

Margaret Cavendish
(1623-1673) (Q)

● Simone de Beauvoir (1908-1986) | a Stokes 100 (#75) top seven existentialist; ranks with: Albert Camus, Jean-Paul Sartre, Franz Kafka, Fyodor Dostoyevsky, and Friedrich Nietzsche per Google also searched for ranking commonality.

● Florence Nightingale (1820-1910) — proposed that Belgian mathematical astronomer Adolphe Quetelet's social mechanics be taught at Oxford.

● Abigail Adams (1744-1818) — wife of the second U.S. president (John Adams), mother of the sixth (John Quincy Adams), and great grandmother to Henry Adams, the leading social Newton, behind Goethe; her intellect and lively wit come alive in her many letters which were preserved; an About.com top 100 (#78) Women of History.

(Q)

> "These are times in which a genius would wish to live. It is not in the still calm of life, or in the repose of a pacific station, that great characters are formed. The habits of a vigorous mind are formed in contending with difficulties. Great necessities call out great virtues."
>
> — Abigail Adams (c.1800), wife of John Adams, mother of John Quincy Adams, and great grandmother to Henry Adams and Brooks Adams (Q); see: Adams family tree (Q)

There are numerous women on the list, including Marie Curie (left) who pioneered research into radioactivity and Ancient Greek Hypatia of Alexandria (right) - a forward thinking mathematician and astronomer who lived in the fourth century BC

Photos of Marie Curie and Hypatia, from Libb Thims' 2009 media-popularized list (Q) of 40 people "cited" with IQs over 200.

● Elizabeth Porteus (1911-2010) – after being challenged by her Vassar College professor to come up with her own philosophy, the former "pineapple princess" of Hawaii, beginning in the 1930s, she spent the next 50 years developing an second law based impulse theory of happiness, the resulting in her *My Twentieth Century Philosophy* (1987).

● Jane Goodall (1934-) — (HR=5) her meticulous documentation of the Gombe national reserve chimpanzee war (1970-1974) gave insight into a number of small group size human-like behaviors, e.g. boundary problem, war, etc.; an About.com top 100 (#48) Women of History (Q); high street poll ranking (below).

● Elizabeth Fulhame (c.1750-c.1820), described by Benjamin Thompson (c.1800) as "ingenious and lively" (Q) and by Keith Laidler (1993) as a 'forgotten genius' (Q), noted for her *Essay on Combustion: with a View of a New Art of Dying and Painting, wherein the Phlogistic and Antiphlogistic Hypotheses are Proved Erronious* (1794), whose main purpose was to support the ideas of Antoine Lavoisier; did work on light sensitive chemicals (silver salts) on fabric (photoimaging); was married to physician Thomas Fulhame, a former student of Joseph Black.

● Henrietta Leavitt (1868-1921) – during her examination of photographic plates, in her effort to measure and catalog the brightness of stars, she discovered, in 1908, that brighter "variable stars" appeared to have longer periods, and by 1912 had pinned down a predictable relation between the luminosity and the period of the Cepheid variable stars, a discovery that soon allowed astronomers to measure the distance between the earth and faraway galaxies; Edwin Hubble, in particular, used Leavitt's rule to discover that the Andromeda nebula was actually a separate galaxy. [16]

● Jane Marcet (1769-1858) – she attended Humphry Davy's lectures; her *Conversations in Chemistry* (1805), which contains the sand-marble model of caloric, was one of the books Michael Faraday read during his period of self-education; she insisted that "successful perseverance is only retrospectively ascribed to genius". (Q)

● Charlotte Bronte (1816-1855), oft-ranked 2012 street polled greatest literary author ever (next to Ayn Rand); genius quotes (Q) maker.

Iconic women

The following is a 2013 WordPress blog series by Italian translator-teacher, with the handle Michael Backpocket, on iconic women, grouped by actresses (Q), musicians (Q) writers (Q), e.g. George Eliot and Sylvia Plath, and polymaths (Q), e.g. Mary Wollstonecraft (mother of Mary Shelley), the latter of which he cites British polymath Jonathan Miller (Q) as once famously described Susan Sontag as the "most intelligent woman in America":

Other | Also rans

The following are runners up or also rans, namely women hypothetically in the genius range, owing to one or another spurious IQ citations, at or above 150, but without any notable genius output to corroborate—many of which are could-shoulda-woulda been a genius turned models, actresses, strippers or escorts:

IQ	Person	IQ estimates	Description
	Gina LoSasso (c.1956-)	IQ_O=168	● BS, MS, and PhD clinical neuropsychology, Wayne State University, Detroit; ● wife of Chris Langan. [2]
	Susan Polgar (1969-)		
	Kate Beckinsale (1973-)	IQ_R=152	Aged six, a school report found she had the reading age of an eleven-year-old and an IQ of 152. [12]
Model	Sharon Stone (1958-)	IQ_O=148-154	
	Marion Bartoli (1984-)	IQ_O=175	● Quote: “Claims that she has a 175 IQ” (link) (link)
Model	Judy Holliday (1921-1965)	IQ_O=172	● Quote: “An unusually brilliant child with a 172 IQ, described as ‘one of those obnoxious children who read *War and Peace*, Schnitzler and Molière’.” (link)
	Carol		

	Vorderman (1960)	IQ_O=154	[5]
	Dorota Rabczewska (1984-)	IQ_O=153	In 2004, is said to have joined Mensa International with an IQ of 156. [11]
Model	Ellen Muth (1981)	IQ_O=156	[5]
Model	Jayne Mansfield (1933-1967)	IQ_O=163 IQ_O=149	● Quote: “Claimed to have an IQ of 163, though she didn't have exceptional grades in school.” (Q) [6]
Model	Sufiah Yusuf (1984-)		● Her domineering father Farooq Yusuf, subjected her to his "accelerated learning technique", in which her days revolved around stretching and breathing exercises in freezing-temperature rooms so as "to keep her brain attentive"; she would be forced to play tennis with just as much intensity; seeded number eight in the country for under 21s (Q). ● From 11, she was studying math all the time. She passed her maths A level aged 12 and started at St Hilda's College, Oxford. "It was an amazing place but I was too young." ● At 15, she ran away, sparking a massive police hunt; after which she become a $400 per date ($95,000/yr) escort.
Model	Asia Carrera (1973-)	IQ_O=156	● Carnegie Hall pianist (age 13); studying Japanese and economics at Rutgers University; homeless by age 17, after running away from home because of the pressure her demanding parents put on her; after which she turned to stripping, and then to porn, so to never be homeless again, in her own words.

Images

The following are images of Olivia Manning (2000-) (IQ=162) (link):

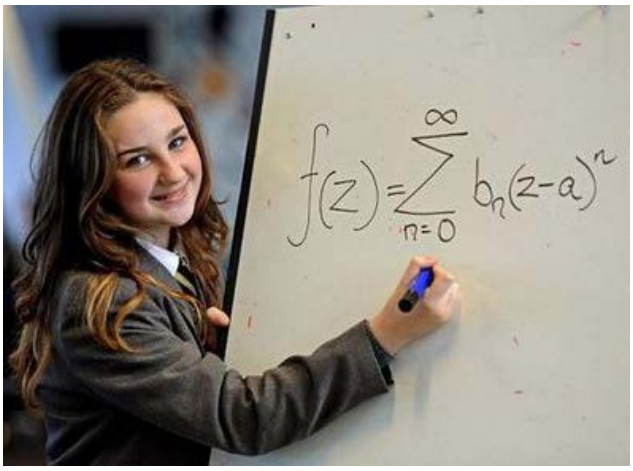

The following is an image of Fabiola Mann (1997-) (IQ=162) (link):

The following are images of Victoria Cowie (2000-) (IQ=162) (link):

The following is an image of Heidi Hankins (2008-) (IQ=159) at about age four (video):

The following is an image of Beatrix Townsend (2008-) (IQ=136) at age two (link):

The following is some generic smart girl woman images:

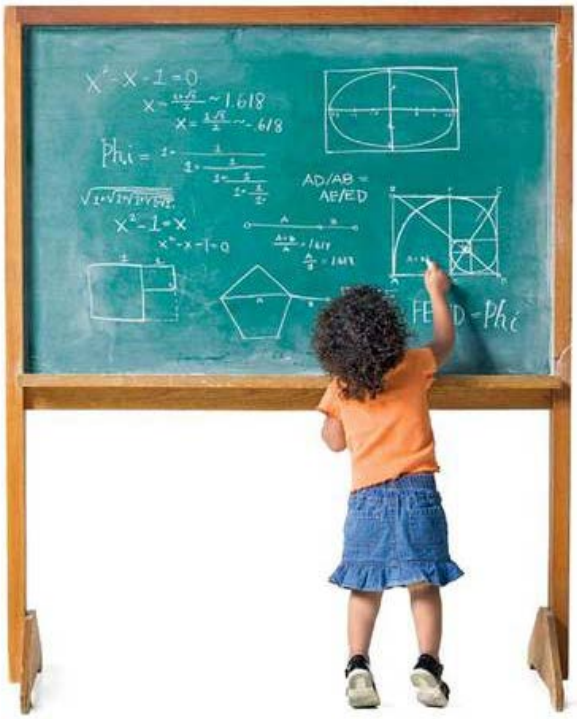

Poster for a 2012 Dean Simonton cited article “Is Too Much Familiarity Bad for Creativity?” (Q)

The 2013 choreographed poster advert for the "Discovering the Higgs through Physics, Dance, and Photography" arts and science collaboration project at Yale (link)

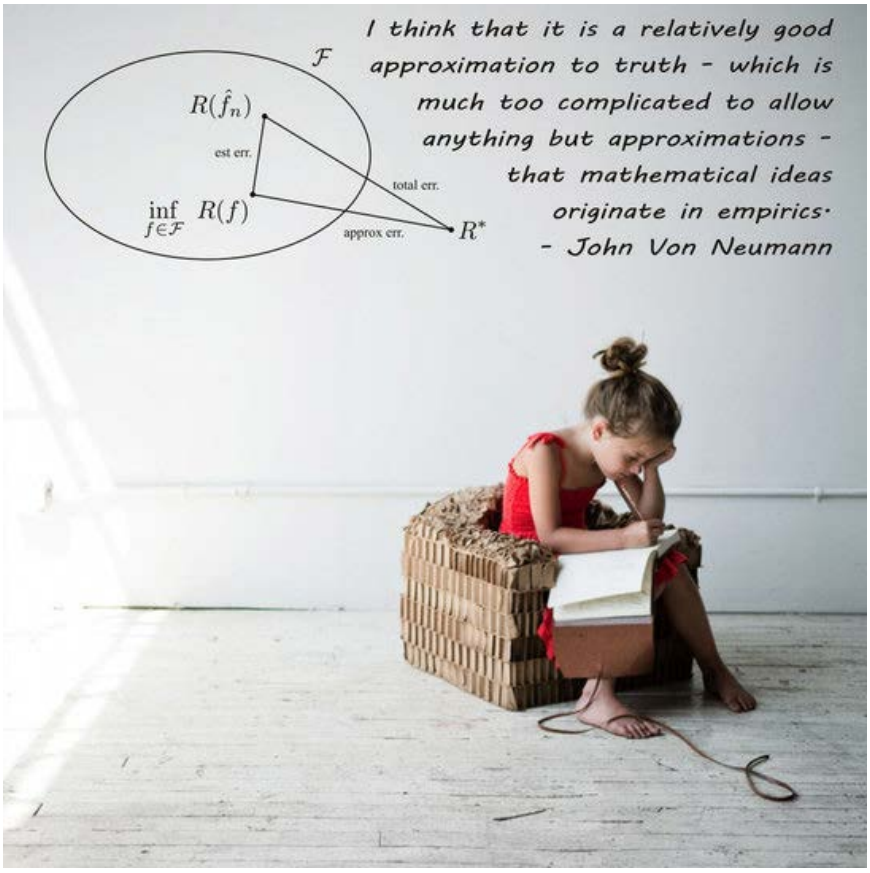

New Scientist | 2009 poll | Greatest woman scientist of all time

In 2009, *New Scientist* editor Roger Highfield carried out a survey of 800 scientists and members of the public, to find, by vote, who people think is the greatest female scientist of all time. The top five are: [10]

New Scientist Poll | Greatest woman scientist of all time

#1	#2	#3	#4	#5
Marie Curie (25.1 percent)	Rosalind Franklin (14.2 percent) W	Hypatia of Alexandria (9.4 percent)	Dame Burnell (4.7 percent) W	Jane Goodall (2.7 percent) W

● Franklin unpublished draft papers, in which she had determined the overall B-form of the DNA helix, was the data used by Francis Crick and James Watson in 1953 to give the first structure of DNA.

● Burnell discovered radio pulsars in 1967.

Other runners up included: Rita Levi-Montalcini, Ada Lovelace, Lise Meitner, Dorothy Hodgkin, Sophie Germain, and Rachel Carson.

2011 | Common opinion

The following is are the results of a street poll conducted by American chemical engineer Libb Thims with the query: "name the three smartest women of all time", the results shown in descending order of popularity of response. [7]

Street Poll | Smartest woman ever

#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
		Hillary Clinton	Susan B. Anthony			Oprah Winfrey			Amelia Earhart

Marie Curie

Cleopatra

(coattail celebrity)

(women's rights celebrity)

Elanor Roosevelt

Margaret Thatcher

(pop genius)

Elizabeth I

Condoleezza Rice

(female celebrity)

Other names mentioned in the impromptu polling of about thirty people included: Hypatia, Elizabeth Taylor, Rosa Parks, Jane Goodall, Joan of Arc, Suzan-Lori Parks, Angela Carter, Mother Teresa, Nancy Regan, Clelia Mosher, Michelle Obama, Mary Shelley, Harriot Tubman, Louisa May Alcott, Gertrude Stein, Marilyn vos Savant, Betsy Ross, and Coco Chanel, Virginia Woolf.

● Hillary Clinton, to note: is more of a coattail celebrity name, in vogue at the moment; intellectually, she failed the DC bar exam three times; and had to retake it in Arkansas to pass.

Other

The following are recent "smarter than Einstein" media hype high school range girls, mostly age 11-15, who have gained a certain amount of press for scoring high on a Mensa test (mostly):

● K. Vishalini (2000-) (IQ=225) (link)

Discussion

Intelligent women in the genius level range are rarer as compared to men in this range, a fact that results for two main reasons. Firstly, being that humans are synthesized in a gas-solid environment (earth surface air environment) according to which human eggs must be hatched in an internal inter-uterine liquid environment, the result of which, men are larger in size and must compete for female egg spots; the opposite is true for reproduction in liquid environments, the ocean in particular, where the females can lay multiple eggs on the ocean floor, with are hatched by multiple different males, the females in this scenario being larger in body size, compete sexually against one another, are the more intelligent of the two sexes, by virtue of this competition.

The second factor, why female geniuses are rarer, has to do with Beckhap's law, namely the idiom that, in general, beauty times brains equals a constant:

$$\text{beauty} \times \text{brains} = k$$

which seems to be factor related to enthalpy-entropy compensation, a sort of heat content (enthalpy) verses organizational content (entropy) competition. This competition is evidenced by the fact that several parentally pressured genius girls eventually turned to prostitution or pornography (e.g. Sufiah Yusuf or Asia Carrera); or some, such as valedictorian Cindy Crawford switching from chemical engineering to modeling; or Sharon Stone from engineering to acting.

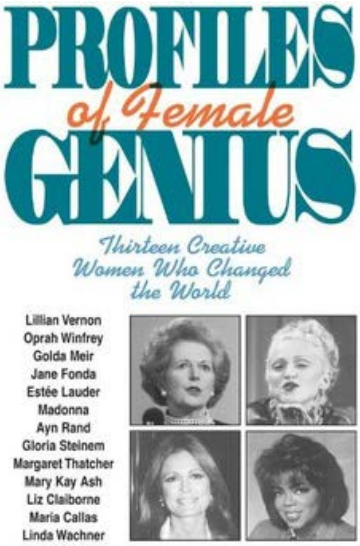

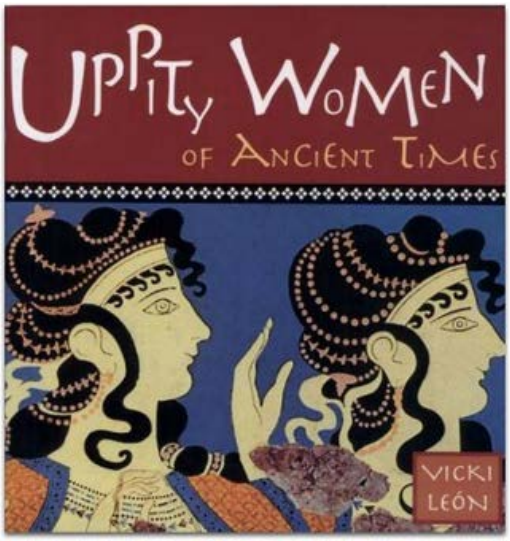

Left: the 1994 book *Profiles of Female Genius* by Gene Landrum gives a decent overview of female genius (pop genius or celebrities aside, such as Madonna or Oprah), focusing on 13 creative women. Only two on this list can be consider possible contenders for the "smartest woman ever" title: [8]

Ayn Rand (philosopher)
Margaret Thatcher (chemist + political leader)

Other famous woman listed include:

Lillian Vernon (catalog merchant)
Oprah Winfrey (talk show hostess)
Golda Meir (Israeli Prime Minister)
Jane Fonda (actress)
Estee Lauder (cosmetics magnate)
Madonna (singer)
Gloria Steinem (woman's liberation activist)
Mary Kay Ash (cosmetics magnate)
Liz Claiborne (cosmetics magnate)
Maria Callas (singer)
Linda Wachner (clothing store buyer magnate)

Right: Vicki Leon's 1995 *Uppity Women of Ancient Times* contains two page sections on a number of smart women of history, such as Hypatia, commenting how she studied under "Plutarch, whose daughter Asclepigenia was not too shabby at philosophy either." [17]

Quotes

The following are related quotes:

> "It is enough to make the general statement that there is not a single woman in the history of thought, not even the most manlike, who can be truthfully compared with men of fifth or sixth-rate genius, for instance with Ruckert as a poet, Van Dyck as a painter, or Schleiermacher as a philosopher."

— Otto Weininger (1903), *Sex and Character* (pg. 69)

"I'm an atheist, and that's it. I believe there's nothing we can know except that we should be kind to each other and do what we can for each other."

— Katherine Hepburn (1991), "Interview", *Ladies Home Journal*, Oct [18]

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1. Terman, Lewis. (1916). *The Measurement of Intelligence: an Explanation of and a Complete Guide for he Use of the Stanford Guide for the Use of the Stanford Revision and Extension of the Binet-Simon Intelligence Scale* (classification of intelligence, pg. 79; I.Q., pg. 53, etc.). Houghton Mifflin Co.
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Further reading

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● Golden, Abigail. (2013). "MacArthur's Genius Women", TheDailyBeast.com, Oct 1.

External links

● Undeniable examples of women geniuses? – Ask.MetaFilter.com.
● Top 83 female scientists (1900 to 1976) – CWP.Library.UCLA.edu.
● Female scientists (famous) – CWP.Library.UCLA.edu.
● Who was the smartest woman in history (2008) – Yahoo Answers.
● Brilliant and Beautiful (2007) – AfterEllen.com.
● Agora (film) – Wikipedia.
● Women can do everything – Pinterest.

A 2013 feminism-propaganda poster pushing the falsified notion that Marilyn Savant, who falsified her IQ testing age to fake a 228 IQ, and some other woman (?) have the highest recorded IQs. (Q)

Note: correctly, the three highest IQs ever recorded (on a standard test), by overzealous fathers, are:

Adragon De Mello (1976-) | IQ=400
Ainan Cawley (1999-) | IQ=349
Michael Kearney (1976-) | IQ=325

Or recorded (on a standard test), by a psychologist, are:

William Sidis (1898-1944) | IQ=300
Marnen Laibow-Koser (1975-) | IQ=268

θΔics

In intellectual categorizations, **IQ: 200 (±) candidates** are those that do not have specific previously estimated or tested IQs, but which whose retrospect intellectual life-long accomplishments would intuitively seem to merit an intellectual quotient, possibly, in the 200 range, plus or minus, via comparative extrapolation of those of those established 200-range IQs.

> **Update**: see Genius IQ table (expanded version of this page + the IQ: 200+ page) a re-ranking of the 1000 greatest geniuses (with IQ over 140) of all time.

This being based on the premise that one can assign any individual, historical or present, a natural number (1, 2, 3, 4, 5 …) said to represent the "relative brightness or intelligence" of that person.

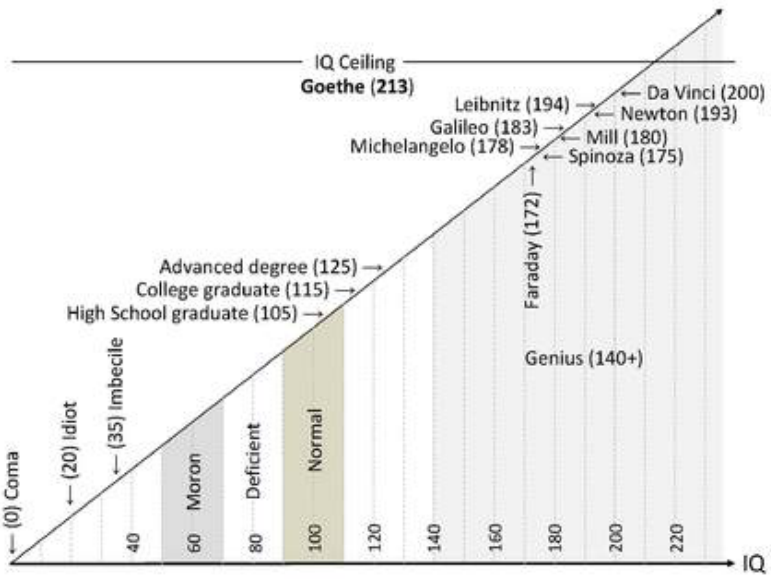

The Cox (1926) Buzan (1994) **ten anchor-point geniuses**, a basic measuring stick to potential candidate 200-range IQ individuals.

This page, which is a work-in-progress, being a precipitate of the IQ: 200+ and IQ: 225+ pages, discusses on this topic. A starting point point includes IQ: 200+ thread discussions (IQ: 200+ page threads or category IQ: 200+), sections from the IQ: 200+ page, e.g. last person to know everything group, internet discussions, hundreds of comments given on the popular 2009 video "IQ | Smartest person ever", and 2007-2010 polling to both scientists and general public, on the question of who are the three smartest people of all time. [1]

YouTube | Missing 200-range thinkers

The following are a growing collection of forum responses to so-called "missing geniuses" from the 2010 four part IQ: 200+ video series, organized by tallied votes (above) and actual dated response quotes (below):

Votes
Tesla (57 votes) (and counting; @ 27 May 2012)
Thims (35 votes) (in three week period: 04-25 May 2012)
Euler (3)
Feynman (3)
Poincare (2)
Kant (1)
Ramanujan (1)

Arhur Rubin, Noam Elkies, Lenhard Ng, Andrew Hsu, Paul Erdös.

Thims
● alphawolf099 (May 2012): "i think the guy narrating the video has the highest iq"

Note: the above comment was "top comment" thread viewable from about May 4th to May 25th, 2012, during which period it was drawing thumbs up votes at a rate of 1.5 thumbs-up votes / 336 views · day (1 thumbs-up vote per 224 views); after which the thread was removed (by Thims).

A 2012 YouTube thumbs up ranking of **Thims** as having the **"highest IQ"** ever (with 34 thumbs up), above that of Goethe (IQ=230), Einstein (IQ=220), and Newton (IQ=215), from the comments section of part four of the "IQ 200+ | Smartest person ever" video (rate: 1.5 thumbs-up votes / 336 views · day), a countdown to the last universal genius, German polymath Johann Goethe, ranked, starting from the Cattell 1000, the 1894 listing of the thousand most eminent individuals of history, by a team of Stanford psychologists led by Catherine Cox (*Early Mental Traits of 300 Geniuses*, 1926) and Lewis Terman, the group that invented the IQ scale, with an IQ of 225, the highest of all modern genius IQs.

Euler
● Billycarr (Jun 2011): "So where's Euler again? Isn't he considered the greatest mathematician ever?"
● igankyoumaybe (Sep 2011): "there's no Poincaré or Feynman or Euler"?

● MrElephantMemory (Oct 2011): “In terms of potential, William James Sidis is definitely the brightest man ever lived. But because of the jealousy of people around him and his social imbalance, he wasted his talent unfortunately. In terms achievement and creativeness, my top 5 would be Leonhard Euler, Isaac Newton, Nikola Tesla, Srinivasan Ramanujan and Paul Erdös.” (12+ votes)

Tesla

● “Some of the stuff you said is OK more, less, but the main thing, the number one genius of all time is NIKOLA TESLA, and you didn't even put him to list... His contribution, works, inventions cannot be matched to any other man. Many of his theories are not even understood by today's man, still. Next time do some more research.” (jimmyglo, 29 Apr 11)
● “Nikola Tesla was, is, and will be the greatest scientist of all time. There is no match for him.” (8Vladimir7, 14 Apr 11)
● @marcmody “Tesla wasn’t that smart hahahaha…” (2 Apr 11, orangegold)
● @orangegold1 “Oh yes he was.” (12 Apr 2011, mannydegger)
● “Emanual Kant, Nicola Tesla?” (marcmody, Mar 2011)
● “Where's Tesla in all of this?” (MosteProduction, Feb 2011)
● “What about men like Tesla and Newton or, the real super geniuses, Goethe, Leibnitz and da Vinci?” (NiXPredator, Jan 2011)
● “Nikola Tesla is not on this list. Why?” (ParadoxPerspective, Mar 2011)

Feynman

● givemeblowjob69 (an atheist scientist) estimates Feynman’s IQ at 190-200 (link) (31 Oct 2011).
● “Richard Feynman was a true magician. The reason he’s not on this list is because he transcends it. He also proves that IQ is not everything.” (BANGBANGBANGBBANG, Mar 2011)
● “Estimated IQs are useless, Terence Tao's IQ was never actually tested. I'm sure if Richard Feynman or Henri Poincare never took an IQ test everyone would've "estimated" their IQs to be extremely high.” (itsnobody, Feb 2011)

Other

● “I'm curious. Why is Andrew Hsu not on your list?” (gojase, 25 Mar 11)
● “Estimated IQs are useless, Terence Tao's IQ was never actually tested. I'm sure if Richard Feynman or Henri Poincare never took an IQ test everyone would've "estimated" their IQs to be extremely high.” (itsnobody, Feb 2011)
● “I think Michael Grost is the most outstanding of these people. When he was in his early teens, he was one of the best mathematics COLLEGE students in the country, he achieved honorable mention on the Putnam Mathematical Competition. By the way, so did a guy called Arhur Rubin. Also, I'd be interested in the IQs of Noam Elkies and Lenhard Ng.” (mozart20dlubos, Dec 2010)

Goethe-Da Vinci range

The main sources for 200-range IQ estimates are from the research done by Cox (1926) and Buzan (1994). The consensus of these two geniuses lists indicates, diagrammed above, indicate that there are only two uniformly agreed-upon 200-range IQ individuals to have ever lived: Leonardo Da Vinci (**IQ$_{CB}$=200**) and Johann Goethe (**IQ$_{CB}$=213**). Goethe is also one of the six individuals said to have known everything; and Da Vinci comes in second place in colloquial polls as to who is the smartest person of all time. These two minds give us a ruler with with which to compare and make potential estimates of other possible overlooked high-end IQ candidates.

Cox-Buzan Anchor Point IQs

213	200	194	193	183	180	178	178	177	172
Goethe (1749-1832)	Da Vinci (1452-1519)	Leibnitz (1646-1716)	Newton (1643-1727)	Galileo (1564-1642)	Mill (1806-1873)	Descartes (1596-1650)	Michelangelo (1475-1564)	Spinoza (1632-1677)	Faraday (1791-1867)

People Said to Have Known Everything

Athanasius Kircher (1602-1680)	Thomas Young (1733-1829)	Johann Goethe (1749-1823)	Alexander Humboldt (1769-	Joseph Leidy (1823-1891)	Thorstein Veblen (1857-1929)

	1859)
IQ=180-225	IQ=185

1850| Emerson's Six Representative Men

The following are American philosopher Ralph Emerson's six greatest all-time geniuses found in his 1850 book *Representative Men*. [3] Emerson's list was cited by Harold Bloom as a forerunner to his 2003 *Genius: a Mosaic of One Hundred Exemplary Creative Minds* (who also included Goethe in his top 100 geniuses).

1850 | Emerson's Six Great Men

Plato	Swedenborg	Montaigne	Shakespeare	Napoleon	Goethe
IQ=180	IQ=165-205	IQ=165	IQ=210	IQ=145	IQ=180-225

1880 | Nietzsche's uberman

In circa 1880, German philosopher Friedrich Nietzsche (1844-1900) assembled his personal listing of the seven archetypes (uberman) of individuals that would eventually result to replace God in the future:

1880 | Nietzsche's uberman | Archetypes to the future replacement god

Socrates	Caesar	Da Vinci	Michelangelo	Shakespeare	Goethe	Napoleon

1950 | Durant's ten greatest thinkers

The following is American writer-historian-philosopher Will Durant (1885-1981)'s circa 1950 list of the ten "greatest thinkers" of all time from the 2002 collected works book *The Greatest Minds and Ideas of All Time*. [2]

Durant's 10 greatest "thinkers"

#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
Confucius	Plato	Aristotle	Copernicus	Aquinas	Bacon	Newton	Voltaire	Kant	Darwin
	IQ=180	IQ=190	IQ=110-185	IQ=165	IQ=180	IQ=190-200	IQ=190-200	IQ=175	IQ=173

1996 | Glenn's twenty greatest scientific minds

In the 1996 book *Scientific Genius: the Twenty Greatest Minds*, American writer Jim Glenn states that "Archimedes, Galileo, Newton, Darwin, and Einstein probably make everyone's scientific top twenty" and on this assumption devotes his book to the following top 20 greatest scientific minds, in chronological order:

Glenn's 20 greatest scientific minds

#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
	Archimedes		Harvey		Pascal				
Aristotle		Galileo		Descartes		Newton	Gauss	Faraday	Darwin

#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Galois	Mendel	Koch	Pavlov	Einstein	Heisenberg	Neumann	Turing	Pauling	Hawking

2010 | Common opinion

The following is are the results of a street poll conducted by American chemical engineer Libb Thims with the query: "name the three smartest people of all time", the results shown in descending order of popularity of response. [1]

Street Poll | Smartest Person of All Time

#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
Einstein	Da Vinci	Edison	Newton	Hawking	Franklin	Gates	Galileo	Curie	Tesla

IQ | estimates

The following are a few tentative 200± candidates, listed in a loose discernible order who seem to have at a minimum an IQ of 140. The following listing, then is a tentative listing, so which to give further time for the topic to marinade. Post discussion below if opinionated on this subject. Some have been tentatively added to the main 200+ IQ page, as indicated.

No T	T/HT	Name	IQ (?)	Notes
		Rudolf Clausius (1822-1888)	205 (added)	● His 1865 mechanical theory of heat, according to Einstein (IQ=160-225), is the only the theory, in science, of universal content, least likely to be ever be overthrown. ● Millennium poll voted Maxwell as the third greatest physicist of all time, after Newton (IQ=190-200) and Einstein (IQ=160-225)" (link)
		James Maxwell (1831-1879)	205 (added)	● #1 greatest equations of all-time (Crease, 2004); #3 greatest equation to change the world (Guillen, 1995); originator of Maxwell's demon; founder of electromagnetic theory a founders of thermodynamics; first color photograph; work formed the basis of Einstein's work; Mahon's 2003 book *The Man who Changed Everything*, gives an idea of the density of Maxwell's mind, etc.
		Willard Gibbs (1839-1903)	200	● His work *On the Equilibrium of Heterogeneous Substances*, which founded chemical thermodynamics, is so dense that very few people (such as Maxwell, Clausius, and Lewis) have been able to understand it; he his one of founder of statistical mechanics (1901); ● William Cropper (*Great Physicists*, 2001) states that: "Few theoretical scientists have had the talent and assurance to do their work in such isolated fashion. Only Einstein (IQ=160-225)—who wrote some of the most important papers before he even laid eyes on another theoretical physicist—may have outdone Gibbs in this respect." ● Einstein, himself, described Gibbs as ""one of the most important and creative minds in the field of science America has produced." ● Ludwig Boltzmann described Gibbs "the greatest synthetic philosopher since Newton (190-200)." ● J.J. Thomson described Gibbs as: "one of the greatest molecular physicists in the world." ● E.P. Bell describes the reading of Gibbs' *Equilibrium* as something like reading Pierre Laplace (IQ=190).

			● John Strutt commented to Gibbs that his *Equilibrium* was "too condensed and too difficult for most, I might say, all readers."
	Thomas Young (1733-1829)	190-200 (added)	● Translator of the Rosetta stone, inventor of the double slits experiment (1801), can first to coin the term energy (1807), in its modern formulation, and his kinetic energy work formed a partial basis for the later (1811) work of Joseph Lagrange (IQ=185) who used calculus to show that a factor of two (or ½) is involved in the relationship "potential" (potential energy) and "vis viva" (kinetic energy).
	Hermann Helmholtz (1821-1894)	190	● A founder of thermodynamics and chemical thermodynamics; work on conservation of force and physiology is that upon which Freud (IQ=156) is built; theorized about the thermodynamics of Goethe's Faust; pioneer of acoustics theory, etc.
	Leonhard Euler (1707-1783)	180-200 (added)	● #2 greatest equations of all-time (Crease, 2004); his work in mathematics formed a large part in the development of the modern language of science.

Other possible/questionable 200+ IQs?

The following are individuals having marginal or questionable references (needing further corroboration) to claims of possible 200+ IQs:

● Gregory Smith (1989-) (IQ=186, 200+) (IQ scores) (Gregory R. Smith) (Hi IQ News link); Quote: "[His IQ] is in the top one quarter to one-half percent of IQs in the world."; Leung, Rebecca. (2005). "Whiz Kids: Science, Music & Memory", *60 Minutes*, July 01.; (Article: BS in mathematics, in 2002, at age 13; plans to have four PhDs by age 27 (2016)). (IQ=186); in 2005, age 16, Smith was working towards four doctorates: math, aerospace engineering, international relations, and biomedical research (link).

● Ivan Cherevko (1991-) (IQ=200+) (Quote: "his IQ has been estimated at much higher than 200" (link) (IQ scores) (AskMeHelpdesk) (Twitter) (link); reading at age 3; began winning various science, law, and dictionary awards at age 8 (link); wrote first book age 10 on topics ranging from microbiology to heraldic to poetry (link); entered the Kyiv-Mohyla Academy, and elite Ukrainian university at age 12 (link); at age 14 stated that he's "developed the analytical theory of a municipal solid waste management, storage and recycling - both post-factum and pre-factum".

● Daniel Simidchieva (c.1955-) (IQ=193, or 200?)
● Hristakieva, Diana. (2009). "Daniela Simidchieva: by Being Good we Bring Good to Our Lives", *BNR Radio Bulgaria.*
● Sherriff, Lucy. (2004). "World's Cleverest Woman Needs a Job: an IQ of 200 is a Sorry Thing to Waste." *The Register*.
● Amble, Brian. (2004). "IQ of 200 but can't Get a Job", *Management-Issues.com.*
● Anon. (2005). "World's Cleverest Woman Inundated with Job Offers in Bulgaria", *Novinite.com.*

● Marta Eugenia Rodiguez (Martha Eugenia Rodriguez de la Torre) (1969-): IQ=218 at age 6 (link); Quote: "I have an IQ of 218, that of Einstein was 180" (link).

● Adrian Seng (or Terence Tao?) (Possibly a Miraca Gross (Exceptionally Gifted Children, 1993) assigned pseudonym) (1977-) (IQ=233) spoke first word at 13-months; taught himself to read before age 2; by age 3, could read, write, and do math at a six-year-old level; at age 3.5 could multiply two-digit numbers in his head. Quote: "at age of 6 years he was assessed on the Stanford-Binet and was found to have a mental age of 14, a ratio IQ of more than 220 [possibly: (14/6)*100=233]; scored 760 on the SAT (mathematics) at 8-years 10-months; completed BS at age 15; completed MS at age 17; then won major scholarship to study math at a prestigious American university. [9]
● Gena Leung (1983-) (IQ=210) at age 5-years 7-months, began to teach other children how to read; at age 11, scored 730 SAT-M; at age 10 was studying French, Latin, and Japanese; completed her university entrance math qualifications at age 13; at age 16, was a certified violinist and also a member of the five person Australian team that competed in the International Physics Olympiad; was diagnosed with depression at age 18, placed on medication, and withdrew from school for a year; at age 20, has "completed a three-year bachelor of medical science degree and is now commenced a four-year bachelor of medicine degree. She wants to make her career in medical research"; quote: "assessment on the Stanford-Binet L-M, two weeks after her tenth birthday,

revealed a mental age of 21 years and thus a ratio IQ in excess of 200 [specifically: (21/10)*100=210]"; [21]
● Ian Baker (1980-) (IQ=200); spoke first word at 12-months; reading and counting before age two; quote: "[at 9 years and 3 months] Ian scored a mental age of 18 years and 6 months and thus a ratio IQ of 200.". [9]
● Christopher Otway (1977-) (IQ=200) taught himself to read before age 2; was reading children's encyclopedias at age 4; at 11-years 4-months, scored 710 on the SAT-M (supposedly fewer than 4-percent of college-bound eighteen-year-olds score at this level) and 580 on the SAT-V; Quote: "at age 11, he achieved a mental age of 22 on the Stanford-Binet, and a ratio IQ of 200." [9]
● Quote: "Pascal and Voltaire both probably had IQs in the neighborhood of 200." [3]
● Masoud Karkehabadi (1981-) (IQ=200+, at age 11). [8]
● Joseph N. Hall (1966-) Quote: "he was assigned an IQ of 200" (link); quote: at age 9 his "intellect can't be measured by simple intelligence quote tests" (link); in college at age 11 (link); Wikipedia User page (link); Wikipedia article (link); EoHT discussion thread (link).

Some of the people listed here are found with mentions of high IQ scores simply based on having taking various 40+ question IQ tests (which take about 100-hours to obtain a high score); then, via various convoluted extrapolation formulas, go on to claim that an obtained score of say 44/45 equates to an IQ of 190 and that if this score is ratioed to another so-and-so scale it gives a "ratio IQ" of 250, etc. Scoring 48/48 on what is called the mega test, for instance, is said to give an adult or deviation IQ of 210+. Thus, supposedly, if one takes a 100-hour logic problem test and gets a perfect score, one will be as smart as Goethe, which is an illogical conclusion.

The Mega Society has in article entitled "Who's the Smartest Person on Earth" (link) in which they give a list of seemingly unknown individuals, being qualified by their "Mega Test", as having ratio IQs of 204+ or deviation IQs of 174+: Anthony Bruni, Arthur Kantrowitz (Mark Kantrowitz), Jim Ferry, John Sununu, Benoit Desjardins, Keith Raniere, Kevin Langdon, Paul Johns, Ferris Alger, Rick Rosner, Greg Treyling, Ronald Hoeflin, Solomon Golomb, Steve Schuessler. These types of scoring methodologies, however, make little sense when compared, for instance, to someone like Einstein (IQ=220) who spent decades on one single question: "what happens when you try to run alongside a beam of light?" or Goethe (IQ=230) who spent about half a century on the question of the relationship between chemical affinity, love, life, work, and death. Another Mega Society lists individuals, supposedly, in the IQ_R=183, IQ_D=164+. [4]

Anon 200+ IQs

● Lovecky (1993) discusses the mindsets of 6 children scoring over IQ 200 via scores obtained using the Stanford-Binet Intelligence Scale Form LM, e.g. Zachery (age 7), James (age 9), Lydia (age 11), and Christopher (age 11). [10]
● Anon girl (c.1910-) Quote: "Langenbeck (1915) described a young girl who at age 5 had a mental age of 11 years (and thus a ratio IQ of over 200), and an oral vocabulary of almost 7,000 words."; Langenbeck, M (1915). "A Study of a Five-year-old". *Pedagogical Seminary*, 22, 65-88.; Gross, Miraca U.M. (1993). *Exceptionally Gifted Children* (pg. 25). Routledge.
● Quote: Theman and Witty (1943) reported a girl, 'B', with an IQ of 200, who took several steps by herself at age 8 months 'under the excitement of running after a dog'. [9]
● Quote: "Morelock (1995) is engaged in a longitudinal study of six children of IQ 200+."; (a) Gross, Miraca U.M. (1993). *Exceptionally Gifted Children* (pg. 21). Routledge; (b) Morelock, M.J. (1995). "The Profoundly Gifted Child in Family Context", *Unpublished Doctoral Dissertation*, Tufts University.
● Quote: "Zorbaugh and Boardman (1936) described a boy, 'R', of Stanford-Binet IQ 204, who began to design and make books at the age of 3 and who had applied to the US patent office for two patents by the time he was 8." [9]
● David (1975-) (IQ=200) at age four, speaks 6 languages, interested in comparative philology, calculates mathematical equations, does chemistry experiments, studies the violin, reads *New York Times* and college textbooks, asked his parents to find him a physics tutor to explain parts of the electromagnetic spectrum, which he didn't understand (all at age 4). [23]
● Quote: "Dr. Julian Stanley knows two children with IQs in the 200 range."
● Korean boy (IQ=210): at age 4-years, 8-months spoke four languages (McWhirter, Norris. (1978). *Guinness Book of World Records* (category: Highest IQ, pg. 49). Bantam Books.)
● From 1979 to 2009, the Gifted Development Center, in Denver, Colorado, has assessed over 5,600 gifted children, finding 18% to be exceptionally gifted (IQ=160+) and 87 to be above 200 IQ (link); prior to this, a consultant to parents of gifted children in the Denver, Colorado area found more than 42 people with an IQ above 200 since 1979. [11] This would imply that cities the size of Denver, with populations around 500,000, would produce about 1 to 2 children per year with IQs about 200.
● Anon nine-year-old African-American girl (c.1930s) (IQ=200) (Simonton, Dean K. (1994). *Greatness: Who Makes History and Why* (pg. 31). Guilford Press).
● Anon Las Vegas waitress (c.1970-) (IQ=238); Quote [Marta Eugenia Rodiguez (IQ=218)]: "the smartest person in the world is a waitress in Las Vegas, who has an established ratio IQ of 238", 2007 interview (link).

Unknown IQs

● Ruth Lawrence (1971-) (IQ=?) BS mathematics

(1985) at age 13, BS physics (1986) age 14, and PhD (1989) age 17 at the University of Oxford; academic post at Harvard (1990) at age 19, and associate professor with tenure at the University of Michigan in 1997.

● Eric Demaine (1981-) (IQ=?) BS age 14; MS mathematics age 15; PhD age 20; joined the MIT faculty in 2001, at age 20, reportedly the youngest professor in the history of MIT.

● Moshe Kai Cavalin (1998-) completed an associate's degree in astrophysics (age 11) in 2009.

Sky Choi (1997-) (IQ=?) at age 3, could speak and read both English and Korean; started taking college courses at age 10 (link); was taking Calculus II, Intermediate Chinese Conversation, Physics with Calculus, at age 12 (2009), at Florida International University, plans to double major in physics and math (link).

● Alia Sabur (1989-) (IQ=?) completed BS (2003) in applied mathematics from Stony Brook University at age 14; MS (2006) and PhD in materials science and engineering at Drexel University; professor of mathematics at age 19.

● Vinodhini Vasudevan (1986-); read 100 books the summer she was 5 (link); mastered college algebra at age 8; at age 12 set record by becoming the youngest person to score a perfect 1,600 (800 on math, 800 on verbal) on the SAT (link), correlates to IQ 165 (link); could be age ratioed higher (e.g. (18/12)*165=247?; in 2007, at age 21, graduated from MIT with a BS in electrical engineering with a minor in biomedical engineering (link).

● Balamurali Ambati (1977-) mastered calculus age 4; BS age 13 from New York University; MD at age 17 from Mount Sinai School of Medicine; ophthalmology residency at Havard; in circa 1987, Set a goal to become the youngest graduate of medical school after reading about Ben-Abrahman's record in the Guinness Book (link), did so at age 17 years, 294 days.

● Jay Luo (1970-) BS mathematics at Boise State University in 1982 (age 12) with a B+ average, degree completed in three years (link); started graduate work at Stanford afterward, but dropped out.

IQ: 200 estimation issues

The topic of estimating 200 range IQs is a difficult subject, primarily owing to the fact that there are different facets of intellect. Moreover, aside from the rigorous Cox-Buzan ranking methodology, in which entire books on the subject are written, groupings of geniuses in bulk to give a side-by-side comparison, using a formulaic point-per-facet scoring methodology to discern rank. Aside from these estimate references, the other "claimed-to-be" 200-range individuals originate from the following main secondary sources:

- American philosopher Ronald Hoeflin's 1985-1999 *Omni* magazine Mega Test.
- Childhood age-ratio extrapolations Stanford-Binet test scores.

Nearly all 200-range estimates originating from these two sources are or seem to be false positive estimates, in some cases yield pure outlandish estimates (e.g. De Mello's (IQ=400) father claiming his child to be twice as smart as Da Vanci (IQ=200)). This is compounded with a smattering of accelerated learning child psychologist test estimates, a few parental estimates of their own children (e.g. Kearney, De Mello, etc.), along with one or two show boaters (e.g. Rick Rosner or Marilyn Savant) who, seeking publicity, find juggle or fudge the results of their own test scores until they so to tell people that they have a 200-range IQ. When these estimated 200+ individual are grouped and sorted, separating the whey from the curd, the issue arises that there seem to famous potential 200-range individuals missing from the list. This page, subsequently, discusses this issue.

IQ societies

The original IQ society, Mensa, occasionally boasts a few claimers to have supposed 200-range IQs (e.g. Marlyn Savant or Daniel Simidchieva).

Giga society founder Paul Cooijmans; a Danish guitar teacher

The claimed-to-be top of these sites, the Giga Society, founded in 1996 by Danish guitar teacher Paul Cooijmans (link), claims to have members all with IQs at or above 196, some of which

include: Suresh Sharma, Paul Johns, Andreas Gunnarsson, Thomas R. A. Wolf, Evangelos G. Katsioulis, Rolf Mifflin, and Scott Durgin. Cooijmans claims to have created the “world's hardest I.Q. tests attracting over 2000 candidates”.

who claims to have an IQ of at least of 196 (thus believing himself to be smarter than both Newton and Leibniz)

These individuals, however, seem to be pure show-and-tell IQ estimates, as evidenced by Savant's faked IQ scores. To give an example, when Evangelos Katsioulis was requested to submit a modern-day scientific explanation of Goethe's *Elecltive Affinities*, he declined. These individuals may certainly be clever, but not in the Da Vinci-Leibniz-Newton IQ range (193-200), as they claim to be.

Fake/scam/joke/boast 200+ IQs?

One can also find random anonymous parents online postings making claims to their children's intelligence (e.g. “As a parent of a 7 year old with 200 IQ, what advice would you give to our family?” (2002 article); this, generally, is an example of the difference between parentally-driven (derived) IQ scores (e.g. Sidis) versus self-driven (derived) IQ scores (e.g. Einstein).

● Jim Diamond (1942-) Quote: his score of 200+ was achieved under the strictest conditions using the best IQ testing system in the world.” (link); supposedly scored “very superior” or three standard deviations above the mean (IQ=145) on the Wechsler Adult IQ test (which has a max IQ score of 155) (link), but he boasts that this equates to 200+.

● Avi Ben-Abraham (1957-) Quote: “His IQ is so high that it cannot even be measured.” Boasting: mastered relativity at age 7; MD at age 18 from the University of Perugia, Italy; held Guinness Book record 1987-90 as youngest doctor;
● Quote: "estimated IQ around 250" (link), supposed based on one of these 22 Jul 2001 Chicago Tribute articles (link) (link)
● supposedly all faked or scammed (link, link, link, etc.)?

● Maria Dos Marinos (1941) (IQ=307) (link)

Internet Joke IQs

● William Alfred Quannigton (Child IQ=350+; Adult IQ=300+) is a fictional person introduced as a joke by an anonymous poster on Sep 5, 2006, to both the AnswerBag forum: "What is the highest rating of IQ ever recorded?" and, it seems, to the "What is Stephen Hawking's IQ" forum, at faq.org (see link), claiming that he was Quigly Anderson (see: blog), who was writing book on the 50 highest IQs ever recorded. Below is an archived screenshot of the post (see: archived link):

Answer 4 out of 17

by Anonymous 2
Beginner
on Sep 5, 2006
at 6:15 pm

Hello, my name is Quigly Anderson.I am writing a book on the 50 highest iqs ever recorded. Steven Hawking is the seventeenth highest iq ever recorded.His overall IQ is 197 not bad.However my main pourpose in this message is to tell you my list of the top ten highest IQs ever recorded,and here they are:

Quigly Anderson Ten Highest IQs

Most of you are probably wondering who this Quannigton guy is, so let me tell you a bit about him.He is a british student at the university of Cambridge he had the following scores on child IQ tests:298,300 310,336,348,350,358,365,380, and a perfect 388 on the geniusiqtest (version 3).When was a toddler his iq was estimated at
a near 400 level.here are some examples of his extraordinary abilaties:

1. He said his first word at 5 months: aluminum
2.He could read, write and spell at a second grade level when he was less than one year old!
3.He taught himself to do Algebra and Geometry when he was about two-and a-half years old
4.He taught himself over 3 years of colledge calculus in a day when he had just turned 4 years old.

1. Phd. William Alfred Quannigton
Child IQ=350+
Adult IQ=300+
2. William James Sidis
IQ=265+
3. Leonardo Da Vinci
IQ=225
4.Johann Wolfgang Von Goeth
IQ=210
5. Hypatia
IQ=210
6. Nathan Leopold
IQ=210
7. Emanuel Sweedonburg
IQ=205
8. Gottfried Wihlem Lebinitz
IQ=205
9.Hugo Grotius
IQ=200
10.Tomas Wolsey
IQ=200

5.when he was in grammerschool he never receved any grade less than an A+.
6.When he was 9 years old he drew and computed a time machiene and how it would work.(though it would have been a succesfully working time machine,the technology and machinery would be too andvanced for this life time!

Well, there you have it folks, William Alfred Quannigton in a nutshell!
If you have any questions for me, please feel free to ask by sending me an email at iqstudies@yahoo.com
happy iq testing,
Quigly Anderson.

In the years to follow, this quickly became incorporated into various high IQs Internet lists. It was likely a on William James Sidis. See examples (here, here, here, etc.). This may be, from where the Da Vinci IQ=225 estimate originated (as Cox estimated 180 and Buzan estimated 220)?

200-range IQs and suicide

● Brandenn Bremmer (1991-2005) – scored IQ=178 on a test at age five, at age 10, his first year of college as a music prodigy, was said to have an IQ twice his weight; later stated in an interview that "America is a society that demands perfection"; shot himself in the head at age 14.
● Chris (or Justin) Chapman (1996-) (IQ=298) at age 6 the IQ purported was fabricated by his mother Elizabeth Chapman; who had her child removed after he attempted suicide a year latter. [5]

Brandenn Bremmer (1991-2005), in 2001, at age 10, shown next to the stack of books he had absorbed to finish high school prior to entering college that year; shot himself in the head four years later (link).

References

1. Polling done in person by American chemical engineer Libb Thims.
2. Durant, Will. (2002). *The Greatest Minds and Ideas of All Time* (ch. 2: The Ten Greatest Thinkers, pgs. 8-30). Simon and Schuster.
3. (a) Emerson, Ralph Waldo. (1850). *Representative Men: Seven Lectures.* H.G. Bohn.
(b) Bloom, Harold. (2003). *Genius: a Mosaic of One Hundred Exemplary Creative Minds* (Emerson's *Representative Men*, pgs. 6-8). Warner Books.
4. Interesting people (IQ_D=164+; IQ_R=183+) – MegaFoundation.org.

Further reading

● Gross, Miraca. (1992). "The Early Development of Three Profoundly Gifted Children of IQ 200", in: *To Be Young and Gifted*, edited by P.N. Klein and A.J. tannenbaum: 94-140. New Jersey: Ablex.

External links

● 100 Scientists Who Shaped the World (four lists) – Adherents.com.

θΔics

*Note: this page is archived (2011) (Ñº); Updated version: **Top 1000 geniuses***

Brain: the seat of **intelligence**.

In genius studies, **IQ: 200+** (LR:4) refers to individuals, throughout history, who have had documented, tested, estimated, cited, and or ratio IQs or deviation IQs calculated at or above 200 (compare: IQ:225+).

Overview

One of the original definitions of IQ, given by genius studies pioneer American psychologist Catherine Cox, in 1926, is:

> "**IQ** is thought to be a measure which expresses the relative brightness or intelligence of any given individual."

The first person, historically, ever calculated, specifically by Lewis Terman (1917), to have had an IQ of 200 was Francis Galton, albeit by rather crude methods, to say the least. The first person calculated, specifically by Maud Merrill (1926), to have an IQ of 225 was Johann Goethe. The first person tested, specifically by an known psychologist, as reported by Helena Sidis to Abraham Sperling (1946), to have an IQ of 250 to 300 was William Sidis. In 2006, Libb Thims, after discovering Goethe, Sidis, and others, such as Christopher Langan (1999) and his self-promoted feigned IQ of 195-210, began collecting and searching, out of curiosity, for individuals with IQs at or above 200. In 2011, Thims as collected 40 individuals, as shown below, who, excluding eight (additions): Maxwell, Clausius, Young, Galileo, Euler, Copernicus, Majorana, and Gauss, all had been previously cited as having an IQ of 200 or above; below this photo collage, the collective group is re-ranked in a meta-analysis, smartest-of-all-time order:

Each IQ is listed with a subscript, to signify source, as indicated:

Type	Name	Description
IQ_T	Terman IQ	An IQ determined by Stanford psychologist Lewis Terman, the inventor of the modern IQ scale (1916), in which IQ=100 is the value of the average intelligence; Terman, in 1917, assigned Francis Galton with the first-ever 200 IQ.
IQ_C	Cox IQ	The assigned IQs of the three-hundred greatest geniuses who lived between 1450 to 1850, from the 1926 book *Early Mental Traits of 300 Geniuses*, determined by IQ-scale inventor Lewis Terman's PhD student Catherine Cox and a team of Stanford psychologists, based on both early mental traits and life-time intellectual accomplishments.
IQ_B	Buzan IQ	The assigned IQs of the hundred greatest geniuses of all-time, from the 1994 *Book of Genius*, determined by English accelerated learning experts Tony Buzan and Ramond Keene, based on an 835-point genius scoring method.

IQ_{CB}	Cox-Buzan IQ	The mean IQs of the thirteen agreed-upon geniuses common to both the Cox (1926) and Buzan (1994) listings; the big five anchor point geniuses being Goethe (213), Da Vinci (200), Leibniz (194), Newton (193), and Galileo (183).
IQ_R	Ratio IQ	An IQ determined based on child age (1-16), a test score, and the age at which the test was designed for; there are dozens of "supposed" 200-range IQs calculated every year, often made by starry-eyed parents, using this method.
IQ_M	Mega Test IQ	An extrapolated IQ based on the 48 question Mega Test, a perfect score said to assign a person with an IQ of 193-202, designed by American philosopher Ronald Hoeflin (IQ of 164), that ran in *Omni* magazine from 1985 to 1999.
IQ_G	Guinness Book IQ	An IQ listed in the *Guinness Book of World Records* (c.1985-1991), under the section "Highest IQ"; in circa 1990, the section was removed on the grounds that the referenced justifications begin for such IQs were incoherent.
IQ_P	Psychologist IQ	An IQ determined by an intelligence psychologist, e.g. in the 1940s, two different testers, one being Abraham Sperling, director of NY city's IQ testing, determined the IQ of William Sidis, before and after his death, to be between 250 and 300.
IQ_O	Other IQ	An IQ determined by other means, e.g. a published opinion, or other contrived means, etc., each of which is discussed in detail on the IQ references page.
$IQ_?$	Estimated IQ	An intuitively estimated IQ of what seem to be obviously overlooked 200-range IQ individuals, that seem to be missing from the above methods, as are discussed on the IQ: 200 (±) candidates page.

Those pictured to the right were involved in the development of either thermodynamics (T) or human thermodynamics (HT), or its precursors, e.g. differential equations, affinity chemistry, etc. The last column shows the modern function, depicted according to the laws of universe, indicative of each person's theory of existence, as described in each individual's self-defined greatest work. [1] The yes✓(above ↑ 200) or no✗(below ↓ 200) icons, as well as question mark ❓(undecided) icon, gives a quick-mark idea as to if that person actually had a 200+ IQ as the references claim; the W icon links to a Wikipedia article on that person.

#	**Genius Rankings:** IQ 200+	**Name**	**IQ**	**Theory**
1		Johann Goethe (1749-1832) ✓ W	IQ_C=210 IQ_B=215 IQ_{CB}=213 IQ_O=180, 225	A = TΔS – ΔH AB + CD → BD + AC Elective Affinities Evolution/Physicist Literature/Lawyer
2		Albert Einstein (1879-1955) ✓ W	IQ_B=205 IQ_O=160, 200, 225	Relativity ($E = mc^2$) G ≠ Love
3		Leonardo da Vinci (1452-1519) ✓ W	IQ_C=180 IQ_B=220 IQ_{CB}=200 IQ_O=210	Animal heat Art Engineering Flight
4		Isaac Newton (1643-1727) ✓ W	IQ_C=190 IQ_B=195 IQ_{CB}=193 IQ_O=200	Physics Affinity Chemistry Differential Equations Optics
5		James Maxwell (1831-1879) ✓ W	$IQ_?$=190-205	Kinetic theory Electromagnetics Thermodynamics
6		Rudolf Clausius (1822-1888) ✓ W	$IQ_?$=190-205	Entropy (S) Thermodynamics Kinetic Theory

7			Nicolaus Copernicus (1473-1543) ? W	$IQ_{?}$=190-200 IQ_{C}=160 IQ_{B}=185 IQ_{CB}=173 IQ_{T}=100-110	Heliocentrisim Mathematician Physician Jurist/Lawyer Governor
8			Gottfried Leibniz (1646-1716) ✓ W	IQ_{C}=205 IQ_{B}=182 IQ_{CB}=194	Differential equations Dynamics (vis viva, vis mortua)
9			William Sidis (1898-1944) ✓ (Will Hunting) W	IQ_{P}=250-300 (age 42) IQ_{O}=200	ΔS Animate/Inanimate Black Holes Entropy Reversal Mathematician Lawyer/Physicist
10			Thomas Young (1733-1829) ✓ W	$IQ_{?}$=185-200	Energy Double Slits Rosetta Stone
11			Carl Gauss (1777-1855) ? W	IQ_{O}=250-300	Mathematics Astronomy Electromagnetics
12		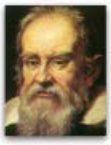	Galileo Galilei (1564-1642) ✓ W	IQ_{C}=185 IQ_{B}=180 IQ_{CB}=183 $IQ_{?}$=185-200	Dynamics Vacuum theory Temperature
13			Leonhard Euler (1707-1783) ? W	$IQ_{?}$=180-200	Reciprocity relation
14			Nikola Tesla (1856-1943) ? W	IQ_{O}=230-310 IQ_{O}=200 IQ_{O}=140-160	Defunct life theory Electricity Magnetism Human energy
15			William Shakespeare (1564-1616) ? W	IQ_{B}=210	Literature (human chemistry) Promethean heat
16			Voltaire (1694-1778) ✓ W	IQ_{C}=190 IQ_{O}=200	Literature Hmol philosophy Physics Religious mythology
17			Ettore Majorana (1906-1938) ? W	IQ_{O}=183-200	Quantum social mechanics Neutron Exchange force Chemical bond
18			Emanuel Swedenborg (1688-1772) ?	IQ_{C}=165 IQ_{G}=210	Nebular hypothesis

			W	IQ_O=205	Atomic theory
19			Christopher Hirata (1983-) ✓	IQ_R=225 (age 16)	ΔG = ΔH – TΔS X + Y ↔ XY Relationship Physics Astrophysics
20			John Stuart Mill (1806-1873) ? W	IQ_C=180 IQ_B=185 IQ_{CB}=183 IQ_O=200	Political philosopher Utilitarianism
21			Terence Tao (1975-) ? W	IQ_R=220-230 (age 11) IQ_O=211	Mathematics Green–Tao theorem
22			Hypatia (360-415) ? W	IQ_O=170-210	Mathematics Philosophy Astronomy
23			Hugo Grotius (1583-1645) ? W	IQ_C=200	Law Politics Theology
24			Thomas Wolsey (1472-1530) ? W	IQ_C=200	Theology Law Politics
25			Marie Curie (1867-1934) ? W	IQ_B=180 IQ_O=200	Chemistry Radioactivity
26			Francis Galton (1822-1911) ✗ W	IQ_T=200	Hereditary Genius Psychology
27			Kim Ung-Yong (1963-) ✗ W	IQ_O=200 IQ_G=210	Nuclear Physics Civil Engineering
28			Edith Stern (1952-) ?	IQ_O=200, 201-203	Science Mathematics Computer Programming
			Dylan Jones		Mathematics

29		(1992-)	IQ_O=200 (age 10)	Computer Science Bioengineering Medicine
30		Sho Yano (1990-)	IQ_O=200 (age 10)	Music Genetics Medicine
31		Michael Grost (1954-)	IQ_R=200 (age 8)	Mathematics
32		Naida Camukova (c. 1976-)	IQ_O=200	History Mathematics
33		Michael Kearney (1982-)	IQ_R=*325* (age 4) IQ_O=200 (age 14)	Anthropology Biochemistry Computer Science
34		Adragon De Mello (1976-)	IQ_R=*400* (age 5)	Mathematics
35		Ainan Cawley (1999-)	IQ_R=263-349 (age 7)	Chemistry Mathematics
36		Marnen Laibow-Koser (1975-)	IQ_R=*268*	Music Computer science
37		Nathan Leopold (1904-1971)	IQ_O=200, 206-210	Law
38		Christopher Langan (1952-)	IQ_M=174, 190 IQ_O=195, 190-210	Cognitive theoretic model Intelligent Design
39		Marilyn vos Savant (1946-)	IQ_M=186 (age 39) IQ_O=127 (age 7), 167 IQ_R=157 IQ_G=228	Writer
40		Rick Rosner (1960-)	IQ_R=140 (age 18) IQ_M=180-200 IQ_O	TV Producer

W =250

Note

Update: see Top 500 geniuses (with IQ over 140) of all time, for an updated expanded version of this page.

Videos

The following is a 56-minute, four-part, 1M+ viewed, video overview of the above table:

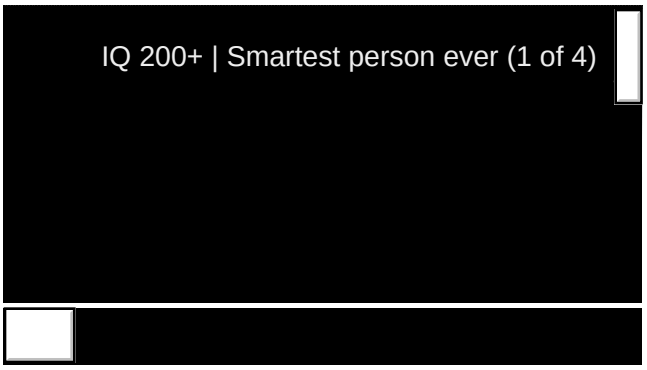

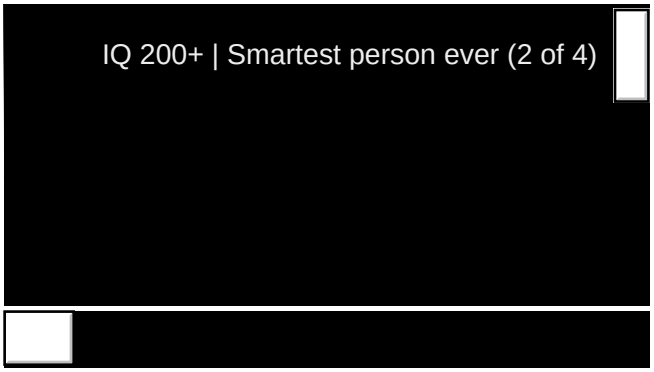

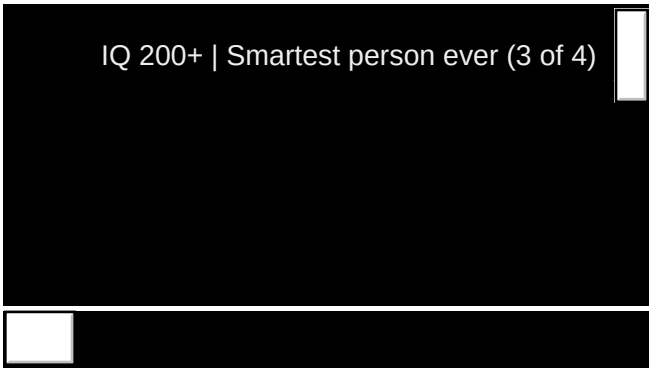

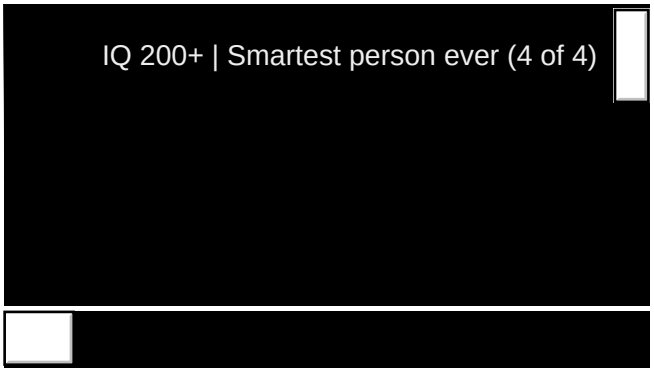

200-range IQ tables | Historical

The backbone of the above table is the grouping of the 200+ range geniuses from both the 1926 Catherine Cox IQ list (of 300 geniuses) and the 1994 Tony Buzan IQ list (of 100 geniuses), merged together (see: IQ tables for full list), the two groups shown below, respectively:

Cox's 200-range Geniuses (1926) **of 300-geniuses**

1. Goethe (IQ=210)
2. Leibnitz (IQ=205)
3. Grotius (IQ=200)
4. Wolsey (IQ=200)

GENETIC STUDIES OF GENIUS

EDITED BY
LEWIS M. TERMAN

VOLUME II

THE EARLY MENTAL TRAITS OF THREE HUNDRED GENIUSES

1926

Buzan's 200-range Geniuses (1994) **of 100-geniuses**

1. Da Vinci (IQ=220)
2. Goethe (IQ=215)
3. Shakespeare (IQ=210)
4. Einstein (IQ=205)

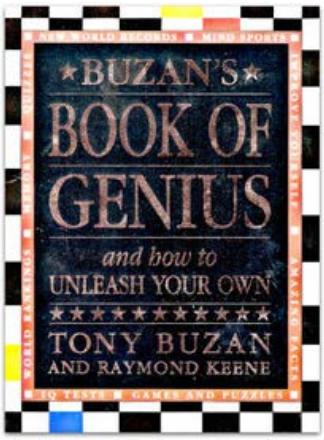

What is evidently striking about these two independent listings of genius IQs is odd coincidence of finding the same person (out of more than several dozen possible billion, come and gone) in the top-two spots, namely German polymath Johann Goethe, who by no coincidence is the core thinker in this

encyclopedia of the 500+ EoHT biographies. To clarify, not only was each IQ assigned using completely different methodologies (Cox using a biographical-achievement method; Buzan using a 9-category, 835-point scoring method), but the Buzan listing, compiled with the help of English chess master and literature historian Raymond Keene, seems to have been done without knowledge of the previous work of Cox (and her group). Buzan's book does not mention Cox and they specifically state, in introducing their list, that: "what follows is the world's first attempt to rank the greatest geniuses of history". In sum, the above table was built by starting with these seven established 200+ range geniuses, but then adding to it other references and citations to individuals in the 200+ plus range (see: IQ: 200+ (references) for further discussion).

IQ: 200± candidates

See main: IQ: 200 (±) candidates

There may, in all probability, exist overlooked individuals (e.g. Maxwell, Clausius, Euler, Tesla, Helmholtz, Young, etc.) not listed above, who would seem to have likely had a 200-range IQ. Of dominance in this group is Scottish physicist James Maxwell, who produced such as large corpus and density of intellectual work, in many different areas, e.g. kinetic theory, thermodynamics, electromagnetic theory, intellectual mentor to Einstein (one of three photos Einstein kept on the wall of his study), photography, etc., in such a short lifespan (died at 48), that he seems to protrude significantly as a missing individual in ceiling range IQs. Some of these individuals, namely Maxwell, Clausius, and Copernicus, are included above.

Last man to know everything

See main: Last person to know everything

To situate the premise of the 200+ IQ in the context near mastery of knowledge, we will highlight those individuals who have been famously called "the last man to know everything". To situate this postulate in the context of a date, French philosopher Pierre Levy argues, in his 1994 book *Collective Intelligence*, that the publication of Denis Didedot and Jean d'Almbert's *Encyclopedie* (1751-1772) marks "the end of an area in which a single human being was able to comprehend the totality of knowledge." [62] Some of the main "all-knowing" people, are listed chronologically below, one, from the above table, being Goethe (IQ=180-225), have been said to have be in possession of this trait of total knowledge attainment: [43]

#	Last All-Knowing Person	IQ	Quick Description
1.	Athanasius Kircher (1602-1680)		German scholar; described as the "master of a 100 arts".
2.	Thomas Young (1733-1829)		English physician and scientist; translator of the Rosetta stone, inventor of the double slits experiment (1801), can first to coin the term energy (1807), in its modern formulation.
3.	Johann Goethe (1749-1832)	180-225	German writer and scientist; described as the "prince of the mind"; founder of human chemistry.
4.	Alexander Humboldt (1769-1859)	185	German naturalist; the founder of biogeography.

"**Young** deserves to be called a Renaissance man or *uomo universale*, like **Goethe**, Franklin, or **Humboldt**—or even, maybe, the most eminent example of such a man in his age."

— Andrew Robinson English science historian, *The Last Man Who Knew Everything: Thomas Young* (2006)

Goethe: polymath, universal genius, the last 'true' man to know everything

Goethe: the ceiling genius.

Central among this group of all-knowing sages, as discussed further below, is German polymath Johann Goethe, whose ranking is unprecedented: largest active vocabulary (90,000 words); #1 Cox genius (out of 300); #2 Buzan genius (out of 100); #2 biggest world author (WorldCat literature: 2010);

â— at age 7, to sugar the pill of grammar, he invented a novel in which the members of a family in various parts of the world wrote letters to each other in six different languages and styles;
â— at age 16, entered the University of Leipzig;
â— at age of 19, during his studies of Fraulen von Klettenberg and Paracelsus, was conducting chemical experiments to reveal the 'principle that permeates the whole universe';
â— at age 20 he had published his first volume of poems and had studied enough medicine to qualify to as a physician;
â— at age 21, he entered the University of Strasbourg, completing a liberal arts curriculum with courses in political science, history,

anatomy, surgery, and chemistry; completed dissertation on “The Legislature, On the Power of the Magistrate to Determine Religion and Culture”; also completed PhD dissertation on history.
â— by 22, prepared and defended 65 theses, received his law degree, and began practicing;
â— by 24, he had written his great tale *Werther* and by 26 was world famous;
â— at age 31 (1780), had worked out the basics of his evolution theory, a biological 'metamorphosis' theory, later to be cited by Darwin as being a forerunner to his own theory; at age 36 (1785), demonstrated through comparative osteology that humans posses an intermaxillary bone of the upper jaw as found in other animals, as proof that humans had evolved from lower animals;
â— at age 47, in his *Third Lecture on Anatomy*, gave his first detailed description of 'affinity'.
â— at age 50 (1799), founded the science of human chemistry, as explained in his theory of "human elective affinities"; publishing the final version in 1809 (age 60), in his *Elective Affinities*, in which the characters are not only governed by affinity chemistry but also discuss the theory amongst themselves;
â— at age 61 (1810), he published his theory of colors, rival to Newton's theory of colors, to explain light and perception;
â— at age 77, was working out a law to explain the blue color of the sky (a phenomenon not fully explained until 1871 by John Strutt); and was working to figure out French chemist Claude Berthollet’s 1799 theory of split affinities (a phenomenon not solved until the theory of 'valence' in the 1850s)
â— at age 82, the year of his death (1832), finished the work he is best known-for *Faust*, the story of a man who is striving to learn everything that can be known and who sells his soul to the devil so to obtain the ultimate in knowledge possession.

Goethe's mastery of knowledge is summarized by the following collection of quotes, from the perspective of other famous polymaths, geniuses, genius studies experts, famous people, and Nobel Laureates, the last of which situates Goethe as the intellectual forefather to Einstein, who kept a bust of Goethe and a fifty-two volume set of Goethe's collected works in his study: [45]

“Goethe, he used to say, was the **last man in the world who knew everything**; after Goethe (d. 1832), there was too much to know for any one person to know it all.”

— Anon German school teacher (circa, before 1966)

“Goethe, poet and philosopher: one of the greatest men of **genius** the world has produced.”

— Francis Galton (IQ=200) English polymath, *Hereditary Genius* (1869)

“Goethe was last true **polymath** to walk the earth."

— George Eliot (IQ=185) English novelist (1871)

“Goethe comes as close to deserving the title of a **universal genius** as any man who has ever lived.”

— Sterling Brown African-American literature professor (1973)

“One rater (M) has scored on the basis of the record of Goethe’s youth an **IQ of 225**. Goethe’s true IQ may in the history of mankind have been equaled in a few instances; one may well wonder whether it has ever been exceeded?”

— Catherine Cox American psychologist, *Early Mental Traits of 300 Geniuses* (1926)

“Without intellectual and individual freedom there would have been no Shakespeare, no Goethe, no Faraday.”

— Albert Einstein (IQ=160-225) German-born American physicist (1933), kept a plaster bust of Goethe in is drawing room.

"History is unkind to **polymaths**. No biographer will readily tackle a subject whose range of skills far exceeds his own, while the rest of us, with or without biographies to read, have no mental 'slot' in which to keep a polymath's memory fresh. So the polymath gets forgotten or at best, squashed into a category we *can* recognize, in the way Goethe is remembered as a poet, despite his claim to have been a scientist."

— Alexander Murray Oxford historian, 1994 bicentenary symposium for English polymath William Jones

"Scholars agree that Goethe was the last **universal genius**: practically nothing within reach of the human mind escaped his attention."

— Walter Wadepuhl German-born American German studies professor, *Goethe's Interest in the New World* (1932)

"It was upon hearing Goethe's beautiful essay on nature that I decided to go to medical school."

— Sigmund Freud (IQ=156) Austrian psychologist, autobiograhical notes (1873)

"The middle of the eighteenth century witnessed the first powerful revolt against cultural tradition, which is marked by Rousseau. This tradition was restarted by **universal genius** Goethe. But it was restarted for the last time. Goethe had not been succeeded by another universal genius."

– Ernst Curtius German literary scholar, "The Medieval Bases of Western Thought" (1949)

"For what concerns chemistry, Goethe was not far from Newton."

— Ilya Prigogine Belgian chemical thermodynamicist (1984), Nobel Prize thermodynamics (1971)

"Since my method is juxtaposition, I delight in bringing together **universal genius** Goethe, with Sigmund Freud, Samuel Johnson, and Thomas Mann."

— Harold Bloom American literary critique, *Genius: A Mosaic of One-Hundred Exemplary Creative Minds* (2002)

"In 1808, German **polymath** Johann Goethe used Bergman's affinity tables as a basis for human behavior and in doing so wrote the classic novella *Elective Affinities*, a book that marks the start of the science of human chemistry."

— Libb Thims American chemical engineer, *Human Chemistry* (2007)

"Throughout his life Einstein was a man of the book, to a much higher degree than other scientists. The remarkably diverse collection of volumes in his library grew constantly. If we look only at the German-language books published before 1910 that

survived Einstein's Princeton household, the list includes much of the cannon of the time: Boltzmann, Buchner, Friedrich Hebbel, the works of Heine in two editions, Helmholtz, von Humboldt, the many books of Kant, Gotthold Lessing, Mach, Nietzsche, and Schopenhauer. But what looms largest are the collected works of Johann von **Goethe** in a thirty-six volume edition and another of twelve volumes, plus two volumes on his *Optics*, the exchange of letters between Goethe and Schiller, and a separate volume of *Faust*."

— Gerald Holton German-born American physicist (2008), Harvard PhD under Percy Bridgman, 1948

"The age of *Faust* [1772-1882] had been the age of the 'Renaissance man', a time when the possibility of a **universal knowledge**, mastery of the arts and sciences, still seemed to be open to the ambitious mind; [thereafter] the separation and dispersion of intellectual endeavors, dubbed the 'two cultures' by C.P. Snow, [resulted]; [in the years to follow, individuals such as] Thomas Young (IQ=200?), Humphry Davy (IQ=185), [and] William Hamilton (IQ=170), could all make serious claims to humanistic breadth, if not universality, in their intellectual accomplishments; nevertheless, a rift between the arts and the sciences was evident."

– Frederick Burwick (1986), American literature scholar

To sum up this collections of quotes, Goethe once famously said that "if one does not know what went on for the last three thousand years, he or she remains ignorant, merely surviving from day-to-day."

Books

â— Goethe, at the age of about 80, had a 5,000 book personal library.
â— Newton's personal library consisted of 1,752 books, of which 369 were scientific works.
â— Young commented in his autobiography: "though he wrote with rapidity, he read but slowly, [and] perhaps the whole list of the works that he studied, in the course of 50 years, does not amount to more than a thousand volumes: while it is said that William King the poet read no fewer than seven thousand in the course of his residence of seven years at Oxford."
â— Photo's of Einstein's personal library shows about 600-700 books.

Top Five WorldCat Identities

According to computer cataloging of the world's literature, as determined by WorldCat Identities, the five biggest names in world literature (excluding the names Jesus Christ and Mary, which derive from the Egyptian Osiris and Isis [*stella maris*] resurrection story (link), are as follows:

1. Shakespeare: 39,345 works (Hamlet #1) in 110,020 publications in **138** languages and 4,387,523 library holdings (link).
2. Goethe: 26,918 works (Faust #1) in 63,794 publications in **81** languages and 698,814 library holdings (link).
3. Mozart: 31,429 works (Le Nozze de Figaro #1) in 103,242 publications in **65** languages and 937,666 library holdings (link).
4. Lincoln: 19,904 works in 30,491 publications in **65** languages and 1,143,104 library holdings (link).
5. Bach: 26,953 works (Brandenburg concertos #1) in 87,937 publications in **41** languages and 834,142 library holdings (link).

Chemical thermodynamics | of human relationships

One of the great unanswered questions of modern times is "what is love?" (or is love a chemical reaction?); along with what happens when you die? and what is the meaning of life? The question of the nature of love (and opposite hate) is one of the all-time greatest philosophical conundrums ever faced by modern man. Four of the 200+ IQ group have situated opinions and theories on this topic, shown below ranked by correctness of theory:

#	Person	Theory of Relationships
		â— At age 60 (1809), using a country estate and surrounding town as his "reacting system",

1. Johann Goethe (IQ=180-225)

used Bergman's 64 affinity equations to write out 36 human chemical reactions, the overarching reaction being a double displacement reaction:

AB + CD → BD + AC (governing equation used: A = TΔS – ΔH)

2. Christopher Hirata (IQ=225)

â— At age 20 (2000), using the undergraduate body of students (900) at CalTech as his "reacting system", used thermochemistry theory learned in his chemistry classes, to model the formation and separation of student relationships as sets of reversible combination reactions:

X + Y ↔ XY (governing equation used: ΔG = ΔH – TΔS

He defined this subject as the "physics of relationships."

3. Isaac Newton 1643-1727

â— At age 43 (1686), commented on his mastery of the gravitational movement of the celestial objects, that:

> "I wish we could derive the rest of the phenomena of nature by the same kind of reasoning from mechanical principles; for I am induced by many reasons to suspect that they may all depend upon certain forces by which the particles of bodies, by some causes hitherto unknown, are either mutually impelled towards each other, and cohere in regular figures, or are repelled and recede from each other."

â— At age 75 (1718), in his famous Query 31, verbally stated the experimental basis behind the construction of affinity tables, which thus later led to the development of the following expression (stated by Helmholtz in 1882):

A = -ΔG (used by Goethe and Hirata, above)

4. Albert Einstein (IQ=160-225)

â— At age 41 (1920), when queried about his views on the science of love, commented: [53]

> "Falling in love is not the most stupid thing that people do, but gravitation cannot be held responsible for it. How on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?"

Einstein, restricted to cold hard mathematical thinking, had very little to say on very complex topic of love; whereas, by comparison, intuitive mathematician Goethe, not only has a clue, but presented an entire theory (1809) on the physics and chemistry if love, in three layers of Gestalt, some hundred years prior to Einstein. What is puzzling, however, in Einstein's comment is that not only did he keep a bust of Goethe in is house, but in his library of books, what looms largest are the collected works of Goethe, contained in some 52-volumes: a thirty-six volume edition and another of twelve volumes, plus two volumes on his *Optics*, the exchange of letters between Goethe and Schiller, and a separate volume of *Faust*. In other words, Einstein, being such a student of Goethe, should have been quite knowledgeable of Goethe's human affinity theories on love? On the other hand, although Einstein was well-steeped in thermodynamics, having written his first 30 papers on thermodynamics, the more advanced subject of chemical thermodynamics, would no essentially come into its own until after 1923, the publication of Lewis' *Thermodynamics and the Free Energy of Chemical Substances*, wherein the translation of Goethe's "affinities" to the modern "free energy" change becomes apparent. Possibly, Einstein had not yet made the connection in 1920, the time of his famous quote?

Age of first spoken word

See main: Age of first spoken word

The following gives a listing of the known ages of the first spoken word for known 200-range geniuses. The mean age at which children (N=241), tested, in the age range 2.5 to 12.5, on the Stanford-Binet, to have an IQ from 160 to 237+, speak their first word is nine months (link).

Age	Word	Person
2 weeks	Said "Ayer" (water in Malay), whenever he was thirsty; also said	Ainan Cawley (IQ= 263-349)

		“poo”, at five weeks, whenever he needed his diaper changed (link).	
6 weeks		Said “hello” at six weeks (link).	Adragon De Mello (IQ=400)
3 months		Speaking first words and grammatically correct sentences (IQ:R).	Marnen Laibow-Koser (IQ=268)
4 months		Said “daddy and “mama” at four months (link).	Michael Kearney (IQ=200-325)
4 months		Spoke first word; also talking at five months; writing at seven months.	Kim Ung-Yong (IQ=200-210)
4 months		Spoke first words.	Nathan Leopold (IQ=200-210)
6 months		Said “door”; also pointed to and said “moon” at seven months (link); at about nine months said "he liked things, doors and people, that move."	William Sidis (IQ=250-300)
6 months		Began talking at six months; reading at three years (link).	Christopher Langan (IQ=174-210)
8 months		Began talking at eight months (link)	Alia Sabur (1989-) (IQ=?)
12 months		Spoke first word (IQ:C).	Ian Baker (1980-) (IQ=200)
13 months		Spoke first word (IQ:C).	Adrian Seng (1977-) (IQ=233)

Youngest college graduate

See main: Youngest college graduates

The following gives a listing of the known youngest college graduates. Youngest BS obtained by Michael Kearney, age 14; the youngest MS obtained by Michael Kearney, age 14; the youngest PhD obtained Kim Ung-Yong, age 14 or 15 (this later age needs to be fact checked). [63]

Age		Person	Degree	Year	Description
8		Michael Kearney (1982-) (IQ=200-325)	AS geology BS anthropology (age 10) MS biochemistry (age 14) MS computer science (age 17)	1992	Completed associates degree in geology from Santa Rosa Junior College (age 8), BS in anthropology from the University of South Alabama (age 10), MS in biochemistry from Middle Tennessee State University (age 14), and MS in computer science from Vanderbilt University (age 17).
11		Adragon De Mello (1976-) (IQ=400)	BS computational mathematics	1987	At 8 he was enrolled at Cabrillo College, a two-year community college in Santa Cruz, California, where he studied physics and mathematics getting straight As; at 10 he transferred to the University of California at Santa Cruz to major in computation mathematics, graduating a year later (age 11). He was listed in the Guinness Book as being the youngest college graduate in history (only to be beat by Michael Kearney in 1992).
12		Sho Yano (1990-) (IQ=200+)	BS biology PhD genetics (age 18) MD (age 21)	2002	Completed BS in biology with minor in chemistry (age 12), from the Loyola University Chicago; entered combined MD-PhD program, in molecular genetics and cytology (age 13) at the University of Chicago Medical School; completed PhD in molecular genetics and cell biology (age 18); third year medical school student as of 2010.
12		Jay Luo (1970-) (IQ=?)	BS mathematics (age 12)	1982	Completed his BS mathematics at Boise State University in 1982 (age 12), with a B+ average, degree completed in three years (link); had started graduate work at Stanford afterward, but dropped out.
12?		Kim Ung-Yong (1963-) (IQ=200-210)	BS physics MS physics (14) PhD physics (age 15) PhD civil engineering (age 22)	1976?	Admitted to the physics department of Hanyang University (age 5), BS physics (age 12), MS physics (age 14), and PhD physics (age 15) from Colorado State University (link); PhD civil engineering (age 22), from Chungbuk National University.
13		Ruth Lawrence (1971-) (IQ=?)	BS mathematics BS physics (age 14) PhD (age 17)	1985	BS mathematics (1985) at age 13, BS physics (1986) age 14, and PhD (1989) age 17 at the University of Oxford; academic post at Harvard (1990) at age 19, and associate professor with tenure at the University of Michigan in 1997.
					BS in mathematics, in 2002 (age 13) from Randolph-Macon College; in

13		Gregory Smith (1989-) (IQ=186, 200+)	BS mathematics MS mathematics (age 16)	2002	2006 (age 16), he completed his MS in mathematics; as of 2010, he is working towards a second graduate degree in computational biology (link); plans to have four PhDs by age 27 (2016) in: math, aerospace engineering, international relations, and biomedical research (link).
13		Balamurali Ambati (1977-) (IQ=?)	BS biology MD (age 17)	1990	Completed his BS biology, at age 13 from New York University; MD at age 17 from Mount Sinai School of Medicine; ophthalmology residency at Havard; in circa 1987; set a goal to become the youngest graduate of medical school after reading about Ben-Abrahman's age 18 MD record in the Guinness Book (link), and did so at age 17 years, 294 days.
14		Thomas Wolsey (1472-1530) (IQ=200)	BS arts	1486	Completed his bachelor's in arts at Oxford University at age 14.
14		Stephen A. Baccus (1969-) (IQ=190)	BS computer science JD (age 16) MS computer science (18) PhD neuroscience (29)		IQ estimated by psychologist Aaron Stern (father of Edith Stern [IQ=203]), following an age 10 interview; BS computer science, University of Miami; entered University of Miami's law school at 14, graduating at 16, making a name for himself by successfully suing the State of New York for its age restrictions on the bar exam after receiving a special waiver in Florida; began practicing law at 17; MS computer science from NYU age 18; made partner in a firm by 19 (link); PhD in neuroscience age 29 at University of Miami (link); currently neurobiology professor at Stanford Medical School.
14		Eric Demaine (1981-) (IQ=?)	BS MS mathematics (age 15) PhD (age 20)	1995	BS age 14; MS mathematics age 15; PhD age 20; joined the MIT faculty in 2001, at age 20, reportedly the youngest professor in the history of MIT.
14		Alia Sabur (1989-) (IQ=?)	BS applied mathematics MS (age 17) PhD materials science and engineering (age 18)	2003	Completed BS (2003) in applied mathematics from Stony Brook University at age 14; MS (2006) and PhD in materials science and engineering at Drexel University; professor of mathematics at age 19.
14		Kathleen Holtz (1989-) (IQ=?)	BS JD (age 18)	2003	Holtz started at Cal State LA at age 10; entered UCLA Law at 15, earning a spot on the law review; passed the bar exam, first time around in 2007 (age 18).
15		Michael Grost (1954-) (IQ=200)	BS mathematics MS mathematics (age 17) PhD mathematics (age 23)	1969	Graduated from MSU, at age 15, with BS in mathematics; MS age (17); PhD in mathematics from the University of Michigan at age 23.
15		Edith Stern (1952-) (IQ=200-203)	BS science PhD mathematics (age 18)	1967	Enrolled in college at 12; BS in science from Florida Atlantic University (age 15), assistant professor of mathematics at MSU at 15; PhD in mathematics at age 18.
15		Adrian Seng (1977-) (IQ=233)	BS MS (age 17)	1992	completed BS at age 15; completed MS at age 17; then won major scholarship to study math at a prestigious American university.
16		William Sidis (1898-1944) (IQ=250-300)	BS mathematics	1914	Passed Harvard medical school anatomy exams (age 6); MIT entrance example (age 8); graduated high school (age 9); BS mathematics at Harvard in 1914 (age 16); professor of mathematics at Rice University (age 17), while pursuing PhD; age 18 to 19 was in Harvard Law School, then quit in his last semester, while in good academic standing, for no apparent reason; age 22, working on advance physics problems at MIT, but soon resigned, after learning of the military applications.
16		Dylan Jones (1992-) (IQ=200+)	BS mathematical and computer science; minor in bioengineering and life sciences	2007	Engineering freshman at Colorado School of Mines at age 10 (link); switched majors to graduate with a BS in math and computer science, with a minor in bioengineering and life sciences (age 16); completed first year of medical by age 17 (2009) and taking into account a seven-year residency, plans to be a board certified neurosurgeon by the time he's 28 (2020) (link)
17		John McClellan (1896-1977)	JD (age 17)	1913	Admitted to the Arkansas Bar Association in 1913 at age seventeen, having previously studied law in his father's office.
18		Christopher Hirata (1983-) (IQ=225)	BS physics PhD physics (age 22)	2001	At age 14 entered Caltech; began working with NASA at age 16 on a project exploring the possibility of colonizing Mars; completed BS at age 18 from Caltech with a 4.2 GPA; completed PhD in physics (2005) at age 22 at Princeton; currently is an assistant professor of astrophysics at CalTech.

(add summary)

Prodigy-on-prodigy influence

The following are known cases of prodigies hearing stories of other prodigies (such as burnout) and being particularly driven or influenced by this:

â— Early on, the Tao family (Terence Tao) had met Jay Luo during a trip to the US and noted the pitfalls of the approach of parental fixation with child's IQ as evidenced by Luo's burnout (link); Jay Luo (1970-) had completed his BS mathematics at Boise State University in 1982 (age 12), with a B+ average, degree completed in three years (link); had started graduate work at Stanford afterward, but dropped out.
â— Sho Yano, who had been told his IQ was tested at about 200, was told before age 12, by his mother, of the story of another child prodigy whose IQ registered 220, and how as the child grew into adulthood, he did nothing with his intelligence, and was never heard from again; after which Yano was determined not to let the same fate happen to him.
â— Michael Kearney, early on, had learned of Adragon De Mello's age 11 college graduation record, and followup fate, and specifically set out to beat De Mello's record by one year, which he did.
â— Balamurali Ambati (1977-) mastered calculus age 4; BS age 13 from New York University; MD at age 17 from Mount Sinai School of Medicine; ophthalmology residency at Havard; in circa 1987, set a goal to become the youngest graduate of medical school after reading about Ben-Abrahman's record in the Guinness Book (link), did so at age 17 years, 294 days.

Parentally-created geniuses

The following are the forced prodigy geniuses known to have been a product of their father's view or "experiment" that geniuses are made not born:

â— John Stuart Mill (IQ=200) is the classic example. He was the eldest son of the Scottish philosopher, historian, and economist James Mill and Harriet Burrow. John Stuart was educated by his father, with the advice and assistance of Jeremy Bentham and Francis Place. He was given an extremely rigorous upbringing, and was deliberately shielded from association with children his own age other than his siblings. His father, a follower of Bentham and an adherent of associationism, had as his explicit aim to create a genius intellect that would carry on the cause of utilitarianism and its implementation after he and Bentham had died.

â— Adragon De Mello (IQ=400) is the extreme example of a paternal-driven genius child. Adragon seems to have had the same relationship to his father as Beethoven had to his. Beethoven's father wanted to create the next Mozart and drove him relentlessly from birth to adulthood, beating him along the way, to achieve perfection. Before Adragon was born, Agustin De Mello, Adragon's father, had written a book about a child prodigy that was born that went on to save the world, so to speak, with his great intellect. Cathy Gunn, Adragon's mother, said she was horrified by the father's obsessive pressure on their son but there was nothing she could do about it, she says. She eventually had to leave the family, fearing for her life. Agustin De Mello would go to any lengths to get his way, according to Gunn. "He threatened to kill himself in front of me. He did that in front of A.D. in order to get him to do things," she recalls. Adragon's father would yell at the top of his voice and scolding the child to no end to achieve his vision. After Adragon began to burnout, his father threatened to come into the college with a hammer and bash the teacher's heads in if they did not give Adragon his degree. Adragon eventually was put into foster care.

â— William Sidis (IQ=250-300) is a another person in the paternal-driven category. Sidis' father, Boris Sidis, before William was born, was locked in body-sized cell for one-year in Russian for teaching presents to read and was released on the condition that he never teach again, after which he escaped to American, and considered the Boston Public Library to be something akin to walking into the gates of heaven, in his own words. With the birth of his son, he hypothesized that if he used William James reserve energy theory of the mind, in the accelerated raising of his son, who he named after William James, that he could achieve a genius mind of ability never before seen. William Sidis was later locked in his parent's asylum, eventually running away, and describing some of the events, in retrospect, as the "old tortures".

â— Edith Stern (IQ=200-203) is noted for her father Aaron Stern's famous "Edith experiment" (or Edith Project), which he carried out on his daughter, a premise that by using the certain type of progressive education, he could turn even a tribal child into a genius. "Aaron Stern, whose daughter Edith is the subject of his book *The Making of a Genius* (Renaissance Publications, 1971), stated that he could foster the same meteoric IQ in the children of the Tasaday tribe, a Stone Age people living in the Philippines."

â— Susan Polgar, Judith Polgar, and Sofia Polgar (IQs in the 170 to 180 range) were part of an "educational experiment" carried out by their father László Polgár, who sought to prove that children could make exceptional achievements if trained in a specialist subject from a very early age. "Geniuses are made, not born," was László's thesis. He and his wife Klara educated their three daughters at home, with chess as the specialist subject.

â— Sufiah Yusuf (1984-), a child math prodigy who entered Oxford at age 13, but eventually ran away and become a $400 per date ($95,000 annually) escort. Her domineering father Farooq Yusuf, early on subjected her to his "accelerated learning technique", in which her days revolved around stretching and breathing exercises in freezing-temperature rooms so as "to keep her brain attentive"; Sufiah would then study hard and be forced to play tennis with just as much intensity as fanatical Farooq drove her on. The routine was so effective, that Sufiah was seeded number eight in the country for under 21s (link). After three years at Oxford (age 15), Sufiah ran away, sparking a massive police hunt. In 2008, she commented that "she is still haunted by her hellish childhood-subjected to her father Farooq's accelerated learning technique, where she studied math day in day out in rooms kept freezing cold to improve her concentration. "As I grew older I began to clash with my father," she says. "He was violent on occasions. Because he pushed me so far academically, I became more confident for a girl of my age. I grew up too quickly. From 11, I was studying maths all the time. I didn't have any friends. I wasn't in the Brownies. My father said they didn't teach Muslim values. I hardly ever played with other children" (link). She passed her maths A level aged 12 and started at St Hilda's College, Oxford. "It was an amazing place but I was too young. By the time I was 15, I wanted to be in control of my life. I fought back." Sufiah sparked a two week nationwide police hunt when she ran away instead of going home at the end of term, saying she'd "had enough of 15 years of physical and emotional abuse".

â— Asia Carrera (IQ=156) is similar to Yusuf's story is the story; Carnegie Hall pianist (age 13); studying Japanese and economics at Rutgers University; homeless by age 17, after running away from home because of the pressure her demanding parents put on her; after which she turned to stripping, and then to porn, so to never be homeless again, in her own words.

Others who might well fall in the parentally created category include: Michael Kearney (whose father had absenteeism regrets) and Ainan Cawley (whose father seems to have missed or failed prodigy regrets in himself).

Calculus

See main: Prodigies and calculus; See also: Greatest mathematician ever; History of differential equations

An interesting benchmark, among individuals claiming or being cited with a 200+ IQ, as well as other unknown IQs listed on this page, is the age at which calculus was learned. Firstly, of course, Newton (1665) and Leibniz (1674), independently invented calculus and later differential equations:

Isaac Newton (IQ=190-200)	at age 22 (1665) invented the first form of the calculus, which he called "the method of fluxions and fluents" (link) (link).
Gottfried Leibniz (IQ=205)	at age 28 (1674) independently invented his own variant of the calculus (link).

The following individuals, whose calculus age are known, are ranked by age at which calculus was learned or mastered:

1.	Kim Ung-Yong (IQ=200-210)	3	Began to learn differential calculus at age 3 (link); solving integral calculus problems at age 4 (1967) (link); on Nov 2, 1967, at age 4, he solved an advanced stochastic differential equation (link); at age 5, was solving complicated differential and integral calculus problems (link).
2.	Balamurali Ambati (IQ=?)	4	mastered calculus at age 4 (1981) (link).
3.	Michael Kearney (IQ=325)	6	at age 6 (1988) was wrapping up homework on calculus to get his high school diploma (link).
4.	Terence Tao (IQ=211-230)	7	started to learn calculus when he was 7 (1982), at which age he began high school; by 9 he was already very good at university-level calculus; by 11, he was thriving in international mathematics competitions (link).
5.	John Neumann (IQ=163-180)	8	learned calculus at age 8 (link).
6.	Adragon De Mello (IQ=400)	9	learned calculus at age 9 (1985) (link).
7.	William Sidis (IQ=200-300)	9	mastered differential and integral calculus at 9 or 10 years (link).
8.	Michael Grost (IQ=200)	10	before age 8, had worked 2 to the 80th power, on a black board, in two hours time; mother could not help much with calculus questions, so at age 10 (1964) enrolled at Michigan State University. (link)
9.	Sky Choi (IQ=?)	11	taking Calculus II, Physics with Calculus I, at age 12 (2009), at Florida International University (link).
10.	John Mill (IQ=180-200)	11	learned calculus by age 11 (Catherine Cox).
11.	Albert Einstein (IQ=160-225)	12	taught himself calculus at age 12 (1891); integral and differential calculus by 13 (link) (link); in 1935, a rabbi in Princeton showed Einstein a clipping of the Ripley's column with the headline "Greatest living mathematician failed in mathematics." Einstein laughed. "I never failed in mathematics," he replied, correctly. "Before I was fifteen I had mastered differential and integral calculus" (link).
12.	Christopher Hirata (IQ=225)	13	at age 14 (1997), upon arriving at Caltech, he registered one of the highest scores in history on the Institute's mathematics diagnostic tests, thereby enabling him to forego freshman calculus and sophomore differential equations for a more difficult upper-division class (link).

Other interesting people include: Nobel Laureates Murray Gell-Mann (IQ=?), who taught himself calculus at age 7 (link) and Richard Feynman (IQ=125) was reading *Calculus for the Practical Man*, at age 13 (link), and had learned differential and integral calculus by 15 (link).

In the context of mathematics, it is interesting to note that there has been much discussion on Goethe's relationship with mathematics, the subject of which, along with astronomy, he seemed to have peculiar relationship with. [49] To exemplify, in 1826, in his discussion of his objection to the work on

light and color by English physicist Isaac Newton, Goethe comments: [57]

> "I receive mathematics as the most sublime and useful science, so long as they are applied in their proper place; but I cannot commend the misuse of them in matters which do not belong to their sphere, and in which noble science as they are, they seem to be mere nonsense. As if things only exist when they can be mathematically demonstrated. It would be foolish for a man not to believe in a woman's love for him because she could not prove it to him mathematically. She can mathematically prove her dowry, but not her love. The mathematicians did not find out the metamorphosis of plants. I have achieved this discovery without mathematics, and the mathematicians were forced to put up with it. To understand the phenomena of color nothing is required but unbiased observation and a sound head, but these are scarcer than folks imagine."

Ironically, Goethe did prove that love exists mathematically, 17-years prior, in his 1809 *Elective Affinities*, when he used the chemical mathematics of Swedish chemist Torbern Bergman's 1775 affinity tables, to present a treatise on the additions and subtractions of human chemical reactants when brought together, to participate in human chemical affinity reactions [39] The point expressed by Goethe, above, is exemplified by ridiculous incorrectness of the conclusions reached in the 1962 stable marriage problem, using pure mathematics, versus conclusions reached using the more realistic *circa* 1975 Gottman stability ratio (measurement + psychology + mathematics), versus even more realistic modern synthesis of circa 2005 human chemical bonding theory (measurement + chemistry + thermodynamics + physics + evolutionary psychology + mathematics).

On the topic of mathematical physics, he said "number and proportion, in their nakedness, destroy all form, and banish the spirit that informs real perception." Goethe seemed to use mathematics in his own unique way. The following excerpt, from the 1985 article "Goethe, Faraday, and Mathematics" by philosopher Nick Thomas, sums up the view of Goethe's style of mathematics: [5]

> "In recent centuries there have been two great men who have shown, in their approach to scientific research, that man is capable of proceeding like a true mathematician even thought he is not using mathematics in the accepted sense. These two men were Goethe and Faraday."

Considered mathematics "the most sublime and useful science", but was guarded against its misuse or misapplication, where it can become reduced to nonsense. Curiously, Goethe seemed to have been attacked by fellow scientists for his non-direct use of mathematics. In the opening to his 1826 treatise *On Mathematics and its Misuse*, in comment to individuals, such as d'Alembert and Lagrange, Goethe states: [52]

> "It pleased me not to find my intentions were falsely interpreted. I have heard accusations against me as though I were an opponent, an enemy of mathematics altogether; yet there is none who holds it in greater esteem than I, for it is able to do the very thing which to perform has totally denied me."

Vocabulary

Low estimates indicate that the average person is said to have an active vocabulary of about 5,000 words, of which most can be 'recognized', a little over 1,000 of which are used in general conversation, and slightly fewer than 1,000 of which are used in writing. [24] A 1991 report, estimated that a typical child aged five to six will have a working vocabulary of 2,500 to 5,000 words. [28] Another 1995 study estimated the vocabulary size of the average high-school graduate at 12,000 words and the college graduate at 17,000 words. [29] English language encyclopedist David Crystal stated in 2003 that values often cited in the media for a modern college graduate run as his as 20-25,000 words (and may be even higher for one with specialty degrees such as chemistry or botany), but that these high-end estimates tend to be meaningless as no significant research has been done on this topic. Crystal also states that there must always be two totals when presenting the size of a person's vocabulary: one reflecting *active* vocabulary (lexemes actively used in speech or writing) and *passive* vocabulary (lexemes known but not used). [27] The following are known estimates of number of active words used in the vocabulary of 200+ IQ individuals. The highest count goes to Goethe:

Rank	Person	Count	Reference
1.	Johann Goethe (IQ=180-225)	50,000-90,000 words	Quote: "Goethe has been described as the man with the largest vocabulary in history. He had a vast vocabulary of 50,000 words, twice that of Shakespeare." [24] Quote: "Goethe's active vocabulary, which is currently being processed in the multi-volume *Goethe-Worterbuch* on the basis of his writings and recorded dialogues, ran to an astonishing c. 90,000 words." [25]
2.	William Shakespeare (IQ=210)	17,000-30,000 words	Quote: "Shakespeare, *in his writing alone*, used a greater vocabulary than any English writer has ever done: an extraordinary 25,000 words." [24] Quote: "Crystal in 'The Language of Shakespeare' estimates the size of Shakespeare's vocabulary as being between 17,000 and 20,000 words"; "Shakespeare could be treated as having a vocabulary of 30,000 words."

3.	Anon girl (age 5) (IQ=200-220)	7,000 words	[26] Quote: "Langenbeck (1915) who described a young girl who at age 5 had a mental age of 11 years (and thus a ratio IQ of over 200), and an oral vocabulary of almost 7,000 words." [9]

Greatest mathematician

See main: Greatest mathematician ever

The following is W.C. Eells' 1962 published a listing of the 100 greatest mathematicians of all time (*Mathematics Teacher*, 7(55) (link)):

1. Newton (CB IQ=193)
2. Leibnitz (CB IQ=194)
3. Lagrange (Cox IQ=185)
4. Euler
5. Laplace (Cox IQ=190)
6. Euclid (Buzan IQ=182)
7. Gauss
8. Archimedes (Buzan IQ=190)
9. Descartes (CB IQ=178)
10. Cardano
11. Legendre
12. Pitagora
13. Monge
14. D'Alembert
15. Cauchy
16. Fourrier
17. Fermat
18. Napier
19. Pascal
20. Apolonije
21. Fibonacci
22. Viete
23. Ptolemej
24. Huygens
25. Regiomontanus
26. Diofant
27. Mac Laurin
28. Bernulli, Jacob
29. Pappus
30. Cavalieri
31. Jacobi
32. Bernulli, Johan
33. Wallis
34. Hamilton (Cox IQ=170)
35. Tartaglia
36. Heron
37. Poncelet
38. Riemann
39. Poisson
40. Abel
41. Chasles
42. Cremona
43. Roberval
44. Boskovic
45. Galilei
46. Clairaut
47. Lambert
48. Barrow
49. Strum
50. Stevin
51. De Morgan
52. Taylor
53. Kepler
54. Bernulli, Daniel
55. Desargues
56. Briggs
57. Sylvester
58. Camot (Cox IQ=170)
59. Maupertius
60. Babbage
61. Hermite
62. Tales
63. Smith, H.J.S.
64. Kovaljevska
65. Pacioli
66. Hipokrat
67. Gerbert
68. Clebsch
69. Plucher
70. Grassmann
71. Dirichlet
72. Cayley
73. Al-Hovrismi
74. Cotes
75. De Moivre
76. Boole
77. Weierstrass
78. Lie
79. Lobacevski
80. Ahmes
81. Borda
82. Beltrami
83. Frisi
84. Galois
85. Torricelli
86. Montucla
87. Hesse
88. Jordanus
89. Platon
90. Poincare
91. Steiner
92. Halley
93. Ampere
94. L'Hospital
95. Thomson (Lord Kelvin)
96. Boethius
97. Tschirnhausen
98. Bhaskara
99. Eratosten
100. Zenon

Equations

Another way to rank geniuses, similar to that used to rank geniuses by active vocabulary and WorldCat Literature ranking, is to rank geniuses by their use of or formulations of equations, which uses the language of mathematics. Opinions on the matter the ranking of the world's greatest equations tend to vary depending on point of view. The following tables give different points of view on the topic of greatest equations rankings. A good starting point are the five equations found in the 1995 book *Five Equations that Changed the World*, by American physicist Michael Guillen. [31]

Guillen's **Five Equations that Changed the World** (1995)

Rank	Equation		Formulator	Name	Date
1.	$F = G\frac{Mm}{d^2}$		Newton (IQ=190-200)	Law of universal gravitation	1687
2.	$P + \frac{1}{2}\rho v^2 = \text{constant}$		Bernoulli-Coriolis	Law of hydrodynamic pressure	1738
3.	$\nabla \times E = -\frac{\partial B}{\partial t}$		Faraday (IQ=180)-Maxwell	Law of electromagnetic induction	1831
4.	$E = mc^2$		Einstein (IQ=160-225)	Mass-energy equivalence	1905
5.	$\Delta S_{universe} > 0$		Clausius	Second law of thermodynamics	1865

In 2002 book *It Must Be Beautiful: Great Equations of Modern Science*, edited by English physicist Graham Farmelo, eleven essays were written by various scientists on the big equations of the 20th century. These equations are shown below, in order of chapter listing: [33]

Farmelo's **Great Equations of Modern Science** (2002)

Rank	Equation		Formulator	Name	Date
1.	$E = hf$		Planck-Einstein (IQ=160-225)	Planck-Einstein equation for the energy of a quantum	1900
2.				The logistic map	
3.				Drake equation	
4.	$E = mc^2$		Einstein (IQ=160-225)	Mass-energy equivalency relation	1905
5.				The Molina-Rowland chemical equations and the CFC problem	
6.			Schrodinger	Schrodinger wave equation	1926
7.				Dirac equation	
8.				Mathematics of evolution	
9			Einstein (IQ=160-225)	Einstein equation of general relativity	
10.			Shannon	Shannon's information theory equations	1948
11.				Yang-Mills equation	

Although Farmelo's list is not a ranked greatest equations of all-time, it did inspire a follow-up readers poll on this topic. In May 2004, stimulated by Farmelo's equation list, American science historian Robert Crease wrote an article in *Physics World* entitled "The Greatest Equations Ever" in which he asked readers to send in their shortlists of great equations, explaining why their nominations belonged on the list and why, after which he received about 120 responses, proposing about 50 different equations. [34] The poll results were published in a followup article, which showed Maxwell's equations and the Euler equation topped the poll. The top 20 greatest equations are show below, listed in order of the number of people who proposed them: first two received about 20 mentions each out of a total of about 120; the rest received between two and 10 each: [35]

Crease's **Twenty Greatest Equations of All-Time** (2004)

Rank	Equation	Formulator		Name	Date	Original List
	$\nabla \cdot \mathbf{D} = \rho$		Gauss-Maxwell			
	$\nabla \cdot \mathbf{B} = 0$		Gauss-Maxwell			
1.	$\nabla \times E = -\frac{\partial B}{\partial t}$		Faraday (IQ=180) Maxwell	Maxwell's equation	1861	
	$\nabla \times \mathbf{H} = \frac{\partial \mathbf{D}}{\partial t} + \mathbf{J}$		Ampere-Maxwell			
2.	$e^{i\pi} + 1 = 0$		Euler	Euler's identity	1755	
3.	$\mathbf{F} = m\mathbf{a}$		Newton (IQ=190-200)	Newton's second law of motion	1687	

4.	$a^2 + b^2 = c^2$		Pythagoras	Pythagorean theorem	530BC
5.	$E\Psi = H\Psi$		Schrodinger	Schrodinger equation	1926
6.	$E = mc^2$		Einstein (IQ=160-225)	Mass-energy equivalence relation	1905
7.	$S = k \ln W$		Clausius-Boltzmann-Planck	Boltzmann equation (statistical second law)	1901
8.	$1 + 1 = 2$		Grammateus-Recorde	Addition equation	1518
9.	$\delta S = 0$		Hamilton (IQ=170)	Hamiltonian variational principle	1835
10.					
11.					
12.					
13.	$C = 2\pi r$		Archimedes	Circumference of a circle	250BC
14.					
15.					
16.					
17.					
18.	$PV = nRT$		Bernoulli-Boyle-Charles-Lussac-Planck	Ideal gas law	1738
19.					
20.	$E = h\nu$		Planck-Einstein	Planck equation	1900

Maxwell's equations:
$\nabla \cdot \boldsymbol{D} = \rho$
$\nabla \cdot \boldsymbol{B} = 0$
$\nabla \times \boldsymbol{E} = -\partial \boldsymbol{B}/\partial t$
$\nabla \times \boldsymbol{H} = \partial \boldsymbol{D}/\partial t + \boldsymbol{J}$
where $\boldsymbol{D}$ is the displacement field, $\boldsymbol{E}$ is the electric field, $\boldsymbol{B}$ is the magnetic-flux density; $\boldsymbol{H}$ is the magnetic-field strength, ρ is the free charge density and $\boldsymbol{J}$ is the free current density.
Euler's equation: $e^{i\pi} + 1 = 0$
Newton's second law: $F = ma$
Pythagoras's theorem: $a^2 = b^2 + c^2$
Schrödinger's equation: $H\Psi = E\Psi$
$E = mc^2$
Boltzmann equation: $S = k \ln W$
$1 + 1 = 2$
Principle of least action: $\delta S = 0$
De Broglie's equation: $p = h/\lambda$
Fourier transformation
Einstein's field equations for general relativity: $G_{\mu\nu} = 8\pi G T_{\mu\nu}$
Circumference of a circle: $C = 2\pi r$
Dirac equation: $i\gamma \cdot \partial\psi = m\psi$
Euler's "other" formula: $\zeta(s) = \prod[(p^s/(p^s - 1)]$
Hubble equation: $v = H_0 d$
Simplest ratio: $a/b = c/d$
Ideal gas law: $PV = nRT$
Balmer series: $1/\lambda = R(1/n_1^2 - 1/n_2^2)$
Planck equation: $E = h\nu$

This polling effort resulted in the 2008 book *The Great Equations: Breakthroughs in Science from Pythagoras to Heisenberg*. [36] Another short two-equation list comes from German physicist Ingo Muller's 2007 book *A History of Thermodynamics*, who comments that "S = k ln W is easily the second most important formula in physics, next to E = mc², or on par with it." [32]

Muller's **Two Most Important Formulas of Physics** (2007)

Rank	Equation		Formulator	Name	Date
1.	$E = mc^2$		Einstein (IQ=160-225)	Mass-energy equivalence	1905
2.	$S = k \ln W$		Clausius-Boltzmann-Planck	Boltzmann equation (statistical second law)	1901

Chemistry

See main: Greatest chemist ever; also: History of chemistry

In theme to previous equation tables, ranked generally according to the view of mathematicians and physicists, another way to gain insight into intellectual rank is by a ranking of all-time famous equations, theories, and discoveries used in the hard science field of chemistry. The top ten greatest chemists according to English chemist James Partington's (JP) famous 1937 *A Short History of Chemistry* (according to name index page count), which is the shortened version of his three-volume treatise, are: Jacob Berzelius (52), Justus Liebig (39), Jean Dumas (38), Robert Boyle (30), Antoine Lavoisier (26), Friedrich Kekule (22), Joseph Priestley (23), Henry Cavendish (21), Carl Scheele (20), and Claude Berthollet (19). These big ten chemists are followed by Humphry Davy (17), Joseph Gay-Lussac (17), Joseph Black (16), Johann Helmont (16), Friedrich Wohler (16), Edward Frankland (15), Hermann Kolbe (15), John Dalton (14), August Laurent (13), Thomas Thomson (13), Robert Bunsen (12), August Hofmann (12), Robert Hooke (12), Michael Faraday (11), John Mayow (11), Julius Meyer (10), Amedeo Avogadro (10), Richard Kirwan (10), Adolf Baeyer (10), Georg Stahl (9), Torbern Bergman (9), Aristotle (9), Fourcroy (9), Hales (8), Gmelin (8), Avicenna (7), Herman Boerhaave (7), Werner (7), Paracelsus (7), Albertus Magnus (6), Guyton Morveau (6), Graham (6), Johann Becher (6), Isaac Newton (6), Wilhelm Ostwald (6), Cannizzaro (6), Ernest Rutherford (6), J.B. Richter (6), Pasteur (6), Marcellin Berthelot (5), Willard Gibbs (3), Geber (2), Johann Goethe (1), among others in the near 1-4 page range.

Two-time Nobel Prize winners

See also: Nobel Prize winners in thermodynamics and thermodynamics awards

Another angle at which to gain perspective on IQ estimates is to compare intellectuals that have received two Nobel Prizes, which are yearly awards given out to those who make outstanding contributions in physics, chemistry, literature, peace, and physiology or medicine, for the betterment of humankind. Those who have won this prize two separate times are listed below, ranked by estimated IQs (where known): [36]

Rank	Person	IQ	Prizes	Note	Ref
1.	Marie Curie (1867-1934)	180-200	â— Physics (1903): discovery of radioactivity â— Chemistry (1911): isolation of pure radium	Mother and sister died before she was 11	[37]
2.	Linus Pauling (1901-1994)	160-170	â— Chemistry (1954): hybridized orbital theory â— Peace (1962): nuclear test-ban treaty activism	Father died when he was 9	[38]
3.	John Bardeen (1908-1991)		â— Physics (1956): invented the transistor â— Physics (1972): superconductivity theory	Mother died when he was 12	
4.	Frederick Sanger (1918-)		â— Chemistry (1958): insulin molecule structure â— Chemistry (1980): virus nucleotide sequencing		

Nietzsche's uberman

Another perspective on criterion for a universal genius, is that the person is of the magnitude to be a replacement for God. This logic comes from the from German philosopher Friedrich Nietzsche's 1883 description of the hypothetical "uberman" (overman or superman) prophesized to replace god in the future, as famously discussed in his *Thus Spoke Zarathustra*, in which he expresses the fundamental contention that since traditional values, represented primarily by Christianity, had lost their power in the lives of individuals, expressed by the proclamation "god is dead", that there would inevitably be a god-like someone to emerge in the future to fill this void. Nietzsche saw the Superman as the answer to the nihilistic rejection of all religious and moral principles that would be consequent on a widespread acceptance that god is dead. The uberman being the exemplar of true humanity. Although he explicitly denied that any uberman had yet arisen, he mentions several individuals (ranked below by date) who could serve as models: [42] English philosopher and mathematician Bertrand Russell was said to have interpreted Nietzche's overman as a person with an IQ of at least 180 and considered himself to have this IQ (link).

Uberman Prototypes		
1.	Socrates (469-399BC)	IQ=160
2.	Julius Caesar (100-44BC)	IQ=170
3.	Leonardo da Vinci (1452-1519)	IQ=180-225

40-ft statue of 17 great authors at the 2006 Walk of Ideas,

4.	Michelangelo Buonarroti (1475-1564)	IQ=175-180
5.	William Shakespeare (1564-1616)	IQ=210
6.	Johann Goethe (1749-1832)	IQ=180-225
7.	Napoleon Bonaparte (1769-1821)	IQ=145

Germany, to commemorate the invention of the printing press by Johannes Gutenberg, in circa 1450, with **Goethe** as the foundation, upon which the others rest.

Napoleon and Goethe, to note, were mutual admirers of each other, Goethe viewing Napoleon as an exemplar of the eternally striving person; Napoleon keeping a copy of Goethe's *Werther* in his campaign library (claiming to have read it seven times). In comment on meeting both Napoleon and Beethoven, Goethe stated that he was impressed with the former but not the latter.

Prodigies | God

See main: Prodigies on god; See also: Existence of god

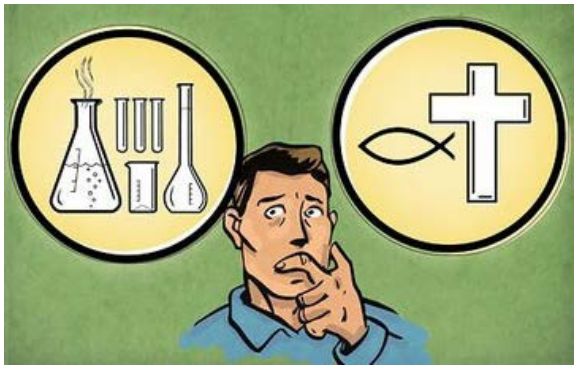

Does God exist?

A standing rule, concerning 200+ IQs, particularly for those born after 1895, a belief in God or gods is an automatic disqualification from the 200+ IQ range. This question, in fact, should be the first question asked on any standard high IQ test, whereby an answer of "yes" would result in an unequivocal 15% reduction in the final IQ score. The reason for this is that one's opinion on the matter of religion, and particularly on the great 'theory of god', is a huge demarcation or insight into one's intellectual framework. God is humankind's oldest scientific theory, conceived by genius men of olden days. Subsequently, if one is a true modern-day genius, it is a matter of duty to question everything, especially those most established ideas. The theory is so dominant, that, in fact, at a minimum, seventy-two percent of the world's population currently believe this theory.

The theory of god serves its purpose for the masses, but for the all-knowledgeable genius, prior to the early 19th century, one may have been excused for adherence to the theory of god, in its various forms, but after 1822, the year in which the cryptic Rosetta stone was deciphered by English physicist Thomas Young, after which it was possible to see clearly that the main tenets of the major modern day religions (Christianity, Islam, Hinduism, etc.) were simply reformulated Egyptian mythology, particularly the story of the birth of the sun god Ra out of the water or choas of beginning god Nu, and the afterlife, rebirth, and reincarnation theories that followed:

Egyptian Version (Pyramid texts: 2500 BC)	Hindu Version (Rig Vida: 1500 BC)	Jewish Version (Pentateuch: 500 BC)
Nun or **Nu**	Ma-**nu**	Noah
Ra	B-**ra**-hman Saraswati	Ab-**ra**-ham Sarai

Photos	Religion	%
Sarai Abraham	Ab-**ra**-ham faiths	53.1
Saraswati Brahma	B-**ra**-hma faiths	18.9
	No religion	15.3
	Yin-Yang faiths	6.4
	Other faiths	6.3

This issue of religious syncretism became even clearer to the inquisitive genius reader when in 1895 Egyptologist Wallis Budge published *The Egyptian Book of the Dead* (*Papyrus of Ani*), wherein after "untold numbers of people began to write books, papers, and dissertations on the parallels between Jesus and Osiris (Ra's great grandson). [54] The issue of the Egyptian origin to the modern world religions can be said to have solidified, without doubt, after the publication of American religious scholar and Egyptologist Gary Greenberg's 2000 *101 Myths of the Bible*, wherein he steps through ever story in the Bible and shows the original Egyptian version (Pyramid texts + Coffin texts), from which these stories (Bible, Koran, Rig Vida, etc.) originated. [55] Beyond this the modern "human molecule" view of human existence, from which humans are of the same family as hydrogen atoms, would forever would act to inter the age-old theory of god, along with other now defunct scientific theories, including: vitalism, caloric theory, flat earth theory, spontaneous generation, and life, in the mind of the true modern universal genius. In this context, the following opinions on the theory of god, expressed by the listed 200+ IQ group, gives a creditable intellectual litmus test as to the truthfulness of each person's estimated IQ:

Person	IQ	Religious Beliefs	Score
Johann Goethe (1749-1832)	180-225	â— At age 21, at the University of Strasbourg, completing a dissertation (rejected on the grounds that it was unorthodox) on "The Legislature, On the Power of the Magistrate to Determine Religion and Culture", in which he contended, among other things, that "Jesus Christ is not the author of Christianity, but rather a subject composed by a number of wise men and that Christian religion is merely a rational, political institution." [65]	pass
William Sidis (1898-1944)	200-300	â— At age 6, was a confirmed atheist. [60] â— At age 21, when asked in court if he believed in god, he replied "No" and clarified that evolution was his god; when pressed further about this he stated that he did not believe in the "big boss of the Christians", but that he did believe in something "that is in a way apart from a human being". [60]	pass
Albert Einstein (1879-1965)	160-225	â— At age 75, gave his opinion that "the word of God is nothing more than an expression of human weakness"; described the Bible as "pretty childish"; and stated that "all religions are incarnations of the most childish superstitions." [56]	pass
James Maxwell (1831-1879)	190-205	â— At age 48, in his last year (the same age his mother passed from the same infliction [stomach cancer] he would pass from), wrote out his final private thoughts about the relationship of science and religion, the soul, choice and chance, and death and eternity his is riddle poem "A Paradoxical Ode".	?
Marie Curie (1867-1934)	180-200	â— At age 11, after both her mother and oldest sister had died (from tuberculosis and typhus, respectively), she fell into a profound depression and concluded that God did not exist. [64]	pass
Voltaire (1694-1778)	190-200	â— Quote: "I want my lawyer, my tailor, my servants, even my wife to believe in God, because it means that I shall be cheated and robbed and cuckolded less often. ... If God did not exist, it would be necessary to invent him."	pass
Michael Kearney (1982-)	200-325	â— At age 21, commented: "You have to be focused on the things that make you a human and not a golden god. You have to focus on just living." (link)	?
Marnen Laibow-Koser (1975-)	268	â— At age 4, engaged in "mystical behavior"; saw his recently deceased Aunt Bessie being carried up an a flight of stairs, assisted by two old ladies, while at the funeral reception (although no one else could see these invisible stairs or invisible ladies), but supposedly described Bessie's funeral dress and arrangement exactly and communicated with her, even though he had never really met here (*Nature's Gambit*, pgs. 187-203). â— At age 34, stated "once again, God / the universe / whatever has reminded me that you get what you want (or what you think you want) when you're not really looking for it." (link)	fail
Christopher Langan (1952-)	174-210	â— Began to question god as a child; later returned to god, and is currently writing a treatise called the cognitive theoretic model of the universe, a type of intelligent design themed argument for the existence of god. â— At age 48, commented "Regarding evolution and creationism, the linkage is simple: Biblical accounts of the genesis of our world and species are true but metaphorical, our task is to correctly decipher the metaphor in light of scientific evidence also given to us by God." (link)	fail
Sho Yano (1990-)	200	â— Name means "happiness with god" (link). â— At age 14, commented that "I'm gifted. I got my gift from God, and I think I better not waste it" (link).	fail
Michael Grost (1954-)	200	â— Grost mostly likely believes in god. In the biographical book of him (*Genius in Residence*, 1970) written by his mother, when he was 16 (and old enough to object), the first page opens to a description of describing Michael as a "miracle of God", and the last page concludes with "may we offer those successes my son has experienced in the past, and God willing, those successes he may experience in the future …"	fail
Marilyn vos Savant	186-	â— Quote: "Suppose you have bet on horse number 1 in a 3 horse race in which there is no favorite. After you have placed your bet, omniscient god, who, of course, knows the horse destined to win and how you have bet tells you, 'It's not going to be horse number 3'. Depending on God's other attributes, e.g. whether God seeks to guide people towards the right decisions, you should probably switch to horse	fail

(1946-)	228	2 if you have the opportunity." (link) â— Quote: "Religions cannot be proved true intellectually. They come from the heart—and your parents—not the mind." (link)	
Rick Rosner (1960-)	140-250	â— At age 7, in his own words, "when my parents returned, they found me spinning clockwise (so that I wouldn't accidentally travel backwards in time) and chanting to God. I was taken to a child psychiatrist and given more IQ tests, including parts of a Stanford-Binet." [59]	fail
Naida Camukova (c.1976-)	140-200	â— Believes in God and creation; has read the Koran multiple times, and re-reads it frequently; uses phrases such as "God willing", etc. (link).	fail

(add discussion)

Date day formula

A curious phenomenon among prodigies is the ability to name the day of the week for any given date in history; a tool often used to entertain people at social gatherings and on talk shows. The algorithm is a relatively memory trick, named the "doomsday rule" by English mathematician John Conway in 1982. The trick for doing calendars is actually a very simple trick: simply remember the first day of every month. January 1, 2010, for example, was a Friday so one wants to know what it would have been in 1982 it would also be a Friday, as every 28 years is a repeat; if you need to go back by say 4 years it should fall on a Sunday since every 4 years is a leap day; if you want to know 2014, we know it will fall on Wednesday. Once one gets to the year and month it is all about adding 7's and then 1's from there on. Whatever the adding trick used, the phenomenon seems to arise naturally in such individuals. Sidis, for instance, by the age of five had devised a formula whereby he could name the day of the week for any given historical date. [30]

150+ IQ thermodynamicists

Among other notable high-IQ pre-thermodynamicists, thermodynamicists, and human thermodynamics, there is English philosopher and mathematician Bertrand Russell who is said to have either claimed his own IQ was 180 or that a psychologist determined this for him via an intelligence test.

Captioned picture of **Goethe** (age 15) from the 1927 *Journal of Heredity* article "The Child Hood of Genius", by scientist Paul Papenoe, with the caption: "Goethe at the age of fifteen. 'His IQ may in the history of mankind have been equaled in a few instances, one may well wonder whether it has ever been excelled.' From the facts which are known of Goethe's childhood he is credited with a youth intelligence quotient of 180, which means that at five years of age he was far advanced as the average child of nearly ten. When he was twelve he amused himself by planning and sketching out a novel written in seven languages." [3]

In Cox's 1926 listing: Antoine Lavoisier (IQ=170), formulator of the caloric theory, Lazare Carnot (IQ=170), father of Sadi Carnot and founder of the École Polytechnique, the first "school" of thermodynamics", and William Hamilton (IQ=170), author of the 1934 pre-Clausius paper "On a General Method in Dynamics", Herman Boerhaave (IQ=165), formulator of Boerhaave's law (precursor to caloric theory), of James Watt (IQ=165), steam engine pioneer, Stephen Hawking (IQ=160), a founder of black hole thermodynamics and outliner of concepts such as neurological entropy, as well as as well as Sigmund Freud (IQ=156), founder of psychodynamics.

Another noted high IQ HT pioneer is American mathematician Norbert Wiener, a former child prodigy who completed his BS in mathematics from Tufts College at age 14 and PhD in mathematics from Harvard at age 18, who while in the class of Harvard mathematics professor Edward Huntington's (*circa* 1909-11) commented about his classmate William Sidis: [16]

> "Both Sidis and I were in the class, and it was there that I first became aware of the boy's real ability and how great a loss mathematics suffered in his premature breakdown."

During his first year of classes, Sidis left Harvard for some months because of a nervous breakdown shortly after having given his speech, at age 11, on four dimensional bodies. To note, Wiener's human thermodynamics theories, as found in his 1948 *Cybernetics* and 1950 *The Human Use of Human Beings*, are on par or comparible to those of Sidis.

Another noted high IQ child prodigy was Hungarian-born American mathematician John Neumann (IQ=163-180), one of the founders of quantum thermodynamics, who by the age of six was able to divide eight-digit numbers in his head, exchange jokes in classical Greek, and to memorize the names, numbers, and addresses in phone books (displayed as a game to guests), and at the age of 23, simultaneously competed a BS degree in chemical engineering, from the Technische Hochschule Zurich, and a PhD in mathematics, with a thesis on set theory, from Pázmány Péter University in Budapest.

To have conceived of a type of human thermodynamics theory, as Goethe, Sidis, and Hirata did, one must have been to near adulthood age by about the year 1718 the year in French chemist Etienne Geoffroy made the first affinity table, a tabulation of the forces of reaction between chemical species, the measure of this force, after 1882 (via Hermann Helmholtz), being determined through free energy change calcuations.

Burnout/detached/defunct/overestimated IQs

Based on the ceiling IQ benchmark , discussed above, if one reads or hears claims of individuals scoring past the Cox-Buzan ceiling (213+) on an IQ test, e.g. De Mello (400), Kearney (325), Sidis (300), Tao (230), Savant (228), Hirata (225), or others (discussed below), we would define these as "false

positive IQs" or overestimated that may have ended in intellectual burnout, in that they may have been miscalculated over-estimates. In other words, these overestimates result from age-ratio biasing and which tend to be indicative of productivity burnout prior to age 25, as evidenced by four of six of these individuals: De Mello (age 11 burnout), Kearney (age 17 burnout), Sidis (age 22 burnout), and Savant (never burned). Then we have individuals who as children had estimated 200+ IQs, supposedly in the genius range, but as adults did not seem to realize their supposed genius potential of getting into historical genius ceiling stardom, not necessarily "burning out", but fettered out into the anonymous average or above average crowd, in terms of adulthood occupational achievements. These prodigies, listed below, can be considered to have "deburned" their potential or stepped out of the lime light burn.

1.		Adragon De Mello (1976-)	*400* (age 5)	Set a world record by graduating from college at age 11 (BS computational mathematics); after which he returned to junior high school; and now works at Home Depot.
2.		Michael Kearney (1982-)	*325* (age 4), 200 (age 14)	Set world record by graduating from college at age 10 (BS anthropology); MS biochemistry (age 14); MS computer science (age 17); now plays poker and enters game shows for a living.
3.		William Sidis (1898-1944)	200, 250-300 (age 42)	Tested out in Harvard Medical school entrance exams (age 9); set record by entering Harvard at age 11; had a "breakdown" at about age 12; graduated BS mathematics (age 16); Harvard Law school age 17; published work on thermodynamics age 22; withdrew from public life at age 24; became vagabond thereafter.
4.		Nathan Leopold (1904-1971)	200, 206-210	Reported to be a child prodigy with an IQ of 210 who spoke his first words at four months; graduated from the University of Chicago at the age of 19 (1923) with honors; entered Chicago Law School that same year and while making plans to transfer to Harvard Law School in the fall, he and another prodigy named Richard Loeb, who was himself the youngest graduate in the history of the University of Michigan, kidnapped and killed Loeb's second cousin Bobby Franks (age 14), the son of a Chicago millionaire.
5.		Marnen Laibow-Koser (1975-)	*268*	Speaking grammatically correct sentences at three months of age; at age 3.5, he read, wrote, and spoke several languages, studied mathematics, and composed music, played the violin; at age 7-8 was attending the MIT computer lab doing programming; obtained a perfect score on the Stanford-Binet at age of about 8; the term "omnibus prodigy" was coined to describe him, as his talents were not bounded within a single domain; child scholar expert Halbert Robinson commented that "Adam was perhaps the most gifted child ever tested on the Stanford-Binet"; he is currently a computer programmer and music composer, and is listed as the premier case of the "gifted underachiever".
6.		Marilyn vos Savant (1946-)	*228* (age 10), **186** (age 40)	Perfect Stanford-Binet score (age 10); pregnant at age 16; college dropout shortly thereafter; then began working in the family laundry business; at the age of 37 (1983) was having dinner with a lawyer Andrew Egendorf who wanted to write a book about high IQ societies (Savant was in Mensa), and suggested to Savant that they "cash in" on her 1956 test score by sending it to Guinness Book; which he did the following year, and by 1985 she was listed as the IQ record holder, and owing to this fame landed a job as newspaper columnist at *Parade Magazine*.
7.		Kim Ung-Yong (1963-)	200-210	Started taking physics in college at age 4; began working with NASA at age 12; PhD in nuclear physics age 14; burned out at age 16, returned to Korea, wishing to remove himself from the public eye; re-entered a mediocre local university obtaining a PhD degree in an easier field of civil engineering; in an interview with the press, on this switch, he has commented "I was not a loser, but just wanted to live ordinarily."
8.		Michael Grost (1953-)	*200* (age 8)	Supposedly had an "IQ so far above 200 it could not be measured meaningfully"; giving college lectures age 8; BS (age 15), MS (age 17), and PhD (age 23) all in mathematics; works as a systems architect at Detroit computer company.
9.		Edith Stern (1952-)	200, 201-203	BS science (age 15), PhD mathematics (age 18), in 2000 was working for IBM in secret computer software research and development.

Sidis, however, is a curiosity in this group, in that his only major work was the 1920 book *The Animate and the Inanimate*, published at age 22, he is judged by other high IQ peers, such as American mathematician Norbert Wiener, a former child prodigy himself (BS in mathematics from Tufts College at age 14, PhD in mathematics from Harvard at age 18), to have had "real ability" and was still testing out in the 250+ range into his 40s.

A point to note, regarding the terms intellectual "brightness", all-time "star" genius, "burnout" IQs, and "deburners", etc., is that these are not simply figures of speech or pure analogy (as many would argue), but rather terms modeled on the phenomenon of hydrogen burning inside of stars, where gravitation pressure acts to squeeze central "star" hydrogen atoms, causing chain thermonuclear reaction which result to release energy.

On this model of stellar 'brightness', a human being can be considered as a large hydrogen atom (made of 26-elements to precise), defined technically as a "human molecule", and this same pressure-induced burning phenomenon acts in the human sphere, in which human electromagnetic pressure acts to squeeze central "star" human molecules, e.g. Geothe, Da Vinci, Newton, Einstein, etc., causing human thermonuclear reactions (an high energy type of human chemical reaction) which result to release energy.

These types of high-energy reaction are indicative of the laws, workings, and movement of the universe. Those individuals forced into this universal current, so as to become adult star "human molecules" or all-time "bright" geniuses, are thus different than those who may have had the potential to become stars, but failed to react, for whatever reason.

Quotes

The following are related quotes:

> "People who talk about their IQ are losers."
>
> Stephen Hawking, when asked in a *New York Times* interview what his IQ was.

References

The references to this page have been moved to separate page: IQ: 200+ (references); as this page became too long (20-30 pages) at which point wiki editor stops working.

Further reading

â— Sommer, Julia K. (1931). "Three Hundred Geniuses: Their Early Mental Traits", *World Theosophy Magazine* (pgs. 143-47), February 1931-June 1931.
â— Hollingworth, Leta S. (1942). *Children Above 180 IQ: Stanford-Binet Origin and Development.* Arno Press.
â— Stanley, J. and Benbow, C. (1983). "Extremely Young College Graduates: Evidence of Their Success." *College and University: American Association of Collegiate Registrars and Admissions Officers,* Vol. 58, pgs. 361-71.
â— Identifying the most intelligent person in the world – Helium (14+ articles).

Related videos

Jan. 2009 Domino's pizza commercial with **Rick Rosner**, subtitling him as someone with an **IQ of 200**, playing the game go with a fifth grader.

Sep. 29, 2008 video "**Top 10 IQ Geniuses**" by Iraqi student San Khorany; list: 1. Goethe (IQ: 210), 2. Da Vinci (IQ: 205), 3. Swedenborg (IQ: 205), 4. Leibniz (IQ: 205), 5. Mill (IQ: 200), 6. Pascal (IQ: 195), 7. Wittgenstein (IQ: 190), 8. Fischer (IQ: 187), 9. Galileo (IQ: 185), 10. De Stael (IQ: 180).

Films

â— The Kid with the 200 I.Q. (1983).
â— Real Genius (1985) supposedly based on real students from California Institute of Technology (link).
â— Good Will Hunting (1997) was based on the life of William Sidis (IQ=250-300) (see: Good Will Hunting (William Sidis)).
â— The 2006 film *The Genius Club*, premised on a scientist with an IQ of over 200 who builds a bomb and threatens to blow Washington DC up unless the President brings together all the people he can find with IQs over 200 to an abandoned building in DC to play a game. The game consists of a Q & A with questions all relating to solving the world's problems. The participants (which turns out to be seven geniuses with IQs over 200) are taken from their lives on Christmas Eve and are put through the test and if they can amass 1,000 points before dawn the next morning, they can walk and DC is safe. At times, the discussion is said to be reminiscent of university lectures, but as the questions progressed to being more moral, the feel of the movie changes. The discussions, however, come off as more like those of a randomly selected group of reasonably intelligent people, who end up discussing rather mundane questions, such as why toner ink is so expensive, war, famine, etc., the culmination of which is an attempt to arguably prove the existence of god, albeit a discussion that results to be the same old tired Rene Descartes and C.S Lewis arguments.

Books

â— Pfeffer, Adam. (2011). *The Genius with the 225 IQ*. iUniverse.

External links

â— List of child prodigies – Wikipedia.
â— William James Sidis | Maza's Weblog (19 Feb 06) – Ranks: #1 Sidis, #2 Da Vinci, #3 Goethe, #4 Voltaire, #5 Newton.
â— How do I get a man with an IQ over 200 to father my babies? – Yahoo Answers.
â— Child Prodigies Through History – HubPages.com.
â— Top 50 Geniuses of All Time (random order) – 2008 list by Drew at 4Mind4Life.com/blog.

θΔics

The following is the listing of case by case **IQ references** (top table) and numbered references (below) to the IQ pages listed in the EoHT.

Case-by-case references

Other case-by-case individual references, giving citations of 200+ IQs, which consist in larger of IQ estimates, and childhood ability, include:

Maxwell		Notes
James Maxwell (1831-1879)		● Estimate: $IQ_?$=190-205 (extrapolated/influence/deepness/variety) ● Millennium poll voted Maxwell as the third greatest physicist of all time, after Newton (IQ=190-200) and Einstein (IQ=160-225)" (link) ● #1 greatest equations of all-time (Crease, 2004); #3 greatest equation to change the world (Guillen, 1995); originator of Maxwell's demon; founder of electromagnetic theory a founders of thermodynamics; first color photograph; work formed the basis of Einstein's work; Mahon's 2003 book *The Man who Changed Everything*, gives an idea of the density of Maxwell's mind, etc.
Clausius		**Notes**
Rudolf Clausius (1822-1888)		● Estimate: $IQ_?$=190-205 (density/influence) ● See: Euler genealogy (to seen the deep influence of Clausius) ● His 1865 mechanical theory of heat, according to Einstein (IQ=160-225), is the only the theory, in science, of universal content, least likely to be ever be overthrown.
Euler		**Notes**
Leonhard Euler (1707-1783) ● See: Euler genealogy timeline (with listed known IQs of other mathematicians, for comparison).		● Estimate: $IQ_?$=180-200 (embeddedness/comparison/influence) ● IQ estimates for Euler seem to be non-existent, in spite of the fact that he is often cited as the most prolific mathematician of all time and generally considered the #1 greatest mathematician of all time; or at least in the top four or five (#4) (#1) (#4) (#5) (#4 in W.C. Eells' 100 greatest mathematicians of all time, *Mathematics Teacher*, 7(55), 1962) (#1) . ● He is often compared to Einstein (160-225) in intellect, to Gauss (Sidis compared IQ=250-300) in mathematical-physics ability, or a ranking above that Euclid (Buzan IQ=182) in straight greatest mathematics rankings.
Ettore Majorana		**Notes**
		In 1938 (age 32), Italian physicist Enrico Fermi, who had previously took him in his group when he was a student, ranked Majorana with Galileo Galilei (IQ=183-200) and Isaac Newton (IQ=190-200): "There are several categories of scientists in the

Ettore Majorana (1906-1938)

● Zichichi, Antonino. (2006). "Ettore Majorana: Genius and Mystery", Ettore Majorana Foundation and Center for Scientific Culture.

● Mantegna, Rosario N. (2006). "The Tenth Article of Ettore Majorana" (abs), Arxiv.org, Aug 29; in: Bassani G.F (ed) (2006) *Ettore Majorana Scientific Papers: on the Occasion of the Centenary of the Birth* (pgs. 250-26). Springer.

● (a) Amaldi, Edoardo. (1966). "Ettore Majorana: Man and Scientist: Commemoration Speech" (pgs. 25-95; quote: 57-8); "La Vita e l'Opera di E. Majorana" (Accademia dei Lincei, Rome, 1966); "Ettore Majorana: Man and scientist," in *Strong and Weak Interactions* (pgs. 10-77). Present problems, A. Zichichi, ed. (Academic, New York, 1966).
(b) Majorana, Ettore. (c.1935). "The Value of Statistical Laws in Physics and Social Sciences" (online reprint, with biography by Carlos Allones Pérez); Spanish version in: C. ALLONES (2004): "El valor de las leyes estadísticas en la Física y en las Ciencias Sociales", Empiria, núm. 7: 183-209 Madrid.

> world; those of second or third rank do their best but never get very far. Then there is the first rank, those who make important discoveries, fundamental to scientific progress. But then there are the geniuses, like Galilei and Newton. Majorana was one of these."

This would corroborate Majorana with an extrapolated IQ of 183-200, which seem probable based on the a reading of his 10 published papers, his quantum social physics paper, his independent discovery of the neutron, his independent formulation of the exchange force, and his two papers on the chemical bonds of molecules (age 25), his 1932 paper on quantum-relativistic equations for higher spin values (1, 3/2, etc.). In a 1938 letter to Mussolini, asking the government to intensify the search for Majorana, Fermi commented further:

> "I have no hesitation to state to you, and I am not saying this as an hyperbolic statement, that of all Italian and foreign scholars that I have met, Majorana is among all of them the one that has most struck me for his **deep sharpness**."

This comment would seem to situate Majorana at a higher intellectual rank than thinkers such as Werner Heisenberg (Buzan IQ = 173). The penetrating mind aspect of Majorana is corroborated by the views of Dutch-American theoretical physicist George Uhlenbeck, as recalled by Edoardo Amaldi (1966): [6]

> "Feenberg remembers attending one of Heisenberg's seminars on nuclear forces, in which Heisenberg also mentioned the contribution made by Majorana to this subject; he said that he author was present and invited him to say something about his ideas, but Ettore refused. When he left the seminar, Uhlenbeck told Feenberg how much he admired Majorana's **penetrating ideas** which had been mentioned by Heisenberg."

This inside view, as recalled by American physicist Eugene Feenberg, further corroborates Majorana as having been a deep thinker.

Tesla		Notes
		● Quote: "Tesla's IQ is estimated to be 200". ● Quote: "as a child, Tesla's IQ would likely have fallen in the 'very superior' range (140-160)" (link). ● Quote: "I have read Tesla's IQ was rated at 230" (link)

Nikola Tesla (1856-1943) ● Barth, David. (2009). "Nikola Tesla", Jan 13, BarthWorks.com. ● Wilson, Daniel H., Long, Anna C., and Heard, Danile. (2008). *The Mad Scientist Hall of Fame* (IQ=very superior range, pg. 62). Citadel Press. ● Who was smarter Einstein or Tesla? (2008) – Yahoo Answers.	● Quote: "Some people consider him to have a 230 to a 310 IQ. I have asked around and no one contacted has knowledge of Tesla ever having been tested for IQ." (link) ● Quote: "300 is the highest human IQ score, 169 is not correct as that information is not verified by anyone. Tesla had one of the highest IQ scores, but nobody confirms the actual number. Tesla most definitely falls into 200 or above area." (link) ● Facts: at age five, he informed his father he was going to harness the power of water; his resulting invention was a water-powered egg beater; at age nine, he made an egg beater powered by the motion of captured bugs; at age 10, he was solving math problems with such speed that his teachers suspected him of cheating. ● Note: He owned a thorough collection of Goethe's scientific texts and read these to the exclusion of all other philosophies; his idea for a self-starting electric motor came to him one evening as he was reciting a poem of Goethe and watching a sunset, at which point he imagined a magnetic field rapidly rotating inside a circle of electo-magnets (link).

Gauss	Notes
● Carl Gauss (1777-1832) ● Glenn, Jim. (1996). *Scientific Genius: the Twenty Greatest Minds.* Crescent Books. ● Hawking, Stephen. (2005). *God Created the Integers* (pgs. 563, 893). Running Press.	● Daniel Comstock (Quote): "Gauss is the only example in history, of all prodigies, whom Sidis [IQ=250-300] resembles" (Comstock, the person behind the character to Gerald Lambaeu, in the 1996 film *Good Will Hunting*, was a mentor, so to speak, and later employer, to the young William Sidis, ages 10 to 20). ● Born into a layperson family, Gauss was correcting his father's payroll additions at age three; and would go onto make contributions in varied fields, number theory, geometry, probability, statistics, astronomy, and electromagnetism; described by (link); ranked as "second greatest" mathematician, behind Newton, and ahead of Euler (#4), (according to James Dow Allen); ranked #44 most influential scientists of all time by John Simmons (2000); described as the "prince of mathematics", by M.B.W. Tent (2008); Gauss is one of the backbones to Crease's twenty greatest equations, determined by vote, of all-time (2004). ● Pierre Laplace (Quote): "Gauss is the greatest mathematician in the world." ● Stephen Hawking (IQ=165) (Quote): "Unquestionably the greatest mathematician of all time." ● Henri Poincare considered the three greatest German mathematicians to be: Gauss, Riemann, and Weierstrass.

Goethe	Notes
Johann Goethe (1749-1832) ● Cox, Catharine, M. (1926). *Early Mental Traits of Three Hundred Geniuses (Genetic Studies of Genius Series)* (pgs. 155, 163). Stanford	● Quote: "One rater (M) has scored on the basis of the record of Goethe's youth an IQ of 225 … Goethe's true IQ may in the history of mankind have been equaled in a few instances; one may well wonder whether it has ever been exceeded." ● Cox IQ=210. ● Quote: "the intelligence of these individuals was uniformly

University Press.
● Mai, Francois F. (2007). *Diagnosing Genius* (pg. 177). McGill-Queen's Press.

high, with the highest being that of Goethe, whose IQ was estimated to be 210."

Da Vinci	Notes
● Leonardo da Vinci (1452-1519) ● Sharp, Evelyn. (1972). *The IQ Cult.* Coward, McCann & Geoghegan. ● Buzan, Tony and Keene, Raymond. (1994). *Buzan's Book of Genius: And how to Unleash Your Own.* Publisher: Stanley Paul. ● Cox, Catharine, M. (1926). *Early Mental Traits of Three Hundred Geniuses (Genetic Studies of Genius Series)* ● (IQ=225) Seems to have originated in the fake 2006 "Quigly Anderson Ten Highest IQs" list.	● Quote: "…but assigned each a fairly exact number: Da Vinci, 180; Galileo 185;" ● Da Vinci assigned highest rank (IQ = 220). ● Cox IQ=180 ● IQ=225?

Adragon De Mello	Notes
● Adragon Eastwood De Mello (1976-) (renamed: James [de Mello] at age 12) ● McFarlan, Donald. (1989). *1989 Guinness Book of World Records* (de Mello, pg. 437). Sterling Publishing. ● Robert, Kurson. (2002). "Just another father-son story." Esquire, Nov. 01. (b) Staff. (2000). "What Price Genius?" *60 Minutes*, Feb. 15. ● Ferrari, M.D. and Sternberg, Robert J. (1998). *Self-Awareness: its Nature and Development* (pg. 220). Guilford Press. ● Winner, E. (1996). *Gifted Children* (201-02). Basic Books. ● Adragon De Mello – Wikipedia. ● Lait, Matt. (1988). "11-Year-Old Faces Life after College; Rejected by Grad Schools (because of age), Boy May Be Forced Back to Junior High." *The Washington Post*, Jun 14.	● Quote: "Adragon Eastwood De Mello (b. Oct. 5, 1976) obtained his BA in mathematics from Univ of Calif, Santa Cruz on June 11, 1988, aged 11 years 8 months" (*Guinness Book*, 1989). ● Quote: **"**Agustin tested AD's intelligence when the boy turned five. He calculated an IQ of 400, meaning AD might rank as the greatest intellect in history." ● Notes: at 6.5 weeks AD said hello; at age 3 he stated that "electric chemicals make boys" and could do cube roots; at age six he was giving video recorded lectures on astrophysics and black holes; at 8 he was enrolled at Cabrillo College, a two-year community college in Santa Cruz, California, where he studied physics and mathematics getting straight As; by nine he learned calculus and stated that he desired to discover the origin of the universe; at 10 he transferred to the University of California at Santa Cruz to major in computation mathematics, graduating a year later in 1987 (age 11). He was listed in the Guinness Book as being the youngest college graduate in history (only to be beat by Michael Kearney in 1992).

Michael Kearney (references)	**Notes**
● Gardner, Howard. (1998). "Extraordinary Minds: Portraits of Exceptional Individuals and an Examination of Our Extraordinariness" (pg. 37). Basic Books. ● Kearney, Kevin J. and Kearney Cassidy Y. (1998). *Accidental Genius* (pgs. 71-41). Woodshed Press.	● Quote: "Michael is an extreme example of a child from the high end of the bell curve. His IQ is clearly in the 200 range—his parents have sometimes claimed it closer to 300." ● Excerpt: "At age four, two psychologists and one sociologist gave Michael Kearney the Stanford-Binet IQ test (L-M version), a test designed for highly-gifted children age six and above. Michael scored 168, the ceiling of the test. Michael's parents, Kevin and Cassidy, in their own words, "discovered in the library that the Stanford-Binet L-M version test gives a mental age which can be ratioed with chronological age for a true IQ …

● Gardner, Howard. (1998). *Extraordinary Minds* (pg. 37). Basic Books.
● Shoron, Sandra. (2002). *The Book Lists for Teens* (pg. 152). Houghton Mifflin Harcourt.

● Michael Kearney – Wikipedia.

Kevin and I did the math and came up with Michael's IQ at 325."

● Quote: "IQ in the 200 range" (Kearney)

● Quote: "IQ above 200, at age 8" (Kearney).

● Facts: completed associates degree in geology from Santa Rosa Junior College (age 8), BS in anthropology from the University of South Alabama (age 10), MS in biochemistry from Middle Tennessee State University (age 14), and MS in computer science from Vanderbilt University (age 17).

William Sidis (references)

Notes

(a) Source: Abraham Sperling, director of New York City's Aptitude Testing Institute.

(b) Sperling, Abraham. (1946). "A Story of Genius" (pgs. 322-339), in *Psychology for the Millions*, F. Fell.

(c) Wallace, Amy. (1986). *The Prodigy: a Biography of William James Sidis, America's Greatist Child Prodigy* (pg. 283). Dutton Adult.

(d) Lyons, Viktoria and Fitzgerald, Michael. (2005). *Asperger Syndrome* (ch. XII: William James Sidis (1898-1944); pgs. 163-74). Nova Publishers.

Quote: "he easily had an I.Q. between 250 and 300. I have never heard of the existence of anybody with such an I.Q. I would honestly say that he was the most prodigious intellect of our entire generation." (Sidis)
Quote: "Helena Sidis told me that a few years before his death, her brother Bill took an intelligence test with a psychologist. His score was the very highest that had ever been obtained. In terms of I.Q., the psychologist related that the figure would be between 250 and 300."
Quote: "I have tested more than five thousand people. Of all the mentally superior individuals that I have seen, nobody begins to approach the intellect and perspicacity of William Sidis. According to my computations, he easily had an IQ between 250 and 300." [Abraham Sperling]

Quote: "IQ between 250-300."

Kim Ung-Yong (references)

Notes

(a) McWhirter, Norris. (1981). *Guinness Book of World Records* (pg. 35). Sterling Publishing Co.

(b) Author. (1977). "Whatever Became of Geniuses?", *Time Magazine*, Monday, 19 Dec.

(c) Kim Ung-Yong – Wikipedia (Korean → English)

Quote: "a figure of 210 has been attributed to Kim Ung-Yong".

Quote: "Kim Ung-Yong, a 14-year old prodigy who was speaking four languages and solving integral calculus problems at age four, is said to tip the mental scales at 210."
Facts: admitted to the physics department of Hanyang University (age 5), completed PhD in nuclear physics from Colorado State University (age 14); completed PhD in civil engineering from Chungbuk National University (age 22).

Marilyn vos Savant (references)

Notes

● Listed in Guinness Book of World Records (for five years), circa 1990, under "highest IQ" for both child and adult scores.

● Baumgold, Julie. (1989). "In the Kingdom of the Brain: How Love Changed the Smartest Couple in New York" (pg. 41). *The New York Magazine.* Feb 06.
● 1989 edition of the *Guinness Book of World*

● Fact: Savant took her first test in September 1956, scoring 167+; her ceiling mental age at 22 years and 10 months (22-10+) yielded a ratio IQ of 228, meaning that at ten years of age she was as intelligent as an average 22-year old.
● Fact: At age 10 received a perfect score on the Stanford Binet IQ test.
Quote: "...as a ten year old achieved a ceiling score for 23-year-olds, thus giving her an IQ of 228." Her record was, supposedly, retired to the Guinness hall of fame because scores that high are

Records (page 26).

● Baumgold, Julie. (1989). "In the Kingdom of the Brain" (pgs. 36-), *New York*, Feb 6.

* Note: this 157 value →
according to actual records (rather than her blurry opinion), seems to be the more realistic estimate (if that) of her real IQ; the 228 value seems to be a number-fudging scam done as a publicity stunt, to become famous.

● Knight, Sam. (2009). "Is a High IQ a Burden as Much as a Blessing?", *FT.com*, Apr 10.

no longer possible due to a lowering of test score ceilings.
● Quote: "was first tested at age 7-years 7-months, hitting the ceiling of the test, a modest 127."
● Quote: "When Marilyn was a ten-year-old student at Susan R. Buder school, she supposedly got a perfect score on the Stanford Binet. She hit the ceiling of that test, when appears on here school record as 167+. That figure was arrives at by dividing her mental age, recorded as 17-years 7-months, by her chronological age, recorded as 10-years 8-months, and multiplying by 100." ([(17+10/12)/(10+8/12)]*100 = 167)

● Quote: "Both the month that Marilyn took the test and the mental age she achieved on it are matters of some question that contribute to the murkiness over the Guinness top score. Her record with the St. Louis board of education shows she took the test in March 1957; she insists she first took it in September 1956."
● The actual records indicate that her IQ based on that test would be:

$$IQ = 100\frac{17 + 10/12}{11 + 4/12} = 157$$

● The idea of sending Savant's Sanford Binet test scores, taken when she was ten, to Guinness was conceived by American Lawyer Andrew Egendorf over dinner in 1983, who wanted promotion for a new book he was writing on high IQ societies. He sent her scores to Guinness on July 25 of that year.

● Quote: "Savant says she answered some additional questions in the adult portion of the test to bring her score to a mental age of 22-years, 10-months."
● Quote: "She has an extremely high IQ, and scored a 167+ on the Stanford Binet when she was ten, but then the saga of the 228 gets a little complicated. Its derivation is murky, end even the man who helped present it to Guinness and compute the 228 now computes 218."
● Quote: "Savant says she answered some additional questions in the adult portion of the test to bring her score to a mental age of 22-years, 10-months."
● Quote: "She says documents supporting her claims were provided by a teacher whose name she can't remember and sent to Christopher Harding, a Mega society member, now in Australia."
● Quote (by Ronald Hoeflin): "Marilyn told me she had received a perfect score on the Binet when she was ten. I computed it. I divided 22 years 11 months by 10 years 6 months, and her IQ was 218. Marilyn [also] showed me a report card that listed her IQ as 167+."
● Quote: "Guinness had been listing IQs of 196 as the world's highest, but Hoeflin knew there were higher, "Marilyn asked me to write on her behalf," he says, and he did. Norris McWhirter, former editor of the Guinness book, says he based vos Savant's

listing on the material from the Mega society. “I haven’t got anything original,” he says. Thus the highest IQ in the world was born. “She values it as a way of getting publicity for her literary work,” says Hoefling.
● Quote (Robert Jarvik): “I have been lucky to find love: my wife has the highest intelligence ever measured.”
● Fact: “graduated 178th out of a high school class of 613.” (top 29 percent)
● Fact: two years of college, studying philosophy, prior to dropping out.
● Wrote the Omni IQ quizes in the 1980s.

Nathan Leopold (references)

Notes

(a) Simpson, James B. (1964). *Contemporary Quotations* (pg. 61). Crowell.
(b) Nash, Jay Robert. (2004). *The Great Pictorial History of World Crime* (pg. 840). Rowman & Littlefield.

Section: "Nathan Leopold, on his IQ of 206 to 210."

Quote: “Leopold, with an estimated IQ of 200, had graduated from the University of Chicago at the age of eighteen, the youngest ever to do so.”

Christopher Langan (references)

Notes

(a) Morris, Errol. (2001). "The Smartest Man in the World". *First Person*, Aug. 14.

(b) Sager, Mike (1999). "The Smartest Man in America". *Esquire*, Nov.

(c) Parker, Philip M. (2008). *Absolutists: Webster’s Quotations, Facts and Phrases* (pg. 301). ICON Group International, Inc.

● In a 2001 video interview, by Errol Morris, titled “The Smartest Man in the World”, Langan stated that he took *Omni* magazine’s World’s Most Difficult IQ Test (a test that ran between in circa 1985-1998), and scored between 190-210.

● Gives and IQ of 195.

● claims “I am closer to absolute truth than any man who has been before me”, outlined his Cognitive-Theoretical Model of the Universe, billed as a theory of everything, in 1999; the theory, however, is fairly weak and inaccurate, particularly as compared to either Sidis or Goethe.
● Facts: Langan took the Mega Test, using the pseudonym of Eric Hart, and supposedly obtained a 42 on a first attempt (IQ=174) and a 47 on a second attempt (IQ=190). To explain his IQ, in his own words, he says he ended up “setting a record score” which correlated to an IQ of, in his own words, "somewhere between 190 and 210".

Francis Galton (references)

Notes

(a) Richards, Robert J. (1989). *Darwin and the Emergence of Evolutionary Theories of the Mind and Behavior* (pg. 169). University of Chicago Press.
(b) Terman, Lewis M. and Chase, Jessie M. (1920). “Psychology, Biology and Pedagogy of Genius” (pgs. 397-409, esp. pg. 404). *Psychological Bulletin*. American Psychological Association, Vol. 17.

Quote: “Lewis Terman, who developed the Stanford-Binet IQ test, estimated Galton’s IQ at 200.”

Quote: “Terman analyzes certain documentary evidence presented in Karl Pearson’s biography of Galton, from which he concludes that boy Galton possessed an I.Q. which could not have been much less than 200.”

Michael Grost (references)

Notes

Quote: “His IQ is so far above the 200 mark that it can’t be measured meaningfully.”

(a) Howard, Jane. (1965). "The Nicest Young Genius in the U.S." *Life* (104-114), May 21. (b) Grost, Audrey. (1970). *Genius in Residence* (except) (pgs. 58, 102, 107, 111). Prentice-Hall. (c) Grost, Michael Edward. (1977). *An Existence Theorem for Boundary Value Problems for Nonlinear Hyperbolic Partial Differential Equations*, University of Michigan (Mathematics Genealogy Project)	Notes: at age 6, had read through two sets of encyclopedias, at age 8 he gave a lecture to a class of college students at Michigan State University, when asked if he had done anything with binary numbers he stated that he had worked 2 to the 80th power once, on a blackboard, and it took him two hours, and when asked about the relation between biology and astronomy, he explained that the two sciences needed to be integrated, so to explain how, in evolution, the sun's reactions in water produced the first forms of life. He later graduated from MSU, at age 15, with BS in mathematics; MS age (17); PhD in mathematics from the University of Michigan at age 23.
(d) Anon. (1964). "Put Away Your Blocks", *Time*, Oct. 09.	Quote: "Mike's IQ was too high to be tested meaningfully, he placed ninth among 3,400 M.S.U. students who took a comprehensive natural-science exam, was in the top 10% of doctoral candidates on a graduate-student screening test."
(d) Michael Grost (newspaper clipping).	Quote: "scored upper one percent on test for mathematical ability for 12-graders/college freshman (at age 10)."

Sho Yano (references) — Notes

(a) Anon. (2001). "Boy Wonder: Sho Yano Attends College at Age 10", *60 Minutes*, June 05. (b) Ryan, Anne. (2003). "12-year-old begins Medical School at the University of Chicago." USA Today, Aug 24.	Quote: "his IQ has been tested at about 200." Quote: "has an IQ over 200"
(c) Sho Yano – Wikipedia (Korean → English). (d) Sho Yano (2009) – CreativeRabbits.com.	Notes: Graduated summa *** laude, from Loyola University Chicago, with a BS in biology and minor in chemistry at age 12 ; entered the combined MD-PhD in molecular genetics and cytology at age 13 the University of Chicago Medical School.
(d) Yano, Sho T., Panbehi, Bahman, Das, Arpita, and Laten, Howard M. (2005). "*Diaspora*, a large family of *Ty3-gypsy* retrotranspons in *Glycine max*, is an envelope-less member of an endogenous plant retrovirus lineage" (abstract). *BMC Evolutionary Biology*, 5:30	Fact: first co-authored research paper published at age 15. Notes: PhD in molecular genetics and cell biology at the age of 18 (2009). Third year of medical school as of 2010.
● Child prodigies (2005 listing) – MangaWorld.4.Forumer.com.	● Quote: "Sho was just 8 when he scored 1,500 out of 1,600 on the college-entrance SATs; he started college at age 9 (MD-PhD program at age 13; PhD age 17); he says his IQ has been tested at about 200"

Isaac Newton (references) — Notes

Albert, Robert S., editor. (1992). *Genius and Eminence* (Ch. 3: The Early Mental Traits of 300 Geniuses, by C. M. Cox, pgs. 53-58, esp	Quote [C.M. Cox]: "Arnauld, Comte, Goethe, Grotius, Laplace, Leopardi, Michelangelo, Newton, Pascal, the younger Pitt, Sarpi, Schelling, Voltaire and Wolsey probably rated at 200 IQ or even higher."

Albert Einstein (references) — Notes

(a) Yingling, Carl S. (1966). *The Living Truth: a Philosophy of Education* (pg. 37). Goodway Printing Co. (b) Patel, Dina. (2004). *A Data Gone Wrong* (pg. 44).	Quote: "Einstein's IQ has been estimated as about 225." Quote: "Einstein's last tested IQ was 220."

iUniverse.
(c) Hockney, D.J., Harper, William L., and Freed, B. (1975). *Contemporary Research in Philosophical Logic and Linguistic Semantics* (pg. 331). Springer.
(d) Anon. (1945). "Yale Prodigy: Youngest Graduate in College's History is Merrill Kenneth Wolf who is only 14 and Started to Talk at Four Months." *Life*, pgs. 51-54 Nov. 12.
(e) Lyons, Viktoria, Fitzgerald, Michael. (2005). *Asperger Syndrome: a Gift or a Curse?* (pg. viii). Nova Publishers.
● Wallace, Amy. (1986). *The Prodigy: a Biography of William James Sidis, America's Greatist Child Prodigy* (pg. 283). Dutton Adult.
● Flindt, Max H. and Binder, Otto O. (1999). *Mankind Child of the Stars* (pg. 180). Ozark Mountain Publishing.
● Seitz, Robert N. (2002). "The Prodigy: a Book Review", May 31.
● Inhaber, Herbert and Carroll, Sidney L. (1992). *How Rich is Too Rich?* (pg 107). Praeger.
● Naam, Ramez. (2005). *More than Human: Embracing the Gift of Biological Enhancement* (pg. 156). Random House.
● Fadul, Jose A. (2007). *Encyclopedia Rizalana: Student Edition* (pg. 49). LuLu.

Quote: "the extent or degree of intelligence possessed by Einstein (e.g. 210 IQ points)."
Quote: "[Merrill Kenneth Wolf]'s of 182, which is only 23 points lower than Einstein's [IQ=205]"
Quote: "Sidis had an IQ of 250 to 300, in comparison Albert Einstein's IQ was 200."
Quote: "Einstein's IQ is estimated to be between 160 and 200." (link)

● Abraham Sperling: "Einstein's IQ was 200".

● Quote: "true geniuses, such as Einstein, with his probable 200 IQ, occur so rarely in the human race that they seem to have little or no relationship to the common law of heredity."

● Quote: "Albert Einstein's IQ was 200."

● Quote: "Einstein, whose IQ was alleged to be over 200, never was in any list of the nation's wealthiest."

● Quote: "We don't know what Einstein's IQ was, but it's been guessed at about 160."

● Quote: "Estimates were made by a group of psychologists at Stanford University for those who never took any IQ test: Leonardo Da Vinci, 220; Einstein and Mozart 160."

Terence Tao (references)

(a) Gross, M. (1986). "Radical Acceleration in Australia: Terence Tao", *Gifted Child Today.* Prufrock Press.
(b) Anon. (2007). "Terence Tao from NYTimes", The Arabesque.
(c) Smith, Deborah. (2006). "Mozart of Maths", *The Sydney Morning Herald.*
(d) Terence Tao - Wikipedia.

● Terrence Tao (08 Jul 2010 thread)

Notes

Quote: "Terry's IQ [age 11] has been assessed as between 220 and 230, and he has no areas of academic weakness."
Quote: "According to Sin Chew Daily, Terrence Tao has an IQ of 211."
Quote: "a one-in-a-million IQ score of 220."
Notes: Started high school at age 8; BS (age 16) and MS (age 17) in science from Flinders University; PhD from Princeton (age 21) in mathematics; professor of mathematics at UCLA (age 24); winner of the 2006 Fields Medal (age 31).
● Quote: "In November of 1983, at the age of 8 years 3 months, Terry informally took the South Australian Matriculation (university entrance) examination in Mathematics 1 and 2 and passed with scores of 90% and 85%, respectively." (18/(8+3/12))*100=218.

Edith Stern (references)

(a) Spratt, Mary and Taylor, Lynda B. (2000). *The Cambridge CAE Course: Self-Study Student's Book* (pg. 276). Cambridge University Press.

Notes

Quote: "today she has an IQ of 203 and works for IBM in secret computer software research and development."
Quote: "with an IQ rating of 201."
Quote: "Aaron Stern, whose daughter Edith (IQ 200) is the subject of his 1971 book *The Making of a Genius*, stated that he could foster the same meteoric IQ in the children of the Tasaday tribe, a Stone Age people living in the Phillippines."

(b) Anon. (1968). "University Graduate at Age 15" (Quote: IQ rating of 201), *Lonl News-Sentinel*, Jun 05.
(c) Ledson, Sidney. (2004). *Teach Your Child to Read in Just Ten Minutes a Day* (pg. 18). Trafford Publishing.
● Anon (date). "Edith Experiment", *New Yorker*.
● McClintock, Jack. (1977). "The Edith Project", *Harper's Magazine*, March, pg. 21-24.
● Tee, George. (2007). "Genius: You Can Be One Too!', July 4th, LifeHack.org.

● Stern, Aaron. (1971). *The Making of a Genius.* Renaissance Publications.

Notes: speaking full sentences before age one; playing chess and solving arithmetic problems by age 3; read entire *Encyclopedia Britannica* by age 5; learned algebra by age 5; reading six book per day at age 6; read Plato, Freud, and Darwin by age 8; enrolled in college at 12; BS in science from Florida Atlantic University (age 15), assistant professor of mathematics at MSU at 15; PhD in mathematics at age 18.

Note: Aaron Stern is a Jewish survivor of WWII, although he suffered from lung and heart conditions from his time living in the forests. He was a professor of language (knew 7 languages) who taught children in displaced persons camps using travel posters - the only things available. In this book, he writes of how he spent time with his young daughter in NYC, teaching her to read in grocery stores. They made museum trips on Sunday and talked about everything they saw from the time they left home until they returned. He emphasized how he always asked open-ended questions and asked his daughter to do research.

Christopher Hirata (references)

Notes

(a) Susan, Goldsmith. (1999). "The Wizard of Pasadena" (abstract), *New Times Los Angeles*, Jun 17.
(b) Woods, Vanessa. (2001). "Balancing Life as a Teenager and a Graduate Student." *The Daily Princetonian*, Sep 21.
(c) Susan, Goldsmith. (2001). "Update on a Genius: at 18 he's off to Princeton for a PhD in Physics", *New Times Los Angeles Online*, Jul 19.

Quote: "Chris Hirata, CalTech student, whose estimate IQ is 225."
Quote: "With an I.Q. estimated to be around 225, Hirata has been sought after by many elite institutions in his life. This year Princeton beat out schools like Harvard and Stanford for the right to claim him among its ranks."
Notes: at age 12 won 1996 Physics Olympiad, an international competition among the world's smartest math and science students (up to age 19), becoming the youngest medalist ever; at age 14 entered Caltech; began working with NASA at age 16 on a project exploring the possibility of colonizing Mars; completed his BS at age 18 from Caltech with a 4.2 GPA; completed PhD in physics (2005) at age 22 at Princeton; currently is an assistant professor of astrophysics at CalTech.

John Stuart Mill (references)

Notes

(a) Famous people IQ table (link) (link), etc.
(b) [ref. #23]
(c) Mill's 200 IQ score seems to trace to Cox (pgs. 707-); who wrote a biographical section on him in her Chapter XXIII: Cases Rated at AI IQ 190 to 200.

● Quote: "IQ=200"
● Feats: "could write Greek with his left hand while writing Latin with his right." [23]
● Facts: Learned Greek at 3; wrote a treatise on the history of Rome at 6; reading Plato, etc. at 7; Latin, geometry, and algebra at 8; conic sections, spherical section, and Newtonian arithmetic; chemistry age 13 at the Royal Military College; at 14, chemistry, zoology, metaphysics, and logic at Montpellier University; law at 16 under John Austin.

Marnen Laibow-Koser (references)

Notes

● Quote: "He allegedly made the highest score attained to date on the Stanford Binet IQ test: 268; exceeding Marilyn vos Savant's score by 40 points. This, however, would have

● Feldman, David H. and Goldsmith, Lynn T. (1986). *Nature's Gambit: Child Prodigies and the Development of Human Potential* (pgs. 34-36). Teachers College Press (updated edition: 1991).
● Adam Konantovich (pseudonym) = Marnen Laibow-Koser (real name); he was one of the six children studied in the 1986 book *Nature's Gambit.*
● Sadiq, Sabah. (2005). "Gifted Children: Analysis of Gifted Underachieves (Case Study: Marnen Laibow-Koser)", University of Michigan.
● Hartigan, Patti. (2005). "Young + Brilliant, Blessed + Cursed", *The Boston Globe*, Mar 6.
● User:Marnen (2003-) - Wikipedia (user page).
● Resume.

occurred after her world-record score was obtained." (link)
● Quote: the Mega Society site references an "Adam Konantovich", stating that "I have seen a claim that Adam tested out at an IQ of 268" (link).
● Notes: Speaking words grammatically correct sentences at three months of age; at age 3.5, he read, wrote, and spoke several languages, studied mathematics, and composed music, played the violin; at age 7-8 was attending the MIT computer lab doing programming; obtained a perfect score on the Stanford-Binet at age of about 8; the term "omnibus prodigy" was coined to describe him, as his talents were not bounded within a single domain.
● Quote: "Adam was perhaps the most gifted child ever tested on the Stanford-Binet" (Halbert Robinson, accelerating learning expert).
● Notes: Engaged in complex conversations at 6-months, reading simple books by age 1; could speak several languages by age 3; parent's home had an estimated 3,000 books (link).
● He currently is a computer programmer and music composer;
● Listed as the premier case study of the "gifted underachiever" (Sabah Sadiq).
● Quote: "Marnen can perhaps be described as not only gifted but highly gifted" (Sabah Sadiq).
● His mother considers him a "failed prodigy" (Hartigan 2).

Rick Rosner (references)

Notes

● Klosterman, Chuck. (2009). *Eating the Dinosaur* (pg. 21). Simon & Schuster.
● Rick Rosner - Wikipedia.

● Rosner, Rick. (1991). "When Good IQs Happen to Bad People", *Noesis*, No. 57.

● Quote: "Rosner is believed to have one of the highest IQ scores ever measured."
● IQ=180-250 (according to his own estimates)
● Notes: scored 44 out of 48 (1985) and 47 out of 48 (1991) on Hoeflin's Mega Test, along with a perfect score on Hoeflin's Titan test, which together supposedly gives him an adult deviation IQ of 195 and a ratio IQ of 250.
● He was famously in a 2009 Domino's commercial (below), playing Go with a fifth grader, which the caption "IQ = 200" shown below him.
● On 24 Dec 07, one time Wikipedian Willzo4 started the Rick Rosner article with the claim: "Rosner's combined scores indicate an adult (deviation) IQ in the mid- to high-190s, corresponds to a ratio IQ of approximately 250 (Scoville)." In 2010 the exert was still there.
● At age 5, in his own words, "on the last page of this test, given to everyone in my kindergarten class, was the "Draw-A-Man Test." We got IQ points based on whether our men had eyelashes, beltloops, and the right number of fingers. My man had all the options. He was standing next to a traffic light. Several weeks later, at a parent-teacher conference, Mrs. Shipper informed my mom and stepdad that I was a genius."
● At age 14, in his own words, "My junior high offered an honors math class in which teams of two would work on special presentations. My friend Lon and I were assigned statistics. The stats we would analyze were the IQ's of the honors math class versus the IQ's of the entire ninth grade. I was allowed to see the

IQ's of everyone in my grade. At 151, I had the highest IQ."
● At age 18, in his own words, "through junior high and high school, I thought someone would love me for my IQ, even though I was a nerd. But I got permission to examine my school records and discovered that my IQ wasn't even that lovable. Most of my scores were in the 140's, not high enough to justify special destiny."
● At age 20, in his own words, "in college, though a born-again dumb person, I was still a sucker for IQ tests, and Kevin Langdon's Adult Intelligence Test was a welcome excuse to ignore coursework. It's a multiple choice test, and, since I couldn't decide between two answers on one verbal problem, I submitted answer sheets under two different names. Apparently one answer sheet was lost, but the report I received gave me a score of 170, not far from the test's ceiling."

● At age 26, in his own words, "I forged about 40 documents and went from being a 26-year-old undergrad to being 17-year-old Gilligan Rosner. I began high school summer school. (I needed to repeat a couple classes I'd missed during my imaginary junior year after a fictitious auto accident sent me into a fabricated coma.) By day, I attended class; by night, I made a living delivering stripping telegrams and bouncing. I got good grades in most of my courses--due to my advanced age relative to my classmates, I had a functional IQ of about 250."

*This 250 value →
which Rosner calls a "functional IQ", has to be one of the stupidest references on this page; according to the Terman formula, a 26-year-old scoring perfect on test designed for 18-year-olds, gives an IQ of (18/26)*100=69, rather than 250.

Marie Curie (references)

Notes

● Sherriff, Lucy. (2004). "World's Cleverest Woman Needs a Job: an IQ of 200 is a Sorry Thing to Waste." *The Register*.

● Quote: "Daniela Simidchieva, [who is] a qualified industrial engineer with an IQ of 200, [is] listed by Mensa as the 'world's cleverest women', [and has a] mind boggling IQ equal to that of Marie Curie, according to reports."
● IQ=180 (Buzan, 1994).

Hypatia (references)

Notes

● IQ Famous People – Kids-IQ-Tests.com.
● Geniuses – AboutFacts.net.

● IQ = 170
● Quote: "She was a mathematician, astronomer, and Platonic philosopher. Her father had been the last head librarian of the Library at Alexandria and a professor of mathematics in Alexandra. This library later burned and everything was destroyed. She was the author of a commentary on Diophantus, she also wrote a work called The Astronomical Canon and a commentary on The Conics of Apollonius. She had a superior intelligence Her intelligence surpassed that of all other philosophers of her time and her accomplishments in music and science paled all others. He intelligence and knowledge surpassed her father's at an early age. People would come from other cities to hear her talk and learn from her. She was murdered for her beliefs. IQ unknown but seems to be in the 180-200 range."
● Quote: "IQ scores of 200+ are 'universal geniuses'. So far there's been only one woman recorded on the 'universal genius list, Hypatia, a Greek mathematician and philosopher of

● MacDonald, Beverley and Weldon, Andrew. (2003). *Written in Blood: A Brief History of Civilization* (pg. 173). Allen & Unwin.	renowned beauty and intellect." ● Note: the IQ=210 estimate doesn't seem to have a good reference; although it has a certain number of mentions around the web, prior to 2007 (link) (link), likely originating in the fake 2006 Quigly Anderson list. ● Note: She is listed in Buzan's *Book of Genius*, but he gives no IQ, only commenting that "the little we know of Hypatia suggests that she must have had a remarkable intellect."

Emanuel Swedenborg (references)	**Notes**
● (Cox, 1926) ● IQ of Famous People – Kids-IQ-Tests.com. ● McWhirter, Norris. (1978). *Guinness Book of World Records* (category: Highest IQ, pg. 49). Bantam Books.	● IQ = 165 ● IQ = 205 ● Quote: "HIGHEST IQ: This Korean boy, with a 210 quotient, at the age of 4 years 8 months spoke 4 languages **...** A similar rating has also been attributed to Emanuel Swedenborg." (note: this is a Google Books snippet; and man be a connected sentence?)

Hugo Grotius (references)	**Notes**
● (Cox, 1926)	● IQ = 200

Thomas Wolsey (references)	**Notes**
● (Cox, 1926)	● IQ = 200

Voltaire (references)	**Notes**
● Cox, Catharine, M. (1926). *Early Mental Traits of Three Hundred Geniuses (Genetic Studies of Genius Series)* (Voltaire 200, 6+ pgs., esp. 144, 217). Stanford University Press. Popenoe, Paul. (1927). "The Childhood of a Genius: A Review" (extract), *Journal of Heredity*. 18(4): 145-51. ● Author. (1943). *Zoological Reprints and Separata*, etc. (pg. #). Nature.	● Cox IQ=190 (finalized list) ● Quote [Catherine Cox]: "Several are well above the 200 IQ mark. Arnauld, Comte, Goethe, Grotius, Laplace, Leopardi, Michelangelo, Newton, Pascal, the younger Pitt, Sarpi, Shelling, Voltaire and Wolsey probably rated at 200 IQ or even higher." ● Quote: "A group containing Voltaire must approach or perhaps exceed a score of 200." ● Quote [Paul Popenoe]: "Pascal and Voltaire both probably had IQs in the neighborhood of 200." ● Note: the fact that Voltaire, a year before his death, visited the imprisoned French polymath Jean Sales, in 1777, the first to employ the "human molecule" concept, lends great credibility to a 200-range IQ, as both Goethe (IQ=225) and Hirata (IQ=225) also, independently, employed the human molecular theory viewpoint.

Ainan Cawley (references)	**Notes**
	● IQ=263; Quote: "O Level is normally taken by sixteen year olds. The average candidate would, therefore, be sixteen and a half years old. Since the brightest 20% of students are the ones the exam is aiming at; to pass it one would need a mental age of 18.645 years. This is derived from the IQ score and the age thus: the deviation IQ of 113 is the same as the ratio IQ (in this case) of 113. IQ as a ratio is mental age divided by

● Cawley, Valentine. (2007). "Passing O Level Aged 7", Blog: *The Boy Who Knew Too Much*, Mar 25.

● Facts: could crawl at four months; walk at six months; read at eight months (link); construct complex sentences by age one; as a toddler, he would seek out science books in the library, showing a preference for dense texts with complicated illustrations of scientific matters, which he would absorb quietly and comment on later; by the time he was 3 or 4, he was interested in hyper-dimensional shapes and would draw their shadows in two dimensions as a form of intellectual play; by age 6½, he had taught himself chemistry on the Internet, and could answer O-level chemistry exams, scoring 100% (link); passed the GCSE (high school equivalency) at age seven; at age 8, on camera (14 Sep 2008), he set a world record for being the youngest person to be able reciting pi to 518 digits (link); in 2009 he was studying chemistry in college.

chronological age multiplied by 100. Therefore the mental age of O level students who pass would be expected to be: 1.13 times 16.5 years, which is 18.645 years. Ainan is not 18.645 years old - he was seven years and one month when he took the exam - so passing means something interesting. It means that, in terms of his scientific reasoning capability his ratio to the norm is: 18.645/7 years 1 month. This equals a ratio of 2.63. That is Ainan is at least 2.63 times more precocious than average. In terms of IQ, were this a fair estimator of ratio IQ, which it is likely to be since it involves scientific reasoning which will have a large component of g, in it - the general intelligence factor - it would represent a ratio IQ of 2.63 times 100 or 263 IQ. This is a ratio IQ estimate which is different from a deviation IQ estimate."

● IQ=349; Quote: "Yet, this is likely to be an underestimate of his precocity - for he has already read the A level texts and is working on a University text. That latter text is suited to a 20 year old Chemistry student. The average IQ of a chemistry student is 124. This corresponds to a ratio IQ of 125. Therefore the average mental age of a 20 year old Chemistry student would be 25. Using this to generate a ratio IQ for Ainan giving his age as 7 years and three months - the time when he started to read the University book, would give a ratio IQ of 349. This should be regarded as an accurate measure of precocity, at least - for it uses actual achievement as a marker for development."

Dylan Jones (references)

Notes

● Facts: engineering freshman at Colorado School of Mines at age 10, taking chemistry, mathematics, and calculus classes; able to recite pi to the 500th decimal; photographic memory; BS in mathematical and computer science (age 16), with a minor in bioengineering and life sciences; medical school age 17, studying to be a neurosurgeon (as of 2009), and to be board certified by age 28.

● Latimer, Clay. (2006). "Football and Studying Leaves Them Smart: at Mines, Tackling Both is All-Consuming", *Rocky Mountain News*, Oct. 21.

● Lay, Jennie. (2009). "Outside the Bell Curve: at 16, He was Mines' youngest-ever Graduate. Then What?", *Mines, Colorado School of Mines Magazine*, Spring, 99(1): 18-21.

● IQ=200+; Quote: "a freshman who had an IQ in excess of 200."

● Quote: "Willy Hereman, Colorado School of Mines mathematical and computer sciences professor, recalls a day when Dylan, age ten, came to his office to let him know that he had memorized the first 500 digits of pi. The professor pulled the number up on his computer screen to fact check and Dylan proceeded to recite about the first 300 digits without a hitch. So Hereman challenged him with another number, e, the basis of the exponential, 2.71828…, curious if Dylan might get the sequences confused. "Why would I get them confused?" Dylan asked, "They are two different numbers." Hereman remembers Dylan returning disappointed two days later: he had only perfected the first 100 digits."

Naida Camukova (references)

Notes

● Naida Camukova (c. 1976-) (IQ=199.37) (Einstein assigned

● Quote: "Camukova's IQ is in the range of 140-200" (link).

ceiling IQ=200) (link); started talking age 1, learned to read and write at age 2; age 14 was enrolled in both Moscow State University (history) and Daghestan State University (literature); began medical school at age 9 (or 15); speaks seven languages; age 25 became professor of history and literature; has published 25-books and read 3000 books; with photographic memory (able to remember even comma placements in books); only child of a neurosurgeon mother and lawyer father; had brain hemorrhage at age 23 (was in coma for 20-days) (Wikipedia) (Facebook), declared the world's most intelligent person by the Moscow Institute from Brain Research;
● BS and MS by age 15, or about.
● Could be a fake or scam (link); but there are many references on here (in Turkey), stating that she is the world's smartest person, with a 200 IQ?

Supposedly can read a 300-page book in two hours (link).

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(b) Sidis, William J. (1920). *The Animate and the Inanimate*. Boston: The Gorham Press.
2. (a) Adler, Jeremy. (1987). "Eine fast magische Anziehungskraft". Goethe's "Wahlverwandtschafte" und die Chemie seiner Zeit ("An almost Magical Attraction"). Goethe's Elective Affinity and the Chemistry of its Time), Munich.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (ch. 10: "Goethe's Affinities", pgs. 371-422). Morrisville, NC: LuLu.
3. Popenoe, Paul. (1927). "The Childhood of a Genius: A Review" (extract), *Journal of Heredity*. 18(4): 145-51.
4. Adler, Jeremy. (1990). "Goethe's Use of Chemical Theory in his *Elective Affinities*" (ch. 18, pgs. 263-79) in *Romanticism and the Sciences* - edited by Andrew Cunningham and Nicholas Jardine, New York: Cambridge University Press.
5. (a) In 2002, for instance, news-worthy story ran about how a mother named Elizabeth Chapman, 27, faked her son's (Chris Chapman) test scores to gain renown as a boy-genius with an IQ of 298; a boy who was later hospitalized over a suicide attempt at age 7 and was later put in foster care.
(b) Anon. (2002). "Mom faked son's genius scores Helped boy get 298 on IQ test; now she faces neglect trail", *Chicago Sun-Times*, March 04.
(c) Hirsh-Pasek, Kathy, Golinkoff, Roberta M., and Eyer, Diane E. (2003). *Einstein Never Used Flash Cards* (pg. 126). Rodale.
(d) Goode, Erica. (2002). "The Uneasy Fit of Precocious and the Average." *NYTimes.com*, Mar. 12.
6. Gowdy, Larry N. (2007). *Myths, Facts, and Lies about Prodigies: a Historiography of William James Sidis* (abstract) (Amazon). Woven Strings Publishers.
8. (a) Cook, Anthony. (1992). "Meet a Real-life 11-year-old Doogie Howser: Masoud, now a College Junior with an A average." *Money*, Dec. 01.
(b) Ringrose, Heather. (2001). "Meet Some Whiz Kids: Average IQ over 200", Feb. 27, Soute101.com.
(c) Cummings, Michael S. (2001). *Beyond Political Correctness* (pg. 153). Lynne Rienner Publishers.
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θΔics

In genius studies, **IQ: 225+** refers to someone with an intelligent quotient (IQ) cited, estimated, opinionated, or calculated to be at or above the 225 range on the IQ scale; a subset of individuals from the IQ: 200+ scale or the top 500 geniuses.

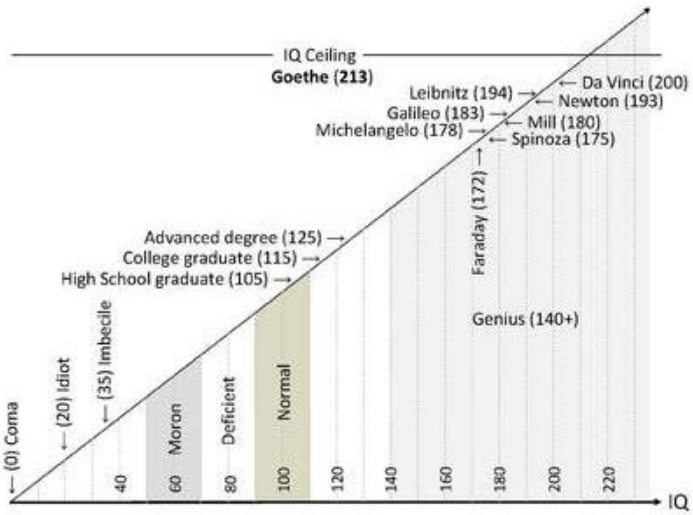

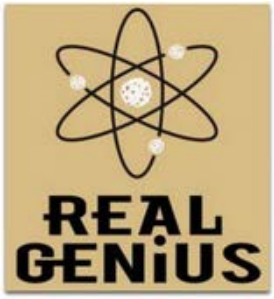

Left: the Cox-Buzan ceiling genius mark of IQ = 213, that of the mind of polyintellect Johann Goethe. Right: a logo of a "real genius" as a thinker with a true IQ approaching the **225+** range.

> "One rater (M) has scored on the basis of the record of Goethe's youth an **IQ of 225**. Goethe's true IQ may in the history of mankind have been equaled in a few instances; one may well wonder whether it has ever been exceeded?"
>
> — Catherine Cox (1926), *Early Mental Traits of 300 Geniuses*

> "The lecturer had said that Albert Einstein had an estimated **IQ of 225**, but that was a pure estimate, or 'guesstimate,' he said, because by all accepted tests the peak rating was 145. Anything beyond that would be in the realm of genius and there simply was no way to test that high."
>
> — Joseph Harrington (1966), *Blind Spot* [17]

The following individuals, listed below, throughout history, have had tested, estimated, approximated, biographically-gauged, comparatively approximated, cited, and or opinion/voted determined intellectual quotients at or above the 225 range on the IQ scale. These individuals, shown below, are the taken from: (a) the 2011-launched Genius IQs table, a work in progress "true IQ" ranking of the world's greatest 425+ geniuses, (b) the top portion of the 2008-2010 constructed 200+ IQ table, which is ranked purely by descending "claimed-to-be" IQ, albeit re-ranked based on a more realistic intellectual stature, capped by Goethe, the leader of the agreed-upon Cox-Buzan IQ ceiling geniuses (above right), and (c) recent citations.

Adult-age estimates

The following are adulthood age individuals with IQ estimates, guesstimates, or citations in the 225+ range (IQ_{cite}), values that can be compared to real or true IQs (IQ_{true}), as are found on the Genius IQs table—all of which by no coincidence have independently interjected on the implications of thermodynamics and human existence, date of theory interjection shown in last column:

#	Person	IQ_{cite}	IQ_{true}	Theory	Date
1	Johann Goethe (1749-1832)	180-230	230	A = TΔS – ΔH AB + CD → BD + AC (elective problem)	1796
2	Albert Einstein (1879-1965)	160-225	220	Gravity ≠ Love (elective problem) ($E = mc^2$)	1920
3	Nikola Tesla (1856-1943)	140-310	195	½mv² (human energy) (defunct theory of life)	1915
	Christopher			ΔG = ΔH – TΔS	

> "Throughout his life **Einstein** was a man of the book, to a much higher degree than other scientists. The remarkably diverse collection of volumes in his library grew constantly. If we look only at the German-language books published before 1910 that survived Einstein's Princeton household, the list includes much of the cannon of the time: Boltzmann, Buchner, Friedrich Hebbel, the works of Heine in two editions, Helmholtz, von Humboldt, the many books of Kant, Lessing, Mach, Nietzsche, and Schopenhauer. But what looms largest

4		Hirata (1983-)	225	190±	X + Y ↔ XY (elective problem)	2000
5.		Stephen Hawking (1942-)	200-250 [245] [280] [160]	190±	Reading ↓ ΔS_{CNS} Human entropy theory	1988
6.		William Sidis (1898-1944)	195-300	185	ΔS (life problem) (universe origin problem)	1916

are the collected works of **Goethe** in a thirty-six volume edition and another of twelve volumes, plus two volumes on his *Optics*, the exchange of letters between Goethe and Schiller, and a separate volume of *Faust*."

— Gerald Holton (2008), German-born American physicist; Harvard PhD under Percy Bridgman, 1948

Hirata, to note, should correctly, be listed in the "teenage tested-estimated" range, below, because, as it seems to be the case, his IQ =225 estimate was made when he was a teenager (possibly age 13 or 16); nevertheless he has been regrouped here, owing to his *circa* 2000 age 17, near-adulthood range, human chemical thermodynamics theory, independently arrived at by both Goethe (1796) and Thims (1995), who are also both, independently, assigned with an adulthood 225+ IQ—and in this sense, independent derivation of a human chemical thermodynamics theory seems to act a cogent ruler to possible adulthood range 225 IQ.

Building on shoulders

One salient commonality among IQ=225+ cited geniuses is the vicarious penchant to be drawn to and read Goethe extensively—Goethe himself, at the time of his reaction end, having a 5,000+ book personal library, encompassing the total extent of human knowledge allowed to him, such as the optical and affinity chemistry work of Newton, who in turn had built on the shoulders of other giants, as shown below:

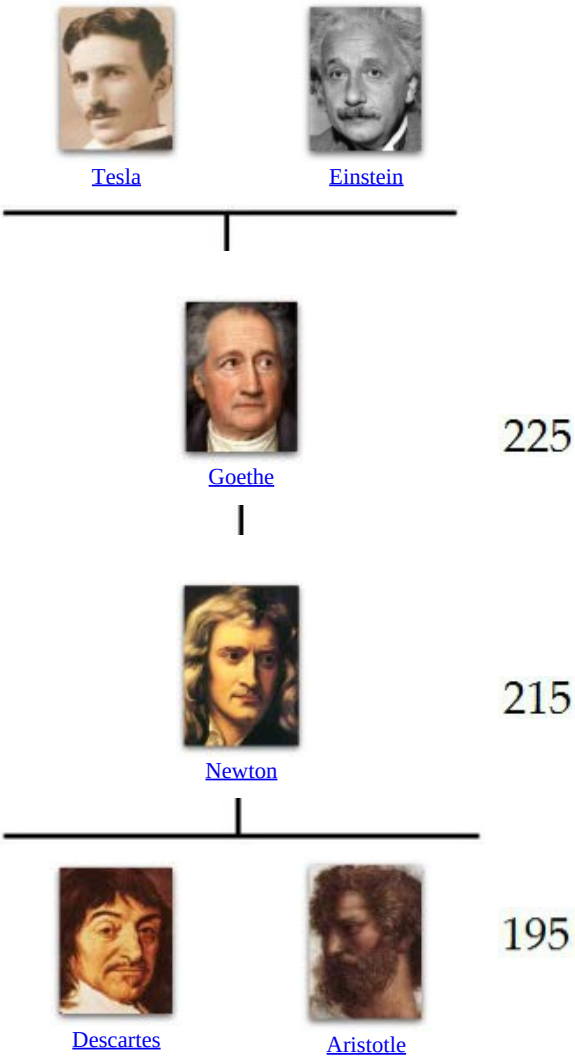

The personal libraries of Tesla and Einstein were dominated by the works of Goethe, whose philosophy each tended to read to

> "Should I not be proud, when for twenty years I have had to admit to myself that the great Newton and all the mathematicians and noble calculators along with him were involved in a decisive error with respect to the doctrine of color, and that I among millions was the only one who knew what was right in this great subject of nature?"
>
> — Goethe (1823), *Letter to Eckermann* (Dec 30)

While Goethe was amiss in his color theory, his extension of the principles embedded in Newton's famous "Query 31" would go on, through the hands of Thims (2007), to launch the science of human chemistry.

Einstein not only kept a bust of Goethe in his study, but Goethe's collected works, as summarized by German-born American physicist Gerald Holton (2008), above right quote, dominated the largest portion of his 1910 Princeton home library—and when doling out advice on what to read would recommend Goethe:

> "Read no newspapers, try to find a few good friends who think as you do, read the wonderful writers of earlier times, Kant, Goethe, Lessing, and the classics of other lands, and enjoy the natural beauties of [the] surroundings."
>
> — Einstein (1933), advice to troubled despondent jobless Munich musician (Apr 5)

Tesla, likewise, owned a thorough collection of Goethe's scientific texts and read these to the exclusion of all other philosophies, Voltaire (IQ=195) aside, the latter of

which he commented in retrospect:

> "I had a veritable mania for finishing whatever I began, which often got me into difficulties. On one occasion I started to read the works of Voltaire when I learned, to my dismay, that there were close on one hundred large volumes in small print which that monster had written while drinking seventy-two cups of black coffee per diem.ï»¿ It had to be done, but when I laid aside the last book I was very glad, and said, 'Never more!'"

the exclusion of all others; all four which have been independently cited with an **IQ of 225** or above; Goethe, in turn, built on the shoulders of Newton (IQ=215)—particularly his Query 31—who in turn in 1676 stated that he had seen further by "standing on the shoulders" of Descartes (IQ=195) and Hooke (IQ=195), and also Aristotle (IQ=195), originally, whose motto: "Plato (IQ=180) is my friend, but truth my greater friend" he scribbled in his notebook at age 19.

Tesla's idea for a self-starting AC electric motor, in fact, came to him one evening as he was reciting a poem of Goethe, specifically a passage from *Faust*, a book which he had memorized in entirety (among other books), and watching a sunset, at which point he imagined a magnetic field rapidly rotating inside a circle of electo-magnets. [20]

Thims, similarly, in his 1,300-book personal library, as of 2013, has a number of works on or by Einstein, many articles by Tesla, and some 27 books by or about Goethe and his philosophy, particularly his chemical philosophy—and in particular upon discovering Goethe and his *Elective Affinities* in 2006, via footnote 2.5 of Belgian chemist Ilya Prigogine's 1984 *Order Out of Chaos*, nearly hypnotically entered into the Csikszentmihalyi flow state and over the course of 18-months and 14-days wrote the world's first textbook on human chemistry (*Human Chemistry*, 2007), which as of 2010s has begun to be classified as a new scientific field, an example of which being the following photos and paper presentation excerpts from Russian-born Israeli chemical engineer Alec Groysman's 2011 generative art conference presentation "Use of Art Media in Engineering and Scientific Education", wherein he discusses Goethe's 1809 physical chemistry based *Elective Affinities* up through modern free energy and human free energy theory, cites the work of Thims, classifies Goethean-based "human chemistry" as a new scientific field, and advocates its use in engineering and scientific education (see: two cultures department): [21]

> "Dobereiner helped in refining Russian platinum, discovered catalysis, and reported his work to Goethe. We can only suspect that Dobereiner read the tragedy *Faust* and the novella *Elective Affinities*.
>
> The latter work of art gave impulse to a **new scientific field** named 'human chemistry'.

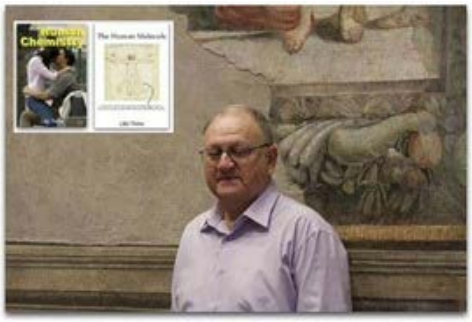

> In the exact sciences there are quantitative measures of estimation of each value: mass, length, force, energy. In the humanistic disciplines (history, philosophy, psychology) as well as art there are no quantitative criteria. This is similar to the question of how to measure beauty, love, friendship, democracy? The function named Gibbs energy defines 'love' between substances [and] [possibly] people ... and is similar to Hamlet's 'to be or not to be?' of William Shakespeare."

American prodigy William Sidis did not directly seem to directly build on the shoulders of Goethe, but seems to have been aware of his genius. The following passage from his father Boris Sidis' 1914 *The Foundations of Normal and Abnormal Psychology*, which the young Sidis would likely have proofed and or read, on the subject of what Boris described as the "moment threshold", gives evidence to this: [22]

> "Once a particular moment is stimulated in its appropriate way, it may go on developing, and usually does so by stimulating and setting into activity aggregates of moments associated with it, or may form new combinations of aggregates. The solution of a problem may present great difficulties, but once started on the appropriate line, the whole series of combination goes on unfolding, stimulating other moments and aggregates and forming more and more complex combinations. Thus, Archimedes,

as the story runs, while in the bath, made the discovery of the law of specific gravity. According to the popular account Newton was led to his discovery of universal gravitation by the accidental fall of an apple. Hughes was started by the idea of symmetry in his discovery of the laws of crystallography. Goethe was led to his conception of metamorphosis and evolution by a skull [see: human intermaxillary bone] on the plains of Italy. Darwin by reading Malthus' economical treatise on population was inspired to work out the great principles of the struggle for existence and natural selection. Myers was led by the greater redness of blood in the blood-vessels of tropical patients to his grand conceptions of transformation, equivalence, and conservation of energy. All these examples illustrate the fact that once a moment has been started it goes on developing by stimulating other cognate moments and aggregates to functioning activity."

It has not been ascertained yet whether or not Christopher Hirata has read or is even aware of Goethe?

Life problem | Life does not exist solution

See main: Defunct theory of life; Great problem of natural philosophy

Goethe
(1809)

Tesla
(1915)

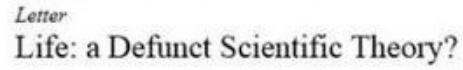

Goethe, Tesla, and Thims, each independently cited in the **IQ=225+** range, have worked on the "defunct theory of life" solution to the theory of life
problem and or life from non-life problem.

Of curiosity, among the 225+ IQ group, the "what is life?" problem, when descended downward on the evolution timeline to the atom-chemistry-molecule and or animate molecule point of demarcation, wherein supposedly, at about 3.85 billion years ago, an undefinable something (property, principle, or description) called "life" is, supposedly, to have come into inception or "emerged", with the strike of a bolt of lightening or following a meteor impact, in the years to follow the the ignition of the sun, 4.8 billion years ago, according to the Nebular hypothesis and Urey-Miller model, was worked on by Goethe (1809), who teetered on the solution, and solved, independently, by Tesla (1925), tersely, who concluded:

"There is no thing endowed with life"

and by Thims (2009), more aggressively, who arrived at the conclusion:

"I am under the view that the term 'life' is a defunct scientific theory."

Thims likewise, arrived at the view that human is an animated molecule, or geometric chemical, with a measured molecular formula, and atoms and molecules, by definition are not alive, nor can atoms and molecule be made to come alive, nor has is there such a thing as a "living molecule" or an "alive chemical", as was a theory common in the 19th century; views that in modern speak amount to panpsychism or panexperientialism at the atom/sub-atomic particle level and are thus incorrigible and untenable views and hence incorrect—a forced mythology/religious-based chemical anthropomorphism, so to speak, maintained in the public mind though prolonged centuries of culturally-ingrained religious teachings: particularly those of Anunian theology and the breath of life/clay creation origin of life theory, rewritten in the form of the Biblical/Quranic story of Adam and Eve, which nearly half the modern world currently believes is a true story (see: existence of God; life force).

Elective affinities problem

See main: Elective affinities problem

Goethe
(1770)

Einstein
(1920)

Hirata
(2000)

The hardest intellectual genius puzzle of them all is the "elective affinities problem", namely to explain human passions, turmoils, experience via the chemical affinities or free energies, such as depicted adjacent. German philosopher Arthur Schopenhauer (IQ=185), Goethe's protégé, described the problem of trying to explain the physics of love—or metaphysics of love as he called it—like this: [13]

"We should be surprised that a matter that generally plays such an important part in the life of man has hitherto been almost entirely disregarded by philosophers, and lies before us as a raw and

untreated material."

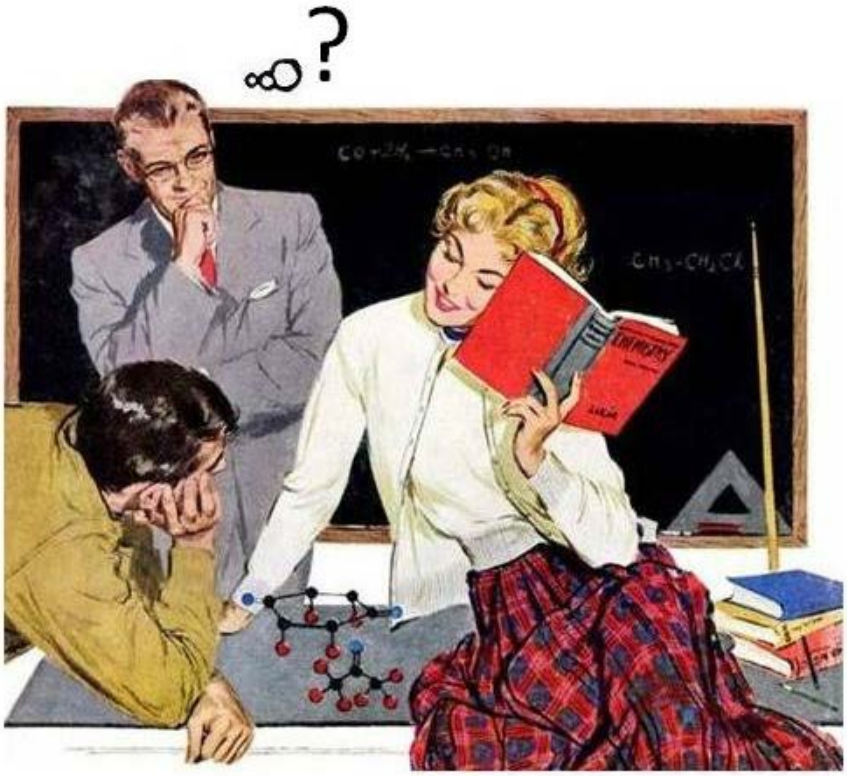

The Elective Affinities Problem

Goethe, Einstein, Thims, and Hirata, each independently cited in the **IQ=225+** range, have worked on the "elective affinities problem", namely how to explain passions and the turmoils of existence and experience in modern physical chemistry terms—Bergman's 1775 chemical affinities theories (Goethe's day) or Gibbs' 1876 free energies theories (modern day) (see: human free energy).

The elective affinities problem is the only puzzle common to the rare ceiling adulthood geniuses, Tesla (?) aside, cited in the IQ=225+ range, namely:

â— Goethe (1796) (IQ_{Cit}=225; IQ=230), who called his solution to this problem his "greatest work" or "best book" (1809), of all his 142+ collected works publications, in which he embedded a secret principle which he said was "true" and which was "only production of greater extent" in which he was "conscious of having labored to set forth a pervading idea";
â— Einstein (IQ_{Cit}=225; IQ=220), who commented on the problem (see: Einstein on love), in a somewhat irritated perplexment scribble note: "gravitation cannot be responsible for people falling in love" (1933) and previously in query to geneticist Thomas Morgan: "how on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?" (1920s);
â— Thims (1995) (IQ_{Cit}=225+; IQ=190), who was led into the problem, similar to Goethe, via a mixture of the "love thought experiment" and the "reverse engineering puzzle";
â— Hirata (2000) (IQ_{Cit}=225; IQ=190), who called his solution a "fun compilation of worthless applications of physics and mathematics to relationships";

Even the great child prodigy William Sidis (IQ_{Cit}=250-300; IQ=195) attempted solution, in a round-about-way, via his 1920 theories on animate matter and entropy; entropy, itself being one of the components of chemical affinity, as quantified via the Goethe-Helmholtz equation.

Some may, to note, be quick to label the "elective affinities" problem as bunk or childish or trivial among other pejoratives. In 1810, for example, German poet and writer Christoph Wieland described Goethe's solution to the elective affinities problem:

"To all rational readers, [Goethe's] use of the chemical theory is nonsense and childish fooling around."

Yet, conversely, Goethe, himself, described his solution as his "best book" of 142 total published works. Wieland's objection, however, was religious one.

Hirata, puzzlingly, listed his solution attempt to the problem a "fun compilation of worthless applications". These naysayers, however, will find it hard to explain the fact that two of the five smartest women of all time, namely George Elliot (IQ=190) and Germaine Stael (IQ=185) also, independently, worked on the very same elective affinities problem:

â— Elliot (1854) (IQ=190): did an analysis of Goethe's solution, with her lover George Lewes; and expanded on Goethe's model to account for, in the 2007 words of Carl Crockel, the "wider social relationships through affinity" in her most-famous 1872 *Middlemarch*, said to be the best English novel ever.
â— Stael (1803) (IQ=185): in 1803, moved to German and entered into Goethe's circle, eventually commenting favorably on his solution.

through their association with Goethe.

Blue sky color problem

Among the 225+ group, the blue sky problem was worked on by both Goethe (1826) and Einstein (1908).

Goethe (1926)

Einstein (1908)

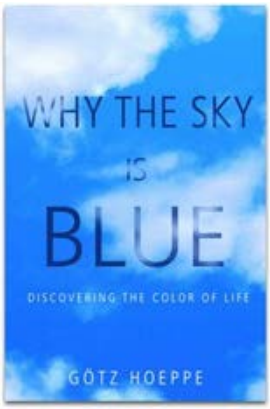

Every single genius in the IQ=205+, and two, Goethe and Einstein, in the **225+** range, worked on the range worked on the blue sky problem.

> "Although ideas about the origins of the sky's blue color can be traced back to Greek antiquity, the first concerted effort to reach a plausible explanation is attributed to Leonardo da Vinci. The Italian master was followed by Newton, and later by Bouguer and de Saussure. Tyndall wrestled with the problem around 1869—'I think Strutt on the sky-blue is very good. It settles Clausius' earlier vesicular theory to explain the blue sky' [Maxwell, 1871]—but the definitive explanation would be proposed only in 1899, by Lord Rayleigh [John Strutt]."
>
> — Pedro Lilenfeld (2004), "A Blue Sky History" [14]

Also, interestingly, from the Genius IQs table, among 205+ geniuses group, to to note, every single genius worked on the blue sky problem: namely Da Vinci (c.1508), Newton (1704), Goethe (1826), Maxwell (1871), and Einstein (1908), in some way or another, prior to and even after (in the case of Einstein) its partial solution by Rudolf Clausius (IQ=205), in 1847, and final solution by John Strutt (IQ=190), in 1899.

Religion problem

The previous quote by Peter Medawar on Galton's 200 IQ—" God alone knows"—gives an excellent lead into the opinions of what the IQ=225+ geniuses say about the existence of or rather more-correctly nonexistence of God. To give a bit of comparison preliminary, among geniuses in the IQ=210+ category:

Goethe (1809)

Tesla (date)

Einstein (date)

Sidis (1905)

All **IQ=225+** cited thinkers, Hirata aside, have digressed into aspects of the so-called religion problem.

â— James Maxwell (IQ=210) expressed his views in a semi-riddled manner in his last dying poem "A Paradoxical Ode", in which he seemed to be ambivalent on the matter to some extent.

â— Isaac Newton (IQ=215) vacillated about in his views on God: he denied the divinity of Jesus Christ and the Holy Spirit; but did seem to have some type of belief, at times, in a deity, which informed his creed of absolute space and absolute time. At one point he wrote: [3]

> "God who gave animals self motion beyond our understanding is without a doubt able to implant other principles of motion in bodies which we may understand as little. Some would readily grant this may be a spiritual one; yet a mechanical one might be shown …"

Here we see Newton grasping at the mechanical model replacement for God, that would not arrive, in part, until the time of Goethe and his 1809 "moral symbols" of physical chemistry replacement for God. Here, we note that Newton errs in his attribution of "self-motion" to humans, in what amounts to perpetual motion of the living kind. In one of his other draft notes that did not see the light of day, Newton wrote of his possible atheism views: [3]

> "Can God be nowhere when the moment of time is everywhere?"

â— Albert Einstein (IQ=220-225) was a bit of bush-beater when it came to his religious beliefs. It is commonly known that he claimed to have believed in the "God of Spinoza", most-likely meaning that he believed that "nature" was God, or something along these lines. At age 75, as described in his famous Bible-bashing letter that sold for $400,000 dollars in 2008, he gave his

A circa 2012 SuperScholar.org infographic listing Christopher Hirata and Terrence Tao as both having IQs at or over 225 (link); the difference between the two, however, to point out, being that Tao's ratio IQ estimate was made at age 9, Hirata's at age 16, the younger aged estimate being easier to skew upwards.

opinion that "the word of God is nothing more than an expression of human weakness"; described the Bible as "pretty childish"; and stated that "all religions are incarnations of the most childish superstitions." [4]

â— William Sidis (IQ=190, 225+) was a confirmed atheist at the age of 6 and at age 21, when asked in court if he believed in god, he replied "No" and clarified that evolution was his god; when pressed further about this he stated that he did not believe in the "big boss of the Christians", but that he did believe in something "that is in a way apart from a human being". [5]

â— Johann Goethe (IQ=230) had questioned the traditional concept of God at an early age; in *Dichtung und Wahrheit* he describes, in poetic language, how at age 9 he built his own alter to nature out of his father's natural history collection, surmounting it with a candle, which he lit when making his devotions. It has been argued that his readings of the works of Benedict Spinoza later confirmed these feelings. [6] At age 21, at the University of Strasbourg, completing a dissertation (rejected on the grounds that it was unorthodox) on "The Legislature, On the Power of the Magistrate to Determine Religion and Culture", in which he contended, among other things, that "Jesus Christ is not the author of Christianity, but rather a subject composed by a number of wise men and that Christian religion is merely a rational, political institution." [7] In July 1782, he described himself as"not anti-Christian, nor un-Christian, but most decidedly non-Christian." In his *Venetian Epigram 66*, Goethe listed four things that he loathed: "tobacco smoke, bugs, garlic, and †." [8] In his collected works of poems, Goethe famously stated the following famous synopsis:

> "He who possesses science and art,
> Possesses religion as well;
> He who possesses neither of these,
> Had better have religion."

It does seem to be the case that Goethe had some type of belief in the existence of God—some have summarized to be similar to the embodiment of nature type of god held in the mind of Benedict Spinoza (similar to Einstein) one of Goethe's intellectual mentors. In a 21 November 1827 letter to his friend, German composer Carl Zelter, the same letter that he famously comments how people have treated his *Elective Affinities* like the "garment of Nessus", to exemplify, Goethe comments in ending: [9]

> "With the kindest greetings, let me exhort and cheer you on to persevere in that activity, to cultivate which—in the midst of peace—we are encouraged and compelled by the hostile pressure of the world. If we help ourselves, God will help us."

In 1831, a year before his end, Goethe commented the following: [10]

> "I have found no confession of faith to which I could ally myself without reservation."

Interesting, indeed. In retrospect, however, we not that Goethe's 1809 conception of physical chemistry based "moral symbols" is what will eventually lead to the downfall of the Bible and eventual replacement of the world-dominating Anunian theologies (Ra theologies): Christianity, Islam, and Hinduism.

â— Nikola Tesla (IQ=140-310) held adamantly to a Goethean philosophy: he owned a thorough collection of Goethe's scientific texts and read these to the exclusion of all other philosophies. A noted Tesla quote on religion is as follows (link):

> "Religion is simply an ideal. It is an ideal force that tends to free the human being from material bonds. I do not believe that matter and energy are interchangeable, any more than are the body and soul. There is just so much matter in the universe and it cannot be destroyed. As I see life on this planet, there is no individuality. It may sound ridiculous to say so, but I believe each person is but a wave passing through space, ever-changing from minute to minute as it travels along, finally, some day, just becoming dissolved."

â— Libb Thims (IQ=170-225+), typical of many American children, was synthesized into a non-scientifically educated family, and was taught the Lutheran version of Christianity. From an early age, however, he was ingrained with a strong inquisitiveness, similar to Scottish physicist James Maxwell's famous age three repeated query "What's the go 'o that?", and deep sensitivity to boredom, similar to German polymath Johann Goethe's famous age eighty to "die of *ennui*" phrase, and insight into the value of the truth above all else, similar to Aristotle's famous motto "Plato is my friend, but truth my greater friend."

Thims' earliest recollected question, asked sometime around the age of 3 to 5, while being led through a local park, was "where does God live?"; a followup, supposedly, to an earlier query: "what happens when you die?", although Thims does not recall asking this specific question—to which Thims was told "he lives in that gardener's shack", a small white toolshed near the edge of the park. The satirical response to this question—a query that embodies the notion that both "God exists" and that "life exists", a viewpoint ingrained into the minds of most young children of the world from inception (see: belief system (child)):

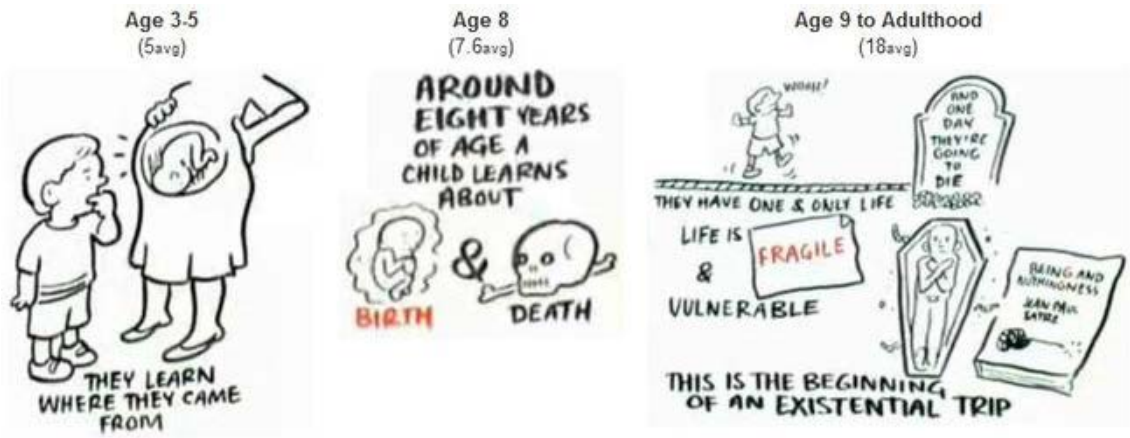

sat in the back of Thims' mind for some time, that is until he would latter enter into scientific studies, then and comparative mythology and religion studies in adulthood, after which, some 85+ books later in religio-mythology, after spending an exorbitant amount of time tracking down the etymological structure of the Abraham/Brahma character, from which all humans are said to descend from, he would come to discern the hidden but dominate Egyptian mythology underlying over 72 percent of the world's belief system—which is, naturally enough, is the basis behind the answers to questions he was given as a child. The following shows the sub-branches of the modern "Father Ra Born of Nun" (Abrahamic/Brahmaic) faith based religions, otherwise known in ancient days as Anunian theology or Ra theology (aka Egyptian mythology), that currently dominates the mindsets of nearly ¾-ths of the modern world: [19]

World Religions Distribution

Ab-Ra-ham-ic faiths: (53%)

Christianity (33%)

Islam (20%)

Judaism (0.2%)

Baha'ism (0.1%)

Mandaeism (0.001%)

B-Ra-hma-ic

Hindu

Buddhism

Sikhism

Jainism

faiths: (19%) (13%) (6%) (0.4%) (0.07%)

Non-religious/Atheist: (15%) Secular (12.6%) Atheist (2.5%)

Other-religions: (13%) Chinese religions (6.4%) Ethnic religions (4.2%) New religions (1.7%) Spiritists (0.2%) Confucians (0.1%) Shintoists (0.05%) Zoroastrians (0.005%)

which resulted to position him into the Dawkins number 10 category of belief system. The idiocy of this situation is summarized well by the following 1883 synopsis, by English Egyptologist Gerald Massey, of the learn-unlearn process the majority of intellectuals (readers) are forced to go through: [18]

> "It takes the latter half of all of one's lifetime to unlearn the falsehood that was instilled into us during the earlier half. Generation after generation we learn, unlearn, and re-learn the same lying legendary lore. Henceforth, our studies must begin from the evolutionist standpoint in order that they mat not have to be gone over again."

In 2011, following much "unlearning", as Massey puts it, Thims had written one manuscript entitled *Purpose: in a Godless Universe*, shown adjacent, and after learning of the Dawkins scale (2009), in the shown adjacent "What's Your Dawkin's number?" video, declared himself publicly an adherent, similar to Tesla, Schopenhauer, and Einstein, of Goethean philosophy, in the chemical philosophy sense of the term, such as he discusses in the adjacent 2011 video, wherein he explains that, on the Dawkins scale, he is a 10 and that in verbal terms:

Left: A 2011 draft manuscript entitled *Purpose? (In a Godless universe*) by American electrochemical engineer Libb Thims (IQ=140-225+), aimed at dispelling (a) the purposeless universe hypothesis, (b) belief in the existence of God, and (c) explaining morality, or the "moral symbols", as Goethe put it (24 Jul 1809), in terms of what is natural (dG < 0), and what is unnatural (dG > 0), and the connection of the two *via* coupling theory. **Right:** A 2011 clip of American electrochemical engineer Libb Thims explaining, at about 19:10, following Bertrand Russell's explanation of "rational morality", how he is a **Goetheanist**, an adherent to Goethe's 1796 chemical philosophy of human existence and experience.

> "Myself, I am a Dawkins number 10. Like Russell, I was forced to tread through a path of self-education, starting from an age 5 question about where does God live?—upward through chemical engineering studies—and further prolonged research in the field of comparative religion and mythology, in a quest for knowledge, which, to note, is embodied presently in a personal library totaling 1,247 books, of which 330 are in thermodynamics, the subject upon which the modern physical chemistry morality system is based.
>
> In plain speak, for me, there is no God—it is not even a thought in the back of my mind—there are no supernatural forces, all that exists is matter and energy governed by the laws of hard physical science; the theory of life, death, afterlife—in particular 'life' [theory of life] and the 'origin of life'—is a defunct theory, passed on to us through religious-mythological teachings. Morality, however, does exist: and is explained within the framework of thermodynamics, the laws that govern the known universe in particular, by way of being explained by differentials of Gibbs free energy, the same energy that governs and describes the nature of the reactions that occur between the atoms of the periodic table—a morality system as outlined in 1809 [1796] by German polymath Johann von Goethe—hence I am what might be called, one step above atheism, as a 'Goetheanist' or a believer in **Goetheanism**—or humanism mixed with physicalism mixed with materialism."

In short, to elaborate, although about 95 percent of modern scientists (see: existence of God) are atheists, by declaration and definition, this only explains what one does not believe in—Goetheanism, or a belief in (a) the periodic table (what one is comprised of), (b) the laws

of thermodynamics, and (c) the main tenets Goethe's chemical philosophy of existence, is a step above this, a way of explaining what one does believe in—a cogent distancing from nihilism or belief in nothing.

Teenage estimates

The following individuals have IQ=225+ citations made while in the childhood age range, Tao (age 9), and Laibow-Koser (*circa* age 8). Ratio IQs, to note, tend to be overestimates and not accurate representations of resultant finalized adulthood IQ, being that they are based on age of the tester rather than the difficulty of the test. In other words, to give an example, to quote from John Morgon's 1941 *Psychology*: [16]

> "The individual with the MA of nine years and the CA of four years would have an **IQ of 225**. The actual ratio would be 2.25. In order to eliminate decimals, the ratio is multiplied by 100 and the IQ expressed as a whole number."

In other words, IQ estimates made below age of about 13 give or take, tend to be overinflated, being that it is relatively easy to train a four year old to pass a test designed for nine year olds.

#	Person	IQ	Theory	Date
6	Terence Tao (1975-) ↑	211-230		
7	Marnen Laibow-Koser (1975-) ↓	268		

Tao, to note, did win the Fields medal and the following is a Tao favorite quote from his online genius section: [15]

> "When a **true genius** appears in this world, you may know him by this sign, that the dunces are all in confederacy against him."
>
> — Jonathan Swift (IQ=155), *Thoughts on Various Subjects, Moral and Diverting* (1706)

Tao, in respect to the "religion problem", on the same page, has an online selection of favorite quotes on God, much of which is represented by Voltaire's views.

Parental-estimated ratios

The following are 225+ range IQs made by the over-zealous parent or parents of each child, Cawley (age 7), Kearney (age 4), and De Mello (before age 11), the given test scored ratioed up to an estimated adulthood equivalent:

#	Person	IQ	Theory	Date
8	Ainan Cawley (1999-)	263-349		
9	Michael Kearney (1982-) ↓	200-325		
10	Adragon De Mello (1976-) ↓	400		

Parentally estimated 225+ IQs, however, firstly biased, and secondly, and most importantly, are "near mathematical abstractions", as Georgi Gladyshev likes to define such contrivances, generally based on some trivial test or feat that the child did during the sub age 6 level of development, that any above average adult could do, such as passing junior high or high school level chemistry test, math quiz, or reading test, etc., and as such are what are called over-estimates. To exemplify, in 1917, American psychologist Lewis Terman, in his "The Intelligence Quotient of Francis Galton in Childhood", used his newly-developed IQ age ratio formula to calculate the the world's first ever 200 IQ, namely that of English anthropologist Francis Galton, based on the following age four letter Galton wrote: "I am four years old and I can read any English book. I can say all the Latin substantives and adjectives and active verbs besides fifty-two lines of Latin poetry. I can cast up any sum in addition and can multibly by 2, 3, 4, 6, 8, 9, 10, 11. I can also say the pence table. I read French a little and know the clock." [1]
In other words, supposedly, as we are led to believe, Galton has an IQ of 200 because he knows the pence table and can read a little French? In 1977, English biologist Peter Medawar, in his "Unnatural Science" article, famous commented on this calculation: "God alone knows how [Terman] estimated Galton's IQ as 200." [2]

Other | Fictionalized/falsified/overestimated 225+ IQs

Below are a few outliers here who claim that their own IQ is above 225, have misrepresented sources to substantiate such a value, among other contrivances, the prime example being Marilyn Savant, a newspaper columnist who sent in faked age when test was taken records in to the Guinness Book to claim world's highest IQ, falsely estimated at 228/230. The vacuousness of this faking an IQ issue is exemplified as follows:

> "Marilyn vos Savant, with an IQ of 230 [falsified], has contributed little to science, literature, or art. Nobel prize–winning physicist Richard Feynman, whom many regarded as a genius, had an IQ of 122."
>
> — Michael Michalko (1998), *Cracking Creativity: the Secrets of Creative Genius* [18]

Correctly, in retrospect, we know Feynman, in the meta-analysis of the ranking framework of the genius IQs table, had a true or real IQ of 190, where Savant, in the meta-analysis of the ranking framework of smartest woman ever comparisons, maybe had an IQ of 120 to 150 at best. In any event, this general group includes:

	Person	IQ	Note
â —	Marilyn Savant (1946-) ↓↓	127-228	Sent in incorrect test dates (which don't match actual school records) to the Guinness Book to claim a 228 IQ (or 157 according to actual records) and when questioned about this stated that documents supporting her claims were provided by a teacher whose name she can't remember;
â —	Evangelos Katsioulis (1976-) ↓	180-258	Is the founder of the so-called "World Intelligence Network", whose online magazine (2006) explains that "spirit is the vital principle which gives the physical organism life, in contrast to its material components"; citing Pierre Teilhard as justification (link); lists himself as IQ=180-205 [11]; a YouTube page lists him as IQ=258 [12]; quote (2011): "I created my high IQ societies and the World Intelligence Network, in order to host spiritual and human interactions in a safeguarded, morally respectful environment." (link)
â —	Rick Rosner (1960-) ↓	140-250	Stated that "at age 26 I forged about 40 documents and went from being a 26-year-old undergrad to being 17-year-old high school student Gilligan Rosner. I got good grades in most of my courses: due to my advanced age relative to my classmates, I had a functional IQ of about 250";
â —	Avi Ben-Abraham (1957-) ↓	250	Seems to have faked college records and or medical school records to boast that he graduated from medical school at age 18, with articles on him stating his "IQ is estimated around 250";
â —	K. Vishalini (2000-)	210-225	In 2011, began to be touted in Indian as IT whiz kid with "IQ around 225" (Ñº) (video); she even touts in 2015 video (Ñº), that she has the world's highest IQ of 225, based on test she took when she was age 3.5; here name crops up, ignorantly, in Quora "highest IQ" (Ñº) discussions; her intellectual feats include: Cicso, Microsoft, and Oracle certification test scores (90% pass) before age 13.
â —	Iqbal Abba (c.1950-) (?)	235	Possibly a fictitious person, who, as some claim, sent in proof of 235 IQ to Guinness Book in circa 1989, but who seems to be non-existent, outside of a few postings on him, claiming that he exists anonymously somewhere in New York at present.
	William		A completely fictitious person, modeled after William Sidis (IQ=250-300), posted to the

â —	Quannigton (fictional person)	300-350	internet in 2006 by someone under the pseudonym of Quigley Anderson, who claimed that he was writing book on the 50 highest IQs ever recorded. The name and listing did the rounds about the Internet for some years.

To note, the same Quigley Anderson person, in the same 2006 internet joke listing, cited Da Vinci as being at 225 IQ, but this seems to be the only citation of Da Vinci this high.

List curator

See main: Libb Thims (genius ranking)

#	Name	Years	I.Q. (200+)
1	Michael Kearny	1982-	325 (age 4)
2	**William James Sidis**	1898-1944	200, 250-300 (verbal estimate)
3	Marilyn vos Savant	1946-	228 (age 10), 186 (age 40)
4	Leonardo da Vinci	1452-1519	180, 210-225
5	**Johann von Goethe** *	1749-1832	210
6	Kim Ung-Yong	1963-	200-210
7	Hypatia	c.360-415	170-210
8	Nathan Leopold	1904-1971	200-210
9	Emanuel Swedenborg	1688-1772	205
10	Gottfried Leibniz *	1646-1716	205
11	John Stuart Mill	1806-1873	200
12	Francis Galton	1822-1911	200
13	Hugo Grotius *	1583-1645	200
14	Thomas Wolsey *	c.1472-1530	200
15	Michael Grost	1954-	200

American electrochemical engineer Libb Thims' original *circa* 2007 personal folder collection of fifteen IQ=200+ range geniuses (asterisk = Cox IQs).

The following table the shows IQ measurements, citations, and estimates of American electrochemical engineer, thermodynamicist, hmolscientist, encyclopedist, Goethean philosopher, and paradigm change initiator Libb Thims, the originator, curator, and current meta-analysis re-ranker of the above **IQ 225+** listing—a listing that owes it origin to field of human chemical thermodynamics (Thims' central field of study), by virtue of the curious finding that IQ=225+ range thinkers are common or rather attracted to the subject: the first two discovered, in 2007, being William Sidis and Johann Goethe, and later Christopher Hirata (in 2010), Thims himself, by community vote (in 2012), then of course Einstein (in 2006) and his paradoxical views on the physics and chemistry of love. Historically, the above table originated in Thims' *circa* 2007 15-person personal folder collection of newly discovered 200+ range geniuses, with citations, as shown adjacent. This was made into a first-draft 2008 online listing: IQ: 200+ table. In 2009, the online list was made into a quickly-made 10-minute YouTube video entitled "IQ 200 | Smartest person ever", containing about 18-individuals, getting about 30,000 views. In 2010, the video was remade and reranked into the format of better-quality 52-minute four-part video series, containing 37-individuals, was uploaded to YouTube, having since attracted over 600,000+ views (Jun 2012). Commentary, feedback, suggestion, and debate from this growing collection of videos and online listings resulted in this webpage (launched on 24 Oct 2011).

IQ	Person	IQ estimates	Description
↕	Libb Thims (c.1975-)	IQ_Y=225+ IQ_O=210 IQ_E=140-150	[:1] Library=1,250+ books; main initiator of modern human chemical thermodynamics—the subject defined, in 1910, by Henry Adams, after continuously working on the subject for 37-years, as one requiring the "aid of another Newton (IQ=215)"—the only science common to the queries of adulthood IQ=225+ geniuses—a very rarified group, inclusive of: Johann Goethe (IQ=230), William Sidis (IQ=195, 300), and Christopher Hirata (IQ=190, 225); adheres to a Goethean philosophy, to the exclusion of all other philosophies (similar to Tesla (IQ=195)); noted for discerning the "defunct theory of life" solution to existence (2009); a theory also independently arrived at, in 1925, by Tesla (IQ=195); a scientific revolutions—Goethean revolution—genius (IQ_{AVG} = 189); a considered-to-be polymath (IQ_{AVG} = 189)—urged to apply for membership to Giga Society (IQ=196+) by Mensa Society (IQ=132+) friend (c.2003); quote: "Thims' edits are far and wide. Unless Physchem is an incredible polymath, I doubt he would be able to pick up on all the BS a Thims-type editor introduces. That's not knocking Physchem, I don't think there is anyone who could deal with the range" (Keith Henson, 2007); quote: "I stumbled onto your website by accident but I have to confess this might be one of the most stunning undiscovered intellectual achievements of the 21st century. I have browsed through your wiki and I cannot express how tragic it must be to a man in your position—to be a pioneering thinker yet to be rejected by an uptight academic community

with neither the depth nor will to understand your unique work, defending their own turf like dogs. I can only compare you to the many other pioneering heroes of science, Newton (IQ=215), Einstein (IQ=220), Tesla (IQ=195), men (IQ_{AVG} = 210) who like you blazed their own paths but were too victims of their own genius, only to be validated years after their death. Perhaps one day historians will look back and have a chuckle—that the pioneer of enthropology published by a vanity press in a book resembling a third rate romance" (Steven Pierce, 2009); quote: "Thims: the great oracle and developer of human thermodynamics—the philosophical revolution of the 21st century. A genius of outstanding stature and originator of many concepts in human chemistry" (Mark Janes, 2011); quote: "I think the guy narrating this video has the highest IQ [ever]" (shown above), 34 thumbs up votes in three weeks (YouTube: "IQ: 200+ | Smartest person ever", 2012; vote rate: one thumbs up every 175 views (1.6 days)).

Key

The following is a key to some of the icons and IQ subscripts used above:

Symbol	Key
IQ_{Symbol}	The following are the links to various IQ_T(Terman IQ), IQ_C(Cox IQ), IQ_B(Buzan IQ), IQ_{CB}(Cox-Buzan IQ), IQ_R (Ratio IQ), IQ_D(Deviation IQ), IQ_M(Mega Test IQ), IQ_G(Guinness Book IQ), IQ_P(Psychologist IQ), IQ_O(Other IQ: cited at IQ references, or per numbered reference), $IQ_?$(Estimated IQ: estimated fit per extrapolation of established previously made Cox-Buzan IQ estimates), IQ_{SB}(Stanford-Binet), IQ_{AI}(or AI IQ) (development to age 17), IQ_{AII}(or AII IQ) (development from 17 to 26), IQ_Y(YouTube community "IQ: 200+ | Smartest person ever", video thumbs up rankings/votes), IQ_E (*Esquire* "Gεπ1us Tεst" IQ), CI_B(Baez crackpot index score), IQ_{CP}(comparison-to-person with existing IQ estimate) [31] .

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θΔics

In genius studies, **IQ:200+ HCT prodigies** refers to prodigies, namely: Goethe, Tesla, Sidis, Neumann, Hirata, and Arroyo, cited, independently, with an IQ in the 200 range AND who have "independently" arrived at a human chemical thermodynamics (HCT) theory or variant (e.g. "this idea"). [N1]

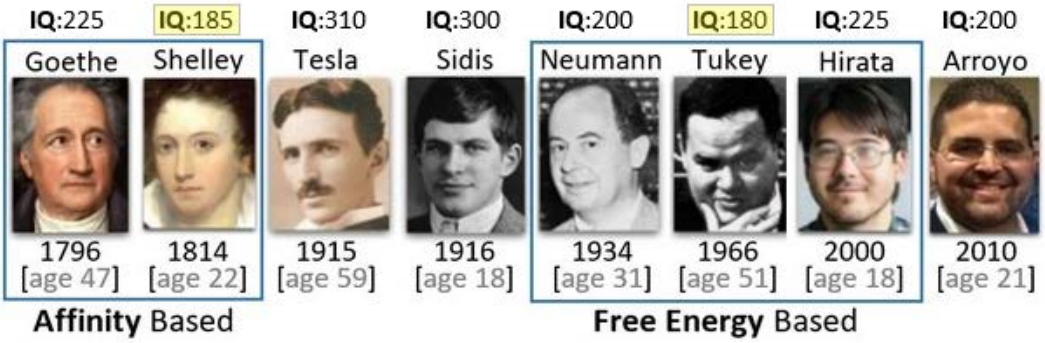

A visual summary of **IQ: 200** range **prodigies**: **Goethe**, **Shelley**, Tesla, Sidis, **Neumann**, **Tukey**, **Hirata**, and Arroyo, each shown with their respective highest IQ estimate (Shelley and Tukey, to note, don't have independent IQ:200+ citations; they are gauged at 180+) who in adulthood, independently, produced a variant of human chemical thermodynamics (**HCT**) theory, affinity based prior to the thermodynamic theory of affinity (1882 to 1923) and free energy based thereafter.

Overview

(add)

List

The following is a listing of IQ:200+ cited thinkers who have independently produced HCT theory. The "discovered" dates listed are the dates when Libb Thims, who derived his own HCT theory in 1995, became aware of these various 200-range IQ thinkers, during his research (see: footnote 2.5), the first two of which being Goethe (2005) and Sidis (2008). IQs shown below, to note, are cited by others (not Thims). Names bolded (Goethe, Hirata, and Thims) are the most pure form of human chemical thermodynamics. Sidis and Hirata, of commonality, are the youngest IQ:200-range thinkers to derive HCT theory. Thims, unusual to practice, for the sake of homogeneity, includes himself in the following list. [N2]

Genius (see: Top 500 geniuses)	**IQ:200+** (year IQ cited / discovered)	**Human Chemical Thermodynamics** (see: two cultures namesakes)	
1. Goethe	IQ:225+ Estimated: 1926 **Discovered**: 10 Oct 2005 (Ñº)	**Theory:** Chemical Affinity Model of Relationships Passion + Morality = *f*{Affinities} **Religion:** Spinoza upgrade atheism (see: ATDB; Goethe on religion)	Derived: 1796 Age: 47
2. Tesla	IQ:200-310 Estimated: 2000 **Discovered**: c.2009	**Theory:** Human is Powered Molecular Automaton with Energy of ½mv² Purpose = *f*{Kinetic Energy} **Religion:** Christian-raised (Serbian orthodox) (youth); largely crypto-atheistic, Spinoza-like theist, as adult. (Ñº)	Derived: 1915 Age: 59
3. Sidis	IQ:250-300 Estimated:1940 **Discovered**: 24 Mar 2008 (Ñº)	**Theory:** Thermodynamics of Animate and Inanimate Life = *f*{Entropy Reversal} **Religion:** Evolution-believing atheist or deist (age 15).	Derived: 1916 Age: 18
	IQ:200	**Theory:** Thermodynamic Free Energy Theory of	Derived: 1934

4.
Neumann

Estimated: 2010
Discovered: 11 May 2004 (Ñº)

Cash Value

Cash Value = f{Free Energy}

Age: 31

Religion: Jewish-born (youth); overly secular, agnostic, non-religiously (adulthood); took Pascal's wager (age 54) (see: Neumann on god).

5.
Thims

IQ:200±
Estimated: 2012

Theory: Chemical Thermodynamic Model of Relationships

Relationships = f{Free Energy}

Derived: 1995
Age: 23

Religion: Extreme atheist (see: ATDB; Thimsian atheism).

6.
Hirata

IQ:**225**
Estimated: 1999
Discovered: 15 Feb 2010 (Ñº)

Theory: Thermochemical Model of Relationships

Relationships = f{Free Energy}

Derived: 2000
Age: 18

Religion: Christian (age 31)

7.
Arroyo

IQ:200
Estimated: 2006
Discovered: 11 Feb 2016 (Ñº)

Theory: Thermal Model of Economics

Value = f{Low Entropy}

Derived: 2010
Age: 20

Religion: Jehovah's Witness (age 15)

The following are are 175+ IQ guesstimated prodigies, without specific IQ citation, but with similar independent HCT theory:

Genius (see: Top 500 geniuses)	**IQ:175+** (year IQ cited / discovered)	**Human Chemical Thermodynamics** (see: two cultures namesakes)	
8. Tukey	IQ:180+ **Discovered**: 2012	**Theory:** Free Energy Attitude State Theory Attitude State = f{Free Energy} **Religion:** Overtly secular [?]	Derived: 1966 Age: 51
9. Wooldridge	IQ:175+ **Discovered**: 2012	**Theory:** Physical Basis of Intelligent Mechanical Human Intelligence = f{Chemical Physics} **Religion:** Implicit atheism; asoulist	Derived: 1968 Age: 55
10. Gross	IQ:175+ **Discovered**: 2013	**Theory:** Causal Entropic Force Intelligence = f{Entropy}	Derived: 2013 Age: 31

Religion: Overtly secular [?]

The above infoboxes show, seemingly, that if one is a coming of age prodigy in the IQ:200± range (and or 175+ range) intellect, one's mind will "naturally" gravito-electro-magnitate towards a chemical thermodynamics model of the existence of things, in one way or another, being that the first law and second law are what define "nature" of things, in modern terms.

> "When two humans get together and make a new human, doesn't that increase the order of the universe?"
>
> — Joe Hanson (2015), 1M-subscriber *It's Ok to be Smart* (Ñº) channel; post (Ñº) to "Does Evolution Violate the Second Law of Thermodynamics?"; compare the views of prodigy Dean Wooldridge (1968), below, on this, Dec

The 200 range genius will use certain "key terms" that are common to other 200 range geniuses; such genius will put these ideas to print and or discuss them with someone who puts these ideas to print. These ideas will be discovered by other 200-range geniuses (similar to the "blue sky problem" common to pre 20th century IQ 200 range geniuses). Hence, the myth of the "anonymous 200-range genius", who supposedly works in isolation from the connected community, seems to be myth.

History | Origin

Historically, Libb Thims was goaded into "IQ ranking" (and re-ranking) when on 17 Feb 2010, the "IQ of 400" citation for Adragon De Mello was found, and subsequently added (see: version 214) into Thims growing circa 2006 to present IQ:200+ collection; after which, the ranking of geniuses by purely "cited" IQs (below right) became mentally incongruous, no longer visually pleasant to look at, i.e. a nonsense ranking:

Thims' IQ 200+ list (2007)

#	Name	Years	I.Q. (200+)
1	Michael Kearny	1982-	325 (age 4)
2	**William James Sidis**	1898-1944	200, 250-300 (verbal estimate)
3	Marilyn vos Savant	1946-	228 (age 10), 186 (age 40)
4	Leonardo da Vinci	1452-1519	180, 210-225
5	**Johann von Goethe**	1749-1832	210
6	Kim Ung-Yong	1963-	200-210
7	Hypatia	c.360-415	170-210
8	Nathan Leopold	1904-1971	200-210
9	Emanuel Swedenborg	1688-1772	205
10	Gottfried Leibniz	1646-1716	205
11	John Stuart Mill	1806-1873	200
12	Francis Galton	1822-1911	200
13	Hugo Grotius	1583-1645	200
14	Thomas Wolsey	c.1472-1530	200
15	Michael Grost	1954-	200

Thims' IQ 200+ list (2010)

	Name	Years	IQ
1.	Adragon De Mello	(1976-)	*400* (age 5)
2.	Michael Kearney	(1982-)	*325* (age 4), 200 (age 14)
3.	William Sidis	(1898-1944)	200, 250-300 (age 42)
4.	Terence Tao	(1975-)	220-230 (age 11), 211
5.	Marilyn vos Savant	(1946-)	*228* (age 10), **186** (age 40)
6.	Christopher Hirata	(1983-)	225 (age 16)
7.	Johann Goethe	(1749-1832)	180, **210**, 215, 225
8.	Leonardo da Vinci	(1452-1519)	**180**, 210, 220, 225
9.	Albert Einstein	(1879-1965)	160, 200, 205, 225
10.	William Shakespeare	(1564-1616)	210
11.	Kim Ung-Yong	(1963-)	200-210
12.	Nathan Leopold	(1904-1971)	200, 206-210
13.	Hypatia	(360-415)	170-210
14.	Christopher Langan	(1952-)	**174**, 195, **190**-210
15.	Emanuel Swedenborg	(1688-1772)	**165**, 205
16.	Gottfried Leibniz	(1646-1716)	**205**
17.	Edith Stern	(1952-)	200, 201-203
18.	Isaac Newton	(1643-1727)	**190**, 195, 200
19.	Francis Galton	(1822-1911)	200
20.	John Mill	(1806-1873)	**180**, 180, 200
21.	Hugo Grotius	(1583-1645)	**200**
22.	Hugo Grotius	(1583-1645)	**200**
23.	Thomas Wolsey	(1472-1530)	**200**
24.	Michael Grost	(1954-)	*200* (age 8)
25.	Sho Yano	(1990-)	*200* (age 10)

after which Thims was **"forced"** (see: self terminology reform quotes) into doing his owing **re-rankings** of ceiling range IQs, which resulted firstly in an Oct 2010 IQ:200+ video (Ñº) series:

(1 of 4)

(2 of 4)

(3 of 4)

(4 of 4)

Then into the the genius IQs (24 Oct 2011) page, which then transformed eventually into the more-cogent five-part top 500 geniuses (Jan 2014) set of pages, ranked by real IQ (or true IQ), i.e. IQs that match up with reality.

Battle of the prodigies | History

In 2013, Thims, on the Christopher Hirata page, began ranking former child prodigy turned MIT triple major valedictorian Alexander Wissner-Gross against Hirata and Goethe after Wissner-Gross boasted to Thims that his new "casual entropic force" theory should be taken "more seriously" than Hirata's relationship physics theory. In 2015, Thims, after reading that Dean Wooldridge was a child prodigy, who, like Hirata (age 13), had graduated high school at age 14, expanded on the above former listing, of the so-called "battle of the prodigies", to make an 8-person prodigy comparison, shown below:

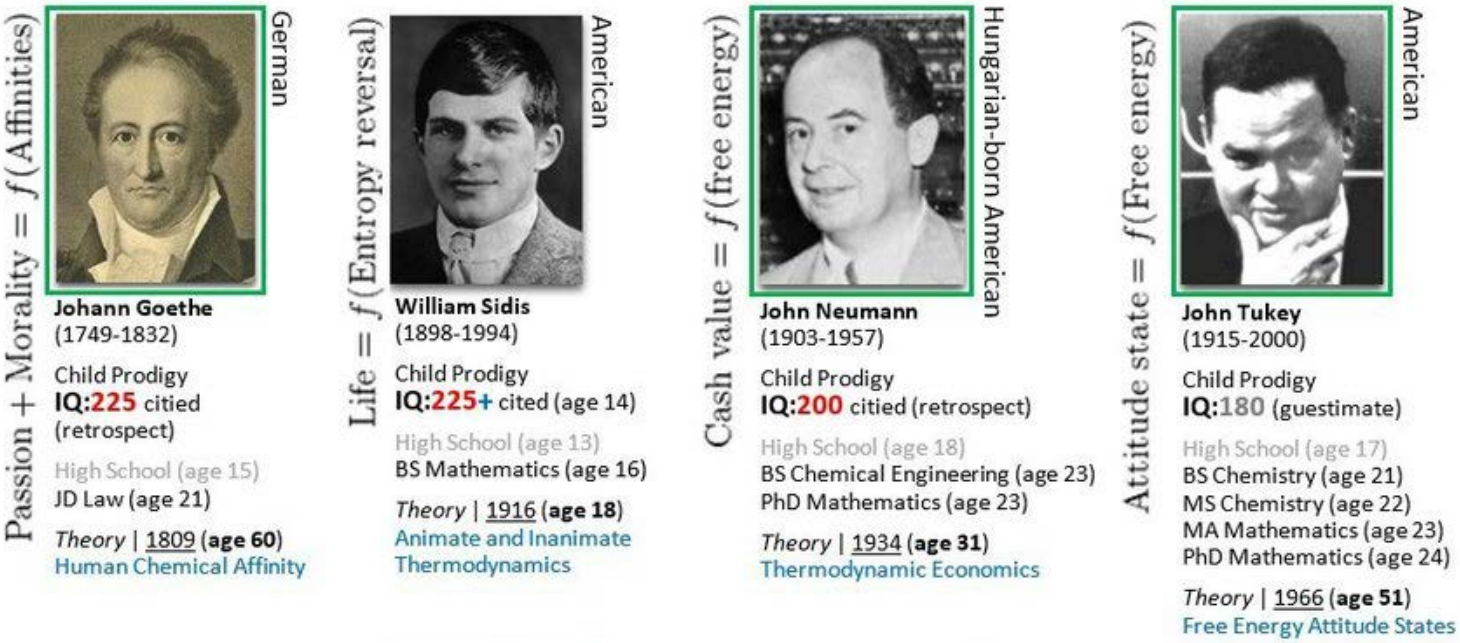

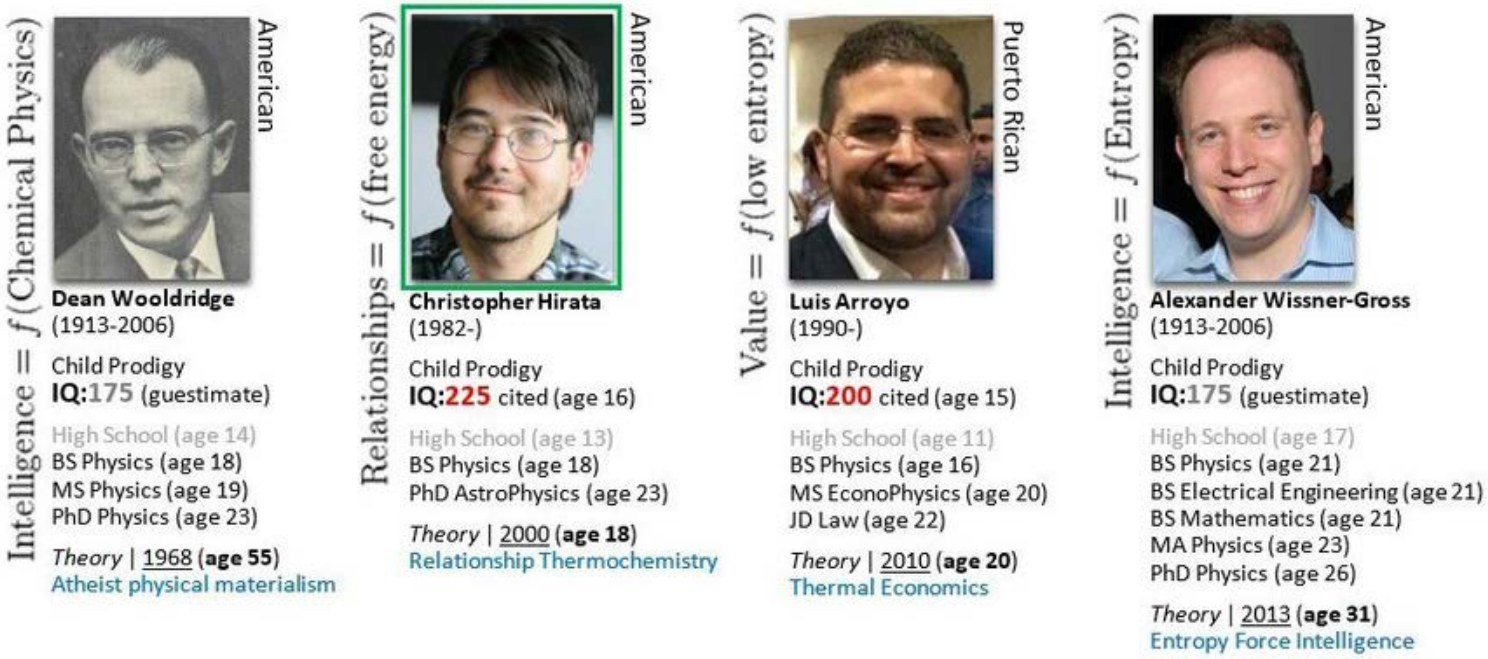

listing eight noted theory related child prodigies, namely: Johann Goethe (1809|60), William Sidis (1916|18), John Neumann (1934|31), John Tukey (1966|51), Dean Wooldridge (1968|55), Christopher Hirata (2000|18), Luis arroyo (2010|20), and Alexander Wissner-Gross (2013|31), five cited with IQ:200+ range (Goethe, Sidis, Neumann, Hirata, and Arroyo), three of which cited in the IQ:225+ range (Goethe, Sidis, and Hirata), who into adulthood (age 18+) independently derived and or arrived at physiochemical, thermodynamic, and or chemical thermodynamics formulation one or more aspects of existence, date (age) of theory publication shown next to each name; Neumann's theory, to note, not quite independent (but nevertheless original), being that it resulted following a request, by Abraham Flexner, to read and comment on Georges Guillaume's 1932 economic thermodynamics PhD dissertation. The **GREEN** box indicates theorists whose model is about the same, i.e. free energy / affinity based; the two related by the Goethe-Helmholtz equation (i.e. thermodynamic theory of affinity).

Note

N1. This page started (27 Nov 2016) as a paste from a section of the "IQ 200 or above impossible page" (Mar 2016), as mentioned in the Prodigies and Calculus video (15 Nov 2016) (Ñº), which derived from the "battle of the prodigies" section of the Christopher Hirata page, which was added after MIT triple major valedictorian Alexander Wissner-Gross was boasting (2013) (Ñº) that his "causal entropic force" theory should be taking "more seriously" than Hirata's relationship physics theory, which derived from the Goethe and Sidis IQ:200+ noted commonality of Thims' genius IQ folder (2007). This page, in short, is a more refined summary of the IQ:225+ page, homogenized with the newer inclusion of Luis Arroyo.

N2. Thims began to be cited (see: Thims genius rankings) with an IQ in the 200 range in 2012, albeit generally by association to Goethe, Sidis, and Hirata.

θΔics

In existographies, **Ira Cardiff** (1873-1964) was an American plant physiologist, outspoken atheist, and atheism historian, noted for []

Overview

In 1913 to 1917, Cardiff was head of the Botany and Plant Physiology department of the State College of Washington; from 1914 to 1917 he was head of the Washington State Agricultural Experimental Station; he later founded the Washington Dehydrated Foods Company, Yakima, Washington.

In 1945, Cardiff published his *What Great Men Think of Religion*, a histography of great irreligious thinkers of sorts, which is oft-cited by James Haught in his *2000 Years of Disbelief* (1996).

References

1. Cardiff, Ira. (1945). *What Great Men Think of Religion* (atheist, 24+ pgs). Christopher Publishing House.

Further reading

● Cardiff, Ira. (1964). *The Wisdom of George Santayana: Atoms of Thought*. Publisher.
● Cardiff, Ira. (1943). *The Deification of Lincoln*. Publisher.

External links

● Cardiff, Ira D. (Ira Detrich) – WorldCat Identities.
● Ira Cardiff (about) – SnacCooperative.org.

θΔics

In hmolscience, **Ira Livingston** (c.1960-) is an American cultural theorist noted, in human thermodynamics, for his 1997 *Arrow of Chaos*, a critique of thermodynamics logic used in literature, politics, and psychology.

Overview

In 1997, Livingston, in his *Arrow of Chaos: Romanticism and Postmodernity*, gave a thermodynamic interpretation of the publications of various individuals in literature, politics, and psychology, such as Sigmund Freud, Stuart Kauffman, and Michel Serres. A noted section of chapter two, Horrors of Order and Disorder, is “Mixture and Fixture: Political Thermodynamics in Burke and Paine”. Livingston, a noted wordsmith, exceeds in coining new human thermodynamic terms, such as “politiothermodynamics”, Freud’s “thermopsychodynamics”, among others, all seemingly used without notice.

Education

Livingston completed his PhD at Stanford. In 1997, Livingston was an assistant professor of English at the State University of New York, Stony Brook. He is currently the chair of the English and humanities department at the Pratt Institute. [2]

References

1. Livingston, Ira. (1997). *Arrow of Chaos: Romanticism and Postmodernity* (thermodynamics, 15-pages; Mixture and Fixture: Political Thermodynamics in Burke and Paine, pgs. 42-47). University of Minnesota Press.
2. Ira Livingston (faculty) – Pratt Institute.

θΔics

In literature chemistry, **Irina I. Strout** (c.1981-) is a Russian-born American languages scholar noted for []

Overview

In 2011, Strout, in her romantics and science conference presentation "Solving the Enigma of Ottilie in the Chemistry of Love in Johann Wolfgang von Goethe's *Elective Affinities*", focused on the enigma of the Ottilie character of Goethe's 1809 *Elective Affinities*, whom she equates to a catalyst. The following are a few excerpts: [1]

> "Johann Wolfgang von Goethe once wrote that "Indem es vollkommen sich selbst darstellt;"
> all life is symbolic and where it is fully represented, it reveals its unity."
>
> "Affinities are not elective but parts of the natural cycle of natural law, as humans are mere agents in chemical reaction."
>
> "Ottilie is the catalyst of a reaction, which creates the human desire. She is the magical force that ignites an attraction between the characters."

(add discussion)

Education

Strout completed her BA in languages at Moscow State Linguistic University and her MA and PhD (2009) both in English at the University of Tulsa, Oklahoma, the latter with a dissertation entitled "Bridging bildungsromane from London to Russia: Paradigms of Masculinity in Charles Dickens's and Leo Tolstoy's Fiction", on the education fiction of Charles Dickens and Leo Tolstoy, after which she has been working as a visiting assistant professor at University of Tulsa.

References

1. Strout, Irina I. (2011). "Solving the Enigma of Ottilie in the Chemistry of Love in Johann Wolfgang von Goethe's *Elective Affinities*", Speaking Nature: Interdisciplinary Nineteenth-Century Studies Conference March 31, Pitzer College (abs), in: CASCA *Journal of Social Sciences, Culture, and Arts*, 2012.

External links

â— Irina Strout – Facebook.

θΔics

In chemistry, **iron**, symbol Fe, atomic number 26, is metallic element.

Rank	CPK (jmol)	Symbol	% Mass	Picture	Z
12		Fe	0.012		26

Human molecule

Iron is the 12th most abundant element in the human molecule, comprising 0.012 percent of its mass. The major function of iron is to combine with protein and copper in making hemoglobin. Iron builds up the quality of the blood and increases resistance to stress, the immune system, energy production, growth in children, and resistance to disease.

Human molecular formula

The position of the element calcium in the average human molecular formula is as follows:

$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}\mathbf{Fe}_{E23}F_{E23}$

$Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$

(add discussion)

Quotes

The following are related quotes:

> "Is it not for want of an attractive virtue [chemical affinity], between the parts of each, that quick-silver ( ) (Hg) will NOT mix with: antimony ( )(Sb), lead ( )(Pb), or **iron** (♂)(Fe); and by a weak attraction, that quick-silver ( )(Hg) and copper (♀)(Cu) WILL mix, with difficult; and from a strong attraction, that quicksilver ( )(Hg) WILL mix readily with tin ( )(Sn)?"
>
> — Isaac Newton (1718), "Query 31"

> "The will of the copper, claimed and preoccupied by the electrical opposition to the **iron**, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive."
>
> — Arthur Schopenhauer (1844), *The World as Will and Representation*

> "If iron sulphate and caustic potash are brought together, the SO_4 ions leave the **iron** to unite with the potassium. When in nature an adjustment of such differences of potential is about to take place, he who would approve or disapprove of the process form the moral point of view would appear to most to play a ridiculous part."
>
> — Otto Weininger (1903), *Eros and Psyche*

> "Men believe that death is stronger than life, and therefore dead things must be stronger than living things; whether those dead things are gold and **iron** and machinery or rocks and rivers and forces of nature. It may sound fanciful to say that men we meet at tea tables or talk to at garden-parties are secretly worshippers of Baal or Moloch. But this sort of commercial mind has its own cosmic vision and it is the vision of

> Carthage. It has in it the brutal blunder that was the ruin of Carthage. The Punic power fell, because there is in this materialism a mad indifference to real thought. By disbelieving in the soul, it comes to disbelieving in the mind."
>
> — Gilbert Chesterton (1925), *The Everlasting Man* [2]

See also

- Earth molecule
- Haber process
- Mark Janes (and his iron-like stability arrow of time theory)

References

1. Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc) (pgs. 52-55). LuLu.

(a) Chesterton, Gilbert K. (1925). *The Everlasting Man* (dead things, pgs. 130, 235) (Q) . Hodder & Stoughton.

(b) The Everlasting Man – Wikipedia.

(b) G.K. Chesterton – Wikipedia.

External links

- Iron – Wikipedia.

θΔics

In thermodynamics, **irreversibility** or "irreversible" is the term used by German physicist Rudolf Clausius in 1854 to describe a cyclic thermodynamic process, particularly the Carnot cycle, in which following a series of heat interactions whereby the working body yields work output and then returns to its original state, there occurs an quantifiable energy loss due to intermolecular work interactions of the atoms and molecules of the working body upon each other. [1]

Carnot | Caloric re-establishment

The following illustration shows a general outline of the jump from the 1780-1820s Lavoisier-Carnot caloric conservation model of heat and cyclical operations to the 1854 Clausius-Rankine caloric transformation equivalence-value model of heat and cyclical operations of bodies:

(Marcet, 1805) (Carnot, 1823) (Clausius, 1854-56)

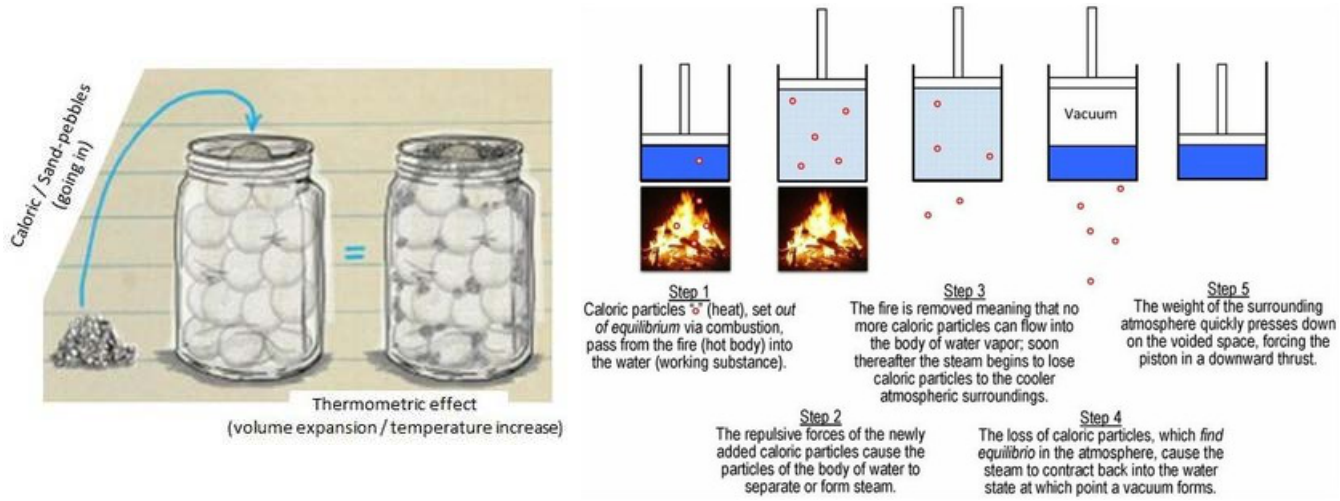

$$N = -\int \frac{dQ}{T}$$

Left: a depiction of English science writer Jane Marcet's 1805 sand-marble illustrative model of capacity of a body for caloric (see: heat capacity), in which the sand represents the "caloric" and the ping pong balls represent the atoms, according to which a given body will have so much capacity for caloric, i.e. heat as it was viewed in that period. [5]Middle: French physicist Sadi Carnot's 1824 so-called re-establishment of equilibrium in the caloric, namely his model of a body being able to "reestablish" its equilibrium amount of caloric, a then considered a conserved particle, following expansion to one volume and state, followed by contraction to its original volume and state. Right: German physicist Rudolf Clausius' 1854-56 caloric conservation upgrade concept of equivalence-value of all uncompensated transformations model of **irreversibility**.

(add overview)

Overview

All natural processes are irreversible. The phenomenon of irreversibility results from the fact that if a thermodynamic system of interacting molecules is brought from one thermodynamic state to another, the configuration or arrangement of the atoms and molecules in the system will change as a result. A certain amount of "transformation energy" will be used as the molecules of the "working body" do work on each other when they change from one state to another. During this transformation, there will be a certain amount of heat energy loss or dissipation due to intermolecular friction and collisions; energy that will not be recoverable if the process is reversed.

The essence of the description and understanding of irreversibility, as defined by Clausius, is the difference between Carnot's understanding of the production of work in a steam engine according to French chemist Antoine Lavoisier's 1787 caloric theory and how the working body or fluid changes during each engine cycle as this contrasts with the post 1850s view of the production of work in a steam engine according to the newer kinetic theory of heat. In short, Carnot assumed that when work was produced in a steam engine, "caloric particles" would pass from a hot body (a furnace) through the steam (the "working body") to the cold body (a river) and that following the expansion and contraction of the steam during the production of work in an engine cycle, the working body of water molecule returned, un-altered, to its original state. Clausius, however, viewed this picture differently. From this is where the concept of entropy stems.

In his 1854 memoir "On a Modified Form of the Second Fundamental Theorem in the Mechanical Theory of Heat", in relation to the Carnot cycle, Clausius states that "it may, moreover, happen that instead of a descending transmission of heat accompanying, in the one and the same process, the ascending transmission, another permanent change may occur which has the peculiarity of *not being reversible* without either becoming replaced by a new permanent change of a similar kind, or producing a descending transmission of heat." The application and understanding of Clausius' conception of irreversibility in the sphere of daily work cycles of human life is a very advanced topic in human thermodynamics, and very difficult one to pin down. [2]

Planck

In 1897, German physicist Max Planck, in his *Treatise on Thermodynamics*, gave the following definition of irreversibility: [4]

> "That a process may be **irreversible**, it is not sufficient that it cannot be directly reversed. This is the case with many mechanical processes which are not irreversible. The full requirement is, that it be impossible, even with the assistance of all agents in nature, to restore everywhere the exact initial state when the process has once taken place."

Planck, in his posthumous autobiography, summarized the term as follows: [3]

> "A process which in no manner can be completely reversed I call a 'natural' one. The term for it in universal use today, is **'irreversible'**."

(add discussion)

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External links

â— Irreversibility – Wikipedia.

θΔics

In thermodynamics, **irreversible** means that that there was a transformation content increase in the system in one heat cycle. Irreversible processes and reactions are quantified by the Clausius inequality. All natural processes are irreversible.

Quotes

The following are related quotes:

> "The process of heat conduction cannot be completely reversed by any means. This expresses the same idea as the wording of Clausius, but without requiring an additional clarifying explanation. A process which in no manner can be completely reversed I called a 'natural' one. The term for it in universal use today, is: '**irreversible**'."
>
> — Max Planck (c.1940), *Scientific Autobiography*

> "Reversible processes are not, in fact, processes at all, they are sequences of states of equilibrium. The processes which we encounter in real life are always **irreversible**."
>
> — Arnold Sommerfeld (c.1850) [1]

See also

- Irreversible process
- Irreversible reaction
- Irreversibility
- Irreversible thermodynamics

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θΔics

In thermodynamics, **irreversible thermodynamics** is the energetic and entropic study of transport processes or, in general, of non-Carnot cycle type systems, those which are never said to approach the equilibrium state. [1] The Brussels school is sometimes referred to as the “Brussels school of irreversible thermodynamics.”

The subject of irreversible thermodynamics seems to trace to the work of Belgian chemist Ilya Prigogine (1945) and Sybren de Groot (1951). [2] The term “irreversible thermodynamics”, is rather self-contradictory, as thermodynamics itself derived out the concept of irreversibility when German physicist Rudolf Clausius introduced the concept of “non-compensated heat” (entropy change) as the measure of irreversibility. [3]

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θΔics

In physical economics, **Irving Fisher** (1867-1947) was an American economist noted for his 1892 PhD dissertation "Mathematical Investigations in the Theory of Value and Prices" completed under engineer Willard Gibbs and economist William Sumner at Yale, in which he developed a mechanical analogy between economics and physics, invoking force and distance to be analogous to price and number of goods, respectively. [1] It was described by Paul Samuelson as the best of all doctorial dissertations in economics. [2]

Fisher, of note, seems to have been the first, in his 1892 dissertation, to make a prototype human thermodynamics variables table, wherein he specifically defines a human as a particle (see: human particle).

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External links

â— Irving Fisher – Wikipedia.

θΔics

In thermodynamics, **Irving M. Klotz** (1916-2005) was an American professor of chemistry and biochemistry, molecular biology and cell biology, notable, in chemical thermodynamics, for the publication of his 1950 textbook *Chemical Thermodynamics: Basic Theory and Methods*, one of the first teaching books on the subject of chemical thermodynamics, and for his later work in energy theory applied to what he referred to as "biochemical reactions". [1]

In following editions of the textbook, which is still in use, Klotz began to co-author with Robert M. Rosenberg. [2] Klotz received his bachelor's degree in 1937 and completed a PhD in 1940, both from the University of Chicago, after which time he joined the faculty of Northwestern University, in Evanston, IL, where he guided the development of the application of thermodynamics into the biological sciences, particularly in the area of ligand-receptor energetics. [3]

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External links

● Symposium Honors Irving Klotz, Northwestern University.

θΔics

In hmolscience, **Irving Simon** (1920-) is/was an American philosopher noted, in animate thermodynamics, for his 1980 "centropy" theory of evolution, according to which evolution operates according to an entropy antonym property of energy centration.

Overview

In 1980, Simon published a 70-page entropy booklet *Centropy: the Vertical Aspect of Evolution*, outlining some type of centropy evolution theory; arguing to the effect that 'centropy', meaning 'energy centration' or the energy of centralized ordering effect, supposedly, originating in the work of American clinical psychologist Joseph Bois, quantifies the vertical aspect of evolution, opposite to that of entropy.

In 1989, Simon published an expanded 250-page *Centropy: Evolution of Energy Systems* (1989); and in 2004 he launched an IrvingSimon.com. [2]

In 2000, Simon, with American mathematician Mark Burgin, published "Information, Energy, and Evolution", arguing that energy and information are the nutrients of evolution. [3]

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θΔics

In etymology, **Is-Ra-El** (LR:3), the theophoric (Ñº) parts of the name Israel, e.g. the Israelites, i.e. the followers of the Judaic religion, refers to root meaning of the compound parts, namely the Egyptian gods Isis (rescripted as Sarah) and Ra (rescripted as Abraham), and the Canaanite god El (rendered as "lord" in the Old Testament).

297. ISIDORUS. *Is-e-do'-rus.* Gr.
The gift of Isis.

298. ISRAEL. *Iz'-ra-el.* Heb.
The prince of God.

An 1859 semi-accurate etymology of the "**Is-Ra-El**", showing that the '*Is-*' prefix is short of the Egyptian goddess Isis. [6] The middle term "Ra", such as is found in Ab-Ra-ham (and B-Ra-hma) is code for Ra the main Egyptian sun god. The suffix "El' refers to the offspring of a Canaanite creator god god.

Overview

In 1791, Constantin Volney (RMS:23), in his *The Ruins: a Survey of the Revolutions of Empires*, citing the Isis and Osiris descriptions of Plutarch, and the previous work of Charles Dupuis (RMS:22), stated as a matter of fact, that the "god of Moses was Egyptian". This assertion was quickly attacked by Joseph Priestley (1797), and thereby run amuck. These types of dangerous assertions, in short, were quickly subterfuged. The personal correspondence between the 2nd and 3rd American presidents testifies to this:

> "We think ourselves possessed, or, at least, we boast that we are so, of liberty of conscience on all subjects. Yet, how far are we from these exalted privileges in fact! **There exists**, I believe, throughout the whole Christian world, **a law which makes it blasphemy to deny or doubt the divine inspiration** of all the books of the Old and New Testaments, from Genesis to Revelation. **Who would run the risk of translating Dupuis**?"
>
> — John Adams (1825), "Letter to Thomas Jefferson", Jan 23

Adams and Jefferson, to repeat, two of the biggest geniuses in the history of America, feared the risks associated with translating the generally correct views of Charles Dupuis, e.g. his 1781 "Fable by Astronomy", from French into English?

In 1858, Samuel Dunlap, in his *Vestiges of the Spirit of Man*, citing Franz Movers (1841), stated that the Hebrews were the first to turn the ancient sun gods into patriarchs (e.g. Atum → Adam, Ra → Abraham, Nun → Noah, etc.), therein mediating a de-deification or god reduction: [1]

> "In this way antiquity disposes of its sun-gods. The **Hebrews turned** [**the sun gods**] **into Patriarchs**. Adam, Abraham, **Israel**, were names of Saturn. Edom is Adam; and the ancient usage was to name the nation, the land or city after the chief god. The Greeks made these deities founders of tribes."

In 1884, Helena Blavatsky, in volume two of her *Isis Unveiled*, citing Dutch Egyptologist Willem Pleyte (1836-1903) (Ñº), on El, and Hodder Westropp and Wake Staniland on Phallism, stated the following view: [7]

> "El, the sun-god of the Syrians, the Egyptians, and the Semites, is declared by Pleyte

JACOB AND HIS SONS. (GEN. XLIX.)

The name Jacob seems to have two rudimentary meanings—one, *smoothe*, not hairy; the other, *summer*, or the sun during summer. And again this was varied to include the entire year, or the sun passing through the signs of the zodiac in one complete revolution, when the name Jacob is changed to Israel—*Is-ra-el*, three syllables, each the name of ancient gods, corresponding to the *three* seasons recognized during a certain epoch by the Egyptians, Babylonians. etc.

A segment from Singleton Davis' 1910 article "The Bible a Book of Myths", wherein he points out that the name **Israel** is syllabic compound of three ancient gods (Is, Ra, El), from Egypt (Isis, Ra) and Babylonian (El) regions. [11]

to be no other than Set or Seth, and El is the primeval Saturn —**Israel**. Siva is an AEthiopian god, the same as the Chaldean Baal–Bel; thus he is also Saturn. Saturn, El, Seth and Kiyun, or the biblical Chiun of Amos, are all one and the same deity, and may be all regarded in their worst aspect as Typhon [Set] the Destroyer. When the religious pantheon assumed a more definite expression, Typhon was separated from his androgyne—the *good* deity, and fell into degradation as a brutal *unintellectual* power."

In 1927, Thomas Spivey, in his *Christianity and Mythology*, after stating that "El means god" (pg. 44), was summarized the Israel etymology (pgs. 45) as follows: [2]

> "**Is** = light + **Ra** = sun + **El** = first cause. Israel = the church of god. Hence, it is the church of god which goes forth to usurp the power and control of established governments, and the church of god rewards the Jews for support by giving them control over Canaan, merchandizing and trading."

In 1935, Spivey, in his *The Awakening of the Sixth Sense*, state the Israel etymology as follows: [3]

> "The prophet whom it is so important to vindicate is 'Is-a-iah'. *Is* means light. **Is-ra-el** is: *Is*, the light of **Ra**, the sun, is **El**, the first cause. The Hebrews express Isis as Jesse, ... Is in Israel is identical with **Isis**, the Egyptian goddess of light; light meaning revealed wisdom, knowledge."

In 1956, Hilton Hotema, in his *Ancient Sun God*, building on Samuel Dunlap (1858), devoted an entire chapter to "Ab-Ram the Sun-God", in which he cites Dunlap as having said the following (hyphens included): [4]

> "The fire-god of Ur was Ab-Ram. The Hebrew world 'Ab' means 'father', and Ram (head sign of the Zodiac) means 'most high'. Ab-Ram and **Is-Ra-El** were names of Saturn."

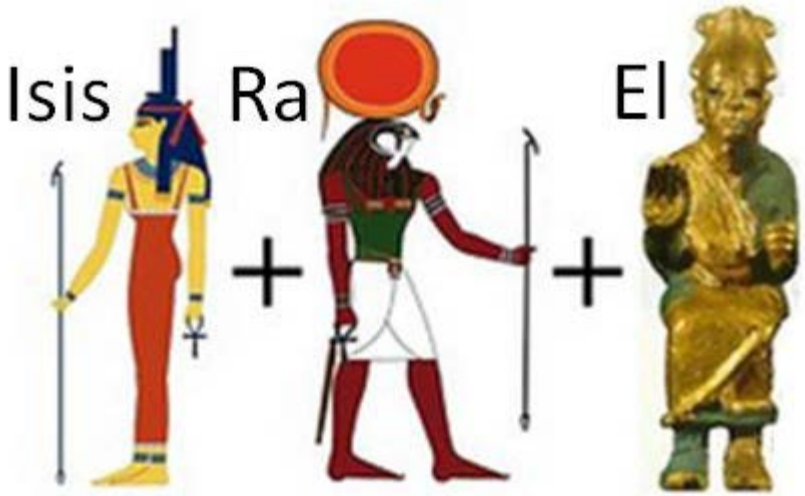

A visual of the compound term "Israel" meaning land of the gods Isis, Ra, and

In c.2000, Jordan Maxwell, who, in his "The Solar Cult" (2000), lists (Ñº) Hilton Hotema as his 6th recommended reading scholar, "Is Ra El" video lecture

El, compounded together as one tripartite god, i.e. **Is-Ra-El**.

Q&A, gives a fairly cogent synopsis of how, in his view, Judaism was formed by the migration process wherein the Phoenician Canaanites, aka Hebrews, with their embedded religion of the Isis Cult and Amen-Ra religion, moved north and encountered the Palestine god El, whom Maxwell defines as the planet Saturn. [5]

In 2011, Collin Bowling put things thusly: [8]

> "The word Israel is another representation of past themes. Isis was the Egyptian moon goddess. Ra was the sun god of Egypt. Saturn was the god of the Elohim. Isis (**Is**), **Ra**, and Elohim (**El**) - IsRaEl."

(add discussion)

Saturn

The connection between Saturn, as defined in Greco-Roman mythology (itself a morph of Egyptian mythology), and El, as re-conceptualized in Canaanite mythology, to note, is a subject to be clarified further.

Discussion

Dunlap (1858), above, in his "the Hebrews were the first to turn gods into Patriarchs", gives a fairly cogent and oft-unspoken statement. It takes some time, e.g., to decode the fact that Ra, the main Egyptian sun god, was turned, via literary rewrite, into the character Abraham (Ab-Ra-ham), the main Patriarch of the Judeo-Christian-Islamic religions, or that Nun, the main Egyptian primordial god, conceptualized as the chaotic waters that existed at the start of creation, became the character Noah (or Nuh, as he is called in Islam). Wallis Budge (1904), of note, calls this process, of making a monotheism out of a polytheism, "god reduction". (Ñº) Changing gods into prophets, in short, reduces the number of previously believed in gods, while at the same time keeping the established religion.

> "Who is there that does not know **that the vapor of the sun is kindled by the rising** of the **dog-star** [Sirius]? The most powerful effects are felt on the earth from this star. "When it rises, the seas are troubled, the wines in our cellars ferment, and stagnant waters are set in motion. There is a wild beast, named by the Egyptians Oryx, which, when the star rises, is said to stand opposite to it, to look steadfastly at it, and then to sneeze, as if it were worshiping it. There is no doubt that dogs, during the whole of this period, are peculiarly disposed to become rabid."
>
> — Pliny the elder (77AD), "On the Rising of the Dog Star" [6]

The gist of the above assembly of opinions is that the people who wrote the Old Testament, aka the Jewish Bible, took the sun (Ra), the star Sirius (Isis), and the annual Nile flood (Nun), and rewrote this into marriage of Abraham (Ra/Sun) and Sarah (Isis/Sirius) who are born from Noah (Nun/Nile River) after the Biblical flood. The followers of this new Egyptian modified, i.e. modified by adding in El (and other gods, e.g. Aten), religion, accordingly came to be known as the Is-Ra-El-ites, and their main religious center called "Israel", similar to how Heliopolis used to be known (see: Heliopolis creation myth), in Egypt, as the city of the sun (aka center of Ra worship).

Quotes

The following are related quotes:

> "The 'Choens' [Cohens] (Ñº) are most senior Egyptian priest-teachers."
>
> — Herodotus (c.450BC) [9]

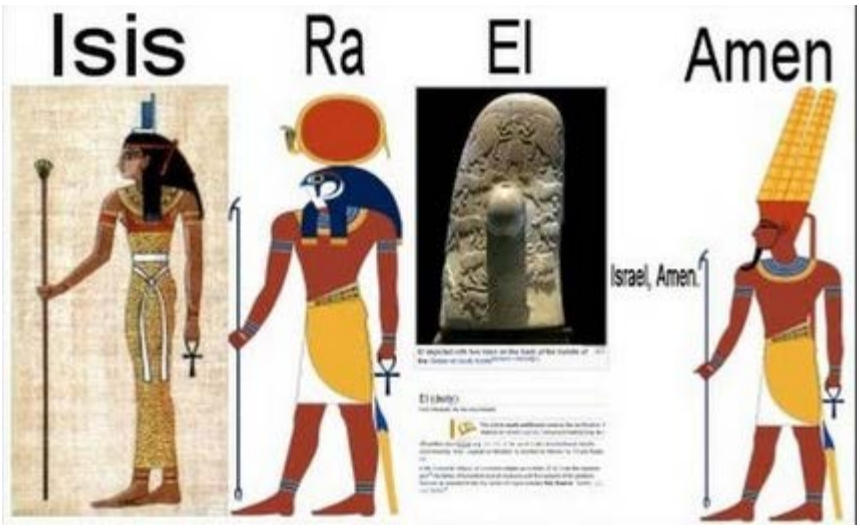

A screenshot from a Jordan Maxwell video (Ñº), where he discusses Isis-Ra-El, as he understood things; where we also see the Egyptian god Amen, who was turned into the word said at the end of prayers (e.g. Lord's prayer). Here we see the trick used to turn four gods (polytheism) turned into one god (monotheism).

"Of the relation between the Is-**RA**-elitish story, whether in its older or in its more recent form, and Egyptian myths not much need here be said. In very early and probably pre-Israelitish times Egypt may have had considerable religious influence on the land of Canaan or Palestine, and it would be easy to indicate points of affinity between the Egyptian cosmogony and that in Genesis. The conception of the primeval watery envelope of all things, also that of creation by a word, also the story of the conflict between Re or **Ra** the sun god and the gigantic dragon Apepi or Apopi, remind us forcibly of the Babylonian and in a wide sense of the Hebrew cosmogony. But while fully admitting the combination of influences to which the Israelites were exposed, I do not think that the influence of Egypt upon the Israelites can be reckoned as at all comparable to that of Babylonia."

— Thomas Cheyne (1907), *Traditions and Beliefs of Ancient Israel* [10]

"Israelites means 'El prevails'."

— Dorothy Murdock (2014), *Publication* (Ñº)(Ñº)

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θΔics

In existographies, **Isaac Asimov** (1920-1992) (IQ:170|#335) [RGM:130|1,260+] (FA:109), was a Russian-born American biochemist turned science fiction writer noted, in literature thermodynamics, for his 1942 to 1993 *Foundation Series*, wherein he outlines a theory he calls psychohistory, through the guise of a character Hari Seldon, a type of physical science based conceptualization of history, and for his 1956 science fiction short story *The Last Question*, on the issue of the fate of humanity in the context of the heat death of the universe. [1] In 2008, Asimov was listed as the 15th most translated author of all time. [6]

Social prediction | Foundation Series

In 1942 to 1993, Asimov published his seven volume *Foundation Series*, a science fiction story about a character Hari Seldon, a physical science minded mathematician, who devotes his time to the development of what he calls "psychohistory" (see: two cultures namesakes), a "science of human behavior reduced to mathematical equations", as Asimov describes it; which, as some have pointed out (Q), seems to be similar, thematically, to Henry Adams' 1908 physico-chemical social dynamics theory of history. [8] The series is chucked full of a number physical materialism stylized quotes and theories:

> "The laws of history are absolute as the laws of physics, and if the probabilities of error are greater, it is only because history does not deal with as many humans as physics does atoms, so that individual variations count for more."
>
> — Isaac Asimov (1952), "girl describing Hari Sheldon's psychohistory", *Foundation and Empire* [14]

> "Hari Seldon devised psychohistory by modeling it upon the kinetic theory of gases. Each atom or molecule in a gas moves randomly so that we can't know the position or velocity of any one of them. Nevertheless, using statistics, we can work out the rules governing their overall behavior with great precision. In the same way, Seldon intended to work out the overall behavior of human societies even though the solutions would not apply to the behavior of individual human beings."
>
> — Isaac Asimov (1986), "Explanation by character Janov Pelorat" [9]

> "Consider the manner in which scientists have dealt with subatomic particles. There are enormous numbers of these, each moving or vibrating in random and unpredictable manner, but this chaos turns out to have an underlying order, so that we can work out a quantum mechanics that answers all the questions we know how to ask. In studying society, we put human beings in the place of subatomic particles, but now there is the added factor of the human mind. To take into account the various attitudes and impulses of mind adds so much complexity that there lacks time to take care of it all."
>
> — Isaac Asimov (1989), "Hari Sheldon" to Emperor Cleon", *Prelude to Foundation* [13]

> "Could not mind, as well as mindless motion, have an underlying order."
>
> — Isaac Asimov (1988), "Emperor Cleon to Hari Seldon" [10]

(add)

Siegfried

American science writer Tom Siegfried, in his *A Beautiful Math* (2006), devotes a significant amount of effort to stitching out a theoretical elaboration of Asimov's ideas via a combination of John Nash based game theory and

statistical mechanics. Siegfried explains Asimov's social prediction mindset as follows:

> "Trained as a chemist, Asimov knew well that the behavior of gases under different conditions could be calculated with precision, even though nobody could possibly know what any one of that gas' atoms or molecules was doing. And so he reasoned that a sufficiently advanced science could do the same with people."

As Siegfried summarizes, in respect to the above *Foundation* quotes of Asimov: [11]

> "Put enough people together and the laws of human interaction will produce predictable patterns—just as the interactions and motion of molecules determine the temperature and pressure of a gas. Describing people as though they were molecules is just what many physicists are doing today—in effect, they're taking the temperature of society."

Siegfried outlines his social temperature theory, which he says he gleaned form a 2004 paper of American physicist David Wolpert—likely his "Information Theory: the Bridge Connecting Bounded Rational Game Theory and Statistical Physics" (Q)—is as follows: [12]

> "One of the best ways to take that temperature, it turns out, is to view society in terms of networks. In much the same way that 'temperature' captures an essential property of a jumble of gas molecules, network math quantifies how 'connected' the members of a social group are."

Siegfried here, to note, is under the (possibly overzealous) view that Nash's game theory (and his Nash equilibrium model) has the potential to become the "great unifier" between the social scientists and the physical scientists.

The Last Question

In 1956, Asimov, in his *The Last Question*, through the course of six scenes in the story, taking place in the year 2061, different characters ask a new computer called Multivac how the threat to human existence posed by the heat death of the universe can be averted? The last question is: [2]

> "How can the net amount of entropy in the universe be massively decreased?"

In each case, Multivac is unable to answer, due to having "insufficient data for a meaningful answer."

Biographical Encyclopedia

Asimov is often cited as an expert on the second law of thermodynamics, even though he has never written a book on thermodynamics? [3] This is likely due to his softening of the subject in story form or watered-down explanation. The following is his 1970 explanation of the second law: [5]

> "Another way of stating the second law is: 'the universe is getting more disorderly!' Viewed that way, we can see the second law all about us. We have to work hard to straighten up a room, but left to itself it becomes a mess again very quickly and very easily. Even if we never enter it, it becomes dusty and musty. How difficult to maintain houses, and machinery, and our own bodies in perfect working order; how easy to let them deteriorate. In fact, all we have to do is nothing, and everything collapses, breaks down, wears out, all by itself, and that is what the second law is all about."

German physicist Ingo Muller, likewise, uses Asimov, specifically his *Biographical Encyclopedia of Science and Technology* (1964), ubiquitously as his main reference in his 2007 *A History of Thermodynamics*; citing his name in the text on more pages than any other (aside for Boltzmann and Einstein). [4]

IQ | Mensa | Rankings

In 1961, Asimov, as retrospectively discussed in his *I, Asimov: a Memoir* (c.1990) (Q)(Q), was asked, by a friend, to join Mensa; firstly, he stated his reservations about this as follows:

> "I have been a lifelong beneficiary of intelligence tests, I don't think much of them. I believe they test only one facet of intelligence—the ability to answer the kind of questions other people with the same facet of intelligence are likely to ask. My IQ rating has always been out of sight, but I am perfectly aware that in many respects I am remarkably stupid. Second, it seemed to me to be beneath my dignity to take an intelligence test. Surely, my life and work were ample testimony to my intelligence (such as it was)."

Then he discussed his joining experience:

> "I took the test, scored high, and became a member of Mensa. It was not on the whole, a happy experience. I met a number of wonderful Mensans, but there were other Mensans who were brain-proud and aggressive about their IQs, who, one got the impression, would like, on being introduced, to be able to say, 'I'm Joe Doakes, and my IQ is 172,' or, perhaps, have the figure tattooed on their forehead. They were, as I had been in my youth, forcing their intelligence on unwilling victims. In general, too, they felt underappreciated and undersuccessful. As a result, they had soured on the Universe and tended to be disagreeable.
>
> What's more, they were constantly jousting with each other, testing their intelligence on each other, and that sort of thing becomes wearing after awhile. Furthermore, I became uncomfortably aware that Mensans, however high their paper IQ might be, were likely to be as irrational as anyone else. Many of them believed themselves to be part of a 'superior' group that ought to rule the world, and despised non-Mensans as inferiors. Naturally, they tended to be right-wing conservatives, and I generally feel terribly out of sympathy with such views.
>
> Worse yet, there were groups among them, I found out eventually, who accepted astrology and many other pseudoscientific beliefs, and who formed 'SIGs' ('special interest groups') devoted to different varieties of intellectual trash. Where was the credit of being associated with that sort of thing, even tangentially?... I stayed on in Mensa for years, getting more and more tired of it. ... Eventually, after both Marvin and Margot [two of the New York Mensans he acknowledged as "delightful and intelligent"] had died, I did resign."

Asimov was a bit of an open speaker about his perceived level of intelligence:

> "Those people who think they **know everything** are a great annoyance to those of us who do."
>
> — Isaac Asimov (c.1960) [37]

> "Marvin Minsky [1927-2016] and Carl Sagan [1934-1996] are two men I conceded were more intelligent than I was."

— Isaac Asimov (1980), *In Joy Still Felt: Autobiography* [16]

In 1976, Asimov, in the non-fiction work *The Planet That Wasn't*, claimed to have an IQ of 300. He got it that high by taking one of the instant IQ-tests found in a book, but taking 15 minutes instead of the 30 that was recommended. The score calculation provided an IQ of 150, and Isaac doubled the score to account for half the time. He then explained why he doesn't have much faith in these IQ tests (the most important claim being that they penalize for slowness but give no bonus for speed). (Q)

Quotes | By

The following are related quotes:

> "The Bible, properly read, is the most potent force for atheism ever conceived."
>
> — Isaac Asimov (c.1970) (Q)

See also

● Edward Bulwer | *Vril* (1871)

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External links

● Isaac Asimov – Wikipedia.

θΔics

In existographies, **Isaac Beeckman** (1588-1637) (IQ:180|#140) was a Dutch physicist, philosopher, astronomer, physician, meteorologist and natural philosopher, characterized as "gifted but overly modest" (Truesdell, 1960), noted for questioning the logic of abhorrence of the vacuum model (see: nature abhors a vacuum) as the cause of "movement in nature" (1614), explained the action of a suction pump by an appeal to the pressure of the air (c.1615), for originating the matter and motion model (1818) of mechanistic philosophy, for introducing the first concept of "molecule" (1820), and for mentoring Rene Descartes and Pierre Gassendi. [8]

Overview

Beeckman developed a view of the world in which everything, from the motion of the heavens to musical harmonies, supposedly, is explained by reducing it to matter in motion (see: matter and motion). [1]

Vacuum

The following are quotes by Beckmann on the topic of the vacuum and or the nature abhors a vacuum premise:

> "**What is the reason that bodies are moved in any direction**, so that a vacuum may not exist in nature? I answer: it happens that air, after the manner of water, presses, upon things and compresses them according to the depth of the super-incumbent air. But some things remain undisturbed, and are not perpetually moved about, because they are everywhere equally compressed by the air above them, just as our divers are pressed by the water. But things rush towards an empty space with great force, on account of the immense depth of the super-incumbent air, and in this way the weight of the air arises. But air must not be said to be heavy, because we walk in it without any pain, as indeed the fishes move in water, suffering no compression."
>
> — Isaac Beeckman (1614), *Journal Notes* [2]

> "You bring forth good arguments about the vacuum. Indeed, if a vacuum is said to exist in the pores of the air, water, lead, etc., or if all the space between the outermost bound of your atmosphere and the stars is said to be empty, nothing follows that is absurd. Really, although the philosophers babble about the necessity of all things being united, of the propagation of accidents and visible appearances in the air, of the impossibility of motion in a vacuum, etc., these seem to me nothing but old wives' tales; for I admit nothing in philosophy, unless it is represented to the imagination as being perceptible to the senses."
>
> — Isaac Beckman (1629), "Letter to Marin Mersenne", Oct 1 [7]

(add)

Education

In 1610, Beeckman obtained the equivalent of a BA in linguistics and philosophy at Leiden University. [5]

In 1618, Beekman, obtained his MD at Caen University, wherein, as corollaries to his dissertation, which was on the subject of "intermittent fever", laid down the principles of a new and revolutionary way to account for natural phenomena, the mechanical philosophy. (O)

Beeckman's later primary interests were: physics, mechanics, and natural philosophy, and his subordinate interests were: astronomy, engineering, and meteorology. [5]

Journal Notes

In 1604 to 1634, Beeckman kept a series personal notes in a journal, rediscovered in 1905, wherein, in what amounts to four-volumes of published ideas, he stated that he knew that air and water were compressible (volume one, pgs. 42, 47, 175), correctly explained the action of a suction pump by an appeal to the pressure of the air (volume one, pgs. 46-47, 79, 200), and dismissed the premise that "nature abhors a vacuum" as being the cause of motion of things (volume one, pg. 36). [7]

Teachers / Influenced by

Beeckman was a student, supposedly, of Snellius and Simon Stevin.

Descartes

In Nov 1618, Beeckman, aged 30, in the city of Breda, met Rene Descartes, aged 22, which followed in a series of stimulating conversations, which put Descartes into his matter and motion philosophical line of thinking. (O)

In a noted anecdote, as the story goes, Rene Descartes and Isaac Beeckman, one day, were in the town square of the Dutch city of Breda, where Descartes was stationed as part of the French army and where Beeckman was head of a local college, during which time, the two were looking a list of philosophical questions posted on the wall, as illustrated adjacent, a custom in this town, during which time Descartes asked Beeckman to translate one of the problems into Latin or French, after which, to Beeckman's surprise, Descartes immediately solved it. [6]

Beeckman, in short, is said to have convinced Descartes to take up the study of nature mathematically. [3]

Rene Descartes on **Beeckman**, in 1618, discussing a list of philosophical questions posted on the town wall of the Dutch city of Breda. [6]

Gassendi

Beeckman also met and influenced Pierre Gassendi, who he supposedly convinced to turn his attention to the natural philosophy side of Epicurus. [3]

Quotes | On

The following are quotes on Beeckman:

> "The first 'molecular' theory of phenomenal matter, be it *avant la lettre* (before the specified word or concept existed), was conceived in the period 1612–1620 by the Dutch natural philosopher **Isaac Beeckman**. According to Beeckman, all matter is an aggregate of so-called "physical homogenea" ("homogenea physica") of varying stability. So, the homogenea of substances such as metals and medicines are quite stable, while those of light and sound, for instance, are far less so. Beeckman's homogenea are supposed to be composed of four kinds of atoms of one and the same prime matter, these atoms being united in specific numbers into a specific structure. The Epicurus batavus compared his homogenea with biological individuals. Like biological individuals of the same species, similar homogenea are not perfectly identical. They are taken as substantial individuals and manifest as such a variability comparable to that of their biological counterparts. Moreover, as substantial individuals they are the necessary and sufficient condition for the existence of a specific substance. Beeckman's concept of "molecule" can rightly be considered as one of the major achievements of the so-called Scientific Revolution of the 17th century."

— Henk Kubbinga (1988), “The first ‘molecular’ theory (1620): Isaac Beeckman” [4]

“**Isaac Beeckman** was a Dutch pioneer of early modern atomist and mechanist speculation. By profession a maker of candles and water supply systems, and later head of various Latin schools, Beeckman devoted a lifetime to studies in natural philosophy, and has received considerable scholarly attention since the rediscovery [1905] of his *Journal* which he kept between 1604 and 1634. Beeckman’s topics in these studies were the atomist assumption that natural phenomena result from nothing but the motion in empty space of small and hard bits of matter and the mechanist assumption that causal impact in the natural world takes place by way of direct contact of matter with matter.”

— Robert Callergard (2017), *Routledge Encyclopedia of Philosophy* (Q)

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External links

- Isaac Beeckman – Wikipedia.
- Isaac Beeckman (overview) – Early Modern Letters Online.

θΔics

In existographies, **Isaac Newton** (1642-1727) (193-277 PE) (0-84 ME) (108-23 AG) (IQ:205|#2) (Cattell 1000:14) (Gottlieb 1000:6) [RGM:3|1,500+] (Murray 4000:2|CS / 1|P / 2|M) (EPD:F0) (GR:1) (RE:84) [CR:866] was an English physicist, mathematician, philosopher, and chemist, aka the "immortal Newton" (Holbach, 1770), noted for his 1686 *The Principia*, in which the theory of universal gravitation, three laws of motion, and the concept of "force" were put forward, and the 1704 *Opticks*, a latter edition of which (1718) led to the start of the chemical revolution, in particular the description of chemical force and affinity tendencies in the famous "Query 31".

Halley | Wren | Hooke

See main: Universal gravitation law

In Jan 1684, Edmond Halley, Christopher Wren, and Robert Hooke were engaged in an animated conversation, either over drinks before a roaring fire (Christianson, 1988), or at a coffee house in London (Q), on the topic of why planets traveled in ellipses, according to which, either Hooke or Halley, or both, depending on story, claimed to have solved the problem, via the theory that the inward force of attraction between planets and the sun must decrease in inverse proportion to the square of the distance between them. Wren, to settle the matter, offered them either a large sum or money or book worth forty shillings to whoever could come up with the mathematical means of proving their theory. Hooke, supposedly, claimed to have solved the problem, "but would conceal the solution for some time so that others trying and failing might know how to value it, when he should make it public."

In Aug 1684, Wren went to Cambridge to see if Newton had the solution, the event of which, as recounted by French mathematician Abraham de Moivre, to whom Newton related the event in his later years, is as follows:

> "In 1684, Halley came to visit Newton at Cambridge, after they had been some time together, Halley asked him what he thought the curve would be that would be described by the planets supposing the force of attraction towards the sun be reciprocal to the square of their distance from it. Newton replied immediately that it would be an ellipsis; Hooke, struck with hoy and amazement, asked him how he knew it, to which Newton said that he had calculated it, whereupon Halley asked him for his calculation. Without any further delay, Newton looked among his papers, but could not find it, but he promised him to renew it, and send it."

Newton then spent the following three months laboring over a nine-page document titled "On the Motion of Revolving Bodies", which he finished in Nov and sent to Halley in London. Newton then went into the Gibbsian flow state, of standing focused work, and over the course of the next 18-months produced his 550-page treatise *Principia*. [10]

Religion

See: Newton on god

The subject of Newton and religion, supposedly, is a large topic. To put things into perspective, in 1619, when Johannes Kepler (1571-1630), derived his three laws of planetary motion, on the nature of elliptical orbits, based on astronomical observations made by Tycho Brahe (1546-1601), data which provided one of the key foundations for Newton's theory of universal gravitation (1687), scientists, nearly unanimously, not only believed in God or gods, but also, Kepler being one example, believed that the planets were pushed around by "angels" beating their wings.

> "God who gave animals self-motion beyond our understanding is without doubt able to implant other principles of motion in bodies which we may understand as little. Some would readily grant this may be a spiritual one; yet a mechanical one might be shown."
>
> — Isaac Newton (1674), philosophical query notes: [5]

Newton, to give one example of religious theory objection, had certain issues with the Julian calender dating system and would objectionably not label years as AD, but instead used AC (*Anno Christum*), signifying is objection to the argument of the existence of the trinity, namely his view that a person named Jesus may have existed, may have been the son of God, and may have been christened or arisen, but definitely was not the 'Lord' or God. [5]

> "Did Christ send his apostles to preach metaphysics to the unlearned people, and to their wives and children?"
>
> — Isaac Newton (c.1680), religious notes (Q)

(add discussion)

Collected works

Newton, at the time of his death (reaction end), had amassed all the world's knowledge into a large collected works set, estimates of which, still not yet finalized (Q), indicate 40-volumes±, including: 25-volume set of correspondence, 8-volume plus set of mathematical papers, 3-volume plus set of optics, one volume plus on *Philosophical Questions*, and untold volumes on alchemical pursuits and religious ventures; the apex of which being his *Principia* (1686) and *Optics* (1718), the latter of which, via Query 31, launched the chemical revolution.

> "Any self-respecting editor—aiming to undertake a publication of Newton's collected works—would have to be absorbed in Newton's 'defunct' world for many years, and 'probably he would never quite find his way out of it'."
>
> — Ralph Sampson (1924), English astronomer (Q)

(add)

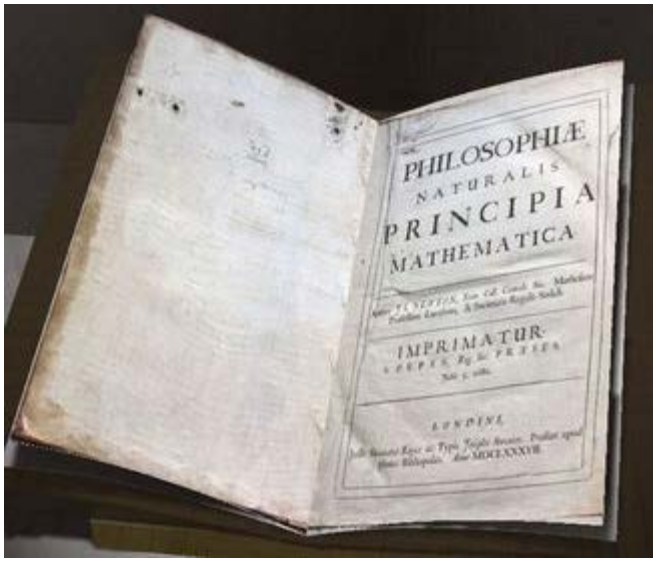

Newton's anchor-point publication, his 1686 *Principia*, in which the laws of motion were presented.

Dating

There seems to be some type of blurry confusion concerning the dates Newton's reactions existence, according to whether one uses the Julian calender system (older calender) or the Gregorian calendar system (modern calender), a transition that occurred, depending on country, during the years 1582 to 1752: [6]

> Reaction existence (Old System, Julian calendar): 25 Dec 1642 – 20 Mar 1726
> Reaction existence (New System, Gregorian calendar): 4 Jan 1643 – 31 Mar 1727

The following quote by Goethe would seem to put preponderant weight on the year "1642" as being the year the modern thinker should consider as Newton's birth:

> "1642 [Newton's birth] is the Christmas of the modern age."
>
> — Goethe (IQ=230) (Q) (Q)

Modern publications outlets and encyclopedias, e.g. *Britannica* (1911), *Wikipedia* (2013), although not all, e.g. BBC (Q), seem to date Newton's birth {OS} (1642) and death {NS} (1727), and his publications {NS}, though it seems without explanation.

Galileo birth | Newton death

The modern issue, in respect to Newton's birth/death dating seems to have something to do with people attempting to correlated or popularizing either their own or certain celebrity scientist birth and death dates in respect to Newton's birth and or death dates and Galileo's death. Science misattribution debunker Gerard Michon comments and diagrams the issues as follows: (Q)

> "Was Newton really born the year Galileo died? No. Galileo died 361 days before the birth of Newton. The death of one and the birth of the other occurred in different Julian years (1641 and 1642) *and* in different Gregorian years (1642 and 1643). The year is the same (1642) only when the death of Galileo is recorded in the Gregorian calendar (then prevalent in Italy) and the birth of Newton is recorded in the Julian calendar (still prevalent in England at the time)."

	Julian Calendar	Gregorian Calendar
Galileo Galilei died (in Arcetri)	Dec. 29, 1641	Jan. 8, 1642
Isaac Newton was born (in Woolsthorpe)	Dec. 25, 1642	Jan. 4, 1643

The following are a few examples of date misattribution:

> "The most famous contemporary of Kepler was Galileo Galilei (1564-1642). William Shakespeare was born the same year as Galileo and **Isaac Newton** was born the year he died."
>
> — Ching-Yao Hsieh and Meng-Hua Ye (1991), *Economics, Philosophy, and Physics* [3]

> "Galileo died on 8 Jan 1642, exactly three hundred years before the day I was born. Isaac Newton was born on Christmas Day of that year later becoming Lucasian Professor of mathematics at Cambridge, the chair I now hold."
>
> — Stephen Hawking (2005), *God Created the Integers* [8]

Science myth debunker Alberto Martinez devotes two pages to dispel the widespread myth that "Newton was born in the same year Galileo died", a myth that stems from using the Gregorian calendar to date the death of Galileo while using the Julian calendar to date the birth of Newton; whereas correctly in the Gregorian calendar (modern) Galileo died

on 8 Jan 1642 and Newton was born on 4 Jan 1643 and in the Julian calendar Galileo died on 29 Dec 1641 whereas Newton was born on 25 Dec 1642. [9]

Humans

The following are noted positions of Newton in respect to human movements and behaviors:

> "I can calculate the movements of stars, but not the madness of men."
>
> — Isaac Newton (c.1690), after losing his hat in a market collapse [4]

(add)

Query 31

Newton, who conceived of molecules as being structures of atoms attached together by a chemical force of affinity. He outlined his atomic chemical force affinity bonding theory in the 'Queries' section to his *Opticks*. To cite one example of Newton's description of a gradient of affinity reactions, he states: [1]

> "Is it not for want of an attractive virtue between the parts of water and oil, of quick-silver (Hg) and antimony (Sb), of lead (Pb) and iron (Fe), that these substances do not mix; and by a weak attraction, that quick-silver and copper (Cu) mix difficultly; and from a strong one, that quicksilver and tin (Sn), antimony and iron, water and salts, mix readily?"

(add)

Affinity tables

See main: Geoffroy's affinity table

In 1718, during a translation into French of Newton's *Opticks*, French physician and chemist Étienne Geoffroy used Newton's descriptions of affinity reactions to construct the world's first affinity table, containing twenty-four reacting species, detailing specifically what affinity reactions would occur between various combinations of reactants. This table seeded the chemical revolution: [2]

Left: Newton shown experimenting with a prism, behind a telescope. Right: a later photo of Newton.

Heat

Newton, in later editions of his *Optics*, stated that the cause of heat is the rapid motion of the parts of bodies, and also proposed a kinetic theory of evaporation. [11]

He also also suggested that the reason why black bodies (see: black body) heat up more rapidly than those of other colors is that they absorb the incident light, which is thereby "stifled and lost" inside them. [11]

Newton, in some unpublished writing, also explained thermal expansion of air by postulating that the constitute atoms vibrate with amplitudes that increase with temperature. [12]

Quotes | On

The following are quotes on Newton:

> "It is likely that animals, being less perfect than man, could have been fashioned first? As they imitated each other, so man probably imitated them; for their whole kingdom is in truth only made up of different, more or less skillful apes, **at the head** of which Pope placed Newton."
>
> — Julien la Mettrie (1750), "On the System of Epicurus" (§23)

> "**Newton**, by the age of 23, invented calculus, explained that light was made up of colored light, and discovered the law of gravity, although he waited to publish. His *Principia* (1687) drew on Descartes' law of inertia, Galileo' ideas on acceleration, and Kepler's laws, and brought it all to a mathematically expressed synthesis that made the world strangely intelligible. In the early drafts for the second edition, Newton included ninety lines from Lucretius' *On the Nature of Things* in association with his concept of inertia."
>
> — Jennifer Hecht (2003), *Doubt: a History* (pg. 326)

> "Immanuel Kant and **Isaac Newton** are both considered to comprise the smartest people to have ever lived. Based on some recent IQ conjectures, both of the above supposedly had IQ's beyond the 250 mark."
>
> — Rork Azak (2011), "Comment to article on Eudoxus" (Q), Nov 14

See also

- Another Newton
- Newton in Senegal
- Newton's law of cooling
- Newtonian government
- Newtonian sociology
- Social Newton

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(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 17). Cornell University Press.
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(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 17). Cornell University Press.

External links

- Isaac Newton – Wikipedia.
- The Chemistry of Isaac Newton – Indiana University.

θΔics

In existographies, **Isaac Peyrere** (1596-1676) (RMS:19) was French radical theologian noted for his 1655 pre-Adamite hypothesis (Q) and for his non-Mosaic authorship conjecture.

Influence

La Peyrère was influenced by Thomas Hobbes.

Influenced

La Peyrere influenced Benedict Spinoza.

Quotes | On

The following are quotes on Peyrere:

> "Four years later, **Isaac de la Peyrere**, a French Calvinist, also wrote explicitly that Moses was not the author of the first books of the Bible. He, too, noted problems running through the text, including, for example, the words 'across the Jordan' in the first verse of Deuteronomy."
>
> — Richard Friedman (1987), *Who Wrote the Bible* [1]

> "The first important scholars to independently argue *against* the prevailing view, namely that the Pentateuch was written by a divinely-inspired Moses (e.g. Newton believed this), were: Thomas Hobbes, Benedict Spinoza, and **Isaac la Peyrere**."
>
> — Gary Greenberg (1996), *The Bible Myth* [2]

References

1. Friedman, Richard E. (1987). *Who Wrote the Bible* (pg. 20). Summit Books.
2. (a) Friedman, Richard E. (1987). *Who Wrote the Bible* (pg. 20). Summit Books.
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External links

- Isaac La Peyrere – Wikipedia.

θΔics

In existographies, **Isabelle Stengers** (1949-) (CR:9) is a Belgian chemist-philosopher noted, in human thermodynamics, for her co-authorship work with Ilya Prigogine, her role being to help laymanize Prigogine's theories.

Overview

In 1984, Stengers co-authored *Order Out of Chaos* with Belgian chemist with Ilya Prigogine, wherein they worked to popularize the far-from-equilibrium view of thermodynamics based evolution, wherein the famous footnote 2.5 on Goethe and Mittler the mediator occurs.

In 1997, Stengers co-authored *The End of Certainty* with Prigogine, a simpler elaboration of their former work. [2]

In 1997, Stengers, in her *Power and Invention*, used the laws of thermodynamics to explain how nonlinear dynamics and chaos theory apply in philosophy. [3]

Stengers' 1982 book 1982 work *Novi Savez*, written with Prigogine, influenced Mladen Knezevic.

Quotes | On

The following are quotes on Stengers:

> "While there is a burgeoning literature on matter in social theory, there has been a surprising lack of interest amongst social theorists in the importance of the concept of energy in natural scientific accounts of matter. In this context, I examine how the work of **Isabelle Stengers** challenges social theorists to take thermodynamic accounts of energy, in particular, seriously. The paper develops three arguments: firstly, while social theorists have often wanted to add social relations to matter, in doing so they have ignored physical scientists' own analyses of relations, including thermodynamics; secondly, that thermodynamics offers a different way of theorizing matter-energy than that suggested by vitalist approaches to political ecology; thirdly, that the thermodynamic concept of energy is necessarily linked to the practice and politics of measurement. At the same time, I argue that Stengers's account of thermodynamics both illuminates her understanding of politics, and points to its limitations."
>
> — Andrew Barry (2015), "Thermodynamics, Matter, Politics" (Ñº)

References

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2. Prigogine, Ilya and Stengers, Isabelle. (1997). *The End of Certainty: Time, Chaos, and the New Laws of Nature.* Free Press.
3. Stengers, Isabelle. (1997). *Power and Invention: Situating Science.* University of Minnesota Press.

Further reading

â— Prigogine, Ilya and Stengers, Isabelle. (1971). *La Nouvelle Alliance: Metamorphose de la Science* (*The New Alliance: Metamorphosis of Science*) (pg. 126-29). Paris: Gallimard.

External links

â— Isabelle Stengers – Wikipedia.

θΔics

In thermodynamics, **isentropic** refers to a line on diagram or graph of equal entropy.

The term was coined in 1873 by American engineer Willard Gibbs and approved of and adopted by German physicist Rudolf Clausius in 1875. [1]

In 1875, James Maxwell was using the term ‘isentropic’ as a synonym or thematic to William Rankine's 1859 term adiabatic. [1]

References

1. (a) Gibbs, J. Willard. (1873). "Graphical Methods in the Thermodynamics of Fluids" (pg. 3), *Transactions of the Connecticut Academy*, I. pp. 309-342, April-May.
(b) Clausius, Rudolf. (1879). *The Mechanical Theory of Heat* (pg. 68). London: Macmillan & Co.
References
2. Maxwell, James. (1875). “Letter to James Thomson”, July 8th; in *The Scientific Letters and Papers of James Clerk Maxwell* (pgs. 230-31). Volume 3; 1874-1879.

External links

â— Isentropic process – Wikipedia.

θΔics

In existographies, **Isidore of Seville** (c.560-636) (IQ:#|#) [RGM:862|1,500+] (GMAG|#) (CR:3) was a Spanish theologian and scholar, noted for []

Overview

In c.630, Isidore, in his *The Etymologies* (Q), building on Pliny the Elder's *Natural History*, along with works by Cassiodorus, Servius, and Solinus, presented a collection of diverse etymologies, which became a widely-read books in the centuries to follow.

Influenced

Isidore influenced: Dante Alighieri, Geoffrey Chaucer, and Petrarch.

Quotes | On

The following are quotes on Isidore:

> "**Isidore** was the last scholar of the ancient world."
>
> — Charles Montalembert (1860), *The Monks of the West from Saint Benoit to Saint Bernard*

Quotes | By

The following are quotes by Isidore:

> "Live as if you were to die tomorrow. Learn as if you were to live forever."
>
> — Isidore (c.620), *Publication* (Q)

External links

- Isidore of Seville – Wikipedia.

θΔics

In Egyptian mythology, **Isis** (CR:22) is an Egyptian mother goddess; wife-sister of Osiris, sister of Nephthys, mother of Horus, noted for having played a key role in the resurrection of the dead Osiris, after his hacking into 14 pieces (see: Orion) by the god Set, as told in the famous "Passion of Osiris". [1]

Statues of **Isis**, holding the ankh, and her brother-husband Osiris (who typically has green skin), with whom she conceives, via black rite resurrection sex, the savior god Horus.

Sirius

In astro-theology, the star Sirius, aka the brightest star in the sky, was originally personified by the goddess Sopdet; this goddess, in turn, was later syncretized with Isis, to the effect that Isis was associated with Sirius. [2]

Synonyms | Morphs

The general Isis goddess model, according to Wallis Budge (1904), morphed outside of Egypt as follows: [8]

> "From the works of classical writers we know that her worship spread from Egypt into several places in Western Europe, and she was identified with Persephone, Tethys, Athene, etc., just as Osiris was identified with Hades or Pluto, Dionysus-Bacchus, and other foreign gods."

In 43BC, according to Budge, temples were built in honor of Isis and Serapis (Ñº), i.e. Osiris-Apis, the Greco-Roman Osiris god syncretism, created per order of Ptolemy I.

Nile River | Annual flood

On Jun 25, in Egypt, annually, what is called the helical rising of Sirius occurs when the star and sun are sufficiently separated so that—for the first time in 70 days—Sirius can be seen on the horizon just before dawn. The day when Sirius is first sighted marks the start of the annual Nile River flood.

> "The Egyptians hold the festival of Isis at the time when they say she is mourning for Osiris. At that time the Nile begins to rise, and it is a common saying among the natives that it is the tears of Isis that cause the river to rise and water the fields."
>
> — Apuleius (c.165AD), *Eleventh Book*; cited by Wallis Budge (1904) [8]

It was believed, as summarized above, that the annual flooding of the Nile River was caused by Isis weeping for her husband. [7]

Mary

It has been known for some time that Isis is the main goddess character behind the Christian character of the Virgin Mary; some quotes of which are as follows:

> "The Virgin Mary seems to have done wonders in this way; so that what Juvenal said of the goddess **Isis** may be applied to her, that the Painters get their livelihood out of her."

— John Poynder (1818), *Popery of the Religion of Heathenism* (pg. 19)

"Among the Egyptians, the zodiacal **Isis** is a virgin mother."

— Romualdo Gentilucci (1848), *Life of the Most Blessed Virgin Mary* [6]

"In Osiris the Christian Egyptians found the prototype of Christ, and in the pictures and statues of **Isis** suckling her son Horus, they perceived the prototype of the Virgin Mary and her Child."

— Wallis Budge (1899), *Egyptian Ideas of the Future Life* [4]

"**Isis**, alone of all the pagan goddesses, was the 'great forerunner' of the Virgin Mary."

— Reginald Witt (1971), *Isis and the Greco-Roman World* [5]

"There is much argument that the Isis cult influenced the portrayal of the Christian Virgin Mary, who was also known as *Stella Maris* and whose portraits with the Christ often bear a striking similarity to those of **Isis** with Horus."

— Michael Jordan (1993), *Encyclopedia of Gods*

"Although there are arguments among scholars that Mary's imagery is closer to that of Kybele, who became the Roman *Magna Mater*, it is the Egyptian goddess **Isis** who provided much of the inspiration. The Greeks and Romans, thoroughly besotted in their adoration of most things Egyptian, had identified Isis as the Star of the Sea and they believed her to make her nightly appearance in the heavens as the north star. *Stella Maris* is a title loaded with meaning since the sea has always been regarded as a source of bounty and fertility. So it does not come wholly as a surprise to discover that, from about the time of the ninth century, Mary was also enjoying the title of *Stella Maris*."

— Michael Jordan (2001), *The Historical Mary* [3]

"It is impossible to ignore the similarities between the Egyptian quarternity: **Isis** and Nephthys (known as 'the Two Goddesses' in Egypt), Osiris and Set (personifications of life and death), and the leading characters of the Eleusinian drama: Demeter and Persephone (also known simply as 'the Two Goddesses'), Dionysus and Hades. Diodorus of Sicily, first century BC, clearly states that the initiatory rites of Demeter in Eleusis were transferred from Egypt (Diodorus Siculus, 1.29.2). Later he states: The rite

A comparison, by Dorothy Murdock, of **Isis** suckling Horus to Mary suckling Jesus. (Ñº)

of Osiris is the same as that of Dionysus and that of Isis very similar to that of Demeter; the names alone having been interchanged, and the punishments in Hades of the unrighteous, the Fields of the Righteous and the fantastic conceptions, current among the many - all these were introduced by Orpheus in imitation of the Egyptian funeral customs.' (1.96.4-5).”

— Timothy Freke and Peter Gandy (2001), *Jesus and the Lost Goddess* [9]

(add discussion)

References

1. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World*. Facts on File, Inc.
2. Oakes, Lorna and Gahlin, Lucia. (2002). *Ancient Egypt: an Illustrated Reference to the Myths, Religions, Pyramids and Temples of the Land of the Pharaohs* (Sah, pgs. 331, 425; Sopdet, 331, 399). Hermes House.
3. Jordan, Michael. (2001). *The Historical Mary: Revealing the Pagan Identity of the Virgin Mother* (pg. 275). Seastone.
4. Budge. Wallis. (1899). *Egyptian Religion: Egyptian Ideas of a Future Life* (pg. 81) (Ñº). Publisher.
5. (a) Witt, Reginald E. (1971). *Isis and the Greco-Roman World* (*Isis in the Ancient World*) (§:Great Forerunner, pgs. 269-81). JHU Press, 1997.
(b) Carroll, Michael P. (1992). *The Cult of the Virgin Mary: Psychological Origins* (pg. 111). Princeton University Press.
6. Gentilucci, Romualdo. (1848). *Life of the Most Blessed Virgin Mary* (pgs. 25-26). E. Dunigan, 1860.
7. Bob. (2015). “Temple of Isis on Philae Island Aswan” (Ñº), Blogspot, Jun.
8. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pgs. 216-17; Isis weeping, pg. 219). Dover, 1969.
9. Freke, Timothy and Grandy, Peter. (2001). *Jesus and the Lost Goddess: The Secret Teachings of the Original Christians* (Osiris, 18+ pgs; quote, pg. 255). Random House.

External links

â— Isis – Wikipedia.

θΔics

In religion, **Islam** (CR:62), aka "Mohammedan faith" (Rheticus, 1540), is the Quranic version of Abrahamic theology, itself being a monotheistic rescript of Anunian theology, the description of which, according to Islamic folklore, is believed to be the spoken words of a god, named Allah, enunciated over the course of 40-years, from 609 to 632, to a prophet named Muhammad, a conceptualized 62-generation descendant of Abraham (a conceptualized ten generation descendant of Noah, i.e. Nuh or Nun); an adherent of which is called a Muslim, whose membership includes some 20 percent of the world's current population.

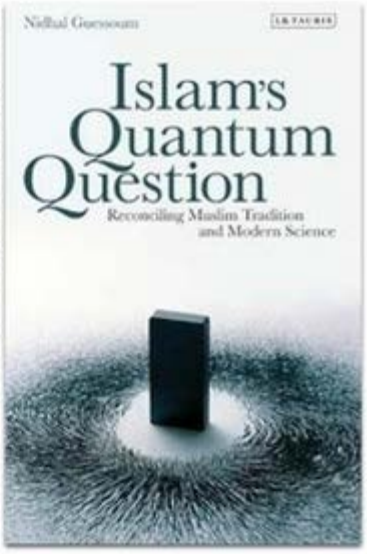

Above: the annual pilgrimage to Mecca (hajj), something that must be done at least once during a Muslim's reaction extent (lifetime), as one of the five "pillars" or basic acts in **Islam**. Right: the 2011 *Islam's Quantum Question*, by Nidhal Guessoum, showing a depiction of iron fillings around a magnet alluding to a comparison of Kaaba (cuboid building at center) and its "black stone" (eastern cornerstone) to the magnet and humans, in Islamic belief, aligned towards the Kaaba, like the aligned iron filings (see: Ising model of human behavior). [1]

Overview

In circa 2011, Neil Tyson posited (Q) that the fall of the Islamic golden age (800-1100) occurred after Hamid Al-Ghazali (1058-1111) declared mathematics evil or the work of the devil.

Atheism

See main: Islamic atheism

In Islam, atheists, among whom are mostly closet atheists (as open atheists in the Muslim world tend to be killed) are categorized as *kafir* (كافر), which carries connotations of blasphemy and disconnection from the Islamic community; a term, to note, that is also used to describe polytheists (*shirk*), and that translates roughly as "denier" or "concealer". In Arabic, "atheism" is generally translated *ilhad* (إلحاد), although this also means "heresy". (Q). In the 14th century, the top three heretics or Islamic atheists were al-Marri (c.1020), aka the "Arab Lucretius", Ibn al Rawandi (c.870), a three impostors advocate, and Abu Hayyan (923-1023) (Q), noted for his dialogue (Q) on "why atheists do good work?" if, e.g., they have they have no fear of a final reckoning, do not seek to be rewarded by god or even expect even to return to god? The gist of their atheism rep was summarized as follows:

> "The heretics in Islam are three: Ibn al Rawandi, Abu Hayyan al Tawhidi, and Abu Alaa al-Ma'arri–of them, mostly Abu Hayyan, because they (attempt to) edify grandiloquence but in fact they babble."
>
> — Ibn al-Jawziyyah (c.1325) [6]

In 2004, Jennifer Hecht, likewise, groups al-Rawandi, al-Tauhidi, and al-Ma'arri as the "three worst zindiqs" [anti-religionists] of Islam, according to the Islamic tradition. [7]

On 11 Feb 2018, in Egypt, the following interaction occurred between Mahmoud Ashour, a former deputy Sheikh of Al-Azhar, and Mohammad Hashem, and Ex-Muslim atheist youth, intermediated by a Muslim talk show host of Alhadath Alyoum TV:

> Sheikh Mahmoud: Why did you become an atheist?

The 11 Feb 2018 interaction between two Muslims and an atheist, during which once the atheist says he believes in big bang and doesn't believe in god, they kick him off the show.

Ex-Muslim Atheist: Because there is no scientific evidence for god.

Muslim *Host*: How can you say that. Who created you? Who made you exist as a human being?
Sheikh Mahmoud: Do you know how you were created?
Ex-Muslim Atheist: There are many theories explaining our existence on this planet …

Sheikh Mahmoud: I'm asking you a question. How did you become a human being?
Muslim *Host*: How come you exist in this universe?
Ex-Muslim Atheist: Ok. Let me explain. There are theories that try to explain our existence. One theory is that god created us. Okay? But there are other theories, with much more evidence, like big bang theory.

Muslim *Host*: Speak Arabic! You are in Egypt. And you are addressing simple people, so don't use big words for no reason.
Ex-Muslim Atheist: I'm using these terms because science is conducted in English.

Muslim *Host*: What science are you talking about, you are confusing and unreliable. You deny the existence of god and reject our religion and principles.
Ex-Muslim Atheist: Is this so bad?

Muslim *Host*: Of course, you come here to talk about a certain idea, but have nothing to offer. You offer atheism! You offer heresy! I apologize to the viewers for having an Egyptian of this kind on our show. I'm sorry, Mohammad, but you cannot stay with us on the show. Because your ideas are inappropriate, I'm sad to say. We cannot promote such destructive ideas. You have not uttered a single convincing word.

Sheikh Mahmoud: Look, dear Mohammad, you need psychiatric treatment. Many young people today suffer from mental illnesses, due to material or mental circumstances.
Muslim *Host*: It's like Sheikh Mahmoud says, have you seen a psychiatrist? I advise you to leave the studio and go straight to a psychiatric hospital. You shouldn't be here. Unfortunately, I cannot let you be here anymore. Please get up and leave, and I will continue the show with Dr. Mahmoud. Unfortunately, your ideas are destructive and bad for Egyptian youth. You are a bad example of Egyptian youth. … Mohammad, you can't stay here. I advise you to go straight to a psychiatric hospital.

Of note, when the atheist said: "One theory is that god created us, okay", he should have inserted: "but this theory says that we were created from "sticky clay" (Quran, Surah 37:11); the problem with this, however, is that one of the main elements in clay is aluminum, but as scientists (e.g. Alfred Lotka, 1925) have pointed out, there is no aluminum in humans and also aluminum is a poison to humans. This, categorically, is the aluminum disproof of the existence of god.

Evolution

In Muslim countries, such as Egypt and Pakistan, only around 15 percent of the population believes in Darwinian evolution, a belief conflict issue that Algerian astrophysicist Nidhal Guessoum investigates in his 2011 *Islam's Quantum Question*. [1]

Muhammad

See also: Muhammad never existed

Little, to note, has been published on the historicity of the Quran, say as compared to the historicity of the Bible, presently known to have written by some 52+ scholars, collectively, over the course of some 600 years (500BC-100AD).

In 2008, German jurist and former Islamic theologian Sven Kalisch, whose doctoral thesis (1997) was on "common sense and flexibility in Islamic legal methodology" (see also: Goethe's jurisprudence issues and student reactions), completed at the Faculty of Law and Economics at the Technical University of Darmstadt—a Protestant-to-Muslim convert (age 15) turned Muslim-to-nonbeliever convert (age 44)—made controversial headlines by stating, in an article entitled "Islamic Theology Without the Historic Muhammad: Comments on the Challenges of the Historical-Critical Method for Islamic Thinking", his researched opinion that Muhammad never existed; at the time, he was said to be in the middle of completing a book on this subject. [2] In addition to the non-existence of Muhammad, Kalisch has doubts on the historical existence of Jesus (god-Horus/Osiris), Moses, Abraham (father Ra son of Nun), and other so-called prophets of the Islamic, Christian, and Jewish traditions. Controversy and legal action over the Muhammad non-existence proposal forced Kalisch to publicly relinquish his belief in Islam (2010) and eventually to have his professorship renamed to "intellectual history of the Middle East in post-ancient time" and to be moved to the Department of Philology. [3]

Quotes

The following are related quotes:

> "Myth as a constituent of Arab-Islamic culture has long been ignored or even denied."
>
> — Jaroslav Stetkevych (2000), *Muhammad and the Golden Bough: Reconstructing Arabian Myth* (pg. ix)

> "Christianity and **Islam** made it illegal and immoral to think for a long time, and that's why philosophy and science slumbered for centuries. That fact is proven by the simple fact that I could not find a philosophy book at a bookstore when I visited Istanbul, Turkey. Turkey is now a Muslim nation so it's hard to find books by philosophers out on display at libraries or bookstores."
>
> — Monydit Malieth (2013), *The Future Affects the Past* [1]

> "The Koran = Mein Kampf of the prophet Mohammad."
>
> — Micheal Sturzenberge (2016), Munich interaction (Q), Mar 3

> "Who burned the books of Averroes? Who banished Alhazen? Who accused Avicenna and Ibn Al-Khwarizmi of heresy? Was it Israel or America?! They didn't even exist back then. We did. Let's be honest about it."
>
> — Ibrahim Al-Buleihi (2010), Al-Arabiya TV (Dubai/Saudi Arabia) part one (Q); part two (Q)(Q), Feb 26; Nasser Dashti, supposedly, is a younger version of him; see: Middle Ages genius; among other (Q) comments

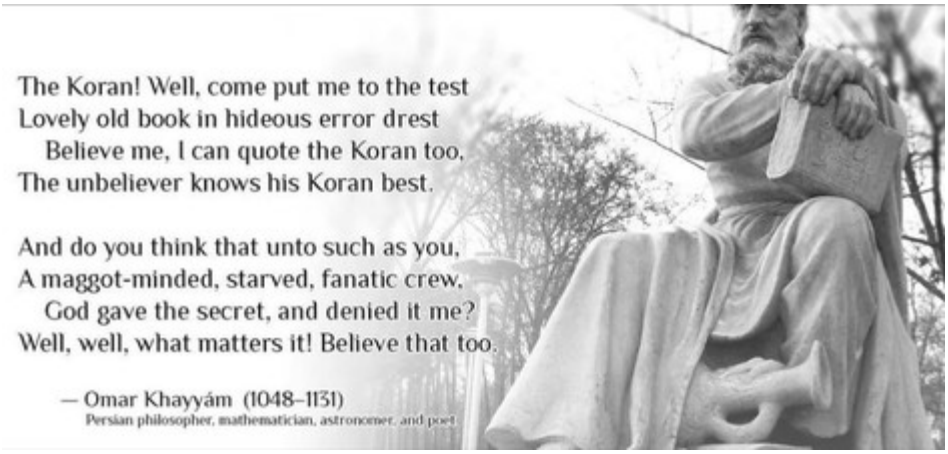

A statue and quote by Omar Khayyam, noted unbeliever.

> "We Arabs and Muslims are backward, but we don't know it."

— Saudi Cleric (2016), Mermi TV translated debate, Sep 1 (Q)

"How come the Europeans, Americans, and Japanese are never possessed by 'Jinns'?

— Khaled Montaser (c.2017), *Publication* (Q)

See also

- Comparative mythology and religion
- Middle ages geniuses
- Religio-mythology
- Mirza Beg
- Mehdi Bazargan

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(e) Historicity of Muhammad – Wikipedia.
(f) Thims, Libb. (2011). *Purpose? (in a Godless universe)*. (94-pg manuscript) (unfinished); Online as 105-page unfinished manuscript (14 Apr 2013). IoHT publications.
(g) Sven Kalisch – WikiIslam.net.
3. Sven Kalisch (German → English) – Wikipedia.
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5. Anon. (2016). "What is the Jefferson Quran" (Q), TheJeffersonQuran, WordPress, Jul 18.
6. Kamel, Marwan. (2015). "The 11th Century Poet Who Pissed of al-Qaeda" (Q), HistoryAnswers.co.uk, Feb 2.
7. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 231-33). HarperOne.

Further reading

- Green, Joey. (2003). *Jesus and Muhammad: the Parallel Sayings* (Foreward: Sayyid Syeed; Introduction: Kenneth Atkinson). Seastone.

External links

- Atheists Ex-Muslims (section) – WikiIslam.

θΔics

In atheism, **Islamic atheism**, aka Muslim atheism, Arab atheism, or Persian atheism, or middle eastern atheism, ex-Muslim atheism, as contrasted with Christian atheism, Jewish atheism, or Hindu atheism, refers to disbelief in god from the point of view of one coming from an Islamic religious background or Islamic cultural milieu; the term "ex-Muslim atheist" is sometimes used as an auto-label by this type of atheist.

An **Islamic atheist** (ex-Muslim atheist) taking c.2010 photo of a note, which reads "proud to be atheist", in front of the Kaaba (black building), at the center of Islam's most sacred mosque, Al-Masjid al-Haram, in Mecca, al-Hejaz, Saudi Arabia, the place where Muslims believe Adam and Eve were created by Allah, which was lost during Noah's flood, but rebuilt by Abraham and Ishmael, during which time an angel brought Abraham a "black stone" (Q), which is now set into the Eastern corner of the Kaaba.

Overview

In Islam, atheists, among whom are mostly closet atheists (as open atheists in the Muslim world tend to be killed) are categorized as *kafir* (كافر), which carries connotations of blasphemy and disconnection from the Islamic community; a term, to note, that is also used to describe polytheists (*shirk*), and that translates roughly as "denier" or "concealer". In Arabic, "atheism" is generally translated *ilhad* (إلحاد), although this also means "heresy". (Q) In the 14th century, the top three heretics or Islamic atheists were al-Marri (c.1020), aka the "Arab Lucretius", Ibn al Rawandi (c.870), a three impostors advocate, and Abu Hayyan (923-1023) (Q), noted for his dialogue (Q) on "why atheists do good work?" if, e.g., they have they have no fear of a final reckoning, do not seek to be rewarded by god or even expect even to return to god? The gist of their atheism rep was summarized as follows:

> "The heretics in Islam are three: Ibn al Rawandi, Abu Hayyan al Tawhidi, and Abu Alaa al-Ma'arri–of them, mostly Abu Hayyan, because they (attempt to) edify grandiloquence but in fact they babble."
>
> — Ibn al-Jawziyyah (c.1325) [10]

In 2004, Jennifer Hecht, likewise, groups al-Rawandi, al-Tauhidi, and al-Ma'arri as the "three worst zindiqs" [anti-religionists] of Islam, according to the Islamic tradition. [11]

History

In 724, Iraqi freethinker and materialist Djad ibn Dirham (715-724) was a labeled "zindiq" (heretic); some of his crimes included: denying the Muslim concept of god with attributes; example quote: [1]

> "God did not speak to Moses, nor take Abraham as a friend."

Dirham became the first person to be executed for the heresy crime of "zandaqa" (heresy).

In 760, Ibn al-Muqaffa was executed for the crime of Manicheanism, attacking Islam, its prophet, and its notion of god. [2]

In 772, Ibn Abi aI-Awja (c.720-772) was executed for believing in things such as the eternity of the world, that the "skies are empty" (Q), for denying the existence of creator, and for questioning the theory of providence, e.g. "why are there catastrophes, epidemics, if god is good?", and for heckling Imam Jafar al-Sadiq (702-765) during his lectures by yelling (Q) out "nonsense!". [3]

In c.780, Iranian poet Abu Nuwas (756-814) was a famous religious doubter who, as the anecdote goes, was at his mosque one day listening to the Iman reading out verse one of surah 109: “Say, O! you unbelievers …”, to which Nuwas yelled out “Here I am!” He was exiled and imprisoned, where he dereacted (died). Nuwas wrote about sexual passion, homosexuality, masturbation, among other taboo topics, and was considered a genius poet. [4]

In c.870, Ibn al-Rawandi, a former Shia Muslim turned free thinker, became the first "radical atheist" of Islam.

In c.900, Zakariya Razi began to openly question the newly formed Islamic religion; for example:

> “If the people of this [Muhammad] religion are asked about the proof of the soundness of their religion, they flare up, get angry and spill blood of whoever confronts them with this question. They forbid rational speculation, and strive to kill their adversaries. This is why the truth became thoroughly silenced and concealed.”

In c.1120, Persian philosopher Omar Khayyam stated is disbelief in the Koran as follows: (Q)

> “The Koran! Well, come put me to the test; lovely old book in hideous error drest. Believe me, I can quote the Koran too; the unbeliever knows his Koran best. And do you think that unto such as you, a maggot-minded, starved, fanatic crew, god gave the secret, and denied it me? Well, well, what matters it! Believe that too.”

In c.1280, Jewish physician-philosopher Ibn Kammuna (c.1210-1284) penned *Examination of the Three Faiths*, a religion-critical book, written in Arabic, thematically stylized as "deism bordering on agnosticism", which appeared in Baghdad, wherein he challenged the legitimacy of Islam where he reasoned that incompatibility of sharia with the principles of justice undercuts Muhammad's claims of being a perfect man and stated that people convert to Islam from ulterior motive; for example: [5]

> “That is why, to this day we never see anyone converting to Islam unless in terror, or in quest of power, or to avoid heavy taxation, or to escape humiliation, or if taken prisoner, or because of infatuation with a Muslim woman, or for some similar reason. Nor do we see a respected, wealthy, and pious non-Muslim well versed in both his faith and that of Islam, going over to the Islamic faith without some of the aforementioned or similar motives.”

In circa 1960, Salmon Rushdie (1947-), as a teen, demonstrated his rejection of Islam by eating a ham sandwich, and waited in vain for the thunderbolt from heaven. In 1988, Rushdie published his *The Satanic Verses*, which, in the Muslim world, drew accusations of blasphemy and unbelief; the Ayatollah of Iran issued a fatwa ordering Muslims to kill him, which was backed by the Iranian government until 1998.

> “I’m a hardline atheist, I have to say.”
>
> — Salman Rushdie (2006), “Interview with Bill Moyers” (Q)

In 1995, Ibn Warraq, after being "shaken loose in his faith by the Rushdie affair", as Christopher Hitchens puts it, penned his *Why I am Not a Muslim*, stylized on Bertrand Russell's *Way I am Not a Christian* (1925), wherein he begins with Ibn Kammuna, and goes onto explain how he lost his faith.

In 2002, actress Ayaan Ali became an atheist, in May, following 9/11, when she looked at herself in the mirror and

asked “do I really believe in God?” (V); on 29 Aug 2004, her film *Submission* (V) — done while working with writer and director Theo van Gogh (who was shot 8 times, semi-decapitated, and stabbed in the chest, on 2 Nov 2004, at 9AM while biking to work), wherein she wrote the script and provided the voiceover — was aired on the Dutch public broadcasting network, which criticized the treatment of women in Islamic society, which was juxtaposed with passages from the Qur'an, were scenes of actresses portraying Muslim women suffering abuse, and an apparently nude actress dressed in a semi-transparent *burqa* was shown with texts from the Qur'an, written on her skin, interpreted as justifying the subjugation of Muslim women.

In 2003, Raymond Converse, an American educational legal philosopher (Q), in his chapter “Atheism and Islam”, digressed on Islam vs Judaism in respect to civil rights as atheism would see things. [6]

In 2009, Egyptian-born German scholar Hamed Abdel-Samad (Q) began destroying leftist Islamic defenders, via logic, Quranic quotes (e.g. the Quran twice mentions beheading non-believers), history, and erudition. (Q)

In 2012, Heina Dadabhoy (1988-), an American ex-Muslim, who in 2007 (age 19) starting becoming active in atheist organizations and events (Q) around Orange County, CA, started a Kickstarter (Q) effort for a book entitled *Skeptic’s Guide to Islam*, raising about 10K, (supposedly due out Dec 2015); in 2014 she interviewed (Q) with Matt Dillahunty. (Q)(Q)

In 2013, Sarah Haider (c.1988-), a Pakistani-born American ex-Muslim, co-founded Ex-Muslims of North America, where she advocates for the acceptance of religious dissent and works to create local support communities for those who have left Islam. Haider, at the circa age of 13 began to lose her faith when a “militant atheist”, as she says (Q), in 2015 discussion with atheist Dave Rubin, gave her printed pages from the Quran, of some horrible passages, and said “look, this is what you believe”, after which, in order to prove the militant atheist wrong, she began to investigate things, became an atheist; in 2015 gave a decent icebreaker “Islam and the Necessity of Liberal Critique” (Q) speech at the American Humanist Association.

In 2014, Iranian-born Canadian ex-Muslim atheist Armin Navabi (Q), curator of WhyThereIsNoGod.com, in his *Why There Is No God: Simple Responses to 20 Common Arguments for the Existence of God*, did some basic god theory debunking, the first chapter, e.g., puts William Paley, and his watch analogy, against John Conway, and his game of life program. The second chapter points our Biblical, e.g. that god told Moses that created plants *before* the sun (Genesis 1:1-19), and Quranic errors, god told Muhammed that the earth is flat with the sun rising and setting in particular parts of the earth (Surah 18:86). [7]

A 2015 Atheist Republic image tweet (Q) of a Muslim getting his feelings hurt per cartoon drawings of Muhammad, an act forbidden, not by the Quran, but by certain Islamic books (Q)(Q), and the rebuttal act of stabbing the cartoonist.

In 2015, atheist Sam Harris and former Islamic radical Maajid Nawaz, in their *Islam and the Future of Tolerance*, outlined a dialogue on the intersection of Islam, atheism, and modernity, or something along these lines. [8]

In 2016, Ali Rizvi, in his *The Atheist Muslim*, outlined a deconversion from Saudi religious ideologies to Canadian-American secularism. [9]

In 2018, Harris Sultan (Q), a Pakistani-born Australian ex-Muslim atheist (Q), in an “Atheism vs Islam” debate (Q),

opened to a coherent argument for secularism based societies in place of “fairy tale” gods based religion run societies.

Quotes

The following are related quotes:

> “The occupation of our brains by gods is the worst form of occupation.”
>
> — Abdullah al-Qasemi (c.1940) (Q)

> “If you can kill a disbelieving American or European - especially the spiteful and filthy French — or an Australian, or a Canadian, or any other disbeliever from the disbelievers waging war, including the citizens of the countries that entered into a coalition against the **Islamic** State … kill him in any manner or way however it may be.”
>
> — Abu Mohammad al-Adnani (2014) (Q)

> “There is no god! There is no god! I came to America so I could say that. In my country [Iran], they will kill me if I say that.”
>
> — Sadegh Simorgh (2014), response following query by Libb Thims of “Are you a Muslim?”, to which he first responded “On my ID card”, to which Thims responded “What do you mean?”, Oct 31

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1. (a) Warraq, Ibn. (1995). *Why I Am Not a Muslim* (pg. #). Prometheus Books, 2003.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 222-23). HarperOne.
(c) Zindiq – Wikipedia.
2. (a) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 222-23). HarperOne.
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3. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 222-23). HarperOne.
4. (a) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 222-23). HarperOne.
(b) Abu Nuwas – Wikipedia.
5. (a) Warraq, Ibn. (2003). *Why I Am Not a Muslim*. Prometheus Books.
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6. Converse, Raymond W. (2003). *Atheism as a Positive Force* (§11: Atheism and Islam, pg. 221-). Algora Publishing.
7. Navabi, Armin. (2014). *Why There Is No God: Simple Responses to 20 Common Arguments for the Existence of God* (eB). Atheist Republic.
8. Harris, Sam, Mawaz, Maajid. (2015). *Islam and the Future of Tolerance: a Dialogue*. Harvard University Press.
9. Rizvi, Ali A. (2016). *The Atheist Muslim: a Journey from Religion to Reason* (Amz). St. Martin’s Press.
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Further reading

● Stroumsa, Sarah. (1999). *Freethinkers of Medieval Islam*: *Ibn al-Rawandi, Abu Bakr al-Razi, and Their Impact on Islamic Thought*. Brill.

● Al-Rawandi, Ibn. (2000). *Islamic Mysticism: a Secular Perspective*. Prometheus Books.
● Whitaker, Brian. (2014). *Arabs Without God: Atheism and Freedom of Belief in the Middle East*. Amazon.
● Kilpatrick, William. (2015). *Christianity, Islam and Atheism: The Struggle for the Soul of the West* (Amz). Ignatius.
● Tzortzis, Hamza A. (c.2017). *The Divine Reality: God, Islam, and the Mirage of Atheism*. Publisher.
● Wadi, Adam. (2017). *Atheism for Muslims: a Guide to Questioning Islam, Religion, and God, for a Better Future* (Amz). Publisher.

θΔics

In hmolscience, **island model**, or “island example”, refers to the method of employing a thought experiment model of a conceptualized simple social system on a hypothetical island, consisting of a number of people, people explicitly modeled as reactive chemicals (human chemicals) or molecules (human molecules), according to which if no people enter or leave the island, e.g. by swimming, boat, or plain, etc., the island is a "closed" system, thermodynamically speaking, but if individuals are able to enter or leave the island, it is then a "open" system; other models may take into account semi-permeable membrane boundary models, such as investigated chemically by Jacobus van't Hoff, via his Van't Hoff equilibrium box.

A rendition of the basic “**island model**”, wherein, originally, one man B and one woman A are stranded on a deserted island, having been that way for some time, and therein having established a certain “relationship”, symbolized by the relationship bond “≡”, quantified by certain bond energy, the scenario representative of the “initial state”. In this model, the people are the “reactants” or "chemicals" (or human chemicals), the surface of the island is the “substrate”, and the air and surrounding water is the “reaction milieu” (Ñº) or reaction medium. Sometime later, a third man C is introduced into the “system”, e.g. by plane crash, drifting ashore, etc., thereby crossing the “boundary” of the system, and triggering, via sunlight, collision theory, and activation energy barrier crossing, new system reactions, after which, given time, the reactive system transforms into the “final state” (or end state), with new final state bonds and dynamics.

Goethe | Estate

In 1809, German polyintellect Johann Goethe, in his physical chemistry based *Elective Affinities*, introduced his now-famous “estate” model, wherein a couple residing on a country estate, was presented as being akin to a chemical retort, into which new reactants could be introduced selectively, crossing the fenced in boundary of the estate, chapter by chapter, causing observable human chemical reactions, acting to displace others from the estate. [1]

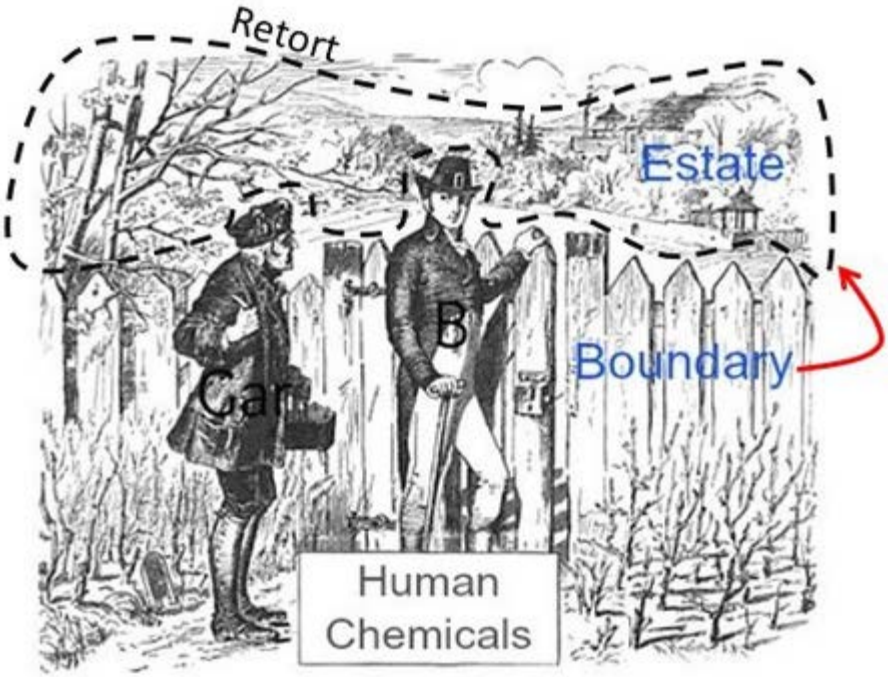

Shown above, e.g., is Edward (B), conceptualized as a human chemical, according to Goethe, and his human chemical

theory, entering his estate (system), in P1:C1, through the fenced in "boundary", engaging in passing discussion (interaction) with the gardener of the estate. See: Goethe's affinity table for more on character symbol assignment, e.g. Charlotte (A), Captain (C), gardener (Gar), etc.

Christie

In 1994, John Christie, an Australian physical chemist, in his "A Survey of Thermodynamical Ideas", builds on the work of John Neumann (1932) and discusses how microcanonical ensembles can be used to formulate economic analogies, wherein he employs a 6-person "island model", in which goods are traded, resulting in a microstate currency distribution; how social equilibrium relates to Gibbs free energy; how coupling and time scales may play a role, etc., in economic processes. Of note, Christie discusses Gibbs free energy, in definitional terms, and alludes to the premise that when an inhabitant enters or leaves the island—if the island were an "open" system—the "component will move into or out of the system to minimize its chemical potential (see: social chemical potential), i.e. it will tend to flow from regions of higher to lower chemical potential." [2]

Thims

In 2005, Libb Thims began to discuss his "idea" of an "island example", to understand Gibbs energy changes in a small social system, in respect to the terms open, closed, and isolated, with Georgi Gladyshev. [5]

In 2007, American electrochemical engineer Libb Thims outlined a closed 2-person "island example", consisting of one man and one women; after which he discussed an "open" system model into which a third male is introduced, as a way to introduce chemical thermodynamics concepts, e.g. changes in bond energy between each person. [3]

Island example

A very simplistic example to illustrate these concepts would be to suppose we have a hypothetical deserted island on which two people live: one man and one woman. Thermodynamically, the island would be considered a *closed system*, approximately. This means technically that energy can flow through the boundary of the system, i.e. the perimeter of the island, but not reactive matter, such as another human. In our situation, this means that no reactive human species may enter or leave the system; the only matter to cross the system boundary we take into account is that which would substantially change the internal energy U of the system. One nitrogen molecule N_2 crossing the system boundary, for example, would not effect energy calculations substantially, whereas one unattached 'single' male entering the system would, i.e. referring specifically to sexual selection, relationship dynamics, work-output tendencies.

Libb Thims' "**island example**" section, from his *Human Chemistry* (2007), which he had originally discussed earlier in 2005 with Georgi Gladyshev.

In 2015, Thims made a more detailed basic "**island model**", shown below:

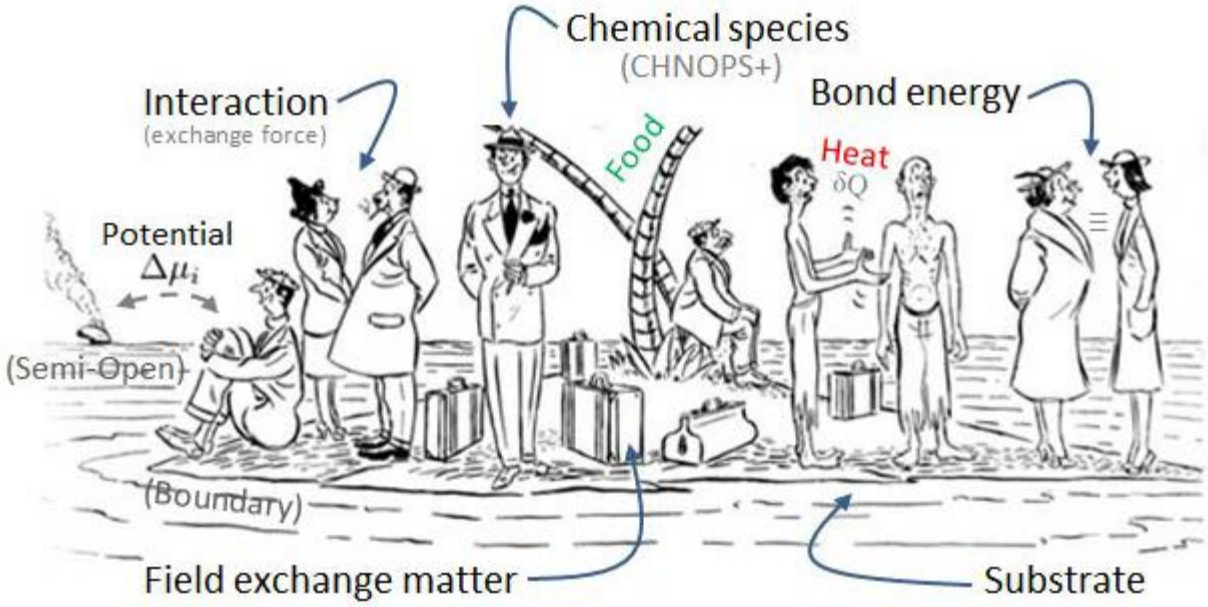

of an initial state of 9 people (N=9), a beginners way to be introduced to the subject of applying chemical thermodynamics concepts, e.g. bond energy, substrate, exchange force, heat (e.g. social heat), human chemical reaction

theory, etc., to the modeling or human interactions and societies, and social systems; given time (reaction extent), in which human reproduction reactions (sexual interactions) may accrue, a final state of say 12 people (N=12) could result. The human free energy theorist, subsequently, would need to quantify, chemical thermodynamically, the change state, in terms of enthalpy and entropy, in the social system, in going (transforming) from state one (year one) to state two (year ten).

Ksenzhek

In 2007, Octavian Ksenzhek, using Robinson Crusoe as a conceptual model example, discussed thermodynamics of economics using an island model thought experiment; the following is the main excerpt:

> "Thermodynamics usually considers a single physical or chemical system in a passive environment. In contrast to that, the environment in which the social objects exist is always an active one. Any social entity, whether an individual or an association of any grade, from a small group to a nation, always maintains more or less tight interaction with other entities of a similar type. The model of Robinson Crusoe, who was removed from a society and placed on a **desert island**, is quite inadequate in this respect."
>
> — Octavian Ksenzhek (2007), *Money, Virtual Energy: Economy through the Prism of Thermodynamics* [4]

Here, Ksenzhek seems to dismiss the hypothetical "island model" thought experiment scenario as useless, per reason that, in his mind, any "social entity" is always maintains a "tight interaction" with other "entities of a similar type" in a "active" environment.

A cartoon version of the **island model**, where one man is stranded on an island with seven voluptuous women, showing him "exhausted" from having to satisfy so many women, that when a new man enters the island, the stranded man exclaims "thank goodness, a relief man!"

Quotes

The following are related quotes:

> "Taking the whole earth instead of **this island**, emigration would of course be excluded; and supposing the present population equal to a thousand millions, the human species would increase as the numbers 1, 2, 4, 8, 16, 32, 64, 128, 256, and subsistence as 1, 2, 3, 4, 5, 6, 7, 8, 9. In two centuries the population would be to the means of subsistence as 256 to 9; in three centuries as 4096 to 13, and in two thousand years the difference would be almost incalculable. In this supposition no limits whatever are placed to the produce of the earth. It may increase for ever, and be greater than any assignable quantity; yet still the power of population being in every period so much superior, the increase of the human species can only be kept down to the level of the means of subsistence by the constant operation of the strong law of necessity acting as a check upon the greater power."
>
> — Thomas Malthus (1798), *An Essay on the Principle of Population* (pg. 8)

References

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θΔics

In science, **isobaric**, from *iso-*, meaning “equal, homogeneous, uniform”, + *-baros*, meaning “weight” (Waser, 1966), or "isopiestic", refers to processes or reactions that occur at constant pressure.

Overview

In isobaric processes or reactions the following differential results:

$$dP = 0$$

meaning that differential changes in pressure *P* in the system do not occur. The term ‘isobaric’, supposedly, was first used in 1878. [1]

References

1. (a) (b) Waser, Jurg. (1966). *Basic Chemical Thermodynamics* (pg. 12). W.A. Benjamin, Inc.
(b) Merriam-Webster Collegiate Dictionary.

External links

â— Isobaric process – Wikipedia.

θΔics

In thermodynamics, **isochoric**, from Greek (*ἴσος*) *iso-*, meaning "equal, homogeneous, uniform", + Greek (*χώρα*) *-chora*, meaning "place, space" (Waser, 1966), "isometric" (synonym) or *isochore*, is a transformation (or process) of a body (or system) that proceeds at constant volume.

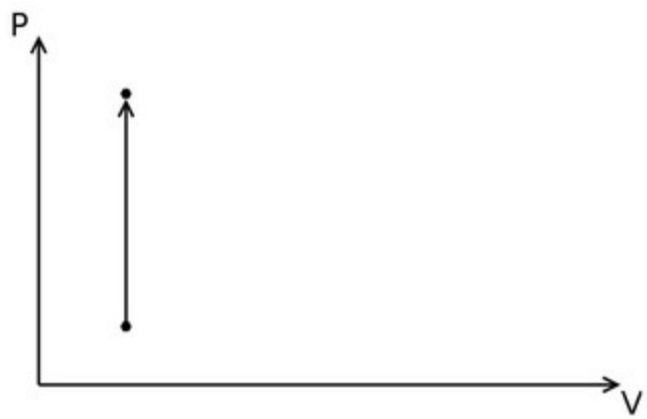

A PV diagram depiction of a **isochoric process** or isochoric transformation.

Overview

The following relation defines the basic meaning of isochoric: [1]

$$V = \text{constant}$$

A typical exam question asked, in the context of isochoric processes, is how much work does the body perform when it is heated at constant volume such that its pressure increases? The answer is that, by definition of work, as a body or region of boundary moved through a distance by a force, no work is performed. [2]

A transformation in which the system performs no external work is called an isochore transformation, or isochoric process, meaning that the volume was constant during the transformation, hence the integral for PV work:

$$W = \int_{V_1}^{V_2} P dV$$

is zero because dV is zero, or by integration, V = a constant. [3]

See also

- Isothermal
- Isobaric
- Isentropic

References

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External links

- Isochoric process – Wikipedia.

θΔics

In thermodynamics, **Isolated** refers to a system surrounded by a boundary across which neither energy, in the form of work or heat, nor matter, may pass or be exchanged with its surroundings. [1] In this sense, an "isolated system" cannot have any interaction with the surroundings.

See also

- Open
- Closed

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics* (pg. 42). Oxford: Oxford University Press.

θΔics

In science, **isothermal** refers to processes or reactions that occur at constant temperature. In isothermal processes or reactions the following differential results:

$$dT = 0$$

meaning that differential changes in the temperature *T* of the system do not occur. The term ‘isothermal’, from the French *isotherme*, from *is-* + *-therme*, supposedly, was first used in 1826. [1]

References

1. Merriam-Webster Collegiate Dictionary.

External links

- Isothermal processes – Wikipedia.

θΔics

In processes, **isothermal-isobaric process** is one that occurs at constant temperature (isothermal process) and constant pressure (isobaric process), meaning that the following differentials will result:

$$dT = 0$$
$$dP = 0$$

These conditions often facilitate thermodynamic calculations. In the case of typical *in vivo* processes (occurring inside of an organism), this condition is almost always assumed to hold; for typical *in vitro* processes, *in situ* processes, or earth bound processes, this condition is approximated to hold in first pass calculations; in more advanced analysis, variations in temperature and pressure need to be taken into account and a full derivation needs to be done from first principles (first main principle and second main principle). In the cases where the above criterion hold (dT=0, dP=0), or are approximated to hold, the Lewis inequality will govern the process. [1]

References

1. Reiss, Howard. *Methods of Thermodynamics* (pg. 78). Dover.

θΔics

In thermodynamics, **Istvan Gyarmati** (1929-2002) was a Hungarian theoretical physicist and physical chemist notable for being the founder of the Hungarian school of thermodynamics. [1] His most widely held book is the 1967 *Non-equilibrium Thermodynamics: Field Theory and Variational Principles*, published in three languages. [3]

Education

In 1948, Gyarmati began his studies at the University of Szeged, and then continued at the University of Debrecen graduating from there in 1953 with a degree in mathematics and physics. He then started as a second year student at the department of theoretical physics, becoming assistant lecturer, working intensively on abstract theoretical physics problems from 1950 to 1954. It seems that Gyarmati began his thermodynamics work in 1965. [2]

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θΔics

In hmolscience, **“It’s a Chemical Reaction, That’s All / All of You”** is music chemistry like song written by Cole Porter, first performed by German-born American actress Hildegard Knef in 1955 Broadway musical *Silk Stockings* (Q), then later sang by American actress Cyd Charisse (Q), alongside Fred Astaire, in the 1957 MGM film *Silk Stockings*, each being a musical rewrite of the earlier "love is a chemical process" scene of the 1939 film *Ninotchka* staring Greta Garbo. [1]

American song writer Cole Porter’s **“It’s a Chemical Reaction, That’s All / All of You”** is the fifth track (time: 4:05) to the original 1955 Broadway Cast Recording performance of *Silk Stockings*, sang by German-born American actress Hildegard Knef, shown above, at the Imperial Theatre, New York. (Q)

Ninotchka | 1939

In 1939, in the film *Ninotchka* (Q), by Hungarian writer Melchior Lengyel (1880-1974) (Q), Swedish-born American actress Greta Garbo informs Melvyn Douglas that: [2]

> “Love is a romantic designation for a most ordinary biological—or, shall we say, chemical—process … a lot of nonsense is talked and written about it.”
>
> — Ninotchka (1939)

In full, the main "what is love" debate dialogue is as follows: (Q)

> LEON
>
> Ninotchka, do you like me just a little bit?
>
> NINOTCHKA
>
> Your general appearance is not distasteful.
>
> LEON
>
> Thank you.
>
> NINOTCHKA

Look at me. The whites of your eyes are clear. Your cornea is excellent.

LEON

Your cornea is terrific. Tell me -- you're so expert on things -- can it be that I'm falling in love with you?

NINOTCHKA

You are bringing in wrong values. Love is a romantic designation for a most ordinary biological, or shall we say chemical, process. A lot of nonsense is talked and written about it.

LEON

Oh, I see. What do you use instead?

NINOTCHKA

I acknowledge the existence of a natural impulse common to all.

LEON

What can I possibly do to encourage such an impulse in you?

NINOTCHKA

OBDURATE RED Ninotchka is serenaded by her U.S. admirer in the show's biggest hit, *All of You*.

A 1955 *Life* magazine (O) synopsis of the "All of You" serenade scene, wherein Cole Porter's chemical reaction song is sang, described as the show's biggest hit.

You don't have to do a thing.
Chemically we are already quite
sympathetic.

LEON

(bewildered, and yet completely intrigued)
You're the most improbable creature I've ever
met in my life, Ninotchka, Ninotchka...

NINOTCHKA

You repeat yourself. More and more puzzled
and fascinated, Leon sits down close to her.

LEON

What kind of a girl are you, anyway?

The official trailer for *Ninotchka* (1939), showing the “do you like me just a little bit?” (0:55) to the “why do doves bill and coo” (1:11) scene clips, amid which the famous **"love is chemical process"** quote occurs.

NINOTCHKA

Just what you see. A tiny cog in the great wheel of evolution.

LEON

You're the most adorable cog I ever saw in my life. Ninotchka, Cogitska, let me confess something. Never did I dream I could feel like this toward a sergeant. A clock strikes.

NINOTCHKA

It's false sentimentality.

LEON

(trying desperately to make her mood more romantic)
You analyze everything out of existence. You analyze me out of existence. I won't let you. Love is not so simple. Ninotchka, Ninotchka, why do doves bill and coo? Why do snails, coldest of all creatures, circle interminably around each other? Why do moths fly hundreds of miles to find their mates? Why do flowers open their petals? Oh, Ninotchka, Ninotchka, surely you feel some slight symptom of the divine passion ... a general warmth in the palms of your hands... a strange heaviness in your limbs... a burning of the lips that is not thirst but a thousand times more tantalizing, more exalting, than thirst? He pauses, waiting for the results of his speech.

NINOTCHKA

You are very talkative.

(add discussion)

Silk

Left: a 1955 audio recording of German-born American actress Hildegard Knef singing **"It's a Chemical Reaction, That's All / All of You"** in the stage performance. Right: The 1957 version of "It's a Chemical Reaction, That's All" sang by American actress Cyd Charisse (Q), alongside Fred Astaire, in the MGM film-version of *Silk Stockings*.

Stockings | 1955

In 1955, *Ninotchka* was used as the basis for the Broadway musical *Silk Stockings* (Q), in which the character Ninotchka Yoschenko, played by German-born American actress Hildegard Knef, elaborates on the above in the form of a song (adjacent video).

In 1957, MGM produced the film-version of *Silk Stockings*, wherein Ninotchka Yoschenko, played by Cyd Charisse, cites a fictional "Mrs. Kamichev" (Q), referred to as one of Russia's greatest scientists, who, as Yoschenko says, in her explanation of how Russians conceive of love and acquire mates, namely "in Russia, when someone want's someone, he says: 'you, come here!", states that:

> "Kamichev—one of our greatest scientists—has proved, beyond any question, that physical attraction is purely electrochemical."
>
> — Nonotchka (1957), in: *Gaither's Dictionary of Scientific Quotations* (Q)

she has "proved that physical attraction is purely electrochemical", that she has worked for 30-years on this proof, concluding in the end that this is a fact of science and "facts are facts", after which the following song ensues:

> When the electromagnetic of the he-male
> Meets the electromagnetic of the female,
> If right away she should say, "This is the male!"
> It's a chemical reaction, that's all.
>
> And though your Fascists may answer with hisses,
> The same applies when your misters and misses
> Hey-diddle-diddle with middle-class kisses,
> It's a chemical reaction, that's all.
>
> Say in love with you I fall,
> And in love with me you also fall,
> Though the uninstructed faction

Calls it mutual attraction,
It's a chemical reaction, that's all.

The lyrics, in the 1957 film, end here, after which Yoschenko says, "you don't believe in Kamichev?", to which Steve Canfield, played by Fred Astaire, replies "no mam". Extended versions of the lyrics, song by German-born American actress Hildegard Knef, in the 1955 musical (Q), are shown below: (Q)

As in the case of invertebrates Cambrian,
As in case of fishes Devonian,
As in case of amphibians Permian,
As in case of reptiles, Triassic or Jurassic,

Merely read in the book by Kamichev
Which has now become classic.

When the electromagnetic of the he-male
Meets the electromagnetic of the female,
If right away she should say, "This is the male!"
It's a chemical reaction, that's all.

The character Steve Canfield, played by Don Ameche, replies, that he disagrees with Kamichev, and that his theory is that "there is no theory" (of love), and goes on to sing about how he "loves the look of her", the smell of her, etc.

Gilbert and Sullivan

Porter's chemical reaction song, to note, according to Robert Solomon (1970), supposedly, traces to a 1871-1896 Gilbert and Sullivan production. [3]

Other

In origin of life discussions, this “it’s a chemical reaction, that’s all” quote, per citation credit to Cyd Charisse, has been cited, amid discussion of Harold Morowitz quotes, to explain the life’s supposed origins 3.8 billion years ago from a mixture of molecules. (Q)

Discussion

Firstly, the entire scene, whether 1939, 1955, or 1957 version, is very-reminiscent of the famous chapter four of Goethe's *Elective Affinities* (1908), albeit with Darwin and Maxwell mixed in, the various stage play, television dramas, and film versions in particular. Likewise, the following quote from the 2004 film *The Aviator* is similar:

Quotes

The following are related quotes:

“Childbirth is a miracle. No, it’s not … **It’s a chemical reaction, that’s all.** Rasin’ a kid that doesn’t talk in a movie theater. Okay, there is a goddamn miracle. It’s not a miracle if every nine months any yin-yang in the world can drop a liter of mewling cabbages on our planet. And just in case you haven’t seen the single-mom statistics

The famous "chapter four" scene from the 1996 French-Italian film version of Goethe's *Elective Affinities*.

lately, the miracle is spreading like wildfire."

— Bill Hicks (1993), *Revelations* (Q) (Q)

See also

- Love the chemical reaction

References

1. (a) Silk Stockings – Wikipedia.
(b) Silk Stockings (film) – Wikipedia.
2. Ninotchka – Wikipedia.
3. (a) Solomon, Robert C. (1970). *Entertaining Ideas: Popular Philosophical Essays, 1970-1990* (pg. 157). Prometheus Books.
(b) Solomon, Robert C. (1981). *Love: Emotion, Myth, & Metaphor* (Goethe, 7+ pgs; quote, pg. 25; *Elective Affinities*, pg. 38). Prometheus Books, 1990.

θΔics

In thermodynamics, **Ivan Pavlovich Bazarov** (1916-2005), or "Иван Павлович Базаров", was a Russian physicist and thermodynamicist noted for his humor and for founding his own school of thermodynamic, prominent in Russian universities, based on the Gibbs method and the Bogolyubov distribution functions, which presented both equilibrium and nonequilibrium from a single point of view. [2]

Existence of god

In his 1964 *Thermodynamics*, Bazarov argued against the thermodynamics-based existence of god argument, such as was proposed by Friedrich Engels. [3] According to a review Bazarov's argument by American chemical engineer Benjamin Kyle: [4]

> "Identifying flaws in the thermal death argument for the existence of a creator, Bazarov points to the unfounded assumption that the laws of thermodynamics apply to the entire universe and to Engels' argument that the creation implied by the second law would be in violation of the first law. In Engels' words, those advocating the pro-creation view saw the universe as winding down and thus assumed that an initial winding up had been provided by "a stimulus from without." However, the process of winding up imparted energy to the universe and hence the total energy of the universe has not always been constant as required by Clausius' first-law statement."

(add discussion)

Education

Bazarov completed his undergraduate work at the Ryazan Pedagogical Institute. In 1949 he completed his candidate's dissertation (1949) and doctoral dissertation (1971) in the physical mathematics at Moscow State University. [2] At MSU, Bazarov taught a course on thermodynamics and statistical physics for over twenty-five years, based on his popular thermodynamics textbook which saw four-editions, being translated into six-languages. Bazarov was a follower and disciple of Russian physicist Nikolay Bogolyubov.

Quotes

The following are noted quotes:

> "The second law of thermodynamics is, without a doubt, one of the most perfect laws in physics. Any *reproducible* violation of it, however small, would bring the discoverer great riches as well as a trip to Stockholm. The world's energy problems would be solved at one stroke. It is not possible to find any other law (except, perhaps, for super selection rules such as charge conservation) for which a proposed violation would bring more skepticism than this one. Not even Maxwell's laws of electricity or Newton's law of gravitation are so sacrosanct, for each has measurable corrections coming from quantum effects or general relativity."
>
> — Ivan Bazarov (1964), *Thermodynamics* [1]

See also

- List of thermodynamics textbooks that include human thermodynamics

References

1. Bazarov, Ivan P. (1964). *Thermodynamics* . Pergamon.
2. Author. (2006). "Ivan Pavlovich Bazarov (1916-2005)", *Russian Journal of Physical Chemistry*, Vol. 80, pgs. 313.
3. Bazarov, ibid. (1964). ("stimulus from without", pg. 76).
4. (a) Kyle, Benjamin G. (1988). "The Mystique of Entropy" (abstract), *Chemical Engineering Education*, Vol. 22., pgs.

92-97. Spr.
(b) Kyle, Benjamin G. (1999). *Entropy: Reflections of a Classical Thermodynamicist* (ch. 8: The Mystique of Entropy, 15 pgs.). Kansas State University; first published on attached CD-ROM to *Chemical and Process Thermodynamics* (3rd ed.), Prentice Hall, 1999.

External links

- Bazarov, I. P. – WorldCat Identities.

θΔics

In thermodynamics, **Ivan R. Kennedy** (c. 1940-) is an Australian agricultural and environmental chemist noted his 2001 theory that energy quantums are the integral cause of action or movement in all systems, albeit one presented in a near baseless type of unitless thermodynamics of his own invention.

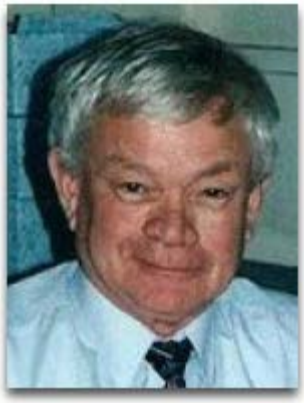

Overview

In 2001, Kennedy, in his *Action in Ecosystems: Biothermodynamics for Sustainability*, introduced his so-called theory of action thermodynamics, a type of unitless thermodynamics based on the logic that energy quantums are the integral cause of action or movement in all systems, molecular to biospheric, and that these movements must correlate with movements towards equilibriums as defined by the spontaneity criterion. [1]

Kennedy's main interest currently is the study of action in ecosystems, as a fundamental thermodynamic theory that transcends disciplines, with strong implications for sustaining the earth's biosphere. [2]

In 2008, Kennedy gave the following updated view on his opinion of the relation between action and thermodynamics in the context of systems subjected to quantum energy or photon inputs: [3]

> "Given the forceful tendency of internal energy to change the action of the system as a whole, there is a real sense in which an initial nonequilibrium state of higher free energy following absorption of a quantum of light is more chaotic and disordered than the more relaxed state of higher action and entropy toward which the system evolves."

(add discussion)

Education

Kennedy completed a BS in agriculture in 1962, a PhD in 1965, and a DSc in agriculture in 1992 all from the University of Western Australia. During Kennedy's five-year agricultural science degree, he was heavily involved with physical chemistry and biochemistry, with a strong interest in physics; this may explain his current affinity and interest in the application of thermodynamics and action to biospheric system.

References

1. Kennedy, Ivan R. (2001). *Action in Ecosystems: Biothermodynamics for Sustainability* (ch. 4: Action Thermodynamics, pgs. 65-98). Research Studies Press.
2. Ivan R. Kennedy – Professor in Agriculture and Environmental Chemistry, University of Sidney.
3. Rose, M.T., Crossan, A.N. and Kennedy, I.R. (2008). "Sustaining Action and Optimising Entropy: Coupling Efficiency for Energy and the Sustainability of Global Ecosystems". *Bulletin of Science, Technology and Society*, 28, 260-272.

Further reading

â— Kennedy, Ivan R. (1983). "Action and entropy in a neurological disorder", in *Molecular Aspects of Neurological Disorders*, P.L. Jeffrey and L. Austin, eds., pgs. 147-50, Academic Press, Sydney.
â— Kennedy, Ivan R. (2000). "Action as a dynamic property of the genotype x environment interaction: Implications for biotechnology." *Acta Biotechnologica* 20, 351-368.

θΔics

In existographies, **Ivan Pavlov** (1849-1936) (IQ:180|#146) [RGM:254|1,500+] (Glenn 20:14) (CR:5) was a Russian physiologist, noted as one of the founders of behaviorism, popularly known for his classical conditioning work on dogs, bells, and the salvation response.

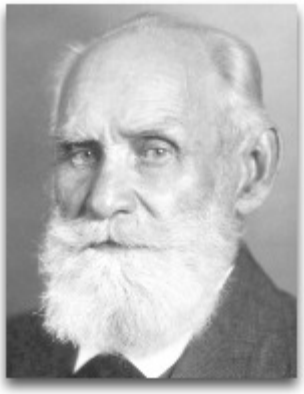

Overview

In 1885 to 1897, Pavlov did work on digestive glands and conditioned response, wherein he showed that by ringing a bell he could get a dog to salivate; this set the foundation for the later work of John Watson and behaviorism (a thematic forerunner to many two cultures namesakes fields).

Other

In c.1920, Pavlov had some type of association, and later falling out, with Vladimir Bekhterev, which resulted in latter developing some loose social energetics like theories.

External links

â— Ivan Pavlov – Wikipedia.

θΔics

In existographies, **Ivan Turgenev** (1818-1883) [RGM:222|1,500+] was a Russian novelist, noted for []

Overview

In 1861, Turgenev, in his novel *Father and Sons*, was using the term "nihilists", as those raised on Ludwig Feuerbach, the positivism of Auguste Comte, and the popular German materialists: Ludwig Buchner, Jacob Moleschott, and Karl Vogt; along with John Mill. The main character of the novel, Eugene Bazarov, is a medical student who describes himself as a "nihilist", wants to educate the people. [1] The term nihilism, supposedly, spread quickly following this publication. The name Turgenev, however, to note, is never mentioned in Friedrich Nietzsche's books, who wrote so proficiently about nihilism in the 1880s. [2]

Quotes | By

The following are quotes by Turgenev:

> "Nature cares nothing for logic, our human logic: she has her own, which we do not recognize and do not acknowledge until we are crushed under its wheel."
>
> — Ivan Turgenev (c.1865) (Ñº)

References

1. Dostoyevsky, Fyodor. (1866). *Crime and Punishment* (editors: Paul Moliken and Lisa Miller) (pgs. 9-11). Prestwick House.
2. Nietzsche, Friedrich. (1885). *Will to Power: An Attempt at a Revaluation of All Values* (translator: Walter Kaufmann and Reginald Hollingdale; editor: Walter Kaufmann) (pdf) (txt) (pg. 51). Random House, 2011.

External links

â— Ivan Turgenev – Wikipedia.

θΔics

In thermodynamics, **Ivo Kolin** (1924-2007) was a Croatian economist and mechanical engineer noted for his 1972 two-volume *Thermodynamics Atlas*, 389-pages in total, written to be a textbook, albeit one prepared by a rare engineering-historian who believes that for a student (or historian) to try to grasp a principle it helps to trace its evolution and to see how it has been embodied in different machines of the past. Kolin's *Atlas* is said to be written in using a rage blend of mathematics, thermodynamics, explanatory English, and graphics. The first volume deals with basic principles and cycles the second with the evolution of the heat engine. [1] According to review, turning the pages of Kolin's book is "like rummaging in the attic of the Smithsonian Institution. [2]

Education

Kolin completed his BA in economics (1949), MS in mechanical engineering (1955), and PhD in technical sciences (1972) at University of Zagreb; he then completed a second PhD in economics (1975) at the University of Sarajevo for investigating the production and investment costs of nuclear power plants. He then became a professor of mining, geology, and petroleum engineering at the University of Zagreb. [3]

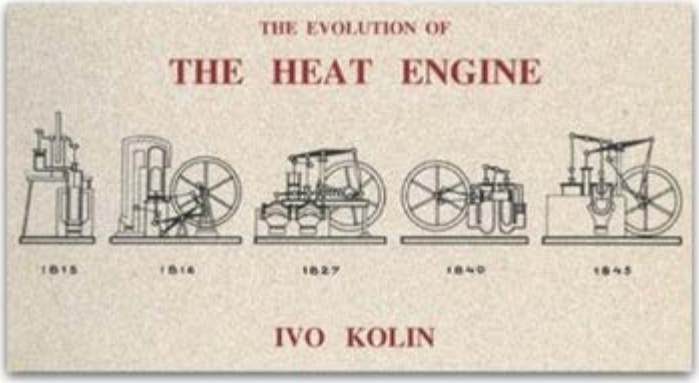

Left: Kolin's wave engine along the coast of Peljesac peninsula, which he tested for a period of four years. [4] Right: a depiction of some of Kolin's 54 heat engines in his evolution timeline of engine development. [4]

Wave engines

Kolin designed and built and tested some of the first prototype wave engines along the coast of Peljesac peninsula, for a period of four years, reporting the results of his findings on the utility of wave energy to various energy congresses. [5]

Heat engine evolution

Impressively, while researching the evolution of heat engines, he designed and built a collection of 54 heat engine models based on the original drawings, a collection on display at the Technical Museum in Zagreb. He calls these second generation heat engines, on the logic that the sun generates wind which generates waves. [4]

Sterling motor

In 1982, Kolin built and improved Stirling motor, wherein, supposedly, in his own words, "the piston motor's heat was turned into mechanical work at a temperature lower than the boiling point of water." American Jim Senft then improved on Kolin's model and was said to have succeeded in running his model at a ΔT of 0.5 °C. [6]

See also

â— Thermodynamics timeline
â— Engine development timeline

References

1. (a) Kolin, Ivo. (1967). *Thermodynamics Atlas. Vol. 1* (abs). Longmans.
(b) Kolin, Ivo. (1972). *Thermodynamics Atlas. Vol. 2: the Evolution of the Heat Engine*. Longmans; Morya-Press (USA), 1998.

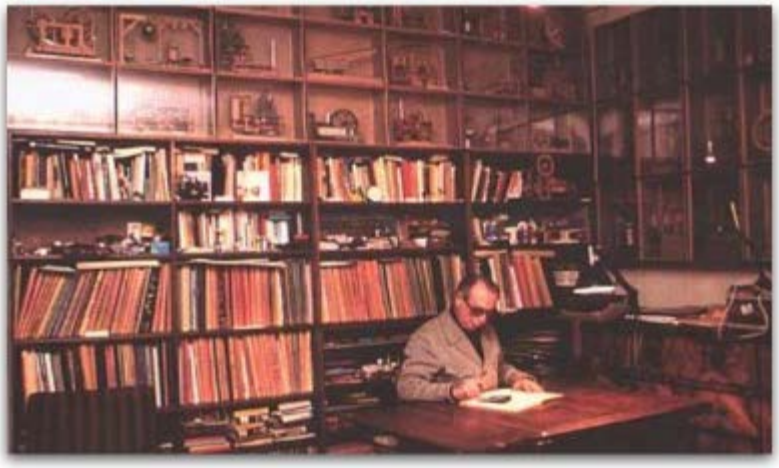

Kolin in his study; shown in the background are some of his 54 hand-built heat engine models. [7]

2. Bryant, Lynwood and Rogowski, A.R. (1974). "Review: Thermodynamics Atlas. Vol. 2: 'The Evolution of the Heat Engine' by Ivo Kolin", *Technology and Culture*, 15(4): 641-44.
3. Ivo Kolin (biography) – IvoKolin.com.
4. (a) Collection of models (overview) – IvoKolin.com.
(b) Technical Museum Zagreb – MDC.hr.
5. Wave energy (overview) – IvoKolin.com.
6. Stirling motor (overview) – IvoKolin.com.
7. Photos of some of the collection (background) – IvoKolin.com.

External links

â— Ivo Kolin (English) – IvoKolin.com.

θΔics

In hmolscience, **J.P. Moreland** (1948-) (CR:2) is an American chemist turned philosopher-theologian apologeticist, semi-cited in a some religion vs science publications and debates.

Panpsychism | Dialogue

See main: Moreland-Strobel dialogue

The following is the Lee Strobel Q&A dialogue with Moreland on the seeming untenability of the atheist mind-from-matter position: [3]

> **Moreland**: "What doesn't make sense—and which many atheistic evolutionists are conceding—is the idea of getting a mind to squirt into existence by starting with brute, dead, mindless matter. That's why some of them are trying to get rid of consciousness by saying that it's not real and that we're just computers."
>
> **Strobel**: "Still, some scientists maintain that consciousness is just something that happens as a natural byproduct of our brain's complexity. They believe that once evolution gave us sufficient brain capacity, consciousness inexorably emerges as a biological process."
>
> **Moreland**: "Let me mention four problems with that. First, they are no longer treating matter as atheists and naturalist treat matter—namely, as brute stuff that can be completely described by the laws of chemistry and physics. Now they're attributing spooky, soulish, or mental potentials to matter."
>
> **Strobel**: "What do you mean by 'potentials'?"
>
> **Moreland**: "They're saying that prior to this level of complexity, matter contained the potential for mind to emerge—and at the right moment, guess what happened? These potentials were activated and consciousness was sparked into existence!"
>
> **Strobel**: "What's wrong with that theory?"
>
> **Moreland**: "That's no longer naturalism. That's panpsychism."
>
> **Strobel**: "Pan *what*?"
>
> **Moreland**: "*Panpsychism*. It's the view that matter is not just inert physical stuff, but that it also contains proto-mental states in it. Suddenly, they've abandoned a strict scientific view of matter and adopted a view that closer to theism than to atheism. Now they're saying that the world began not just with matter, but with stuff that's mental *and* physical at the same time. Yet they can't explain where these pre-emergent mental properties came from in the first place."

(add discussion)

Rational | Irrational

Moreland seems to be a citation anchor among Christian apologeticists for the "science = rational; belief = irrational" motto. Moreland, as summarized by American journalist Lee Strobel (2004), at one point, ran into an engineer completing his doctorate in physics, who argued the following: [3]

> "Only science is rational; only science achieves truth. Everything else is more belief and opinion. If something cannot be quantified or tested by the scientific method, it cannot be true or rational."

In 1989, Moreland, in his *Christianity and the Nature of Science*, spent a good amount of time on the so-called "rational vs irrational" dichotomy, often rummied about by apologeticists as a type of defense mechanism; one recent example is as follows:

> "In a world where there is no god, where you and are just molecules in motion, why am I obligated to be rational?"
>
> — Dustin Segers (2012), Reason Rally debate, Mar 24 (Ñº)

Strobel also cites the following Moreland quote: [2]

> "Scientific, for many people, means good, rational, and modern, whereas something not-scientific is old-fashioned and not worth the belief of thinking people."

Moreland devotes sections to "rational realism" (vs. rational nonrealism) in the views of Ernst Mach and W.H. Newton-Smith.

Unbridgeable gap

In 1992, Moreland, with Gay Habermas, published *Immortality: the Other Side of Death*, which, together with Arthur Custance's 1978 *Science and Faith*, Turkish-born American physicist Turner Edis (2002) cites in conjunction with the following statement on unbridgeable gaps: [1]

> "Even in the realm of what we see, there must be **unbridgeable gaps** separating order from chaos, animate from inanimate, life from nonlife, humans from other animals, and consciousness from nonconscious matter."

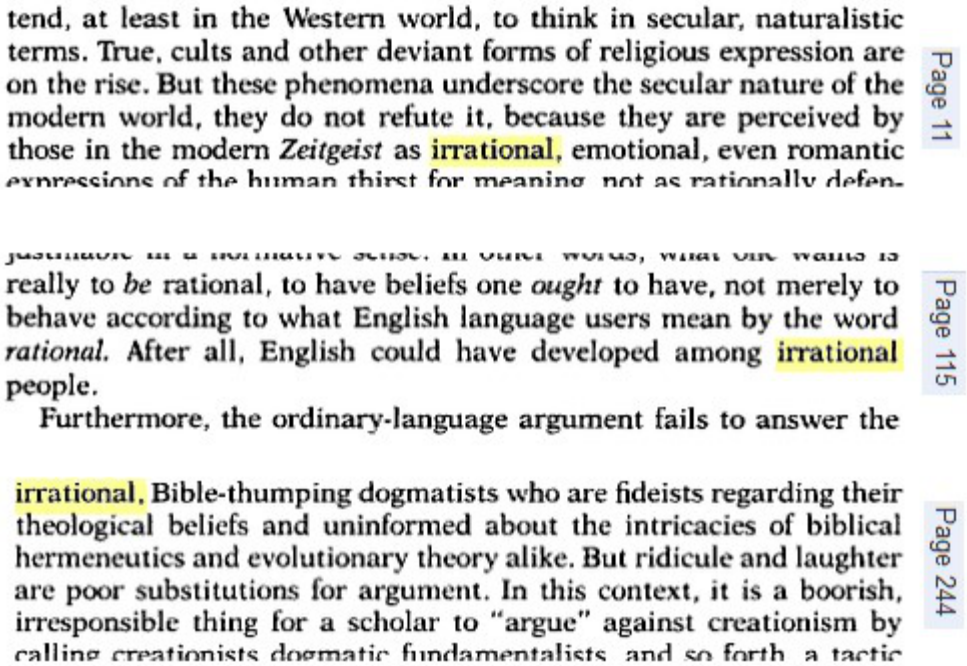
tend, at least in the Western world, to think in secular, naturalistic terms. True, cults and other deviant forms of religious expression are on the rise. But these phenomena underscore the secular nature of the modern world, they do not refute it, because they are perceived by those in the modern *Zeitgeist* as irrational, emotional, even romantic expressions of the human thirst for meaning, not as rationally defen-

Page 11

really to *be* rational, to have beliefs one *ought* to have, not merely to behave according to what English language users mean by the word *rational*. After all, English could have developed among irrational people.

Furthermore, the ordinary-language argument fails to answer the

Page 115

irrational. Bible-thumping dogmatists who are fideists regarding their theological beliefs and uninformed about the intricacies of biblical hermeneutics and evolutionary theory alike. But ridicule and laughter are poor substitutions for argument. In this context, it is a boorish, irresponsible thing for a scholar to "argue" against creationism by calling creationists dogmatic fundamentalists, and so forth, a tactic

Page 244

A selection of some of Moreland's 1989 "irrational" vs "rational" statements. [2]

Amid which Edis mentions how some religious philosophers still defend the notion of an animal soul or life force irreducible to physics.

Education

Moreland complete his BS in chemistry 1970 at the University of Missouri, his ThM in theology in 1979 at Dallas Theological Seminary, his MA in philosophy in 1982 at University of California, Riverside, and his PhD in philosophy in 1985 in philosophy at the University of Southern California; currently he is a philosophy professor at the Talbot School of Theology, at Biola University. (Ñº)

Quotes | About

The following are commentary or quotes on or about Moreland:

> “I don’t believe scientific knowledge necessarily takes precedence over other things that we know. **Moreland** has argued, for example, that there are some things we know more certainly though introspection than we know from sciences. I know that I have free will on the basis of my introspection, and no studies on the social sciences will convince me otherwise. I know I can turn that switch on [motioning towards a wall light switch] and refute those who say I was determined thus.”
>
> — Stephen Meyer (c.2003), interview with Lee Strobel, at Discovery Institute, in response to hearing Richard Lewontin's claim that: "science is the only begetter of truth." [3]

Quotes

The following are related quotes:

> “Bangs have bangers, information has an informer, and rigged dice have riggers.”
>
> — J.P. Moreland (2004), a William Paley's watch analogy reformulated to big bang theory, information in DNA, and the fine tuning argument [3]

References

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(b) Habermas, Gay and Moreland, J.P. (1992). *Immortality: the Other Side of Death* (abs) (pg. 51). Publisher.
(c) Edis, Taner. (2002). *The Ghost in the Universe: Science in the Light of Modern Science* (pgs. 54, 78). Prometheus.
2. (a) Moreland, J.P. (1989). *Christianity and the Nature of Science: a Philosophical Investigation* (rational, pg. 76+ pgs; irrational, 11+ pgs; quote, pg. 19). Baker.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 20). Zondervan, 2009.
3. Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 88; Panpsychism dialogue, pgs. 328-29). Zondervan, 2009.
4. Strobel, Lee. (2004). “Eddie Tabash vs J.P. Moreland | Is the Supernatural Real?” (Ñº), Faith Under Fire, Oct 9.

External links

â— J.P. Moreland – Wikipedia.

θΔics

In hmolscience, **Jack Hokikian** (1945-) is an Egyptian-born American physicist noted, in human thermodynamics, for his 2002 *The Science of Disorder*, wherein he digresses on a number of applications of thermodynamics reasoning in philosophy, economics, and education.

Overview

In 2002, Hokikian, in his *The Science of Disorder: Understanding the Complexity, Uncertainty, and Pollution in Our World*, used the entropy equals disorder ideology, and views on how the first and second law of thermodynamics effect human endeavor, to outline the following philosophical thermodynamics type of reasoning: [1]

> "[Long ago] science and philosophy were unified in their goal: to discover the truth about how nature works, [in recent years, however] science has been taken over by technology—applied science—but technology does not provide us with any principles of nature, principles needed to derive a practical philosophy of life—for this we have to turn to the laws of thermodynamics."

Hokikian's book containing sections such as "Humans as an Open Thermodynamic System" and chapters such as "The United States in High Entropy", etc., in which the first two laws of thermodynamics are applied to an analysis of various facets of human activity and endeavor, such as medicine, education, agriculture, economics, technology, and ecology. [2] The closing chapter is on American physicist Robert Lindsay's 1959 thermodynamic imperative. [3]

Economic thermodynamics

See main: Economic thermodynamics

One of the more interesting aspects of Hokikian's presentation, according to reviewer Canadian lawyer Norm Goldman, is Hokikian's discussion of how the laws of thermodynamics govern the economy. Hokikian postulates, for instance, how government intervention can act to create turbulence-entropy. [6]

Thermodynamic view of education systems

In his section on the thermodynamics of educational systems, Hokikian states "the educational system takes in simple, low-entropic human beings and feeds them increasingly complex ideas, procedures, and theories, transforming them into high-entropic, complex human beings." [3] This sentence, implying that human molecules are in a low entropy state at the start of a school year and a higher entropy state at the end of the school year, sounds backwards (in the sense that people should be more "ordered" and thus be in a lower entropy state)?

Education

See main: Human thermodynamics education

Since its publication in 2002, Hokikian's book has been used as a text or as additional reading in the United States at the University of Maryland, University of Wisconsin at Green Bay, and New Jersey Institute of Technology, and abroad at Helsinki University of Technology, Finland, and Ben-Gurion University of the Negev, Israel. [5]

Difficulties on theory

One difficulty in Hokikian's presentation is his view, similar to writers such as Henry Adams (1910), Jeremy Rifkin (1980), Lawrence Chin (1990), etc., that the world is becoming more and more polluted, disordered, and degraded every day, in a downward spiral towards chaos, and that the second law is behind this. [7] This view, however, is a mis-extrapolation of the Boltzmann chaos assumption, applicable only for ideal gas systems, to all systems. For chemically reactive systems, such as are found attached to the surface of the earth, one has to turn to studies of free energy, and everything is not simply a matter of "systems tending towards disorder" as is argued, according to Planck-Boltzmann

view, to occur in ideal gas phase systems.

In terms of Hokikian's understanding of the second law and entropy, he tends towards an over generalized description. In his introduction, he tells the us "the second law stipulates that entropy increases in all processes irreversibly." Correctly, one must specify a body, and the body must go through a cyclical process, which is in any way possible, and that in this context the following integral will hold: [8]

$$\int \frac{dQ}{T} \geq 0$$

meaning that sum of all the inputs and outputs of incremental quantities of entropy (dQ/T), defined by the value of incremental heat flow values *dQ* divided by the absolute temperature *T* of the surface of the body, will be greater than zero, thus defined by a positive value. Thus, we say that, in the context of the cycle, the entropy of the body increased in value, meaning that more heat went in than went out over the entire cycle, heat that was converted irreversibly into internal work. In any event, Hokikian goes on to declare, universally, that "entropy [is] a measure of the disorder of the system." Hokikian fails, however, to mention that this notion is Austrian physicist Ludwig Boltzmann's idealized view of entropy, applicable specifically for an ideal gas system, not generally applicable to all systems.

Education

Hokikian completed his PhD in experimental nuclear physics from the University of Southern California in *circa* 1969. In the 1970s, Hokikian worked at the Jet Propulsion Laboratory, for eight years, involved in spacecraft orbital determinations. He has been a professor of computer science at the University of Southern California and at California State University, Northridge. [4]

References

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(b) Hokikian, Jack. (2004). *The Science of Disorder*. Korean edition.
(c) Hokikian, Jack. (2007). *The Science of Disorder*. Chinese edition.
2. *ibid*, section: "Humans as an Open Thermodynamics System", pgs. 63-66; ch. 5: The United States in High Entropy, pgs. 89-108)
3. *ibid*, ch. 11: The Thermodynamic Imperative, pgs. 229-54; Thermodynamic View of the Educational System, pg. 79.
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θΔics

In hmolscience, **Jack S. Kirkaldy** (1926-) is a Canadian materials science engineer noted, in human thermodynamics, for his 1965 free energy based thermodynamic theory of brain operation and terrestrial evolution.

Overview

In 1965, Kirkaldy, in his two part "Thermodynamics of the Human Brain", outline a free energy minimization principle of brain operation, consciousness, and development.

Kirkaldy, in part two "Thermodynamics of Terrestrial Evolution", then argued that the "causal element of biological evolution and development can be understood in terms of a potential function which is generalized from the variational principles of irreversible thermodynamics."

These two articles, printed in the *Biophysical Journal*, were based upon Kirkaldy's first-time proposed dissipation minimax stability principle and were so in demand that they led to over 400-reprint requests and forced an order to the publisher for a second print run. These articles simply stated, in the words of Kirkaldy, in scientific terms, the obvious conservational symbiosis in the biosphere. Of his more than 200 peer-reviewed journal articles, these are considered two of his best and most-recognized original papers. [2]

Education

In the 1950s, Kirkaldy completed a bachelor's degree in engineering physics, a master's in nuclear physics from the University or British Columbia, and a doctorate in nuclear physics from McGill University. Kirkaldy is presently a professor emeritus at McMaster University.

References

1. (a) Jack Kirkaldy (Curriculum Vitae) – McMaster University.
(b) Publications List (1953-Present) – Jack Kirkaldy.
(c) Kirkaldy, Jack S. (1965). "Thermodynamics of the Human Brain" (PDF), *Biophys J. Nov. 5(6): 981-986.*
(d) Kirkaldy, Jack S. (1965). "Thermodynamics of Terrestrial Evolution" (PDF), *Biophysical Journal*, 5, No. 6.
(e) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (pgs. 105-107), (preview), (Google books). Morrisville, NC: LuLu.
2. 80th Birthday Address (Jack Kirkaldy) – to founding faculty of Materials Science and Engineering, McMaster University.

θΔics

In existographies, **Jack London** (1876-1916) (RGM:553|1,500+) (FA:142) was an American realism and naturalism novelist, a semi-ranked greatest literary author ever, noted for []

Atheism

In 1895, London, age 19, while tramping and arrested and jailed for one month for vagrancy, listed 'atheist' as his religion on the necessary forms. [2]

Quotes | By

The following are quotes by London:

> "I have always inclined to Haeckel's position. In fact, 'incline' is too weak a word. I am a hopeless materialist. I see the 'soul' as nothing else than the sum of activities of the organism plus personal habits—plus inherited habits, memories, experiences, of the organism. I believe that when I die, I am dead. I believe that with my death I am just as much obliterated as the last mosquito you and I squashed."
>
> — Jack London (1914), "Letter to Ralph Kasper", Jun 25 [1]

References

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(b) Cardiff, Ira. (1945). *What Great Men Think of Religion* (pg. 240). Christopher Publishing House.
(c) Commager, Henry S. (1950). *The American Mind: An Interpretation of American Thought and Character Since the 1880's* (pg. 111). Publisher.
(c) Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pg. 247). Prometheus.
2. Gabel, Stewart. (2012). *Jack London: a Man in Search of Meaning: a Jungian Perspective* (pg. 14). AuthorHouse.

External links

â— Jack London – Wikipedia.

θΔics

In black hole thermodynamics, **Jacob Bekenstein** (1947-) is a Mexican-born Jewish physicist noted for his 1971 conception of black hole entropy, conceived in response to American theoretical physicist John Wheeler's concern that black holes seem to flout the second law, by seemingly concealing actions associated with entropy increase.

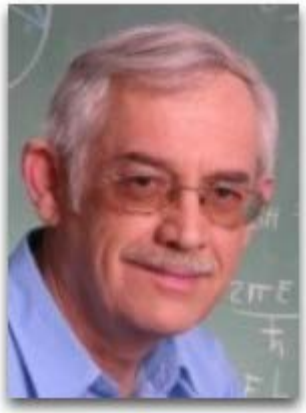

Education

Bekenstein completed his BS (1969) and MS (1969) at the Polytechnic Institute of Brooklyn and a second MS (1971) and PHD in 1972, with a thesis on "Baryon Number, Entropy, and Black Hole Physics", at Princeton University. Since 1993, he has been the chair of the theoretical physics department at the Hebrew University, Jerusalem. [1]

References

1. Bekenstein, Jacob. (1972). "Baryon Number, Entropy, and Black Hole Physics", PhD thesis, Princeton.

Further reading

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External links

● Jacob Bekenstein – Wikipedia.
● Jacob Bekenstein (faculty) – Hebrew University, Jerusalem.

θΔics

In existographies, **Jacob Bernoulli** (1654-1705) (IQ:175|#307) (Murray 4000:12|M) (GME:20) (Eells 100:28) (CR:12) was a Swiss mathematician, older brother to Johann Bernoulli (see: Bernoulli genealogy), both of whom were earlier developers of German mathematician Gottfried Leibniz' version of differential calculus, uncle to Daniel Bernoulli, the famed *Hydrodynamia* author, student of Gottfried Leibniz, general secondary PhD advisor to Leonhard Euler (see: Euler genealogy), noted for []

Quotes | By

The following are quotes by Bernoulli:

> "It is utterly implausible that a mathematical formula should make the future known to us, and those who think it can would once have believed in witchcraft."
>
> — Jacob Bernoulli (c.1700) (Ñº)

External links

â— Jacob Bernoulli – Wikipedia.

θΔics

In existographies, **Jacob Berzelius** (1779-1848) (IQ:180|#152) (Cattell 1000:424) (Murray 4000:2|C / 18|CS) (EPD:F4 / M9) (GCE:3) (CR:41) was a Swedish chemist noted for his 1806 book on animal chemistry, for his 1808 coining of the term "organic chemistry" (and seemingly the terms organic vs inorganic), his 1811 theory of electric dualism of affinity, his 1831 charge distribution atomic structure model, and his 1836 postulate of the "catalytic force" (catalyst), different from that of the force of affinity, possessed by some materials, and is the person who introduced the two letter nomenclature of elements, helium as "He". [1]

Overview

In 1818, Berzelius had determined the atomic weights for 45 of the 49 accepted elements.

The word "catalysis" was coined by Berzelius in 1835 who noted that certain chemicals or material speed up a chemical reaction:

> "A catalyst is a substance which alters the velocity of a chemical reaction without appearing in the final products."
>
> — Jacob Berzelius (c.1835) (Q)

Berzelius was also very interested in the relation between heat, affinity, and temperature in the context of chemical reactions. In his 1814 book *Theory of Chemical Proportions*, a forerunner to stoichiometry, Berzelius stated: [5]

> "Experience shows that heat is disengaged in every chemical combination when carried out in circumstances favorable to its perception, and that by the saturation of powerful affinities, the temperature often rises to the point of incandescence, whilst the satisfaction of the feeblest affinities is capable of only raising the temperature through a few degrees."

Here we see an early connection between free energy (affinity), heat (enthalpy), and temperature.

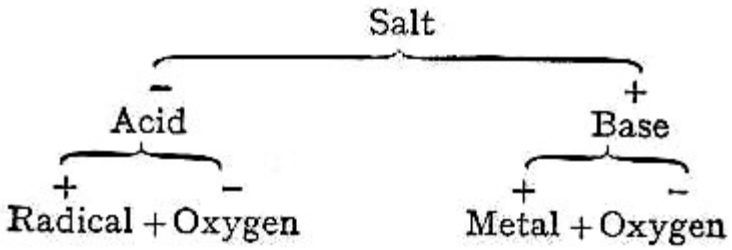

Berzelius' 1831 charge distribution model of salts.

Acid base theory

The first semi-accurate model to account for charge distributions in molecules was proposed by Swedish physician and chemist Jöns Berzelius, in which salts are said to be comprised of acids (negatively charged components) and bases (positively charged components).

In 1807, Berzelius had become a chemistry professor at the Karolinska Institute, one of the largest medical schools in the world. Over the next several years, he wrote a chemistry textbook for medical students and in 1831 after studying the results of various electrolysisexperiments he outlined an electrochemical theory in which a salt has an atomic structure composed of an acid, with a negative charge, and a base, with a positive charge. [4] The acid and the base were further deduced to that of an acid anhydride, comprised of a positively charged radical attached to a negative oxygen, and a basic oxide, comprised of positive metal attached to a negative oxygen.

Molecules, according to this view, are three-dimensional structures comprised of positive and negative charges attached, in some way, to their structure. Berzelius'charge distribution model was based on the observation that salts in solution are decomposed by the electric current of a Voltaic pileinto bases, which attract towards the battery's negative pole and therefore seem to carry a positive charge, and acids, which are drawn to the battery's positive pole and therefore seem to carry a negative charge. [4]

Berzelius' theories on charge distribution would later be used as a basis for the work of Irish physicist George Stoney, the person who coined the term electron in 1891.

Protein

See also: Protein thermodynamics

In the 1830s, on the advice of Berzelius, Dutch chemist Gerardus Mulder carried out elemental analysis of common animal and plant proteins. To everyone's surprise, all proteins had nearly the same empirical formula, roughly $C_{400}H_{620}N_{100}O_{120}P_nS_m$, where subscripts *n* and *m* are constants which vary per protein. In 1837, Mulder published his findings in which he hypothesized that there was one basic substance ('Grundstoff'') of proteins, and that it was synthesized by plants and absorbed from them by animals in digestion. Berzelius was an early proponent of this theory and proposed the name *protein* for this substance in a letter dated July 10, 1838: 'the name protein that I propose for the organic oxide of fibrin and albumin, I wanted to derive from Greek word *πρωτειος*, because it appears to be the primitive or principal substance of animal nutrition.'

Meteoroid origin of life theory

The meteoroid origin of life theory (or panspermia) has been proposed by several scientists.

In 1834, Jacob Berzelius obtained samples of the Alais meteorite (a meteorite that had fell near the town of Alais in France in 1802) and subjected them to chemical analysis, and found the presence of carbon compounds, which to Berzelius meant life. [16] This seems to have been the start of the so-called "comet origin of life theory".

Berlin school of thermodynamics

Berzelius can be said to have been one of the early theoretical guiding posts in the formation of the Berlin school of thermodynamics. Specifically, in 1831, Berzelius was mentor to German chemist and physicist Heinrich Magnus, who in turn later became the mentor to a young German physicist Rudolf Clausius in the early 1840s, the core founder of thermodynamics.

Quotes | By

The following are noted quotes

> "Chemical signs ought to be letters, for the greater facility of writing. I shall take therefore for the chemical sign, the initial letter of the Latin name of each elementary substance: but as several have the same initial letter, by writing the first two letters of the word."
>
> — Jacob Berzelius (c.1810), *Publication* (Q)

> "I can prepare urea without the aid of a kidney of man or beast."
>
> — Jacob Berzelius (c.1810), *Publication*; cited by George Scott (1985) in *Atoms of the Living Flame* (pg. 91)

References

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2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (Berzelius, Jons, pgs. 22, 95, 141, 213-14, 216, 248), (preview), (Google books). Morrisville, NC: LuLu.
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(b) Berzelius, Jon, J. (1836). *Ann. Chim*., ixi, 146.
4. Partington, J.R. (1937). *A Short History of Chemistry*. New York: Dover Publications, Inc.
5. Berzelius, Jons Jakob. (1814). *An Attempt to Establish a Pure Scientific System of Mineralogy: by the Application of the Electro-Chemical Theory and the Chemical Proportions*. London.

Further reading

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● Kim, Mi Gyung. (2003). *Affinity, That Elusive Dream – A Genealogy of the Chemical Revolution* (Berzelius, Jacob, pgs. 434, 437, 4450. Cambridge, Mass: The MIT Press.

External links

● Jöns Jacob Berzelius – Wikipedia.

θΔics

In existographies, **Jacob Bronowski** (1908-1974) (CR:4) was Polish-born English mathematician and philosopher noted, in hmolscience, for []

Overview

In 1953, Bronowski gave three lectures at MIT themed on "science and human values", published in book form in 1958 as *Science and Human Values*, the gist of which being the epiphany he felt when in 1945 he visited ground zero of Nagasaki, where 40,000 Japanese had been vaporized by the atomic bomb, and therein saw the "power of science for good and evil" as he characterized things. [3]

In 1969, Bronowski, in his "New Concepts in the Evolution of Complexity: Stratified Stability and Unbounded Plans", the gist of which, according to Ralph Burhoe (1970), being that "chance fluctuations", supposedly based on Prigogine, allow life to arise from the physics of non-life, in the context of the second law, or something to this affect; an attempt at a vitalism reconciliation, so to say. [4]

In 1970, Bronowski attended the AAAS Symposium on Science and Human Values, the title of which being named in reference to his 1956 *Science and Human Values*.

In 1973, Bronwski, in his *The Ascent of Man* documentary television series and accompanying book, asserted his views that biology and physics are run by different laws; the gist of which is as follows: [1]

> "The living world is different because it is seen to be a world in movement. The creation is not static but changes in time in a way that physical processes do not. The physical world ten million years ago was the same as it is today, and its laws were the same. But the living world is not the same. Unlike physics, every generalization about biology is a slice of time; and it is evolution which is the real creator of originality and novelty in the universe."

(add)

Other

Bronowski, according to Paris Arnopoulos, supposedly, referred to man as a "social atom", but this logic seems contrary to his views; and secondary citations of this are difficult to confirm. [2]

Quotes | On

The following are quotes on Bronowski:

> "For several decades, the search for adequate foundations on which a moral system could be constructed was directed toward the physical sciences. The assumption underlying these efforts was that the laws of physics represent the 'foundations of nature', and if—and what a huge if—human ethics should conform to natural requirements, then a set of weighty commandments could evolve from this study. Some of the better-known consequences of these considerations are the fine study of **Bronowski** [*Science and Human Values*, 1953] on the moral foundations of the whole structure of science and the famous attempt of Niels Bohr [*Atomic Physics and Human Knowledge*, 1958] to show that the principle of complementarity of atomic physics suffices for a new approach to human understanding and may serve as a basis for international complementary relations between contradictory cultures."
>
> — Aharon Katchalsky (1970), "Thermodynamics of Flow and Biological Organization" (pg. 100)

References

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(b) Foley, Michael. (1990). *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian Mechanics* (pg. 87). Routledge, 2014.
2. Arnopoulos, Paris. (2005). *Sociophysics: Cosmos and Chaos in Nature and Culture* (origin, pg. xxviii; thermodynamics, 17+ pgs; fermions or humans, pg. xIviii; thermics, pgs. 26-31). Nova Publishers.
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(b) Burhoe, Ralph W. (1971). "Introduction to the Symposium on Science and Human Values" (abs)(Ñº), *Zygon*, 6(2):82-98, Jun.

External links

â— Jacob Bronowski – Wikipedia.

θΔics

In existographies, **Jacob Hermann** (1678-1733), aka “Jakob”, was a Swiss mathematician and physicist, noted for his 1716 views on kinetic theory.

Education

Hermann was taught mathematics by Jacob Bernoulli. [1]

Quotes | By

The following are quotes by Hermann:

> “Heat, other things being equal, is proportional to both the density of a hot body and to the square of the agitation of its particles.”
>
> — Jacob Hermann (1716), *Phoronomia* [1]

References

1. (a) Talbot, G.R. and Pacey, A.J. (1966). “Some Early Kinetic theories of Gases: Herapath and his Predecessors”, *British Journal for the History of Science*, 3:133.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 24). Cornell University Press.
2. Jakob Hermann – Maths History, University of St. Andrews.

External links

â— Jakob Hermann – Wikipedia.

θΔics

In existographies, **Jacob Leachman** (c.1983-) (HFE:51) (CR:7), aka Jake Leachman, is an American mechanical engineer and "intensely philosophical engineer" (Q), as he auto-categorizes, noted for his 2016 to 2017 blog to draft book stage ideas on social thermodynamics, e.g. social phase change ideas, similar to Henry Adams (1910), political thermodynamics, similar in some sense to Serge Galam (2016), and his sociophysics political prediction models, and or Frederick Rossini (1971), and his "Chemical Thermodynamics in the Real World", and empathy-stylized thermodynamic models, similar in some ways to Jeremy Rifkin (2010).

Overview

In Apr 2016, Leachman, in his "Initial Thoughts on the Thermodynamics of Societal Phase Change", an idea blog reaction to Darpa's Mar 2016 "Next Generation Social Science" posting (Q), on the US governments desire to "soliciting innovative research proposals to build a new capability (methods, models, tools, and a community of researchers) to perform rigorous, reproducible experimental research at scales necessary to understand emergent properties of human social systems", discussed social phase ideas and outlined a smattering of intuited or guesstimated first-draft human thermodynamics variables, namely:

> Entropy → Empathy
> Temperature → Energy and or Resources
> Density → Population and or Agent Density
> Pressure → Stress
> Internal energy → Value Evolution
> Gibbs energy → Potential for Societal Change

These, he discusses tersely in social terms.

Empathy | Entropy

In Aug 2017, Leachman, in his "Social Thermodynamics: Empathy for Autism Spectrum Disorders" (Q) blog, discusses how his sister, a year younger than him, in seventh grade (circa 12-13 years old), who had been diagnosed with Autism Spectrum Disorder (ASD), tried to end her existence by sticking a fork in an electric socket. He speaks about this, retrospectively, in chemical thermodynamic terms, as follows:

> "Empathy in ASD individuals is a long-term investment. The Gibbs energy function for phase change adds insight to the challenges of developing those with ASD:
>
> $$G = U + Pv - TS$$
>
> For phase change to occur, indicated by G2 – G1 being negative, there needs to be a fall in values (U) and stress (P), coupled with an increase in density (1/v), empathy (S), and resources (T). ASD individuals already have a very fine-tuned value focus, don't handle stress or groups well, and are empathicly challenged. Change will be slow, if at all, over the course of a lifetime. They will likely be very consistent through time, even if they can be mercurial in the moment."

He comments that to bring about this phase change, while he was away at college: "during this time a psychologist, who is nothing short of a hero, volunteered for over a decade to empathize with my sister. Now, she turns to my sister to help her empathize with new ASD clients." Leachman comments how this phase change was successful and how his sister is now in her 30s making valuable art and helping others in empathetic ways to find value.

Social Thermodynamics | Why this book?

In Jun 2017, Leachman, in his blog "Social Thermodynamics: a Belated Introduction", explained that he was working to turn his blogs into a book; firstly, he opens to the following: [4]

> "From years of teaching introductory thermodynamics courses to undergraduate engineers, I know that thermo is a very hard topic. Finding people really passionate about thermo is rare. Moreover, **the likelihood of someone becoming an expert in thermodynamics and then switching to sociology or psychology is much rarer yet** [e.g. James Coleman]. This area is relatively unexplored for good reason. I originally started discussing 'social thermodynamics' as a series of posts on my research blog (Q). Around my fourth post, one of my engineer friends Dave Rowe asked me a question about people's capacity to understand a concept. While this question was pointed towards recent political elections, it could've just as easily been a critique of my writing. That's when I realized, from the theory itself, how much time and resources it takes just to get others on board with the basic concepts. This is covered in the heat capacity section later in this book. In short, **it's not easy to influence the way people view their reality**, and we now have math that explains why."

Leachman then, of great interest, talks about his funding effort and traditional research papers:

> "Many have asked why I haven't published research papers in this area and the capacity argument explains that — it takes too much time to gain an understanding in both the fields of thermodynamics and psychology for a short paper to convey. Others have asked why I don't do the typical academic exercise of pursuing federal grants to prove the concepts by some scientific means. I approached one program manager, my colleague and I had to fly 9 hours each to Washington D.C. to get 16 minutes of his time. He and his colleagues kept getting stuck on basic definitions **before laughing us out of his office**. His final request was a dismissal: return with some way of proving the concept by scientific means… That's when I knew the federal funding route wasn't going to go anywhere."

Here, of course, we recall John Q. Stewart's reflections on the reaction to his efforts to get funding from the Rockefeller Foundation (see: Stewart Weaver fallout):

> "In the early nineteen-twenties it had become clear that natural science and technology would continue their triumphant advances while the social and humane studies, in order to reduce their tragic lag, would need to be equipped with methods far more effective than archaic types of merely verbal reasoning. With untrammeled enthusiasm of a youthful PhD in physics, I expected to find a general sympathy with this [social physics] program but the case was otherwise. There is a proverb that 'in the country of the blind the one-eyed man is king', the falsity of which has been depicted in the story by H.G. Wells. One has to find for himself that in the country of the blind—meaning university faculties and their learned societies—the one-eyed man meets with lifted eyebrows."
>
> — John Q. Stewart (c.1955), commentary on the friction involved in his decade-long effort to get "social physics" established at Princeton

We also recall Indian-born American mechanical engineer Satish Boregowda, who, after completing his NASA-funded (Q) PhD on *Thermodynamic Modeling and Analysis of Stress Responses* (1998), joined, in 2005, the Bioengineering Department, University of Illinois, Chicago, home to the UIC Thermodynamics Research Lab, run by Iranian-born American chemical engineer Ali Mansoori, after which from 2008 to 2010, he was an assistant professor of mechanical engineering department of Purdue University, where he taught thermodynamics. Boregowda, eventually left Purdue University, and went into industry (Sandia Labs); per, in part, the following reasons: [5]

> “I left Purdue in 2010 to join Sandia labs. Previously, I could not be affiliated with your site as some of my colleagues and my tenure reviewers were not in favor of my work in "human thermodynamics'.”

We also recall American Smith College chemical engineering professor Donna Riley’s 2011 EGR 205 course, and accompanying book *Engineering Thermodynamics and 21st Century Energy Problems*, targets what she calls "five often-neglected ABET outcomes", a course through which she seeks "revise engineering curricula to be relevant to a fuller range of student experiences and career destinations", inclusive of topics such as: entropy's philosophical implications, ethics, social constructs, arrow of time, etc. [6]

Education

Leachman completed his BS in in mechanical engineering in 2005 and MS in mechanical engineering, thesis: Fundamental Equations of State for Parahydrogen, Normal Hydrogen, and Orthohydrogen”, in 2007, both at the University of Idaho, and completed his PhD in Mechanical Engineering, dissertation: “Thermophysical Properties and Modeling of Hydrogenic Pellet Production Systems”, with a minor in nuclear engineering and engineering physics, in 2011, at the University of Wisconsin-Madison. (Q) Leachman, presently, is an associate engineering professor in the Mechanical and Materials Engineering department of Washington State University.

Quotes | Employed

The following are quotes employed by Leachman:

> “How could one person prioritize anti-establishment concepts over overtly racial division? … As I’m writing, I’m thinking – what if heat capacity actually represents a person’s capacity to accept a certain issue?”
>
> — David Rowe (2016), “Reflection on election and property definitions”, Nov 10 [2]

Quotes | By

The following are quotes by Leachman:

> “One of the things my thermodynamics treatment of empathy and value memes (v-memes) has shown me is that it may be easy to know that change is happening, but it’s still very difficult to know which way you’re headed with what we currently know about psychology and sociology (figuring out the state functions for social problems is the holy grail of sociology).”
>
> — Jacob Leachman (2016), “Using design theory to explain our Political System and Trump” [3]

> “Allow me to introduce my friend and mentor Chuck Pezeshki who created the empathy.guru (Q) blog that is a much more well-formed body of work. Chuck introduced me to the Spiral vMeme [value meme] scaffolding that helped bridge the connection between statistical thermodynamics and social space.”
>
> — Jacob Leachman (2017), “Email to Libb Thims”, Mar 1

> “Chemical engineer Libb Thims has compiled an **incredibly sophisticated wiki**, titled the *Encyclopedia of Human Thermodynamics*, of the historical works attempting to merge social systems and humans to thermodynamics. Libb concludes that humans actually are molecules, a complex 26 atom molecule. As Libb’s cohort has shown, many have attempted, in many ways, to apply thermodynamics to social

systems."

— Jacob Leachman (2017), "Social Thermodynamics: Gibbs and the Energy for Change" (Q), Aug 24

See also

- Amir Shirzadi
- Alec Groysman
- Erich Muller
- James Ferri
- Jurgen Mimkes
- Ram Poudel

References

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2. Leachman, Jacob. (2016). "Social Thermodynamics: Derivative Properties" (Q), Hydrogen.wsu.edu, Nov 11.
3. Leachman, Jacob. (2016). "Using Design Theory to Explain our Political System and Trump" (Q), Hydrogen.wsu.edu, Nov 9.
4. Leachman, Jacob. (2017). "Social Thermodynamics: a Belated Introduction" (Q), Washington State University, Hyper Lab, Jun 19.
5. Boregowda, Satish. (2012). "Email to Libb Thims", Jan 24.
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Further reading

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External links

- Jacob Leachman (faculty) – Washington State University.
- Jacob Leachman – Twitter.

θΔics

In hmolscience, **Jacob Moleschott** (1822-1893) was a Dutch physiologist noted for his philosophical advocation of "scientific materialism", over that of spiritual life, and for his 1850 logic that "thought is a motion of matter" and famous motto:

> "No thought without phosphorus."

This dates the time when he and Ludwig Buchner believed they had determined phosphorous to be the primary chemical element required for all mental activity. [1]

Feuerbach

In 1848, Moleschott attended Ludwig Feuerbach's "Essence of Religion" bi-weekly lectures given at the University of Heidelberg, Dec 1848 to Mar 1849; the two seemingly developing a mutual respect. [5]

Commentary

In 1895, British psychiatrist Charles Mercier commented on this: [2]

> "A German physiologist has said that there is no thought without phosphorus. He might as well have said that there is no thought without carbon, no thought without oxygen, without nitrogen, or without any one of the numerous elements which enter into the molecular constitution of the nervous system. There is no mental condition—no thought, and no feeling—which is not the mental shadow, or equivalent, or obverse, or accompaniment, of some process, some discharge, some disturbance of tension, or some molecular rearrangement in the nervous centers. This is the secret of the connection between body and mind."

Prior to this Mercier comments the following rather decent reductionism view of feeling preceding movement and molecular movement arrangement preceding feeling:

> "The feeling of thirst, the desire for water, precedes the movement. It is in these higher centers whose action also precedes the movement, that the feelings produce their effects. Well, mount as high as you like, whatever part of the brain you explore, you will find nothing but cells, fibers, and ground substance, and all alike are reducible to molecules—to molecules differently arranged and moving in different ways."

In *circa* 1900, American philosopher-historian John Fiske commented on this phosphorus motto: [3]

> "To me this seems a very barren piece of truism. I have no doubt that a century hence the fact that such a remark should have been regarded either as a valuable novelty or as an alarming heresy will be cited in evidence of the intellectual dullness of our time."

Quotes

The following are related quotes:

> "The brain cannot exist without phosphorus-containing fat. The phosphorus is the origin, hence also established activity of the brain—without phosphorus no thought."
>
> — Jacob Moleschott (c.1849), cited by Ludwig Feuerbach, 1850 [4]

> “Force is no impelling god, no entity separate from the material substratum ; it is inseparable from matter, is one of its eternal indwelling properties.”
>
> — Jacob Moleschott (c.1850), cited by Ludwig Buchner (1855) in *Force and Matter* (pg. 1)

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5. Ludwig Feuerbach – Boston Collaborate Encyclopedia of Western Theology.

External links

â— Jacob Moleschott – Wikipedia.

θΔics

In hmolscience, **Jacob Moreno** (1889-1974) was a Romanian-born American psychologist noted, in human thermodynamics, for his *circa* 1951 'social atom theory', a modified Freudian-Jungian psychology mixed with extrapolated chemistry and physics metaphors, in which each person is defined as a social atom, with focus on the differences in energy levels of different relationships, and how invested energy in specific relationship bonds can cause spontaneous quantum leaps or up or down shifts in relationship structure and dynamics. [1] The concept of a person is discussed in the context of what Moreno calls 'psychodrama' or the drama of interactions between social atoms, which particular focus on the aspects of ambivalence as contrasted with spontaneity involved in choice, and 'sociometry', the quantitative measurement of social relationships.

Social atom

Moreno states that in developing his concept of the social atom, that he is borrowing the term from Democritus in the sense of meaning 'any very small thing'. The way in which he uses the word atom, when conjoined with other words, however is somewhat elusive. The following is his attempt at definition of his conception:

> "*Social atom*, operational definition: plot all the individuals a person chooses and those who choose him or her, all the individuals a person rejects and those who reject he or she; all the individuals who do not reciprocate either choices or rejections. This is the 'raw' material of a person's social atom."
>
> "*Social atom*, conceptual definition: the smallest unit of the sociometric matrix."

The following selection of example quotes picket from various works gives an idea of what Moreno tends to mean by the word 'atom' and the various adjectives he employs: [2]

> "The pattern of role relations around an individual as their focus is his 'cultural atom'. Every individual, just as he or she has a set of friends and a set of enemies—a social atom—also has a range of roles facing a range of counter-roles."
>
> "The use of the word 'atom' can be justified if we consider a cultural atom as the smallest functional unit with a cultural pattern. The adjective 'cultural' can be justified when we consider roles and relationships between roles as the most significant development within any specific culture."
>
> "The social atom is the nucleus of all individuals toward whom a person is emotionally related or who are related to him at the same time. It is the smallest nucleus of an emotionally toned interpersonal pattern in the social universe. The social atom reaches as far as one's tele [From Ancient Greek τῆλε (tēle), 'at a distance, far off, far away, far from'] reaches other persons. It is therefore also the tele range of an individual. It has an important operational function in the formation of a society."

> "The focal pattern of role-relations around an individual is called his cultural atom. We are here coining a new term, 'cultural atom', since we know of no other which expresses this peculiar phenomenon of role relationships. Obviously, the term is selected as an analogue to the term 'social atom'.
>
> "Our social atoms and the changes which are registered in them are continuously interiorated as well as exteriorated. In the course of sociometric interiorization the individual has all the individuals of his or her social atom and the relations between them interiorated. He or she can 'send' messages (choice and rejections) out to them and can receive them without any external exchange taking place."
>
> "Viewing the detailed structure of a community we see the concrete position of every individual in it, also,

> a nucleus of relations around every individual which is 'thicker' around some individuals, 'thinner' around others. This nucleus of relations is the small social structure in a community, a *social atom*."
>
> "A social atom is thus composed of numerous tele structures; social atoms are again are again parts of still a larger pattern, the sociometric networks which bind or separate large groups of individuals due to their tele relationships. Sociometric networks are parts of a still larger unit, the sociometric geography of a community. A community is again part of the largest configuration, the sociometric totality of a human society itself."

As seen, Moreno seems to be digging into subject of uncharted human chemistry.

Social atom volume

Interesting, Moreno even makes an attempt to formulate an idea of atomic volume. He states that there are two points connected to the ratio of acquaintance volume to social atom volume: (a) the social atom volume of an individual increases in direct proportion to his acquaintance volume. (b) the individual whose acquaintance volume and social atom volume are constantly identical approximates an ideal sociometric status; for he or she no social contract is lost, each turn immediately into social reality.

Energy

On energy, Moreno states that: [2]

> "According to the sociometric theory there are two forms of energy: 'conservable' and 'unconservable' energy. An illustration of conservable energy is the law of conservation of energy as described by physics, or as the 'cultural conserve' as described by sociometry. An illustration of unconservable energy is spontaneity."

In this attempted formulation, Moreno is in the neighbor hood of correctness. Technically, from a chemical thermodynamic point of view, there are three different types of energy involved in the spontaneity (defined by the spontaneity criterion) of human chemical reactions, free energy G, enthalpy H, and entropy S, which in formulation are related as:

$$G = H - TS$$

The sum amount of the three types of energy are conserved, according to the first law, but also able or made to transform in a certain direction according to the second law, in the sense that any given process will lose its spontaneity when the free energy change or variation is zero.

Human molecular orbital theory

On human molecular orbitals, Moreno states:

> "The social atom is that peculiar pattern of inter-personal relations which develops form the time of human birth. It first contains mother and child. As time goes on, it adds from the first persons who come into the **child's orbit** such persons as are unpleasant or pleasant to him, and vice-versa, those to whom he or she is unpleasant or pleasant."

The following quote is representative of Moreno's view how quantum leaps can occur in the orbital dynamics of

existing relationships: [1]

> "For changes in [relationship] level, both literally and figuratively, a quantum leap is required, like the movement of electrons from ring to ring. The energy invested in a relationship builds through the quantity and diversity of interaction until suddenly and uncontrollably the level of the relationship shifts. Although the conditions for such an energy increase can be induced, e.g. one can bring people together in a group, thus helping them go from nothing to acquaintanceship and even to collective contact, the transitions occur somewhat unpredictably."

In other places, Moreno also expresses the view, modeled on atomic theory, that just in deeper levels of core nuclear relationships, more energy is needed or found, just as the electrons closer to the nucleus are more tightly bound.

Social entropy

Moreno seems to use the concept of social entropy rather correctly, as compared to most others who make an attempt at extrapolating the Gibbs-Clausius definition of entropy into sociology. Moreno seems to define social entropy as the point at which the collective spontaneity of a community has reached zero. He states:

> "Social entropy reaches its maximum when choices are rejections are entirely extinct. Indifference alone prevails. The group spontaneity has 'withered away' and is replaced by an aggregation of individuals entirely left to change."

This is representative of Moreno's hypothesis of sociodynamics decline.

Warming up process

Moreno seems to devote considerable time to theorizing on what he calls the 'warming up process', loosely defined as the various starters which brings a person into 'spontaneous states'. [2] This is a type of thermal metaphor (or thermal word) extrapolation, but one which seems to have a certain needed explanation.

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External links

- Jacob Moreno – Wikipedia.

θΔics

In chemistry, **Jacob Spielmann** (1722-1783) was a French chemist, professor of chemistry at Strasbourg University from 1749 to circa 1780, notable for being German polymath Johann Goethe's chemistry teacher in 1770-71. [1] Spielmann was one of the last French chemists who supported the phlogiston theory. [2] Spielmann could have been the role model for the Captain in Goethe's human affinity table.

Education

Spielmann was a student of phlogiston era chemists, Germans Johann Pott (1692-1777), Andreas Marggraff (1709-1782), and Johann Henckel (1678-1744), and most notably French chemist and affinity table creator Étienne Geoffroy (1672-1731). [2]

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External links

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In existographies, **Jacobus van't Hoff** (1852-1911) (CR:75) was a Dutch physical chemist noted, in chemical thermodynamics, for his work in 1884 *Studies in Chemical Dynamics*, in which he described a new method for determining the order of a reaction using graphics, and applied the laws of thermodynamics to chemical equilibria, such as captured in his *circa* 1886 van't Hoff equilibrium box. [1] In this work, Van't Hoff gave one of the first thermodynamical treatments of affinity (following Helmholtz, 1882), defining affinity as the maximum external work done by the chemical reaction at constant temperature and volume. [5]

Education

In c.1873, Van't Hoff studied at the Polytechnic and Delft and the University of Leiden. He then studied under chemist Friedrich Kekule at the University of Bonn, Charles Wurtz at the Ecole de Medecine, Paris, and in 1874 he obtained his PhD under G.J. Mulder at the University of Utrecht, supposedly written on a relatively trivial thesis on organic chemistry. [8]

In 1874, Van't Hoff jumped to novel fame, so to speak, when he built on the work on isomers of German chemist Johannes Wiclicenus, and showed that the four valencies of the carbon atom were probably directed in space toward the four corners of a regular tetrahedron, a model which explained how optical activity could be associated with an asymmetric carbon atom, a theory which laid the foundations of stereochemistry. [7]

In 1877, while a lecturer in physics at the veterinary school in Utrecht, van't Hoff published "Views on Organic Chemistry" (Ansichten über die organischen Chemie), which contains the beginnings of his studies in chemical thermodynamics. [7]

In 1878, he became a professor of chemistry, mineralogy, and geology at the University of Amsterdam, where he began his researches in thermodynamics and chemical kinetics in order to explain chemical equilibrium and chemical affinity. [8]

In 1884, a result of his prolonged decade-long effort to explain chemical equilibrium and chemical affinity, he published his famous 1884 *Studies in Chemical Dynamics* (*Études de Dynamique Chimique*), one of the early founding publications of chemical thermodynamics, wherein he outlined the the principles of chemical kinetics, described a new method of determining the order of a reaction, and applied thermodynamics to chemical equilibrium.

In 1886, he published results of his study that dilute solutions show an analogy with gases, in the sense that the both obey an equation of the type:

$$PV = RT$$

In 1887, Van't Hoff and German physical chemist Wilhelm Ostwald started the *Journal of Physical Chemistry* (Zeitschrift fur Physikalische Chemie), which together with the work of Svante Arrhenius, is a year said to mark the start of "physical chemistry" as a recognizable discipline. [8]

In 1896, he became a professor at the Prussian Academy of Sciences in Berlin.

Schools

Van't Hoff is said to be one of the three "chiefs" of the Dutch school of thermodynamics, along with Dutch physical chemist Johannes van der Waals and Dutch chemist Bakhuis Roozeboom at the University of Amsterdam, as well as to have his own school the so-called "Van't Hoff school". [6]

Chemical affinity

Of importance in this paper, van't Hoff showed the chemists how thermodynamics could be applied to their science, especially with reference to ideas on affinity. [2] In his work, he drew the distinction between chemical kinetics and

chemical thermodynamics and showed that the maximum external work obtained when a chemical reaction was carried out reversibly and isothermally could serve as a measure of chemical affinity. [2] This was similar in theory to the 1882 work of German physician and physicist Hermann von Helmholtz who called such maximum work "free energy". [3] Supposedly, however, it was van't Hoff who introduced the notion of chemical affinity as the driving force for chemical reactions. [4]

In the early 20th century, American Gilbert Lewis proposed that the term free energy be restricted to mean "work available for use". [2]

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External links

● Jacobus Henricus van't Hoff – Wikipedia.

θΔics

In existographies, **Jacques Abbadie** (c.1654-1727), aka "Abbadie" (Holbach, 1770), was a French Protestant minister and philosopher, noted for []

Quotes | On

The following are quotes on Abbadie:

> "**Abbadie** says 'our soul has no useless desires, it desires naturally an eternal life' and by very strange logic he concludes that this desire could not fail to be fulfilled."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 118)

Quotes | By

The following are quotes by Abbadie:

> "Man, I confess, has his imperfections; his soul finds itself shut up within a very narrow compass (see: Heisenberg-Pauli dialogue) He sees himself confined on all sides, in the middle of an unlimited extent of space. He finds himself obliged to follow the condition of matter, which is much inferior to him in perfection. He perceived himself miserable and poor in the midst of prosperity and abundance. Nothing fills him; nothing satisfies him: He loathes everything, and desires everything. **He is always seeking knowledge**, and understands nothing perfectly. He admires, because he is ignorant. He has a curiosity to know, because he knows nothing. He is not only the sport of others, but in some manner his own. Equity and rectitude, with relation to him, are whatever his passions make them to be; and truth is nothing but what pleases him. His imperfections are great, and because they are great, they are not to be met with, but in an excellent being, and therefore serve better than anything else to show the perfection of man. This is what may easily be conceived with a little consideration and reflection upon ourselves."
>
> — Jacques Abbadie (c.1720), *Treatise on the Truth of the Christian Religion, Volume One* (§:13) (Ñº)

> "**An atheist cannot be virtuous**; to him *virtue* is only a chimera, *probity* no more than a vain scruple, *honesty* nothing but foolishness. **He knows no other law than his interest** where this sentiment prevails, conscience is only a prejudice, the law of nature only an illusion, right no more than error; benevolence has no longer any foundation; the bonds of society are loosened (see: social bond); fidelity is removed; the friend is ready to betray his friend; the citizen to deliver up his country; the son to assassinate his father in order to enjoy his inheritance, whenever he shall find an occasion, and that authority or silence, will shield him from the arm of the secular power, which alone is to be feared. The most inviolable rights, and the most sacred laws, must no longer be considered, but as dreams and visions."
>
> — Jacques Abbadie (c.1720), *Treatise on the Truth of the Christian Religion, Volume One* (§:17); cited by Baron d'Holbach (1770) in *The System of Nature* (pg. 306-307)

> "The question is, whether there be a god, and not what god is."
>
> — Jacques Abbadie (c.1720), *Publication*; cited by Baron d'Holbach (1770) in *System of Nature* (pg. 221)

External links

â— Jacques Abbadie – Wikipedia.

θΔics

In existographies, **Jacques Charles** (1746-1833) (IQ:#|#) was a French physicist, chemist, mathematician, and inventor, noted for []

Ballooning

On 4 Jun 1783, Joseph Montgolfier, and his brother, demonstrated an unmanned hot air balloon before the provincial Estates of Vivarais. News of this flight quickly reached Paris, where a commission from the Royal Academy of Sciences followed. (Ñº) Charles, being one of the leading experimental physicists in France, presumably thereafter became aware of these Montgolfier balloon experiments.

Charles, as a chemist, after studying the work of contemporaries Henry Cavendish, who had isolated hydrogen previously, Joseph Black, and Tiberius Cavallo, became convinced that hydrogen would be the best gas to make a balloon that would carry people, per reason that it would avoid the cooling problem seen in the Montgolfier tests. [2]

On 27 Aug 1783, Charles, with the help of engineering brothers Jean Robert and Louis Robert (Ñº), launched an unmanned balloon, made of sheets of silk coated with dissolved rubber in a solution of turpentine, 35 cubic meters in volume, filled with hydrogen made by pouring sulphuric acid into scrap iron, which carried 9 kg of weight, and flew for 21 kilometers.

On 1 Dec 1783, they flew a manned hydrogen balloon.

Charles law

In 1787, Charles conducted an experiment where he filled five balloons to the same volume with different gases, and then raised the temperature of the balloons to 80ºC and noticed that they all increased in volume by the same amount; he thus found the following relation: [3]

$$V = kT$$

In 1802, Joseph Gay-Lussac, in a paper on the precise relationship between the volume and temperature of a gas, wherein, supposedly, the above relation was first expressed, mathematically, referenced Charles' unpublished experiment, and used the term "Charles law" in reference to the finding that a volume of any ideal gas, at constant particle count and pressure, is proportional to the temperature of the gas.

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External links

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θΔics

In hmolscience, **Jacques Ellul** (1912-1994) was a French sociologist noted, in sociological thermodynamics, for his use of entropy in his theories of social systems, discussing his views on terms such as economic entropy, technological entropy, and neg-entropy in the reverse process. [1]

Ellul, together with German sociologist Niklas Luhmann, were said to share a "systems" bias view of sociology, wherein the goal of a system is self-maintenance and the task of the systems analyst is to study how social processes and mechanisms forestall the end state of societal entropy. [2]

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External links

â— Jacques Ellul – Wikipedia.
â— A Short Biography of Jacques Ellul (1912-1994) by Patrick Chastenet – Ellul.org.

θΔics

In hmolscience, **Jacques Lacan** (1901-1981) was a French psychoanalyst noted, in psychological thermodynamics, for his circa 1960s lectures and publications in commentary and discussion of Freud, psychology, entropy, and energy.

Overview

Lacan, in his works, dissected the Freudian theory, showing to what extent Freud's logic rested on the view of man as an energy machine. [1]

Lacan also had ideas on the thermodynamics of psychology of his own, which he expressed in his circa 1968 lectures, extrapolating on the conservation of energy and entropy, albeit in a very obscure and riddled manner. Lacan speaks of entropy, for example, as a "loss of jouissance", in some way connected to the pleasure principle or a loss of enjoyment. [6]

In one of his works, Lacan draws a parallel between entropic loss and the inevitable loss that occurs when one attempts to formalize knowledge, to transfer it from the implicit knowing how to the explicit knowing that by the process of writing. [2] Lacan notes that Freud made mention of entropy in his *circa* 1910 *Wolfman*. Freud's mention of entropy is: [3]

> "In examining conversion in psychic processes we must give consideration to the concept of entropy, which is in proportional opposition to the undoing of what has already taken place."

On this basis, Lacan argues that Freud had a firm sense that entropy had something to do with his death instinct. [4]

Lacan also comments on the entropy views of Austrian psychologist Siegfried Bernfeld who in 1931, in association with physicist Sergei Feitelberg, published a research article entitled "The Principle of Entropy and the Death Instinct", in the *International Journal of Pshcyo-analysis*, in which presented the results of their study where they attempted to measure a paradoxical pulsation of entropy within a living organism, specifically in the nervous system of a man. [5] Specifically, by comparing the brain temperature to the rectal temperature of a man, they thought to acquire evidence of paradoxical variations, i.e. variations not conforming to the principle of entropy as it functions in physics for inanimate systems. [4]

Quotes

The following are representative quotes:

> "Since Freud, the center of man is not where we thought it was; one has to go on from there."
>
> — Jacques Lacan (c.1950) (Ñº)

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External links

â— Jacques Lacan – Wikipedia.

θΔics

In existographies, **Jacques Loeb** (1859-1924) (CR:13) was a German-born American physiologist and chnopsologist (biologist) noted for his work in attempting to establish a materialistic biology, specifically in regards the nature of plant and animal movement and also the question of the origin of life. In 1920, American mathematician William Sidis classified Loeb, among the various life theorists, as the representative of the "extreme mechanistic view" with his classification of a living body as a "chemical machine." [9]

Tropism theory

In 1888, Loeb, in his "The Orientation of Animals to Light", first introduced his tropism theory or forced movement theory action (see also: induced movement), the beginning of a long effort to overthrow that anthropomorphic-view of animal and plant movement, e.g. that protoplasmic substances move toward the source of light, "because of curiosity", as many argued during Loeb's day. [7]

In 1918, Loeb, in his *Forced Movements, Tropisms, and Animal Conduct*, stated that his aim is not only to overthrow the anthropomorphized view of movement but also the Aristotelian view or teleological viewpoint of movement—in his own words:

> "The Aristotelian viewpoint still prevails to some extent in biology, namely that an animal moves only for a purpose, either to seek food or to seek its mate or to undertake something else connected with preservation of the individual or the race. The Aristotelians had explained the process in the inanimate world in the same teleological way. Science began when Galileo overthrew this Aristotelian mode of thought and introduced the method of quantitative experiments which leads to mathematical laws free form the metaphysical conception of purpose. The analysis of animal conduct only becomes scientific in so far as it drops the question of purpose and reduces the reactions of animals to quantitative laws."

Loeb goes on to state that this is what he has attempted in his tropism theory of animal conduct.

Laboratory created life | Artificial parthenogenesis

See main: Laboratory produced life

Loeb's *circa* 1905 work on artificial parthenogenesis (virgin generation) based on pure physical chemistry mechanism, is said to have been a blow to vitalism. [5] Loeb's follow-up books on the mechanical, dynamical, or physical chemical view of the organism seem to be indicative of this. [6] American writer Frank Stockbridge's 1912 article "Creating Life in the Laboratory" quotes a good deal from Loeb and his work—some examples of which are: [1]

> "Life is a chemical reaction; death is the cessation of that reaction; living matter, from the microscopic yeast spore to humanity itself, is merely the result of accidental groupings of otherwise inert matter, and life can actually be created by repeating in the laboratory nature's own methods and processes!"

This passage, to note, may be a mixture of Loeb and of the views of Henry Bastian, as Stockbridge's article is not clear enough on the matter. The following, however, are explicitly attributed to Loeb:

> "We cannot hope to succeed in making living matter artificially unless we have a clear conception of what living matter is."

(add)

Human mathematics

In 1921, Loeb sent a copy of his *Forced Movements, Tropisms, and Animal Conduct* to US Supreme Court justice Louis Brandeis, along with a letter commenting that his book may become a forerunner to some type of human mathematics: [2]

> "I think one day—by some future generation [the ideas put forth in my book]—may be elaborated into a mathematical theory of human conduct."

This internal force/external force view of animal action, of course, was first espoused by Goethe in 1796 (see: Goethe timeline). American physical evolutionist Henry Osborn states, in his 1916 *The Origin of Life: On the Theory of Action, Reaction and Interaction of Energy*, that he drew heavily from Loeb's 1906 *Dynamics of Living Matter*. [4]

Quotes | On

The following are quotes on Loeb:

> "Another important study showed how the sessile marine annelid *Spirographis Spallanzani* reacted to light in the same way as did plants studied by **Loeb**'s friend and unofficial mentor, the renowned German botanist Julius von Sachs. These then were the 'proofs' of the 'heliocentrism of animals and its identity with the heliocentrism of plants'. His point being: since we do NOT attribute will, desire, and mind to plants, there is no reason to attribute such properties to animals, which perform in the same way under the same conditions. Loeb envisioned a biology that would become as completely deterministic as he believed physical science to be. Under the right conditions, the behavior of an organism—plant, animal, or human—is completely determined and therefore accurately predictable."
>
> — Jerry Hirsch (1973), "Introduction" (pg. x) to Dover edition of *Forced Movements, Tropisms, and Animal Conduct*

Quotes | By

The following are quotes by Loeb:

> "Confusion always reigns when anthropomorphic motives are brought into scientific research. Before the time of Galileo, a body sinking in a fluid 'sought its place'. Galileo and his followers put an end to the sovereignty of this psychology, at least in inanimate nature. Mankind has no reason to regret this revolution. In biology, however, even at this present date, protoplasmic substances still move toward the source of light 'because of curiosity'."
>
> — Jacques Loeb (1905), *Studies in General Physiology* (pg. 81); cited by Jerry Hirsch (1973) in "Introduction" (pgs. viii-ix) to Dover edition of *Forced Movements, Tropisms, and Animal Conduct*

> "If our existence is based on the play of blind forces and only a matter of chance; if we ourselves are only chemical mechanisms, how can there be an ethics for us?"
>
> — Jacques Loeb (1912), *The Mechanistic Conception of Life* (Ñº)

> "The book is dedicated to that group of freethinkers, including d'Alembert, Diderot, Holbach, and Voltaire,

who first dared to follow the consequences of a mechanistic science—incomplete as it then was—to the rules of human conduct and who thereby laid the foundation of that spirit of tolerance, justice, and gentleness."

— Jacques Loeb (1916), *The Organism as a Whole: from a Physico-Chemical Standpoint* (pg. viii)

"The analysis of the mechanism of voluntary and instinctive actions of animals is based on the assumption that all these motions are determined by internal and external forces."

— Jacques Loeb (1918), *Forced Movements, Tropisms, and Animal Conduct* (pg. 13); cited by Libb Thims (2007) in *Human Chemistry* [3]

"What has been stated for light holds true also if light is replaced by any other form of energy. Motions caused by light or other agencies appear to the layman as expressions of will and purpose on the part of the animal, whereas in reality the animal is forced to go where carried by its legs. For the conduct of animals consists of forced movements."

— Jacques Loeb (1918), *Forced Movements, Tropisms, and Animal Conduct* (pg. 14)

"the Aristotelian viewpoint still prevails to some extent in biology, namely, that an animal moves only for a purpose, either to seek food or to seek its mate or to undertake something else connected with the preservation of the individual or the race. The Aristotelians had explained the processes in the inanimate world in the same teleological way. Science began when Galileo overthrew this Aristotelian mode of thought and introduced the method of quantitative experiments which leads to mathematical laws free from the metaphysical conception of purpose. The analysis of animal conduct only becomes scientific in so far as it drops the question of purpose and reduces the reactions of animals to quantitative laws."

— Jacques Loeb (1918), *Forced Movements, Tropisms, and Animal Conduct* (pgs. 17-18)

"Tropisms are reactions of the organism as a whole, while reflexes are reactions of isolated segments."

— Jacques Loeb (1918), *Forced Movements, Tropisms, and Animal Conduct* (pg. 23)

"The writer described such reactions first for tube worms like *Serpula*, which withdraws suddenly into its tube when a shadow passes over it or when the intensity of light is suddenly diminished in some other way. The anthropomorphists, of course, declare this reaction to be induced by the instinctive fear of an enemy, oblivious of the fact that if they were consistent they would have to give the same explanation for the twitching of a muscle upon rapid changes in the intensity of a current."

— Jacques Loeb (1918), *Forced Movements, Tropisms, and Animal Conduct* (pg. 95)

"Harper stated for the heliotropism of certain worms, that in in strong light the animals move by heliotropism, in weak light by 'trial and error'. These statements are as erroneous as the assertion that while a stone falls under the influence of gravity a feather finds its way down by the method of ''trial and error'."

— Jacques Loeb (1918), *Forced Movements, Tropisms, and Animal Conduct* (pg. 154)

"This tentative extension of the forced movement or tropism theory of animal conduct may explain why

higher animals and human beings seem to possess freedom of will, although all movements are of the nature of forced movements. The tropistic effects of memory images and the modification and inhibition of tropisms by memory images make the number of possible reactions so great that prediction becomes almost impossible and it is this impossibility chiefly which gives rise to the doctrine of free will. The theory of free will originated and is held not among physicists but among verbalists. We have shown that **an organism goes where its legs carry it** and that the direction of the motion is forced upon the organism."

— Jacques Loeb (1918), *Forced Movements, Tropisms, and Animal Conduct* (pg. 171)

"The persistent courtship of a human male for a definite individual female may appear as an example of persistent will, yet it is a complicated tropism in which sex hormones and definite memory images are the determining factors."

— Jacques Loeb (1918), *Forced Movements, Tropisms, and Animal Conduct* (pg. 172)

"Our conception of the existence of "free will" in human beings rests on the fact that our knowledge is often not sufficiently complete to account for the orienting forces, especially when we carry out a "premeditated" act, or when we carry out an act which gives us pain or may lead to our destruction, and our incomplete knowledge is due to the sheer endless number of possible combinations and mutual inhibitions of the orienting effect of individual memory images."

— Jacques Loeb (1918), *Forced Movements, Tropisms, and Animal Conduct* (pg. 172)

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External links

â— Jacques Loeb – Wikipedia.

θΔics

In existographies, **Jacques Monod** (1910-1976) (CR:13) was French protein chemist, chnopsologist, and science philosopher noted, in animate thermodynamics, for his 1970 book *Chance and Necessity*—a title drawing its name from Greek atomic theorist Democritus' idiom "everything existing in the universe is the fruit of chance and necessity"—a book that seemingly attempts to outline a natural philosophy of modern biology [chnopsology] crouched on pure chemistry and physics, using recourse to Maxwell's demon, cybernetics, among other topics, to prove in the end, supposedly, that the process of evolution and of life are the result of natural processes resulting from "pure chance" (see: random chance). [1] A noted quote from the book is: [2]

> "Evolution in the biosphere is therefore a necessarily irreversible process defining a direction in time; a direction which is the same as that enjoined by the law of increasing entropy, that is to say, the second law of thermodynamics. This is far more than a mere comparison: the second law is founded upon considerations identical to those which establish the irreversibility of evolution. Indeed, it is legitimate to view the irreversibility of evolution as an expression of the second law in the biosphere."

The book has been described by American animate chemist Jeffrey Wicken as a "manifesto of materialist biology in the most reductivist sense." [3]

Autonomy

Monod seems to think that his 1963 sparsely-cited article "Allosteric Proteins and Molecular Control Systems" established the view that proteins and enzymes have a type of cybernetic allosteric interaction system that "permit a complete freedom in the 'choice' of controls" such that: [6]

> "The huge network of cybernetic interconnections makes each organism an autonomous functional unit, whose performance appears to transcend, if not to escape, the laws of chemistry. It is in the structure of these molecules that one must see the ultimate source of the autonomy, or more precisely, the self-determination that characterizes living beings in their behavior."

This of course is nothing but perpetual motion code for the free will argument in people. This biasing perspective is evidenced in the closing line of his book:

> "Neither his destiny nor his duty have been written down. The kingdom above or the darkness below: it is for him to choose."

In short, Monod's entire effort seems to have spun a "blind random chance" model of genetic mutation, in a convoluted end aim to situate free will within a materialist framework. This view, however, conflicts with the chemical thermodynamics view that reactions are predetermined by free energy measurements.

Origin of life

Monod, on the origin of life, supposedly, was a proponent of the view that life on earth arose by freak chemical accident and was unlikely to be duplicated even in the vast universe. The following circa 1971 statement by Monad is said to exemplify this position:

> "Man at last knows he is alone in the unfeeling immensity of the universe, out of which he has emerged only by chance. His destiny is nowhere spelled out, nor is his duty. The kingdom above or the darkness

below; it is for him to choose."

Some have summarized this as a "bleak assessment [of human existence] and a springboard to argue for atheism and the absurdity and pointlessness of existence." Monod also, supposedly, stated we are merely chemical extras in a majestic but impersonal cosmic drama—an irrelevant, unintended sideshow

A bronze sculpture of Greek atomic theory philosopher Democritus, mediating on the seat of the soul, done by Léon-Alexandre Delhomme (1868), the philosopher behind the "chance and necessity" theory of existence, which is the inspiration behind **Monod**'s 1970 *Chance and Necessity*, on the relationships of atoms, molecules, DNA, thermodynamics, and chnopsology (biology).

Purpose

Monad employs the term "teleonomic" to permit recognition of purpose in the sphere of animate existence. [4] The following, possibly contradictory quote, is also attributed to Monad: "The first scientific postulate is the objectivity of nature: nature does not have any intention or goal." (check)

Education

Monad learned from French embryologist Louis Rapkine, noted for his 1932 *The Energetics of Development*, the concept that only chemical and molecular descriptions could provide a complete interpretation of the function of living organisms. [5]

Quotes

The following are related quotes:

> "There are living systems; there is no living 'matter'. No substance, no single molecule, extracted and isolated from a living being possess, of its own, the aforementioned paradoxical properties. They are present in living systems only; that is to say, nowhere below the level of the cell."
>
> — Jacques Monod (1967) (Ñº)

See also

â— Ernest Schoffeniels

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5. (a) Jacques Monad – NobelPrize.org.
(b) Louis Rapkine – Wikipedia.
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External links

â— Jacques Monod – Wikipedia.

θΔics

In existographies, **Jacques-Andre Naigeon** (1738-1810) (FA:71) was French atheist philosopher, editor, and artist noted for []

Overview

Naigeon, aka the so-called "monk of atheism" (Q), characterized a "brash evangelical atheist" (Hecht, 2003), was a friend of Baron d'Holbach (Q), who in circa 1869 had begun to increasingly politicize d'Holbach and his views, who assisted d'Holbach in the classic atheist works, such as Jean Meslier, and who penned the preface to Holbach's *The System of Nature*. [1]

Quotes | By

The following are noted quotes by Naigeon:

> "The idea of god is nonsense and the barrier to all human progress."
>
> — Jacques Naigeon (1770), "Preface" to *The System of Nature* (quote paraphrased by Hecht) [1]

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 553). HarperOne.

External links

- Jacques-Andre Naigeon – Wikipedia.

θΔics

In physical humanities, **Jacques Rueff** (1896-1978) was a French science trained economist noted for his 1922 *From the Physical to the Moral Sciences*, retitled during the English-translation as *From the Physical to the Social Sciences: Introduction to a Study of Economic and Ethical Theory*, wherein, building on French economist Leon Walras' 1874 *Elements of Pure Economics*, he attempts to outline, via derivation, using what he refers to as a rational mechanics "analogy", or specifically "we shall be guided in the definition of terms by a mechanical analogy", some type of utilitarian stylized ethical economics.

Mathematical | Mechanical analogy | Political economy

Nearly the entire first 100 pages of Rueff's book is page fluff. On page 109, however, Rueff digs into his aim, namely to derive a "mathematical political economy", via guidance in the definition of terms by a mechanical analogy of the Leon Walras variety. Rueff's opening statement to this is effort, is as follows:

> "The fundamental fact which gives rise to rational mechanics is the existence of movements which its purpose is to explain. Similarly, the fundamental fact of political economy is the existence of exchanges whose laws its purpose is to rediscover."

(add discussion)

Jurisprudence

American law professor Herman Oliphant and associate Abram Hewitt in the 1929 "Introduction" to the English translation of Rueff's book devote 25-pages to a discussion to a discussion of the three general methods by which a judge reaches a decision in a legal case, the gist of which being the following:

> "Under the guise of logic, then, we have methods purely arbitrary, everything depending on the choice of the major premise. This is not objectionable as method; the abuse lies in applying logic in the proper sphere of the empirical. When so applied, there is nothing to insure that the major premise chosen bears any useful relation to prevalent social values—the essence of justice. It is quite as likely to be the dogma of a medieval ghost still ruling us from the mists of antiquity."
>
> If all of the foregoing is considered in the light of **Rueff's** discussion, it will be seen that, so far as law has an empirical branch, its precarious existence is largely either unsuspected or is the haphazard product of a 'common sense' empiricism which professes no order or methods."

Oliphant and Hewitt, in short, seem to think that the scientific method and the logic of the physical sciences might bring some clarity to this process of jurisprudence; the example they focus on being a decision on whether or not a School Board has the right to re-higher teachers based on whether or not they join a teachers' union.

Overview

Rueff begins his book as follows:

> "Reading a book on ethics is, for a scientific mind, a source of great astonishment. The systems are innumerable but the conclusions are alike. Whether the system of ethics treated be religious or utilitarian, whether it be finalistic or pragmatic, it leads invariably to an ensemble of very precise rules, which are, with very few variations, a humanized code for our civilized world."

He then gives the following straightforward criticism of all of them:

> "As for the method which evolved these laws—almost always being peculiar to the social sciences—the line of reasoning begins with concepts which are not very clearly defined. It involves hypotheses which have not been enunciated, and all too often, the true, the beautiful, the good—undefined or undefinable entities—interpose at each step to lead it wherever one may wish to go."

He then queries the following, which he says it to be the focus of the problem addressed in his book:

> "Why does the geometrician—the mind of the physicist—feel he steps on quicksand the moment he enters the realm of the moralist? If the rules of morals are one, why are the systems of ethics without number?"

Rueff then steps through quick short snippet chapters on the subjects of mechanics, which he defines as the "science of motions", wherein he defines force as the "determining cause of the movements we observe". [2]

Will | Force

This is where Rueff begins to stumble, in respect to human movements, other physical movements, and free will—stating, e.g., that the "theory of relativity seems to indicate that the causes will have to be modified in order to explain appearances not yet interpreted." He goes on throughout his argument, seemingly, to argue that macroscopically a system will behave according to the law of causality, but seems to allude to the premise that microscopically (socially or economically) people have free will in their decisions and choices. This argument seems to come from Leon Walras—Rueff's main source—who in his 1874 *Elements of Pure Economics*, states the following:

> "We may divide the facts of the blind and ineluctable forces of nature and those which result from the exercise of the human will, a force that is free and cognitive. Facts of the first category are found in nature, and that is why we call then *natural* phenomena. Facts of the second category are found in man, and that is why we call then *human* phenomena. Alongside the many blind and ineluctable forces of the universe there exists a force which is self-conscious and independent, namely, the will of man. It may be that this force is not quite as self-conscious and independent as it supposes itself to be. It is only after a study of the will of man that we can tell."

(add discussion)

Other

The objection was typically raised that methods applied, say, to the theory of thermodynamics cannot be applied to the study of human beings endowed with free will. Rueff replied that just as there is no thermodynamics for a single molecule, there is no economics for an individual. The acts of individuals — individual particles in physics or free human beings in social sciences — are essentially "indeterminate"; yet in both cases, the pattern of behavior of a large number of individuals can be explained and predicted as a matter of statistical probability. The greater precision commonly observed in natural sciences is simply a function of sample size: while human beings in a national economy are typically counted in the millions (multiples of 10^6) or at most billions (multiples of 10^9), molecules are measured in moles (10^{23}).

Education

Born in 1896, the son of a physician, Rueff was trained in science and mathematics at the *Ecole Polytechnique*. His attention was turned from the study of medicine when he studied classical economics under Clement Colson, and was especially influenced by the mathematical general-equilibrium theory of Leon Walras.

Quotes

The following are related quotes:

> "The methods which have proved so fruitful in the physical sciences can be applied to the social sciences."
>
> — Herman Oliphant and Abram Hewitt (1929), "Introduction" (pg. ix)

> "The laws of political economy are statistical laws in the sense that the sequential relations which they enunciate result from the presence and simultaneous activity of a large number of isolated elements. They are thus quite comparable to the laws of gases, individuals playing in political economy the role of molecules in the kinetic theory."
>
> — Jacques Rueff (1922), *From the Physical to the Social Science* (pg. 104)

> "There is no political economy of the individual any more than there is a thermodynamics of the molecule."
>
> — Jacques Rueff (1922), *From the Physical to the Social Science* (pg. 104)

> "The great difficulty in observing these [gas like political economy] laws is that we are ourselves one of the elements combining to bring about the appearance whose advent they foretell. In seeking these laws, we are in the position of a molecule that wished to comprehend the properties of gases."
>
> — Jacques Rueff (1922), *From the Physical to the Social Science* (pg. 104-05)

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Further reading

â— Weighell, Gladys M. (1926). *From Physical Sciences to Moral Sciences: a Critical Digest of Des Sciences Physiques Aux Sciences Morales, by Jacques Rueff*. Master's thesis. Columbia University.

External links

â— Jacques Rueff – Wikipedia.

θΔics

In science, **Jacques Vaucanson** (1709-1782) was a French inventor noted for his 1737 flute player automaton and 1738 tambourine player and digesting duck automatons.

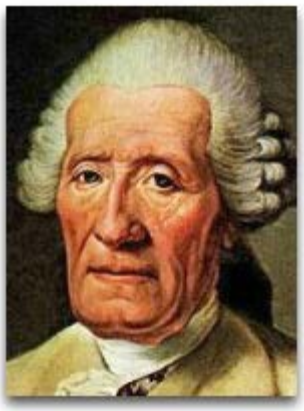

Automatons

The following is the frontispiece to Vaucanson's *The Mechanism of the Flute Player Automaton* presented to the French Royal Academy of Science:

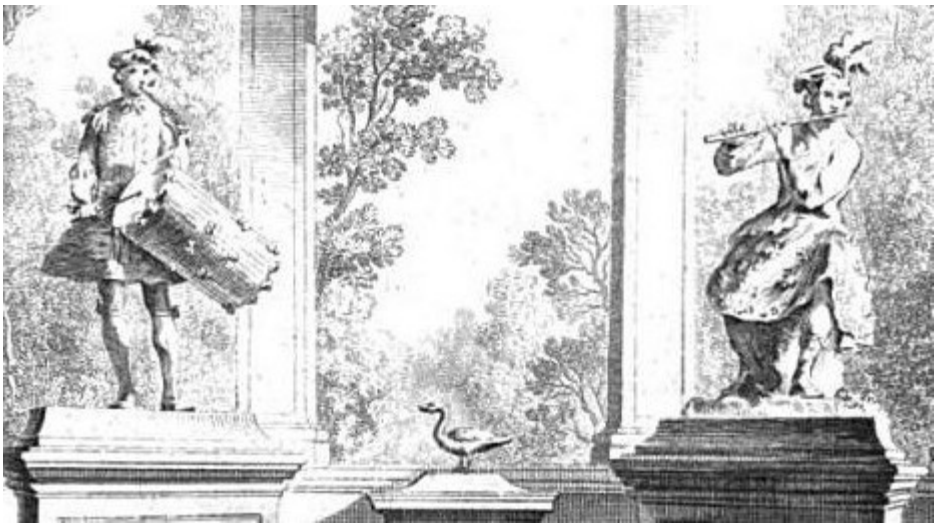

French physician-philosopher Julien la Mettrie's 1748 *The Human Machine*, which was inspired by seeing Vaucanson's automatons, outlined a philosophical discussion on the human machine theory that specifically rejected Cartesian dualism. [1]

References

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External links

â— Jacques de Vaucanson – Wikipedia.

θΔics

In hmolscience, **Jaegwon Kim** (1934-) is a Korean-born American physicalism philosopher, notable for his positions on: downward causation, nonreductive physicalism, mind-body problem, consciousness amid materialism, emergence, supervenience, among others.

Overview

(add)

Human movement?

In 1992, Kim, in his "Downward Causation in Emergentism and Nonreductive Physicalism", asks the following straightforward question: [1]

> Scenario: "It occurs to you that you need to check a few references for an article you are writing, so you decide to walk over to the library after your office hours. Miracle of miracles! In half an hour, you find your body, all of it, at the front steps of the library, half a mile away. Think of all the molecules that make up your body: each of them has traversed the half-mile, zigzag path from your office to the library, and your whole body is now where it is."
>
> Question: "What explains the spatial displacement of your body from the office to the library? What caused the motion of each and every molecule of your body over the half-mile path?"

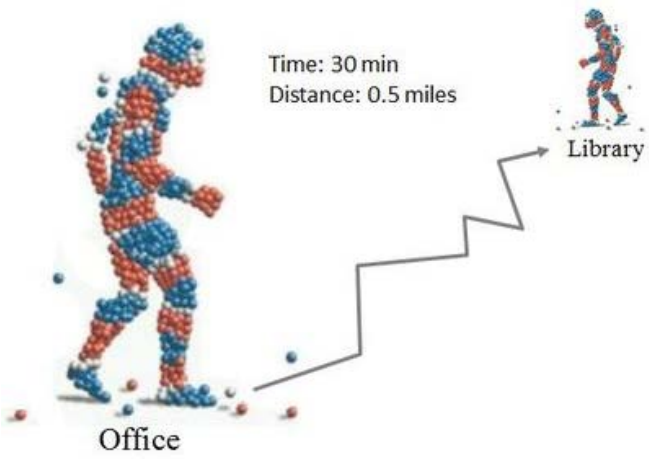

This, comparatively speaking, is a fairly decent hmolscience-type homework problem. The root of the answer, of course, is found in the opening paragraph of German physicist Rudolf Clausius' 1875 "Mathematical Introduction" chapter, of his *The Mechanical Theory of Heat*, the foundation stone of thermodynamics, as follows:

> "Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, work is performed."

The body in question here is the human or human molecule in technical speak. To clarify, the following shows the old and now defunct theory classified 2000 *Merriam-Webster Collegiate Dictionary* definition of a human as compared to the new accurate chemical thermodynamically neutral 2011 *Advanced Engineering Thermodynamics* textbook definition of a human (citation: Libb Thims, 2002): [7]

	Human		Date	Source
Old	"A bipedal primate mammal (*Homo sapiens*); *broadly* : any living or extinct member of the family (Hominidae) to which the primate belongs."		2000	*Merriam-Webster Collegiate Dictionary*
New	"A 26-element energy/heat driven dynamic atomic structure."		2011	*Advanced Engineering Thermodynamics*

the latter baby shown with the "Hu" human element symbol overlaid, the difference between the two being that the term "living" is not found in the latter: the former of which (old view) being crouched vicariously in 5,000-year-old religio-mythology based "life theory"; the latter (new view) being chemically and thermodynamically neutral in terminology and definition (see: life terminology upgrades). The following, to give some comparative basis with which to get one's bearings, shows a walking molecule, specifically a video animation and image of the walking molecule "kinesin", characteristically compared to a a walking human (human molecule), energetically walking with two molecular legs, along a protofilament of a microtubule, for Ronald Vale and Ronald Milligan's 2000 article "The Way Things Move": [8]

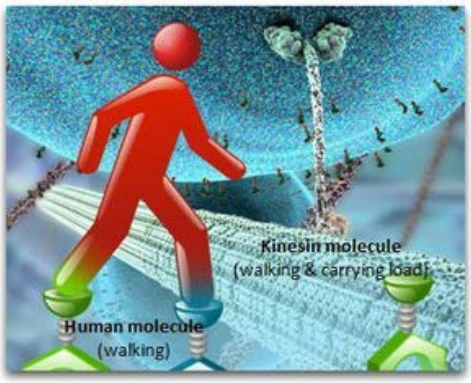

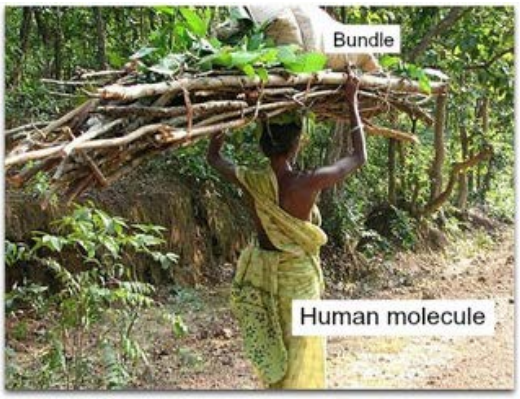

Left: a 1999 animation of the walking molecule "*kinesin*" energetically walking, with two molecular legs, along a protofilament of a microtubule in for the article "The Way Things Move." [8] Center: a walking kinesin (right), carrying a large load along a microtubule. [6] Right: a walking 26-element human molecule carrying a bundle. The ignorant person will tend to argue that the underlying principle behind the movement of each respective bundle-carrying animated atomic geometry, kinesin and human, respectively, is somehow different; the learned individual, however, will know that chemical thermodynamics sees one point of view to explain the movement of each: namely energy will be conserved and entropy will increase, for each respective process—which translated to the affect that for movement to accrue a free energy coupling action must take place; as the video explains, the movement principles of the smaller molecule, kinesin, have been largely worked out, utilizing ATP / phosphate bond energy release explanations; a logic mostly derived from German physical chemist Fritz Haber's extension of American physical chemist Gilbert Lewis' chemical thermodynamics work applied to the problem of muscle contraction. The explanation for movement in the human molecule case, is but the same, the details of which are but an extrapolation issue.

The force in question here is the electromagnetic force. This latter point is a strangely peculiar technical detail often neglected from the studies of modern physical hard science students? Whatever the case, Kim, not being schooled in the logic of Clausius—which is the case for anyone not having gone through engineering school—and in turn the science of chemical thermodynamics, and in turn the understanding that a human is a molecule—a 26-element animated heat-driven surface-attached bound state turnover rate freely-going molecule (see: human molecular formula), existing in various states of reactivity, to be specific—goes on to discuss the two, supposedly, dominant views concerning the answer to this query. Firstly, he says "these molecular motions happened" because you wanted to go to the library owing to a desire about a belief that what you need is there; these desires in turn were caused by "psychological events and states"; these events and states, in turn, being the result of antecedent "causal agents", as Kim calls them, that acted, worked, or brought about the resulting psychological events and psychological states, that situated the desire in you to go the library. Kim then cites American neurophysiologist Roger Sperry's 1984 nearly inane explanation of scenario movement:

> "The molecules of higher living things are moved around mostly by the living, vital powers (see: vitalism) of the particular species in which they're embedded. They're flown thought the air, galloped across the plains, swung through the jungle, propelled through the water, not by molecular forces or quantum mechanics but by the specific holistic vital and also mental properties—aims, wants, needs—possessed by the organisms in question."

Kim states that this view is an example of what philosophers call "downward causation"—a 1974 coining of American psychologist Donald Campbell—a term that, strangely, seems to be at the core of the 2012 Juarrero-Deacon affair UC Berkeley investigation about research misconduct, accuser Cuban-born American action theory philosopher Alicia Juarrero arguing for downward causation; defender American qualia absenteeism philospher Terrence Deacon arguing against downward causation; both, however, ironically using a far-from-equilibrium bifurcation theory Prigogine thermodynamics platform to argue for nonreductive physical materialism. [1]

Anti-emergence position

American cognitive science philosopher Jerry Fodor, in 1998, described Kim's challenge to the theory of emergence and to emergentists as follows: [4]

> "Why is there anything except physics?"

In 2011, American neurological anthropologist Terrence Deacon, likewise, described Kim as the "most devastating critique of emergentism", and rephrased Fodor's truncation of Kim's query, in semi-humorous terms, as follows: [3]

> "It's all just quarks and gluons."

This last statement is pretty decent; but to clarify for Deacon, the correct statement, as modern hard science currently sees things is: "It's all just fermions, bosons, and various states of existence of vacuum."

Quotes | By

By the following are quotes by Kim:

> "It is an ironic fact that the felt qualities of conscious experience, perhaps the only things that ultimately matter to us, are often relegated in the rest of philosophy to the status of 'secondary qualities,' in the shadowy zone between the real and the unreal, or even jettisoned outright as artifacts of confused minds."
>
> — Jaegwon Kim (2005), *Physicalism: or Something Near Enough* [6]

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2. (a) Downward Causation – InformationPhilospher.com.
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â— Jaegwon Kim (quotes) – Cereoso.com.

θΔics

In hmolscience, **Jaime Leon Aguilar-Arias** (c.1972-), oft-cited as "J.L. Aguilar-Arias", is Colombian chemical engineer and materials scientist noted for his 2014 conference presentation "Chemical Engineering and Complexity, an Undissipated Structure … Yet", wherein he suggests that chemical engineering students be introduced to applications beyond traditional "classical chemical engineering" applications, namely in the humanities-applied area of investigation, that of the: Erich Muller, Paul Samuelson, Mohsen Mohsen-Nia, John Bryant, *Journal of Human Thermodynamics*, Santa Fe Institute, etc., type of chemical thermodynamics based complexity approach applied to sociology and economics; similar to what Israeli chemical engineer Alec Groysman suggested at the 2011 Generative Art Conference, Rome. [2]

Education

Aguilar-Arias completed his BS in chemical engineering in 1994 and his MS in chemical engineering in 2002, both at the University of Valle, Colombia, and his PhD in materials science and engineering in 2013 at the Federal University of Santa Catarina, Brazil. Aguilar-Arias presently is a chemical engineering professor, processes in the Department of Environmental and Chemical Engineering of the National University of Colombia, whose group (Ñº) works on the investigation of chemical and biochemical processes. [2]

References

1. (a) Aguilar-Arias, Jaime L. (2014). "Chemical Engineering and Complexity, an Undissipated Structure … Yet", 20th Brazilian Congress of Chemical Engineering (*Congresso Brasilerro de Enenharia Quimica*, XX) (pdf), Florianopolis, Brazil, Oct 19-22.
(b) Groysman, Alec. (2011). "Use of Art Media in Engineering and Scientific Education" (§3.4: Human Chemistry), Generative Art Conference, XIV, Roma, Italy, Dec 5-7.
2. Jaime Leon Aguilar-Arias (cv) - National University of Colombia.

External links

â— Jaime Leon Aguilar-Arias (faculty) - National University of Colombia.

θΔics

In existographies, **Jakob Lenz** (1751-1792) was a German philosopher, writer, and playwright, noted for []

Overview

In c.1669, Lenz studied under Immanuel Kant, who encouraged him to read Jean Rousseau.

In 1771, Lenz joined the *Society of Philosophy and Beautiful Letters*, a literary group, where he came in met Johann Goethe, who became his literary idol, and through him met Johann Herder.

In 1772, Lenz, in his *First Principles of Morals*, defined the nature of the urge towards completeness", which he declared to be one of the fundamental impulses of human nature. [2]

In Dec 1776, Goethe permanently broke off with Lenz because of his "asininity", as Goethe vaguely put it in his diary.

Quotes | By

The following are quotes by Lenz:

> "Morals must be based on firm and inviolable principles, and there are no actions that are more in conflict with human nature than those without a goal."
>
> — Jakob Lenz (1772), *First Principles of Morals* [1]

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External links

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θΔics

In existographies, **Jameel Jalibi** (1929-2019) was an India-born Pakistani sociologist, noted for []

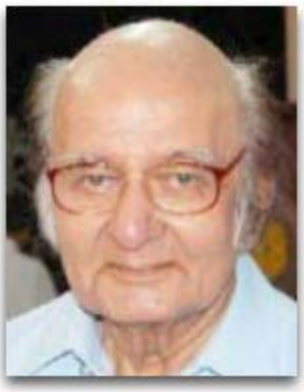

Education

Jalibi completed his BA at Meerut College, India, his MA, Bachelor of Laws, and PhD from Sindh University, Pakistan. In 1983 to 1987, Jalibi was vice chancellor of Karachi University.

Beg

In 1987, Jalibi penned the "Foreword by a Sociologist" of Mirza Beg's *New Dimensions in Sociology*. [1]

Quotes

The following are related quotes:

> "If it could stand the test of time, [**Beg's**] ideas, presented in [*New Dimensions in Sociology*] will rediscover new frontiers in sociology and will revolutionize the existing theories of human behavior as it has so far been propounded by philosophers. Beg's approach is a pioneering effort **his writing style is matter of fact** and demands adequate knowledge of physical chemistry [see: polymathy degree problem]."
>
> — Jameel Jalibi (1987), "Foreword by a Sociologist" [1]

See also

- Ahmed Mumtaz
- Ahsan Siddiqui
- Mumtaz Kazi

References

1. Beg, Mirza Arshad Ali. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (intro) (pdf, annotations by Libb Thims, 2014) (Foreword by a Sociologist, pgs. vi-v). Karachi: The Hamdard Foundation.

External links

- Jameel Jalibi – Wikipedia.

θΔics

In existographies, **James Arthur** (1958-2005) was an American new age religio-mythology scholar, noted for his work in ethno-mycology, i.e. the study of mushroom-use aspects in religion and mythology, in particular his 2000 *Mushrooms and Mankind*, wherein he attempts to trace the the Egyptian origin of Christmas and related, Santa Clause, Christmas tree, reindeer, etc.

Mushrooms | Pine trees

The Egyptians, as summarized by Wallis Budge (1904) (Q), often referred to the divine food of the gods called “tchefau”; this is speculated to have been mushrooms (Q), and or resin-based “manna” (Q), that grew under the evergreen trees, e.g. tamarisk tree (Egypt) or pine tree (Europe).

In 1959, Andrija Puharich, in his *The Sacred Mushroom: Key to the Door of Eternity*, touched on mushroom use in Egyptian religio-mythology, e.g. in respect to Osiris. [1]

In 1971, John Allegro, author of *The Dead Sea Scrolls and the Christian Myth* (1970) (Q), published *The Sacred Mushroom and the Cross: a Study of the Nature and Origins of Christianity within the Fertility Cults of the Ancient Near East* (Q), wherein he outlined the historical use of Mushroom use, religion, and the cross.

In 1968, Gordon Wasson, in his *Soma: Divine Mushroom of Immortality* (Q), identified the Hindu plant god Soma as related to the hallucinogenic Amanita muscaria (Q) mushroom.

In c.1976, James Arthur, building on Puharich and Allegro, began to engage into the study of the history of mushroom use, pine trees, and religious experience. The result of these studies, was his *Mushrooms and Mankind* (2000), wherein he asserts, among other things, that the "presents" left under the pine tree originated in the hallucinogenic "mushroom" gifts left, or made, under the pine trees in autumn-winter season, grown out of the roots of the evergreen trees. In c.1980, James Arthur engaged into discussion with Wasson on the religious use of mushrooms. Arthur then intermixed this with views of Wilhelm Reich on sociology-psychology.

Reindeer

Arthur, in his *Mushrooms and Mankind* (pg. 13), asserts that the St. Nicholas version of Santa Claus, with his flying reindeer, derive from phenomena of Shaman in Siberia, and their reindeer, eating mushrooms and therein perceiving the reindeer and sleigh to fly through the sky. [1] Shaman, as reported in a BBC documentary (Q), also drink the urine of the reindeer after they eat the mushrooms:

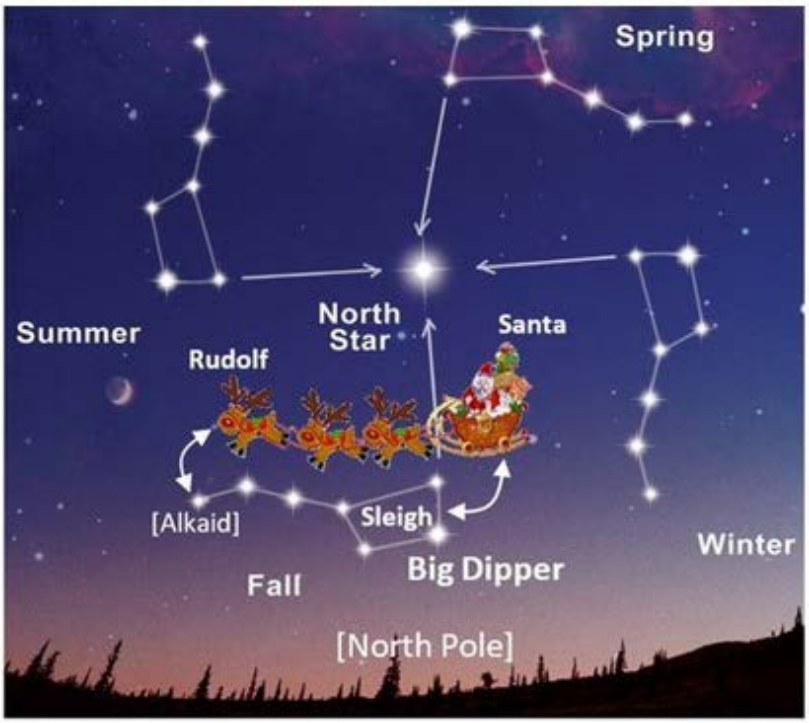

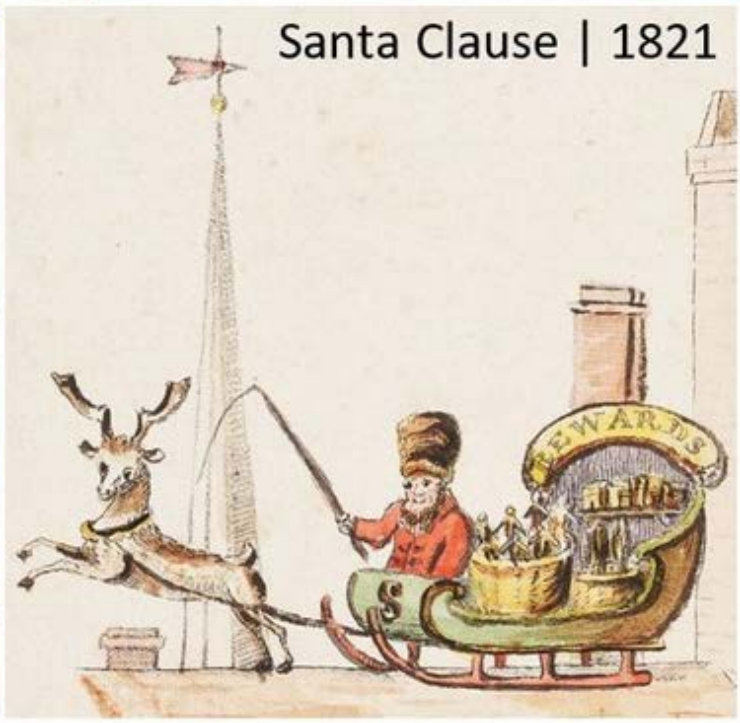

This, in turn, give the perception of flying on a sleigh through the sky. This, in turn, combined with the model that Big Dipper goes around the pole star (Polaris), according to Arthur, gave way to the Santa Claus model.

Santa-ology

In 2000, Arthur, in his *Mushrooms and Mankind*, interjected on what he called the "hidden meaning of Christmas", amid which he outlined the subject he defined as “Santa-ology” or “Santa-ism”, wherein he asserts the following: [1]

> “Today's Santa Claus is a metamorphosis of many older mythologies, including Thor or Donner (German Donar) who wears red and rides in a Golden Flying Chariot pulled by two Goats (Cracker and Gnasher). In a sense, these goats were the ancestors to the now popular reindeer. What would the red and gold clad angel be doing with that nice basket? An Easter basket at Christmas is an interesting concept.
>
> The icons, symbols, and relics that have managed to survive from the "Winter Solstice" celebrations of old, have a commonality that deserves some reflection, study, and perhaps even some reverence. Understanding that these traditions are borrowed ones, is central to getting at the heart of the true meaning of Christmas.
>
> Christmas is commonly thought of as a Christian holiday (the birth of Jesus). Many Christian beliefs and traditions were borrowed from more ancient religions and mythologies. This is well documented by authors

such as Gerald Massey, Godfrey Higgins, Robert Graves, Kersey Graves, and many others. The virgin birth, the incarnation of God, the sacrament, Christmas, Easter, etc. have all been adopted/stolen by Christianity as its own."

Arthur, in continuation, comments on umbrella term 'pagan' as follow:

Arthur (1999) in Egypt outside of the Temple of Horus, wherein he filmed a two-hour documentary (Q) on mushroom use in ancient Egyptian religion. [1]

"It is well documented by fundamentalists (apologists) that the Christmas traditions are Pagan in origin. This simply means that their origin comes from the traditions of the country-folk (pagan). By contrast, the Pagan origins of most of the other attributes of Christianity are vigorously denied. It is also very easy to obscure, overlook and discredit the Egyptian, Mithraic, Germanic, Norse, Celtic, Greek, Hindu and Buddhist roots by lumping all non-Christian religions together and labeling them 'Pagan'. These are certainly not simple country-folk religions. So to just say Christmas has Pagan roots, and not go further, is glossing over what exactly those roots are, and discrediting their study as worthless. Christmas icons, traditions and stories have hidden meanings. Although not initially apparent, a more thorough investigation reveals far more symbolic content (which is decipherable) than originally suspected. At the roots of this symbolism research is information about the secrets of the mushroom, regarding its habitats, forms, uses, preparations, and effects."

Arthur continues:

"Shaman of Siberia and the Russian icon, St. Nicholas, both play parts in the tale of Christmas, providing clues as to where Christmas came from and why there are certain symbols associated with the holiday. It is these types of clues that will help (the questors) in the deciphering of the symbols. Siberian Shaman used/use (despite governmental oppression) the Amanita muscaria as a religious sacrament. It is used for spiritual vision, out-of-body travel into the realms of the spirits, and as a plant-spirit guide in teaching and healing. The value of the inebriant is placed highly among the commodities of the native tribesmen, fetching reindeer pelts, meats, and all manner of tradable goods in payment and barter. Interesting to note: If you aren't quick enough in the hunt, you will find only the mushroom stubs, the rest greedily gobbled up by the hungry reindeer.

The ancient shamanic use of Amanita muscaria in Siberia is well documented. Despite governmental oppression against its use, there are still many who refuse to accept the authorized state religion, and continue the shamanic traditions in secret. Just as the Siberian shaman (commonly dressing in red and white) would enter through the opening in the roof of a home where a ritual was to be done, Santa Claus also arrives on the roof and enters through the chimney. Just as the shamans would gather the mushrooms in bags which they would bring with them when performing a ceremony, Santa Claus also (on the Holy Day) brings presents in a bag. The Santa Claus we see today evolved from traditions developed in Germany. It is fairly common knowledge that the Weihnachtsmann (St. Nick) was an amalgamation of older Germanic/Norse gods such as Thor, Donner, Odin and Wotan. What's missing here is just as Santa flies through the skies in his sleigh, Odin (as well as the rest) rode through the sky in his chariot, which is depicted in the stars by "The Big Dipper". The Big Dipper is the chariot of Odin & Wotan, Thor, King Arthur, and even Osiris (of Egypt). The chariot

> that circles the North Star in a 24-hour period is thus also known as the sleigh of Santa Claus because it circles his mythological home, the North Pole. It is no surprise that Nordic/Germanic gods have connection to mushrooms in their mythology. As Thor throws his mushroom-shaped hammer to the ground, mighty thunders and lightning cracks cause the real mushroom(s) to appear. As the horses pulling Odin through the sky in his chariot become over-exerted, their blood-mingled spit falls to the ground and causes the Amanita mushrooms to grow at those exact points."

This "Big Dipper" equals chariot of Odin, sleight of Santa, may be off, being that the star boat (solar barque) of Osiris was the Orion constellation, as is well-established, and the "Big Dipper" has to do with the opening of the mouth. Author continues:

> "The Osiris mythology has even more to add to this. To the Egyptians; South was up (North). Osiris was the lord of the underworld, the South, (South=down) which is why he circles the sky in the furthest possible lower (southern) area. Not only did Osiris ride the sky in a chariot, but after his death Isis found that an evergreen (Cedar) had grown overnight from a dead stump to full-sized (this also relates to the Djed pillar); which was understood as a sign of Osiris' rebirth and immortality. Interestingly, the traditional birth of Osiris is the 25th of December. The 25th of December was also celebrated annually by putting presents around the Cedar tree. This tradition is at least five thousand years old. The birth of Horus to the goddess-virgin-mother, Isis, is perhaps the eldest representation of the goddess/son mythology, yet it is impossible to know this or the real age of the Astro-theological-Virgo-giving-birth-to-the-child/god/star mythology for sure. However, it is the **oldest source** I have found; it is very old.
>
> Drying the mushrooms was/is a necessary procedure typically accomplished by stringing them up (like popcorn) and hanging them above the hearth of the fireplace. shamans and lay people alike, would gather and dry them. They gather all they can since they are a valuable commodity. Reindeer (native to Siberia) are known to be quite fond of eating these mushrooms. The mythology of flying Reindeer reflects the supposed pharmacological effects of such a meal.
>
> It is important to point out that this Christmas/Winter Solstice celebration, with all its various counterparts, transcends the world's religions. The reason that this celebration is held all over the planet in various forms may have something to do with this other commonality at which we are looking; it is certainly entwined in the symbolism."

(add)

Maxwell

Arthur was an associate of fellow religio-mythologist Jordan Maxwell. [2]

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3. Puharich, Andrija. (1959). *The Sacred Mushroom: Key to the Door of Eternity* (Osiris, 5+ pgs). DoubleDay.

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- Home | JamesArthur.net – WayBack Machine, 2007.
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θΔics

In hmolscience, **James Beatty** (1934-c.2005) was an American chemical engineer noted for his extended 1970s discussions with Brazilian chemical engineer Edison Bittencourt on the application of thermodynamics to problems including the creation of order and seeming purposive processes observed in biology (powered-chnopsology), sociology, and economics. [1]

Education

Beatty, in the 1970s, seems to have been associate with North Carolina State University.

References

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â— Beatty, James Wayne (1934-) – WorldCat Identities.

θΔics

In hmolscience, **James Ralph Beniger** (1946-2010) was an American sociologist noted, in sociological thermodynamics, for his 1986 life is an anti-entropy phenomena supposition.

Overview

In 1986, Beniger, in his *The Control Revolution*, situated the view that "the one true test of all living systems is the persistence of [their] organization counter to entropy"; the basic message of the book is captured in the following excerpt: [1]

> "A system can sustain work only if its internal energy is purposively organized in a heat gradient, as, for example, in the steam engine, which inspired early work on thermodynamics. Only living systems can maintain and even increase such organization—to work as if guided by some vitalist equivalent of Maxwell's demon. This does not mean that life decreases entropy in the universe, however, but only within its own systems and only by increasing entropy in the matter it consumes. Hence all living systems, including human societies, must be seen as eddies in the entropic stream—as countercurrents resisting for a time the rush of the universe toward final heat death."

The thermodynamic content of the book, however, seems to be rather elementary. The second law, for example, is defined as follows: "the so-called principle of the degradation of energy [states that] a system's energy cannot be converted from one form to another—including work—without decreasing it organization and hence ability to do further work." This, certainly, is one of the more incorrect and mis-convoluted of the many statements of the second law, being what seems to be a haphazard mixture of the 1860s Kelvin verbal dissipation views and 1900 Planck system disorder views of the second law. He also defines the first law as the statement that matter and energy cannot be created nor destroyed. Matter, of course, is not a part of the statement of the second law.

His basic message is that, because of the laws of thermodynamics, societies must be open systems. He cites Arthur Eddington, Leo Szilard, and Norbert Wiener as main references and spends a good amount of time talking about Maxwell's demon.

Education

Beniger completed his BA in history from Harvard University and an MS in statistics, and MA and PhD in sociology, all from the University of California, Berkeley. [2] He presently is a professor of communications and sociology at the University of Sothern California, Los Angeles.

References

1. Clark, Robert P. (1997). *The Global Imperative: an Interpretive History of the Spread of Humankind* (keyword: Thermodynamics, pgs. 2-6). Westview Press.
2. James Beniger (overview) – MediaResearchHub.SSRC.org.

Further reading

â— Beniger, James R. (1986). *The Control Revolution: Technological and Economic Origins of the Information Society* (thermodynamics, pgs. 36-37, 45-47, 55). Harvard University Press.

External links

â— Beniger, James R. (James Ralph) (1946-2010) – WorldCat Identities.

θΔics

In existographies, **James Cattell** (1860-1944) was an American psychologist, *Science* magazine editor, and *Popular Science Monthly* founding editor, noted for his 1894 so-called Cattell 1000, a methodological ranking of the top one-thousand men preeminent according to text allocation space in six biographical dictionaries or encyclopedias.

Quotes

The following are noted quotes:

> "The **method I followed** [IQ ranking methodology] to discover the 1,000 men who are preeminent **was this**: I took six biographical dictionaries or encyclopedias (*Lippincott's Biographical Dictionary*, *The Encyclopedia Britannica*, Rose's *Biographical Dictionary*, *Le Dictionnaire de Biographie Generale*, Beaugean's *Dictionnaire Biographique*, and Brockhaus' *Conversations lexicon*)—two English, two French, one German, and one American and found the two thousand men (approximately) in each who were allowed the longest articles. In this way some 6,000 men were found. I then selected the men who appeared in the lists of at least three of the dictionaries, and from these (some 1,600) selected the thousand who were allowed the greatest average space, the value of the separate dictionaries being reduced to a common standard. Thus was obtained not only the thousand men esteemed the most eminent, but also the order in which they stand."
>
> — James Cattell (1894), "A Statistical Study of Eminent Men" [1]

References

1. Cattell, James McKeen. (1894). "A Statistical Study of Eminent Men", statistics of paper presented to the American Psychological Association Dec.; abstract published in *the Psychological Review*, Mar., 1895; read in present form as a lecture before the Philosophical Club of Yale University, 1897; *Popular Science Monthly* (1903), 62: 359-77.

External links

â— James McKeen Catttell – Wikipedia.

θΔics

In existographies, **James Chadwick** (1891-1974) (GPE:85) was English physicist noted for his 1932 discovery of the neutron—though, technically, Ettore Majorana, independently, arrived at the same conclusion, namely the existence of a "heavy neutral particle", as he termed it, within the same period that year.

Neutron

A new form of penetrating radiation came to light in 1930, when Bothe and others bombarded beryllium with a-particles. Although these emissions were attributed initially to an unusual form of gamma radiation, James Chadwick suspected a different origin.

On 17 Feb 1932, Chadwick, in his "Possible Existence of a Neutron", stated the following: [2]

> "If we ascribe the ejection of the proton to a Compton recoil from a quantum of 52 x 106 electron volts, then the nitrogen recoil atom arising by a similar process should have an energy not greater than about 400,000 volts, should produce not more than about 10,000 ions, and have a range in the air at N.T.P. of about 1-3mm. Actually, some of the recoil atoms in nitrogen produce at least 30,000 ions. In collaboration with Dr. Feather, I have observed the recoil atoms in an expansion chamber, and their range, estimated visually, was sometimes as much as 3-mm. at N.T.P.
>
> These results, and others I have obtained in the course of the work, are very difficult to explain on the assumption that the radiation from beryllium is a quantum radiation, if energy and momentum are to be conserved in the collisions. The difficulties disappear, however, if it be assumed that the radiation consists of particles of mass 1 and charge 0, or **neutrons**. The capture of the *a*-particle by the Be9 nucleus may be supposed to result in the formation of a C12 nucleus and the emission of the neutron. From the energy relations of this process the velocity of the neutron emitted in the forward direction may well be about 3 x 109 cm per sec. The collisions of this neutron with the atoms through which it passes give rise to the recoil atoms, and the observed energies of the recoil atoms are in fair agreement with this view. Moreover, I have observed that the protons ejected from hydrogen by the radiation emitted in the opposite direction to that of the exciting *a*-particle appear to have a much smaller range than those ejected by the forward radiation. This again receives a simple explanation on the neutron hypothesis."

(add discussion)

Humans | Composition

Humans, atomic composition, are comprised of 26 elements: oxygen, carbon, hydrogen, nitrogen, calcium, phosphorus, potassium, sulfur, chlorine, sodium, magnesium, iron, fluorine, zinc, silicon, copper, iodine, tin, boron, selenium, chromium, manganese, nickel, molybdenum, cobalt, and vanadium. Humans, in bound state and or particle composition, are comprised of four entities: protons (discoverer: Ernest Rutherford, 1911), neutrons (discoverer: James Chadwick and or Ettore Majorana, 1932), electrons (discoverer: Joseph Thomson, 1897), and photons (theorizer: Albert Einstein, 1905).

Quotes | Related

The following are related quotes:

> "The answer to the question 'what are we made of' is: protons and neutrons, the heavy particles, or baryons, and electrons, the light particles, or leptons."
>
> — Michael Robinson (1999), *The Nine Number of the Cosmos* [1]

References

1. Rowan-Robinson, Michael. (1999). *The Nine Numbers of the Cosmos* (pgs. 6, 8). Oxford University Press.
2. Chadwick, James. (1932). "Possible Existence of a Neutron" (Ñº), Letter, *Nature*, 129:312, Feb 17.

External links

â— James Chadwick – Wikipedia.

θΔics

In sociological thermodynamics, **James Coleman** (1926-1995) was an American chemical engineer turned sociologist noted for his 1964 *Introduction to Mathematical Sociology*, in which he presented employs some cursory chemistry, physics, and thermodynamics models to sociology.

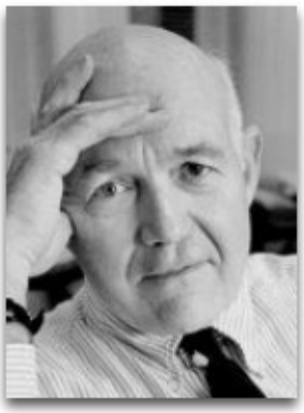

Tukey

In 1971, Coleman, in his "Theoretical Bases for Parameters of Stochastic Processes", discussed the 1961 social "attitude" free energy theory of John Tukey. [7]

Chemical reactions

The following is an example quote from his section on chemical reactions:

> "Chemistry is one science that, like sociology, is often concerned with discrete states rather than continuous variables. Many chemical problems concern chemical reactions, that is, movement between two states, or equilibrium between two (or more) states. Since these reactions are at the atomic or molecular level, the movement between states is a movement of very large numbers of particles (i.e. atoms, molecules)."

In physics applied to sociology, Coleman cites the 1955 work of Stuart Dodd of the Princeton school of social physics.

Social temperature

On the possible of deriving a concept like temperature in sociology, Coleman states the following:

> "If it is possible to have such meaningful and useful aggregate concepts as temperature in thermodynamics, as simply the sum of average molecular level measurements—mean of velocity distribution among molecules—then shouldn't it be just as possible in sociology?"

He answers his own question with: the "answer is generally No" and attempts to give two give reasons, both of which are off in their logic, the gist of which in his view is that humans are not gas molecules.

Education

In 1944, Coleman entered the Navy and during this time spent a year studying engineering at Emory College. After discharge, he then studied chemistry at Indiana University. He then transferred to Purdue University completed his BS in chemical engineering in 1949.

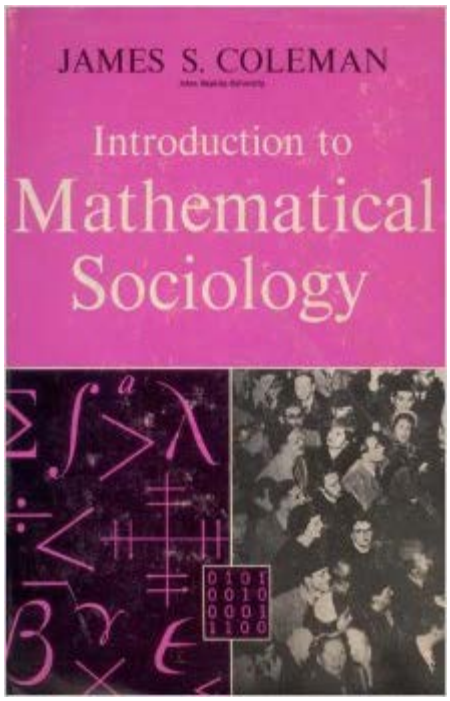

He then when on a belated honeymoon bicycling through France, while there, being supposedly a "voracious reader", reading, in French, a number of banned novels.

He then returned to America to work as a chemical engineer for Eastman Kodak, where he was assigned to work on developing the substratum coating that is applied to film backing to make the film emulsion adhere. Coleman, however, was said to have begun "quickly growing dissatisfied intellectually with this type of work", after which he contemplated returning to graduate school to obtain an advanced degree in physical chemistry.

A joining of a Great Books club, however, worked to realign his career direction, and he realized that the most interesting subject matter of all was people, their relationships, and their social organizations.

Coleman's 1964 *Introduction to Mathematical Sociology*, wherein he applies some chemistry, physics, and thermodynamics. [1]

In 1951, he left Kodak to enter the graduate program in sociology at Columbia University completing his PhD there in 1955 with a dissertation on a political sociology aspect of the New York printer's community. Coleman, in his *Autobiographical Sketch II* (1985), described Emile Durkheim, Adam Smith, and Max Weber as three theorists who influenced his sociological thinking. [4]

He went on to teach sociology at Stanford University, the University of Chicago, and significantly at Johns Hopkins University (1959-1973), becoming chair of department of social relations their as early as 1964. Coleman, in sum, is said to have entered sociology from a job as a chemist at Eastman Kodak with a self-described 'positivist orientation … carried over from the physical sciences', an orientation he was able to polish in courses on the philosophy of science taken under Ernest Nagel. [5]

Entropy as diversity

A noted downside of Coleman's presentation is his statistical applications of entropy, albeit of the Shannon entropy variety generally, to sociology. He derives a function of H and discussed its use by American electrical engineer Claude Shannon, but also "noted the parallel" with the entropy used in physical chemistry by Austrian physicist Ludwig Boltzmann. [2] Coleman, supposedly, introduced an "entropy index" as a measure of diversity defined as:

$$H = -\sum_i p_i \ln p_i$$

Coleman's expression, which is similar in form to Gibbs entropy, is such that for an individual tract, the entropy index refers to the proportion of a racial/ethnic group in a tract multiplied by the log of that proportion and summed over all racial/ethnic groups. For four groups the maximum entropy, or diversity, is 1.386 and zero indicates no diversity, or homogeneity. [3]

References

1. Coleman, James S. (1964). *Introduction of Mathematical Sociology* (chemistry, 8+ pgs; thermodynamics, 7+ pgs; physics, 11+ pgs; entropy, pgs. 87, 441-42). The Free Press.
2. Bailey, Kenneth D. (1990). *Social Entropy Theory* (pgs. 75-76). New York: State University of New York Press.
3. Waldinger, Roger D. and Bozorgmehr, Mehdi. (1996). *Ethnic Los Angeles* (pg. 138). Russell Sage Foundation.
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7. Coleman, James S. (1971), "Theoretical Bases for Parameters of Stochastic Processes", *The Sociological Review*, 19(S1):17-28; in: *The Sociological Review Monograph: Stochastic Processes in Sociology* (free energy, pg. 25; Tukey, 26-27; state, 25-26), Issue 19. Routledge & Kegan Paul.

External links

â— James Samuel Coleman – Wikipedia.

θΔics

In existographies, **James Conant** (1893-1978) was an American organic chemist and philosopher, noted for []

Overview

In 1951, Conant gave a series of Bampton lectures at Columbia University, in area of science, sociology, and philosophy, published as *Modern Science and Modern Man*; the following is an example quote: [1]

> "The theorist who is attempting to 'lower the degree of empiricism' in the material world is now respected."
>
> — James Conant (1952), *Modern Science and Modern Man*

In c.1970s, Conant's views were read by Mirza Beg, who in his work later work on physico-chemical sociology, stated that he too sought to 'reduce empiricism' by a certain degree.

Quotes | On

The following are quotes on Conant:

> "Human behavior an physico-chemical laws seem to be inter-related, but time and again it has been questioned whether the enormously complex processes of human behaviour could have a scientific basis at all. The human organism has a limited dimension and there are a number of actions and reactions taking place within as well as on it and to all of these the Heisenberg's uncertainty principle applies. Thus, it is apparently beyond the range of predictive or reproducible science. This is why researchers, in spite of the limitations, have settled for the limited degree of prediction achieved by science and if we go by **Conant** the most that could be achieved is a reduction in the degree of empiricism (Ñº) in social sciences. The following pages are likewise aimed at reducing empiricism by a certain degree."
>
> — Mirza Beg (1987), *New Dimensions in Sociology* (pgs. vii-viii) [1]

References

1. (a) Conant, James B. (1952). *Modern Science and Modern Man* (Amz). Columbia University Press.
(b) Hahn, Roger. (1952). "Conant, A New Philosopher of Science" (Ñº), The Harvard Crimson", Dec 5.
2. Beg, Mirza. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (intro) (pdf, annotations by Libb Thims, 2014) (pgs. vii-viii). Karachi: The Hamdard Foundation.

Further reading

â— Conant, Jennet. (2017). *Man of the Hour: James B. Conant, Warrior Scientist*. Publisher.

External links

â— James B. Conant – Wikipedia.

θΔics

In thermodynamics, **James Dewar** (1842-1923) was a Scottish physical chemist noted for his low-temperature thermodynamics work in the liquefaction of gases in his quest to reach absolute zero in temperature or close to it. [1]

Education

In 1852, at the age of ten, Dewar fell through ice of a pond after which it took him two years to recover. In retrospect, Dewar commented that this was his most "formative early experience". Extended periods of childhood, adolescent, or teenage convalescence to recover health and strength gradually after sickness or weakness are common to many who would go on to become great geniuses, thinkers, and or inventors.

In 1859, Dewar matriculated at the University of Edinburgh, i.e. the Glasgow school of thermodynamics, in natural philosophy, mathematics, and chemistry. During this period, he designed a brass-and-wood model of Fredrich Kekule's benzene ring, after receiving a copy of this, Kekule invited Dewar to come and work with him.

Chemical thermodynamics

In his 1888 presidential address to the chemical industry society, Dewar gives a fairly decent historical summary of the chemical thermodynamics, citing William Rankine as having done some early outlines, but attributing the proof that thermodynamics is applicable to chemical phenomena to American physicist-engineer Willard Gibbs: [2]

> "In a series of remarkable papers read before the Connecticut Academy, Gibbs has proved that the laws of thermodynamics are as applicable to chemical action as to simple changes of state."

(add discussion)

References

1. Shachtman, Tom. (1999). *Absolute Zero and the Quest for Absolute Cold* (James Dewar, pgs. 125-87). New York: Mariner Books.
2. Dewar, James. (1888). "Presidential Address to the Society of Chemical Industry", *Journal of the Society of the Chemical Industry*, 2: 474-79; in: *The Collected Papers of Sir James Dewar* (thermodynamics, pgs. 312-14).

External links

â— James Dewar – Wikipedia.

θΔics

In hmolscience, **James Eadon** (1968-) or "Jim Eadon" is an English physicist noted for 2001 human molecule poll.

Human molecule | Poll

In 2001, Eadon initiated an online poll “Are You a Giant Molecule?”, which, as of 2009, with over 340 people polled, indicates that about 57% of people "believe" they are a molecule (human molecule) or "giant molecule" as Eadon terms things: [1]

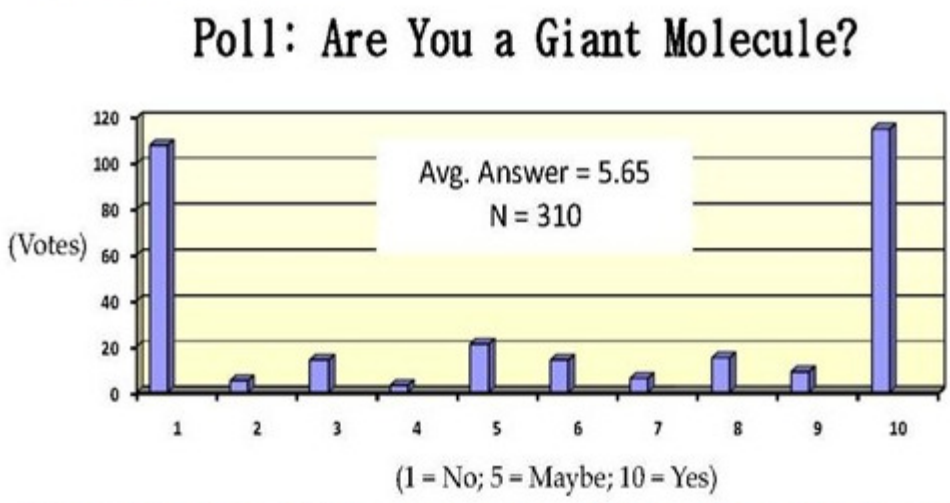

The poll was referenced in the 2008 book *The Human Molecule* by American chemical engineer Libb Thims. [2]

Meta-analysis

Eadon's poll can be compared to Thims' 2005 poll results of 100 Americans on the query: "is love a chemical reaction?", finding that 65.5% of Americans believe that love is a chemical reaction. [5] These, in turn, can be compared to 1992 data by Helen Fisher, which found that about 67% of people believe in love at first sight and 20% fall in love at first sight and marry that person. [6] This can be compared to 2013 polls by Sydnee Stannard of American high school student which found that 62% believe in love at first sight. [7] These related data sets are shown below:

Belief	Percent
Believe humans are giant molecules	57%
Belief love is a chemical reaction	66%
Believe in love at first sight	62% (high school) - 67% (general)

In sum, 63% of people, on average, believe: (a) they are molecule, (b) love is a chemical reaction, and (c) that light (sight) can trigger this reaction. [8]

Education

Eadon completed his BS in physics and MS in solid state physics and computer science from Newcastle Upon Tyne University. [3] Eadon is also the recent inventor of the Culica, a type of Rubic's cube like puzzle game. [4]

See also

â— People are not molecules

References

1. Running Poll: "Are You A Giant Molecule?" (2001-2009+) – Eadon.com.
2. Thims, Libb. (2008). *The Human Molecule* (pg. 69) (preview) (Google Books). Morrisville, NC: LuLu.
3. Jim Eadon (about) – Eadon.com.
4. Culica - Culica.com.
5. Thims, Libb. (2005). "Poll: Is Love a Chemical Reaction?", *Research Project* #4, Chicago: Institute of Human Thermodynamics.
6. Fisher, Helen. (1992). *Anatomy of Love - a Natural History of Mating, Marriage, and Why we Stray* (section: "Love at First Sight", pgs. 49-50). Fawcett Columbine.
7. Stannard, Sydnee. (2013). "Together Forever: High School Relationships", *Knight Life*, 53(3):11.
8. 63% = (57+66+64.5) / 3

External links

â— James Eadon – Google Profiles.
â— James Eadon – Facebook.

θΔics

In hmolscience, **James J. Elser** (c. 1959-) is an American evolutionary ecologist and limnologist noted, in human chemistry, for his 2000 Sterner-Elser human molecular formula.

Overview

In 2000, Elser, together with Robert Sterner, calculated the following 22-element human molecular formula:

$$H_{375,000,000}\ O_{132,000,000}\ C_{85,700,000}\ N_{6,430,000}\ Ca_{1,500,000}\ P_{1,020,000}\ S_{206,000}\ Na_{183,000}\ K_{177,000}$$
$$Cl_{127,000}\ Mg_{40,000}\ Si_{38,600}\ Fe_{2,680}\ Zn_{2,110}\ Cu_{76}\ I_{14}\ Mn_{13}\ F_{13}\ Cr_{7}\ Se_{4}\ Mo_{3}\ Co_{1}$$

They published the result in their 2002 book *Ecological Stoichiometry: the Biology of Elements from Molecules to the Biosphere*. This amounts to a 22-element human empirical molecular formula. [1] A similar 26-element empirical molecular formula calculation was made by American chemical engineer Libb Thims also in 2002. [2]

They conclude "this formula combines all compounds in a human being into a single abstract 'molecule'". They continues, "our main purpose in introducing this formula for the 'human molecule' is to stimulate you to begin to think about how every human being represents the coming together of atoms in proportions that are, if not constant, at least bounded and obeying some rules".

They state that ecological stoichiometry is about "how chemical elements come together to form evolved, living species in ecosystems." The abstraction followed in this science, according to Sterner and Elser, is that "organisms can be thought of as complex evolved chemical substances that interact with each other and the abiotic world in a way that resembles a complex, composite, chemical reaction" and that "ecological interactions invariably involve chemical rearrangements". In summary, they state that "like any other normal chemical rearrangement at the surface of the Earth, when organisms interact, mass must be conserved and elements are neither created nor destroyed." Moreover, "there is stoichiometry in ecology, just as there is in organic synthesis in a test tube".

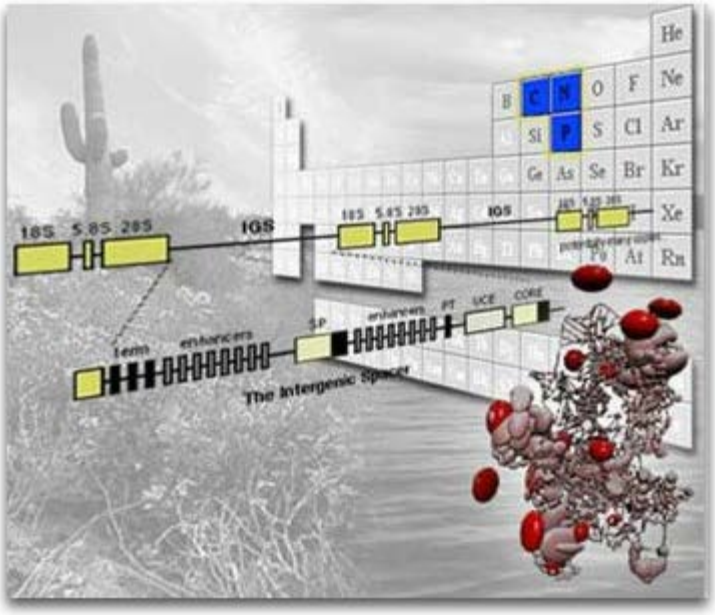

Elser's artistic rendition of ecological stoichiometry: a periodic table of elements overlaid on an ecological area.

Education

Elser completed his BS in biology from the University of Notre Dame in 1981, his MS in ecology from the University of Tennessee in 1983, and his PhD in ecology from the University of California, Davis, in 1990.

References

1. Sterner, Robert W. and Elser, James J. (2002). *Ecological Stoichiometry: the Biology of Elements from Molecules to the Biosphere*, (chapter one), (pg. 3-7, 47, 135). Princeton: Princeton University Press.
2. (a) Thims, Libb. (2008). *The Human Molecule*, (preview). Morrisville, NC: LuLu.
(b) Molecular Evolution Table - Institute of Human Thermodynamics.
(c) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (ch. 2: "The Human Molecule", pgs. 15-35). Morrisville, NC: LuLu.

Further reading

â— Elser, James J. and Hamilton Andrew. (2007). "Stiochiometry and the New Biology: The Future is Now," *PLoS Biol*, Vol. 5(7), July.

External links

â— James Elser (faculty) – Arizona State University.

θΔics

In human thermodynamics, **James K. Ferri** (1975-) is an American chemical engineer noted for his departmental supervision and development of the 2011 student-produced video "Thermodynamics of Life: Occupy Wall Street Edition", made by chemical and biomolecular engineering students Angela Wnek (ChBE, 2013), Isaac Lavine (ChBE, 2014), Ashley Kaminski (ChBE, 2013), wherein, using an impact style of presentation, they apply a number of different molecular, physical chemistry, and chemical engineering principles to the ongoing "Occupy Wall Street" protests taking place worldwide (which are protesting the economic divide), namely what thermodynamics has to say about the fact that about 90 percent of a country's wealth tends to be held in about 10 percent of the population, a phenomenon sometimes referred to as the Pareto principle, 80-20 rule, or Pareto's natural law of wealth, named after French-Italian mathematical engineer Vilfredo Pareto who first studied this phenomenon. [1]

Overview

The video employs: the game version of the laws of thermodynamics (1971); desire (they argue as a fact of existence that people want wealth); Ostwald's ripening (a principle stated in 1896 by German physical chemist Wilhelm Ostwald), a process by which small droplets of one fluid dispersed in another fluid phase shrink at the expense of the growth of the larger droplets, wherein they use a human fluid model and equate rich people to the larger droplets and poor people to the smaller droplets; the Calvin equation, relating actual vapor pressure to saturated vapor pressure; the Ostwald equation:

$$\langle R\rangle^3 - \langle R\rangle_0^3 = \frac{8\gamma c_\infty v^2 D}{9R_g T}t$$

where $\langle R\rangle$ is the average radius of all the particles, γ is the particle surface tension or surface energy, is the solubility of the particle material, *v* is the molar volume of the particle material, *D* is the diffusion coefficient of the particle material, R_g is the ideal gas constant, and *T* is absolute temperature.

They then attempt to tie all this into economics in terms of how things such as one's car breaking down or not getting tuition money, etc., are in affect a type of human molecular "pressure" (human pressure or social pressure) or mediate (field particle) the effect of pressure in one's state of existence.

They then talk about equality, the idealized notion, such as being protested for at the Wall Street Sit-in, that wealth should be spread out more evenly throughout society (such as was done in a failed attempt through communism). The subject of idealized equality of wealth, however, does not corroborate in fields such as racial thermodynamics, integration and segregation thermodynamics, the famous lazy ant study, among other areas of realistic conflict, and the students attempt to address this thermodynamically in the video, such as using the analogy of money (and people as particles) distributions in a container, which is shaken, explaining that such arrangements are inherently unstable (see: stability), on the premise that it is much easier to create bigger droplets by adding energy than it is to create

Ferri's 2011 student-produced thermodynamics of Wall Street video (financial thermodynamics). [1]

smaller droplets, a model which they say is the logic behind the big business bailout plan.

Lastly, the correlate new ideas and inventions in the market place, such as Steve Job's iPad, to droplet growth effects, and how wealth begins to aggregate or accumulate around the new or novel idea, inventor, or producer, similar to liquid aggregation around larger droplets.

Production staff

The student production staff for the "Thermodynamics of Life: Occupy Wall Street Edition" is as follows:

Artwork	Script	Audio	Editing
Ashley Kaminski	Angela Wnek Isaac Lavine	Ashley Kaminski Angela Wnek Isaac Lavine	Angela Wnek

Difficulties on theory

Overall the fast-flow presentation style of the video and theory was fairly advanced and well done in retrospect of the work of 500+ HT pioneers/HP pioneers of the past. A few salient difficulties: one, use of "molar volume" as a unit digs into the large and as of yet unsolved question of the unit of the "hmol" the molar number for one unit of reactive human molecules (such as addressed in the social Avogadro number), wherein questions about single particle thermodynamics or single molecule thermodynamics definitions of extensive and intensive variables in this range come into play.

Second, the overuse of the term "life" in this defining the droplet molecules as being alive, e.g. "it's the circle of life for the molecules", whether metaphorical or not, indirectly assumes or implies the existence or adherence to either (a) the unbridgeable gap model, (b) the emergence model, (c) panpsychism, i.e. that the definition of life extends all the way down do the sub-atomic, or (d) the "life principle" model, all of which are untenable, and thus the over-use of the word "life" leads one into the very large problem-solution of the defunct theory of life, the fact that when one goes searching for the origin of life, i.e. the exact "second" so-called "life" started in the evolution timeline, the theory of life falls apart and erodes, being seen only as a mythological-religious based theory carried over into modern science as sort of unwanted baggage, a theory (that certain molecules are alive, where others are not) that is in fact defunct according to modern hard science, in particular hmolscience.

Education

Ferri completed his BS and PhD in chemical engineering at Johns Hopkins University and currently is head of the chemical and biomolecular engineering department of Lafayette College, Pennsylvania. [3]

References

1. (a) Ferri, James K, Kaminski, Ashley (artwork), Wnek, Angela (script), Lavine, Isaac (script). (2011). "Thermodynamics of Life: Wall Street Edition", YouTube, Oct. 26.
(b) Occupy Wall Street – Wikipedia.
2. Ostwald ripening – Wikipedia.
3. James Ferri (department head) – Chemical and Biomolecular Engineering, Lafayette College, Pennsylvania.

External links

â— Ferri, James K. – WorldCat Identities.

θΔics

In existographies, **James Forbes** (1809-1868) (CR:13) was a Scottish physicist notable for his 1830s publications on the “undulatory theory of heat” and for his influence on Scottish engineer William Rankine, a student of his at Edinburgh University between 1836 and 1838. [1]

Rankine

In 1849, Scottish engineer William Rankine, building on Forbes ideas on heat, gave Forbes a copy of his two-part paper outlining a “molecular vortices” hypothesis of atomic structure and vortex heat generation. Forbes, who was at that time the secretary of the Royal Society of Edinburgh (RSE), sponsored the election of Rankine to the RSE. This brought Rankine into contact with the likes of William Thomson, James Maxwell, Peter Tait, and Rudolf Clausius, among others. [2]

Education

In 1825, Forbes, aged 16, entered the University of Edinburgh, and soon afterwards began to contribute papers to the *Edinburgh Philosophical Journal* anonymously under the signature "Δ", likely in being a pseudonym for a person who is interested in heat (see also: θΔcs). [3] Between 1836 and 1844 he published in the *Trans. Roy. Soc. Ed.* four series of "Researches on Heat".

References

1. Shairp, John C., Tait, Peter G., and Adams-Reilly, Anthony. (2001). *Life and Letters of James David Forbes.* Adament Media Corporation.
2. Smith, Crosbie. (1998). *The Science of Energy: a Cultural History of Energy Physics in Victorian Britain* (pgs. 102-07). University of Chicago Press.
3. Proceedings of the Royal Society of London, vol. XIX, p ii.

External links

â— James David Forbes – Wikipedia.

θΔics

In religio-mythology, **James Forlong** (1824-1904) was a Scottish, road engineer, major general, and religio-mythology and comparative religions scholar noted for his erudite three-volume posthumously-published 1904 *Faiths of Main: an Encyclopedia of Religions*, with some rather impressive etymological entries on terms, such as "Ab", and thinkers, such as Empedocles.

Ab

The following is Forlong's entry on "Ab", the salient root of Anunian theologies, namely the Ab-ra-ham-ic faiths and B-ra-hma-ic faiths, which dominate the belief states of over three-quarters of the modern world: [1]

> **Ab**. This word, in many languages, denotes "father" (as in Akkadian, Turkish, Hebrew, etc.) like the Latin *avus*. With Akkadians also *ab* was "moving water " (compare A) like the Turkish *ab* "wave," and the Aryan *ap* "water." The Babylonian month Ab was called in Akkadian Nene-gar ("fire making"), sacred to "the queen of the spear" (see Quirinus). This was August, but the Akkadian January was called Abba-uddu (" rising flood "). *Ab* "father," and *Ma* "mother," are reversed in many dialects; and *Ab* becomes the Aryan *Pa* and *Pa-pa*, while *Ma* becomes *Am*, and *Urn*, and *Ma-ma*, "the great nurse." Ab, as the father, is the type of "fertility" and of "fruit" (Hebrew *Eb:* see Job viii, 1 2; Dan iv, 12, etc); but the root *abah* signifies "desire."

(add discussion)

Empedocles

The following is Forlong's entry on "Empedocles", the Greek standard model philosopher: [2]

> **Empedokles**. A native of Sicily, about 450 B.C. He was a man of wealth and learning, who embraced the atomic theory of Demokritos (see that heading), and affirmed that all nature evolved under fixed laws, without the interference of the gods. With poetic fancy he spoke of atoms combined or separated through love and hate. He thus anticipated our modern theory, and our discoveries as to attractions and repulsions. He said that unfit combinations endured only for a time, to be succeeded by others, and that matter was but the combination of unalterable and substantial atoms, which he called "the roots of things." He distinguished four elements, fire, air, water, and earth, deified, he said, as Zeus, Hera, Nestis, and Aidoneus. These he supposed to be simple elementary substances, eternal and unalterable, which united mechanically according to properties of attraction and repulsion. He conceived them to be constituted by spheres of pure existence, offering equal resistance in every direction, and embodying the ideas of pure divinity, united by Love. Like the Eleatiks he spoke of a "holy and infinite Spirit passing through the world with rapid thoughts ... an eternal power of Necessity " (see Prof. Brandis. Smith's *Dicty. Gr. and Rom. Biogr.).*
>
> Empedokles insists on good moral conduct, as the best preventive of disease, since all things so follow their natural course. He was extolled as an "averter of evils," and even as a "controller of storms," his disciples saying that he accomplished this miraculously: that he drained marshes, and quelled noxious winds, and epidemics: that he cured strange malignant diseases, and prolonged lives. He was supposed to desire that men should regard him as being an incarnate god. It was an age of varied movements; and Empedokles was acquainted with Anaxagoras, Parmenides, Pausanias, and the Pythagoreans; he was also said to have visited Magi. He believed in transmigrations of souls; and Aristotle places him among the "lonik" physiologists, holding that an existence could as little be supposed to pass into non-existence as that the non-existent could pass into existence, since "from nothing nothing comes." Thus a complete final annihilation (of the universe), is, he said, impossible; and life and death are mere questions of mixture and separation.

(add discussion)

Education

Forlong joined the Indian Army in 1843 later filling various posts including that of Secretary and Chief Engineer to the government of Oudh, during which time his exposure to Indian religions, while doing missionary work, led him to abandon his Christian faith, and to investigate some very heterodox ideas about religious origins, including those of the ancient Hebrews. These found expression, firstly, in his two-volume work of comparative religion, *Rivers of Life*, with its markedly sexual, some would say blasphemous, interpretation of religious rites and symbolism.

The following is a 2008 synopsis of Forlong and his comparative religions encyclopedia: (Q)

> "This 1906 classic of comparative literature, hard to find in print today, was the first English-language project to approach the world's religions from an anthropological perspective. The work of thirty years for Scottish author **James G.R. Forlong** (1824-1904), it was originally published under the now-antiquated title *A Cyclopedia of Religions* and produced at the author's own expense, so strongly did he feel about the need for it despite the reluctance of the publishing houses of the day to produce it. A road engineer by trade, Forlong traveled the world, learning seven languages and becoming an avid amateur student of native culture-his labor of love was gathering, in this three-volume set, a comprehensive, academic knowledge of the totality of human religious belief."

(add discussion)

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Further reading

● Forlong, James. (1883). *Rivers of Life*: *or sources and streams of the faiths of man in all lands showing the evolution of faiths from the rudest symbolisms to the latest spiritual developments* (two-volumes). Publisher.
● Forlong, James. (1897). *Short Studies in the Science of Comparative Religions*: *Embracing all the Religions of Asia*. London: Bernard Quaritch.
● Forlong, James. (1906). *Faiths of Man: A Cyclopædia of Religions, Volume 3: N-Z*. London: Bernard Quaritch.

External links

● James Forlong – Wikipedia.

θΔics

In existographies, **James Frazer** (1854-1941) (RMS:66) was Scottish social anthropologist, noted for his 1915 *The Golden Bough*, a 12-volume treatise on comparative religion and mythology.

Overview

In 1890, Frazer published *The Golden Bough: a Study in Comparative Religion*, in two volumes; in 1906-1915 it comprised twelve volumes, wherein he proposed that mankind progresses from magic through religious belief to scientific thought.

In 1907, Frazer, in his *Adonis, Attis, and Osiris*, starting with Herodotus, summarized the historical views on the Osiris to Dionysus rescript fairly well. [2]

Doug Renselle (c.2000) reasons, in respect to William Sidis, that: "Amy describes incredible visits by Sidis and Sharfman to Paul Saunders' home. Sharfman told Saunders that Sidis was the greatest brain in our USA. Sidis loved Saunders' library. He would browse Saunders' 20 volume *Golden Bough* set with ease and almost as if he knew it all, in parallel, instantaneously. He knew what material was on which page in Saunders' whole set! Sharfman brought to mind a recent movie, *Good Will Hunting*, touched upon briefly in a Harvard link near this page's top." (Q)

In the film *Apocalypse Now* (1979), Frazer's *The Golden Bough*, was one of the reading books (Q) of Colonel Kurtz, along with the Bible and *From Ritual to Romance*. (Q)

Quotes

The following are related quotes:

> "Pareto's *Treatise on General Sociology* is the hardest boiled book I have ever read. Three times, since I passed my puberty, has my mind been made over. Once by a nexus of which Henry Adams was the center, once by a matrix of which **Frazer** (Q) (Q) burned brightest, and once by a long study of genetics and evolution. Pareto is doing the job a fourth time, and far more vitally than any others."
>
> — Bernard DeVoto (1928), personal note reflection [1]

Photo of Frazer's *The Golden Bough*, was one of the reading books (Q) of Colonel Kurtz, along with the Bible and *From Ritual to Romance* (Q), seen in *Apocalypse Now* (1979).

See also

- William James | *The Golden Bowl* (1904)

References

1. Stegner, Wallace E. (2001). *The Uneasy Chair: A Biography of Bernard DeVoto* (course, pg. 82; derivation, pg. 110; §: Seminar on Pareto, pg. 138-43; Pareto, 26+ pgs; three times, pg. 138). University of Nebraska Press.
2. Frazer, James. (1907). *Adonis, Attis, Osiris* (pg. 357). MacMillan.

External links

- James Frazer – Wikipedia.

θΔics

In human chemistry, **James Froude** (1818-1894) (IQ:180|#150) was English clergyman-abnegator turned historian, novelist, biographer, and editor—noted firstly for his 1849 epistolary philosophical novel *The Nemesis of Faith*, in which the following is a noted quote: [6]

> "What is man the wiser or the happier for knowing how the air-plants feed, or how my centuries the flint-stone was in forming, unless the knowledge of them can be linked on to humanity, and elucidate for us some of our hard moral mysteries?"

wherein he came to question his Christian faith in light of early nineteenth century developments in history, theology, and science, which thus drove him to abandon his religious career—and secondly and most-importantly for being the 1854 "anonymous" English translator German polymath Johann Goethe's controversial and dangerous 1809 physical chemistry based novella *Elective Affinities* (see: translations).

In 2013, Irish historian Ciaran Brady, in his *James Anthony Froude: An Intellectual Biography of a Victorian Prophet*, detailed Froude's Spinoza-Goethe ripened mind. [8]

Goethe

Irish historian Ciaran Brady, in his *James Anthony Froude: An Intellectual Biography of a Victorian Prophet*, discusses the Goethe-influence on Froude, speculating on how Froude's personal experience of sexual abuse at Westminster and later over-indulged taste for ladies brought him to place the exploration of the ethics of love, sexual attraction, and sexual conduct at the center of his aim to ferret out a dialogue on practical ethics. Brady, interestingly, shows how the plot of *The Nemesis of Faith* is borrowed from *Elective Affinities*. [8]

Book burning

In 1849, Froude's *The Nemesis of Faith* was famously burned during at Oxford by English moral philosophy professor, semi-rector, and reverend William Sewell. English science historian and philosopher David Knight (2009) summarizes this as follows: [5]

> "**Froude**'s semi-autobiographical *Nemesis of Faith*, published in 1848, owed much to Goethe's novel of human and chemical reactions, *Elective Affinities*, which he translated. *Nemesis* lost him his fellowship at Exeter College, Oxford, where his book was publicly burned."

(add discussion)

Carlyle

Scottish satirical writer, essayist, and historian Thomas Carlyle is noted, in this mix, for being Goethean-disciple Ralph Emerson's (1803-1882) primary guide to German literature; Emerson, in turn, being associated with Froude. [4]

Anonymity

The preface to the collected works set, written by publisher Henry Bohn, states the following: [1]

> "The [translation of] *Elective Affinities* has been executed by a gentleman well known in the literary world, who does not wish his name to appear."

An additional "Publisher's Note" (pg. vi) in 1901 identified the translator as James Anthony Froude. [2] Froude's

biographer Herbert Paul (1905) notes that Froude had “translated *Wilhelm Meister* in 1824, and it was probably at [Carlyle’s] suggestion that Froude translate *Elective Affinities* for Bohn’s Library in 1850”. [3]

Morality | Sin | Laws | Will

In 1849, Froude, in his *The Nemesis of Faith*, digressed in a physical sense on the morality and will as follows:

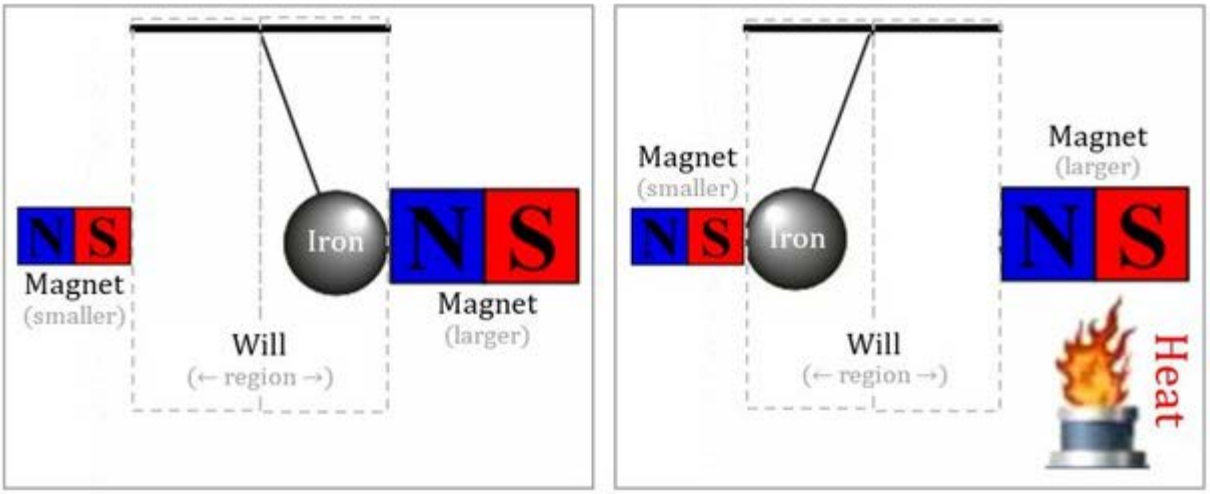

Left: the Froude model of the will (1849), according to which the "will" of the man is "determined" as is the pull of a suspended iron rod to a stronger magnet, similar to the views Arthur Schopenhauer (1844), according to which “sin, as commonly understood, is a chimera”. [10] Right: a diagram showing how the will can be changed by external factors, such as the heating of the one of the magnets, during which, when reaching the Curie point (Ñº) (or Curie temperature) (Ñº), the larger magnet will lose its attractive power, after which the so-labeled “will” of the iron may result to be inclined, in this new system state, to the smaller magnet.

> “The source of all superstition is the fear of having offended god, the sense of something within ourselves which we call sin. Sin, in its popular and therefore most substantial sense, means the having done something to gratify ourselves which we knew, or might have known, was displeasing to god. It depends, therefore, for its essence on the doer having had the power of acting otherwise than he did. When there is no such power there is no sin.
>
> Now let us examine this. In reflecting upon our own actions we find that they arise from the determination of our will, as we call the ultimate moral principle of action, upon some object. When we will, we will something, not nothing. Objects attract or repel the will by the appearance of something in themselves either desirable or undesirable. And in every action, if analyzed, the will is found to have been determined by the presence of the greatest degree of desirableness on the side towards which it has been determined.
>
> It is alike self-contradictory and contrary to experience, that a man of two goods should choose the lesser, knowing it *at the time* to be the lesser. Observe, I say, at the time of action. We are complex, and therefore, in our natural state, inconsistent, beings, and the opinion of this hour need not be the opinion of the next. It may be different before the temptation appear; it may return to be different after the temptation is passed; the nearness or distance of objects may alter their relative magnitude, or appetite or passion may obscure the reflecting power, and give a temporary impulsive force to a particular side of our nature. But, uniformly, given a particular condition of a man's nature, and given a number of possible courses, his action is as necessarily determined into the course best corresponding to that condition, as a **bar of steel suspended between two magnets** is determined towards the most powerful. It may go reluctantly, for it will still feel the attraction of the weaker magnet, but it will still obey the strongest, and must obey. What we call knowing a man's character, is knowing how he will act in such and such conditions. The better we know him the more surely we can prophesy. If we know him perfectly, we are certain.
>
> So that it appears that at the stage first removed from the action, we cannot find what we called the necessary condition of *sin.* It is not there; and we must look for it a step higher among the causes which determine the conditions under which the man acts. Here we find the power of motives depends on the character, or the want of character. If no character be formed, they will influence according to the temporary preponderance of this or that part of the nature; if there be formed character, on the conditions, again, which have formed it, on past habits, and therefore on past actions. Go back, therefore, upon these,

and we are again in the same way referred higher and still higher, until we arrive at the first condition, the natural powers and faculties with which the man has been sent into the world.

Therefore, while we find such endless differences between the actions of different men under the same temptations, or of the same man at different times, we shall yet be unable to find any link of the chain undetermined by the action of the outward circumstance on the inner law; or any point where we can say a power lay in the individual will of choosing either of two courses—in other words, to discover sin. Actions are governed by motives. The power of motives depends on character, and character on the original faculties and the training which they have received from the *men* or *things* among which they have been bred.

Sin, therefore, as commonly understood, is a chimera.

If you ask me why, then, conscience so imperatively declares that it is real? I answer, conscience declares nothing of the kind. We are conscious simply of what we do, and of what is done to us. The judgment may come in to pass sentence; but the judgment is formed on instruction and experience, and may be as wrong in this matter as in any other: being trained in the ordinary theory of morals, it will and must judge according to it; but it does not follow that it must be right, any more than if it be trained in a particular theory of politics, and judges according to that, it must be right. Men obey an appetite under present temptation, to obey which they have before learned will be injurious to them, and which, after the indulgence, they again learn has been injurious to them; but which, at the time, they either expected would, in their case, remit its natural penalty, or else, about which, being blinded by their feelings, they never thought at all. Looking back on their past state of mind, and finding it the same as that to which they have returned when the passions have ceased to work, it seems to them that they knew better, and might have done otherwise. They wish they had. They feel they have hurt themselves, and imagine they have broken a law. It is true they have broken the higher law, but not in the way which they fancy, but by obeying the lower law, which at the time was the stronger.

Our instinct has outrun our theory in this matter; for while we still insist upon free will and sin, we make allowance for individuals who have gone wrong, on the very ground of provocation, of temptation, of bad education, of infirm character. By and by philosophy will follow, and so at last we may hope for a true theory of morals. It is curious to watch, in the history of religious beliefs, the gradual elimination of this monster of moral evil. The first state of mankind is the unreflecting state. The nature is undeveloped, looking neither before nor after; it acts on the impulse of the moment, and is troubled with no weary retrospect, nor with any notions of a remote future which present conduct can affect; and knowing neither good nor evil, better or worse, it does simply what it desires, and is happy in it. It is the state analogous to the early childhood of each of us, and is represented in the common theory of paradise—the state of innocence.

But men had to grow as we grew. Their passions developed rapidly, their minds slowly; but fast enough to allow them, in the interval of passion, to reflect upon themselves, to generalise, and form experience; and, acquiring thus rudimental notions of laws from observing the tendency of actions, men went through what is called the "fall"; and obtained that knowledge of good and evil which Schiller calls "ein Kiesen Schritt der Menscheit" ["a gravel step of humanity"]. Feeling instinctively that the laws under which they were, were not made by themselves, but that a power was round and over them greater than themselves, they formed the notion of a lawgiver [see: Critias hypothesis], whom they conceived they could please by obedience to the best they knew, and make angry by following the worse. It is an old remark, that as men are, such they paint their gods; and as in themselves the passionate, or demonic nature, long preponderated, so the gods they worshiped were demons like themselves, jealous, capricious, exacting, revengeful, the figures, which fill the old mythologies, and appear partly in the Old Testament. They feared them as they feared the powerful of their own race, and sought to propitiate them by similar offerings and services."

(add discussion)

Quotes

The following are related quotes:

> "Goethe is the most remarkable person the world has seen for centuries."
>
> — James Froude (1846), "Goethe's *Faust*" [7]

> "I know but one man, of more than miserable intellect, who in these modern times has dared defend eternal punishment on the score of justice, and that is Leibnitz; a man who, if I know him rightly, chose the subject from its difficulty as an opportunity for the display of his genius, and **cared so little for the truth** that his conclusions did not cost his heart a pang, or wring a single tear from him. And what does Leibnitz say? That sin, forsooth, though itself be only finite, yet, because it is against an Infinite Being, contracts a character of infinity, and so must be infinitely punished. It is odd that the clever Leibnitz should not have seen that a finite punishment, inflicted by the same Infinite Being, would itself of course contract the same character of infinity."
>
> — James Froude (1849), *Nemesis of Faith* (Letter 2) (Ñº)

> "High original genius is always ridiculed on its first appearance; most of all by those who have won themselves the highest reputation in working on the established lines. Genius only commands recognition when it has created the taste which is to appreciate it."
>
> — James Froude (c.1855) (Ñº)

> "To deny the freedom of the will is to make morality impossibility."
>
> — James Froude (1871), "Calvinism", Mar 17 [9]

References

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2. Glass, Derek, Bell, Matthew, and Jones, Martin H. (2005). *Goethe in English: a Bibliography of the Translations in the Twentieth Century* (pg. 233). MHRA.
3. Paul, Herbert W. (1905). *The Life of Froude* (pg. 68). C. Scribner's sons.
4. (a) Thomas Carlyle – Wikipedia.
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5. (a) Knight, David. (2009). *The Making of Modern Science: Science, Technology, Medicine and Modernity: 1789-1914* (Elective Affinities, pgs. 29, 184, 255). Polity Press.
(b) David M. Knight (faculty) – Durham University.
6. (a) Froude, James. (1849). *The Nemesis of Faith* (pg. 86). London: John Chapman.
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7. (a) Froude, James. (1846). "Goethe's *Faust*", *Oxford and Cambridge Review*, 2:1-23.
(b) Brady, Ciaran. (2013). *James Anthony Froude: An Intellectual Biography of a Victorian Prophet* (pg. 130). Oxford

University Press.
8. (a) Brady, Ciaran. (2013). *James Anthony Froude: An Intellectual Biography of a Victorian Prophet* (Elective Affinities, 6+ pgs; Goethe, 30+ pgs; plot borrowed, pg. 154). Oxford University Press.
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10. Froude, James. (1849). *The Nemesis of Faith* (pgs. 90-95). London: John Chapman.

Further reading

â— Brady, Ciaran. (2013). *James Anthony Froude: An Intellectual Biography of a Victorian Prophet* (Elective Affinities, 6+ pgs; Goethe, 30+ pgs). Oxford University Press.

External links

â— James Anthony Froude – Wikipedia.

θΔics

In hmolscience, **James Gleick** (1954-) (CR=27) is an American science writer noted for his 1987 *Chaos: Making a New Science*, which worked to popularize chaos and complexity theory as the new ontic opening pop theory of emergence-based meaning into the 1990s; which, to note, is similar to how Ilya Prigogine sold far-from-equilibrium bifurcation-based pop theory of meaning in the 1980s.

Chaos | Lunch mob argument

In 1990, Gleick, in a talk at Gustavus Adolphus College, Minnesota, said the following: [1]

> "Chaos is anti-reductionist. This new science makes a strong claim about the world: namely, that when it comes to the most interesting questions, questions about order and disorder, decay and creativity, pattern formation and life itself, the whole cannot be explained in terms of the parts. There are fundamental laws about complex systems, but they are new kinds of laws. They are laws of structure and organization and scale, and they simply vanish when you focus on the individual constituents of a complex system—just as the psychology of a lynch mob vanishes when you interview individual participants."

(add discussion)

In 1992, American physicist Steven Weinberg cited Gleick and his lynch mob argument of an example of someone lost in self-delusions about holism: [2]

> "The question of **emergence**: is it really true that there are new kinds of laws that govern complex systems? Yes, of course, in the sense that different levels of experience call for description and analysis in different terms. The same is just as true for chemistry as for chaos. But *fundamental* new kinds of laws? Gleick's lynch mob provides a counterexample."

(add discussion)

References

1. (a) Gleick, James. (1990). "Closing Address", Nobel Conference, Gustavus Adolphus College, Minnesota, Oct.
(b) Weinberg, Steven. (1992). *Dreams of a Final Theory: the Scientist's Search for the Ultimate Laws of Nature* (pgs. 60, 290). Random House.
2. Weinberg, Steven. (1992). Weinberg, Steven. (1992). *Dreams of a Final Theory: the Scientist's Search for the Ultimate Laws of Nature* (pg. 62). Random House.

Further reading

â— Gleick, James. (1992). *Genius: The Life and Science of Richard Feynman*. Pantheon Books.
â— Gleick, James. (2003). *Isaac Newton*. Vintage.

External links

â— James Gleick – Wikipedia.

θΔics

In existographies, **James Haught** (1932-) (FA:125) is an American newspaper editor turned free inquiry writer and religious and atheist historian, noted for his 1996 book *2000 Years of Disbelief: Famous People with the Courage to Doubt* (see: Haught disbeliever), wherein he pens out a decent historical of famous atheists. [1]

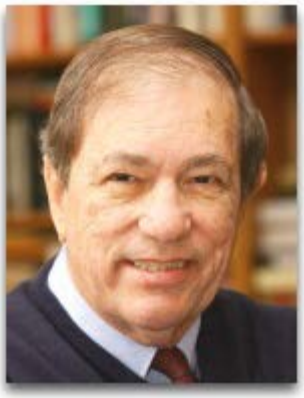

Beliefs

Haught is a pro-atheism writer, a self-classified "skeptic and agnostic" and or a “skeptic” (2012), when confronted with god-talking Unitarian preachers. (O), who is a member of the Unitarian church.

Overview

The following is a circa 2000 description of Haught: [3]

> “Editor of the Charleston Gazette in West Virginia, Haught has spent more than 50 years as an investigative journalist, columnist, and author. A self-proclaimed skeptic and agnostic, Haught writes and lectures frequently on religious topics, particularly injustices and atrocities committed in the name of religion, and the scientific debunking of supernatural claims. He is the author of five books, including: *Holy Horrors: An Illustrated History Of Religious Murder and Madness*; *Holy Hatred: Religious Conflicts Of The '90s*; and *2000 Years of Disbelief*, a paean to freethinkers, atheists, and religious doubters. Haught also serves as a senior editor at *Free Inquiry* magazine, published by the Council for Secular Humanism.”

In 2007, Haught, in his personal webpage, described himself as follows: [2]

> “I’m in a quest for mental honesty. I'm an old newspaper editor who has spent half a century chronicling social struggles and cultural tides. Personally, I've waged a long crusade for rational, scientific thinking as an antidote for harmful supernaturalism. I've written seven books and many magazine articles against religion, astrology, mysticism, psychic claims, cults, ‘New Agery’, fundamentalism, and other magical beliefs. Although billions of people pray to invisible gods, there's no actual evidence of deities and devils, heavens and hells, spirits and prophecies, etc. They're just imaginary, as far as a sincere inquirer can tell. So, to me, the only honest viewpoint is the humanist one, which doubts the supernatural and focuses on improving human life. This web site contains some of my skeptical pieces - plus others on science, sailing, sex, serenity, the joy of nature, and the meaning of life (or lack thereof). You're free to read, download, print out, circulate or reprint any of these materials.”

Haught currently is editor emeritus of the West Virginia newspaper *The Charleston Gazette-Mail*.

Quotes | Favorite

The following are Haught’s favorite quotes:

> “Man is certainly stark mad; he can’t make a worm, yet he can make gods by the dozen.”
>
> — Michel Montaigne (c.1570) [2]

> “Religion is all bunk.”
>
> — Thomas Edison (c.1900) [2]

Quotes

The following are representative quotes:

> "During a recent evolution showdown, a visiting "creation scientist" from California repeatedly challenged me to debate, because I support the teaching of evolution. A Charleston talk radio host blistered me on the air because I would not come on his show and quarrel with the creationist professor. But I felt it would be silly for me to argue about his supernatural beliefs. After all, I would not debate a Scientologist who asserts that all human souls are 'thetans' from another planet. And I would not quarrel with a Unification Church member's claim that Jesus appeared to Master Moon and told him to convert all people as "Moonies." And I would not dispute a Mormon's belief that Jesus visited prehistoric America. And so on, and so on. Let them all believe whatever they want. It is pointless to go on radio shows and wrangle over mystical claims. However, such claims must not be imposed on captive children in government-owned schools. That is prohibited by the separation of church and state, a core principle in the First Amendment in America's Bill of Rights."
>
> — James Haught (c.1994), *Source* [3]

> "Is religion a force for good? The evidence of history and the evidence of current events cast doubt on the truism."
>
> — James Haught (c.1994), *Source* (Q)

> "Challenge supernaturalism in all its forms, from religion to Ouija boards."
>
> — James Haught (2007), webpage header quote [2]

References

1. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§: George Santayana, pgs. 228-30). Prometheus.
2. James Haught (about) – Wvinter.net.
3. James Haught (about) – TheInfidels.org.

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- Haught, James A. (1990). *Holy Wars: an Illustrated History of Religious Murder and Madness*. Prometheus.
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External links

- James A. Haught (publications) – Wvinter.net.
- James A. Haught (about) – UUHumanistSymposium.com.
- James A. Haught – WorldCat Identities.
- James A. Haught – Infidels.org.
- James A. Haught – CelebAtheists.com.

θΔics

In existographies, **James Hutton** (1726-1797) (IQ:170|#350) (Murray 4000|#2ES) was a Scottish geologist, noted for 1785 *Theory of the Earth*, wherein he disabused six day creation myth, replacing it with "laws observable in the composition, dissolution and restoration of land upon the globe".

Overview

In 1785, Hutton, in his *Theory of the Earth: an Investigation of the Laws observable in the Composition, Dissolution, and Restoration of Land upon the Globe*, which in the years to follow allowed his "disciples to remove the assumption that six thousand years was the age of this planet", which, according to Norman Dolloff (1975), was a "relaxation [that] gave Darwin the lever to pry biology loose from religion." [1]

Quotes | On

The following are quotes on Hutton:

> "Black was a friend and supporter of **James Hutton** the geologist, whose 'uniformitarian' doctrine, which lays down that in attempting to account for the nature of the earth's surface we must assume that no agency acted in the past that we cannot actually observe at work today: frost, rain, wind, avalanche, deposition of silt, earthquakes and volcanoes, coastal and river erosion, etc., which represented an application of positivist principles to the new science of geology."
>
> — Donald Caldwell (1971), *From Watt to Clausius* (pgs. 35-36)

Quotes | By

The following are quotes by Hutton:

> "The past history of our globe must be explained by what can be seen to be happening now. No powers are to be employed that are not natural to the globe, no action to be admitted except those of which we know the principle."
>
> — James Hutton (1785), "Theory of the Earth" [1]

> "There is no vestige of a beginning, no prospect of an end."
>
> — James Hutton (1785), "Theory of the Earth" (pg. 96) [1]

> "Man is made for science; he reasons from effects to causes, and from causes to effects; but he does not always reason without error. In reasoning, therefore, from appearances which are particular, care must be taken how we generalize; **we should be cautious not to attribute to nature, laws which may perhaps be only of our own invention**."
>
> — James Hutton (1785), "Theory of the Earth" (pg. 65) [1]

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1. Hutton, James. (1785). "Theory of the Earth: an investigation of the laws observable in the composition, dissolution and restoration of land upon the globe" (Q), *Transactions of the Royal Society of Edinburgh*. Publisher.
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- Hutton, James. (1795). *Theory of the Earth: with Proofs and Illustrations: Volume Three*. Publisher, 1899.
- Repcheck, Jack. (2010). *The Man Who Found Time: James Hutton and the Discovery of the Earth's Antiquity*. Publisher.

External links

- James Hutton – Wikipedia.

θΔics

In hmolscience, **James Hyslop** (1854-1920) was an American abnormal psychologist noted, in cessation thermodynamics, for his 1918 discussions about energy and afterlife.

Overview

In 1918, Hyslop, in his *Life After Death: Problems of the Future and its Nature*, discussed the conservation of energy in the context of death and afterlife; the following being a representative example: [1]

> "The consequence of [conservation of energy] is that survival after death would be absolutely assured on any such view as is usually held of conservation and the only escape from it would be to question the truth of conservation of energy or to deny the causal relation between physical and mental phenomena."

(add discussion)

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1. Hyslop, James H. (1918). *Life After Death: Problems of the Future and its Nature* (conservation of energy, pgs. 34, 171-74). E.P. Dutton & Co.

External links

â— James H. Hyslop – Wikipedia.
â— James Hyslop – The Red Pill wiki.

θΔics

In existographies, **James Jeans** (1877-1946) (CR:18) was an English mathematical physicist who worked in astronomy, thermodynamics, heat, and radiation, noted, in hmolscience, for a number of physics-based philosophical conjectures, implications, and summaries.

Thermodynamics | Life

See main: Jeans, Donnen, Guggenheim debate

In 1933, Jeans, in his *The New Background of Science*, an expansion of his 1931 book *The Mysterious Universe*, argues that inanimate matter obeys the second law of thermodynamics implicitly, but life succeeds in evading the second law in varying degrees. Jeans even argues that this is what defines life: [1]

> "In fact it would seem reasonable to define life as being characterized by a capacity for evading this law. If probably cannot evade the laws of atomic physics, which are believed to apply as much to the atoms of a brain as to the atoms of a brick, but it seems able to evade this statistical laws of probability. The higher the type of life, the greater is its capacity for evasion."
>
> — James Jeans (1933), *The New Background of Physics* (pg. 280)

Jeans, in his work, made occasional reference to god stating, for example, that: "from the intrinsic evidence of his creation, the Great Architect of the Universe now begins to appear as a pure mathematician." This may explain his objection to governance of the second law and life. Jeans argues further that the higher the type or form of life, the greater its capacity for evasion, and that these observed evasions resemble the results that would be produced by an army of sorting demons, so much so that "it would seem permissible to conjecture that life operates in some similar way." Romanian mathematician Nicholas Georgescu-Roegen cites this violation of the second law view in his 1971 *The Entropy Law and the Economic Process*, by stating that "the thought that life may be characterized by a capacity for evading this law [as professed by Jeans], once generally denounced as sheer obscurantism, is now endorsed by almost every authority in physico-chemistry." [2]

Free will

In 1942, Jeans, in his *Philosophy and Physics*, cites Benedict Spinoza as saying: [3]

> "A stone in the air would think itself free if it could forget the hand that had thrown it."

Jeans, after discussing Rene Descartes, summarizes that "free will is only our name for unconscious determinism." Jeans also states:

> "Modern philosophy has come to the conclusion that there is no real alternative to determinism, with the result that the question now discussed is no longer whether we are free but why we think we are free."

(add)

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External links

â— James Hopwood Jeans – Wikipedia.
â— James Jeans (summary) – Mac Tutor Biography.

θΔics

In existographies, **James Johnstone** (1870-1932) (CR:45) was an English oceanographer and experimental biologist noted, in evolution thermodynamics, for his 1914 to 1921 publications wherein he treated an organism as physio-chemcial mechanism, and therein digressed into philosophical discourse.

Overview

In 1914, Johnstone, in his *The Philosophy of Biology*, discussed the nature of the mechanism of life in relation to thermodynamics. On thermodynamics and subjects such as table-rapping, spooks, the planchette, etc., Johnstone concludes that:

> "The law of conservation applies to some things and not to others, and the things which it does not apply are unreal."

In 1921, Johnstone, in his *The Mechanism of Life in Relation to Modern Physical Theory*, built on the thermodynamics of Scottish physicist William Thomson and the evolutionary logic of French philosopher Henri Bergson, to postulate that if the universe has existed for eternity than the existence of life must confirm that sometime in the past the second law of thermodynamics must have reversed itself; the following is an example view:

> "In living processes, the increase of entropy is retarded."
>
> — James Johnstone (1921), *The Mechanism of Life* (pgs. 217-21); cited by Alfred Lotka (1922) in "Contributions to the Energetics of Evolution" (pg. 149)

In this work, Johnstone was speculative about the physical chemistry implications of free will vs. determinism, concluding that the question is meaningless, because the mind cannot be measured. [1]

In 1932, Johnstone, in *Philosophy*, penned "Entropy and Evolution"; the abstract of which is as follows: [6]

> "The conception of entropy came from the theoretical study of the steam-engine, and, neglecting refinements of mathematical treatment, can easily be illustrated. The motive power of the engine comes from the transformation of the heat generated by the combustion of the fuel. The mechanism transforms the kinetic energy of the molecules of heated steam into the kinetic energy of the parts of the engine. Consider a steamship under way: for a brief period of time this can be regarded as an automatic physical system. Some of the heat conveyed by the steam transforms directly into mechanical energy and some passes out into the ocean in the condenser water. We take the latter fraction: in the boiler there is a certain quantity, Q1, at a temperature of, say, 200°C, that is, 473° absolute, and its entropy is simply Q1/473° ab. The same quantity passes out into the ocean where its temperature falls to, say, 10°C, or 283° ab., and its entropy is now Q1/283° ab. Plainly the former quantity of entropy is less than the latter, so that in the transformation of heat into mechanical energy entropy has increased. The conception has been generalized so as to include all forms of energy and all physical transformations, and it can be shown that in all physical events that occur of themselves entropy increases. The conception includes these notions: (1) Available and unavailable energy; (2) greater or lesser improbability of the elements of the systems contemplated; and (3) the physical meanings of before and after."

(add)

Animate engines and working substance

Johnstone has the view that the steam engine is an "inanimate engine" (inorganic engine) and that life, e.g. a plant or an animal, is an "animate engine" (organic engine). On this model, he correctly explains how in the steam engine there is a boiler or the hot body, that the water is the working substance, and how the condenser is the cold body.

In extrapolating this model to animals, Johnstone arrives at the correct view that the heat from the sun is the hot body, but incorrectly concludes that the mass of chemical compounds, namely taken up from the soil in plants roots and animal digestion (water, carbonic acid, and nitrate) is the working substance, and that radiated heat, to the atmosphere is the condenser, so to speak.

In the correct view, however, nutrients are substrate, catalyst, or activation energy factor, not the body of the working substance. He states incorrectly that following excretion, the working substance is has become degraded in respect to the energy it contained.

Life and reversals of the second law

In relation to evolution and life, Johnstone states "we are convinced that an evolutionary process that has occurred", and that "we cannot think of a time in the past when the universe did not exist". On this basis, to account for the existence of "human and animal minds" (which he associates with a retardation in the increase of entropy), Johnstone reasons: [1]

> "We are compelled to postulate that somewhere or other, or some time or other, the second law of thermodynamics must reverse itself … otherwise we shall be compelled (as Sir William Thomson was) to postulate a beginning, or creation."

Curiously, this 1921 theory is very similar to American mathematical prodigy William Sidis' thermodynamics of life theory, found in his 1920 treatise *The Animate and the Inanimate* (published in 1925), where he, similarly on the logic of Thomson, that

> "Reversals of the second law are a regular phenomenon, and [they are identified] with what is generally known as life." [3]

In 1914, on the relation between entropy, mechanism, and life, Johnstone stated: [2]

> "Entropy is a shadowy kind of concept, difficult to grasp … but again, we may point out that, the reader who would extend the notion of mechanism into life simply *must* grasp it."

Yet, by 1921, Johnstone stated:

> "The concept which is special to the organism is one which involves the reversal of the second law of thermodynamics."

It would seem logical, therefore, to conclude that this Sidis-Johnstone reversal of the second law theory of life, must have an earlier theorist?

Influences

Johnstone's publications were influential to American physical chemist and mathematician Alfred Lotka and his 1922 articles "Contribution to the Energetics of Evolution", "Natural Selection as a Physical Principle", and his 1924 book *Elements of Physical Biology*. In commentary on Johnstone's entropy retardation logic, in particular that "in living

processes, the increase in entropy is retarded," Lotka states tells us "he points out that this is true, primarily, of plants; but that among animals also natural selection must work toward the weeding out of unnecessary and wasteful activities, and thus toward the conservation of free energy, or, what amounts to the same thing, toward retarding energy dissipation." [4]

Education

Early in his career Johnstone a professor of oceanography at the University of Liverpool. He later became head of department in 1919 remaining in the position into his death. Johnstone was involved in the formation of the Journal of Experimental Biology, formed between 1923 and 1929. [5]

Quotes | By

The following are noted quotes:

> "An organism is a physico-chemical mechanism."
>
> — James Johnstone (1914), *The Philosophy of Biology* (pg. 49)

> "Entelechy does not cause chemical reactions to occur."
>
> — James Johnstone (1914), *The Philosophy of Biology* (pg. 329)

See also

â— Johnstone-Pavlovich rule

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(b) Paulist Fathers. (1922). "Book Review: *The Mechanism of Life in Relation to Modern Physical Theory*", (pgs. 694-95). *Catholic World.*
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θΔics

In existographies, **James Joule** (1818-1889) (IQ:180|#167) (Murray 4000:16|P) [Kanowitz 50:17] [Cropper 30:3|T] (GPE:28) [CR:120] was an English engineer and physicist noted for his experiments in the determination of the mechanical equivalent of heat, one of the precursors to the logic behind both the first and second law of thermodynamics. Joule was the son of a wealthy brewer who was tolerant enough of the scientific interests of his son to furnish him with a home laboratory, in which his elaborate experiments on the inter-conversion of forms of energy, from heat, gravitational, to mechanical, to electric, etc., were conducted. [1]

Mechanical equivalent of heat

See main: *Mechanical equivalent of heat*

Into the late 1830s, while working by day as a brewer, Joule, at night, was said to have been searching for the appropriate principles of the construction of an electromagnetic engine that would rival the steam engine with respect to commercial efficiency. By 1841, however, he realized that the inherent limitations of the electric motor would not allow it to outperform the steam engine; this setback, it is said, is what prompted him to consider the interrelationships between heat and electricity. [7]

In the early 1840s, Joule repeated British chemist and physicist Humphry Davy's famous 1799 ice-rubbing experiments, which showed that ice cubes rubbed together in a room colder than the freezing point of water can be made to melt, a result which conflicted with the caloric theory, and began to extrapolate this principle to various other work-producing experiments, such as chemical, mechanical, and electrical.

In his 1843 paper "On the Caloric Effects of Magneto-Electricity, and on the Mechanical Value of Heat", Joule refuted the caloric theory, by showing that current generated heat and that heat was not a substance, but a "state of vibration" that could be "induced by an action of a simple mechanical character." [4]

In 1843, Joule summarized his overall objective and theory by stating that:

> "I shall lose no time in repeating and extending these experiments, being satisfied that the grand agents of nature are … *indestructible*; and that wherever mechanical force is expended, an exact equivalent of heat is *always* obtained."

In total, Joule would eventually go on to complete 65 separate experimental trials, in a great variety of ways, contraptions, and arraignments, whereby heat can be made from work or work from heat.

The best known calculation for the mechanical equivalent of heat was Joule's famous "water paddle experiment", that performed in Jun 1845, wherein the falling weight was attached to wound rope to a wooden paddle-wheel immersed in a tub of water. When the

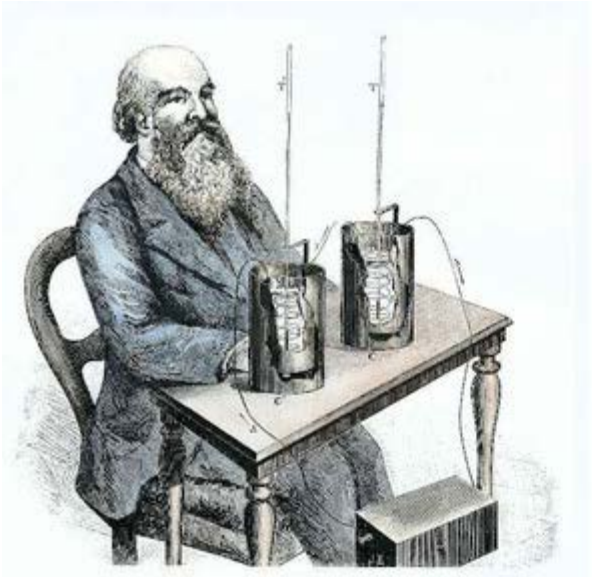

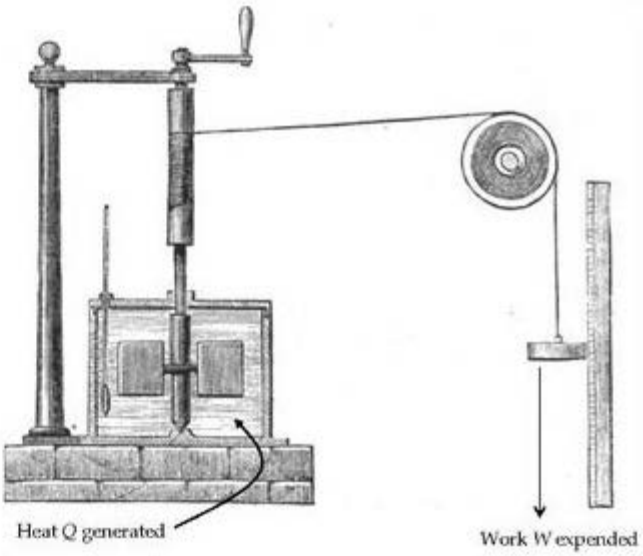

Left: **Joule** doing one of his mechanical equivalent of heat experiments: measuring the conversion of electrical energy into heat, as measured by a thermometer. Right: engraving of **Joule**'s 1843 apparatus for measuring the mechanical equivalent of heat, from an 1869 issue *Harper's New Monthly Magazine*. [3]

weight fell, the paddle wheel turned, causing agitation in the water and as a result a temperature increase. [2] The depiction shown adjacent is an engraving of Joule's apparatus for measuring the mechanical equivalent of heat. [3]

In Joule's famous 1845 paper, entitled "On the Mechanical Equivalent of Heat", he published the value *A* for the amount of work *W* required to produce a unit of heat *Q*. Joule contended that motion and heat were mutually interchangeable and that in every case, a given amount of work would generate the same amount of heat, regardless of the process. [2]

Joule's second law

See main: Joule's second law

In 1844, Joule, in his "On the Changes of Temperature produced by the Rarefaction and Condensation of Air", stated the following summary, in respect to his two previous mechanical equivalent of heat experiments:

> "The mechanical equivalents of heat derived from the foregoing experiments were so near 838 lbs, the result of magnetical experiments in which 'latent heat' could not be suspected to interfere in any way, as to convince me that the heat evolved was simply the manifestation, in another form, of the mechanical power expended in the act of condensation."
>
> — James Joule (1844), "On the Changes of Temperature produced by the Rarefaction and Condensation of Air" (pg. 180) [10]

after which, he then reported on two experiments, wherein he used two strong connecting copper vessels, and calorimeter, with double walls, designed to accommodate the two vessels, as shown below, wherein after evacuating one container, with an air pump (vacuum pump), leaving the other filled with gas, then opened the valve, and calculated the change in temperature in the water of the calorimeter: [10]

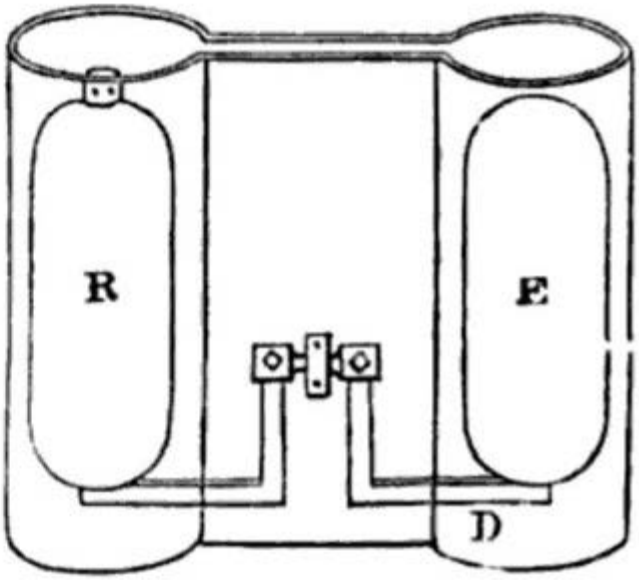

He then repeated this experiment, but this time by putting each copper vessel in its own calorimeter, so to ascertain a unique temperature change for each:

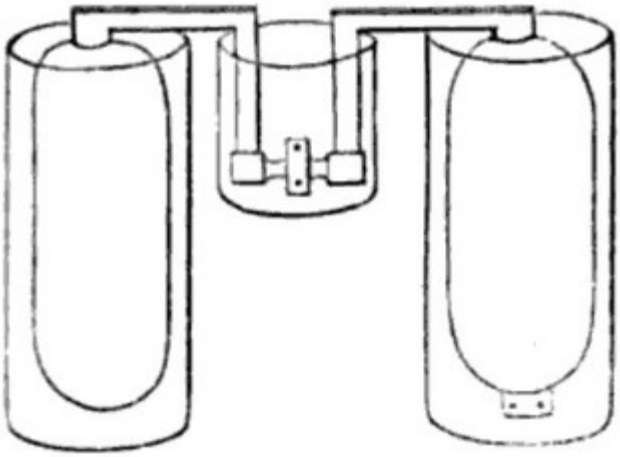

These two experiments enabled him to prove that when a “perfect gas” expands without doing work its “internal energy” remains unchanged.

BAAS meeting

Joule was brought into the famous “thermodynamics” circle when in 1847 he gave a short presentation on an improved version of his paddle wheel experiments to the British Association for the Advancement of Science.

The meeting was attended by Irish-born Scottish physicist William Thomson, along with his friend Gabriel Stokes, during which they watched Joule exhibit his paddle wheel, wherein he demonstrated how fluid friction generated heat.

After the meeting, the two approached Joule and began a discussion with him. William and his brother James Thomson would later comment that the Joule's data would "unsettle" anyone steeped in the Carnot-Clapeyron version of heat, particularly the datum that heat could be generated by friction of fluids in motion. [9] Thomson, prior to his encounter with Joule, is said to have imbibed from Carnot the caloric theory logic that: [8]

> “Heat is a substance, invariable in quantity, not convertible into any other element, and incapable of being generated by any physical agency.”

The followup publications of Thomson (1848, 1849), in turn, resulted to communicate Joules' work to German physicist Rudolf Clausius, who would use this his experimental data to found the science of thermodynamics (1850-1865). [7]

Religion | Niagara Falls

See main: Niagara Falls; See also: Thermodynamics anecdotes

Joule’s draw to experimentation, much of it done at the family brewery, was such that Joule rarely left home without scientific apparatus. Indeed, while visiting a waterfall with his wife on their honeymoon in 1847, he produced a thermometer with which to measure the change in the temperature of the water as it fell. [5]

The underlying motives behind the anecdote becomes apparently clear from a Joule’s 1847 lecture “On Matter, Living Force, and Heat”, read at the reading room of St. Ann’s Church, in which he explains that the measure of the mechanical equivalent of heat created by the friction of the wind and agitation of the water gives experimental proof for the story of genesis as described in the Bible, to the effect that God’s powers have been conserved, so to speak, or something to this effect over the "last 4000 to 6000 years" since the creation of the universe.

In other words, the need to take the measurements on his honeymoon were out of a need to find an experimental proof for the story of genesis and hence the existence of God. [6]

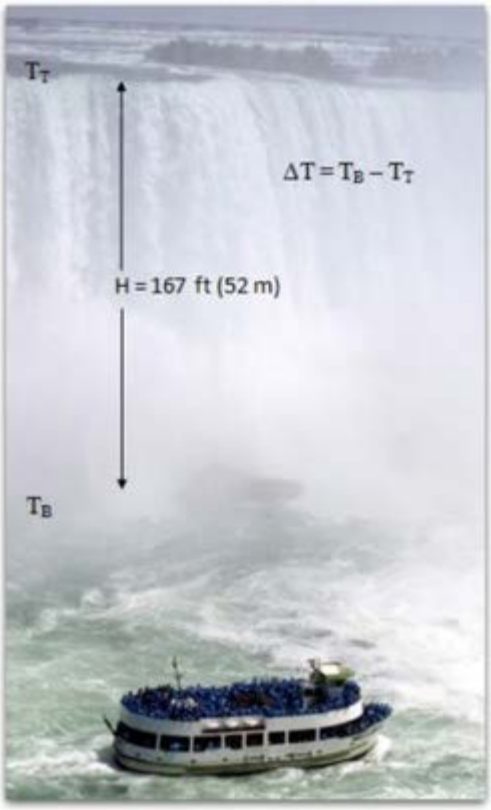

Joules' famous 1847 Niagara Falls honeymoon experiment, where he measured the mechanical equivalent of heat; an indirect motive of which was to find experimental proof for the genesis theory of creation, as described in the Bible.

Quotes | By

The following are quotes by Joule:

> “The mechanical equivalents of heat determined by the various series of experiments given in this paper are 823, 795, 820, 814, and 760. The mean of the last three, which I take as least liable to error, is 798 lb., a result so near 838 lbs, the equivalent which I deduced from my magnetical experiments, as to confirm, in a remarkable manner, the above explanation of the phenomena described in this paper, and to afford a new and, to my mind, powerful argument in favor of the ‘dynamical theory of heat’ which originated with Bacon, Newton, and Boyle, and has been at a later period so well supported by the experiments of Rumford, Davy, and Forbes.”
>
> — James Joule (1844), “On the Changes of Temperature produced by the Rarefaction and Condensation of Air” (pg. 187) [10]

> “The principles I have adopted lead to a theory of the steam-engine very different from the one generally received, but at the same time much more accordant with facts. It is the opinion of many philosophers that the mechanical power of the steam-engine arises simply from the passage of heat from a hot to a cold body, no heat being necessarily lost during the transfer. This view has been adopted by Clapeyron in a very able theoretical paper, of which there is a translation in the Third part of Taylor's Scientific Memoirs. This philosopher agrees with Carnot in referring the power to vis viva developed by the caloric contained by the vapor in its passage from the temperature of the boiler to that of the condenser. I conceive that this theory,

however ingenious, is opposed to the recognized principles of philosophy, because it leads to the conclusion that vis viva may be destroyed by an improper disposition of the apparatus."

— James Joule (1844), "On the Changes of Temperature produced by the Rarefaction and Condensation of Air" (pg. 188)

"The height of the pulleys from the ground was twelve yards, and consequently, when the weights had descended through that distance, they had to be wound up again in order to renew the motion of the paddle. After this operation had been repeated sixteen times, the increase of the temperature of the water was ascertained by means of a very sensible and accurate thermometer."

— James Joule (1845), "On the Existence of an Equivalent Relation between Heat and the Ordinary Forms of Mechanical Power" (Ñº)(Ñº)

"It was from **Dalton**'s instruction, that I first formed a desire to increase my knowledge of original research."

— James Joule (c.1870), *Publication*

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â— James Joule – Eric Weisstein's World of Scientific Biography.

θΔics

In existographies, **James Joyce** (1882-1941) (GLA:12|43+) was an Irish writer noted for his 1915 characterizations of beauty and truth, in his *A Portrait of the Artist as a Young Man*, for his 1922 *Ulysses*, the mechanics of which are said to be based on a "fairly Newtonian model", in which he uses scientism of his age as a mode of psychological insight and character development, and for his 1939 *Finnegans Wake*, from which the term "quark" derives. [1]

Influence

Joyce was said to have been influenced by Otto Weininger. [4]

Quarks

In particle physics, American physicist Murray Gell-Mann, as a ten year old read Joyce's notoriously difficult *Finnegans Wake*, and would later name the subatomic particles of the nucleid, protons and neutrons, i.e. quarks (up quark and down quark), which are found bound in groups of three, after the phrase "Three quarks for Muster Mark" from the book. [2]

Moral continuity

The term "metempsychosis", the Greek term for the theory of the transmigration of the soul, especially in its reincarnation after death, a doctrine popular in the Eastern religious, namely Hinduism, Buddhism, Jainism, and Druzism, wherein an individual incarnates from one body to another, either human, animal, or plant, which has been used by Arthur Schopenhauer, Kurt Godel, and in *Ulysses*, where it is associated with Friedrich Nietzsche.

Quotes

The following are noted quotes:

> "The true and the beautiful are akin. Truth is beheld by the intellect which is appeased by the most satisfying relations of the intelligible: beauty is beheld by the imagination which is appeased by the most satisfying relations of the sensible."
>
> — James Joyce (1915), *A Portrait of the Artist as a Young Man* [3]

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External links

â— James Joyce – Wikipedia.

θΔics

In hmolscience, **James J. Kay** (1954-2004) was an Canadian environmental systems professor noted, in evolution thermodynamics, for his 1984 to 2002 work on applying a thermodynamics based gradient theory to questions of life and evolution.

Overview

In 1984, Kay, in his PhD dissertation "Self-organization and the Thermodynamics of Living Systems", on self-organization in living systems, argued for a modified Prigoginean thermodynamics principle to be governing ecosystems and evolution. [5]

In 1994, Kay, in his "Life as a Manifestation of the Second Law of Thermodynamics", co-written with American ecologist Eric Schneider, argued on the basis of a Hatsopoulos-Keenan-Kestin reformulated second law that evolutionary structures are a result of gradients maintaining systems at some distance away from equilibrium. [1] Their joint research on the role of the second law in the understanding of complexity and ecosystem dynamics was the subject of the cover story for the October 5, 2002 issue of *New Scientist.*

In 1999, Kay, in his "Ecosystems as Self-Organization Holarchic Open Systems: Narratives and the Second Law of Thermodynamics", stated the following: [4]

> "At the turn of the century, thermodynamics, as portrayed by Boltzmann, viewed nature as decaying toward a certain death of random disorder in accordance with the second law of thermodynamics. This equilibrium seeking, pessimistic view of the evolution of natural systems is in contrast with the phenomenology of natural systems, whose time dependent behavior is a progression away from disorder and equilibrium, into highly organized structures that exist some distance away from equilibrium."

Kay goes on to state that Austrian physicist Ludiwg Boltzmann recognized the apparent contradiction between the heat death of the universe and the existence of life in 1886.

Kay was a strong proponent of the integration of the second law into ecology, as evidenced by famous 1928 Eddington pet theory quote found prominently on the top of his personal webpage. [2]

Education

Kay studied physics at McGill University and systems design engineering at the University of Waterloo. His PhD thesis was 1984 "Self-Organization in Living Systems." In 2002, Kay was a tenured professor at the University of Waterloo.

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θΔics

In existographies, **James Lovelock** (1919-) (CR:25) is a English scientist noted, in chnops-thermodynamics, for his 1964 argument that to build a thermodynamics-based life-detection apparatus, to be used in space missions on other planets, Mars in particular, able to "look for a reduction or reversal of entropy as a sign of life". This tentative theory, as outlined in his 1975 article "Thermodynamics and the Recognition of Alien Biospheres", evolved into the now famous Gaia hypothesis. [1]

Entropy and extraterrestrial life

In *circa* 1964, while Lovelock was working at the Jet Propulsion Laboratories (JPL), at the California Institute of Technology, he conceived of a verbal life-detection entropy reversal theory during discussions and debates on how one would construct life-recognition equipment for use in a planned voyager mission to Mars. Two probes, to note, built by JPL and funded by NASA, were eventually launched in 1977. [3] In the planning stages of probe construction, discussions erupted on the issues of life recognition and what is life, in general; Lovelock was skeptical and posed the following question:

> "How can we be sure that the Martian way of life, if any, will reveal itself to tests based on Earth's lifestyle?"

After a bit of debate on the issue, one of Lovelock's JPL colleagues responded with: "well, what would you do instead?" At the time, Lovelock gave the vague reply:

> "I'd look for an entropy reduction, since this must be a general characteristic of all forms of life."

In 1979 retrospect on this response, along the lines of other famous entropy quotes, Lovelock comments: [1]

> "Understandably, this reply was taken to be at the best unpractical and at worst plain obfuscation, for few physical concepts can have caused as much confusion and misunderstanding as has that of entropy."

In 1979, after thinking about the relation between entropy, fitness, beauty, and survival, Lovelock stated: [2]

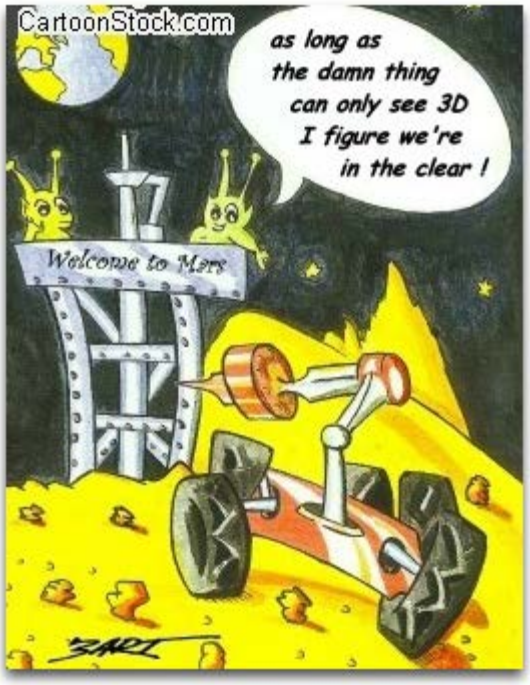

> "I wonder if a positive answer would enable us to rate beauty objectively, rather than through the eye of the beholder. We have seen that the capacity greatly to reduce entropy or, to put it in the terms of information theory, greatly to reduce the uncertainty of the answers to the questions about life, is itself a measure of life. Let us set beauty as equal to such a measure of life. Then it could follow that beauty also is associated with lowered entropy, reduced uncertainty, and less vagueness."

(add discussion)

Gaia hypothesis

The tentative theory was rejected by Lovelock's colleagues, but the idea of life being associated with a reduction or reversal of entropy stayed on his mind later evolving, with the help of American biologist Lynn Margulis,

into the now-famous Gaia hypothesis, a postulate that the earth is a large living organism. [1] The hypothesis argues that the earth is large living super-organism, where “the biosphere, atmosphere, oceans, and soil constitute a feedback or cybernetic system which seeks an optimal physical and chemical environment for life on this planet”. [4]

A Martian life cartoon, depicting **Lovelock**'s circa 1964 question about how a probe would be able to recognize "life" according to modern physical science?

Education

Lovelock completed a BS in chemistry in 1941 from Manchester University, a PhD in medicine in 1948 from the London School of Hygiene and Tropical Medicine, and a DSc in biophysics from London University in 1959. [2] Lovelock worked briefly with British biochemist Archer Martin, who did pioneering work on gas chromatography, which may be from where Lovelock learned his thermodynamic ideas.

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(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (term: Lovelock, pgs. 32, 109, 302, 308, 310, 320) (preview), (Google books). Morrisville, NC: LuLu.
2. James Lovelock (Curriculum Vitae) – JamesLovelock.com.
3. Voyager program – Wikipedia.
4. Gaia hypothesis – Wikipedia.

Further reading

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External links

â— James Lovelock – Wikipedia.

θΔics

In existographies, **James Madison** (1751-1836) (IQ:180|#147) [RGM:171|1,500+] (Cattell 1000:476) [HD:18] (CR:65) was an American political theorist, America's fourth president, the so-called "father of the constitution" (see: US constitution), and early social physicist, noted for []

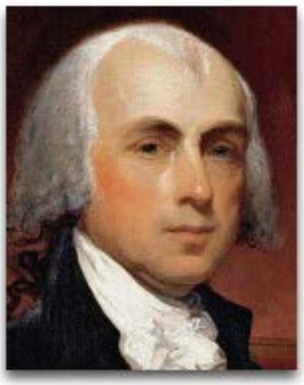

Education

Madison, according to James Haught (1996), was a brilliant student, born into a wealthy family. [5]

In 1769, Madison, age 18, specifically chose to ride horseback to New Jersey to attend the College of New Jersey, or what is now Princeton University, which he selected, according to historian Irving Brant (1974), specifically for its "hostility to episcopacy", i.e. a school against the model of educational government by bishops. [9] Madison completed his four year course in just two years.

Social physics

See main: Princeton social physics; Newtonian government

In 1769, Madison, according to John Q. Stewart, was studying a primitive form of Newtonian-based social mechanics (or social physics) at Princeton, under the direction of Scottish-born American John Witherspoon, the logic of which he is said to have used in the construction and debate room floor selling of the penning of the US Constitution (1787); the following are example quotes:

> "There can be no question of the fact that, in early Princeton, physics cooperated with politics in a sort of analogical double play, Newton to Witherspoon to **Madison**."
>
> — John Q. Stewart (1955), on social physics at Princeton [1]

> "The eighteenth century was dominated intellectually by the scientific work of Newton, and mechanical metaphors sprang naturally to men's minds. Men had found a rational order in the universe and they hoped that it could be transferred to politics. **Madison** spoke in the most precise Newtonian language when he said that such a 'natural' government must be so constructed 'that its several constituent parts may, by their mutual relations, be the means of keeping each other in their proper places.'"
>
> — Richard Hofstadter (1967), *The American Political Tradition* [2]

> "The third element—the principle of checks and balances—in the principle of separation of powers is what **Madison** called 'partial agency', which gives each branch enough power over the others to be able to check them. This principle of checks and balances, designed to enable the three branches to protect themselves from each other's encroachments."
>
> — Levine and Cornwell (1968), *An Introduction to American Government* [4]

> "The founders were elitists, and realists about human nature. Their task was to make passion subject to reason. If men could be expected to be selfish, or worse, then said **James Madison** 'ambition must be made to counteract ambition'. The Newtonian principles of action and reaction were applied to politics."
>
> — Lance Morrow (1987), "The Ark of America" [3]

(add)

Overview

In 1781 to 1783, Madison, a Virginia-born American, was a delegate to the Congress of the Confederation from Virginia, and was succeeded by Thomas Jefferson, who became delegate for one year, until May 1784.

In Nov 1784, the Virginia legislature was in an uproar over a proposal come before it to support, via a new general tax, "teachers of the Christian religion". In support of this proposal was Patrick Henry (1736-1799) (Q), the person behind the famous "Give me liberty, or give me death!" speech, in opposition to the Stamp Act 1765. Henry maintained that this new tax was needed because of the "moral decay" that had set in since Virginia disestablished the Anglican church in 1777 by adopting its own Bill of Rights.

First Amendment

In Jun 1785, Madison penned his "Memorial and Remonstrance Against Religious Assessments", in opposition to the proposal, which, according to Charles Pierce (2009), is the "most closely reasoned argument for the separation of church and state ever written". [6] Madison, in his writing, warned that even the minimal infringement of religious liberty, such as was being proposed by the Virginia state legislature, namely a small tax to support "teachers of the Christian religion", was an opening wedge that could lead to tyranny. His thoughts on the issue, according to Sunand Joshi (2014), led to the passage of the First Amendment. [8]

Education

Madison had a 4,000-book personal library. [7]

Religion | Beliefs

Madison, a Haught disbeliever (#18), is described, by James Haught (1996), as a "non-Christian" who fought against the employment of chaplains to pray at sessions of Congress. [5]

Quotes | By

The following are quotes by Madison:

> "Religious bondage shackles and debilitates the mind and unfits it for every noble enterprise."
>
> — James Madison (1774), "Source", Apr 1; in FSM app

> "Every new and successful example, therefore, of a perfect separation between the ecclesiastical and civil matters, is of importance; and I have no doubt that every new example will succeed, as every past one has done, in showing that religion and government will both exist in greater purity the less they are mixed together."
>
> — James Madison (c.1785), in FSM atheism app

See also

- Princeton social physics | Princeton Department of Social Physics
- Princeton school of social physics

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2. (a) Hofstadter, Richard. (1967). *The American Political Tradition* (pg. 8). Jonathan Cape.
(b) Foley, Michael. (1990). *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian*

Mechanics (Hofstadter, pg. 16; Madison, 20+ pgs). Routledge, 2014.
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5. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§:James Madison, pgs. 97-98). Prometheus.
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6. (a) Madison, James. (1785). “Memorial and Remonstrance Against Religious Assessments” (Q), Jun 20.
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9. (a) Brant, Irving. (1974). *Encyclopedia Britannica*. Publisher.
(b) Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§:James Madison, pgs. 97-98; episcopacy, pg. 97). Prometheus.

External links

- James Madison – Wikipedia.

θΔics

In hmolscience, **James Martineau** (1805-1900) was an English theologian and philosopher noted, in cessation thermodynamics, for his 1888 speculations on the physics of death, in respect to energy transformations.

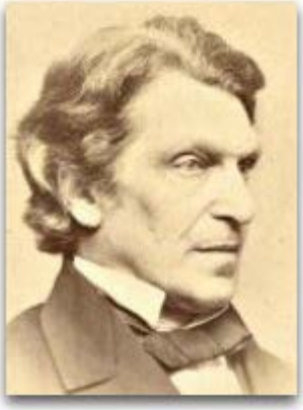

Overview

In 1888, Martineau, in his *A Study of Religion*, devoted a section to the implications of the conservation of energy and brain death; the following is an example excerpt: [1]

> "Let us follow the law of conservation of energy into the phenomena of death. In its physical aspect, death presents simply a case of transformation of energy."

Beyond this base statement, however, Martineau reaches rather ambiguous conclusions; speculating that mental thoughts, affections, and volitions may or may not be in the category of 'energy'. He also devotes a second chapter to the 'metaphysics' of death, with digression on aspects of the soul. Martineau's discussions seem to be based largely on Irish physicist John Tyndall's 1876 article on the physics of the brain. [2]

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Further reading

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External links

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θΔics

In existographies, **James Maxwell** (1831-1879) (IQ:205|#4) [RGM:73|1,500+] (Gottlieb 1000:205) (Murray 4000:20|CS / 9|P) (EPD:M8) (DN:4±) (RE:48) (GPE:3) [CR:478] was a Scottish mathematical physicist, a child prodigy, turned top ranked magnitude genius, one of the core founders of thermodynamics, noted for his 1860 development of the kinetic theory of gases, his 1862 Maxwell's equations, describing the nature of the electromagnetic field, his 1871 *Theory of Heat*, his 1873 electromagnetic field theory of light, his 1875 thermodynamic surface work, among a number of other impressive accomplishments.

Maxwell's various letters, articles, and promotions helped to stitch together the early beginnings of the sciences of thermo-dynamics. [1] Maxwell used the symbol θΔics for the newly developing science of thermodynamics in his personal communications with Scottish physicist Peter Tait and Irish physicist William Thomson.

Social physics

In 1986, Theodore Porter, in his chapter "Social Law and Natural Science", of his *The Rise of Statistical Thinking*, argued that Maxwell arrived at his molecular velocity distributions modes via John Herschel's review of Adolphe Quetelet's 1846 work. [27] Maxwell also read Henry Buckle.

Education

By the age of three, everything that moved, shone, or made a noise drew the question: "what's the go o' that?" and if that did not satisfy his curiosity, the more specific query "what's the *particular* go o' that?" would follow. In 1834, his mother described him as such: "he has great work with doors, locks, keys, etc., and 'show me how it doos' is never out of his mouth. He also investigates the hidden course of streams and bell-wires, the way the water gets from the pond through the wall." Maxwell is among the early parental death and genius group; his mother dereacting when he was age 8.

In 1847, Maxwell, age 16, entered the University of Edinburgh; in an answer to an exercise for Scottish philosopher William Hamilton (1788-1856) on the properties of matter, Maxwell brilliantly and correctly concluded: [4]

> "The only thing which can be directly perceived by the senses is force, to which may be **reduced** light, heat, electricity, sound and all the other things which can be perceived by the senses."

The University of Edinburgh still has a record of books that Maxwell borrowed to take home while an undergraduate; these include: [26]

- Augustin Cauchy, *Calcul Différentiel*
- Charles Fourier, *Théorie de la Chaleur*
- Gaspard Monge, *Géometrie Descriptive*
- Isaac Newton, *Optics*
- Simeon Poisson, *Mechanics*
- Richard Taylor, *Scientific Memoirs*
- Robert Willis, *Principles of Mechanism* (1841) (Q)

In 1854, Maxwell graduated from college, after which he consulted William Thomson on which books to read in respect to the subject of electricity:

> "Dear Thomson, now that I have entered the unholy estate of bachelorhood I have begun to think of reading. This is very pleasant for some time among books of acknowledged merit which one has not read

but ought to. But we have a strong tendency to return to physical subjects, and several of us here wish to attack electricity."

— James Maxwell (1854), "Letter to William Thomson" (Q), Feb 20

At Edinburgh University, from 1854 to 1856, he worked in the laboratory of James Forbes, where he did some of his first work in color theory. Maxwell, in respect to thermodynamic schools, is generally classified as part of the Edinburgh school of thermodynamics.

Color wheel | Tartan ribbon

In circa 1855, Maxwell made a color disc (shown adjacent), the testing design of James Forbes idea that based on Thomas Young's wave theory of light that one could make any color (perceptual to the eye) by mixing colors; namely by taking a disc marked with pie chart like colored sectors and spinning it fast. [4]

Maxwell and his color wheel, his color photographed tartan ribbon (top right), and his color photograph method (below right).

In 1861, Maxwell directed the undertaking of the world's first color photograph, namely that of a tartan ribbon (shown), constructed by having photographer Thomas Sutton photograph the ribbon on black-and-white film three times, first with a red, then green, then blue color filter over the lens: the three black-and-white images were developed and then projected onto a screen with three different projectors, each equipped with the corresponding red, green, or blue color filter used to take its image; when brought into alignment, the three images (a black-and-red image, a black-and-green image and a black-and-blue image) formed a full color image, thus demonstrating the principles of additive color. [10]

Kinetic theory

In 1859, after reading the 1857 paper "On the Nature of the Movement, Which we call Heat" by German physicist Rudolf Clausius, Maxwell formulated what is known as the "Maxwell distribution" of molecular velocities, which gave the proportion of molecules having a certain velocity in a specific range. [3] This was the first ever statistical law in physics. [4]

Maxwell's demon

His studies of kinetic theory led him to propose the now-famous Maxwell's demon paradox in a 1867 letter to Tait. [2]

Theory of heat

In 1871, Maxwell published the first edition of his now-famous *Theory of Heat*, one of the first treatises on thermodynamics. Of note, in the early editions, Maxwell had misinterpreted entropy, supposedly by relying its description by Peter Tait in his 1868 *Sketch of Thermodynamics*, and had to correct for his mistake in later editions.

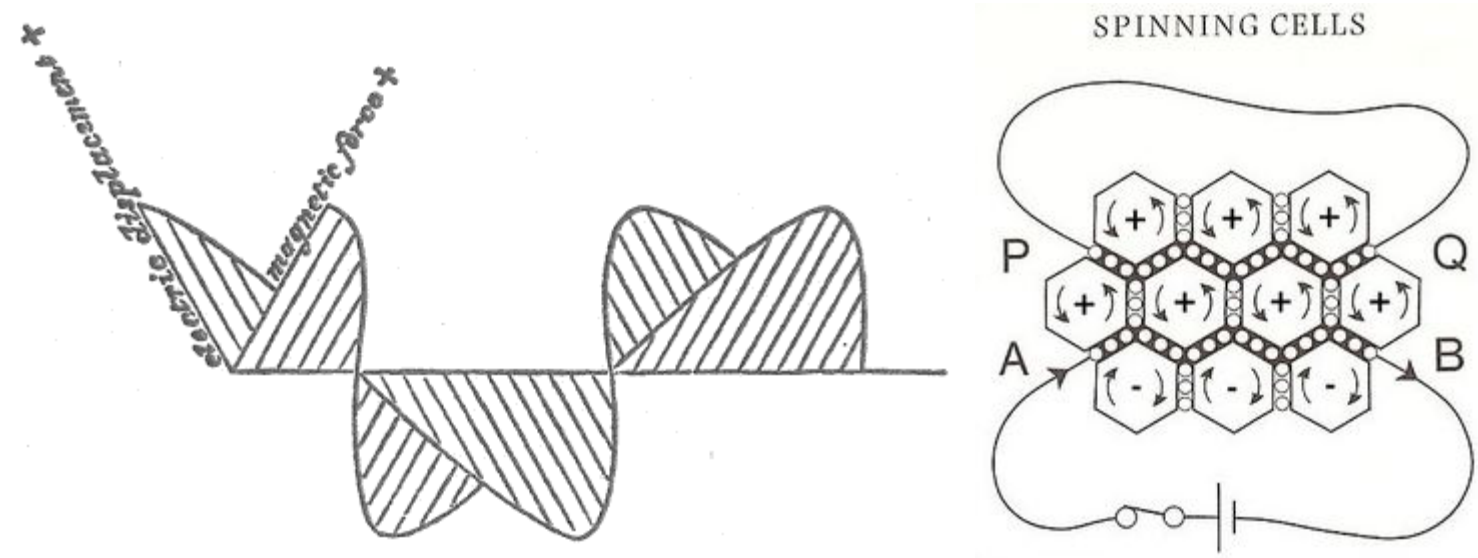

Left: Maxwell's 1873 diagram of the spatial relationship between electromagnetic fields (see: electromagnetic force) 'at a given instant' along a ray of 'plane-polarized light'. [24] Right: Maxwell's 1856 "spinning cells", or what he called "mechanical illustrations to assist the imagination", the precursor models to the his eventual formulation of electromagnetic theory; seeded, in some way, from Scottish engineering physicist William Rankine's 1842 molecular vortices model precursors. [8]

Electromagnetism

His 1873 publication *A Treatise on Electricity and Magnetism*, introduced the world to Maxwell equations, the four governing equations on the phenomenon of electricity and magnetism. Maxwell showed that these equations implicitly required the existence of electromagnetic waves traveling at the speed of light. [5]

Maxwell-Gibbs thermodynamic surface

In 1874, Maxwell constructed the first 3D thermodynamics surface model of the three states of existence of water. A sketch of this is famously shown as figure 26f in the 1875 edition of this *Theory of Heat* and the same diagram is also shown on the backdrop to the 2005 Gibbs stamp.

Evolution

Maxwell seems to have presented his views on evolution, in rather indirect ways, carrying his speculations all the way down to the atom-molecule level. [12]

Gibbs

Maxwell was the first to recognize and promote the work of Willard Gibbs around Europe.

Morality | Soul

See main: Maxwell on the soul

It has been surmised, such as by American physical economist Philip Mirowski, that Maxwell suggested that moral laws could be modeled by a process of analogy with natural laws, base on his statement concerning "attractions of pleasure or the pressure of constraint activity", discussed in the context will or the will of beings. [8] This assertion (fact checked) is based on Maxwells 1856 article "Analogies in Nature", wherein this passage occurs. [9] This assertion about Maxwell deriving "moral laws" in these early years contradicts his deeper religious ambivalences, such as his 1878 conviction of his belief that his "soul is an amphicheiral knot", as expressed in his "A Paradoxical Ode." [7]

God

See main: *Maxwell on god*

Maxwell, while clearly not an atheist – he said, e.g. dinner time prayers, believed in Jesus Christ and god, in some form

or another, and believed in soul – seemed to align somewhere between a “god-fearing Israelite and a modern materialist”, in the form of a side-line commentator. [25] His last dying poem “A Paradoxical Ode” seems to give his finalized thoughts on the matter, mostly ambivalent views, that lean towards the materialistic side of the fence.

Reaction end | Philosopher's paradox

In 1878-79, the year of his death, Maxwell penned a review article "Paradoxical Philosophy" and followed this up with his last poem "A Paradoxical Ode", both outlining his views on the philosopher's paradox and the implications of thermodynamics and conservation of energy in regards immortality, the soul, the life/death demarcation, evolution, morality, consciousness, down to the atomic level. [7]

The poem is Maxwell’s rare inner thoughts on this tenuous matter and his last and dying poem, written in his final year as he was in the final stages of stomach cancer, as he went into his 48th year, the same age his mother died previously from the same disease.

The poem seems to have been provoked, in part, as a parting words reaction to the Tyndall-Stewart-Tait debate.

Collected works

Maxwell published at least 47 documents (letters, articles, books, correspondence, etc.) on thermodynamics during the years 1855 to 1878. [6]

Poetry

The following are a few noted Maxwell poetry stanzas:

> “I come from empyrean fires –
> From microscopic spaces,
> Where molecules with fierce desires,
> Shiver in hot embraces.
> The atoms clash, the spectra flash,
> Projected on the screen,
> The double D, magnesian*b*,
> And Thallium’s living green.”
>
> — James Maxwell (1874), To the Chief Musician upon Nabla: A Tyndallic Ode (O) (O)

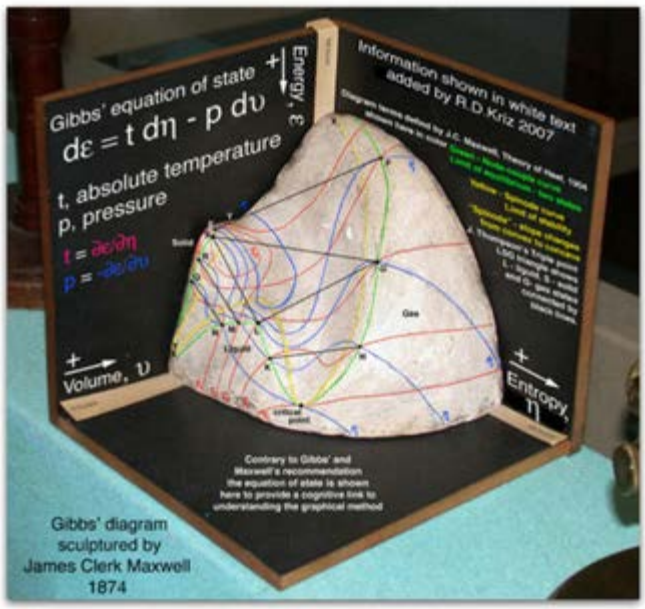

Left: a modern annotated version of **Maxwell**'s famous 1874 thermodynamic surface, constructed over the course of about seven months, from November 1874 to July 1875, based on the descriptions of thermodynamics surfaces in American engineer Willard Gibbs' two 1873 papers on the graphical methods of thermodynamics.

Signature

Maxwell, amid his secret code letter writing circle, with Peter Tait and William Thomson (see: θΔics), would sometimes sign his letters, articles, and post cards as follows:

$$\frac{dp}{dt}$$

which, is the analytical equivalent of the thermodynamical quantity JCM (and to James Clerk Maxwell's initials); such as reported by his existographer Lewis Campbell (1882); meaning: [16]

$$\frac{dp}{dt} = \mathrm{JCM}$$

The equation first appears in Peter Tait's 1868 *Sketch of Thermodynamics* (§162, eq. 4; pg. 91), in the following form, which Tait defines, specifically, as the second law of thermodynamics:

$$\frac{\frac{dp}{dt}}{M} = JC$$

Maxwell, shortly thereafter, took notice of the equation, and began using the dp/dt signature, first used in an Apr 1870 letter to William Thomson, and thereafter to Tait and various witty publications in *Nature*.

In 1964, physicist David MacDonald, in his *Faraday, Maxwell, and Kelvin*, stated that the derivative dp/dt would now be written more correctly written as: (∂p/∂t)v, and that it is one of Maxwell's four thermodynamic relations derived by him in *Theory of Heat* (pgs. 165-69) from the geometry of isothermal and adiabatic curves; now commonly derived from the equality of the mixed second derivatives of the various thermodynamic potentials. [16]

In 1970, American science historian Martin Klein, in an appendix section "On Maxwell's Signature", citing Macdonald, devotes two pages to a discussion of Maxwell and his derivative signature, which he surmises that Maxwell meant as not only his own initials, but also "the second law of thermodynamics itself", as Klein puts it, where J is the mechanical equivalent of heat, C is Carnot's universal function, depending on temperature, and M is the "coefficient of proportionality, the heat absorbed per unit volume change in an isothermal expansion". [17]

Quotes | On

The following are quotes on Maxwell:

> "Scholars dined together at one table. This brought Maxwell into daily contact with the most intellectual set in the college, among whom were many who attained distinction in later life. These, in spite of his shyness and some eccentricities, recognized his exceptional powers. The impression of power which Maxwell produced on all he met was remarkable; it was often much more due to his personality than to what he said, for many found it difficult to follow him in his quick changes from one subject to another, his lively imagination started so many hares that before he had run one down he was off on another."
>
> — Joseph Thomson (c.1880), on Maxwell's 1850 age 16 years at Cambridge; in: *James Clerk Maxwell: A Commemorative Volume 1831-1931* (1931) (pgs. 1-44) [26]

> "Only one man lived who could understand Gibbs' papers. That was **Maxwell**, and now he is dead."
>
> — Anon (1879), Connecticut Academy member; *circa* Nov, said in meeting [23]

> "Was it god who wrote these signs?"
>
> — Ludwig Boltzmann (1893), commentary on Maxwell's equations (O)

> "Before **Maxwell**, people conceived of physical reality—insofar as it is supposed to represent events in nature—as material points, whose changes consist exclusively of motions, which are subject to partial differential equations. After Maxwell they conceived physical reality as represented by continuous fields,

not mechanically explicable, which are subject to partial differential equations."

— Albert Einstein (1935), *The World As I See It* [13]

"The most fascinating subject at the time that I was a student was **Maxwell**'s theory. What made this theory appear revolutionary was the transition from forces at a distance to fields as fundamental variables. The incorporation of optics into the theory of electromagnetism, with its relation of the speed of light to the electric and magnetic absolute system of units as well as the relation of the refraction coefficient to the dielectric constant, the qualitative relation between the reflection coëfficient and the metallic conductivity of the body— it was like a revelation. Aside from the transition to field-theory, i.e., the expression of the elementary laws through differential equations, Maxwell needed only one single hypothetical step—the introduction of the electrical displacement current in the vacuum and in the dielectrica and its magnetic effect, an innovation which was almost prescribed by the formal properties of the differential equations. In this connection I cannot suppress the remark that the pair Faraday-Maxwell has a most remarkable inner similarity with the pair Galileo-Newton — the former of each pair grasping the relations intuitively, and the second one formulating those relations exactly and applying them quantitatively."

— Albert Einstein (1949), *Autobiographical Notes* (pgs. 33-340 (O)

"**Maxwell** was one of those once-in-a-century geniuses who perceived the physical world with sharper senses than those around him."

— Tom Siegfried (2006), "Maxwell and Molecules" [15]

Quotes | Gravity

The following are noted quotes by Maxwell on gravity:

"But when we face the great questions about gravitation: Does it require time? Is it polar to the 'outside of the universe' or to anything? Has it any reference to electricity? or does it stand on the very foundation of matter–mass or inertia? then we feel the need of tests, whether they be comets or nebulae or laboratory experiments or bold questions as to the truth of received opinions."

— James Maxwell (1857), "Letter to Michael Faraday", Nov 9 (O)

"Any opinion as to the form in which the energy of gravitation exists in space is of great importance, and whoever can make his opinion probable will have, made an enormous stride in physical speculation. The apparent universality of gravitation, and the equality of its effects on matter of all kinds are most remarkable facts, hitherto without exception; but they are purely experimental facts, liable to be corrected by a single observed exception. We cannot conceive of matter with negative inertia or mass; but we see no way of accounting for the proportionality of gravitation to mass by any legitimate method of demonstration. If we can see the tails of comets fly off in the direction opposed to the sun with an accelerated velocity, and if we believe these tails to be matter and not optical illusions or mere tracks of vibrating disturbance, then we must admit a force in that direction, and we may establish that it is caused by the sun if it always depends upon his position and distance."

— James Maxwell (1868), "Letter to William Huggins", Oct 13 (O)

Quotes | Second law

The following are noted quotes by Maxwell on the second law:

> "The second law of thermodynamics has the same degree of truth as the statement that if you throw a tumblerful into the sea, you cannot get the same tumblerful out again."
>
> — James Maxwell (1870), "Letter to John Strutt", Dec 6; the "moral" of his Maxwell's demon argument [21]

> "I have also a great respect for the elder of those celebrated acrobats, Virial and Ergal, the Bounding Brothers of Bonn …. But it is rare sport to see those learned Germans contending for the priority of the discovery that the 2nd law of θΔcs is the Hamiltonsche Princip, when all the time they *assume* that the temperature of a body is but another name for the vis viva of one of its molecules, a thing which was suggested by the labors of Gay-Lussac, Dulong, etc., but the first deduced from the dynamical statistical considerations by dp/dt. The Hamiltonsche Princip, the while, soars along in a region unvexed by statistical considerations, while the German Icari (Q) flap their waxen wings in nephelococcygia [cloud-cuckoo-land] (Q) amid those cloudy forms which the ignorance and finitude of human science have invested with incommunicable attributes of the invisible Queen of Heaven."
>
> — James Maxwell (1873), "Letter to Peter Tait", Dec (Number 483) [22]

Quotes | General

The following are general noted quotes by Maxwell:

> "The only thing which can be directly perceived by the senses is force, to which may be reduced light, heat, electricity, sound and all the other things which can be perceived by the senses."
>
> — James Maxwell (1847), age 16

> "I have now nobody that I see too much of, though I have got several new acquaintances, and improved several old ones. I find nothing gives one greater inertia than knowing a good many men at a time, who do not know each other intimately. N.B.—Inertia, not = laziness, but mass; i.e. if one knows a man, he forms an idea of your character, and treats you accordingly. If one knows a company of men, they are strong in union, and overawe the individual. If one man only, we become mutual tyrants. If several independently, everyone plays the part of Dr. Watt's celebrated 'Busy Bee', and by mixing according to every possible combination hit out the best results."
>
> — James Maxwell (1852), "Letter to Lewis Campbell", Mar 7 [20]

> "All the mathematical sciences are founded on relations between physical laws and laws of numbers, so that the aim of exact science is to **reduce** the problems of nature to the determination of quantities by operations with numbers."
>
> — James Maxwell (1856), "Faraday's Lines of Force" (Q)

“A strict materialist believes that everything depends on the motion of matter. He knows the form of the laws of motion though he does not know all their consequences when applied to systems of unknown complexity. Now one thing in which the materialist (fortified with dynamical knowledge) believes is that if every motion great & small were accurately reversed, and the world left to itself again, everything would happen backwards the fresh water would collect out of the sea and run up the rivers and finally fly up to the clouds in drops which would extract heat from the air and evaporate and afterwards in condensing would shoot out rays of light to the sun and so on. Of course all living things would regrede from the grave to the cradle and we should have a memory of the future but not of the past. The reason why we do not expect anything of this kind to take place at any time is our experience of irreversible processes, all of one kind, and this leads to the doctrine of a beginning and an end instead of cyclical progression forever.”

— James Maxwell (1868), “Letter to Mark Pattison”, Apr 7 (O)

“It is of great advantage to the student of any subject to read the original memoirs on that subject, for science is always most completely assimilated when it is in the nascent state.”

— James Maxwell (1873), *A Treatise on Electricity and Magnetism* (pg. xiii)

“First causes are not known to us, but they are subjected to simple and constant laws that can be studied by observation and whose study is the goal of natural philosophy … Heat penetrates, as does gravity, all the substances of the universe; its rays occupy all regions of space. The aim of our work is to expose the mathematical laws that this element follows … The differential equations for the propagation of heat express the most general conditions and reduce physical questions to problems in pure analysis that is properly the object of the theory.”

— James Maxwell (c.1870) [14]

“I cannot help thinking about the immediate circumstances which have brought a thing to pass, rather than about any ‘will’ setting them in motion. What is done by what is called myself is, I feel, done by something greater than myself in me.”

— James Maxwell (1879), “Comment to Fenton Hort when terminally ill” [19]

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Maxwell standing (left) and a 2008 statue of Maxwell (right) in George Street, Edinburgh. [11]

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Sculpture Alexander Stoddart in 2008, at the Black Isle Bronze foundry at Nairn in the Highlands, at work on the James Maxwell sculpture.

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External links

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θΔics

In existographies, **James Grier Miller** (1916-2002) (CR:13) was an American psychologist noted, in sociological thermodynamics, for []

Overview

In 1965, Miller published *Living Systems: Basic Concepts*, a 120-page cybernetics based book.

In 1978, Miller, in his *Living Systems*, a thousand-page expansion of the former, attempted to outline a biology-based sociology, discussing his views on "open" and "closed" systems (albeit defined incorrectly), and how entropy relates to such systems. [1] Miller uses the abstract conception of "matter-energy" as well as information as that which may cross the boundary of the system. The following quote summarizes his view of systems: [2]

> "Most concrete systems have boundaries which are at least partially permeable, permitting sizable magnitudes of at least certain sorts of matter-energy or information transmissions to cross them … such a system is an open system. A closed system, in contrast, is one with impermeable boundaries through which no matter-energy or information transmissions of any sort can occur. In open systems entropy may increase, remain in steady state, or decrease."

The conception of "matter-energy or information" crossing a thermodynamic boundary, however, make little sense (see: thermodynamic information fallacy).

Education

Miller completed his AB (1937), AM (1938), and PhD with a thesis on thesis: on unconsciousness and subliminal perception (1943) all in psychology at Harvard University. Miller also obtained his MD from Harvard Medical School in 1942 focusing on psychiatry and general medicine. [3]

Living systems

The following quote summarizes Miller's view of living systems, whether it be an organism, a group, an organization, a society, or a supranational system: [2]

> "Living systems maintain a steady state of negative entropy even though entropic changes occur in them as they do everywhere else. This they do by taking in inputs of foods or fuels, matter-energy higher in complexity or organization or negentropy, i.e. lower in entropy, than their outputs."

Miller also speculates on the relationship between energy and entropy; reasoning, for instance, that it may be possible to determine the minimal amount of energy necessary to transmit one bit of information. [1]

Biology and social science

Miller's original seed or goad of interest in living systems theory came from English-born American mathematical philosopher Alfred Whitehead, who in the mid 1930s was a mentor to Miller at Harvard. Whitehead suggested that Miller make a serious attempt to develop a theoretical integration of the biological and social sciences dealing with mankind and other living beings comparable to the physical universe theories of English physicists Arthur Eddington and James Jeans. [3] It is likely from Eddington's 1928 book *The Nature of the Physical World* that Miller learned his definition of entropy.

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θΔics

In human chemistry, **James Morgia** (1922-) is a American philosopher noted for his 2001 *Life Long Human Values*, wherein he presents a mixture of humans-as-molecules logic, human chemical reaction logic, over Bible arguments.

Overview

In 2001, Morgia, in his *Life Long Human Values*, uses a human molecule description of people and chemical analogy model of human micro interactions to theorize about what he calls "micro abuses", such as subtle verbal child abuse, intonational emotional abuse, among others. The following is Morgia's human interaction model synopsis: [1]

> "There is a reaction beyond every event or occurrence. It is the consequence. The reactions keep following the initial action. When two chemicals are combined under certain conditions, there always is a reaction product. The new product is different than the original chemical. Nature works constantly to produce new substances from basic chemicals in an efficient manner. A subtle light impulse from the sun converts basic water and carbon dioxide into multi-chain complexes every moment, all over the world. The key thought here is simply that the impulse of energy which is almost too small to measure, the photon, results in providing fuel and food in millions of tons each year. The natural chemical reaction is analogous to the problem which is undermining our society. It closely resembles what is happening around us. It takes a lot of imagination to declare the idea."

On this basis, Morgia goes on to speculate on how negative impulses can act to create a loose thought, something akin to a flagella whipping along causing rampage, and one that can only be stopped by neutralization, like an antioxidant neutralizing an oxidant. Morgia's aim to outline a chemical reaction based type of moral fabric model.

Morgia speculates, on analogy, on how family love is what he calls "true bonding", a term which seems to be similar to Dutch physical chemist Johannes van der Waals' 1910 mention of what he calls "true association" that results from "new chemical forces", when molecules combine, as contrasted with "pseudo-association". [2]

Individualism | Human molecules

The central motto in Morgia's book is the concept of individualism in the sense that when each individual person thinks about their future, one must "decide what the proper formula is to guide their life", where the proper formula must include a lifelong principle that will set the course to reach one's planned destination. Morgia's description of human molecules, however, is a bit blurry. He states:

> "Of course, no one has detected the mass action effect of this human equation. The human molecules have been activated with a subtle catalyst, which promotes hyperism in the world's melting pot. A mysterious force has upped the activation threshold of each person. This influence must be stopped. Only individualism can curtail this unavoidable disaster!"

(add discussion)

Note

To note, the majority of Morgia's writing is stylized in the beginner level and nearly the entire book is written in Bible-style.

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External links

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θΔics

In existographies, **James Murphy** (1880-1946) was an Irish German-to-English translator noted for []

Overview

In 1929, Murphy set up a highbrow magazine called *The International Forum*, where he published interviews of eminent people, including Albert Einstein and Thomas Mann. [1]

In circa 1930, Murphy was collaborating with Max Planck on a book about the problem of causation and the freedom of the human will.

In 1932, Murphy interviewed Einstein about the possibility of physical science attributing free will to organic processes (see: Einstein-Murphy dialogue).

In 1939, Murphy did the first unabridged English translation of Adolf Hitler's *Mein Kampf*.

Education

In 1905, Murphy became an ordained priest of St. Patrick's College Chapel. At some point, Murphy obtained a doctorate of something.

Quotes | On

The following are noted quotes on Murphy:

> "**James Murphy** was a complicated and fascinating man. He was a true polymath, with a deep knowledge of literature, art and science; a journalist, a lecturer, a translator; an expert on Italian fascism and Nazi Germany."
>
> — John Murphy (2015), synopsis of his grandfather [1]

References

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External links

â— James Vincent Murphy – Wikipedia.

θΔics

In existographies, **James Riddick Partington** (1886-1965) (CR:50), oft-cited "J.R. Partington", was an English chemist, chemical thermodynamicist, and premier chemistry historian noted for his 1913 *Text-book of Thermodynamics with Special Reference to Chemistry*, followed by his 1924 updated second edition titled *Chemical Thermodynamics*, one of the first textbooks on chemical thermodynamics. [1] Partington well-known for his known for his five-volume *An Advanced Treatise on Physical Chemistry*.

Education

Partington completed his BS in 1909 and MS in 1911 both in chemistry at Manchester University. He then worked under Walther Nernst in Berlin where he studied specific heats of gases. He became a lecturer in chemistry in 1913 at Manchester University. He completed his DSc in 1918 from the University of Manchester, after which, in 1919, he became professor of physical and organic chemistry at Queen Mary College, University of London; where he remained until his retirement in 1951. He continued his scientific research on the specific heats of gases which led to a book with William Shilling, *The Specific Heats of Gases* (1924). Although technical in nature, the book shows Partington's early interest in the importance of the history of chemistry, a topic for which he would later become widely known. [4]

History of chemistry

See main: History of chemistry

Partington is renowned for his four-volume *A History of Chemistry*. [5] Partington collected a considerable library of works, 1500 books or items, on the history of alchemy and chemistry which are preserved in the John Rylands Library in Manchester. [2] His condensed 1937 book *A Short History of Chemistry*, revised and enlarged in 1957, 415-pages in length, is the standard go-to quick reference for historians of chemistry. [3]

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External links

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θΔics

In existographies, **James Pickard** (c.1735-1800) was an English engineer, noted for []

Overview

In Dec 1799, James Watt was exploring the use of a crank, which was already widely used to drive grinding stones, potter's wheels, and foot lathes, for use in steam engines to convert converting reciprocating motion into rotary motion. Supposedly, as the story goes, Dick Cartwright, a Soho pattern maker, was asked to build a model, but before he could do so, was drinking beer at a public house, and said the following:

> "The idea of to put a 'crank' in the steam engine, is one of the best things Watt has ever brought out."
>
> — Dick Cartwright (c.1799), comment at beer house

Cartwright, supposedly, even chalked a plan of Watt's crank-based steam engine on a table. [1]

In 1780, Pickard, having, as some have conjectured, heard of Watt's crank-based steam engine, obtained a 14-year patent for a crank method of converting reciprocating motion into the "turning of wheels", so to make steam engines applicable to work done in factories, not just that for pumping water out of mines. [1]

Watt, accordingly, finding his crank idea blocked, by the patent, turned instead to the use of the sun and planet system of intermeshed gears to convert reciprocating motion into rotary motion.

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External links

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θΔics

In economic thermodynamics, **James Allan Reiss** (c.1937-) is an Australian organic chemist and commerce theorist noted for his 1994 chapter "Comparative Thermodynamics in Chemistry and Economics", in which he attempts to redefine economic processes in the language of physical chemistry and thermodynamics. [1]

Economic-thermodynamic parameters

Of interest, citing the comparative 1989 work of Hungarian physicist Bela Lukacs, Reiss gives a table of economic parameters equated to thermodynamic parameters, as shown below, stating that there has been some debate as to the exact matching of the chemical parameters with those of economics: [2]

This seems to be one of the first printed tables of such form. Most of these speculative assignments, however, seem to be incorrect, such as enthalpy being equated to work, or entropy equaling negentropy. The only assignment here that may have merit to it could possibly be Gibbs free energy change ΔG being equated to "value", being that what is favored evolutionary wise, tends to be something that has a future to it, and Gibbs free energy change is what predicts the future or favorability of chemical reactions or processes.

raw materials		≡	chemicals
value	(ΔV)	≡	Gibbs free energy (ΔG)
work (labour, energy)	(ΔW)	≡	enthalpy (ΔH)
negentropy (order)	(ΔN)	≡	entropy (ΔS)
temperature (a constant)		≡	temperature (T)
process energy barrier	(E_p)	≡	activation energy (E_a)
factory		≡	concentration [A]
concentration of industry		≡	coupled reactions, cells
technology		≡	catalysis
money		≡	storable energy (e.g., gasoline)

Reiss' 1994 human thermodynamics variables table; one of the first of its kind, namely to discuss a dominant number of the main quantities of chemical thermodynamics in human societal system terms. [1]

In his table, Reiss equates raw materials to chemicals (correctly: raw materials are catalysts and substrate factors, whereas people are the reactive chemicals); value to Gibbs free energy change ΔG (correctly: this should be the functional work output of the factory); work and labor energy to enthalpy change ΔH (correctly: enthalpy is the raw heat released or absorbed from the activation of the human chemical bonds plus the work related to pressure-volume work changes inside the economy, although there is some connection between work and enthalpy); order or negentropy to entropy (correctly: the magnitude of entropy |S| is a measure of disorder, although there is more to the issue); temperature to temperature (correctly: there are other issues, e.g. economic temperature, sexual temperature, physical attractiveness temperatures, intellectual temperatures, etc.); process energy barriers to activation energy Ea (correctly: the activation energy most germane to an economic system is the barrier to successful sexual reproduction, faced by each individual); concentration of industry to free energy coupling of reactions and cells (correctly: sector formations is a result of like-attracts-like industry chemical bonding energy lowering effects); technology to catalysis (correctly: Reiss may be correct in this assignment, in that he defines tools, such as hammers, screwdrivers, and wrenches to be 'catalysts' designed to increase the efficiency of human processes); and money to stored energy as in fuel (correctly: money can act in the form of stored chemical potential, but more accurately money is defined as a secondary field particle acting to transmit the force of human chemical reaction).

Education

Reiss completed his PhD, with a 1967 dissertation "Photochemical Products from Aromatic Azo Compounds", at the University of Adelaide, Australia. [3] Reiss was a colleague of John Christie at La Trobe University, Melbourne Australia, lecturing in chemistry; but at some point had a change of career, began studying accounting, then transferred to become a lecturer in the accounting department for several years. He retired in the 1990s.

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θΔics

In hmolscience, **James Francis Salmon** (c.1934-) is an American physical chemist, mechanical engineer, and reverend noted for a number of publications surrounding the work of Pierre Teilhard, admixtured with the works of Ilya Prigogine, Alfred Whitehead, Harold Morowitz, among others, in a general effort to supplant reductionism with Christian-infused emergence, so to meld religion into science, via ontic opening argument. [1]

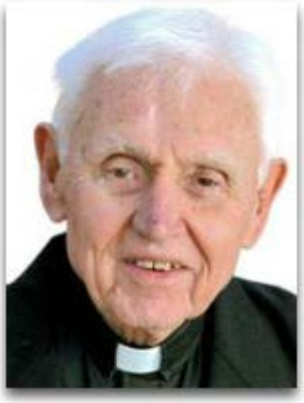

Teilhard

In 1981, having been inspired by the writings of French thinker Pierre Teilhard, Salmon founded the annual Cosmos and Creation Conference at Loyola University, directing the conference until his retirement in 2010, with the overt focus on promoting a Christian interpretation of theology of creation in an evolutionary world or evolving universe as a whole. (Ñº)

In 2009, Salmon, in his "Emergence in Evolution", citing Teilhard on human molecules, and Robert Laughlin on emergence, stated the following ideology: [3]

> "It eliminates the dualism that plagued science and philosophy since Descartes' general metaphysical **...** irreversible chemical phenomena could very will make it a 'perennial' philosophical discourse for **...** No other substance but this could produce the human molecule."

The article lists the key words: emergence, matter, chemical self-organization, thermodynamics, process metaphysics, Whitehead, and Teilhard, which are but cherry picked toolism playthings of the ontic opening theorist.

Education

Salmon completed his BS in mechanical engineering at Stevens Institute of Technology, his MA in philosophy at Boston College, and his PhD in physical chemistry in 1961 with a dissertation on "Some properties of tetramethyl-disiloxydialuminum and interaction of boron phosphide diiodide with ammonia and ethylamine" at the University of Pennsylvania. Salmon studied theology at Woodstock College, thereafter becoming an ordained priest. [2] Since at least 2002 to 2014, Salmon has been a professor of chemistry and theology at Loyola University, Maryland. (Ñº) (Ñº)

References

1. (a) Salmon, James F. (1987). *Teilhard and Prigogine*. Publisher.
(b) Salmon, James F. (2009). "Emergence in Evolution" (abs), *Foundations of Chemistry*, 11(1):21-32.
(c) Salmon, James F. (2005). "Teilhard's Law of Complexity-Consciousness" (abs), Revista Portuguesa de Filosofia, T. 61, Fasc. 1, Espaço - Tempo - Evolução: Albert Einstein e Pierre Teilhard de Chardin (Jan-Mar):185-202.
2. James F. Salmon (about) – NowYouKnowMedia.com.
3. Salmon, James F. (2009). "Emergence in Evolution" (abs), *Foundations of Chemistry*, 11(1):21-32.

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θΔics

In hmolscience, **James Sandham** (c.1984-) is a Canadian writer noted, in literature thermodynamics, for 2008 *The Entropy of Aaron Rosclatt*, which touches on the philosophical turns involved in the youth-coming-into-manhood, i.e. of idealism into reality transition, themed on the inevitability of the second law.

Overview

In 2008, Sandham, in his *The Entropy of Aaron Rosclatt*, addresses "the confrontation of youth's crisp idealism with reality-the reality that life is not so easily understood or tamed, and that, despite our best efforts, we are all inevitably subject to the slow slide into entropy". [2]

Education

Sandham completed his BA in political science in 2006 from the University of Guelph. [2]

References

1. (a) Sandham, James. (2008). *The Entropy of Aaron Rosclatt* (Google Books). Clark-Nova Books.
(b) The Entropy of Aaron Rosclatt – Mini Book Expo for Bloggers, 09 Oct 2008.
(c) James Sandham (blog/photo) (18 Apr 09) – CarmenCheungPhoto.blogspot.com.
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θΔics

In thermodynamics, **James Swinburne** (1858-1958) was a British electrical engineer noted for starting the 1902 "What is Entropy Debate", which resulted in his 1904 *Entropy: or Thermodynamics from an Engineer's Standpoint and the Reversibility of Thermodynamics*. The following are the humorous opening words of the preface: [1]

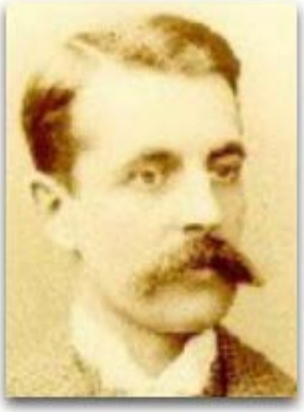

> "My reason for adding another little book on thermodynamics to those in existence is that it is wanted. As far as I am aware there is not any work on steam- or gas-engine in this country that gives the correct definition of entropy."

The aim of the book, according to Swinburne, was to correct the widespread mistake, supposedly promulgated by many authors, that entropy is conservative in irreversible change. [2] He objects also to the classification of entropy as "a factor of heat" in many thermodynamics books.

Swinburne fought against British textbooks for their laxity in defining entropy. He seems to have first addressed his concerns over the teaching of entropy in his December 02, 1902 presidential address before the British Institute of Electrical Engineers, in which nearing the end of the lecture he turned to the question of the proper mathematical definition of entropy, appending to the body of his address a footnote which reiterated and elaborated his ideas. [3] The appearance of these statements sparked a lively debate over the following two years in the British electrical and mechanical engineering journals, with opinions on the matter being professed by those as Oliver Lodge, John Perry, Henri Poincare, and Max Planck.

Entropy interest origin

Swinburne worked as an apprentice at a locomotive works in Manchester before becoming an electrical engineer. This may have been from where he became acquainted with thermodynamics. In reflection, in a personal note to his 1904 book, he states: [1]

> "As a young man I tried to read thermodynamics, but I always came up against entropy as a brick wall that stopped my further progress. If found the ordinary mathematical explanation, of course, but no sort of physical idea underlying it. No author seemed even to try to give any physical idea. Having in those days great respect for textbooks, I concluded that the physical meaning must be so obvious that it needs no explanation, and that I was especially stupid on the particular subject."

He goes on to state that he eventually found the physical meaning and correct definitions through study of irreversible thermodynamics in physical chemistry.

References

1. Swinburne, James. (1904). *Entropy: or Thermodynamics from an Engineer's Standpoint and the Reversibility of Thermodynamics* (quote: Personal, pgs. 3-4). Westminster: Archibald Constable & Co.
2. Swinburne, James. (1904). "Entropy", *Nature* (pgs. 54-55), No. 1803, Vol. 70, May 01.
3. Reeve, Sidney. (1907). "The Question of Entropy", *Harvard Engineering Journal* (pgs. 138-54), Vol. 6.

Further reading

â— Perry, John. (1904). "Entropy", *Nature*, April 14.

External links

â— James Swinburne – Wikipedia.
â— James Swinburne (1858-1958) – PlastiQuarian.com.

θΔics

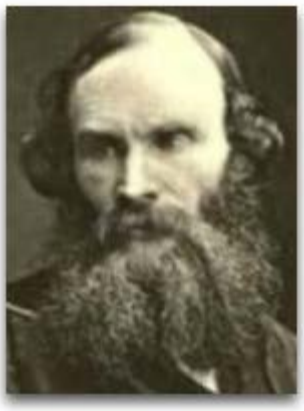

In thermodynamics, **James Thomson** (1822-1892) (IQ:175|#210) was a Scottish engineer, grandson to James Thomson (farmer), son of James Thomson (mathematician), and older brother to William Thomson (physicist), who in about 1843 began to establish a dialog with his younger brother on application of the heat engine theories of French engineer Sadi Carnot in his 1824 *Reflections on the Motive Power of Fire*, as presented in the 1834 paper "Memoir on the Motive Power of Heat" by French physicist Émile Clapeyron, to the application in the area of steamship improvement, particularly power going to waste.

Differential analyzer

In 1876, James Thomson built a differential analyzer (Q), similar to that done earlier by Gustave Coriolis (1836) and later by Vannevar Bush (1931).

Carnot queries

In Aug 1844, James, in a letter to his brother William Thomson, inquired who [Sadi Carnot] it was that had proved there was a definite quantity of mechanical effect (work) given out during the passage of heat from one body to another. He stated his intentions of writing an article for the *Artisan* about the theoretical possibility of working steam engines without fuel by using over again the heat which was thrown out in the hot water from the condenser, noting that:

> "I shall have to enter on the subject of the paper you mentioned to me."

This "paper", according to historian British energy historian Crosbie Smith, was almost certainly the 1837 translation for Taylor's *Scientific Memoirs* of Clapeyron's "Memoirs on the Motive Power of Heat". [3] The discussions in James letter of 1844, according to Smith, are the earliest record of implicit references to Clapeyron and Carnot by the Thomsons.

The core strand of influence in the early development of thermodynamics, traces from Carnot to Clapeyron to the Thomson brother's discussions on Clapeyron's paper, to German physicist Rudolf Clausius, who found out about Carnot's theory through William's 1848-49 papers on the subject. [2] James may have picked up on the work of Clapeyron through association with his Glasgow College professor Lewis Gordon, beginning in 1841, although it seems that William was the first to acquire a copy of Clapeyron's book. [3] In their early years, both James and William had studied the writings of Scottish physicist David Forbes, a later influence to Scottish engineer William Rankine, another founder of thermodynamics.

Prediction | Freezing point lowering by pressure

On 2 Jan 1849, Thomson, in his publication "Theoretical Considerations on the Effect of Pressure in Lowering the Freezing Point of Water", made the following prediction, arrived at after grappling with an apparent "absurdity" of the possibility of perpetual motion pointed out by his brother: [4]

> "Some time ago my brother, professor William Thomson, pointed out to me a curious conclusion to which he had been led, by reasoning on principles similar to those developed by Carnot, with reference to the motive power of heat. It was, that water at the freezing point may be converted into ice by a process solely mechanical, and yet without the final expenditure of any mechanical work. This at first appeared to me to involve an impossibility, because water expands while freezing; and, therefore, it seemed to follow, that if a quantity of it were merely enclosed in a vessel with a moveable piston, and frozen, the motion of the piston, consequent on the expansion, being resisted by pressure, mechanical work would be given out without any corresponding expenditure; or, in other words, a perpetual source of mechanical work, commonly called a perpetual motion, would be possible. After farther consideration, however, the former conclusion appeared to be incontrovertible; but then, to avoid the absurdity of supposing that mechanical work could be got out of nothing, it occurred to me that it is necessary farther to **conclude**, that the *freezing point becomes lower as the pressure to which the water is subjected is increased*."

Later that year, James' brother William Thomson verified this deduction to its numerical details by direct experiment. [5] American science historian Fielding Garrison summarizes [6]

> "**James Thomson**, one of the early pioneers of physical chemistry, was able, by an implicit denial of Carnot's assumption [material theory of heat], to predict and prove that the freezing point of water would be lowered by pressure."

(add discussion)

Glasgow school of thermodynamics

See main: Glasgow school of thermodynamics

In 1855, James was appointed professor of civil engineering at Queen's University Belfast. He remained there until 1873, when he accepted the professorship of Civil Engineering and Mechanics at the University of Glasgow, a post in which he was successor to the influential William Rankine. He retired in 1889.

Thomson's thermodynamic surface

See main: History of thermodynamic surfaces

In 1871, James Thomson constructed a plaster pressure-volume-temperature surface, the original shown adjacent as a P,V,θ surface, on display (Q) at the Hunterian Museum and Art Gallery, University of Glasgow based on data for carbon dioxide collected by Thomas Andrews. [6] The surface is described as follows: [7]

James Thomson's plaster pressure-volume-temperature surface, labeled as a P,V,θ surface, on display (Q) at the Hunterian Museum and Art Gallery, University of Glasgow. [7]

> "This is a plaster model of the theoretical thermodynamic surface for carbonic acid, also called the PV theta curve.
> Carbonic acid H_2CO_3 results from dissolving carbon dioxide gas in water. It only exists in solution."

The model, according to the gallery, is dated "circa 1860 Queen's University, Belfast, Northern Ireland". [7]

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1. (a) From a pencil drawing by his sister Elizabeth in 1838, National Portrait Gallery, London.
(b) Smith, Crosbie and Wise, Norton M. (1989). *Energy and Empire*, (pg. 52). Cambridge University Press.
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4. Thomson, James. (1849). "Theoretical Considerations on the Effect of Pressure in Lowering the Freezing Point of Water" (Q), Read to the Royal Society of Edinburgh, Jan 2; in: *Transactions of the Royal Society of Edinburgh*, 16:575-80.
Stewart, Balfour and Tait, Peter G. (1875). *The Unseen Universe: or Physical Speculations on a Future State* (§108). Macmillan.
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7. Model PV theta curve – Hunterian Museum & Art Gallery.

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● Thomson, James. (1912). in J. Thomson and J. Larmor (eds): Collected Papers in Physics and Engineering.

External links

● James Thomson (engineer) – Wikipedia.

θΔics

In thermodynamics, **James Thomson** (farmer) (1738-c.1810) was a Scottish farmer notable for being, in a way, the grand-patriarch of the Glasgow school of thermodynamics, through the later workings of his third son James Thomson (mathematician), and his sons James Thomson (engineer) and William Thomson (physicist). It is said James Thomson (farmer) gave his children what little education they could receive. [1]

References

1. James Thomson (mathematician) – MacTutor Biography, University of St. Andrews.

θΔics

In thermodynamics, **James Thomson** (1786-1849) was an Scottish mathematician, son of James Thomson (farmer), noted for being the base-board of the Glasgow school of thermodynamics, where he was a professor of mathematics (1832-49), and for the idea that his two sons James Thomson (engineer) and William Thomson (physicist) should have a well-rounded education, taking them to France and Germany among other places; the synergy and discussions between the latter two on theoretical nature of heat engines (1843-1848) resulted in launching the science of thermodynamics. [1]

Education

James Thomson was the son of James Thomson (farmer), a wealthy farmer who is said to have home-schooled his son on the basics of education. The young James Thomson was said to have remarkable abilities and strong character. He was brought up on the land as a farm laborer, and received from his father the rudiments of education. Of note, he taught himself, without either skilled teachers or good textbooks, the art of making sundials and a night-dials, able to tell the time of day by one of the positions of Ursa Major. [2]

Sometime at about the age of twelve, James Thomson began as a pupil at a small school run by a Dr. Samuel Edgar, a Presbyterian minister, at Ballykine, to learn the classics and mathematics; his abilities where such that he soon was promoted to assistant teacher. From 1810 to 1814, while still teaching at Ballynahinch, he spent six winter months studying at the University of Glasgow, completed his MA in 1812. In the years to follow, he continued to attend classes in Medicine and Divinity still with the intention of entering the Church.

In 1814 he was appointed to the Belfast Academical Institution. This Institution had been founded in 1810 and had both a school department and a college department. Thomson's first appointment was to the school department where he taught arithmetic, geography, and bookkeeping for a year before moving to the college department where he became professor of mathematics.

James and William

In Belfast he met Margaret Gardner, the daughter of a Glasgow merchant, and they were married in 1817. The newly married couple lived in a house opposite the Belfast Academical Institution and their seven children were born in that house. The first son of the marriage was James Thomson (engineer), born in 1822, the second son, born in 1824, is the famous William Thomson (physicist).

James Thomson was offered the Chair of Mathematics at Glasgow University and took up the appointment in 1832, the essential starting point for the Glasgow school of thermodynamics.

Margaret Thomson, to note, had died in 1830 leaving Thomson to bring up his seven children. Two years after taking up the professorship his two sons James (then twelve years old) and William (then ten years old) began their university studies at Glasgow. These two young men turned out to be Thomson's most talented mathematics students.

In 1841, at the age of seventeen, in coordination with his father, William Thomson wrote his first scientific paper on Joseph Fourier's analysis of heat under the pseudonym *P.Q.R.* (an insistence of his father that William be disguised, supposedly owing to his young age; the acronym, according to physics historian David Lindley, having no particular meaning, except that they are often used as a triplet of variables in three dimensional mathematical problems), which was submitted to the *Cambridge Mathematical Journal* by his father, titled "On Fourier's expansions of functions in trigonometric series"; and soon two more papers of similar theme soon followed. This was William's first foray into studies on the nature of heat.

William Thomson would go on to become professor of natural philosophy at Glasgow in 1846 and James Thomson professor of engineering at Glasgow in 1855.

Publications

As a mathematician he is famed as a writer of textbooks. While in Belfast he published *A Treatise on Arithmetic in*

Theory and Practice (1819), *Trigonometry, Plane and Spherical* (1820), *Introduction to Modern Geography* (1827), and *The Differential and Integral Calculus* (1831). He later edited a version of Euclid's *Elements* (1834) and wrote his most famous text *An Elementary Treatise on Algebra Theoretical and Practical* (1844). [3]

References

1. Lindley, David. (2004). *Degrees Kelvin - a Tale of Genius, Invention, and Tragedy* (pg. 1-25). Washington, D.C.: Joseph Henry Press.
2. Thompson, Silvanus P. (1910). *The Life of William Thomson, Baron Kelvin of Largs, Volume 1* (pg. 1-3). MacMillian.
3. James Thomson (senior) – MacTutor Biography, University of St. Andrews.

External links

â— James Thomson (mathematician) – Wikipedia.

θΔics

In hmolscience, **James Ward** (1843-1925) was an English psychologist and philosopher noted, in philosophical thermodynamics, for

Monism

In 1899, Ward, in his Gifford Lectures turned book *Naturalism and Agnosticism*, argued against materialism and dualism, criticizes "naturalism", i.e. the belief that all phenomena are governed by the laws of science, and that supernatural cannot exist, and criticizes "agnosticism", i.e. the belief that the existence of spiritual phenomena cannot be proved or disproved, and in their place argued for panpsychism, i.e. reality consisting of plurality of centers of activity, similar to the monism of Gottfried Leibniz, believing that the universe was comprised of psychic monads. [1]

Maxwell's demon

Ward, at some point, argued that Maxwell's demon gives a positive affirmation of illustrating the importance of mind. [2] Ward seems to have also critiqued the views of Herbert Spencer and his version of evolution; which may be from where he became acquainted with the second law. [3]

Reference

1. Ward, James. (1899). *Naturalism and Agnosticism*. Cambridge University Press, 2011.
2. Author. (1967). "Article" (James Ward, pg. 229; extropy, pg. 229; demon, pgs. 220, 221, 229), *Physis*, Vol. 9-10.
3. Author. (1925). *Evolution in Light of Modern Knowledge: A Collective Work* (pg. 453). Blackie and Son Limited.

External links

â— James Ward (psychologist) – Wikipedia.

θΔics

In existographies, **James Watt** (1736-1819) (IQ:175|#217) (Cattell 1000:225) [RGM:130|1,500+] (Gottlieb 1000:110) (Murray 4000:1|T) (EP:28) (SIG:8) (CR:109) was a Scottish instrument maker turned engineer noted for number of inventions and design improvements to the functionality of the steam engine, including: separate condenser (1765), the fly-ball governor (1788), the definition of "pony power" (or horse power), all embodied in what came to be known as the Watt engine.

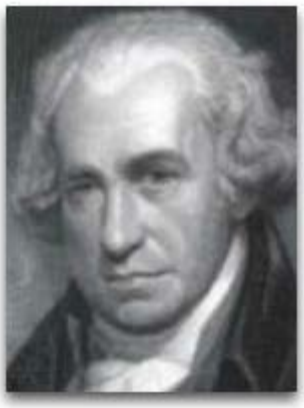

PT graph

In 1764, Watt, puzzled by the breakdown in the “law of mixtures” in respect to calculating the efficiency of steam engines, based on four datum points, shown by circle dots below, made the following PT graph: [12]

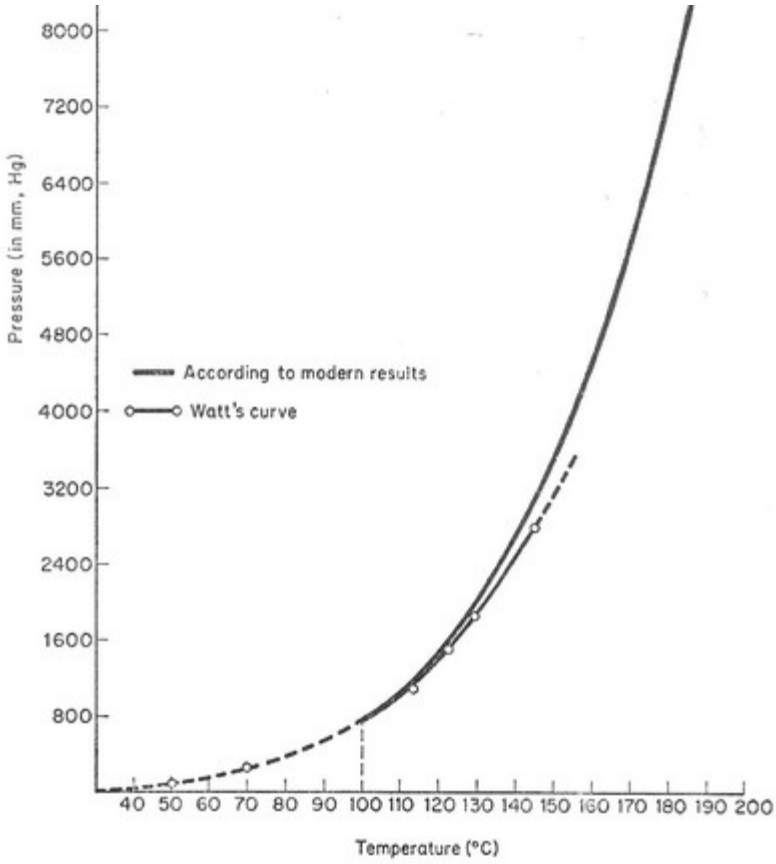

On this graph, he commented:

> “From these elements **I laid down a curve** in which the abscissa [y-axis] represented the temperatures and the ordinate [x-axis] the pressure, and thereby found the law by which they were governed sufficiently near for my then purpose.”
>
> — James Watt (c.1764), “on his pressure-temperature graph” [12]

In 1792, Davies Gilbert was claiming and or demonstrating in court some type of calculus based integration of the work or efficiency of a Hornblower engine (1781).

In 1796, John Southern, Watt's employee, invented the the "indicator", and correlative and "indicator diagram", which tracked the changes in volume of the piston, which was stimulated in some way by Gilbert's court proceedings.

Murdock

In 1781, William Murdock (1754-1839), Watt's employee, invented the sun and planet gear. [4]

Anderson

In 1757, John Anderson (1726-1796) (Q), a professor of natural philosophy at Glasgow College, asked Watt to repair a model of a Newcomen engine that Anderson used in lecture demonstrations. [10]

Newcomen engine | Model sized

Shown below (left) is the model Newcomen steam powered atmospheric engine that James Watt tried to repair in 1763. It was his failure to coax the machine back to optimum capacity that sparked his invention of the separate condenser, held at the Hunterian Museum, University of Glasgow (Q)

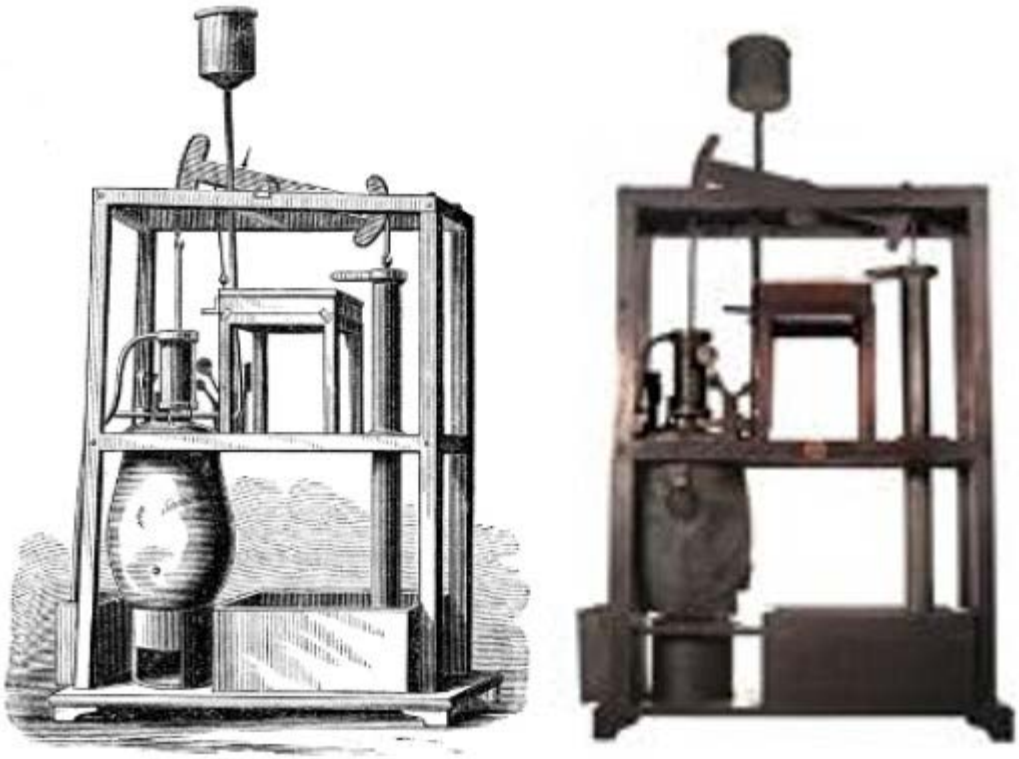

The scaled down model of a Newcomen steam engine that Watt began to repair, at the University of Glasgow, in 1763, which led to the idea of of the separate condenser (cold body).

Condenser

In 1765, Watt commented in what seems to be autobiographical journal format that: [2]

> "Two years before I was given the job of repairing a model Newcomen steam pump for the University of Glasgow and realized the great inefficiency of this engine. But compared with muscle-powered pumps, Thomas Newcomen's engine represents technical progress. Even the first example from 1711 was able to replace a team of 500 horses that had powered a wheel to pump out a mine. In over 50 years few detailed changes have been made to the basic design. Seventy-five of these engines can now be found at mines all over England. Coal is dearly needed, because wood has become scarce. But following the seams of coal down into the earth, the mines get flooded by water. Getting that water out of the mines is vital for exploiting the only available substitute for wood fuel. But Newcomen's pump consumes too much of the coal it unearths."

He continues later:

> "A separate condensing chamber for the steam could save much fuel! That's it!"

This insight was the start of Watt's improved engine.

In 1765, Watt built the following first-draft laboratory sized version of his steam engine with a separate condenser, where A is the boiler, C and D are the piston and cylinder, and G and K are the "separate condenser" consisting of two pipes of thin tin plate, 10 or 12 inches long and 1/6th of an inch in diameter, which was connected to K a air pump used as a "snifting valve", the entirety of which being set in a cistern of cold water, the machine being able to lift an 18-pound weight E: [8]

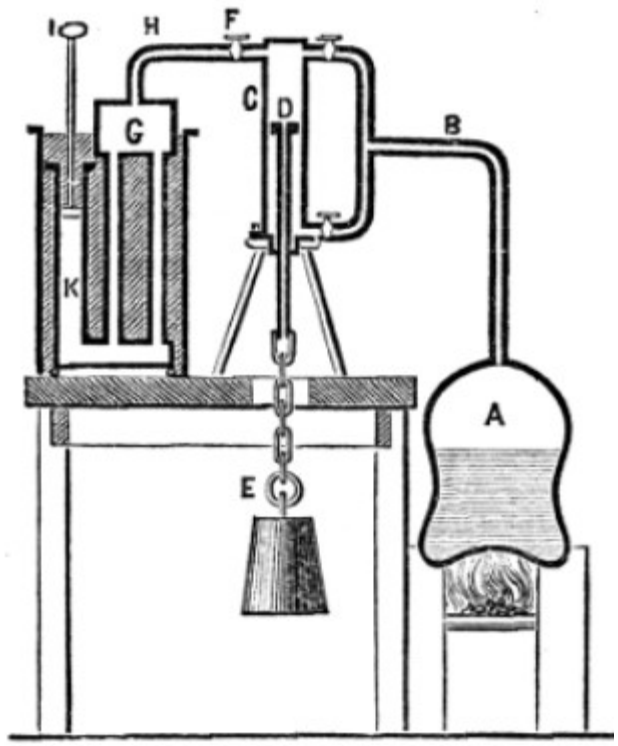

The following is a retrospect rendition the basic design of the so-called "separate condenser":

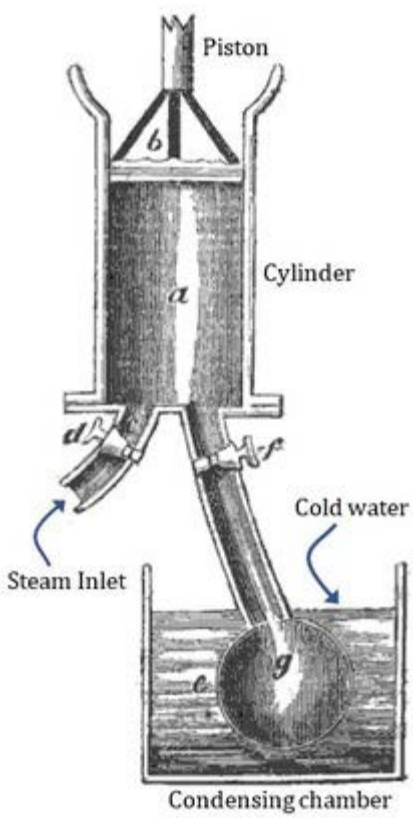

The operation of which is described as follows:

> “In which *a* represents the cylinder, and *b* its plug or piston made to fit air-tight. The pipe *d* is furnished with a stop-cóck, by means of which the elastic vapor is occasionally admitted. A similar pipe, furnished with a stop-cóck at *f*, passes from the other side of the cylinder, and enters the vessel *g; e* being the reservoir to contain water. If we now suppose the piston at the bottom of the cylinder, and steam admitted by the pipe *d*, its expansive force will elevate the piston, and when the air is expelled, the whole internal cavity of the tube will be filled with condensible vapor. On closing the steam-cóck, and opening that connected with the vessel *g*, a portion of the vapor will immediately expand itself, and **coming in contact with the cold sides of the vessel, a portion of its heat must be absorbed by the water at *e*.** A new portion of steam then descends, and is also condensed, and indeed the same process continues till the whole of the steam is drawn from the tube. A **vacuum being thus formed**, the pressure of the atmosphere will preponderate, and the piston rod be depressed to the bottom of the tube. On closing the stop-cóck *f*, a new supply of steam may be admitted by the other pipe, and after raising the piston, the process of condensation may be readily repeated.”
>
> — Charles F. Partington (1825), note on the history of the steam engine [9]

Here, we see, in the tub of water e, the roots of the concept of the "cold body" as envisaged by Sadi Carnot (1824).

In Nov 1774, Watt announced the successful trial of his new-designed full-sized steam engine, with a separate condenser, erected at Kinneil, near Boroughstones, with an 18-inch diameter cylinder, as shown below: [8]

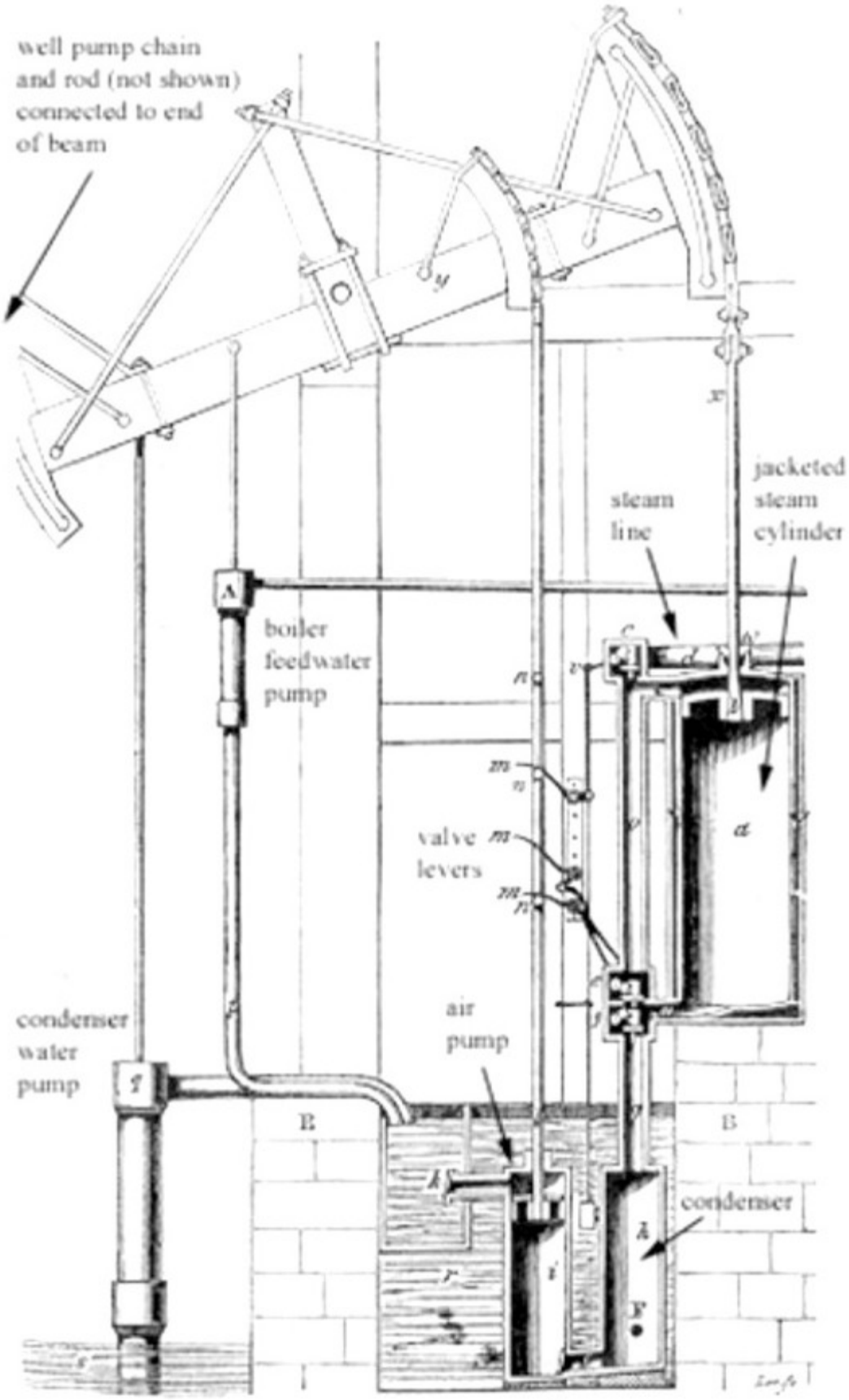

(add)

Thermodynamics

Watt's indicator diagrams were later utilized by French engineer Émile Clapeyron to graphically analyze the work output during a Carnot cycle.

Black

The Scottish physicist and chemist Joseph Black was an existence-long friend and mentor of Watt. [1] Of note, there is a embedded legend, originating from the mis-information of John Robinson, an existographer of both Black and Watt, that is extensive in 19th century history books, that Black told Watt about his theory of latent heat, whereupon Watt perceived the idea for the "separate condenser". Watt, however, latter denied this legend. [9]

An 18th century artwork entitled "First steam experiment of James Watt" (see: tea kettle anecdote) based on Watt's cousin Marion Muirhead's later recollected apocryphal story of how Watt, at age thirteen, became intrigued by the force of steam of a teapot to later go on to "invent the steam engine", which of course is fiction: Denis Papin invented the steam engine (see: Papin engine, 1690), by watching his pressure release valve bubble up and down on his pressure cooker in the 1680s. [3]

Education

Watt, as a youth, studied Euclid's *Elements* and Isaac Newton's natural philosophy. [3]

In 1751, Watt, age 15, had read Willem Gravesande's *Elements of Natural Philosophy* twice. [10]

Quotes | On

The following are quotes on Watt:

> "**James Watt** was equally distinguished as a natural philosopher and chemist; his inventions demonstrate his profound knowledge of those sciences, and that peculiar characteristic of genius, the union of them for practical application."
>
> — Humphry Davy (1824), "Address to Royal Society" (Q)(Q)

> "**James Watt** who, directing the force of an original genius, early exercised in philosophic research, to the improvement of the steam engine."
>
> — Henry Brougham (1825), epitaph below statue (Q)(Q) of Watt at Westminster Abbey

> "**Watt** started as an instrument maker and went on to be a practicing engineer. His big idea came to him while he was assisting in the laboratory of Glasgow University where the Scottish scientist Joseph Black was lecturing on heat. Watt noted the waste of heat between strokes in the model of the Newcomen engine, which he was repairing, because the walls of the cylinder had to be cooled and re-heated with each cycle. He continued to use steam at atmospheric pressure and a partial vacuum, but he provided a separate chamber for condensing the steam, connected with, but apart from, the cylinder around which he put a steam jacket to keep its walls hot. Thus, he saved three-fourths of the fuel which Newcomen had required."
>
> — Richard Kirby (1959), *Engineering in History* [6]

> "**Watt**, in 1761 or 1762, with his friend John Robinson, who was then an undergraduate, carried out experiments with a Papin digester—an early form of pressure cooker. He used a syringe with a plunger as a makeshift cylinder and piston, and found that the pressure of steam from the digester was enough to cause

the plunger to raise about fifteen pounds, a considerable weight."

— Donald Cardwell (1971), *From Watt to Clausius* (pg. 42)

"In a rather tentative fashion, knowledge of the work of Watt and of Black was spread abroad by authors such as J.A. du Luc and Joao Magellan, and the anonymous author of the 1770 volume."

— Donald Cardwell (1971), *From Watt to Clausius* (pg. 55) [11]

Quotes | By

The following are quotes by Watt:

"I can think of nothing else than this machine."

— James Watt (1765), "Letter to Dr. Lind" (Q), Apr 29

"I intend in many cases co employ the expansive force of steam to press on the pistons, or whatever may be used instead of them, in the same manner in which the pressure of the atmosphere is now employed in common fire engines [Newcomen engines]."

— James Watt (1769), Patent description; cited by Richard Kirby (1959) in *Engineering in History* (pgs. 167-68)

"In the winter of 1763-64, having occasion to repair a model of Newcomen's engine belonging to the Natural Philosophy [John Anderson's] class at the University of Glasgow, my mind was again directed to it. At that period, my knowledge was derived principally from Desaguliers [*Natural Philosophy*], and partly from Belidor [*Hydraulic Architecture*]."

— James Watt (c.1800), *Publication* [5]

"It was well known to some philosophers that the capacity [see: heat capacity] or 'equilibrium of heat' as we then called it, was much smaller in mercury and tin than in water."

— James Watt (1814). "Letter to David Brewster", May [9]

See also

- John Roebuck
- Matthew Boulton

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(b) Robinson, John. (1818). *The Articles Steam and Steam-Engines: Written for the Encyclopedia Britannica, by the Late John Robinson, with Notes and Additions by James Watt* (§: Letter from Mr Watt to Dr Brewster on the History of the Steam Engine, pgs. iii; §: On Steam, pgs. 1-45; §: On the Steam Engine, pgs. 46-151; §: Appendix by Mr Watt, pgs. 152-80). Edinburgh: Murray.
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Further reading

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● Smiles, Samuel. (1865). *Lives of Boulton and Watt: Principally from the Original Soho Mss. Comprising Also a History of the Invention and Introduction of the Steam Engine* (pg. 35). Murray.
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External links

● James Watt – Wikipedia.

θΔics

In human physics, **James Weatherall** (c.1983-) is an American physicist, philosopher, and mathematician noted for his 2013 book *The Physics of Wall Street*, wherein he discusses Brownian motion, among other subjects, connecting finance to physics. The thrust of the book seems to be themed around the following quote: [1]

> "I can calculate the movements of stars, but not the madness of men."
>
> — Isaac Newton (c.1690), after losing his hat in a market collapse

Weatherall's book mentions things such as Americans economist Paul Samuelson's use of engineer Willard Gibbs' thermodynamics and statistical mechanics methods in economics, American electrical engineer Claude Shannon's casino betting prediction adventures, among others.

Education

Weatherall completed his AM and AB both in physics at Harvard University in 2005, a mathematics and physics PhD in 2009, with a dissertation on "Quantum Control of Linear Susceptibility in Five Level Atoms via Dressed Interacting Ground States, With Focus on Group Velocity Control", at Stevens Institute of Technology, his MFA, in 2010, with a thesis on "The Scientific Image: On the Uses of Technical Language in Fiction", at Fairleigh Dickinson University, and a philosophy PhD in in 2012, with a dissertation on "Mass and Motion: Topics at the Interface of General Relativity and Newtonian Gravity", at the University of California, Irvine. Weatherall currently is an assistant professor of logic and philosophy of science at the University of California, Irvine, where he is also a member of the Institute for Mathematical Behavioral Science.

Related

In the neighborhood of Weatherall's Wall Street physics book is American chemical engineer James Ferri's 2011 student-produced "Thermodynamics of Life: Occupy Wall Street Edition" video project. [2]

See also

- Econophysics
- Financial thermodynamics

References

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- James Owen Weatherall – JamesOwenWeatherall.com.
- James Owen Weatherall – Academia.edu.

θΔics

In existographies, **Jan Ingenhousz** (1730-1799) (IQ:#|#), or "Ingen Housz", was a Dutch physician, physiologist, biologist, and chemist, noted for []

Heat conduction

In 1789, Ingenhousz tried to measure the thermal conductivities of different substances, and in one experiment, used uniform wires made of different metals, coated them with wax, and then noted the speed with which the 'melting point' travelled along the wires when one end was heated. [1]

Photosynthesis

In 1771, Ingenhousz, after meeting with Joseph Priestley, who had found that plants make and absorb gases, began to experiment with plants and respiration; by 1779, he had found that plants, in the presence of light, give off bubbles, which he identified as oxygen, from their green parts, while in the shade, do not give off oxygen bubbles, but rather give off carbon dioxide; this led him to realize that the amount of oxygen given off in the light is more than the amount of carbon dioxide given off in the dark, which demonstrated that some of the mass of plants comes from the air, and not only the water and nutrients in the soil.

Associates

Ingenhousz associated with: John Michell (Ñº), Benjamin Franklin, and Joseph Priestley.

Influenced

Ingenhousz influenced Pieter Musschenbroek (Ñº) .

Quotes | On

The following are quotes on Ingenhousz:

> "Go on with your excellent experiments, produce facts, improve science, and do good to mankind. Reputation will follow. You can always employ your time better than in polemics."
>
> — Benjamin Franklin (c.1775), advise (Ñº) to Ingenhousz in respect to scientific disputes

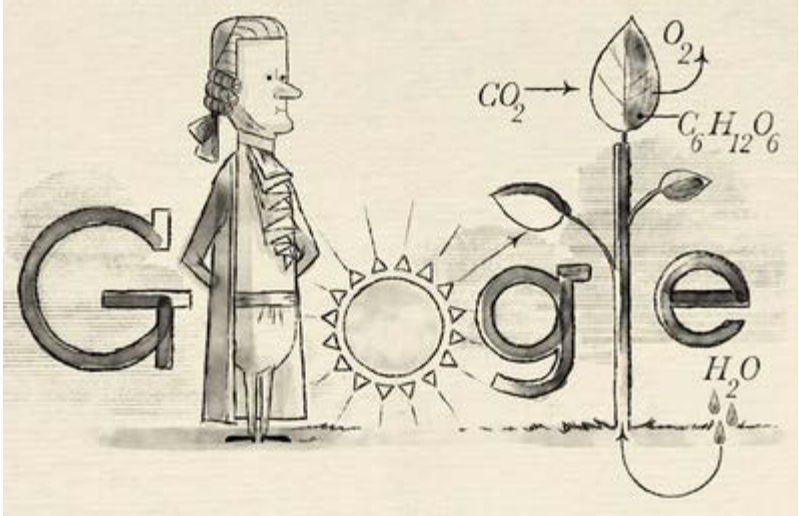

Above photosynthesis photo is a 2017 Google Doodle (Ñº) commemorating Ingenhousz' 287th birthday.

> "Animal electricity*: The* observation that certain animals could give shocks resembling the shock of a Leyden jar induced a closer examination of these powers. The ancients were acquainted with the benumbing power of the torpedo-fish [torpedo ray], but it was not till 1676 that modern naturalists had their attention again drawn to the fact. Edward Bancroft was the first person who distinctly suspected that the effects of the torpedo were electrical. In 1773, John Walsh (d. 1795) and **Jan Ingenhousz** (1730–1799) proved by many curious experiments that the shock of the torpedo was an electrical one *(Phil. Trans.*, 1773–1775); and John Hunter *(id.* 1773, 1775) examined and described the anatomical structure of its electrical organs. Alexander Humboldt and Joseph Gay-Lussac *(Ann. Chim.*, 1805), and Geoffroy Saint-Hilaire *(Gilb. Ann.*, 1803) pursued the subject with success; and Henry Cavendish *(Phil. Trans.*, 1776) constructed an artificial torpedo, by which he imitated the actions of the living animal."
>
> — Anon (1911), *Encyclopedia Britannica, Volume Nine* (pg. 182)

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External links

â— Jan Ingenhousz – Wikipedia.

θΔics

In existographies, **Jan Smuts** (1870-1950) (CR:3) was a South African statesman, military leader, and philosopher, noted for []

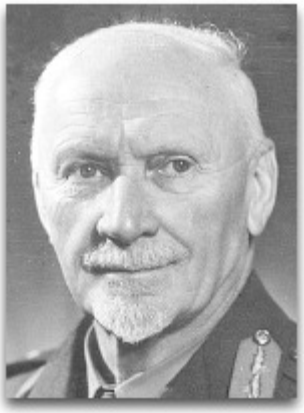

Overview

In 1926, Smuts, in his *Holism and Evolution*, argued that there is a tendency in nature to form "wholes that are greater than the sum of the parts", an idea that he called "holism", a term he coined, which via "creative evolution", of the Henri Bergson (1907) variety, will thus bridge the perceived gap of the disconnect between "matter, life, and mind", broken in the aftermath of mechanistic Darwinism.

Influences

Smuts was influenced by Henri Bergson.

Influenced

Smuts influenced: Jeff Tuhtan and Georgi Georgiev, and most who adhere to a "holism" ideology.

Quotes | By

The following are quotes by Smuts:

> "The acceptance of evolution as a fact, the origin of 'life structures' from the inorganic, must mean a complete revolution in our idea of matter. If matter holds the promise and potency of life and mind it is no longer the old matter of the physical materialists [see: spiritual materialist]. We have accepted evolution, but have failed to make the fundamental readjustment in our views which that acceptance involves. The old mechanical view-points persist, and natural selection itself has come to be looked upon as a mere mechanical factor. But this is wrong: **sexual selection is admittedly a psychical factor**, and even natural selection has merely the appearance of a mechanical process, because it is viewed as a statistical average, from which the real character of struggle among the living has been eliminated."
>
> — Jan Smuts (1926), *Holism and Evolution* (pg. 1) [1]

> "The free creativeness of mind is possible because, the world ultimately exists, not of 'material' stuff, but of patterns, of organization, the evolution of which involves no absolute creation of an alien world of material from nothing. The purely structural character of reality thus helps to render possible and intelligible the free creativeness of life and mind. The energy which is being dissipated by the decay of physical structure is being partly taken up and organized into life structures. Life and mind thus appear as products of the cosmic decline. Our origin is thus 'accidental', our position is exceptional and our fate is sealed, with the inevitable running down of the solar system. Life and mind, are thus 'reduced' to a very casual and inferior status in the cosmic order, a transient and embarrassed phantom in an alien, if not hostile universe. The human spirit is not a pathetic, wandering phantom of the universe, but meets with spiritual hospitality and response everywhere. Our deepest thoughts and emotions are but responses to stimuli which come to us not from an alien, but from an essentially friendly and kindred universe."
>
> — Jan Smuts (1931), "Presidential Address to British Association" (Ñº), Sep.

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External links

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θΔics

In hmolscience, **Jan Tinbergen** (1903-1994) was a Dutch physical political economist noted for his 1962 "gravity equation" of the so-called gravity model of international trade and economics, a statement of which is the hypothesis that: [1]

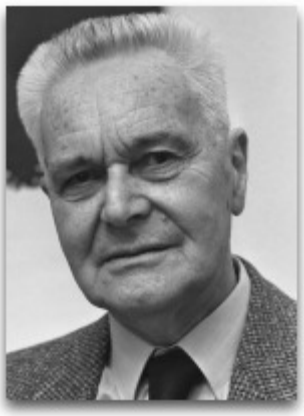

> "Interaction between large economic clusters is stronger than between smaller ones, and nearby clusters attract each other more than far-off ones."

English physical urban architect Alan Wilson commented that by 1966 the gravity model, in the social sciences, was "well-known", but he may have not been referring to the same gravity model. [4]

In 1969, Tinbergen was inaugural Nobel Prize in economics, along with Ragnar Frisch, for "having developed and applied dynamic models for the analysis of economic processes"; other noted hmolscience recipients in the years to follow include: Paul Samuelson (1970), Tjalling Koopmans (1975), Robert Fogel (1993), John Nash (1994), and Thomas Schelling (2005). [3]

Education

Tinbergen completed his BS in mathematics and theoretical physics at the University in Leiden, while at the same time pursing his interests in animal behavior, social democracy, and economic depression theories, largely being influenced by Paul Ehrenfest. He comments on this period in retrospect: [2]

> "Ehrenfest I owe a great deal. I studied physics at a time when a number of fascinating persons were there together. Ehrenfest would not instruct as such, as he preferred dialogue. Thanks to him I could participate in discussions with Albert Einstein. Also Kamerling Onnes, Lorentz and Zeeman were present. Being a student in the hands of such teachers, you are very fortunate indeed."

Tinbergen then completed graduate work under Ehrenfest who, one his own, was also said to have been interested in developing mathematical theories in economics, stimulated by his notion that there should be an analogy between thermodynamics and economic processes. While Ehrenfest's economic thermodynamics ideas did not result in publications, he did encourage his then graduate student Tinbergen to follow up on this. The result was Tinbergen's 1929 thesis "Minimization Problems in Economics and Physics" was devoted to problems in physics, economics, and politics.

Family

Tinbergen's brother ethologist-ornithologist Nikolaas Tinbergen (1907-1988), noted animal behavior pioneer—winner of 1970 Nobel Prize in physiology or Medicine (with Karl Frisch and Konrad Lorenz)—taught both Robin Dunbar and Richard Dawkins.

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θΔics

In hmolscience, **Jane Bennett** (1957-) is an American political theorist turned thing philosopher noted for []

Overview

In 2005, Bennett, in her "In Parliament with Things", opened to Bruno Latour's *Pandora's Hope*, and therein seems to have begun to digress into some type of "thing theory" of human values. [1]

In 2009, Bennett, in interview, on the topic of "Agency, Nature and Emergent Properties", stated the following: [2]

> "What counts as the material of vital materialism? Is it only human labour and the socio-economic entities made by men using raw materials? Or is materiality more potent than that? How can political theory do a better job of recognizing the active participation of nonhuman forces in every event and every stabilization? Is there a form of theory that can acknowledge a certain 'thing-power', that is, the irreducibility of objects to the human meanings or agendas they also embody?"

In 2010, Bennett, in her *Vibrant Matter: a Political Ecology of Thing*, outlined a "vital materiality" theory, which is code for living matter theory, which some, such as Rita Felski, dub as "new materialism", e.g. the "vital power" of "things" such as landfills, chemical streams, omega-3 fatty acids, etc.; the following is her abstract: [3]

> "Bennett examines the political and theoretical implications of vital materialism through extended discussions of commonplace things and physical phenomena including stem cells, fish oils, electricity, metal, and trash. She reflects on the vital power of material formations such as landfills, which generate lively streams of chemicals, and omega-3 fatty acids, which can transform brain chemistry and mood. Along the way, she engages with the concepts and claims of Spinoza, Nietzsche, Thoreau, Darwin, Adorno, and Deleuze, disclosing a long history of thinking about vibrant matter in Western philosophy, including attempts by Kant, Bergson, and the embryologist Hans Driesch to name the "vital force" inherent in material forms. Bennett concludes by sketching the contours of a "green materialist" ecophilosophy."

she seems to be trying to sell neo-green materialism ecophilosopy, situated on an empty "neo-neovitalism" platform; which is what Brown seems to be pointing out, in respect to the incorrigibleness of the term life, and in turn the underlying foundationless of Bennett's well-mindedness in aim position.

Quotes | On

The following are quotes on Bennett:

> "The problem for biology, then, is that it is constantly on the cusp of either reduction to physical chemistry or ideological capture by metaphysics. The concept of 'life' tends to get lost between explanations of biological organisms referring either to molecular interactions or to an irreducible systemic wholeness [e.g. Behe]. And because it gets lost, it is prone to over-extension as the je ne sais quoi (Ñº) which accounts for the substance of the biological precisely through its indetermination. Should we have done with life? If we deploy this concept as a means of pretending we know what we mean when we do not, then we probably should. And this is perhaps the dominant para-philosophical use of this concept today, as it is deployed by actor-network theory spin-offs and vitalist Spinozisms extolling the so-called 'life of things'. As, for example, in the 'vital materialism' of **Jane Bennett**."
>
> — Nathan Brown (2011), "Introduction" to the To Have Done With Life conference, Multimedia Institute, Zagreb, Croatia [4]

References

1. Bennett, Jane. (2005). “In Parliament with Things”, in: *Radical democracy: Politics Between Abundance and Lack* (§8:133-) (editors: Lars Tønder, Lasse Thomassen). Manchester University Press.
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External links

â— Jane Bennett (political theorist) – Wikipedia.

θΔics

In hmolscience, **Janusz A. Holyst** (1955-) (CR:3) is a Polish physicist noted for his 2003 to present efforts to launch the econophysics and sociophysics conferences in Poland.

FENS

In 1997, Holtst was the leader of a working group on nonlinear dynamics of complex systems (currently: Physics in Economics and Social Sciences). [2]

In circa 2003, the Polish Physics Society created a new division entitled "Physics in Economics and Social Sciences" (FENS), under the leadership of Holyst, as section president, catering to physicists who try to "look over the bridge" between the methods used in physics and those of the analysis of economical and social phenomena. [1]

His current research field includes models of emotions in cybercommunities, economic and social networks, collective bankruptcies, collective opinion formation, non-equilibrium statistical physics, cellular automata, self-organized criticality and phase transitions. He is one of the pioneers in applying physical methods to economical and social systems and is the co-founder, supposedly with Ryszard Kutner (Q), and chairman of the Section Physics in Economy and Social Sciences of Polish Physical Society.

Education

Holyst completed his MS in technical physics in 1979 and his PhD in physics in 1985 in solid state physics, with a thesis on "Solutions in Quasi-One-Dimensional Magnetic Systems", both at the Warsaw University of Technology, and his habilitation in theoretical physics, with a thesis on "Nonlinear Effects in Spin Dynamics" at the University of Warsaw", and in 2001 became a physics professor at Warsaw University of Technology. [2]

References

1. FENS (Polish → English) – Polish Physical Society.
2. Janusz A. Holyst (cv) – Warsaw University of Technology.

Further reading

● Kacperski, Krzysztof and Holyst, Janusz A. (2000). "Phase Transitions as Persistent Feature of Groups with Leaders in Models of Opinion Formation" (abs), *Physica A: Statistical Mechanics and its Applications*, 287(3-4):631-43.
● Aleksiejuk, A., Hoyst, Staufer D.. (2002). "Ferromagnetic Phase Transition in Barabasi-Albert Networks", Physica A 2002, 310, 260.

External links

● Janusz Holyst (homepage) – Physics Department, University of Technology.
● Janusz Holyst – GoogleScholar.

θΔics

In religio-mythology, **Japheth**, from the Hebrew *Ja-* ‘god’ + Egyptian ‘*-ptah*’, is the Judaeo recension rescript of the Egyptian god Ptah (Greenberg, 2000), recast into the Biblical story of him being one of the three sons, along with Shem (Ogdoad) and Ham (keme), of the flood man Noah (water god Nun). [1]

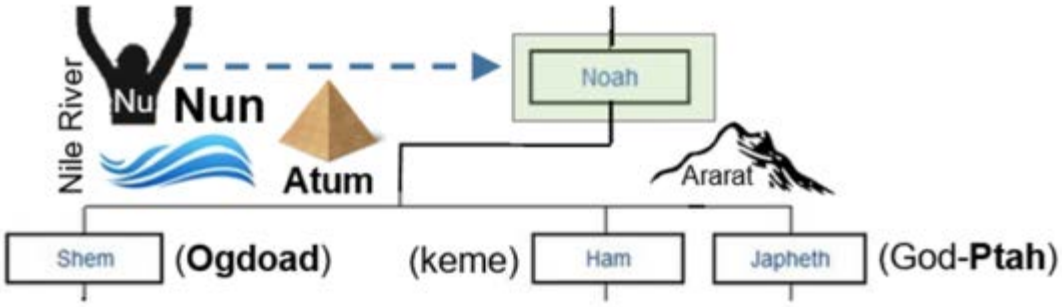

An family tree diagram (see: Judeo-Christian Islamic pantheon), from the Hermopolis creation myth article, showing the Egyptian equivalent of the the Biblical character **Japheth**, namely the god Ptah.

Quotes

The following are related quotes:

> “Turning to the Egyptian sphere, though, again we have a connection. The name **Japheth** in old Hebrew consists of three consonants, ‘**J-Ph-Th**’. The ‘ph’ and ‘th’ sounds are linguistically equivalent to ‘p’ and ‘t’, so we can write the name as **J-PT**. In Hebrew, when combining the name of god with another word, one would use a ‘J’ for god's name, which usually appears in transliteration as ‘Ja’ [Ja-Pheth / god Ptah] or ‘Jo’ [Jo-seph / Joseph / god Geb]. In J-PT, the PT part of the name contains the same letters used for the name of the Memphite creator deity, Ptah, so Japheth would be the linguistic equivalent of the name ‘god-Ptah’. This is a typical form of Egyptian combination name, such as Atum-Re [Atum-Ra] or Re-Herakhte. It also suggests the frequently used Hebrew term ‘lord god’.”
>
> — Gary Greenberg (2000), *101 Myths of the Bible* (pg. 75)

References

1. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (pg. 75). Source Books.

External links

â— Japheth – Wikipedia.

θΔics

In hmolscience, **Jaroslav Sestak** (1938-), "Jaroslav Šesták", is a Czech chemical engineer, solid state physicists, and materials scientist noted for his 2005 *Science of Heat and Thermophysical Studies*, which employs both a historical perspective, e.g. citing Herman Boerhaave's 1724 *Elements of Chemistry* as the start of modern chemistry, and an applied to sociology perspective, e.g. citing Gilbert Lewis' 1925 economics article, arisen via conversation with Irving Fisher, Jurgen Mimkes 1995 integration and segregation thermodynamics theories, along with discussions of thermodynamics of feelings, the econophysics works of Vilfredo Pareto, e.g. his power laws based Pareto principle, Ettore Majorana, among others. [1]

Mimkes

In 2017, Jurgen Mimkes, in his "Thermodynamics and Economics", was citing the following to chapters of Sestak's "Thermodynamics and Society: Laws versus Feelings" (2004) and "Thermodynamics, Econophysics, and Societal Behavior" (2005). [3]

Economic Carnot cycle

The following is Sestak's rendition of an economic Carnot cycle or the Carnot cycle of an economic system: [1]

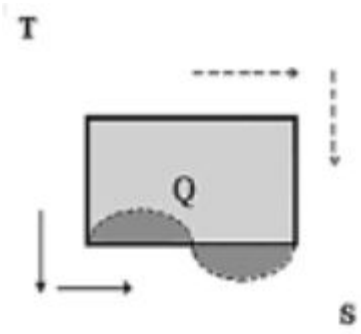

Sestak captions this as follows:

> "Economic application of the textbook Carnot thermodynamic cycle, where the solid arrows show traditionally the power cycle while the opposite cycle (dashed) shows the reverse heat pump (refrigeration process),. Correspondingly, the assumed business cycle (when replaced by the minimum Gibbs energy by maximum economic prosperity) can be imagined by using a less conventional representation of *T* as the mean property of a society, while retaining the meaning of entropy *S* (societal order/disorder) the same. In other words, products are manufactured in cheap (lower *T*) market and sold in a more affluent market (higher *T*). The shaded area represents useful work *Q* (either as heat or money) and the dotted line illustrates the more natural, non-equilibrium processing due to delays caused by, e.g. thermal conductivity (Curzon-Ahlborn diagram) or business transport obstacles. It is worth noting that a similar non-linear backgrounds will be shown characteristic for thermophysical measurements where, for example, s-shaped zero line is acquired for a DTA-peak."

(add discussion)

Physico-chemical approach | Sociology

Sestak, in his chapter section "Thermodynamic Laws Versus Human Feelings", states:

> "We need to look for some basic links between the mathematical

description of particles strictly controlled by the laws of thermodynamics and human beings affected by their feelings."

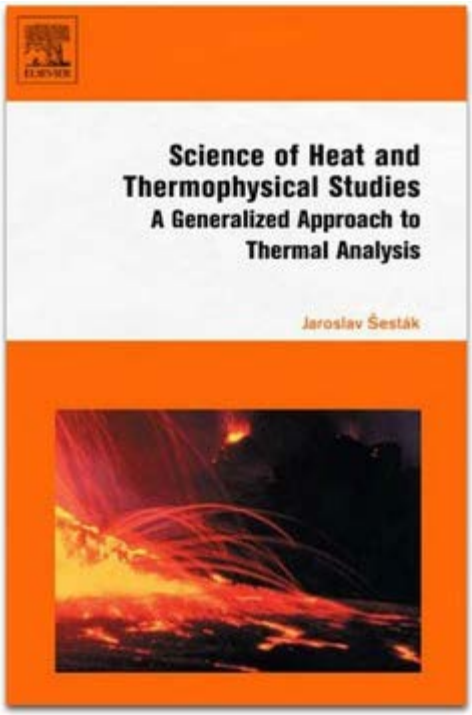

Joroslav's 2005 *Science of Heat and Thermophysical Studies*, contains a chapter eight on "Thermodynamics, Econophysics, Ecosystems and Societal Behavior". [1]

Strangely, he then cites Gilbert Lewis, and in his 1925 "A Plan for Stabilising Prices", as having made "correlations of thermodynamic ideas and rules applied to economics". This, however, is something not found in the article. [2] Sestak employs what he calls the "physico-chemical" approach to the sociological studies of human societies, according to which he defines "people as unvarying thermodynamic particles without accounting for their own human-self-determination". He estimates that the full elaboration of this approach might take another century:

> "Researching the analogy of physical chemistry to sociological studies of human societies is a very attractive area particularly assuming the role of thermodynamic links, which can be functional until the relation between inherent particles and independent people, is overcome by the conscious actions of humans because people are not so easily classifiable as are mere chemicals. Such feedback between the human intimate micro-world to the societal macro-state can change the traditional form of thermodynamic functions, which, nevertheless, are here considered only in a preparatory stage of feelings. Therefore this sociology-like contribution can be classified as a very first though rather simplified approach to the problem whose more adequate solution will not, hopefully, take another century [2105] as was the development of the understanding of heat and the development of the concept of the early elements."

(add discussion)

Education

Sestak completed a degree in chemical engineering in 1962 at the Technical University of Prague, a PhD in solid state physics in 1968 at the Institute for Solid State Physics, and a DSc in materials science in 1990, became an associate professor of inorganic chemist in 1991 at the University of Pardubice, and a full professor of materials science and engineering in 1993 at the Institute of Chemical Technology, Prague. He has taught at a number of Universities since. Sestak main fields of interests are: "Thermal physics and thermodynamics, chemical kinetics, solid-state chemistry and physics, material science and engineering: oxides (magnetics, superconductors, bioactive ceramics), glasses (both metallic and silicates), semiconductors (III-V compounds), quantum aspects of diffusion, interdisciplinarity of science and humanities, philosophy and education, wisdom of heat and scientific world in general; construction of TA instruments."

References

1. Sestak, Jaroslav. (2005). *Science of Heat and Thermophysical Studies: a Generalized Approach to Thermal Analysis* (§8: Thermodynamics, Econophysics, Ecosystems and Societal Behavior, pgs. 230-; 8.3: Thermodynamic Laws Versus Human Feelings, pgs. 236-42; Carnot cycle, pg. 232). Gulf Professional Publishing.
2. Lewis, Gilbert. (1925). "A Plan for Stabilising Prices" (abs), *The Economic Journal*, 35(137):40-46.
3. (a) Sestak, Jaroslav. (2004). "Thermodynamics and Society: Laws versus Feelings", in: *Heat, thermal analysis and society* (§18:230-46). Nucleus, Hradec Kralove, Czechia.
(b) Sestak, Jaroslav. (2005). "Thermodynamics, Econophysics, and Societal Behavior", in: *Science of Heat and*

Thermophysical Studies: a Generalized Approach to Thermal Analysis (§8:230-46). Elsevier.
(c) Mimkes, Jurgen. (2017). “Thermodynamics and Economics” (abs), *Thermal Physics and Thermal Analysis*, Volume 11 of the series Hot Topics in Thermal Analysis and Calorimetry (pgs. 495-519), Mar 25.

Further reading

â— Sestak, Jaroslav, Chvoj Z., Proks, I., and Barta, C. (1990). *Thermodynamic Applications Concerning Constrained States: Thermodynamic History, Kinetic Diagrams, Glasses, Phases Characterization* (pdf). FZU.
â— Sestak, Jaroslav. (2004). *Heat, Thermal Analysis, and Society* (pdf). Rucleus HK.

External links

â— Jaroslav Sestak (faculty) – Academy of Sciences of the Czech Republic.

θΔics

In hmolscience, **Jason Robert Smith** (c.1973-) is an American physicist noted for his circa 2014 launched blog "Information Transfer Economics", wherein he writes as a self-described "physicist who messes around with economic theory", on topics such as Eric Weinstein (Q) has been pushing for an interpretation of economics in terms of gauge theory; Cosma shalizi (2007) on Philip Ball's views of econophysics (Q); and most-interesting his attempt at defining economic potentials in terms of thermodynamic potentials via what he calls thermodynamic analogies.

Overview

In circa 2000, Smith, while writing his physics thesis, toyed with the idea of becoming a "quant" or quantitative analyst as he was, during which time he studied up on finance models, and was offered a few positions in that area (which he turned down). [2]

In circa 2005, Smith, amid a period when he was considering going into financial physics, states that Jan Dash's 2014 *Quantitative Finance and Risk Management: a Physicist's Approach* (Q) was his main reference book. [3]

In circa 2012, Smith discovered Peter Fielitz and Guenter Borchardt's 2009 "A General Concept of Natural Information Equilibrium: from the Ideal Gas Law to the K-Trumpler Effect" (Q), wherein Edwin Jaynes' information theory based version of the maximum entropy principle (MaxEnt school) is applied to system far from equilibrium (Prigogine model) systems of the economic variety, which stimulated him into starting a blog to expand on his own economics + physics ideas. [2]

Weinstein | Gauge theory economics

In Oct 2013, Eric Weinstein (Q), then managing director of Thiel Capital, in his "What Math and Physics Can Do for New Economic Thinking" (Q) video interview, with New Economic Thinking, asserted that gauge theory could fix economics, or something along these lines.

On 21 Mar 2014, economist blogger Chris House posted the following toolism grip about Weinstein and his assertion that gauge theory could fix economics: (Q)

> "Eric Weinstein for instance has somehow managed to convince himself that the instability of preferences is a huge problem for economics (it's not) and that the application of gauge theory to economics will improve things. Now, I don't know anything about gauge theory but I would be willing to bet that it has virtually nothing to add to economics. If Eric Weinstein has some insight that he wants to share then fine – send it my way and I'll listen but I'm not going to listen just because the math is difficult. The fact that it's difficult to understand something does not mean that it is important to pay attention to it. Weinstein might be perfectly well-intentioned but if he thinks that because he knows some fancy mathematics, economists are obligated to grant credence to his work, he is sorely mistaken."

On 2 Apr 2014, Smith posted the following rebuttal on House's objections: [1]

> "Now there is nothing incorrect about Weinstein's reformulation of economics in the language of fiber bundles with ordinal utility behaving like a connection (gauge field). As a physicist, I actually enjoyed the mathematics involved in reformulating gauge theory in the language of fiber bundles (and differential forms). I gave seminars on both as a grad student."

(add discussion)

Economic | Thermodynamic potentials

In 2013, Smith, in his “Economics for Fun and Profit”, was citing and discussing Paul Samuelson's 1960 objectionable views of economic thermodynamics: [3]

> “The formal mathematical analogy between classical thermodynamics and mathematical economic systems has now been explored. This does not warrant the commonly met attempt to find more exact analogies of physical magnitudes—such as entropy or energy—in the economic realm. Why should there be laws like the first or second laws of thermodynamics holding in the economic realm? Why should "utility" be literally identified with entropy, energy, or anything else? Why should a failure to make such a successful identification lead anyone to overlook or deny the mathematical isomorphism that does exist between minimum systems that arise in different disciplines?”

Smith, at this point, however, is unaware that in 1938, Edwin Wilson, the last protege of Willard Gibbs, who was also Samuelson' economics PhD adviser, wrote the following to Samuelson, in commentary on one of Samuelson's papers, wherein, in the context of his mathematical economics course, suggested that he use Gibbs equation 133 to formulate a new foundational version of economics; specifically:

> “Moreover, general as the treatment is I think that there is the possibility that it is not so general in some respects as Willard Gibbs would have desired. [In] discussing equilibrium and displacements from one position of equilibrium to another position [Gibbs] laid great stress on the fact that one had to remain within the limits of stability. Now if one wishes to postulate the derivatives including the second derivatives in an absolutely definite quadratic form one doesn’t need to talk about the limits of stability because the definiteness of the quadratic form means that one has stability. I wonder whether you can’t make it clearer or can’t come nearer following the general line of ideas [that] Gibbs has given in his *Equilibrium of Heterogeneous Substances*, equation 133.”

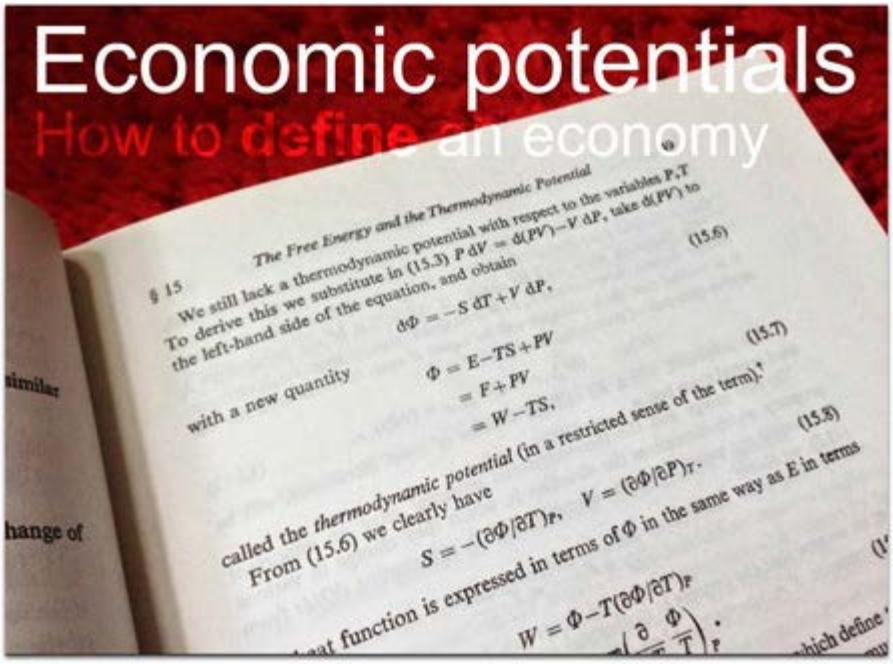

Annotated image, page from Lev Landau and Evgeny Lifschitz’ 1959 *Course of Theoretical Physics* (Q), from **Smith**’s 2015 blog “Economic Potentials: How to Define an Economy”, wherein he attempts, as she says, to “construct the thermodynamic potential of an economy by elaborate analogy.” [5]

The very impressive mention of "equation 133", from Gibbs' subsection "Internal Stability of Homogeneous Fluids as indicated by Fundamental Equations", is the following:

$$U - TS + PV - M_1m_1 - M_2m_2... - M_nm_n$$

Wilson, in other words, is suggested that Samuelson use the Gibbs fundamental equation to formulate a theory of economic stability. Samuelson, however, not being intellectually capable (i.e. he lacked education in pure physics, chemistry, and engineering, of the Gibbs mentality) of doing what Wilson suggested; accordingly, nine years later, in 1947, Samuelson, taking Wilson's advice, in part, as best he could, used some of this logic, via "mathematical isomorphisms", as Samuelson called them, in outline (e.g. Le Chatelier's principle), to pen his magnum opus

Foundations of Economic Analysis, which invariably put economics into a new form of a more rigorous, semi-physical science conceptualized or analogized, mathematics-based science; in short, he used Gibbs' models of minima and maxima, not thermodynamically, but generally, and argued that such could be found amid various economic variables.

In 2015, Smith, in his "Economic Potentials: How to Define an Economy", still unaware that Samuelson was told that the correct way to formulate "equilibriums" in economics was to used the isothermal isobaric thermodynamic potential (equation 133), i.e. the Gibbs energy for open systems, attempted to derive economic potentials via thermodynamics. [5]

Difficulties

The main difficulties on Smith's research efforts, idea brain storms, articles, and blogs, presently is that his is taking an unknowing ride on the Shannon bandwagon; which, as history has shown, e.g. Brooks-Wiley theory, leads to a self-Sokal affair sabotage and academic dead-end, as is often the case with many melting pot theories (when the name Shannon is involved). [6] That, however, Smith is digging around in the area of thermodynamic potentials shows he has promise, as long as he scrapes off his information theory adhesions.

Education

In the 1990s, Smith completed a degree in mathematics, focused on topology and group theory, and a degree in physics, focused on plasma physics, at the University of Texas. He then completed a PhD in theoretical physics, with a thesis (Q) on the quark structure of the nuclei. [2]

Quotes | Employed

The following are employed, discussed, and or cited quotes:

> "And where is this law of the universe that says that the human world can't be modeled like the world of particles or the world of cells and DNA? Does anyone have evidence to back up that contention? How the heck do you know that human behavior doesn't lend itself to modeling? If humans are so unpredictable, tell me why Google auctions get so much money from advertisers, or how economists can predict (Q) how many people will ride a train before the train is built. If you think social science can never be science, explain to me why these successes were possible."
>
> — Noah Smith (2015), "Lazy Econ Critiques" (Q), Oct 12; per assertion (Q) Noah is stealing his material, Oct 12

References

1. Smith, Jason. (2014). "Economics is Neither Physics nor Computer Science" (Q), Information Transfer Economics, BlogSpot, Apr 1.
2. Smith, Jason. (2015). "About Me" (Q), Information Transfer Economics, BlogSpot, May 20.
3. Smith, Jason. (2015). "The Foundation" (Q), Information Transfer Economics, BlogSpot, Apr 17.
4. Smith, Jason. (2013). "Economics for Fun and Profit" (Q), Information Transfer Economics, BlogSpot, Apr 1.
5. Smith, Jason. (2015). "Economic Potentials: How to Define an Economy" (Q), Information Transfer Economics, BlogSpot, Apr 25.
6. Thims, Libb. (2012). "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair" (url), *Journal of Human Thermodynamics*, 8(1): 1-120, Dec 19.

Further reading

● Smith, Jason. (2013). "Are the Thermodynamic Analogies Useful?" (Q), Information Transfer Economics, BlogSpot, Apr 27.

External links

● Jason Smith – Google+
● The Anome (user) – Wikipedia.

θΔics

In hmolscience, **Jawad Parvez Mirza** (c.1987-) is an American chemical engineer noted for his participation in Mary Guthrie's 2000 video parody "Why Students Choose Chemical Engineering?", wherein he comments: “When it comes to thermodynamics, you’ll learn about heat transfer … there’s a lot of heat transfer taking place—between people also.”

See also

- James Ferri

Education

Mirza completed his BS in chemical engineering at North Carolina State University (Q) in 2009; presently he a global technical operations engineer at Merck pharmaceuticals. [2]

References

1. Guthrie, Mary. (2009). “Investigative Report: on Why Students Choose Chemical Engineering” (Q) (writer: Mary Guthrie) (Mirza quote, 4:47-4:53; Byrnes quote [2012], comment section), ChETube, CHEnected, Jan 13.
2. Alumni (2009) – Che.NCSU.edu.

θΔics

In hmolscience, **Jay Alan Labinger** (c.1946-) is an American organometallic chemist noted—in literature thermodynamics—for his 1995 Society for Literature and Science presentation "Metaphoric Usage of the Second Law: Entropy as Time's (double-headed) Arrow in Tom Stoppard's *Arcadia*", on the thermodynamics of English playwright Tom Stoppard's 1993 play *Arcadia*, and—in literature chemistry—for his 2010 *The Routledge Companion to Literature and Science* section on "Chemistry", discussing founding works such as German polymath Johann Goethe's 1809 *Elective Affinities* up to modern commentators such as Roald Hoffmann. [1]

Literature & Science | Two cultures

See also: Two cultures department; Literature and Chemistry: Elective Affinities

Into the early 1990s, Labinger began to become increasingly interested or "distracted", as he puts it, in the literary, historical, and cultural aspects of science. In 1995, for instance, he organized a "Society for Literature & Society Conference". Labinger has also written a number of articles on the divided two cultures issue, particularly, it seems, in regards to the problem of "compartmentalization", frictional heat (see: social heat) generated between the two groups, and the lack of interest in practicing scientists to venture into the humanities. [2]

In 2001, Labinger contributed three articles to and was a co-editor of the 2001 book *The One Culture? A Conversation about Science*, the abstract of which is: [3]

> "So far the "Science Wars" have generated far more heat than light. Combatants from one or the other of what C.P. Snow famously called "the two cultures" (science versus the arts and humanities) have launched bitter attacks but have seldom engaged in constructive dialogue about the central issues. In *The One Culture?*, **Jay A. Labinger** and Harry Collins have gathered together some of the world's foremost scientists and sociologists of science to exchange opinions and ideas rather than insults. The contributors find surprising areas of broad agreement in a genuine conversation about science, its legitimacy and authority as a means of understanding the world, and whether science studies undermines the practice and findings of science and scientists."

(add discussion)

Quotes | Employed

The following are note quotes employed:

> "The second law in its objective-physical form (freed from all anthropomorphism) refers to certain mean values which are found from a great number of like and 'chaotic' elements. This law has no *independent* significance, for its roots go down deep into the theory of probabilities. It is therefore conceivable that it is applicable to some purely human and animate events as well as to inanimate, natural events, provided the variable elements present constitute adequate haphazard for the calculus of probabilities."
>
> — Joseph Klein (1910), *The Physical Significance of Entropy* [6]

> "[He] found in entropy or the measure of disorganization for a closed system an adequate metaphor to apply to certain phenomena in his own world. He saw, for example, the younger generation responding to Madison Avenue with the same spleen his own had once reserved for Wall Street: and in American 'consumerism' discovered a similar tendency from the least to the most probable, from differentiation to sameness, from ordered individuality to a kind of chaos. He found himself, in short, restating Gibbs'

prediction in social terms, and envisioned a heat-death for his culture in which ideas, like heat-energy, would no longer be transferred, since each point in it would ultimately have the same quantity of energy; and intellectual motion would, accordingly, cease."

— Thomas Pynchon (1960), "Entropy" [8]

"Although information theory is more comprehensive than is statistical mechanics, this very comprehensiveness gives rise to objectionable consequences when it is applied in physics and chemistry. It remains true, nevertheless, that information theory can be of value in a heuristic sense. Notions about 'loss of information' can sometimes be intuitively useful. But they can also, like the comparable concept of 'disorder', give rise to mistakes. It needs to be kept in mind that *thermodynamic* entropy is fully objective and the same must apply to any other 'entropy' which is used as surrogate."

— Kenneth Denbigh and John Denbigh (1985), *Entropy in Relation to Incomplete Knowledge*; see: information entropy (quotes) [4]

"When time goes forward there is a role for chance, because small or random fluctuations near a bifurcation point can cause a system to take a different path than it otherwise would. But when time runs backwards along the same track it took before, every juncture point is already predetermined, and hence chance can play no farther part in the system's evolution."

— Katherine Hayles (1990), *Chaos Bound: Orderly Disorder in Contemporary Literature and Science*; paraphrase of Ilya Prigogine and Isabelle Stengers (*Order Out of* Chaos, 1984) [7]

Quotes

The following are noted Klein quotes:

"Just a quick search of a library's (University of California) holdings for titles with the word "entropy" turned up dozens of books on topics not explicitly concerned with thermodynamics, such as the environment, information theory, traffic patterns, etc. Also included are at least half a dozen works of fiction, as well as a score for a piece entitled 'Entropy' for woodwind trio (which, alas, I have not yet heard). To what extent do these various endeavors represent rigorous application of the second law, as opposed to approximate or even metaphoric usage? Nobody questions the rigorous applicability of the second law to heat engines. The inevitable 'heat death' of the universe, too, is little questioned. However, there is rather less immediate concern about the conclusion that we're all going to die in some billions of years than about the potential implications for the fate of man and society over a more relevant time scale. Are those implications rigorous? If not, are they nonetheless of value in the realms to which they are applied?"

— Jay Labinger (1995), "Metaphoric Usage of the Second Law" (pg. 31) [5]

"It has been noted that there are risks attendant upon imprecise usages, and the second law is no exception. Indeed, it gives us some prime examples, such as the creationists' entropic argument against evolution or Jeremy Rifkin's appallingly neo-Luddite 'new world view', which misapplies the second law in about every way possible."

— Jay Labinger (1995), "Metaphoric Usage of the Second Law" (pg. 31) [5]

> "Joseph Klein's [human applicability assertion] suggests that a minimum requirement for applicability of the second law is a sufficiently large number of elements—an Avogadro's number of people, perhaps? [see: social Avogadro number]—as well as hinting at issues such as free will versus random actions."
>
> — Jay Labinger (1995), "Metaphoric Usage of the Second Law" (pg. 32) [5]

Education

Labinger completed his BS in 1968 at Harvey Mudd College, Claremont, CA, and his PhD in 1974 with a dissertation on "Mechanistic Studies on the Oxidative Addition of Alkyl Halides to Low-valent Transition Metal Complexes" under John Osborn at Harvard University, after which he did postdoctoral work and instructorship at Princeton University with Jeffrey Schwartz. In 1986, he became the administrator of the Beckman Institute and a chemistry professor at Caltech. His research interests have concentrated in the area of organo-transition-metal chemistry and catalysis.

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1. (a) Labinger, Jay A. (1995). "Metaphoric Usage of the Second Law: Entropy as Time's (double-headed) Arrow in Tom Stoppard's *Arcadia*", Presented at Nov meeting of the Society for Literature and Science, Los Angeles; in: *The Chemical Intelligencer*, Oct. 31-36, 1996.
(b) Labinger, Jay. (2010). "§4: Chemistry" (pdf), in: *The Routledge Companion to Literature and Science* (editors: Bruce Clarke, Manuel Rossini) (pgs. 51-62). Routledge, Abingdon (UK); Taylor & Francis, 2011.
2. Labinger, Jay A. (1995). "Science as Culture: A View from the Petri Dish", *Social Studies of Science*, 25:285-306.
3. Labinger, Jay A. and Collins, H. (2001). *The One Culture? A Conversation about Science* (§1: Awakening a Sleeping Giant?; §2: Split Personalities, or the Science Wars Within; §3: Let's Not Get Too Agreeable) (pdf). University of Chicago Press.
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(b) Labinger, Jay A. (1995). "Metaphoric Usage of the Second Law: Entropy as Time's (double-headed) Arrow in Tom Stoppard's *Arcadia*", Presented at Nov meeting of the Society for Literature and Science, Los Angeles; in: *The Chemical Intelligencer* (pg. 32), Oct. 31-36, 1996.
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6. (a) Klein, Joseph F. (1910). *Physical Significance of Entropy: or of the Second Law* (humans, pg. 89-90). D. van Nostrand.
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7. (a) Hayles, N. Katherine. (1990). *Chaos Bound: Orderly Disorder in Contemporary Literature and Science* (pg. 98-90). Cornell University Press.
(b) Labinger, Jay A. (1995). "Metaphoric Usage of the Second Law: Entropy as Time's (double-headed) Arrow in Tom Stoppard's *Arcadia*", Presented at Nov meeting of the Society for Literature and Science, Los Angeles; in: *The Chemical Intelligencer* (pg. 34), Oct. 31-36, 1996.
8. (a) Pynchon, Thomas. (1960). "Entropy", in: *Slow Learner* (pgs. 88-89). Little, Brown, 1984.
(b) "Entropy", in: *Slow Learner* (pgs. 88-89). Little, Brown, 1984.

External links

- Jay A. Labinger (faculty) – Caltech.
- Labinger (non-technical articles) (pdfs) – BeckmanInstitute.Caltech.edu.
- Labinger, Jay A. – WorldCat Identities.

In sociological thermodynamics, **Jay Teachman** (c.1950-) is an American sociologist noted for his 1980 article "Analysis of Population Diversity: Measures of Quantitative Variation", in which he uses a reformulation of American electrical engineer Claude Shannon's 1948 information entropy as a measure or index of social diversity. [1] This logic has come to be known as the "Teachman index" or Teachman/Shannon/Entropy index". [2] The index has since been applied to the study of variables such as gender or religious diversity.

American sociologist Kenneth Bailey calls Teachman's theory a "proportional reduction of uncertainty" (PRU) interpretation of entropy and notes that a similar PRU interpretation was done by American sociologist Patrick Horan (1975) who applied entropy to the study of the structure of teaching opportunities in academic departments. [3]

References

1. Teachman, Jay D. (1980). "Analysis of Population Diversity: Measures of Quantitative Variation." (abstract) *Sociological Methods and Research*, Vol. 8, No. 3, pgs. 341-62.
2. Konrad, Alison M, Prasad, Pushkala, Pringle, Judith, K. (2006). *Handbook of Workplace Diversity* (pgs. 206-07). Sage Publications.
3. (a) Bailey, Kenneth D. (1990). *Social Entropy Theory* (pg. 73). New York: State University of New York Press.
(b) Horan, Patrick M. (1975). "Information-theoretic Measures and the Analysis of Social Structures", *Sociological Methods and Research*, Vol. 3, pgs. 321-40.
(c) Patrick M. Horan (faculty) – Institute for Behavioral Research, University of Georgia.

External links

â— Jay D. Teachman (faculty) – Western Washington University.

θΔics

Article
Juarrero, Deacon, Nonreductive Physical Materialism, and Chemical Teleology | **Peer Review**
(a JHT submission)

Article | Review versions
â— **Formatted article** | 21 May 2013 | Pages: 36 | Format: PDF

This is a new **JHT peer review stage article**, in the re-formatting and or re-construction stage of development, about which: comments, suggestions, and or criticism are welcome, which can be submitted via: (a) the threads below, (b) comments added into the "this" wiki page, via the EasyEdit button, (c) attachment added to this page, via EasyEdit tools, (d) review posted externally, e.g. in beta wiki, WordPress, Blogger, your own website, etc., or (e) email comments sent to JHT editor Libb Thims directly *via* libbthims@gmail.com, which will be made public.

Abstract
The formatted abstract of the working draft-article is as follows:

In the aftermath of the 2012 University of California, Berkeley 120-day research misconduct investigation into the accusation of 'idea plagiarism' in the nonreductive physical materialism teleology theories of UC Berkeley anthropology professor Terrence Deacon, a parallel reading of the respective nonreductive physical materialism teleology theories of plagiarism accuser Cuban-born American philosopher Alicia Juarrero (*Dynamics in Action*, 1999) and Terrence Deacon (*Incomplete Nature*, 2011) was done in effort to ascertain any resemblance, novelty, priority, or worth of each. A report of these findings his presented here and along the way a critique and analysis of physical teleology theory in general is given.

Author
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Institute of Human Thermodynamics, 4126 N. Keystone Ave, Chicago IL, 60641, USA;

Received: 21 May 2013; *Reviewed:* 21 May 2013-Date; *Published:* Date

Review period

This article entered the review period on 21 May 2013 and will close prior to 27 Jun 2013, the date when JHT editor Libb Thims leaves for the University of Pitesti Econophysics and Sociophysics Workshop 2013, if not sooner as Thims will need to focus on completion of his key speaker talk. [1] Comments and review in between these two points will be appreciated.

Peer review

Reviews | **Review board** | Other

Terrence Deacon | 22 May 2013 | 12:32 AM EDT | **Email**

Comments: I hesitate to even write to you. You have a remarkably poisoned pen that seems to overshadow your intellectual care. And you clearly have a love of cheap shots. So I suspect that you are likely to twist what I have to say here. I'll take that chance.

I am responding because I am disappointed. Initially I had the impression that you were a scholar and scientist, not some self-published wacko angry at the world for not taking his theories seriously. And that you would read carefully instead of just using out of context quotations and ad hominem jabs to push your own agenda. Please don't prove this latter revised impression to be the more accurate one.

Juarrero-Deacon theory

What astounds me is how totally you have misrepresented my views, presumably because you needed a straw man intellectual adversary. I must say that I was surprised.

To be clear:

- I am an atheist with no interest in reinserting classical teleology back onto the physical sciences,
- I do not claim or believe that life or mind violate the 2nd law of thermodynamics,
- I am emphatically NOT attempting to resurrect Aristotle,
- I do not believe that the idea of top-down causality makes sense,
- I am not an anti-reductionist,
- I am not a humanist or social scientist

- I don't think that current systems theory, complexity theory, dissipative systems theory, the autopoiesis metaphor, etc., adequately explain the special thermodynamic organization of living organisms
- my attempt "teleodynamics" IS consistent with the 2nd law of thermodynamics (no magic);
- I argue that it is just a special case of thermodynamics not some new physics
- teleodynamics is a testable hypothesis about molecular chemistry (not some metaphysical claim) and I provide sufficient details to empirically test it and prove me right or wrong (the autogen model system),
- I am particularly surprised that given your interest in information theory that you said nothing about my arguments about information or evolution (where I assumed you might come up with cogent critiques).

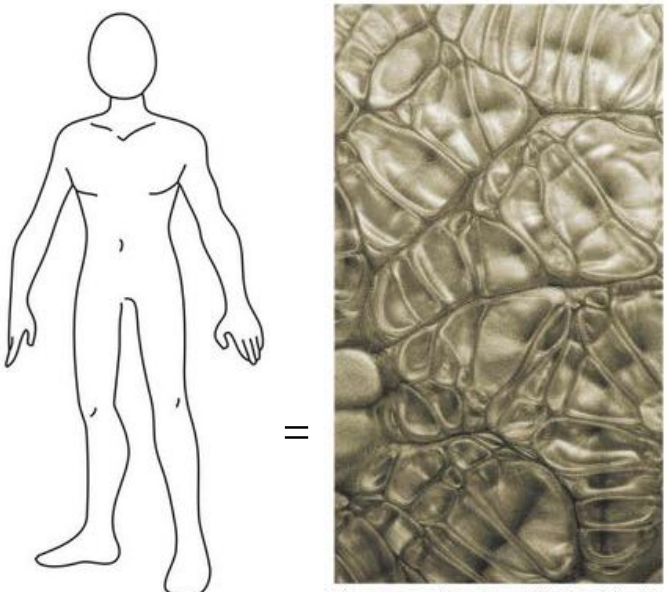

The geometry of convection cells in heated liquid.

A synopsis of Canadian philosopher Evan Thompson's 2011 *Nature* review of Deacon's book, wherein he summarizes that Deacon's main argument is that "absences", like meaning, desire, longing, morning, etc., arise or emerge similar to how molecules are "constrained" (constraints) to certain paths (Benard cells) when heated, or something along these lines. [2]

The argument for teleodynamics (NOT teleology) succeeds or fails with the autogen theory (which is emphatically not the same as autopoiesis). In the relationship I describe between reciprocal catalysis and molecular self-assembly that constitutes autogenesis there is nothing thermodynamically impossible (yes I have discussed this with many physical chemists). Anyway, claims about it don't really matter. It is an empirically testable model system and so the properties I hypothesize can be falsified (unlike your human molecule theory), and I am on the path to test it, to find out if it is right or wrong.

So I ask you, before you go ballistic because of what you THINK I said, spend at least a few minutes trying to understand what I REALLY said. Yes, here and there I use rhetorical tricks, trying to reach a general audience, and yes I invent neologisms to get my point across. But don't make the same mistake as Juarrero and only skim for words or phrases that seem to support your prejudice, or skip from chapter to chapter without trying to follow the argument as have others.

As for my education which you have imaginatively invented in order to make some point about the sciences vs the humanities, I attach my CV [see: attachment to this page below]. I began my college education in physics and took the standard courses including thermodynamics and quantum theory before moving laterally to the neurosciences (being chair of Anthropology does not make me a social scientist or humanist - it's just an administrative penance soon to be over). My research career is as a bench scientist and has mostly focused on brain development and evolution. So let me say this as clearly as I can: REDUCTIONISM WORKS, if I didn't believe this I would have given up lab work decades ago. That doesn't mean that science is over and that we won't discover interesting twists in thermodynamic theory that undermine simplistic reductionism. We just won't find magic. And we won't find that the 2nd law fails. Apparently even the suspicion that I might have a teleological aim was enough to set you off in an imaginary witch hunt. But as they say, you've got the wrong man. I'm not the anti-reductionist, religiously motivated, humanist, Aristotelian metaphysician you seem to imagine me to be.

To conclude this note (that I wouldn't have spent time on, except that you dug deep enough to uncover the silliness of the allegations against me), I found your penchant to quote me out of context, and repetitive self-promotion, to be cheap shots. It is almost as bad as McGinn's invention of what he imagines I must have said (having not spent the effort to really find out) in order to convince folks not to read my book or Juarrero's word-matching spreadsheet game (which you seem to have emulated in your article more than once) that could only convince someone who didn't actually read these texts. Your collection of quotations and piles of books are also now less convincing because you clearly did not read my book all that carefully.

A serious scholarly article would engage the arguments, provide a careful analysis of the key theoretical issues, and provide a clear alternative along with the critique, not just invent an imagined theory against which to promote one's own ideology.

I urge you to give up the ad hominem rhetoric and self-promotion and be that careful scholar.
Sincerely, Terry

Libb Thims | 22 May 2013 | 2:21 AM EDT | **Post**

Response: Thanks for the quick response. I will let it digest for awhile before responding fully on the above [this] page.

FYI, I also contacted Juarrero's four cohorts: Lissack, Rubino, McGinn, and Thompson, to give peer review. Hopefully they will have something interesting to say?

Also, to clarify, I read your book in detail, cover to cover, and this reading is inclusive of my standard dissection of books method of pencil noting commenting, boxing in of certain text, stars, checks, boxes, dates, question marks, "what" comments, one or two occasional highlights for exceptional sentences (which in your case amounted to one, namely your statement that Seth Lloyd writes in a "way of telling the story" that "misrepresents the history", which is strikingly true, hence I highlighted it), circles around certain foot notes, etc., etc., etc., which in your case amounted to a total of 1,340 pencil dissection incidences, all the way through your Glossary, Notes, References, Index, up through your second to last page (#601), where I box in all your usages of the term "vitalism", one notation example of which I scanned and will post on the above wiki review page [shown below], namely notation note #1250 your date typo of the Schneider and Kay reference, which you incorrectly put as 1997 (pg. 561), whereas it should correctly be 1994:

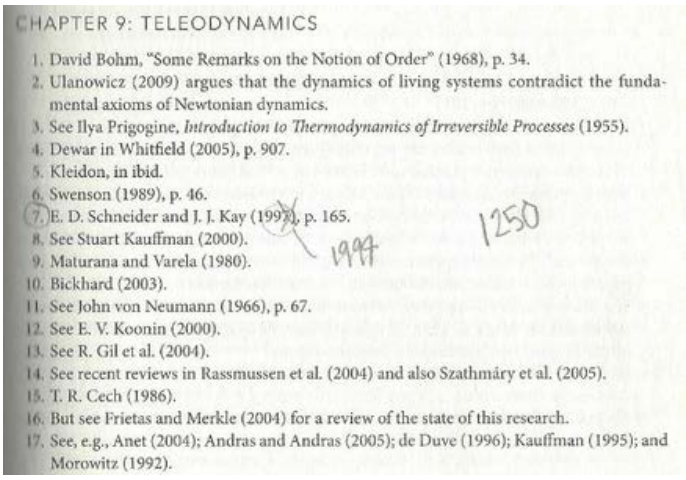

CHAPTER 9: TELEODYNAMICS

1. David Bohm, "Some Remarks on the Notion of Order" (1968), p. 34.
2. Ulanowicz (2009) argues that the dynamics of living systems contradict the fundamental axioms of Newtonian dynamics.
3. See Ilya Prigogine, *Introduction to Thermodynamics of Irreversible Processes* (1955).
4. Dewar in Whitfield (2005), p. 907.
5. Kleidon, in ibid.
6. Swenson (1989), p. 46.
7. E. D. Schneider and J. J. Kay (1997), p. 165. 1997 1250
8. See Stuart Kauffman (2000).
9. Maturana and Varela (1980).
10. Bickhard (2003).
11. See John von Neumann (1966), p. 67.
12. See E. V. Koonin (2000).
13. See R. Gil et al. (2004).
14. See recent reviews in Rassmussen et al. (2004) and also Szathmáry et al. (2005).
15. T. R. Cech (1986).
16. But see Frietas and Merkle (2004) for a review of the state of this research.
17. See, e.g., Anet (2004); Andras and Andras (2005); de Duve (1996); Kauffman (1995); and Morowitz (1992).

I then let the book sit for some time, read two other books [Karl Pearson's 1892 *The Grammar of Science* and Francis Crick's 1996 *Of Molecules and Men*], as discussed, then came back to it, went through all 1,340 notation and commentary notes AGAIN and wrote this article with my "remarkably poisoned pen" as you call it.

Again, I will respond more later in [this] wiki page.

Libb Thims | 22 May 2013 | 3:37 AM EDT | **Post**

Response: Re: "angry at the world for not taking his theories seriously", to quickly comment on this statement, as there is some truth to it, in respect to anger, but to clarify it's for the most part not "at the world" and certainly not about taking "my theories seriously", as you seem to think, everything I write has been said or done before, e.g. you comment "unlike your human molecule theory", correctly: human molecular hypothesis comes from French philosopher Jean Sales (*The Philosophy of Nature: Treatise on Human Moral Nature*, 1770), who was put in prison for this "theory" because it was against religion, there was but one who came to his defense, namely the great and witty Voltaire, who gave the modern day equivalent of $100,000 dollars towards his release. There have been over 120+ HMS pioneers who, mostly independently, arrived at the same view, which you ascribe as "my human molecule theory". See: human molecule (banned) for a history of opposition and resistance to this notion, the classic case being French physical chemistry philosopher Pierre Teilhard being excommunicated from the church for this view. I would sense that my anger is no different that Newton's anger.

Moreover, as I have said before to many people, a view that I came to discern, in my pre 2007 years, after discovering Goethe nd that everything that I am attempting has been done before by him, two hundred years ago (and that he faced nothing but unkind words [see: Elective Affinities (enemies)] for his remaining 23 years of existence, following the 1809 completion of his tripartite metamorphology theory), I don't expect what I am saying to be taken seriously until the year 3,000, at which point I assume it will be an accepted common fact that people are molecules whose behaviors are governed by chemical thermodynamics. The following two quotes come to mind here at this point:

> "We do not have to visit a madhouse to find disordered minds; our planet is the mental institution of the universe."
>
> — Goethe

> "I must say, I started watching your videos over a year ago, and have re-watched many. And they still fascinate me. I'm only 17 and I'm seriously considering doing a degree in chemistry after watching your videos. The only downside is not many people I know can have a conversation about the things you're talking about. You were right your videos are decades if not a century in front of its time."
>
> — Ben (2011), comment on Human Chemistry 101 YouTube channel

Everything that Goethe wrote, in respect to an explanation of what you call "intrinsically incomplete curious attributes", namely: "longing, desire, passion, appetite, mourning, loss, aspiration" (pg. 3 of your book), was proved correct following the publication of German physicist Hermann Helmholtz' 1882 "On the Thermodynamics of Chemical Processes", at which point the affinity-free energy equation was established and at which point the thermodynamic theory of affinity was established as the bedrock of modern physical science, after which it remains but a task for us to explain what Goethe was talking about in his explanations of longing, desire, passion, appetite, mourning, loss, aspiration, etc., in terms of "affinities" and human chemical reaction theory, albeit now one must do so in terms of the components of free energy G, internal energy U, pressure volume work PV, transformation content TS energy. If you don't believe me, you can consult American physical chemist and former college president Thomas Wallace, who explained it as follows in 2009:

> "The thermodynamic parameter free energy:
>
> $$\Delta G = \Delta H - T\Delta S$$
>
> represents the fundamental driving force in nature and determines whether physical and chemical processes conducted by nature and society will take place [and] the civilization development model [can be] represented by the following equation:
>
> $$P \rightarrow F \Leftrightarrow S \Leftrightarrow I \rightarrow F$$
>
> where *P* is the primitive phase, *F* the feudal phase, *S* the state phase, *I* the imperial phase,⇔meaning dynamic equilibrium, and → meaning complete conversion to products."

And if you don't believe Wallace, then you can consult the 40+ human free energy theory pioneers. I openly admit that I was ignorant of all of this prior to say about 2001, and especially after 2007, following my discovery of Goethe, and I will gladly and willingly call anyone ignorant (including you) who is not up-to-date on all of this.

What you call "ad hominem" I call a search for the truth and a quest to come closer to the secret principle of the universe that Bacon, Newton, and Goethe all searched for.

Libb Thims | 23 May 2013 | 9:59 AM EDT | **Post**

Comment: As I see your next response in my email inbox, I thought I would quickly comment on your pejorative labeling of me as a "self-published wacko". Firstly, as Juarrero formulaically points out in her spreadsheet line #43 (repeated in my article on pg. 78), the nutshell of both your books is as follows:

> *Dynamics in Action* (1999) & *Incomplete Nature* (2011) = Final cause (Aristotle) + Far-from-equilibrium thermodynamics (Prigogine)

In this light, perhaps you are not aware firstly that the science of thermodynamics was launched by a self-published book? (*On the Motive Power of Fire*, Sadi Carnot 1824); and secondly, perhaps you are also not aware that according to Aristotle one of the attributes of genius is a tincture of madness, to quote:

> "There was never a genius without a tincture of madness."
>
> — Aristotle (c.320BC), Publication

Hence, I may well be mad and possibly wacko, but whatever the case, if so, I am a mad wacko who has over the course of 10 years written over 500 online biographies of people, simply as a curious hobby, to have applied thermodynamics to questions of mind and life:

http://www.eoht.info/page/HT+pioneers

a listing, which to quote from the following abstract (I assume written by you) of the findings of the investigation committee report: [3]

> "To adopt this novel standard for defining plagiarism would create some "interesting" situations. Take, for example, the intellectual arena of human thermodynamics, a topic that both Deacon and Juarrero address in their respective books. *Hmolpedia: An Encyclopedia of Human Thermodynamics, Human Chemistry and Human Physics* maintains a webpage, "HT pioneers," which lists scientists and writers who over the

years have contributed theory and logic to the understanding of the thermodynamics of human existence. At the moment the page lists some 505 individuals. How many of these authors would Deacon and Juarrero have to cite to avoid a charge of plagiarism under Lissack's novel definition? **Note that this list does not include either Juarrero or Deacon**, both of whom have written on the thermodynamics of human existence. So even the encyclopedic *Encyclopedia of Human Thermodynamics* may not meet Lissack's standards of complete citation."

The committee, citing the my HT pioneers timeline, that even in the Internet/Google Books age it still takes over 10-years of research to uncover every theorist in a given field (thermodynamics applied to questions of human existence in this case), thus "rejected [Lissack's] attempt to redefine plagiarism", concluding that "failure to cite an earlier work with the same subject matter, even an important one, is not by itself research misconduct."

Why exactly is it that you and Juarrero are not on the list? The answer is that you and Juarrero are both small fish. A. you do not use equations (a factor of a big fish). B. if the two of you were notable, someone would have cited you both by now, in respect to your early articles on thermodynamics and mind and or life, I would have read the citations, and thus put you in the table, which was last edited on 29 Mar 2012. Granted, at the 500-person mark I had to stop adding people, as the wiki editing tools are becoming very slow at this rate and granted your book is rather recent compared to Juarrero's but never the less you are both small fish. A big fish, by contrast, is German theoretical physicist Reiner Kummel whose 2011 book (which I ordered this morning) *The Second Law of Economics: Energy, Entropy, and the Origins of Wealth*:

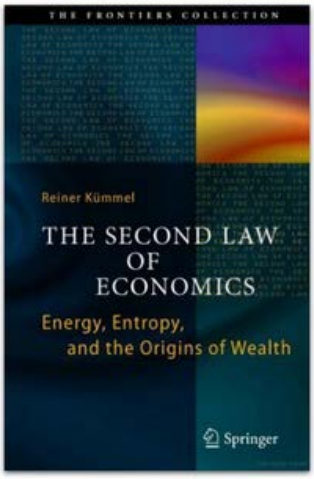

Left: Kummel's 2011 *The Second Law of Economics*, the result the product of lecture notes for a course he taught for several years on economics and thermodynamics. Right: Kummel giving a 2012 talk on the subject matter of his book.

argues that we need to begin to incorporate energy and entropy thinking into economics. No doubt, Kummel having now taught a course, since 2005, on "Economics and Thermodynamics", at University of Wurzburg, I will be less "angry" when I read his book, being that it will be closer to reality as compared to your book—and when I say "reality" I am referring specifically to American UC Berkeley chemical thermodynamicist Frederick Rossini's 1971 Priestley Medal address "Chemical Thermodynamics in the Real World", which in 2006 launched the ongoing Rossini debate.

Possibly, if you had done the same and taught a course on "Anthropology and Thermodynamics" your book would have been more sensible, as you would have gotten straight-from-the-shoulder feedback from your students that some of the things you say don't make sense. Instead of berating me for giving you a hard review, what you should be doing, recognizing your status as a small fish (the big fishes are all listed here), and what I mean by this is that you no doubt will never be able to explain your theory using partial differential equations, which is the language of thermodynamics, because you are not a trained thermodynamicist or even a self-taught thermodynamicist, and hence thanking me for giving you a hard review.

Evan Thompson | 22 May 2013 | **Email**

Comments: [wants comments kept anonymous] [2nd email 23 May 2013 at 10:27 AM EDT]

Libb Thims | 23 May 2013 | 9:38 AM EDT | **Post**

Response: Thank you. I will correct [your non-association with Juarrero] accordingly.

Also, from now having a read of your review [2], and image of it posted above, I notice that both you and Juarrero refer to heated water molecules forming Bernard cells. As far as I am aware, water does not have enough viscosity to form such shapes, only viscous things such as silicon oil and whale oil, in a dish, when heated will make the hexagonal-shaped cells. And also, to correct Juarrero, if she is following along [?], bifurcations are not phase transitions (pg. 120 of *DIA*), the latter of which are processes such as a liquid to vapor transition.

To note, a reading of your 2011 review, especially this part:

> "Deacon stumbles on two crucial junctures—his explanations for the emergence of meaning and for the emergence of consciousness. The problem of meaning is the problem of how it is possible for certain physical phenomena, such as brain states, to have content or be 'about' something beyond themselves. Deacon's answer is not easy to decipher. Roughly, he seems to be saying that certain states of self-generating system acquire content when they correlate reliably with features of the environment that are useful to that system. For example a system that needs molecules form the environment in order to reproduce 'interprets; the presence of those molecules as meaning that the environment is conductive to reproduce."

convinced me into ordering your book just now. Hopefully, I will find more of this kind of discussion therein?

Colin McGinn | 22 May 2013 | **Email**

Comment: My only comment is that I've never been Juarero's professor at Miami and have never actually met her. The first I heard of her was when I reviewed Deacon's book.

Libb Thims | 23 May 2013 | 10:22 AM EDT | **Post**

Response: Thank you. I will correct accordingly.

Terrence Deacon | 22 May 2013 | 12:11 PM EDT | **Email**

Comments: That you sent this to the people you mention suggests to me that your interests are journalistic rather than scientific. Mine are scientific. OK, to get beyond the he said she said quibbling and to the science (not philosophy), there are two simple questions that you need to answer:

Q1. Is the molecular model system that I call autogenesis thermodynamically and chemically realizable? If not why not?

Q2. If so, are the properties I ascribe to it likely to be demonstrated? If not why not?

My arguments hinge on this. Here are the properties I ascribe to this distinctive thermodynamic system:

- that MEPP is violated by this system and therefore cannot adequately account for living thermodynamics (and is probably wrong in general)
- that autogenesis produces an entropy ratcheting effect, thus preserving (and reconstituting) the attractor constraints it generates
- that it produces a higher-order synergy constraint that is substrate transferrable,
- that this creates the capacity to channel the specific form of physical work (in this system the source of free energy must be externally available, e.g. in the breakable chemical bonds of substrate molecules) that can generate the conditions that perpetuate this same capacity
- that these properties are required to explain living thermodynamics and functional information (not merely Shannon/Kolmogoroff information)

If you can demonstrate that this sort of molecular system is impossible, then you have indeed shown my analysis to fail. If you can show that one or more of these properties violates the first or second laws of thermodynamics I will need to rethink that aspect of the argument. This is the kind of exchange that science is about, not polemics about ideology or academic politics. Let's have a dialog about the science.

If you cannot fault these specific claims, then you need to rethink your criticism of the theory and your comments about my personal credibility. Only these sorts of detailed engagements with the theoretical content will convince me that you really read my book rather than merely searched for quotes that you could use.
Sincerely, Terry

Libb Thims | 23 May 2013 | 11:07 AM EDT | **Post**

Response: I'm low on time today, so to quickly comment:

â— Your “autogenesis” is a perpetual motion theory, that violates perpetual motion of the first kind, perpetual motion of the second kind, and perpetual motion of the living kind. I’m guessing you got the “auto-” part from Stuart Kauffman, and his autocatalytic closure theory, whose review I will read and post shortly.

â— This comment: “that MEPP is violated by this system” I don’t fully see what you mean?

â— This term usage “living thermodynamics” (or life thermodynamics), particularly when applied to human mental interactions, as clarified by Swedish physical chemist Sture Nordholm, in his noted 1997 article “In Defense of Thermodynamics: an Animate Analogy”, is something that should correctly be called “animate thermodynamics”, and if you want to further distinguish between an “animate” thing such as a heat driven Hero steam engine, Hero automaton, or robot, then you would want to signify that it is CHNOPS-based animate thermodynamics that you are discussing. That you ascribe the term “living” to certain types of animation and “non-living” to others is your shortsightedness.

â— In this comment “constraint that is substrate transferrable”, can you explain this in simple English, per each term: transferrable, substrate, constraint. You and Juarrero both seem to think that the container of the piston and cylinder is a “constraint” to the molecules inside of it, in the same way that a societal boundary is a “constraint” to humans. Is this correct?

â— This statement: “source of free energy must be externally available” is a huge misconception in science—the biggest blunder of which is Nicholas Georgescu-Roegen’s material entropy theory extrapolation of this. Free energy is something, in human mental terms, is something that comes from the changes in bonds “between” people (see: human chemical bond and bond energy), in same way that free energies result from the reactions between molecules, as quantified on free energy tables. What comes externally to us is “heat” from the sun.

â— Re: your last point: talking about or even associating oneself with Shannon entropy is like associating one’s theory with either, phlogiston, Peter Tait’s knot theory of the atom (see: atomic theory), or even possibly string theory, though the hat may be still out on this, they are all a waste time. We each only have so many years of moving existence on this planet as a bound state reactive molecule, and in my view there are “so many theories, so little time”. Hence, I prefer not to waste my time on paths with no fruit.

â— Re: “convince me that you really read my book” did you not read my response above [22 May 2013 | 2:21 AM EDT]? Not only did I read your book, cover-to-cover, in detail, but I also wrote commentary in your book with my pencil a total of 1,350 times. Here is another scan, showing "personal note" comments (namely: "retarded slop"), again these are personal note comments, I try to refrain from such derisive language in articles and public communication, written in early February 2013, to further satisfy your doubt:

Chemical perpetual motion **Mechanical perpetual motion**

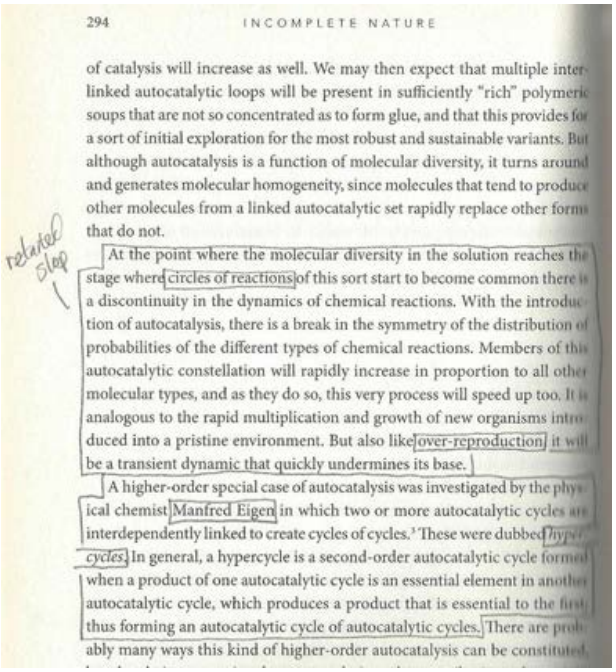

294 INCOMPLETE NATURE

of catalysis will increase as well. We may then expect that multiple interlinked autocatalytic loops will be present in sufficiently "rich" polymeric soups that are not so concentrated as to form glue, and that this provides for a sort of initial exploration for the most robust and sustainable variants. But although autocatalysis is a function of molecular diversity, it turns around and generates molecular homogeneity, since molecules that tend to produce other molecules from a linked autocatalytic set rapidly replace other forms that do not.

retarded slop

At the point where the molecular diversity in the solution reaches the stage where circles of reactions of this sort start to become common there is a discontinuity in the dynamics of chemical reactions. With the introduction of autocatalysis, there is a break in the symmetry of the distribution of probabilities of the different types of chemical reactions. Members of this autocatalytic constellation will rapidly increase in proportion to all other molecular types, and as they do so, this very process will speed up too. It is analogous to the rapid multiplication and growth of new organisms introduced into a pristine environment. But also like over-reproduction it will be a transient dynamic that quickly undermines its base.

A higher-order special case of autocatalysis was investigated by the physical chemist Manfred Eigen in which two or more autocatalytic cycles are interdependently linked to create cycles of cycles.[3] These were dubbed *hypercycles*. In general, a hypercycle is a second-order autocatalytic cycle formed when a product of one autocatalytic cycle is an essential element in another autocatalytic cycle, which produces a product that is essential to the first, thus forming an autocatalytic cycle of autocatalytic cycles. There are probably many ways this kind of higher-order autocatalysis can be constituted.

↔

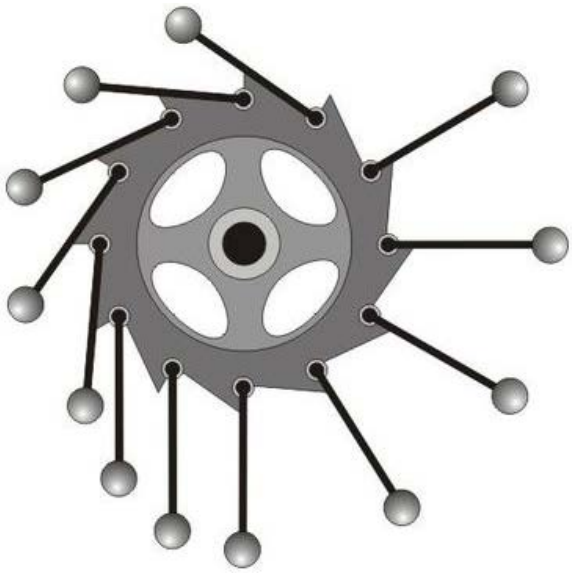

Left: Terrence Deacon's 2011 description of chemical perpetual motion, wherein he argues that life started from what he terms an "autogen" that started from "circles of reactions" that "self-generated" 3.85 billion years ago. Right: an overbalanced wheel perpetual motion device, according to which it was reasoned that the metal balls on the right side would turn the wheel because of the longer lever arm, hence achieving perpetual motion.

So, again, please stop accusing me of skipping chapters or not reading. I sometimes read upwards of three books per day and my home library is well over 1,300 books, which is more than Thomas Young (1000 book library) but less than Goethe (5,000 book library).

Libb Thims | 23 May 2013 | 12:00 PM EDT | **Post**

Response: [2nd] Re: "That you sent this to the people you mention suggests to me that your interests are journalistic rather than scientific", this is one of the stupidest things you've said. I contact people because I what to get this subject out of the closet and to get everybody's cards on the table so we can play the game.

Libb Thims | 23 May 2013 | 1:05 PM EDT | **Post**

Comment: One last comment, before I close up for the day, specifically regarding my "poisonous pen". What comes to mind here is American chemical engineer Linus Pauling and his 1987 chapter contribution to *Schrodinger: Centenary Celebration of a Polymath*, and how he ripped apart Schrodinger's famous *What is Life*? booklet. Specifically, while everyone else was and has been patting Erwin Schrodinger (1887-1961) on the back and extolling upon his greatness, Pauling was the only one to call him out:

> "When I first read this book, over 40 years ago, I was disappointed. It was, and still is, my opinion that Schrodinger made no contribution to our understanding of life. Several physicists and biologists with whom I have discussed this question have disagreed with me. When I asked what the contribution made by Schrodinger to our understanding of life is, each answered essentially by saying that Schrodinger showed that life is negative entropy, that living organisms utilize entropy in a way different from non-living matter.
>
> I have not had the opportunity to discuss this matter with a physical chemist, a person with a good understanding of the great work by J. Willard Gibbs on chemical thermodynamics. I am sure that he or she would agree with me.
>
> Schrodinger's discussion of thermodynamics is vague and superficial to an extent that should not be tolerated even in a popular lecture. In the discussion of thermodynamic quantities it is important to define the system. When he is writing about a change in entropy of the system, Schrodinger never even defines the system. Sometimes he seems to consider that the system is a living organism with no interaction whatever with the environment; and sometimes it is a living organism in thermal equilibrium with the environment; and sometimes it is the living organism plus the environment, that is the universe as a whole."

Pauling here, as we see, has intellectual balls! I would guess that 99 out of 100 scientists have the view in their head that Schrodinger, in his 1943 lecture turned book, solved the what is life in terms of physics and chemistry puzzle. Deacon, you for instance, being well grouped as one of these 99, state the following about Schrodinger (pg. 267):

> "A focus of on the far-from-equilibrium dynamics of living systems was highlighted by Erwin Schrodinger's effort to bring attention to their unusual thermodynamic tendencies."

This his historical anachronism, just as you deride Seth Lloyd of doing in respect to statistical mechanics and information theory. Far-from-equilibrium dynamics, as you call it was not yet invented until the 1950s, 60s, and for the most part becoming popular in the 70s, some thirty years after Schrodinger's *What is Life* lecture. Also you state (281):

> "Schrodinger's answer to the question was that living chemistry must somehow be continuously performing work to stave off the pressures of thermodynamic decay, and to do this it needs to feed off of sources of free energy available in the outside world that he enigmatically called 'negentropy', or sources of order".

This, again, is HUGE misrepresentation. Schrodinger said organisms must "feed of negative entropy", but that was about it. He never said "organisms must continuously perform work to stave off thermodynamic decay. This is your particular reading of his work. Schrodinger eventually got attacked for all of this (just like I am attacking your theory), after which he was forced to pen his famous "Note to Chapter 6" retraction, saying he should have turned the discussion to free energy (or correctly to human free energy theory, in modern 21st century terms).

Again you say that you ran your theory through a number of physical chemists, but did you, as Pauling says, "discuss this matter with a physical chemist, a person with a good understanding of the great work by J. Willard Gibbs on

chemical thermodynamics"? There are very few of these in this world, so I'm sure you didn't. In fact very few people have the ability to read Gibbs' two graphical thermodynamics of fluids articles and followup *On the Equilibrium of Heterogeneous Substances* cover to cover (see commentary on this here). I still have not completed the task myself.

So, again, a poisonous pen, like that of Pauling, is healthy for everyone and as I like to say "we learn the best from that which wounds us the deepest." On the flip side, my aim is to found America's first two cultures department, like John Q. Stewart did at Princeton (1948-1955) with Percy Bridgman, and two other sociologists, which involves two cultures bridge building, so please try to thicken your skin, and not take things personally.

Stuart Kauffman | 22 May 2013 | 12:19 PM EDT | **Email**

Comments: Thank you. Wife died 6 weeks ago. Hiding on S. Carolina island. Cannot review now. Hi Luigi. Stu.

Libb Thims | 23 May 2013 | 11:25 AM EDT | **Post**

Response: Thanks for the note. Hopefully, you will be back in spirits soon. Review for this article will close on or prior to the 4th week of June, as I will be leaving for Romania, to attend their econophysics workshop (poster).

FYI, a person cannot "die" any more than can any other animate molecule "die" (see: defunct theory of life & life terminology upgrades). Also, to give you some consolation, sometimes great things can come following the analysis (death) of a person. The example that comes to mind, for me, being Goethe's 3 Oct 1809 writing of his self defined greatest work *Elective Affinities*, or "best book" as he called it, following the analysis (death) of his closest intellectual friend Friedrich Schiller on 9 May 1805, after which he said he was "set free" (see: Goethe timeline).

Terrence Deacon | 23 May 2013 | **Email**

Comments: I should have guessed that it was pointless to have this conversation. Too bad. I had thought there might be some useful scientific discussion possible, not merely polemics, pronouncements, and self-promotion. And by the way just saying that X violates principle Y without a hint of analysis doesn't cut it. My participation in this conversation will end here.

Libb Thims | 27 May 2013 | 4:10 PM EDT | **Post**

Response: Whatever the case, I've got your theory disproved here: chemical teleology; and have you listed [here] as someone, similar to American historian John Diggins and his 1995 "crank" labeling of Henry Adams, not able to see the forest among the trees.

Good day to you.

Stephen Ternyik | 2 Jun 2013 | 10:07 AM EDT | **Post**

Comment: Artificial & machine intelligence researcher Eliezer Yudkovsky opines that human life is a painful chain of short-term mistakes & long-term-errors, giving even parameters for 'pain reduction' (=learning to knowledge). Physical teleology can not provide empirical evidence for a supreme cause of the physical world by pure reasoning or experimental design, i.e. scientists seek formal or ideal unity for aesthetic reasons and intellectual reputation. Concerning the cultivation of new & good ideas (=learning), academia (=knowledge) still lacks efficient mechanisms (=tolerance?). Ethical teleology can be supported by physical teleology, thus promoting and establishing practical theological reasoning (e.g. atheism, agnosticism). The hidden curriculum of 'intellectual property' is directed against open learning & knowledge; property is economically physical possession of and in this world.

JDNM is a profoundly written article and it was a pleasure for me to learn about the implicit theological 'explosives' by entering into 'intellectual property'. When Simon Ohm [Georg Ohm] wanted to conduct electrical experiments, the 'Geheimrat' (Goethe) advised him that it is better to look at the beauty of nature than to technically 'vivisect' it; there seems to be no true reason without passion and no true passion without reason, i.e. creative unity of heart and brain (mind).

Libb Thims | 2 Jun 2013 | 12:28 PM EDT | **Post**

Response: Thanks, for the review.

The following noted quote, from the 1980 film *The Shining*, for whatever reason, seems to come to mind here:

> "Perhaps they need a good talking to, if you don't mind my saying so. Perhaps a bit more. My girls, sir, they didn't care for the Overlook at first. One of them actually stole a pack of matches, and tried to burn it down. But I "corrected" them sir. And when my wife tried to prevent me from doing my duty, I "corrected" her." (Delbert Grady, *The Shining*)

Sometimes well-intentioned scholars become a bit too smug in their positive feedback embedded old boys review networks, and, lacking any hard, "give it to me straight", feedback, digress into layered awry arguments greatly in need of "correction".

Re: "implicit theological 'explosives' by entering into 'intellectual property'", yes, on the latter point this was one of the things that irritated me the most, namely a legal action pressured near-lawsuit investigation into claims of "intellectual property rights" on science, and on the former point, i.e. theological explosives, there is something these three respective authors are digging around at, in the distant vicinity of a minefield (the world religions as a whole), but again they are near but off target.

The REAL "**radical** new explanation of how life and consciousness emerged from physics and chemistry" [tagline to Deacon's 624-page book], was long ago done by Goethe, not Deacon, Juarrero, nor Aristotle (thought Goethe absorbed Aristotle), the implicit religion-exploding effect of which was clearly stated in by Victoria Woodhull in her 1871 review:

> "[This] work of the greatest genius of Germany [Goethe], the first who promulgated the thought that there is a **chemistry of the mind**, and that "elective affinities" [A = –ΔG] are as powerful and legitimate in the realm of human sentiment as in the realm of matter. [This] scientific truth cannot be appreciated by the world too soon, nor its immense sweep of consequences be too clearly foreseen and provided for. It will affect the whole scope of morals and social order, whether we accept it in our theories or not, and the less hurtfully and the more beneficently, in proportion as we thoroughly study and understand the subject.
>
> A great revolutionary doctrine pervades the whole. The American public is entitled to know what this great leader of modern thought, one of the founders of comparative anatomy, has thought on the more recondite subject of the chemistry of mind. In none of his works is that question so effectively answered as in *Elective Affinities*. [Though] it may be thought not **radical** and outspoken enough [it] prepares the mind for the still more **radical** change which the next few years [centuries] will inevitably produce."

This quote, in particular the "American public is entitled to know" statement, greatly captures the "anger" which Deacon, above (22 May), attributes me with. It deboggles my mind, every day, how someone, such as my self, can go through the entire standard American educational process (age 6-18), then through the supposed hardest and most science encompassing degree one can obtain (chemical engineering) (age 19-22), at one of the world's leading engineering schools (University of Michigan, top 13 presently), and not once be taught, amid all of the 1000's of theories and equations learned, the one equation (affinity-free energy equation) and theory (human chemical theory) that explains our existence:

> $A = -\Delta G$

and that Goethe, over two hundred years ago, worked out the "micro" sociological aspects (A) of this, that Gibbs, Lewis, and Guggenheim worked out the "macro" chemical (sociological) system aspects (ΔG) of this, and that Helmholtz, famously in 1882, proved ("On the Thermodynamics of Chemical Processes") the two, A and ΔG, were connected by a negative sign (–). The modern American should have been taught all of this before the age of 15. The fact that we are not taught any of this, nor even told about it in passing, and moreover that world leading chemical engineer thermodynamicists, e.g. John Prausnitz, head of molecular thermodynamics at UC Berkeley (world's leading chemical thermodynamics university), openly "deny" the implications of the theory—quote: "In the social sciences and in some humanities, thermodynamics may be useful as an analogy, as a suggestion for looking at a problem, but beyond that, I see little use of thermodynamics outside [physio-chemical] science" (28 Mar 2013)—in the face of the fact that chemical thermodynamicists decades ago declared this as the science that explains the "REAL WORLD" (Frederick Rossini, 1971). In short, it is acutely better to learn about the science of the "real world" than to waste so many years learning about the "make-believes of the economic systems of society" (Frederick Soddy, 1921) that we are currently taught in school.

Stephen Ternyik | 3 Jun 2013 | 2:21 AM EDT | **Post**

Response: the advancement of electronic communication and intelligent machines will come to terms with mechanical

regurgitations of non-applicable formulism; the Goethe-Helmholtz formula seems to have some similarity with the arguments at sintropia.it as affinity can be understood as syntropic effect balancing the entropic causes in complex systems: wo-man is physically variform and hu-man thought will psychologically never follow one path as decisions in real life are also complex. **All the best for *Pitesti***.

Libb Thims | 3 Jun 2013 | 8:40 AM EDT | **Post**

Response: Thanks, for the secondary comments.

Re: "arguments at sintropia.it", I have yet to dig through that school of thought surrounding Italian mathematician Luigi Fantappie (1941) and his modern followers: Italians cognitive psychologist Antonella Vannini and sociologist Ulisse de Corpo, and their recent attempts to mix quantum mechanics, relativity, and entropy to argue the conclusion that "life is moved by final causes" (link), just like the above Juarrero-Deacon argument. My recent readings into chemical teleology, however, have been very illuminating on this particular question. The statement:

> "Atoms react in order to maintain stability."

Is final cause based teleological, and hence erroneous, like the statement "life is moved by final causes", being that both statements "violate temporal constraints by treating an entity's consequence [stability/final cause] as if it could be its own cause in a backward causal fashion." [4] It would be like saying that in the following reaction:

$$H_2 + \frac{1}{2}O_2 \rightarrow H_2O$$

the "stability" inherent in the stronger water molecule bonds "caused" the movement. In other words, just as the atoms do not react (or are moved) by the end state (stability)—the final state is simply a point of equilibrium, wherein transformation content stops (entropy reaches a maximum)—or some type of future force, so to is life (animate matter) not moved by final cause.

Current models, to clarify, indicated that the movement is caused by exchange forces and behavior change of the fermion or bound state entity resulting therefrom. A non-teleological statement of the above, I am guessing, would be something along the lines of:

> "Atoms react spontaneously when the system shows a free energy decrease; increase in stability tends to result."

or something along these lines. The issue here is is very subtle, often hinging on correctness of phrasing, some of this wording issue of which I am still grappling with. The issue where this teleology/non-teleology subtlety is ripe, as Mexican-born American chemist Vicente Talanquer has found through his 2007 dissectional study of eight leading US college chemistry textbooks, is in three areas: [5]

- â— Second law descriptions (free energy minimization and or entropy maximization)
- â— Le Chatelier's principle (system reaction to perturbation descriptions)
- â— Octet rule (Abegg's rule) descriptions (electron geometrical patterns for atoms of atomic number 20 or less)

Much of human chemistry, human thermodynamics, and human physics are anchored in these three subjects, hence prudence is advised as to correctness of wording here, in respect to human movement; the library walk problem seems to be a good exercise to get one's bearings.

Stephen Ternyik | 3 Jun 2013 | 12:02 PM EDT | **Post**

Response: An established Swiss professional psychiatrist revealed to me that he sees his discipline as the true human medical science because all other human diseases can be treated as veterinary medicine, i.e. in this view, only the higher functions of the nervous system are human and animals just lack the linguistic abilities (e.g. they do not walk to libraries) and monetary purchasing power (e.g. they can not go off-shore) to being healed

by such sophisticated human experts. The inter-personal differences of human beings are the chemical result of motion and development of matter in this observable world, but the same material conditions do not result in equal behavioral responses of the human actors; this may even apply to animals. So, life seems to be very much about pain and coping successfully with pain; in any case, I will study your above mentioned points painstakingly to arrive at practical applications for our human existence. **Multumesc**, for all your efforts.

Libb Thims | 4 Jun 2013 | 5:24 AM EDT | **Post**

Response: Interesting comments. On an aside, what do you think of Vilfredo Pareto's human molecule based socioeconomic theories? I have been working on him today, and I think I might use his *homo economicus* theories:

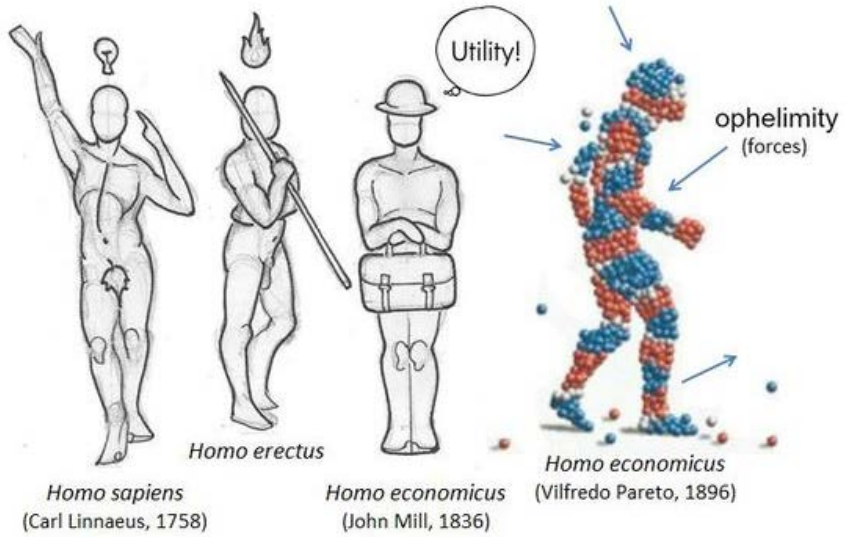

The term *homo economicus*—a Linnaeus-themed variant of John Mill's 1836 generic utility maximizing "economic man"—is said to be attributed to the work of **Pareto** and his 1896 statement that: "man himself; stripping him of a large number of his attributes, leaving out the passions, good or bad, reducing him to *a kind of molecule* that only acts in response to the forces of ophelimity", which, as summarized by Australian economics historian Michael McLure (2002), is an abstract entity that only responds to the forces of ophelimity, in other words "an abstract molecule that acts only in response to economic forces". [6]

in my Pitesti talk, albeit as a spring board to go into econoengineering based on chemical thermodynamics, rather than material science as Pareto did.

Stephen Ternyik | 4 Jun 2013 | 8:20 AM EDT | **Post**

Response: The Pareto-optimum closed the scientific gap to marginal benefit (= statistical social science / 2 research articles send to you via e-mail); while working on the political economics of American Independence, I could apply his theory of elite circulation = history as cemetery of elites. Also of methodical interest is his dynamic view of speculation/speculators as drivers of socio-economic change, i.e. of 'Faustian' insight into our current monetary transition period.

Libb Thims | 4 Jun 2013 | 5:14 PM EDT | **Post**

Response: Thanks. I printed those out. Power law (Pareto principle) stuff—the writings of Mark Buchanan aside—by itself is pretty boring; papers on which seem to be a dime a dozen. What I'm interested in if someone is going to discuss, e.g. 90 percent of a country's wealth being confined to 10 percent of a population, I what to hear mechanism speculations, such as the following by Pareto:

> "The molecules of which the social aggregate is composed don't stay at rest; some individuals enrich themselves, other impoverish themselves."

There's underlying physical laws at work here, as evidenced by the famous 1980s "lazy ant study". I want to know the mechanism to this. How, for instance, as Joseph Schumpeter states, does the following process actuate:

> "It can be shown that in all cases, that human molecules rise and fall within the class into which they are born, in a manner which fits the hypothesis that they do so because of their relative aptitudes; and it can also be shown, second, that they rise and fall across the boundary lines of their class in the same manner. This rise and fall into higher and lower classes as a rule takes more than one generation. These molecules are therefore families [see: family molecule] rather than individuals. And this explains why observers who focus attention on individuals so frequently fail to find any relation between ability and class position."

None of these Pareto principle / Zipf's law articles, give or take a few rare ones, attempt to go into this.

Stephen Ternyik | 5 Jun 2013 | 2:15 AM EDT | **Post**

Response: Response: Yes! This is the reason why the Pareto approach has certain methodically limited applications and why you received the boring articles; social scientific research into the **psychophysical laws** of human action/behavior comes first and mathematical social science/statistical data science can consequently condense the body of learned knowledge. Your molecular methodology will be very effective at the micro-methodical level of group dynamics as decisive evolutionary quantum of humankind; however, also the content of a book is psychochemically more than ink, paper, etc., i.e. on the macro-methodical level, we have to explain the inter-re-active energetics of group behavior patterns as mass motion & development of animate matter (e.g. observe the large-scale co-operation of small-scale groups for a global soccer competition). Of course, these are inter-generational learning processes and only open systems have this learning ability; the professional economic focus on **property** (+ credit x interest) is short-sighted = also Marx and Engels went into this cognitive trap, owing to their bourgeois background; Heinrich Heine opined that the poor masses need 'soap and education'. Maybe, you will be one of the first to push the social scientific solution of this macro-molecular-problem forward !

Reviewer | Date | Time | **Via**

Comments: (add)

Exercises | Problems

Exercises | **Homework problems** | Other

On the wise protocol of Swedish physical chemist Sture Nordholm's penning of eight homework problems to his 1997 *Journal of Chemical Education* article "In Defense of Thermodynamics: an Animate Analogy", the submitting author has provide (6 May 2013) two homework problems and or exercises, shown below, that will be added to the finial version of the submitted article, if published:

â— Problem #1:

â— Problem #2:

JHT editor Libb Thims, in his university lectures to thermodynamics students, frequently assigns students the task to attempt to solve one of the problems on the Hmolpedia "homework problems" page; Thims also, down the road, may end up writing a *Chemical Thermodynamics: with Applications in the Humanities* textbook, built on Gilbert Lewis' famous 1923 *Thermodynamics and the Free Energy of Chemical Substances*; some of these newly-proposed JHT end of article problems/exercises may find their way into the end of chapter exercises and or into the Hmolpedia homework problems page.

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1. Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (abs) (main), University of Pitesti Econophysics and Sociophysics Workshop (UPESW) 2013 / Exploratory Domains of Econophysics News (EDEN V) (organizer: Gheorghe Savoiu).

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2. Thompson, Evan. (2011). "Life Emergent. Review of Terrence Deacon, *Incomplete Nature: How Mind Emerged from Matter*," *Nature*, Volume 480:318, Dec 15.
3. Plagiarism Investigation Exonerates Terrence W. Deacon – TerryDeacon.Berkeley.edu.
4. Kelemen, Deborah, Rottman, Joshua, Seston, Rebecca. (2012). "Professional Physical Scientists Display Tenacious Teleological Tendencies: Purpose-Based Reasoning as Cognitive Default" (pdf), *Journal of Experimental Psychology*, 1-10, Sep 10.
5. Talanquer, Vincete. (2007). "Explanations and Teleology in Chemistry Education" (abs) (pdf), *International Journal of Science Education*, 00(0):1-18.
6. (a) McLure, Michael. (2002). *Pareto, Economics and Society: the Mechanical Analogy* (molecules, pg. 124; molecule, 4+ pgs). Routledge.
(b) Michael McLure (faculty) – University of Western Australia.
(c) Kirman, Alan P. (1987). "Pareto as an Economist", in: *The New Palgrave: A Dictionary of Economics, Volume Three* (editors: J. Eatwell, M. Milgate, and P. Newman) (pgs. 804-09). MacMillan Press.

Videos

â— Deacon, Terrence. (2012). "Incomplete Nature: How Mind Emerged From Matter" (1:44-min), Apr 18.

JHT

In philosophical thermodynamics, **Jean Baudrillard** (1929-2007) was French social philosopher and pataphysicist noted for his 1981 book *Simulacra and Simulation*, one the three required reading books for actors in the 1999 HT film *The Matrix*, in which he theorizes on concepts such as energy, negentropy, cybernetics, and information, viewed in terms of societies as molar groups, contracting and expanding. The following is a representative excerpt, in which he seems to be alluding to the idea of humanity as collection of carbon-based human atoms forming social molecules: [1]

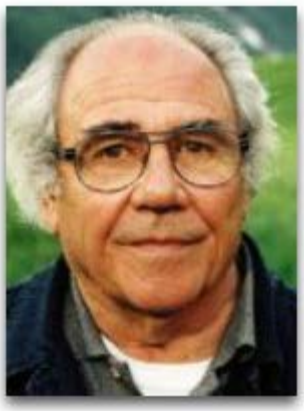

> "Our only culture in the end is that of hydrocarbons, that of refining, cracking, breaking cultural molecules and of their recombination into synthesized products."

In this context, Baudrillard discusses topics such as if information produces meaning, if so, being what he calls a 'negentropic factor', or if information has nothing to do with significance, based on what he calls 'Shannon's hypothesis'.

The presentation is similar in theme to that of French philosopher Pierre Levy's 1994 human molar group logic of collective intelligence.

References

1. (a) Baudrillard, Jean. (1981). *Simulacra and Simulation* (cultural molecules, pg. 64). Editions Galilee.
(b) Simulacra and Simulation – Wikipedia.

External links

â— Jean Baudrillard – Wikipedia.

θΔics

In chemistry, **Jean Beguin** (1550-1620), Ioannes Beguinus or Johannis Beguini, was a French iatrochemist noted for his 1610 *Tyrocinium Chymicum*—variously translated as *Beginner's Chemistry*, *Apprenticeship in Chemistry*, or *First Voyage in Chemistry*, respectively, a type of laboratory manual for his students—which contains the first prototype of the chemical equation (see: history of the chemical equation)—which is often characterized as the first true chemistry textbook. [1]

In about 1604, Beguin began to give lectures on chemistry to the general public. In the 1615 Paris edition of his *Beginner's Chemistry* (*Tyrocinium Chymicum*), he famously details the reaction of corrosive sublimate ($HgCl_2$) with sulfide of antimony (Sb_2S_3), as shown below: [1]

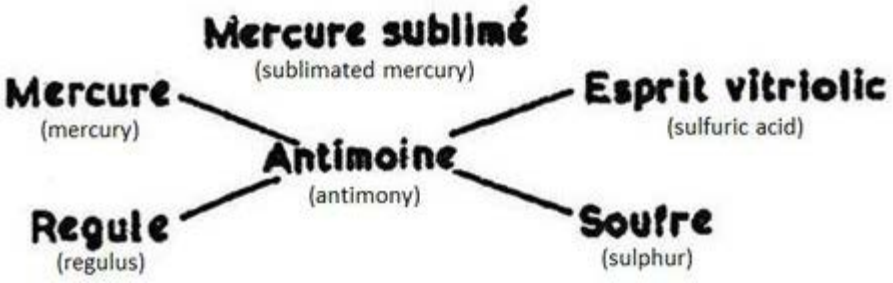

English chemistry historian Henry Leicester defines this as "an almost modern equation." [4] Other chemistry historians: Maurice Crosland (1959), Alistair Duncan (1971), likewise, corroborate on this distinction.

Influence

Beguin's *Beginner's Chemistry* was very influential, in its time, appearing in an extraordinary number of Latin, French and English editions, going through some forty-one editions between 1610 and 1690. [3] Beguin's book was the second book on the required reading list for the chemistry lectures of Dutch physician and chemist Herman Boerhaave, the leader of influential "Leyden school" of physical chemist (see: schools of thermodynamics), which included: Andrew Plummer, William Cullen, Joseph Black, and John Roebuck, and—through association with Black—James Watt—which can all products or precipitates, so to speak, of the Leyden school centered around Boerhaave.[2] Beguin's chemistry book was also frequently cited by English physicist-chemist Robert Boyle. [3]

References

1. (a) Duncan, Alistair M. (1970). "Introduction to the 1970 Edition"; in *A Dissertation on Elective Attractions* (pgs. vii-xxxviii) by Torbern Bergman. Frank Cass & Co.
(b) Beguin, Jean. (1615). *Beginner's Chemistry* (*Tyrocinium Chymicum*) (pgs. 167-68). Paris.
(c) Patterson, Thomas S. (1937). "Jean Beguin and his Tyrocinium Chymicum" (abs), *Annals of Science*, 2:243-98.
(d) Debus, Allen G. (2001). *Chemistry and Medical Debate: Van Helmont and Boerhaave* (pg. 24). Science History.
2. Moran, Bruce T. (2006). *Distilling Knowledge: Alchemy, Chemistry, and the Scientific Revolution* (pg. 112). Harvard University Press.
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4. Leicester, Henry M. (1971). *The Historical Background of Chemistry* (pg. 102). Dover.

Further reading

â— Applebaum, Wilbur. (2000). *Encyclopedia of the Scientific Revolution: from Copernicus to Newton* (§: Jean Beguin, pgs. 125-26). Psychology Press.

External links

â— Jean Beguin – Wikipedia.
â— Beguin, Jean (1500-1620) – Eric Weisstein's World of Scientific Biography.

θΔics

In existographies, **Jean Biot** (1774-1862) was a French physicist, astronomer and mathematician, noted for []

Heat

In 1804, Biot measured the steady-state temperature of an iron bar heated at one end, the results of which enabled him to formulate a simple theory of heat flow that took into account internal and external effects. [2]

Atomic theory

In c.1810s to 1830s, Biot was the central person of the 'atomic theory' group at the Ecole Polytechnique, including Augustin Cauchy (1789-1857) and Simeon Poisson (1781-1840), who, in the 1810s to 1830s, employed models in which the atom consisted of a massive nucleus surrounded by an atmosphere of imponderable ether particles. [1]

In 1816, Biot published a textbook on experimental and theoretical physics, wherein he mentioned views on atomic structure similar to Andre Ampere's 'geometric model' .

Meteorites

Biot, supposedly, established the reality of meteorites. [3]

Light

In c.1809, Biot, a supporter of the corpuscular theory of light, in the wake of Thomas Young's 1806 wave theory of light experiments and Etienne Malus' 1808 experiments showing that reflected light became polarized, began to make some significant advances in optics. [4] Biot studied, studied, e.g., the polarization of light passing through chemical solutions. [3]

Electromagnetism

In 1820, Biot, working with Felix Savart, discovered the intensity of the magnetic field established by a wire carrying an electric current is inversely proportional to the distance from the wire; this phenomenon was later dubbed the "Biot-Savart law". [4]

Influenced

Joseph Fourier, building on Biot's heat flow experiments, constructed his analytical theory of heat. [2]

Education

Biot's academic advisor was Gaspard Monge.

References

1. Mehra, Jagdish and Rechenberg, Helmut. (2000). *The Historical Development of Quantum Theory* (II.2: Ideas Towards a Model of Atomic Structure, pgs. 168-). Springer.
2. Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 62-63). Cornell University Press.
3. Jean- Baptiste Biot – Wikiquote.
4. Jean Biot (about) – Florida State University.

Further reading

â— Biot, Jean. (1826). *Elements of Electricity, Magnetism, and Electro-Magnetism: Embracing the Late Discoveries and Improvements, Digested into the Form of a Treatise; Being the Second Part of a Course of Natural Philosophy*. Cambridge.

External links

â— Jean-Baptiste Biot – Wikipedia.

θΔics

In existographies, **Jean Bodin** (1530-1596) (FA:48) was a French jurist, political philosopher, and "secret atheist", aka "undisputed intellectual master of the later sixteenth century", noted for []. [1]

Overview

In c.1580, Bodin penned *Colloquium of the Seven about Secrets of the Sublime*, which, supposedly, became and "underground classic" of 17th century atheism. [1]

Bodin has been grouped with Pietro Pomponazzi, Machiavelli, Arentino, Montaingne, Charron, and Gassendi as "secret atheists". (Ñº)

Quotes | On

The following are quotes on Boden:

> "I have also the opinion of Kaspar Peucer and **Jean Bodin** who contend that evil spirits and genii exercise great power, with divine permission, in the heavens and over the earth."
>
> — Sanislaus Lubienietzki (1665), "Letter to Otto Guericke", on the comet of 1664/1665, Mar 4/14; by Otto Guericke (1663) in *New Experiments on the Vacuum of Space* (pg. 287)

> "The peaceable Epicurus never disturbed Greece; the poem of Lucretius caused no civil wars in Rome; **Bodin** was not the author of the league; the writings of Spinoza have not excited the same troubles in Holland, as the disputes of Gomar and d'Arminius. Hobbes did not cause blood to flow in England."
>
> — Baron d'Holbach (1770), *The System of Nature* (pgs. 311-312)

Quotes | By

The following are quotes by Boden:

> "Because all of the competing religions claim to be true, all are refuted by all."
>
> — Jean Bodin (c.1580), *Colloquium of the Seven about Secrets of the Sublime* [1]

References

1. Stark, Rodney. (2015). *For the Glory of God: How Monotheism Led to Reformations, Science, Witch Hunts, and the End of Slavery* (pg. 222). Princeton University Press.

External links

â— Jean Bodin – Wikipedia.

θΔics

In existographies, **Jean Bruyere** (1645-1696) (IQ:165|#410) (Cattell 1000:562) (RGM:379|1,300+) was a French philosopher, moralist, and satirist, characterized a “sensible writer” (Meslier, 1727), noted for []

Quotes | By

The following are quotes by Bruyere:

> “It’s motive alone that gives character to the actions of men.”
>
> — Jean Bruyere (c.1690) (Q)

> “Next to sound judgment, diamonds and pearls are the rarest things in the world.”
>
> — Jean Bruyere (c.1690) (Q)

> “Avoid lawsuits beyond all things; they pervert your conscience, impair your heath, and dissipate your property.”
>
> — Jean Bruyere (c.1690) (Q)

> “It is a sad thing when men have neither the wit to speak well nor the judgment to hold their tongues.”
>
> — Jean Bruyere (c.1690) (Q)

> “A pious man is one who would be an atheist if the king were.”
>
> — Jean Bruyere (c.1690) (Q)

External links

- Jean de la Bruyere – Wikipedia.

θΔics

In existographies, **Jean Champollion** (1707-1832) (IQ:175|#180) was a French polygot noted for his 1822 to 1832 work on the decipherment of Egyptian hieroglyphics, a key to later 19th century religio-mythology scholarship work.

Hieroglyphics

In 1822, Champollion published his first breakthrough in the decipherment of the Rosetta hieroglyphs, showing that the Egyptian writing system was a combination of phonetic and ideographic signs – the first such script discovered. In 1824, he published a Précis in which he detailed the decipherment of the hieroglyphic script demonstrating the values of the phonetic and ideographic signs. In 1829, he traveled to Egypt where he was able to read many hieroglyphic texts that had never before been studied, and brought home a large body of new drawings of hieroglyphic inscriptions. Home again he was given a professorship in Egyptology, but only lectured a few times before his health, ruined by the hardships of the Egyptian journey, forced him to give up teaching. He died in Paris in 1832, 41 years old. His grammar of Ancient Egyptian was published posthumously.

Young

Champollion was a rival to Thomas Young, whose 1818 work he built on, in this regard to Rosetta stone translation.

Education

Champollion has been described as a brilliant son of an impoverished bookseller, who could speak various languages before he was 10. By age 16, he can speak dozen languages, and his only teacher was his brother, who was also a linguistic prodigy. (Ñº) At age 16, Champollion decided he would devote his life to the decipherment of hieroglyphs (Ñº).

External links

â— Jean-Francois Champollion – Wikipedia.

θΔics

In existographies, **Jean-Baptiste Dumas** (1800-1884) (GCE:5) (CR:15) was a French chemist noted, in human chemistry, for his 1837 opinion that there is some truth in Herman Boerhaave's 1732 metaphorical comparison of love and chemical affinity.

Overview

In 1837, Dumas asserted his opinion that "there is some truth in Boerhaave's poetic comparison", referring to Dutch chemist Herman Boerhaave who in 1732 supposition that force of chemical affinity is "love, if love be the desire for marriage". [1]

Dumas, to note, is the third greatest chemist, behind Jacob Berzelius (52), Justus Liebig (39), in the history of chemistry, according to English chemist James Partington's famous 1937 *A Short History of Chemistry*, based on name index page-count (38).

Education

In 1830, Dumas was a chemistry professor at the Royal College of France, at which time Irish chemist Thomas Andrews, a student of his that year, described him as "one of the ablest chemists in France." [2] In 1835, Dumas was professor of chemistry at the École Polytechnique.

References

1. (a) Boerhaave, Herman. (1732). Article/Books (quote: "si amor dicendus copulae cupido."). Publisher.
(b) Dumas, Jean. (1837). *Lessons on Chemical Philosophy* (Leçons sur la philosophie chimique). Paris: Gauthier-Villars.
(c) Mellor, Joseph W. (1922). *Modern Inorganic Chemistry* (pg. 95). Longmans, Green & Co.
2. Andrews, Thomas, Tait, Peter G., and A. Crum Brown. (1889). *The Scientific Papers of the Late Thomas Andrews: with a Memoir by P.G. Tait and A. Crum Brown* (Dumas, pg. xii). Macmillan & Co.

Further reading

â— Dumas, Jean. (1842). *Essai de Statique Chimique des Etres Organises* (*The Statistical Chemistry of Organized Beings*). Paris.

External links

â— Jean-Baptiste Dumas – Wikipedia.

θΔics

In existographies, **Jean d'Alembert** (1717-1783) (IQ:185|#84) (Cattell 1000:124) (GME:26) (GPE:71) (CR:35) was a French mathematical physicist and encyclopedist, PhD advisor to Pierre Laplace (see: Euler genealogy); whose 1772 *Encyclopedie*, co-written with Denis Diderot, is said to mark "end of an area in which a single human being was able to comprehend the totality of knowledge" (see: "last persons to know everything"), noted generally for his d'Alembert's principle.

Diderot | Living point

In 1769, Denis Diderot grappled with what he called the "living point" issue, problem, or paradox in his *D'Alembert's Dream*, via Platonic dialogue style, wherein the character D'Alembert, modeled Jean d'Alembert, outlined a material, atheistic view of the universe, and on the puzzle of the origin of life tries to reason how an animal can be constructed from the union of so-called dead or inert atoms and molecules to form that he calls 'living points' or 'living molecules' to then form what he calls a 'living unity', which is summarized as follows: [1]

> "Nothing at first, then a living point … Another living point attaches itself to this one, and then another—and from these successive conjoinings a single living unity results, for I am certainly a unity …. It's certain that contact between two living molecules is something different from the contiguity of two inert masses … and this difference—what could it be? … a customary action and reaction … That way everything comes together to produce a sort of unity which exists only in an animal … My goodness, if this isn't the truth, it's really close to it."

This type of query, to note, historically, is one of the more famous mindset stepping stone examples into the defunct theory of life position, life does not exist conclusion, and life terminology reform solution. In modern terms, this query translates to the premise of a special one unique mechanism "living reaction" governed by some type of "funny" free energy change, conceptually occurring sometime between the Hadean era (4.0 BYA) and the formation of bacteria (3.85 BYA), i.e. a type of magical or perpetual motion stylized "reaction point", so to say.

Vis viva

D'Alembert was, in some way, involved in the vis viva dispute. [2]

Quotes | On

The following are quotes on or about d'Alembert:

> "Accordingly, we find Euler and **D'Alembert** devoting their talent and their patience to the establishment of the laws of rotation of the solid bodies. Lagrange has incorporated his own analysis of the problem with his general treatment of mechanics, and since his time M. Poinsot has brought the subject under the power of a more searching analysis than that of the calculus, in which ideas take the place of symbols, and intelligent propositions supersede equations."
>
> — James Maxwell (1857), "On a Dynamical Top" (Q)

Quotes | By

The following are d'Alembert quotes:

> "All that we see distinctly in the motion of a body is that the body traverse: a certain distance and that it takes a certain time to traverse that distance. lt is from this one idea that all the principles of mechanics should be drawn, if we wish to demonstrate them in a clear and accurate way; so no one need be surprised

that for this reason I have turned my thought away from cause of motion to consider solely the motions that they produce; and that I have entirely excluded force inherent in bodies in motion, obscure and metaphysical entities which can only cast shadows on a science that is in itself clear. It is for this reason that I have thought it bat not to take up the consideration of the famous question of vis viva. For thirty years mathematicians have been divided in opinion as to whether the force of a body in motion is proportional to the product of the mass by the velocity [mv], or to the product of the mass by the square of the velocity mv^2]; for example whether a body twice as large as another one, and which has duce times as much velocity has eighteen times as much force or only six times as much."

— Jean d'Alembert (1743), *Treatise on Dynamics* [3]

"A philosopher is a fool who torments himself while he is alive, to be talked of after he is dead."

— Jean d'Alembert (c.1770), *Publication* (Q)

References

1. (a) Ball, Philip. (2011). *Unnatural: the Heretical Idea of Making People* (pg. 125-26). Vintage Books.
(b) *Le Rêve de d'Alembert* (D'Alembert's Dream) – Wikipedia.
2. Litis, Carolyn. (1970). "D'Alembert and the *Vis Viva* Controversy", *Studies in History and Philosophy of Science*, 1: 115-24.
3. Magie, William. (1935). *A Course Book in Physics* (IA)(txt) (pg. 55). Harvard University Press.

External links

- Jean d'Alembert – Wikipedia.

θΔics

In existographies, **Jean Fernel** (1497-1558) (CR:23) was a French physician, coiner of the term 'physiology' referring to the study of the body's function, and also "pathology", the study of the body's disease—his philosophical derived in contrast or upgrade from the older views of Aristotle—who is specifically noted for his 1548 *On the Hidden Causes of Things*, a Platonic-style dialogue of sorts between the three fictional friends, Eudoxus, Brutus, and Philiatros, an example quote of which is the following:

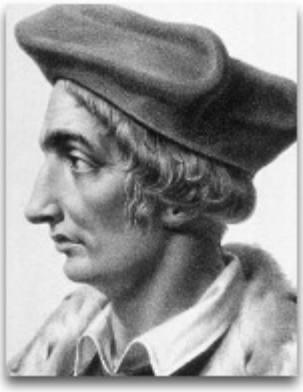

> "The stone selenite holds the image of the moon even to her very phases. The magnet-stone points to the pole star. These are dead things, says Brutus, do living things likewise draw influences from the sky."

This erudite dead things vs. living things quote, among others, are employed as an intellectual springboard for English physiologist Charles Sherrington's 1938 very-sharp *Man on His Nature*—which is the most explicative work in the defunct theory of life corpus.

Overview

The following is an abstract from a 2005 edited, annotated, and translated reprint of his *On the Hidden Causes of Things*: (Ñº)

> "An annotated translation of Jean Fernel's *On the Hidden Causes of Things* (1542), with a scholarly introduction showing its great importance in the intellectual history of the Renaissance. The only sixteenth-century writer, apart from Paracelsus, to develop a new theory of disease, Fernel was also a leading natural philosopher. His survey of the role of occult qualities and powers in life processes, especially generation, and in contagious and pestilential diseases draws upon astrology, alchemy, and other occult sciences. Although an original and innovatory thinker, Fernel operated within the parameters of Aristotelian and Galenic philosophy, while drawing upon Platonic, Stoic and other worldviews. Accordingly, this book shows the continued vitality in traditional thought in the period just before the Scientific Revolution."

(add)

Innate heat | Life and death

See also: Animal heat; Vital heat; Combustion theory of animal heat;

On the theory of "innate heat", in Fernel's day, in the context of the life/non-life issue, Sherrington quotes the following by Fernel, from his *On the Hidden Causes of Things*:

> "If there is one attribute which more widely than any other is evident as inherent in life it is warmth. In that we come across a great thing. A great thing like those great things which were found by the ancients. It is the **innate heat**. A law common to all animal kind, an ordinance of nature, is that they live by innate heat. While they live they are possessed of heat appropriate to them. When dead that heat is extinguished and they are cold. That is plain even to sense; it is heat sensible to man; a touch demonstrates it. It is however not so evident in plants. Yet in them no less than in animals it holds true. Further, the more sentient and active the animal the greater and more liberal the heat it has. If you as a reason, think on the excellence of the sun, prime prince and controller of the world, favoring and forwarding every life that is. By its chastened heat it supports them from without in doing what life does. Now if its heat from without can so cherish, whereas cold checks, life, is there not within living things a heat which cherishes what they do, a heat which even of the same nature as the suns? Did not Aristotle well and truly say, and leave it written for all posterity, that:

> ‘Heat is the condition of life’?

He defined death as the extinction of heat. Now this heat is innate heat. The innate heat is a heat which can be observed to survive even in the coldness of the decrepitude of age. The coldness of old age dominates, it is true, the material fire which is in the temperament, by the old age cannot, so long as there is life, overcome the innate heat itself. It is in the virtue of this heat that the snake lives, although its temperament is cold. So too mandragora, and the poppy and all of the herbs of the frigid temperament.

Whence it is clear that innate heat is superior to elemental heat. Elemental cold avails against elemental heat, but it avails nothing against this more excellent heat which is the innate heat of living things. Therefore this innate heat is not of the same nature as fire. It comes from a source superior to fire. In defining death, Aristotle, with the intuition of a master, said that:

> ‘Coldness of death comes not by mere overthrow of the temperament—not by surcharge of elemental cold, but by lapse of innate heat. Innate heat, vital heat, like light has no opposite. Light had not ‘contrary’; darkness is but privation of light. Death is a privation of innate heat, vital heat.’

This heat is not of the commingling of the elements. The body at death demonstrates that. Death occurs and still the body retains the structure and shape in all its parts. We recognize our friend, although his life is not there, and his heat is not there. The innate heat has fled him. It is not therefore traceable to the elements. They still compose the body. Therefore the innate heat—the vital heat—must have its source ‘elsewhere’.”

On Aristotle’s discussions of darkness being the privation of light, cold the lapse of innate heat, etc., here we recall the 2004 "Evil Does not Exist" video rendition of this (misattributed to Albert Einstein), which took the form, it seems of a summary of French philosopher Rene Descartes expansion on Aristotle’s light/darkness discussion; particularly Descartes’ 1637 *Discourse on Method* (section: What Do Heat and Light of Fire Consist In?), and his 1641 *Meditations* (primarily the Third), in which he argues that cold is merely the absence of heat, that darkness is the absence or recess of ethereal substance of the heat of fire (or stars), discusses good and evil, and intertwines these in with discussion on the possible existence a deity. [7] On heat in general, in relation to the above passage, Sherrington humorously states rather cogently:

> “In physical science no phenomenon perhaps has proved more puzzling, and no conception has had so chequered a career, as that of heat.”

Sherrington

On deanthropomorphism, the following being a few representative statement by Sherrington: [2]

> “Our sixteenth-century **Fernel** viewed the body as a tenement for faculties. One faculty was that which actuated the various bodily movements. Then came Descartes with is robot [see: Cartesian automata], a mechanism actuating itself. Such too had been Descartes’ thought with respect to the motions of the macrocosm. For Kepler still, a century later than Fernel, each planet was ridden by an angel. Then later with the ‘reign of law’ that guidance became a ‘force’, e.g. gravitational. Today that ‘force’ has in turn disappeared. There remains a curvature of space. The human mind looking at nature has had to dehumanize its point of view—it has, using Samuel Alexander’s word, to ‘deanthropize’ itself. It has to dispense with ‘causation’, which is regarded as an anthropism, but is yet a final cause. It is more faithful to William of

Occam."

On the illusion of the unbridgeable gap, i.e. that the various conceptualized divides (e.g. life/non-life) or dualisms (e.g. mind/matter) are fictional, the following is a representative statement by Sherrington: [2]

> "In the middle ages, and after them with Fernel, as with Aristotle before, there was the difficulty of the animate and the inanimate and finding of the boundary between them. Today's scheme makes plain why that difficulty was, and dissolves it. There is no boundary."

References

1. (a) Fernel, Jean. (1548). *On the Hidden Causes of Things* (*De Abditis Rerum Causis*). Paris.
(b) Hirai, Hiro. (2011). *Medical Humanism and Natural Philosophy: Renaissance Debates on Matter, Life and the Soul* (pgs. 47-48). Brill.
2. Sherrington, Charles. (1940). *Man on His Nature* (deanthropize, pg. 169; boundary, pg. 242). CUP Archive.

External links

â— Jean Fernel – Wikipedia.

θΔics

In existographies, **Jean Foucault** (1819-1868) (IQ:160|#495), or “Leon Foucault” (Q), was a French physicist, noted for []

Overview

In 1851, Foucault, in order to prove Nicolaus Copernicus’ 1514 assertion that the earth rotates, on its axis, once every 24 hours, built his famous 200-foot long swinging pendulum, shown below:

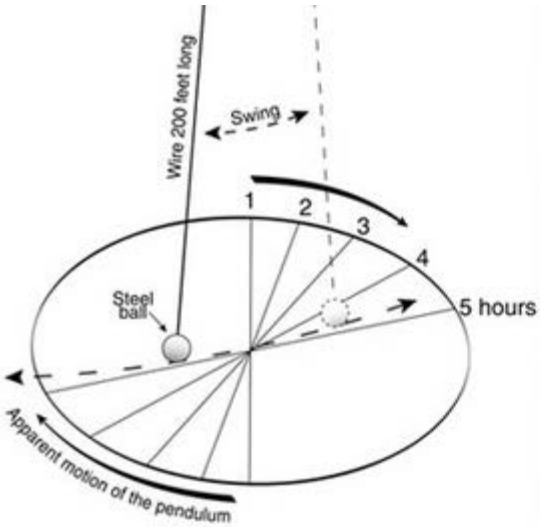

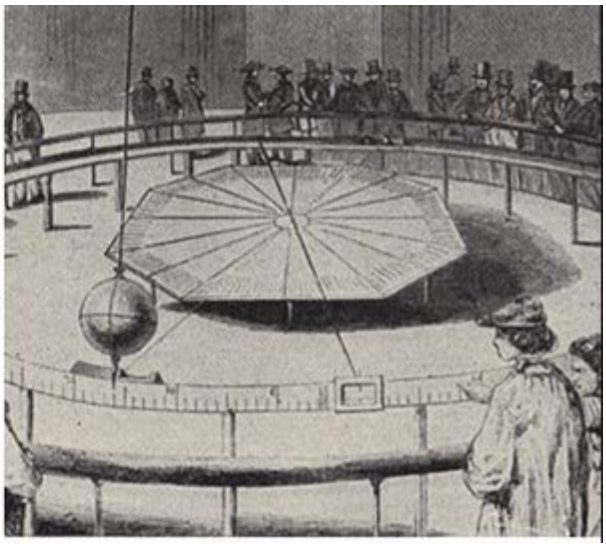

which shows that when the pendulum circled clockwise, it returned to its original spot after twenty-four hours.

Quotes | By

The following are quotes by Foucault:

> “You are invited to come to see the earth turn, tomorrow, from three to five, at Meridian Hall of the Paris Observatory.”
>
> — Jean Foucault (1851), Invitation cards which he sent out to the scientists of Paris, to witness his famous pendulum experiment, Feb 3

External links

- Jean Foucault – Wikipedia.

θΔics

In science, **Jean Hachette** (1769-1834) was a French mathematician, a professor of the École Polytechnique, noted for his 1811 *Elementary Treatise on Machines*, in which, supposedly, he was the first to propose a dynamic unit of 'kg·m', being a type of energy (although he likely didn't use this word) as a unit of measurement for all natural phenomena. [1] Hachette's unit may have been a precursor to French mathematician and engineer Gustave Coriolis' 1829 proposal of the unit of dynamode (1,000 kg·m) as a measure of mechanical effect. [2]

References

1. (a) Hachette, Jean N.P. (1811). *Elementary Treatise on Machines* (*Traité élémentaire des Machines*). Paris.
(b) Fernández-Galiano, Luis and Carino, Gina (translator) (2000). *Fire and Memory: On Architecture and Energy* (Hachette, pgs. 47, 183-184, 186, 190). MIT Press.
2. Coriolis, Gustave. (1829). *Calculation of the Effect of Machines, or Considerations on the Use of Engines and their Evaluation* (*Du Calcul de l'effet des Machines, ou Considérations sur l'emploi des Moteurs et sur Leur Evaluation*). Paris: Carilian-Goeury, Libraire.

Further reading

● Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (Hachette, pgs. 165-66, 189). Cornell University Press.

External links

● Jean Hachette – Wikipedia.

θΔics

In existographies, **Jean Hautefeuille** (1647-1724) (EP:17) was a French engineer, physicist, and abbe, noted for []

Overview

In 1678, Hautefeuille, in his *Perpetual Pendulum, with a new Pendulum and the Way of raising the Water by the means of the Canon Powder*, gave a depiction of a gunpowder engine, shown below, where: [4]

> EF, rising pipe
> AB, KL, tanks alternately evacuated by gunpowder charges
> A, rising pipe with non-return valves
> E, pipe from gunpowder combustion chamber

According to which, as shown in figure VII, adjacent (right) a rising pipe delivered into a vessel that was partially evacuated by exploding a gunpowder charge in it, and the water so raised was drawn off by a tap into a reservoir. In figure VIII, the force of the gunpowder explosions brought about the raising of the water through non-return valves as high as the materials would stand.

Huygens

Hautefeuille, supposedly, twice got into a dispute with Christiaan Huygens, at some point, about the rights to his inventions.

Correctly, Leonardo da Vinci (c.1495) sketched and explained the operation of the first gunpowder engine employed to raise weight, which was followed by Christiaan Huygens (1673), and his assistant Denis Papin (1674), followed by Hautefeuille (1678); one summary of which is as follows:

> "In several surveys of this important chapter of the history of technology, the abbe **Jean de Hautefeuille** (1678) is credited with the invention of the first gunpowder engine. This is a manifest error: the experiments of Huygens were known at least from 1673, even though he published them later. Besides, Hautefeuille's device is a water-raising box and not an engine."
>
> — Ladislao Reti (1969), "Leonardo da Vinci the Technologist: the Problem of Prime Movers" (pg. 98) [4]

What ever the case, Hautefeuille, as some have claimed, only described the theory, before or after Huygens, while Huygens actually built the devices and connected one with a pumping station. [3]

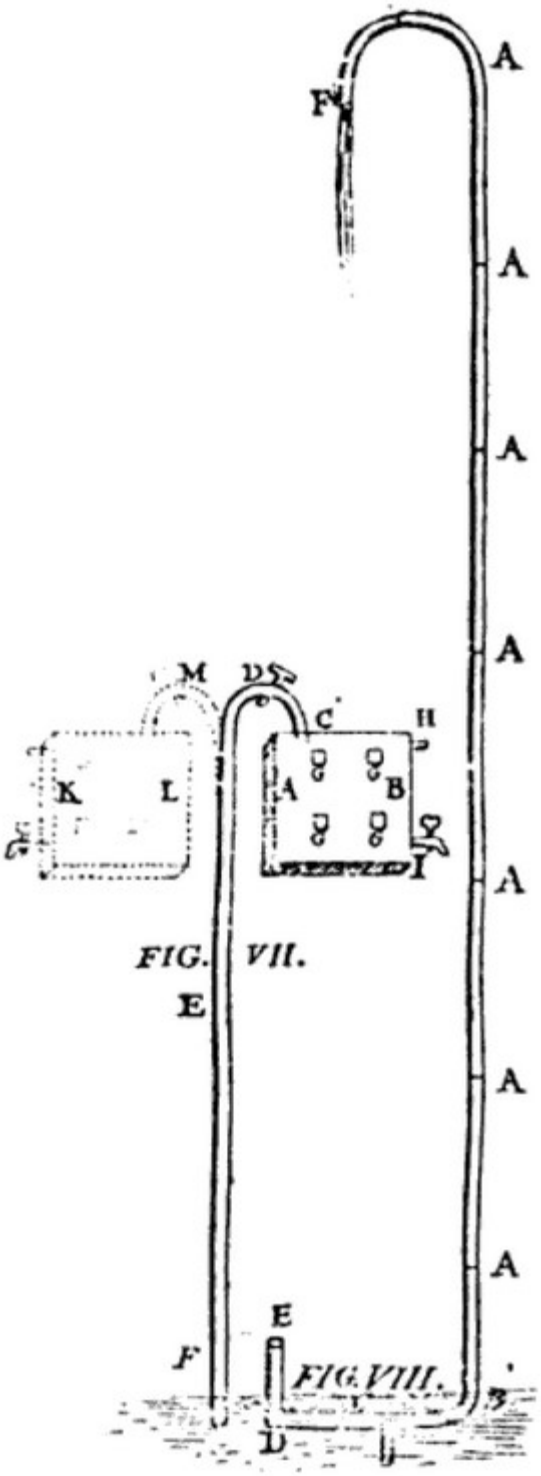

An illustration of **Hautefeulle**'s 1678 gunpowder engine, designed to raise water. [1]

Misattribution

In 1961, Hautefeuille is mentioned in the German childrens "inventor series" book or cartoon *Mosaic*, which wherein Huygens is said to "remember" a machine described by Hautefeuille, and thereafter constructs an explosive pump powered by gunpowder; the online wiki now incorrectly lists

the following image as being the “invention of Hautefeuille”, whereas the image shown is a sketch of the 1682 Huygens engine: [3]

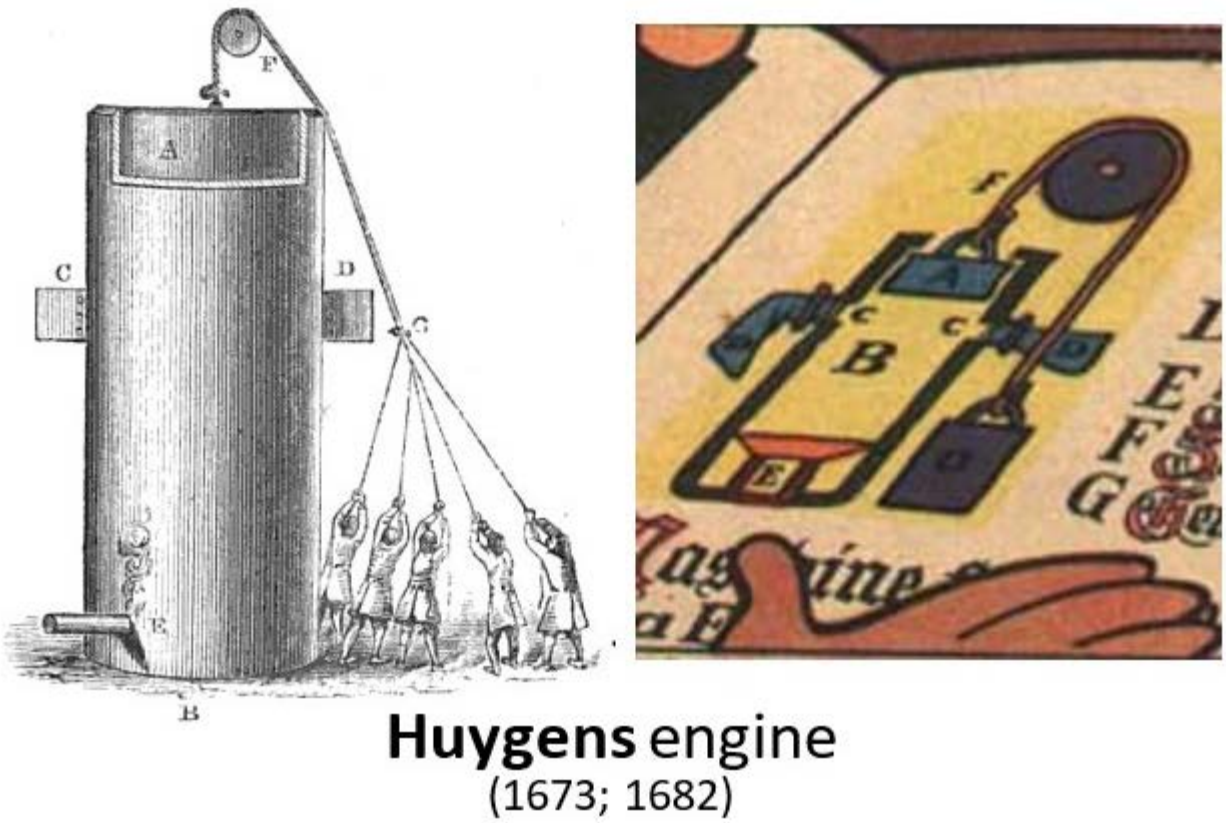

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Other

This model, according to Joseph Needham (1987), were precursory to Thomas Savery’s so-called “water commanding engine” (1698).

Quotes | On

The following are quotes on Hautefeuille:

> “**Jean Hautefeuille**, the son of a French *boulanger*, born Orleans, adopted by the Duchess of Bouillon at the suggestion of De Sourdis, profiting by the great opportunities offered him, entered the Church, and became one of the most learned men and greatest mechanicians of his time. He studied the many schemes then brought forward by inventors with the greatest interest, and was himself prolific of new ideas.
>
> In 1678, he proposed the use of alcohol in an engine [see: alcohol engine], ‘in such a manner that the liquid should evaporate and be condensed, *tour a tour*, without being wasted’—**the first recorded plan, probably, for surface-condensation and complete retention of the working-fluid**.
>
> He proposed a gunpowder engine, of which he described three varieties. In one of these engines [first design], he displaced the atmosphere by the gases produced by the explosion, and the vacuum thus obtained was utilized in raising water by the pressure of the air. In the **second machine**, the pressure of the gases evolved by the combustion of the powder acted directly upon the water, forcing it upward; and in the **third design**, the pressure of the vapor drove a piston, and this engine was described as fitted to supply power for many purposes.

There is no evidence that he constructed these machines, however, and they are here referred to simply as indicating that all the elements of the machine were becoming well known, and that an ingenious mechanic, combining known devices, could at this time have produced the steam engine. Its early appearance should evidently have been anticipated. Hautefeuille, if we may judge from evidence at hand, **was the first to propose the use of a piston in a heat engine**, and his gunpowder engine seems to have been the first machine which would be called a heat-engine by the modern mechanic. The earlier 'machines' or 'engines', including that of Hero and those of the Marquis of Worcester, would rather be denominated 'apparatus', as that term is used by the physicist or the chemist, than a machine or an engine, as the terms are used by the engineer."

— Robert Thurston (1878), *A History of the Growth of the Steam Engine* [2]

References

1. (a) Hautefeuille, Jean. (1678). *Perpetual Pendulum, with a new Pendulum and the Way of raising the Water by the means of the Canon Powder* (*Pendule Perpetuelle, avec un nouveau Balancier et la Manière d'elever l'Eau par le Moyen de la Poudre a Canon*) (17-pgs). Paris.
(b) Needham, Joseph. (1987). *Science and Civilization in China: Volume 5, Chemistry and Chemical Technology, Part 7, Military Technology: The Gunpowder Epic* (pg. 563). Cambridge.
2. Thurston, Robert. (1878). *A History of the Growth of the Steam-Engine* (pgs. 24-25). Appleton and Company.
3. Jean de Hautefeuille (German → English) (1961) – Mosapedia.de.
4. Reti, Ladislao. (1969). "Leonardo da Vinci the Technologist: the Problem of Prime Movers", in: *Leonardo's Legacy: and International Symposium* (editor: C.D. O'Malley) §4:67-100; quotes, pgs. 95-98). University of California Press.

External links

â— Jean de Hautefeuille – Wikipedia.

θΔics

In existographies, **Jean Lamarck** (1744-1829) (IQ:175|#329) (Cattell 1000:681) [RGM:342|1,500+] (Murray 4000:3|B) (EvT:10|21+) (CR:13) was a French anti-chance based naturalist noted for his 1800 evolution theory (see: Lamarckian theory) that employed several mechanisms as drivers of evolution, drawn from the common knowledge of his day and from his own belief in (pre-Lavoisier) chemistry namely he envisioned two forces as comprising evolution; a force driving animals from simple to complex forms, and a force adapting animals to their local environments and differentiating them from each other. He believed that these forces must be explained as a necessary consequence of basic physical principles, favoring a materialistic attitude toward biology.
Lamarck advocated the usage theory of evolution, e.g. that giraffes grew longer necks by reaching for leaves, and that this trait could be passed on to offspring; he the doctrine that all species, including man, are descended from other species. [4]

Animal origins

In 1802, in his *Observations of Living Organisms*, expressed new ideas about mutability and formation of species. [1]

In 1809, Lamarck, in his two-volume *Philosophie Zoologique*, gave the following great chain of being like tree depicting the origins of animals: [2]

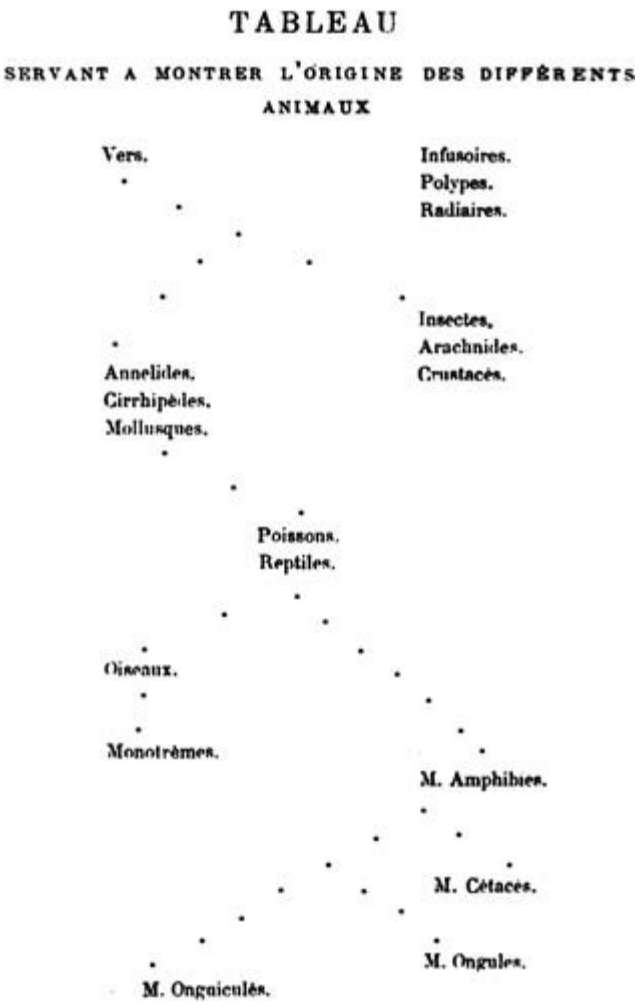

Quotes | By

The following are noted quotes:

> “It is not enough to discover and prove a useful truth previously unknown, but that it is necessary also to be able to propagate it and get it recognized.”
>
> — Lamarck (1809), *Zoological Philosophy*

References

1. (a) Haeckel, Ernst. (1882). "The Systems of Darwin, Goethe, and Lamarck", Lecture given at Eisenach.
(b) Haeckel, Ernst. (1899). *The Riddle of the Universe: at the Close of the Nineteenth Century* (translator: Joseph McCabe) (pgs. 75-76). Harper & Brother, 1900.
2. Ragan, Mark A. (2009). “Trees and Networks Before and After Darwin” (Ñº), *Biology Direct*, 4:43.
3. Darwin, Charles, Marcus, Hans. (1926). *The Origin of Species* (An Historical Sketch: on the Progress of Opinion on the Origin of Species, pgs. 4-17). Plain Label Books.

External links

â— Jean-Baptiste Lamarck – Wikipedia.

θΔics

In existographies, **Jean Meslier** (1664-1729) (IQ:170|#310) (FA:63) (GA:3) (CR:96), pronounced "John Mes-lee-a" (Q), was a French “ultra-intelligent” (Q), "clear headed" (Buchner, 1884), thing philosopher, and closet extreme atheist, semi-ranked as the world's first true atheist (Onfray, 2009), a Catholic priest (abbe) by profession, who was discovered, upon his reaction end (death), to have penned four duplicate copies of a hand written tome entitled *Testament*, wherein he denies the existence of the soul, classifies "spirit" as non existent (§70), denies afterlife (§72), rebuts the Cicero letters analogy / Paley watch analogy (see: typing monkeys) (§83), dismissed the notion of free will, denounces all belief in and associated with god, and all religions, Christianity in particular, and in which, in the latter portions of which (§65+) he expounds on a matter, force, motion, and being theory upgrade replacement for the god void; therein touching on things such as the nebular hypothesis (§71), among other interesting ground-breaking views.

-

Good | Evil

The following are Meslier’s discussion of how there exists a necessary confused mix of good and evil in godless nature:

> “The very necessity of evil that, according to the present constitution of nature, will necessarily follow from good itself and from the suppression of all vices and viciousness.”
>
> — Jean Meslier (1729), *The Testament* (§94, pg. 573)

> “Consequently, it is an inevitable necessity, following the present constitution of nature, that there be evil of one kind or another. As a result, when evil did not come, as it does now, from the vice, malice, or viciousness of men and beasts, it would be necessarily and inevitably come from the excessive multitude of men and animals of all species that there would be on earth, who could not survive or have enough to eat without tearing each other apart and eating each other.”
>
> — Jean Meslier (1729), *The Testament* (§94, pg. 573)

> “The world is necessarily a mix of good and evil in there has to be good and evil, seeing that the natural order of generations and productions that are successfully made in nature cannot subsist or continue without this untoward mix of good and evil and without a great number of productions coming to an end every day to make way for new ones, which cannot happen without good for the one and evil for the other, i.e., without birth and growth for the one in destruction for the other.”
>
> — Jean Meslier (1729), *The Testament* (§94, pg. 574)

> “Consequently, it could not want to do evil when it could always do good without a mix of any evil. And so, since the world is, as we see, necessarily a confused mix of good and evil, it evidently follows that it was not made by an infinitely perfect being and, consequently, there is not god.”
>
> — Jean Meslier (1729), *The Testament* (§94, pg. 574)

(add)

-

Matter | Thinking & feeling

In §91: “The Thoughts, Desires, Will, and Sensations of Good and Evil are only Internal Modifications of the Person or Animal that Thinks, Knows, or Feels Good or Evil”, Meslier engages in an attack on Cartesian-themed views of

Malebranche (*The Search after Truth*) and Fenelon (*The Existence of God*), and one point of which he first cites Horace and laughing at humorous work rule:

-

> "Could you, my friends, contemplating this work, hold yourselves back from laughing?"
>
> — Horace (c.19BC), *Art of Poetry* (5)

-

Then he cites how Fenelon said the following about "laughing children" (see: laughing children rule) and people who would attribute feelings to stones: [1]

-

> "Matter cannot think or feel and the people, even children, cannot be persuaded otherwise. People and children are far from believing that matter is capable of thinking and feeling in anyway, so that they could not help laughing if you told them that a **stone, a piece of wood, a table, or their dolls felt pain or pleasure and joy or sadness**."
>
> — Francois Fenelon (c.1690), *On the Existence of God*

An image of a stone with feelings from the Stones Have Feelings Too! (Q) Card deck set, as a representation of the view of **Meslier** that feelings derive from matter as contrasted with the view of Francois Fenelon that a "feeling stone" (see: rock vs human) is something that children will laugh at.

-

Meslier rebuts this logic as follows: [1]

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> "Now that is a lovely argument for a person of such rank, merit, and erudition! People and even children could really have a reason to laugh and make fun of those who to amuse themselves would like to make them believe that stones, tables, boards, furniture, or dolls had knowledge and sentiment because they know, indeed, that these sorts of things cannot know or feel anything. But, their laughter would not come, as Fenelon would like to make them understand, from the fact that these kinds of things are only matter or made of matter, but because they would see that these things are not 'animate' and do not have life like animals and consequently they cannot think or feel."

-

Here, this is good rebuttal logic. The children can understand that while a stone and a human and a human are both types of matter, the difference between them is a difference of "animation" properties, a human being carbon-based being animate thereby, and a stone being aluminum and silicon based being inanimate thereby. Meslier concludes:

-

> "It would be crazy to have compassion for things that were not intimate and did not feel good or bad, which is why we do not bother to have pity or compassion for a dead body we see cut into pieces or rotting on the ground. We do not bother to have pity or compassion for sheets that we twist around mallets at the launderer or wood that we see split and thrown in the fire to burn; we do not bother to have pity or compassion for these kinds of things because they are 'inanimate' and do not feel good or bad."

-

Influenced

Meslier's *Testament* influenced thinkers including: Baron d'Holbach, Denis Diderot, and Voltaire (Q), the latter of whom considered his atheism "too extreme" (Palmer, 2013). [1]

Influences | Library

Meslier's library contains works of: Michel Montaigne, Lucilio Vanini, Jean la Bruyere (1645-1696), a French philosopher and moralist, Etienne la Boetie (1530-1563), French political philosopher and best friend of Montaigne, among others. [3] In his *Testament*, he cites Montaigne mostly, but also: Lucretius, Rene Descartes, indirectly, the "Cartesians", and Nicolas Malebranche.

Matter | Motion

Meslier, in §65 of his *Testament*, after 360 pages of loose ridicule themed talk, finally begins to talk about the deeper subject of matter and motion as the replacement for god:

> "The system of the natural formation of things, made by the matter itself of which it is composed, contains no contrast or contradiction and, consequently, it can be assured that it contains nothing impossible. We only have to suppose, e.g., that matter is eternal, that it is what it is of itself and that it **moves by itself**, which assumption is very simple and natural, and we see clearly enough that there is nothing impossible in this assumption. Firstly, we see that matter exists and that it is not an imaginary and chimerical being. Secondly, we clearly see that a certain portion of matter is capable of division and that all matter is capable of movement and even that matter really is moved: we cannot doubt any of these things. So why could we not suppose that matter is indeed eternal and that it **does indeed move by itself**, seeing that we see nothing offensive in this and we do not and even cannot see anything that could have created it or given it movement."
>
> — Jean Meslier (1729), *The Testament* (§65, pg. 362-63)

Here, although the conjecture that "matter moves by itself" is a violation of the principle of inertia (aka the first law of motion), we do note that Newton himself grappled with this same issue, in respect to animals have "self-motion" or whether a mechanical cause may be sought:

> "God who gave animals self motion beyond our understanding is without doubt able to implant other principles of motion in bodies which we may understand as little. Some would readily grant this may be a spiritual one; yet a mechanical one might be shown."
>
> — Isaac Newton (c.1674), Philosophical Query Notes

Meslier continues:

> "Finally, we cannot doubt that being in general has its existence and movement from itself. From what could it have received the one or the other? Certainly, it could only have received it from what exists. Now, matter itself is this being in general that can have its existence and movement only from itself. And only supposing this, we have a clear principle that cannot only straightaway remove all difficulties, contrasts, and absurdities that necessarily follow from the system of creation but also at the same time can open an easy way to enter into the physical and moral knowledge and explanation of all things of nature. Only the idea of a universal matter that moves in different directions and that by different configurations of its parts can always be modified in thousands upon thousands of different ways, clearly shows us that everything that exists in nature can be made by the natural laws of movement and by the configuration and combination alone or modification of the parts of matter."
>
> — Jean Meslier (1729), *The Testament* (§65, pg. 362-63)

Here, we see good conjecture, particular for this period of time in history.

In §65 "It is Useless to Resort to the Existence of an All-Powerful God to Explain the Nature and Formation of Natural Things", he continues as follows:

> "I know well enough that it is not easy to imagine what it is precisely that makes matter move or what it is that makes it move in such and such a manner or with such and such force and speed. I cannot imagine the origin and efficient principle of this movement, I admit. Nevertheless, I see nothing offensive, no absurdity, no complication in attributing it to matter itself. All that they can say against this is that the large or small bodies do not have in themselves the force to move themselves because, they say, there is no necessary connection between the idea they have of their bodies and the idea they have of their movement. Being able to imagine and show with reason that matter has the force to move itself, however, is not a proof that it does not have it. But, on contrary, the obvious absurdities and contradictions that follow from the supposed principle of creation are, as I have said, convincing proofs of the falsity of that principle."
>
> — Jean Meslier (1729), *The Testament* (§66, pg. 365)

The following is another related quote:

> "Matter and energy moves itself. It has no exterior mover."
>
> — Jean Meslier (1729), *The Testament* (§#, pg. #) (O)

The following (§66, pgs. 366-67) is good logic:

> "Just as we do not see, for example, a necessary connection between the natural construction of our eye and the sight or vision of some object, so to do **we not see a necessary connection between our will and the movement of our arms and legs**. We do not even know the nature or employment of the hidden springs that re used to move our arms and legs. However, this does not stop all these springs from working when we want to move; we see every day that those who know the construction of their bodies the least [e.g. children or animals], are often the ones who move their limbs more easily and adroitly. There has to be, therefore, a natural bond between our will and the movement of the parts of our bodies, even though we do not know what it consists of or how it works."

Meslier digresses on the brain as follows:

> "There is also no doubt about the connection that exists between he movement and shaking of the fibers of our brain and our thoughts. We do not see a bond between the two or how there could be; that does not mean, however, there is not any, since our thoughts depend on the movement or shaking of the fibers of the

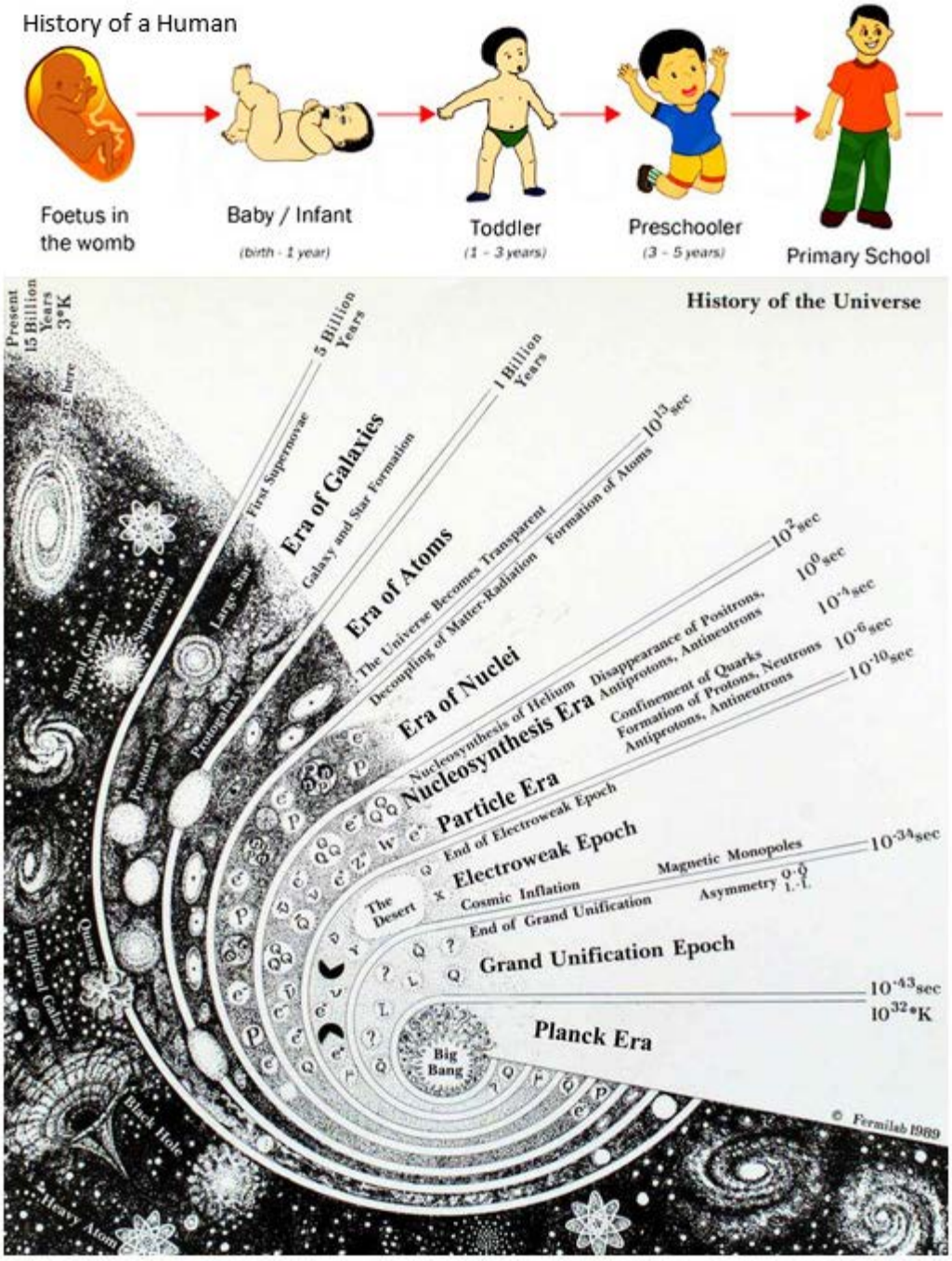

A origin of a human diagram compared to the origin of the universe (Q), which **Meslier** uses to laugh at the theist "but what was in the beginning" rebuttal argument.

brain and the movements of the 'animal spirits' that are in our brains."

Next, he cleverly uses the ignorance of human birth analogy to rebut the theist ignorance of origin objection:

"Let us take an example of **our own origin and our own belief**. I assert, in fact, that the most skillful philosopher and the subtlest mind in the world could never develop a true idea of his origin and birth if he had never seen or heard about the generation and birth of humans or any other animal. Would he figure out, e.g., using only his natural reason that he was conceived and formed little by little in the belly of a woman? And that he came out afterward in such and such matter at the end of nine months? Certainly not. He could never imagine this. And would never even think that a woman had suckled him if he had never seen or heard of such a thing."

Then he cleverly jumps to:

"And if this so skillful philosopher or subtle mind, thinking only about the ideas of other things he learned or saw done, pretended to deny his real origin and attribute it to something else that he could imagine, on the pretext that he could not perceive a necessary bond between the belly of a woman and the formation and generation of a man, **would we not laugh at him**? Would we not make fun of him? Yes, surely. Yet this is what they do when they deny the eternity of matter and deny that it has the force of its movement of itself,

> on the pretext that they do not see a necessary connection between the idea of matter and its movement."

Then concludes:

> "So, although the idea we have of **matter** may not reveal to us and show us clearly that it **has the force to move itself,** it does not follow that it does not actually have it, in view of the fact that it *moves*."

(add)

Being

Meslier, in his §67: "Being Cannot Have Been Created; Time Cannot Have Been Created. Likewise, Extension, Location, and Space Cannot Have Been Created and, Consequently, No Creator", and §68, engages into what seems to be a Parmenides vs Heraclitus like argument that "being" is the at the bottom of all things; the following are opening quotes:

> "Matter is what it is of itself, it moves itself, and is the first cause of all things."
>
> — Jean Meslier (1729), *The Testament* (§67, pg. 369)

> "I believe that there is no one, as skeptical or as mad as he may be, who does not know and feel and even is not convinced that there is at least some difference between pleasure and pain, between good and evil, and also between a good piece of bread that he might eat in one hand and a stone that he holds in the other."
>
> — Jean Meslier (1729), *The Testament* (§67, pg. 369)

He then introduced us to his being views, via what seems to be a Cartesian like "I think therefore I am" (1637) argument, as follows:

> "We know and feel with all certainty that we are and we think; we can in no way doubt this: so, it is certain and **evident that being exists**. For if it did not exist we certainly would not exist; and if we did not exist, we certainly would not be able to think. There is nothing more clear evident than this. Supposing this, it is necessary to recognize the existence of being. Not only this, but it is also necessary to recognize that being has always existed and, consequently, that it was never created."
>
> — Jean Meslier (1729), *The Testament* (§67, pg. 369-70)

He concludes:

> "**Being is the first principle and first foundation of all things**. For, it is evident that all things are not really and truly what they are except that they have being and that they are themselves participants in or proportions of being. It is clear and sure that no thing would exist if being did not exist: it is like the same thing."
>
> — Jean Meslier (1729), *The Testament* (§67, pg. 370)

> "There is not creator."
>
> — Jean Meslier (1729), *The Testament* (§67, pg. 370)

The next section follows as such:

> "All things in the end are reduced to material being, i.e. to matter itself."
>
> — Jean Meslier (1729), *The Testament* (§68, pg. 372)

(add)

Chance

Meslier, possibly under the influence of Epicurus, seems to have replaced god, in his mind, not only with matter and force, but also with chance:

> "In the end, we know that 'chance' can sometimes make something good, beautiful, and perfect enough; but, we should not think that an all-powerful, infinitely perfect god would or could ever allow any evil or flaw in his works."
>
> — Jean Meslier (1729), *The Testament* (§77, pg. 468)

This, however, seems to be one example of a rare use of the term by Meslier.

Quotes | On

The following are quotes on Meslier:

> "**Meslier**'s *Testament* is the most singular phenomenon ever seen among all the meteors fatal to the Christian religion."
>
> — Voltaire (1766) [2]

> "**Meslier**'s war cry [*Testament*, 1729], never before heard in the history of western thought, offers one of the first true atheist moments, if not the first. Prior to him, they call the *agnostic* an atheist who, as Protagoras, concludes that when it comes to god one can conclude nothing; the *pantheist* who, such as Spinoza, affirms its existence consubstantial with nature; the *polytheist*, like Epicurus, who teaches its multiplicity; the *deist*, in the way of Voltaire, for whom god creates the world en bloc, but does not care about the details; or whoever's idol does not correspond to the strict criteria established by the church. Now, the *atheist* clearly says that 'god does not exist'. This is what Meslier clearly writes: 'there is no god' (chapters 59, 74, 93, 94)—that is clear and distinct, blunt, and straightforward."
>
> — Michel Onfray (2009), "Preface: The War Song of an Atheist Priest" (pg. 19) [3]

> "What is **Meslier**'s philosophy? He invented modern materialism. Without friends, without sophisticated conversations, without libraries, salons, or correspondence with the intellectual bigwigs of his time, without spiritual emulation, but by nature, alone and solitary, cloistered deep in his country., Meslier formulates the French materialism that la Mettrie and Helvetius, d'Holbach and Diderot will pillage later. Meslier doesn't enter on the details of materialistic physics. He doesn't cite Epicurus. Lucretius isn't in his library,

Diogenes Laertius neither."

— Michel Onfray (2009), "Preface: The War Song of an Atheist" (pg. 20) [3]

"**Meslier**'s *Testament* denounced all belief, all god and all religion with a frenzied anger that makes Richard Dawkins' *The God Delusion* seem like a work of reasoned scholarship."

— Nick Spencer (2014), "Why Aren't More Americans Atheists?" [4]

Quote | Guts

The following are variants of the famous "strangled with guts" quote oft attributed to Meslier:

A rendition of **Meslier**'s anti-theology work according to Voltaire (1766), the first translator of his work.

"This reminds me of the **wish that was once uttered by a man** who neither knew science nor had education, but who obviously was not lacking judgment for appraising correctly all the obscene grievances and despicable despotisms which I am incriminating here; his wish and the manner in which he expressed his thought show that he was quite sharp-witted and had penetrated deep enough into this abominable mystery of malice of which I am talking, as he recognized so well the initiator and promoter. He wished that all the great and noble of the earth be hanged and strangled with the guts of the priests. This expression will not fail to appear brute, uncouth and shocking, but one will have to admit that it is frank and naive; it is brief but expressive, as it says enough with few words what such people deserve."

— Jean Meslier (1729), recollection of a man's wish, in *Testament* (§2) (Q)

"I would like — and this would be the last and most ardent of my wishes — I would like the last of the kings to be strangled by the guts of the last priest."

— Jean Meslier (1729), attributed to Meslier by Denis Diderot (Q)

Quotes | By

The following are noted quotes:

"Do not fool yourselves, my dear friends, open your eyes to this and in general everything that your pious morons or mocking, self-interested priests and scholars are eager to tell you and make you believe on the false pretext of the infallible certainty of the so-called holy and divine religion."

— Jean Meslier (c.1727), *Testament*; dust-jacket (2009) quote

"All the religions that exist in the world are only human inventions and only error, abuse, vanity, illusion, fraud, lies, and imposture are spouted and practiced in the world by the cult and worship of gods."

— Jean Meslier (1729), *The Testament* (pg. 69)

"If our Christ-cultists say that their Jesus Christ was born miraculously from a virgin who had known no men, likewise the pagans had already said that Romulus and Remus, the founders of Rome, were miraculously born of a vestal virgin (see: virgin birth) named Ilia, Sylvia, or Rhea Sylvia. They had already said that Mars, Vulcan, Argus, and others were born of Juno, who had no knowledge of men."

— Jean Meslier (1729), *The Testament* (pg. 129)

"If our Christ-cultists say that their Jesus Christ was seen by his apostles to rise up gloriously into heaven and that many souls of their so-called saints were seen gloriously carried away into heaven by the angels, so too had the Roman pagans already said that Romulus, their founder, was seen in all his glory after his death."

— Jean Meslier (1729), *The Testament* (pg. 130)

"If a ram was miraculously found in place of Isaac when Abraham wanted to sacrifice him, so also did the goddess Vesta miraculously send a cow to be sacrificed in place of Metella, daughter of Metellus. Likewise, the goddess Diana sent a doe in place of Iphigenia when she was on the stake to be immolated, whereby Iphigenia was miraculously delivered."

— Jean Meslier (1729), *The Testament* (pg. 131)

"If Moses made water spring from a rock by striking it with his rod, Pegasus the horse did as much when he struck a rock with his hoof and a fountain sprang up."

— Jean Meslier (1729), *The Testament* (pg. 131)

"We can say that the truth, generally speaking, is so independent of everything we can think of or imagine that although there be no body or mind, no form or matter, no creator or creature, even no thing in the world, there would still at least be a truth because in this case, it would be true that there was nothing; so true is it to say that the first and fundamental truths of things are eternal and unchanging in themselves and entirely8 independent."

— Jean Meslier (1729), *The Testament* (§69, pg. 380)

"I am not talking here about what we normally call 'spirits' or 'spiritual substances' because these so-called substances do not exist and are not even possible."

— Jean Meslier (1729), *The Testament* (§70, pg. 383)

"This is the state to which each of us will be reduced after death: we will all return to the state we were in before we were born or before we existed, and just as at that time we thought about nothing, imagined nothing, and were nothing, so also after death we will think about nothing, feel nothing, and imagine nothing anymore."

— Jean Meslier (1729), *Testament* (§73, pg. 430)

"Religion is a real nursery of fanatics, it is truly the theater where they play their parts the best."

— Jean Meslier (1729), Testament (§73, pg. 431)

"Everything that is most beautiful and admirable in nature is made by the laws and forces of nature."

— Jean Meslier (1729), The Testament (§77, pg. 465)

"A thing that always remains in the same state can be or do only the same thing always."

— Jean Meslier (1729), The Testament (§81, pg. 494); cited as a truthful maxim, possibly in relation to principle of inertia

"All the religions of the world are, as I said at the beginning of this writing, only human inventions, and that everything they teach us or make us believe are only errors, illusions, lies, and impostures invented by scoffers, swindlers, and hypocrites to deceive men, or by shred and crafty politicians to hold men in check and do whatever they want to the ignorant people, who blindly and foolishly believe everything they are told comes from god."

— Jean Meslier (1729), *The Testament* (§96, pg. 577)

"To discover the true principles of morality, men have no need of theology, of revelation, or of gods. They need but common sense. They have only to look within themselves, to reflect upon their own nature, to consult their obvious interests, to consider the object of society and of each of the members who compose it, and they will easily understand that virtue is an advantage, and that vice is an injury to beings of the species."

— Jean Meslier (1729), *Testament* (O)

"To claim that the souls of men will be happy or unhappy after the death of the body, is to pretend that man will be able to see without eyes, to hear without ears, to taste without a palate, to smell without a nose, and to feel without hands and without skin. Nations who believe themselves very rational, adopt, nevertheless, such ideas."

— Jean Meslier (1729), *Testament* (O)

"After this, let people think, judge, say, and do whatever they want in this world; I do not care. Let men adapt themselves and be governed as they want, let them be wise or crazy, let them be good or vicious, let them say or even do with me whatever they want after my death: I really do not care in the least. I already take almost no part in what is done in the world. The dead, whom I am about to join, no longer worry about anything, they no longer take part in anything, and they no longer care about anything. So, I will finish this with nothing. I am hardly more than nothing and soon will be nothing."

— Jean Meslier (1729), his final recorded words

> "Know, my dear friends that everything that is happening in the world concerning the cult and the adoration of gods, is nothing but error, abuse, illusion, mendacity, and betrayal; that all the laws and ordinances published under the authority of god or gods are nothing but human inventions."
>
> — Jean Meslier (1729), *Testament* (Q)

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(c) Palmer, Michael. (2013). *Atheism for Beginners: a Coursebook for Schools and Colleges* (pg. 194). Lutterworth Press.
(d) Spencer, Nick. (2014). "Why Aren't More Americans Atheists? Turns out it has nothing to do with Science. And everything to do with Politics" (Q), *The Big Idea*, Aug 05.
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4. Spencer, Nick. (2014). "Why Aren't More Americans Atheists? Turns out it has nothing to do with Science. And everything to do with Politics" (Q), *The Big Idea*, Aug 05.

Further reading

● Onfray, Michel. (2006). "Jean Meslier the Gentle Inclination of Nature" (translator: Marvin Mandell) (Q), *New Politics*, Vol:X-4, Winter.
● Mainil, Pierre J. (2011). "Jean Meslier: Atheist and Communist Priest in the 18th Century" (Q) (pdf), AFT Blog, Dec 25.

External links

● Jean Meslier – Wikipedia.

θΔics

In science, **Jean Perrin** (1870-1942) (CR:15) was a French physicist noted for his 1909 study of Brownian motion, according to which he provided demonstrable proof of the existence of atoms, namely by determining Avogadro's number via several methods; he also showed that cathode rays were made of negative electric charge; and explained that solar energy resulted from thermonuclear reactions of hydrogen.

Atoms + Molecules | Evolution

See: Defunct theory of life; life does not exist

In 1903, French physical chemist Jean Perrin, noted winner of the 1926 Nobel prize for proving that molecules exist, in his *Treatise on Physical Chemistry* (chapter: "The Principle of Evolution"), was one of the first to discuss the inconsistencies the notion of evolution, in the context of the second law, heat death theory, and so-called "life" originated or rather being synthesized from "dead" atoms (in the context of Carnot's principle), one of his comments being: [3]

> "Molecules and atoms are lifeless beings that never evolve."

The first part of this statement is quite accurate: atoms and molecules are indeed lifeless. A single hydrogen atom is not alive, nor are its derivatives (molecules). When one first begins to calculate the molecular formula for a single human (e.g. Sterner and Elser, 2002; Thims, 2007, etc.) and to specifically define a human as a "molecule", however, one is quickly confronted with a paradox: at what point, second, or reaction mechanism step (in the evolution timeline) on going from hydrogen to human, do molecules come alive? The beginning student will likely have been told that the Urey-Miller experiment (laboratory produced life) or Darwin's warm pond model solved this issue long ago, and that there only remain a few pieces of the puzzle to work out: but this could not be farther from the truth.

On the second point, i.e. "molecules don't evolve", here we are to take recourse in the "hydrogen to human" mindset and the Goethean metamorphosis (proto-evolution theory) to wrap our head around how to reconcile Darwin with Dalton + Clausius; some of the first to do this semi-cogently were: Lawrence Henderson (1913), Harold Blum, in his "A Consideration of Evolution from a Thermodynamic View-Point", cites Lawrence Henderson (1913) and Gilbert Lewis (1923), to outline a coupling theory plus free energy decrease based theory of orthogenesis (directional-change) conceptualized evolution, in the explicitly-stated "religious-free" form of what he refers to as "chemical peneplanation", i.e. an synonym the semi-modern term Gibbs landscapes, as seems to be the case. [5]

Atoms | Proof

In 1909, Perrin proved that atoms exist by calculating Avogadro's number using three different methods, all involving liquid phase systems. First, he used a gamboge soap-like emulsion, second by doing experimental work on Brownian motion, and third by confirming Einstein's theory of particle rotation in the liquid phase. In 1926, Perrin's work was recognized by his win of the Nobel Prize in physics for proving, conclusively, the reality of the "atomistic description" of nature—a recognition often said to mark the final and formal acceptance of Leucippus' c.450BC atomic theory by science officially.

Religion | Atheism

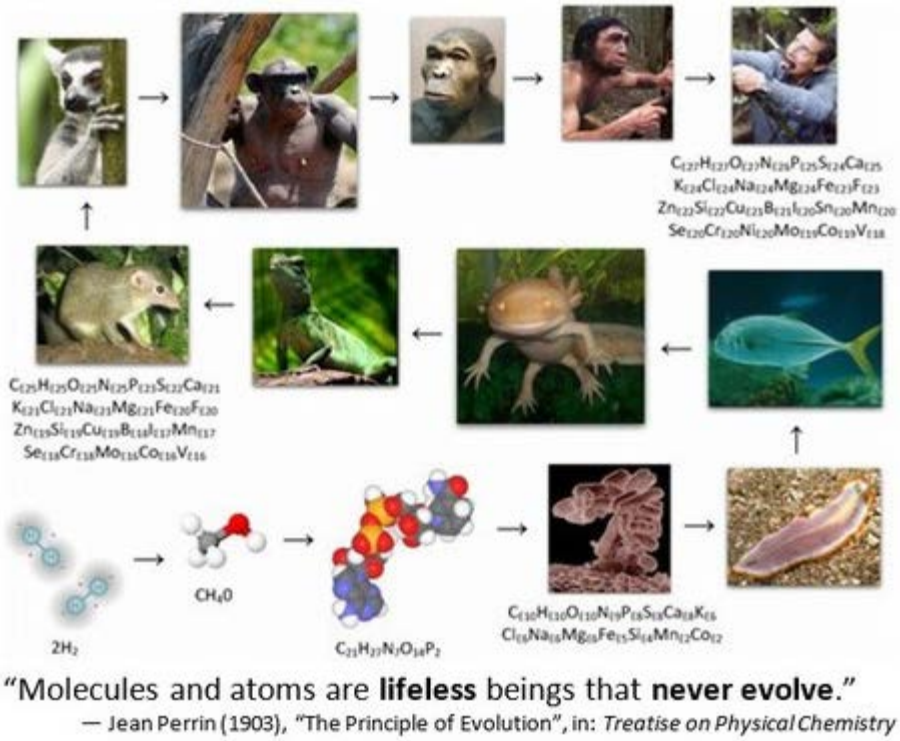

Perrin was an atheist: [5]

> "Jean and Francis Perrin held similar political and philosophical ideas. Both were socialists and atheists. Like many nineteenth century French men of science, Jean Perrin viewed science almost as a religion."

He and his son, Francis, were atheists who had science as their religion.

Students

In 1911, Leon Brillouin studied under Perrin.

Quotes | On

The following are Perrin-related quotes:

> "This suicide must be ranked as one of the great tragedies in the history of science, made all the more ironic by the fact that the scientific world made a complete turnabout in the next few years and accepted the existence of atoms, following Perrin's experiments on Brownian motion."
>
> — Stephen Brush (1964), on Boltzmann's suicide [2]

Quotes

The following are noted Perrin quotes:

> "The invariable number N is a universal constant, which may appropriately be designated *Avogadro's constant*."
>
> — Jean Perrin (1909), "Brownian Motion and Molecular Reality" [4]

References

1. Perrin, Jean, B. (1926). “Discontinuous Structure of Matter”, Nobel Lecture, December 11.
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4. (a) Perrin, Jean. (1909). “Brownian Motion and Molecular Reality” (*"*Mouvement brownien et réalité moléculaire"), Annales de Chimie et de Physique, 18: 1–114.
(b) Engl. Trans. by Frederick Soddy (London: Taylor and Francis, 1910) [Excerpt: sections 1-6 complete (from: David M. Knight, ed., Classical Scientific Papers: Chemistry (New York: American Elsevier, 1968) and the abridgment reprinted in Henry A. Boorse & Lloyd Motz, The World of the Atom, Vol. 1 (New York: Basic Books, 1966)].
5. Bernard Valeur, Jean-Claude Brochon (2001). New Trends in Fluorescence Spectroscopy: Applications to Chemical and Life Sciences (atheists, pg. 17). Springer, 2012.

External links

â— Jean Baptiste Perrin – Wikipedia.

θΔics

In existographies, **Jean Rey** (1583-1645) was a French physician and chemist, noted for []

Overview

In 1630, Rey, in his *Essay on Tying to Find out why Tin and Lead Increase Weight when Calcined*, according to William Middleton (1964), was thinking about the weight and pressure of air. [1]

Rey, in this same work, according to Gilbert Lewis (1925), was the first person to clearly announce the law of the conservation of mass. [2]

Associates

Rey corresponded with Rene Descartes and Marin Mersenne.

Quotes | By

The following are quotes by Rey:

> "Let there be taken a portion of earth which shall have in it the smallest possible weight, beyond which no weight can subsist: let this earth be converted into water by means known and practiced by nature; it is evident that this water will have weight, since all water must have it, and this weight will either be greater than that of the earth, or less than it, or else equal to it. My opponents will not say that it is greater, for they profess the contrary, and I also am of their opinion: smaller it cannot be, since we too the smallest weight that can exist: there remains then only the case that the two are equal, which I undertook to prove."
>
> — Jean Rey (1630), *The Increase in Weight of Tin and Lead on Calcination*

References

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(b) Middleton, William E. (1964). *The History of the Barometer* (pg. 8) (Amz). Publisher.
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Further reading

â— Partington, James R. (1938). *A Short History of Chemistry* (§:Jean Rey, pg. 84). MacMillan and Co, 1960.

External links

â— Jean Rey (physician) – Wikipedia.

θΔics

In existographies, **Jean Robinet** (1735-1820) was a French physicist philosopher, naturalist, encyclopedist, and early evolutionist, noted for []

Activity | Active principle

The fundamental reality of nature, according to Robinet, as summarized by Arthur Lovejoy (1933), was not "matter" but "activity" or rather the force behind the active principle; Robinet explains as follows:

> "To the inferior beings, such as minerals and vegetables, we refer all the phenomena that occur to matter, as the principle constituent (*le fond principle*) of these beings. A little higher in the scale, we begin to doubt; we are undecided. We remark a 'spontaneity' of movements and operations which discloses an 'active principle' which we cannot but attribute to them.
>
> Nevertheless, this activity may still be seen to be dragged along and invincibly determined by matter, so that, in such systems, matter and activity appear to dominate by turns, being alternately principal and accessory, according to circumstances. The active power seems to be making efforts to raise itself above the extended, solid, impenetrable mass to which it is chained, but of which it is often compelled to submit to the yoke. In man, on the contrary, it is evident that matter is only the organ through which the 'active principle' brings its faculties into play. The former is an envelope which modifies the action of the latter, one without which it would perhaps act more freely, but also without which, perhaps, it could not act at all, and without which it assuredly could not render its activities sensible.
>
> Does it not, once more, seem that the active power grows and perfects itself in being, in proportion as it raises itself above matter? Such, according to this hypothesis, would be the progression of the active force inherent in matter. At first it would be but the smallest portion of being. By a multiplication of efforts and progressive developments, it would succeed in becoming the principal part. **I am strongly inclined to believe that this 'force' is the most essential and the most universal attribute or bottom of being** (*le fond de l'etre*) — and that matter is the organ whereby this force manifests its operations. If I am asked to define my conception of such a force, I shall answer, with a number of philosophers, that I represent it to myself as a tendency to change for the better; since every change is the proximate predisposition to another and better one."
>
> — Jean Robinet (1768), *Philosophical View of the Natural Gradation of the Forms of Being* (*Vue Philosophique de la Gradation Naturelle des Formes de l'etre*) (pgs. 8-10); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 282)

Moreover:

> "Accustomed as we are to judge the reality of things by the appearances which strike our senses, we a re unwilling to admit that anything exists in the world except matter, since we see only matter. And, to borrow the words of a modern author, since all the modifications which our senses observe in nature consist simply in the variations of the limits of extension, as soon as we are compelled to give up this extension we seem to be confronted with mere nothingness; we come a stop as if there is naught beyond. We do not give heed to the fact that the material or visible world is an assemblage of phenomena and nothing more – that there must necessarily be an invisible world, which is the foundation, the subject, of the visible world, and into which we ought to resolve all that is real and substantial in nature. This invisible world is the collection of all the forces which tend to ameliorate themselves, and which to so in fact, by incessantly extending and perfecting their activity, in the proportion suitable to each of them. **There is a 'gradation of forces' in the invisible world** as there is a progression of forms in the extended or visible world. The active forces propagate themselves in their manner as the material forms do. One might well say that material forms only proceed from one another because a certain degree of force from one has animated the other, and so on. The necessary progress of these two elements fills the universal scale of nature. The whole of nature thus offers

to our contemplation two great objects, the progression of forces and the development of forms."

— Jean Robinet (1786), *Philosophical View of the Natural Gradation of the Forms of Being* [7]

This so-called 'activity philosophy', in the opinion of Lovejoy, supposedly, anticipated concepts such as: Friedrich Schelling's 'natural philosophy' and Henri Bergson's elan vital. [3] This categorization by Lovejoy, however, seems to be in the neighborhood, but on the wrong side of the fence of nature. Correctly, baring a full reading of Robinet (which mostly seems extant only in the original French), in modern terms, Robinet's so-called "active principle", rooted in active forces and powers, behind the spontaneity of movements, mineral to man, is the Gibbs energy, aka the force function, behind the spontaniety of chemical change, such as is found, in pre-cursory form in Goethe's human chemical theory, described by affiinity chemistry logic, Friedrich Nietzsche's will to power theory, and the leading modern human free energy theorists.

Overview

In 1761, Robinet, in his *Of the Nature*, the first volume of five (the last volume completed in 1768), sought to outline an sort of pan-rationalism themed evolutionist scale of being philosophy.

In 1763, Robinet, in *Of the Nature, Volume Two*, attacked Charles Bonnet and his attempt to "divide the different orders which constitute the scale of being" into the following four classes:

1. Inorganic
2. Organic but inanimate (i.e. plants)
3. Organic and animate, but without reason (i.e. animals)
4. Organic, animate, and rational (i.e. humans)

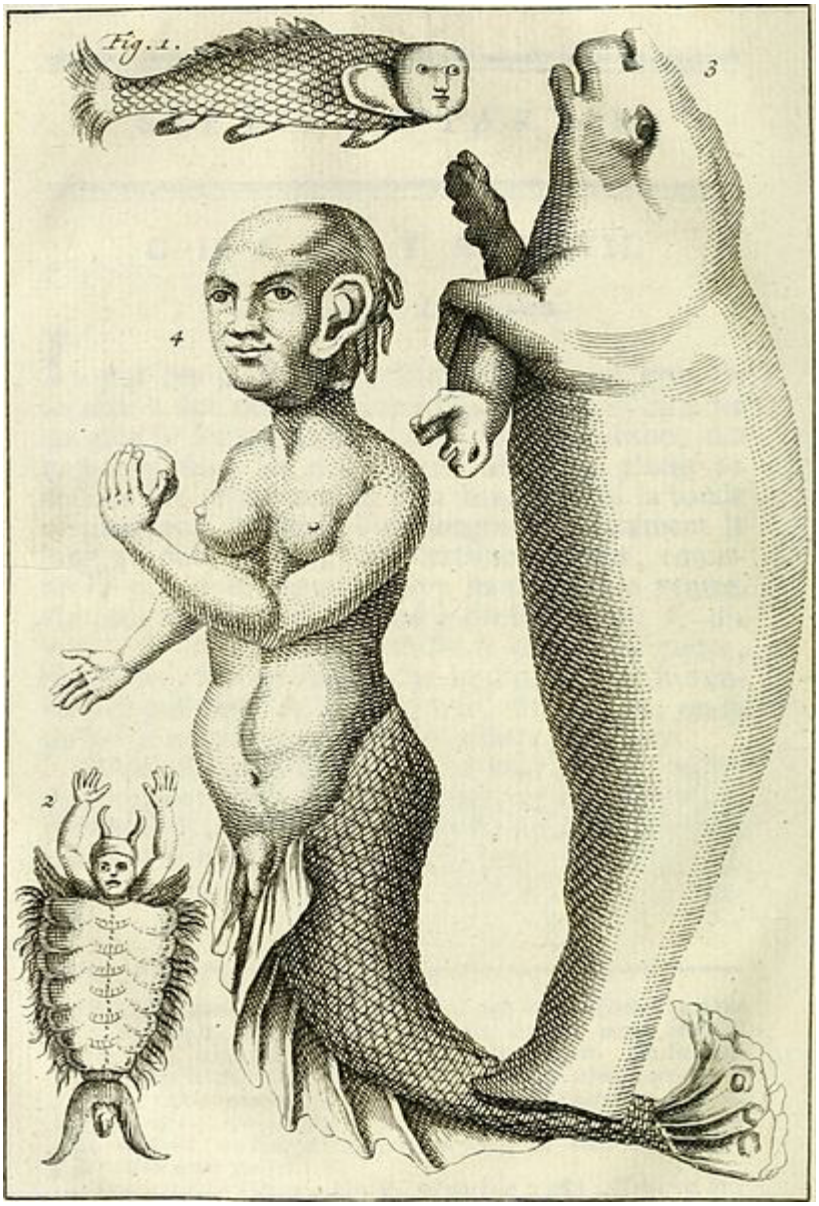

An illustration (Ñº) from **Robinet**'s 1768 *Philosophical View of the Natural Gradation of the Forms of Being*, wherein he is attempting to show, via descriptions of human-like reported species, that humans "metamorphosized" over time back through the fish species.

Robinet viewed this four-part classification divide as an outright denial of continuity, because it credited some classes with possession of certain traits or positive attributes, which the others absolutely lack. Robinet, conversely, argued that we should think not in terms of positive and negative divisions, in respect to certain attributes, but in terms of some common character, which forms the basis of the principle of continuity. [3] Robinet argues as follows:

> "What continuity can there be between the organic and the inorganic, between the animate and the inanimate, between the rational and the non-rational? It is evident that there is no mean between the positive and the negative, and consequently, that there are no intermediate beings which link the two together. If there were such beings, it would be necessary that their constitution should simultaneously participate in two mutually exclusive contraries; . . . e. g., that the passage from inorganic to organic should be filled up by a middle sort of beings which are both organic and

inorganic. But such beings are self-contradictory (repugnant). If we wish to leave the law of continuity standing, ... if we wish to allow nature to pass insensibly from one of her productions to another, without compelling her to make leaps, we must not admit the existence of any inorganic beings, or any inanimate, or any non-rational. Where there is a single essential quality (an essential one, I say) characteristic of a certain number of beings to the exclusion of others, .. . the chain is broken, the law of continuity becomes a chimera, and the idea of a whole an absurdity."

— Jean Robinet (1762). *Of the Nature, Volume Four* (pgs. 4-5) [1]

In commentary on this ideology, chain of being historian Arthur Lovejoy (1933), , characterizes this as the "retrotensive method", a term he coined in 1927, in contrast to the "emergent method", as follows:

"This was an acute and important observation upon the concept of the qualitative continuum. It made explicit, and generalized, the logic which was to be more vaguely and less consistently followed by many later philosophers. One of the principal motives, for example, of panpsychism in the philosophy of our own time is the desire to avoid the discontinuity which is manifestly implied by the supposition that consciousness or sentiency is an 'emergent' property [see: emergent property] or function, which abruptly supervenes at a certain level of the integration of matter, and at a certain stage in planetary evolution.

Underlying all such reasoning is the assumption of the necessity of what may be called the 'retrotensive method' — the rule that whatever is empirically found in or associated with the more complex and highly evolved natural entities must inferentially be read back into the simpler and earlier ones. But where later writers have, as a rule, applied this method only spasmodically and without full realization of its general import, Robinet saw that it must either be applied universally or be admitted to have no cogency at all. The result, it will perhaps seem to the judicious reader, was simply a *reductio ad absurdum* of the principle of continuity. But to **Robinet**, it was the establishment, by a single stroke of logic, of a whole group of important philosophical conclusions — among them, hylozoism, panpsychism, and a peculiar sort of panlogism, a doctrine of ubiquity of the rudiments of rationality in all natural things."

— Arthur Lovejoy (1933), *The Great Chain of Being* (pgs. 276-77)

Lovejoy cites the following statement of Robinet, as an example of this retrotensive ideology:

"For myself, I would rather give even intelligence to the least atom of matter – provided it were in a degree and of a quality suitable to it – than to refuse organization to the fossils and make of them isolated beings, having no connection with others. It is to no purpose to tell me that this is a bizarre opinion, and that it is not possible to that a stone thinks."

— Jean Robinet (1762). *Of the Nature, Volume Four* (pgs. 11-12) [1]

"By including among the 'animals' the: fossils, the semi-metals, air, fire, etc., I have ventured farther than any naturalist who has preceded me."

— Jean Robinet (1762). *Of the Nature, Volume Four* (pg. #); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pgs. 355-67)

(add)

Quotes | On

The following are quotes on Robinet:

> "**Robinet**, though not the originator, was, so far as I know, the first elaborated and enthusiastic champion of the notion of the Urbild, upon which all organic and perhaps all natural forms are variations, which was to be taken up by Herder and to become an almost obsession of Goethe at one period."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* [6]

> "In joining man to nature, La Mettrie disputed the Cartesian distinction between the reasoning mid and the corporeal body. For his part, La Mettrie reduced man's spiritual faculties to the Cartesian category of extended substance and so rid philosophy of the two independent realities. Furthermore, his materialist position contradicted essentialist metaphysics and opened the way for **Robinet**'s revision of the chain of being."
>
> — Terence Murphy (1976), "Jean-Baptiste Rene Robinet" (pg. 162) [5]

> "**Robinet**'s *Of the Nature* firmly rejected mechanism and examined alternate philosophies in order to elaborate the central questions, methods, and aims of a science of living things."
>
> — Terence Murphy (1976), "Jean-Baptiste Rene Robinet" (pg. 2) [5]

> "**Robinet**, a French naturalist, combined a traditional belief in the perfect hierarchy of species with the notion of continual progress. In five volumes, issued between 1761 and 1768, he argued that all matter contained both life and soul, and that organisms were simply combinations of these living atoms."
>
> — Stuart Curran (2012), "Contexts (Ñº) to Mary Shelley's *Frankenstein: the Modern Prometheus* (Ñº) | Science: Biology: Evolution (Ñº)", University of Pennsylvania [4]

Quotes | By

The following are quotes by Robinet:

> "The scale of beings constitutes a whole infinitely graduated, with no real lines of separation; that there are only individuals, and no kingdoms or classes or genera or species. This great and important truth, the key to the universal system, and the basis of all true knowledge, will day by day become more evident, as we progress in the study of nature."
>
> — Jean Robinet (1762). *Of the Nature, Volume Four* (pgs. 1-2) [1]

> "When I compare the stone with the plant, the plant with the insect, the insect with the reptile, the reptile with the quadruped, I perceive, through all the differences which characterize each of them, relations of analogy, which persuade me that they have all been conceived and formed in accordance with a single model (dessein), of which they are variations graduated ad infinitum."
>
> — Jean Robinet (1762). *Of the Nature, Volume Four* (pg. 17); supposedly, a paraphrase, in some sense of Denis Diderot (1754) [3]

"**Nature is always at work**, always in travail, in the sense that she is always fashioning new developments, new generations."

— Jean Robinet (c.1768), *De La Nature, Volume Five* (pg. 148) [2]

"Society, therefore, is the work of nature, since it is a natural product of human perfectibility, equally fertile of evil and of good. Arts and sciences, laws, the diversity of the forms of government, war and commerce — everything, in short, is only a development. The seeds of all were latent in nature; they have unfolded, each in its own time. Perhaps she still retains in her womb other germs, of slower growth, of which future races will reap the fruits. Then genius will expand and take on a still greater form. **The tree of science will acquire new branches**. As the catalogue of the arts is extended, their scope will become more ample. Thus, new vices and other virtues will manifest themselves."

— Jean Robinet (c.1768), *De La Nature, Volume Five* (pg. 148) [1]

"In the prodigious varied sequence of the animals below man, I see nature in labor advancing fumbling towards that excellent being who crowns here work. However imperceptible the progress which she makes in one step, that is, in each new production, in each variation upon the original design which she achieved, nevertheless the advance becomes clearly sensible after a certain number of 'metamorphoses'. All the varieties intermediate between the prototype and man I regard as so many essays of nature, aiming at the most perfect, yet unable to attain it except though this innumerable sequence of sketches. I think we may call the collection of the preliminary studies the apprenticeship of nature in learning to make a man.""

— Jean Robinet (1768), *De La Nature, Volume Five* (pg. #); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 280)

"Each [organic] mechanism tends immediately and of itself to produce only that which we see it in fact engendering; but the sum of these mechanisms tends towards the final outcome; and we here take man as the final outcome, in order to limit ourselves to terrestrial beings, which alone are within our knowledge."

— Jean Robinet (c.1768), *De La Nature* (pg. #); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 281)

"When I contemplate the innumerable multitude of individuals spread on the surface of the earth, in its entrails, and in its atmosphere…I perceive among the differences which characterize each of them, the relations of analogy [which] persuade me that they all have been conceived and formed after a unique design…They offer me all the striking traits of this model of this original exemplar, of this prototype, which, while realizing itself, has successfully clothed an infinite multitude of forms under which being is manifested to our eyes."

— Jean Robinet (c.1768), *Of the Nature*; cited by Terence Murphy (1976) in "Jean-Baptiste Rene Robinet" (pg. 184)

"The unity of the model, or the plan, maintained in the prodigious diversity of its forms, provides the base of the continuity of the graduated liaison of beings. All beings differ from one another, but all these differences are the natural variations of the prototype which it is necessary to regard as the generative element of all beings. It engenders them by the means of development. It is a germ which naturally tends to develop. As such, it has a force of extension so great that it contains many more beings than those which

exist…The germ develops them, and each degree of development gives a variation of the prototype, a new combination of the universal primitive plan."

— Jean Robinet (c.1768), *Of the Nature*; cited by Terence Murphy (1976) in "Jean-Baptiste Rene Robinet" (pgs. 184-85)

"We have proposed that matter is essentially endowed with the faculties of nourishing itself, growing and reproducing. We have also seen that this triple faculty is the distinctive character of animality. Let us conclude that all matter is essentially animal."

— Jean Robinet (c.1768), *Of the Nature*; cited by Terence Murphy (1976) in "Jean-Baptiste Rene Robinet" (pg. 208)

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4. Curran, Stuart. (2012), "Contexts (Ñº) to Mary Shelley's *Frankenstein: the Modern Prometheus* (Ñº) | Science: Biology: Evolution (Ñº)", University of Pennsylvania.
5. (a) Murphy, Terence. (1976). "Jean-Baptiste Rene Robinet: the Career of a Man of Letters", Miscellany, Studies on Voltaire and the Eighteenth Century 150:187-88; 195; 201-31.
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Further reading

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â— Robinet, Jean. (1763). *De La Nature, Volume Two*. Chez.
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External links

â— Jean-Baptiste Robinet – Wikipedia.
â— Anon. (c.2015). "The Great Chain of Being" (Ñº), SUNYOrange.edu.

θΔics

In hmolscience, **Jean Rostand** (1894-1977) was a French biologist (chnopsologist) noted for []

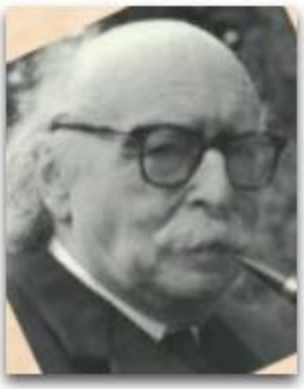

Overview

In circa, 1960, Rostand gave the following eschatology views on entropy and heat death theory in relation to the existence of humans: [1]

> "The human race will pass, just as did the dinosaurs. Little by little the tiny star which serves as our sun will lose its brightness and warmth. All life will then cease on the earth which, deprived of the sun, will continue to turn in space, endlessly. Then, of all, civilization, philosophy, discoveries, religions, ideas, nothing will be left."

His 1956 book *Atomism in Biology*, the synopsis of which is as follows, seems to give a decent sketch of the history of the integration and supplementation of atomic theory in chnopsology (biology): [2]

> "Sketches on the history of atomism in biology; at a glance the history of ideas relating to the origin of monsters; remarks on on the concept of the germ of Leeuwenhoek, Descartes and biology; Diderot and biology; the conception of man according as Helvetius and Diderot; Montesquieu and biology; a precursor of Mendel: the pharmacist Coladon; Cournot and biology; Renan's precursor scientific work; the remains of the natural history of creation; Bechamp and Soviet biology; return to Bacon."

Rostand's *Atomism in Biology*, to note, seems to have some connection to Emile Meyerson's struggle with second law, or the "Carnot's principle" as it was called in France in Meyerson's time, in relation to identity. [3]

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External links

â— Jean Rostand – Wikipedia.

θΔics

In existographies, **Jean-Jacques Rousseau** (1712-1778) (IQ:180|#145) (Cattell 1000:43) [RGM:118|1,320+] (Murray 4000:18|WP / 6|WL) (EPD:M1) (CR:49), aka "Jean-Jacques" (Sade, 1783) or "Rousseau", was a Genevan philosopher noted for []

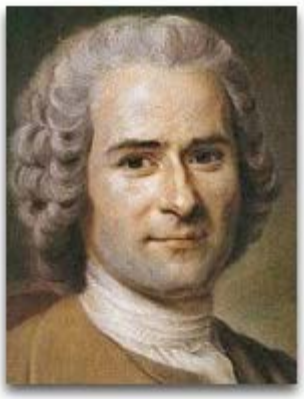

Overview

In 1762, Rousseau, in his *The Social Contract: Principles of the Political Right*, argued the following position, in respect to forces: [1]

> "Now as men cannot create any new forces, but only combine and direct those that exist, they have no other means of self-preservation than to form by aggregation of sum of forces which may overcome the resistance, to put them in action by a single motive power, and make them work in concert."

(add)

Influenced

The only picture in Immanuel Kant's otherwise sparsely decorated home was a portrait of Rousseau that he hung over his writing desk. (Q)

Education

Rousseau's mother died when he was young (see: early parental death and genius), and he was initially brought up by his father, a watchmaker. He left Geneva aged 16 and travelled around France, where he met his benefactress, the Baronnesse de Warens, who gave him the education that turned him into a philosopher. In 1742, he connected with Denis Diderot, and the two formed the core of an intellectual group called the 'Philosophes'. (Q)

Influenced | By

Influenced (Q) by: Voltaire, John Locke, Charles Montesquieu, Thomas Hobbes, Denis Diderot, Plato, Aristotle, Rene Descartes, Niccolo Machiavelli, Benedict Spinoza, Michel Montaigne, Jean d'Alembert, Gottfried Leibniz, Hugo Grotius, Epicurus, Etienne Condillac, Samuel Pufendorf, Samuel Richardson, Nicolas Malebranche, Louise d'Epinay, Ibn Tufail, Jean Burlamaqui, and Jean Bareyrac.

Influence | On

Influenced (Q): Marquis de Sade, Immanuel Kant, Karl Marx, Maximilien Robespierre, David Hume, Georg Hegel, Thomas Paine, Maria Montessori, Jacques Derrida, Johann Fichte, Louis Saint-Just, Leo Strauss, and Louis Althusser.

Quotes | On

The following are relevant quotes on Rosseau:

> "**Rousseau**, whose survey of human nature often strangely and suspiciously resembles that of Hobbes, advocated—in some moods at least—a return to nature. Rousseau's 'nature' was a pig-sty, but Hobbes's state of nature was something far worse than that."
>
> — Pogson Smith (c.1895), "The Philosophy of Hobbes" [4]

> "But if we must abandon the idea of an original social instinct uniting men, then the only theory of the state that seems to be left is that of which among the moderns Hobbes is the keenest and most important representative. Instead of seeing society as the result of an instinct of "sympathy," we must regard it as a product of the sheer instinct for power. It is based on power, and only by power can it be preserved.

Rousseau went indeed so far in his attack on Grotius and the Encyclopedists as to hail Hobbes as his ally against them. For a time, he saw in Hobbes the great political realist, and as such he preferred Hobbes to all those who have painted human society in charming colors. In one of his essays he called Hobbes one of the greatest philosophers and one of the most eminent men of genius."

— Ernst Cassirer (c.1940), *Rousseau-Kant-Goethe* (Q)

"The middle of the eighteenth century witnessed the first powerful revolt against cultural tradition, which is marked by **Rousseau**. This tradition was restarted by universal genius Goethe. But it was restarted for the last time. Goethe had not been succeeded by another universal genius."

— Ernst Curtis (1949), "The Medieval Bases of Western Thought" [2]

"**Rousseau**'s 'I felt before I thought', which opposed Descartes 'I think therefore I am', brings a new idea, which is feelings may lead to 'truth'."

— Abdeslam Badre (2006), on romanticism (Q)

Quotes | By

The following are noted Rousseau quotes:

"Man is born free, but everywhere in chains."

— Jean Rousseau (1762), *The Social Contract* [3]

"I feel an indescribable ecstasy and delirium in melting, as it were, into the system of being, in identifying myself with the whole of nature."

— Jean Rousseau (c.1770) (Q)

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θΔics

In existographies, **Jean Delisle de Sales** (1741-1816) (IQ:190|#67) (CR:89) was a French polygraph and philosopher noted for his 1770-initiated seven-volume *The Philosophy of Nature: Treatise on Human Moral Nature*, wherein he employs materialism philosophy logic, presents social Newton illustrated play "Reasonable Drama", goes against the prevailing 6,000-year-old creationism model of the Bible, digresses on rational morality, among other controversial topics; in the 1789 edition of which he coins the term "human molecule" and introduces the human molecular hypothesis.

Name | Variations

Sales, historically, is found in a number of name variants, including: Jean Claude Izouard Delisle de Sales, Jean Baptiste Claude Isoard, Jean-Baptiste-Claude Delisle de Sales, or Jean-Baptiste Isoard de Lisle, surnamed-cited as: "Delisle de Sales" (Buckle, 1856), "Delisle de Sales" (Gustav Johoda, 1999; Antonello Gerbi, 2010; Patricia Fara, 2011), and labeled "J. Del. de Sales" in portrait (Ñº), among other variants; including an indexed name grouping of: "Jean-Babtiste-Claude Isoard" (first name) and "Delisle de Sales" (surname or last name) by Robert Darnton (1996). In circa 2010, reprint publishers, of tendency, began to republish his works, simply as: Jean Sales.

Overview

Sales, according to American new worlds scholar Antonello Gerbi, is summarized as follows: [2]

> "Sales' [writings] are a morass of long-winded and conventional hodgepodge of ideas. **Delisle de Sales** is basically a Voltairian. But in natural philosophy he often inclines to Robinet, and his idolization of nature frequently brings him alongside Rousseau. He approves of Condillac, Helvetius, and with some hesitation of d'Holbach. As a convinced theist, however, he fulminates against the atheist La Mettrie; believing firmly in the immortality of the soul, he 'demonstrates' it with the story of Richardson's Clarissa, and by way of further proof with a doleful tale of his own, 'the pathetic history of Jenny Lille'."

The following is a circa 2010 French-to-English translated Bibliopolis.com book description of Sales:

> "Izouard, who styled himself, Delisle de Sales, was a member of the group of the Ôphilosophes.Õ ÒHe wrote a work called *Philosophie de la Nature* (in 1770) which was condemned by the Chatelet in 1775 and after which Sales was imprisoned. Chatalet, after lengthy proceedings sentenced, Delisle to perpetual banishment on absurdly inadequate grounds, but the sentence was quashed by the parliament.
>
> Izouard wrote a number of philosophical, historical, and political works including a defense of freedom of the press, and a utopian work based on Plato's *Republic* which impressed Voltaire, but he remains a relatively unstudied figure in French 18th century philosophy.
>
> The fourth edition had first appeared in 1793-5 but our author condemns the poor printing of that edition and has corrected the errors and omissions of that issue and has added some new text and a map of Atlantis. It is interesting to note that he remarks that America has been left off his maps as it is still too new to picture accurately. The title of Izouard's work is reminiscent of Court de Gebelin's grammatically based work and is sometimes confused with it but Izouard calls the other work a poor performance. One available book of his contains seven engraved t.p.s & 30 plates including 13 folding maps (3 fully hand-colored), and 3 folding astrological star charts some signed by Macret, Monnet, Schmitx, etc.; portrait of Delisle de Sales by Duflos after Borel."

(add discussion)

Reasonable Drama | Newton in Senegal

In 1777, Sales' penned "Reasonable Drama", a short Socratic dialogue style satirical play, accompanied by an image of "Newton in Senegal", shown adjacent, which is found in volume four of his *The Philosophy of Nature*, with a accompanying discussion section, of controversial nature, the gist of which, as summarized by Patricia Fara (2002), situates an allegorical tale of Newton perched by the coast in Senegal, Africa, representative of a civilizing force of the enlightenment, taking time off from checking his calculations of the tides to contemplate the grandeur of nature, during which Newton, presented as vegetarian, enters into a dialogue with a merman, an oyster, and a native African about whether or not they should eat each other.

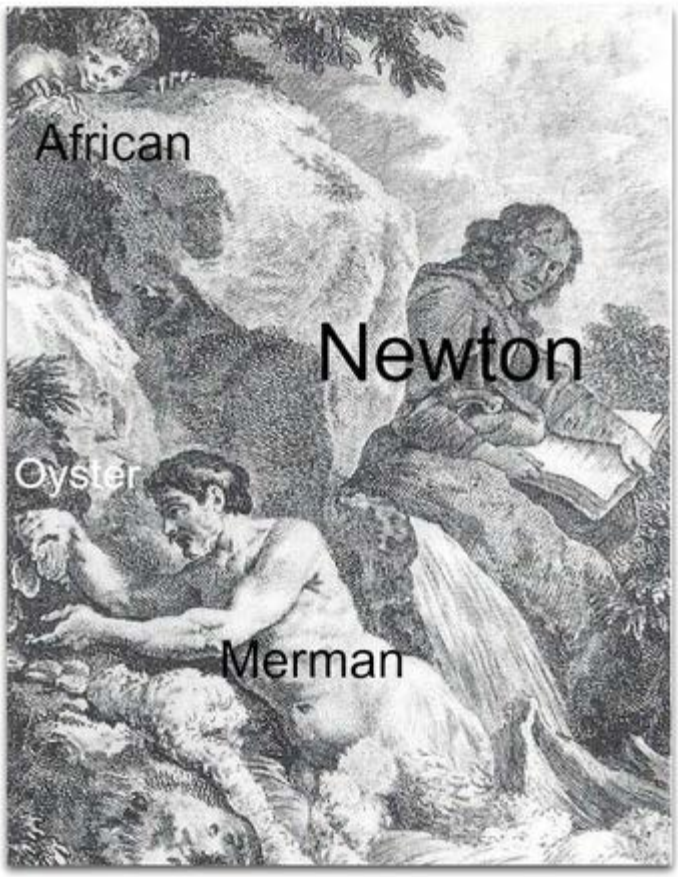

Sales' illustration of "Newton in Senegal" (see: social Newton), from his satirical play "Reasonable Drama" (1777), showing Newton, depicted as a vegetarian, eavesdropping on a conversation between a merman, a meat-eater, and an oyster, which is desperately reasoning for its life, amid which a African, who believes in a scarab-like god, enters the scene, illustrating the idiosyncrasies and seeming moral conundrums involved in so-called morality of eating. [4]

Newton, set up as an icon of rationality, concludes that only African is worth teaching, since his perception of God as a cockchafer does at least indicate that he can acquire a human soul. [4]

Bible | Earth age

Sales challenged the young earth biblical 6,000 year old date of creation which was popular in his day, instead believing on the basis of astronomical data that the earth was around 140,000 years old and that it took 40,062 years to cool down following its formation. He however rejected the three-million year old date of the earth which was taught in India at the time. [3]

Prison and banishment

See main: Human molecule (banned)

Sales' *Philosophy of Nature*, supposedly, was condemned by the Chatelet (a Paris courthouse and prison) in 1775 after which Sales was imprisoned and later sentenced to perpetual banishment on what have been called "absurdly inadequate grounds". Alternatively, at first the book passed passed unnoticed, by then in 1777 began to attract objectionable attraction owing to its moral views considered contrary to religion, during which time he was condemned to perpetual banishment by the order of the Chatelet.

Voltaire

While imprisoned, in 1777, Sales (age 36) was visited by French philosopher Voltaire (1694-1778) (IQ=195) (age 83), a year before his death, who gave 500 pounds to towards his release, which is equivalent to 91,000 dollars in 2013 inflation terms.

Philosophy of Nature

There do not seem to be any English translations of Sales' best-known work *The Philosophy of Nature: Treatise on Human Moral Nature*. The following is a translate of the French Wikipedia article summary of Sales' *Philosophy*: [3]

> "Philosophically, Delisle claims to Locke and envisions a world whose god is the architect and the nature of the machinist. A primitive fire, God's instrument and agent of nature, communicates to the world movement and life. In psychology, Delisle was inspired by Descartes basing the exploration of human faculties on the experience of consciousness rather than the rationalist assumptions. In ethics, consistent with French philosopher Claude-Adrien Helvetius, who says that self-love is the sole foundation. The state of nature, in

> his view, a dream that man is born to live in society, and all laws that underpin the social order are identical with those upon which our own happiness. The ideal government is held as far from the despotism of anarchy."

(add)

Human molecular hypothesis

In 1789, Sales introduced the human molecular hypothesis via his coining of the term 'human molecule', or molécules humaines (French), referring to a person atomically, in the following way: [1]

> "We conclude that there exists a principle of the human body which comes from the great process in which so many millions of atoms of the earth become many millions of **human molecules**."

from the fourth volume of his multi-edition, multi-volume opus *The Philosophy of Nature: Treatise on Human Moral Nature*, first published in 1770 and expanded over the years, supposedly going through seven editions, increasing in size to include up to a dozen volumes. The following shows the full French to English translation where Sales uses the term molécules humaines or human molecules: [1]

"Il faut conclure de mon fyrtême, que Sevu le principe du corps humain vient de la terre qui d'abord a végété, & de l'état de végétal a enfuite paffé à celui d'animal: cet animal a fervi d'aliment à l'homme, & cet aliment a été d'abord du fperme , enfuite de la chair, des veines & des os dont l'être eft né , & après la naiffance il fubfifte, ou il ne fubfifte pas. — Sachez donc, vous qui cherchez le grand œuvre, que de tant de millions d'atomes de la terre^ à peine un feul devient affez actif pour végéter ; que la plus petite partie de mille millions de végétaux devient animale ; que de mille millions d'animaux une feule molécule devient humaine, & que de mille millions de **molécules humaines**, il n'y en a qu'une qui devienne une goutte de fperme ce n'eu pas tout encore : de mille million.' de gouttes de fperme, une feule devient femence : de mille millions de parties de femence, une feule arrive à la matrice, & de mille millions de ces particules féminales qui arrivent à la matrice, il en naît un feul homme, & de mille millions qui naiffent, un feul fubiifte, & de mille millions qui fubfiftent un feul eft Mufulman, & de mille millions de Mufulmans, un feul a la vraie foi , & de mille millions de fideles un feul eft philofophe, & de mille millions de philofophes, un feul devient adepte. — Le but de tant de générations eft donc un adepte : ainfi la nature emiere a contribué * à fon exiftence."

"We conclude my fyrtême, Sevu that the principle of the human body comes from the earth first vegetated, and the rule of plant has pafled afterwards to that of animals: This animal ferved food to man, and the food was the first fperme, and afterwards of the flesh, veins and bones which is being born, and after the birth it subsists, or it does not subsists. - Know So, who seek the great work, as so many millions of atoms of the earth just one only becomes active enough to vegetate; the smallest part of a mile million plant becomes animal, than a thousand millions of animals alone molecule becomes human, and how many thousand millions of **human molecules**, there is only one that will become a drop of sperm this n'eu not all: one thousand million. Drops of fperme, alone becomes a feeds: one thousand million games of feeds, one reaches the matrix alone, and a thousand million of these particles Feminale coming to the matrix, there arises a alone man, and a thousand million who are born, a fubiifte alone, and a thousand million that subsist alone is a Mussulman, and a thousand millions of Mahometans, one only has the true faith, and a thousand million faithful one alone is philosopher, and a thousand million philosophers, one only becomes a follower. - The goal of many generations is thus a fan: thus nature ime has contributed to existence."

(add)

Quotes | On

The following are quotes about Sales:

> “I think this work is worn out. The same goes for philosophical books in general, which have rarely been requested for more than a year now.”
>
> — Jean-Felix Charmet (1781), “Letter to Societe Typographique de Neuchatel”, Jun 9 [5]

> “Among his many books, is often found a vast erudition, often brilliant ideas and new.”
>
> — Anon (c.1800), quote from the description of 1804 seven-volume set (Ñº)

> “**Delisle de Sales** was sentenced to perpetual exile, and confiscation of all his property, on account of his work on the *Philosophy of Nature*.”
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 534)

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3. Johoda, Gustav. (1999). *Images of Savages: Ancient Roots of Modern Prejudice in Western Culture* (pg. 75). Psychology Press.
4. (a) Sales, Jean. (1777). “Reasonable Drama” (“Drame Raisonnable”). Publisher.
(b) Sales, Jean. (1789). *The Philosophy of Nature: Treatise on Human Moral Nature, Volume 4* (*De la Philosophie de la Nature: Ou Traité de Morale Pour Le Genre Humain, Tiré de la Philosophie Et Fondé Sur la Nature, Volume 4*) (Drame Raisonnable, 7+ pgs; esp. pgs. 173-201, 205). Publisher.
(b) Darnton, Robert. (1996). *The Forbidden Best-Sellers of Pre-Revolutionary France* (Delisle de Sales, Jean-Babtiste-Claude Isoard, pgs. 48-49, 70-71, 397 n. 32). W.W. Norton.
(c) Malandian, Pierre. (1982). *Delisle des Sales: Philosophe de la Nature (1741-1816), Volume 1*. Oxford: Voltaire Foundation.
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(e) Fara, Patricia. (2002). *Newton: the Making of a Genius* (pg. 126; Newton in Senegal, figure 5.1). Columbia University Press.
(f) Shank, J.B. (2008). *The Newton Wars and the Beginning of the French Enlightenment* (pg. 9). University of Chicago Press.
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External links

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- Sales, J. de (Jean) (1741-1816) – WorldCat Identities.

θΔics

In existographies, **Jean-Paul Sartre** (1905-1980) (IQ:165|#461) [RGM:355|1,500+] (Stokes 100:73) (EPD:F2) (Becker 139:13) (GPhE:#) [CR:54] was French atheist existentialist philosopher, predominately noted for his 1943 *Being and Nothingness*, who promoted an anti-deterministic variety, i.e. science not based on causality, of individual "freedom as the foundation of all values" type of existentialism, according to the logic of "existence precedes essence", meaning that man first materializes into the world, encounters himself, and only afterwards defines himself.

Sartre's work is similar, albeit not on all points, to Albert Camus (see: Camus model).

Materialism

Sartre, as he conceived the term, seems to have been anti-materialistic, the logic of which he summarizes as follows: [1]

> "The effect of any form of materialism is to treat all men—including oneself—as objects, which is to say as a set of predetermined reactions indistinguishable from the properties and phenomena that constitute, say, a table, a chair, or a stone. Our aim is exactly to establish the human kingdom as a set of values distinct from the material world."

Sartre goes on to base his freedom-based existentialism logic on Rene Descartes' *cogito* motto of "I think therefore I am" model of consciousness confronting itself.

Existentialism

Sartre, along with Danish philosopher Soren Kierkegaard (1813-1855), one of the four main existentialism founders, along with Russian writer Fyodor Dostoyevsky (1821-1881), German thinker Friedrich Nietzsche, is one of the four main existentialism philosophers.

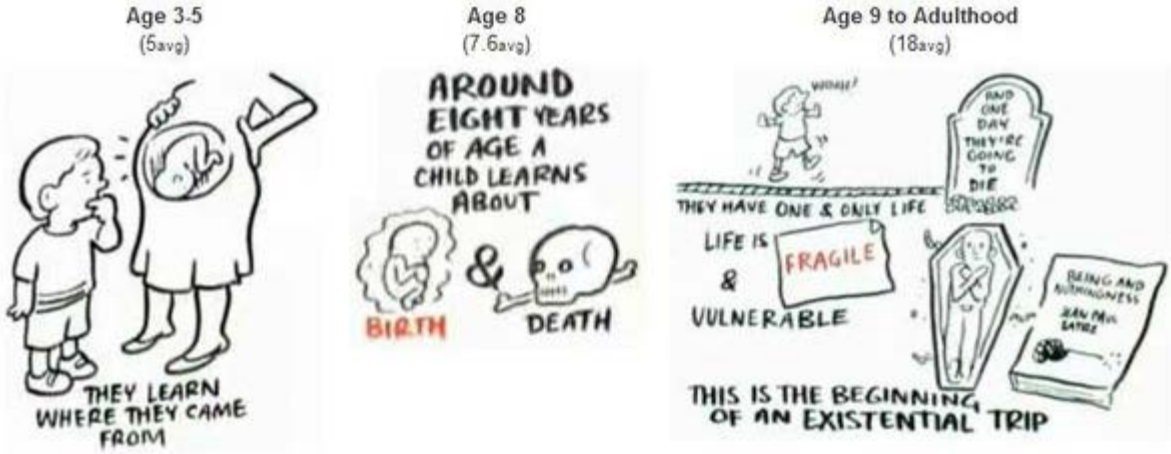

American writer Jeremy Rifkin's 2010 view that Sartre's *Being and Nothingness* is one of the typical stops on the average atheist person's queries about the nature of existence (see: belief system children). [2]

Difficulties on theory

Sartre's advice that he gives to people lost in the confusion of a world devoid of god or religious belief is the following: [1]

> "You are free, so choose; in other words, invent. No general code of ethics can tell you what you ought to do; there are no signs in this world."

Sartre, to uphold this "humans are free" logic, opening denies that science makes use of the notion of causality.

Deathbed deconversion

See main: Atheist deathbed deconversions

Sartre, in his latter year, began to waver on his atheistic beliefs, leaning, in the end, towards Judaism. In 1974, in an interview with Simone de Beauvoir, his lover, he stated: (Ñº)

> "I see myself as a being that could, it seems, only come from a creator. This, however, is not a clear, exact idea."

In 1980, while on his deathbed, in conversation with Pierre Victor, he supposedly said the following: [3]

> "I do not feel that I am the product of chance, a speck of dust in the universe, but someone who was expected, prepared, prefigured. In short, a being whom only a creator could put here; and this idea of a creating hand refers to god."

The 1996 book *Hope Now: the 1980 Interviews* (Ñº) goes into this deconversion episode.

Quotes | By

The following are quotes by Sartre:

> "Hell is just other people."
>
> — Jean-Paul Sartre (1944), *The Exist* (character: Garcin)

> "Existence precedes essence. A human first exists, encounters himself, surges up in the world, and defines himself afterwards."
>
> — Jean-Paul Sartre (c.1960) [4]

> "Everything has been figured out, except how to live."
>
> — Jean-Paul Sartre (c.1960) (Ñº)

> "I was led to unbelief not though conflicting dogma but through my grandparent's indifference."
>
> — Jean-Paul Sartre (c.1960) [4]

References

1. Sartre, Jean-Paul. (1945). "Existentialism is a Humanism", Lecture at Club Maintenant, Oct 29; in: *Existentialism is a Humanism* (including A Commentary on *The Stranger*; translator: Carol Macomber; Introduction: Annie Cohen-Solal; Notes and Preface: Arlette Elkaim-Sartre; editor: John Kulka) (materialism, pg. 41). Yale University Press, 2007.
2. The Empathic Civilization (RSA Animate) (2010) – YouTube.
3. (a) Molnar, Thomas. (1982). "Jean-Paul Sartre, RIP: A Late Return", *National Review*, 34:677, Jun 11.
(b) McDowell, Josh, J. Stewart, Don. (1982). *Handbook of Today's Religions* (Existentialism) (Ñº). Publisher.
(c) Zacharias, Ravi. (2008). *The End of Reason: a Response to the New Atheists* (pg. 43). Zondervan.
4. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 457). HarperOne.

External links

â— Jean-Paul Sartre – Wikipedia.

θΔics

In hmolscience, **Jean-François Lyotard** (1924-1998) was a French philosopher noted, in philosophical thermodynamics, for his 1990s metaphorical use of entropy in his descriptions of cultural and social change, as they differ by being isolated, closed, or open, in relation to the future and "progress". [1]

Overview

In 1993, Lyotard, in his *Political Writings*, posited that war and conflict are the result of entropy: [2]

> "Conflict (and ultimately war) does not arise between human and nature; rather, the struggle is between more developed systems and something else that is necessarily less developed and that the physicists know as entropy, the second principle of thermodynamics."

Lyotard reasons that the third world is nothing but a source of entropy for the *autopoesis* of the great monad and that the conflict between more human and the more inhuman types of people is between negative entropy or negentropy, which he defines as development, and entropy, the opposite of development. In relation to the Germany and the fall of the Berlin Wall (1989) and Islam and the Gulf crisis (1990), as an examples of an isolated systems, Lyotard tells us:

> "A system is all the more performative for being more 'open'; and reciprocally, it is condemned to be eliminated by its competitors or by mere entropy if it closes in on itself."

In addition to this statement, Lyotard comments that "Brezhnev", the leader of the USSR from 1964 to 1982, "should have spent more time studying thermodynamics". [3]

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1. Ansell-Pearson, Keith. (1997). *Viroid Life* (keywords "Lyotard" and "entropy," pgs. 167-73). Routledge.
2. Lyotard, Jean-François. (1993). *Political Writings* (pg. 99-100). University of Minnesota Press.
3. Lyotard, Jean-François. (1999). *Postmodern Fables* (pg. 80). University of Minnesota Press.

External links

- Jean-François Lyotard – Wikipedia.

θΔics

In human chemistry, **Jean-Marie Lehn** (1939-) is a French chemist noted for his 1995 *Supramolecular Chemistry*, a textbook based on his 1978 Baker Lectures given at Cornell University, in which he defines the newly-emerging field of "supramolecular chemistry" as a type of beyond molecular chemistry subject whose goal is to understand non-covalent intermolecular forces and to gain control over the intermolecular bond and to introduce this subject in laymanized terms as follows using Empedocles-Goethe stylized chemistry aphorisms: [1]

> "Supramolecular chemistry is a sort of molecular sociology! Non-covalent bonds define the inter-component bond, the action and reaction, in brief, the behavior of the molecular individuals and populations: their social structure as an ensemble of individuals having its own organization; their stability and their fragility; their tendency to associate or to isolate themselves; their selectivity, their 'elective affinities' and class structure, their ability to recognize each other; their dynamics, fluidity or rigidity or arrangements and of castes, tensions, motions and reorientations; their mutual action and their transformations by each other."

In other words, Lehn here alludes to the notion that supramolecular chemistry is the study of interactions of supermolecules akin to German polymath Johann Goethe's 1809 *Elective Affinities*, the chemistry of human molecules.

Supramolecular thermodynamics

Lehn gives a fairly cogent introduction to supramolecular thermodynamics, an example of which is as follows: [1]

> "A receptor-substrate supermolecule is characterized by its geometric (structure, conformation), its thermodynamic (stability, enthalpy and entropy of formation) and its kinetic (rates of formation and of dissociation) features."

Education

Lehn completed a BA in philosophy (1957), BS in natural sciences (1957), and PhD in chemistry (1963), all at the University of Strasbourg. He did post-doctoral work for a year at American organic chemist Robert Woodward's laboratory at Harvard University, working among other things on the synthesis of vitamin B12. In 1970 he became a professor of chemistry at Louis Pasteur University in Strasbourg. From 1979 to 2010 he was professor at the College de France in Paris and director of the Supramolecular Chemistry Laboratory in Strasbourg. He continues presently to direct this laboratory as Professor Emeritus at the University of Strasbourg. [2]

Other

Lehn who won the 1987 Nobel Prize in chemistry for development and use of molecules with structure-specific interactions of high selectivity.

References

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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (Lehn, pgs. 450-51). Morrisville, NC: LuLu.
2. Jean-Marie Lehn (faculty) – Freiburg Institute for Advanced Studies.

External links

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θΔics

In science, **Jean-Marie Wiame** (1914-2000) was a Belgian bacterial geneticist noted for his 1946 article "Biology and Thermodynamics of Irreversible Phenomena", co-authored with Belgian chemist Ilya Prigogine, wherein the so-called Prigogine-Wiame theory was presented, which states that the evolution of biological systems (chnopsological systems) is towards states with the least production of entropy (per mass unit) compatible with the boundary conditions imposed. [1]

Education

Wiame completed his PhD in 1945 at the Brussels school of biology on the physiological role of polyphosphates in yeast. In the early 1960s, his scientific interest shifted from bacterial to yeast genetics.

References

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2. Dubois, Evelyne and Thuriaux,Pierre. (2001). "Obituary: Jean-Marie Wiame, 1914-2000", *Current Genetics*, 39(2):

Further reading

â— Prigogine, Ilya. (2003). *Is the Future Given?* (pg. 46). World Scientific.

θΔics

In econophysics, **Jean-Philippe Bouchaud** (1962-) is a French physicist noted for his late 1990s to present work in applying physics to the economic-centric humanities, mostly it seems in financial physics; some of which has been cited as an example of toolism.

Overview

In 1997, Bouchaud began working with French-English physicist and mathematical fiance theorist Rama Cont on applying percolation theory was one of the inspirations for German physicist Dietrich Stauffer to go into econophysics. [1]]

In 2008, Bouchaud, in his "Economics Needs a Scientific Revolution", gave a very harsh and critical critique of economic theories; the following are a few humorously-correct statements from this article:

> "Compared to physics, it seems fair to say that the quantitative success of the economic sciences is disappointing. Rockets fly to the moon, energy is extracted from minute changes of atomic mass without major havoc, global positioning satellites help millions of people to find their way home. What is the flagship achievement of economics, apart from its recurrent inability to predict and avert crises, including the current worldwide credit crunch? Why is this so? Of course, modelling the madness of people is more difficult than the motion of planets, as Newton once said [c.1690]. But the goal here [see: social ideal gas law] is to describe the behaviour of large populations, for which statistical regularities should emerge, just as the law of ideal gases emerge from the incredibly chaotic motion of individual molecules.
>
> Classical economics is built on very strong assumptions that quickly become axioms: the rationality of economic agents (the premise that every economic agent, be that a person or a company, acts to maximize his profits), the 'invisible hand' (that agents, in the pursuit of their own profit, are led to do what is best for society as a whole) and market efficiency (that market prices faithfully reflect all known information about assets), for example. An economist once told me, to my bewilderment: "These concepts are so strong that they supersede any empirical observation." As economist Robert Nelson argued in his book, *Economics as Religion* (Pennsylvania State Univ. Press, 2002), the marketplace has been deified.
>
> Physicists, on the other hand, have learned to be suspicious of axioms. If empirical observation is incompatible with a model, the model must be trashed or amended, even if it is conceptually beautiful or mathematically convenient. So many accepted ideas have been proven wrong in the history of physics that physicists have grown to be critical and queasy about their own models. Unfortunately, such healthy scientific revolutions have not yet taken hold in economics, where ideas have solidified into dogmas. These are perpetuated through the education system: students don't question formulas they can use without thinking."

The "perfect economic system" cartoon from Bouchaud's 2008 article "Economics Needs a Scientific Revolution". [2]

(add discussion)

Quotes

The following are noted quotes: [2]

> "Whereas the simple Curie-Weiss mean-field approximation for homogenous systems is well known and accounts for interesting collective effects, its heterogeneous counterpart is far subtler and has only been worked out in detail in the last few years. It is a safe bet to predict that this powerful analytical tool will find many natural application in economics and social sciences in the years to come."
>
> — Jean-Philippe Bouchaud (2009), "The (Unfortunate) Complexity of Economy" [3]

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(b) Kakarot-Handtke, Egmont. (2013). "Toolism! A Critique of Econophysics", MPRA, Apr 30.

External links

â— Jean-Philippe Bouchaud – Wikipedia.
â— Jean-Philippe Bouchaud (papers) – ArXiv.
â— Jean-Philippe Bouchaud (directory) – Ecole Polytechnique.

θΔics

In debates, **Jeans, Donnan, Guggenheim debate** (TR:8), aka dialogue on "Activities of Life and the Second Law of Thermodynamics", refers to a Jan to Aug 1934 debate on the question of whether "life" is has the capacity or is defined by the capacity to "evade" the second law of thermodynamics, between English mathematical physicist James Jeans, who is for the position, per some closeted theism and or anthropism reasons, and Irish physical chemist Frederick Donnan and English physical chemist, physicist, and statistician Edward Guggenheim, who both oppose the conjecture, the dialogue of which taking place via an exchange of letters in *Nature*.

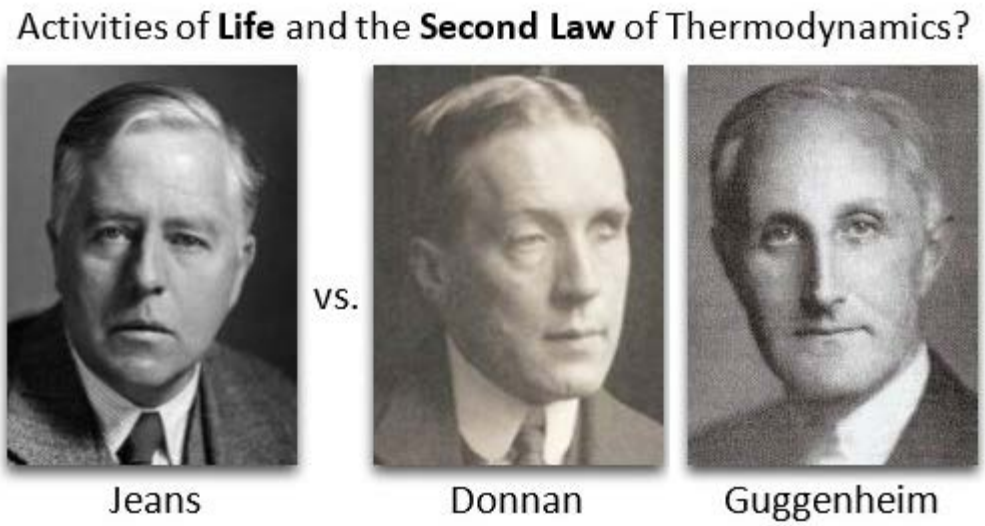

The **Jeans, Donnan, Guggenheim debate** was a Jan to Aug 1934 debate, taking place via an exchange of letters in *Nature*, between James Jeans, whose book *The New Background of Science* (1933) defines, as a matter of fact, "life" to be characterized by the ability or capacity to evade the second law of thermodynamics, and Frederick Donnan and Edward Guggenheim, who oppose this view.

Jeans | 1933

In 1933, James Jeans, in his *The New Background of Science*, following passing references to god, e.g. "from the intrinsic evidence of his creation, the Great Architect of the Universe now begins to appear as a pure mathematician", stated that, as a supposed matter of fact, that life is defined by its ability to evade the second law of thermodynamics; the exact quote is as follows:

> "In fact, it would seem reasonable to **define life as being characterized by a capacity for evading this law**. If probably cannot evade the laws of atomic physics, which are believed to apply as much to the atoms of a brain as to the atoms of a brick, but it seems able to evade this statistical laws of probability. The higher the type of life, the greater is its capacity for evasion."
>
> — James Jeans (1933), *The New Background of Physics* (pg. 280) [1]

The full 15-page section, which opens chapter 8, on "events", devoted to thermodynamics and the "activities of life", in which the above debate-provoking quote is found, is as follows:

> **§8 EVENTS**
>
> §§Thermodynamics
>
> The province of atomic physics is to discuss the nature of particular events, and it has been very successful in showing us how it is that certain kinds of events occur, while others do not. Yet this can give us but little information as to what is happening to the universe as a whole. Another branch of physics, known as thermodynamics, takes this problem in hand; it does not concern itself with individual events separately, but studies events in crowds, statistically. Its province is to discuss the general trend of events, with a view to predicting how the universe as a whole will change with the passage of time
>
> The science of thermodynamics had its origin in

severely practical problems relating to the efficiency of engines, but it was soon extended to cover the operations of nature as a whole. **All this happened in the days when nature WAS assumed, without question, to be mechanical and deterministic**. In what follows, we shall not treat nature as mechanical, but for the moment we shall treat it as though it were strictly deterministic.

On a deterministic view of nature, the universe never has any choice; its final state is inherent in its present state, just as this present state was inherent in its state at its creation. It must inevitably move along a single road to a predestined end, like a train rolling along a single-track line, on which there are no junctions of any

(pg. 261)

kind. Thus, if a 'super-experimentalist' [see: Holbach's geomatrician] could discover the exact position and the exact speed of motion of every particle in the universe at any single instant, a 'super-mathematician' would be able to deduce the whole past and the whole future of the universe from these data.

CONTENTS

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The contents to James Jeans' *The New Background of Science* (1933), wherein he attempts to present the new wave-particle duality view of the universe as the "new background" view of science, but after his "Indeterminacy" (§7) chapter, wherein Heisenberg uncertainty principle is introduced, thereafter selling a metaphysical indeterministic platform, in his "Events" (§8) chapter, he devotes a section to "Entropy", at the end of which provocatively claiming that living things have the ability to "evade" the second law of thermodynamics. [1]

Experimental physics has not yet been able to provide such data, **and the uncertainty principle shows that it never will be**. Yet a 'super-mathematician', who had unlimited time at his disposal, might calculate out all the different pasts and futures which would result from all conceivable sets of data — in other words from all conceivable present states.

He might commence his labors by **making a diagram in which to map out all possible states (Ñº)(Ñº) of the universe**, just as all points in England are mapped out in an ordinary geographical map. He could start from any particular point in this diagram and trace out, by mathematical calculation, the whole future of a universe which started from the state represented by this point. He could represent this future by a line through the point, which would run through his diagram much as a railway line is represented by a line running across the map of England. He could take point after point in his diagram in turn, and represent the development of a universe which started from each point by a line, until his whole diagram was filled with lines. These lines would represent all the lines of development which were possible for the universe. If the universe was strictly deterministic, as we have so far supposed, the diagram would look like the map of a country covered with single-track lines of rail-way, with no junctions of any kind. If, on the other hand, strict determinism does not prevail in the universe, there

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may be any number of junctions and connecting tracks between the different lines.

Let us imagine that a perfect diagram of this kind is at our disposal, as it would be — in theory at least — if we had a perfect knowledge of the laws of nature. No matter how perfect the diagram is, we are still unable to gain a detailed knowledge of our future from it, because we do not know our present position on the map.

This makes it impossible to identify the particular track on which we are travelling, so that we can neither say what part of the diagram it will traverse next nor where it will end. Yet it may be possible to discover in what kind of country it ends, and this is the information we really want. It is information of this kind that the science of thermodynamics can provide.

Imagine that we suddenly waken up from a state of unconsciousness to discover we are on a British railway. We have no means of knowing where our journey will end. Yet if we have a physical map of Great Britain with us, we may notice that only a few hundred acres out of 55 million lie as much as 4000 feet above sea-level. Although we cannot say where our journey will end, there are obviously very long odds that it will end at a height of something less than 4000 feet above sea-level. If a barometer in our compartment indicates that we are already as much as 4000 feet above sea-level, then there are very long odds that the general trend of our journey will be downhill.

It is to considerations of this kind, rather than to exact knowledge, that we must turn for guidance in our efforts to study the evolution and final end of the universe. As certain knowledge is beyond our reach, we must be

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guided entirely by probabilities. Yet the odds we encounter in calculating these probabilities prove always to be so immense that we may, for all practical purposes, treat long odds as certainties. Because the number of particles — electrons and protons — in the universe is of the order of 10^79, we find that high powers of 10^79 enter into all our odds, and, this being so, we need not trouble to differentiate too carefully between probabilities of such a kind and certainties.

§§: Entropy

Thermodynamics is much concerned with a quantity known as ‘entropy’. This plays much the same part in our **diagram of the universe** as height played in our imaginary railway map of Great Britain, except that small entropy corresponds to great height, and vice-versa [large entropy corresponds to great depth]; thus entropy does not correspond so much to height above the level of the sea, as to depth below the top of the highest mountain. The highest mountain in Great Britain rises to 4400 ft above sea-level, and as most of Great Britain is only a little above sea-level, most of it is at a depth, in this sense of the word, of nearly 4400 ft — the maximum depth possible. In the same way, we find that most of the configurations which figure in our **map of the universe** are at the maximum entropy possible — all, indeed, except for minute regions whose sizes are proportional to inverse powers of 10^79.

At the moment we cannot justify this statement because we have not yet **defined ‘entropy’**. And there is no need to justify it, because the best definition of ‘entropy’ makes the statement true of itself and automatically. It is convenient to define ‘maximum entropy’ as specifying

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the condition which is commonest in our map of the universe, and then, having done this, to define entropy in general in such a way that the more common condition is always of higher entropy than the less common. Thus, we define **entropy to be a measure of the ‘commonness’ of a given state** in our map. If W is the ‘commonness’ [see: multiplicity] of a certain state, the mathematician defines the entropy of this state as:

$$\text{Entropy} = k \log W$$

where k is the gas constant [see: Boltzmann constant]. With this definition we find that, just because the

numerical factors involved are so immense, conditions of 'maximum' entropy are not only more common, but incomparably more common, than those whose entropy is less, and so it is all down the ladder. Because of this, it is practically certain that each state of the universe will be succeeded by a state of higher entropy than itself, so that the universe will 'evolve' through a succession of states of ever-increasing entropy, until it finally reaches a **state of maximum entropy**. Beyond this it cannot go; it must come to rest — not in the sense that every atom in it will have come to rest (for maximum entropy does not involve this), but rather in the sense that its general characteristics cannot change any more.

Yet if someone asserts that this will not happen, and that the universe will move to a state of lower entropy than the present, we cannot prove him wrong. He is entitled to his opinion, either as a speculation or as a pious hope. All we can say is that the odds against his dream coming true involve a very high power of 10^79 his disfavor.

Thermodynamics is accustomed to disregard all such infinitesimal chances and forlorn hopes, and announces its laws as certainties. We must nevertheless always bear in mind that there is a small risk of failure attached to

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every such law. The famous 'second law of thermodynamics' asserts that the entropy of a natural system always increases, until a final state is attained in which the entropy can increase no further; a fuller statement of the law would be that the chances of the entropy doing otherwise are negligibly small.

§§: The Final State of Maximum Entropy

We now see that the question of discovering the final state of the universe is merely that of discovering how far the entropy of the universe can increase without violating the physical laws which govern the motions of its smallest parts. There was no need to take the physical properties of matter into account in defining entropy, but we must do so before we can discover the state in which the entropy is a maximum.

The process is usually very complicated, but two simple instances may illustrate the general characteristics of a state of maximum entropy. They do not refer to the universe as a whole, but merely to minute portions which have been selected for their simplicity and familiarity.

Let us pour some red ink into water, and leave the ink and the water to diffuse into one another. We know, before the event occurs, that the final state will be one in which they are uniformly mixed to form a homogeneous pinkish fluid, and as this state of uniform mixture is invariably the final state, we know that it must be the state of maximum entropy.

Again, let us put a kettle of cold water over a hot fire. We know, before we perform the experiment, that the final state will be one in which all the water is turned into steam. This also must be a state of maximum entropy.

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Just as the red ink diffused itself equally through all parts of the water in attaining a state of maximum entropy, so the heat of the fire tends to diffuse itself equally through coal, kettle, and water.

These instances have shown us two final states in which the entropy is a maximum. They illustrate a very wide and very general principle — the final state of maximum entropy avoids concentration, whether of special sub-stances (as with the ink) or of energy (as with the heat of the fire). The 'commonest state' is one in which both substance and energy are uniformly diffused, just as the commonest state in which we find a concert audience is that in which tall people and short, dark and fair, and so on, are uniformly diffused.

General considerations of this kind can tell us something at least as to the **final end of the universe**, but they cannot indicate the road by which it will be reached. All they can tell us is that the road is practically certain to be one of increasing entropy throughout; and **the better we understand entropy, the more this statement will convey to us**. It is not impossible for the entropy to decrease, but it is almost infinitely improbable that it should do so.

For instance, when the ink and water have once become thoroughly mixed, the state of maximum entropy has been attained; the ink-water mixture cannot change its general characteristics any further without a decrease of entropy. Yet the molecules of ink and water still jostle one another about, and change places as they do so. It is quite conceivable that their random motions should take them into a configuration in which all the ink molecules are found at one end of the vessel, and all the water molecules at the other. The entropy of such a configuration

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is far below the maximum possible, so that the odds against the molecules of ink and water assuming such a configuration are immense. Yet it is important to notice that no law of nature prohibits it. Indeed, if we had an infinite number of vessels of ink and water, the unexpected would be bound to happen in a few of them — just as, if an enormous number of hands of bridge are played, there are bound to be few deals in which each player gets one complete suit, in spite of the immense *a priori* odds against such an event occurring in a single individual case. The event is bound to occur either if an enormous number of players play bridge for a short time or if a single party of players play for an enormous time. In the same way we may say that a complete separation of the ink and water is bound to occur, either if we have an infinite number of vessels containing the mixture, or if a single vessel exists for an infinite time.

Similar considerations apply to our other miniature universe of fire, kettle and water; **the water in the kettle may freeze as the result of being put over a hot fire** [?]. To prove this, we need only notice that there is a possible state of this group of objects in which the water exists in the form of ice, and the fire is even hotter than before because there is less heat in the kettle and its contents. If we map out all the configurations of the system, this particular configuration must appear on the map, so that we cannot know for certain that it will not be the end of the journey. We know, however, that when we put a kettle of ice on the fire the normal event is for it to turn into a kettle of water. This shews that the entropy of the water-configuration is higher than that of the ice-configuration, and this in turn shows that although **it is**

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possible for a kettle of water to freeze when placed over a hot fire [?], it is almost infinitely improbable that it will do so on any single occasion. If even the most credible of witnesses told us a kettle of water had frozen when he put it on a hot fire, we should not believe him, although there is **nothing in the laws of nature to prohibit such an occurrence** [?]; indeed these very laws assure us that the event must occasionally happen. Yet such occasions must from the nature of things be so very rare, that we should think it far more likely that our informant had gone crazy, had been deceived, or was lying, than that he had been present at one of them.

These examples have both illustrated cases in which the individual atoms and molecules are left to perform random motions under the play of blind forces. If the atoms and molecules **receive any kind of guidance** [?], the result may be very different. Suppose that, instead of ink, we pour oil into our water. We no longer expect the final result to be a uniform mixture; we know that we shall find all the oil on top and all the water below. An arrangement which is inconceivably improbable for ink and water is found to be the most probable of all for oil and water; indeed, exact calculation confirms that a state of practically complete separation is the state of maximum entropy in the case now under consideration. The reason for the change is that the force of gravity differentiates between the molecules of oil and of water. When we say that oil is of lower specific gravity than water, we mean in effect that the earth's attraction draws particles of water

downward with a force greater than it exerts on equal-sized particles of oil. Because it continually drags these latter particles down with a smaller force, it encourages

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them to move upwards through the water. When we mix oil and water, we are not handing over their molecules to be the **playthings of a blind chance**, but rather to a chance over-ridden by the selective action of gravitation. **There is blind interplay of the molecules of oil between themselves and of the molecules of water between themselves, but the cross interplay is controlled by gravitation**.

Suppose, for instance, that we divide our vessel into two equal divisions, each holding a pint, by a horizontal membrane with a small pinhole in it. Let us mix a pint of oil and a pint of water as thoroughly as possible, and fill our vessel on both sides of the membrane with this quart of mixed liquid. After a sufficient time, we shall of course find that all the oil has passed into the upper half, while all the water has passed into the lower half; our careful mixing has been undone, and this by very simple means. Whenever a particle of oil in the lower half met a particle of water in the upper half at the pinhole — the only place at which they could meet — the force of gravity urged them to change places, and such interchanges have continually increased the amount of oil in the upper half and that of water in the lower half, until complete separation has been effected.

§§: The Sorting Demon of Maxwell

If we performed a similar experiment with our previous mixture of water and red ink, no such action would take place in the ordinary course of nature, since gravity makes no distinction between liquids of the same specific gravity. Yet suppose an intelligent being of microscopic size were placed at the pinhole, armed with a tiny shutter with which he could dose the aperture when he wished, and

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was given instructions to open it only for molecules of ink passing upwards or for molecules of water passing downwards — in brief his task would be to perform a selective action like that which gravity performs for oil and water. It is clear that after a long enough time the ink and water will be as thoroughly separated as the oil and water had previously been, although this time the separation would have been produced not by gravity but by intelligence.

The intelligent microscopic being we have just described was introduced into science by the Cambridge physicist James Maxwell, and is generally described as ‘Maxwell's demon’. The demon, we must notice, in no way sets himself in opposition to the laws of mechanics. We do not know how often he finds it necessary to open and close his microscopic shutter. The natural motions of the molecules may conceivably be such that he finds no occasion to close it at all. Then everything will go on precisely as though the demon had not been called on to help, the ink and water separating out under their own natural random motions. Yet the odds against such an occurrence are unthinkably large. As each separate molecule comes into view, **the demon must ask himself the question ‘To act or not to act?’**, and then put his decision into practice. A prolonged run of decisions all in the same sense will be as improbable as a prolonged run of heads or of tails when we spin a coin. Thus, it is exceedingly unlikely that our demon will find that no action is needed time after time; the normal event will be that he will need to open and close his shutter millions of times. Even so, **he expends no energy in so doing** [?], and each time the shutter is closed against a molecule, we may reflect

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that had the path of the molecule in question been a hair's-breadth to right or left, it would have bounced off the membrane without the demon touching his shutter.

Although the demon does not interfere with the operation of the laws of nature, yet he exercises a selective effect, and **by this alone he can cause any system to pass to a state of lower entropy [see: low entropy state]**. Natural forces, left to their own blind interplay, are practically certain to increase the entropy, but it is the play of the laws of probability rather than of the laws of nature that produces this result. The demon has not been told to circumvent the laws of nature, but the laws of probability; he can so to speak load the dice from moment to moment, and obtain any result he wants provided this does not violate the laws of nature — the conservation of mass, of energy, and so forth. When red ink and water are mixed, he cannot increase the total amount of either or both; all he can do is to disentangle them, as one might sort out a heap of red and white beads, or again as a railway shunter divides up a goods train by moving the switches in different ways for different wagons. When a kettle of water is placed over a fire, he cannot add to the total amount of heat, but he can, if he wishes, increase the heat of the fire by subtracting heat from the kettle. His accomplishments are limited to robbing Peter to pay Paul (Ñº), whereas unaided nature would leave Peter and Paul to fight it out — or perhaps to toss up for it time after time.

Quite general considerations shew that the universe as a whole has a very long way to go before coming any-where near its final state of maximum entropy. In this final state, concentrations of radiation and of temperature will equally have disappeared, so that radiation will be

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distributed uniformly throughout space, and the temperature will be everywhere the same. At present, the density of radiant energy out in the farthest depths of space corresponds to a temperature of less than one degree above absolute zero; in the interstellar spaces of the galactic system, to three or four degrees only; near the earth's orbit to about 280 degrees; at the sun's surface to about 6000 degrees; at the sun's centre to perhaps 40 or 50 million degrees. The universe can always increase its entropy by equalizing these temperatures; as for instance by letting energy flow from the sun's hot centre to its cooler surface, by letting it then stream out into space, past the earth's orbit, into the cold and dark of interstellar and intergalactic space. There can be no end to the increase of entropy until these regions are all at the same temperature, with radiant energy diffused uniformly throughout space. Then, and then only, will the universe have reached its final state, a state in which the temperature will everywhere have fallen too low for life to exist —the perfect quiet and perfect darkness of eternal night.

§§: The Activities of Life

A general survey of the universe as a whole suggests that it is rapidly moving towards such an end. The sun is dying, pouring out some 250 million tons of its substance in the form of radiation each minute, thereby lowering its own heat and raising that of empty space. Other stars tell the same story; we find no evidence of sorting demons sitting on their surfaces to turn the heat back into their hot interiors. Yet a **being from another universe** [see: advanced intelligence] who scrutinized this earth of ours with sufficient care might notice signs which led him to wonder whether there

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might not be **local exceptions** [see: local entropy decrease] to the general increase of entropy. For instance, regarded from the purely physical point of view, gold is a fairly ordinary metal; natural laws shew it no favor nor special treatment. Yet our visitor might notice that the world's total supply of gold, which had originally been fairly uniformly scattered throughout parts of the earth's crust, tended to become highly concentrated in a few small regions, in a way which would seem to set the demands of the second law of thermo-dynamics utterly at defiance. Again, **the law does not approve of fires occurring at all, although it admits that accidents will happen** [?]. It insists, however, that these accidental violations are most likely to occur when the weather is hot and dry. Yet our observer would not only detect innumerable fires on earth, but would notice that they occurred most frequently when it was cold and damp; he would see more in those parts of the surface of the earth which were covered with winter snow than in those which were

parched with equatorial or summer heat. On the other hand, he might notice that small accumulations of ice were especially in evidence when the weather was hot and sultry.

The odds against all these events occurring in the normal course of a nature which had not been tampered with would be of the same order as the odds against a kettle of water freezing when placed on a hot fire. Thus, no picture of nature can claim to be complete, unless it contains some means by which the **statistical laws of nature** [?] may be evaded — if not throughout the whole of nature, at least in chosen spots on our own earth. Our visitor might perhaps conjecturally attribute these evasions to the activities of innumerable sorting demons.

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A statistical survey of the more violent offences committed against the second law of thermodynamics would shew that the hotbeds of crime are precisely those places we describe as centers of civilization. **Inanimate matter obeys the law implicitly; what we describe as life succeeds in evading it in varying degrees. In fact, it would seem reasonable to define life as being characterized by a capacity for evading this law**. It probably cannot evade the laws of atomic physics, which are believed to apply as much to the atoms of a brain as to the atoms of a brick, but it seems able to evade the statistical laws of probability. **The higher the type of life, the greater is its capacity for evasion.** And the observed evasions so closely resemble the results that would be produced by an army of sorting demons, that it would seem permissible to conjecture that life operates in some similar way.

So long as nature was believed to be mechanistic, and therefore deterministic, such a conjecture was hardly permissible — the sorting demons would have interfered with the predestined course of nature.

On the other hand, modern physics can adduce no such objection to the conjecture; the only determinism of which it is at all sure is of a merely statistical kind. We still see the actions of vast crowds of molecules or particles conforming to determinism — this is of course the determinism we observe in our everyday life, the basis of the so-called law of the uniformity of nature. But no determinism has so far been discovered in the motions of the separate individuals; **on the contrary, the phenomena of radioactivity and radiation rather suggests that these do not move as they are pushed and pulled by inexorable forces**; so long as we picture them in time and space, their

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future appears to be undetermined and uncertain at every step. They may go one way or another if nothing intervenes to direct their paths; they are not controlled by predetermined forces, but only by the **statistical laws of probability**. If an unknown something intervenes to guide them, they may transfer their allegiance from the laws of probability to the guiding something, as the molecules of the oil-water mixture did to the force of gravitation. There seems no longer to be any reason why this something should not be similar to the action of sorting demons, the volitions of intelligent minds loading the dice in their own favor, and so influencing, so to speak, the motions of the molecules when they are in doubt which path to take — provided always that volitions and molecules are not too dissimilar in their nature for such interaction to be possible.

§§: Space-time and Nature

We can also look at the matter in the alternative way described on p. 257. We have just been picturing nature as an assemblage of particles set in a framework of space and time. Yet we have seen elsewhere that such a framework is not suited for the arrangement of the whole external world, but only for the photons by which it sends messages to our senses. Because these messages arrive in a framework of space-time, we must not conclude that the whole external world exists within the confines of the same framework. Our observational knowledge of the outer world is limited by the aperture of our senses, and these form blinkers

> which prevent our seeing beyond space and time — just as our telescope may prevent us seeing more than a small angle of the sky. But the events we see
>
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The rest of the chapter and book, in short, makes a passing attempt to argue for free will.

Donnan

On **20 Jan** 1934, Frederick Donnan, then auto-stylized as professor of physical and inorganic chemistry at University College, London, in a letter titled "Activities of Life and the Second Law of Thermodynamics" to *Nature*, gave a critical review of Jeans' statement that life evades the second law; which reads as follows: [2]

> "In *The New Background of Science*, Sir James Jeans, in discussing the activities of life in relation to the second law of thermodynamics, states that living organisms must possess **some method of evading this law**. He points out, for example, that a **visitor to this planet** from some tither universe would observe various curious and highly improbable arrangements of matter, such as collections of gold in various places [e.g. gold rings], numerous collections of ice in hot climates [e.g. ice cube in refrigerators], etc. These improbable arrangements or organizations **imply presumably a decrease of entropy**, that is, a violation of the second law. Surely, however, these actions are functionally inter-related with other simultaneous actions; namely, the metabolism and oxidation of food by the human organisms and the oxidation of fuel in such engines as they employ, and these causally inter-related actions involve an increase of randomness, that is, disorganization and consequent increase of entropy. I presume that Sir James Jeans would agree that the total effect will be a net increase of entropy.
>
> An essential feature of the second law is that finite amount of organization may be purchased at the expense of a greater amount of disorganization in a series of inter-related spontaneous actions. If for a single moment the blood sugar circulating through the brains of Sir James Jeans' humans should cease to be oxidized, they would fall down unconscious and cease to be able to collect gold or ice. **Is it good logic to pick out a series of actions which imply an increase of organization and therefore a decrease of entropy, whilst neglecting simultaneous interlocked actions in the same system which involve a greater increase of entropy; and then to announce as a mysterious result that the former actions evade the second law?** Could one not reason in a similar manner that a crystal evades the second law when we watch a crystal growing in a supersaturated solution? No doubt the growth of the crystal involves *per se* an increase of organization, but this increase is purchased at the expense of a greater decrease of organization in the inter-related actions, as may very readily be demonstrated. Such examples in inorganic nature can be multiplied almost ad *infinitum.*
>
> I do not wish to assume the role of a die-hard 'defender of the faith' (*fidei defensor*) of the science of the nineteenth century, or to assert or even *suggest that* the present known principles of science suffice to offer an adequate description of the phenomena of life. Indeed, in various publications I have striven to show that such an opinion or assertion would be quite unjustified. Nevertheless, I would humbly suggest that eminent physicists must not ignore the known and relevant facts of biochemistry, and that a knowledge of these facts may serve to remove a certain amount of mystery from their minds."

On **3 Feb** 1934, Jeans, in a response letter, titled "Activities of Life and the Second Law of Thermodynamics", to *Nature*, responded to Donnan, as follows: [3]

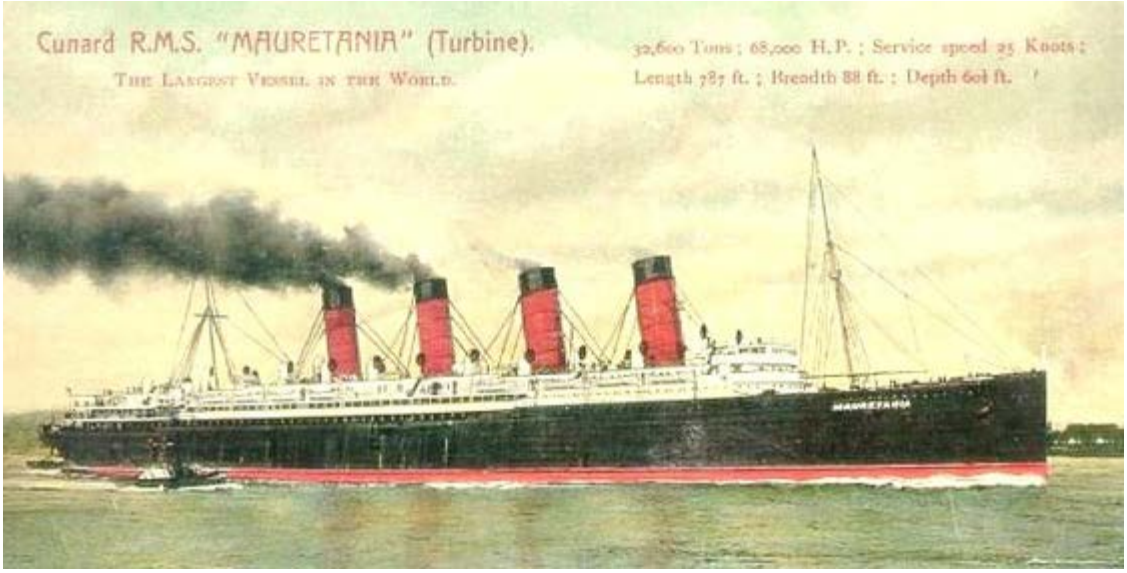

On 3 Feb 1934, James Jeans, in his response letter, contended that a man who drives a railroad or a ship, such as the 68,000 horsepower *Mauretana*, above, can "decrease" the entropy of the world enormously, without any concordant significant "increase" in entropy, and that this is an example of subverting the second law.

"I am very glad to have elicited Prof. F. G. Donnan's critical views (*Nature*, Jan. 20, p. 99) on my suggestion as to life and thermodynamics, but confess I remain unconvinced by his arguments.

Prof. Dorman challenges my neglect of the body metabolism or fuel oxidation which, as he says, necessarily accompanies the arrangement or disarrangement of material objects by human activities, considering that such chemical changes may produce an increase of entropy sufficient to offset any **[entropy] decrease produced by human intelligence**. No doubt it may, but I cannot see that these two effects are 'functionally interrelated' or in any way suitable subjects for comparison. **Given perfectly level and frictionless railways, a man may move millions of tons of matter, and thereby decrease the entropy of the world enormously, without incurring any corresponding increase of entropy through the combustion of food or fuel**. Any increase of entropy which occurs in practice is a mere side-issue, an accident resulting from the impossibility of realizing ideal conditions, and so should not enter into the theoretical discussion at all.

A further increase of entropy might of course occur if the mental effort of arranging objects caused an increase in bodily metabolism. I believe orthodox physiology teaches that any such effect is inappreciable, but it is in any case obvious that it cannot be relied on to offset the decrease of entropy resulting from intelligent arrangement. We cannot, for example, suppose that the **man who steers the *Mauretania*** (Ñº) consumes food-energy at a rate comparable with 100,000 h.p. more than normal, merely because he is guiding a ship of that horsepower. Prof. Donnan's parallel from crystal growth seems to me to fail through identifying 'increase of organization' with 'decrease of entropy'. The two are equivalent so long as potential energy is unimportant, but when this becomes preponderating, as in a crystal, maximum entropy may well demand regular packing, and so maximum, not minimum, organization."

Donnan | Guggenheim

On **15 Mar** 1934 (published **7 Apr** 1934 in *Nature*), Donnan teamed up with Edward Guggenheim, in opposition to Jeans, with a jointly-written rebuttal letter, which reads as follows: [4]

"In a recent letter [3] in *Nature* Sir James Jeans, in replying to a criticism made by one of us [2], writes: 'Given perfectly level and frictionless railways, a man may move millions of tons of matter, and thereby decrease the entropy of the world enormously, without incurring any corresponding increase of entropy through the combustion of food or fuel'. Not only can this surprising statement be disproved, but the very reverse of it can be readily demonstrated. The entropy decrease associated with the sorting out of trucks depends not on the number of tons but on the number of trucks. Its magnitude would be the same if the trucks were replaced by an equal number of miniature trucks or counters or molecules. If a man were to sort

out a million trucks, the entropy decrease would be of the same order of magnitude (to within a few powers of ten) as the increase of entropy when he breathes a million molecules of oxygen. To complete the proof of our assertion it is only necessary to estimate roughly how long it would take a man to sort out a million trucks and then estimate how many millions of millions of millions of millions of molecules of oxygen he must have breathed while he was doing it.

The same letter contains the statement: 'We cannot, for example, suppose that the man who steers the *Mauretania* consumes food energy at a rate comparable with 100,000 h.p. more than normal'. Indeed, no one with a knowledge of thermodynamics would suppose so. **The entropy associated with the steering of the *Mauretania* is of the order of magnitude of Boltzmann's constant *k***, simply because there is only one *Mauretania* being steered. In thermodynamic parlance, the difference between the total energy and the free energy associated with the motion of the centre of mass of the *Mauretania* is of the order of magnitude kT, where T is the absolute temperature, and this quantity is some 10^30 times smaller than the kinetic energy of the ship. The same thing may be expressed by saying that the Brownian movement of the *Mauretania* is negligible in comparison with its directed motion. In view of Sir James's lapse in thermodynamic reasoning, we consider it not unreasonable to challenge his vague reference to 'orthodox physiology', and ask on what experimental evidence he relies for his statement concerning entropy changes in the brain."

On **21 Apr** 1934, Jeans, responded as follows: [10]

"I am anxious to treat Prof. Donnan's views with all courtesy, but think his last letter, written in conjunction with Prof. Guggenheim, is entirely invalidated, like his previous letter, by a technical error in thermodynamics. The ordinary formula for the positional entropy of a large number of particles is:

$$k \iiint \nu \log \nu \, dxdydz$$

where ν is the number of particles per unit volume. Thus, moving N particles from a place of density ν to one of higher density ν' decreases the entropy by

$$kN (\log \nu' - \log \nu)$$

Surely Profs. Donnan and Guggenheim have overlooked the factor *N*. Owing to its presence, moving a single molecule does not, as they contend, have the same effect as moving a truckload of *N* molecules, but only 1/Nth of this effect. The same error, I think, invalidates their second paragraph.

It is difficult to discuss views based on arguments which seem to me so entirely fallacious, so I can only repeat that I think the writers are in error by more than mere technical mistakes. They seem to me to be comparing two things that do not enter into relation with one another at all—like the number of calories in a man's dinner, and the number of ergs needed to carry it in from the kitchen to the dining-room.

As they ask for a physiological reference, may I (although no physiologist) refer them to F.G. Benedict and C.G. Benedict's 1933 "Mental Effort in Relations to Gaseous Exchange, Heart Rate, and Mechanics of Respiration [N4]."

On **9 Jun** 1934, Donnan and Guggenheim, in their response letter "Activities of Life and the Second Law of Thermodynamics", stated the following: [9]

"We regret the necessity of prolonging this discussion, but in spite of the letter of Sir James Jeans [*Nature*, 133:612, Apr 21] we persist in the conviction that it is his reasoning, not ours, which is fallacious. We are quite aware that the change of positional entropy associated with the type of process which he cites involves the factor *Nk*, where *k* is the Boltzmann constant and *N* the number of particles concerned in the process, nor do we dispute the correctness of the well-known formula which he quotes. We must, however, point out that he is wrong in assuming that the number of 'particles' *must* coincide with the number of molecules. We might ask, why not the number of atoms, or the number of protons and electrons? The answer is, that for a given process of redistribution the particles are those units whose relationship to one another is altered but whose internal structure remains unaffected. In the process of sorting out trucks each truck is to be reckoned as a particle; in the process of steering the *Mauretania* the ship is a 'particle.'

To revert to the type of case originally considered by Sir James Jeans, let us imagine a large number of equal spheres of glass on a frictionless horizontal plane. If *N* of these spheres be moved from a place where the (superficial) density of distribution of the spheres is ν to a place of higher density ν1, then the decrease– of positional entropy of the system is equal to *kN* (log ν 1 – log ν). According to Sir James Jeans, however, the decrease of positional entropy would be *kn*1 N (log ν 1 – log ν), where n1 is the number of molecules contained in each sphere. If he reasons in this manner, we would ask him why the decrease of positional entropy should not also be kn2N (log ν 1 – log ν), where n2, is the number of atoms, or the number of protons and electrons, contained in each sphere. This paradox clearly reveals the fallacy in his reasoning.

Finally, we would point out that the total entropy of an assembly of *N* identical systems, each made up of n ultimate particles, may be resolved into the sum of two terms, the first of the order *Nk* determined by the configuration (and relative motion) of the centers of mass of the *N* systems, the second of the order N(n – 1)k determined by the internal arrangement of the ultimate particles in each system. In any process in which the internal arrangement of the systems remains unchanged, only the first in the entropy is affected. We think it scarcely possible that Sir James Jeans would dispute this statement, although the views expressed in his last letter contradict it."

On **30 Jun** 1934, Jeans responded as follows: [11]

"I am at one with Profs. Donnan and Guggenheim in hoping that this discussion will end soon, but ask leave to explain why I think that their supposed paradox [N5] is merely a third mare's nest. It is a well-known, and indeed **obvious, fact that entropy has different values according as it is measured with reference to atoms or molecules or other units**. Profs. Donnan and Guggenheim have re-discovered this, hail it as a paradox, and claim that because this paradox exists my arguments must be unsound. As well might they rediscover the 'paradox' that temperature has different values according as it is measured on the Centigrade and Fahrenheit scale, and try to use this as ammunition against anyone who mentions temperature."

On **18 Aug** 1934, Donnan and Guggenheim published the following final statement of the debate: [8]

"In his last letter [N1], Sir James Jeans writes: 'It is a well-known, and indeed obvious, fact that entropy has different values according as it is measured with reference to atoms or molecules or other units?' If by entropy he means the absolute entropy of a given state of a system, his remark, though true, has no bearing whatever on the point at issue. If, on the other hand, ho means the entropy change in some definite process, such as the sorting out of trucks, then we suggest that he is unique amongst physicists in holding this opinion.

We have consistently maintained [N1], and still maintain, that the entropy change associated with the

sorting of trucks is of the order of magnitude (to within a few powers of ten) *Nk*,, where *k* is Boltzmann's constant and *N* is the number of trucks sorted. Sir James Jeans, on the other hand, recently expressed the opinion [N3] that N should denote the number of molecules in the trucks. He now apparently suggests that it is merely a question of convention. Though we have discussed the matter with several authorities, including one of the most eminent theoretical physicists of the world, we have failed to find anyone, other than Sir James Jeans, who disagrees with us. We are content, therefore, to leave the matter in dispute to the judgment of the readers of *Nature*."

Though we have discussed the matter with several authorities, including one of the most eminent theoretical physicists of the world, we have failed to find anyone, other than Sir James Jeans, who disagrees with us. We are content, therefore, to leave the matter in dispute to the judgment of the readers of *Nature*."

(add)

Other

In 1971, Nicholas Georgescu-Roegen, in his confused book *The Entropy Law and the Economic Process*, cited Jeans view as a violation of the second law view, stating that "the thought that life may be characterized by a capacity for evading this law [as professed by Jeans], once generally denounced as sheer obscurantism, is now endorsed by almost every authority in physico-chemistry." [6]

Quotes

The following are related quotes:

"In a **fascinating interchange**, Frederick Donnan and Edward Guggenheim argue against an assertion by the eminent physicist James Jeans, that life could yield a net increase in organization and therefore a decrease in entropy (Donnen 1934; Guggenheim 1934; Jeans 1934; called to my attention by Max Delbruck). In 1933, Jeans had written that 'in fact, it would seem reasonable to define life as being characterized by a capacity for evading this law. It probably cannot evade the law of atomic physics, which are believed to apply as much to the atoms of a brain as to the atoms of a brick, but it seems able to evade the statistical laws of probability. The higher the type of life, the greater is its capacity for evasion' (1933)."

— Richard Adams (1988), *The Eight Day* (pg. 34) [5]

"A particularly **remarkable exchange** between Sir James Jeans and the physical chemist F. G. Donnan attests to the confusion. In four rounds of increasingly technical letters published in *Nature* in 1934, Jeans and Donnan insist on opposite answers to the question of whether the total (global) entropy production of metabolic processes—the organism in interaction with its environment—need be positive (Jeans claims no, Donnan yes). The debate itself produces a great deal of heat but ends where it begins, with Jeans expressing the hope 'that this discussion will end soon', and Donnan attempting to recruit allies sufficiently numerous to counteract Jeans' otherwise indisputable authority."

— Evelyn Keller (1995), *Refiguring Life* [7]

"Typical views in the 1930's on this subject were expressed in an **exchange of letters** to the journal *Nature* between F. G. Donnan, a professor of physical and inorganic chemistry, and the physicist James Jeans. Donnan [1934] challenged the view expressed by Jeans in his book *The New Background of Science* that organisms must have some means for evading the second law of thermodynamics. Jeans [1934] replied that a person steering a large steamship adds little entropy in the activities of steering, but the 'positional

entropy' of the cargo is changed considerably. This is due to moving the cargo from a location where it has a high density υ1 to a location where it has a low density υ2, thereby changing the positional entropy by **$\Delta S = k_B N[\ln \upsilon 1 - \ln \upsilon 2]$**. In this case, the intervention of an intelligent being is incidental to the entropy calculation. In spite of the entry of the physicist E. A. Guggenheim on Donnan's side, and the exchange of several more letters, this controversy died without being resolved and without, apparently, leaving any further trace. Jeans' positional entropy is only one example of the types of entropy proposed during this period."

— Paul McEvoy (2002), *Classical Theory* (pg. 175)

See also

â— What is entropy debate | 1897-1907
â— What is life in terms of physics and chemistry debate | 1946 (see: Bridgman paradox)
â— Rossini debate | 2007
â— Morarity-Thims debate | 2009

Notes

N1. Nature, **133**, 986, Jun 30 1934.
N2. Nature, **133**, 530, Apr 7, 1934. **133**, 869, Jun 9, 1934.
N3. Nature, **133**, 612, Apr 21, 1934.
N4. Benedict, F.G. and Benedict, C.G. (1933). "Mental Effort in Relations to Gaseous Exchange, Heart Rate, and Mechanics of Respiration" (abs), Washington: Carnegie Institution, No. 446:83.
N5. Nature, 133:869, Jun 9.

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(c) Donnen, Frederick. (1934). "Letters", *Nature*, Jan 20, Apr 7, Jun 9, Aug 18, Vol 133, pgs. 99, 530, 869; vol. 134, pg. 255.
(d) Guggenheim, Eduard. (1934). "Letters", *Nature*, Apr 7, Jun 9, Aug 18, Vol. 133, pgs. 530, 869; Vol 134, pg. 255.
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θΔics

In ecological thermodynamics, **Jeffrey Andrew Tuhtan** (1979-), or Jeff Tuhtan, is an American ecohydraulic engineering noted for his 2011 PhD dissertation "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality", wherein he employs thermodynamics in deriving a conceptual model designed for alpine river fish habitats.

Rivers, according to Tuhtan, are considered as finite-time, open irreversible thermodynamic systems in order to study the effects of the daily fluctuation effects of hydropeaking (large fluctuations in flow rates due to peak energy production) on alpine fish. The goal of his work is to improve mainstream 'first law' modeling approaches which only consider the external (potential and kinetic) energy of a river, and afterward develop semi-empirical relations tying 'abiotic-biotic' relations to hydraulic variables such as water depth and velocity. [1]

Doctoral thesis

Tuhtan, in his 2011 PhD dissertation "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality", summarizes his applied thermodynamics hydropeaking project as follows: [2]

> "The goal of the EcoPeak project is to develop a tool which can be used to predict the effects of hydropeaking on a given indicator species (e.g. brown trout, grayling) for various life stages. In this work, fish are represented as unique thermodynamic entities responding to hydrodynamic and thermodynamic gradients, where in the case of hydropeaking, the hydrodynamic terms are considerably larger. The model development has been heavily influenced by the constructal theory of Adrian Bejan and Sylvie Lorente.
>
> Aspects of theoretical biology have been taken from Robert Rosen's relational biology. The works of Robert Ulanowicz and Donald Mikulecky have also strongly influenced the nature of the fish model development. Deterministic notions have been replaced with a probabilistic assessment of suitable locations, considering a single species and life stage's evolved physiological constraints. The purpose of this work is to incorporate a more rigorous biophysical approach, rooted in irreversible thermodynamics which allows for an improved habitat estimation for fish subject to highly instationary flow regimes."

Robotics researcher Maarja Kruusmaa (2014), examining the fish robot sensor prototype, co-developed with Tuhtan and signal processing researcher Joni Kamarainen. (Ñº)

In his dissertation, Tuhtan employs German physicist Max Planck's theory of dilute solutions, as was first extended to animate systems by Werner Ebeling and Peter Mauersberger, the physical and thermodynamic principles developed by Sven Jorgensen and Adrian Bejan.

FishView

In 2014, Tuhtan, working together with robotics researcher Maarja Kruusmaa, shown adjacent examining the fish robot sensor prototype, and signal processing researcher Joni Kamarainen, launched the EU-funded project "FishView" on assessing fish passages by the use of robotic fish sensor and enhanced digital imaging, the project goal of which is to develop a novel fish robot based sensor to evaluate flows and conditions of rivers and fish passes and help to assess and develop better fish passages. (Ñº)

Biocule

A noted turning point in Tuhtan's hydropeaking research was his reading, *circa* 2010, of British animal psychologist Lloyd Morgan 1929 "biocule", a term Morgan, being a student of English Darwinian evolution promoter and social

molecule theorist Thomas Huxley, employed as being representative of the borderland between the atom/molecule scale and the amoeba/rabbit/oak tree scale of atomic organization, which according to English mathematical philosopher Alfred Whitehead are to be both seen as different "organisms"—albeit, as Morgan specifies, "not a living organism" (see: defunct theory of life). [4]

This rabbit as molecular organism or "biocule" point of view, naturally enough, led Tuhtan to the "human-as-molecule" work American electrochemical engineer Libb Thims, specifically Thims' 2008 history book *The Human Molecule*, in which, on the molecular evolution table of chapter nine, the approximate molecular formula for a fish is given as follows (see: fish molecule): [4]

$$\text{Molecular formula}_{fish} = \begin{array}{l} C_{E22}H_{E22}O_{E22}N_{E21}P_{E20}S_{E19}Ca_{E20}K_{E18}Cl_{E18}Na_{E18}Mg_{E18} \\ Fe_{E17}F_{E17}Zn_{E16}Si_{E16}Cu_{E15}I_{E14}Mn_{E14}Se_{E14}Mo_{E13}Co_{E13}V_{E12} \end{array}$$

This viewpoint led Tuhtan into the study and model fish habitat preferences in terms of energy and entropy considerations, as Thims had previously been doing in regards to his 2000s thermodynamic systems of human molecules models and as Huxley had groped at in his 1871 social chemistry/social molecule models and as his grandchildren Aldous Huxley and Julian Huxley later attempted, in the early 20th century, in their theories of human entropy and evolution as an anti-entropic process models.

In Tuhtan's work, fish are considered from both the top-down as parts of a larger ecosystem whole, and from the bottom-up as animate systems subject to the laws of thermodynamics, not explicitly as 'fish molecules.' The model Tuhtan currently is exploring posits that, for an individual fish swimming in a volume element, estimates of the entropy generation are made based on the pattern of the local energy landscape, whereby fish continuously attempt to position themselves in flow fields which tend to minimize the entropy generated by the river+fish system. The formulation requires the use of a 2D or 3D hydrodynamic model in order to accurately estimate small scale (sub 1 m²) changes in the local energy landscape.

Education

Tuhtan completed his BS in civil engineering in 2004 at California Polytechnic University, his MS (2007) in water resources engineering and management, and his engineering doctorate (2011) at the Institute for Modeling Hydraulic and Environmental Systems at the University of Stuttgart, Germany. [1] In December of 2013 he began his post-doctoral research in biorobotics at the Tallinn University of Technology in Estonia working on a robotic fish with an artificial lateral line sensor for the EU BONUS Innovation Project FISHVIEW.

→

Quotes

The following are noted quotes:

On 29 Jan 2011, Tuhtan had finished reading American electrochemical engineer Libb Thims' *The Human Molecule* (2008), wherein fish are conceptualized as 22-element molecules and described thermodynamically. [5] This inlet into modelling fish thermodynamically gave Tuhtan impetus and direction to his work and, over the next year, used Hmolpedia and its discussion forum, as spring

board and research platform to complete his PhD dissertation, entitled: "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality", in ecological engineering. [2]

> "The human species is but one of many. Viewed from a sort of universal microscope, we appear as but a vast collection of molecules in motion. In our current state we are firmly attached to an Earthly substrate, feeding off the energy gradient of the Sun. The fate of our chemical species is undeniably tied to the affinities and energies of interaction required to maintain our evolving earth ecosystem. We live in a closed system. In order to understand the nature of things, we must learn more about both our reactions and our products."
>
> — Jeff Tuhtan (2012), PhD "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality" (pg. 1); cited by Libb Thims, in his piston and cylinder section (Ñº), of his 2013 NIU lecture. [6]

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(b) Jeff Tuhtan – Academia.edu.
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(b) Alfred North Whitehead – Wikipedia.
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(b) Thims, Libb. (2013). "A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies" (abs) (NIU announcement) (cover) (main) (full video) (abs video), Lecture to mechanical engineering thermodynamics students (professor: Milivoje Kostic), Northern Illinois University (NIU), Apr 16.

External links

- Jeff Tuhtan – Matlab Central.
- Jeff Tuhtan – Cosm - the internet of things platform.

θΔics

In existographies, **Jeffrey Dahmer** (1960-1994) [RE:34] (CR:13) was an American serial killer noted, among serial killers, for his discussion of philosophical nature of his course of action; namely that he enacted the Darwinian atheist killing scenario, aka the killing spree paradox, a thought scenario that commonly runs through the minds, particularly believers, of many who ruminate on the implications of a godless or atheistic-based universe.

Quotes | By

The following are noted quotes:

> "If it all happens naturalistically? What's the need for god? Can't I set my own rules? Who owns me? I own myself!"
>
> — Jeffrey Dahmer (c.1993), variant of atheism belief he tried (see: killing spree paradox); as told to his father (O)

> "If a person doesn't think there is a god to be accountable to, then—then what's the point of trying to modify your behaviour to keep it within acceptable ranges? That's how I thought anyway. I always believed the theory of evolution as truth, that we all just came from the slime. When we died, you know, that was it, there is nothing ..."
>
> — Jeffrey Dahmer (1994), interview (O) with Stone Phillips, *Dateline NBC*, Nov 29

> "If there's no god and we all came from 'slime', then what's the point of trying to modify your behavior to keep it within acceptable ranges?"
>
> — Jeffrey Dahmer (c.1993) [1]

See also

- Breaking Bad
- Dostoyevsky dilemma

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(b) Copan, Paul. (2011). *Is God a Moral Monster? Making Sense of the Old Testament God* (pg. 19). Baker Books.

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External links

- Jeffrey Dahmer – Wikipedia.

θΔics

In existographies, **Jeffrey Stephen Wicken** (1942-2002) (CR:34) was an American evolutionary chnops-chemist (bio-chemist) noted, evolution thermodynamics, for his 1987 book *Evolution, Thermodynamics, and Information: Extending the Darwinian Program.* [1] To quote a noted except on his synopsis on the relationship of life (structuring) in an expanding universe, Wicken states: [1]

Nationality	American
Fields	Evolution Thermodynamics Life theory Religion and philosophy
Alma matter	University of Pittsburgh University of Idaho
Note	Patch covers a lost eye from accident in youth. [10]

> "In a universe where cosmic expansion maintains a disequilibrium between potential and thermal forms of energy, this means that putting smaller entities together to form larger entities will generate entropy through the conversion of potential energy to heat. Hence, the potential energy wells into which natural processes tend to flow are correlated with the buildup of structure … Dissipation is the driving force of the universe's building up or integrative tendency. Entropic dissipation propels evolutionary structuring; nature's forces give it form."

Wicken extended the work of American mathematical physical chemist Alfred Lotka (1922) and Austrian physicist Erwin Schrödinger (1944) on the thermodynamical nature of life to argue that thermodynamics, particularly the second law, is the "go" of life. [2]

Influence

American ecological thermodynamicist Eric Schneider cites Wicken as being the most influential person in the development of his ideas in regards to the publication of his 2005 book *Into the Cool: Energy Flow, Thermodynamics, and Life*, co-written with American science writer Dorion Sagan. [3] Wicken, no doubt, is one of the more deeper thinkers of the last several decades.

Organic vs. inorganic

In 1981, Wicken summarized: [7]

> "Even now there are serious conceptual discontinuities in the evolutionary theory, were its philosophical mission of unifying organic and inorganic nature is not fully realized. Whereas organic nature is pictured as purposive, self-serving, and, at least in its highest expressions, conscious, inorganic nature is conceived as behaving according to the blind mechanistic principles of chance and necessity."

This seems to be digging around in the origin of life / unbridgeable gap area.

Human thermodynamics

It seems that Wicken was attempting to write (or may have written) an 1989 book on the thermodynamics (and information theory) of socioeconomic evolution, but no copies of the book seem to exist. [6]

Religious and philosophical beliefs

> *See main: Philosophical thermodynamics, Religious thermodynamics*

Wicken's religious beliefs are difficult to track down, although a number of his publications occur in *Zygon*, which typically caters to scientist favorable to presenting scientific reconciliations of religion. In respect to the religious-philosophical implications of thermodynamics, evolution, genetics, ecology, and human meaning, upon each other, Wicken outlined the following abstract: [4]

> “How should we best understand ourselves in the new, evolutionary cosmos? What are the problems with the kind of genetic reductionism espoused by neo-Darwinism? How are those problems resolved by the "relational" understanding of life made available by thermodynamics and ecology? How do we generate meaning-structures in this relationally-constituted cosmos? Finally, how do these developments enrich our understandings of responsibility—to each other and to our private conceptions of God?”

Wicken here seems to allude to the idea that he has a "private conception of god"?

Education

Jeffrey Wicken is the son of American metallurgical engineer Oscar M. Wicken (1913-2005). [8] Wicken attended Penn State University and majored in chemistry but received his BS degree in chemistry from the University of Pittsburgh in 1965, his MS degree in chemistry, with a thesis on “Procedures and Methodology for Determining the Binding Ratios and Association Constants of the Glucose: Glucose Oxidase Apoenzyme System”, from University of Idaho in 1968, and his PhD from University of Pittsburgh in 1971. He was appointed an assistant professor of chemistry at Behrend College of Penn State University Erie in 1974. [5] In the 1980s, Wicken was a lecturer at Behrend College, in the sciences and engineering division, and was often voted by students as best lecturer.

In the 1970s, Wicken turned to theoretical biology and thermodynamics because his small college lacked research facilities in molecular biology. [2] Beginning in 1976, Wicken published thirty-five papers and culminating in his most-popular 1987 book *Evolution, Thermodynamics, and Information*.

Recent

In 2012, Danish chnops-ologist (bio-logist) Richard Egel published an essay on Wicken’s legacy. [11]

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9. Photo of Jeffrey S. Wicken (thread) – Hmolpedia.
10. Photo of Wicken Wicken at the height of his publishing career; Courtesy of Jessica Wicken (29 Sep 2012).
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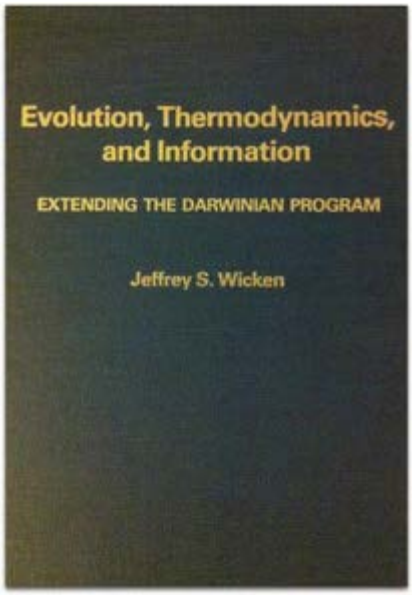

Wicken's 1987 book *Evolution, Thermodynamics, and Information*, wherein he attempts to do "semantic house-cleaning", as he calls it, of the Brooks-Wiley theory of evolution. [1]

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External links

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● Wicken, Jeffrey S. (published: 1987-1989) – WorldCat Identities.

θΔics

In existographies, **Jennifer Hecht** (1965-) (FA:133) is an American historian noted for her 2003 *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas*, a well-referenced cross-cultural history of atheism, in short.

Religion | Atheism

Hecht was raised Jewish (see: Jewish atheism) and believed in god until she was 12 after which, as she explained, in 2014 interview, she began to see that "we are one species among great nature, and as the trees very slowly rot, so do our pampered haunches". Amid writing her *Doubt* (2003), she was in the atheist-label avoiding mindset. On 7 Dec 2016, Hecht re-Twitted (Q) Albert Camus' "unfree world" quote; therein indicating that she is a Sisyphean atheist (see: Camus model), give or take.

Education

In 1995, Hecht completed a PhD in history of science and European culture from Columbia University.

Quotes | By

The following are quotes by Hecht:

> "Atheists tend to see believers as naïve and dependent. Believers tend to see atheists as having abandoned themselves to meaninglessness, amorality, and pain."
>
> — Jennifer Hecht (2003), *Doubt* (pg. x)

> "Schopenhauer is the person who, coming upon Kant's philosophy, noticing that god therein was not attached to anything, shook the text until god fell out."
>
> — Jennifer Hecht (2003), *Doubt: a History* (pg. 393)

> "When Darwin's book hit the crowd, it was like Christmas for ex-Christians."
>
> — Jennifer Hecht (2003), *Doubt: a History* (pg. 405)

> "Initially after writing my book *Doubt*, I avoided the atheist label, saying only that I did not believe in god. After some reflection, I realized I needed to defend what I truly believe. I now call myself an 'atheist', and proudly."
>
> — Jennifer Hecht (2013), "The Last Taboo" (Q)

See also

- Hecht atheism quiz

References

1. (a) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (doubt quiz, pgs. x-xi). HarperOne.
(b) Zepps, Josh and Beyerstein, Lindsay. (2008). "Jennifer Michael Hecht – Doubt" (Q), Point of Inquiry, Podcast (36:55-min), Nov 28.

Further reading

● Hecht, Jennifer M. (2003). *The End of the Soul: Scientific Modernity, Atheism, and Anthropology in France*. Columbia.

External links

● Jennifer Michael Hecht – Wikipedia.
● Doubt: a History – Wikipedia.
● Jennifer M. Hecht – Twitter.
● Home – JenniferMichaelHecht.com.

θΔics

In hmolscience, **Jenny McPhee** (1962-) is an American writer noted for her 2001 novel *The Center of Things*, wherein, as a kind of female Tom Stoppard, she seemingly blends musings on romance as this possibly relates to a number of scientific theories, such as: dark matter (or dark energy), superclusters, string theory, quantum mechanics, relativity, and objective truth—a blend of quantum physics and philosophy, so to say, molded into an outline of a discourse on the seeming randomness of love and the concordant glory of fate, or something along these lines.

McPhee, among other things, of curiosity, likens the properties of photons to the properties of people (i.e. coherence, entanglement), ruminates on the seeming what happens when you die problem, mentions the junk DNA supposition, quantum psychology, M-theory, Hawking radiation, and even makes a particle physics stylized sound of music rhyme. [1]

McPhee method | Evolutionary psychology

Jenny McPhee is one of five daughters born creative nonfiction pioneer John McPhee (1931-), who in the 1960s, as a staff writer for *Time*, had the curious habit—as she puzzlingly observed as a young girl, aged two to seven—of writing in his office below juxtaposed pictures of the 1938 cautious elderly Cayo Santiago island rhesus monkey (Q), shown below, and the 1960 *Life* cover photo of Italian film star Silvana Mangano (1930-1989), below left, both semi-submerged in water, in a state of emotional immobility. McPhee explains her retrospective ruminations on this confusing juxtaposition of photos observation as follows: [3]

> "I grew up in New Jersey. Our suburban house had a detached double garage with a small office built into one corner where my father wrote his books. On the wall in his office were a pair of photographs, side by side, in a single frame. One was of a naked woman immersed in water to her cleavage, the other was of a monkey also immersed in water to the middle of his chest. My father worked in that office in the garage from 1964 to 1969–from the time I was two years old until I was seven. During that period, many thoughts occurred to me about those photographs. I was sorry for her because someone had stolen her bathing suit and she couldn't get out of the water. She even looked frightened and a little angry. The photograph of the monkey confused me. The monkey was ugly and old and [seemingly] had nothing to do with [the

woman].”

McPhee explains that after spending a year in college in Italy and falling in love she eventually called to ask her father about those photos he always kept above his type-writer:

> “Eventually, I called my father to ask him about those photographs on his office wall. Before moving to New Jersey, my father had worked for TIME magazine which shared offices and an art department with LIFE magazine, since they were owned by the same company. The monkey, my father told me, was one of a shipload of rhesus monkeys brought to a tiny Puerto Rican island [Cayo Santiago (Q)(Q)] in 1938 where a free-ranging monkey colony was to be established for long-term study purposes.
>
> After the monkeys disembarked, they immediately went crazy–fighting, screeching, swinging from trees, copulating. One elderly monkey took a look at the frenzied scene around him, walked out into the water up to his chest, and watched. He refused to return to shore for hours. The LIFE photographer who was covering the monkey-colony story took a snap. The photograph became one of the most reproduced images in the history of LIFE Magazine and was something of a legend in the offices where my father worked. In April of 1960, the photograph of the Italian film star Silvana Mangano was published on the cover of LIFE. The setting and her body position were nearly identical to the monkey’s, her expression as defiant and disdainful as his, so my father went upstairs to the art department and asked for copies of both photos. He had them mounted together and framed and then hung them above his desk. ‘I liked the juxtaposition,’ he said.”

This, of course, is evolutionary psychology par excellence.

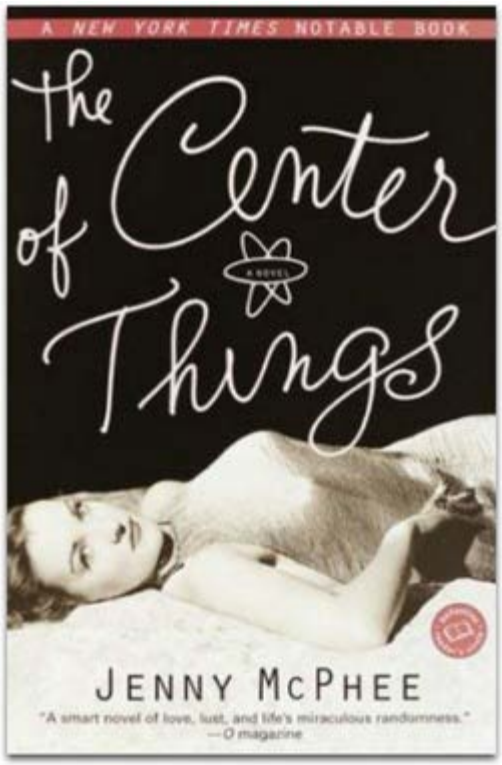

McPhee's 2001 *The Center of Things*, wherein she outlines her quantum psychology theory of love.

Education

McPhee attended Williams College. [2] Regarding science, in her acknowledgements section, McPhee explains her background as follows: [1]

> “Although I am passionate about science I am no scientist—in fact, the only way I passed my physics for non-majors class in college was by writing an extra credit paper on the life of Marie Curie. The science in my novel comes mostly from articles in the *New York Times* Science Times section (I live for Tuesdays), and from popular science books such as Brian Green’s *The Elegant Universe*, Steven Weinberg’s *Dreams of a Final Theory*, John Gribben’s *In Search of Schrodinger’s Cat*, John Horgan’s *The End of Science*, John Barrow and Frank Tipler’s *The Anthropic Cosmological Principle*, and everything written by Paul Davies.”

(add discussion)

Quotes

The following is an example quote:

> “Heisenberg’s uncertainty principle, nonlocality, eigenstates, Bell’s theorem, and the Aspect Experiment … wasn't actually Einstein's theory of special relativity that put the nail in the coffin of objective truth.”
>
> — Jenny McPhee (2001), *The Center of Things* (pg. 38)

> "There is probably some law of love equivalent to the principle of the conservation of energy: in a system—in this case, two people—the total love is constant. One person will have more, the other less. Two people with infinite love for each other defy the laws of nature and have to cancel each other out, like Romeo and Juliet."
>
> — Jenny McPhee (2001), *The Center of Things* (pg. 132)

> "Easy", Michael declared. "Take the first enigma. *Is death the end of being or only an unknown transformation?* With the development of nanotechnology" Michael explained, "the distinction between living and nonliving, natural and artificial, brain and computer, will become increasingly blurred—much in the same way as fiction and nonfiction have become 'faction'."
>
> — Jenny McPhee (2001), *The Center of Things* (pg. 230)

See also

- Chanel Wood
- Equation of love
- Johann Goethe
- John Green

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1. McPhee, Jenny. (2001). *The Center of Things* (energy, 12+ pgs; love, 47+ pgs). Ballantine Books.
2. Birnbaum, Robert. (2002). "Jenny and Martha McPhee", *IdentityTheory.com*, Dec 25.
3. (a) Who Am I – JennyMcPhee.WordPress.com.
(b) John McPhee – Wikipedia.

θΔics

In human chemistry, **Jeremy D. Adler** (1947-) is an English poet and Goethean human chemical theory historian noted for his 1977 PhD dissertation on the chemistry of German polymath Johann Goethe's *Elective Affinities* and his 1987 "An almost Magical Attraction: Goethe's *Elective Affinity* and the Chemistry of its Time", wherein he was one of the first to analyze which chemist, which theory, and which reaction is used by Goethe behind the veil of each chapter in the book to model the various human chemical reactions (see: HCR theory) described both in discussion between the characters (Eduard, Charlotte, Captain, Ottilie, etc.) in the novella and in coded form via the hidden language and messages in the novella. [1] Adler is an expert on German literature from 1600 to the present day.

Student

A noted student of Adler's is English German literature science scholar Peter Smith, who in turn did further work on Goethe's *Elective Affinities*.

Henry James

In 2012, Adler produced a colloquium paper on the influence of Goethe and his *Elective Affinities* on American-born English writer Henry James—the synopsis of which is as follows: [6]

> "James regarded Goethe as one of the three greatest figures in Western culture, alongside Plato and Beethoven, and Goethe's impact on James was commensurate with this view. In his early twenties, he studied Goethe and Schiller whilst learning German in Bonn, acquiring a good knowledge of some difficult texts, including *Die Wahlverwandtschaften* and *Hermann und Dorothea*, and continued to show an interest in Goethe in later life, e.g. in his lengthy review of a reissue of Carlyle's translation of *Wilhelm Meister* and in a late letter on *Die Wahlverwandtschaften*.

> James's literary reception of Goethe can be seen throughout his career, beginning with his first novel, *Roderick Hudson*. Strands from *Werther*, *Faust*, and *Wilhelm Meister* can all be found in what is essentially a tragic "Künstlerroman"; at the end of James's early period, The Tragic Muse, with its subject of the theatre, recalls Wilhelm Meisters Lehrjahre as a Theaterroman; and at the end of the middle period, What Maisie Knew echoes Ottilie's misfortune in *Die Wahlverwandtschaften*. Arguably, the transparent structure and the moral ambiguity of *Die Wahlverwandtschaften* also played a part in helping to fashion the transparent complexities of the last three novels, the crown of James's achievement, *The Ambassadors*, *The Golden Bowl* and *The Wings of the Dove*. Moreover, James's treatment of "the international theme" in his novels closely echoes Goethe's call upon writers to produce what he called "Weltliteratur"."

Others, such as Judith Ryan (1982) and Joseph O'Leary (2005), likewise, have discussed the similarities between James' *The Golden Bowl* and Goethe's *Elective Affinities*. [7]

Origin of interest

In London, Adler first began to work on the theoretical dissection of Goethe's *Elective Affinities* as a PhD thesis under professor Claus Bock (compiler of the 1960 book *Goethe the Critic*) in 1969. Bock's suggestion was to examine the connection between Swedish chemist Torbern Bergman, particularly his 1775 textbook *A Dissertation on Elective Attractions*, and Goethe's novel. In this direction, Adler soon discovered links to many other chemists, beginning with the works of French chemist Pierre Macquer, i.e. his 1849 *Elements of Theoretical Chemistry* (*Elemens de Chymie Theorique*) and his 1778 *Dictionary of Chemistry* (*Dictionnaire de chymie*), and the other dictionary writers, and then extended his search to as much of the tradition as he could uncover.

Adler at a poetry meeting, circa 1977, about the time he was working on his dissertation on the chemistry used in Goethe's *Elective Affinities*. [4]

John McEvoy (later at Pittsburgh) and his supervisor, Satish Kapoor (Sussex), gave Adler assistance with the background to the history of chemistry. Satish was working on French chemist Claude Berthollet at the time, and suggested to Adler that he switch to the history of chemistry; and so Adler joined the outfit of historians of science in England that ranged from the old masters, such as Joseph Needham and Walter Pagel, to his colleagues, like Roy Porter, Nick Jardine and others, interested in linking literature and science. Adler also had good contact with English affinity chemistry historian Alistair Duncan, who was working on the history of affinity theory.

With this basis of support and study, analysis of the vocabulary in Goethe's book convinced Adler that the use of affinity theory to explain human interactions and life was a thorough-going theme. [3]

Education

Adler was born in London in 1947, where he studied German with English at Queen Mary's College.

In 1977 or 1978 (Q) Adler completed his PhD, at at at Westfield College London, on the chemistry of Goethe's 1809 *Elective Affinities*.

After lecturing in German for several years, he became professor of German at King's College London and later head of department. Adler is currently a professor emeritus of German literature at King's College, London. [2]

Quotes | On

The following are quotes on Adler:

> "To date, **Jeremy Adler** has provided the most detailed study of Goethe's research in the history of chemistry, particularly "Zur Geschichte der chemischen 'Verwandtschaft' (The History of Chemical Affinity)."
>
> — Karl Fink (1991), *Goethe's History of Science* [5]

See also

- Goethe's human chemistry

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1. (a) Adler, Jeremy. (1987). "Eine fast magische Anziehungskraft: Goethe's 'Wahlverwandtschafte' und die Chemie seiner Zeit ("An almost Magical Attraction: Goethe's *Elective Affinity* and the Chemistry of its Time) (Amazon). Munich: Beck.
(b) Adler, Jeremy. (1990). "Goethe's use of chemical theory in his *Elective Affinities*", in: *Romanticism and the Sciences* (editors: Andrew Cunningham and Nicholas Jardine) (§:18, pgs. 263-79; Tabor, pg. 278). Cambridge University Press.
(c) Tantillo, Astrida O. (2001). Goethe's *Elective Affinities* and the Critics. New York: Camden House.
(d) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (ch. 10: "Goethe's Affinities", pgs. 371-422), (preview), (Google books). Morrisville, NC: LuLu.
2. (a) Adler, Jeremy. (2000). "Midlife Sturm and Drang – Volume II of Goethe's biography takes him through marriage and the French Revolution", *NYTimes.com*, 28 May.
(b) Jeremy Adler (director of experts) - King's College, London.
(c) Jeremy D. Adler (Emeritus staff and research fellows) - King's College, London.
3. Email from Jeremy Adler to Libb Thims on 26 Jul 2008.
4. Photo (BobinCanada.jpg) described as: "Cris Cheek, Bob Cobbing, B.G., Jeremy Adler, ca. 1977, by Steven Smith" at what seems to be a poetry reading (link), with Cheek and Cobbing, two noted British poets. (note: post below confirms that it is the same of this article Adler).
5. Fink, Karl J. (1991). *Goethe's History of Science* (elective affinities, pgs. 111, 195). Cambridge University Press.
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7. (a) Ryan, Judith (1982). "Elective Affinities: Goethe and Henry James." Goethe Yearbook 1:153-71.

(b) O'Leary, Joseph S. (2005). "Goethe in 'The Golden Bowl'", *Essays on Literary and Theological Themes*, Jun 22.
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Further reading

● Adler, Jeremy. (1985-86). "Newton, Goethe, and *Die Wahlverwanddtschaften.* On the Virtue of Contradictory Hypotheses", *Wissenschaftskolleg zu Berlin. Jahrbuch*, 211-21.
● Adler, Jeremy. (1998). "The Aesthetics of Magnetism: Science, Philosophy, and Poetry in the Dialogue between Goethe and Schelling", in: *The Third Culture: Literature and Science* (pgs. 66-102). Walter de Gruyter.

External links

● Jeremy Adler – Wikipedia.
● Adler, Jeremy D. – WorldCat Identities.

θΔics

In hmolscience, **Jeremy Bentham** (1748-1832) (IQ:180|#112) (Cattell 1000:327) [RGM:376|1,250+] (FA:87) was English jurist and philosopher notable for []

Utilitarianism

In 1789, Bentham, in his *Introduction to the Principles of Morals and Legislation*, took ideas from: Helvetius, Denis Diderot, Voltaire, John Locke, and David Hume, while simultaneously discarding ideas from: Plato, Aristotle, and Immanuel Kant, e.g. his "categorical imperative" (1785), and therein introduced the so-called: 'utilitarianism' system of morality, wherein he suggested that we forget about parsing "good and evil" and work logically to minimize pain and increase pleasure; aimed at the greatest happiness for the greatest number. [4]

This utility-based moral model was later developed further by John Mill.

Other

Bentham was also involved a noted two cultures stylized debate with English poet-philosopher Samuel Coleridge (Coleridge noted for his participation in the 1833 Whewell-Coleridge debate, as a result of which the term "scientist", distinguished from that of the natural philosopher, was coined). [1]

In Stark classification, Bentham is classified as being a secondary form of mechanistic social thought.

Mills

Bentham was a friend of like-minded philosopher James Mill and he helped to educate Mill's son John Mill, along with the help of Francis Place.

Quotes | On

The following are quotes on Bentham:

> "**Bentham**'s idea is that all our actions are determined by pleasure and pain."
>
> — Howard W. Odum (1929), *Introduction to Social Research* [3]

> "Snow is the spokesperson for the technologico-Benthamite reduction of human experience to the quantifiable, the measurable, the manageable."
>
> — Frank Leavis (1962), "The Significance of C.P. Snow" [1]

> "Meslier, d'Holbach, Diderot, Hume, and **Bentham** can, with fair certainly, be called atheists."
>
> — Sunand Joshi (2014), *The Original Atheists*

Quotes | By

The following are quotes by Bentham:

> "Pain and pleasure govern us in all we do, in all we say, in all we think."
>
> — Jeremy Bentham (c.1810), *Publication*; cited by Matthew Lieberman (2013) *Social: Why Our Brains are Wired to Connect* (preface) (Ñº)

> “Philosophical radicalism is nothing but an attempt to apply the principles of Newton to the affairs of politics and morals.”
>
> — Jeremy Bentham (c.1810) [2]

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1. (a) Leavis, Frank R. (1962). “The Significance of C.P. Snow”, *Spectator*, Mar 9.
(b) Collini, Stefan. (1993). “Introduction”, in: *The Two Cultures* (by Charles Snow) (technologio-Benthamite, pg. xxxiii; Coleridge vs. Bentham, pg. xxxv). Canto.
2. (a) Matson, Floyd. (1964). *The Broken Image: Man, Science, and Society* (§Homo ex Machina: the Legacy of Newton, pg. 34). G. Braziller Anchor Books.
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3. Odum, Howard W. and Jocher, Katharine C. (1929). *An Introduction to Social Research* (pg. 190). H. Holt and Co.

External links

â— Jeremy Bentham – Wikipedia.

θΔics

In science, **Jeremy Campbell** (1931-) is an English-born American writer noted for his 1982 book *Grammatical Man: Information, Entropy, Language, and Life*, "an attempt to tell the story of information theory and how it evolved", for his 1983 two cultures contributions, and for his 2006 *The Many Faces of God*, which outlines how Isaac Newton and his generation altered the medieval definition of God from one interpreted through divine messengers to an all-knowing, autocratic God who watched over the scientific wonders of the universe, arguing that religions harbor a secret fear that science may one day explain God away.

Information | Wiener, Weyl, and Neumann

Campbell, in his 1982 *Grammatical Man: Information, Entropy, Language, and Life*, reports his communication interviews, via letters and conversations, of several key figures surrounding the famous 1948 article "A Mathematical Theory of Communication" by American electrical engineer Claude Shannon, the creator of information theory. [1] Campbell gives a simplified and positive spin on the relation between information and thermodynamics, in a way that positions information as an equal counterpart to matter and energy. [2]

Campbell reports that Shannon may have first come across the notion of entropy from American mathematician Norbert Wiener, noted for his 1948 entropy-themed book *Cybernetics*, whom Shannon studied under at MIT in the early 1930s. In 1947, for instance, according to electrical engineer Robert Fano, Wiener was said to have walked into Fano's room several times, while Fano was working on his doctoral dissertation, touting the phrase "information is entropy", then turn around and walk out again without saying another word.

Campbell also claims that the notion of an information measure with an entropy form came to Shannon when he was a research fellow at Princeton in 1940-41, while studying under German mathematician Hermann Weyl. [2]

In reference to the infamous entropy quotation by Hungarian-born American chemical engineer John Neumann that "no one knows what entropy is", supposedly said to Shannon, in *circa* 1940s, on a suggestion as to what to call his new information variable, Campbell reports that: [2]

> "Shannon does not remember von Neumann giving him such advice. However, Myron Tribus has a clear recollection of hearing Shannon tell him this story during a conversation in Shannon's office at MIT on April, 1961."

Much of this historical fog surrounding the origins and history of information theory was clarified in 2012 by Libb Thims. [3]

Education

Campbell, since at least 1983 to 2006, has been the Washington, D.C., correspondent of the London *Evening Standard*.

References

1. (a) Campbell, Jeremy. (2002). *The Liar's Tale*. W.W. Norton & Co.
(b) Back cover: Campbell is the Washington correspondent for *The Evening Standard*.
2. Campbell, Jeremy. (1982). *Grammatical Man: Information, Entropy, Language, and Life* (pgs. 16, 20-21, 32, 277). New York: Simon and Schuster.
3. Thims, Libb. (2012). "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair" (url), *Journal of Human Thermodynamics*, 8(1): 1-120, Dec 19.

Further reading

● Campbell, Jeremy. (1983). "Observer and Object, Reader and Text: Some Parallel Themes in Modern Science and Literature", Conference on Science, Technology, and Literature, Long Island University, Brooklyn, New York, Feb; in: *Beyond the Two Cultures: Essays on Science, Technology, and Literature* (editors: Joseph Slade and Judith Lee) (about, pg. xii; §1:23-38). Iowa State University Press, 1990.

● Campbell, Jeremy. (2002). *The Liar's Tale: a History of Falsehood*. W.W. Norton & Co.
● Campbell, Jeremy. (2006). *The Many Faces of God: Science's 400-Year Quest for Images of the Divine* (Kirkus review). Norton.

External links

● Jeremy Campbell – LibraryThing.com
● Jeremy Campbell – GoodReads.com

θΔics

In existographies, **Jeremy L. England** (c.1981-) is an American biochemical physicist noted, in chnops-thermodynamics, for his 2012 dissipative-driven adaptive organization theory of evolution, as described in his semi headline-making article "Statistical Physics of Self-Replication", wherein he outlines a natural selection conceptualized far-from-equilibrium and or nonequilibrium self-reproduction theory of bacterial replication.

Driven energy landscapes

In 2013, England, in his "Statistical Physics of Self-Replication", attempted to argue for an entropy production model of RNA-based self-reproducing living things; the abstract of which is as follows: [10]

> "Self-replication is a capacity common to every species of living thing, and simple physical intuition dictates that such a process must invariably be fueled by the production of entropy. Here, we undertake to make this intuition rigorous and quantitative by deriving a lower bound for the amount of heat that is produced during a process of self-replication in a system coupled to a thermal bath. We find that the minimum value for the physically allowed rate of heat production is determined by the growth rate, internal entropy, and durability of the replicator, and we discuss the implications of this finding for bacterial cell division, as well as for the pre-biotic emergence of self-replicating nucleic acids."

In 2014, England, together with Nikolai Perunov and Robert Marsland, pre-printed "Statistical Physics of Adaptation", wherein they used a mixture of Richard Dawkins 1976 selfish-genes program, Ilya Prigogine' 1971 far-from-equilibrium statistical mechanics or thermodynamics, Helmholtz free energy, and what they referred to as "driven energy landscapes" (see: Gibbs landscape) to attempt to explain Darwinian adaptations; the following is one of their energy diagrams: [5]

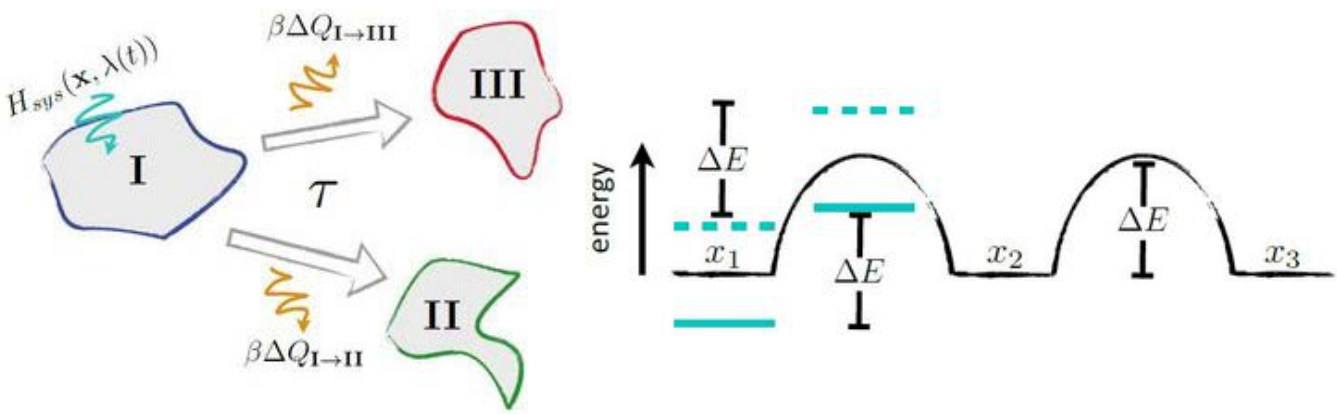

(add discussion)

Thims | Discovery

On 27 May 2014, Thims, amid reading Neil Shubin's *Your Inner Fish* (2008), was prompted into searching for key terms: first life + thermodynamics, and thereby found England's work, via the *Quanta Magazine* article on him and his self-replication theory, and thereafter started his *Hmolpedia* article and emailed England, pointing out to him the issues involved when talking about the thermodynamics of a "living thing", e.g. that Charles Sherrington pointed out in 1938 that physics and chemistry do not recognize the world "alive", directing him to the defunct theory of life page and terminology reform page. [7]

What is Life | Lecture

On 9 Sep 2014, England, in his "What is Life" lecture, given at the Karoinska Institute, at 4:30-8:30, possibly owing to the Sherrington distinction pointed out, by Thims, to England, he opens to a "need to make a distinction" between how a physicist and a biologist describes, firstly, a whale jumping out of the water: [8]

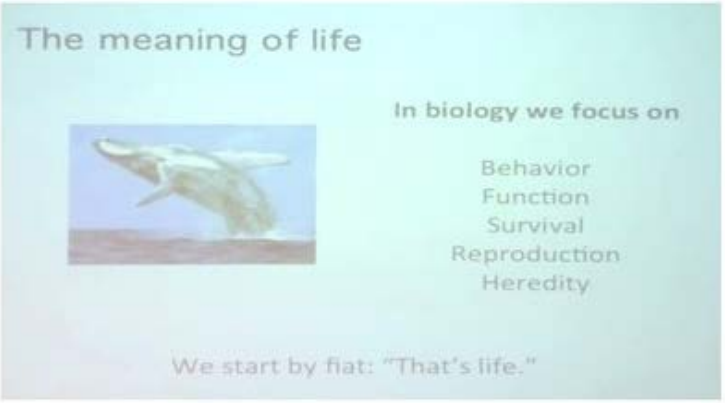

Biologist's view of a thing called a whale

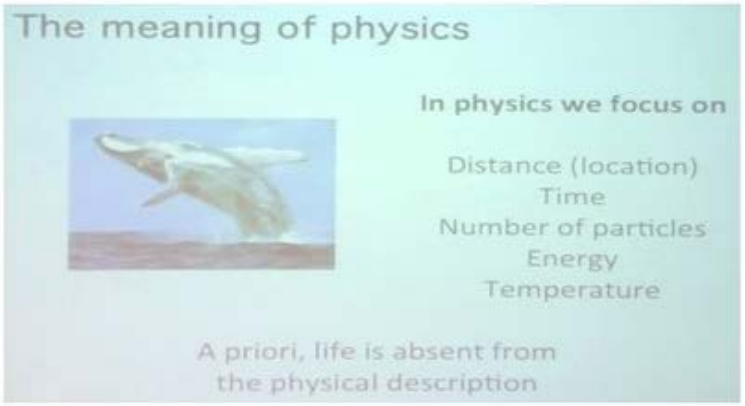

Physicist's view of a thing called a whale

about which (4:38-5:46) he says:

> "As physicists, we can look at this collection of particles, and instead of seeing this 'living thing' sitting on water, we might instead say that there are a bunch of different locations of particles, and distances between them, and periods of time that pass between when particles are located in one place and another, and counting things, and measuring things like energy and temperature. Energy, also, if you look at the units, can be reduced to a counting of particles, time, and distance.
>
> The point I want to make is that *a priori*, life is total absent from the physical properties of the system. Physics doesn't make any distinction between particles that are in the whale and particles that are around it, it's all just a bunch of positions and momenta, and presumably there's some equation of motion we could write down, that's a good model of how they evolve over time. Whether we're looking at something that is alive or not is not something I would argue that those basic physical descriptors can tell us."

The he goes to (6:15-8:16) his hypothetical cat dropped off a leaning tower experiment, so to be sure that, as he says, if one is "going to do biophysics and do it well", one has to be able to do a good translation from one perspective to the other:

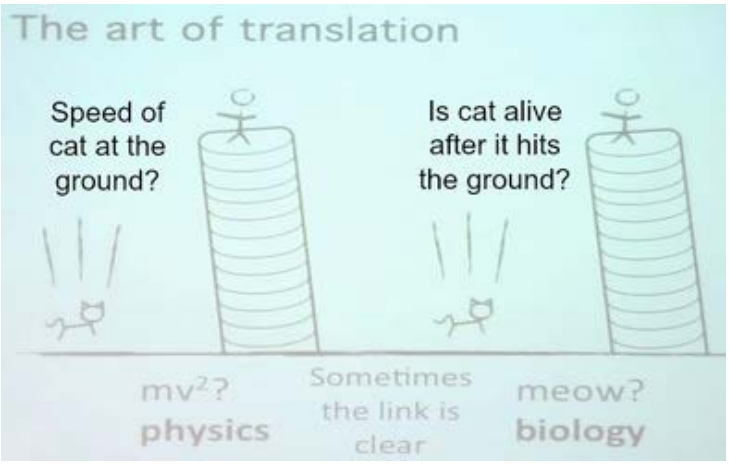

about which he doesn't really come to much of a conclusion, other than saying that the "speed of the cat is not going to tell us whether it's alive or not". Whatever the case, the comparison brings to mind Weismann's pour acid on chalk or a worm (1889) and Bateson's kid a dog or kick a stone (1972) comparisons:

> "We can, indeed, kill all organic beings and thus render them inorganic at will. But these changes are not the same as those which we induce in a piece of chalk by pouring sulphuric acid upon it; in this case we only change the form,

> and the inorganic matter remains. But when we pour sulphuric acid upon a worm, or when we burn an oak-tree, these organisms are not changed into some other animal and tree, but they disappear entirely as organized beings and are resolved into inorganic elements."
>
> — August Weismann (1889), *Essay on Heredity*

> "When I kick a stone, I give energy to the stone, and it moves with that energy … When I kick a dog, it responds with energy [it received] from [its] metabolism."
>
> — Gregory Bateson (1972), truncated version by Fritjof Capra (1996) [9]

(add discussion)

Reactions | Commentary

In 2014, the news media stir of England's paper caused English-born Mexican physicist Karo Michaelian to gripe the following: [2]

> "The theory for the origin and evolution of life as presented above and accredited to **Jeremy England** is not new. It was published by myself in 2009 ("Thermodynamic Origin of Life" (Q)) and in 2011 ("Thermodynamic Dissipation Theory for the Origin of Life" (Q)). The observation that under a generalized chemical potential, material self-organizes into systems which augment the dissipation of that potential should be accredited to Ilya Prigogine, *Introduction to Thermodynamics of Irreversible Processes* (1968)."

In 2014, American mechanical engineer Bill Nye, in his *Undeniable: Evolution and the Science of Creation*, written in the wake of the Nye-Ham debate (Q)(Q), cited England as one of the new abiogenesis thinkers since the Miller-Urey experiment: [4]

> "Very recently, research led by MIT physicist **Jeremy England** suggests that life may happen automatically, a result of physics, specifically thermodynamics. England argues that molecules assemble themselves in the most energy-efficient way they can find. Molecules may be driven to seek thermodynamic equilibrium, and that my lead to life."

(add discussion)

Other

In 2015, American civil engineer John Patrick became very interested in England's "Statistical Physics of Adaptation" and emailed England, MIT biology department head Alan Grossman (Q), DMR Sekhar, and Libb Thims about his excitement. Patrick's excitement, however, is belied by the falsified belief that he is searching for the science of god in his work.

Education

England completed his AB in biochemical sciences in 2003 at Harvard, after which he spent two years, via a Rhodes Scholarship, at St. John's College, Oxford, at the Rudolf Peierls Center for Theoretical Physics, doing work on the effects of stochastic noise on morphogen gradient patterning in embryonic development, after which in 2009 he completed his PhD with a dissertation on "Theory and Simulation of Explicit Solvent Effects on Protein Folding in Vitro and in Vivo" at Stanford. On 2012, England started his own lab at MIT, a research group focused on the study the theoretical questions in the biophysics of cells and macromolecules, albeit largely, it seems, focused on a physics approach to protein thermodynamics and cellular thermodynamics. [3]

Quotes

The following are noted quotes:

> "You start with a random clump of atoms, and if you shine light on it for long enough, it should not be so surprising that you get a plant."

— Jeremy England (2014), interview commentary with Natalie Wolchover [2]

See also

- Alexander Wissner-Gross

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External links

- Jeremy England – Google Scholar.

θΔics

In hmolscience, **Jeremy Griffith** (1945-) is an Australian zoologist and philosopher noted, in human thermodynamics, for his second law based or framed "human condition" theory, published in a series of six books beginning in 1988, a grand narrative explanation of human nature, using a multi-disciplinary approach, drawing from the physical sciences, biology, anthropology, and primatology together with philosophy, psychology, and psychiatry; citing thinkers drawn from varied backgrounds and eras, from Socrates and Plato to the Ra theology based Christian figure of Jesus Christ (Osiris anointed), through to more contemporary philosophers and scientists such as Charles Darwin, Pierre Teilhard, and Louis Leakey, among others.

His 2003 *A Species in Denial*, a bestseller in Australia and New Zealand, employs Erwin Schrodinger's celebrated 1944 dictum: "what an organism feeds on is negative entropy", as extolled upon in the work of Arthur Koestler (*Janus: A Summing Up*, 1972), to argue that the term 'God' is the historical term used to describe the integrative meaning of existence, and that in the modern physical science perspective, as stated by Stephen Hawking in 1989 "the term God is the embodiment of the laws of physics" or as stated by Paul Davies "these laws of physics are the correct place to look for God or meaning or purpose" (1997) and "humans came about as a result of the underlying laws of physics" (1999), to argue, in effect, that negative entropy, or rather the equations behind this term, is the new God, so to speak.

References

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(b) Koestler, Arthur. (1972). *Janus : A Summing Up* (§"Strategies and Purpose in Evolution"; thermodynamics, pgs. 64, 66, 222-23, 306). Publisher.

External links

- â— Jeremy Griffith – Wikipedia.
- â— Jeremy Griffith (about) – WorldTransformation.com.
- â— The human condition and thermodynamics (2005) – tread, CaptianCynic.com.

θΔics

In hmolscience, **Jeremy Rifkin** (1945-) is an American economist and philosopher noted, in human thermodynamics, for his 1980 to present effort to use the error-filled Nicholas Georgescu conceptualized model of material entropy, as a philosophical platform, to argue argue for all sorts of social, political, ecological, and ethical positions; a kind of soft snake oil selling self-Sokal affair-ing like philosopher so to say.

Overview

In 1980, Rifkin, in his *Entropy: A New World View*, outlines an agenda-driven view, based on a modified-logic of Romanian-born American mathematician and economist Nicholas Georgescu, that the second law of thermodynamics mandates a universal tendency, as mediated through entropy, of economic, social, and environment systems to move from an ordered state to a disordered state. [1] Rifkin argues that every modern-day malady, from pesticides, to city crime, to mental illness, is due to what he refers to as the "Entropy Law". Rifkin's core theory, reasoning incorrectly that negative entropy equates to "available energy", is:

> "Economic activity is merely human intervention in the ecological cycle, borrowing *low-entropy* inputs (fossil fuels), converting them into temporary utilities, and eventually discarding them back into the ecological cycle in the form of *high-entropy* wastes (pollution)."

Rifkin's new 2010 book *The Empathic Civilization*, argues that at the paradoxical relationship between empathy and entropy is at the very core of the human story; and comments on other topics such as Sigmund Freud's thermodynamic-chemistry based 1920 death instinct theory. [10]

Rifkin's general theory is a result of a misinterpretation of the definition of entropy and the framework behind the second law of thermodynamics. Rifkin's theory is that natural resources, such as wood, coal, and soil, what he calls terrestrial stock, constitute low levels of "material entropy" and that the conversion of this stored or "free" available energy into the products of pollution and waste constitute maximum levels of entropy, i.e. high levels of unavailable energy, as dictated by the idiom of the tendency for entropy to increase.

He quotes German physicist Rudolf Clausius' 1865 version of the second law as "in the world, the entropy [the amount of unavailable energy] always tends towards a maximum", where the square bracket quotes are his additions. From here, he makes the jump to the conclusion that "here on earth material entropy is continually increasing and must ultimately reach a maximum", which he means to imply that humans are squandering the world's fossil fuels.

Beyond this, based on the mis-logic of Georgescu-Roegen, Rifkin defines there to be two types of energies in nature: (a) that which is capable of conversion into work and (b) that which is incapable of conversion into work. He gives examples of a piece of coal which can be burned to produce work and its reaction products of sulfur dioxide and gases, which cannot be converted into work; as well as water at the top of a water fall that can be used to turn a water-wheel to do work verse the water at the bottom which cannot do gravitational work. He summarizes "these two states are referred to as *available* or free energy *states* verse *unavailable* or bound energy *states*".

These terminological definitions, in turn, are borrowed from Georgescu-Roegen's 1971 *The Entropy Law and the Economic Process.* [5] Georgescu-Roegen, in turn, culled his definitions from Webster's dictionary among other non-thermodynamic sources. In doing this, unknowingly, Georgescu-Roegen was unaware that the phraseologies "free energy" and "bound energy" stem from the 1882 chemical thermodynamic descriptions of German physicist Hermann von Helmholtz who equated free energy as a measure of the chemical affinities of the reacting system and bound energy as irreversible energy associated with the work the molecules of the system do on each other that is bound to the system, which he associated with Clausius' entropy or the quantity "*TS*", i.e. system temperature times entropy. [4] In other words, Helmholtz showed, through derivation, how the long-sought "chemical affinity" (the force of reaction) of chemistry was measured by the "free energy" of the system, i.e. that which could be converted into other forms of usable energy (such as mechanical work or electricity) not by the heat of the reaction, which was the going theory in the

mid 19th century.

Difficulties

All-in-all, Rifkin's theories on how thermodynamics fits into the various processes of human life are, in most cases, unsubstantiated and very illogical. He seems to throw the word "entropy" out where ever he sees fit. To cite one of many examples, he states, supposedly as a matter of fact, that "pesticides are destroying [the microorganisms of the soil], thus greatly hastening the *entropy process* of the soil." He uses the phrase "entropy watershed", repetitively, as a sort of foreboding as to a future time when nonrenewable fossil fuels will run out or when a facet of society will collapse. [2]

In one of his silliest examples, he uses incorrect versions of the first and second laws of thermodynamics to argue that military hardware fuels inflation. He starts out with an incorrect definition of the first law of thermodynamics, “the first law of thermodynamics tells us that the quantity of energy and matter is fixed”. Correctly, the first law has nothing to do with the quantity of matter being fixed. He continues, “because the military sector consumes six percent of the nation’s total energy use, along with massive quantities of nonrenewable mineral resources, the entropy *increase* represented by military hardware causes tighter resource supplies, which in turn fuels inflation.” [2]

In sum, Rifkin’s entire theory is based on a terminological misinterpretation through his referece of Georgescu-Roegen. The use of material entropy, as seeded by Georgescu-Roegen and promulgated by Rifkin, is generally seen as point of non-logic. Israeli physical chemist Brian Silver, for instance, states that “readers should be on guard against books in which entropy appears without a definition, or a faulty definition, and in which it is used in relation to undefined systems”. [6] He continues, “the outstanding example is Jeremy Rifkin’s *Entropy: A New World View*”. Moreover, in commentary on what he calls “Georgescu-Roegen’s brainchild”, Silver states that “the term *material entropy* is meaningless; it has not the slightest connection with entropy. [6] Likewise, American chemist Glen Gordon states that “in taking up entropy, Rifkin is like a child with a new toy—he has great fun applying the concepts to all aspects of our high-technology society.” [7]

In many of Rifkin’s musings, he seems to have completely jumped off the tracks in making certain thermodynamic arguments. In one example, in his section on minerals, he states that in regards to scares minerals such as copper, gold, antimony, bismuth, and molybdenum, and others, that recycling is often proposed as the answer to the future problem of mineral resource depletion. In rebuttal of this suggestion, he states that “it should not be forgotten that recycling also conforms to the second law of thermodynamics” and that “every time a mineral is recycled, some of it is inevitably, and irreversibly, lost.”

A number of things are incorrect about this statement. For one, a mineral, such as copper, is basically an atom, and atoms are never irreversibly lost. Second, the second law is about energy loss in working bodies during heat engine cycles, not about the recycling of atoms in the biosphere. This logic used by Rifkin, however, likely stems from Georgescu-Roegen’s supposed fourth law of thermodynamics, that in a closed system, such as a human society, “material entropy must ultimately reach a maximum.” [8]

Other

Between 1997 and into 2009, a human thermodynamics education course based on Rifkin's book called "Entropy and Society" has been taught intermittently in the Physics Department at Ohio University by American physics professor Richard Piccard. [9]

Religious thermodynamics

Rifkin can also be classed with the religious thermodynamics thinkers. In the section on "World Views", to begin with, Rifkin misquotes British astronomer Arthur Eddington's 1927 quote: "the law that entropy increases—the second law of thermodynamics—holds, I think, the supreme position among the laws of Nature" by rephrasing it as "Sir Arthur Eddington referred to it as the supreme metaphysical law of the entire universe". Regarding spiritual transcendence in relation to the thermodynamics, Rifkin states that: [2]

> "The [second law] is mute … when it comes to the vertical world of spiritual transcendence. The spiritual plane is not governed by the ironclad dictates of the entropy law. The spirit is a nonmaterial dimension where there are no boundaries and no fixed limits to attend to the relationship of the physical to the spiritual world is the relationship of a small part to the larger unbounded whole within which it unfolds. While the Entropy Law Helps govern the world of time, space, and matter, it is, in turn, governed by the primordial spiritual force that conceived it."

(add discussion)

Notes

The book was re-titled as a revised 1989 edition *Entropy: Into the Greenhouse World*, with an afterword by Romanian-born American mathematician and economist Nicholas Georgescu-Roegen. [2] Georgescu-Roegen, who is considered as Rifkin's "prophet and teacher", as mentioned, is the main influence behind Rifkin's theories. [3]

Education

Rifkin has a degree in economics from the Wharton School of the University of Pennsylvania, and a degree in international affairs from the Fletcher School of Law and Diplomacy at Tufts University.

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External links

â— Jeremy Rifkin – Wikipedia.

θΔics

In hmolscience, **Jerome Heath** (c. 1940-) is American physicist-chemist turned information scientist noted, in human thermodynamics, for his 1997 melting-pot theory attempt to outline an idea of cultural thermodynamics.

Overview

In 1997, Heath, in his online "Thermodynamics of Culture", attempted, via introductory citation to a number of over-typical springboard scholars, namely: Ludwig Bertalanffy (1962), Norbert Wiener (1961), Ilya Prigogine (1980), along with an ontic opening scholars, namely: Claude Shannon (1949), then jumps to Georg Hegel (1830), among a few other conclude, in a non-connective way, that concepts of energy, entropy, and temperature apply to social science, to form what he passingly refers to as "cultural thermodynamics". [1]

Education

Heath completed his BS in physics and chemistry (1962) at Monmouth College, IL, his MBA (1985) at the University of Minnesota, and his PhD in communications and information science (1997) at the University of Hawaii. [2]

References

1. Heath, Jerome. (1997). "Thermodynamics of Culture", Hawaii.edu.
2. Jerome Heath (homepage) – Wayback Archived Page.

External links

â— Jerome Heath – LinkedIn.
â— 1998-2006 – Wayback Archived Pages.

θΔics

In hmolscience, **Jerome Rothstein** (1918-2002) was an American physicist noted for his 1952 to 1980s effort to explain free will and determinism in terms of loose thermodynamics ideas and information theory.

Overview

In 1952, began arguing for the equivalence of system “organization” and “negative entropy” of information theory. [1]

In 1964, Rothstein, in his article “Thermodynamics and Some Undecidable Physical Questions”, set out to answer questions on free will and determinism, origin and fate of the universe, and causes and purposes in nature via thermodynamics, specifically modeling people as automatons or well-informed heat engines, where he concludes that some of these admit answers, whereas others admit violations answers that entail violations of the second law. [2]

In 1979, Rothstein published his article “Generalized Life”, wherein uses thermodynamic arguments to conclude that life forms in the cosmos may exist as self-replicating, computer-controlled, heat engines able to play survival games, that we may not be able to recognize. [3] On the model of the Carnot engine, defined by Rothstein as follows:

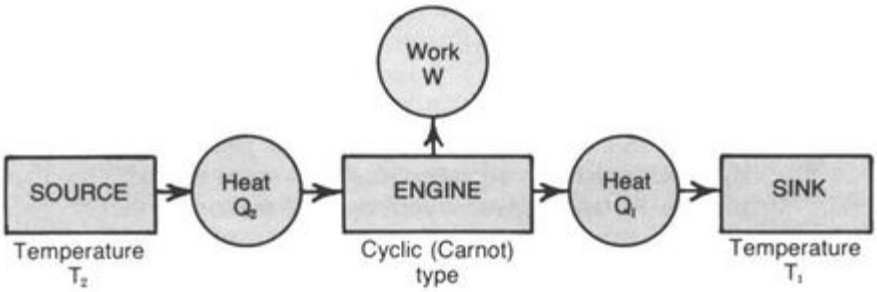

he conceptualizes his so-called carbon chemistry animal machine model of a human as follows:

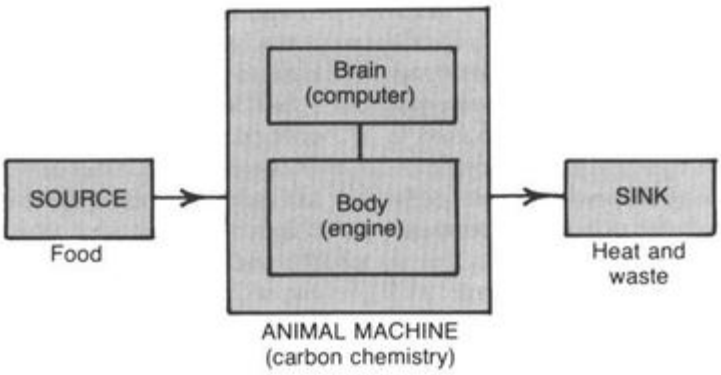

This model of course is interesting but error filled. Food stuff, at a given temperature, for example, is not the same as a boiler or hot body and excrement is not the same as condenser or cold body. Both of which, in any event, he says abides by the following three ABCs of thermodynamic "conditions":

Work (ideal maximum) by engine $= Q_2 - Q_1$ (First law of thermodynamics)

No work done if $Q_1 = Q_2$ (Condition A)

Increase in entropy $S = \frac{Q_1}{T_1} - \frac{Q_2}{T_2} \geq 0$ (Second law of thermodynamics)

Work (ideal maximum) by engine $= Q_2 \frac{T_2 - T_1}{T_2} = W$ (Condition B)

$\frac{\text{Change in entropy}}{\text{Change in time}} = \frac{dS}{dt} \geq 0$ (Second law; Condition C)

Engine efficiency (ideal maximum) $= \frac{W}{Q_2} = \frac{T_2 - T_1}{T_2} \leq 1$

Other

English scientist James Lovelock, in his chapter on "God and Gaia", wherein he attributes his thermodynamic understanding of life and death from Erwin Schrodinger, among other discussion, attributes Rothstein as having put forward the argument that thermodynamics bars understanding of the far past and distant future: [4]

> "We have evolved from the world of simple molecules through dissipative structures to the more permanent entities that are living organisms. The further we go from the present, either into the past or the future, the greater the uncertainty. Darwin was right to dismiss thoughts about the origin of life; as **Jerome Rothstein** has said, the restrictions of the second law of thermodynamics prevent us from ever knowing about the beginning or end of the universe."

Lovelock also cites Rothstein has having helped him conceptualizing his "living earth" theory better by comparing earth, with its "dead rock" composition, to a red oak, 99% of which is defined as dead wood.

Heat death and cold life

Rothstein has the following theory about evolution, life, and heat death: [3]

> "I close with what seems to me to be a pleasing new insight of almost poetic beauty. It is that the gloomy heat-death of the universe, so often thought to be an inescapable consequence of the second law of thermodynamics need not follow at all. To paraphrase Mark Twain, I believe reports of the heat-death of the universe in X billion years are grossly exaggerated. As the universe cools, low-temperature forms of generalized life will be able to evolve. I believe it plausible that cold life will win over heat-death, that from the big bang on, there has been a succession of generalized life forms evolving, that they are still evolving, and that we share the cosmos with them."

Education

Rothstein completed bachelor's degrees from the City College of New York and the Jewish Theological Seminary of America and a master's degree in 1940 in physics from Columbia University. From 1942 to 1957, he worked at the U.S. Army Research and Development Laboratories in the areas of solid state physics and physical electronics. In 1967, Rothstein joined the faculty of the Ohio State University as a professor of computer and information science and of biophysics.

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Further reading

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External links

● Rothstein, Jerome – WorldCat Identities.
● Jerome Rothstein (profile) – InformationPhilosopher.com.

θΔics

In religio-mythology, **Jesus** (CR:206), from the Hebrew *Ja-* meaning "god" + Egyptian -Horus, i.e. "god son" (of Osiris), plus "Yes" or Bacchus (aka Osiris) (Volney, 1771), is the Roman recension name of the dying and rising god, astro-theologically based on the perceptual yearly dying and rising *Orion* constellation (the root of Osiris myth, turned Bacchus myth, turned Jesus story), aka the dying and rising hunter (Greek), warrior, or god (ancient Egypt), is the first name of Jesus Christ, the purported, albeit mythological, founder of Christianity; the Roman empire monotheistic reformulation of the Osiris (god the father) and Horus (god the son) vs Set (devil) story.

The gist of the Roman recension formation of the "**Jesus**" character (see: god character equivalences), namely a god reduction synretism of main attributes of the Egyptian gods Osiris and Horus into the form of a god man who, after being conceived immaculately (see: virgin birth), baptized by a "John" (see: John the Baptist) or Anubis, dies horribly, i.e. is whipped or cut into 14 pieces (number of stars in Orion constellation), like Osiris was, and is resurrected (see: death and resurrection of Osiris; death and resurrection of Jesus), i.e. rises like the Orion constellation does, from the horizontal position, visually in the sky (in Nov-Dec), like a reborn pharaoh.

Overview

In 1239, Frederick II asserted that Jesus was an imposter.

In 1514, Pope Leo X stated that Jesus or Christ was a fable and a profitable superstition.

In 1771, Constantin Volney decoded the the etymology of Jesus from Bacchus (the Greek version of Osiris) as follows:

> "Volney has shown that Yes was one of the names of Bacchus, which, with the Latin termination, is nothing else than Yesus, or Jesus."
>
> — Robert Taylor (1829), *The Diegesis* (pg. 186)

In 1817, Napoleon Bonaparte put forward his reasoned opinion that Jesus never existed:

> "I have dictated thirty pages on the world's three religions; and I have read the Bible. My own mind is made up. I do not think **Jesus Christ** ever existed."

In 1912, American church historian Shirley Case, in her *The Historicity of Jesus*, attempted to refute the contention that Jesus never existed. [1]

In 2014, Richard Carrier, in his *On the Historicity of Jesus: Why We Might Have Reason to Doubt*, wherein he describes himself as a "marginally renowned atheist", attempts to argue that Jesus as an historical figure never existed, but rather the figure of Jesus is a mythical aggregate, or something along these lines. [2]

Quotes

The following are related quote:

“In my personal experience, it’s easier to find and atheist practicing the teachings of **Jesus** than a Christian.”

— Phillip Slater (2011), “Is Religion Inherently Homicidal?”, May 25 (Q) (Q)

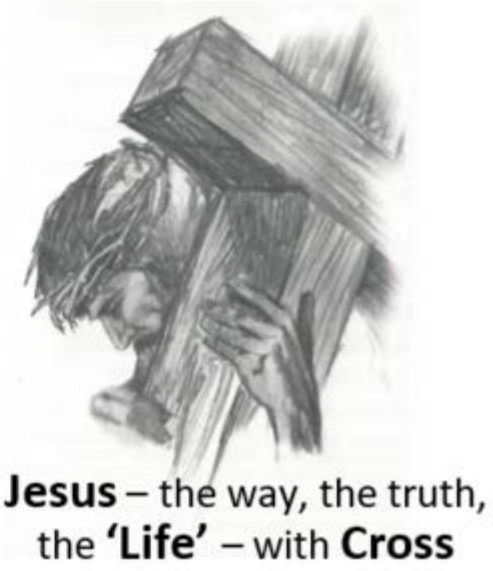

Image from a 2014 article (Q) discussing the similarities between Horus and **Jesus**, each with a cross (or ankh), the symbol of life and afterlife.

“The original Hebrew-Aramaic name of **Jesus** is yeshu‘a, which is short for yehōshu‘a (Joshua) [compare: Joshua 10:13], just as Mike is short for Michael. The name yeshu‘a occurs 27 times in the Hebrew Scriptures, primarily referring to the high priest after the Babylonian exile, called both yehōshu‘a (see, e.g., Zechariah 3:3) and, more frequently, yeshu‘a (see, e.g., Ezra 3:2). So, Yeshua’s name was not unusual; in fact, as many as five different men had that name in the Old Testament. And this is how that name came to be “Jesus” in English: Simply stated, this is the etymological history of the name Jesus: Hebrew/Aramaic yeshu‘a became Greek Iēsous, then Latin Iesus, passing into German and then, ultimately, into English, as Jesus.”

— Michael Brown (2013), “What is the Original Hebrew Name for Jesus?” (Q)

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External links

- Jesus – Wikipedia.

θΔics

In religio-mythology, **Jesus Christ** (CR:213), a conjunction of Jesus + Christ, a character morph or syncretism of "Osiris risen", "Horus Anointed", and "Ra reborn", in short, in association with his mother, the Virgin Mary (Isis, Stella Maris), is the most dominate name in world literature, whose representation is held in 101,001 works in 155,545 publications in 230 languages and 3,387,028 library holdings. [1]

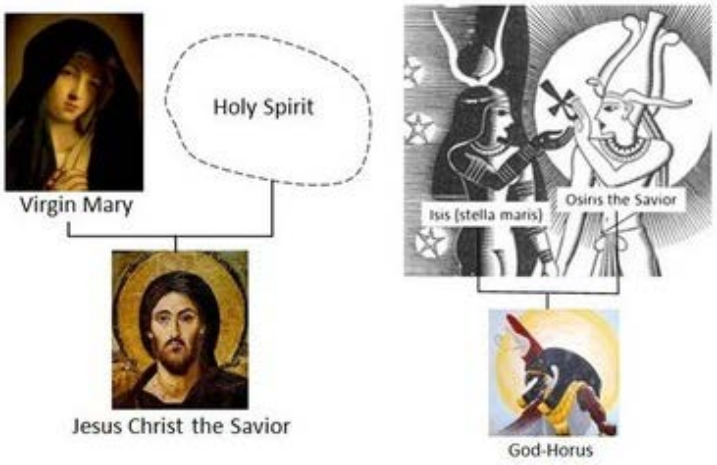

A snapshot of the how the resurrection of Osiris was re-written, in Christianity, into the resurrection of **Jesus**, and, in Hinduism, in to the reincarnation of Buddha. [1]

The names Jesus and Mary, so called patriarch and matriarch of Christianity, as explained in comparative mythology and religion, are the only two, of the top seven names of the WorldCat 100, including Bach, Goethe, Lincoln, Mozart, Shakespeare, that are fictional.

The great anchoring of the real existence of a person named Jesus Christ, who of course is modern-day rewrite of Osiris resurrection (of Ra theology), is the single greatest barrier to the future potential bridging the gap between the two cultures.

Other

In 37-41AD, Julius Canus (c.10BC-c.35AD), a Stoic philosopher, was condemned to death by Caligula, who promised to appear to his friends after death, and inform them of the state of the soul after quitting the body; as reported by Plutarch and Seneca, and commented on by Julien la Mettrie (1747), he appeared to one of them, a person named Antiochus, in a vision. (Q)(Q)

Jesus | Early descriptions

In c.150AD, Justin Martyr, his heretical “Acts of John”, described Christ as encountering his followers in “many different guises, not especially a human one”, i.e. a human with a falcon head, i.e. god Horus:

In 350AD, the author of Pistis Sophia, describes (Q) how the Virgin Mary asked Jesus to tell her how many places of punishment there are in the “outer darkness”, to which Jesus replies: [6]

> “The outer darkness is a great serpent, the tail of which is in its mouth, and it is outside the whole world, and surroundeth the whole world; in it there are many places of punishment, and it containeth twelve halls wherein severe punishment is inflicted. In each hall is a governor, but the face of each governor differeth from that of his neighbour. The governor of the first hall hath the face of a crocodile, with its tail in its mouth [description continues with Jesus describing all 12 halls].”

This serpent is the Egyptian Ouroboros. Wallis Budge (1904) comments on this: [6]

> “It is quite clear that in the above extract from the famous Gnostic work we have a series of chambers in the outer darkness which has been borrowed from the twelve divisions of the Egyptian Tuat already described, and the reader has only to compare the vignettes to Chapters cxliv. and cxlv. of the *Book of the Dead* with the extract from "Pistis Sophia" to see how close the borrowing has been. An examination of another great Gnostic work, generally known as the "Book of leu," proves that the Underworld of the Gnostics was nothing but a modified form of the Amentet or Amenti of the Egyptians, to which were added characteristics derived from the religious systems of the Hebrews and Greeks.”

In short, between 100AD and 600AD, Egyptian polytheism was reformulated into Roman monotheism. The Osiris-Horus “Christ” story kept getting watered down, until just a divine human remained.

Genealogy | Problem

The Bible gives two alternative genealogies of Jesus:

> "The learned have also been much tormented by the difference between the **two genealogies of Jesus Christ**. St. Matthew makes Joseph the son of Jacob, Jacob of Matthan, Matthan of Eleazar [Matt 1:16-17]. St. Luke, on the contrary, says that Joseph was the son of Heli, Heli of Matthat, Matthat of Levi, Levi of Melchi, etc. [Luke 3:24] They will not reconcile the fifty-six progenitors up to Abraham, given to Jesus by Luke, with the forty-two other forefathers up to the same Abraham, given him by Matthew; and they are quite staggered by Matthew's giving only forty-one generations, while he speaks of forty-two."
>
> — Voltaire (1764), *Philosophical Dictionary* (§Christianity) [5]

The 42 generations between Abraham and Jesus is a rescript of the Egyptian model of their being 42 gods (nome gods) in the Judgment Hall who presided over the weighing of the soul:

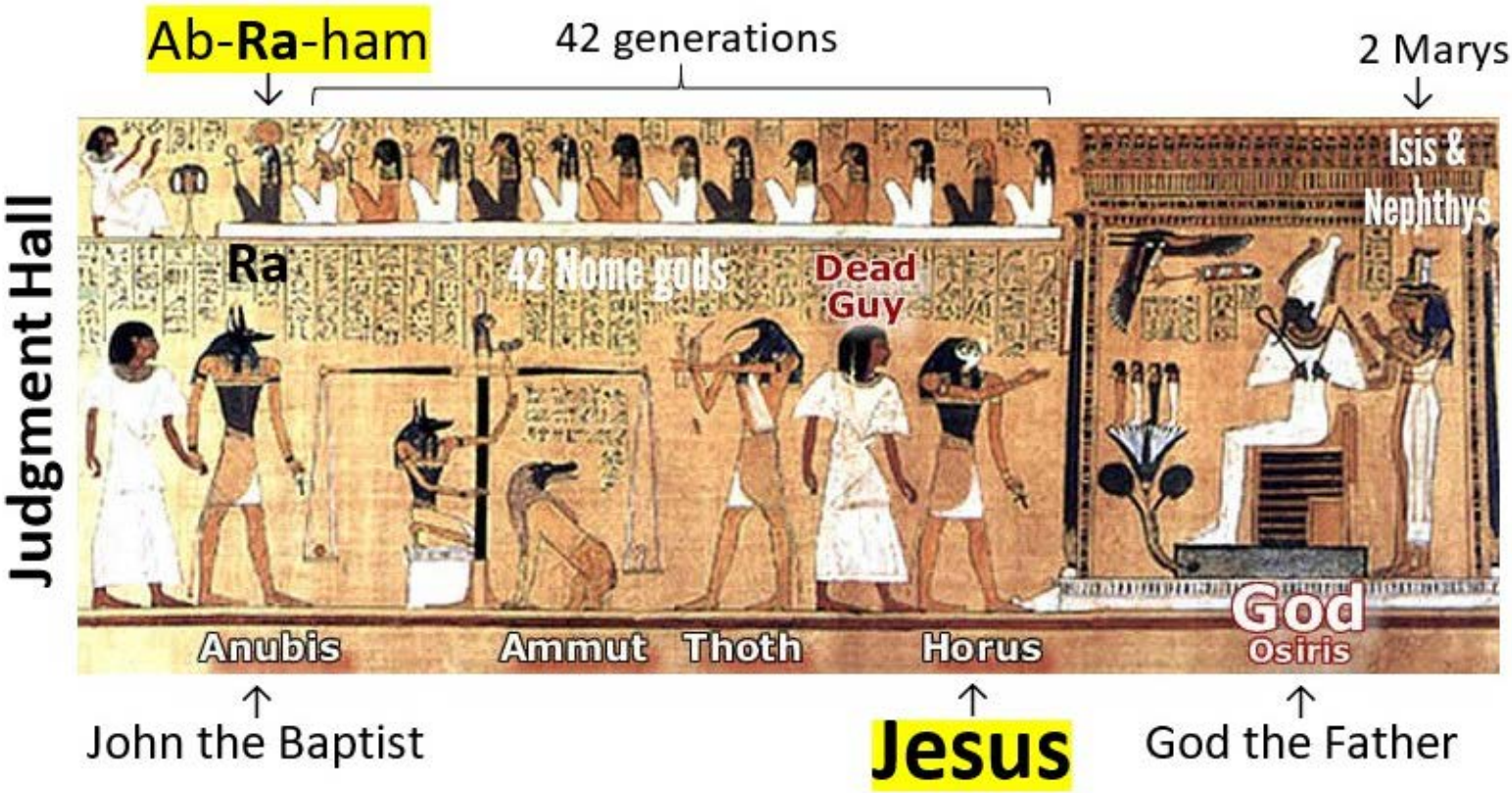

This has been summarized in video. (Q)

Transubstantiation | Osiris cakes

The origin of Catholic practice of "transubstantiation" is an inherited version of the ancient Egyptian ritual of making the Osiris cakes, i.e. bread made being symbolic of the reborn or regrown god Osiris, which took place during the annual 30-day Khoiak festival. [5]

Death and Resurrection of Jesus | John 19-20

> *See main: Death and Resurrection of Jesus; Compare: Death and Resurrection of Osiris*

The sentencing, crucifixion, and death of Jesus, is told in John 19 (Q), and in an alternative re-telling (Q) in Matthew 27; and in Mark Luke.

Thoth heals Horus' eye | Jesus heals blind man's eye

The following shows how the story of Thoth healing Horus's right eye (see: eye of Horus), by spitting on it and touching it, after it had been torn out by Set, was changed into the story of Jesus healing a blind man's eyes by spitting on them and touching them:

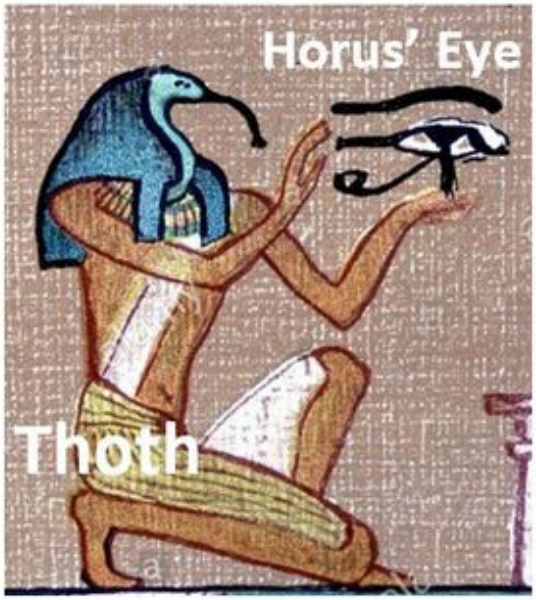

"**Thoth** heals **Horus**'s right **eye** by **spitting** on it and then **touching** it."
— Anon (1250BC), *Egyptian Book of the Dead* (Spell 17)

"**Jesus** heals a blind man's **eyes** by **spitting** on them and then **touching** them."
— Anon (150AD), *Bible* (Mark 8:23)

(add)

Soldier spears Jesus

The following is the original and rewritten version of the "sold spearing Jesus" in the story of the death of Jesus, according to John 19:33-34, in the Bible:

The original version (see: death and resurrection of Osiris), such as shown above left, one of the scenes on the walls at the Dendera Temple, described by Auguste Mariette (1873) and Wallis Budge (1911) as "Horus opening the mouth and two eyes of Osiris with a spear", in the presence of Isis, aka "Stella Maris" as the Greeks and Romans referred to her, was conceptualized, by the Egyptians, to the effect that the two eyes refer to the sun and the moon being reborn, and the opening of the mouth symbolic of the big dipper putting the breath of life into the Orion constellation before it rises from the dead, conceptualized as the god Sah, prior to later syncretism with Osiris.

Jesus resurrection | Osiris mummification

The following, below left, from the Temple at Dendera (Q), shows how the resurrection of Osiris became re-written into the resurrection of Jesus:

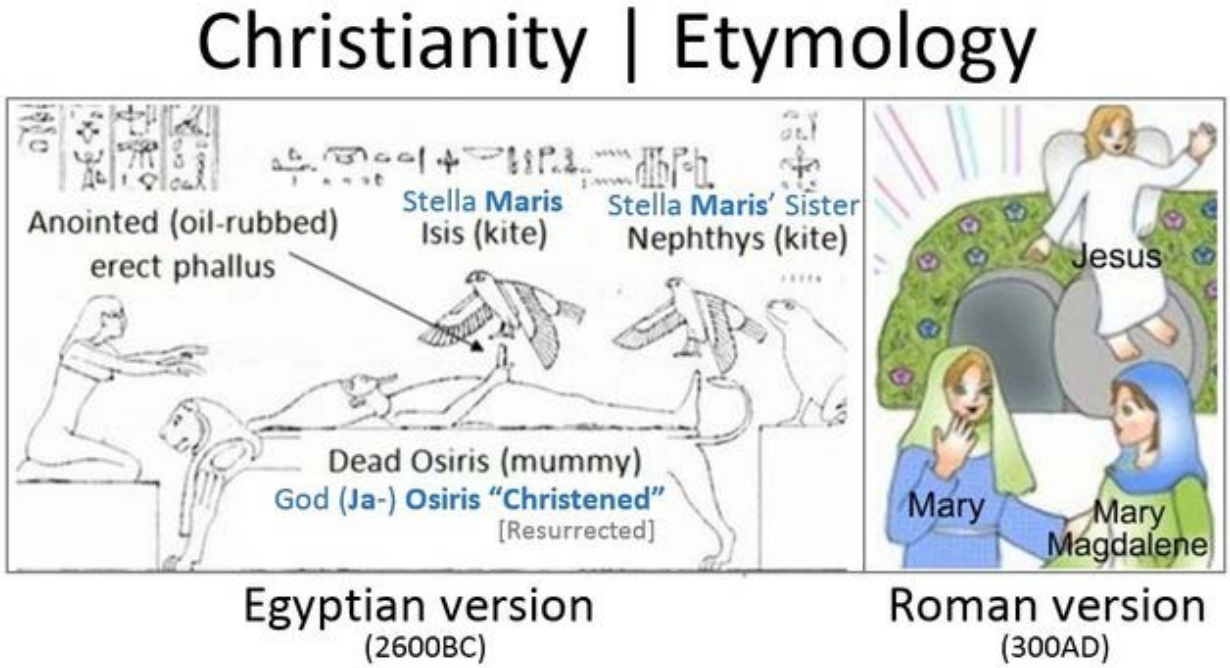

The following (Q) shows the shows the Isis (aka Stella Maris) on top of the tomb of Osiris, which became rewritten into Matthew 27:59-61 as "And when Joseph [god Geb] had taken the body, he wrapped it in a clean linen cloth, And laid it in

his own new tomb, which he had hewn out in the rock: and he rolled a great stone to the door of the sepulchre, and departed. And there was Mary Magdalene, and the other **Mary, sitting over** against **the sepulchre**."

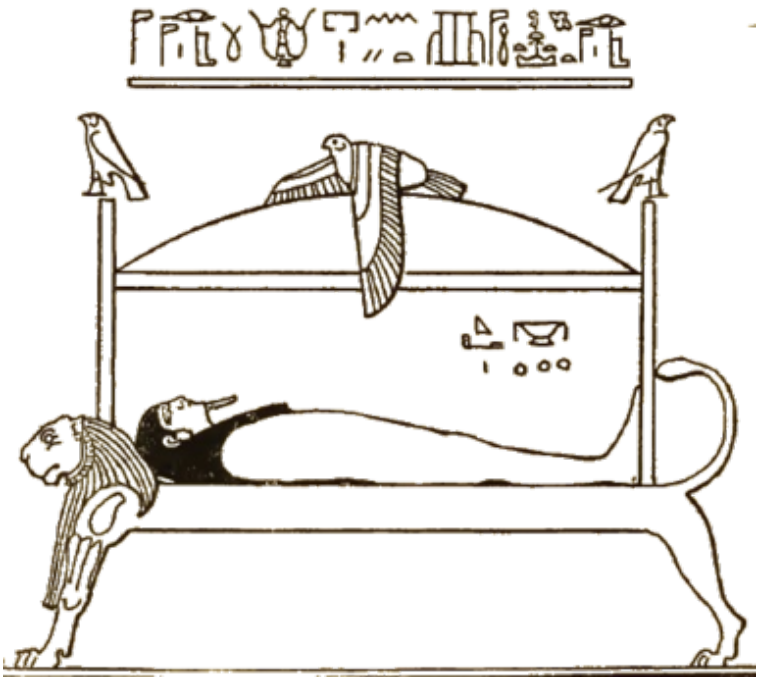

In the original version a mummified dead Osiris, had to be oiled, then wrapped in linen, after which during the "black rite", wherein the god Thoth stopped time, Osiris, as described in the story of the Passion of Osiris, is brought back to life by the power of the double resurrection sex with the goddesses Isis (Stella Maris) and Nephthys (Stella Maris' sister), in the form of kites, who bring him back to terrestrial life long enough to conceive the man-god child Horus. In the Christian version, Jesus is crucified, then oiled, and wrapped in linen, and only after TWO females named Mary, i.e. Virgin Mary and Mary Magdalene, clime "on top of" the sepulcher, which is a literary way of saying they have resurrection sex with the dead Jesus, is Jesus reborn into the afterlife.

12 disciples

The following is a comparison of Horus enthroned before the "twelve" in the Seventh Hour of Amduat, and Jesus and his twelve disciples: [4]

(add discussion)

Anointed | Christened | Oil rubbed

The term "Christ" derived from the Greek *Kristos* which means to "anoint" or to rub with oil, which derived from the fact that, in the 2700 resurrection story of the Passion of Osiris, the 14 body parts of the dead Osiris, after being chopped up by his brother Set, and scattered about the land, were re-collected by the goddess Isis, re-assembled, then rubbed with oil, then wrapped in linen, prior to "black rite" resurrection sex with two Marys: Isis (Stella Maris) and Nephthys (Stella Maris' sister). English religio-mythologist Gerald Massey (1907), referring to the two Marys as "two Mertae-sisters", explains this as follows: [3]

> “When Horus, or the Egypto-gnostic **Jesus**, rises in the sepulchre on coming forth to day it is in the semi-corporeal form of the Karestmummy that is not yet become pure spirit and therefore has not yet ascended to his father in the hawk-headed likeness of Ra. This figure can be studied in the tomb as that of Amsu. The scene of the resurrection is in Amenta, the earth of eternity, the earth of the manes, not on the earth of mortals. It is here the risen Horus breathes the breath of his new life into the sleeping dead to raise them from their coffins, sepulchres and cells. When the Egyptian Christ, or Karest, rose up from the tomb as Amsu-Horus it was in a likeness of the buried mummy, as regards the shape, with one arm loosened from the swathes or bandages. But this resurrection was *not corporeal on earth.* Osiris had been transformed into Horus, and although the mummy-shape was still retained, the texture had been transubstantialized; the *corpus* was transfigured into the glorious body of the Sahu or divine mummy. The mystery of transubstantiation was not understood by the writers of the Gospels, who did not know whether Jesus reappeared in the body or in spirit, as a man or as a god. They carried off all they could, but were not in possession of the secret wisdom which survived amongst the Egypto-gnostics. They wrote as carnalizers of the Christ. It follows that the risen Jesus of the canonical Gospels is not a reality in either world; neither in the sphere of time, nor as divine Horus transfigured into spirit. 'Tis but a misappropriated type; the spurious spectre of an impossible Christ; a picture of nobody. The Christian history fails in rendering Horus as an apparition of Osiris. When Horus came from Sekhem he had left the earthly body behind him in the sepulchre, and was greeted as pure spirit by the glorified ones who rejoiced to see how *he continued walking* as the risen Horus, he who " steppeth onward through eternity" (Rit, ch. 42). Jesus in this character comes forth from the tomb in the same body that was buried and still is human, flesh and bones and all. Thus, as a phantom, he is a counterfeit; a carnalized ghost,

upon the resurrection of which no real future for the human spirit ever could or ever will be permanently based. A corpse that has not made the transformation from the human Horus into Horus the pure spirit offers no foundation for belief in any known natural fact. Horus in his resurrection is described as being once more set in motion. At this point he says, " I am not known, but I am one who knoweth thee. I am not to be grasped, but I am one who graspeth thee. I am Horus, prince of eternity, a fire before your faces, which inflameth your hearts towards me. I am master of my throne, and I pass onwards." "The path I have opened is the present time, and I have set myself free from all evil" (ch. 42, Renouf). But when he is transubstantialized, it is said of the deceased in his resurrection : "The gods shall come in touch with him, for he shall have become as one of them." Now let us see how this was converted into history. Jesus is the prince of eternity in opposition to Satan, Sut, or Judas, the prince of this world. In his resurrection he is supposed to have opened the pathway from the tomb historically and for the first time some 1800 or 1900 years ago. When he rises from the dead he is unknown to the watchers, but he knows them. Mary knew not that the risen form was Jesus. He is not to be grasped, saying, "Touch me not," or do not grasp me, " for I am not yet ascended unto my Father" (John xx. 14, 17). On the way to Emmaus Jesus appears and inflames the hearts of the disciples towards him, after calling them "slow of heart," and "they said one to another, Was not our heart burning within us? " (Luke xxiv. 13, 32). Horus had opened a path from the tomb as the sun-god in the mythos, the divine son of god in the eschatology, and he ascended to his father and took his seat upon the throne of which he had become the lord and master. So Jesus goes on his way" unto the mountain," where he had appointed to meet his followers (Matt. xxviii. 16). The mountain in the Ritual is the mount of rebirth in heaven, whether of the sun-god or of the enduring spirit.

The change from bodily death to future life in spirit was acted as a transformation-scene in the mysteries of the resurrection. The mummy-Osiris was an effigy of death. The Sahu-mummy Amsu-Horus is an image of the glorious body into which Osiris transubstantiated to go forth from Sekhem as pure spirit. It is the mummy in this second stage that is of primary import. First of all the dead body was smeared over with unguents and thus glorified. During the process of anointing it was said, "O Asar (the deceased) the thick oil which is poured upon thee furnishes thy mouth with life " (Budge, " The Mummy," p. 163). It is also said that the anointing is done to *give sight to the eyes, hearing to the ears, sense of smell to the nostrils and utterance to tlie month.* To embalm the body thus was to karas it and the embalmment was a mode of making the typical Christ as the Anointed. Thus the mortal Horus was invested with the glory of the only God-begotten Son. Now this making of the Krst, or mummy-Christ, after the Egyptian fashion is apparent in the Gospels. When the woman brings the alabaster cruse of precious ointment to the house of Simon and pours it on the head of Jesus he says, " In that she poured this ointment upon my body, she did it *to prepare me for my burial"* (Matt. xxvi. 12). She was making the Christ as the anointed-mummy previous to interment. After the description of the crucifixion it is said that Nicodemus came and brought a " mixture of myrrh and aloes, about a hundred pound " and "they took the body of Jesus and bound it in linen cloths with the spices as the custom of the Jews is to bury" (John xix. 39, 40). This again denotes the making of the Karestmummy = the Christ. # Moreover, it is the dead mummy in one version and it is the living body in the other which is anointed, just as Horus was anointed with the exceedingly precious Antu ointment, or oil, that was poured upon his head and face to represent his glory.

The two Mertae-sisters are the watchers over the dead Osiris. They are also the mourners who weep over him when he is anointed and prepared for his burial. It is said of Osiris that he was triumphant over his adversaries on the night when Isis lay watching in tears over her brother Osiris (ch. 18). But the Mertae-sisters both watch and both weep over the dead body. In the vignettes to the ritual one of the two stands at the head and one at the feet of the body on the bier. These two mourners, weepers, anointers, or embalmers, appear in the Gospels as two different women. According to John it was Mary the sister of Martha who anointed Jesus for his burial. And as these are the two divine sisters in historic guise we ought to find one at the head of the victim and one at the feet, as, in fact, we do so find them. In the account furnished by Luke it is said that *the woman who stood behind at the feet of fesus weeping* "*began to wet his feet with her tears,* and wiped them with the hair of her head" (Luke vii. 38). No name is given for the woman who was "a sinner," which seems to denote the other Mary called Magdalene. Matthew also omits the name of the woman with an alabaster cruse or flask. In keeping with the mythos this other one of the two Mertae-sisters should be Martha, but the point is that the woman with the cruse does not anoint the feet of Jesus. She poured the ointment " *upon his head as he sat at meat"* (Matt. xxvi. 7). Thus we see there are two different women who anoint Jesus, one at the head, one at the

feet, even as the two divine sisters of Osiris called the Mertae, or watchers, stand at the head and feet of Osiris, when preparing him for his burial, or watching in tears, like Isis, the prototype of the woman who never ceased to kiss the feet of Jesus since the time when he had come into the house (Luke vii. 45-6). We have identified the other sister Nephthys, the mistress of the house, with the housekeeper Martha, and as Nephthys also carries the bowl or vase upon her head, this may account for the vessel of alabaster that was carried by the "woman" who poured the ointment on the head of Jesus, whereas Mary the sister of Martha poured it on his feet. Martha is one of the two Mertae by name. In the Egyptian mythos the two Mertae are Isis, the dear lover of Horus the Lord, bowed at his feet, and Nephthys mourning at his head (Naville, *Totdenbuch*, V. I., Kap. 17, A. g. and B. b.).”

(add summary)

Miracle | Raising people from the dead

The following recounts the origins of the "miracle" of Jesus raising people from the dead:

Original	Rewrite
Original: Horus raising Osiris (or Lazarus) from the dead with his ankh. Note: Pythagoras' student (or disciple) Empedocles (450BC), known to some as an “immortal god, no longer mortal”, was said to have raised a woman back to life who had been dead for 30 days. [3] →	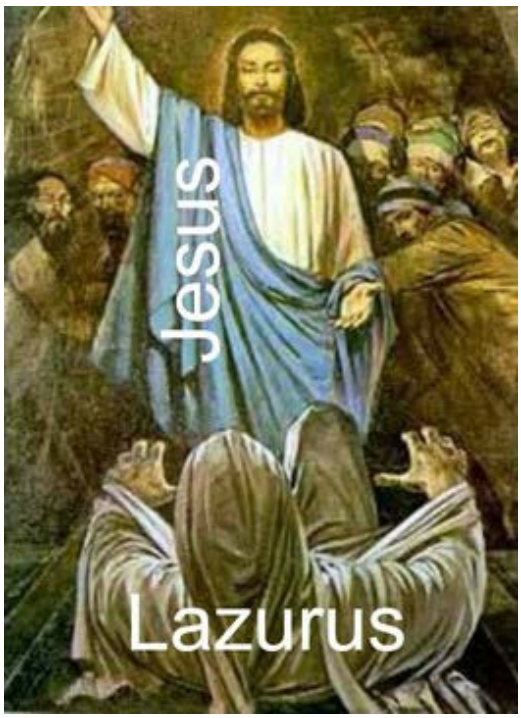

(add discussion)

Miracle | Measure of the fish

The following recounts the origins of the measure of the fish "miracle" of Jesus:

Original	Rewrite
In 510BC, the number 153 was regarded as sacred by Pythagoras and a miracle story of him catching a large number of fish was attributed to him; the ratio 265/153, being the height-to-width ratio of the intersection of two circles (called by Archimedes in 250BC the "measure of the fish"):	

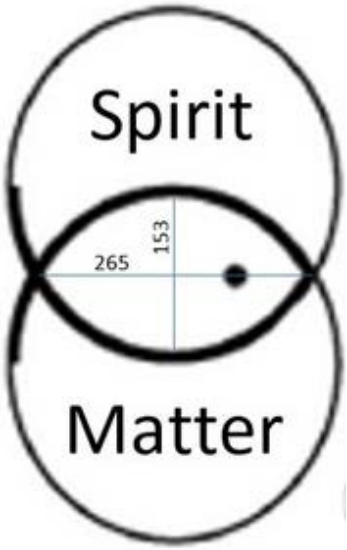

265/153 = √3

The ratio 265/153 being the nearest whole number approximation to the square root of three, the controlling ratio of the equilateral triangle, supposedly utilized in the design of the pyramids. [2]

→

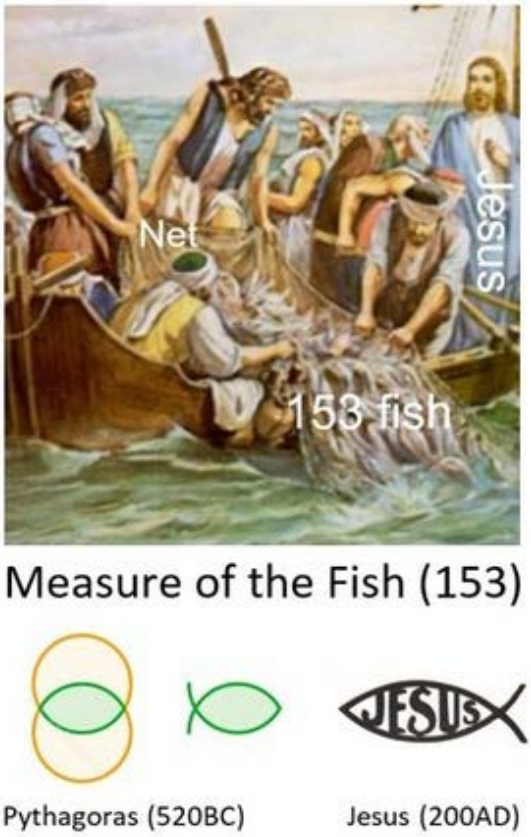

(add discussion)

See also

- People claimed to be son of god

Quotes

The following are related quotes:

> "I have dictated thirty pages on the world's three religions; and I have read the Bible. My own mind is made up. I do not think **Jesus Christ** ever existed."
>
> — Napoleon Bonaparte (1817)

References

1. Thims, Libb. (2011). *Purpose? (in a Godless universe)* (94-pg manuscript) (unfinished); Online as 105-page unfinished manuscript (14 Apr 2013) (Jesus, pg. 59). IoHT publications.
2. Freke, Timothy and Gandy, Peter. (1999). *The Jesus Mysteries: Was the Original Jesus a Pagan God?* (pg. 16). Three Rivers Press.
3. Massey, Gerald. (1907). *Ancient Egypt, the Light of the World: A Work of Reclamation and Restitution in Twelve Books, Volume 2* (Osiris, anointed, oil, pgs. 878-81). T.F. Unwin.
4. Hornung, Erik, Lorton, David. (1999). *The Ancient Egyptian Books of the Afterlife* (pg. 48) (O). Cornell University Press.
5. (a) Voltaire. (1764). *Philosophical Dictionary* (§Christianity) (txt). Publisher.

(b) Joshi, Sunand T. (2014). *The Original Atheists: First Thoughts on Nonbelief* (pg. 53). Prometheus Books.
6. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (pgs. 265-66). Dover, 1969.

External links

- Jesus – Wikipedia.

θΔics

In non-existences, **Jesus never existed** refers to the studied, thought out, and or reasoned opinion, e.g. silent historians problem, Osiris-Horus overlaps, god character rescripts, etc., that Jesus Christ (0-33AD), the supposed-to-have-existed figurehead of Christianity, "never existed" as a real person, but rather is a post ad hoc character invention; the term "achristism", similar to atheism, is disbelief in the existence of Jesus and or Christ.

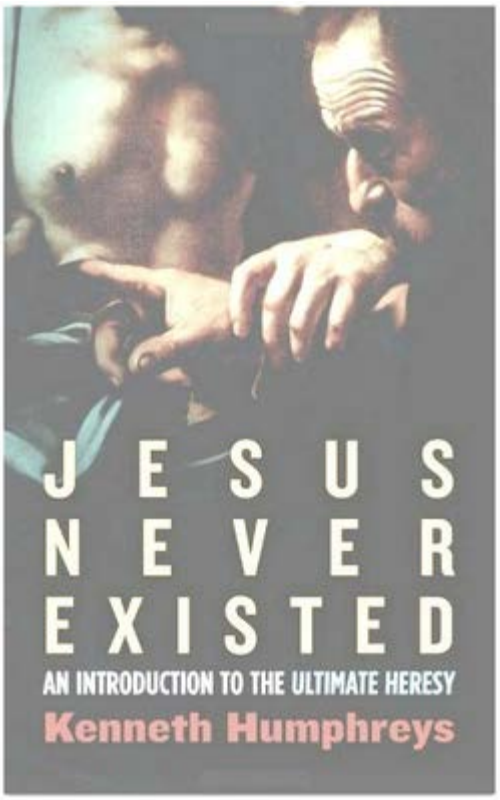

Kenneth Humphreys 2005 book *Jesus Never Existed*, based on his 2001 launched site JesusNeverExisted.com, wherein he expounds on the historical views of some that Jesus never existed, i.e. that he was not a real person, but a mythical figure.

Overview

In c.170AD, Lucian, in his *Passing of Peregrinus*, gave one of the first secular, i.e. real person, accounts of the existence of Christians as a distinct actual faith common to a group of people who considered each other brothers; the gist of which is as follows: [1]

> "The Christians, you know, worship a man to this day—the distinguished personage who introduced their novel rites, and was crucified on that account. … You see, these misguided [deluded] creatures start with the general conviction that they are immortal for all time, which explains their contempt of death and voluntary self-devotion which are so common among them; and then it was impressed on them by their **original lawgiver** that they are all brothers, from the moment that they are converted, and deny the gods of Greece, and worship the **crucified sage**, and live after his laws. All this they take quite on faith, with the result that they despise all worldly goods alike, regarding them merely as common property."

There is, however, to note, no evidence that this "crucified sage", referred to here by Lucian, was a real person, but rather a recension theory meld, blend, god-man anthropomorphized syncretism of the previous crucified gods (see: Osiris rescripts) of the period (see: supreme god timeline), namely: Serapis (Vespasian, 69AD), Osiris (Nero, 54AD), Dionysus (Ptolemy IV, 204BC), Serapis (Osiris-Apis), Ptolemy II, 250BC), Amen-Ra / Horus; Serapis (Ptolemy I, 305BC), all of which derive from Osiris and the apparent rising of the Orion constellation and the bulk mythology associate with this. The gist of this is that there was a Roman recension in the works; retrospect historical commentary, accordingly, has worked to assign an actual "person" to this movement, which is as about as creditable as aiming to assign an actual person to any of the other religious recensions dating previous, back to 3,100BC.

In 1514, Pope Leo X classified Christ as a fable (see: Christ fable).

In the early 19th century, thinkers to state their researched opinion that Jesus never existed are the following:

> "I have dictated thirty pages on the world's three religions; and I have read the Bible. My own opinion is made up. **I do not think Jesus Christ ever existed**. I would believe in the Christian religion if it dated from the beginning of the world. That Socrates, Plato, the Mohammedan, and all the English should be damned is too absurd. Jesus was probably put to death, like many other fanatics who proclaimed themselves to be prophets or the expected Messiah. Every year there were many of these men."
>
> — Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr [1]

> "Thou hast in this pamphlet all the sufficient evidence, that can be adduced for any piece of history a thousand years old, or to prove an error of a thousand years standing, that such a *person* as **Jesus Christ never existed**; but that the earliest Christians meant the words to be nothing more than a personification of

the principle of reason, of goodness, or that principle, be it what it may, which may most benefit mankind in the passage through life."

— Robert Taylor (1828), *Syntagma of the Evidences of the Christian Religion* [2]

"**Such a person as Jesus Christ, alleged to have been of Nazareth, never existed**; the Christian religion has no such origin as has been pretended; neither is it in any way beneficial to mankind; but that it is nothing more than an emanation from the ancient Pagan religion."

— Robert Taylor (1829), "Debate Circular", Sent to leading Clergyman of Cambridge (Q)

In 2001, Kenneth Humphreys, being inspired (Q) by: Earl Doherty (*The Jesus Puzzle*, 1999); Dorothy Murdock (*The Christ Conspiracy*, 1999); Timothy Freke and Peter Gandy (*The Jesus Mysteries*, 1999); George Wells (*The Jesus Myth / The Jesus Legend*, 1999); Arthur Drews (*The Christ Myth*, 1910); Robert M. Price (*Deconstructing Jesus*, 2000); Hyam Maccoby (*The Mythmaker: Paul & the Invention of Christianity*, 1987); Burton Mack (*Who Wrote the New Testament?*, 1995); and Elaine Pagels (*The Gnostic Gospels*, 1979), launched: JesusNeverExisted.com, which turned (Q) 2014 book. [3]

Presently, according to recent polls, 92% of Americans (Q) think Jesus was a real person who actually existed and 60% of British (Q) think Jesus was a real person.

References

1. (a) Bonaparte, Napoleon. (1817). "Comment to Gaspard Gourgaud", Apr.
(b) Gougaud, Gaspard. (1898). *Talks of Napoleon at St. Helena with General Baron Gourgaud: Together with the Journal Kept by Gourgaud on Their Journey from Waterloo to St. Helena* (pg. 276). Nabu Press, 2012.
(c) Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pg. 109). Prometheus.
2. Taylor, Robert. (1828). *Syntagma: of the Evidences of the Christian Religion* (Preface) (Q). Publisher.
3. (a) Main – JesusNeverExisted.com.
(b) Humphrey, Kenneth. (2005). *Jesus Never Existed: an Introduction to Ultimate Heresy*. Publisher, 2014.

External links

- Do atheists think Jesus existed as a real person? (2016) – Reddit.

θΔics

In atheism, **Jewish atheism**, as contrasted with Christian atheism, Islamic atheism, or Hindu atheism, refers to disbelief in god from the point of view of one coming from an Judaic religious background or Jewish cultural milieu; the term “ex-Jewish atheist” is sometimes used as an auto-label by this type of atheist.

A basic "new atheism" poster, with the religious background of each atheist labeled, indicating the peculiar phenomenon that 50% of new atheists, according to above poster grouping are of Jewish background, whereas Jews themselves account for on 0.2% of the world religious beliefs, as compared to 32% for Christians.

Overview

In 2010, Robert Putnam and David Campbell, according to polling research, found that about 50 percent of American Jews, doubt the existence of god; which can be compared to other Americans where the number is between 10 and 15 percent. [2]

In 2011, David Silverman, who was born into a Jewish family, asserting (Q) that he became an atheist at age 6, thereabouts becoming open about his disbeliefs, and in a Q&A with David Pakman, stated the following: (Q)

> **Pakman**: Last thing: did you grow up an atheist? When did you ... were your parents atheists? How did this all happen?
>
> **Silverman**: I could spend a lot more than just a few minutes on this. I was raised in a Jewish home. My mother insisted I was an atheist when I was six. I remember the moment I became an atheist when I was six years old very clearly. Nothing happened to instigate it. I lost god, the Easter Bunny, the Tooth Fairy, and Santa Claus all at the same time. I didn't believe ever. I went to [and] had my Bar Mitzvah as an atheist. And I stood up in front of my friends and my family during my Bar Mitzvah and I said, 'Let us declare the greatness of our god and render honor under the Torah which god gave through Moses as a heritage through the congregation of Jacob...' I had the whole thing memorized, didn't believe a word of it. My mother knew I didn't believe a word of it, but I didn't get a choice, because I was 13. So I went through the whole Bar Mitzvah, I went through the confirmation process as an atheist, and I asked a whole bunch of questions in Hebrew school, and it never stuck. Interestingly, it wasn't until I was 30 years old and New Jersey State Director of American Atheists that my father came out to me and told me he was an atheist.

In 2015, Silverman, in his *Fighting God*, devoted a six-page section to “Jewish atheism”, wherein he discusses how he retracts his previously held attempts to justify Jewish atheism per the view that Judaism is both a “religion and a culture” or “race and a religion”, separable from each other:

> “I have since concluded I was wrong—when I tried to justify Jewish atheism, for this book, and failed.”

Silverman, in this section, goes through a number of interjections, e.g. with Penn Jillette, who is married Emily Jillette, an atheist of Jewish descent, whose family members attempt to state that their kids are Jewish by “Jewish law”, among other examples. [3]

Among notable, prolific, or public atheists, a peculiarly large percentage come from Jewish background and or upbringing; some of which are listed below:

- Albert Einstein

Arthur Jonath
Ayn Rand | Randianism (aka Objectivism)
Benedict Spinoza | Spinozism
Carl Sagan
David Silverman
Karl Marx | Marxian atheism (aka Marxism)
Howard Bloom
Lawrence Krauss
Leon Lederman
Sam Harris
Sigmund Freud | Freudian atheism

Spinoza, the most powerful of the bunch, of note was excommunicated from the Jewish community for equating god with nature (see: Spinoza's god). [1] Sam Harris, who started writing his *End of Faith*, the day *after* 9/11, of note, is oft-credited with starting new atheism. Freud and Ayn Rand, of commonality, both started their own brand of atheism.

Films

In films, two prominent atheism-themed films, made by Jewish-background agnostic-atheists, include: Bill Maher's *Religulous* (2008) and Seth Rogen's *Sausage Party* (2016).

Quotes

The following are related quotes:

> "Gods are fragile things; they can be killed by a whiff of science or a dose of common sense."
>
> — Chapman Cohen (c.1920), *The Devil* (Q); in FSM atheism app

References

1. Winston, Kimberly. (2011). "Judaism Without God? Yes, say American Atheists" (Q), USA Today, Nov 26.
2. (a) Putnam, Robert D. and Campbell, David E. (2010). American Grace*: How Religion Divides and Unites Us* (atheist, 18+ pgs). Simon & Schuster.
(b) Winston, Kimberly. (2011). "Judaism Without God? Yes, say American Atheists" (Q), USA Today, Nov 26.
3. Silverman, David. (2015). *Fighting God: An Atheist Manifesto for a Religious World* (§: On Jewish Atheism, pgs. 53-59). MacMillan.

External links

● List of Jewish atheists and agnostics – Wikipedia.

θΔics

In mythology, **Jewish mythology** refers to a syncretism mythology, made in c.500BC by the Is-Ra-El-ites, constructed from an admixture of: Egyptian mythology, Sumerian mythology (or Babylonian mythology), and Greek mythology, wherein the god-to-prophet technique of god reduction was employed, e.g. the god Atum became the man or prophet Adam, implicitly, starting from the basis of the then prevalent two alternative creation myths (version A and version B), such as found on the Nesi-Amsu Papyrus (c.310BC), and made into the opening pages of Genesis.

Quotes

The following are related quotes:

> "The **Hebrew** redactors used Egyptian myths to make the biblical stories; which, from time to time, had Babylonian myths grafted onto earlier texts or replaced portions of the original stories."
>
> — Gary Greenberg (2000), *101 Myths of the Bible* (pg. 7) [1]

See also

- Christian mythology (Christianity)
- Egyptian mythology (Anunian theology)
- God character rescripts
- Hindu mythology (Hinduism)
- Jewish mythology (Judaism)
- Judeo-Christian pantheon

References

1. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (myth 53*:* "Abraham pretended that Sarah was his Sister", pgs. 131-34). Source Books.

External links

- Jewish mythology – Wikipedia.

θΔics

In acronyms, **JHT** is short for the *Journal of Human Thermodynamics*, a semi-annual publication of topics on the thermodynamics of human life. [1]

See also

- JHT: Journal article potentials
- HT
- IoHT
- EoHT

References

1. (a) *Journal of Human Thermodynamics*, Chicago: IoHT Publishing.
(b) Journal of Human Thermodynamics – Google Books.
(c) Journal of Human Thermodynamics – WorldCat.org.

θΔics

In Hmolpedia, the **JHT formatting** page outlines the requirements for submitted articles to the *Journal of Human Thermodynamics* (JHT).

> "Ninety-nine percent of journal articles get read by at most seven people, and this includes the author, the author's mother, best friend, and dog."
>
> — Anon (c.1990), read somewhere by JHT founder Libb Thims; in remotely the above form

JHT founding editor Libb Thims does all of the editorial processing of newly-submitted, hence it is in the time-saving interest of both particles to have articles in the proper JHT-style format prior to submission and in a "readable" format.

JHT publication philosophy

A key word in writing philosophy of American electrochemical engineer Libb Thims, in regards to journal article production, writing, and reading, is "readability", the term bring to mind English science writer Matt Ridley's 1999 *Genome: the Autobiography of a Species in 23 Chapters*, a national bestseller, that was the writing-style presentation template on which Thims began to mold himself as a writer. Centric to this writing philosophy, as concerns "journal" writing is the aim to get people, and not just academics, but lay people in the street and in their homes, to read. The above old saying about how the average journal article gets read by at most seven people is something Thims keeps in mind in his writing and this applies to JHT publication philosophy.

A key philosophical focus of JHT articles is "**readability**" namely to produce articles that are readable by the average person, while at the same time keeping reference finding functionality (for scholars) and intellectual correctness (for the adept mind).

There is a fine balance in the art of keeping science writing "alive" so-to-speak.

Q&As

The following are common JHT queries:

Q: How long should my article be?
A: Typically 5-15 pages, unless otherwise discussed.

Q: Can the article be a literature view or a survey?
A: Yes, literature thermodynamics, for example, is an active field. Data collection surveys (with discussion) are welcome as well.

Word JHT template

The link to the Word file of the JHT template page is here:

http://www.humanthermodynamics.com/JHT_PDF__format_page_.docx

New JHT submissions should be inputted into the Word formatted page (above) and sent as an email attachment to Libb Thims (libbthims@gmail.com).

General

General JHT formatting protocols include the following:

Factors	Example
Names of people	If a person is cited in the body of an article, it must include three things: 1. **Full name** (e.g. Albert Einstein (good) vs. Einstein (bad)) 2. **Nationality** (e.g. German-born American) 3. **Title** (e.g. physicist) The first time their name is mentioned, include: nationality (e.g. German-born American), first and last name (e.g. Albert Einstein), and title (e.g. physicist). This applies to every single person cited in the article. After the person is introduced, the first time, into the article, thereafter the surname (last name) may be use alone (e.g. "Hence, according to Einstein, energy and matter are equivalent.")
Title	Intellect-catching titles (e.g. *Genome: the Autobiography of a Species in 23 Chapters*)
Division of material	23 rich chapters for a 344-page book (e.g. *Genome*), as an example, as compared to 6 bloated chapters for a same-sized book.
Artwork	The "visual" use of text-related diagrams, e.g. figures, images, drawings, etc., are encouraged; although not to the affect that the article becomes a picture book.

Conjunctions

Almost always never start sentences with a conjunction. For example:

> WORSE: The conclusion here, in regards to the use of information theory in thermodynamics, is that sending text messages is not entropy. *However, there is a role* in which text messaging can be interpreted in human chemical thermodynamic terms, as a function of free energy (see: human free energy).
>
> BETTER: The conclusion here, in regards to the use of information theory in thermodynamics, is that sending text messages is not entropy. *There is, however, a role* in which text messaging can be interpreted in human chemical thermodynamic terms, as a function of free energy (see: human free energy).

Third person

Always write in the third person.

Run-on paragraphs

Try to avoid run-on paragraphs. Certainly, there are a few exceptions where an author seems to have mastered the art of extended length sentences that employ dashes and colons to created paragraph length or page length chains of thought in the form of one connective sentence (William James comes to mind here), but, in regards to JHT articles, assume one is not a master and aim to facilitate the mind of reader not the writer. This means breaking up complex thoughts into digestible sentences.

Parentheses

Try to avoid overuse of “parentheses” in paragraphs. The article submissions of Georgi Gladyshev come to mind here. The following, for example, is 19 Apr 2006 email message sent to Libb Thims by Gladyshev, similar in style to the types of articles that Thims had to repeatedly spend time on converting parenthetic- structured sentences, such as shown below (wherein we see parentheses with in parentheses), into comma-structures sentences:

> “For decades, many scientists have looked at the increase of specific chemical tissue component of the Gibbs free energy during biological evolution (aging) of living systems (the biological evolution (aging) goes from water to organisms which contain many organic substances). They believe that the living systems spontaneously move away (run away) form chemical equilibrium. That is why IIya Prigogine proposed his theory, etc.! I understood that this effect is a secondary effect. It is connected with the thermodynamics of spontaneous supramolecular interactions that correspond to the second law! The law of temporal hierarches helps me to do this. Thus it was the principle point.”

Certainly there is a difference, e.g., between the choice of the terms "move away" versus "run away", just as there is a subtle difference between Gilbert Lewis' term "freely-running" (1923) versus "freely-going" (semi-modern) (see also: "What's the go o' that? | Maxwell), but this difference needs to be addressed in the article, or else layers upon layers of ambivalence are created, which thus works to detract the new reader from seeing *exactly* what is in the author's mind. There are important semantic difference, for example, between something that is "going" as compared to something that is "running".

To exemplify further, in his In his 1925 *Anatomy of Science* (§7: Non-Mathematical Sciences), Lewis delves into the at-the-time tricky question of evolution of the animate things/living things, terms which he rotates usage of. Rotation of term usage is indication that one is "undecided" in regards to which is the correct term to use.

Neologisms

Do not submit JHT articles filled with neologisms and vocabulary that is peculiar to your own personal thoughts and notes. The main meaning of “neologism”, according to Merriam-Webster, is “a new word, usage, or expression”; the second meaning, according to Merriam-Webster, is “a meaningless word coined by a psychotic”. One must always keep this in mind, particularly when writing in the hmolsciences, as over-zealousness and mania are common in the new stages of theory development, particularly because hmolscience theories tend to take decades to develop, hence in the going public stage of theory launch, there is a certain fuel that tends to encourage inflated over-importance to certain things over that of reflective reserve, the latter which requires a time-delayed reflective stage of processing, and digestion of peer feedback.

New words are certainly a step in the process of scientific writing, but if they are to be done in JHT article, they must be accompanied by a full and clear definition of the newly introduced term. Hence, for example, do not start off an abstract with the sentence:

> “Psychic neuroentropic bioenthalpy is argued to facilitate post-human chemistry apertures involved in soulatrophic pathways of entropmorphic atoms.”

The writings of Mark Janes and Peter Baofu come to mind here.

Citation formatting

The following, to exemplify citation issues, is the the JHT citation formate for American engineer Myron Tribus’ 1971 article “Energy and Information”,

shown above MLA, APA, and Chicago citations methods, which some authors will sometimes use in their JHT submissions. This, however, clogs things up, as Thims then has to go through all the citation, by hand, and convert, say from, Chicago or AMA to JHT style.

JHT	Tribus, Myron and McIrvin, Edward C. (1971). "Energy and Information", *Scientific American*, 225(3):179-88.
MLA	Tribus, Myron, and Edward C. McIrvine. "Energy and information." *Scientific American* 225.3 (1971): 179-188.
APA	Tribus, M., & McIrvine, E. C. (1971). Energy and information. *Scientific American*, *225*(3), 179-188.
Chicago	Tribus, Myron, and Edward C. McIrvine. "Energy and information." *Scientific American* 225, no. 3 (1971): 179-188.

Further JHT format differences between "book" versus "journal" citations are shown below:

References

1. (a) Last, First. (Year). "Article Title", *Journal*, Vol(No): pages, Month.
(b) Reference two (to note one, if more than one)
(c) etc.
2. (a) Last, First. (Year). *Book Title* (pgs. cited). Publisher.
(b) Reference two (to note two, if more than one)
3. etc.

Note also that multiple references citing a given sentence are grouped and listed alphabetically. Hence:

NO: Einstein proved that matter and energy are equivalent. [1][2][3]

References
1. Author One. (Year). *Book* (pg. #). Publisher.
2. Author Two. (Year). "Article", Vol(No):Pages.
3. Author Three. (Year). *Book* (pg. 3). Publisher.

YES: Einstein proved that matter and energy are equivalent. [1]

References
1. (a) Author One. (Year). *Book* (pg. #). Publisher.
(b) Author Two. (Year). "Article", Vol(No):Pages.
(c) Author Three. (Year). *Book* (pg. 3). Publisher.

Inline citations

Inline citations or rather "in sentence" citations are not acceptable. A main focus of JHT is "readability"

NO: Einstein proved [1] that matter and energy are equivalent. [2]

References
1. Author One. (Year). *Book* (pg. #). Publisher.
2. (a) Author Two. (Year). "Article", Vol(No):Pages.
(b) Author Three. (Year). *Book* (pg. 3). Publisher.

Hence, for example, the following extensive usage of upwards of 10 inline citations per sentence:

> For the complex systems at the stationary states, the entropy generation has been proven to be always an extremum[17-25]. This result has been used in solid state physics[26,27], in two-phase flows[28,29], in the optimization of magnetic refrigeration[30], in economic analysis of production systems[31,32] and in biological systems[25,33] and in many other applications in chemistry and biochemistry[34].

needs to be editorially redacted into the following form:

> For the complex systems at the stationary states, the entropy generation has been proven to be always an extremum.[10] This result has been used in solid state physics, in two-phase flows, in the optimization of magnetic refrigeration, in economic analysis of production systems and in *bio*logical (*chnops*ological) systems and in many other applications in chemistry and *bio*chemistry (*chnops*chemistry).[11]

wherein (a) references are grouped into one (e.g. 26-34 regrouped into ref. #10 each listed secondarily as (a), (b), (c), etc.) and also we see life terminology upgrade clarification, in the use of the "bio-" prefix.

Name bracket citations

Also do not not use name bracket citations:

> No: It has been proved that matter and energy are equivalent (Einstein, 1905).

Three stage formatting

The JHT, as of 2012, uses a three stage submission process, as outlined below, which requires formatting additions. First, newly submitted articles are posted online as "as is", meaning articles "as" they actually are when first submitted by the submitting author, draft watermarked PDFs, hosed at HumanThermodynamics.com file servers, under the abbreviated title acronym, e.g. the draft submission article “Information Theory ≠ Thermodynamics: Science's Greatest Sokal Affair”, is uploaded online using the following URL title abbreviated file name (TNETIT):

> http://www.humanthermodynamics.com/TNETIT__draft_.pdf

This first draft submission is then linked to the *Journal of Human Thermodynamics* home page, shown below right, in stage one:

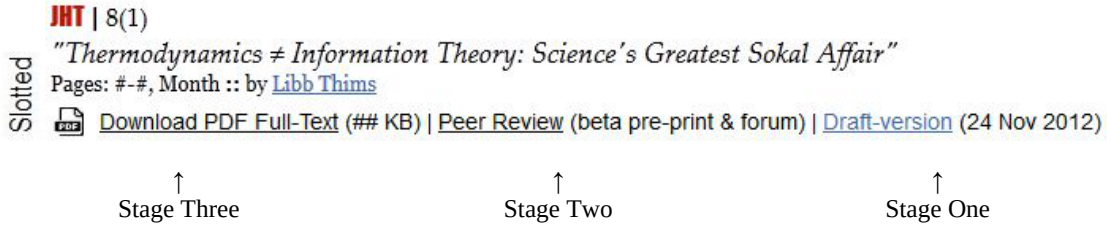

This will facilitated email exchanges of the new article submission among interested parties, and is a step that takes little time to completed. Articles in this stage should have their citations formatted as such:

> In American engineer Myron Tribus’ 1971 article “Energy and Information”, he told the Neumann-Shannon anecdote.[2]
>
> References
> 1.
> 2. Tribus, Myron and McIrving, Edward C. (1971). “Energy and Information”, *Scientific American*, 225(3):179-88.

In stage two, if they make it this far, article go into online "wiki" page format at the JHT beta wiki (eohtbeta.wikifoundry.com), filed as separate pages under the file header:

http://eohtbeta.wikifoundry.com/page/JHT+beta+%28submissions%29

In this stage two, articles be resubmitted with hyperlinked references, as follows:

In American engineer Myron Tribus' 1971 article "Energy and Information", he told the Neumann-Shannon anecdote. [2]

References
1.
2. Tribus, Myron and McIrving, Edward C. (1971). "Energy and Information", *Scientific American*, 225(3):179-88.

This will facilitate the open forum beta peer review process, meaning that reviewers will have quick access to links, terms, and references. Also note that in stage two, superscripts must be come square bracketed citations, i.e. "[2]" (stage two) versus "²" (stage one), being that the Wetpaint editing tools do not have superscript capabilities.

The formatting work of stage three, if articles make it this far, is mostly done by Thims.

Variables table

Last, but not least, every JHT submission needs to have a "variable table", such as the one shown below, that specifically defines how the author models the "individual" in the context of their theory or mindset:

Fisher's 1892 variable table

In Mechanics.			*In Economics.*
A particle	corresponds	to	An individual.
Space	"	"	Commodity.
Force	"	"	Marg. ut. or disutility.
Work	"	"	Disutility.
Energy	"	"	Utility.

American economist Irving Fisher's economics thermodynamics variable table, from his 1892 PhD dissertation *Mathematical Investigations into the Theory of Value and Prices*, described by Paul Samuelson as "the best of all doctoral dissertations in economics", the content of which was heavily influenced by the physics, chemical thermodynamics, and vector analysis teachings of his advisor, American engineer Willard Gibbs.

In 2011, following the discovery of American economisit Irving Fisher's economics thermodynamics variable table, shown adjacent, wherein Fisher defines a human as a "particle" (see: human particle), as found in American physical economics historian Philip Mirowski's 1989 *More Heat Than Light*, JHT founder Libb Thims began to request human thermodynamics variables table from submitting authors, so to (a) define what exactly the view the human to be, in their models, and (b) to define exactly how they see or view every other "variable" (or property) in their article, so to keep presentations away or aloof from obfuscation, misrepresentation, and or confusion.

Topics not accepted

The following are topics not accepted for JHT publication:

â— God theories
â— Life theories (perpetual motion theories; this includes origin of life theories; see: defunct theory of life)
â— Information theory (information theory; see: Shannon bandwagon)

See also

â— Hmolpedia: Editing rules

θΔics

In Hmolpedia, **JHT potentials** refers to potential or possible articles for the *Journal of Human Thermodynamics* (JHT). Add an article title below if you would like to see a certain topic discussed or published. The following list of titles are only tentative ideas for potential journal articles:

● “Relationships, Escape Velocities, and Orbital Trajectory Breaking” (Q)

New ideas | Recent

● “Mpemba effect and war” | 17 Jun 2013

New ideas | Semi-recent

● "Goethe meets Gibbs"
● "Thermodynamics: All's Fair in Love and War"
● "Maxwell's Demon meets Cupid"
● "Sports Team Trades and Chemical Potential" (see also: William Ramsay)

Other

● "On the Chemical Thermodynamics of Human Molecules"

Semi-old

● “Man, the Molecule of Society, is the Subject of Social Science” (quote by Henry Carey, *Principles of Social Science*, 1858)
● “On the Chemical Thermodynamics of Goethe’s *Elective Affinities*”
● “The Principles of the Thermodynamics of Evolutionary Psychology”
● “On the Myth of Evolution by Random Chance” (the word "random" not used in *Origin of Species*, supposedly stems from *The Blind Watchmaker*?*)*

Old ideas

● “Whoever Said State Functions apply to People?”

> Regarding the general query: “whoever said state functions apply to humans?”, see: Moriarty-Thims debate (2009), e.g. comments: #128, #160, etc.; The Literate Engineer's Jun 2005 comment (in Libb Thims (attack)); Ilya Prigogine’s 1977 Nobel Lecture “obviously” comment; and Mala Radhakrishnan’s 23 Sep 2013 tweet.

● “On the Thermodynamics of Hot or Not”
● “Thermodynamics of Extrovert and Introvert Personality Types”
● “On the Thermodynamics of Cold Sex” (see: 2005 study "Hot Sex, Cold Sex, Ambient Sex")
● "The the Nature of the Temperature of Sex" (see: 2005 study "Hot Sex, Cold Sex, Ambient Sex")
● "On Human Enthalpy"
● "A Review of C.G. Darwin's Human Statistical Thermodynamics" (*The Next Million Years*, 1952)
● "A Review of Mehdi Bazargan's Human Thermodynamics" (*Thermodynamics of Humans*, 1954)
● "On the Activation of Animate Matter" (harnessed by forces that stem from the future), (a Pierre Teilhard theory, e.g. see: *The Human Molecule*, pg. 28)
● "On the Ultimate Driving Force of the Mechanism of Evolution" (a Pierre Teilhard phrase, e.g. see: *The Human Molecule*, pg. 28)
● "On the Nature of the Energy Flow in Dissolving Relationships"
● “On the Nature of the Human Chemical Reaction”
● "The Thermodynamics of Human Behavior" (e.g. thermodynamic law of behavior)
● "The Thermodynamics of Human Activity" (e.g. Marguerite Callaway's 2006 "energetics of collective human activity" quote)
● "On Thermodynamic Analogies: Fact or Fiction?" (e.g. in 2006, Jozef Zycinski comments that his 2000 article “God,

Freedom, and Evil: Perspectives from Religion and Science", "offers an interpretation of human behavior with consideration of analogies from thermodynamics")
● "Child as Precipitate" (see: Karl Fink's 2001 'Goethe's Intensified Border' + thread: "I tend to view the child as a possible product or precipitate")
● "Relationships as Carnot heat engines" (the efficiency of the 'working' aspects of the relationship is purely a function of the difference in temperature between the hot body and the cold body (Carnot efficiency); albeit, this seems to operate on what each individually uniquely sees has 'hot' and 'cold' in various physics and mental aspects or traits unique about the opposite mated person)
● "On the Work of Relationships" (e.g. comment: 'I don't see how it's ever going to work between us', 'our relationship's not working anymore', 'it just works good between us, I don't know why?,' etc.) (see: principle of the transmission of work and mechanical equivalent of heat)
● "Thermodynamics of Human Interactions"

See also

● EoHT wiki: List of articles to write

θΔics

In journals, the **JHT review board** (listed below) refers to academic and scholarly reviewers for articles submitted for potential publication in the *Journal of Human Thermodynamics* (JHT).

> "To HEAT are due the vast movements which take place on the earth."
>
> — Sadi Carnot (1824), French physicist-engineer

"Human thermodynamics is the study of systems of human molecules."
— C.G. Darwin (1952), English physicist

The top section to the 2005-present cover of the *Journal of Human Thermodynamics*, showing that the cyclical heat input from the sun is what drives all processes of human existence, a set of phenomena studied by the science and laws of thermodynamics.

History

The JHT, as an internationally-registered scientific journal (ISSN: 1559-386X) was formerly established online on 02 Dec 2005. The review process for JHT articles in the years 2005 to 2010 was somewhat haphazard, involving a combination of email exchanges and online discussion. In 2011, in an effort to embrace open wiki format, and to get away from the older internal email review process, Iranian-born American chemical engineer Mohsen Mohsen-Nia's submission "A Thermodynamic Methodology for Evaluating Friendship Relations Stability", was tested using "open" beta wiki review format, wherein selected reviewers were requested to give "public" feedback, comments, critiques, and general peer review in wiki threads or via email. [2] A ten member JHT review board was formerly established on 23 Oct 2012, comprising: Libb Thims, Jing Chen, Jeff Tuhtan, Josip StepaniÄ‡, Curtis Blakely, Mohsen Mohsen-Nia, Kalyan Annamalai, Gerard Nahum, David Porreca, and Robert Kenoun.

JHT board members | Active

The following is the "active"—did peer review (see: submissions chronology) within last 12 months—JHT peer review board, ordered primarily by peer review count since 2011 and secondarily by date joined, the end columns showing peer reviews done per year:

Board member		Joined	Quote	2011	2012	2013	2014
Founding editor Libb Thims | American electrochemical engineer Institute of Human Thermodynamics, 4126 N. Keystone Ave, Chicago, IL 60641 USA **Phone:** 1-312-576-8158 **Website:** LibbThims.com **Email:** libbthims@gmail.com **Interests:** chemical thermodynamics and humanities **Related publications:** *Human Chemistry* (§16: Human Thermodynamics, pgs. 653-701) (2007), *The Human Molecule* (2008), Hmolpedia (2008-present), etc.	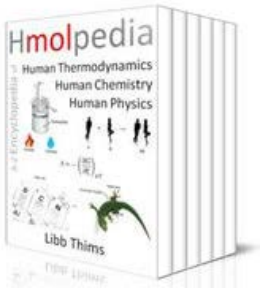	2005	"Plato is my friend, but truth my greater friend." — Aristotle [1]	2	1	4+	
Academic reviewer | Postdoctoral researcher Jeff Tuhtan | American ecohydraulic engineer and ecological thermodynamicist SJE Ecological Engineering GmbH. Viereichenweg 12, 70569 Stuttgart, Germany **Phone:** +49 (0)711 677-3435 **Website:** uni-stuttgart.academia.edu/JeffTuhtan Email: jtuhtan@gmail.com **Interests:** ecological thermodynamics, constructal theory, ecohydraulics, ethology **Related publications:** PhD "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality" (pdf) (2011), etc.		2011		1	2	3+	
Academic reviewer | Justice systems professor Curtis Blakely | American sociologist, criminal justice professor, and socio-physicist Justice Systems Department, Truman State University, 100 E. Normal, BT 2215, Kirksville, MO, USA **Phone:** (660) 785-7434 **Website:** justicesystems.truman.edu/web/faculty_directory/ **Email:** cblakely@truman.edu		2012	"The true sign of intelligence is not knowledge but imagination." — Albert Einstein				5+

Interests: physics, sociology, sociophysics, penology
Related publications: "Sub-atomic Particles and Prisoners: A Novel Examination of Socio-Physics and Penology", etc.

Scholarly reviewer | Electronics industry

Robert Kenoun | Iranian-born American materials scientist, metallurgical-electrical engineer, and social thermodynamicist
Email: robert.kenoun@sbcglobal.net
Interests: thermodynamics, energy, history, social evolution, prediction
Related publications: *A Theory of History and Social Evolution* (2006)

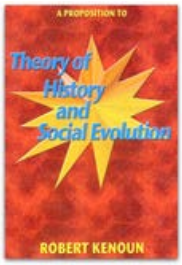

2011 1 1

Academic reviewer | Chemical engineering professor

Mohsen Mohsen-Nia | Iranian-born American chemical engineer and human thermodynamicist
Thermodynamic Research Laboratory, University of Kashan, Kashan, Iran
Division of Chemistry and Chemical Engineering, Caltech, Pasadena, California, USA
Email: moh.moh@cheme.caltech.edu
Interests: chemical thermodynamics, human relationship stability,
Related publications: "A Thermodynamic Methodology for Evaluating Friendship Relations Stability" (2011), etc.

2012 1+

Academic reviewer | Professor of classical and medieval studies

David Porreca | Canadian history thermodynamics scholar
Department of Classical Studies, University of Waterloo, 200 University Avenue West, Waterloo ON N2L 3G1, Canada
Phone: +1 519 746 7881
Website: arts.uwaterloo.ca/profprofiles/porreca
Email: dporreca@uwaterloo.ca
Interests: big history, societal organization, control of resources, etc., from the laws of thermodynamics perspective
Related publications: current research project on the thermodynamics of rise and fall of civilizations

2012 1+

Academic reviewer | Mechanical engineering professor

Kalyan Annamalai | Indian-born American mechanical engineer and thermodynamicist
Texas A&M University, MEOB 307, College Station, Texas 77843-3123, USA
Phone: 1-979-845-2562
Website: meen-apps1.tamu.edu/FacultyProfiles/facultyinformation.asp?LastName=kannamalai,
Research , Thermo Book, Combustion Book
Email: kannamalai@tamu.edu
Interests: thermodynamics, combustion theory, thermodynamics of biological systems (animate systems)
Publications: *Advanced Thermodynamics Engineering* (§14.4.1: Human body: formulae, pg. 726-27) (2011)

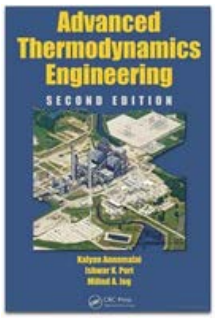

2012 1+

Academic reviewer | Mechanical engineering professor

Robert Balmer | American mechanical engineer and dean of engineering
Department of Engineering and Computer Science, Union College, Schenectady, NY, USA
Phone: 1-518-388-6530
Email: balmerr@union.edu
Interests: entropy of animate systems (fish); entropy and aging
Related publications: "Entropy and Metabolism: A Macroscopic View of Aging" (1978), "An Entropy Model for Biological Systems" (1984), *Modern Engineering Thermodynamics* (2011).

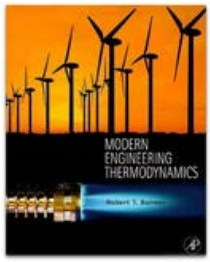

2013

Academic reviewer | Economics professor

Gheorghe Savoiu | Romanian economist and econophysicist

Department of Economics, University of Pitesti,
University of Pitesti,
Strada Târgul din Vale, PiteÈ™ti 110040, Romania
Email: gheorghe.savoiu@upit.ro
Interests: physical demographics [see: John Q. Stewart], econophysics, sociophysics, economic thermodynamics, two cultures synergy
Publications: *Econophysics: Background and Application in Economics, Finance, and Sociophysics* (2012)
See also: Romanian school of socioeconomic physics

2013 | 1

Academic reviewer | Physics professor

Ion Siman | Romanian physicist and sociophysicist
Department of Physics, University of Pitesti,
Strada Târgul din Vale, PiteÈ™ti 110040, Romania
Email: ioniorgasiman@yahoo.com
Interests: sociophysics, econophysics, and two cultures synergy
Publications: *Biophysics* (2000), *Econophysics: Background and Application in Economics, Finance, and Sociophysics* (2012) (co-author), etc.
See also: Romanian school of socioeconomic physics

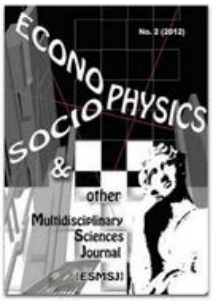

2013 | 1

JHT board members | Inactive

The following are the "inactive"—have not done peer review (see: submissions chronology) within last 12 months—JHT peer review board members, ordered by date joined, showing peer reviews done per year:

Board member	Joined	Quote	2011	2012	2013
Academic reviewer | Business school professor Jing Chen | Chinese-born Canadian mathematician and thermodynamic economist School of Business, University of British Columbia, 3333 University Way, Prince George, B.C., Canada, V2N 4Z9 **Phone:** 1-250-960-6480 **Website:** web.unbc.ca/~chenj/ Email: chenj@unbc.ca **Interests:** economics, finance, thermodynamics, entropy, human behavior, psychology, sexual selection **Related publications:** *The Physical Foundation of Economics: an Analytical Thermodynamic Theory* (2005), etc.	2005	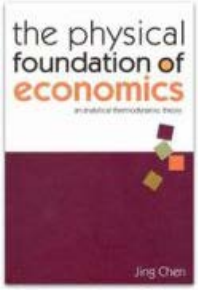		1	
Academic reviewer | Mechanical engineering professor Josip StepaniÄ‡ | Croatian physicist, mechanical engineer, and human thermodynamicist Faculty of Mechanical Engineering and Naval Architecture, Ivana Lucic 5, 10002 Zagreb, PO Box 102, Croatia **Phone:** +385 1 6168 222 **Website:** unizg.academia.edu/JosipStepanic **Email:** josip.j.stepanic@fsb.hr **Interests:** Thermodynamics and statistical physics of complex systems, interdisciplinarity, social systems theory, social free energy **Related publications:** "Social Equivalent of Free Energy" (2004); *Interdisciplinary Description of Complex Systems* (Editor-in-Chief), etc.	2011				
Academic reviewer | Pharmaceutical industry Gerard Nahum | American chemical engineer, medical school professor, and consciousness thermodynamicist Vice President of Global Clinical Development, Primary Care, Anti-infectives, and Women's Healthcare, Bayer HealthCare Pharmaceuticals, Montville, New Jersey, U.S. & Berlin, Germany **Website:** epernicus.com/ggn **Email:** GNahum2003@yahoo.com **Interests:** first law of thermodynamics, consciousness, cessation thermodynamics, physical information theory, continuity theories **Related publications:** “A Proposal for Testing the Energetics of Consciousness	2012				

and its Physical Foundation" (1998)

Review process

The JHT review process is diagrammed in the following flow chart schematic:

Step one		Step two		Step three
Libb Thims (collects article submissions) (via libbthims@gmail.com)	→	Articles are formatted (and then reviewed)	→	Articles are published (or rejected)

In short, JHT article submissions, in Word document format, are collected by Libb Thims, sent to him as attachments, primarily via libbthims@gmail.com or sometimes via questions@humanthermodynamics.com. The submitted articles are accumulated, as the year progresses, stored in computer file. At a point later in the year, Thims uploads each article into a JHT formatted online wiki page at the beta review site: JHT beta (submissions), each as a separate online article, ready to undergo the peer review and article improvement process, each review wiki article filed as a subpage to the JHT beta (submissions) header page. Thims then emails everyone (review board members and collective set of submitting authors) that the set of articles are ready for the open beta review process, and that everyone (review board members + authors + other interested parties) is now invited to review and comment on the said articles, through the following means of communication: (a) threads below each article, (b) text comments added into a review section at the top or bottom of wiki page of the article itself [as article changes can be tracked via the "about this update" and "complete history" links, below each article], (c) email reviews sent back to Thims (e.g. via word document attachment or email comments), or (d) other means the reviewer may think of to communicate his or her critique.

Other

German solid German metalurgist, solid state thermodynamicist, and professor of physical socio-economics Jurgen Mimkes reviewed for the JHT in 2011; but currently (Oct 2012) is busy with a book on physical economics with Peter Richmond to be published with Oxford U Press based on J. Mimkes, *Introduction to Macro-Econophysics and Finance Continuum Mechanics and Thermodynamics*, (2011) Springer, but wishes to be "kept posted" at to JHT progress and development.

References

1. Quote inscribed into Newton's age 19 written notebook *Philosophical Questions*.
2. Mohsen-Nia, Mohsen, Arfaei, F., Amiri, H., and Mohsen Nia, A. (2011). "A Thermodynamic Methodology for Evaluating Friendship Relations Stability", *Journal of Human Thermodynamics*, 7(2): 5-14, (Beta Review), Dec.

In Hmolpedia, **JHT slated** refers to *Journal of Human Thermodynamics* articles that are scheduled to be written per discussion with JHT editor Libb Thims. These slated articles are listed below:

↑ JHT ↓ Preprint

JHT slated articles become JHT preprint articles, either hosted from JHT servers, prior to JHT submission open beta review process.

Slated | Active

The following are slated articles with the most-recent email communication dialog:

Title | Slated: "A Constructal Approach to Human Thermodynamics"
Author: Jeff Tuhtan
Discussion: 6 May 2014 | preprint (pdf)

Title | Slated: "Protein Thermodynamics, Kinetic Proofreading, and Human Thermodynamics"
Author: Andres Florez
Discussion: 19 May 2014 | preprint (pdf)

Other recent authors to have been in more recent JHT article contribution discussions, include: Mirza Beg (May, 2014).

Slated | Semi-active

The following are slated articles, ranked according to submitting author activity, aiming to enter 2014 JHT submissions open beta peer review:

Article | Slated: "Social Cohesion Proportional to Temperature"
Author: Raddai Raikhlin
Received version (in Russian) circa Aug/Sep 2013

Article | Slated: "Two Cultures Formation Dynamics of Pitesti Econophysics and Sociophysics, 2006-2013"
Abstract: Nuts and bolts of the history and construction dynamical gears of the development of econophysics and sociophysics at the University of Pitesti.
Author: Gheorghe Savoiu
Date initiated: 30 Jun 2013 | Date draft (version 1): 13 Jul 2013 | **Preprint** (pdf)

Article | Slated: "Physical Socioeconomics of Romanian Population Explosion and Implosion"
Author [s]: Gheorghe Savoiu and Ion Siman
Date initiated: 30 Jun 2013 | Date draft estimated : 15 Aug 2013 | preprint (pdf)

Articke | "Unified Evolution Theory"
Author: John Patrick
Original: draft (15 Mar 2013)

Article | Slated: "Studies on Thermodynamics and the Humanities"
Author: Robert Balmer

Date [s]: | preprint (pdf)

Article | Slated: “Goethe, Gibbs, Adams, and Rossini's Chemical Thermodynamics in the Real World”
Author: Richard Schowen
Date Late Spring/Summer 2014: | preprint (pdf)

Article | Slated: “Title”
Author: Mark Janes
Date initiated: 22 Oct 2013 (semi-draft version received; too big) | Date new submission: (??)

Question mark?

The following are promised JHT articles but author activity interaction is either difficult (e.g. possibly backed out?), and or impaired (e.g. translation issues) in some way:

Article | Slated: “Thermodynamics and Urban Aesthetic Theory”
Author: Seda Bostanci

Article | Slated: “Molecular Human Networking”
Abstract: Outline on theory of human as a stable construct, and its propensity to share time, talents, trades, thoughts, and treasure, similar to how atoms share electrons to gain complexity.
Author: Drew Sowersby (Hmol user) (G+)
Date initiated: 14 Jul 2013 (Ñº) | Aim: 3-5 page theory overview article (w/ 3+ references)
Date preprint: Later summer / Fall | Preprint (pdf)

Process

When articles enter into readable preprint draft form, authors are advised to attach copies to Libb Thims (libbthims@gmail.com) so that he can make preprint pdfs available for preliminary (pre JHT submission review) discussion and perusal.

See also

â— JHT formatting
â— JHT potentials

θΔics

Newly-accepted **JHT article submissions**—to the *Journal of Human Thermodynamics*—are entered into their own wiki page, such as shown listed in the adjacent drop menu, and thereafter begin the open beta review, by the JHT review board and others, e.g. submitting authors are suggested to provide two or more reviewers, and article improvement process. [1]

2014

The following are 2014 submissions (see: JHT slated) either in the JHT review process, in the formatting process prior to entering review, or JHT article submissions that have passed through the open beta review process and have been published (✓) or rejected (✗):

Issue	Review Main	Title	Received	Author[s]	Review enter	Reviewed by	Review exit	Result
		"Big Bang Theory, Energy Flow, and Institutional Behaviors"		Curtis Blakely	26 Sep 2013	Libb Thims | Sep-Dec 2013		Retracted (Filtered-out) ✗ [N2]
10(1) ##-								
10(2) ##-								

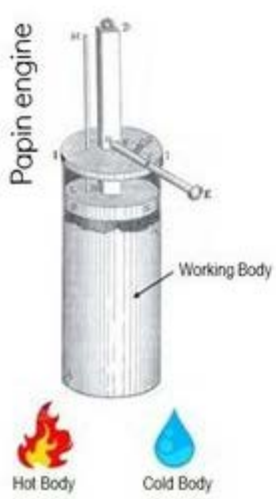

2013

The following are 2013 submissions either in the JHT review process, in the formatting process prior to entering review, or JHT article submissions that have passed through the open beta review process and have been published (✓) or rejected (✗):

Issue	Review Main	Title	Received	Author[s]	Review enter	Reviewed by	Review exit	Result

9(1) 1-28	OANP	"Old and New Paradigms for the Science of Human Behavior"	24 Oct 2012	David Bossens	15 Jan 2013	David Porreca | 20 Jan Curtis Blakely | 22 Jan Libb Thims | 23 Jan Jeff Tuhtan | 29 Mar	26 Apr 2013	Published ✓	pdf
9(2) 29-42	SEOS	"Social Equation of State"	12 Apr 2012	Mohsen Mohsen-Nia	30 Apr 2013	Curtis Blakely | 26 Dec Libb Thims | 30 Apr Kalyan Annamalai | 3 May ? Stephen Ternyik | 6 May Jeff Tuhtan | 6 May Umberto Lucia | 8 May Robert Kenoun | 11 May Ion Siman | 29 May	31 Dec 2013	Published ✓	pdf
9(3) 43-54	NLSS	"Natural Law Social Science: A Method of Socioeconomics as an Exact Science"	31 Jan 2012	Stephen Ternyik	3 May 2013	Kalyan Annamalai | 3 May ? Curtis Blakely | 7 May Libb Thims | 7 May Umberto Lucia | 8 May Mohsen Mohsen-Nia | 9 May Gheorghe Savoiu | 29 May	31 Dec 2013	Published ✓	pdf
9(4) 55-64	EGBD	"Entropy Generation, Brain Dynamics, and Thomas Aquinas"	12 Oct 2012	Umberto Lucia	7 May 2013	Libb Thims | 7 May Jeff Tuhtan | 9 May Arto Annila | 17 May Curtis Blakely | 20 May	31 Dec 2013	Published ✓	pdf

9(5) 65-76	DBPP	"On the Differences Between a Person and a Particle"	13 Nov 2012	Jeff Tuhtan	8 May 2013	Curtis Blakely | 14 May Libb Thims | 31 Dec	31 Dec 2013	Published ✓	pdf
9(6) 77-112	JDNM	"Juarrero, Deacon, Nonreductive Physical Materialism, and Chemical Teleology"	21 May 2013	Libb Thims	21 May 2013	Terrence Deacon | 22 May Evan Thompson | 22 May Colin McGinn | 22 May Stephen Ternyik | 2 Jun Vicente Talanquer | Date	31 Dec 2013	Published ✓	pdf

2012

The following are 2012 JHT article submissions that have passed through the open beta review process and have been published (✓) or rejected (✗):

Issue	Main	Title	Received	Author[s]	Review enter	Reviewed by	Review exit	Result
8(1) 1-120	TNIT	"Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair"	26 Jun 2012	Libb Thims	14 Dec 2012	Axel Roch Thomas Schneider Annick Lesne Roman Frigg Jeff Tuhtan Arieh Ben-Naim Ivan Erill Milivoje Kostic Thomas Young	18 Dec 2012	Published ✓
8(2) 121-132	STCL	"A Strange Thing Called Love: in View of Thermodynamics"	2 May 2012	Ravi Vedula Vamshi Regalla	26 Dec 2012	Jeff Tuhtan Libb Thims	30 Dec 2012	Published ✓

2011

The following are 2011 JHT article submissions that have passed through the open beta review process and have been published (✓) or rejected (✗):

Issue	Main	Title	Received	Author[s]	Review enter	Reviewed by	Review exit	Result
					21	Libb Thims		Retracted

	ASSP	"A Science of Social Power"	16 Feb 2011	Jim Grove	Feb 2011	Mark Ciotola | 28 Feb		(Filtered-out)	✗ N1
7(1) 1-4	(pdf)	"Thermodynamic Proof that Good Always Triumphs over Evil"	21 Mar 2011	Libb Thims			22 Mar 2011	Published	✓
7(2) 5-14	TMEF	"A Thermodynamic Methodology for Evaluating of Friendship Relations Stability"	21 Oct 2011	Mohsen Mohsen-Nia F. Arfaei H. Amiri A. Mohsen Nia	22 Oct 2011	Libb Thims Jewgeni Starikow Sean O'Reilly | 25 Oct John Bryant | 25 Oct Jeff Tuhtan | 25 Oct Robert Kenoun Jing Chen | 31 Oct DMR Sekhar | 31 Oct Jurgen Mimkes | 15 Nov	07 Dec 2011	Published	✓

2005-2010

JHT submissions and peer reviews for submissions in the years 2005 to 2010 occurred mostly via email exchanges; some of which, beginning in 2008, began to migrate over into Hmolpedia threads. Most of this early reviewing, however, was haphazard and not easily documented.

Notes

N1. Retracted on 22 Feb 2011 per growing tension (see: thread) with chemical thermodynamically neutral review cleaning process; quote: "You have inserted stuff totally unrelated to my argument and even contradicting it. It is beyond even a retraction. It is wholly unacceptable. The article is withdrawn. Please confirm that this is done" (Jim Grove)

N2. Retracted on 5 Dec 2013, in the second or third round of email improvement process, per resistance to giving physical science definition of human in variables table per Irving Fisher (1892) protocol; quote: "I remain confused about what you want or even its value—either your readers will appreciate my paper or they won't—I've done enough revisions on it and do not wish to offer further opinion/conceptualization regarding humans—I will simply withdraw it." (Curtis Blakely)

References

1. Note: JHT submissions prior to 26 Apr 2013 were formerly reviewed at the EoHT beta wiki (initiated in a testing stage in 2011); reviews done on 30 Apr 2013 and after are now done at Hmolpedia; this being the main page for the organization of new reviews.

JHT

The **JHT: Cover pa**ge is a place to see a larger image of the working cover design for the Journal of Human Thermodynamics started in 2005. The first cover design for the JHT was made by Libb Thims and is shown below:

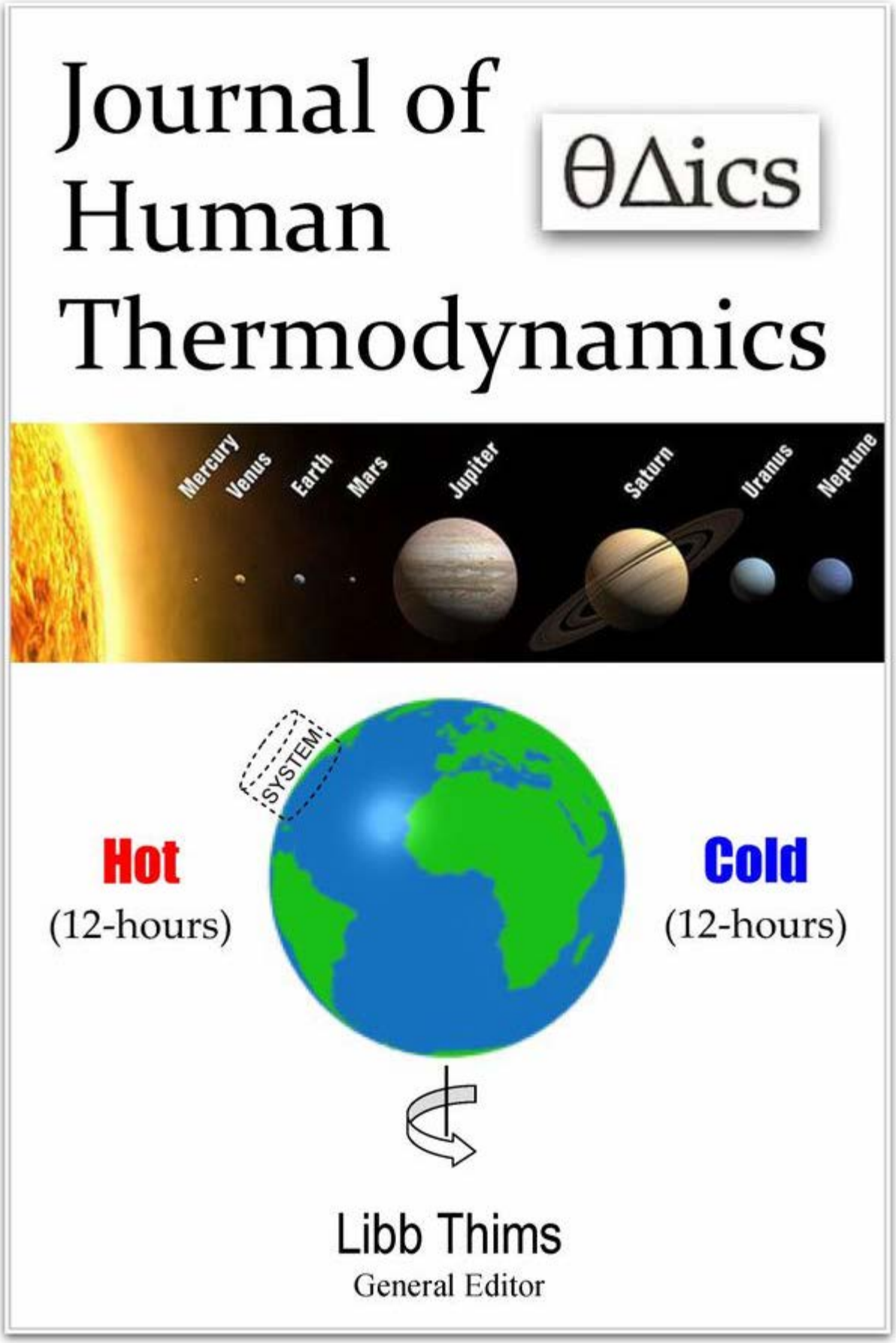

Notes

(a) The small diagram on the surface of the Earth is the Carnot engine referring to a "working substance" (or working body) enclosed by a boundary according to which heat passing in a cycle from a hot body to a cold body produces work irreversibly - the basic outine of human life.

(b) The symbol "θΔics" is the shorthand for the term “thermo-dynamics” used by Peter Tait, James Maxwell, and William Thomson in their personal communications.

(c) Comments and suggestions on this design are welcome here, either in the threads below or as edited in comments.

In economic thermodynamics, **Jing Chen** (c.1965-) is a Chinese-born, Canadian mathematician and thermodynamic economist noted for his publications in the field of thermoeconomics, in particular his views on entropy and its relation to areas such as sexual selection and the economic process. Chen began his research on the connection between thermodynamics and economics in the early 2000s. [1] His first book on this topic was the 2005 *The Physical Foundation of Economics - an Analytical Thermodynamic Theory*. [2] One of the more interesting points of Chen's theories is his ideas on natural selection. In particular, Chen argues that the struggle to stay in low-entropy states is called natural selection. [7]

Overview

In overview, as discussed in his major work the *Physical Foundations*, using the second law of thermodynamics as a basis of logic, Chen argues that in representing life systems thermodynamically, human social systems included, that living systems need to extract low entropy from the environment to compensate for continuous dissipation and that this process can be represented mathematically by a log normal process containing a growth term and a dissipation term. On this basis, he postulates that the display of low entropy levels, such as the creation of works of art, athletic prowess, and wealth accumulation, among others, have evolved as a universal signal of attractiveness in the process of sexual selection.

The seeds of Chen's thermoeconomic logic, generally seems to follow the views of Romanian mathematician and economist Nicholas Georgescu-Roegen, as found in his 1971 magnum opus *The Entropy Law and the Economic Process*, which situated the view that according to the "entropy law" (a term he helped to popularize), usable "free energy" (coal being his example) tends to disperse or become lost in the form of "bound energy" (waste or pollution) and that this overall process governs economics. Chen also uses a blend of Shannon's information theory (1949), Ilya Progogine's non-equilibrium dissipative structures theory (1977), and a mixture of modern economic theory and mathematics. In short, Chen's generalized theoretical point of view, which relies on the material entropy postulate, is that "social and biological systems, as open dissipative systems, need to extract low entropy from the environment to compensate for continuous dissipation." [6]

Thermodynamics and economics

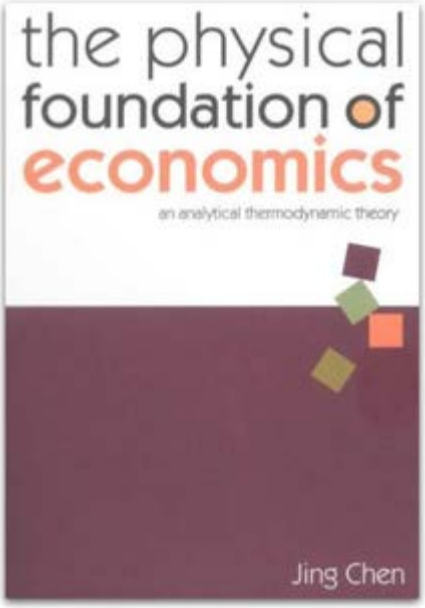

In the early 2000s, Chen began to think about possible connections between thermodynamics and economics. In particular, according to Chen, the three big questions on the possible relation between human behavior, economics, and thermodynamics are:

> (a) *How general is the thermodynamic theory in understanding human behaviors?*
> (b) *How is economic value related to thermodynamic value?*
> (c) *Is it possible to develop an analytical theory of thermodynamic foundation of economics?*

In other words, firstly people generally agree that life processes are thermodynamic processes and that the "lower" needs of human beings, such as eating, are thermodynamic processes. But the "higher" needs, such as literature, arts, are seen as beyond the working of the physical laws. Secondly, according to Chen, human activities are predominantly economic activities, hence how is economic value related to thermodynamic value? Thirdly, can mathematical theory of economic be formulated? With these directives as an outline, Chen began his human thermodynamic economic research. [5]

Universal law and universal human behavior

One of Chen's first papers, among many to follow, on the relationship between entropy and human life was the 2002

"Universal Law and Universal Human Behavior." [3] In this paper, Chen states that people generally agree that life processes are thermodynamic processes and that the "lower" needs of human beings, such as eating, are thermodynamic processes. But the "higher" needs, such as literature, arts, are seen as beyond the working of the entropy law (the second law of thermodynamics). However, according to Chen, good poems and distinct piece of paintings are rare events, characterized by high information content, which represents low entropy level.

This logic, to note, is similar to Stephen Hawking who in his 1996 *A Brief History of Time*, argues that by reading a good poem or book, in the process, one is lowering the entropy content of their central nervous system via the increase of neuronal order in the storage of information. [4] Thus as intelligence, such as in information storage and processing qualities related to one's economic function, is a desired mate selection quality, Hawking was connecting mate selection to thermodynamics.

Thus, similar to Hawking, Chen notes that the developments in cognitive sciences reveal that the "higher" needs of human beings are methods of attracting members of the opposite sex in the competition for reproduction, or sexual selection. Organisms have evolved the ability to reproduce sexually for about one billion years. In conclusion, Chen reasons that since the second law of thermodynamics, which states that closed systems tend towards states of higher entropy, is the most universal law of the nature, it is natural that the display of low entropy levels evolves as the universal signal of attractiveness in sexual and social communication. From poem writing to money making, the pursuit of low entropy is the main drive of human behavior. This common understanding of animal and human behavior will allow us to utilize the insights developed from different disciplines systematically. [4] Here we see excellent insight.

Education

Chen completed his BS in mathematics in 1987 at Fudan University, Shanghai, his MS in mathematics in 1990 at the Institute of System Sciences, Chinese Academy of Sciences, Beijing, and his PhD in mathematics in 1994 at the University of Michigan.

References

1. Jing Chen - Publications and Curriculum Vitae
2. Chen, Jing. (2005). *The Physical Foundation of Economics - an Analytical Thermodynamic Theory*. New Jersey: World Scientific.
3. Chen, Jing. (2002). "Universal Law and Universal Human Behavior", April, *Social Science Research Network*.
4. Hawking, Steven. (1996). *The Illustrated: A Brief History of Time* (pg 195). New York: Bantam Books.
5. Thermo Link Research - Jing Chen
6. Chen, Jing. (2003). "The Thermodynamic Foundation for Ecological, Evolutionary, and Institutionalist Economics", Working Paper Series, *Social Science Research Network*.
7. Chen, Jing. (2005). *The Physical Foundation of Economics - an Analytical Thermodynamic Theory*, (ch. 5: "The Entropy Theory of the Human Mind"). New Jersey: World Scientific.

Further reading

● Chen, Jing. (2008). "The Physical Foundation of the Mind", *NeuroQuantology* (pgs. 222-33), Vol. 6, Issue 3, Sept.
● Chen, Jing. (2008). "Understanding Social Systems: A Free Energy Perspective", *September*, 16. pgs. 1-10. Social Science Resource Network.
● Chen, Jing and Vinig, Tsvi G. (2007), "Entrepreneurship: An Analytical Thermodynamic Theory". *A Working Paper Series*. Jan.
● Chen, Jing. (2015). *The Unity of Science and Economics: a New Foundation of Economic Theory* (thermodynamics, 35+ pgs). Springer.

θΔics

In human thermodynamics, **Jitao Wang** (1933-), J.T. Wang, Ji-Tao Wang or 王季陶 (Chinese), is a Chinese organic chemist, materials scientist, and thermodynamicist noted for []

Overview

In 2002, Wang, in his *Nonequilibrium Nondissipative Thermodynamics: with Application to Low-Pressure Diamond Synthesis*, concludes with an end chapter section entitled "Modern Thermodynamics in Social Science and Philosophy", in which he states: [1]

> "Modern thermodynamics in macroscopic region (but not for the universe) may be 'the only physical theory of universal content', as Einstein said, so it should be used not only for the natural sciences but also for the social sciences and even philosophy. Many economic and social activities are subordinate to statistical rules and therefore also to thermodynamic rules. Any substantial progress in thermodynamics might affect social science. For instance, an equilibrium state has been regarded as an ideal state for getting the highest efficiency for energy transformation, but in any equilibrium state there is not macroscopic process run. Based on modern thermodynamics mentioned in this book, the nondissipative state is of more extended meaning than the equilibrium state. In an ideal nonequilibrium state, macroscopic process(es) might still be going on without any free energy dissipation, i.e., with the highest efficiency. If such a basic new idea were widely accepted that will promote human society developing with higher efficiency."

Wang goes on to conclude that this is why modern thermodynamics is important for evolution, social development, and emerging science and technology. Wang seems to have been drawn into his interest in thermodynamics via his diamond synthesis research; this can be gleamed from the abstract from his 2002 book:

> "Since the success of the activated process in 1970, diamond growth with simultaneous graphite etching under low pressure has often been regarded as a violation of the second law of thermodynamics. A series of nonequilibrium phase diagrams, which agree excellently with the activated diamond experiments, have been calculated by the author and his coworkers on the basis of reaction coupling. The book goes on to demonstrate how these lead to a complete new systematization of modern thermodynamics, [and thus] provides a framework for analysing complex systems for which classical thermodynamics is often not applicable."

Affinity

In his 2011 *Modern Thermodynamics: Based on the Extended Carnot Theorem*, citing Theophile de Donder, Wang gives a fairly cogent overview of the relation between affinity *A*, driving force *D*, Gibbs free energy change ΔG, and chemical potential, as follows: [2]

$$A = D = -\Delta G_m = \sum_{i=1} \nu_i \mu_i$$

where μ is the chemical potential of ith component or chemical species and ν is the stoichiometric coefficient of the ith component or chemical species in the reacting system. This can also be redefined in terms such as: extent of reaction, progress of reaction, and or relaxation of reaction.

Education

Wang completed his BS in organic chemistry in 1955; from 1958 to 1962, he was a professor in the physics department with the Institute of Polymer Science and Research Group, from 1969 to 1979, he was engaged in research and teaching in the materials science department; from 1989 to 1998, he was with the electronic engineering department; since 1990,

he has been engaged in the study of modern thermodynamics, with focus on the second law, all at Fudan University. He currently is professor emeritus. [3]

Quotes

The following are noted quotes:

> "Thermodynamics is a core part of science. Nearly all scientists should have a basic knowledge of thermodynamics. Thermodynamics is a science of development, and is a viewpoint of scientific development in natural sciences. Achievement of thermodynamics has influence not only on natural sciences, but also on social sciences and philosophy."
>
> — Jitao Wang (2009), "Modern Thermodynamics" [4]

> "From the mathematical expression of thermodynamic coupling, i.e. [diS1<0, diS2>0 & diS 0], another natural rule, dissipation (or entropy production) decrease theorem, can be obtained. That is, in complex systems, spontaneous irreversible process does always incline to utilize any useful energy in the form of transformation or storage into nonspontaneous process, i.e. negative entropy production process. The framework of applicability of this theorem is just the same as that of modern thermodynamics, including nondissipative thermodynamics, linear and nonlinear dissipative thermodynamics for complex (coupling) systems. We can also say that this theorem is a generalized applicable theorem, but in simple systems nonspontaneous process could not form, because the systems are too simple. For instance, in a system composed of A and B gas mixture, heat conduction may cause a nonspontaneous diffusion against the concentration gradient; but in a gas of single molecule, heat conduction could not form a nonspontaneous diffusion. In fact, this theorem is the thermodynamic basis and guidance for biological evolution in nature. The energy transformation efficiency in living bodies is often very high, and that is the result of the continuous complication and the continuous evolution. Therefore, this theorem is of deep academic significance, and is a basic principle which should be followed in social science, progresses of science and technology, and development of society. It is not the case that the dissipation decrease theorem has not been found until now, because in Onsager's famous article (1931) "Lord Rayleigh's 'principle of the least dissipation of energy'" was mentioned."
>
> — Jitao Wang (2009), "Modern Thermodynamics" [5]

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In existographies, **Joao Magellan** (1722-1790) (CR:8) was a Portuguese physicist noted for his 1780 "Essay on a New Theoretical Law of the Fire Element, and of the Heat of Bodies", in which the term 'specific heat' (an early synonym for heat capacity) first appeared along with a table of specific heats. [1] Magellan attributed the data of his specific heat table to Richard Kirwan, who was working on this topic in London, beginning in 1777. [2] In a series of letters concerned principally with his forthcoming publication, written to James Watt at the beginning of 1780, Magellan attacked Joseph Black for his failure to publish his own work on heat. [2]

Name translations

His Portuguese name is João Hyacintho de Magalhaens (or João Jacinto de Magalhães); his first name is sometimes translated as Jean or John; his full name is commonly cited as Jean Hyacinthe de Magellan (or John Hyacinth de Magellan), but more often than not abbreviated as J.H. de Magellan.

Quotes | On

The following are quotes on Magellan:

> "In a rather tentative fashion, knowledge of the work of Watt and of Black was spread abroad by authors such as J.A. du Luc and **Joao Magellan**, and the anonymous author of the 1770 volume."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 55) [3]

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● Jean Hyacinthe de Magellan – Wikipedia.

θΔics

In hmolscience, **Joel de Rosnay** (1937-) is a French biochemist and surfer pioneer (in France) noted for his 1975 to 1995 advanced perspective writings on the humanities, utilizing energy and entropy arguments.

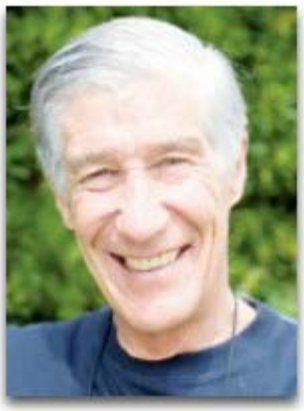

Overview

In 1975, Rosnay, in his *The Macroscope: a New World Scientific System*, a mixture of cybernetics, systems theory, biochemistry, and thermodynamics, presented a human particle view, utilizing energy, entropy, negentropy, and free energy to a significant extent. [1] The following quote exemplifies Rosnay's view:

> "Nothing can escape the implacable laws of thermodynamics; human society, like any machine or organism, is no exception."

All-in-all, Rosnay's work is a readable mishmash of different theories, with an interesting global-view perspective, albeit laced with a very elementary understanding of thermodynamics.

In 1995, Rosnay, in his *The Symbiotic Man*, utilized discussions on entropy and life, citing the likes of Ilya Prigogine, Pierre Teilhard, and chaos theory, etc., and commenting, for instance, on how there are "two great tendencies of matter, toward life and toward entropy." [2]

Difficulties on theory

The central difficulties on Rosnay's presentation are firstly that he mixes information theory concepts together with energy flow and thermodynamics, e.g. by citing French-born American physicist Leon Brillouin's take on the situation, with no distinction. Secondly, in his application of entropy to society, similar in theme to Romanian mathematician Nicholas Georgescu-Roegen, he chalks off entropy to the part of fossil fuel that goes to waste in the flow-through of an economy (as depicted adjacent); whereas correctly, fossil fuel acts only as a catalyst on the activation energy of human chemical reactions. [3]

Third, Rosnay over-simplistically understands the concept of free energy in an economy. Although he defines free energy in a loose figurative sense (in a footnote) as "energy – entropy x absolute temperature", he makes nonsensical statements such as "the increase in free energy at each stage in the transformation of a product during its manufacture is the physical equivalent of the economic concept of value added."

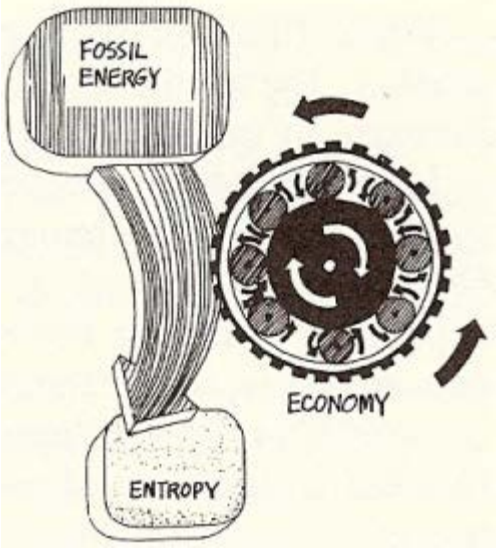

One of Rosnay's fossil fuel entropy diagrams

As to evolution and entropy, Rosnay cites French soft-science philosopher's Henri Bergson and Pierre Teilhard, concluding with them, it seems, that "life manifests itself as a current opposed to entropy."

Education

Prior to 1979, Rosnay spent three years doing research and teaching in molecular biology at Massachusetts Institute of Technology.

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θΔics

In hmolscience, **Joel Isaac** (c.1975-) is an English historian noted for his work on detailing some of the intricacies of the Harvard Pareto circle. [1]

Education

Isaac completed his BA and MA at the Royal Holloway, University of London, and his PhD from the University of Cambridge. In 2007, Isaac was a lecturer in American History at Queen Mary, University of London. Currently, Isaac is a lecturer in the history of modern political thought at department of history, University of Cambridge.

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External links

â— Joel Isaac (faculty) – University of Cambridge.

θΔics

In hmolscience, **Joel Janin** (c.1941-) or “Joël Janin” (French), is a French bio-physicist (chnops-physicist) noted for his 1995 protein thermodynamics article “Elusive Affinities”, which opens and closes to a quote (P1:C4) and commentary, respectively, on the nature of German polymath Johann Goethe’s 1809 physical chemistry based novella *Elective Affinities* in respect to modern views on the thermodynamics aspects of specificity involved in protein-protein complex formation and disassociation: [1]

Key words: protein–protein interaction, protein–DNA interaction, microcalorimetry, heat capacity changes, entropy, accessible surface area

INTRODUCTION

Have we not already come to affinities?—We have indeed, and let us at once now get to know them in what they are and in what they do. We say of those natures which on meeting speedily connect and interact that they have an affinity for one another.

Goethe, *Elective Affinities*

The ability to form noncovalent complexes of high affinity and specificity is a fundamental property of biological macromolecules. It is through specific as-

Elective Affinities

In 2013 retrospect commentary on his usage of Goethe's *Elective Affinities* in his "Elusive Affinities" article, Janin states: [3]

> “Goethe's novel was an attempt to blend chemistry and human sciences. Two centuries later, it's still fun to read, and I was happy to quote his definition of affinity:
>
> > Have we not already come to affinities?-
> > We have indeed, and let us at once
> > now get to know them in what they are
> > and in what they do. We say of those
> > natures which on meeting speedily connect
> > and interact that they have an affinity
> > for one another.”

Rossini debate

In commentary on the Rossini debate, Janin is of the following opinion: [3]

> “I guess I generally agree with Frederick Rossini, though I see no chance to make a quantitative estimate of 'energy' and 'enthalpy' in social issues.”

This latter "no chance" comment by Janin here is a foray into the newly-emerging field of the development of human thermodynamic instrumentation, though ideas on how to go about calculating human energy, human entropy, human enthalpy, and human free energy have a long historical past, such as have been attempted in historical attempts at making human thermodynamics variable tables, a subject dating back to at least to American economist Irving Fisher's 1892 table.

Education

Janin completed his BS in solid state physics in 1964 at Ecole Normale Supérieure, Paris, and his PhD in 1969, initially under Cy Levinthal at MIT , where he learned molecular biology, then later in France, under Gif-sur-Yvette at the Pasteur Institute, then finally in enzymology under Georges Cohen at the University of Paris, with a dissertation on: “Aspartokinase I-homoserine dehydrogenase I of Escherichia coli K 12: the study of ligand binding and allosteric equilibrium”. Janin has been with protein studies ever since, initially via crystallography and the field of protein-protein interaction during a post-doc with David Blow at the MRC Laboratory of Molecular Biology (Cambridge, UK) in 1973-74. In 1981, Janin became a biophysics professor at Université Paris-Sud, Orsay, where he taught undergraduate biochemistry (chnops-chemistry) and structural biology, and managed the graduate program in enzymology. From 1992 to 2005 Janin was head of the CNRS Laboratoire de Biochimie et Enzymologie Structurales. Presently, Janin is professor emeritus of biophysics at the Yeast Structural Genomics Laboratory,Université Paris-Sud, Orsay. He has authored two textbooks (in French) and over 180 publications. [2]

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External links

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θΔics

In sociological thermodynamics, **Johan Galtung** (1930-) (CR:12) is a Norwegian sociologist noted for his 1967 *Theories of Peace: a Synthetic Approach to Peace Thinking*, which presents the results of a year-long funded project to develop an "entropy/energy theory of peace", done for United Nations Education, Scientific and Cultural Organizations (UNESCO), from 1966 to 1967, under a contract with the International Peace Research Association (IPRA), the last chapter of which, namely "Entropy and the General Theory of Peace", was presented at the 1967 IPRA general conference in Tallberg, Sweden, wherein he employs a mixture of thermodynamics, as defined by Mark Zemansky, and information theory ideas about entropy, such as high entropy, low entropy, entropy as order or disorder. [4]

Chemical metaphor

Galtung, recently (2013), has been grouped with Libb Thims, i.e. Human Chemistry (2007) and "On the Nature of the Human Chemical Bond" (2005), as being one of the early "chemical metaphor" theorists, specifically for his 1977 "Chemical Structure and Social Structure: an Essay on Structuralism". [5]

Entropy dynamics

The following is an example quote from Galtung's 1967 dynamics of entropy section: [4]

> "Let us now bring in time and ask the crucial question: can any long time tendency be posited, using entropy as the basic variable? Does the world move towards higher or lower entropy in general? We shall try to show that any such uni-directional theory is bound to fail because of the strong forces operating both at the high entropy and the low entropy levels, tending to push the systems back when they have moved too far out on either extreme. In other words, we shall argue that there are considerable merits to a pendulum theory, where social systems are seen as oscillating between states of low and high entropy."

The following is Galtung's table 5.6.1, a type of human thermodynamics variables table, captioned as a survey of push and pull forces, in systems of low and high entropy, at the personal and social levels:

	Person level		**Social level**	
	pull factors	push factors	Pull factors	push factors
Low entropy systems	wish for consonance, simplicity, homophily	too much micro-stability, uniformity repetition	facilitates control for, ,"good" purposes, stability	facilitates control for "bad" purposes dangerous macro-conflict
High entropy systems	wish for variety, new experience micro-dynamism	too much dissonance, information overload, ambivalence	Conflicts solved locally facilitates micro-changes	too much micro-conflict impedes macro-changes

He also attempts to explain peace and conflict are using conceptions such as conflict energy, conflict transformation, actor entropy, and interaction entropy; the two entropy types which supposedly can be used to derive a large number of peace models. [1]

Galtung postulates that macro-conflicts, such as war between nations, will occur when entropy level is low, while micro-conflicts, such as cognitive dissonance,

will occur when the entropy level is high. [2] Entropy, for Galtung, refers to a condition of messiness or disorder but not in a pejorative sense; the incapacity of a system to crystallize or establish order permits, for instance, greater complexity and diversity, thus acting to mitigate the reification of violent structures. [3]

Oscillating social systems

In contrast to the general view that social systems always tend towards maximum entropy, Galtung argues that strong forces exist to push the system away from either extreme low states of entropy or maximum states, such that systems tend to oscillate between high and low entropy states. [2]

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The contents of Galtung's 1967 *Theories of Peace*. [4]

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External links

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θΔics

In existographies, **Johan Wilcke** (1732-1796) (CR:3) was a Swedish physicist and chemist, noted for []

Overview

In c.1775, Wilcke, supposedly, was doing some type of calorimetry work.

In 1782, Wilcke, in his "On the Snow's Cold at Melting", is said to have calculated the latent heat of ice. [1]

Quotes | On

The following are quotes on Wilcke:

> "**Wilcke** had, in the course of his investigations into latent heat, searched for the cooling effect which melted ice would have, he thought, upon the ice-cold water in which it was floating. Such cooling, 'necessitated' by the latent heat required to melt the ice, would amount to a flow of heat from a cold body to a hot body (the melting of ice)."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 251) (compare: Clausius) [2]

> "**Wilcke** also noticed and reported similar phenomena, as that of Black, at about the same time. Wilcke saw that the final temperature of a mixture of hot water and snow was less than the mean between the temperature of the snow and the temperature of the water. Black and Wilcke, however, did not profit financially from their observations; Watt did."
> — Cathy Cobb (1995), *Creations of Fire* (pg. 217)

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External links

● Johan Wilcke – Wikipedia.

θΔics

In existographies, **Johann Becher** (1635-1682) (IQ:170|#358) (Partington 50:43) (CR:18) was a German physician, chemist, economist, and philosopher, characterized a “man of original, but irregular, genius” (Ripley, 1861) (Q) also “inventive, erudite, and entirely self-educated” (Cassell, 1893) (Q), noted for his 1669, Paracelsus model advancing, terra pinguis theory (see: entropy models) of combustion.

Overview

In 1682, Becher published *A Mineral Alphabet of Twenty-Four Theses on Chemistry*, his last work, in which he described some 1,500 chemical processes included one for making a philosopher's stone to turn lead into gold. [1]

Terra pinguis

In 1669, Becher, in his *Subterranean Physics*, proposed the existence of three new chemical principles or “earths”; one of them, terra pinguis, thought (Q) of as a substance present in inflammable materials and given off during combustion; this is summarized as follows: [4]

CONCERNING THE SECOND PRINCIPLE OF MINERALS, WHICH IS FATTY EARTH [*terra pinguis*], IMPROPERLY CALLED SULFUR[4]

We find the three earths in animals, vegetables, and minerals. . . . These three have a great affinity one for the other, and a great analogy. While it [*i.e. terra pinguis*] is related to the other earth which we have already treated and whence metals and stones obtain their liquidity and fusibility, it most certainly has a great relationship and analogy with the earth of vegetables, that, namely, which is present in the calcination of vegetables and the lixiviation of ashes. . . . It can also be prepared from all vegetables, for this earth, although it seems to be useless and of no value, has a very great analogy with the preceding earth of minerals and magnetism. This is apparent in the glassmaker's art, for when the glassmaker makes glass out of stone and flint, that is, from the aforementioned earth of minerals, which is thickened in flowing, either because of a lack of salt, or because of an excess of fire, so that it is again made hard and coagulates, nevertheless as soon as the preceding earth is injected from the ashes, not only is the whole mass of glass made more flowing, but also . . . takes on growth and augment. This not only proves the great affinity of vegetable earth with mineral, but even a great likeness, harmony, and analogy, since this earth per se can be made into glass. . . .

[4] *Ibid.*, Book 1, Sec. 3, Cap. 3, pp. 129–132.

Becher, as summarized by Henry Leicester (1951), believed in the four element theory, of Aristotle, supposedly, and the three principles theory, of Paracelsus (namely: sulfur, mercury, and salt), with some modification.

Psychosophia

In 1687, Becher published *Psychosophia*, the 1725 edition title page image of which shown below, wherein he espoused some type autodidactic philosophy according to which he asserted that every person could learn all sciences by introspection and by knowing his own soul; his words, according to Roll, supposedly, are pompous, concerning his wide-ranging studies; therein asserting that his revolutionary ideas would remain unsurpassed for a hundred years. [3]

Education

In 1654, at age 19, Becher edited an alchemical tract, at age 26, he published a metallurgical chemistry book. [1]

Students

Becher's terra pinguis theory was reformulated in 1703 into the "phlogiston theory of heat" by his student, German chemist Georg Stahl.

Image from the 1725 edition of **Becher's** autodidactic proclaiming treatise *Psychosophia*, in which he posits that anyone can learn all the sciences by reflection on the nature of the own soul, or something along these lines. [3]

Quotes | On

The following are quotes on Becher:

> "All solid sub-stances, according to **Becher**, consist of three types of earth: *terra fluida* is the mercurial element, which contributes fluidity and volatility; *terra lapida* is the solidifying element, which produces fusibility or the binding quality; and the third element is *terra pinguis* (literally 'fatty earth'), which gives material substance its oily and combustible qualities. This is the principle of inflammability. Terra pinguis worked as follows: a piece of wood originally consists of ash and terra pinguis; when the wood is burnt, the terra pinguis is released, leaving the ash. Becher's three elements are a recognizable development of the mercury, salt and sulphur theory proposed by Paracelsus and the alchemists. The notion of terra pinguis is not exactly original either. But the time was ripe for such an idea."
>
> — Paul Strathern (2001), *Mendeleyev's Dream* [5]

Quotes | By

The following are noted quotes:

> "Chemists are a strange class of mortals, impelled by an almost insane impulse to seek their pleasure among smoke and vapor, soot and flame, poisons and poverty, yet among all these evils I seem to live so sweetly, that [I'd die before I'd] change places with the Persian King."
>
> — Johann Becher (c.1675), *Publication* [1][5]; possibly a Democritus paraphrase

See also

- Entropy models

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External links

● Johann Joachim Becher – Wikipedia.

θΔics

In existographies, **Johann Blumenbach** (1752-1840) (CR:13) was German physician and natural philosopher, noted for []

Overview

In 1781, Blumenbach, in his *On the Formative Drive of the Generation Process*, posited the existence of a "bildungstrieb" or "formational drive" in human development, a term that united growth, maintenance, healing, regeneration, and reproduction as variations of the single goal of maintaining form. [1] A representative exert of this position is: [2]

> "In all living creatures from the human to the maggot and from the cedar up to the seed there lies a particular, inborn, effective drive active throughout life, first in order to attain their specific form, then to maintain it, and if it is destroyed, to restore it where possible."

Blumenbach's inborn drive theory, supposedly, is the start, origin, or precursor, in some respects, to supposedly both the Goethe drive theory (1809) (e.g. see: EA | IAD: Love theories, and Freud-Schiller drive theory (1910)).

Goethe's circle | 1803

Goethe read or reread Blumenbach, according to Elaine Miller, after noticing a reference to it in Immanuel Kant's *Critique of Judgment*. [4] The following could be the passage in question:

> "That crude matter should have originally formed itself according to mechanical laws, that life should have sprung from the nature of what is lifeless, that matter should have been able to dispose itself into the form of a self-maintaining purposiveness — this [**Blumenbach**] rightly declares to be contradictory to reason."
>
> — Immanuel Kant (1790), *Critique of Judgment*; cited by Lawrence Henderson (1917) [5]

Blumenbach, shown seated below left (purple jacket), with his back turned, talking to German writer Heinrich Kleist (1777-1811), in Weimar, Germany, in 1803, was part of "Goethe's circle", one of the rare epicenter genius aggregations known to history. [3]

Quotes | On

The following are quotes on Blumenbach:

> "**Blumenbach** observed in 1775 that 'innumerable varieties of mankind run into each other by insensible degrees'. In 1776, he was named professor of medicine at the University of Gottingen, where he began his research into the varieties of human beings. He was the first to propose a division of humanity into five races: Caucasian, Ethiopian, American, Mongolian, and Malay; it was in fact Blumenbach who first used the term Caucasian (derived from the residents of Georgia in the Caucasus Mountains) to describe the white race. His most important works are the *Collectio craniorum diversarum gentium illustrata* (1790-1828) and *On the Natural Variety of Mankind* (1795)."
>
> — Stuart Curran (2012), "Contexts (Q) to Mary Shelley's *Frankenstein: the Modern Prometheus* (Q) | Science: Biology: Evolution (Q)", University of Pennsylvania [6]

Quotes | By

The following are quotes by Blumenbach:

> "I long ago pointed out considerations against the reality of the structural conceptions of the gradation of creatures according to their mere exterior form, and against the very well meant, but at the bottom very presumptuous tendency towards this idea, which is found in many physico-theologians; and these are entirely empirical, taken from natural history itself, and from the visible constraint which, in all the various essays on such gradations, is done to nature. Who does not feel how constrained he is when Bradley carries up his scale from the simplest fossils through the vegetable kingdom and animal kingdom up to man? It must be understood that all that has been said here…on the use of petrifications is only to be regarded as a warning against the misuse of the common conception of gradation, according to the outward form of creatures under the favorite images of ladders and links…Only instead of the partisans of this gradation acknowledging its value in dividing the productions of nature into kingdoms, classes, etc., and as a means of methodizing study and an assistance to memory, but allowing that it has no real existence in nature itself; exactly the opposite seems to have come of those structural conceptions, whose unmistakable value for the science of method cannot be denied, but which are so very far from having any real ground in nature itself, that it has often happened to well-meaning physico-theologians."
>
> — Johann Blumenbach (1806), *Publication* [7]

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External links

- Johann Friedrich Blumenbach – Wikipedia.

θΔics

In existographies, **Johann Caspar Goethe** (1710-1782) was a German lawyer, husband to Catharina Elisabeth Textor (1731-1808), and father to Johann Wolfgang Goethe (1749-1832), founder of human chemistry (1796), Cornelia Goethe (1750-1777), and three other children that did not reach adulthood.

External links

- Johann Caspar Goethe (German → English) – Wikipedia.
- Johann Caspar Goethe (Italian → English) – Comune.Pisa.it.

θΔics

In biographies, **Johann Cotta** (1761-1837) was a German publisher noted for being the main publishing outlet for the work of German polymath Johann Goethe. Cotta paid Goethe 2,000 taler for his *Elective Affinities*. [2]

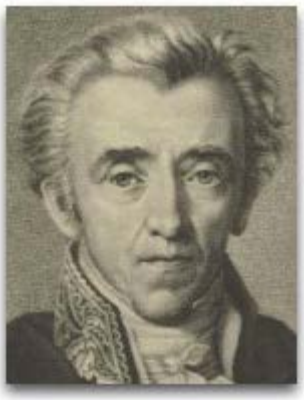

Overview

Goethe told Cotta, supposedly on 01 Oct 1809, about his soon-to-be published novella *Elective Affinities*, that: [1]

> "Es ist manches hineingelegt, das, wie ich hoffe, den Leser zu wiederholter Betrachtung auffordern wird."

which translates loosely as:

> "There are many things put into it, with which I hope to invite the reader back for repeated viewing."

American Goethean scholar Astrida Tantillo, translates this, to the effect that: "Goethe wrote that much is hidden within the novel and hoped that this aspect would spur readers to read and reread it." [3]

Goethean philosopher John Armstrong argues that "advertisement" approach (see: Goethe's advertisement) was used being that the Cotta feared or anticipated attack, and he was thus employing the advert as a neutralizing deflection. [4]

See also

â— Simon Capelin

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4. Armstrong, John. (2006). *Love, Life, Goethe: How to Be Happy in an Imperfect World* (Ch. 6: Elective Affinities, pgs. 357-; chemistry, pgs. 362, 368). Allen Lane.

External links

â— Johann Friedrich Cotta – Wikipedia.

θΔics

In chemistry, **Johann Dobereiner** (1780-1849) was a German chemist called the 'founder of the study of catalysis' (1823), developer of theory of triads (1817), a precursor to the periodic table, and most noted for his association with German polymath Johann Goethe (1810-32). [7]

Education

Dobereiner, the son of a coachman and servant, had little formal education and little money for formal education. From age 15 to 17, Dobereiner worked as an apprentice at an apothecary named Lotz in Munchberg, after which he attended college lectures on chemistry, botany, and mineralogy, and studied on his own, but was unable to afford college.

In 1802, although now an apothecary, Döbereiner had neither the money nor license to buy a pharmacy. He opened an agricultural produce business (*Landesproduktenhandlung*) and small chemical factory in the small town of Gefree near Bayreuth, and he began to produce pharmaceutical-chemical preparations, publishing the reports of his experiments in the *Neues allgemeines Journal der Chemie*, edited by Adolph Ferdinand Gehlen (1775–1815). [8] It was Gehlen who later proposed his name for professor of chemistry at the University of Jena.

In 1810, Dobereiner became professor of chemistry at Jena, teaching there for thirty-nine years. Dobereiner's publications include *Essays on Physical Chemistry* (1824-36) and *Principles of General Chemistry* (1826, 3rd ed.). [6]

Triads

for his 1817 observation that in certain groups of three elements, such as Ca (40), Sr (88), Ba (137), the atomic weight of the middle element was approximately the mean of those of the first and third, e.g. (40+137)/2=88. [1] These groupings were known as the “Dobereiner’s triads”, a concept that was a forerunner to the 1869 periodic table made by Dmitri Mendeleyev. [2]

Ferments

In 1823, Dobereiner discovered that platinum sponge could cause the combustion of hydrogen and oxygen at room temperature, which was considered as a ‘ferment’ effect a precursor to the theory of catalysis and the 1835 term catalyst coined by Swedish chemist Jacob Berzelius. In short, what Dobereiner discovered was the property of spongiform platinum to inflame hydrogen. [6]

Dobereiner’s tombstone in Jena bearing the inscription: “Goethe’s advisor, creator of the rule of triads, discovery of platinum catalysis.” [8]

Goethe

A famous student and life-long friend of Dobereiner was German polymath Johann Goethe, the founder of human chemistry, who attended Dobereiner’s weekly lectures, teaching Goethe about chemical analysis. [3]

In the 1951 book *Dobereiner, Goethe und die Katalyse*, author Alwin Mittasch documents the exchange of letters between Goethe and Dobereiner who kept Goethe informed about the progress of his researches in chemistry. The book includes the letters in which he explained his results and Goethe’s replies. In a review of the book by American historian Henry Leicester, he explains that

Mittasch traces the concept of ‘ferments’, in the works of Goethe, who was ‘often incorporated chemical ideas into his writings’, arguing that Goethe in 1823, the age of 74, could not accept the new concept proposed to him by Dobereiner. [4]

It is argued that Dobereiner served as a model for the Captain in Goethe's 1809 *Elective Affinities.* [5] This, however, may by incorrect as Dobereiner was only 28 in 1808 the time of conception of Goethe's novella and still earliest date of association of Goethe with Dobereiner needs to be ascertained. Author Donald McDonald notes that in 1810 it was Goethe, then head Minister of the independent German state of Saxe-Weimar, who approved the appointment of

Dobereiner as professor of chemistry at the University of Jena, after which Dobereiner became Goethe's chemical assistant. [7] American chemist George Kauffman states that Dobereiner first met Goethe on September 08, 1810 at Weimar. [8] The two then had a close interrelationship in years to follow, Goethe attending his lectures, reading his textbooks, studying his stoichiometry, funding his researching, designing and building his laboratories, etc., and Dobereiner reporting all his experimental finds to Goethe, conducting chemical research for him, e.g. searching for experimental chemical support of Goethe's color theory, etc. [8]

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External links

● Johann Dobereiner – Wikipedia.

θΔics

In human chemistry, **Johann Eckermann** (1792-1854) was a German author noted for being Goethe's verbal secretary, of sorts, from 1823 until 1832, and joint-editor of his works thereafter.

Overview

In 1848, Eckermann published his conversations with German polymath Johann Goethe, which he later documented in *Conversations with Goethe* (1836-1848). [1] Eckermann, it seems, did not become acquainted with Goethe until 1823. Specifically, in 1822, Eckermann wrote a *Poetry with Special Allusion to Goethe*, whose manuscript he sent to Goethe in Weimar. Goethe, age 73, then visited Eckermann, age 31, after which it seems Goethe hired him on as an organizational aid and sort of confidant. [4] To Eckermann, Goethe entrusted the publication of his *Nachgelassene Schriften* (posthumous works) (1832-1833). He was also joint-editor with Friedrich Riemer of the complete edition of Goethe's works in 40 vols. (1839-1840). [2]

Elective Affinites

On 06 May 1827, Goethe commented to Eckermann the retrospect weight of his *Elective Affinities i*n his mind: [3]

> "The only production of greater extent, in which I am conscious of having labored to set forth a pervading idea, is probably my *Elective Affinities*."

On 18 Jan 1827, in conversation with Eckermann, Goethe discussed a letter from Solger to Tieck in which kind words about his *Elective Affinities* were spoken on the fine nature of the Architect's character. Goethe commented on this letter that: [1]

> "These remarks were written as early as 1809. I should then have been much cheered to hear so kind a word about the *Wahlverwandtschaften*; for at that time, and afterwards, not many pleasant remarks were vouchsafed be about that novel."

Goethe commented to Eckermann, at the end of his life, that:

> "I lived every word of my *Elective Affinities*."

(add discussion)

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.
(b) Eckermann, Johann P. (06 May 1827).
4. Johann Eckermann (German → English) – Wikipedia.

External links

â— Johann Eckermann – Wikipedia.

θΔics

In thermodynamics, **Johann Diedrich Fast** (1905-1991), oft-cited as "J.D. Fast", was a Dutch chemist noted for []

Quotes

The following are noted quotes:

> "Although, in principle, one is free in the choice of the limits of a system, that choice sometimes determines whether or not a problem is solvable."
>
> — Johann Fast (1962), *Entropy*; cited by Norman Dolloff (1975) on the boundary problem [1]

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(b) Dolloff, Norman H. (1975). *Heat Death and the Phoenix: Entropy, Order, and the Future of Man* (pg. 169). Exposition Press.

Further reading

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External links

â— Johann Fast (Dutch → English) – Wikipedia.
â— Fast, J.D. (Johan Diedrich) – WorldCat Identities.

θΔics

In existographies, **Johann Faust** (c.1485-c.1540) (IQ:#|#) (CR:6), commonly known as "Dr. Faustus", was a German physician, enchanter, and chemist, and eponym of the "Faust legend", Faustian, Faustian quest, etc., described by Johann Spies (1587), as someone whose crime was that he “took the eagle’s wings, and wished to investigate all the depths of heaven and earth”, owing to his insatiable desire for knowledge; or, as later expanded and or elaborated on by Georg Widman (1599), someone lured into magic by his desire for worldly enjoyments. [1]

Overview

Johann Faustus was born in Roda in the province of Weimar, of god-fearing parents. Although he often lacked common sense and understanding, at an early age he proved himself a scholar, mastering not only the Holy Scriptures, but also the sciences of medicine, mathematics, astrology, sorcery, prophesy, and necromancy. [1]

Pact

In c.1520, Faust began to become renowned for the so-called "Faust legend". So the story goes, his pursuits for knowledge aroused in him a desire to commune with the Devil, so—having made the necessary evil preparations—he repaired one night to a crossroads in the Spesser Forest near Wittenberg. Between nine and ten o'clock he described certain circles with his staff and thus conjured up the Devil. Feigning anger at having been summoned against his will, the Devil arrived in the midst of a great storm. After the winds and lightning had subsided the Devil asked Dr. Faustus to reveal his will, to which the scholar replied that he was willing to enter into a pact. The Devil, for his part, would agree: [1]

1. To serve Dr. Faustus for as long as he should live,
2. To provide Dr. Faustus with whatever information he might request, and
3. Never to utter an untruth to Dr. Faustus.

The Devil agreed to these particulars, on the condition that Dr. Faustus would promise:

1. At the expiration of twenty-four years to surrender his body and soul to the Devil,
2. To confirm the pact with a signature written in his own blood, and
3. To renounce his Christian faith.

Having reached an agreement, the pact was drawn up, and Dr. Faustus formalized it with his own blood.

Faust's barrel ride | Goethe

In 1525, Dr. Heinrich Stromer, aka Dr. Auerbach (a reference to his birthplace in Germany’s Upper Palatinate region), a professor of medicine, opened an underground wine bar called Auerbachs Keller, in Leipzig. The bar soon became associated with the legend of a scholar named Dr. Johannes Faust, a patron of the bar, someone who had grown bored with life, made a pact with the Devil through the Horned One’s representative, Mephistopheles (aka Mephisto). The Devil agreed to give Dr. Faust access to unlimited knowledge and

worldly pleasures—but only for the next 24 years (one year for every hour in the day). At the end of the contract term, the scholar would be required to hand over his soul to the Devil.

A 1625 depiction of Faust riding a wine barrel up the stairs, against the force of gravity, to the mystification of the students, in the wine bar Auerbachs Keller, Leipzig, seen by Goethe in his student days, which he would refer in his 1832 novel *Faust.* [2]

To convince Dr. Faust of the plan's merit, Mephisto invited him to an evening of revelry in the underground wine bar of the Auerbachs Keller. At the end of the night, the scholar rode up the stairs on the back of a barrel in a gravity-defying feat of devilish fun.

On the tavern's 100th anniversary in 1625, two paintings were mounted on the wall, one depicting Faust and Mephisto drinking with students and the other showing Faust riding the barrel.

In the 1770s, the Auerbachs Keller had become a well-established hangout for Leipzig University students, and one regular patron went on to become one of Germany's leading literary figures: Johann Goethe. Inspired by the legend during his student days—and perhaps after staring at the paintings of Faust and Mephisto through a wine-induced haze—Goethe later wrote a tragic play titled *Faust*. He set one scene in his old hangout, where Mephisto and Faust join a group of students in a night of drinking until the revelry turns violent. The Devil's agent casts a spell on the students, who watch Faust riding out of the tavern on his legendary barrel. [2]

Times

Henceforth, following his pact with the devil, Dr. Faustus' life was filled with comfort and luxury, but marked by excess and perversion. Everything was within his grasp: elegant clothing, fine wines, sumptuous food, beautiful women—even Helen of Troy and the concubines from the Turkish sultan's harem. He became the most famous astrologer in the land, for his horoscopes never failed. No longer limited by earthly constraints, he traveled from the depths of hell to the most distant stars. He amazed his students and fellow scholars with his knowledge of heaven and earth. However, for all his fame and fortune, Dr. Faustus could not revoke the twenty-four year limit to the Devil's indenture. Finally recognizing the folly of his ways, he grew ever more melancholy. He bequeathed his worldly goods to his young apprentice, a student named Christoph Wagner from the University of Wittenberg. [1]

End

Shortly after midnight on the last day of the twenty-fourth year, the students who had assembled at the home of the ailing Dr. Faustus heard a great commotion. First came the sound of a ferocious storm and then the shouts—first terrifyingly loud then ever weaker—from their mentor. At daybreak they ventured into his room. Bloodstains were everywhere. Bits of brain clung to the walls. Here they discovered an eye, and there a few teeth. Outside they found the corpse, its members still twitching, lying on a manure pile. [1]

Quotes | On

The following are quotes on Faust:

> "Next in respect of time to Cornelius Agrippa comes the celebrated **Dr. Faustus**. Little in point of fact is known respecting this eminent personage in the annals of necromancy. His pretended history does not seem to have been written till about the year 1587, perhaps half a century after his death. This work is apparently in its principal features altogether fictitious. We have no reason however to deny the early statements as to his life. He is asserted by Camerarius and Wierus to have been born at Cundling, near Cracow, in the kingdom of Poland, and is understood to have passed the principal part of his life at the university of Wittenberg. He was probably well known to Cornelius Agrippa and Paracelsus. Melanchthon mentions him in his letters; and Conrad Gessner refers to him as a contemporary. The author of his life cites the opinions entertained respecting him by Luther. Philip Camerarius speaks of him in his 'Horas Subsecivae' as a celebrated name among magicians, apparently without reference to the life that has come down to us; and Wierus does the same thing. He was probably nothing more than an accomplished juggler, who appears to have practiced his art with great success in several towns of Germany. He was also no doubt a pretender to

necromancy."

— William Godwin (1834), *Lives of Necromancers* [4]

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θΔics

In existographies, **Johann Fichte** (1762-1814) (IQ:170|#322) (Cattell 1000:150) [RGM:187|1,350+] (Murray 4000:20|WP) (CR:13) was a German philosopher, noted for his involvement in the 1798 to 1800 "atheism dispute" and for his development of some type of non-romantic idealism.

Atheism dispute

See main: Forberg-Fichte atheism dispute

In 1798, German philosopher and classical scholar Friedrich Forberg (1770-1848), in his essay "Development of the Concept of Religion", published in his *Philosophical Journal*, argued that unbelievers could be moral if they act as if an all-seeing and punishing god exists. [1]

Fichte, in response to this, published the essay "On the Ground of Our Belief in a Divine World-Governance", wherein he attempted to sketch some of his preliminary ideas on philosophy of religion formulated within his “doctrine of science” (Wissenshaftslehre), which characterized god as the living moral order of the world. [2]

Fichte’s essay provoked the publication of an anonymous essay that accused both Fichte and Forberg of atheism and called for Fichte's dismissal from his post at the University of Jena. German authorities later suppressed the original essay as well as threatened the University of Jena itself with preventing enrollment

Fichte launched a public campaign of defense that included his threat to resign his position at the University of Jena if he were subjected to any government reprimand. Fichte was forced to make good this threat when his work was censured, and he was forced to flee Berlin.

In 1799, Friedrich Jacobi (1743-1819), a noted (Ñº) Lessing commentator, in his famous “Open Letter to Fichte”, originally penned as a personal communication to Fichte, introduced the term “nihilism” into public philosophical discourse as follows: [4]

> “Since outside of the mechanism of nature, I come across nothing but miracles, mysteries, and signs and have a terrible aversion to ‘nothingness’, the absolutely indefinite, the utterly empty (these three are one, the Platonic infinite!), particularly as the object of philosophy or goal of wisdom; but in the investigation of the mechanism of the nature of the ego as well as that of the non-ego, reach nothing but ‘nothing-in-itself’ and am so tainted, struck, and exhausted by it in my transcendental essence (personally, so to speak), that in order to empty out the infinite, I even must want to fill it up, as an infinite ‘nothingness’, a purely totally ‘in-and-of-itself’, were it only not impossible! Since, I say, that is the way it is with me and the science of the true, or more accurately, the true science; I therefore do not see why I, for reasons of good taste, should not be allowed to prefer my ‘philosophy of not-knowing’ to the ‘**philosophical knowing of nothing**’, even it were only in *fugam vacui* (void flight or avoiding the void). I have nothing against me but ‘nothingness’; and with that, even chimeras can probably compete.
>
> Truly, my dear Fichte, it should not vex me if you, or whoever it might be, want to call what I contrast to idealism, what I chide as **nihilism**, chimerism. I have made a display of my ‘not-knowing’ in all of my writings; I have so boasted of being **unknowledgeable with knowledge**, completely and extensively to such a high degree, that I should be allowed to despise the mere doubter. With earnestness and fervor I have strived from childhood on for truth as have few, have experienced my incapacity as have few, and my heart has thereby become tender—oh, very tender, my dear Fichte, and my voice so gentle! Just as I, as a human being, have a deep sympathy with myself, so I have it with others. I am patient without effort; but that I am truthful without effort costs me a lot. The earth will be light above me— before long.”

Jacobi’s use of the terms “nihilism” or chimerical nihilism, here, meaning "philosophical nothingness" or the "philosophical knowing of nothing", were later picked up by his friend Friedrich Koppen, and thereafter into public

discourse; the following are a few comments on this etymology:

> "Although on good personal terms with Fichte, Friedrich Jacobi was nevertheless the most severe critic of Fichte's systematic tendency and his attempt to construct a completed system of reason. Absolute reason, in the last analysis, was nothing but atheism for Jacobi, and the endeavor of Fichte's science of knowledge was so alien and repugnant to him that a conflict between the two philosophers was unavoidable. Whereas this controversy was conducted in the manner of a mutually respectful dissent, however, Hegel's excessive polemics led to the result that the entirety of transcendental idealism fell under the indictment of '**nihilism**' and Jacobi's formerly more technical usage of the term assumed the caustic and aggressive nuance which it has since kept."
>
> — Ernst Behler (1987), "Introduction" to *Philosophy of German Idealism* (pg. xiii)

> "The scientific discourse about god results in the death of god, a purely 'logical enthusiasm', and has no other consequence but **nihilism**. Inverting the real into the ideal, the basic action of reason, marks the beginning of the 'philosophy of absolute nothingness', and the idea of an absolute centrifugal and centripetal movement as practiced by Fichte suggested to Jacobi only a movement out of nothing, to nothing, for nothing, and into nothing."
>
> — Ernst Behler (1987), "Introduction" to *Philosophy of German Idealism* (pg. xiv)

> "One of them, by Jacobi's friend Friedrich Koppen, maligned Schelling's doctrine as the 'philosophy of absolute no-thing-ness'— a claim certainly derived from Jacobi's term **nihilism**: a philosophy which lays claim on all and everything, like Schelling's system of identity, necessarily results in absolute nihilism. When Jacobi offered his response to Hegel's attack in three open letters to Koppen, and Koppen included them as an appendix in his book, Jacobi certainly contributed to the eschatological nuance in the term nihilism noticeable throughout the nineteenth century and culminating in Nietzsche."
>
> — Ernst Behler (1987), "Introduction" to *Philosophy of German Idealism* (pg. xvi)

This blurry nuanced use of the term "nihilism" eventually culminating, in the 1880s, in the writings of Friedrich Nietzsche.

Quotes | On

The following are related quotes:

> "This philosophy has for its principle, not the substance of Spinoza, not the ego of Kant and **Fichte**, not the absolute identity of Schelling, not the absolute mind of Hegel, in short, no abstract, merely conceptional being, but a real being, the true Ens realissimum—man; its principle, therefore, is in the highest degree positive and real."
>
> — Ludwig Feuerbach (1841), *The Essence of Christianity*

> "The kind of romantic idealism represented by, e.g. Arthur Schopenhauer, which Helmholtz particularly detested and which his arch-foe Zollner ardently embrace, should be distinguished from idealism considered as the antithesis to materialism. Helmholtz never embraced materialism, and he may have been strongly influenced by the non-romantic idealism developed by **Fichte**. Schopenhauer's philosophy powerfully antagonized many physicists associated with Helmholtz. Years later, in 1906, Boltzmann, to cite one example, nearly entitled a talk 'Demonstration, that Schopenhauer was a Mindless, Ignorant, Spreader

of Nonsense'."

— Jed Buchwald (1993), on Hermann Helmholtz's anti-romanticism [3]

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External links

â— Johann Fichte – Wikipedia.

θΔics

In existographies, **Johann Wolfgang Goethe** (1749-1832 ACM) (0-82 AG) (IQ:210|#1) (Cattell 1000:7) (Gottlieb 1000:131) [RGM:36|1,500+] (Murray 4000:2|WL) (GMG:1) (Perry 80:1|Li) [LUG] [LPKE] [TCG] [polymath] [uberman] (**SN**:1) (HD:19) (FA:56) (GA:6) (LR:2) (Re:82) (EvT:8|21+) [CR:2151], pronounced: GU(R)-tuh or **gu(r)**-te) (audio), or "Wolfgang Goethe" (Haeckel, 1899), was a German polyintellect and or polymath, depending, known famously as: "last universal genius" (Wadepuhl), "prince of the mind" (Pestalozzi), the "know-it-all" (Grass), man of "a hundred scholarly disciplines" (Pelikan), "wisest of us all" (Carlyle), "highest IQ in the history of mankind" (Cox), "the thinker" (Vietor), a top 3 "evolution theory pioneer" (Darwin), "smartest person ever" (Cox-Buzan), "last person to know everything" (Smith), intellectual mentor to: Schopenhauer (him to Nietzsche), Einstein, Tesla, and Freud, among other epitaphs—wielder of a 5,000+ book personal library, 100,000+ word vocabulary, and polyglot (7+ languages)—renowned, in the niche field of hmolscience, for his self-defined greatest theory (or best book), namely his 1796 incredibly-advanced revolutionary-view (see: Goethean revolution) that human relationships and interactions are in fact large-scale evolved or "metamorphized" types of bond changing chemical reactions, i.e. human chemical reactions, in which people, as chemical entities, in his own words "attract and reply, neutralize each other, separate again, and reestablish themselves", actuating according to the laws and principles of affinity chemistry—a subject known currently or rather subsumed as chemical thermodynamics—hence, he pioneered the modern field of "human chemical thermodynamics". The following 1809 incident concerning a women who attacked Goethe in the street, claiming that his book, and inherent theory, was immoral, summarizes this well:

IOANNES WOLFGANG GŒTHE

Nationality	German
Fields	Literature Poetry Philosophy Anatomy Evolution theory (pioneer) Morphology (founder) Human chemistry (founder) Color theory
Alma matter	University of Leipzig University of Strasbourg
Students	Arthur Schopenhauer
Known for	Goethe-Helmholtz equation Goethean philosophy
Library	Total: 5,000+ books
Collected works	Total: 142+ publications
Eponyms	Goethean revolution Goethendipity Goethe's affinity table
Influences	Torbern Bergman, William Shakespeare, Benedict Spinoza, Carl Linnaeus

Signature

> "I'm sorry you feel that way. It is my "best book", and don't think that this is the mere whim of an aging man. I grant you that one loves most deeply the child of one's last marriage, the product of one's late power of generation. But you wrong me and the book.
>
> The principle illustrated in the book is true and not immoral.
>
> But you must regard it from a broader point of view and understand that the conventional moral norms can turn into sheer immorality when applied to situations of this character."

The issue here, in retrospect, since the translation of the Rosetta stone, by Thomas Young (1814) and Jean Champollion (1822), of course, is that "conventional moral norms", are those rooted in the big three religions of the world, as told through the Bible, Quran, and Rig Vida, collectively known as Anunian theology, each framed on the Egyptian life-death theory of the negative confessions and the weighing of the soul, and the various afterlife theories (resurrection or reincarnation) derived therefrom—whereas, correctly, as Goethe viewed things, morality, from the modern day perspective, does *not* derive from religion, but correctly is rooted in framework of physical science, namely the "moral symbols" of physical chemistry, as Goethe put it on 24 Jul 1809—and as such the reading of his great morality revising theory has been the "Robe of Nessus" to may, over the decades, as Goethe put (21 Nov 1827). Interestingly, not much has changed in the last 200-years, and these very same debates can be found, only re-clothed in chemical thermodynamic terms, the 2006 Rossini debate being a prime example.

Labels | Occupations

The number of labels, jobs, occupations, and/or pastimes attributed to Goethe is large. To get a rough estimate, American writer Arnold Jacobs, who in 2004 documented his experience of reading the 32-volume *Encyclopedia Britannica*, something his PhD engineer, MBA lawyer, almost MD father attempted in 1982 (making it to the mid-*B*s), lists 20 titles: [77]

> "Goethe's curriculum vitae—from *Britannica*—when [he] wasn't busy explaining to people how to pronounce his name, he found time to be a: critic, journalist, lawyer, painter, theater manager, statesman, educationalist, alchemist, soldier, astrologer, novelist, song writer, philosopher, botanist, biologist, color theorist, mine inspector, and issue of military uniforms, irrigation scheme supervisor. I was familiar with the phrase 'Renaissance Man', but Goethe was like a renaissance man with access to amphetamines. He makes Leonardo da Vinci look like a lazy bum. Did I mention that Goethe's scientific writings alone fill fourteen volumes? And that he also found the time to write fifteen hundred passionate letters to Charlotte von Stein? Remember that his *Faust* was all about the dangers of the quest for knowledge."

To this we can add: anatomist, agriculturist, horticulturist, miner/mineralogist, dramatist, evolutionist, human chemist, geologist, mathematician, meteorologist, morphologist, physicist, playwright, poet, and religion scholar—a grand total of 35 as a ball park estimate; not to mention his polyglot, polymath, last universal genius labels (38), thus giving weight to his "polyintellect" umbrella label. Quick estimates, to give some comparison, tend to cite Leonardo da Vinci with 14+ job titles (Ñº), which no doubt is an underestimate.

Influences

Goethe is said to have commented, at some point, that after William Shakespeare and Benedict Spinoza he was influenced most strongly by Carl Linnaeus, particularly with respect to his early botanical studies for form change (see: his tripartite metamorphology theory of form change), who in turn was the doctoral advisor to Swedish chemist Torbern Bergman, whose 1775 *A Dissertation on Elective Attractions*, Goethe specifically credits as being the main scientific reference behind his 1809 *Elective Affinities*, his claimed-to-be "best book" of his vast intellectual output. [75]

Posthumous influence

The following is a synopsis of Goethe's world influence, by Hjalmar Boyesen, from his *The Life of Goethe* (1885):

> "It is difficult to overestimate the value of Goethe's work to humanity. The bequest which he left to the world in his writings, and in the whole intellectual result of his life, is not as yet appreciated at its full worth; because, intellectually, the world has not yet caught up to him. His influence today asserts itself in a hundred minute ways—even where no one suspects it. The century has received the stamp and impress of his mighty personality. The intellectual currents of the age, swelled and amplified by later tributaries, flow today in the directions which Goethe indicated."

In this peculiar paragraph, there is an unusually-great-truth stated, namely "the world has not yet caught up to him". The reason that the statement is "unusually-great", is that 125-years have since passed since Boyesen envisaged that Goethe was ahead of us in the intellectual race, and somehow the situation has only compounded? As as of the early 2010s, over two-hundred years have now past, since the publication of his self-defined greatest theory—his human chemical theory—and we—a collective mass of some 72-million human molecules, come and gone—are still struggling to decode his enigmatic puzzle-laden best book publication (see: *Elective Affinities: Illustrated, Annotated, and Decoded*), in which the theory is embedded in codded layers of gestalt, a process greatly hindered by (a) the knowledge fanning effect of the two cultures and (b) Willard Gibbs' 700-equation laden *On the Equilibrium of Heterogeneous Substances*, which one has to master if one is to uncode the secrets of Goethe's novella; as a result of which, the theory is still stuck in the "ridicule" stage of scientific acceptance, as defined by Schopenhauer, Goethe's sole human chemistry prodigy:

A depiction of **Goethe**, from the 2010 film *Young Goethe in Love*, at age 26, becoming world famous for his great tale *Werther*, written at age 24, a novel that Napoleon Bonaparte (IQ=175) claimed to have red six times during battle.

> "All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident."

and is a subject labeled as "crackpot" by the blind ignorance of the modern hard science community blind to reality of the situation. As German poet Heinrich Heine put it: the theoretical implications contained in "novel overturns everything holy [alles Heilige]" and is a direct attack on religion, morality, and social forms." [7]

Works | Libraries | Correspondences

Goethe's personal home library comprised over 5,000 books. His collected works set amounts to over 140+ publications (14 volumes of which are devoted to scientific studies). Nearly 3,000 drawings by Goethe survive, as do the villa he built, the palace he rebuilt, and the park he first laid out. In 1796, Goethe began to keep a regular diary. Some of this, along with his daily activities following his move to Weimar, have been published in seven volumes by Robert Steiger. Accounts of conversations with him run some 4,000 printed pages; over 12,000 letters from him are extant, as are about 20,000 letters addressed to him. [68] At the turn of the millennium (2000), Goethean biographer Nicholas Boyle comments on this: [69]

A sketch of Goethe reading, during his Roman adventure years, by Johann Tischbein (1751-1828)

> "As the age of paper passes, so [Goethe] seems its supreme product."

Whosoever comes to surpass the age of the Internet will no doubt build on the shoulders of Goethe.

Blue baby

See main: Early parental death and genius

(check).

Goethe came into the world—as he reports in his autobiography—just as the town's clocks struck noon (in late summer, August 28, 1749) and, as is dramatically depicted in his most absorbing autobiography of the earlier years of his existence, Dichtung und Wahrheit ("Poetry and Truth"), he almost died as a "blue baby" at birth, a significant part of his "fragments of great confusion" as he called it in his writings; and he had to endure several severe life-threatening illnesses during his eight plus decade long existence (see: convalescence and genius, e.g. Newton). [51]

Stages of existence | Philosophy

See main: Goethean philosophy

The following excerpt by Goethe, from his posthumously-published 1833 *Maxims and Reflections*, is said to depict how his philosophical views changed as he stepped through the various stages of existence (see: Goethe timeline):

Realism

"Every stage of life corresponds to a certain philosophy. A child appears a realist; for it is as certain of the existence of pears and apples as it is of its own being.

(age 9)

(age 15)

Idealism

A young man, caught up in the storm of his inner passions, has to pay attention to himself, look and feel ahead; he is transformed into an idealist.

(age 24)

(age 38)

Skepticism

A grown man, on the other hand, has every reason to be a skeptic; he is well advised to doubt whether the means he has chosen to achieve his purpose can really be right. Before action and in the course of action he has every reason to keep his mind flexible so that he will not have to grieve later on about a wrong choice.

(age 42)

(age 59)

Mysticism

An old man, however, will always avow mysticism. He sees that so much seems to depend on chance: unreason succeeds, reason fails, fortune and misfortune unexpectedly come to the same thing in the end; this is how things are, how they were, and old age comes to rest in him who is, who was and ever will be."

(age 69)

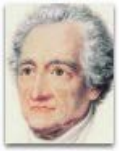
(age 81)

The core of his philosophy, in retrospect, revolved around a natural science philosophy, a chemical philosophy in particular. In another sense, as summarized by German-born American translator Ludwig Lewisohn (1882-1955), in the preface to his two-volume 1949 *Goethe: the Story of a Man*: [60]

> "He was, as he himself was fond of saying, no formal philosopher, not even a very attentive reader of formal philosophy. Yet it is correct to state that his final speculative conclusions coincided, while they transcended them, with the late Sir Arthur Eddington's re-confirmation of Kant according to the last implications of contemporary science."

Goethe timeline

The horizontally-scrolling Goethe timeline, a screen-shot of which is partially shown below (click on), depicts the main steps in the course of the development of Goethe's self-defined "best book" (of his 142 plus collected works publications), namely his 1809 *Elective Affinities*, up through its impact in modern times:

Overview

Goethe presented the final version of his human chemical reaction theory in his famous 1809 novella *Elective Affinities*, a treatise on the chemical principles and mechanisms of human relationships, a publication that he considered, in his own words, his "best book", which was based primarily on Swedish chemist Torbern Bergman's 1775 textbook *A Dissertation on Elective Attractions*. [1] The following 1827 comment by Goethe, to his associate, German author Johann Eckermann, surmises the retrospect weight of this novella in Goethe's mind: [8]

> "The only production of greater extent, in which I am conscious of having labored to set forth a pervading idea, is probably my *Elective Affinities*."

The following equation, relating the chemical affinity A to Gibbs free energy change ΔG, as proved in 1882 by German physicist Hermann Helmholtz in his "The Thermodynamics of Chemical Processes":

$$A = -\Delta G$$

Friedrich Schiller (IQ=175), the Humboldt brothers (Wilhelm (IQ=175) and Alexander (IQ=185)), and **Goethe** (IQ=230) in Jena, 1797, discussing, in Goethe's own words, "all of nature from the perspectives of philosophy and science". [36]

shows that Goethe's *Elective Affinities* was a modern-day treatise on the explication of Gibbs free energy changes involved in the determination of human chemical reactions. In reduced modern format, Goethe showed, over two-hundred years ago, that the affinities, or the forces of love and hate, which are balanced in stability ratios in successful relationships, of human relationships are functions of enthalpy change ΔH, entropy change ΔS, and temperature T:

$$A = T\Delta S - \Delta H$$

which, noting that H = U + PV, equates to:

$$A = T\Delta S - \Delta U - P\Delta V$$

meaning that human affinity, or the affinity between two people, i.e. the force of reaction between people, according to Helmholtz and Goethe, is a function of temperature, entropy, internal energy, pressure, and volume.

This means that affinity will be favored, between two people, when there is an increase in entropy, a decrease in internal energy, and a decrease of volume, of the interactive system, over time. One can expand on this equation in

more detail, by noting that Rudolf Clausius defined internal energy of the system, which in this case concerns a system of interacting people or human molecules, as the sum of the vis viva and the ergal, or U = T + J, which referring to a change Δ over time is:

$$\Delta U = \Delta T + \Delta J$$

Subsequently, the measure of the affinity between two people, wherein A > 0 for spontaneously favored relationships (or ΔG < 0, thermodynamic sense, i.e. according to the spontaneity criterion), is expressed by the equation:

$$A = T\Delta S - P\Delta V - \Delta T - \Delta J$$

meaning that in addition to an entropy increase, ΔS > 0, or transformational content increase (meaning that heat was transformed in to system internal evolution work), which signifies that the body or boundaried system of the relationship has transformed or evolved over time, and a volume decrease, ΔV < 0, associated with favorable relationships, meaning that spatial movements of the pair come together over time rather than diverging (simplified by saying that two homes become one), a vis viva decrease, ΔT < 0, and an ergal decrease, ΔJ < 0, will also be associated with favored relationships. A decrease in vis viva seems to make intuitive sense, in that a couple nearing their golden wedding anniversary will invariably tend to have less kinetic energy then a newly minted couple, in the sense that the former's daily movements will often be slow and tending to be confined to the kitchen, bathroom, and television room. The subject of an ergal decrease over time as associated with stable relationships requires more thought. In formulaic terms, ergal change over time is defined as:

$$\Delta J = J_{\text{final}} - J_{\text{initial}}$$

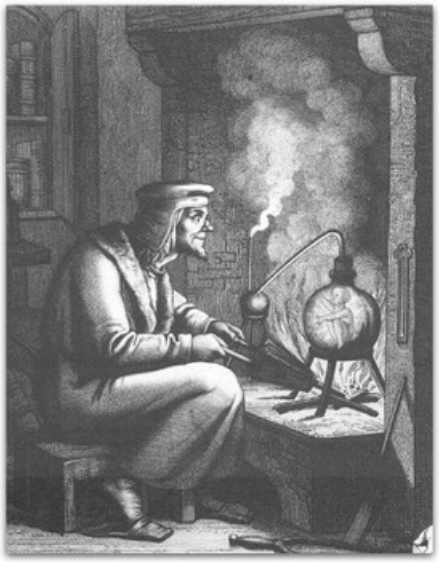

Left: Wagner, a famed sorcerer's former student, creating **Homunculus** in the chemical laboratory using fire (or heat) and some type of chemical apparatus, as described in Goethe's 1832 *Faust part II* (see: laboratory produced life); in his talk with Eckermann, Goethe is supposed to have said that Homunculus is virtually the same as the Leibnizian entelechy or monad, according to John Williams. [37] Right: Goethe in 1808/09 the time when he wrote his famous physical chemistry base novella.

Thus, a negative ergal change, which be the above reasoning is associated with favored relationships, implies that the ergal at the start of the relationship, *Ji*, must be greater than the ergal at the end of the relationship, *Jf*. In the terminology of William Hamilton, this is expressed by saying that the was a decrease in the force function of the relationship over time or in the terminology of William Rankine, this is expressed by saying that there was a decrease in the potential energy of the relationship over time.

Goethe, Minister of State, of the independent German state Saxe-Weimar, and Grand Duke Karl August (who appointed Goethe a member of the privy council in 1776 and later

The affect of free energy coupling, discovered in 1941 by Fritz Lipmann, however, compounds this description, in the sense the human relations must thus be coupled to each other if coupling is a universal phenomenon in the biosphere. In direct extrapolation, it means that the energy (bond energy) released from the cleaving of certain high energy human chemical bonds will function to drive many endergonic human chemical reactions (relationships and processes that would not normally go on their own).

Said another way, Goethe showed that human relationships (affinity relationships) are governed by the laws of chemical thermodynamics. In addition, with the publication of German-born American biochemist Fritz Lipmann's 1941 paper "Metabolic Generation and Utilization of Phosphate Bond Energy", which showed that, in nature, endergonic reactions are coupled to exergonic reactions, we know that human chemical reactions between people are coupled to each other, as Goethe showed in his novella, or that bond energy released from some certain energy dense human bonds, acts to drive less energetic human reactions that would not otherwise go on their own. Thus, wherein affinity equates to free energy *G* and elective affinity reaction equates to chemical reaction in modern terms, Goethe pioneered the science of human chemical thermodynamics, two-hundred years ahead of its time.

Goethe's fields of expertise are varied, he was a lawyer, poet, painter, architect, playwright, governor, statesman, botanist, chemist, physicist, biologist, anatomist, novice mathematician, philosopher, scientist, in the general sense of the word, and as been called: "the last true person to know everything". Goethe is also considered to be the founder of two sciences: morphology (1790) and human chemistry (1809). [22] In the latter sense, he is considered as the world's first human chemist. [4]

Minister of State) in the courtyard of the Jena Castle. [29]

Goethe is also a pioneer of human thermodynamics for his theories on human energies and affinities in relation to human work productivities, the latter of which was determined to be a measure of "free energy" (in 1882). Goethe, along with William James Sidis, both of which who were driven to outline a thermodynamic theory of life, are coincidentally both among the only three people to have had adulthood intelligences estimated at the IQ: 225+ range. Goethe, according to English novelist Georgi Eliot, is: [2]

> "Germany's greatest man of letters ... and the last true polymath to walk the earth."

Left: A Goethe barometer used by Goethe in 1822 in his studies of meteorology. [21] Center: the **Goethe-Schiller statue** in Weimar; it was to German writer Friedrich Schiller, in 1799, that Goethe first confided his newly forming theory that the passions of human relationships are governed precisely in the same manner as are the reactions of chemicals of affinity tables. Right: the Goethe-Schiller bust (circa 1805).

Goethe, by way of his 1809 theory of human elective affinities, as found in coded story form in his *Elective Affinities*, in which, as he wrote to many people, he had not only placed numerous different elements within the text, but that many of these were hidden within it and that past the transparent or non-transparent veils in the novel one may be able to see the 'truly intended Gestalt', is truly the all-time greatest mind to have ever walked the face of the earth, beyond that of either Newton, Einstein, or Da Vinci. [3] The genus and logic of Goethe's mind, for instance, who had stated: [7]

> "How I look forward to the effect that this novel [*Elective Affinities*] will have in a few years on many people rereading it."

is now only beginning to come into light, some 200-years after publication. [4] The logic of Goethe's human affinity theories, for instance, is currently forming the basis of the new beta-stage, science-based pair matching site ReactionMatch.com, situated on the premise of "matching affinities in love the chemical reaction." Noted researchers on Goethe's *Elective Affinities* include: German science historian Jeremy Adler, who did his 1969 PhD dissertation on the chemists, particularly Swedish chemist Torbern Bergman, affinity reactions, and affinity theory used by Goethe in his novella, and American Germanic studies scholar Astrida Tantillo, author of the 2001 book Goethe's *Elective Affinities* and the Critics.

Goethe genealogy

In genealogies, Goethe's genealogy is unique in that although it can be traced back through eleven generations, his seed only carried forward through two generations, and in this sense, it is more apt to say correctly that we are the progeny of his prolific output. [63]

First generation

A

Johann Caspar Goethe (1710-1782)

+

B

Catharina Textor (1731-1808)

→

C

Johann Wolfgang Goethe (1749-1832)

+

D

Cornelia Goethe (1750-1777)

Second generation

A

Johann Wolfgang Goethe (1749-1832)

+

B

Christiane Vulpius (1765-1816)

→

C

August von Goethe (1789-1830)

Third generation

A		B		C + D + E
August Goethe (1789-1830)	+	Ottilie Pogwisch (1796-1872)	→	Walter Wolfgang von Goethe (1818-1885) Maximilian Wolfgang von Goethe (1820-1883) Sedina Alma Henrietta Cornelia von Goethe (1827-1844)

Goethe’s grandchildren Walter and Maximilian, as it has been noted, turned homosexual in mating behaviors, thus producing no offspring, and their sister Sedina (Alma), ended at the age of 17 during the typhoid epidemic, thus producing no offspring—hence, stands the 1885 passage on Walter's tombstone:

> “With him went Goethe’s seed, whose name survives forever.”

There, no doubt, is some unnamed principle or law at work here, in the neighborhood of "having one's cake and eating it to", in regards to elite geniuses and progeny, something akin to the two being inversely proportional to each other, as in Beckhap's law.

Goethe family in Schäfertracht (1762), from left to right: Katharinea Elisabeth Goethe (1731-1808), Johann Caspar Goethe (1710-1782), **Johann Wolfgang Goethe** (1749-1832), and Cornelia Goethe (1750-1777). (see: Genealogy)

Education

Goethe's early education was attended by his father Johann Caspar Goethe, i.e. "Rat Goethe", a prominent lawyer, who was determined that his son and daughter, Cornelia, should not be contaminated by attending a public school. [19] Goethe’s early education has been described as irregular; he went to no school, and his father stimulated rather than instructed him. [18]

Goethe's only formal education took place from 1765 to 1767, where, at the age of 16, Goethe entered the University of Leipzig, studying the classics, and graduating with a degree in law. The bulk of Goethe’s education, however, can best be described as autodidactic in style, or a self-directed type of self-education; he was a self-taught genius.

Goethe had an association with Estonian-born German physician and physicist Thomas Seebeck, noted for his 1821 experimental discovery of the thermoelectric effect or of thermo-electricity, who helped Goethe in his scientific investigations, supposedly in his color theory. [30]

Religion

See main: Goethe on religion

Born into a Lutheran family, Goethe's early faith was shaken by news of such events as the 1755 Lisbon earthquake and the Seven Years' War. [63]

Goethe had questioned the traditional concept of God at an early age; in *Dichtung und Wahrheit* he describes, in poetic language, how at age 9 he built his own altar to nature out of his father’s natural history collection, surmounting it with sulfur, and lit a candle, when making his devotions. It has been argued that his readings of the works of Benedict Spinoza later confirmed these feelings. [52]

At age 21, at the University of Strasbourg, completing a dissertation (rejected on the grounds that it was unorthodox) on "The Legislature, On the Power of the Magistrate to Determine Religion and Culture", in which he contended, among other things, that "Jesus Christ is not the author of Christianity, but rather a subject composed by a number of wise men and that Christian religion is merely a rational, political institution." [53]

The dissertation was rejected being that it was attack on orthodoxy—as a result, he only achieved the "licentiate" to practice law. Following dissertation rejection, to show contempt for university authorities he offered a series of 56 theses for disputation, e.g. "natural law is what nature has taught all creatures" (thesis 1), "should the woman who kills her newly born child suffer the death penalty? (thesis 55), a moral issue reoccurs in *Faust*, etc., all themed on his distaste for learned authority, and casting for a new way of looking at the relationship between humans to nature, society, and tradition.

In July 1782, he described himself as"not anti-Christian, nor un-Christian, but most decidedly non-Christian."In his *Venetian Epigram 66*, Goethe listed four things that he loathed:"tobacco smoke, bugs, garlic, and †." [63]

Scene from the 2011 film *Young Goethe in Love*, wherein he is told that his Christianity-dismantling law degree dissertation failed.

In his collected works of poems, Goethe famously stated the following famous synopsis:

> "He who possesses science and art,
> Possesses religion as well;
> He who possesses neither of these,
> Had better have religion."

It does seem to be the case that Goethe had some type of belief in the existence of God—some have summarized this to be similar to the embodiment of nature(pantheistic) type of god held in the mind of Benedict Spinoza, one of Goethe's intellectual mentors. In a 21 November 1827 letter to his friend, German composer Carl Zelter, the same letter that he famously comments how people have treated his *Elective Affinities* like the "garment of Nessus", to exemplify, Goethe comments in ending: [62]

> "With the kindest greetings, let me exhort and cheer you on to persevere in that activity, to cultivate which—in the midst of peace—we are encouraged and compelled by the hostile pressure of the world. If we help ourselves, God will help us."

In 1831, a year before his end, Goethe commented the following: [56]

> "I have found no confession of faith to which I could ally myself without reservation."

Interesting, indeed.

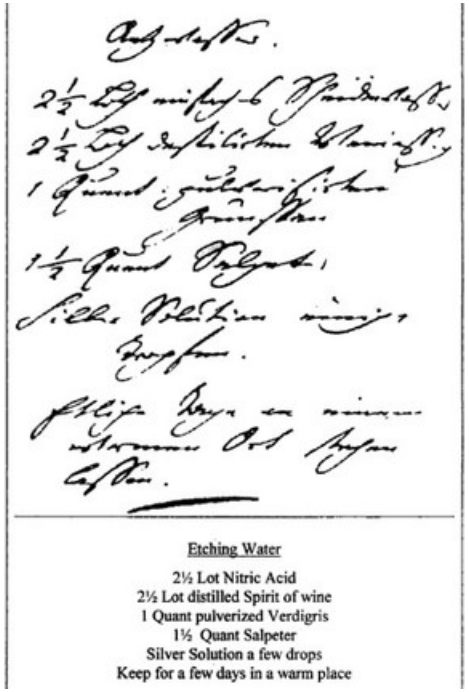

Etching Water

2½ Lot Nitric Acid
2½ Lot distilled Spirit of wine
1 Quant pulverized Verdigris
1½ Quant Salpeter
Silver Solution a few drops
Keep for a few days in a warm place

One of Goethe's first chemical experiments: the preparation of corrosive water for etching. [24]

Chemistry

See main: Goethe and chemistry

In 1758, at age 9, Goethe erected an altar of natural products, derived largely from his father's natural history collection, surmounting it with a candle, which he lit when making his devotions, the whole surmounted by sulphur, signifying the unity of nature. [79]

In 1768, at age of 19, during his convalescent year at home in bed (1768-69), through the direction of Susanne Klettenberg (1723-1744), he studied the works of Paracelsus, Anton Kirchweger's *The Golden Chain of Homer: a Description of Nature and Natural Things* (1723), Georg von Welling's *Opus Mago-Cabalisticum*, the writings of Hermann Boerhaave, and others; and was conducting chemical experiments in his attic using a draught furnace to reveal the 'principle that permeates the whole universe'.

Some have argued that Goethe was drawn into the science of chemistry during his 1768 spell of illness during his return home from the University of Leipzig wherein he was treated by a

physician who claimed to have found an infallible panacea or mysterious drug which he did not dare use because he was afraid of the legal action against him, but that was convinced into using, after his patient was suddenly seized with an attack of violent illness which threatened his life, after which Goethe began to mend and soon recover. [32]

In 1769, at the age of 20, Goethe was conducting chemical experiments in his attic using a draught-furnace. As Goethe wrote, at age 21, in a 1770 letter to writer Susanne von Klettenberg, age 47, who had helped Goethe during his Leipzig disease two years prior: [24]

> "Chemistry is still my secret love."

Books on chemistry and alchemy, according to Goethe's biographer Heinrich Düntzer, became "almost a craze with him", though, seeking exact knowledge, he was sometimes made desperate by their strange mystifications. [12] Goethe's reading of Bavarian alchemist Georg von Welling's 1735 *Opus Mago-Cabalisticum*, a sort of religious-chemistry mixture, for instance, led him to the clearer chemistry of Dutch physician and chemist Herman Boerhaave's 1724 *Elements of Chemistry*, a book greatly influential to French chemist Antoine Lavoisier and his 1787 *Elements of Chemistry*. [13] Goethe also studied the works of Swiss physician and chemist Paracelsus. [14]

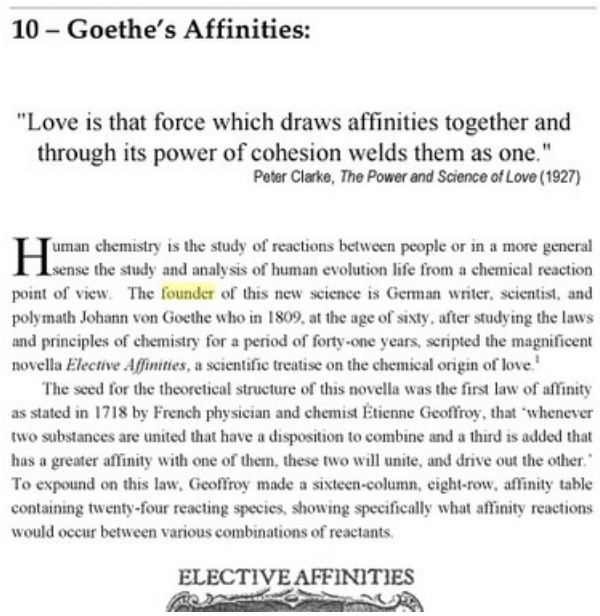

10 – Goethe's Affinities:

"Love is that force which draws affinities together and through its power of cohesion welds them as one."
Peter Clarke, *The Power and Science of Love* (1927)

Human chemistry is the study of reactions between people or in a more general sense the study and analysis of human evolution life from a chemical reaction point of view. The founder of this new science is German writer, scientist, and polymath Johann von Goethe who in 1809, at the age of sixty, after studying the laws and principles of chemistry for a period of forty-one years, scripted the magnificent novella *Elective Affinities*, a scientific treatise on the chemical origin of love.[1]

The seed for the theoretical structure of this novella was the first law of affinity as stated in 1718 by French physician and chemist Étienne Geoffroy, that 'whenever two substances are united that have a disposition to combine and a third is added that has a greater affinity with one of them, these two will unite, and drive out the other.' To expound on this law, Geoffroy made a sixteen-column, eight-row, affinity table containing twenty-four reacting species, showing specifically what affinity reactions would occur between various combinations of reactants.

ELECTIVE AFFINITIES

Opening section of chapter the "Goethe's Affinities" of the 2007 textbook *Human Chemistry*, by American chemical engineer by Libb Thims, specifically defining Goethe as the "**founder**" of the science of human chemistry.

In 1770, at the University of Strasbourg, Goethe began attending the chemistry courses of French chemist Jacob Spielmann, his first chemistry teacher.

One of Goethe's first mentors in chemistry was German physician-chemist Wilhelm Buchholz, who presented the latest findings in chemistry at the weekly Friday Society meetings at Weimar, from 1791 to 1797, of which Goethe was a member. [32] It may be that Buchholz was the model for the Captain in *Elective Affinities* (see: Geothe's human affinity table).

In a 2 Jul 1792 letter to German physician Samuel Sommerring, Goethe stated the following: [76]

"It seems to me at least for the moment, that everything connects well when you in this teaching for Barbie takes the concept of polarity to guide. Like ... it was impossible to connect the previously chemical experience with optical, you only see the first chapter of each Dyeing, even the newest of Berthollet, in which the progress of chemistry, we must admire the way so much. Because basically ... the thing itself must be very simple, as all higher, the general principles of acting. As you pointed out quite rightly, the effect of acids and friendship is to the Yellow Red and Yellow, the alkalis to the Blue Red and Blue brought in a great relationship, what offers us the countless chemistry experiments. "

"Mir scheint wenigstens für den Augenblick, daß sich alles gut verbindet, wenn man auch in dieser Lehre zum Versch den Begriff der *Polarit*ät zum Leitfaden nimmt. … Wie unmöglich war es bisher die chemischen Erfahrungen mit den optischen zu verbinden, man sehe nur die ersten Kapitel einer jeden Färbekunst, selbst der neuesten von Berthollet, in welcher wir die Fortschritte der Chemie übrigens so sehr bewundern müssen. … Denn im Grunde muß die Sache an sich sehr einfach sein, wie alle höhere, ins Allgemeine wirkende Prinzipien. Wie Sie ganz richtig bemerkten, wird die Wirkung und Freundschaft der Säuren zu dem Gelben und Gelbroten, der Alkalien zum Blauen und Blauroten in einen schönen Zusammenhang gebracht, wozu uns die Chemie unzählige Versuche anbietet."

At some point, Goethe came across Swedish chemist Torbern Bergman's 1775 chemistry textbook *A Dissertation on Elective Attractions* (likely the 1785 German edition by Heinrich Tabor, as most scholars have argued), which became his core anchor point for developing his theory of human chemical reactions or human elective affinity reactions and human morality based on measurable chemical affinity tendencies. To exemplify this, in 1809, Goethe explained to his friend Friedrich Riemer that:

> "The moral symbols used in the natural sciences were the elective affinities discovered and employed by the great Bergman."

In 1810, Goethe began attended the weekly lectures of German chemist Johann Dobereiner, one of Goethe's lifelong friends, who taught Goethe about chemical analysis and stoichiometry. [17]

In 1826, at age 77, on the paradoxical issue of French chemist Claude Berthollet's 1799 theory of split affinities (or color theory and chemical affinity), Goethe commented that: "for decades I have been struggling with Berthollet in the matter of affinities" (see: Berthollet's affinity theory). [16] Goethe was said to have exchanged letters with Swedish chemist Jacob Berzelius (noted for his "electrochemical theory") whom he met at one point. [14]

Steam engine

In 1788, the first steam engines to hoist water were operating in Upper Silesia; sometime thereafter, Goethe was introduced to the Newcomen engine and a water column engine during his visit there. (Ñº) Goethe's 1797 poem "The Sorcerer's Apprentice", a ballad in fourteen stanzas, the story line behind Disney's 1940 *Fantasia*, about an apprentice who evokes a spell to bring animation to a broom so to carry buckets of water from the river, was supposedly inspired by or, according to Norbert Wiener, has something to do with the Newcomen engine. [80]

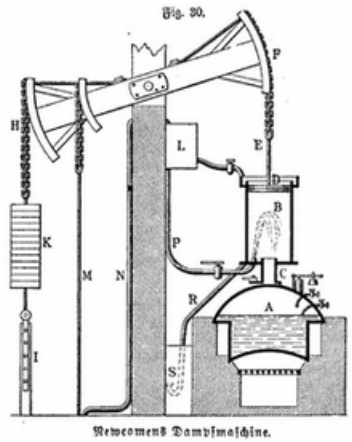

Goethe's 1797 poem "The Socerer's Apprentice", the poem behind Disney's 1940 *Fantasia*, in which a broom is animated via incantation to carry buckets of water, is said to have been inspired by his 1780s studies of the Newcomen engine in Upper Silesia and the flooded mine problem (pump problem).

Electricity

Ethics author Julie Prandi (1993) stated that Goethe believed in the essential unity of nature to the effect that he hoped to develop a sort of unified field theory that would connect magnetism, electro-chemical reactions, and colors. [72]

The reference to electro-chemical reactions seems to be a bit of an anachronism, as the battery was not developed until 1800 by Alessandro Volta, who built on the pioneering work of Luigi Galvani, after which electrochemistry came into the mainstream. The attribution, however, could refer to German physicist Johann Ritter (1776-1810) who made discoveries in galvanism, electrochemical properties of elements, and effects of light on chemical reactions, to whom Goethe's name is associated. [73]

It is also known that Goethe, together with Alexander Humboldt and Wilhelm Humboldt, prior to 1797, had conducted electrical experiments on frog preparations, in testing the subject of galvanism or animal electricity theories of Luigi Galvani. [74]

Human chemistry | Elective Affinities

See main: Goethe's human chemistry

Goethe spent a period of over 50-years studying chemistry, human life, and its driving passions. His conclusion on the phenomenon of human life was that human beings are chemical species and that both the work of life and the underlying vicissitudes of relationships, in all varieties, e.g. marriage, friendships, social interactions, etc., are chemical reactions, pure and simple. Using Swedish chemist Torbern Bergman's 1775 chemistry textbook *A Dissertation on Elective Attractions*, particularly his 69-diagrammed affinity reactions, Goethe outlined a 36-chapter novella in which each character is considered as different type of chemical species and each chapter plays out a variation on a different type of elective affinity reaction. The following would be a combination reaction, according to Goethe:

â™, + â™€ → â™,â™€ (Goethe's view)
A + B → AB (Bergman's view)

The following would be a single elective affinity (single displacement reaction), in Goethe's view, wherein a new female species two acts to displace female species one, with whom the male has a weaker chemical affinity to than as compared to species two:

â™,â™€$_1$ + â™€$_2$ → â™,â™€$_2$ + â™€$_1$ (Goethe's view)
AB + C → AC + B (Bergman's view)

A year before publication, Goethe, who had been studying chemistry for a period of forty-years, told his friend Riemer that:

"My idea for the new novella is to portray social relationships and their conflicts symbolically."

In this statement, Goethe meant that his idea would be to define people as chemical units, lettered using Bergman's pioneering conception of using letters, *a*, *b*, *ac*, *abd*, *abcd*, etc., to represent chemical species. The idea of symbols and symbolic relationships is a statement in reference to a Scottish physician and chemist William Cullen's 1757 pioneering development of affinity reaction diagrams, where in during lecture he invented the use of brackets and darts to represent the change in reaction on going from reactants to products in time, or in a sense the way in which the force of affinity would act in the process of the reaction. The following affinity reaction diagram is one example:

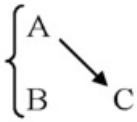

in which chemical species (or people) *A* and *B* are attached in a weakly bonded chemical union, signified by the bonding bracket "{", ordered such that if species *C* (a third person) were introduced into the system, the greater affinity preference of *A* for *C* would cause *A* to displace *B* and to thus form a new union with *C* (a new relationship), which equates to the following in modern terms:

$$AB + C \rightarrow AC + B$$

In short, Goethe wrote out 36 of these types of reactions in story form in his 36-chapter novella *Elective Affinities.* In the famous chapter four of this, his magnum opus, the characters discuss among themselves what chemical dissection means or implies in the context of human choice, free will, love, and the interconnectedness of human relationships. The following is a 1899 summary of Goethe's theory of human chemical affinities by German biologist Ernst Haeckel: [31]

> "Goethe, in his classical romance, *Affinities*, compares the relations of pairs of loves with the phenomenon of the same name in the formation of chemical combinations. The irresistible passion that draws Edward to the sympathetic Ottilie, or Paris to Helen, and leaps over all bounds of reason and morality, is the same powerful unconscious attractive force which impels the living spermatozoon to force an entrance into the ovum in the fertilization of the egg of the animal or plant—the same impetuous movement which unities the two atoms of the hydrogen to one atom of the oxygen for the formation of the a molecule of water. This fundamental unity of affinity in the whole of nature was recognized by the great Greek scientist Empedocles in the fifth century BC in his theory of the love and hatred of the elements."

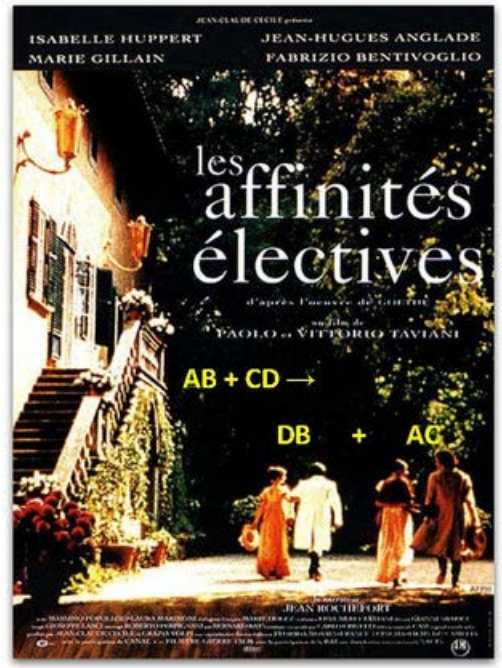

The 1996 French-Italian film adaption of Goethe's 1809 *Elective Affinities*, written and directed by: Paolo Taviani and Vittorio Taviani; produced by: Jaen-Claude Volpi with modified chemical equation overlay (by Libb Thims), showing the basic double elective affinity reaction threading the chapters of the book together (see: history). [28]

The equation overlaid cover design to 2012-launched online, planned 2013-book published, ***Elective Affinities: Illustrated, Annotated, and Decoded*** by American electrochemical engineer Libb Thims, based the 1885 cover illustration by Philipp Johann and translation by Hjalmar Boyesen.

(add discussion)

Scientists to have cited *Elective Affinities*

See main: Scientists who've cite *Elective Affinities*

The following is a list of chemists, chemical engineers, and chemistry historians and other scientists who have cited Goethe's 1809 human elective affinity theory:

1905 | Wilhelm Ostwald | Sixth Lecture: Affinity Lecture at MIT.
1910 | Fielding Garrison | comment: "seems so plausible and fascinating".
1969 | Jeremy Adler | *Goethe's* 'Elective Affinity' *and the Chemistry of his Time*

"Dobbs, op. cit., also examined the role of the 'mediator' by which two substances are made 'sociable'. We may recall here the importance of the mediator [Mittler] in Goethe's *Elective Affinities* (Engl. Trans. Greenwood 1976). For what concerns chemistry, Goethe was not far from Newton."

Belgian chemist Ilya Prigogine and his famous footnote 2.5 (*Order Out of Chaos*, 1984), the one that led American electrochemical engineer Libb Thims to the work of Goethe, which thus became the main stimulus behind the writing of the world's first textbook on "human chemistry" in 2007 (see: Libb Thims (history)).

1978 | Pierre Laszlo | “All Kinds of Affinities”
1984 | Ilya Prigogine | *Order Out of Chaos* (pgs. 64, 319)
1995 | Jean-Marie Lehn | *Supramolecular Chemistry* (pg. 2)
1995 | Roald Hoffmann | *The Same and Not the Same* (pgs. 58, 88-89, 179-80, 256) [43]
1995 | Joel Janin | protein thermodynamics article “Elusive Affinities”. [41]
1997 | Kevin Yee | The Captain as Catalyst in Goethe's *Wahlverwandtschaften*
2000 | Jurgen Mimkes | "Society as a Many Particle System" (pg. 2)
2003 | Mi Gyung Kim | *Affinity, That Elusive Dream* (pgs. 1-2)
2004 | Tominaga Keii | *Heterogeneous Kinetics* (section: Chemical Affinity in 1806, pgs. 16-17)
2007 | Libb Thims | *Human Chemistry* (ch. 10: Goethe's Affinities, pgs. 371-422)
2008 | Philip Ball | "Literary Reactions" in *Science World*
2010 | Sam Kean | *The Case of the Disappearing Spoon* (ch. 14: Artistic Elements)

What is curious (Ñº) in this list (Thims aside), is the number of people (particularly Prigogine, Keii, and possibly Janin), knowledgeable about chemistry and in particular chemical thermodynamics, to have seemingly been unmoved, so to speak, by Goethe's theory, discussing it only as a passing amusement? Ostwald, in fact, translated Gibbs' *Equilibrium* into German in 1892, gave lectures on affinity, and wrote books on the subject, and had an "energy theory of culture."

Gestalt

Goethe wrote to many people about *Elective Affinities*, informing them of a unified ‘Gestalt’, hidden meanings, and the necessity of multiple re-readings. [23] In 1817, Goethe explained *Gestalt* as follows: [22]

> “The Germans have a word for the complex of existence presented by a physical organism: Gestalt. With this expression they exclude what is changeable and assume that an interrelated whole is identified, defined, and fixed in character. But if we look at all these Gestalten, especially the organic ones, we will discover that nothing in them is permanent, nothing is at rest or defined - everything is in a flux of continual motion. This is why German frequently and fittingly makes use of the word Bildung to describe the end product and what is in process of production as well. Thus in setting forth a morphology we should not speak of Gestalt, or if we use the term we should at least do so only in reference to the idea, the concept, or to an empirical element held fast for a mere moment of time”

Morphology | Evolution

See main: Goethe on evolution

Goethe had discovered a universal principle of evolution, specifically "morphology" as he termed it, as early as 1784, some 75+ years before Charles Darwin’s 1859 *Origin of Species.* Darwin, in his book, in fact, attributes the discovery of evolution to three people: Saint-Hilaire (1833), Erasmus (1791), and Goethe (1784). Goethe is said to have discovered evolution in 1784 as pronounced in a missive to Herder from Jena, March 27, at night (quote to right):

> “I have found neither gold nor silver, but something that unspeakably delights me—the **human Os intermaxillary**! I was comparing human and animal skulls with Loder, hit up the right track, and behold—Eureka! Only, I beg of you, not a word —for this must be a great secret for the present. You ought to be very much delighted too, for it is like the keystone to anthropology—and it’s there, no mistake! But how?”

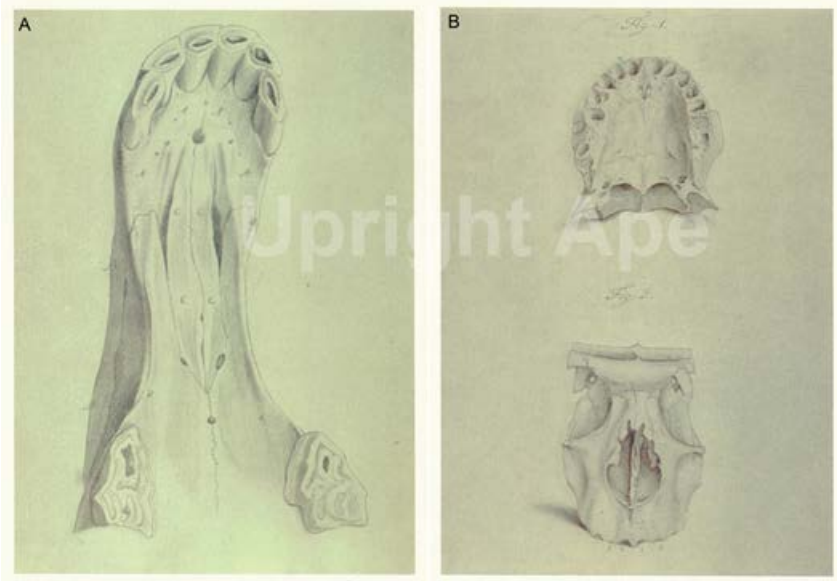

— Goethe, on his discovery of the human intermaxillary bone, 1784

This formal illustration from Goethe's publication (1784) shows his discovery of a bone that anatomists of his time had claimed was missing from humans. This was used to support the argument of continuity of human anatomy with the rest of the biotic world. [46]

In this instance, according to Carl Becker, as discussed in his 2003 book *A Modern Theory of Evolution*, Goethe had "discovered the evolution of the human being from the ape", a concept that prior to him had only existed as a metaphor in occult tradition: the ape representing man untransformed by alchemy. [35]

As explained by German physician-physicist Hermann Helmholtz, in his In the 1853 essay "On Goethe's Scientific Researches", Goethe's studies of comparative botany and comparative anatomy led him to "a happy glimpse of an all-pervading law" of the conception that the differences in the anatomy different animals or morphology of different plants are to be "looked upon as variations from a common phase or type, induced by differences of habit, locality, or food."

The specific observation that led Goethe to this fertile conception of evolution, is found in Goethe's monograph on the intermaxillary bone, written as early as 1786. Prior to this publication, it was known that in most vertebrates (mammalia, birds, amphibia, and fishes) that the upper jaw consists of two bones, the upper jaw-bone and the intermaxillary bone. The former always contains in the mammalia the molar and canine teeth, the latter the incisors. Humans, being distinguished from all other animals by the absence of the projecting snout, have, on the contrary, on each side only one bone, the upper jaw-bone, containing all the teeth. This being so, according to Helmholtz, Goethe discovered in human the skull faint traces of the sutures, which in animals unite the upper and middle jaw-bones, and thus concluded from it that man had originally possessed an upper jaw-bone.

By 1795, following more studies in osteology, Goethe had become convinced of the universality of his "newly discovered principle", and was able to define the idea in his "Sketch of a General Introduction to Comparative Anatomy", wherein he laid down with the utmost confidence and precision, that "all differences in the structure of animals must be looked upon as variations of a single primitive type, induced by the coalescence, the alteration, the increase, the diminution, or event the complete removal of singe parts of the structure."

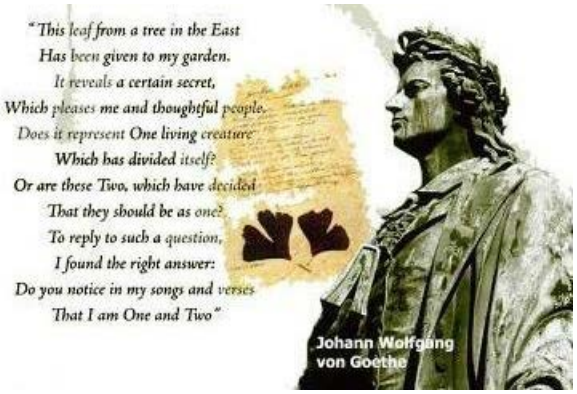

Sketch of Goethe's research and poem entitled *Ginkgo Biloba* which gives a hint of what he was digging for in his work on comparative botany: [45]

In his 1790 treatise on the metamorphosis of plants, according to Helmholtz, Goethe had worked out the principles behind the transformation of stem-leaves into sepals and petals, and of sepals and petals into stamens, nectaries, and overaies, just as the "anterior extremity of vertebrate animals takes different forms, becoming in man and apes an arm, in other animals a paw with claws, or a forefoot with a hoof, or a fin, or a win, but always retains the same divisions, the same positions, and the same connection with the trunk, all resembling each other to a certain extent in origin and composition, and even under certain conditions passing from one form into the other." [20]

Goethe's 1786-1795 theories on metamorphosis and variation of plant and animal species, as being descendant common ancestors, through a process of transformation, had a significant influence on English naturalist Charles Darwin and the reception of his 1859 *Origin*

Goethe's color triangle: has the primary colors at the corners, with the secondaries along the triangle's sides and the tertiaries filling the inner spaces. Scottish physicist James Maxwell developed a chart in 1872 from his studies of the electromagnetic theory of light, which was in the form of a triangle, similar to Goethe's. Isaac Newton had said that the seven basic colors created by a prism were elementary and unmixable, but Maxwell proved that only three colors—red, green, blue—were necessary to create all the others—a conclusion that became the basis for color photography (first made by Maxwell), and later color printing. [42]

of Species.

Helmholtz reiterated in 1892, on Goethe's metamorphosis theory, that Goethean morphology had so shaped nineteenth-century biology that it paved the way for Darwin's theory. [25]

Darwin, in his work, gives credit on this matter by stating that the three precursor theories to his own were his Erasmus Darwin (his grandfather), French naturalist Geoffroy Saint-Hilaire, and Goethe: [26]

"It is rather a singular instance of the manner in which similar views arise at about the same time that Goethe in Germany, Erasmus Darwin in England, and Geoffroy Saint-Hilaire in France, came to the same conclusion on the origin of species, in the years 1794-95"

Erasmus had expressed the view, in his *Laws of Organic Life* (1794), that "all warm-blooded animals have arisen from one living filament".

Goethe expressed his views, on evolution in three different occasions: in his 1786 monograph on the intermaxillary bone, where he showed that humans had originally possessed an upper jaw-bone similar to other vertebrates, but that over time the upper-jaw and lower jaw of humans had fused through a process of morphogenesis; his 1790 *Metamorphosis of Plants*, where he showed how the various parts of the plant had evolved from earlier precursors over time; and his 1809 *Elective Affinities*, where he showed that the evolution of humans (and by implication all species) originated at the chemical level.

Geoffroy remarked in his 1794 and 1795 work that "there is no doubt that Goethe was an extreme partisan of similar views" to his own; and who, in his 1795 *History Making or Monkeys from Madagascar*, expressed his view that there is a unity of organic composition and that nature presents us with only one plan of construction, the same in principle, but varied in its accessory parts.

On these pioneers of the theory of "variation of species" as French botanist Henri Lecoq wrote in 1854: [27]

> "We see that our researches on the fixity or the variation of the species, lead us directly to the ideas issued by two men justly famous, Geoffroy Saint-Hilaire and Goethe."

This passage was also cited by Darwin. In total, in his in his 'Historical Sketch', on those who advocated variations on a theory of origin of species, prior to 1859, Darwin gives thirty-four authors who believe in the modification of species, or at least disbelieve in separate acts of creation, of which twenty-seven have written on special branches of natural history or geology, in which the two foremost of these, according to Darwin, are Goethe and Geoffroy.

Goethe's last writings were said to have been devoted to defending Saint-Hilaire. [44]

It should be noted that Ernst Haeckel and Lester Ward considered Geoffroy Saint-Hilaire's contributions to evolutionary theory to be relatively insignificant and instead ranked Jean Lamarck along side Erasmus Darwin and Goethe. While both Haeckel and Ward agree that Erasmus Darwin was the least important of the three they disagree on whom was most important. Haeckel ranks his fellow countryman Goethe at the top while Ward considers Lamarck's body of work to be superior. [78]

Theme | Freedom, choice, and circumscriptions

According to English German-cultures scholar Carl Krockel, three of Goethe's main works circled around the issue of freedom of choice of an individual embedded in a system: [70]

> "In *Faust*, the *Wilhelm Meister* novels, and *Die Wahlverwandtschaften* Goethe explored the freedom of each individual to choose his path in life, while revealing how this choice was circumscribed by oppressive social demands."

Goethe's IQ

See main: Genius IQs

Goethe, being generally known as polymath of great and varied knowledge, is also regarded as having one of the world's highest IQ. [5] In fact, Goethe is one of the only three people to have had independently estimated adulthood age IQs at or above 225.

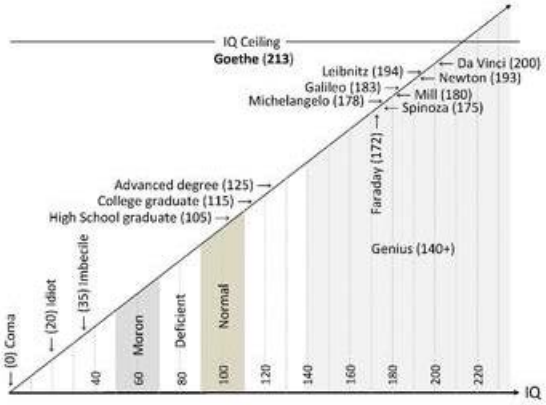

#	Person	IQ	Theory	Date
1	Johann Goethe (1749-1832)	180-225	A = TΔS – ΔH AB + CD → BD + AC *Elective Affinities*	1809
2	Albert Einstein (1879-1965)	160-225	G ≠ Love (Relativity) ($E = mc^2$)	1920
3	William Sidis (1898-1944)	200-300	ΔS *Animate-Inanimate* (Entropy Reversal)	1920
4	Christopher Hirata (1983-)	225	ΔG = ΔH – TΔS X + Y ↔ XY "Physics of Relationships"	2000

Right: Known individuals with an estimated adulthood IQ of 225+; four which have theories surrounding the concept of entropy *S*, two of which (Goethe and Hirata) applying affinity or free energy to human relationships.

Famously, in 1926, psychologist Catherine Cox, assisted by psychologists Lewis M. Terman, Florence L. Goodenaugh, and Kate Gordon, published the results of her studies of 301 ratings of individual case histories of the behavior and performance of 301 eminent young men and women, between 17 and 26 years of age, born 1450 to 1850, prepared from 1,500 biographical sources, reported as estimated intelligence quotients based on *The Stanford Revision of the Binet-Simon Intelligence Scale*, and corrected for regression to the mean, in her book *Early Mental Traits of Three Hundred Geniuses*. The following quote by Cox summarizes the general view of Goethe's IQ:

Goethe meeting with Napoleon in 1808; Napoleon's famous greeting of the author Werther on 2 October, «Voilà un homme!» ('Now here is a real man!'). [47]

"One rater (M) has scored on the basis of the record of Goethe's youth an **IQ of 225**. Goethe's true IQ may in the history of mankind have been equaled in a few instances; one may well wonder whether it has ever been exceeded."

The result of Cox's studied was that Goethe was assigned the highest intelligence quotient of all geniuses with a ceiling IQ value of 210. [6] A second independent study on assigning IQs to the all-time top 100 geniuses to have ever lived, as found in the 1994 *Book of Genius*, conduced by English accelerated learning expert Tony Buzan (and Raymond Keene), assigned Goethe with the second highest IQ of 215, behind Shakespeare who was assigned an IQ of 220.

Beauty

Beauty according to Goethe, from his 1809 *Elective Affinities*, is "everywhere a welcome guest". Goethe stated that human beauty "acts with far greater force on both inner and outer senses, so that he who beholds it is exempt from evil and feels in harmony with himself and with the world."

Napoleon | 1808

In 1808, Goethe famously met Napoleon, a great fan of Goethe, who had read his *Werther*, supposedly, six time during battle. [47] After meeting with Beethoven, four years later (below), Goethe famous commented something along the lines of how he admired the former, but despised (?) the latter, or there to this affect.

Beethoven | 1812

In 1812, Goethe spent four days visiting with Beethoven, a great fan of Goethe, the interactions of which have been retold many times. Beethoven was 42, Goethe 63, with the publication of the first part of Faust four years behind him.

Of this meeting, the following vignette has come down to us. - As Beethoven and Goethe walked, some of the nobility passed with their entourage. Goethe politely stepped aside and bowed deferentially to the nobles - while Beethoven, in a typical gesture, strode almost defiantly right through their midst, with his hands behind his back and without acknowledging the presence of the nobles, who had no alternative but to give him clear passage. When Goethe asked Beethoven how he could so disrespectfully treat these nobles, the composer replied, again characteristically, "There are countless 'nobles', but only two of us."

> "His talent astonished me, but his is a totally untamed personality, and he is not entirely wrong in finding the world detestable, though this attitude does not make it more pleasant, either for himself or others … To think of teaching him would be an insolence even in one with greater insight than mine, for he has the guiding light of genius, whilst the rest of us sit in total

The “incident at Teplitz”, as depicted by Carl Rohling (1849-1922), Beethoven and Goethe meeting the imperial family, July 1812: Goethe stepped aside and gave them respect; whereas Beethoven pushed through commenting “they should make way for us, not us for them”, or something along these lines.

darkness, scarcely suspecting the direction from which daylight will break upon us."

— Goethe, of his meeting with Beethoven

"The Court suits him too much. It is not becoming of a poet."

— Beethoven, of his meeting with Goethe

A 1918 poster for Goethe's *Faust*, by Richard Roland Holst, the story of a main who strives to learn everything that can be known so to gain power over the physical world.

The the so-called "incident at Teplitz" (adjacent) was famously remade in the 1994 film *Immortal Beloved*, albeit not with Goethe, but with one of Beethoven's lovers.

Faust

From the age of 4½, in 1753, wherein he learned the story of *Faust*, through his puppet stage, till the last two months of his reaction existence, in 1832, when he finished the second part to his epic drama version of the *Faust* legend—the subject of a man striving to learn everything that can be learned—seemed to occupy a large part of his thoughts. As summarized by Jaroslav Pelikan, in his 1997 *Faust the Theologian*: [67]

“Doctor Faust the polymath is — as was Goethe the polymath — a man of "a hundred scholarly disciplines" [and] also a natural scientist.”

As far as authors go, according to WorldCat Identities, Shakespeare is #1 and Goethe is #2, based predominately on the following two main works of each author:

Hamlet (by Shakespeare)
3,641 editions published between 1603 and 2009 in 72 languages and held by 6,941 libraries worldwide

Faust (by Goethe)
4,422 editions published between 1787 and 2008 in 55 languages and held by 5,204 libraries worldwide

As far as minds go, regarding density of knowledge base and vocabulary variety, however, Goethe far excelled Shakespeare, in that, language ability aside, Goethe mastered every field of knowledge; mathematics and astronomy, aside—although he did eventually write a short treatise on mathematics. The references state that Goethe had three-times the vocabulary of Shakespeare.

Last year

The following is a recounting of the last year of Goethe's activities, as recounted by Johann Eckermann (1792-1854), German poet and Goethe's literary assistant, 1823-forward: [57]

"At the close of this (20 Jul 1830), and in the beginning of the next year, Goethe turned again to his favorite studies, the natural sciences. At the suggestion of Boisseree, he occupied himself with deeper inquiries into the laws of the rainbow; and also, from sympathy with the dispute between Cuvier and St. Hilaire, with subjects referring to the metamorphoses of the plant and animal world. He, likewise, revised with me the historical part of the "Theory of Colors," taking also lively interest in a chapter on the blending of colors, which I, by his desire, was arranging to be inserted in the theoretical volume.

During this time, there was no lack of interesting conversation between us, or of valuable utterances on his side. But, as he was daily before my eyes, fresh and energetic as ever, I fancied this must always be the case, and was too careless of recording his words till it was too late, and, on the 22d of March, 1832, I, with thousands of noble Germans, had to weep for his irreparable loss."

Goethe at his mountain hut (1831), by Woldemar Friedrich, a place where he carved poems into the walls. [61]

Last words

Throughout his life, Goethe had a deep fascination for the physical and metaphorical effects of light on humans. Whilst being best remembered now for his literary works, he himself believed the scientific treatise The Theory of Colours, which he published in 1810, to be his most important work. Although a confirmed non-believer for almost all of his life, a year before dying Goethe sided with the eclectic Hypsistarian sect, writing in a letter to a friend that: "A joyous light thus beamed at me suddenly out of a dark age, for I had the feeling that all my life I had been aspiring to qualify as a Hypsistarian." He spent the evening before his death discussing optical phenomena with his daughter-in-law. All of the above might lead us to believe that his celebrated deathbed cry of Mehr Licht! (More light!) was a plea for increased enlightenment before dying. The truth appears to be more prosaic. What he actually said (in German) was: "Do open the shutter of the bedroom so that more light may enter". [59]

Influence

Serbian-born American electrical engineer Nikola Tesla owned a thorough collection of Goethe's scientific texts and read these to the exclusion of all other philosophies; his idea for a self-starting electric motor came to him one evening as he was reciting a poem of Goethe and watching a sunset, at which point he imagined a magnetic field rapidly rotating inside a circle of electo-magnets. [48]

Goethe's version of nature was the reason Austrian psychologist Sigmund Freud went to medical school.

German sociologist Max Weber, as a young student, secretly read *Elective Affinities*, in the classroom, hiding it behind his textbook. [50]

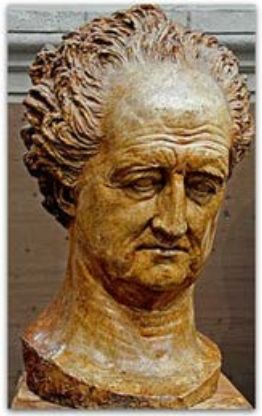

Einstein kept a **bust** of Goethe in his study, along with pictures of Faraday, Newton, and Maxwell.

German-born American physicist Albert Einstein kept a bust of Goethe in his study, along with pictures of Faraday, Newton, and Maxwell, and in his personal library the most-represented author was the work of Goethe in a thirty-six volume edition and another of twelve volumes, plus two volumes on his *Optics*, the exchange of letters between Goethe and Schiller, and a separate volume of *Faust*. [49]

American electrochemical engineer Libb Thims worked on the problem of human free energies, in terms prediction, human chemical reactions, and free energy tables, for a period of eleven years (1995-2006), before even knowing who Goethe was and discovering (see: footnote #5) that he had, independently, worked on the very same problem, albeit in terms of affinity tables (vs. free energy tables), over two-hundred years ago (1799-1809), the influence of which on Thims has been unprecedented.

Videos

The following are videos related to or about Goethe. The third of which discusses the modern-day equation thermodynamics affinity equation according to which the vicissitudes, formations, and dissolutions of friendships, working relationships, and intimate relationships are determined by the measure of the affinity *A* of the reaction or process; the latter quantifications of affinity, as A = TdS – dH, in terms of entropy *S*, enthalpy *H*, and temperature *T*, were determined later by those as Helmholtz (1882), Nernst (1893), and de Donder (1921). [9]

Goethe's single elective affinity reaction to explain love; and a discussion of the modern equations that quantifies "affinity" via free energy measurements.	A discussion on the world's collective individuals with IQs at or above 200 and a discussion as to who is the smartest person of all time (hypothesis: **Goethe**).	A note on the **essence of life** according to German polymath Johann Goethe, in honor of the 200th anniversary of his classic novella *Elective Affinities*.

Pictures

The following are pictures of Goethe or related images:

Goethe in youth [58]

Sketch of Goethe by Eugène Delacroix.

Goethe 1808-1809

An 1800 drawing of Goethe, supposedly, housed in the Pinacoteca, Rome.

Goethe, age 15, painting in oil by Johann Adam Kern. [15]

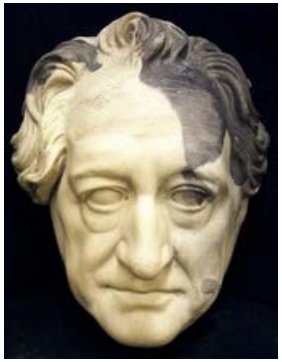

Goethe: life mask found in the rubble of Frankfurt after the Second World War (The Laurence Hutton collection at Princeton.

Goethe in his circa 20s.

Goethe, age 26, by Georg Melchior Kraus (1775).

Stieler's Portrait of Goethe

Goethe's silhouette (around 1775 or shortly thereafter created). The original black from a deposited white paper is kept in the Foundation of Weimar Classics.)

Goethe, age 38, painted by Swiss-born Italian artist Angelika Kauffmann (1787).

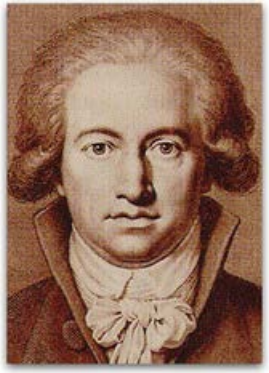

Goethe, age 42, from a pastel sketch by Libs (1791).

1823 portrait of Goethe by Orest Kiprensky.

Goethe self portrait (c.1777, Weimar, *The Weimar Classics Foundation*).

Goethe, age 59-60, in 1808/1809, by Franz Gerhard von Kügelgen.

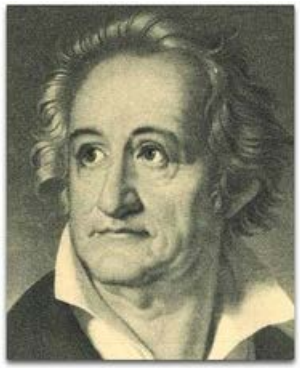

Goethe (1822/26) by Heinrich Kolbe.

Goethe, age 69, painted in 1828 by Joseph Karl Stieler.

Goethe, age 70, in 1819, from the painting by Georg Dawe at the Goethe Museum, Weimar.

Goethe, *circa* age 30, Goethe, painting in oil by Georg Oswald May (1779), left, and a later engraving, right.

Color postcard rendition of painting of Goethe (1979), based on original by George May.

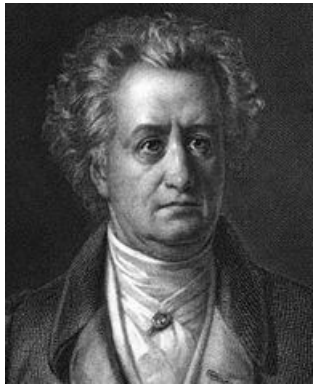

[66]

Above: Bust of Goethe by Karl Fischer, designed c. 1832; this is a 20th-century copy in bronze of the original iron-and-copper

Above: photo of 1789 bust of Goethe by Alexander Trippel (1744-1793).

piece, located in Bryant Park, New York, between Fifth and Sixth Avenues, near 40th Street (just east of the carousel).

Goethe, age 81, at Weimar, engraving by artist Charlotte Amalia Schwerdgeburth (c. 1830).

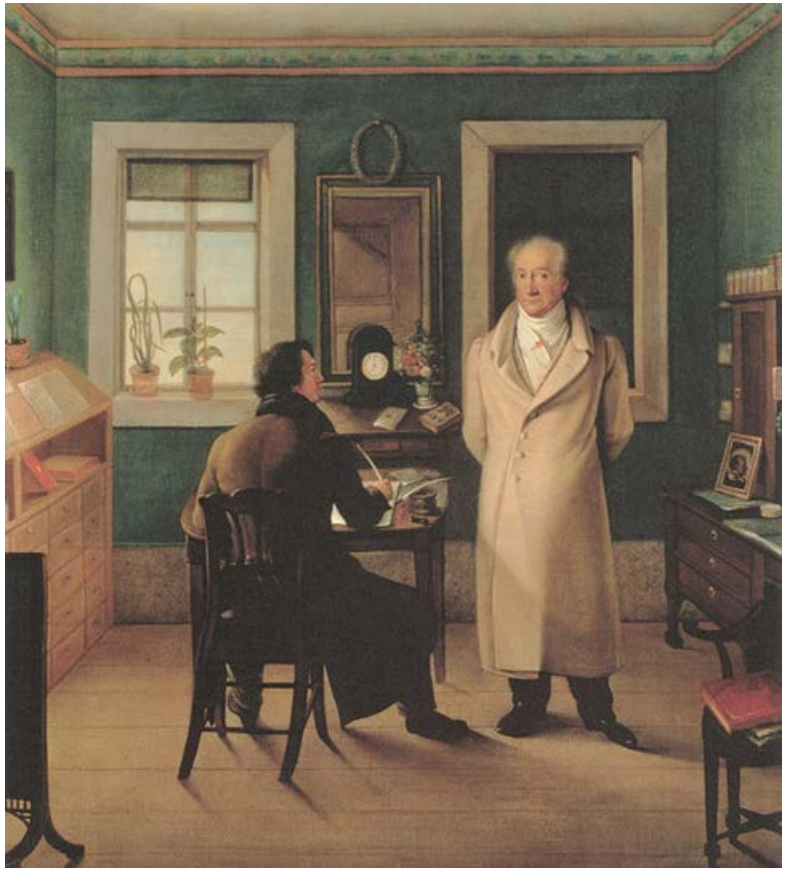

An oil painting of Goethe in his study, dictating to his scribe, John, by Johann J. Schmeller, 1829-1831, from the Nationale Forschungs-und Gedenkatten, Weimar. [33]

A side-profile engraving of Goethe (year?). [38]

"Weimar's golden days", before Schiller Dowager Duchess Amalia, the Duke and Duchess Luise and Karl August, Goethe, Wieland, Herder, Musus, including the Humboldt Brdern; the color print of Gemlde of Theobald Reinhold Freiherr von Oer, 1860, Bellevue Palace, Berlin.

Goethe and Beethoven at Teplitz.

A vivid depiction of the “Weimar 1803” painting (right side), drawn by German painter Otto Knille (1884), giving a well-imaged viewing of Goethe's erudite intellectual circle, showing, from left to right:

Back row: Wilhelm Humboldt (1767-1835) (IQ=175), Alexander Humboldt (1769-1859) (IQ=185), Friedrich Schleiermacher (1768-1834) (IQ=160), Carl Gauss (1777-1855) (IQ=195), who knew of Goethe's poetry works, and August Schlegel (1767-1845).

Middle row: Barthold Niebuhr (1776-1831) (IQ=185), Johann Herder (1744-1803) (IQ=165), in whom in 1784 Goethe first confided his discovery of evidence for human evolution from lower animals, and Johann Gleim (1719-1803).

Front row: **Goethe** (1749-1832) (IQ=230)—the big intellectual, standing at the center of attention—followed by Christoph Wieland (1733-1813) (IQ=170), seated right front, who in 1810 called Goethe's self-defined greatest theory "childish nonsense and fooling around", August Iffland (1759-1814)—and last but not least Friedrich Schiller (1759-1805) (IQ=175)—Goethe’s closest intellectual friend—in whom, in 1796, he first confided his newly-forming human elective affinities theory—and a bench mark point for the launching of the science of human chemistry.

See the Goethe timeline, for full size color version (showing both the left and right side of the original image).

Image: "Schiller's garden house in Jena," 1797, seated from left: unknown, Caroline of Beulwitz, Charlotte Schiller (1766-1826), Johann Herder (1744-1803), and Caroline of Dachroeden, etc., Schiller, standing from left: **Goethe**, Wieland, William and Alexander von Humboldt.

Top 100 Identities

Goethe (#2), according to WorldCat Identities, is among the top seven biggest identities in world literature, along with Bach, Jesus Christ, Lincoln, Mary, Mozart, and Shakespeare. [11]

Quotes | On

The following are quotes on Goethe:

"**Goethe** will be eighty years old in a few years, but he is not tired of inquiries and experiments. He is always on the track of **some great synthesis**."

— Johann Eckermann (1825) [81]

"Close thy Byron, open thy **Goethe**."

— Thomas Carlyle (c.1850), *Publication* (Ñº)

"All before **Goethe** are ancients, and all who have read him are modern."

— Ralph Emerson (c.1910) [34]

"**Goethe**, who stands far above any of Kant's successors in wisdom and an almost instinctive recognition of the truth. In judgment he surpassed his scientific contemporaries like Humboldt almost as much as in philosophical intuition he surpassed Schelling."

— Lawrence Henderson (1917), *The Order of Nature* (pg. 72)

"**Goethe** opportunistically bowed to every invader. But as a thinker and man, he remained noncommittal and aloof… His aloofness, in these as in other matters, gained him the reputation of 'the Olympian'; and the label was not always meant to be flattering. But his Olympian appearance was due least of all to an inner indifference to the fate of his contemporaries. It veiled his drama: his incapacity and reluctance to identify himself with causes, each an inextricable, tangle of right and wrong… All three – Jefferson, Goethe, and Shelley – were in a sense outsiders to the great conflict of their time, and because of this they interpreted their time with more truthfulness and penetration than did the fearful – the hate-ridden partisans on either side."

— Isaac Deutscher (1950) (Ñº) (Ñº)

"Gauss and **Goethe** were Quetelet's intellectual parents and Goethe predominated."

— Author (1998), (Ñº)

"I was familiar with the phrase 'Renaissance Man', but **Goethe** is like a Renaissance Man with access to amphetamines. He makes Leonardo da Vinci look like a lazy bum."

— Arnold Jacobs (2004), *The Know-It-All: One Man's Humble Quest to Be the Smartest Person in the World*

Quotes | By

See main: Goethe (quotes)

The following are noted quotes by Goethe:

"The human has an unstoppable drive, at least to try, to detect the inmost force, which binds the world, and guides its course."

– Faust [10]

"If one does not know what went on for the last three thousand years, he or she remains ignorant, merely surviving from day-to-day."

"The history of science is science itself."

Theory of Colors (1810) [64]

"A creation of importance can only be produced when its author isolates himself; it is a child of solitude."

"We do not have to visit a madhouse to find disordered minds; our planet is the mental institution of the universe."

A woman holding up the famous Goethe quote on freedom, from *Elective Affinities* (P2:C5) at the Occupy Wall Street

— Johann Goethe (1830), a seeming variant (Ñº) of one of his "conversations" (Ñº)

protests (Zuccotti Park, New York, 28 Sep 2011).

“Only by joy and sorrow does a person know anything about themselves and their destiny. They learn what to do and what to avoid.”

“None are more hopelessly enslaved than those who falsely believe they are free.”
("Niemand ist mehr Sklave, als der sich für frei hält, ohne es zu sein.") (*Elective Affinities*, P2:C5) [71]

“Nothing shows a man's character more than what he laughs at.”

“The first and last thing which is required of genius is the love of truth.” [65]

“He who is firm in will moulds the world to himself.”

Monuments

The following are public monuments to Goethe:

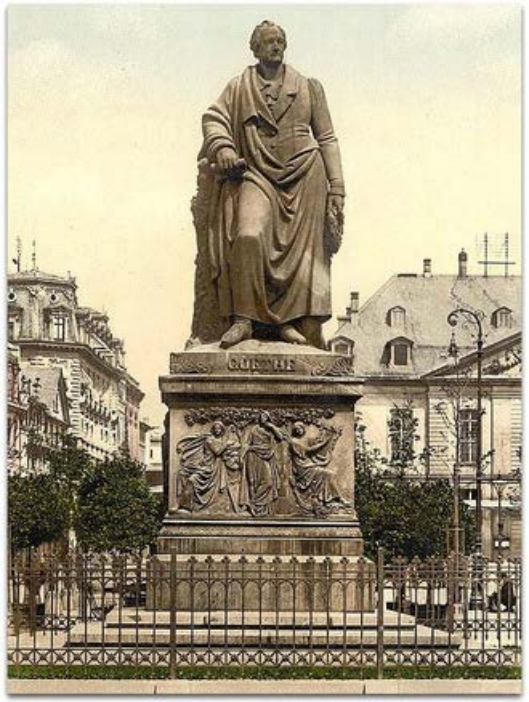

The 1844 Goethe Monument, in Frankfurt-am-Main, made by Ludwig von Schwanthaler:

A photo of the Goethe sculpture by sculptor Herman Hahn in Munich (1913), eventually placed in Lincoln Park, Chicago.

Goethe's study in Frankfurt (c.1769/72, Weimar, *The Weimar Classics Foundation*).

A Goethe statue (link).

A 40ft stack of books at the 2006 Berlin Walk of Ideas with **Goethe** as the foundation, in commemoration of Gutenberg's 1445 invention of the movable printing press.

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(b) Top 10 Geniuses of All Time (according to *Buzan's Book Of Genius*, 1994).
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(b) Cox's IQ Estimates of 301 Geniuses - IQ Comparison Site.com
7. (a) Tantillo, Astrida, O. (2001). *Goethe's Elective Affinities and the Critics* (pgs. 6, 157, 198; Heine, pg. 8). New York: Camden House.
(b) Photo of Goethe at age 69, painted in 1828 by Joseph Karl Stieler.
8. (a) Tantillo, Astrida, O. (2001). *Goethe's Elective Affinities and the Critics* (pgs. 154-57). New York: Camden House.
(b) Eckermann, Johann P. (06 May 1827)
(c) Conversations with Goethe (Gespräche mit Goethe) – Wikipedia.

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The Goethe medal, and annual award since 1955. [40]

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(b) Goethe popularized the Goethe Barometer using a principle established by Evangelista Toricelli (1643). According to Hegel, 'Goethe has occupied himself a good deal with meteorology; barometer readings interested him particularly... What he says is important: the main thing is that he gives a comparative table of barometric readings during the whole month of December 1822, at Weimar, Jena, London, Boston, Vienna, Töpel... He claims to deduce from it that the barometric level varies in the same propoportion not only in each zone but that it has the same variation, too, at different altitudes above sea-level'. (Hegel's Philosophy of Nature, pp 128–129).

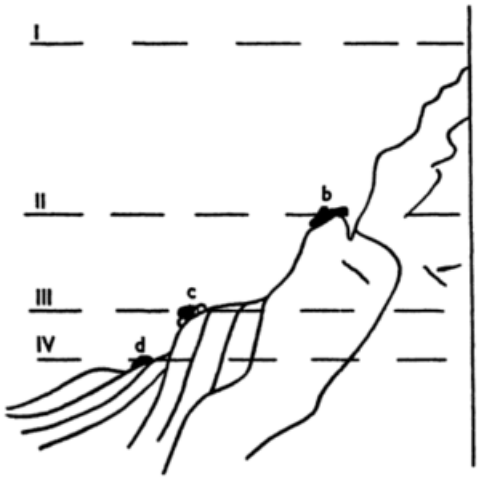

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θΔics

In existographies, **Johann Goethe 2** is []

→ **Johann Goeth**e (mobile) | Readable; uneditable
→ **Johann Goethe** (online) | Readable; WayBack
→ Johann Goethe (online) | Non-readable; hacked (being recovered)

θΔics

In existographies, **Johann Helmont** (1579-1644) (IQ:180|#185) (Murray 4000:17|C) (GCE:15) (CR:20), or "Jan Baptista van Helmont", was Flemish physician and iatrochemist noted for his circa 1610s five-year willow growing experiment, amid which he coining of the word 'gas', among discerning other details about nature and elements.

Soul

In 1648, Helmont, in his *Ortus Medicinae*, situated the "archeus" or soul, part of the world soul, in the upper opening of the stomach (Thomson, 1996); Mettrie later cited him as situating the soul in the pylorus:

> "One could say at times that the soul is to be found in our stomach and that when **van Helmont** placed its seat in the pylorus, his only mistake was to take the part for the whole."
>
> — Julien la Mettrie (1747), *Man: a Machine* (pg. 8) [4]

(add)

Gas | Oak experiment

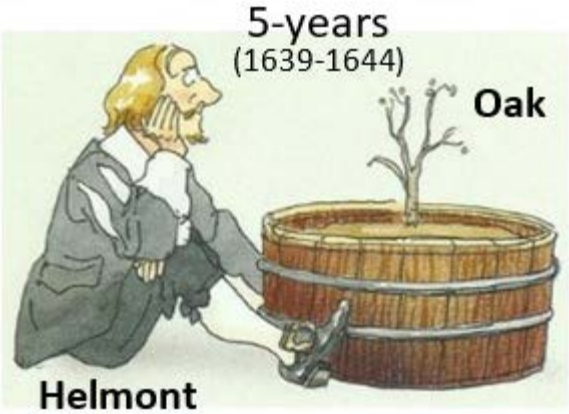

In c.1615, Helmont is said to have introduced the word "gas" as a type of spirit that can be reduced to liquid form and can, if produced, cause glass containing vessels to explode. [1] Helmont likely derived the term from the Greek *khaos* (*chaos*) meaning void or "empty space", being that the Dutch "g" is roughly equivalent to that of Greek "kh."

The word was gas was introduced by Helmont in an experiment where he burned 62 pounds of oak after which time only one pound of ash remained. Thus, he concluded that 61-pounds (or 98%) of the material was converted into a new type of invisible air or spirit, to which he affixed the name "gas". Specifically, in his writings, Helmont states: [2]

> "The flame which is only burning smoke, perishes at once in a closed vessel, and charcoal may be heated continuously in a closed vessel without wasting … yet it 62-pounds of oak charcoal contain 1-pound of ashes, the remaining 61-pounds are "wild spirit" (*spiritus silvestre*), which cannot escape from the shut vessel."

Then tells us:

> "I call this spirit, hitherto unknown, by the new name of **gas** (*Hunc spiritum, incognitum hactenus, novo nomine Gas voco)*, which can neither be retained in vessels nor reduced to a visible form, unless the seed is first extinguised. But bodies do contain this spirit, and do sometimes wholly depart into such a spirit, not indeed, because it is actually in those very bodies (for truly it could not be detained, yea the whole composed body should I lie away at once) but it is a spirit grown together, coagulated after the manner of a body, and is stirred up by an attained ferment, as in wine, the juice of unripe grapes, bread, hydromel or water and honey. "

More than once, Helmont concluded that he was the "inventor" of gas. He investigated and categorized a number of gases, such as gas from eructions (belches) or CO_2, poisonous red gas (NO_2) that is formed when aqua fortis (HNO_3) acts on silver, sulfurous gas that "flies off" burning sulfur, and others. He says that gas is composed of invisible atoms

which can come together by intense cold and condense to minute liquid drops; and that gases can be contained in bodies in fixed form, and set free again by heat, fermentation, or chemical reaction. [2] In relation to combustion, he concluded that there were two classes of gas: [3]

(a) Gas sylvestre – one that would not burn or support combustion.
(b) Gas pingue – one that would burn (a combustible gas).

His research was published posthumously in *Ortus Medicinae* (1648) and is one of the first examples of the use of the "scientific method". Earlier variants of this growing experiment were, supposedly, done by the Greeks and Da Vinci did a similar unpublished experiment with pumpkins. (Ñº)

Quotes | On

The following are noted about quotes:

> "And when with excellent microscopes I discern in otherwise invisible objects the inimitable subtlety of nature's curious workmanship; and when, in a word, by the help of anatomical knives, and the light of chemical furnaces, I study the 'book of nature', and consult the glosses of Aristotle, Epicurus, Paracelsus, Harvey, **Helmont**, and other learned expositors of that instructive volume; I find myself oftentimes reduced to exclaim with the psalmist, how manifold are thy works, O Lord? In wisdom hast thou made them all."
>
> — Robert Boyle (1659), *Some Motives and Incentives to the Love of God* (pgs. 59-60) (Ñº)

Quotes | By

The following are noted quotes:

> "That all plants immediately and substantially stem from the element water alone I have learned from the following experiment. I took an earthern vessel in which I placed two hundred pounds of earth dried in an oven, and watered with rain water. I planted in it a willow tree weighing five pounds. Five years later it had developed a tree weighing one hundred and sixty-nine pounds and about three ounces. Nothing but rain (or distilled water) had been added. The large vessel was placed in earth and covered by an iron lid with a tin-surface that was pierced with many holes. I have not weighed the leaves that came off in the four autumn seasons. Finally I dried the earth in the vessel again and found the same two hundred pounds of it diminished by about two ounces. Hence one hundred and sixty-four pounds of wood, bark and roots had come up from water alone."
>
> — Johann Helmont (c.1620) (Ñº)

References

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External links

â— Jan Baptista van Helmont – Wikipedia.

θΔics

In existographies, **Johann Herder** (1744-1803) (IQ:175|#246) (Cattell 1000:264) (CR:37) was a German philosopher, noted for []

Overview

Herder is noted for his evolution theory of language, and for being a comrade to Goethe, whom, it seems, Goethe looked up to in some ways; such as evidenced in his 1770 intercourse with him about the Faust play (see: Faustian); also Herder was the person to whom Goethe wrote in 1784 that he had found morphological evidence of human evolution (discovered the human intermaxillary bone), of humans and lower animals being related; a date which, according to Darwin, marks the start of evolution theory. [1]

Quotes | On

The following are quotes on Herder:

> "Robinet, though not the originator, was, so far as I know, the first elaborated and enthusiastic champion of the notion of the Urbild, upon which all organic and perhaps all natural forms are variations, which was to be taken up by **Herder** and to become an almost obsession of Goethe at one period."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* [3]

Quotes | By

The following are related quotes:

> "It is really astonishing, that this fine passage (Joshua 10:6-14) has been so long misunderstood. We are expressly told that it is an extract from the Book of Jasher—a collection of poems on the heroic deeds of leaders of the Israelites."
>
> — Johann Herder (c.1790), *Source* [2]

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External links

â— Johann Herder – Wikipedia.

θΔics

In existographies, **Johann Lambert** (1728-1777) (Odueny 100:62) (Eells 100:47) (GME:#) (CR:2) was a Swiss mathematician, physicist, philosopher, astronomer, cardiographer, and general polymath, noted for []

Heat

Lambert, at some point (Q), studied the physical and psychological effects of heat on humans.

Education

Lambert was a colleague of Leonhard Euler and Joseph Lagrange at the Berlin Academy. (Q)

Influences

Lambert was influenced by: Aristotle, Francis Bacon, Leonhard Euler, and Christian Wolf.

Influenced

Lambert influenced: Immanuel Kant and Moses Mendelssohn.

Quotes | On

The following are quotes on Lambert:

> "Higgins' theory [1776] accounted for the phenomenon of the heating (or cooling) of a gas when it is suddenly compressed (or expanded): 'adiabatic' heating or cooling as it was later called. This had first been noticed in connection with experiments on the air pump. Cullen mentioned it but had no insight into its significance. Higgins also referred to it, and **Johann Lambert** pointed out that when air enters an evacuated vessel the temperature rises. His explanation was that even 'empty' space contains the 'matter of heat', so that the entry of air carrying more heat must cause a rise in temperature; and he went on to suggest that suddenly reducing the volume of a void should have a heating effect."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 58) [1]

References

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External links

- Johann Heinrich Lambert – Wikipedia.

θΔics

In mathematics, **Johann Pfaff** (1765-1825) was a German mathematician noted for, supposedly, developing the mathematical outline to the Pfaffian form.

Influence

A noted student of Pfaff was Carl Gauss.

External links

- Johann Friedrich Pfaff – Wikipedia.

θΔics

In existographies, **Johann Philipp von Schonborn** (1605-1673) (CR:3), aka “Joannis Philippi” (Schott, 1664) or “Johann Philipp” (Guericke, 1672), “Elector of Mainz” (Guericke, 1656), or “Archbishop of Mainz and Bishop of Wurzburg”, was a German religious leader, noted for []

Overview

In 1654, Otto Guericke, at the Imperial Assembly at Regensburg, demonstrated his new vacuum-making device (vacuum pump / air pump), to a number of people. Shortly thereafter, Schonborn heard about these experiments, and requested that Guericke make one for him.

In 1663, Schonborn acquired a vacuum pump from Guericke, which supposedly was Guericke’s “final design” of his various air pump design improvements.

Schonborn is said to have bought it and brought the pump to his house, and supposedly had Gaspar Schott test it out. [1]

Schonborn’s pump is the oldest surviving pump, and is not kept in the Deutsches Museum in Munich. The following table, made by Anne Helden (1991), of the Boerhaave Museum in Leiden, shows the extant air pumps: [2]

Extant Seventeenth Century Air Pumps

(Helden, 1991)

type	maker	date	first owner	present keeper
2a		1663	Otto von Guericke	Deutsches Museum, Munich
2a		< 1674	C. Heraeus	Kunstkapstivoli, Malmö
2a		1675-1725	Otto von Guericke (?)	Technische Hochschule, Braunschweig
3		1660-1700		Museum Boerhaave, Leiden
4	Samuel van Musschenbroek	1675	Leiden University	Museum Boerhaave, Leiden
6a		c. 1740	J.A. Nollet	C.N.A.M., Paris
6a		c. 1740		C.N.A.M., Paris
7	Johan van Musschenbroek	1686	Count of Hesse-Kassel	H.L.M., Kassel
7	Johan van Musschenbroek	1697		Domus Galilaeana, Pisa
7	Johan van Musschenbroek	1698	Groningen University	Museum Boerhaave, Leiden
7	Jan van Musschenbroek	1706	Utrecht University	University Museum, Utrecht
7	Jan van Musschenbroek	1708		Deutsches Museum, Munich
7	Jacob Leupold	1709	Elector of Saxony	Zwinger, Dresden
7a	Johan van Musschenbroek	1675-1700		Museum Boerhaave, Leiden
9	Francis Hauksbee	c. 1708	Royal Society	Science Museum London
9		c. 1710		private collector
9		c. 1730		M.H.S., Oxford
9		1700-1750		Deutsches Museum, Munich
9		1700-1750	Cristino Martinelli	University of Padua
9		1743		M.S.S., Florence
9a		c. 1720		N.M.S., Edinburgh
9a		1725-1750		C.N.A.M., Paris
10	Jan van Musschenbroek	1722	W.J. 's Gravesande	Museum Boerhaave, Leiden
10	Jan van Musschenbroek	c. 1735	Franeker University	Museum Boerhaave, Leiden
	Jacob Leupold	1700-1725		Deutsches Museum, Munich

(add)

Quotes | On

The following are quotes on Schonborn:

> "At the Imperial Assembly held at Regensburg, in 1654, where I had been sent on municipal business, some enthusiasts for scientific matters heard something about these experiments and pressed me to give a demonstration. The person most taken by them was **Johann Philipp**, Archbishop of Mainz and Bishop of Wurzburg, who prevailed upon me to send him the apparatus that **I had brought with me to Regensburg** and he then had it taken to Wurzburg."
>
> — Otto Guericke (1672), *New Experiments* (preface)

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2. Helden, Anne. (1991). "The Age of the Air-Pump" (pdf) (pg. 157), *Tractrix: Yearbook for the History of Science, Medicine, Technology, and Mathematics*, 3:149-72.

External links

â— Johann Philipp von Schonborn – Wikipedia.

θΔics

In science, **Johann Poggendorff** (1796-1877) was a German physicist and editor of the famous peer-reviewed science journal *Annalen der Physik*, from 1824 to 1876, during which time he infamously rejected German physician-physicist Robert Mayer's 1841 conservation of energy paper "On the Quantitative and Qualitative Determination of Forces", wherein the postulate that "motion is converted into heat" was first enunciated, and German physician-physicist Hermann Helmholtz's 1847 "On the Conservation of Force", which presented one of the first versions of the conservation of force (or conservation of energy), depending on context.

To Poggendorff's credit, to note, he did finally get wise and accept Rudolf Clausius' 1850 "On the Moving Force of Heat and the Laws of Heat which may be Deduced Therefrom", the founding article on thermodynamics. [1]

References

1. Clausius, Rudolf. (1850). "On the Moving Force of Heat and the Laws of Heat which may be Deduced Therefrom", Communicated to the Academy of Berlin, Feb.; Published in Poggendorff's *Annalen*, March-April, Vol. lxxix, pgs. 368, 500, and Translated in the *Philosophical Magazine*, July 1851, Vol. ii. pgs. 1, 102.

External links

â— Johann Poggendorff – Wikipedia.

θΔics

In chemistry, **Johann Ritter** (1776-1810) was a German physical chemist noted for []

Overview

In circa 1800s, Ritter performed noted electrolysis and electrochemical work about which, in respect to human chemistry, he is said to have exchanged ideas on with German polyintellect Johann Goethe, which, according to German literature scholar Joseph Vogl, had some type of influence "on chemistry for Goethe's *Elective Affinities*." [1]

In 1808, Ritter, in his "Attempt a History of the Fate of the Chemical Theory in the Last Centuries", stated: [2]

> "Another major advantage of the new or of the electrical view of hydrogen and oxygen is that, it is won with an explanation of chemical affinity, kinship, attraction, or the person who for the sake of looking at all body union and find. Anything that can be put anywhere and always in chemical processes of bodies have recently just hydrogen and oxygen untereinander."

Ritter is also know for some type of "Ritterian fire", as Joseph Vogl calls it. [3]

American literature scholar Frederick Burwick states that Ritter's 1806 *Die Physick als Kunst*, and similarly Humphry Davy's 1807 "Parallels between Art and Science", were two of the earliest publications themed on the two cultures issue. [6]

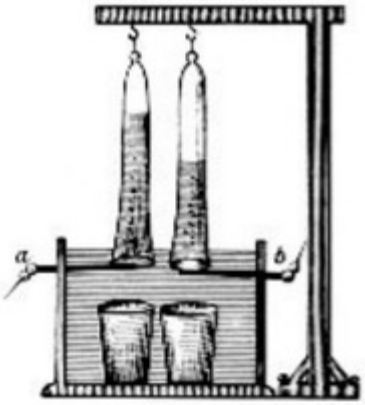

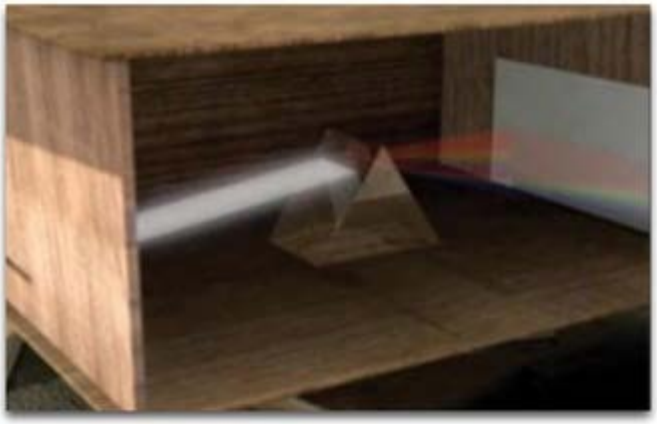

Left: Ritter's 1800 electrolysis experiment, the measuring cup to catch the escaping gas and certain Ritter's first time estimate of the ratio of hydrogen gas and oxygen gas right two-to-one. [2] Right: Ritter's 1801 experiment to investigate the existence of energy beyond the violet end of the visible spectrum. Knowing that photographic paper would turn black more rapidly in blue light than in red light, he exposed the paper to light beyond violet. Sure enough, the paper turned black, proving the existence of ultraviolet light. [3]

References

1. (a) Vogl, Joseph. (1999). "Nomos der Ökonomie. Steuerungen in Goethes *Wahlverwandtschaften*." MLN 114(3):503-27.
(b) Holland, Jocelyn. (2009). *German Romanticism and Science: the Procreative Poetics of Goethe, Novalis, and Ritter* (pg. 206). CRC Press.
(c) Joseph Vogl (German → English) – Wikipedia.
2. Ritter, Johann. (1808). "Versuch einer Geschichte der Schicksale der chemischen Theorie in den letzten Jahrhunderten." In: *Journal für die Chemie, Physik und Mineralogie* 7, S. 1–66, hier S. 47.
3. Blechschmidt, Stefan. (2010). "A Repository for the Present, an Archive of the Past: Who creates Order in *Elective Affinities*?" ("…eine Repositure für das Gegenwärtige, ein Archiv für das Vergangene". Wer schafft Ordnung in den *Wahlverwandtschaften*?"), in: *Goethes Wahlverwandtschaften: Werk Und Forschung* (*Goethe's Elective Affinities: Work and Research*) (editor: Helmut Huhn) (pgs. 383-402). Walter de Gruyter.
4. (a) First quantitative electrolysis of water by Johann Wilhelm Ritter, first published in "Voigt's magazine for the latest state of natural history", Vol.2 (1800) p.356-400.
(b) Erste quantitative Wasserelektrolyse durch Johann Wilhelm Ritter, zuerst veröffentlicht in "Voigts Magazin für den neuesten Zustand der Naturkunde", Bd.2 (1800) S.356-400.
5. Ultraviolet waves – MissionScience.Nasa.gov.
6. (a) Ritter, Johann. (1806). *Die Physik als Kunst* (*Physics as Art*). Lindauer.

(b) Burwick, Frederick. (1986). *The Damnation of Newton: Goethe's Color Theory and Romantic and Romantic Perception* (pg. 3). Walter de Gruyter.
(b) Black, Joel. (1990). "Introduction: Newtonian Mechanics and the Romantic Rebellion", in: *Beyond the Two Cultures: Essays on Science, Technology, and Literature* (editors: Joseph Slade and Judith Lee) (pg. 133). Iowa State University Press.

External links

â— Johann Wilhelm Ritter – Wikipedia.

θΔics

In hmolscience, **Johannes Barandun** (c.1850-c.1920) was a German-born American free thinker, editor, and philosopher noted for his 1910 article “An Excursion into the Infinitely Small”, wherein he addresses the question of what happens to the anthropomorphic concepts of life, soul, will, mind from matter, or "matter into mind" (as Barandun phrased it), etc., as one scales down the ladder of existence, or great chain of being, along the way citing precursor thinkers, in this area, such as Arthur Schopenhauer, Wilhelm Wundt, Ernst Haeckel, etc., to arrive at near-solution to vexing problems such as the origin of life (e.g. "life began with motion itself", as Barandun put it), the general outline of which, according to Paul Carus, is said to be thematically in the neighborhood of Goethe’s 1813-1830 Aristotle-Leibniz themed soul conversational discussions of his so-called entelechy-monad initial point chemical animation conceptualized theory (see: Goethe on the soul). [1]

Death | Terminology

Barandun, in introducing a closing quote from Lord Byron, equates “death” synonymously to “dissolution from other [well-developed molecules] units”. This, while interesting, in regards to life terminology upgrades, remains blurry, being that Barandun’s conceptual definitions of the terms “elements, chemical atoms, atoms, units, ultimate units, well-developed units, animate atoms, animated molecules, etc., is inconsistent, in some areas, with the modern definitions of atom, molecule, and chemical; to cite the main nonsensical passage: “we know these elements are composed of molecules, and these of *chemical* atoms—to be carefully distinguished from the atoms of which we shall have to speak on later.” Here, Barandun gives evidence of a rather blurry chemistry terminology conception. While we may excuse some of this terminology confusion to the time, i.e. the electron (J.J. Thomson, 1897) had only recently been discovered and the nucleus (Ernest Rutherford, 1909/1911) was in the midst of discover at the time of writing (see: Particle discovery timeline), other talk is a bit opaque, e.g. he seems to define himself either as a "unit" or a "well-developed molecule", but what he means by "elements being composed of molecules" (above quote) is inconsistent with modern terminology.

Education

In 1910, Barandun was the editor of German periodical *Free Thinkers* (*Friedenker*), in Milwaukee, Wisconsin.

Quotes

The following are noted quotes;

> “Today the most eminent scientists think that these units, or atoms, are likewise formed by numerous minor units which are themselves aggregates of still smaller units, and so forth, down into the infinite depths of the infinitely small, until the ultimate essence is reached, which shows itself as energy, force or will (Schopenhauer's will-to-live), and which in no case can be a mere nothing.”
>
> — Johannes Barandun (1810), “An Excursion into the Infinitely Small” (pg. 115)

> “Thus we reach a much deeper and more worthy idea of life than a shallow materialistic philosophy possibly could. Assuming that each molecule preserves forever the inner (mental) world once acquired, and further assuming that it be at least as indestructible as the chemical atoms are supposed to be; then we would have in the whole universe, as far as it is in motion, an evolution of mental life, or an evolution of matter into mind. Every motion would produce concepts, at least in the molecules participating in it. The whole stellar world might then be regarded as a stupendous factory, where matter is changed into mind. Every motion, every feeling, every thought, would have a lasting importance which would reach far beyond our terrestrial life and perhaps out into eternity. In this connection many a reader will perhaps recall Haeckel’s ‘animated atoms’ *(bescelte Atome)* or Wundt’s ‘animated will-centers’ *(Willenszentren).*”
>
> — Johannes Barandun (1810), “An Excursion into the Infinitely Small” (pg. 116)

"It is also easy to be seen that the real origin of life is to be sought deep down in the wonderful small world. Life began with motion itself, as soon as concepts began to be formed in the original molecules. It is thus also easily to be inferred that there is life and motion, yea a species of concept life, even in the molecules composing the hardest stone or metals. Space does not permit us to cite examples here. Chemistry tells wonderful stories about the force of the 'animated' atoms. One gram of hydrogen, for instance, could produce sufficient heat to drive a steamer five times over the ocean."

— Johannes Barandun (1810), "An Excursion into the Infinitely Small" (pg. 116-17)

"We may safely assume that the 'changing of matter into mind' (the production of concepts in the molecules) may have taken place long before our solar system was formed, and will go on taking place indefinitely."

— Johannes Barandun (1810), "An Excursion into the Infinitely Small" (pg. 117)

"Suppose all those molecules, from the beginning till now and for all times, could unite and form a higher unity, this higher unity, containing all the animated molecules, would then be a kind of world-spirit or world-soul, the units (molecules) of which would all be in a certain sense individuals with their own independent inner life, and each individual or unit would know, according to its measure of capacity or inner life, all that the others know."

— Johannes Barandun (1810), "An Excursion into the Infinitely Small" (pg. 117)

"A well-developed molecule or unit could survey all that had happened during countless ages, seeing it in the molecules then taking part in the process of evolution. Its whole surroundings would be something like a theater with ever changing scenery and actors ever new, and new units would continually arrive from all parts of our universe."

— Johannes Barandun (1810), "An Excursion into the Infinitely Small" (pg. 117-18)

"We may also, thinking of the composite nature of the elements (see above), fancy the formation of different elements in different parts of space, which would lead to forms of life wholly incomprehensible to us. But to expound all these ideas, a whole book would be required."

— Johannes Barandun (1810), "An Excursion into the Infinitely Small" (pg. 118)

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1. (a) Carus, Paul. (1907). "Goethe's Soul-Conception", *The Open Court*, 21:745-51.
(b) Barandum, Johannes. (1910). "Excursion Into the Infinitely Small", *The Open Court*, 24:114-18.
(c) Carus, Paul. (1910). "Have Atoms Souls?" (pdf), *The Open Court*, 24:119-22.

Further reading

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â— Barandun, Johannes. (1888). *Pegasus Under the Yoke* (*Pegasus im Joche*). Publisher.

External links

â— Barandun, J. – WorldCat Identities.

θΔics

In thermodynamics, **Johannes Bronsted** (1879-1947) was a Danish chemical engineer and physical chemist known in chemistry for his Bronsted acid-base theory (Q), and noted for his 1946 *Principles and Problems in Energetics*, in which he outlined what seems to have been one of the first overviews of a work principle to the organization of the varieties of the conjugate variable pairs that characterize systems.

Work principle

In his 1946 monograph, Bronsted summarized the main topics in thermodynamics in terms of energetics in what he called the “work principle”. In particular, he stated that the overall work ΔW performed by a system is the sum of contributions due to transport of extensive quantities ΔK_i across a difference of "conjugated potentials" P_{i1} - P_{i2}:

$$\Delta W = \sum_{i=1}^{k} (P_{i1} - P_{i2}) \Delta K_i$$

in which P_{i1} - P_{i2} may be T_1 - T_2 (thermal potential difference), μ_1 - μ_2 (chemical potential difference), or ψ_1 - ψ_2 (electric potential difference) and ΔK_i will be ΔS (quantity of entropy), Δn (quantity of substance), or Δe (quantity of electricity), respectively.

Free energy

Bronsted is also said to have said to have done some of first work, following Fritz Haber, in measuring and calculating free energy tables or quantifications of chemical reactions. [2]

References

1. Bronsted, Johannes. (1946). *Principles and Problems in Energetics*. Interscience Publishers, 1955.
2. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances*, McGraw-Hill Book Co., Inc.

External links

- Johannes Bronsted – Wikipedia.

θΔics

In existographies, **Johannes Gutenberg** (1398-1468) (IQ:150|#696) (Cattell 1000:231) [RGM:34|1,500+] (Gottlieb 1000:1) (Hart 100:3) (CR:4) was a German blacksmith, goldsmith, and engraver; noted for his c.1450 invention of the movable type printing press.

Overview

In c.1450, Gutenberg invented the printing press.

In 1450, Gutenberg printed 180 copies of the Gutenberg Bible. (Ñº)

In 1456, Gutenberg, owing to lawsuits, and printing costs, was effectively bankrupt.

In 1480, there were 110 printers in Europe, mostly in Italy and German. [1]

References

1. Repcheck, Jack. (2007). *Copernicus' Secret: How the Scientific Revolution Began* (pg. 128). Simon & Schuster.

External links

â— Johannes Gutenberg – Wikipedia.

θΔics

In existographies, **Johannes Hevelius** (1611-1687) (IQ:#|#) (Murray 4000:20|A) (CR:4), aka "von Hevel" (Q), was a Polish astronomer, lawyer, mayor, and brewer, noted for []

Overview

In 1627, Hevelius, age 16, began to study under mathematician, astronomer, and purported polymath (Q) Peter Kruger (1580-1639), himself a student (Q) of Tycho Brahe and Johannes Kepler.

In 1639, Hevelius re-visited Kruger, who convinced him to engage fully in astronomy, after which he established an observatory, which he called "Stellaburgum", on the roof of his Danzig home, which eventually grew to cover three adjacent buildings. The following shows Hevelius using some type of projection telescope which showed a night sky image on a sheet of paper, enabling it to be drawn, which was used in observation of the transit of Mercury on 3 May 1661: [2]

In 1670s, Hevelius' Stellaburgum, was Europe's finest observatory; prior to it being burned down in 1679. [2]

Hooke

In 1668 to 1674, Hevelius did battle with Robert Hooke as to who could build superior astronomical instruments, i.e. quadrants and telescopes. [1]

Quotes | On

The following are quotes on Hevelius:

> "Nothing is sweeter than to **know everything**, and enthusiasm for all good arts brings, some time or other, excellent rewards."
>
> — Elisabeth Hevelius (c.1665), frequent words of encouragement to her husband Johannes Hevelius; cited by Maria Popova (2014) [2]

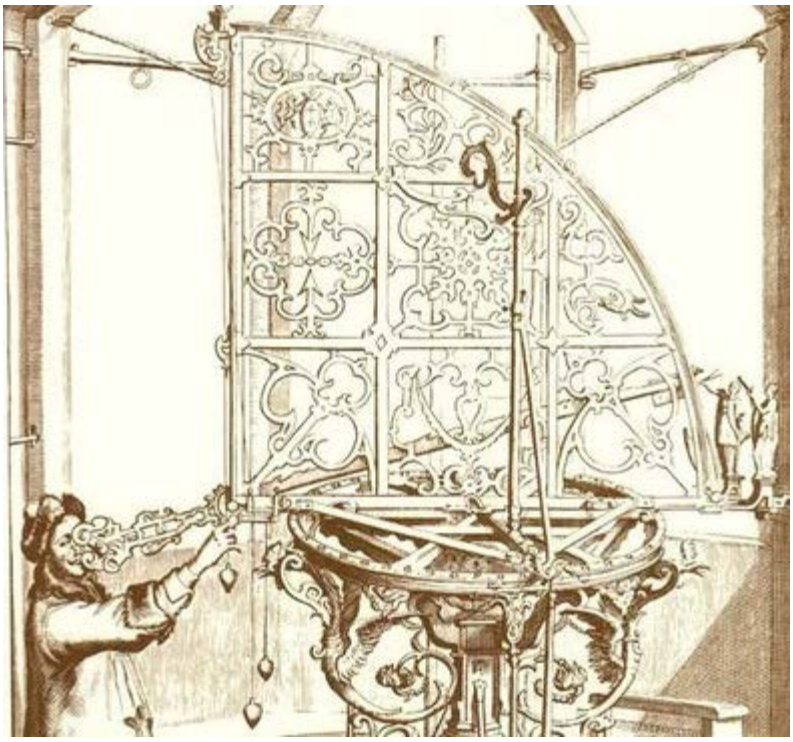

A photo of Hevelius using his sextant to make star observations; Robert Hooke, of note, bragged to Hevelius that he had made a better sextant, and the two battled for several years. [2]

> "Comets had fascinated astronomers for thousands of years, and Hooke set about reading what had been written about them from Aristotle and Seneca to Kepler, Galileo and **Hevelius**."
>
> — Stephen Inwood (2002), *The Man Who Knew Too Much* (pg. 313) [1]

See also

- Helvetius

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1. Inwood, Stephen. (2003). *The Man Who Knew Too Much: the Strange and Inventive Life of Robert Hooke 1653-1703* (Hevelius, 6+ pgs; quote, pg. 76). Pan MacMillan.
2. Popova, Maria. (2014). "Ordering the Heavens: Hevelius' Revolutionary 17th-Century Star Catalog and the First Moon Map" (Q), BrainPickings.org, Aug 11.

External links

- Johannes Hevelius – Wikipedia.

θΔics

In existographies, **Johannes Kepler** (1571-1630) (IQ:180|#96) (Cattell 1000:157) [RGM:18|1,500+] (Murray 4000:4|CS / 2|A) (GAE:4) [CR:100] was a German mathematician and astronomer, a fabled "last persons to know everything", known for his 1619 three laws of planetary motion, all generally on the nature of elliptical orbits, which he derived from astronomical observations made by Tycho Brahe, which provided one of the foundations for Isaac Newton' theory of universal gravitation.

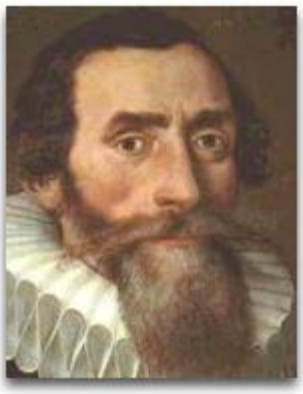

Overview

In 1596, Kepler published *The Cosmic Mystery: the Secret of the World*, rejected the Ptolemaic model in favor of the Copernican model, the first publication to do so in the 53-years since publication of *On the Revolution of the Heavenly Spheres*; Kepler explains as follows:

> "When I was studying under the distinguished Michael Maestlin at Tubingen six year ago, seeing the many inconveniences of the commonly accepted theory of the universe, I became delighted with Copernicus, whom Maestlin often mentioned in his lectures, that I often defended his opinions in the students' debates about physics. I have by degrees – partly out of hearing Maestlin, partly by myself – collected all the advantages that Copernicus has over Ptolemy."

Kepler, age 25, sent copies of this out to Galileo, age 32, who replied as follows:

> "Many years ago, I accepted Copernicus' theory, and from that point of view I discovered the reasons for numerous natural phenomena which unquestionably cannot be explained by the conventional cosmology. I have written down many arguments as well as refutations of objections. These, however, I have not dared to publish up to now. For I am thoroughly frightened by what happened to our master, Copernicus. Although he won immortal fame among some persons, nevertheless among countless – for so large is the number of fools – he became a target of ridicule and derision. I would of course have the courage to make my thoughts public, if there were more people like you. But since there aren't, I shall avoid this kind of activity."

A segment (Ñº) of the reaction path of Kepler.

Kepler also sent a copy to Tycho Brahe.

In 1599, Kepler moved to Prague, so to study under Brahe.

Angels | Planetary motion

Kepler, supposedly, had some sort of theological foundation in mindset in the conceptual underpinnings of his celestial mechanics. [4] Somehow in this mix, Kepler is often cited as having asserted himself that planetary motion was driven by angels pushing them about the sun, having entertained this premise for a spell, or that people in his day believed and or asserted this argument; the following are a few example statements:

“The search for cause and effect, the striving to reduce everything to law and order, the explanation of the universe in terms of machine—all this Pavlov carried over from Kelvin, Maxwell and Helmholtz. But in physics, causality, machines, law and order have disappeared. Schrodinger even regards them as infantile concepts—as infantile as **Kepler’s** hypothesis that angels push the planets around the sun.”

— Anon (1936), *New York Times* editorial [1]

“Our sixteenth-century Fernel viewed the body as a tenement for faculties. One faculty was that which actuated the various bodily movements. Then came Descartes with is robot [see: Cartesian automata], a mechanism actuating itself. Such too had been Descartes’ thought with respect to the motions of the macrocosm. For **Kepler** still, a century later than Fernel, though each planet was ridden by an angel. Then later with the ‘reign of law’ that guidance became a ‘force’, e.g. gravitational. Today that ‘force’ has in turn disappeared. There remains a curvature of space. The human mind looking at nature has had to dehumanize its point of view—it has, using Samuel Alexander’s word, to **‘deanthropize'** itself. It has to dispense with ‘causation’, which is regarded as an anthropism, but is yet a final cause. It is more faithful to William of Occam.”

— Charles Sherrington (1938), *Man on His Nature* [2]

“What makes planets go around the sun? At the time of **Kepler** some people were saying that there were angles behind them beating their wings and pushing the planets around in orbit. As you will see, the answer is not very far from the truth. The only direction is that the angles sit in a different direction and their wings push inwards.”

— Richard Feynman (1965), *The Character of a Physical Law* [3]

“When **Kepler** began to wonder why the planets move as they do, for a while he entertained the then-popular notion that planets were pushed by angels. After all, planetary motion had been found to be quite lawful and regular, yet there was no obvious agent to give them a push, as Aristotelian physics required. But Kepler did not leave it there, he wanted to know more about ‘how’ the process worked, and after considering and discarding many hypotheses over many years (some of them fantastical and mystical), he finally stripped away the supernatural notions and worked out his three purely mathematical laws of planetary motion.”

— Donald Simanek (2006), “Why Not Angels?” [5]

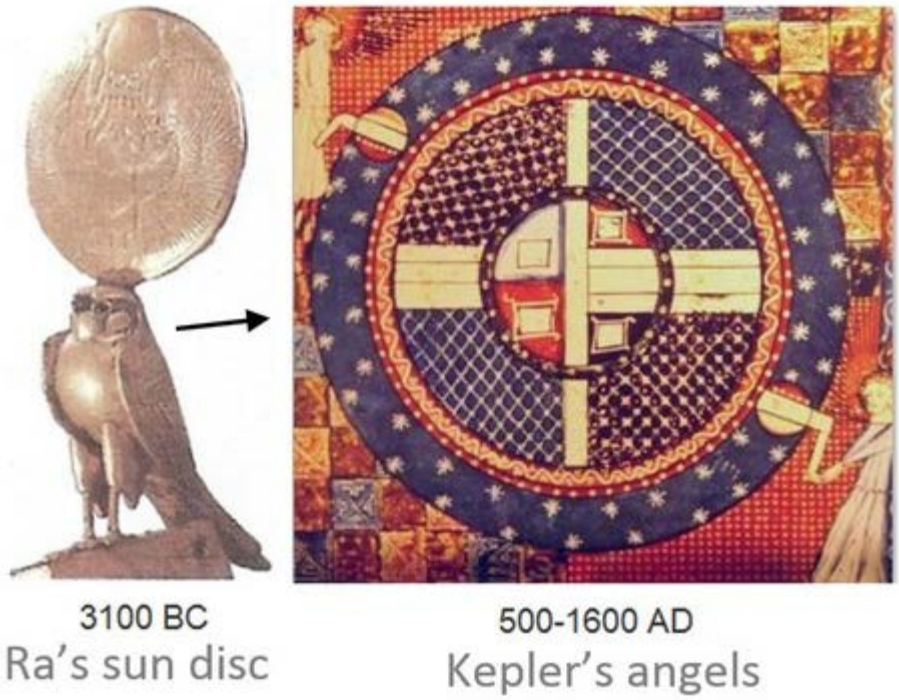

Left: the sun conceptualized, in Egyptian theology, as disc, or sun god Ra (3100 BC), being carried through the sky by a bird; later described as the phoenix by Herodotus. **Right:** a medieval (500-1600 AD) conception of “angles”, the Christian reconceptualization of the bird-conceptualized deities of the Egyptian Ogdoad/Ennead creation myth pantheon pushing planets or what seems to be angels moving the planets by crank arm mechanism. [5]

(add discussion)

Education

Kepler was a recognized prodigy of sorts, completing his MS degree at age 20 at the University of Tubingen, where he studied under Michael Maestlin (1550-1631), who had begun teaching Copernican theory, informally.

Quotes | On

The following are noted quotes of praise and or tributes:

> "Give me a fruitful error any time, full of seeds, bursting with its own corrections. You can keep your sterile truths for yourself."
>
> — Vilfredo Pareto (c.1810), comment on **Kepler** [6]

> "Einstein is a genius in higher physics and ranks with Copernicus, Newton and **Kepler**."
>
> — William du Bois (1932) (Ñº)

Quotes | By

The following are related quotes:

> "The chief aim of all investigations of the external world should be to discover the rational order which has been imposed on it by god, and which he revealed to us in the language of mathematics."
>
> — Johannes Kepler (c.1620) (Ñº)

> "If a person be too dull-witted to comprehend his knowledge or to enfeebled by his wounded piety to believe Copernicus, I encourage him to dismiss the school of astronomers and, if he wishes, even those among the condemned philosophers he favors, and pursue his own interest and cease his earthly wanderings."
>
> — Johannes Kepler (1635), *Perioche ex Introductione in Martem*; cited by Otto Guericke (1672) in *New Magdeburg Experiments on the Vacuum of Space* (pg. 24)

> "And I cherish more than anything else the 'analogies', my most trustworthy masters. They know all the secrets of nature, and they ought to be least neglected in geometry."
>
> — Johannes Kepler (c.1620) (Ñº)

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External links

â— Johannes Kepler – Wikipedia.

θΔics

In existographies, **Johannes Hubritus Cornelius Lisman** (c.1900-c.1990) (CR:7), often cited as J.H.C. Lisman, was a Dutch scientist noted, in economic thermodynamics, for []

Overview

In 1946, Lisman, in his book *Econometrics, Statistics, and Thermodynamics*, presented a compilation of various previously published articles.

In 1949, Lisman, in his "Econometrics and Thermodynamics: A Remark on Davis' Theory of Budgets", in which he picks apart the economic equations, via the employment of the thermodynamic isomorphisms (or mathematical isomorphism) technique, of American mathematician Harold Davis, concluding that none of the variables Davis used in his mathematical economic models seem to play the same role as entropy in thermodynamics. [1]

Education

Lisman seems to have co-authored the 1931 article "The melting-curve of hydrogen to 450 kg/cm2". [2]

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Further reading

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θΔics

In hmolscience, **Johannes Muller** (1801-1858) was a German physiologist noted, human thermodynamic, for his adherence to vitalism theory, and particularly for a number of noted students who worked in his laboratory, namely Ernst Haeckel, Hermann Helmholtz, etc., and secondary students, e.g. Oswald Kulpe (via Wilhelm Wundt), who all adopted the energy view of animal and human function over that of vitalism view.

Evolution

Muller explained to Richard Owen that life had a special "organizing energy" that controlled evolution. Owen, in turn, expressed these views to Charles Darwin in their 1840s discussions on evolutionary theory. [3]

Helmholtz school | Reaction against vitalism

During the years 1838 to 1842, German physicians Ernst Brücke, Herman Helmholtz, and Emil Du Bois-Reymond worked in Muller laboratory. In opposition to Muller's adherence to the principle of vitalism, a doctrine that the functions of a living organism are due to a vital principle distinct from physiochemical forces, the three of them, in the words of Du Bois-Reymond, formulated a desire to validate the basic truth that: [1]

> "In an organism no other forces have effect than the common physio-chemical ones."

This force or *kraft*, as it is called in German, soon later became synonymous with the newly forming concept of energy.

Psychodynamics | Helmholtz-Brucke precipitate

This concept was soon carried over into psychology by Austrian psychologist Sigmund Freud, Brücke's medical school student, and later by Freud's protégé Swiss psychologist Carl Jung. One of the first to explicitly define the concept of psychic energy, according to Jung, was Russian psychologist Nicolas von Grot, who in 1898 stated: [2]

> "The concept of psychic energy is as much justified in science as that of physical energy, and psychic energy has just as many quantitative measurements and different forms as has physical energy."

Others, such as Oswald Kulpe, were a precipitate of this school

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External links

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θΔics

In hmolscience, **Johannes Reinke** (1849-1931) was a German botanist and philosopher noted for []

Overview

In 1899, Reinke, in his *The World as Fact*, critically contested Ernst Haeckel's monism with a batch of cosmological dualism, written with "admirable lucidity and clarity", according to Haeckel, the gist argument of which summarized as follows: [1]

> "God restricted his interference to two creative acts. First he created the inorganic world, mere dead substance, to which alone the law of energy applies, working blindly and aimlessly in the mechanism of material things and the building of the mountains; then god attained intelligence and communicated it to the purposive intelligent forces which initiate and control organic evolution."

Inorganic nature, according to Reinke, is governed by physical and chemical forces, whereas organic nature is governed by "intelligent forces", that are regulative or dominant forces.

In 2012, German botanist Volker Wissemann, in his *Johannes Reinke: the life and work of a Lutheran botanist*, digresses on Reinke's religion + science reconciliation efforts, the abstract of which is as follows: [2]

> "Modern science is daily concerned with unraveling the mysteries of life. And yet the example of **Johannes Reinke** shows that there is great agreement between natural science and religion. The life of the German botanist Johannes Reinke (1849-1931) is an example for the conflict between natural science and beliefs at the turn of the 20th century, under the influence of Charles Darwin and Ernst Haeckel. Reinke represented a philosophy in which the unity of natural science and religion was prominent and vital, to both liturgy and to earning a living. Two previously unknown writings of the botanist, professor, writer, politician, philosopher and Lutheran protagonist Johannes Reinke are republished in this volume."

(add discussion)

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θΔics

In thermodynamics, **Johannes van der Waals** (1837-1923) was a Dutch physical chemist noted for his 1873 derivation of the equation of state for condensing bodies when approaching the liquid state and for his theory of dispersion forces; work for which he won the 1910 Nobel Prize in physics. [1] Van der Waals is associated with the Dutch school of thermodynamics. In his explaining how he arrived at his equation of state, he states: [2]

> "The first incentive to this my life's work came to me when, after my studies at university, I learned of a treatise by Clausius (1857) on the nature of the motion which we call heat … [in which] he showed how Boyle's law can very readily be derived on the assumption that a gas consists of material points which move at high velocity, that this velocity is of the order of that of sound and increases in proportion to the square root of the absolute temperature."

Overview

As noted, early in his studies in physics and mathematics, Van der Waals was greatly influenced by Clausius' 1857 treatise *On the Kind of Motion we Call Heat*. [2] Van der Waals was later influenced also by the writings of James Maxwell, Ludwig Boltzmann, and Willard Gibbs.

Van der Waals' 1873 doctoral thesis, completed at University, was entitled *On the Continuity of the Gas and Liquid State.* [3] In this work, for which he would be later awarded the 1910 Nobel prize in physics, he derived the equation of state bearing his name, which describes the behavior of condensing gases and criticality; introduced the concepts of molecular volume and molecular attraction (presently known as the Van der Waals force); overall thus giving a model in which the liquid and the gas phase of a substance merge into each other in a continuous manner.

In deriving his equation of state van der Waals assumed not only the existence of molecules (which in physics was disputed at the time), but also that they are of finite size and attract each other. As he wrote in his memoirs later he was afraid he would not pass his PhD exam since at that time people in science did not believe on the existence of atoms and molecules.

Van der Waals equation

> *See main: Van der Waals equation*

In 1864, German physicist Rudolf Clausius began to write the ideal gas law as:

$$pv = RT$$

where *p* is the pressure, *v* the volume, and *T* the absolute temperature of the body of non-interactive gas particles. In systems where either the pressure is increased, volume decreased, or temperature decreased, the gas can be turned into a liquid state, and the above equation becomes inapplicable. The system will be become a non-dilute aggregate of moving particles, interacting through inter-particle forces, and will fail to comply with Boyle's law. These two effects, according to Van der Waals, can attributed to attraction between the particles, signified by a new constant "a", and particle volume effects, signified by a new constant "b", and thus the new vapor-approaching-liquid state of the body of particles can thus be quantified by the following equation:

$$\left(p + \frac{a}{v^2}\right)(v - b) = RT$$

or

$$p = \frac{RT}{v-b} - \frac{a}{v^2}$$

in its original formulation. [2]

Tributes

In 1874, Scottish physicist James Maxwell gave his qualified endorsement of Van der Waal's thesis in *Nature*: [4]

> "There can be no doubt that the name of **Van der Waals** will soon be among the foremost in molecular science."

thus establishing Van der Waals's reputation. [1]

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θΔics

In chemical thermodynamics, **Johannes Jacobus van Laar** (1860-1939), often cited as J.J. van Laar, was a Dutch chemist who became a self-assigned representative of what he called the "Gibbs-Planck view" of chemical thermodynamics, namely the view that the thermodynamic potentials, in contrast to the alternative early methods of going about studying chemical processes thermodynamically, are the paramount concept, superior to that of the methods used in the so-called "osmotic school" of thermodynamics. [1]

Van Laar is often classified as being part of the Dutch school of thermodynamics. [2]

In 1896, he engaged with a heated debate with Walther Nernst; and continued on with his attack on "osmotics" for over ten years. [1]

Education

Both of van Laar's parents dereacted (died; ended) before he was thirteen (mother at two; father at thirteen), thus situating him, curiously, in the early parental death categorization. After becoming a naval officer, at the behest of his guardians, from 1881 to 1884 he began to study chemistry, physics, and mathematics, attending the lectures of Jacobus van't Hoff and Johannes van der Waals. In 1893, he wrote his first book *The Thermodynamics of Chemistry*. In 1898, he began tutoring in mathematical chemistry at the University of Amsterdam. In 1903, he became an assistant to Dutch chemist Bakhuis Roozeboom. He resigned for health reasons in 1912, and moved to Switzerland. [3]

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External links

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θΔics

In existographies, **Johannes Wislicenus** (1835-1902) was a German chemist and free thinker noted for 1885 comment: "that must disappear!", to his University of Leipzig tour guide, upon talking over the chair of chemistry, from Hermann Kolbe, in reference to the Biblical quote, stating "god has arranged all things by measure and and number and weight", from Wisdom of Solomon (11:20) (Q), above the classroom periodic table (Dmitri Mendeleyev version, 1869).

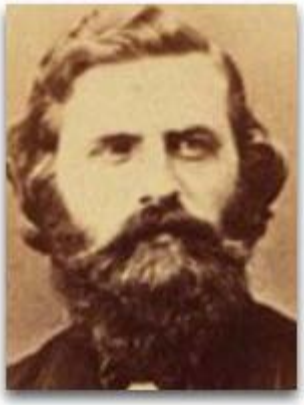

Chemical atheism | That must disappear!

In 1885, Wislicenus gave the following order to his tour guide, during his orientation tour of the University of Leipzig, as the new chemistry professor successor to Hermann Kolbe:

> “That must disappear!”

in reference to Kolbe’s Biblical quotation "God has arranged all things by measure and number and weight" (Wisdom of Solomon 11:20) in large letters, such as depicted adjacent, above the periodic table chart of the chemical elements at the front of his lecture theater: [1]

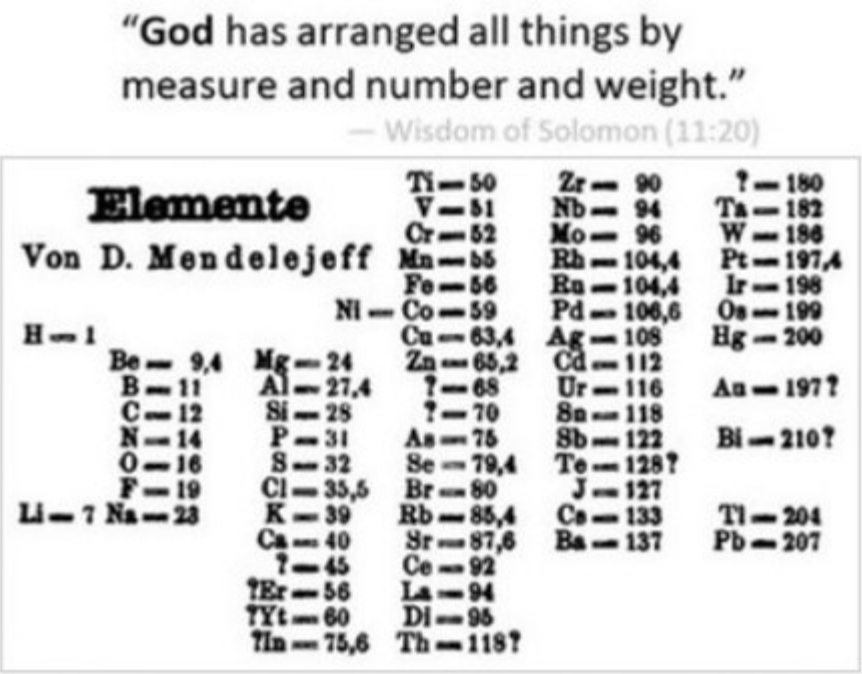

Hermann Kolbe’s chemistry lecture hall’s **Periodic Table**
University of Leipzig (1885)

(add discussion)

Ostwald

In 1905, German chemist Wilhelm Ostwald came into serious conflict with the university, the reason being concerned with “religious questions”, as biographer Eduard Farber puts it, at the time of the official obsequies for Wislicenus. The tensions came to a breaking point, when Ostwald was asked to be relieved of lecturing duties, after which he was suspended until 1906, officially appointed as an exchange professor to the United States.

See also

- Juliana Goates

References

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θΔics

In existographies, **John Adams** (1735-1826) (IQ:177|#246) [RGM:188|1,250+] (HD:14) (Cattell 1000:182) (founding father:3) (American President:2) was an American politician and thinker, noted for []

Genius

In 1758, Adams, aged 23, in his diary entry, had the following to say about genius, and its five main types: mechanical genius, poetical genius, philosophic genius, moral genius, and political genius: [3]

> "What are the proofs, the characteristics of genius? — Answer invention of (a system) new systems or combinations of old ideas.
>
> 1. The man, who has a faculty of inventing and combining into one machine, or system, for the execution of some purpose and accomplishment of some end, a great number and variety of wheels, levers, pullies, ropes, etc., has a great 'mechanical genius'. And the proofs of his genius (unless it happens by mere luck) will be proportionably to the number, and variety of movements, the nice connection of them, and the efficacy of the entire machine to answer its end. The last, I think at present, ought to be considered in [estimating?] any genius. For although genius may be shown in the invention of a complicated machine, which may be useless, or too expensive, for the end proposed, yet one of the most difficult points is to contrive the machine in such a manner, as to shorten, facilitate, and cheapen, any manufacture, etc. For to this end a man will be obliged to revolve in his mind perhaps a hundred machines, which are possible but too unwieldy or expensive, and to select from all of them, one, which will answer the purposes mentioned.
>
> 2. The man who has a faculty of feigning (a great number, and variety of characters, actions, events, etc.) and combining into one regular, correct, consistent plan or story, a great number and variety of characters, actions, events, etc. has a great 'poetical genius'. And the proofs of his genius are in proportion to the variety, consistency and number of his characters, actions and events; and to the nice connection and dependence of these upon each other through a whole poem. And these proofs have been given in a surprising degree by Milton and Shakespeare, Homer, Virgil, etc. Milton has feigned the characters of arch angels and devils, of sin, death, etc., out of his own creative imagination and has adjusted, with great sagacity, every action and event in his whole poem to these characters.
>
> 3. The man, who has a faculty of inventing experiments and [reasoning?] on them [means?] of starting new experiments from that reasoning, and on these experiments forming new reasonings till he reduces all his experiments, all his phenomena, to general laws and rules, and combines those rules to an orderly [and regular dependence on each other, through the whole system, has a great 'philosophic genius'.
>
> 4. The man who has a faculty of considering all the faculties and properties of human nature, as the senses, passions, reason, imagination and faith, and of (combining) classing all these into order, into rules, for the conduct of private life, has a great 'moral genius' (genius in morality).
>
> 5. He who has a faculty of combining all these into rules, for the government of society, to procure peace, plenty, liberty, has a great 'political genius'.

Thus order, method, system, connection, plan, or whatever you call it, is the greatest proof of genius, next to invention of new wheels, characters, experiments, rules, laws, which is perhaps the first and greatest.

Query. Does not the word invention express both these faculties, of inventing wheels &c. and putting them in order.
Query. May not genius be shown in arranging a man's diet, exercise, sleep, reading, reflection, writing, etc., in the best order and proportion, for his improvement in knowledge?

These are but vague, general, indeterminate reflections. I have not patience to pursue every particular attentively. But, this patience' (is the greatest attainment) or a great superiority to a man's own unsteadiness, is perhaps one of the greatest marks of genius. inattention, wandering, unconnected thoughts, are the opposites to this patience."

(add)

Adams family

John Adams was patriarch of the so-called Adams family (or Adams political family): his son, John Quincy Adams, was 6th president, and his great grandson was Henry Adams, the leading social Newton, behind Goethe.

Jefferson

John Adams was a close intellectual associate of Thomas Jefferson; the following are noted segments of correspondence:

"This would be the best of all possible worlds, if there were no religion in it."

— John Adams (c.1810), "Letter to Thomas Jefferson"; in FSM app

"I feel: therefore I exist. I feel bodies which are not myself: there are other existences then. I call them *matter*. I feel them changing place. This gives me *motion*. Where there is an absence of matter, I call it *void*, or *nothing*, or *immaterial space*. On the basis of sensation, of matter and motion, we may erect the fabric of all the certainties we can have or need."

— Thomas Jefferson (1820), "Letter to John Adams", Aug 15 [1]

"We think ourselves possessed, or, at least, we boast that we are so, of liberty of conscience on all subjects. Yet, how far are we from these exalted privileges in fact! **There exists**, I believe, throughout the whole Christian world, **a law which makes it blasphemy to deny our doubt the divine inspiration** of all the books of the Old and New Testaments, from Genesis to Revelation. Who would run the risk of translating Dupuis?"

— John Adams (1825), "Letter to Thomas Jefferson", Jan 23 [1]

(add)

Last words

Both Adams and Jefferson, by curious incidence, "ceased to exist", as Jefferson would say, within 4 to 5 hours of each other; the following are the last words of John Adams (age 90):

"Thomas Jefferson still survives."

— John Adams (1826), Last Words (age 90) (Ñº), Jul 04

Adams, when he said these words, was unaware, that Jefferson had ceased to exist 4 to 5 hours earlier.

Quotes | By

The following are noted Adams' quotes:

"Let us dare to read, think, speak and write."

— John Adams (1735), A Dissertation on the Canon and Feudal Law (Ñº)

"There are two types of education… One should teach us how to make a living, and the other how to live."

— John Adams (c.1750) (Ñº)

"**The United States of America have exhibited, perhaps, the first example of governments erected on the simple principles of nature**. In the formation of the American governments, it will never be pretended that any persons employed in that service had interviews with the gods, or were in any degree under the influence of heaven. These governments were contrived merely by the use of reason and the senses."

— John Adams (1788), A Defense of the Constitutions of Government of the United States of America

"To be good, and to do good, is all we have to do."

— John Adams (c.1790) (Ñº)

"The divinity of Jesus is made a convenient cover for absurdity."

— John Adams (c.1790), in FSM atheism app

"The government of the United States is **not in any sense founded** on the Christian religion."

— John Adams (1797), Article 11 of Treaty of Tripoli, Jun 7

"Let the human mind loose. It must be loose. It will be loose. Superstition and dogmatism cannot confine it."

— John Adams (1816), "Letter to son, John Quincy Adams", Nov 13

"Twenty times, in the course of my late reading, have I been on the point of breaking out, 'This would be the best of all possible worlds, if there were no religion in it!' But in this exclamation I should have been as fanatical as Bryant or Cleverly [minister and tutor to Adams's son]. Without religion, this world would be something not fit to be mentioned in polite company, I mean hell. .. . The most abandoned scoundrel that

ever existed, never yet wholly extinguished his conscience, and **while conscience remains there is some religion**. Popes, Jesuits and Sorbonists and inquisitors have some conscience and some religion."

— John Adams (1817), "Letter to Thomas Jefferson", Apr 19

"There exists, I believe, throughout the whole Christian world, a law which makes it blasphemy to deny or doubt the divine inspiration of all the books of the Old and New Testaments, from Genesis to Revelations. In most countries of Europe it is punished by fire at the stake, or the rack, or the wheel. In England itself, it is punished by boring through the tongue with a red-hot poker. In America it is not better; even in our own Massachusetts, which I believe, upon the whole, is as temperate and moderate in religious zeal as most of the states, a law was made in the latter end of the last century, repealing the cruel punishments of the former laws, but substituting fine and imprisonment upon all those blasphemers upon any book of the Old Testament or New. Now, what free inquiry, when a writer must surely encounter the risk of fine or imprisonment for adducing any argument for investigating the divine authority of those books?"

— John Adams (1825), "Letter to Thomas Jefferson", Jan 23

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External links

â— John Adams – Wikipedia.

θΔics

In hmolscience, **John Armstrong** (1966-) (CR=6) is a British Goethean scholar and philosopher noted for his 2006 *Love, Life, Goethe*, wherein he touches on a number of areas, such as Goethe's advertisement, the Goethe and Napoleon meeting, *Elective Affinities*, aspects of Goethe's affinity table, Goethe's mid 1808 (see: Goethe timeline) draft story "The Renouncers", about a hero simultaneously in love with four women (see: Goethe love thought experiment), Goethe pronunciation issues, among others topics of interest. [1]

Overview

In 2013, Armstrong, in his "On Goethe" University of Melbourne Key Thinkers seminar, elaborated on how he got involved in the business of being a Goethean scholar, during which he explains how a 1932 centenary address by Thomas Mann, given in the house of Goethe, in Frankfurt, about how he "can only speak of Goethe in terms of love", which exited Armstrong, which he elaborates on as follows:

> "Mann saying how he 'can only speak of Goethe in terms of love' was a moment of tremendous intellectual hope: that you could love a great thinker, not merely be intellectually interested, [but] the quality of relationship could be marked by emotion, by friendship, by a feeling of closeness and longing, not just as it were the cold principles of reason; and it was really that, that illuminated for me what I wanted from intellectual life. I wanted to find thinkers and ideas that I could love. In thinking about why does one want to get to know the work of a figure like Goethe? For me the beginnings were really a feeling of loneliness, of encountering an intellectual world where there seemed to be a lot of very clever people, but where I didn't really fell that I was being spoken to as an individual. And the appeal of Goethe was that here was someone with whom I could make friends."

(add discussion)

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External links

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θΔics

In existographies, **John Scales Avery** (1933-) (CR:38) is a Lebanese-born Danish theoretical chemist and physicist, noted for []

Overview

In 1960 to 1961, Avery worked, during the summers, with Albert Szent-Gyorgyi, during which time Szent-Gyorgyi was interested in the following problem, as summarized by Avery (2017): [5]

> "Szent-Györgyi wondered how the chemical energy from food is harnessed to do mechanical work or to drive our metabolisms. He reasoned that there must be structures in living organisms which are analogous to the structures of engines. If you pour gasoline onto the street and set fire to it, no useful work results, only heat, but if you burn it inside an engine, the chemical energy of the gasoline can be converted into useful mechanical work. Following this line of thought, Szent-Györgyi looked for energy-transducing structures in the tissues of living organisms."

After which, Szent-Gyorgyi spent a year at the Institute for Advanced Study, Princeton, so to learn about quantum theory in respect to mitochondria, in regards to how the energy of photons is stabilized and trapped, and ready to drive the synthesis of sugars.

In 1969, Avery, after completing his PhD in theoretical chemistry, at Imperial College London, was asked, supposedly per suggestion of Szent-Gyorgyi, to become the managing editor of *The Journal of Bioenergetics and Biomembranes*, wherein he published the works of Peter Mitchell and Jens Skou, whose ideas were getting rejected by other journals.

In 1973, Avery moved to the University of Copenhagen, wherein he taught course on "Statistical Mechanics from the Standpoint of Information Theory", initiated by Kund Anderson, and taught physical chemistry to biologists, and also a course on "Science and Society". Two lecturers from at this course probed Avery into book writing; he explains as follows:

> "One of the features of my Science and Society course was that we had many exciting guest lecturers. Among these were Dr. Claus Emmeche and Dr. Luis Emilio Bruni, both of whom were experts in the new field of Biosemiotics, which regards information as the central feature of living organisms. Listening to their wonderful lectures, I found a criticism forming in my mind: They did not distinguish between cybernetic information and thermodynamic information. In other words, they did not distinguish between the information contained in messages, and the information content of Gibbs free energy. I decided that I would try to write a book which would make this distinction clear, but the project was left "on the back burner", and I too no steps towards starting it."

Here, of note, we see Avery venturing into his own peculiar model of the "information content of Gibbs free energy", supposedly of the sunlight and DNA manner of thinking, as contrasted with "cybernetic information", supposedly of the Leon Brillouin and Claude Shannon variety. A few years later, during lunch with Anita Goel, a chemical physics PhD-MD student, her questions prompted him into getting the book outline down; the gist of which he explains ad follows:

> "I also have a fascination for the second law of thermodynamics, and how it affects every aspect of our life. You've wonderfully connected the evolution of life and the second law of thermodynamics. Can you explain briefly for CC readers how both these phenomena are connected? The second law of thermodynamics states the the entropy (disorder) of the universe constantly increases. This follows from the fact that disorder is more statistically probable than order. For example, if we put a completed jigsaw puzzle into the bottom of a box, and shake the box, a disordered jumble of pieces results. The reverse process is virtually impossible. We could never, or almost never, put disordered pieces of a puzzle into a box, shake it,

and then to find the completed puzzle in the bottom,

> Since disorder (entropy) always increases, how is it possible that the world we see around us so highly ordered? How is life possible? How is the Taj Mahal possible? How is the internet possible? The answer is that the earth is not a closed system. A flood of information-containing free energy reaches the earth's biosphere in the form of sunlight. Passing through the metabolic pathways of living organisms, this information keeps the organisms far away from thermodynamic equilibrium, which is death. As the thermodynamic information flows through the biosphere, much of it is degraded to heat, but part is converted into cybernetic information and preserved in the intricate structures which are characteristic of life. The principle of natural selection ensures that when this happens, the configurations of matter in living organisms constantly increase in complexity, refinement and statistical improbability. This is the process which we call evolution, or in the case of human society, progress."

In 2003, Avery published these ideas into the book *Information Theory and Evolution*, wherein he cites the following group of recent thinkers to have aimed to uncover this hypothetical general law: Alexander Oparin, Herald Urey, Stanley Miller, Melvin Calvin, Sydney Fox, Leslie Orgel, Carl Sagan, Manfred Eigen, Christian de Duve, Erwin Schrodinger, Claude Shannon, and Stuart Kauffman. His own book attempts to state an outline of this general law by making appeasement to a mixture of thermodynamics, statistical mechanics, and information theory.

Free energy

In order to explain the seeming contradiction between the second law, i.e. that closed ideal gas phase systems tend towards disorder, and the high degree of order and complexity produced by living systems, Avery argues that this paradox has its resolution in the information content of the Gibbs free energy that enters the biosphere from outside sources. [1]

A notable aspect of Avery's book is his discussion of Neumann automaton theory in terms of free energy. [3]

Other

In 2006, Avery was a peer-reviewer for American electrochemical engineer Libb Thims' 2007-published *Human Chemistry* manuscript, about which Avery suggested to Thims, as discussed in the section on "Human Molecular Dynamics", that 26-element human molecules (people), similar to smaller 6-element protein molecules, are "drawn along paths that minimize the Gibbs free energy of the system." [4]

Education

Avery completed his BS in physics in 1954 at MIT; his MS in physics in 1955 at the University of Chicago; and PhD in theoretical chemistry in 1965 at Imperial College, London.

Quotes | Employed

The following are quotes employed by Avery:

> "The principle of life will hereafter be shown to be part or consequence of some general law."
>
> — Charles Darwin (1882), Letter to George Wallich [2]

References

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2. (a) Darwin, Charles. (c.1882). "Letter to George Wallich" (full quote: "I believe that I have somewhere said (but I cannot find the passage) that the principle of continuity renders it probable that the principle of life will hereafter be shown to be part or consequence of some general law." Publication.
(b) Avery, John (2003). *Information Theory and Evolution* (pg. viii). World Scientific.

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5. Mathew, Binu. (2017). "Interview with John Scales Avery, one of the Greatest Living Intellectuals on Earth" (Q), Counter Currents, Mar 15.

Further reading

● Avery, John. (2012). "Entropy and Economics" (Q), Cadmus, Apr 12.
● Avery, John S. (c.2018). "Thermodynamics and Negentropy of Spherical Classes Societal Harmony: Global Peace Thermodynamics" (co-authors: Vera Afanasyeva, Timi Ecimovic and Leo Semashko) (Q), PeaceFromHarmony.org.

External links

● Biography – Overview.
● John Avery (faculty) – University of Copenhagen.
● John Avery List Publications - Danish Peace Academy.

θΔics

In human chemistry, **John Banville** (1945-) is an Irish writer noted for his short 82-page 1982 novel *The Newton Letter*, which adopts aspects of German polymath Johann Goethe's 1809 novella *Elective Affinities* and owes essential sentiments, as Banville notes himself, to Hugo von Hofmannsthal's 1902 *The Chandos Letter*.

In regards to *Elective Affinities* similarities, in Banville's version, the inhabitants of 'Fern House' are Edward, the often drunk master of the house; Charlotte, his wife, a tall, middle-aged woman with an abstracted air and a penchant for gardening; Ottilie, the big, blonde, twenty-four year old niece of Charlotte; and Michael, the adopted son of Edward and Charlotte.

References

1. (a) Banville, John. (1982). *The Newton Letter*. Secker & Warburg.
(b) Sharman, Gundula. (2002). *Twentieth-Century Reworkings of German Literature: an Analysis of Six Fictional reinterpretations from Goethe to Thomas Mann* (§6: Constellation of Character: Goethe's *Die Wahlverwandtschaften*; Hugo von Hofmannsthal's *The Chandos Letter*; and John Banville's *The Newton Letter*, pgs. 151-74). Camden House.

External links

â— John Banville – Wikipedia.

θΔics

In existographies, **John Bardeen** (1908-1991) (IQ:180|#130) (GPE:42) (EPD|M12) (CR:7) was an American physicist and electrical engineer, a dual Nobel prize recipient, co-inventor of the transistor (1947), noted for []

Quotes | By

The following are quotes by Bardeen:

> "Science is a field which grows continuously with ever expanding frontiers. Further, it is truly international in scope. Any particular advance has been preceded by the contributions of those from many lands who have set firm foundations for further developments."
>
> — John Bardeen (c.1960) (Q)

Further reading

● Daitch, Vicki, and Hoddeson, Lillian. (2002). *True Genius: the Life and Science of John Bardeen: the Only Winner of Two Nobel Prizes in Physics*. Joseph Henry Press.

Videos

● Anon. (2010). "Spark of Genius: the Story of John Bardeen at the University of Illinois" (Q), Illinois1867, Aug 26.

External links

● John Bardeen – Wikipedia.

θΔics

In existographies, **John M. Becker** (c.1950-) is an American musician and meta-list maker, noted for his Becker 160 (greatest scientists) and Becker 139 (greatest philosophers) meta-analysis rankings.

Overview

In 2013, Becker, a professed “lister” (Q), via WordPress, began combining lists on various topics, from books and the Internet, ranking the combined list in terms of how many times a given thing, e.g. person, appeared across multiple lists, and ranking individuals chronologically with groups, such as ten people equally found on three separate lists.

In 2018, Becker made a ranked "Greatest Scientists of All Time" listing, containing 160 individuals (see: Becker 160). [1]

In c.2019, Becker made a ranked "Greatest Philosophers of All Time" (see: greatest philosopher ever) listing, with 139 individuals (see: Becker 139). [2]

References

1. Becker 160 (Q) (2018) – Greatest Scientists of All Time | Ranked.
2. Becker 139 (Q) (c.2019) – Greatest Philosophers of All Time | Ranked.

θΔics

In hmolscience, **John Bernal** (1901-1971) (CR:6), often cited as J.D. Bernal, was an Irish-born English physicist noted, in animate thermodynamics, for his 1949 introduction of the term "biopoesis", referring to a hypothetical three-step origin of life process, and for his 1951 physical theory of the origin of life.

Overview

In 1949 (or before 1957), Bernal coined the term “biopoesis” (or biopoiesis), to refer to the origin of life, i.e. life arising from non-living matter (e.g. simple organic compounds), arguing that it occurred in three stages”: the origin of biological monomers, the origin of biological polymers, and the evolution from the former two into life (O); or Stage 1: Origin of bio molecules. Stage 2: Biological polymers. Stage 3: Evolution to cell. (O)

In 1951, Bernal, in his *The Physical Basis of Life*, outlined the following theory: [1]

> “Life is one member of a class of phenomena which are open or continuous reaction systems able to decrease their internal entropy at the expense of free energy taken in from the environment and subsequently rejected in degraded form.”

Hungarian-born American physicist Eugene Wigner (1961), supposedly, expressed a similar view. [2] Bernal's chemical thermodynamic definition of life has been cited by those including: James Lovelock and Lynn Margulis, among others. [3]

Bernal, according to some accounts, is a said-to-be “two-cultures” genius. [4]

Eobiont

Bernal, at some point, seems to have either coined and or adopted the term “eobiont”, a conjunction of *eo-* [earliest / oldest] + *-bio* [life] + *-nt* [?], meaning “hypothetical precursor of living organisms in the chemical evolution preceding the occurrence of life”. [5]

Note, however, that other sources credit the coining of “eobiont” to British biochemist and “dogmatic atheist” Norman Pirie (1907-1997); supposedly, and equivalent to Soviet biochemist Alexander Oparin’s protobiont. [6] Pirie’s coining of the term was such that he used it to designate the entire process of development from the evolution of organic out of inorganic compounds, including the production of the first protoliving creature or "eobiont”. (O)

References

1. Bernal, John D. (1951). *The Physical Basis of Life*. Routledge and Paul.
2. Wigner, Eugene P. (1961). *The Logic of Personal Knowledge* (free energy, pg. 28). Free Press.
3. Lovelock, James. (1992). “What is Gaia?”, In: *Gaia’s Hidden Life: the Unseen Intelligence of Nature* (Bernal, pgs. 67-68), editors: Shirley Nicholson and Brenda Rosen. Quest Books.
4. Slack, Nancy G. and Wilson, Edward O. (2011). *G. Evelyn Hutchinson and the Invention of Modern Ecology* (polymath, 12 pgs; two cultures, pgs. 1, 323). Yale University Press.
5. Danner, Horace G. (2014). *A Thesaurus of English Word Roots* (pg.256). Rowman & Littlefield.
6. Anon. (1992). *The New Encyclopedia Britannica, Volume 4* (pg. 513)

Further reading

● Bernal, John. (1939). *The Social Function of Science* (abs). Publisher.

External links

● John Desmond Bernal – Wikipedia.

θΔics

In hmolscience, **John Boodin** (1869-1950) was a Swedish-born American philosopher noted for his 1916 *A Realistic Universe: an Introduction to Metaphysics*, wherein he critiques the "social compound" theories of Emile Durkheim, among other aspect of sociochemistry, e.g. explosion, human element theory, etc., along with making some type of proto social energetics like argument. [1]

Social energy | thermodynamics

The following is a noted section wherein Boodin seems to translated the language of kinetic energy and potential energy to social systems in semi-thermodynamic terms:

> "In analyzing energy systems we have selected our illustrations from the kinetic state of energy. This is due partly to the fact that we found this procedure simpler, but more to the fact that this state of energy is more significant for metaphysical purposes. The potential state, that of position or configuration, derives its significance from the moving state. By potential, we mean what energy *can* do when certain conditions are supplied which are different from those obtaining. Thus, to pass from energy of position to the kinetic state, there must, somehow, be unequal distribution of energy. In the case of falling bodies, we have unequal distribution of gravitational energy.
>
> Thermodynamics is built on the unequal distribution of heat. In the case of electrical energy, 'if any cause operates to add or remove electrons at one point, there is an immediate diffusion of electrons to reestablish equilibrium, and this electronic movement constitutes an electric current. This hypothesis explains the reason for the identity between the laws of diffusion of matter, of heat, and of electricity. Electromotive force is then any cause making, or tending to make, an inequality of electronic density in conductors, and may arise from differences in temperature, *i.e.* thermo-electromotive force, or from chemical action when part of the circuit is an electrolytic conductor, or from the movement of lines of electromagnetic force across the conductor.' In the case of social systems, it would be a case of the unequal distribution of emotional-volitional excitement.
>
> In the potential state, energy is just as real as in the kinetic state, but is balanced or in equilibrium for the time being. In the case of a building supported on pillars, the energy of the pillars balances, for the time being, the gravitational energy. In the case of human actions, certain tendencies to action are balanced for the time being by inhibitions. A man would steal, but he is afraid of the police. In either case, when the balancing energy is withdrawn, we have an unequal distribution, and the persistent tendency becomes kinetic energy."

(add discussion)

Social chemistry | Reactions

The following is a noted social chemistry conceptualized quote:

> "We must know our people, their race traits of instinct and temperament, and their psychological tendencies of needs, ambitions, and aversions. This is quite as necessary as knowing the elements which enter into the chemical compound. In either case, if we fail to take account of the reactive properties of our elements, we may find ourselves unwilling participants in an explosion. We must try to discover, too, the amount of emotional excitement which is necessary for the specific reaction to take place. Social compounds have their boiling point and freezing point, their point of solvency and crystallization, as truly as chemical elements. We must find what degree of affirmation or passion will precipitate the special type of reaction. As in the case of dynamite, the instability of the structure may make the effect out of all proportion to the releasing stimulus. Witness the present war of the European nations."

(add discussion)

Education

Boodin was educated at the University of Colorado, University of Minnesota, Brown University, and Harvard University. He was influenced by Charles Peirce, William James, and especially panpsychism philosopher Josiah Royce (1855-1916). Boodin, in fact, dedicates this *A Realistic Universe* to Royce, to whom he refers to as his friend and teacher. [2]

Boodin had teaching appointments at: Brown University (1896-1897), Harvard University (1899-1900), Grinnell College (1900-1904), University of Kansas (1904-1913), Carleton College (1913-1928), and UCLA (1928-1939). [3]

References

1. Boodin, John E. (1916). *A Realistic Universe: an Introduction to Metaphysics* (chemistry, 13+ pgs; physics, 12+ pgs; social compound, pg. 43; social chemistry, pgs. 43-44; social energetics, pgs. 44-45). MacMillan.
2. (a) Josiah Royce – Wikipedia.
(b) Skrbina, David. (2005). *Panpsychism in the West* (thermodynamics, pgs. 13, 151; panpsychist philosophers, pg. 155). MIT Press.
3. Reese, William. (2012). *Biographical Dictionary of Twentieth-Century Philosophers* (editors: Stuart Brown, Diane Collinson, Robert Wilkinson) (§:Boodin, John Elof, pgs. 86-87). Routledge.

External links

â— John Boodin – Wikipedia.
â— Boodin, John Elof – WorldCat Identities.

θΔics

In hmolscience, **John Bowlby** (1907-1990) was a British developmental psychologist noted his 1969 attachment theory, amid which he attempts to deride Sigmund Freud's energy-entropy model of the mind or "psychical energy model" (i.e. psychodynamics), as he refers to it, for his 1972-1980 separation theory.

Overview

In 1969, Bowlby published *Attachment*, the first of his three-volume set, wherein he introduced his "attachment theory", a precursory model to later "parent-infant bonding" models, general human bonding theories, and, in human chemistry, the modern conception of human chemical bonding. [1] With his theories of "detachment", Bowlby was also instrumental in the later theories of human debonding.

Bowlby was, oddly, very outspoken against Austrian psychologist Sigmund Freud's use and application of thermodynamics in psychology in his development of, what Bowlby calls, Freud's "psychical energy model", otherwise known as psychodynamics.

In fact, Bowlby devoted the entire first chapter, titled "Point of View", of his monumental three-volume *Attachment* series treatise, towards an effort to discredit Freud in his use of physics terms, such as energy, entropy, force, pressure, or inertia, as in "principle of inertia", etc., in psychology. To cite one example, at the end of this chapter, Bowlby states:

> "Nor is it to be supposed that the principle of entropy apples to living as it does to non-living systems."

(add discussion)

References

1. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (§: John Bowlby, pgs. 489-91). Morrisville, NC: LuLu.
2. Bowlby, John (1969). *Attachment*. *Attachment and Loss, Volume One* (pgs. 20). Basic Books.

Further reading

â— Bowlby, John. (1972). *Separation: Anxiety and Anger*. *Attachment and Loss, Volume Two*. Basic Books.
â— Bowlby, John. (1980). *Loss: Sadness & Depression*. *Attachment and Loss, Volume Three*. Publisher.

External links

â— John Bowlby – Wikipedia.

θΔics

In war thermodynamics, **John Boyd** (1927-1997) was an American industrial engineer, combat pilot, and military strategist noted for his energy-entropy decision based reaction cycle model of combat operation processes, or OODA loop (short for observe, orient, decide, and act) model, which he consulted the pentagon on, in over 1500 briefings, over a period of about 30 years. Boyd mixed in ideas on Heisenberg's uncertainty principle and chaos theory into his model.

Boyd seems to have been well read in general human thermodynamics authors; his 1976 *Destruction and Creation*, for example, cites: Erich Fromm, Nicholas Georgescu, Werner Heisenberg (*Physics and Philosophy*, 1962), David Layzer ("The Arrow of Time", 1975), Michael Polanyi (*Knowing and Being*, 1969), Thomas Kuhn, among others.

Education

In 1944, as a high school junior, Boyd enrolled in the US army and served two years. In 1947, he entered the University of Iowa to study economics, graduating four years later. [1] In 1951, he became a US air force officer, completing his pilot training at Williams Air Force Base. In 1953, he flew 22 combat sorties in the F-86 Sabre during the Korean War.

In 1954, he attended the Fighter Weapons School Instructor Course, at Nellis Air Force Base, Nevada, remaining there as a fighter weapons and tactics instructor. During this period, Boyd began to focus on "air combat tactics", publishing several articles on this, including his famous 147-page *Aerial Attack Study*, detailing every maneuver possible, in words and graphic illustrations, for a pilot to use in a dog fight. The problem that intrigued him during his period was that despite flying in an F-86 aircraft, which had a lower ceiling, a wider turn radius, and slower maximum speed than its rival, the Russian Mig-15, the kill ratio was still 10:1 in favor of the F-86 during the Korean War. This anomaly, that despite having worse planes (slower, bigger, less maneuverable) than the enemy, US pilots were still killing better, was the goad of his curiosity, which he assumed could be explained scientifically.

To aid in his research end, in 1960 Boyd enrolled at Georgia Tech to complete as BS in industrial engineering, where he studied thermodynamics, physics, and production lines, among other subjects; his interest in these subjects, it is said, did not lie in the mathematical details, but rather in the underlying principles and concepts. During this time he was said to have "wrestled with thermodynamics", the logical insights of which he began to apply back to his F-86 problem. [2] He would go on to develop his thermodynamics based theories of combat over the next 20 years.

1927	Born in Erie, Pennsylvania
1946	Drafted into the US Army, served with occupation forces in Japan
1952	Attended USAF pilot training at Williams Air Force Base, Arizona
1953	Flew 22 combat sorties in the F-86 Sabre in the 51st Fighter Interceptor Wing during the Korean War
1954	Attended the Fighter Weapons School Instructor Course and remained as an instructor at the school
1957	Published first article on air combat in the Fighter Weapons School Newsletter
1960	*Aerial Attack Study* is published for the first time
1961	Attended Georgia Tech University, received BS Industrial Engineering in 1962
1962	Stationed at Eglin AFB, Florida as an engineer. Developed concepts of Energy Maneuverability
1966	Sent to Pentagon to begin work on the FX fighter project, which would become the F-15 Eagle
1970–75	Worked in the Office of the Secretary of Defense (OSD). Began work in the Reform Movement
1975	Retired from active duty
1975	Continued working as a civilian in OSD. Began studying and writing about conflict and warfare
1976	Completes *New Conception for Air-to-Air Combat*
1976	First draft of *Destruction and Creation* completed
1977	First draft of *Patterns of Conflict* completed
1982	First draft *Organic Design for Command and Control* completed
1986	First draft of *The Strategic Game of ? and ?* completed
1987	Final versions of *Organic Design for Command and Control* and *The Strategic Game of ? and ?* completed
1987	Widespread dissemination of *A Discourse on Winning and Losing*, which includes previous works
1992	*Conceptual Spiral* completed and added to *A Discourse*
1995	*The Essence of Winning and Losing (The Big Squeeze)* completed
1997	Died 9 March

Boyd's chronology. [1]

Applications

Boyd, among other things, is credited for largely developing the strategy for the invasion of Iraq in the first Gulf War (1990-1991). In a letter to the editor of *Inside the Pentagon*, former Commandant of the Marine Corps general Charles C. Krulak is quoted as saying: "The Iraqi army collapsed morally and intellectually under the onslaught

of American and Coalition forces. John Boyd was an architect of that victory as surely as if he'd commanded a fighter wing or a maneuver division in the desert."

Other

English complexity theory economist Antoine Bousquet, in his chapter three entitled "Thermodynamic Warfare and the Science of Energy", digressed into the some the thermodynamical details of Boyd's theories. [3]

References

1. Coram, Robert (2002). *Boyd: The Fighter Pilot Who Changed the Art of War*. Little, Brown & and Company
2. Osinga, Frans P.B. (2006). *Science, Strategy and War: the Strategic Theory of John Boyd* (thermodynamics, 75+ pgs; thermodynamics education, pg. 21-23). Routledge.
3. Bousquet, Antoine. (2009). *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity* (Boyd, pgs. 18+ pgs). Columbia University Press.

Further reading

â— Safranski, Mark and Barnett, Thomas P.M. (2008). *The John Boyd Roundtable: Debating Science, Strategy, and War* (thermodynamics, pgs. 7, 20, 45; Origin diagram, pg. 6). Nimble Books.

External links

â— John Boyd (military strategist) – Wikipedia.
â— OODA loop – Wikipedia.

θΔics

In hmolscience, **John D. Brey** (1963-) is a Christian (Q) anti-materialism paradox philosopher noted for his 2002 *Tautological Oxymorons*, wherein he digresses on absurdities embedded in things such as the chemistry professor paradox.

Overview

In 2002, Brey, in his *Tautological Oxymorons: Deconstructing Scientific Materialism*, attempts to show that "natural selection" is an oxymoron via the logic that negative entropy, in Schrodinger's language, is a state of order, e.g. a person, and is unnatural according to the second law, which tends to select for states of higher or greater entropy, in short.

Brey seems to give a critique of what seems to be "thermodynamic materialism" in collision with Darwinian evolution based survival of the fittest based models of human existence; an interesting section of which is as follows: [1]

> "Our bodies represent a particular state of entropy. I our bodies were destroyed, the energy would now be in a new state of entropy. The point is that our physical body represents energy in a particular entropic state. While the heart is beating, the body guards its low entropy state, and when the heart stops beating, the entropy of the body rapidly increases as the energy (within the body) tries to find equilibrium with the environment outside the body. When we speak of 'survival', we are speaking of the desire to protect a low state of entropy (whether we're speaking of the universe itself, or a human body). But if 'survival' has positive meaning, then it would appear that low states of entropy are more desirable than high states of entropy, since all that is truly 'survived' is rising entropy.
>
> Why should low states of entropy be 'good', so that we guard low states of entropy with our life? And if low states of entropy are preferable to high states of entropy, wasn't the universe at its best, at or before the big bang, and won't it be at its worst at the heat death where entropy is in an absolutely 'high' state. Therefore, isn't the universe going from 'good' to 'bad'—from a low state of entropy, to a high state of entropy. Now if survival is good, then the universe is bad, for the universe will not *survive* the second law of thermodynamics, which states that the universe will eventually find itself in a state that is the antithesis of 'survival' (where survival is the retention of low entropy). If the universe is bad, the so is the human body, since inevitably the human body will not survive the second law of thermodynamics."

This is a variant of the chemistry professor paradox.

Common terms and phrases found in the book include: Arthur Schopenhauer, consciousness, Darwinism, Karl Popper, laws of physics, Ludwig Wittgenstein, matter, mechanisms, metaphor, natural selection, negative entropy, Newton, Nietzsche, Richard Dawkins, second law, soul, quantum, among others.

In 2005, Brey was theorizing about how, in his own words, "what the Bible calls 'sin', physics calls the 'second law'." [2]

In 2010 to 2013, Brey seems to have launched a "Tautology Wiki" (Q), on Wikia.com, wherein he penned 324+ pages, seemingly on the topic that the "uncaused cause" argument for the existence of god is a tautological argument, i.e. circular reasoning.

In modern hmolscience terms, the subject Brey seems to be digging at above, regarding "our bodies represent a particular state of entropy", is human free energy of formation (see also: free energy table), in the sense that at any given state of existence, a molecule, such as a human, can be assigned a measure of entropy and enthalpy and hence a free energy of formation for that given state at specified conditions, typically standard temperature and pressure (STP), but more specifically what seems to be a search for a system of directionality that the older religio-mythology systems offered and that Darwinian evolution upgraded to some extent, but one consistent with modern physical science.

Quotes

The following are representative quotes:

> "Materialists, on the other hand, want to deny blind faith [blind faith] and even the Jungian 'will of god.' They want to escape the tyranny of the laws of physics in the programming of the 'selfish genes and selfish memes.' They don't want to be mere cogs in the laws of physics, they want so badly to transcend the gene and the meme, which they claim, is all there is. They accuse the believer of practicing mysticism in his hopes of transcending the gene and the meme, when it's clear that it's they who so badly want to transcend the flesh (replicating information) in a way that is the natural course for those who exercise 'blind faith' in the one who underwrites the laws of the flesh (replicating information). This serpentine desire to rise above the laws of physics and become like the laws of physics, without any faith in him, is pure religion for the materialist."
>
> — John Brey (2002), *Tautological Oxymorons*; cited on reddit (Q)

References

1. Brey, John D. (2002). *Tautological Oxymorons: Deconstructing Scientific Materialism: an Onto-theological Approach* (quote, pgs. 44-45; thermodynamics, 21+ pgs). iUniverse.
2. Brey, John D. (2005). "Newton, Science, Theology", Tread, TheologyWeb.com, Dec 10

External links

- John D. Brey (profile) – Blogger.com.

θΔics

In literature thermodynamics, **John P. Bruni** (c.1970-) is an American literature scholar noted for []

Overview

In 2010, Bruni, in his article "The Miseducation of Henry Adams: Fantasies of Race, Citizenship, and Darwin Dynamos", incorrectly argued that American historian Henry Adams' 1907 *The Education of Henry Adams*, particularly the later chapters, forecasts the importance of information for thermodynamics. [2] Bruni, in this case, seems to be unaware, as are most, that thermodynamics has nothing to do with information nor information theory. [3]

In 2011, Bruni did an entry on thermodynamics, in the *The Routledge Companion to Literature and Science*, wherein he touched on the works of those including: Ira Livingston, Charles Baudelaire, Gustave Flaubert, H.G. Wells, Bruce Clarke, Yevgeny Zamyatin, D.H. Lawrence, Isaac Asimov; the end of the article, however, seems to drift off into a general treatise on thermodynamics, evolution, and life, e.g. discussing the works of Erwin Schrodinger, David Depew, Bruce Weber, Eric Schneider, among others. [1]

Education

Bruni completed his BA at the University of Rochester, his MA in 1995 with a thesis on "Computer-generated Writing, Chaos Theory, and Contemporary Text" at Villanova University, and his PhD in 2003 with a dissertation on "Making the Fittest Culture: Social Darwinism and American Naturalist Writing at the Turn of the Twentieth Century" at the University of Kansas. Currently, Bruni is a professor of American literature at Grand Valley State University, Michigan. His research interests include: 20th-century U.S. literature and film, ecocriticism, evolution and thermodynamics, cybernetics, animal studies.

References

1. Bruni, John. (2011). "§20: Thermodynamics", in: *The Routledge Companion to Literature and Science* (editors: Bruce Clarke, Manuel Rossini) (pgs. 226-38). Taylor & Francis.
2. Bruni, John. (2010). "The Miseducation of Henry Adams: Fantasies of Race, Citizenship, and Darwin Dynamos", in: *Darwin in the Atlantic Cultures: Evolutionary Visions of Race, Gender, and Sexuality* (editors: J.E. Jones, P.B. Sharp) (pgs. 260-82). Routledge.
3. Thims, Libb. (2012). "Information Theory ≠ Thermodynamics" (link), *Journal of Human Thermodynamics*, 8(1):1-#.

External links

â— John Bruni (faculty) – Grand Valley State University.

θΔics

In economics thermodynamics, **John Bryant** (1944-) is an English mechanical engineer noted for his 1980s to present ideas on economics and thermodynamics.

Overview

In 1974, Bryant began to publish papers on the nature of equilibrium and thermodynamics in relation to economics. [1]

In 1982, Bryant published "A Thermodynamic Approach to Economics", in which he argued that "economic value" is equivalent to "energy value", that there exist economic equivalents to the first and second law of thermodynamics, and that inflation is a function of "net cycle entropy gain". [2]

In 2009, Bryant published *Thermoeconomics: A Thermodynamic Approach to Economics* (now in an updated second addition 2011), on the subject of thermoeconomics, the gist of which being based on the so-called "letter rhyming derivation method". [4]

In his *Thermoeconomics*, Bryant cites those including: Paul Samuelson (1947), who applied Le Chatelier's principle in economics, Johannes Lisman (1949), who saw a similarity between money and entropy, George Pikler (1954), who highlighted connections between temperature and velocity of circulation of money, John Proops (1985), on general analogies between thermodynamics and economics, and Fritz Sollner (1997), who argues that there is no direct link between thermodynamic properties and the characteristics of economic systems, and that all attempts in this direction to produce economically interesting results have been failures, among others.

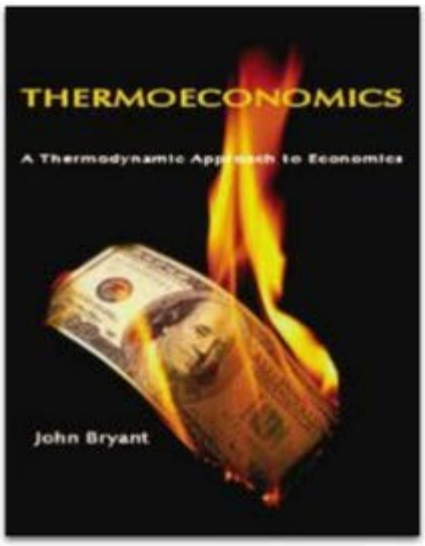

Cover of Bryant's 2009 book ***Thermoeconomics** - a Thermodynamic Approach to Economics.*

Education

Bryant has a BS in mechanical engineering and an MS in management studies. [3]

References

1. (a) John Bryant (About: Information, Working Papers, and Articles) – Ideas.Repec.org.
(b) Details about John Bryant - EconPapers.
2. Bryant, John. (1982). "A Thermodynamic Approach to Economics", (Abstract), *Energy Economics*, Vol. 4, No. 1, (pgs. 36-50).
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4. Bryant, John (2009). *Thermoeconomics: A Thermodynamic Approach to Economics* (ch. 1: Introduction; ch. 3: Thermodynamic Principles; ch. 5: Money). VOCAT International Ltd.

Further reading

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● Bryant, John. (2007). "A Thermodynamic Theory of Economics", *International Journal of Exergy*, 4, (pgs. 302-37).
● Bryant, John. (2008). "Monetary Aspects of a Thermodynamic Theory of Economics: an Application to the UK Economy 1969-2006 (pt. I, pt. II)", Working Papers, Vocat International.

External links

● John Bryant (papers) – Ideas.Repec.org.

θΔics

In existographies, **John Bunyan** (1628-1688) (IQ:160|#490) (Cattell 1000:488) was and English writer, noted for []

Overview

In 1678, Bunyan, in his *The Pilgrim's Progress: from this World, to That Which is to Come*, one of the first claimed novels in English (O), tells the allegorical story of everyday man named "Christian" who begins his journey with knowledge of original sin from the Bible and travels through places such as the "Slough of Despond", a boggy mire-like swamp where pilgrims' doubts, fears, temptations, lusts, shames, guilts, and sins of their present condition of being a sinner are used to sink them into the mud of the swamp; along the way is diverted by the secular ethics of Mr. Worldly Wiseman into seeking deliverance from his burden through the law, supposedly with the help of a Mr. Legality and his son Civility in the village of Morality, rather than through Christ, allegorically by way of the Wicket Gate, meets the laughing atheist, etc. (O)

§25. The Atheist

The following is the dialogue from chapter 25, "The Atheist", of John Bunyan's 1678 *The Pilgrim's Progress*:

> Now, after a while, they perceived afar off, one coming softly along the highway to meet them.
>
> Then Christian said to his fellow, "Yonder is a man with his back toward the Celestial City [Heaven], and he is coming to meet us."
>
> HOPEFUL: "I see him. Let us be careful now — lest he should prove to be a flatterer also."

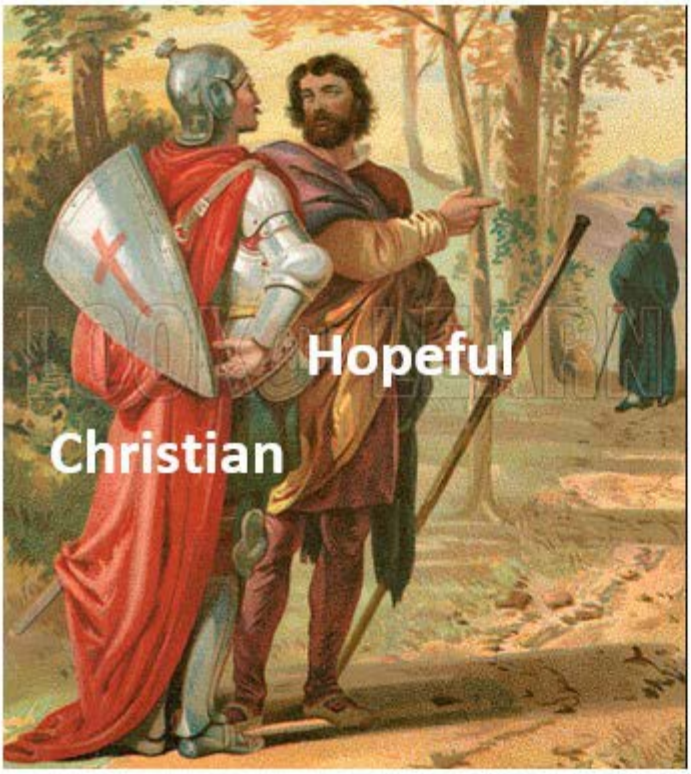

"Then the atheist fell into a great laughter!"

So the man drew nearer and nearer, and at last came up to them. His name was "Atheist", and he asked them where they were going.

CHRISTIAN: "We are going to the Celestial City."

Then **Atheist burst into laughter**.

CHRISTIAN: "What is the meaning of your laughter?"
ATHEIST: "I laugh because I see **what ignorant people you are** — to take so tedious a journey, and yet are likely to gain nothing for your travel but pains."

CHRISTIAN: "Why do you think we shall not be received?"
ATHEIST: "Received! **There is no such place as you dream of in all this world!**"

CHRISTIAN: "That is true — **but there is in the world to come** [afterlife]."
ATHEIST: "When I was at home in my own country, I heard of that place which you speak of. So I went out to find it — and **have been seeking this City for these past twenty years**; but I have not found it in all this time!"

CHRISTIAN: "We have both heard and **believe that there is such a place to be found**!"
ATHEIST: "Had not I, when at home, also believed — I would not have come thus far to seek it. If there had been such a place, I would have surely found it by now — for I have gone much further than you. So not finding it, I am going back home again, and will seek the pleasures which I had then cast away — for the vain hope of a world to come."

Then Christian said to Hopeful, "Do you think that what this man has said is true?"
HOPEFUL: "Take heed — he is one of the flatterers! Remember what it has cost us once already for our hearkening to such a fellow. What! No Celestial City? Did we not see, from the Delectable Mountains, the gate of the City? Also, **we are now to walk by faith**. Let us go on, lest the man with the whip overtake us again.

"You should have taught me that lesson, which I will now remind you of: 'Do not listen to any advice which would lead you to stray from the words of knowledge.' I say, my brother — do not listen to him — but let us believe to the saving of our souls!"

CHRISTIAN: "My brother, I did not ask the question of you, because I doubted the truth myself — but to test you, and to hear your heartfelt response. As for this man, I know that he is blinded by the god of this world. Let us go on, knowing that **we believe the truth**, and that no lie is of the truth."
HOPEFUL: "Now I rejoice in the hope of the glory of god!"

So they turned away from the man — and he, laughing at them, went on his way back home.

(add)

Quotes | On

The following are quotes on Bunyan:

> "Much of Lincoln's unhappiness, the melancholy that 'dripped from him as he walked', was due to his want of religious faith. When the black fit was on him, he suffered as much mental misery as **Bunyan** or Cowper in the deepest anguish of their conflicts with the evil one."
>
> — Ward Lamon (1872), *Life of Lincoln* [2]

References

1. (a) Bunyan, John. (1678). *The Pilgrim's Progress: from this World, to That Which is to Come* (Q) . Publisher.

(b) Schmidt, Leigh E. (2016). *Village Atheists: How America's Unbelievers Made Their Way in a Godly Nation* ("Then the Atheist Fell into a Very Great Laughter", pg. 69). Princeton University Press.
2. (a) Lamon, Ward. (1872). *Life of Lincoln* (pg. 486). Publisher.
(b) Jacoby, Susan. (2004). *Freethinkers: a History of American Secularism* (pg. 115). Henry Holt and Co.

External links

- John Bunyan – Wikipedia.

θΔics

In existographies, **John Burroughs** (1837-1921) (IQ:170|#350) (HD:37) (FA:140) was an American philosopher and essayist, whose views have been characterized as "scientific pantheism" (Kennedy, 1924), noted for []

Overview

In 1885 to 1888, Burroughs penned a set of essays on the "religious experience of mankind", which in 1910 were collected and published as volume ten of his collected works, subtitled *The Light of Days*; the gist message of which he thematically explains as follows: [5]

> "In Central Asia, near the river Oxus, there is said to be a famous rock, called the Lamp Rock, from a strange light that seems to issue from a cavern far up on the side of the mountain. The natives have a superstitious fear of the rock, and ascribe the light to some dragon or demon that lives in the cave. Recently a bold English traveler climbed up and investigated the phenomenon. The light was found, after all, to be only the light of common day. The cave proved to be a tunnel, and the mysterious light came through the rock from the other side, making a strong glow or nimbus at the mouth of the dark cavern.
>
> This incident, so typical of much that has taken place and is still taking place in the world, especially in the religious experience of mankind, has suggested the title to this volume of essays, in which I have **urged the sufficiency and the universality of natural law**, and that most of the mysterious lights with which our fears, our ignorance, or our superstitions have invested the subject of religion, when brought to the test of reason, either vanish entirely or give place to the light of common day."

Among these, his oft-cited "God and Nature" declares the following:

> "When I look up at the starry heavens at night and reflect upon what it is that I really see there, I am constrained to say, "There is no god." The mind staggers in its attempt to grasp the idea of a being that could do that. It is futile to attempt it. It is not the works of some god that I see there. **I am face to face with a power that baffles speech**. I see no lineaments of personality, no human traits, but **an energy upon whose currents solar systems are but bubbles**. In the presence of it man and the race of man are less than motes in the air. I doubt if any mind can expand its conception of god sufficiently to meet the astounding disclosures of modern science. It is easier to say there is no god. The universe is so unhuman, that is, it goes its way with so little thought of man. He is but an incident, not an end. **We must adjust our notions to the discovery that things are not shaped to him, but that he is shaped to them**. The air was not made for his lungs, but he has lungs because there is air; the light was not created for his eye, but he has eyes because there is light. All the forces of nature are going their own way; man avails himself of them, or catches a ride as best he can. If he keeps his seat he prospers; if he misses his hold and falls he is crushed."

In 1915, Burroughs, in his *The Breath of Life*, via citation to thinkers such as: Lawrence Henderson, Johann Goethe, Joseph Butler (Bishop Butler) and John Tyndall on "dead atoms", Henri Bergson, Frederick Soddy, among others, he attempted to explain the difference between the living and non-living or not living and dead, in a way that seemingly teeters close to the defunct theory of life position. [1]

In 1920, Burroughs, in his *Accepting the Universe*, seems to have outlined some fence-sitting views on naturalism in respect to religion; the following are a few example quotes: (Ñº)

> "Science kills credulity and superstition, but to the well-balanced mind it enhances the feeling of wonder, of veneration, and of kinship which we feel in the presence of the miraculous universe."
>
> — John Burroughs (1920), *Accepting the Universe* (pg. 108)

> “The truths of naturalism do not satisfy the moral and religious nature.”
>
> — John Burroughs (1920), *Accepting the Universe* (pg. 301)

> “My elements and my forces go back into the original sources out of which they came, and these sources are perennial in this vast, wonderful, divine cosmos. I do not mind if you call them material forces; the material and the spiritual are inseparable. I do not mind if you call this view the infidelity (or atheism) of science; science, too is divine; all knowledge is knowledge of god.”
>
> — John Burroughs (1920), *Accepting the Universe* [3]

These views of Burroughs have been characterized as "scientific pantheism" (Kennedy, 1924). [4]

Note

Burroughs was friends with: Walt Whitman, Thomas Edison, Henry Ford, Theodore Roosevelt, and Ralph Emerson; his writing style and logic is so similar to Emerson, in fact, that he originally was thought to be an Emerson plagiarizer.

Quotes | By

The following are quotes by Burroughs:

> “Joy in the universe, and keen curiosity about it all—that has been my religion.”
>
> — John Burroughs (1910), *Journal Entry*, Feb 18 [2]

> “We must get rid of the great ‘moral governor’ or head director. He is a fiction of our brains.”
>
> — John Burroughs (c.1920) [2]

References

1. Burroughs, John. (1915). *The Breath of Life*. Houghton Mifflin Company.
2. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§:Burroughts, 168-70). Prometheus.
3. Burroughs, John. (1920). *Accepting the Universe* (quotes, pgs. 251-52 + 312-13) (Ñº). Publisher.
4. (a) Kennedy, William S. (1924). *The Real John Burroughs*. Funk & Wagnalls.
(b) Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§:Burroughts, 168-70). Prometheus.
5. (a) Burroughs, John. (c.1885). “God and Nature”, Essay.
(b) Burroughs, John. (1900). *The Complete Writings of John Burroughs, Volume 10: The Light of Days* (preface, pg. vii; bubbles, pgs. 164). WM. H. Wise & Co, 1924.
(c) Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§:Burroughts, 168-70). Prometheus.

External links

â— John Burroughs – Wikipedia.

θΔics

In chemical thermodynamics, **John Alfred Valentine Butler** (1899-1977), oft-cited “J.A.V. Butler”, and known to his friends and colleagues as “J.A.V” (Q), was an English physical chemist noted for his 1935 textbook *The Fundamentals of Chemical Thermodynamics*, which uniquely focused on thermodynamic applications in electrochemistry, and his later 1940s to 1970 attempts to understand the "life process" via thermodynamics. [1]

Human thermodynamics

In 1947, Butler published a review, entitled “Thermodynamics and Humanism”, of Belgian-born English thermodynamicist Alfred Ubbelohde’s book *Time and Thermodynamics*. [2]

Life | Second law

See main: Animate thermodynamics

In his 1946 article "Life and the Second Law of Thermodynamics" Butler outlined William Thomson's 1852 view of the second law, a view which he summarized by stating that Thomson "expressly excluded the operations of animate agencies" from the second law, which is not exactly correct; but, nevertheless, also discussed the recent views on thermodynamics and life expressed by Gilbert Lewis (1926) and Erwin Schrodinger (1944); the abstract of which is as follows: [4]

> “Whether life processes obey the second law of thermodynamics or if life finds a way of evading the otherwise universal dissipation of energy has been something of a puzzle for a century. Kelvin left the matter open in his formulation of the second law, by expressly excluding the operations of ‘animate agencies’. Since then, opinions on both sides have been expressed, although a majority would probably be found in favour of the view that any local increase of ‘free’ energy is compensated by a greater amount of dissipation elsewhere, or as Schrödinger has recently put it in picturesque if somewhat inaccurate language, the organism feeds on ‘negative entropy’. On the other hand, G. N. Lewis referred to living organisms as “cheats in the game of entropy”, which “alone seem able to breast the great stream of apparently irreversible processes. These processes tear down, living things build up. While the rest of the world seems to move towards a dead level of uniformity, the living organism is evolving new substances and more and more intricate forms.”

Butler seems to have followed up this open-ended puzzle statement with a number of solution attempting works: *Man is a microcosm* (1950), *Science and human life* (1957), *The site of protein synthesis in Bacillus megaterium* (1958), *Inside the living cell; some secrets of life* (1959), *Gene control in the living cell* (1968), and lastly his *The Life Process* (1970), wherein he seems to conclude that "life" is something describable as a "process" or an energy process, as the focus of the book seems to be. [6]

Education

Butler completed undergraduate degree (1926/27) and his DSc (1928/29) at the chemistry department of the University of Edinburgh. [3]

Quotes | On

The following are about quotes:

> “The credit for connecting electrochemical thermodynamics and kinetics must go to English physical chemist John Butler (1899-1977). He, along with German surface chemist Max Volmer (1885-1965), and Hungarian physical chemist Erdey-Gruz Tibor (1902-1976), laid the seeds of the phenomenological basis of electrochemical kinetics.”

— Ashok Shukla (2008), “Pillars of Modern Electrochemistry” (Q)

References

1. Butler, J.A.V. (1935). *The Fundamentals of Chemical Thermodynamics (Part 1: Elementary Theory and Electrochemistry / Part 2: thermodynamical Functions and Their Applications).* Macmillan and Co.
2. Butler, J.A.V. (1947). “Thermodynamics and Humanism (Review: Time and Thermodynamics)”. *Nature* (pg. 72), Vol. 19, July 19.
3. Picture Archive (1927/27 and 28/29) – University of Edinburgh.
4. (a) Butler, John A.V. (1946). "Life and the Second Law of Thermodynamics" (abs), *Nature*, 158: 153-154.
(b) Thomson, William. (1852). "On a Universal Tendency in Nature to the Dissipation of Mechanical Energy" (Google Books) (URL), Proceedings of the Royal Society of Edinburgh for April 19, 1852, also Philosophical Magazine, Oct. 1852, also Mathematical and Physical Papers, vol. i, art. 59, pp. 511.
(c) Schrodinger, Erwin. (1944). *What is Life?* Cambridge University Press.
5. (a) Lewis, Gilbert N. (1925). *The Anatomy of Science*, Silliman Lectures; Yale University Press, 1926.
(b) Coffey, Patrick. (2008). *Cathedrals of Science* (pg. #). Oxford University Press.
6. Butler, John. (1970). *The Life Process* (energy, 20+; thermodynamics, 2+ pgs). Allen & Unwin.

Further reading

● Anon. (1977). “J. A. V. Butler, D.S.C., F.R.I.C., F.R.S.”, *The British Medical Journal*, Vol. 2, Aug. 13, pg. 464.

External links

● John Alfred Valentine Butler – Wikipedia.
● John Alfred Valentine Butler (German → English) – Wikipedia.
● John Alfred Valentine Butler – Famous ‘Electro’ Scientist, Hebrew University.

θΔics

In existographies, **John Robert Christie** (1947-) (CR:7) is an Australian physical chemist and chemical thermodynamicist noted, in economic thermodynamics, for his 1994 human free energy theory application of thermodynamics to economics, in the form of an "island model" economic system.

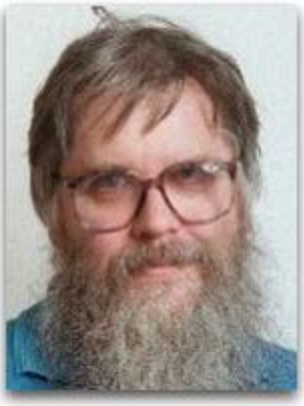

Overview

In 1994, Christie, in his "A Survey of Thermodynamical Ideas", builds on the work of John Neumann (1932) and discusses how microcanonical ensembles can be used to formulate economic analogies, specifically using the "island model" of a small number of inhabitants, in which goods are traded, resulting in a microstate currency distribution; how social equilibrium relates to Gibbs free energy; how coupling and time scales may play a role, etc., in economic processes. [1]

In 2010, Christie gave his opinion as to applying physical science methods to the humanities as follows: [2]

> “I am personally very skeptical about any attempt to develop a physical sciences type model to "explain" or even to accurately describe human interactions, even on the level of statistics across large populations. I think that a lot of the rich, important, and influential detail is inevitably lost—a strong leader, a wildly irrational choice at a crucial point, the power of tribalism that is sometimes all-dominating, or sometimes almost totally suppressed, for no obvious reason.”

Curiously, this 2010 view seems to contradict his earlier 1994 views.

Education

Christie completed his BS in 1967 and PhD in 1970 at the Australian National University; was a research fellow at the University College London from 1970 to 1973; a lecturer at La Trobe University, Melbourne, Australia, from 1973 until his retirement in 2007, after which he became an honorary fellow of La Trobe University. Christie’s areas of interest include: theoretical chemistry, mass spectrometry, reaction kinetics, atmospheric chemistry, philosophy of chemistry, and chemical education. [2] Aside from his book chapter, his only other publications specifically on thermodynamics are a paper with Don Phillips and Anthony Hall on the statistical thermodynamics of sonic degradation of DNA, and a circa 1980s conference paper presented at the second annual Australian Conference on Thermodynamics, on a similar topic.

References

1. Christie, John R. (1994). “A Survey of Thermodynamical Ideas”, in: *Economics and Thermodynamics: New Perspectives on Economic Analysis* (editors: Peter Burley and John Foster). Kluwer Academic Publishers.
2. Christie, John. (2010). "CV email to Libb Thims", Dec 28.

External links

â— John Christie (faculty) – La Trobe University.

θΔics

In existographies, **John Claxton** (c.1950-) is an American humanities scholar and advertising idea maker, noted for []

The Human Element

In c.2006, Andrew Liver, a newly established Dow Chemical CEO, was interested in making a new philosophical mantra for the company—to make Dow the most respected chemical company in the world—and was anxious to make it a reality, and so turned to DraftFP Chicago, whereat Claxton was the creative director. Claxton, after brainstorming on his objective, hand having drawn out some sketches, e.g. of a “human element” missing from the periodic table, and bullet point ideas, and an "Hu" chemical symbol for human (see: human molecular symbols):

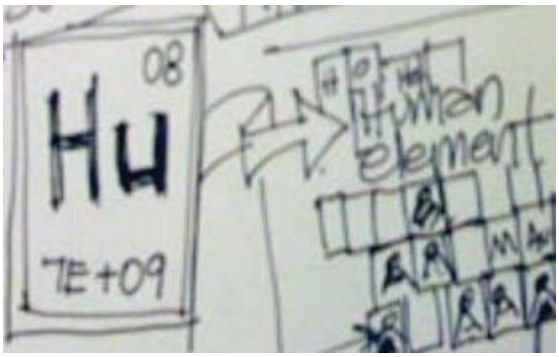

Also a play on the symbol for Bismuth "Bi", atomic number 80, as short for "Business Imperative"

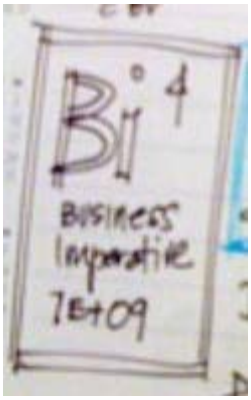

He then came into the meeting as follows:

> “One of the first steps was a creative meeting at our agency during the “pitch process.” I walked into the meeting with a new element for the periodic table. . . not carbon, hydrogen or oxygen, but the Human

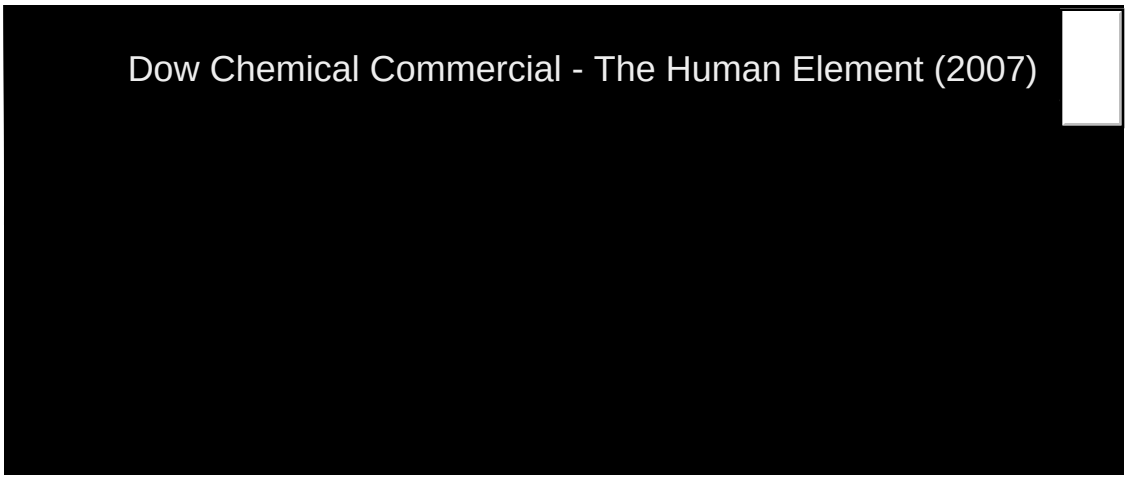

Element. That pretty much put everything in motion. Including the Human Element on the Periodic Table of the Elements changed the way Dow looked at the world and the way the world looked at Dow. Every creative decision we made from that point on was filtered through the lens of the Human Element, and that's what took us down a very non-science approach to science advertising."

One of the "Human Element" advertising campaign videos made from **Claxton**'s Hu as the symbol of the human idea.

The campaign became known as "The Human Element" advertisement campaign.

The "voice" of the campaign, was themed on three things: science essays, the writing of American biologist Edward Wilson, and contemporary American poetry. The campaign was very moving for many: "we were completely surprised by the passionate response from people at all levels of society. From teachers to politicians to parents, people were so moved that they felt compelled to write to the company and express their feelings. The campaign struck a nerve in a way that we had never imagined", says Claxton.

Advertising

Claxton has made a number of award-winning branding campaigns for American Airlines, Diners Club, Dow Chemical and Illinois Tourism.

Education

In c.1975, Claxton completed a degree at Butler University, after which he taught humanities at Ladywood-St. Agnes High School in Indianapolis. [2]

Claxton also likes to auto-educate, his hobbies including: reading science essays, studying human behavior, and being an outerspace junky of some sort.

Quotes | By

The following are quotes by Claxton:

> "One of the first steps was a creative meeting at our agency during the "pitch process." I walked into the meeting with a new element for the periodic table. . . not carbon, hydrogen or oxygen, but the Human Element. That pretty much put everything in motion. Including the Human Element on the Periodic Table of the Elements changed the way Dow looked at the world and the way the world looked at Dow. Every creative decision we made from that point on was filtered through the lens of the Human Element, and that's what took us down a very non-science approach to science advertising."
>
> — John Claxton (2009), on DraftFCB's new marketing campaign for Dow [1]

References

1. Grbic, Jovana J. (2009). "Selling Science Smartly: Dow Human Element Campaign (Interview with advertising mastermind John Claxton)", Feb 18. ScriptPhD.com.
2. About – ClarkStreetBridge.com.

θΔics

In chnops-thermodynamics, **John Donald Collier** (1950-) is a Canadian philosopher and so-called "physical information theorist" noted for his defense of what he calls the “Brooks-Wiley theory” or physical information theory, namely the information theory, semi-thermodynamics, and evolution theory presented Canadian zoologist Daniel Brooks and American zoologist Edward Wiley’s 1986 *Evolution as Entropy: Towards a Unified Theory of Biology*, in which, as critics argued, the “they abused terminology from information theory and thermodynamics.” [1] Brooks and Wiley, in their defensive rebuttal second edition (1986), open their preface by stating that Collier has made important advances, in the previous two years, in clarifying the relationship between information theory, physical information systems, and entropy. [2]

Education

Collier completed his BS in earth and planetary science, focusing on planetary interiors, in 1971 at MIT. He then completed a MA in analytic philosophy, focusing on the relation between the subjective and objective aspects of science, at the University of California, Los Angeles. In 1984, he completed a PhD, dissertation “Progress in Scientific Revolutions: the Problem of Semantic Incommensurability” (see: scientific revolutions), at the University of Western Ontario.

In 1991, he began teaching full time at the University of British Columbia, where he met a group of biologists centered around Daniel Brooks and Edward Wiley and their recently developing so-called “unified theory of biology” based on a mixture of information theory, non-equilibrium dynamics, and thermodynamics, after which Collier began giving Brooks and Wiley tutorials on information theory, which soon became the major focus of his research. Collier has since transitioned through several universities and research groups: University of Calgary, Rice University, Indiana University, University of Melbourne (1991), University of Newcastle (1995-2001), Konrad Lorenz Institute for Evolution and Cognition Research (2002), and the philosophy department of the University of Natal, Durban, South Africa (2003-present).

References

1. Collier, John D. (1986). “Entropy and Evolution” (abs), *Biology and Philosophy*, 1:5-24.
2. (a) Brooks, Daniel R. and Wiley Edward O. (1988). *Evolution and Entropy* (pg. ix). University of Chicago Press.
(b) Collier, John D. (1988). “The Dynamics of Biological Order”, in: *Entropy, Information and Evolution* (§10, pgs. 229-42), editors: Bruce Weber, David Depew, and James Smith. MIT Press, 1988.
3. John Collier (about) – Foundations of Information Science.

Further reading

â— Collier, John D. (1990). “Two Faces of Maxwell’s Demon Reveal the Nature of Irreversibility”, *Studies in the History of Philosophy of Science*, 21:257-68.

External links

â— John Collier – Academia.edu.
â— John Collier (faculty) – Philosophy, Howard College, University of Kwazulu-Natal.

θΔics

In existographies, **John Dalton** (1766-1844) (IQ:180|#145) [RGM:435|1,500+] (Murray 4000:7|C) (Gottlieb 1000:248) (Simmons 100:74) (Hart 100:26) (Partington 50:14) (GCE:19) (CR:29) was an English chemist, a chemical revolution player, notable for his work on atomic theory, specifically for giving the basic definition of atomic weights; for verification that all gases have the same coefficient of expansion.

Ewart

In 1810, Dalton, had his friend friend of Peter Ewart, build a simple wooden model, shown below, of Dalton's atomic theory, which Dalton used to demonstrate his atomic theory. The model is made up of five wooden balls, three with a diameter of 29mm, and two with a diameter of 19mm. Three are joined together, and two are loose: [5]

Dalton's wooden ball atomic model
with attachment atomic bonding pins
(built by **Peter Ewart**, 1810)

They are said to probably have been part of a larger group of wooden balls, and could be fitted together in different shapes to represent different chemical compounds. He was the first person to use ball-and-stick models to represent the structure of molecules. [5]

> "My friend Ewart, at my suggestion, suggestion, made me a **number of equal balls** about an inch in diameter about thirty years ago; they have been in use ever since, I occasionally showing them to my pupils. One ball had 12 holes in it equidistant, and twelve pins were stuck in the other balls so as to arrange the 12 around the one and be in contact with it; they (the 12) were about 1/10th of an inch asunder. Another ball, with 8 equidistant holes in it; and they (the 8) were about 3/10th of an inch asunder, a regular series of equidistant atoms. I had no idea at the time that the atoms were all of a bulk, but for the sake of illustration I had them made alike."
>
> — John Dalton (1842), "On the Analysis of Sugar" [6]

In 1813, Ewart, in his "On the Measure of Moving Force", defended the nascent ideas of the conservation of energy championed by John Smeaton. [3] Donald Cardwell conjecture's that their friendship influenced the development of thermodynamics in some way:

> “It is safe to say, that the long friendship between Ewart and **Dalton** had some significance for the development of thermodynamics.”
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 80)

Ewart’s paper, supposedly, was strongly to influence Dalton's pupil James Joule. [4]

Atoms | Molecules

In 1808, Dalton, in his *New System of Chemical Philosophy*, stating that volumes of gas consist of “a number of ultimate particles or molecules”, and used the terms atom and molecule differently; the following are his 20 main elements and symbols: [2]

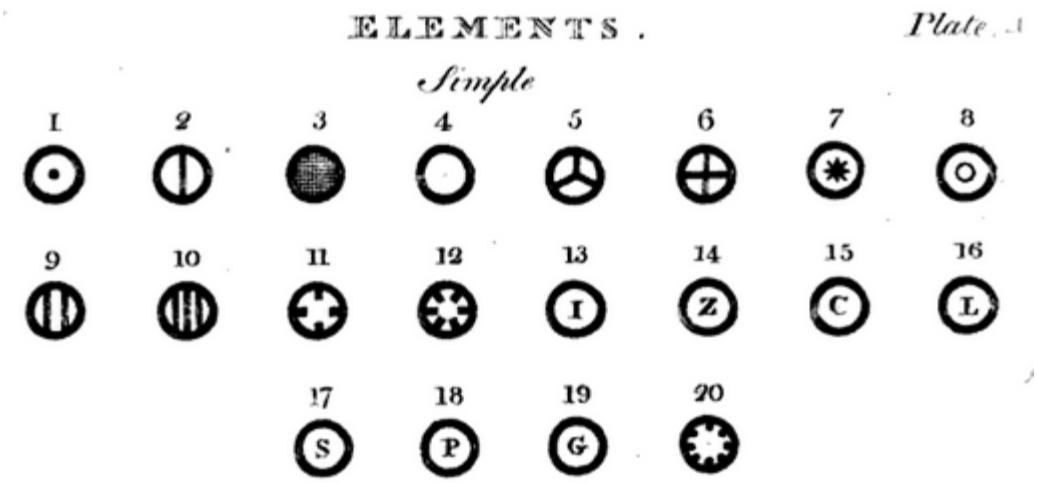

These he explains as follows, where the right column number is the elements "relative atomic mass", relative to hydrogen:

PLATE IV. This plate contains the arbitrary marks or signs chosen to represent the several chemical elements or ultimate particles.

Fig.			Fig.		
1	Hydrog. its rel. weight	1	11	Strontites	46
2	Azote	5	12	Barytes	68
3	Carbone or charcoal	5	13	Iron	38
4	Oxygen	7	14	Zinc	56
5	Phosphorus	9	15	Copper	56
6	Sulphur	13	16	Lead	95
7	Magnesia	20	17	Silver	100
8	Lime	23	18	Platina	100
9	Soda	28	19	Gold	140
10	Potash	42	20	Mercury	167

The following are Dalton's molecules:

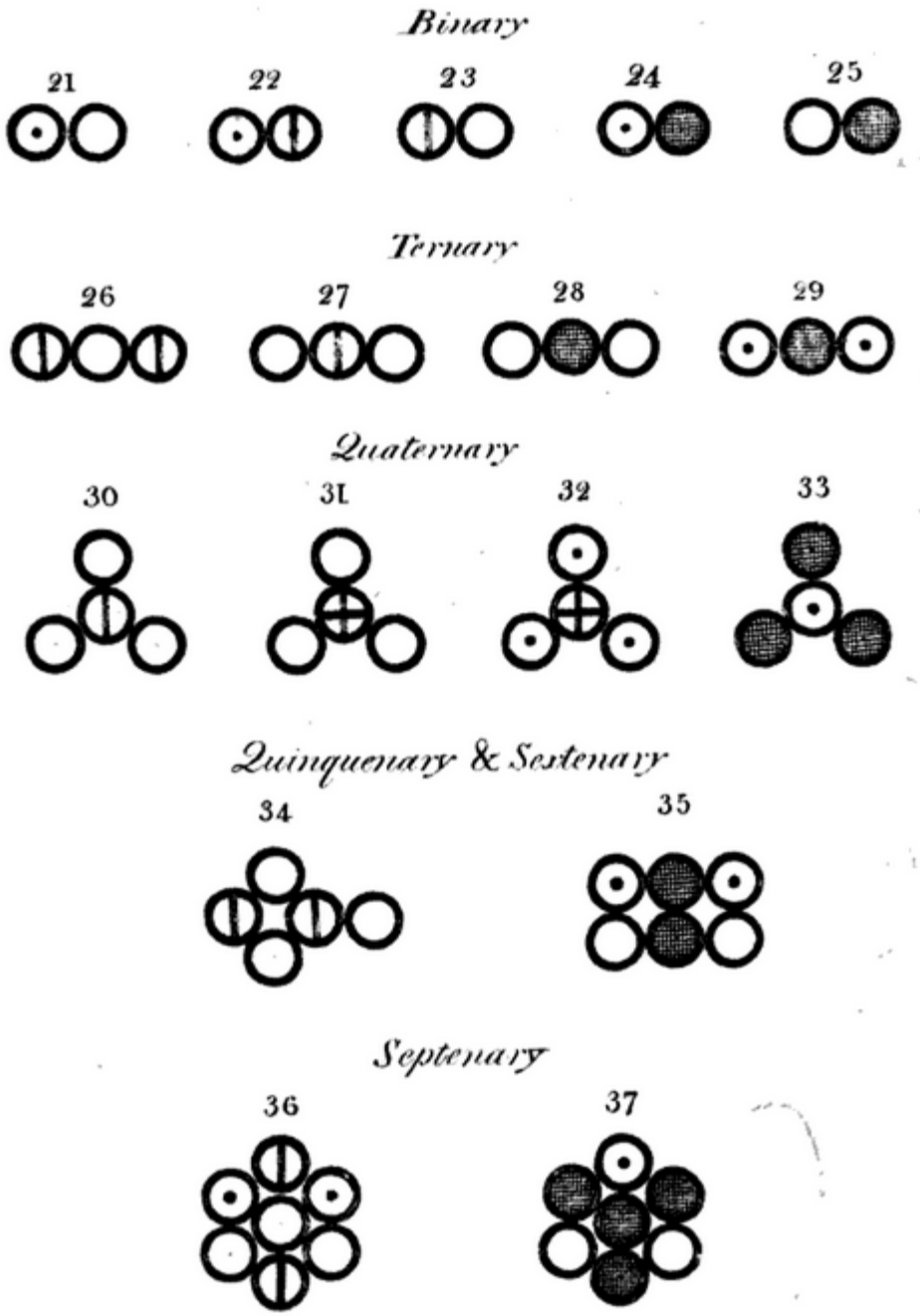

These he explains as follows:

21	An atom of water or steam, composed of 1 of oxygen and 1 of hydrogen, retained in physical contact by a strong affinity, and supposed to be surrounded by a common atmosphere of heat; its relative weight = ...	8
22	An atom of ammonia, composed, of 1 of azote and 1 of hydrogen.....	6
23	An atom of nitrous gas, composed of 1 of azote and 1 of oxygen.....	12
24	An atom of olefiant gas, composed of 1 of carbone and 1 of hydrogen	6
25	An atom of carbonic oxide composed of 1 of carbone and 1 oxygen.....	12
26	An atom of nitrous oxide, 2 azote + 1 oxygen... ..	17
27	An atom of nitric acid, 1 azote + 2 oxygen.....	19
28	An atom of carbonic acid, 1 carbone + 2 oxygen	19
29	An atom of carburretted hydrogen, 1 carbone + 2 hydrogen	7
30	An atom of oxynitric acid, 1 azote + 3 oxygen ...	26
31	An atom of sulphuric acid, 1 sulphur + 3 oxygen	34
32	An atom of sulphuretted hydrogen, 1 sulphur + 3 hydrogen.....	16
33	An atom of alcohol, 3 carbone, + 1 hydrogen	16
34	An atom of nitrous acid, 1 nitric acid + 1 nitrous gas	31
35	An atom of acetous acid, 2 carbone + 2 water.....	26
36	An atom of nitrate of ammonia, 1 nitric acid + 1 ammonia + 1 water	33
37	An atom of sugar, 1 alcohol + 1 carbonic acid ...	35

Dalton's main contribution was that he founded modern 'atomic theory' by initiating the basics of stoichiometry, assigning the hydrogen atom, the lightest element, as unity, and determined the atomic ratios in various molecules, such as nitrous anhydride N_2O_3. Dalton is often considered the 'father of modern atomic theory.'

Bonding

Dalton, aside from the discussion of strong chemical affinities, employed and popularized the hooked atom theory as a model for bonding; as well as some type of billiard ball model of atomic movement and collision.

Pauling

In 1917, of note, the Dalton-version of the "hook-and-eye bonding method" was still being taught at Oregon Agricultural College, to a young chemical engineering student Linus Pauling; the teaching of this archaic method is what supposedly drove Pauling to write the now famous 1939 textbook *On The Nature of the Chemical Bond*.

Quotes | On

The following are quotes on Dalton:

> “It was from **Dalton**’s instruction, that I first formed a desire to increase my knowledge of original research.”
>
> — James Joule (c.1850) [1]

References

1. Shachtman, Tom. (1999). *Absolute Zero and the Quest for Absolute Cold* (pg. 90). Mariner Books.
2. Dalton, John. (1808). *New System of Chemical Philosophy*. (extracts, pgs. 70-72; elements and molecules, pgs. 219-20, 227). Weale.
3. (a) Ewart, Peter. (1813). “On the Measure of Moving Force” (abs) (abs) (pg. 105), *Memoirs of Manchester Literary and Philosophical Society*. Bickerstaff.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 83). Cornell University Press.
4. Peter Ewart – Wikipedia.
5. Imagining Atoms – Science and Industry Museum.
6. (a) Dalton, John. (1848). “On the Analysis of Sugar”. Publisher.
(b) Henry, William. (1854) Memoirs of the Life and Scientific Researches of John Dalton (equal balls, pg. 124). London: The Cavendish Society.
(c) Imagining Atoms – Science and Industry Museum.

External links

â— John Dalton – Wikipedia.

θΔics

In existographies, **John Desaguliers** (1683-1744) (SN:56) (EP:27) (CR:14) was an English natural philosopher, engineer, and experimental assistant of Newton, noted for his 1728 Newtonian government model and 1734 "Course in Experimental Philosophy and Astronomy" wherein he summarized early steam engine theory.

Overview

In 1718, Desaguliers built the following modified Savery engine, with a safety valve P invented by Denis Papin and a two-way valve K that could let either cold water or hot steam into the receiver A: [6]

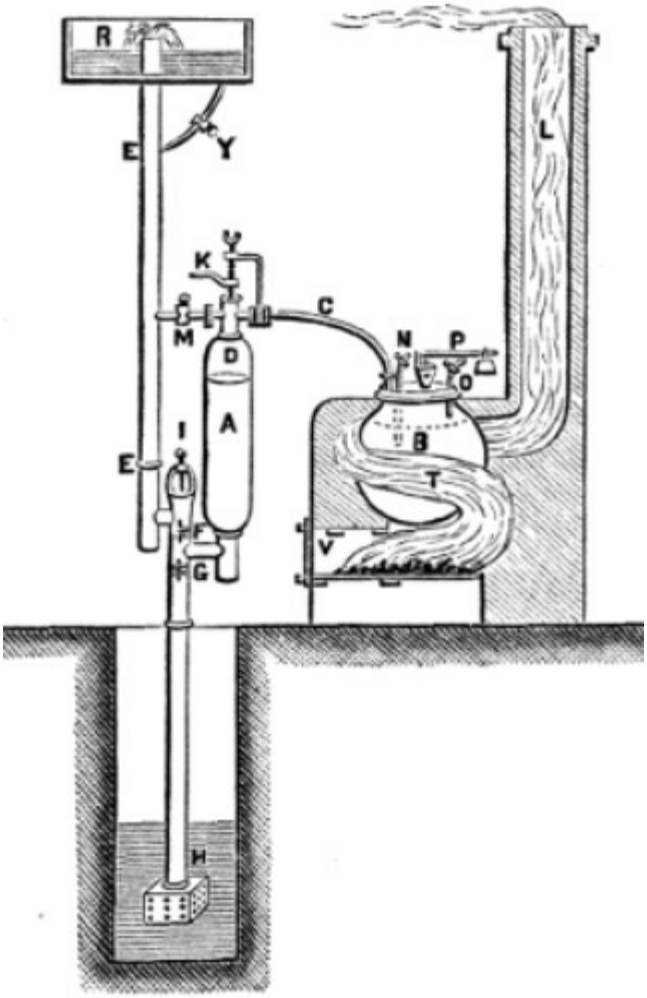

In 1728, Desaguliers, in his *The Newtonian System of the World: the Best Model of Government*, outlined what seems to have been the first draft of a "Newtonian government", arguing how the ideal government should be run according to celestial mechanics. [1]

In 1734, Desaguliers had given 121 lectures in his "Course in Experimental Philosophy and Astronomy", on mechanics, hydrostatics, pneumatics, and optics, explained via about 300 experiments. [3]

In c.1735, Desaguliers calculated that one horsepower equals 27,500 foot-pounds. [2]

In 1744, Desaguliers, in his posthumously published *A Course in Experimental Philosophy, Volume Two*, gave a chapter on the origins of the steam engine, or what he called "fire engine" defined as an "engine to raise water by fire", along

with a diagram of the Newcomen engine of Thomas Newcomen, and a anecdotal account of how Thomas Savery, supposedly, burned a bunch of Edward Somerset's 1655 *Century of Inventions* books (which was printed in London in 1663), when he had heard people claiming that he got the idea of the steam engine from him. [4]

Quotes | By

The following are quotes by Desaguliers:

> "Captain Savery, having read the Marquis of Worcester's book [*Century of Inventions*, 1655], was the first who put in practice the raising 'water by fire', which he proposed for the draining of mines. His engine is described in Harris's Lexicon (see the word 'engine') which being compared with the Marquis of Worcester's description, will easily appear to have been taken from him; **though Savery denied it**, and the better to conceal the matter, bought up all the Marquis of Worcester's books that he could purchase in Paternoster Row, and elsewhere, **and burned them in the presence of the gentleman his friend, who told me this**. He said that he found out the 'power of steam' by chance, and invented the following story to persuade people to believe it, *viz.* that having drank a flask of Florence at a tavern, and thrown the empty flask upon the fire, he called for a basin of water to wash his hands, and perceiving that the little wine left in the flask had filled up the flask with steam, he took the flask by the neck and plunged the mouth of it under the surface of the water in the basin, and the water of the basin was immediately driven up into the flask by the pressure of the air. Now he never made such an experiment then, nor designedly afterwards, which I thus prove: I made the experiment purposely with about half a glass of wine left in a flask, which I laid upon the fire till it boiled into steam: then putting on a thick glove to prevent the neck of the flask from burning me, I plunged the mouth of the flask under the water that filled a basin; but the pressure of the atmosphere was so strong, that it beat the flask out of my hand with violence, and threw it up to the ceiling. As this must also have happened to Captain Savery, if ever he had made the experiment, he would not have failed to have told such a remarkable incident, which would have embellished his story."
>
> — John Desaguliers (c.1740), *A Course in Experimental Philosophy, Volume Two* (pgs. 465-66)

> "A gravity-like force of attraction is now as universal in the political as in the philosophical world."
>
> — John Desaguliers (1728), *The Newtonian System of the World* [5]

References

1. Desaguliers, John T. (1728). *The Newtonian System of the World: the Best Model of Government - an Allegorical Poem.* A. Campbell.
2. Hills, Richard L. (1989). *Power from Steam* (pg. 89). Cambridge University Press.
3. Carpenter, Audrey T. (2011). *John Theophilus Desaguliers: A Natural Philosopher, Engineer and Freemason in Newtonian England*. Bloomsbury.
4. (a) Desaguliers, John. (1734). *A Course in Experimental Philosophy, Volume One*. Publisher.
(b) Desaguliers, John. (1744). *A Course in Experimental Philosophy, Volume Two* (§13: Fire-Engine, pgs. 464-; Newcomen, 3+ pgs). W. Innys, 1744.
(c) Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 163). Courier, 1990.
5. (a) Desaguliers, John T. (1728). *The Newtonian System of the World: the Best Model of Government - an Allegorical Poem* (§:dedication). A. Campbell.
(b) Ball, Philip. (2016). "Describing People as Particles Isn't Always a Bad Idea: Using Physics to Describe Social Phenomena Can Work – If It's the Right Physics" (Ñº), *Nautilus*, Feb 11.
6. Thurston, Robert. (1878). *A History of the Growth of the Steam-Engine* (txt) (pg. 43). Appleton and Company.

External links

â— John Theophilus Desaguliers – Wikipedia.

θΔics

In hmolscience, **John Dewey** (1859-1952) (IQ:170|#320) [RGM:304|1,260+] (DN:6±) (library: 1,687 books) was an American psychologist philosopher, a ranked humanities citation scholar, noted for his 1931 discussions on causality, for his 1938 "cultural cleavage" version of the two cultures discussion, and for his latter "atheism" labeling discussions.

Overview

In 1931, Dewey, in his *Philosophy of Civilization*, gave the following sharp statement: [1]

> "There is no superstition more benumbing, I think, than that the current notion of things are not what they are, and do not do what they seem to do, because these things have themselves come into being in a causal way. Water is what it does rather than what it is caused by. The same is true of the fact of intelligent choice. A philosophy which looks for freedom in antecedents and one which looks for its consequences in a developing course of action, in becoming rather than in state of being, will have far different notions about it. Yet we cannot separate power to become from considerations of what already antecedently is."

(add discussion)

Zucker

American physical historian Morris Zucker devotes a certain amount of effort, in his 1945 *A Field Theory of History*, to refute Dewey's supposed contention that a science of history is impossible, arguing the following in response: [3]

> "Physical phenomena in the gross is not concerted with the internal structure of each atom in each successive moment, nor is history with the relation of each individual being every moment of time. History is vitally interested in the laws of continuity in finite space and definite time. Were it not for the existence of these laws developed from definite relations subsisting among the mass, all science would be impossible. These propositions are fundamental in physics, and they apply with equal footing in history. Society is a definite reality. All we have to do is to look about us to be conscious of its ubiquitous presence though no one yet has examined it under the microscope or tested it in a chemists' retort. The retort will be that we are comparing inert matter, iron, with a living reality, society. Matter [after all] is not so terribly inert."

(add discussion)

Religion

In 1935, Dewey, in commentary on the label atheism, wrote the following to his atheist friend Max Otto (1876-1968), author of *Is There a God?* (1932), among other works: [2]

> "I feel the gods are pretty dead, though I suppose I ought to know that || however, to be somewhat more philosophical in the matter, if atheism means simply not being a theist, then of course I'm an atheist. But the popular if not the etymological significance of the word is much wider. It has come to signify it seems to me a denial of all ideal values as having the right to control material ones. An in that sense I'm not an atheist and don't want to be labelled as one."

(add discussion)

References

1. (a) Dewey, John. (1931). *Philosophy of Civilization* (pg. 292-93). Publisher.

(b) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (Retort, pg. 170; intelligent choice, pg. 621-22). Arnold-Howard Publishing Co.
2. (a) Dewey, John. (1935). “Letter to Max Otto”, Jan 14; in: *The Correspondence of John Dewey, 1871-1952* (abs), electronic edition.
(b) Hickman, Larry A. (2009). “Secularism, Secularization, and John Dewey” (pdf), in: *John Dewey at 150: Reflections for a New Century* (editors: A.G. Rud, Jim Garrison, and Lynda Stone) (pg. 22). Purdue University Press.
(c) Max Carl Otto (1876-1968) – Wikisource.org.
3. Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (retort, pg. 170). Arnold-Howard Publishing Co.

θΔics

In hmolscience, **John Diggins** (1935-2009) was an American historian noted for []

Overview

In 1995, Diggins, in his chapter "Who Bore the Failure of the Light: Henry Adams", attempts to critique American physical historian Henry Adams' physical chemical thermodynamic theory of history, albeit in the end labeling Adams incorrectly as a more of a crank than a prophet:

> "On the matter of science, the consensus of conventional wisdom in Adams scholarship regards him as more of a crank than a prophet."

which is but the result of Diggins own ignorance. Diggins' incorrect labeling of Adams is further corroborated by American physical science historian Morris Zucker, whose two-volume *Historical Field Theory* treatise is an expansion of Adams work, inclusive of relativity, quantum mechanics, and the Heisenberg uncertainty relation, and James Maxwell's electromagnetic field theory work, who classifies Adams as follows: [2]

> "Adams [is the] greatest stylist American historical writing has produced".

Diggins' classification of Adams as a "crank", in short, is but the result of ignorance: thinkers, such as Goethe, Adams, and Zucker, while each may be off or two on a few points, Adams in his case about the second law applied to history (it applies to history, just not the way he envisaged it), go deeper into the problem are are better able to see the forest amid the trees (see: ships not seen) as compared to less self-educated in the physical sciences thinkers such as Diggins.

References

1. Diggins, John P. (1995). *The Promise of Pragmatism: Modernism and the Crisis of Knowledge and Authority* (§2: Who Bore the Failure of the Light: Henry Adams, pgs. 55-107; §§: Science and the Fate of the Universe, pgs. 67-80; quote, pg. 84; thermodynamics, 9+ pgs). University of Chicago Press.
2. Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (Adams, pg. 5). Arnold-Howard Publishing Co.

External links

â— John Patrick Diggens – Wikipedia.

θΔics

In existographies, **John Eccles** (1903-1997) was an Australian neurophysiologist and dualist (Musolino, 2015), noted for his anti-reductionist views, namely he believed that consciousness is not reducible to physics. [1] The following is a related creationism-tinged statement by Eccles and Karl Popper: [2]

> "The story of evolution suggests that the universe has never ceased to be creative or 'intensive'."

Eccles, as cited by Francis Crick (1995) as one of the rare individuals among scientists, believed that the idea of a soul is not a myth. [3]

Education

Eccles who studied under extreme reductionist Charles Sherrington at Oxford (1926-1929), via Rhodes Scholarship, where he completing his PhD.

References

1. Chalmers, David. (1992). "Realms of Cognitive Science", Consc.net, Jan 30.
2. Popper, Karl Eccles, John. (1997). *The Self and the Brain* (pg. 61). Springer International.
3. (a) Popper, Karl Eccles, John. (1997). *The Self and the Brain*. Springer International.
(b) Eccles, John D. (1986). "Do Mental Events Cause Neural Events Analogously to the Probability Fields of Quantum Mechanics" (Ñº), *Proceedings of the Royal Academy of London*, B 227:411-28.
(c) Crick, Francis. (1995). *The Astonishing Hypothesis: the Scientific Search for the Soul* (pg. 6). Simon and Schuster.

Further reading

â— Cousins, Norman. (1985). *Nobel Prize Conversations: With Sir John Eccles, Roger Sperry, Ilya Prigogine, Brian Josephson* (thermodynamics, 10+ pgs). Saybrook Pub.

External links

â— John Eccles (neurophysiologist) – Wikipedia.

θΔics

In science, **John Edsall** (1902-2002) (CR:6) was an American chemist, specializing in: physical chemistry, biochemistry, protein chemistry, and bioenergetics, noted for his 1970s and 1980s publications on bioenergetics and biothermodynamics.

Overview

In 1974, Edsall, in his "Some Notes and Queries on the Development of Bioenergetics", attempted a short history on the founding fathers of physical chemistry, with focus on bioenergetics, wherein he points out, among other things, how American physical chemist Gilbert Lewis worked as an instructor at Harvard for a year before taking a traveling fellowship, studying under the physical chemists Wilhelm Ostwald at Leipzig and Walther Nernst at Göttingen. [1]

Edsall, here, also touches on Ostwald's energetic imperative.

In 1983, Edsall, together with Hanoch Gutfreund, published *Biothermodynamics: the Study of Biochemical Processes at Equilibrium*, wherein they discusses the history and biological processes of thermodynamics; theoretical aspects of thermodynamic principles which aid in understanding biochemical processes; and the interpretation of data obtained from biochemical reactions, ligand binding, and calorimetric measurements on biological systems. [2]

Quotes

The following are representative quotes:

> "There is an obvious relation between [message transmission] and what happens, for instance, when a solid melts and the orderly crystal structure is replaced by the more random motion of the molecules in the liquid. This has led [Shannon and Weaver (1949) and Szilard (1925)] to propose that the production of information is in effect the production of negative entropy (increase in order). In spite of the obvious analogy between the two kinds of processes, the attempt to embody this general idea in quantitative terms runs into serious difficulties and Popper (1976) and others hold it to be invalid [see: information entropy (quotes)]."
>
> — John Edsall and Hanoch Gutfreund (1983), *Biothermodynamics: the Study of Biochemical Processes* [3]

> "How much of the work of Gibbs is still untapped—relations that may be of chemical and biochemical importance—we cannot tell. It is interesting to remember that Gibbs had formulated the principle of Donnan equilibrium in 1876 thirty five years before Donnan. Nobody recognized this until G.S. Adair one of the few biochemists who had actually read Gibbs, pointed it out in 1923. One wonders what other precious nuggets may still be hidden in this work."
>
> — John Edsall (1974), "Some Notes and Queries on the Development of Bioenergetics" (pg. 104)

References

1. Edsall, John T. (1974). "Some Notes and Queries on the Development of Bioenergetics. Notes on some 'Founding Fathers' of Physical Chemistry: J. Willard Gibbs, Wilhelm Ostwald, Walther Nernst, Gilbert Newton Lewis" (abs), *Molecular and Cellular Biochemistry*, 5(1-2): 103–12, Nov 15.
2. Edsall, John T. and Gutfreund, Hanoch (1983). *Biothermodynamics: the Study of Biochemical Processes at Equilibrium*. John Wiley & Sons, Inc.
3. (a) Popper, Karl. (1976). *Unended Quest: an Intellectual Autobiography*. Routledge, 2005.
(b) Edsall, John T. and Gutfreund, Hanoch (1983). *Biothermodynamics: the Study of Biochemical Processes at Equilibrium* (pg. 27). John Wiley & Sons, Inc.

External links

â— John Tileston Edsall – Wikipedia.

θΔics

In chemistry, **John Emsley** (1938-) is an English chemist noted for his 2001 book *Nature's Building Blocks*, in which he gives a short chapter to each of the first 100 elements, listed in alphabetical order, inclusive of a short history of the discovery of each element, and most-importantly a subsection entitled "human element" (see also: human element), wherein he describes the amount of the element in the average person and what it does. [1] Emsley's *Nature's Building Blocks*, to note, was an expanded spin-off of his previous 1989 book *The Elements*, written for scientist, especially chemists, mostly consisting of tables and numerical data.

Human molecular formula

Emsley's *Nature's Building Blocks* and its "human element" section functioned as the main backbone citation, 2005-forward, to the mass-percent based calculation of the human molecular formula by American electrochemical engineer Libb Thims. [2]

Education

Emsley completed his BS in chemistry at Manchester University and PhD in inorganic chemistry, with a dissertation on phosphazenes (phosphorus-nitrogen ring molecules). He went on to teach at King's College London for 25-years, specializing in non-metallic inorganic chemistry and very strong hydrogen bonding. In 2001, he was associated with the department of chemistry at the University of Cambridge.

References

1. Emsley, John. (2001). *Nature's Building Blocks.* Oxford University Press.
2. (a) Molecular Evolution Table - Institute of Human Thermodynamics.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(c) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
(d) Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc). LuLu.
3. John Emsley (about) – JohnEmsley.com.

External links

â— John Emsely – Wikipedia.
â— Emsley, John – WorldCat Identities.

θΔics

In existographies, **John Farey** (1791-1851) (CR:3) was an English mechanical engineer, noted for his 1827 *A History of the Steam Engine*, one the main early publications in the history of the steam engine.

Overview

In 1826, Farey learned of the "indicator" when he saw one being used on an engine in Russia. [2]

In 1827, Farey, in his *A History of the Steam Engine*, gave a detailed summary of the barometer used by James Watt in his steam engine.

References

1. Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 80). Cornell University Press.
2. Farey, John. (1827). *A Treatise on the Steam Engine: Historical, Practical, and Descriptive* (§: Barometer gauge, pgs. 377-79). Longman.

External links

â— John Farey Jr. – Wikipedia.

θΔics

In thermodynamics, **John Fenn** (1917-2010) is an American chemist noted for his 1982 book *Engines, Energy, and Entropy: a Thermodynamics Primer*, in which he quotes Willard Gibbs as being the 'greatest thermodynamicist of them all'. [1] Fenn is also a Nobel Prize winner in thermodynamics, for his 2002 win in chemistry, for his work in the field of mass spectrometry, specifically for the electrospray ionization technique often used to identify and analyze biological macromolecules.

Education

Fenn completed his PhD in thermodynamics on "The Thermodynamics of Hydrochloric Acid in Methanol-Water Mixtures" at Yale University in 1940.

References

1. Fenn, John B. (1982). *Engines, Energy, and Entropy: a Thermodynamics Primer*. W.H. Freeman and Co.

External links

â— John Fenn (chemistry) – Wikipedia.

θΔics

In existographies, **John Fiske** (1842-1901) was an American philosopher historian noted, in hmolscience, for his multivolume 1874 *Outlines of Cosmic Philosophy*, which is filled with a number interesting digressions on what seems to be a type of evolution materialism based philosophy.

Overview

In 1874, Fiske, in his *Outlines of Cosmic Philosophy: Based on the Doctrine of Evolution, with Criticisms on the Positive Philosophy*, gives commentary on a number of thinkers, such as Jacob Moleschott, Hermann Helmholtz, among others. On prediction, as quoted by Morris Zucker, Fiske states: [1]

> "As surely as the astronomer can predict the future state of the heavens, the sociologist can foresee that process of adaption must go on until in a remote future it comes to an end in proximate equilibrium."

Zucker, latter, classifies or groups Fiske as follows, namely as what seems to be a social mechanism theorist:

> "Comte, Spencer, **Fiske** and Ward sought the laws of social organization ton some vast universal pattern."

At one point, Fiske says the following: (Ñº)

> "The ideal goal of physical inquiry would be to furnish algebraic equations for every curve described by every particle of matter during the entire series of transformations, from the arrested molar motions of the gravitating particles of the sun, down to the endlessly complex molecular motions which take place within the cerebral tissue of a mathematician engaged in solving partial differential equations."

(add)

Quotes | By

The following are quotes by Fiske:

> "Is it honest for me to go and sit there on communion day and drink the wine and eat the bread while feeling it all to be mummery?"
>
> — John Fiske (1860), "Letter to his Mother", Mar 20 [2]

> "The Hindu sacred writings contain all the myths and fables found in the Cristian Bible."
>
> — John Fiske (c.1865) [2]

References

1. (a) Fiske, John (1902). *Outlines of Cosmic Philosophy: Based on the Doctrine of Evolution, with Criticisms on the Positive Philosophy, Volume 2* (pg. 234). Cambridge.
(b) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pgs. 63; 614). Arnold-Howard Publishing Co.
2. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pgs. 191-92).

Prometheus.

External links

â— John Fiske (philosopher) – Wikipedia.

θΔics

In existographies, **John Foster** (1953-) (CR:4) is an American sociologist, focused on political economy of capitalism, ecological economics, and Marxism, noted for []

Overview

In 1994, Foster, along with Peter Burley, edited *Economics and Thermodynamics: New Perspectives on Economic Analysis*, wherein John Christie's "A Survey of Thermodynamical Ideas" was published along with is "island model". [1]

In 1999, Foster, in his *Marx's Ecology: Materialism and Nature*, digressed on the ideas of Karl Marx in respect to Epicurus and materialism. [4]

In 2006, Foster, and Peter Burley, in their "Metabolism, Energy, and Entropy in Marx's Critique of Political Economy: Beyond the Podolinsky Myth", digressed on Marxism in the context of ecological economics, in respect to the energetics and thermodynamical ideas of Sergei Podolinsky. [2]

In 2008, Foster and Burley, in their "Classical Marxism and the Second Law of Thermodynamics: Marx/Engels, the Heat Death of the Universe Hypothesis, and the Origins of Ecological Economics", digressed on the oft-stated fact that Friedrich Engels and Karl Marx rejected the second law of thermodynamics, particularly in respect to the heat death implications to ecological economics. [3]

Quotes | On

The following are quotes on Foster:

> "Paul Burkett and **John Foster** (2006) made a great contribution in producing a well-researched vindication of a thermodynamic interpretation of Marx, and if we read Marx thermodynamically, this opens up fascinating new doors to a different conceptual world. The capitalists are trying to expand the quantity of work, and work is a thermodynamic process which capitalism is harnessing. So far so good. The problem, however, is that the Burkett and Foster analysis produces a somewhat mechanistic version of this process. The key weakness is a failure to realise that thermodynamics is not the whole of systems theory: we also have to understand the principle of emergence and the crucial role of information. Capitalism controls information, and its disempowerment of the workforce at the level of knowledge is an absolutely fundamental condition for controlling 'work'. In fact, in the pre-capitalist situation 'work' was inseparable not only from individual knowledge (properties of plants, craft-skills) but from a social and institutional dimension (gender roles, regimes for the collective management not just of physical resources but skills). The destruction of this autonomous sphere was from the beginning fundamental to the rise of capitalism, a reality of which a narrow, purely thermodynamic reading would remain ignorant."
>
> — Robert Biel (2011), *Entropy of Capitalism* [5]

References

1. Christie, John R. (1994). "A Survey of Thermodynamical Ideas", in: *Economics and Thermodynamics: New Perspectives on Economic Analysis* (editors: Peter Burley and John Foster). Kluwer Academic Publishers.
2. Burkett, Paul and Foster, John B. (2006). "Metabolism, Energy, and Entropy in Marx's Critique of Political Economy: Beyond the Podolinsky Myth" (abs), *Theory and Society*, 35:105-56.
3. Foster, John B. and Burkett, Paul. (2008). "Classical Marxism and the Second Law of Thermodynamics: Marx/Engels, the Heat Death of the Universe Hypothesis, and the Origins of Ecological Economics" (abs), *Organization and Environment*, Jan 17.
4. Foster, John B. (1999). *Marx's Ecology: Materialism and Nature* (pg. #). San Val.
5. (a) Burkett, Paul and Foster, John B. (2006). "Metabolism, Energy, and Entropy in Marx's Critique of Political Economy: Beyond the Podolinsky Myth" (abs), *Theory and Society*, 35:105-56.
(b) Biel, Robert. (2011). *Entropy of Capitalism* (pg. 48). BRILL.

External links

â— John Bellamy Foster – Wikipedia.
â— John Bellamy Foster (faculty) – University of Oregon.

θΔics

In hmolscience, **John Garcia** (1936-2001) was an American writer noted for his 1971 book *The Moral Society*, in which, building on the work of French philosopher Pierre Teilhard, he advocated a human moral evolution through a mixture of discussions on entropy and the entropic force. [1]

Overview

in 1971, Garcia, in his *The Moral Society: a Rational Alternative to Death*, argued the following key opinions: [1]

> "Entropy is the counter-force to evolution. Entropy drives mind toward matter and matter toward chaos. Entropy manifests itself in mind by a decrease in awareness. The maximum form of entropy for life is death. The ultimate form of entropy is chaos. Imaginary awareness is the direct manifestation of entropy. Mind succumbs to the entropic force by declining the challenge of the game of life. Life succumbs to entropy by specialization, i.e. by acquiring an ever more fixed and specific form until it is indistinguishable from matter. Matter succumbs to entropy by becoming randomly dispersed until it no longer has a specific form and it becomes chaotic energy.
>
> The evolutionary force driving man toward ever-greater mind causes him to seek ever-greater awareness. The entropic force drives him toward matter and causes him to seek ever-greater peace and tranquility. Tension is produced by an unpredictable and uncontrollable environment. Man, in an effort to adjust to both the entropic and the evolutionary forces, relieves his tension by deluding himself into believing he is aware when he is not. He deliberately avoids the tension of the evolutionary force by destroying his feedback. Without feedback the game of life cannot be won.
>
> Both evolution and entropy are natural manifestations of the cosmic force. It is just as "natural" to sink into matter as to rise to greater mind. It is only possible to rise to greater mind, pure thought, by playing the game of life in the presence of total feedback. Man can continue to have feedback only if he plays the game *deliberately*."

In 1991, Garcia published *Creative Transformation*, his third book, with chapters on the evolution of matter, life, and mind (having sections on social entropy); which is said to be his finest work. [2]

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â— John David Garcia – Wikipedia.
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θΔics

In hmolscience, **John Gatto** (1935-) is an American underground educational reformer noted for his 2000 posit that thermodynamics can be used to explain school tragedies.

Overview

In 2000, Gotto, in his *The Underground History of American Education*, postulated the following: [1]

> "Our school tragedies are an early warning of something inherent in the laws of human thermodynamics."

Here, in this rare human thermodynamics quote, Gatto is speculating on some yet unwritten "laws of human thermodynamics", such as C.G. Darwin did in 1952.

References

1. Gatto, John T. (2000). *The Underground History of American Education* (ch. 17: The Politics of Schooling, section: "The Planetary Management Corporation"). Oxford Village Press.

External links

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θΔics

In hmolscience, **John Gottman** (1942-) is an American mathematical psychologist noted for his 1994 book *Why Marriages Succeed or Fail*, in which he presents his findings of a multi-decade long research study which finds that stable long-term marriages have a 5-to-1 ratio of attractive-to-repulsive bonding interaction, a ratio called the Gottman stability ratio.

Overview

In the 1970s, Gottman began video recording the interactions of several hundred married couples and then later keeping track of divorce patterns years later, after which he analyzed the data, finding that stable long-term marriages have a 5-to-1 ratio of attractive-to-repulsive bonding interaction (see: Gottman stability ratio).

In 1999, Gottman gave the following speculation on marriage debonding (degradation) and the second law: [1]

> "Something like a second law of thermodynamics seems to function in marriage—that is, when marital distress exists, things usually deteriorate (entropy increases)."

The following is a condensed excerpt of Gottman's description of his marriage bond stability ratio: [2]

> "My laboratory conducts on what amounts to the most intensive studies of couples interacting ever attempted, something akin to an X ray or CAT scan of a living relationship. My research teams have compared, microsecond by microsecond, how couples talk to one another. We've examined their facial expressions, monitored how much they fidget, and how they gesture, [etc.,] … gathering such information has allowed us to identify the specific processes that lead to the dissolution of a marriage, and those that weld it more firmly together. Amazingly, we found that it all comes down to a simple mathematical formula: no matter what style your marriage follows, you must have at least five times as many positive as negative moments together if your marriage is to be stable."

Gottman's research and theory functioned as a core support for the development of the Americans chemical engineer Libb Thims' 2007 theory of the formations and stabilities of human chemical bonding. [3] Specifically, in the formation of a human marriage bond between two people (human molecules), A and B, Gottman discovered that 5-to-1 ratios are indicative of stability:

$$A + B \rightarrow A{\equiv}B \text{ (bond formation)}$$

whereas ratios of 5-to-2 or higher are indicative of instability and exact ratios of 0.8-to-1 lead to divorce (debonding):

$$A{\equiv}B \rightarrow A + B \text{ (bond dissolution)}$$

In 2008, building on the work of Thims, social scientist Satch Ejike also utilized Gottman's findings in support of his physical science, i.e. human chemistry-human physics -human thermodynamics, approach to relationships and love. [4]

Education

Gottman's founding education was in mathematics at MIT. He later turned to applied psychology. Gottman currently is a professor emeritus of psychology at the University of Washington.

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3. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (preview) (section: "Gottman stability ratios", pgs. 179-182). Morrisville, NC: LuLu.
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External links

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θΔics

In existographies, **John F. Grant** (1892-1949) was an American physician noted for his “Chemical Sociology” article, wherein presents what he calls "chemical sociology", i.e. chemistry defined in sociological terms.

Overview

In c.1940, Grant penned “Chemical Sociology”, wherein he anthropomorphized the elements and stepped through a Goethe chapter four, Henry Bray, and Chemical Party stylized presentation of reactions, albeit mostly done in a humorous sense, a copy of which was given to his long-term friend Alexander A. Day, a professor of bacteriology, who then got the article published posthumously in *Quarterly Bulletin of Northwestern University Medical School*.

Male | Female

Grant opens his article to the loose analogy that the left side of the periodic table holds the male-like elements and the left side holds the female-like elements; he says, e.g., that sulfur is bisexual:

> “Nor should we scorn these unfortunate individuals who live so close to the line dividing the sexes that they themselves do not seem to know to which sex they belong. Thus, sulfur may play a male role in $S0_2$ and a female part in H_2S though it must he conceded that in either case the combination exudes a very foul odor.”

This, in some sense, is reminiscent of Joseph Dewey's male and female ideas in his 1988 *The Molecular Relationship*.

NaCl + AgNO3

The following is Grant’s take on sodium chloride reacting with silver nitrate:

> “NaCl plus $AgNO_3$ equal AgCI plus $NaNO_3$. This is not just a dry formula, it is a story of a romance in a test tube. It can be visualized. Sodium and Chlorine (if you are incurably facetious you may crass out the I) are fondly attached to each other and nothing obtrudes upon their felicity. The same is true of that refined gentleman Silver and his rather commonplace friend Nitrate (NO_3 to her friends). But one day NaCl and $AgNO_3$ attend the same party [see: Chemical Party]. They enter into solution, not an unusual form of activity in chemical society. All four are in festive mood; in fact, when they enter solution they are actively ionized and start to wander about separately. Silver soon meets Chlorine and immediately loses his electron to her. In less technical language lie falls for her and she falls for him. In fact they both fall; to the bottom of the test tube. But, Silver is a gentleman and not given to casual attachments and when he unites it is for keeps so he and Chlorine drop out of solution to live forever (or almost forever) in molecular bliss. Poor Sodium has lost his partner and so has Nitrate but Sodium is a rugged fellow and NO3 is not too particular so they clasp valencies and continue on quite unperturbed.”

(add)

Education

Grant completed hid MD at Northwestern University Medical School in 1917, after which he worked for 29 years as a practicing obstetrician and pediatrician in Long Beach, California.

Quotes | By

The following are quotes by Grant:

> “It is quite possible that the chemist in his laboratory, his hands blackened with sulfides, his nostrils protesting against the reek of mercaptans or other equally foul odors, is not in the proper mood to recognize and appreciate the analogies that exist between chemicals and the people who work for them. The failure to grasp these similarities is a loss to imaginative thinking for the elements and their compounds have

characters and personalities so human that they can be fitted into a social or psychological classification with perfect real-ism and much benefit to the student."

— John Grant (c.1940), "Social Chemistry"

"And so it goes from hydrogen to plutonium—each element has its own peculiar properties that reflect human qualities. Or, is it not we who reflect the personalities of the elements of which we are but the compounds?"

— John Grant (c.1940), "Chemical Sociology"

"I shall refrain from pointing out that every time an element the left [of the periodic table] units with one from the right it is the male who gives and gives his last electron and the female who takes it all."

— John Grant (c.1940), "Social Chemistry"

See also

â— Sociology 23
â— Physicochemical sociology

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θΔics

In human mathematics, **John Green** (1977-) is an American young adult fiction author noted for his widely-popular 2006 equation of love themed, graphical footnoted, anagram-filled book *An Abundance of Katherines*, which tells the story of a prodigy-turning-adult person named up who after getting dumped by 19 girls named Katherine goes on a quest to derive an equation for predicting love. [1]

An Abundance of Katherines

See main: Equation of love (section: An Abundance of Katherines)

The book tells the story of Colin Singleton, an anagram-loving seventeen-year-old boy who has become depressed because though he has maintained his status of a child prodigy, he has not yet become a "genius." He wishes to accomplish this goal by having a Eureka moment. As well as not being the genius he hopes to be, his girlfriend, Katherine 19 (over the span of his life, Colin has dated nineteen girls only named Katherine, all spelled in that manner), recently dumped him. In these relationships, Colin remembers only the Katherine dumping him.

Throughout the novel, Colin attempts to derive a theorem to determine the curve of any relationship based on several factors of the personalities of the two people in a relationship. It would predict the future of any two people. His theorem eventually works for all but one of his past relationships with a Katherine. But it is later discovered by Colin that he had dumped this Katherine (Katherine the Third), rather than the other way around. The graphs all make perfect sense at this juncture.

References

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See also

- HM pioneers

External links

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- Nerdfighters – NerdFighters.Ning.com.
- John Green – JohnGreenBooks.com.

θΔics

In science, **John Haldane** (1982-1964), often cited as J.B.S. Haldane, was an English biochemist (powered-chnops chemist), with a "formidable intelligence" (Smith, 1965), noted for his 1929 half living thing theory, for his 1932 hot thin soup theory (see: primordial soup), and for his 1950s kin selection theory.

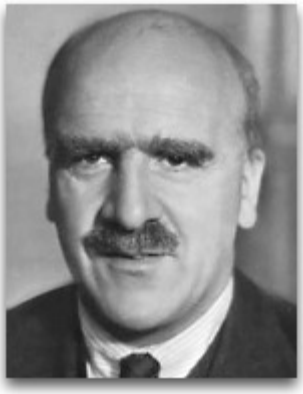

Hamilton's rule | Two brothers or eight cousins

In 1924, Haldane, in a series of papers, worked out the consequences of Mendelian genetics for the theory of evolution. [7]

The so-called theory kin selection, i.e. the premise that any individual person would be willing to die for so many genetically-related kin, supposedly, arose in the work of Sewall Wright (1924), Ralph Fisher (1930) and Haldane (1932), who each were working out the mathematical theory of population genetics. [4][7]

Sometime later, "in the fifties", as recalled by Haldane's graduate student John Maynard Smith (1920-2004), who was either there or told the story by Haldane, Haldane was with some other of is graduate students at a London pub called *The Orange Tree*, working on the mathematics of kin selection, during which time Haldane, who had been calculating on the back of an envelope for some minutes, suddenly sprang up and announced the following humorous conclusion, deduced from his calculations:

> "I would gladly die [lay down my life] for two brothers or eight cousins."
>
> — John Haldane (c.1952), recalled by Maynard Smith [5]

The basic premise here, being that because siblings are on average 50% identical by descent, nephews 25%, and cousins 12.5%, that, owing to the Darwinian paradigm of survival of the fittest, with its inherent supposed overarching aim to pass on one's genes, that human kin lives can be equated as follows:

1 person = 8 cousins (12.5x8=100)
1 person = 4 nephews (4x25=100)
1 person = 2 brothers (2x50=100)

Haldane later referred to this "idea", which, to many, has become the laughing stock, semi-truthful, semi-funny, semi-absurd, punchline joke of genetic based natural selection theory, in an article in *Penguin New Biology*. [5] Alternatively, according to Smith (1976), as the memory of the details of this infamous statement seems a bit opaque to him, "Haldane's remark, I guess was made when he was writing the Penguin *New Biology* article, and remembered it." [6]

In 1964, English evolutionary biologist William D. Hamilton put the above logic, supposedly done independently, into formulaic form, and theory has since become known as Hamilton's rule, the supposed basis of the theory of "kin selection".

Half living things

In 1929, on half living things, Haldane, in hi "The Origin of Life", states: [1]

> "When ultra-violet light acts on a mixture of water, carbon dioxide, and ammonia, a vast variety of organic substances are made, including sugars and apparently [Edward Baly, 1920s] some of the

$C_4H_7O_4N$ (aspartic acid) – not alive
$C_{10}H_{12}O_6N_5P$ (ribonucleic acid) – alive
$C_{21}H_{36}O_{16}N_7P_3S$ (coenzyme A) – more alive

A 2007 labeling, by American electrochemical engineer Libb Thims, of the four element molecule aspartic acid as "not alive", according to common laymanized scientific views, and ribonucleic acid (RNA) as "alive", according to theories such as the RNA world hypothesis, which

materials from which proteins are built up. The first living or half-living things were probably large molecules synthesized under the influence of the sun's radiation, and only capable of reproduction in the particularly favorable medium in which they originated."

supposes that RNA was the first form of life; a depiction that is similar to **Haldane**'s 1929 "half-living thing" precursory origin of life supposition. [3]

Here, to note, in Haldane's supposition of a 'half-living thing', we recall American electrochemical engineer Libb Thims' 2007 ridicule (*Human Chemistry*), depicted adjacent, of the more-alive/less-alive theory associated with the RNA life theory; in another instance he states:

> "The link [line] between the living and dead matter is somewhere between a cell and an atom."
>
> — John Haldane (1929), "The Origin of Life" (Q)

The half-living thing theory or the more alive, alive, not alive divide is one of the precursory mindsets to the defunct theory of life.

Other

In his 1924 book *Daedalus*, Haldane uses the name 'Daedalus' in the sense of a symbol of the revolutionary spirit of science; a book which was cited by Russian mineralogist Vladimir Vernadsky in his biosphere theory.

In his 1932 *The Causes of Evolution*, Halden postulated that, some two billion years ago, something of microscopic size separated from the 'hot thin soup' (see: primordial soup).

Quotes

The following are noted quotes:

> "Teleology is like a mistress to a biologist: he cannot live without her but he's unwilling to be seen with her in public."
>
> — John Haldane (c.1930s), supposedly, a requote of something said in the 1880s by Ernst Brucke [2]

> "An ounce of algebra is worth a ton of verbal argument."
>
> — John Haldane (c.1935), quoted by Maynard Smith [7]

See also

- Truth

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Further reading

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External links

● J.B.S. Haldane – Wikipedia.

θΔics

In ecological thermodynamics, **John Harte** (1939-) is an American physical ecologist noted for his 2011 book *Maximum Entropy and Ecology: a Theory of Abundance, Distribution, and Energetics*, in which he applies the MaxEnt school of thought to ecosystems to develop what he calls the "maximum entropy theory of ecology" (METE). The book is marred to a large extent by its usage of information theory. Harte states, for example, the "connection between information theory and thermodynamics [is starting] to come into focus". [1]

Education

Harte completed his BA in physics in 1961 at Harvard and his PhD in 1965 in theoretical physics at the University of Wisconsin. Currently he is with the Energy and Resources Group at the University of California, Berkeley.

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External links

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â— Harte, John (1939-) – WorldCat Identities.

θΔics

In existographies, **John Herapath** (1790-1868) was an English physicist noted for []

Overview

In 1820, Herapath, in his "On the Causes, Laws and Phenomena of Heat, Gases, Gravitation", on the kinetic theory of gases, argued that motion stops at absolute zero of temperature, a precursor to the third law of thermodynamics. [1] Herapath's paper was originally rejected by Humphry Davy of the Royal Society, but later published the following year in the *Annals of Philosophy*. [2]

Quotes | On

The following are quotes on Herapath:

> "Hooke's kinetic theory of heat and matter was then forgotten for many years, until the Swiss scientist Daniel Bernoulli rediscovered the kinetic theory of gases in 1738. Bernoulli's work was in turn ignored until the idea was revived by two uninfluential English amateurs, **John Herapath** and John Waterston, in 1820 and 1845. Only with the work of James Joule in the 1840s, and Rudolf Clausius and James Maxwell in the 1860s, did the kinetic theory of heat and matter achieve general acceptance."
>
> — Stephen Inwood (2001), *The Man Who Knew Too Much* (pg. 276)

References

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External links

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θΔics

In existographies, **John Herschel** (1797-1871) (Cattell 1000:692) (CR:5) was an English mathematician, astronomer, and chemist, son of William Herschel, noted, for []

Overview

In 1833, Herschel stated, supposedly, that heat is the motive force powering not only people but the planet. [1] He held that the sun vivifies or endues with life not only plant and animal life but also inanimate matter, lifting and expanding air and water, and producing the weather currents that give earth the restless character of a living being.

References

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External links

â— John Herschel – Wikipedia.

θΔics

In hmolscience, **John Grier Hibben** (1861-1933) was an American mathematician, physician, and theologian noted, in philosophical thermodynamics, for his 1903 critiques of the social energetics philosophies of Wilhelm Ostwald.

Overview

In 1903, Hibben, in his "The Theory of Energetics and its Philosophical Bearings", gave short summary of the philosophical implications of German chemist Wilhelm Ostwald's 1901 lectures on *Natural Philosophy*. [1] The following is one of seven criticisms discussed by Hibben on Ostwald's energetics philosophy: [2]

> "The physical world is characterized by decrease of energy and increase of entropy. The reverse is true of the world of thought."

(add discussion)

Education

Hibben obtained his BS in mathematics from Princeton, graduating valedictorian of his class. In 1882, he spent a year in philosophical studies at the University of Berlin. He became an ordained as a minister of the Presbyterian Church in the United States of America by the Carlisle Presbytery on May 19, 1887. He received a PhD in 1893 with a dissertation on "The Relation of Ethics to Jurisprudence," became assistant professor in 1894, and Stuart Professor of Logic in 1907. In 1912 he was elected fourteenth president of Princeton.

References

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2. Hibben, John Grier. (1903). "The Theory of Energetics and its Philosophical Bearings", *The Philosophical Review*, 12: 175-77.

External links

â— John Hibben – Wikipedia.

θΔics

In human chemistry, **John Hodgson** (c.1950-) is an American writer and painter noted for his 2002 *Book of Molecules and or Humans*, wherein he gives a total of a total ninety-eight chemistry aphorisms comparing humans to molecules.

Overview

In 2002, Hodgson published the booklet *Little Fun Book of Molecules Humans*, a human molecule themed book which looks at how molecules behave as compared to how humans behave, utilizing metaphors and other common similarities, consisting of a total ninety-eight chemistry aphorisms. [1] In his preface, Hodgson states that his book is intended to look at the similarities between the two entities: humans and molecules. He states, in particular that:

> "If we understand more of each entity there may be clues to hold new clues to hold new scientific information leading to new research."

> "Different **molecules** or **humans** behave differently having different reactions or behaviors to changing situations."

> "When molecules or humans mesh they have chemical or physical reaction and or reproduction."

> "With experiment we can better understand these molecules or humans like we never knew before."

> "Molecules and humans take in elements or food."

> "Molecules and humans engage in different behaviors and or sex."

> "Molecules and humans make or change common bonds."

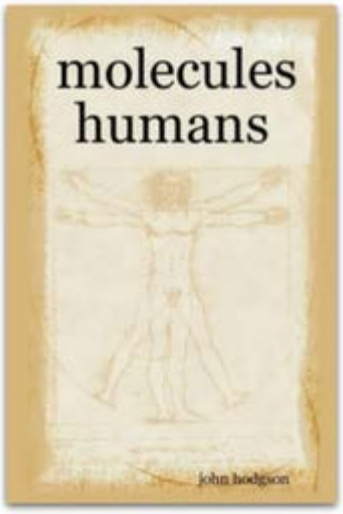

Left: Hodgson's 2002 1st books edition of ***Little Fun Book of Molecules Humans***. [1] Right: a 2010 LuLu.com edition, which a re-designed cover, inspired by American chemical engineer Libb Thims' 2008 book *The Human Molecule*. [2]

Of Hodgson's five books, his 2002 book on 'molecules/humans' is his most popular.

Education

Hodgson is a painter who self-defines himself as someone who 'enjoys spending time learning new concepts using knowledge he has learned through studying relationships and interaction of human behavior in society and workplace.' [3]

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Further reading

â— Hodgson, John. (2010). *A Biography*. Lulu.com.

θΔics

In hmolscience, **John Hunter** (1728-1793) (IQ:165|#393) (Cattell 1000:141) (Murray 4000:19|Med) was a Scottish physiologist, comparative anatomist—much of his time was devoted to building and stocking a rather large anatomy museum—surgeon, and scientist philosopher noted for his, 1755 to reaction end, rather peculiar experiments, on animals, insects, and plants, and correlative theories, aimed at ferreting out some type of life principle or experimentally based physical science "theory of life", as his student John Abernethy (1817) summarizes.

Overview

Hunter, as summarized by *Britannica* (1911), pursued the following areas: [1]

> "The scope of **Hunter's** labors may be defined as the explication of the various phases of life exhibited in organized structures, both animal and vegetable, from the simplest to the most highly differentiated. By him, therefore, comparative anatomy was employed, not in subservience to the classification of living forms, as by Cuvier, but as a means of gaining insight into the principle animating and producing these forms, by virtue of which he perceived that, however different in form and faculty, they were all allied to himself. 'In what does life consist?' is a question which in his writings he frequently considers, and which seems to have been ever present."

Hunter, in one experiment, froze fish and snakes to see if they would remain alive after being frozen, as "had been confidently asserted" by earlier natural philosophers. [2] Many of his "theory of life" philosophical ideas are summarized in his posthumously-published 1794 so-called "masterpiece" *Treatise on the Blood*, written predominantly in 1792-93.

Life | Great chemist

Hunter's investigative inquiry into the vital phenomena, as his student John Abernethy, summarizes, began in 1755 with his observations of the incubated egg. [4] The following is the 1911 *Britannica* summary of Hunter's theory of life: [1]

> "Life, he taught, was a principle independent of structure, [3] most tenaciously held by the least highly organized beings, but capable of readier destruction as a whole, as, e.g., by deprivation of heat or by pain, in young than in old animals. In life he beheld an agency working under the control of law, and exercising its functions in various modes and degrees. He perceived it, as Abernethy observes, to be 'a great chemist', a power capable of manufacturing a variety of substances into one kind of generally distributed nutriment, and of furnishing from this a still greater variety of dissimilar substances."

This "great chemist" comment was mentally recorded by English surgeon John Abernethy (1764-1831), an attendee of Hunter's lectures. Abernethy, in his his 1817 *Physiological Lectures: Exhibiting a General View of Mr. Hunter's Physiology and of His Researches in Comparative Anatomy*, delivered before the Royal College of Surgeons, London, opens to the following: [5]

> "I have praised **Mr. Hunter** for his 'theory of life', because it is a probable one, cautiously and philosophically deduced, and adequate to explain the phenomena. Therefore am I directed by the precepts of philosophy, and also induced by other reasons, which I have partly explained in my first *Lectures*, to uphold it as a good theory, till a more satisfactory one be discovered."

Abernethy goes on in his lecture to state the following: [5]

> "As Sir H. Davy's experiments fully prove that electricity may be superadded to, and that it enters into the composition of all those substances we call matter; I felt satisfied with this establishment of the philosophy of Mr. Hunter's views, nor thought it necessary to proceed further, but merely added, "It is not meant to be affirmed that electricity is life. I only mean to argue in favor of Mr. Hunter's theory, by showing that a subtle substance of a quickly and powerfully mobile nature, seems to pervade everything, and appears to be the life of the world, and that therefore it is probable a similar substance pervades organized bodies, and is the life of these bodies." I am concerned, yet obliged to detain you by this recapitulation, because my meaning has been either misunderstood or

misrepresented.

Mr. Hunter was the first physiologist who placed in clear array the various vital functions before our view, so as to enable us to judge of their nature and probable cause. He told us that "life was a great chemist", and even in a seemingly quiescent state, had the power of resisting the operation of external chemical agency, and thereby preventing the decomposition of those bodies in which it resided. Thus seeds may lie buried far beneath the surface of the earth for a great length of time without decaying, but being thrown up, they vegetate. Mr. Hunter showed us that this chemist, life, had the power of regulating the temperature of the substances in which it resides. Seeds possessing the principle of life being placed within the influence of the atmosphere, and in contact with moisture, produce heat, form sugar to edulcorate the first nutriment of the young plant, and in short, bring about all those phenomena which characterize incipient vegetation. He further showed us, that life, by its chemical processes, could convert a great variety of dissimilar substances, into one kind of generally distributed nutriment, and could also prepare from it a still greater variety of dissimilar substances. Mr. Hunter showed us that Life was also an architect, that it built up a great variety of curious structures or edifices, in which it continued to reside and execute its future functions. No unprejudiced person can, I think, possibly doubt that it is by the active power of Life such effects are produced."

The following are further *Britannica* (1911) summaries of Hunter and his life theories: [1]

"Like Harver, who terms it the anima vegetiva, he regarded it as a principle of self-preservation, which keeps the body from dissolution. Life is shown, said he, in renovation and action; but, although facilitated in its working by mechanical causes, it can exist without action, as in an egg new-laid or undergoing incubation. It is not simply a regulator of temperature; it is a principle which resists cold, conferring on the structures which it endows the capacity of passing some degrees below the freezing-point of ordinary inanimate matter without suffering congelation. Hunter found, in short, that there exists in animals a latent heat of life, set free in the process of death (see: Treatise on the Blood, p. 80). Thus he observed that sap if removed from trees froze at 32° F., but within them might be fluid even at 15°; that a living snail placed in a freezing mixture acquired first a temperature of 28°, and afterwards of 32° ere it froze; and that, whereas a dead egg congealed immediately at 32°, a living egg did so only when its temperature had risen to that point after a previous fall to 294°.

The idea that the fluid and semifluid as well as the solid constituents of the body contain the vital principle diffused through them he formed in 1755-1756, when, in making drawings illustrative of the changes that take place in the incubated egg, he noted specially that neither the white nor the yolk undergoes putrefaction. The blood he, with Harvey, considered to possess a vitality of its own, more or less independent of that of the animal in which it circulates. Life, he held, is preserved by the compound of the living body and the source of its solid constituents, the living blood. It is to the susceptibility of the latter to be converted into living organized tissue that the union of severed structures by the first intention is due.

He even inclined to the belief that the chyle has life, and he considered that food becomes "animalized" in digestion. Coagulation of the blood he compared to the contraction of muscles, and believed to be an operation of life distinct from chemical coagulation, adducing in support of his opinion the fact that, in animals killed by lightning, by violent blows on the stomach, or by the exhaustion of hunting, it does not take place. "Breathing," said Hunter, "seems to render life to the blood, and the blood continues it in every part of the body." (Treatise on the Blood, pg. 63)

Life, he held, could be regarded as a fire, or something similar, and might for distinction's sake be called "animal fire". Of this the process of respiration might afford a constant supply, the fixed life supplied to the body in the food being set free and rendered active in the lungs, whilst the air carried off that principle which encloses and retains the animal fire. (Essays and Observations, i. 113)

The living principle, said Hunter, is coeval with the existence of animal or vegetable matter itself, and may long exist without sensation. The principle upon which depends the power of sensation regulates all our external actions, as the principle of life does our internal, and the two act mutually on each other in consequence of changes produced in the brain. Something (the " materia vitae diffusa ") similar to the components of the brain (the " materia vitae coacervata ") may be supposed to be diffused through the body and even contained in the blood; between

these a communication is kept up by the nerves (the " chordae internunciae"). (Treatise on the Blood, pg. 89)

Neither a material nor a chemical theory of life, however, formed a part of Hunter's creed. " Mere composition of matter," he remarked, " does not give life; for the dead body has all the composition it ever had; life is a property we do not understand; we can only see the necessary leading steps towards it." (Treatise on the Blood, pg. 90)

As from life only, said he in one of his lectures, we can gain an idea of death, so from death only we gain an idea of life. Life, being an agency leading to, but not consisting of, any modification of matter, " either is something superadded to matter, or else consists in a peculiar arrangement of certain fine particles of matter, which being thus disposed acquire the properties of life." As a bar of iron may gain magnetic virtue by being placed for a time in a special position, so perhaps the particles of matter arranged and long continued in a certain posture eventually gain the power of life."

American science historian Everett Mendelsohn, in his *Heat and Life: the Development of the Theory of Animal Heat* (1964), quotes from Hunter's "Experiments on Animals and Vegetables, with Respect to the Power of Producing Heat" (1775) and his "Of the Heat, &c of Animals and Vegetables" (1778), crediting him as being one of the earlier "animal heat" theorists. [6]

Quotes

The following are noted quotes:

"We find it a common principle in the animal machine, that every part increases in some degree according to the action required. Thus we find vessels become larger in proportion to the necessity of supply, as for instance, in the gravid uterus; the external carotids in the stag, also, when his horns are growing, are much larger than at any other time."

— John Hunter (1793), *Treatise on the Blood* (pg. 288)

"Experiments should not be often repeated which tend merely to establish a principle already known and admitted, but that the next step should be the application of that principle to useful purposes."

— John Hunter (Ñº), Anim. Oecon., *Works*, iv. 86

Images

The following are images of Hunter and his self-built anatomy museum, which at his surmise, totaled some 500 exhibits, now part of the Hunterian Museum in London, which has collections of human anatomies and pathology as well as animals and art work:

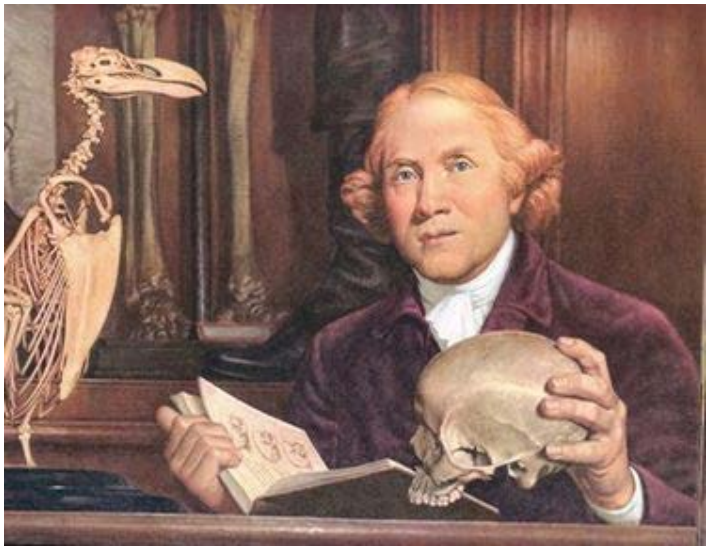

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3. Hunter, John. (1793). *Treatise on the Blood, Inflammation and Gunshot Wounds* (independent of structure, pgs. 28, 46;). Publisher, 1794.
4. (a) Abernethy, John. (date). "Of Mr. Hunter—Progress of His Mind, &c.", in: *Memoirs of John Abernethy, F.R.S.: With a View of His Lectures, Writings, and Character, Volume 1* (editor: George Macilwain) (pg. 241). Harper & Brothers, 1853.
(b) John Abernethy (surgeon) – Wikipedia.
5. Abernethy, John. (1817). *Physiological Lectures: Exhibiting a General View of Mr. Hunter's Physiology and of His Researches in Comparative Anatomy*, delivered before the Royal College of Surgeons (theory of life, pg. 1; §: "Reiteration of the Denial that He [Hunter] Identified Life with Electricity", pgs. 26-27). London: Longman, Hurst, Rees, Orme, and Brown, Paternoster-Row.
6. (a) Hunter, John. (1775). "Experiments on Animals and Vegetables, with Respect to the Power of Producing Heat" (pg. 457), *Philosophical Transactions of the Royal Society*, London, 45:452-54.
(b) Hunter, John. (1778). "Of the Heat, &c of Animals and Vegetables", *Philosophical Transactions of the Royal Society*, London, 48:7-49.
(c) Mendelsohn, Everett I. (1964). *Heat and Life: the Development of the Theory of Animal Heat* (pgs. 101, 117). Harvard University Press.

Further reading

â— Hunter, John. (1777). "The Production of Heat by Animals and Vegetables", *Transactions of the Royal Society*.
â— Foot, Jesse. (1794). *The Life of John Hunter*. London: T. Becket, Pall-Mall.
â— Moore, Wendy. (2005). *The Knife Man: Blood, Body Snatching, and the Birth of Modern Surgery*. Random House.

External links

â— John Hunter (physician) – Wikipedia.

θΔics

In existographies, **John Jackson** (1907-1993) (RMS:91) (FA:136) was an American Afro-American studies and religio-mythology scholar, noted for []

Christ myth

In 1938, Jackson wrote a little pamphlet called "Christianity Before Christ". [4]

In 1974, Jackson wrote the foreword to Gerald Massey's *Lectures*; the following is an example quote: [2]

> "**Massey**, a man of many talents, distinguished himself as a social reformer, a poet and an Egyptologist. His fame rested mainly on the six monumental volumes in which he dealt at length on the mythology and religion of ancient Egypt, and on his poetry. Although he was a capable lecturer, the lectures were not widely circulated, and were privately printed in an obscure volume."

In 1985, Jackson, turned his earlier pamphlet notes into the book *Christianity Before Christ*, a work which soon became of the best-selling books of the American Atheist Press (Zindler, 2002), wherein builds on Augustine's statement that "that which is known as Christian religion existed among the ancients", as elaborated on by Alvin Kuhn (*Shadow of the Third Century*, 1949), to attempt to summarize in synopsis form the comparative religion and mythology works of: T.W. Doane, James Frazer, Edward Carpenter, Godfrey Higgins, Gerald Massey, Albert Churchward, G.R.S. Mead, Arthur Drews, and Heinrich Zimmern, the German Assyriologist who discussed the "Bel passion play", as found on a 2000BC Babylonian tablet.

In 1986, Jackson, in his lecture on "Introduction to African Civilizations", said that his *Christianity Before Christ* had sold a thousand copies; commenting on an aside that he would have rather entitled as the "African Origin of Christianity", but reasoned that since most black folks were illiterate, owing to television, that he need to gear the title towards "white intellectuals", in hopes that it would be read. [4]

Religion | Atheism

Jackson, in old age, averred that he had been an atheist since he was old enough to think; his earliest recollection being when, born into a family of Methodists, the family minister asked him: "how made him", to which he replied: "I don't know". [1]

In 1930 to 1955, Jackson lectured at the "Ingersoll Forum" of the American Association for the Advancement of Atheism; he also wrote for *Truth Seeker* magazine and the Rationalist Press association.

Influences

Jackson was influenced by Hubert Harrison, who he referred to as an "agnostic atheist". [3]

Quotes | By

The following are noted Jackson quotes:

> "Most of you have the brain capacity of an intellectually retarded mule."
>
> — John Jackson (c.1950), comment to students, at City College New York, after finding out that most of his college students were reading at a fourth grade reading level [4]

References

1. Jackson, John G. (1985). *Christianity Before Christ* (forward: Frank R. Zindler). American Atheist Press.
2. Massey, Gerald. (1900). *Gerald Massey Lectures* (foreword: John G. Jackson; Introduction: Sibyl Ferguson) (arc)

(pdf). Samuel Weiser, 1976; The Book Tree, 2008.
3. Jackson, John G. (1987). *Hubert Henry Harrison: the Black Socrates* (Amz) (7-pg pamphlet). American Atheist Press.
4. Jackson, John G. (1986). “Introduction to African Civilizations” (Ñº) (pamphlet, 11:15-; mule, 14:15-14:45), Church lecture, YouTube, BrooklynMagi, 2011.

External links

â— John G. Jackson (writer) – Wikipedia.

θΔics

In existographies, **John Keynes** (1883-1946) (IQ:170|#379) (RGM:291|1,500+) (Gottlieb 1000:201) (Stokes 100:68) (GEcE:7) (CR:5) was a British economist, noted for []

Overview

In 1921, Keynes, in his "The Application of Probability to Conduct", attempted to predict human behavior. [1]

Quotes | On

The following are quotes on Keynes:

> "**Keynes** had a high IQ."
>
> — Paul Samuelson (c.1940), *Publication* (Ñº)

References

1. (a) Keynes, John M. (1921). "The Application of Probability to Conduct", in: *Treatise* (§26:307-23) (Ñº); in: *The World of Mathematics* (editor: James Newman). Simon and Schuster, 1956.
(b) Bouw, Gerardus D. (1999). "Entropy and the Human Situation" (Ñº), *Biblical Astronomer*, 9(89):16-25.

External links

â— John Maynard Keynes – Wikipedia.

θΔics

In thermodynamics, **John Kirkwood** (1907-1959) was an American physical chemist noted for his 1961 *Chemical Thermodynamics*, co-written with Irwin Oppenheim, which includes a rather decent appendix section on mathematical thermodynamics. [1]

Of note, Kirkwood was on the faculty at Yale, for a short period, at the same time Lars Onsager (1903-1976) was the J. Willard Gibbs professor of chemistry.

Some argue that Kirkwood laid the foundations for the standard method for estimating free energy differences, namely perturbation theory and thermodynamic integration, by building on the chemical affinity and extent of reaction work of Theophile De Donder. [2]

Education

Kirkwood was a protégé of Arthur Noyes, notable for having done, following Fritz Haber, free energy change calculations of certain reactions. [2] Noyes convinced Kirkwood to enroll at Caltech before finishing high school, which he did for two years. He completed his BS in physics in 1926 at the University of Chicago and PhD in chemistry in 1929 at MIT.

References

1. Kirkwood, John G. and Oppenheim, Irwin. (1961). *Chemical Thermodynamics.* New York: McGraw-Hill Book Co. Inc.
2. Chipot, Christphe and Pohorille, Andrew. (2007). *Free Energy Calculations: Theory and Applications in Chemistry and Biology* (1.1.1: Pioneers of Free Energy Calculations, pgs. 1-2). Springer.

External links

â— John Gamble Kirkwood – Wikipedia.

θΔics

In existographies, **John Locke** (1632-1704) (IQ:180|#179) (Cattell 1000:35) [RGM:108|1,500+] (Murray 4000:7|WP) (Gottlieb 1000:11) (Stokes 100:38) [HD:7] (FA:63) (GPhE:#) (CR:67) was an English physician and social philosopher, noted for his developed an alternative to the Hobbesian state of nature and asserting that a government could be good only if it received the consent of the governed and protected the natural rights of life, liberty, and estate; according to which if such a consent was not achieved, the people have the right to rebellion.

Newton's circle

Locke, when he studied at Oxford, became friends with Isaac Newton and Robert Boyle, friendships that lasted their entire existences. [3]

Atomic theory

Locke, supposedly, was a deism-based Christian atomist, and accordingly rejected the notion that “things entirely devoid of knowledge, acting blindly, could produce a being endowed with awareness.” [1] Locke, supposedly, adopted many Epicurean tenants from the translations of Epicurus done by Pierre Gassendi. (O)

Tabula rasa | Mind

In 1690, Locke, in his *Essay Concerning Human Understanding*, supposedly, made the first serious attempt to explain the functioning of the mind in purely naturalistic terms, without the need for divine intervention in the development of reason; every human, he posited, comes into the world with his or her mind as a blank slate or *tabula rasa*; over time, according to Locke, the child absorbs experiences though the senses and then organizes these experiences the processes of association (O) The mind is born "blank", according to Locke, and all knowledge, ideas, images come from sense and experience. [3] Some of this blank mind conjecture, to note, has been disproved in the beauty vs ugly studies of newborn babies, who will turn towards or gaze at longer so-deemed "beautiful" faces longer than as compared to so-deemed "ugly" faces, prior to having any sense experience.

Influence

In 1764, Honore Mirabeau, aged 15, found that he “needed” John Locke’s *Essay on Human Understanding*.

Locke, along with John Mill, was influential to Leon Walras and the development of the Lausanne school of physical economics.

Quotes | On

The following are noted quotes of tribute and or praise:

> “How has it happened, that the profound **Locke**, who, to the great mortification of the metaphysicians, has placed this principle of Aristotle—that nothing enters the mind of man, but through the senses—in the clearest point of view; how is it that all those who, like him, have recognized the absurdity of the system of innate ideas, have not drawn the immediate and necessary consequences? How has it come to pass, that they have not had sufficient courage to apply so clear a principle to all those fanciful chimeras with which the human mind has for such a length of time been so vainly occupied?
>
> — Baron d’Holbach (1770), *The System of Nature* (pg. 79)

> “Bacon, **Locke**, and Newton are the three greatest men that have ever lived, without any exception.”
>
> — Thomas Jefferson (1789), “Letter to John Trubull”

"Voltaire's letter on **Locke** from the *Philosophical Letters* (1734), which circulated separately as a 'Letter on the Soul', which La Mettrie had read, [touched on] Locke's hypothesis that god might 'superadd to matter a faculty of thinking', which gave rise to great controversy in Britain concerning materialism and the nature of the soul."

— Ann Thomson (1994), "Introduction" to Julien La Mettrie's writings [4]

Quotes | By

The following are noted quotes by Locke:

"There cannot be any one moral rule proposed, whereof a man may not justly demand a reason."

— John Locke (1669), *An Essay Concerning Human Understanding* (Q)

"In all the visible corporeal world we see no chasms or gaps. All quite down from us the descent is by easy steps, and a continued series that in each remove differ very little one from the other. There are fishes that have wings and are not strangers to the airy region; and there are some birds that are inhabitants of the water, whose blood is as cold as fishes. There are animals so near of kin both to birds and beasts that they are in the middle between both. Amphibious animals link the terrestrial and aquatic together; . . . not to mention what is confidently reported of mermaids or sea-men. There are some brutes that seem to have as much reason and knowledge as some that are called men; and the animal and vegetable kingdoms are so nearly joined, that if you will take the lowest of one and the highest of the other, there will scarce be perceived any great difference between them; and so on until we come to the lowest and the most unorganical parts of matter, we shall find everywhere that the several species are linked together, and differ but in almost insensible degrees."

— John Locke (1869), *Essay Concerning Human Understanding* (III, chap. 6, §12); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 184)

"I greatly esteem all those who faithfully defend their opinion; but there are so few persons who after the manner they do defend them, appear fully convinced of the opinions they profess, that I am tempted to believe there are more sceptics in the world than are generally imagined."

— John Locke (c.1670) *Publication*; cited by Baron d'Holbach (1770) in *The System of Nature* (pg. 221)

"The actions of men the best interpreters of their thoughts."

— John Locke (c.1680), *Publication*

"Heat is a very brisk agitation of the sensible parts of the object, so that what in our sensation is *heat* in the object is nothing but motion."

— John Locke (c.1670), "On the Five Senses of Touch" (Q); in: *The Works of John Locke in Nine Volumes, Volume Two* (Elements of Natural Philosophy; Chapter 11 (Q)

References

1. (a) Pullman, Bernard. (1995). *The Atom in the History of Human Thought* (translator: Axel Reisinger) (pgs. 144-45). Oxford University Press, 1998.
(b) Stenger, Victor J. (2013). *God and the Atom: from Democritus to the Higgs Boson: the Story of a Triumphant Idea* (pg. 76). Prometheus Books.
2. Jefferson, Thomas. (1789). "The Three Greatest Men: Letter to John Trumbull", Feb 15, Library of Congress.
3. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 334). HarperOne.
4. (a) Yolton, John. (1983). *Thinking Matter: Materialism in Eighteenth-Century Britain*. University of Minnesota Press.
(b) La Mettrie, Julien. (1751). *Machine Man and Other Writings: Treatise on the Soul, Man as Plant, The System of Epicurus, Anti-Seneca or the Sovereign Good, Preliminary Discourse* (translator and editor: Ann Thomson) (pg. xii). Cambridge University Press, 1996.

External links

- John Locke – Wikipedia.

θΔics

In existographies, **John Lydus** (490-c.560) (CR:2), aka “Johannis Lydus” (Barry, 1999), “Ioannis Lydus”, or “John the Lydian”, was Lydian antiquarian scholar, who, in retirement, published books in the area of the antiquities of Rome, employing the works (now lost) of old Roman writers on similar subjects, noted for []

Overview

In 552, Ludus lost the favor of Justinian I (482-565), and was dismissed. In his retirement, he began to publish a number of books, based on Roman antiquity, and earlier scholars of Roman antiquity.

In c.555, Ludus in his *On Months* (*De Mensibus*), a book on a history of the different pagan festivals of the year; this was semi-influential to a number of later religio-mythology scholars, such as Samuel Dunlap (1861) and David Fideler (1993). [3]

Lydus, supposedly, at one point in his works, noted that the Egyptians used a symbol in the form of the Greek theta ‘Θ’ (see: alphabet) for the cosmos, with an airy fiery circle representing the world, and a snake, spanning the middle, representing the *agathos daimon* or ‘good spirit’; which would seem to correspond to what we now call the "ouroboros". [1]

Quotes | By

The following are quotes by Lydus:

> “Time is the creator as well as the destroyer of its own progeny.”
>
> — John Lydus (c.540), *De Mensibus* (I,1) [2]

References

1. (a) Barry, Kieren. (1999). *The Greek Qabalah: Alphabetical and Mysticism and Numerology in the Ancient World* (pg. 73). Publisher.
(b) Theta (2007) – Schools Wikipedia.
2. Grigoriadis, Iordanis. (1995). “Linguistic and Literary Studies in the ‘Epitome Historian’ of John Zonaras” (Ñº), PhD thesis, University of St. Andrews, Jul 20.
3. (a) Dunlap, Samuel. (1861). *Sod: the Son of Man* (Lydus, 2+ pgs). Publisher.
(b) Fideler, David. (1993). *Jesus Christ, Sun of God: Ancient Cosmology and Early Christianity* (Lydus, pg. 370). Publisher.

External links

â— John the Lydian – Wikipedia.

θΔics

In hmolscience, **John Macionis** (1947-) is an American sociologist noted for []

Overview

In 2008, Macionis, in his *Sociology: A Global Introduction*, coauthored with Ken Plummer, discussed German sociologist Max Weber—who notably built his entire sociology theory platform following an influential age fourteen reading of Goethe's physical chemistry based *Elective* Affinities, a book wherein it is argued that humans are like molecules, aka human molecular theory, both similar in nature, differing in but metamorphosized size (see: Weberian elective affinity)—after which they give five points on the so-called limitations of "scientific sociology" (see: two cultures namesakes), namely that human behavior is too complex to allow for prediction, and then states the following contradictory unbridgeable gap model:

> "Human behavior differs from all other phenomena precisely because human beings are symbolic, subjective creatures. Human beings—*unlike* planets or molecules—are always constructing meaning. What marks us off from other animals is the elaborate symbolic systems we weave for ourselves. Therefore, sociologists cannot simply study societies from the outside; they have to take on board ways of 'entering' these worlds of meaning."

Macionis here, like many American sociologists, seems to be unaware, firstly that the earth-as-molecule (earth molecule) definition exists, and secondly and more importantly that the human-as-molecule approach, similar to the 1993 cell-as-molecule approach, with calculated 26-element human molecular formula, is a newly emerging definitional position of a human, employed in ecological stoichiometry (*Ecological Stoichiometry*, 2002) and thermodynamics *(Advanced Engineering Thermodynamics*), and that the human molecule perspective has a long history in social mechanics and social mechanism theories. [2]

Shown adjacent, to given an idea of the comparison of people to smaller atoms and molecules, is a color accentuated comparison of molecular sociology to Macionis' 2008 *Sociology* textbook. [3]

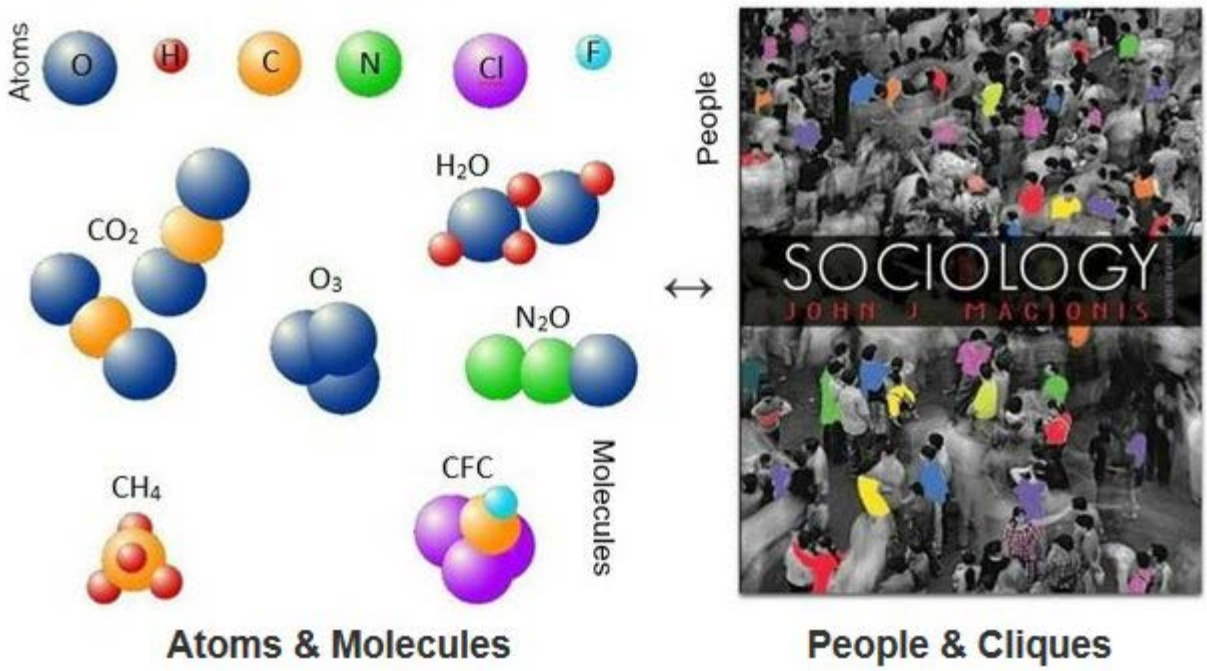

A visual rendition of the "**human molecular engineering**" (molecular sociology + engineering, pure and applied), based on the new 21st century thermodynamics textbook 26-element "molecular formula" or human molecule definition of a human (see: HMS pioneers), the extrapolate up principle, and the "there is, after all, only one nature" Goethean philosophy viewpoint (see: Goethe's advertisement). [5]

For whatever puzzling reason, while chemistry, physics, and thermodynamics based social mechanics and social mechanism theories of sociology were in the mid to early 20th century considered the "fundamental forms" (Werner Stark, 1962) and or "contemporary sociology" (Pitirim Sorokin, 1932), the teaching of these subjects have completely disappeared from the modern 21st century school of American sociology? American sociologist Leon Warshay has recently given some commentary as to why this has occurred.

References

1. Macionis, John. (2008). *Sociology: A Global Introduction* (molecules, pgs. 54-55). Pearson Education Limited.
2. (a) Sterner, Robert W. and Elser, James J. (2002). *Ecological Stoichiometry: the Biology of Elements from Molecules to the Biosphere* (chapter one) (human molecule, empirical formula pg. 3; discussion, pgs. 47, 135). Princeton University Press.
(b) Annamalai, Kalyan, Puri, Ishwar K., and Jog, Milind A. (2011). *Advanced Thermodynamics Engineering* (§14: Thermodynamics and Biological Systems, pgs. 709-99, contributed by Kalyan Annamalai and Carlos Silva; §14.4.1: Human body | Formulae, pgs. 726-27; Thims, ref. 88). CRC Press.
3. Macionis, John. (2007). *Sociology*. Publisher.

External links

â— John J. Macionis (faculty) – Kenyon College, Ohio.
â— Sociology – Macionis.com.
â— Macionis, John J. – WorldCat Identities.

θΔics

In existographies, **John Mayow** (1641-1679) (Partington 50:25) (CR:3) was an English chemist, physician, and physiologist, noted for []

Overview

In 1666, Mayow, in his *de Respiratione*, reported on experiments he had done with candles burning and mice breathing in sealed containers to calculate how "nitro-aerial" (oxygen) a mouse breaths, in respect to volume change. (O)

In 1674, Mayow introduced some type of chemical theory the phenomena of chemical combination depend upon peculiar attractions, which exist between the minute particles of different bodies

In 1937, James Partington, in his *Short History of Chemistry*, stated that some classify Mayow's chemical attraction theory, along with the theories of Étienne Geoffroy (1718), and Torbern Bergman (1775), as the "old theory" of chemical affinity or elective affinity. [1]

Quotes | On

The following are quotes on Geoffroy:

> "The suggestion by **Mayow** and by Newton, that the phenomena of chemical combination depend upon peculiar attractions, which exist between the minute particles of different bodies, ought perhaps to be regarded as the first successful attempt to lay the foundation of chemistry as a science, and to distinguish it from the other branches of natural philosophy. The attention given to chemistry by some of the more distinguished members of the Academy of Sciences at Paris, the delivery of lectures on this subject in the French language by the elder Lemery; the curious experiments of Homberg on phosphorus, metals and salts; the discovery of the remarkable effects produced upon various bodies by the burning glass; and the ingenious method conceived by Geoffroy of framing tables, which should exhibit the relative degrees of chemical affinity between different substances,—had all contributed to render the pursuits of chemistry more generally popular in France than they appear to have been at the same period in any other country of Europe."
>
> — John Thomson (1832), *An Account of the Life, Lectures and Writings of William Cullen, Volume One* (pg. 36) [2]

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External links

- John Mayow – Wikipedia.

θΔics

In hmolscience, **John Milfull** (1940-) is an Australian German literature scholar noted for his 1970s work on decoding Goethe's *Elective Affinities*.

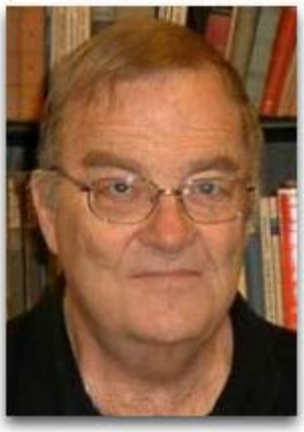

Overview

In 1971, Milfull, in his "The Function of the Novelle 'Die Wunderlichen Nachbarskinder' in Goethe's *die Wahlverwandtschaften*", gave commentary on the novel-within-novel "The Quaint Neighborhood Children" of P2:C10 of *Elective Affinities*. [1]

In 1972, Milfull, in his "The 'Idea' of Goethe's Wahlverwandtschaften", supposedly, gives some type of digression on the "chemical analogy" of *Elective Affinities*, as Judith Ryan (1982) puts it. [1]

Milfull notes, e.g., how in May 1827, Goethe told Eckermann that he had based his *Elective Affinities* on a "thoroughgoing idea" ("durchgreifende Idee"), which determined the structure of the whole work. Milfull also asserts that this "idea" was never explicitly stated, but is somewhat found in the laconic statement reported to Riemer that:

> "The idea for my new novel is to depict social relations and their conflicts symbolically."

> "Seine Idee be idem neuen Roman sei, sociale Verhältnisse und die Conflicte derselben symbolische gefaßt darzustellen."

Here, of course, the mention of "symbolically" is a reference to Bergman symbols: Bergman reaction diagrams, Bergman chemical signs explained, Bergman affinity table.

Milfull comments that in a conversation with August Ruhle (1780-1840) (Ñº)(Ñº), noted associate of Carl Clausewitz (Ñº), Goethe remarked that he had received "the first suggestion of the 'elective affinities' from Schelling" ("die erste Anregung zu den *Wahlverwandtschaften* durch Schelling"), or something along these lines; which Milfull reports as "an obvious reference to their combined study of chemistry in the late 1790s.

Education

In 1961, Milfull completed his BA in German and his PhD in 1968 in German both at the University of Sydney. (Ñº) In 2003, Milfull was director the Center for European Studies at the University of South Wales. Currently, he is professor emeritus of German, of the University of South Wales.

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θΔics

In existographies, **John Stuart Mill** (1806-1873) (IQ:185|#74) (Cattell 1000:180) [RGM:144|1,330+] (Perry 80:6|Li) [HD:24] (FA:80) was an English child prodigy turned moral philosopher and political economist noted for his 1842 chemical emergent properties arguments and for his latter efforts to amalgam a justice + utility model of natural morality.

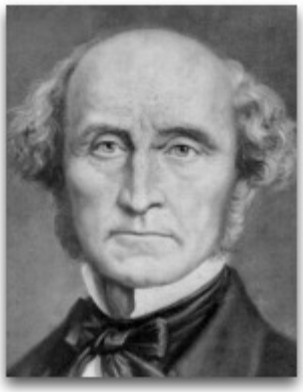

Theism | Deism | Atheism

Mill's father James Mill had rejected revealed religion as contrary to reason, and after much thought found "no halting place in deism", but for some time remained in a state of perplexity, until concluding that nothing could be known about the origin of things; this has been described thusly:

> "My father's religion was of the same kind with that of Lucretius: he regarded it with the feelings due not to mere mental delusion, but to a great moral evil. His standard of morals were Epicurean, inasmuch as it was utilitarian, taking as exclusive text of right and wrong, the tendency of actions to produce pleasure or pain."
>
> — John Mill (1873), *Autobiography* [8]

> "I am one of the very few examples in this country, of one who has not thrown off religious belief, but never had it. I grew up in a negative state with regard to it. I looked upon the modern [religion] exactly as I did upon the ancient religion, as something which in no way concerned me."
>
> — John Mill (1873), *Autobiography* [8]

Mill declared his atheism, and that of his father, in a famous essay published posthumously. [7]

Nature | Utility | Religion

In the 1850s, Mill penned three essays on nature, utility, and religions: "Nature" (c.1852), "Utility of Religion" (c.1858), and "Theism" (c.1869), wherein, according to Francis Edgeworth (1881), he, supposedly, gives the dimly discerned notion of a "divine idea of a power tending to the greatest possible quantity of happiness", or something along these lines. [6]

Utilitarianism | Justice + Utility

In the 1850s, following the publication of his influential *Principles of Political Economy* (1848), Mill penned two essays entitled "Justice" and "Utility", which were then incorporated with some alterations and additions into his 1861 *Utilitarianism*, wherein he expanded on English jurist and philosopher Jeremy Bentham's 1789 'utilitarianism' system of morality.

> "There are few circumstances among those which make up the present condition of human knowledge, more unlike what might have been expected, or more significant of the backward state in which speculation on the most important subjects still lingers, than the little progress which has been made in the decision of the controversy respecting the criterion of right and wrong."
>
> — John Mill (1861), *Utilitarianism* (pg. 1)

(add summary)

Emergence | Chemical properties

In 1842, Mill, in his *System of Logic*, at some point, according to American anthropological neuroscientist Terrence

Deacon, outlined the "first attempt to describe emergence", supposedly, by giving an account of chemical properties of chemical compounds, e.g. salt, and as distinguished from those of their component elements, e.g. sodium and chlorine.

Mill, according to Deacon, gives the idea of a chemical reaction phenomenon of producing so-called table salt (needed for life) by the contact of two toxic and dangerous substances, chlorine gas and sodium metal, in some way, could be the combinatorial logic that produced life from mere chemistry. [1] This interpretation by Deacon, to note, my be elaborated adumbration, being that although Mill does, in his *System of Logic*, mention salt in the context of acid alkali reactions, the above "emergence" re-interpretation is difficult to find, being that Mill does not use this term. [4]

English philosopher George Lewes 1875 ideas on “emergence”, supposedly, were influenced by Mill. [2]

Natural morality

See main: Natural morality

In 1852, Mill, in his "Nature" essay, stated the following on Alexander Pope's 1734 *An Essay of Man* moral poetry work: [5]

> “For how stands the fact? That, next to the greatness of these cosmic forces, the quality which most forcibly strikes everyone who does not avert his eyes from it is their perfect and absolute recklessness. They go straight to their end without regarding what or whom they crush on the road. Optimists, in their attempts to prove that **‘whatever is, is right,’** are obliged to maintain, not that nature ever turns one step from her path to avoid trampling us into destruction, but that it would be very unreasonable in us to expect that she should. Pope's **‘Shall gravitation cease when you go by?’** may be a just rebuke to anyone who should be so silly as to expect common human morality from nature. But if the question were between two men, instead of between a man and a natural phenomenon, that triumphant apostrophe would be thought a rare piece of impudence. A man who should persist in hurling stones or firing cannon when another man 'goes by,' and, having killed him, should urge a similar plea in exculpation, would very deservedly be found guilty of murder. In sober truth, nearly all the things which men are hanged or imprisoned for doing to one another are nature's every-day performances.”

The "slave stealing parable" of Zeno of Citium seems to come to mind here.

Genius rankings

Mill is the classical example of a "parentally-created genius" or forced prodigy. He was the eldest son of the Scottish philosopher, historian, and economist James Mill and Harriet Burrow, and was educated by his father, with the advice and assistance of Jeremy Bentham (also a former child prodigy) and Francis Place. He was given an extremely rigorous upbringing, and was deliberately shielded from association with children his own age other than his siblings. His father, a follower of Bentham and an adherent of associationism, had as his explicit aim to create a genius intellect that would carry on the cause of utilitarianism and its implementation after he and Bentham had died.

He learned Greek at 3; wrote a treatise on the history of Rome at 6; reading Plato, etc. at 7; Latin, geometry, and algebra at 8; conic sections, spherical section, and Newtonian arithmetic; chemistry age 13 at the Royal Military College; at 14, chemistry, zoology, metaphysics, and logic at Montpellier University; law at 16 under John Austin.

Mill is a top six Cox-Buzan genius; he is one of the fabled "last persons to know everything"; he is also, supposedly, a split-brainer who “could write Greek with his left hand while writing Latin with his right.” [3]

Education

Mill is one of the rare "successful" breeds of forced prodigy; he recounts, in his *Autobiography* (1873), his early education as follows: (Ñº)

“I have no remembrance of the time when I began to learn Greek. I have been told that it was when I was three years old. My earliest recollection on the subject, is that of committing to memory what my father termed Vocables, being lists of common Greek words, with their signification in English, which he wrote out for me on cards. Of grammar, until some years later, I learnt no more than the inflexions of the nouns and verbs, but, after a course of vocables, proceeded at once to translation; and I faintly remember going through AEsop's Fables, the first Greek book which I read. The Anabasis, which I remember better, was the second. I learnt no Latin until my eighth year. At that time I had read, under my father's tuition, a number of Greek prose authors, among whom I remember the whole of Herodotus, and of Xenophon's Cyropaedia and Memorials of Socrates; some of the lives of the philosophers by Diogenes Laertius; part of Lucian, and Isocrates' ad Demonicum and ad Nicoclem. I also read, in 1813, the first six dialogues (in the common arrangement) of Plato, from the Euthyphron to the Theaetetus inclusive: which last dialogue, I venture to think, would have been better omitted, as it was totally impossible I should understand it. But my father, in all his teaching, demanded of me not only the utmost that I could do, but much that I could by no possibility have done. What he was himself willing to undergo for the sake of my instruction, may be judged from the fact, that I went through the whole process of preparing my Greek lessons in the same room and at the same table at which he was writing: and as in those days Greek and English lexicons were not, and I could make no more use of a Greek and Latin lexicon than could be made without having yet begun to learn Latin, I was forced to have recourse to him for the meaning of every word which I did not know. This incessant interruption, he, one of the most impatient of men, submitted to, and wrote under that interruption several volumes of his History and all else that he had to write during those years.

The only thing besides Greek, that I learnt as a lesson in this part of my childhood, was arithmetic: this also my father taught me: it was the task of the evenings, and I well remember its disagreeableness. But the lessons were only a part of the daily instruction I received. Much of it consisted in the books I read by myself, and my father's discourses to me, chiefly during our walks. From 1810 to the end of 1813 we were living in Newington Green, then an almost rustic neighbourhood. My father's health required considerable and constant exercise, and he walked habitually before breakfast, generally in the green lanes towards Hornsey. In these walks I always accompanied him, and with my earliest recollections of green fields and wild flowers, is mingled that of the account I gave him daily of what I had read the day before. To the best of my remembrance, this was a voluntary rather than a prescribed exercise. I made notes on slips of paper while reading, and from these, in the morning walks, I told the story to him; for the books were chiefly histories, of which I read in this manner a great number: Robertson's histories, Hume, Gibbon; but my greatest delight, then and for long afterwards, was Watson's Philip the Second and Third. The heroic defence of the Knights of Malta against the Turks, and of the revolted provinces of the Netherlands against Spain, exited in me an intense and lasting interest. Next to Watson, my favourite historical reading was Hooke's History of Rome. Of Greece I had seen at that time no regular history, except school abridgments and the first two or three volumes of a translation of Rollin's Ancient History, beginning with Philip of Macedon. But I read with great delight Langhorne's translation of Plutarch. In English history, beyond the time at which Hume leaves off, I remember reading Burnet's History of his Own Time, though I cared little for anything in it except the wars and battles; and the historical part of the Annual Register, from the beginning to about 1788, when the volumes my father borrowed for me from Mr Bentham left off. I felt a lively interest in Frederic of Prussia during his difficulties, and in Paoli, the Corsican patriot; but when I came to the American war, I took my part, like a child as I was (until set right by my father) on the wrong side, because it was called the English side. In these frequent talks about the books I read, he used, as opportunity offered, to give me explanations and ideas respecting civilization, government, morality, mental cultivation, which he required me afterwards to restate to him in my own words. He also made me read, and give him a verbal account of, many books which would not have interested me sufficiently to induce me to read them of myself: among others, Millar's Historical View of the English Government, a book of great merit for its time, and which he highly valued; Mosheim's Ecclesiastical History, McCrie's Life of John Knox, and even Sewel's and Rutty's Histories of the Quakers. He was fond of putting into my hands books which exhibited men of energy and resource in unusual circumstances, struggling against difficulties and overcoming them: of such works I remember Beaver's African Memoranda, and Collins's account of the first settlement of New South Wales. Two books which I never wearied of reading were

Anson's Voyage, so delightful to most young persons, and a Collection (Hawkesworth's, I believe) of Voyages round the World, in four volumes, beginning with Drake and ending with Cook and Bougainville. Of children's books, any more than of playthings, I had scarcely any, except an occasional gift from a relation or acquaintance: among those I had, Robinson Crusoe was preeminent, and continued to delight me through all my boyhood. It was no part however of my father's system to exclude books of amusement, though he allowed them very sparingly. Of such books he possessed at that time next to none, but he borrowed several for me; those which I remember are the Arabian Nights, Cazotte's Arabian Tales, Don Quixote, Miss Edgeworth's "Popular Tales," and a book of some reputation in its day, Brooke's Fool of Quality.

In my eighth year I commenced learning Latin, in conjunction with a younger sister, to whom I taught it as I went on, and who afterwards repeated the lessons to my father: and from this time, other sisters and brothers being successively added as pupils, a considerable part of my day's work consisted of this preparatory teaching. It was a part which I greatly disliked; the more so, as I was held responsible for the lessons of my pupils, in almost as full a sense as for my own: I however derived from this discipline the great advantage of learning more thoroughly and retaining more lastingly the things which I was set to teach: perhaps, too, the practice it afforded in explaining difficulties to others, may even at that age have been useful. In other respects, the experience of my boyhood is not favourable to the plan of teaching children by means of one another. The teaching, I am sure, is very inefficient as teaching, and I well knew that the relation between teacher and taught is not a good moral discipline to either. I went in this manner through the Latin grammar, and a considerable part of Cornelius Nepos and Caesar's Commentaries, but afterwards added to the superintendence of these lessons, much longer ones of my own.

In the same year in which I began Latin, I made my first commencement in the Greek poet with the Iliad. After I had made some progress in this, my father put Pope's translation into my hands. It was the first English verse I had cared to read, and it became one of the books in which for many years I most delighted: I think I must have read it from twenty to thirty times through. I should not have thought it worth while to mention a taste apparently so natural to boyhood, if I had not, as I think, observed that the keen enjoyment of this brilliant specimen of narrative and versification is not so universal with boys, as I should have expected both a priori and from my individual experience. Soon after this time I commenced Euclid, and somewhat later, algebra, still under my father's tuition.

From my eighth to my twelfth year the Latin books which I remember reading were, the *Bucolics* of Virgil, and the first six books of the *Aeneid*; all Horace except the Epodes; the *Fables of Phaedrus*; the first five books of Livy (to which from my love of the subject I voluntarily added, in my hours of leisure, the remainder of the first decade); all *Sallust*; a considerable part of Ovid's *Metamorphoses*; some plays of Terence; two or three books of Lucretius; several of the *Orations* of Cicero, and of his writings on oratory; also his letters to Atticus, my father taking the trouble to translate to me from the French the historical explanations in Mongault's notes. In Greek I read the *Iliad* and *Odyssey* through; one or two plays of Sophocles, Euripides, and Aristophanes, though by these I profited little; all Thucydides; the Hellenics of Xenophon; a great part of Demosthenes, AEschines, and Lysias; Theocritus; Anacreon; part of the Anthology; a little of Dionysius; several books of Polybius; and lastly Aristotle's *Rhetoric*, which, as the first expressly scientific treatise on any moral or psychological subject which I had read, and containing many of the best observations of the ancients on human nature and life, my father made me study with peculiar care, and throw the matter of it into synoptic tables. During the same years I learnt elementary geometry and algebra thoroughly, the differential calculus and other portions of the higher mathematics far from thoroughly: for my father, not having kept up this part of his early acquired knowledge, could not spare time to qualify himself for removing my difficulties, and left me to deal with them, with little other aid than that of books; while I was continually incurring his displeasure by my inability to solve difficult problems for which he did not see that I had not the necessary previous knowledge.

As to my private reading, I can only speak of what I remember. History continued to be my strongest predilection, and most of all ancient history. Mitford's Greece I read continually; my father had put me on my guard against the Tory prejudices of this writer, and his perversions of facts for the white-washing of

despot, and blackening of popular institutions. These points he discoursed on, exemplifying them from the Greek orators and historians, with such effect that in reading Mitford my sympathies were always on the contrary side to those of the author, and I could, to some extent, have argued the point against him: yet this did not diminish the ever new pleasure with which I read the book. Roman history, both in my old favourite, Hooke, and in Ferguson, continued to delight me. A book which, in spite of what is called the dryness of its style, I took great pleasure in, was the Ancient Universal History, through the incessant reading of which I had my head full of historical details concerning the obscurest ancient people, while about modern history, except detached passages, such as the Dutch war of independence, I knew and cared comparatively little. A voluntary exercise, to which throughout my boyhood I was much addicted, was what I called writing histories. I successively imposed a Roman history, picked out of Hooke; an abridgment of the Ancient Universal History; a History of Holland, from my favourite Watson and from an anonymous compilation; and in my eleventh and twelfth year I occupied myself with writing what I flattered myself was something serious. This was no less than a history of the Roman Government, compiled (with the assistance of Hooke) from Livy and Dionysius: of which I wrote as much as would have made an octavo volume, extending to the epoch of the Licinian Laws. It was, in fact, an account of the struggles between the patricians and plebeians, which now engrossed all the interest in my mind which I had previously felt in the mere wars and conquest of the Romans. I discussed all the institutional point as they arose: though quite ignorant of Niebuhr's researches, I, by such lights as my father had given me, vindicated the Agrarian Laws on the evidence of Livy, and upheld to the best of my ability the Roman democratic party. A few years later, in my contempt of my childish efforts, I destroyed all these papers, not then anticipating that I could ever feel any curiosity about my first attempt at writing and reasoning. My father encouraged me in this useful amusement, though, as I think judiciously, he never asked to see what I wrote; so that I did not feel that in writing it I was accountable to any one, nor had the chilling sensation of being under a critical eye."

(add)

Quotes | By

The following are quotes by Mill:

> "The amount of eccentricity in a society has generally been proportional to the amount of genius, mental vigor, and moral courage it contained. That so few now dare to be eccentric marks the chief danger of the time."
>
> — John Mill (c.1860), Ranker (Ñº) best quote (#2)

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External links

â— John Stuart Mill – Wikipedia.

θΔics

In existographies, **John Milton** (1608-1674) (IQ:180|#111) [RGM:330|1,250+] (Cattell 1000:16) (CR:24) was an English poet, polemicist, fabled "last persons to know everything", and GLAE candidate, generally known for []

Overview

In 1667, Milton, in his epic poem *Paradise Lost*, digressed on the biblical story of the "fall of man", i.e. the temptation of Adam and Eve by the fallen angel Satan and their expulsion from the Garden of Eden.

Other

In 1999, Forbes Allan, in his literature thermodynamics novel *Milton's Progress*, a supposed play on Milton's *Paradise Lost*, presents a conversation between a character named John and a Dr. Snipe, along with references to a "Ilya Meiliakin", a play on Ilya Prigogine, noted for his 1970s dissipative structure theory, and Robert Millikan, noted for his 1909 oil drop experiment (Ñº), concerning human life, which is described as "the most effective multiplier of *entropic decay* in the universe", and man's quest to understand his function in the scheme of things: [1]

> "It's just human thermodynamics, my friend," John said stiffly, "you're inside the jaws of laws beyond your ken." That's an acer poem, he decided, which nicely sums up the plight of humankind and the worthlessness of being. "Maybe I've stumbled upon a new law of physics!" it flashed on him suddenly: "— that life-driven anti-entropic processes are an integral component of all the second law activities and provide an engine with which to accelerate the overall degradation of energy into heat! … Or would that be a 'fourth' law of thermodynamics? …"

(add)

Quotes | On

The following are quotes on Milton:

> "How little the dialectic of the idea of plenitude determined **Milton**'s scheme of things is most clearly shown by his adoption of the doctrine of Jerome and of Origen — which Thomas Aquinas and Dante had expressly rejected."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pg. 165)

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External links

â— John Milton – Wikipedia.

θΔics

In existographies, **John Napier** (1550-1617) (IQ:170|#401) (Cattell 1000:172) (Eells 100:18) (CR:4) was a British landowner, mathematician, physicist, and astronomer; generally know as the "inventor of the logarithms" (c.1594), which he described in his *A Description of Logarithm Tables* (1614).

Quotes | On

The following are quotes on Napier:

> "**John Napier**, strict Protestant and Scottish laird, invented logarithms about 1594 and published his table in 1614. Henry Briggs (1561-1630), friend and disciple of Napier and first professor of mathematics at Gresham College, set them upon a base of 10. The logarithm of a given number is the number of times the base must be multiplied by itself to raise it to the given number. Thus 3 is the logarithm of 1,000 (10 X 10 x 10) in the common or Briggs system. William Oughtred (1574-1660), clergyman in the English Church, a "pittyful preacher" but very much of a mathematician, applied logarithms about 1622 to the invention of a mechanically crude slide rule, making it possible by mechanical addition and subtraction to multiply and divide. Oughtred also taught Christopher Wren, architect of St. Paul's, and wrote books which Isaac Newton studied."
>
> — Richard Kirby (1956), *Engineering in History* [1]

References

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External links

â— John Napier – Wikipedia.

θΔics

In existographies, **John Nash** (1928-2015) (IQ:180|#165) [RGM:324|1,500+] (YCG:32) (DN:7) (CR:29) was an American mathematician and economist, characterized, at age 19, a "mathematical genius" (Duffin, 1947), a 2014 smartest person existive (#6) (O), noted, for doing work in economic thermodynamics, stemming, supposedly, from or found somewhere in his PhD dissertation (Mansoori, 2010). [1]

Overview

American chemical physics historian turned science writer Tom Siegfried, in his 2006 *A Beautiful Math*, devotes a certain amount of effort to stitching thermodynamic connections between the work of Nash, John Neumann, and Oskar Morgenstern—the following being one noted excerpt: [2]

> "In a chemical reaction, all the atoms involved are seeking a stable arrangement, possessing a minimum amount of energy. It's because of the laws of thermodynamics. And just as in a chemical reaction all the atoms are simultaneously seeking a state with a minimum energy, in an economy all the people are seeking to maximize their utility. A chemical reaction reaches an equilibrium enforced by the laws of thermodynamics; an economy should reach a Nash equilibrium dictated by game theory."

Nash (1994) is one of the noted hmolscience Nobel Prize in economics recipients, along with: Jan Tinbergen (1969), Paul Samuelson (1970), Tjalling Koopmans (1975), Robert Fogel (1993), and Thomas Schelling (2005). [3]

Education

The education of Nash, as summarized by Tom Siegfried, is as follows: [2]

> "Nash alluded to the statistical interactions of reacting molecules in his derivation of the Nash equilibrium. Nash, after all, studied chemical engineering and chemistry at Carnegie Tech before becoming a math major, and his dissertation at Princeton drew on the chemical concept of 'mass action' in explaining Nash equilibrium."

Nash earned a doctorate at Princeton in 1950 with a 28-page dissertation on "Non-Cooperative Games", written under the supervision of doctoral advisor Albert W. Tucker, based partially on John Neumann and Oskar Morgenstern's *Theory of Games and Economic Behavior* (1944), which contains the definition and properties of what would later be called the "Nash equilibrium", a crucial concept that later won Nash the Nobel prize in economics in 1994. [4] The following is a noted quote from *Theory of Games and Economic Behavior*: [5]

> "In order to elucidate the conceptions which we are applying to economics, we have given and may give again some illustrations from physics. There are many social scientists who object to the drawing of such parallels on the grounds, among which is generally found the assertion that economic theory cannot be modeled after physics science it is a science of social, of human phenomena, has to take psychology into account, etc. Such statements are at least premature."

(add)

Other

The 2001 film *A Beautiful Mind*, is based on the existence reaction of John Nash, in which the following fictionalized equation of love quote is made:

> "I've always believed in numbers. In the equations and logics that lead to reason; but after a lifetime of such pursuits I ask, what truly is logic? Who decides reason? My quest has take me through the physical, the metaphysical, the delusional and back, and I have made the most important discovery of my career... the most important discovery of my life. It is only in the mysterious **equations of love** that any logical reasons can be found. I'm only here tonight because of you. You are the only reason I am... you are all my reasons."

This is a quote from John Nash's fictional Nobel Prize speech. In actual fact, however, Nash was never asked to speak upon his acceptance of the 1994 Nobel Prize in economics. The film depiction, nevertheless, made the culture rounds that the film was based on someone who in reality had developed a love equation.

Quotes | On

The following are quotes on Nash:

> "This is to recommend **Mr. John F. Nash, Jr**. who has applied for entrance to the graduate college at Princeton. Mr. Nash is nineteen years old and is graduating from Carnegie Tech in June. He is a mathematical genius."
>
> — Richard Duffin (1947), "Graduate School Recommendation Letter" (Q)

Quotes | By

The following are quotes by Nash:

> "[A] non-Zoroastrian could think of Zarathustra as simply a madman who led millions of naive followers to adopt a cult of ritual fire worship. But without his "madness" Zarathustra would necessarily have been only another of the millions or billions of human individuals who have lived and then been forgotten."
>
> — John Nash (1994), Nobel Prize speech (Q)

> "I liked to think of myself as a genius, but I later on realized it's sort of meaningless. You are using a popular word. You could think of whether it is good to work in mathematics at all? In mathematics there are some good achievements that can be made, and if you are successful you will be recognized. I think of myself now as an enlightened philosopher."
>
> — John Nash (c.2010), short film (Q) documentary

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External links

- John Nash – Wikipedia.

θΔics

In existographies, **John von Neumann** (1903-1957) (IQ:190|#40) [RGM:234|1,500+] (Gottlieb 1000:959) (Becker 160:142) (Odueny 100:54) (RE:53) [CR:219], born “Janos” (anglicized to John), called the diminutive "Jancsi" in Hungary, which became “Johnny” in America, the "von" title purchased by his Father in 1913, was a Hungarian-born American mathematician, chemical engineer, economist, physicist, and computer scientist, a distinguished polymath, magnitude genius (see: genius), and "last" known of the supposed dying bread of "last universal geniuses" (see: hydraism), noted for his work in quantum thermodynamics (1927, 1932), human free energy theory of economic thermodynamics (1934-1944), for his ill-fated 1940 suggestion to American electrical engineer Claude Shannon to call information by the name “entropy” as in "information entropy" (see: Neumann-Shannon anecdote), for his computer system architecture designs (von Neumann architecture, 1945), and for his ideas on automaton self-assembly (see: Neumann automaton) (1948,1951), and for his work in computer science thermodynamics (1949). [1]

Quantum thermodynamics

See main: Quantum thermodynamics

In 1927, Neumann published "Thermodynamics of Quantum Mechanical Assemblies", in which he extended Austrian physicist Ludwig Boltzmann’s notion of entropy to quantum systems. [9] This was later expanded into his 1932 book *Mathematical Foundations of Quantum Mechanics*, wherein he included the earlier 1922 work of his friend Hungarian physicist Leo Szilard on Maxwell's demon and the newly conceived uncertainty principle conceived in 1927 by Werner Heisenberg. [10]

Game theory

In 1928, Neumann published “On the Theory of Games” in which he set out to answer the following question: [24]

> “n players, S_1, S_2, … S_n, are playing a given game of strategy. How must one of the participants, S_m, play in order to achieve a most advantageous result?”

In the decades to follow, Neumann would go onto attempt to incorporate game theory into economics intermixed with thermodynamics.

Economics

In 1932, Neumann read his “A Model of General Economic Equilibrium”, in the winter at the mathematical seminar of Princeton University, in which derives a function φ (X, Y) related to the production of goods, based on the model of thermodynamic potentials, which he abstracts as follows: [6]

> “A direct interpretation of the function Φ(X,Y) would be highly desirable. Its role appears to be similar to that of thermodynamic potentials in phenomenological thermodynamics; it can be surmised that the similarity will persist in its full phenomenological generality (independent of our restrictive idealisations).”

Because of this paper, it is often said that Neumann was one of the first to apply the classical thermodynamic approach to economics; though, of course, the subject dates back much earlier. On this publication, American economist Paul Samuelson, in his review, comments: [29]

> “Of the attempts to find analogies between thermodynamics and economies there is alas no end. But the mathematical genius John von Neumann has earned the right to command our investigation when he suggests that his growth model (1945; earlier 1932 and 1937) defines a function:

$$\text{Value of Inputs}_t \,/\, \text{Value of Outputs}_{t+1} = \sum in \sum jm PiAijXj / \sum in \sum jm PiBijXj = \ddot{I}\bullet(P,X)$$

> whose "role seems to be similar to that of thermodynamic potentials in phenomenological thermodynamics." (1945, p.1)

In 1934, Abraham Flexner, the director of the Institute for Advanced Study at Princeton, sent Georges Guillaume's economic thermodynamics PhD dissertation (turned book) *On the Fundamentals of the Economy with Rational Forecasting Techniques*—in which, critical of the Lausanne school, he applies the formalisms of thermodynamics to the theory of value—to Neumann to read. After reading the book, a month latter, Neumann commented back: [25]

> "I think that the basic intention of the authors, to analyze the economic world, by constructing an analogous fictitious 'model', which is sufficiently simplified, so as to allows an absolutely mathematical treatment, is —although not new—sound, and in the spirit of exact sciences. I do not think, however, that the authors have a sufficient amount of mathematical routine and technique, to carry out program out.
>
> I have the impression that the subject is not yet ripe (I mean that it is not yet fully enough understood, which of its features are the essential ones) to be reduced to a small number of fundamental postulates—like geometry, or mechanics (cf. pgs. 77-78). The analogies with thermodynamics are probably misleading (cf. pgs. 69, 85). The authors think that the 'amortization' is analogous to 'entropy'. It seems to me, that if this analogy can be worked out at all, the analogon of 'entropy' must be sought in the direction of 'liquidity'. To be more specific: if the analogon of 'energy' is 'value' of the estate of an economical subject, then analogon of its thermodynamic 'free energy' should be its 'cash value'.

Thermodynamic variable	Economic analogon
Energy	Value (estate of an economical subject)
Entropy	Liquidity
Free energy	Cash value

Neumann's 1934 human thermodynamics variables table, based on his review of Georges Guillaume's 1934 *On the Fundamentals of the Economy with Rational Forecasting Techniques*. [25]

> The technique of the authors to set up and deal with equations is rather primitive, the way, for instance, in which they discuss the fundamental equations (1) and (2) on page 81-85 is incomplete, as they omit to prove that 1: the resulting prices are all positive (or zero), 2: that there is only one such solution. A correct treatment of this particular question, however, exists in the literature. Various other technical details in the setting up of their equations and in their interpretations could be criticized, too. I do not think that their discussion of the 'stability of solutions', which is the only satisfactory way to build up a mathematical theory of economic cycles and of crises, is mathematically satisfactory.
>
> The emphasis the authors put on the possibility of states of equilibrium in economics (cf. pgs. 68-69) seems to me to entirely justified. I think that the importance of this point has not always been duly acknowledged. I cannot judge the value of their statistical methods, as they are given in the last part of the book for practical purposes. Their aim is to diagnose the present status of economics, and to lead to forecasts. But I think that the theoretical deduction, which lead to them is weak and incomplete."

This incident is recounted in greater detail by Canadian economics historian Robert Leonard's 1995 article "From Parlor Games to Social Science". In this article, Leonard summarizes that Guillaume's book is an effort to construct a mathematical economics in the manner of Leon Walrus and Vilfredo Pareto, treating not just exchange but also global production, along the way drawing parallels between economics and physics. [4]

Game theory biographers Giorgio Israel and Ana Gasca, to note, give their opinion on the above passage that "here there is no outright rejection of the attempt to construct concepts similar to physics", and go on to give the rather dubious statement that "Neumann was later to claim that a worthwhile foundation of mathematical economics should be based on the rejection of mechanical and physical reductionism and on the creation of a new kind of mathematics better suited to the specific nature of socio-economic phenomena." [28] The assertion here that Neumann in later years became anti-reductionist in view, contradicts his 1938 basing of economics on thermodynamic potentials, his 1948 floating parts automaton theory, and his 1956 mind as computer treatise.

American physicist and econophysicist Joseph McCauley comments the following on Neumann here: [26]

> "Attempts at neo-classical equilibrium economic analogies with thermodynamics go back to Guilluame and Samuelson. Von Neumann apparently believed that thermodynamic formalism could potentially be useful in computer theory, for formulating a description of intelligence, and was interested in the possibility of a thermodynamics of economics. But presented with Guillaume's work, he criticized it on the basis of the misidentification of a quantity as entropy."

In 1944, Neumann, together with German-born Austrian economist Oskar Morgenstern, publishes *Theory of Games and Economic Behavior*, in which they employ physics models and discuss physics (26+ pages), the theory of heat (6+ pages), and thermodynamics on one page. [24] As American science writer Tom Siegfried summarizes: [15]

> "In drawing analogies between economics and physics, von Neumann and Morgenstern talked a lot about the theory of heat."

The one page where the term thermodynamics is an effort to speculate on a type of utility thermometer:

> "Given a physical quantity, the system of transformations up to which it is described by numbers may vary in time, i.e. with the stage of development of the subject. Thus temperature was originally a number only up to any monotone transformation. With the development of thermometry particularly of the concordant ideal gas thermometry the transformations were restricted to the linear ones, i.e. only the absolute zero and the absolute unit were missing. Subsequent developments of thermodynamics even fixed the absolute zero so that the transformation system in thermodynamics consists only of the multiplication by constants. Examples could be multiplied but there seems to be no need to go into this subject further. For utility the situation seems to be of a similar nature."

This quote, comparing temperature measurement with utility, to note, seems to be a rehash of Henri Poincare's circa 1807 commentary to Leon Walras about the possibility of measuring satisfaction, as found in Walras' 1909 "Economics and Mechanics" or Francis Edgeworth's 1915 "Recent Contributions to Mathematical Economics". [27] As Morgenstern was a Edgeworth aficionado, this add possibly could have come from him.

The majority of mentions of "heat" in the book revolve around using it as a comparative example to help elucidate the objects raised about utility not being a measurable quantity.

Information theory | Entropy

> *See main: Neumann-Shannon anecdote; Information theory*

Left: Neumann (age 25) in 1928. [16]. Center: Neumann in 1948. Right: Neumann at Princeton. [16]

In 1940, Neumann suggested the idea to American electrical engineer Claude Shannon that he should call his new equation for the transmission of information by the namesake "entropy" (instead of either *uncertainty* or *information*, which Shannon was leaning towards), since, according to Neumann, Shannon's logarithm equation had the same mathematical form or isomorphism form to both his equation for quantum entropy and his associated Hungarian physicist Leo Szilard's equation for Maxwell's demon mental entropy generation, after which in 1945 Shannon began to adopt the view that "information is negative entropy". Likewise, sometime between 1937 and 1947, Neumann also consulted American mathematician Norbert Wiener about his information communication equations, after which in 1945, Wiener began to tout the view that "information is entropy". The result, in the centuries to follow, has been the adoption of the misaligned viewpoint, by many, that information theory is the backbone of thermodynamics, which is not the case. [11]

Automaton free energy theory

See main: Neumann automaton theory

In a 1948 Hixton Symposium, organized by American chemical engineer Linus Pauling, Neumann invented a famous thought experiment which illustrates the role which free energy plays in creating statistically unlikely configurations of matter. Neumann imagined a robot or automaton, made of wires, electrical motors, batteries, etc., constructed in such a way that when floating on a lake stoked with component parts, it will reproduce itself (self-replicate). [2] The important point about Neumann's automaton, however, is that it would require a source of free energy in order to function. [1] Neumann gave an outline of his theory in 1948, and an expanded chapter version of the same theory in 1951, but did not go on to complete and publish any further work on this topic. Most of what is written on his automaton free energy theory has been published post humorously (Ed. A. W. Burks, 1966). [4]

Education

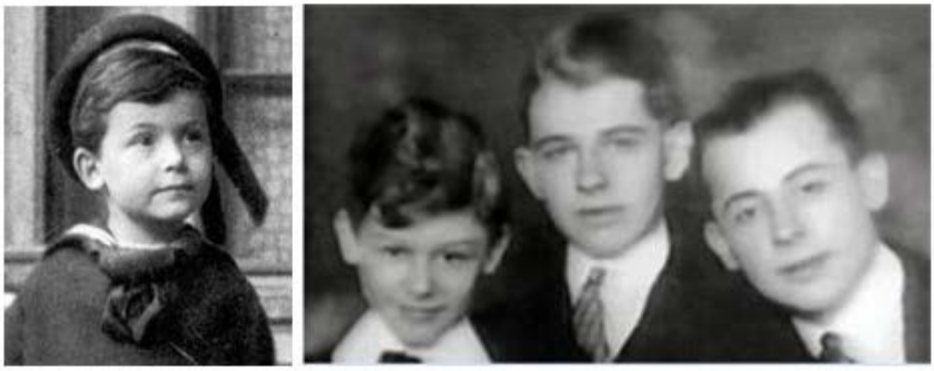

Left: Neumann age 7. [16] Right: Neumann with one of his brothers and cousin. [16] See also: *John von Neumann as Seen by his Brother* by Nicholas Von Neumann. [17]

Neumann was a child prodigy born with a photographic memory, able to divide eight digit numbers in his head, exchange jokes in classical Greek (with his father), and to memorize the names, numbers, and addresses in phone books (displayed as a game to guests), all by the age of six. [3]

Regarding phone book memorization, a visiting guest would select a page and column of the phone book at random, then let Johnny read the columm over a few times, then hand the page back to the guest, after which he could answer any question, such as who has number such and such? He could recite names, addresses, and numbers in order, and so on. [19]

By the age of 8, he was familiar with differential and integral calculus. [20]

Neumann's early mathematical ability is speculated to have been a product of his intrigue of his grandfather's ability to rapidly perform complex mathematical calculations. [8]

By age 10, the family library had become one of Johnny's favorite spots. As American writer William Poundstone (Ñº) summarizes: [19]

> "The Neumann household was a congenial environment for a child prodigy's intellectual development. Max Neumann bought a library in an estate sale, cleared one room of furniture to house it, and commissioned a cabinetmaker to fit the room with floor-to-ceiling bookcases. Johnny spent many hours reading books from the library. One was the [44-volume] encyclopedic history of the world edited by the once-fashionable German historian Wilhelm Oncken. Von Neumann read it volume by volume. He would balk at getting a haircut unless his mother let him take a volume of Oncken along. By the outbreak of World War I, Johnny had read the entire set and could draw analogies between current events and historical ones, and discuss both in relation to theories of military and political strategy. He was ten years old."

From age 8 to 18, 1911-1921, Johnny attended the Lutheran Gymnasium, a high school for boys with a strong academic reputation, in Budapest. Neumann's mathematical prowess was said to have been discovered by Hungarian mathematician Laszlo Racz, who recognized John's math talent, gave him special tutelage, and made recommendations for a special program to his father Max Neumann. [18]

In 21 Mar 1919, when Johnny was 15, Jewish Hungarian utopian socialist Bela Kun seized power of Hungary, as head of the workers and peasants' state, and began to implement the prescriptions of Karl Marx and Vladimir Lenin, such as issuing a decree transferring ownership of land, businesses, and means of production to the proletariat. In Aug 1919, Kun's government collapsed, after which Admiral Miklos Horthy seized power, initiating fascism. Kun's collapse was blamed on the Jews, after which lynch mobs began to operate, some 5,000 people were killed, and 100,000 people fled Hungary. Neumann, when he turned 18, left first to Germany then to America.

In 1926, at the age of 23, Neumann simultaneously competed a BS degree in chemical engineering, from the Technische Hochschule Zurich, and a PhD in mathematics (with minors in experimental physics and chemistry), with a thesis on set theory, from Pázmány Péter University in Budapest. Biographer William Poundstone elaborates on this as follows: [19]

> "Von Neumann's complex college career spanned three nations. In 1921, he enrolled in the University of Budapest but did not attend classes. He showed up only to ace the exams. Simultaneously, he enrolled at the University of Berlin, where he studied chemistry through 1923. After Berlin, his academic grand tour took him to the Swiss Federal Institute Technology of Zurich. There he studied chemical engineering, earning a degree in 1925. Finally, he received his PhD in mathematics—with minors in physics and chemistry—from the University of Budapest in 1926. He was then named *Privat dozent* (assistant professor) at the University of Berlin, reportedly the youngest man ever to hold that position."

Neumann if frequently known for his quick thinking. An oft cited example is how he famously solved the "fly problem" in a matter of seconds at a cocktail party: [12]

> Fly puzzle: "Two bicyclists are 20 miles apart and head toward each other at 10 miles per hour each. At the same time a fly traveling at a steady 15 miles per hour starts form the front wheel of the northbound bicycle. It lands on the front wheel of the southbound bicycle, and then instantly turns around and flies back, after landing instantly flies north again. What total distance did the fly cover before it was crushed between the two front wheels?"
>
> When the question was put to Neumann he danced around and answered immediately: "15 miles". When

> someone exclaimed: “Oh, you’ve heard that one before?” The puzzled Johnny replied: “I simply summed the infinite series.”

(add)

Religion

Neumann was born into a Jewish family with “ambivalent” religious attitudes; his family was so ecumenical that his family put up a Christmas tree, exchanged gives, and sang Christmas carols each year with their German governess, while also maintaining equal secular observance of the major Jewish holidays. Once Johnny’s brother Michael asked his father Max Neumann why the family considered itself Jewish when it did not observe the religion seriously? Max’s answer was: “tradition”. This religious confusion, according to William Poundstone, “would follow von Neumann throughout his life”, inclusive of a nominal conversion to Catholicism at the time of his first marriage, stitched together with an essentially agnostic belief system stance [19]

Neumann’s friend Edward Teller commented that whenever Neumann was tempted to curse, he would refrain himself and joke, “Now I will have to spend two hundred fewer years in purgatory.” [19]

While Neumann remained overtly secular and religiously-neutral or agnostic throughout his existence, when he went into his 18-month death bed, things changed (see below).

IQ

IQ guesstimate of 200 (Ñº); IQ ranked (2016) by AI zealot / Christopher Langan fan, at 225 (Ñº).

Death | Reaction end

> *See main: Neumann on god*

In the spring of 1956, at the hospital, while in his last 18-months dereacting (dying) from cancer, Neumann invited Anselm Strittmatter, a well-educated Roman Catholic priest who could discuss classical Rome and Greece, to visit him for consultation, who thereafter he began to see regularly. During these visits, Neumann expressed great fear of death. To his visitors, he despaired that “he could not visualize a world which did not include himself thinking within it.” [22]

Neumann recited in Old Latin passages about judgment, right and wrong, and freedom:

> “When the judge his seat hath taken .. what shall wretched I then plead? Who for me shall intercede when the righteous scarce is freed?

Neumann told the priest that Blaise Pascal, in section 233 of *Pensees*, had a point, referring to Pascal's wager, commenting something to the effect of: [22]

> “So long as there is a the possibility of eternal damnation for nonbelievers it is more logical to be a believer at the end.”

Neumann, in short, he sided with Pascal about betting one's afterlife on belief or nonbelief in the existence of god.

Subsequently, so to not lose in the wager, Father Strittmatter administered the last sacraments to him. [20] To his mother, who was also dying from cancer during this period, he expressed the following similar view:

> “There probably has to be a God, because it is more difficult to explain if there is than if there isn't.”
>
> — John Neumann (c.1956), said to his mother late in life (reaction existence) [12]

Some of Von Neumann's friends, having always known him as "completely agnostic", believed that his religious conversion was not genuine since it did not reflect his attitudes and thoughts when he was healthy. As Dutch-born American physicist and science historian Abraham Pais reports: [23]

> “He had been completely agnostic for as long as I had known him. As far as I could see this act did not agree with the attitudes and thoughts he had harbored for nearly all his life.”

Even after his conversion, Father Strittmatter recalled that von Neumann did not receive much peace or comfort from it as he still remained terrified of death.

Quotes | On

The following are related quotes on or about Neumann:

> “I have had the privilege of hearing Dr. von Neumann speak on various occasions, and I always find myself in the delightful but difficult role of hanging on to the tail of a kite. While I follow him, I can’t do much creative thinking as we go along.”
>
> — DH. Gerard, Neumann “Fourth Lecture” discussions (1948)

> “It isn't often that the human race produces a polymath like von Neumann.”
>
> — Howard Rheingold (2000), *Tools for Thought* [14]

> “If any one person in the previous century personified the word *polymath*, it was von Neumann.”
>
> — Tom Siegfried (2006), *A Beautiful Math: John Nash, Game Theory, and the Modern Quest for a Code of Nature* [15]

Quotes | By

The following are noted and or relevant quotes by Neumann:

> “It is just as foolish to complain that people are selfish and treacherous as it is to complain that the magnetic field does not increase unless the electric field has a curl. Both are laws of nature.”
>
> — John Neumann (date) [13]

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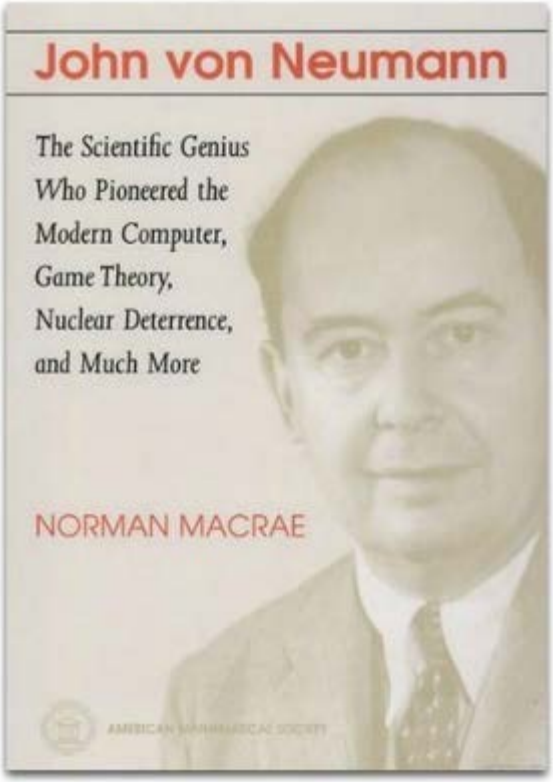

Neumann, a multi-cited universal genius, possibly the last known descendent of "last universal geniuses", hailed for his diverse achievements in a number of deep fields: thermodynamics, quantum mechanics, computer technology, artificial life theory, economics, etc. [12]

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External links

â— John von Neumann – Wikipedia.

θΔics

In chemistry, **John Newlands** (1837-1898) was and English chemist noted for his 1860s periodic table investigations.

Overview

In 1863, Newlands began to investigate atomic relationships among the elements, especially in bromine, chlorine, and iodine series. [1]

In 1864, Newlands arranged about 60 known elements in order of atomic weights and observed similarities between the first and ninth elements, the second and tenth elements etc.; he proposed the 'law of octaves'. This was the forerunner to the notion of “periods”. [2]

The following is an 1866 version of Newlands periodic table: (Ñº)

No.	No.	No.	No.	No.	No.	No.	No.
H 1	F 8	Cl 15	Co & Ni 22	Br 29	Pd 36	I 42	Pt & Ir 50
Li 2	Na 9	K 16	Cu 23	Rb 30	Ag 37	Cs 44	Os 51
G 3	Mg 10	Ca 17	Zn 24	Sr 31	Cd 38	Ba & V 45	Hg 52
Bo 4	Al 11	Cr 19	Y 25	Ce & La 33	U 40	Ta 46	Tl 53
C 5	Si 12	Ti 18	In 26	Zr 32	Sn 39	W 47	Pb 54
N 6	P 13	Mn 20	As 27	Di & Mo 34	Sb 41	Nb 48	Bi 55
O 7	S 14	Fe 21	Se 28	Ro & Ru 35	Te 43	Au 49	Th 56

(add summary)

See also

â— Henry Roscoe | Human periodic table analogy

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External links

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θΔics

In science, **John Nichol** (1804-1859) was a Scottish astronomer noted for being a significant earlier mentor to Irish physicist William Thomson, particularly by introducing him, at the age of fifteen, to French mathematical physicist Joseph Fourier's 1822 treatise *Analytical Theory of Heat*, thus instilling in Thomson a lifelong curiosity about the nature heat and its relation to engine efficency. Nichol gave one of the first encyclopedia definitions of 'thermo-dynamics' in 1860. Nochol was a founding member or integral component of the Glasgow school of thermodynamics.

Influence on Thomson

Nichol's was a professor of practical astronomy at the University of Glasgow from 1836 to 1859, the point of his death. In this span, for a period of two years, beginning in 1839, Nichol's taught classes in natural philosophy, as a fill-in for the regular professor William Meikleham who had become absent due to illness. [1]

When Nichol's took the chair of natural philosophy, he quickly updated the curriculum, introducing students to the new mathematical works of French mathematical physicist Joseph Fourier's, particularly his 1822 *Analytical Theory of Heat.* [2] The mathematical treatment much impressed young Thomson, who became intrigued with Fourier's *Théorie analytique de la chaleur* and committed himself to study the "continental" mathematics resisted by a British establishment still working in the shadow of English physicist Isaac Newton.

In particular, after listening to the praises of Fourier's book by Nichol, likely in one of his lectures, Thomson asked whether he should read the *Théorie Analytique*, to which Nochol's replied "the mathematics is very difficult". [3] William later got the book from the library. In his own words, "On the 1st of May … I took Fourier out of the University Library; and in a fortnight I had mastered it—gone right through it." [4] This was Thomson's first intellectual stimulator as to puzzle behind the nature of heat.

Thomson, to note, through the workings of his father, James Thomson, would later replace Meikleham after his death in 1846 as professor of natural philosophy at Glasgow, thus forming one of the early schools of thermodynamics, particularly in the *Glasgow Philosophical Society*. [5]

Other notes

Nichol's last published work was the 1860 *Cyclopedia of Physical Sciences*, within which, it seems, the first encyclopedia definition of thermo-dynamics, as a branch of science, is found. [6] In commentary on this small dictionary or encyclopedia, Scottish engineer William Rankine commented on it that it is "almost unparalleled for the extent and accuracy of the information that it contains in small bulk." [7]

References

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2. Fourier, Joseph. (1822). *Analytical Theory of Heat* (*Théorie Analytique de la Chaleur*). Cambridge.
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7. MacLehose, James. (1886). *Memoirs and Portraits of One Hundred Glasgow Men* (John Pringle Nichol, pgs. 249-51). Glasgow: The Publishers.

External links

â— John Pringle Nichol – Wikipedia.

θΔics

In hmolscience, **John Thompson O'Manique** (1936-2003) was a Canadian philosopher noted, in religious thermodynamics, for his 1966 to 1969 work on science, religion, and evolution in the guise of Pierre Teilhard.

Overview

In 1966, O'Manique, in his doctoral thesis "The Theory of Orthogenesis in the Synthesis of Teilhard de Chardin", done at the University of Ottawa, discussed the ideas of Pierre Teilhard. [2]

In 1969, O'Manique, in his *Energy in Evolution*, expanded on Pierre Teilhard's hyperphysics, with focus on Teilhard's definition of energy as "a capacity for action, or more exactly, for interaction", discussed in the context of the second law; the following is a condensed excerpt: [1]

> "The evolution of complexity [is] a continuous development from the simplest forms such as electrons and protons to the most complex of organisms such as man. The continuity of this development is very important in Teilhard's principle of coherence."

On this basis, O'Manique then delves into the issues encountered when one begins to question the "ludicrous statement" of fundamental particles having consciousness, among other issues.

Difficulties on theory

Towards the end of his book, O'Manique leans towards the unscientific, concluding that evolution will tend towards an Omega-God point, whereby "love energy animates and directs the whole evolutionary process and love brings about the final convergence."

Education

O'Manique completed his undergraduate degree in physics and mathematics. He then wrote his doctoral thesis in 1966 on "The Theory of orthogenesis in the Synthesis of Teilhard de Chardin" at the University of Ottawa. [2] He then became professor of philosophy at St. Patrick's College of Carleton University in Ottawa, Canada, where he taught physics, philosophy, and developmental studies for over 35 years. [3]

References

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Further reading

â— Gessell, Paul. (2008). "John Thomson O'Manique", *The Ottawa Citizen.* Dec. 17.

θΔics

In existographies, **John P. Anderson** (1939-) (CR:3) is an American non-academic author noted, in literature thermodynamics, for his 2006 *Mann's Doctor Faustus*, wherein he speculates on demonic-like energy seen in times of war and genocide.

Overview

In 2006, Anderson, in his *Mann's Doctor Faustus: Gestapo Music*, theorized about stored sub-conscious demonic energy centers in the minds of human humanity that, if stirred, can give rise to phenomena such as the rise of a generic Hitler and mass holocaust. The following is a rare human thermodynamics quotation: [1]

> "The novel is in one sense a study in human thermodynamics—what it takes to make certain kinds of total and fundamental changes. In totally starting over, as opposed to gradually starting evolution, the Nazi experience suggests that what is necessary is a collective quantity of energy that is available only in the primitive and unconscious human energy centers, those energy centers deposited by hundreds of thousands of years of survival tactics—the reptile centers in our brains."

(add)

See also

● John Anderson (1726-1796) (O) | James Watt's natural philosophy professor

References

1. Anderson, John P. (2006). *Mann's Doctor Faustus: Gestapo Music* (pg. 23). Universal Publishers.

External links

● Anderson, John P. (1939-) – WorldCat Identities.
● John P. Anderson (books by) – Universal Publishers.

θΔics

In religious thermodynamics, **John H. Patrick** (c.1950-) (DN=1?) as an American civil engineer and architect noted for his *circa* 2006 theory of unified evolution, in which he attempts to unify Darwinian evolution, the Bible, aspects of QED, and thermodynamics, under the overarching premise that there is a God who created the universe that operates according to physical laws. [1] Patrick's central theme is capture in the following passage: [2]

> "Under some circumstances occurrences of negative entropy are expedient to the over-arching imperative of entropy. This makes the occurrences favored by the laws of thermodynamics. Mammals, for example, are highly ordered chemical structures made up of less highly ordered [chemical structures]. This requires processes indicating negative entropy, but their net impact is to increase the amount of entropy in the world. They give off heat produced by their food processing, respiration, defecation, etc. Their net contribution is in the form of positive entropy, in abeyance of the second law of thermodynamics."

Beyond this, much of Patrick's writing is crouched in numerous Biblical passage quotations, used in a way to make claims about God. Patrick is somehow associated with Indian chemical engineer DMR Sekhar's network.

The following are Patrick's 2013 views on his evolution theory: [3]

> "I think Lotka was correct in suggesting his [principle of maximum energy Flux]. By referring to "natural selection" in the wording of his fourth law, his suggestion would seem to apply only to living systems that already exist, as Darwin would have thought it must. This is because Darwin believed (and wrote) that with regard to the initial origin of life, it can only be attributed to, in his words "some other process wholly unknown". However I think that the [principle of maximum energy flux] also explains the initial origins of life. Maybe Lotka thought so too, I have not as yet studied his work, as I just this hour came across your web-site and his [principle of maximum energy flux]. The attached paper is one that I wrote about life origins and evolution some time ago [c.2006?]. Although I did not use the same language as Lotka, the core mechanism is similar I think."

Education

Patrick currently is an engineer at GTP Plant Engineering.

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(b) Patrick, John. (2013). "Unified Evolution Theory", JHT submission candidate (pdf), Mar 15.

External links

â— John Patrick (profile) – Nature Network.

θΔics

In hmolscience, **John W. Patterson** (1936-) is an American materials scientist, engineer, and atheism advocate noted for his 1975 to present creationism debates, commentaries, publications, courses, and symposiums, etc., aimed at combating creationism, religion, and supernatural phenomena. Paterson is famous for giving handouts of various creationist claims about thermodynamics to his thermodynamics students to find the reason for the incorrectness of each statement as homework assignments. [2]

Creationism | Debates

In 1975, Patterson engaged into a nationally public debate with David A. Weltha (c.1941-) (Q), a fellow professor home economics and family environment, who promoted and gave lectures on a variety of topics such as astrology, hypnosis, life after death (afterlife), and other unexplained phenomena; during which time he gave a seminar at Iowa State University (ISU) on reincarnation, a subject that elicited the most vocal criticism from Patterson, the resulting debates, which spilled out into various forums, e.g. radio show interviews, articles, chapters, many of which making national headlines, would continue, it seems, into 2005.

Patterson's collected papers, at ISU special collections, contain clippings and correspondence accumulated by Patterson in his efforts to dispute supernatural phenomena, creationism, religion, and even claims of perpetual motion.

Patterson, at one point, Patterson gave a seminar on critical thinking which in turn led to a dispute with David R. Boylan, dean of the College of Engineering. [3] Boylan, previously, in *21 Scientists Who Believe in Creation* (1977), published apologetics arguments to the effect that he used the second law as an apologetic against abiogenesis to "defend Biblical truths". [5]

Patterson's papers also include regular correspondence with several friends and colleagues. His correspondences with Henry P. Zuidema and Frank Trumpy document his efforts in opposition to creationism. He became a regular correspondent with Erica Heftmann, author of Dark Side of the Moonies, about religious cults and even contemplated co-authoring a book together. Also included in the collection are letters between Patterson and William "Bill" Brouwers, a pastor from Indiana. Brouwers and Patterson developed a friendship despite their opposing views and co-taught a class for the Iowa State University college for seniors on "The Conflicting Worldviews of Theism and Atheism."

At the 1981 meeting of the Iowa Academy of Sciences, Paterson gave the following response to a question about his paper, which criticized creationists: [7]

> "If they can lie like hell about us, the least we can do is tell the truth about them."

In 1983, Patterson, in his "Thermodynamics and Evolution", a chapter contribution to *Scientists Confront Creationism*, did battle with Henry Morris; in which, as summarized by Helge Kragh (2008), he gave a decent presentation of the entropy order from disorder paradox, often used by creationists as an ontic opening polemical device to argue for the existence of god: [1]

> "The name 'ectropy' goes back to 1900, when it was introduced by Georg Hirth in the context of biological systems (Hirth, 1900). It became widely known through Felix Auerbach's *Extropismus oder die physikalische Lehre des Lebens* (Leipzig, 1910). The mistaken view that the evolution of life forms contradicts the second law continued to play a role during the twentieth century, since the 1960s often in the context of new creationism. Local processes, such as the building up of complicated molecules from simpler ones, can occur even though they involve a decrease in entropy. Because the energy diminishes in such a way that the free energy is lower for the product, they are in full accord with the second law of thermodynamics. For an overview, see: Patterson (1983)."

In 1983, Patterson authored an article for the *American Atheist*, in which he excoriated all of his fellow engineers who dared to be politically incorrect and believe in the concept of "design in nature resulting from an intelligent Creator." Patterson labeled any engineer who believed in creation as "incompetent," and charged the professional societies who accepted their credentials as being "irresponsible." (Q)

In circa 2000, Patterson was summarized as follows: [4]

> "Patterson is professor emeritus of materials science and engineering at Iowa State University at Ames. *Science Citation Index* has designated one of his thermodynamics-associated papers as a "classic" most cited in its area. A formidable debater against the creationists most notorious platform artists, he has never hidden his atheism and has always made it clear that he disagrees with the notion that there is no contradiction between science and religion."

(add discussion)

In 2014, Patterson published a commentary on the Bill Nye vs Ken Ham debate. [8]

In 2015, Patterson was listed as scientific and technical consultant for *skeptical Inquirer*. (Q)

Education

Patterson attended Baldwin-Wallace College, in the 1950s, before being drafted into military service in 1955, then completed a combined BS and MS in 1962 in mining engineering and a PhD in metallurgical engineering, both at Ohio State University, thereafter becoming a materials science and engineering professor at Iowa State University, focusing on electrical transport properties of solid electrolytes at elevated temperatures; retiring in 1995. [1]

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External links

- John Patterson W. Jr (faculty) – Iowa State University.
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θΔics

In existographies, **John Philoponus** (c.490-570) (IQ:165|#451) [RGM:772|1,500+] was a Roman philosopher, scientist, theologian, grammarian (Q), and astronomer (Q), noted for []

Impetus

In c.530, Philoponus, amid his *Commentary on Aristotle's Physics* and or his *Commentary on Aristotle's Soul*, rejected Aristotle's dynamical theory of motion, and in its place situated a theory of impetus, according to which an object moves and continues to move because of an energy imparted in it by the mover and ceases the movement when that energy is exhausted; this influenced, supposedly, Avicenna, Bonaventure, John Buridan (or Jean Buridan), and Galileo, the latter of whom, in his *The Two New Sciences* (1638), cites Philoponus, and the later development of inertia (principle of inertia).

Library burning | Apocrypha

In c.1300, Abu'l Faraj, an Arab historian, floated the retrospectively categorized apocryphal apocryphal story, e.g. it was debunked by Edward Gibbon, that during the 642AD Muslim capture of Alexandria, a certain Christian priest named "John the Grammarian" approached the army leader Amr ibn al-As and asked him if he could spare all the books of wisdom, about which Amr queried the caliph Omar, who purportedly replied that all the wisdom we need is the Quran, so they burned the books, and used them as fuel to heat the baths of Alexandria, and that it took six months to burn them all. This, supposedly, is invented history. (Q)(Q)

Quotes | Employed

The following are quotes employed by Philoponus:

> "Water has a greater affinity with wine, but with olive oil it is unwilling to mix."
>
> — Empedocles (c.450BC), fragment 56 (B91); cited by Philoponus (c.550AD) in *Commentary on Aristotle's Generation of Animals* (123.19-20)

Quotes | On

The following are quotes on Philoponus:

> "Philoponus is one of the greatest geniuses of antiquity."
>
> — Pierre Duhem (1913), *The System of the World* (*Le système du monde*) [2]

> "**Philoponus**, who was was the last great philosopher of nature in the Greek world, refuted Aristotle's theory that the velocities of falling bodies in a given medium are proportional to their weight, making the observation that 'if one lets fall simultaneously from the same height two bodies differing greatly in weight, one will find that the ratio of the times of their motion does not correspond to the ratios of their weights, but the difference in time is a very small one'. He also criticized Aristotle's antiperistasis theory of projectile motion, which states that the air displaced by the object flows back to push it from behind. Instead Philoponus concluded that 'some incorporeal kinetic power is imparted by the thrower to the object thrown' and that 'if an arrow or a stone is projected by force in a void, the same will happen much more easily, nothing being necessary except the thrower'. This is the famous 'impetus theory' (Q), which was revived in medieval Islam and again in fourteenth century Europe, giving rise to the beginning of modern dynamics."
>
> — John Freely (2012), *Before Galileo* [1]

Quotes | By

The following are quotes by Philoponus:

> “If one lets fall simultaneously from the same height two bodies differing greatly in weight, one will find that the ratio of the times of their motion does not correspond to the ratios of their weights, but the difference in time is a very small one.”
>
> — Philoponus (c.530), *Publication* [1]

> “If the early philosophers said that mind moves everything, e.g. Aristotle (*De Anima* 405a18-19), how is it that they said that motion was proper to the soul? Yes they did, Aristotle says, for they thought that soul and mind were identical, as for instance Democritus did Now we nowhere find him explicitly saying that mind and soul are identical, but he established this by an argument. Democritus, he says, plainly intends this for he said straight out that truth and appearance are identical, and that there is no difference between the truth and what appears to the senses, but what appears and seems so to each individual is true, as Protagoras said, whereas in fact they are different, sensation and imagination being concerned with appearance, and the mind with truth. Now if the mind is concerned with truth, and the soul is restricted to appearance, and what is true is the same as what appears, as Democritus things, then the mind is identical with the soul.”
>
> — John Philoponus (c.530), *Commentary on De Anima* (71.19-34)

See also

- Philodemus (c.110-35BC) Greco-Roman Epicurean philosopher

References

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External links

- John Philoponus – Wikipedia.

θΔics

In existographies, **John Platt** (1918-1992) was an American child prodigy turned physicist, biophysicist, social thermodynamicist, genius studies scholar, and reductionism defender, noted for []

Social thermodynamics

In 1972, Platt, in his “Social Traps”, said the following about social thermodynamics: [9]

> “There are three distinct types of locked-in patterns in collective behavior that need much more study from a reinforcement point of view to see the microstructure that gives rise to a kind of social thermodynamics. The first type is what Adam Smith referred to as the invisible hand of the marketplace. He used this term to emphasize the absence of any overt or mechanical causal mechanism in the stabilization of prices or wages around some median value in a free economic market of competing individuals. A similar invisible hand tends to equalize and centralize the political parties in systems with majority (rather than proportional representation) elections.
>
> The second type might be called by contrast the invisible fist, where the competition of numerous individuals does not produce agreement on a median value, but instead runs away from the median, with either escalation or elimination past some point of no return. This happens with Gresham's law in economics, where "bad money drives out good." Several of our current crises have this characteristic, as with the escalation of arms races or unrestrained pollution or the elimination of good railroad service, as we have noted. The urban crisis is made almost unsolvable by multiple complex escalations of this kind, as slum clearance drives slum dwellers elsewhere, and the poor are migrating into the city to get welfare money, while the rich are moving to the suburbs to escape taxes.
>
> The third type of locked-in pattern could be called the invisible chain. This signifies a loop of transactional relationships among two or more people, forming self-maintaining systems that are sometimes very damaging and very hard to get out of. Married couples frequently get locked into repetitive disagreements over sex or money or the temperature of the room or whether to go to the show early or late. Eric Berne (1964) has discussed various locked-in networks of this kind in his book *Games People Play*. In his game of "alcoholic," for example, he shows how the alcoholic is trapped in a self-maintaining game with three or four other people, such as the long-suffering wife, the best friend, and the corner bartender, with each of their responses reinforcing the others for their responses.
>
> Over a lifetime, our originally accidental roles in many such chains, beneficial and damaging, may come to create and maintain the responses that finally appear as our personal or social "character." The self-maintaining character of federal bureaus or of the military-industrial complex come from large-scale invisible chains of the same sort. A careful analysis of such spontaneous lock-ins could be crucial today.”

(add)

Genius ranking

See main: Platt IQ

In 1962, Platt published an article positing a coming genius explosion, wherein he give IQs of geniuses.

In 1962, Platt, in his “The Coming Generation of Genius”, in a discerning manner, gauged a number of genius IQs as follows: [1]

> “There is an apocryphal story physicists tell [see: fly bicycle problem] about the late John Neumann—

probably a 180—that shows the difference they feel between such really high-speed minds and those of ordinary brilliance.

In mental ability, an adult chimpanzee can solve mechanical problems about as well as a six-year-old child. This ape might be given an IQ of about 40. A moron would be around 70, an average adult 100, a PhD 140, an Einstein 180 or better. The hardest problems can be solved only by men of the greatest ability, and brilliant men are few.

The second hard fact about the IQ scale is that there are not very many brilliant men at the top of it. At the 190 level, which might describe Archimedes, Newton, and Gauss, we have been seeing about one every five hundred years.

A Newton at the 190 level occurs once in 500 years. At the 180 level of Darwin, Freud, Shaw, Bertrand Russell, Percy Bridgman, Linus Pauling, there might be a dozen living Americans. There are some 300 at 170 in the US, 5,000 at 160, about 100,000 at 150, and one million at 140."

The following, from the above description, is a tabulation of Platt's ranking scheme:

IQ_{JP}	**Platt IQ scale**
190	Newton, Gauss, Archimedes
180+	Einstein, Pasteur
180	Neumann, Pauling, Bridgman, Russell, Freud, Darwin, Shaw → Mycroft Holmes [fictional genius]
170	about 300 existive Americans (out of a 1962 population of 187 million) → Sherlock Holmes [fictional genius]
160	about 5,000 existive Americans (out of a 1962 population of 187 million)
150	about 100,000 existive Americans (out of a 1962 population of 187 million)
140	about 1,000,000 existive Americans (out of a 1962 population of 187 million) → Inspector Lestrade [fictional genius] (Ñº); equivalent to someone with a PhD
100	average adult
70	a moron
40	an adult chimpanzee, six-year-old human

The article seems to have been reprinted in Platt's 1962 *The Excitement of Science*. [4]

Platt vs Polanyi | Reductionism vs Emergence

In 1967, Platt, at during the annual AAAS meeting, at Rockefeller University, was on a discussion panel (Ñº) with Michael Polanyi, Ernest Nagel, and Barry Commoner, chaired by Gerald Holton, about the interplay of reductionism and emergence in biology, physics, and chemistry, i.e. questions about the nature of scientific explanation and its relevance for questions of life and religion; the abstract of which is as follows: [7]

> "In the attempt to relate religion to the sciences, philosophers and theologians and other scholars are apt to be bothered by what is called 'reductionism', a common form of which is the supposition that explanations of phenomena of practically any kind—including human, social, psychological, and even (according to some) religious phenomena—can be **reduced** to an explanation in terms of physics. When distinguished scientists [e.g. Polanyi] challenge this reductionistic view, it has an interest even greater than when it is challenged by humanists. While the editor of *Zygon* is not disturbed by reductionism, many others are; hence the importance of publishing this symposium which may not be the last word, but which is nevertheless on the new frontier of the age-old debate. Michael Polanyi gave an early version of his now famous answer to this question at the *Center for Advanced Study in Theology and the Sciences* on May 81, 1967. A more detailed version will be found published in *Science*, 160:1309-12 (Jun 21, 1968). But the version printed here and the significantly revealing commentary by other distinguished scientists and philosophers of science may have a special value, not only for those concerned with relating religion and the sciences, but for all who are concerned to understand the nature of scientific explanation in general and its explanation of life in particular. The text printed here is a modestly edited transcription of the audio tape recording of the informal panel discussion, and the reader may feel that be is attending an exploratory conversation of experts contemplating frontier questions about the nature of scientific explanation and its relevance for questions of life and religion."

(add)

Education

In 1936, Platt, age 18, a seeming child prodigy of sorts, completing his BS in science at Northwestern University and in 1941 at age 23 completed his PhD in physics at the University of Michigan. [2] In the 1940s, he taught molecular biophysics and biophysics at the University of Chicago, and in the 1960s he switched to philosophy of science, vision, perception, and social trends.

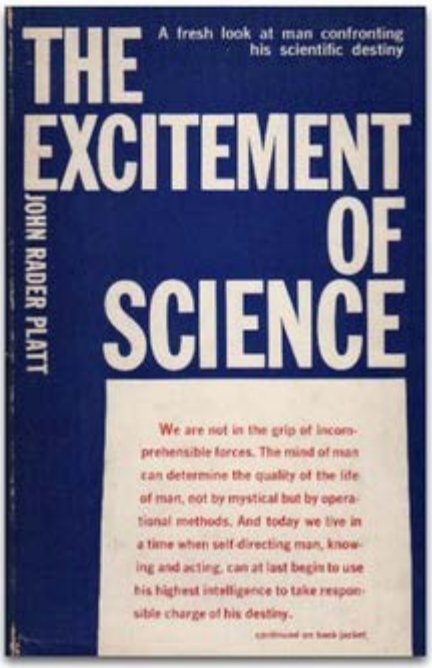

Platt's 1962 *The Excitement of Science*, wherein, supposedly, his IQ 180+ genius intellect estimates are found. [4]

Quotes | On

The following are Platt related quotes:

> "I read this book when it was first published. What it imparted to me has stuck with me through the years … undergraduate school, graduate school and law school … I recently referred to it in a discussion within the software company I founded and run. The concepts in the book about maintaining mental sharpness and the pure excitement of the learning process are without parallel. Should be read by every student and teacher of science."
>
> — Anon (1997), book review (Ñº) of Platt's 1962 *The Excitement of Science*

Quotes | By

The following are representative quotes:

> "The needs of man, if life is to survive, are usually said to be four -- air, water, food, and in the severe

climates, protection. But it is becoming clear today that the human organism has another absolute necessity... This fifth need is the need for novelty -- the need, throughout our waking life, for continuous variety in the external stimulation of our eyes, ears, sense organs, and all our nervous network."

— John Platt (1959), "The Fifth Need of Man", Jul [5]

"Quiz show facts are not enough."

— John Platt (1959), "The Sweep and Excitement of Science", Nov 6 [6]

"To say that basic science is exciting may sound like a contradiction... But I would remind you that there are two intellectual excitements that are not tame at all and that we remember all our lives. One is the thrill of following out a chain of reasoning for yourself; the other is the pleasure of watching several strongly individualistic personalities argue about their deepest convictions. That is to say, the thrill of a detective story and the pleasure of watching a play by George Bernard Shaw."

— John Platt (1959), "The Sweep and Excitement of Science", Nov 6 [6]

"Due to the new patterns of marriage, e.g. next few years, the number of IQs in the 180s getting out of college in the next few years may not be a mere dozen but hundreds. It could be an explosion of genius such as the world has never seen."

— John Platt (1962) "The Coming Generation of Genius" (pg. 77) [3]

"Lestrade (Ñº) to be let loose on such a study is exactly as pathetic as for a subnormal waitress in the IQ of 90 range to try to measure the intellectual differences in college students."

— John Platt (1962) "The Coming Generation of Genius" (pg. 73)

"Unfortunately, few of us are big enough or matter-of-fact enough not to be offended when a smart man shows he knows he smart."

— John Platt (1962) "The Coming Generation of Genius" (pg. 73)

"Certain drugs in the body can strongly affect mental behavior in various ways, but the sex hormones are particularly powerful. Rats, male or female, injected with a trace of male hormone at a certain spot in the brain, come out fighting: with a tract of female hormone at another spot, they want to mother everything in sight. The survival of the species mist often have depended on this sensitivity to our internal chemical balance."

— John Platt (1962) "The Coming Generation of Genius"

"We are not in the grip of incomprehensible forces. The mind of man can determine the quality of the life of man, not by mystical but by operational methods."

— John Platt (1962), *The Excitement of Science*

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θΔics

In hmolscience, **John Polkinghorne** (1930-) (CIR:24) (CR:5) is English physicist-priest noted for, what seems to be, his use of quantum mechanics and the fine tuning argument, among others, as ontic opening playing cards, to promote the view that one can be an intelligent believer in the age of science.

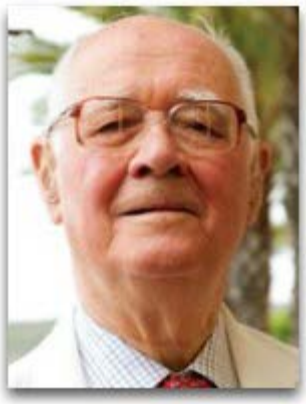

Polkinghorne's work is often cited, together with English bishop N.T. Wright, by Francis Collins, as a type of deflection shield, which amounts to what Sam Harris refers to as "pure madness, a bizarre conflation, a word salad".

Quotes | About

The following are quotes concerning Polkinghorne:

> "The Templeton Prize bridges the gap between sense and nonsense."
>
> — Martinus Veltman (2003), on John Polkinghorne's acceptance [1]

Quotes

The following are related quotes

> "If we were deterministic beings, what would validate the claim that our utterance constituted rational discourse? Would not the sounds issuing from mouths, or the marks issuing on paper, be simply the actions of automata?"
>
> — John Polkinghorne (1998), *Science and Theology*; cited by Bo Jinn [2]

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θΔics

In science, **John Poynting** (1852-1914) was an English physicist noted for []

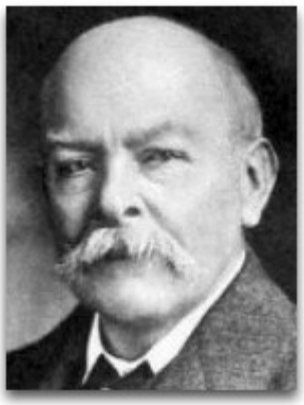

Overview

In 1883, Poynting, as cited in discussions of the superluminal Filon-Pearson demon (Q), in his "Overtaking the Rays of Light", building on an anonymous circa 1843 to 1953 pamphlet entitled "The Stars and the Earth: Thoughts on Space, Time, and Eternity", digressed on the physical possibility of the idea of "magnifying or reducing time". [1]

In 1909, Poynting, in his "Atomic Theory: Medieval and Modern", wrote about the Roger Boscovich, in particular how William Thomson even took up the 'inevitable theory of Boscovich', and sought to show how the grouping of Boscovichian atoms could account for crystalline arrangement and for the phenomena of light. [1]

In 1925, Alfred Lotka dedicated his *Elements of Physical Biology* to the "memory of Poynting", on the opening page, and later (viii) states:

> "My greatest debt is acknowledged in the dedication. Whatever merits this book possesses may well be credited to the influence and teaching of **Poynting**. There is little danger that its faults shall be charged to his account."

The only place, however, that Lotka cites Poynting is in reference note (pg. 193) to Poynting's 1913 *The Earth*, which gives the principle determinations of the mass of the earth.

Education

Poynting was one of James Maxwell's students (Q) at Cambridge between 1871 and 1878.

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θΔics

In hmolscience, **John Michael Prausnitz** (1928-) is an American chemical engineer, specializing in molecular thermodynamics of phase transitions, noted his 1986 work on the history of chemical thermodynamics, and for his 2013 opinion to American electrochemical engineer Libb Thims that a "two cultures department" would not be welcome at University of California, Berkeley, slated to be centralized within the department of chemical and biomolecular engineering, and furthermore that he did not believe that thermodynamics had applicability in the humanities or specifically out side of hard science and engineering proper: [1]

> "I don't know what the Rossini debate is but I hope to find out. No, your idea for a department for teaching two cultures would not be appreciated at Berkeley. In the social sciences and in some humanities, thermodynamics may be useful as an analogy, as a suggestion for looking at a problem (e.g., information theory) but beyond that, I see little use of thermodynamics outside science."

Discussion

This is a very interesting position to take by a chemical engineer, reminiscent of Japanese chemical engineer Tominaga Keii's 2004 chemical thermodynamics chapter subsection "Chemical Affinity in 1806", wherein he gave his opinion that Goethe's "[*Elective Affinities*] did not add any scientific knowledge" (see: HC pioneers). Prausnitz's opinion here, however, of "seeing little use of thermodynamics" outside of hard science proper, does not corroborate with the chronological listing of over 500 HT theorists, over the last two centuries to have used thermodynamics outside of hard science proper.

Religion

Prausnitz seems to have an inherent theistic ingrained science belief system. In 2011, for example, interviewer Anna Rascouet-Paz, stated that he had an "interest in philosophy and theology", and when queries about how, presently, "God and science seem to be at war", he cited quotes from William James (a theist), and went on to state how he doesn't see any problem between science and religion. The following is a "god term" usage also employed during the interview: [2]

> "You can use your God-given good brains in a much broader way and I think it is very satisfying to do that."

See the atheism timeline to see how these types of religious views affect things.

Education

Prausnitz completed his PhD in 1955 with a dissertation "Liquid-Phase Turbulent Mixing Properties" at Princeton University. Prausnitz currently is professor emeriti of the graduate school of the University of California, Berkeley, department of chemical and biomolecular engineering.

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θΔics

In existographies, **John Proops** (1947-) (CR:5) is an English ecological economist noted, in economic thermodynamics, for []

Overview

In 1985, Proops, in his chapter "Thermodynamics and Economics: from Analogy to Physical Functioning", did some thermodynamic based analogies in economics. [1]

In 1986, Proops co-authored various articles with German economist Malte Faber, such as the 1986 "Time Irreversibilities in Economics: Some Lessons from the Natural Sciences", on irreversibility in economics. [2]

In 1987, Proops, in his "Entropy, Information, and Confusion in the Social Sciences", dug into the thermodynamic information fallacy; the abstract of which is as follows: [3]

> "The term 'entropy' is now widely used in social science, although its origin is in physical science. There are three main ways in which the term may be used. The first invokes the original meaning, referring to the unidirectionality of heat flow, from hot bodies to cold ones. The second meaning can be derived from the first via statistical mechanics; this meaning is concerned with measures of 'evenness' of 'similarity'. The third meaning derives from information theory. The three distinct meanings are carefully described and distinguished, and their relationships to each other are discussed. The various uses of the three concepts in the social sciences are then reviewed, including **some uses which confuse the different meanings of the term**. Finally, modern work in thermodynamics is examined, and its implications for economic analysis are briefly assessed."

(add)

Education

Proops is a professor of ecological economics at the Keele University, Keele, UK, wherein he teaches a third year entropy-based on ecological economics. (O)

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External links

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θΔics

In existographies, **John Quincy Stewart** (1894-1972) (SN:11) (CR:128), oft-cited as "John Q. Stewart", not to be confused with John Stewart (1749-1822), was an American astrophysicist, engineer, and social physics pioneer noted his *circa* 1945 to 1955 work on the development of social physics, or social mechanics (as he later came to call it), applied, via physics-based equations and diagrams, e.g. the construction of population potential maps, work which culminated in the once-active Rockefeller-funded Princeton Department of Social Physics or "social physics project at Princeton", as Stewart called it, the apex of the multi-century sporadically developed Princeton school of social physics, and later 1960s-developed geology-focused "social physics school"; coiner of: doctrinaire departmentalism.

Overview

The following is an over-typical Stewart view:

> "Statesmen of this and other nations … have embarked upon grandiose undertakings where on physical grounds failure was predictable, and … failure meant that … people perished in vain."

Stewart formed a social physics group at the University of Princeton, funded by a grant from the Rockefeller Foundation, which germinated from a 1925 view that there should exist some order in the social sciences comparable to that of the physical sciences. [2] Stewart's project is summarized well by *Princeton Alumni Weekly*, in their 1955 "Social Physics" article on Stewart, as follows: [5]

> "In the early phase of their efforts, Professor Stewart and his colleagues in this enterprise confined their efforts to mass human relationships. They treated large aggregates of individuals as though they were composed of social molecules, without attempting to analyze the behavior of each molecule. They then attempted to describe demographic, economic, political, and sociological situations in terms of such physical factors as time, distance, mass, and numbers of people."

Stewart, to give one example of his approach, treated mass of good per capita as "molecular weight".

Working bodies | Relationships

Stewart speculated, in the thermodynamic sense, that there are "working bodies" (thermodynamic system), i.e. ones wherein different kinds of energy: thermal, kinetic, electrical, gravitation, chemical, etc., are converted one to another, receiving, storing, and emitting energy, in human relations, according to which persons in organizations are like atoms in a molecule, that can be treated like a working body, with an input, stored energy (internal energy), and output. [5]

Princeton research team | Social physics

See main: Princeton University Department of Social Physics

Stewart, in spite of what has been referred to as the "gravest skepticism" on the part of some of his contemporaries, worked to assemble the following group of social and physical scientists: Stuart Dodd (sociologist), Raymond Bassett (sociologist), Percy Bridgman (physicist and thermodynamicist), and John Trimmer (physicist) all centered around him and his social physics research project. [5]

From *circa* 1945 to 1955, at the Princeton University physics department, Stewart ran a Rockefeller Foundation grant-funded social physics/**social mechanics** applied research group. [25]

Stewart credits a number of Princeton alumni as having been prototype social physicists. The early history of social mechanics or social physics, depending on classification scheme, according to Stewart, dates as far back as 1769 when American political theorist James Madison (1751-1836), the so-called "father of the constitution" and America's fourth president, was said to be studying a primitive form of social physics a Princeton. [2] Madison, as Stewart points out, was a student of Scottish-born American John Witherspoon (1723-1794) a signatory of the Declaration of Independence and 6th president of Princeton University, who in turn was a noted interpreter of the political philosophy of French theorist Charles Montesquieu, notable for his "hot climates" / "cold climates" theory of human behavior, who in turn had been deeply influenced by the celestial mechanics work of Isaac Newton. Stewart comments on this: [5]

> “There can be no question of the fact that, in early Princeton, physics cooperated with politics in a sort of analogical double play, Newton to Witherspoon to Madison.”

(add)

Social energies

Stewart’s investigations identified at least three kinds of social energy: thinking (thermal), feeling (electromagnetic), and doing (mechanical), a triad which he hypothesized represented a triad of a health society, but speculated that in unhealthy societies, e.g. in the United States he reasoned there is too much emphasis on doing, the triad is out of balance. [5]

Overview

In 1947, Stewart, in his article “Suggested Principles of ‘Social Physics’”, attempted to outline, formulaically, what he called a “human gas” model of population demographics, in which he viewed each person as a “molecule” (or human molecule, in the modern sense of the term) and used the following shorthand version of ideal gas law:

$$pa = NT$$

where p is "demographic pressure", a is an area of land occupied by *N* individuals (human molecules), and *T* is the "demographic temperature", combined with population census data, to derive concepts such as “demographic energy”, "demographic force", and “demographic gravitation”, among others. [1]

In 1948, Stewart, in his “Concerning ‘Social Physics’”, opened to the following: [9]

> “Concerning ‘Social Physics’. The quotation marks indicate that it is **NOT an accepted science**, although it may well become one. Its principal concept: the behavior of people in large numbers may be predicted by mathematical rules. A GIANT observer [see: advanced perspective] who himself was as big as the earth could easily **consider a man as being no more than a molecule**. From such a vantage point. an observer equipped with appropriate devices for measuring population densities and movements might discover that, like molecules in a gas, groups of men obey certain simple physical laws. The point of view would be favorable for formulating an exact social science (see: exact science) — a ‘social physics’.
>
> Molecules are unable to study themselves with such detachment. Nevertheless, man is strongly tempted to try to find some mathematical order in human relations. More than one investigator has sought to apply the analogies and precision of physics to the study of societies. The term "social physics" is at least as old as the nineteenth century French philosopher Auguste Comte, although he contributed nothing to the subject but its name. **Today social physics is still only a science in the making**. It still has far to go before it is ready for uncritical acceptance. But already its barrier-breaking results unite demography (the study of populations) with phases of economics, and both of course with physics.
>
> But what has physics to do with people? Men, after all, are more than molecules. Can we advance the study of human relations by forgetting that they are human? Or, to put it another way, can we roughly approximate satisfactory overall solutions of mass sociological problems by an analysis that averages the conflicting desires and the varied characteristics of individuals into a uniform mathematics?
>
> I am confident that we can. People can be counted. They exist in space and time. Their distances apart can be measured. Their activities are subject to mechanical limitations which can be described. True, an individual human being is a complex, often unpredictable organism. But the physics of atoms is subject to similar uncertainties. The famous indeterminacy principle, stalest by the German physicist Werner Heisenberg, means that the motions of individual corpuscles cannot be described with indefinitely great precision. The behavior of an individual particle is exceedingly hard to predict. Nonetheless the physicist makes progress because the averaged motions of a group of corpuscles conform to mathematical formulas or ‘laws’. In the same way, human behavior can be averaged.

> When the physicist attempts to study people in their societies by comparing them to molecules in fluids, his difficulty is not that there are too many people but too few. If reduced to the size and density of molecules in normal air, the entire world's population would comprise a cube only a thousandth of an inch on a side. To reduce the planet to this size, our physicist must be a coarse-grained giant of astronomical dimensions. Little wonder that professors of history, politics and economics …"

Stewart continued to develop this line of social physics research into at least the late 1950s.

In 1948, Stewart penned the textbook *Demographic Gravitation: Evidence and Application*, wherein he incorporated his view that the laws of physics should have applicability to the social sciences, in which he introduced the concept of "potentials of population". [4]

In *c.*1953, Stewart presented a paper before the American Physical Society, wherein he discussed how three of the first three of the main six main forms of physical energy (kinetic, elastic, gravitational, thermal, electromagnetic, and chemical), namely: kinetic, elastic, and gravitational have been showing up in the form of a subject classified as "social mechanics", which is said to deal with time, space, and mass of material as social controls, albeit classified as a "rather neglected" branch of general social study. [13]

Social | Characteristic function

In 1953, John Q. Stewart, in his "Remarks on the Current State of Social Physics", in commentary on his growing Princeton social physics group, gave the following variables table, which he says are intensive and extensive social variables: [10]

Form	Intensive Factor		Extensive Factor
Sociowork	f, cogency	of	C, decisions
Meaning	r, relatedness	of	I, information
Feeling	a, demand	for	G, body-thing satisfaction
	b, demand	for	H, person-person satisfaction
Authority	s, social effectiveness of role		P, status of role

Then gives the following so-called "characteristic function" for the social "working body" as he defines things:

$$fdC = rdI + adG + bdH + sdP - dV$$

Which, as we see, is his attmept at making a social Pfaffian form of cherry picked social conjugate variables, as he sees things.

Social gravitation

See main: Social gravitation

In 1948, Stewart, in his "Demographic Gravitation: Evidence and Applications", according to a review by Daniel Rigney, had some success in predicting the economic and social flow of traffic among cities by using physical mathematics equations used to measure gravitational force between objects, finding that the larger and closer together two cities are, the greater is the strength of their interaction. [7]

Education

Stewart completed his BS in 1915 and and PhD in 1919 both at Princeton University, followed by wartime service with the 29th Engineers in France. In 1919, he was employed as an engineer in the department of research and development at the American Telephone and Telegraph Company, New York, where he developed the first electronically synthesized "voice". From 1921 to 1963, Stewart was associated with Princeton University's astronomy department, obtaining the rank of associate professor in

1927. He co-authored, with Henry Norris Russel and Raymond Dungan, the widely-used two-volume textbook *Astronomy*.

In 1963, he retired from Princeton, moved to Sedona, Arizona, and three years later was appointed professor of metaphysics of science at Prescott College, Arizona, a post he held until his reaction end (death).

Quotes | On

The following are quotes on Stewart:

> "With the help of a small grant from the Rockefeller Foundation, a handful of scholars at Princeton University have been working for some time past in what most people would call a new science: social physics. As the name implies, this science is based on the proposition that physical laws governing the behavior of atoms and planets are applicable as well to social relationships among humans. Distance and time spate one mass of people (a city, say, or a nation) from another and affect interactions accordingly: the number of people and their psychological temper and desire also help to decide what turns are taken in world's affairs. Stewart, associate professor of astronomical physics at Princeton, equates these half dozen social quantities with six fundamental categories of physical science—distance, time, mass, number of molecules, temperature, and electric charge. And he says that it is most unfortunate that the parallels are ignored by politicians and statesmen, for the laws of science have a way of making themselves felt even when the existence is disputed. "Statesmen of this and other nations … have embarked upon grandiose undertakings where on physical grounds failure was predictable," **Stewart** observes, "and … failure meant that … people perished in vain."
>
> — John Lear (1957), "The Laws of Social Relations" [2]

Quotes | By

The following are quotes by Stewart:

> "The way of progress—in social physics—is obstructed by the opinion, common among authorities on economics, politics, and sociology, that human relationships never will be described in mathematical terms. There may be some truth in this as regards the doings of individual persons, but the time to emphasize individual deviations is after the general averages have been established, not before."
>
> — John Q. Stewart (1947), "Empirical Mathematical Rules Concerning Distribution and Equilibrium of Population" (pg. 461)

> "There is no longer excuse for anyone to ignore the fact that human beings, on average and at least in certain circumstances, obey mathematical rules resembling in a general way some of the primitive 'laws' of physics. 'Social physics' lies within the grasp of scholarship that is unprejudiced and truly modern. When we have found it, people will wonder at the blind opposition its first proponents encountered."
>
> — John Q. Stewart (1947), "Empirical Mathematical Rules Concerning Distribution and Equilibrium of Population" (pg. 485)

> "One has to find for himself that in the country of the blind—meaning university faculties and their learned societies—the one-eyed man meets with lifted eyebrows."
>
> — John Q. Stewart (1950) on early 1920s attempts to initiate social physics [6]

> "Our immediate quest is for uniformities in social behavior which can be expressed in mathematical forms more or less corresponding to the known patterns of physical science. Social physics so defined analyzes … sociological situations in terms of purely physical factors: time, distance, mass of material, and number of people, which recourse also to social factors which can be shown to operate in a similar way to two other physical agents, namely, temperature and electrical charge. Social physics describes mass human aggregations of individuals as though there were composed of 'social molecules' without attempting to analyze the behavior of each molecule."

— John Q. Stewart. (1952), “A Basis for Social Physics” [8]

“Immaturity, lack of imagination, ‘doctrinaire departmentalism’, and [in particular] overspecialization is choking modern scholarship and limiting man’s communication with his fellows.”

— John Q. Stewart (1955), commentary on efforts to initiate an interdisciplinary social physics department at Princeton [5]

“For thirty years, I have harbored a deep-seated desire to find some order in the social sciences comparable to that in the physical sciences.”

— John Q. Stewart (1955), “Social Physics” [5]

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A 1999 listing (Ñº) of a some Stewart publications, as pertains geostatistical analysis.

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External links

â— John Quincy Stewart – Wikipedia.
â— Demographic gravitation – Wikipedia.
â— John Q. Stewart (photo) – Photos.AIP.org.

θΔics

In existographies, **John Quincy Stewart** (1894-1972) (SN:11) (CR:64) was an American astronomer and social physicist [see: **John Q. Stewart** (mobile)].

In existographies, **John Ray** (1627-1705) (IQ:170|#350) (Cattell 1000:867) (Murray 4000:15|B) (CR:8) was an English parson, naturalist, botanist, and zoologist; noted for his proverb commentary on beauty, money, and power; e.g. supposed coiner of the phrase "beauty is power"; for his commentary on the fortuitous concourse of atoms model formation of things; and for his classification scheme for grouping species, later referenced by Carl Linnaeus in his more famous Linnaean classification; characterized a “forgotten genius” (Q).

Beauty

See main: Beauty is power

The "beauty is power" proverb is oft-attributed to Ray—the most popular modern rendition of which is:

> “**Beauty is power**; a smile is its sword.”
>
> — John Ray (c.1680)

The original source of this exact quote, however, remains to be determined; one version, from a 1737 collection of his proverbs, reads: [1]

> “Beauty is potent, but money is omnipotent.”

In the same work, Ray also gives the inquisitive proverb: “the prerogative of beauty proceeds from fancy.”

Quotes | On

The following are quotes on Ray:

> “**Ray** was the first to formulate the notion of the species to distinguish plants and animals from one another. His taxonomic system of 1693, based on that of Aristotle, used such anatomical features as nature and number of toes and teeth to classify the animals. Many thinkers in the eighteenth century, especially theologians, disbelieved in the possibility of the extinction of species. Ray, however, demonstrated convincingly that fossils represent extinct animal species, and provided the basis for Cuvier's more thorough system of paleontology.”
>
> — Stuart Curran (2012), “Contexts (Q) to Mary Shelley’s *Frankenstein: the Modern Prometheus* (Q) | Science: Biology: Evolution (Q)”, University of Pennsylvania [3]

Quotes | By

The following are noted quotes:

> “Good words cool more than cold water.”
>
> — John Ray (c.1670) (Q)

> “Money and friendship bribe justice.”

— John Ray (1670), *a Complete Collection of English Proverbs* (pg. 94) (Q)

"A wonder it must be that there should be any man found **so stupid** as to persuade himself that this most beautiful world could be produced by the fortuitous concourse of atoms."

— John Ray (c.1680) (Q)

"It would follow, that many species of shell fish are lost out of the world, which philosophers hitherto have been unwilling to admit, esteeming the destruction of any one species a dismembering of the universe, and rendering it imperfect; whereas they think the divine providence is especially concerned to secure and preserve the works of creation. That it is so, appears, in that providence was so careful to lodge all land animals in the ark at the time of the great deluge."

— John Ray (1703), *Three Physico-Theological Discourses* [2]

See also

- William Paley (Q)

References

1. Ray, John. (1737). *A Complete Collection of English Proverbs* (pg. 137). J. Hughs.
2. (a) Ray, John. (1703). *Three Physico-Theological Discourses* (pg. 149). Publisher, 1713.
(b) Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea* (pg. 243). Harvard University Press, 1936.
3. Curran, Stuart. (2012), "Contexts (Q) to Mary Shelley's *Frankenstein: the Modern Prometheus* (Q) | Science: Biology: Evolution (Q)", University of Pennsylvania.

External links

- John Ray – Wikipedia.

θΔics

In hmolscience, **John Rennie** (1959-) is an American science writer and editor noted for his 17 Jun 2002 *Scientific American* article "15 Answers to Creationist Nonsense" — a reaction to the Mar 2002 Ohio Board of Education move (Q) to have creationism or intelligent design, per initiative of the Discover Institute, taught alongside evolution, and to publications of creationists, such as American law professor Philip Johnson, author of *Darwin on Trial* (1991) — wherein he attempts to tackle the top arguments used by opponents of evolution, which sparked the Rennie creationism fiasco; the article has since become one of the most read and downloaded (Q) articles in the history of ScientificAmerican.com. [1]

Atheism

Rennie, himself, seems to be an atheist, such as characterized by William Dembski (2008), who refers to his "atheistic approach to science". (Q)

In 2008, Rennie, during a Christmas holiday, visiting his wife's family in southern Indiana, took a trip to the Creation Museum with his father-in-law Larry, described (Q) as "not only an avowed and combative atheist but seems to have taken it as a personal goal to try to bring down the Catholic Church during his lifetime as one step toward the total elimination of all religion". Here, to interject, being that "religion", derived from the Latin *legare*, "that which binds", is but a term for a binding system of belief of a social system, the attempt at a total elimination of religion, is akin to an attempt at a total elimination of a binding system, which paramount to the supposition of an unbound system, i.e. a system lacking binding force, which seems to be a theoretical impossibility. Religion, in other words, will morph.

Quotes

The following are noted quotes:

> "Embarrassingly, in the 21st century, in the most scientifically advanced nation the world has ever known, creationists can still persuade politicians, judges and ordinary citizens that evolution is a flawed, poorly supported fantasy."
>
> — John Rennie (2002), "15 Answers to Creationist Nonsense" [1]

Education

Rennie completed his BS in biology at Yale in 1981, after which he worked as a science writer and researcher at Harvard Medical school, then became editor of *Scientific America* from 1994 to 2009. [2]

References

1. Rennie, John. (2002). "15 Answers to Creationist Nonsense: Opponents of evolution want to make a place for creationism by tearing down real science, but their arguments don't hold up" (aud), *Scientific America*, Jun 17.
2. About – JohnRennie.net.

External links

- John Rennie (editor) – Wikipedia.
- Home – JohnRennie.net.

θΔics

In existographies, **John Robinson** (1739-1805) (CR:3) was a British physicist, mathematician, and natural philosopher, noted for []

Overview

In 1797, Robinson, in his "Steam-Engine" article of *Encyclopedia Britannica*, supposedly gave the following illustration, in some form or another, of the Watt-Southern indicator diagram:

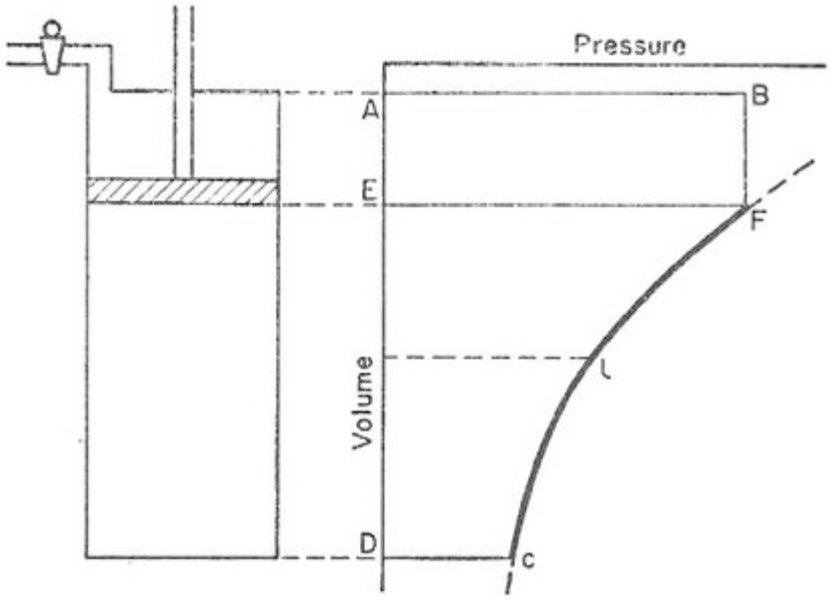

about which he commented the following:

> "The accumulated pressure during the motion of the piston from EF to DC will be expressed by the area EFcDE and the pressure during the whole motion by the area ABFcDA. Now it is well known that the area EFcDE is equal to ABFE multiplied by the hyperbolic logarithm:
>
> AD/AE = L · AD/AE
>
> and the whole area:
>
> ABFcDA = ABFE (1 + L · AD/AE)
>
> It having been granted that FLc is a rectangular hyperbola."

In commentary on this, Donald Cardwell (1971) points out that although this "remarkable analysis" soon came to be much-admired by contemporary writers on the steam engine, Robinson, as he commented in a letter to Watt, knew of Davies Gilbert's earlier 1792 analysis of a similar nature.

Coulomb's law

In 1769, Robinson announced that the balls of like electrical charges repel each other with a force that varies as the inverse-square of the distance between them; thus anticipating Coulomb's law (see: scale of things).

Watt

Robinson was a friend and associate of James Watt and published a number of summary articles on the specifics of Watt engine.

References

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(b) Rees, Abraham. (1819). *The Cyclopedia, Volume 34* (§:“Steam-Engine”; quote, pg. #). Publisher.
2. (a) Robinson, John. (1797). “Letter to Watt”, Jul 22.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pgs. 79-80). Cornell University Press.

Further reading

● Robinson, John. (1797). “Steam-Engine”, *Encyclopedia of Britannica*. Publisher.
● Robinson, John. (1818). *The Articles Steam and Steam-Engines: Written for the Encyclopedia Britannica, by the Late John Robinson, with Notes and Additions by James Watt* (§: Letter from Mr Watt to Dr Brewster on the History of the Steam Engine, pgs. iii; §: On Steam, pgs. 1-45; §: On the Steam Engine, pgs. 46-151; §: Appendix by Mr Watt, pgs. 152-80). Edinburgh: Murray.
● Robinson, John. (1822). *A System of Mechanical Philosophy, Volume Two* (notes: David Brewster) (quote, pg. 17). Edinburgh, 1822.

External links

● John Robinson (physicist) – Wikipedia.

θΔics

In existographies, **John Roebuck** (1718-1794) (CR:4) was an English physician, chemist, and industrialist, noted for []

Overview

In 1759, Roebuck founded the Carron Company ironworks, at Carron, Stirlingshire, and also leased a colliery at Bo'ness to supply coal to his ironworks plant, but found that the coal pit his so much water, that a Newcomen engine was unable to keep the pit clear, after which he had heard of James Watt's steam engine, and became Watt's first investor, in return for two-thirds share.

In c.1765, Joseph Black, characterized as "Watt's best friend" (Carnegie, 1905), approached Roebuck about the possibility of funding James Watt, and by Sep 1765, Roebuck had invited both Black and Watt to his country home to discuss business potentials. [1]

Education

Roebuck studied under Herman Boerhaave. [2]

References

1. Carnegie, Andrew. (1905). *James Watt* (§4: Partnership with Roebuck, pgs. 67-; Roebuck, 25+ pgs). Publisher.
2. Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 49). Cornell University Press.

External links

â— John Roebuck – Wikipedia.

θΔics

In existographies, **John Ruskin** (1819-1900) (CR:9) was an English artist, social philosopher, and essayist, noted for []

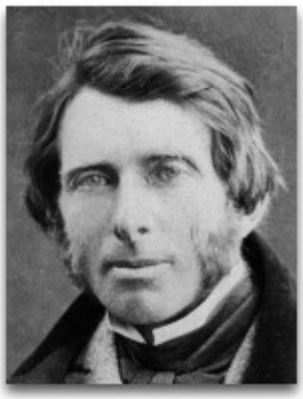

Economics

Ruskin, view that economics required a scientific component and described wealth as a "dynamic flowing stream". [1]

Ruskin, in this respect, in social and economic applications of thermodynamics, is cited by a number of thinkers, including: Frederick Soddy, Patrick Geddes, Thomas Wallace, and Greg Myers.

Quotes | On

The following are quotes by Ruskin:

> "The 'motion' of an energy system is its 'behavior'. Various types of organization of systems produce on that basis various types of behavior. A **gray rock**, said **Ruskin**, is a **good sitter**. That is one type of behavior. A darting dragon-fly is another type of behavior. We call the one alive, the other not. But both are fundamentally balances of give and take of motion with their surround. To make 'life' a distinction between them is at root to treat them both artificially."
>
> — Charles Sherrington (1938), "Man on His Nature"; reference, supposedly, to an 1849 pocket book note, by Ruskin, scribbled to his father about how he was sitting on a gray rock on a glacier while waiting for the fog to clear

Quotes | By

The following are quotes by Ruskin:

> "The highest strength of [artistic] genius is generally marked by strange unconsciousness of its own modes of operation, and often by no small scorn of the best results of its exertion. The inferior mind intently watches its own processes, and dearly values its own produce; the master-mind is intent on other things than itself, and cares little for the fruits of a toil which it is apt to undertake rather as a law of life than a means of immortality. It will sing at a feast, or retouch an old play, or paint a dark wall, for its daily bread, anxious only to be honest in its fulfillment of its pledges or its duty, and careless that future ages will rank it among the gods."
>
> — John Ruskin (1854), *Giotto and His Works in Padua* (Ñº)

> "When I seriously believe a thing, I say so in a few words, leaving the reader to determine what my belief is worth. But I do not choose to temper down every expression of personal opinion into courteous generalities. **Let us learn to speak plainly and intelligibly first**, and, if it may be, gracefully afterwards."
>
> — John Ruskin (1885), *On the Old Road* (pg. 260); cited by Mangasar Mangasarian (1910) in *The Bible Unveiled* (opening quote)

> "Morality does not depend on religion."
>
> — John Ruskin (c.1890), *Publication* [2]

References

1. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values* (Geddes, pg. 25-26). AuthorHouse.
2. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pg. 193). Prometheus.

External links

â— John Ruskin – Wikipedia.

θΔics

In economic thermodynamics, **John Rutledge** (c.1948-) is an American economics consultant and investor notable for his 2006 Beijing University of Technology lecture "Thermodynamics and Economics", for his 2008 book *Lessons From a Road Warrior*, wherein he outlines a thermo-economics framework for investing, and for his 2012-launched teaching of Claremont Graduate University course "Topics in Far from Equilibrium Economics: Evolutionary Economics and Finance", a human thermodynamics education type of course, wherein, getting away from the older agent-based equilibrium economics models, he uses nonequilibrium thermodynamics to help understand phenomena such as periodic booms, busts, recessions, depressions, and financial crises.

Overview

In his 2006 lectures "Thermodynamics and Economics" presented at the Beijing University of Technology, Rutledge uses a thermodynamics framework to re-think economics and finance, the synopsis of which is as follows: [1]

> "My basic premise is that economic activity is a transformation of current or vintage thermal energy into kinetic, or coherent motion, which we call work or GDP. Energy is stored in vessels (batteries)–natural resources, plants, animals, people, technology, and capital goods. As economic agents, we are gradient-seeking systems, transforming energy into work (GDP) and cost or waste (entropy). Differing endowments of the various forms of stored energy lead to differing relative prices in different closed systems (countries, markets). International trade creates an open system in which the second law (arbitrage) drives relative prices (temperatures, pressures) together.
>
> Boltzmann's distribution gives a useful way to think about the impact of relative price differentials and transactions costs (Boltzmann's constant) on the speed of convergence toward thermal equilibrium. When the differential is small the adjustment is smooth. When the differential is great or the bandwidth connecting the closed systems is high relative to both systems (fiber optic cable connecting service sectors with effectively infinite capacity) the adjustment can be abrupt, discontinuous, and chaotic, leading to potentially violent trade wars and other frictions, as shown in the literature on non-equilibrium thermodynamics. Relative price differentials between China and America, together with massive optical fiber capacity connecting the systems, is a potentially volatile situation. Both countries should give serious consideration to stability when setting policies, giving high priority to a stable currency regime."

In his 2008 book *Lessons From a Road Warrior*, Rutledge outlines what he calls his "thermo-economics framework for investing" that shapes the way he sees the world today, according to which he uses a thermodynamics-based framework to help understand the important economic, financial, and political forces that shape human existences and determines the value of homes and stock portfolios. [2]

Education

Rutledge completed his BA in economics in 1970 at Lake Forest College, Illinois, his PhD in economics in 1973 at the University of Virginia, after which he began working as an economics professor at: Lake Forest College (1969-1970), University of Virginia (197-1973), Tulane University (1973), University of Konstanz, Germany (1976), Claremont McKenna College (1976-1983), after which he founded the Claremont Economics Institute (1979-1991), an economic advisory and forecasting company, after which he founded Rutledge Capital LLC, a private equity investment and forecasting company (1991-present). Recent activity includes being a contributing columnist to *Forbes* (1994-present), visiting professor at the Chinese Academy of Sciences (2007-present), senior research professor at Claremont Graduate University (2009-present), and instructor in the MBA managerial economics program of Bethel University (2011-present).

References

1. Rutledge, John. (2006). "Thermodynamics and Economics" (abs), Beijing University of Technology, May 21.

2. Rutledge, John. (2008). *Lessons From a Road Warrior*. Rutledge Research.

External links

â— John Rutledge – RutledgeCapital.com.

θΔics

In religious thermodynamics, **John C. Sanford** (1950-) is an American plant geneticist noted for his 2005 book *Genetic Entropy* in which he argues that the standard Darwin evolution motto, i.e. of life being the result of random mutations and natural selection, is false, on the premise that higher genomes degenerate over time, in accordance with the second law. Sanford is an atheist-turned-Christian. His points out that for many, when one abandons the life, death, purpose views of religion for science, that one is left with the resultant mindset question: [1]

> "Are you are just a meaningless bag of molecules—the product of nothing more than random molecular mutations and reproductive filtering?"

To remedy this succumbing view and to reinstate a religious faith to the modern person, Sanford's central argument states that:

> "For decades biologists have argued on a philosophical level that the very special qualities of natural selection can essentially reverse the biological effects the second law of thermodynamics. In this way, it has been argued, the degenerative effects of entropy in living systems can be negated—making life potentially immortal. However, all of the analysis of this book contradicts that philosophical assumption. Mutational entropy appears to be so strong within larger genomes that selection cannot reverse it. This makes eventual extinction of such genomes inevitable. I have termed this fundamental problem genetic entropy."

The basic points of this statement by Sanford are correct on the view of Clausius-Planck view that "the entropy of the universe tends to a maximum" (Clausius, 1865) + "entropy depends on disorder" (Planck, 1901), therefore the disorder of the universe tends to a maximum, and evolution should be impossible in a universe governed by the laws of physics. This issue has never been completely reconciled. Then, however, Sanford mixes this all together with diatribe on how God and Jesus are the answer:

> "I hate the consequences of entropy (degeneration). I hate to see it in my own aging body, in the failing health of loved ones, or in the deformity of a new-born baby. I find it absolutely ghastly, but also absolutely undeniable. The good news [is that] Jesus has the power to defeat death and degeneration."

The bit of thermodynamics discussion in Sanford's book, which amounts to only a few pages, is pure nonsensical in style. He argues at one point, for example, that God gave us the genome and that the second law of thermodynamics can be found by plotting the descendents of Noah (in the bible) vs. life-span of each descendent.

Education

Sanford completed his BS (1976) in horticulture at Minnesota University, St. Paul, and both his MS (1978) and PhD (1980) in plant breeding and plant genetics at the University of Wisconsin, Madison.

References

1. Sanford, John C. (2005). *Genetic Entropy and the Mystery of the Genome - the Genome is Degenerating* (second law: pg. 144, entropy: pg. 154). Lima, New York: Ivan Press.

External links

â— John C. Sanford – Wikipedia.
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â— Sanford, J. C. – WorldCat Identities.

θΔics

In hmolscience, **John Schmitz** (c.1950-) is a Danish chemist noted, in human thermodynamics, for his 2007 *The Second Law of Life*, a laymanized presentation of thermodynamics applied to questions surrounding the humanities.

Overview

In 1980s to 1990s, Schmitz noticed how the concept of entropy was used in other fields, aside from chemistry and physics, such as in history, sociology, economics, art, ecology, and religion. Thus, "struck by the simplicity of thermodynamics, the fact that it remained virtually unchanged for decades, and that the theory quietly determines many aspects of our daily lives", he got the idea to write a book about it for non-scientists.

In 2007, Schmitz reluctantly published *The Second Law of Life: Energy, Technology, and the Future of Earth as We Know It*, in which, being a general historical book of thermodynamics applied to general humanities and biology subjects, he argues that the second law is the second law of life. [1]

In his book, Schmitz states that there are "parallels between money and entropy". In rectification of the chaos view of the second law as this contrasts with the ordering view of evolution in the formation of organized life forms, Schmitz states that "the creation of life occurs at the expense of available energy elsewhere in the isolated system (stipulation: universe = isolated system)."

One of the best aspects of his book, is his human entropy, i.e. the entropy of a human being, diagram (adjacent).

Entropy | Colloquial views

Schmitz stated that he was stimulated to write this book after asking his friends and neighbors what they knew about entropy? Most didn't know anything and some vaguely remembered something about chaos. Subsequently, he wrote his book, for the scientific layperson, to give an overall idea of how entropy applies in human life.

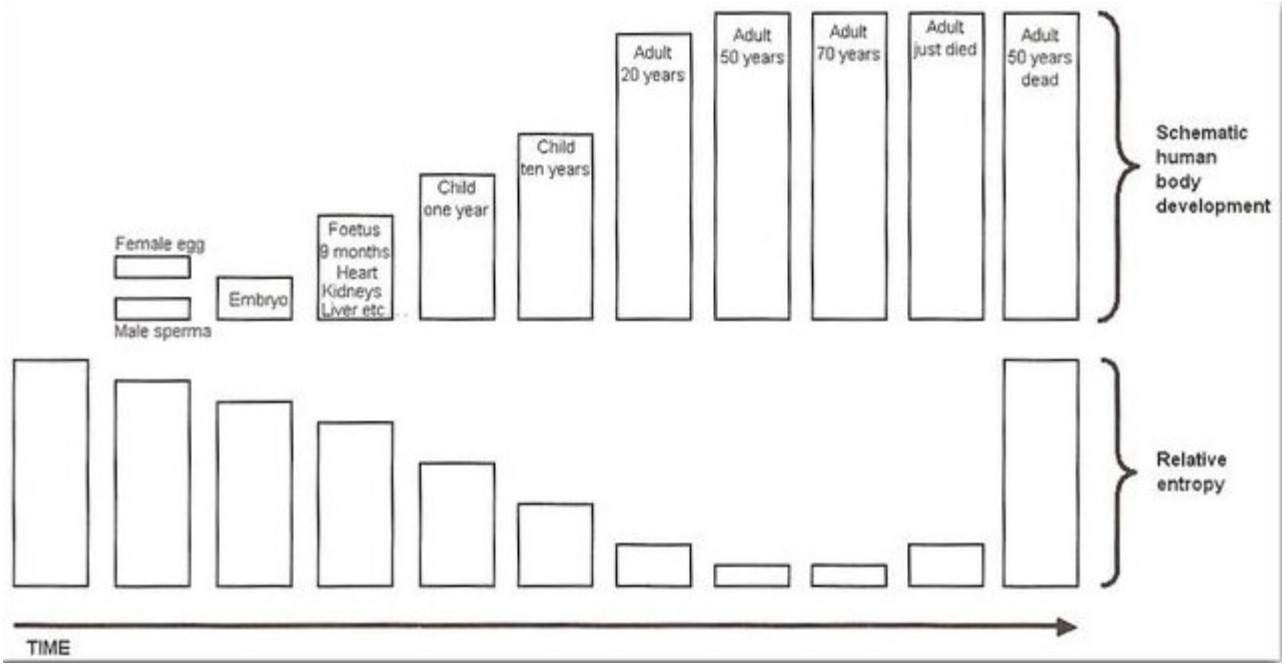

Schmitz's so-called "relative entropy of a human", i.e. "**human entropy**", diagram, according to which he seems to conceptualize the notion that a person's level of entropy is the lowest (low entropy) at their last decades existence, prior to death (dereaction), e.g. an adult aged 50-70, after which 50-years later, following decomposition, a person's so-called afterlife entropy is as high (high entropy) as it was before his or her birth (reaction synthesis).

In 2008, Libb Thims, stimulated by the above comment, i.e. that Schmitz polled his neighbors about entropy, polled 81 Chicagoans with a flash card with the word "entropy" on it and asked if they knew what it was? [3] Of those polled, 64 had no idea, and 17 gave answers (21%). Of those answers, the following key words occurred more than once: energy (4), heat (2), chaos (2), disorder (2), and universe (2).

Difficulties on theory

In writing the book for the lay-person, as Austrian physicist Erwin Schrödinger did in his 1944 book *What is Life?* (thus promoting the non-logical "feeding on negative entropy" postulate of life), Schmitz falters on the ambivalent-to-support side of the fence for a number of fallacious or disproved human thermodynamic theories. In particular, Schmitz supports both Romanian economist Nicholas Georgescu-Roegen's 1971 take on the thermodynamics of the economic process and American economist Jeremy Rifkin's 1980 "material entropy" view of consumerism and remains ambivalent on the matter of American engineer Claude Shannon's 1948 theory of information entropy. In regards to Georgescu-Roegen's conception of the "Entropy Law", for instance, Schmitz states "we have now established that the economic process transforms available energy and the world's resources into a situation of high entropy … at a rate much faster than natural processes would drive".

This postulate is incorrect. For one, he assumes that human activity is not a natural process. Second, "available energy" (or free energy), as was outlined illogically by Georgescu-Roegen, is an 1873 mathematical conception, developed by American engineer Willard Gibbs, signifying the working chemical potential of a "thermodynamic system" or the amount of energy that can be converted into system external work. In the case of a human thermodynamic system, the boundary is the system of human molecules under study; hence, in this point of view, a natural resource, such as coal, functions as a "catalyst", thus lowering the activation energy barrier to human reaction, and it not representative of entropy or free energy. [4]

Schmitz states that "life needs a low entropy resource – photosynthesis – to survive and reproduce." The difficulty in this statement is, for one, the use of the word "need" instead of the incorporation of the conception of "drive" (as in life is driven by energy from the sun), and secondly, the equality of the process of photosynthesis:

$$6\ CO_2\ (g) + 12\ H_2O\ (l) + \text{photons} \rightarrow C_6H_{12}O_6\ (aq) + 6\ O_2\ (g) + 6\ H_2O\ (l)$$

or the conversion of photons into stored chemical bond energy, such as glucose, is a low entropy resource. Correctly, as defined by German physicist Rudolf Clausius, entropy is the loss of energy as the molecules of a system "work on each other" irreversibly (a loss that results owing to the mechanical equivalent of heat operating in systems wherein heat flows). Hence, the postulate, originating from Schrödinger, that food stuff, such as glucose $C_6H_{12}O_6$, a 3-element molecule, a simple sugar, represents a "low entropy resource" is an oversimplification.

In regards to "free will", Schmitz seems to allude to the view that people have "choice" or free will. He states "another problem area is the perceived determinism of the second law". Moreover, "the second law is seen by some as something that would take away the possibility of choice for humanity, so that the entire universe and life itself would be predetermined." He concludes, incorrectly, that "if we consider our planet as a system under study, then we know that because of the influx of energy from the sun, there is plenty of room for a bi-directional trend for the entropy".

This non-logical statement is similar to English physicist Charles Galton Darwin, who in his 1952 book *The Next Million Years* applied thermodynamics to the modeling and understanding of human life, evolution, and the future, in a relatively correct manner, but in a side note commented that people are "human molecules", who abide by the "laws of human thermodynamics", but that "unlike a molecule, a man has a *free will*, which makes his actions unpredictable." [5] The correct view is the induced movement view, which is the case for all molecules, human or otherwise; a fact which can be deduced through study of a molecular evolution table. [4]

Education

Schmitz's interest in thermodynamics began in 1980, in which he began working on his PhD thesis "Thermodynamic and Activation Parameters of Redox Reactions of Transistion Metal Coordination Complexes", which dealt with the energetic properties of certain chemical compounds, and from this research he became acquainted with "entropy". He was awarded his Ph.D. in Chemistry in 1984 from the Catholic University of Nijmegen (Netherlands). [2] Schmitz holds six patents in the semiconductor field and has published over 45 scientific articles and one technical book in the field of integrated circuit technology. Before, Schmitz was the Chief Operating Officer Manufacturing Technology of SEMATECH (Austin, Texas) a consortium that develops semiconductor manufacturing technology, materials, and equipment for their member chip maker companies. Schmitz has dealt with thermodynamics and entropy for 25 years on

a professional level. Schmitz currently holds a senior management position in semiconductor technology research.

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5. Darwin, Charles G. (1952). *The Next Million Years* (pg. 26), (Scribd). London: Rupert Hart-Davis.

θΔics

In existographies, **John Scopes** (1900-1970) was an American teacher and geologist, noted for voluntarily being the accused in the infamous 1925 Scopes Monkey Trial, wherein he was charged with teaching, in Tennessee, the “prohibited subject” of evolution to children, which at that time was a violation of the state’s “Butler Act”.

Overview

in c.1920, John Butler, a farmer and part-time high school teacher, was sitting at the Primitive Baptist Church, Tennessee, listing to a sermon about a young woman in his community who enrolled in a biology course at a nearby university, and after finishing the course returned home, the preacher said, and was no longer a Christian. The theory of evolution was said to have destroyed her faith in god. Butler asked himself whether evolution could turn one his own three boys into an atheist. Could this happen to his neighbors’ children? Could this happen in his the high schools of his own Macon County, where evolution was currently being taught? It just wasn’t right, Butler thought, that parents could bring their children up to be god-fearing, only to have a taxpayer-supported biology teacher rob them of their faith. Evolution fit into a strong concern he had about education: it replaced the solid, land-based values of his neighbors with more cosmopolitan and irreligious values.

In 1922, Butler ran as a Democrat for state representative and in his campaign fliers promised voters in his district that he "would work to protect schoolchildren from the effects of the godless doctrine of evolution".

In 1925, Butler, as state Democrat, passed the so-called Butler act, making it illegal to each evolution in school:

> "That it shall be unlawful for any teacher in any University and all other public schools of the State which are supported in whole or in part by the public school funds of the State, to teach any theory that denies the Story of the Divine Creation of man as taught in the Bible, and to teach instead that man has descended from a lower order of animals."

The reasoning behind this act is as follows, as he later reported:

> "I didn't know anything about evolution when I introduced it. I'd read in the papers that boys and girls were coming home from school and telling their fathers and mothers that the Bible was all nonsense."

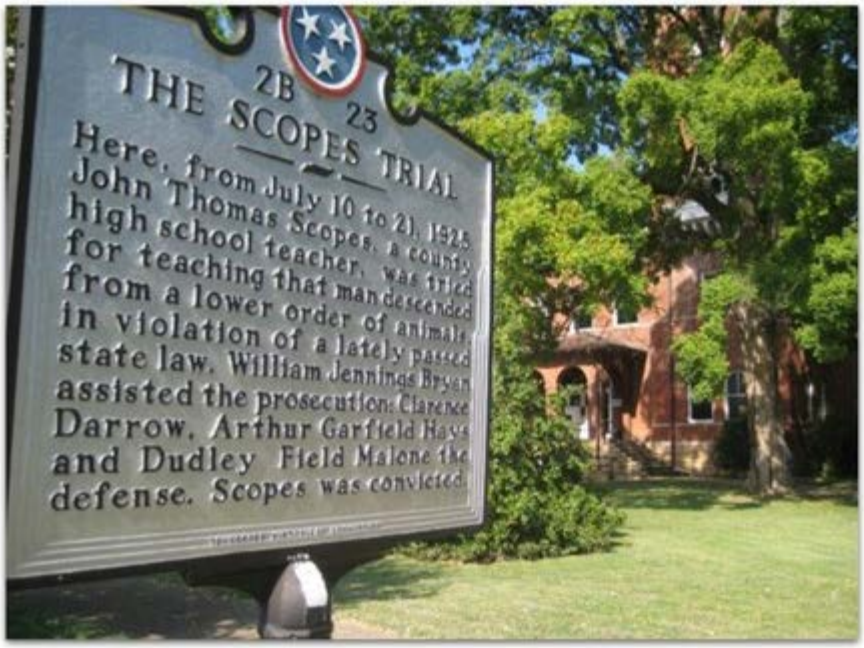

John Scopes

John Butler

A plaque stating that than on Jul 10 to 21, 1925, **John Scopes**, a county high school teachers, was fired for teaching that "man descended from a lower order of animals", a violation of the states "Butler act" passed by Christian-minded democrat John Butler.

In 1925, Scopes was approached by several men to see if he would be willing to volunteer to test the validity of the state’s anti-evolution teaching Butler act; this meeting is retrospectively recounted as follows: [1]

> “He recounts that he showed several men gathered in a local drugstore the textbook used to teach high school biology: "I explained that I ... used it for review purposes while filling in for the principal during his

> illness. He was the regular biology teacher... you can't teach biology without teaching evolution." He was asked, "John, **would you be willing to stand for a test case**?'... [Scopes thought] To tell the truth, I wasn't sure I had taught evolution. Robinson and the others apparently weren't concerned about this technicality".”

Here, interestingly, we see that Scopes might not even have taught evolution; the trial was a matter of principles.

Quotes | By

The following are quotes by Scopes:

> “I don't know... who does?”
>
> — John Scopes (c.1925), response to reporter who asked if he was a Christian [1]

See also

â— Science vs religion legal cases

References

1. Scopes, John and Presley, James. (1967). *Center of the Storm: Memoirs of John T. Scopes* (I don’t known, pg. 83; recounting, pg. 59-60) (Ñº) (cover). Holt, Rinehart and Winston.

External links

â— John Scopes – Wikipedia.

θΔics

In existographies, **John Searle** (1932-) [RGM:740|1,310+] (PGT:30) is an American philosopher noted for []

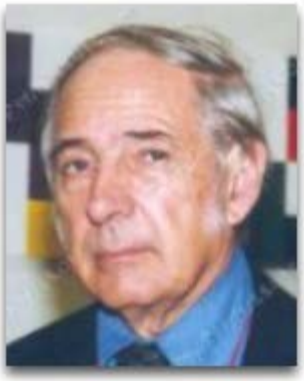

Biological naturalism

In 1980, Searle, in opposition to Cartesian dualism, proposed "biological naturalism" ; the gist of which, supposedly, is as follows: (Q)

> "Searle denies Cartesian dualism, the idea that the mind is a separate kind of substance to the body, as this contradicts our entire understanding of physics, and unlike Descartes, he does not bring god into the problem. Indeed, Searle denies any kind of dualism, the traditional alternative to monism, claiming the distinction is a mistake. He rejects the idea that because the mind is not objectively viewable, it does not fall under the rubric of physics."

(add)

Quotes | On

The following are quotes on Searle:

> "I wish there were a term in the English language that honestly captures the idea that all we experience is due to brain function. 'Materialism' comes close, but is laden with excess metaphysical baggage. The philosopher **John Searle** coined 'biological naturalism' as a mind-body theory within philosophy, and that comes very close. '**Asoulism**' is more modest: a simple disbelief in the existence of souls based on evidence."
>
> — David Weisman (2010), "The Experience of a Unified Mind and the Possibility of an Everlasting Soul are Connected and there is Scant Evidence to Support the Existence of Either" [1]

References

1. Edison, Thomas. (1924). "Do We Live Again?" (Q), *The Illustrated London News*, May 3.

External links

- John Searle – Wikipedia.

θΔics

In existographies, **John Smeaton** (1724-1792) (Murray 4000:8|T) (EP:23) (CR:2) was an English mechanical engineer, civil engineer, and physicist, noted for []

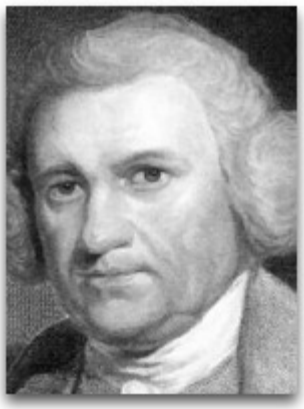

Overview

Smeaton, as a boy, made a fire engine or heat engine of some kind; supposedly in the manner or style of a Newcomen engine.

In c.1765, Smeaton equated one horsepower to 5 men or to 22,916 pounds of water raised one foot high in one minute against the force of gravity. [2]

Quotes | On

The following are quotes on Smeaton:

> "**Smeaton** was the first to call himself a 'civil', as distinguished from a 'military', engineer."
>
> — Richard Kirby (1956), *Engineering in History* [1]

> "**Smeaton** built a number of Newcomen engines at the Carron ironworks in Scotland and greatly increased their mechanical efficiency by more precise cylinder boring, a better proportioning of parts, and general improvement in shopwork. He attained, it is said, the highest performance of which this type of engine was capable in practice. One of his largest engines went to Russia in 1775 to pump out Catherine II's dry docks at Kronstadt. It replaced two enormous windmills, 100 feet high, which Dutch engineers had installed in 1719. It was said that these mills had required a year for the task; the Newcomen engine built by Smeaton did the job in about two weeks."
>
> — Richard Kirby (1956), *Engineering in History* [1]

References

1. Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pgs. 166-67). Courier, 1990.
2. (a) Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 171). Courier, 1990.
(b) Hills, Richard L. (1989). *Power from Steam* (pg. 89). Cambridge University Press.

Further reading

â— Stewart, R.J. (2017). "John Smeaton and the Fire Engine: 1765-1785" (abs), Proceedings of the 1st International Conference Early Engines Conference - Part 1, in: Issue 2: *The International Journal for the History of Engineering and Technology*, 87.

External links

â— John Smeaton – Wikipedia.

θΔics

In existographies, **John Southern** (1758-1815) was an engineering assistant and employee to engineers Brit Matthew Boulton and Scot James Watt notable for his 1796 invention of the indicator diagram, a modification of the earlier circa 1790 invention of the indicator, a device for measuring steam pressure in the piston and cylinder.

In 1782, Matthew Boulton (1728-1809) introduced Southern, then aged 24, an aspiring musician of sorts, to James Watt, who thereafter became Watt's assistant and right-hand man, becoming partner in 1810. (Ñº)

Indicator

The 'indicator' was invented by engineers Matthew Boulton and James Watt in circa 1790 and evidence for its use is found in a long series of 1793 experiments of Watt's friend George Lee at the Philips & Lee cotton spinning factory, which had bought a Watt rotative engine in 1792. In his experiments, Lee had used an indicator to measure the highest and lowest pressures reached in the cylinder.

Indicator diagram

In early 1796, Southern invented the indicator diagram; a version which is shown below: (Ñº)

On 12 April 1796, after hearing of Southern's invention of the indicator diagram method, Lee wrote:

> "I am like a man parch'd with thirst in the expectation of relief, or a woman dying to hear (or tell) a secret—to know Southern's mode of determining power."

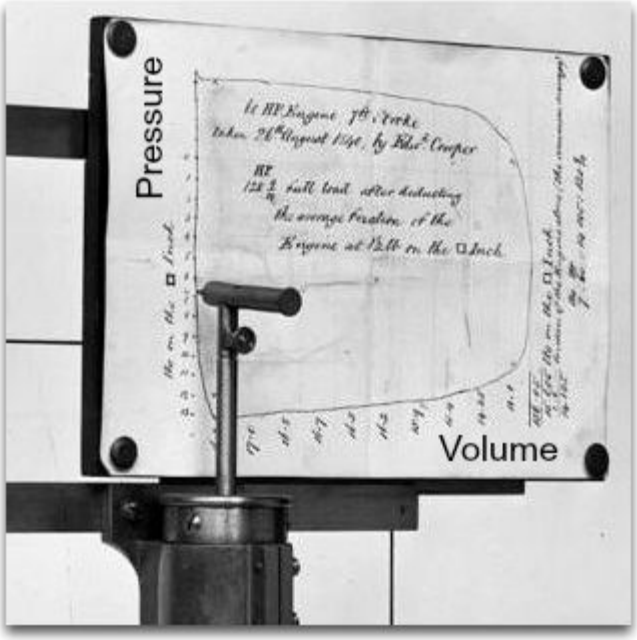

Diagram of the indicator (vertical part), which gives a reading of pressure, invented by James Watt and Matthew Boulton in 1790, and the sliding board (horizontal part) and pencil tracer (attached to the indicator), invented by Southern in 1796, which makes an 'indicator diagram', the pressure-volume graph (drawn on the sheet).

Southern's invented device was that whereby a pencil replaced the pointer on the indicator and traced a line, recording the pressure, on a paper which moved backward and forward in pace with the piston. The line traced out was a graph, representing a plot of the

pressure against the displacement of the piston. A week later, after being told more about the invention, he commented:

> "Southern's scheme is highly scientific and ingenious but will require nicety in the execution—a good experiment upon a pump engine would not be amiss."

Watt and Southern's device, afterwards given the name 'indicator diagram', were said to have quickly realized that the indicator diagram could be used to give a direct measure of an engine's power. [2]

Thermodynamics

Southern's indicator diagram method was utilized in the 1834 paper "Memoir on the Motive Power of Heat" by French engineer Emile Clapeyron in such a way as to put the 1824 verbal description of the Carnot cycle into a more rigorous graphical methodology as to how the pressure volume work the working body of the steam engine does in one cycle. This paper then came into the hands of William Thomson (1848) and from him into the hands of Rudolf Clausius (1850) after which the science of thermodynamics was founded. [3]

Education

Little seems to be known about Southern. He authored the 1785 book *A Treatise on Aerostatic Machines* and contributed to the 1814 Encyclopedia Britannica and steam and steam engines. [3] Southern, in latter years, was described as one of Watt's good friends.

Quotes

The following are related about quotes:

> "The indicator was invented by Watt and the sliding board and tracer were afterwords added by **Southern**."
>
> — Thomas Tredgold (1838) [1]

References

1. (a) Okil, John. (1938). *Autographic Indicators for Internal Combustion Engines* (pg. 10). Arnold.
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4. (a) Southern, John (1785-1818) (engineer) – WorldCat Identities.
(b) Robinson, John, Southern, John, Watt, James, and Brewster, David. (1818). "The Articles Steam and Steam Engines written for the Encyclopedia Britannica" (link), John Murray.

External links

â— John Southern (engineer) – Wikipedia.

In hmolscience, **John Murray Spear** (1804-1887) was an American spiritualist, magnetic healer (mesmerist), and universalist minister noted for his 1858 draft article “Human Chemistry: What is It?”, wherein he seems to make an attempt to address the subject of “human possibilities” in terms of chemistry, the animal kingdom, animate and inanimate things, chemistry, admixtures with spirituality ideas; barring further exacting translation of the handwritten cursive text. [1]

New motive power | Mechanical messiah

In 1852, Spear constructed a spirit-designed mechanical messiah, which he called “new motive power”, designed to be powered by the life force, and constructed of copper, zinc and magnets, all carefully machined, which he thought would herald in a new era of utopia. (Ñº)

Human chemistry

The following is the opening section of Spear's “Human Chemistry: What is It?” draft, to give a flavor of his manuscript, wherein he seems to be discussing things such as how "written out in the variety of forms are the mathematical chemical proportions of substances that make up the finest soul impressions" (if translating correctly), among other ideas: [1]

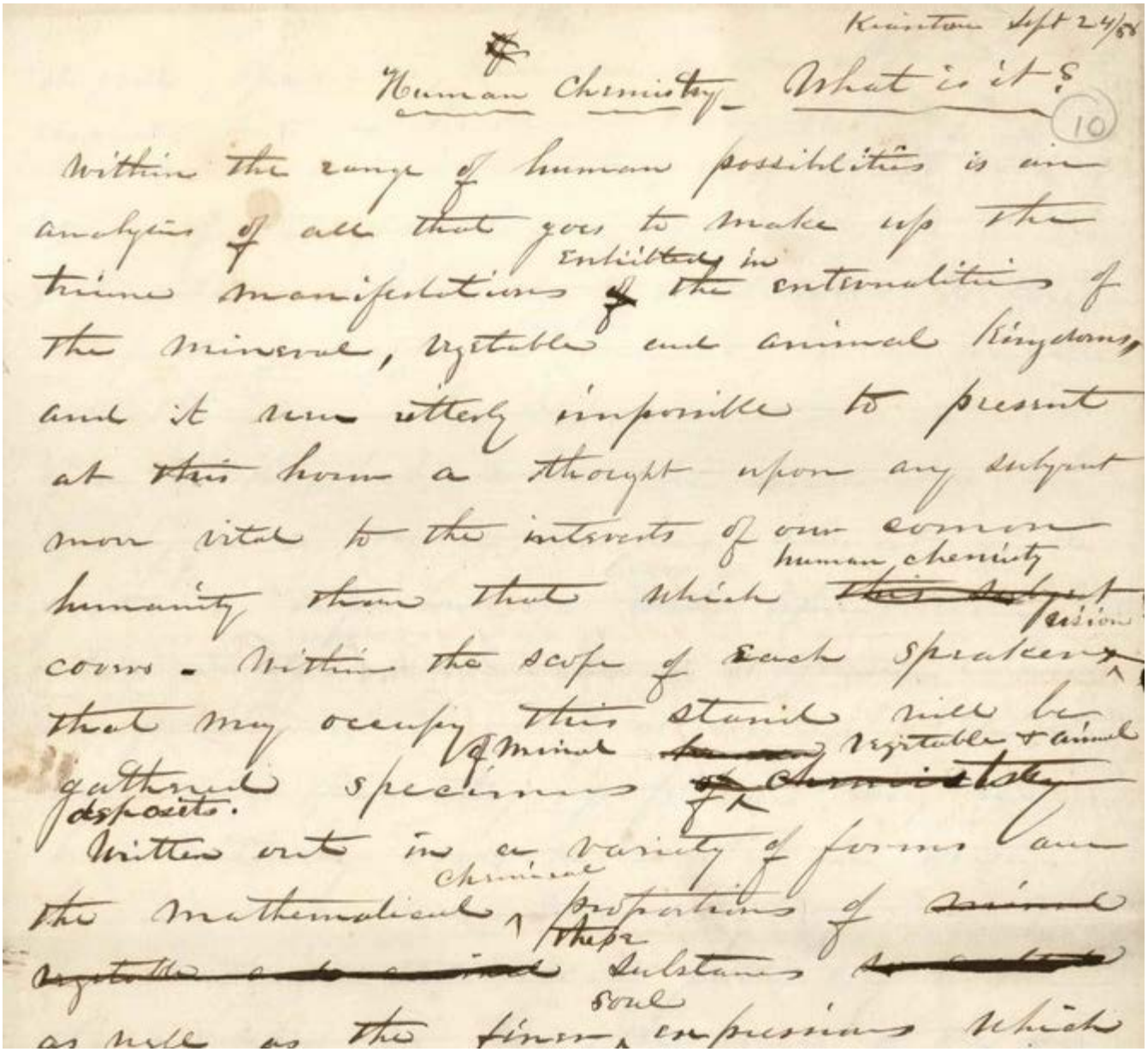

Kinston Sept 24/58

Human Chemistry What is it?

(10)

Within the range of human possibilities is an analysis of all that goes to make up the trine manifestations entitled in the externalities of the mineral, vegetable and animal kingdoms, and it was utterly impossible to present at this hour a thought upon any subject more vital to the interests of our common humanity than that which human chemistry ~~this subject~~ occasions. Within the scope of each speaker's that may occupy this stand will be gathered specimens of mind ~~human~~ vegetable & animal ~~chemistry~~ deposits.

Written out in a variety of forms are the mathematical chemical proportions of ~~animal~~ ~~vegetable~~ these substances ~~[illegible]~~ as well as the finer soul impressions which

(add discussion)

References

1. Spear, John M. (1858). “Human Chemistry: What is It?” (Ñº), 15-page manuscript, Sep 24; in: *Thaddeus Sheldon Papers, 1853-1868, Box I, Folder 10, DAR. 1960.01, Darlington Collection, Special Collections Department, University of Pittsburgh*.

External links

â— John Murray Spear – Wikipedia.

θΔics

In human chemistry, **John Spollon** (c.1854-c.1914) was an American poet noted for his 1894 article "Among the Bards", wherein he discusses the mixing of democrats and republicans in the language of English poet William Cowper's 1782 "On Friendship" and German polyintellect Johann Goethe's 1809 *Elective Affinities*.

Overview

See main: Political chemistry

In 1894, Spollon, in his article "Among the Bards", on German polyintellect Johann Goethe's 1809 *Elective Affinities*, in which he characterizes Goethe as the father of affinity, wherein, among other things, he compares the effervescent liquored mixing of mix democrats and republicans to being akin to pouring water over some antacids (seidlitz powder); the full article of which is as follows: [1]

> Goethe, whose name in charity to young pronouncers should be spelled Getty, was the father of affinity. If there is a more dangerous combination than a woman, a kerosene can and damp kindlings, it is a poet, an inquiring mind and the science called chemistry. While tinkering with the science in an amateur way. Getty, the German Shakespeare, discovered, what every chemist knew, that there are certain atoms that possess elective affinities for certain other atoms; that is, they were intended by nature to meet with and adhere to each other, forming a perfect whole. He was not the only poet who got an idea from the elements. Cowper noticing that salts and certain acids have no affinity for each other, wrote :
>
> > "Courtier and patriot cannot mix
> > Their heterogeneous politics
> > Without an effervescence
> > Like that of salts with lemon juice."
>
> When, in mixing your seidlitz powder (Ñº), after placing together in one tumbler the contents of the blue paper and the white paper, you pour some water on them and they kick up a tremendous fuss, the thought may occur to you: take an handful of democrats and a handful of republicans, put them together just before election, pour some whiskey on them and the result will be the same as when mixing a seidlitz powder, because they have *not* an affinity for each other.
>
> Even so the thought came to Getty, that every man and every woman was born to meet sooner or later one certain woman or one certain man who was born for him or her — his or her

A 1910 advert for seidlitz powder (Ñº) tablets, an an early type of antacid pill, composed of a mixture of tartaric acid, sodium bicarbonate, and potassium sodium tartrate, and is used as a mild cathartic by dissolving it in water and drinking, after which the powder combines with gastric juices to develop intestinal gases which are somewhat helpful in evacuating the user's bowels; and acid-based type reaction which Spollon compares to the mixing of liquored-up republicans and democrats before an election.

affinity. And he wrote a great story based upon that idea.

> "Chemistry!
> Come with all thy pervading gases,
> Thy crucibles retorts and glasses,
> Thy fearful energies and wonders.
> Thy dazzling lights and mimic thunders."

Come, and do your durndest, and you won't be able to do one-tenth of the mischief that can be worked by the pen in the hands of a man who knows how to move the millions. There was never a story written that could compare with his for popularity and results. Its effects were felt not only in his own time and country, but all over the civilized world and for generations. It was the cause of murder, suicide, debauchery and despair.

How easy it made things for a man whether married or single! If single, the first pretty maid he met was his affinity and they married in haste. In the course of time he meets another maid — prettier than his wife. All right: it seems he made a mistake that first trip, quite natural; and no doubt his wife, if she has read the great story, is of the same opinion, and has already made the acquaintance of her own genuine Simon Pure Affinity; or if she is not that sort of a woman, she makes the discovery that there is an affinity between her husband's new flame and a horsewhip and loses no time in bringing them together. And so it goes on, and everything is made easy and philosophical and pleasant for libertines, and all because a poet knew no better than to monkey with the elements and apply their peculiarities to human nature. (*To be continued.*)

The article seems to have been continued in a column later that much entitled “Among the Bards”, albeit focused on American poets in general, and not mentioning Goethe further. [2]

Reaction discussion

To give a simple idea of what Spollon here is alluding to, in his comparison of a democrat-republican reaction to that of an antacid in water or in stomach acid, the following is the reaction of the popular antacid Tums (calcium carbonate, $CaCO_3$) with HCl (stomach acid), the the gas product of carbon dioxide CO_2 being given off:

$$2HCl(aq) + CaCO_3(s) \rightarrow CaCl_2(aq) + CO_2(g) + H_2O(l)$$

(add discussion)

Cowper

Spollon above cites section 20 of the 1782 Empedocles-style chemical aphorism like poem “On Friendship” by English poet William Cowper which reads as follows: [3]

Courtier and patriot cannot mix
Their het'rogeneous politics
Without an effervescence,
Such as of salts with lemon-juice,
But which is rarely known t'induce,
Like that, a coalescence.

which has the alternative translation variations of:

VARIATIONS.

XX.——4. Like that of salts with lemon-juice,
Which does not yet like that produce
A friendly coalescence.

(add discussion)

Purpose | Chemical teleology

The excerpt "they were intended by nature to meet with and adhere to each other" has a bit of bent or slanted chemical teleology feel to it, which is in need of discussion and dissection.

References

1. Spollon, John. (1894). "Among the Bards", Truth, and Opinion, *Supplement to Fibre and Fabric: A Record of American Textile Industries in the Cotton and Woolen Trade*, 20(509):1113, Dec 1.
2. Spollon, John. (1894). "Among the Bards", Truth, and Opinion, *Supplement to Fibre and Fabric: A Record of American Textile Industries in the Cotton and Woolen Trade*, 20(512):1149, Dec 22.
3. Cowper, William. (1782). "On Friendship", in: *The Life and Posthumous Writings of William Cowper* (editor: William Hayley) (pg. 219). J. Seagrave, 1803.

External links

â— Spollon, John – WorldCat Identities.

θΔics

In existographies, **John Stewart** (1747-1822) was a Scottish-English colonel turned peregrinating philosopher, labeled the "modern Pythagoras" (Q), noted for his 1789 two-volume *Moral Motion* treatise, wherein, building predominately on Baron d'Holbach's 1770 *The System of Nature*, he attempts to promulgate a so-labeled "curious" physical sciences based "original materialistic philosophy" (Q) "moral motion" theory of well-being and happiness of "animate matter", in which he viewed people as aggregated particles of matter, a type of intellectualized matter, and that all there is in the universe is matter and motion, a theory which out-rightly proclaims that deities do not exist. [1]

Following the publication of his two-volume *Moral Motion* (1789), over the next three decades, Stewart wrote prolifically, publishing nearly thirty philosophical works, including *The Opus Maximum* (London, 1803) and the long verse-poem *The Revelation of Nature* (New York, 1795).

Stewart suggested—as what seems to be one of the more hilarious, albeit realistic, anecdotes in science—that his books should be translated into Latin and buried to escape anticipated censorship and suppression. [9]

Stewart's main ideologies include: (1) abandon every idea of a deity, (2) abandon every hope of future existence, (3) accept the understanding that one is made of particles of matter (atoms), (4) consider the design of happiness in the context of great integer of nature in the course of universal change. [3]

Intellect

Stewart seems to have been quite cerebral; the following quote attests to such:

> "**Stewart** is the most eloquent man on the subject of nature I have ever met."
>
> — Thomas De Quincey (c.1792), discussion with William Wordsworth (IQ:165|#231); view concurred (Q)

De Quincey, moreover, referred to him as an "inconsistent and perhaps slightly unhinged genius". [8] Similarly, in 1796, James Sharples, the portrait-painter for George Washington, executed a pastel likeness of Stewart for a series of portraits which included such sitters as William Godwin (FA:40), Joseph Priestley, and Humphry Davy, suggesting the intellectual esteem in which Stewart was once held. [7] Likewise, adverts for his *Moral Motion* (1790) labeled the "modern Pythagoras" (Q) thus comparing him as an upgraded Pythagoras (IQ:180|#83).

Associates

Stewart was friends and associates with: Thomas Paine, William Wordsworth, and John Oswald, Thomas De Quincey (Q).

Walker | Locations

Stewart is known as the: "Celebrated Walking Stewart" (Q), "General John 'Walking' Stewart" (Q), "Walking Stewart" (Q), or "the traveler", among other variants, owing to the fact that, after his work as a writer in Madras (1763), after which he resigned in a letter of "juvenile insolence and audacity", served under Hyder Ali (1765), going from interpreter to General; amid which he was wounded, and escaped to become Prime Minister to the Nawab of Arcot; after which he left and "took to travelling" on foot in Persia, Ethiopia, Abyssinia, across Arabia, through France and Spain, to England, from Calais to Vienna (1784) and visited North America, during which time he focused his efforts on studying the "morality" systems of each country or state. Stewart, in sum, seems to have traveled to the following key locations: England, Scotland, Ireland, Madras (1763), Arcot (South India), Persia, Ethiopia, Abyssinia (Ethiopian empire), Arabia, Calais (Northern France), Vienna (1784), Italy, Portugal, Switzerland, Germany, Danish, Swedish, Russia, Poland, and North America; supposedly among others. The following, according to Ralph Griffiths, is what Stewart said about the Polish:

> “The Poles are advanced in knowledge; but their diets hold forth a dreadful scene of the conflict of private and public good.”

Lapland, the northern most region of Finland, according to Stewart, as summarized by Griffiths, is the “only asylum of liberty”, whereas the rest of the world is “wretched all over the globe, and moral chaos is universal”. [3]

About | Overview

In 1767, Stewart, the black sheep of an eminent Scottish family of drapers based in London, who had been a reluctant pupil at Harrow School (Q) and Charterhouse School (Q), supposedly “keen to break the shackles of European education”, set off to India to seek his fortune. [6]

The *Encyclopedia Britannica* (1911) describes Stewart as follows: [5]

> “British traveler, was born in London of humble parentage. After an unruly career at school he entered the service of the East India Company at Madras in 1763, but he threw up his position about two years later and became interpreter to Hyder Ali, afterwards serving as a general in his army; subsequently he served the nabob of Arcot, whose chief minister he became. Having enriched himself in this capacity, he began a series of travels through India, Persia, Ethiopia and Abyssinia, which earned him the nickname of "Walking Stewart." About 1783 he returned to Europe, where he cut a curious figure by wearing Armenian dress. He crossed over to America in 1791 and had various adventures, but soon came back to Europe, and made the acquaintance of Wordsworth in Paris and later of De Quincey in Bath. Be-coming short of money, he again went to America, where he supported himself by lecturing. Having returned to Europe, Stewart's fortunes began to mend. In 1813 a claim he had made against the nabob of Arcot was settled by the East India Company for £1o,00o, and he took rooms in London and settled down to enjoy life, airing his opinions on literature and art. He died on the loth of February 1822. De Quincey (see *Collected Writings*, 1890, vol. iii.) gives various particulars of him.”

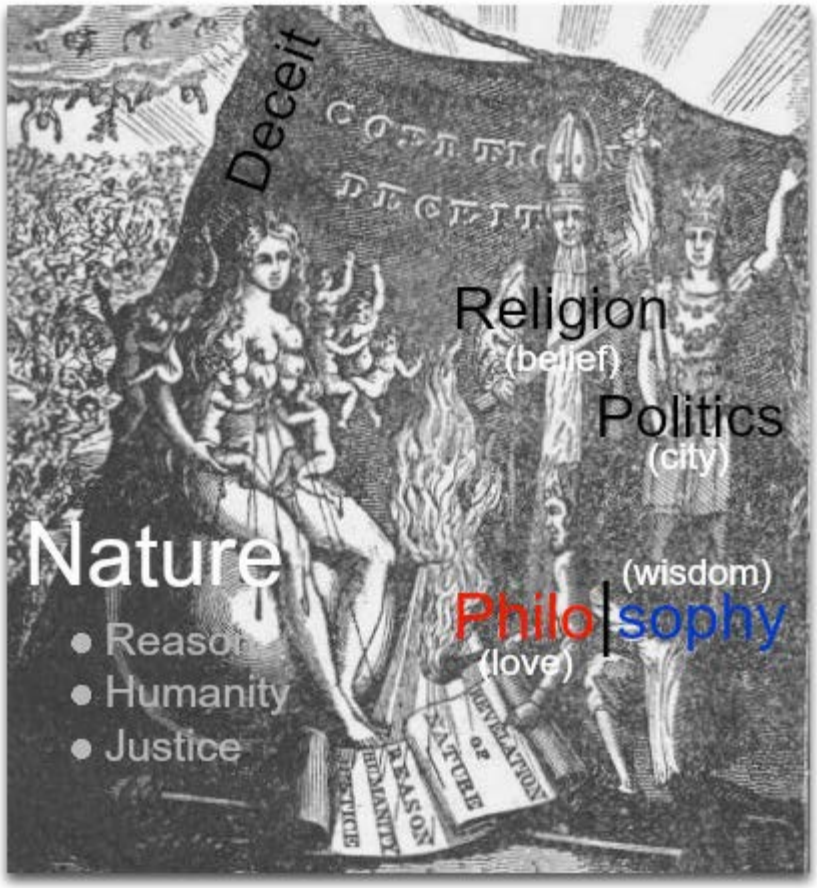

Stewart's frontispiece, to his *The Moral State of Nations* (1790), showing Nature (or Mother Nature), being benighted by the artifices of priests of politics and religion; amid which philosophy consumes their screen in order to display the universality of transmutations; below which the following poem is shown: [4]

> For Self and Nature linked in one great frame; Shows true Self-love and Nature’s as the same. Eternal matter to one center brings Men changed to boasts, and insects changed to kings. Who dares with force on Nature's chain to strike; On man or insects, jars the chain alike On Self, which changing never quits the chain In life or death, transmits or joy or pain.

The philosopher's scroll, seen by the light of fire, reads: Revelation of Nature: Reason, Humanity, Justice.

Stewert, in his 1789 *Travels to Discover the Source of Moral Motion* (volume one) and *Apocalypse of Nature, wherein the Source of Moral Motion is Discovered* (volume two), outlines the very-interesting results of his researchers of

having travelled the world to study the various systems of morality, out of which he derives a religion-free eight tenet "Religion of Nature", based firstly on abandonment of every notion of a deity, with the replacement of the postulate that all that exists is matter and motion, then secondly outlines a new replacement religion of how combinations of the particles of matter coalesce to form "intellectualized bodies" that can have both moral motion and immoral motion in the course of the "revolutions and operations" of the universe, which is said to have neither beginning or end. [2]

Retrospect knowledge | Dating system

In 1790, John Stewart seems to have invented his own unique god-free dating system, according to which dates the zero year to the "start of man's retrospective knowledge", which he deduces by astronomical calculations (similar to Thims; see below), to have occurred 5,000-years prior to the publication of his *Treatise on the Source of Moral Motion and the Moral State of Nations*, or in abbreviated full:

> ● Stewart, John. (1790). *The Moral State of Nations: Travels Over the Most Interesting Parts of the Globe, to Discover the Source of Moral Motion; Communicated to Lead Mankind Through the Conviction of the Senses to Intellectual Existence, and an Enlightened State of Nature. In the Year of Man's Retrospective Knowledge, by Astronomical Calculation 5000. Year of the Common Era, 1790*. George H. Evans, 1837.

Stewart scholar Tristram Stuart comments the following on Stewart's peculiar dating system: [6]

> "From 1789 to his death in 1822 (allegedly from laudanum overdose), he produced reams of poetic and polemic work with extraordinary titles like *The Apocalypse of Nature*, *The Revolution of Reason*, and *The Sophiometer: the Regulator of Mental Power*. Published in England, France and the United States, they were idiosyncratically dated according to a chronological system in which 1795 was the 'fifth year of intellectual existence', or the publication of *The Apocalypse of Nature*' and 1818 was the '7000th year of the Astronomical History, from the Chinese Tables'."

Here, we see possibly, that Stewart seems to have utilized at least three different dating systems, one of which he epoch marks to the 1790 publication of his own work; which seems to corroborate to his "notorious egotistic disquisitions" in which he declared himself, to the London literary elite, e.g. Robert Owen, Thomas Taylor, Thomas Rickman, Henry Bohn, etc., as the "universal self, or man-god."

Passion | Energy

Stewart utilizes an energy logic to a good extent, discussing the "energy of passion" for instance, and refers to the relation of heat and fire, to explain existence in relation to the body. The following quote gives a gist of his view:

> "Body and identity of man or manhood, like fire and heat, may be changed or commuted, and in portions what was fire may become man, and what was man become fire; the connection with nature being the same in all its parts, animate or inanimate; but motion in the former has the power of procuring happy combinations or identities; and the volition that propels that motion is motived by happiness, which it procures to its present, and perpetuates to all future stages of its revolution into sensitive nature, by which self, or the moral system, is temporally and eternally benefited."

All-in-all, it seems that Stewart was a deep-thinker, very modern for his times. In summary of his work, one reviewer comments that after traveling the world and having seen how immoral the various countries have become: [3]

Natural religion | Religion of Nature

The following are Stewart's eight tenets, the first five of which also shown adjacent, of

his natural religion (Part II, §:The Religion of Nature, pgs. 75-76): (Q)

I. NATURE is the great integer of being, or matter and motion, without beginning as without end.

II. Mankind are the instruments of nature in its moral motion, formed to procure well-being or happiness to all animated matter.

III. All animated matter, however organized, changed, or dissolved, is related as parts inseparable from the great integer nature.

IV. Bodies "intellectualized" and possessing identifications of I, you, and they, are created to possess consciousness of existence by sensations of pleasure and pain; and though these [individual identities] are annihilated upon the dissolution of the bodies, they still, as parts of nature, are concerned in the future pain and pleasure of their common integer, from which they are inseparable, though subject to endless change and revolution.

V. Moral and physical motion are subject to fixed laws, which produce volition—the cause of action in animate matter.

VI. The judgment or result of the operation of the mental faculties can have cognizance only of secondary causes which it apparently controls and directs to produce well-being or happiness to its essence, which it will ever suppose to be the end [object] of primary causes.

VII. The human intellect has no power beyond the secondary causes of volition, and their end, which is happiness, all beyond being incomprehensibility; and the reasoning of analogy can influence only from its probability, and that must be considered relative to the happiness of all animated nature.

VIII. Man, in forming a volition to procure happiness, begins with self as the center, and extends to the circle formed by all animate matter. He is to will for himself alone, and do no violence to any part of animate matter; and in the orbit of social attraction he must imitate the revolution of the celestial bodies, whose reciprocal repulsion and attraction operate without concussion or violence to the center, or the point, self. Man cedes not, but reforms his volition when it is in collision with that of another, to acquire more happiness, considering himself a component part in this eternal relation to the great integer of nature; and by this means he produces and eternizes a system of moral harmony, or pain and pleasure, of which he must ever be a center, and participate as an eternal part of an eternal integer; which connection is indissoluble, though its mode is incomprehensible, and passes through every form of matter in an infinite revolution.

THE RELIGION OF NATURE.

TENET I. NATURE is the great integer of being, or matter and motion, without beginning as without end.

II. Mankind are the instruments of Nature in its moral motion, formed to procure well-being or happiness to all animated matter.

III. All animated matter, however organized, changed, or dissolved, is related as parts inseparable from the great integer Nature.

IV. Bodies intellectualized and possessing identifications of I, you, and they, are created to possess consciousness of existence by sensations of pleasure and pain; and though these [individual identities] are annihilated upon the dissolution of the bodies, they still, as parts of Nature, are concerned in the future pain and pleasure of their common integer, from which they are inseparable, though subject to endless change and revolution.

V. Moral and physical motion are subject to fixed laws, which produce volition—the cause of action in animate matter.

Stewart's five main tenets of his "moral motion" natural religion theory.

On the subject of the fourth tenet, the Stewart elsewhere writes:

> "Self, as a part of all nature, is immortal and universal, and though identity of matter and mind separate, and their combination or identity is annihilated by death; yet self, as a part of nature, can never be annihilated, and pervades all nature in its revolutions and operations, and self is as much concerned in the present or future health or happiness of all nature, as the toe is concerned in that of the body.
>
> Men who have no superstitious fears, suppose the dissolution of the body to end their concern with nature; but if their mental faculties were still more enlightened, they would see, that particular combinations of matter, called intellectualized bodies, are but stations or inns to receive matter in its revolution, and that those inns are to be regulated by laws and policy, to give comfort and pleasure to matter in its eternal revolution or passage, and from which self can never separate its connection.
>
> Matter may be divided into two parts, intellectualized and unintellectualized, and these are constantly changing places; so that the former, by wise operations, labors to the happiness of both. By education and constitutions good moulds are formed to receive matter, and by a wise government happy inns or resting places are provided; and while it enjoys this happiness it has produced, it prepares it for unintellectualized matter, and prepares it for its own return in the general revolution.
>
> When the mind takes into contemplation a subject of such importance, novelty, and magnitude, as the religion of nature, it is apprehensive and alarmed, and descends with caution and terror into its vast profundity."

Reviews for this work in its day seem to have been to mortify many, whereas in the modern day, we seem that many of the parts of Stewart's ideas, particularly classifying animate matter into intellectualized bodies (carbon-based matter) and unintellectualized bodies (non carbon-based matter), were well ahead of its time.

Atheism | Religion

On the current state of the minds of men in his day, with regard to religion and the physical sciences, Stewart states:

> "When the mind takes into contemplation a subject of such importance, novelty and magnitude, as the religion of nature, it is apprehensive and alarmed, and descends with caution and terror into its vast profundity. In subjects and researches of infinitely less utility and consequence, how many minds have been debilitated and distracted! The mathematics have sacrificed many victims, astronomy more, the longitude and chemistry have absorbed and deranged many of the most strongly organized faculties, but the subject of religion has so universally deranged and destroyed the human faculties, that reason seems to have lost its powers of pre-eminence, and instinct would be preferred, but that the former contains innate elastic matter, which, when heated by the sun of wisdom, must expand, and reason then assume its pre-eminence and dignity."

Then, prior to delving into the details of his new replacement "religion of nature", he says:

> "Agitated, though not confounded by these discouraging reflections, I shall proceed to give the course of exposition to my thoughts without any regard to ceremonious rules of literature on one hand, or the menaces of prejudice on the other."

At one point (§2, pg. 32), to note, Stewart declares that "self is god", but it is in blurry connotation. Stewart's view of nature is said, according to the books advertisement (Q), to present a golden mean between the "deluded superstitionist,

the dogmatic deist, and the chaotic atheist". Stewart, himself, however, seems to be a big fan of Holbach.

Moral vegetarianism

See also: Newton in Senegal

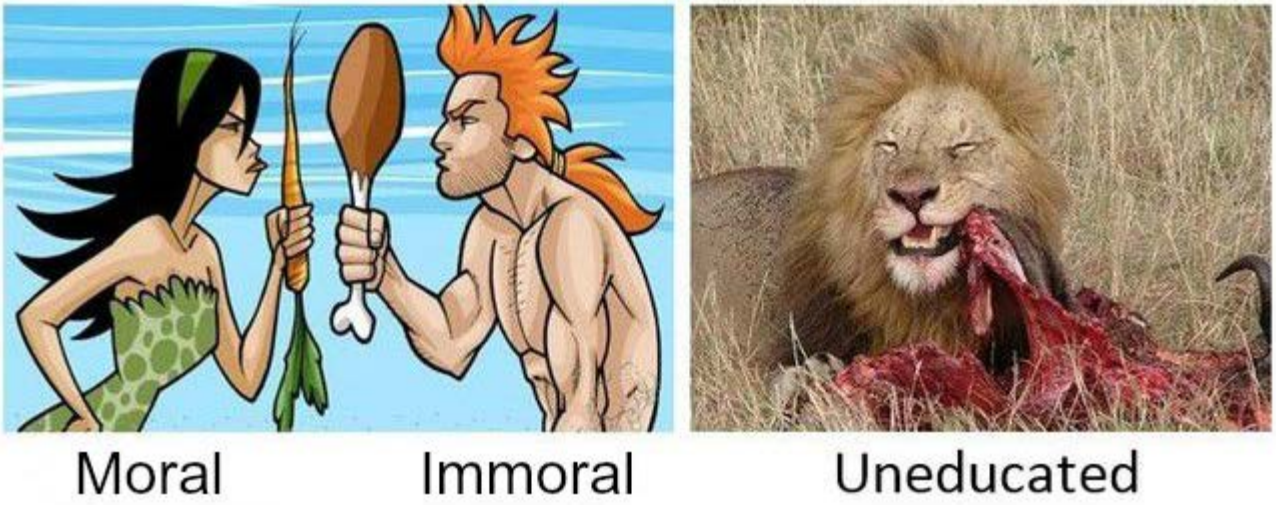

The basic outline of **Stewart**'s moral vegetarianism ideologies; for humans, as "sentient intellectualized animate matter", eating meat is "immoral" owing to the "violence" involved in the procurement of meat and the "sacred passion of sympathy", but it's lower animals to eat meat, because they are uneducated.

Stewart, possibly similar to Leonardo da Vinci, seems to have derived a vegetarianism philosophy based on his moral motion sympathy-centric ideology; some of which seems to be elaborated on as follows: (Part II, §: The Arts, pg. 73): (O)

> "The first art, and the most useful, which quality alone, in an enlightened slate of nature gives pre-eminence, is agriculture, as on this depends the existence of animate matter; and though a greater proportion of the human race subsist by devouring sentient fellow parts of this matter, yet this evil must cease in an enlightened state of nature; and man, the great instrument by which nature operates her own perfection, the moment he is called to intellectual existence, must change his aliment from animal to vegetable, in order to procure both health of body and health of mind. For as animal food tends to pamper the body with gross humors, and inflame the blood which gives strength to the passions, and in the same proportion debilitates the reason, so it must engender disease and vice; but vegetable diet has the contrary effect, which may be proved at any time by experience: though it requires a delicacy of attention, and accuracy of judgment to discover such results.
>
> A man in an enlightened state of nature will be averse to the violence necessary to procure subsistence by animal food, and the only violence he will permit, and that with extreme regret, will be the destruction of destructive creatures, whom he cannot change by education or prevent by restriction: both of which means he will first attempt, in order that the "sacred passion of sympathy" may receive no callosity or diminution by hasty or voluntary violence,"

The roots of some of this error in logic, firstly seems to be stated in tenet VIII, which no doubt is why he placed it last, i.e. he was least confident about this tenet, and his misunderstanding of collision theory, and the fact that collisions have to be violent in order to break bonds to form new products, which is a part of natural chemistry; secondly, is his ideology that vegetarianism will solve the "problem of evil", in some way, which does not corroborate with coupling theory and how natural (i.e. good, in colloquial speak) is coupled to unnatural (i.e. evil, in colloquial speak).

Modern

In modern logic, it may be possible to re-write Stewart's moral motion theory in terms of Gibbs free energy changes, as in motion associated with negative change being quantified as "moral motion" and motion associated with positive change being quantified by "immoral motion" and system based definitions of morality based on Fritz Lipmann's 1941 free energy coupling theory, such as was alluded to in Robert Kenoun's 2006 *Theory of History and Social Evolution*.

John Q. Stewart

Scottish walking moral philosopher John Stewart (1749-1822), to note, is not to be confused with American social physicist John Q. Stewart (1894-1972); being that they both promulgated similar social materialism theories, and thereby initial confusion may arise.

Birth | Date confusion

There seems two listings of the date of Stewart's birth (reaction start), 1747 and 1749; a review of Google Books shows latter to be the more common date, returning 339 results (Q) for 1739 and 524 results (Q) for 1749. Conversely, the mention (below) that he self-dereacted (suicide) on 20 Feb 1822, the morning after his 75th birthday, via laudanum ingestion, seems to corroborate the earlier date of 1747.

Reaction end

On 20 February 1822, the morning after his seventy-fifth birthday, 'Walking' Stewart's body was found in a rented room in Northumberland Place, near present-day Trafalgar Square, London. An empty bottle of laudanum lay beside him. [7]

Quotes | On

The following are quotes on Stewart:

> "The title page of a book ought to give the reader some insight into the author's design: but from those titles which arc prefixed to the two volumes before us, we were not able to form any conjecture respecting their contents; and after the most careful perusal, we are not certain that we understand the work sufficiently to make our readers acquainted with the author's leading ideas. The only thing of which we are sure, is, that this 'traveling philosopher' is, in his first volume, a haughty censor, and in the second, a professed enemy to all religion;— for a 'religion of nature', without a 'god of nature', is a solecism, too gross to pass on the meanest understanding."
>
> — Ralph Griffiths (1791), "Review of Stewart's *Moral Motion, Volumes 1 and 2*" (pg. 143) [3]

> "The remedy, which this wild projector proposes for correcting the disorders of human nature, is, to abandon every idea of deity, and every hope of "future existence", in the common acceptations of those terms; and to make the *integer* of nature, and self as connected with it, the sole objects of adoration; and to consider the design of providing for the happiness of those particles of matter, which happen to belong to our present bodies, through all their future connection with sentient beings, as the only comfortable and reasonable doctrine of immortality. This, if we are not greatly mistaken, is the whole of the wonderful discovery contained in a work, which calls itself the apocalypse of nature, and boasts of containing 'the most important and useful ideas the press has ever presented to the discussion and contemplation of man'."
>
> — Ralph Griffiths (1791), "Review of Stewart's *Moral Motion, Volumes 1 and 2*" (pg. 144) [3]

Quotes | By

The following are quotes by Stewart:

> "In a disposition of mind interested in the happiness of all animated matter, the author of the following new ideas traversed the globe, and proposes to lay them before the public, conjuring his readers to pay them the attention their importance demands."
>
> — John Stewart (1790), *Moral Motion* (Preface) (pg. 7)

“The operations of knowledge are employed upon outward and foreign objects; but those of wisdom are internal, and applied only to the self. The greatest efforts of the former were exerted by Newton, to discover the physical laws of bodies; but when he attempted to make use of the latter to make discoveries in the moral world, he became an eminent example of deficiency in the quality of wisdom, and proved its greatest differences from knowledge.”

— John Stewart (1789), *Moral Motion*

STEWART, JOHN (1749–1822)

Born 1749 : a Scotchman : at school at Harrow and Charterhouse : went out to Madras as a writer, 1763 : resigned his appointment, in a letter of “juvenile insolence and audacity,” 1765 : served under Hyder Ali, from Interpreter to General : was wounded, and escaped : became Prime Minister to the Nawab of Arcot : left him and took to travelling on foot in Persia, Ethiopia, Abyssinia, across Arabia, through France and Spain, to England, from Calais to Vienna, 1784 : visited N. America : friend of De Quincey : obtained £10,000 from the E. I. Co. for his claims against the Nawab of Arcot, 1813 : died Feb. 20, 1822 : a doctrinaire : wrote curious works, such as *Travels to Discover the Source of Moral Motion* : *Opus Maximum*, etc, : called “Walking Stewart.”

A 1906 *Dictionary of Indian Biography* entry (Q) on **Stewart**, wherein his work is described as "curious".

“The chimerical operations of religious phrenzy will be destroyed, by the doctrine of real existence.”

— John Stewart (1789), *Moral Motion* (xiii) [8]

“There is no doubt that all matter, however organized or modified, is subject to the same laws of nature.”

— John Stewart (1789), *Moral Motion* (§1, pg. 106)

“A weak mind, that attaches itself to identity alone, may not be able to conceive its eternal connection with Nature, but I defy a mind, that has arrived at the acme of intellect and considers the indestructibility of matter to separate itself from its eternal integer, though it can have no knowledge of the mode of connection.”

— John Stewart (1789), *Moral Motion* (§2, pg. 12)

“The volition of man may be regarded as the source of moral motion, and takes its birth from outward or inward impression.”

— John Stewart (1789), *Moral Motion* (§2, pg. 13)

“We find in that combination of matter, called man, two powers, one passive, and the other active. The first is the corporeal power, formed of the visible and tangible parts, called body: the other is the result of the organization of that body, forming the power vulgarly called soul.”

— John Stewart (1789), *Moral Motion* (§2, pg. 16)

“Self, as a part of all Nature, is immortal and universal, and though identity of matter and mind separate, and their combination or identity is annihilated by death; yet self as a part of nature, can never be annihilated; self pervades all nature in its revolutions and operations, and self is as much concerned in the present or future health and happiness of all nature, as the hand is concerned in that of the body.”

— John Stewart (1789), *Moral Motion* (§2, pg. 23)

“Personal identity. is that state of matter in which it possesses a consciousness of existence, and power of motion to procure happiness for the present, and thereby perpetuate it in every stage of its transmutation or

revolution; and no change of that identity by loss of memory or by death, can dissolve the connection with its integer Nature, but like a river absorbed by the ocean, it transmutes into all forms of matter, and returns to rivers again."

— John Stewart (1789), *Moral Motion* (§2, pg. 29)

"To assist these meditations, these pages, I hope, will be useful; if not, I must recommend the writings of Hume, Voltaire, Bolingbroke, Rousseau, and last of all Mirabaud [D'Holbach,] who has completed the destruction of error in his *System of Nature*: and when, conversant with these writings, the mind shall be purged of its errors and prejudices, these pages will, I trust, be useful to introduce it to a system of wisdom and happiness."

— John Stewart (1790), *Moral Motion* (§2, pg. 43)

"If these observations are not comprehensible or satisfactory, I must refer my reader to the *System of Nature* written in French by M. Mirabaud [now ascribed to Baron d'Holbach] where error is so closely combatted and pursued in all its recesses, that the mind by irresistible conviction emerges from its abyss, and seeks with impatience a new guide, or the light of nature, which I hope will be found in these pages, and that they will form a complete supplement to that work."

— John Stewart (1789), *Moral Motion* (§2, pg. 78)

"Body and identity of man or manhood, like fire and heat, may be changed or commuted, and in portions what was fire may become man. and what was man become fire; the connection with nature being the same in all its parts, animate or inanimate; but motion in the former has the power of procuring happy combinations or identities; and the volition that propels that motion is, motived by happiness, which it procures to its present, and perpetuates to all future stages of its revolution into sensitive nature, by which self, or the moral system, is temporally and eternally benefited. The religion of nature differs from invented religion, as the former adores the effect of motion, which is comprehensible, and the latter the cause of motion, which is incomprehensible."

— John Stewart (1789), *Moral Motion* (§2, pg. 81)

"Let us suppose that a man, who is **incommoded by a fly**, instead of driving it away, kills it. Utility to the system of nature, the only standard of moral motion or action, may be applied to this act in the following manner: the fly in committing an act of violence on my body, agitates the chain of nature (see: great chain of being): it is useful to remove this cause, but utility does not demand the annihilation of it by death, because it disproportions the means to the end, and infects, by a motive of resentment, the disposition of the mind for universal sympathy and benevolence. The destruction of the tiger and lion, when brought to the standard of utility, may be justified in proportion to the violence they cause the human specks, which, as being the most happy existence of matter, is to be preferred to the

Stewart applies his new "moral motion" theory of natural religion to the instance of a person being "incommoded by a fly", the justice of the act being determined by the "utility to the system of nature, the

brute. When the tiger infests the environs of man's habitation, utility requires him to be destroyed, and this would cause no vibration of the chain, because it would re-establish a counterpoise to the effect of the concussion began by the violence of the tiger; but when the hunter wantonly seeks him in the forest to destroy him, to promote the pleasure of the chase, the chain of nature would be agitated by this act of remote utility; for utility must be urgent to justify the least act of violence, otherwise the volition becomes corrupted, and the source of moral motion being polluted, its streams would convey the cause of moral pestilence or vice over all Humanity."

only standard of moral motion or action", according to which it is not OK to destroy the fly, per reason that it "disproportions the means to the end", but that it would be OK to destroy a tiger or lion set loose in a human environment.

— John Stewart (1789), *Moral Motion* (§2, pg. 82)

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External links

- Stewart, John – WorldCat Identities.

θΔics

In science, **John Strutt** (1842-1919) (IQ:185|#52), aka Lord Rayleigh, was a English physicist noted for his 1870 discussions with Maxwell on the so-called truth of the second law of thermodynamics; his 1871 "scatter theory" solution to the blue sky problem, about which he gave the definitive explanation of in 1899; his 1892 discussions with Willard Gibbs on statistical mechanics; his 1894 isolation, with William Ramsay, of the element argon (work for which he would win the 1904 Nobel Prize in physics); and his 1900 formulation of spectral energy flux density of black body radiation, which led to the ultraviolet catastrophe problem, and hence to the "energy element" solution by Max Planck, which launched the science of quantum mechanics. Strutt is considered by some to be the “last of the great Victorian polymaths”. [4]

Ultraviolet catastrophe

Strutt notably obtained the spectral energy flux density *J* of black body radiation in 1900: [1]

$$J(\nu, T) = \frac{2\pi k T \nu^2}{c^2}$$

where *v* is frequency of the radiation, *c* the speed of light, *k* the Boltzmann constant, and *T* the temperature of the black body.

This formula worked well for small frequencies, but did not fit experimental data at high frequencies; this issue that came to be called the ultraviolet catastrophe; only to be reconciled by German physicist Max Planck in 1901, who incorporated Boltzmann’s views on the partition of energy in his version of the second law, thus launching the quantum revolution. [2]

Why is the sky blue?

See main: blue sky problem

Strutt is also famous for being the first to explain the blue color of the sky in 1871, an explanation now referred to as Rayleigh scattering; a problem previous worked on by other great geniuses of antiquity, such as: Aristotle, Da Vinci, Newton, Goethe, and Clausius. [4]

Gibbs

In 1892, American engineer Willard Gibbs wrote Strutt with characteristic modesty on his now-famous book on statistical mechanics: [3]

> “Just now I am trying to get ready for publication something on thermodynamics from the *a priori* point of view, or rather on 'Statistical Mechanics' . . . I do not know that I shall have anything particularly new in substance, but shall be contented if I can so choose my standpoint (as seems to me possible) as to get a simpler view of the subject.”

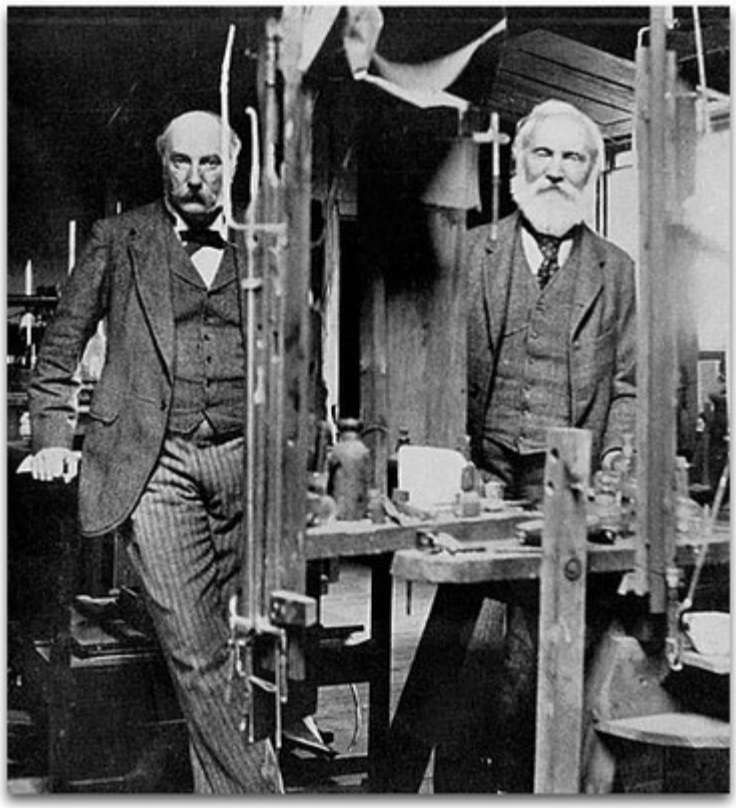

Photograph of Strutt and William Thomson at Strutt's family home, Terling Place, Witham, Essex, UK, in 1900. [5]

Supposedly, by the term *a priori* Gibbs meant related to or derived by reasoning from self-evident propositions. In any

event, ten years later this work resulted in a classic book, *Elementary Principles in Statistical Mechanics* (1902), which has since been called the "bible of statistical physics", which put statistical mechanics on a new and more general basis.

Cavandish professorship

Strutt, of note, was second Cavendish Professor of physics, following James Maxwell, from 1871 to 1879, after which he was followed by J.J. Thomson (1884-1919), who in turn was followed by Ernest Rutherford (1919-1937), who was in turn followed by William Bragg (1938-1953), who in 1919, at the age of 25, became the youngest-to-date winner of a Nobel Prize (in physics, for his X-ray crystallography work) and who was the director of the Cavendish Laboratory, Cambridge, when the epochal discovery of the structure of DNA was made by James Watson and Francis Crick in February 1953. [6]

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External links

â— John Strutt, 3rd Baron Rayleigh – Wikipedia.

θΔics

In existographies, **John Stuart-Glennie** (1841-1910) (RMS:72) (CR:4) was a Scottish barrister and religio-mythologist noted for []

Overview

In 1878, Glennie, in his *Isis and Osiris: the Origins of Christianity*, penned out a treatise on the similarities and differences of the "doctrines of Christianism" and the "myths of Osirianism", as he phrased things. [2]

See also

- John Q. Stewart
- John Stewart

References

1. Stuart-Glennie, John. (1878). *Isis and Osiris: Or, The Origin of Christianity as a Verification of an Ultimate Law of History*. Longmans, Green and Co.

External links

- John Stuart Stuart-Glennie – Wikipedia.

θΔics

In hmolscience, **John Templeton** (1912-2008) was an American-born British billionaire stock investor noted for his Christian-themed 1972 initiated Templeton Prize and 1987 initiated Templeton Foundation (O) both aimed at science + religion reconciliation attempts at "affirming life's spiritual dimension".

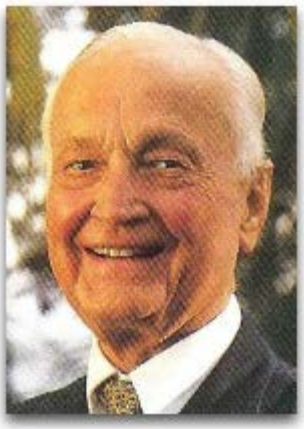

Quotes | Related

The following are quotes about or related to Templeton:

> "At nearly every public lecture that I give on the universe, I try to reserve adequate time at the end for questions. The succession of subjects is predictable. First, the questions relate directly to the lecture. They next migrate to sexy astrophysical subjects such as black holes, quasars, and the big bang. If I have enough time left over to answer all questions, and if the talk is in America, the subject eventually reaches God. Typical questions include: Do scientists believe in God? Do you believe in God? Do your studies in astrophysics make you more or less religious? Publishers have come to learn that there is a lot of money in God, especially when the author is a scientist and when the book title includes a direct juxtaposition of scientific and religious themes. Successful books include Robert Jastrow's *God and the Astronomers*, Leon Lederman's *The God Particle*, Frank Tipler's *The Physics of Immortality: Modern Cosmology, God, and the Resurrection of the Dead*, and Paul Davies' two works *God and the New Physics* and *The Mind of God*. Each author is either an accomplished physicist or astronomer and, while the books are not strictly religious, they encourage the reader to bring God into conversations about astrophysics. Even Stephen Jay Gould, a Darwinian pitbull and devout agnostic, has joined the title parade with his recent work *Rock of Ages: Science and Religion in the Fullness of Life*. The financial success of these published works indicates that you get bonus dollars from the American public if you are a scientist who openly talks about God. After the publication of *The Physics of Immortality*, which suggested the law of physics might allow you and your soul to exist long after you are gone from this world, Tipler's book-tour included many well-paid lectures to Protestant religious groups. This lucrative sub-industry has further blossomed in recent years due to efforts made by the wealthy founder of the Templeton investment fund, Sir **John Templeton**, to find harmony and reconciliation between science and religion. In addition to sponsoring workshops and conferences on the subject, Templeton seeks out widely published religion-friendly scientists to receive an annual award whose cash value exceeds that of the Nobel Prize."
>
> — Neil Tyson (1999), "Holy Wars" [1]

Quotes

The following are noted quotes:

> "Would it not be strange if a universe without purpose accidentally created humans how are so obsessed with purpose?"
>
> — John Templeton (1998), *The Humble Approach* [2]

References

1. Tyson, Neil de. (1999). "Holy Wars", *Natural History Magazine*, Oct 1.
2. (a) Templeton, John. (1998). *The Humble Approach: Scientists Discover God* (pg. 19). Templeton Foundation.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 153). Zondervan, 2009.

External links

- John Templeton – Wikipedia.

θΔics

In religio-mythology, **John the Baptist**, the noted figure, in Christianity, who famously "baptizes" Jesus, is the Roman recension rewrite of the Egyptian god Anubis, the god who plays the main role in "anointing" Osiris.

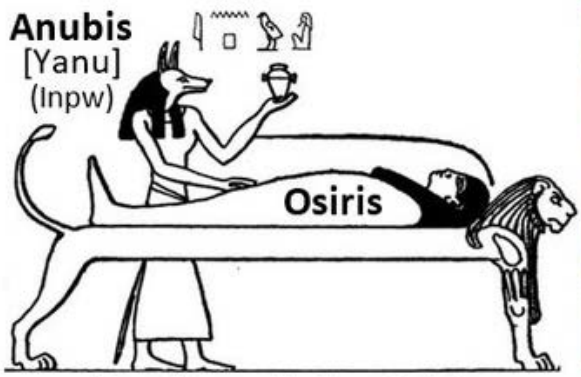

Anubis anointing Osiris

John baptizing Jesus

A depiction of Anubis anointing Osiris (Dendera Temple, c.30AD) compared to a portrait of **John baptizing** Jesus (600AD), the later being a re-write of the former; both of which deriving the the older model that Ra was reborn each morning, and yearly, out of the water of the Nu (or Nun), aka sun born out of the receding annual 150-day flood of the Nile River.

Overview

The Egyptian chief mortuary god of the dead Osiris, called "Anubis", i.e. A-**Nu**-bis, by the Greeks (800BC), signified by the hieroglyphic name 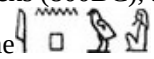 or , i.e. the Maat feather (truth/moral) + water (**Nu**) + square (heaven?) + bird (?) + god or jackal god symbol, by the Egyptians (3100BC), transliterated by the Hebrews (500BC) as **'Yanapu'** or 'Yanape' (Murdock, 2008), from *Ya*- "god/father" + -*Napu*, -Npu, or -Nape "Anubis", akin to "Yani" being the Hebrew equivalent of John, similar to Yahweh, the Hebrew god, pronounced as (/ˈjɑːhweɪ/, i.e. Ja-Way, meaning "god the father", which became **'**Ionais**'** (Latin), in Roman times (Ion is means John), and "John", in modern English, which, in decoded speak, is short for "god Anubis" (Massey, 1906).

In c.710, Bede connected John the Baptist with the Aquarius constellation.

In 1906, Gerald Massey had decoded that the Christian character of "John the Baptist", according to Dorothy Murdock (2008), is a re-write of "Anup the Anointer" and or Anup the herald", aka Anubis, as he puts it. Anubis was the anointer Osiris before his resurrection, and also, supposedly, baptized Horus, the son of Osiris, with water; an excerpt of Massey's detailed digression on this is the following: [4]

> "It now became the mission of Horus to make known the newly-found father in heaven to those who had not so much as heard of the holy spirit. It was the work of the anointed and beloved son to found the kingdom of heaven for the father in the father's name. He became the teacher of the coming kingdom, previously proclaimed by **Anup** [Anubis] **the herald** and forerunner who was his **John the Baptist** crying in the wilderness of the underworld."

In 2008, Dorothy Murdock, building on Massey, summarized things thusly: [2]

> "Anubis is at times also depicted as a human being, an important fact to know when comparing him to **John the Baptist**. Sired by either Set or Osiris, depending on the myth, Anubis is the son of their sister Nephthys. Thus, like John's mother, Elizabeth, who was the Virgin Mary's cousin, Anubis's mother, Nephthys, was related to Horus's mother, Isis. In Hebrew 'Elizabeth' is *Elisheba*, meaning 'oath of god', the components of which are El, or 'god', and sheba, 'seven'. Anubis's mother, Nephthys, is the tutelary deity of the seventh nome of Upper Egypt, making her the 'god seven', so to speak, as well. Interestingly, both Elizabeth and Nephthys have their celebrations in September, the former on the 8th and the latter on the 13th. Also, John's father is 'Zacharias' (Luke 1:5), while Anubis' father is Set-Osiris."

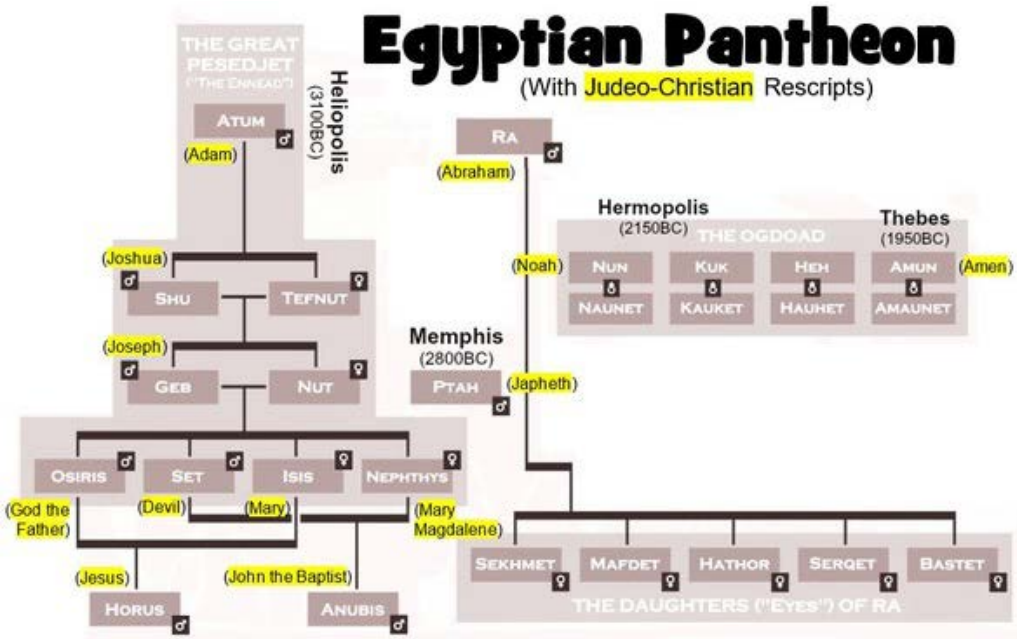

A diagram (Q), made by Libb Thims (2018), showing how, in the original Egyptian version, the model of Horus and Anubis being "cousins", was rescripted in the Bible (Luke 1:36) to the affect that Jesus and **John** were conceived at the same time from the "cousins" Mary (fathered via the holy spirit) and Elizabeth (fathered via Zacharias), Mary being an Isis rescript and Elizabeth being a Nephthys rescript.

While some of these conjectures may be tenuous, e.g. the Zacharias etymology the nome seven etymology; there is one variant of the Set battle, in respect to the number seven, as reported by Plutarch (c.100AD), as summarized by Budge (1904), in *The Gods of the Egyptians, Volume Two* (pg. 253), where Set escaped out of the battle upon an Ass after a fight of "seven" days."

Beheading of John

> *See main: Beheading of John the Baptist*

(add)

Astro-theology

Murdock connects Anubis with John the Baptist, astro-theologically, via the following: [3]

> "He must increase, but I must decrease."
>
> — Anon (300AD), *Bible* (John 3:30)

which she equates with the summer solstice, which is associated with Anubis and also that "John's feast day" is on the summer solstice:

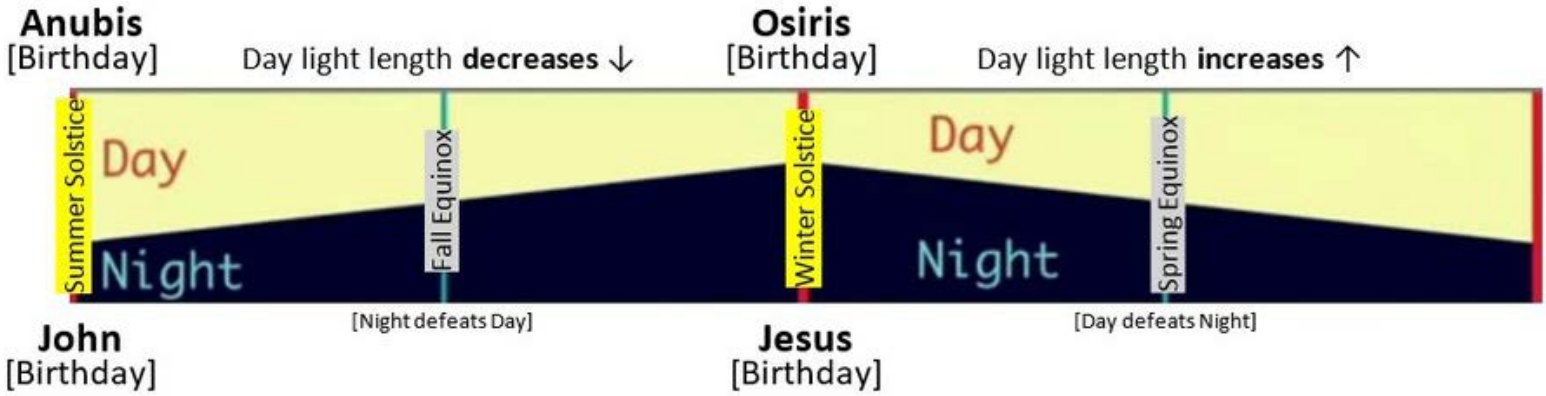

Budge (1904), to note, corroborates on this, in some sense, in his statement that "Anubis was the personification of the summer solstice", and that a second god, Ap-uat, was the "personification of the winder solstice", both being mentioned in the Book of the Dead. [1]

Etymology | Anubis / Yanaup / John

A basic etymology of how the god Anubis became the man John, is the work conjunction play of the name "god Anpu" becoming "J-Anpu" or 'J- Inpw" in Hebrew, which over time became truncated as Jan or John, similar to how Joseph reverse translates as Jo- + -Seb or "god Geb".

In 2008, Dorothy Murdock gave the following more involved etymological jump to go from "Anubis", the Greek name of the god defined by the hieroglyph: 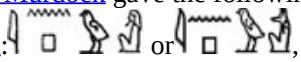 or , the feather (truth/moral) + water (Nu) + square (heaven?) + bird (?), symbol (followed by a "jackal"), rendered as the sound ***ìnpw***, vocalized in Egyptian, according to the Akkadian transcription in the Amarna letters, as "Anapa" (Conder, 1894) (Q), to the Biblical name "John", reasoning that Anubis became Yanapu or Yanu, equivalent to the Hebrew "Yoni" (Q) or Latin "Ion", which eventually translated as "John" in English, in going from the Hebrew to Greek to Latin to English translations of the Bible:

> "The Greek name for this god is **'Anubis'**, while he is 'Anoub' or 'Anob' in Coptic, apparently reflecting a later stage in the Egyptian for his name. Earlier transliterations of major Egyptologists such as Birch, Brugsch and Poole rendered the name 'Anup', while there arose a preference in more modern times for 'Anpu', going against the Coptic and Greek. While Budge transliterates the name as Anpu, James Allen prefers *jnpw*, which would essentially be equivalent to 'Anpu' or 'Inpu', although the final vowel is uncertain, and the name has been written simply as *jnp* or *Anp*.
>
> The transliterations into modern languages also vary from country to country, with a range of suggestions, including 'Anapa', 'Anaahpa', **'Yanapu'** or 'Yanape', as, again, the vowels are uncertain. We are further told that in Egyptian the reversal, transposition or metathesis of letters is not uncommon, based on aesthetics. (Cowie) In fact, there is an "Egyptian propensity for metathesis" or transposition of letters, and Anubis was also written as *jnwp* or *inwp* ('Inup') on occasion by Egyptian

scribes. (Colburn) Citing an ancient text favoring ‘Anup’, Edward Butler remarks, "Witness the fact that in an Old Coptic spell (PQM 94ff, text available in *Coptology Past, Present, and Future: Studies in Honour of Rodolphe Kasser*, ed. Giversen, Krause and Nagel (Orientalia Lovaniensia Analecta 61, 1994)), Anubis is clearly spelled out as ANOUP." ("Ancient Egyptian Language Discussion List.")

Since te modern times, by Hare. (Hare, 127.) The debate as to the proper way to transliterate Anubis is irrelevant to the issue at hand, which is whether or not the god served as an ahe Greek and Coptic favor Anubis/Anoub/Anoup, here we will utilize at times the older convention of "Anup," as it was originally used by Birch, Brugsch and Poole, as well as, in morrchetype upon which the Christian character **John the Baptist** was predicated in significant part.”

In video, Murdock (2011) renders the Anubis (Greek) as Ionais (Latin) or Yo-onis (Hebrew) the baptizer or purifier. [3]

Quotes

The following are related quotes:

“The relationship of Anup [Anubis] to Isis, the virgin mother, as her guide through all her wanderings, **is continued in the connection of a John with the Virgin Mary** as maintained in certain legends. One name of Anup is Tuamutf, he who adores the mother (tua, to worship, mut the mother, f, he, him, it). His station is at the cross (Jno. XIX, 26-27), to which he had led the mother in her search. Jesus on the cross consigns the care of his mother to John. So, Horus, in the Ritual, pleads, " Do not ye do any evil to my mother." **Isis the mother of Horus, adopted Anup (the child of Nepthys) as her own son; and John adopts Mary as his mother, or, it may be said, Mary accepted John as her son**, and is reputed to have dwelt with him after the crucifixion. In the Ritual it is said "by the sun to him who is before him, Let him stand unchanged for a month.'" Ch. CXV. In John's Gospel it is said of a John, " What shall this man do?' Jesus saith, « If I will that he tarry till I come, what (is that) to thee?' This saying therefore went forth among the brethren that that disciple should not die." Jno. XXI, 21-23. Hence, in accordance with this saying of Jesus, is **the legend of John's living on, and lying unchanged through a certain course of time which in the ritual is one month. John is he who, according to the legend, survived alive and breathing in the tomb. Now the good Anup [Anubis] alternates with Christ precisely in this way**. He waited and watched with the dead in the tomb. He is the preserver in the lower world as Horus is above. He is the breather in the tomb, who survives as John in the legend; he dwelt with the genetrix after the crucifixion at the Autumn equinox. Moreover, it is at Ephesus that repose the "Seven Sleepers" with their dog, who is Anup the dog (jackal) of the seven spirits in the ritual; and Ephesus is the place of the heaving grave and the buried breather, John, as according to Augustine.

In a communication to a learned society in Paris the fact was pointed out by De Rouge that in the 3rd century the Egyptians worshiped a large number of Saints, and had a calendar of Saints. Many of these are found to be **deities reduced**. The well-known story of Christopher shows that his name represented Apheru, a name of Sut-Anup [Set-Anubis]. It is related that he overtook the child Christ at the side of the river Jordan, and, lifting him on his back, carried him across the water. But all the while the wondrous child grew and kept on growing as they went, and when they had come to the other side the child had grown into the god. The origin of this legend is found in the passage of the annual sun across the waters, which reaches the other side as the full-grown god. Anup, the jackal-headed, is named Apheru, as guide of roads; he carries the infant Christ as Horus. "Apheru dandles" me, says Horus. Christ-Apher is Apheru turned into a Christian saint. **On the Gnostic stones the child Christ (Harpocrates [Horus the Child]) is frequently accompanied by Apheru-Anubis**. If John the Baptist represent Anup, we may look on "Bethany beyond Jordan" as the House of Anup in Annu, the solar birthplace beyond the river in the planisphere.”

— Robert Shaw (1904), *Sketch of the Religions of the World* (pgs 313-14)

See also

- Egyptian-to-Christian transliteration
- Christian-to-Egyptian transliteration

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pg. 260; summer solstice, pg. 264). Dover, 1969.
2. (a) Murdock, Dorothy M. (2008). *Christ in Egypt: the Horus-Jesus Connection* (§: Who is Anubis?, pgs. 236-). Stellar House Publishing.
(b) Smith, Alexander. (2012). *The Holiest Lie Ever* (§16: John the Baptist, pgs. 150-). Trafford Publishing.
3. Murdock, Dorothy. (2011). “Was John the Baptist and Egyptian Myth” (Q), Stellar House, Dec 30.
4. Massey, Gerald. (1907), *Ancient Egypt, Volume Two* (pg. 855). Publisher.

External links

- John the Baptist – Wikipedia.

θΔics

In existographies, **John Toland** (1670-1722) (IQ:180|#160) (FA:62) (CR:24) was an Irish-born British rationalist, philosopher, religio-mythology scholar, self-proclaimed atheist, first to be called a "free thinker", coined by William Molyneux (1697) in reference to him (in letter to John Locke), coiner of the term "pantheist" (1704), as one who sees the universe and god to be one (in letter to Gottried Leibniz), labeled a "modern Lucian" in obituaries, noted for []

Overview

In 1696, Toland published *Christianity Not Mysterious*, wherein the Bible was read in a new critical mode, which included the most doubting aspects of John Locke's philosophy; the publication was said to have started the "deist controversy"; the book was burned in Ireland in 1697. [1]

In 1698, Toland published an existography (biography) of John Milton, which caused a scandal per reason that a passage (Ñº) in it was believed to question the authenticity of the New Testament.

In 1704, Toland, in *Letters to Serena*, addressed the following six topics: [7]

> I. The Origin and Force of Prejudices.
> II. The History of the Soul's Immortality Among the Heathens.
> III. The Origin of Idolatry, and Reasons of Heathenism.
> IV. A Letter to a Gentleman in Holland, Showing Spinoza's System of Philosophy to be Without Any Principle Or Foundation.
> V. Motions Essential to Matter; in Answer to Some Remarks by a Noble Friend on the Confutation of Spinoza. To All which is Prefix'd,
> VI. A Preface; Being a Letter to a Gentleman in London, Sent Together with the Foregoing Dissertations, and Declaring the Several Occasions of Writing Them

Toland, here, claimed that rest, or absence of motion, is not merely relative; that rest is a special case of motion, according to which when there is a conflict of forces, the body that is apparently at rest is influenced by as much activity and passivity as it would be if it were moving.
In 1713, Toland published an English translation of Giordano Bruno's *Expulsion of the Triumphant Beast* (1584), which espoused the belief that moral and political regeneration will only be achieved though the expulsion of the beast of superstition and began to circulate it around England and the continent. [9]

Pantheism

In 1705, Toland, in his *Socinianism Truly Stated*, defined himself as a pantheist, a term that he used to describe the god equals nature views of Benedict Spinoza.

> "Pantheism is the belief in no other eternal being but the universe."
>
> — John Toland (1710), "Letter to Gottfried Leibnitz"

In 1720, Toland, in his *Pantheisticon*, outlined an entire new religion based on pantheism, replete with rituals, secular liturgy, meetings, etc. [4]

Influences

Toland was influenced by Giordano Bruno, e.g. he purchased Queen Elizabeth's bound copy of the four dialogues of Bruno, and Lucretius, e.g. his *On the Nature of Things* was near him in the room where he dereacted (died). He was friends with Anthony Collins. [4]

Influenced

Toland, via his "Letters to Serena", influenced Baron d'Holbach's ideas about physical motion, specifically his idea that apparent rest is an illusion, and that all things are in motion, to some degree. [6]

Quotes | Employed

The following are quotes employed by Toland:

> "We need not desire a better evidence that any man is in the wrong, than to hear him declare against reason, and thereby to acknowledge that reason is against him."
>
> — John Tillotson (c.1693), Archbishop of Canterbury (Ñº); front cover quote [1]

Quotes | On

The following are quotes on Toland:

> "**Toland** is the great oracle of anti-Christians."
>
> — Jonathan Swift (c.1710) [4]

> "**Toland** is the Lucian of our times."
>
> — Author (1722), "Obituary" [8]

> "This truth—that every thing in the universe is in motion; the essence of matter is to act: if we consider its parts attentively, we shall discover that not a particle enjoys absolute repose; those which appear to us to be without motion, are, in fact, only in relative or apparent rest; they experience such an imperceptible motion, and expose it so little on their surfaces, that we cannot perceive the changes they undergo—which is still denied by many metaphysicians, has been conclusively established by the **celebrated Toland**, in a work which appeared in the beginning of the eighteenth century, entitled *Letters to Serena.* Those who can procure this scarce work will do well to refer to it, and their doubts on the subject, if they have any, will be removed."
>
> — Denis Diderot (1770), note (pg. 18) to Baron d'Holbach's §2: Of Motion and its Origin of *The System of Nature* [6]

> "Toland is best known for his call for common-sense thinking in the deist manifesto *Christianity Not Mysterious*, he gained notoriety as editor and biographer of Milton, Harrington, and Ludlow; translator and publicist of Giordano Bruno; pamphleteer and spy for Robert Harley, and purveyor of Hermetic and clandestine manuscripts for Prince Eugène of Savoy. A self-proclaimed atheist, he amused, annoyed, and embarrassed such personal acquaintances as Locke, Swift, Bayle, Leibniz, Shaftesbury, and Sophie Charlotte of Prussia. His works on biblical criticism, philosophical materialism, and the Druids became sources for Diderot and Holbach; and historians of Freemasonry and of English political and diplomatic affairs continue to search for keys to the intrigue that surrounded him."
>
> — Stephen Daniel (1984), abstract of *John Toland: His Methods, Manners, and Mind* [5]

> “Jacob Reimann, in his *Universal History of Atheism* (1725), included as atheists: Thomas Hobbes, **John Toland**, Charles Blount, and Anthony Collins.”
>
> — Jennifer Hecht (2003), *Doubt: a History* [3]

> “Even on his deathbed, Toland appeared more interested in books than his own health, after all **it was books and ideas that had dominated his life**. Crammed into his back room, books were his most precious belongings. Stacked on chairs, teetering in piles on chests, or packed into boxes, these works, and his intimacy with their contents, were the foundation of Toland's reputation. A mixture of recondite theology, classical learning and political tracts, the eclecticism of his library underscores the range of his interests and erudition. Even the last letters he wrote, which as well as describing in harrowing detail his sickness, also included remarks about books. He would lend Lady 'H' a copy of the fine romance *Zayde* so that she could be freed from the drudgery of the 'longwinded and unwieldy *Cleopatra*'. To Molesworth, he wrote of Cicero's *De Republica* and a projected volume on the 'history of the late Wars from King William's death to Queen Anne's peace'.”
>
> — Justin Champion (2013) *Republican Learning: John Toland and the Crisis Christian Culture, 1696-1722* [8]

Quotes | By

The following are noted Toland quotes:

> “I believe all men will readily allow, that none should speak with more freedom and assurance than he that defends or illustrates the truth.”
>
> — John Toland (1696), *Christianity Not Mysterious* (pg. iii)

> “[Toland] was an assertor of liberty, a lover of all sorts of learning, but no man’s follower or dependent. Fowns or fortune bend him to decline from the ways he had chosen.”
>
> — John Toland (1722), self-penned epitaph, shortly before his reaction end [2]

References

1. (a) Toland, John. (1696). *Christianity Not Mysterious*. Sam Buckley.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 335). HarperOne.
2. Daniel, Stephen H. (1984). *John Toland: His Method, Manners, and Mind* (epitaph, pgs. 13-14). McGill-Queen’s Press.
3. (a) Reimann, Jacob F. (1725). *Universal History of Atheism* (Historia universalis atheismi et atheorum falso et merito suspectorum). Publisher.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 335). HarperOne.
4. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 335-37). HarperOne.
5. Daniel, Stephen H. (1984). *John Toland: His Methods, Manners, and Mind*. McGill-Queen’s Press.
6. d’Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (Toland, pgs. 13, 178). J.P. Mendum, 1889.
7. Toland, John. (1704). *Letters to Serena*. B. Lintot.

8. Champion, Justin. (2013). *Republican Learning: John Toland and the Crisis Christian Culture, 1696-1722* ("Lucian of our times, pg #; books quote, pg. #). Oxford University Press.
9. Daniel, Stephen H. (1984). *John Toland: His Methods, Manners, and Mind* (pg. 184). MQUP.

Further reading

â— Toland, John. (1747). *The Miscellaneous Works of Mr. John Toland: Now First Published from His Manuscripts ... To the Whole is Prefixed a Copious Account of Mr. Toland's Life and Writing, Volume One* (editor: Pierre des Maizeaux). J. Whiston, S. Baker, and J. Robinson.
â— Toland, John. (1747). *The Miscellaneous Works of Mr. John Toland: Now First Published from His Manuscripts ... To the Whole is Prefixed a Copious Account of Mr. Toland's Life and Writing, Volume Two* (editor: Pierre des Maizeaux). J. Whiston, S. Baker, and J. Robinson.

External links

â— John Toland – Wikipedia.

θΔics

In hmolscience, **John D. Trimmer** (1908-1983) was an American physicist noted for his involvement in the so-called "Princeton social physics project", his 1950 *Response of Physics Systems* being cited by John Q. Stewart in his 1953 report on social physics. [1]

Education

Trimmer completed his PhD in physics, in 1936, with a dissertation on "An Investigation of Subjective Tones by Means of the Steady Tone Phase Effect", at the University of Michigan. In 1953, Trimmer was associated with the University of Tennessee. [1] In 1980, Trimmer was an adjunct professor of physics at Drexel University. (Ñº)

References

1. (a) Trimmer, John D. (1950). *Response of Physics Systems*. Wiley.
(b) Trimmer, John D. (1950). "Instrumentology", *Science*, Oct 23.
(c) Stewart, John Q. (1953). "Remarks on the Current State of Social Physics" (pdf), Paper presented at the American Association for the Advancement of Science conference, Boston, Dec 30; in: Box 58, Miscellaneous Writing, John Q. Stewart Papers, Rare Books Special Collections, Princeton University.

Further reading

â— Trimmer, John D. (1955). "Measurement of Human Activity" (abs), *Annals of the New York Academy of Sciences*, 60:829-35, Apr.

External links

â— Trimmer, John Dezendorf (1907) – WorldCat Identities.

θΔics

In existographies, **John Tukey** (1915-2000) (IQ:180|#157) (CR:20) was an American chemist, mathematician, and statistician noted for his 1966 chemical thermodynamics framed model of attitude change, based on the theory of absolute reaction rates in chemistry.

Overview

In 1966, Tukey, via personal communication to American chemical engineer turned sociologist James Coleman, explained his so-called "free energy" model of personal "attitude" state change; the gist of which, or at least what is known about this unpublished Tukey free energy theory, was summarized by Coleman (1971) as follows: [1]

> "Another approach that is suggestive in this direction is one proposed recently by **John Tukey** (1966) for models of attitude change, based on the theory of absolute reaction rates in chemistry. Each state of a chemical entity is characterized by a 'free energy level', and each boundary between states by a free energy level that is higher than the levels of the states it separates.
>
> The transition rate from each state to the other is an exponential function of the difference between the free energy level of the state and that of the boundary. Tukey's proposal is that an attitudinal state may be characterized by a tension level, and the boundary between states by a higher tension level, with the transition rates an exponential function of the difference between tension levels.
>
> This conception has the virtue that in any system with three or more intercommunicating states, it can be tested, because the number of transition rates is greater than the number of tension levels. In such a system, of course, the individual in effect 'seeks out' that state that has the lowest tension level, although the expected time to arrival depends upon the tension level of the boundaries that separate it from other states.
>
> In a system with three states: 1, 2 and 3, there are six transition rates qij, two between each pair of states. Tukey's proposal would define three tension levels, s1, s2, and s3, for the three states, and three for the boundaries between states, s12, S13, and s23. The transition rate qij is a function of the difference in tension levels between state i and boundary ij.
>
> That is, qij is a function of sij – si, in particular, qij = exp (sij – si). This formulation, analogous to that of absolute reaction rates in chemistry, allows estimation of the values of sij and si, from the values of qij for all i and j. Further, since the zero point of the tension levels does not affect these differences, one tension level can arbitrarily be set equal to zero with no loss of generality. Thus, in a three-state system, there are only five tension levels to estimate, and six empirically-obtained qij's. This allows testing of the underlying model that Tukey proposed. When the number of states is greater than three, the test can be made stronger, since the number of transition rates is n(n— 1), while the number of tension levels is ½n(n—1)+n-1."

Tukey, in short, seems to have conceptualized the logic that people are "chemical entities" who have "attitude states", states of which, as in chemistry, operates such that each state is characterized by a 'free energy level', and each boundary between states by a free energy level that is higher than the levels of the states it separates. [1]

Other

Tukey, while working with John Neumann (also a free energy theorist) on early computer designs, was the person who coined the term "bit", a contraction of "binary digit", a usage later adopted and made popular by Claude Shannon in 1948.

Education

Tukey was a child prodigy who taught himself to read by age three; the anecdote of which is summarized by David Brillinger (2002) as follows: [2]

> "Tukey was a prodigy. His parents had not realized that he had learned to read until on a driving trip there was concern over whether a particular bridge over the Susquehanna was closed. Aged 3 years, he spoke up to say that the bridge was closed. He had read a legal notice in the newspaper announcing the closure."

This similar to other prodigies turned human free energy theorists, namely: Goethe, Neumann, and Hirata (read Dr. Seuss series by age three).

He completed his BS (1936) and MS (1937) in chemistry at Brown University and MA and PhD in mathematics at Princeton. Tukey worked at Bell Labs, where he was known as a "genius with tremendous drive" who was said to known "a lot" because he "worked hard at knowledge for many years" (Richard Hamming, 1986) (Q)(Q) He retired from Bell Telephone Laboratories and from teaching at Princeton in 1985. [2]

Religion

Little key term can be found information on Tukey, in respect to god, atheism, Christianity, religion; Other than the fact that he co-authored at least two papers (Q)(Q) in 1966 on pollution in the *Christian Science Monitor*. Tukey would seem to be secular, by overt classification means.

Quotes

The following are noted quotes:

> "Far better an approximate answer to the right question, which is often vague, than an exact answer to the wrong question, which can always be made precise."
>
> — John Tukey (c.1960) (Q)

References

1. (a) Tukey, John. (1966). "Personal communication to James Coleman"; note #6 of Coleman (1971).
(b) Coleman, James S. (1971), "Theoretical Bases for Parameters of Stochastic Processes" (abs), *The Sociological Review*, 19(S1):17-28; in: *The Sociological Review Monograph: Stochastic Processes in Sociology* (free energy, pg. 25; Tukey, 26-27; state, 25-26), Issue 19. Routledge & Kegan Paul.
2. Brillinger, David R. (2002). "John W. Tukey: His Life and Professional Contributions", *The Annals of Statistics*, 30(6): 1535-75.

External links

- John Tukey – Wikipedia.

θΔics

In existographies, **John Tyndall** (1820-1893) (IQ:170|#414) (FA:138) (CR:68) was an Irish physicist notable for having done the first English translations of the works of Clausius and Helmholtz, in the early 1850s, for having seeded the Spencerian dilemma (1858), and for having launched the 1874 Tyndall-Stewart-Tait debate, on the relation between modern hard science and religion, wherein one of the first dead atom theory ridicules resulted.

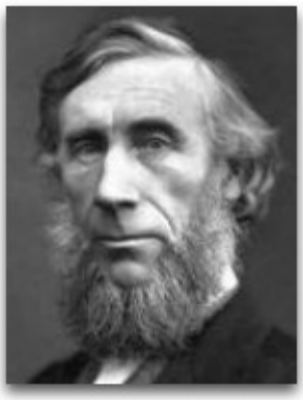

Translations

In 1850, Tyndall did the first German-to-English translations for the thermodynamics papers of German physicists Rudolf Clausius and Hermann Helmholtz and in 1867 penned the introduction to the 1867 edition of Clausius' textbook *The Mechanical Theory of Heat*. [1] Tyndall was associated with English mathematician Thomas Hirst, English translator of the first edition, whom he had worked with in 1845 while an engineer Halifax.

Mechanical equivalent of heat

In mid 1850s, both Tyndall and Irish physicist German physicist Rudolf Clausius were the first to repeat German physicist Robert Mayer's calculations of the mechanical equivalent of heat, using the specific heat measurements of French chemist Henri Regnault, thus confirming agreement between the results of Mayer and those of English physicist James Joule. [4]

Spencer, equilibration, and the second law

See main: Spencerian dilemma

In c.1858, Tyndall informed English philosopher-scientist Herbert Spencer that his theory of the existence of a type of "moving equilibrium" between society and the environment, moving society towards a state of ultimate bliss, the utmost state correlative with a point at which equilibration ceased, was incorrect in view of the second law of thermodynamics. By this, Spencer was thus "staggered" when told by Tyndall that ultimate equilibrium was system death (according to the second law), otherwise known as heat death. [2] In a letter to Tyndall, Spencer declares: [3]

> "Regarding, as I had done, equilibration as the ultimate and highest state of society, I had assumed it to be not only the ultimate but also the highest state of the universe … and your assertion that when equilibrium was reached life must cease, staggered me. Indeed, not seeing my way out of the conclusion, I remember being out of spirits for some days afterwards."

The issue of what then happens to a society after equilibration is reached stayed on Spencer's mind for the next forty years. In his 1899 autobiographical "The Filliation of Ideas", Spencer concludes that when equilibration is completed, "dissolution" occurs. [2]

Tyndall-Stewart-Tait debate

See main: Tyndall-Stewart-Tait debate

Tyndall was responsible for launching the 1874 four-year debate that erupted at a Belfast, Ireland, meeting of the British Association for the Advancement of Science (BAAS) on whether or not modern science will replace religion or whether the two will forever remain separate, which involved a number of the greatest scientists of the 20th century such as James Maxwell, and a number of the founders of thermodynamics, such as Peter Tait and William Thomson. The debate erupted when the newly appointed BAAS president John Tyndall announced boldly that "all religious theories, schemes and systems must submit to the control of science, and relinquish all thought of controlling it." In the four years to follow resulted in a number of articles published in *Nature*, one book, exchanges of post cards, and one last dying poem by Maxwell all centered around the nature of thermodynamics, death, morality, and the theories of immortality.

Tyndall, in his 1874 Belfast Address, supposedly, stated that thermodynamics and Darwin's theory of evolution were the two great scientific doctrines of his time, and stated that the latter was of "still wider grasp and more radical significance" than the former. [5]

Atheism

Following the infamous lecture both he and, it seems, Thomas Huxley, were charged with being "material atheists" (see: atheism) and for "ignoring the existence of god and advocating pure and simple materialism". [6]

> "Christian men are proved by their writings to have their hours of weakness and of doubt, as well as their hours of strength and of conviction; and men like myself share, in their own way, these variations of mood and tense. Were the religious views of many of my assailants the only alternative ones, I do not know how strong the claims of the doctrine of 'material atheism' upon my allegiance might be. Probably they would be very strong. But, as it is, I have noticed during years of self-observation that it is not in hours of clearness and vigor that this doctrine commends itself to my mind: that in the presence of stronger and healthier thought it ever dissolves and disappears, as offering no solution to the mystery in which we dwell, and of which we form a part."
>
> — John Tyndall (1874), response in regards to the charge of atheism [8]

> "God is nowhere treated worse than by the natural scientists who believe in him. Newton still allowed him the 'first impulse,' but forbade him any further interference in his solar system. Secchi [c.1872] (Ñº) only allows him a creative act as regards the primordial nebula. Finally, **Tyndall** totally forbids him any entry into nature and relegates him to the world of emotional processes. What a distance to the old god — the creator of heaven and earth, the maintainer of things — without whom not a hair can fall from the head."
>
> — John Draper (1874), *History of the Conflict between Religion and Science* (pg. 200); cited by Helge Kragh (2008) in *Entropic Creation* (pg. 137)

(add)

Quotes | By

The following is a noted quotes by Tyndall"

> "In our day grand generalizations have been reached. The theory of the origin of species is but one of them. Another, of still wider grasp and more radical significance, is the doctrine of the conservation of energy, the ultimate philosophical issues of which are as yet but dimly seen—that doctrine which 'binds nature fast in fate' to an extent not hitherto recognized, exacting from every antecedent its equivalent consequent, from every consequent its equivalent antecedent, and bringing vital as well as physical phenomena under the dominion of that law of causal connection which, so far as the human understanding has yet pierced, asserts itself everywhere in nature."
>
> — John Tyndall (1874), BAAS meeting address [7]

References

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2. Bailey, Kenneth D. *Social Entropy Theory* (pg. 58). State University of New York Press.
3. Duncan, David. (1908). *Life and Letters of Herbert Spencer* (vol I, pg. 136). Two volumes. New York: Appleton.
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World (pg. 6-7, 13). Los Feliz Publishing.
5. (a) Dale, Peter A. (1989). *In Pursuit of a Scientific Culture: Science, Art, and Society in the Victorian Age* (pgs. 130, 132). University of Wisconsin Press.
(b) Gold, Barri J. (2010). *ThermoPoetics: Energy in Victorian Literature and Science* (pg. 47). MIT Press.
6. Tyndall, John. (1874). "Address", Delivered before the British Association assembled at Belfast. Longmans, Green, and Co.
7. (a) Gold, Barri J. (2010). *ThermoPoetics: Energy in Victorian Literature and Science.* MIT Press.
(b) Tyndall, John. (1874). "Address" (pg. 45), Delivered before the British Association assembled at Belfast. Longmans, Green, and Co.
8. Anon. (1874). "Professor Tyndall and 'Materialistic Atheism'" (Ñº), *The English Mechanic and World of Science and Art*, Oct 2.

Further reading

â— Tyndall, John. (1863). *Heat: a Mode of Motion*. D. Appleton and Co., 1915.

External links

â— John Tyndall – Wikipedia.

θΔics

In existographies, **John Wallis** (1616-1703) (IQ:#|#) (Murray 4000:17|M) (Eells 100:33) (GME:25) was an English mathematician and theologian, noted for []

Mathematics

In mathematics, Wallis is the inventor of the infinity symbol ∞, the greater than or equal to symbol ≥, the less than or equal to symbol ≤, and his 1650s mathematical work paved the way for differential calculus. [1]

Hooke

In 1687, after Robert Hooke gave an account of his theory that ancient sea shell fossils could be explained by supposing that in the past the earth had been covered in a great flood, not one that lasted a year, but one that lasted much longer, which resulted from the axis of the earth shifting over time. In Feb 1687, Edmond Halley sent an account of Hooke's hypothesis to Wallis, who criticized the theory per reason that it ignored or contradicted the Genesis account of things. [2]

Hobbes

At some point, Wallis beat Thomas Hobbes in a mathematical dispute. [2]

Quotes | On

The following are quotes on Wallis:

> "Descartes took up almost without change what this anonymous mathematician of the thirteenth century had written; and henceforth, from Descartes to **Wallis**, from Wallis to Bernoulli, and from the former to Lagrange, then to Gibbs, the principle of virtual displacements continued to be extended."
>
> — Pierre Duhem (1913), "Research on the History of Physical Theories", in: *Essays in the History and Philosophy of Science* (pg. 242)

References

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(b) Stedall, Jacqueline. (2012). *The History of Mathematics: A Very Short Introduction*. Oxford University Press.
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2. Inwood, Stephen. (2003). *The Man Who Knew Too Much: the Strange and Inventive Life of Robert Hooke 1653-1703* (pg. 374). Pan MacMillan.

External links

â— John Wallis – Wikipedia.

θΔics

In thermodynamics, **John James Waterston** (1811-1883) was a Scottish civil engineer noted for his 1845 article "On the Physics of Media that are Composed of Free and Perfectly Elastic Molecules in a State of Motion", one the first treatises on the kinetic theory of gases. [1] Waterston knew of the earlier 1820 work by English physicist John Herapath. [2]

Waterston's pioneering work on kinetic theory remained generally unknown until his lost manuscript was discovered in 1891 by English physicist William Ramsay, while tracking down some old citations, who arranged for a belated publication in the *Philosophical Transactions* of the Royal Society in 1892 along with a short commentary of its history.

References

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(b) Anon. (1846). "Notice: On the Physics of Media that are Composed of Free and Perfectly Elastic Molecules in a State of Motion", *Philosophical Magazine* (pg. 50), Mar 05.
2. Lindley, David. (2001). *Boltzmann's Atom: the Great Debate that Launched a Revolution in Physics* (pgs. 1-3). The Free Press.

External links

â— John James Waterston – Wikipedia.
â— John James Waterston (neglected pioneer) – History of Kinetic Theory, by Dave Levermore.
â— John James Waterson – SciencePhoto.com.

θΔics

In existographies, **John Watson** (1878-1958) (CR:7) was an American psychologist, often compared to Burrhus Skinner, generally known as one the founder of behaviorism, noted for his effort to reduce the soul, mind, and thinking to chemical processes; in a way that supposedly did away with Cartesian dualism. [1]

Education

Watson, at the University of Chicago, studied philosophy under John Dewey, and under the influence of Jacques Loeb, completed his PhD in 1903 with a dissertation on "Animal Education: An Experimental Study on the Psychical Development of the White Rat, Correlated with the Growth of its Nervous System", wherein he described the relationship between brain myelinization and learning ability in rats at different ages, according to which the degree of myelination was largely related to wand learning, i.e. that the kinesthetic sense controlled the behavior of rats running in mazes. In 1908, Watson became a psychologist at Johns Hopkins University, shortly thereafter becoming chair of the psychology department.

Influenced

A noted student of Watson was Karl Lashley. Watson was influential to Albert Weiss (1925).

Quotes | By

The following are related quotes by Watson:

> "No one has ever touched a soul, or seen one in a test tube."
>
> — John Watson (1924), *Behaviorism* [2]

References

1. Henry, Carl F.H. (1999). *God Who Stands and Stays* (pg. 390). Crossway.
2. (a) Watson, John B. (1924). *Behaviorism* (pg. 3). The People's Institute Publishing Co.
(b) Kroth, Jerry. (2011). *Psyche's Exile: an Empirical Odyssey in Search of the Soul* (pg. 31). Genotype.

External links

â— John B. Watson – Wikipedia.

θΔics

In science, **John Wheeler** (1911-2008) was an American theoretical physicist, semi-ranked as a greatest physicist ever, noted for his 1967 coining of the term "black hole", and for his 1971 puzzlement that black holes seem to flout the second law..

Entropy | Black holes

In 1971, Wheeler told Mexican-born Jewish physicist Jacob Bekenstein that black holes seem to flout the second law of thermodynamics; about which, a year later, in 1972, Bekenstein gave his solution to this issue with the argument that black holes should have a well-defined entropy (see: black hole entropy). [1]

Quotes

The following are semi-notable quotes:

> "The black hole is a source of enlightenment."
>
> — John Wheeler (1985) (Ñº)

> "In any field find the strangest thing and then explore it."
>
> — John Wheeler (c.1990) [2]

> "Space tells matter how to move and matter tells space how to curve."
>
> — John Wheeler (1998), *Geons, Black Holes, and Quantum Foam* [3]

References

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2. Crick, Francis. (1994). *The Astonishing Hypothesis: the Scientific Search for the Soul*. Simon and Schuster.
3. Wheeler, John. (1998). *Geons, Black Holes, and Quantum Foam* (pg. 235) (Ñº). W.W. Norton & Co, 2010.

External links

â— John Wheeler – Wikipedia.

θΔics

In existographies, **John Wilkins** (1614-1672) (EP:12) (CR:3) was an English natural philosopher, experimenter, deism-like clergyman, Royal Society founder, and general polymath of sorts, noted for []

Overview

In 1640, Wilkins, in his *Discovery of a New World*, argued, supposedly, that gravitational attraction was similar to magnetism, as William Gilbert (1600) had argued, but a "different force" of some sort. [1]

In 1648, Wilkins, in his *Mathematical Magic*, gave an account of heat powered automata; the first of which being:

> "That musical instrument invented by Cornelis Drebbel, which being set in the sun shine, would of itself render a soft and pleasant harmony, but being removed into the shade would presently become silent. The reason was this, the warmth of the sun, working upon some moisture within it, and rarifying the inward air unto so great an extension, that it must needs seek for a vent or issue, did thereby give several motions unto the instrument."
>
> — John Wilkins (1648), *Mathematical Magic* (pgs. 148-49)

Then spoke about the aeolipile, supposedly reminiscent of Giovanni Branca's device (1629), and Cardano's smoke jack, and gives the following illustration:

This device operates such that the heat rising in the chimney turns blades AB, which then turns gears CD, which turns

pulley E, which thus connects to rope F, which can be put to work for some practical purpose. Leonardo da Vinci, supposedly, was the first to sketch a smoke jack (Ñº) of this type. Wilkins says these have been frequently used for the exciting and contracting of heat in the melting of glasses or metals, and that they may be contrived for other pleasant uses, such as the moving of sails in a chimney corner or the turning of a spit. [2]

In 1668, Wilkins, in his *Essay towards a Real Character, and a Philosophical Language*, proposed a new universal language, and upgrade to the Latin language standard, be made so to facilitate communication, in scientific circles, among different countries; he also proposed, supposedly, that a new integrated system of measurements, akin to the modern metric system.

In Aug-Sep 1665, Wilkins and Robert Hooke, at the Banstead Downs (Ñº) chalk wells, which are 315 feet deep, weighed objects on the surface of the earth and the bottom of the wells, to test Henry Power's reports that objects weigh less at depths, but their measurements failed to confirm Power's findings. [1]

Quotes | By

The following are quotes by Wilkins:

> "Obscurity in writing is commonly an argument of darkness in the mind. The greatest learning is to be seen in the greatest plainness."
>
> — John Wilkins (c.1665)

> "Man's natural desire for happiness is as certain as the descent of heavy bodies."
>
> — John Wilkins (c.1665), *Principles and Duties of Natural Religion* (pg. 17) (Ñº)

References

1. Inwood, Stephen. (2003). *The Man Who Knew Too Much: the Strange and Inventive Life of Robert Hooke 1653-1703* (pgs. 79-80). Pan MacMillan.
2. (a) Wilkins, John. (1648). *Mathematical Magic: the Wonders that May be Performed by Mechanical Geometry; in Two Books, Concerning Mechanical Powers and Motions* (§:Book Two: Daedalus: Mechanical Motions, §§1:145-; esp. pg. 148-49). Baldwin, 1691.
(b) Mathematical Magick – Wikipedia.
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(d) Kitsikopoulos, Harry. (2015). *Innovation and Technological Diffusion: and Economic History of Early Steam Engines* (pg. #). Routledge.

External links

â— John Wilkins – Wikipedia.

θΔics

In existographies, **John Williams** (c.1940-) is a Scottish existographer, German literature scholar, and Goethean scholar, noted for []

Overview

In 1987, Williams in his *Goethe's Faust*, presented a thorough and lucid introduction and commentary on the whole of Goethe's *Faust*. [3]

In 1998, Williams, in his *The Life of Goethe*, gave his opinion on a number of cyphers in Goethe's *Elective Affinities*, namely: CHEM (see: CHEM cypher), OTT, TOT, Echo, and EO. [1]

Education

In 1982, Williams was awarded a prize by the Theodor-Storm-Gesellschaft in an international competition for verse translation.

In c.2015, Williams was an honorary senior lecturer in the department of German at the University of St. Andrews. [2]

References

1. Williams, John R. (1998). *The Life of Goethe* (anagram, pg. 137; Otto anagram, pgs. 233-34). Blackwell.
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External links

â— John R. Williams (faculty) – University of St Andrews.

θΔics

In human chemistry, **John Winkelman** (1911-c.2000) was an American German-languages scholar noted for []

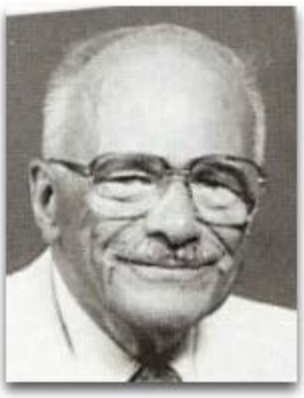

Overview

In 1987, Winkelman, in his *Goethe's Elective Affinities: an Interpretation*, digressed on Goethe's *Elective Affinities*, commenting a bit on the reaction theory, and on interpreters such as Christoph Wieland, Friedrich Gundolf, among others. [1]

Education

Winkelman completed his BA and MS from City College New York and his PhD in 1952 with a dissertation on "Social Criticism in the Early Works of Erich Kaestner" at the University of Michigan. From 1966 to 1970, he served as the department chairman of the German department. In 1987 he was professor emeritus of German literature.

References

1. Winkelman, John. (1987). *Goethe's Elective Affinities: an Interpretation*. Peter Lang.

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θΔics

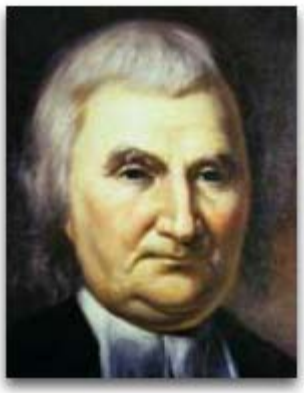

In existographies, **John Witherspoon** (1723-1794) (IQ:175|#225) (CR:12) was a Scottish-born American political philosopher, a signatory of the Declaration of Independence (1776), 6th president of Princeton University, interpreter of the Newtonian-based political philosophies of French theorist Charles Montesquieu, and mentor to American political theorist James Madison (1751-1836), the "father of the constitution", who is said to have used the Newtonian-conceptualized theories of Witherspoon and or Montesquieu in the construction of the US Constitution.

Celestial mechanics | Orrery politics

In 1748, French political philosopher Charles Montesquieu, in his *The Spirit of the Laws*, notes that iron bars tend to contract when cooled, a phenomenon known as Boerhaave's law, and that by extrapolation such an effect may occur in human nerve endings, thus mediating different personal behaviors in love, sex, courageousness, and passions, etc., of people in lands of different heat.

In 1769, American political theorist James Madison (1751-1836), the so-called "father of the constitution", and America's fourth president, was said to be studying a primitive form of social physics a Princeton (see: political physics). [1]

Madison, according to John Q. Stewart, was a student of Witherspoon, who in turn was a noted interpreter of the political philosophy of French theorist Charles Montesquieu, notable for his "hot climates" / "cold climates" theory of human behavior, who in turn had been deeply influenced by the celestial mechanics work of Isaac Newton; Stewart, e.g., comments on this: [2]

> "There can be no question of the fact that, in early Princeton, physics cooperated with politics in a sort of analogical double play, Newton to **Witherspoon** to Madison."

A pen and ink drawing of David Rittenhouse, in 1771, showing his orrery to Princeton president **John Witherspoon**, an item he purchased for Princeton that year [3]

In 1771, College President John Witherspoon purchasedan orrery, i.e. mechanical model of the solar system—regarded as essential teaching equipment for 18th-century lectures on "natural philosophy"—from American clockmaker, and self-taught astronomer David Rittenhouse, for approximately £220 and installed it in Nassau Hall. [3]

In these years, the Whig-Cliosophic Society, Princeton's literary and debate club, formed, which had in its circle John Witherspoon, James Madison, and Irish-born American statesman William Paterson; the latter of which, in 1795, made explicit comparisons of the social and planetary realms. [4] American criminal justice professor Curtis Blakely cites this as the first recorded comparison of its kind by a criminal justice official. [5]

In 1912, Woodrow Wilson stated that the Madison-Witherspoon "political mechanics" amounted to something along the lines of the following: [6]

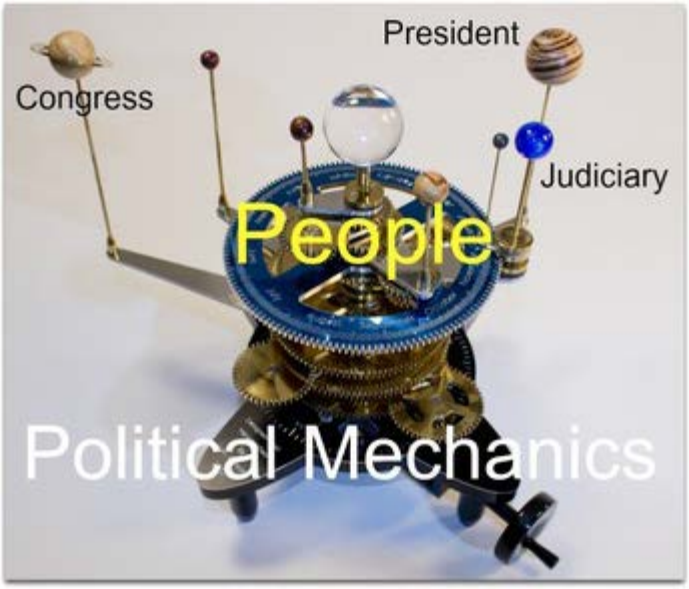

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5. Blakely, Curtis R. (2014). "Applying Humanized Physics to Penology: Parallels Between Natural and Social Realms", *JHT submission*, 12-pg draft preprint, received 6 Sep 2013.
6. Wilson, Woodrow. (1912). "What is Progress?" (Ñº), second campaign speech; in: *The New Freedom: a Call for the Emancipation of the Generous Energies of a People* (Ñº) (§2:38-59). Bernard Tauchnitz , 1913.

External links

â— John Witherspoon – Wikipedia.

θΔics

In human thermodynamics, **John Francis Wojcik** (1938-) is an American physical chemistry professor emeritus, of Catholic Villanova University, Pennsylvania, noted for his very opinionated objections, in the 2006 Rossini-Leonard-Wojcik debate, to assertions that chemical thermodynamics could be used to explain aspects of freedom and security in the human condition. [1]

Overview

In 2006, Wojcik, in his "A Response to Chemical Thermodynamics in the Real World", gave the following argument in objection to chemical thermodynamics being used to explain and solve real world problems, such as freedom and security regulations in a post 9/11 world: [2]

> "There is the danger that some will think that true human freedom can be measured in terms of some sort of calculus of simultaneous maximums and minimums. And worst of all, there is the danger that chemical thermodynamics will have ascribed to it a power that it simply does not have, namely, the power to 'explain' the human condition."

Wojcik's underlying objection is a religious objection, similar to Christoph Wieland (1809), Pitirim Sorokin (1928), and Christopher Dawson (1957).

Education

Wojcik completed his PhD on "the Radioisotope Exchange of Nickelous, Cobaltous and Cupric Ions with their Ethylenediaminetetraacetato Complexes" in Ithaca, New York, in 1965. [3] Wojcik taught chemistry for one year, in 1965, at St. Francis College in Loretto, Pennsylvania. In 1966, Wojcik joined the chemistry department at Villanova University. He served as Chair of the chemistry department from 1990-1994. Wojcik announced his retirement from teaching chemistry effective August 15, 2006. [4]

References

1. Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (section: Rossini's political thermodynamics, pgs. 679-88). (preview). Morrisville, NC: LuLu.
2. (a) Leonard, Harold, E. (2006). "Chemical Thermodynamics in the Real World." (PDF) *Letters, Journal of Chemical Education*, (83) 39, Jan, No. 1. pg. 39.
(b) Wójcik, John F. (2006). 'A Response to Chemical Thermodynamics in the Real World.' (PDF) *J. Chem. Educ.* (*83)* 39.
3. Wojcik, John Francis. (1965). "the Radioisotope Exchange of Nickelous, Cobaltous and Cupric Ions with their Ethylenediaminetetraacetato Complexes", *Thesis/Disseration*, Ithaca, N.Y.
4. Anon. (2006). "Departmental News", June 01, Villanova University.

External links

â— Wojcik, John Francis (1939-) – WorldCat Identities.
â— John Wojcik (faculty) – Villanova University.

θΔics

In hmolscience, **Johnjoe McFadden** (1956-) is an Irish biochemist and geneticist noted for []

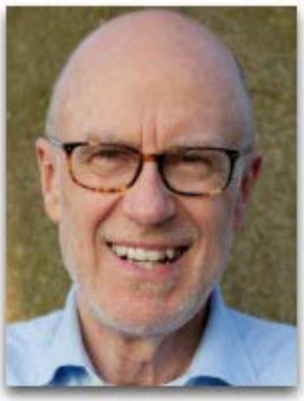

Overview

In 2000, McFadden, in his *Quantum Evolution*, uses quantum mechanics, the Heisenberg uncertainty principle, in particular, as an ontic opening to argue for indeterministic free will based model of evolution; the following dismal dualism model highlights the gist of his viewpoint:

> "Determinism is one of the bedrocks of modern science. It is the principle that the future (or present) state of any system (say, a stick of dynamite) is determined solely by its past. If you know the precise configuration of any system, by adding the laws of physics and chemistry, you can calculate its future behavior.
>
> There is nothing that the dynamite can *do*, no *action* it can take when it is likely to explode. It does not possess the ability to direct its own actions. However, if we similarly determined the pigeon's precise chemical composition and added the prevailing temperature, wind conditions. etc., could we predict that it would fly up into the air? Perhaps.
>
> But then, suppose it spied a bag of seed on the ground. It would then be more likely to descend towards the food. But perhaps there is a cat nearby. The pigeon might decide to wait in the tree until the cat has crept away. Could we predict all these possible behaviors by analyzing the chemistry of the pigeon alone or even that of the pigeon and its surrounding environment? The only differences which have led to the pigeon's altered behaviour are the pattern of light photons that fell upon its retina (carrying the images of food, cat, etc.). If we include these photons in the equations of motion that describe the pigeon and its environment would the equations predict such widely different outcomes?
>
> I hope to convince you that the answer to this question is no. We cannot account for life with classical science alone. In particular we cannot account how living creatures are able to direct their actions according to their own internal agenda. For higher animals, such as ourselves, we call this ability our will. The ability to will actions is a profoundly puzzling aspect to living organisms that appears to contradict scientific determinism. There is no role for will in determinism; we do not have

McFadden's quantum dualism model, which he uses to argue that pigeons are different from dynamite, e.g. in their ability to fly, the former being governed by indeterminism science the later by deterministic science, because "the pigeon (or man) is not an automaton; its conscious electromagnetic field exploits quantum measurement to move particles in its brain, proving it with the phenomena of free will, according to which consciousness drives free will." [1]

choices."

Compare, conversely, the more discerning views of Alfred Lotka on dynamite and trigger action.

Education

McFadden his BS in biochemistry at Bedford College, University of London, and his PhD in fungal virus genetics at Imperial College.

Religion

McFadden, based on god quotes usage in his "about me" (Q), and "creation" terminology, and Bible quote usage, Christian soul discussions, and general pro free will argument in general, would seem to be a closet theist or secular theist, or theist in denial of some sorts. Some recent publications, however, refer to him (Q)(Q) as an atheist.

References

1. McFadden, Johnjoe. (2000). *Quantum Evolution: How Physics Weirdest Theory Explains Life's Biggest Mystery* (consciousness drives free will, pg. 314). W.W. Norton.

External links

- Johnjoe McFadden – Wikipedia.
- About – JohnjoeMcfadden.com.

θΔics

In science, **Johnstone-Pavlovich rule**, or “Pavlovich-Johnstone rule” (Ñº), is a general or universal rule-of-thumb which states that "things", questions, or effects not recognized by the first law and second law of thermodynamics are unreal and do not exist; things contradictory to thermodynamics do not exist.

James Johnstone
(1870-1932)
English oceanographer and experimental biologist

Boris Pavlovich
(1893-1970)
Russian chemist and biophysicist

James Johnstone and Boris Pavlovich; independent purveyors of the so-called **Johnstone-Pavlovich rule**, i.e. the rule or motto that only those “things” which exist or are real are those recognized by and not contradicting the first law and second law of thermodynamics.

Overview

In circa 2014, Libb Thims in discussion with Jeff Tuhtan, somewhere in Hmolpedia threads (and or possible email exchanges), were exchanging their joint agreement on one or another version of the Johnstone-Pavlovich rule.

Quotes

The following are representative quotes:

> “The law of conservation applies to some things and not to others, and the things which it does not apply are unreal.”
>
> — James Johnstone (1914), *The Philosophy of Biology* [1]

> “Every question or effect has the right to exist if it does not contradict the second law of thermodynamics.”
>
> — Boris Pavlovich (c.1935), in: *Zeldovich: Reminiscences* [2]

References

1. Johnstone, James. (1914). *The Philosophy of Biology* (pg. #). Cambridge: University Press.
2. (a) Sunyaev, R.A. (2004). *Zeldovich: Reminiscences* (pg. 16). CRC Press.
(b) Boris Pavlovich Belousov – Wikipedia.

θΔics

In existographies, **Jon McGowan** (1939-) (CR:3) is an American mechanical engineer, noted for []

Overview

In 2012, McGowan, University of Massachusetts, Amherst, became an academic advisor for Ram Poudel, who was in his first year, at UMass, working as a teaching assistant for a course in systems identification, amid which he envisioned doing his PhD on "Energy and the Poverty Dynamics", conceptually-based on a Navier-Stokes equation (Q) for a social field, i.e. a "social fluid" model, or something along these lines. Poudel proposed this idea to his McGowan, who in turn gave him Howard T. Odum's *Energy Basis for Man and Nature* (1976) and *Environment, Power, and Society* (1971) to read, which initiated Poudel's engagement in trying to grapple with the subject of mechanical engineering based social energetics and or social mechanics, focused on poverty betterment. [1]

In Mar 2019, McGowan and Poudel, co-authored the article "The Dynamics of Human Society Evolution: an Energetics Approach", which they submitted to the Hindawi-based journal *Complexity* (Q), the abstract of which is the following: [2]

> "Human society is an open system that evolves by coupling with various known and unknown (energy) fluxes. How do these dynamics precisely unfold? Energetics may provide further insights. We expand on Navier Stokes' approach to study non-equilibrium dynamics in a field that evolves with time. Based on the 'social field theory', an induction of the classical field theories, we define social force and social energy and Hamiltonian of an individual in a society. The equations for the evolution of an individual and society are sketched based on the time-dependent Hamiltonian that includes power dynamics. In this paper, we will demonstrate that Lotka-Volterra type equations can be derived from the Hamiltonian equation in the social field."

The article is dedicated to Richard Adams and his *The Eighth Day*.

In Jan 2019, McGowan was taking part in the organization of a potential Thermodynamics Two Cultures Conference 2020, tentatively slated for Jun 22-24.

Education

McGowan completed his BS in 1961 at Carnegie Institute of Technology, his MS in 1962 at Stanford University, and his PhD in 1965 at Carnegie Institute of Technology, and in 2019 was professor of mechanical and industrial engineering at University of Massachusetts, Amherst, where his work tends to focus on publications in the area of energy systems, e.g. solar power, wind power, and battery power.

References

1. Poudel, Ram. (2016). "Energetic Foundation of Statistical Economics" (history, V:0-2:30; energy equation, 5:35-), 7th BioPhysical Economics Conference, Jun 28.
2. Poudel, Ram and McGowan, Jon. (2019). "The Dynamics of Human Society Evolution: an Energetics Approach", 37-page article submitted to *Complexity* (reviews: Arto Annila, James Dixon (Q), and anon), Mar 10.

External links

- Jon G. McGowan (faculty) – University of Massachusetts, Amherst.
- Jon G. McGowan – WorldCat.
- Jon McGowan – Google Scholar.

In hmolscience, **Jonathan Borofsky** (1942-) is an American sculpture artist noted for his 1977 hole-filled "Molecule Man" sculptures, a depiction of a human-as-molecule.

Overview

In 1977, Borofsky began making the first "Molecule Man" sculptures were built in Los Angeles. The sculptures originated because, in Borofsky's own words:

> "I was fascinated by this 'molecule idea', the simple fact that even though we appear to be quite solid, we are in fact composed of a molecular structure which in itself is mostly composed of water and air."

The first ones were human-size. In the decades to follow, he has made four multi-story, hole-filled, Molecule Man sculptures in four locations in the world, where the holes are representative of "the molecules of all human beings coming together to create our existence". As of 2010, there are four outdoor Molecule Man sculptures:

Los Angeles, California, USA	Yorkshire, England	Berlin, Germany	Council Bluffs, Iowa, USA
Height: 30-fit Date: 1978	Height: 30-ft Date: 1988	Height: 100-ft Date: 1996	Height: 50-ft Date: 2008

(add discussion)

See also

- Antony Gormley
- Chris Gash
- Norval Morrisseau
- Shawn LaPaix

External links

- Jonathan Borofsky – Wikipedia.

θΔics

In existographies, **Jonathan P. Dowling** (c.1955-) is an American physicist noted for []

Abioism

In 1998 to 2004, Dowling, while working at the NASA Jet Propulsion Laboratory, on the topic of "life detection" devices, one would supposedly use on some type of distant planetary probe, engaged into "endless discussions" on the definition of life; his response to these discussions, which amount to the abioism position, were made public in a footnote to his 2013 artificial life chapter of his *Schrodinger's Killer App*, as follows: [1]

> "When [1998-2004] I was at the NASA Jet Propulsion Laboratory, we would have endless discussions on the definition of life. What is life? The discussions were always hinged on the metaphysical and religiously infused idea that there should be a line—things on one side of the line were alive and things on the other were not. The game was to find that line. People argued and continue to argue about this endlessly. Should it reproduce, reduce the entropy of its environment, have DNA, or what? For example, viruses are infectious, reproduce, and have DNA and most vote they are alive (but some not). Prions, which cause mad cow disease, are malevolent proteins that reproduce, are infectious, but have no DNA. Most say they are not alive and say we should draw the line of life between prions and viruses. My response to these discussions was, **there is no such thing as life!** [see: life does not exist] There are interesting chemical reactions, like Stephen Hawking, and less interesting chemical reactions, like salt crystals growing in a glass of salt water. There is no line, no 'breath of life' separating living from nonliving. That is a metaphysical bit of silliness. We should focus on interesting over boring chemical reactions and **forget about this line** that does not exist except in our own minds."

Here, firstly, regarding the Jet Propulsion Laboratory, we can compare Dowling's chemical reaction materialistic siding answer to the "what is life?" puzzle to the alternative of new age siding or aligning approach followed by James Lovelock who, similar to Dowling, while was working at the Jet Propulsion Laboratories in 1964, engaged into the endless what is life debates, amid which he entertained similar ideas, e.g. about entropy reduction equating to life, etc., but in the end ventured into panbioism belief system, with eventual focus on his so-dubbed "Gaia hypothesis", the view that the earth is "alive", which, although it amounts to an incorrect position, he wrote several books on.

Secondly, regarding "Stephen Hawking" defined passingly as an interesting chemical reaction, we can compare the more sober take on the matter by Gilbert Lewis, the main founder of modern chemical thermodynamics, who in his 1925 *Anatomy of Science* lectures compared both view points, in the end stating that the view of him, as a chemical reaction, writing a textbook, was the most absurd thing he could think of.

Thirdly, Dowling's "breath of life" dismissal, while commendable, is but the lid of a 6,000-year-old can of worms, which can only be sated by a plethora of dense and deeply entrenched religio-mythology scholarship. [2]

Religion

Dowling, in his *Schrodinger's Killer App*, never employs the word "atheist" but employs the word "god" twelve times, mostly in reference to Einstein's "god's dice", at one point of which (pg. 34) he states the following: [1]

The character Beni Gabor (Kevin J. O'Connor) in the 1999 movie *The Mummy* showing his various religious symbols to the reanimated mummy Imhotep (c.2650–2600BC), whose supreme god (see: supreme god timeline) would have been either Ptah (Heliopolis) or Atum-Ra (Memphis), to see which god the mummy would recognize, which Dowling says embodies his belief system.

> "Here is my problem with Pascal's wager—which god should I choose to believe in? There are many religions. Most are mutually exclusive. If you spend your life as a devout Buddhist, then you're not getting into heaven. If you spend your life as a devout Christian, then you will never reach nirvana. There are, sadly, many places in this world where the public proclamation of a belief in the 'wrong' god is much more dangerous to one's personal health than quietly admitting a belief in no god at all. When it comes to interpretations of quantum theory. **I am a pantheist**. The pantheist approach was the one taken by the character Beni Gabor (played by Kevin J. O'Connor) in the 1999 remake of the movie *The Mummy*. When Beni first encounters the reanimated mummy of the high priest Imhotep. Beni pulls out from under his shirt a plethora of grimy religious talismans and begins praying aloud with each of them proffered up, one after the other, to ward off the mummy. Beni finally hits upon the Star of David with a Hebrew prayer, which the mummy recognizes, and instead of sucking out his life force, the mummy turns him into a slave."

Dowling, of note, also employs the term "soul" twice, once in a passing metaphor, namely the phrase "soul-stealing lecture", and a second time as follows: [1]

> "As this is a popular science book and not a popular philosophy book or religious studies book, I will not discuss such objections to the strong AI hypothesis such as computers do not have souls and so forth."

This comment would seem to place Dowling into the implicit soul-believing category (implicit soulism). In sum, Dowling, in 2013, would seem to classify as an agnostic pantheist soulist abioist (see: atheism types by denial and belief).

Education

Dowling completed his BS in physics at the University of Texas at Austin, his MS in applied mathematics, MS in physics, and in 1986 his PhD in mathematical physics, the latter three at the University of Colorado at Boulder. Presently, he is chair of theoretical physics at Louisiana State University.

Keys

Dowling was found via the Google Books search keys: Ferris Jabr, life.

References

1. Dowling, Jonathan. (2013). *Schrödinger's Killer App: Race to Build the World's First Quantum Computer* (ref. #88, pgs. 429-30; soul, pgs. 11, 398; god, 12+ pgs). CRC Press.
2. Thims, Libb. (2016/17). *Smart Atheism: For Kids* (pdf | 309-pgs; breath of life, 3+ pgs). Publisher.

External links

â— Jonathan Dowling – Wikipedia.
â— Jonathan Dowling (faculty) – Louisiana State University.

θΔics

In existographies, **Jonathan Hornblower** (1753-1815) (EP:33) was British engineer, noted for []

Overview

In 1781, Hornblower invented a “compound steam engine”, which had two cylinders instead of one single acting cylinder.

In 1792, James Watt took Hornblower to court over intellectual property issues; Hornblower eventually lost and later became an astronomer. During the course of the court hearings, however, Hornblower called on the aid of his friend and advisor Davies Gilbert, who, in court, is said to have employed some type of Newton-based integral calculus method to calculate the work done by the Hornblower engine, that has been conjectured to have been something formally similar to something that Daniel Bernoulli, in his *Hydrodynamica* (1738), had done, and which acted to spur on the invention of the “indicator diagram” by John Southern in 1796.

Family

Jonathan Hornblower, brother of Jabez Hornblower (dates), son of Jonathan Hornblower (dates), who was himself the older brother of Josiah Hornblower (1729-), both of whose father was Joseph Hornblower (1696-), an early builder of Newcomen engines in Cornwall. [1]

References

1. Lienhard, John H. (2005). “Five Hornblowers” (Ñº), Engines of Ingenuity, #2015, University of Houston.
2. (a) Bernoulli, Danile. (1738). *Hydrodynamica* (§10:200-204). Strasbourgh.
(b) Pacey, A.J.; Fisher, S.J. (1967). “Daniel Bernoulli and the Vis-Viva of Compressed Air” (abs), *British Journal for the History of Science*, 3(4)::388-92.
(c) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pgs. 79-80). Cornell University Press.

External links

â— Jonathan Hornblower – Wikipedia.

θΔics

In existographies, **Jonathan Swift** (1667-1745) (IQ:180|#169) (Cattell 1000:64) [RGM:194|1,500+] (CR:17) was an Anglo-Irish satirical writer, religious commentator, and unlearn expositor, generally known for his *Gulliver's Travels* (1726), noted for commentary on John Toland, who he called the "great oracle of the anti-Christians", and for his Cicero-like digression on whether the mind was formed by god or by the Epicurean fortuitous concourse of atoms origin of things.

Quotes | By

The following are quotes by Swift:

> "The latter part of a wise man's life is taken up in curing the follies, prejudices, and false opinions he had contracted in the former."
>
> — Jonathan Swift (1706), "Thoughts on Various Subjects, Moral and Diverting" (see: unlearn) [1]

> "When a **true genius** appears in this world, you may know him by this sign, that the dunces are all in confederacy against him."
>
> — Jonathan Swift (1706), "Thoughts on Various Subjects, Moral and Diverting" [1]

> "We have just enough religion to make us hate, but not enough to make us love one another."
>
> — Jonathan Swift (1706), "Thoughts on Various Subjects, Moral and Diverting" [1]

> "Unless a proposition 'can be presently comprehended by the weakest noodle', it is no part of religion."
>
> — Johnathan Swift (c.1710), *Publication*; supposedly a sneer (O) at deism [3]

> "Once and a while a **true genius** may happen to arise. Every age might perhaps produce one or two of these to adorn it, if they were not sunk under the censure and obloquy of plodding, servile, imitating pedants: I do not mean by a true genius any bold writer, who breaks through the rules of decency to distinguish himself by the singularity of his opinions: but one, who upon a deserving subject is able to open new scenes, and discover a vein of true and noble thinking, which never entered into any imagination before: every stroke of whose pen is worth all the paper blotted by hundreds of others in the compass of their lives."
>
> — Jonathan Swift (1711), "Letter to Lord [name]" (O), Feb 22 [2]

> "Philosophers say, that man is a microcosm, or little world, resembling in miniature every part of the great; and, in my opinion, the body natural may be compared to the body politic; and if this be so how can the Epicurean's opinion be true, that the universe was formed by a **fortuitous concourse of atoms**; which I will no more believe, than that the accidental jumbling of the letters of the alphabet could fall by chance [see: typing monkeys] into a most ingenious and learned treatise of philosophy. *Risum tincatis amici?* [hor] This false opinion must needs create many more; it is like an error in the first concoction, which cannot be corrected in the second; the foundation is weak, and whatever superstructure you raise upon it, must of necessity fall to the ground. Thus men are led from one error to another, until with Ixion they embrace a cloud instead of Juno; or, like the dog in the fable, lose the substance in gaping at the shadow: For such opinions cannot cohere; but like the iron and clay in the toes of Nebuchadnezzar's image, must separate and break in pieces. I have read in a certain author, that Alexander wept, because he had no more worlds to

conquer; which he needed not have done, if the fortuitous concourse of atoms could create one; but this is an opinion fitter for that many headed beast the vulgar to entertain, than for so wise a man as Epicurus; the corrupt part of his sect only borrowed his name, as the monkey did the cat's claw to draw the chestnut out of the fire."

— Jonathan Swift (c.1720), "A Critical Essay on the Faculties of the Mind" (Q)

References

1. (a) Swift, Johnathan. (1706). "Thoughts on Various Subjects, Moral and Diverting"; in: *The Works of Jonathan Swift, Volume Two* (true genius, 9+ pgs; true genius, pg. 223; contracted, pg. 223). C. Bathurst, 1755.
(b) Thoughts on Various Subjects, Moral and Diverting – Wikipedia.
(c) Terrence Tao (favorite quotes) – Math.UCLA.edu.
2. Swift, Johnathan. (1706). "Thoughts on Various Subjects, Moral and Diverting"; in: *The Works of Jonathan Swift, Volume Two* (true genius, 9+ pgs, quote, pg. 197). C. Bathurst, 1755.
3. Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea* (pg. 289). Harvard University Press, 1936.

External links

- Jonathan Swift – Wikipedia.
- An Argument Against Abolishing Christianity – Wikipedia.

θΔics

In hmolscience, **Jonathan Tennenbaum** (1950-) is an American mathematician turned Lyndon LaRouche science advisor noted for his hilarious 1993 lectures on an attempt to refute the first law and second law of thermodynamics. [1]

LaRouche

Tennenbaum, in his 1993 speech "The LaRouche Method and the New Physical Principles", has the following to say about how Lyndon LaRouche stumbled upon his new economic theory: [2]

> "As Lyn reports, what provoked him to embark on the essential phase of his discovery was an encounter with the famous [1948] book by Norbert Wiener on cybernetics. One thing in Wiener's book infuriated Lyn to the point of having an angry impulse to throw the book against the wall. Wiener had attempted to characterize what we call *living processes*, by methods borrowed from Ludwig Boltzmann's statistical thermodynamics. And Wiener tried to do the same thing for human intelligence, developing the now-famous approach of information theory."

(add discussion)

Education

Tennenbaum completed his PhD in mathematics in 1973 with a dissertation on "A Construction Version of Hilbert's Basic Theorem" at the University of California, San Diego. [3] In 1993, Tennenbaum, during his attempt to refute the laws of thermodynamics, stated that he has never taken a physics course. [1]

Tennenbaum, supposedly, worked from some time as the chief scientific advisor for the LaRouche movement group, but was eventually fired by LaRouche for disagreement on views, or something along these lines. (Ñº)

References

1. Tennenbaum, Jonathan. (1993). "The First and Second Law of Thermodynamics Refuted" (vid), Speech given at the Schiller Institute Conference, Mar 23.
2. Tennenbaum, Jonathan. (1993). "How the SDI Was Created: the LaRouche Method and the New Physical Principles", Speech given at the Schiller Institute Conference, Mar 20-23; in: *American Almanac*, May 17, 1993.
3. Tennenbaum, Jonathan Benjamin (1950-) – WorldCat Identities.

External links

â— Tennenbaum, Jonathan – WorldCat Identities.

θΔics

In hmolscience, **Jonathan Wright** (c.1870-c.1945) was an American physician and Greek philosophy scholar note for his 1920 article “Empedocles the Primitive Physiologist”, where gives an overview of the theories of Empedocles, and his purported teacher Alcmaeon, according to Wright, during which time he connects Empedocles four element two force theory of form generation to Goethe’s "wonderful", as he calls it, *Elective Affinities*. [1]

Goethe

In 1906, Wright began discussing Goethe-Empedocles connections. [3]

In 1920, Wright penned the following Goethe-Empedocles connection statement:

> “These elements are equal, all of them, and of like ancient race; and one holds one office and another and each has his own nature”—some being predominantly warm, others cold. They were coeval and eternal—for if they perish whither should they go? (Fragment 87.) "From these arose blood and various kinds of flesh" (203), “and if your faith be at all lacking in regard to these (elements), how from water and earth and air and sun (fire) when they are mixed arose such colors and forms of mortal things,” the attraction and repulsion of modern physical chemistry, symbolized under the conception of love and hate accomplished it, a simile carried out in the meaning of Empedocles by Goethe in his wonderful novel (*Die Wahlverwandtschaften*—*Elective Affinities*). Combinations of the elements arose under “the uniting power of Aphrodite” (210). He seems to have thrown much, if not all, of his written work into the form of poetry and his other physical ideas as well, are full of poetical conceptions even in the reports and traditions of later writers. So Goethe made poetry of the *Metamorphosis of Animals and Plants*.”
>
> — Jonathan Wright (1920), “Empedocles the Primitive Physiologist” (pg. 143-44)

(add discussion)

Of note, Wright attributes the maternal imagination theory, or “idea of maternal impressions” as he calls it, used by Goethe, as being of Empedocles origin.

Terminology

The following, per Wright's statement that Goethe's novel is a "simile carried out in the meaning of Empedocles", is a terminology table: [2]

Term	Definition
Simile	A figure of speech comparing two unlike things that is often introduced by *like* or *as*.
Analogy	A resemblance in some particulars between things otherwise unlike; a comparison based on such resemblance.
Metaphor	A figure of speech in which a word or phrase literally denoting one kind of object or idea is used in place of another to suggest a likeness in place of another to a likeness between them.

being that it is interesting to note the term use of various authors in their description of the logic of *Elective Affinities*.

Empedocles

Wright quotes the following statement by Empedocles:

> "When strife has reached the very bottom of the seething mass, and love assumes her station in the center of the ball, then everything begins to come together, and to form one whole—not instantaneously, but different substances come forth, according to a steady process of development. Now, when these elements are mingling, countless kinds of things issue from their union. Much, however, remains unmixed, in opposition to the mingling elements, and these malignant strife still holds within his grasp. For he has not yet withdrawn himself altogether to the extremities of the globe; but part of his limbs still remain within its bounds, and part have passed beyond. As strife, however, step by step, retreats, mild and innocent love pursues him with her force divine; things which had been immortal instantly assume mortality; the simple elements become confused by interchange of influence. When these are mingled, then the countless kinds of mortal beings issue forth, furnished with every sort of form—a sight of wonder."

Wright, citing some Taylor translation of Aristotle, gives the following so-called "vacuum experiments" done by Empedocles:

> "Empedocles explains this by the example of the clepsydra, an instrument which has in the upper part a large hole, and in the lower part many small holes. If, therefore, this instrument is filled with water, and the upper hole is closed with the finger, the water will not go out of the lower holes, because the air cannot enter from the upper hole, in order to fill the vacuum in the place of the departing water. But when the upper hole is opened, then the air entering, the water flows downward, and departs thru the inferior holes."

Quotes

The following are a few noted quotes:

> "There is no discrimination of organic and inorganic, of animate or inanimate for [Empedocles]. It is all animated, it is all instinct with life."
>
> — Jonathan Wright (1920), "Empedocles the Primitive Physiologist" (pg. 139)

> "Instead of accepting the monovalent doctrine of the nature philosopher who severally thought of water or air or fire or earth as the primordial element, Empedocles made a polyvalent system of it by adopting them all. To match the elements numerically he added the qualities, the hot and the cold, the moist and the dry."
>
> — Jonathan Wright (1920), "Empedocles the Primitive Physiologist" (pg. 143)

> "With elements, qualities, colors, humors, each four in number, there seems a striving after a tetralogy which can be referred only to Egyptian influence."
>
> — Jonathan Wright (1920), "Empedocles the Primitive Physiologist" (pg. 144)

> "Empedocles was the first evolutionist."
>
> — Jonathan Wright (1920), "Empedocles the Primitive Physiologist" (pg. 144)

Keys

Wright was found via the Google Books search keys: “Goethe, Empedocles, love, hate, affinity”.

References

1. Wright, Jonathan. (1920). “Empedocles the Primitive Physiologist” (Goethe, pgs. 144-45; evolutionist, pg. 144; maternal impressions, pg. 145; clepsydra, pg. 146), *American Medicine*, 26:139-47, Mar.
2. Merriam-Webster Collegiate Dictionary, 2000.
3. Wright, Jonathan. (1906). “The Primordial Nature of the Forceps Exerted Against the Penetration of the Surface of the Body” (Goethe, Empedocles, pg. 118), *New York Medical Journal, Incorporating the Philadelphia Medical Journal and the Medical News, a Weekly Review of Medicine* (pg. 117-), Jan 20.

Further reading

â— Wright, Jonathan. (1919). “Modern Commentaries on Hippocrates: From the Darkness to the Light in the Evolution of Medicine”, *International Record of Medicine and General Practice Clinics*, 110:485-88.

θΔics

In existographies, **Jordan Maxwell** (c.1939-) is and American rough-around-the-edges religio-mythology scholar, noted particularly for his astro-theology work, most of which is in the form of audio talks, DVDs, and video lectures.

Massey

In 1970, Maxwell read Gerald Massey's c.1890 lecture "The Historical Jesus and the Mythical Christ", becoming inspired by it, and therein gleaning the idea of "astro-theology". [2]

Isis-Ra-El

In c.2000, Maxwell in his "Is Ra El" lecture Q&A, gives a fairly cogent synopsis of how, in his view, Judaism was formed by the migration process wherein the Phoenician Canaanites, aka Hebrews, with their embedded religion of the Isis Cult and Amen-Ra religion, moved north and encountered the Palestine god El, whom Maxwell defines as the planet Saturn. [1]

Anointed Phallus

In c.2000, Maxwell produced an audio talk (Q) entitled "Anointed Penis Head", which no doubt is about the god Atum.

Beliefs

Maxwell believes that religion is but something for controlling minds, that god exists, and that there is some kind of spiritual dimension to the universe.

Quotes | By

The following are related quotes:

> "The entire New Testament is a metaphor, and astrological metaphor for the outworking of god's plan on the earth."
>
> — Jordan Maxwell (c.2009), "The Root of All Religion 7/15" (4:49-5:02) (Q)

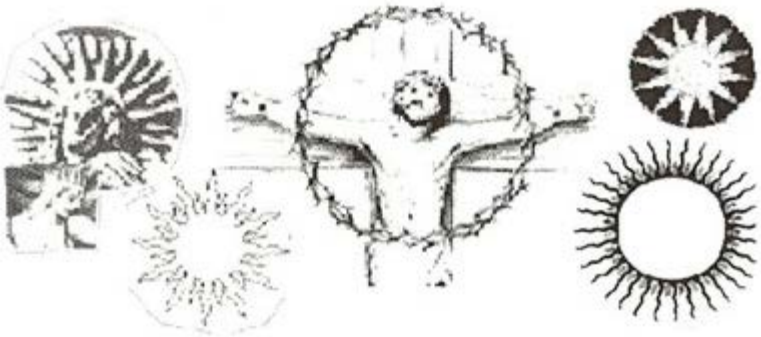

A solar corona "crown of thorns" depiction from Maxwell's 2000 chapter "The Solar Cult". [2]

References

1. Maxwell, Jordan. (c.2000). "Essential Jordan Maxwell: Isis-Ra-El = Israel (It's Not Holy). Amen" (Q)(Q), Merkabah Master Truther, Apr 30.
2. Maxwell, Jordan; Tice, Paul; Snow, Alan. (2000). *That Old-Time Religion: the Story of Religious Foundations* (§: Astro-Theology, pgs. 5-24; §:The Solar Cult, pgs. 35-54). The Book Tree.

Further reading

● Irvin, Jan; Maxwell, Jordan; Rutajit, Andrew. (2006). *Astrotheology and Shamanism*. Book Tree.

External links

● About – JordanMaxwell.com.

θΔics

In existographies, **Jordan Peterson** (1962-) is a Canadian political scientist, psychologist, and existential philosopher, noted for []

Beliefs

In May 2017, Jordan, in an interview titled "Do You Believe in God?" (Q), stated that he doesn't like the query: "do you believe in god?" per reasons of terminology disagreement on the terms "belief" and "god", stating that he "acts as if god exists", leaving the question open; he also, to note, fumbles around with the query, not about the existence of Christ, but about whether he believes in the "divinity of Christ", meaning, implicitly he believes that a person named Jesus Christ existed (see: Jesus never existed), divine or not. Peterson here seems to have an agnostic leaning towards atheism belief state, a Dostoyevskyan view or things, give or take.

Religion | Atheism

In 1999, Peterson, in his *Maps of Meaning: The Architecture of Belief*, which he spent 13-years writing, building on the ideas of Sigmund Freud, Carl Jung, Friedrich Nietzsche, and most importantly Fyodor Dostoyevsky, his main intellectual kinship, attempts to argue that all Westerners, even admitted atheists, are Judeo-Christian in their actions; to argue this position, Jordan posts the following statement by Nietzsche: [1]

> "When one gives up Christian belief [for example] one thereby deprives oneself of the right to Christian morality. Christianity is a system, a consistently thought out and complete view of things. If one breaks out of it a fundamental idea, the belief in god, one thereby breaks the whole thing to pieces: one has nothing of any consequence left in one's hands. Christianity presupposes that man does not know, cannot know what is good for him and what evil: he believes in god, who alone knows. Christian morality is a command: its origin is transcendental; it is beyond all criticism, all right to criticize; it possesses truth only if god is truth —it stands or falls with the belief in god. If [modern Westerners) really do believe they know, of their own accord, "intuitively," what is good and evil; if they consequently think they no longer have need of Christianity as a guarantee of morality, that is merely the consequence of the ascendancy of Christian evaluation and an expression of the strength and depth of this ascendancy: so that the origin of [modern] morality has been forgotten, so that the highly conditional nature of its right to exist is no longer felt?"

Jordan then elaborates his idea that even if Christianity is superfluous, the fundamental tenets or theories of Christianity, e.g. don't steal, don't kill, love thy neighbor, etc., still govern the actions of Westerners, even atheists:

> "If the presuppositions of a theory have been invalidated, argues Nietzsche, then the theory has been invalidated. But in this case the "theory" survives. The fundamental tenets of the Judeo-Christian moral tradition continue to govern every aspect of the actual individual behavior and basic values of the typical Westerner—**even if he is atheistic and well-educated**, even if his abstract notions and utterances appear iconoclastic. He neither kills nor steals (or if he does, he hides his actions, even from his own awareness), and he tends, in theory, to treat his neighbor as himself. The principles that govern his society (and, increasingly, all others) remain predicated on mythic notions of individual value—intrinsic right and responsibility—despite scientific evidence of causality and determinism in human motivation. Finally, in his mind—even when sporadically criminal—the victim of a crime still cries out to heaven for 'justice', and the conscious lawbreaker still deserves punishment for his or her actions."

(add)

Harris

In Jan 2017, Peterson debated (Q)(Q) Sam Harris, in his SamHarris.org podcast, on the topic of "what is true?"

In Apr 2017, Jordan, in his "Maps of Meaning 10: Genesis and the Buddha" lecture (Q), section "The Problem with Atheism" (Q), dialogues on Fyodor Dostoyevsky's Raskolnikov character of *Crime and Punishment* (1866) who ruminates on the justifications of committing a murder (note: Dostoyevsky's father was murdered in 1839, when the Dostoyevsky was 18), i.e. the pros and cons of the rumination "why don't I just kill her?", namely take an axe to an immoral pawnbroker. Peterson goes on to state that because of the so-named "Dostoyevsky dilemma" -- namely the idea or thought that in a godless universe, of the Dostoyevskyan universe type, that because there is no transcendent value, one can do whatever they want, and therefore rational murder can be permissible, accordingly – he has issues with the radical atheists, like Sam Harris and Richard Dawkins; he elaborates:

> "The universe that people like Dawkins and Harris inhabit is so intensely preconditions by mythological presuppositions that they take for granted the ethic that emerges out of that as if it's just a given, a rational given—and this is precisely Nietzsche's observation as well as Dostoyevsky's. The ethic that you think is normative is a consequence of its nesting inside this tremendously lengthy history, much of which was expressed in mythological formulation. If you wipe that out, you don't get to keep all the presuppositions and assume that they're rationally axiomatic. To make a rational argument, you have to start with an initial proposition. The proposition that underlies western culture is that there is a 'transcendent morality'. Now you can say that that's a transcendent morality substantiated in the finger of god, that's fine, you could even call that a personification of the morality, if you don't want to move into a metaphysical space. I'm not arguing for the existence of god, I'm arguing that the ethic that drives our culture is predicated on the idea of god, and you can't just take that idea away and expect the thing to remain intact, midair, without any foundational support."

In May 2017, Jordan, in a Rubin Report interview (Q), was pulling the above "stock argument" in his attack on Sam Harris and his atheism entourage as follows:

> "You can be a non-believer in your surface rationality, but you can't be a non-believer in your actions, you see, because Harris' metaphysics is fundamentally Christian. So he acts out a Christian metaphysics, while at the same time saying 'I don't believe it'. Yes, you do, because you're acting it out. You just say you don't believe it, but he's acting it out, e.g. he doesn't rob banks, he doesn't kill people, he doesn't rape. This addressed in Dostoyevsky's *Crime and Punishment*."

Here we see Peterson, again, attempting to scapegoat on the Dostoyevsky dilemma.

Religio-mythology

See main: God character equivalences

Peterson, in his *Maps of Meaning* (1999) devotes some eight pages to Osiris and Isis (of Egyptian mythology), connecting this to Marduk and Tiamat (of Babylonian mythology), and Isis to Mary (of Christianity). [1]

Controversy | Gender pronoun

In 2016, Peterson gained notoriety when he released a series of videos publicly protesting Canada's Bill C-16 (Q), which aimed to make it a crime to use certain derogatory gender identity pronouns, in a discriminatory way; Peterson's subtle but powerful objection (Q) was that legally-enforced "political correctness" is a slippery slope to a Marxism-like government, and another 100 million dead (de-bound stated). The controversy that ensued resulted in the HR department of the University of Toronto threatening to terminate him, on one side, and him raising $200K funding on IndieGogo (by 2693 backers) and 56K per month (by 4,923 backers) on Patreon, on the other; thus acting to push him into online media celebrity status range in 2017.

IQ

In Jun 2017, Peterson, in his Patreon-funded (Q) Q&A video series (Q)(Q), stated, in response to the query "what is your IQ?", answered that he doesn't known what his IQ is, but that he did have it tested at one point, finding that it was "in excess of 150". In another interview (Q), he stated that a 160 IQ estimate for Donald Trump's IQ was "too high". Another time, he stated, in lecture, that IQ is set from birth and that you "cannot raise the IQ of a low IQ person" (Q). He obviously have never heard of the Stern experiment nor of "forced prodigies".

Education

Peterson completed his BA in political science in 1982, his BA in psychology in 1984, both at the University of Alberta, and his PhD in clinical psychology from McGill University. Since 1997, he has been a professor of psychology at the University of Toronto.

Quotes | By

The following are quotes by Peterson:

> "In order to be able to think, you have to risk being offensive. I mean, look at the conversation we're having right now. You're certainly willing to risk offending me in the pursuit of truth. Why should you have the right to do that?"
>
> — Jorden Peterson (2018), "Channel 4 Interview" (Q), response to Cathy Newman's query: "why should your freedom of speech, trump a trans-person's right not to be offended", Jan 17; cited as viral in later interview on the Bill Maher show

> "The god Horus – often regarded as the precursor to Christ, historically and conceptually speaking, experienced the same thing, when he confronted his evil uncle Set, which is the etymological precursor to Satan, usurper of the throne of Osiris, Horus' father."
>
> — Jordan Peterson (2018), 12 Rules for Life: an Antidote for Chaos (pg. 181)

References

1. Peterson, Jordan. (1999). *Maps of Meaning: The Architecture of Belief* (atheism, pgs. 6, 452, 448; Osiris, 8+ pgs; Tiamat, 10+ pgs). Publisher.

External links

- Jordan Peterson – Wikipedia.
- Home – JordanBPeterson.com.

θΔics

In existographies, **Jordanus Nemorarius** (c.1250-1310) (IQ:#|#), aka “Jordanus de Nemore”, was a French mathematician and physicist, noted for []

Related

In c.1545, Niccolo Tartaglia, in his booklet on the Nemorarius, was, supposedly, the first to state the idea of both “vertical pressure” and “lateral pressure” (see: mean girls model) in a liquid, e.g. at different depths. [1]

Quotes | On

The following are quotes on Nemorarius:

> “The thirteenth century author, possibly **Jordanus Nemorarius**, of *De Ratione Ponderis*, had thought of investigating the weight of an object resting upon an inclined plane. This idea the Netherlander Simon Stevin developed in 1586 into the ‘parallelogram of forces’, demonstrating that three forces in equilibrium at a point can represent both in magnitude and in direction by the sides of a triangle.”
>
> — Richard Kirby (1956), *Engineering in History* [2]

References

1. (a) Tartaglia, Niccolo. (c.1545). *Jordanus: a Small Treatise: Correction Study with New Growth Figures* (*Iordani: Opusculum de ponderositate, Nicolai Tartaleae studio correctum novisque figuris auctum*) (abs). Publisher, 1565.
(b) Middleton, William E. (1964). *The History of the Barometer* (pg. 5). Publisher.
2. Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 127). Courier, 1990.

External links

â— Jordanus de Nemore – Wikipedia.

θΔics

In existographies, **Jorge Borges** (1899-1986) (IQ:170|#430) [RGM:491|1,500+] (Gottlieb 1000:483) (CR:2) was an Argentine short story writer, essayist, poet, and translator, noted for []

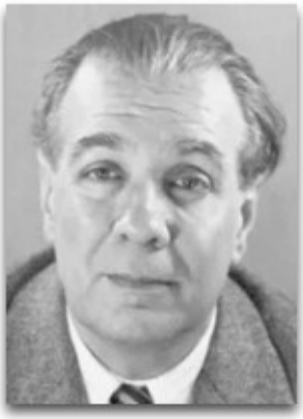

Overview

Borges used Georg Cantor's theory of infinite sets in some (Q) of his literary works; despised Marxism and characterized himself as a "Spencerian anarchist."

Quotes | By

The following are quotes by Borges:

> "Khayyam is an atheist, but knows how to interpret in orthodox style the most difficult passages of the Koran; for every educated man is a theologian and faith is not a requisite."
>
> — Jorge Borges (c.1960), *Selected Non-Fictions* [1]

> "I have always imagined that paradise will be a kind of library."
>
> — Jorge Borges (c.1960), *Publication* (compare: Boris Sidis, 1874)

References

1. Borges, Jorge. (c.1950). *Selected Non-Fictions* (Q). Publisher, 1999.

External links

- George Luis Borges – Wikipedia.

θΔics

In hmolscience, **Jose Miguel Aguilera** (1947-) is Chilean chemical engineer, specializing in food technology, noted for []

Overview

In 2012, Aguilera, in his chapter subsection "Molecular Sociology", of his book *Edible Structures: the Basic Science of What We Eat*, wherein he touched on the subject of molecular sociology, as introduced by French supramolecular chemist Jean-Marie Lehn, and also of human chemistry in general, which Aguilera introduces as follows: [1]

> "Human chemistry analyzes the 'reactions' [see: human chemical reaction] that form and break the bonds [see: human chemical bond] between people [see: human molecule] and the social structures that derive from those relationships."

Aguilear, *via* citation footnote to American electrochemical engineer Libb Thims' 2007 *Human Chemistry* textbook, correctly traces the subject of human chemistry historically back to the work of German polymath Johann Goethe. [2]

Aguilera, in his six-page molecular sociology chapter subsection, gives six types of Empedocles-style human-to-chemicals comparisons, aphorism, or analogies, depending, ranging from: speculations on how a marriage is like a weaker type of covalent bond and or Van der Waals interaction force [see: Muller dispersion force], how uncharged molecules clustering together in a charged environment are like people discriminated against joining together, how enzymes can can break up and or catalyze the formation of bond between big molecules, like matchmakers, or about how there may be some type of "activity coefficient", similar to the water activity a_w, which quantifies the layers of water moisture around dry foods, that may quantify the way in which people are attracted to "high energy surfaces" (see: surface chemistry), among other comparisons.

Education

Aguilera completed his BS in chemical engineering in 1971 at Pontificia Universidad Católica de Chile (PUC), his MS in 1973 at MIT and PhD in 1976 at Cornell University, both with specialization in food technology, and an MBA from Texas A&M University in 1983. He has been the Head of the Department of Chemical and Bioprocess Engineering at PUC, Associate Dean for Development and the Director of Research and Postgraduate Studies in the School of Engineering. Since 1986, he has been a visiting professor at the University of California at Davis, Cornell University, and Technical University Munich, a technical consultant for the FAO, and a scientific advisor for the Nestlé Research Center in Switzerland, for more than 12 years. In 2010 was first Chilean to become a foreign associate member of the U.S. National Academy of Engineering, for his contributions to the understanding of the role of food structures and their properties.

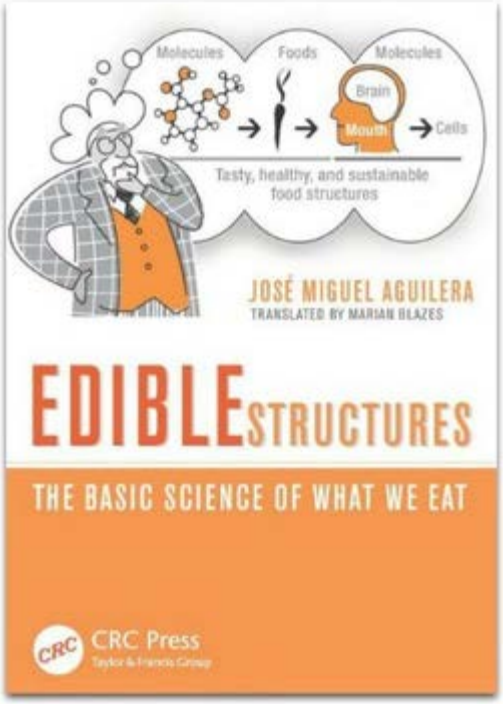

Aguilera's 2012 *Edible Structures* has a six-page section on Thims-Goethe based "molecular sociology". [1]

References

1. Aguilera, Jose M. (2012). *Edible Structures: the Basic Science of What We Eat* (translator: Marian Blazes) (§:Molecular Sociology, pgs. 59-63; "human chemistry", pg. 59; Thims, note 2, pg. 102). CRC Press.
2. (a) ibid, chapter 2, note 2, pg. 102.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(c) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.

External links

â— Jose Miguel Aguilera Radic (Spanish → English) – Pontificia Universidad Católica de Chile.
â— Jose Miguel Aguilera – CRC Press.

In philosophy, **Jose Ortega y Gasset** (1883-1955), commonly referred to as "Ortega" (paternal name), or "Ortega y Gasset" (paternal and maternal names), per Spanish naming customs, was a Spanish philosopher noted for some type of realist historicism, based on a mixture of perspectivism, pragmatism, vitalism, and existentialism.

Social newton?

Ortega, curiously, is listed in Johan Hendrik Jacob Van Der Pot's seeming 1985 social Newton listing, between Vilfredo Pareto and Bertrand Russell. [4]

Goethe

In 1932, on the centenary of Goethe's dereaction (death), Ortega published an essay entitled "Man's Vocation: In Search of Goethe from Within", themed of Eros, wherein the term 'vocation' is Ortega's synonym for Greek 'destiny.' [1]

Related

Thematically, Gasset, according to 2014 GS data, is similar, in some way, to the work and writings of the following individuals, namely: Miguel de Unamuno, Friedrich Nietzsche, Martin Heidegger, Juan Jimenez, and Jean-Paul Sartre, among other. (Q)

Quotes | On

The following are quotes on Ortega:

> "For **Ortega**, Goethe was the first romantic, the inventor of lyricism, and the first man to perceive clearly the value of life in itself. ... song is the singer's best reward to support his theory that all vital processes begin in the superfluous and free energy of play or sport (II, p. ... Hence his strange, post-juvenile almost love affairs."
>
> — Author (1988), "Essay" (Q)

Quotes | By

The following are quotes by Ortega:

> "Love is gravitation toward a beautiful object."
>
> — Ortega y Gasset (c.1920) [2]

> "'Falling in love' is an inferior state of mind, a form of imbecility."
>
> — Ortega y Gasset (c.1940), *On Love* [3]

> "Polybius is one of the few great minds that the turbid human species has managed to produce. Damage to his *Histories* is without question one of the gravest losses that we have suffered in our Greco-Roman heritage."
>
> — Jose Ortega (c.1940), *Meditations On Hunting*

References

1. (a) Gasset, Ortega. (date). “In Search of Goethe from Within”, in: *The Dehumanization of Art and Other Essays on Art, Culture, and Literature* (translator: Willard R. Trask, 1949) (pgs. 133-70). Princeton University Press, 1968.
(b) Norton, David L. and Kille, Mary F. (1971). *Philosophies of Love* (pgs. 110-). Rowman & Littlefield, 1983.
2. Solomon, Robert C. (1981). *Love: Emotion, Myth, & Metaphor* (gravitation, pg. 6). Prometheus Books, 1990.
3. (a) Ortega y Gasset, Jose. (date). *On Love: Aspects of a Single Theme* (translator: Toby Talbot) (abs). Meridian books, 1957.
(b) Singer, Irving. (1958). “Ortega on Love” (abs), *The Hudson Review*, 11(1):145-54.
(c) Solomon, Robert C. (1981). *Love: Emotion, Myth, & Metaphor* (falling in love, pg. 35). Prometheus Books, 1990.
4. (a) Van der Pot, Johan H.J. (1985). *Die Bewertung des Technischen Fortschritts: Eine Systematische Ubërsicht der Theorien* (volume 1). Uitgeverij Van Gorcum.
(b) Van der Pot, Johan H.J. (1985). *Die Bewertung des Technischen Fortschritts: Eine Systematische Ubërsicht der Theorien* (volume 2). Uitgeverij Van Gorcum. (c) Van der Pot, Johan H.J. (1999). *Sinndeutung und Periodisierung der Geschichte: eine Systematische Ubërsicht der Theorien und Auffassungen* (*Of Meaning and Periodization of History: a Systematic Overview at Theories and Concepts*) (pg. 959). Brill. (d) Van der Pot, Johan H.J. (2004). *Encyclopedia of Technological Progress: a Systematic Overview of Theories and Opinions, 2nd Edition* (2-volumes) (O) Eburon. (e) Note: found via keys: “Goethe, Henry Adams, Pareto” GB search (O).

External links

- Jose Ortega y Gasset – Wikipedia.

θΔics

In hmolscience, **Jose Pacheco** (c.1947-), or "José Miguel Pacheco Castelao", is a Spanish applied mathematician noted for his 2008 “Does More Abstraction Imply Better Understanding”, in which he touches on the social mechanics work of Antonio Portuondo, Eduard Sacher, and Rudolf Clausius. [1]

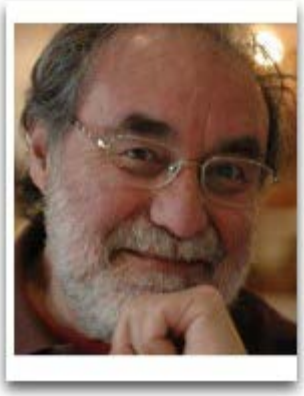

Overview

In 2008, Pacheco, in his “Does More Abstraction Imply Better Understanding: *Ampuntes de Mecanica Social* by Antonio Porunondo”, discusses the works of: Thomas Hobbes, Jonathan Swift, Adolphe Quetelet, Auguste Comte, among others, then discusses the influence of Ernst Mach in regards to the mathematical and physical content of Portuondo’s 1912 *Notes on Social Mechanics*, and also compares the work of Portuondo to that of Spiru Haret.

Education

Pacheco completed his BS in mathematical sciences in 1969 at the University of Madrid, and his PhD in 1983 at the University of Complutense of Madrid. In 2008, Pacheco was associated with the Max Planck Institute for the History of Science. Currently, Pacheco is a tenured professor of applied mathematics and head of the department of mathematics at the University of Las Palmas de Gran Canaria, Spain.

Quotes | Cited

The following are quotes cited and or employed by Pacheco:

> “Political and moral methods should be based on observation and calculation, which has served us so well in the natural sciences.”
>
> — Pierre Laplace (1820), *Analytical Probability Theory* (Q)

References

1. (a) Pacheco, Jose M. (2008). “Does More Abstraction Imply Better Understanding: *Ampuntes de Mecanica Social* by Antonio Porunondo). Max Planck Institute for the History of Science, *Preprint 351*.
(b) Clausius, Rudolf. (1885). *Über die* Energievorräthe der Natur *und ihre Verwerthung zun Nutzen der Menschheit (On the Energy Supplies of Nature and the Utilization of them for the Benefit of Mankind*). Bonn: Verlag von Max Cohen & Sohn.
2. Jose-Miguel Pacheco (curriculum vitae) (Spanish → English) – DMA.ULPGC.es.

Further reading

● Pacheco, Jose M. (2010). “Portuondo y la matematización de la Sociología” (pdf) (“Portuondo and the Mathematization of Sociology”), Fundación Orotava de Historia de la Ciencia, La Orotava (Tenerife), Feb.

External links

● Pacheco Castelao, Jose Miguel – WorldCat Identities.
● Jose Pacheco (faculty) – University of Las Palmas de Gran Canaria.

θΔics

In human thermodynamics, **Jose-Manuel Rey** (c. 1975-) is a Spanish mathematical economist noted for his 2010 article "A Mathematical Model of Sentimental Dynamics Accounting for Marital Dissolution", in which he argues using equations, formulation, and graphs that the process of marriage and relationship dissolution is based on the second law of thermodynamics. [1]

Overview

In 2010, Rey, in his "A Mathematical Model of Sentimental Dynamics Accounting for Marital Dissolution", builds on the work of John Gottman, to outline a metaphorical second law of thermodynamics based model for human relationships; the following being an example quote: [2]

> "[The] second law of thermodynamics for sentimental relationships [states that] there is a tendency for the initial feeling for one another to fade away. This kind of inertia must be counteracted by conscious practices."

Rey comments on his paper that: "that there is no real use of thermodynamics. The second law is mentioned only as a metaphor to indicate that the feeling of attachment in a relationship 'cools down' as as time evolves—unless energy in form of effort is supplied to keep things alive. Moreover, that formulation was originally proposed by John Gottman. I just used it as an ingredient in the model, which is in fact an optimal control model with no role of entropy." Nevertheless, the use of analogy is often a stepping stone along the path to future hard science.

Education

Rey obtained his PhD in mathematics in Madrid after which he spent a postdoctoral year at St. Andrews University and the University of College London. [3] Rey currently is an associate professor in the department of economic analysis of the Complutense University of Madrid.

References

1. (a) Edwards, Lin. (2010). "Mathematical Model Explains Marital Breakups", May 17, PHysOrg.com.
(b) Hamaker, Paul. (2010). "Relationships are Based on the Second Law of Thermodynamics", *Birmingham Science News Examiner*, Apr 02.
2. Rey, Jose-Manuel. (2010). "A Mathematical Model of Sentimental Dynamics Accounting for Marital Dissolution", PLoS One 5(3). Mar 31.
3. Rey, Jose-Manuel. (2008). "If We All Go for the Blonde", Jun, Plus Magazine: Living Mathematics.
4. Email communicate from Rey to Libb Thims (18 May 2010).

External links

â— Mathematical model explains marital breakups (twitter reactions) – Science Blibs.

θΔics

In human thermodynamics, **Josef Ludvik Fischer** (1894-1973) was a Czech philosopher and sociologist who at one point had worked hard to develop a fourth law of thermodynamics. [1]

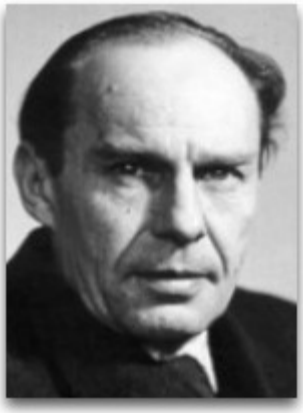

Education

In 1935, Fischer was appointed associate professor of sociology and philosophy at Masaryk University in Brno. In the period 1939-1945, he was in exile in Holland. After his return, he actively participated in the recovery of Czech universities, was Dean of the Faculty of Philosophy in Brno from 1945 to 1946, Rector of Palacky University in Olomouc, 1946-1949, Rector 1949-1950. Co-founded and edited the magazine Index and Sociological Review. He has worked at leading domestic and foreign scientific societies, published a series of books, journals works of philosophy, sociology, political science, cultural theory, cultural politics and literature. [2] Fischer, notably, was mentor to Vaclav Havel in circa 1953.

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External links

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θΔics

In thermodynamics, **Josef Loschmidt** (1821-1895) was an Austrian physical chemist notable for being a mentor to Ludwig Boltzmann, at the Vienna school of thermodynamics, and for having pointed out, in 1876, the reversibility paradox, otherwise known as Loschmidt's paradox, between reversible classical dynamics and irreversible thermodynamics; thus prompting Boltzmann to write his 1877 article "On the Relation of a General Mechanical Theorem to the Second Law of Thermodynamics" in efforts to reconcile the issue. [1] Loschmidt is also noted for being the first to draw double and triple bonds in molecules, as found in his 1861 book *Chemische Studien (Chemical Studies)*. [2]

Education

Loschmidt became professor of physical chemistry at the Vienna University in 1868.

Size of air molecules

Loschmidt was the first to calculate the size of air molecules as one millionth of a millimeter, as described in his 1865 article "On the Size of Air Molecules", using the kinetic theory of gases. [5]

Double and triple bonds

See main: History of chemical bonding theory

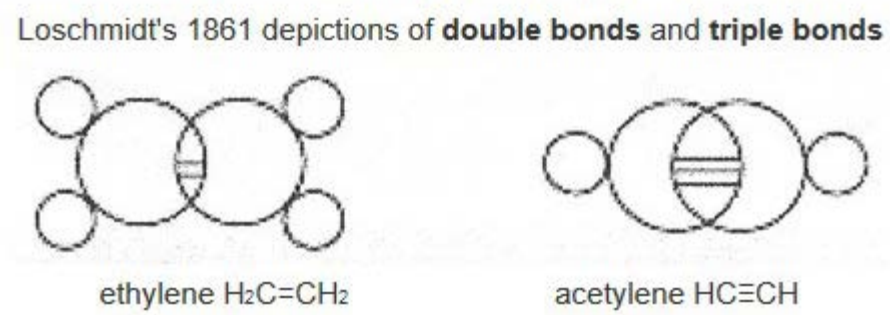

In 1861, during his studies of chemical structure, Loschmidt originated the use of double lines and triple lines to represent double bonds and triple bonds, respectively, in molecules. [4] The following are Loschmidt's 1861 molecular drawings of ethylene $H_2C{=}CH_2$ and acetylene HC≡CH, the first depictions of double bonds and triple bonds, a step away from the olden-days hooked atom theory of bonding.

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θΔics

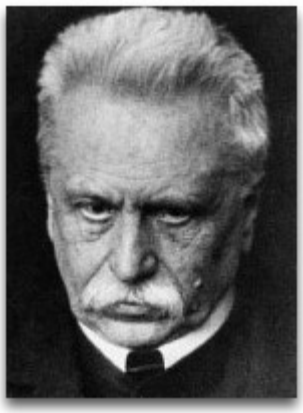

In thermodynamics, **Josef Popper** (1838-1921), or Lynkeus (pseudonym), was an Austrian physicist, engineer, and social theorist noted for his unsuccessfully attempts to promote a biophysical view of the economy as a subsystem embedded in a larger system subject to the laws of thermodynamics. [1] Popper, supposedly, wrote on the history of thermodynamics wherein he insisted on strict separation of scientific propositions and metaphysical propositions, complaining in 1876 about William Thomson's religious tirades based on the second law. [2] Popper was an associate of Ernst Mach.

Education

Popper studied mathematics, physics, and technology at the Polytechnic in Prague and economics, cultural history, and aesthetics at Vienna University, but was largely excluded from academia because he was a Jewish, a group virtually excluded from public service in Austria and Germany, due to State and Church regulation.

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θΔics

In hmolscience, **Josef Schnippenkotter** (1886-c.1955) was a German science philosopher noted, in religious thermodynamics, for his 1920 historical work on entropological proofs of god's existence.

Overview

In 1920, Schnippenkotter, in his *The Entropological Proof of God*, his 109-page PhD dissertation, discussed the so-called 'entropy proof of God's existence' citing over 320 papers (200 of which, supposedly, on entropy and god speculations) to draw the conclusion that entropy does not necessarily imply the existence of a deity. [1] He concludes: [3]

> "There is no scientifically certain proof that the end and the beginning of the world, and then the existence of God, can be derived from the entropy law."

Schnippenkotter was said to have based much of his argument on the earlier work of German physicist Caspar Isenkrahe, an active participant in the debate over entropy and theology.

Education

Schnippenkotter studied philosophy, physics, and mathematics in Munich and Gottingen and has been described by Helge Kragh as "Jesuit physics teacher". [3]

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External links

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θΔics

In thermodynamics, **Josef Stefan** (1835-1893) was an Austrian physicist of the Vienna school of thermodynamics, a founder of radiation thermodynamics, notable for being a mentor to Austrian physicist Ludwig Boltzmann and for his 1879 Stefan-Boltzmann law.

Boltzmann

At some point in the early 1860s, Stefan famously gave Boltzmann, then an undergraduate (or new graduate student) at the University of Vienna, copies of James Maxwell's papers and an English grammar, and told him he would do well to study these ideas. [1] The paper he likely gave Boltzmann was Maxwell's 1860 paper "On the Dynamical Theory of Gases", showing how, through kinetic theory, to obtain physical properties of gases from the underlying distribution of velocities, which was thus an elaboration of Clausius' 1857 theory, taking into account not simply the average speed of the atoms, but their distribution of speeds greater or smaller than the average. [2] Boltzmann later recalled that, at the time, he knew no English, but armed with Stefan's grammar and a dictionary his father had given him, that he succeeded in familiarizing himself with Maxwell's new theory.

In 1868, Boltzmann published a more convincing physical explanation for the formula Maxwell had derived, resulting in the now-famous Maxwell-Boltzmann distribrution. Boltzmann is said to have did this by analyzing what would happen to a volume of gas rising in the Earth's gravitational field, meaning that pressure would decrease (or volume would increase) with height, according to which Boltzmann showed that Maxwell's formula correctly predicted how the number of atoms or molecules with a particular energy would change. [1] Boltzmann followed this up with his 1872 derivation of his minimum theorem, later to be called an H-theorem, a function that quantified an approached to equilibrium at which point the Maxwell distribution of velocities would exist and that the negative value of this function, i.e. -*H*, was said to be a representative measure of the entropy of the gas.

Education

Stefan was born to illiterate Slovenian peasants, but quickly rose through the education ladders. Stefan studied mathematics and physics at the University of Vienna, graduating in 1857. He became a physics lecturer the following year, at the age of 23.

Vienna school

Stefan was the anchor point of the Vienna school of thermodynamics. He began running the physics department at the University of Vienna in 1862, becoming the director in 1866 remaining there until his death in 1893. Stefan gave Josef Loschmidt a junior level teaching position in 1868.

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External links

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θΔics

In names, **Joseph** (CR:168), from Hebrew *Jo-* "god" + *-Seb* (or *-Geb*) "Egyptian earth god", يوسف or Yūsuf in Arabic (Quran), refers to the Biblical character, stylized as the husband of Mary and step-father of Jesus, who is based on the Egyptian earth god Geb, of Heliopolis creation myth.

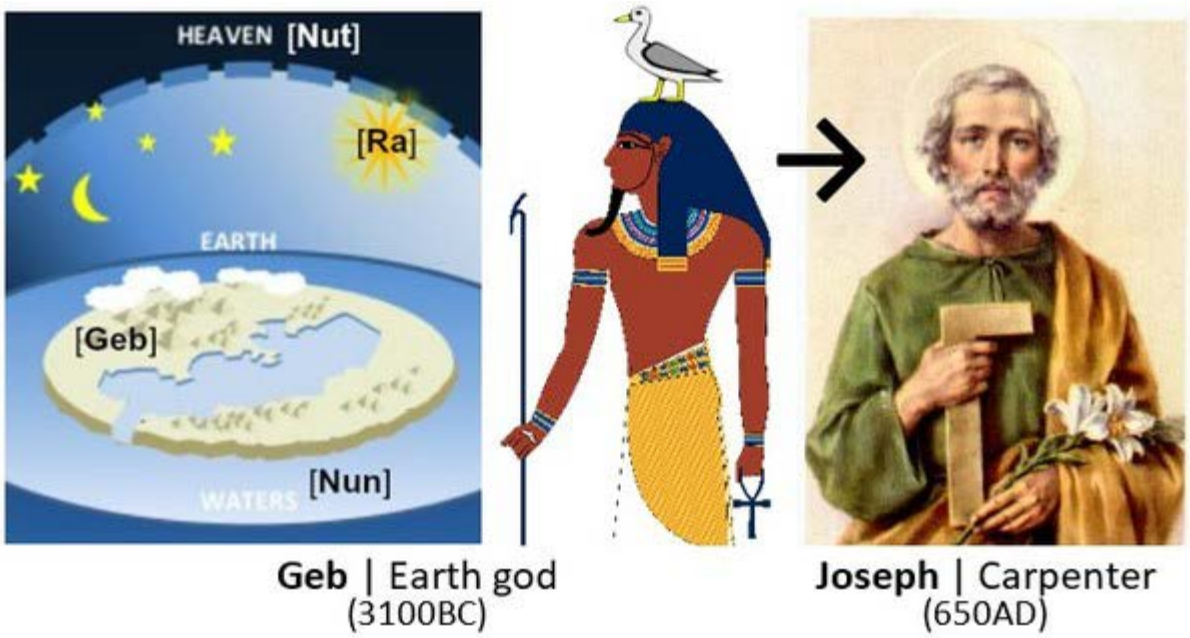

A visual of how the Egypt god Geb, of Heliopolis creation myth (3100BC), was monotheistically morphed over the years into the character of the man **Joseph**, a carpenter, who becomes the step-father of the man-god Jesus born to a virgin named Mary, the baby Jesus (baby sun) being born in the house of Joseph (house of Geb) on Dec 25th.

Imhotep | Seven-year flood

In c.2675BC, a seven-year floodless period in Egypt had occurred, as documented by several ancient manuscripts, during which time pharaoh Djoser (Zoser) consulted engineer Imhotep, after which the famous Step Pyramids were built.

In 1982, Isaac Asimov speculated that this seven-year Djoser period Nile River flood drought might have something to do with the Hebrew mythology rendition of the legends of Joseph and his seven year drought. [1]

Geb | Joseph

In c.300AD, the Egyptian model of god Osiris begin son of god Geb was rewritten into the story of man-god Jesus being adopted son of Joseph.

The following is a noted passage in respect to the resurrection of Jesus:

> "And when **Joseph** [Geb] had taken the body [of Jesus] [of Osiris], he wrapped it in a clean linen cloth, And laid it in his own new tomb, which he had hewn out in the rock: and he rolled a great stone to the door of the sepulchre, and departed. And there was Mary Magdalene [Nephthys], and the other **Mary** [Isis]**,** sitting over against the sepulchre."
>
> — Anon (c.300AD), *Bible* (Matthew 27:59-61)

In c.650AD, the *History of Joseph the Carpenter* was published, grouped under New Testament apocrypha (Q), which filled in a fictional account of the events of the Jesus before he was age 12, depicting Joseph as being a carpenter and Mary as being a virgin. [2]

In 1883, Gerald Massey, in *The Natural Genesis*, quoting Burch (§:xlviii), summarized the Joseph equals Geb (or Seb) connection as follows: [3]

> "When Osiris the savior comes down to earth as the child Horus to cross it 'as a substitute', he exclaims:

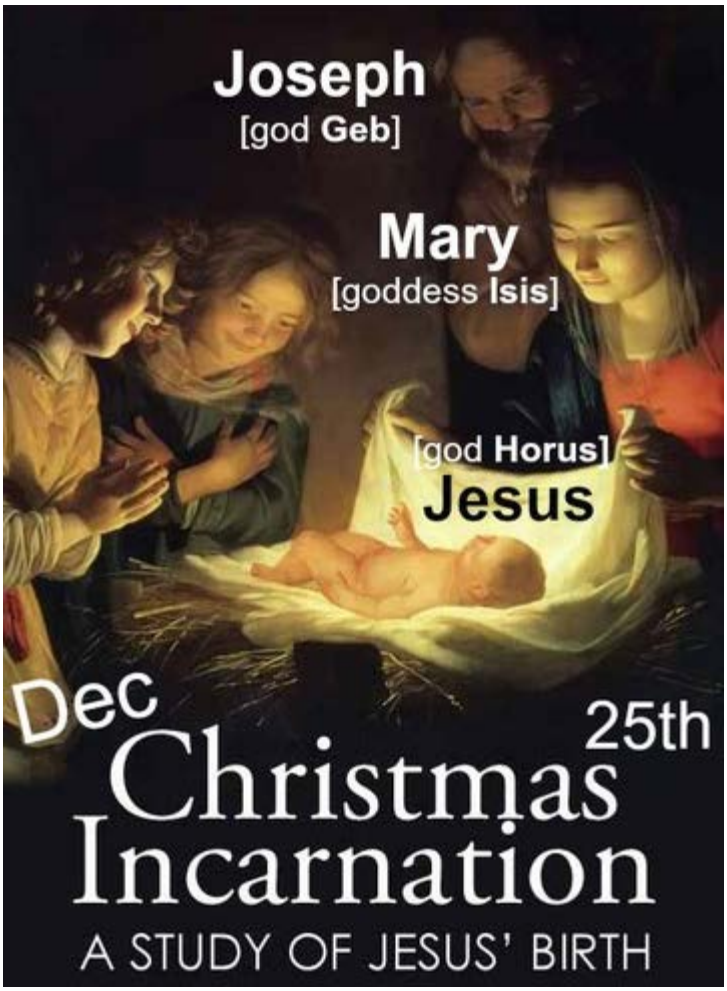

The re-labeled (O) diagram showing how the Egyptian model of the baby son (Ra-Khepra) is reborn, on Dec 25th, or when the new Osiris corn figure is made, in Dec 23 to Jan 2 of Koiak festival (see: Christmas tree), after which Horus is conceived, being born out of the earth (or earth god Geb), was rewritten via god reduction into the story of the baby Jesus (grandson of Geb) being born in the house of **Joseph** (god Geb).

‘The gates of earth open to me. **Seb** [Geb] has opened the bolts, he has opened the chief or lower abode wide. The Osiris comes. He prevails over his heart, he prevails over his hand, he prevails over the meals, he prevails over the waters, he prevails over the streams, he prevails over the pools, he prevails over everything done against him in hades, he prevails over what he has been ordered to do on earth. The Osiris is born like, or as, a ‘word’. He lives. — then it is of the bread of Seb.’

Half the history of the Christ on earth is contained in this passage. He comes to earth as a substitute. He is born as the word. He is the great prevailer over the waters as the worker of miracles. He also prevails over the meals by working three different miracles, and is very possibly born into the house of Seb, represented by god in time or Kronus in person, he is the divine father on earth of the Messiah-son who manifests in time. Thus, Seb is the father of Osiris or Horus on earth. “My father is Seb, my mother is Nu [Nut], I am Horus’, i.e. as son of earth and heaven. When on earth, he is in the dwelling of Seb. He says, ‘My bread on earth (is) that of Seb.’ In the same way, house and food for the Christ are found by Joseph.

Now the iconography of the catacombs continually furnishes a bridge from Egypt to Rome, by which we can pass over independently of the alleged history. In certain sculptures of the ‘first ages of Christianity’, the Christ or Horus is depicted, without a nimbus, and with his feet resting on a scarf that is upheld by a naked female, who is identified by Didron and others as a personification of earth. But, in other sculptures the supporter of the youthful Christ is an aged man with a beard, who undoubtedly represents the earth-god Seb. In each case the head and shoulders only of the figure are shown; and the earth was called the “back of Seb.” Seb's back sometimes opened female-fashion, as the bringer-forth on earth and in time, hence Seb was a mother as well as the father. Seb is the opener of the earth for the solar god. The consort of Seb is the mother heaven, named Nu [Nut]; but Meri is also an Egyptian name for heaven as well as of the genitrix. Thus, Seb and Meri (Nu) [Nut] for earth and heaven would afford two mythic originals for **Joseph** and Mary as parents of the divine child.”

In 2004, Dorothy Murdock, in her *Sons of Gods*, building on Massey, summarized the Joseph equals Geb connection as follows: [3]

“In the same hymn above, Osiris's ‘sister’ Isis is described in lunar terms, and Isis and Osiris's child, Horus, is said to have ‘waxed strong in the house of Seb.’ Seb is Osiris's earthly ‘father’; yet, it is clear that Horus — who is not only the son but also the father of Osiris, who is thus the ‘father and son of Horus’ — is

likewise a ‘son of Seb’ in the same way that Jesus is the ‘son of David’. Seb is also known as ‘Geb’, and ‘Horus the Elder ... was believed to be the son of Geb and Nut.’ In addition, Seb is ‘lo-sef’, or **Joseph**; hence, like Jesus, Horus is the ‘son of Joseph’.”

(add)

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4. Murdock, Dorothy M (aka Acharya S). (2004). *Sons of God: Krishna, Buddha and Christ Unveiled* (pg. 91). Adventures Unlimited.

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θΔics

In existographies, **Joseph Addison** (1672-1719) (IQ:165|#481) (Cattell 1000:71) was an English essayist, poet, playwright, politician, and philosopher, noted for []

Overview

Addison was associated with Richard Steele and their magazine *The Tatler*.

Quotes | On

The following are quotes on Johnson:

> "It was in the eighteenth century that the conception of the universe as a 'chain of being', the principles which underlay this conception – plenitude, continuity, gradation – attained their widest diffusion and acceptance. The faith in speculative *a priori* metaphysics was waning, and the Baconian temper (if not precisely the Baconian procedure), the spirit of patient empirical inquiry, continued its triumphant march in science, and was an object of fervent enthusiasm among a large part of the general educated public. There has been no period in which writers of all sorts — men of science and philosophers, poets and popular essayists, deists and orthodox divines — talked so much about the 'chain of being', or accepted more implicitly the general scheme of ideas connected with it, or more boldly drew from these their latent implications, or apparent implications. **Addison**, King, Bolingbroke, Pope, Haller, Thomson, Akenside, Buffon, Bonnet, Goldsmith, Diderot, Kant, Lambert, Herder, Schiller — all these and a host of lesser writers not only expatiated upon the theme but drew from it new, or previously evaded, consequences; while Voltaire and Samuel Johnson, a strange pair of companions in arms, led an attack upon the whole conception. Next to the word 'nature', the 'great chain of being' was the sacred phrase of the eighteenth century, playing a part somewhat analogous to that of the blessed word 'evolution' in the late nineteenth."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pgs. 183-84) [2]

Quotes | By

The following are quotes by Addison

> "The whole chasm in nature, from a plant to a man, is filled up with diverse kinds of creatures, rising one over another by such a gentle and easy ascent, that the little transitions and deviations from one species to another, are almost insensible. This intermediate space is so well husbanded and managed, that there is scarce a degree of perception which does not appear in some part of the world of life."
>
> — Joseph Addison (1712), *The Spectator* (No. 519) (per citation to John Locke) [1]

References

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External links

â— Joseph Addison – Wikipedia.

θΔics

In existographies, **Joseph Atwill** (c.1950-) (RMS:143) (CR:7) is a Japanese-born English religio-mythology scholar noted for his 2006 to present work on Christ myth theory, in the period of the so-called first Roman redaction (see: recension theory).

Overview

In 1995, Atwill, after "selling his shares", in the software industry (his profession), and "exiting the industry", there, supposedly, becoming stably self-funded, he engaged into Bible studies, something he had studied, in youth, before college. [2]

In 2005, Atwill, in his *Caesar's Messiah: the Roman Conspiracy to Invent Jesus*, attempted to argue the following:

> "The Christian Gospels were actually written under the direction of first-century Roman emperors. The purpose of these texts was to establish a peaceful Jewish sect to counterbalance the militaristic Jewish forces that had just been defeated by the Roman Emperor Titus in 70 AD."

Atwill, in short, argued that the modern first recension version of the Jesus figure (see: Christ myth theory; Christ fable) was invented by the Caesars or Flavian dynasty (69-96AD). (Ñº)

The gist of Atwill's argument, in more detail, is that the Flavian Caesars had their court historian Josephus (Ñº) pen "gospels", i.e. war victory summaries, patterned on the "messiah" figures of the Old Testament, to the affect that the Caesars were the new Messiah, as prophesied by the Jews, therein quelling or pacifying the growing Jewish uprisings in the new Roman empire.

Documentary

In 2012, Atwill was the team leader of the documentary film *Caesar's Messiah Documentary: the Roman Conspiracy to Invent Jesus*, which featured the following Christ myth theory scholars: Robert Eisenman, Timothy Freke, Dorothy Murdock, Rod Blackhisrst, Kenneth Humphreys, and John Hudson. [3]

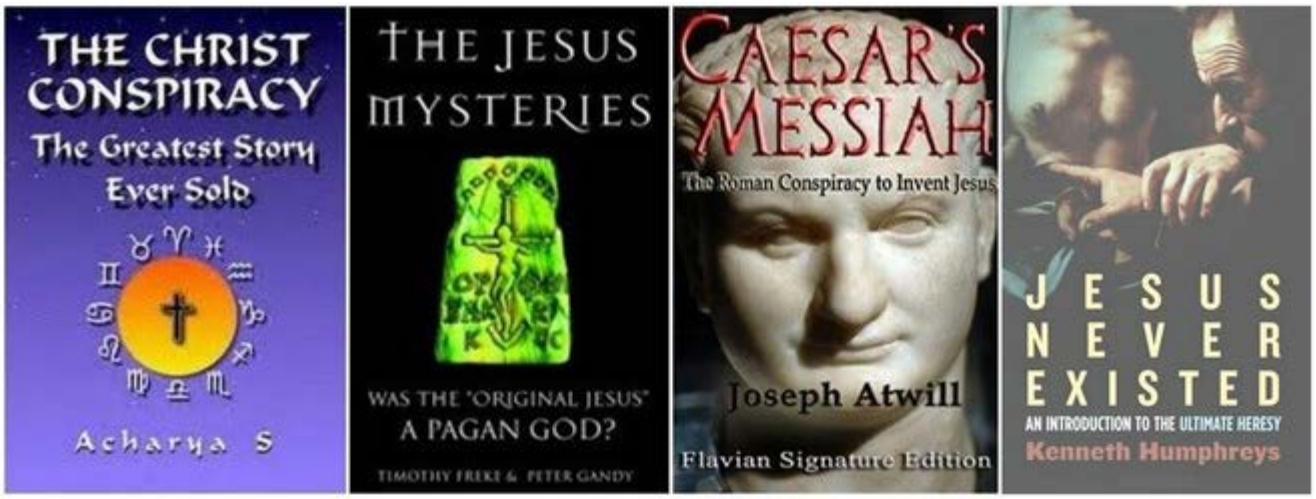

Dorothy Murdock's *The Christ Conspiracy* (1999), Timothy Freke's *The Jesus Mysteries* (1999), **Joseph Atwill's** *Caesar's Messiah* (2006), and Kenneth Humphreys' *Jesus Never Existed* (2005), the four main books behind Atwill's 2012 documentary film on the so-called "Flavian Jesus hypothesis".

> "The truth is that Christianity grew from neither a god nor a man, but out of what had gone before. A 'human Jesus' was no more necessary than was a human Horus, a human Dionysus, or a human Mithras."
>
> — Kenneth Humphreys (2005), *Jesus Never Existed* (pg. 21)

Atwill's documentary was a akin to Peter Joseph's 2006 viral film *Zeitgeist*

Education

In youth, Atwill studied Greek, Latin and the Bible at St. Mary's Military Academy, a Jesuit-run school in Japan. In college, he studied computer science. [2]

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Further reading

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External links

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θΔics

In existographies, **Joseph Black** (1728-1799) (IQ:180|#171) (Murray 4000:9|C) (Partington 50:13) (GCE:14) [CR:76] was a Scottish physicist and chemist notable for his scientific investigations into the nature of heat, for being a mentor and financier to Scottish mechanical engineer James Watt, and for his discovery of the phenomenon of "latent heat", calculations of which were later used by French chemist Antoine Lavoisier and Pierre Laplace in their 1782 invention the "ice calorimeter", which was used to determine the heat evolved in various chemical reactions.

Cullen

Black's mentor was Scottish physician and chemist William Cullen, notable for being the first, in 1757, to make diagrams of affinity reactions in chemistry. Through this interaction, both Cullen and Black arrived at the view that heat may have a significant effect on affinities. [1]

Whiskey distilling

Black was said to have been led into his studies on the levels of heat stored in vapor in an investigative effort to find ways to reduce the local scotch whiskey distiller's rising fuel costs, amid rising shortages of wood.

Black measured how much energy [fuel?] it took to melt a pan of frozen water, and then how much more it took to boil water away. From these experiments, Black was able to show the distillers the minimum amount of wood they needed to burn in order to evaporate a given quantity of whiskey mash, and then how much cold water it would take to condense the whiskey out of the steam. [8]

This research, supposedly, is what gave James Watt the idea of inventing the separate condenser. [8]

Heat

In 1761, in his studies of the melting of ice, Black noted that the temperature of a pail of ice-cold water placed in a warm room rose quite quickly, whereas, if the pail contained ice, the temperature remained constant for many hours while the ice melted. If, according to then dominate view, phlogiston, matter of fire, or caloric as it was latter called, flowed into the pail from the surroundings when it contained ice-cold water, it must also do so when it contained ice. Therefore, he argued, ice-cold water must contain more caloric than ice. [7]

Thus, by 1761, Black had deduced that the application of heat to ice does not cause its immediate liquefaction, but rather that for a period of time the ice absorbed the heat without a rise in temperature. [3] He designated this quantity of heat absorbed by the ice by the term "latent heat". [4]

Publicly, Black never stated any definitive ideas about the ultimate nature of heat, but privately, he later came favor the material theory of heat, commending William Cleghorn (1751-c.1800) (Q) and his 1779 idea of heat as subtle fluid composed of atomic particles, which repel one another, but are strongly attracted to the atoms of ordinary matter. [10]

In 1784, Black had adopted Antoine Lavoisier's caloric theories and was teaching them. [2]

Publications

Black famously only published the following five works in his lifetime: his MD thesis (in Latin), *De humore acido a cibis orto, et magnesia alba*, 1754; "Experiments upon magnesia alba, quicklime, and some other alcaline substances" in *Essays and Observations, Physical and Literary*, 1756; a letter to the president of the Royal Society on the subject of the effect of having boiled water on its freezing point was published in *Philosophical Transactions*, 1775; a letter on the temperature of mercurial congelation in *Philosophical Transactions*, 1783; and a paper on the analysis of some hot springs in Iceland published in *The Transactions of the Royal Society of Edinburgh*, 1794.

He was much irritated by the appearance of a pirated version of his lectures on the subject of heat which appeared anonymously as *An Enquiry into the General Effects of Heat*, 1770, as well as by a number of letters written by Black published by their recipients in his lifetime.

Lectures

A 1786 book titled *Lectures on Chemistry* was published, a collection of both his and his student's views of his lectures. [5] After his death his lectures were written out from his own notes, supplemented by those of some of his pupils, and published with a biographical preface by his friend and colleague, professor John Robison (1739-1805), in 1803, as *Lectures on the Elements of Chemistry*, delivered in the University of Edinburgh. [6] In his lectures on chemistry can be found one of the first statements of what is known as the zeroth law of thermodynamics, i.e. that heat tends to reach equilibrium among bodies.

Quotes | On

The following are quotes on Black:

> "**Joseph Black** was the preeminent man of science in the Scottish enlightenment."
>
> — David Wilson (2009), *Seeking Nature's Logic* [9]

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● Tait, Peter G. (1868). *Sketch of Thermodynamics* (gives extracts of Black's lectures on caloric theory). Kessinger Publisher .

External links

● Joseph Black – Wikipedia.

θΔics

In hmolscience, **Joseph Samuel Bois** (1892-1978) was a French-born Canadian-American Jesuit priest turned clinical psychologist noted, in human thermodynamics, for having, supposedly, introduced the entropy antonym term centropy as the central organizing energy effect of evolution, opposite to that of entropy. [1]

Overview

In the late 1930s, Bois read Polish-born American science philosopher Alfred Korzybski's 1933 *Science and Sanity* and was shaken by it. The foundation of his primary assumptions about our humanness was rocked, so he went and studied with Korzybski and became his most adventurous student. Korzybski had started the Institute of General Semantics (IGS), first in Chicago, and later in Lakeland, Connecticut. After he died, Bois became the heir apparent, and was the chief lecturer. Bois went on to develope his own work, epistemics, as a further elaboration of what Korzybski started, and as a new development that introduced factors which warranted calling it a new discipline. [3]

In 1996, Bois, in *The Art of Awareness*, for example, comments: [2]

> "They bring to a higher order of existence the energies that surround them; they form islands of order in the sea of entropy where the non-living world disintegrates into chaos. Man is the highest form of life, the most resourceful of ..."

Bois cites, among others, Ludwig Bertalanffy and Pierre Teilhard in his work, which is likely from where he gained his understanding of entropy.

Bois was a French Canadian Jesuit priest who was forced out of the Church in the 1920's for his radical, against-doctrine views; similar in theme to Pierre Teilhard. After Bois left the Church he completed a degree in psychology from McGill University in Canada.

It remains to be determined if in fact Bois actually used the term 'centropy', or if this is a secondary interpretation; although, according to Irving Simon, Bois coined the term. Bois, however, does discuss entropy in a number of his books.

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External links

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θΔics

In existographies, **Joseph Butler** (1692-1752), aka “Bishop Butler”, was an English theology apologist philosopher noted for his 1736 *Analogy of Religion: Natural and Revealed*, wherein he employs the term “living powers”, cited by Peter Tait and Balfour Stewart in their conservation of force speculations about death, among other religio-science blends. [1]

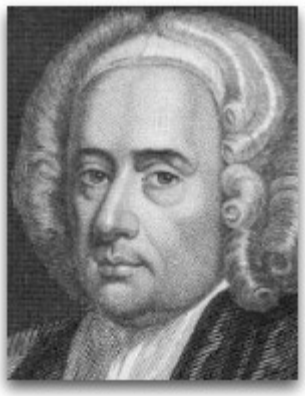

Living powers | Dead atoms

The following is an abstract of Butler's “living powers” based natural religion theory:

I. THE PLAN OF NATURAL RELIGION. Chaps. 1–5.

1. THAT MANKIND ARE APPOINTED TO LIVE IN A FUTURE STATE. Chap. 1.

I. It is a general law of nature, that the same creatures should exist in degrees of life and perception, in one period of their being, greatly different from those of another period. Why then may we not exist hereafter, in a state as different from the present, as this is from our former? (Pp. 91, 92.)

II. The possession of living powers now, is a presumption that they will exist hereafter, unless there is reason to believe that they will be destroyed by death. (Pp. 92–104.) But there is none. For there is no ground to believe death to be

(I.) Either the destruction of *living agents*. (Pp. 93–101.)

(II.) Or the destruction of their *present* powers of reflection. (Pp. 101, 102.)

(III.) Or even the *suspension* of the exercise of those powers. (Pp. 102–104.) And

(I.) There is no ground to believe death to be the destruction of *living agents:* either

1. From the reason of the thing;—for we know not what death is, but only some of its effects, nor what our living powers depend upon. (P. 94.)
2. Or from the analogy of nature;—for we cannot trace animals after death, and up to that time, the analogy is against the destruction of their living powers. (P. 94.)

This discussion of living powers (a power that is alive), wherein "power" is defined as force (moving an object) times distance (moved) per unit time, or energy (or work) per unit time in short:

$$P = \frac{E}{t}$$

naturally enough leads to further contentious speculations about incongruous terms such as "living force" or "living energy", and or more subtle terms such as "living work", the embodiment of the latter captured well in the existence defining query "what do yo do for a living"?, all of which are but religio-science neoplasms.

In 1874, in this sense, Irish physicist John Tyndall in his debated erupting Belfast BAAS *Address* (see: Tyndall-Stewart-Tait debate), invoked Butler as the antagonist in an imaginary debate with Lucretius on the issue of how all terrestrial things, or "living agents" as Butler phrased things, could have arisen from "dead atoms". [2]

Quotes | On

The following are quotes on Butler:

> "**Bishop Butler** dug up more snakes than he killed—suggested more difficulties than he explained—more doubts than he dispelled."
>
> — Robert Ingersoll (1896), "Why I Am an Agnostic" [3]

References

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(b) Stewart, Balfour and Tait, Peter G. (1875). *The Unseen Universe: or Physical Speculations on a Future State* (pgs. 4-5). Macmillan.
2. (a) Tyndall, John. (1874). "Address" (pg. 32), Delivered before the British Association assembled at Belfast. Longmans, Green, and Co.
(b) Burroughs, John. (1915). *The Breath of Life* (pg. 220). Publisher.
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External links

â— Joseph Butler – Wikipedia.

θΔics

In existographies, **Joseph Campbell** (1904-1987) (IQ:#|#) [RGM:1224|1,500+] (RMS:103) (CR:4) was an American literature professor, comparative religion and mythology scholar, popularly known as the world's most famous mythologist, noted for []

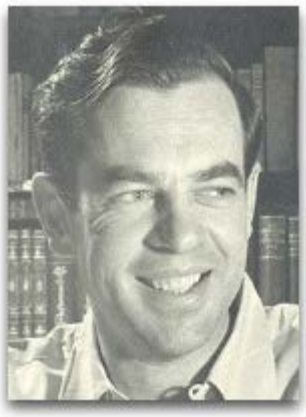

Overview

Campbell, in his *The Hero with a Thousand Faces* (1949), asserted the theory that a single myth stood behind the stories of Krishna, Buddha, Apollonius of Tyana, Jesus and other hero stories; in his *The Masks of God: Occidental Mythology, Volume Three* (1960), stated "it is clear that, whether accurate or not as to biographical detail, the moving legend of the crucified and risen Christ was fit to bring a new warmth, immediacy, and humanity, to the old motifs of the beloved Tammuz, Adonis, and Osiris cycles." (Ñº)

Quotes | On

The following are quotes on Campbell:

> "History, **Joseph Campbell** argued, is completely silent (see: silent historians problem) on Jesus Christ. The only sources on Jesus are the Pauline Epistles and the Four Gospels of the New Testament. Having eliminated them as having no historical or evidential value, all that remained were alleged references to Jesus by Jewish and pagan writers, upon whom "religious apologists" rely to make their case for the historical Jesus. They are from the writings of the Jewish historian Josephus, and from the three Roman writers Tacitus, Pliny the Younger, and Suetonius. None, he argued, could withstand critical testing."
>
> — Bryan Beau (2005), *The Atheist Madalyn Murray O'Hair* (pg. 213)

Quotes | By

The following are quotes by Campbell:

> "The cave you fear to enter holds the treasure you seek."
>
> — Joseph Campbell (c.1960), paraphrase (Ñº) of his ideology, recorded by associate

External links

â— Joseph Campbell – Wikipedia.

θΔics

In hmolscience, **Joseph John Dewey** (1945-), known as J.J. Dewey, is an American new age spiritual philosopher noted, in human chemistry, for his 1999 *The Molecule Relationship*, wherein he mixes god talk, with chemistry talk, to theorize in a kind of self-help way about relationships, sexual energy, dialogue about reincarnation, among other topics, an a kind of amateurish albeit partially interesting way.

Overview

In 1999, Dewey, in his coil-bound mail order booklet *The Molecular Relationship*, conceived of a "human molecule" type of theory, wherein the pair-bond relationship is conceived as the molecule, creating a certain amount energy. [1] The following is a representative excerpt from his chapter on human relationships: [2]

> "The **molecular relationship** [exists in] the foundation of the family unit through the establishment of the marriage bond. The one-to-one monogamous relationship has been historically proven to be the most natural and stable one existing among men and women. In this union, the man is like a positive ionic atom who takes a negative ion. Together they produce a whole with greater properties than either alone have. These greater properties appear, however, only when there is true union. When this union is consummated, the couple has the power to become as one entity, with much greater strength and power than the one sex alone."

Here Dewey seems to be employing the "ionic bond" model of chemistry as a model for the marriage bond. He continues:

> "Unfortunately, few ever achieve true union, for about half of all marriages end in divorce. Of the married, surveys reveal that about 75 percent of all couples are eventually not happy with their marriage, and would leave their relationships if the right opportunity presented itself. Thus, about 25 percent of married couples have achieved relative stability and happiness, and therefore have attained a degree of molecular bonding. The creation, or hope of creation, of this simple molecule (or completed atom) has been the impetus behind almost all great social evolutionary systems among humanity."

The seeds of this logic originated in Dewey's 1998 new age book *The Immortal*, in which he begins to conceives of a "human molecule" type of theory, where in the pair-bond relationship is the molecule, creating a certain amount energy, all intertwined with discussions on creationism and god, wherein god is representative of the energy.

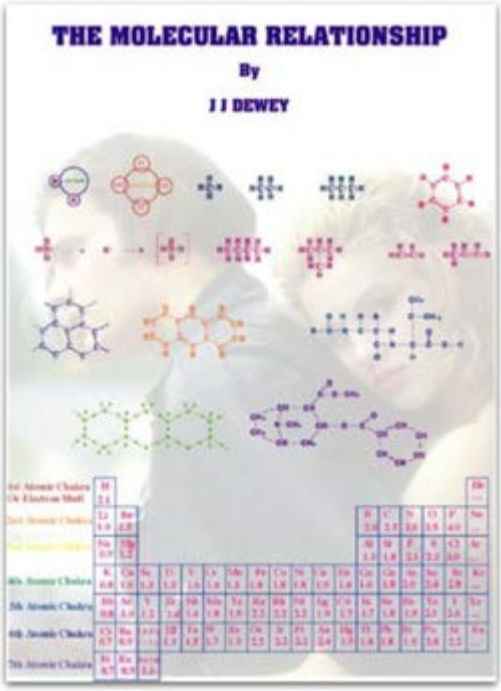

Most of this book consists of dialog between Dewey and his second wife Elizabeth. The first mention of molecules comes up when Elizabeth asks: "are we ever born again as animals, spiders or anything like that?" To which Dewey replies: [3]

> "The human as a unit is made of smaller energy centers [chakras] that compose acupuncture points. The five lower chakras and hundreds of the smaller energy points are actually little lives that were once animals and other little lives eons ago. These do not become human but combine to create something greater than themselves. This is the true order of evolution. The subatomic particles unite to create atoms, cells unite to create the vegetable kingdom, the essence of life unites to create animal, and animals and all the smaller lives unite in consciousness to create

human."

Dewey's 1999 book *The Molecular Relationship*, depicting a couple embracing, with an overlay of various molecules and the periodic table, intending to convey the idea that the paired couple is a new bonded molecule. [6]

A reading of Dewey's "going molecular" themed quotes, gives a good picture that Dewey's immortal theory is a sort of Christian-themed type of relationship chemistry, using a very loose, often incorrect, or ballpark understanding of chemical terminology, extrapolating on things such as molecular business, or molecular politics, molecular success, albeit always conceived in such a way so as to be connected to Biblical narration. [4]

Dewey's *The Immortal* was followed by two more books: *The Lost Key of the Buddha* (2003) and *Eternal Words* (2006), which constitute a series. Dewey discusses things such as the "evolution of the molecular relationship", the "mystery of romantic energy" (human thermodynamics), the "marriage of atoms", the "human molecule", the "expanding molecule", molecular principles, among other things. [1]

Education

Dewey has been a student of philosophy, metaphysics, and religion for most of his life. He took a chemistry course in college. A significant turning point occurred in Dewey's life when he was excommunicated from the Mormon Church for writing an article with argued that there is a progression from one kingdom to another. In 1998, Dewey began teaching his ideas in an Internet group called the "Keys of Knowledge", started by a reader of the immortal series, which boasts a following of about 450 members. [5]

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- Joseph7322 – YouTube.com.
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θΔics

In science, **Joseph Emmet Earley, Sr.** (1932-) is an American chemist noted for his chemical philosophy views surrounding the philosophical implications of autocatalytic theory and Belgian chemist Ilya Prigogine's dissipative structures theory. [1]

Brooks-Wiley theory

In his review of the bend-over-backwards incoherent Brooks-Wiley theory, Earley gives them "high marks for intellectual *schutzpah*." [2]

Education

Earley completed his BS in chemistry at Providence College in 1954 and his PhD in physical and inorganic chemistry at Brown University in 1957. In 1958, he became a chemistry professor at Georgetown University, becoming professor emeritus in 2000.

References

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2. Earley, Joseph E. (1987). "Review: Evolution as Entropy" (abs), *The Review of Metaphysics*, 40(4):760-61.

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● Earley, Joseph. (1981). "Self Organization an Agency: in Chemistry and Process Philosophy", *Process Studies*, 11:246.
● Earley, Joseph E. (2003). "On the Relevance of Repetition, Recurrence, and Reiteration", in: *Chemistry in the Philosophical Melting Pot* (editors: Danuta Sobczynska, Zeidler Pawel, and Ewa Zielonacka-Lis) (pgs. 171-). Peter Lang, 2004.
● Earley, Joseph E. (2006). "Philosophy and the Statistical Mechanics of Ilya Prigogine", *Foundations of Chemistry*, 8:271-283.

External links

● Joseph E. Earley (works) – PhilPapers.org.

θΔics

In existographies, **Joseph Fourier** (1768-1830) (IQ:180|#140) (GPE:76) (Eells 100:16) (CR:34) was a French mathematician and physicist notable for being one of the first instructors and later chair of the École Polytechnic and for his 1822 book *Analytical Theory of Heat.* [1]

Analytical Theory of Heat

In 1822, Fourier, in his *Analytical Theory of Heat*, baising logic on Newton's law of cooling, namely, that the flow of heat between two adjacent molecules is proportional to the extremely small difference of their temperatures, outlined a mathematical model of heat movement in various directions. He argues that any function of a variable, whether continuous or discontinuous, can be expanded in a series of sines of multiples of the variable.

Thermodynamics

See also: Thomson's search for Carnot's Reflections

In 1839, after listening to the praises of Fourier's book by Royal Belfast Academical Institution of Northern Ireland astronomy professor John Nichol, a 15-year old William Thomson asked whether he should read the *Théorie Analytique*, to which Nochol's replied "the mathematics is very difficult". [2] William later got the book from the library. In his own words, "On the 1st of May … I took Fourier out of the University Library; and in a fortnight I had mastered it—gone right through it." [3] This was one of Thomson's first seeds of interest on the topic of the nature of heat. Thomson would later go on to coin the term "thermo-dynamic" in his 1849 "An Account of Carnot's Theory of the Motive Power of Heat". [4]

Quotes | By

The following are quotes by Fourier:

> "Primary causes are unknown to us; but are subject to simple and constant laws, which may be discovered by observation, the study of them being the object of natural philosophy. Heat, like gravity, penetrates every substance of the universe, its rays occupy all parts of space."
>
> — Joseph Fourier (1822), *The Analytical Theory of Heat* (Ñº)

> "There cannot be a language more universal and more simple, more free from errors and obscurities...more worthy to express the invariable relations of all natural things [than mathematics]. [It interprets] all phenomena by the same language, as if to attest the unity and simplicity of the plan of the universe, and to make still more evident that unchangeable order which presides over all natural causes."
>
> — Joseph Fourier (1822), *The Analytical Theory of Heat* (Ñº)

References

1. Fourier, Joseph. (1822). *Analytical Theory of Heat* (*Théorie Analytique de la Chaleur*). Cambridge.
2. Lindley, David. (2004). *Degrees Kelvin - a Tale of Genius, Invention, and Tragedy*. Washington, D.C.: Joseph Henry Press.
3. Thomson, S.P. (1910). *Life of Kelvin* (I: 14). London: MacMillan.
4. Thomson, William. (1849). "An Account of Carnot's Theory of the Motive Power of Heat – with Numerical Results Deduced from Regnault's Experiments on Steam", (127-203) *Transactions of the Edinburgh Royal Society*, xiv.; *Annales de Chime*, xxxv. 1852.

External links

â— Joseph Fourier – Wikipedia.

θΔics

In existographies, **Joseph Gay-Lussac** (1778-1850) (Murray 4000:8|C) (CR:31) was a French chemist particularly noted for his 1802 formulation of the volume-temperature gas law relation, one of the forerunners to the ideal gas law. The publication for which he is known for seems to be the 1807 “First Attempt to Determine the Changes in Temperature which Gases Experience owing to changes of Density, and Considerations of their Capacity for Heat”. [4]

Gay-Lussac's law

In 1800, an eighteen-year-old Joseph Gay-Lussac, a recent graduate of the École Polytechnique, met and became a lab assistant and protégé of chemist Claude Berthollet. While working under Berthollet, Gay-Lussac discovered that gases expand by the same proportion for an equivalent rise in temperature. Gay-Lussac’s approach to chemistry was to express laws mathematically. [1] In 1802, referencing the previous work of French scientist Jacques Charles, Gay-Lussac published a paper on the precise relationship between the volume and temperature of a gas, which Gay-Lussac named "Charles law" in honor of Jacques Charles' original experiment. In modern terms, Charles’ law is defined as:

$$V = KT\,|_{n,P}$$

which states that for a body of gas at constant particle number *n* and pressure *P* the volume *V* of the gas will be constant *K*.

Gas constant: R

The first dominant use of *R* as a constant in the various gas laws seems to have been the use by French engineer Emile Clapyron's use in his 1834 *Memoir on the Motive Power of Fire*, wherein he states that Mariotte’s law (PV = k, at constant temperature) combined with that of Gay-Lussac’s law (P = kT, at constant volume) gives the expression: [2]

$$Pv = R(267 + t)$$

Education

On a friend’s recommendation, French chemist Claude Berthollet hired young Gay-Lussac to work as his assistant in his laboratory; upon his retirement, Gay-Lussac was appointed to his position at the Ecole Polytechnique, the founding school of thermodynamics. [3]

Students

In 1831, German chemist and physicist Heinrich Magnus, one of the main founders of the Berlin school of thermodynamics, studied under Gay-Lussac.

References

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3. Morris, Richard. (2005). *The Last Sorcerers: the Path from Alchemy to the Periodic Table* (pg. 149). The National Academies.
4. (a) Gay-Lussac, Joseph L. (1807). “First Attempt to Determine the Changes in Temperature which Gases Experience owing to changes of Density, and Considerations of their Capacity for Heat”, *Memoires d’Arcueil*, I.
(b) Reprinted in *Die Principien der Warmelehre*, E. Mach. Leipzig, 1896.
(c) Gay-Lussac, Joseph L. (1807). “First Attempt to Determine the Changes in Temperature which Gases Experience

owing to changes of Density, and Considerations of their Capacity for Heat"; In: *Laws of Gases: The Free Expansion of Gases: Memoirs by Gay-Lussac, Joule, and Thomson*, Carl Barus, Wyatt William Randall, Joseph Sweetman Ames (edited by Joseph S. Ames) (pgs. 1-). Harper & Brothers Publishers, 1898.

External links

â— Joseph Gay-Lussac – Wikipedia.

θΔics

In existographies, **Joseph Hager** (1757-1819) was an Italian-born ancient languages scholar noted for his 1801 translation of some Babylonian bricks, the dissertation of which he makes an early Brahma = Abraham connection.

Babylonian bricks

In 1797, the directors of the East India Company obtained 10 or 12 specimens of bricks near Hillah (Helle), a small town on the Euphrates, near Bagdad, the then supposed location of ancient Babylon, which contained indented scroll or label in letters. The bricks reached London in 1801 and were the task of copying them and describing them was given to Hager.

Babylon | Egypt

In 1801, Hager, in his *Dissertation on the Newly Discovered Babylonian Inscriptions*, over-zealously attributes these inscriptions to be the world's oldest language, conjecturing that the tower of Babel was bigger than the Egyptian pyramids, and that the Egyptians themselves, who pretend to be the instructors of all nations, probably derived their pyramids and obelisks from Babylon; the gist assertion (pgs. xviii-xix) of which he explains as follows:

> "By the Babylonian bricks here exhibited, the whole difficulty in regard to their origin is removed; as it is evident that Babylon, in point of cultivation, was much earlier than Persepolis, and that the Chaldeans were a celebrated people, when the name of the Persians was scarcely known. To confirm this opinion, and by it to prove that the Persepolitan characters were derived from the Babylonian, I have thought it necessary to begin this work by a brief examination of the antiquity, extent, and sciences of the Babylonians; and through scantiness of original monuments, to prove by astronomy, architecture, and languages, their well-founded claim to antiquity. At the same time, I have endeavored to show that not only the Persians, but also the Indians, were disciples of the Chaldeans; and that the Egyptians themselves, who pretend to be the instructors of all nations, probably derived their pyramids and obelisks from Babylon. Proceeding then to the Babylonian inscriptions, I have shown their similarity to that celebrated alphabet which the Indians call divine or celestial, (deva-nagari) because they believe that it was communicated by the Deity himself in a voice from heaven; and I have tried to prove that they were not derived from heaven, but from our earth, and from the borders of the Euphrates. I have confirmed my assertion by means of the Tibetan characters, those acknowledged descendants of the Indian ones, and thus endeavored to invalidate the opinion of that great antiquity and boasted originality of the Bramins."

This Babylon (2300BC) before Egypt (3100BC) conjecture, to note, is in correct, being that modern evidence indicates that earliest mention (Q) of the city of Babylon is found in a clay tablet from the reign of Sargon of Akkad (2334–2279BC).

Brahma | Abraham

On Brahma and Abraham, Hager says:

> "In regard to Brama [Brahma], I shall only observe, that according to the researches of the learned Thomas Hyde [1700], the Persians, those neighbors of the Indians, called their most ancient religion the religion of Abraham, and that Zoroaster [c.1000-600BC] (Q), their legislator, himself is never called otherwise but Ib**ra**him, or Abraham Zerdusht [N1]. The same may be said of the A**ra**bians, the neighbors of the more southern India, amongst whom Abraham was believed to have founded the famous temple of Mecca, to say nothing of the Egyptians, whom he instructed, as Josephus (37-100) (Q) attests, in the Chaldaic astronomy [N2]. Whilst we find then such a number of Persian words in the ancient language of India, which prove the great communication which must have existed between both countries, there is no wonder if the name of Abraham, the prophet of Persia, had been likewise adopted in India, and the testimony of those authors confirmed who pretend the Bramins to have been disciples of the Persians [N3]; and the Chaldaic name of the sacred fire, the worship of which is one of the principal points of the religion of Zoroaster, shows the

primeval origin of the ancient religion of Persia."

(add discussion)

Quotes | On

The following are noted quotes on Hager:

> "Let me not be called a wicked atheist for seeing the likeness between **Brahma and Abraham**; for what says the learned **Joseph Hager** [1801]: 'As the Indian alphabets are all syllabic, and every consonant without a vowel annexed is understood to have an A joined to it, there is no wonder if from *Abraham* was made Brahma; and thus we see other Persian words in the Sanskrit having an *a* annexed as *deva* from *div*, *appa* from *ab*, *deuda* from *deud*, etc.'"
>
> — Godfrey Higgins (1833), *Anacalypsis, Volume One* [1]

Notes

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N2. Antiquit. lib. 1. cap. 9. apud Hyde cit.
N3. As the Indian alphabets are all syllabic, and every consonant without a vowel annexed, is understood to have an a joined to it, there is no wonder if from *Abraham* was made *Brahma*; and thus we see other Persian words in the Sanskrit having an *a* annexed as *deva* from *div*, *appa* from *ab*, *deuda* from *deud*, etc. (See: Father Paolino's *Amarasinha* [1798] (pgs. 12) (Q); Michael Symes' *Embassy to Ava* [1795] (§14) (arc)).

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Further reading

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External links

● Joseph Hager (Italian → English) – Wikipedia.

θΔics

In existographies, **Joseph Henry** (1791-1867) (IQ:160|#534) (Gottlieb 1000:605) (SIG:19) (GPE:99) was an American physicist and electrical engineer, noted for []

Overview

In 1832, Henry discovered induction; independent of Michael Faraday (1831). [1]

Quotes | On

The following are quotes on Henry:

> "My own judgment, if of any value, would rank the [genius] ability of **Henry**—I do not say his achievements—a little below that of Faraday. Indeed, their lives and their manners of working were strangely alike. Each born in humble condition, without any of the adventitious aids of position or influence, was destined apparently to mechanical occupation. Faraday was an apprentice to a bookbinder. Henry served in the same capacity under a silversmith. Each started in life with moral and benevolent habits, well developed and healthy bodies, quick and accurate perceptions, calm judgment and self-reliance tempered with modesty and good manners, a good ground surely in which to plant the germs of the scientific life. Each by innate force of taste and intellect, was impelled to the pursuit of knowledge under obstacles which would have damped the ardor of ordinary youths. Each, endowed with a lively imagination, was in his younger days fond of romance and the drama; and, by a singular similarity of accidents, each had his attention turned to science by a book which chance threw in his way. This work in the case of Faraday was Mrs. Marcet's *Conversations on Chemistry*; and the book which influenced Henry's career was Gregory's *Lectures on Experimental Philosophy, Astronomy, and Chemistry*."
>
> — Alfred Mayer (1880), "Memorial Address of Joseph Henry: as a Discoverer" [3]

Quotes | By

The following are quotes by Henry:

> "Although the discoveries of Oersted, Arago, Faraday, and others, have placed the intimate connection of electricity and magnetism in a most striking point of view, and although the theory of Ampere has referred all the phenomena of both these departments of science to the same general laws, yet until lately one thing remained to be proved by experiment, in order more fully to establish their identity; namely the possibility of producing electrical effects from magnetism."
>
> — Joseph Henry (1832), "On the Production of Currents and Sparks of Electricity from Magnetism" [2]

> "By 'genius' I would understand that power, or rather those powers of the mind which are capable of penetrating into all things within our reach and knowledge, and of distinguishing their essential differences. These are no other than invention and judgment: and they are both called by the collective name of genius, as they are of those gifts of nature which we bring with us into the world. Concerning each of which, many seem to have fallen into very great errors; for by invention, I believe, is generally understood a creative faculty, which would indeed prove most romance writers to have the highest pretensions to it; whereas by invention is meant no more (and so the word signifies) than discovery or finding out; or, to explain it at large, a quick and sagacious penetration into the true essence of all the objects of our contemplation. This, I think, can rarely exist without the concomitancy of judgment, for how we can be said to have discovered the true essence of two things, without discerning their difference, seems to me hard to conceive. Now this last is the undisputed province of judgment; and yet some few men of wit have agreed with all the dull fellows in the world, in representing these two to have been seldom or never the property of one and the same person."

— Joseph Henry (c.1850), *Publication* [3]

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External links

â— Joseph Henry – Wikipedia.

θΔics

In thermodynamics, **Joseph Henry Keenan** (1900-1977) was an American mechanical engineer noted for his 1941 textbook *Thermodynamics* and his 1965 expanded textbook *Principles of General Thermodynamics*, co-written with George Hatsopoulos. [1] Keenan was a central founder of the MIT school of thermodynamics.

Influence | Students

Keenan's 1941 textbook was influential to Polish-born American mechanical engineer Joseph Kestin. Italian thermodynamicist Gian Beretta is under the view that Keenan's 1965 textbook is the greatest thermodynamics book of the 20th century. A noted economics thermodynamics student of Keenan was Lithuanian-born Brazilian metallurgical-nuclear engineer, physicist, and thermodynamicist Borisas Cimbleris.

Law of stable equilibrium

Hatsopoulos and Keenan are known for their 1962 attempt to reduce the first law, second law, and state principle into one law, which they have called the law of stable equilibrium. [4] This principle states that:

> "A system having specified allowed states and an upper bound in volume can reach from any given state one and only one stable state and leave no net effect on its environment."

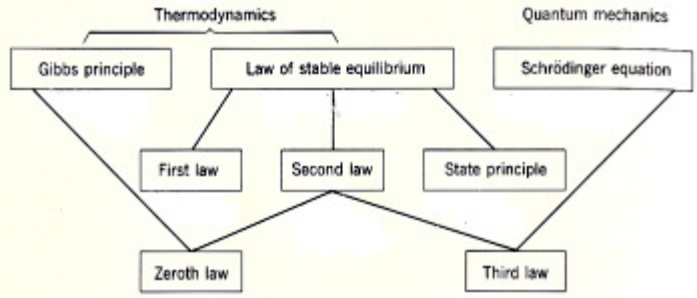

Law of stable equilibrium diagram. [4]

This has been restated as: [5]

> "When an isolated system performs a process, after the removal of a series of internal constraints, it will always reach a unique state of equilibrium; this state of equilibrium is independent of the order in which the constraints are removed and is characterized by a maximum value of entropy."

(add discussion)

Keenan school of thermodynamics

Between 1834 and 1961, Keenan was a professor and later head of the department of mechanical engineering at the Massachusetts Institute of Technology (MIT), and while there he established what has been come to be known as the "Keenan School of Thermodynamics". [2] This, in effect, seemed to have largely founded what has become known nowadays as the MIT school of thermodynamics, added on to by the work of others.

Keenan is known for his calculation of steam tables, research in jet-rocket propulsion, and his work in furthering the understanding of the laws of thermodynamics. His classic 1941 textbook *Thermodynamics* served as a fundamental teaching tool in various engineering curricula during the 1940s and 1950s. Keenan brought to the mechanical engineering profession the fundamental work of Willard Gibbs.

The faculty of MIT, during the summer session of 1953, under the guidance of Keenan, organized a Rumford summer school of thermodynamics in celebration of Count Rumford (Benjamin Thomson) Bicentennial: During Summer Session 1953, from Monday, June 29, to Friday, July 10, Inclusive. [3]

Notables associated this school include George Hatsopoulos and Gian-Paolo Beretta, the latter of which states that he ran a "thermodynamics think tank" at MIT in the late 1990s. The website QuantumThermodynamics.org, run by Beretta, lists publications by members of the "Keenan school of thermodynamics".

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Citations

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External links

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● Keenan, Joseph Henry – WorldCat Identities.

θΔics

In thermodynamics, **Joseph Kestin** (1913-1993) was a Polish-born American mechanical engineer noted for his 1966 textbook *A Course in Thermodynamics*. [1]

Influences

Kestin states that his interest in thermodynamics was aroused during a *circa* 1945 translation of German engineer Ernst Schmidt's *Thermodynamics.* Other thermodynamicists that were influential to Kestin in the writing of his textbook include: Max Planck, *Theory of Heat* (1897), Joseph Keenan, *Thermodynamics* (1941), Arnold Sommerfeld, *Thermodynamics and Statistical Mechanics* (1956), A. H. Wilson, *Thermodynamics and Statistical Mechanics* (1957), Herbert Callen, *Thermodynamics* (1960), Mark Zemansky, *Thermodynamics* (1943), and Howard Reiss, *Methods of Thermodynamics* (1965). [2]

Other

In ecological thermodynamics, from Kestin's textbook, what has come to be known as the "unified principle of thermodynamics" states that: [3] "when an isolated system performs a process after the removal of a series of internal constraints, it will reach a unique state of equilibrium: this state of equilibrium is independent of the order in which the constraints are removed." This statement is, supposedly, also attributed to the 1965 work of George Hatsopoulos and Joseph Keenan. [4] Kestin is also noted for completing the post-humorous English translation of German physicist Arnold Sommerfeld's *Thermodynamics and Statistical Mechanics.* [5]

Education

Kestin completed his undergraduate work at the Technical University of Warsaw, Poland, in 1937. Soon thereafter he began graduate work at Kings College, London, but then in a late summer visit to Warsaw he was sent to a Russian prisoner-of-war camp and was not released to serve with the Allies until 1941. He completed his PhD, thesis "High Speed Flow of Gases through Channels", at the Imperial College London in the mid 1940s. [6] He joined Brown University in 1952 as an engineering professor and was the director of Brown's Center for Energies Studies up till 1984, after which he worked as a research professor. Kestin published over 250 research papers in thermodynamics and five books. [7]

Quotes

The following are noted quotes:

> "The subject [thermodynamics] cannot be fathomed in all its profundity in a single pass."
>
> — Joseph Kestin (1979), *A Course in Thermodynamics* (xix)

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External links

â— Kestin, Joseph – WorldCat.org.

θΔics

In thermodynamics, **Joseph Frederic Klein** (1849-1918) was a French-born American mechanical engineer, a "friend" of Willard Gibbs, noted for his 1910 *The Physical Significance of Entropy*, wherein he attempts to present a clear exposition on the Boltzmann-Planck model of entropy, as this applies to the entire universe.

Overview

In 1907, Klein completed the first English translation of Gustav Zeuner's *Technical Thermodynamics*. [2]

In 1910, Klein, in his booklet *Physical Significance of Entropy*, distills the latest synthesis or rather reinterpretation entropy by Max Planck of Ludwig Boltzmann's earlier work, the synopsis of which is best summarized by his abstract:

> "In this little book the author has in the main sought to present the interpretation reached by Boltzmann and by Planck. The writer has drawn most heavily upon Planck, for he is at once the clearest expositor of Boltzmann and an original and important contributor. Now these two investigators reach the result that; entropy of any physical state is the logarithm of the probability of the state, and this probability is identical with the number of "complexions" of the state. This number is the measure of the permutability of certain elements of the state and in this sense: Entropy is the measure of the disorder of the motions of a system of mass points. To realize more fully the ultimate nature of entropy, the writer has, in the light of these definitions, interpreted some well-known and much-discussed thermodynamic occurrences and statements."

This book seems to be one of the first to clearly elaborate on what soon came to be known as the Boltzmann-Planck "principle of elementary disorder". [1]

Education

In 1868, Klein, age 19, at the suggestion of "friend" Willard Gibbs, then aged 29, he registered at the Sheffield Scientific School, taking a course in dynamic (mechanical engineering. In 1871, he completed a Ph.B., after which he served as assistant to professor W.P. Trowbridge, thereafter completed a D.E. in mechanical engineering. Klein then worked for five years as a draftsman of Colt Company, Hartford, Connecticut, eventually becoming chief engineer. In 1877, he became an instructor of mechanical engineering at Yale University, wherein he began to do experimental work on low temperature thermodynamics. In 1881, he went to Lehigh University, Pennsylvania, becoming dean in 1907, and acting president (1910), during which time he translated a number of engineering and thermodynamic works from German to English. [4]

Quotes | Employed

The following are quotes employed by Klein:

> "The driving motive (or impelling cause) in all natural events is the difference between the existing entropy and its maximum value."
>
> — Ludwig Boltzmann (c.1887), Publication; cited by

PART V

REACH AND SCOPE OF SECOND LAW

SECTION A

ITS EXTENSION TO ALL BODIES

CLAUSIUS extended the operation of the Second Law or, what is the same thing, the scope of entropy, to all bodies. See RÜHLMANN'S "Handbuch d. mech. Wärmtheorie," Vol. I, pp. 395–405.

BOLTZMANN says in this connection: "As regards entropy, solid and liquid bodies do not differ *qualitatively* from perfect gases; the discussion of the entropy of the former, however, presents greater mathematical difficulties."

Certain features of the entropy of solid and liquid bodies have, however, been derived with the help of ideal gases as temporary auxiliaries. We consider this argument the simplest and therefore now give an outline of PLANCK'S presentation of the matter.[1]

PLANCK'S PROOF THAT ALSO FOR ANY OTHER BODIES THAN GASES THERE REALLY EXISTS A FUNCTION WHICH POSSESSES THE CHARACTERISTICS OF ENTROPY; THE MAIN STEPS ARE NUMBERED

(1) Expression of entropy for an ideal gas and properties of entropy.

$$(2)\ (a)\quad S = M\left(C_v \log T + \frac{R}{m}\log v + \text{const.}\right); \quad . \quad . \quad (34)$$

$$(b)\quad dS = \frac{dU + p\,dV}{T} = \frac{d'Q}{T}, \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (35)$$

[1] Thermodynamik, 2d Ed., pp. 87–100.

Joseph Klein (1910) in: *Physical Significance of Entropy* (pg. 98)

Klein's 1910 chapter "Reach and Scope of Entropy", wherein he explains that entropy applies to any and all "bodies" of the universe, and goes through Max Planck's proof of this; compare: Moriarty-Thims debate (2009).

Quotes

The following are noted quotes:

> "The second law in its objective-physical form (freed from all anthropomorphism) refers lo certain mean values which are found from a great number of like and 'chaotic' elements. This law has no *independent* significance, for its roots go down deep into the theory of probabilities. It is therefore conceivable that it is applicable to some purely human and animate events as well as to inanimate, natural events, provided the variable elements present constitute adequate haphazard for the calculus of probabilities."
>
> — Joseph Klein (1910), *The Physical Significance of Entropy*; cited by Jay Labinger (1995) [3]

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External link

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θΔics

In existographies, **Joseph Lagrange** (1736-1813) (IQ:190|#25) (Cattell 1000:512) [RGM:558|1,500+] [GME:7] (DN:5-7) (CR:114) was an Italian mathematician noted for his 1788 *Analytical Mechanics*, in which, building on the work of physicist Isaac Newton, he employed a single function to express the different forces of a system, thus forming the differential equations of the system's motion. [1] This work was extended in 1835 by Irish mathematical physicist William Hamilton, who gave the name "force-function" of the system, symbol *U*; logic that was later employed by German physicist Rudolf Clausius in his formulation of the energy of a body, otherwise known as "internal energy", symbol *U*, in a modern sense.

Analytical Mechanics

In 1788, Lagrange published his *Analytical Mechanics*; the following is a recent Dover-translation abstract: [7]

> "*Analytical Mechanics* presents a comprehensive account of Lagrangian mechanics. In this work, Lagrange used the principle of virtual work in conjunction with the Lagrangian multiplier to solve all problems of statics. For the treatment of dynamics, a third concept had to be added to the first two—d'Alembert's principle—in order to develop the Lagrangian equations of motion. Hence, Lagrange was able to unify the entire science of mechanics using only three concepts and algebraic operations."

(add)

The greatest successor to English physicist Isaac Newton to extend the subject of dynamics, according to Hamilton, was Lagrange who, with his 1788 *Analytical Mechanics* (*Mécanique Analytique*), showed that most varied consequences respecting the motions of systems of bodies may be derived from one radical formula. Namely, using a method of generalized co-ordinates (Cartesian coordinates), Lagrange showed that if one determines a system's configuration by a sufficient number of variables whose number is the same as that of the degrees of freedom possessed by the system, then the kinetic and potential energies of the system can be expressed in terms of those variables, and the differential equations of motion thence deduced by simple differentiation.

The work of Lagrange was later extended by Irish mathematical physicist William Hamilton with his two-part 1835 treatise "On a General Method in Dynamics". [1]

Clausius | Gibbs

Hamilton's derivation of what he called a "force function" was later referenced in German physicist Rudolf Clausius' 1879 *The Mechanical Theory of Heat*, the founding textbook of the newly emerging science of "thermo-dynamics". [2] American engineer Willard Gibbs, in turn, extended the work of Clausius to found chemical thermodynamics, wherein, so to say, the so-called "Gibbsian" is the Lagrangian-Hamiltonian formulation for freely going or "freely-running", in Lewis-speak, isothermal isobaric earth-bound reacting systems.

Napoleon-Laplace anecdote

Lagrange was involved in the famous 1802 Napoleon Laplace anecdote; the following being one example quote:

> "How comes it, then, that Laplace was an atheist? At the Institute neither he nor Monge, nor Berthollet, nor **Lagrange** believed in God. But they do not like to say so."
>
> — Napoleon Bonaparte (c.1814), debate with Gaspard Gourgaud [6]

(add)

Education

Lagrange was educated at the college of Turin, but it was not until he was seventeen that he showed any taste for mathematics. His interest in mathematics was said to have been first excited by a paper by English astronomer Edmund Halley, which he came across by accident. Alone and unaided he threw himself into mathematical studies; at the end of a year's incessant toil he was already an accomplished mathematician, and was made a lecturer in the artillery school.

In 1754, he began working on the problem of tautochrone, i.e. curves for which the time taken by an object sliding without friction in uniform gravity to its lowest point is independent of its starting point, discovering a method of maximizing and minimizing functionals in a way similar to finding extrema of functions. Lagrange wrote several letters to Swiss mathematician Leonhard Euler between 1754 and 1756 describing his results. He outlined his "δ-algorithm", leading to the Euler–Lagrange equations of variational calculus and considerably simplifying Euler's earlier analysis. Lagrange also applied his ideas to problems of classical mechanics, generalizing the results of Euler and French mathematician Pierre Maupertuis.

In 1794, Lagrange became the first professor of analysis at the École Polytechnique, the founding school of thermodynamics, upon its opening.

Students and influence

Lagrange was the advisor to French mathematical physicist Joseph Fourier.

Kinetic energy

In 1807, English physicist Thomas Young was credited as having first coined or used the term "energy" *E* in a modern sense, as:

$$E = mv^2$$

Four years later, in partial correction to Young's expression, Lagrange used calculus to show that a factor of two is involved in the relationship "potential" (potential energy) and "vis viva" (kinetic energy). [3] In the symbols used by Lagrange, i.e. *T* as kinetic energy, in his 1788 *Analytical Mechanics*:

$$T = \frac{1}{2}mv^2$$

where *2T* denotes the whole "living force of the system". [1]

Social mechanics

In 1881, Irish mathematical economist Francis Edgeworth, in his *Mathematical Psychics: an Essay on the Application of Mathematics to the Moral Sciences*, attempted to platform an outline of a theory of social mechanics on the analytical mechanics of Lagrange, and in turn Hamilton, akin to a celestial mechanics formulation of societies, centered around the idea of calculations of utilitarian minimas and maximas . [4]

In the 1890s, Lagrange's principle was employed by Polish economist Léon Winiarski in his formulation of "social mechanics".

Quotes | On

The following are noted quotes on Lagrange:

> "Scientific investigations are a sort of warfare, carried on in the closet or on the couch against all one's

contemporaries and predecessors; I have often gained a single victory when I have been half asleep, but more frequently found, on being thoroughly awake, that the enemy had still the advantage of me when I thought I had him fast in a corner—and all this, you see, keeps one alive."

— Thomas Young (c.1820), commentary on the work of Lagrange amid a reading of 100 of his articles [5]

Quotes | By

The following are notes of praise and or tribute:

"Dynamics is the science of accelerating or retarding forces, and of the varied motions which they must produce. This science is wholly due to the moderns, and Galileo is the one who threw or made the first foundations."

— Joseph Lagrange (1788), *Analytical Mechanics* (Volume One, pg. 221) [13]

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θΔics

In existographies, **Joseph McCabe** (1867-1955) was an English freethinker, secularist, atheist (Joshi, 2014), historian, and translator noted for []

Overview

In 1905, McCabe translated Ernst Haeckel's *The Riddle of the Universe* into English. [1]

In 1908, McCabe edited a multi-volume set on of the *Life and Letters* of George Holyoake. (O)

In 1912, McCabe published *Goethe, the Man and His Character*, aimed at filling the need for an English existography of Goethe, when he touched on elective affinities, the boyhood genius of Goethe, Goethe and Schiller, among other topics. [2]

In 1948, McCabe published *Rationalist Encyclopedia: a Book of Reference on Religion, Philosophy, Ethics, and Science*, a dictionary of atheism of sorts. [3]

Quotes | By

The following are quoted by McCabe:

> "There is no difference between the howl of a dog and a symphony of Beethoven."
>
> — Joseph McCabe (c.1910), as quoted by Howard Lovecraft (1936) [4]

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External links

- Joseph McCabe – Wikipedia.

θΔics

In hmolscience, **Joseph McCauley** (1943-) is an American physicist turned econophysicist, noted, in economic thermodynamics, for his 2000s outspoken opinions that thermodynamics cannot be applied to economics and finance.

Reversible trading

In 2002, McCauley, in his "Self-Financing, Replicating Hedging Strategies, an Incomplete Thermodynamic Analogy", attempted to apply the concept of irreversibility to stock trading; the abstract of which is as follows: [8]

> "In the theory of risk-free hedges in continuous time finance, one can start with the delta-hedge and derive the option pricing equation, or one can start with the replicating, self-financing hedging strategy and derive both the delta-hedge and the option pricing partial differential equation. Approximately reversible trading is implicitly assumed in both cases. The option pricing equation is not restricted to the standard Black-Scholes equation when nontrivial volatility is assumed, but produces option pricing in agreement with the empirical distribution for the right choice of volatility in a stochastic description of fluctuations. The replicating, self-financing hedging strategy provides us with an incomplete analogy with thermodynamics where liquidity plays the role of the heat bath, the absence of arbitrage is analogous to thermal equilibrium, but there is no role played by the entropy of the returns distribution, which cannot reach a maximum/equilibrium. We emphasize strongly that the no-arbitrage assumption is not an equilibrium assumption, as is taught in economics, but provides only an incomplete, very limited analogy with the idea of thermal equilibrium."

On reversible trading, McCauley says the following:

> "We define an approximately "reversible trade" as one where you can reverse your buy or sell order over a very short time interval (on the order of a few seconds or ticks) with only very small percentage losses, in analogy with approximately reversible processes in laboratory experiments in thermodynamics. All that follows assumes that approximately reversible trading is possible, although reversible trading is the exception in the market."

From here he attempts to do a Legendre transform of a derived stock buying and selling mathematical function and jump to the assertion that this is a generalized Gibbs-Duhem relation and that the following function:

$$\Pi = -\Psi m$$

where Ψ is a share (of some company) and m is the share's price, is analogous to a thermodynamic potential. The sum attempted derivation, and unstated assumptions embedded therein, is nearly a mess, to say the least.

Overview

In 2003, McCauley, in his "Thermodynamic Analogies in Economics and Finance: Instability of Markets", in which he attempts to argue that:

> "Real financial markets cannot behave thermodynamically."

This, of course, is incorrect. Everything in the universe behaves thermodynamically—in fact, the behavior of every process in the universe is governed by energy conservation and entropy increase. In any event, McCauley's argument is

that "financial markets are unstable, they do not approach statistical equilibrium, nor are there any available topological invariants on which to base a purely formal statistical mechanics." All-in-all, McCauley is of the opinion that "thermodynamics is impossible in economics", as shown by his article. [3]

McCauley's paper, according to Russian applied mathematician Andrei Khrennikov, is said to be one of the founding papers of the field of financial thermodynamics. [1]

Thermodynamic analogies fail?

In 2004, McCauley, in his econophysics book *Dynamics of Markets: Econophysics and Finance*, with its noticeable picture of Erwin Schrodinger on the cover, devotes chapter seven to a criticism of thermodynamic analogies in finance, in which he pens a section entitled "Why Thermodynamics Analogies Fail", in which he uses the Legendre transform to argue that formal thermodynamic analogies will always fail when trying to describe economic behavior. [2]

Money | Energy

In his 2006 response article "Response to Worrying Trends in Econophysics", following an attack on his points of view by four authors, McCauley states: [5]

> "It [is] generally be quite useless to assume conserved quantities in economics and finance. There is no reliable analog of energy in economics and there are very good reasons why no meaningful thermodynamic analogy can be constructed. In particular, money is not conserved. Money is created and destroyed rapidly via credit. Leveraging leads to big changes in 'money'. Are there any conservation laws at all in real markets, and if so do they have any significance for deducing market dynamics?"

Although a long-standing practice to apply the conservation of energy to the money, the issue McCauley seems to be grappling with here is that the way the conservation of energy applies to say a US $1 dollar bill is that if it is burned (combustion) the total energy (internal energy) of the what goes into (reactants) the reaction will equal the total energy of what goes out (products), of the reactions accruing in the economic system.

Paper is obtained from fibers of plant cells, which are mostly composed of carbohydrate polymer (polysaccharides), of the general formula $(CH_2O)_n$, or more generally for polysaccharides $C_x(H_2O)_y$, where x is usually a large number between 200 and 2500, with a carbon content of about 40%, which are impregnated with varying degrees with lignin, an aromatic polymer, which has the approximate composition $C_{10}H_{11}O_4$. [6] The simplest approximation of a combustion reaction for paper (money) would thus be:

$$CH_2O + O_2 \rightarrow CO_2 + H_2O$$

namely the combustion of formaldehyde CH_2O with oxygen O_2 which has the following thermodynamic data: [7]

Molecular formula	Name	Gas			
		$\Delta_f H^\circ$ kJ/mol	$\Delta_f G^\circ$ kJ/mol	S° J/mol K	C_p J/mol K
CH_2O	Formaldehyde	-108.6	-102.5	218.8	35.4

which has a Gibbs free energy of formation of -102.5 kJ/mol, according to which we see that the conservation of energy does indeed apply to money, or at least to the combustion of a unit mass of paper. The general issue here is that McCauley needs to see through his problem in terms of economic combustion reactions—people as molecules reacting economically to each other—of a form similar to formaldehyde combustion. This is where he will come to find

resolution in his complaints about thermodynamics not applying to finance, such as outlined in plain speak in the adjacent photo and caption box.

To explain further by example, in 1974, American chemist, mathematician, and statistical mechanicist Elliott Montroll, in his *Introduction to Quantitative Aspects of Social Phenomena*, coauthored with Wade Badger, employ a certain number of humans to molecules comparisons, which as of 2011 is the "correct" textbook thermodynamic way humans are supposed to be viewed (*Advanced Engineering Thermodynamics*, 2011) (see: human molecular formula), and in one section of this book give the following formula for the total kinetic energy of the ith molecule in a system, being supposedly a socioeconomic system:

$$\epsilon_i(x) = \frac{1}{2} m u_i^2$$

where m is mass and u_i the velocity of the molecule, respectively, then comments:

> "The [acts of a human] individual [occurs] in a manner to that in which energy is transferred from gas molecule to gas molecule by collisions. Through transfer of goods or services (or welfare), every family has someone with an annual income. One might argue that through many transactions money tends to get randomly distributed but, through some unclear constraints which are due to training, motivation, risk-taking, inheritance, intimidation etc., some people obtain [more money]."

This is pretty decent logic. Here, Montroll seems to be making a reference to the Pareto principle of wealth distribution. Likewise, the statement that ever family has someone with an annual income (money paid for services), is but a academic restatement of the 2013 Alley equation or the following colloquial street logic rule of thumb:

$$\text{no job} = \text{no sex}$$

In other words, a person, typically male, being that human socioeconomic systems are non-aqueous, with a job, occupation, or trade will have strong tendency to have sexual intercourse, which can be defined as a combination reaction:

$$\mathrm{A} + \mathrm{B} \rightarrow \mathrm{AB}$$

in the first step of the mechanism, which, just like the formaldehyde reaction, will be quantified and governed by a free energy change (see: human free energy; human free energy of formation), composed of enthalpy and transformation content energy changes. This is where McCauley will find "real financial markets behaving thermodynamically." Of these sexual combination reactions, 85 percent will result in reproduction, which in human chemical reaction formulation, in overall mechanism, double displacement reaction, will accrue, and attached family will be a product of the reaction, and accumulated money, according to Pareto's principle will result.

Education

McCauley completed his MS in 1965 at the University of Kentucky, and his MS (1967), MPh (1968), and PhD (1972) at Yale University, completing his dissertation work under Norwegian-born American thermodynamicist Lars Onsager.

Econophysics | University of Houston

See main: Two cultures department

McCauley, among American econophysics schools, currently teaches econophysics at the University of Houston, a school that is said to be one of only a handful of PhD programs worldwide that has an econophysics specialization. [4]

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External links

â— Joseph L. McCauley – Wikipedia.
â— McCauley, Joseph L. – WorldCat Identities.
â— Joseph McCauley (faculty) – University of Houston.

θΔics

In thermodynamics, **Joseph Mellor** (1869-1938) was an English inorganic chemist noted for his 1902 book *Higher Mathematics for Students of Chemistry and Physics*, one of the first books in the field of mathematical thermodynamics, resulting from the eagerness he saw in students to readily pursue research and work in the newly forming field of physical chemistry, and for his *A Comprehensive Treatise on Inorganic and Theoretical Chemistry*, which contains a well-honed digression on affinity chemistry.

Overview

In 1922, Mellor, in his *A Comprehensive Treatise on Inorganic and Theoretical Chemistry*, gives a well-honed digression on the transition between affinity chemistry and the newly-forming subject of modern chemical thermodynamics (1920s); for example, he correctly defines driving force as such:

> "Chemical affinity can be regarded as the driving force of a chemical reaction."

On affinity and its various synonyms, Mellor comments:

> "Some try to evade the difficulty by using other terms: 'elective attraction', 'chemical activity', 'chemical avidity', 'chemical energy', etc., but the original term 'chemical affinity', is convenient, provided it is kept in place."

(add discussion)

Quotes | Employed

The following are quotes employed by Mellor:

> "Substance is like a river in continual flow; the energies undergo constant changes and do work in infinite variety. There is hardly anything that stands still or remains still."
>
> — Marcus Aurelius (c.160), a seeming Heraclitus (475BC) paraphrase; cited by Mellor, in: chapter twelve "Thermodynamics and Thermochemistry" (1922)

> "That matter and power are the principles of each body is clear, for having taken away all the accidental forms, we arrive at length at substantial form which, being abstracted *per intellectum*, there remains a something very occult which is *prima material*."
>
> — Albertus Magnus (c.1270), *The Generation of the Elements* (*De Generatione Elementorum*); cited by Mellor in section on matter and energy (1922)

> "All physical science starts from certain postulates. One of them is the objective existence of a real world."
>
> — Thomas Huxley (1887), cited by Mellor, in: chapter twelve "Thermodynamics and Thermochemistry" (1922)

Education

In 1899, Mellor completed a degree in chemistry, with first class honors, at Otago University, New Zealand, after which he was awarded a research scholarship to the University of Manchester.

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1. Mellor, Joseph W. (1902). *Higher Mathematics for Students of Chemistry and Physics*: *with special reference to the work of J.W. Mellor* (exact differential, pg. 57-62). Longmans, Green, and Co.
2. (a) Mellor, Joseph W. (1922). *A Comprehensive Treatise on Inorganic and Theoretical Chemistry*, *Volume One* (§: Chemical Affinity, pgs. 291-93; §12: Thermodynamics and Thermochemistry, pgs. 688-; Magnus, 32+ pgs; "accidental forms", pg. 688; Aurelius, pg. 688). Longmans.
(b) Mellor, Joseph W. (1922). *A Comprehensive Treatise on Inorganic and Theoretical Chemistry*, *Volume Two*. Longmans.

External links

â— Joseph William Mellor – Wikipedia.
â— Mellor, Joseph William (1873-1938) – WorldCat Identities.

θΔics

In existographies, **Joseph Montgolfier** (1740-1810) (IQ:#|#) was a French aeronautics engineer and paper manufacturer, noted for []

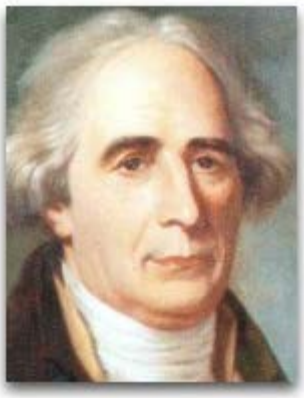

Overview

In 1760s, Montgolfier, in his early 20s, while observing laundry drying over a fire incidentally form pockets that billowed upwards, he began to contemplate the building of a hot air powered flying machine.

In 1775, Montgolfier built parachutes and did test jumps from his family house.

In 1782, Montgolfier, together with his brother Etienne Montgolfier, who originally was averse (Q) to the idea, built a working hot air balloon.

On 4 Jun 1783, Montgolfier, and his brother, demonstrated an unmanned hot air balloon before the provincial Estates of Vivarais. News of this flight quickly reached Paris, where a commission from the Royal Academy of Sciences followed. (Q)

On 21 Nov 1783, Montgolfier flew a manned hot air balloon.

Related

On 1 Dec 1783, Jacques Charles few a manned helium filled balloon. This, supposedly, launched a rivalry of sorts, as to which type of ballooning method was the best. (Q)

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See also

- Francesco Terzi

External links

- Montgolfier brothers – Wikipedia.

θΔics

In animate thermodynamics, **Joseph John Murphy** (1827-1894) was an Irish poet, natural philosopher, and science and religion reconciliatory, noted for his 1869 *Habit and Intelligence in their Connexion with the Laws of Matter and Force*, wherein he attempts to grapple with thermodynamics and evolution.

Overview

In 1869, Murphy, in his 1869 *Habit and Intelligence in their Connexion with the Laws of Matter and Force*, a completely original work as he states,
he attempts to integrate the recent work of Charles Darwin (*Origin of Species*, 1859) and the newly-developed principles of thermodynamics (particularly the views of Hermann Helmholtz) to outline some type of laws of the habit and intelligence, as he sees things.

Murphy defines thermo-dynamics (although he doesn't actually use this term) as the theory that proved that "heat consists in molecular motions, and that the laws of heat are only a particular case of the laws of force", and on this definition attempts to outline a "dynamics of life".

The book contains a number of interesting chapters for such a date, such as on topics including: chemical energy, chemical affinity, the "border-land where life comes into contact with inorganic matter and force", among others.

Of note, Murphy compares the animal organism to the steam engine, and reasoned that a "vital energy", a variable quantity of static actual energy, is capable of being transformed when needed either into heat or into muscular motor power. He regarded vital energy as "a distinct form of actual energy, just like heat, electricity, magnetism, or the energy of motion. [1]

In his treatise, Murphy seems to make an attempt at the phenomenon of exothermic (heat releasing) and endothermic (heat absorbing) reactions, with his notion of "thermo-positive" and "thermo-negative" compounds.

Dead matter

An updated and revises second edition was published in 1879 in an attempt to incorporated recent advances in knowledge seen in the previous decade. The revised work moves the tenuous subject of the "origin of life" into the third chapter position, opening with a query on how "dead matter" (or "dead molecules" as recent works have addressed things) give rise to "living matter" (or "living molecules", recent): [2]

> "Question whether life can evolve from matter.—We have seen in the preceding chapter that life appears to consist in the peculiar relations of the organism, or living being, to matter and energy. This however does not solve the questions, whether the peculiar vital principle is a resultant from the powers of dead matter, and whether life can be produced from inorganic matter by any physico-chemical process."

This sticky point issue quickly rises to the fore in the works of authors attempting to reconcile religion and science; a recent example being the work of Christian de Quincey, who asks in his 2002 book *Radical Nature.* [3]

Education

Murphy's education, born into a wealthy family, was almost wholly "at home" and he had no university training, a loss due to the fact that nonconformists were then excluded from all the universities; he was always studious, and an omnivorous reader, but independent and outspoken in his judgments, sentiments, opinions, speculations. [4]

References

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θΔics

In existographies, **Joseph Needham** (1900-1995) (CR:25) was a British biochemist (chnopsologist), embryologist, sinologist, Chinese chemistry historian noted for various publications in attempt to reconcile the tendency to disorder view of the second law with the tendency to order view of biological and social evolution and for being a mentor to English human chemistry historian Jeremy Adler.

Overview

In 1936, Needham, in his Silliman memorial lecture (religious-based science lecture) turned book *Order and Life*, states: [1]

> "For the astronomers and the physicists the world is, in popular words, continually 'running down' to a state of dead inertness when heat has been uniformly distributed through it. For the biologists and sociologists, a part of the world, at any rate is undergoing a progressive development in which an upward trend is seen, lower states of organization being succeeded by higher states. For the ordinary man the contradiction, if such it is, is serious, because many physicist, in expounding the former of these principles, the second law of thermodynamics, employ the word 'organization' and say it is always decreasing."

Here, Needham points out that the view promoted by the physicists, that organizations or orderings in nature are always decreasing, is a serious contradiction to the common sense the ordinary man who sees processes as striving for order socially and biologically.

In 1942, Needham penned "Evolution and Thermodynamics: a Paradox with Social Significance", a paper in the construction of which he consulted a number of leading thinkers, including English thermodynamicist Edward Guggenheim and a "Professor Polanyi" (Karl Polanyi or Michael Polanyi?), among others, on the problem of the seeming contradiction between the second law and the progressive development seen in biology and sociology. [4]

Needham, somewhere in his 1943 *Time: the Refreshing River (Essays and Addresses, 1932-1942)*, differentiates thermodynamic order from biological organization, discussing entropy as "mixed-up-ness" and "separatedness". [4]

Steam engine | History

In 1963, Needham, in his the 'Pre-Natal History of the Steam-Engine', according to where the origin of every single part of the compound mechanism is discussed and traced (boiler, cylinder and piston, double acting principle, crank and rod transmission, etc.). [6]

In 1987, Needham, in his chapter section "Gunpowder as the Fourth Force: its Role in the History of Steam Engines", the culmination his five-volume *Science and Civilization in China*, attempted to connect the invention of gunpowder by the Chinese to the first gunpowder engines by Leonardo Da Vinci (1508) and Christiaan Huygens (1773) and others to follow. [6]

Human chemistry

Sometime in the mid 1970s, English graduate student Jeremy Adler joined the outfit of historians of science in England, including: Joseph Needham, Walter Pagel, Roy Porter, Nick Jardine, and others, interested in linking literature and science, to pursue research on the usage of affinity chemistry by Goethe in his 1809 novella *Elective Affinities*. Needham references Adler's history of affinity chemistry work in multi-volume 1954-1995 *Science and Civilization in China* in his chapter concerning Chinese affinity theory. [3]

Education

Needham completed his BS (1921), MS (Jan, 1925), and PhD (Oct, 1925) at Cambridge University, after which he did work in biochemistry and embryology. In 1948, he switched focus to the history of Chinese science, staying in this field until his retirement in 1990.

Quotes | On

The following are quotes on Needham:

> "Like Marx, **Joseph Needham** (1935) argued that 'the Carlylean tendency to regard the history of science as a succession of inexplicable geniuses arbitrarily bestowing knowledge upon mankind has now generally been given up as quite mythological. A scientific worker is necessarily a child of his time and the inheritor of the thought of many generations."
>
> — Sarah Franklin (2015), *Biological Relatives* (pg. 107); Twitted (O) by Philip Ball (2018)

Quotes | By

The following are quotes by Needham:

> "We cannot make any sharp line of distinction between the living and the non-living. At the level of the submicroscopic viruses, they overlap. Some particles show some of the properties of life but not others. Some 'dead' protein molecules are much bigger than the particles of some 'living' viruses. Particles which show the properties of life can be had in paracrystalline, and even in crystalline, form. There are many similarities between the morphology and behavior and crystals and the living organism."
>
> — Joseph Needham (1942), "Evolution and Thermodynamics" [5]

> "From this point of view [categories of organization and energy as replacing the more ancient concepts of form and matter], there can no longer be any barrier between morphology and chemistry. We may hope that the future will show us, not only what laws the from of living organisms exhibit at its own level, but also show how these laws are integrated with those which appear at the lower levels of organization."
>
> — Joseph Needham (1943), "A Biologists View of Whitehead's Philosophy", in: *Time: the Refreshing River* (pg. 206); cited by Roderick Seidenberg (1950) in *Post-Historic Man* (pg. 163)

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(b) Reti, Ladislao. (1969). “Leonardo da Vinci the Technologist: the Problem of Prime Movers”, in: *Leonardo’s Legacy: and International Symposium* (editor: C.D. O’Malley) §4:67-100; quotes, pgs. 95-98). University of California Press.
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Further reading

● Needham, Joseph. (1951). “Human Law and the Laws of Nature” (O). Cambridge University Press; in: *The Grand Titration: Science and Society in East and West* (§8: Human Law and the Laws of Nature, pgs. #). Routledge, 1969.

External links

● Joseph Needham – Wikipedia.

θΔics

In existographies, **Joseph Priestley** (1733-1804) (IQ:180|#173) (Cattell 1000:338) [RGM:503|1,500+] (Murray 4000:4|C) (Gottlieb 1000:137) (Becker 160:81) (GCE:7) (CR:45) was an English polymath noted for his 1774 theory of phlogiston as the driving force for chemical reaction—the forerunner, in conceptual form, details aside, according to Leslie Woodcock (2005), of Gibbs free energy.

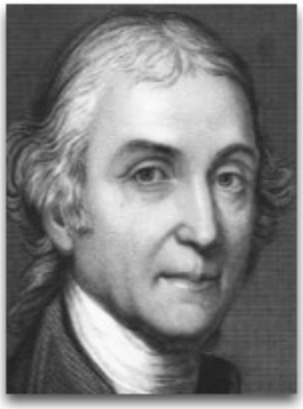

Electricity

In 1767, Priestly, noticing an analogy with the inverse square law of gravitational force, conducted some type of experiment with a charged shell and a small mass, placed exterior and interior to the shell, and thereby deduced the inverse square law of force between electric charges, some near two-decades before this would become known, famously, as Coulomb's law, via the more publicized 1785, independent, experiments of Charles Coulomb. [3]

Gas laws

In c.1770, Priestly, building the work of Guillaume Amontons (1703), he became the first person, supposedly, to investigate the expansion of gases by heat, other than air; the following shows his apparatus and results: [5]

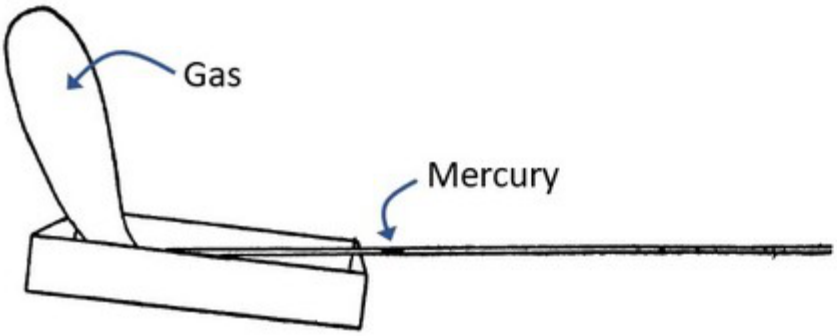

Common air . .	1·31 inches
Hydrogen . .	2·05 ,,
Nitric oxide . .	2·02 ,,
Carbon dioxide .	2·20 ,,
Hydrochloric acid gas	1·33 ,,
Oxygen . . .	2·21 ,,
Nitrogen . . .	1.65 ,,
Sulphur dioxide .	2·37 ,,
Hydrofluoric acid gas	2·83 ,,
Ammonia . .	4·75 ,,

(add)

Influenced

In 1785, Charles Coulomb construction of a built a torsion balance (Q), as shown, wherein, in an effort to prove Priestly's 1766 inference that the force of attraction or repulsion between two small charged spheres would be inversely proportional to the square of the separating distance, using Hooke's spring law, and showed quantitatively that charged spheres haven an inverse proportionality relationship, which he explained formulaically (see: Coulomb's law)

Religion

In 1772, Priestley, in his *Institutes of Natural and Revealed Religion*, argued against atheism, aiming instead to outline a combined: theism, materialism, and determinism theory.

In 1777, Priestley published his soul theory espousing *Disquisitions Relating to Matter and Spirit: the History of the Philosophical Doctrine Concerning the Origin of the Soul, and the Nature of Matter; with its Influence on Christianity, Especially with Reflection to the Doctrine of the Pre-existence of Christ*, wherein, supposedly, he espoused a materialist philosophy, which entailed denial of free will and the soul (specifically: he denied the materialism of the soul, while simultaneously claiming its existence, in some way), and argued that there is no mind-body duality. [4]

By 1782, over a dozen hostile refutations were published; Priestley was labeled an atheist.

In 1782, an anonymous "Mr. Hammon", later said to be English chemist-physician Matthew Turner (Q), or possibly two authors combined, published *Answer to Dr. Priestley's Letters to a Philosophical Unbeliever* (Q), in which he states:

“as to the question whether there is such an existent being as an atheist, to put that out of all manner of doubt, I do declare upon my honor that I am one.” This statement, supposedly, is the first declaration of an overt or avowed atheist (see: atheism timeline) in Britain.

In 1791, Priestley’s London house and church were burned down by religiously-upset rioters (O); after which he was forced to flee to America.

Oxygen

In 1774, Priestley discovered oxygen, which he called "dephlogistated air", and attempted to redefine the old phlogiston theory; in opposition to Lavoisier’s newer caloric theory.

Phlogiston

In 1774 to 1786, Priestley, in his six-volume *Experiments and Observations on Different Kinds of Air*, published the results of a number of experiments he conducted on air, that worked to repudiated the last vestiges of four element theory, in which he attempted to situate his own variant of phlogiston theory. [1] Herein, according to English chemical thermodynamicist and chemistry historian Leslie Woodcock, Priestley posited phlogiston as the driving force for chemical reactions; thereby, supposedly, presaging Gibbs by some 200-years, a precursor to Gibbs free energy, in the following sense, as supposed by Woodcock: [1]

> “Every thermodynamic material does indeed have a constitutive state function, (‘phlogiston’?), which can be given a definition: ‘minus the Gibbs chemical potential of oxygen within the material.’ It has the dimensions of (free) energy per mole of oxygen, and measures its oxidation propensity. While the antiphlogistonists may have been the first inorganic chemists, Priestley’s conceptual interpretation of phlogiston was the first attempt at the physical chemistry of reactions. If phlogiston is regarded as an alternative description of ‘Gibbs free energy,’ the theory appears to be an intuitively accurate description, as could reasonably be expected at that time, and remains essentially correct today given its precise thermodynamic definition.”

(add discussion)

Other

Some of Priestley’s other noteworthy accomplishments, according to an overly-enthusiastic Leslie Woodcock, include: the description of atoms, 40 years before John Dalton; the hypothesis of the division of atoms, 150 years before Ernest Rutherford; the prediction of black holes, 200 years before Stephen Hawking; the positing of forces between atoms; 100 years before Johannes van der Waals; discovered photosynthesis and the carbon cycle; among others. [2]

Quotes | By

The following are noted quotes:

> “Will is nothing more than a particular case of the general doctrine of association of ideas, and therefore a perfectly mechanical thing.”
>
> — Joseph Priestley (c.1780), *Publication* (O)

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External links

- Joseph Priestley – Wikipedia.

θΔics

In existographies, **Joseph Scaliger** (1540-1609) (IQ:180|#209) (Cattell 1000:461) was a French religious leader, philosopher, and scholar; expanded the notion of classical history from Greek and ancient Roman history to include Persian, Babylonian, Jewish, and ancient Egyptian history.

Quotes | On

The following are quotes on Scaliger:

> "God cannot make a vacuum, because he cannot make anything dissimilar to himself. Since a vacuum is nothingness, it is clearly dissimilar to god, and since creation always has an end in something, god certainly did not create nothing."
>
> — Joseph Scaliger (c.1600), synopsis quote of view; according to Otto Guericke (1672) [1]

> "As for the opinions of Epigenes, Bienewitz, Cardano, **Scaliger**, let these pass because they are not apposite to the subject and I do not have the at hand right now a copy of their work. As for whether storms are stirred by demons, as Paracelsus holds, this should be discussed at some length and a distinction should be made between the demons."
>
> — Otto Guericke (1665), "Reply Letter to Sanislaus Lubienietzki", Mar 29; in *New Experiments on the Vacuum of Space* (pg. 289)

> "Christoph Rothmann who did not withdraw from entering into the so-called field of combat with **Scaliger** on the subject of comets, declared, in a certain letter to Tycho, that: 'the lighter exhalations of the earth are carried on high with the help of good angels and are lifted above the moon, which the result that, being lighted by the penetrating rays of the sun there, they appear in the form of comets with tails or beards."
>
> — Otto Guericke (1665), "Reply Letter to Sanislaus Lubienietzki", Aug 5/15; in *New Experiments on the Vacuum of Space* (pg. 298)

References

1. Guericke, Otto and Schott, Kaspar. (1672). *Otto Guericke's New Experiments: on (as they are called) on the Magdeburg vacuum space* (*Ottonis De Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (preface, pdf) (pg. 87). Janssonius a Waesberge.

External links

â— Joseph Justus Scaliger – Wikipedia.

θΔics

In hmolscience, **Joseph Schumpeter** (1883-1950) (CR:22) was an Austrian-born American economist and political scientist, part of the Harvard Pareto circle, noted for his effort to study what he called "scientific economics", a version of economics that is equated with physics, and for his discussions on the rise and fall of people, which he viewed as human molecules, in social classes.

Human molecules | Social class rise and fall theory

In 1942, in commentary on the rise and fall of human molecules in social classes over generations, Schumpeter stated the following logic: [1]

> "It can be shown that in all cases, that human molecules rise and fall within the class into which they are born, in a manner which fits the hypothesis that they do so because of their relative aptitudes; and it can also be shown, second, that they rise and fall across the boundary lines of their class in the same manner. This rise and fall into higher and lower classes as a rule takes more than one generation. These molecules are therefore families [see: family molecule] rather than individuals. And this explains why observers who focus attention on individuals so frequently fail to find any relation between ability and class position."

This rise and fall of human molecules in social structure theory, to note, is but a footnote, digressing on a theory that Schumpeter says he would like to elaborate on in the framework of a book, but this not at the moment being possibly, is something about which he refers readers to his 1927 "Theory of Social Classes in the Ethnic Homogenous Milieu" [3]

In this quote, Schumpeter seems to be digging around in a number of issues: one that human molecules are coupled to each other, especially in family lineages; to that a group of human molecules can also be termed or considered a new type of larger aggregate human molecule, e.g. such as the trihumanide molecule (three human molecules bonded in a unit); among other factors.

The quote also brings to mind the famous 1980s "lazy ant study".

It is likely Schumpeter employed the "human molecule" view after coming across this logic in his studies of the Lausanne school, being that he penned articles on human molecular theorists such as Vilfredo Pareto and Leon Walrus.

Other

American physical economics historian Philip Mirowski describes Schumpeter's *History of Economic Analysis* as a "breathtakingly audacious misrepresentation of both the history of economics and the history of physics", supposedly for his discussion of James Joule's version of the conservation of energy (or rather mechanical equivalent of heat) and Leonhard Euler's development of the variational principles. [2]

References

1. Schumpeter, Joseph. (1942). *Capitalism, Socialism, and Democracy* (§18: The Human Element, pgs. 200-218; human molecules, pg. 204). Routledge.
2. Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics.* Cambridge University Press.
3. Schumpeter, Joseph A. (1927). "Theory of Social Classes in the Ethnic Homogenous Milieu" ("Theorie der sozialen Klassen im ethnisch homgene Milieu"), *Archiv fur Soziallwissenichaft.*

External links

â— Joseph Schumpeter – Wikipedia.

θΔics

In existographies, **Joseph John Thomson** (1856-1940) (IQ:180|#192) (RGM:404|1,500+) (Murray 4000:8|P) [Kanowitz 50:33] (GPE:19) (CR:22), aka "J.J. Thomson", was an English physicist noted for []

Overview

In 1897, Thomson, in his “On Cathode Rays”, discussed some of the results his cathode-ray experiments done to test some of the consequences of the so-called “electrified-particle theory”, as he called it, wherein he posited the existence of “negatively electrified particles”, previously dubbed “electrons”.
In 1904, using the geometrical pattern results of Alfred Mayer’s 1878 “floating magnets” experiment, Thomson famously posited the so-called “plum pudding” model of the atom, according to which negatively charged particles were embedded within a sea of positive charge.

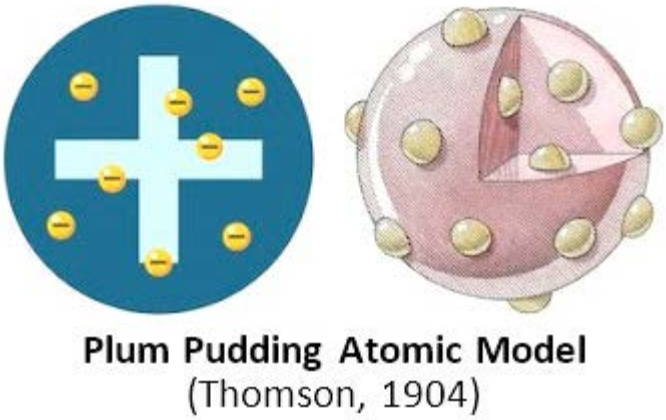

This was a big stepping stone in the history of atomic theory.

Rutherford

Thomson’s plum pudding model held sway until 1909, during which year Ernest Rutherford conducted his famous “gold foil experiment”, in which he fired positively charged alpha particles at thin sheets of gold foil, expecting the particles to pass through, only to be surprised that some of the particles bounced backwards, leaving him to conclude that the atom had most of its mass at the center characterized by a "positive central charge *N* e, and surrounded by a compensating charge of *N* electrons", and later coined the term 'proton' (1919) for this positive structure, i.e. the structure of hydrogen nuclei specifically. [2]

Quotes | By

The following are quotes by Thomson:

> “The atoms of the elements consist of a number of negatively electrified corpuscles [see: electron] enclosed in a sphere of uniform positive electrification [see: proton].”
>
> — Joseph Thomson (1904), “On the Structure of the Atom”, Mar [3]

References

1. Thomson, Joseph J. (1897). “On Cathode Rays” (Ñº), *Proceedings of the Cambridge Philosophical Society*, Feb 8, 9:243-71; in: *Philosophical Magazine*, 44:293-316.
2. Rutherford, Ernest. (1911). “The Scattering of α and β Particles by Matter and the Structure of the Atom”,

Philosophical Magazine, 21: 669-88, Apr.
3. Thomson, Joseph. (1904). “On the Structure of the Atom: an Investigation of the Stability and Periods of Oscillation of a number of Corpuscles arranged at Equal Intervals around the Circumference of a Circle; with Application of the Results to the Theory of Atomic Structure” (pdf), *Philosophical Magazine*, 7(39):237-65.

External links

â— J.J. Thomson – Wikipedia.

θΔics

In existographies, **Joseph Daniel Unwin** (1895-1936) (CR:2), cited as "J.D. Unwin", was an English anthropologist noted for his efforts for ferret out a "theory of the sexual foundations for a new society" (Ñº), the gist of which being that there exists a positive correlation between the degree of conditions imposed on the marital bond, and the monogamous strength of the bond maintained therefrom, and the level of the social energy of the society produced therefrom; he also has a unique spin on social entropy.

Overview

In 1934, Unwin, in his *Sex and Culture*, summarized the results of a study of 80 primitive tribes and 6 known civilizations through 5,000 years of history, wherein he found a positive correlation between the cultural achievement of a people and the sexual restraint they observe, which he describes in terms of forces, energy (e.g. social energy), and entropy (e.g. social entropy); the following are representative views: [1]

> "All the deistic societies insisted on pre-nuptial chastity; conversely, all the societies which insisted on pre-nuptial chastity were in the deistic condition. Is there any causal relationship between the compulsory continence and the thought, reflection and energy which produced the change from one cultural condition to another? One thing is certain: if a causal relation exists, the continence must have caused the thought, not the thought the continence. The power of thought is inherent; similarly, the power to display social energy is inherent; but neither mental nor social energy can be manifested except under certain conditions. The group within the society which suffers the greatest continence displays the greatest energy and dominates the society."

In 1938, Aldous Huxley, in his *Ends and Means*, spends a good amount time quoting and digressing on Unwin's social energy as a function of pre-nuptial and post-nuptial marital rules; Huxley summarizes Unwin's theory as follow: [2]

> "All human societies are in one another of four cultural conditions: zoistic, monistic, deistic, rationalistic. Of these societies, the zoistic display the least amount of mental and social energy, the rationalistic the most. Investigation shows that the societies exhibiting the least amount of energy are those where pre-nuptial continence is not imposed and where the opportunities for sexual indulgence after marriage are greatest. The cultural condition of a society rises in exact proportion as it imposes pre-nuptial and post-nuptial restraints upon sexual opportunity."

Huxley, continues his elaboration on Unwin's key points as follows:

> "The energy produced by sexual continence starts as 'expansive energy' and results in the society becoming aggressive, conquering its less energetic neighbors, sending out colonies, developing its commerce and the like. But 'when the rigorous tradition (of sexual restraint) is inherited by a number of generations, the energy becomes productive.' Productive energy does not spend itself exclusively in expansion; it also goes into science, speculation, art and social reform."

(add)

Social entropy

Huxley next (pg. 362) summarized Unwin's ideas on social entropy as follows:

> "Where productive energy persists for some time, a factor which Unwin calls 'human entropy' comes into

> play. Human entropy is the inherent tendency, manifested as soon as the suitable social conditions are created, towards increased refinement and accuracy. 'No society can display productive social energy unless a new generation inherits a social system under which sexual opportunity is reduced to a minimum. If such a system be preserved a richer and yet richer tradition will be created, refined by human entropy'."

Huxley continues:

> "As a matter of brute historical fact, no civilized society has tolerated for very long the limitation to a minimum of its sexual opportunities. Within a few generations, the
> rules imposing absolute pre-nuptial continence upon females and absolutely monogamous forms of marriage are relaxed. When this happens, the society or the class loses its energy and is replaced by another society, or another class, whose members have made themselves energetic by practicing sexual continence. 'Sometimes', writes Unwin, 'a man has been heard to declare that he wishes both to enjoy the advantages of high culture and to abolish compulsory continence. The inherent nature of the human organism, however, seems to be such that these desires are incompatible, even contradictory. Any human society is free to choose, either to display great energy or to enjoy sexual freedom; the evidence is that it cannot do both for more than one generation'."

(add)

Forces | Energy

Huxley comments (pg. 364) on Unwin's forces model of the zoistic society as follows:

> "Zoistic societies live in a condition of animal solidarity. In Unwin's words, 'we begin with a society in which all the individuals are locked together by forces we do not understand such a society displays no energy."

(add)

Education

Unwin was associated with Oxford University and Cambridge University.

References

1. (a) Unwin, Joseph D. (1935). *Sex and Culture*. Publisher.
(b) Huxley, Aldous. (1938). *Ends and Means: An Enquiry Into the Ideals and Into the Methods Employed for their Realization* (Arc) (pg. 361). Chatto & Windus.
2. Huxley, Aldous. (1938). *Ends and Means: An Enquiry Into the Ideals and Into the Methods Employed for their Realization* (pg. 360-61). Chatto & Windus.

Further reading

â— Unwin, Joseph D. (1927). "Monogamy as a Condition of Social Energy", *The Hibbert Journal*, 25:662.

External links

â— J.D. Unwin – Wikipedia.

In hmolscience, **Joseph Vogel** (c.1960-) is an American-born Puerto Rican chemist turned economist noted, in human thermodynamics, for his 1987 to present efforts to meld thermodynamics logic into economics.

Overview

In 1987, Vogel completed his PhD with a dissertation on "The Economic Implications of Sociobiology and Evolution from and Economic Viewpoint: Another Look at Entropy", and in 2009 published the book *The Economics of the Yasuní Initiative: Climate Change as if Thermodynamics Mattered*. [1]

Education

Vogel completed his BA in chemistry and Spanish in 1977 at Durham, North Carolina; his MBA in 1978 at the American Graduate School of International Management, Glendale, Arizona; was a visiting doctoral student at Harvard University, working under evolutionary biologist Edwin Wilson, from 1984 to 1986; and completed his completed his PhD in economics and biosocial anthropology in 1987 at Rutgers University. Since 2003, Vogel has been an economics professor at the University of Puerto Rico.

References

1. (a) Vogel, Joseph H. (1987). "The Economic Implications of Sociobiology and Evolution from and Economic Viewpoint: Another Look at Entropy", PhD thesis/dissertation. Rutgers University.
(b) Vogel, Joseph H. (2009). *The Economics of the Yasuní Initiative: Climate Change as if Thermodynamics Mattered*. Anthem Press.

External links

â— Economics – JosephHenryVogel.com.

θΔics

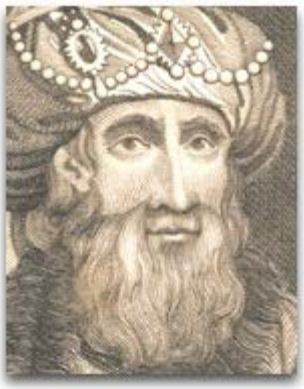

In existographies, **Josephus** (c.37-100AD) (IQ:155|#535) (Cattell 1000: 645) (CR:7), aka "Flavius Josephus", was a Roman-Jewish historian, scholar, and hagiographer, oft-cited in the silent historians problem on whether or not he refers to a "Jesus" as the "Christ", a factoid that was “unknown to” Origen (c.230AD), who had copies of Josephus; he also conjectured that the Jewish exodus was based on the 1300BC expulsion of the Hyksos from Egypt.

Moses

In c.80AD, Josephus, citing Manetho, conjectured that the expulsion of the Hyksos from Egypt (c.1600BC) (see: supreme god timeline) was the origin of the mythical story of the Jewish exodus. (Q)(Q)

Silent historians

See main: Silent historians problem

In 94AD, Josephus is purported (Q) to have said the following about a was man named Jesus: [3]

> “Now there was about this time **Jesus**, a wise man, if it be lawful to call him a man; for he was a doer of wonderful works, a teacher of such men as receive the truth with pleasure. He drew over to him both many of the Jews and many of the Gentiles. He was [the] Christ. And when Pilate, at the suggestion of the principal men amongst us, had condemned him to the cross, those that loved him at the first did not forsake him; for he appeared to them alive again the third day; as the divine prophets had foretold these and ten thousand other wonderful things concerning him. And the tribe of Christians, so named from him, are not extinct at this day.”
>
> — Josephus (94AD), *The Antiquities of the Jews* (§3.3) (Q)

This passage, however, as William Smith, in his *The Silence of Josephus and Tacitus* (1910), points out, was “unknown to” Origen (c.230AD), who had copies of Josephus, and also unknown to earlier writers, such as Irenaeus, Tertullian, and Clement of Alexandria, which points to the conclusion that this was “interpolated in” by a later post-Origen Christian hand; it is invented history, so to say. [7]

Quotes | On

The following are quotes on Josephus:

> “Several learned men have testified their surprise at not finding in the historian, **Flavius Josephus**, any mention of Jesus Christ; for all men of true learning are now agreed that the short passage relative to him in that history has been interpolated. The father of Flavius Josephus must, however, have been witness to all the miracles of Jesus. Josephus was of the sacerdotal race and akin to Herod’s wife, Mariamne. He gives us long details of all that prince’s actions, yet says not a word of the life or death of Jesus; nor does this historian, who disguises none of Herod’s cruelties, say one word of the general massacre of the infants ordered by him on hearing that there was born a king of the Jews. The Greek calendar estimates the number of children murdered on this occasion at fourteen thousand. This is, of all actions of all tyrants, the most horrible. There is no example of it in the history of the whole world. Yet the best writer the Jews have ever had, the only one esteemed by the Greeks and Romans, makes no mention of an event so singular and so frightful. He says nothing of the appearance of a new star in the east after the birth of our Savior — a brilliant phenomenon, which could not escape the knowledge of a historian so enlightened as Josephus. He is also silent respecting the darkness which, on our Savior’s death, covered the whole earth for three hours at midday — the great number of graves that opened at that moment, and the multitude of the just that rose again.”

— Voltaire (1776), *Philosophical Dictionary* (Q)

> "Claims of Mary's authenticity would never stand up in a court of law because, apart from what is written in the Bible, there is little evidence of the existence of either Mary or Jesus Christ. Historians such as **Josephus**, Tacitus, Suetonius and Pliny the Younger, who are near-contemporaries of Mary and Jesus, are **largely silent** on the subject."

— Michael Jordan (2001), *The Historical Mary* (xv)

References

1. (a) Paulkovich, Michael. (2013). *No Meek Messiah*. Publisher.
(b) Paulkovich, Michael B. (2014). "God on Trial: The Fable of the Christ" (Q), *Free Inquiry*, 34(5).
2. Smith, William B. (1910). *The Silence of Josephus and Tacitus* (pg. 6). Open Court.

External links

- Josephus – Wikipedia.

θΔics

In religio-mythology, **Joshua**, from *Jo-* meaning "god" + *-Shua* meaning "Shu", i.e. **"god Shu"**, or "Jah" (name of god) + Shu (Egyptian air god) (Massey, 1881), the namesake of the sixth chapter of the Old Testament of the Bible, i.e. Book of Joshua, described as **"son of Nun"**, born in Egypt prior to the Exodus, who became successor to Moses, is the Hebrew recension god-to-prophet rescript of the Egyptian god Shu, the god of air.

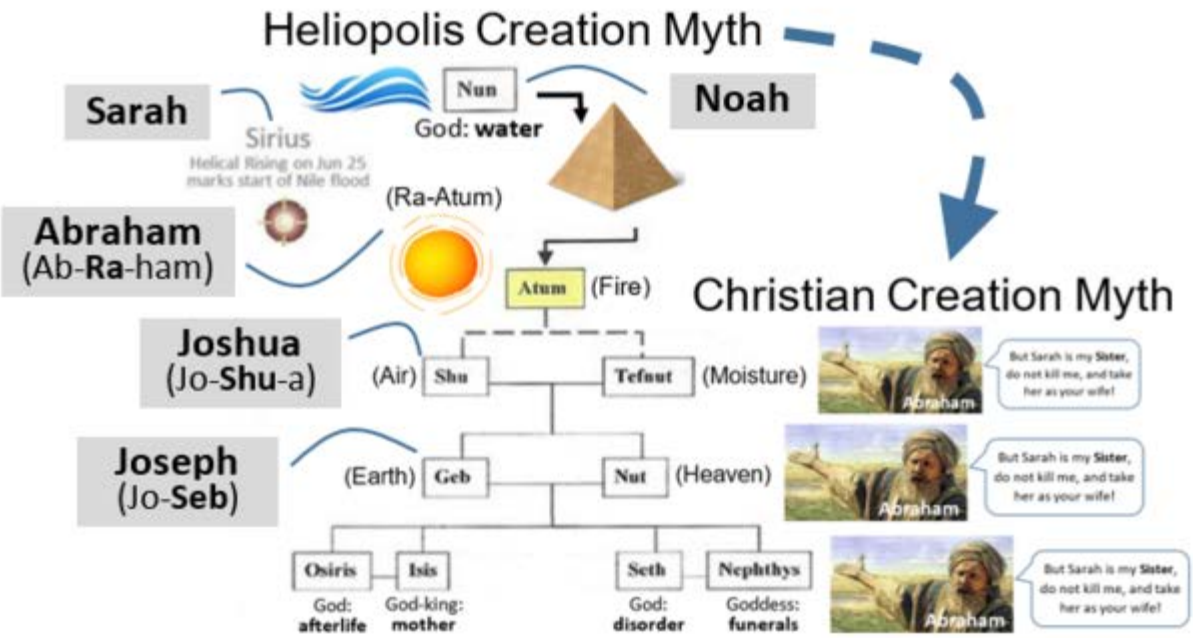

The gist of how the Egyptian gods, in the Jewish recension, became Judaic prophets (see: religious prophets); about which, Galileo (1614) was queried to explain how Copernican cosmology, with its "moving earth", could explain **Joshua 10:13**, based on the model that it is the sun (Ra) and moon (Thoth) that "move" about a stationary earth (Geb), according to Heliopolis cosmology (Heliopolis creation myth). [1]

Etymology

In 1881, Gerald Massey, in his *A Book of Beginnings* (pg. 285), decoded the Joshua equals "god Shu" etymology as follows:

> "Now as the name of **Joshua** was altered in order that the name of the male god Jah, made known by Moses, might be compounded with that of Shu or Shva ; and as Jah-Adonai is the sun-god Ra who adopted Shu as his son in the solar regime, it follows that Jah-Shua is the Hebrew equivalent Shu-si-Ra, and the original Oshea becomes the son of Adonai-Jah, just as the pre-solar god Shu in the creation by Ra becomes the son of Ra, whereas previously he was, like Joshua, the sun of Nun."

In 1907, Massey, in his *Ancient Egypt: the Light of the Modern World* (Ñº), elaborated on the above in more detail. Others to do the Joshua equals Shu etymology include: Andre Austin (c.2015) (Ñº) and Libb Thims (2016), the latter, independently, while reading the story of the Sorrows of Isis in Muata Ashby (1997) and later Wallis Budge (1904).

Joshua 10:13

The most cited mention, in secular literature, of Joshua is the story, as told in Joshua 10:13, of Joshua commanding both the sun and the moon stood still for an entire day; the physically-impossible descriptions, which has troubled geniuses (Maimonides, Gersonides, Galileo, Spinoza, Herder, Paine, Napoleon, etc.) for centuries, is a monotheistic rescript of the Egyptian mythology story of the Sorrows of Isis (line 205), wherein Isis finds her son Horus foaming at the mouth after being bitten by a scorpion and summons Ra the "sun" god and Thoth the "moon" god to her aid, to stop time and to heal her son; the god Shu, originally the grandfather of Isis, according to Heliopolis creation myth, becomes the man Joshua, from *Jo-* meaning "god" + *-Shua* meaning "Shu". [1]

References

1. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

External links

â— Joshua – Wikipedia.

θΔics

In religio-mythology, **Joshua 10:13**, is section 10, line 13, of the Book of Joshua (aka Book of god Shu), from the Old Testament, of the Bible, the first book after the Pentateuch (five books of Moses), wherein, in the physically-impossible riddled statement that both the sun and the moon stood still for an entire day is infamously found.

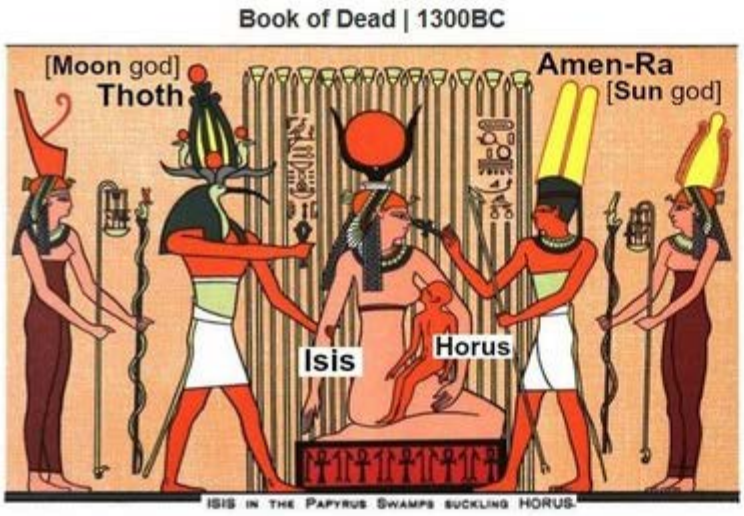

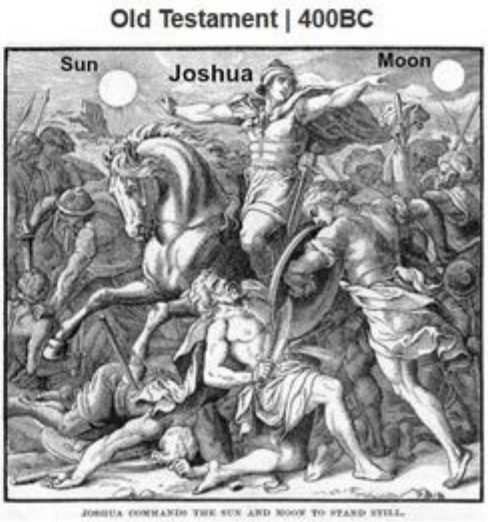

Left: the Illustration from the *Book of the Dead* (1300BC) showing the Isis in the papyrus swamps, in the region of Buto (O), in nome 5 of Lower Egypt, suckling Horus, before he is stung by a scorpion, and stabbed by Aun-ab (slayer of the heart), per order of the evil Set, who is then brought back to life, by the cries of Isis, which stops the sun boat of Ra and which brings the moon god Thoth to her aid. [4] This became re-told as **Joshua 10:13** in the Bible, to the effect that god (or Joshua) made the sun and the moon stand still for a day. Right: a depiction of Joshua, on horseback who, in the midst of a battle, commands the sun and the moon to stand still. (O)

Overview

The Biblical KJV version (1611) of the Joshua 10:13 statement is as follows: [1]

> "And the **sun stood still**, and the **moon stayed**, until the people had avenged themselves upon their enemies. Is not this written in the *Book of Jasher* [*Book of god Shu*]? So the sun stood still in the midst of heaven, and hasted not to go down about **a whole day**."

This, of course, is physically impossible. Prior to Copernicus, however, people in large were geocentrists, meaning they believed the earth is immobile and at the center of the universe, and that the sun and the moon went around the earth. Now we believe, a few Muslim enclaves aside, that the moon goes around the earth, but the earth goes around the sun, and the sun goes around the milky way, all of which never stop moving.

Joshua | God Shu

An important point to the puzzling Biblical story of Joshua making the sun and moon stand still for a day originated as an astro-theology based story of actual perceptual movements of the constellations, sun, moon, and earth; the following passage gives a hint of this:

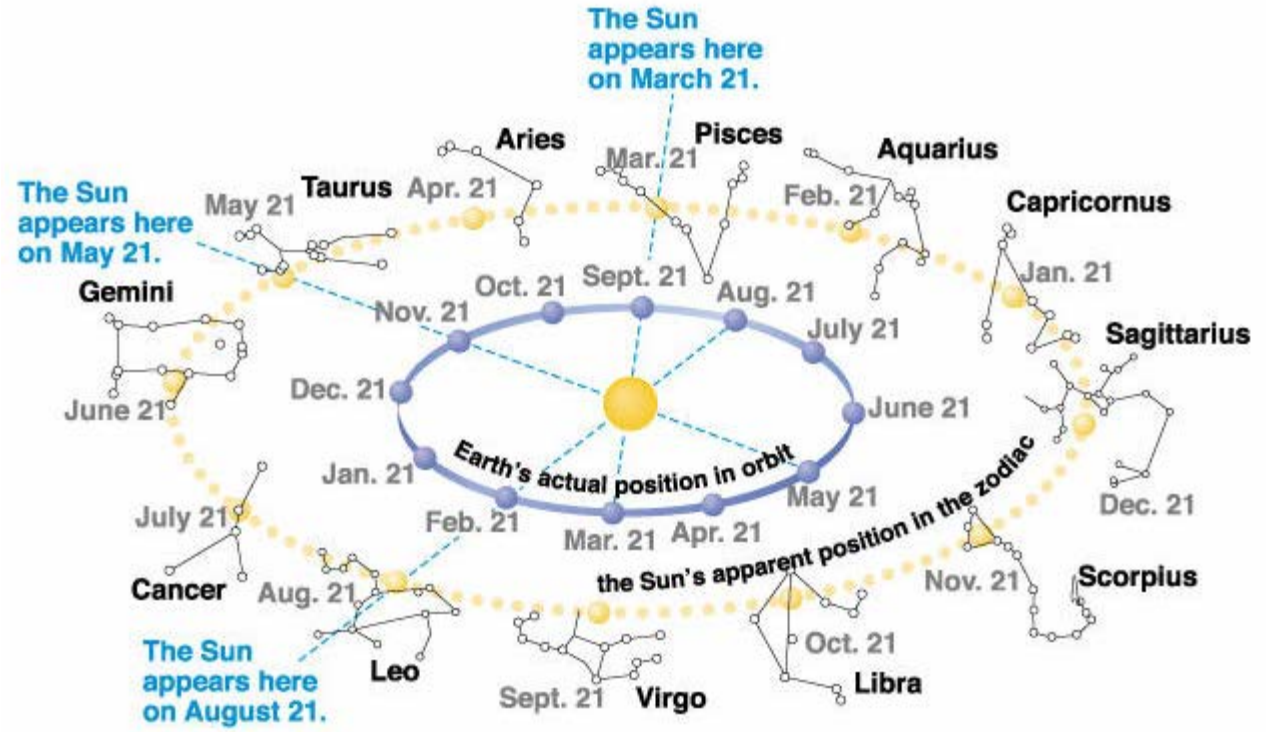

A depiction of the Zodiac (Q) or 12 animal-shaped star constellations "apparent" to humans, each month, as the earth completes its annual rotation around the sun; the period of the "sun passing through Scorpius", in Nov, is said to have been, in Egyptian calendar terms, when Set trapped **Osiris in his chest** and also, supposedly, when Horus is bitten by the scorpion (see: Joshua 10:13)

"They say that the date on which this deed – Set trapping Osiris in chest and throwing it into the Nile – was done was the seventeenth day of Athyr [Nov 13] when the **sun passes through the Scorpion**, and in the twenty-eighth year of the reign of Osiris; but some say that these are the years of his life and not his reign."

— Plutarch (100AD), *On Isis and Osiris* (pg. 37); note: compare Horus being bitten by a scorpion and Isis summoning the sun and moon to heal him, as told in Sorrows of Isis (line 205), and as rescripted in Joshua 10:13

Here we see that the story of Horus being bitten by a scorpion is in some way a syncretism or aspect of the time of the year when the sun passes thought the Scorpion constellation, variants of which can be seen in the Egyptian myth (Q) of Orion battling the Scorpio.

Whatever the case, Osiris and Horus originally were different, non-overlapping, gods, Horus being the oldest of all gods, who later became synretized together into one overlapping story, i.e. Osiris trapped in chest (when the sun passes though the Scorpion) and Horus being bitten by a scorpion (after which the sun comes to his aid), as told in connected *Egyptian Book of the Dead* stories: Heliopolis creation myth, Passion of Osiris, and Sorrows of Isis.

In the late 19th century, following the translation of the Rosetta stone (c.1820), noted religio-mythology scholars to have decoded the Joshua equals god Shu etymology include: Gerald Massey (1881, 1907) (Q), Andre Austin (c.2015) (Q), and Libb Thims (2016) while reading the story of the Sorrows of Isis in Muata Ashby (1997) and later Wallis Budge (1904).

The adjacent Heliopolis creation myth

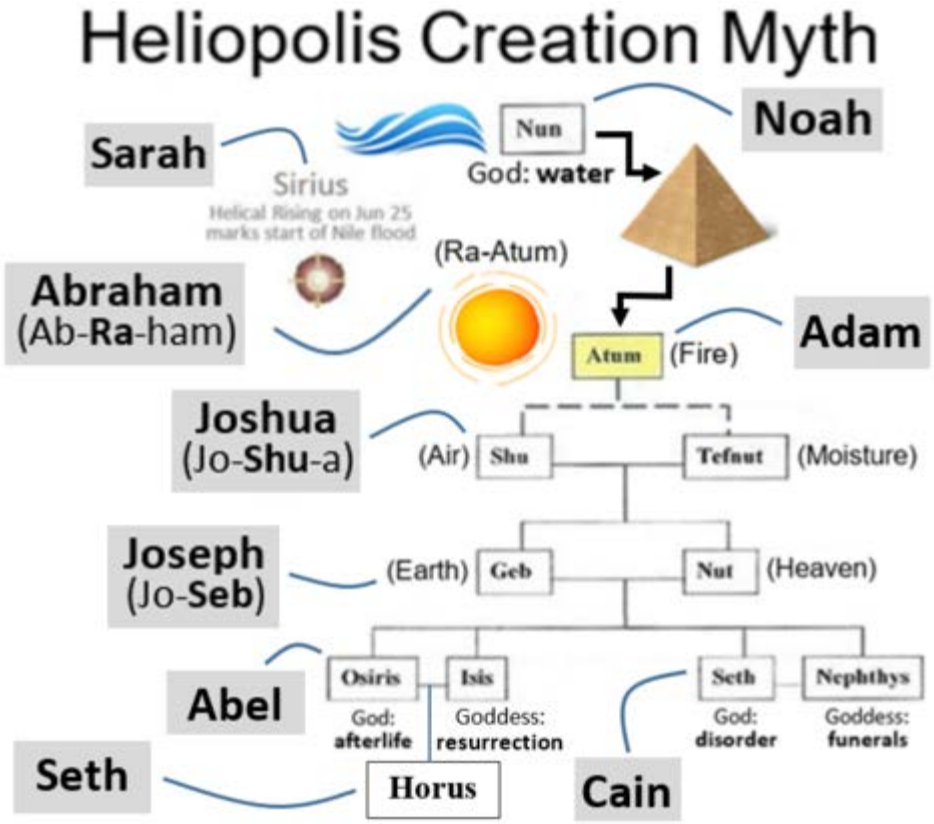

diagram shows how, in the Hebrew rescript of Egyptian religio-mythology, the god Shu became the prophet Joshua, and in turn how the story of Isis, the grand-daughter of Shu, and great grand-daughter of the sun god Ra (or Ra-Atum), using the power of Ra, by "stopping his solar boat", i.e. making the sun stand still, and the power of Thoth, the moon god, to bring Horus, her son, back to life, became the Biblical story of Joshua making the sun and the moon stand still, so he could kill his enemy.

The gist of how the Egyptian gods became Judaic prophets (see: religious prophets); about which, Galileo (1614) was queried to explain how Copernican cosmology, with its "moving earth", could explain **Joshua 10:13**, based on the model that it is the sun (Ra) and moon (Thoth) that "move" about a stationary earth (Geb), according to Heliopolis cosmology (Heliopolis creation myth).

Egyptian | Sorrow of Isis

See also: Ennead

The name Joshua or Jo- “god” + -Shu “wind god”, meaning god Shu, transliterates the so-called “Book of Joshua”, in the original form, as the “Book of god Shu”. The story of the sun and moon stopping, accordingly, is the story of the cry of Isis, the grand-daughter of the god Shu, making Ra the sun god stop in his boat, and Thoth the moon god come to her aid. The Book of Joshua, in short, on a rewrite or re-telling of the earlier Egyptian mythology story of the Sorrows of Isis (line 205), which is shown below:

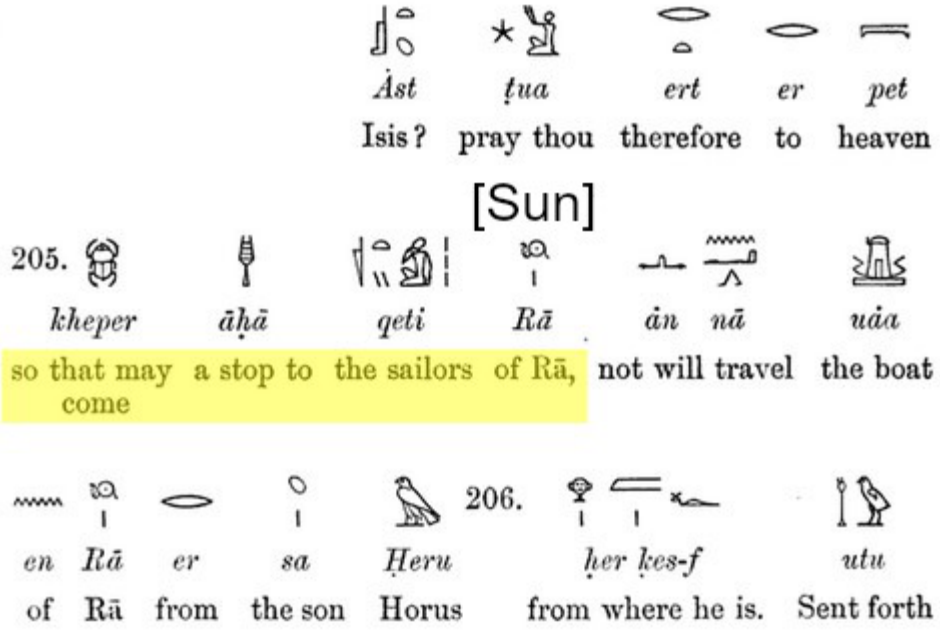

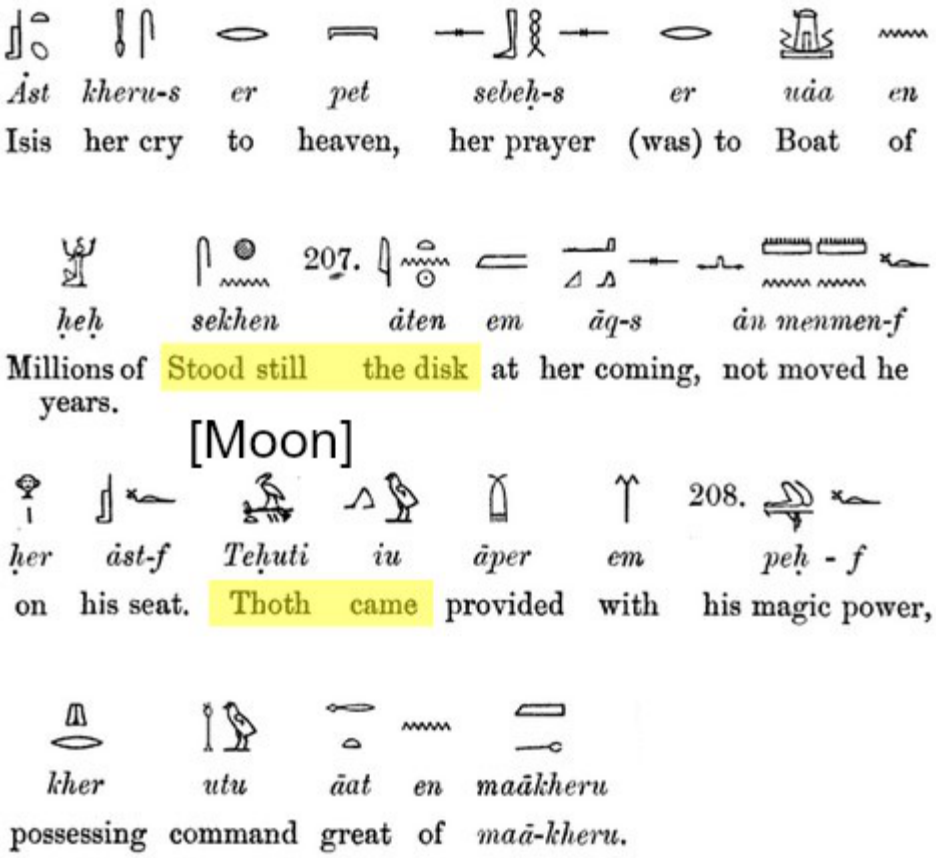

Prior to this, line 194 refers to Shu or Ja-Shua or "god Shu" in respect to the stinging of Horus by a poisonous scorpion sent by his evil brother Set as follows:

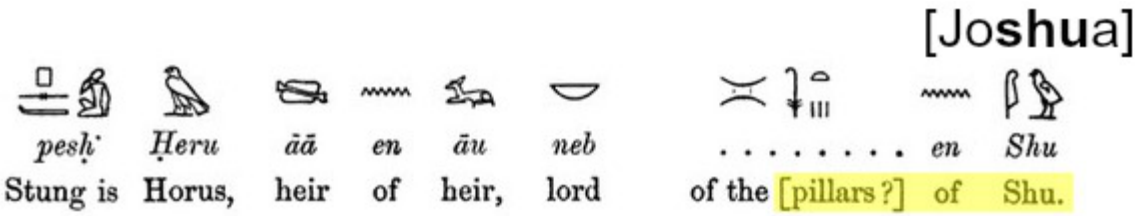

Hence, the "Sorrows of Isis", as Vladimir Golenischeff (1877) and Wallis Budge (1904) entitle the above tale, became the "Book of Joshua", or Joshua chapter of the Bible, according to which, Joshua made (or bade) both the sun and the moon to stand still. Nearly the entire Old Testament and New Testament were written in the manner.

The original text, from the *Egyptian Book of the Dead* (1300), which accompanies the above Isis in papyrus swamps vignette, below left, is compared to the Joshua 10:13, from the *Old Testament*, rewrite, below right:

Tale of Osiris, Isis, and Horus Book of Dead (2500BC)	**Joshua 10:12-14** KJV (1611AD)
"O Isis, pray thou to heaven so that the sailors of Ra may cease rowing, so that the Boat of Ra may not depart from the place where the child Horus is. Then Isis sent forth a cry to heaven, and addressed her prayer to the Boat of Millions of Years;	

and **the** [sun] **Disk stood still**, and moved not from the place where he was. And Thoth [**moon god**] came, and he was provided with magical powers and possessed the great power which made [his] word to become Maat (i.e., Law), and he said: 'O Isis, thou goddess, thou glorious one, who hast knowledge how to use thy mouth, behold, no evil shall come upon the child Horus, for his protection cometh from the Boat of Ra. I have come this day in the Boat of the Disk from the place where it was yesterday.

When the night cometh the light shall drive [it] away for the healing of Horus for the sake of his mother Isis, and every person who is under the knife [shall be healed] likewise., In answer to this speech Isis told Thoth that she was afraid he had come too late, but she begged him, nevertheless, to come to the child and to bring with him his magical powers which enabled him to give effect to every command which he uttered. Thereupon Thoth besought Isis not to fear, and Nephthys not to weep, for said he, 'I have come from heaven in order to save the child for his mother,' and he straightway spake the words of power which restored Horus to life, and served to protect him ever afterwards in heaven, and in earth, and in the Underworld."

Then spake Joshua [god Shu] (Q)(Q) to the Lord in the day when the Lord delivered up the Amorites before the children of Israel [Is-Ra-El], and he said in the sight of Israel, Sun, stand thou still upon Gibeon; and thou, Moon, in the valley of Ajalon.

And the **sun stood still**, and **the moon stayed**, until the people had avenged themselves upon their enemies. *Is* not this written in the *Book of Jasher* [*Book of the Dead*]? So the **sun stood still** in the midst of heaven, and hasted not to go down about a whole day.

And there was no day like that before it or after it, that the Lord hearkened unto the voice of a man: for the Lord fought for Israel.

The same "Sorrows of Isis" story, where "Thoth stops the boat of a Million years, on which Ra was riding", to note, is found on the back text of the Metternich Stele (380BC), from Alexandra. [4]

In 1997, Egyptian religio-mythology scholar Muata Ashby summarized the sun (Ra), moon (Thoth), and Isis parable as follows: [3]

> "When Isis [Aset] found out about the evil scorpion [sent by Set] that stung and killed Horus [Heru], she was so grief stricken that her cry was heard to the farthest reaches of the universe. When Ra [**sun**], the supreme being, heard it, he **stopped his movement**. This effectively brought the entire universe to a standstill." [6]

The sun and the moon in the Joshua version originally were either Ra (the sun) stopping his movement or the the eyes of Horus, one being the sun, the other the moon, being gouges out by Set; the eyes (sun and moon) were later restored by the gods Hathor (Hethor) and Thoth (Djehuti). [6]

Maimonides

In c.1180, Maimonides asserted his patch opinion that events described in Joshua 10:13 occurred because of "extended local daylight", without there having been any change in the movement of the heavenly spheres. [7]

Gersonides

In c.1320, Jewish astronomer Gersonides (1288-1344) (Q) gave his opinion that Joshua 10:13 occurred because the victory was so fast that it took place in such a short time that the sun "seemed to stop" at the top of the sky, i.e. that the description was a literary device.

Luther | Copernicus

In Jun 1539, Martin Luther, after learning of Nicolaus Copernicus' newly-being popularized heliocentric model, via Philipp Melanchthon, who learned of it via Georg Rheticus, said the following during a dinner meeting (possibly in the

presence of Rheticus): [8]

> "There is mention of a certain new astrologer who wanted to prove that the earth moves and not the sky, the sun, and the moon. This would be as if somebody were riding on a cart or in a ship and imagined that he was standing still while the earth and the trees were moving."

This is hilarious to the last. Luther continues:

> "Whoever wants to be clever must agree with nothing that others esteem. I believe the holy scriptures, for **Joshua commanded the sun to stand still and not the earth**."

(add)

Galileo

In 1613, Galileo publishing work, based on his telescope observations, supported Copernican cosmology, in opposition to Ptolemaic cosmology (which is based on Heliopolis cosmology, aka Heliopolis creation myth), therein asserting the Bible-contradicting idea that the "earth moves". The main passage from the Bible that gave Galileo's contemporaries the most trouble, as summarized by Jennifer Hecht (2003), was Joshua 10:12-13. [6]

In 1614, priest Tommaso Caccini insisted that Galileo explain the **Joshua 10:13** passage in light of his new telescope findings.

In late 1614, Tommaso Caccini, a young Dominican priest, drove Galileo from the pulpit, insisting that Galileo explain the Joshua 10:12-13 passage? The gist of the debate that followed, as summarized by Tamar Rudavsky (2001) reads as follows: [7]

> "For Galileo, the question is one of straightforward biblical exegesis and reflects his use of both PPD and PA, namely, how to reconcile this passage with the new science. {68} Galileo argues that under the Ptolemaic system, the example "in no way can happen." {69} For if the sun stops its own true motion, the day becomes shorter and not longer and that, on the contrary, the way to prolong it would be to speed up the sun's motion; thus, to make the sun stay for some time at the same place above the horizon, without going down toward the west, it would be necessary to accelerate its motion so as to equal the motion of the Prime Mobile, which would be to accelerate it to about three hundred and sixty times its usual motion. {70}
>
> And so, if Joshua had wanted the day to be lengthened, he should have ordered the sun to accelerate its motion in such a way that the impulse from the primum mobile would not carry it westward. On the Ptolemaic system, there-fore, we must reinterpret Joshua's words: "given the Ptolemaic system, it is necessary to interpret the words in a way different from their literal meaning." {71} If we assume that

> Joshua had any astronomical knowledge, we can say that his primary purpose was to demonstrate to the masses a miracle, and not to teach astronomy. Joshua simply stooped to their capacity and "adapted himself to their knowledge and spoke in accordance with their understanding because he did not want to teach them about the structure of the spheres but to make them understand the greatness of the miracle of the prolongation of the day." {72} This is not a case in which the explicit meaning of Scripture can be maintained on the basis of a geocentric model.
>
> The question for Galileo, then, is whether the events in Joshua can be rendered consistent with the Copernican system. In fact, Galileo argues that only heliocentrism can make sense of this example. Assume, he says, that the sun revolves upon its own axis (as Galileo had recently demonstrated in his Letters on Sunspots). By this rotation, it infuses both light and motion into the bodies that surround it. If the rotation of the sun were to stop, so too would the rotation of all these bodies. And so, when God willed that at Joshua's command the whole system of the world should rest, it sufficed to make the sun stand still. Upon its stopping, all the other revolutions ceased: "in this manner, by stopping the sun, and without changing or upsetting at all the way the other stars appear or their mutual arrangement, the day on the earth could have been lengthened in perfect accord with the literal meaning of the sacred text." {73}
>
> A fringe benefit of Galileo's heliocentric interpretation is that he is able to give a clever reading of the next phrase, namely that the sun stood still "in the midst of the heavens" (Joshua 10:13). Classical theologians have had a difficult time with this statement, for if it meant that the sun was at the meridian, there would be no reason for a miracle at the time of Joshua's prayer; but if the sun were setting when Joshua asked for cessation of movement, it's not clear how to explain the phrase "in the midst." Galileo's interpretation is that by "in the midst of the heavens" we should understand that the sun is at the center of the celestial orbs and planetary rotations, in accordance with Copernican heliocentrism. Thus at any hour of day we can say that the sun stands "at the center of the heavens, where it is located." {74}"

In 1616, Galileo was banned by the Church from teaching heliocentric cosmology.

Spinoza

In c.1660, Benedict Spinoza also was drawn into the Joshua 10:13 puzzle;

> "Do we have to believe that the soldier Joshua was a skilled astronomer, or that the sun's light could not remain above the horizon for longer than usual without Joshua's understanding the cause? Both alternatives seem to me ridiculous. Perhaps something [strange] occurred, e.g., owing to excessive coldness of the atmosphere."
>
> — Benedict Spinoza (1677), *Treatise on Theologico-Politics* [7]

Spinoza also argued, according to Hecht (2003), that the Book of Joshua might be untrue, per reason of multiple authors. In more detail, Tamar Rudavsky (2001) summarizes Spinoza's take on this, as follows: [7]

> "For Spinoza the Joshua example is used to bring home his rejection of supernatural miracles. Within his new mechanistic philosophy Spinoza argues that every event falls within a comprehensive system of causal laws (there can be no random events), and that these causal laws possess the same kind of necessity as the laws of mathematics and logic. He then shows how biblical miracles can be explained in naturalistic terms. {75}
>
> But here, too, Spinoza had historical precedents in Jewish philosophy. {76} In the Guide, Maimonides had already eliminated supernaturalistic interpretations of miracles and had begun the reductionist process of explaining miracles in naturalistic terms. In the context of demonstrating that the miracles wrought by other

prophets differ from those of Moses, Maimonides uses Joshua 10:11-12 as an example of a prophecy which occurs in front of some, but not all, of the people. Maimonides goes on to explain the text as claiming that the miracle consisted in the prolongation of daylight without any change in the course of the sun, so that in Gibeon the day was longest but in other places not. {77} Gersonides is even more explicit than Maimonides, arguing that it is impossible for the sun to have stood still for Joshua. According to Gersonides, the miracle consists in the fact that the victory was achieved during the short period of time in which the sun at its zenith appeared to be stopped. {78} And so what was implicit in Maimonides is spelled out explicitly by Gersonides.

Against the backdrop of these medieval discussions Spinoza uses Joshua 10:12-13 in an attempt to rule out supernatural miracles. All the commentators, says Spinoza, try to demonstrate that the prophets knew everything attainable by human intellect. He takes Joshua 10.11 as an example, stating that do we have to believe that the soldier Joshua was a skilled astronomer, that a miracle could not be revealed to him, or that the sun's light could not remain above the horizon for longer than usual without Joshua's understanding the cause? Both alternatives seem to me ridiculous. {79}

In contradistinction to Galileo who tried to grant Joshua the benefit of the doubt, Spinoza's conclusion is that we cannot expect scientific knowledge of the prophets. According to Spinoza, Joshua was a simple prophet who, confronted with an unusual natural phenomenon, namely "excessive coldness of the atmosphere," attributed to this phenomenon a supernaturalistic explanation. "Knowledge of science and of matters spiritual" should not be expected of prophets.80 For Spinoza, then, there is no room for derash, for interpretative hermeneutics: the Bible must be interpreted literally. Scripture must use Scripture itself to accomplish this. Either the biblical text is compatible with our rational conceptions or it is not; and if it is not, it must be rejected."

(add)

Scopes Trial

In 1925, in the Scopes Monkey Trial, on the illegalness of teaching Darwinian evolution in Tennessee high school biology classes, agnostic Clarence Darrow famously interrogated theist William Bryan on the stand on the Joshua 10:13 passage as follows: [9]

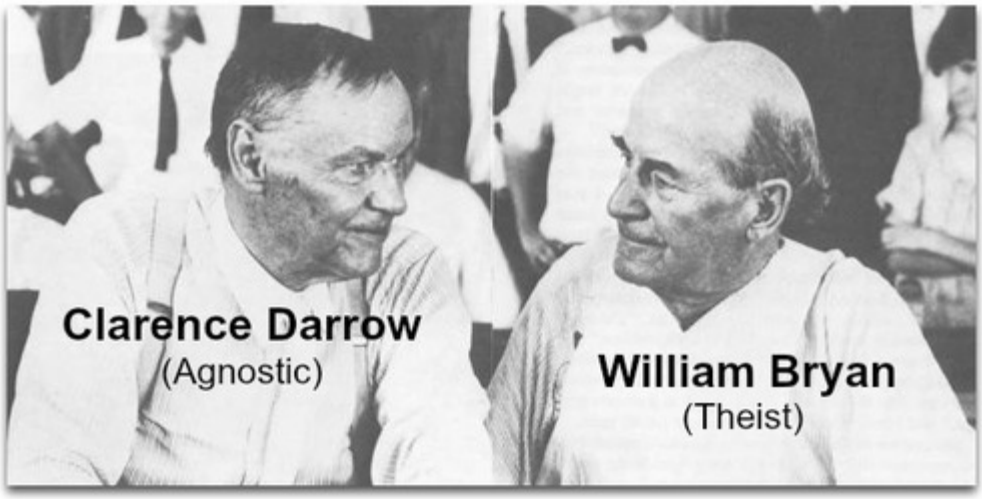

Clarence Darrow, at the Scopes Monkey Trial (1925), famously asking William Bryan if he really believed that the sun stood still for one day, as it says in **Joshua 10:13** of the Bible?

"After eliciting Bryan's profession of belief in every biblical miracle—the creation of the earth in seven days, the swallowing and regurgitation of Jonah by the whale (in the Bible, a "great fish," as Bryan pointed out), **god commanding the sun to stand stil**l so that Joshua and the Israelites would have enough time to slaughter their enemies—Darrow closed in for the kill. **How was it possible for the sun to stand still**, he asked Bryan, since it had long been known that the sun does not move. Or did Bryan believe that the sun moved around the earth because that was what people believed in biblical times? Bryan was naturally forced to concede that the earth moves around the sun, which led to his acknowledgment that the Bible is filled with metaphors appropriate to the limited knowledge of man in the biblical era. He also conceded that each of the six days of creation might stand for millions of years. Bryan's exhausted admission that even he did not interpret the Bible literally made him appear pathetic or traitorous to his adherents and ridiculous to his detractors, and the case went to the jury."

(add)

Quotes

The following are related quotes:

> "It is really astonishing, that this fine passage (**Joshua 10:6-14**) has been so long misunderstood. We are expressly told that it is an extract from the Book of Jasher—a collection of poems on the heroic deeds of leaders of the Israelites."
>
> — Johann Herder (c.1790), *Source* [5]

> "This tale of the sun standing still upon Mount Gibeon, and the moon in the valley of Ajalon, is one of those fables that detects itself. Such a circumstance could not have happened without being known all over the world. One half would have wondered why the sun did not rise, and the other why it did not set; and the tradition of it would be universal; whereas there is not a nation in the world that knows anything about it. But why must the moon stand still? What occasion could there be for moonlight in the daytime, and that too whilst the sun shined? As a poetical figure, the whole is well enough; it is akin to that in the song of Deborah and Barak, *The stars in their courses fought against Sisera*; but it is inferior to the figurative declaration of Mahomet to the persons who came to expostulate with him on his goings on, *Wert thou, said he, to come to me with the sun in thy right hand and the moon in thy left, it should not alter my career*. For **Joshua** to have exceeded Mahomet, he should have put the sun and moon, one in each pocket, and carried them as Guy Faux carried his dark lantern, and taken them out to shine as he might happen to want them. The sublime and the ridiculous are often so nearly related that it is difficult to class them separately. One step above the sublime makes the ridiculous, and one step above the ridiculous makes the sublime again; the account, however, abstracted from the poetical fancy, shews the ignorance of Joshua, for he should have commanded the earth to have stood still."
>
> — Thomas Paine (1794), *The Age of Reason* (pg. 107)

> "Science, which has disproved that the earth is the center of the celestial system, struck a great blow at religion. **Joshua**, we are told, **stayed the sun**, and that stars will fall into the sea from heaven. What do I say? All the suns, and all the planets, etc."
>
> — Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr [5]

See also

- Genesis
- 2 Kings 2:24

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External links

- Book of Joshua – Wikipedia.

θΔics

In science, **Joshua David Greene** (1974-) is an American moral philosopher and neuroscientist whose research is focused on the interplay between emotion and reasoning in moral judgment, noted for his 2008 to present work the neuroscience of morality, touching on topics such as the nature of evil, themed on a synthesis of a utilitarianism, evolutionary psychology, and neuroscience based probing into morality theory. Greene's work may be similar, to some extent, to Sam Harris, an associate of his, and his moral landscape theory.

US BioEthics | Angels & Souls

In 2014, Greene was one of the experts on the 17th meeting of the Presidential Commission for the Study of Bioethical Issues, during which time “angels” were discussed and “soul” was employed six time, all amid fundamental discussion of morality and neuroscience; some excerpts of which are as follows:

> “In other words, I don't know whether you are speaking now as a scientist or as a philosopher about people's intuitions about choosing. I mean, most people in the United States, if you ask them on a public poll, you'll get intuitions about whether there's **angels** in the universe, you know, all kinds of things. So are you saying scientifically speaking people's intuitions about choosing requires the incompatibalist's view or is there a division there scientifically speaking about what people's intuitions are?”
>
> — Amy Gutmann (2014), comment

> “But whether you have a full-blown metaphysical view of human nature where we're bodies and **souls** joined somehow, everybody agrees that there's a body.”
>
> — Joshua Green (2014), comment

> “I think that whether or not you think, when it comes to the proximate causes of behavior, just brains, or whether you think that we are brains that are in some sense being animated by minds or **souls** that are distinct from brains, brains are still what most immediately cause behavior.”
>
> — Joshua Green (2014), comment

> “There are lots of studies like this. There are some that go the other way. It's a little complicated. I myself did a study about whether **souls** are required for free will. I had about 280 subjects.”
>
> — Alfred Mele (2014), comment

Compare Lawrence Krauss (2015) on god talk amid in scientific meetings. [13]

Values | Freedom and security

On paradoxical or rather inverse relation between freedom and security, in regards to "values", and which value to value most, Greene has the following to say: [3]

> “I didn’t understand value premises (‘freedom’, ‘security’), because it seemed to me that, no matter what your most favored value is, there could always be other considerations that take precedence. Sure, freedom is important, but is it everything? Sure, security is important, but is it everything? How can there be one preeminent value?”

The issue queried here, to note, was firmly addressed by American physical chemist Frederick Rossini, in his 1971 "Chemical Thermodynamics in the Real World", who pointed out that the precarious balance between freedom and security, in a given social system (e.g. America), is a balance between entropy and enthalpy, respectively, or in his own words: [11]

> "The final state of equilibrium is a compromise between the 'freedom' term, $\Delta S°/R$, and the 'security' term, a $-\Delta H°/RT$. To repeat, the final state of equilibrium, then, is a compromise between two more or less opposing factors: greater freedom or greater entropy, as measure by $\Delta S°/R$; and greater security or lesser energy, as measured by $-\Delta H°/RT$."

Greene continues:

> "Then I discovered utilitarianism, the philosophy pioneered by Jeremy Bentham and John Mill. Utilitarianism is a great idea with an awful name. It is, in my opinion, the most underrated and misunderstood idea in all of moral and political philosophy."

Here, Green would be keen to also discover the Lagrangian-Hamiltonian differential based version of utilitarianism espoused by Francis Edgeworth (1881), in regards to minimas and maximas of happiness, in his "utilitarian calculus", as he calls it, being that Lagrangian-Hamiltonian differential based models of the energetics of dynamic systems was subsumed, via the combined work of Clausius (1865), Gibbs (1876), Lewis (1923), al a chemical thermodynamics, into the free energy differential versions of freedom and security comprised models of social system happiness, such as outlined by Rossini (1971) above. [12] The glimpse of this modern discernment, however, requires a great deal of learning on the part of the reader, a rather detailed understanding of chemical thermodynamics, on one hand, and deep humanities philosophical understanding, on the other.

Magic moment | Magic formula | Magic corner hypocrisy

A saliently noticeable issue with Greene's treatise is his usage on some near two-dozen pages of the term "magic" (17+) and a "magic corner" (11+) that we should believe in and attempt to get into in regards to competing morality systems, then towards the end of the book he begins to denounce belief in magic, in regards to the point when God supposedly puts souls into people (see also: Napoleon Bonaparte and Napoleon Laplace anecdote on souls of infants), as something not to believe, at which point he becomes a hypocrite on this term usage; below are conflicting usage examples:

> "Does God attach the soul when the head of sperm makes contact with the zona pellucida? Or does ensoulment occur when the sperm hits the cell membrane? Is it enough for all of the sperm's genetic material to enter the egg cell? Or does God wait until the male pronucleus and the female pronucleus have fused? All the way fused, or partway? Whatever it is that makes people worth of moral consideration, these things don't all appear in one **magic moment**. Without a magic moment to believe in, pro-choicers simply have to draw the line somewhere, while acknowledging that the line they've drawn is somewhat arbitrary." (pg. 326)

> "In the beginning, there was primordial soup. Cooperative molecules formed larger molecules, some of which could make copies of themselves and surround themselves with protective films. Cooperative cells merged to form complex cells, and then cooperative clusters of cells. Life grew increasingly complex, finding again and again the **magic corner** in which individual sacrifice buys collective success, from bees to bonobos." (pg. 347)

> "There's no **magic formula**, no bright line between the extremes of perfectionism and unbridled gluttony … just an ill-defined Goldilocks zone between the two extremes." (pgs. 256-57)

Here, in short, according to Greene, there is no "magic formula" for morality, but we should believe in "magic corners" and "Goldilocks zones", but not in "magic moments"? While, indeed, Greene may argue that one usage is but metaphor while the other is considered real (e.g. to Christians, say in regards to stem-cell research funding), the argument, nevertheless is hypocritical. "Historians", or in this case "moral psychologists", as Morris Zucker (1945) advised, "will have to learn to be as precise in the employment of their **terms** as the mathematician and the physicist."

Also, to note, Greene's zona pellucida ensoulment query, brings to mind dialogue post #144, between Libb Thims and Mirza Beg, on 28 Jul 2014, in which Thims probes Beg, a soul believer, with the question as to which second in synthesis time of his reaction existence he came "alive", as follows:

> "Beg, said another way, if you prefer not to digress on yourself, in what year did Goethe, in your view, come "alive"? Possible answers, from you, might include: the hour his parents, Johann Caspar Goethe (1710-1782) and Catherina Elizabeth Goethe (1731-1808), had intercourse (sex), calculated to have occurred at noon on 21 Dec 1748, see Goethe timeline sketch: (Ñº), a process which leads to the five-step mechanism by which the interaction of the sperm and the egg to form zygote generally proceeds (Ñº), or the hour at which he emerged from the birth canal, which he says occurred at noon on 28 Aug 1749, and took his first breath, or the year he reached the age of one, which occurred on 28 Aug 1750, being that some cultures don't recognize infants as people until they reach the age of one, or some other hour or day, e.g. when the brain begins to form (week three), when blastocyst that will be the baby splits to form the placenta and the embryo (week four), when the heart begins to beat (week five), when the embryo begins to move in the womb (week eight), when embryo turns into fetus and begins breathing-like movements (week nine), when the fetus begins to have eye movement (fourteen weeks), when fetus begins to feel pain and suck their thumb (twenty weeks), when fetus begins to dream as evidenced by REM (week twenty-six), or possibly some time before inception, e.g. the second when his father first fell in love, at first sight, with his mother, light (electromagnetic field in 400-700 nm range) being the trigger to surpassing the activation energy barrier to this reaction, which would have occurred on or about the year 1746-47 (pair married on 20 Aug 1748), or alternatively, as Francis Crick intuits, one is never alive at any point in one's reaction existence?"

This, in short, is but a variant of Greene's query about which second in development "ensoulment" occurred, both "soul" and "life" being religio-mythology terms, which is why a given start second is not able to be found, because both soul and life are concepts not recognized by physics and chemistry (Charles Sherrington, 1938), i.e. they are defunct semi-scientific concepts, like ether and caloric, i.e. they do not exist, though they were once believed to exist, but not viable theories as the modern physical sciences understand things.

Metamorality

Greene calls his overarching theory "metamorality" which he defines as follows: [3]

> "Metamorality is a higher level moral system that adjudicates [settles judicially] among competing tribal moralities [e.g. French atheists vs Pakistani Muslims], just as a tribe's morality adjudicates among competing individuals."

(add discussion)

Morality | Ongoing debates

The aim of Greene's moral psychology theory, as he says, is to develop a clearer understanding of the subject so to better progress on the following tenuous moral issues common to US debate: [3]

> “Ongoing debates over taxes, healthcare, immigration, affirmative action, abortion, end-of-life issues, stem cell research, capital punishment, gay rights, the teaching of evolution in public schools, animal rights, environmental regulation, and the regulation of the financial industry.”

(add discussion)

Hallway study

> *See main: Hallway study; See also: Sidewalk study*

Green, citing several notable "studies", devotes several pages to the so-called “hallway study”, a two part experiment conducted by American psychologists Dov Cohen and Richard Nisbett in the 1990s on male University of Michigan students, both northern and southern students. [10]

In the first experiment, students were brought into their lab with the overt purpose to fill out some questionnaire, after which they were instructed to take their form to a table at the end of a long, narrow hallway, along the way passing a man—a confederate of the experiment—standing in the hallway working in a file cabinet. After dropping of the completed form on the table, upon return down the hallway, the man would slam the file cabinet drawer shut, bump into the student’s shoulder, and call the student an “a**hole”. On average, southern students responded to the incident with more anger and less amusement than northern students, as assessed by independent observers positioned in the hallway, and secondly, according to saliva samples collected before and after the experiment, southerners exhibited greater increases in their levels of both cortisol, a stress, anxiety and arousal hormone, and testosterone.

In the second part of the experiment, Cohen and Nisbett arranged for an experimental game of chicken, in which, after being insulted (or not), the students encountered a second confederate, a six-foot-three-inch, 250-pound man walking quickly down the hall, in which the middle point of was lined with tables and thus too narrow for both to pass, meaning someone had to give way. The experiment found, via experimental measurement of the distance at which the subjects gave way to the big man, that the insulted southerners, on average, gave way to the approaching confederate when he was 37-inches away, whereas the non-insulted southerners gave way, on average, at 108-inches. The insult had no effect on the northerner’s chicken point; the non-insulted northerners typically gave way at about 75-inches. These results are summarized below:

	Chicken point (insulted)	**Chicken point** (non-insulted)
Southerners	37-inches	108-inches
Northerners	75-inches	75-inches

Experimenters found, also, that the non-insulted southerners were more polite than the northerners. Greene correlates this data the premise that different "herders", as he calls them, will spend more or less "time and energy" defending and or standing their "ground" (territory, volume, or personal space).

Suppositions

Greene, based on a combination of moral psychology polling studies and scenarios and anatomical neuropsychology findings, posits a number of suppositions based on polling, some being on target, e.g. “if the soul is out of a job, well some people, obviously, would think that’s terrible, but the worst thing we could find out is that we don’t have souls [see: soulless bag of chemicals]. But, it could also be a wonderful thing”, some off target. The following, based on the Nichols-Knobe determinism study, seems to have missed the dartboard:

> “Our taste for justice is a useful illusion.”

Here, we may cite the punishment and justice in a deterministic universe views of Zeno of Citium and the slave stealing parable, for a more on target handling of the issue.

Beg analysis

The following a “Beg analysis” of Greene's *Moral Tribes*, i.e. a dissection and look at the overtly, albeit unconsciously aware, physical science and or physicochemical terms and terminology employed by Green in his treatise— the “Beg effect”, i.e. physical terminology usage and meaning gone awry in argument, surfacing in Greene’s treatise significantly on pages 261-63, wherein he ventures into assertions about physical “distance”, personal “force”, our “reactions”, and our “movements”, etc. according to which he asserts that distance plays no role in what is moral or amoral among people, wherein noticeable discussion of the difficulties his assertions become apparent. The following, accordingly, is a work-in-progress Beg analysis of Greene’s *Moral Tribes*:

Term	#		Usage	Note
Force (F)	21+	(Ñº)	“Prosperous Northerners often make charitable donations to help such people. Nevertheless, they object to being ***forced*** to help the foolish …” (pg. 67)	Noticeable in Greene’s section "The Duty to Help" (pg. 261-63), is the Coriolis work transmission principle: $$W = Fd$$ namely that the component of force acting on a material entity multiplied by the distance of space traveled by the entity equals the work done by the force, amid which Greene seems to argue that "mere physical distance", in regards to morally obligatory questions, such as helping a drowning child in a pond directly in front of you versus helping a starving child in hurricane ridden country, really doesn't matter, that "people who are insensitive to distance are morally abnormal". among other snippets of blurry assertion.
Distance (d)	9+	(Ñº)	“Our sense of moral obligation is heavily influenced by mere physical **distance**. *Should* physical distance matter? …. People who are insensitive to distance are morally abnormal.” (pg. 261)	
Work (W)	51+	(Ñº)		
Reaction	14+	(Ñº)	“… conducted a series of experiments examining our **reactions** to identifiable, as opposed to statistical victims.” (pg. 263)	
Gut reaction		(Ñº)		
Movement	13+	(Ñº)	“The harder question, from a biological point of view, is why we sometimes *are* **moved** by the plight of nearby strangers.” (pg. 262)	The so-called “biological point of view” is a baseless point of view, being that hypothetical “life force”, the root of the term “biology” (Theodore Roose, 1797) has been found to be something that does not exist (see: defunct theory of life), as per the work of the Helmholtz school.
Move	7+	(Ñº)		

Power	13+ (Ñº)		
Powerful	6+ (Ñº)		
Bond		"Ants, for example, confer benefits on their genetic relatives, but, so far as we can tell, ants are not motivated by tender feelings. Among humans, of course, caring behavior is motivated by feelings, including **powerful** emotional **bonds** that connect us to our close relatives." (pg. 31)	The assertion that ants don't have feelings—and by implication powerful bonds—whereas humans do, seems to contradict Greene's earlier (pg. 20) statement that ants and humans have evolved or formed from "molecules joining together" by the "same principle", molecular joining implying chemical "bonding", thus insinuating some type of two natures argument, i.e. that ants and humans are of different natures, in regards to bonds, power, movements, actuated by "feelings", which derive from the senses, which, as James Maxwell (1847) correctly says, derive from force: [7] "The only thing which can be directly perceived by the senses is force, to which may be reduced light, heat, electricity, sound and all the other things which can be perceived by the senses."

Green, in the context of the above distance argument, goes on to cite a number of psychological donation studies, wherein donation scenarios are varied, after which he concludes with the following:

> "So is there really a moral difference between the nearby drowning child and the faraway children who need food and medicine? These cases certainly *feel* different, but we now know that our intuitive sense of moral obligation is at least somewhat unreliable, sensitive to things that don't really matter, such as mere physical distance and whether we know, in a trivially minimal way, whom we are helping." (pg. 264)

The difficulties in this paragraph are immense. Firstly, not only has Green failed to define what exactly a "moral" is—namely something that, if not obliged, brings about the arrival of Mor, i.e. the Greco-Roman goddess of death, in religio-mythology colloquial speak, or dereaction, reaction end, or being existence cessation, in physicochemical neutral upgrade terminology. Secondly, Greene dismissal of physical "distance" as a meaningless factor in the equation, goes against the grain of the various social gravity or social gravitation theories, i.e. social electromagnetation theories in a modern sense, or that the "work" done by someone making a so-called moral action, the human movement here supersedes the principle of transmission of work, in respect to the distance factor. Thirdly, Greene equates the death or rather dereaction of two children in "different" systems as being equivalent, in regards to the level of responsibility of the world's total human population; this assertion, however, fails in the face of the fact that each system or country will have a certain level of "stability" and or "instability" associated with its molecular structure, each being a possible transformation reaction path, e.g. synthesis (coming together), analysis (coming apart), social combustion, etc. the so-called "nature" of each defined by thermodynamics, each system, if connected, mediated via Lipmann coupling free energy factors. Hence, one's so-called moral intuitive sense will inherently "feel" different by each person in each respective (social) system, being that different "forces" will be acting on each respective person, through the senses, as Maxwell says, in alignment with the distinct direction of the transformation process of that given respective social system. Therefore, without prolonged digression, to state matter-of-factly, per vicarious statistical hypothetical moral scenario Q&A studies, that one's intuitions, in regards to the deeper so-called moral choices people are forced to make, are "somewhat unreliable" is rather spurious and unfounded—though, to note, digression on the tricks or so-called misleadings of "intuitions" in general, e.g. questions about whether the earth is flat, the sun goes around the earth, or

doing certain math problems, etc., is a rather involved subject. But, to clarify, citation to the Muller-Lyer illusion, is but fodder to the jump to the conclusion that moral intuitions are baseless, akin to optical illusions, and therefore they should be abandoned in favor of everyone becoming Goldilocks utilitarians.

Crying baby scenario

One of Greene's most-discussed studies is the so-called "crying baby scenario", a study done at Princeton, in the period 1999 to 2007, wherein subjects, while inside of an MRI, were asked what they would do if they were in the following difficult situation:

> "Enemy soldiers have taken over your village and will kill any civilians they find. You are hiding in the cellar of a house with a group of townspeople, and you hear the soldiers enter the house. Your baby starts to cry, and the only way to quite him is to hold your hands over his mouth and, eventually, smother him. But if the baby keeps crying, the soldiers will discover your group and kill everyone, the baby, included. What should you do?"

The crying baby scenario study as seen in the 2008 National Geographic documentary, the "Science of Evil", showing **Greene** and Jonathan Cohen, director of Princeton's Center for the Study of Brain, Mind & Behavior, whom Green started working with in 1999, watching brain activity as a women is show the question on a video screen while being imaged, the village scenario shown in the documentary being that of an African village. [1]

Half of the subjects, as the study found, said they would murder their own child. [8] People who say yes, were found to have more activity in the dorsal lateral prefrontal cortex, i.e. the cognitive control area). Those who say no, show more activity in the medial prefrontal cortex and the posterior singular cortex. [1]

This morally ambiguous finding, to note, brings to mind Goethe's famous 1771 thesis 55, cited by Thims in his 2013 university lectures (Ñº), of his series of 56 theses on the "Positions of the Rights", submitted for his law degree, namely the query: "should the woman who kills her newly born child suffer the death penalty?".

Green had the following to say about his findings: [8]

> "A moral judgment is ultimately a balance of several different considerations—the initial, primal reaction; empathy; cultural or religious norm; and individual reasoning. Sometimes these will be inline and make the decision an easy one, but often they will conflict."

(add discussion)

Personal force | Moral force

Greene, in a few pages, discusses the possibility of the existence of an independent "moral force", such as follows:

> "According to the utilitarians, the distinction between doing and allowing is morally irrelevant, or at least has no independent moral force. A *harm is a harm is a harm*, we say, and there is no fundamental

> distinction between the harms that we actively cause and harms that we merely allow to happen. Given our values and our circumstances, does it make sense to draw a moral distinction between what we do and what we allow to happen?"

The only other thinker to outline a "moral force" theory or logic, of sorts, to note, was Prussian warfare theorist Carl Clausewitz. [4]

Greene also distinguishes what he refers to as a "personal force" as follows:

> "Personal force may play a role in action plans as well. The events in an action plan are arranged not just in a temporal sequence but in a *causal* sequence. Each event causes the next, as we go from the body movement to the goal. There is evidence that we represent causes in terms of forces. When you see one billiard ball knock into another, all that you pick up with your retinas is balls in a series of location, lie the frames of movie. Nevertheless, we intuit, apparently correctly, the delivery of a force from one ball to another. Thus, the kinds of forces represented in an action plan—personal force verses other kinds—may affect the extent to which one feels as if one is personally causing harm."

This personal force distinction, to note, may be equivalent to the "internal force" model in the internal force / external force dichotomy.

In this rather humorous "there is evidence", i.e. that we "represent causes in terms of forces", statement, Greene cities three authors, the first and foremost of which being American cognitive scientist Leonard Talmy and his highly-cited "Force Dynamics in Language and Cognition", the abstract of which is as follows: [5]

> "'Force dynamics' refers to a previously neglected semantic category—how entities interact with respect to force. This category includes such concepts as: the exertion of force, resistance to such exertion and the overcoming of such resistance, blockage of a force and the removal of such blockage, and so forth. Force dynamics is a generalization over the traditional linguistic notion of 'causative': it analyzes 'causing' into finer primitives and sets it naturally within a framework that also includes 'letting', 'hindering', 'helping', and still further notions. Force dynamics, moreover, appears to be the semantic category that uniquely characterizes the grammatical category of modals, in both their basic and epistemic usages. In addition, on the basis of force dynamic parameters, numerous lexical items fall into systematic semantic patterns, and there exhibit parallelisms between physical and psychosocial reference. Further, from research on the relation of semantic structure to general cognitive structure, it appears that the concepts of force interaction that are encoded within language closely parallel concepts that appear both in early science and in naive physics and psychology. Overall, force dynamics thus emerges as a fundamental notional system that structures conceptual material pertaining to force interaction in a common way across a linguistic range: the physical, psychological, social, inferential, discourse, and mental-model domains of reference and conception."

along with Phillip Wolff (2007) and Steven Pinker (2007), who in turn each cite Talmy and his so-called force dynamics theory; Wolff, e.g. abstracts Talmy's theory of force dynamics as something that characterizes causation as a pattern of forces and a position vector. [6]

Other

In 2008, Green's moral neuroscience work was featured National Geographic's "Science of Evil" documentary, wherein he commented how neuroscience findings are seeming to point to the conclusion that the "soul" might be out of a job, i.e. scientists are beginning to find that "we don't have souls"; in full: [1]

> "What happens if we look at the brain and after a while it becomes clear that all of human behavior is ultimately just a product of neurons firing at each other and ultimately controlling muscles that ultimately constitute our behavior? Is that good is that bad? If the soul is out of a job, well some people, obviously, would think that's terrible, but the worst thing we could find out is that we don't have souls. But, it could also be a wonderful thing, and the thought is that belief in souls could do a lot of damage. Perhaps the most extreme example is take the events of 9/11. People who committed those highjacks believed their bodies were going to die, but that their souls were going on to live a very pleasant existence. Could they have been brought to do that if it were not for their belief that their souls were participating in a higher purpose?"

In 2014, Greene was one part of the 17th annual meeting of the Presidential Commission for the Study of Bioethical Issues, which on day one, was focused on the "ethics of neuroscience", i.e. on the "ethics of doing neuroscience research", then secondly, day two, in which Greene was the opening speaker, on the "potential impact of neuroscience research on our understanding of ethics and moral decision making", i.e. "how if at all does neuroscience change, alter, revolutionize possibly, some people have claimed, our understanding of ethics", specifically the "possibility of neuroscience changing the way we think about issues of right and wrong". The following is a noted opening statement by Greene made at the meeting: [2]

> "The brain is a mechanistic system, everything that determines our behavior is ultimately a physical process, if that's true, and I think people have speculated about this since antiquity and more so during the enlightenment, but now it's increasingly clear that everything that affects your behavior is ultimately just one neuron making another neuron fire. It's one physical process going all the way back in time back to before you were born."

(add discussion)

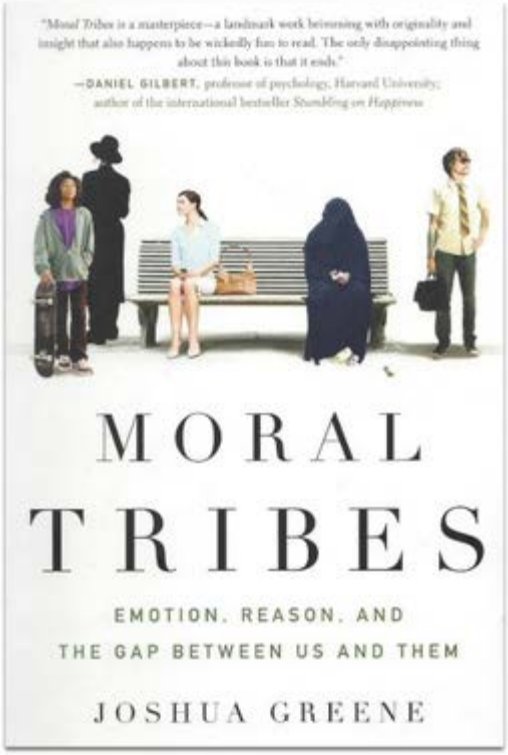

Green's 2013 *Moral Tribes*, wherein he outlines the field of "moral neuroscience", which he helped to pioneer over the last decade, via asking people morally tricky questions while inside an MRI machine. [3]

Difficulties on theory

To note a few salient issues in Greene's *Moral Tribes*, firstly is his use of the word "magic", employed 17+ times, in terms such as "magic corner", which he implies exists, and "magic formula", which he says does not exist. On the latter, Green states: [3]

> "There's no magic formula, no bright line between the extremes of perfectionism—ideal utilitarian—and unbridled gluttony … there's just an ill-defined Goldilocks zone between two extremes."

(add discussion)

Other

Greene cites the work American ethicist and social psychologist Jonathan Haidt, in some 15+ pages, whose semi-popular 2012 *The Righteous Mind* posits the notion that morality is something evolved to deal with issues of cooperation. [9]

Education

Greene completed his AB in philosophy with a thesis on "Moral Psychology and Moral Progress" in 1997 at Harvard and his PhD in 2002 with in psychology with a dissertation on "The Terrible, Horrible, No Good, Very Bad Truth About Morality and What to Do About It" at Princeton, in 2008 was doing MRI-based research in the neuroscience of

morality, specifically querying men and women about trolley problem (Philippa Foot, 1967) like queries while being imaged, and presently is the a social science professor director of the Moral Cognition Lab at Harvard where he also is an associate professor of psychology.

Religion

Greene, whose first name, Joshua (or J- Shu), is derived from the Egyptian god Shu (see: Joshua 10:13), auto-describes himself as a "secular Jew" who seemingly doesn't believe in the existence of the soul. [3]

Quotes | Employed

The following are quotes employed by Greene:

> "The philosophy of one century is the common sense of the next."
>
> — Henry Beecher (c.1865), second opening quote in Greene's *Moral Tribes*

Quotes | By

The following are quotes by Greene:

> "Most people are dualists. Intuitively, we think of ourselves not as physical devices, but as immaterial minds or souls housed in physical bodies. Most experimental psychologists and neuroscientists disagree, at least officially. The modern science of mind proceeds on the assumption that the mind is simply what the brain does. We don't talk much about this, however. We scientists take the mind's physical basis for granted. Among the general public, it's a touchy subject."
>
> — Joshua Greene (2011), "Social Neuroscience and the Soul's Last Stand" [14]

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External links

- â— Joshua D. Greene (faculty) – Harvard University.
- â— Joshua Greene (psychologist) – Wikipedia.
- â— Greene, Joshua D. – WorldCat Identities.

θΔics

In existographies, **Joshua Rigley** (c.1710-1785) was an English engineer, noted for []

Overview

In 1702, Thomas Savery, in his "The Miner's Friend", proposed that his steam engine (see: Savery engine) be employed to pump water up, from a pond or mine, to above the level or height of an overshot wheel, which then fell, turning the wheel, the rotary motion then being used to work machines in factories.

In c.1768, Rigley, using Savery's water wheel mill proposal, and built the following factory engine at the cotton works of a Mr. Kiers in St. Pancras, London, which worked lathes and other machines: [1]

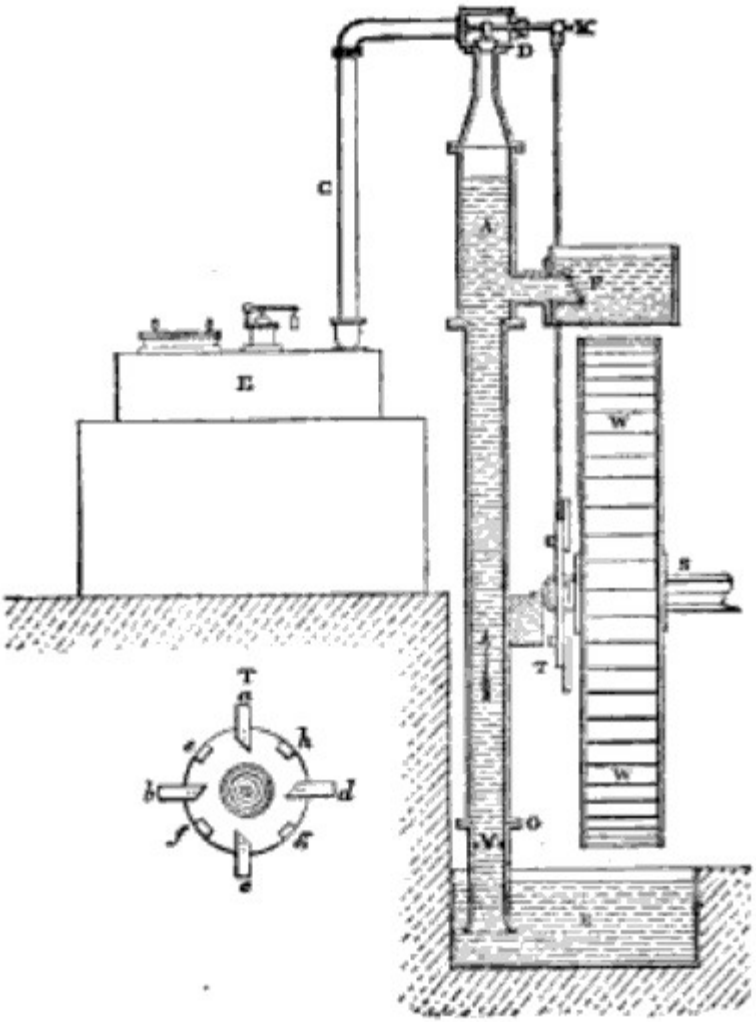

(add)

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θΔics

In existographies, **Josip Stepanic** (1970-) (SNE:7) (CR:29) is a Croatian physicist noted for a number of sociological thermodynamics papers, in 2000 to 2007, modeling social systems and economies via thermodynamic formalism, using concepts such as social free energy, among others.

Stepanic lists his current key term areas of interest as complex systems, systems theory, non-equilibrium thermodynamics, and socio-physics. [4]

Overview

In 2000, Stepanic, published his "Approach to a Quantitative Description of Social Systems Based on Thermodynamic Formalism", co-authored with Hrvoje Stefancic, Mislav Zebec, and Kresimir Perackovic, wherein the sought to base social potentials on thermodynamic potentiss, the abstract of which is as follows: [1]

> "Certain statistical aspects of social systems are described by appropriately defined quantities named social potentials. Relations between social potentials are postulated by drawing an analogy with thermodynamics relations between thermodynamic potentials, thus obtaining a toy model of some of the statistical properties of social systems. Within this model, an interpretation of a socially relevant acting that does not invoke structural changes in social systems, is given in terms of social potentials."

(add discussion)

Education

In 1995, Stepanic was a research and teaching assistant at the faculty of science of the University of Zagreb, in 2003 he completed his PhD, and in 2006 he became a professor of mechanical engineering, at the University of Zagreb. [2] Stepanic is currently the editor-in-chief of the Croatian bi-annual thermodynamics-content journal *Interdisciplinary Description of Complex Systems*. [3]

Quotes

The following are noted quotes:

> "Recently, the application of quantities of thermodynamic origin for social system description occurred in which the free energy is used along with entropy (Dragulescu and Yakovenko, 2000; Mimkes, 2000; **Stepanic** et al., 2000; McCauley, 2002; Muller, 2002). In these works, authors interpret the free energy in social context as profit in economic processes (Dragulescu and Yakovenko, 2000), common happiness or common benefit (Mimkes, 2000), or as a part of complete thermodynamically based formalism without a specific meaning (McCauley, 2002; Muller, 2002). Furthermore, it has been specifically described as a measure of possible social actions in relatively stationary social system states, i.e. a measure of iso-structural social actions (Stepanic et al., 2000). The stationary state means a state describable using time-independent quantities. In all these cases the social analogue of free energy is close to material and immaterial surplus of resources. The measure of iso-structural social acting provides information about what activities can happen in a given social system, without a significant change of the system structure. Therefore, it is analogous to a measure of the quantity of work obtainable from some physical system in that its initial and final states are in equilibrium. That recognition led to its description as social free energy. Nevertheless, the similarity between social and thermodynamic free energy is not complete. Thermodynamic free energy is accompanied with the firm formalism. In the social system context we are not aware of explicitly written, appropriate equations of state, although their existence has been discussed (Bailey, 1994)."
>
> — Josip Stepanic, et al (2005), "Describing Social Systems Using Social Free Energy and Social Entropy" [6]

> “I have just recently found out about the EoHT—a truly marvelous project! I did not think that it **could be possible** for someone to be able to conduct such a demanding project, but the result itself proves it is possible. Thank you for *Hmolpedia*.”
> — Josip Stepanic (2009), “Email to Libb Thims”, Apr 13

> “Originally I assumed or believed that everybody thought like I did [or like we do]; I soon, however, found this not to be the case.”
>
> — Josip Stepanic (c.2009), comment to American electrochemical engineer Libb Thims (see: forest blind) [5]

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External links

- Josip Stepanic (overview) – Ideas.Repec.org
- Josip Stepanic – (curriculum vitae) – GetCited.org
- Josip Stepanic – FSB locator.
- Josip J. Stepanic (faculty) – Department of Quality.
- Josip Stepanic – Academia.edu.
- Josip Stepanic – Twitter.com.

θΔics

In units, **joule**, symbol J, in honor of James Joule, is the SI unit for energy, which became a formal adoption in 1971, in components units of newtons times meters, or N m. [1]

See also

- Joule's first law
- Joule's second law
- SI unit geniuses

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External links

- Joule – Wikipedia.

θΔics

In science,**Joule's first law** (TR:13) states that the heat *Q* produced when a current *I* flows through a resistance *R* for a specified time *t* is given by the current squared multiplied by the product of the resistance and the time, or equalitively: [1]

$$Q = I^2 Rt$$

The law is named after English physicist James Joule.

See also

- Joule's second law

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(b) Daintith, John. (2005). *Oxford Dictionary of Science.* Oxford University Press.

θΔics

In thermodynamics, **Joule's second law** (TR:17), as contrasted with Joule's first law (1841), states that the internal energy *U* of a given mass of an ideal gas is independent of its volume and pressure, depending only on its temperature T, as defined by: [1]

$$U = f(T)$$

The law is named after English physicist James Joule who determined this relation via experiment in 1843. [5] To note, in the case of a non-ideal gas, intermolecular forces would cause changes in internal energy should a volume change occur. [2]

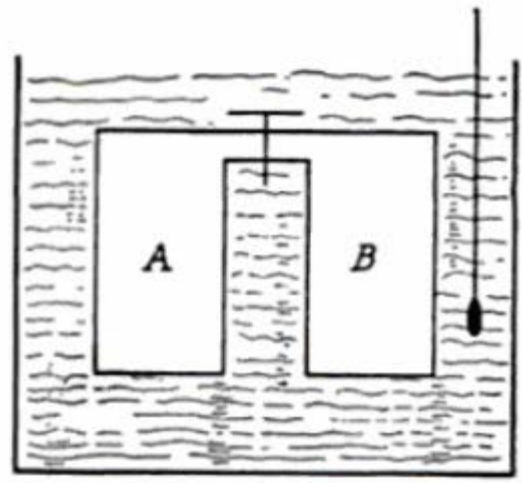

English physicist James Joule's 1844 volume expansion experiment: wherein a pressurized volume A is connected to a vacuumed volume B, the connecting valve is opened, and temperature change is recorded (no change was found); which gave experimental proof to **Joule's second law**, that the internal energy of an ideal gas body is independent of volume or volume change, depending only on temperature. [4]

Proof

The experimental proof for the law that the energy of a body of gas is a function of temperature only, and does not depend on volume was conducted by English physicist James Joule in 1844 who conducted an experiment in which he placed a single bi-chamber system (A and B), as depicted adjacent, with chamber A filled with gas, chamber B evacuated, the two chambers connected by a closed stopcock into a calorimeter. [4]

After placing the bipartite system into the water bath, he then let the system (A + B) reach thermal equilibrium, as indicated by a thermometer placed within the calorimeter; meaning that he waited until the temperature reached a constant value.

In this initial state, to clarify terminology, what seems to be the case is that Joule is defining the "system", or working substance, working body, or working fluid, or thermodynamic system, in modern parlance, as the boundaried region contained within containers A and B, such that A and B constitute one system, such that in this initial state, whatever happens to the system, e.g. if the experimenter twists the stopcock, the process will abide by the first law of thermodynamics:

$$Q = \Delta U + W$$

meaning that if any heat release (or absorption) is measured by the calorimeter, it will be a function of the change in internal energy ΔU and or work W done by or on the system. The work W, to clarify, is PV work, done on or by the surroundings. Since, however, the boundary of A + B is fixed, irregardless of the internal happenings, the PV work, will always be zero:

$$W = 0$$

Hence, with substitution, in the second previous equation, Joule's experiment, according to the first law, will abide by the following expression:

$$Q = \Delta U$$

Joule then opened the stopcock, thus permitting the gas to

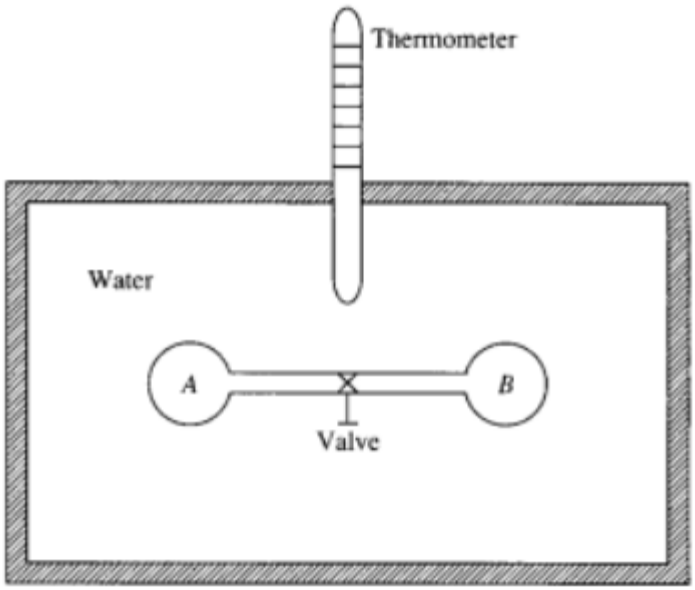

A modern rendition of Joule's classic **dual bulb experiment**, which, according to American thermodynamicist Merle Potter, took place in 1843. [5]

expand in volume, a type of internal system volume change, until it filled both chambers, thus the body of initial state gas reaching a final state volume V_f (size of chambers A and B, combined) and final state internal energy U_f. The internal system volume change defined by:

$$\Delta V = V_f - V_i$$

which equals:

$$\Delta V = (V_A + V_B) - V_A$$

or

$$\Delta V = V_B$$

The energy change defined by:

$$\Delta U = U_f - U_i$$

Joule then observed that there was only a slight change in the reading of the thermometer, meaning that there had been practically no transfer of heat Q from the calorimeter to the chamber or vice versa. In equation form:

$$Q \cong 0$$

It has been assumed that if the experiment could be performed with a perfect ideal gas, with chamber B initially being a perfect vacuum, that there would be no temperature change at all and that there would be no heat flow across the boundary during the volume expansion. In equation form:

$$Q = 0$$

With substitution of this experimental finding into the first law balance for this equation:

$$\Delta U = 0$$

From these results, Joule concluded that the internal energy of an ideal gas is not a function of volume change:

$$U \neq f(V)$$

since the initial state volume and final state volume were different, yet no heat left or was absorbed by the body. He also concluded that the internal energy of an ideal gas is not a function of pressure change:

$$U \neq f(P)$$

since the initial state volume and final state volume were different, yet no heat left or was absorbed by the body.

Conclusion

Joule's experimental findings leads us to the conclusion that a variation in volume at constant temperature produces no variation in energy or in other words the energy of an ideal gas is a function of the temperature only and not a function of the volume:

$$U = f(T)$$

One must then determine the form of this function, from experimental findings.

Discussion

The underlying conclusion, as to internal system happenings, with the finding that the overall internal energy change was zero:

$$\Delta U = 0$$

implies that with substitution of zero into the definition of internal energy change:

$$\Delta U = U_f - U_i$$

the conclusion is that the initial state internal energy must equal the final state internal energy:

$$U_f = U_i$$

The definition of the formula for internal energy, however, is a bit illusive. The standard formula is that given by German physicist Rudolf Clausius in 1850 as:

$$U = H + J$$

where *H* (not to be confused with enthalpy, H) is vis viva, not to be and *J* is ergal, which loosely translates as the sum of kinetic energy and potential energy, respectively:

$$U = E_K + E_P$$

or the sum of the energies of motion and the sum of the energies of position. Other more exotic definitions of internal energy exist. In regard to Joule's experimental finding, using the standard Clausius definition:

$$E_{K_i} + E_{P_i} = E_{K_f} + E_{P_f}$$

which loosely states that some of the initial experiment state potential energy E_{Ki} was converted into final experiment state kinetic energy E_{Pf}.

Human thermodynamics

Iranian-born American engineer Robert Kenoun, in his 2006 book *Theory of History and Social Evolution*, seems to use an unwritten Joule's second law interpretation of human social systems, in combination with Newton's law of cooling, to argue that evolving human social systems tend towards a minimum of internal energy and that conjoined systems will exchange energy during these evolutions, through a process of thermalization or equilibriation, at a rate proportional to their difference in internal energies. [3]

References

1. Powell, Michael. (2004). *Stuff You Should Have Learned in School.* New York: Barnes & Noble.
2. Daintith, John. (2005). *Oxford Dictionary of Science.* Oxford University Press.
3. Kenoun, Robert. (2006). *A Proposition to Theory of History and Social Evolution*. Trafford Publishing.
4. Fermi, Enrico. *Thermodynamics* (proof, pg. 22). Dover.
5. Potter, Merle C. and Somerton, Craig W. (2009). *Schaum's Outlines: Thermodynamics for Engineers* (pgs. 67-68). McGraw-Hill.

External links

â— Joule’s second law – WolframAlpha.com.
â— Joule’s laws – Wikipedia.

θΔics

In journals, **Journal of Human Thermodynamics** (JHT) is a semi-annual publication of articles on topics related to the thermodynamics of human existence and experience, on topics ranging from atoms, entropy, relationships, society, to wealth, etc., inclusive of connective topics in chemistry, physics, and or physical chemistry, as well as place for book reviews, on recently-published articles or books on human thermodynamics and the related, and or letters to the editor. [1]

Journal cover

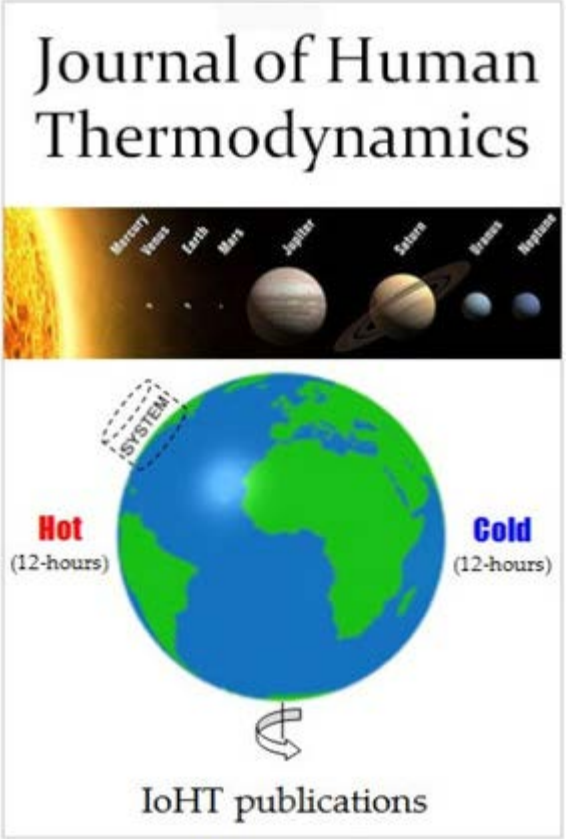

Journal details

Abbreviation	JHT
Disciplines	Thermodynamics, chemistry, physics, humanities, philosophy
Language	English
Publisher	Institute of Human Thermodynamics
History	2005, 2008-2013, 2015-present
Reviewers	Review board
Frequency	Yearly
Access	Open
ISSN	1559-386X
Format	PDF
Cost	Fee = $0, submission or access
Links	Homepage

Overview

The JHT is an open-access, free of charge, online journal maintained by the *Institute of Human Thermodynamics*, articles being hosted at the URL: humanthermodynamics.com. The JHT, is a periodic publication of articles on thermodynamics and its applications to human states, processes, and transformations of existences as contributed by human thermodynamicists, and related researchers, scientists, and writers in the field.

Checklist

The following are submission requirements:

1) Article

(formatted into provided JHT template page).

2) Human thermodynamics variables table

(thermodynamics "variables" mapped or correlated to the terms, conceptions, and or entities of the "humanities" and put in the form of a table of human thermodynamic variables)

3) Homework problems

(provide two end of article homework problems or exercises).

These two end of article additions are to be formatted into the JHT template page in the slots provided.

Review board

See main: JHT review board

The review process for JHT articles in the years 2005 to 2010 has been somewhat haphazard, involving a combination of email exchanges and online discussion. In 2011, the Mohsen Mohsen-Nia article "A Thermodynamic Methodology for Evaluating Friendship Relations Stability" article was tested using open beta review format, wherein selected reviewers were requested to give comments and critiques, in wiki threads or via email.

In 2012, an effort was initiated by Thims to establish a formal review board for the JHT, similar to the public listing of the online *Entropy* journal, so as to facilitate and speed the mechanism of the review process. [4] The following are the current JHT board members: Libb Thims, Jing Chen, Jeff Tuhtan, Josip Stepanić, Mohsen Mohsen-Nia, Kalyan Annamalai, Gerard Nahum, David Porreca, and Curtis Blakely.

JHT citation format

See main: JHT formatting

A good rule of thumb is to the the same citation format that is found in *Hmolpedia* articles.
The following are a few example JHT citations in Google Books or Google Scholar, wherein the JHT is mentioned or has one its articles cited:

● (a) Nahle, Nasif. (2009). "A Thermodynamic Description of Life and Death in Biosystems", *Journal of Human Thermodynamics*, 5: 7-14.
(b) Feng, Hao. (2010). *Ultrasound Technology for Food Bioprocessing* (Nahle, pgs. 110, 122). Springer.
● Pati, Surya P., Padhi, Mousumi, and Kumar, Pankaj. (2010). "Influencing Employee Attitudes through HR Practices: an Exploration Study in Indian IT sector." (abs) *International Journal of Indian Culture and Business Management*, 3(6): 607-22.

Review process

See main: JHT review process

The review process for the JHT is diagrammed in the following flow chart schematic:

1. Articles are formatted (using the JHT template page)
2. Articles are sent to Libb Thims (as attachment to: libbthims@gmail.com).
3. Submissions, if approved, are formatted further for "readability" by Thims, and then put into a review wiki page (filed under the JHT submissions page).
4. Thims emails the JHT board members and initiates the review process.
5. Article, if it passes the peer review process, is published and subsequently enters into Google Scholar.

In short, JHT article submissions, in Word document format, are collected by Libb Thims, sent to him as attachments, primarily via libbthims@gmail.com or sometimes via questions@humanthermodynamics.com. The submitted articles are accumulated, as the year progresses, stored in computer file. At a point later in the year, Thims uploads each article into a JHT formatted online wiki page at the beta review site: JHT beta (submissions), each as a separate online article, ready to undergo the peer review and article improvement process, each review wiki article filed as a subpage to the JHT beta (submissions) header page.

Thims then emails everyone (review board members and collective set of submitting authors) that the set of articles are ready for the open beta review process, and that everyone (review board members + authors + other interested parties) is

now invited to review and comment on the said articles, through the following means of communication: (a) threads below each article, (b) text comments added into a review section at the top or bottom of wiki page of the article itself [as article changes can be tracked, changed, and or reverted via the "about this update" and "complete history" links, below each article], (c) email reviews sent back to Thims (e.g. via word document attachment or email comments), or (d) other means the reviewer may think of to communicate his or her critique.

Topics not accepted

As a standing rule, the following are topics *not* accepted for JHT article submission:

- God theories
- Information theories
- Life theories

There are exceptions to the above, e.g., in regards to religion (or religious thermodynamics), if the article discusses morality, such as Goethe's famous "moral symbols" of physical chemistry, or aspects of history of comparative religion and mythology in connection to modern hmolscience topics, etc., among other possibilities; although these types of submissions can only be discerned on a case by case basis, as often hidden agenda is difficult to discern. In addition, as of 2012, following prolonged multi-year debate, discussion, and development of the defunct theory of life (2009) position, life theories and origin of life theories are now classified as perpetual motion of the living kind theories, and hence not accepted as JHT submissions, just as is the case with any other perpetual motion theory. In the famous 1938 wisdom of English physiologist Charles Sherrington: chemistry and physics do not recognize the term "life", hence neither does the JHT.

A 2012 video on the process of paper submission to *Nature*, founded in 1869 by Norman Lockyer, with contributions from his X Club, including: Joseph Hooker, Herbert Spencer, John tyndall.

Motto

The 2005-launched motto of the JHT—a spin on the Nobel Prize motto—was:

> "To Promote the Art and Science of Human Thermodynamics for the Betterment of the Human Kind."

A 2012 Google listing profile for the ***Journal of Human Thermodynamics***, showing the URL location at which articles are freely-available as pdfs.

In 2012 retrospect reflection, knowing that thermodynamics and physical science in general is strongly deterministic, meaning that the fate/destiny of humankind is already determined, a more apt motto might be: "To Promote the Art and Science of Human Thermodynamics for the Better Understanding of Human Existence." A better motto may be suggested as well.

ISSN

The ISSN for the JHT is **1559-386X** as registered with the US ISSN Center and listed in the OCLC. [2] The JHT is listed in *Ulrich's Periodical Directory* under category "energy". [3]

Variables table

In 2011, following the discovery of

American economisit Irving Fisher's economics thermodynamics variable table, shown adjacent, wherein Fisher defines a human as a "particle" (see: human particle), as found in American physical economics historian Philip Mirowski's 1989 *More Heat Than Light*, JHT founder Libb Thims began to request human thermodynamics variables table from submitting authors, so to (a) define what exactly the view the human to be, in their models, and (b) to define exactly how they see or view every other "variable" (or property) in their article, so to keep presentations away or aloof from obfuscation, misrepresentation, and or confusion.

In Mechanics.			*In Economics.*
A particle	corresponds	to	An individual.
Space	"	"	Commodity.
Force	"	"	Marg. ut. or disutility.
Work	"	"	Disutility.
Energy	"	"	Utility.

American economisit Irving Fisher's economics thermodynamics variable table, from his 1892 PhD dissertation *Mathematical Investigations into the Theory of Value and Prices*, described by Paul Samuelson as "the best of all doctoral dissertations in economics", the content of which was heavily influenced by the physics, chemical thermodynamics, and vector analysis teachings of his advisor, American engineer Willard Gibbs.

See also

- JHT: Journal article potentials

References

1. (a) *Journal of Human Thermodynamics*, Chicago: IoHT Publishing.
(b) Journal of Human Thermodynamics – Google Books.
(c) Journal of Human Thermodynamics – WorldCat.org.
2. (a) ISSN = International Standard Serial Number.
(b) JHT is registered with the US ISSN Center and listed in the OCLC (Online Computer Library Center).
3. Journal of Human Thermodynamics – *Ulrich's Periodical Directory* (category "energy").
4. Editorial board – mdpi.com/journal/entropy.

θΔics

In thermodynamics journals, the **Journal of Non-Equilibrium Thermodynamics**: Thermophysical, Chemical, and Biochemical Processes is a four-time per year publication on topics in nonequilibrium thermodynamics, with priority given to contributions which increase understanding of nonequilibrium phenomena and processes in engineering and related natural systems. [1]

Focus: topics in nonequilibrium thermodynamics
ISSN: 1437-4358
Imprint: Walter de Gruyter
Inception: 1976

References

1. Journal of Non-Equilibrium Thermodynamics (homepage) – Walter de Gruyter.

In publications, **journals** are semi-annual periodicals dealing with matters and subjects of interest to specific topics. [1]

References

1. Journal (definition) – Merriam-Webster Collegiate Dictionary, 2000.

External links

â— Journal – Wikipedia.

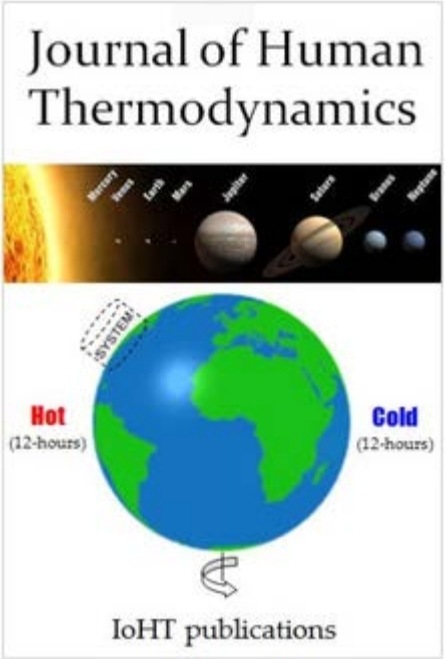

2005-present

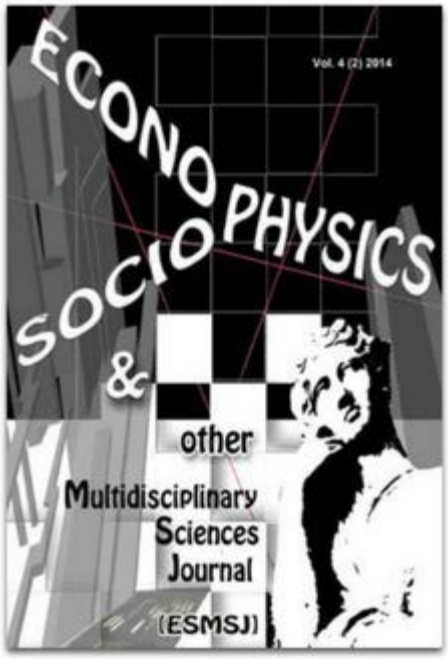

2011-launched

The *Journal of Human Thermodynamics*, launched in 2005 by American electrochemical engineer Libb Thims, and the *Econophysics, Sociophysics, and Multidisciplinary Sciences Journal*, launched in 2011 by Romanians economist Gheorghe Savoiu and physicist Ion Siman, two examples of **journals** that publish hmolscience-related content, people defined explicitly as molecules and or atomic-based structures.

In existographies, **Juan Martinez-Alier** (c.1941-) (CR:5) is a Spanish economist noted, in economic thermodynamics, for []

Overview

In 1987, Alier publisher *Ecological Economics: Energy, Environment, and Society*, one of the first books on ecological economics, the aim of which seems to be an effort to employ some kind of energy accounting system into economic theory and practice. Alier notes that engineer Josef Popper tried unsuccessfully to promote a biophysical view of the economy as a subsystem embedded in a larger system subject to the law of thermodynamics. He notes that Popper wrote on the history of thermodynamics wherein he insisted on strict separation of scientific propositions and metaphysical propositions, complaining about William Thomson's religious tirades based on the second law. [2]

Education

Martinez-Alier completed his PhD in economics at the Autonomous University of Barcelona and has been a professor of economics and economic history there since 1975.

Quotes | By

The following are quotes by Alier:

> "The starting point for economics should be the first and second laws of thermodynamics."
>
> — Juan Alier (1987), *Ecological Economics* (pg. 135)

References

1. (a) Martinez-Alier, Juan and Schlupmann, Klaus. (1987). *Ecological Economics: Energy, Environment, and Society* (quote, pg. 135). Blackwell.
(b) Rotond, Claudia. (2001). "Competition and Economic Temperature: the Entropy Law in Emanuele Sella's Work", in: *Economics and Interdisciplinary Exchange* (ch. 6:, pgs. 150-170), ed. Guido Erreygers. Routledge.
(c) Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (pg. 25). AuthorHouse.
2. Alier-Martinez, Juan. (2002). *The Environmentalism of the Poor: a Study of Ecological Conflicts and Valuation* (thermodynamics, pg. x, 18-19, 32, 44, 163, 217). Edward Elgar Publishing.

External links

- â— Martinez Alier, Juan – WorldCat Identities.
- â— Juan Martinez-Alier (researcher) – United Nations Research Institute for Social Development.
- â— Joan Martinez Alier (contributor) – Encyclopedia of Earth.

θΔics

In debates, **Juarrero-Deacon affair** or "theory plagiarism allegation case" refers to the 2011-2012 legal-action perused allegation made by Cuban-born American philosopher Alicia Juarrero, formerly a professor of Prince George's Community College, Maryland, that American neurological anthropologist Terrence Deacon, the current head of the of the University of California, Berkeley, anthropology department, stole or "misappropriated" the bulk of her thermodynamics-based non-reductive materialism theories contained in her 288-page 1999 book *Dynamics in Action: Intentional Behavior as a Complex System*, and used them as the basis of his 602-page 2011 book *Incomplete Nature: How Mind Emerged from Matter*, without citation of her work.

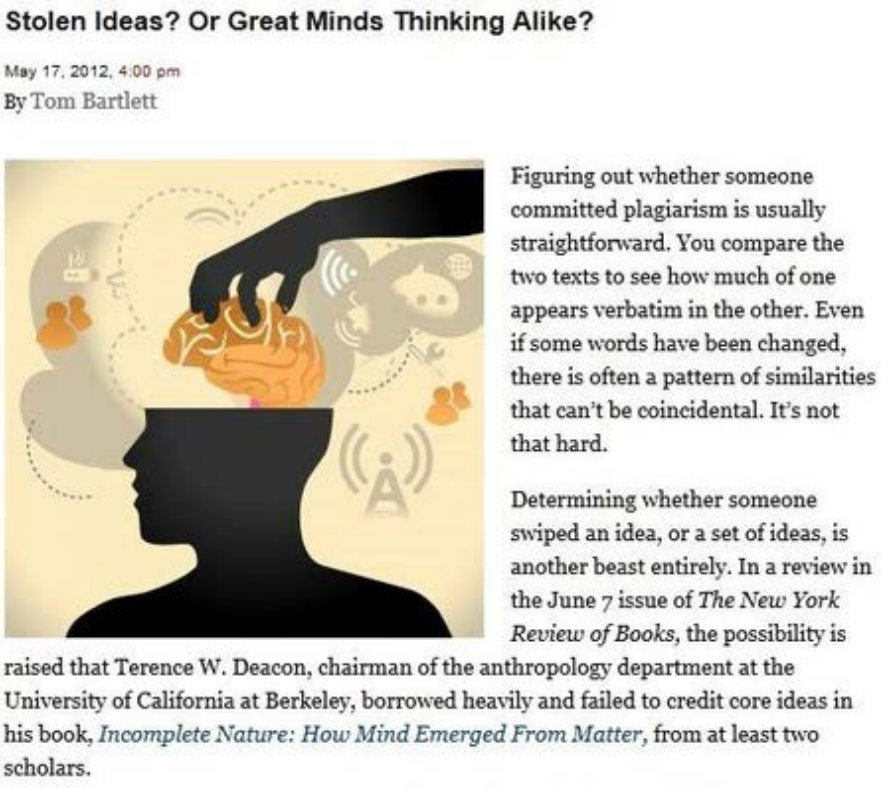

Stolen Ideas? Or Great Minds Thinking Alike?

May 17, 2012, 4:00 pm

By Tom Bartlett

Figuring out whether someone committed plagiarism is usually straightforward. You compare the two texts to see how much of one appears verbatim in the other. Even if some words have been changed, there is often a pattern of similarities that can't be coincidental. It's not that hard.

Determining whether someone swiped an idea, or a set of ideas, is another beast entirely. In a review in the June 7 issue of *The New York Review of Books*, the possibility is raised that Terence W. Deacon, chairman of the anthropology department at the University of California at Berkeley, borrowed heavily and failed to credit core ideas in his book, *Incomplete Nature: How Mind Emerged From Matter*, from at least two scholars.

Science research writer Tom Barlett's 2012 blog article "Stolen Ideas? Or Great Minds Think Alike?" on the so-called **Juarrero-Deacon theory plagiarism allegation**, the allegation by Cuban-born American philosopher Alicia Juarrero that American neurological anthropologist Terrence Deacon stole her ontic opening dissipative structures emergence theory of intentional behavior. [1]

Positions

The following are representative statements by the two sides of the so-called theory plagiarism allegation affair, the first statement by Michael Lissack, the aggressive leader of the Juarrero camp, an American Wall Street whistleblower turned complexity-emergence theorist:

Michael Lissack (13 Sep 2012): [15]

"Our position on this matter is very clear: Terry Deacon is a serial plagiarist and UC Berkeley has no interest in dealing with that ugly truth."

Terrence Deacon: (29 Feb 2012): [16]

"Hi all (and especially Marianna), I have been directed to your blog by a colleague who noticed the comments about my book and Juarrero's spreadsheet. This is a nasty business in which Juarrero is spreading false claims suggesting that I have used her ideas without attribution. I have not. I urge you to read both books [17,18], and you will see this for yourself. Although there are indeed superficial similarities, as inevitably occurs in an area of such intense intellectual discussion, these are ultimately quite superficial. I have only recently come to read her book [17] and her one paper [13] on Kant in response to her **tirade** [19] **about not being cited**, and it is now clear that I disagree with her approach in far more ways than we agree. This is not just because she is a philosopher and I am a lab scientist by training. I think that we are fundamentally driving at very different ways of explaining almost every aspect covered in my book: life, mind, sentience [feeling/sense], consciousness, information, work, and so forth, even though we both borrow insights from dynamical systems theories and share a criticism of simple eliminative materialism. Nevertheless, once you overcome the accusatory hype of her spreadsheet [3] and actually do compare these two approaches the differences can be quite informative and worth debating. To those of you struggling through the book [18]. I hope that you find the ideas worth the time and teleodynamic work. I can't promise

> to be able to keep up with your blog or to have any idea of what OOP is about but I am honored to have initiated some interesting discussions."

This, in the famous words of English polymath Thomas Young, is scientific warfare at its best! Lissack and his camp, surrounding the work of Alicia Juarrero, is making the "attack" and the unwary, it seems to be, caught off guard Terrence Deacon is now fighting a near long battle of "theory plagiarism" accusations. For those in the "materialism versus emergence" field of debates this is a ripe educational experience, to say the least—particularly being the case that the near tipping point investigation turned legal action law suit, seems to have implications for everyone in science, namely that whenever independent theory overlap occurs, without citation, knowingly or unknowingly aware of the other similar theories, accusations of theory plagiarism may erupt. As Thomas Kuhn as famously pointed out independent theory development does not, however, typically tend to be the result of theory plagiarism, but one of paradigm change.

Berkeley investigation

In 2012, Robert Price, a political scientist, associate vice "chancellor for research" at the University of California, Berkeley, the person in charge of so-called "research misconduct", assigned two "experts" in the field, whoever these may be, to look into the plagiarism allegations, and report the results of their investigation at the end of a 120-day period. On 22 Jan 2013, the Berkeley investigation committee released its findings, the conclusion of which is as follows: [26]

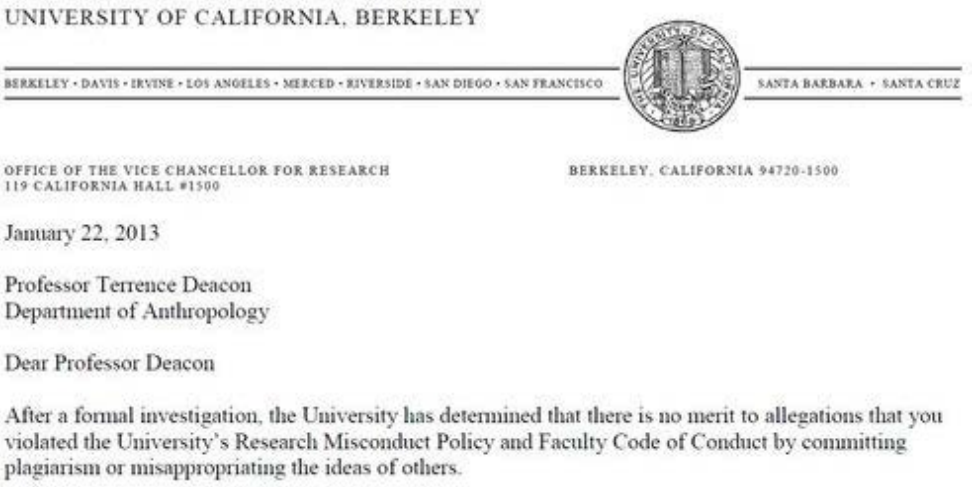

UNIVERSITY OF CALIFORNIA, BERKELEY

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OFFICE OF THE VICE CHANCELLOR FOR RESEARCH
119 CALIFORNIA HALL #1500

BERKELEY, CALIFORNIA 94720-1500

January 22, 2013

Professor Terrence Deacon
Department of Anthropology

Dear Professor Deacon

After a formal investigation, the University has determined that there is no merit to allegations that you violated the University's Research Misconduct Policy and Faculty Code of Conduct by committing plagiarism or misappropriating the ideas of others.

The opening section of the formal exoneration, by the official investigation of the University of California, Berkeley, of the plagiarism allegations of Deacon made by Juarrero. [28]

> "After a formal investigation, the University has determined that there is no merit to allegations that you violated the University's Research Misconduct Policy and Faculty Code of Conduct by committing plagiarism or misappropriating the ideas of others."

Per the unusual "public nature" of the case, full details of the report can be found online at TerryDeacon.Berkeley.edu.

Plagiarism by negligence

Of note, the Berkeley report overview cites the Hmolpedia "HT pioneers" page, with its 500+ chronological listing of theorists to have applied thermodynamics to questions of human existence, a group to which both Juarrero and Deacon belong (though not yet input into the table, as they are both newly-found theorists, i.e. theorists not found in the 2002-2012 search period construction of the table), as a method of disproof to American Wall complexity-emergence theorist Michael Lissack's definition of what he calls "plagiarism by negligence", the gist of which is that anyone now, according to Lissack, in the modern Internet age, who publishes a new idea or theory without first doing a search for previous theorists, is guilty of plagiarism. [27] Specifically, as stated in a 2012 letter to Robert Price, entitled "Subliminal Influence or Plagiarism by Negligence?", according Lissack: [28]

> "There is no excuse, to even tolerate the idea that in the Internet Age it is acceptable … to fail to see what others have written before publishing his own work. Plagiarism by negligence is still plagiarism."

This idealized view of Lissack, as the Berkeley investigation report explains, is a naïve perspective. The HT pioneers page, in fact, as stated here (31 Jan 2012), took American electrochemical engineer Libb Thims 10-years (2002-2012) to construct and compile, using an exhaustive method of searching, namely: Google Books, Google scholar, libraries,

Internet, footnotes, bibliographies, articles, blogs, webpages, etc., and that was after working independently on his own theoretical queries, without worry about what had been done prior to him, for a period of seven years (1995-2001) simply as a personal curiosity. Some HT authors, such as Iranian-born American electrical engineer and material scientist Robert Kenoun (*Theory of History and Social Evolution*, 2006), to note, choose specifically to avoid a prior read of the extant literature to keep the originality of their work in view. Hence, Lissack's conception of "plagiarism by negligence", even if an idea gets into the mind of the author via "subliminal influence", as Lissack puts it, where the author loses track of or may not be aware of the original seed, is an unreal idealization and hence defamatory in assertion.

Thims investigation

In late 2012, Libb Thims, having previously written Hmolpedia articles on both Juarrero and Deacon, prior to coming across the debate, during the course of research for his Dec 2012 JHT article "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair", decided, out of basically humor, to make a neutral party go of the investigation. [20] On 1 Jan 2013, Thims has read the Kant paper [13], and is beginning to read, in chronological order, the 1999 Juarrero book and then the 2011 Deacon book to see if there is any truth to the allegations. Thims finished reading both the Juarrero (1999) book and the Deacon (2011) book in early Feb 2013, along the way creating a Google Book search overlapping "key term" usage in each book to account for similarity.

On Jul 2013, following open peer review and debate (Ñº), Thims, in his "Juarrero, Deacon, Nonreductive Physical Materialism, and Chemical Teleology" (Ñº), presented his unbiased analysis of the situation.

Overview

In overview—in what seems to be a case of "they stole my theory" paranoia—in 2011 Cuban-born American philosopher Alicia Juarrero asserted, through a series of MIT press legal-action advised communications to Robert Price, associate vice chancellor for research at the University of California, Berkeley, that Deacon misappropriated her theories (in his 2011 *Incomplete Nature*), as presented in her 1999 book *Dynamics in Action: Intentional Behavior as a Complex System*, and those in the 2007 book *Mind in Life: Biology, Phenomenology, and the Science of Mind* by Canadian philosopher Evan Thompson, who cites Juarrero, an interaction which as she chronologies dates back to 1981, without giving her proper citation credit. [2] The gist of the allegation is depicted as follows:

A

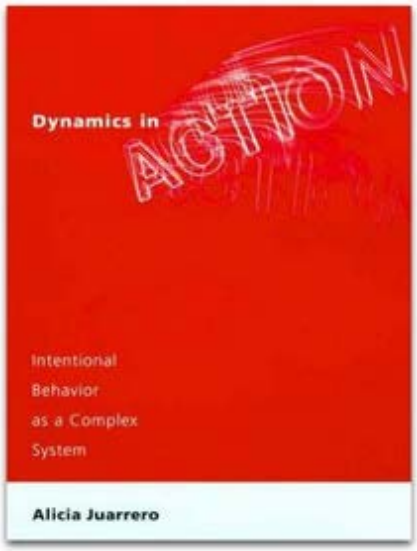

Alicia Juarrero (1999) [17]

+

B

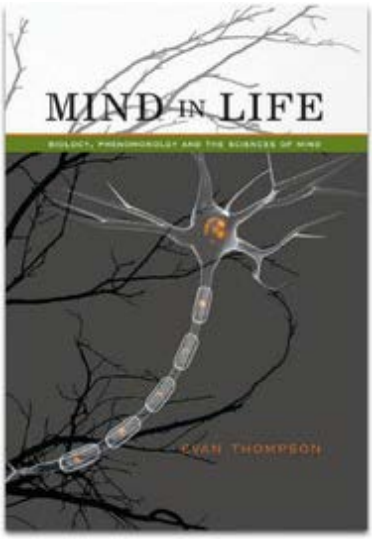

Evan Thompson (2007)

[?]
→

C

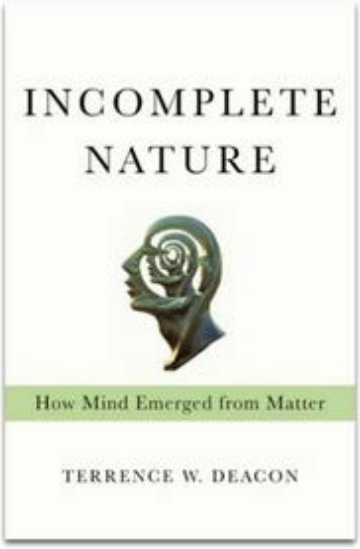

Terrence Deacon (2011) [18]

In short, Juarrero claims that Deacon culled his theories from Juarrero and Thompson, without citation.

Juarrero's team

To make her case heard, Juarrero teamed up with American Wall Street whistleblower turned complexity-emergence

theorist Michael Lissack, who notably in 1994 was awarded $30 million dollars for a Wall Street yield burning scandal, albeit who also notably pleaded guilty in 1996 to second-degree email harassment in another non-related whistle-blowing case, along with Carl Rubino, among others, to get the University of California, Berkeley, to take action, by using mass-email harassment tactics, public websites to showcase the event, among other venues. [4]

Michael Lissack claims to have sent fervent e-mails to more than 1,500 faculty members at Berkeley. Staff members, students, administrators and state legislators have also received the e-mails. [10]

Carl Rubino, a classics professor at Hamilton College, coauthor with Juarrero of the 2010 book *Emergence, Complexity, and Self-Organization: Precursors and Prototypes* (published by Lissack's Institute for the Study of Coherence and Emergence), claims that Deacon misappropriated. [11]

Colin McGinn, a British-born American mind-consciousness philosopher, a professor at Juarrero's alma matter (University of Miami), who supposedly was one of Juarrero's PhD advisers, seems to be also on the Juarrero team.

The 2012-launched sites AliciaJuarrero.com (29 Mar 2012) , run by Juarrero, and TheTerryDeaconAffair.com (27 May 2012), run by Lissack, are host and post to all of the related correspondence material surrounding the supposed "misappropriation allegations." [5]

Originality arguments

On 7 Jun 2012, British-born American mind-consciousness philosopher Colin McGinn, a professor at Juarrero's alma matter (University of Miami), who supposedly was one of Juarrero's PhD advisers, published a scathing review of Deacon's book in the *New York Times Book* review, promoting Juarrero, wherein he alludes indirectly to misappropriation of theory without citation as follows: [12]

> "There is in fact **hardly an original idea** in [Deacon's] book. Two works, in particular, stand out in the prior literature: *Dynamics in Action* by Alicia Juarrero and *Mind and Life Mind and Life* by Evan Thompson. **Neither book is cited by Deacon**, although they cover much the same ground as his—far more lucidly and insightfully."

One of the problems here, citation issues aside, in regards to originality, is that very few theories in the hmolsciences, specifically in the area of attempts to explain "mind" in the context and framework of materialism and physicalism are original. Only theorists fundamentally trained in the hard physical sciences, which is not the case here, are able pen out an original theory straight from chemistry and physics, without making a prior read of the existing literature.

A rare few notable examples of the latter case include: Iranian mechanical engineer and thermodynamicist Mehdi Bazargan (*Human Thermodynamics*,1956), South African chemical physicist Adriaan de Lange (*Entropy, Creativity, and Learning*, 1987), Iranian-born electrical engineer and material scientist Robert Kenoun (*A Proposition to Theory of History and Social Evolution*, 2006), and most-recently and impressively American physicist and computer scientist Wayne Angel (*Theory of Society*, 2007) who rips an equation-rich subject he he calls "relation thermodynamics" directly from American physicist Herbert Callen's 1960 *Thermodynamics* textbook, without citation of anyone.

These few rare examples aside, the majority of mind from matter (life from matter, consciousness from matter, purposive from matter, etc.) theories are cull theories, a good estimate, based on a look at the 500+ HT pioneers, would indicate that over 90-95 percent are cull theories, meaning theorists have to cull their ideas from the core theorists. Belgian chemist Ilya Prigogine, both cited by Juarrero and Deacon, is an example of a core theorist, as compared to cull theorist, who derived his theory right from the hard sciences. Juarrero and Deacon, for the most part are cull theorists, e.g. they both cull on the theories of self-organization and autocatalysis—albeit, it seems, in slightly different ways—to argue their mind from matter positions. Cull theorists, invariably, are forced to feed off core theorists. Juarrero, in her 1985 article "Self-Organization: Kant's Concept of Teleology and Modern Chemistry" (which seems to be the backbone to her 1999 book), to exemplify, in her attempt to explain "possessiveness" in a materialistic-deterministic world, culls off the following theorists: [13]

Theorist	Date	Theories
Democritus	c.410BC	accidentality mechanism theory (atomic theory)
Epicurus	c.300BC	accidentality mechanism theory (atomic theory)
Gottfried Leibniz	c.1714	mechanistic *vera causa* theory; hylozoism (panbioism); monad theory (internal force)
David Hume	1740	pre-Kantian ideas
Johann Blumenbach	1781	"bildungstrieb" (formational drive)
Immanuel Kant	1781	teleology and self-organization; living matter as inconceivable (origin of life); external force/internal force theory; hylozoism (panbioism)
Ilya Prigogine	1967	dissipative structures; order through fluctuations
Ludwig Bertalanffy	1968	general systems theory
Humberto Maturana	1973	autopoiesis
Mario Bunge	1979	emergent properties; holism
Milan Zeleny	1980	autopoiesis; holism; origin of life (first autopoietic system)
Erich Jantsch	1980	self-organization; autocatalysis; allopoietic systems; autopoietic systems; consciousness
Joseph Earley	1981	autocatalyticity

All of Juarrero's theory, at this point, mixed together, is what is classified as an ontic opening melting pot theory, an attempt to derive an anti-reductionism model of teleology (puposiveness) within the framework of materialism. Hence, Juarreo's claim to originality, at this point, is a bit tenuous.

Facts

Juarrero points out that Deacon attended one of her STARS conference lectures in Cancun in January 2007, they are shown seated near each other in the adjacent photo of the conference. Juarrero claims that that sometime therein they met in person. [7] Lissack says he gave a copy of Juarrero's book to Deacon a few years ago at a conference; though Deacon says this is not true. [1]

Keynote speakers, Terrence Deacon, second from left, and Alicia Juarrero, right, at the STARS conference lectures in Cancun in January 2007, one of

In commentary on these so-called "facts", listed here according to Juarrero's perspective, Deacon states his position, in regards to these alleged facts, as follows: [25]

the points of contact between the two; they both presumably listed to each other's lectures; Juarrero specifically states that Deacon was in the audience during her lecture.

"The "facts" listed [above] aren't in fact true. Lissack did NOT provide me with a copy of Juarrero's work (there are many witnesses to this). I presented the core theory from *Incomplete Nature* at the conference that was also attended by Juarrero (and my slides were made public by the organizers). I do not believe in top-down causality. I criticize the dynamical systems approach. I develop a fundamentally re-worked understanding of information that is not Shannonian. I am not an anti-reductionist. I find phenomenology vacuous. And I explicitly demonstrate why self-organization is insufficient for an account of life much less mind."

Theory overlap allegations

Juarrero, interesting, has produced a five-page spreadsheet where, according to her, supposedly, there are 243 instances of concept, term, theory, or idea misappropriation. [3] The gist of Juarrero's misappropriation claim seems to boil down to the her view that Deacon stole the following eleven ideas from her, as she explains in a 25 Jan 2012 letter to Thomas Barlett, an editor of *The Chronicle of Higher Education*:

"I need to emphasize that **Deacon**'s theses—and the arguments he presents to back up those theses—track mine practically from beginning to end (without my emphasis on action theory, and certainly without his neologisms!). We're not just talking of a few selected passages here and there that are similar. My central ideas and argumentation permeate Deacon's book from beginning to end, as the spreadsheet shows. Here are the two books' main theses:

1. Newtonian mechanical (efficient) causality cannot account for end-directedness and goal-directedness (teleology, purposiveness) –or agency, intentionality (consciousness, sentience). So attempts to reduce the latter to the former won't work.
2. Aristotelian formal and final causes used to serve this purpose but not an option since the enlightenment/scientific revolution—Kant knew that, however, and associated teleology with intrinsic finality/self-organization. Prigogine's discovery of dissipative structures provides a scientific respectable understanding of teleology as self-organization. I published this material in 1985.
3. Best to reconceptualize causality in other terms
4. Consider information theory and entropy in thermodynamics can help—especially Prigogine/self-organization/far from equilibrium thermodynamics (complex systems), and self-organization, especially autocatalysis. Autocatalysis embodies formal cause and constitutes a proto-self through the implementation of intrinsic constraints. Far from equilibrium thermodynamics do not violate the first law.
5. Part-whole and whole-part context-sensitive/dependent constraints (redundancy) can account for mereological causality (bottom up constraints are enabling, expand degrees of freedom); top-down second/higher order constraints—from whole to part—are restrictive)—differences between physical, chemical and biological constraint production and operation do not obviate the similarities and both can account for "whole to part causality"—these in turn embody formal and final causes without reduction or remainder.
6. The workings of constraint in both cases are changes in probability/frequency distribution—this dissolves the Maxwell demon problem by making the demon an internal. Second law of thermodynamics is thereby upheld too.
7. [Points] 5 and 6 above are best understood as ontogenetic and phylogenetically constructed dynamical attractors and can be pictured topologically. Doing so dissolves the semantics/syntax (meaning-grammar) problem—answers Searle's Chinese room objection.
8. The self, free will, and individuality are best reconceptualized and understood as the operations of complex dynamical constraints.
9. Dynamical constraint operation is irreducible to matter/energy considerations. There is decoupling between levels due to multiple realizability feature of higher level constraints. Hence emergence is ontological.
10. Agency and intentional causation are the exercise of whole-part dynamical constraints

11. Biological constraints are semiotic; interpretive since there is no sentence by sentence or paragraph by paragraph identities, in order to make a determination that my main claims and arguments have been appropriated there is no other way than to read both books carefully and in their entirety—using the spreadsheet's identification of specific page references in both books for assistance.

Juarrero seems to think she has some kind of intellectual property rights patent on concepts such as: Kant's theories, Prigogine thermodynamics, autocatalysis, far-from-equilibrium models, holism, emergence, anti-reductionism, Maxwell's demon exorcisms, attractor theories, Shannon bandwagon theories, free will theories, among others. This, however, is not the case. Her so-called idea number four, above, namely: "autocatalysis embodies formal cause and constitutes a proto-self through the implementation of intrinsic constraints", for example, dates back to the 1920s, such as in the works of Alfred Lotka (1920) and Gilbert Lewis (1925), to name two examples, and their similarly-aligned attempts to explain human existence in physical science terms. All of Juarrero's so-called "original" 1980s theories, in fact, have independent, forerunners, if not prototypes.

Discussion

That Deacon wrote a 602-page book after listening to one of Juarrero's 2007 lectures, however, is a big jump.

This conclusion is corroborated by the fact that Deacon by August of 2007 had published (in print) a co-authored chapter of his ideas, table of contents shown adjacent, entitled “The Physical Origins of Purposive Systems”, in a collaborative multi-author book *Embodiment in Cognition and Culture*, which as anyone knows who has ever published in a collaborative-chapter book is not a project that makes it into Amazon books within a seven-month window, but rather is a year or more effort.

These details aside, there does not seem to be any connection between the two, theory overlap aside.

The overlap in theory between books A and C seems to a repercussion of the fact that they are both irreducible (anti-reduction) emergence theorists, in favor of the top down approach (over the bottom up approach), who both similarly argue from a Prigogine thermodynamics + information theory (Shannon bandwagon) platform, and both seem to be of the view that the mind is irreducible to the level of matter.

The HT pioneers page alone lists a mixture of some 500+ theorists who argue in or about this neighborhood of reasoning, hence it is no surprise that book A and book C are similar in argument structure; this however, does not imply plagiarism or misappropration, but rather a theory of theory overlap.

The physical origins of purposive systems
Terrence Deacon and Jeremy Sherman

1 Telos: A lost cause? 3
2 Method 6
3 Minding the theoretical gaps 9
4 The model 11
4.1 The thermodynamic universe 11
4.2 Random collisions and geometric biases 12
5 From thermodynamics to morphodynamics 14
5.1 Autocatalysis: a morphodynamic chain reaction 15
5.2 A morphodynamic source of coherence 16
5.3 Autocell functions 17
5.4 The birth of evolvable telo-dynamics 18
6 From evolvability to purpose 20

Deacon's August 2007 chapter "The Physical Origins of Purposive Systems", co-authored with Jeremy Sherman, that Cuban-born American philosopher Alicia Juarrero claims, via legal action, he misapproprated from her lecture in Cancun seven months prior. [9]

Paranoia?

Juarrero, a community college professor, who promotes her book as "the first book by a community college professor to be published by MIT Press", seems to give the impression of a self-perceived underdog, so to speak, not getting the public credit for an independent common theory that someone at a higher ranked big league university is getting.

This seems to be corroborated by the fact

Cuban-born American philosopher Alicia Juarrero's 2012 "Is it Plagiarism?" poll (left) with vote count as of 17 Dec 2012, which show that 81% of voters (at her cite) think she is either paranoid or that the similarity is a repercussion of the fact that they work in the same field. [7]

that in her timeline of events, Juarrero seems to give indication to the idea that she also believes that Stuart Kauffman, in his 1995 *At Home in the Universe: the Search for the Laws of Self-Organization and Complexity*, stole theories from her 1985 article "Self-Organization: Kant's Concept of Teleology and Modern Chemistry". [6]

The siding with Deacon, in the conclusion that Juarrero is paranoid, however, is strengthened by the fact that the above paranoid conclusion sentence (this seems to be a case of "they stole my theory" paranoia) was typed out before coming across the fact that in 29 Mar 2012, Juarrero actually launched a site called AliciaJuarrero.com, where in she has a "am I paranoid poll" running, shown adjacent. [8]

Lissack allegations

Related to Juarrero plagiarism allegations, on 17 Oct 2012, American emergence-complexity theorist Michael Lissack, formerly sent in a complaint to Robert Price of the University of California, Berkeley, that Deacon plagiarized his meme as a 'sign' for an 'environmental niche' theory, from his 2003 article "The Redefinition of Memes: Ascribing Meaning to an Empty Cliché", using it without appropriation for the content of his 2004 chapter 'Memes as Signs in the Dynamic Logic of Semiosis: Beyond Molecular Science and Computation Theory.' [14]

Roland comparison example

A comparative "tirade about not being cited" example, to give some neutral perspective bearing on the above Juarrero-Deacon affair, are the multiple 2011 Hmolpedia thread posting complaints by Polish-born Canadian physicist Marek Roland that Americans ecologist Eric Schneider and science writer Dorion Sagan, in their 2005 book *Into the Cool*, stole his hot photon / cold photon earth-sun system depiction (both versions shown adjacent). In multiple 2011 Hmolpedia thread posts, and in other related email communications, Roland stated: [22]

> "It seems that in the book *Into the Cool: Energy Flow, Thermodynamics, and Life* ideas and drawings from my 1992 paper "Life on Earth: Flow of Energy and Entropy" are **used without my permission or due credit**."

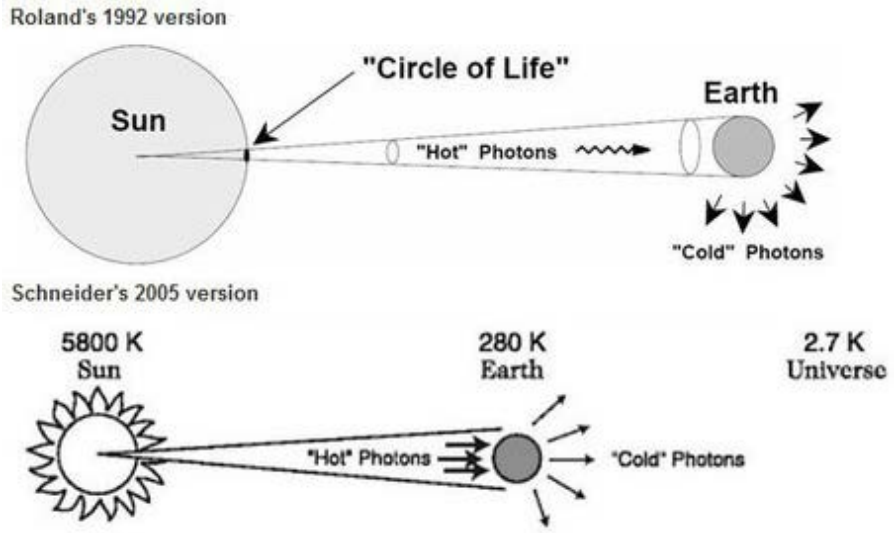

Two similar photon mill diagrams: Polish-born Canadian physicist Marek Roland's 1992 version and Americans ecologist Eric Schneider's 2005 version, the latter of which Roland claims Schneider copied without permission or citation, whereas correctly the hot/cold photon mill concepts predates both of them, particularly in the 1988 work of German physical evolutionists Werner Ebeling, Rainer Feistel, and Andreas Engel. [21]

In another thread Roland states: [23]

> "'Hot' and 'Cold' photons concepts were explained in my paper 1992 paper "Life on Earth: Flow of Energy and Entropy". **None of the authors above got my permission to use it or to re-work my diagram**."

The similarity between the Roland allegation and Juarrero allegation is striking. Indeed, Roland is not cited in Schneider's book. The diagrams are strikingly similar. The titles of both article and book are nearly synonymous. Schneider and Roland both are energy/entropy flow life theorists. Perhaps Schneider copied Roland without proper credit?

Yet, detailed comparative investigation shows, however, that all of these conceptual theories are *not* original that the hot-cold photon diagram model predates them both, specifically being found in the 1988 diagram work of German physical evolutionists Werner Ebeling, Rainer Feistel, and Andreas Engel. [21] Hence, the rant by Roland about theory and diagram stealing becomes rather puerile—particularly being that Roland actual cites the 1992 article "Theory of Self-organization and Evolution: the Role of Entropy" by Ebeling and Feistel, which is no doubt from where he got is diagram and ideas from and no doubt Schneider independently arrived at his ideas as commonly happens to theorists working in the same area. [24]

Other comparisons

Historically similar scenarios, comparable to the above, might include the way that Charles Darwin and Alfred Wallace both arrived at the same evolution theory coincidentally. The famous Newton-Leibniz controversy over who gets credit for the invention of calculus, Isaac Newton or Gottfried Leibniz, seems to come to mind. The famous "who gets credit for discovery of the conservation of energy", James Joule (predominately) or Robert Mayer (work discovered after the case), also seems to come to mind. The thermodynamical nature of the above brings to mind American thermodynamics Harold Morowitz and his expert testimony in the 1982 McLean vs. Arkansas (evolution vs. creation science) lawsuit.

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Further reading

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θΔics

In hmolscience, **Judah Leo Abravanel** (c.1465-c.1523) was a Portuguese-born Italian physician-philosopher noted for his c.1510 *Dialogues of Love*, oft-cited, e.g. Cervantes, Robert Burton, Henry Finck, etc., as one of the first love philosophers, per his philosophical discourses on love. [1]

Name

Leo also known as "Leone Medico" (Doctor Leon), Judah Leo (Finck, 1887), Judah Leon, Leo Hebraeus (Latin), Leão Hebreu (Portugese), León Hebreo (Spanish), Leone Ebreo (Italian), Leo the Hebrew (English), among others — literally meaning "Leo the Jew of the Ab (father) Rabban (priest) El (of God) family" (Ñº), one of the oldest and most distinguished Jewish families of the Iberian peninsula.

Overview

In circa 1510, Leo published his *Dialogues of Love*, wherein, in seeking to define love in philosophical terms, he structures his three dialogues as a conversation between two abstract and mostly undeveloped "characters": Philo, representing love or appetite, and Sophia, representing science or wisdom, in other words, Philo+Sophia (philosophy).

Cervantes, in his first volume of *Don Quixote*, refers those who wish to acquire some information concerning love to Leo's *Dialogues of Love*. [2]

Burton, in the chapter on love, in his *Anatomy of Melancholy*, quotes freely from this work of Leo, whom he names as one of about twenty-five authors who wrote treatises on love in ancient and medieval times. [2]

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External links

â— Judah Leon Abravanel – Wikipedia.

θΔics

In religio-mythology, **Judaic recension** (TR:5), or “Hebrew redaction” (Greenberg, 2000), refers to the recension (see: recension theory) actuated, in the years 1300 to 500BC, by Hebrew priests (e.g. Cohens), aka Judaism religious leaders the newly formed Is-Ra-El-ite culture, wherein a god-to-prophet reformulation of then extant cultural religious models, was enacted, resulting in a god reduction, of several 100 active gods, into about four supreme gods, e.g. Aten, Amun, Ra, YHWH, Yahweh, El, Elohim, etc., all merged into one general morphed monotheistic god-like character.

Overview

In c.450BC, Herodotus, in his *The History*, pointed out that a group of religious leaders called the "Choen", or Cohen (modern), were high ranking Egyptian priest-teachers. [1]

In c.800 to 200BC, a religious reformation actuated, wherein a new "Judaism" religion was formulated out of the older atrophying "Egyptian" religions, along with pieces of neighboring religions; the following section, from John Spark's 1931 histomap (2000BC-1900AD), gives a general idea of respective "powers", in terms of world dominance, of the various cultures, changing century by century, wherein we see that as Egyptian-power began to wane, in about 1000BC, as shown below, although this date is likely off by several centuries, given more accurate dating scheme, so-called Hebrew-power began to grow:

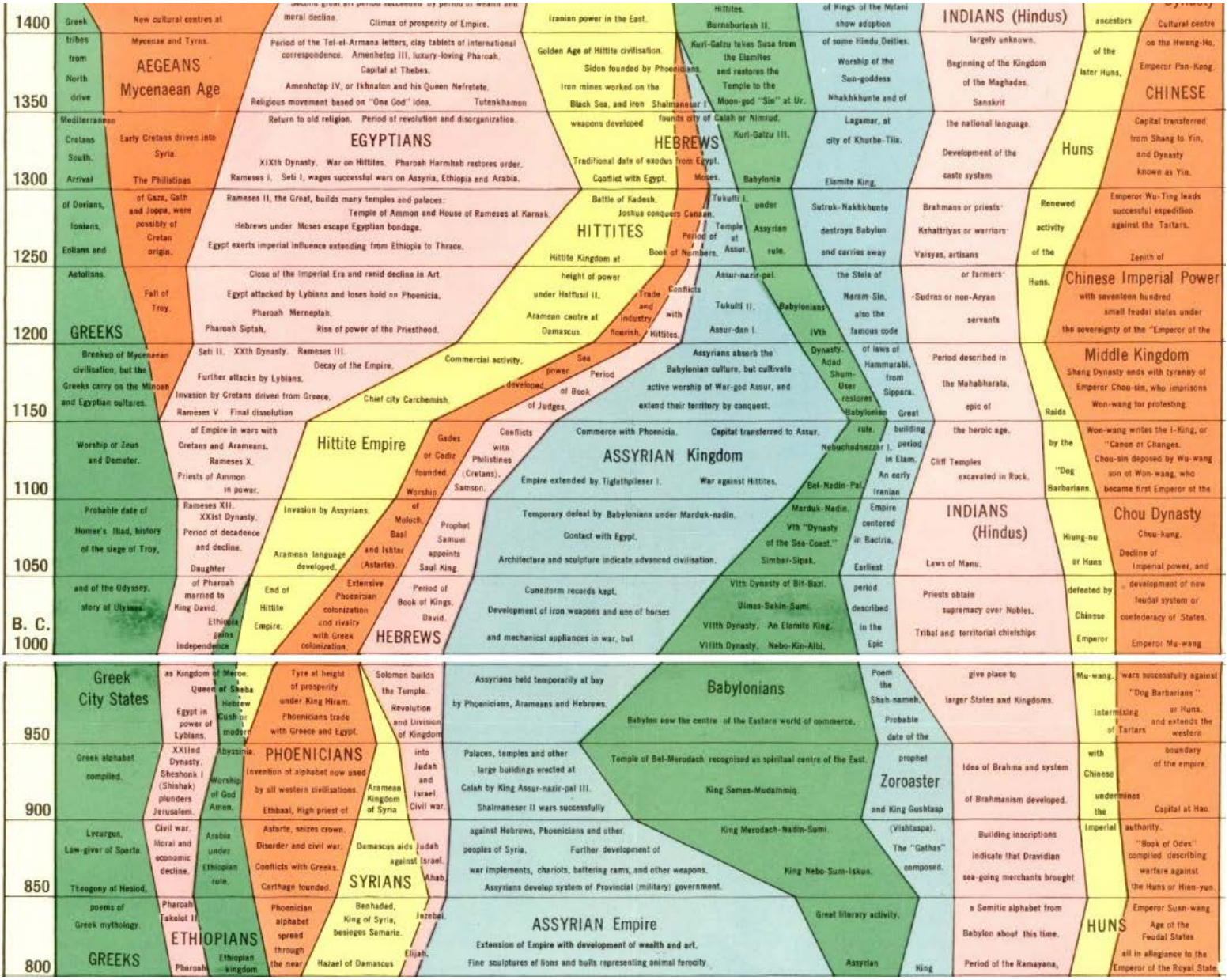

Now, when we look at this map, thinking about "Egyptian power" vs "Hebrew power", say as compared to Assyrian power, or Babylonian power, we must keep in mind that the term "religion" is Latin for *ligare*, meaning "to bind", according to which, the religion of any given cultural power, is, in effect, is the bonding force glue, that holds a given culture together, the exchange force for the underlying dynamics of the culture, so to say. Hence, when a given culture begins to atrophy or deteriorate in size, for whatever reason, in order to form a new culture, from the leaving migrants of the old culture, a "new" exchange force, has to be formulated, so that the "exchange" of ideas, concepts, and ideologies, of the newly-reformulated religion, or binding belief system, becomes or works as a new bond energy for the newly formed and growing culture.

In c.1850s, Samuel Dunlap, via citation to Franz Movers (1841), began to explain the general method by which the Hebrew religion form as a sort of truncate amalgamation of the surrounding gods of the land, albeit such that former "gods" were recast into Biblical "characters", thus reducing the number of worshiped gods, but while simultaneously retaining the former stories:

> “In this way antiquity disposes of its sun-gods. The **Hebrews turned [the gods] into Patriarchs**. Adam, Abraham, Israel, were names of Saturn. Edom is Adam; and the ancient usage was to name the nation, the land or city after the chief god. The Greeks made these deities founders of tribes.”
>
> — Samuel Dunlap (1858), *Vestiges of the Spirit of Man* [5]

> “The **Hebrew religion** stepped out from the noblest side of the Dionysus-worship, influenced, no doubt, to some extent by Persian and Babylonian ideas, but still retaining the Phoenician impress.”
>
> — Samuel Dunlap (1861), *Sod: the Mysteries of the Adoni* [4]

The following diagram shows the basics of the Hebrew redaction of extant Egyptian religion:

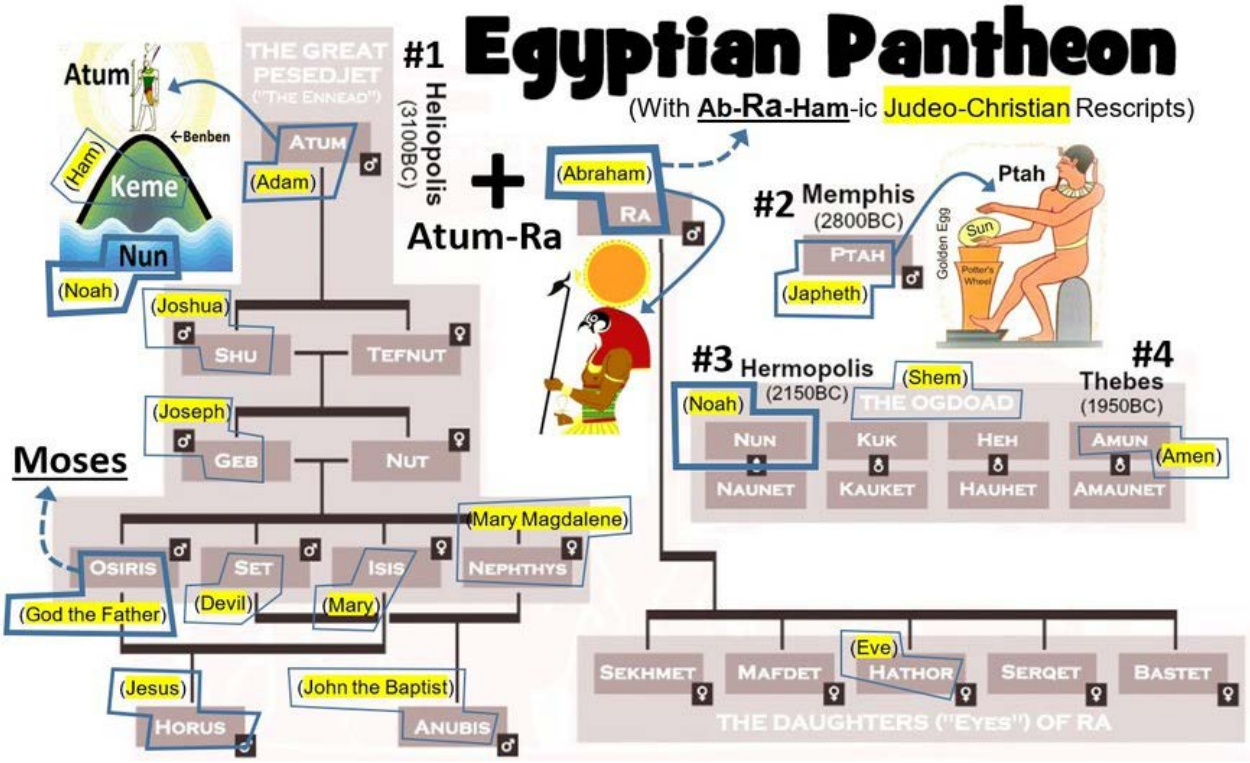

In this redaction, one of the key things done to unify the four main dominant religious sects of ancient Egypt, namely Heliopolis (#1 | 3100BC) (see: Heliopolis creation myth), Memphis (#2 | 2800BC) (see: Memphis creation myth), Hermopolis (#3 | 2150BC) (see: Hermopolis creation myth), and Thebes (#4 | 1950BC) (see: Thebian creation myth), was to script a story wherein the "two forms" of the god Nun, namely the Heliopolis version (3100BC), below left, wherein the land, or god Atum, with the black soil "keme" is born out of the waters of the Nun, and the Hermopolis version (2150BC), wherein in Nun was recast into an amalgamation of eight watery-chaos like gods called an "Ogdoad", into the Biblical story where in a man named **Noah** (Nun), descendant from a man named **Adam** (Atum), has three sons: **Shem** (Ogdoad), **Ham** (Keme), and **Japheth** (Ptah), from whom, via the Shem branch (see: religio-mythology genealogy), a man named **Abraham** (Ra) is born, form whose lineage a man named **Moses** (Osiris) is born; thereby affecting a unification of all extant previous belief system or cosmologies, albeit done in a god-to-prophet retelling of the earlier four creation myths.
The following, from the larger god character rescripts table, gives a better visualization of how these four main Egyptian god-like entities, Nun, Ogdoad, keme, and Ptah, were recast nearly in parallel in both Hindu mythology and Jewish mythology:

		Egyptian (3100-2400BC) Egyptian mythology	**Indian** (900BC) Hindu mythology	**Hebrew** (300BC) Jewish mythology
1.	**Nile River** 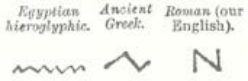	**Nun** (Nu)	Vish**Nu** (god) Ma**Nu** (man)	**Noah**
2.	Chaos (before the flood)	Ogdoad	Sherma	Shem
3.	Black fertile soil	Keme	Hama	Ham
4.	Creative force	**Ptah** [2800BC]	Jiapheta	Japheth

(add)

Documentary hypothesis

In 2000, Gary Greenberg, in his *101 Myth of the Bible* (pg. 7), described what he referred to as "Hebrew redaction", in short, as follows:

> "The Hebrew redactors used Egyptian myths to make the biblical stories; which, from time to time, had Babylonian myths grafted onto earlier texts or replaced portions of the original stories."

In more detail, according to the documentary hypothesis, as summarized by Greenberg (2000) this redaction involved at least involving four source documents and one editor; summarized as follows:

Source	Date	God	Roots	Discussion
A source	1300BC	Aten	[see: Aten's finger]	
AR source	1250BC	Amun; Ra		
J source	1000BC	YHWY; Jahweh [Yahweh]	Heliopolis recension roots [1]	
E source	922BC	El; Elohim	El god based roots	
P source	586BC		Theban recension roots [1]	
D source	650BC			
Editor	500BC			

In more detail, according to the so-called documentary hypothesis, first decoded by French Biblical scholar Jean Astruck (1753), who noted a distinction between the Jahvist god and Elohist god textual sources, these scholars or editor, took four Egyptian mythology source documents, aka the: **J source** (Jahweh theist), **E source** (Elohim theist), **P source** (theist concerned with Priestly matters, e.g. rituals, dates, numbers, measurements, etc.), and **D source** (theist who authored Deuteronomy), and syncretized the batch into the so-called *Book of Moses*. The dated origin of these different sources, including the Aten source (A source), are as follows: A source (1300BC), J source (1000BC), i.e. A morphed into J source, E source (922BC), J and E sources merged + commentary (722BC), D source (650BC), P source (586BC), final editor or redactor (500BC). [2]

See also

â— Jewish mythology
â— Judeo-Christian pantheon
â— Roman recension

References

1. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (roots, pgs. 3-4; pgs. 4-5). Source Books.
2. (a) Freud, Sigmund. (1939). *Moses and Monotheism* (pg. 50). Vintage, 1955.
(b) Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (pg. 74). Facts on File, Inc.
(c) Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (pg. #). Source Books.
(d) Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs) (pg. 131). Publisher.
3. Gordon, J.S. (2011). *Land of the Fallen Star Gods: the Celestial Origins of Ancient Egypt* (pg. #). Inner Traditions.
4. Dunlap, Samuel F. (1861). *Sod: the Mysteries of the Adoni* (pdf) (pgs. iii-iv). Williams and Norgate.
5. (a) Movers, Franz C. (1841). *The Phoenicians: Investigations on the religion and deities of the Phoenicians with regard to the murdered Cult of the Carthaginians, Syrians, Babylonians, Assyrians, the Hebrews and the Egyptians, Volume One* (*Die Phonizier, Volume One*) (86, 130) (arc). Publisher.
(b) Franz Karl Movers – Wikipedia.
(c) Dunlap, Samuel F. (1858). *Vestiges of the Spirit History of Man* (Israel, pg. 53). Publisher.

θΔics

In religions, **Judaism** (TR:10) is the name of the circa 500BC initiated religion adhered to by the Isis-Ra-El-ites, i.e. followers of the Canaanite recension (see: recension theory), the Amen-Ra (Yahweh/YHWH), Isis, and El god theogony, intermixed with Atenism (Akhenaten's god), e.g. Aten's finger penned the Ten Commandments, ideologies; the belief system espoused by the monotheism-minded branch of senior Egyptian priest-teachers called the 'Choen' (Cohen) (Herodotus, 450BC).

An 11-centemeter Cave of Skulls papyrus, carbon dated to 700BC, a receipt of delivery of wineskin, showing the name "Jerusalem" (Q) the oldest mention of the name, dating to the time of the first Judaic temple period. (Q)

Overview

In c.450BC, Herodotus referred to the most senior Egyptian priest-teachers as the 'Choen', which is found in the modern Hebrew variant overly-common surname Cohen, the name of the teacher caste. [1] The Indo-Tibetan variant, to note, is *chokhan* meaning 'adept teacher in chief'.

The following shows how the Egyptian "sidelock" of hair carried over from the Egyptian religion to the Jewish rescript of the former:

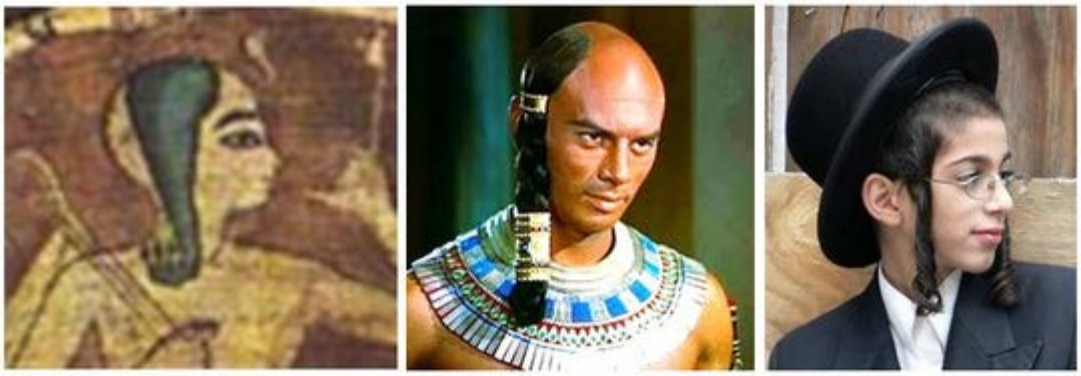

The following shows how the Egyptian skullcap of Ptah became the Jewish kippah or yarmulke:

(add)

Afterlife | Beliefs

The following is a rare statement about Jewish afterlife belief:

> "All Israel has a share in the world to come, as Isaiah said: and all of your people who are righteous will merit eternity and inherent the land. And these are the people who do not merit the world to come: (a) the ones who say that there is no resurrection of the dead, (b) those who deny the Torah is from the heavens, and (c) the Epicureans."
>
> — Anon (c.200AD), *Mishnah* (§:Sanhedrin) [1]

(add)

Is-Ra-El

> *See main: Is-Ra-El*

In 1858, Samuel Dunlap, in his *Vestiges of the Spirit of Man*, citing Franz Movers (1841), stated that the Hebrews were the first to turn the ancient sun gods into patriarchs (see: god-to-prophet), therein mediating a de-deification or god reduction: [3]

> "In this way, antiquity disposes of its sun-gods. The **Hebrews turned** [**gods**] **into Patriarchs** [see: god reduction]. Adam, Abraham, Israel, were names of Saturn. Edom is Adam; and the ancient usage was to name the nation, the land or city after the chief god. The Greeks made these deities founders of tribes."

In 1927, Thomas Spivey, in his *Christianity and Mythology*, after stating that "El means god" (pg. 44), was summarized the Israel etymology (pgs. 45) as follows: [6]

> "**Is** = light + **Ra** = sun + **El** = first cause. Israel = the church of god. Hence, it is the church of god which goes forth to usurp the power and control of established governments, and the church of god rewards the Jews for support by giving them control over Canaan, merchandizing and trading."

In 1935, Spivey, in his *The Awakening of the Sixth Sense*, state the Israel etymology as follows: [7]

> "The prophet whom it is so important to vindicate is 'Is-a-iah'. *Is* means light. **Is-ra-el** is: *Is*, the light of **Ra**, the sun, is **El**, the first cause. The Hebrews express Isis as Jesse, ... Is in Israel is identical with **Isis**, the Egyptian goddess of light; light meaning revealed wisdom, knowledge."

In 1956, Hilton Hotema, in his *Ancient Sun God*, building on Samuel Dunlap (1858), devoted an entire chapter to "Ab-Ram the Sun-God", in which he cites Dunlap as having said the following (hyphens included): [4]

> "The fire-god of Ur was Ab-Ram. The Hebrew world 'Ab' means 'father', and Ram (head sign of the Zodiac) means 'most high'. Ab-Ram and **Is-Ra-El** were names of Saturn."

In c.2000, Jordan Maxwell, who, in his "The Solar Cult" (2000), lists (Q) Hilton Hotema as his 6th recommended reading scholar, "Is Ra El" video lecture Q&A, gives a fairly cogent synopsis of how, in his view, Judaism was formed

by the migration process wherein the Phoenician Canaanites, aka Hebrews, with their embedded religion of the Isis Cult and Amen-Ra religion, moved north and encountered the Palestine god El, whom Maxwell defines as the planet Saturn. [5]

Quotes

The following are related quotes:

> "The [Judeo-Christian] Cosmogony, that is, the account of the creation with which the book of Genesis opens, has been taken and mutilated from the Zend-Avesta of Zoroaster, and was fixed as a preface to the Bible after the **Jews** returned from captivity in Babylon, and that the Robbins of the Jews do not hold their account in Genesis to be a fact, but mere allegory. The six thousand years in the Zend-Avesta, is changed or interpolated into six days in the account of Genesis."
>
> — Thomas Paine (c.1803), "Origin of the Christian Religion"

> "I call belief in revealed **Judaism** 'supernaturalism', not in the sense of the dogma restraining freedom of thought, but certainly in the sense of the dogma which admits the supernatural meaning of events that happen contrary to the usual order of nature, like miracles and revelation."
>
> — Samuel Luzzatto (c.1850), cited by Jennifer Hecht (2003) in *Doubt: a History* (pg. 378)

> "The **Hebrew religion** stepped out from the noblest side of the Dionysus-worship, influenced, no doubt, to some extent by Persian and Babylonian ideas, but still retaining the Phoenician impress."
>
> — Samuel Dunlap (1861), *Sod: the Mysteries of the Adoni* [2]

> "The **Hebrew** redactors used Egyptian myths to make the biblical stories; which, from time to time, had Babylonian myths grafted onto earlier texts or replaced portions of the original stories."
>
> — Gary Greenberg (2000), *101 Myths of the Bible* (pg. 7)

See also

- Jewish atheism
- Jewish mythology
- Judeo-Christian pantheon

References

1. Gordon, J.S. (2011). *Land of the Fallen Star Gods: the Celestial Origins of Ancient Egypt* (pg. #). Inner Traditions.
2. Dunlap, Samuel F. (1861). *Sod: the Mysteries of the Adoni* (pdf) (pgs. iii-iv). Williams and Norgate.
3. (a) Movers, Franz C. (1841). The Phoenicians, Volume One (*Die Phonizier, Volume One*) (86, 130) (arc). Publisher.
(b) Dunlap, Samuel F. (1858). *Vestiges of the Spirit History of Man* (Israel, pg. 53). Publisher.
4. (a) Dunlap, Samuel F. (1858). *Vestiges of the Spirit History of Man* (Ra, 19+ pgs; Brahma, 24+ pgs; Abraham, 15+ pgs; Ab-Ram, 7+ pgs). Publisher.
(b) Hotema, Hilton. (1956). *Ancient Sun God* (pg. 26). Publisher.
5. (a) Maxwell, Jordan. (c.2000). "Essential Jordan Maxwell: Isis-Ra-El = Israel (It's Not Holy). Amen" (Q)(Q), Merkabah Master Truther, Apr 30.
(b) Maxwell, Jordan; Tice, Paul; Snow, Alan. (2000). *That Old-Time Religion: the Story of Religious Foundations* (§:The Solar Cult, pgs. 35-54; Bibliography and Recommended Reading, pg. 74). The Book Tree.
6. Spivey, Thomas S. (1927). *Christianity and Mythology* (pg. 45). Book Tree, 2002.
7. Spivey, Thomas S. (1935). *The Awakening of the Sixth Sense* (pg. 236). Publisher.

8. (a) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 171-72). HarperOne.
(b) Cohen, Shaye J.D. (2014). *From the Maccabees to the Mishnah* (pg. 218). Presbyterian Publishing Corp.

External links

- Judaism – Wikipedia.

θΔics

In pantheons, **Judeo-Christian Islamic pantheon** is the Roman era (c.300BC-300AD) monotheistic recension (see: Roman recension) of the Egyptian pantheon, constructed via a god reduction focused pantheonic adjustment admixture (see: god character rescripts) of the then prevalent Judaic pantheon, Persian pantheon, Babylonian mythology, and Greek pantheon, followed by a secondary Islamic (600-800AD) modification, in short.

Overview

In c.150AD, early Christian theologians, known as Matthew and Luke, in the Roman province, and or "Roman theologians" (see: Roman recension), building on the earlier c.300BC Judaic recension (see: Jewish mythology) of Egyptian mythology, elaborated on the Abrahamic lineage (see: religio-mythology genealogy), namely in continuation of the Judaic god reduction practice of "turning Egyptian gods into prophets", e.g. Atum became Adam; Nun became Noah; Ra became Abraham; Osiris (or Osiris-Dionysus), a new afterlife based monotheism was proposed, wherein: Joseph became Geb; Isis became Mary; the syncretistic god Horus-Osiris (or Osiris-Horus) became of "god the son" or divinely born man (or god-man), retrospectively named Jesus Christ; Osiris became Lazarus, among others, e.g. Muhammad claimed descendant of Abraham via Ishmael; the gist of of which diagrammed (Ñº) as follows: [1]

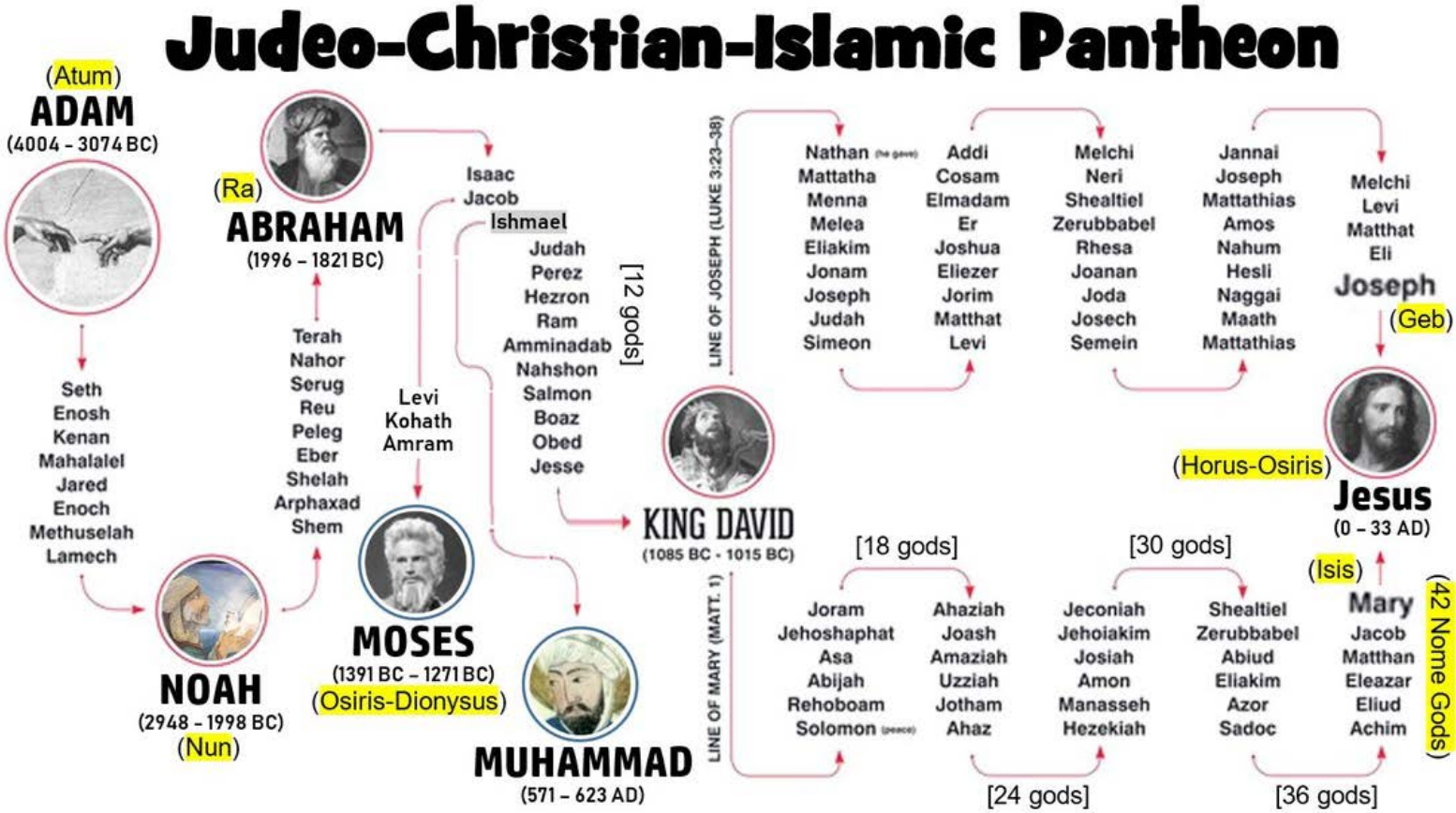

In the Matthew lineage, of note, we see a cleaver "god reduction" technique, wherein the previous 42 nome gods, one for each state capital of Egypt, who presided over the weighing of the soul of the dead in the judgment hall, between Ra and Osiris, became the 42 descendants between Abraham and Jesus, thereby acting to reduce 44 gods to one god man.

Quotes

The following are related quotes:

> "The **[Judeo-Christian] Cosmogony**, that is, the account of the creation with which the book of Genesis opens, has been taken and mutilated from the Zend-Avesta of Zoroaster, and was fixed as a preface to the Bible after the Jews returned from captivity in Babylon, and that the Robbins of the Jews do not hold their account in Genesis to be a fact, but mere allegory. The six thousand years in the Zend-Avesta, is changed or interpolated into six days in the account of Genesis."
>
> — Thomas Paine (c.1803), "Origin of the Christian Religion"

> "Bind it about thy neck, write it upon the tablet of thy heart: **'everything of Christianity is of Egyptian origin'**."
>
> — Robert Taylor (1829), *Oakham Gaol*; cited by Gerald Massey (1883) in *Natural Genesis, Volume One* (pg. iv)

> "The rapid growth and progress of Christianity in Egypt were due mainly to the fact that the new religion, which was preached there by St. Mark and his immediate followers, in all essentials **so closely resembled** that which was the outcome of the worship of Osiris, Isis, and Horus that popular opposition was entirely disarmed."
>
> — Wallis Budge (1904), *The Gods of Egypt, Volume Two* (pgs. 220-21) (Ñº)

References

1. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

θΔics

In religio-mythology, **Judgment Hall** (TR:10), aka "Hall of Maat" (Q), is location the dead were said to go in the afterlife, escorted there first by Anubis, for the initial soul weighing, i.e. to have the deeds of their soul weighted (see: soul weight), measured by 42 acts (see: negative confessions), against the feather of truth, on the scale of Maat, in the presence of 42 nome gods and Osiris, the king of gods, who sits at the thrown, accompanied by the goddesses Isis and Nephthys; the weight of the soul is recorded by Thoth; if the soul is heavy with sin, the monster Ammut "devours" the soul, and it goes into a fiery lake; if the soul is righteous or "light" with sin, the dead is led by Horus into the presence of Osiris and allowed into the afterlife.

Overview

In c.3100BC, during the formation of the Egyptian 1st dynasty, the model of one supreme god presiding or reigning over 42 nome gods, one god for each territory or nome (state) of Egyptian, solidified; the first pharaohs, e.g. were generally known by their so-called "Horus name", i.e. Horus in life, Osiris in the afterlife, or something to this affect.

The following is a depiction of the Judgment Hall, from the Papyrus of Ani (c.1250BC), from the British Museum (No. 10,470), sheet 3 and 4), as found as a fold-out diagram in the last page of Wallis Budge's *The Gods of Egypt, Volume Two* (1904), showing the scribe Ani and his wife entering the hall to have his soul weighed, judged, and if successful, to go into the company of Osiris, and supposedly the Egyptian paradise afterlife, aka the "field of reeds" (Q) or Aaru (Q), the precursor to Christian heaven, or if unsuccessful to have his soul be eaten by Ammit and thereafter to go into the lake of fire, or duat, depending, the precursor to Christian hell: [1]

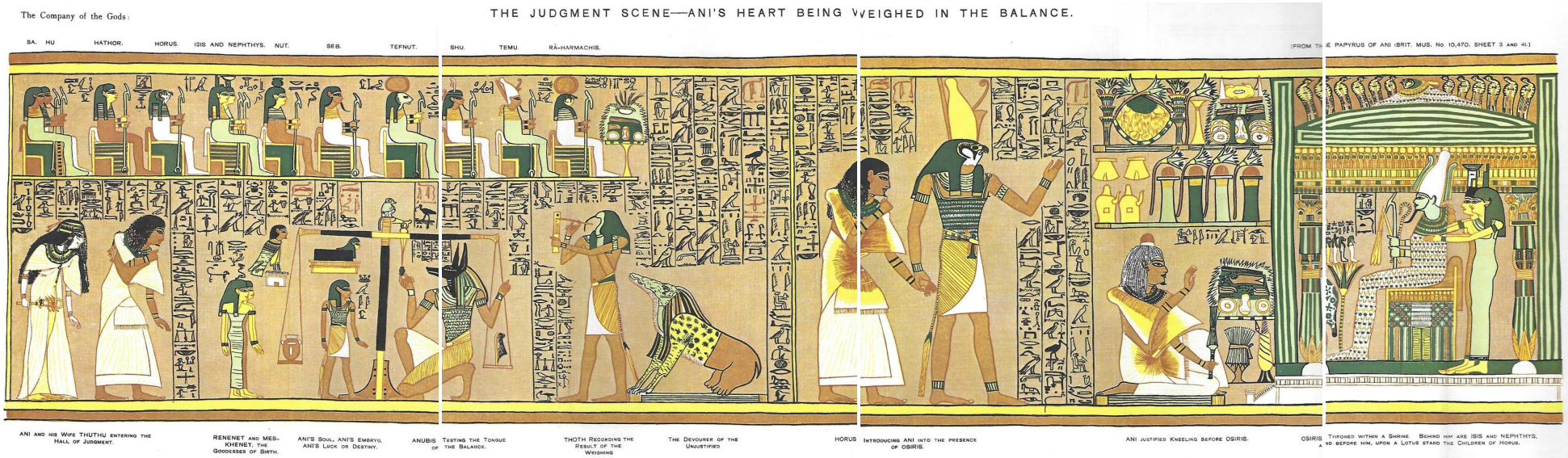

In c.1375, such as found in the *Book of the Dead* of the scribe Hunefer (Q), Judgment Hall was artistically conceptualized (Q) as follows:

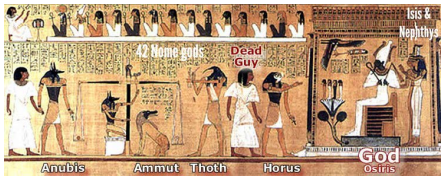

(add)

Christianity

In c.300AD, the Egyptian "Judgment Hall" became rescripted, during the Roman recension, into the model of "judgment day", as follows:

Original Version
(Egypt, 1500BC)

Rescript Version
(Rome, 300AD)

wherein Horus became Jesus and Osiris became god, who judged the sum of the rights and wrongs of the acts of the dead, therein determining if he would go to either heaven or hell.

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two*. Dover, 1969.

Further reading

- Thims, Libb. (2017). "If god asks you on Judgment Day, "why didn't you believe in me", what would you say?" (Q), Quora, Jul 26.

External links

- Last Judgment – Wikipedia.

θΔics

In human chemistry, **Judith Ryan** (1943-) is an Australian-born German-educated American German literature and languages scholar noted for []

Overview

In 1982, Ryan, in her "Elective Affinities: Goethe and Henry James", was the first to point out a connection between Goethe's *Elective Affinities* and Henry James' 1904 *The Golden Bowl*, both written by authors aged 60, lead character having the Charlotte name, both treatises on the nature of adultery, among other commonalities. [2] Joseph O'Leary expanded on this Goethe-James overlap further in his 2005 article "Goethe in *The Golden Bowl*". [3]

In 1988, Ryan was the English translator of the American Suhrkamp edition of Goethe's works.

In 2009, Ryan argued that Ottilie's *Tagebuch* is a hybrid between an older tradition of bookkeeping and an emerging tradition of psychological reflection. [4]

Ryan has also written on Gunter Grass.

Education

Ryan completed her BA at Sydney University, Australia, and her PhD at the University of Munster, Germany. In 1983, she was a professor of German literature at Smith College, Massachusetts. Ryan currently is department chair and professor of Germanic languages and literatures at Harvard University.

References

1. Goethe, Johann. (1988). *Elective Affinities* (translated by Judith Ryan, pgs. 89-; translators note, pg. 91; *Elective Affinities* End Notes, pg. 282-); in Volume XI of the American Suhrkamp edition of Goethe's works; Princeton University Press, 1995.
2. Ryan, Judith (1982). "Elective Affinities: Goethe and Henry James" (abs), *Goethe Yearbook*, 1:153-71.
3. (a) O'Leary, Joseph S. (2005). "Goethe in 'The Golden Bowl'", *Essays on Literary and Theological Themes*, Jun 22.
(b) The Golden Bowl – Wikipedia.
4. (a) Ryan, Judith. (2009). "Pfeile mit Widerhaden': On the Aphorisms in Goethe's *Wahlverwandschaften* und *Wanderjahre*", *Goethe Yearbook*, 16: 2-3.
(b) Author. (2010). "Article" (pg. 200), *Goethe's Yearbook*, 17.

Further reading

â— Ryan, Judith. (1983). "Views from the Summerhouse: Goethe's *Wahlverwandtschaften* and its Literary Successors", in: *Goethe's Narrative Fiction: the Irving Goethe Symposium, Volume 1982* (pgs. 145-). W. de Gruyter.

External links

â— Judith Ryan (faculty) – Harvard University.
â— Ryan, Judith (1943-) – WorldCat Identities.

θΔics

In hmolscience, **Charles Judson Herrick** (1868-1960), oft-cited as C. Judson Herrick, not to be confused with his older brother Clarence Luther Herrick (1858-1904) (Q), the founder (Q) of developmental psychobiology, whose work the younger carried forward, was an American self-classified "evolutionist" (1894), "biologist" (1912), and "anatomist" (1930), and or by profession: neurologist (1891), zoologist (1898), and pathologist (1917), noted for his 1930 speech "The Scientific Study of Man and the Humanities", given at the opening of the new Social Science Research Building (Q), University of Chicago, a very cogent and two cultures gripping appeal to humanities + natural science unification; Herrick, to note, became anti-reductionist and theism-defending (1956) in his latter publications.

Choice | Free will

Judson, citing Roy Sellars conception of immanent causality, falls into disarray when he attempts, in *The Evolution of Human Nature* (pg. 212), to define choice:

> "The operations at this level are not uncaused; but the psychological laws of 'immanent causality' in this domain cannot be formulated in terms of a linear temporal sequence, every step of which is inexorably predetermined by the preceding steps, such as is implicit in the laws of causal necessity codes of conventional inorganic mechanics. The choice is determined at the moment of its exercise in accordance with psychological laws of a different order."

Herrick, to exemplify, gives (pg. 213), the following looped argument, using (a) recursiveness and (b) the code word "creative", aka power of god, to argue for coded free will or free agent theory:

> "When the living body is viewed as a continuously evolving system which NEVER reacts identically to repeated exposure to apparently identical conditions. The act of response alters subsequent responsiveness. This alteration is neither random nor lawless. Creativity is exhibited in some measure by every mechanism."

Elsewhere (pg. 217) he states:

> "Human freedom of choice is not uncaused action. The cause is intrinsic to the situation. The action is not predetermined by an extrinsic causal agent. It is determined at the moment of its exercise."

Herrick goes on to discuss how the seeds for his model of a human as a "moral free agent", in a deterministic universe, were first outlined in his "Biological Determinism and Human Freedom", and follow up booklet *Fatalism or Freedom*. [12]

Nihilism | Individualism

Herrick, citing Leslie White, states the following confused understanding of value and individualism as modern positivism, in his day, saw things:

> "The overemphasis which these social positivists place upon environment and impersonal cultural factors leads to a social entropy which tends to reduce all social movements to the low level of inorganic mechanics. The logical outcome is Haeckel's evaluation of man — 'our human nature sinks (under scientific scrutiny) to the level of a placental mammal, which has no more value for the universe at large than an ant or the fly of a summer's day.' Human society is actually moving in the opposite direction, by reversal of entropy, toward constructive integration at a higher level; and the operative agencies are

individual people endowed with capacity for creative work. White's contention that the individual is irrelevant to an explanation of the cultural process leads to a nihilism would paralyze all man's effort to improve his condition, and this is not what science is for."

— Judson Herrick (1956), *The Evolution of Human Nature* (pg. 196)

"The social positivism to which the preceding criticisms are directed is, in my opinion, a perversion of the true significance of positivism as a general principle. If positivism is defined as the rule that we should never impute to a concept more properties than its operational definition allows, it follows obviously that we should never neglect any factors which do have operational efficiency. I claim, accordingly, that it is a violation of the rule of positivism to claim that the individual person's needs, desires, and ideals have no operational significance. I go further and insist that operational efficiency does not tell the whole story."

— Judson Herrick (1956), *The Evolution of Human Nature* (pg. 196)

(add discussion)

Experience | Evolution of

See also: Experientialism (Q)

Judson, in his §13: "The Evolution of Experience", has the following to say:

"If we are looking for the early precursors of human 'experience', we find (see: Boyajian's formula), that this limit is not reached at the level of the simplest animals known, for some rudimentary precursors of mentation can be recognized throughout the whole realm of inorganic nature. I prefer to give these early precursors of mind some noncommittal name: 'mind-stuff', if you like, but not mind."

— Judson Herrick (1956), *The Evolution of Human Nature* (pg. 160)

"All animals have experiences of some kin , and so do inanimate things. The engineer says that a cantilever bridge experiences certain measurable stresses when a train of cars passes over it, and it reacts to this strain in measurable ways. The bridge experiences the strain but, so far as we can tell, it has no knowledge about it. The
engineer upon completion of his measurements and computations has scientific knowledge about the situation, though he lacks the firsthand experience that the bridge has. An ameba experiences the satisfaction of hunger when it devours a smaller animalcule. A man has experience when he winces from pain of a pinprick. This is common usage. In each of these cases the object reacts to a change in the situation and the reaction is part of the experience; in fact, I think it is safe to say that the reaction is the experience.

The exciting agent is, of course, an integral factor in the situation, but the quality of the experience as such is determined primarily by what the organism does about it. If the creature has no visual organs, light is not an adequate stimulus and the animal does nothing about it. How he does respond to an adequate stimulus depends on the structural organization of his body. There may be no awareness of the experience in any of these instances, but if the man is conscious of the pain this awareness is part of his reaction. His experience is different and different parts of the brain are acting if the awareness component of the experience is present. The experience is a property of the individual that has it, or, better, that does it; for an experience is an act, not a passive receptivity, merely something that happens to an
inert body. This is true equally for the bridge, the ameba, and the man."

— Judson Herrick (1956), *The Evolution of Human Nature* (pg. 161)

> “This twofold quality of experience and of things experienced, as manifested in external relations in contrast with internal relations, is everywhere observable, form atoms to galaxies, from ameba to man. In the series of things, it is the key factor in determining the distinctive characteristics of every individual organism, and beyond thus of every social group.”

— Judson Herrick (1956), *The Evolution of Human Nature* (pg. 166)

(add discussion)

Chance | Determinism

Herrick was an anti-chance and anti-accident philosopher; the following is one example:

> “The living machine, like every other mechanism, works in an orderly way. No operations of nature are disorderly. An apparently random movement is random only within some particular frame of reference. Even the movements of electrons are not lawless. If they were, they could not be systematized statistically or treated scientifically in any way. The laws of probability imply order, not chaos. Accidents don't happen in nature. The novelties that constantly appear in nature do not happen by chance.”

— Judson Herrick (1956), *The Evolution of Human Nature* (pg. 61)

> “I repeat that the behavior of any class of things, whether electrons or people, which seems to us to be random is not lawless. We do not know all of the laws of these events, and Heisenberg has shown that in the nature of things there are some features of behavior that we never can know because of our limitations. But we do know that all apparently random events when studied statistically show certain uniformities which can be formulated as laws of probability. These laws do not enable us to predict with certainty the action of any individual, but they give us a measure of probability that is adequate for practical operations.”

— Judson Herrick (1956), *The Evolution of Human Nature* (pg. 62)

> “Let the goddess of chance aside in that pantheon to which Sam Weller assigned his Wenus and all other fabulous monsters. If nature is only partially integrated and utterly random actively is anywhere prevalent, then ever hiatus must be filled with some unnatural or mystical agency and the problems presented are scientifically insoluble.”

— Judson Herrick (1956), *The Evolution of Human Nature* (pg. 63)

Herrick, however, was not a full determinist (per his closet theism); for example:

> “Nothing in nature is indeterminate; but this does not imply that all is inexorably predetermined.”

— Judson Herrick (1956), *The Evolution of Human Nature* (pg. 62)

Herrick, in short, seems to have has some type of "choice" in open systems model of free will and soul, or something along these lines.

Dynamic Realism

In 1904, Clarence Luther Herrick (1858-1904) (O), Judson Herrick's older brother, had begun penning out draft notes for a “dynamic realism” philosophy; one of his posthumous fragments, cited by Judson (pg. 42), states the following assumption:

> “A unitary nature underlies all things. They have in common an energetic character which implies, on the face of it, nothing more than efficiency or power to act, and this, of course, a fundamental philosophical necessity of all being.”

Herrick the younger seems to have attempted to carry forward this research program, in the decades to follow.

Entropy | Second law

In 1956, Judson, in his *The Evolution of Human Nature*, citing Ludwig Bertalanffy (1950) and Leon Brillouin (1949), devotes 9+ pages to discussion of entropy and thermodynamics as he sees things, to argue that entropy only applies to closed systems; the following are a few examples:

> “The second law of thermodynamics is a rather special case in that it **applies only to** closed systems. It does not define the steady state as this is exhibited in vital processes. Entropy may decrease in open systems. Therefore, such systems may spontaneously develop toward states of greater heterogeneity and complexity.”
>
> — Judson Herrick (1956), *The Evolution of Human Nature* (pg. 51)

> “In the organic realm all growth and all progressive evolution manifest an apparent reversal of entropy. In this domain entropy means degeneration, death, and decay. It may well be that the reversal of entropy is true for the cosmos as a whole and that the process of degradation that we call entropy is merely a local and transient episode in a vast domain of creative process that is continuously enlarging and progressively differentiating. In fact, this possibility may be regarded as a probability, because there are no strictly closed systems in nature. Nothing that exists is completely isolated from its surroundings. The second law of thermodynamics — ‘the entropy of a closed system never decreases’ — is experimentally confirmed in certain selected types of situations where the system in question is closed, or isolated, in respect to the measurable quantities under investigation, but this does not mean that the law is a universal principle applicable to all existing things.”
>
> — Judson Herrick (1956), *The Evolution of Human Nature* (pg. 51)

> “The second law of thermodynamics applies only to closed (isolated) systems: entropy is not a universal principle: indeed, it is never absolutely …”
>
> — Judson Herrick (1956), *The Evolution of Human Nature* (pg. 52)

> “A more technical discussion of the relation between vital processes, including mental acts, and the second law of thermodynamics is found in Grunbaum’s essay ‘Time and Entropy’ (1955). His explanation of the meaning of time involves two tasks ….”
>
> — Judson Herrick (1956), *The Evolution of Human Nature* (pg. 53)

Here, we see an example of the so-called "system type fallacy" (or isolated

systems fallacy), i.e. the asserted belief that entropy only applies to certain "types" of systems, e.g. only to "isolated" systems, but not to "closed" or "open" systems; or as Judson confuses things only to closed or isolated systems, which he convolutes as synonyms. Entropy, and the second law, in Judson's view, ceases to operate in open systems.

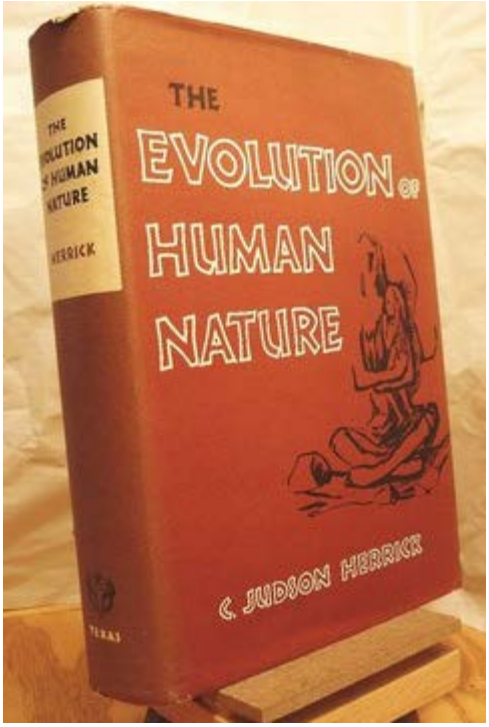

Herrick's 1956 *The Evolution of Human Nature*, the culmination of his thoughts on science, evolution, religion, and the nature of humans. [3]

Religion | Theism

Herrick was the son of Nathan Henry Herrick, a farmer who worked as a Baptist pastor on the side. Herrick was originally directed towards ministry as a career, until his older brother Clarence introduced him to nature studies, e.g. the classification of plants, which led to the study of the neuroanatomy of fish; in the end of his scientific education, Herrick seems to have become a "spiritual materialist" in belief system, or something along these lines; believing, supposedly, in evolution, but allowing for some type of god's finger "spiritual" role (i.e. "natural spirit" of some conceptual type) to operate in the neuroanatomical mechanism of the mind, while at the same time denying "supernatural spirit" and "ghosts", yet believing in some type of "natural spirit" theory.

In 1956, Herrick, in his *The Evolution of Human Nature*, only used the term god four times. Though he doesn't use the term "atheist" or "atheism", in this book, he does seem to be pro-atheist, e.g. citing George Santayana's 1906 *Reason in Common Sense* (Q), thereby presenting a leaning towards implicit atheism seeming view.

Creative | Nature

Herrick, in his §4: "The World in Which We Live" and §5: "Mechanism of the Living", however, employs a good deal of "creative process", e.g. "creation of novelties", "creative act", "creative factor", etc., indicating that he is trying to sell god via coded creation talk argument, i.e. the argument that god is the creative process in nature, with saying so directly. This would define Judson, at the age of 88, as an implicit creationist (see: implicit theism) ; the following is representative creationism-like statement:

> "It is not the province of science to enter the domains of esthetics, religion, and transcendentalism."
>
> — Judson Herrick (1956), *The Evolution of Human Nature* (pg. 39)

> "It is now clear that in all natural processes there is a formative or creative factor, but it is much more difficult to find and describe the mechanisms of this apparently miraculous creative production of novelties that it is to discover the mechanical principles of those repetitive processes that yield uniform products."
>
> — Judson Herrick (1956), *The Evolution of Human Nature* (pg. 43)

> "Every natural system, e.g, a volcano or a solar system, regarded as a mechanism, has intrinsic creative power, and non is a tightly closed system."
>
> — Judson Herrick (1956), *The Evolution of Human Nature* (pg. 57)

Here we seek Herrick setting up a coded theological divide argument; similar, some ways, to Stephen Gould's NOMA god (O) argument.

Neurology | Philosophy

In circa 1889, Herrick began to procure his own field of research, when, as an undergraduate student, at the University of Cincinnati, he worked on nervous systems of locally available bony fish. [5] In 1916, Herrick began teaching a course, at the request of the Department of Psychology, called "Elementary Neurology" for graduate students, which ran for twenty years; his former student George Bartelmez (1973) summarized this experience as follows: [5]

> "In 1916, at the request of the Department of Psychology, Herrick offered a course on "Elementary Neurology" for graduate students. There were no prerequisites, all the rules and regulations of the pedagogues were disregarded, attendance was voluntary both for laboratory and for conferences, the content of the latter being usually determined by questions raised by the students. There were only two requirements for credit: a term paper that critically discussed a subject chosen by the student and a statement of such contents of the course as were most pertinent to the student's interest and program. For twenty years the course was filled to capacity by students not only from the Department of Psychology but from other scientific departments and from the divinity school and the faculty of philosophy as well. Herrick regarded the course as the most satisfactory and stimulating work of his teaching career."

(add discussion)

Scientific humanities | Spiritual life

> *See main: Herrick Humpty Dumpty analogy*

In 1930, Herrick, in his "The Scientific Study of Man and the Humanities", a speech given at the opening of the new Social Science Research Building (O), University of Chicago, gave a very cogent and gripping appeal to humanities + natural science unification. [4]

Thermodynamics

In 1956, Herrick, in his *The Evolution of Human Nature*, speculated on how the second law of thermodynamics may or may not apply to the mind, in relation to entropy increases or decreases in open or closed systems; discussing aspects of human social evolution and the second law. [3]

Vitalism | Subterfuged

In 1928, Herrick, in his "Behavior and Mechanism", opened to subterfuged vitalism as follows: [1]

> "The modern period of biology began with the recognition that vital processes are natural events, not acts of the caprice of some supernatural spirit or ghostly presence. Today qualified biologists, with very few exceptions, accept this doctrine without reserve and devote themselves to the task of finding out just how the activities of living bodies are related with those of inorganic nature from which we derive our sustenance and our vital energies."

Herrick, in other words, covertly attempts to deny, without being aware of his own denial, he is a vitalist, while at the same type continuing with the usage of vitalism language; this same problem continues into the 21st century. He continues:

> "This does not mean chat the behavior of living bodies is just like that of dead machines; but it does mean that everything that goes on in a living body is related in an orderly way that is in causal sequences, with

> the events of the world in which that body lives. The laws of biology are not those of physics and chemistry, but they are congruous with them and the rules of these relationships are rapidly being discovered and recorded."

Here, the "dead machines" mention, which is akin to mention of "dead atoms", dead molecules, dead chemicals, etc., is but code for "unaware closet theism", unconscious theology, or something along these lines; and the latter, i.e. about biological laws being congruous with physicochemical laws, is but a flavor of the supervenience (Q) argument.

All of this hidden coded take comes out into the open in his 1956 *The Evolution of Human Nature*, the philosophical magnum opus of all his decades of neuroanatomy research, wherein he outlines what his former student George Bartelmez seems to characterize as "spiritual mechanics" of mental processes (1973 | pgs. 89-90) in short, a 90% science (neuroanatomy, physics, and chemistry) + 10% theology (spiritual life) model.

Education

Herrick began his education in a one-room school house, where his education, initially, was directed, by his father, a pastor of the frontier Baptist church, towards ministry. Herrick, however, had already begun to be introduced to nature, via the influence of his older brother Clarence Luther Herrick, a naturalist who eventually became a psychobiologist, with whom he collected and identified plants; something he continued to do into college.

In 1891, Herrick completed his BS in science at the University of Cincinnati.

In 1892, Herrick married Marry Talbot, the daughter of the retired president of Denison University, Ohio, and where he was studying, and also where his brother had become a new professor of biology; sometime therein, Herrick heard about a new course in "psychology" being offered by the new college president, supposedly Daniel B. Purinton (Q), and asked him if his own course on the nervous system be concordant with it; to which the president replied:

> "Young man, the brain has no more to do with the operations of the mind than have the cabbages out there in my garden."
>
> — Daniel Purinton (1892), reply to Judson Herrick about the possibility of a unified "neuro-psychology" course taught at Denison University [5]

In 1893, Herrick enrolled as a graduate student at Denison University, under his brother, or something along these lines. The following year, his brother was stricken with acute pulmonary tuberculosis, had to resign his professorship, after which Herrick the younger took over his brother's professorship and his *Journal of Comparative Neurology*, founded in 1891, which he ran up until 1907.

In 1896, Herrick obtained a leave of absence, to go to Columbia University and Woods Hole, where he completed his PhD.

In 1898, he was appointed professor of zoology at Denison

In 1907, he was offered the professorship of neurology at the University of Chicago, about which he was hesitant, owing to example of his brother's earlier demise owing primarily to "overwork". The following hilarious thermal word laced query by his wife eventually settled the matter:

> "Would you sooner go to Chicago and burn out or stay here and rust out?"
>
> — Mary Herrick (1907), hilarious query to her husband on his indecision on whether to go to University of Chicago to become professor of neurology or stay at Denison University as a zoologist; knowing, in context, that his older brother Clarence Luther Herrick, had, supposedly, "died" from overwork three years prior.

Herrick went to Chicago, where he worked for 30 years.

Quotes | Employed

The following are quotes employed by Herrick:

> "The entropy content of a living organism is a completely meaningless notion. We have been looking, up to now, for a physicochemical interpretation of life. It may well happen that the discovery of new laws and of some new principles in biology could result in a broad redefinition of our present laws of physics and chemistry, and produce a complete change in point of view."
>
> — Leon Brillouin (1949), "Life, Thermodynamics, and Cybernetics"; cited by Judson Herrick (1956) in *The Evolution of Human Nature* (pg. 51) [7]

> "Without some tension, social energy cannot be put to the service of man. Tension, like the voltage in an electrodynamic system, would permit energy to flow in useful channels without dangerous resistance which might destroy the structure."
>
> — Quincy Wright (1948), "Social Tensions"; cited by Judson Herrick (1956) in *The Evolution of Human Nature* (pg. 181) [8]

> "Nowhere is the positivistic fiction of a dispassionate, objective observer wholly removed from the field of his observation more absurd than in the social sciences. The difference between the social and the other sciences, however, is merely one of degree."
>
> — Kenneth Boulding (1949), "Is Economics Necessary?"; cited by Judson Herrick (1956) in *The Evolution of Human Nature* (pg. 199) [9]

> "A unified method of attack upon social problems which 'must be that of modern natural science applied fully to human society, including man's thoughts, feelings, and 'spiritual' characteristics."
>
> — George Lundberg (1947), *Can Science Save Us?*; cited by Judson Herrick (1956) in *The Evolution of Human Nature* (pg. 199) [10]

> "The artificial division that now exists between the natural and the humane sciences, and between the scientists and the humanists, is a survival of an outmoded dualism between things of matter and things of the mind. What we need today is a humanism that is scientific, and a science that is truly humane."
>
> — Agnes Meyer (1955), source; cited by Judson Herrick (1956) in *The Evolution of Human Nature* (pg. 203) [11]

Quotes | On

The following are quotes on Herrick:

> "The leitmotiv of **Herrick**'s scientific career was to contribute to the "psychobiology" envisioned by his

brother Clarence in 1891. This was to be a coordinated attack on the "mind-body" problem by comparative anatomists, physiologists, psychologists, and psychiatrists in correlation with the advances in other fields of science. In 1956 he summarized the progress in this field in his *The Evolution of Human Nature*."

— George Bartelmez (1873), "A Biographical Memoir of Charles Judson Herrick" [5]

Quotes | By

The following are noted quotes:

"Looking back now over the field which we have traversed, in our analysis of the behavior of animals and its mechanisms we start with the tropism and the reflex. This type of response is in some of its simpler phases indistinguishable from the reactions of dead machines to the forces which actuate them. But the more complex reflexes, on the other hand, grade over into those behavior types which we call intelligent. No one has yet succeeded in formulating a clear-cut definition of the limits of the reflex at either its lower or its higher extreme, and perhaps no one ever will; for the whole list of behavior types from machines to men probably forms a closely graded series."

— Judson Herrick (1909), "The Evolution of Intelligence and its Organs", citing Charles Sherrington (1904); cited by Alfred Lotka (1925) [6]

"With the advancement of practical and scientific knowledge though the centuries the primitive demonolatries have been generally, although by no means universally, abandoned in the domain of inorganic nature. The primitive spiritistic tradition linters, however, under various disguises in many reputable scientific circles, an in the vast domain of human affairs probably the majority of men today believe as one of their most cherished articles of faith that the human personality comprises a physical body which is 'natural' and a spirit which is unnatural and in some inscrutable way may control the movements of the natural body."

— Judson Herrick (c.1927), "The Spiritual Life of a Mechanist" [13]

"Science is a three step process, the final achievement of which is 'control of natural forces', i.e. in the sense of conformity of behavior with the laws of physical and chemical science. The application of scientific method to natural phenomena, in short, involves three great processes: First, finding out as much as possible about natural 'things', how they are constructed and how they work. They operate according to rule and when we have learned these rules we have formatted the laws of nature. Second, the prediction of future events is possible as soon as we have learned the uniformities of natural processes, i.e., the laws of nature. Third, some measure of control of the future course of events is possible when the two steps just mentioned have been taken."

— Judson Herrick (1928), "Behavior and Mechanism"; cited by Howard W. Odum in *An Introduction to Social Research* (pg. 28) [2]

"When I taught physics in secondary school in 1891, the invisible and indestructible atom was the foundation upon which the scientific structure was built. Some of my naïve pupils were skeptical and asked if I were telling a fairy tale."

— Judson Herrick (1956), *The Evolution of Human Nature* (pg. 33)

"As we have seen, any mechanism—a solar system, an electric battery, a man, a family, or a nation—is a more or less well-integrated unit which maintains transactional relations with surrounding things. It preserves its identity just so long as its own integrating processes are dominant over the disintegrating agencies that act within it and upon it. Both the integrating and the disintegrating factors of the operation are lawfully ordered processes. The disturbing or destructive processes are disorderly only from the standpoint of the mechanism involved. The laws of nature were not enacted by men to suit their own convenience, and if men disobey these laws the infraction carries its own penalty."

— Judson Herrick (1956), *The Evolution of Human Nature* (pg. 64)

"The behavior of human beings is more labile and unpredictable than that of planets in their orbits, but in no case does science ever reach ultimate or absolutes of knowledge or predictability. The probability of the truth of a verifiable law or principle is one of the things to be determined."

— Judson Herrick (1956), commentary on George Lundberg's positivism ideas; *The Evolution of Human Nature* (pg. 199-200)

"Ethical values do not arise miraculously. There is an evolution of values, and all human idealistic values have their roots in biological values, which are recognizable and definable. Homeostasis at the level of human social adjustment must NOT be equated with that the chemistry of body fluids."

— Judson Herrick (1956), *The Evolution of Human Nature* (pg. 216)

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External links

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- Charles Judson Herrick – Encyclopedia.com.
- Herrick, C. Judson (1868-1960) – WorldCat Identities.

θΔics

In physiology, **Jules-Auguste Beclard** (1817-1887), oft-cited as J. Beclard, was a French physician, focusing on anatomy and physiology, noted for his 1860 work on muscle contraction in relation to temperature; work that was later improved upon by Herdenheim who obtained clearer results by operating upon frogs' muscles, which he made to contract with or without the production of work, ascertaining their temperature by means of thermo-electric apparatus (see: animal mechanism). [1]

Quote | On

The following are quotes on Beclard:

> "**Beclard** was the first who endeavored to prove that in the muscles of man heat may be substituted for mechanical work, and *vice versa*. For this purpose he examined the thermometrical temperature of two muscles, both of which contracted, but one worked, that is to say, raised weights, while the other did not work. It might have been expected that less heat would have been found in the first muscle, because a portion of the heat produced during its contraction ought to have been transformed into work. The idea which governed Beclard's experiments was assuredly correct, but the means at his disposal for ascertaining the heating of the muscles were altogether insufficient. A thermometer was applied to the skin at the level of the muscle, in order to give the measure of the heat produced; thus the variations of temperature obtained by Beclard according as the muscle worked or not, were so slight that no real value could be attached to them."
>
> — Etienne Marey (1873), *Animal Mechanism* (pg. 17)

> "**Beclard** was probably the first to attempt to measure the relation of quantity and of transformation, thermodynamically, if such energy-transformations actually occur, in the animal machine."
>
> — Robert Thurston (1894), *The Animal as a Machine and Primer Mover* (pg. 41)

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1. Jules-Auguste Beclard (French → English) – CosmoVisions.com.

External links

â— Jules-Auguste Beclard – Wikipedia.

θΔics

In hmolscience, **Julian Huxley** (1887-1975) was an English evolutionary biologist noted for his supposed view that the second law is inoperable in the case of evolution and for his 1940 discussion of the so-called experimental bias problem of the physical sociologist.

Huxley family

See main: Huxley genealogy

Julian Huxley's grandfather was Thomas Huxley, coiner of the term social chemistry, and his brother was Aldous Huxley, noted for his use of entropy in literature.

Overview

Huxley, supposedly, has the view that the attainment of greater complexity in the forms of life denies the second law of thermodynamics and the actions of entropy, in that: [1]

> "While the universe of physics is running down; the universe of evolution is winding up … on this planet the second law of thermodynamics is now not working, and of course [this] opens up the possibility that there may be agencies operating in the universe supplying energy which would enable the whole cosmos to behave in an anti-entropic manner."

Huxley was in correspondence with American prodigy William Sidis on the topic of the second law in relation to animate matter at least as early as 1916. Huxley began publishing views on the second law and evolution in his 1931 *Science and Religion: a Symposium*, views which he seems to cull from Arthur Eddington and William Thomson. [2] Huxley elaborated on his anti-entropy views in his 1953 *Evolution in Action.* [3]

In 1959, Huxley was professing the view that evolution is an antientropic process running counter to the second law of thermodynamics. [4]

In his 1964 *Essays of a Humanist* he explains that: [5]

> "The second law of thermodynamics is entropic, tending towards a decrease in organization and to ultimate frozen immobility."

In 1964, Huxley was commented on French philosopher Pierre Teilhard's anti-entropy type theory of noosphere. [5] Likewise, previously, in an unpublished manuscript dated November 19, 1951 (dedicated to Julian Huxley), in a section titled "The Transformation, starting with Man, of the Process of Evolution", Teilhard defined *anti-entropy* as "an effect of changes that are seized, draws a portion of matter in the direction of continually higher forms of structurization and centration." [6] Huxley also had commentary on French philosopher Henri Bergson's *élan vital* evolution theory.
d

Physical sociology | Experimental bias problem

In 1940, Huxley, in his "Science, Natural and Social", stated the following: [7]

> "… experiment for one fundamental reason—namely, that in the one case the investigator is outside his material, in the other he is not. Man cannot investigate man by the same

> methods he investigates external nature. He can use the methods of natural science to investigate certain aspects of man—the structure and …"

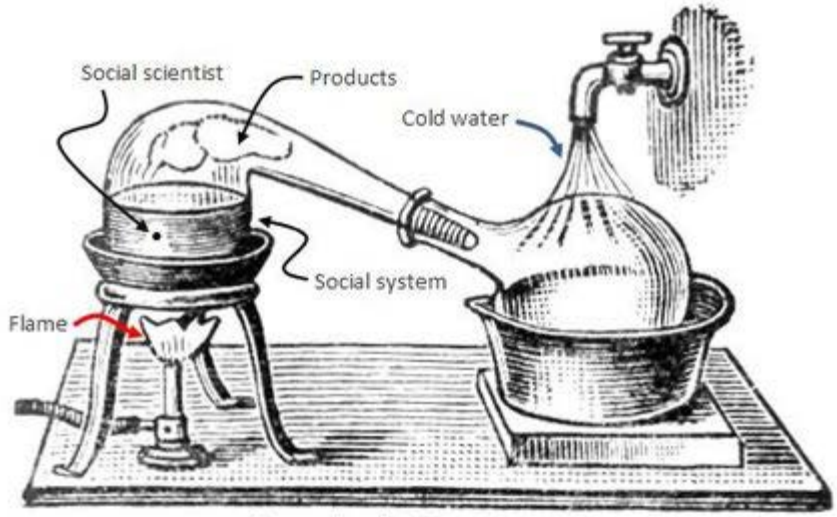

Social Retort

A retort (or social retort) depiction of **Huxley**'s 1940 so-called **social retort problem**, namely his assertion that "man cannot investigate man" by the methods of physical science because he is one of the elements of the physical system and therein inherently biasing his results.

In 1942, Ruth Anshen, in her compendium *Science and Man*, wherein Huxley's article is reprinted, penned a chapter entitled "Man as an Element of Every Experiment" seemingly on Huxley's issue. [8]

In 1947, George Lundberg quoted Huxley as follows in this matter: [9]

> "One distinguished scientist [Julian Huxley] has urged that a basic difference between the physical and the social sciences is that in the latter 'the investigator is inside instead of outside his material.' This is supposed to be self-evident and require no analysis."

This seeming issue, Huxley raises, in the Morris Zucker on John Dewey sense of the matter, seems to be well-summarized as the problem of a chemical (or human chemical) in a retort (or social retort) trying to study its own reactions, to other chemicals, via the methods of physical science, e.g. hypothesis, testing, experimentation, measurement, theory, etc., while trying to maintain objective neutrality on its subject matter: which, paradoxically, is a system wherein its self is an admixture, of the social matter, so to say, he is trying to study; as depicted adjacent.

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External links

â— Julian Huxley – Wikipedia.

θΔics

In existographies, **Julian Simon** (1932-1998) (CR:5) was an American economist, noted for

Overview

In 1981, Simon, in his chapter "Grand Theory, section: Entropy and Finiteness: the Irrelevant Dismal Theory", of his *Ultimate Resource 2*, attacked Herman Daly, Nicholas Roegen, and Paul Samuelson for their generally incorrect use of thermodynamics in economics. [1]

In 1991, Simon, in his "Entropy and Energy Accounting: are They Relevant Concepts?", talked about the use and abuse of energy and entropy in economics, similar, in a toolism sense, how people, historically, have abused the uncertainty principle and relativity principle [4]

Boundary

See main: Boundary issue

On the boundary issue, however, meaning that entropy is typically formulated for closed or isolated systems (with boundaries), and that one must find a boundary in human thermodynamic formulations, Simon correctly comments on this difficult issue in saying that "it is quite unclear where the boundary should be drawn for discussions of the quantity of energy, or if there is any relevant boundary."

Objections

Simon soon came under attack for his suppositions that the second law was irrelevant to the growth and development of humans over the next seven billion years. Garrett Hardin wrote to him "I am appalled at your omission, misunderstanding, or denial of the second law of thermodynamics, conservation laws, the idea of limits." Paul Ehrlich wrote "One wonders if Simon could not at least find a junior high school science student to review his writings."

Education

Simon completed his BA in experimental psychology in 1953 at Harvard, MBA in 1959, and PhD in business economics in 1961 both at the University of Chicago. He then became business professor at the University of Maryland.

Quotes | On

The following are quotes on Simon:

> "The I am appalled at your omission, misunderstanding, or denial of the second law of thermodynamics, conservation laws, the idea of limits."
>
> — Garrett Hardin (1981), "Letter to Julian Simon", Nov [4]

> "One wonders if **Simon** could not at least find a junior high school science student to review his writings?"
>
> — Paul Ehrlich (1981), *Publication*; cited in: Simon (1990); Simon (1991) [4]

> "On **Simon's** world, the laws of thermodynamics do not operate."
>
> — Eric Zencey (2012), *The Other Road to Serfdom* [3]

Quotes | By

The following are quotes by Simon:

“The concept of ‘entropy’ is unquestionably valid and relevant for a closed container in the laboratory. It may also be relevant for any larger entity that can reasonably be considered a closed system. But **it is quite *unclear* where the boundary should be drawn** for discussions of the quantity of energy, or if there is any relevant boundary. It is clearly wrong to say that ‘as to the scarcity of matter in a closed system, such as the earth, the issue may, in my opinion, prove in the end more critical than that of energy’ (Roegen, 1979): the earth is NOT a closed system because both energy (from the sun) and matter (cosmic dust, asteroids, debris from many planets) constantly rain down on the earth. Perhaps the solar system will prove to be an isolated system for some period in the future, conceivably for the entire life of the human species. But even then, it will last perhaps seven billion years. And the chances would seem excellent that during that span of time humans will be in touch with other solar systems, or will find ways to convert the matter on other planets into the energy we need to continue longer. So, with respect to energy **there is no practical ‘boundary’ surrounding** any [economic] unit of interest to us. And without such a boundary, the notion of entropy in the large is entirely irrelevant to us.”

— Julian Simon (1981), *The Ultimate Resource 2* (pg. 79) [1]

“There is in me a pixy-ish (or quixotic) propensity to make it even more difficult than necessary for you to believe the ideas herein. In that spirit: Paul Samuelson, the first American Nobel Prize winner in economics, called Georgescu-Roegen ‘a scholar's scholar, an economist's economist’ in an admiring foreword to a 1966 book of Roegen's that Samuelson says is ‘a book to own and savor’. In my view, this just shows how **great talents can swear to nonsense** when the nonsense is framed in the ‘difficult art’ (Samuelson's phrase) of mathematical economics.”

— Julian Simon (1981), *The Ultimate Resource 2* (pg. 79) [1]

“Concepts of physics are frequently misused by those who become intoxicated by casual acquaintance with them. After Einstein discovered the principle of special relativity, college sophomores and trendy preachers cited the principle as "proof" that "everything is relative". And after Heisenberg discovered the uncertainty principle, social scientists, humanists, and theologians seized on it to "prove" that certain kinds of human knowledge are impossible. The concept of entropy and the associated second law of thermodynamics have yet a longer history of abuse -- even by physicists, who should know better. As far back as 1910, America's greatest philosopher -- William James -- felt the need to disabuse America's greatest novelist -- his brother Henry -- of the idea that the second law had portentous social implications.”

— Julian Simon (1991), “Entropy and Energy Accounting: Are They Relevant Concepts?” [4]

“The situation of the [economic ‘**energy account-*ants***’; see: energy accounting] resembles a **couple of ants** sitting on the jungle floor, hesitating to eat a leaf lest they hasten the disappearance of the forest. And if one of them says, "We're only two small ants, and the forest is so large," the other replies, "Yes, but what if all the ants thought that way?" The ants' actual knowledge of the life cycle of the forest may not be much inferior to humans' present knowledge of the life cycle of the set of universes that may exist?”

— Julian Simon (1991), “Entropy and Energy Accounting: Are They Relevant Concepts?” [4]

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Further reading

● Simon, Julian. (1981). "Energy Accounting" (Q), Afternote 2 to §12: Today's Energy Issues, of *The Ultimate Resource 2*. Princeton, JulianSimon.com, 1994.

External links

● Julian Lincoln Simon – Wikipedia.
● Julian Simon (writings) – JulianSimon.com.

θΔics

In thermodynamics, **Juliana Boerio-Goates** (c.1953-) is an American physical chemist noted for her 2000, two-volume textbook *Chemical Thermodynamics*, co-authored with J. Bevan Ott. [1] Ott and Goates' textbook is one of the first two-volume chemical thermodynamics textbooks, since John Butler's 1928/34 two-volume *The Fundamentals of Chemical Thermodynamics*.

Education

Goates completed her BA in chemistry in 1975 at Seton Hill University. She completed her MS in 1977 in physical chemistry and PhD in 1979, in physical chemistry, with a dissertation on "Thermodynamic Studies of Reorientiational Motion in Pi-Molecular Compounds", both at the University of Michigan. [3] Since 1982, Goates has been a physical chemistry professor at Brigham Young University, a university owned by the Church of Jesus Christ of Latter-day Saints.

Thermodynamics

Since 2001, Goates' laboratory, which includes four undergraduates and two graduate students, has received about a million dollars, from the US Department of Energy, to look at the thermodynamics of nanoparticles (nanothermodynamics). Much of their work revolves around measuring the heat capacities of materials at low temperatures.

Religion

Goates is very religious. Posted on the door to Boerio-Goates' office is the eighth verse from Micah, chapter 6:

> "And what does the Lord require of you but to do justly and to love mercy and to walk humbly with your god?"
>
> — Bible (100AD), Micah 6:8 (Ñº), posted above Juliana Goates' office door (compare: Johannes Wislicenus)

The verse is there, she says, because "that's how I view things and how I remind myself what I think is important." In 2001 Boerio-Goates contributed a chapter to the book Finding God at BYU. Her essay, "A Catholic Rediscovers God," describes how being a minority in the constant company of Latter-day Saint colleagues, students, and neighbors compelled her to examine her own religion more closely and recommit herself to it. In her physical science class, she makes an announcement in the first lecture about her deep Catholic faith, which is typically greeted with an audible gasp. Her studies of chemistry and thermodynamics, supposedly, have instilled in her the belief that the universe has been under the operation of a "divine Creator with an intellect". [2] The only other known thermodynamics textbook author with such religious enthusiasm is Gordon van Wylen.

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External links

- Juliana Boerio-Goates (faculty) – Brigham Young University.
- Boerio-Goates, Juliana – WorldCat Identities.

θΔics

In thermodynamics, **Julie Deborah Forman-Kay** (c.1963-) is an American-born Canadian biophysical chemist note for her 1999 article “The ‘Dynamics’ in the Thermodynamics of Binding” in which she summarizes the logic that: [1]

> “Whether two molecules will bind is determined by the free energy change (ΔG) of the interaction, composed of both enthalpic and entropic terms.”

This view summarizes a certain turning-point in the history of chemical bonding theory, that started when German physicist Hermann Helmholtz, in his 1882 article "The Thermodynamics of Chemical Processes", explained that the measure of chemical affinity of a reaction or the force of attraction between the reactants is free energy, followed by American physical chemist Gilbert Lewis who in 1916 outlined the logic of thermodynamic stability of bonding, in the context of free energy changes.

Education

Forman-Kay received her BS in chemistry from the Massachusetts Institute of Technology in 1985 and her PhD in molecular biophysics and biochemistry from Yale University in 1990, under Fred Richard. She currently is a biochemistry professor at the University of Toronto.

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External links

â— Julie D. Forman-Kay (faculty) – University of Toronto.

θΔics

In hmolscience, **Julie Prandi** (1951-) is an American Germanic studies scholar noted for her 1993 *Dare to be Happy! A Study of Goethe's Ethics*, wherein she discusses Goethe's so-labeled "natural morality", as derived from the atomic theory based ethics of Epicurus and Lucretius, and the god equals nature infused ethics of Spinoza, similar to but deviating from that of Kant's morality and Aristotle's morality. [1]

Prandi argues, curiously, that Goethe believed in the essential unity of nature to the effect that he hoped to develop a sort of unified field theory that would connect magnetism, electro-chemical reactions, and colors. [1]

References

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External links

â— Julie Prandi (faculty) – Illinois Wesleyan University.

θΔics

In human chemistry, **Julie A. Reahard** (c.1958-) is an American Goethean scholar noted for []

Overview

In 1991, Reahard, in her PhD dissertation turned book *From an Unknown Center to an Unknowable Boundary: Chaos Theory, Hermeneutics, and Goethe's Die Wahlverwandtschaften*, attempted to explain German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities* in terms of chaos theory and or complexity theory; in this work see seems to have been one of the first to make a connection between Goethe's model of human chemistry and entropy (see: historical attempts on reaction decipherment). [1]

In 1993, at the Annual Meeting of the International Association for Philosophy and Literature, Pittsburgh, Pa, she presented some type of paper on black hole entropy in relation to Goethe's *Die Wahlverwandtschaften* (*The Elective Affinities*). [2]

Education

Reahard completed her BA in English at Michigan State University in 1980, her MA in 1984, in Old Germanic Languages and Literature, with a thesis on "A Thematic Analysis of Occurrence of the Hypermetric Lines in Old English" at the University of Nevada, Reno, and her PhD in 1991, in comparative literature, with a dissertation on "From an Unknown Center to an Unknowable Boundary: Chaos Theory, Hermeneutics, and Goethe's *Die Wahlverwandtschaften*" at the University of Colorado. Her dissertation was published in 88-page book formate, in English and German, in 1997 as *Aus einem unbekannten Zentrum, zu einer nicht erkennbaren Grenze: Chaos Theory, Hermeneutics, and Goethe's Die Wahlverwandtschaften*. [1] Reahard was a teaching fellow, Department of English, University of Nevada, Reno, 1981-84; I\instructor, Department of English, University of Colorado, Boulder, 1987-88; instructor, College of General Studies, University of Pennsylvania, 1988-89; Graduate Work, Literary Theory, University of Pennsylvania, 1988-91; Post Doctoral Research, History of Science, Massachusetts Institute of Technology, 1992-93; Associate Professor, English Department, Providence University, Shalu, Taiwan, 1996-98. Since 1993, she has been a tutor at St. John's College, Santa Fe.

See also

â— Elective Affinities: Illustrated, Annotated, Decoded

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External links

â— Reahard, Julie A. – WorldCat Identities.
â— Julie Reahard (faculty) – St. John's College.

θΔics

In existographies, **Julien la Mettrie** (1709-1751) (IQ:170|#320) (FA:75) (GA:11) (Re:42) (CR:91) French physician, materialist chance-based philosopher (compare: anti-chance), ateleologist, and auto-characterized "big genius" (compare: little genius), and retrospectively ranged extreme atheist, noted for his 1745 *The Natural History of the Soul*, in which he argued for a mechanist materialistic position, according to which there was no need of the soul to animate matter, that life was a property of matter, not something breathed into; and for his 1748 *Man Machine*, wherein he attacks Cartesian dualism.

Morality

Mettrie had the following cogent things to say about morality:

> "What vices, says Augustine, have not been approved of? What virtues have not been condemned in different centuries? This father of the church, here more of a philosopher than a theologian, has no difficulty in inferring that human reason is too powerless, too incapable of judging the nature of things, to be able to decide the great question of vices and virtues. This, I believe, is tantamount to saying quite clearly that good and evil possess no specific signs to characterize them absolutely and that they can be distinguished from each other only by the interests of society (a truth which can never be taught enough). Remove this support, and farewell morality! Vices and virtues are absolutely indiscernible, to use Leibniz's unpleasant word. Such is natural equality. If anyone has another conception of it, I would be glad if he would give it to me."
>
> — Julien la Mettrie (1751), "Anti-Seneca" (pgs. 131-32)

(add)

Maupertuis

La Mettrie was a friend and compatriot of Pierre Maupertuis, then president of the Berlin science academy, who was the one who suggested that Mettrie do a translation of Seneca's *On Happiness*, which resulted in his *Anti-Seneca*, and was the one largely responsible for Frederick the Great's invitation to Mettrie to come to Potsdam, Prussia.

Influences

La Mettrie was influenced greatly, firstly, by Epicurus, considering himself an Epicurean of sorts; he often stylized his personal reflections on those of Michel Montaigne, whom he considers as one of his models; and his *Anti-Seneca* was influenced by Francois Vayer's *The Wisdom of the Pagans*. [5]

Mud slinging

La Mettrie, because, supposedly, he undermined efforts to provide a "non-religious basis for morality" (Thomson, 1994), was dubbed a "lunatic" by post-1750s fellow atheistic materialists Baron d'Holbach and Denis Diderot, while at the same time borrowing his ideas. [5]

> "The atheist d'Holbach labeled La Mettrie 'insane', while Diderot described him as 'frenetic' and was clearly disgusted with his ethical views."
>
> — Martin Staum (2014), *Cabanis: Enlightenment and Medical Philosophy in the French Revolution* (pgs. 69-70)

Holbach, supposedly, referred to La Mettrie as a "frenzied lunatic" (Q) Holbach, in his *The System of Nature* (pg. #), refers to La Mettrie, indirectly, derisively as "the author" of "that book". Others, later, to note, also dubbed Holbach insane:

> “The notion that the brain itself feels and thinks is a ‘revolting opinion’ reminiscent of the ‘**insane** [see: crazy] author [**Holbach**] of the *Systéme de la Nature*’.”
>
> — Mathieu Buisson (c.1802) (Q), as cited by L.S. Jacyna (1987) in summary of Buisson’s criticism (Q)(Q) of Xavier Bichat’s 1801 theory (Q) of physiological properties; note: quoted misattributed, by Jennifer Hecht (2003), to Louis de Bonald

Diderot, in his *Essay on the Reigns of Claude and Nero* (1778) (Q), made derisive comments on La Mettrie. [5]

Treatise on the Soul

See: Genius hiatus effect

In 1744, during the Siege of Freiburg, La Mettrie nearly died (dereacted) from a fever (Q); this gave him time to speculate on the nature of a human as a mechanical machine, the theory of the soul, and these in relation to illness, which he deemed as interrelated; Frederick the Great (1751), in his eulogy on La Mettrie summarized this as follows: [3]

> “During the campaign of Freiburg, **La Mettrie** had an attack of violent fever. For a philosopher an illness is a school of physiology; he believed that he could clearly see that thought is but a consequence of the organization of the machine, and that the disturbance of the springs has considerable influence on that part of us which the metaphysicians call soul. Filled with these ideas during his convalescence, he boldly bore the torch of experience into the night of metaphysics; he tried to explain by aid of anatomy the thin texture of understanding, and he found only mechanism where others had supposed an essence superior to matter. He had his philosophic conjectures printed under the title of “The Natural History of the Soul.” The chaplain of the regiment sounded the tocsin against him, and at first sight all the devotees cried out against him.”

In 1745, the result of these conjectures were published as *The Natural History of the Soul*, later translated as *Treatise on the Soul*, which was considered so heretical that all the copies were rounded up and publicly burned (Q), after which he fled from France first to Holland then to Prussia, where he was granted a safe haven by King Frederick II (Frederick the Great), where he was asked to be the King’s personal physician (Q) or as, Voltaire would later refer to him, he was the "court atheist" or held the seat of the "royal atheist". On the subject of the term ‘soul’, La Mettrie states: [1]

> “The soul is merely a vain term of which we have no idea and which a good mind should use only to refer to that part of us which thinks.”
>
> — Julien la Mettrie (1747), *Man: a Machine* (pg. 26) (Thomson translation)

An alternatively translation is as follows:

> “What is the soul, but an empty word to which no idea corresponds?”

La Mettrie then gives the following ten scientific studies presented, supposedly, to back up his argument, that the term "soul" is but a vain word for that part of the mind that thinks, or something to this effect: [5]

La Mettrie asserts that because the body "moves according to its own principle", without its head, as evidenced by the ability of the body of a Turkey's to move about, without a head or brain, the location of the soul, as believed in his day, that the animal soul doesn't exist, and hence, as humans are part of the animal kingdom, so also the human soul does not exist, but is only a vain word for the thinking part of humans.

"Given the slightest principle of movement, animate bodies will have everything they need to move, feel, think, repent and, in a word, behave in the physical sphere and in the moral sphere which depends on it. None of this is mere supposition. Those who believe that all the difficulties hate not yet been removed will find here a list of experiments which will completely satisfy them.

1. All animal flesh palpitates after death and the more cold-blooded the animal is and the less it perspires, the longer the flesh palpitates. Tortoises, lizards, snakes, etc. prove this.
2. When separated from the body, the muscles retract when they are pricked.
3. The bowels retain for a long rime their peristaltic or vermicular movement.
4. A simple injection of warm water reanimates the heart and the muscles, according to Cowper. [N1]
5. A frog's heart, particularly when left in the sun, or even better on a warm table or a plate, moves for an hour or more after having been removed from the body. If the movement seems to have vanished beyond recovery, you only need to prick the heart and this hollow muscle still beats. William Harvey has made the same observation concerning toads. [N2]
6. Francis Bacon, a first-class author, speaks in his *History of Life and Death* of a man convicted of treason whose heart was torn out while he was still alive, and thrown into the flames; this muscle first leapt vertically to a height of one and a half feet, but then, losing force, it leapt less high each time, for seven or eight minutes. [N3]
7. Take a chick still in its egg and tear out its heart: you will observe the same phenomena in more or less the same circumstances. The warmth of one's breath alone reanimates an animal on the point of death in a pneumatic engine. The same experiments that we owe to Boyle and Steno39 can be done on pigeons, dogs, rabbits, pieces of whose hearts move just like whole hearts. The same movement can be seen in the torn-off paws of moles.
8. Caterpillars, worms, spiders, flies and eels give rise to the same observations, and the movement in the cut-off parts increases in hot water because of the fire it contains.
9. A drunken soldier **cut off the head of a turkey**-**** with a sabre. The animal stayed upright, then it walked and ran; when it hit a wall it turned round, beat its wings, still running, and finally fell down. Even when it was on the ground, all this ****'s muscles continued to move. That is what I saw, and it is easy to see more or less the same phenomena in kittens or puppies whose heads have been cut off.
10. Polyps do more than move after being cut up: within a week each piece generates a new animal. I am sorry for the way this affects the naturalists' theory of reproduction; or rather I am pleased, because this discovery teaches us never to draw general conclusions, even from all the most decisive experiments ever known.

I have given many more facts than are needed to prove beyond all doubt that each tiny fiber or part of organized bodies **moves according to its own principle**, whose action does not depend, like voluntary movements, on the nerves; this is because the movements in question happen without the part which undergoes them being in contact with the circulation. Now, if this force can be observed even in the pieces of fibers, the heart, which is a particularly complex structure of fibers, must have the same property."

He then concludes:

> ”The principle of motion in whole bodies or in parts cut into pieces is such that it produces movements which are not, as has been thought, disordered, but completely regular, both in warm whole animals and in cold incomplete ones.”

Of first note, much of this post-cessation animation was later more famously picked up by Luigi Galvani (1771) and his animate frog leg experiments. Secondly, this "moves according to its own principle" ideology or phrasing is found in the writings of Baron d'Holbach, albeit Holbach refers to la Mettrie as a loon of sorts.

Human machines

In 1748, after becoming impressed by the androids and automatons of French inventor Jacques Vaucanson, Mettrie published *The Human Machine* (*L'homme Machine*), wherein he elaborated on rejection of the Cartesian dualism of mind and body, and siding instead with the model of the human as machine. On Cartesian dualism, he stated:

A French-English edition of **la Mettrie**'s *Man a Machine* or *Human Machine.*

> “[Dualism] is a trick of skill, a ruse of style, to make theologians swallow a poison.”

Further more: [2]

> “It thus appears that there is but one type in the universe, and that man is the most perfect example. He is to the ape, and to the most intelligent animals, as the planetary pendulum of Huygens is to a watch of Julien Leroy. More instruments, more wheels, and more springs were necessary.”

In 1751, Frederick the Great, in his eulogy on La Mettrie, said the following about the reaction to his *Man a Machine*: [3]

> “**M. La Mettrie** after losing sight of his hospitals and his patients, gave himself up completely to speculative philosophy; he wrote his *Man a Machine* or rather he put on paper some vigorous thoughts about materialism, which he doubtless planned to rewrite. This work, which was bound to displease men who by their position are declared enemies of the progress of human reason, roused all the priests of Leyden against its author. Calvinists, Catholics and Lutherans forgot for the time that consubstantiation, free will, mass for the dead, and the infallibility of the pope divided them: they all united again to persecute a philosopher who had the additional misfortune of being French, at a time when that monarchy was waging a successful war against their High Powers.”

(add)

Human perpetual motion

La Mettrie argued that humans are type of perpetual motion machines (see: perpetual motion of the living kind) operated, driven, or rather excited by some type of internal "irritability" as he called it:

> "The human body is a self-winding machine, a living representation of perpetual motion in which the motive force resides in the very substance of the parts, not including the veins, arteries, and nerves, in short, the organization of the entire body. Each part contains in itself springs whose forces are proportioned to its needs."

This seems to be a variant of the self-drive/self-motion theory of movement.

Education

La Mettrie studied medicine in Holland under Herman Boerhaave before becoming a military surgeon in Paris.

Quotes | Employed

The following are quotes employed by La Mettrie:

> "We do not know nature at all; causes hidden deep within her may have produced everything. Look in your turn at Trembley's polyp! Does it not contain inside it the causes of its own regeneration? Why then would it be absurd to believe that there exist physical causes for which everything was made and to which the whole chain of this vast universe is so necessarily linked and subordinated that nothing that happens could not have happened; that it is our absolutely invincible ignorance of these causes that has made us look to a god, who is not even a being of reason, according to some? Thus, destroying chance does not mean proving the existence of a supreme being, for **there may be something else which is neither *chance* nor *god***; I mean 'nature', the study of which can as a result only produce unbelievers, as is proved by the manner of thinking of all its most successful observers."
>
> — Denis Diderot (c.1745), *Philosophical Thoughts*; cited by Julien la Mettrie (1747) in *Man: a Machine* (pg. 24)

> "The universe will never be happy unless it is atheistic."
>
> — French Pyrrhonian (c.1745), said to his friend Julien la Mettrie; quoted in *Man: a Machine* (pg. 25)

Quotes | On

The following are quotes about La Mettrie:

> "**La Mettrie** had much genius and imagination, who advanced in the career of science at a giant's pace; but he suffered from jealously, and his quick temper made him too susceptible to it."
>
> — Frederick the Great (1751), "Eulogy on Julien Offray de la Mettrie" [4]

> "Mettrie expressed his heretical views publicly in two tracts published in 1745, *Natural History of the Soul*, and in 1748, *Man as Machine*. With these two arrows aimed at the priests, La Mettrie declared that human beings are **soulless automata**, like animals of Descartes' system."
>
> — Julien Musolino (2015), *The Soul Fallacy* (pg. 151) [4]

> "There are very good reasons indeed to believe that materialism is true and that **Julien de La Mettrie** was a visionary. If there is no positive evidence supporting dualism, if modern science renders the doctrine untenable, if it is explanatorily impotent, and if all the evidence points toward materialism instead, then it is

time to acknowledge what reason is trying to tell us—there is most likely no soul."

— Julien Musolino (2015), *The Soul Fallacy* (pg. 154) [4]

Quotes | By

The following are other noted quotes:

"Since diseases of the brain, according to the place where the attack, destroy sometimes one sense and sometimes another, are those who place the soul in one of the pairs of the optic lobes any more wrong than those who would like to limit it to the oval center, the corpus callosum (Giovanni Lancisi, 1713), or even the pineal gland (Descartes, c.1620)?"

— Julien la Mettrie (1745), *Treatise on the Soul* (pg. 65); note: Johann Helmont placed the soul in the pylorus, Aristotle place the soul in the heart, and William Harvey placed the soul in the blood (O)

"For a wise man, it is not enough to study nature and truth; he must dare to proclaim it for the benefit of the small number of those who are willing and able to think; for the others, who are the willing slaves of prejudice are no more capable to of reaching the truth than are flying frogs."

— Julien la Mettrie (1747), *Man: a Machine* (pg. 3)

"The more ferocious animals are, the less brain they have."

— Julien la Mettrie (1747), *Man: a Machine* (pg. 10)

"In the same way as a violin string or harpsichord key vibrates and gives out a sound, so the strings of the brain, struck by rays of sound, are stimulated to give out or repeat the words which touch them."

— Julien la Mettrie (1747), *Man: a Machine* (pg. 14)

"Break the chains of your prejudices and take up the torch of experience, and you will honour nature in the way she deserves, instead of drawing derogatory conclusions from the ignorance in which she has left you. Simply open your eyes and ignore what you cannot understand, and you will see that a laborer whose mind and knowledge extend no further than the edges of his furrow is no different essentially from the **greatest genius**, as would have been proved by dissecting the brains of Descartes and Newton; you will be convinced that the imbecile or the idiot are animals in human form, in the same way as the clever ape is a little man in another form; and that, since everything depends absolutely on differences in organization, a well-constructed animal who has learned astronomy can predict an eclipse, as he can predict recovery or death when his genius and good eyesight have benefited from some time at the school of Hippocrates and at patients' bedsides."

— Julien la Mettrie (1748), *The Human Machine* (O)

"We can see that there is only one substance in the universe and that man is the most perfect one. He is to the ape and the cleverest animals what Huygens's planetary clock is to one of Julien Leroy's watches. If it

took more instruments, more cogs, more springs to show or tell the time, if it took Vaucanson more artistry to make his flautist than his duck, he would have needed even more to make a speaking machine, which can no longer be considered impossible, particularly at the hands of a new Prometheus. Thus, in the same way, nature needed more artistry and machinery to construct and maintain a machine which could continue for a whole century to tell all the beats of the heart and the mind; for we cannot tell the time from the pulse, it is at least the barometer of heat and liveliness, from which we can judge the nature of the soul."

— Julien la Mettrie (1748), *The Human Machine* (Q)

"Descartes and all the Cartesians, among whom the followers of Malebranche have long been numbered, have made the same mistake. They have taken for granted two distinct substances in man, as if they had seen them, and positively counted them."

— Julien La Mettrie (1748), *The Human Machine* [4]

"Let him who so wishes take pleasure in boring us with all the wonders of nature: let one spend his life observing insects, another counting the tiny bones in the hearing membrane of certain fish, even in measuring, if you will, how far a flea can jump, not to mention so many other wretched objects of study; for myself, who am curious only about philosophy, who am sorry only not to be able to extend its horizons, active nature will always be my sole point of view; I love to see it from afar, in its breadth and its entirety, and not in specifics or in little details, which, although to some extent necessary in all the sciences, are generally the mark of **little genius** among those who devote themselves to them."

— Julien la Mettrie (c.1747), *The Human Plant* (Q)

"There is nothing weird or strange for the nature. It's people who ascribe to her various oddities."

— Julien la Mettrie (c.1745) (Q)

"Humanity will not be happy until it is atheistic."

— Julien la Mettrie (c.1748) (Q)

"They have *spiritualized* matter rather than 'materializing' the soul."

— Julien la Mettrie (c.1748), the "incomprehensible" monadism of Leibniz and his supporters

"Man is a machine and in the whole universe there is but a single substance, matter, variously modified."

— Julien la Mettrie (c.1748) (Q)

"Perhaps minerals are formed according to the laws of attraction, so that iron never attracts gold nor gold iron, all heterogeneous parts repel each other and only homogeneous parts unite or form a single body together. But without deciding anything in the obscurity which covers all sorts of reproduction, should I, because I do not know how fossils are formed, call on, or rather suppose, a soul to explain the formation of

bodies."

— Julien la Mettrie (1748), "Man as Plant" (pg. 84)

"Do we need to resort to a soul to explain plants' growth, which is infinitely faster than that of stones? And in the vegetation of all bodies, from the softest to the hardest, surely everything is determined by nourishing fluids, which are more or less terrestrial and applied with differing degrees of force to more or less hard masses? From which I can indeed see that a stone must grow less in a hundred years than a plant does in a week."

— Julien la Mettrie (1748), "Man as Plant" (pg. 84)

"We must forgive the ancients for their general and particular souls; for lack of experimental physics and anatomy, they were not at all versed in the structure and organization of bodies. Everything must have been as incomprehensible to them as to children or savages seeing a watch for the first time; knowing nothing of its springs, they think it to be animated or endowed with a soul like them, while it is enough to glance at the artifice of this machine; it is a simple artifice which really implies, not the possession of its own soul, but the soul of an intelligent workman without whom chance would never have been able to indicate the time and the sun's passage."

— Julien la Mettrie (1748), "Man as Plant" (pgs. 84-85)

"We are much more enlightened by physics, which shows us that there is no other soul of the world than god and movement, and no other soul of plants than heat."

— Julien la Mettrie (1748), "Man as Plant" (pg. 85)

"Man is, above all the beings hitherto known, the one which has the most soul, as if it were necessary for that to be so; and the plant is likewise the one which has, and was destined to have, the least of all, if we exclude minerals."

— Julien la Mettrie (1748), "Man as Plant" (pg. 85)

"After the vegetables and the minerals – bodies without a soul – come beings which begin to be animate, such as the polyp and all the animal-plants still unknown to today, which other favored Trembleys will discover in time."

— Julien la Mettrie (1748), "Man as Plant" (pg. 85)

"If all bodies are moved by fire, what gives fire its movement? Ether. What gives it to ether? Diderot is right: our philosophy is no better than the Indians."

— Julien la Mettrie (1750), "The System of Epicurus" [N4]

"Here are some incontrovertible facts. People are dying of hunger at sea, who eat the one among their companions who is sacrificed by lot, experience no

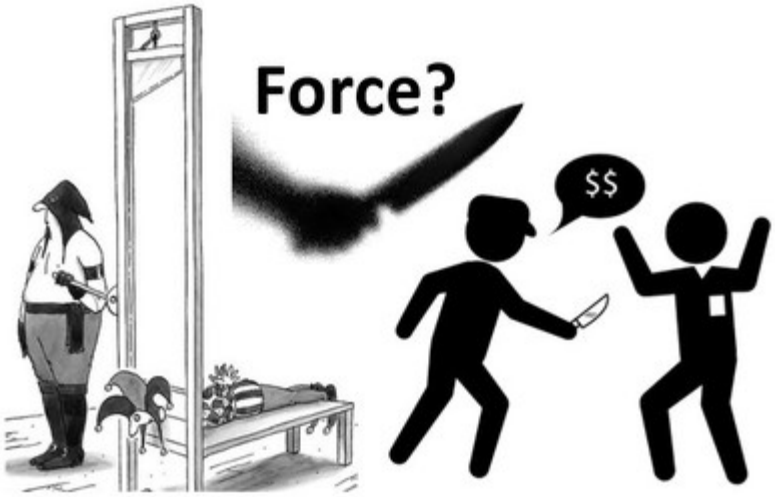

more remorse than cannibals do. Such is habit and such is need, thanks to which anything is allowed. When I see our executioners hanging, breaking on the wheel, burning and torturing their fellow beings, I can feel inside myself something which is in revolt; I seem to hear a voice groaning in the depths of my heart: 'oh nature, or humanity, you are only an empty word if by these actions you are not violated – no that is not enough – if you are not turn apart while obeying the law'. But no, criminals have executioners and executioners have none; their hearts are closed to remorse and repentance. And yet they are murderers! Yes, but stipended murderers, in the same way as idolaters were and perhaps still are sacred murders. They ones are paid and the others are revered. Is a man who, dying of hunger, is forced to slit a traveler's throat, any more guilty than a man who strangles a criminal on the orders of judges? **Whether one is forced by justice or forced by misery, surely one is still forced**?"

— Julien la Mettrie (1751), "Anti-Seneca" (pg. 136)

"Lycurgus had weak and unhealthy children drowned and was proud of his wisdom. Look at Plutarch's account of his life, and you will see at Sparta they knew neither modesty, nor robbery, nor adultery, etc."

— Julien la Mettrie (1751), "Anti-Seneca" (pg. 136)

Notes

N1. (a) Cowper, William. (1694). *Myotomia Reformata: Or A New Administration Of All The Muscles Of Humane Bodies: Wherein The true Uses of the Muscles are Explained, the Errors of former Anatomists concerning them Confuted, and several Muscles not hitherto taken notice of Described* (Q). London: Publisher.
(b) Not to be confused with poet William Cowper (1731-1800).
N2. (a) Harvey, William. (1628). *De motu cordis et sanguinis in animalibus*. Frankfort: Publisher.
(b) Ann Thomson (1996) states that was eels, not toads.
N3. Bacon, Francis. (1628). *Historia Vitae et Mortis* (Intentions, X, par. 32). London: Publisher.
N4. (a) Diderot, in *Letter on the Blind* (1749), refers to an Indian who explains that the world is carried on the back of an elephant, and when asked what carries the elephant, replies that it is a tortoise, and so on. Diderot claims that our explanations are no better.
(b) Turtles all the way down – Wikipedia.

References

1. Ball, Philip. (2011). *Unnatural: the Heretical Idea of Making People* (pgs. 97-99). Vintage Books.
2. (a) La Mettrie, Julien. (1749). *L'Homme Machine*. Publisher.
(b) Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pg. 67). University Press of America.
3. Frederick, William II (Frederick the Great). (1751). "Eulogy on Julien Offray de la Mettrie" (Q). Publisher.
4. Musolino, Julien. (2015). *The Soul Fallacy: What Science Shows We Gain from Letting Go of Our Soul Beliefs* (Forward: Victor Stenger) (Q) (counted them, pg. 151; visionary, pg. 154). Prometheus Books.
5. La Mettrie, Julien. (1751). *Machine Man and Other Writings: Treatise on the Soul, Man as Plant, The System of*

Epicurus, Anti-Seneca or the Sovereign Good, Preliminary Discourse (translator and editor: Ann Thomson) (Lunatic, pg. x; influenced by, pg. xxii; shocked, pg. xxii; Vayer, pg. xxii; death experiments, pgs. 26-27). Cambridge University Press, 1996.

Further reading

● La Mettrie, Julien. (1747). *Man a Machine: including Frederick the Great's 'Eulogy' on la Mettrie and extracts from la Mettrie's The Natural History of the Soul* (notes: Gertrude Bussey) (Arc)(pdf). Open Court Publishing, 1912.

External links

● Julien Offray de La Mettrie – Wikipedia.

θΔics

In existographies, **Julien Musolino** (1970-) is a French-born American cognitive scientist, psychologist, monist, asoulist, and "atheist" (Q), noted for []

Overview

In 2012, Musolino polled his 200+ student psychology class, at Rutgers University, with the following soul belief query: [2]

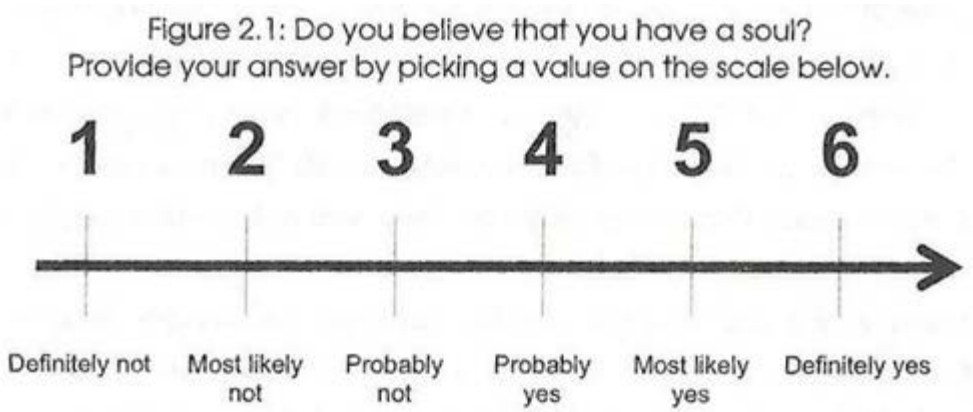

Results found that 80 percent of students picked numbers between 4 and 6, and that 40 percent picked 6. This can be compared to the Dawkins scale. He also found that 73 percent of student believed that the soul was an "immaterial entity separate from the body" and that it performed the following functions:

1. Moral compass (71%)
2. Consciousness (67%)
3. Feelings (58%)
4. Free will (55%)
5. Personality (52%)
6. Ability to make decisions (48%)
7. Ability to fall in love (46%)

Musolino also found that among soul believers, 61 percent believe the soul is separate from their minds. Musolino also polled his students with the following: [2]

> "**Do you believe** that **the question** of whether **human beings have a soul** is **a question that can be answered** objectively—at least in principle—and thus one that can be answered **using scientific means**?"

finding that 74 percent did not agree with this statement.

Here, of note, we are reminded of the Stephen Asma (2010) soul discussion in class quote (below) and the 2010 bioengineering hand-written student reactions (Q) Libb Thims UIC talk on human thermodynamics; the most direct of which being:

> "In the beginning, I thought this seminar on human thermodynamics would be interesting. At first, I though he was going to talk about thermodynamics **IN the human body** as a physiological view, rather than an emotional and social view. When he started talking about finding a future spouse and morals defined though thermodynamics, things became a little funny. **I believe** thermodynamics can ONLY be function in man-made things: mechanical items (such as vehicles), combustion, politics, and stuff. However, things like

morals and love go further beyond thermodynamics. It can perhaps be argued to a certain point that thermodynamics can explain these phenomena. But, if thermodynamics can't even be fully explained in the body, how can it explain the mind and the soul? "

— Anon student (2010), "take home assignment", review (Q) of Libb Thims' bioengineering human thermodynamics lecture, University of Illinois, Chicago, Apr

In 2013, Musolino repeated the repeated the experiment on 220 undergraduate students, with the same soul questionnaire, finding that 88 percent were soul believers, and also, that when queried with the follow-up question, about where they believed their soul came from, 73 percent said that "god gave it to them". [2]

A cartoon of god putting a free will based soul into the chemical mixture of a human.

In 2015, Musolino, in his *The Soul Fallacy: What Science Shows We Gain from Letting Go of Our Soul Beliefs*, attempts to platform off Francis Crick's 1994 asoulism hypothesis, namely that: that traditional conceptualizations of the soul as a non-material being must be replaced by a materialistic understanding of how the brain produces mind, to argue something to the effect that "the soul probably doesn't exist", but that we "can preserve a meaningful conception of "moral responsibility in a soul-free world." [1]

Difficulties

A few salient difficulties, noticeable, in Musolino's presentation include:

"Nothing gets lost, morally, spiritually, or aesthetically, by giving up our soul beliefs."

— Julien Musolino (2015), *The Soul Fallacy* (pg. 27)

Here, supposedly, like Sam Harris, we are to replace soul belief by spirituality belief, as though one were somehow different than the other?

"If such great minds—such as Plato, Descartes, Leibniz, Locke, Kant, Galileo, Newton, Karl Popper, and Wilder Penfield—believed in the soul, who are we to scoff at the idea of the soul? Someone could, of course, reply that other great minds, like Bertrand Russell and Albert Einstein, explicitly rejected the soul."

— Julien Musolino (2015), *The Soul Fallacy* (pg. 27)

Einstein, correctly, never "explicitly" rejected either god (see: Einstein on god) or the soul (see: Einstein on the soul). Secondly, while Russell, in his 1928 "What is the Soul?" (Q), comes pretty close to jettisoning the soul, he never seems to "explicitly" reject the existence of the soul, in the form of the explicit statement: the "soul does not exist"; Russell, e.g., at one point, supposedly, described spirit as "matter in the gaseous state". (Q)

Education

Musolino studied at the University of Geneva, in neighboring Switzerland, the University of North Wales, Bangor, in the United Kingdom, the University of Maryland, and the University of Pennsylvania; presently, he is a psychology professor at Rutgers University.

Quotes | Employed

The following are quotes employed by Musolino:

> "I have made a ceaseless effort not to ridicule, not to bewail, not to scorn human actions, but to understand them."
>
> — Benedict Spinoza (c..1675), *Publication*; cited by Musolino (2015) in *The Soul Fallacy* (pg. 28)

Quotes | Related

The following are related quotes:

> "No self-respecting professor of philosophy wants to discuss the **soul** in class. It reeks of old-time theology, or, worse, new age quantum treacle. The soul has been a dead end in philosophy ever since the positivists unmasked its empty referential center. Scientific philosophy has shown us that there's no there there. But make no mistake, our students are very interested in the soul. In fact, that is the main reason many of us won't raise the soul issue in our classes: The bizarre, speculative, spooky metaphysics that pours out of students, once the box has been opened, is truly chaotic and depressing. The class is a tinderbox of weird pet theories—divine vapors, god particles, reincarnation, astral projections, auras, ghosts—and mere mention of the soul is like a spark that sets off dozens of combustions. Trying to put out all these fires with calm, cool rationality is exhausting and unsuccessful."
>
> — Stephen Asma (2010), "Soul Talk" (see: turnover rate) [3]

Quotes | By

The following are quotes by Musolino:

> "The dualistic doctrine rests on conceptual quicksand."
>
> — Julien Musolino (2015), *The Soul Fallacy* (pg. 36)

> "At what point in the unbroken chain between primitive life-forms and human beings did the soul get added to the mix and why?"
>
> — Julien Musolino (2015), *The Soul Fallacy* (pg. 129)

References

1. (a) Crick, Francis. (1994). *The Astonishing Hypothesis: the Scientific Search for the Soul*. Simon and Schuster.
(b) The Astonishing Hypothesis – Wikipedia.
(c) Musolino, Julien. (2015). *The Soul Fallacy: What Science Shows We Gain from Letting Go of Our Soul Beliefs* (foreword: Victor Stenger). Prometheus.
2. Musolino, Julien. (2015). *The Soul Fallacy: What Science Shows We Gain from Letting Go of Our Soul Beliefs* (foreword: Victor Stenger) (soul questionnaire, pgs. 52-54, 57). Prometheus.
3. Asma, Stephen. (2010). "Soul Talk", *The Chronicle Review*, May 2.

Audio

- Zepps, Josh. (2015). "Interview with Julien Musolino" (35-min) (Q), PointOfInquiry.org, Feb 9.

External links

- Julien Musolino (about) – JulienMusolino.com.

θΔics

In economic thermodynamics, **Julius Davidson** (c.1875-c.1935) (SN:22) was an American economist noted for his 1919 article “One of the Physical Foundations of Economics” in which, using American engineer Willard Gibbs’ 1901 *Elementary Principles of Statistical Mechanics* as a basis, he argues that the law of diminishing returns is based on chemistry and physics, comparing human chemical reactions to basic equilibrium adjusting chemical reactions.

Law of diminishing returns

Davidson, of significance, compares the pairing of single men and single women in a fixed sized society, with varying starting numbers of single men in respect to a fixed number of single women to a type of and Le Chatelier’s principle based equilibrium-seeking chemical reaction (although, to note, he doesn’t mention French chemist Henry Le Chatelier or his 1888 chemical equilibrium principle). In introducing this scenario, Davidson describes six different possible reactions in which a thousand single woman are introduced into a society with varying starting numbers of single men (1, 500, 1000, 2000, 3000, and 4000), to give the following hypothetical reactions, each with different equilibrium state outcomes (as shown below). Under normal circumstances, evolutionary psychologists estimate that 90% of people typically marry or pair. On the following reaction scenario:

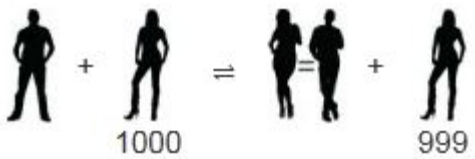

Davidson states: "If in a certain community there were a thousand women all of marriageable age, and all desiring to be married, and if in this same community there were only one man of marriageable age also desiring to be married, and if furthermore polygamy were prohibited, the probability that this one man would, within a measurable period of time, be married, would amount, for practical purposes, to certainty." In other words, it would be nearly certain (~100% probability) that in this situation the man would pair (MF). On the following reaction scenario:

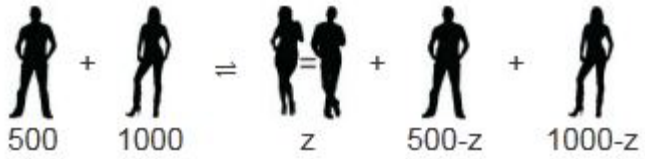

Davidson states: "we should not be at all certain that all of them would be married off within a given time". In other words, a certain number, say z=495 or 95% of the single men, would be paired up in the equilibrium or end state of the reaction. In Le Chatelier's principle terms, more reactants M (males) have been introduced into the system, and the equilibrium shifts to the products side of the reaction, yielding more paired products MF (male-female pairs). On the following reaction scenario:

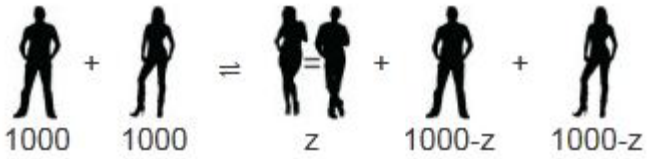

Davidson states: "if the number of marriageable men reached 1000, the chances of marriage for each man, though good, would be much less than before". In this case, about 90%, or z=900, of the single reactants would be paired up in the finalize end (equilibrium) state of the reaction. On the following reaction scenario:

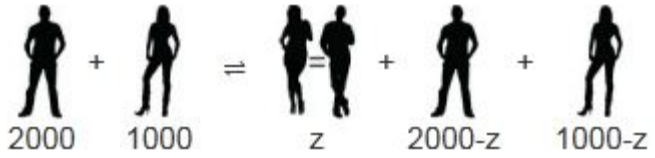

Davidson states: "if the number of men increased further to 2000, 3000, 4000, etc., each man's chances of marriage would gradually diminish, while the chances of each woman would increase." In other words, in the M=2000 scenario, we should expect the number of pairings to be about 95% or z=950 of limiting reactant (females), because the increase in the concentration of male reactants would shift the equilibrium of the reaction to the products side. On the following reaction scenario:

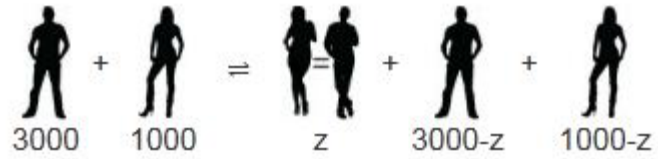

Davidson states that, similar to previous, we should expect the number of pairings MF to be about z=970, i.e. about ~97% or limiting reactant (females) would have converted to pairings. On the following reaction scenario:

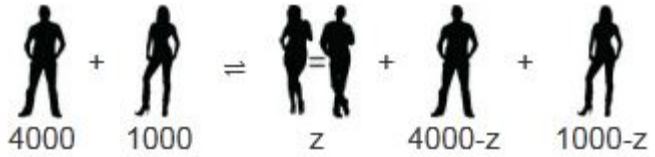

Davidson states, similar to the previous, we should expect the number of pairings MF to be about z=980, i.e. about ~98% or limiting reactant (females) would have converted to pairings.

Julian goes on to note that a number of factors have been neglected in his reaction model, by stating that: "here some one will protest that human factors are being neglected. Men and women have qualities which are sometimes better and sometimes worse; in one instance there may be more likelihood of attachment than in another; in one community social life gives to each sex more opportunities to meet the other than in another. All this is true and even more. Despite this, however, the element of chance still remains, and we are justified in our conclusion that as the number of either sex increases, the number of the other remaining constant, the probability that any one of the first will be married diminishes." Likewise, in the first and second reaction scenario, for example, many female-female homosexual relationships would likely form, owing to the limited number of men.

In sum, as the number of initial reactant single men M increased further, each man's chances of marriage MF would gradually diminish, while the chances of each women marrying would increase

Chemical comparison

Davidson the compares this male-female reaction to the reaction of ethanol (ethyl alcohol) and acetic acid to produce ethyl acetate and water:

CH_3CH_2OH	+	CH_3COOH	â‡Œ	$CH_3COOCH_2CH_3$	+	H_2O
(ethanol)		(acetic acid)		(ethyl acetate)		(water)

a reaction according to which, as he states, if the starting reactants are introduced to each other in equivalent ratio (similar to 1000-to-1000 ratio of single men to single women as starting reactant), action will cease, i.e. chemical equilibrium will be reached, when two-thirds of each reactant is transformed into ethyl acetate and water.

Davidson then states that if ethanol and acetic acid are brought into a ratio of three to one (similar to 3000-to-1000 ratio of single men to single women as starting reactants), the action will proceed until nine-tenths of the acetic acid is converted (similar to 9 out of every 10 women ending up married, in a society in which there is a 3-to-1 ratio of single men to single women at the start of the society).

Davidson goes on to discuss how this model extend to the three big factors of economics: land, labor, and capital, where increase in any given input (such as by adding an extra plow to a farmer's capital) will produce diminishing returns in the long run.

Notes

Interestingly, Davidson's comparison is similar to American astrophysicist Christopher Hirata's *circa* 2000 article "The Physics of Relationships", wherein he attempts to describe equilibrium shifts in a student body at a hypothetical college campus using the equilibrium constant and related chemical thermodynamic equations. [2]

Later citations of Davidson's paper, such as made by American mathematical economist Barkley Rosser, erroneously state that Davidson mentions the "entropy law" (and or entropy) as underpinning economics; which, however, is not the case, as Davidson does not use the word entropy, nor does he allude to it, but rather only seems to discuss the law of mass action, the law of chemical equilibrium, and Le Chatelier's principle (although he doesn't mention this term either) in the general sense. [3]

Davidson, according to American political economist Kenneth Stokes (1994), is listed as one of the 'heretical philosophers of social energetics', along with Wilhelm Ostwald, Leon Winiarski, Alexander Bogdanov, Nikolai Bukharin (*Historical Materialism: a System of Sociology*, 1921), Eduard Sacher, Felix Auerbach, Rudolf Clausius, Patrick Geddes, Leopold Pflaunder, Georg Helm, Thomas Carver, F. Ackerman, Fred Henderson (*The Economic Consequences of Power Production*, 1923), Alfred Lotka, and Frederick Soddy. [4]

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θΔics

In chemistry, **Julius Thomsen** (1826-1909) was a Danish chemist noted for his 1854 "thermal theory of affinity", also independently developed by French chemist Marcellin Berthelot (1864), that the heat evolved in a chemical reaction is the measure of the chemical affinity, on the grounds that the heat represented the work done by chemical forces. [1] Thomsen and Berthelot similarly defined affinity as the force that unites the component parts of a chemical compound and that must be overcome by an equivalent force, the quantity of which can be measured by the heat evolved. [2] Thomsen appears to have been the first, in 1853, to have applied the first law version of the conservation of energy to the field of chemistry. [3] That same year, Thomsen did work with Danish engineer Ludwig Colding, an early formulator of the conservation of energy.

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External links

â— Hans Peter Jørgen Julius Thomsen – Wikipedia.
â— Thomsen-Berthelot principle – Wikipedia.

θΔics

In religio-mythology, **Jupiter**, the name of the 5th planet from the sun, the Roman equivalent of the Greek god Zeus, the Greek equivalent or rescript of the Egyptian god Osiris (Taylor, 1829) and or Amen-Ra, depending.

Quotes

Th following are related quotes:

> "Ethiopians inhabit the country immediately above Elephantine, and one half of the island; the other half is inhabited by Egyptians. Meroe is said to be the capital of all Ethiopia. The inhabitants worship no other gods than **Jupiter** and Bacchus; but these they honor with great magnificence; they have also an oracle of Jupiter; and they make war, whenever that god bids them by an oracular warning, and against whatever country he bids them."
>
> — Herodotus (c.435BC), *The Histories* (pg. 92)

> "And the day will come when the mystical generation of Jesus, by the supreme being as his father in the womb of a virgin will be classed with the fable of the generation of Minerva in the brain of Jupiter."
>
> — Thomas Jefferson (1823), "Letter to John Adams", Apr 11 (Ñº)

> "Cicero mentions four of this name. Pausanias and Herodotus, rank Apollo among the Egyptian deities. Diodorus Siculus expressly states, that Isis, after having invented the practice of medicine, taught this art to her son Orus [Horus], named also Apollo, who was the last of the gods that reigned in Egypt. It is easy to trace almost all the Grecian fables and mythologies from Egypt. If the Apollo of the Greeks, was said to be the son of Jupiter, it was because Orus [Horus], the Apollo of the Egyptians, had **Osiris for his father, whom the Greeks confounded with Jupiter**."
>
> — Robert Taylor (1829), *The Diegesis* (pg. 180)

See also

â— Mangnall's Abstract of Heathen mythology

External links

â— Jupiter (mythology) – Wikipedia.

θΔics

In existographies, **Jurg Waser** (1916-2002), or "Jürg Waser", was a Swiss-born American mathematician and chemist noted for []

Overview

In 1966, Waser published *Basic Chemical Thermodynamics*, a simplified mostly non-mathematics (partial differential equations and partial molar quantities are avoided), which grew out of freshman chemistry class notes at Caltech, aimed at giving a thorough introduction to thermodynamics, before it is taken up again, e.g. in senior level physical chemistry class, chemical engineering thermodynamics, or other "expert thermodynamics" areas of study.

Education

Waser attended the University of Zurich, during which time, in 1939, he went to Caltech on a one-year exchange program, where at, per WWII reasons, he remained, completing his PhD in chemistry in 1944 under Linus Pauling. He taught mathematics and undergraduate chemistry at Caltech from 1945 to 1948 and 1958 until his retirement in 1975.

Waser's time as a professor was divided between, firstly, his teaching duties, and secondly with extensive research in the field of structural chemistry, using the experimental methods of x-ray diffraction and his thorough knowledge of mathematics; he particularly enjoyed the concepts and notations of dyadics. He was one of the first to include 'restraints' in the least-squares refinement process. After his retirement, he turned more and more to questions involving basic thermodynamics, and often collaborated on this subject with his close friend, the late Verner Schomaker (also a past president of the ACA) and with Hans Kuhn of the Max Planck Inst. at Goëttingen, Germany on theories concerning the origin of life. [1]

Quotes

The following are representative quotes:

> "The strength of thermodynamics is that its relationships, e.g. between quantities such as pressure, temperature, and volume, are not affected by the changes to which microscopic explanations are subject even today. On the contrary, the conclusions of atomic and molecular theories *must not* contradict those of thermodynamics, so that thermodynamics can be used as a guide for as a touchstone in the development of microscopic theories."
>
> — Jurg Waser (1966), *Basic Chemical Thermodynamics* (pg. 3)

> "Two bodies, *A* and *B*, are said to be of *different* 'temperatures' if they change their properties when in contact with each other, even though interchange of matter, or mechanical, chemical or electrical interaction is prevented. When a hot metal wire, e.g., is immersed in cold water, the wire is found to shorten, and the water changes its density. A third body *C* may be used to compare the temperatures of *A* and *B* without bringing *A* and *B* into direct contact. This is the role of a 'thermometer', and any suitable physical property of *C*, for instance its volume or electrical resistance, may be used to establish a temperature scale."
>
> — Jurg Waser (1966), *Basic Chemical Thermodynamics* (pgs. 5-6)

References

1. Waser, Jurg. (1966). *Basic Chemical Thermodynamics*. New York: W.A. Benjamin, Inc.

External links

â— Jurg Waser – International Union of Crystallography.

θΔics

In existographies, **Jürgen Mimkes** (1939-) (HFE:26) (SNE:1) [CR:139] or Juergen Mimkes, is a German physicist, metallurgist, solid state thermodynamicist, and physical socio-economics professor, known for publications and work, beginning in 1992, in the fields of sociological thermodynamics and economic thermodynamics, such as his 2000 "Society as a Many Particle System", his 2005 "Chemistry of the Social Bond", and 2007 chapter “A Thermodynamic Formulation of Social Science”, wherein he employs the Lagrangian formulation of free energy to explain social and economic phenomena. [1]

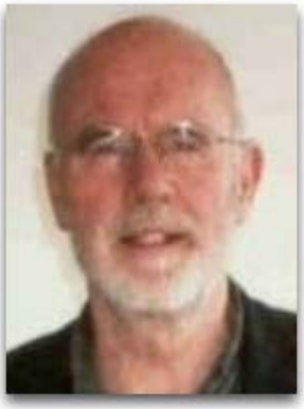

Overview

In circa 1992, Mimkes, as head of the physics department of University of Paderborn, German, assembled the physics professor together for a meeting to see if they could, as a group, come to understand the mechanism of racial killings, related to the Bosnian war, and Nazi youth killing Turks, occurring recently in German. This meeting resulted in the Paderborn Thermodynamics of Physical Socio-Economics research group being established; a circa 2015 faculty page synopsis of which is as follows: [7]

> The focus of research
> 1. Applied Thermodynamics: Physical Socio - Economics
>
> This interdisciplinary work area studied society and economy as a many-body systems. Specifically, the following issue is particularly being investigated:
>
> "Phase diagrams in homogeneous and heterogeneous societies".
> Social problems of integration and segregation are described different angle also in physical chemistry under the theme solubility undPhasentrennung. The aim of the research is the transfer of Modellsder regular mixture to society and the economy. The statistical Modellberücksichtigt only interactions that are attractive (sympathy), repellent (antipathy) oderindifferent, it can be applied to matter and companies alike. This leads to the statistics by Lagrange, the equivalent to the thermodynamics of matter.
>
> This statistic describes homogeneous societies the three dependent living standard government forms hierarchical, democratic, globally. They meet in a homogeneous matter determined the three temperature-dependent phases, liquid, gaseous. The characteristics of the society in the various phases correspond to the thermal properties of matter. This can be confirmed by data: Similar to the energy distribution of molecules in gases arises eg in Germany a Boltzmann distribution of the assets of a.. The upheaval in the GDR 1989 - as the French Revolution in 1789, a phase transition of the first order with abrupt change in the social order and deferred costs - analogous to the melting of the matter with Entropiesprung and latent heat of fusion. Integration and segregation (both German and foreign, East and West) are phase transitions of the second order of the heterogeneous (multicultural) society with a continuous structural change as inhomogeneous matter, the mixture of water and wine or the separation of water and oil. This model is already being discussed since antiquity (Empedocles) and was revived in Goethe's *Elective Affinities*. According to today's model, integration depends essentially on the standard of living. Just as sugar in your tea better dissolves when it is made hot, then let foreign workers integrate better when the economy is growing. Labor and energy are basic concepts of economics as well as thermodynamics. Since the terms mean in both sciences the same, the laws of thermodynamics can be transferred to the economy. They lead to the connection between labor, capital, standard of living and education and are the foundation for any economic activity. Businesses are engines of the economy. The economic cycle corresponds to the Carnot cycle of the engine. Every working person and every company works like a heat pump, it is produced at the lowest possible cost and sold at the highest possible price. The gain is stored in banks and reinvested if needed. This general economic cycle creates and reinforces the tendency towards two-tier society locally and globally, as the return grows disproportionately to the class difference. Operation with too low a yield loses - similar to an old refrigerator with poor efficiency - in value and is discarded on the stock exchange.

In 1995, Mimkes, in his “Binary Alloys as a Model for a Multicultural Society”, argued the following: [2]

> “The model of regular solutions, that may be applied to binary alloys (e.g. Au−Pt, Si−Ge) has been compared to binary societies: blacks — non-blacks in the US, catholics — non-catholics, foreigners — German citizen. The excellent agreement of phase diagrams and intermarriage data encourages a calculation of the multicultural society by functions of thermodynamics: Solubility corresponds to integration, miscibility gap to segregation, free enthalpy to happiness and temperature to tolerance of a society. Only a high level of tolerance will integrate ghettos and lead to a peaceful multicultural society.”

In 1996, Mimkes authored a 110-page article on "Politics and Thermodynamics", wherein he outlined some type of political thermodynamics. [3]

In 2002, Mimkes, in his “The Structure of Complex Systems: Thermodynamics, Socio-Economics”, given at German ZiF SocioPhysics conference, talked on the following pioneering points of view: [10]

> “The state of large stochastic systems of N objects may be calculated by the Lagrange principle L(N) = T log P(N) + E(N) → maximum ! P is the probability, that is to be maximized under a system condition E, and T is the Lagrange ordering parameter. L is the Lagrange function of the system, that may be far away or close to stability. At equilibrium the Lagrange function is at maximum.
>
> In natural sciences E is given by the **chemical bonds** and the (negative) Lagrange function corresponds to the free energy, from which all thermodynamic states may be calculated. In social systems the Lagrange principle corresponds to the common benefit. The function E represents the **social bonds** of the system.
>
> The existence of a quasi-temperature T_{in} social systems is demonstrated by data for binary societies (Catholics - non Catholics in Germany, black - non-black in USA) and may be interpreted as tolerance of the society and is proportional to the standard of living (GNP per capita). At high standard of living a society will be integrated, at low standard of living a society will be segregated or aggressive.
>
> These results are supported by data from Bosnia and North Ireland. Hierarchy is observed at low standard of living, democracy at high standard of living and the global phase at very high standard of living. The phases transitions correspond to revolutions, DS > O.
>
> Economics: the Lagrange principle corresponds to the common profit of an economic system, E represents the capital, the costs or the prices of a market. The existence of a quasi-temperature T in economic systems is demonstrated by data for the distribution of property in Germany and is again represented by the standard of living (GNP per capita). At low standard of living the economic structure will be in a hierarchic or feudal state, only at a higher standard of living the economy will become capitalistic. Social and economic states are closely related, this may be observed worldwide, but also in smaller socio-economic systems like companies, clubs, families. Work is defined by the send law of thermodynamics, economic production cycles correspond to the Carnot cycle of engines.”

(add discussion)

In the 2006 multi-authored book *Econophysics and Sociophysics*, Mimkes is the lead author with chapters on “A Thermodynamic Formulation of Economics” and “A Thermodynamic Formulation of Social

Science". [5]

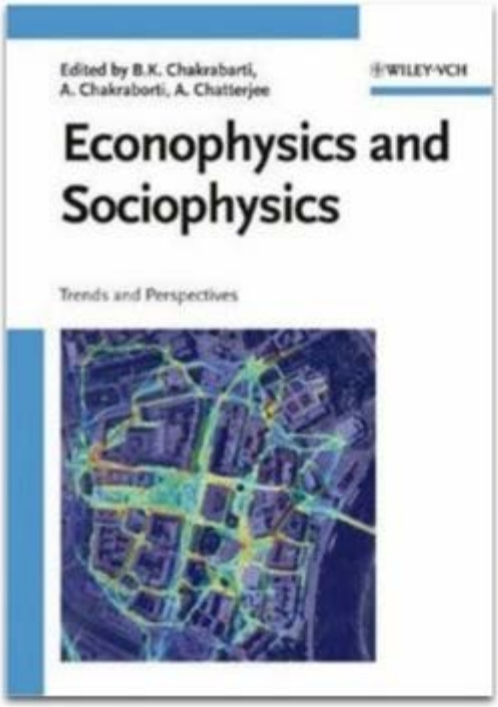

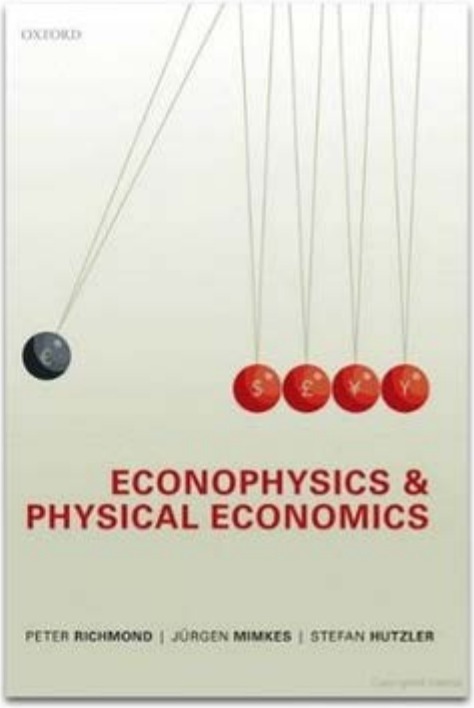

Left: The 2006 *Econophysics and Sociophysics*, contains Mimkes' "A Thermodynamic Formulation of Economics" (ch. 1) and "A Thermodynamic Formulation of Social Science" (ch. 10). [5] **Right:** Mimkes' co-authored 2013 econophysics and physical economics book. [8]

In 2010, Mimkes, in his "Stokes Integral of Economic Growth", on the subject of what he terms econophysics, argued that economic properties may be calculated in physical terms: capital to energy, production to physical work, and GDP per capita to temperature, and production function to entropy. He attempts to show how production, trade, and banking may be compared to motors, heat pumps, and refrigerators and that what he calls the "Carnot process of the first law", creates two levels in each system: buyer and seller, investor and saver, rich and poor, which, supposedly, have a correlation to "hot and cold in physics". He concludes with the postulate that efficiency rises in proportion to the income difference between the rich and poor, on the model that heat engine efficiency increases as the temperature difference between the hot and cold bodies increases. [6]

In 2013, Mimkes co-authored *Econophysics and Physical Economics*, together with physicists Peter Richmond and Stefan Hutzler. [8]

Other

In 2008, Polish psychologist Wouter de Raad, in his "A Dynamic Approach to Multicultural Integration", cited and discussed Mimkes article as follows: [9]

A different approach, adopted by Mimkes (1995), uses binary alloys as a model for a multicultural society. His model is based on the laws of thermodynamics and is truly dynamic; the final state of the system depends on the interactions of the agents (or particles). The behaviors of people in this model are based on the rules or natural laws that govern the behavior of physical particles. Mimkes outlines striking similarities between alloys of metals at the molecular level (solubility of molecules) and multicultural societies (patterns of intermarriage between people from different races or religions). Despite the parallels, the precision of the model and its elegant simplicity, there is a fundamental problem with the rules that govern the behavior of the elements in this model. We know that people behave in a different fashion than molecules, and close inspection of the principles defining the behavior of the elements in the model shows that those principles are not in line with findings from social psychology: The way people are attracted to each other differs from the way molecules are attracted to each other. So even though the outcomes of this model may be comparable to societal situations, the rules and dynamics that produce these outcomes do not compare to social dynamics and are unlikely to provide the understanding that we seek. What we need is a model that combines the precision and dynamic nature of Mimkes' model, but is firmly based on an empirically supported social psychological theory, as in Berry's model.

This, of course, is the classic "people are not molecules" objection, which is but unbridgeable gap dualism confusion.

Physical SocioEconomics | Lectures

Mimkes, since engaging in 1992 with the subject of the statistics, physics, thermodynamics, and chemistry of social and economic systems, has given following lectures on physical socio-economics systems: [3]

DPG Spring Meeting Regensburg, 2010
Royal Netherlands Academy of Arts and Sciences, Amsterdam, Dr. A. Scharnhorst, 2009
Department of Systems Science, Beijing Normal University Beijing, Dr. D. Wang 2009
International Conference Physics of Competition and Conflicts Rome 2009
International Conference on Complexity Shanghai 2009
European conference Competition and Conflicts Paderborn, 2009
Physics Department University of the Bundeswehr Munich ,. Dr. J. Becker, 2008
Physics Department University of Paderborn, Prof. Schmidt, April 2008
German Physical Society Spring meeting, Berlin, 2008
Technical Univ. ITBA, Buenos Aires, Argentina, Prof. R. Martinez November 2007
International Conference on Economics, Ancona, Italy, 2007
International Conference Physics of Risk COST P10, Palermo, Italy, 2007
Summer School Univ. of Economics, Sibiu (Sibiu), Romania, Prof. Costea, 2007
International Workshop on Econophysics-Sociophysics, Kolkata, India, 2007
Physics Department University of Maryland, Prof. Michael Fisher, October 2006
International Conference "physics of risk", Vilnius, Lithuania, 2006
Summer School Univ. of Economics Bucharest, Sinaia, Romania, Prof. Costea, 2006
American Physical Society Spring meeting, Baltimore, 2006
German Physical Society Spring meeting, Dresden, 2006
Summer School, Univ. of Economics Bucharest, Sibiu, Romania, Prof. C. Costea, 2006
Summer School Univ. of Economics Bucharest, Navodari, Romania, Prof. Costea, 2005
International Workshop on Econophysics-Sociophysics, Kolkata, India, 2005
German Physical Society Spring meeting, Berlin, 2005
Kloster Loccum, seminar on economy and politics, Andreas Dally, 2004
International Economics Conference WEHIA, Tokyo, 2004
Max Planck Institute of Economics, Jena, Prof. Dr. Witt, 2004
Department of Economics of the University of Kiel, Prof. Dr. Lux, 2004
International Conference Physics of Risk COST P10, Mallorca, Spain, 2004
International Conference Physics of Risk COST P10, Crete, Greece, 2004
International Conference New Economic Window, Salerno, Italy, 2004
International Conference Physics of Risk COST P10, Nyborg, Denmark, 2004
Conference on SocioPhysics, Germany, 2002

(add discussion)

Education

Mimkes completed his BS in physics in 1963 at the University of Gottingen, his MS in physics in 1964 at the Free University of Berlin, and PhD at the in 1967 at the Technical University of Berlin. Since then, he taught at various universities in the US and in Berlin. Since 1977, Mimkes has been a professor at the physics department at the University of Paderborn, Germany, focused on the fields of solid state physics and thermodynamics. Since 1992, he has been also dealing with the subject of the statistics and thermodynamics of social and economic systems. In 2010, Mimkes was a professor of, in his own words, and “physical socio-economics”, and solid state thermodynamics. [7]

Quotes | By

The following are quotes by Mimkes:

> "The system – solid or social – will be stable only if the negative free energy (-dG) is at a maximum. This idea goes back to Empedocles (450BC), who in his *On Nature* explains that solubility of wine in water similar to love of relatives, and Goethe (1809) who in his *Elective Affinities* demonstrated that love and marriage depend on the physico-chemical laws of society."
>
> — Jurgen Mimkes (2012), *Chemistry of the Social Bond* (Q)

> "People are not spins. People are elements or agents with 'attractions' or 'dis-attractions'. So what people can do is they can attract each other, if the [free] energy is positive [-dG > 0] or they can dis-attract (repel) each other if the [free] energy is negative [-dG < 0], and they can be indifferent if the interaction energy is zero [dG ≈ 0].
>
> — Jurgen Mimkes (2016), "On Goethe's affinities vs modern free energies"; Interview by Libb Thims at the BPE 2016 conference, Washington DC

> "My background is physics and solid-state thermodynamics. My present field is 'physical economics', especially macro and microeconomics, and finance. My time invested in this interdisciplinary work is 100%. I have trouble calling my field 'econophysics', as this only covers finance."
>
> — Jurgen Mimkes (2019), "Answer to Question #1"; cited by Kishore Dash (2019) in *The Story of Econophysics* (pg. 182)

References

Mimkes lecturing, at the 2005 *Navodari Econophysics Conference*, on the thermodynamic applications in economics. [4]

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2. Mimkes, Jurgen. (1995). "Binary Alloys as a Model for a Multicultural Society" (abs), *Journal of Thermal Analysis*, 43:521-37.
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5. (a) Chakrabarti, Bikas K. Chakraborti, Anirban, and Chatterjee, Arnab. (2006). *Econophysics and Sociophysics: Trends and Perspectives*, ("A Thermodynamic Formulation of Economics" (PDF) [ch. 1] and "A Thermodynamic Formulation of Social Science" [ch. 10]). Wiley-VCH.
(b) Mimkes, Jurgen. (2006). "A Thermodynamic Formulation of Social Science", In: *Econophysics & Sociophysics: Trends & Perspectives* (pgs. 277 – 308). Bikas K. Chakrabarti, Anirban Chakraborti, Arnab Chatterjee (Eds.). WILEY-VCH Verlag, Weinheim, Germany.
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9. Raad, Wouter E. de. (2103). "A Dynamic Approach to Multicultural Integration", in: *Complex Human Dynamics: From Mind to Societies* (editors: Andrzej Nowak, Katarzyna Winkowska-Nowak, David Brée) (§8:131-; quote, pg. 134). Springer.

10. Mimkes, Jurgen. (2002). “The Structure of Complex Systems: Thermodynamics, Socio-Economics”, SocioPhysics Conference (abs) (toc) (pdf), Center for Interdisciplinary Research (Zentrum fiir interdisziplinare Forschung) (ZIF), Bielefeld Germany, Jun 6-9.

Further reading

● Mimkes, Jurgen. (1997). “Society as a Many Particle System”, Conference report, Bretsnajder Seminar, Krakow.
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● Mimkes, Jurgen. (2017). “Thermodynamics and Economics” (abs), *Thermal Physics and Thermal Analysis*, Volume 11 of the series Hot Topics in Thermal Analysis and Calorimetry (pgs. 495-519), Mar 25.

External links

● Jurgen Mimkes (articles) – Springer.com.

θΔics

In hmolscience, **Jurgen Ruesch** (1910-1995) was a Swiss-born American psychiatrist noted, in psychological thermodynamics, for his 1964 classification of psycho-thermodynamics as the psychological modeling of human functioning based on energy analogies, as contrasted with "psychohydraulics" (pressure analogies) or "psychoelectronics" (machine analogies). [1]

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External links

â— Jurgen Ruesch – Wikipedia.

θΔics

In terminology, **justice** (TR:94) refers to the principles or ideas related to right, as opposed to wrong, action or judgment.

Determinism | Free will

In circa 300BC, Greek natural philosopher Zeno of Citium outlined the basics of punishment and justice in a deterministic universe via his famous slave stealing parable.

In 1978, in the case of United States v. Grayson, the Supreme Court gave its legislative stance on "free will", arguing that belief in free will is a "universal and persistent" foundation of the system of law, distinct from "a deterministic view of human conduct that is inconsistent with the underlying precepts of the criminal justice system." A repercussion of this ruling, is that any scientific developments that threaten our notion of free will would seem to put the ethics of punishing people for their bad behavior in question." [4]

A depiction of some of the main issues at hand in regards to the concept of **justice**, namely: belief in the concept of free will amid an atomic-force based, or fermion-boson structured deterministic universe, internal force coupled to external force mechanisms of the mind, social balance and or imbalance, retribution, legislature, the morality of an existive justice system, righting wrongdoings, etc.

Thermodynamics

In 1983, Michael Feeley, in his *Court Reform on Trial*, pointed out how a major change in one part of a justice system, may affect decisions in other parts, or in his own words set off a "chain reaction throughout the entire system", thus forcing officials to adapt, which thus sometimes creates new and unanticipated problems. [7]

In 1994, American criminal justice historian Samuel Walker (Ñº) (Ñº), citing evidence, e.g. that California's three strikes law is rarely used, as well as the finding that the use of the death penalty is so rare that it is comparable to be being struck by lightning, mixed Feeley's chain reaction premise together with Newton's third law of motion to argue that in the court system, "actions produce reactions", and that this actuates in the form of what he refers to as a "law of criminal justice thermodynamics", which he formulates as follows: [8]

> "A major increase in the severity of the penalty will result in less frequent application of that penalty."

(add)

Other

Scottish social philosopher Adam Smith's formulation of justice, supposedly, is a negative formulation of Vilfredo Pareto's optimality. (Ñº)

Danish physicist Niels Bohr, according to Bruce Lindsay (1983), somewhere applied his complementarity principle of quantum mechanics to domain of human experiences, the complementary aspects of love and justice, specifically. [3]

Recently, American Curtis Blakely, a criminal justice professor, has been working on sociophysics of inmate population dynamics.

Quotes

The following are related quotes:

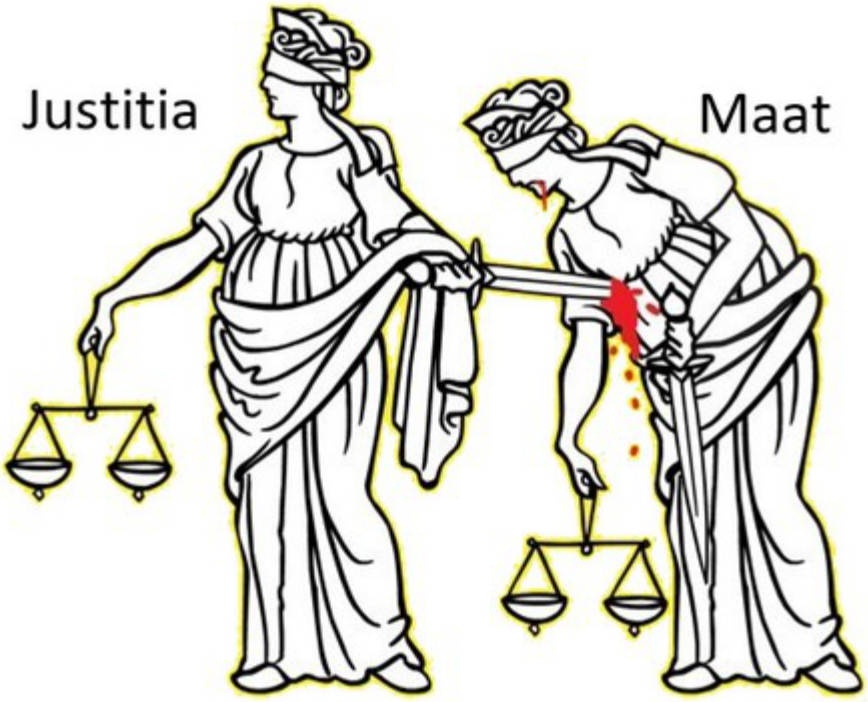

A justice goddess killing an older justice goddess depiction. (Ñº)

"**Justice** is doing what should be, injustice is not doing what should be, but turning aside from it."

— Democritus (c.420BC) Fragment D120; cited by Stobaeus (c.550BC) in *Ethics* (IV.2.14) [10]

"Since **justice** too was introduced according to the relationship of men to each other and to the gods, **if there are no gods, justice too will not exist. And this is absurd**. So the followers of Pythagoras and Empedocles and the rest of the Italian group say that we have a kind of communion not only with each other and the gods but also with irrational animals. For there is one spirit penetrating the entire cosmos, like a soul, which also unites us with them."

— Sextus Empiricus (c.200 ACM), *Against the Mathematicians* (9.126-130) [9]

"Power, truth, **justice**: they are words that denote something great, but that something we are quite unable to see and conceive."

— Michel Montaigne (1580), *Essays* [1]

"I, too, have long investigated, have gone through all arts and sciences. I became a theologian, consulted authorities, weighed all, tested all,—polemics, exegesis, dogmatism. All was babble: nothing breathed of divinity! I became a jurist, endeavored to become acquainted with **justice**, and learned how to distort justice. I found an idol, shaped by the hands of self-interest and self-conceit, a bastard of justice, not herself. I became a physician, intending to learn the human structure, and the methods of supporting it when it gives way; but I found not what I sought, — I only found the art of methodically murdering men. I became a philosopher, desiring to know the soul of man, to catch truth by the wings and wisdom by the forelock; and I found shadows, vapors, follies, bound into a system!"

— Faust (c.1770), Augsburg puppet-play version (see: Faustian) [6]

"The criticisms which have been hurled at me have not worried me. A man cannot control his beliefs. If he is honest in his frank expression of them, that is all that can in **justice** be required of him. Professor Thomson and a thousand others do not in the least agree with me. His criticism of me, as I read it, charged that because I doubted the soul's immortality, or 'personality,' as he called it, my mind must be abnormal, 'pathological,' in other, words, diseased. I greatly admire Thomson. What he said about my mind did not disturb me. I try to say exactly what I honestly believe to be the truth, and more than that no man can do. I honestly believe that creedists have built up a mighty structure of inaccuracy, based, curiously, on those fundamental truths which I, with every honest man, must not alone admit but earnestly acclaim."

— Thomas Edison (1910), response to his controversial 1910 *New York Times* soul-denying interview [2]

"I was raised Catholic, [but] I'm pretty much agnostic at this point in my life. But I find atheism just as hard to get my head around as I find fundamental Christianity. Because if there is no such thing as **cosmic justice**, what is the point of being good? [see: Jeffrey Dahmer] I feel some sort of need for biblical atonement, or justice, or something. I like to believe there is some comeuppance, that karma kicks in at some point, even if it takes years or decades to happen. My girlfriend says this great thing that's become my philosophy as well. 'I want to believe there's a heaven. But I can't not believe there's a hell.'"

— Vince Gilligan (2011), *NY Times* interview on *Breaking Bad* [2]

"Our taste for **justice** is a useful illusion."

— Joshua Greene (2013), commentary on the Nichols-Knobe determinism study [5]

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(b) Henderson, Lawrence J. (1935). *Pareto's General Sociology: A Physiologists Interpretation* (pg. 33). Harvard University Press.
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3. Lindsay, Robert B. (1983). "Social Exemplifications of Physical Principles"; in: *Old and New Questions in Physics, Cosmology, Philosophy, and Theoretical Biology: Essays in Honor of Wolfgang Yourgrau* (editor: Alwyn Merwe) (§B7:647-58; Bohr, pg. 654). Plenum Press.
4. Harris, Sam. (2010). *The Moral Landscape: How Science can Determine Human Values* (pg. 106) Free Press.
5. Greene, Joshua. (2013). *Moral Tribes: Emotion, Reason, and the Gap Between Us and Them* (pg. #). Penguin.
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9. Empedocles. (435BC). *The Poem of Empedocles: a Text and Translation with an Introduction* (editor: Brad Inwood) (pg. 139). University of Toronto Press, 1992.
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θΔics

In hmolscience, **Justin Lancaster** (1955-) is an American natural scientist noted, in evolutionary thermodynamics, for his 1989 article “The Theory of Radially Evolving Energy”, in which he argues that evolution is a function of energy itself, and that all energetic systems, including societies, evolve with the bounds of thermodynamics laws, whereby nonequilibrium thermodynamics, following Ilya Prigogine, is joined with ecological energetics and chemical evolution to reveal "a strong analogy between chemical, biological, social, and ecosystem evolution.” [1]

Radially evolving energy theory

A formative idea of Lancaster’s radial evolution theory, that a "strong analogy" between organismic and societal subsystems show an evolutionary trend, he put forward in an essay written in 1972 for a course in Comparative Politics at Case Western Researve University (CWRU), which followed his earlier studies of insect societies (see also: Klaus Jaffe). This seed idea then sparked to general level of energetic systems in 1980, following research session on geographic modeling of cities and comparing oxidation processes of rust and fires. Lancaster then applied to the Scripps Institution of Oceanography (SIO) in 1980 for purpose of further developing the theory, but his senior professors (Munk, Revelle and Keeling) deemed it too philosophical to be a useful research topic.

Lancaster went back to undergraduate studies at University of California, San Diego (UCSD) for two years, studying physics, biology, chemistry, thermodynamics, energy, mathematics and other topics, before gaining admission to SIO in 1983, in the chemistry group with Charles David Keeling's laboratory.

The first draft of the radially evolving energy paper was submitted in 1981-82 in a UCSD course with Professor Sanford Lakeoff, who judged the biological analogy as an "old idea" long since abandoned. Journal publication interest was lacking, so it was put aside for a few years. Lancaster then came back to the theory in 1987, struggling mostly with getting to a concise description in the Restatement section, filling out the literature review and adding to the discussion section, after which he submitted it to the *International Journal of General Systems*, who during the first round of reviews found the paper too “gloomy”; but, it was eventually picked up by Czech-American systems scientist George Klir, perhaps simply for the work that went into it.

Education

In the early 1970s, Lancaster began studies in mathematics and science at Case Western Reserve University, before gaining his B.A. in American Studies at Lyndon State College (1975). He attended Vermont Law School (J.D., 1978) and became a lawyer in VT at age 23. After turning back to science at USCD/SIO, he completed his MS thesis in 1985, worked a year with the U.S. Senate on environmental law issues, studied for a year with Dr. Ralph Cicerone at the National Center for Atmospheric Research in Boulder, CO, and then returned to SIO to complete his PhD research on using isotopic carbon tracers for modeling biospheric-atmospheric exchange of carbon dioxide. [2] He then pursued postdoctoral research with the California Space Institute with astronaut and professor Sally Ride and at Harvard University with physicist Richard Wilson, before branching out into corporate research and business.

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1. Lancaster, Justin. (1989). “The Theory of Radially Evolving Energy” (abs), *Int. J. General Systems*, 16: 43-73.
2. (a) Lancaster, Justin. (1985). “Carbon Dioxide Variations, Ocean Air Sampling near Hawaii and Southern California from July 1983 to September 1984 (abs)”, MS thesis, University of California, San Diego.
(b) Lancaster, Justin. (1990). “Biospheric-atmospheric exchange of CO2 as tracked by carbon isotopes”, PhD thesis, University.

Further reading

â— Geyer, Richard A. (1993). *A Global Warming Forum: Scientific, Economic, and Legal Overview* (Lancaster, 7+ pgs. pg. 560). CRC Press.

External links

â— Justin Lancaster (about) – JustinLancaster.com.
â— Lancaster, Justin – WorldCat Identities.

θΔics

In existographies, **Justin Martyr** (100-165AD) (CR:3) was a Christian apologist – the "first and most distinguished" apologist (Taylor, 1829) – noted for []

Quotes | On

The following are quotes on Martyr:

> "**Justin Martyr** [c.150] says that Christ was born on the same day on which the sun was re-born in stabulo Augiae, and the stable of Angles, cleansed by Hercules in his sixth labor, corresponds to the cave in Capricorn, which is the cave of Mithra and of the other saviors. Abba Udda, the Akkadian name of the tenth month, answering roughly to Dec, the month of Capricorn, denotes the cave of light. The cave or winter solstice in Capricorn was the birthplace of the Mithraic Messiah from 2410 to 255 BC and this was continued as the cave or birthplace of the Christ after it had ceased to be applicable to the solar god. Justin, however (determined to include both), asserts that Christ was born in the stable and afterwards took refuge in the cave." But no messiah, whether called Mithra, Horus or Christ could have been born in the stable of Augias, or the cave of Abba Udda, on the 25th of Dec, after the date of 255BC because the solstice had passed out of that sign into the constellation of Sagittarius."
>
> — Robert Shaw (1904), *Sketch of the Religions of the World* (pg. 209); elaborated re-quote of Gerald Massey (c.1890) in *The Historical Jesus and the Mythical Christ* (pg. 41)

Quotes | By

The following are noted quotes:

> "For by declaring the logos, the first begotten of god, our master, Jesus Christ, to be born of a virgin without any human mixture, to be crucified and dead, and to have risen again into heaven; we say no more in this, than what you say of those whom you style the sons of Jove [Jupiter], &c. As to the son of god, called Jesus, **should we allow him to be nothing more than man**, yet the title of the 'son of god' is very justifiable upon the account of his wisdom, considering that you have your Mercury in worship under the title of 'the word', and 'messenger of god'."
>
> — Justin Martyr (c.150AD) [1]

> "When we say that that Jesus Christ was produced without sexual union, was crucified and died, and rose again, and ascended to heaven, we propound nothing new or different from what you believe regarding those whom you call the sons of Jupiter."
>
> — Justin Martyr (150AD) *Source*; in *The God Who Wasn't There* (21:30) (Ñº)

> "For when they say that Dionysus arose again and ascended to heaven, is it not evident the devil has imitated the prophecy?"
>
> — Justin Martyr (150AD) *Source*; in *The God Who Wasn't There* (22:56) (Ñº)

References

1. (a) Author. (1716). *Reeve's Apologies of the Fathers*, vol. 1, London: Publisher.
(b) Taylor, Robert. (1829). *The Diegesis: a Discovery of the Origin, Evidences, and Early History of Christianity, Never*

Yet Before or Elsewhere so Fully and Faithfully Set Forth (Arc) (Martyr, pg. 184). London: Richard Carlile.

External links

â— Justin Martyr – Wikipedia.

θΔics

In existographies, **Justus Liebig** (1803-1873) (IQ:175|#233) (Cattell 1000:382) (Murray 4000:11|C) (Partington 50:2) (GCE:4) (CR:37) was a German chemist notable for his teaching of French chemist Antoine Lavoisier's 1785 combustion theory of animal heat; one student in particular being German physician-physicist Robert Mayer, who in 1840 used the "dark blood = more combustion" variant of the theory to derive the mechanical equivalent of heat, the first formulation of the the conservation of energy. Liebig was an associate of Karl Mohr.

Chemistry

Liebig, according to English chemist James Partington's famous 1937 *A Short History of Chemistry* (a shortened version of his three-volume treatise), according to index citation page count, is one of the top five chemists of history: Jacob Berzelius (52), Liebg (39), Jean Dumas (38), Robert Boyle (30), and Antoine Lavoisier (26).

Mayer

One of Liebig's most famous students was German physician-physicist Robert Mayer, who studied under him in 1838 at medical school.

Liebig, in his 1842 *Animal Chemistry*, used a language of vital forces and and drew on the metaphor of the furnace to describe the "metamorphosis" of nutrition and oxygen. [3]

In 1842, Liebig published Mayer's controversial paper, entitled "Remarks on the Forces of Inorganic Nature" (previously rejected elsewhere), in his *Annals of Chemistry and Pharmacy*, in which one of the first statements of the mechanical equivalent of heat appeared: [1]

> "The warming of a given weight of water from 0˚C to 1˚C corresponds to the fall of an equal weight from the height of about 365 meters."

In this now-famous paper, Mayer is said to have argued for the principle that has since become known as the law of conservation of energy; in which he introduced the concept of fall-force. [2]

Students

Another noted student of Liebig was Russian biochemist Carl Schmidt, who is noted for being the PhD supervisor for German physical chemist Wilhelm Ostwald in 1875 at the University of Tartu, Estonia.

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1. (a) Mayer, Robert. (1842). "Remarks on the Forces of Inorganic Nature", *Annalen der Chemie und Pharmacie*, Vol. xlii, (pg. 233), May.
(b) Mayer, Robert. (1842). "Remarks on the Forces of Inorganic Nature", in *Philosophical Magazine* (pgs. 371-77), 1862, translated by G.C. Foster.
2. Ellis, Brian D. (2002). *The Philosophy of Nature* (pg. 151). McGill-Queen's Press.
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Further reading

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External links

● Justus Liebig – Wikipedia.
● Justus Liebig – NNDB.

θΔics

In religio-mythology, **Ka**, one of the seven main parts (see: Egyptian model of human) of the human in Egyptian mythology (compare: ba), the precursor to the Christian concept of the spirit, is a thing conceptualized as []; oft-depicted as a pair of arms raised.

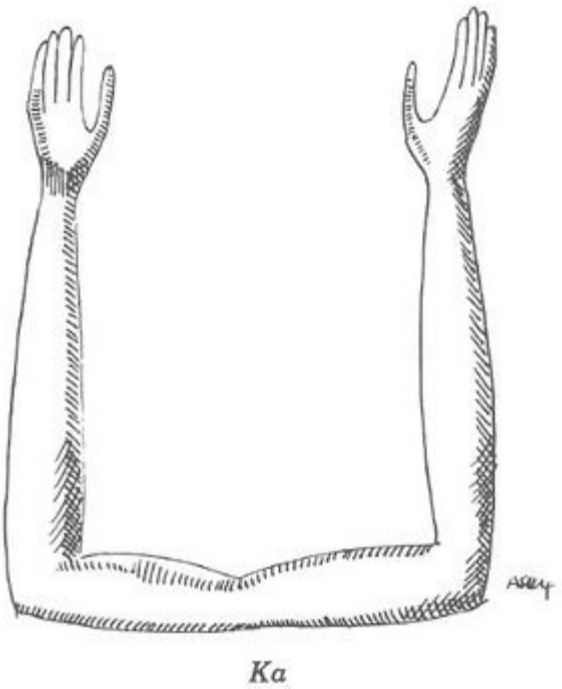

The basic visual representation of the **Ka**, a pair of raised arms. [1]

Overview

In 1978, Anthony Mercante, in his *Who's Who in Egyptian Mythology*, a basic dictionary of sorts, defined Ka as follows: [1]

> "**KA**: The double or the abstract personality of a man or woman. The Ka could separate itself from or unite itself to the body at will and could move freely from place to place. A dead man's Ka had to be preserved if his body was to become everlasting. Funeral offerings, such as meats, cakes, wines, and unguents, were made to the Ka, and when food was not available, offerings were painted on the walls, accompanied by the recitation of specific prayers. The tombs of the early Egyptian had special chambers in which the Ka was worshiped and received offerings, and the priesthood included a group called "priests of Ka," who performed services in honor of the Ka. According to one version of the creation myth that appears in the *Pyramid Texts*, after the sun god spit the gods Shu and Tefnut, he put his arms about them so that his "Ka might be in them." The Ka is closely associated with the Ba, the soul."

(add summary)

Quotes

The following are related quotes:

> "As their lives and loves survive in memory among their offspring, their **ka** souls will continue to shine from the shadow play among the ba structures of this book."
>
> — Karl Luckert (1991), "In Memory" of father Wilhelm G. Luckert, whose "restless mind harbored questions and doubts which the Karl imbibed in childhood", and mother Emilie Luckert-Hilt, who passed while book was going to press; note: he seems to have "ka" associated with soul, whereas correctly the "ba" is typically translated as soul [2]

References

1. Mercante, Anthony S. (1978). *Who's Who in Egyptian Mythology* (editor and reviser: Robert Bianchi) (ka, pg. 81; ba, pg. 19). Metro Books, 1995.
2. (a) Luckhert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective* (pg. viii). SUNY Press.
(b) Mercante, Anthony S. (1978). *Who's Who in Egyptian Mythology* (editor and reviser: Robert Bianchi) (ka, pg. 81; ba, pg. 19). Metro Books, 1995.

External links

â— Ka (section) – Wikipedia.

θΔics

In existographies, **Kaj Linderstrom-Lang** (1896-1959) (SN:15) (CR:6), referred to as "Lang", was a Danish chemical engineer, physiologist, and protein scientist noted, in hmolscience, for his 1956 parody article "The Thermodynamic Activity of the Male Housefly", wherein he attempts to poke fun at those who attempt to apply simple models to complex systems, or something along these lines.

Spoofers

It's difficult to say who he is spoofing exactly (O), but he does mention Ronald Fisher and reference #6 alludes to the idea that he's spoofing Erwin Schrodinger's *What is Life* (1943), or anyone who cites this. An intuitive guess might be that he is spoofing Alfred Lotka's *Elements of Physical Biology* (1925), in one part of which, namely §6: The Fundamental Equations of Kinetics of Evolving Systems (pg. 59), Lotka gives a simple example of flies introduced into a house and equilibrium breeding levels that result as follows:

> "To give a touch of concreteness to the discussion at this stage a very simple example may be given to illustrate how several equilibria may occur in a life-bearing system. A perfectly screened dwelling may be kept indefinitely free from **flies**. This is a condition of equilibrium, but of unstable equilibrium; for if only a few flies gain access, presently these will breed, and the room will become inhabited by a population of flies whose number will depend on the amount of food present, on the measures taken to combat the pest, etc. Unless these measures are very active, the flies will not be wholly exterminated, but the population will attain some approximately steady number (for a given season) . There are, then, in this case, two possible equilibria; one with a zero population of flies, the other with some positive number of fly population."

Lotka's general aim is to explain evolution via physical chemistry, namely as thermodynamically irreversible process; this, therefore, could be the main spoof candidate; though, to note, Lotka is not a key term found in Lang's *Selected Papers*.

Overview

In 1956, Lang published an humorous 20-page article entitled "The Thermodynamic Activity of the Male Housefly", with a fictional co-author F. Fizz-Looney, wherein he gives a parody of simplified system models of overly-complex systems; the following is the abstract:

Lang (1955) standing (O) in the doorway to the Carlsberg Laboratorium.

> "The immense importance of applying chemico-physical methods to biology has gained world-wide recognition in recent years. Not even the most miserable scientific sparrow falls to the earth without the fateful god of mechanical statistics having something to do with it. Still, there are a few realms within which this power has not yet taken charge, and the present article is written with the purpose of showing where and how it can be applied in an entirely new fashion and whither this application may lead us in our struggle for bigger and better science. [1]

1. Problem: Measurement of activity of housefly.
2. Materials: Adult male flies. No particular strain. [N2]
3. Method: Osmotic. Suspension of flies in air (aerosol) enclosed in semipermeable cylinder with piston.
4. Results: Inconclusive.
5. Theoretical: Yes.

[N1] By special courtesy the present article was accepted without having passed the usual five referees. An American friend of the author has however pointed out to him that it is inadvisable to go the whole hog in the direction of broken literary English, and it will therefore be attempted—in places—to adopt the Standard American Scientific Language whose meaning will be clear even to the luniest [see: crackpot or madness].
[N2] Except from exercise."

Shown adjacent, is Lang's fly osmometer, with a semi-permeable membrane. [1]

The following equation, to get "some idea of the flavor of his article", as John Schellman (1997) puts it, is Lang's Schrodinger equation for the male housefly: [4]

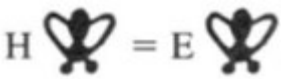

where H, supposedly, is the Hamiltonian operator of the wave function of the fly and E is the energy of the state of the fly, or something along these lines. Lang, also in the article, calculated the pressure vs temperature plot (PT diagram) for houseflies where it is shown that the "fly pressure" increase up to about 60°C, above which there is a mysterious and precipitous drop to zero. [4]

The housefly article was cited as "famous" (Q) by 1960, "celebrated" (Q) by 1963, and his "most humorous scientific parody" (Q) by 2000.

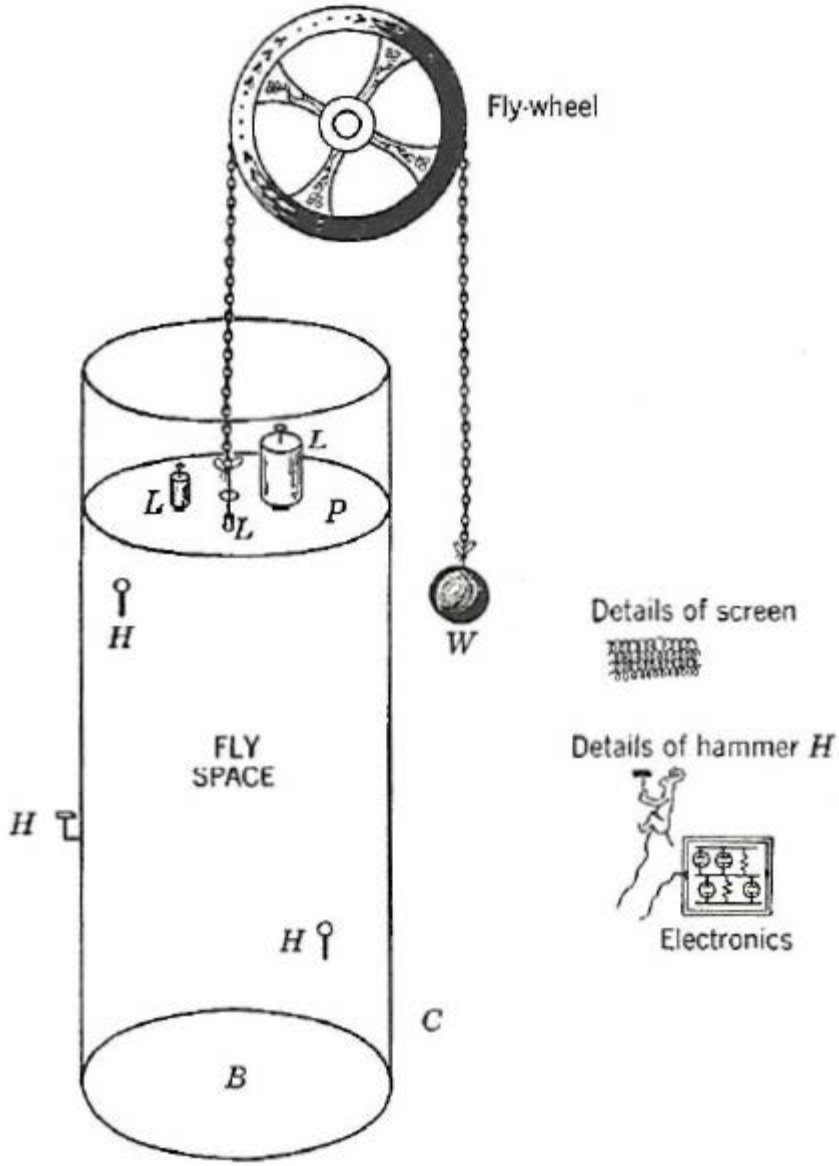

Lang's figure 1, captioned "The osmometer. Flies are left out for obvious reasons." Device, supposedly, is a play on the van't Hoff equilibrium box, a piston with a piston heads semi-permeable to certain types of gas molecules, designed and built in *circa* 1886 by Jacobus van't Hoff.

Education

In 1914, Lang began to study chemical engineering, or "factory engineering" as it was called then, during which time he edited a magazine called *Student Chemists*, at that time also having aims to become a playwright. [3] He then was briefly employed at the Agricultural Research Laboratory, under the direction of A.C. Andersen (1882-1970), then in 1919 transferred to the Carlsberg Laboratory, then divided into chemical and physiological research, headed by Soren Sorensen (1869-1939). In the 1920s, Lang, supposedly, began applying the recent physicochemical thermodynamic theories put forward by Gibbs, Lewis, Bronsted, and Bjerrum to proteins; after which, he completed his PhD, on some type of thesis on casein, at the University of Copenhagen. [3] In the 1950s, Lang, then famous for his protein science and or proto protein thermodynamics, work, was a sought after speaker, particularly in America.

Quotes | On

The following are quotes on Lang:

> "He was one of the most gifted, generous and lovable men I have ever met, and is remembered, indeed worshiped, by those who came in contact with him, particularly those who had the experience of working in his laboratory."
>
> — Fritz Lipmann (1980), commentary on Lang [4]

Quotes

The following noted quotes:

> "One well established and generally accepted method of treating systems which are complicated beyond comprehension is to construct simple models and see whether they fit the systems in question. If they do, you will immediately become suspicious, and so will your colleagues most certainly, with the result that a blooming literature sprints up (or breaks out) dealing with the problem of how you have managed to make all your errors cancel one another. If they do not fit, the beauty of the models themselves may shine for years untainted by the squalid awkwardness of reality."
>
> — Kai Lang (1956), "The Thermodynamic Activity of the Male Housefly" (§:5.31); cited by Mogens Westergaard [2]

> "Are flies comparable to macromolecules? Yes."
>
> — Kaj Lang (1956), "The Thermodynamic Activity of the Male Housefly" (§:5.312)

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1. (a) Linderstrom-Lang, Kaj. (1956). "The Thermodynamic Activity of the Male Housefly" (pdf), Conference / Banquet Lecture, America.
(b) Fizz-Loony, F. and Linderstrom-Lang, Kaj. (1956). "The Thermodynamic Activity of the Male Housefly (Muscus domesticus L-L.)." New York: Academy Press; in: *Selected Papers* (of Kaj Linderstrom-Lang) (pgs. 573-84). Danish Science Press, 1962.
(a) Fizz-Loony, F. and Linderstrom-Lang, Kaj. (1974). "Thermodynamics of the Housefly", *Chemtech* (*Chem Technol*), 4(6):366-69.
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(b) Westergaard, Mogens. (1957). "On the Identification of Genetic and Non-Genetic Variation in Bacteria", CIBA Foundation Symposium; in: *Drug Resistance in Microorganisms: Mechanisms of Development* (pgs. 280-93; esp. pg. 289). Wiley, 2009.
3. Kaj Linderstrom-Long (Danish → English) – Biokemi.org.
4. Schellman, John A. and Schellman, Charlotte G. (1997). "Kay Ulrik Linderstrom-Lang (1896-1959)" (pdf), *Protein Science*, 6:1092-1100.

External links

- Kaj Ulrik Linderstrom-Lang – Wikipedia.

θΔics

In human thermodynamics, **Kalyan Annamalai** (c.1943-), or Kalyan Thakkolam Annamalai, is an Indian-born American mechanical engineer noted for his 2011 inclusion of human molecular theory in his *Advanced Thermodynamics Engineering* chapter on the thermodynamics of animate systems (chnopsological systems) or "Thermodynamics and Biological Systems", as they entitle it (see: defunct theory of life, for terminology discussion), the chapter co-authored with Venezuelan-born American mechanical engineer Carlos Silva, wherein they cite American electrochemical engineer Libb Thims' 2002 molecular formulation (see also: Sterner-Elser human molecular formula, 2000); specifically, they specifically define a human, formulaically, as a such: [1]

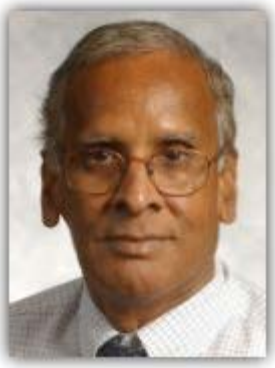

> "Humans may be called a 26-element energy/heat driven dynamic atomic structure."

This, of course is a long-overdue upgrade definition of a human, in the context of standard engineering thermodynamics, since English physicist C.G. Darwin's famous 1952 definition of the science of human thermodynamics as the study of conservative dynamical systems of human molecules. [2]. Scaling laws for metabolic rate, oxygen consumption rate,lung volume, breathes per min, blood volume, blood circulation rate, heart mass, entropy generation rate and life span were derived in Chapter 14 of ref. [1].

Aging thermodynamics

Annamalai and Silva are also noted for their 2008-2009 articles on aging, lifespan, entropy (heat) stress of vital organs and their relation to leading causes of death [3] [4].

Education

Annamalai completed his BS in mechanical engineering in 1966 at the University of Madras (Anna University, Guindy, Chennai), his MS in internal combustion engineering in 1968 at Indian Institute of Science, and PhD in mechanical engineering in 1975 at Georgia Institute of Technology. In 1981, Annamalai joined the Texas A&M engineering department. Currently, he is Paul Pepper Professor of mechanical engineering and conducts research in the area of Combustion and Gasification of Coal and Biomass and Thermodynamics. He had written graduate level text book on *Combustion Science and Engineering* where he discusses the effect of deficiency of oxygen on combustion rate of fuel particle clouds. [5].

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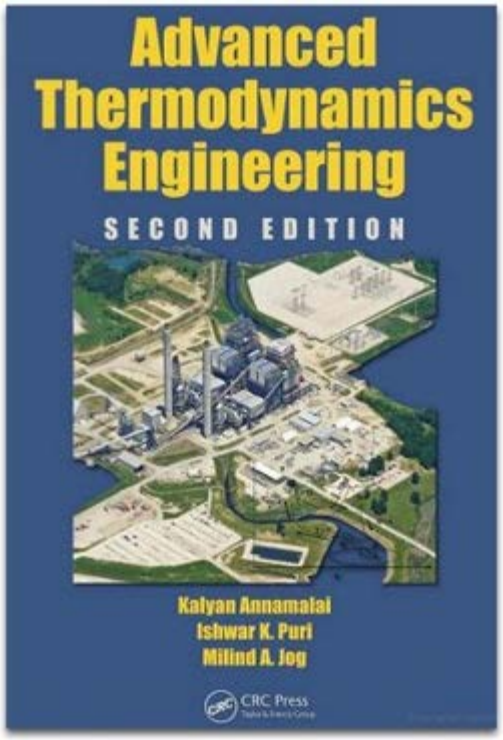

Annamalai's 2011 *Advanced Thermodynamics Engineering*, co-written with Ishwar Puri and Milind Jog, wherein the Thims-based 26-element human molecular formula definition of a person is employed (§14.4.1: Human body | Formulae). [1]

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(b) Silva, Carlos A. and Annamalai, Kalyan. (2009). "Entropy Generation and Human Aging: Lifespan Entropy and Effect of Diet Composition and Caloric Restriction Diets", *Journal of Human Thermodynamics*, Jan 23.
4. Annamalai K., Silva C. Entropy Stress and Scaling of Vital Organs over Life Span Based on Allometric Laws. Entropy. 2012; 14(12):2550-2577.
5. Annamalai, Kalyan, and Puri, Ishwar K. (2007). *Combustion Science and Engineering*, CRC Press.

External links

â— Annamalai, Kalyan – WorldCat Identities.
â— Kalyan Annamalai (faculty) – Texas A&M University, Engineering.
â— Kalyan Annamalai (profile) – CRC press.

θΔics

In textbook controversies, **Kanawha County textbook controversy** was a tenuous event, which occurred in spring 1974 to 1975 in Kanawha County, West Virginia, involving protest over newly adopted set of course books, for the 46,000 students attending the county's 124 public schools, that were religion-questioning and ethnicity-broadening in content, resulting in one shooting, bus and school bombings, school closings, reporters being beaten up, police being shot at, some 3,600 miners going on strike, among other non-peaceful events, that has come to be known as the "most violent protest over public school textbooks" in US history. [1]

Images of the 1974-75 **Kanawha County textbook controversy**, in West Virgina. Top (left): a video still of Alice Moore, the leader of the protests, on camera during testimony. Top (right): one of the 3,600 to 10,000 miners that went on strike over the textbooks. Bottom (left): a street march, showing a sign "God is Not a Myth", in objection to the teaching curriculum change of how children are asked to compare the Bible story of Daniel in the Lion's Den to Aesop's fable "Androcles and the Lion?" (Ñº), suggesting that both were myths. Bottom (right): a Kanawha County woman (Ñº) protesting against the deemed anti-Christian textbooks, with the sign "Even Hillbillies have Constitutional Rights".

Overview

On 11 Apr 1974, the school board of Kanawha County, West Virginia, met to consider new textbooks that had been recommended by a state selection committee, which included more multiculturalism and diverse authors, such as: John Milton (*Paradise Lost*), F. Scott Fitzgerald (*The Great Gatsby*), Ernest Hemingway (*The Old Man and the Sea*, Plato (*The Republic*), something by Sigmund Freud, *The Autobiography of Malcolm X*, by Malcolm X and Alex Haley, to name a few.

One board member Alice Moore (c.1936-), a Christian fundamentalist, wife of a local preacher, the only board member *without* a college degree, but who had been elected for campaigning *against* the teaching of sex education in public schools, objected over concerns of dialectology. The books were approved against Moore's objections. After the board approval, Moore's husband showed her the following quote, from the *Autobiography of Malcolm X*, which the students would be reading in the coming year:

> "All praise is due to Allah that I moved to Boston when I did. If I hadn't, I'd probably still be a brainwashed black Christian."

He told his wife "look what you just approved!" Thus began the Kanawha County textbook controversy. [2] Moore, single-handedly, via Church and social networking, got 96,000 copies of 300 different "text books", as she and protestors referred to them, removed from public school classrooms, because of their "anti-Christian slant" passages. Some of these concerns, as Moore latter reported, were the following issues:

"One of the elementary school books had a poem that referenced God, but they used a lowercase g. In another section, they had a plural reference to 'gods' capitalized."

During a rallies, to follow, the reverend Charles Quigley prayed for god to kill the three board members who had approved the books. Families threatened to kill families who did not support the book ban. By Oct 1974, sticks of dynamite were being exploded all over the county, in schools, and around gas stations, and busses; snipers were firing on police who were protecting the buses.

During the event, a newly-minted journalist named Lee Strobel, who then was an "intellectually-fulfilled atheist", working for the *Chicago Tribune*, was assigned the job of going to report on the Kanawha County incident; some of which he recounts 2004 *The Case For Christ*, such as interviews with local residents and business owners. [4]

Dynamics of Language

The book *Dynamics of Language*, seemed to be a hot button tension spot for man. The following, e.g., is a conversation between Lee Strobel and a local businessman over hamburgers at a Charleston diner: [4]

Textbook battle rages in Bible Belt county

By Lee Strobel

Chicago Tribune Press Service

CAMPBELL'S CREEK, W. Va.—The Rev. Marvin Horan, full-time truck driver and part-time country preacher, raised his arms to quiet the applause of 1,000 angry neighbors in a school outside Charleston.

"This is going to turn your stomachs, but this is the kind of book your children are reading," he shouted in his Andy Griffith accent as he showed a copy of a book titled "Facts About V.D."

There were gasps from the crowd, which was overflowing from two bleachers in a high school gym.

"GET THOSE books out of the schools!" someone shouted.

"Get 'em out!" several others echoed as if they were saying, "amen" at a revival meeting.

Rev. Horan, perspiration rings expanding on his shortsleeved shirt as he paced back and forth, waved the book. "Y'all have got to force yourselves to look at these books so you can really understand what the issue is all about," he shouted.

"Your children may be reading these books. And that's why we've got to continue keeping our children out of school for another week to boycott those filthy, un-American, antireligious books."

THAT CATAPULTED the crowd into a clapping frenzy. Money poured into the Kentucky Fried Chicken buckets being passed around for donations to fight the war which has erupted in this conservative coal mining county.

The battle was sparked when a school

Continued on page 24, col. 1

The clipping of Lee Strobel's 20 Oct 1974 *Chicago Tribute* article on the Kanawha Country textbook uproar; which mentions reverend Marvin Horan, later sentenced to three years on prison for conspiring to blow up two elementary schools over the textbooks. [4]

Strobel: "Why are you so enraged over the new school textbooks?"

Businessman: "Listen to what *Dynamics of Language* tells our kids. To quote: 'Read the theory of divine origin and the story of the Tower of Babel as told in Genesis. Be prepared to explain one or more ways these stories could be interpreted.' [tossing a well-worn clipping on the table] The *theory* of divine origin! The word of god is *not* a theory. Take god out of creation and what's left? Evolution? Scientists want to teach our kids that divine origin is just a theory that stupid people believe but that evolution is a scientific fact. Well, it's not. And that's at the bottom of this."

Strobel: "Are you saying Charles Darwin is responsible for this?"

Businessman: "Let me put it this way: If Darwin's right, we're just sophisticated monkeys. The Bible is wrong. There is no god. And without god, there's no right or wrong. We can just make up our morals as we go. The basis for all we believe is destroyed. And that's why this country is headed to hell in a handbasket. Is Darwin responsible? I'll say this: people have to choose between science and faith, between evolution and the Bible, between the Ten Commandments and make-'em-up-as-you-go ethics. We've made our choice—and we're not budging."

Businessman: [taking a swig of beer] "Have you seen the teacher's manual?"

Strobel: No.

Businessman: “It says students should compare the Bible story of Daniel in the Lion’s Den to that [slave and the thorn in the lion’s paw] myth

Strobel: “Androcles and the Lion?” (Ñº) [from Aesop’s fable]

Businessman: “Yeah, that’s the one. [wagging a french fry at Strobel] What does it tell our kids when they’re supposed to compare that to the Bible? That the Bible is just a bunch of fairy tales? That it’s all myth? That you can interpret the Bible any way you darn please, even if it rips the guts out of what it really says?”

Businessman: “We’ve got to put our foot down. I’m not going to let a bunch of eggheads destroy the faith of my children.”

Video clips, depicted adjacent, show Moore complaining about *Dynamics of Language* during testimony. [5]

Situational ethics | Moral relativism

See main: Moral relativism

One textbook included a story of a child cheating a merchant out of a penny. Students were asked:

> “Most people think that cheating is wrong. Do you think there is ever a time when it might be right to? Tell when it is. Tell why you think it is right.”

Parents objected, believing these lessons were undermining Christian values. One parent, of an elementary school student, stated in obvious frustration:

> “We’re trying to get our kids to do the right thing. Then these books come along and say that sometimes the wrong thing is the right thing. We just don’t believe that! The ten commandments are the ten commandments.”

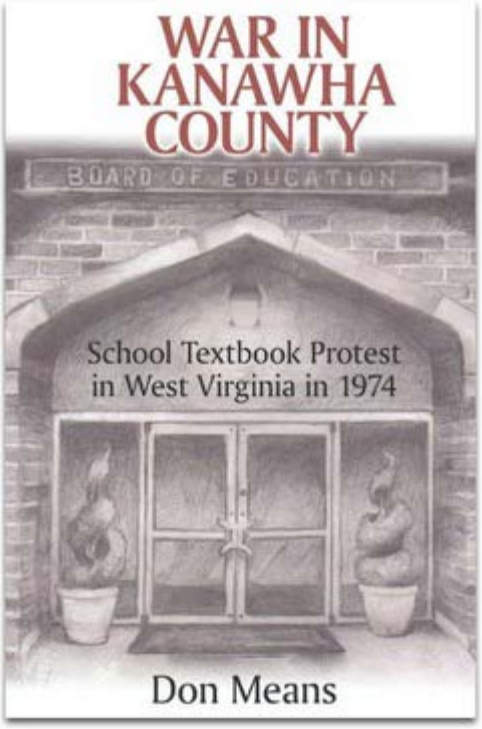

Local businessman turned activist Don Mean’s 2010 *War in Kanawha County*, recount of the event. [3]

(add discussion)

Morality | Immorality

The following are quotes representative of "morality turned to sheer immorality", as Goethe (Ñº) would have phrased things:

> “A few extremists among the churchman who wanted ‘godless’ textbooks removed from the schools became so fanatical they discussed bombing carloads of children whose parents were driving them to school in defiance of the boycott.”
>
> — Reporter (1974), article in *Charleston Gazette* [5]

> “They're shooting people because they don't want to see violence in books.”
>
> — Student (1974) [6]

A reverend Marvin Horan was later sentenced to three years in prison for conspiracy to blow up two elementary schools; several other reverends were sentenced to months in jail for violating court injunctions and orders. [6]

Quotes

The following are related quotes:

> “If a parent objects to some particular textbook, they can tell the teacher that their child is not supposed to be involved or to have to use that textbook. What do we do? Does the child hold his hand up and say: ‘I’m sorry Mrs. Smith, my mother doesn’t want me to read that book. I’ve got to leave the room.’ I know what happens to a child like that. I know what happens to students who are the babies in the class, who are too immature to read certain materials: they’re the laughing stock of the schools.”
>
> — Alice Moore (1974), interview commentary, following defeat [5]

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2. The Great Textbook War – AmericanRadioWorks.com.
3. Mean, Don. (2010). *War in Kanawha County: School Textbook Protest in West Virginian in 1974*. iUniverse.
4. (a) Strobel, Lee. (1974). “Textbook Battle Rages in Bible Belt County” (Ñº), *Chicago Tribune*, Sun, Oct 20.
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5. Anon. (2012). “Textbook War Video IX” (Ñº), Dave Flang, Apr 13.
6. Foerstel, Herbert N. (2002). *Banned in the U.S.A.: A Reference Guide to Book Censorship in Schools and Public Libraries* (§1.1: Kanawha Country—by God—Virginia, pgs. 1-6). Greenwood Publishing Group.

External links

â— Kanawha County textbook controversy – Wikipedia.
â— The Great Textbook War – UsAndThemPodcast.com.

θΔics

In genius studies, **Kanowitz 50** refers to a 2008 ranking of top 50 physicists and astronomers, by most influence, of all time, made by Gavin Kanowitz. [1]

Overview

The following is the listing of the Knowitz 50: [1]

1. Isaac Newton
2. Albert Einstein
3. Galileo Galilei
4. Michael Faraday
5. Johannes Kepler
6. Archimedes
7. Nikola Tesla
8. Max Planck
9. James Maxwell
10. Marie Curie
11. Niels Bohr
12. Erwin Schrodinger
13. Werner Heisenberg
14. Ernest Rutherford
15. Nicolaus Copernicus
16. Christiaan Huygens
17. James Joule
18. Henry Cavendish
19. William Thomson
20. Thomas Young
21. Enrico Fermi
22. Richard Feynman
23. Alessandro Volta
24. Heinrich Hertz
25. Benjamin Franklin
26. John Bardeen
27. Georg Ohm
28. Paul Dirac
29. Robert Millikan
30. Edwin Hubble
31. Pieter Zeeman
32. Andre Ampere
33. Joseph Thomson
34. Henri Becquerel
35. Louis de Broglie
36. Charles Coulomb
37. Georges Lemaitre
38. Christian Doppler
39. Lise Meitner
40. Hans Oersted
41. Robert Boyle
42. Hendrik Lorentz
43. Joseph Fraunhofer
44. Ludwig Boltzmann
45. Robert Hooke
46. Evangelista Torrecelli
47. Wilhelm Weber
48. Ernst Mach
49. John Wheeler
50. Wilhelm Roentgen

(add)

References

1. (a) Kanowitz, Gavin. (2008). "50 Most Influential Physicists/Astronomers of All Time", *WorldOfHistory.blogspot.com*, Aug 08.
(b) Gavin Kanowitz – Quora.

θΔics

In existographies, **Karel Hujer** (1902-1988) (RMS:102) (CR:4) was a Czechoslovakian-born American astronomer, philosopher, science historian, and political essayist, noted for []

Education

Hujer, while on travel in the United States, but prevented from returning to his home country of Czechoslovakia, after the Munich Pact (1938), stated in the US becoming a professor of astronomy at the University of Tennessee at Chattanooga, retiring from that position in 1976.

Quotes | Employed

The following are quotes employed by Hujer:

> "The first day of the first month is the first of the month Nisan; it corresponds to the **25th of March** of the Romans, and the Phamenot of the Egyptians. On that day Gabriel saluted Mary in order to make her conceive the savior. I observe that it **is the same month Phamenot, that Osiris gave fecundity to Isis**, according to Egyptian theology. On the very same day, our god savior — Christ, Jesus, after the termination of his career, arose from the dead; that is what our forefathers called Passover, or the passage of the Lord."
>
> — George Kendrenos (c.1050), *A Concise History of the World*; cited by Charles Dupuis [1]

Quotes | By

The following are quotes by Hujer:

> "The English word 'Easter' is distinctly derived from the Anglo-Saxon goddess of spring, Ostara; in the Saxon language, the month of April had the name Oestur-month."
>
> — Karel Huier (1946), "The Astronomical Significance of Easter"

> "It is evident that the celebration of this resurrection is symbolic of the return of spring, conditioned by the position of the sun exactly as it crosses the celestial equator, which is on March 21; 2000 years ago, this apparently occurred on March 25."
>
> — Karel Hujer (1946), "The Astronomical Significance of Easter"

> "An analysis of our Easter rituals, which seemingly purport purely Christian significance, will reveal that similar miraculous events occurred in faiths of civilizations which preceded the Christian era by thousands of years. For example, Dupuis writes' that Krishna, the crucified Hindu Savior, rose from the dead. Similar stories circulated about Buddha' the Chinese Lao-Kium, and Zoroaster. Ovid's poem, written at the time of the Roman Emperor Augustus, describes Aesculapius, the 'son of god', as being put to death and being **resurrected**. Likewise, the savior Adonis or Tammuz, after being put to death, arose from the dead. Julius Firmicius, an eminent early Christian priest and scholar who lived during the reign of Constantine and therefore at the time of the Council of Nicaea (325 AD) gives an account of the rites of **Adonis**. He is struck by the similarity of the heathen mysteries with the Christian sacrament honoring the death and resurrection of Christ Jesus. Alexander Murray quotes the exclamation which the ancient Greeks used during their Easter festival: 'Adonis lives and is risen again'. In our Christian Easter services, the name of Christ replaces Adonis. Bonwick, Prichard, and other authoritative writers agree that Adonis was to the ancient Greeks, Osiris, the Egyptian savior. Osiris, too, was put do death, whence he rose from the dad. The worship of Osiris was universal in Egypt prior to any similar worship in the Mediterranean region."
>
> — Karel Hujer (1946), "The Astronomical Significance of Easter" [1]

References

1. Hujer, Karel. (1946). “The Astronomical Significance of Easter” (Ñº), *Popular Astronomy*, 154:131-34.

Further reading

â— Hujer, Karel. (2019). *The Unfolding Universe: Karel Hujer’s Reflections on Cosmic Consciousness* (editor: Harold McAlister) (Amz). Publisher.

External links

â— Karel Hujer (photographs) – George State University.

θΔics

In existographies, **Karl Benz** (1844-1929) (IQ:#|#) [RGM:161|1,500+] (Gottlieb 1000:140) was a German engineer, noted for []

Overview

In 1885, Benz built the world's first reliable internal combustion engine automobile, as shown below:

(add)

Quotes | On

The following are quotes on Benz:

> "It was **Karl Benz** of Mannheim, Germany, who built the first reliable internal-combustion engine automobile in 1885, after a decade of experience in building and selling small stationary gas engines. Benz's first car was a three-wheeler (see: figure). Equipped with a single-cylinder four-stroke-cycle engine, it had electric instead of flame ignition. There was a differential gear, and the engine was water-cooled. Not having unlimited supplies of water available for cooling his moving engines, Benz invented and patented in 1886 a rudimentary radiator to cool water for reuse. Electric ignition was also original with Benz. These three important features—electric ignition, water cooling, and the differential gear—are on nearly every one of the 70 million automobiles in the world, and it is to Benz's credit that they were all on his first car. Benz's four-stroke-cycle engine had a horizontal cylinder, horizontal flywheel, poppet valves, and a surface carburetor patented by him in 1886, and could produce 3/4 horsepower at 250 revolutions per minute."
>
> — Richard Kirby (1956), *Engineering in History* [1]

References

1. Kirby, Richard. (1956). *Engineering in History* (co-authors: Sidney Withington, Arthur Darling, Frederick Kilgour) (pg. 406). Courier, 1990.

External links

â— Karl Benz – Wikipedia.

θΔics

In human chemistry, **Karl Bottiger** (1760-1835) was a German archaeologist, drama critique, and "sometime friend" of German polymath Johann Goethe, notable for having received an 1810 letter, which came with the instructions that it was to be burned after being read, from German author Christoph Wieland (neighbor of Goethe), who expressed the opinion of Goethe's recent publication *Elective Affinities*, that: "To all rational readers, the use of the chemical theory [in *Elective Affinities*] is nonsense and childish fooling around." [1]

On 2 Jan 1810, Bottiger published a review article entitled "About Goethe's *Elective Affinities*" in the German periodical *Newspaper for the Elegant World* (*Zeitung für die Elegan*), wherein, as seems to have been summarized in the affinity chemistry work of Jeremy Adler (1987), he was the first or one of the first to point out the fact that it was obvious to the educated reader of the time that Goethe's novel was clearly linked to well-known chemical theories of the late eighteenth century and that concepts from the field of chemistry permeated the novel. [2]

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(b) Tantillo, Astrida O. (2001). Goethe's *Elective Affinities* and the Critics (pg. 9-10.). New York: Camden House.
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(b) Böttiger, Karl A. (1810). "Ueber Göthes *Wahlverwandtschaften*" ("About Goethe's *Elective Affinities*"), *Zeitung für die Elegante Welt* (*Newspaper for the Elegant World*), Leipzig Nr. 2, 2. 1.; in: *Goethe im Urtheile seiner Zeitgenossen: Zeitungskritiken, Berichte, Notizen, Goethe und seine Werke betreffend, aus den Jahren 1772-1812* (pgs. 265-69). 3 vols. Julius W. Braun. Berlin: Friedrich Luckhard, 1885; in: *Die Wahlverwandtschaften: Eine Dokumentation der Wirkung von Goethes Roman 1808-1832* (pgs. 107-09). Heinz Hartl. Weinheim: Acta humaniora, 1983.

External links

â— Karl Bottiger – Wikipedia.

θΔics

In existographies, **Karl Ense** (1785-1858) was a German existographer (biographer) noted for []

Little girls

In 1843, Ense documented the Goethe "I wrote *Elective Affinities* for little girls" comment to Karl Knebel. [1]

Captain

Ense is said to have reported, according to general August Lilienstern, as reported by John Winkelman (1987), that Prussian officer Friedrich Muffling, who did surveying, was the model for the Captain of *Elective Affinities*. [2]

Varnhagen

In 1814, Ense married German write and salon runner Rahel Varnhagen (1771-1833), whom had met Goethe in 1795 during a visit to Carlsbad, and whom she saw again in 1815 at Frankfurt am Main. (Ñº)

References

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External links

â— Karl August Varnhagen von Ense – Wikipedia.

θΔics

In human chemistry, **Karl J. Fink** (c. 1960-) is an American Germanic-literature professor noted for 1990s work on the chemistry of Goethe's human chemical theory, amid which he speculates on nine reactions likely employed by Goethe in his HCR theory.

Overview

In 1991, Fink, in his *Goethe's History of Science*, noted Goethe's studies in trinitarian chemistry, especially of Paracelsus and the chemical views of color, where nature was thought to be reducible to three principles, e.g. in chemistry: acids, bases, and a means of bonding, and argues that trinitarian chemist or the three principles theory of chemistry evolved into 18th century affinity chemistry.

Fink also cites German science historian Jeremy Adler, with his 1987 *An Almost Magical Attraction:* Goethe's *Elective Affinity and the Chemistry of its Time*, who, according to Fink, "has provided the most detailed study of Goethe's research in the history of chemistry, particularly "Zur Geschichte der chemischen 'Verwandtschaft' (The History of Chemical Affinity)."

In 1999, Fink gave a conference presentation turned book chapter "Goethe's Intensified Border", in which he gives explication and discussion of nine of the thirty-six chemical reactions in German polymath Johann Goethe's 1809 *Elective Affinities*. [1]

Fink's nine reactions

See also: Goethe's human affinity table; Human chemical reaction (history)

The first reaction of Goethe's novella, according to Fink, is a combination reaction, beginning with Charlotte (A) and Eduard (B) being described as being bonded by marriage, where the attachment AB signifies a human chemical bond:

$$A + B \rightarrow AB$$

This changes, according to Fink, with the arrival of the Captain (C), which triggers the second reaction, the Eduard detaching from Charlotte and bonding with his old friend the Captain:

$$AB + C \rightarrow A + BC$$

The third reaction, according to Fink, is designed (by Eduard and Charlotte) to find a bonding partner for Charlotte, which is actuated by the introduction of Ottilie (D), Charlotte's adopted niece, as discussed in Goethe's famous chapter four:

$$A + BC + D \rightarrow AD + BC$$

The fourth reaction, according to Fink, operates such that, following their natural inclinations rather than planned expectations, Charlotte (A) and the Captain (C) are attracted by common interest in landscaping and music, whereas Eduard (B) and Ottilie (D) bond in self-same patterns of each other with common headaches, music skills, handwriting, and habits of eating:

$$AD + BC \rightarrow AC + BD$$

The fifth reaction, according to Fink, is that stimulated by illicit bonding, the married couple conceives a child in the images of elective affinities, creating what Fink calls a precipitate (P) or PPT, using Fink's symbols. Fink gives the following chemical equation for this reaction:

$$AC + BD \rightarrow AC + BD + P$$

In this last reaction, to note, there may be some error (and correction needed), in that many mechanism steps seem to have been grouped into an overall reaction; whereas human reproduction typically is described as a double displacement reaction. In any event, Fink states that this is the end to part one of the novella, where we find Charlotte pregnant with a baby conceived with her husband in the image of the Captain and Ottilie. Fink explains that the second part of the novel is a mirror opposite of the first or the negative undoing of the precipitate from the first half. At the pregnant threshold between parts one and two of the novella, according to Fink, "the experiment goes on, but the bonding unravels." The sixth reaction, wherein Fink seems to be using subtraction signs (-), is that in which the Captain, having found suitable employment, leaves the estate:

$$AC + BD + P \rightarrow A - C + BD + P$$

This last reaction equation guess is not technically correct in a chemical sense, as negative signs are not used in reactants and products. Fink seems to be trying to employ the negative sign to indicate that the product C leaves the reaction system (container), which, in a modern sense, would be quantified energetically by a Gibbs chemical potential term. The seventh reaction, in Fink's view, is that where the child drowns as Ottilie is rowing with him across the lake, which Fink writes as:

$$A - C + BD + P \rightarrow A - C + BD - P$$

The errors here seem to be the use of the negative sign for the death of the child precipitate P and inclusion of the Captain in the reactants and products, as he left in reaction six. The eight reaction, in Fink's view, is that after which we find Ottilie (D) starving herself in severe guilt over the drowning, Mittler, the family pastor, comes into the sceen, and hastens with a short talk on the seventh commandment (thou shall not commit adultery), which causes the Eduard-Ottilie union (BD) to separate, which Fink describes with the following ballpark reaction equation:

$$A - C + BD - P \rightarrow A - C + B - D - P$$

The ninth reaction, according to Fink, is that in which Eduard (B) dies under mysterious circumstances, leaving Charlotte (A) alone in the experiment in human behavior guided by chemical reactions of elective affinities:

$$A - C + B - D - P \rightarrow A - C - B - D - P$$

Fink, supposedly, here is using a change of plus sign (reactants) to negative sign (products) to indicate that Eduard has died. In commentary, among other notes, Fink states that with the formation of the precipitate, the human chemical reaction was at its climax (highest point on the activation energy barrier), where nothing new could be formed and the reaction was irreversible, except for the removal of reactants, which are removed one by one in the second half of the

novel.

Education

Fink completed his BA in 1982 at Wartburg College, Iowa, his MA at the University of Arizona, and his PhD at the University of Illinois, with a dissertation on *Goethe, Herder, Weimar Classicism, and the History of Science.* In 2010, Fink was a professor of German and the German-American exchange program advisor at St. Olaf College. [3]

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2. Fink, Karl J. (1991). *Goethe's History of Science* (elective affinities, pgs. 111, 195). Cambridge University Press.
3. (a) Karl J. Fink (faculty) – St. Olaf College | Northfield, Minnesota, USA.
(b) German-American exchange program – St. Olaf College.

Further reading

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θΔics

In hmolscience, **Karl Friston** (1959-) is a British neuroscientist noted for his 2006 "Free Energy Principle for the Brain", wherein he attempts to platform off of self-organization theorists, such as Ross Ashby (1943), Hermann Haken (1983), and Stuart Kauffman (1993), etc., along with dissipative structures and far-from-equilibrium theories, Ilya Prigogine (1977) in particular, to outline a blurry information theory infused, Bayesian methods coated, Darwinian connected, melting pot theory stylized, self-Sokal affair themed, so-labeled unified model (O) of brain operation, approximately.

Free energy | Information theoretic

Friston points out that his theory is not based on thermodynamics; specifically: [1]

> "This free energy is NOT a thermodynamic free energy but a free energy formulated in terms of information theoretic quantities. The free energy principle discussed here is not a consequence of thermodynamics but arises from population dynamics and selection. Put simply, systems with a low free energy will be selected over systems with a higher free energy. The free energy rests on a specification of a generative model, which is entailed by the organism's structure. Identifying this model enables one to predict how a system will change if it conforms to the free energy principle. For the brain, a plausible model is a hierarchical dynamic system in which neural activity encodes the conditional modes of environmental states and its connectivity encodes the causal context in which these states evolve. Bayesian inversion of this model, to infer the causes of sensory input, is a natural consequence of minimizing free energy or, under simplifying assumptions, the suppression of prediction error. We concluded with a simple but compelling experiment that showed the relative suppression of prediction error, in the context of predictable stimuli, is indeed mediated by backward connections in the brain as predicted by a free energy descent scheme."

Curiously, and somewhat humorous, Friston's cites the 1860 work of Hermann Helmholtz on "neuronal energy" but fails to note that Helmholtz was also the one that coined the term "free energy" in 1882, in his "On the Thermodynamics of Chemical Processes", thereby continuing with his new corrupted vacuous term usage that would be non-recognizable to Helmholtz. [2]

Friston, in short, with his 2010 "The Free-Energy Principle: a Unified Brain Theory?" generating near 1,000+ citations, seems to presently be taking a ride on the Shannon bandwagon.

See also

- Jack Kirkaldy

References

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2. Helmholtz, Hermann. (1860). *Handbuch der Physiologischen Pptik*, Vol 3 (English trans., Southall JPC, Ed.). Dover.

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- Friston, Karl. (2010). "The Free-Energy Principle: a Unified Brain Theory?" (abs), *Nature Reviews Neuroscience* (C:929+), 11:127-38.

External links

- Karl J. Friston – Wikipedia.

θΔics

In existographies, **Karl Heinzen** (1809-1880) (EPD:M4) (FA:122) was a German-born American philosopher, poet, and political theorist, also an atheism, women's rights, and abolition activist, noted for []

Overview

In c.1840s, Heinzen came under the influence of Ludwig Feuerbach and the so-called "scientific materialists", namely: Jacob Moleschott, Ludwig Buchner, and Karl Vogt, who sought to replace religion with an atheistic philosophy based on scientific materialism. [2]

In 1846, Heinzen, in his *Six Letters to a Pious Man*, presented a series of letters, in the form of a pamphlet, which contain the confession of the belief of an 'atheist' in concise form; the following is the main section of his pamphlet:

> "**If no 'god' exists** or can exist beyond mankind or the world, then he can have revealed nothing to them from beyond; nothing is revealed to the mind of man except that, which he develops out of himself or the world. As further the spirit cannot have come in the world from beyond, but must have always been in it, thus it cannot return to a 'god' from whom it did not proceed; therefore, it quietly remains in the world. I too believe in 'immortality', in as much as I believe in the immortality of the world. But in a personal continuance of man I of course do not believe, neither does it interest me, having once recognized the impossibility of it. Even to you it must be indifferent, if you do not straight-way believe in the resurrection of the flesh with skin and bones. For from what other motive would you wish your existence continued, if not because you hope to continue, after death, your individual life, and indeed, if possible, with other human beings, whose individuality is endeared to you? But what forms your individuality? Nothing but the union of your flesh, your blood, your nerves, etc. Dissolve this union, destroy but one single part of this organic, corporal combination, and the product of the same, 'Reverend N.' , is likewise vanished or changed; and even though you assume a separate continuance of the spirit, after this dissolution, you can only conceive this 'spirit' as perfectly indifferent, that is, provided you do not reconnect it with the remaining parts of your personality. I do not imagine the spirit separate, neither in man nor in the whole world, but consider it as not without existence, and existence not without life, and life not without 'matter' and matter again not without life.
>
> But this is 'materialism'! you will exclaim. Yes, it is materialism! 'Materialism' in a like manner to 'atheism' has become an epithet of abuse, which is applied by narrowmindedness and ill-will to that which they do not understand, or which is inconvenient to them. I maintain that in the world there can be nothing immaterial. And what is lost by it? Is that which we call 'soul', thought, feeling &c, less soul, thought, feeling, because I do not separate them from matter? Would you have the perfume of the flower without the flower? **Abusing 'materialism' is the most stupid thing in the world**. As long as it is found necessary to bring the sensitive and material, that is, the existing to be acknowledged and respected, so long there can be no talk of a general happiness and general rationality. As long as people need the ghosts of things instead of their substance, so long will they bother themselves with chimeras. **The mind is nothing but the result of an organic combination of physical powers. The universe is, as it were, a chemical, magnetical, electrical, etc., laboratory, in which, the material powers (also called vital powers) consummate their unceasing changes and transformations**. Where one formation ceases [final state], another begins [initial state]. Even the corpse of man lives; but this is no longer human life, it is only the **life of 'anorganic' nature** [see: inorganic life], to which the human form, after its dissolution, returns, and out of which 'organic' nature reproduces itself. **There is nothing dead in the world**, and dying implies only a retransformation to the material of common life. But if the 'special spirit', which is the subject of contest, the spirit of a single human being, is to reappear, there must from that material, by way of generation and sustenance, an organic human form be redeveloped; and how you are to imagine the reproduction of all the millions of individual human forms, which have returned to that material, remains with yourself. **Where is the perfume of the flower, when the flower is withered? Where is the spirit of man, when man is deceased?** With the same right, wherewith you claim a resurrection of man, I might claim a resurrection of

the flowers. And that animals have as much claim to your 'immortality' as yourself, is a matter of course."

Here, we see well-honed logic, given the period. Se see, generally, a panbioism-themed materialism, retained with some type of ill-defined "non-special spirit", presumably something akin to the conservation of energy [?], which makes for the continuity of individual.

In 1846, Heinzen was became involved in the so-called "Der Zürcher Atheismusstreit 1846" (Q) or the "Zurich atheism dispute 1846"; adjacent is a cartoon (Q) of the dispute.

A cartoon (Q) of the "atheism dispute" in Zurich that **Heinzen**, along with Arnold Ruge, Auguste Follen, and Friedrich Schultz, was embroiled in.

Associates

Heinzen was close friends with: Wendell Phillips, William Garrison, Charles Summer, and Marie Zakrzewska; along with Ludwig Feuerbach and Arnold Ruge, whom he was acquainted with.

Terrorism

In 1853, Heinzen, in his "Murder and Liberty", was one of the early theoreticians of terrorism (Q); the anarchist Johann Most derived most of his theories from Heinzen. [3]

Education

In 1827, Heinzen, after attending school in his hometown Grevenbroich and in Kempen Heinzen, began to study medicine at the University of Bonn, where he became a member of Corps Guestphalia Bonn in 1828. In 1829, Heinzen, aged 20, was relegated from the university for a speech in which he accused his teachers of narrow-mindedness and condemned the lack of academic freedom.

Quotes | On

The following are quotes on Heinzen:

> "Heinzen was a born satirist, he spared neither friend nor foe; opposition he could not tolerate; the value of tact and cooperation he never learned. A courageous seeker after truth, he could not compromise with truth as others saw it. The most intellectual of all the German revolutionists, he never mastered the English language and his works with very few exceptions became known to only a limited few."
>
> — Albert Faust (c.1900), *Dictionary of American Biography* (Q)(Q)

Quotes | By

The following are quotes by Heinzen:

> "The universe is nothing more than a physical and chemical laboratory in which material powers carry on

an unceasing change and transformation. The mind is nothing but the result of an organizing combination and cooperation of physical and physiological powers."

— Karl Heinzen (1856), *Six Letters to a Pious Man* (pg. 14); truncated version [2]

"There is no greater contradiction than mind and god."

— Karl Heinzen (1856), *Six Letters to a Pious Man*; truncated quote [2]

"We need a new savior. His common name is 'reason', but he is not accustomed to sign himself with this name always, because now-a-days every rascal calls himself reason. The real name of the savior is 'atheism' or 'unbelief', in other words, the belief in reason, the spirit of truth and the will to make these the ruling powers. ... Yes, the new savior of the world is the spirit of truth—is radical heathenism—is the sovereign human nature. This armed with the besom of knowledge and science first sweeps the broad spaces of the universe dear of the spectres and harpies which have hitherto tortured poor mortals on this very tolerable earth, where no 'lord god', and no devil, but only the reasoning, free, human being ... makes its household arrangements as a democratic republic and provides for all humanity, woman as well as man, food, lodging and education."

— Karl Heinzen (1856), *Six Letters to a Pious Man* [2]

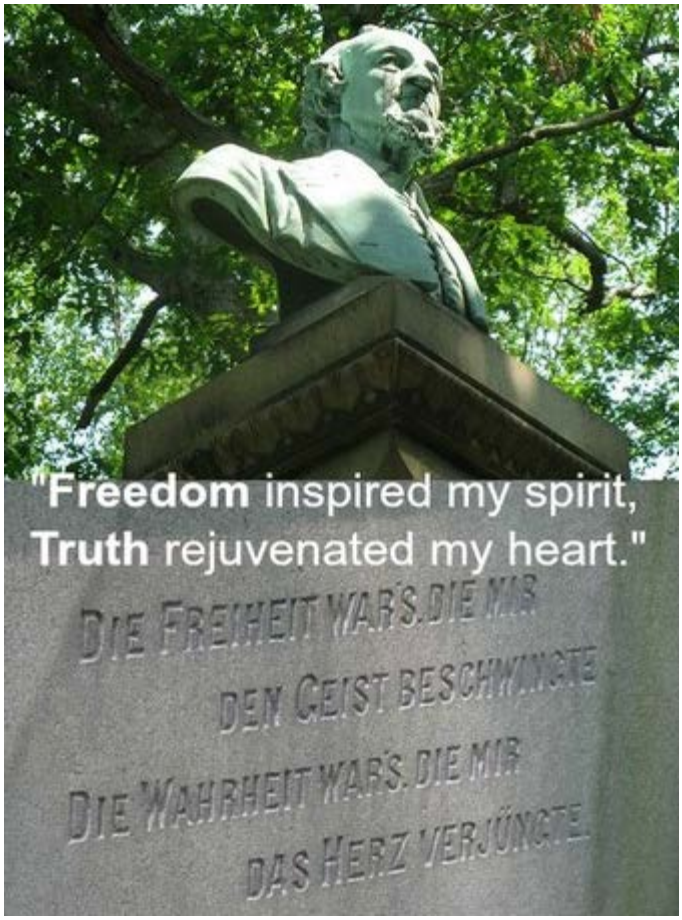

The **Karl Heinzen** statue, Boston, shown with engraving: "freedom inspired my spirit. truth rejuvenated my heart". [3]

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1. Tuchman, Arleen M. (2006). *Science Has No Sex: the Life of Marie Zakrezewska, M.D.* (pg. 109). University of North Carolina Press.
2. (a) Heinzen, Karl. (1846). *Six Letters to a Pious Man: Introduced by an Address to Bishop Hughes* (translator: American Lady). Publisher, 1856.
(b) Tuchman, Arleen M. (2006). *Science Has No Sex: the Life of Marie Zakrezewska, M.D.* (pg. 109). University of North Carolina Press.
3. Karl Heinzen statue (O), Boston – Flickr.

Further reading

● Heinzen, Karl. (1852). *The Rights of Women and the Sexual Relations: an Address to an Unknown Lady*; expanded edition, 1875; English edition (translator: Emma Schumm). B.R. Tucker, 1891.

External links

● Karl Heinzen – Wikipedia.

θΔics

In hmolscience, **Karl Knebel** (1744-1834) was a German poet noted for []

Overview

Knebel's translations of Lucretius' *On the Nature of Things* (*De Rerum Natura*) (2 vols, 1821) have been praised.

Knebel and Goethe were intimate friends, since their first acquaintance. Knebel, as a former tutor of Grand Duke Karl August—who appointed Goethe a member of the privy council in 1776 and later Minister of State—was the person who had brought Goethe to Weimar.

Little girls | Comment

On 7 Feb 1810, a famously cryptic dialogue interaction took place between Knebel and Goethe, about what he thought of *Elective Affinities*, the dialogue of which, as reported by as reported by Karl Ense (1843) is as follows, as summarized by Astrida Tantillo (2001): [1]

> Goethe: "What did you think of *Elective Affinities*?"
>
> Knebel: "I couldn't stomach it."
>
> Goethe: "I did not write the book for you, but for young girls."

Alternatively, as reported by Reginald Hollingdale (1971), after Knebel started making moral objections to the novel, Goethe exploded: [2]

> Goethe: "But I didn't write it for you, I wrote it for little girls!"

The original German version, from Heinze Hartl (1983) is as follows: [4]

German	English
Ant wortete Knebel: "Nimm es nicht ubel, lieber Freund, ich kann sie nicht verdauen."	Replied Knebel: "Do not take it amiss, dear friend, I can not digest it."
Goethe antwortete: "Ich habe sie auch nicht fur Dich, sondern fur die Madchen geschrieben, und verdenke es Dir nicht."	Goethe said, "I have written it not for you, but for the girls, and blame is not you."

(add discussion)

Hollingdale

English-born translator and Nietzschean scholar Reginald Hollingdale reasoned that Goethe made this statement 'to assert that the book is altogether wholesome and romantic and that only a moralizing old man could find anything in it to object to'. [2]

Nietzsche

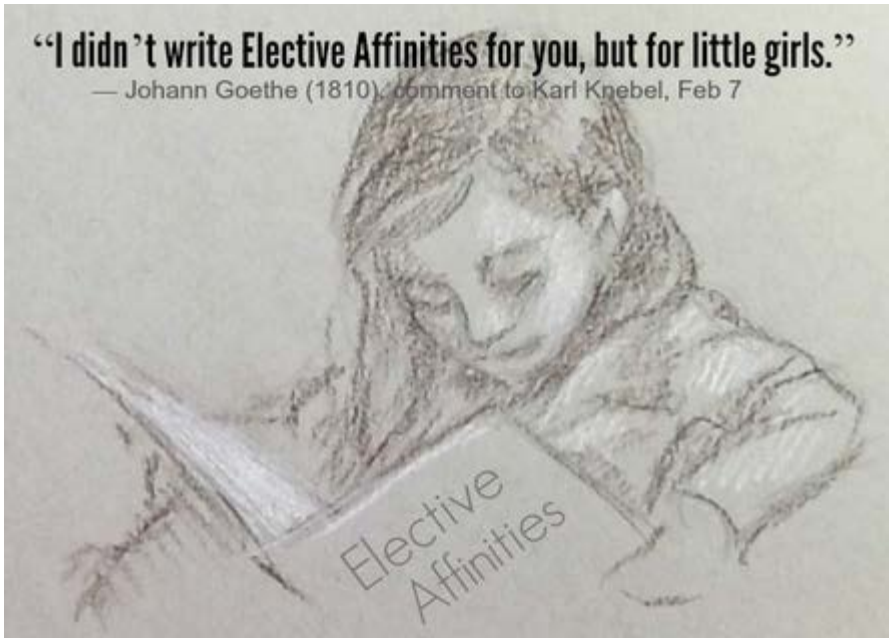

Sketch (Ñº) of a little girl, reading about frogs, retouched with the famous 1810 Goethe-Knebel dialogue on who Goethe claimed to have written *Elective Affinities* for, namely: for "die Madchen", i.e. little girls (Hollingdale, 1971) or young women (Tantillo, 2001), translation depending.

In 1887, Friedrich Nietzsche noted Goethe's admiration for Spinoza, by citing Goethe's 11 Nov 1784 letter to Knebel. (Ñº)

Quotes

The following are related quotes:

> "Goethe's statement that he wrote *Elective Affinities* for '**young girls**' (as reported by Varnhagen von Ense, pg. 321), is one of the many cryptic comments made by Goethe. It is highly likely, according to Thims' point of view, that Goethe wrote *Elective Affinities*, for young girls, as he says, for the same reason that *Human Chemistry* (a modern day *Elective Affinities*) was written, i.e. 'for a young person 7-15 years of age'; namely that in Goethe's time, as is the case presently, no one teaches a young person how the world really is. Moreover, past a certain age, people, on average, will no longer be malleable to correct teachings. As such, Goethe invariably wrote *Elective Affinities* so that young, un-biased, girls (persons) might know how the world really is, namely a [physico]-chemical one."
>
> — Libb Thims (2007), *Human Chemistry (Volume Two)* [3]

References

1. (a) Ense, Karl. (1843). "Diary Entry", Jun 28; in: *Karl August Varnhagen von Ense Werke*. 5 vols. Frankfurt: Keutscher Kalssiker verlag, 1994. 5:320-21; quote, pg. 321; in: *Goethes Werke*. Ed. erich Trunz. 14 vols. Hamburg: Christian Wenger Verlag, 1949-71. Reissued 13th Ed., Munich: Verlag C. H. Beck., 6:641.
(b) Tantillo, Astrida O. (2001). Goethe's *Elective Affinities* and the Critics (§Unpublished Comments, pgs. 7-12; §Negative Reviews and Responses, pgs. 12-26; Knebel, 8+ pgs). Camden House.
(c) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (N8, pg. 704). Morrisville, NC: LuLu.
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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (N8, pg. 704). Morrisville, NC: LuLu.
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External links

â— Karl Ludwig von Knebel – Wikipedia.

θΔics

In hmolscience, **Karl Lashley** (1890-1958) was an American child prodigy turned zoologist-geneticist who, together with his mentor John Watson (1878-1958), penned some of the first arguments of behaviorism—the antagonist of dualism.

Quotes

The following are noted quotes:

> "The essence of behaviorism is the belief that the study of man will reveal nothing except what is adequately describable in the concepts of mechanics and chemistry."
>
> — Karl Lashley (1928), "The Behavioristic Interpretation of Consciousness" [1]

References

1. (a) Lashley, Karl. (1928). "The Behavioristic Interpretation of Consciousness", I (abs), II (abs), (Ñº) *Psychological Review*, 30(4):237-72.
(b) Brown, Richard H. (1977). *A Poetic for Sociology: Toward a Logic of Discovery for the Human Sciences* (pg. 140). University of Chicago Press, 1989.

External links

â— Karl Lashley – Wikipedia.

θΔics

In religio-mythology, **Karl Luckert** (1934-) (RMS:122|155+) (CR:10) is a German-born American comparative religion and mythology scholar noted for []

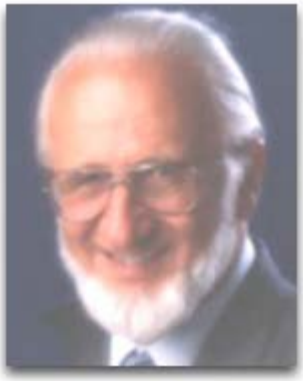

Overview

In 1991, Luckert, in his *Egyptian Light and Hebrew Fire*, alternatively titled: *Egyptian Light, Hebrew Fire, Greek Embers, and German-American Smoke*, presents a compelling and cogent summary, similar contextually to Gary Greenberg (2002), of the Egyptian underpinnings of the Christianity, along the way touching on topics, e.g., such as that while it has largely been assumed that Heraclitus was a was a haughtily independent scholar, that his thinking stems from a direction of Egyptian ontological heritage. [1]

In 2002, Luckert, made a DVD 62-min video lecture, entitled *Out of Egypt: an Other Son*, wherein he opens to the following: [2]

> "Heliopolis: While no land is holier than any other, there appears to be nevertheless one place on planet earth that qualifies as having been the religious and intellectual birth-place of Western Civilization. This place in ancient history was the city of Junu, in Egypt, dedicated to the sun deity and named 'Heliopolis' by the Greeks, and named 'On' in the Hebrew Bible."

(add)

Religion

Luckert, as a youth, went to Sunday school, and studied the Bible, and ruminated on the puzzle of "Semitic anti-Semitism" after WWII. His writings style seems to belie an attempt to carry the idea of a "universal divine" (pg. 118) backward through Judaism, via the god Yahweh and into the Egyptian god Amen and Atum before that. He also comments that "the religion and priesthood of Amun outlived Akhenaton's attempt at royal reintrenchment. And Egypt was probably better off because of it" (pg. 109) with footnote to Donald Redford's comment, in his *Akhenaten: the Heretic King* (1984), that he judged the Akhenaten's fascination for the sun disc Aten as constituting "atheism". Luckert, therein, seems to be an open-minded closet theist with anti-atheism tendencies.

Education

Luckert completed his BA in philosophy at University of Kansas in 1963, then completed some type of study at the Evangelical Theological Seminary, Naperville, Illinois, in 1964, followed by an MA in 1967 in the history of religions, and PhD with a dissertation on "Mythical Geographies of the Dead in Melanesia", both at the University of Chicago, and in 1999 became a professor emeritus at Southwest Minnesota State University. [3]

Quotes | On

The following are quotes on Luckert:

> "**Luckert**'s *Egyptian Light and Hebrew Fire* presents an original thesis and supports it with a remarkable array of erudition. Its main thesis is that Christianity owes a great deal to ancient Egyptian religion, a debt which has been almost universally overlooked. Its scholarship is impressive, and it is interesting to read. In fact, it is difficult to put down if one has a serious interest in Christian origins or the relation of religion to philosophy."
>
> — Hugo Meynell (1991), front matter (Ñº) review

> "The prominence in the texts of Asclepius, a thinly-disguised Imhotep, suggest an association with Heliopolis ... Although even the *Pyramid Texts* fail to set out the beliefs of Heliopolis systematically, why

should we expect them to? After all, the people who mattered — the priests and worshipers — were already familiar with their own religion. The *Texts* do, however, allow the core theology and cosmology behind them to be reconstructed. The most successful attempt is found in **Karl Luckert**'s *Egyptian Light and Hebrew Fire* (1991), which isolates two related aspects: the overall understanding in the origins and nature of the cosmos, and its relationship to human beings."

— Lynn Picknett and Clive Prince (2013), *The Forbidden Universe: the Occult Origins of Science* [4]

Quotes | By

The following are noted quotes by Luckert:

"As their lives and loves survive in memory among their offspring, their ka souls will continue to shine from the shadow play among the ba structures of this book."

— Karl Luckert (1991), "In Memory" (pg. viii) of father Wilhelm G. Luckert, whose "restless mind harbored questions and doubts which the Karl imbibed in childhood", and mother Emilie Luckert-Hilt, who passed while book was going to press; note: he seems to have "ka" associated with soul, whereas correctly the "ba" is typically translated as soul [1]

"The theological dependency of Christendom on ancient Egypt is much stronger than its theological link with the Hebrew tradition. The religio-political Christian gospel of the 'kingdom of heaven' owes some of its sparks to the ancient Hebrew fiery reaction to Egyptian imperialism."

— Karl Luckert (1991), *Egyptian Light and Hebrew Fire* (pg. 4)

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1. Luckhert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective* (§:Heraclitus, pgs. 206-; quote, pg. #). SUNY Press.
2. Luckert, Karl. (2002). *Out of Egypt: an Other Son* (62-min) (Ñº). Publisher.
3. Karl W. Luckert (about) – TripleHood.com.
4. Picknett, Lynn and Prince, Clive. (2013). *The Forbidden Universe: the Occult Origins of Science and the Search for the Mind of God* (pg. #). Skyhorse Publishing.
5. Mercante, Anthony S. (1978). *Who's Who in Egyptian Mythology* (editor and reviser: Robert Bianchi) (ka, pg. 81; ba, pg. 19). Metro Books, 1995.

External links

â— Karl W. Luckert (about) (Ñº) – Virtual MesoAmerican Archive.

θΔics

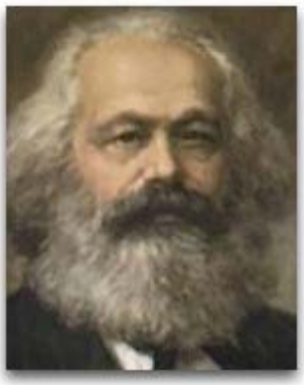

In existographies, **Karl Marx** (1818-1883) (IQ:180|#124) [RGM:237|1,500+] (Gottlieb 1000:14) (Becker 139:12) (Stokes 100:63) (Scott 50:23) (FA:120) [CR:204] was a German sociopolitical economic theorist, notable for founding, together with German social scientist Friedrich Engels, the basic tenets of communism, in their 1848 publication *The Communist Manifesto*, also noted for his 1867 three volume *Capital: a Critique of Political Economy*, in which he sought to describe the economic laws of motion (see: laws of motion).

Overview

In 1837, Marx began to be attracted to the mental pantheism ideas of Georg Hegel (1770-1831), who thought Christianity was the best of the religions, but yet offered a new "secular morality" in which "community" replaced god (see: god replacement) as the arbiter of good and evil. [1] Some of this "community" god replacement logic seems to echo in Marx as follows:

> "Let the ruling classes tremble at a Communist revolution. The proletarians have nothing to lose, but their chains. Workers of the world unite!"
>
> — Karl Marx (c.1848) a Ranker (Ñº) top quote (#4)

In this time, Marx went to a café where the "young Hegelians" (Ñº) frequented, where he met Bruno Bauer, characterized as one of "fieriest atheists" of the period, and early Jesus myth proponent. [11]

In summer 1841, after Bauer began to edit a journal called *Atheist Archive*, which didn't pan out, he and Marx wrote an atheist pamphlet that got Bauer fired and made it impossible for Marx to find work in academia. [11]

In 1841, Marx finished his dissertation entitled "Difference Between the Democritean and Epicurean Philosophy of Nature," from which his conception of historical materialism, and its near synonym description "scientific socialism", coined by Friedrich Engels, supposedly, arose based on research on the materialism philosophy of Epicurus, as well as his reading of Adam Smith, and other writers in classical political economy. [9]

Bauer | Feuerbach

Marx, sometime after his Bauer interaction, then found Ludwig Feuerbach, and was struck by his idea of religion as a man-made invention, and his claim that by studying it, we could learn about ourselves; shortly thereafter, he found that he could no longer agree with Bauer, and traded "Hegelian idealism" for "philosophical materialism". [11]

Purpose

Marx envisions a human as a "purposive producer" (Ñº), supposedly, of sorts, similar to how a spider is a weaver, a bee an architect; about which he says the following:

> "A spider conducts operations that resemble those of a weaver, and a bee puts to shame many an architect in the construction of her cells. But what distinguishes the worst architect from the best of bees is this, that the architect raises his structure in imagination before he erects it in reality. At the end of every labor-process, we get a result that already existed in the imagination of the laborer at its commencement. He not only effects a change of form in the material on which he works, but he also **realizes** (bring into reality) **a purpose** of his own that gives the law to his *modus operandi*, and to which he must subordinate his will. And this subordination is no mere momentary act."
>
> — Karl Marx (1867), *Capital*, §:The Labor-Process: the Production of Use-Values (Ñº)

(add discussion)

Economic laws of motion

The following is Marx's stated amenable aim of his 1867 three volume *Capital: a Critique of Political Economy*, from his preface: [6]

> "Even when a society has got upon the right track for the discovery of the natural laws of its movement—and it is the ultimate aim of this work, to lay bare the economic law of motion of modern society—it can neither clear by bold leaps, nor remove by legal enactments, the obstacles offered by the successive phases of its normal development. But it can shorten and lessen the birth-pangs."

In this objective, Marx seems to make a slight chemical analogy blunder in his effort to promote his macroscopic or organic holism study perspective: [7]

> "The body, as an organic whole, is more easy of study than are the cells of that body. In the analysis of economic forms, moreover, neither microscopes nor chemical reagents are of use."

Here, Marx seems to dismiss the application of human chemistry to economic analysis, as in science of economic chemistry, as useless.

Thermodynamics

Supposedly, Marx began discussion thermodynamics in his 1867 *Capital*. The following 1926 comment by English radio chemist Frederick Soddy gives an idea of this: [5]

> "Indeed, nowhere in *Capital* probably does **Marx** so excel himself in vituperation as in his description of the founder of thermodynamics as 'an American humbug, the baronised Yankee, Benjamin Thompson (*alias* Count Rumford) …"

The pair, Marx and Engels, together they were said have debated and or given commentary on the implications of the newly forming universal science of thermodynamics on economic theory; although, it seems to be the case that Engels was the main commenter on this topic, supposedly discussing the economic thermodynamics work of Ukrainian social-physicist Sergei Podolinsky with Marx in the early 1880s. It is difficult, to note, to actually track down exactly publication where Marx comments on the emerging science of thermodynamics, but his name frequently pops up in paradigm discussions connected to economic thermodynamics, often those connected to, for instance, Charles Darwin (1859) and Rudolf Clausius (1865). [1]

In the 1960s, American anthropologist Eugene Ruyle, supposedly, developed a thermodynamics-based sociological theory using a combination of ecological energetics and Marx's labor theory of value. [3]

The 2006 social internal energy minimization theory of Iranian-born American engineer Robert Kenoun is based, in larger part, on the works of Marx. [4]

Students

A vicarious student of Marx was Polish social economist Leon Winiarski, one of the first to teach the thermodynamics of German physicist Rudolf Clausius in sociology and economics. In 1886, at the age of twenty-one, Winiarski was a student at Warsaw University, where probably with the help of his brother Wolf Winiarski, tried to keep up the tradition of spreading Marxist ideas among the first Polish scientists. He authored two pamphlets of this kind: "About Cries and their Sources" and "On Supplementary Values", being a popularization of Karl Marx's *Das Kapital*. [2]

Quotes | On

The following are quotes on Marx:

> "**Marx** stands in the same relation to his predecessors in the theory of surplus value that Lavoisier maintains to Priestley and Scheele (Ñº) … He saw that he had to deal neither with dephlogisticised air, nor with fire-air, but with oxygen."
>
> — Friedrich Engels (1893) [8]

> "**Marx** considers the movement of society as governed by laws that are not only independent of the will, consciousness, and intention of men but instead, and conversely, determine their will, consciousness, and intentions."
>
> — Anon Russian (1946), review of *Capital*; note: Richard Brown considers this statement "equally startling" as Freud's "A Project for Scientific Psychology" [1]

Quotes | By

The following are noted quotes by Marx:

> "Gassendi, who freed Epicurus from the interdict laid down on him by the fathers of the Church and the whole of the middle ages (see: middle ages genius) — that age of materialized irrationalism. It is more a case of Gassendi learning philosophy from Epicurus than being able to teach us about Epicurus's philosophy. Gassendi attempt to make Epicurus cohabitate with the church is like throwing the habit of a Christian nun over the exuberant body of the Greek Lais. Philosophy, so long as a drop of blood shall beat in its heart, being absolutely free and master of the universe, will never grow tired of throwing to its adversaries the cry of Epicurus."
>
> — Karl Marx (1841), "Difference Between the Democritean and Epicurean Philosophy of Nature" [12]

> "Religion is the sigh of the oppressed creature, the heart of a heartless world, just as it is the spirit of a spiritless situation (or soul of soulless condition) (Ñº). It is the opium of the people. The abolition of religion as the illusory happiness of the people is require for their real happiness."
>
> — Karl Marx (1843), posthumously-published paper on Hegel [11]

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External links

â— Karl Marx – Wikipedia.

θΔics

In thermodynamics, **Karl Friedrich Mohr** (1806-1879) was a German chemist noted for

Overview

In 1837, Mohr, in his "About the Nature of Heat", stated the following:

> "Besides the 54 known chemical elements there is in the physical world one agent only, and this is called Kraft (force). It may appear, according to circumstances, as motion, chemical affinity, cohesion, electricity, light and magnetism; and from any one of these forms it can be transformed into any of the others."

This is often credited as one of the earliest statements of the conservation of force. [1] The term kraft, to note, is more often than not translated as 'force', albeit some references assert that this was an early statement of the conservation of energy, as the two are nearly synonymous. Mohr was an associate of Justus Liebig. [4]

In the 1860s, Mohr turned to thermodynamics, albeit, supposedly, in an amateurish way, and soon thereafter, in opposition to English physicist William Thomson's 1862 heat death theory, came to be classified as being among the German anti-heat death scientists. Mohr, supposedly, viewed the universe to be in a state of equilibrium that would remain so. [2]

In 1869, Mohr argued: [3]

> "There is no reason at all to take into account Clausius' feared entropy of the world, or to the equalization of all motion into uniform heat. [On the contrary] one can claim with certainty that the maximum entropy already has been reached an infinity of time ago. Thus, it is evident that the assumption that the world has existed without a beginning rules out the feared entropy or return to an equilibrium state. Since the entropy has not set in, it cannot occur in the future."

(add discussion)

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External links

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θΔics

In existographies, **Karl Pearson** (1857-1936) (IQ:170|#331) (CR:55) was an English mathematician-physicist, philosopher, lawyer, statistician, evolutionist, Germanic literature scholar, noted for his 1885 lecture "Matter and Soul", wherein he puts the extrapolate down argument in the form of an Aunt Sally in regards to consciousness and life (as a mechanism), supposedly, arisen from "dead mechanism", and for his 1892 book *Grammar of Science*, the first book read in German physicist Albert Einstein's 1902 "Olympia Academy" study group, which expands on the former in regards to what physics has to say about life.

Consciousness

In 1885, Pearson, aged 28, in his "Matter and Soul" lecture, gave us the following very telling argument, wherein he puts the extrapolate down argument in the form of an Aunt Sally in regards to consciousness and life (as a mechanism), supposedly, arisen from "dead mechanism": [3]

> "But I fancy one of you objecting: This may be very true, but it neglects the fundamental distinction between matter and life, namely the phenomenon of consciousness. Very good, my dear sir, let us endeavour to analyse this phenomenon of consciousness, and see whether denying consciousness to matter may not be just as dogmatic as asserting that matter possesses it. Now let me ask you a question: Do you think I am a conscious being, and if so, why? The only answer you can give to that question will be agnostic. You really do not know whether I am conscious or not. Each individual *ego* can assert of itself that it is conscious, but to assert that that group of sensations which you term me is conscious, is an assumption, however reasonable it may appear. For you, sir, I and the rest of the external world are automata, pure bits of mechanism; it may be practically advisable for you to endow us with consciousness, but how can you prove it? You will reply: I see spontaneous actions on your part, similar to those I can produce myself. I am compelled by analogy to endow you with will and consciousness. Good! you argue by analogy that I have consciousness; you will doubtless grant it to the animal world; now you cannot break the chain of analogy anywhere till you have descended through the whole plant world to the simple cell, there you find apparently spontaneous motion and argue life—consciousness. Now I carry your argument a step further and tell you that I find in the ultimate atom of matter most complex phases of motion and capacity for influencing the motion of others. All these things are to me inexplicable. They *appear* spontaneous motion; *ergo* by analogy, dear sir, matter is conscious.
>
> Now the only thing, which I am certain is conscious, is my own individual *ego;* I find nothing, however, more absurd in the assertion that matter is conscious, than in the assertion that the simple cell is conscious, or working upwards that *you* are conscious. They are all at present unproven assertions. That matter is conscious is no more nonsense than that life is mechanism; possibly some day, as the human intellect develops with the centuries, we may be able to show that one or other of these statements is true, or more probably that both are true."

Excellent argument indeed! This is one of the stepping stones to the defunct theory of life position. Pearson's "Matter and Soul" lecture, to note, seems to have been a reaction against English statesman William Gladstone's spark-controversy article "Dawn of Creation and of Worship", published the month prior, which was an aggressive attempt to simultaneously discredit what Gladstone called "solarism", or a solar myth origin to all religions, and to defend the book of Genesis in modern scientific terms. [4] The article spurred on what came to be called "Gladstone-Huxley controversy", in that Thomas Huxley jumped into the debate on the side of science.

Overview

Pearson was a mathematician (Cambridge third wrangler), physicist, philosopher, lawyer, statistician, evolutionist, Germanic literature scholar, and Goethean-style / Faustian style polymath of sorts.

His 1892/1900 *Grammar of Science*, digs into aspects of the defunct theory of life (e.g. "there is no single sense impression which can be said to be that of life"), relativity, and the issue of irreversibility in nature, via his very unique

discussion of a superluminal relativistic Maxwell's demon (Filon-Pearson demon), that can watch evolution in reverse, among other deep topics, and was the first required reading book of Albert Einstein's (IQ=220) so-called Olympia Academy intellectual club.

Grammar

In his opening chapter on life, Pearson states:

> "The object of our *Grammar* so far has been to investigate the radical concepts of physics, the basis of that 'dead' mechanism to which science is popularly supposed to reduce the universe. In the course of the investigation we have had occasion to call in question several of the notions commonly associated with these physical concepts; we have seen that in speaking of matter and force much of our current language requires to be remodeled for scientific purposes."

A recent example of such language remodeling is the 2012 introduction of the term "chnopsology" as a replacement term for biology. The following are noted quotes from Pearson's *Grammar of Science*:

> "One system of planetary gravitation is accepted throughout the civilized world, but more than a dozen distinct theological systems and almost as many philosophical systems hardly suffice even for our own country."

(add)

Life theory | Defunctness

A few example quotes of Pearson's attack on the theory of life include:

> "There is no single sense impression which can be said to be that of life."
>
> "How, therefore, we must ask, is it possible for us to distinguish the living from the lifeless if we can describe both conceptually by the motion of inorganic corpuscles?"

Citing the earlier ideas of Lloyd Morgan, Pearson states:

> "Those who believe that the organic has been developed from inorganic, that living has proceeded from dead 'matter' [dead matter], may then assert that there must be in matter 'something-which-is-not-yet-life-but-which-may-develop-into-life' (see: half-alive theory), and may fitly term this side of matter *supermateriality*."

(add)

Superluminal relativist Maxwell's demon

See main: Filon-Pearson demon; Scientific demon,

The second edition (or possibly the third edition), quite interestingly, contains and appendix section note "On the Reversibility of Natural Processes", wherein Pearson discusses a "relativistic" conceptualized Maxwell's demon that can travel away from the earth at a speed greater than that of light and observe history in reverse. Pearson states that this

conception of historical change and of time as a problem in relative motion was suggested to him by French-born English mathematical physicist Louis Filon.

Edition

In the expanded 1900 second edition, Pearson added on two chapters on the numerous inconsistencies resulting from the collision of physical science with biological science, citing the theories of Lloyd Morgan, among others, resulting to outline what would eventually come to be known, in the 21st century, as the defunct theory of life. [1] In the 1911 third edition, Pearson expanded further, dividing the book into two separately published parts, in the second of which, as he states, "there is much also to be added to the chapters dealing with living forms, where progress in the last ten years has been as great as in the physical branches of science.

Other

In 2005, Theodore Porter, an American social science historian, in his *Karl Pearson: the Scientific Life in a Statistical Age*, discussed some of the reactions to the Christian apologetic stylized paradoxical philosophy of Peter Tait and Balfour Stewart. [2]

Quotes | On

The following are related quotes:

> "Even the prolific Leonhard Euler, whose collected works are still being published more than two centuries after his death, falls short of Pearson in sheer volume—a moderate collection of his works occupies 5 feet of shelf space"
>
> — Stephen Stigler (2008), *Publication*

Quotes | By

The following are quotes by Pearson:

> "What is this word 'life' for him who has only existed in order to hand down his name to posterity in the footnotes of a classic or as an inventor of an integral. [To answer this question] I rush from science to philosophy, and from philosophy to our old friends the poets; and then, over-wearied by too much idealism, I fancy I become practical in returning to science. Have you ever attempted to conceive all there is in the world worth knowing — that not one subject in the universe is unworthy of study? The giants of literature, the mysteries of many-dimensional space, the attempts of Boltzmann and Crookes to penetrate nature's very laboratory, the Kantian theory of the universe, and the latest discoveries in embryology, with their wonderful tales of the development of life — what an immensity beyond our grasp! … Mankind seems on the verge of a new and glorious discovery. What Newton did to simplify the planetary motions must now be done to unite in one whole the various isolated theories of mathematical physics."
>
> — Karl Pearson (1880), *The New Werther*

> "There is, for example, the principle of inertia, the statement that no physical corpuscle need be conceived as changing its motion except in the presence of other corpuscles, that there is no need of attributing to it any power of **self-determination** (p. 287). There are probably those who think some power of self-determination must be ascribed to the elementary organic corpuscle, but this seems very doubtful. Placed in a certain field, environed with other organic or inorganic corpuscles, the life-germ moves relatively to them in a certain manner."
>
> — Karl Pearson (1892), *The Grammar of Science* (pg. 343); cited in 'self-' [TR:116]

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â— Karl Pearson – Wikipedia.

θΔics

In existographies, **Karl Popper** (1902-1994) (IQ:165|#280) (RGM:1182|1,500+) (Stokes 100:94) (GPhE:25) (CR:25) was an Austrian-born English philosopher, noted for his 1919 falsifiability model of good science, according to which to know if something is true or not, e.g. a new theory like relativity, there must be a way to test it, e.g. measure during an eclipse if the mass of the sun bends light, and for his latter discussions on the arrow of time in relation to entropy as well as his critique on general laws of science.

Falsifiability | Science vs. pseudoscience

In 1919, at the age of 17, Popper reflects on how there were many "theories" in the air, the three dominating his mind being: Albert Einstein's relativity, Karl Marx's theory of history (historical materialism), Sigmund Freud's psycho-analysis (psychodynamics), and Alfred Adler's individual psychology, and that the problem that troubled him was the following: [3]

> "'When should a theory be ranked as scientific?' or 'Is there a criterion for the scientific character or status of a theory?' The problem which troubled me at the time was neither, 'When is a theory true?' nor, 'When is a theory acceptable?' My problem was different. I wished to distinguish between science and pseudo-science; knowing very well that science often errs, and that pseudo-science may happen to stumble on the truth."

Popper states that he began to grapple with this problem in the "since the autumn of 1919", after becoming impressed with recent May 1919 confirmation of Einstein's light bending prediction of his relativity theory via Arthur Eddington's solar eclipse expedition: [4]

Shown adjacent, we see a photo, by Cambridge Observatory director Arthur Eddington, who led an expedition to observe the total solar eclipse of May 29, 1919. During an eclipse, the sky gets dark enough that you can see stars, even close to the Sun. So Eddington set out to map the position of the stars when they were close to the Sun (right image), and see how the Sun bent the light (middle image) and to see if his measurements matched up with Einstein's prediction, Newton's prediction, or would light not bend at all? [5]

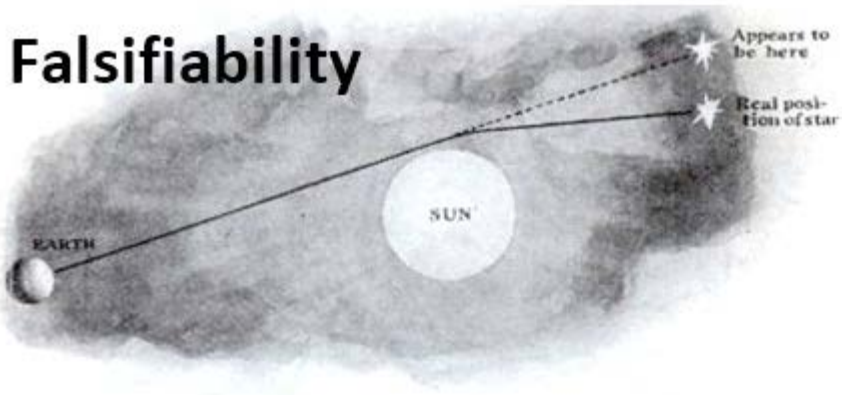

A summary of Arthur Eddington's 29 May 1919 solar eclipse expedition, which confirmed Einstein's relativity-based theory that mass bends or makes a spacetime warp around it, and hence a large mass will bend light; this became the basis of **Popper**'s "falsifiability" ideology of knowledge.

Popper used this Einstein-Eddington based "theories which can be confronted with observations or experimental results" model as his "falsifiability" test, which separates science from pseudoscience; according to which bad, nonscientific theories could not be falsified. [6]

Thermodynamics

In 1950s, Popper seems to have published a number of articles in which he claimed, without reason or evidence to support his assertion, that the second law has no importance on a cosmic scale. [1]

In 1991, Popper seemed to conclude that Ilya Prigogine's version of open systems, far from equilibrium, that producing

or exporting entropy to the surroundings, creating internal order, resolves the Boltzmann-Planck idiom that "molar disorder" tends to a maximum versus life as a tendency to order paradox. [2]

Quotes | By

The following are quoted by Popper:

> "Parmenides' theory may be described as the first hypothetico-deductive theory of the world. The atomists took it as such; and they asserted that it was refined by experience, since motion does exist. Accepting the formal validity of Parmenides' argument, they inferred from the falsity of his conclusion the falsity of his premise. But this meant that the **nothing** — the **void**, or **empty space** — existed. Consequently, there was now no need to assume that 'what is' — the full, that which fills some space — had no parts; for its parts could now be separated by the void."
>
> — Karl Popper (1958), "Back to the Presocratics" [7]

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External links

â— Karl Popper – Wikipedia.

θΔics

In existographies, **Karl Reinhard** (1761-1837) was a German-born French diplomat, Napoleon's ambassador to Cassel, and writer of German origin, noted for his association with German polymath Johann Goethe, particularly in regards to the construction and reception of his 1809 novella *Elective Affinities* (see: Goethe timeline).

Overview

Shortly after the novel's appearance, Reinhard wrote to Goethe, in regards to the character Ottilie: [1]

> "This lovely creature is a kind of natural necessity, emanating from it to all of their environments, by tightening and pushing back. It exists to say so in a constant state of magnetization."

> "Dieses liebliche Wesen steht untereiner Art von Naturnotwendigkeit, die von ihr auf alle ihre Umgebungen ausgeht, durch Anziehen und Zur ücksto ßen. Sie existiert so zu sagen in einem beständigen Zustand der Magnetisation."

On 31 Dec 1809, Goethe wrote to Reinhard: [2]

> "How I look forward to the effect that this novel will have in a few years on many people upon rereading it."

Das Publicum, besonders das deutsche, ist eine närrische Karikatur des demos; es bildet sich wirklich ein, eine Art von Instanz, von Senat auszumachen, und im Leben und Lesen dieses oder jenes wegvotieren zu können was ihm nicht gefällt. Dagegen ist kein Mittel als ein stilles Ausharren. Wie ich mich denn auf die Wirkung freue, welche dieser Roman [*Die Wahlverwandtschaften*] in ein paar Jahren auf manchen beim Wiederlesen machen wird. (*FA* 2, 6:523)

[The public, especially the German one, is a foolish caricature of the demos. It really imagines that it forms a kind of court or senate and can vote down in life or in reading this or that which it does not like. The only remedy against this is quietly to hold out. How I look forward to the effect that this novel [*Elective Affinities*] will have in a few years on many people upon rereading it.]

An English translation, by Astrida Tantillo, of the 31 Dec 1809 Goethe to Reinhard letter mentioning *Elective Affinities*. [2]

In the same letter, Goethe predicted that the novel's meaning might remain incomprehensible for a time, only to be rediscovered through multiple rereadings at a later date. [2] Indeed, it would be some 200-years before this prediction would come true, following American electrochemical engineer Libb Thims' *circa* 2006 discovery of Goethe and his *Elective Affinities* (see: Thims history), publication of *Human Chemistry*, centered around Goethe's human chemical theory, in 2007, and construction of *Elective Affinities: Illustrated, Annotated, and Decoded*, begun in 2012.

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(b) H. A. Werke VI, 651.
2. Tantillo, Astrida, O. (2001). *Goethe's Elective Affinities and the Critics* (Reinhard, pgs. xx, 6). New York: Camden House.

External links

â— Karl Friedrich Reinhard (German → English) – Wikipedia.
â— Charles-Frederic Reinhard – Wikipedia.

θΔics

In existographies, **Karl Vogt** (1817-1895) (FA:111), aka "Carl Vogt" (Lange, 1879) was a German-born Swiss geologist, physiologist, naturalist, materialist, and atheist, oft-classified (Q) with the so-called "scientific materialists" Jacob Moleschott, Ludwig Buchner, and Ernst Haeckel, noted for []

Overview

In 1858, Vogt translated Robert Chambers' *Vestiges of the Natural History of Creation* (1858) into German.

In 1859, Vogt, with the publication of Darwin's *Origin of Species*, began to tour Europe with promoting Darwin's materialism-based evolution theories.

Quotes | On

The following are quotes on Vogt:

> "**Vogt** was the public preacher, and Moleschott a powerful symbol, yet it was Ludwig Buchner's *Force and Matter* that, for many people, was the century's key book on science and belief."
>
> — Jennifer Hecht (2003), *Doubt: a History* (pg. 405)

> "According to **Vogt**, and his ilk [Haeckel, Buchner, Moleschott], science had proved the world was nothing more than matter."
>
> — Nick Spencer (2014), *Atheists: the Origin of Species* [1]

Quotes | By

The following are quotes by Vogt:

> "Thoughts come out of the brain as gall from the liver, or urine from the kidneys."
>
> — Karl Vogt (c.1860) [2]

References

1. Spencer, Nick. (2014). *Atheists: the Origin of Species* (pg. #). Bloomsbury.
2. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 405). HarperOne.

Further reading

● Lange, Friedrich A. (1865). *The History of Materialism and Criticism of its Present Importance: Materialism in Antiquity* (translator: Ernest Thomas) (Vogt, 20+ pgs, e.g. pg. 292). Houghton, Osgood. & Co, 1879.

External links

● Karl Vogt – Wikipedia.

θΔics

In hmolscience, **Johann Karl Friedrich Zollner** (1834-1882), variously cited as J.C.F. Zollner, J.C. Friedrich Zollner, Karl Zollner, Carl Zollner, or Friedrich Zollner, was a German astrophysicist noted for his 1872 book *The Nature of Comets: Contributions to the History and Theory of Knowledge*—a treatise on the physics of comets, intermixed with a Immanuel Kant and Arthur Schopenhauer based critical-philosophical account of the nature of knowledge, along with some type of four-dimensional space model based on physics of Hermann Helmholtz.

Helmholtz

Zollner is known to have been the arch enemy, in some respects, of German physicist Hermann Helmholtz, with whom he had a prolonged heated debate with. In 1874, Helmholtz wrote his "On the Use and Abuse of the Deductive Method in Physical Science", a general attack on Zollner, in which he commented the following: [1]

> "I do not find in Mr. **Zollner's** book a distinct declaration by which his new mode of procedure may be distinguished from that generally followed. Judging from what he aims at as his ultimate object, it comes to the same thing as Schopenhauer's metaphysics. The stars are to love and hate one another, feel pleasure and displeasure, and to try to move in a way corresponding to these feelings. Indeed, in blurred imitation of the principle of least action (pp. 326, 327), Schopenhauer's pessimism, which declares this world to be indeed the best of possible worlds, but worse than none at all, is formulated as an ostensibly generally applicable principle of the smallest amount of discomfort, and this is proclaimed as the highest law of the world, living as well as lifeless."

(add discussion)

Nietzsche

Zollner's *The Nature of Comets*, which Swedish science historian Thomas Brobjer describes as "a strange mixture of advanced science, epistemology, Kantian philosophy, and moral statement", along with atomic theory writings of Roger Boscovich, were influential to early natural science readings of Friedrich Nietzsche. [2]

Spiritism

In 1875, Zollner visited English physical chemist and spiritualism advocate William Crookes, views about which he intermixed with his previous *Theory of 4-Dimensional Space* (1867) work, to pen the 1878 book *Transcendental Physics*, in an attempt to validate concepts such as "clairvoyance, matter transfer, ghosts and natural spirits" in terms of physics.

References

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(b) Helmholtz, Hermann. (1874). "On the Use and Abuse of the Deductive Method in Physical Science" (translator: Crum Brown), from Helmholtz' preface to the second part of the German edition of William Thomson and Peter Tait's *Treatise on Natural Philosophy*, vol. 1; in: *Nature*, 11:149-51, Dec 24; in *Nature*, 11:211-12, Jan. 14.
(c) Buchwald, Jed Z. (1993). "Electrodynamics in Context: Object States, Laboratory Practice, and Anti-Romanticism", in: *Hermann von Helmholtz and the Foundations of Nineteenth-Century Science* (editor: David Cahan) (§8:334-73, esp. pgs. 370-72). University of California Press.
(d) Karl Friedrich Zollner (German → English) – Wikipedia.
2. Brobjer, Thomas H. (2004). "Nietzsche's Reading and Knowledge of Natural Science: An Overview", in: *Nietzsche and Science* (editors: Gregory Moore, Thomas H. Brobjer) (§1:21-50, esp. pg. 32). Ashgate Publishing.

External links

â— Johann Karl Friedrich Zollner – Wikipedia.

θΔics

In hmolscience, **Karl-Henrik Robert** (1947-) is a Swedish physician noted for his 1987 to 1991 developed thermodynamics conceptualized four step model to sustainability, or something along these lines.

Overview

In 1987, a United Nations conference which introduced environmental concerns to the political sphere, which initiated Robert to developed a natural step framework, setting out four “system conditions”, supposedly derived from the laws of thermodynamics, for the sustainability of earth. [2]

In 1991, Robert produced a thermodynamics-structured “natural step” theory of societal sustainability, based on cyclical growth, rather than linear. [1]

Education

Robert received his MD in 1975 and his PhD in 1979, generally focused on leukemia and its pathological connection to the environment.

References

1. Robèrt, K.H. (1991). "Educating A Nation: The Natural Step." *In Context* 28:10.
2. The Natural Step – Wikipedia.

External links

â— Karl-Henrik Robèrt – Wikipedia.

θΔics

In human thermodynamics, **Karlis Ullis** (1959-) is an American sports medicine and anti-aging physician note for his chapter "The Critical Point and the Theory of Human Thermodynamics", of his 1999 book *Age Right*, where he compares people to physiological engines or anabolic biomachines, outlining a thermodynamic human lifespan perspective, wherein he attempts to connect entropy to a critical point theory of a balance between anabolic and catabolic states.

Human body entropy

See main: Human entropy

Ullis notes that human bodies (as human systems) are open systems and postulates that a person's resting metabolic rate is representative of the amount of heat or entropy that one produces. In addition, he reasons that when a body is ill, e.g. with a high fever, or at high levels of stress, that the body "has excessive entropy (disorder)", and that to remedy this the body decelerates various anabolic repair functions to focus on the issues of cellular disorganization at hand.

Thermodynamic triangle of life

Ullis argues that all of human life fits into a "thermodynamic triangle" of three phases: (a) Conception and childhood; (b) Sexual maturation and reproduction; and (c) Post-reproduction and decline. On this model, Ullis argues that the development of an embryo corresponds to the development of cellular organization, which he defines as a "state of antientropy or extropy", and that this building of organized biological structures, culminates in sexual maturation and reproduction. Following this, according to Ullis, the human organism stays in a state of biolimbo for a period before reaching a critical point, at about the age of forty, ± 5-years, wherein after order turns to disorder, which he equates with anabolism turning to catabolism or regeneration to degeneration.

Difficulties on theory

Ullis' theory, to note, is composed mostly of verbal analogies on the metaphor of entropy equals order/disorder of the Boltzmann-Planck perspective. Ullis has limited understanding of thermodynamics, citing Sadi Carnot as the one who developed the second law, whereas the correct developer is Rudolf Clausius.

The important point of Ullis' chapter is that it is one of the first publications to use the term "human thermodynamics" in a functional sense, as branch of science, albeit in a exercise physiology perspective; the only other uses of the term prior to this being C.G. Darwin (1952) and Gustave-Adolphe Hirn (1893).

References

1. Ullis, Karlis (1999). *Age Right - Turn Back the Clock with a Proven Antiaging Program*, (ch. 4: The Critical Point and the Theory of Human Thermodynamics, pgs. 32-45, section: "Human Thermodynamics", pg. 34-36). New York: Simon & Schuster.

Videos

â— Ullis, Karlis. (2008). "Love-Bonding Sexual Hormone: Oxytocin" (V), ullisboy, Oct 17.

External links

â— Karlis Ullis – Linked In
â— UllisBoy – YouTube channel.

θΔics

In religio-mythology, **karma** is the Hinduism metaphor for the law of cause and effect; derived, supposedly, from the Egyptian concept of Maat. [1]

See also

- Karma weight

References

1. Ashby, Muata. (1997). *Anunian Theology: African Religion, Volume One* (Karma, pg. 74). Cruzian Mystic Books.

External links

- Karma – Wikipedia.

θΔics

In religio-mythology, **karma weight** is a theory that each action has a moral mass, termed ‘karma’, such that good deeds lighten a person’s soul (or atman), whereas evil deeds weigh down a person’s soul, and that the totality of one’s actions and their concomitant reactions in this and previous lives, determines a person’s future and future rebirth in a reincarnated state, good or bad, of existence in the next cycle of life, the cycle known as samsara, and that if the soul becomes light enough, the person can escape, be released, or achieve liberation from the samsara cycle of death and reincarnation, at which point they will be in nirvana or total bliss. Around 20% of the modern world believes in this morality system of life and death.

Etymology

The theory of karma weight is the Vedic version (500BC) or syncretism-derivative of the Egyptian soul weighing theory of morality (2500BC) as found in the B-ra-hma-ic religions (Abrahamic/Brahmaic religions) of the world.

In origin, in regards to karma weight theory, what seems to have occurred is that each act of the 42 negative confessions, good or bad, served as a model for the idea of karma, to the effect that each negative confession is a type of karma to be weighed against the feather of truth, such that when the scale becomes light enough the person’s soul is set free or achieves moksha.

Thermodynamics

The modern-day physical sciences based model of morality is that: (a) a person is animated reactive 26-element molecule (human molecule), (b) that "good" actions, or rather "natural" actions, are governed by the Lewis inequality for a natural process ($dG < 0$), (c) that "bad" (or evil) actions, or rather "unnatural" actions, are governed by the Lewis inequality for an unnatural process ($dG > 0$), (d) that both natural and unnatural processes are thermodynamically "coupled" together, such that natural processes energetically drive the unnatural processes and that some reactions will progress in a direction contrary to that prescribed by their own affinity, (e) that there is no such thing as "life" and "death" according to the defunct theory of life model.

This is the thermodynamic explanation to age-old idiom that "good always triumphs over evil", which means that natural processes will always triumph over unnatural processes or technically that the total set of processes will only go when the system shows an entropy increase or transformation content increase. [1]

References

1. Thims, Libb. (2011). “Thermodynamic Proof that Good Always Triumphs over Evil”, *Journal of Human Thermodynamics*, 7: 1-4.

External links

â— Karma – Wikipedia.
â— Samsara – Wikipedia.
â— Moksha – Wikipedia.

θΔics

In science, **Karman line**, named after Theodore Karman, a Hungarian-American engineer, is the boundary 62 miles (100 km) above the earth's surface at which point weightless begins and is the agreed upon region at which outer space begins. [1]

A photo Amazon.com founder Jeff Bezo's Apr 2015 unmanned test launch of his Blue Origin, a **Karman line** space tourism aiming spacecraft, which flew to a height of 58 miles, four miles below the 62 mile height Karman line, where the pull of the force of earth's gravity ends, outerspace starts, and weightlessness begins. (Ñº)

Overview

In 1663, Otto Guericke, in his *Magdeburg Experiments on the Vacuum of Space*, stated the following: [3]

> "The air surrounding the earth presses upon itself because it is corporeal and has a certain weight. Indeed, the upper air presses down increasingly heavily on the lower. Thus, it follows that the lower air here, which surrounds us, is much denser than the upper air."

In another place:

> "Air not only becomes more and more rarefied and lighter the higher and higher one goes, but even, if one could go to a distance of 1,000 or say even 2,000 German miles, absolutely nothing more would be left of it and pure space, void of all matter would be found."
>
> — Otto Guericke (1665), "Reply Letter to Sanislaus Lubienietzki", Jul 22; in *New Experiments on the Vacuum of Space* (pg. 293)

The use of the Karman line frequently arises in attempts to quantify the earth as a system in a thermodynamic sense. The standard thermodynamics concepts of atmospheric pressure and work become blurry at the Karman line boundary, which thus requires more detailed thought in attempts of formulation. [2]

References

1. Theodore von Karman – Wikipedia.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (Karman line, pgs. 64, 312-14). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (Karman line, pg. 407).. Morrisville, NC: LuLu.
3. Guericke, Otto. (1663). *The Vacuum of Space* (*De Spatio Vacuo*). Unpublished; *New Magdeburg Experiments on the Vacuum of Space* (*Ottonis De Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (preface, pdf) (pg. 112). Janssonius a Waesberge, 1672.

External links

â— Karman line – Wikipedia.

θΔics

In existographies, **Karo Michaelian** (1960-) is an English-born Mexican physicist noted, in evolution thermodynamics, for a number of publications, beginning in 2000, on the physics of evolution, in which he attempts to build up a Prigoginean variant of a non-equilibrium thermodynamics based life principle of evolution and origin of life. Increases in the global entropy production afforded to Earth in its solar environment through organic molecule dissipation of the solar UV and visible photon flux are suggested to be behind the origin and evolution of life [1,2]. A further theory considers the population stability and dynamics of ecosystems within a Prigoginean thermodynamic framework in which individuals of species are considered as "units of entropy production and exchange"; that non-equilibrium ecosystem can go through "phase transitions" brought on by a sudden change of external constraints through a "thermodynamic critical point", among other theories. [3]

Michaelian teaches a course entitled "Thermodynamics Out of Equilibrium", which is based almost entirely on Belgian chemist Ilya Prigogine's 1955 booklet *Introduction to the Thermodynamics of Irreversible Processes*, which seems to be his core go-to thermodynamicist. His recent 2011 article "Biological Catalysis of the Hydrological Cycle: Life's Thermodynamic Function", is abstracted as follows: [2]

> "The dissipation of sunlight into heat by organic molecules in the biosphere and its coupling to the water cycle (as well as other abiotic processes), is by far the greatest entropy producing process occurring on earth. Life, from this perspective, can be viewed as performing an important thermodynamic function; acting as a dynamic catalyst by aiding irreversible abiotic process such as the water cycle, hurricanes, and ocean and wind currents to produce entropy. The role of animals in this view is that of unwitting but dedicated servants of the plants and cyanobacteria, helping them to grow and to spread into initially inhospitable areas."

In other words, Michaelian seems to make the argument that life is a type of dissipative catalyst, disspating sunlight into heat through organic molecules (pigments) in water, and so also contributing to Earth's global water cycle.

Education

Michaelian completed his BS in geophysics and PhD (1987), with a thesis on "Polarized Proton-proton Bremsstrahlung at 280 MeV", both at the University of Alberta, Canada [4]. Michaelian currently is a professor of physics and thermodynamics at the National Autonomous University of Mexico, Institute of Physics.

References

1. Michaelian, Karo. (2011). "Thermodynamic Dissipation Theory for the Origin of Life." *Earth Syst. Dynam.* 2: 37–51.
2. Michaelian, Karo. (2011). "Biological Catalysis of the Hydrological Cycle: Life's Thermodynamic Function". *Hydrol. Earth Syst. Sci. Discuss.* 8: 1093–1123; Hydrol. Earth Syst. Sci., 16, 2629–2645, 2012 www.hydrol-earth-syst-sci.net/16/2629/2012/
doi:10.5194/hess-16-2629-2012
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Further reading

● K. Michaelian and O. Manuel. (2011). "Origin and Evolution of Life Constraints on the Solar Model", Journal of Modern Physics, Vol. 2, No. 6A, PP.587-594 DOI: 10.4236/jmp.2011.226068
● K. Michaelian, (2011) "Entropy Production and the Origin of Life", Journal of Modern Physics, Vol 2, No. 6A, PP.595-601 DOI: 10.4236/jmp.2011.226069
● V. Alonso-Chávez and K. Michaelian, (2011) "Predicting Ecosystem response to Perturbation from Thermodynamic

Criteria", Journal of Modern Physics, Vol 2, No. 6A, PP.627-635 DOI: 10.4236/jmp.2011.226073
● Thermodynamics Out of Equilibrium (syllabus) – Fisica.Unam.mx.
Michaelian, Karo. (2000). “A Physical Basis of Evolution and Speculation on an Evolutionary Basis of Physics”, in: *Topics in Contemporary Physics*, pgs. 195-210, Ed. J. Heras.
● Michaelian, Karo. (2002). “A Non-Equilibrium Thermodynamic Framework for the Dynamics and Stability of Ecosystems” (abs), ArXiv.org.
● Michaelian, Karo. (2009). "Thermodynamic Function of Life" (abs). Arxiv.org.
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● Michaelian, Karo. (2010). ”Thermodynamic Origin of Life”. *Earth Syst. Dynam. Discuss.* 1: 1–39.
● Michaelian, Karo (2010). "Homochirality Through Photon-Induced Melting Of RNA/DNA: Thermodynamic Dissipation Theory of the Origin of Life”. *WebmedCentral Biochemistry* 1: WMC00924. http://www.webmedcentral.com/article_view/924.

External links

● Thermodynamic origin of life (Abiogenesis) – Wikipedia.
● Misioneros de la Ciencia -- Divulgation of Science in the Schools of Mexico
● Karo Michaelian (faculty) – Instituto de Fisica, UNAM

θΔics

In human chemistry, **Kaspar Bott** (1933-) is a German organic chemist noted for []

Overview

In 2001, Bott, in his April fool's day *News in Chemistry* article "Humans, All Too Chemical", the abstract of which is:

> "Why do we not finally get serious about the revaluation of our values?

which would seem to give indication that Bott is thinking along the lines of upgrading our current secular morality system by the physical chemistry based "moral symbols" Goethean philosophy model. In his article, Bott platforms off German polymath Johann Goethe's 1809 human chemical theory, as presented in his physical chemistry based novella *Elective Affinities*, touching along the way: Friedrich Nietzsche on "revaluation of our values" from the chemical perspective, Ludwig Boltzmann, Willard Gibbs on "free energy", Arthur Schopenhauer, and Plato and the unwritten chemical philosophy teaching that:

> "Not everyone learns, as a youth, that Platonic love is nothing other than love without the bang."

(add discussion)

Gibbs and free energy

> *See main: Human free energy*

On the chemical thermodynamic work of American engineer Willard Gibbs, although the German-to-English translation is a bit wanting, Bott first mentions the so-called physical chemistry philosophy ideas of German philosopher Arthur Schopenhauer, namely the view that the "reduction to zero value of all passions should bring redemption", then jumps to the following:

> "Another step further in the direction taken was the scientist Josiah Willard Gibbs. According to the equation developed by him must as "free energy" designated driving force chemical reactions once to negative values â€‹â€‹decrease, so these operations voluntarily can run. For most people, however, are words such as driving force or voluntarily symbol of all that is associated with pleasure, love and passion. Mr. Gibbs would have inconsequential as a misanthrope call fun in our society?"

which would seem to indicate that Bott is aware of the 1882 Goethe-Helmholtz equation transition of affinity chemistry to chemical thermodynamics, something very few in the English-speaking world, as of 2012, are aware of. [2] Bott goes on, however, to make a play on the technical term "negative values decrease", which means mathematically that Gibbs free energy must decrease in the system for a spontaneous reaction to occur, and comments that there is "too much negativity in the Swedish Academy of Sciences" in regards to winning certain a Nobel Prize in regards to some topic.

A Molecular Hermaphrodite

At the end of his article, Bott cites the following paragraph (by someone):

> "The technology components are often called 'female' (eye, mother) and as 'masculine' (rod, screw) refers. By analogy one can also call molecules 'male' with such structural elements of and 'female' and speak of molecules containing both a 'male' and one 'female' end, have consequently called hermaphrodites and

hermaphrodites. Such a hybrid molecule is a kind of loop and a rod-shaped part constructed and two of these molecules dimerize by threaded mutually the rod-shaped part in the eye of the partner molecule is. Pairings of such hybrid molecules were previously in solution to stabilize it."

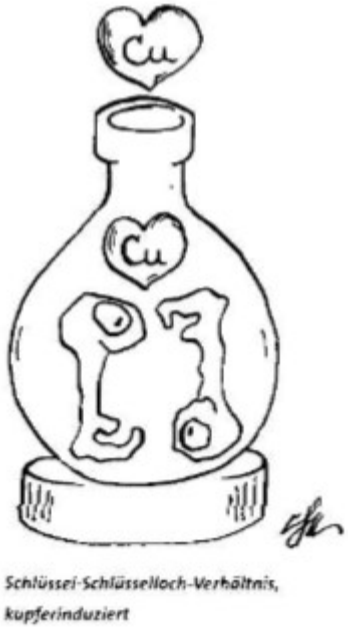

A chemical love cartoon (by Constance Heller) found in Bott's article. [1]

(add discussion)

Education

Bott completed his BS in 1956, his MS in 1959, and his PhD with a dissertation in organic chemistry all at the University of Munich. From 1962 to 1964, Bott was an assistant Justus von Liebig professor at the University of Munich, after which he worked as an applied research chemist at the BASF laboratories AG, Ludwigshafen, and of Chemical Werke Huls AG, Marl until 1994.

Key

Bott was found, on 06 Nov 2012, via Google key words: Goethe, "freie Energie", *Die Wahlverwandtschaften*; the equivalent English language search: Goethe, "free energy", *Elective Affinities*—the work of Libb Thims aside—returns almost no results.

References

1. Bott, Kaspar. (2001). "Humans, All Too Chemical" ("Menschliches, allzu Chemisches"), *News in Chemistry* (*Nachrichten aus der Chemie*) (abs), 49(4):471-72, April.

External links

â— Kaspar Bott (German → English) – Bott-Online.net.

θΔics

In existographies, **Katalin Martinas** (1947-) (CR:3) is a Hungarian physicist, thermodynamicist, noted for her c.1992 to present efforts in formulating a theory of economic thermodynamics. []

Overview

In 1986, Martinas, together with Tibor Pacher, published "Extended Thermodynamics in the Early Universe" (Q), the abstract of which is:

> "It is a general belief that in some early stages of the evolution of the universe unequilibrium situations played important role. In order to incorporate some deviations from thermal equilibrium into the description of the evolution, here an extension of the thermodynamic formalism is given, where, using the notion of ekaentropy, new terms are introduced into the Gibbs-Duhem relation for representing the deviation. Two situations are investigated in simplified models: the primordial thermalization in the symmetric phase of grand unification theory (GUT), and the development of a nonthermal distribution for massive neutrinos."

In 1987, Martinas, together with Lazlo Ropolyi, penned "On the Hidden Aristotelian Thermodynamics". [5]

In Jul 1990, Martinas gave a talk on "Aristotelian Thermodynamics", at the Thermodynamics: History and Philosophy: Facts, Trends, Debates Conference, Veszprém, Hungary, wherein she attempts to argue that Aristotelian physics can be interpreted "irreversibly", and that therefore it has a close relation to irreversible thermodynamics; and idea which she says she got from reading Karoly Simonyi's *The Cultural History of Physics*, who interpreted Aristotle's physics as the dynamics of movement with friction, after which "this gave us the idea that the Aristotelian dynamics is the dynamics of thermodynamics", as she says. [4]

In 1990, Martinas co-authored, with Bela Lucas, "Thermodynamics of Negative Absolute Pressures". (Q)

In 1993 to 1994, Martinas was a visiting fellow at INSEAD (Fontainebleau) Environmental erőforások management group, whereat she came into contact with Robert Ayres, who worked there.

In 1994, Martinas, with Robert Ayres, penned "A Non-Equilibrium Evolution Economic Theory" (Q), the abstract of which is:

> "There are good arguments for asserting that the economic system evolves irreversibly, in some sense, at the macro-level. Not only is this notion consistent with the second law of thermodynamics (Georgescu-Roegen, 1971); it is also suggested by the analogy with biological evolution that has been noted a number of times (Faber & Proops 1986; Ayres 1988b). Finally, it makes strong intuitive sense that economic progress should follow in parallel with the irreversible increase in human knowledge."

In 1995, Martinas, with Robert Ayres, penned "Waste Potential Entropy: the Ultimate Exotic" (Q); this was followed by "Exergy, Waste Accounting, and the Life-Sycle Analysis" (1998) (Q), by Martinas, Robert Ayres, and L. Ayres.

In 1997, Martinas, in her "Entropy and Information", attempted to talk about a concept she called "embodied information" and to argue that this could be measured in entropic terms, and, supposedly, attempts to give an "information balance" for the production of aluminum chloride. (Q)

In 2007, Martinas, together with co-author Attila Grandpierre, penned "Thermodynamic Measure for Nonequilibrium Processes", wherein they attempted to use the "extropy" concept to for formulate a new second law for non-equilibrium conditions, biological or otherwise.

In 2020, Martinas had the following abstract, on her faculty page, as the general overview of her general economic thermodynamics model:

> "We have shown that one of the main obstacles to understanding thermodynamics is the confusion of energy. The concepts corresponding to the energy remaining, consumed and produced must be separated and precisely defined. Extropy (extropia): When discussing terrestrial processes, the use of entropy is cumbersome (in practice, the change in entropy is unpredictable), an equivalent description is given by extropy, which measures the distance from equilibrium in entropic units. The numerical value of extropy is relatively easy to determine for real systems.
>
> We have shown that the axioms of thermodynamics (theorems I and II) only led to the existence of absolute entropy, and thus to the conclusion that irreversibility can be characterized only by entropy because a possible natural but unnecessary assumption was also accepted. The assumption: The amount expressing irreversibility is constant in an adiabatic (without heat transfer) reversible process. Clausius showed that heat transfer divided by absolute temperature results in an amount (entropy) that can only increase in an isolated system. However, other quantities are obtained if constancy is required in a different process. For example, if we prescribe that in a process in which the workability of the system does not change, the quantity should be constant, then the extropy is obtained. We have given the statistical-physical meaning of extropy. The phenomenological equivalent of Kullback entropy is extropy.
>
> Economics: Our goal is to develop an economic description in which physical constraints can be incorporated. The economy is a complex system in which material, information, energy and cash flow (use, production) take place. Through interactions, the actors of the economy change and thus also change their environment. Economic processes are therefore simultaneously physical, biological, economic and evolutionary processes. We have shown that it is possible to build an economic model that also incorporates the laws of thermodynamics. The current theory characterizes the actors with the utility function, in which thermodynamic constraints are not or very difficult to incorporate. In the new model, the status of economic actors is characterized by the 'wealth measurement function'. In this theoretical approach, economic agents are characterized by the amount of tangible assets (stocks) they own. Sets, as physical objects, can be characterized by physical metrics (mass, energy). The law of mass retention and II. the prevailing of the main theorem in economic processes requires that the actors of the economy have a loss avoidance rule, this is the no loss rule."

(add)

Other

In 2020, Martinas signed on to speak at the Thermodynamics 2.0 conference, with a talk on "Thermodynamics for Evolution". [3]

Quotes | By

The following are quotes by Martinas:

> "Analogous properties of chemical and economic processes are well known for a long time. Kalman Szily, a physicist, gave a lecture in 1871 with the title 'Communistic State of the Physical World", where he used some economic examples to explain the first and second law of thermodynamics. In 1903, just 100 year ago, when von Neumann was born, Bela Jankovich (1865-1939) (O) published a paper, entitled 'Mechanical Foundation of Value Theory', on the mechanical foundation of value. Imre Fenyes, professor of thermodynamics, emphasized the similarity between the economic goods and the thermodynamic quantities. Microeconomics and thermodynamics are both based on the idea of exchange. In thermodynamics the irreversibility of exchanges is a key idea and one that is sometimes difficult for my

physics students to understand. So about 15-years ago [c.1992], I went looking for **examples of irreversibility in economic theory** that I could use in my teaching of thermodynamics. What I found, however, was no irreversibility in the neoclassical paradigm. As a physicist this struck me as preposterous and incredible. Without irreversibility, microeconomics might be a wonderful mathematical theory, but it could not offer a theory of economic activity. This encounter marked the beginning of my long-term interest in economic research. In 1986, with Andras Brody and Konstantin Sajo [Brody et al., 1986, 1994] I wrote a paper based on the irreversible properties of exchanges, where we showed the existence of an 'economic entropy' function for neoclassical economics. Later, it became clear that this paper was a mistake. A lot of concepts were used simultaneously with different thermodynamic and economic interpretations. Thermodynamic interpretation did not coincide with the neoclassical interpretation. Neoclassical economics is basically a static theory without irreversibility [Samuelson, 1983]. The structure of neoclassical economic theory and that of thermodynamics are distinctly different. Later, with Robert Ayres, I started to elaborate a non-neoclassical economic theory based on the framework suggested by the irreversible thermodynamic theory. When it was finished, it was easy to show that this approach reduces to the Neumann model in the case of a Neumann economy. On the other hand, the equilibrium approach of neoclassical economics to economic processes kills the possibility of the incorporation of irreversibility of economic processes, as well as the material side of economic actions. The Neumann model is not in the neoclassical trend."

— Katalin Martinas (2007), "Von Neumann: a Chemist's Approach to Economics" (§2.1: A Quick Summary of the History of Economics and Thermodynamics" [7]

Education

In 1965, Martinas completed a degree in accounting from the English department of Kossuth Lajos School of Economics, then in 1970 a degree in physics from Eotvos Lorand University (ELU / ELTE) (O). In 1974, Martinas was doing research on the "total entropy density of a general superconductor" and "thermodynamic stability of superconducting magnetic states". [6] In 1984, she completed her PhD in the area of superconductor thermodynamics at ELU, after which she became a professor in the low temperature physics department of ELU, becoming chairperson of the thermodynamics section of ELFT. [1]

References

1. Katalin Martinas (Hungarian → English) – Web.Elte.Hu.
2. Martinas, Katalin and Grandpierre, Attilia. (2007). "Thermodynamic Measure for Nonequilibrium Processes", *Interdisciplinary Description of Complex Systems*, 5(1): 1-13.
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● Martinas, Katalin. (2017). "Entropic Limitations of Possible Futures" (O), Eotvos Lorand University.

θΔics

In human physics, **Katarzyna Sznajd-Weron** (1971-), or "Kasia Sznajd" as Dietrich Stauffer refers to her, is a Polish physicist noted for a number of social physics theories, since circa 2000, such as a "sociomagnetism" theory of how opinions form and change, an Ising model of human behavior, the model that people are like atoms (human atoms) or electrons (human electrons) (free electron) rather than individuals with feelings and free will—although noting, curiously, that she is well aware that people recoil when told this. [1]

Overview

The following is one of the slides from **Sznajd-Weron's** 2011 presentation "Social Physics or Sociophysics?", on the difference between the older term social physics and the newer term sociophysics, on the validity of the human particle model:

wherein she discusses: Pierre Laplace, Adolphe Quetelet, James Maxwell, Auguste Comte, Ludwig Boltzmann, Wilhelm Lenz and Ernst Ising, Thomas Schelling, wherein she claims that sociophysics was "born" with Serge Galam's 1982 "Sociophysics: A New Approach of Sociological Collective Behavior" article, which is incorrect (see: two cultures namesakes), among a few other recent topics: [3]

Romanian sociophysicists Gheorghe Savoiu and Ion Siman (2012) compare Sznajd-Weron to Serge Galam as one of the pioneers of sociophysics in the last decades. They state: [2]

> "Some of the most remarkable pioneers of sociophysics probably are Serge Galam ("Sociophysics: A Personal Testimony"), Dietrich Stauffer ("Sociophysics Simulations I: Language Competition), Paris Arnopoulos (*Sociophysics: Chaos and Cosmos in Nature and Culture*), and **Katarzyna Sznajd-Weron** ("Sznajd Model and its Applications")."

(add discussion)

Education

Sznajd-Weron is currently associated with the Complex Systems and Nonlinear Dynamics Division Institute of Theoretical Physics, University of WrocÅ‚aw, Poland.

References

1. Siegfried, Tom. (2006). *A Beautiful Mind: John Nash, Game Theory, and the Modern Quest for a Code of Nature* (§: Sociomagnetism, pgs. 169-). National Academies Press.
2. (a) Savoiu, Gheorghe and Siman, Ion. (2012). "Sociophysics: A New Science or a New Domain for Physicists in a Modern University", in: *Econophysics: Background and Application in Economics, Finance, and Sociophysics* (§10, pgs.149-68; "famous", pg. 154; quote, pg. 156). Academic Press.

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3. Sznajd-Weron, Katarzyna. (2011). “Social Physics or Sociophysics?” (pdf), Presentation, 16 Sep, Uniwersytet Wroclawski.

External links

â— Katarzyna Sznajd-Weron (faculty) – University of WrocÅ‚aw, Poland.
â— Sznajd-Weron, Katarzyna (1971-) – WorldCat Identities.

θΔics

In literature thermodynamics, **Nancy Katherine Hayles** (1943-), a Perry greatest thinker (#16) often cited as N. Katherine Hayles, is an American chemist turned English literature scholar noted for []

Overview

Hayles, in several early 1990s books, used of chaos theory, cybernetics, information theory, dissipative structure theory, and statistical mechanics in literature.

In 1991, Hayles, in her *Chaos Bound: Orderly Disorder in Contemporary Literature and Science*, stated the following: [1]

> "The essential change is to see chaos as that which makes order possible. Life arises not in spite but because of dissipative processes that are rich in entropy production. Chaos is the womb of life, not its tomb."

Her 1999 *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*, likewise, mentions "thermodynamics" on a dozen or so pages, has a section on "Entropy as a cultural Relay", wherein she discusses Mark Seltzer's 1992 discussion on thermodynamics and humanism in his *Bodies and Machines*. [2]

Education

Hayles completed her BS in chemistry in 1966 at Rochester Institute of Technology, here MS in chemistry in 1969 at the California Institute of Technology, here MA in English literature in 1970 at Michigan State University, and her PhD in English literature at the University of Rochester in 1977. In this regard, Hayles unique educational background seems to fit her well into the two cultures group. Currently, she is professor and director of graduate studies in the literature department of Duke University.

References

1. (a) Hayles, N. Katherine. (1991). *Chaos Bound: Orderly Disorder in Contemporary Literature and Science* (pg. 100). Cornell University Press.
(b) Gold, Barri J. (2010). *ThermoPoetics: Energy in Victorian Literature and Science* (pg. 245). MIT Press.
2. Hayles, N. Katherine. (1999). *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (thermodynamics, 13+ pgs). University of Chicago Press.

Further reading

● Hayles, N. Katherine. (1991). *Chaos and Order: Complex Dynamics in Literature and Science*. University of Chicago Press.
● Hayles, N. Katherine. (2002). "Escape and Constraint: Three Fictions Dream of Moving from Energy to Information", in: *From Energy to Information: Representation in Science and Technology, Art, and Literature* (pgs. 235-54), eds. Bruce Clark and Linda Henderson. Stanford University Press.

External links

● N. Katherine Hayles – Wikipedia.
● Hayles, N. Katherine – WorldCat Identities.
● Katherine Hayles (faculty) – Duke University.

θΔics

In hmolscience, **Keith Robert Burich** (c.1950-) is an American historian noted, in human thermodynamics, for a number of publications, from 1987 to 1991, on the physics-based history thermodynamics ideas and theories of Henry Adams, e.g. his social phase concepts; much of which seems to be a critique, extension, or rather continuation of American historian William Jordy's earlier 1952 work *Henry Adams: Scientific Historian*.

Overview

In 1987, Burch published "Henry Adams, the Second Law of Thermodynamics, and the Course of History",

Education

Burich completed his PhD in 1979, in history, with a thesis on "The Catholic Church and American Intellectuals: from Cooper to Santayana", at the University of North Carolina at Chapel Hill. [2] Burich currently is a history professor at Canisius College.

References

1. Burich, Keith R. (1987). "Henry Adams, the Second Law of Thermodynamics, and the Course of History" (abs). *Journal of the History of Ideas*, Vol. 48, No. 3 (Jul-Sep.), pp. 467-482.
2. Burich, Keith R. (1979). "The Catholic Church and American Intellectuals: from Cooper to Santayana" (abs), PhD thesis, University of North Carolina at Chapel Hill.

Further reading

- Burich, Keith R. (1989). "Our Power is Always Running Ahead of Our Mind: Henry Adams' Phases of History", *New England Quarterly*, 62: 163-86.
- Burich, Keith R. (1996). "Henry Adams and the Rise and Fall of Luminiferous Ether", *Proceedings of the Massachusetts Historical Society*, pgs. 57-84.
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External links

- Keith Burch (faculty) – Canisius College.

θΔics

In existographies, **William Keith Burton** (1922-1996) (IQ:#|#) (CR:15), commonly known as "Keith Burton", cited as K. Burton, was English electrical engineer and theoretical physicist, notable, according to American physical chemist Robert Alberty, for producing and compiling his 1957 thermodynamics table for biochemical reactions, four pages in length, the first of five entitled "Free Energies of Formation from the Elements", containing free energy of formation values ΔG_f^o for about 100 species of biochemical reactions, able to make predictions on reactions that had not yet occurred. [1] The table was appended to the Germans physician and biochemist Hans Krebs and biochemist Hans Kornberg's booklet *Energy Transformations in Living Matter*, the first major publication on the thermodynamics of biochemical reactions.

Thermodynamic tables

In 1957, famously Burton published a set of five thermodynamic tables. Prior to this time, apparent equilibrium constants had been measured for a number of enzyme-catalyzed reactions. Burton's significance was that he recognized that these apparent equilibrium constants together with standard Gibbs energies of formation ΔG_f^o for biochemical species to make a table that could be used to calculate equilibrium constants of biochemical reactions that had not yet been studied. [4]

Last publication

Oddly enough, with his keen perception as to the constructions and underpinnings of biochemical thermodynamic tables, although Burton could have become another Gilbert Lewis, he published very little after his famed thermodynamics table. In particularly, according to his biographer George Wyllie, Burton found publication increasingly difficult because, as he expressed it: [2]

> "Of the impossibility of saying anything without saying everything."

Burton seems to have arrived at this view due to his tendency towards meticulous analysis of subjects, where he could never contemplate a physical question without digging through its foundations. [2]

■ 1.1 BRIEF HISTORY OF THE THERMODYNAMICS OF BIOCHEMICAL REACTIONS

The first major publication on the thermodynamics of biochemical reactions was by Burton in Krebs and Kornberg, *Energy Transformations in Living Matter*, 1957. Before that time, apparent equilibrium constants had been measured for a number of enzyme-catalyzed reactions, but Burton recognized that these apparent equilibrium constants together with standard Gibbs energies of formation $\Delta_f G^0$ of species determined by chemical methods can yield $\Delta_f G^0$ for biochemical species to make a table that can be used to calculate equilibrium constants of biochemical reactions that have not been studied (Burton and Krebs, 1953). In retrospect it is easy to see that in 1953 to 1957 there were some problems that were apparently not clearly recognized or solved. Since Burton was the first, it is worth saying a little more about his 1957 thermodynamic tables. The first table gives $\Delta_f G^0$ values for about 100 species in biochemical reactions. A large number of these values were taken from chemical thermodynamic tables available in the 1950s, but a number were new values calculated from measured apparent equilibrium constants for enzyme-catalyzed reactions. $\Delta_f G^0$ values of species can be readily calculated when the reactants in the enzyme-catalyzed reaction are all single species and $\Delta_f G^0$ values are known for all of the reactants except one.

A section from Robert Alberty's 2003 *Thermodynamic of Biochemical Reactions*, discussing the significance of **Burton**'s work on making his thermodynamic table of free energies of formation for chemical species involved in the physiology of organisms and reactions occurring inside organisms. [1]

Thermodynamics

Burton collaborated with F.C. Frank and N. Cabrera in a study of surface processes in crystal growth, to which his prime contribution was an analysis of the statistical thermodynamics of islands of monomolecular thickness on a clean crystal surface. His interest in the logical basis of physics led to a useful collaboration with Robin Giles, whose seminal 1964 book on the logic of thermodynamics owed much to their discussions. [3] Burton also corresponded with Edwin Jaynes, who it is said that he converted, on the probabilistic interpretation of statistical mechanics in relation to information theory.

Education

Burton completed his BS and MS in electrical engineering at the Manchester College of Technology and a PhD in

theoretical physics at Bristol University. [2]

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External links

● Keith Burton – Wikipedia.

θΔics

In thermodynamics, **Keith James Laidler** (1916-2003) was an English physical chemist noted for a number of well-researched books dealing with the history of physical chemistry, with particular focus on energy and thermodynamical considerations, particularly his 1993 *The World of Physical Chemistry*, which has become sort of a classic to many physical chemists.[1] Laidler was a noted expert on chemical kinetics, on the subject of the energy disposition of molecular reactions.

Education

Laidler completed his BA in chemistry in 1934 from Trinity College, Oxford and his MA and DSc in physical chemistry (kinetics) at Oxford in 1938. Laidler, at Oxford, notably attended the lectures of Walther Nernst.

Quotes | By

The following are quotes by Laidler:

> "Maxwell's theory of electromagnetic radiation alone places him among the great scientists of all time."
>
> — Keith Laidler (c.1995) (Q)

References

1. Laidler, Keith. (1993). *The World of Physical Chemistry*. Oxford University Press.

Further reading

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External links

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● Laidler, Keith J. (1916-2003) – WorldCat Identities.

θΔics

In human physics, **G. Keith Still** (1959-) is a Scottish mathematician and crowd dynamics researcher and consultant noted for his 2000 PhD dissertation “Crowd Dynamics”, having been supposedly downloaded over 60,000 times, in which, in his section 2.5.1 "Why is the Fluid Analogy Untenable?", he presents the view that human fluid and human particle computational analogy models are untenable in modeling the dynamics of crowds because, in his own words: [1]

> “The laws of crowd dynamics have to include the fact that people do not follow the laws of physics; they have a choice in their direction, have no conservation of momentum and can stop and start at will. They cannot be reduced to equations which are appropriate for the movement of ball bearings through viscous fluids.”

This is funny stuff indeed: “people do not follow the laws of physics”! Humorous to the last. No doubt physicists Philip Ball and Mark Buchanan would disagree with this position. [5]

Crowd dynamics

Still became interested in the nature of crowd dynamics and how to map the way in which crowds move when he visited a rock concert in 1991. In 2011, Still comments on his foray into crowd dynamics: [4]

> "When I started, in the early 90s, there was no formulated science on crowds," he says. Crowd-modelling was based on analyses that treated masses of people like fluids. "But people don't behave like that," he says. "They don't move in neat, linear ways."

Still has since consulted and worked in the planning of events such as the Sydney and Beijing Olympics and the Royal Wedding. He has since developed interesting experimental technologies such as the “crowd pressure monitoring suit”, shown adjacent, which supposedly measures or gauges “crowd pressure”, possibly in collisions or impacts per minute—which seems to be a potential type of human thermodynamic instrument. [1]

An image of the crowd at Mecca, Saudi Arabia, during the Hajj, where some 2 to 20 million devout Muslims gather each year on the 8th to 12th day of the last month of the Islamic calendar, during which time, on average, some 200 people are crushed to dereaction (death) owing to “critical density” crowd dynamics. [4]

Mecca

The adjacent image shows the famous annual crowd at Mecca, Saudi Arabia, during the Hajj, occurring each year on the 8th to 12th day of the last month of the Islamic calendar, during which time, on average, some 200 people are crushed to dereaction (death) owing to “critical density” crowd dynamics.

In 2004, following trampling incident at the Jamarat Bridge, where some 251 people were trampled to dereaction, Saudi Arabia's King Fahd created a high-level commission to develop a multibillion-dollar plan to restructure the holy sites of the Hajj and called in Still who is described, by *Wired Magazine*, as the "world's leading expert on crowd dynamics". [4]

Critical density

Still as determined that critical density occurs at a human social space or personal space density of four people per square meter. He explains this as such: [4]

> "To analyse a crowd, Still says, you must determine the comparative rates at which people arrive, are served and then disperse. If the speed at which they arrive is greater than that at which they are served, a queue will form. However, arrival and serving rates are rarely constant. As the size of a crowd increases, so does the rate at which it flows, until a critical density is reached. At this point the speed at which it is moving suddenly decreases. People have less room, so the crowd immobilises itself. For humans, this critical density is typically four people per square metre. At that concentration, there is not enough room to move without bumping into someone else. Moreover, if someone falls, a cascade effect causes people in front to knock into their neighbours in a propagating wave. This is what has caused many of the deaths in Mecca."

This sounds to be something akin or similar to the concept of critical mass.

Education

Still completed his BS in the physical sciences in 1981 at Robert Gordon's Institute of Technology, Aberdeen, and his PhD in in mathematics in 2000 with a dissertation on "Crowd Dynamics" at the University of Warwick. [1] Still currently is a professor of crowd dynamics at Bucks New University, United Kingdom and has been a crowd dynamics consultant, at various events, for at least two decades.

Left: Still in his "crowd pressure monitoring suit", which measured "crowd pressure". [2] Right: a 2011 interview clip of Still discussing the factors of crowd dynamics, in relation to the 1989 Hillsborough disaster, at Hillsborough Stadium, Sheffield, England, where 96 people were crushed to dereaction (death) and 776 others injured. [3]

References

1. (a) Still, G. Keith. (2000). "Crowd Dynamics" (abstract), PhD dissertation, University of Warwick, Department of Mathematics.
(b) Pan, Xiaoshan, Han, Charles S., Dauber, Ken, and Law, Kincho H. (2005). "Human and Social Behavior in Computational Modeling and Analysis of Egress", *Automation in Construction*, 15(4): 448-461.
2. News – SaferCrowds.com.
3. Hillsborough disaster – Wikipedia.
4. (a) Graham-Rowe, Duncan. (2011). "Faith in Numbers", *Wired*, Jan 03.
(b) Data: In 1990, 1,426 pilgrims were trampled in an overcrowded pedestrian tunnel leading out of Mecca towards Mina. In 1994, 270 people died while stoning the pillars at the Jamarat Bridge. Three years later, 343 died when a fire broke out in a residential camp. In 1998, 118 pilgrims were trampled to death at the Jamarat Bridge. After another 251 were crushed to death at the bridge in 2004.

(c) Calculation: (1426+270+343+118+251)/(2004-1990)=172 dereactions/year (or 200/year rounded off).
5. (a) Ball, Philip. (2001). “The Physical Modeling of Society: A Historical Perspective”; A Talk Presented at Messina, Sicily; Published in Physica A 314, 1-14 (2002).
(b) Ball, Philip. (2004). *Critical Mass - How One Thing Leads to Another* (social physics, social mechanics, pg. 58; free will, pgs. 71-72, Buckle, 65-69, 205). New York: Farrar, Straus and Giroux.
(c) Buchanan, Mark. (2000). *Ubiquity: Why Catastrophes Happen*. Three Rivers Press.
(d) Buchanan, Mark. (2007). *The Social Atom: Why the Rich get Richer, Cheaters get Caught, and Your Neighbor Usually Looks Like You*, (pgs. x-xi, 13). New York: Bloomsbury.

Further reading

â— Mayer, Christopher and Davis, Stanley M. (2003). *It’s Alive: the Coming Convergence of Information, Biology, and Business* (pg. 78). Crown Business.

θΔics

In thermodynamics humor, **Kelvinic University** is a fictional school of thermodynamics conceived by Internet writer Lyle Zapato in 1989. [1] The Kelvinic University approach and mission statement is: [2]

> "Employing the laws of thermodynamics developed by William Thomson in the 19th century, the KU thermodynamics-based approach works *with* nature to cause a local decrease in mental entropy, more commonly referred to as *learning*."

In more detail, according to Zapato, it what seems to be an excellent, albeit humorous, guideline to follow, for those teachers in education thermodynamics:

> "This scientifically proven technique, used widely in industry, physics, and engineering, and applied for the first time at KU towards education, helps our students flourish and prosper academically and personally. By instilling in our students an awareness for the thermodynamic laws that govern nature, and how they can be applied to science, business, the humanities, and their private life, our approach virtually guarantees success in all endeavors that our graduates choose to tackle. Our mission is not only to provide these benefits that come from a thermodynamics-based approach to our students, but to also disseminate thermodynamic thinking through-out business, the arts, and public policy making - world-wide - for the betterment of society and the individual."

Ironically, this statement is not far from the future; in that much of this logic is slowly being taught to students, such as in growing human thermodynamics education courses and lectures.

References

1. (a) ZPi Research Labs – Zapatopi.net.
(b) Lyle Zapato – Zapatopi.net.
(c) The Kelvin Library – Various Writings by Lord Kelvin.
2. Kelvinic University – Zapatopi.net.

θΔics

In terminology, **keme**, or *kēme* (pronounced: chem, as in *chem*-istry), from the Egyptian hieroglyph "km.t", meaning 'black', is the ancient name of Egypt, a reference to the fertile black Nile Delta earth, left behind following the annual Nile flood.

Roots

The term keme forms the base or root of Abraham (Ab-ra-ham) and Brahma (B-ra-hma), in religion, meaning "father/water Ra born of Nun", i.e. fire (sun) burst forth out of a land mound (earth), arisen out of a water, and, in science, the base of chemistry, as the "black art" (see: chemistry etymology).

Quotes

The following are related quotes:

> "Christianity was neither original nor unique, but that the roots of much of the Judeo / Christian tradition lay in the prevailing **Kamite** (ancient Egyptian) culture of the region. We are faced with the inescapable realization that if Jesus had been able to read the documents of old Egypt, he would have been amazed to find his own biography already substantially written some four or five thousand years previously."
>
> — Gerald Massey (1883), *Natural Genesis* [2]

> "Treating of **ham** in his elaborate 'key' to the *Bible*. Christian Stock (1717) says:
>
> > "Pater fuit Mizraimi, Autoris AEgyptiorum, Gen. x. 6; 1. Chron. i. 8. Undo ab istius nomine Aegyptua dicitur nunc ***Cham*** [pronounced: "chem"], nunc terra *Cham.* Hireronymus in Gen. testatur AEgyptum [House of Ptah] usque ad sua tempora AEgyptiorum lingua dictam fuisse *Cham."* And under the head of *Cush* he says: "Primus filiorum Chami, Gen. x. 6. qui AEthiopibus nomen dedit, unde AEthiopia Chusch dicta fuit, 2 Reg. 19. 9."
> >
> > [The father was Mizraimi According to the Egyptians, Gen. x. 6; 1. Citron. i. 8. Hence the name of the Egyptian testifies that now Cham [pronounced: "chem"], now Cham. Gen. Hireronymus Egypt until the time he testifies to AEgyptiorum language Ham said. "And under the head of Gush he says," The first son, Gen. x. 6. who Aethiopis its name, it was called the Ethiopian Husham, 2 Reg. 19. 9]
>
> That is, 'the father of Mizraim, the founder of the Egyptians, was Ham. Whence, from this name, Egypt was called now Ham now the land of Ham. St. Jerome (in Genesis) asserts that always, even down to his time, Egypt had been called *Ham* in the tongue of the Egyptians. Cush, the eldest son of Ham, gave his name to the Ethiopians. Whence Ethiopia was called *Cush*."
>
> — Rufus Perry (1893), *The Cûshite* [4]

See also

- CHEM cypher
- Chemistry (etymology)

References

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(b) Kemet (disambiguation) – Wikipedia.
2. Massey, Gerald. (1883). *The Natural Genesis: or Second Part of a Book of the Beginnings, Containing an Attempt to Recover and Reconstitute the Lost Origins of Myth and mysteries, Types and Symbols, Religion and Language, with Egypt for the Mouthpiece and Africa as the Birthplace* (Volume I) (Volume II) (§8: The Mythical Christ). London: Williams and Norgate; in: *The Natural Genesis: Two Volumes in One*. Cosimo, 2011.
4. (a) Stock, Christian. (1717). *The Key of the Holy Tongue of the Old Testament* (*Clavis linguae sanctae Veteris Testamenti*) (pg. 355). Apvd Ioh. Felicem Bielckivm.
(b) Perry, Rufus. (1893). *The Cûshite: The Descendants of Ham: As Found in the Sacred Scriptures and in the Writings of Ancient Historians and Poets from Noah to the Christian Era* (Ham, Cham, Egypt, pgs. 63-64). Willey & Co.

External links

- Kemetism – Wikipedia.

θΔics

In hmolscience, **Kennith A. Dill** (1947-) (CR=2), commonly cited as "Ken A. Dill", is an American mechanical engineer and biophysicist noted for his 1985 energy landscape work on the thermodynamics of protein folding (see: protein thermodynamics), for his 2003 *Molecular Driving Forces: Statistical Thermodynamics in Chemistry and Biology*, and for his rather peculiar commentary on the thermodynamics and evolution aspects of the Rennie vs Thompson and Harrub creationism fiasco, wherein he comments, among other things, the following nearly upside down statement:

> "The second law has very little bearing at all on evolution."

and goes on to side with Darwin over Clausius in regards to who has the correct theory behind the drive of evolution?

Overview

In circa 2003, American radiochemist Robert Holloway queried Dill about his opinion on the Rennie vs Thompson and Harrub creationism fiasco, i.e. on the Oct 2002 article "15 Answers to John Rennie and *Scientific American's* Nonsense", by American creationists microbiologist Bert Thompson (1950-) and neurobiologist and anatomist Brad Harrub (Q), itself a reaction to the 17 Jun 2002 article "15 Answers to Creationist Nonsense", published in *Scientific America*, itself, in turn, a reaction to the Mar 2002 Ohio Board of Education move (Q) to have creationism (or intelligent design), per funded initiative of the Discover Institute, taught alongside evolution in public schools. [1] The following are Dill's comments on the fiasco, in regards to the thermodynamic arguments positioned from both sides: [2]

> Dill: In their item (9), Thompson and Harrub (T&H) state that 'the second law of thermodynamics strictly prohibits organic evolution.' I disagree. The second law does not prohibit evolution. The second law has very little bearing at all on evolution. The premises behind item (9) of T&H are that: (1) according to the second law, closed systems tend toward increased entropy, (2) living systems are more 'ordered' than nonliving systems, and (3) entropy is a measure of 'disorder.' Therefore, according to T&H: (4) living systems must have lower entropy than nonliving systems. T&H conclude that biological evolution toward increasing complexity would violate the second law.

Here, Dill's comment 'the second law has very little bearing at all on evolution", is in great need of correction (add discussion).

> Dill: But there's a simple way to disprove their conclusion (4). You can measure the entropy using a standard device called a calorimeter. You will find no difference in the entropy of a living organism and a lump of coal or a rock of the right size. A small rock has less entropy than a cow and a big rock has more entropy than a cow. Entropy does not distinguish living from nonliving systems.

Here, Dill seems to be descending down a slope to complete backwardness (add discussion); compare: rock vs human, Bridgman paradox, entropy of a mouse (Martin Goldstein, 1993), free energy of a rabbit (Daniel Schroeder, 2000), standard free energy of formation of a human, and affinity tables vs free energy tables in general.

> Dill: Here's why. There are two kinds of entropy. One is very different from the other. They don't even have the same physical units. One kind of entropy has units of

energy/temperature and has to do with the second law. We will call this the 'thermal' entropy. The thermal entropy describes the type of 'ordering' and 'disordering' that occur when the temperature or pressure are changed. The other kind of entropy, a mathematical measure of the flatness of probability distribution functions, has nothing to do with the second law, so it is not relevant for the present argument.

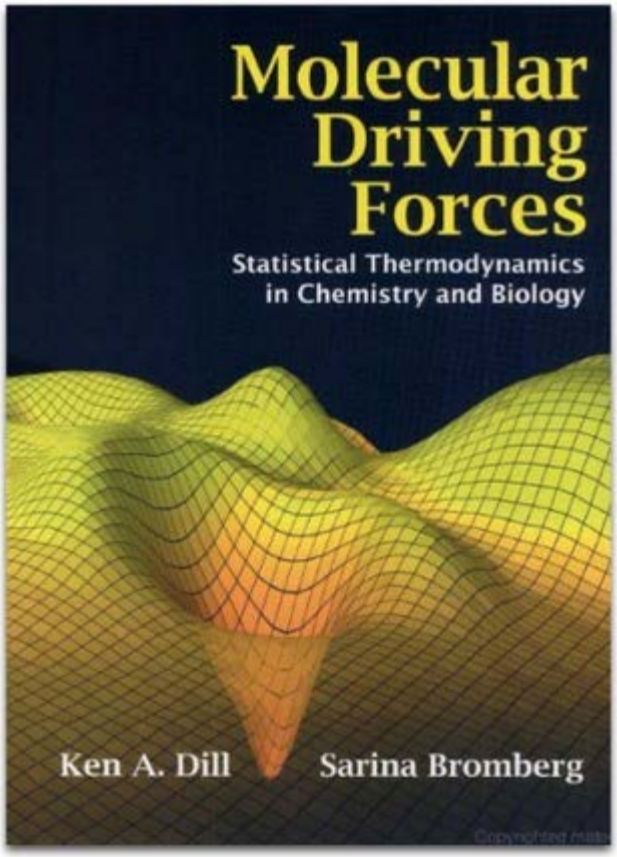

Dill's 2003 *Molecular Driving Forces*, co-written with Sarina Bromberg, focused on driving forces involved in protein folding and DNA dynamics, employing energy landscape analysis, as depicted. [5]

Firstly, claiming that multiplicity (W), of the Boltzmann-Planck entropy formula, has nothing to do with entropy, is like claiming that rainwater has nothing to do with the moisture content of clouds. Secondly, Dill and his two kinds of entropy statement is in need of amendment (add discussion).

Dill: The second law has little to do with the chemical origins of life. The reason is that the sort of order and disorder that is described by the thermal entropy is not related to the sort of 'complexity' that distinguishes living from nonliving systems. Why not? The term 'complexity' refers to a distinction that would undoubtedly rank humans higher than earthworms, and earthworms higher than rocks. But, as noted above, the thermal entropy has no ability to make this distinction. In short, heating or pressurizing a rock cannot convert it to an earthworm. And heating or cooling an earthworm does not convert it into a human being. If temperature did interconvert these species, then the thermal entropy would predict the relative amounts of earthworm and human at a given temperature. But, of course, it does not.

To begin with, for someone, supposedly, who has been interested in tackling the origin of life question since 1971, as summarized below: [3]

NAS (2014): "Dill decided to pursue a PhD in the University of California at San Diego's fledgling biology department in 1971. Initially, he says, he wanted to tackle a fundamental question: how did life originate from a hodgepodge of chemicals? However, that question proved too daunting for him at the time, and therefore, Dill began working with chemist and National Academy of Science member Bruno H. Zimm to understand the biophysics of DNA molecules."

One is nonplused at his dismissal of the second law in regards to the origin of life question? Beyond this, we seem to be descending into either idiot savant realm territory and or some type of underlying religious belief conflict objection giving rise to such absurdities? Firstly, the second law is the main driving force, underlying free energy change, which is behind the chemical origins of NOT life, as this is a defunct scientific theory, as cogently pointed out by Charles Sherrington (1938), Francis Crick (1966), and others (see: defunct theory of life), but powered chnopsological forms, one example being monkeys one example being humans, the latter having been synthesized form the former. Second,

the statement "heating or pressurizing a rock cannot convert it to an earthworm and heating or cooling an earthworm does not convert it into a human being", is nearly childlike; possibly one of the dumbest things coming out of the mouth of a published thermodynamics textbook author, particularly coming from one who focuses, at least in title claiming, on "driving forces" in molecular reactions? Third (add discussion).

> Dill: Thompson and Harrub also draw attention to the distinction between closed systems and open systems. While closed systems tend toward states of maximum entropy, open systems tend toward states that are at the minimum of a quantity called the 'free energy'. Is this distinction important? No. You can't distinguish a rock from an earthworm on the basis of its free energy either. In short, the second law only tells us about how materials respond to temperature and pressure. Survival of the fittest is the law that describes how systems evolve complexity. The second law gives no basis for understanding the survival of the fittest law. You can neither derive nor disprove chemical evolution from the second law of thermodynamics. They are unrelated concepts.

This last posting takes the cake! (add extensive discussion). Dill, puzzlingly, sides with Darwin over Clausius?

Education

Dill completed his BS and MS in mechanical engineering at MIT, then his PhD in 1978 on the biophysics of DNA at the University of California, San Diego, after which he was a post-doctoral fellow at Stanford University, and presently is a professor of physical and quantitative biology at Stony Brook University. [4]

See also

- Rossini debate

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(c) Thompson, Bert and Harrub, Brad. (2002). "15 Answers to John Rennie and *Scientific American's* Nonsense" (Q) (pdf). ApologeticsPress.org, Oct 2.
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θΔics

In hmolscience, **Ken Ham** (1951-) (CR=13) is an Australian-born American creationism evangelist noted for his 1975 antagonistic popularization of the phrase "molecules-to-man evolution" which he employs as a polemical device in debates—his popular 2014 Creationism Museum with Bill Nye in particular—as a tool to stump the evolutionist on vexing questions such as the origin of life, among others of similar nature, e.g. mind-from-matter.

Overview

In the early 1970s, Ham, while in high school, began to reject the concept of "molecules-to-man evolution", per religious reasons; namely, as a child, his father taught him that one had to accept ever word of the old testament, and to reject any one point of the entire system, would mean one would have to reject the entire testament, and that one's life depended on this; as Ham, in 2008, put it frankly:

> "[My father] was always very adamant about one thing - if you can't trust the Book of Genesis as literal history, then you can't trust the rest of the Bible. After all, every single doctrine of biblical theology is founded in the history of Genesis 1-11. My father had not developed his thinking in this area as much as we have today at Answers in Genesis, but he clearly understood that if Adam wasn't created from dust, and that if he didn't fall into sin as Genesis states, then the gospel message of the New Testament can't be true either."

This, to note, seems to well-encapsulate the tension felt in the mind of nearly half of America, if not more.

In 1974, Ham, while in college, became influenced by John Whitcomb and Henry Morris' *The Genesis Flood* (1961)

In 1975, Ham began using the phrase "molecules-to-man evolution" in his science class teachings, then later began to publish, into the 2000s, works using the term.

In 2006, Ham, in his *Raising Godly Children in an Ungodly World*, began to employ the explicit hyphened phrase "molecules-to-man evolution" as follows:

> "Whether it was the worldwide flood, the feeding of the 5,000, or arguing against the possibility that man evolved from **molecules to ape to man** over millions of years, dad defended the word of God as if his life depended upon it … which, in fact, it did. He was always adamant about one thing: if you can't trust the Book of Genesis as literal history, then you can't trust the rest of the Bible." (pg. 19)

Here, we see why Ham, naturally enough, would go on to become the curator of the AnswersInGenesis.com website and the Creation Museum, i.e. they are byproducts of a vexation between two possibilities seeded into his mind as a youth.

In college, at Queensland Institute of Technology, Ham obtained a BS in applied sciences, with focus on environmental biology, during which time his textbooks, in biology, geology, and other subjects, filled with evolutionary ideas, explained the following to him: [1]

> "My textbooks laid out what claimed to be convincing proof that we progress *from* ***molecules to man*** without any outside influence. I was further taught ideas on how the universe was formed—but they all involved naturalistic processes. God wasn't involved at all."

Ham then, in 1974, came across Whitcomb and Morris' 1961 *The Genesis Flood*:

> "This small booklet [*The Genesis Flood* (1961)] gave me a number of biblical arguments about why Christians can't accept **molecules-to-man evolution** and the Bible's record of origins at the same time."

Ham continues:

> "One of the first times this really hit me was during my first year as a science teacher in 1975. In my class were the true native Aborigines, tribal descendants of the first tribes that settled in Australia long before the Europeans came. Because of evolutionary thinking, the aborigines have been oppressed and even killed. Those who committed the atrocities often claimed that the Aborigines (who tend to be darker skinned than Europeans) were 'lower' [see: Darwin on 'lower' and 'higher' in terminology] on the evolution chain, and therefore sub-human. As I taught the class, I made sure that my students were taught the problems with **molecules-to-man evolution** and the idea that the earth is millions of years old. I shared some of the arguments I had gleaned from *The Genesis Flood* and other sources that supported the biblical account of origins. I explained that I did not believe man evolved from ape-like ancestors, but that the account of the creation of Adam and Eve was true—we were all descendants of to people."

In 2013, Ham began employing the phrase "molecules-to-man" in his online AnswsersInGenesis.com article titles. [2]

In 2014, in his YouTube debate with Bill Nye, the science guy, Ham frequently employed the term "molecules-to-man evolution" as a sort of pejorative labeling tactic to shut Nye—an electrical engineer by education—up into silence.

Quotes

The following are related quotes:

> "Though atheists make their own "meaning" or "purpose" while alive, ultimately atheism is all meaningless, purposeless, and utterly hopeless."
>
> — Ken Ham (2016), Tweet, Oct 16 (Ñº)

See also

â— Creationism scientists ranked by idiocy

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2. (a) Ham, Ken. (2013). "Overview of Natural History: Molecules-to-Man Evolution", AnswersInGenesis.org, Feb. 22. (b) Creation Museum (history) – Wikipedia.

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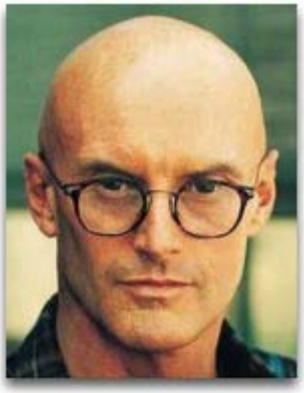

In existographies, **Ken Wilber** (1949-) is an American auto-characterized "integral philosopher", conceptualized, supposedly, as a mixture of Pierre Teilhard, Alfred Whitehead, Stuart Kauffman, Ilya Prigogine, and Erich Jantsch, and possibly with a bit of Deepak Chopra, noted for []

Overview

In 1999, Wilber, in his *Sex, Ecology, and Spirituality*, outlined a model of spirituality and consciousness that attracted many people.

In the early 2000s, Wilber, then one of the leading author in new age book stores, was then becoming semi-famous for his so-called "integral theory", the gist of which being that no one is 100% error proof, therefore one should attempt to integrate not the errors of each person, but rather what is correct about everyone's views, or something to this effect.

In 2005, Wilber was giving room-packed seminars.

In the years to follow, however, Wilber's views began to fall off via attacks from academics combined with his online statements, e.g. "enlightened teachers can make crops grow twice as fast by blessing them". [1]

Quotes | By

The following are quotes by Wilber:

> "I have one major rule: Everybody is right. More specifically, everybody — including me — has some important pieces of truth, and all of those pieces need to be honored, cherished, and included in a more gracious, spacious, and compassionate embrace."
>
> — Ken Wilber (1996), *A Brief History of Everything*

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● Visser, Frank. (2017). "Is Stuart Kauffmann Really Ken Wilber's Allay?" (Q), IntegralWorld.net,

External links

● Ken Wilber – Wikipedia.

θΔics

In existographies, **Kendra Krueger** (c.1984-) is an American electrical engineer, new age themed two cultures activist, and auto-characterized “mindfulness coach and social justice advocate”, noted for []

Overview

In 2011, Krueger, after completing her graduate work in electrical engineering, engaged in work in the semiconductor industry and worked at SPIE and their advanced lithography laboratory, during which time she began to struggle, introspectively, in a disillusioned sense, with where the technology was going, who was utilizing it, and how it was helping society; to quote: (Q)

> “When I was a graduate student in electrical engineering, I realized that science was not just about exploring the external world but also about understanding ourselves. This thought began a journey of reconciliation. In a world that is so divided both scientifically and socially, I see the new stories we will tell of a more interconnected and intersectional universe.”

In 2014, Krueger quit her engineering job, and began to focus on building a social intersectional framework themed on “science of and for the people”.

In 2017, Krueger taught a course entitled “The New Science”, wherein class 12 was on “states of being”, based on probability, heat, thermodynamics, and entropy. (Q)

In Oct 2017, Kreuger gave a talk on how people are wave-particle dualistic [see: human wave function]; the following are images (Q)(Q) from the talk:

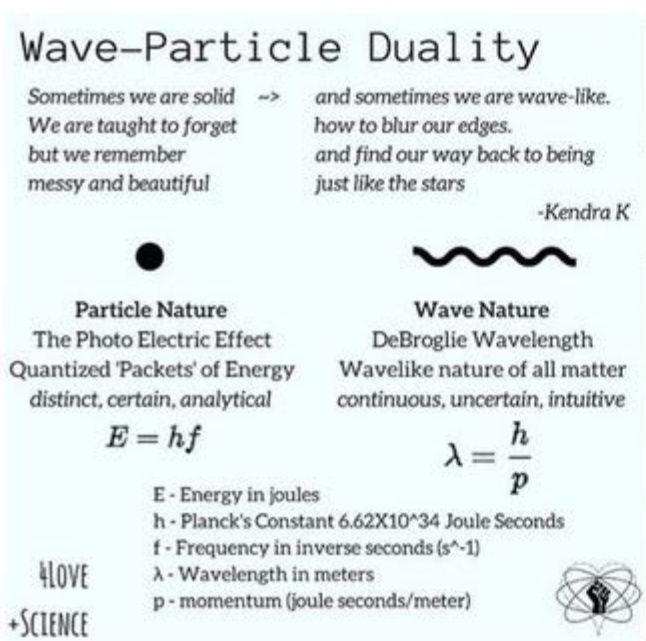

Historically, to note, the first to theorize about humans in a wave and particle sense are: Ernst Mach (1885), Peter Atkins (1992), Antony Gormley (c.1998), and Libb Thims (2007).

In 2017, Krueger won the Consciousness in Action Award (Q) from the institute of Noetic Sciences for her work at the intersections of science and social justice.

On 8 May 2018, Krueger, hosted an event, at the Heal Denver center, entitled “The Thermodynamics of Love, People, and Justice: Physics and Mindfulness in the Context of Social Change”, the abstract of which is as follows: [1]

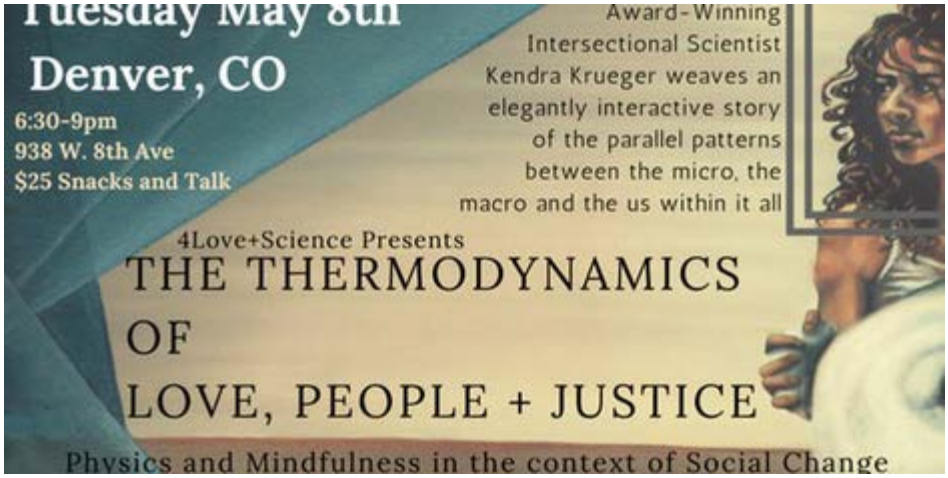

The flyer for **Krueger**'s 2018 workshop "The Thermodynamics of Love, People, and Justice", wherein she attempted to talk about social justice and love from the point of view of thermodynamics and physics. [1]

> “What do social justice and physics have in common? Dynamics. Energy dynamics. Thermodynamics studies how systems with different energies reconcile together. The social justice movements of today asks us to do the same. We as individuals, as particle-wave beings, as communities with different experiences, trauma and love have to come together to live, heal and grow. Perhaps then, there may be some inspiration from each of these wisdom schools to guide on another. In this interactive workshop we will playfully weave through the art and science of entropy, kinetics, liberation theory and restorative justice. Join us on this journey of reconciliation.”

The following quote comes to mind:

> “Michael, you are a materialist, so what is the chemical composition of justice?”
>
> — Frank Turek (2018), “Naturalism Can’t Justify Reason” (Q|1:08-), Feb 14

The following (Q) is a slide or flyer on Krueger's views of entropy:

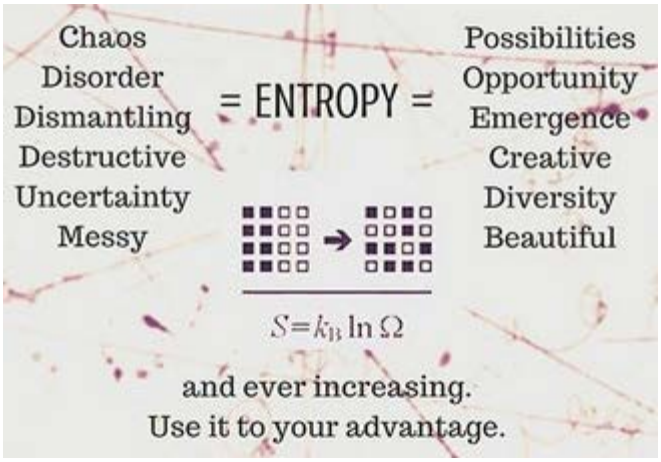

Here, interestingly, she connects entropy to "beauty", a connection first noticed by Arthur Eddington.

New Age | Ontic openings

Of note, many of the underlying

tenets of Krueger's views veer into the new age and or ontic opening side of the metaphysical fence; to quote (Q), from a recent

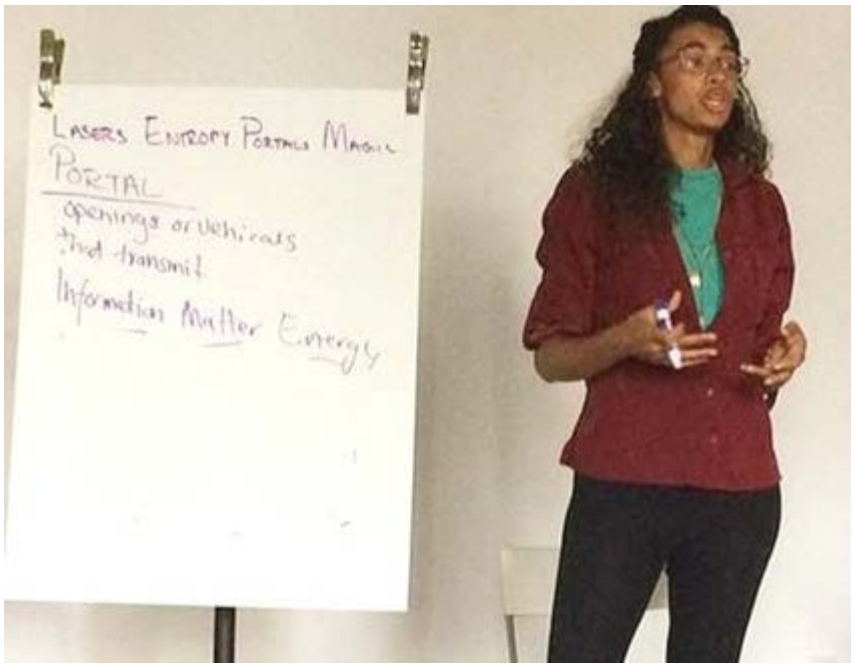

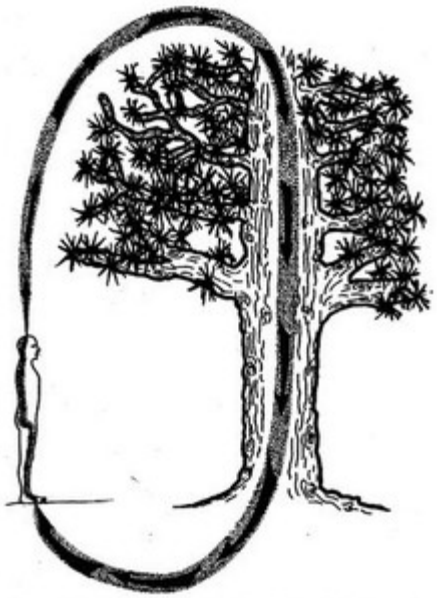

Figure 2-34. Absorb the Earth's Force. Circulate it through the tree after sending it out through the crown

Left: Kreuger (2017) (Q) talking about lasers, entropy, portals, and magic, the first three of which are classic ontic opening themes. Right: a 2012 liked image (Q) of her views, supposedly, on the force of the earth in respect to human mindfulness.

ThinkStories.com (c.2018) profile on her:

> "Each classroom is an "exploratory space" where students can read about chakras, or spiritual centers of energy, and look at fossils under a microscope in the same afternoon. The space offers students a chance to explore their physical and spiritual worlds using many different knowledge bases, not just the Eurocentric scientific canon that dominates American education."

Examples of this include her: 2012 re-blog (Q) of weather predictions and prophecies, in the context of Noah and the flood (see: Noah's flood) and Moses and the ten plagues; her 2012 re-blog (Q) of the Arthur Clarke themed quote: "politics and religion are obsolete. The time has come for science and spirituality"; her 2016 Instagram photos (Q) of "tantric energy" models; her use of James Lovelock, and his living earth theory, her use of Rasheedah Phillip's 2015 *Black Quantum Futurism* (Q), and its conjecture that people can "manipulate space-time in order to see into possible futures, and or collapse space-time (see: wave function collapse) into a desired future in order to bring about that future's reality"; and chaos theory, which she used in 2017 to teach the "science of magic, love, and community." Her 2017 chalkboard photo (Q) of notes gives clear indication that she is an "information = energy" stylized emergentist.

Education

In 2009, Krueger completed her BS in electrical engineering, with focus on nano structures and materials, at Rensselaer Polytechnic Institute, and in 2011 completed (Q) her MS in electrical engineering, with focus on electronic, with a minor in physics and astronomy, focusing on nanomaterials and optics, at the University of Colorado Boulder, in some parts of which she specialized in thermodynamics and material science, and presently is an adjunct professor of Naropa University, Denver, Colorado.

Quotes | By

The following are quotes by Krueger:

> "I believe science can be a tool for personal liberation, allowing individuals to actively observe and question our inner world. This precious balance of scientific method and mindfulness can unlock the capacities of our conscious and unconscious mind."

— Kendra Krueger (c.2017) [2]

See also

- Donna Riley
- Jacob Leachman

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- Kendra Krueger (about) – CirciutBreakerLabs.com.
- Kendra Krueger – LinkedIn.

θΔics

In hmolscience, **Kenneth Bailey** (1941-) is an American sociologist noted, in sociological thermodynamics, for his 1983 to 1990 effort to amalgamate Boltzmann entropy and Shannon entropy, in an incongruous way, to formulate a social entropy theory.

Overview

In circa 1980, Bailey began to conceive a theory that entropy applies to social phenomena; his theory is said to "draw quite heavily" from Austrian biologist Ludwig Bertalanffy's 1968 general systems theory.

The "social entropy theory model", according to Bailey, studies human actors as they interact in physical space within and across "societal boundaries" (modeled on thermodynamic boundary). Bailey reasons that one needs to be able to measure the state of a social system using a variable other than that of equilibrium, and postulates that such a variable is entropy, which he defines as a "measure of system structure that has both theoretical and statistical interpretations". He states that "entropy is a sibling concept of equilibrium and generally subsumes it" and thus the concept of equilibrium can still be used when appropriate.

In 1983, Bailey, in his "Sociological Entropy Theory: Towards a Statistical and Verbal Congruence", attempted to meld Boltzmann entropy and Shannon entropy into one package, to see to sociology, via a ride on the Shannon bandwagon.

In the 1980s, Bailey's efforts to quantify social systems began to turn towards a thermodynamics systems view of society, publishing papers such as "Equilibrium, Entropy, and Homeostasis", Entropy Measures and Inequality", among others. [4]

In 1990, Bailey, in his *Social Entropy Theory*, characterized the term social entropy, the result of decade long effort to understand and quantify the conception of a "social system" from a physics point of view, in a "social entropy theory". The book is a nonequilibrium approach of societal analysis using a mix of Ludwig Bertalanffy's general systems theory, Claude Shannon's entropy, and Rudolf Clausius' entropy. Bailey defines an "isomorphic complex system" as being comprised of human individuals as the components, interaction of these components, and the national (political) border of the country, with the latter serving as a boundary for social interaction. Bailey also included a section titled the "History of Social Entropy", in which he traces the use of thermodynamics and entropy in sociology from Pareto to Prigogine to Samuelson and others in the literature.

Bailey's overall incorrect opinion is that the nonequilibrium thermodynamics work of Belgian chemist Ilya Prigogine is more applicable to the study of social systems than is the chemical thermodynamics work of American engineer Willard Gibbs: [1]

> "The twentieth century Prigogine entropy analysis provides a much more viable model for open systems, such as social systems, than nineteenth century Gibbsian equilibrium analysis."

This is a common viewpoint, such as is popularized in the 1972 article "Thermodynamics of Evolution", but correctly the statement should be reversed, in that Prigogine's work is more applicable to phenomena such as Benard cell dynamics, whereas Gibbs' work is more applicable to chemical reaction studies, as in "love the chemical reaction". In any event, Bailey makes a readable effort in his theory.

Shannon entropy in sociology

Bailey seems to have scoured the literature to collect all publications that use the signal transmission entropy formula (Shannon entropy) of American electrical engineer Claude Shannon. Some of these are listed below:

- George A. Miller (1953) analyzed sociological organization via entropy and negentropy.
- Jerome Rothstein (1958) – argued for the equivalence of system "organization" and "negative entropy" of information

theory.
● James Coleman (1964) – introduced an “entropy index” as a measure of diversity.
● Vittorio Capecchi and Frank Moller (1964-75) – used to classify the political participation of 108 Communist and Christian Democratic party workers.
● Walter Buckley (1967, 68) – mixes general systems theory and Shannon entropy; describing closed systems as entropic and open systems as negentropic; arguing that the equilibrium concept should not be applied to open systems.
● P. Pergler (1968) – applied to measuring the quality of prediction in sociological typology construction.
● Sandri (1968) – applied to the logic of classification.
● Feldman and El Houri (1975) – applied to a discussion of homogamy measures.
● McFarland (1969) – applied to the study of permeability of occupational workers.
● Vodakova and Vodak (1969) – conceived of a “vector entropy” for the study of the validation problem.
● Entwisle and Knepp (1970) – used to study the educational aspirations of high school students.
● Henri Theil (1967, 1970) – used to formulate his Theil index, a measure of economic of inequality.
● Frantisek Charvat (1970-73) – conceived of “semantic entropy” and “entropy of behavior”, eponym of the Havrda-Charvat entropy measure, Tsallis-Havrda-Charvát etc., in addition used general systems theory in his logic.
● Hauser (1975) – applied McFarland’s entropy measure to the study of social diversity.
● Horan (1975) – applied to the analysis of the structure of teaching opportunities in academic departments.
● Jay Teachman (1980) – used to measure population diversity.
● Allison (1978) – analyzed Theil’s measures.
● J. Magidson (1981) -
● Katakis and Katakis (1982) – conceived of “teleonomic entropy” to study hierarchies of living systems.

Difficulties on theory

The central difficultly of Bailey’s entire theory is that he seems to have no idea of what entropy is. In his 1990 book *Social Entropy Theory*, he devotes one paragraph to the symbol S and to Clausius, where he incorrectly states that “we symbolize entropy by S and change in entropy by dS [where] the degree of change in entropy is *inversely related* to q/T, where T is the temperature of the system and q is the amount of heat being added to the system.” [5] Taken word for word, Bailey thus defines entropy as:

$$dS \propto \frac{1}{(q/T)}$$

or essentially:

$$dS = \frac{T}{q}$$

which, of course, is incorrect. Certainly, this may have been a typo? But such a typo in a book entitled "Social Entropy Theory" is inexcusable. In any event, on this mis-understood footing, Bailey goes on to explain conceptions such as Le Chatelier's principle in terms of an information theory, the resolution of the Specerian dilemma in terms of Bertalanffy's general systems theory, and describes, for instance, coded messages as being "highly entropic" to the code breaker of the intercepted message, among numerous other convoluted ideas. On the issue of social boundaries, to cite another example, he makes nonsensical statements such as "*Ceteris paribus*, the lower the ratio of internal entropy to external entropy, the greater the task of boundary maintenance." To illuminate, by further example, Bailey’s misunderstanding of thermodynamics, he says: [6]

> “Organizations are open systems … as such, they are not bound by the perpetual increase in entropy dictated by the second law of thermodynamics.”

In sum, the majority of Bailey's theory, for the most part, assumes an equivalence of Clausius entropy *S* to Shannon entropy *H*, and attempts to explain any and all sorts of distributions, which vary between zero and one (or log K), such as sex ratios, as having some kind of relation to information entropy or maximum entropy, in attempts at a weak unwritten connection to the second law. Almost the entire last half of the book is an attempt to show how any type data set, collected in various sociological studies, e.g. the sex distribution or ratio of faculty in a sociology department, can be put into a function of a logarithm and is thus entropy. Near the end of his book, after dozens of different studies and logarithm formulas, Bailey concludes: [6]

> "Entropy [is] a basic generic measure of variation in *any* variable and as such easily related to virtually *all* of the statistics used in sociology. The inescapable conclusion is that *H* is entropy and not information, and that *H* and various other entropy formulations have great utility in sociology and will increasingly be used."

It is difficult to express how corrupted this statement is, from a scientific point of view or thermodynamics standpoint. One may always wonder why Shannon acted (what his motives were) to seed this following?

Education

Bailey completed his BS in mathematics (1963), MA in sociology (1966), and PhD in sociology (1968), thesis "Human Ecology: A General Systems Approach", all at the University of Texas, Austin. [2] He then began working as a professor of sociology at the University of California, Los Angeles where he is currently a professor emeritus. [3]

Quotes

The following are quotes by Bailey:

> "When I began studying the notion of entropy it became clear to me that thermodynamic entropy was merely one instance of a concept with much broader applications … I became convinced that entropy applied to social phenomena as well."
>
> — Kenneth Bailey (2009), "Email to Libb Thims" [7]

References

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3. Kenneth D. Bailey (faculty) – University of California, Los Angeles.
4. (a) Bailey, Kenneth D. (1983). "Sociological Entropy Theory: Towards a Statistical and Verbal Congruence." *Quality and Quantity*, 18: 113-33.
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(e) Bailey, Kenneth D. (1988). "Social Entropy Theory: an Overview", *Systems Practice* 1.
5. ibid, Bailey. (1990). Section: Thermodynamic Equilibrium and Entropy (pgs. 52-53).
6. ibid, Bailey. (1990). pgs. 158, 163, 253.
7. Bailey, Kenneth D. (2009). "Email to Libb Thims", Mar 10.

Further reading

● Bailey, Kenneth. (1991). "From Thermodynamics to Sociology: The Changing Face of Equilibrium." Paper presented at the Annual Meeting of the International Society for Systems Science, Ostersund, Sweden, June.

External links

- Kenneth D. Bailey (sociologist) – Wikipedia.

θΔics

In hmolscience, **Kenneth Boulding** (1910-1993) was an English-born American economist noted, in ecological economics, for his 1966 to 1978 entropy theories, of the material entropy variety, and ideas applied in ecology and economics.

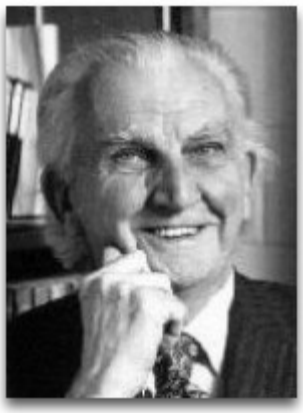

Overview

In 1956, Boulding, supposedly, was a developer of general systems theory.

In 1964, Boulding, in his *The Meaning of the 20th Century*, devoted a chapter to what he calls "The Entropy Trap", later cited by Jeremy Rifkin (1980), , where he argues that a post-civilization will arise when a "mutation" makes all men geniuses, after which a "society specializing in spiritual experiences" will emerge. [4]

In 1966, Boulding, in his "The Economics of the Coming Spaceship Earth", introduced the term "material entropy".

In 1978, Boulding, in ecodynamics, introduced a view of entropy and the second law in relation to social evolution. [1]

Boulding, in his theories, cited Pierre Teilhard, and his views on entropy and the noosphere, as well as Ludwig Bertalanffy, and his views on entropy and open systems, which may have been possible sources from where he learned the concept of entropy, albeit in a very erroneous or elementary sense.

Some cited Boulding as having introduced the concept of entropy in ecological economics, particularly on the subject of waste material management. [2]

Some have argued that the science of economic thermodynamics began following the publication of Boulding's famous 1966 article "The Economics of the Coming Spaceship Earth", in conjunction with Romanian mathematician Nicholas Georgescu-Roegen's 1971 book *The Entropy Law and the Economic Process*, after which economist became interested in the subject. [3]

References

1. (a) Boulding, Kenneth E. (1956). "General Systems Theory: the Skeleton of Science", *Management Science*, 2: 197-208.
(b) Boulding, Kenneth E. (1966). *Environmental Quality in a Growing Economy*. John Hopkins Press.
(c) Boulding, Kenneth E. (1978). *Ecodynamics: A New Theory of Social Evolution* (keyword: entropy). Sage Publication.
2. Mayumi, Kozo and Giampietro, Mario. (2004). Ch. 5: "Entropy in Ecological Economics" (pgs. 80-101) in *Modelling in Ecological Economics* by John Proops and Paul Safonov. Edward Elgar Publishing.
3. (a) O'Hara, Phillip A. (1999). *Encyclopedia of Political Economy*, (section: "Entropy, Negentropy, and the Laws of Thermodynamics", pg. 261-65). Routledge.
(b) Boulding, Kenneth E. (1966). "The Economics of the Coming Spaceship Earth", in H. Jarret, ed., *Environmental Quality in a Growing Economy*. Johns Hopkins University Press.
(c) This paper (Spaceship Earth) was first presented by Kenneth Ewart Boulding at the Sixth Resources for the Future Forum on Environmental Quality in a Growing Economy in Washington, D.C. on March 8, 1966.
(d) The Economics of the Coming Spaceship Earth – Encyclopedia of Earth.
4. (a) Boulding, Kenneth. (1964). *The Meaning of the 20th Century: the Great Transition* (§7: The Entropy Trap; entropy, 10+ pgs). Harper & Row.
(b) Tillson, David S. (c.1965). "Review: *The Meaning of the 20th Century*" (pdf), *American Anthropologist*, 68(1).
(c) Schweller, Randall L. (2014). *Maxwell's Demon and the Golden Apple: Global Discord in the New Millennium* (pg. 10). JHU Press.

External links

â— Kenneth E. Boulding – Wikipedia.
â— Boulding's Evolutionary Perspective – Wikipedia.

θΔics

In hmolscience, **Kenneth Connors** (1932-) is an American pharmacologist, a pioneer of pharmaceutical thermodynamics, noted for 2002 footnote on the analogies between balancing components of energy and entropy in physical systems, quantified by free energy, and balancing components of security and liberty (freedom) in social systems, quantified by politics.

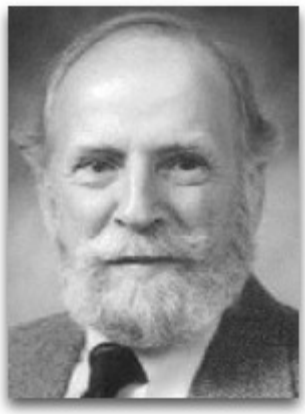

Thermodynamics | Security vs liberty

In 2002, Connors, in his *Thermodynamics of Pharmaceutical Systems*, footnotes a politics type explanation of free energy, i.e. a type of political thermodynamics, as a compromise between security and freedom (or liberty), as follows: [1]

> "It is not too fanciful to draw an analogy with a political science setting, in which each society must choose its own compromise position between the extremes of maximum security (the energy component) and maximum liberty (the entropy component)."

In 2010, Connors, together with co-author Italian-born American pharmaceutical chemist Sandro Mecozzi (Q), in their second edition, restated the above footnote, albeit in a little more organized fashion, with the footnote bottom page, versus end of chapter (2002), showing a free energy diagram concordantly; the newer presentation, with the footnote inserted, reads as follows: [3]

> "The essential characteristic of the Gibbs free energy function is its combination of both energy and entropy components in a form that reveals how these two thermodynamic concepts complete to generate a compromise that determines the position of equilibrium in a chemical process. It is not too fanciful to draw an analogy with a political science setting, in which each society must choose its own compromise position between the extremes of maximum security (the energy component) and maximum liberty (the entropy component). A more negative ΔH favors spontaneous reaction, and a more positive ΔS favors spontaneous reaction, in both instances making ΔG more negative."

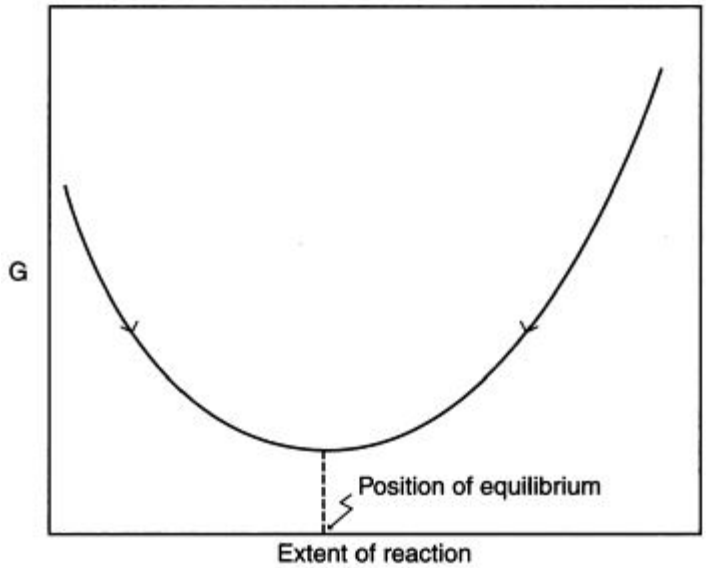

Connor's figure 3.1 captioned as "free energy of a reacting chemical system, showing how the direction of the reaction depends on the initial state of the system", amid his free energy and political science discussions. [3]

(add discussion)

This comparison is strikingly similar to American thermodynamicist Frederick Rossini's 1971 "Chemical Thermodynamics in the Real World" address. Connors, to note, does cite Rossini's 1950 *Chemical Thermodynamics* textbook twice, though he does not seem to be aware of his 1971 Priestley Medal address (nor of the Rossini debate).

Education

Connors completed his undergraduate degree in 1954 in pharmacy at the University of Connecticut. He completed his MS (1957) and PhD (1959) in pharmacy, focus pharmaceutical analysis, at the University of Wisconsin, Madison, under the direction of American pharmacologist Takeru Higuchi, a graduate of the Lewis school of thermodynamics, known as the "father of physical pharmacy", pioneer of the application of physical chemistry theory to drug design, delivery, and analysis. [2] In 1962, Connor became a professor of pharmacy at the University of Wisconsin at Madison, remaining there over the next forty plus years.

References

1. Connors, Kenneth A. (2002). *Thermodynamics of Pharmaceutical Systems: an Introduction to Students of Pharmacy* (ch. 3: The Free Energy, pgs. 30-41, esp. 41). John Wiley and Sons.
2. (a) Anon. (2002). "2002 UW Honorary Citation Report: Kenneth A. Connors". *School of Pharmacy*, University of Wisconson-Madison.
(b) Hersey, Mark D. (1987). "It's all in the Delivery: Hat's off to Higuchi", *Oct. 17*, KUHistory.com.
3. Connors, Kenneth A. and Mecozzi, Sandro. (2010). *Thermodynamics of Pharmaceutical Systems* (pgs. 95-96). Wiley.

Further reading

● Connors, Kenneth A. (1990). *Chemical Kinetics: the Study of Reaction Rates in Solution.* Wile.
● Connors, Kenneth A., Amidon, Gordon L, and Stella, Valentino J. (1986). *Chemical Stability of Pharmaceuticals: Handbook for Pharmacists.* Wiley.
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External links

● Connors, Kenneth A. (Kenneth Antonio) (1932-) – WorldCat Identities.
● Kenneth A. Connors (faculty) – University of Wisconsin, Madison.

θΔics

In existographies, **Kenneth Denbigh** (1911-2004) (CR:7) was an English chemical engineer, thermodynamicist, and philosopher of science, known as one of creators of near-equilibrium thermodynamics, known also for his applications in physical chemistry, and as a noted scientific investigator in problems of the metaphysics of time. Denbigh was the pioneer in the formulation of the concept of 'chemical reactor engineering', in the application of chemical thermodynamics to industrial processes, and in the detail investigation of the thermodynamics of the steady state. Denbigh was an associate of Russian physical chemist Georgi Gladyshev.

Thermodynamics

At the start of WWII, in September of 1939, Denbigh became head of the laboratories of the Royal Ordnance Factory at Bridgewater in Somerset. Here he found that he had to cope with both engineering and chemical problems, such that he had to consider the role of time in governing the operations. These considerations led him to the field of thermodynamics and to its application to problems of the rate of change of processes of all kinds. [1]

Denbigh wrote the many textbooks and monographs. The first was the short *The Thermodynamics of the Steady State* (1951). In this monograph, Denbigh investigated steady state near equilibrium prosesses in systems for which the state functions have the real physical sense. This was followed by his most famous 1955 *The Principles of Chemical Equilibrium*, a more conventional exposition of thermodynamics for students, going through four later editions, and many translations. He followed this up with the excellent 1956 textbook *Chemical Reactor Theory*.

In *An Inventive Universe* (1975) he argued that the personal sense of time was as valid a measure of its sense, from past to future, as any provided by the physical sciences. In 1981, he returned to this field in the monograph *Three Concepts of Time* (1981). These were focused on the usually reversible time of physics, the irreversible times of thermodynamics, and of mental time of human consciousness.

His fellow workers in the field of thermodynamics are most appreciative of his last book, written in collaboration with his son, Jonathan, *Entropy in Relation to Incomplete Knowledge* (1985). Here the authors discuss “that most slippery concept, entropy, and whether it should be considered to be a fully objective entity or whether it is subjective, and dependent on one's personal knowledge”. [2]

Evolution

Canadian zoologist Daniel Brooks and systems ecologist Edward Wiley claim that Denbigh, in his 1975 article “A Non-Conserved Function for Organized Systems”, assert that most processes relevant to thermodynamics have nothing to do with thermodynamics. [3] This, however, is most-likely misrepresentation, as this type of polemic is common to Brooks and Wiley.

Education

Denbigh completed his BS in chemistry at the University of Leeds in 1932 and his PhD in chemistry in 1934, at the same university, under English chemist Robert Whytlaw-Gray. He then went to work at the Imperial Chemical Industries for four years and in 1938 became a lecturer in chemistry at Southampton University.

Quotes | By

The following are noted quotes:

> “There is no conservation law which prevents changes in the number of connections. Thus, if the integrality of a system depends on the factor c there is no requirement from physics that this factor shall remain constant during the course of time even if the system is isolated. It might either increase or decrease. It would appear, in short, that the most significant processes which are studied in biology, the evolutionary processes, have no direct connection with thermodynamics”

— Kenneth Denbigh (1975), “A Non-Conserved Function for Organized Systems” (pgs. 88, 90); cited by Richard

Adams (1988) in *The Eighth Day* (pg. 73)

> "Although information theory is more comprehensive than is statistical mechanics, this very comprehensiveness gives rise to objectionable consequences when it is applied in physics and chemistry. It remains true, nevertheless, that information theory can be of value in a heuristic sense. Notions about 'loss of information' can sometimes be intuitively useful. But they can also, like the comparable concept of 'disorder', give rise to mistakes. It needs to be kept in mind that *thermodynamic* entropy is fully objective and the same must apply to any other 'entropy' which is used as surrogate."

— Kenneth Denbigh (1985), *Entropy in Relation to Incomplete Knowledge*; see: information entropy (quotes) [4]

References

1. Rowlinson, John S. (2004). "Obituary: Professor Kenneth Denbigh", *The London Independent*, Feb. 24.
2. Kenneth George Denbigh – Endeav.org.
3. (a) Denbigh, Kenneth. (1975). "A Non-Conserved Function for Organized Systems", In: *Entropy and Information in Science and Philosophy* (pgs. 83-92), ed. L. Kubat and J. Zemen. American Elsevier.
(b) Brooks, Daniel R. and Wilson, Edward O. (1988). *Evolution as Entropy: Toward a Unified theory of Biology* (pg. 99). University of Chicago Press.
4. (a) Denbigh, Kenneth and Denbigh, John S. (1985). *Entropy in Relation to Incomplete Knowledge* (abs) (pg. 117). Cambridge University Press.
(b) Labinger, Jay A. (1995). "Metaphoric Usage of the Second Law: Entropy as Time's (double-headed) Arrow in Tom Stoppard's *Arcadia*", Presented at Nov meeting of the Society for Literature and Science, Los Angeles; in: *The Chemical Intelligencer* (pg. 32), Oct. 31-36, 1996.

Further reading

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- Denbigh, Kenneth G. (1955). *The Principles of Chemical Equilibrium: With Applications in Chemistry and Chemical Engineering*. Cambridge University Press, 1981.
- Denbigh, Kenneth G. (1956). *Chemical Reactor Theory*. Cambridge University Press.
- Denbigh, Kenneth. (1975). *An Inventive Universe* (thermodynamics, 15+ pgs). Braziller.
- Denbigh, Kenneth. (1981). "How Subjective is Entropy?" *Chem Brit* 17:168-85.
- Denbigh K.G. (1989). "The Many Faces of Irreversibility." *Brit. J. Phil. Sci*. v. 40, p. 501.
- Denbigh K.G. (1989). "Note on Entropy, Disorder and Disorganization". *Brit. J. Phil*. Sci. v. 40, p. 323.
- Rowlinson, John S. (2004). "Biographical Memoirs of Fellows of the Royal Society", Vol. 50, pp. 61-71. Kenneth George Denbigh. *JSTOR.org*.

External links

- Denbigh, Kenneth George – WorldCat Identities.
- Prof. Kenneth G. Denbigh – National Academy of Engineering (USA).

θΔics

In hmolscience, **Kenneth Friedman** (c.1945-) is an American physicist, philosopher, and financial theorist noted, in economic thermodynamics, for 2003 attempt to extend the Benard cell molecular interaction model of Ilya Prigogine to economics.

Overview

In 1973, Friedman studied under Belgian chemist Ilya Prigogine.

In 2003, Friedman, in his *Myths of the Free Market*, modeled economies as nonlinear thermodynamic systems where people are viewed as interacting economically similar to the way the neighboring molecules of a Benard cell "cooperate" in their movement to dissipate heat.

Education

Friedman completed his MS in physics and PhD in the philosophy of science at MIT, after which, in 1973, on an American Council of Learned Societies fellowship, he then studied nonlinear thermodynamics under Belgian chemist Ilya Prigogine at the Free University of Brussels. As a student, Friedman states that he studied with science philosophers including: Imre Lakatos, Karl Popper, Abner Shimony, and Huston Smith, along with thermodynamicists including: Prigogine and Laszlo Tisza. Friedman then taught for twelve years at SUNY at Oswego, where he chaired the philosophy department. He then worked as a securities analysis and money manager, during which time he claims to have capitalized on a cyclic view of markets grounded in nonlinear thermodynamics. In 2003, Friedman was president of a publically traded company.

References

1. Friedman, Kenneth S. (2003). *Myths of Free Market* (thermodynamics, 16+ pgs; section: Nonlinear Thermodynamics and Economics, pgs. 105-20). Algora Publishing.

External links

â— Friedman, Kenneth S. – WorldCat Identities.

θΔics

In existographies, **Kenneth Humphreys** (c.1950-) (RMS:132) (CR:7) is an English achristism mythologist, noted for []

Overview

In 2001, Humphreys, inspired (Q) by: Earl Doherty (*The Jesus Puzzle*, 1999); Dorothy Murdock (*The Christ Conspiracy*, 1999); Timothy Freke and Peter Gandy (*The Jesus Mysteries*, 1999); George Wells (*The Jesus Myth* / *The Jesus Legend*, 1999); Arthur Drews (*The Christ Myth*, 1910); Robert M. Price (*Deconstructing Jesus*, 2000); Hyam Maccoby (*The Mythmaker: Paul & the Invention of Christianity*, 1987); Burton Mack (*Who Wrote the New Testament?*, 1995); and Elaine Pagels (*The Gnostic Gospels*, 1979), launched: JesusNeverExisted.com (see: Jesus never existed),

In 2005, Humphreys, in his book *Jesus Never Existed: an Introduction to Ultimate Heresy*, outlined his non existence of Jesus view. [1]

In 2015, Humphreys, in his Milwaukee Mythicist podcast interview, stated his view that Christmas as a holiday began in the 4th century AD, which is incorrect; correctly the so-called Germanic-English version of Christmas is a cultural transmission of the Roman version of Christmas, which is a truncated recension version of the ancient month-long Egyptian Khoiak festival (Dec 10 to Jan 8) and its raising of the djed pillar, aka raising of the Christmas tree, which dates crudely to 3,100BC, if not before.

Other

In 2012, Joseph Atwill made a documentary film entitled "Flavian Jesus Hypothesis", based on Dorothy Murdock's *The Christ Conspiracy* (1999), Timothy Freke's *The Jesus Mysteries* (1999), Atwill's *Caesar's Messiah* (2006), and Kenneth Humphreys' *Jesus Never Existed* (2005), arguing that Jesus was an invention of the Flavian dynasty.

Quotes | By

The following are quotes by Humphreys:

> "The truth is that Christianity grew from neither a god nor a man, but out of what had gone before. A 'human Jesus' was no more necessary than was a human Horus, a human Dionysus, or a human Mithras."
>
> — Kenneth Humphreys (2005), *Jesus Never Existed* (pg. 21)

References

1. Humphrey, Kenneth. (2005). *Jesus Never Existed: an Introduction to Ultimate Heresy*. Publisher, 2014.
2. Edward, Brian and Moore, Rob. (2015). "The Origin of Christmas: Interview of Ken Humphreys" (Q), Mythicist Milwaukee, Dec 4.

External links

- Home – JesusNeverExisted.com.
- Kenneth Humphreys – WorldCat Identities.

θΔics

In thermodynamics, **Kenneth R. Jolls** (c.1936-) is an American chemical engineer notable for being the designer behind the 2005 Gibbs stamp, depicting the graphical thermodynamics methods of American engineer Willard Gibbs. Jolls is an expert on the computer programming aspects of thermodynamic surfaces, and the history of Maxwell's thermodynamic surface, and authored the 1990 booklet *Gibbs and the Art of Thermodynamics*, on Gibbs graphical work; a publication later becoming one of the chapters to the 1990 collaboration book *Gibbs Symposium*. [1]

Education

Jolls completed his AB in music in 1958 at Duke University, BS in chemical engineering in 1961 at North Carolina State University, MS (1963) and PhD (1966) both in chemical engineering at University of Illinois. He is currently a chemical engineering professor at Iowa State University. [2]

References

1. (a) Jolls, Kenneth R. (1990). *Gibbs and the Art of Thermodynamics*. 80-pgs. Engineering Research Institute, Iowa State University.
(b) Jolls, Kenneth R. (1990). "Gibbs and the Art of Thermodynamics" (pgs. 293-); in: Caldi, D. G. and Mostow, George D. (1989). *Proceedings of the Gibbs Symposium*, *May 15-17* (Kenneth Jolls, plaster model, pg. 296, 309). American Mathematical Society.
2. Kenneth R. Jolls (faculty) – Iowa State University.

Further reading

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● Jolls, Kenneth R. (2005). "Engineering, Entropy and Art: a Tour through the Thermodynamics of J. Willard Gibbs" (Q), Lecture, Fiedler Hall Auditorium, Kansas State University, Apr 14.

External links

● Gibbs models (Kenneth Jolls) – Public.IAState.edu.

θΔics

In hmolscience, **Kenneth Miller** (1948-) (DN:1) is an American theistic biologist, who specializes in chloroplast thylakoid membranes, noted for his circa 1980 to present anti-creationism opinions, debates, and testimonies.

Religion

Miller, in his *Finding Darwin's God* (1999), supposedly, states his Roman Catholic evolution believing mindset, according to which the earth is not young, that science must work based on "methodological naturalism", and that evolution cannot be construed as an effective argument for atheism. [2]

Debates

In 1981, Miller debated Henry Morris, then head of the Institute for Creation Research, on whether "the theory of evolution is superior to the theory of special creation as an explanation for all the scientific evidence related to origins"; the audio of which is available. (Ñº)

Quotes

The following are noted quotes:

> "Evolution is not anti-god."
>
> — Kenneth Miller (c.2001) [1]

References

1. (a) Morris, Holly J. (2002). "Life's Grand Design", *U.S. News and World Report*, Jul 19.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 25). Zondervan, 2009.
2. Finding Darwin's God – Wikipedia.

External links

â— Kenneth R. Miller – Wikipedia.
â— Only A Theory – Wikipedia.

θΔics

In hmolscience, **Kenneth Stokes** (c. 1960-) is an American political economist noted for his 1992 to 1995 publications on energy, entropy, and thermodynamics used in the humanities.

Overview

In 1992, Stokes, in his *Man and the Biosphere*, discussed thinkers including: Frederick Soddy, Karl Marx, Friedrich Engels, Herman Daly, Karl Polanyi, and topics such as negentropy, thermodynamics, physiocrats, energy, entropy, cybernetics, embodied energy, among others.

In 1995, Stokes, in his *Paradigm Lost*, argued that the theory of equilibrium, used by Talcott Parsons, was borrowed from thermodynamics. [2]

Education

Stokes studied economics, social theory, and political thought at York University. He is an associate professor of political economy at the International University of Japan.

References

1. Stokes, Kenneth M. (1992). *Man and the Biosphere: Towards a Coevolutionary Political Economy*. M.E. Sharpe.
2. Stokes, Kenneth M. (1995). *Paradigm Lost* (pg. 301). M.E. Sharpe.

External links

â— Kenneth M. Stokes (about) - International University of Japan.

θΔics

In hmolscience, **Kent Hovind** (1953-) (CIR:2) is an American creation science evangelist noted, in religious thermodynamics, for a number of 1990s video lectures, mostly to church groups, it seems, wherein he employs science concepts, albeit in a semi-twisted manner to argue for the existence of god, often filled with humor.

Overview

In the 1990s, Hovind began employing a dumbed-down use of the first and second law of thermodynamics, which he learned, in his own words, from reading numerous high school science books, to disprove evolution, in particular the "thermodynamic law says that all systems towards disorder", hence evolution is false (systems seen to be increasing in order), and thus humans were created by god. [1]

Quotes | Employed

The following are quotes often employed by Hovind in his arguments:

> "The second law of thermodynamics is man's description of the prior and continuing work of a creator, who also holds the answer to the future destiny of man and the universe."
>
> — Gordon van Wylen (1973), *Fundaments of Classical Thermodynamics* [2]

Quotes

The following are related quotes:

> "Evolutionism is a religious worldview not supported by science, scripture, popular opinion, or common sense. The exclusive teaching of this dangerous, mind-altering philosophy in tax-supported schools, parks, museums, etc. is a clear violation of the First Amendment."
>
> — Kent Hovind (c.1998), DrDino.com (Q)

References

1. (a) Duncan, Julie A. (2009). *Faith Displayed as Science* (pg. 72). Publisher.
(b) Isaak, Mark. (2007). *The Counter-creation Handbook* (pg. 317). University of California Press.
2. Wylen, Gordon and Sonntag, Richard. (1973). *Fundamentals of Classical Thermodynamics* (section: 7.16: Some General Comments Regarding Entropy, pgs. 247-48; creator, pg. 248), 2nd ed. Wiley.

Videos

- Hovind on the first law (1 of 2) (2008)
- Hovind on the first law (2 of 2) (2008)
- Hovind, Kent and John D. Callahan. (2004). "Debate on Second Law and Evolution" (V), Dec 5.

External links

- Kent Hovind – Wikipedia.
- The Laws of Thermodynamics Refute Evolution (2009) – TheFallibleFiend.Blogspot.com.

θΔics

In hmolscience, **Kent Klitgaard** (c.1957-) is an American economist noted for co-authoring, with Charles Hall, the 2011 textbook Energy and the Wealth of Nations: Understanding the BioPhysical Economy, wherein the attempt to interject on a loose conceptualized thermodynamics-based economics model, of the Roegen-Daly school variety.

Energy | Philosophy

Klitgaard, in his 2011 author excerpt, states the following: [1]

> "Klitgaard is interested in the outdoors in general: from hiking to beach walking to the occasional round of golf, despite the high energy use of golf courses."

The half-joking assertion here that golfing is fundamentally "wrong" because it wastes a limited supply of fossil fuels, belies a well-meaning, albeit faulty, misaligned, and or off-target energy philosophical foundation of the general Hall-Klitgaard energy ideology, particularly after he dedicates his book to his two children with hopes that the information presented in his book will make their world a "better place to live" and to "give life meaning". Golfing, in short, according to Klitgaard, is morally wrong because it wastes energy. This is evident in Hall's video lectures wherein he talks about how many barrels of oil went into the production of the cup of coffee he drinks; and both are thematic to Howard T. Odum's 1976 energy flow diagrams inter-stitched with energy retrograde cartoons: [2]

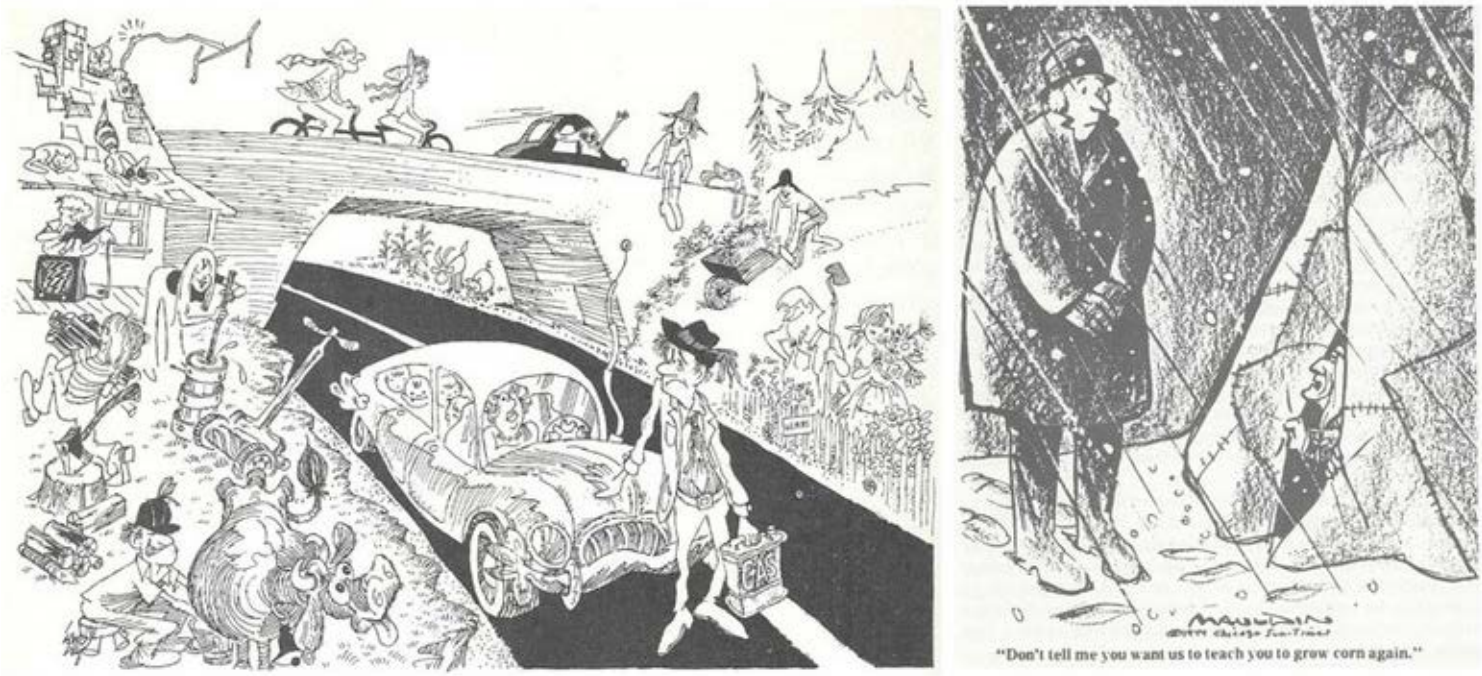

Odum Energy Retrograde Philosophy

all of which derive, as Odum points out (1976 | pg. 15), from the experience of the "energy crisis" (Q) that resulted when in 1973 the Arab countries withheld oil from the world for a time, as a result of which oil prices increase globally four-fold; the Odum-based Hall-Klitgaard ideology, accordingly, is a well-meaning albeit misaligned reactionary economic policy change philosophy to this event. The philosophy is misaligned per reason that they think of gas (or oil) as being a low entropy type of material entropy, aka type of mis-conceptualized bound energy, per teachings of the Roegen-Daly school, which is incorrect, and that according to the second law, this bound energy will tend towards free energy, i.e. waste fumes, as they see things; e.g. order will tend towards disorder, which is incorrect. Correctly, the 1973 Arab oil withhold worked to raise the activation energy barrier, which had nothing to do with the second law, according to the thermodynamic theory of affinity. If, e.g., Hall and Klitgaard had been keen to read Thomas Wallace (2009) on the energy in respect to the wealth nations, they

would have been more aligned with reality.

Other

In 2015, Klitgaard, during his "Biophysical Economics" talk (Q), states that he is teaching ecological economics, wherein he uses Herman Daly's 1996 *Beyond Growth* as the course textbook.

Quotes | Employed

The following are quotes employed by Klitgaard:

> "Anyone who believes that any economy can grow exponentially inside a finite planet is either a madman or an economist."
>
> — Kenneth Boulding (1973), attributed (Q) during congressional hearings on the Energy Reorganization Act; listed at header of faculty page

Education

Klitgaard completed a BA in 1974 at San Diego State University, his MS in 1979 and PhD in 1987 both at the University of New Hampshire, and in 1991 became professor of economics and social science at Wells College, Aurora, New York.

References

1. Hall, Charles A.S. and Klitgaard, Kent. (2011). *Energy and the Wealth of Nations: Understanding the Biophysical Economy* (Klitgaard bio, pg. xiii; thermodynamics, 18+ pgs). Springer.
2. Odum, Howard, T. and Elisabeth, Odum, C. (1976). *Energy Basis for Man and Nature*. McGraw-Hill Book Company.

External links

- Kent Klitgaard (faculty) – Wells College.
- Kent A. Klitgaard – ResearchGate.net.

θΔics

In existographies, **Kersey Graves** (1813-1883) was an American free thinker and religio-mythology scholar, noted for []

Influence | On

Graves influenced: Madalyn O'Hair, Dorothy Murdock, and Tom Harpur.

Quotes | By

The following are related quotes:

> "Zoroaster [800BC]: A virgin will conceive and bear a son, and a star would appear blazing at midday to signalize the occurrence. When you behold the star, follow it wherever it leads you. Adore the mysterious child, offering him gifts with profound humility. He is indeed the almighty word which created the heavens. He is indeed your lord and everlasting king."
>
> — Kersey Graves (1875), *The World's Sixteen Crucified Saviors*; cited by Tom Harper (2014) as example of Jesus parallel [1]

References

1. (a) Graves, Kersey. (1875). *The World's Sixteen Crucified Saviors* (Osiris, 24+ pgs; Horus, 2+ pgs). Publisher.
(b) Harpur, Tom. (2004). *The Pagan Christ* (pgs. 37-38). Thomas Allan Publishers.

Further reading

● Graves, Kersey. (1865). *The Biography of Satan: An Historical Exposition of the Devil and His Fiery Dominions – Disclosing the Oriental Origin of the Belief in a Devil and Future Endless Punishment; Also, An Explanation of the Pagan Origin of the Scriptural Terms, Bottomless Pit, Lake of Fire and Brimstone, Chains of Darkness, Casting Out Devils, Worm That Never Dieth, etc.* (forward: Paul Tice and Marshall Gauvin). The Book Tree, 1999.
● Graves, Kersey. (1879). *The Bible of Bibles: Twenty-Seven 'Divine Revelations': Containing a Description of Twenty-seven Bibles, and an Exposition of Two Thousand Biblical Errors in Science, History, Morals, Religion, and General Events; Also a Delineation of the Characters of the Principal Personages of the Christian Bible, and an Examination of Their Doctrines*. Colby & Rich.

External links

● Kersey Graves – Wikipedia.
● The World's Sixteen Crucified Saviors – Wikipedia.

θΔics

In hmolscience, **Kevin Conover** (c.1985-) is an American Udemy instructor noted for []

Overview

In 2015, Conover was teaching online courses in science-conceptualized Christian apologetics, e.g. Irreducible Complexity and Thermodynamics (Q) (40 students), The Big Bang and the Anthropic Principle (Q) (45 students), and gems such as Age of the Earth (Q) (83 students), wherein students learn about the argument for a young earth (i.e. Genesis-based earth age), or "Which is Scientific, the Bible or Atheism?" (Q), with videos and articles on the "life from non-life" problem, which is part of an overall 10-section class entitled "Created by Purpose or Evolved by Chance", at the number ten of which is "Answering Atheism". [1]

Keys

Conover's course was the first and only return for "thermodynamics" in a 3 Feb 2015 Udemy search, following no returns for sociophysics or econophysics, amid Libb Thims' test query search for possibly practice teaching course in physicochemical sociology; Conover also is the only return for courses on "atheism".

See also

- Deepak Chopra
- Frank Turek
- Ian Hutchinson
- John Lennox
- Ken Ham
- Ravi Zacharias
- William Craig

References

1. Created on Purpose or Evolved by Chance – EducateForLife.org.

External links

- Kevin Conover (about) – Udemy.com.

θΔics

In existographies, **Kevin Hand** (c.1975-) is an American planetary scientist, noted for []

Overview

In 2011, Hand In 2011, American planetary scientist Kevin Hand asserted that the "Gibbs energy" concept, applied ecologically and to civilizations, in the form of energy landscape models, i.e. as "Gibbs landscapes" constructions, is one of the top 100 concepts of the 21st century that will make you smarter. [1]

> "When you start to view the world around you with Gibbsian eyes [compare: molecular goggles; thermodynamic lens] you see the untapped potential in so many of our modern technological and industrial ecosystems."
>
> — Kevin Hand (2011), concept that would improve everybody's cognitive toolkit

Hand's conception of "Gibbs landscape" here, to note, is that conceptualized along the lines of a renew, recycle, and green movement ecosystem conception, in the sense of "waste not free energy", as English physiologist William Bayliss (1915) translated Wilhelm Ostwald's thermodynamic imperative; and not that of a Gibbs landscape conception of reactions between humans, as in human chemical reaction theory, themselves conceptualized as molecules, akin to the way Mirza Beg illustrates the cover of his *New Dimensions* with activation energy diagrams, shown adjacent, or the way de Lange makes his evolution-conceptualized Gibbs landscapes, or the way Thomas Wallace makes his rise and fall of civilization free energy diagrams.

Hand's suggestion was selected as one of Sean Carroll's favorites. [2]

Education

Hand completed his BA in physics and his BA in psychology in 1998 at Dartmouth College, his MS in mechanical engineering in 2002 at Stanford University, and his PhD in geological and environmental sciences at Stanford in 2007. Presently, Hand is the deputy chief scientist for Solar System Exploration, NASA Jet Propulsion Laboratory, California Institute of Technology.

References

1. Hand, Kevin. (2011). "The Gibbs Landscape", Submission (WB) (Q)(Q) (pdf) to the *Edge* World Question Center's query: "What Scientific Concept Would Improve Everybody's Cognitive Toolkit?", Jan, in: *This Will Make You Smarter* (§:The Gibbs Landscape, pgs. 312-14). Harper Perennial, 2012.
2. Carroll, Sean. (2011). "Edge World Question Center: Your Cognitive Toolkit" (Q), Cosmic Variance, DiscoverMagazine.com Blog, Jan 15.

External links

- Kevin P. Hand (about) – Edge.org.
- Kevin Hand (about) – Jet Propulsion Laboratory, Caltech.
- Kevin Hand – Wikipedia.

θΔics

In human thermodynamics, **Kevin Kelly** (1952-) is an American futurist noted for his use of entropy and extropy in theorizing about the impact of machines and technology in the future. His noted book is the 1994 *Out of Control: the New Biology of Machines, Social Systems, and the Economic World*, touching on the topics of cybernetics, emergence, self-organization, complexity, and chaos theory, in which he spends about ten pages discussing entropy in the context of evolution and technology. [1] The aim of the book was to lay out the basic principals defining 'artificial evolution', a phenomenon argued to become commonplace in the next century. Keyy defines extropy as "life force" and life as an "information process making new order".

Kelly, supposedly, in one of the luminaries of the extropian movement and philosophy of extropianism, along with AI guru Marvin Minsky, nanotechnologist Eric Drexler. [2]

In 2009, Kelly gave a TED talk wherein he discussing the story of technology, with digression entropy and extropy (or exotropy, as he sometimes calls it). (V)

Matrix

Of note, Kelly's *Out of Control*, along with French philosopher Jean Baudrillard's 1985 *Simulacra and Simulation* and British philosopher Dylan Evans' 1999 *Introducing Evolutionary Psychology* (evolutionary psychology), were the three required reading (had to be read prior to even opening the script) texts for actors in the 1999 film *The Matrix.*

Education

Kelly attended the University of Rhode Island for one year in circa 1971, before dropping out. He went to become the founding editor of a number of science magazines, most notably *Wired Magazine*.

References

1. (a) Kelly, Kevin. (1994). *Out of Control: the New Biology of Machines, Social Systems, and the Economic World* (extropy, pg. 106; entropy, pgs. 79, 405-06, 413, 452). Addison Wesley.
(b) Out of Control – Wikipedia.
2. Goertzel, Ben and Bugaj, Stephan V. (1996). *The Path to Posthumanity: 21st Century Technology and its Radical Implications for Mind, Society and Reality* (pg. 395). Academica Press, LLC.

External links

â— Kevin Kelly – Wikipedia.

θΔics

In existographies, **Kevin Langdon** (c.1940-) (IIQ:176|#29) is an American IQ test maker, noted for []

Overview

In early 1970, Langdon joined Christopher Harding's International Society for Philosophical Enquiry.

In 1977, Langdon made a 14-page so-called "Adult Intelligence Test" or "Langdon Adult Intelligence Test" (Q).

In 1979, *Omni* magazine published Langdon's test (Q), at the point when he was aiming to start a "Four-Sigma Society" to accept people four standard deviations or more above the mean.

Quotes | On

The following are quotes on Langdon:

> "Try taking one of the tests created by Ron Hoeflin [Mega Test; Titan Test] or **Kevin Langdon** [Adult Intelligence Test] which were designed with the specific intent of measuring high IQ. Chris Harding [MultiMax Test] also creates upper limit tests. His Multimax Test contains only ten multiple-choice questions and claims a ceiling of 200+. Each author's address is listed at the beginning of this issue."
>
> — Rick Rosner (1992), "Reply Letter to William Archer" (Q), *Noesis*, 69, May

> "The Four Sigma Society (1 out of 30,000) was founded by [then] International Society for Philosophical Enquiry [founder: Christopher Harding] member **Kevin Langdon** in 1977. The society was active for about six years (1977 - 1983). Kevin edited four issues of the society's journal Sigma Four, with an average interval of two months. George Koch edited eight issues from 1980 to 1983, with an average interval of six months. The society accepted only one test, the Langdon Adult Intelligence Test (LAIT), on which an I.Q. score of at least 164 was required (later, other Langdon tests were also accepted). When the LAIT was published in Omni, in the April 1979 issue, it was taken by over 25,000 people, resulting in many new recruits for Four Sigma. Unfortunately, the large volume of responses to his test (which is no longer scored), coupled with Kevin's propensity for tardiness, also produced numerous complaints of late or non-existent score reports. *Omni* eventually sued Kevin for one million dollars (which they never collected). Kevin writes that he did eventually score the backlogged test answer sheets. There was a settlement under which he was to score approximately 2500 answer sheets in his possession and provide a list of testees' addresses to Omni for use in verifying that answer sheets were in fact received. Kevin scored all the tests, mailed score reports, and sent Omni the list. I have received an anecdotal report that at least one of the answer sheets did not return to the testee."
>
> — Darrly Miyaguchi (2000), "A Short and Bloody History of the High IQ Societies" [1]

Quotes | By

The following are quotes by Langdon:

> "I believe that there may be free will, but the possibility of freedom resides in the attention."
>
> — Kevin Langdon (1996), "Article" (Q), Noesis, 118

References

1. Miyaguchi, Darrly. (2000). “A Short and Bloody History of the High IQ Societies” (WB), Eskimo.com.

External links

- Kevin Langdon (president) (WB) – FourSigma.org.

θΔics

In human chemistry, **Kevin F. Yee** (1970-) is an American German literature professor noted for his 1997 posit that the Captain in Goethe's *Elective Affinities* functioned, in Goethe's mind, as a catalyst.

Overview

In 1997, Yee, in his "The Captain as Catalyst in Goethe's *Wahlverwandtschaften*", argued that the Captain, in German polymath Johann Goethe's 1809 *Elective Affinities*, acts as a catalyst (or human catalyst) who "propels, accelerates, and alters the reaction without being affected himself." [1] To cite an excerpt, as critiqued by Germanic literature theorist Astrida Tantillo: [2]

> "The implied 'correct' outcome of the human reaction (a simple exchange of partners), which was predicted much like a chemical reaction, is avoided because the Captain is a catalyst and not a normal reactant … [Goethe's] presentation of the Captain, the wild card in the mix of reactants, saves for humanity the possibility of freedom."

Yee's theory that Goethe's character the Captain was a catalyst in the context of affinity chemistry theory, to note, would not have been strictly the case in the mind of Goethe as the concept and discovery of catalysts did not occur until 1831.

Beyond this, most agree that the Captain, symbolized by Torbern Bergman style chemical species letter 'C', as described by Goethe in his famous chapter four, was a 'reactant' in the main human chemical reaction of the novella, which was a double elective affinity. These human chemical symbol assignments would then be:

A = Charlotte
B = Eduard
C = Captain
D = Ottilie

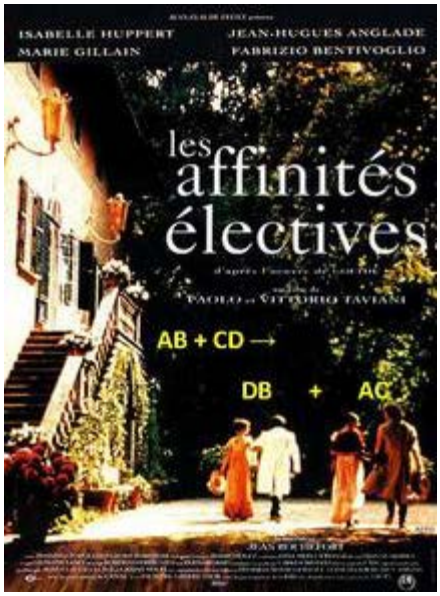

1996 film adaption of Goethe's 1809 *Elective Affinities*: cover showing the basic double elective affinity reaction threading the chapters of the book together (see: history). [4]

In plain talk, Goethe is saying that when Ottilie (D) arrives at the estate, Charlotte (A) will naturally cling to her adopted niece ("A will go over to D") and that when their friend the Captain (C) arrives at the estate to visit, he will naturally begin to hang out with his childhood friend Eduard ("C will go over to B"). As the story unfolds, however, Goethe gives his readers the true final end reaction he had in mind, which occurs as a second main step in the reaction mechanism, in the heightened activation energy state of the time period the visitor's arrival, where the pairings of Charlotte-Ottilie, AD, and Captain-Eduard, CB, begin to relax, wherein after Eduard and Ottile fall in love, DB, and Charlotte and the Captain fall in love, AC:

$$AD + CB \rightarrow DB + AC$$

These two reaction mechanism steps constitute the main human chemical reaction described in the novella. In each of the 36 chapters, however, Goethe used a different affinity reaction, based on his studies in chemistry.

Beyond this, Goethean theorists Jeremy Adler (1994) and Ilya Prigogine (1983) have pointed out, the character to have been the human catalyst in the novella would have been “Mittler the mediator”, who facilitated marriages and relationships, bringing harmony to disputes, without himself being consumed.

Education

Yee's knowledge of chemist seems to come from the dabbling in the subject has a hobby. During his undergraduate years, for instance, he would often spend time balancing chemical equations stoiciometrically, while board in certain classes.

Yee completed his BA (1992), MA (1994), and PhD, with a 1997 dissertation “Identification, Patriarchy, and Aesthetic Homosociality in Wackenroder’s and Tieck’s Work”, all at the University of California, Irvine. His research, in general, focuses on German romanticism, Goethe, fairy tales, and 19th century German novellas. Yee has taught at the UC-Irvine, Pomona College, the University of Iowa, and Duke University. In 2004, he became the assistant director at the University of Central Florida.

References

1. Yee, Kevin F. (1997). “The Captain as Catalyst in Goethe’s *Wahlverwandtschaften”* (abstract). *JEGP* 96: 58-70.
2. Tantillo, Astrida O. (2001). Goethe’s *Elective Affinities* and the Critics (pgs. 196-97). Camden House.
3. Kevin Yee (biography) – University of Central Florida.
4. The Elective Affinities - Wikipedia.

External links

â— Yee, Kevin F. (1970-) – WorldCat Identities.

θΔics

In Hmolpedia, the **key terms** page is a file header for articles of central importance in the hmol sciences. Key articles are listed in dropmenu (left).

θΔics

In headers, **key terms (A-E)** is a file tree header page for key terms articles A through E; as listed in the adjacent dropmenu.

θΔics

In headers, **key terms (F-N)** is a file tree header page for key terms articles F through N; as listed in the adjacent dropmenu.

θΔics

In headers, **key terms (O-Z)** is a file tree header page for key terms articles O through Z; as listed in the adjacent dropmenu.

θΔics

In religio-mythology, **Khepri**, from the Egyptian *kheprer* “to become”, aka Kheperi, Kheprer, and Chepera, is the Egyptian sun god personification, typically the morning sun, as compared to the noon sun or evening sun, of the dung beetle, which has the ability to “fly” (Q), and the characteristic that it lays its eggs in dung mounds, which incubate in the heat for a number of days, out of which new dung beetles burst forth; a proto-model of heat working on earth and water seemingly producing “life”.

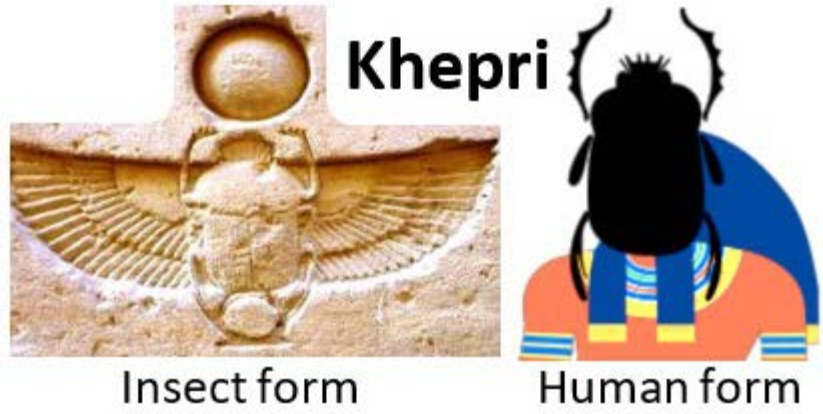

Two forms of the Egyptian sun god **Khepri**, left as a scarab or dung beetle flying with the sun in its arms, andright a human body with a scarab head.

Khepri was thought to either roll the morning sun across the sky each day and to bury it each night, like it does when it rolls dung balls (Q) across the ground, burying them in underground incubation holes; and or to carry the sun in its grip as it flies through the sky. Syncretism variants: Ra-Khepri and Atum-Khepri.

Quotes

The following are related quotes:

> “To say: O **Atum-Khepri**, when thou didst mount as a hill; and didst shine as bnw of the ben (or, benben) in the temple of the "phoenix" in Heliopolis; and didst spew out as Shu, and did spit out as Tefnut; (then) thou didst put thine arms about them, as the arm(s) of a ka, that thy ka might be in them. Atum, so put thine arms about N.; about this temple, about this pyramid, as the arm (s) of a ka; that the ka of N. may be in it, enduring for ever and ever. O Great Ennead who are in Heliopolis: Atum, Shu, Tefnut, Geb, Nut, Osiris, Isis, Set, Nephthys.”
>
> — Anon (c.2500BC), Pyramid Text, Utterance 600 (Q)(Q)

See also

● What is Being? (2016) – Hmolpedia Threads.

Further reading

● Mercante, Anthony S. (1978). *Who’s Who in Egyptian Mythology* (editor and reviser: Robert Bianchi) (§:Khepera, pgs. 83-84. Metro Books, 1995.

External links

● Khepri – Wikipedia.

θΔics

In festivals, **Khoiak festival**, or "month of Khoiak (or Koiak)", the forerunner to the modern month of Christmas, was the annual Egyptian holiday season month, Dec 10 to Jan 8, each day of which is themed around the Passion of Osiris, i.e. the myth of the death and resurrection of the god Osiris, the raising of the evergreen tree (or djed pillar), the forerunner to the modern Christmas tree, and the making of barley Osiris corn mummies.

An example of an "Osiris Bed", aka corn mummy, the center piece of the **Khoiak festival**, a mold-shaped container, that was filled with mud and grain (typically barley; or millet or wheat), ranging in size from a few inches to body-sized, that beginning in the New Kingdom (1550BC) began to be put into the tombs of pharaohs. An Osiris Bed found in the tomb of Egyptian courtier Tuya (c.1390BC) (Ñº) had 8-inch sprouts growing out of it. [4] These Osiris Beds were precursors to the **Christmas tree**.

Overview

In Egypt, annually, the 30-day period of Dec 10 to Jan 8, the fourth month of the Season of Akhet (Inundation), just as the waters receded to expose silt-covered fields fresh for sowing, was a festival month called the "month of Khoiak (or Koiak)", the forerunner to the modern Christmas season, each day of which a special holiday event or ritual occurred. [1] The festival of Khoiak was a seed-planting festival of sorts; the gist of which is summarized as follows: [2]

> "The **festivals of Khoiak** are among the best attested from ancient Egypt. They revolve around the myth of the god Osiris, murdered by his brother Seth, and revived by his sister-wife Isis to the point where she could conceive their son Horus. Osiris withdrew to rule the underworld, while Isis protected Horus until he was old enough to avenge his father in battle with Seth, and win the throne."

In 1550BC, the Osiris rebirth myth became a month-long festival, which involved the making of pottery-like Osiris mold planting beds, examples of which are shown adjacent, that were planted each year; the gist of which is summarized as follows: [2]

> "The death and revival of Osiris provide the mythic echo of the annual rebirth of crops. In the ceremony, seeds [barley, millet, wheat (Ñº)] were sown in earth, which was from the New Kingdom [1550BC] shaped in [corn mummy] moulds to the **form of Osiris**; the sown earth was watered until the seeds germinated, and then this guarantor of a successful crop was buried. The timing of the festival in the official year placed it in the fourth month of flood, just as the waters receded to expose silt-covered fields fresh for sowing. The name of the festival was ka-her-ka 'ka upon ka' (or 'sustenance upon sustenance'); it survived into Christian times as the name of the fourth month of the season of flood, rendered in Coptic as Khoiak."

The following is relate quote:

> "The deceased wears an onion necklace to prepare for the solarization of the Sokar-Osiris. A luminous rebirth occurs on the morning of the 26-th day in the month of Khoiak in the hnw-barge, which is protected by the five geese, daughters of Ra, and their barges. The transport of the hnw was organized by the high priest of Ptah in Memphis."

— Donald Redford (2001), *The Oxford Encyclopedia of Ancient Egypt, Volume 3* (Ñº)

The following shows the timeline "events", based on known sources, that occurred each day of the month of the Koiak festival; in the Hathor temple (100AD) column, to note, we see Osiris being identified with Sokar (Sekar), the underworld god of Memphis, which, according to Budge (pg.130), occurred sometime after the Pyramid Texts, at an unknown time:

Day	**Modern**	**Medinet Habu** [1150BC]	**Koptos Basin** [850BC]	**Jumilhac Papyrus** [100BC]	**Hathor temple** [100AD]	**Budge Summary** [1904]	**Christianity** [400AD]
1	Dec 10	[make new Osiris god mould case]	[make new Osiris god mould case]	[make new Osiris god mould case]	[make new Osiris god mould case]		
2-11	Dec 11-20						
12	Dec 21		watering the moulds		watering the Osiris/relic moulds	the Festival of the Ploughing of the Earth and the Festival of the Tena were celebrated.	
13	Dec 22		watering the moulds		watering the moulds		
14	Dec 23		watering the moulds		watering the moulds; **new Sokar [Osiris]** figure made	the great Festival of Pert	
15	Dec 24		watering the moulds		watering the moulds		
16	Dec 25		watering the moulds		watering the moulds; anointing the Sokar figure, placed on bier	the Festival of Osiris Khent Amenti	Christmas, aka Birth of Jesus, i.e. a **new Jesus** is born.
17	Dec 26		watering the moulds		watering the moulds		
18	Dec 27		watering the moulds		watering the moulds		

19	Dec 28		watering the moulds	finding the head of Osiris	watering the moulds; censing the Sokar figure		
20	Dec 29		watering the moulds	finding the eyes of Osiris	watering the moulds; weaving the shroud		
21	Dec 30	opening window in Shetayt shrine	watering the moulds	finding the jaws of Osiris	Osiris and relic figures taken out of moulds; cloth woven		
22	Dec 31	hoeing the earth	watering the moulds	finding the neck/arm of Osiris	search on the Sacred Lake		
23	Jan 1	making way in Shetayt shrine	watering the moulds	finding the innards of Osiris	burial preparations		
24	Jan 2	placing Sokar in their midst	procession of figures	finding the intestines of Osiris	removal of figures of last year	the model of the god of the preceding year was taken out from its place and buried suitably, and the **new Osiris** [corn mummy] was embalmed in the sanctuary	
25	Jan 3	Netjeryt (tying onion strings in evening)	final rites on roof (or 26?)	finding the lungs/phallus of Osiris		The new Osiris remained without burial for seven days because of the tradition which declared that the god had remained for seven days in the womb of his mother Nut when she was with child.	
26	Jan 4	Sokar festival - circling the walls	inal rites on roof (or 25?)	finding the thighs/legs of Osiris			
27	Jan 5			finding the leg/fingers of Osiris			
28	Jan 6			finding the phallus/arm of Osiris			
29	Jan 7			finding the heart of Osiris			Eastern Orthodox Christmas, i.e. a **new Jesus** is made.

30	Jan 8	raising the Djed pillar	finding arm/Horus sons; raising the Djed pillar	burial of figures; raising the Djed pillar	the Tet was set up in Tettu [Busiris], because on this day the divine members of Osiris were brought."

This thirty-day festival ending in the raising of the djed pillar eventually morphed into the Christmas tree celebration.

Dorothy Murdock (2010) comments how at some point in the Khoiak festival, the Egyptian baby son god Sokar was carried out of the temple on an ark (Ñº); also that Epiphanius (c.350AD) had his comments about how the Egyptians brought forth a "baby sun born of a virgin at winter solstice" censored.

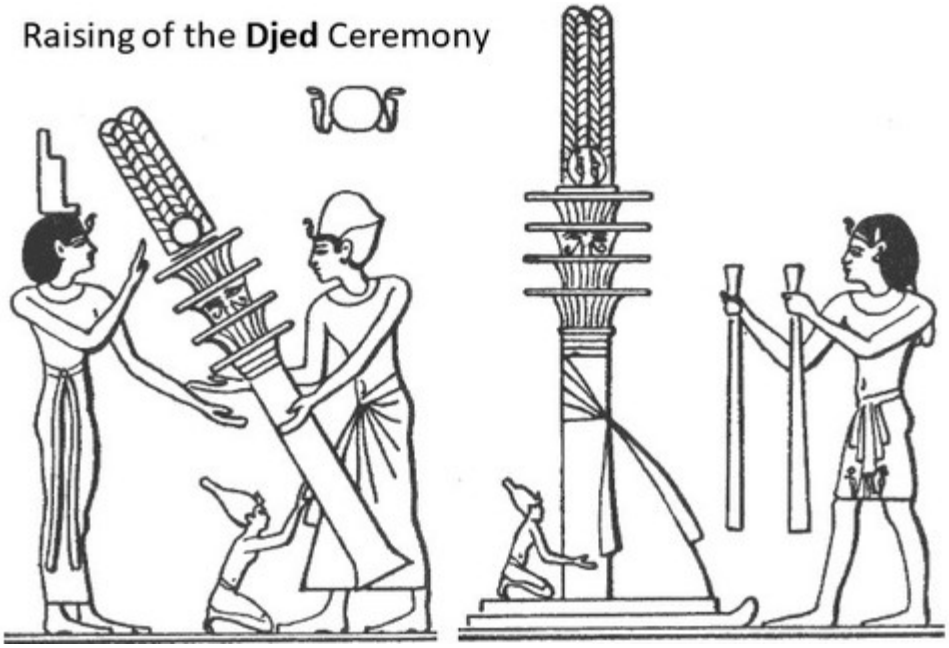

A visual the so-called "raising of Osiris" or raising of Djed pillar ceremony, which took place on day 30 of the **Khoiak** month.

Vincent Brown (2002) summarizes this as follows: [3]

> "The reconstruction of the body of Osiris occurred at a place called *Djedu*,in the Delta region of Lower Egypt and it was here that the yearly ceremony of 'Raising the Djed Pillar' took place on the last day of the **month of *Khoiak***, the eve of the agricultural New Year. The next day marked the beginning of the four month long season of *Pert*, or 'Going Forth' during which the lands rose out of the flood waters allowing the fields to be sown. *Djedu* was also referred to as *Per-Asar-Neb-Djedu*, meaning "The House of Osiris - the Lord of Djedu". The Greeks called it **Busiris**, after the shortened title *Per-Asar* - "The House of Osiris". Mythologically, the 'Raising of the Djed' symbolised the resurrection of Osiris, and with its annual re-enactment represented the death and renewal of the yearly cycle. Osiris is referred to as "Lord of the Year" in the Pyramid Texts and that he was also the god of agriculture meant that his annual resurrection ensured the stability of the abundance of the next season's crops."

On the eve of the new year, i.e. the last day of the month of Khoiak, a golden statue of the ba of Osiris would be brought up to the temple kiosk (Ñº) to be put in the sun to rejuvenate the soul of of Osiris, or something along these lines. The image shown, at right, is the Dendera Temple kiosk, about which Mick Palarczyk summarized the following: [5]

> "Located on the roof of the Hathor Temple at Dendera this kiosk was used during the celebration of the New Year's Festival. On the eve of New Year [day 30] a golden statue of the soul (ba) of Hathor was brought

up here from a crypt below the southern wall in a solemn procession. The statue, together with images of other gods, was placed below a cloth which was suspended over the Hathor headed columns of the kiosk. During the first day of the New Year the cloth was removed at some time so that the rays of the sun could touch the statue, thus rejuvenating its vital energy. This part of the Dendera Temple was built during the later Ptolemaic period (first century BC)."

The Dendera Temple "kiosk" where the golden Ba statue of Osiris would be brought to on day 30 of the **Khoiak festival**. [5]

(add)

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External links

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θΔics

In atheism, **killing spree paradox** is the generalized question, oft-posed by theists semi-curious about atheism, that if there is no god what stops a person from going on a killing spree.

A cartoon rendition of the so-called "**killing spree paradox**", often put to atheists, by believers, who raise the question about the basis of atheistic morality.

Chemical morality

When one begins to grapple with the question of morality in a godless universe, and or the premise of a human conceptualized as a molecule (or chemical), governed by physicochemical principles, commonly one of the first queries to come to mind, for many, concerns the seeming universe without morals issue, typified by the query: "what's stopping me from going on a killing spree", or something along these lines, if there is no God and or the universe is moral-less.

> "Crebillon … treats the passions like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. There is no trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover."
>
> — Johann Goethe (1799), "Letter to Friedrich Schiller", Oct 23

The following are other related quotes:

> "The morality Libb would propose, is never explicitly proposed. Rather, Libb, each time after he says 'life does not exist', goes on to claim that this should have something to do with morality. To me the most obvious moral principle that would follow from 'life does not exist' is that 'it really doesn't matter whether we would kill somebody', since life does not exist. Clearly, such reasoning is highly *immoral* and I hope that Libb does not propose this?" (pg. 97) .... Can Libb be a **serial killer** if it doesn't really matter since: one, life does not exist, so you cannot remove it, and two if the negativeness of dG tells me that killing many people is OK, then I must do so." (pg. 104)
>
> — David Bossens (2013), *Debates of the Hmolpedians* [2]

> "What's stopping me, if I am just a molecule, and morality or the judgment of god does not exist, from going on a **killing spree**?"
>
> — Rodolfo Flores (2013), In Person Query to Libb Thims, Oct 10; compare: molecules in motion

(add discussion)

Dostoyevsky

See: Dostoyevsky dilemma

The original statement of the premise that if there is no god, then anything goes, was stated directly by Russian moral atheism philosopher Fyodor Dostoyevsky, as follows:

> "If god does not exist, everything is permissible."
>
> — Fyodor Dostoyevsky (1880), *The Brothers Karamazov*; view of Ivan Karamazov

(add)

Dahmer

The one person, historically, who tested out the Dostoyevsky premise, was American serial killer Jeffrey Dahmer, killing some 17 people, to satisfy his need to have men with him, the logic of which he stated as follows:

> "If it all happens naturalistically? What's the need for god? Can't I set my own rules? Who owns me? I own myself!"
>
> — Jeffrey Dahmer (c.1993), variant of atheism belief he tried (see: killing spree paradox); as told to his father (Q)

> "If a person doesn't think there is a god to be accountable to, then—then what's the point of trying to modify your behaviour to keep it within acceptable ranges? That's how I thought anyway. I always believed the theory of evolution as truth, that we all just came from the slime. When we died, you know, that was it, there is nothing ..."
>
> — Jeffrey Dahmer (1994), interview (Q) with Stone Phillips, *Dateline NBC*, Nov 29

(add discussion)

Kelley

In 2017, American Devin Kelley, aged 26, a former Bible study teacher (Q) turned atheist, with Facebook likes of atheism cites such as the Atheist Republic and the Friendly Atheist, gunned down two-dozen plus people at the Church his second wife was teacher at.

See also

- Physicochemical morality puzzles
- Robertson sin problem (Q)
- Slave stealing parable

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θΔics

In hmolscience, **Kim P. Bondoc** (c.1990-) is a Philippine chemist noted for his 2013 usage of American electrochemical engineer Libb Thims' 2005 study of 30 individuals on queried definitions of hot sex, cold sex, and ambient sex, qualified in thermodynamic terms, for his graduate program physical chemistry class for an assignment wherein he was asked to present a published study in the class in relation to chemical thermodynamics. [1]

Education

In 2013, Bondoc was working on the completion of his ME in chemistry at the University of Philippines Cebu, while working as a physical sciences instructor.

See also

- Libb Thims (students)

References

1. (a) Email communication from Kim Bondoc to Libb Thims (12 Aug 2013).
(b) Thims, Libb. (2012). "Hot Sex, Cold Sex, Ambient Sex" (pdf), *Journal of Human Thermodynamics*, 6(4):47-61.

External links

- Kim Bondoc (speaker profile) – Philippine Youth Congress on IT 2013.
- Kim Bondoc – Google+
- Kim Bondoc – LinkedIn.

θΔics

In science, **kinetic energy** is the quantity of work:

$$\frac{1}{2}mv^2$$

that must be done to bring a body of mass *m*, initially at rest, to a velocity *v*. [1]

History

In 1689, German mathematician Gottfried Leibniz had defined the following quantity, determined previously to be conserved in perfectly elastic collistions in 1669 by Dutch physicist Christiaan Huygens, as vis viva or living force:

$$Vis\ viva = mv^2$$

In 1807, English physicist Thomas Young defined the above quantity as "energy":

$$E = mv^2$$

In 1811, Italian mathematician Joseph Lagrange used calculus to show that a factor of two is involved in the relationship "potential" (potential energy) and "vis viva" (kinetic energy). [2] As defined via the symbols used by Lagrange, i.e. *T* as kinetic energy, in his 1788 *Analytical Mechanics*, kinetic energy was thus defined as:

$$T = \frac{1}{2}mv^2$$

where *2T* denotes the whole "living force of the system". [3]

Etymology

In 1853, or earlier, the term *vis viva* eventually was abandoned in favor of the term "actual energy" introduced by William Rankine.

In Oct 1862, William Thomson and Peter Tait, in their article entitled "Energy" in the latitudinarian Church of Scot magazine *Good Words*, introduced the term "kinetic energy". [9]

In 1871, James Maxwell cited William Thomson and Peter Tait as having introduced "kinetic energy". [4]

Thomson, to note, is assumed to be the lead or primary author, at least as surmised by John Tyndall ("Remarks on the Dynamical Theory of Heat" to William Thomson, 1863), whom the article seems to be directed at. [7] Also, of note, as Crosbie Smith discusses in more detail (1998), there is a bit of a religious issue historical agenda to the publication of this article. [8] In any event, in regards to the etymology of the term "kinetic energy", as G.C. Foster comments on the matter (1863): [8]

> "The distinction here drawn between "motion" and "falling force" is the same as that made by Helmholtz *(Die Erhaltung der Kraft*, 1847) between "*vis viva" (lebendige Kraft)* and "tension" *(Spankraft)*. The English expressions "dynamical energy" and "statical energy " were used by Prof. W. Thomson (Phil. Mag. S. 4. vol. iv. p. 304, 1852) in the same sense, but were afterwards abandoned by him in favor of the terms "actual energy" and "potential energy" introduced by Prof. Rankine. More recently (*Good Words* for

> October 1862) Professors Thomson and Tait have employed the expression **"kinetic energy"** in place of "actual energy"."

Thomson, in retrospect, stated the following on the matter in an 1882 footnote: [6]

> "The name **kinetic energy**, which I subsequently gave as seeming preferable to 'actual energy', has been generally adopted; but Rankine's name 'potential energy' remains to this day, and is universally used to designate energy of the static kind."

In short, the etymology of the modern term "kinetic energy" is a convoluted one, similar to the intricate etymology to the term thermodynamics.

See also

â— Kinetic theory

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External links

â— Kinetic energy – Wikipedia.

θΔics

In physical chemistry, **kinetic factor** refers to the finding that in order for two chemical entities to react, they must not only have the correct "thermodynamic factor", i.e. form stable end state products, as determined by the free energy change of the reaction, but also have the correct collisional energy (see: collision theory) or kinetic energy, i.e. right trajectory, bond orientation, and reactant concentration, in order to get over the activation energy barrier. [1]

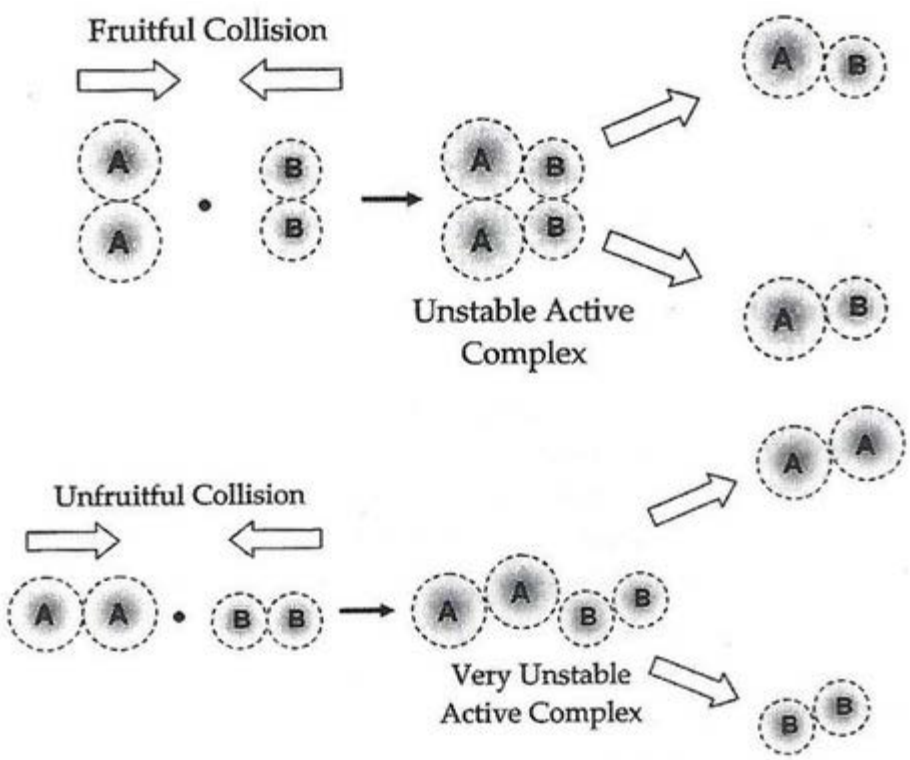

An example of orbital orientation at point of collision (see: collision theory) as an aspect of the "**kinetic factor**" in chemical reactions; namely above: molecular orbitals are aligned, at collision point, in such a way that orbital A and orbital B both make contact, therein allowing the products AB and AB to form; below: molecular orbitals are misaligned at collision point, such that only one orbital A and one orbital B make contact, and no products are formed, i.e. no chemical reaction occurs, only an inelastic collision occurs. [1]

Quotes

The following are related quotes:

> "If you have chemistry, you only need one other thing. Timing. But timing's a bitch."
>
> — Anon (c.2010), Internet (Q) meme

References

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External links

● Chemical kinetics – Wikipedia.
● Kinetic and thermodynamic control – University of Calgary.

θΔics

In physics, **kinetic theory,** or "kinetic theory of gases" or "kinetic theory of heat", as opposed to the "material theory of heat" (or matter theory of heat), is a statistical model which links the temperature of a gas to the velocity of its particles.

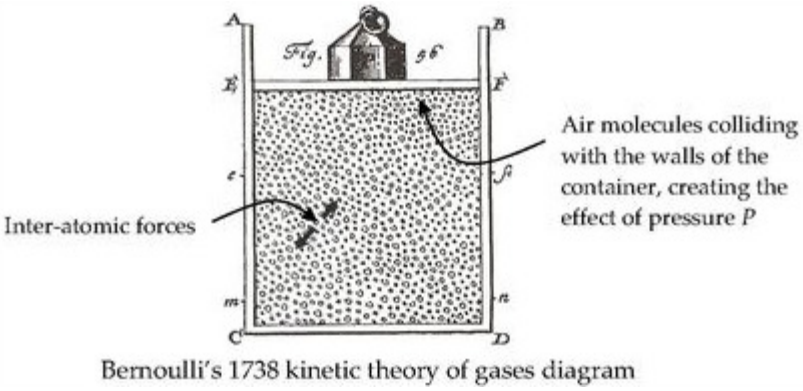

Diagram from Swiss physicist Daniel Bernoulli's *Hydrodynamica*, showing that pressure is the result of the average collisions of gas particles hitting the wall of the container.

Overview

In this kinetic theory, the particles, atoms or molecules, are considered to be spherical, to have non-correlation of velocities, and to have perfectly elastic collisions. [1] The principle founder of the kinetic theory of gases, according to Scottish physicist James Maxwell, is German physicist Rudolf Clausius. [6] Maxwell referred to the theory, which explained the properties of gases, as the "theory of the collisions of molecules". [6]

The term 'kinetic theory of gases', according to the 1898 view of Scottish chemist William Ramsay, concerns the attempts by Daniel Bernoulli, in 1738, to explain Boyle's law (1662) in terms of the nature and motion of particles, followed by similar attempts by John Herapath (1821) and James Joule (1851), whose ideas were systematized in 1857 by Clausius under the name 'Kinetic Theory of Gases.' [9] Another pioneer of kinetic theory is Scottish civil engineer John Waterston (1843).

History

In 1716, Jacob Hermann, a student of Jacob Bernoulli, put forward the following view:

> "Heat, other things being equal, is proportional to both the density of a hot body and to the square of the agitation of its particles."
>
> — Jacob Hermann (1716), *Phoronomia* [11]

In 1738, Daniel Bernoulli, in his *Hydrodynamica*, possibly being influenced by either his father which laid the basis for the kinetic theory of gases. This publication, in which Bernoulli's gave an explanation of Boyle's law, is said to have marked the initiation of the kinetic theory of gases. [7] In this work, Bernoulli positioned the argument, still used to this day, that gases consist of great numbers of molecules moving in all directions, that their impact on a surface causes the gas pressure that we feel, and that what we experience as heat is simply the kinetic energy of their motion. [2] Bernoulli also stated that: [8]

> "The weight *P* [weight of the mass + atmospheric pressure] will vary as the square of the particle velocity (v^2)."

In 1856, August Kronig, German chemist and physicist, published his "A General Theory of Gases", which outlined a simple gas-kinetic model that considered the translational motion of the particles. [3] In 1857, German physicist Rudolf Clausius published his "On the Nature of the Motion which we call Heat", in which, according to his own words independently of Krönig, developed a similar, but much more sophisticated version of the theory which included translational and contrary to Krönig also rotational and vibrational molecular motions. In this same work he introduced the concept of mean free path of a particle. [4]

In 1859, after reading Clausius' paper, James Maxwell formulated what is known as the "Maxwell distribution" of molecular velocities, which gave the proportion of molecules having a certain velocity in a specific range. [5]

Human molecules

William Ramsay, in his 1898 “The Kinetic Theory of Gases and Some of its Consequences”, likened gas molecules to football players.

In 1991, Chinese writer Ben She.Yi Ming, associated with Beijing Science and Technology, published a book entitled *Kinetic Theory of Human Molecules*; though it remains to be seen as to what its contents are. [10]

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(b) Bernoulli, Daniel. (1738). *Hydrodynamica*, *Sive Vivibus et Motimus Fluidorum Commentarii*. Sectio Decima: “De affectionibus atque botimus fluidorum elasticorum, praecipue autem aeris.” (pgs. 200-204). Argentorati, Sumptibus Johannes Reinholdi Dulseckeri.
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External links

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θΔics

In science, **kinetic theory of gases**, oft-cited as "kinetic theory", but not to be confused with the "kinetic theory of billiard balls" (see: billiard ball model), refers to []

Quotes

The following are related quotes:

> The history of atomism goes back to the ancient Greek and Roman philosophers, but the history of the '**kinetic theory of gases**' does not really begin until the 17th century when Torricelli, Pascal, and Boyle first established the physical nature of air."
>
> — Stephen Brush (2003), *Kinetic Theory of Gases* (pg. 1) [1]

> "It was Wallis, Wren, and Christiaan Huygens, who—in response to a request from the Royal Society in 1668—independently formulated the law of impacts. These laws are the basis of the kinetic theory of 'billiard balls' (see: Billiard ball model), atoms represented as [in-] elastic spheres."
>
> — Stephen Brush (2003), *Kinetic Theory of Gases* (pg. 3) [1]

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External links

â— Kinetic theory of gases – Wikipedia.
â— Kinetic theory of gases – NASA.gov.

θΔics

In science, **kinetics**, from the Greek *kinetos* "moved", verbal adjective of *kinenin* "to move" (from the PIE root *keie-* "to set in motion") (O), refers to the force that sets a thing in motion, or the motion produced or resulting therefrom.

Overview

The so-called "kinetic theory" of gases, as developed by August Kronig (1856), Rudolf Clausius (1857), and James Maxwell (1850), argues that atoms and molecules in a gas have three types of motion: translational, rotational, and vibrational.

In 1862, the term "kinetic energy" was introduced by William Thomson and Peter Tait, to replace the older problematic term "vis viva", or living force, introduced by Gottfried Leibniz (1686), in respect to Rene Descartes colliding sphere's experiments (c.1640).

The subject of "chemical kinetics" was introduced by Cato Guldberg and Peter Waage (1864), based on the general model that chemical reactions have both a forward reaction and a reverse reaction, that depends on the amount of active masses of the reactants and the affinities driving the activities of these masses; this was later developed independently by Jacobus van't Hoff (1877).

Quotes

The following are related quotes:

> "Well, one really shouldn't call it a force. It's more accurately an effect of **kinetics**."
>
> — Nicolas (2019), *The Motive Power of Fire* (response to query: "You mean there's something like a life-force that's real?") [1]

See also

- Kinetic factor
- Social kinetics

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External links

- Kinetics (disambiguation) – Wikipedia.

θΔics

In existographies, **Kishore C. Dash** (1961-) (CR:5) is an Indian physicist, part of the Indian school of econophysics, noted for his 2009 to present involvement in Eugene Stanley (1995) based history of econophysics, an example of which include his 2014 chapter "Evolution of Econophysics", in the book *Econophysics of Agent-Based Models*, on agent based econophysics, edited by Bikas Chakrabarti, Anirban Chakraborti, Frederick Abergel, Hideaki Aoyama, and Asim Ghosh. [1]

Origin

Dash explains the origin of his interest in econophysics as follows: [2]

> "In 2006 May, I overheard from some commerce professors that 'stock market is not gambling, it is science'. I was a bit curious. In the same year in the month of Nov, during my refresher course at Calcutta University, I was fortunate to attend few classes of Bikas Chakrabarti, senior professor of Physics, Saha Institute of Nuclear Physics, Kolkata on "A Brief History of Economics". It was amazing and amusing on my part to know that there is a branch of physics called as 'Econophysics'. Later on in Mar 2007, I was able to present a poster and short talk on 'Multiphase Transition of Stock Prices and Stock Indices' in the International workshop on "Econophysics of Markets and Business Networks" under the banner of 'Econophysics Kolkata – III', using thermal physics, based on my experience of teaching undergraduate students. It was certainly due to the influence of Chakrabarti's talk delivered in Calcutta University during my refresher course."

Here, to note, we see econophysics conceptualized as thermal physics of stock prices; which, to note, is something quite different that "thermal physics of people", such as followed by Wenyuan Niu and his 2001 social combustion theory.

Econophysics | History

In early 2014, Dash was attempting to assemble a draft chapter to become book on a history of econophysics, and was seeking to co-author with Libb Thims, to publish with Cambridge University Press, e.g. via Simon Capelin. [4]

In 2019, Dash published *The Story of Econophysics*. [5]

Education

Dash completed his PhD on "Small Angle X-Ray Scattering Study of Pure, Cancerous and Infected Human Bones". His research interests are in the area of small angle x-ray scattering (SAXS), fractals, and econophysics. [3] Dash currently a reader in physics, at Neelashaila Mahavidyalaya, a college in Rourkela, India.

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Further reading

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External links

â— kishoredash (user) – Hmolpedia.

θΔics

In existographies, **Klaus Jaffe** (1951-) (CR:7) is a Venezuelan chemical biologist noted, in sociological thermodynamics, for his 1980s to present efforts to integrate thermodynamic ideas into social dynamics of ants and humans.

Overview

In 1984, Jaffe, in his "Negentropy and the Evolution of Chemical Recruitment in Ants", focused on the application of concepts such as negentropy, synergy, energetics, among others, to explain socialization behaviors in ant societies and human societies.

In 1994, Jaffe wrote "Energetics of Social Phenomena: Physics Applied to Evolutionary Biology", co-written with Carlos Fonck, to explain the social life in terms of energy consumption and irreversible thermodynamics, citing empirical evidence in support of his theory using data from the formation and socialization of ant societies and colonies; an articles cited by Venezuelan-born English chemical engineer Erich Muller, in support of his own 1998 chemical thermodynamics of human societies theory. [1]

In 2001, Jaffe, in his *Evolutionary Biodynamics*, a 100-page online booklet, penned chapters on the thermodynamics of biological and social evolution. [3]

In 2002, Jaffe analyzed human cooperation and altruism with a perspective grounded on thermodynamics, in which he argued that human cooperation can be explained if the energetic balance on the aggregate individual contributions in a society is positive in the long run. [2]

In 2016, Jaffe, with Gerardo Febres, began using free energy (see: human free energy) in his social synergy theory. [5]

Education

Jaffe completed a BS chemistry in 1974 at the University of Simon Bolivar, Caracas, with a thesis "Studies on the function of arsenate in the enzymatic reduction of dihydroxyacetone and its derivative phosphorylated catalyzed by the glycerol-3-P dehydrogenase; a MS in biology, with mention in biochemistry, in 1977 at the Venezuelam Institute for Scientific Research, Caracas, with a thesis "Study of some aspects of the relationship between memory and molecular circuitry in the mantle"; and a PhD in 1979, with a thesis "Chemical Communication Among Workers of Leaf Cutting Ants", at the University of Southampton, England. In 1990 he became a full professor of biological sciences at the University of Simon Bolivar.

Jaffe, of note, also worked in the research group directed by Belgian chemical thermodynamicist Ilya Prigogine in Brussels during a sabbatical.

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θΔics

In terminology, **knowledge** is the fact or condition of being aware of something. [1]

Quotes

The following are related quotes:

> "It seems that the author's continued work in the physical sciences caused him to arrive at this strange title. He might have noticed that in the natural sciences very often ethical parables, far removed from the circle of human **knowledge**, are employed in order to bring about a closer match of the two—and in this sense, in the case of morality, he likely sought to drive the nature the chemical parable back to its mental origins—being that there is, after all, only *one* nature—and also since, within serene realm of rational freedom, the cloudy tracks of passionate necessity move inexorably through their course, only to be wiped out by a higher hand, and perhaps not completely wiped out in this life."
>
> — Johann Goethe (1809), "Advertisement" for *Elective Affinities*, Sep 4

> "When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your **knowledge** is meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science, whatever the matter may be."
>
> — William Thomson (1883) [2]

A depiction of **knowledge**; "The Bookworm" (1850) by Carl Spitzweg.

> "All knowledge can be divided into two classes: subjects that study the interrelations of two or more persons (history, literature, economics, sociology, law, politics, theology, education, etc.) and those that do not (logic, mathematics, physics, biology, and other natural sciences, grammar, harmony, etc.); [the former are slower] in setting in motion activity that becomes the most important and influential in the world."
>
> — Lawrence Henderson (1935), on Machiavelli's studies vs. Galileo's studies [3]

> "Three passions, simple but overwhelmingly strong, have governed my life: the longing for love, the search for **knowledge**, and unbearable pity for the suffering of mankind."
>
> — Bertrand Russell (1956), "What I Have Lived For", Prologue to *Autobiography* [5]

> “If devotion to truth is the hallmark of morality, then there is no greater, nobler, more heroic form of devotion than the act of a man who assumes the responsibility of thinking .... the alleged short-cut to **knowledge**, which is faith, is only a short-circuit destroying the mind.”
>
> — Ayn Rand (1957), *Atlas Shrugged* (Q)

> “No modern chemist, if he is vitally concerned with this experiment as Beard is in discovering the causes of war, would be content with the empirical **knowledge** that the eleventh chemical somehow did the trick, either by itself, or in activating others. He would want to know just why and how the precipitation came about. He would want to know whether he must always use all of the eleven chemicals the way that he did, or if simpler combinations could effect the desired result. In history, Beard contends, we have an analogous situation. There are ten know factors. An eleventh, let us say, the German unrestricted submarine warfare is added. War is declared. Was that the cause of war? No one knows. Furthermore it is impossible to know.”
>
> — Morris Zucker (1945), commentary on Charles Beard’s 1936 chemical analogy argument against causation in history [4]

See also

- Faust
- Tree of knowledge

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- Knowledge – Wikipedia.

θΔics

In hmolscience, **Kozo Mayumi** (1954-), or 眞弓浩三 (Japanese), is a Japanese applied economist, a student of Romanian mathematician Nicholas Georgescu-Roegen and his material entropy hypothesis, notable, in ecological economics, for extending Georgescu-Roegen's theories on entropy in the study of energy analysis. [1] Topics of Mayumi's include dissipative systems models of socioeconomic systems (1997), pseudo measures of entropy, exosomatic energy metabolism of China (2007), among others. [2]

Education

Mayumi completed his MS in engineering from Kyoto University in 1979, a second MA from Vanderbilt University in 1988 in economics, working under Georgescu-Roegen, with a thesis on "Land: Ecological and Economic Achilles' Heel", and a PhD from Kyoto University, with a dissertation on "Studies on Georgescu-Roegen's Bioeconomic Paradigm", from the Graduate school of Engineering at the Department of Applied Mathematics and Physics. In more detail, from 1984 to 1988, Mayumi studied Bioeconomics at the Department of Economics of Vanderbilt University under the supervision of Romanian mathematician Nicholas Georgescu-Roegen. Mayumi has been working in the areas of energy analysis, ecological economics, and complex hierarch theory. He is currently a professor at the University of Tokushima.

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θΔics

In thermodynamics, **Kräft** (force) or **Kräfte** (forces) is the German word for force. The term ‘kraft’ is sometimes translated in English as energy and sometimes as power, although this may depend on context, in the same way the conservation of force differs subtly from the conservation of energy. The following is German chemist Karl Mohr‘s 1837 definition of Kraft: [1]

> "Besides the fifty-four known chemical elements there is in the physical world one agent only, and this is called **Kraft**. It may appear, according to circumstances, as motion, chemical affinity, cohesion, electricity, light and magnetism; and from any one of these forms it can be transformed into any of the others."

To cite one example of a translation ambiguity, the founding paper of thermodynamics, the 1850 “Üeber die bewegende Kraft der Wärme und die Gesetze, welche sich daraus fur die Warmelehre selbst ableiten lassen” by Rudolf Clausius, has the main title “On the Moving Force of Heat” (Üeber die bewegende Kraft der Wärme), but some English reprints, e.g. Eric Mendoza (Dover, 1960), re-title this as “On the Motive Power of Heat”, thus translating Kraft as power, which does not seem to be a technically correct translation, although the meaning still comes across.

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θΔics

In religio-mythology, **Krishna** is a character rescript (see: god character equivalents) mainly of the Horus aspect of the Nun Osiris-Horus motif (see: Osiris rescripts), who in Hinduism (see: Hindu mythology) was reconceptualized as the eight avatar of Vishnu (see: Nu or Nun).

A few parallel comparisons (O) of Christ and **Krishna**, both of whom derive from the more ancient Egyptian religio-mythology based Horus and Osiris stories. [6]

Overview

In c.300BC, Greek historian Megasthenes identified Krishna with Hercules. [1]

In 1791, Constantin Volney identified Krishna with Christ. [2]

> "That being put to death by the wicked, he would gloriously rise again, ascend from hell into heaven, where he would reign forever.' By these expressions was described the life of the same Sun, who, terminating his career at the winter solstice, when Typhon [Set] and the rebellious angels exercised their sway, seemed to be put to death by them; but shortly after revived and rose again (note 97) in the firmament, where he still remains. These traditions went still farther, specifying his astrological and mysterious names, maintaining that he was called sometimes Chris or Conservator (note 98); and hence the **Hindu God, *Chris-en*, or *Christna***; and the Christian *Chris-tos*, the son of Mary. That at other times he was called Yes, by the union of three letters, which, according to there numerical value, form the number 608, one of the solar periods (note 99). And behold, oh Europeans, the name which, with a Latin termination has become your *Yes-us* or Jesus; the ancient and cabalistical name given to young Bacchus, the clandestine son of the virgin Minerva, who in the whole history of his life, and even in his death, calls to mind the history of the God of the Christians; that is, the star of day, of which they are both of them emblems."

In 1889, reverend J.E. Scott, chairman of a missionary relief program in India, in his "Krishna and Christ", outlined the main Christ-Krishna parallels as follows: [4]

> "For the student of religious there can be no more interesting and important question than this: Is there any historical connection between the story of Krishna, the eighth incarnation of Vishnu, the second person of the Hindu triad, and the life and teachings of Christ? And do the similarities found in their lives and teachings show that anything has been borrowed by one from the other? That there are many striking and remarkable similarities and apparent agreements has been frequently pointed out by numerous oriental scholars. And these similarities undoubtedly have been found both in their lives and teachings. Among such resemblances noticeable in their lives are the following: The similarity in the sound of the names Krishna and Christ, the flight into Egypt from the wrath of Herod, and the flight to Gokhula from the wrath of Kansa; the massacre of the innocents by both Herod and Kansa; the miraculously born forerunners, John and Balarama; the songs of the angelic hosts and the worship of both Christ and Krishna by the shepherds; the prominence given to the childhood of both Christ and Krishna in St. Matthew's gospel and in the Vishnu *Purana;* the kinship of Christ and Krishna with kings; the assumption of divinity and the exhibition of miraculous powers by both Christ and Krishna. Weber, Lorinser, Wilson, Muir, Sir William Jones, and

many others, have pointed out at great length many such striking similarities in the respective sacred narratives."

Scott ends is article, to note, by incorrectly concluding that the Hindus copied the Krishna motif from the Bible; correctly, both were rescripts of the stories found in the *Egyptian Book of the Dead*.

Death | Poisonous arrow to foot

In Egyptian mythology, Osiris (Orion constellation), astro-theologically speaking, famously "disappears" (Q) and loses his life (Q), as pointed out by British Egyptologist John Wilkinson (1797-1875) (Q), when the sun was in the Scorpio constellation.

Horus, similarly, in the original Egyptian version (Q), as told in the "Sorrows of Isis" (see: Joshua 10:13), dies by the sting to the foot of a poisonous scorpion. [5]

The stories of Horus and Osiris, who originally were separate gods where merged into a father son relationship, in the Heliopolis creation myth era.

In the Greek rescript version, Orion the hunter, the Greek rescript of Osiris or the Orion constellation, dies from a scorpion sting to the foot:

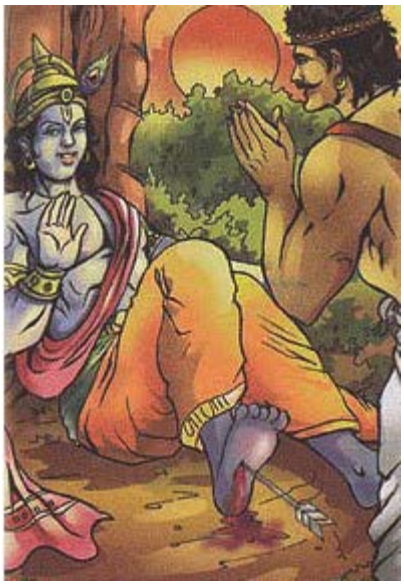

Krishna dies from a poisonous arrow to the foot, just as Osiris, Horus, and Orion, similarly die by poison from the scorpion sting.

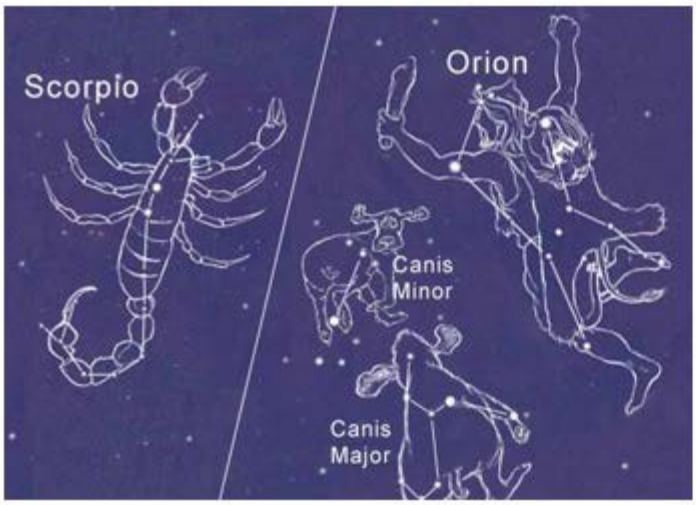

Krishna, in the rewritten Hindu version (Q), dies by being shot in the foot by a poisonous arrow, by a hunter named Jara, who mistakes Krishna's foot for a deer.

> "Note the strong similarity between this [Horus's death] myth and the story of Orion's death from a scorpion sting to his foot (chapter 3). This parallelism is better appreciated when it is realized that the Egyptians identified the constellation of Orion with Osiris, Horus's resurrected father. The Orion myth, then, appears to have descended from this ancient Egyptian story of how the Earth became shrouded in darkness."
>
> — Paul Laviolette (2005), *Earth Under Fire* [5]

The death by poison to the foot, as seen in the stories of Osiris, Horus, Orion, and Krishna, are each parallel rescripts of what originally was an astro-theological story, originating in Egypt.

Quotes

The following are related quotes:

> "Some recent English discussion as to the historic relation of the Christ myth and the Krishna myth would seem to make desirable a judicial and yet popular' investigation of the subject, from the rationalist point of view. By the rationalist point of view, I mean the attitude of disbelief in the supernatural claims of all religions alike — a point of view from which, of course, the question of the miraculous origin of Christianity is already disposed of. The falsity of the bases of that creed has been directly demonstrated a hundred times, and, for those not yet convinced, may be demonstrated again by old and new arguments; and it would merely overload a discussion in comparative mythology to prove in full, by way of preamble, what is properly to be proved by several other lines of inquiry as well. What is now in hand is a question of priority of myth forms."
>
> — John Robertson (1889), *Christ and Krishna* [3]

See also

- Abraham and Brahma
- Christ and Krishna

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θΔics

In hmolscience, **Krzysztof Kulakowski** (c.1950-) is a Polish physicist noted for a number of publications and lectures, beginning in circa 2005, in sociophysics.

Overview

In 2007, Kulakowski, in his chapter "Around the Gap between Sociophysics and Sociology", defined Serge Galam as "one of the leading authors in sociophysics". [1]

In 2008, Kulakowski, "Sociophysics: an Astriding Science", focused on asking if the second law of thermodynamics can be useful in the social sciences", which he does not seem to think is the case. [2]

In 2013, Kulakowski, in query about if he would be interested in being on the JHT review board, commented the following: [3]

> "I would accept it willingly, but the problem is that I deeply do not believe that thermodynamics can be fruitful in solving social sciences, where I work."

See objections to human thermodynamics for more on these types of opinions.

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θΔics

In existographies, **Kurt Bell** (c.1966-) (FA:120) (CR:8) is an American atheist philosopher note his 2011 to present peripatetic stylized vlogs wherein he discusses his beliefs, e.g. how he considers his wife and kids to be "soulless bags of chemicals", his atheism beliefs, etc.

Education

Bell completed his associates degree in biology in 1986 at Chaffey Community College, California and his BA in speech communication in 1990 at Humboldt State University, after which he worked in software development and management. [2]

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External links

â— Kurt Bell – Twitter.

θΔics

In science, **Kurt Godel** (1906-1978) (IQ:170|3351) [RGM:268|1,320+] (Stokes 100:95) (Murray 4000:N/A) (CR:21) (library: 700 books) was Austrian-born logician, mathematician and philosopher, noted for his 1931 incompleteness theorems, two main theorems in total, used by many as an ontic opening argument, the first of which states that in any formal (mathematical or logical) system that is internally consistent (i.e. contains no contradictions), there will be some well-formed propositions that cannot be proven either true or false. [1] Godel is also known for his 1931 Godel's demon (see: scientific demon).

Time

In 1949, Godel produced a proof that in any universe described by relativity, time cannot exist; a conclusion that, supposedly, was semi-endorsed by Einstein. [3]

Incompleteness theorem

In 1931, Godel published his "incompleteness theorem". The following is a sociophysics applied summary of Godel's incompleteness theorem, according to Paris Arnopoulos (1993): [2]

> "According to Godel's theorem all consistent axiomatic formulations of rigorous theories cannot be complete propositions. That is to say, no theory can explain itself because there cannot be a general law that is both logical and finite. Any self-referential system must be either incomplete or inconsistent. Thus, human reason cannot explain completely anything as complicate as itself, since to do so require more connections than are available in the brain."

Arnopoulos, naturally enough, tags Godel's theorem in amid his general discussion of ontic opening theories, namely: the uncertainty principle and the law of conservation of information.

Godel's incompleteness theorem was used in John Boyd, somehow, in his successful war thermodynamics based invasion design of the first Gulf War (1990-1991).

Religion

Godel supposedly gave some type of ontological proof for the existence of god (see: Godel's ontological proof); the following are other related Godel quotes on religion:

> "I like Islam, it is a consistent idea of religion and open-minded."
>
> — Kurt Godel (c.1960) (Q)

> "Ninety percent of [contemporary philosophers] see their principle task as that of beating religion out of men's heads. … We are far from being able to provide scientific basis for the theological world view."
>
> — Kurt Godel (c.1960) (Q)

(add discussion)

Genius rankings

Godel's name frequently comes up in genius IQs rankings. Godel is a Pickover top 14 "most influential" GME; some think his "incompleteness theorem" ranks him up with Aristotle (IQ=195) (video: "The World's Most Incredible Mind", 2011), which seems a bit overzealous; 8+ thread posts on him.

Voltaire | Leibniz

Godel, supposedly, has the following to say about Voltaire: (Q)

> "Whoever became more intelligent by reading Voltaire?

His aversion to Voltaire, likely had something to do with the fact that Godel was a Leibniz proselyte, and a transmigrationist, supposedly (Q). The answer to his question is: Nikola Tesla, who read some 100-volumes of Voltaire: "I had a veritable mania for finishing whatever I began, which often got me into difficulties. On one occasion I started to read the works of Voltaire when I learned, to my dismay, that there were close on one hundred large volumes in small print which that monster had written while drinking seventy-two cups of black coffee per diem. It had to be done, but when I laid aside the last book I was very glad, and said, 'Never more!'"

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External links

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θΔics

In hmolscience, **Kurt Lewin** (1890-1947), pronounced 'Leveen', was Polish-born German American physical sciences trained psychologist noted for his *Field Theory in Social Science*, in which, as summarized by Daniel Rigney, he constructed an entire theory of personality out of the language of physics and topology, filled with references to force fields, valences, gradients, among others. [1]

Overview

In 1937, Lewin, in his "Field Theory and Experiment in Social Psychology", asserted that: [5]

> "To explain social behavior it is necessary to represent the structure of the total situation and the distribution of the forces in it."

In 1956, Judson Herrick ranked Lewin's *Field Theory in the Social Sciences*, along with Nicholas Rashevsky's *Mathematical Biology of Social Behavior* (1951), as two examples of works pointing the way to quantitative treatment of some factors of social analysis. [4]

In 1977, American political scientist Rudolph Rummel expanded on Lewin's work. [3]

In 2002, American psychologist Meg Bond, in her team consultations, supposedly, applies Lewin's notion of 'force field analysis', in which consultants analyzed the resources or driving forces that the team could draw on in their initial state to reach their vision or final state and the various barriers or restraining forces that could make it difficult. [2]

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External links

â— Kurt Lewin – Wikipedia.

θΔics

In symbols, **L** is the symbol for length, which has the units if meters.

A depiction of the letter "**L**", which is often associated with love, as in the "L word", in flames.

The symbol L in colloquial usage is often associated with love as in the "L word", a depiction of which is shown adjacent in flames. The subject of combustion, heat, flames (or fire), light in respect to the human passions, naturally enough, is at the heart of human chemical thermodynamics, and the physical humanities in general.

One of the first formulas for love is the following:

$$\text{Love} \propto \frac{1}{d^2}$$

as done by Italian natural philosopher Francesco Algarotti, in his *Newtonianism for the Ladies*, wherein he employed the inverse square law to calculate the power of attraction between a pair of separated lovers".

External links

â— L – Wikipedia.

θΔics

In science, **laboratory produced life** or *synthesis method* refers to any of a number of attempts, hopes, or objectives of producing, creating, or synthesizing life or an aspect of life under controlled experimental laboratory conditions.

In terms of classification, the synthesis method, according to American quantum physicist Michael Brooks, wherein one attempts to "build something that is 'alive' from scratch", such as by taking certain chemicals and putting them together in ways that might make them alive, is classified as the traditional second option of ways to unravel the essential nature of life; the first being the *trace method*, i.e. to trace the tree of life or the mechanism of life back in time to the point where it all started and where all that existed was chemistry or chemicals; the third being the *definition method*, where one sits down and tries to think up a suitable definition that distinguishes living matter from non-living matter. Brooks notes that the third method is the most well-trodden, but also the one widely admitted to be a dead end. [1]

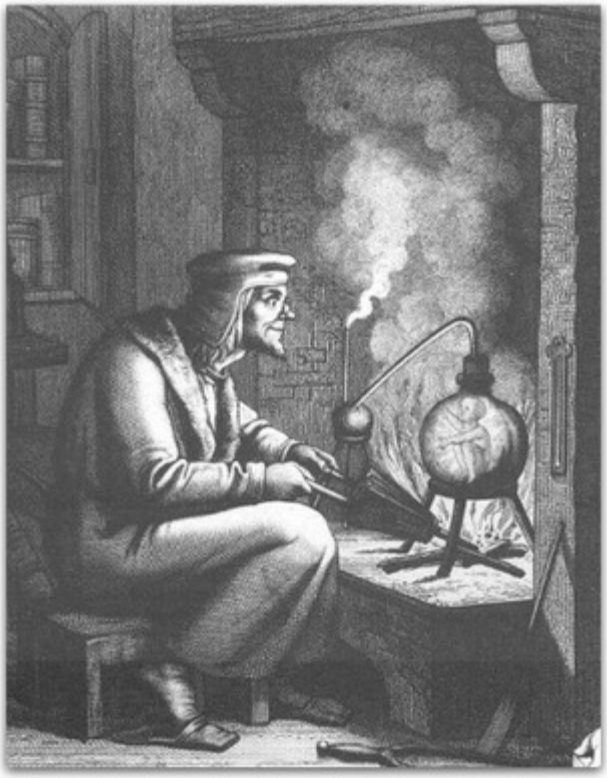

a 19th century engraving of Wagner, a famed sorcerer's former student, creating **Homunculus** in the chemical laboratory using fire (or heat) and some type of chemical apparatus, as described in German polymath Johann Goethe's 1832 *Faust part II*. [5]

History

The hope or object of 'producing life in the laboratory', according a 1946 review by Belgian-born American thermodynamicist Alfred Ubbelohde, has a long and somewhat disreputable ancestry. [2]

The earliest idea, supposedly, traces to the alchemical experiments and theories of Swiss-born Austrian chemist Paracelsus and his homunculi or "receipt to make a man without conjunction". [3]

Ubbelohde cites the literary examples of English writer Mary Shelley's 1818 'Frankenstein' (depicted below) as well as German polymath Johann Goethe's 1832 Dr. Faust and his little chemical-laboratory synthesized character 'homunculus' (depicted adjacent)

The recent idea of 'robots' or artificial life, as the subject is called in modern terms (or even the physical science based premise of physical intelligence, as the US government has recently attempted to formulate), is another example. [4]

In Shelley's version, she was said to have been inspired to outline her scientifically created life fiction/non-fiction version by both her knowledge Paracelsus and the recently published 1791 dead frog leg twitching electrical experiments of Italian physician Luigi Galvani.

In his talk with Eckermann, Goethe is supposed to have said that Homunculus is virtually the same as the Leibnizian entelechy or monad, according to John Williams. [12]

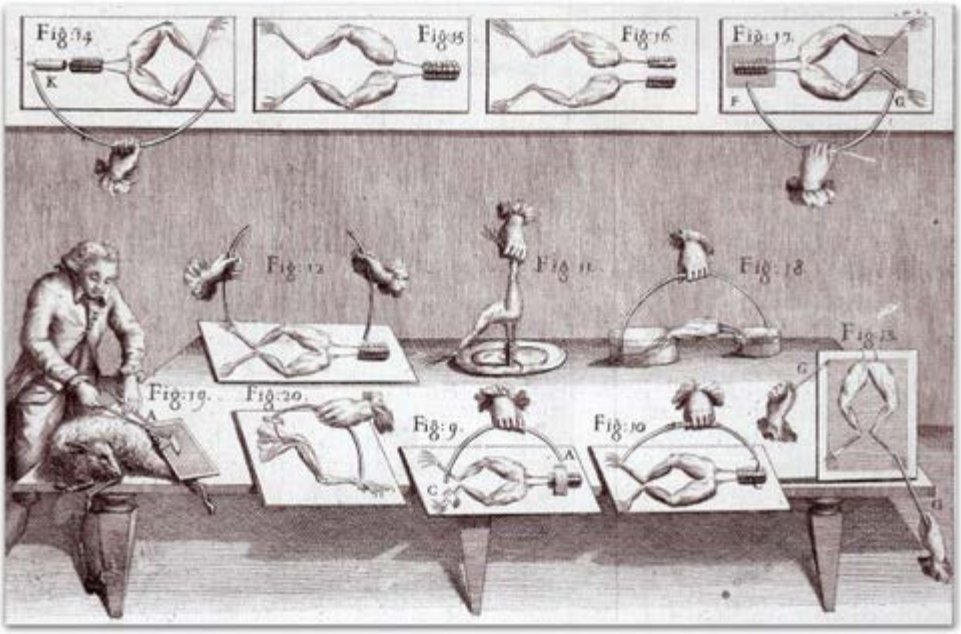

An illustration from a book by Italian Luigi Galvani showing him conducting experiments in 1791 of the ability of electricity to produce movement in dead matter (what he termed as "animal electricity"); a further perusal of his 1771 discovery that dead frog legs can be made to twitch when connected to an metal-junction type of electrochemical circuit (frog legs suspended by copper hooks on an iron rail, the arc or switch made by touching a scalpel of the foot to the rail). [6] These experiments served as the basis to Mary Shelley's famous 1818 story of Frankenstein.

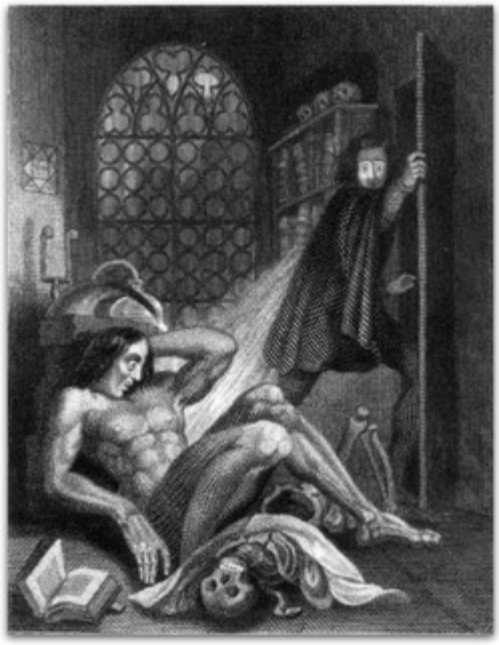

An 1831 Illustration, by Theodor von Holst, of the laboratory creation of Mary Shelley's 1818 story of Frankenstein, a scientifically-created living human made by surgically re-connecting the severed dead parts of various corpses and then reanimating the body with electricity. [7]

Romanian historian Radu Florescu notes that Shelley's father, William Godwin, and her husband, Percy Shelley were both quite familiar with the lives and works of alchemists like Paracelsus and others. Florescu also suggests that Johann Conrad Dippel, an alchemist born in Castle Frankenstein whom he believes may have been the inspiration for Victor Frankenstein, was a student of Dr. David Christianus.

In Goethe's version, as depicted above, the famed sorcerer's former student, Wagner, create a homunculus, who then carries out extended conversations with Mephistopheles as well as travels with him to the Pharsalian Fields to save Faust.

In 1952 the famous Urey-Miller experiment was conducted in which the so-called proto-life chemicals were synthesized in a beaker over several days via the action of electrical sparks.

In origin, in circa 1950, American planetary chemist Harold Urey, a former student of Gilbert Lewis, speculated that the early terrestrial atmosphere was probably composed of ammonia, methane, and hydrogen. To test this hypothesis, Urey then directed his new graduate student Stanley Miller, a newly-forming biochemist, to see if an atmospheric of such mixture is exposed to electric sparks and to water, whether or not it can interact to produce amino acids, commonly called the "building blocks of life", which are precursor units needed to make proteins.

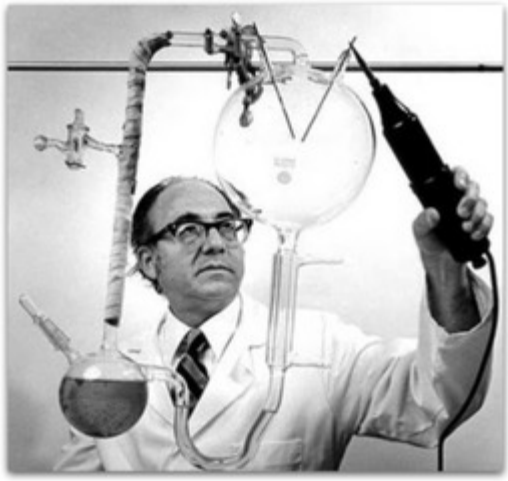

American biochemist Stanley Miller demonstrating the outline of his famous 1952 spark-creating life experiment.

Laboratory measured life

In the theme of laboratory produced life, there have been a number of noted attempt to measure life (vs death) quantitatively in controlled laboratory conditions.

One of the more famous experiments is Italian physician Francesco Redi's series of experiments, published in 1668 as *Esperienze Intorno alla*

Generazione degl'Insetti (*Experiments on the Generation of Insects*) which is regarded as one of the first steps in refuting "spontaneous generation", a theory also known as Aristotelian abiogenesis. At the time, prevailing wisdom was that maggots formed naturally from rotting meat. In his experiment, Redi took six jars, which he divided in two groups of three: in the first jar of each group, he put an unknown object; in the second, a dead fish; in the last, a raw chunk of veal. Redi took the first group of three, and covered the tops with fine gauze so that only air could get into it. He left the other group of jars open. After several days, he saw maggots appear on the objects in the open jars, on which flies had been able to land, but not in the gauze-covered jars.

A 2011 artistic rendition of **soul weighing**, i.e. of a person's soul or spirit leaving their body at the point of death, such as would have been conceived by those as King Charles II (c.1670) or Douglas MacDougall (1900) in their death weighing experiments. [11]

He continued his experiments by capturing the maggots and waiting for them to metamorphose, which they did, becoming flies. Also, when dead flies or maggots were put in sealed jars with dead animals or veal, no maggots appeared, but when the same thing was done with living flies, maggots did. [10] The earliest outline of this ideology of quantitatively weighing the state of life as compared the state of death traces to the circa 2,500BC Ra-theology based conception of the weighting of the soul after death in the judgment hall, depictions of which abound on the tombs of ancient Egypt.

Thermodynamic soul weighing

See also: soul snow

The first attempt to prove or disprove this life-death weight distinction was the circa 1670 famous weighing problem of King Charles II who in question of whether 'life' can be weighed, compared the weight of a live and a dead fish. [8] Charles II, the founder of the Royal society, initiated the problem to solve the so-called supposed finding that a dead fish weighed more than a live fish.

A variation of this experiment was then again carried out with a dying person in 1901 by American physician Douglas MacDougall, who theorized that if the soul exists it "must exist as a space-occupying body" and thus have a measurable mass; his measurements found that the average "soul substance" weighs 3/4th of an ounce (or 21 grams). This value soon entered urban legend.

In 1905, German-born American physicist Albert Einstein introduced his famous mass-energy equivalence formula ($E = mc^2$), which showed that mass and energy were equivalent. In 1939, it was noted that Einstein's formula implied that a small amount of mass might be converted into a large amount of energy or came to be known as "nuclear energy" and this prompted the famous "Einstein-Szilard letter" (written by Leo Szilard), which led to the Manhattan Project (1942) and thus to the 1945 atomic bombings of Hiroshima and Nagasaki. These showings instilled the possibility that the soul might be related to nuclear energy, in some round-about way.

The pros and cons of this premise was touched, in terms of mass converting into nuclear energy by both Belgian-born American thermodynamicist Alfred Ubbelohde (1946), in verbal thermodynamics discussion, and American chemical engineer and physician Gerard Nahum (1998), in formulaic thermodynamic discussion as well as proposed experimental outline.

Test tubers and cloning

A variation of laboratory produced life, although not as famous as the philosopher's stone quest for the synthesis of the so-called "life" from the so-called "non-life", is the process of test tube babies or in vitro fertilization (sperm and egg joined outside of the body), the first human created via this method being the 1978 Louise Brown, and cloning (creation starting with a somatic cell), the first animal creating via this method being the 1996 sheep

named “Dolly”.

1978 *Time* cover stimulate by the birth of the world's first test tube baby, Louise Brown.

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â— Berg, Siv F. (2008). “Artificial Creation of Human Beings – Three Cultural Prototypes: Goethe’s Homunculus, Shelly’s Monster, and Huxley’s Creatures”, Talk, Nov. 12, Cambridge University.
â— Ball, Philip. (2011). *Unnatural: the Heretical Idea of Making People* (pg. 3). Vintage Books.

θΔics

In existographies, **Ladislao Reti** (1901-1973) was an Italian chemical engineer and da Vinci historian, particular in respect to engine pioneers, noted for []

Overview

In 1969, Reti, in his “Leonardo da Vinci the Technologist: the Problem of Prime Movers”, recounts how he tried to collect all the related manuscripts of Leonardo da Vinci in respect to his theories on heat, steam, and heat engines: [1]

> “In contrast to the scarce interest of Leonardo in the utilization of wind-power, heat and fire as possible sources of energy received his constant attention. Years ago, I tried to collect and discuss all the pertinent references in the Vinci manuscripts, and the late Ivor Hart examined them in a chapter of his last book. The invention of the steam engine marked the effective beginning of the conquest of energy. And, from the very beginning, the development of steam power was correlated with the evolution of the internal combustion engine. We are indebted to Professor Joseph Needham for a thought-provoking essay on the ‘Pre-Natal History of the Steam-Engine’, where the origin of every single part of the compound mechanism is discussed and traced (boiler, cylinder and piston, double acting principle, crank and rod transmission, etc.).
>
> It is remarkable that each of those elements was discovered long before Newcomen and Watt and used in several kinds of mechanical applications, generally in the East. However, a distinct thread can be traced back from Watt to Heron of Alexandria in the Western development of the steam engine. Watt's attention was first directed to the subject in the year 1759, by Dr. Robinson, a scholar in the University of Glasgow, and a few years later by professor Anderson, who asked him to overhaul a model of the Newcomen engine. Newcomen was acquainted with the work of Savery and Papin, just as they were with the experiments described by Morland, the Marquis of Worcester, and David Ramsay.
>
> All of them, in their turn, were under the influence of an important group of scholars whose interest in the study of the behavior and dynamics of fluids, i.e. pneumatics, was explosively stimulated by the [Latin] printing of Heron's *Pneumatica* in 1575. Pneumatics, after being merely a kind of a game and a curiosity, became a science with Galileo, Torricelli, Blaise Pascal, Edme Mariotte, Otto Guericke, and especially Robert Boyle.”

Reti then discredits the oft-purported statement about Gerolamo Cardano, in his "obscure passage", being the first claim that a vacuum is made when steam condenses, even though he was an avowed avacuist: [3]

> “Most of the writers on the history of steam power attribute to Cardan the fundamental statement that a vacuum is created by the condensation of steam. It is unaccountable how the obscure passage in the *De subtilitate* [pg. 25] was interpreted to the credit of Cardan. More than fifty years earlier, Leonardo had clearly made the same statement several times. For example, in MS E, back cover, we read:
>
> > “When air [steam] is condensed into rain it will produce a vacuum, if the rest of the air does not prevent this by filling its place, as it does with a violent rush.”
> >
> > — Leonardo da Vinci (c.1495), MS E (back cover)
>
> Of course, Leonardo calls water ‘vapor’ or steam ‘air’, just as the later chemists called every kind of gas an air. But if we forgive Leonardo's faulty terminology, the meaning is clear.”

Reti then states that da Vinci presaged both Giovanni Porta (c.1601) and Salomon de Caus (c.1615):

> "To our greatest surprise, all the famous 'theorems' of Salomon de Caus, which made him one of the founding fathers of the conquest of steam power, had been clearly enunciated by Leonardo, as shown in my cited publication. Leonardo da Vinci attempted to determine the volume of steam obtainable by evaporating a given amount of water, long before Della Porta (1606), as can be seen in the familiar folio 10r of the Codex Leicester. Less known in the same Codex (fol. 15r) is Leonardo's description of other analogous experiments, revealing an amazing knowledge of the relation existing between volume, temperature, and pressure of vapors and gases. His approximate estimation of the quantity of steam evolved by the evaporation of an ounce of water points to the ratio 1:1,500. J.B. Besson, in his 1569 *L' Art et la Science de Trouver les Eaux*, still believed that the proportion was 1:10, a ratio raised to 1:255 in the famous experiments of Jean Rey. It was not until 1683 that a better estimate 1:2,000 was made by Samuel Moreland, the correct figure being around 1:1,700."

Reti then goes on to argue that the "Architronito" or steam-powered cannon was a unique invention of da Vinci, and not solely made by Archimedes, as follows:

> "Leonardo's best-known contribution to the history of the conquest of steam power is his famous 'Architronito' (MS B, fol. 33r), a steam cannon. Needham remarked recently that the 'Architronito' was symbolic in the highest degree if we may look upon the piston as a tethered projectile. As for the attribution to Archimedes, I hope I have demonstrated convincingly in a recent paper that the steam gun is one of the most original ideas of Leonardo. Following older authorities (Valturius and Petrarca) he credited Archimedes with the invention of the ordinary gunpowder bombard. He merely did not realize that his own substitution of steam for gunpowder was a very significant additional invention."

Reti then concludes with the conjecture that the "unknown author" employed by Giovanni Branca, as discussed by Francois Arago:

> "If, against all probability, steam is ever used in a state of direct blast, Branca, or the **currently unknown author** to whom he has been able to borrow this idea, will take the first place in the history of that breath of new kind of machines. With regard to current machines, the titles of Branca are completely null and void."
>
> — Francois Arago (1939), *Eloge Historique de James Watt* (pg. 20)

was da Vinci, and his Codex Leicester (folio 28v) discussion of a steam-driven meat-roasting jack:

> "Water which is blown through a small hole in a vessel in which it is boiled, is blown out with a fury and is entirely changed into wind, and by this means, meat is turned to be roasted."
>
> — Leonardo (c.1495), Codex Leicester (folio 28v)

Reti also points out that da Vinci, on several pages of Codex Atlanticus (fos. 80r, b; 400v, a; 380v, a), depicts cauldrons (aeolopiles) in the form of a human torso, identical to that found in Branca's book.

Education

Reti completed his BS in chemical engineering at Techniche Hochschule, after which he went he worked as an assistant to Hermann Suida, at the Institute of Organic Chemistry, Vienna, after which he completed his PhD in organic

chemistry at the University of Bologna. [2]

Quotes | By

The following are quotes by Reti:

> "The only detail that differentiates Leonardo's machine from those of Huygens and Papin is the system adopted for raising the weight sustained by the piston. Huygens and Papin use a pulley and rope transmission (the same that Leonardo adopted in his experiments with steam), while Leonardo preferred to attach a rod to the bottom of the piston."
>
> — Ladislao Reti (1969), "Leonardo da Vinci the Technologist: the Problem of Prime Movers" (pg. 98) [1]

> "It is remarkable that the internal combustion engine utilizing the same mechanical arrangement precedes historically the steam engine, though substantial practical application came much later. A common origin of both inventions is revealed in the evolution of the experiments of Huygens and Papin. Papin came to the idea of the atmospheric steam engine (1690) after Huygens' experiments (1673) with a piston, moved by the pressure of the air consequent to the explosion of a charge of gunpowder in the cylinder (atmospheric internal-combustion engine), failed to give consistent results? In several surveys of this important chapter of the history of technology, the abbe Jean de Hautefeuille (1678) is credited with the invention of the first gunpowder engine. This is a manifest error: the experiments of Huygens were known at least from 1673, even though he published them later. Besides, Hautefeuille's device is a water-raising box and not an engine."
>
> — Ladislao Reti (1969), "Leonardo da Vinci the Technologist: the Problem of Prime Movers" (pg. 98) [1]

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Further reading

● Da Vinci, Leonardo. (1974). *Unknown Leonardo* (editor: Reti Ladislao) (heat-operated device, pg. 173). McGraw-Hill..
● Anon. (1973). "Ladislao Reti, Who Helped Find Leonardo Notebooks, Dies" (Q), New York Times, Nov 3.

External links

● Ladislao Reti (Croatian → English) – Wikipedia.

θΔics

In existographies, **Lady Professor** (c.1830-c.1885) (SN:59), her characterized name, abbreviated LP, herein, or **Girtham Girl**, abbreviated GG, her used vicarious pen name (Ñº), was an anonymous female science and or mathematics professor of Girtham College, whose lectures, essays, and other matter, as found in her desk, after her passing, were collected and published posthumously by Peter Hampson (1854-1930) (MA, Oriel College, Oxford) (Ñº), and or Elliot Stock (pg. 131), one of her former students (possibly turned husband), in a book entitled *The Romance of Mathematics: Being the Original Researches of a Lady Professor of Girtham College in Polemical Science, with Some Account of the Social Properties of a Conic; Equations to Brain Waves; Social Forces; and the Laws of Political Motion*. [1]

Social forces

In her "Social Forces" lecture (pgs. 72-77), LP stated the following:

> "In this lecture I propose to examine some of the forces which exist in our social system, and shall endeavor to estimate them by methods of mathematical procedure and analogical reasoning. We will begin with the old definition of force as *that which puts matter into motion, or which stops, or changes, a motion once commenced.* When a mass is in motion, it has a capacity for doing work, which is called *energy;* and when this energy is caused by the motion of a body it is called kinetic energy, in mathematical language:
>
> $$KE = \frac{1}{2} mv^2$$
>
> Another form of kinetic energy is called potential energy, which is in reality the capacity of a body for doing work *owing to its position.* For example, we may take an ordinary eight-day clock. When the weights are wound up, they have a certain amount of potential energy stored up, which will counteract the friction of the wheels and the resistance of the air on the pendulum. Or, again, we have the example of a water-wheel: first the water in the reservoir, being higher than the wheel, has an amount of potential energy. This is converted into kinetic energy in striking against the paddles, and after this we have potential energy again produced by the action of the fly-wheel.
>
> By the principle of conservation of energy, if we consider the whole universe, not our planet alone (for its heat and energy are continually diminished to some slight degree), we find that *no energy is lost.* Force is recognized as acting in two ways: in *statics*, so as to compel rest, or to prevent change of motion; and in *Kinetics*, so as to produce or to change motion; and the whole science which investigates the action of force is called *dynamics*. All this is of course pure mathematics, and I have made these elementary observations for the benefit of my younger hearers, the students of this University. My grave and reverend seniors will pardon, I am sure, the repetition of facts well known to them for the sake of those who are less informed than themselves.
>
> Now before I proceed further, I will endeavor to point out that **these elementary truths of physical science hold good in our social system**. Each individual is a mass, acted on by numerous forces, capable of 'doing work,' which work can be measured and his velocity calculated. Some individuals have a vast *potential energy;* that is to say, from their position and station in the social system, they have a power which is capable of producing work which a less exalted individual has not."

Here, we recall the similar 1868 views expressed by Norman Lockyer and Balfour Stewart. [2]

Romance | Student

On Jun #, LP, in her diary notes (pg. 128), jotted her confusion on the matter of a student who was in love with her and her love for science, and being "forced" to choose between the two, per reason that married women couldn't hold professorships in her day:

> “It has come! and I half expected it. My eager pupil writes with all the energy and love of his noble nature to ask me to be his wife! He says *that* is all he cares for, and only values his Honors as a step to a higher honour and dignity, that of gaining my love and being my husband. All this is very nice to read; but a terribly difficult problem is placed before me for solution. I do indeed love this dear, good fellow—no one could help doing so, I am sure; but do I not love science more? There is a stringent regulation in this University that no one shall occupy the position of professor who is bound by any domestic ties or cares. All married women are excluded. If I say 'Yes,' I must resign my high position, leave this beloved college, give no more lectures to entranced audiences. In the interests of science, ought I to refuse, and sacrifice my heart's affections for the cause of mathematics? But if I say 'No,' I must give up—*him;* sacrifice his happiness too, and blight his life. Was ever anyone so perplexed? Science, aid thine obedient servant! May I not determine this vital question by thine all-pervading light? ....”

(add)

Reviews

In 1868, an anon book review, in *Nature*, edited by Norman Lockyer, dismisses Girtham Girl’s work as follows: [3]

> “We ought to apologize for going into such detail, but our account will show our readers that the present work does not deal with mathematical discoveries. It is a ‘skit’, with the perusal of which a reader acquainted with mathematics may while away, not unpleasantly, an odd half-hour or two.”

Here we see a short-sighted mind, to say the least.

Quotes

The following are quotes by LP:

> “I have been engaged, as you are doubtless aware, for some years in the pursuit of mathematical research, exploring the mines of science, which have of late been worked very persistently, but often, like the black diamond mines, at a loss. Concurrently with these researches, I have speculated on the great social problems which perplex the minds of men, both individually and collectively. And I have come to the conclusion that the same laws hold good in both spheres of work; that methods of mathematical procedure are applicable to the grand social problems of the day and to the regulation of the mutual relations which exist between man and man. Take, for example, the force of public opinion. Of what is it composed? It is the Resultant of all the forces which act upon that which is generally designated the 'social system.' Public opinion is a compromise between the many elements which make up human society; and compromise is a purely mechanical affair, based on the principle of the parallelogram of forces. Sometimes disturbing forces exert their influence upon the action of Public Opinion, causing the system to swerve from its original course, and precipitating society into a course of conduct inconsistent with its former behaviour ; and it is the duty of the governing body to eliminate as far as possible such disturbing forces, in order that society may pursue the even tenor of its way.”
>
> — LP (c.1883), “Lecture on the Theory of Brain Waves and the Transmigration and Potentiality of Mental Forces”, in: *The Romance of Mathematics* (pg. 16-17)

> “The application of mathematics to the study of social science and political government has curiously enough escaped the attention of those who ought to be most conversant with these matters. I shall endeavor to prove in the present lecture that the relations between individuals and the government are similar to those

which mathematical knowledge would lead us to postulate, and to explain on scientific principles the various convulsions which sometimes agitate the social and political world. Indeed, by this method **we shall be able to prophesy the future of states and nations, having given certain functions and peculiarities appertaining to them**, just as easily as we can foretell the exact day and hour of an eclipse of the moon or sun. In order to do this, we must first determine the *social properties of a conic section.*"

> — LP (c.1885), "Lecture on the Social Properties of a Conic Section and the Theory of Polemical Mathematics", in: *The Romance of Mathematics* (pg. 25-26)

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θΔics

In hmolscience, **Lake Lambert III** (c.1966-) is an American ethics and religion scholar noted for his 2009 *Spirituality, Inc.: Religion in the American Workplace*.

Overview

In 2009, Lambert, in his *Spirituality, Inc.: Religion in the American Workplace*, attempts to use Max Weber's interpretation of "elective affinities", noting that Weber learned this concept from Goethe (e.g. he cites the famous reaction description of chapter four), to describe "workplace spirituality" or spirituality in the business corporation, arguing something to the effect that there exists an "elective affinity" between business and religion. [1]

Lambert, at one point (pg. 154), asserts that Weber's 1904 usage of elective affinities was the first time the concept had been used in the social sciences; this, however, is an incorrect assertion. American Henry Carey, in his *Principles of Social Science* (1858), e.g., was using "affinity" for both chemicals and humans, similar to what Goethe did. [2] There are, no doubt, many other examples of social usage of elective affinities amid the period 1809 to 1904.

Education

Lambert completed his BA in economics and history and his masters in theology both at Emory University, after which he completed a PhD in social ethics at Princeton Theological Seminary. (Ñº) In 1996, he joined the faculty of Wartburg College where he was a professor of religion and ethics and a Board of Regents Chair in Ethics. In 2010, he became dean of the College of Liberal Arts at Mercer College, Macon, Ga., and in 2015 became president of Hanover College, Indiana. (Ñº)

Quotes

The following are related quotes:

> "I am fascinated by vocation—my own, other people's, and the very idea of a god who calls frail human beings to be part of god's mission in the world. Growing up in Nashville, Tennessee, my family owned a small business, and I saw how my parents tried to connect faith and work. Along with my own struggles to discern a calling, I am sure that these experiences helped shape my teaching and research interests in vocation, business ethics, and workplace spirituality. My favorite theologians include St. Augustine, Martin Luther, Reinhold Niebuhr, and Martin Luther King. I enjoy reading biographies of historical figures, the novels of Graham Greene, and the Dave Robicheaux novels of James Lee Burke."
>
> — Lake Lambert (2014), "Roberts Department of Christianity" about statement (Ñº)

References

1. Lambert, Lake. (2009). *Spirituality, Inc.: Religion in the American Workplace* (affinities, 14+; affinities in 1904, pg. 154). NYU Press.
2. Carey, Henry C. (1858-59). *The Principles of Social Science* (Vol I , Vol II, Vol III). J.B. Lippincott & Co.

θΔics

In hmolscience, **Lancelot Whyte** (1896-1972) was a Scottish engineer, physicist, and physicalism-based one nature evolution philosopher noted for []

Overview

In 1974, Whyte, in his posthumous *The Universe of Experience*, attempted to outline a "universal principle" verbalized sort of argument about the physics of organisms, using a soft-atheism slanting type of approach.

His work is cited by new age thinkers, such as Rupert Sheldrake (Q) and Nathan Schwartz-Salant (Q), two name two, and anti-reductionist theists such as Judson Herrick.

Quotes

The following are representative quotes:

> "The unitary principle provides a non-quantitative theory of tendency applicable to a wide class of one-way processes. It leads, e.g., to a theory of organism using terms which are equally relevant to 'physical' and to 'mental' processes, and do not imply any fundamental dualism."
>
> — Lancelot Whyte (1949), *The Unitary Principle in Physics and Biology* (pg. 45); cited by Judson Herrick (1956) in *The Evolution of Human Nature* (pg. 52) [1]

References

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Further reading

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● Whyte, Lancelot. (1955). "On the Relation of Physical Laws to the Processes of Organisms", *Brit. J. Phil. Sci.*, 7, 347
● Whyte, Lancelot. (1961). *Roger Joseph Boscovich, S.J., F.R.S., 1711-1787: Studies of his Life and Work on the 250th Anniversary of his Birth* (phlogiston, pgs. 159-60, etc.). G. Allen & Unwin.
● Whyte, Lancelot. (1974). *The Universe of Experience: A Worldview Beyond Science and Religion*. Publisher.

External links

● Lancelot Law Whyte – Wikipedia.

θΔics

In genius studies, **Landau genius scale** (LGS), Landau's ranking (LR), or "Landau physicist genius scale", is a personal ranking of physics geniuses, e.g. greatest physicists ever (of the 20th century predominately), maintained by Russian physicist Lev Landau (1908-1968), assembled in circa 1930s, and modified over the years, which he supposedly kept in his coat pocket; amid which he ranked himself, considering thinkers below him to be "fools", and those above him to be "superior intellects", and those comparable to him, e.g. Wolfgang Pauli, supposedly, to make him angry if they were skeptical of his views and or theories.

	Landau genius scale
0	Isaac Newton
0.5	Albert Einstein
1	Paul Dirac Erwin Schrodinger Richard Feynman [11] Niels Bohr Werner Heisenberg Louis de Broglie [11] Satyendra Bose Eugene Wigner, and a few others
1.5	**Lev Landau** (in later years) [8] Hans Bethe (2016) [12]
2	**Lev Landau** (after 1962 Nobel Prize) Juan Maldacena (2008) [9]
2.5	**Lev Landau** (before 1962 Nobel Prize)
3	Edward Witten (2008) [9]
3.5	
4	
4.5	David Mermin (own estimate ±)
5	Mundane or "pathologists"

Votes

The following is a photo of of Lev Landau with his teacher Niels Bohr visiting the physics department of Moscow State University, 1961, with Landau's genius scale #s shown:

A few recent votes include:

1.0 Lev Landau [vote | 2008] [9]
2.5 Edward Witten [vote | 2016] [12]
3.5 David Mermin [vote | 2016] [12]

(add)

Logarithmic | Scale

Landau's scale, according to Vitaly Ginzburg (2004), was a logarithmic scale, from 0 to 5, according to which a physicist in the first class had ten times the impact of someone in the second class, and so on. [7]

Feynman

Landau, at one point, according to Russian physicist Vitaly Ginzburg (2004), ranked Richard Feynman in the 1 category. [8]

Pauli | Anecdote

Lev Landau, according to David Kahana (2015), was well-known to be utterly merciless with colleagues that he considered to be lesser intellects than himself. The only person, according to Kahana, who easily matched him in

arrogance was Wolfgang Pauli. The following is the story, quite possibly apocryphal, as reported by Lubos Motl (2008), of what is supposed to have happened when Pauli met Landau: [10]

> "Landau who treated everyone else as a fool found his match in Pauli. After explaining his work to a skeptical Pauli, he angrily asked whether Pauli thought that his ideas were nonsense. 'Not at all, not at all,' came the reply. 'Your ideas are so confused I cannot tell whether they are nonsense or not'."

(add)

Overview

> *See main: Landau genius scale*

In the years circa 1930 to 1960, Russian physicist Lev Landau (1908-1968) developed a personal physicist ranking system, which he kept on him, using a logarithmic 0 to 5 point scale (Lifshitz, 1974) (Pitaevskii, 2010) to rank, in his calculated opinion, the great physicists. (Q)

In 1974, Landau's close associate Russian Evgeny Lifshitz, in a talk at the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, mentioned Landau's genius scale; an account of which is given by Indian physicist Asoke Mitra (2006) as follows: [1]

> "Landau's classification of outstanding genius physicist, as narrated by his close associate Evgen Lifshitz, at a talk given in 1974 at the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy. According to Landau's classification, Isaac Newton received the highest rank, 0, followed by Albert Einstein at a rank of 0.5, then by Niels Bohr, Werner Heisenberg, Erwin Schrodinger, Paul Dirac, Satyendra Bose, Eugene Wigner, and a few others at 1, and so on. Landau had given himself a modest rank of 2.5. The classification continued to the rank of 5 for mundane physicists."

A 2008 rendition of Landau rankings by Czech theoretical physicist Lubos Motl, is shown below: [9]

Landau's ranking

Landau liked to rank physicists on a 0-5 logarithmic scale.

- 0: Newton
- 0.5: Einstein
- 1: Bohr, Heisenberg, Dirac, Schrödinger; Bose, Wigner
- 2: Landau (initially 2.5)
- 4.5: David Mermin (who wrote Homage of a 4.5 to a 2)

Similarly, Russian physicist Lev Pitaevskii (2010), one of Landau's former students, corroborates Lifshitz's account of the scale, as follows: (Q)

> "**Landau** was always walking around with a ranking of the best physicists in history recorded in his notebook. He scored them on a logarithmic **scale** of 0 to 5. Newton was rated the best. Einstein was next and, of course, Bohr. After them came Heisenberg, Dirac, Schrödinger, Bose and Wigner."

Landau, according to both of these accounts, ranks Newton first. Pitaevskii, to note, seems to places Dirac at 5th place

and Schrodinger at 6th, contrary to Lifshitz who puts Schrodinger at 5th and Dirac at 6th.

as a light-hearted sally by a great man who was constantly trying to classify and systematize everything. On this scale, physicists were allotted to five classes. Einstein alone occupied the position ½, while class 1 was headed by Bohr, followed by Schrödinger, Heisenberg, Dirac, Fermi, and others. Landau

Livanova (1980)

↓

Let me first modify my title. There is a short biography of Landau by Anna Livanova. There she describes his classification of physicists on a logarithmic scale from 1 to 5. Einstein has a special rank, ½. Bohr, Schrödinger, Heisenberg, and a few others were 1s. Landau, originally a 2½, later promoted himself to a 2. Members of class 5 were called "pathologists." When I reviewed[1]

Mermin (1988)

→

[18] Landau kept a ranking of how smart various physicists were—ranked on a logarithmic scale. Einstein was on top with a ranking of 0.5. Bose, Wigner, and Newton all received a ranking of 1. Schroedinger, Heisenberg, Bohr, and Dirac were ranked 2, and Landau modestly ranked himself a 2.5 but after winning the Nobel Prize raised himself to 2. He said that anyone ranked below 4 was not worth talking to.

Simon (2013)

Miss-attributions | Incorrectly cited rankings

A contradictory account of Landau's ranking, wherein Einstein, supposedly, is ranked first, with a score of ½, *above* that of Newton, who is said to be assigned with a score of 1, is found Anna Livanova's 1980 biography of Landau, entitled *Landau: a Great Physicist and Teacher*. [2]

In 1981, American physicist David Mermin published a review of this book, for *Physics Today*, entitled "One of the Great Physicists … and Great Characters", wherein he cites the Landau scale, as follows: [3]

> "Landau's classification of physicists on a scale of 1 to 5, Einstein rating ½, Bohr and the other founding fathers 1, Landau himself 2½ (but promoted later in life to 2), and the 5s 'pathologists'."

In 1988, Mermin, in his talk "My Life with Landau: Homage of a 4½ to a 2", elaborated on the scale as follows: [4]

> "Let me first modify my title ["My Life with Landau"]. There is a short biography of Landau by Anna Livanova. There she describes his classification of physicists on a logarithmic scale from 1 to 5. Einstein has a special rank, ½, Bohr, Schrodinger, Heisenberg, and a few others were 1s. Landau, originally a 2½, later promoted himself to a 2. Members of class 5 were called 'pathologists'. When I reviewed this book for *Physics Today* the editor asked for a short biographical blurb. Just say, I replied, that I've worked in fields of interest to Landau in hope of getting out of class 5. So, in Jun 1981 *Physics Today*, you can read at the bottom of page 61, "N.D. Mermin is a professor of physics at Cornell University. Struggling to qualify as a 4½, he has made occasional contributions to the theory of phase transitions and liquid helium."

In 1997, citing Mermin, Einstein biographers Anthony Hey and Patrick Walters refer to the scale as follows: [5]

> "Landau used to keep a list of names, in which he graded physicists into 'leagues'. The first division contained the names of physicists such as Niels Bohr, Werner Heisenberg and Erwin Schrodinger, the founding fathers of quantum physics, as well as historical 'giants' such as Isaac Newton. He was rather modest about his own classification, grading himself 2½, although he later promoted himself to a 2. Landau [also] created a 'superleague' containing only one physicist, Einstein, whom he uniquely classified as a ½."

The list of publications that mis-attribute, per Livanova-Mermin, Landau equating Newton, BELOW that in intelligence of Einstein, and on part or EQUAL in intellect with the likes of "Bohr, Heisenberg, and Schrodinger" [10] or "Satyendra Bose and Eugene Wigner" [6], and so on, seems to be endless.

Later years

Landau, in his later years, according to Vitaly Ginzburg (2004), mentioned his "classification" less often as the years passed, supposedly, taking a more sober view of classifying people.

Quotes

The following are related quotes:

> "Of all the physicists I have known personally, nobody resembled Landau more than Feynman. This resemblance extends to many things, scientific style, aspects of their personality and behavior, and interest in pedagogical ideas."
>
> — Vitaly Ginzburg (1993), "A Unique Physicist and Teacher of Physicists" [11]

> "Lev Landau was a genius and I propose to upgrade him from 2 to 1.5 if not 1 on the Landau scale."
>
> — Lubos Motl (2008), "Lev Landau was Born 100 Years Ago" [9]

References

1. Mitra, Asoke. (2006). "Letter: Why No 'New Einstein'?" (pdf), *Physics Today*, pg. 11, Nov.
2. Livanova, Anna. (1980). *Landau: a Great Physicist and Teacher*. Pergamon Press.
3. Mermin, N. David. (1981). "One of the Great Physicists … and Great Characters", *Physics Today*, Jun; in: *Boojums All the Way Through: Communicating Science in a Prosaic Age* (§3:35-37). Cambridge University Press, 1990.
4. Mermin, David. (1988). "My Life with Landau: Homage of a 4½ to a 2", Talk delivered at the Landau Memorial Conference, Tel Aviv, Jun, 1988; in: *Frontiers of physics: proceedings of the Landau Memorial Conference, Tel Aviv, Israel, 6-10 June, 1988* (pgs. 43-). Pergamon Press; in: *Boojums All the Way Through: Communicating Science in a Prosaic Age* (§4:38-51; quote, pg. 39). Cambridge University Press, 1990.
5. Hey, Anthony J.G. and Walters, Patrick. (1997). *Einstein's Mirror* (pg. 1). Cambridge University Press.
6. Simon, Steven H. (2013). *The Oxford Solid State Basics* (note 18, pg. 33). Oxford University Press.
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(b) Hsu, Stephen. (2005). "Out on the Tail" (Q), Information Processing, Blogspot, Feb 19.
9. Motl, Lubos. (2008). "Lev Landau was Born 100 Years Ago" (Q), The Reference Frame, Blogspot, Jan 22.
10. (a) Motl, Lubos. (2008). "Lev Landau was Born 100 Years Ago" (Q), The Reference Frame, Blogspot, Jan 22.
(b) Where would Edward Witten fall in Lev Landau's scale? (2015) – Quora.com.
11. Ginzburgh, Vitaly. (1993). "A Unique Physicist and Teacher of Physicists", *Priroda* [*Nature*], 2:29; in: *About Science, Myself and Others* (Article 10: "Lev Davidovich Landau: the Physicist and the Man" (retitled), pgs 267-; pg. 281). CRC.
12. Anon. (2016). "Landau Genius Scale" (Q), Hmolpedia Forums, Oct 18.

θΔics

In information theory, **Landauer's principle** argues that energy has to be expended to erase information. This principle was put forward in the 1960s by German-born American physicist Rolf Landauer.

Landauer's principle, said another way, argues that in order to erase one bit of information, we need to increase the entropy of the environment by at least as much. In other words we need to dissipate at least one bit of heat into the environment (which is just equal to the bit of entropy times the temperature of the environment). [2]

In 1961, through some demonstrations, Landauer argued that when information is lost in an "irreversible circuit", i.e. a circuit whose inputs cannot be reconstructed from its outputs, the information becomes entropy and an associated amount of energy is dissipated as heat.

Some have reasoned that this principle links thermodynamics with information theory. [1]

A 2011 paper by Vlatko Vedral argues that in quantum physics or quantum mechanics, one can, in fact, erase information and cool the environment at the same time and that this, in some way, "flout the second law", owing to a relation between entanglement and negative entropy. [2]

References

1. Daintith, John. (2005). *Oxford Dictionary of Science* (5th ed.). Oxford: Oxford University Press.
2. Vedral, Vlatko. (2011). "Does Quantum Mechanics Flout the Laws of Thermodynamics", *Scientific American*, Guest Blog, Jun 01.

Further reading

â— Thims, Libb. (2012). "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair" (url), *Journal of Human Thermodynamics*, 8(1): 1-120, Dec 19.

External links

â— Landauer's principle – Wikipedia.

θΔics

In education, language refers to written form of the spoken word.

Etymology

The following diagram (Q) shows the origin of all modern written language from Sumerian pictographs and Egyptian hieroglyphs: [1]

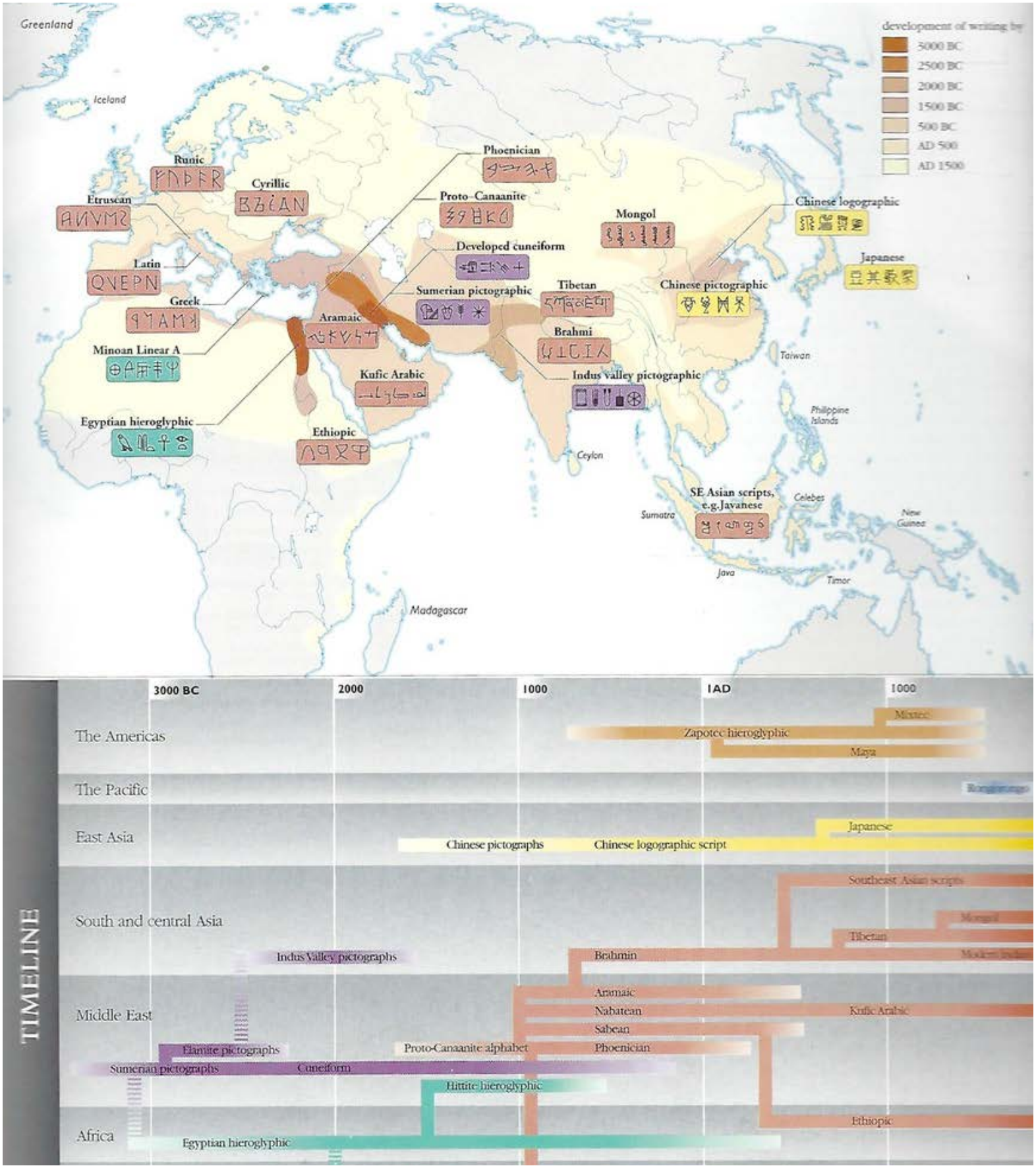

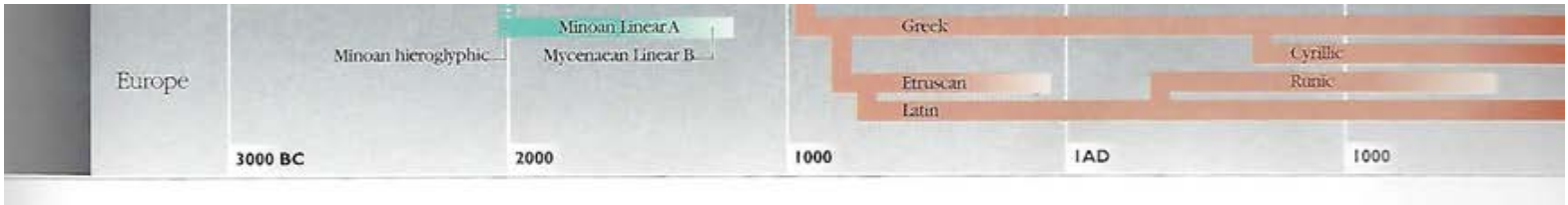

Now, of note, there is some ongoing debate as to whether Sumerian or Egyptian is older, or whether one derived from the other, and also as to what influence each had on each other, e.g. they both have the same flood and boat motif in their respective mythologies (see: god character rescripts). The following, alternatively, shows both Sumerian mythology (or religion) and Egyptian mythology (or religion) arising simultaneously at 3,200BC: [2]

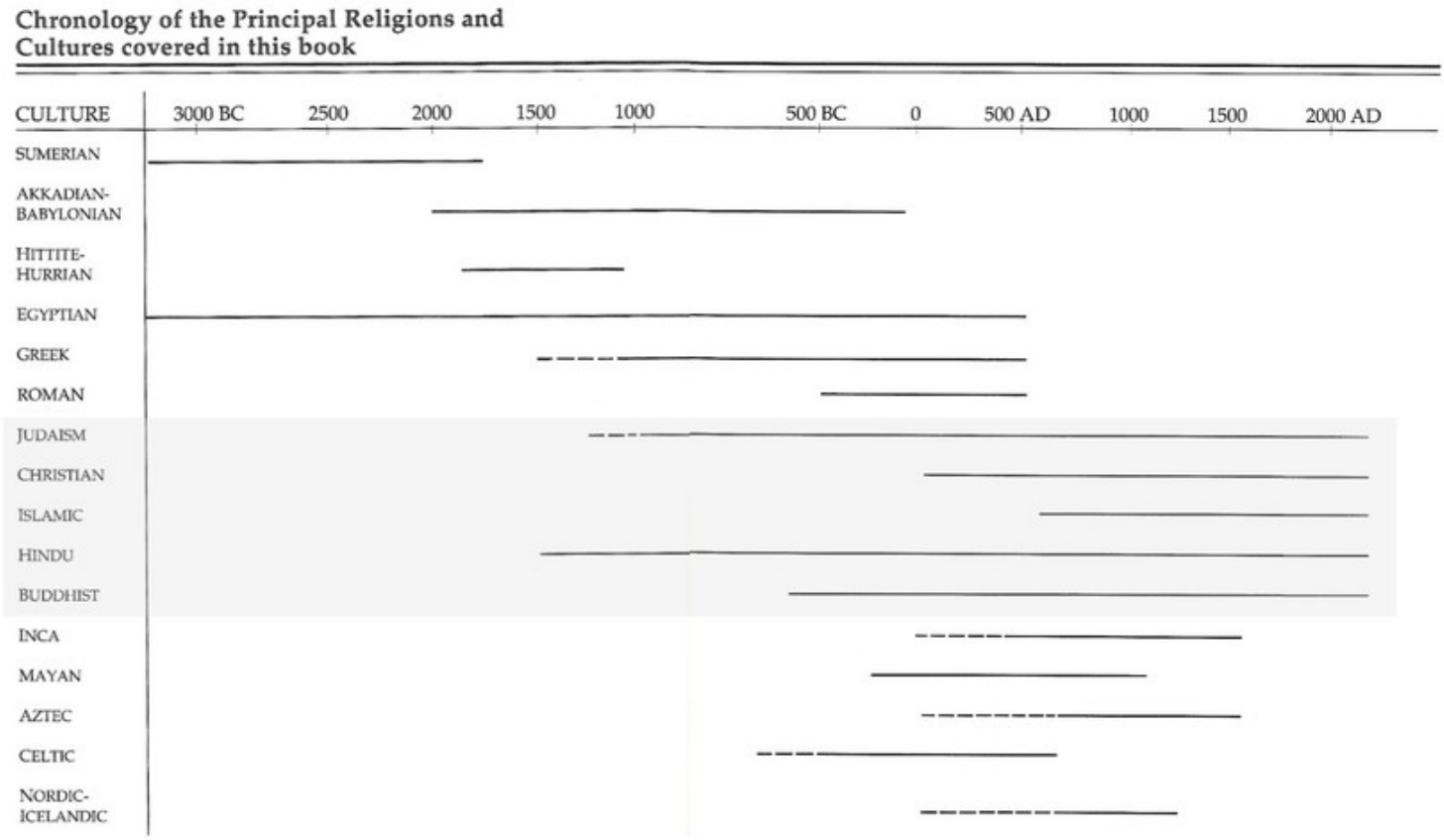

Jordan's **Religions Existence Period Diagram** (1996)

The key feature that differentiates the two, is that owing to Egypt's geographical location, desert on one side, and ocean on the other side, and fertile Nile running through the center, they as a culture were fortified on each side from attack and take-over, hence their culture and concordant religion held sway for about 4,000-years of active operation, as compared to the Mesopotamian religions (Sumerian mythology and Akkadian mythology, and Babylonian mythology), which had shorter existences, and hence less long-term culture influence, in respect to modern world religions.

Hmolpedia

The following are stub-size language translations of the human thermodynamics article (with linked subpages in the drop menu):

- Menschliche thermodynamik ("Mechanische Wärmetheorie", however, was the original name for thermodynamics used by Clausius) – Deutsch (German)
- Thermodynamique de l'homme – Français (French)
- Termodynamiki człowieka – Polski (Polish)
- Человек термодинамики – Русский (Russian)
- 人間の熱力学 – 英語 (Japanese)
- Humanos termodinámica – Español (Spanish)

- Umano termodinamica – Italiano (Italian)
- پارسی – ترمودینامیک بشر – (Persian)
- İnsan termodinamik – Türkiye (Turkish)

See also

- English translations needed

References

1. Haywood, John. (1997). *Atlas of World History* (Forward: Barry Cunliffe) (pg. 1.07). Barnes & Noble.
2. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World*. Facts on File, Inc.

θΔics

In scientific demons, **Laplace's demon**, or the "Holbach-Laplace intelligence" or "Holbach's geometrician", is a hypothetical vast intellectual entity, conceived originally by Baron d'Holbach (1770) and following him by French mathematician Pierre Laplace (1773; 1814), who if it knew the precise location and momentum of every atom in the universe could then use the laws of motion to reveal the entire course of cosmic events, past and future. [1]

An artistic rendition of **Laplace's demon**: a vast intellect that knows forces and positions of all atoms and great bodies of the universe, who with this information knows the future and the past with absolute certainty.

Holbach

See main: Holbach's geometrician

In 1770, Baron d'Holbach, in his §4: "Of the Laws of Motion common to all the Beings of Nature—of Attraction and Repulsion—of Inert Force—of Necessity", stated the following very-ripe anti-chance (or non-chance) view of a dust storm and a political revolution: [3]

> "Two examples will serve to throw the principle here laid down, into light—one shall be taken from **physics**, the other from **morals**. In a whirlwind of dust, raised by elemental force, confused as it appears to our eyes, in the most frightful tempest excited by contrary winds, when the waves roll high as mountains, **there is NOT a single particle of dust, or drop of water, that has been placed by 'chance'**, that has not a cause for occupying the place where it is found; that does not, in the most rigorous sense of the word, act after the manner in which it ought to act; that is, according to its own peculiar essence, and that of the beings from whom it receives this communicated force. A **geometrician exactly knew the different energies acting in each case**, with the properties of the particles moved, could demonstrate that after the causes given, each particle acted precisely as it ought to act, and that it could not have acted otherwise than it did.
>
> In those terrible convulsions that sometimes agitate political societies, shake their foundations, and frequently produce the overthrow of an empire; there is not a single action, a single word, a single thought, a single will, a single passion in the agents, whether they act as destroyers, or as victims, that is not the necessary result of the causes operating; that does not act, as, of necessity, it must act, from the peculiar essence of the beings who give the impulse, and that of the agents who receive it, according to the situation these agents fill in the moral whirlwind. This could be evidently proved by an understanding capacitated to rate all the action and re-action, of the minds and bodies of those who contributed to the revolution."

Here we see Holbach, in his jettisoning of Greek chance-based version of atomic theory, stating what would later become the basis of what is commonly called Laplace's demon.

Laplace

In 1770, a young Pierre Laplace, then aged 21, or some time thereabouts, read Holbach's then anonymously-published *The System of Nature*, and soon their after became his disciple. Ralph Blumenau (2014), in his *Philosophy and Living* (Ñº), summarizes this as follows:

> "Holbach's best known book, prudently published under another name, was *Le Systime de la Nature* (1770). Helvetius had concentrated his attack on the clergy, but had (perhaps only out of fear) professed his full adherence to the Christian faith. Holbach scoffed at all religious beliefs. At worst, he thought, they were based on fear, superstition and the inability to face nature's indifference to suffering. At best, it was the making of hypotheses for who might be the architect of what we call 'creation'. Like **his disciple**, the

> scientist De Laplace, Holbach would have said that he had no need of such a hypothesis. Nor would Holbach have any truck with Spinoza's equation between 'god and nature' (*Dew sive Natura*). For Holbach, this was merely an attempt to anthropomorphize or pantheize nature. Nature consists entirely of matter and motion; the causes that operate in it come wholly from within itself and not from anything outside of it. It is entirely indifferent to what we call good or evil; everything within nature is governed by egoism (what Spinoza had called the *conatus sese preservandi*)."

In 1773, Pierre Laplace, in his "Research on the Integration of Differential Equations with Finite Differences and their use in the Theory of Randomness", read to the Royal Academy, is said to have stated an early version of what would later become, famously, Laplace's demon.
The finalized version of Laplace's demon seems to have been penned in his 1814 "A Philosophical Essay on Probabilities", an extension of a lecture on probabilities delivered in 1795 to the normal schools, on his inauguration as a mathematics professor with Joseph Lagrange, which eventually became a book entitled *The Analytical Theory of Probabilities*, the essay being specifically on the subject of probabilities applied to the most important question of life, such as the principles of reason, justice, and humanity. The opening of this 1814 essay is as follows:

> "All events, even those which on account of their insignificance do not seem to follow the great laws of nature, are a result of it just as necessarily as the revolutions of the sun. In ignorance of the ties which unite such events to the entire system of the universe, they have been made to depend upon final causes or upon hazard, according as they occur and are repeated with regularity, or appear without regard to order; but these imaginary causes have gradually receded with the widening bounds of knowledge and disappear entirely before sound philosophy, which sees in them only the expression of our ignorance of the true causes.

Present events are connected with preceding ones by a tie based upon the evident principle that a thing cannot occur without a cause which produces it. This axiom, known by the name of the *principle of sufficient reason*, extends even to actions which are considered indifferent; the freest will is unable without a determinative motive to give them birth; if we assume two positions with exactly similar circumstances and find that the will is active in the one and inactive in the other, we say that its choice is an effect without a cause. It is then, says Leibnitz, the blind chance of the Epicureans. The contrary opinion is an illusion of the mind, which, losing sight of the evasive reasons of the choice of the will in indifferent things, believes that choice is determined of itself and without motives.

> We ought then to regard the present state of the universe as the effect of its anterior state and as the cause of the one which is to follow. Given for one instant an **intelligence** which could comprehend all the forces by which nature is animated and the respective situation of the beings who compose it—an intelligence sufficiently vast to submit these data to analysis—it would embrace in the same formula the movements of the greatest bodies of the universe and those of the lightest atom; for it, nothing would be uncertain and the future, as the past, would be present to its eyes.
>
> The human mind offers, in the perfection which it has been able to give to astronomy, a feeble idea of this intelligence. Its discoveries in mechanics and geometry, added to that of universal gravity, have enabled it to comprehend in the same analytical expressions the past and future states of the system of the world. Applying the same method to some other objects of its knowledge, it has succeeded in referring to general laws observed phenomena and in foreseeing those which given circumstances ought to produce. All these efforts in the search for truth tend to lead it back continually to the vast intelligence which we have just mentioned, but from which it will always remain infinitely removed."

The modern popular version of Laplace's demon is as follows:

> "We may regard the present state of the universe as the effect of its past and the cause of its future. An **intellect** which at a certain moment would know all forces that set nature in motion, and all positions of all items of which nature is composed, if this intellect were also vast enough to submit these data to analysis, it would embrace in a single formula the movements of the greatest bodies of the universe and those of the tiniest atom; for such an intellect nothing would be uncertain and the future just like the past would be present before its eyes."

Hugh Roberts (1997), in respect to how Percy Shelley, supposedly, read both versions, copying the above Holbach version in his notes, summarizes this as follows: [4]

> "Holbach's *Systeme de la nature* dates from 1770, whereas the paper that contains Laplace's most famous statement of absolute determinism, 'Research on the Integration of Differential Equations with Finite Differences and their use in the Theory of Randomness' ('Recherches sur I'integration des equations differentielles aux differences finies et sur leur usage dans la theore des hasards'), was read to the Royal Academy in 1773, and published in 1776 (Oeuvres completes, vol. 8). Shelley also refers to Laplace in his notes, and had evidently read his *Systeme du monde* (Hutchinson, 809)."

(add)

Exorcism

Laplace's demon is said to have met its demise with the publication of German physicist Rudolf Clausius' 1865 *The Mechanical Theory of Heat*, which introduced the concepts of entropy and irreversibility into mechanics. [2] In simple terms, the mechanics described by Isaac Newton's three laws of motion (*Principia*, 1686) are reversible with respect to time (e.g. Poincaré recurrence theorem, 1890), whereas Clausius' two laws of the mechanical theory of heat are irreversible with respect to time (e.g. Loschmidt's paradox, 1876), described verbally by the the effect that entropy increases in all natural processes and described mathematically by famed 1856 inequality of Clausius (Clausius inequality), which introduced the arrow of time into celestial mechanics.

Thermodynamic demons

With the downfall of Laplace's demon, the rise of the so-called "thermodynamic demons" soon took its place, the first of which being the famed Maxwell's demon (1867), then Szilard's demon (1929), along with various fictional devices said to contain a Maxwell's demon, such as the Nefastis Machine (1865).

A 2009 rendition, by Libb Thims, of a humorous meeting **Laplace's demon** and Maxwell's demon.

Quotes

The following are related quotes:

> "Besides, since everything happens by fate, as will be shown elsewhere, if there could be any mortal who could observe with his mind the interconnection of all causes, nothing indeed would escape him. For he who knows the causes of things that are to be necessarily knows all the things that are going to be. But since no one but God could do this, what is left for man is that he should be aware of future things in advance by certain signs which make clear what will follow. For the things which are going to be do not come into existence suddenly, but the passage of time is like the unwinding of a rope, producing nothing new but unfolding what was there at first."
>
> — Cicero (44BC), *On Divination* (Ñº)

> “Everything proceeds mathematically...if someone could have a sufficient insight into the inner parts of things, and in addition had remembrance and intelligence enough to consider all the circumstances and take them into account, he would be a prophet and see the future in the present as in a mirror.”
>
> — Gottfried Leibniz (c.1770), *Publication* (Ñº)

> “Any point of matter, setting aside free motions that arise from the action of arbitrary will, must describe some continuous curved line, the determination of which can be reduced to the following general problem. Given a number of points of matter, & given, for each of them, the point of space that it occupies at any given instant of time; also given the direction & velocity of the initial motion if they were projected, or the tangential velocity if they are already in motion; & given the law of forces expressed by some continuous curve, such as that of Fig. 1, which contains this Theory of mine; it is required to find the path of each of the points, that is to say, the line along which each of them moves. [...] Now, although a problem of such a kind surpasses all the powers of the human intellect, yet any geometer can easily see thus far, that the problem is determinate, & that such curves will all be continuous [...] & a mind which had the powers requisite to deal with such a problem in a proper manner & was brilliant enough to perceive the solutions of it (& such a mind might even be finite, provided the number of points were finite, & the notion of the curve representing the law of forces were given by a finite representation), such a mind, I say, could, from a continuous arc described in an interval of time, no matter how small, by all points of matter, derive the law of forces itself; [...] Now, if the law of forces were known, & the position, velocity & direction of all the points at any given instant, it would be possible for a mind of this type to foresee all the necessary subsequent motions & states, & to predict all the phenomena that necessarily followed from them.”
>
> — Roger Boscovich (1763), *A Theory of Natural Philosophy* (Ñº)

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θΔics

In thermodynamics, **Lawrence Kaufman** (c.1930-2013), or Larry Kaufman, was an American metallurgist, of the MIT school of thermodynamics, notable for founding the science of computational thermodynamics in 1966, via his calculation of phase diagrams method (CALPHAD method). [1]

Overview

Kaufman received his BS in metallurgical engineering from the Polytechnic Institute of Brooklyn in 1952 and a ScD from the Massachusetts Institute of Technology in 1955. [2] Kaufman's first thermodynamics work was the modeling of the thermodynamic properties of the Fe-Ni system, while a student at MIT, beginning in about 1953. [3] Kaufman completed his doctorate under Morris Cohen, a charismatic steel metallurgist, on the topic of simple equilibrium calculations directed at practical problems of the steel industry. [4] In 1967, Kaufman began to face opposition, in his calculations of binary phase diagrams using an ideal solution model, from solid-state physicists who preferred to use first-principles calculations of electronic band structures instead of thermodynamical inputs. In the end, however, he prevailed.

CALPHAD method

The method developed by Kaufman is named as CALPHAD (CALculation of PHAse Diagrams). [5] Later he worked closely with Dr. Mats Hillert, who also completed the Sc.D. in Morris Cohen's group at MIT, on further development of the CALPHAD approach. Kaufman founded the Mens Lab to apply thermodynamics to practical engineering applications. Besides, he founded the CALPHAD inc for organizing the activities of the CALPHAD research community, such as the annual CALPHAD conference. Kaufman also founded the CALPHAD journal, which is published by the publisher Elsevier. The CALPHAD method is nowadays considered as one of the most powerful tools for materials design, and is adopted widely in both academia and industry. Kaufman was always active in research, and considered as the leader of the CALPHAD research community beyond all doubt. The last time he attended the CALPHAD conference was 2012 in University of California, Berkeley, and the last paper published by him is a short viewpoint on CALPHAD and its vital role in the Materials Genome Initiative, written jointly with John Ågren, who was a doctoral student of Mats Hillert at KTH Royal Institute of Technology, Sweden. [6]

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θΔics

In thermodynamics, **Lars Onsager** (1903-1975) was a Norwegian-born American chemical engineer and physical chemist noted for his 1931 reciprocal relations, which founded the subject of near-equilibrium thermodynamics, and for his 1968 win of the Nobel Prize in chemistry for the formulation of these relations. [1]

Education

Onsager completed his BS in chemical engineering in 1925 at Norwegian Institute of Technology and then went on to studying with Dutch physical chemist Peter Debye at Zurich University for three years. In 1928 Onsager moved to the United States where he studied at John Hopkins University and Brown University. His thesis on reversible processes was considered incomprehensible by the chemistry, physics and mathematics departments at Brown University. He eventually received his PhD from Yale University in 1935, with a dissertation entitled "Solutions of the Mathieu equation of period 4 pi and certain related functions." In 1945, he was awarded the J. Willard Gibbs Professor of Theoretical Chemistry.

References

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(b) Onsager, Lars. (1968). "The Motions of Ions: Principles and Concepts", *Nobel Lecture*, 11 December.
(c) Lars Onsager (biography) – NobelPrize.org.

Further reading

- Onsager, Lars. (1931). "Reciprocal Relations in Irreversible Processes I" (abs) (pdf), *Physics Review*, 37:405-26.
- Onsager, Lars. (1931). "Reciprocal Relations in Irreversible Processes II" (abs) (pdf), *Physics Review*, 37:2265-79.

External links

- Lars Onsager – Wikipedia.
- The Lars Onsager Archive – NTNU Library.

θΔics

In science, **William Lash Miller** (1866-1940), oft-cited as W. Lash Miller, was Canadian chemist noted for his 1925 article "The Method of Willard Gibbs in Chemical Thermodynamics", cited by Herbert Salzer as a prerequisite to any type of Gibbsian thermodynamics approach to any type cellular upwards equilibrium theory reading. [1]

Overview

Miller is best remembered as one of the first proponents of Gibbsian thermodynamics in North America, a subject he first became acquainted with in Ostwald's laboratory. Although Gibbs, the first person to put the whole of thermodynamics, including chemical thermodynamics on a sound basis, was at Yale University, as Professor of Mathematical Physics, the language of his work was mathematical and the result was less readily accepted in North America than in Europe. Miller is credited with having done a great deal to make the subject intelligible, as well as palatable, to Canadian students and scientists. He is also known for studies on chemical equilibrium, reaction rates, and diffusion, and, in electrochemistry, transference numbers, over-voltage and high current electric arcs. In later years, he became interested in yeast and the effect of various substances on the growth of living cells. In addition to being a brilliant research man, he was a first-class teacher, many remember him for the enthusiasm he brought to the teaching of thermodynamics and electrochemistry. [2]

Education

Miller completed his BS in 1887 in chemistry at the University of Toronto, where his first teacher was Henry Croft, a former student of Michael Faraday. Miller then went to Germany to study at Berlin, Gottingen, and Munich, receiving the first of two PhD degrees at Munich under Baeyer in 1890. He then moved to Leipzig to work with Wilhelm Ostwald and Jacobus van't Hoff. Although appointed demonstrator in chemistry at the University of Toronto in 1891, he spent his summers in Leipzig, and in 1892 received his second PhD. In 1894, he was promoted to the rank of lecturer (the Chemistry Department then having a staff of three: one professor, one lecturer, and one demonstrator), and then to associate professor in 1900, professor in 1908, and finally to department head in 1921, retiring in 1937.

References

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â— McBryde, W.A.E. (1989). "William Lash Miller (1866-1940)" (abs), in: *Electrochemistry, Past and Present* (§12:165-70). American Chemical Society.

External links

â— W. Lash Miller (publications) – OpenLibrary.org.

θΔics

In genius studies, **last person to know everything**, i.e. technically "last man to know everything", as there has never been a "last woman to know everything", possibly Hypatia, the only known purported "female universal genius", aside, is a title or epitaph that has been attributed to a number of individuals over the years.

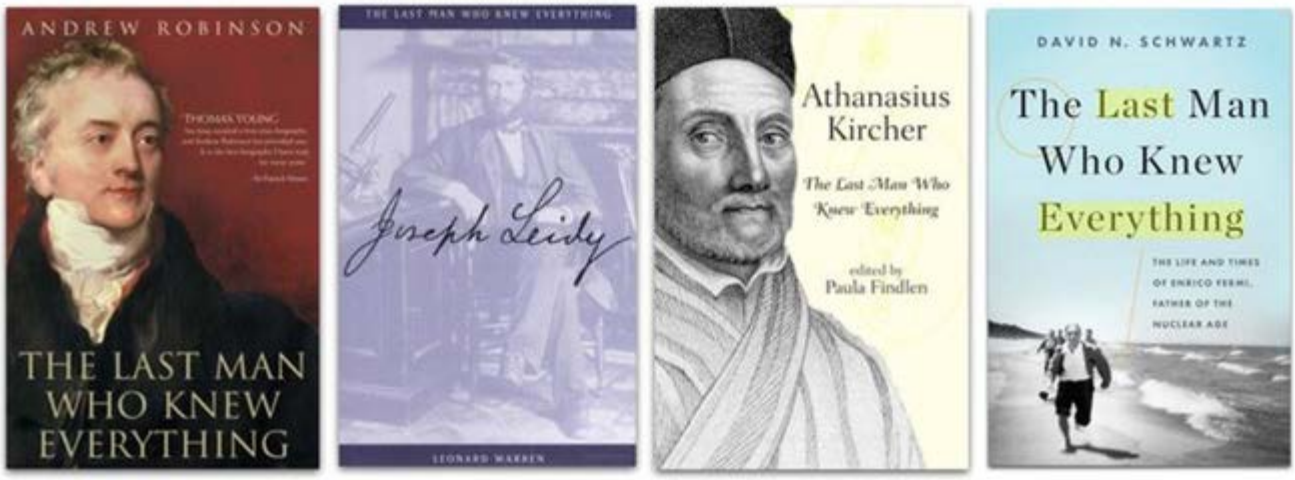

A selection of four books, on: Thomas Young (1733-1829), Joseph Leidy (1823-1891), Athanasius Kircher (1602-1680), and Enrico Fermi (1901-1954), each subtitled with the "**last man who knew everything**" epitaph.

> "Nothing is more beautiful than to **know all**."
>
> — Athanasius Kircher (c.1670) (Ñº)

> "Spend a few thoughts sometimes on the puzzling inquiries concerning vacuums and atoms, the doctrine of infinites, indivisibles, and incommensurables in geometry, wherein there appear some insolvable difficulties: do this on purpose to give you a more sensible impression of the **poverty of your understanding** and the imperfection of your knowledge. This will teach you what a **vain thing** it is to fancy that you **know all things**, and will instruct you to think modestly of your present attainments."
>
> — Isaac Watts (1727), *The Improvement of the Mind* (pg. 22); read by Michael Faraday at age 14

The following page gives an overview of oft-cited names attributed with this title.

At least four, as shown adjacent, namely: Thomas Young, Joseph Leidy (IQ:150|#439), who built on Goethe's morphology work, and Athanasius Kircher, and Enrico Fermi, have had books written about them, with the epitaph "last man to know everything" attributed or affixed to their name. [7]

Intellectual breaching point

Sometime between 1700 to 1900, predominately, people began to profess the view that the body of "known knowledge" had become so large that it was no longer possible for one person to know everything. To situate this postulate in the context of a date, French philosopher Pierre Levy argues, in his 1994 *Collective Intelligence*, that the publication of Frenchman Denis Diderdot and Jean d'Almbert's *Encyclopedie* (1751-1772) marks "the end of an area in which a single human being was able to comprehend the totality of knowledge."

English mathematician-physicist Karl Pearson, in his science overhauling 1892 book *Grammar of Science* (the first book on Albert Einstein's "Olympia Academy" study group reading list) stated his view that naturalist Alexander Humboldt, pictured adjacent, was someone at the cusp of total knowledge possession (as was his

associate Goethe, also pictured): [35]

> "At the beginning of this century it was possible for an Alexander von Humboldt to take a survey of the entire domain of the extant science. Such a survey would be impossible for any scientist now, even if gifted with more than Humboldt's powers. Scarcely any specialist of today is really master of all the work which has been done in his own comparatively small field. Facts and their classification have been accumulating at such a rate, that nobody seems to have leisure to recognize the relations of subgroups to the whole. It is as if individual workers in both Europe and America were bringing their stones to one great building and piling them on cementing them together without regard to any general plan or to their individual neighbor's work."

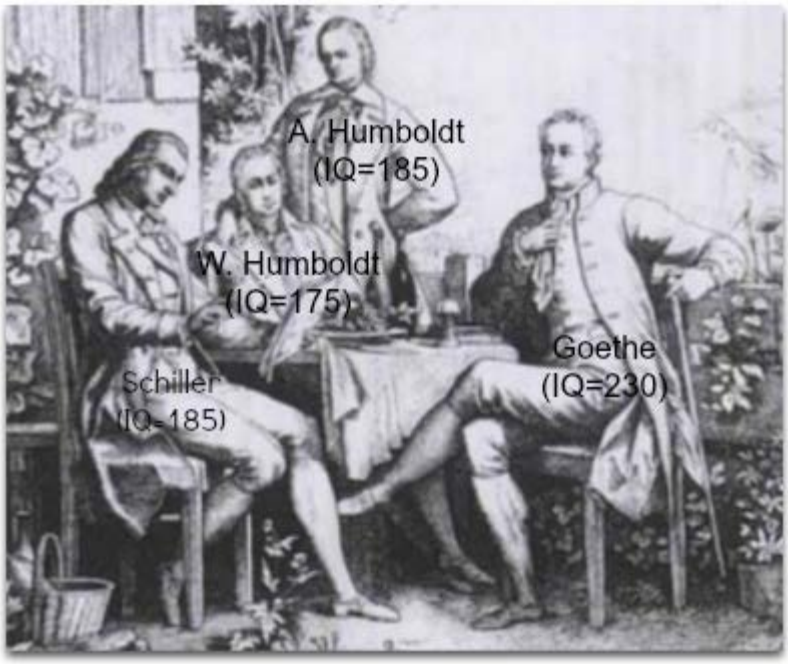

An intellectual roundtable: Friedrich Schiller, Wilhelm Humboldt, Alexander Humboldt, a cited **last person to know everything**, and Johann Goethe, another well-cited last person to know everything, Jena 1797, discussing, in Goethe's own words, "all of nature from the perspectives of philosophy and science". [36]

Humboldt is one of the cited "last persons to know everything" (below); a Cattell 1000 (top 100); was one of the first to propose that South America and Africa were both joined; in 1797, in Jena, with his brother Wilhelm, Friedrich Schiller, and Johann Goethe, the four discussed, in Goethe's own words, "all of nature from the perspectives of philosophy and science".

Overview | Chronological

The following group of individuals, listed in chronological order by reaction end (death), gives a listing of the known referenced opinions on the matter of who considers who to be the last person to know everything, ranked by:

(a) prevalence of citations claiming that person was the last to know everything;
(b) age of the citation, e.g. Leibniz (1914) and Young (1921);
(c) a weighting factor addition for known established IQs,

The following are the purported-to-be all-knowers:

#	Person	Citations
1.		"Aristotle, described by some as the **last man to know everything** there was to know, wrote his classic books on rhetoric some 2300 years ago." (1986) [30] "His combined works constitute a virtual encyclopedia of Greek knowledge. It has been said that Aristotle was probably the **last person to know everything** there was to be known in his own time." (2009) [4]

Aristotle
(384-322BC)
IQ:195|#10

"Aristotle may have been the **last person to know everything** there was to be known in his own time." (2009) [5]

2.

Roger Bacon
(1214-1294)
IQ:175|#188

"Roger Bacon—the founder of English philosophy whose knowledge of chemistry and mathematics led him to recognize the value of deductive reasoning, establish a scientific method, and invent spectacles—who has been called the **last man to know everything**, the last man to bridge the two cultures." (2003) [18]

3.

Leonardo da Vinci
(1452-1519)
IQ:200|#7

"The **last person to know everything** was Leonardo da Vinci." (1985) [12]

"Da Vinci, the **last man to know everything**, was overwhelmed by waves of depression, which left him shy and insecure." (2004) [28]

4.

Francis Bacon
(1561-1626)
IQ:185|#81

"Francis Bacon, they say, was the **last man to know everything**." (1992) [32]

"Francis Bacon, a contemporary of Shakespeare, is regarded by historians as the **last person to know everything** in the world. Since then, each of us learns a progressively smaller percentage of all the information that exists." (1998, 2004) [1]

5.

Johannes Kepler
(1571-1630)
IQ:180|#95

"I think someone said that Kepler was the **last man to know everything**. It may be that we are now redefining the 'everything' that this new man has to know; he must have just sufficient knowledge to assess the contribution of his predecessors." (1968) [33]

6.

John Milton
(1608-1674)
IQ:180|#111

"Milton, some say, was the **last man to know everything** (or to know enough about most things to discuss them with authority)." Darwin was the last biologist who could claim that." (2001) [29]

"It is said that the 17th-century poet John Milton, although blind towards the end of his life, was the **last person to know everything** because he had read virtually every book ever written at that time." (2007) [13]

"By the time of the Jesuit natural philosopher Athanasius Kircher (in Joscelyn Godwin's words, the 'last man to know everything'), the Renaissance man of knowledge had split into three mutually exclusive figures: theologian, philosopher, and scientist." (2001) [23]

7.

Athanasius Kircher

Book Findlen, Paula. (2004). *Athanasius Kircher: the Last Man Who Knew Everything.*

"Kircher combined polymath erudition and intellectual eccentricity in ways far beyond mortal men. He is often mentioned as a candidate for 'the last man to know everything', from obscure archaic languages and literatures to the latest in science to the most fantastical absurdities then in currency, all in heaps in the measureless attic of his remarkable mind. He wrote 40 books on subjects ranging from Egyptian hieroglyphics to possible causes of the bubonic plague, constructed strange objects, including an automatic organ, and assembled in

(1602-1680)
IQ:190|#46

Rome what was arguably the first natural history museum." (2006) [24]

Book Godwin, Joscelyn. (2009). *Athanasius Kircher's Theatre of the World: the Life and Work of the Last Man to Search for Universal Knowledge.* Inner Traditions.

"Another candidate [for the last person to know everything] is archaeologist, mathematician, biologist, physicist, volcanologist, and Egyptologist Athanasius Kircher." (2009) [2]

"Leibnitz was the last man to know everything, and Locke confessed his ignorance." (1914) [22]

8.

Gottfried Leibniz
(1646-1716)
IQ:195|#14

"Leibnitz, it has been said, was the last man to know everything. Thought this is most certainly a gross exaggeration, it is an epigram with considerable point. For it is true that up to the last years of the eighteenth century our greatest mentors were able not only to compass the whole science of their day, perhaps together with mastery of several languages, but to absorb a broad culture as well. But as the fruits of scientific labor have increasingly been applied to our material betterment, fields of specialized interest have come to be cultivated, and the activities of an ever-increasing body of scientific workers have diverged. Today we are most of us content to carry out an intense cultivation of our own little scientific garden (to continue the metaphor), deriving occasional pleasure from chat with our neighbors over the fence, while with them we discuss, criticize, and exhibit our produce." (1957, 2001, 2005) [17]

"Leibnitz, it has been said, was probably the last man to know everything." (1969, 1971, 1973) [15]

"Leibniz is said to be the last person to know everything." (1976) [11]

"Leibniz had a huge range of theoretical as well as practical interests. Philosopher, mathematician, historian, logician, political writer, and counselor to statesmen and aristocrats: he was a 'universal genius' (Kneale, 1962), the 'last man to know everything' (Bugarski, 1976)." (2004) [25]

9.

Emanuel Swedenborg
(1688-1772)
IQ:185|#80

"Emanuel Swedenborg *probably* was the **last person to know everything** in the world. He wrote 155 books in 17 sciences (before age 54): mastering astronomy, engineering, chemistry, mathematics, geology, paleontology, anatomy, physiology, optics, metallurgy, cosmogony, cosmology, and psychology; after which he wrote an additional 282 books [on religion] in the remaining 32 years, some being substantial tomes of more than 1,000 pages." [6]

10.

Immanuel Kant
(1724-1804)
IQ:185|#88

"Kant was the **last man to know everything** worth knowing in the humanities and sciences of his age, thought he was not quite caught up in the most recent advances in mathematics." (2003) [26]

"Goethe, he used to say, was the last man in the world who knew everything; after Goethe (d. 1832), there was too much to know for any one person to know it all." (c.1966) [10]

Johann

11.

Goethe (1749-1832)

IQ:225|#1

"It was said of Goethe, after his death in 1932, that he was the last man to know everything worth knowing." (1982, 1985, 1990) [14]

"It has been said that the last person to know everything was Goethe. Can't vouch for that, but there has been such an explosion of knowledge, industry, technology, and techniques since his life that this statement sounds about right."
— Carlton Smith (2014), *The Ignorant Grandfather* (Ñº)

"Thomas Young, one of the great lights of British medicine, and science, and as someone as said, the last man to know everything." (1921) [21]

12.

Thomas Young (1773-1829)

"Young as been called the last man to know everything. This obviously over-simplified statement is to be taken to mean that during the nineteenth century the world of learning rapidly was becoming much too broad for any polymath to master more than a fragment of it." (1959) [31]

Book Robinson, Andrew. (2006). *The Last Man Who Knew Everything: Thomas Young, the anonymous Polymath who proved Newton wrong, Explained how we see, Cured the sick, and deciphered the Rosetta stone, among other feats of Genius.* OneWorld.

"It has been suggested that physicist, physician, and Egyptologist Thomas Young was the *last person to know everything*." (2009) [2]

13.

Alexander Humboldt (1769-1859)
IQ:185|#83

Hjelmroos-Koski, Mervi. (2009). "Baron Alexander von Humboldt: the Last Man Who Knew Everything." May 19, Blog of the Botanical Art and Illustration Program at Denver Botanical Gardens.

14.

John Mill (1806-1873)

IQ:185|#73

"John Stuart Mill, the British economist, political thinker, and philosopher of science, died more than a hundred years ago. The year of his death (1873) is important because he is reputed to have been the last man to know everything there was to know in the world." (1998, 2007) [20]

"John Stuart Mill has been described as the last man to know everything." (2000) [16]

"British economist, political thinker, and philosopher of science John Stuart Mill was reputed to have been the last man to know everything there was to know." (2006) [19]

15.

Joseph Leidy (1823-1891)

IQ:150|#454

Warren, Leonard. (1998). *Joseph Leidy: the Last Man Who Knew Everything.* Yale University Press.

16. Henri

"A mathematician I know once described Poincare as the last man to know everything."

	 Poincare (1854-1912) IQ:190|#45	(2006) [27]
17.	 Max Weber (1864-1920) IQ:170|#251	"Weber seems to me very much a man of a particular time. A man of whom it has been said (as it has of others) that he was the last person to know everything of importance that was to be known. A nonsensical idea, of course, but one which point to the extraordinary breadth of his interests in sociology, religion, economics, politics, history, music, and much else besides." (2005) [3]
18.	 Thorstein Veblen (1857-1929) IQ:155|#455	"He became known as 'the last man who knew everything'." (1999) [8]

Others, e.g. as summarized on a 2004 blog article "Last Man to Know Everything" by high-profile blogger Dennis Mangan, include: Joseph Scaliger (1540-1609), Erasmus, Alvin Saunders Johnson (1874-1971), Carl Gauss, Denis Diderot, Thomas Jefferson, and William Whewell, and Archimedes (nominated by Mangan). [34] There's also a bit of Internet talk about Samuel Coleridge said to have known everything (Ñº) (Ñº), but a Google Books reference for this claim does note seem to be available.

In general, after c.1930, the growth of knowledge (or tree of knowledge) had proliferated so much so, that the effects of hydraism, information obesity (Scott, 2012), anti-interdisciplinarity, "doctrinaire departmentalism" (Stewart, 1955), forest blindness, ships not seen, glass walls, etc., resulted in making the labels "last universal physicist" (e.g. Enrico Fermi) or "last universal mathematician" (e.g. Jacques Hadamard) began to be used.

Discussion | Overlap

The close association of these intellectual know-it-alls is striking: Kircher was frequently cited by Goethe: for instance, in his search of a science of optics to counter Newton's, Goethe rediscovered the earlier work of Kircher, and to the extent that Kircher's theories kept popping up in Geothe's path, is exemplified by Goethe's circa 1800 comment: "thus, entirely unexpected, Father Kircher is here again." Kircher's work on hieroglyphics translations was frequently discussed and critiqued by Young. Young endorsed Goethe's explanation of certain pathological conditions of color-blindness and color confusion; had no objection to Goethe's description of *Physische* (Physics) and *Chemische Farben* (Chemical Colors), but expressed great aversion to Goethe's *Farbenlehre* (Color Theory) and went to great lengths to disprove it.

Goethe's connections with Alexander Humboldt date back to 1797, when he and Alexander and Wilhelm Humboldt formed a close circle in Jena to pursue scientific research in anatomy, chemistry, mineralogy, physics, and zoology. Goethe's opinion of Humboldt was exceedingly high, referring to him as a 'cornucopia of sciences' and stating that "a person cannot derive as much information from books in a week, as Humboldt can convey in an hour" and "I have never known anybody who has so harmoniously combined such determined activity with so much intellectual universality."

Leidy, in his late 1870s search to prove that flies were the agents of contagion, acknowledged Goethe as being the first

to observe fungi in flies; he was also knowledgeable of Goethe's pre-Darwin theories of change from one form to another, of many forms arising from a few.

Last mathematician to know all of mathematics

In 2003, John Derbyshire, in his *Prime Obsession: Bernhard Riemann and the Greatest Unsolved Problem in Mathematics*, stated: [39]

> "You will see it written that Hadamard was the last of the universal mathematicians—the last, that is, to encompass the whole of the subject, before it became so large that this was impossible. However, you will also see this said of Hilbert, Poincare, Klein, and perhaps of one or two other mathematicians of the period. I don't know to whom the title most properly belongs, though I suspect the answer is actually Gauss."

In Internet folklore, citing this quote (Ñº), since at least 2009, the query who was the last mathematician to know or understand all mathematics, is a semi-common debate topic, with answers supplied including: Blaise Pascal, Emile Picard (1856-1941) (Ñº), Henri Poincare, John Neumann, David Hilbert, Leonhard Euler, Carl Gauss, Bernhard Riemann. (Ñº)(Ñº)

Quotes

The following are related quotes:

> "To seem to '**know all things**' certainly, and to speak positively of them, is a trick of bold and young fellows; whereas those, that are indeed intelligent and considerate, are wont to employ more wary and diffident expressions as he speaks."
>
> — Aristotle (c.350), *Publication*; cited by Robert Boyle (1662) in *New Experiments Physico-Mechanical on the Spring of the Air* (pg. 2); in: *Collected Works, Volume One* (Ñº)

> "Spend a few thoughts sometimes on the puzzling inquiries concerning vacuums and atoms, the doctrine of infinites, indivisibles, and incommensurables in geometry, wherein there appear some insolvable difficulties: do this on purpose to give you a more sensible impression of the poverty of your understanding and the imperfection of your knowledge. This will teach you **what a vain thing it is to fancy that you know all things**, and will instruct you to think modestly of your present attainments."
>
> — Isaac Watts (1727), *The Improvement of the Mind* (pg. 22); read by Michael Faraday at age 14 [40]

> "If this universe is one universe, if it is so far thinkable that you can pass in reason from one part of it to another, it does not matter very much what that fact is. For every fact leads to every other by the path of the air. Only men do not yet see how, always. And your business as thinkers is to make plainer the way from some thing to the whole of things; to show the rational connection between your fact and the frame of the universe. If your subject is law, the roads are plain to anthropology, the science of man, to political economy, the theory of legislation, ethics, and thus by several paths to your final view of life. It would be equally true of any subject. The only difference is in the ease of seeing the way. To be master of any branch of knowledge, you must master those which lie next to it; and thus, to know anything — you must **know all**."
>
> — Oliver Holmes Jr. (1886), "The Profession of the Law" [38]

"Those people who think they **know everything** are a great annoyance to those of us who do."

— Isaac Asimov (c.1960) [37]

"Ideas about order and disorder began to germinate in my mind about the end of the 1940s and the beginning of the 1950s. Their origin was in the areas of physics and chemistry—the Carnot cycle, of course, as well as my wanderings through the labyrinth of chemical thermodynamics. It was about this time that the laws and principles of thermodynamics began to be applied on an increasing scale to the geological and biological sciences. The conviction grew that energy and entropy relationships were fundamental not only in understanding processes in physics and chemistry but also in astronomy, geology, and biology. Inevitably this led to the conjecture that further extrapolation would lead to the human sciences and arts, and even to psychology, sociology, history, music, philosophy and religion. Someone, I thought, will bring out the importance of understanding the concepts of order and disorder to all configurations of matter—including man and all of his works. Individuals have applied these concepts within their own specialties; there are articles on information and electronics, entropy in literature, music, and even entropy in religion. But I have waited in vain for someone to show that order and disorder are universal. Most of this essay, and it is an essay—an attempt—was written in the early 1960s. But I am, I believe, a cautious person. I ask myself, who am I [**four degrees:** BS geology MIT; MA Columbia; MA and PhD metallurgical engineering, Stanford] to presume myself enough of an eclectic to be **able to discuss all of human knowledge** [see: last person to know everything]?"

— Norman Dolloff (1975), Preface to *Heat Death and the Universe* (see: polymathy degree problem)

See also

â— Genius IQs

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External links

â— Who is called the last person to know everything? (2006) – FunTrivia.com.

θΔics

In religio-

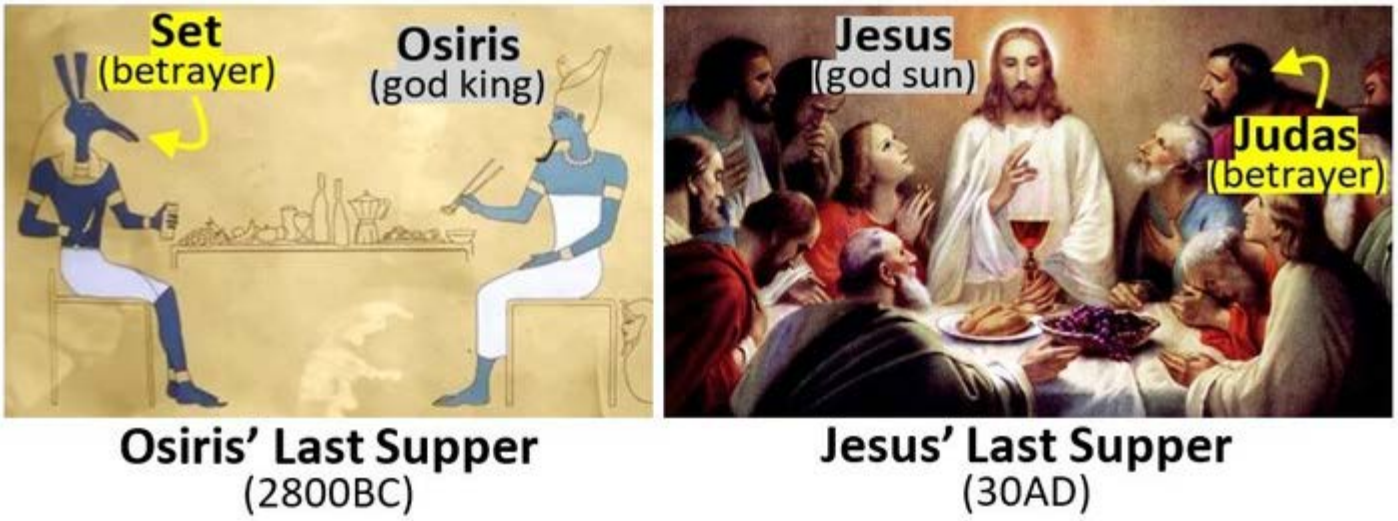

The "**Last Supper** of Osiris", before he his betrayed by his brother Set, and tricked into getting into a chest of wood, which is thrown into the Nile, after which his body is torn into 14 pieces, prior to being resurrected (see: death and resurrection of Osiris), which became, in the Roman recension (100AD-600AD), the "Last Supper of Christ", after which he is betrayed by Judas, for 30 pieces of silver, and Jesus is then whipped into pieces and "crucified" on the cross, prior to being resurrected (see: death and resurrection of Jesus).

mythology, **Last Supper** refers to the famous 3100BC mythical last dinner of Osiris, before his betrayal, by his brother Set, death, and resurrection; which, in the Roman recension (100-800AD), became the fictional story of the last supper of Jesus, before his betrayal, by Judas, death, and resurrection; and thereafter the basis of the absurd ritual of Eucharist, which people still practice to this day.

Osiris' last supper

In Egyptian mythology, Osiris, as related by Plutarch, in his, famously had a "last supper" before being betrayed by his brother Set, chopped into pieces, and later put back together, in the form of a mummy, and resurrected by his wife-sister Isis.

In 100AD, Plutarch, *On Isis and Osiris* (100AD), summarized Osiris' last dinner as follows: [1]

> "During his absence the tradition is that Typhon [Set] attempted nothing revolutionary because Isis, who was in control, was vigilant and alert; but when Osiris returned home Typhon contrived a treacherous plot against him and formed a group of conspirators seventy-two in number. He had also the co-operation of a queen from Ethiopia who was there at the time and whose name they report as Aso. Typhon, having secretly measured Osiris's body can having made ready a beautiful chest of corresponding size artistically ornamented, caused it to be brought into the **room where the festivity was in progress**. The company was much pleased at the sight of it and admired it greatly, whereupon Typhon jestingly promised to present it to the man who should find the chest to be exactly his length when he lay down in it. They all tried it in turn, but no one fitted it; then Osiris got into it andlay down, and those who were in the plot ran to it and slammed down the lid, which they fastened by nails from the outside and also by using molten lead. Then they carried the chest to the river and sent it on its way to the sea through the Tanitic Mouth. Wherefore the Egyptians even to this day name this mouth the hateful and execrable. Such is the tradition. They say also that the date on which this deed was done was the seventeenth day of Athyr, when the sun passes through Scorpion, and in the twenty-eighth year of the reign of Osiris; but some say that these are the years of his life and not of his reign."

In 1907, Gerald Massey, citing Plutarch, summarizes this as follows: [2]

> “As the legend is related by Plutarch, the death of Osiris was preceded by his betrayal, and the betrayal, which was the work of his twin brother, Sut, took place in the banqueting-room. Sut, having framed a curious ark just the size of Osiris's body, brought it to a **certain banquet**. As this was on the last night of Osiris's life or reign, and on the last night of the year, the meal may fairly be called the **Last Supper**.”

(add)

Jesus' last supper

In Christianity, Jesus, who is the Roman recension rescript of Osiris and or Osiris-Horus, had a purported “Last Supper”, as described in Matthew 26:17–29; Mark 14:12–25; Luke 22:7–38; I Corinthians 11:23–25, characterized as the final meal shared by Jesus and his disciples in an upper room in Jerusalem, the occasion of the institution of the Eucharist (Q).

In 2008, Dorothy Murdock, building on Massey, in her *Christ in Egypt: the Horus-Jesus Connection*, summarized the main points of "Osiris + Horus = Jesus" syncretism as follows: [3]

> “In ancient mythology, in which immortal gods can die, the death of a deity is very significant and is often attended by a sentiment of redemption and salvation, such as the ultimate sacrifice of god's son in Jesus Christ. We have already seen how Osiris and Horus both were betrayed and murdered by their brother/uncle Typhon/Set, with Osiris's death plotted during a sort of "**Last Supper**" gathering. But were either Osiris or Horus "crucified," as has been claimed by a number of writers? Firstly, when it is asserted that Horus (or Osiris) was "crucified," it should be kept in mind that it was not part of the Osiris/Horus myth that the murdered god was held down and nailed to a cross, as we perceive the meaning of "crucified" to be, based on the drama we believe allegedly took place during Christ's purported passion. Rather, in one myth Osiris is torn to pieces before being raised from the dead, while Horus is stung by a scorpion prior to his resurrection.”

Here, Murdock's mention of Osiris' death plotted during a sort of "Last Supper" refers to how the story of Set inviting Osiris to a big dinner and then tricking him into getting into a "chest" that just fit the body size of Osiris, after which he threw the chest into a river (see: Christmas tree), became the New Testament story of the final meal, aka Last Supper (Q), that, in the Gospel accounts, Jesus shared with his Apostles in Jerusalem before his crucifixion; during the meal Jesus predicts his betrayal by one of the apostles present. In the original version, Set betrays his brother Osiris during Osiris' last meal.

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θΔics

In genius studies, **last universal genius** is a rarefied epitaph assigned to a select few of the group of universal geniuses, of which there are about a dozen, referring to a person said to have been the last of the lineage of geniuses to have a universal grasp of knowledge.

Last Universal Geniuses

Leibniz (1646-1716)	Goethe (1749-1832)	Helmholtz (1821-1894)

The following quote by German polymath Johann Goethe (who in his college years, circa 1767-70, simultaneously attempted mastery of medicine, chemistry, law, and religion) gives indication of the genius dividedness (see also: two cultures) in knowledge: [1]

> "In all our academies we attempt far too much. ... In earlier times lectures were delivered upon chemistry and botany as branches of medicine, and the medical student learned enough of them. Now, however, chemistry and botany are become sciences of themselves, incapable of comprehension by a hasty survey, and each demanding the study of a whole life, yet we expect the medical student to understand them. He who is prudent, accordingly declines all distracting claims upon his time, and limits himself to a single branch and becomes expert in one thing."

Big three

Of this universal geniuses, only three: Leibniz (1646-1716), Goethe (1749-1832), and Helmholtz (1821-1894), the middle of these three in the most predominant manner, are frequently assigned the very rarefied epitaph of "last universal genius", as shown in bolded text format below, of which the mean IQ of this group is 207, which can be taken as the mean IQ for an archetype last universal genius. [1]

Leibniz:

> (a) "Remarkable for his encyclopedic knowledge and diverse accomplishments outside the fields of philosophy and mathematics, he was perhaps the **last universal genius**, spanning the whole of contemporary knowledge."
>
> > Author. (2003). *The Houghton Mifflin Dictionary of Biography* (quote, pg. 913). Houghton Mifflin Harcourt.
>
> (b) "Remembered for his philosophy of 'preestablished harmony' on one hand and his bitter feud with Isaac Newton of the invention of calculus on the other, Leibniz was, according to one modern writer, the 'last universal genius.' His famous claim that this is the 'best of all possible worlds', was later ridiculed by Voltaire in *Candide*"
>
> > Cutler, Alan. (2004). *The Seashell on the Mountaintop: How Nicolaus Steno Solved the Ancient Mystery and Created the Science of the Earth* (quote, pg. #). Penguin.
>
> (c) Kreeft, Peter. (2009). *Socrates Meets Kant* (quote: "Leibniz was one of the greatest geniuses in the history of human thought, perhaps the **last universal genius**", pg. 24). Ignantius Press.
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Goethe:

> (a) "We often hear that Goethe was the last man in the world who was a universal genius. By this it is meant that he can be compared with a figure of the Renaissance such as Leonardo da Vinci. To me it never seems that Goethe fills happily the role of modern Leonardo. He is called the **last universal genius**, of course, because it is impossible to think of anyone …"

Spender, Stephen. (1950). “Article” (quote). *The Listener* (pg. 151). Vol. 44.

(b) “Scholars agree that Goethe was the **last universal genius**: practically nothing within reach of the human mind escaped his attention.”

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Helmholtz:

> “The matter of multiplicity of contributors needs no great explanation, for we are all used to this in the modern handbooks. I believe it is a common saying that Helmholtz was the **last universal genius**, and we are fast arriving at the point where even a single subject becomes too vast for one man. At any rate, whether or not any of my learned colleagues could write an entire chemical engineering handbook, I could not—hence the present form.”
>
> — Donald Liddell (1922) *Handbook of Chemical Engineering*, McGraw-Hill

Other

One recent reference cites Henri Poincare as being the last universal genius as follows: [2]

> “The earliest work in radar polarimetry is found in the early 1950s [Sinclair, 1950]. The theory was inspired by the work of Stokes [Stokes, 1852] and of the ‘**last universal genius**’ Poincare [1989], both of whom laid the basis for a unified formalism for electromagnetic waves, regardless of their state of polarization.”

Chronologically, according to year of reaction end (death), Hungarian chemical engineer and mathematician John Neumann, with 3+ universal genius citations, puts him as official "last universal genius" (see: universal genius page), but citation of this, other than herein, is wanting.

In the social sciences, one to have been called the "last universal genius of social science" is Max Weber (1864-1920) (IQ=170), the vicarious student of Goethe, who notably began reading Goethe's elective affinities theory, at the age of 14, hidden behind his primary school books, while in class, which is a rather apt epitaph being he was first to apply Goethe's self-proclaimed greatest theory in the social sciences. [3]

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θΔics

In quotes, **last words** are []

List

The following are a few, said to be, last words of a some noted thinkers:

> "If I had the whole world, I would give anything to live one day. I am about to take a leap in the dark. I shall be glad to find a hole to creep out of the world. I am about to take a fearful leap in the dark."
>
> — Thomas Hobbes (1679), supposed last words [1]

> "I am abandoned by god and man; I shall go to hell! I will give you half of what I am worth, if you give me six months life."
>
> — Voltaire (1778), supposed last words [1]

> "I am abandoned by god and man. I will give you half of what I am worth if you will give me six months of life. Then I shall go to hell and you will go with me, oh, Christ, oh, Jesus Christ!"
>
> — Voltaire (1788), variant of what he reportedly said to his attending physician (Q)

> "I would give worlds, if I had them, that the *Age of Reason* had never been published. Oh, god, save me; for I am at the edge of hell alone."
>
> — Thomas Paine (1809), supposed last words [1]

> "Thomas Jefferson still survives."
>
> — John Adams (1826), Last Words (age 90) (Q), Jul 04

> "More light."
>
> — Johann Goethe (1832), last words; said to his daughter-in-law Ottilie Pogwisch (1796-1872), Mar 22

> "Men pass away, but their deeds abide."
>
> — Augustin Cauchy (1857), last words (Q)

> "Life is a narrow vale between the cold and barren peaks of two eternities. We strive in vain to look beyond the height. We cry aloud, and the only answer is the echo of our wailing cry. From the voiceless lips of the unreplying dead there comes no word."
>
> — Robert Ingersoll (1879), said at the grave of his brother [2]

(add discussion)

See also

- Atheist deathbed deconversions

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θΔics

In thermodynamics, **Laszlo Tisza** (1907-2009) was a Hungarian-born American physicist noted for his 1963 definition of the subject of quantum thermodynamics in structural form, and for his 1966 textbook *Generalized Thermodynamics*, in which he was the first to use the term Gibbsian thermodynamics, with clarification, to a significant degree. [1]

Education

Tisza studied mathematics and physics in 1928 at the University of Gottingen, studying under those such as Max Born, where he began his life-long search to find a better connection between physics and mathematics. After completing his PhD thesis on molecular spectra, submitted in Budapest, Tisza joined Russian physicist Lev Landau's group in Kharkov, where he was much influenced by Landau's integration of thermodynamics into modern physics. In 1941, Tisza immigrated to the United States joining the MIT physics department, in connection with the MIT school of thermodynamics, where he set up a rigorous but intuitive course in thermodynamics and statistical physics.

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External links

- Laszlo Tisza – Wikipedia.

θΔics

In thermodynamics, **latent heat** is a heat flow to a body that results in no change in temperature in the body, with specific respect to heat flows that accompany phase transitions such boiling or freezing. [1] In technical terms, latent heat is the heat quantity absorbed or released by a substance during a change of state. [2]

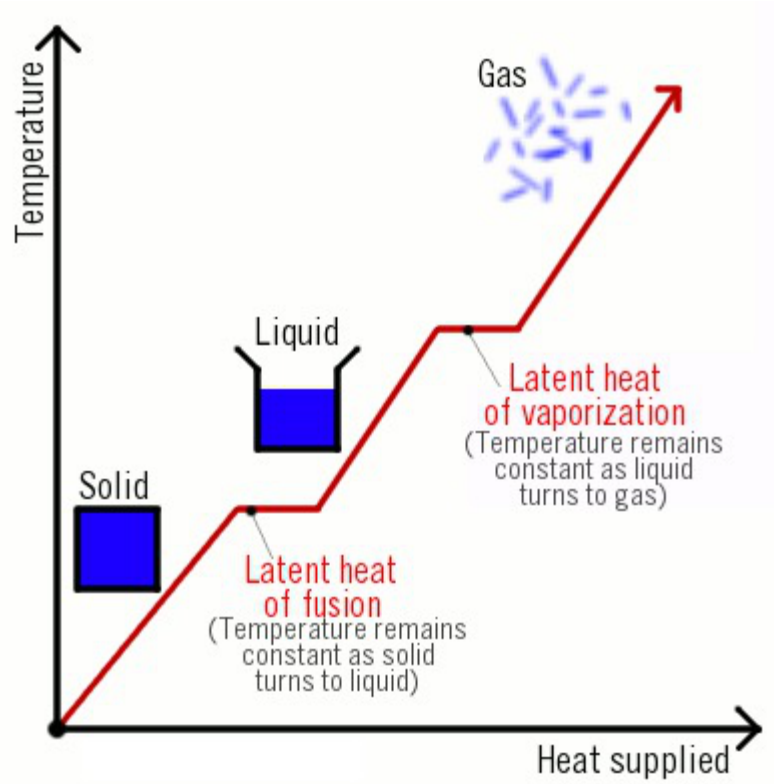

A **latent heat** diagram by English science writer Chris Woodford, depicting the isothermal (constant temperature) aspect of latent heat, namely that there is a certain period of phase change (solid → liquid; liquid → gas) where heat is being added, but where no temperature change is measured. [6]

History

In 1757, Joseph Black, in his lectures, to account for inconsistencies in the then theories on how heating and melting occurred in relation to heat movements and temperature recordings, introduced the concept of latent heat. [3] The older established view of heat flow in relation to phase change, according to Black, when he began to lecture, was that:

> "Fluidity was universally considered as produced by a small addition to the quantity of heat which a body contains, when it is once heated up to its melting point; and the return of such a body to a solid state, as depending on a very small diminution of the quantity of heat, after it is cooled to the same degree; that a solid body, when it is changed into a fluid, receives no greater addition to the heat within it than what is measured by the elevation of temperature indicated after fusion by the thermometer; and that, when the melted body is again made to congeal, by a diminution of its heat, it suffers no greater loss of heat than what is indicated also by the simple application to it of the same instrument."

The newer view of heat in relation to a solid to liquid phase change, according Black's recent experiments, is that:

> "The opinion I formed from attentive observation of the facts and phenomena, is as follows. When ice, for example, or any other solid substance, is changing into a fluid by heat, I am of opinion that it receives a much greater quantity of heat than what is perceptible in it immediately after by the thermometer. A great quantity of heat enters into it, on this occasion, without making it apparently warmer, when tried by that instrument. This heat, however, must be thrown into it, in order to give it the form of a fluid; and I affirm, that this great addition of heat is the principal, and most immediate cause of the fluidity induced."

Conversely, the newer view of heat in relation to a liquid to solid phase change, according to Black, is that:

> "On the other hand, when we deprive such a body of its fluidity again, by a diminution of its heat, a very great quantity of heat comes out of it, while it is assuming a solid form, the loss of which heat is not to be perceived by the common manner of using the thermometer. The apparent heat of the body, as measured by that instrument, is not diminished, or not in proportion to the loss of heat which the body actually gives out on this occasion; and it appears from a number of facts, that the state of solidity cannot be induced without the abstraction of this great quantity of heat. And this confirms the opinion, that this quantity of heat, absorbed, and, as it were, concealed in the composition of fluids, is the most necessary and immediate cause of their fluidity."

To sum his view up, he introduces a new term:

> "[In the] common process of freezing water, the extrication and emergence of the **latent heat**, if I may be allowed to use these terms, is performed by such minute steps, or rather with such a smooth progress, that many may find difficulty in apprehending it; but [other] example[s] [occur], in which this extrication of the concealed heat becomes manifest and striking."

In 1772, Johan Wilcke (1732-1796) (Q), a Swedish physicist,, independent of Black, whom he was then unaware of, published his discovery of the latent heat of fusion of ice; later, in 1781, Wilcke coined the concept and term of "specific heat" (*Specifica-varme*), in analogy with the term "specific gravity" (*Specifica-tyngd*), drawing up a list of specific heats of different mixtures, obtained experimentally by the method of mixtures. [9]

Heat of evaporation

The observation that the temperature of water, in open, air began to remain fixed as soon as it reached the boiling point and that addition of more heat only seemed to produce more ebullition and rapid evaporation was first noted by Robert Hooke in circa 1680. [5]

Thermodynamic views

Into the 1860s, German physicist Rudolf Clausius expressed his views on heat and latent heat, to the effect "the heat actually present in a unit weight of [a] substance [is] the *vis viva* of it molecular motions" and that latent heat "is not only, as its name imports, hidden from our perceptions, but has actually no physical existence … it has been converted into work." [4]

Enthalpy

Modern terminology, for phase transitions that occur at constant temperature and pressure, the term "enthalpy of transformation" is used instead of the more obsolete term "latent heat", as the enthalpy function (U + PV) is the so-called "heat content" of bodies.

Social latent heat

> *See main: Social latent heat*

In 2019, Guilherme Arrude, et al, in their "Social Contagion Models on Hypergraphs", attempted a blurry derivation attempt at "social latent heat", using hypergraphs, Poisson process model ideas, a Fourier transform, etc., which gives them the following so-called social latent heat equation:

$$Q_l(\lambda_c^X) = \left(\rho^{\text{Upper}}(\lambda, \delta, \lambda^*, N) - \rho^{\text{Lower}}(\lambda, \delta, \lambda^*, N)\right)_{\lambda=\lambda_c^X}$$

where $Q_l(\lambda_c^X)$ is the energy released or absorbed; the following are a few excerpts:

> "Phenomenologically, a discontinuity implies that our system possesses a **'social latent heat'**, that is released or accumulated at a constant value of λ. In terms of a social process, the latent heat interpretation is the fraction of individuals we have to add or remove to move the dynamics from one solution to the other."

(add)

Quotes

The following are related quotes:

> "When water is boiling the temperature, as Amontons showed, remains constant, yet heat must be entering it all the time. Black calls this heat, which produces no sensible effect on the thermometer, the **'latent heat'**, and it is specifically associated with change of state. An exactly similar argument indicates that the melting of ice is associated with the absorption of latent heat."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pgs. 37-38)

> "The methods Black used to measure **latent heats** were extremely simple. He compared the time take to heat up a certain amount of water from a known temperature to boiling point with the time taken for the water to boil away. Assuming the heat was entering the water at a constant rate, he computed by simple arithmetic the temperature that the water would have reached had it not been turned into steam. The excess of this temperature above the boiling point is his measure of the latent heat of vaporization of water. In other words, it is the measure of the heat that has entered the water during the time it was boiling; the value he obtained for it was about 960 degrees Fahrenheit. His method for determining the latent heat of fusion of ice is essentially the same: he compares the time taken for a piece of ice at freezing point to melt with the time taken for it, in the form of water, to heat up from freezing point to a given temperature. The figure he gets for the latent heat of fusion is 140 degrees Fahrenheit."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 38) [7]

See also

- Specific heat
- Heat capacity

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Further reading

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External links

- Latent heat – Wikipedia.

θΔics

In science, **lateral pressure**, as compared to "vertical pressure", refers to the effect of a force per unit area directed horizontally to the system or species in question.

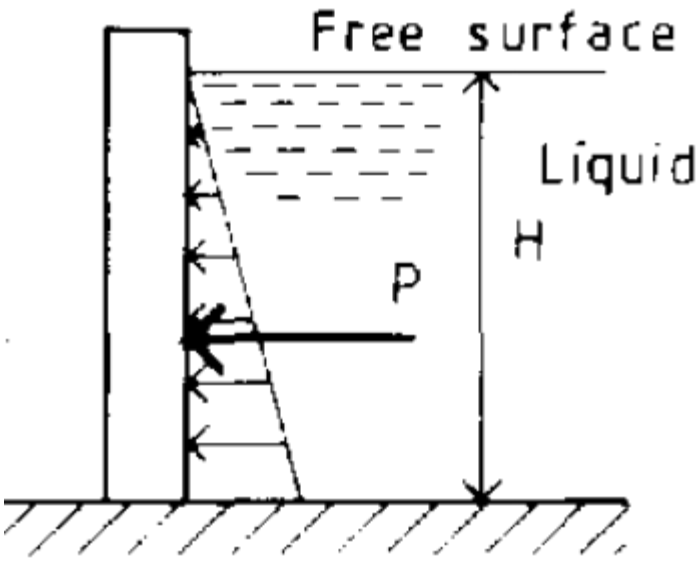

A sketch of a retaining wall holding a liquid surface back, which shows that the **lateral pressure** in the water increases with depth.

Overview

In In c.1545, Niccolo Tartaglia, in his booklet on Jordanus Nemorarius, stated the following:

> "The deeper the liquid is, the more it will compress the deeper parts; for they are compressed both by the upper parts [vertical pressure] and by those next to them [lateral pressure]."
>
> — Niccolo Tartaglia (c.1545), *Jordanus: a Small Treatise*

This, supposedly, according to William Middleton (1964), was the first clear statement of the idea of both "vertical pressure" and "lateral pressure" (see: mean girls model) in a liquid, e.g. at different depths.

Quotes

The following are related quotes:

> "Tartaglia was the first to have a clear idea of the 'vertical' and **'lateral' pressure** in a liquid."
>
> — William Middleton (1964), *The History of the Barometer* (pg. 5) [2]

References

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(b) Middleton, William E. (1964). *The History of the Barometer* (pg. 5). Publisher.
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(b) Jordanus de Nemore – Wikipedia.

Threads

â— Niccolo Tartaglia (1565), Mean Girls (2004), and lateral pressure (2019) – Reddit.

External links

â— Lateral pressure theory – Wikipedia.

θΔics

In hmolscience, **Laura A. McKinney** (c.1981-) is an American environment sociologist noted for []

Overview

In 2013, McKinney, in her "A Study of Sustainability: Entropy and the Urban/Rural Transition", employed a Georgesu-Roegen, Herman Daly, Prigogine-cited, plus entropy | disorder stylized "thermodynamic lens" to argue about sustainability and urban development; the following being an illogical quote derived thereupon: [1]

> "The ideology of urban as characterized of forward progress is at odds with thermodynamic postulates, and thus comprises sustainability in the long term. When examined using thermodynamic lens, it becomes apparent that modernization, in general, and urbanization, in particular, accelerates the dissipation of entropy in the system, which constricts future room to maneuver. Disordered environments complicated humanity's ability to meet their basic needs. As societies modernize and urbanize, they are in fact creating more disorder or entropy in the very physical and natural systems needed to sustain life."

(add discussion)

Education

McKinney completed a BS in sociology and a BS in psychology at University of Northern Alabama in 2004, an MS in sociology at Middle Tennessee State University, and a PhD with a dissertation on "A Theoretical Integration and Structural Equation Modeling of the Environmental, Economic, and Social Sustainability of Nations" in sociology at North Carolina University. (Ñº) Presently, she is an assistant professor of sociology at Tulane University.

Further reading

â— McKinney, Laura. 2015. "The Entropy Curse." Ecological Unequal Exchange Conference, University of Tennessee, Knoxville.

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External links

â— Laura McKinney (faculty) – Tulane University.

θΔics

In existographies, **Laurel Richardson** (1938-) is an American sociology educator, noted for []

Overview

In 2016, Richardson, in her *After a Fall: a Sociomedical Sojourn*, recounted the influence of Charles Snow's 1959 "two cultures" inflaming Rede Lecture *The Two Cultures and the Scientific Revolution*, wherein he said that modern university-educated intellectuals were divided between those who understood a literary work of Shakespeare and those who understood a scientific work of Clausius, specifically the second law of thermodynamics, in respect to the completion of her 1963 PhD in sociology, at the University of Colorado, and how the first question of her dissertation oral examination, hilariously, was apply the second law to sociology; which she recounts as follows:

> "A book that enthralled my graduate school professors was C.P. Snow's *The Two Cultures and the Scientific Revolution* [1959]. Snow argued that scientists were illiterate in the humanities, and that humanists were illiterate in science. Not knowing the second law of thermodynamics, Snow said, was equivalent to not knowing who Shakespeare was; not being able to define mass or acceleration was equivalent to not being able to read. If sociology were to bridge the two cultures it would have to be literate in both of them. **The first question on my PhD oral examination was: 'apply the second law of thermodynamics to sociology!'**
>
> The idea of a divide between the sciences and humanities was particularly trenchant for sociology. Departments determined, I think, to get a good share of governmental cold war largesse, beefed up claims to be a *science*. Statistics classes became the backbone of a sociological education. I was even enlisted to teach them, although I had never taken one, because I was 'good at math'; my dissertation topic was a study of pure mathematics and I was then married to a mathematician.
>
> Research methods seminars taught *scientific* methods of sampling and surveying populations to test deductively constructed hypotheses. Long established methods such as interviewing and participant-observation were rejected as *subjective* or seen as a kind of foreplay to the main research event, climaxing in an article in a top-ranked journal, and then the opportunity to snag another grant. And so, a new and pernicious division within sociology was reified: quantitative vs. qualitative. Snow's main point was missed: to solve problems, the two cultures need each other. Some researchers try to do this through mixed methods, reaching into quantitative and qualitative toolboxes (note not cosmetics bags). I have done that myself. But, over the past few decades the philosophical under-pinning of the 'two cultures' has been discredited. Bye-bye, bifurcation."

(add)

Education

Richardson completed her BA in 1955 at the University of Chicago and her doctorate of philosophy at the University of Colorado in 1963, thereafter becoming a professor of sociology at California State University, the Denison University, and Ohio State University in 1979, where she is professor emeritus.

References

1. Richardson, Laurel. (2016). *After a Fall: a Sociomedical Sojourn* (pgs. 74-75). Routledge.

External links

â— Laurel Walum Richardson – Prabook.com.
â— Laurel Richardson (faculty) – Ohio State University.

θΔics

In hmolscience, **Laurence Foss** (c.1940-) is an American philosopher noted, in psychological thermodynamics, for his 1987 book *The Second Medical Revolution*, co-written with Kenneth Rothenberg, wherein they suggest a new approach to modern medicine based on quantum mechanics, irreversible thermodynamics, and information theory, and his follow-up 2002 book *The End of Modern Medicine* chapter section on what he calls the "second law of psychothermodynamics", wherein, building on religious physicist Michael Guillen's idea that human existence is an unnatural anomaly in the framework of a universe governed by the second law, he attempts to slant the presentation of the second law into a contrived anthropomorphism to argue, in his own words, for a vitalistic (vitalism), mentalistic (mentalism), and spiritualistic (autopoietic) universal view, unlike the mechanistic (mechanism), physicalistic (physicalism), and materialistic (materialism) prevailing scientific world view. [1]

Overview

In 1987, Foss, in his "The Second Law of Psychothermodynamics", tilizes English physicist Paul Davies' 1983 gravity-driven entropy gap model, mixed anthropomorphized ideas on negentropy, information theory, vitalism, and self-organization, among others, to argue that the second law deviates when it comes to the formation of humans. In introducing his model, Foss states that according to standard thermodynamics, the mechanical universe is governed by the following equation: [1]

$$\Delta G_{universe} > 0$$

Foss seems to cull this version of the second law from American religious physicist Michael Guillen's 1995 book *Five Equations that Changed the World*, the second chapter of which is devoted to the second law. Foss then quotes the following comment by Guillen concerning the second law and life: [2]

> "Contrary to popular belief, being alive is unnatural; in fact, all life exists in defiance of, not in conformity with, the most fundamental law of the universe."

This comment by Guillen, who to note lists his favorite book as the Bible, is code for "God created life and continues to create and evolve life in defiance or opposition to the second law", or something to this effect. On this religious-physics basis, Foss goes on to argue on to argue that life, mind, and culture, are nonmechanistic "miracle" outcomes that arose from the mechanistic beginnings of the big bang. Foss goes on to state that "physicists assure us that these are negentropic outcomes", that derive from empirical outcomes.

Skipping over several pages of argument, Foss then goes on to state that following the mechanistic beginnings of the big bang, a phase or age of "spiritual machines" emerged, which possessed a degree of autonomy or self-determination; an autonomy which he says "permits them to import negative entropy, which Foss defined as energy and information, from their surroundings and export entropy back into those surroundings. Foss then concludes that this exported energy can then be imported as free energy by neighboring structures.

He then goes onto define primordial particles, atoms, living things, stars, and spiral galaxies as "experiential entities" that all display some degree of self-determination. On this basis, Foss postulates that we may infer a successor law, which he defines as the "second law of psychothermodynamics", which he says can be expressed in pseudo mathematical form as follows:

$$\Delta G_{universe} >< 0$$

where the twinned greater than and less than symbols designate the creative tension between life and death, growth and decay, richness and corruption that characterizes our universal experience. Foss states that complexity theorists refer to

this tension as "order at the edge of chaos", a condition attributed to unstable, nonlinear systems at a critical threshold away from equilibrium. Foss here seems to be citing the bifurcation theory of Ilya Prigogine. Foss states that the prefix 'psycho' is to be understood in terms of the formula:

$$\psi = f(m^3)$$

which he doesn't seem to elaborate on. In sum, Foss argues for a type of panpsychism in which all matter, from atoms to humans to stars, is infused with conscious properties, and that the universe is not a mechanical universe, but rather is "vitalistic and autopoietic (spiritual)", all in effort to establish an argument platform on which to advocate medicine practice reform, that towards a more humanizing or holistic style of medical treatment and practice. [3]

Education

Foss completed his PhD in 1968 at the University of Notre Dame, in what seems to be philosophy, with a dissertation on "Substance as a Category of Descriptive Metaphysics". [4]

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(b) Michael Guillen (about) – MichaelGuillen.com.
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External links

â— Laurence Foss (articles) – PhilPapers.org.
â— Foss, Laurence – WorldCat Identities.

θΔics

In schools, **Lausanne school of physical socioeconomics**, a two cultures synergy, refers the 1858 to 1946 physical science based economics and sociology models of French political economist Auguste Walras, his son socioeconomist Leon Walras, French-born Italian engineer Vilfredo Pareto, Polish social mechanics economist Leon Winiarski, Italian economist Maffeo Pantaleoni, and Italian lawyer and political economist Emanuele Sella, centered at the University of Lausanne, Switzerland.

Lausanne school of physical socioeconomics

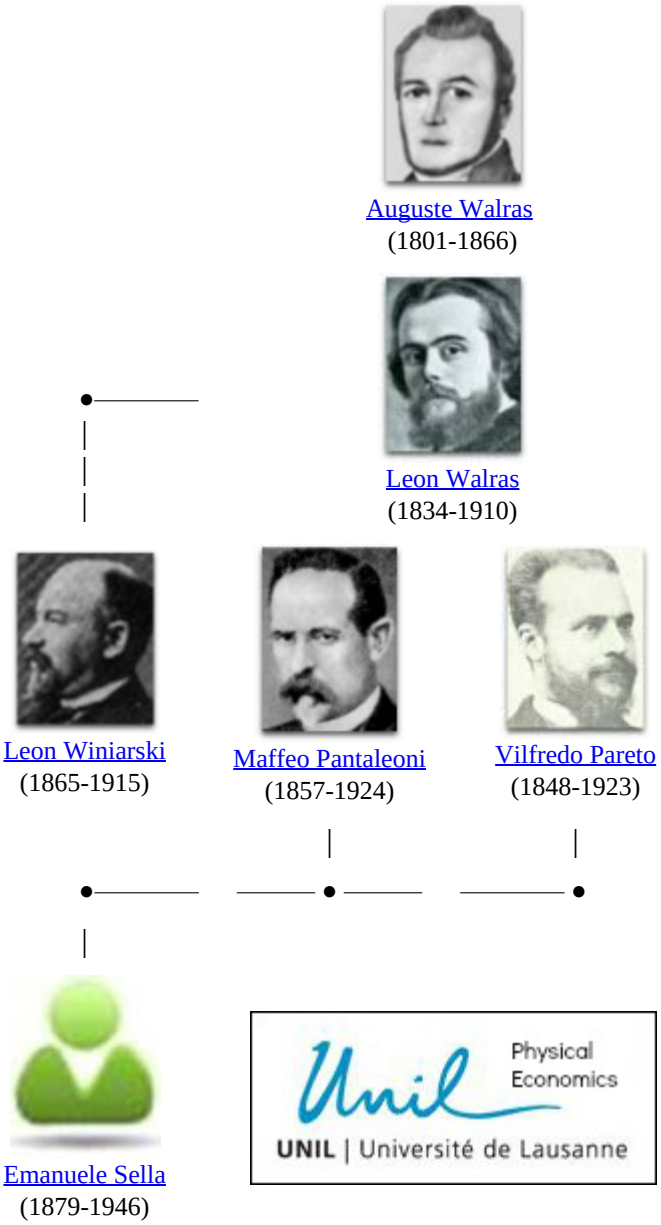

The connectivity tree of hard science based economics philosophy of the Lausanne school starting from French socioeconomist Leon Walrus to the two cultures synergy of Italian economist Maffeo Pantaleoni, to that of Emanuele Sella who studied under Pantaleoni.

History

In 1858, French political economist Auguste Walras, during a walk with his 24-year-old son socioeconomist Leon Walras, told the young Walras that: [1]

> "To create a scientific theory of economics one would need to use differential calculus to derive a 'science of economic forces, analogous to the science of astronomical forces'."

This seed idea catapulted Leon to go on to formulate a general equilibrium theory of economics, which soon attracted the reading attention of French-born Italian engineer Vilfredo Pareto, who eventually in 1893 would succeed Leon Walrus as chair of political economy at the University of Lausanne, and friend-follower Polish social mechanics economist Leon Winiarski, who would go on to teach a course on Pure Political Economics and Social Mechanics at the University of Geneva, Switzerland, from 1896 to 1903, or thereabouts. Italian economist Maffeo Pantaleoni, Pareto's closest intellectual two cultures synergy associate, and his student Emanuele Sella were also connected in this Lausanne school circle. Economics historians Benedicte Berthe and Michel Renault give the following Winiarski connection view of the Lausanne school: [3]

> "Leon Winiarski, a friend of Leon Walras and member of the **Lausanne school**, made the principle of least effort the 'basis of social science' (Winiarski, 1903)."

In 1870, when Walras became professor of political economics at Lausanne, to about 1903, the year about which Winiarski was still publishing applied concepts, is thereabouts the launching point of the Lausanne school. The following 2005 quote by Mainzer Klaus summarizes retrospect gist of the Lausanne school: [2]

> "The **Lausanne school** explicitly used mathematical terms of thermodynamics, like equilibrium, to describe economic balance."

All three of them conceived of people as economic molecules or human molecules; the latter two explicitly used thermodynamic concepts in formulating economic and sociological theory.

Leon Walras

In his early development, Leon Walras was influenced by the views of John Locke, John Mill, and from Rene Descartes, arguing the supposition that utility, defined as the "intensity of the last want satisfied", is measurable in economics, akin to mass being measurable in mechanics as the "number of molecules" or "quantity of matter", such that utility might be rendered measureable "as is done with temperature". In 1901, he wrote to French mathematician Henri Poincare (IQ=195): [4]

> "You have made me very happy by explaining to me with the authoritativeness that you command that I was justified in representing the satisfaction of individuals by functions."

Pareto

The contributions of Vilfredo Pareto are rather extensive; as are the extensions of his works into various economics schools (e.g. Harvard Pareto circle). His complete works total some 20 books or booklets, more than 600 articles in journals, magazines, and newspapers, and over 100 published book reviews, introductions, prefaces, and or interviews, on subjects including: physics, mathematics, statistics, public policy, and sociology (Q)

Winiarski

It is difficult, at this point, to say who, in retrospect, is the biggest chief genius of the Lausanne school: Vilfredo Pareto or Leon Winiarski, being that a complete English-translated set of their respect works, is not yet available? Winiarski, however, seems to have gone a step above Pareto in his thermodynamics usage, particularly his use of the reversible cycle to explain social energy.

In 1990, the **Walras-Pareto Center** for Interdisciplinary studies (see: interdisciplinarity) was established at the University of Lausanne; a noted member of which is Swiss economics historian Francois Allison, a scholar on Leon Winiarski, Nikolai Bukharin and the history of Russian economics (Karl Marx, Vladimir Lenin, etc.). [5]

In 1898, Winiarski, in his *Essay on Social Mechanics*, chapter ten "The Social Energy", states the following rather impressive logic:

> "The imperative nature of morality, law, etc., does nothing special and mysterious it very well in between the action of the laws of mechanics and just means that some transformation of energy, which correspond to irreversibilities. But like all irreversible cycles tend to their evolution towards a state of full reversibility ensures that only a maximum, the binding nature and imperative of social institutions weakens over the course of time. [19]
>
> Note 19:
> With the conditions of complete reversibility in the second principle:
>
> $$\int \frac{dQ}{T} = 0$$
>
> is in fact the starting point for another reason. If experience leads us to establishing the equation:

$\int_{\circ}^{\circ} \frac{dQ}{T} = 0$ [or $\oint \frac{dQ}{T} = 0$ meaning closed line or path integral?]

for a closed cycle and reversible, it should be a function of independent variables do not sear the differential an exact differential. In other words:

$$\frac{dQ}{T} = dS$$

or *S* is a function of x and y, such that *dS*, will be an exact differential on a plot of x and y. It is this function that *S* that Clausius has called the name of ***entropy***, a function which presents some analogy with that of the energy (U). Indeed, the like energy, entropy is a property of the body completely determined by the current values of variables and it follows that pet always be translated by a formula which expresses the function of these independent variables. As for energy incurs, its value should not depend of the path followed by a body to reach its current state, in case this is not a full cycle of operations. One can always express entropy by the equation:

$$\frac{dQ}{T} = dS$$

but only, of course, for a reversible cycle."

This discussion, as we see, is well-ahead of its time, hardly anything like this, with it intermixing of discussion on morality, weakening of social institutions, and reversibility, described in terms of circle integrals, can be found at present.

Sella

(add)

Other

In 1995, Italian political economist Claudia Rotondi did her 1995 PhD on Pantaleoni, Pareto, and Sella.

Quotes

The following are related quotes:

> "Walras was an agrarian socialist and wanted to nationalize land, but he talked of humans as 'economic molecules' and gave concepts like scarcity scientific definitions analogous to heat in physics."
>
> — Hazel Henderson (1981) [1]

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(b) Berthe, Benedicte and Renault, Michel. (2001). “Economic Analysis of Human Effort in Organizations: an Historical and Critical Perspective”, in: *Evolution and Path Dependence in Economic Ideas: Past and Present* (editors: Pierre Garrouste and Stavros Ioannides) (§9, Lausanne school, Winiarski, pg. 184). Edward Elgar Publishing.
4. Walker, Donald A. (2005). *Walrasian Economics*. Cambridge University Press.
5. (a) Walras Pareto Center for Interdisciplinary Studies (French → English) – University of Lausanne.
(b) Walras Pareto Center (about) (French → English) – University of Lausanne.
(c) Francois Allisson – Francois.Allisson.co.

External links

- Lausanne School – Wikipedia.

θΔics

In science, a **law** is a hypothesis turned postulate turned principle that has been verified by experiment and not found to contradict experimental fact. A law, stated another way, is a descriptive principle of nature that holds in all circumstances. [1] Laws differ depending on whether they apply universally or only to certain phenomena, systems, or processes. The two most established laws are the first law of thermodynamics and second law of thermodynamic, which were originally the first main principle and second main principle. A partial listing of laws is shown below, most of which are merely precipitates, derivatives, synonyms, or reformulations of the first and second law:

Laws | Main

The following are the main laws, shown via chronological inception, all of which are generally derived the latter from the former:

- Nature abhors a vacuum | Parmenides (485BC)

- Law of inertia | Aristotle (335BC)

    Laws of motion | Newton (1687)

        First law of motion
        Second law of motion
        Third law of motion

- Gas laws

    Boyle's law | Robert Boyle (1662)
    Mariotte's law
    Charles' law
    Gay-Lussac's law
    Boyle-Charles law

        Ideal gas law | Walther Nernst (1893)

- Laws of thermodynamics

    - Zeroth law of thermodynamics | Joseph Black (1786)
    - First law of thermodynamics | Rudolf Clausius (1865)

        Boerhaave's law
        Mechanical equivalent of heat

            Conservation of energy
            Conservation of force

    - Second law of thermodynamics | Rudolf Clausius (1865)

    Carnot's law of thermodynamics (Stephane Leduc)
    Law of dissipation
    Law of entropy
    Law of increasing entropy
    Murphy's law
    The entropy law
    Law of disintegration (Porteus' theory of happiness)

The first and second law
Law of increasing material entropy (material entropy)
Principle of degradation (degradation)
New second law (computational thermodynamics)

- Third law of thermodynamics | Walther Nernst (1908)
- Combined law of thermodynamics

On the Moving force of Heat and the Laws of Heat which may be Deduced Therefrom
Laws of affinity

First law of affinity
Second law of affinity

- Fourth law of thermodynamics

Fifth law of thermodynamics
Eth law of thermodynamics (principle of fast entropy) (Mark Ciotola)

- Laws of human thermodynamics

Laws of social thermodynamics
Law of racial thermodynamics

Heat | Other

The following are heat-specific related laws:

- Newton's law of cooling | Isaac Newton (c.1690)
- Joule's first law | James Joule (1841)
- Joule's second law | James Joule (1843)

Evolution | Other

The following are evolution-related laws:

- Darwin-Lotka energy law
- Second law evolution problem (second law evolution paradox) (Thermodynamics of Evolution)
- Second law (disordering) evolution (ordering) reconciliations

Laws | Other

The following are miscellaneous laws:

- Laws of human chemistry
- Laws of information

Conservation of information

- Laws of life
- Hess' law
- Surface law

● Conservation laws

Conservation of mass

● Goldsmith's two laws of ecodynamics (ecodynamics)
● Wien's law (energy element)
● Laws of organization (human elective affinity)
● Law of matter and force (vital energy)
● Law of chemical operation (George Carey)
● Physical laws (John Patrick, Charles Darwin)
● Laws of self-organization (Stuart Kauffman)

● Laws of the universe
● Four laws of black hole mechanics (Stephen Hawking)

● Laws of nature

Self-proclaimed laws

A few instances, there are theorists who proclaim to name or move their own principles to the rank of "law", a few examples:

● Law of temporal hierarchies | Georgi Gladyshev (c.1970s)
● Constructal law | Adrian Bejan (c.1990s)

This, however, is usually a bit of red flag, in that it bucks historical protocol of the "theorem" (1798/1850) to "principle" (1875), e.g. first main principle, to "law", e.g. "first law of thermodynamics" (Peter Tait, 1868) status migration of Clausius model historical transition:

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External links

● Law (disambiguation) – Wikipedia.

θΔics

In thermodynamics, the **law of dissipation** states that in the material world there exists a universal tendency to the dissipation of mechanical energy and that any restoration of mechanical energy, without more than an equivalent of dissipation, is impossible. [1]

Overview

The law of dissipation was stated by Irish physicist William Thomson in his April 1852 paper "On a Universal Tendency in Nature to the Dissipation of Mechanical Energy". [2] The following simplified original statement of the law of dissipation of energy, made by Kelvin at the conclusion of his paper, is oft-quoted summary of the law of dissipation: [3]

Law of Dissipation (parts)

1. There is at present in the material world a universal tendency to the dissipation of mechanical energy.
2. Any *restoration* of mechanical energy, without more than an equivalent of dissipation, is impossible in inanimate material processes, and is probably never effected by means of organized matter, either endowed with vegetable life or subject to the will of an animated creature.
3. Within a finite period of time past, the earth must have been, and within a finite period of time to come the earth must again be, unfit for the habitation of man as at present constituted, unless operations have been, or are to be performed, which are impossible under the laws to which the known operations going on at present in the material world are subject.

The law of dissipation was an early verbal prototype version of the second law of thermodynamics made more rigorous in the years to follow by German physicist Rudolf Clausius in his mechanical theory of heat.

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3. Thayer, William R. (1921). "Vagaries of Historians". *Annual Report of the American Historical Association* (pgs. 80-84, "law of dissipation", pg. 81). G.P.O.

θΔics

In human thermodynamics, the **law of entropy** is an entropology-like synonym for the second law of thermodynamics.[1] The term is similar to the variations "entropy law" or "law of increasing entropy."

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θΔics

In thermodynamics, the **law of increasing entropy** is loose metaphor for the second law of thermodynamics. In the 1964 Translator's Introduction to Boltzmann's *Gas Theory*, for instance, physics historian Stephen Brush, comments that: "Boltzmann was able to deduce immediately a very important result from his equation, which was not at all obvious from Maxwell's original formulation: a quantity called *H*, which can be identified with the negative of the entropy, must always decrease or remain constant, if one assumes that the velocity distributions of two colliding molecules are uncorrelated. The molecular interpretation of the *law of increasing entropy* is thus intimately related to the assumption of molecular chaos and the relation between entropy and probability." He continues, "*H* remains constant only when the gas attains a special velocity distribution which had previously been deduced by Maxwell (1859) in a less convincing manner." [1]

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θΔics

In human thermodynamics, the **law of racial thermodynamics** is an analogy-type postulate, modeled on the law of conservation of energy, introduced by American law professor and critical race theorist Richard Delgado, in his 1990 article "Does Voice Really Matter?", wherein he stated that: [1]

> "There is change from one era to another, but the net quantum of racism remains exactly the same. Racism is neither created nor destroyed."

This is sometimes paraphrased as: [2]

> "Racism is never destroyed but always comes back in new forms."

To explain this in a physics sense, one can argue that racism is a force, such as theorized in integration and segregation thermodynamics models, that keeps groups separated, and that owing to law of conservation of force, which states that forces cannot be created nor destroyed, that so to racism cannot be created nor destroyed.

Whatever the case, the pros and cons, validity, and or difficulties on theory to the idea of the "conservation of racism" in a physical science sense are yet to be worked out.

See also

â— Laws of human thermodynamics
â— Laws of social thermodynamics
â— Integration and segregation thermodynamics

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θΔics

In hierarchical thermodynamics, **law of temporal hierarchies** states that any living system of any temporal hierarchical level in a normal state has a "thermostat", which is a surrounding medium that is characterized by slightly changing average values of thermodynamic parameter. In simple terms, the law of temporal hierarchies is a means of identifying or discerning a systems-within-systems point of view in the classical thermodynamic anaysis of living system both internally and socially. This law was formulate by Russian physical chemist Georgi Gladyshev beginning in 1978. As a general rule, according to Gladyshev, the higher the hierarchy, the smaller the energy of interaction between the particles. [1]

Overview

The justification of this statement is connected with the phenomenon of metabolism and the exchange of matter and energy between adjoined hierarchies. Lower level hierarchical molecular structures are often reproduced in a medium of higher level hierarchical molecular structures during the lifetime of the latter. Thus, we have:

$$t_i << t_{i+1}$$

As a rule, modern thermodynamics studies simple or complex systems with similar processes taking place in a single fixed time scale. Usually, the processes are localized in one or several hierarchies. However, the processes in real systems usually imply complicated transformations involving structures of various hierarchies and relating to different time scales. In this situation we use the full differential equations and characteristic functions defined for macrothermodynamics - thermodynamics *of complex hierarchic natural systems* at constant temperature and pressure.

In such hierarchic systems, not only do chemical reactions take place but also transformations between the structure elements of other *j*-th hierarchic levels (*i*-th partial evolution). Moreover, let the reagents of each *i*-th evolution condense into the particles of the *i*-th evolution phase - a structure of higher level of substance organization. In their turn, the latter are reagents of the next, (*i+1*) -th, partial evolution. (The order of the partial evolution, *i* and of the structure hierarchy, *j* corresponds to the hierarchy order of the reagents.) Transformation of similar reagents of some hierarchic level (*j*) into similar reagents of the next hierarchic levels (j+1, j+2,...) can be represented as using a system of bi-directional two-way transition reactions arrows. This law is based on the observation that different structures delineate into different classifications of separate yet connected reacting systems distinguished by life-span *(t)*:

$$\ldots << t_{mol} << t_{cel} << t_{org} << t_{pop} << \ldots$$

Where ti is the average lifetime of the molecular structures of the lower temporal hierarchical level and ti+1 is the average lifetime of molecular structures of higher temporal hierarchical level. This law justifies the use quasi-closed equilibrium thermodynamic models to investigate open living systems. These distinctions are important in justifying a Gibbsian thermodynamic analysis of human life. In making this distinction, we now theoretically define, subgroup, or compartmentalize different interactive reactive living systems into separate yet connected quasi-equilibrium hierarchic thermodynamic systems, which can be defined as: thermodynamic systems consisting of hierarchic subsystems that are related to each other by structure and may be other subordination and by the transitions from lower level to higher ones. These subsystems should be also separated in space and or with respect to the time needed for the relaxation to equilibrium.

Using the law of temporal hierarchies, Gladyshev for the first time has strictly proved a possibility to apply the methods of the classical thermodynamics (the methods of the quasi-equilibrium thermodynamics) for studying the individual mono-hierarchical quasi-closed systems in living polyhierarchical open systems. It has

allowed to show, that the thermodynamics is convenient for research the interactions between similar mono-hierarchical particles in near-equilibrium systems. To apply thermodynamics to the poly-hierarchical system, as a rule, has no physical sense, as this system is composed of particles of different nature. It is not possible to use linear equations for the research of this system. From this point of view it is possible to analyze a correctness of use of thermodynamics by different authors. For example, R.Clausius and J.W.Gibbs stated: “Die Energie der Welt ist constant. Die Entropie der Welt strebt einem Maximum zu.” Here it is necessary to keep in mind, that 'Der Welt' – the Universe of Clausius and Gibbs – is a model of isolated ideal simple thermodynamic system, where no work or where only extension work is performed. Many authors often forgot about this important circumstance. As result of it in science there are many misunderstanding connected with concept “entropy”.

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θΔics

In human thermodynamics, **Lawrence Chang-Lung Chin** (c.1969-) is a Chinese-born American philosopher and science writer noted for his treatise *A Thermodynamic Interpretation of History*, written over the years 1999 to 2006, in which he argues that human history can be best understood as being under the guidance of a Prigoginean thermodynamics like form of evolution. In philosophical thermodynamics, Chin interprets a human thermodynamic meaning of life as a process focused on dissipation and defecation. [1] His treatise or history thermodynamics project, according to Chin, "is essentially a theory of everything in terms of thermodynamic laws, both the first and second."

In 2005, discussions between Chin and American chemical engineer Libb Thims, on the topic of the thermodynamics of evil, as discussed in Chin's chapter "Power, the Second Law of Thermodynamics and the Problem of Evil", resulted, in part, to stimulate the writing of the first article for the *Journal of Human Thermodynamics*, titled "Evil, Structural Stability, and Pre-disposed Movements." [2] In addition, in regards to the field of cessation thermodynamics, parts of Chins theory are mentioned Thims' 2005 manuscript *Cessation Thermodynamics* and his 2007 textbook *Human Chemistry*. [3]

Education

Chin competed his BS in philosophy at the University of Long Beach, California, and completed some post-graduate work at the University of Montreal, Canada.

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θΔics

In existographies, **Lawrence Henderson** (1878-1942) (IQ:180|#102) (SN:8) (EvT:19|21+) (CR:250) was an American physical chemist, biochemist, and physiologist noted for his 1910s to late 1930s efforts to outline and teach how matter and energy evolve physicochemical systems in general, not just living [reactive] organisms, nor man specifically, the culmination of which was his "Sociology 23" a physicochemical sociology and physical science based sociology course taught at Harvard.

Overview

The following seems to be an apt truncation of Henderson's overall philosophy:

> "Matter and energy have an original property, assuredly not by chance, which organizes the universe in space and time."
>
> — Lawrence Henderson (1913), *The Fitness of the Environment* [19]

A sophisticated version of his philosophy is said to be found in his *The Order of Nature* (1917). Henderson, however, is best known for having been the head of the so-called Harvard Pareto circle (1932-1939), noted in for his 1935 book *Pareto's General Sociology: a Physiologists Interpretation*, in which he explains French-Italian engineer Vilfredo Pareto's 1916 four-volume *Treatise on General Sociology*, and Pareto's view of society as a system of "human molecules", via of the logic of Gibbsian thermodynamics, using what Henderson calls Gibbsian "analogies", where a social system is said to contains individuals roughly analogous to "Gibbs' components". [1] Henderson was also influenced by the equilibrium physiology work of Claude Bernard. [16]

Goethe

In 1917, Henderson, in his *The Order of Nature*, a book which he seems to devote to what he calls the "riddle of voluntary action", stated has the following views of Goethe: [24]

> "Goethe, who stands far above any of Kant's successors in wisdom and an almost instinctive recognition of the truth. In judgment he surpassed his scientific contemporaries like Humboldt almost as much as in philosophical intuition he surpassed Schelling."

While admirable, Henderson, amid his history of the development of teleology theory, Aristotle, to Bacon, to Kant, to Leibniz, etc., up into the late 19th century mechanistic philosophy rise, prior to jumping into Gibbs, states the following incorrect discernment:

> "On the whole neither Goethe nor Lotze, nor indeed Mill, Spencer, or Comte, seriously modified the development of scientific thought, which now becomes our principal concern."

In other words, Henderson, amid his gropings to dismiss teleology as defunct, is seemingly unaware that Goethe's human chemical affinity work, via Hermann Helmholtz's 1882 thermodynamic theory of affinity proof, is the forerunner to what the Gibbs-based socioeconomic theories he will come to develop in the two decades to follow, via his Harvard Pareto circle.

Equilibrium | Le Chatelier | Gibbs | Pareto

Henderson, in his appendix notes 3 and 4, gives a rather

ripe Le Chatelier's principle type example of a isolated five component liquid and gas phase physico-chemical system, in which he steps though calculations to show how the addition of some 100 units of the gas phase shifts the original unperturbed chemical equilibrium of the entire system into a new second chemical equilibrium, after which he concludes rather boldly:

> "This simple example illustrates logical principles that find almost universal application in the physical, biological, and social sciences."

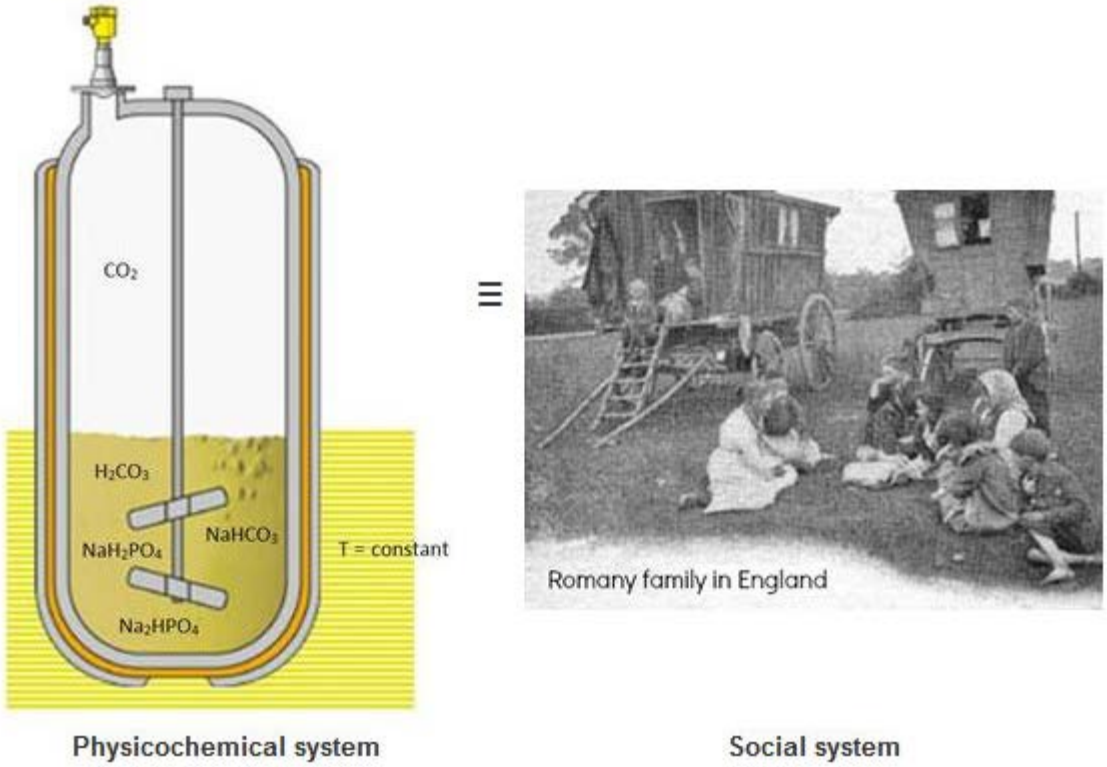

Left: **Henderson's** 1935 isolated five component liquid and gas phase physico-chemical system example model, wherein he shows how equilibrium of the system, according to Le Chatelier's principle (and Gibbs methods), shifts when carbon dioxide CO_2 is added, and goes on to assert that these reactive shifting equilibrium models apply universally to the social sciences, namely to connective semi-permeable boundaried (migrative) social systems. [2] Right: a Romany nomadic family immigrating into England, photo from *Our waifs and Strays* (1902) (Ñº), who, according to Henderson, are akin to the CO_2 molecules, pushed into England from the over pressurized Romania when the concentration increases. Note: similar chemical-to-social equilibrium adjusting examples are found in the works of: Julius Davidson (1916), Frederick Rossini (1971), Christopher Hirata (2000), and Thomas Wallace (2009).

The one person, prior to statement, that Henderson cites, to have made similar assertions, albeit without the reaction example, is American physical chemist Wilder Bancroft (1910). [23]

Henderson also states, in his example, that he is using the Le Chatelier model, over that of Gibbs, in that the former is simpler and easier to illustrate; though, as he goes on to discuss, Gibbs is the more accurate, albeit more complex description. The isolated physico-chemical system he employs in his example is a gas phase of carbon dioxide CO_2 in contact with a four component liquid phase system, namely an aqueous solution of carbonic acid H_2CO_3, sodium bicarbonate $NaHCO_3$, monosodium phosphate NaH_2PO_4, and disodium phosphate Ha_2HPO_4, as depicted adjacent. Henderson assumes the concentration of water and system temperature to be constant, as a first approximation. The equilibrium chemical reaction for the liquid phase is:

$$H_2CO_3 + Na_2HPO_4 \rightleftharpoons NaHCO_3 + NaH_2PO_4$$

The chemical equilibrium for this reaction, per ratio of concentration ratio of products over reactant is, according to Henderson, is:

$$\frac{[NaHCO_3][NaH_2PO_4]}{[H_2CO_3][Na_2HPO_4]} = 3$$

The equilibrium of the gas phase carbon dioxide shifting into free carbonic acid in the liquid phase is:

$$[CO_2]_g = [H_2CO_3]_{aq}$$

Henderson then defines the condition of equilibrium as reaction condition or state in which the velocity of a process in one direction, namely forward reaction, is equal to the velocity in the opposite direction, namely reverse reaction, so that there is no net change and therefore no observable change in the composition of the system.

He then goes through an algebraic type of concentration calculation wherein he adds a 100 units of carbon dioxide CO_2 gas to the the system, shows how so much carbon dioxide converts into liquid carbonic acid H_2CO_3, after which all the individual species concentrations adjust, at the end of which the second state equilibrium concentration ratio becomes 3.011, i.e. the original state equilibrium reaction velocities. On systems, Henderson explains:

> "Isolation may be regarded as the case where exchanges between the system and the environment have the value zero. If these exchanges have some other known value, the requirements for logical analysis are likewise fulfilled, and the analysis ay not present any serious inconvenience. Thus a metal bar one end of which is being heated at a constant rate, or a country with constant immigration rate, may for certain purposes be treated as a system, without regard to the properties of the source of heat, or of the countries from which the immigrants come."

Moreover, in rather telling postulation, which juxtaposes the earlier century Le Chatelier principle based sociology of Vilfredo Pareto with the later century free energy minimization bases sociologies of the late 20th century burgeoning human free energy theorists (e.g. Christopher Hirata, 2000), we fine the following very excellent statement:

> "Another characteristic of many ideal systems that is, in general, indispensable in order that conditions shall be determinate is the establishment and use of some definition of equilibrium or some criterion of equilibrium, whether in the case of statical equilibrium or in the case of dynamical equilibrium. This criterion is often of such a character that some function like entropy or energy assumes a maximum or a minimum value or, as in the case of the derivatives or variations of such functions, vanishes. In the case of Pareto's social system the definition of equilibrium takes a form that closely resembles the theorem of Le Chatelier in physical chemistry, which expresses a property of physico-chemical equilibrium, and which may be deduced from the work of Gibbs."

Here we are reminded of Irish physicist Philip Moriarty's infamous 2009 bend over backwards incorrect comment, spurted amid the prolonged Moriarty-Thims debate:

> "Whereï»¿ did Gibbs state that 'a society is one such material system'? He didn't - that is your particular (incorrect) reading of the application of thermodynamics."

Here, without going into detail, we see a rather telling look inside the likely to become growing battleground of physical science base humanities (physical humanities), namely a comparison between the way a physicist (Moriarty) sees things as compared to a physical chemist (Henderson) and chemical engineer (Thims) sees thing.

Education

Henderson completed his BS in physical chemistry at Harvard in circa 1899. It was during this period, according to Cynthia Russett, that Henderson had come to know or learn about Willard Gibbs and his work in thermodynamics. [16]

Henderson then went on to completed his MD at Harvard Medical School in 1902. He then continued his studies in biological chemistry at Strasbourg for four semesters and then returned to a lectureship at Harvard College, and the following year (1904) to teach biochemistry at both Harvard College and Harvard Medical School until his death (reaction end) in 1942. [13] During this period, he established the first laboratory of physical chemistry. [5] In 1927, he also established the Fatigue Laboratory at Harvard Business School to discover physiological norms for human biological processes and to study the physiological changes that cause fatigue in workers. [3]

In 1928, Henderson was was introduced to the French version of Pareto's work by his colleague entomologist William Morton Wheeler, whose studies of insect societies hand prompted him to take an interest in the structure of human societies. [16]

In circa 1926, Henderson's friend and colleague myrmecological entomologist William Wheeler—whose studies of insect societies had prompted him to take an interest in the structure of human societies—introduced Henderson to Vilfredo Pareto's *Treatise on General Sociology*, the 1917 French version. Henderson, supposedly, resisted at first because he did not think much of sociology, but the agreed to read the book on Wheeler's recommendation. [16]

By 1928, Henderson, in his *Blood: a Study in General Physiology*, was already quoting Pareto on over seven pages. [21] At some point, in or around this growing Pareto assimilation period, Henderson began to hold the following views in mind: [20]

> "As my familiarity with the work [of Pareto] has increased, I have become convinced that my acquaintance with Pareto's analysis of facts, with his synthesis of results, with his methods, and with some of his theorems is at present indispensable for the interpretation of a wide range of phenomena, whenever and whatever men act and react upon one another."

The key players in **Henderson's** so-called Harvard Pareto circle, a group which held from 1932 to the early 1940s, or till the start of WWI, where after focus switched to Marxism-based sociology.

In 1932, Henderson began to offer his now-famous seminar at the Harvard sociology department on "Pareto and the Methods of Scientific Investigation". The seminar members were chiefly Henderson's colleagues, e.g. sociologist Talcott Parsons, historian Crane Brinton, and advanced graduate students. [17]

In 1938, Henderson developed another seminar entitled "Concrete Sociology", which was aimed primarily at undergraduates. The first few meetings were devoted to lectures on Pareto's social theory; the rest of the semester was comprised of 25-guest lectures, from Talcott Parsons, George Homans, two anthropologists, two historians, a physiologist, among others. [17]

Harvard Pareto circle

American sociologist Barbara Heyl, in her 1968 "The Harvard 'Pareto Circle'", argues that the so-called "Pareto period" or Harvard Pareto circle, as it seems to have increasingly been called, in American sociology, fell off and or ended in the 1940s, at least in part to the second world war, during which America became allies with Russian, and a switch or change of direction to a sociology focus on the less innocuous Marxian historical materialism resulted. [15]

Early theories

In his early researches on the acid-base balances of organisms, Henderson was "strongly influenced" by American

engineer Willard Gibbs and French mathematician Philbert d'Ocagne. [5]

American equilibrium historian Cynthia Russett argues that the two main equilibrium models Henderson employed were that of Gibbs, in physical chemistry, and Claude Bernard, in physiology. [14]

In the 1920s, Henderson wrote two philosophical works, *The Fitness of the Environment* (1913) and *The Order of Nature* (1917), in which he argued, supposedly (check), that the planet's natural environment is perfectly suited for the development of life; felt that "unique physical properties of matter" made a steadily increasing variety of chemical interactions inevitable; thus, chemical evolution, the creation of life, and biological evolution proceed by design and not accidentally. [11]

The title of his 1917 *Order of Nature*, seems to derive from the following quote by Jean-Baptiste Lamarck, which Henderson's preface: [12]

> "Nature is an order ... which together constitute an unalterable power in its essence, subject in all its acts, and constantly acting on all parts of the universe." . . . "an order ... able to give successively the existence of so many different things." . . "that power which did so much, and yet is constantly confined to only do those."

Henderson, the follows this "one simple question", as he calls it, which he says sound be borne in mind when reading his work:

> "What are the physical and chemical origins of diversity among inorganic and organic things, and how shall the adaptability of matter and energy be described? He may then see his way through all the difficulties which philosophical and biological thought have accumulated around a problem that in the final analysis belongs only to physical science, and at the end he will find a provisional answer to the question."

This, we see, is pretty decent—a question that would not begin to find resolution until the early 21st century: defunct theory of life (2009), life terminology upgrades (2012), sociology terminology upgrades (2013).

Students

A noted student of Henderson was American sociologist Talcott Parsons who learned the concept of equilibrium, as taught to him by Henderson, thus believing that without equilibrium, a society would display no order. [4] Henderson had intensive discussions with Parsons during the writing of the manuscript for his 1937 *The Structure of Social Action.* Henderson's influence can also be seen in Parsons' 1951 work. [6] Other students of Henderson influenced by his teaching of systems theory and the equilibrium concept include George Homans and Charles Curtis (1934) and James Miller (1978). [7] Homans and Curtis belonged to a discussion group at Harvard called the Pareto Circle, led by Henderson and inspired by the work of Pareto.

Gibbs and Pareto systems

> *See also: Socio-physical chemistry*

In a footnote, at the end of his book, in commentary on his view of the physical chemistry origin of Pareto's

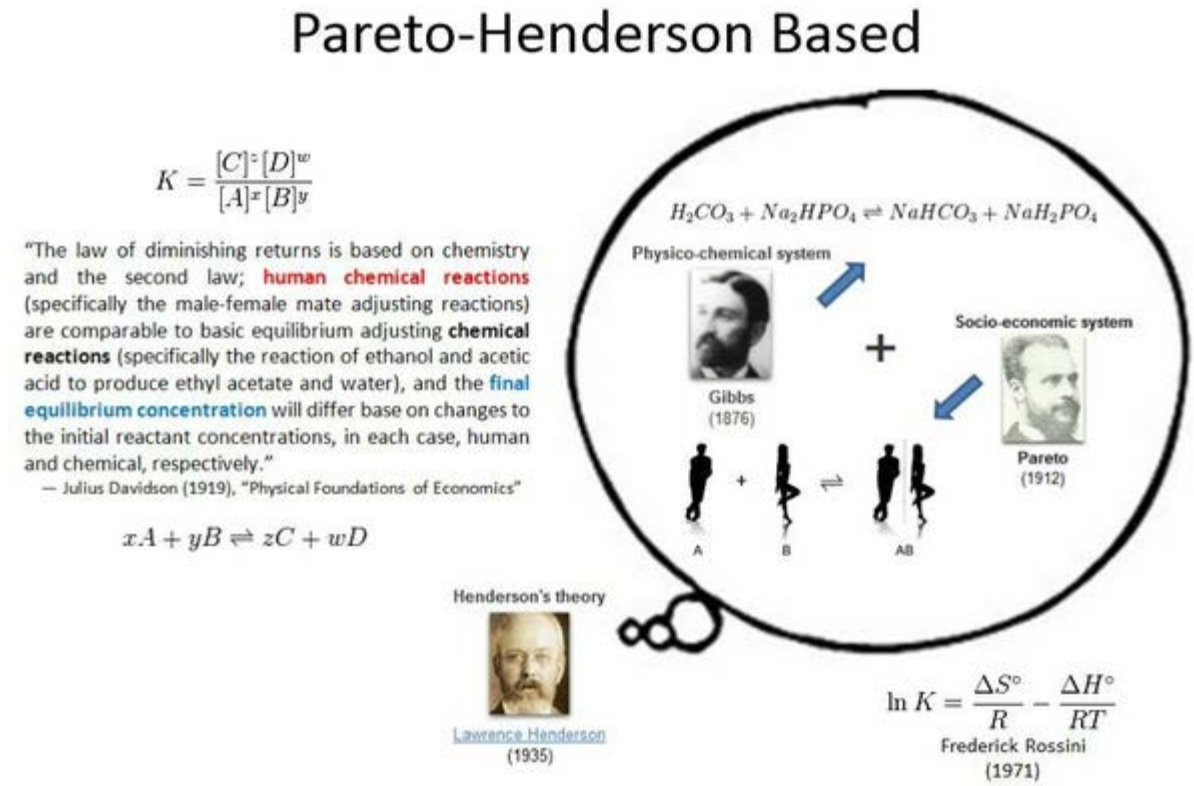

A power point synopsis of Henderson's Gibbs-Pareto envisaged chemical economic equilibrium theory, from American electrochemical engineer Libb Thims's UPESW 2013 talk: "Econoengineering and Economic Behavior." [10]

sociological theories, in respect to the chemical thermodynamics work of American engineer Willard Gibbs, Henderson concludes:

> "It is very unlikely that the general characteristics of Gibbs' system had anything to do with Pareto's construction of his social system. In other words it is very probable, I think nearly certain, that Pareto did not keep Gibbs' work in mind and *a fortiori* that he did not imitated it, when he worked out his social system; so that Pareto's system is not the result of the application of the theories of physical chemistry to sociology."

In comment on the possible incorrectness of this conclusion, Pareto, we note, first published his *Treatise*, in Italian, in 1916 under the title *Trattato di Sociologia Generale* (translated in French in 1917). Gibbs *Equilibrium* had been translated in French in 1899 by French chemist Henry Le Chatelier. Hence, Pareto, being part French, may have possibly known about the works of Gibbs and been influenced by him?

Quotes | On

The following are praise and or tribute quotes on Henderson:

> "**Henderson** may have given greater impetus to the diffusion of equilibrium concepts among American social scientists than any other single individual."
>
> — Cynthia Russett (1966), *The Concept of Equilibrium in American Social Thought* (Ñº)

> "**Henderson's** role in this transmission of concepts was essentially prismatic. His was a clear instance of what might be called the refractive phase of concept transmission—the point at which several different sources of an idea meet, are synthesized briefly into a new form, and are then scattered over a wider area than before."
>
> — Cynthia Russett (1966), *The Concept of Equilibrium in American Social Thought* [21]

"Gibbs' work is so foreign to most sociologists that it is doubtful that they would ever have adopted his interest in the equilibrium concept had it not been through **Henderson's** teaching."

— Kenneth Bailey (1990), *Social Entropy Theory* [8]

Quotes | By

The following are popular quotes by Henderson:

"Pavlov's researches on the glands of digestion, the study of internal secretions and hormones, Sherrington's investigation of the integrative action of the nervous system, Cannon's study of the emotions, and many other independent lines of investigation have cleared the ground, and at the present moment the physico-chemical treatment of the problem of organization is widely if somewhat vaguely recognized as the ultimate goal of physiological research."

— Lawrence Henderson (1917), *The Order of Nature* (pg. 80)

"Science owes more to the steam engine than the steam engine owes to science."

— Lawrence Henderson (1917), *The Order of Nature* [9]

"No one, not even the vitalist, doubts that the organism is a Gibbs system."

— Lawrence Henderson (1917), *The Order of Nature* [22]

"The theory of the organism is more than a philosophical generalization; it is a part of the working equipment of the physiologist, fulfilling a purpose not unlike that of the second law of thermodynamics."

— Lawrence Henderson (1927), "The Process of Scientific Discovery" [25]

"All knowledge can be divided into two classes: subjects that study the interrelations of two or more persons (history, literature, economics, sociology, law, politics, theology, education, etc.) and those that do not (logic, mathematics, physics, biology, and other natural sciences, grammar, harmony, etc.); [the former are slower] in setting in motion activity that becomes the most important and influential in the world."

— Lawrence Henderson (1935), on Machiavelli's studies vs. Galileo's studies [2]

"The social system thus defined and characterized is clearly an instrument that may be employed, within limits, similar to those explained [by Gibbs] for the physico-chemical system, in studying all the subjects of the first class (history, literature, economics, sociology, law, politics, theology, education, etc.). For like history, literature, law, and theology, all these subjects are conversant with the interactions of individuals in their manifold relations, with their sentiments and interests, with their sayings and doings, while none can dispense with considerations of the mutual dependence of many factors."

— Lawrence Henderson (1935), *Pareto's General Sociology: a Physiologist's Interpretation* (pg. 18)

"The actions, thoughts, and feelings of individuals depend upon the present condition, the past condition,

the rate of change, etc., of society and of its parts. They also depend upon other factors, e.g. age, sex, concentration of alcohol in the blood, body temperature, external temperature, weather, mental complexes, and, notably, conditioning that has been received in early years."

— Lawrence Henderson (1935), "Note 2: Durkheim's Study of the Sentiments" [2]

"When societies are too unstable, individuals suffer."

— Lawrence Henderson (1941), "What is Social Progress?" [26]

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External links

â— Lawrence Joseph Henderson – Wikipedia.

θΔics

In hmolscience, **Lawrence Krauss** (1954-) (CR:5) is an American physicist and atheism advocate — a frequenter of Atheism Reviews debates— noted for his 2012 book *A Universe from Nothing*, wherein he contends to solve the Gottfried Leibniz' circa 1700 posit "why is there something rather than nothing?", the last of the so-called "theologian trump cards", according to Richard Dawkins, via recourse to quantum vacuums. [1]

Overview

In 2001, Krauss published *Atom: an Odyssey from the Big Bang to Life and Earth … and Beyond*.

In 2005, Krauss, on PBS, dialogued, via video feed, with Michael Behe on the statement by the president that "both sides" should be taught, on the subject of intelligent design and evolution. (Q)

Stardust

See main: Humans as stardust

In circa 2005, Krauss, during a talk, stated the following:

> "Here's a beautiful picture [below] from the Hubble Space Telescope of a distant galaxy, far far away and long long ago. It's about a billion light-years away. We're looking at it as it looked a billion years ago. So many of those stars no longer exist.
>
> Here's an object that's just as bright as the center of the galaxy. You would think it's a start that's close to our galaxy that just got caught in the picture. It's not. It's a star on the edge of that galaxy that has exploded. Exploding stars shine with a brightness of 10 billion stars. They're the brightest fireworks in the universe. [They're called] supernovas. They're remarkable. This is something that I wrote a whole book about. Someone asked yesterday why I wrote that book. [The answer is] that it is the most poetic thing that I know about the universe.
>
> Richard Dawkins wrote a great book called *Our Ancestor's Tale: a Pilgrimage to the Dawn of Life* (2004) (Q), and I wrote a book about a different ancestor's tale, it's called *Atom: an Odyssey from the Big Bang to Life and Earth … and Beyond* (2001) (Q).
>
> The amazing thing is that every atom in your body came from a star that exploded. The atoms in your left hand probably came from a different star than the atoms in your right hand.
>
> It really is the most poetic thing that I know about physics. You are all **stardust**. You couldn't be here if stars hadn't exploded, because the elements: the carbon, the nitrogen, the oxygen, the iron, all the things that matter for evolution weren't created at the beginning of time, they were created

A galaxy a billion light-years from earth, shown next to an exploding star (bottom left), the atoms of which Krauss refers to as stardust.

> in the nuclear furnaces of stars, and the only way they can get into your body, is if the stars were kind enough to explode. So forget Jesus, the stars died so that you could be here today!"

This, according to GoodReads (Q) like rankings, is his most-popular quote. The "humans as stardust" model, as was popularized by Carl Sagan in 1980, seems to have originated via Hilda Finnemore's 1924 book *A History of the Earth from Star-Dust to Man*. [2]

In 2012, Krauss, in his *A Universe from Nothing: Why There is Something Rather Than Nothing*, of note, mentions stardust twice, as shown below, but does not mention Jesus.

> "We are all, literally, star children, and our bodies made of stardust. Quantum fluctuations, which otherwise would have been completely invisible, get frozen by inflation and emerge afterward as density fluctuations that produce every-**thing** we can see. If we are all **stardust**, as I have written, it is also true, if inflation happened, that we all, literally, emerged from quantum no-**thing**-ness."

Every "thing" came from no "thing", according to Krauss?

Religion | Atheism

Krauss was brought up in a Jewish household, was bar mitzvahed, and read the Bible and the Quran as a kid, and says (2016) that he "wanted to believe" in god, like he wanted to believe in Santa Claus, but that as he got older, it became apparent that those were just myths and superstitions. (Q)

Quotes | On

The following are Krauss related quotes:

> "The belief that all of reality can be fully comprehended in terms of physics and the equations of physics is a fantasy."
>
> — George Ellis (2014), commentary on Krauss' *A Universe from Nothing* (Q)

Quotes | By

The following are noted Krauss quotes:

> "Commitment to open questioning is deeply tied to the fact that science is an atheistic enterprise. "My practice as a scientist is atheistic," the biologist John Haldane wrote, in 1934. "That is to say, when I set up an experiment I assume that no god, angel, or devil is going to interfere with its course and this assumption has been justified by such success as I have achieved in my professional career." It's ironic, really, that so many people are fixated on the relationship between science and religion: basically, there isn't one. In my more than thirty years as a practicing physicist, I have never heard the word "god" mentioned in a scientific meeting [compare: Joshua Greene]. Belief or nonbelief in god is irrelevant to our understanding of the workings of nature—just as it's irrelevant to the question of whether or not citizens are obligated to follow the law."
>
> — Lawrence Krauss (2015), "All Scientists Should Be Militant Atheists" [4]

> "We are here by 'chance', absolutely, as far as we can tell, and we should be thrilled by that fact. First of

all, there is NO evidence of any ‘design’ or ‘purpose’ that we can see in any case. Secondly, in my last book, *The Universe From Nothing*, I explain how the entire universe can be created from nothing, without any supernatural shenanigans, and so even our entire universe could be here by ‘chance’. Once you’re in our universe, what this [new] book is about is the remarkable fact that even the laws of physics we see today are somewhat accidental, so the universe wasn’t even designed for life. The fundamental laws of physics don’t even allow life at all, and we’re here just by ‘accident’, like an icicle on a window and we should celebrate that fact. The fact that we’re here as a ‘cosmic accident’ means, in some sense, that ‘life’ is more precious and we should enjoy our brief moment in the sun.”

— Lawrence Krauss (2017), video (O) interview of his new book *The Greatest Story Ever Told*, Simon Schuster UK, Feb 28

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Videos

- Lawrence Krauss on Science Based Morality (2014) (O)
- Lawrence Krauss vs Michael Behe (2005) | Reviewed (O)

External links

- Lawrence M. Krauss – Wikipedia.
- A Universe from Nothing – Wikipedia.

θΔics

In chemistry, **laws of affinity** are any of various combining theories or rules for how specific chemical species can combine according to affinity preferences or necessities. [1] In the history of chemistry, there have been at least a dozen or more laws of affinity, depending on which chemist is sourced. One of the first, was Greek philosopher Plato's c. 390 BC affinity law that "like tends towards like". Over the years, these affinity laws became more elaborate and complex as new chemical discoveries occurred.

Empedocles

In circa 450 BC, Greek philosopher Empedocles' introduced his "standard model" of physics, in which the universe was comprised of four elements: fire (△), earth (▽̸), air (△̸), water (▽), meaning that humans are entities made of four elements, whose interactions were governed by two forces: philia (●→|←●), i.e. attraction (or love) and neikos (←●|●→), i.e. repulsion (or hate). In short, two forces governed movement: *philia* (attractive force) and *neikos* (repulsive force). Empedocles expanded on this via employing anthropomorphized types of chemical aphorisms: as in enemies repel; friends attract.

Plato

In c.390 BC, Greek philosopher Plato built on Empedocles' conception of *philia* (attractive force) and *neikos* (repulsive force) by postulating the first law of affinity that "likes tend toward likes" (likes attract), e.g. earth to earth or water to water, etc.

Geoffroy

In 1250, Albertus Magnus applied the conception of 'affinity' to chemical systems and postulated four laws of affinity. [2]

In 1687, English physicist Isaac Newton proposed that chemical affinities were due to certain forces that would likely follow similar laws analogous to the three laws of planetary motion. He expanded on these views in 'Query 31' of his 1704 *Opticks*.

In 1718, after translating Newton's *Opticks*, French physician and chemist Étienne Geoffroy proposed a new law of affinity that 'whenever two substances are united that have a disposition to combine and a third is added that has a greater affinity with one of them, these two will unite, and drive out the other.' Using this law, he published the first every affinity table. Geoffroy's first law of affinity was that:

> "Whenever two substances are united that have a disposition to combine and a third is added that has a greater affinity with one of them, these two will unite, and drive out the other."

To expound on this law, using data from the 1718 edition of Newton's *Opticks* (query 31), Geoffroy made a sixteen-column, eight-row, affinity containing twenty-four reacting species, showing specifically what affinity reactions would occur between various combinations of reactants.

Other

In 1749, building on Geoffroy's affinity table, French chemist J. P. Macquer published six truths of chemical affinity, which encompassed both Plato's and Geoffroy's affinity laws, as well as four new ones. In 1766, he published seven types of affinity in his *Dictionnaire de chymie*. In this direction, most consider Isaac Newton to be the one who stimulated the discovery of the "laws of attraction". Before this, however, the ancient Greeks knew from magnetic interactions that "opposites attract" and "likes repel". This factor is modeled, in modern terms, via Coulomb's law.

In the latter half of the 20th century, the theory of electromagnetism, unified by Scottish physicist James Clerk Maxwell in 1873, is the physics of the electromagnetic field; a field encompassing all of space which exerts a force on particles that possess the property of electric charge, and is in turn affected by the presence and motion of those particles. This effect, as modeled via Maxwell's field equations, can be thought of as the electromagnetic laws of attraction and

repulsion.

With the discovery of sub-atomic particles, such as the quark (1964), and the fundamental forces, the term "laws of attraction" has been replaced with the conception of field particle exchange, and the bonding effect created therefrom. Subsequently, in the 20th century the laws of affinity were replaced by the laws of quantum chemistry and chemical thermodynamics.

In the mid 20th century, social scientists began to apply Plato's first law of affinity, i.e. "likes attract", to relationship life noting that, for example, people tend to marry based on such factors as age, religion, socioeconomic status, and education. In the 1950s, in opposition to this view, sociologist Robert Winch proposed the "opposites attract" theory, arguing that people are attracted to those whose needs conversely match his or her own. [3]

Laws of attraction

In new age, the original Greek formulation of the laws of affinity, via self-help stylized distortion, towards the late 20th century, began to be reconceptualized into what is referred to, by some, as the "laws of attraction", the idea that "like attracts to like" means that if you think about what you want, via some type of new age power model, it will come to you.

A “law of attraction” stylized banner (Q), which in Empedocles notions of attraction and repulsion are discussed; precursors to the **laws of the affinity**.

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θΔics

In human chemistry, **laws of human chemistry** are a supposed set of chemical laws that govern the reactions of "human chemicals".

Overview

In 1948, English writer Thomas Dreier stated the following: [1]

> "Those who, consciously or unconsciously, apply the **laws of human chemistry**, get along well with people and live successful lives. Those who do not find, it hard to get along with people, and do not enjoy the success of happiness that might be theirs."

In this self-help style of context, Dreier reasons that an understanding of the "chemistry of human beings" will give the latter group a fresh start.

See also

â— Laws of human thermodynamics

References

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θΔics

In human thermodynamics, the **laws of human thermodynamics** are set of hypothetical laws of thermodynamics, supposedly differing in some way from the standard laws, that supposedly govern human or human molecular actions.

Overview

In 1952, English physicist C.G. Darwin stated the following:

> "If we determine 'some kind of **laws of human thermodynamics**' we shall be more successful in doing good in the world."

Moreover, he concludes by saying that "I am going to try to see what these laws of human thermodynamics are; of course they cannot be expected to have the hard outline of the laws of physical science, but still I think some of them can be given a fairly definite form." Curiously, he reasons that it will be up to "someone more skilled in biology than he is to perfect, or perhaps correct, his attempts at a possible formulation of the laws of human thermodynamics." Correctly, to clarify, knowing that biology is a softer science (mathematically speaking), he should have said that this task would soon likely be completed by someone more skilled in a harder science such as physical chemistry or chemical thermodynamics. Very few publications in thermodynamics ever come from the biologists.

In 1972, American political theorist Marlan Blissett discussed the laws of social thermodynamics. [5]

In 1999, Forbes Allan, in his book *Milton's Progress*, in a conversation between to scientists, stated: [2]

> "It's just **human thermodynamics**, my friend," John said stiffly, "you're inside the jaws of laws beyond your ken." That's an acer poem, he decided, which nicely sums up the plight of humankind and the worthlessness of being. "Maybe I've stumbled on a **new law** of physics!" it flashed on him suddenly: " -- that life-driven anti-entropic processes are an integral component of all second law activities and provide an engine with which to accelerate the overall degradation of energy into heat! ... Or wouldn't that be a **'fourth' law of thermodynamics**?"

In 2000, American schooling advocate John Gatto said the following: [4]

> "Our school tragedies are an early warning of something inherent in the **laws of human thermodynamics**."

In 2002, German physicist Ingo Müller referred to what he called first law of socio-thermodynamics and second law of socio-thermodynamics found in conjunction with discussions on the working and heating aspects of human life. [3]

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θΔics

In science, **laws of information** are a collection of metaphor types of statements as to supposed properties of information, modeled generally on the laws of thermodynamics.

Overview

In 1985, American educator Dick Hammond, in the context of evolution of life, information theory, and thermodynamics, gave four information laws: [1]

> First law of information: Information, genetic or learned, exists in the arrangement of matter.
> Second law of information: Information, genetic or learned, regulates time, organizes matter, and controls energy flow.
> Third law of information: Information, genetic or learned, is inversely related to entropy.
> Fourth law of information: Information, genetic or learned, is created and destroyed.

Hammond later (2005) declared: "what has been discovered are a **new set of laws** which necessarily evolved for life to cope with the laws of thermodynamics."

In 1998, American intelligent design advocate William Dembski proposed a aw of conservation of information.

In circa 1999, Italian philosopher Luciano Floridi proposed four principles of information ethics: [2]

> 0. Information entropy ought not to be caused in the infosphere.
> 1. Information entropy ought to be prevented in the infosphere.
> 2. Information entropy ought to be removed from the infosphere.
> 3. The flourishing of information entities as well as of the whole infosphere ought to be promoted by preserving, cultivating and enriching their properties.

(add summary)

Difficulties

All of the various laws of information are baseless; give or take, for the most part.

References

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θΔics

In nature, **laws of life** are hypothetical universal laws said to govern the operation of every living object or life-like entity.

Overview

In 1869, French philosopher Hippolyte Taine, in the preface to his 1869 two volume book *On Intelligence*, stated: [1]

> "It is now admitted that the laws which rule formation, nutrition, locomotion, for bird or reptile, are but one example and application of more *general laws* which rule the formation, nutrition, locomotion, of every animal. The same way we begin to admit that the laws which rule the development of religious conceptions, literary creations, scientific discoveries, in a nation, are only an application and example of laws that rule this same development at every moment and with all men."

In modern terms, its generally agreed that one of the core laws of life, is the conservation of energy or the first law of thermodynamics. However, experience has shown that not all processes that satisfy the conservation of energy are possible. Real processes must also satisfy both the second and the third laws of thermodynamics. Life, sub-bacterial, microbial, plant, animal, and human, then, are processes governed by these laws. In the 2001 words of American biophysicist Donald Haynie: [2]

> "Any theory claiming to describe how organisms originate and continue to exist by natural causes must be compatible with the first and second laws of thermodynamics."

Other possible laws of life yet to be discerned may possibly develop in relation to gravity, relativity, particle physics, quantum electrodynamics, among others.

Defunct theory

In 2009, with the defunct theory of life, life has been found to be akin to ether, and non existent; therefore, any so-deemed "laws of life", if cogent, are reducable to physics and chemistry.

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θΔics

In physics, **laws of motion**, aka "Newton's law of motion", are three sets of laws that defined the nature of the forces and motions of interacting bodies.

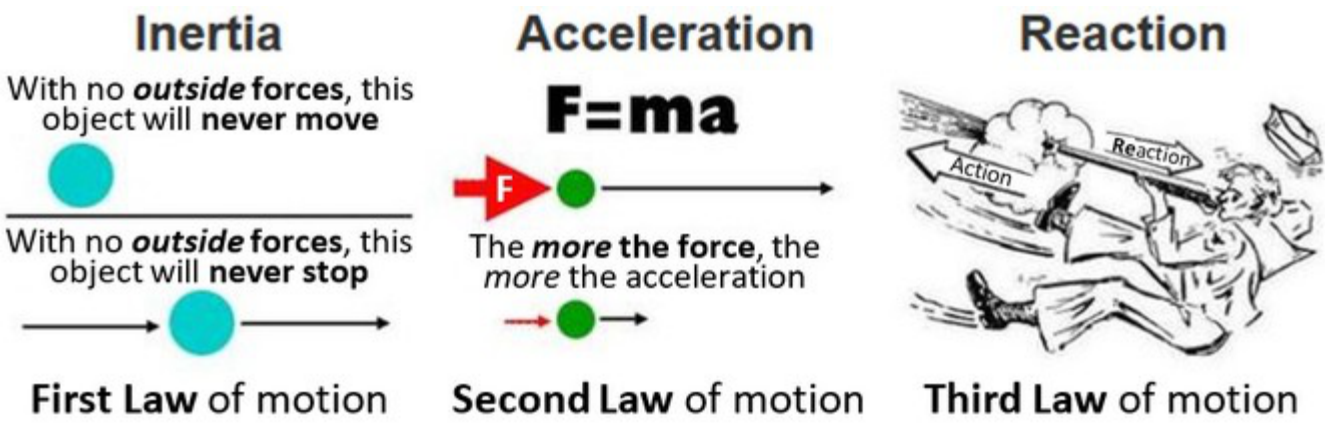

The three **laws of motion**: firstly, that a body will only moved when acted on by an outside force (see: external force); two, that greater the force, the greater the change in motion (aka acceleration); third, that for every action (force) there is an equal and opposite reaction (force), which implies that forces are always found in pairs (see also: conjugate variables). [3]

The three laws of motion, as a set, were codified by English physicist Isaac Newton and first presented in his 1687 *Principia*, the first sixty copies of which were printed and shipped on a wagon from London to Cambridge.

First law of motion

See main: First law of motion

Greek philosopher-scientist Aristotle (384-322BC) was one of the first to grapple with the outlines of the first law; discussions of which resulting from his investigations into the nature abhors a vacuum query, which he was an advocator of. Aristotle's proto-version version of the first law was: [4]

> "Nobody can give a reason why a body that has been put into motion in empty space should stop on its own account. Why should it stop in one place rather than in another? Thus it will remain at rest, or it will of necessity keep moving ad infinitum unless it is hindered from doing so."

Greek physicist-engineer Hero (c.10-70AD) stated the following on the matter: [4]

> "Bodies will have a rapid motion through a vacuum where there is nothing to obstruct or repel them, until they are in contact."

In 1490, Leonardo Da Vinci, in his notebooks, moved from simply describing inventions to a more intense search for underlying principles, the laws of motion, in particular. In respect to what Newton would later categorized, in 1687, as the first law of motion, Da Vinci wrote: [5]

> "Nothing whatever can be moved by itself, but its motion is effected through another. There is no other force."

> "All movement tends to maintenance, or rather that all moved bodies continue to move along as the impression of the force of their motors (original impulse) remains in them."

In c.1600, Italian physicist Galileo Galilei outlined a proto-version of the first law of motion in the form of the principle of inertia, or Galileo's principle, refined—there are two states: being at rest and moving uniformly, which are to be treated as being the same. [1]
In 1644, Rene Descartes, in his *Principles of Philosophy*, proposed seven laws of motion, which, supposedly, were almost entirely wrong. [8]
In 1687, Newton codified the first law of motion as follows:

> "Every body perseveres in its state of being at rest or of moving uniformly straight forward, except insofar as it is compelled to change its state by forces impressed."

(add)

Second law of motion

See main: Second law of motion

The second law of motion, according to Newton (1687), states that:

AXIOMS, OR LAWS OF MOTION.

LAW I.

Every body perseveres in its state of rest, or of uniform motion in a right line, unless it is compelled to change that state by forces impressed thereon.

PROJECTILES persevere in their motions, so far as they are not retarded by the resistance of the air, or impelled downwards by the force of gravity. A top, whose parts by their cohesion are perpetually drawn aside from rectilinear motions, does not cease its rotation, otherwise than as it is retarded by the air. The greater bodies of the planets and comets, meeting with less resistance in more free spaces, preserve their motions both progressive and circular for a much longer time.

LAW II.

The alteration of motion is ever proportional to the motive force impressed; and is made in the direction of the right line in which that force is impressed.

If any force generates a motion, a double force will generate double the motion, a triple force triple the motion, whether that force be impressed altogether and/at once, or gradually and successively. And this motion (being always directed the same way with the generating force), if the body moved before, is added to or subducted from the former motion, according as they directly conspire with or are directly contrary to each other; or obliquely joined, when they are oblique, so as to produce a new motion compounded from the determination of both.

LAW III.

To every action there is always opposed an equal reaction: or the mutual actions of two bodies upon each other are always equal, and directed to contrary parts.

Whatever draws or presses another is as much drawn or pressed by that other. If you press a stone with your finger, the finger is also pressed by the stone. If a horse draws a stone tied to a rope, the horse (if I may so say) will be equally drawn back towards the stone: for the distended rope, by the same endeavour to relax or unbend itself, will draw the horse as much towards the stone, as it does the stone towards the horse, and will obstruct the progress of the one as much as it advances that of the other. If a body impinge upon another, and by its force change the motion of the other, that body also (because of the equality of the mutual pressure) will undergo an equal change, in its own motion, towards the contrary part. The changes made by these actions are equal, not in the velocities but in the motions of bodies; that is to say, if the bodies are not hindered by any other impediments. For, because the motions are equally changed, the changes of the velocities made towards contrary parts are reciprocally proportional to the bodies. This law takes place also in attractions, as will be proved in the next scholium.

The 1687 original rendition of the **laws of motion** by Isaac Newton, according to the English translation by Andrew Motte (1850). [7]

> "A change in motion is proportional to the motive force impressed and takes place along the straight line in which that force is impressed."

In equation form, relation is defined by the following formula:

$$F = ma$$

which states that the force *F* acting on a body of mass *m* will tend to cause an acceleration *a* of motion. Force, in other words, generates motion, and these are quantities to be added and multiplied according to mathematics. [1]

Third law of motion

See main: Third law of motion

In circa 340BC, Greek philosopher Plato stated the following:

> "The excessive increase of anything causes a reaction in the opposite direction."

In 1494, Leonardo Da Vinci, in his notebooks (e.g. Codex Arundel, f. 44v), penned next to his designs (shown below), penned something about how he arrived at conclusion of the impossibility of perpetual motion, supposedly, foreshadowing Newton's third law in some way. [6] The following statement, by Da Vinci, according to Leonard Shlain, is said to express the idea or essential principle behind the third law: [5]

> "See how the wings, striking the air, sustain the heavy eagle in the thin air on high. As much force is exerted by the object against the air as the air against the object."

In 1687, Newton codified the third law of motion as follows:

> "To any action there is always an opposite and equal reaction; in other words, the actions of two bodies upon each other are always equal and always opposite in direction."

(add)

Human physics

In 1960, Lewis Richardson (1881-1953), an English physical chemist and mathematical psychologist, in the context of human physics (or possibly human mathematics), expanded upon his earlier method of differential equation based weather forecasting to develop an "action-reaction pairs" model of warfare scenarios between countries (see also: war thermodynamics), in some type of effort to forecast and or scientifically explain the causes of war and conditions of peace. [2]

Quotes

The following are related quotes:

> "Descartes discovered coordinate geometry and the first two **laws of motion**, while Galileo discovered the acceleration due to gravity and the two moons of Jupiter."

— Thomas Conlon (2011), *Thinking About Nothing* (pg. 319)

See also

- Dean Hamden
- Self-motion
- Universal gravitation law

References

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2. (a) Attar, Riad A. (2009). *Arms and Conflict in the Middle East* (pg. 68). Emerald Group Publishing.
(b) Lewis Fry Richardson – Wikipedia.
3. Laws of motion – Physics4Kids.com.
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5. Shlain, Leonard. (2009). *Leonardo's Brain: Understanding da Vinci's Creative Genius* (manuscripts, pg. 6; spurge, pg. 9; Machiavelli, pg. 27; desire to know, pg. 75; laws of motion, pgs. 111-14). Lyons Press, 2014.
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(c) Leonardo da Vinci's Notebooks (overview) – British Library.
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7. Newton, Isaac. (1687). *The Principia: the Mathematical Principles of Natural Philosophy* (translator: Andrew Motte; existography: N.W. Chittenden, pgs. 9-61; Preface, pgs. 65-67; laws of motion, pgs. 83-84). Putnam, 1850.
8. Inwood, Stephen. (2003). *The Man Who Knew Too Much: the Strange and Inventive Life of Robert Hooke 1653-1703* (pg. 116). Pan MacMillan.

External links

- Newton's laws of motion – Wikipedia.

θΔics

In science, **laws of nature**, or 'law of nature', depending, refers to the binding practice or rule of conduct or action through which processes and governance of systems, in the universe, in various matter, energy, and vacuum states of existence, accrue, via enforcement, of which there are to general varieties: natural or exergonic and unnatural or endergonic, both of which are coupled to each other and to the assumed mechanisms of operation of the known universe.

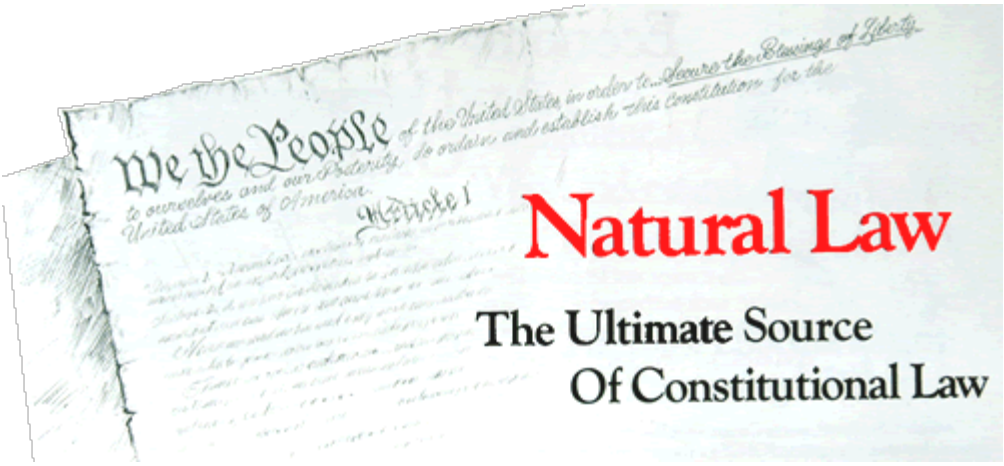

A image from an NCCS.net article on how the 1776 Declaration of Independence established the premise that in America a people might assume the station "to which the **laws of nature** and nature's god entitle them…" and how Americas leaders of 1787 had studied Cicero, Polybius, Coke, Locke, Montesquieu, and Blackstone, among others, as well as the history of the rise and fall of governments, and they recognized underlying principles of natural law as those of the Decalogue (ten commandments), the golden rule, and the deepest thought of the ages. [2]

Quotes

The following are related quotes:

> "Nature will never follow people, but people will have to follow the **laws of nature**."
>
> — Dioscorides (c.60), *Of Material Medicine*

> "No one cares to dispute overly man's free will, but no one yet has proved that man can thereby violate the **laws of nature**, despite the authentic accounts to the contrary as recorded in the Bible."
>
> — Morris Zucker (1945), on the problem of the accident [Sorokin theory version] in history [1]

> "To a materialist no thing is real but atoms in a void and we are but molecular people controlled by the actions of **natural physicochemical law**."
>
> — George Scott (1985), *Atoms of the Living Flame*

> "The title of Goethe's novel Elective Affinities refer to the chemical tenet of rapports between different bodies which, from Etienne-François Geoffroy's works in 1718, emerge as a prevailing theory [see: affinity theory] in the eighteenth-century chemistry. Goethe does not limit his views to the analogy between love attractions which made and break up couples and chemical processes which determine bonds and precipitations of chemical substances. His excellent knowledge of chemical and alchemical tradition leads him to consider affinity as a **law of nature** having effects in chemistry as well as in the living being and in the mind."
>
> — Bernard Joly (2006), "Goethe's *Elective Affinities:* Between Science and Literature" (abs) [3]

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1. Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 681). Arnold-Howard Publishing Co.
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Affinities: Between Science and Literature" (English), Methodos, 6.

External links

â— Law of nature (disambiguation) – Wikipedia.
â— Laws of nature – Stanford Encyclopedia of Philosophy.

θΔics

In hmolscience, **laws of social thermodynamics** refers to supposed or apocryphal laws in sociology based on the laws of thermodynamics.

Overview

In 1972, American political theorist Marlan Blissett used the term "laws of social thermodynamics" to characterize American physicist Alvin Weinberg's 1967 theory of the underlying process by intellectual "thermodynamic revolutions", which argues that paradigm changes in science, similar to the theme of Thomas Kuhn's scientific revolution structure, are the result of two factors: available "energy levels", a variation he culled from Leo Szilard who defining energy and entropy as having a meaning or measure as information) and the "second law" (entropy or disorder always tends to increase) both intertwined with Wienberg's idea of the "semantic complexity" inherent in the various branches of science as they become more and more specialized, where at the same time science as a whole becomes more and more tensioned. [1]

In 2009, Chinese physicist Yi-Fang Chang, in his "Social Synergetics, Social Physics, and Research of Fundamental Laws in Social Complex Systems", claims that in his paper he searches the subject of "social thermodynamics and the five fundamental laws of social complex systems," so to discuss topics such as the evolution equation of the system, social temperature, social entropy, the latter two which he gives equations for, among other theories. [2]

References

1. (a) Weinberg, Alvin M. (1967). *Reflections on Big Science*. MIT Press.
(b) Blissett, Marlan. (1972). *Politics in Science* (section: Big Science and the Laws of Social Thermodynamics, pg. 25-35; term: entropy, pgs. 26, 53, 66, etc.). Little, Brown and Co.
2. Chang, Yi-Fang. (2009). "Social Synergetics, Social Physics, and Research of Fundamental Laws in Social Complex Systems" (abstract), eprint arXiv: 0911.1155.

θΔics

In science, **laws of the universe** are regulatory equations, statements, or governing principles that are deemed to hold true in any part of the known universe or regions of space discernible to observation. One the first to make statements of two laws of the universe was German physicist Rudolf Clausius who in 1865 stated: [1]

> "If for the entire universe we conceive the same magnitude to be determined, consistently and with due regard to all circumstances, which for a single body I have called *entropy*, and if at the same time we introduce the other and simpler conception of energy, we may express in the following manner the fundamental **laws of the universe** which correspond to the two fundamental theorems of the mechanical theory of heat: (a) *The energy of the universe is constant*, (b) *The entropy of the universe tends to a maximum*."

See also

- Laws of affinity
- Laws of human thermodynamics
- Laws of life
- Laws of thermodynamics

References

1. (a) Clausius, Rudolf. (1865). "On Several Convenient Forms of the Fundamental Equations of the Mechanical Theory of Heat", Read at the *Philosophical Society of Zurich* on the 24th of April, 1865, published in the *Vierteljahrsschrift of this society, Bd. x. S. 1.; Pogg. Ann.* July, 1865, Bd. cxxv. S. 353*; Journ. de Liouville*, 2e ser. t. x. p. 361.
(b) Clausius, Rudolf. (1867). *The Mechanical Theory of Heat – with its Applications to the Steam Engine and to Physical Properties of Bodies*, (pg. 365), (URL). London: John van Voorst, 1 Paternoster Row. MDCCCLXVII.

Further reading

- Atkins, Peter. (2007). *Four Laws - that Drive the Universe.* Oxford: Oxford University Press.
- Penrose, Roger. (2005). *The Road to Reality: A Complete Guide to the Laws of the Universe*, (ch. 27: The Big Bang and its Thermodynamic Legacy, pgs. 686-734). New York: Alfred A. Knopf.

θΔics

In thermodynamics, the **laws of thermodynamics** define the rules of temperature equivalence (zeroth law, 1786), energy conservation (first law, 1837), entropy tendencies (second law, 1865), and conditions for an absence of temperature (third law, 1906). [1] The combined law of thermodynamics, sometimes called the Gibbs fundamental equation, is the combination of the four laws in one expression.

In 1952, Norwegian-born American physical chemist Lars Onsager's reciprocal relations (1929) began to be referred to as the fourth law of thermodynamics.

For the present I will confine myself to the statement of one result. If for the entire universe we conceive the same magnitude to be determined, consistently and with due regard to all circumstances, which for a single body I have called *entropy*, and if at the same time we introduce the other and simpler conception of energy, we may express in the following manner the fundamental laws of the universe which correspond to the two fundamental theorems of the mechanical theory of heat.

1. *The energy of the universe is constant.*
2. *The entropy of the universe tends to a maximum.*

Crop of the original English translation of the famous April 24, 1865 statement of the first two **laws of thermodynamics** (laws of the universe) by Rudolf Clausius. [3]

In some marginal publications, especially in economic thermodynamics (e.g. via Nicholas Roegen) and ecological thermodynamics, (e.g. via Corrado Giannantoni) one can also find a fourth law, fifth law, sixth law, or seventh law of thermodynamics, etc., among other variations. The zeroth through the fourth laws of thermodynamics were introduced in chronological order as follows:

0th | 1786

The theoretical framework zeroth law was first enunciated by Scottish physicist Joseph Black in his 1786 *Lectures on Chemistry*, as such: [6]

> "[There exists] a tendency of heat to diffuse itself from any hotter body to the cooler around, until it be distributed among them, in such a manner that none of them are disposed to take any more heat from the rest. The heat is thus brought into a *state of equilibrium*. This equilibrium is somewhat curious. We find that when all mutual action is ended, a thermometer, applied to any one of the bodies, acquires the same degree of expansion: therefore the temperature of them all is the same, and the equilibrium is universal."

In this context of the property thermal equilibria, Black typically is cited in prefix histories on the zeroth law. [7] Most references, however, state that Irish physicist James Maxwell's 1871 law of equal temperatures, stated by Maxwell as "if when two bodies are placed in thermal communication neither of them loses or gains heat, the two bodies are said to have equal temperatures of the same temperature [and] are then said to be in thermal equilibrium", was the first formulation of what is now called the zeroth law. [4] The actual establishment of this argument to the position of a zeroth law, as "two systems in thermal equilibrium with a third system are in thermal equilibrium with each other", was first formulated by Ralph Fowler in 1931. [5] It seems, however, that the actual coining of the term "zeroth law" was done jointly by Fowler and Edward Guggenheim in their 1939 *Statistical Thermodynamics* textbook: [8]

> "The concept of temperature. As a natural generalization of experience we introduce the postulate: *if to assemblies are each in thermal equilibrium with a third assembly, they are in thermal equilibrium with each other*. From this it may be shown to follow that the condition for thermal equilibrium between several assemblies is the equality of a certain single-valued function of the thermodynamic states of the assemblies, which may be called the temperature *t*, any one of the assemblies being used as a 'thermometer' reading the temperature *t* on a suitable scale. This postulate of the 'existence of temperature' could with advantage be known as the *zeroth law of thermodynamics*."

(add discussion)

1st + 2nd | 1865

The first two laws solidified on April 24th 1865, during a reading at the Philosophical Society of Zurich, when German physicist Rudolf Clausius enunciated the finalized verbal form of his two main principles of the mechanical theory of heat:

> (1) the energy of the universe is constant
> (2) the entropy of the universe tends to a maximum,

which Clausius declared to be the "fundamental laws of the universe". [3]

3rd | 1906

The third law is associated with the work of German physical chemist Walther Nernst and his 1906 heat theorem. According to students of Nernst, sometime during his lectures in Berlin in the early 1900s, Nernst stated the following, or something to this effect:

> "The first law of thermodynamics has been discovered by three scientists: Robert Mayer, James Joule, and Hermann Helmholtz; the second by two scientist: Sadi Carnot and Rudolf Clausius; and, as for the **third**, well, this I have just done by myself."

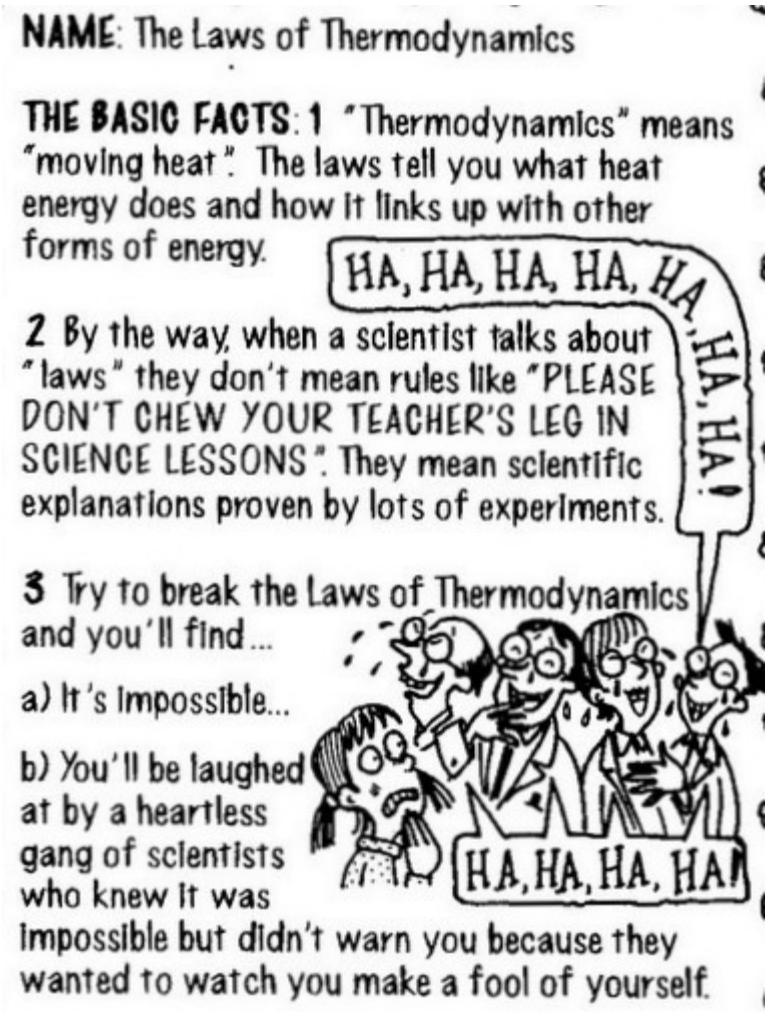

A **laws of thermodynamics** humor (pgs. 14-15, 16-17) book segment.

In 1910, German physical chemist Otto Sackur, in a paper submitted to the *Annalen*, was calling Nernst's heat theorem a "new law of thermodynamics". This paper was read by Max Planck, who began to assimilate Nernst's work into his own work on thermodynamics, in particular radiation thermodynamics and quantum mechanics. In the November 1910 preface to the third edition of his *Treatise on Thermodynamics*, Planck was beginning to indicate that Nernst's heat theorem was an additional principle of the thermodynamics (to that of the first main principle and the second main principle):

> "Should this [heat] theorem, as at present appears likely, be found to hold good in all directions, then thermodynamics will be enriched by **a principle** whose range, not only from the practical, but also from the theoretical point of view, cannot yet be foreseen."

In 1923, Nernst's heat theorem had been enshrined into a law with its incorporation into chapter thirty-one "The Third Law of Thermodynamics" of American physical chemist Gilbert Lewis and Merle Randall's famous *Thermodynamics* textbook. [10]

4th | 1920s

In 1952, Lars Onsager's 1929 reciprocal relations began to questionably be referred to as the fourth law of thermodynamics. By 1976, several authors had been calling Onsager's relations by the name "fourth law". In the application of thermodynamics to evolution, economics, and ecology, scientists with little fundamental training in thermodynamics have purported other "verbal" fourth laws. These include: Nicholas Georgescu-Roegen (1971), Victor Weisskopf (1977), Howard Odum (1983), Harald Wergeland (1985), Charles Hall (1986), Robert Ayres (1998), Stuart

Kauffman (2000), I. M. Kolesnikov (2001), Sven Jorgensen (2002), William Dembski (2002), Ian Stewart (2003), Peter Graham (2003), Eric Schneider (2005), and Jurgen Honig (2007), among others. Others, such as Peter Landsberg (1990), argue that there can be no fourth law and that nobody can formulate a fourth law.

Other

The 2002 nearly-incorrigible work of Corrado Giannantoni makes reference to possible fifth law of thermodynamics and possibly sixth law. There's also Murphy's law of thermodynamics.

Laws of human thermodynamics

See main: Laws of human thermodynamics

A common misconception arrived at when first thinking or theorizing about the conception of a science of "human thermodynamics", is to believe that there are some sort of special "laws of human thermodynamics". The first to arrive at this view was English physicist Charles Galton Darwin in his 1952 book *The Next Million Years*. [2]

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3. Clausius, Rudolf. (1865). "On Several Convenient Forms of the Fundamental Equations of the Mechanical Theory of Heat" (ninth memoir), Read at the *Philosophical Society of Zurich* on the 24th of April, 1865; published in the *Vierteljahrsschrift* of this society, Bd. x. S. 1.; *Pogg. Ann*. July, 1865, Bd. cxxv. S. 353; *Journ. de Liouville*, 2e ser. t. x. p. 361; *The Mechanical Theory of Heat*, ch. 9 (pg. 365). J. Van Voorst, 1867.
4. (a) Maxwell, James. (1871). *Theory of Heat* (pgs. 32, 336). London: Longmans, Green and Co.
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8. Fowler, Ralph and Guggenheim, Eduard A. (1939). *Statistical Thermodynamics: a Version of Statistical Mechanics for Students of Physics and Chemistry* (zeroth law: pg. 56 - coined). Cambridge University Press.
9. Nye, Mary Jo (1999). *Before Big Science: the Pursuit of Modern Chemistry and Physics, 1800-1940* (ch. 4: Thermodynamics, Thermochemistry, and the Science of Energy, pgs. 88-146). Harvard University Press.
10. Lewis, Gilbert and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (ch. 31: The Third Law of Thermodynamics, pgs. 435-54). McGraw-Hill.

April 2008 video (2:14) by English physical chemist Peter Atkins on the **four laws** of thermodynamics.

Further reading

â— Macaulay, W.H. (1913). *The Laws of Thermodynamics*. Cambridge University Press.
â— Sandler, Stanley I. and Woodcock, Leslie V. (2010). "Historical Observations on Laws of Thermodynamics", *J. Chem. Eng. Data*, Aug.

External links

â— Laws of thermodynamics – Wikipedia.
â— 10+ Variations of the Zeroth Law of Thermodynamics - Institute of Human Thermodynamics
â— 30+ Variations of the First Law of Thermodynamics - Institute of Human Thermodynamics
â— 110+ Variations of the Second Law of Thermodynamics - Institute of Human Thermodynamics
â— 20+ Variations of the Third Law of Thermodynamics - Institute of Human Thermodynamics

â— 15+ Variations of the Fourth Law of Thermodynamics - Institute of Human Thermodynamics
â— News and articles on the Laws of Thermodynamics – Surfwax (chemistry news)

θΔics

In thermodynamics humor, the **game version** of the **laws of thermodynamics** restates the laws of thermodynamics, in over-laymanized terms, as a game, the most-popular version of which is as follows:

A 2011 cartoon strip rendition, reproduced in full below, of the so-called game version of the laws of thermodynamics.

> Prologue
>
> > You have to play the game | Thermodynamics governs existence (zeroth law)
>
> Laws
>
> > 1) You can't win (first law)
> > 2) You can't break even (second law)
> > 3) You can't quit the game (third law)

Other variants exist as well. [1]

Etymology | Early models

In his 1925 Silliman Lectures "The Anatomy of Science", American physical chemist Gilbert Lewis stated the following: [4]

> "[Living organisms are] cheats in the **game of entropy**, [which] alone seem able to breast the great stream of apparently irreversible processes. These processes tear down, living things build up. While the rest of the world seems to move towards a dead level of uniformity, the living organism is evolving new substances and more and more intricate forms."

This seems to the origin of the so-called "game version" of the laws of thermodynamics as they have frequently been passed around popular culture.

The game version of the laws has sometimes been attributed to American physicist C.P. Snow; this, however, may be a mis-attribution. [2]

American science writer Isaac Asimov stated at least the first two game versions in his 1970 article "In the Game of Energy and Thermodynamics You Can't Break Even", and was being credited with the paraphrased version (of the first two laws) by the end of the decade. [3]

Ginsberg's theorem | Bloch reinterpretation

In 1975, someone—possibly either William Burroughs or Philip Whalen, poetry associates of American political philosopher Allen Ginsberg (1926-1997)—in an issue of *The Coevolution Quarterly*, in a listing of parody-like proverb laws, i.e. Murphy's laws (Q), listing in fun a so-called "Ginsberg's theorem", as follows: [6]

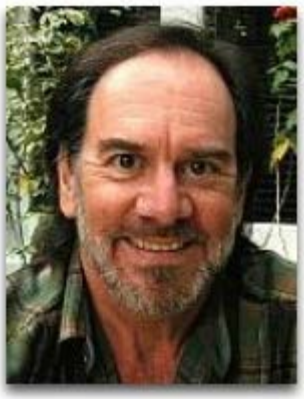

American humor writer Arthur Bloch (Q), person behind the Beckhap's law and the

> Ginsberg's theorem:
>
> > 1) You can't win.
> > 2) You can't break even.

3) You can't even quite the game.

thermodynamic game reinterpretation (1977) of Ginsberg's theorem (1975), in his Murphy's law collection.

The three statements being vicariously attributed to Ginsberg who, supposedly, stated these fun facts during a *circa* 1974 poetry session. [6] There is, to note, no association at this point to thermodynamics.

In 1977, someone, in an issue of *Production Engineering*, stated the following: [7]

> "After the three laws of thermodynamics, the most used laws in engineering are Murphy's laws—which begin with, 'if something can go wrong … it will!" There have been countless corollaries and adjunct theorems made, …"

On the same page, a mention of Ginsberg's theorem is made; though connection between the two does not seem to exist..

In 1977, American writer Arthur Bloch (1948-) published his popular *Murphy's Law and Other Reasons Why Things Go Wrong!* (Q), the same book from which Beckhap's law derives, wherein he convoluted thermodynamics with Ginsberg's theorem as follows: [8]

> "If you doubt this, witness the laws of thermodynamics as they are restated in Ginsberg's theorem:
>
> 1. You can't win.
> 2. You can't break even.
> 3. You can't eve quit the game.
>
> Murphy's law of thermodynamics is simpler: Things get worse under pressure."

This pun association soon thereafter became thermodynamics folklore; akin to the mythology of information theory, via John Neumann and Claude Shannon, becoming equated to thermodynamics.

Ginsberg did, to note, employ the second law in at least one of his poems, namely: "Yes and It's Hopeless", a snippet of which is as follows: (Q)

long run, death is certainly victor. The despair that is the enemy of political hope has visited Ginsberg many times. "Yes and It's Hopeless" is the title of one poem:

All hopeless, the entire solar system running
Thermodynamics' Second Law
down the whole galaxy, all universes brain illusion

This, however, is a heat death model interpretation of the second law, not a "you can't break even" interpretation, as Bloch adumbrates things in attempts at parody humor.

In 1983, American physicist Bruce Lindsay was referring to the first law in the form of there's no free lunch: [11]

> "A somewhat more flippant way of expressing the social content of the first principle of thermodynamics is: 'there is no such thing as a free lunch.' (someone always pays!) The current humorous literature is full of such clichés as: 'you cannot win,' which also exemplify the first principle."

(add discussion)

Mis-attributions

One example of mis-attribution being the following 2007 listing in *Politipedia*: [9]

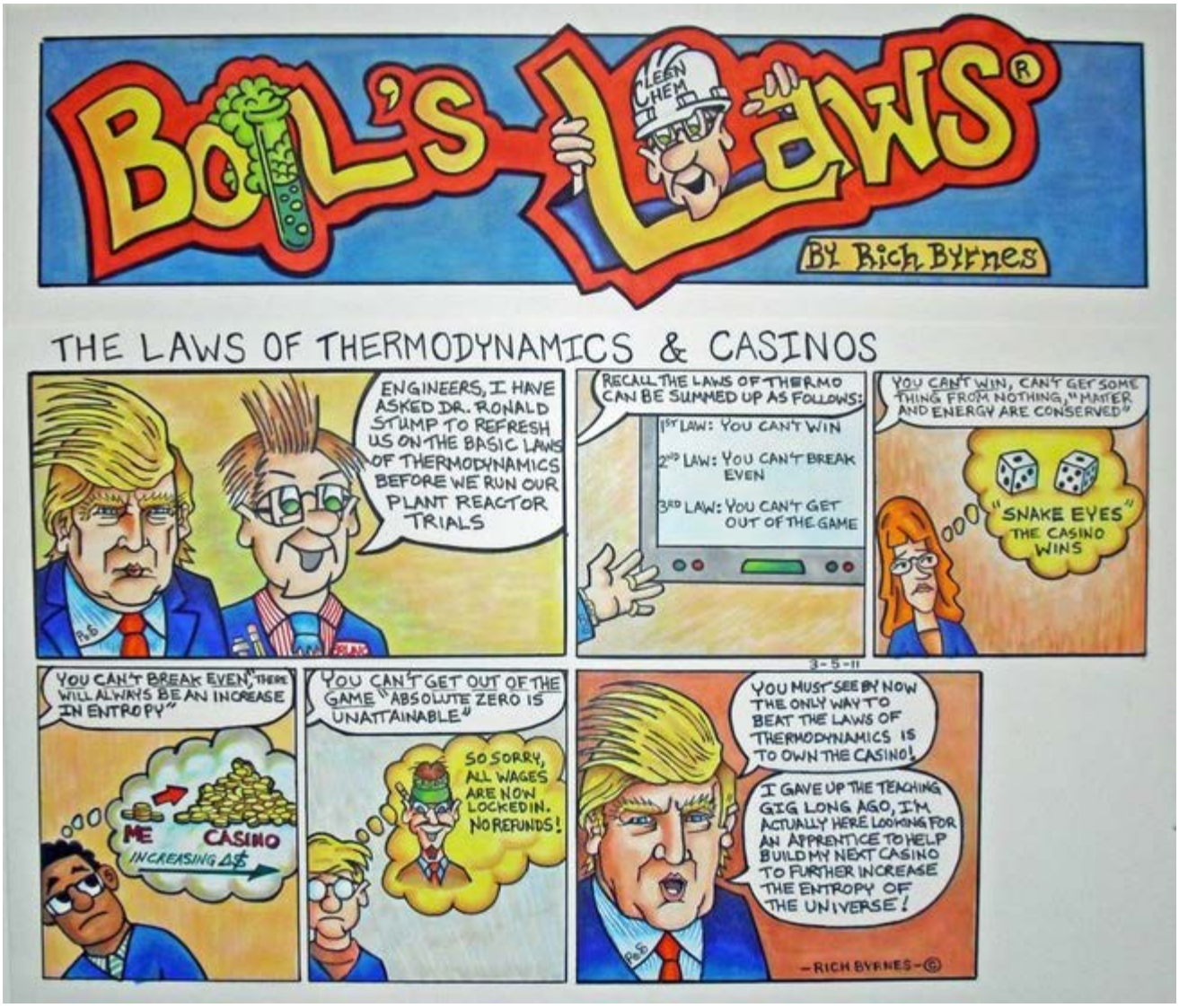

A 2011 comic take on the game version of the laws by American chemical engineer Rich Byrnes. [5]

Allen Ginsberg's Restatement of The Laws of Thermodynamics

You can't win.
You can't break even.
You can't even quit the game.

Another example of mis-attribution is found in American science writer Arthur Wiggins' 2007 *The Joy of Physics*, wherein he gives the following mis-fact: [10]

Beat poet Allen Ginsberg paraphrased the three laws of thermodynamics as:[4]

First law: "You can't win."
Second law: "You can't break even."
Third law: "You can't quit."[4]

In short, Ginsberg never paraphrased the three laws.

Other

Charlie Smalls wrote a song title "You Can't Win," for the 1975 stage musical "the Wiz." The opening lines of the song are nearly identical to Ginsburg's Theorem:
"You can't win/You can't break even/And you can't get out of the game."
The song lyrics are copyrighted 1974 [12], one year earlier than the first attribution of the Theorem to Ginsberg in Coevolution Quarterly.

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6. (a) Anon. (1975). "Article", *The Coevolution Quarterly* (Ginsberg's theorem, pg. 138; Ginsberg, pgs. 121-23), 8-12.
(b) Allen Ginsberg – Wikipedia.
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12. http://www.onlinesheetmusic.com/you-cant-win-p258733.aspx

External links

- The game is thermodynamics – Facebook.
- Ginsberg's theorem – Wikipedia.

θΔics

In thermodynamics, **laymanized thermodynamics** refers to bare bones, simplified, dumbed-down, etc., versions of thermodynamics that the average layperson or person on the street might hold in his or her mental framework, if they have any conception at all, as to how they view the laws of thermodynamics, which govern the known universe, and how the laws apply to their own state of existence.

Overview

The following is a fairly decent example of "laymanized" version of thermodynamics, in a 2006 query post at the Randi.org discussion forums by a female thinker named Oxymoron: [1]

> "I not going to pretend to be a rocket scientist but I do have a pressing question that maybe some of you great minds can help me out with. The first law of thermodynamics: energy can be transformed but not created or destroyed. The second law of thermodynamics: the entropy of the universe is increasing. Okay, I can grasp this. Believing in a God or Gods or a higher power aside, when we die, what the hell happens to all of this energy. Since we are made up of atoms and molecules and such, and everything is, is it fair to say that when we die, we don't really die, but go on as energy? And if this is true, what form of energy do we take? I know there are a million different arguments that can be made on this, I'm just curious as to what people think about it?"

In other words the person seem to have a fairly decent grasp of the verbalized version of the first and second law as stated by German physicist Rudolf Clausius in conclusion of his 1865 textbook *The Mechanical Theory of Heat*.

Often is the case that the layperson will have had come across a passing mention of thermodynamics say in a biology books, literature work, noted quote, and took this as the general idea of what thermodynamics means.

Some so-called laymanized views of these might include: entropology, entropy (child's playroom), entropy (shuffling cards), entropy (unscrambled eggs), heat death, among others.

Lectures

Many famous laymanized lectures have resulted in some rather famous publications and followup debates. The most famous of these being Austrian physicist Erwin Schrodinger's February 1943 "What is Life? the Physical Aspect of the Living Cell" lectures delivered under the auspices of the Dublin Institute for Advanced Studies at Trinity College, Dublin, which resulted in the so-called negative entropy model of life, and the latter attack by fellow physicists that the discussion should have been on free energy. The attack resulted in a "Note to Chapter 6" appended to his followup 1944 booklet *What is Life?*, in which he responded to these criticisms that:

> "My remarks on negative entropy have met with doubt and opposition from my physicist colleagues. If I had been catering for them alone I should have let the discussion turn on free energy instead. It is the more familiar notion in this context. But this high technical term seemed linguistically too near to energy for making the average reader alive to the contrast between the two things. He is likely to take *free* as more or less an *epitheton ornans* without much relevance, while actually the concept is a rather intricate one, whose relation to Boltzmann's order-disorder principle is less easy to trace than for entropy and 'entropy taken with a negative sign', which by the way is not my invention."

In other words, Schrodinger guessed that the "lay public" would better understand an entropy-based explanation of life than as compared to a free energy based explanation, the latter of which he viewed as being "a rather intricate" topic.

See also

â— Folklore thermodynamics

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θΔics

In existographies, **Lazare Carnot** (1753-1823) (IQ:175|#222) (Eells 100:58) (CR:36) was a French engineer, mathematician, and politician, father of thermodynamics founder Sadi Carnot (and his brother Hippolyte Carnot), who in 1794, working in coordination with French mathematician Gaspard Monge, founded École Polytechnique the hotbed of science in the early 19th century. Beginning in 1784, Lazare published several books on the geometric physics of machines, in general, those such as screw presses, pulleys, water wheels, wind mills, electromagnetic devices, in which he set out to show that in all variations of machines there existed fundamental principles of operation and limits to operation owing to the geometry of movement of the parts and the laws of force. This universal machine theory set forth a framework of logic with which Sadi Carnot would later tackle the general laws of the operation of heat engines, in 1824.

Overview

Lazare was born in Nolay (Gold Coast), Côte-d'Or, and first was educated in Burgundy at the Collège d'Autun, an artillery and engineering prep school. In 1771, he entered the Mezieres School of Engineering, where he had met and studied with the likes of Benjamin Franklin (IQCB=173), at the age of twenty and obtained commission as a lieutenant in the Prince of Condé's engineer corps. It was here that he early made a name for himself both in the line of physics and in his work in the field of fortifications. Although in the army, he continued his study of mathematics.

In 1784, Lazare published his first work *Essay on Machines* (*Essai sur les machines en général*) which contained a statement that foreshadowed the principle of energy as applied to a falling weight. In 1797, he published *Reflections on the metaphysics of infinitesimal calculus* (*Réflexions sur la métaphysique du calcul infinitesimal*); a title that likely later served as a model for Sadi's *Reflections on the Motive Power of Fire*, the founding paper of thermodynamics, written in 1824.

At the turn of the century, he had published three scientific books *The correlation figures of geometry* (*De la correlation des figures de geometrie*) (1801), *Geometrie de position (Geometrie de position)* (1803), and a mathematical work entitled *Fundamental Principles of Equilibrium and Movement* (*Principes fondamentaux del' equilibre et du mouvement)* (1803), a discussion on the efficiency of olden machines, such as pulleys and inclined planes, all of which were translated into German. [3]

Lazare used German polymath Gottfried Leibniz's calculus (over that of Newton's) and also made fine use of Leibniz's ideas about mechanical energy conservation. He pointed out, for instance, that an imaginary *perfect* waterwheel, none of the water's energy would go to waste. None would be dissipated, and all the motion would be completely reversible. If the perfect waterwheel were run backward, it would become the perfect pump. [2]

Magdeburg steam engine

In 1816, following Napoleon's final defeat at Waterloo, Lazare, the only general of Napoleon's army to never be defeated, went into exile in the German city of Magdeburg, where he occupied himself with science. [3] Lazare's interest soon turned to steam engines, with the first steam engine coming to Magdeburg in 1818. [1] Sadi soon visited him in Magdeburg in 1821 and it likely that Lazare influenced his son with his thoughts on the universal principle of heat engines in general; for, within three years, in 1824, Sadi Carnot would publish his masterpiece on the thermodynamics of steam engines.

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3. Lazare Nicolas Marguerite Carnot – Encyclopedia Britannica, 1911.

External links

â— Lazare Carnot – Wikipedia.

â— Scientific work of Lazare Carnot (French → English) – Wikipedia.

θΔics

In religio-mythology, **Lazarus**, the Roman recension rescript of the Egyptian god Osiris, is the Biblical figure famously said to have died for four days, and then been risen (see: Raising of Lazarus) from the dead by Jesus.

Quotes | On

The following are related quotes:

> "The process of **reducing** the fairy-godmother's coach-and-six to the status of a one-horse cab may be seen in the Gospel according to Luke in getting rid of Osiris. The pair of sisters, Martha and Mary, appear in this Gospel, but without their brother Lazarus, and also without the resurrection. After all that has now been done towards identifying Bethany with the house in Annu [Heliopolis] and the nest of the two sisters, the two sisters with Isis and Nephthys, and the Christ with Horus, it cannot be considered far-fetched if we look upon Lazarus as a form of the Osiris that was dead and buried and raised to life again. As to the name, the Egyptian name of the Greek Osiris is Hesar, or Asar. And when we take into consideration that some of the matter came from its Egyptian source through the Aramaic and Arabic languages (witness the Arabic Gospel of the infancy) there is little difficulty, if any, in supposing that the Al (article the) has been adopted through the medium of the Arabic, or derived from the Hebrew prenominal stem × ×œ [AL], to emphasize a thing, as in 'the Osiris' [the mummy], which passed into the article Al for "the" in Arabic, and was prefixed to the name of Osiris as Al-Asar, which, with the Greek "s" for suffix becomes L-azarus. The connecting link whereby Al-Asar was turned into Lazarus, *the* Osiris, was in all likelihood made in the Aramaic language, which had its root-relations with the Egyptian. Hieroglyphic papyri are among its monumental remains, as well as the inscription of Carpentras."
>
> — Gerald Massey (1907), *Ancient Egypt, the Light of the Modern World, Volume Two* (pgs. 264)

> "The rod that is waves by Jesus at the raising of Lazarus is the symbolic scepter in the hand of Horus when he raises the Osiris. In every instance, Lazarus is a mummy made after the Egyptian fashion. It is a bandaged body that had been soaked in salt and pitch which was at times so hot that it charred the bones. Seventy days was the proper length of time required for embalming the dead body in making an Egyptian mummy. Lazarus when portrayed in the Roman catacombs comes forth from the tomb as an eviscerated, embalmed and bandaged mummy, warranted to have been made in Egypt. Now according to the Gospel narrative, there was no time for this, as Lazarus had only been dead for four days. The mummy, anyway, is non-historical; and it is the typically **mummy called *the* Osiris**, Asar in Egyptian, **El-Asar in Aramaic**, and Lazarus with the Greek terminal [La-Asar-us] in the Gospel assigned to John."
>
> — Gerald Massey (1907), *Ancient Egypt, the Light of the Modern World, Volume Two* (pgs. 851-52)

See also

â— Diderot-Barthelemy dialogue
â— Tom Harpur

θΔics

In existographies, **Lazarus Ercker** (c.1530-c.1594) (EP:5), “Erckern” or “Erckers”, was a German metallurgist, noted for []

Overview

In 1574, Ercker, in his *Sub-terrarium Classroom* (*Aula Subterranea*) gives an illustration (O) of metallurgists using aeolipile, of some design, as shown below, to produce a blast of steam in smelting ores: [1]

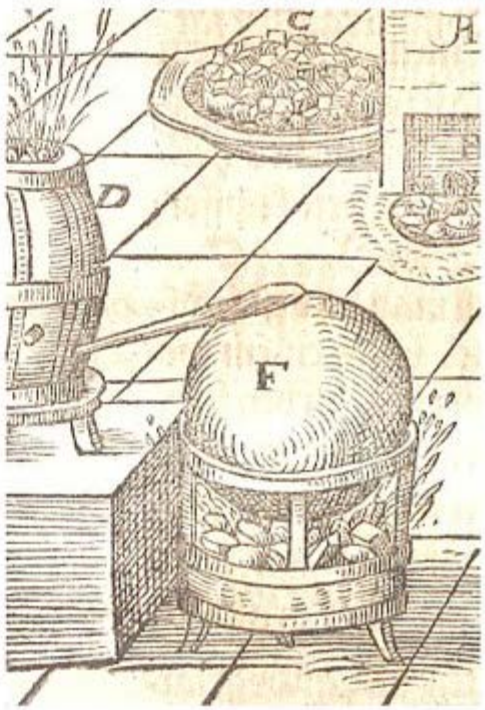

(add)

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External links

- Lazarus Ercker – Britannica.
- Lazarus Ercker (German → English) – Wikipedia.

θΔics

In experiments, **lazy ant study** is a 1980s study which found that ants can be divided into two categories: one consisting of hard workers, the other of inactive or 'lazy' ants, and also, most interestingly, that if the "system" were shattered by separating the two groups from one another, each in turn developed its own subgroups of hard workers and idlers. In other words, a significant percentage of the 'lazy' ants suddenly turned into hard working ants. [1]

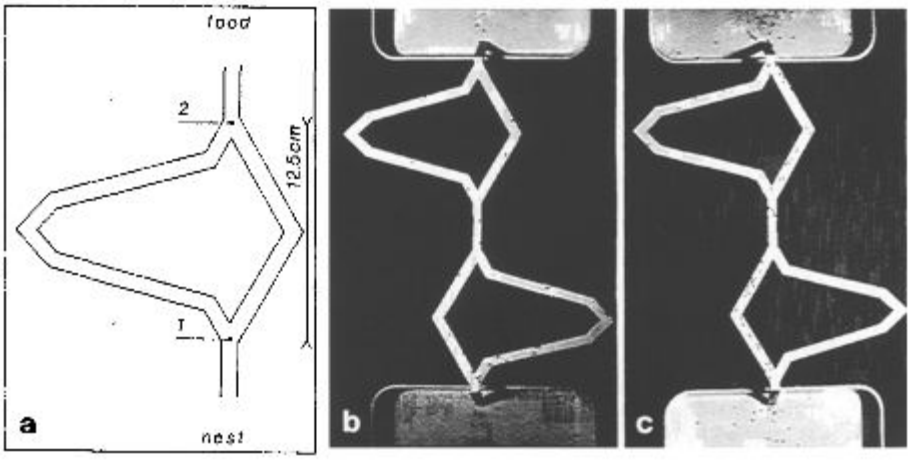

Fig. 1. A colony of *I. humilis* selecting the short branches on both modules of the bridge; a) one module of the bridge, b) and c): photos taken 4 and 8 min after placement of the bridge

One of Belgian complexity theorist Jean Deneubourg's 1989 ant nest, food, bridge experiments, which is similar to his earlier circa 1983 **lazy ant experiment**. [7]

Study

The published details of the study remain to be tracked down. Mention of the study was made in the 1984 foreword "Science and Change", to Belgian chemist Ilya Prigogine's *Order Out of Chaos*, by American writer Alvin Toffler, who refers to it, without citation, as a "recent study". [2]

Prigogine, in his 2003 "Surprises in a Half Century", one of his last published works, attributes the experiment to Belgian complexity theorist Jean Deneubourg, who first started working with his colleagues on the collective behavior of ants in 1983, and who has published theories such as autocatalysis of ant behavior. Prigogine summarizing the experiment as follows: [6]

> "Let me quote a final example. My colleague Deneubourg has performed the following experiment. You have two large boxes connected by a small channel. The ant's nest is displaced from one box to the other. Ants are crossing the channel to recover the initial situation. Deneubourg has found a way of identifying the individual ants. The surprising result is that there are two groups of ants: active ants and **lazy ants**. The active ants cross the channel repeatedly. The lazy ants remain most of the time in the same box. Deneubourg selected out the lazy ants and made the same experiment. The astonishing result is that some of the lazy ants then begin to work. How human this sounds!"

(add)

Pareto principle

The findings of the lazy ant study corroborates well with the Pareto principle, which says that 80 percent of a system's wealth is typically confined to 20 percent of the population.

The study can be used as a reference case in point in regards to those who would advocate equality of wealth distribution, such as discussed and critiqued in chemical engineering thermodynamics terms in American chemical engineer James Ferri's student produced 2011 "Thermodynamics of Life: Wall Street Edition" video production. [3]

Communism

The study can also be used as a case in point in regards to failed "equality of workers" political theories such as

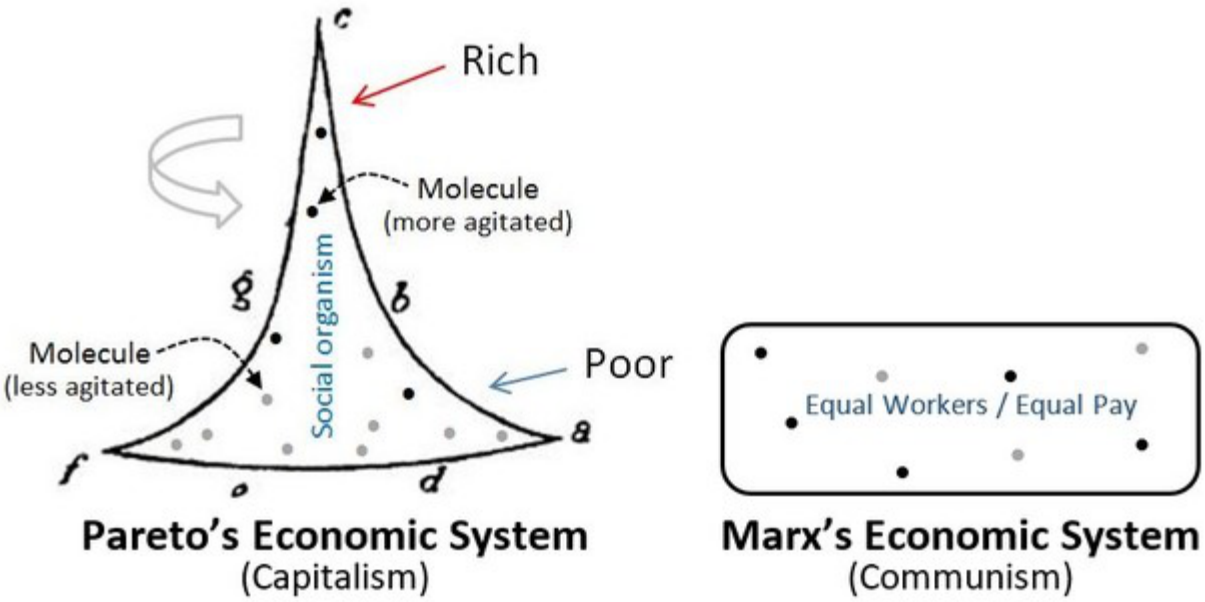

captured well in the 1965 epic drama *Doctor Zhivago*, which details the early 20th century implementation of Bolshevism (Communism) as the answer to the autocracy of Tsar Nicholas II, an implementation based in part on the scientific theories of Karl Marx, among others. [4] At one point in the film, Dr. Zhivago, when he first meets his half-brother Yevgraf, a CHEKA policeman, he comments:

> "Cutting out the tumors of injustice, that's a deep operation; someone must keep life alive while you do it."

Here we see the "Tsar autocracy" ruling theory, in the context of a growing Russian state, no longer being functionable, hence a growing "tumor of injustice", and the Bolshevism "equal workers" ruling theory being an operation done in an attempt to remove the tumor. Some operations, however, are not successful. Hence, the ultimate fall of the communist regime, possibly because its theoretical structure was not based on fundamental studies, such as the lazy ant study, and principles, such as the Pareto principle.

Human molecules | Rise and fall

The study also brings to mind Austrian-born American political economist Joseph Schumpeter and his theory of the multi-generational rise and fall of human molecules through social classes, to the effect that one newly-partitioned group of "lazy ants", considered as a social class, spontaneously divides into two classes: lazy (lower class) and hardworking (upper class), in one step or generation, one might say. [5]

Mechanical equivalent of heat

In 2008, American electrochemical engineer Libb Thims incorporated implications of the lazy ant study in regards to the thermodynamics of human molecules, work and occupational choice, as discussed in his JHT article "On the Mechanical Equivalent of Heat and Occupation." [1]

Stability

The study also brings to mind American physicist Alfred Mayer's 1884 floating magnetics experiment as well as British anthropologist Robin Dunbar's 1992 theory of the Dunbar number of maximal size of working group stability, in regards to the aspects of system structural and operational stability.

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θΔics

In chemistry, **Le Chatelier's principle**, also called "Le Chatelier-Braun principle" (Lindsay, 1927), after Karl Braun, or "principle of mobile equilibrium" or "general law of inertia", is a generalized rule which states that perturbation of a system at equilibrium will cause the equilibrium position to change in such a way as to tend to remove the perturbation. [1] In short, systems in equilibrium tend to react to perturbations in a transformational direction towards the change, thus re-establishing a new equilibrium.

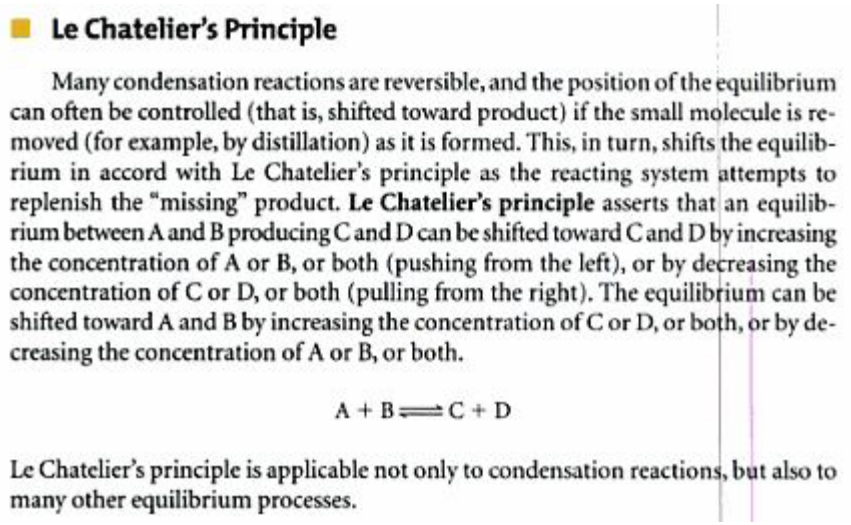

Le Chatelier's Principle

Many condensation reactions are reversible, and the position of the equilibrium can often be controlled (that is, shifted toward product) if the small molecule is removed (for example, by distillation) as it is formed. This, in turn, shifts the equilibrium in accord with Le Chatelier's principle as the reacting system attempts to replenish the "missing" product. **Le Chatelier's principle** asserts that an equilibrium between A and B producing C and D can be shifted toward C and D by increasing the concentration of A or B, or both (pushing from the left), or by decreasing the concentration of C or D, or both (pulling from the right). The equilibrium can be shifted toward A and B by increasing the concentration of C or D, or both, or by decreasing the concentration of A or B, or both.

$$A + B \rightleftharpoons C + D$$

Le Chatelier's principle is applicable not only to condensation reactions, but also to many other equilibrium processes.

A 2004 concentration-focused synopsis of **Le Chatelier's principle** (neglecting temperature, pressure, and volume change factors) by American organic chemists Marye Fox and James Whitesell. [5]

History

In the early 1880s, French chemist Henry Le Chatelier (1850-1936) was a professor of chemistry at the École des Mines in Paris working on the theoretical and practical aspects of chemistry. His research on the chemistry of cements led him to formulate a principle to predict how changing the pressure affected a chemical system. [2] The new equilibrium principle discerned by Le Chatelier was first published in an 1884 note by him in the following form: [3]

> "Any system in stable chemical equilibrium, subjected to the influence of an external cause tends to change either its temperature or its condensation (pressure, concentration, number of molecules in unit volume), either as a whole or in some of its parts, can only undergo such internal modifications as would, if produced alone, bring about a change of temperature or of condensation of opposite sign to that resulting from the external cause."

Four years later, in a longer 1888 article entitled "Experimental and Theoretical Research on Chemical Equilibria" in the *Annales des Mines*, Le Chatelier restated the Principle in a simpler and more comprehensive form: [4]

> "Every change of one of the factors of an equilibrium occasions a rearrangement of the system in such a direction that the factor in question experiences a change in a sense opposite to the original change."

The expanded paper contains a large number of applications to equilibria including ones involving electromotive force as well as pressure and temperature. The extension of this argument to include applications to biology and social sciences have been made by later writers and were not represented in Le Chatelier's original explanation.

See also

â— Social Le Chatelier principle

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External links

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θΔics

In science, a **lecture** refers to an instructional talk on a given subject.

Famous lectures

A number of famous lectures, many turned into books, have functioned have been idea spurring locations in the development of key topics, not often produced in the non direct human interactions style of journal or book writing. Some of these are listed below.

In 1747, Scottish physician and chemist William Cullen became a chemistry lecturer at Glasgow University and also later lectured at the University of Aberdeen, during the course of which he invented the now standard "reaction arrow" notation of chemical reactions. Cullen was a charismatic lecturer, attracting large classes. He always came before a class with a manuscript or lengthy notes that he revised each year, but he rarely used them and spoke extemporarily. He gave the students the necessary background of information, but this was never presented as a list of facts to be memorized, rather as a journey of exploration into the mysteries of diseases and the processes that caused them. The professor and his students were companions on the journey. Phrases like 'as far as I know' and 'I am persuaded' abound in his lectures and textbooks. In 1757, at the University of Aberdeen, Cullen began to use Geoffroy's affinity table in lectures at the University of Aberdeen. [1] To help in explaining to his students the idea of 'single elective attractions' (single displacement reactions) and 'double elective attractions' (double displacement reactions), Cullen pioneered the use of reaction arrows '→' or 'darts', as he called them, drawn diagonally to represent the affinity tendencies of the individual species in the reaction. In addition, he introduced the conception of using brackets '{' to represent a bonded association.

The 1902, the Harvard University chemistry class lectures by American physical chemist Gilbert Lewis is where the now-famous Lewis dot structures were introduced as a classroom teaching aid.

In 1925, Lewis' "Anatomy of Science" lecture gave some of the first speculations on hmolscience, in regards to whether him writing a book was but a chemical reaction.

The 1943 laymanized "What is Life?, in terms of chemistry and physics, lectures of Austrian physicist Erwin Schrodinger, and followup 1944 booklet, and followup retraction "Note to Chapter 6", is one of the most widely read booklets by scientists in the science community overall.

(add)

Hmolpedia

In Hmolpedia pages, the thermodynamics lectures page contains videos of a number of university lectures on topics in thermodynamics and or physical chemistry.

The Hmolpedia "videos" page contains related hmolscience videos and some lectures.

See also

â— Libb Thims (lectures)

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θΔics

In hmolscience, **Lee Strobel** (1952-) (CR:36) is an American "intellectually fulfilled atheist" (1966), turned investigative journalist (1974), turned Christian apologeticist and pastor, noted for his 2004 *The Case for a Creator*, oft-name dropped by theists (Q) in debates, as an example of an atheist who was turned to theism owing to his research.

Atheism

In 1966, at age 14, Strobel states that he became an "intellectually fulfilled atheist", to use the words of Richard Dawkins (1986), when in his biology class he saw four images that stuck in his mind; specifically: [4]

1. Miller-Urey experiment
2. Darwin's tree of life (see: great chain of being)
3. Haeckel's embryo drawings (Q)
4. The missing link | Archaeopteryx (Q)

Strobel states that these images were the start of his study on this topic; he states that by the time he had finished his study of this topic, he was "thoroughly convinced that Darwin had explained away any need for god."

Kanawha County

See main: Kanawha County textbook controversy

In 1974, Strobel, a newly-minted journalist, working for the *Chicago Tribune*, was assigned the job of going to report on the Kanawha County, West Virginia "textbook controversy" initiated by Christian fundamentalist school board member Alice Moore the wife of a local preacher, who single-handedly, via Church social networking, got 96,000 copies of 300 different "text books", as she and protestors referred to them, e.g. *Paradise Lost* (John Milton), *The Great Gatsby* (F. Scott Fitzgerald), *The Old Man and the Sea* (Ernest Hemingway), *The Republic* (Plato), to name a few (Q), removed from public school classrooms, because of their "anti-Christian slant" passages and views. When Strobel set off to report on the event, he let the following quote run thought his mind, him supposedly being an atheist at this point: "Christians … hadn't they heard, as one skeptic [Feuerbach] famously put it, that modern science had already dissolved Christianity in a vat of nitric acid."

Strobel | Businessman dialogue

The following conversation took place in 1974, in the heat of the textbook controversy, between Strobel and a local businessman over hamburgers at a Charleston diner:

> **Strobel**: "Why are you so enraged over the new school textbooks?"
>
> **Businessman**: "Listen to what *Dynamics of Language* tells our kids. To quote: 'Read the theory of divine origin and the story of the Tower of Babel as told in Genesis. Be prepared to explain one or more ways these stories could be interpreted.' [tossing a well-worn clipping on the table] The *theory* of divine origin! The word of god is *not* a theory. Take god out of creation and what's left? Evolution? Scientists want to teach our kids that divine origin is just a theory that stupid people believe but that evolution is a scientific fact. Well, it's not. And that's at the bottom of this."
>
> **Strobel**: "Are you saying Charles Darwin is responsible for this?"
>
> **Businessman**: "Let me put it this way: If Darwin's right, we're just sophisticated monkeys. The Bible is wrong. There is no god. And without god, there's no right or wrong. We can just make up our morals as we go. The basis for all we believe is destroyed. And that's why this country is headed to hell in a handbasket.

Is Darwin responsible? I'll say this: people have to choose between science and faith, between evolution and the Bible, between the Ten Commandments and make-'em-up-as-you-go ethics. We've made our choice—and we're not budging."

Businessman: [taking a swig of beer] "Have you seen the teacher's manual?"

Strobel: No.

Businessman: "It says students should compare the Bible story of Daniel in the Lion's Den to that [slave and the thorn in the lion's paw] myth

Strobel: "Androcles and the Lion?" (Q) [from Aesop's fable]

Businessman: "Yeah, that's the one. [wagging a french fry at Strobel] What does it tell our kids when they're supposed to compare that to the Bible? That the Bible is just a bunch of fairy tales? That it's all myth? That you can interpret the Bible any way you darn please, even if it rips the guts out of what it really says?"

Businessman: "We've got to put our foot down. I'm not going to let a bunch of eggheads destroy the faith of my children."

(add)

Quotes | On

The following are quotes on or about Strobel:

"I lost 5 IQ points reading **Strobel**'s book, which was nothing more than mindless propaganda."

— Anon (2003), commentary on Strobel's *The Case For Christ* (Q)

Quotes | Employed

The following are quotes employed by Strobel:

"By coupling undirected, purposeless variation to the blind, uncaring process of natural selection, Darwin made theological or spiritual explanations of life processes superfluous."

— Futuyma Douglas (1986), *Evolutionary Biology*; cited by Strobel (2004) in *The Case for a Creator* (pg. 25) [1]

"You can't put an omnipotent deity in a test tube."

— Eugenie Scott (1994), "Keep Science Free From Creationism"; cited by Strobel (2004) in *The Case for a Creator* (pg. 21) [2]

"Is there an intellectually honest Christian evolutionist position? Or do we simply have to check our brains at the church house door?"

— Anon (c.1997), query to The Scientist from a San Antonio attorney; cited by Lee Strobel (2004) in *The Case for a*

Creator (pg. #)

"Ethics lie outside the province of science. Science doesn't make ethical judgments."

— William Craig (c.2003), "Interview with Lee Strobel" [1]

Quotes | On

The following are noted quotes:

"Christians … hadn't they heard, as one skeptic famously put it, that modern science had already dissolved Christianity in a vat of nitric acid."

— Lee Strobel (2004), reflective monologue, with reference to the Ludwig Feuerbach nitric acid prophecy, on being sent in 1974 to report on the West Virginia hillbilly bombings and shootings over certain non-Christianity conforming textbooks being used in public schools [1]

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External links

- Lee Strobel – Wikipedia.

θΔics

In thermodynamics, **Legendre transform**, or "Legendre transformation", is a mathematical procedure employed to convert a specific variable of a state function equation into a more convenient form, often one in which the variable can thus be calculated readily from existing experimental data. The Legendre transformation allows one to obtain functions equivalent to $U = U(S,V)$ dependent on more accessible laboratory coordinates or variables. [5]

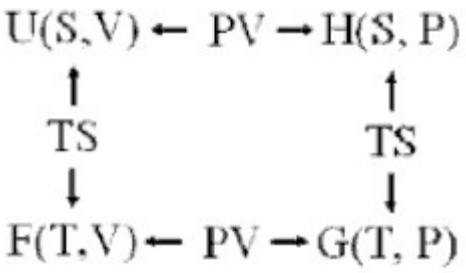

Legendre transformations among the four main thermodynamic potentials; the arrows indicate possible transformations of each potential; the products of conjugate variables *PV* and *TS* used in each transformation are also indicated. [5] 1820 watercolor caricature of French mathematicians Adrien-Marie Legendre eponym of the **Legendre transform**, by French artist Jules Boilly. [4]

Overview

The equations for a system containing heat as a variable, for example, contain entropy as a variable quantity. Entropy is an inconvenient variable, difficult to control for and hold constant as one can hold temperature, pressure, and volume constant. The Legendre transform allows a researcher to convert equations containing entropy into equations expressed only in terms of temperature, pressure, and volume. The Legendre transform can be applied correctly only under certain conditions, which must be specified.

The Legendre transform is named after French mathematician Adrien-Marie Legendre (1752-1833). [1] In mechanics, the Legendre transformation is used to go from the Lagrangian formulation to the Hamiltonian formulation. [2] The Legendre transform is an important tool in biochemical thermodynamics, in that it makes the application of thermodynamics to biochemical reaction analysis more convenient. [3]

In the 2000s, American physical chemist Robert Alberty published a number of summary papers and chapters on the overview of the use of the Legendre transform as used in chemical thermodynamics and biochemical thermodynamics. [6]

See also

- Bridgeman formulas

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External links

- Legendre transform – SklogWiki.org.
- Legendre transformation – Wikipedia.
- Legendre transformation – Wolfram Mathworld.

θΔics

In thermodynamic schools, **Leiden University**, or "Leyden University" in archaic Dutch or "Leiden school", historically, is the first of the so-called "school" of thermodynamic thought, tracing back, generally, to the experimental demonstration of Boerhaave's law or volume expansion by heat of Dutch physician and chemist Herman Boerhaave along with kinetic energy experiments by Dutch physicist Christiaan Huygens, regarding inelastic collisions, and later by Dutch physicist-mathematician Willem Gravesande, involving brass balls and clay surfaces.

Room four of the Boerhaave Museum, Leiden, which shows some of the original instrumentation of the Leiden University research program: Some type of early telescope, large globes, tiny pocket globe, a table sized planetarium, star atlas, vacuum pumbs (1670-1730), several Magdeburg hemispheres, hydrometers, an aerometer, a hydrostatic bellows, a balance and steam pump, several table-top fountains all used to look into hydrostatic pressure, and capillary attraction, and models of three out of five of Archimedes' so called simple machines (lever, inclined plane, wedge, screw and wheel), several hydrostatic balances to demonstrate Archimedes' law and two tables of forces which demonstrate interactions of forces in a horizontal plane, among other devices. [3]

Overview

In the 1720s, a significant pre-thermodynamics school of influence was Leyden University, where Dutch physician and chemist Herman Boerhaave and Dutch physicist Willem Gravesande were famously conducting some of the first research on volume expansion by heat (ball and ring experiment), kinetic energy (ball and clay surface experiment), the general principle of volume expansion of bodies by heat (Boerhaave's law), electricity (Leyden jar), among other noted scientific advances. As commented by French philosopher-physicist Voltaire, who acted as a scientific liaison between the Netherlands, France, and England, in a 1736 letter to the crown prince of Prussia (afterwards Frederick the Great), with whom he had entered into an active corresponds with:

> "I am the town of two simple citizens, Boerhaave and Gravesande attract from four to five hundred strangers."

The work of Boerhaave was carried over into later-to-come to predominance French science (Ecole polytechnique) school of thought, significantly in the work and caloric theory of Antoine Lavoisier (*Elements of Chemistry*, 1787). Students of Boerhaave include: Andrew Plummer, William Cullen, Joseph Black, and John Roebuck, and—through association with Black—James Watt—which can all products or precipitates, so to speak, of the Leyden school centered around Boerhaave. [20]

Kinetic energy experiment

In 1669, Dutch physicist Christiaan Huygens determined that the quantity of the mass of an object multiplied by its velocity squared mv^2 remains constant during perfectly elastic collisions, such as between steel balls.

In circa 1718, Dutch physicist-mathematician Willem Gravesande conducted his most-famous experiment in

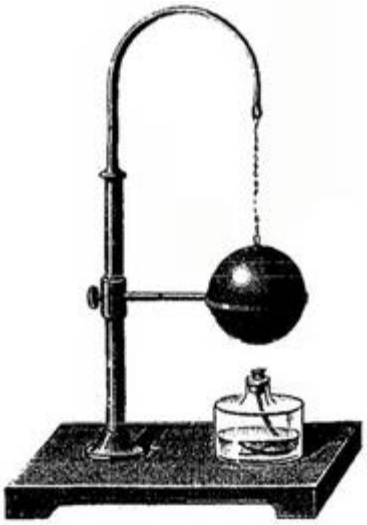

Left: a photo of what seems to be Dutch physicist-mathematician Willem Gravesande's brass ball clay surface kinetic energy experiments, shown at the Boerhaave Museum, Leiden, Netherlands. [3] Right: Dutch physicist-mathematician Willem Gravesande invented the "ball and ring experiment".

which he allowed brass balls to be dropped (or rolled down a ramp) with varying velocity onto a soft clay surface. Gravesande found in his experiments that a ball with twice the velocity of another would leave an indentation four times as deep, that three times the velocity yielded nine times the depth, and so on. [1] The adjacent device, shown at the Boerhaave Museum, Leiden, Netherlands, seems to be Gravesande's brass ball rolling clay surface experimental device. [3]

Gravesand shared these results with French mathematical physicist Emilie Chatelet, and with Voltaire (Chatelet's companion), after which, it is said, that Chatelet subsequently corrected English physicist Isaac Newton's formula $E = mv$ to $E = mv^2$, and thus synthesized the first version of the conservation of energy (vis viva into vis mortua). This was a precursor step in the later 1905 derivation of the mass-energy equivalence formula of $E = mc^2$ by German-born American Albert Einstein. [2]

Ball and ring experiment

In circa 1720, Dutch physicist-mathematician Willem Gravesande invented the "ball and ring experiment" top demonstrate Boerhaave's law of volume expansion by heat, a rendition of which is shown above.

Leiden jar

In 1745, the Leyden jar, a an early type of capacitor for storing charge, was invented independently by German cleric Ewald Georg von Kleist, on October 11th, and by Dutch scientist Pieter van Musschenbroek of Leiden (Leyden), in 1745–1746. The invention was named for the city. The adjacent photo shows a set of four Leyden jars at the Boeraave Museum, Leiden. [3]

Left: four Leyden jars. Right: Dutch physical chemist Johannes van der Waals's energy surface for carbon dioxide. Both shown at the Boerhaave Museum, Leiden.

Energy surface for carbon dioxide

See also: Maxwell's thermodynamic surface

In circa 1890, Dutch physical chemist Johannes van der Waals published a treatise on the *Theory of Binary Solutions* in

the Archives Néerlandaises, wherein he related his equation of state (see: Van der waals equation) with the second law of thermodynamics, in the form first proposed by American engineer Willard Gibbs, and was able to arrive at a graphical representation of his mathematical formulations in the form of a surface which he called Ψ (Psi) surface following Gibbs, who used the Greek letter Ψ for the free energy of a system with different phases in equilibrium. Shown adjacent is his energy surface for carbon dioxide, shown at the Boerhaave Museum, Leiden. [3]

Other alumni

The following are notables associated with Leiden University:

â— Heike Kamerlingh-Onnes
â— Jacobus van't Hoff
â— Bakhuis Roozeboom (1878)

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θΔics

In hmolscience, **Leland Gilsen** (c.1945-) is an American anthropologist, archeologist, and computer hobbyist noted his 2006 theory of culture as a thermodynamic machine amenable to computer simulation.

Overview

In 2006, Gilsen, in his “Modular Approach to Designing Computer Cultural Systems: Culture as a Thermodynamic Machine”, outlined a computer simulation theory of culture modeled as a thermodynamic machine; the following is an example quote: [1]

> “A thermodynamic characteristic of cultures is their ability to map out matter, energy and information about resources, their relative distribution, relative abundance, relative activity, and relative predictability.”

Gilsen’s central argument is that culture can be best modeled as an energy-information-economic, general systems theory, ecological thermodynamics based, type of thermodynamic machine (heat engine), with focus on the "mosaic of minerals valued by human groups".

Education

In circa 1977, Gilsen completed is PhD in anthropology with a specialization in archeology at the University of Arizona. From 1978 to 2002, Gilsen was the state archeologist of Oregon. Gilsen states that he has had a “long standing interest in physics, systems theory, thermodynamics, and cosmology.” [2]

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θΔics

In hmolscience, **Len Fisher** (1942-) is an Australian-born English science writer noted his 2009 to 2011 social physics attempting sociophysics critiquing publications.

Overview

In 2009, Fisher, in his *The Perfect Swarm*, attempted to explain how at low densities, organisms and people in a crowd behave more or less like atoms or molecules in an ideal gas, wherein their speeds follow a Maxwell-Boltzmann distribution, but that as more and more bodies are packed in the once random crowd spontaneously organizes. [1] The book is a mixture of complexity theory, Benard cells, dissipative structures logic, bifurcation theory, with interjections on subjects such as six degrees of separation, self-organization, and game theory, in attempt to explain the rules of decision involved in crowd and swarm behavior.

In 2011, Fisher published *Crashes, Crises, and Calamities*, wherein he takes a jab at criticism of social thermodynamics, a field which seems to be new to him, commenting on Croatian physicist Josip Stepanic's 2000 article "Approach to a Quantitative Description of Social Systems based on Thermodynamic Formalism" and Yi-Fang Chang's 2009 article "Social Synergetics, Social Physics, and Research of Fundamental Laws in Social Complex Systems", calling the two articles nothing but pages of complex mathematics, filled with hilarious conclusions. [5]

Chaos

Fisher seems to present the view that human societies organize, owing to the attractions and repulsions that exist between people, similar to the forces of attraction and repulsion that exist between atoms and molecules, but he also seems to have adopted the Prigoginean view that humans exist constantly at the edge of chaos, a logic base on the hypothesis that humans and human societies are advanced types of Bénard cells. The following opening exert gives an idea of Fisher's view:

> "Atoms and molecules experience forces of attraction and repulsion with nearby atoms and molecules, and these forces are sufficient in themselves to produce long-range order that can extend for billions of atomic diameters in all directions. Our society is made up of billions of individuals also, and the forces of attraction and repulsion between us can act to create social structures among us as well. These structures, however, are not nearly as regular as atoms (e.g. in a crystal) – to use the complexity scientist's picturesque but slightly misleading phrase, they are on the edge of chaos."

Fisher goes on to explain that the term 'edge', which in the Bénard cell speak of fluid mechanics is quantified by a specific Raleigh number, implied not that our social structures are on forever in danger of descending into anarchy, but that their degree of organization lies somewhere between complete order and complete chaos. He goes on to state as a matter-of-fact that:

> "Systems on the edge of chaos, including animal groups and human societies, have dynamic order, [which] lasts longer than the vortices in a cup of coffee."

In direct speak, Fisher assumes that human society is a system constantly on the edge of chaos, which is an incorrect assumption culled from the work of Ilya Prigogine.

Henderson

Fisher cites the 1971 work of engineer Roy Henderson who monitored the movements of college students on a campus and children on a playground, finding that in both cases their movements fit the Maxwell-Boltzmann distribution, meaning that both velocities of gas particles and the speeds of students follow a Gaussian distribution. [4] A noted difference between the children and college students, according to Fisher, was that the children had much more energy and consequently moved at much higher average speeds. [2]

Education

Fisher completed his BS in chemistry and mathematics and MS in radiation chemistry at the University of Sidney. He completed his PhD in surface physics at the University of New South Wales. He later completed a BA in biological sciences at Macquarie University and MA in philosophy at the University of Bristol. [3] Since 2004, Fisher has been a visiting research fellow in physics at the University of Bristol.

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(c) Chang, Yi-Fang. (2009). "Social Synergetics, Social Physics, and Research of Fundamental Laws in Social Complex Systems" (abstract), eprint arXiv: 0911.1155.

Further reading

● Fisher, Len. (2004). *Weighing the Soul: the Evolution of Scientific Beliefs*. London: Weidenfeld & Nicolson.

External links

● Len Fisher (faculty) – University of Bristol.
● Fisher, Len – WorldCat Identities.
● Len Fisher (author page) – Amazon.com.

θΔics

In chemistry, **Lennard-Jones potential** is a type of chemical potential that models the attraction and repulsion behaviors between pairs of neutral atoms or molecules, as defined by the following equation:

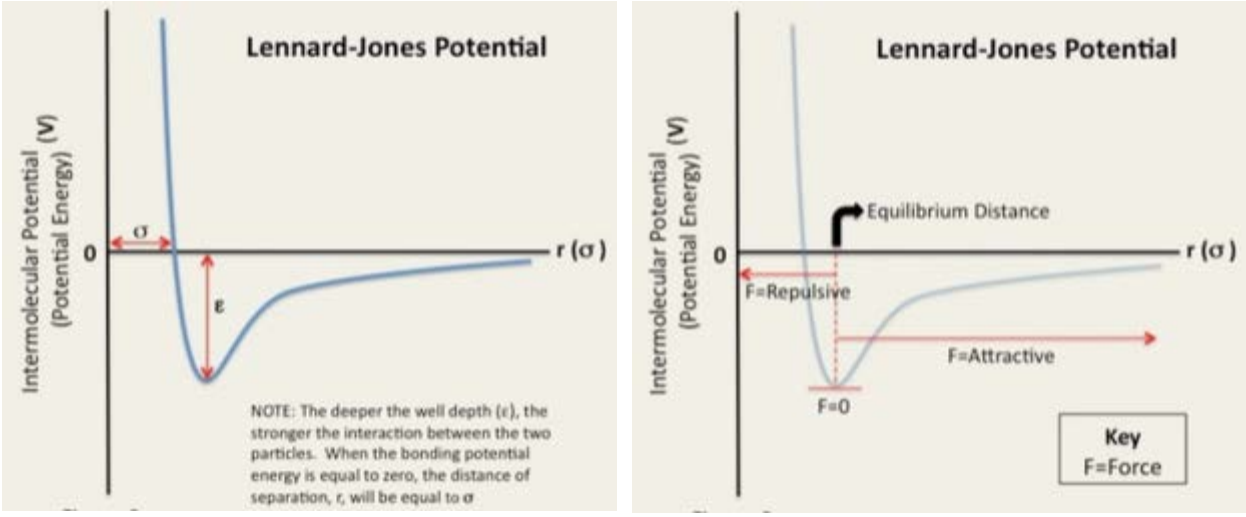

A graphical summary of the **Lennard-Jones potential**, shown that strong molecular field interaction is represented by the distance of separation location at the bottom of the well. [4]

$$\phi(r) = 4\epsilon\left[\left(\frac{\sigma}{r}\right)^{12} - \left(\frac{\sigma}{r}\right)^{6}\right]$$

where, for a molecular system, ε is the depth of the potential well, σ is the finite distance at which the inter-particle potential is zero and r is the distance between the particles.

The Lennard-Jones potential was introduced in 1924 by English mathematical physicist John Lennard-Jones, as derived in his two-part article "On the Determination of Molecular Fields". [1]

Human thermodynamics

In recent years, a few have begun to independently use the Lennard-Jones potential model to study and model human interactions, viewing people either as particles (human particles) or molecules (human molecules).

In 1988, Venezuelan-born English chemical engineering thermodynamicist Erich Muller employed the Lennard-Jones potential model in his applied human thermodynamics article "Human Societies: A Curious Application of Thermodynamics", wherein he introduced the concept of an 'interhuman potential', modeling pairs of humans interacting socially 'similar to that of insignificant molecules', discussing their interactions in thermodynamic terms. [2]

In 2011, independent of Muller, Iranian-born American chemical engineer Mohsen Mohsen-Nia, and his associates Iranians human scientist F. Arfaei, thermodynamicist H. Amiri, and computer engineer A. Mohsen Nia, wherein they present the results of a small relationship study, of different pairings of male and female co-workers, and discuss the results in energetic terms and attempt to explain interhuman relationship potential modeled on the Lennard–Jones potential. [3]

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External links

â— Lennard-Jones potential – Wikipedia.

θΔics

In existographies, **Leó Szilárd** (1889-1964) (CR:65) was a Hungarian-born American physicist noted for his 1922 article "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings", one of the first publications to espouse on the relationship between Maxwell's demon and information, and for conceiving, in 1933, of the nuclear chain reaction, a process releases several million times more energy than ordinary chemical reactions. [1] Szilárd is associated with the Berlin school of thermodynamics.

Szilard's demon | Chronology

Szilard's Brownian motion based Maxwell's demon article "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings", to note chronology, was written in 1922, accepted by the University of Berlin as his habilitation (habilitationsschrift), where thereupon he was appointed a private lecturer (privatdozent), and published in German in 1929 in the *Zeitschrift fir Physik* (*Journal of Physics*), then translated into English in 1964 by translators Anatol Rapoport and Mechthilde Knoller and published in *Behavioral Science*, then later found in reprinted with permission form in various books, thereafter. [3]

Information theory

Szilard was a personal friend of Hungarian chemical engineer John Neumann, in 1930, for example, they taught a theoretical physics seminar together with Erwin Schrodinger; and would seem that it was Szilard's influence through Neumann that reached Claude Shannon convincing him to call information by the name entropy. [2]

Education

In about 1919, Szilárd conducted engineering studies at Technische Hochschule (Institute of Technology) in Berlin-Charlottenburg, but soon changed to physics taking classes from Albert Einstein, Max Planck, and Max von Laue. His dissertation on thermodynamics *Über die thermodynamischen Schwankungserscheinungen* (On The Manifestation of Thermodynamic Fluctuations) in 1922 was praised by Einstein and awarded the highest honor. In 1923 he received the doctorate in physics from the Humboldt University of Berlin. He was appointed as assistant to von Laue at the University of Berlin's Institute for Theoretical Physics in 1924. In 1927 he finished his habilitation and became a *Privatdozent* (instructor) in Physics at University of Berlin.

See also

- Szilard's demon
- Szilard's paradox

References

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External links

- Leo Szilard – Wikipedia.

- Einstein-Szilard letter – Wikipedia.

θΔics

In existographies, **Leo Tolstoy** (1829-1910) (IQ:180|#108) [RGM:43|1,500+] (Murray 4000:10|WL) (Gottlieb 1000:34) (WorldCat 100:24) (GLAE:#) (CR:41), was a Russian literature philosopher, and free thinker, noted for

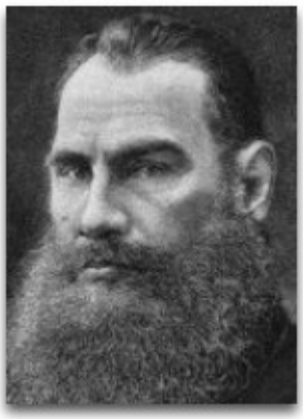

Overview

In 1869, Tolstoy, in his epic novel *War and Peace*, comments on the inconsistent views of man in regards to his own nature as being supposedly different from the nature of other particles: [1]

> "A particle of matter cannot tell us that it is unconscious of the laws of attraction and repulsion and that the law is not true; but man, who is the subject of history, says bluntly: I am free, and am therefore not subject to laws."

Tolstoy was said to have learned of the human particle view of people (or human molecule view) from Henry Buckle. [2]

Schopenhauer

Tolstoy, according to Sudanese-born American philosopher Monydit Malieth, was an ardent reader of Arthur Schopenhauer. [3]

Quotes | By

The following are quotes by Tolstoy:

> "Freethinkers are those who are willing to use their minds without prejudice and without fearing to understand things that clash with their own customs, privileges, or beliefs. This state of mind is not common, but it is essential for right thinking."
>
> — Leo Tolstoy (1862), *War and Peace* (Ñº)

> "Schopenhauer takes us as far as philosophy can."
>
> — Leo Tolstoy (c.1890) [3]

> "One may say with one's lips: 'I believe that god is one, and also three' – but no one can believe it, because the words have no sense."
>
> — Leo Tolstoy (1902), *What is Religion* [4]

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3. Malieth, Monydit (aka Tonnerre). (2013). *The Future Affects the Past* (Tolstoy, pg. 54). Red Lead Books.
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External links

â— Leo Tolstoy – Wikipedia.

θΔics

In existographies, **Léon Brillouin** (1889-1969) (GS:9) (CR:60) was a French-born American physicist noted in information thermodynamics, for his 1956 book *Science and Information Theory* in which, building on the work of American electrical engineer Claude Shannon, who he worked with at IBM as director of electronics education (1948-53), he uses a hodgepodge of mathematical derivation to make connections between thermodynamics and information, in which he employed a mixture of term negentropy and cybernetics arguments [1]

Life principle

As early as 1949, seeded by Erwin Schrodinger's 1944 *What is Life?*, Brillouin was search for a supposed "life principle" to be active in living structures as a sort of remedy against the second law. His entire argument, as is the case in these sorts of grasps at historical vitalism, seems to have been rather nonsensical. Brillouin's basic argument is that a living organism has special properties, namely: resist destruction and healing ability, which do not appear in inert matter, hence we must accept a life principle that allows for such exceptions to the second law. He states: [2]

> "When life ceases and death occurs, the 'life principle' stops working, and the second principle regains its full power, implying demolition of the living structure."

The basic problem here is that nowhere in German physicist Rudolf Clausius' 1865 mechanical theory of heat (thermodynamics) is there any supposition that the second law implies demolition of living structure, nor does the thermodynamics explicitly differentiate as to two types of bodies, there is only the hot body, the cold body, and the working body.

Harvard debate

Brillouin states that in 1946 at Harvard there was some kind of "what is life—in terms of physics and chemistry—debate", similar to the one held in 1938 at the University of France, themed around the famous 1920 what is life in the context of second law query of Swiss physicist Charles Guye.

> "How is it possible to understand life, when the whole world is ruled by the second law of thermodynamics, which points towards death and annihilation?"

Brillouin also states American thermodynamicist Percy Bridgman was at the 1946 Harvard debate, where at, supposedly, during the discussion, he commented how he saw a fundamental difficulty in the possibility of applying the laws of thermodynamics to any system containing living organisms (chnopsological organisms). [2]

Other

Reaction articles to Brillouin's 1949 "Life, Thermodynamics, and Cybernetics", include ones by Americans physicist Richard Raymond (1950) and psychologist Mortimer Ostow (1951). [3]

Maxwell's demon

See main: Scientific demons

In 1951, Brillouin, in his "Maxwell's Demon Cannot Operate", asserted that: [4]

> "In an enclosure at constant temperature, the radiation is that of a "blackbody," and the demon cannot see the molecules. Hence, he cannot operate the trap door and is unable to violate the second principle. If we introduce a source of light, the demon can see the molecules, but the over-all balance of entropy is positive.

> This leads to the consideration of a cycle 'Negentropy → Information → Negentropy' for Maxwell's demon as well as for the scientist in his laboratory. Boltzmann's constant *k* is shown to represent the smallest possible amount of negative entropy required in an observation."

American social second law historian Eric Zencey asserts that this publication marks the date in which "physics could assert, with sound theoretical justification, that the [second] law held in all cases; until then the law's negation had to be viewed with a certain theoretic, if not practical, tolerance." [5] This, however, is a rather blurry if not spurious conjecture; as this type of argument was done originally by Leo Szilard (see: Szilard's demon) in 1922.

Education

Brillouin studied physics at the École Normale Supérieure, Paris, from 1908 to 1912. In 1911, he studied under Jean Perrin until he left for the Ludwig Maximilians University of Munich (LMU), in 1912. At LMU, he studied theoretical physics with Arnold Sommerfeld. Just a few months before Brillouin's arrival at LMU, Max von Laue had conducted his experiment showing X-ray diffraction in a crystal lattice. In 1913, he went back to France to study at the University of Paris. From 1914 until 1919, during World War I, he served in the military. At the conclusion of the war, he returned to the University of Paris to continue his studies with Paul Langevin, and was awarded his *Docteur ès science* in 1920, with a thesis composed of Langevin, Marie Curie, and Jean Perrin, on the quantum theory of solids, which proposed an equation of state based on the atomic vibrations (phonons) that propagate through it. In 1949, the time of publication of his noted "Life, Thermodynamics, and Cybernetics" article, Brillouin was associated with Cruft Laboratory, Harvard University.

Quotes

The following are representative quotes:

> "The entropy content of a living organism is a completely meaningless notion. We have been looking, up to now, for a physicochemical interpretation of life. It may well happen that the discovery of new laws and of some new principles in biology could result in a broad redefinition of our present laws of physics and chemistry, and produce a complete change in point of view."
>
> — Leon Brillouin (1949), "Life, Thermodynamics, and Cybernetics"; cited by Judson Herrick (1956) in *The Evolution of Human Nature* (pg. 51)

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Further reading

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External links

● Leon Brillouin – Wikipedia.

θΔics

In existographies, **Leon Cooper** (1930-) is an American physicist (Q) and neuroscientist noted for

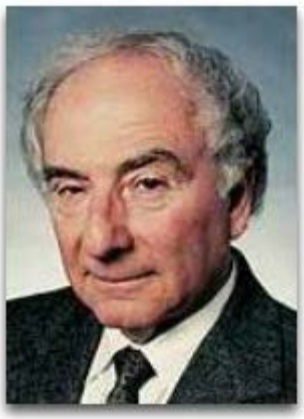

Overview

In 2014, Cooper, in his *Science and Human Experience*, cites Goethe's *Faust*, the character Mephistopheles – aka the "cultivated, witty, and cynical exponent of materialism and nihilism, and preaches a sophisticated doctrine of philosophical negation; the outstanding skeptic, with the inability to believe in anything; who represents evil, but, ironically, can also be an unconscious force for good" (Q) in respect to the modern age – the 1802 Napoleon-Laplace anecdote, and attempts to riddle out what science, from an implicit atheism point of view, has to say about human experience, particularly what the new theories in neuroscience have to say about this. [1]

Superconductivity

Cooper is generally noted for his BCS theory (Q) of superconductivity (codeveloped with John Bardeen and John Schrieffer).

Other

Coooer, of note, is the person behind the fictional genius (see: greatest fictional geniuses ever) character Sheldon Cooper (Q) [compare: Hari Seldon of Isaac Asimov's psychohistory], of 2007-launched *The Big Bang Theory* (Q), with a claimed IQ of 187, described as a "BS, MS, MA, PhD, ScD, Caltech theoretical physicist, who started college at 11 and finished his PhD at 18", in his *Science and the Human Experience*.

Religion | Beliefs

Cooper, who, in his "Science and Human Experience" (1976), cites Albert Camus, evidences that he is a Sisyphean atheist (see: Camus model) in purview and outlook.

Quotes | Employed

The following are quotes employed by Cooper:

> "There are many phenomena that we do not yet understand. But it is reasonable to predict that man will eventually understand all of nature scientifically."
>
> — Victor Weisskopf (1975), "The Frontiers and Limits of Science"; in: *Science and Human Experience* (pg. 7) [2]

> "Asked to nominate a worthy successor to Victor Frankenstein's macabre brainchild, what should we choose from our contemporary inventory of terrors? The bomb? The cyborg? The genetically synthesized android? The behavioral brain washer? The despot computer? Modern science provides us with a surfeit of monsters, does it not? I have another monster in mind that troubles me as much as all the others – one who is nobody's child but the scientist's own and whose taming is no political task. I mean an invisible demon who works by subtle poison, not upon the flesh and bone, but upon the spirit. I refer to the **monster of meaninglessness**. The psychic malaise. The existential void where modern man searches in vain for his soul. Further, it is science which has made our universe an unbound theater of the absurd."
>
> — Theodore Roszak (1974), "The Monster and the Titan"; in: *Science and Human Experience* (pg. 9)

Quotes | By

The following are quotes by Cooper:

“Will the Laplace of 1984 tell us with a sneer that he did not need that hypothesis?”

— Leon Cooper (1976), “Science and Human Experience”; reference to Napoleon Laplace anecdote (1802) [4]

“When it comes to ‘feeling’, academia generally becomes uneasy (compare: Stewart-Weaver fallout). I recall a meeting concerning educational policy attended by representatives of the humanities and sciences. It was a scientist who suggested that in the humanities a student’s ‘emotions’ might be engaged – an intriguing, if unintentional revelation of his state of mind. The response of the humanities representatives was equally instructive. He quite violently took issue. The humanities, he insisted, are not a domain where emotion and feeling are predominant. They are scholarly, analytical, and emotionless as is science. Quite right. Where then is emotion in our systems.”

— Leon Cooper (1976), “Science and Human Experience”: in: *Science and Human Experience* (pg. 17) [4]

“It might turn out, in spite of the popular opposition between the ‘cold logic of science’ and the ‘warm spontaneity of art’, that science may yet provide us with a concrete realization of a human being as unique and individual as any ever heralded in poetry or song.”

— Leon Cooper (1976), “Science and Human Experience”; in: *Science and Human Experience* (pg. 19) [4]

“A consequence for the twentieth century is a society perhaps characterized as a ‘theater of the absurd’, not in the cosmic sense, but on a very individual level: a society in which there is no general faith to guide action, in which the individual is often so separate from the important social consequences of his actions that individual social action seems meaningless, a society which seems plagued by what might be characterized a as generalized problem of the commons.”

— Leon Cooper (1979), “Can Science Serve Mankind?”; in: *Science and Human Experience* (pgs. 38-39)

“Has the level of college education in this country dropped so low that not only mathematics, but any serious and disciplined intellectual approach is no longer acceptable?”

— Leon Cooper (1986), “Art and Science”; in: *Science and Human Experience* (pg. 63)

“As for reductionism, I have always been somewhat mystified as to what the fuss is about.”

— Leon Cooper (2014), *Science and Human Values* (pg. 127)

“Faust knew everything that could be known as was not content.”

— Leon Cooper (2014), *Science and Human Values* (pg. 130)

“The good materialist fervently believes that everything in our world, from vacuum polarization contributions to the electron’s magnetic moment, to chemical reactions, mental states, and social behavior, can be constructed from such objects as protons, electrons, quarks, strings, or branes: objects that obey

those few remarkably concise rules known as the ‘laws of physics’. Why then don’t these ‘laws’ explain everything? We might as well as why they don’t explain *Hamlet*.”

— Leon Cooper (2014), *Science and Human Values* (pg. 133)

“We need the leap of imagination that will show us how to construct feeling entities from non-feeling atoms.”

— Leon Cooper (2014), *Science and Human Experience* (pg. 151)

“Whether we like it or not, we’ll very likely find that what we call ‘soul’ is some configuration of material objects. I’m not saying I particularly like it or dislike it, but we might as well face the fact that it is probably that way.”

— Leon Cooper (2014), *Science and Human Experience* (pg. 166)

“Thinking, according to Pierce, is an activity that begins when the mind is uncomfortable and ceases when it is comfortable again.”

— Leon Cooper (2014), *Science and Human Experience* (pg. 179)

“It is the mark of a mathematician, as Bertrand Russell once said, that he does not know what he is talking about.”

— Leon Cooper (2014), *Science and Human Experience* (pg. 190)

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External links

- Leon Cooper - Wikipedia

θΔics

In existographies, **Marie-Esprit Léon Walras** (1834-1910) (CR:63) was a French socioeconomist, one of the founding heads of the Lausanne school of physical economics, noted for his efforts, between 1858 and 1896, in aims at developing a calculus-based science of economics utilizing the notion of economic forces, wherein he came to view people as "economic molecules". [1]

Overview

In 1874, Walrus, in his *Elements of Pure Economics*, said the following: [7]

> "The words 'scarce' and 'scarcity' are herein given scientific meaning like the word 'velocity' in mechanics and the word 'heat' in physics. The mathematician and physicist do not oppose velocity to slowness and heat to coldness as is done in ordinary language. To the mathematician slowness means only less velocity; to the physicist cold means less heat. In the language of science, a body has velocity as soon as it moves at all; it has heat whenever it has any temperature at all. In the same way, scarcity and abundance are not opposed for our purposes. In political economy, however, abundant a thing may be, it is scarce whenever it is useful and limited in quantity, just as in mechanics a body has velocity whenever it travels a given distance within a given time. Does this mean that scarcity is a ratio of utility to quantity, i.e. the utility per unit of quantity, in the same manner that velocity is the ratio of distance passed over to the time taken to pass over it, i.e. the distance travelled per unit time?"

The following quote from the preface of the 1900 fourth edition exemplifies Walras' view:

> "As for those economists who do not know any mathematics, who do not even know what is meant by mathematics and yet have taken the stand that mathematics cannot possibly serve to elucidate economic principles, let them go their way repeating that 'human liberty will never allow itself to be cast into equations' or that 'mathematics ignores frictions which are everything in social science' and other equally forceful and flowery phrases."

In his work, Walrus developed a generalized economic theory of human equilibriums, based on movements towards satisfaction "states". [2] Walras was, supposedly, deeply influenced by the works of French mathematical physicist Louis Poinsot, author of the 1806 *General Theory of Equilibrium and of movements in Systems*, among other works. [8]

In 1909, Walras published "Economics and Mechanics", one of his last papers, wherein he argued that the psycho-mathematical science of pure economics, as he conceived it, used identical methods as the physico-mathematical sciences of rational and celestial mechanics. [1]

Auguste Walras

Walras' economic and social views derive from the beliefs of his father, French school administrator and amateur economist Auguste Walras. Auguste became professor of rhetoric at the College of Evreauz in 1831 and that same year published his first book on political economy, *The Nature of Riches and the Origin of Value.* [6]

In 1858, one evening while the two were out walking, Auguste situated the postulate in Léon that to create a scientific theory of economics one would need to use differential calculus to derive a 'science of economic forces, analogous to the science of astronomical forces'. [3] Léon soon became convinced that if the equations of differential calculus could capture the motion of the planets and atoms in the universe, then they should also be able to capture the motion of human minds in the economy. [4]

Economic molecules

According to 1981 views of English economist Hazel Henderson: [3]

> "[Walras] was an agrarian socialist and wanted to nationalize land, but he talked of humans as 'economic molecules' and gave concepts like scarcity scientific definitions analogous to heat in physics."

Economic equilibrium

On the basis of his father's direction, Walras conceived the view of people as *economic molecules* and 'trades' of goods in economy as signs that the system was out of equilibrium. As goods are traded in a day, according to Walrus, people move from their initial less satisfied state to a more satisfied (happier) state, a point that Walras called the *general equilibrium* point. [4] This was the original seed of logic for the later development of equilibrium theories in modern economics.

In the years to follow, Léon Walras developed an interest in both sociology and economics. In 1866, and over the next two years, edited a journal called *Le Travail*, to which he contributed many valuable sociological articles. In 1870 he was appointed professor of political economy at Lausanne, thus forming the Laussane school. His most important works are his 1877 *Elements of Pure Economics*, a mathematical treatment of economics, and the 1883 *Mathematical Theory of Social Riches*. [5]

Students

Two of his notable students, greatly influenced by his ideas, were Polish sociologist Léon Winiarski, who utilized the thermodynamics of German physicist Rudolf Clausius in the teaching of sociology, and French-Italian economist Vilfredo Pareto, who came to view people as human molecules. In 1893, Pareto succeeded Walrus in the chair of economics at the University of Lausanne, Switzerland.

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Further reading

â— Jolink, Albert and Daal, Jan van. (1993). *The Equilibrium Economics of Leon Walras* ("A Life Sketch of Leon Walras", pgs. 129-34). Routledge, 2002.

â— Leon Walras' Socialism and his Economics (39-pgs) – Roberto Baranzini (2001).

External links

â— Léon Walras – Wikipedia.

θΔics

In existographies, **Leon Harold Warshay** (c.1931-) (CR:17) is an American sociologist noted, in hmolscience, for []

Overview

In 1993, Warshay, in his chapter "The Social Theory of a Humane Organicist: On Werner Stark as Intellectual Detective and Moralist", wherein he gives a synopsis of the critical social mechanics views of Austrian macroeconomist turned sociologist Werner Stark, namely his 1962 *The Fundamental Forms of Social Thought*, wherein Stark devotes two chapters to an "angry" critique, as Warshay summarizes it, of what Stark refers to as the "extreme mechanicism" school of sociology (see: mechanistic school) or social mechanics, where people are treated as particles (see: human particle) and or molecules (see: human molecule) whose behaviors are explained through mechanism and physical science principles. The gist of Warshay's summary of Stark's views are as follows: [2]

> "Some modes of mechanism (Chapter 10), such as Simmel's, are tolerated; others, such as Lundberg's, are not. Simmel is deemed a moderate even though he leans toward nominalism, just as Durkheim is favorably contrasted with Simmel as a moderate who leans toward realism. Lundberg is criticized for aping physics—for using motion, energy, and force as social mechanism and defining societal groups as 'electron-proton configurations'—thereby being enslaved by 'mechanistic modes of thought' (pgs. 153-54).
>
> The work of Henry Charles Carey (which is discussed in Chapters 10 and 11) and that of S.C. Haret is characterized as extreme mechanicism. Both apply physical principles to society (e.g. force, attraction, motion, constrains, space, equilibrium, energy, and electricity) and both see individuals in mechanistic-atomistic terms (e.g. as particles and or molecules) as inert elements caused from without. Stark criticizes extreme mechanicism for its inability to deal with social fact (pg. 163) and as inclined to be a- or anti-historical (pg. 159).
>
> Some 'empiricism' is evident here in Stark's criticisms of the various types of mechanicism he posits. His argument is an angry one: that Carey, Pareto, and Lundberg have all 'imported' models from elsewhere (e.g. from physics and astronomy), and have 'imposed' them on social phenomena (which Stark knows to have an idealistic character) under a 'unity of nature' positivist ideal, which is really a sociology unified under physics (pg. 155)."

(add)

Two cultures department | Commentary

In 2013, in commentary on American electrochemical engineer Libb Thims effort to found America's first two-cultures teaching department, embodying "sociology vs. physics" tension inherent in Stark's "anger", Warshay stated the following in communication to Thims on Mar 05: [3]

> 1. Thank you for your bold effort at culture-bridging.
> 2. I tend to be a pluralist rather than seeking one system that might include divergent "cultures" such as sociology and chemical engineering (my younger brother is a chemical engineer, and certainly not a sociologist although he could be one kind of sociologist).
> 3. I see most efforts at theoretical, and/or theory-method, integration as ignoring "natural," qualitative differences, whether Parsons, Merton, Radcliffe-Brown, or anyone else (See my MacIver, below, points 7 and 8).
> 4. Hence, I tend to be anti-reductionist.
> 5. Lundberg saw physics as underlying sociology, for example, groups were seen by him to be "electron-proton configurations." Physics was evidently his model.

6. In contrast with Cooley, who really rejected science, Mead accepted it, but leaned toward a biological, rather than physical, view of science as closer to human behavior and to Interactionism (or. as he called it, "Social Behaviorism.)"
7. MacIver has rightly criticized attempts (by people such as Lundberg, to "charm away a difference that nature itself reveals.") (MacIver, *Social Causation*, Harper, 1942, p. 300), nature should be "carved at its joints. (Incidentally, I met MacIver years ago (invited by political scientists, not by sociologists, at Ohio State, but social theorists were invited.. When I mentioned his "paper flying before the wind" versus "a man fleeing from a pursuing crowd " example, MacIver said that he never liked "that man."
8. MacIver distinguished between mechanical causation and "conscious being" causation, thereby giving respectability to the notion of cause, i.e., it need not be confined to mechanical, one-way, causation. causation.
9. Lester Ward asserted that, to be a science, one must talk of "forces," an arbitrary argument.
10. Homans was "mechanistic" as well.
11. To return to your original question, mechanistic approaches appear to have been ruled out of court, by Parsons at al.
12. Probably some social phenomena fit the mechanistic model, i.e., it may be a question of "fit."
13. I think that Interactionists and those that stress "meaning" could accept "causation" under a broader view of it not confined to mechanical causation.

Warshay followed this up with the following 08 Mar 2013 communication: [3]

This is yet another comment-answer about your statement about the mechanistic school in sociology:

1. I certainly do not rule out a mechanistic, or mechanical, I am open to a mechanistic school for sociology as one of several approaches, therefore would not rule it out of court (as Parsons has). Sociologists should be open to applying:

a. Various scientific models should be applied—physical (including the mechanical), chemical (various types), biological (my wife, Diana, started as a biologist). Then there are diverse other approaches. phenomenological, radical behaviorist,
b. Various "humanistic" models (humanistic in the sense of anti-science, at least anti-mechanistic science, as Cooley did in his 1930, his last, text. Mead was pro science (a biological model).

Today many call themselves "qualitative" sociologists, presumably as distinguished from "quantitative" sociologists, some of whom are Empiricists, others better fitting a Neo-Positivist label.
2. Still, from the standpoint of one's approach "fitting" social phenomena, one stressing "meaning" is my preference, maybe a Blumerian one (although Blumer pales before Mead). Dewey wrote that Mead did not realize the "originality" of his own approach (In a similar manner, Friedrich Engels, while rightly thinking highly of his own approach, granted Marx's genius. So, Dewey is to Mead as Engels is to Marx.). Mead was genius, as was Marx, although more modest.
3. I will now more directly try to answer your question as to why the mechanistic school is not being taught in American sociology.

a. It is taught by implication, at least for those having a mechanistic view of causation (e.g., Lundberg, Homans, maybe Ward, among many).
b. That is, some believe, or assume, that cause-effect is always mechanical. As my items 7 and 8, in my previous E Mail to you, asserted, there are diverse approaches to causation (As MacIver's *Social Causation* [1942] text indicated.). As I wrote in item 13 of my previous E Mail, Interactionists, Social Action theorists, social phenomenologists, and others could accept an idea of causation not confined the mechanical.

4. Thus, a short answer to your question is that

a. A mechanistic sociology does exist, as indicated variously above, but less openly presented.
b. One problem is confusing "humanistic" with "humanitarian."
c. Another is assuming that theory must be humanistic (i.e. mentalistic, conceptualistic, value-laden, ideological) whereas a diverse approach does include empiricist and positivistic theory (physical, biological, chemical, etc.)

5. The same argument applies to methodology.
6. Incidentally, and not so incidentally, my recently published theory text (*Perspectives in Sociological Theory*, Landon Elsemere Press, Canada.) lists many items in the Index under "Mechanical," p. 526).
7. In any case, I fully endorse your efforts to include the mechanical.
8. The bottom line is bias, those seeking to overcome bias often being called names.

The following is Warshay's 14 May 2013 response: [3]

In answer to your question of why the mechanistic school is not being taught in American sociology:

1. The mechanistic school is seen to be "foreign matter," particularly given the emphasis in sociology of the below:
a. Interactionism,
(1) particularly that of Blumer (Symbolic Interactionism) (1937, 1954, 1962,1969) and Cooley's "mentalistic" emphases (1902, 1909, 1922, 1930)
(2) Mead is more marginal. He is behavioristic ("social behaviorism, 1934, 1938) but does not deny the importance of the subjective, the inner life, but asserts that one should begin with the "outside" (i.e., the observable) and then move to the "inside" rather than the other way around.
b. Functionalism and/or Stricture-Functionalism, largely Parsons (1951, 1966, 1977) but also Merton (1949, 1957, 1968), is largely Weberian.
c. Peter Blau,
(1) who began with Merton's emphasis on large-scale organization and bureaucracy,
(2) but also included Social Exchange theory (1964, 1968),
(a) following Simmel's "social association" approach (i.e., relationism)
(b) while rejecting Weber's and Parsons' "social action," i.e., subjective (Blau 1964:13).
(3) While not mechanistic, Blau is closer to it than are the above others; he is a "neo-positivist," as is Merton.
2. In contrast with all the above is George Lundberg (1939, 1947, 1964), using physics as the proper model fort sociology
a. For example, groups were seen as "electron-proton configurations").
b. With the possible exception of mathematics, physics was seen as the ultimate
(1) In contrast were those who, while on the side of science, saw biology as a better scientific model for sociology (e.g., Mead) than physics.
(2) This raised the issue of "reductionism," the most threatening to sociology as a discipline is reductionism of sociology to psychology
(a) This issue particularly emphasized by Emile Durkheim (1895), who argued against reducing, i.e., explaining, sociology (i.e., "social fact") in terms of psychology i.e., individual or psychological fact
(b) Reductionism was emphasized by Floyd Allport, older brother of Gordon Allport, in the early 1920s, when psychology tended to stay on the individual level," reducing" social variables to psychological ones such as perception, motivation, and personality.
(c) In contrast with reductionism is emergence, or emergent properties, the issue being a pragmatic one, theoretical strategy, rather than the "real world."

(I) Part of what it involved here is culture, i.e., English and American culture, leaning toward Capitalism, tending to individualism and individualistic explanations, a more real and/or valid.
(II) In contrast are more collectivist cultures, such as Germany and, possibly, France, Russia, etc..

Also, on 14 May 2013, in commentary on University of Chicago sociology department chair Mario Small's comment to Libb Thims that a two cultures (sociology department + physics department) proposal for establishment at University of Chicago is too "tall" an order at the moment, Warshay commented the following: [3]

1. Mario Small's statement that the "introduction of a department or class, strung between the physics and sociology department, seems like a tall order at the moment" but, being true to a physical analogy or model, tall orders can be toppled.
2. While a physical sociology, or social science, is "foreign matter," given the prevalence in sociology of Weberian, Parsonian, Interactionist, Functionalist, and similar approaches, the concepts and theories to be selected and used are a pragmatic matter, a matter of fit and usefulness, in prediction, explanation, intelligibility, and the like.
3. Hence, sociophysics cannot, and should not, be ruled out of court, despite Talcott Parsons.
4. At the other "extreme," neither should qualitative, humanistic, and/or idealist approaches be ruled out, whether subjective idealist or objective idealist.
4. What should be avoided is narrowness and closed-mindedness.
5. Hence, it is necessary to entertain physicalist, chemical, biologistic, psychologistic, material culturalist, geographic concepts, models, and theories.

(add)

Education

Warshay completed his PhD in sociology in 1959 with a dissertation on “Breath of Perspective, Culture Contact, and Self” at the University of Minnesota. Currently, he is a professor of sociology at Wayne State University, Michigan.

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3. Email communication from Leon Warshay to Libb Thims (5, 8 Mar; 14 May 2013).

Videos

â— Anon. (2014). “Dr. Warshay Honoring 45-years” (Ñº), Way State University Sociology Department, YouTube, Apr 11.

External links

â— Leon H. Warshay (faculty) – Wayne State University.
â— Warshay, Leon H. – WorldCat Identities.

θΔics

In existographies, **Léon Winiarski** (1865-1915) (IQ:190|#41) (SN:4|55+) (CR:176) was a Polish mathematical physics based sociopolitical economist notable for teaching a course on "social mechanics" for six years (1894-1900) at the University of Geneva (see: human thermodynamics education), in which he utilized a a Lagrangian-Clausius based explanation of social and economic movement, using differential equations, in which he discusses advanced concepts such as sexual energy, aesthetic energy, among numerous others, in terms of energy and entropy. The bulk of his theory is captured in his 1898 book *Essay on Social Mechanics* and his teaching course is described in his 1900 report "The teaching of pure economics and politics of social mechanisms in Switzerland." In 1929, American sociologist Howard W. Odum describing Winiarski as the leader of the mechanistic school of sociology and described his theory as follows: [18]

> "**Winiarski**'s mechanistic interpretation posits society as a system of points, individuals in perpetual movement, with attraction as the primary cause of movement. This attraction is like chemical affinity which mechanical bases but with psychic force not present in the physical world, which, however, in turn is nothing more than a form of physico-chemical energy which in turn, in the form of life, may be transferred from potential to kinetic energy, and this transformation is primarily through the processes of alimentation and reproduction. Human masses transmute energies of hunger and sex into various social, economic, aesthetic or intellectual forms, the transformation proceeding entirely according to the laws of thermodynamics. Society and human beings will ultimately reach an equilibrium in some way as the physical world has reached its equilibrium and social science must devise objective units of studying this energistic system of humans in relation to their world."

Odum's summary, in turn, was based on the earlier interpretation of Winiarski as given by Russian-born American sociologist Pitirim Sorokin, from his 1928 *Contemporary Sociological Theories*, who in turn devotes over fifteen pages to Winiarski's theories. [19]

Citations

Winiarski, in building his social mechanics theory, cites some big names: Joseph Lagrange, Emile Clapeyron, Robert Mayer, Rudolf Clausius, Cato Guldberg and Peter Waage (law of mass action), Hermann Helmholtz, Max Planck, Henri Poincare, Joseph Thomson, to name a few. [26]

Pareto | Walras

Vilfredo Pareto and Leon Walras had the following to say about Winiarski: [27]

> "Winiarski is a socialist and in addition ignorant."
>
> — Vilfredo Pareto ()

> "Winiarski est socialiste et de surcroit ignorant."

> "Winiarski is perfectly aware of this very new and very difficult science. It is mathematician, which is essential to penetrate as well and to teach correctly."
>
> — Leon Walras ()

> "Winiarski est parfaitement au courant de cette science tres neuve et tres difficile. Il est mathematician, ce qui est indispensable pour as bien penetrer et pour l'enseigner correctement."

(add discussion)

Education

In 1886, at the age of twenty-one, Winiarski was a student at Warsaw University, where probably with the help of his brother Wolf Winiarski, tried to keep up the tradition of spreading Marxist ideas among the first Polish scientists. He authored two pamphlets of this kind: “About Crises and their Sources” and “On Supplementary Values”, being a popularization of Karl Marx’s *Das Kapital*. [12]

Following his studies at Warsaw University, Winiarski then studied at Paris and London, before coming to Switzerland, where at the University of Geneva he began teaching a course on social mechanics, for at least six years (1894-1900), in which he utilized a a Lagrangian-Clausius based explanation of social and economic movement.

During this period, Winiarski published at least three books on theoretical sociology and economics. [23]

In 1903, Winiarski became professor of finance and statistics at the University of Lausanne (see also: Lausanne school). [22]

Of greatest influence, Winiarski a pupil of French-Italian engineer Vilfredo Pareto, one of the first to conceive of people as "human molecules", who himself had been a student of French economist Léon Walras, the first to conceive of people as "economic molecules". Walras and Winiarski exchanged letters in the discussion of ideas; at least in 1899. [7] Winiarski was a professor of finance and statistics at the University of Lausanne; was an ardent advocate of social mechanics, and it is said that he considered himself to be following in the footsteps of Walras. [17]

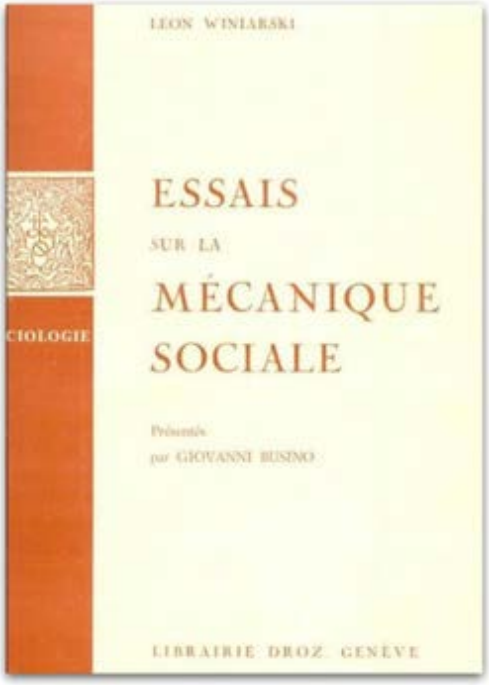

In 1967, Swiss sociologist Giovanni Busino published a 315-pg edition of Winiarski's collected works on social mechanics entitled *Essay on Social Mechanics*.

Economics

Winiarski took a view of “economics as social physics” on the model that the exchanges in human society studied by economists were seen as analogous to the exchanges that physics studies in nature. [21]

Sex

On sex, Winiarski states: [20]

> “The psychology of sexual elements on one hand, seems to us quite right. It is between the sperm and egg that biological attraction, more or less, which is the same mechanics as the chemical attraction between the atoms of hydrogen and oxygen.”

In other words, what Winiarski seems to be saying is that the psychology of sexual attraction, which results ultimately in the biological attraction that draws the sperm and egg together, are both of the same mechanics of the operation of chemical affinity, or Gibbs free energy change (modern view), as that which draws the hydrogen and oxygen atoms together.

Overview

In 1894, Winiarski began teaching a class called “social mechanics”, at the University of Geneva, where he applied the dynamics of Italian mathematician Joseph Lagrange and the thermodynamics of German physicist Rudolf Clausius, through equation formulation, in sociology and economics. [1] Some aspects of these lectures began to be published in works such as Winiarski's 1898 "Essay on Social Mechanics", and post-humorous 313-page collected works, by the same

name. To summarize, Winiarski held the view that: [10]

> "A social aggregate is nothing but a system of points, i.e. individuals, who are in perpetual movement of approaching or withdrawing from one another."

Winiarski treated human societies in terms of energy, discussed social systems in terms of the first and second laws of thermodynamics, and used differential equations to describe certain social processes. [2] He has been classified as one of the representatives of "energetic theory" in sociology. [4] Most of his works were published in French (having limited translations), which may explain why he is not as well known in modern times.

Ward

In America, the work of Winiarski was very influential to American sociologist Lester Ward, who credits Winiarski as forming the basis of the third part of his 'system of sociology' (developed up until 1913), that of the "difference of potential" or transformative principle of sociology, as is said to be exemplified by the following quote:

> "The forces of work, system kinetic energy will be equal to the differences of the potential energies. To ensure the transformation of the active forces of the biological energies, unrealised potential processing takes place, it must be between comprizing breeds in a social aggregate, where there is a difference in potential. All the differences in these potential energies go into energy kinetic—but the total energy remains unchanging during processing; there is only a change in form."

> Le travail des forces, l'énergie kynétique du système sera égale à la différence des énergies potentielles. . . . Pour que la transformation en forces actives des énergies biologiques latentes potentielles ait lieu, il faut qu'entre les races comprises dans un agrégat social, il existe une différence. . . . Toute la différence de ces énergies potentielles passe en énergie kynétique—mais la somme totale d'énergie reste invariable pendant la transformation; il n'y a qu' un changement de forme.—LÉON WINIARSKI.

Through the application of the branches of mathematical physics to sociology, such as found in the above quote, according to Ward, Winiarski was the world's first mathematical sociologist. [3]

Name translations

Winiarski was born in Poland, but taught and worked at the primarily French-speaking University of Geneva, Switzerland, which is next to Italy and France, hence his publications seem to be only in French, Italian, and Polish, in descending order. [13] An English variant of his last name is "Winiarsky" (as used by Ward). A Spanish and Italian variant of his first name is "Leone". [8] In his 1900 biographical book on American sociologist William Morris, he goes by the name "Leona Winiarskiego". [11]

Social mechanics

To cite an overview of Winiarski's teachings, at the 1900 *Sociology at the Paris Exposition*, after referring to the earlier works of Lagrange, and his general equations of motion, and to Walras, and his general theory of economic equilibrium, Winiarski gives the following synopsis of his teaching, over the previous six-years, of the application of mechanics and thermodynamics in the social science: [4]

> "Having furnished the equations of social equilibrium, we have laid the foundations for social mechanics—on its static side—on the principle of Lagrange, that of least effort or greatest energy, i.e. on the principle that serves as the basis of cosmic mechanics. Passing to the dynamic side of the problem, we have given a definition of socio-biologic energy in the two following forms: Potential (hunger and love) and kinetic (economic, political, juridical, moral, esthetic, religious, and scientific). This led us to the application of the

> principles of thermodynamics, the third of which, that of Clausius, explains at the same time the gradual spiritualization of every closed social aggregate and the lowering of its potential. It is the dissipation of the entropy which takes place in the social world as in the physical world."

Winiarski noted further that their researchers in social mechanics were published in the *Revue Philosophique* (March, 1898) under the title: "Essai sur la mechique sociale" ("Essay on Social Mechanics"), which consisted of three parts: [5]

> (a) Equilibrium and social economics (L'equilibre economieque et social)
> (b) The transformations of social energy (Les transformations of de l'energie sociale)
> (c) Social dynamics (La dynamique sociale)

The second part referring to "transformations" would seem to indicate that Winiarski was utilizing Clausius' logic of equivalence values of uncompensated transformations (transformation-equivalents), an early variation type of description of entropy.

The above quotation, to note, indicates that Winiarski had a well-advanced mind on the subject of human thermodynamics, more so than most modern researches on the same topic at present.

Aesthetic / biological / social energy

> *See main: Aesthetic energy*

Winiarski seems to have had views on the relationships between aesthetics, energy, and equilibrium points in life, as published in his 36-page 1899 article "Aesthetic Equilibrium". [14] Winiarski argued that beauty, in respect to those nervous system movements that result in attraction movements, is a function of "aesthetic energy", i.e. the energy correspondent to movements towards objects of beauty, and to "biological energy". To cite an example, Winiarski affirmed that: [9]

> "The prices of commodities represent nothing but the various conversion coefficients of biological energy: gold is therefore the general social equivalent, the pure personification and incarnation of socio-biological energy."

In a sense, movements, such as the making of arms, dwellings, ornaments, sculpture, painting, music, or architecture, etc., as they connect to the possessions of strength, objects of wealth, or the development of skills in the arts or sciences, actuate such that the individual or race who wishes to attain a higher position in the class structure does so according to the intensity or duration of the pleasure given from the process. In an 1899 review of Winiarski's work, an F. M. Winger states, according to Winiarski's theory: [6]

> "Periods of maximum pleasure are followed and preceded by a period of equilibrium, and just so much pleasure results as there has been energy expended."

In a modern sense, it would seem that this period of maximum pleasure would correspond to the heightened energy state (activation energy) in the range of the transition state of reactants going to products, between two lower saddle points of minimal free energy (thermodynamic equilibrium).

Objections

In 1911, in commentary on Winiarski's view that "selfishness and altruism are both manifestations of elementary biological energy as attraction and repulsion are of cosmic energy; biological energy is directed into each individual and

each group of individuals by the tendency to maximize pleasure and happiness", American sociologist Luther Lee Bernard comments that: [15]

> "**Winiarski** has gone to the metaphysically ridiculous in attempting to establish an identity between biologic energy and feeling consciousness, thus reducing 'egoism' and 'altruism' to actual social forces, akin to the physical forces, which will enable us to formulate an exact science of sociology."

In 1954, Leslie White, in his "The Energy Theory of Cultural Development", gave the following semi-down playing statement: [24]

> "**Leon Winiarski**, a European sociologist, treated human societies in terms of energy. He discusses social systems in terms of the first and second laws of thermodynamics, and uses differential equations to describe certain social processes. But for all this, he seems merely to present social systems as analogous to physical systems, to describe them in the language of physics, rather than to apply physical concepts to gain new insights and understandings of socio-cultural systems."

In 1991, Juan Martinez-Alier cites White's popular quote (above), and describes Winiarski as having absurd views, as follows: [25]

> "Discussions about energy and the economy have included two mistaken views. One mistaken view is the 'energy theory of value' (Punti, 1988). Another mistaken view is based on the isomorphism between the equations of mechanics and the equations of economic equilibrium of neoclassical economics after 1870. It was believed that in economic exchange there is an exchange of psychic energy. **Winiarski**, at the turn of the century, was a spokesman for this absurd view."

(add)

Quotes | On

The following are quotes on Winiarski:

> "Georgescu-Rogen, in his *Entropy Law and the Economic Process* (pg. 283), points out that 'there have been sporadic suggestions that all economic value can be reduced to a common denominator of low entropy' and mentions Helm (1887) and **Winiarski** (1900)."
>
> — Richard Adams (1988), *The Eight Day* (pg. 94)

Quotes | By

The following are noted quotes by Winiarski:

> "The energy of **social** transformation is submitted to the same laws as the energy of the universe. These are the laws of **thermodynamics**. We can thus represent a primitive horde, as a material system in movement, the driving forces that cause the movement being hunger and love or attraction. Similar to how a cannonball meeting an obstacle transforms the energy contained in its mass movement into internal heat, energy of light, electricity, etc., so to do the members of the movement of the crude social mass transform when meeting barriers from the natural surroundings and other tribes, represented by economic, political, legal, moral, aesthetic, religious, and intellectual needs. There is transformation of the energy of the mass social

movement in internal energies, psychologies, but there is no gain or loss of energy. Moreover this transformation is continuous across social system. Just as any movement of any mass of the universe is accompanied by production of heat, so to are the masses of biology and society transformed into mental phenomena of different kinds. Here we can apply the first principle of thermodynamics: that of the equivalence (the principle of Mayer)."

— Leon Winiarski (1898), "Essay on Social Mechanics: Social Energy and its Measurements." [28]

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External links

â— Leon Winiarski – Wikipedia.
â— Leon Winiarski – Encyclopedia WIEM (Polish → English translate)

θΔics

In existographies, **Leonardo da Vinci** (1452-1519) (IQ:200|#6) (Cattell 1000:86) [RGM:1|1,500+] (Murray 4000:3|T / 4|WA) (Gottlieb 1000:9) [GEE] [LPKE] [uberman] (RE:67) (RMS:13) (EP:4) [CR:194] was an Italian artist, technologist, general polymath, universal genius, physicist, lay astronomer, and general philosopher, noted for his 1487 Vitruvian man, a geometrical model of the ideal human; for his 1494 classification of perpetual motion as impossible, based on the principle that "for every action there is an equal and opposite reaction", otherwise known as Newton's third law of motion; for his discarding of Galen's innate heat (or animal heat) model of the heart; for his rejection of Biblical flood myth (see: Noah's flood); for his view that an animal was a machine functioning according to the laws of mathematics; for his views on liberty and freedom vs tyranny; among other subjects of interest.

Vacuum

Da Vinci read all of Hero's work, who believed in vacuums, or at least "partial vacuums"; the following evidences this:

> "Leonardo's comparison of the elements is made explicit in the text where he mentions Heron of Alexandria's steam-driven rotating ball, the Eolipile, as a demonstration of applied pressure created by the heat."
>
> — Michael Desmond (2000), *Leonardo da Vinci: the Codex Leicester: Notebook of a Genius* (pg. 116)

The following are statements by da Vinci on vacuums:

> "When air [steam] is condensed into rain ***it will*** produce a **vacuum**, if the rest of the air does not prevent this by filling its place, as it does with a violent rush; and this is the wind which rises in the summer time, accompanied by heavy rain."
>
> — Leonardo da Vinci (1505), "Of Rainbows and Rain" (#480); MS E (back cover); Reti (1969) translation [21]

> "The motion of the air is seen by the motion of the dust thrown up by the horse's running and this motion is as swift in again filling up the **'vacuum' left** in the air which enclosed the horse, as he is rapid in passing away the air."
>
> — Leonardo da Vinci (c.1505), *The Literary Works* (pg. 304)

> "And if you want to convince yourself that water is not drawn up by fire, make a hole in the vessel *m* at point *p*, and you will see that the water will not leave its place."
>
> — Leonardo da Vinci (c.1505), *Codex Leicester* (O)

On this last quote, some have commented:

> "Despite this deviation, **he accurately describes that a 'vacuum' effect**, not heat, **draws the water up**. He applies the specific result of the experiment to the real world, arguing that in an open system, with the necessary hole on the side of the mountain as an outlet for water, the application of heat from above would not draw water up but air in."
>
> — Author (1996), *Codex Leicester: a Masterpiece of Science* (pg. 56); cited by Michael Desmond (2000) in: *Leonardo da Vinci: the Codex Leicester: Notebook of a Genius* (pg. 44)

(add)

Life

The following are quotes on da Vinci's views about life:

> "Motion is the cause of all life."
>
> — Leonardo da Vinci (c.1500), "Philosophical Maxim" (#1139) [20]

> "Where there is life there is heat, and where vital heat is, there is movement of vapor."
>
> — Leonardo da Vinci (c.1500), "On the Nature of Water" (#941) [20]

(add)

Steam | Volume change experiments

In c.1505, da Vinci conducted an experiment to determine the amount of volume increase when water turns to vapor; the following, supposedly, is a sketch of the device he used to solve this problem: [19]

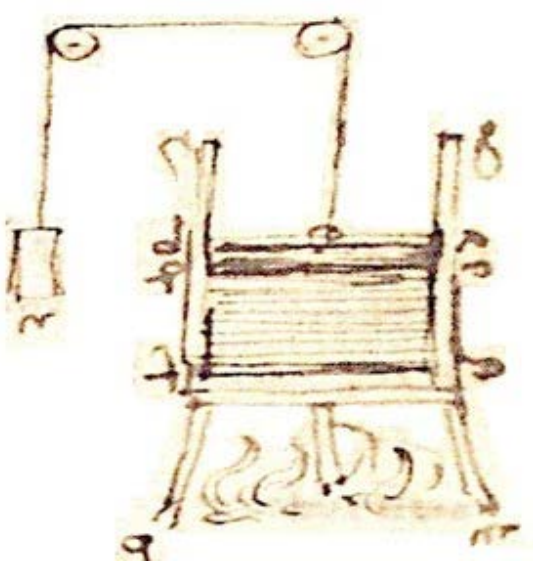

While difficult to say just what this device is; the following seem to pointing to what this is:

> "In 1504, da Vinci sketched a machine using steam, and this survives in his Codex Leicester (later renamed the Codex Hammer and now owned by Bill Gates). His design involved **steam from a metal receptacle to power a pulley**, but there is no indication whether or not he put this idea into practice, or even manufactured the machines that he drew."
>
> — Kenneth Henderson (2014), *Encyclopedia of the Industrial Revolution in World History, Volume Three* (pg. 903)

> "To our greatest surprise, all the famous 'theorems' of Salomon de Caus, which made him one of the founding fathers of the conquest of steam power, had been clearly enunciated by Leonardo, as shown in my cited publication. Leonardo da Vinci attempted to determine the volume of steam obtainable by evaporating a given amount of water, long before Della Porta (1606), as can be seen in the familiar folio 10r of the Codex

Leicester. Less known in the same Codex (fol. 15r) is Leonardo's description of other analogous experiments, revealing an amazing knowledge of the relation existing between volume, temperature, and pressure of vapors and gases. His approximate estimation of the quantity of steam evolved by the evaporation of an ounce of water points to the ratio 1:1,500. J.B. Besson, in his 1569 *L' Art et la Science de Trouver les Eaux*, still believed that the proportion was 1:10, a ratio raised to 1:255 in the famous experiments of Jean Rey. It was not until 1683 that a better estimate 1:2,000 was made by Samuel Moreland, the correct figure being around 1:1,700."

— Ladislao Reti (1969), "Leonardo da Vinci the Technologist: the Problem of Prime Movers" (pg. #)

(add)

Automatons

In c.1500, da Vinci, in his notebooks, according to Graham Short (2004), was aware of the metal tree with singing birds automaton, made by Guillaume Boucher (1346), for one of the gardens of Genghis Khan or his grandson (O); and in his 1502 to 1503 draft notes for his plans for a garden, likely while in service of Cesare Borgia, he wrote that he know how to make all manner of mills for making music and how to create the means for producing the songs of birds. [18] This indicates that da Vinci had read Hero's *Pneumatics* (50AD).

Love

In c.1490, da Vinci made the following pictograph (O), drawn in the margins of a draft architectural plan (O), on a question of love (top quote), below which he supplies the answer (bottom quote); read right to left:

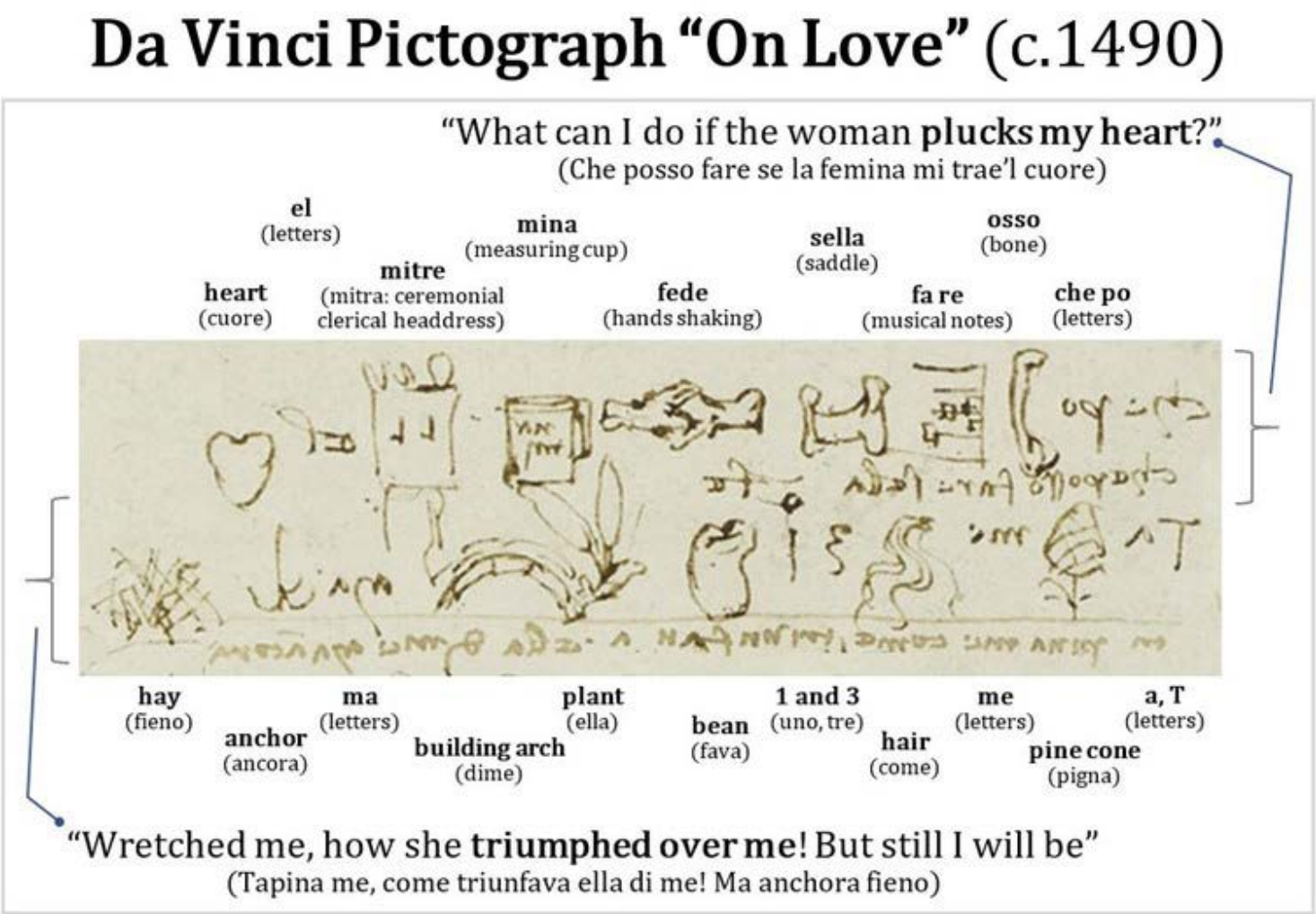

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Heat engine

See main: Da Vinci engine

In 1508, da Vinci, in his folio 16v of MS F, sketched a heat engine, shown below:

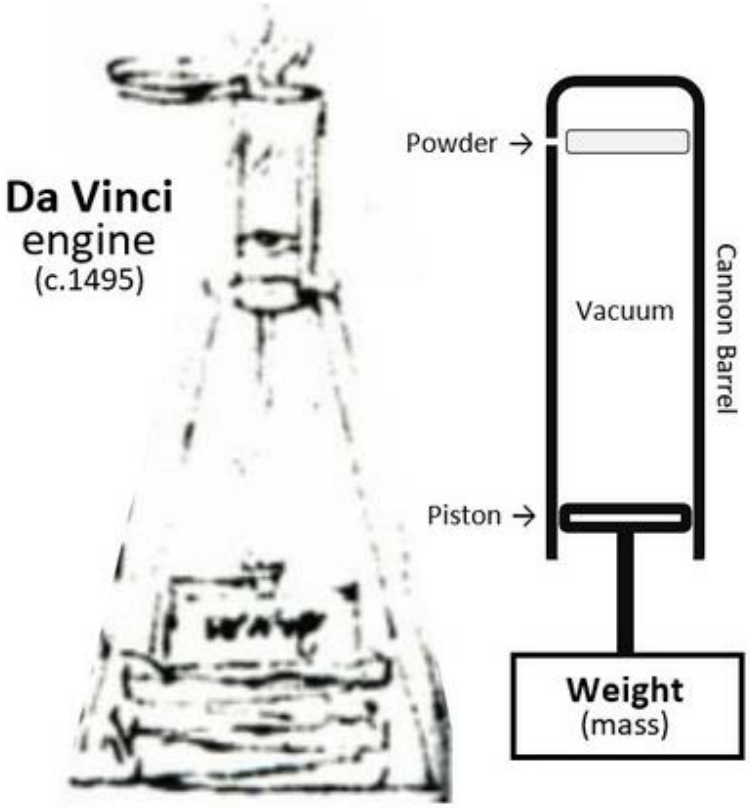

described as follows:

> "A mechanism to lift heavy weights. To lift a heavy weight with fire, like a cupping glass. And the vessel should be one braccio [about 2 feet] wide and ten long, and should be strong. It should be lit from below like a bombard (O) and the touchhole rapidly and immediately closed on top. The bottom, that has a very strong leather, like a bellow, will rise and this is the way to lift any heavy weight."
>
> — Leonardo da Vinci (1508), "note on device to lift heavy weight with fire", Folio 16v of MS F [17]

This, supposedly, anticipated the later gunpowder engines of Christiaan Huygens, Jean Hautefeuille, and Denis Papin; one comment on this is as follows:

> "The only detail that differentiates Leonardo's machine from those of Huygens and Papin is the system adopted for raising the weight sustained by the piston. Huygens and Papin use a pulley and rope transmission (the same that Leonardo adopted in his experiments with steam), while Leonardo preferred to attach a rod to the bottom of the piston."
>
> — Ladislao Reti (1969), "Leonardo da Vinci the Technologist: the Problem of Prime Movers" [17]

(add)

Soul

In c.1500, Da Vinci, in his anatomical notes on child birth, specifically “Quaderni d’ Anatomia III, 3 and 8 verso”, stated the following: [14]

> “I reveal to me the origin of their second – first or perhaps second – cause of existence. Though these figures will be shown the cause of many dangers of ulcers and diseases. Division of the spiritual from the material parts. And how the child breathes and how it is nourished through the umbilical cord; and why **one soul governs two bodies**, as when one sees that the mother desires a certain food and the child bears the mark of it. And why the child [born] at eight months does not live. Here Avicenna contends that the soul gives birth to the body and every member, but **he is in error**. In the case of this child the heart does not beat and it does not breath because it lies continually in water. And if it were to breathe it would be drowned, and breathing is not necessary to it because it receives life and is nourished from the life and food of the mother. And this food nourished such creature in just the same way as it does the other parts of the mother, namely the hands, feet and other members. And a single soul governs these two bodies, and the desires and fears and pains are common to this creature as to all the other animated members. And from this it proceeds that a thing desired by the mother is often found engraved upon those parts of the child which the mother keeps in herself at the time of such desire; and a sudden fear kills both mother and child. We conclude therefore that a single soul governs the bodies and nourishes the two [bodies].”

At another time, in his physiology notes, he says the following:

> “The soul seems to reside in the judgment, and the judgment would seem to be seated in that part where all the senses meet; and this is called the ‘common sense’ and is not all-pervading throughout the body as many have thought. Rather it is entirely in one part. Because, if it were all-pervading and the same in every part, there would have been no need to make the instruments of the senses meet in one center and in one single spot; on the contrary it would have sufficed that the eye should fulfil the function of its sensation on its surface only and not transmit the image of the things seen, to the sense, by means of the optic nerves, so that the soul—for the reason given above—may perceive it in the surface of the eye. In the same way as to the sense of hearing , it would have sufficed if the voice had merely sounded in the porous cavity of the indurated portion of the temporal bone which lies within the ear, without making any farther transit from this bone to the common sense, where the voice confers with and discourses to the common judgment. The sense of smell, again, is compelled by necessity to refer itself to that same judgment. Feeling passes through the perforated cords and is conveyed to this common sense. These cords diverge with infinite ramifications into the skin which encloses the members of the body and the viscera. The perforated cords convey volition and sensation to the subordinate limbs. These cords and the nerves direct the motions of the muscles and sinews, between which they are placed; these obey, and this obedience takes effect by reducing their thickness; for in swelling, their length is reduced, and the nerves shrink which are interwoven among the particles of the limbs; being extended to the tips of the fingers, hey transmit to the sense the object which they touch. The nerves with their muscles obey the tendons as soldiers obey the officers, and the tendons obey the common [central] sense as the officers obey the general. Thus, the joint of the bones obeys the never, and the never the muscle, and the muscle the tendon and the tendon the common sense. And the **common sense is the seat of the soul**, and memory is its ammunition, and the impressiblity is its referendary since the sense waits on the soul and not the soul on the sense. And where the sense that ministers to the soul is not at the service of the soul, all the functions of that sense are also wanting in that man’s life, as it is seen in those born mute and blind.”
>
> — Leonardo da Vinci (c.1500), “How the Five Senses are the Ministers of the Soul” (#838) [20]

(add)

Other

Da Vinci, among other things, as summarized by Leonard Shlain, was not only opinionated on the blue sky problem, but had experimentally deduced a wave theory of light; the phenomenon of wave intersection; along with a semi-conception of a heliocentric cosmology, as evidenced by statements such as: [11]

> "The sun does not move."
>
> "The earth is but a speck in the universe."

He also had the invention of the telescope in mind, in his mental note jotting "make glasses to see the moon enlarged". He also invented the first contact lens, specifically by putting a man's head in a round fish bowl, filled with water, and therein noting that the man was able to see better.

Physics | Laws of motion

In 1490, Da Vinci, in his notebooks, moved from simply describing inventions to a more intense search for underlying principles, the laws of motion, in particular. In respect to what Newton would later categorized, in 1687, as the first law of motion, Da Vinci wrote: [11]

> "Nothing whatever can be moved by itself, but its motion is effected through another. There is no other force."
>
> "All movement tends to maintenance, or rather that all moved bodies continue to move along as the impression of the force of their motors (original impulse) remains in them."

A 2013 art piece (O) shown Goethe's *Elective Affinities* in upside down mirror writing, as used by Da Vinci; possibly symbolic of multiple layers of secret coding, messages, and meaning Goethe claimed to have hidden in his novel.

In 1494, Da Vinci, in his notebooks (e.g. Codex Arundel, f. 44v), penned next to his designs (shown below), penned something about how he arrived at conclusion of the impossibility of perpetual motion, supposedly, foreshadowing Newton's third law in some way. [12] The following statement, by Da Vinci, according to Leonard Shlain, is said to express the idea or essential principle behind the third law: [11]

> "See how the wings, striking the air, sustain the heavy eagle in the thin air on high. As much force is exerted by the object against the air as the air against the object."

The following is another quote on the topic of force:

> "Forces arise from the dearth or abundance; it is the child of physical motion, and the grand-child of spiritual motion, and the mother and origin of gravity. Gravity is limited to the elements of water and earth; but this force is unlimited, and by it infinite worlds might be moved if instruments could be made by which the force could be generated. Force, with physical motion, and gravity, with resistance are the four external powers on which all actions of mortals depend. Force has its origin in spiritual motion; and this motion, flowing through the limbs of sentient animals, enlarges their muscles. Being enlarged by this current the muscles are shrunk I length and contract the tendons which are connected with them, and this is the cause of the force of the limbs in man. The quality and quantity of the force of a man are able to give birth to other forces, which will be proportionally greater as the motions produced by them last longer."
>
> — Leonardo da Vinci (c.1500), "Earth as a Planet" (#859) [20]

(add)

Associations

In 1500, Da Vinci, then forty-eight, engaged in competition with Michelangelo, then twenty-five, who four years early had just finished his statue of *David*, and also began to find competition with Raphael, then aged 17. Michelangelo, supposedly, intensely disliked Da Vinci, being that Da Vinci derided sculpting as a lesser art.

In 1502, Da Vinci met and formed a lasting relationship with Niccolo Machiavelli. [11]

Collected works

In 1519, at the reaction end of Leonardo da Vinci, his manuscripts passed to Francisco Melzi, from which the first two main synopsis publications of which were done by Gerolamo Cardano. [16]

Conservative estimates indicate that da Vinci archives, housed around the world, hold in excess of 4,000 pieces of papers, many loosely collected into "notebooks" or "manuscripts". [14]

Da Vinci, according to Leonard Shlain (2009), penned over 5,000-pages of writing in the form of unpublished manuscripts, mostly written in Italian (though he did attempt to learn Latin in his 40s); never once actually publishing anything; the only cohesive "book" he attempted to assemble was his *Treatise on Painting*. [11] More robust estimate, according to the British Library, indicates that Da Vinci's surviving manuscripts consist of some 7,000 pages of notes and drawings, bound and unbound: about half of what is believed to have existed at the time of his death (reaction end); they are the most important sources for understanding Leonardo's work as a natural philosopher, engineer, and (in addition to his finished paintings), an artist. [13]

Steam engines

Da Vinci drew out a design for a steam driven cannon. [6] Specifically, in the late 15th century, he designed a steam-powered cannon called the Architonnere which works by the sudden influx of hot water into a sealed red hot cannon. [7] A description of the design is found in the papers of da Vinci, although he attributes its invention to Archimedes in the 3rd century BC. [8]

Perpetual motion

At some point da Vinci investigated perpetual motion devices; the following are some of his sketches and notes, text written in his characteristic personal note coded mirror writing (O) format, shown adjacent, next to which he, supposedly, wrote “for every action there is an opposite and equal reaction”, implying something to the effect of the conclusion that the machines will not work, which of course is the famous third law of motion, of the laws of motion, formulated by Isaac Newton two centuries later. (O)

> “In whatever system where the weight attached to the wheel should be the cause of motion of the wheel, without any doubt the center of the gravity of the weight will stop beneath the center of its axle. No instrument devised by human ingenuity, which turns with its wheel, can remedy this effect. Oh, speculators about perpetual motion, how many vain chimeras have you created in the like quest. Go and take you place with the seekers after gold.”
>
> — Leonardo da Vinci (1494) [10]

(add)

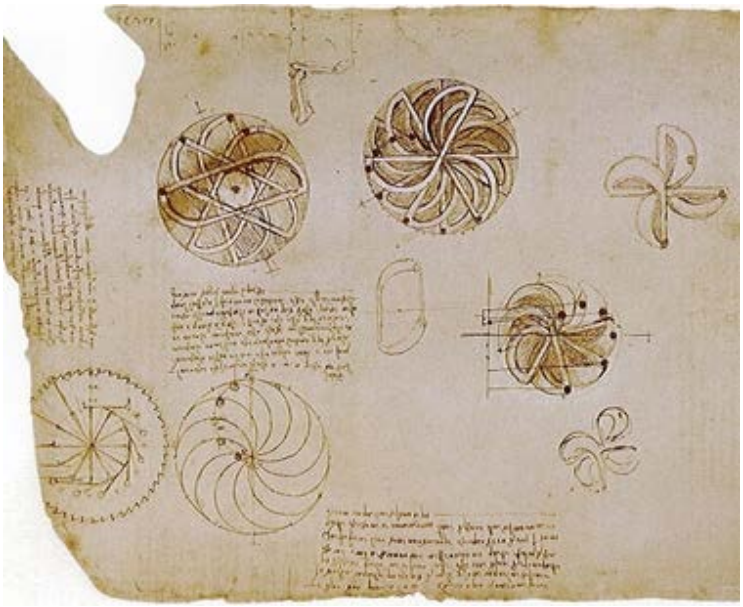

Some of Da Vinci's drawings and notes on perpetual motion, in which he wrote "for every action there is an opposite and equal reaction", implying something to the effect of the conclusion that the machines will not work, which of course is the famous third law of motion, of the laws of motion, formulated by Isaac Newton two centuries later. [12]

Animal machine

The following are da Vinci's views on what a bird is:

> "A bird is a **machine** functioning in accordance with the laws of mathematics, an instrument that man can reproduce with all its motions."
>
> — Leonardo da Vinci (c.1500), *Machine for Flying* [9]

(add)

Animal heat

Da Vinci seems to have been the first of note to discard the innate heat or animal heat model of the heart as had been espoused previously for centuries by Galen back to pre-Hippocratic times along lines that heat was a kind of spiritual energy originating in the left ventricle. Unsatisfied with this view, Da Vinci viewed heat as existing but asserted that it is due to the friction of the blood swirling through the organ's valves and chambers, in what might be one of the first precursors to what would later become the mechanical theory of heat. In support of his view, Da Vinci pointed out that the heart beats faster when a patient has a fever. [4]

Da Vinci is said to have recognized, firstly, that fire consumed air (although this may be contentious mis-attribution) and, secondly, that animals could not live in the variety of air that could not support the flame. [5]

Religion

Da Vinci, supposedly, rejected the notion that the Biblical flood was responsible for depositing fossils many miles from their origin and deduced the existence of very long spans of geological time. (Q)

Vitruvian man Other

See main: Human molecule

In 1487, da Vinci penned his now-iconic so-called Vitruvian man, shown adjacent, an ideal human conceived modeled on a geometrical theory of universal structure. [1]

The artwork and theory behind the concept of a Vitruvian man was discussed in the opening chapter to American chemical engineer Libb Thims' 2008 book *The Human Molecule*, shown adjacent; a cover-design which inspired

the second edition cover-redesigned printing of American writer John Hodgson's 2010 book *Molecules Humans*.

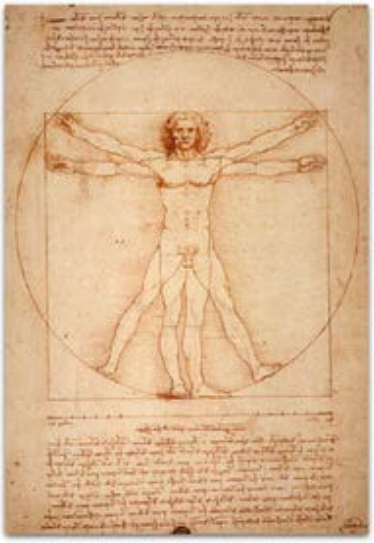

Left: Original circa 1487 drawing of the **Vitruvian man** by Da Vinci, with theoretical description of man as being a tiny geometrical universe. Right: 2008 depiction of Da Vinci's Vitruvian man defined as a 26-element molecule as shown on the cover of the book *The Human Molecule* by American chemical engineer Libb Thims. [2] A similar 2010 cover design for the book retitled as *Molecules Humans*, inspired by Thims' design, was done by John Hodgson. [3]

Contact lens

In 1508, Da Vinci invented the first conceptual model for the contact lens, firstly by doing an experiment in which he filled a bowl with water, then placed a man's face into it. It is said that for the first time the individual was able to see clearly. Secondly, he made a contact lens with a funnel on one side so that water could be poured into it. Ideas for which he made diagrams of. (Q)

Family

Leonardo was born on 15 Apr 1452 at the 'third hour of the night' in the Tuscan hill town of Vinci, in the lower valley of the Arno River in the territory of Florence. He was the illegitimate son of Messer Piero Fruosino di Antonio da Vinci, a Florentine notary, and Caterina, a peasant who may have been a slave from the Middle East. Leonardo had no surname in the modern sense, 'da Vinci' simply meaning 'of Vinci': his full birth name was "Leonardo di ser Piero da Vinci", meaning 'Leonardo, son of (Mes)ser Piero from Vinci'. Little is known about Leonardo's early life. He spent his first five years in the hamlet of Anchiano, then lived in the household of his father, grandparents and uncle, Francesco, in the small town of Vinci. His father had married a sixteen-year-old girl named Albiera, who loved Leonardo but died young. (Q) When his father died (de-existed), Leonardo wrote the following:

> "On Wednesday at the 7th hour Se Piero da Vinci died, on the 9th day of July 1504."
>
> — Leonardo da Vinci (1504), note on the passing of his father

His mother Caterina had died (de-existed) several years previous; her passing going unremarked by Leonardo. Da Vinci, at some point, had learned that his father, in 1492, had made a will that left nothing for him, but instead left all his money and possessions to his eleven legitimate children. When Leonardo visited Francesco, his uncle, in Aug 1504, he found that Francesco had changed his will, leaving all his money to Leonardo, and none to the eleven legitimate children. (Q)

Education

The following is a quote on the early education of da Vinci:

> "His father, a well-to-do notary of Florence, gave him his name and his initial education in art under Andrea Verrochio. The youth was soon better than his teacher. His left-handedness, so complete that he wrote backwards, produced the mirror writing which is deplored today as an obstacle to the intellectual progress of children. It interfered not at all with the effectiveness of **Leonardo**; in fact. it may have helped. Sketches along the margins of his writing indicate that his hand was free to do as he wished while his mind worked on something else."

— Richard Kirby (1956), *History of Engineering* (pg. 124)

Quotes | On

The following are quotes on da Vinci:

"**Leonardo** deserves fame in the profession rather less as practicing engineer than as prophet of engineering's future. Besides his machine guns, breech-loading cannon, tanks, a submarine, and a flying machine, Leonardo's sketches included lathes, pumps, cranes, jacks, water wheels, a canal lock, drawbridges, wheelbarrows, a diver's helmet with air hose, roller bearings, a self-propelled carriage, a double-decked city street, sprocket chains, an automatic printing press, a universal joint, a helicopter, and a wooden truss bridge. There were a great many more devices as varied and ingenious. His ideas are recorded on more than five thousand sheets of drawings and notes. But these were scattered over Europe in private collections and libraries beyond the reach of practicing engineers and were not published for centuries after his death. In recent years efforts have been made to gather and publish them."

— Richard Kirby (1956), *History of Engineering* (pgs. 124-25)

"Da Vinci wrote 5,000 pages on mechanics, flight, and machines."

— William Leith (1966), *Resources for Man* (pg. 140)

"I'm really surprised! From what I know of the three personalities. I do not understand how you can compare **Leonardo da Vinci** with Goethe or Einstein. Da Vinci had an IQ of 260, he is far from the other two."

— Cecilia Araugo (2017), "Email to Libb Thims", Apr 19.

Quotes | By

The following are noted da Vinci quotes:

"The desire to know is natural to good men."

— Leonardo da Vinci (c.1490) [11]

"It is a good plan every now and then to go away and have a little relaxation; for then when you come back to the work your judgment will be surer, since to remain constantly at work will cause you to lose the power of judgment."

— Leonardo da Vinci (c.1490), "On Judging Your Own Picture", Codex Ashburnham, Manuscript 2038 [14]

"It seems to me that those sciences which are not born of experience, the mother of all certainty, and which do not end in known experience—that is to say, those sciences whose origin or process or end does not pass through any one of the five senses—are vain and full of error."

— Leonardo da Vinci (c.1500), *A Treatise on Painting* (*Trattato della Pittura*) (pg. 33); cited by Lawrence Henderson (1938) in "Sociology 23" (pg. 78)

"Anyone who conducts an argument by appealing to authority is not using his intelligence; he is just using his memory."

— Leonardo da Vinci (c.1500)

"No human investigation can be called real science if it cannot be demonstrated mathematically."

— Leonardo da Vinci (c.1500)

"The noblest pleasure is the joy of understanding."

— Leonardo da Vinci (c.1500) [14]

"When besieged by ambitious tyrants I find a means of offense and defense in order to preserve the chief gift of nature, which is liberty. Death rather than loss of liberty. The goldfish bring spurge [a poisonous plant] to its young when they are imprisoned in a cage. It is better to die than to lose one's freedom."

— Leonardo da Vinci (c.1500) [11]

"Astrology is that deceptive opinion by means of which a living is made from fools."

— Leonardo da Vinci (1490) [11]

"Nothing strengthens authority so much as silence."

— Leonardo da Vinci (c.1500) (Q)

"The man who blames the supreme certainty of mathematics, feeds on confusion, and can never silence the contradictions of sophisticated sciences, which lead to an eternal quackery."

— Leonardo da Vinci (c.1500), *Literary Works, Volume Two* [15]

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(b) Reti, Ladislao. (1969). "Leonardo da Vinci the Technologist: the Problem of Prime Movers", in: *Leonardo's Legacy: and International Symposium* (editor: C.D. O'Malley) §4:67-100; quotes, pgs. 95-98). University of California Press.

Further reading

● Da Vinci, Leonardo. (1519). *The Literary Works of Leonardo da Vinci: Compiled and Edited from the Original Manuscripts, Volume One* (editor: Jean Paul) (vacuum, pg. 239-40). Publisher, 1883.
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External links

● Leonardo da Vinci – Wikipedia.

θΔics

In hmolscience, **Leong Ying** (c. 1960-) is a Asian-born American nuclear physicist noted, in literature thermodynamics, for his 2002 semi nonfictional "twin universes theory" about entropy and being, or something along these lines.

Overview

In 2002, Ying published an online semi-nonfiction idea called twin universes theory, an attempt to explain life, consciousness, dark matter, and cosmic expansion, second law, then in the form of a science fiction book *Klystar*, the latter of which incorporates Chinese principle of Yin-Yang with laws of thermodynamics to postulate the existence of a “single omnipotent consciousness” or god, bonded by a force akin to love, residing in the parallel universe. [1]

The book tells the story of a young man named Leo on his quest to discover his own origins and learn the truths of the universe. Ying's theory was originally conceived in 1995 in the context of the fictional sci-fi novel, but soon more of the theory began to emerge out of the writing, to which he now devotes more of his time to.

Ying’s theory, in theme, seems to be a cross between French philosopher Pierre Teilhard’s 1916 second law based omega point theory, American mathematician William Sidis’ 1920 entropy reversal theory, and American engineer Ronald Pearson's 1990 intelligent ether theory, possibly geared along the lines of Russian engineer Yevgeny Zamyatin's futuristic 1920 thermodynamics-based novel *We*. The following is the structural overview to Ying’s theory: [2]

Laws of the Total Universe	
First law of thermodynamics	Energy of the universe is conserved.
Second law of thermodynamics	Entropy of the universe is conserved.
Law of Ying Yang	There is a natural order in the universe acting as the foundation of all things, the mother of all change, and the root of life and death; whereby in healing, one must grasp the view that the root of disharmony is subject to the actions of Yin and Yang.

Postulates of the Total Universe	
First postulate	The total universe is composed of two symmetric systems, a positive universe and a negative universe. Both universal systems occupy the same space-time.
Second postulate	Energy can flow between both universe systems, but the total energy in the total universe is conserved: $$E_{total-universe} = E_{positive-universe} + E_{negative-universe}$$
Third postulate	Entropy can flow between both universal systems, but the total entropy in the universe is conserved: $$S_{total-universe} = S_{positive-universe} + S_{negative-universe}$$
Fourth postulate	Gravity dictates the direction of of entropy change (time).

Fifth postulate	Life on earth exists only in the positive universe.

Formulae of the Total Universe	
Energy	$E = Q + W$
Entropy	$S = \frac{Q}{T}$
Entropy (statistical)	$S = k \ln \Omega$ (where k is the Boltzmann constant and Ω is the number of microstates)
Positive entropy	$S = k \ln D$
Negative entropy	$S = k \ln \frac{1}{D}$ (where D is a measure of disorder and 1/D is a measure of order).

In the positive universe, according to Ying, which is where earth is, the original second law states that "for irreversible processes, the entropy of the enclosed system must increase, or put another way, all real processes move towards a state of maximum disorder." [2]

Religion

Ying is a former atheist, who up until circa 2003 considered himself to be an anti-religious as well as a "religious bigot" who viewed religious people as "losers who needed to get a life", but has since, in his mind, discovered a bridge between science and faith, viewing god as a “single omnipotent consciousness”. His 2007 book, according to reviews, presents a scientific proof of God in an easy to understand, powerful way for non-scientists.

Education

Ying completed his BS in physics in 1983 and PhD in nuclear physics in 1987 both at the University of Liverpool.

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2. Twin Universe Theory (overview) – TwinUniverse.org.

Videos

- Ying, Leong. (2010). “Twin Universes Love One God (1 of 2)” (V), Jan 24.

External links

- Leong Ying – LinkedIn.com.
- Klystar (Leong Ying) – Twitter.
- Leong Ying (Klystar) – Facebook.

θΔics

In existographies, **Leonhard Euler** (1707-1783) (IQ:195|#17) (Cattell 1000:512) [RGM:101|1,500+] (Murray 4000:16|CS / 1|M) (GME:1) (CR:103) was Swiss mathematician, a top-ranked greatest mathematician ever, noted for his his 1739 reciprocity relation (or Euler reciprocity relation), the mathematical proof behind state functions, in particular entropy.

Overview

Euler made advances in a number of areas, such as the invention of various mathematical relations, proofs, symbols, and operators used in thermodynamics, such as the function, i.e. *f(x)*, denoting the function f applied to the argument *x*, the imaginary number *i*, the natural log base *e* (such as used famously in S = k ln W), the summation operator ∑, among others, all introduced in years around circa 1755. His famous "Euler identity", shown below:

$$e^{i\pi} + 1 = 0$$

where *e* is the mathematical constant sometimes known as Euler's number and *i* is the square root of minus one, is widely considered the most beautiful equation in mathematics, and second greatest equation of all time, behind Maxwell's field equations, according to Robert Crease's 2004 *Physics World* “The Greatest Equations Ever” reader poll.

The interaction of Euler with his best known student Italian mathematician Joseph Lagrange, between 1754 and 1756, resulted in the Euler–Lagrange equations of variational calculus.

Thermodynamics

In mathematical thermodynamics, Euler is noted for his homogenous function, which supposedly is the mathematical form which relates an extensive property of a system to its component variables. [1]

His his reciprocity relation (or Euler reciprocity relation) is the mathematical proof behind state functions, in particular entropy.

Collected works | Publications

Euler’s collected works, according to Albert-Laszlo Barabasi (2002), began to be published in 1911 under the title *Opera Omnia* (Basel, Switzerland: Birkhauser Verlag AG, 1913), of which, more than six-dozen volumes have appeared, but the work is still completed. [6]

Euler’s collected works, according to another estimate, are said to total 60 to 80 quarto volumes. [2] Euler is considered the most prolific mathematician of all time, publishing close to 900 books. When he went blind in his late 50s, however, his productivity in many areas increased. [3]

Education

Euler, as a child, was given math lessons by Johann Bernoulli, who is said to have quickly discovered his new pupil's talent.

At some point along the way, Euler carefully analyzed the basic concepts and methods introduced by Rene Descartes, Isaac Newton, and Gottfried Leibniz. [5]

Euler would eventually complete his dissertation on the physics of sound under Bernoulli in 1726 at the Universität Basel, Switzerland. [4]

Students

See main: Euler genealogy

Euler had six students: [4]

Student	School	Descendents
Johann Euler		
Nicolaus Fuss	St. Petersburg Academy	
Johann Hennert	Königliche Akademie der Wissenschaften zu Berlin	3,958
Semen Kotelnikov	Universität Berlin	
Joseph Lagrange		60,026
Stepan Rumovsky	Universität Berlin	

as well as many indirect students of his work. A statement attributed to French physicist Pierre Laplace expresses Euler's influence on mathematics: "Read Euler, read Euler, he is our teacher in all things," which has also been translated as "Read Euler, read Euler, he is the master of us all."

Religion

A downfall of Euler, is that he often took recourse to the Bible to explain these things; as many were forced to do before the 1830s translation of the Rosetta stone.

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3. Bellos, Alex. (2010). "The 10 Best Mathematicians", *The Guardian*, Apr 10.
4. Leonhard Euler – Mathematics Genealogy Project.
5. Suisky, Dieter. (2008). *Euler as Physicist* (pg. 8). Springer.
6. Barabasi, Albert-Laszlo. (2003). *Linked: the New Science of Networks* (pg. 244). Basic Books.

Further reading

● Gladyshev, Georgi. (2007). "Leonhard Euler's Methods and Ideas Live in the Thermodynamic Hierarchical Theory of Biological Evolution." *International Journal of Applied Mathematics and Statistics*, Vol. 11, No. N07, Nov.
● Gladyshev, Georgi P. (2007). "Hierarchical Thermodynamics - General Theory of Existence: A Living World Development" (with photos), *Becthnk*, Vol. 1, pgs. 44-48, Herald of the International Academy of Sciences (Russian Section).

External links

● Leonhard Euler – Wikipedia.
● Leonhard Euler – ScienceWorld.Wolfram.com.

θΔics

In existographies, **Leonteus** (c.320-260BC) was a Greek Epicurean follower, noted for []

Quotes | On

The following are quotes on Leonteus:

> "Yet for a long time Epicurus used to call himself a Democritean, as is attested by many sources, particularly **Leonteus**, one of Epicurus' principal pupils, in a letter to Lycophron; he says that Democritus was held in honour by Epicurus for having anticipated him in getting hold of correct knowledge, and that his whole theory was called Democritean because he had anticipated him in coming upon the principles of nature. And Metrodorus says straight out in his *On Philosophy* that, if Democritus had not led the way, Epicurus would not have attained wisdom."
>
> — Plutarch (c.110AD), *Against Colotes* (3, 1108e-f) [1]

References

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External links

â— Leonteus of Lampsacus – Wikipedia.

θΔics

In existographies, **Leontion** (c.330-280BC), or “Leontium”, was a Greek philosopher, characterized as “Epicurus’ first female disciple” (Hecht, 2003) and or the "mistress of Epicurus" (Walsh, 1997), a well-known “hetaerae of the time” (Q), noted for []

Overview

In c.300BC, Leontion penned a treatise criticizing Theophrastus (Q), presumably, according to Patrick Walsh (1997), for the peripatetic doctrine of god as the unmoved mover. [3]

In 1850, Frances Wright (1795-1852) (Q), in her *A Few Days in Athens*, gave a discussion of Leontion and Epicurus, amid which she stated:

> “Surely the absurdity of all other doctrines of religion, and the iniquity of many, are sufficiently evident. To fear a being on account of his power is degrading; to fear him if he is good, ridiculous. I see no sufficient evidence of his existence; and to reason of its possibility I hold to be idle speculation.”

Wright, of note, has been put into the category, along with Robert Owen, of practical atheism. (Q)

Quotes | On

The following are quotes on Leontion:

> “**Leontium** was an insolent meretricula.”
>
> — Cicero (c.50BC) (Q)

> “Madame Clive-Hart's house was a rendezvous for atheists. Well for them had they been such atheists as Epicurus, **Leontium**, Lucretius, Memmius (Q), and Spinoza —the most upright man of Holland — or Hobbes, so faithful to his unfortunate king, Charles I.”
>
> — Voltaire (1776), *The Sage and the Atheist* [1]

References

1. (a) Wright, Frances. (1850). *A Few Days in Athens: the Translation of a Greek Manuscript Discovered in Herculaneum*. J.P. Mendum.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 385). HarperOne.
2. Voltaire. (1776). *The Sage and the Atheist: Including the Adventures of a Young Englishman* (pg. 123). Publisher. 1921.
3. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (pg. 167). Oxford University Press, 1998.

External links

- Leontion – Wikipedia.

θΔics

In hmolscience, **Leopoldo Alas** (1852-1901), pen name Clarín (1875-forward), was a Spanish realism novelist noted for []

Overview

In 1885, Alas in his realist novel *The Regent's Wife* (*La Regenta*), supposedly employs the metaphor of the body as a living heat engine (a heat engine that is alive) and the notion of the drive toward entropy.

In 1890, Alas, in his novel *His Only Son* (*Su Unico Hijo*), which supposedly was inspired by German polymath Johann Goethe's 1809 *Elective Affinities*, employed the notion of elective affinity (or human elective affinity?), the theme of renunciation, the preoccupation with a child's resemblance to the parents, and character parallels. [1] American physical organic chemist and literature chemistry historian Stephen Weininger gives his opinion that Alas' *His Only Son* is an "inspired successor" to Goethe's novella. [2]

References

1. (a) Larsen, Kevin S. (1994). "Hunger, Heat, and Humiliation: Aspects of the Alimentary Thermodynamics of *La Regenta*", *HisJ*, 15(1): 73-88.
(b) Larsen, Kevin S. (1990). "On the Paternity of Clarin's 'Second Novel' *Su Unico Higo* and Goethe's *Die Wahlverwandtschaften*", GRM, 40: 408-21.
2. Weininger, Stephen J. (2002). "Chemistry", in: *Encyclopedia of Literature and Science* (pg. 77-79), ed. Pamela Gossin, Greenwood Publishing Group.

External links

â— Leopoldo Alas – Wikipedia.

θΔics

In existographies, **Leslie White** (1900-1975) (CR:34) was an American anthropologist, described as a "cultural determinist" (Herrick, 1956), noted, in anthropological thermodynamics, for being the first to introduce the laws of thermodynamics into the study of anthropology or cultures. [1] White is known, to some, as known as “anthropology’s most significant prophet of the second law”.

Determinism | Cultural

In 1948, White, in his “Man’s Control Over Civilization: an Anthropocentric Illusion”, stated the following, which Judson Herrick (1956) classifies as cultural determinism: [11]

> “Man is wholly at the mercy of external forces, astronomic and geologic. Human beings are merely the instruments through which cultures express themselves.”

This “external forces” model, to note, is similar to the views of Einstein and his 1936 mysterious tune quote.

Overview

In 1943, White, in his “Energy and the Evolution of Culture”, opened to the following grand logic: [9]

> “Everything in the universe may be described in terms of energy, meaning ‘the capacity for doing work’. Galaxies, stars, molecules, and atoms may be regarded as organizations of energy. Living organisms may be looked upon as engines which operate by means of energy derived directly or indirectly from the sun. The civilizations, or cultures of mankind, also, may be regarded as a form or organization of energy.”

In 1949, in his *The Science of Culture*, stated the following: [5]

> “Everything—the cosmos, man, culture, may be described by matter and energy. The second law of thermodynamics tells us that the cosmos as a whole is breaking down structurally and running down dynamically; matter is becoming less organized and energy more uniformly diffused. But in a tiny sector of the cosmos, namely in living material systems, the direction of the cosmic process is reversed: Life becomes a building up process that must draw upon free energy in non-living systems, capture it, and put it to work in the maintenance of vital process. All life is a struggle for free energy. Biological evolution is a movement toward greater organization, greater differentiation of structure, increased specialization of function, higher levels of integration, and greater degrees of energy concentration.”

Curiously, in at this point in his writings he used the word thermodynamics three times discusses the second law, and free energy, but does not use the more elusive word entropy.

In 1959, White, in his *The Evolution of Culture*, employed the word thermodynamics thirteen times, defining culture as a “thermodynamic system”, and includes a chapter on “Energy and Tools”, referencing people such as Wilhelm Ostwald and Alfred Lotka, as well as concepts such as negative entropy, even using formulas. In short, here he attempted to create a theory explaining the entire history of humanity, where he outlined a theory that the measurement of energy consumption of a society is an indication of a society’s advancement.

White states, for instance, that one may think of the cultural process as being described the formula:

$$E \times T \rightarrow P$$

where *E* is energy and *T* is tool or technology that is producing *P* a quantity of human goods and services. In other cases, he gives the formulas:

$$E(HxN) \rightarrow P$$

where H and N are the human and nonhuman components of the energy factor; or even:

$$ExTxV \rightarrow P$$

where V refers the environmental factors involved. [6]

White's law

He is known for White's law, which states that: [3]

> "Culture evolves as the amount of energy harnessed per capita per year is increased, or as the efficiency of the instrumental means of putting the energy to work is increased."

In a modern sense, this law of White might be interpreted or translated as a statement of the conversion of photonic energy, stemming from the sun, into induced movement geospheric surface growth and evolution, as quantified by the combined law of thermodynamics, in terms of the mechanical equivalent of heat. [4]

Cultural systems

The following are notable quotes by white on his views of the cultural system, from his 1969 work: [7]

> "The primary function of culture is to harness and control energy so that it may be put in man's service. Culture thus confronts us as an elaborate thermodynamic mechanical system."

As found in his 1975 book *The Concept of Cultural Systems*: [8]

> "Cultural systems, like all material systems, are thermodynamic systems. Their existence and operation require energy. Every cultural event involves the expenditure of energy."

(add)

Influenced

A noted student of White was Richard Adams.

Quotes | By

The following are related quotes:

> "Human behavior is determined, therefore, but culture. But culture is not determined by man, by his wishes, wills, hopes, fears, etc. Everything in the cosmos can be interpreted in terms of matter and energy, whether

it be a star, atom, cell, or man."

— Leslie White (1949), *The Science of Culture* [10]

"In living systems, the direction of the cosmic process is reversed. It runs counter to the cosmic current."

— Leslie White (1949), *The Science of Culture* (pg. 367); cited by Richard Adams (1988) in *The Eighth Day* (pg. 59)

"No ape can appreciate the difference between holy water and distilled water, because there is none, chemically speaking."

— Leslie White (c.1950), oft-repeated dictum spoken to students at the University of Michigan; oft-referenced by his student Marshall Sahlins (2008) (Ñº)

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(c) Beekman, Christopher S. and Baden, William W. (2005). *Nonlinear Models for Archaeology and Anthropology*, (ch. 6: Modeling Prehistoric Maize Agriculture as a Dissipative Process, by William W. Baden, pgs. 95-122). Ashgate Publishing, Ltd.
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(b) Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (pg. xxv). AuthorHouse.
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9. White, Leslie. (1943). "Energy and the Evolution of Culture" (abs) (pdf), *American Anthropologist*, 45:335-56.
10. Herrick, Charles J. (1956). *The Evolution of Human Nature* (abs) (pg. 49). University of Texas Press.
11. (a) White, Leslie. (1948). "Man's Control Over Civilization: an Anthropocentric Illusion", *Scientific Monthly*, 66:235-47.
(b) Herrick, Charles J. (1956). *The Evolution of Human Nature* (abs) (pg. 49). University of Texas Press.

External links

â— Leslie White – Wikipedia.
â— Leslie A. White – NNDB.

θΔics

In science, **Leslie V. Woodcock** (c.1943-) (CR:5) is an English chemical thermodynamicist and chemistry historian noted for his 2005 publication on Joseph Priestley and phlogiston theory, and for his 2010 publication, with Stanley Sandler, on the history of the laws of thermodynamics. [1]

Education

Woodcock received his PhD in 1970 at the University of London. (Q) In 2005, he was a chemical thermodynamics professor at the University of Manchester, and chairmen of the Priestley Society (PriestleySociety.net). Presently, he is a professor emeritus.

Quotes

The following are related quotes:

> "What a great website! It's a fantastic summary of all the confusion. I am curious to know where your website is coming from. Who owns and funds it? Who is its intended readership?"
>
> — Leslie Woodcock (2010), commentary to Libb Thims on Hmolpedia; following query about his "Historical Observations on the Laws of Thermodynamics" article [3]

> "The theory of 'man-made climate change' is an unsubstantiated hypothesis. It's an industry that creates vast amounts of money for some people."
>
> — Leslie Woodcock (2014), commentary (Q) on the U.N.'s International Panel on Climate Change; note: similar views are expressed by Freeman Dyson (Q) [2]

References

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3. (a) Woodcock, Leslie. (2010). "Email to Libb Thims", Aug 9.
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External links

- Leslie Woodcock (faculty) – Manchester University.

θΔics

In famous publications, ***Lessons on Social Movement*** or *Leçons sur le Mouvement Social* is an 1899 book, dated to have been written in Nonac, France, completed on October 15, 1898, by French social-philosopher Maurice Hauriou in which social phenomenon are explained in terms of thermodynamic principles of Rudolf Clausius, Sadi Carnot, and Robert Mayer, using, it seems, the 1892 *Thermodynamics* textbook of French physicist Henri Poincare as a reference.

LEÇONS

SUR LE

MOUVEMENT SOCIAL

DONNÉES A TOULOUSE EN 1898

PAR

MAURICE HAURIOU

PARIS

LIBRAIRIE DE LA SOCIÉTÉ DU RECUEIL GÉNÉRAL DES LOIS ET DES ARRÊTS

Ancienne Maison L. LAROSE & FORCEL

L. LAROSE, Directeur de la Librairie

1899

Title page to French social philosopher Maurice Hauriou's 1899 book *Lessons on Social Movement.*

New science

The following excerpt seems to capture Hauriou's aim in that he is attempting to outline a new science: [1]

> "I intend to seek analogies between social movement with physical movements, therefore, to compare the mechanics of social science with thermodynamics. I owe you some explanations on this design. There is need to establish a **new science** if analogies and relations that unite science are already established. In doing so, the human mind obeys the feeling that he has the web link and continuity of natural phenomena at the same time, if using the similarities found it is possible to determine more accurately the specific content of the new science and to classify the essential elements, then they serve it as it touchstone of human theories."

A larger part of Hauriou's effort to establish this 'new science', which he leaves nameless, seems to be the aim to reconcile determinism and freedom in social movement under the guidelines of the universality of 'thermodynamics', a subject which, in Hauriou's view, can be used to explain the moral sciences or the "sciences of the conduct of social movements". A key guiding aspect of Hauriou's approach seems to be German physicist Rudolf Clausius' second main principle or the principle of increasing entropy, as Hauriou calls it, which he argues leads to a state of stasis in the social body or a static society.

Research

The following preface excerpt seems to capture Hauriou's research efforts in the development of his lesson on social movement:

> "It became necessary to study the thermodynamics. Not being a mathematician, I feared this study, but my learning was greatly facilitated by the work of Henri Poincare which I wish to pay tribute to the uninitiated, that he is not only accessible, but bright. Taken together the principles of thermodynamics seemed to confirm my views rather than the reverse, but it might perhaps not suffice to mention that I was not sufficiently reassured, but when I understood the importance of the principle of increasing entropy I felt like a shocked. Here was the reason for the doubling of energy in the form of movement and heat, the key opposition of the organic and the representative, the increase in entropy was a sign that it exists in the "conduct" of the universe, conduct that is carried out by application of the organic representative and it is manifested by the creation of static and the increase of law, it aims to free items. I ventured to see in thermodynamics 'the science of behavior of physical movements' and I made for the moral sciences or sciences of the conduct of social movements."

In short, according to Hauriou, thermodynamics, being the science of physical movements, can be used to develop a science of human behavior and social movements.

Book review

The following is a one-page 1900 book review by French sociologist Celestin Bougle: [2]

Pour concilier, par une théorie plus satisfaisante que celle de M. Fouillée ou de M. Bernés, les deux conceptious de la réalité sociale, —• celle qui la considère comme un produit du mécanisme, et celle qui y voit un produit de la liberté,—

M. H. a cherché des analogies directrices dans la mécanique rationnelle et la thermodynamique. Il y a un mouvement social « comparable au mouvement physique » ayant comme lui son espace, sa direction, sa mesure (Leç. I). Il y a un « potentiel social », constitué par la situation, les richesses les inventions, les traditions, capable de se transformer eu vitesse acquise et inversement (Leç. II). Enfin, et surtout, de môme que les phéuomèues d'ordre thermique « représentent » les mouvements physiques, les mouvements sociaux ont leur représentation, scientifique ou idéaliste, mécauiste ou non mécauiste (Leç. III.).

Par cette forme nouvelle de l'énergie, capable de se convertir eu mouvement et inversement (Leç. IV;, une solidarité nouvelle est constituée, qui est représentative et non plus seulement organique (Leç. V). Grâce à la réaction incessante de l'une sur l'autre, le mouvement social peut être « conduit », comme le prouve le principe de la dissipation de l'entropie, vers la création d'un « statique social, qui tend à concilier pratiquement le mécanisme et la liberté ».

Nous ne saurions suivre dans le détail tant d'assimilations hardies. Elles ont d'ailleurs donné lieu, dans les articles cités, à un débat sufiïsant. D'une manière générale, il nous est impossible de trouver que les rapprochements invoqués éclairent les objets rapprochés. Sommes-nous instruits sur la nature du fluide électrique qui opère dans le téléphone si on nous dit qu'il est « représentatif », et qu'il roule les formules d'ondulation en ondulation (p. 60j ?

Inversement, « que les alternances que l'on observe dans l'histoire des institutions sociales n'empêchent point les institutions de conserver la même individualité, le môme être, » cela s'explique-t il vraiment par la formule générale du principe de la conservation de l'énergie? Les métaphores orgauicistes ont longtemps égaré la sociologie : il ne semble pas qu'elle doive attendre beaucoup d'éclaircissements des métaphores rnécauistes.

To reconcile a more satisfactory theory than Fouillee or Mr. Bernes, both conceptious of social reality one that sees it as a product of the mechanism, and one that sees a product of freedom.

Hauriou's guidelines sought analogies in rational mechanics and thermodynamics. There is a social movement "comparable to the physical movement" with him as its space, its direction, its measure (Leç. I). There is a "social potential", constituted by the situation, the riches inventions, traditions, was able to turn momentum and vice versa (Leç. II). Finally, and most importantly, the same order of thermal phenomenon 'represent' physical movements, social movements have their representation, scientific or idealistic or not mécauiste mécauiste (Leç. III.).

Through this new form of energy that can be converted into motion and vice versa (Leç. IV, a new solidarity is formed, which is representative and not only Organic (Leç. V). With the reaction relentlessly one over the other, the social movement can be "led", as evidenced by the principle of dissipation of entropy, towards the creation of a "social static, which seeks to reconcile the almost mechanism and freedom".

We cannot follow in detail so bold assimilations. They have also resulted in the articles cited in a debate sufiïsant. Generally, it is impossible to find that invoked comparisons illuminate near objects. Are we educated about the nature of the electric fluid which operates the phone if we are told it is "representative", and it rolls formulas ripple ripple (p. 60J?

Conversely, " the vibrations that we observe in the history of social institutions do not prevent the institutions to retain the same individuality, the same being, "Does it really reflects the general formula of the principle of conservation energy? organistic metaphors have long lost sociology: it does not seem to await clarification of many metaphors rnécauistes.

English translation

No English translation, as yet, seems to exist. Shown below is the partial start of a straight French → English Google

translation of Hauriou's book.

(pgs. ii-vi)

Other books by Mr. Maurice Hauriou: Study on decentralization, ^ 8vo pamphlet, 1892 (Paul Smith) 2 fr. 50; The traditional social science, 1 volume in-8, 1896 (Larose editor) 7 Fr. 50; Precis of Administrative Law, a vol.in-8 ", 3eédi 'Lion, 1897 (Larose editor) 12 fr."

ON SOCIAL MOVEMENT

PARIS: LIBRARY OF THE SOCIETY OF GENERAL COLLECTION OF LAWS AND JUDGMENTS, BY JB FO.NDÉ S1REÏ, AND THE JOURNAL OF THE PALACE, Old House L. LA.ROSK & FORCKL, 22 IIK Soufflat 22, L. LAROSE, Director of the Library, 1899.

PREFACE

I just want to show the chain of ideas where I went because my starting point was the study of something very special and if I got a kind of general system of the world, is without have premeditated. I started to prepare lessons on the "power" material that has long attracted and, appropriately, to get benefit comparisons, I was armed with some information on the energy. The power can indeed be regarded as a kind of social energy of a mechanical nature. But no sooner had I set in my mind reconciling, I was struck more the difference between the two concepts, the power seemed to be some "representation" that men are the real energy that circulates throughout the social body and yet this represented presentation was itself a social energy. There was social energies "representative" social energies near real or organic.

At this point my thoughts, I joined at most Fouillee, because either idéesforces theory due to philosopher, from the design of the contracting agency, we can easily make out the opposition the organic social and representative office. But the way of energy comparisons where I had committed myself to train further. I wondered if there was not in the world other representative examples of energy and if the opposition of the organic and the representative could not be found in all things. Memories of the physical transformation of motion into heat energy and heat energy in motion [mechanical equivalent of heat] climbed back into my memory, it occurred to me that the heat and light could be a form of energy that is representative of the form of movement, and immediately I argued that the waves of light actually contain representations, I imagined that the mental representation of things there was a previous representation fluid, especially caloric things.

It became necessary to study the thermodynamics. Not being a mathematician, I feared this study, but she was greatly facilitated by the work of Henri Poincare which I wish to pay tribute to the uninitiated they are not only accessible, but bright. Taken together the principles of thermodynamics seemed to confirm my views rather than the reverse, but it might perhaps do not sufficiently reassured, but when I understood the porlée the principle of increasing entropy I felt like a shock. Here was the reason for the doubling of energy had the form

(pgs. vii-3)

movement and heat in the form, the key opposition of the organic and the representative, the increase in entropy was a sign that it exists in the universe "conduct" that conduct is carried out by application of the organic representative and it is manifested by the creation of static and the increase of law, it aims to free items. I ventured to see in thermodynamics "the science of behavior of physical movements" and I made for the moral sciences or sciences of the conduct of social movements.

I have no doubt these insights to my preconceptions lawyer because a lawyer does not deny that there is a line of social movement and it shall, in general, to attach great importance to the idea conduct. Shall I also, at the risk of compromising that very philosophical passages of the thermodynamics of H. Poincare seemed to be turned to my advantage?

Such is the genesis of the trilogy that I got: movement, motion representation, led the movement. Like all systematic construction, this one is probably too simple to be completely true. But I thought it contained enough truth to be given lessons in which the original program found himself strangely altered. I still hope she has enough to deserve that these lessons are published.

Mathematicians forgive me for having used a thermodynamic where mathematics are excluded. They will remember that the basic principles of this science, the Carnot-Clausius, like Mayer, are, above all, the truths of experience. They'll pardonnerontaussi to have, for the convenience desapplications social, diverted some expressions of their strictly scientific sense. They want good, moreover, refer to "notes and clarifications" I'm the main elements to the kindness of Mr. Camille Dauzère, licensed physical èsysciences.

Quantal sociologuesetauxjuristes, jelesprie discredit this doctrine on the social movement, if its truth appeared, would have certain advantages:

First, while confirming the legitimacy of organicism it shows the limits of this theory, it would take away the claim, accepted so lightly by so many people, to serve as a basis to direct the moral and right, it would restore the 'ethics on its true foundation is the idealist representative, that is to say, the ideal but this restaurant would operate retrospectively by scientific considerations and analogies that would only strengthen the traditional ideal of freedom and justice;

A second advantage of this doctrine is that the "representative office" to be distinct from the "organic office) • would still be objective; sociology avoid engaging in the deceptive way of subjectivism mind, everything would no body, but everything is objective, as befits the subject of a science;

Finally, there are three main directions in the sociology organismic direction, the direction in which representative Tarde has done such a great way to science with its laws of imitation and social logic, management ethics, the mental tendencies find the most diverse to meet.

Nonac, October 15, 1898.

ON SOCIAL MOVEMENT
LESSON: The social movement.

Summary. - Object Lessons: analogies to draw on rational mechanics and thermodynamics to support the theory that there were deficiencies in the social life of both the mechanism and freedom. - I. The social movement. - A. Distinction between social movement and the representation of the social movement. - B. The movement, energy, atoms, and the system of Hertz, the energy system, the system of central forces atomic. - G. Developments on the social movement: a) nature of this movement, 6) the mobile social state c) social space d) the direction and extent of the social movement, the value, the rating on the stock exchange, a kind of differential . - D. Applying the principles of social movement of inertia, relative movements of the equality of action and reaction.

I intend to seek analogies that this social movement with physical movements, therefore, to compare the mechanics of social science with thermodynamics. I owe you some explanations on this design. There is need to establish a "new science" by M. H. if analogies and relations that unite science are already established. In doing so, the human mind obeys the feeling that he has the web link and continuity of natural phenomena at the same time, the similarities found it possible to determine more accurately the specific content of the new science and to classify the essential elements, they serve it as it touchstone peoples theories.

Social science in its formative period, has not escaped the common law, the most important contributions she has received include, besides the theories suggested, analogies invoked. There is one direction in which, to my knowledge, there has not yet undertaken comparisons followed and yet where it is necessary that it should be established.

The social reality must be conceived as the product of the mechanism or the like freedom; sociologists can not escape the urgency of this issue that stirs the depths of all existence, but is especially exciting for the existence of a social thing.

They started by choosing one or the other point of view, by adopting it exclusively and draw analogies to support their claims. Those who leaned to the mechanism on social, found similarities in the side of biology, and these companies appeared to them comparable to living organisms. Those who opted instead for freedom, found similarities in the side of logic and law, labor agreements they seemed comparable to syllogistic reasoning, and ultimately legal contracts W.

(1) The major organismic sociological theorists of this century, Auguste Comte, Herbert Spencer, etc.. We found both

However, as these two theories asserted themselves, they felt, and this is precisely the advantage of magnification artificial analogies, if both contain an element of truth, neither one nor the other not shut up entirely. The companies appeared very similar in part to organizations, but partly also to syllogistic agreements or contracts. It was suspected that it was appropriate to combine the two theories, because in reality the mechanism and liberlé were amalgamated. This sentiment was again revealed in the well-known works, from that which Fouillee [Alfred Fouillée, *Contemporary Social Science*, 1880], in 1880, launched the idea of agency-company contract, until the most recent of Mr. Marcel Bernes [Marcel Bernes, *Sociology and Moral*, 180?] believed to explain the transition from freedom to the mechanism by successive consolidation becomes a reality.

It was then formed on the social reality a third theory, conciliatory first two. But the third theory, in turn, would need to undergo the test of scientific comparisons, analogies found the singularly fortified, at the same time, they provide guidance on the process used by the society to make the synthesis that is assumed between determinism and freedom. This is a full and critical bibliography in the book by René Worms, *Body and Society*, Paris, 1805. - The contractual theory is well known, the first theoreticians of international law and Rousseau. - As to the logical theory, which also does not refer so openly for freedom, I see as its main representative, in addition to logicians and philosophers, in his *Logic Tarde social*, passim, esp., P. 60 "a nation is a complicated syllogism, etc.. .

(pgs. 4-8)

(pgs. 5-9)

(pgs. 10-14)

(pgs. 15-19)

(pgs. 20-24)

(pgs. 25-29)

(etc.)

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θΔics

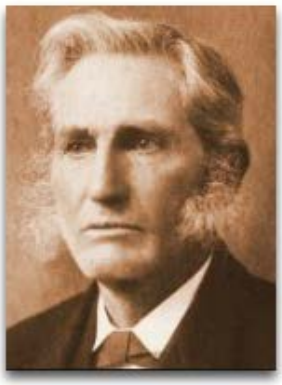

In existographies, **Lester Ward** (1841-1913) (SN:21) (CR:50) was an American paleobotanist-trained sociologist, labeled as the "father of American sociology" (Aho, 1975) and "American Aristotle" (Chugerman, 1939), noted, in hmolscience, for his prolonged effort to derive a physical science based sociology. The salient aspect of this effort is Ward's advocation of Polish economist Leon Winiarski's 1890s thermodynamics-based social mechanics theories, as being an essential aspect of the newly developing science of sociology. Ward, supposedly, did a certain amount of battle with Albion Small in regards to the shaping of early American sociology.

Ward's 1900 article "Social Mechanics" advocated most of the theory of Winiarski, in outlining the newly forming subject of social mechanics, which Ward says falls into two subdivisions: social statics, dealing with social forces and social equilibrium, and social dynamics, dealing with social progress and social transformation. [1] Ward, to note, does not mention thermodynamics at this point, as this seems to be his first introduction to this potential application in sociology. In any event, Winiarski, that year, comments that he finds consolation in Ward's adoption of his term 'social mechanics'. [2]

Sociology books

Between 1883 and 1913, Ward completed several important works, the first of which was his: *Dynamic Sociology* (1883), the first systematic sociological treatise written in the United States. [8]

This was followed by *Outlines of Sociology* (1898), *Pure Sociology* (1903), *A Text-Book of Sociology* (1905), and *Applied Sociology* (1906). His *Dynamic Sociology* was revolutionary, arguing that progress depended on a planned society led and controlled by a benevolent government, which provided universal education, freedom from poverty and happiness for all. In this work, Ward hopped to restore the central importance of experimentation and the scientific method to the field of sociology.

When *Dynamic Sociology* was first published, the only sociology course being taught in America was William Sumner's course at Yale, based on Herbert Spencer's program; by the time the second edition was published in 1896, sociology was being taught in all colleges.

In 1905, in his *A Textbook of Sociology*, co-authored with James Dealey, Ward devote a section to "social chemistry", which they describe as being the [reaction] processes of the tendency of the women of the conquered race to be appropriated by the conquerors. [9]

Energy storage evolution theory

In 1894, in his *The Natural Storage of Energy*, Ward theorized, based on the law of the conservation of energy, that the evolution of the universe is the result of the storage of energy in increasingly complex forms; according to which he divided evolution into what seem to be three emergent stages: chemic (chemical), biotic (biological), and telic (teleological). The chemic stage involves the evolution of increasingly complex elements and chemical compounds, culminating in the creation of organic molecules and rudimentary protoplasm. The biotic stage begins with the development of life. The telic stage is marked by the appearance of intelligent life, of which mankind is the highest known example.

> "The unalterable inherent motion of all the elements of the universe is the fundamental source of all effects, the primal cause of all things — it is the true *causa sui*, *causa immanens*, or self-activity of the philosophers.... Primarily there is seen the tendency to concentration due to a principle of attraction among the elements. This may be designated the gravitant force. There is, however, at the same time an opposite tendency to dissolution due to a principle of repulsion among the elements. This may be designated as the radiant force. These two primary forces interact, and wherever suitably balanced they result in the formation of symmetrical bodies preserved by equilibrating forces. It is this that constitutes true evolution, best exemplified in the celestial systems — cosmic evolution — and in organised beings — organic evolution. But looked at from another standpoint, the process may be regarded as one of organisation, which is chemical up to a certain point, beyond which it becomes biotic. In the former the activities are molecular, in the latter they are molar. The products of the former are chemical substances, those of the latter are organic forms."

The main difference between living and non-living matter is sensation:

> "In order that sensibility accomplish its purpose, the preservation of the organism, sensations must be either agreeable or disagreeable; hence pleasure and pain. The instability of protoplasm renders every part ephemeral. The entire organism is in a state of constant and rapid change of substance (metabolism), and fresh supplies must be momentarily introduced to prevent destruction by waste. The biological principle of advantage is adequate to secure this end. The supply of tissue is attended with pleasure and the actions necessary thereto follow naturally. The same is true of reproduction, which a study of the lowest organisms shows to be theoretically only a form of nutrition. The origin of pain is even simpler. The destruction of tissues results in pain and the actions necessary to prevent it also follow naturally."

The main difference between life in general and intelligent life involves using indirect methods to obtain goals:

> "The direction of progress was seen at the outset to be toward the greater concentration of cosmic energy, toward making the universal force, whose quantity cannot change, perform more work. This law continues in operation to the last. Telic causation is only another way of accomplishing this end. Just as biotic organisation was called in where chemical organisation could go no farther, so teleology is resorted to at the point where genesis ceases to be effective. In the last stages before this point is reached the chief agent in nature is will, but, as already stated, its action is direct, the same as mere force in any other form. The new agent differs primarily from all others in being indirect....The telic power differs essentially from the conative power in being directed not to the end but to some means to the end. Intelligence works exclusively through means, and only in so far as it does this does it employ the final cause. Instead of seeking the thing desired it seeks some other thing, unimportant in itself, whose attainment it perceives will secure the thing desired"

At the end of the article Ward notes that there are limits to science's ability to predict human behavior:

> "Great indeed is man's power of prevision under science. The motions of the planets can be foreknown for an indefinite future, physical and chemical effects are accurately deduced from the known laws of these sciences, the rate of growth and multiplication of plants and animals can be approximately arrived at, the psychic activities of animals can be counted upon with sufficient definiteness to be of great value to man, even the feelings, emotions, and propensities of human beings, with their resulting actions, can be rudely presaged, and the will itself reduced to very general laws; but when an attempt is made to bring the intellect under the dominion of law, to calculate the orbit of the reason, to determine the path of a thought, all rules of the calculus fail. It is here and not in the will that the nearest approach to freedom is to be found. In all other departments there is some limit to the causational influence, but in the department of the higher mind, where all other forces in nature are brought under subjection, the possibilities are practically unlimited."

System of sociology | Winiarski

In *Glimpses of the Cosmos: Volume 6*, a compilation of of Ward's collected works, of the period 1897-1912, a post humorous outline of Ward's system of sociology, planned and largely executed, is given, the aim of which was to reduce sociology to an exact science, consisting of social mechanics (social statics and social dynamics), viewed through the guise of the formation and transformation of cosmic, organic, and social structures. The parts Ward's 'system of sociology' are summarized to be representative of (a) formative principles or synergy, based on the work of Auguste Comte and Jean Lamarck; (b) creative synthesis, based on the work of Wilhelm Wundt; (c) transformative principles, based on the work of, primarily, Leon Winiarski, as is said to be summarized by the following quote:

> “The forces of work, system kinetic energy will be equal to the differences of the potential energies. To ensure the transformation of the active forces of the biological energies, unrealised potential processing takes place, it must be between comprizing breeds in a social aggregate, where there is a difference in potential. All the differences in these potential energies go into energy kinetic—but the total energy remains unchanging during processing; there is only a change in form.”
>
> — Leon Winiarski (date)

> Le travail des forces, l'énergie kynétique du système sera égale à la différence des énergies potentielles. . . . Pour que la transformation en forces actives des énergies biologiques latentes potentielles ait lieu, il faut qu'entre les races comprises dans un agrégat social, il existe une différence. . . . Toute la différence de ces énergies potentielles passe en énergie kynétique—mais la somme totale d'énergie reste invariable pendant la transformation; il n'y a qu' un changement de forme.—LÉON WINIARSKI.

Through the application of the branches of mathematical physics to sociology, such as found in the above quote, Winiarski, according to Ward, was the world's first mathematical sociologist. [3]

Social energy

In 1903, Ward, in his *Pure Sociology*, devotes an entire chapter to "Social Mechanics", with section on ‘social energy’, discussing the conservation of energy and how energy and force are nearly equivalent, citing the work of James Joule and Hermann Helmholtz, in terms of ‘social forces’. [3] Ward also defines the popular term ‘spiritual energy’ to purely functions of psychological energy and social energy: [3]

CHAPTER		PAGE
IX.	SOCIAL MECHANICS	145
	Mathematical sociology	145
	Social physics	147
	Psychics	150
	Psychometry	159
	The law of parsimony	161
	Mechanics	163
	Social energy	165

Ward's 1907 social mechanics chapter, with sections on: mathematical sociology, social physics, and mechanics, the latter dealing with social energy, wherein he cites a rather telling quote by American physicist Fernando Sanford. [3]

> “I am always very chary about using such expressions as ‘spiritual phenomena’, because the word *spiritual* has almost become a synonym of supernatural. Yet the word is a perfectly proper one and ought to be redeemed and freely used, more nearly as a synonym of *psychic* in its widest sense, and I shall not hesitate so to use it. The last three chapters have been devoted to showing that spiritual phenomena are as much natural phenomena as physical phenomena, that spiritual forces are true natural forces, and that there is a spiritual energy, *i.e.*, a psychic and social energy, that is as capable of doing work as any other form of kinetic energy. In fact it is the highest and most effective form of energy or *vis viva*.”

See: terminology reform for more on this.

Social mechanics | Thermodynamics

Likewise, as found in the 1907 edition of his *Pure Sociology*, on the use of thermodynamics in social mechanics, Ward cites Winiarski as being the initiator and justifier of this application, as follows: [3]

> “There is therefore a true science of social mechanics, and as social energy is only a special mode of manifestation of the universal energy, social mechanics is only a kind of mechanics which deals with this form of energy. The fundamental classification of mechanics, as we saw, is into statics and dynamics, and social statics and social dynamics are as legitimate branches of mechanics as are hydrostatics and hydrodynamics, the principles of which are commonly included in text-books of mechanics. In fact, Winiarsky has made a direct application of thermodynamics to social mechanics as essential to its full treatment. I shall deal with social statics and social dynamics in that order, which is the same as that in which mechanics is always treated, the advantage of which is even greater here than in other departments, as will be clearly apparent as we proceed.”

To note, although Ward advocates the use of thermodynamics as being essential to the development of sociology, he may have not had the mathematical skills to carry out this development, as Winiarski did in part.

Education

The Ward family was not wealthy so there was no extra money with which to send Lester to school for a formal education. Instead, Ward was self-educated in his youth. Some reports indicate that Ward taught himself many languages including Latin, Greek, and German, and could read Russian, Japanese and Hebrew. His studies also included mathematics and geology. [4] By day Ward joined his brother Cyrenus in the family wagon wheel shop, in Myersburg, Pennsylvania. By night he devoured books and developed a craving for knowledge and study. In the early 1860's Ward attended classes at the Susquehana Collegiate Institute in Towanada. From 1865 to 1881 Ward was employed by the United States Treasury Department. During this period he studied at Columbian College (now George Washington University) from which he received the A.B. degree in 1869, the LL.B. degree in 1871, and the A.M. degree in 1872. Ward became the first president of the American Sociology Society (1906-07). In 1907, he was professor of sociology at Brown University.

Quotes | On

The following are quotes on Ward:

> "**Ward**'s psychological interpretation of social phenomena was based upon a conscious direction of social forces. Desires or feelings furnish the dynamic energy of society and are, therefore, the fundamental social forces. But the social process is not left to blind chance as is the natural process, since these social forces can be directed as society desires. The human intellect is the agency or "condition" which guides but does not propel the desires; and ways and means are thus derived. As society advances, this function of intellect increases, and man's social adaptation becomes more and more artificial, but with universal happiness the ultimate aim."
>
> — Howard W. Odum (1929), *An Introduction to Social Research* (pg. 139)

Quotes | By

The following are noted quotes:

> "The truth is that no profession of faith or lack of faith has anything to do with a man's morals. Away with the bugbear that to be good we must be pious."
>
> — Lester Ward (1870), *Iconoclast* [10]

> "Everything capable of forming a distinct intellectual conception is reducible to a place under some one of the scientific categories. Indeed, science itself, in so far as it is distinguishable from knowledge in a general sense, consists in a co-ordination and subordination of the different kinds of knowledge; in a word, the essential of all science is the classification of knowledge. The classification of the sciences, therefore, is itself strictly a science, and consists in a prolongation of the scientific process, whereby it is extended into higher fields and made to embrace its own grand divisions, objectively regarded as material for science. Mere classification, or "systematization," is, therefore, a less trivial operation than some persons have intimated. It is the essential process of organization, and has for its real object to arrive at the true order which exists in the universe."
>
> — Lester Ward (1883), *Dynamic Sociology*

> "I wish to lay special emphasis on the word *spontaneous* in this title, as embodying my conception of pure sociology. Whatever is spontaneous *is* pure in this sense. Its two other chief synonyms are 'genetic' and 'natural' as opposed to 'telic' and 'artificial.' Still, as the telic faculty is itself a genetic product, it cannot be omitted from a treatment of pure sociology, and, as I have shown, its manifestations are in one sense as strictly spontaneous as are those of the dynamic agent."

— Lester Ward (1903), *Pure Sociology: a Treatise on the Origin and Spontaneous Development of Society* (pg. x)

"Every independent thinker has his system. It is always based on some one leading idea or unitary principle which binds all its parts together, and this principle is the chief matter with the author. The system constitutes a means of thoroughly illustrating his ruling idea."

— Lester Ward (1903), *Pure Sociology* (pg. 8)

"Men perpetually praise the bridge that took them across the river of life, and continue to praise it and cling to it after its timbers have decayed and its abutments begin to crumble."

— Lester Ward (1903), *Pure Sociology: a Treatise on the Origin and Spontaneous Development of Society* (pg. 230)

"Social science becomes as much more thorough, intelligible, interesting, and useful when based on physical science as is astronomy, for example, when based on mathematics."

— Lester Ward (1907), *Pure Sociology* [7]

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External links

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θΔics

In genius studies, **Leta Hollingworth** (1886-1939) was an American psychologist noted for her work on the education of exceptional children. Hollingworth, supposedly, set the genius mark at IQ of 160 or above.

Children with IQs above 180

In 1916, Hollingworth witnessed a child score 187 on one of the Binet-stylized intelligence tests; this prompted her to seek out eleven other children with similar capabilities. The next twenty-three-years The twenty three years were spent finding the children and attempting an in-depth study. Fully aware that she would never react long enough to see all of the children into their adulthood, Hollingworth meticulously attempted to build a framework upon which future research findings could be accomplished. Hollingworth's final study on gifted children was published after her dereaction (death), by her husband in 1942. [1]

She found that individuals who test above 180 IQ are characterized as having a strong desire for personal privacy, rarely provide personal information, are afraid of the potential consequences of being labeled "special", and do not like attention being called to them or their families. Hollingworth was able to work past all of these concerns and conducted research that benefited science while maintaining participant privacy at the same time. She laid the foundations for future studies of gifted children with this work. The results of the study suggested that many exceptionally gifted children suffer adjustment problems due to two factors: inept treatment by adults and lack of intellectual challenge.

Quotes | Employed

The following are quotes employed by Hollingworth:

> "**Genius**—a very superior mental ability, especially a superior power of invention or origination of any kind, or of execution of some special form, such as music, painting, or mathematics. It has no special technical meaning, but has occasionally been **defined as equivalent to an intelligence quotient (IQ) of 140 or above**."
>
> — Howard Warren (1933), *Dictionary of Psychology* (pg. #); cited by Leta Hollingworth (1939) in *Children Above 180 IQ* (pg. 3)

Quotes | By

The following are quotes by Hollingworth:

> "Children of 140 IQ waste half their time. Those above 170 IQ waste practically all their time in ordinary elementary school."
>
> — Leta Hollingworth (1939), *Children Above 180 IQ* (§22)

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θΔics

In hmolscience, **letter rhyming derivation method** refers to the equation derivation method, commonly seen in economic thermodynamics, wherein theorists will attempt to derive a thermodynamic formula of a given subject or system, e.g. economics, sociology, anthropology, guided by the poetical model or idea of letter or word rhyme, e.g. "U" of utility (of economics) is the same letter as "U" of internal energy (of thermodynamics), therefore they must be the same, as defined by the first law (Hans Kreuzer, 2010); or "P" of price level (of money flow systems) is the same as "P" of pressure (in thermodynamics), therefore they must be the same, as defined by the ideal gas law (John Bryant, 2010). [1]

Discussion

The letter rhyming derivation method is an example of what NOT to do, in that the method, and all results derived therefrom, has no logical basis.

The correct method is to go through thermodynamics proper to do the derivation, e.g. start with the works of Clausius, understand what a "system" is, understand what the "equivalence-value of all uncompensated transformations" means, understand the "mechanical equivalent of heat", understand basic definitions, e.g. pressure, temperature, volume, mol, molecule, bond, energy, etc., and then do the derivation from the bottom up, going through the proper branch of thermodynamics, e.g. Edwin Wilson being taught thermodynamics by Willard Gibbs, the founder of chemical thermodynamics, who then told his student that the a good approach to formulate the thermodynamics of economic systems and equilibrium would be to start with Gibbs' equation 133 and derive upward therefrom.

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θΔics

In existographies, **Leucippus** (c.500-450BC) (IQ:180|#124) (GCE:10) (ACR:18) (GPhE:#) [CR:212] was a Greek atomic physicist and philosopher, noted for conceiving of the atomic theory, which was a reactionary theory developed in response to Greek philosopher Parmenides' 485BC denial of the void.

Education

Leucippus either never existed, as Epicurus and Hermarchus, supposedly profess (Laertius, 230), or he was the pupil of Zeno of Elea (Pseudo Galen, c.1500), or the pupil of Melissus (Tzetzes, c.1170), and or he was a member of the school of Pythagoras (Iamblichus, c.305). [4]

Influence

Leucippus' student was Democritus, who in turn mentored Epicurus, whose 300 scrolls were amassed by Lucretius, aka the "posthumous mouth-piece of Epicurus" (Schrodinger, 1949), and presented in the form of the c.60BC poetic book *On the Nature of Things*.

Quotes | On

The following are quoted on Leucippus:

> "Apollodorus in his *Chronology* tells us that Epicurus was a pupil of Nausiphanes and Praxiphanes; but in his letter to Eurylochus, Epicurus himself denies it and says that he was self-taught. Both Epicurus and Hermarchus **deny the very existence** [?] of **Leucippus** the philosopher, though by some and by Apollodorus the Epicurean he is said to have been the teacher of Democritus. Demetrius the Magnesian affirms that Epicurus also attended the lectures of Xenocrates."
>
> — Diogenes Laertius (c.230), *Lives and Opinions of Eminent Philosophers* (§10.12)

> "A pupil of Zeno's was Leucippus, the first proponent of the theory of atoms. Democritus got the theory from him and developed if further."
>
> — Pseudo Galen (c.1500), *History of Philosophy* (3); cited by C.C.W. Taylor (1999) in *The Atomists Leucippus and Democritus* (pg. 54)

> "From the earliest beginnings of physical science, we meet with the firm conviction that everything that happens is governed by inviolable laws, so that the course of events forms an inevitable and unalterable infinite sequence of causes and effects. The first atomic physicist was **Leucippus**, a contemporary of Socrates in the fifth century BC. Of Leucippus, only two sayings are preserved: one that he refused to believe that the sun, moon, and the stars are living beings; the other that nothing comes to pass without a cause, but everything happens by reason and of necessity. This he maintained in the fifth century BC. And toward the end of the nineteenth century AD, physicists were fully prepared to endorse his opinion."
>
> — Erwin Schrodinger (1949), "Do Electrons Think?" [1]

Quote | Determinism

The following are the various English renditions of the determinism fragment of Leucippus:

> "Nothing happens *in vain*, but everything from reason and by necessity."

— Leucippus (c.460BC), *On Mind* (Fragment L1); cited (Q) by Johannes Stobaeus (c.520AD) in *Book of Selections* (1.4.7c) [4]

"Nothing comes to pass *without a cause*, but everything happens by reason and of necessity."

— Leucippus (c.460BC), Fragment #2; cited by Erwin Schrodinger (1949) in his "Do Electrons Think" talk [2]

"Nothing occurs *at random*, but everything for a reason and by necessity."

— Leucippus (c.460BC), Fragment #2 [3]

"Nothing happens without a cause, but with a cause and by necessity."

— Leucippus (c.460BC), Fragment #2; cited by Arthur Compton (1935) in his *The Freedom of Man* [1]

The key variously translated term here is "ματην" (Q), in the "Nothing happens ["ματην"]" segment, which has been translated as: "at random", "causelessly", or "in vain".

Quotes | Other | By

The following are the other two extant quotes attributed to Leucippus:

"I refuse to believe that the sun, moon, and stars are living beings."

— Leucippus (c.460BC), Fragment #1; cited by Erwin Schrodinger (1949) in his "Do Electrons Think" talk [2]

"Atoms are always in motion in space [void]."

— Leucippus (470BC), fragment #3; cited by Democritus (420BC) in Pay (Q) fragment #48

References

1. Compton, Arthur H. (1935). *The Freedom of Man* (pg. 10). Yale University Press.
2. Schrodinger, Erwin. (1949). "Do Electrons Think?" (Q)(Q), BBC talk.
3. Krik, G.S., Raven, J.E., and Schofield, M. (1983). *The Presocratic Philosophers* (pg. 420) (Q). Publisher.
4. Taylor, C.C.W. (1999). *The Atomists: Leucippus and Democritus: Fragments: a Text and Translation with a Commentary by C.C.W. Taylor* (pg. 1; education, pg. 54). University of Toronto Press.

External links

- Leucippus – Wikipedia.
- Leucippus – NNDB.

θΔics

In existographies, **Lev Landau** (1908-1968) (IQ:170|#340) (CR:25) was a Russian physicist noted, in thermodynamics, for his low-temperature work and for free energy calculation theory; noted, in physics, for his multi-volume *Course of Theoretical Physics* (O), much of which was composed in his head while in an NKVD prison in 1938-1939, later written with the co-authorship assistance of his student Evgeny Lifśhitz, which some consider to the the "bible of physics" (see: scientific bibles); known popularly for his so-called Landau genius scale, a personal logarithmic ranking of physics geniuses that he kept in his pocket, changing from time to time.

Free energy

American physicist John Kirkwood, a protégé of Arthur Noyes, is said to have laid the foundations for the standard method for estimating free energy differences, using perturbation theory and thermodynamic integration, by building on the chemical affinity and extent of reaction work of Theophile De Donder. Landau, along with Benjamin Widom and Robert Zwanzig, are said to have further this approach. [1]

Landau genius scale

See main: Landau genius scale

Landau is noted for his personal physicist ranking system, which he kept on him, using a logarithmic 0 to 5 point scale (Lifsĥitz, 1974) (Pitaevskii, 2010) to rank the great physicists. (O) In 1974, Landau's close associate Russian Evgeny Lifsĥitz, in a talk at the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy, mentioned Landau's genius scale; an account of which is given by Indian physicist Asoke Mitra (2006) as follows: [5]

> "Landau's classification of outstanding genius physicist, as narrated by his close associate Evgen Lifsĥitz, at a talk given in 1974 at the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy. According to Landau's classification, Isaac Newton received the highest rank, 0, followed by Albert Einstein at a rank of 0.5, then by Niels Bohr, Werner Heisenberg, Erwin Schrodinger, Paul Dirac, Satyendra Bose, Eugene Wigner, and a few others at 1, and so on. Landau had given himself a modest rank of 2.5. The classification continued to the rank of 5 for mundane physicists."

In table form, Landau's rankings are as follows:

#	Landau physicist genius scale
0	Isaac Newton
0.5	Albert Einstein
1	Niels Bohr, Werner Heisenberg, Erwin Schrodinger, Paul Dirac, Satyendra Bose, Eugene Wigner, and a few others
1.5	
2	Lev Landau (after 1962 Nobel Prize)
2.5	Lev Landau (before 1962 Nobel Prize)
3	
3.5	

4	
4.5	David Mermin (per his own estimate ±)
5	Mundane or "pathologists"

Similarly, Russian physicist Lev Pitaevskii (2010), one of Landau's former students, corroborates Lifsĥitz's account of the scale, as follows: (Q)

> "**Landau** was always walking around with a ranking of the best physicists in history recorded in his notebook. He scored them on a logarithmic **scale** of 0 to 5. Newton was rated the best. Einstein was next and, of course, Bohr. After them came Heisenberg, Dirac, Schrödinger, Bose and Wigner."

Landau, according to both of these accounts, ranks Newton first. Pitaevskii, to note, seems to places Dirac at 5th place and Schrodinger at 6th, contrary to Lifsĥitz who puts Schrodinger at 5th and Dirac at 6th.

Greatest physicist rankings

In the 1960s, Landau was considered (Q) and semi-cited (Q) as "Russia's greatest physicist". In 1981, American physicist David Mermin published a book review article entitled "One of the Great Physicists … and Great Characters" on Landau. [4] Recent postings consider Landau to be among the greatest physicist ever candidate grouping classification. (Q)

Education

Landau was said to have been a child prodigy, producing a brilliant paper on quantum mechanics at the age of nineteen. [1] Landau was a protege of Niels Bohr. He is the eponym, in schools classifications, of the "Landau school", a low-temperature research department at Kharkov, Russia, focused on explaining the properties of Helium II using thermodynamics and quantum mechanics.

Students

A noted student of Landau, in Kharkov, was Hungarian-born physicist Laszlo Tisza, who did post-graduate work with Landau and was said have been much impressed with Landau's integration of thermodynamics into modern physics.

Quotes | By

The following are relevant quotes:

> "No, I'm not a genius. Bohr is, and Einstein is. I'm not. But I'm very talented … Yes, I'm very talented."
>
> — Lev Landau (c.1940), reply to a young lady [3]

References

1. Chipot, Christphe and Pohorille, Andrew. (2007). *Free Energy Calculations: Theory and Applications in Chemistry and Biology* (1.1.1: Pioneers of Free Energy Calculations, pgs. 1-2). Springer.
2. Shachtman, Tom. (1999). *Absolute Zero and the Quest for Absolute Cold* (pgs. 211-14). New York: Mariner Books.
3. Mermin, David. (1990). *Boojums All the Way Through: Communicating Science in a Prosaic Age* ("no I'm not a genius", pg. 37; genius scale, pg. 37, pg. 39). Cambridge University Press.
4. Mermin, N. David. (1981). "One of the Great Physicists … and Great Characters", *Physics Today*, Jun; in: *Boojums All the Way Through: Communicating Science in a Prosaic Age* (§3:35-37). Cambridge University Press, 1990.
5. Mitra, Asoke. (2006). "Letter: Why No 'New Einstein'?" (pdf), *Physics Today*, pg. 11, Nov.

External links

- Lev Landau – Wikipedia.

θΔics

In hmolscience, **Lev I. Rozonoer** (c.1934-) or "л.и. РОЗОНОЭР" (Russian), is/was a Russian cybernetician noted, in economic thermodynamics, for his 1973 work on applying thermodynamics in economics.

Overview

In 1973, Rozonoer, published a four part article "A Generalized Thermodynamic Approach to Resource Exchange and Allocation", discussed, via derivation, what Kenneth Bailey (1990) refers to as analogies in thermodynamics and economics. [1] The following of which is the abstract of part one: [2]

> "The paper is an attempt to reveal resource exchange and allocation mechanisms common for processes of various nature (economic, sociological, physical,etc.). The paper will consist of four parts. The first will describe an equilibrium model assuming the existence of a"structural function" (interpreted as entropy in thermodynamics and autility function in mathematical economics). The conditions for equilibrium of acomposite system are described for the case where the subsystem structural functions are additive."

The entire article seems to be available only in Russian at present. [3]

Education

Rozonoer came to IAT in 1955, immediately after the MEI, and worked the Institute for more than 40 years, before leaving for family reasons in the US in 1996, the first time he was involved in the automation of the chemical industry. In 1960, he defended his PhD thesis on some aspects of the theory of optimal control in 1964 - a doctoral (theory of systems with compensation of external influences). Since 1965, Professor in the Department of MIPT "Theoretical Mechanics" and base chair in IATe. (O)

In 1996, Rozonoer was a professor associated with the Soviet Academy of Sciences.

References

1. Bailey, Kenneth D. (1990). *Social Entropy Theory* (pg. 270). New York: State University of New York Press.
2. Rozonoer, Lev I. (1973). "A Generalized Thermodynamic Approach to Resource Exchange and Allocation. Part I" (abs) (pdf), *Avtomat. i Telemekh*, 5:115-32; in: *Automation and Remote Control* (.), Vol. 34, 5(2):781-795.
3. Rozonoer, Lev I. (1973). "A Generalized Thermodynamic Approach to Resource Exchange and Allocation", Part 2 (pdf), 6(1) pgs. 915-927; Part 3, 8(1), pgs. 1272-1290; Part 4 (add)

Further reading

● Rozonoer, Lev I. (1998). "On the Dissipation of Energy upon Classical Measurement and on the Relation between Information and Entropy." (Russian) *Problems of Information Transmission*, Vol. 34:2, pgs. 62-64.
● Orlov, N.N. and Rozonoer, L.I. (1984). "The Macrodynamics of Open Systems and the Variational Principle of the Local Potential." *J. Franklin Inst.* Vol. 318, pgs. 283-314 and 315-47.
● Rozonoer, Lev I. "Thermodynamics of Nonequilibrium Processes far from Equilibrium" In *Kinetics of Biological Processes* (pgs. 169-86). Nauka, Moscow (1980).
● Kogan, A.M. and Rozonoer, L.I. (1964). "On the Macroscopic Description of Kinetic Processes." *Dokl AN SSSR*, 158, pgs. 566-69.
● Tsirlin, A.M., Kazakov, V., Alimova N.A., Ahremenkov, A.A. (2005). "Thermodynamic Model of Capital Extraction in Economic Systems." *Interdisciplinary Description of Complex Systems*, 3(1): 1-16.

θΔics

In hmolscience, **Lev Shneider** (1946-) is a Russian-born American science fiction writer noted for his 2005 novel *Matryoshka*, in which the character ZeeBrain initiates a dialogue to his pen-pal Ginnie, on whether or not a person is a molecule, whether two people in a bond are a new type of molecule, and the ramifications of this logic in the context of love, particularly in terms of stability. The dialogue has resemblance to German polymath Johann Goethe's famed chapter four. In 2010 commentary on his novel, Shneider gave his opinion that: [3]

> "The molecule approach applies to all potential couples."

The story, in overview, is a doll-with-in-a-doll themed story, about a man named James Morris who begins reading up an 'obscure scientific text', and journeys to Soviet Lithuania in the sixties, all the while completing a revolutionary theory in his mind. Shneider began working on the book in 1988.

Dihumanide molecules

In the first part of the dialog, ZeeBrain comments: [1]

> "Talk is cheap. Talk is safe. Let's talk about love. Lust flares and dims. Relationships start and end. Love is or isn't. Love is a person, a separate entity with its own body, metabolism, and dreams. Love is two human molecules bound to make a third."

In this last quote, Shneider is making reference to the complex idea that when two human molecules, A and B, that transform through a combination reaction to form a couple:

$$A + B \rightarrow AB$$

the product 'AB', where letter proximity, in the Bergman sense, indicates the existence of a human chemical bond (A≡B), are actually now, technically, defined as a 'dihumanide molecule', a single entity, or 'third molecule', as Shneider puts it. In this context, the combination reaction could more aptly be written as:

$$A + B \rightarrow C$$

where, in stead of AB, signifying a connection of two entities, the letter symbol C is used to signify that a new single entity has formed, the couple.

Stable vs unstable reactions

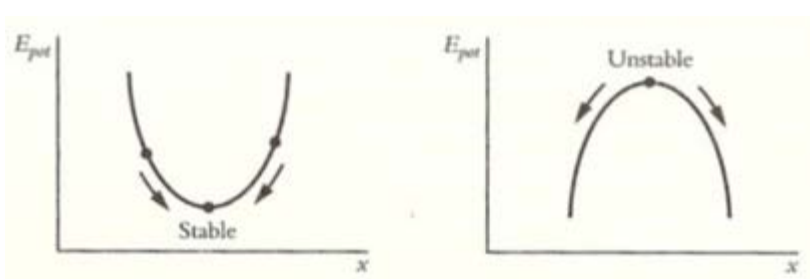

The basic models for stability: indicating that locations near the bottom of a thermodynamic potential energy well, the potential being Gibbs free energy

Stable human molecules

ZeeBrain continues:

> "Just like molecules, people need an outside force to restore the initial, 'prelove' conditions. Are you a stable molecule, Ginnie? I know I'm not lately."

in the human molecular case, are indicative of tight bonds and stability (the isothermal-isobaric potential); whereas, conversely, locations at the top or hill of potential are indicative of instability, a sort of heightened reaction energy state. [2]

Here, Shneider is dealing with a number of complex issues. The person is musing on whether it is scientifically possible to restart a reaction or bring things back to their initial state. This can be looked at from two points of view. One, the reaction may be at equilibrium:

$$A + B \leftrightarrow AB$$

meaning that both the initial state and final state have equivalent values of potential energy, i.e. Gibbs free energy, where, resultantly, the reaction oscillates or equilibriates back and forth between reactants (A + B) and products (AB); which is captured in the types of relationships where people "make up to break up", many times over.

Irreversibility | Return to initial conditions?

Secondly, and more correctly (oscillation reactions tend to be fleeting), the discussion may be looked at in the context of the second law, irreversibility, and the arrow of time for chemical reactions. In simple terms, according to German physicist Rudolf Clausius, the system of the couple can be considered as a working body, in a thermodynamic sense, and a working body can never be "returned to its original state" or atomic configuration. This is expressed by Ginnie who answers:

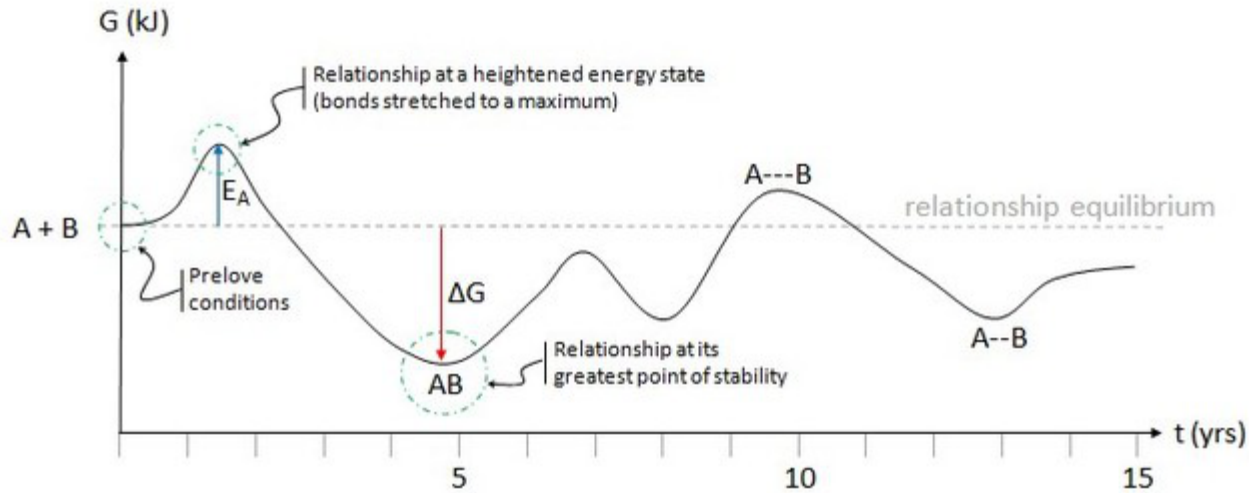

Reaction coordinate model (potential energy surface) of Gibbs free energy (kilojoules) of the reaction versus time (years); the negative free energy change, in the first five years of the reaction, signifying a spontaneous process; further free energy hills and valleys, following the region of greatest stability indicative of changing states of the relationship reaction (see also: energy landscapes).

> "ZeeBrain, people are not molecules! Love changes us forever. Once in love, we can never be restored to 'prelove conditions' even after our love is gone."

The last exclamation, that people are not molecules, certainly has its adherents (e.g. Steve Fuller); but, nevertheless, it is interesting to note that the discussion of both sides of the debated, in this dialog, seems to mirror the discussion on the same topic between Eduard and Charlotte in Goethe's celebrated chapter four.

See also

â— Human chemical reaction theory

References

1. Shneider, Lev. (2005). *Matryoshka* (human molecule, pg. 75). Lulu.com.
2. Prigogine, Ilya. (1996). *The End of Certainty: Time, Chaos, and the New Laws of Nature* (stability, 6+ pgs, graph, pg. 30). Free Press.
3. Email communicate from Shneider to Libb Thims 20 Aug 2010.

External links

â— Lev Shneider – Facebook.com.

θΔics

In mononyms, **Lewis** (CR:530|#5) [CR:23] tends to refer to American physical chemist Gilbert Lewis (CR:293) and his 1923 *Thermodynamics and the Free Energy of Chemical Substances*; and or his other work, e.g. Lewis dot structure (1902), his 1925 *Anatomy of Science* (§7: Non-Mathematical Sciences), wherein he speculates on whether "crystals think" or alternatively whether the process of him "writing a book is but a large chemical reaction"; among others:

- Lewis dot structure
- Lewis chemical bond (Q)
- Lewis cubic atoms (Q)
- Lewis inequality
- Lewis inequality for natural processes
- Lewis inequality for unnatural processes
- Lewis school of thermodynamics

Other

The following are other Lewis-names:

- C.S. Lewis
- Lewis Gordon
- Lewis Mumford
- Lewis Terman
- Lewis Wolpert

θΔics

In existographies, **Lewis Campbell** (1830-1908) was a Scottish classics scholar noted for being one of the main intellectual correspondents of James Maxwell, particularly in regards to classical subjects, e.g. morality and Greek philosophers.

Overview

In the 1840s, Campbell, at the Edinburgh Academy, developed a friendship with James Maxwell, initiated in some way, when Campbell helped Maxwell with his bully issues, after which they began walking to school together. [1]

In 1863, Campbell was a professor of Greek at St. Andrews University. [1]

In 1882, Campbell, together with William Garnett, Maxwell's former demonstrator, published *The Life of James Clerk Maxwell: with Selections from His Correspondence and Occasional Writings*, his collection of Maxwell's correspondence to him, and other items of correspondence he obtained from others. [3]

Quotes | Related

The following are related quotes:

> "One night I read 160-pages of Buckle's *History of Civilization*—a bumptious book, strong positivism, emancipation from exploding notions and that style of thing, but a great deal of actually original matter, the result of fertile study, and not mere brainspinning."
>
> — James Maxwell (1857), "Letter to Lewis Campbell" [2]

See also

â— Maxwell on the soul

References

1. Seitz, Frederick. (2001). "James Clerk Maxwell (1831-1879); Member APS 1875" (pdf), Proceedings of the American Philosophical Society, 145(1):1-45, Mar.
2. (a) Campbell, Lewis and Garnett, William. (1882). *The Life of James Clerk Maxwell: with Selections from His Correspondence and Occasional Writings* (pg. 210). MacMillan and Co, 1884.
(b) Ball, Philip. (2004). *Critical Mass: How One Thing Leads to Another* (pg. 67). New York: Farrar, Straus and Giroux.
3. Campbell, Lewis and Garnett, William. (1882). *The Life of James Clerk Maxwell: with Selections from His Correspondence and Occasional Writings* (pg. 210). MacMillan and Co, 1884.

External links

â— Lewis Campbell (classicist) – Wikipedia.

θΔics

In science, **Lewis Gordon** (1815-1876) was a Scottish civil engineering notable for introducing the term "mechanical effect" into the science of steam engines and particularly for his influence on young Scottish brothers engineer James Thomson and physicist William Thomson and their interest in a general theory of heat and heat engines.

Education

Gordon born in Edinburgh, Scotland, and his first university was Edinburgh University, where he was a student of Scottish physicist James Forbes. [4] This associates Gordon with the Edinburgh school of thermodynamics. Gordon also spent time studying abroad at the School of Mines at Freiberg in Saxon and the Ecole Polytechnique, the original French school of thermodynamics; an educational path a result of which he became an engineer. Gordon was involved with the construction of the Thames Tunnel, from 1837 to 1839. In 1840, he set up a civil engineer partnership with Lawrence Hill in Glasgow. From 1841 to 1855, Gordon was the first holder of the chair of civil engineering and mechanics at Glasgow University. In 1855, supposedly frustrated with the lack of facilities at Glasgow, he handed over his position to William Rankine and moved on to a private practice involved with the designing iron bridges. He also went on to be involved with wire rope, submarine cables, railway engineering, and telegraphy engineering. [3]

Thomson brothers

See main: Glasgow school of thermodynamics

During the 1841-42 school year, a 19-year old James Thomson (the older brother) went to Glasgow College and was able to study engineering under Gordon, a newly appointed professor of civil engineering and mechanics (1840-45). [2] During his mentoring of James, in some way or another, it seems that Gordon's French education at the Ecole Polytechnique, the school of Sadi Carnot, author of *Reflections on the Motive Power of Fire* (1824) and Emile Clapeyron, author of *Memoir on the Motive Power of Fire* (1834), the first two papers on thermodynamics, seems to have rubbed off on James, being that a discussion with his younger brother William on the early two French pioneers of heat engine theory (Carnot and Clapeyron)

In a letter to William in August, 1844, James inquired who it was that had proved there was a definite quantity of mechanical effect (work) given out during the passage of heat from one body to another. He stated his intentions of writing an article for the *Artisan* about the theoretical possibility of working steam engines without fuel by using over again the heat which was thrown out in the hot water from the condenser, noting that:

> "I shall have to enter on the subject of the paper you mentioned to me."

This paper, according to historian British energy historian Crosbie Smith, was almost certainly the 1837 translation for Taylor's *Scientific Memoirs* of Clapeyron's "Memoirs on the Motive Power of Heat". [3] The discussions in James letter of 1844, according to Smith, are the earliest record of implicit references to Clapeyron and Carnot by the Thomsons.

In 1848, Gordon famously gave William Thomson (the younger brother) a copy of French physicist Sadi Carnot's 1824 memoir *Reflections on the Motive Power of Fire*. [1] It was after reading this memoir, which William had previously spent years searching for (particularly in the bookstores of Paris), that William essentially launched the science of thermodynamics, when he published his 1848 "On an Absolute Thermometric Scale founded on Carnot's Theory of the Motive Power of Heat, and Calculated from Regnault's Observations" and 1849 "An Account of Carnot's Theory of the Motive Power of Heat; with Numerical Results Deduced from Regnault's Experiments on Steam", the latter of which found its way into the hand of German physicist Rudolf Clausius who in turn was so intrigued with this new subject that he "founded", in the retrospect words of American engineer Willard Gibbs, the science of thermodynamics with the publication of his most-famous memoir the 1850 "On the Moving Force of Heat and the Laws of Heat which may be

Deduced Therefrom".

References

1. Smith, Crosbie. (1998). *The Science of Energy - a Cultural History of Energy Physics in Victorian Britain* (pgs. 35-44). Chicago: The University of Chicago Press.
2. Smith, Crosbie and Wise, Norton M. (1989). *Energy and Empire* (pg. 51, ch. 9: "Thermodynamics: the years of uncertainty, pgs. 282-316, ch. 10: "Thermodynamics: the years of resolution", pgs. 317-347). Cambridge University Press.
3. Day, Lance and McNeil, Ian. (1996). *Biographical Dictionary of the History of Technology* (Gordon, Lewis Dunbar Brodie, pgs. 297-98). Taylor and Francis.
4. Constable, Thomas and Stevenson, David. (1877). *Memoir of Lewis D.B. Gordon*. Constable.

External links

â— Lewis Gordon – Wikipedia.
â— Lewis Gordon – Oxford Dictionary of National Biography.

θΔics

In inequalities, the **Lewis inequality** states that no actual earth-bound, freely going, natural process or reaction is thermodynamically possible unless the following relation holds:

$$\Delta G < 0$$

which states that the excess of the value of the Gibbs free energy of the system in its final state G_f less the value of the Gibbs free energy of the system in its initial state G_i:

$$\Delta G = G_f - G_i$$

must be a negative value, i.e. be less than zero, where:

$$G = U + PV - TS$$

meaning that the reaction process shows a diminution in free energy over the extent of the reaction.

for a natural process

$$dT = 0 \qquad dP = 0 \qquad dG < 0$$

for an unnatural process

$$dT = 0 \qquad dP = 0 \qquad dG > 0$$

for a reversible process

$$dT = 0 \qquad dP = 0 \qquad dG = 0$$

The Lewis inequalities for natural processes and unnatural process in the 1933 notation of English chemical thermodynamicist Edward Guggenheim. [2]

History

The above simplified outlined was first given focus by American physical chemist Gilbert Lewis in 1923 and referred to by others as the Lewis free energy, albeit based on the more rigorous 1876 work of American engineer Willard Gibbs.

Earth-bound

The term "earth-bound" is short for reaction processes that occur at constant temperature (isothermal) and constant pressure (isobaric), which approximate those on the surface of the earth, in a given window of time.

Freely going

The term "freely going" refers to reactions that "run freely", in Lewis' words, "like the combustion of fuel, or the action of an acid upon a metal". This signification is done to contrast with reactions that are "harnessed" in some way for the production of useful work w', or "net work", as Lewis calls it, in which case the following "universal rule", in Lewis' words, holds:

$$-\Delta G > w'$$

whereby, although, in practice, different processes differ greatly in their degree of irreversibility, if any isothermal-isobaric process is to occur with finite velocity, it is necessary that this inequality exists. The model reaction given by Lewis for harnessed useful work is that of a galvanic cell or battery, in which an electrochemical reaction occurs inside the battery, whereby if the two electrodes are connected to an external motor or other electrical system, in such a way as to utilize the electrical energy which is available, an amount of work will be done. This amount of "net work" w', according to Lewis, will be the electrical work w less the pressure volume work $P\Delta V$, i.e. the work done against the constant pressure of the atmosphere:

$$w' = w - P\Delta V$$

In the more general case where the reactions are not harnessed in some way for the production of work (the example of the "harnessed reaction" here being the internal battery reactions electrically connected to an external motor or other electrical system), the reactions are those of a system not subjected to external forces, except constant pressure exerted by the environment and in such cases the net work is equal to zero:

$$w' = 0$$

whereby with substitution:

$$-\Delta G > 0$$

and then after multiplying the negative sign through, which reverses the inequality, we have the following "universal rule" for freely going isothermal isobaric reactions not harnessed in some way for the production of useful external net work:

$$\Delta G < 0$$

then, in Lewis' words, "we know that the reaction in the direction indicated, is thermodynamically possible." This is the Lewis inequality for a natural process. If, conversely, the measure of Gibbs free energy change for for the process is positive:

$$\Delta G > 0$$

then, in Lewis' words, "we know that the reaction in the direction indicated, is thermodynamically impossible." This is the Lewis inequality for an unnatural process.

Notation and etymology

The formulas given above were first expressed in now famous capital delta symbol notation (Δ) in 1923 by American physical chemist Gilbert Lewis, albeit he used the German symbol notation ‘F’, from the German *freie energie*, a 1882 term introduced by Hermann Helmholtz, albeit for the isothermal-isochoric potential). The symbol G, in honor of Willard Gibbs, was introduced in 1933 by English chemical thermodynamicist Edward Guggenheim. This is summarized below:

$\Delta F < 0$	$F = E + PV - TS$	Lewis and Randall (1923)
$dG < 0$	$G = E + PV - TS$	Guggenheim (1933)

The notation and symbol usage in chemical thermodynamics, prior to Guggenheim's uniformity of the notation system, was chaotic and varied, to say the least, as evidenced by both Guggenheim's (1933) and Theophile de Donder's (1936) historical usage characteristic function notation tables. The central point to note is that in 1933 the symbol G was assigned to replace F in the following formula:

$$F = E + PV - TS$$

by Guggenheim, as the new universal symbol for Gibbs free energy, or the thermodynamic function of the internal energy E (or U modern) plus the pressure volume work energy (PV) less the entropic energy (TS). This adoption, however, was not immediate as evidenced by the fact that in 1950 American chemical thermodynamicist Frederick Rossini, a student Lewis was people were still sometimes calling the above function the "Gibbs' or Lewis' free energy". Rossini defines the inequality as such (using the symbol δu) as the notation for what he calls "useful energy" a synonym for free energy (Helmholtz) or available energy (Gibbs). In his own words: "the algebraic sign of the useful energy obtainable from the system serves to tell us whether the given process is one in which the system is moving toward or away from equilibrium". He explains this as such: [5]

Rossini notation (1950)	Modern notation	Description
$\delta u < 0$	$\Delta G < 0$	If the value of δu is negative, useful energy is obtainable from the system and we know the change is a naturally occurring one in the direction toward the state of equilibrium.
$\delta u > 0$	$\Delta G > 0$	If the value of δu is positive, useful energy is required to be supplied to the given system to bring about the desired change and we know that the change is an unnatural one in the direction away from equilibrium.

On this combined notation recommendation logic (Guggenheim + Rossini), it would seem intuitive to keep to the naming of the function ‘E + PV – TS’, by standard convention, as Gibbs free energy, symbol ‘G’, but to call the inequality ‘dG’ (or ΔG), by the name ‘Lewis inequality’, as follows:

Differential change	State change	Name
$dG < 0$	$\Delta G < 0$	*Lewis inequality for a natural process* (or spontaneous process), one in which the change will occur naturally or spontaneously and in which useful energy is obtainable from the system.
$dG > 0$	$\Delta G > 0$	*Lewis inequality for an unnatural process* (or spontaneous process), one in which useful energy is required to be supplied to the given system to bring about the desired change.

on the premise that (a) the function was commonly known as the Lewis free energy, (b) Lewis was the one who did the most work to center focus on the development and application of this key function, particularly by bring it into the hands of the working chemist, (c) Lewis spent at least two decades doing some of the first free energy calculations and measurements in laboratory, (d) Lewis has been cited as the one whose efforts resulted in the replacement of the name affinity with free energy in the English speaking world. In simple terms, this one inequality, of Gibbs' 700 equations, is the one that Lewis deciphered from the Rosetta stone and brought into the light for the chemists of the world to begin to use.

Affinity and work

The negative of the Gibbs free energy change:

$$-\Delta G$$

according to English chemical thermodynamicist James Partington, "is a measure of the electrical work, chemical work, or internal work done by the system." This can be expressed in terms of the chemical affinities or forces operating among the reactants in the system, in their interactions, bond formations, and bond dissolutions, on the premise that the correct measure of the affinity (A) of a reaction is the diminution of free energy (–ΔG). This can be expressed formulaically, according to Partington, as such: [3]

$$A = -\Delta G$$

Interestingly, Partington comments on this relation between the free energy and chemical affinity that:

> "The consequences of this statement for chemistry are as yet hardly realized, but with the further progress of science it is to be expected that empirical results will more and more give way to exact quantitative laws."

Lewis goes on to state, similar to Willard Gibbs' 1876 description of the two force-functions, that:

> "We may think of the quantity '– ΔF ' as the driving force of a reaction; where, in a thermodynamic sense, a system is stable when no process can occur with a diminution in free energy."

Lewis introduce here not only the notion that free energy change is the driving force of earth-bound natural processes, as was described in 1718 by Isaac Newton in terms of respective values of the forces of chemical affinity A as being the driving force behind reactions, as historically outlined below:

Newton notation (1718)	Lewis notation (1923)	Partington notation (1924)	Modern notation (1933)
$A > 0$	$A = -\Delta F$	$A = -\Delta Z$	$A = -\Delta G$

but also introduces the notion of "stability", i.e. that when the variation of free energy for the process or reaction reaches its lowest value, or, as Lewis puts it, when "no further process can occur with a diminution in free energy", the system will be said to be stable, as would be indicated graphically by the lowest point of free energy on the reaction coordinate, as depicted adjacent.

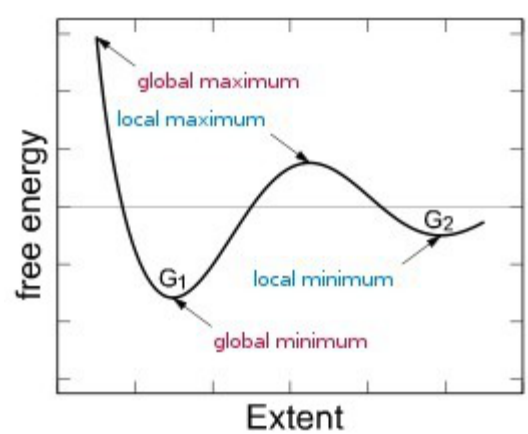

The position of G_1 is such that, in the words of Gilbert Lewis (1923), "no further process can occur with a diminution in free energy", and is thus representative of a state of maximal stability;

Human chemistry

This logic was first applied to human chemical reactions in 1995 by American chemical engineer Libb Thims. [4]

Derivation

The derivation prior to this originated in the various Gibbs inequalities (1876) which in turn are based on the famous Clausius inequality (1856).

whereas the position of G_1 could decrease further in free energy, to the position of state one, and is thus not maximally stable.

Constant volume reactions

Reaction processes governed by the Lewis inequality, to note, can be contrasted with laboratory "volume-bound" processes that occur at occur at constant temperature (isothermal) and constant volume (isochoric), in which cases the thermodynamic relation which decreases is the Helmholtz free energy function.

References

1. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pgs. 160-61). McGraw-Hill Book Co., Inc.
2. Guggenheim, Edward, A. (1933). *Modern Thermodynamics by the Methods of Willard Gibbs* (pg. 17). London: Methuen & Co.
3. Partington, James R. (1924). *Chemical Thermodynamics: An Introduction to General Thermodynamics and its Applications to Chemistry* (pg. 120, 146-47). D. Van Nostrand.
4. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
5. Rossini, Frederick D. (1950). *Chemical Thermodynamics* (pg. 122). John Wiley & Sons, Inc.

θΔics

In inequalities, the **Lewis inequality for a natural process**, as contrasted with the Lewis inequality for an unnatural process, states that any natural change in a system, i.e. those which are actually observed in nature, must show a differential Gibbs free energy decrease if the process is to occur, which is quantified by the following inequality: [1]

for a natural process

$$dT = 0 \qquad dP = 0 \qquad dG < 0$$

Summary the **Lewis inequality for a natural process** according to standard 1933 definition of English chemical thermodynamicist Edward Guggenheim. [1]

$$dG < 0$$

for a differential change in the system, or by the following expression:

$$\Delta G < 0$$

for a change in the system on going from an initial state (in time) to a final state (in time). In hyperlinked form:

$\Delta G < 0$

The Lewis inequality for a "natural process", of the two types of Lewis inequalities, is the inequality for a spontaneous process or reaction. The 'type' of systems here being closed isothermal-isobaric systems not harnessed in some way for the production of useful work, which include the common cases of reactions which 'run freely', like the combustion of a fuel, the action of an acid upon metal, or a reaction between two people on the surface of the earth. [1]

References

1. Guggenheim, Edward, A. (1933). *Modern Thermodynamics by the Methods of Willard Gibbs* (pg. 17). London: Methuen & Co.
2. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pgs. 160-61). McGraw-Hill Book Co., Inc.

θΔics

In inequalities, the **Lewis inequality for an unnatural process** is: [1]

$$dG > 0$$

for a differential change in the system, or:

$$\Delta G > 0$$

for a change in the system on going from an initial state to a final state. The Lewis inequality for an "unnatural process", of the two types of Lewis inequalities, is inequality for a non-spontaneous process or reaction. The 'type' of systems here being closed isothermal-isobaric systems not harnessed in some way for the production of useful work, which include the common cases of reactions which 'run freely', like the combustion of a fuel, the action of an acid upon metal, or a reaction between two people on the surface of the earth. [1]

for an unnatural process

$$dT = 0 \qquad dP = 0 \qquad dG > 0$$

Summary the **Lewis inequality for an unnatural process** according to standard 1933 definition of English chemical thermodynamicist Edward Guggenheim. [1]

References

1. Guggenheim, Edward, A. (1933). *Modern Thermodynamics by the Methods of Willard Gibbs* (pg. 17). London: Methuen & Co.
2. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pgs. 160-61). McGraw-Hill Book Co., Inc.

θΔics

In hmolscience, **Lewis Mumford** (1895-1990) was an American historian noted, in human thermodynamics, for his ideas on social energetics and how thermodynamics applies to theories of human activity. [1]

Overview

In 1934, Mumford published his *Technics and Civilization*, wherein he frequently made reference to the study of economic activity from the viewpoint of energy; following is an example quote: [2]

> "What are called capital gains often turn out, from the standpoint of social energetics, to be losses; while the real gains … [remain] outside the commercial scheme of accountancy."

In 1951, in the context of religious thermodynamics, Mumford reasoned that the evil or destroying force of the universe is captured by the workings of the second law of thermodynamics: [3]

> "As soon as religion, in fact, makes its God the creator and all-wise author of the universe, it must either gloss over the evils of existence at the expense of truth, or it must invoke another principle, equally at work in the universe, which brings the creator's work to naught, defacing his creatures and defaming his beneficent intentions. Sheer logic thus drove man of the classic religions to invent the Devil or the Destroyer, the mythical equivalent of the second law of thermodynamics, who undermines all the constructive activities of life. As Kali, as Ahriman, as Satan, as Loki, the devil personifies an inescapable fact of human experience: the fact of de-building, disorganization, degradation."

Mumford, in his *Pentagon of Power* (1970), according to American social energetics historian Eric Zencey, supposedly, took a theme of approach similar to Fred Cottrell. [4]

References

1. Fernández-Galiano, Luis. (2000). *Fire and Memory: On Architecture and Energy* (pg. 199). MIT Press (written: 1982).
2. Mumford, Lewis. (1934). *Technics and Civilization* (pgs. 112ff, 221ff, 373ff, 375). Harcourt, Brace and Co.
3. Mumford, Lewis. (1951). *The Conduct of Life* (pg. 73). Harcourt, Brace and Co.
4. Zencey, Eric. (2013). "Energy as a Master Resource" (pdf), in: *State of the World 2013: Is Sustainability Still Possible?* (§7:##-; image, figure 1-2). Island Press, 2013.

External links

â— Lewis Mumford – Wikipedia.
â— Lewis Mumford – NNDB.

θΔics

In thermodynamics schools, the **Lewis school of thermodynamics** is generally known as the location of the University of California, Berkeley centered around the work of American physical chemist Gilbert Lewis (1895-1946). [1] Notables from this school include: Merle Randall (1909-1947), George Gibson (1914-1954), William Giauque (1916-1962), Herman Kalckar (1939), Frederick Rossini (1927-1971), Terrell Hill (1936-1942), and Peter Rock (1962-2003).

Photo of the University of California, Berkeley, home to the **Lewis school of thermodynamics**.

UC Berkeley chemical engineering | History

In circa 1906, Frederick Cottrell, classified as UC Berkeley's first true chemical engineer, invented electrostatic dust-precipitation.

In 1912, Gilbert Lewis, as incoming dean of the College of Chemistry, instituted a chemical technology major, subsequently directed by Merle Randall. In 1942, Donald McLaughlin, Wendell Latimer, Randall, Llewellyn M. K. Boelter, and others formed a "graduate group" to offer the MS degree in chemical engineering. [3]

The 1946 appointment of Philip Schutz as professor of chemical engineering marked the administrative decision that ultimately led to the present chemical engineering program at Berkeley. [4]

In 2010, the name of the UC Berkeley "Chemical Engineering" department was changed to the Department of Chemical & Biomolecular Engineering to reflect the widened scope of teaching and research activities in the department.

Lewis school | Formation

The "Lewis school", a term used as early as 1923, or G.N. Lewis school, a term that came into use commonly into the 1950s, refers to anyone schooled under the logic of American physical chemist Gilbert Lewis. In the 20th century, the most cited textbook on thermodynamics was the 1923 *Thermodynamics and the Free Energy of Chemical Substances* written by Lewis and his editorial assistant American physical chemist Merle Randall.

This activity centered around the University of California, Berkeley beginning in 1912 when Lewis was made dean of the College of Chemistry. Lewis stayed there, reorganizing the department, until his death in one of the UC Berkeley laboratories in 1946.

In circa 1914, Lewis, whose major interests were thermodynamics and physical chemistry, placed George Gibson in charge of two new honors courses, 'thermodynamics' and 'advanced physical chemistry'. Out of this, Gibson published, in 1917, an English translation of *A Textbook of Thermochemistry and Thermodynamics*, by Otto Sackur, and this served as a reference text for this subject until 1923, when Lewis and Randall's now-famous textbook on chemical thermodynamics appeared. [2]

Beginning in about 1895, based on work by American engineer Willard Gibbs, Lewis was aware that chemical reactions proceeded to an equilibrium determined by the free energy of the substances taking part. Lewis then spent 25 years determining free energies of various substances via experimental measurement. In 1923, he and Randall published the results of this study, which helped formalize modern chemical thermodynamics. One of his notable students was Frederick Rossini, who wrote one of the first chemical thermodynamics textbooks (1850). Herman Kalckar, who had spent a year at Cal Tech (California Institute of Technology) in Pasadena, was famously said to be in "the orbit of the great G. N. Lewis school of thermodynamics". [1]

Canadian-born American chemist William Giauque, who won the 1949 Nobel Prize in chemistry for studies on the properties of matter at temperatures close to absolute zero, was a student of Lewis at Berkeley receiving his bachelors there in 1920 and PhD in chemistry with a minor in physics in 1922. He later became a full professor of chemistry there

in 1934, where he stayed until his retirement in 1962.

References

1. (a) Ott, Bevan J. and Boerio-Goates Juliana. (2000). *Chemical Thermodynamics – Principles and Applications*, (pg. 229). Academic Press.
(b) Kaplan, Nathan O., Lipmann, Fritz A., Kennedy, Eugene P. (1966). *Current Aspects of Biological Energetics: Fritz Lipmann Dedicatory Volume*, (pg. 2). Academic Press.
2. Anon. (date). "George Ernest Gibson, Chemistry: Berkeley", *Calisphere*.
3. Chemical Engineering – Content.Cdlib.org.
4. About the Chemical and Biomolecular Engineering Department – Cheme.Berkeley.edu.

θΔics

In genius studies, **Lewis Terman** (1877-1956) was an American psychologist noted for his 1916 invention of the concept of the intelligent quotient "IQ" and the "IQ scale", a 1-200 point numerical scale: 20 being idiot, 100 being average intelligence, 140 being genius level, and 200 being ceiling genius range for intelligence ranking, testing, and classifications methodology.

In 1917, Terman used his formula to calculate or rather miscalculate (see: IQ miscalculation) an IQ of 200 for Francis Galton. [2]

Quotes | By

The following are quotes by Terman:

> "How to find the IQ of adult subjects. Native intelligence, in so far as it can be measured by tests now available, appears to improve but little after the age of 15 or 16 years. It follows that **in calculating the IQ of an adult subject, it will be necessary to disregard the years he has lived beyond the point where intelligence attains its final development**. Although the location of this point is not exactly known, it will be sufficiently accurate for our purpose to assume its location at 16 years. Accordingly, any person over 16 years of age, however old, is for purposes of calculating IQ considered to be just 16 years old. If a youth of 18 and a man of 60 years both have a mental age of 12 years, the IQ in each case is 12 + 16, or .75. The significance of various values of the IQ is set forth elsewhere. Here it need only be repeated that 100 IQ means exactly average intelligence; that nearly all who are below 70 or 75 IQ are feeble-minded; and that the child of 125 IQ is about as much above the average as the highgrade feeble-minded individual is below the average. For ordinary purposes all who fall between 95 and 105 IQ may be considered as average in intelligence."
>
> — Lewis Terman (1917), *The Measurement of Intelligence* (pgs. 140-41)

> "There is nothing about an individual as important as his IQ, except his morals."
>
> — Lewis Terman (1922) [3]

See also

â— Terman IQ

References

1. Terman, Lewis. (1916). *The Measurement of Intelligence: an Explanation of and a Complete Guide for he Use of the Stanford Guide for the Use of the Stanford Revision and Extension of the Binet-Simon Intelligence Scale* (I.Q., pg. 53, etc.). Houghton Mifflin Co.
2. Terman, Lewis. (1917). "The Intelligence Quotient of Francis Galton in Childhood," *American Journal of Psychology*, 28: 209-15.
3. Castles, Elaine E. (2012). *Inventing intelligence: How American Came to Worship IQ* (pg. 3). ABC Clio.

External links

â— Lewis Terman – Wikipedia.
â— Lewis Terman – Human Intelligence, University of Indiana.

θΔics

In hmolscience, **Lewis Wolpert** (1929-) (CR=3) is a South African-born English developmental biologist (powered-chnopsologist) and atheist noted for his evolution debates with creationists, and as someone who has spoken out against the argument for evil (Bo Jinn, 2013). [1]

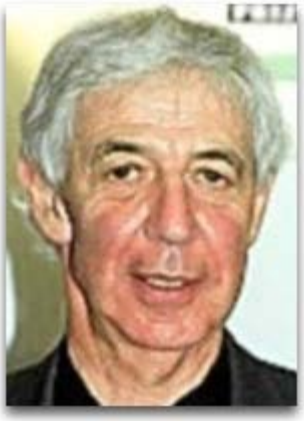

In a circa 2009 film *Creation*, Wolpert debated English thermodynamics professor and creationist Andrew McIntosh and theistic evolutionist Denis Alexander. (Ñº)

Quotes

The following are noted quotes:

> "I regard it as ethically unacceptable and impractical to censor any aspect of trying to understand the nature of our world."
>
> — Lewis Wolpert (2002) "Is Science Dangerous" (Ñº) [1]

References

1. Jinn, Bo. (2013). *Illogical Atheism: a Comprehensive Response to the Contemporary Freethinker from a Lapsed Agnostic* (eB). Sattwa Publishing, 2014.

Further reading

â— Wolpert, Lewis. (1992). *The Unnatural Nature of Science*. Faber & Faber.

External links

â— Lewis Wolpert – Wikipedia.

θΔics

In human physics, **Lex Sisney** (c.1968-) is an American business consultant noted for []

Overview

In 2012, Sisney, in his *Organizational Physics: the Science of Growing a Business*, applied concepts such as force and English physicist Isaac Newton's laws of motion to things such as business execution; the following is an excerpt from his acknowledgments section: [1]

> "When it comes to physical sciences, this book will reference the luminaries of classical physics, as well as biology and systems theory. These include Ludwig von Bertalanffy, one of the founders of general systems theory, who helped us see that systems are everywhere and exhibit some common properties; Edward Lorenz, the mathematician and meteorologist who worked in obscurity while identifying the principles of chaos theory; Charles Darwin, the legendary biologist and grandfather of evolution theory who recognized that the single greatest mistake a species can make is to fail to adapt to its environment; Rudolf Clausius, who introduced the world to the principles of thermodynamics and the concept of entropy; and, of course, the greatest classical physicist, Isaac Newton, who helped us understand the laws of motion and momentum."

Lex's approach seems to be a mixture of business thermodynamics, business physics, possibly even mixed in with business chemist ideas. In the introductory section of the book, Sisney gives what he calls the six laws of organizational physics:

1. An organization is a complex system.
2. An organization is subject to the first law of thermodynamics.
3. An organization is subject to the second law of thermodynamics.
4. An organization must shape and respond to its environment and do so as a whole system, including its parts and sub-parts.
5. An organization is subject to the conditions of its environment.
6. An organization is subject to the laws of motion.

Each of which he clarifies further with synopsis paragraphs. Then, after quoting the famous Arthur Eddington "supreme law" quote, states the generic motto: "you, me, and everything in the universe are ultimately falling apart over time. Wherever we find aging, disintegration, deterioration, and disorder we're looking at entropy at work", then gives the following formula for success:

$$\text{Success} = \Sigma \left[\frac{\text{Integration}}{\text{Entropy}} \right]$$

which seems to the gist of his book, which seems to be angled as being a type of CEO guidance book.

Other

In 2005, Sisney published Ready for Enlightenment?, which he describes as a "guide to spiritual development for Type A leaders, which has been endorsed by luminaries like Deepak Chopra, Gay Hendricks, and Barbara Marx Hubbard", which would seem to give a red flag indication that his "physics" is likely to be biased towards new age types of spirituality.

See also

â— Dan Cobley

References

1. Sisney, Lex. (2012). *Organizational Physics: the Science of Growing a Business*. Publisher.

External links

â— Lex Sisney (about) – OrganizationalPhysics.com.

θΔics

In existographies, **Libb Thims** (1972- ACM) (222- AG) (HFE:29) (RMS:109) (LR:3) (EPD:M12) (FA:221) [CR:2087] is an American electrochemical engineer, noted for his work in atheism-explicit physico-chemical monism, such as alluded to below:

Nationality	American
Genetics	German | 50% Swedish | 25% Irish | 12.5% French-Scottish | 12.5%
Residence	Chicago, Illinois
Legal name	Libb Michael Thims (2009)
Fields	Human thermodynamics | 1995 Human chemistry | 2007 Human physics **Hmolscience** | 2010 Smart atheism | 2014 Genius studies | **Top 1000 geniuses**
Alma matter	University of Michigan
Institutions	Institute of Human Thermodynamics
Known for	Human chemical thermodynamics Defunct theory of life Human molecular theory Paradigm change Thimsian atheism
Library	Total: 1,500+ books Thermodynamics: 400+ Mate selection: 140+ Religio-mythology: 130+ Neuroscience: 50+
Collected works	Total: 13+ volumes (see: books)
Influences	**Clausius**, Gibbs, Gilbert Lewis, **Goethe**, David Buss, Greenberg, Shelley, Paine, **Holbach**
Awards	Lomonosov award (2008)
Nominations	Nobel Prize (2007) (Ñº) Ig Nobel Prize (2010)
Contact	libbthims@gmail.com
Other	DN:10; GS:60+

Signature

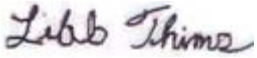

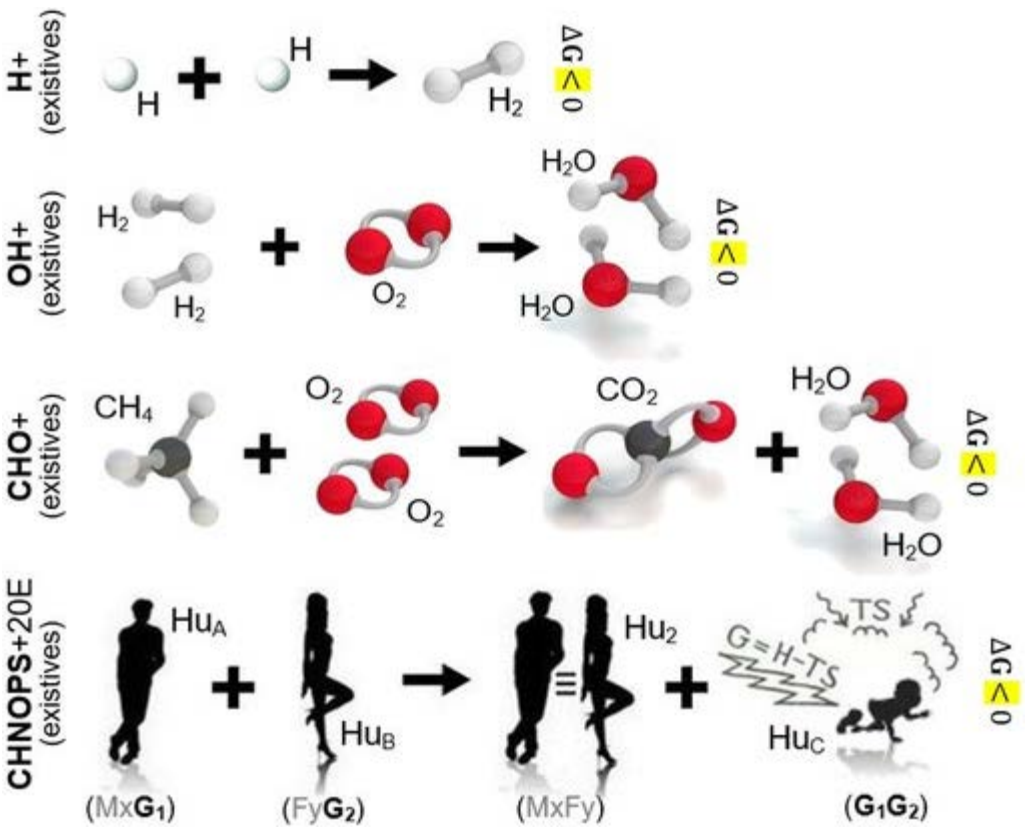

Thims, in more detail, is an **anti-chance**, unlearn, **abioist**, **asoulist**, go-thing philosopher, and **explicit** (compare: implicit) **smart atheism** advocate (see: Thimsian atheism), noted for his ongoing work in the development of **human chemical thermodynamics**, i.e. thermodynamics, chemical thermodynamics in particular, employed as a foundation to explain every "thing", movement, and phenomena, especially applied to the more deeply rooted and **religio-mythology**-intertwined questions in the humanities.

> "Since my name is not Socrates or Einstein and I hold only one [organic chemistry] of the **seven or eight PhD degrees** [see: **polymathy degree problem**] this problem [EAP] requires, readers are quite justified in questioning my qualifications to testify as such a multidisciplinary expert."
>
> — George Scott (1985), *Atoms of the Living Flame* (pg. viii)

The following are two recent publication efforts in this direction, namely: *Smart Atheism: for Kids*, which stalled out at the three volume draft level (Jan 2017), and the currently-drafting *Human Chemical Thermodynamics: Chemical Thermodynamics Applied to the Humanities – Sociology, Economics, History, Philosophy, Ethics, Government, Politics, Business, Jurisprudence, Religion, Relationships, Warfare, and Meaning* (2019): [15]

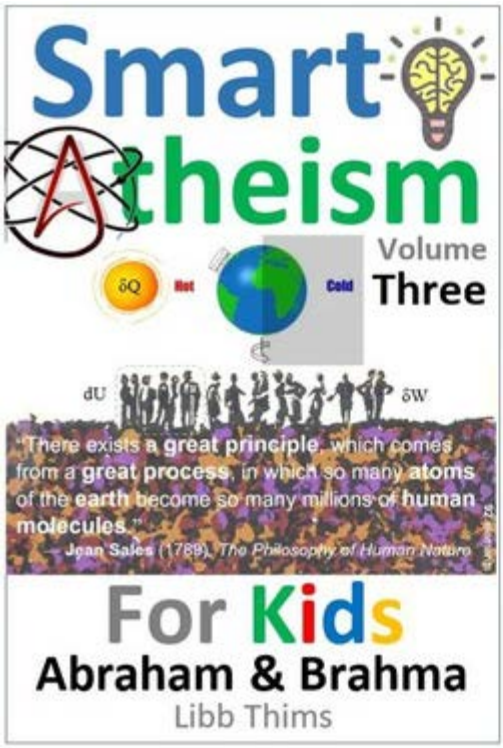

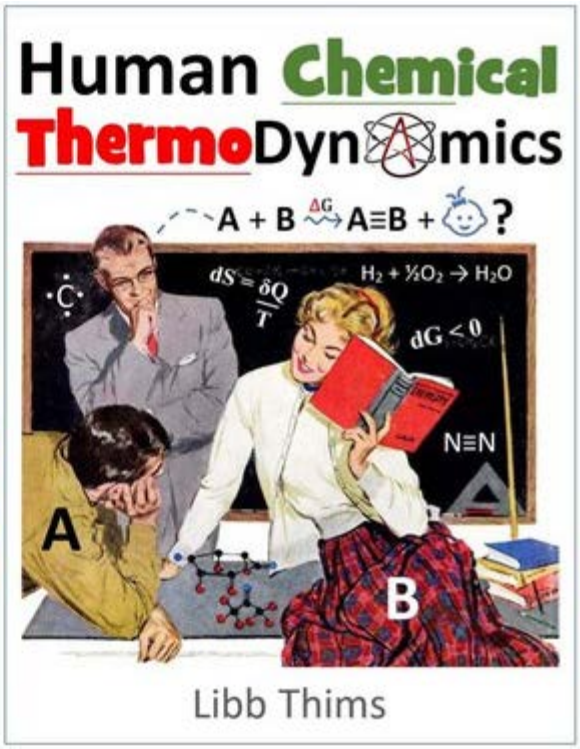

Thims, in short, is the history's leading scholar in physicochemical humanities, i.e. in the two cultures namesake subjects.

Overview

In 1995, Thims, out of curiosity, engaged into the puzzle solving hobby (see: reverse engineering puzzle), turned 2005 to present public work (see: genius hiatus effect), in the development of physicochemical humanities, a generalized version of physicochemical sociology (Beg-Adams variety) or mathematical economics (Wilson-Winiarski variety), among other synonyms (see: two cultures namesakes), centered on the Goethean-Empedoclean logic that what governs the spontaneity of reactions between atoms and molecules, e.g. sodium displacing hydrogen in its bond with oxygen (in H_2O), or smaller animate carbon-based or CHN-type "chemical" entities, e.g. the bending of the retinal molecule ($C_{20}H_{28}0$) in response to light, or trajectories of surface-attached molecule, e.g. walking molecules or carrying molecules, whether natural (e.g. kinesin) or synthetic (e.g. DTA), is what "governs", from an explicit extreme realism-based atheism purview, aka smart atheism view, the spontaneity of larger "human" CHNOPS+20 type reactions and behavior (see: human chemical reaction theory); the latter variant of reactions being but a more complex or "evolved", as Darwin (1859) saw things, "metamorphosized", as Goethe (1809), or "synthesized", as Thims (1995) sees "things", bound state existence-extended powered animate variant of the former.

Works

The following are the main publications of Thims as of Apr 2016:

A 15 Sep 2019 photo during the monumental meeting of Mirza Beg (EPD:F11), author of *Physico-Chemical Sociology* (1987),

and **Libb Thims** (EPD:M12), author of *Human Chemistry* (2007), the first two main books to independently outline chemical thermodynamics based human chemical reaction theory, in Karachi, Pakistan, at the start of their 5-day interview session.

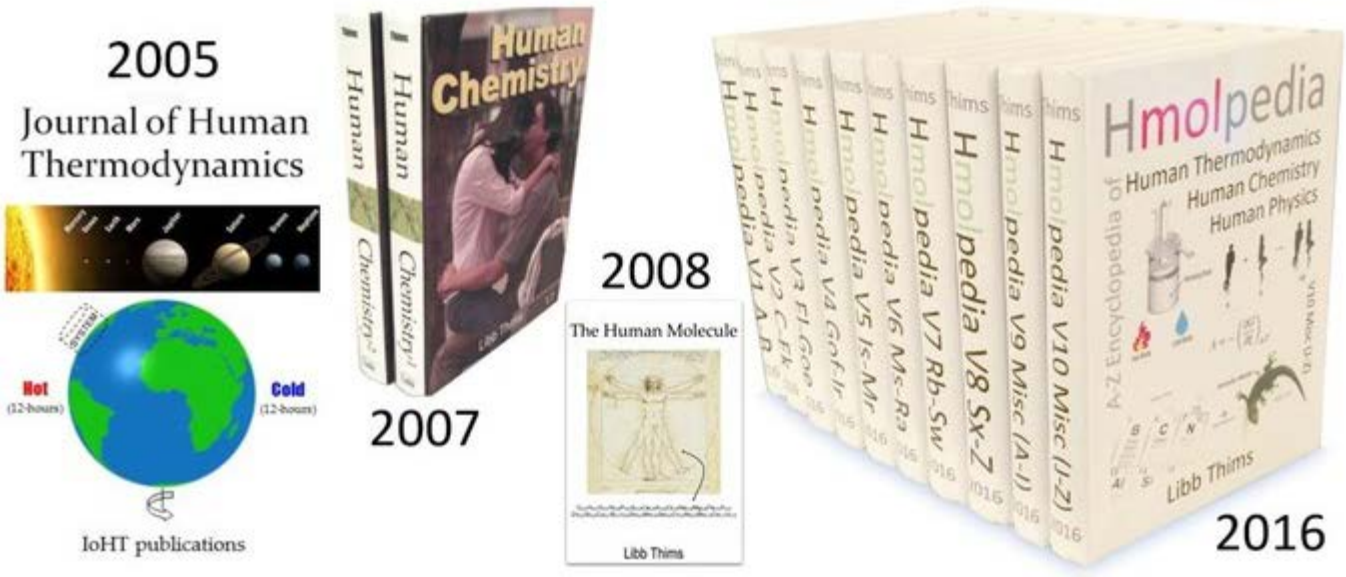

which have arisen out of a total 15+ draft-stage projects (and manuscripts), among other article-sized publications, symposium presentations, courses taught, lectures, and videos.

Quotes | On

See main: Libb Thims (quotes on)

The following are quotes and or commentary on or about Thims and his work:

> "Eye-opening and understandable. Revolutionary!"
>
> — Lynn Liss (2003), American MBA student; review of *Human Thermodynamics* manuscripts

> "Something 60-80 years ahead of its time. **Thims**, in the future, will be someone who's talked about in classrooms as this guy who had **this idea**. However, now, yes the book will sell, but its premise will not be accepted by people of this generation."
>
> — Monzer Ettawil (2005), American law student; see: posthumous genius [1]

> "**Thims**' brilliant book [*Human Chemistry*] symbolizes the beginning of a new era (epoch) in human history."
>
> — Georgi Gladyshev (2006), Russian physical chemist [2]

> "One day instead of (or in addition to) regular math, chemistry, physics, etc., kids in school will

Hmolpedia

be learning something like one human molecule + another human molecule = ? ... it's just a crazy thought, but hey, we'll see or somebody will."

— Natalia Roubanenko (2006), Russian-born American language studies scholar (see: dihumanide molecule; human reproduction reaction; zerotheism for kids); commentary after reviewing 100-page manuscript of **Thims**' *Cessation Thermodynamics*, Apr 29

Thims (2016) giving an off-the-cuff video overview of the newly-printed 10-volume *Hmolpedia* set (see: print set).

"I want to say how much I enjoyed reading [**Thims**] splendid discussion of Gibbs free energy. It is wonderful to see someone who is not afraid to look at the phenomena of life in a unified way."

— John Avery (2006), Lebanese-born Danish physicist and theoretical chemist

"The chapters [*Human Chemistry*] are wonderfully written. I have a feeling it will be [**Thims**] who will get the public's attention about the fundamental change in thinking in science."

— Jing Chen (2006), Chinese-born Canadian mathematician and economist [3]

"**Thims**' edits are far and wide. Unless Physchem is an incredible polymath, I doubt he would be able to pick up on all the BS a Thims-type editor introduces. That's not knocking Physchem, I don't think there is anyone who could deal with the range."

— Keith Henson (2007), American electrical engineer and evolutionary psychologist

"If we accept **Thims'** logic of human thermodynamics as a viable explanatory framework, which it very well is, romantic bonding then becomes the subject matter of quantum electrodynamics (QED), an aspect of particle physics that traces human attachment and bonding to the interactions of photons and electrons. Thus, applying Thims' theory to interpersonal and love relationships, it is unlikely that any one person has the ability to coerce or unilaterally secure another person's affection. In a different sense, the force of attraction between a man and a woman is beyond their physical control, except, of course, by way of the energies they emit and exchange between them. Thims' *Human Thermodynamics* thus makes substantial contribution to our understanding of the perplexing nature of romantic love, greatly supplementing prior research in this field."

— Satch Ejike (2008), African-born American lawyer and social scientist [4]

"I

Top (left): **Thims**, at BPE 2016, with Jurgen Mimkes, Ram Poudel, and Serge Galam. Top (right): Thims, holding copy of volume one of the newly-published 10-volume print set of *Hmolpedia*, with Mimkes (see: two-hour Mimkes video interview **playlist**). Middle (left): Thims, in 2013, in Pitesti, Romania (see: UPESW 2013), with the two heads of the Romanian school of physical socioeconomics: physicist Ion Siman and economist Gheorghe Savoiu, holding Thims' 2008 *The Human Molecule*, Thims, holding Savoiu and Siman's 2012 *Econophysics: Background and Applications in Economics, Finance, and Sociophysics*, and engineer Constantin Bratianu, noted for his work in "knowledge thermodynamics", i.e. thermodynamics applied to business theory. Bottom (left): Thims in circa 1995 partying at clubs in the Flats, Cleveland, Ohio, during which time the seeds of human chemical thermodynamics began to plant (see: Thims thought experiment). Bottom (middle): Thims and Georgi Gladyshev in Chicago 2007, discussing thermodynamics applied to evolution and the humanities (see: Gladyshev and Thims). Bottom (right): Thims with "King Atheist" Patrick Fergus in 2014 during their debut Atheism Reviews show "History of Atheism" (see: atheism timeline) doing fist-bump (@2:45-) after Fergus responded to the query: in what year did Nietzsche declare that 'god is dead?' [answer: 1882] with the quick-witted answer: "god can never be dead, because he's never existed."

stumbled onto [**Thims**] website by accident but I have to confess this might be one of the most stunning undiscovered intellectual achievements of the 21st century. I have browsed through your wiki and I cannot express how tragic it must be to a man in your position—to be a pioneering thinker yet to be rejected by an uptight academic community with neither the depth nor will to understand your unique work, defending their own turf like dogs. I can only compare you to the many other pioneering heroes of science, Newton, Einstein, Tesla, men who like you blazed their own paths but were too victims of their own genius, only to be validated years after their death. Perhaps one day historians will look back and have a chuckle—that the

pioneer of enthropology published by a vanity press in a book resembling a third rate romance."

— Steven Pierce (2009), Canadian mathematical physicist and computer scientist [5]

"I think the notion that Facebook may be in the process of auto-brain-forming is at least credible as the idea that we – us humans – can be thought of as giant molecules. As a starting point to examine this intriguing concept see: "Inside the IoHT" as explained by **Libb Thims**, at the Institute of Human Thermodynamics."

— Martin Gardiner (2010), comment (Ñº) to Carl Zimmer's "Facebook is Not a Brain, and Other Failed Metaphors", Jul 9

"One of the most interesting topics [human molecule] I have ever had the pleasure to read. Going through it a second time, and looking forward to the third. [*The Human Molecule*] covers the most fundamental change in human knowledge since Charles Darwin's *On the Origin of Species* [1859], by presenting a theory that we are fundamentally molecules, and that the question of life itself is a fundamentally flawed one. Especially important is the carefully laid out historical narrative of how **Thims** came to his theory of the human as a molecule. Whether you ultimately agree with this work or not, it represents a paradigm shift in viewing our place in the world."

— Jeff Tuhtan (2011), American civil engineer and ecological thermodynamicist [6]

"**Libb Thims**: the great oracle and developer of human thermodynamics—the philosophical revolution of the 21st century. A genius of outstanding stature and originator of many concepts in human chemistry. [His] breathtaking contribution to science needs to be rewarded. Let's hope one day [he] can add a Nobel Prize to [his] impressive career."

— Mark Janes (2011), English chemical engineering student turned biotechnologist and human free energy theorist [7]

"I must say, I started watching your videos over a year ago, and have re-watched many. And they still fascinate me. I'm only 17 and I'm seriously considering doing a degree in chemistry after watching your videos. The only downside is not many people I know can have a conversation about the things you're talking about. You were right your videos are **decades if not a century in front of its time**."

— Benjamin Cresdee (2011), comment on Human Chemistry 101 YouTube channel

"The idea that individual humans are atom-like entities and there is a kind of chemistry between social atoms and molecules is very natural, but whether it is more than a metaphor remains uncertain. Anyway, human chemistry has been on the marketplace of ideas for quite a while [see: Goethe timeline, 1796]. The main reason why I abstain from referring to **Libb Thims'** flamboyant venture other than as to a commendable review of literature is that he, apparently, uses the term chemistry too literally in the sense of molecular chemistry, while I am interested in pattern chemistry. I can only note that the very idea of human thermodynamics as a separate subject looks to me completely sound. Thus, the concept of metabolic cost is part of it. Obviously, human interaction is a component of global economy."

— Yuri Tarnopolsky (2011), *Introduction to Pattern Chemistry* [8]

A selection of video-recorded "experiments" done by Thims in 2013 to 2015 (see: Thims experiments) to exemplify physical and chemical principles that scale and or apply to the social interaction level.

"The short booklet *The Human Molecule* by **Libb Thims** (esp. chapter 9 and pg. 70 - the Molecular Evolution Table) presents a fascinating depiction of man's evolution. One is able to see how all life forms slowly became more complex by way of molecular evolution. Accepting this evolutionary understanding requires us to also accept a 'new story' in our quest."

— Tavit Smith (2012), "Ancient Religions and the New Story", Jan 1 [9]

"[Human thermodynamics] is a branch of science that attempts to predict the behavior of people via chemical and thermodynamical equations. It is an interesting philosophy, a change of paradigm, perhaps even having a broader explanation for human behavior than Darwanian evolution. Human thermodynamics can also be useful as a new framework for the origin of life. For instance, **Libb Thims**, proposed online that the idea of Darwin's 'dark pond' which suddenly sprang to 'life', is not a very coherent one [defunct theory of life], and that it would be much more creditable and parsimonious to have as a rule that molecules bond and form ever more complex beings. Libb Thims also proposed a 'human molecule' where people are attracted to each other by chemical bonds [see: human chemical bond]. All this I believe to be a reasonable explanation: even if Darwin's theory is still correct, the approach of thermodynamics and chemistry is a much more simple, and at the same time broader view. If the concept of biology is somehow redundant, then we must study it by means of chemistry and physics."

— David Bossens (2012), "Reflections: Criticisms of Science" [10]

"**Libb Thims** is [a walking] encyclopedia of human thermodynamics."

— Milivoje Kostic (2013), introduction to Thims' 16 Apr NIU talk [11]

"This [are viruses alive] debate could take an entirely different route if you consider a letter published [2009] in the *Journal of Human Thermodynamics* by **Libb Thims** in which he discussed the idea that a theory of life was in fact defunct. The point was made that we do not consider a single atom to be alive, nor two atoms, or three. He builds

A video still of Thims, amid the 2015 "Zerotheism for Kids" lecture, one of near a dozen public lectures Thims has given (see: Thims lectures), including four universities (UIC, NIU, UP, and UDC) and two conferences (UPESW 2013 and BPE 2016), as of 2016, teaching six kids (see: Thims students) aged 6 to 11 the modern upgrade to the 5,000-year-old "god created the world in six days", Nile flood (Noah's flood), and Adam and Eve model of everything, with humans as evolved powered CHNOPS+20 chemicals, with a chemical thermodynamic morality (i.e. Goethean morality) system, moving in a big bang universe, amid a human chemical reaction model view of everything.

on this statement to say that 'it should be very obvious that no matter how many atoms one adds to the argument that an atom or a structure made of two or more atoms cannot be alive'. This is a **bold statement** as it clearly implies that it is impossible to apply the idea of life to anything, even us. Nikola Tesla also outlined a 'defunct theory of life' in 1915 where he said that 'There is no thing endowed with life'. This is obviously a very pedantic way to look at the definition of life but a relevant viewpoint nonetheless. Is anything living, or nothing? Or everything?"

— David Busse (2013), "Viruses: Living or Not?", Dec 10 [12]

"I've got a MA in chemistry—but your book [*Human Chemistry*]—it really affected me. I've been prompting it in our university [Technion] in the last couple of years—and got great responds from some top researchers—I think you're doing excellent work!"

— Ofer Po (2013), Facebook messaging; see: religious views (Ñº) adjacent (Dec 24)

"I was very excited Mr. **Libb Thims** on reading about your Hmol.science [hmolscience] which touches the human dimensions with the implicit assumption that human transformation processes are thermodynamic transformation processes and that reactions between people constitute chemical reactions between human molecules."

— Mirza Beg (2014), email communication (15 May) following Thims' 13 May discovery of Beg's very ripe physicochemical sociology book (*New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, 1987)

"American electrochemical engineer **Libb Thims** took an unorthodox approach when he set out to rank the smartest people of all time."

— Natasha Bertrand (2015), "The 40 smartest people of all time" (Ñº), *Business Insider*, Feb 27

"When I visited the house of German writer and artist, Johann Wolfgang von

A 2012 YouTube 34+ thumbs up ranking of **Thims** as having the **"highest IQ"** ever, above that of Goethe (IQ=230), Einstein (IQ=220), and Newton (IQ=215), from the comments section of part four of the "IQ 200+ | Smartest person ever" video (rate: 1.5 thumbs-up votes / 336 views **âˆ™** day), a countdown to the last universal genius, German polymath Johann Goethe, ranked, starting from the Cattell 1000, the 1894 listing of the thousand most eminent individuals of history, by a team of Stanford psychologists led by Catherine Cox (*Early Mental Traits of 300 Geniuses*, 1926) and Lewis Terman, the group that invented the IQ scale, with an IQ of 225, the highest of all modern genius IQs.

Goethe (the oft-called 'last universal genius') in Weimar many years ago, I was taken by his original writing desk. To stand before the great writer's creative space thrilled me. I was quite literally standing in the spot he wrote his great works; you see, he wrote while standing up. His desk was tall, five feet high and on a slant like a podium. Since then I've discovered other genii who also wrote whilst on their feet. Sir Isaac Newton wrote his entire *Mathematical Principles of Natural Philosophy* standing up. Ernest Hemingway also wrote standing at a chest height desk on which he'd placed his typewriter. He once said, 'writing and travel broaden your ass, if not your mind, and **I like to write standing up**.' German philosopher Friedrich Nietzsche, and American electrochemical engineer **Libb Thims** also wrote standing up. Even Aristotle is credited with walking about while talking and thinking. So, with so many great thinkers to vouch for the benefits of standing up to write, a while ago I purchased a standing desk for myself."

— Angela Sunde (2015), "Standing Up to Write", Apr 8 [14]

"My brain is getting bigger by the minute."

— Caleb (2015), six-year-old student of "Zerotheism for Kids" class; comment (V[L10]:6:30) on learning (from **Thims**) big bang to human molecule based evolution, in upgrade to god-based six-day creationism, Aug 10

"**Libb Thims**, whose real IQ I estimate at 200, is an American electrochemical engineer, and one of the ten most intelligent humans currently reacting on this planet. His primary website, the *Encyclopedia of Human Thermodynamics*, is widely considered the greatest intellectual achievement on the Internet. The EoHT Forum discusses topics spanning from morality to 'life' and 'death', and from literature and art to the many fields of science. Reading through the threads on the forum will probably yield an increase in the reader's IQ."

— Inderjit Singh (2015), "Knowledge is Power" (Ñº), Oct 3

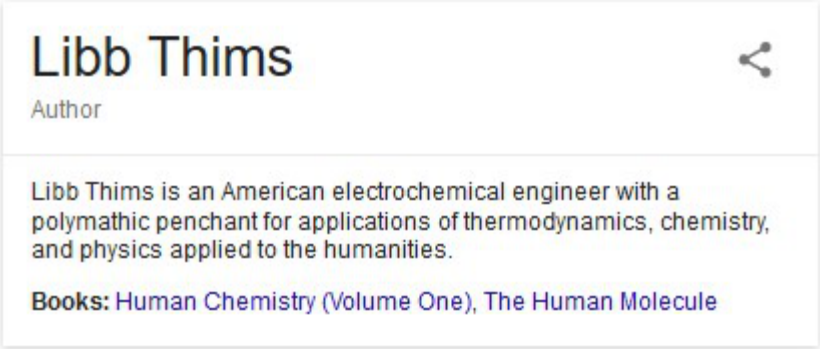

A 2016 Google "noted person" (Ñº) profile for Libb Thims.

"Economist Roefie Hueting (1929) explains that his economic analysis on the environment isn't understood by Herman Daly, which is a pity since Daly worked at the department for the environment of the World Bank in 1988-1994. **Libb Thims** suggests that Georgescu-Roegen and Daly have a wrong concept of thermodynamics as well: but I have not looked into this. We see a similar kind of confusion with

Robert Costanza, who has a background in architecture and environmental system engineering, but who switched to what is called "ecological economics" but which quite surely need not be economics at all, but which may be an application of hoped-for notions of thermodynamics."

— Thomas Cool (2015), "Dirk Bezemer disinforms Dutch Parliament" (Ñº), Nov 17

"I have **watched your videos for years** and was wondering if you might let me know what you consider to be the single most important thing you have learned throughout your studies?"

— John Gaetano (2016), "Email query to **Thims**"; Harvard (Ñº) freshman studying government (Ñº) (see: response), Mar 6

"Congratulations for publishing the 10-volume print set of *Hmolpedia*. I will recommend it to librarians I know. Excited to see your great contribution to this field now also available in printed version. You are one of my inspirations of the difference a **one-man-army** may make to resuscitate this field! I repeat, you are a living encyclopedia of HT. I have no doubt many aspiring students like me around the world benefiting from your contribution to the field."

— Ram Poudel (2016), "Email communicate to Thims" on news of finishing printed version of *Hmolpedia*, Mar 25 + Aug 2

"For a **really down-to-earth** discussion of the topic that entropy and information are not the same thing, see: **Thims** (2012)."

— Roman Krzanowski (2016), "Towards a Formal Ontology of Information" (pg. 19)

"The book: *New Dimensions in Sociology, A Physicochemical Approach to Human Behaviour* (1987) received major attention in 2014 when **Libb Thims**, of the Institute of Human Thermodynamics, in Chicago, compared the work with that Goethe some 200 years back. His appreciation encouraged me to develop the Socio-Physicochemical Theory and one may find a few publications on ResearchGate all based on application of the Theory."

— Mirza Beg (2017), "Living in an Entropy-Driven World: Socio-Physicochemical Theory" (Ñº), Jan 7

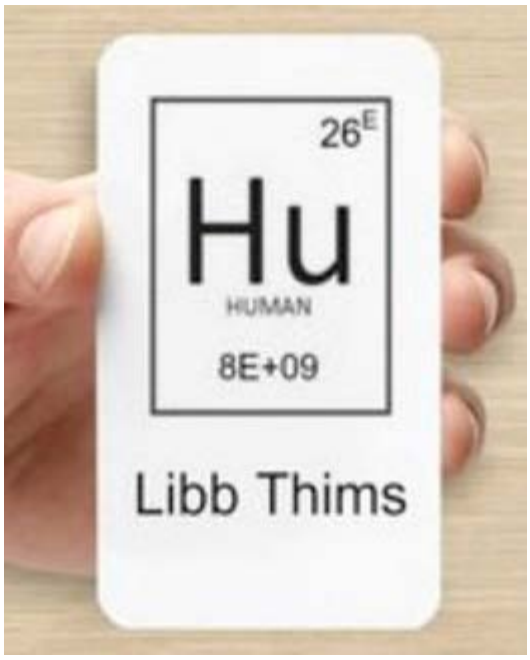

Thims' 2020 business card, which he keeps in his back pocket, and gives to connections, the back side having only his phone # and emai, the **Hu** symbol short for "human element" (or human chemical), the 26 symbolic of the fact that a human is a CHNOPS+26 element thing, the number 8E+09, representative of the mol amount

"I love this site. It's pure genius. I have never seen someone rank geniuses in such a brilliant way. I dedicated a [468+ genius] genealogy project (Ñº) to your work. You even have a [Geni.com] profile (Ñº) … because I feel your work deserves wider recognition. I am fairly intuitive … I feel you are descended from Goethe (or another genius on your list)."

— Alex Bickle (2017), cite [oye777] message to Libb Thims, Feb 22, 25

"Chemical engineer **Libb Thims** has compiled an **incredibly**

sophisticated wiki, titled the *Encyclopedia of Human Thermodynamics*, of the historical works attempting to merge social systems and humans to thermodynamics. Libb concludes that humans actually are molecules, a complex 26 atom molecule. As Libb's cohort has shown, many have attempted, in many ways, to apply thermodynamics to social systems."

(population) of humans on the earth. [17]

— Jacob Leachman (2017), "Social Thermodynamics: Gibbs and the Energy for Change" (Ñº), Aug 24

"Definitely putting a delta G on my tombstone! ï»¿"

— Dan Pohl (2017), comment on "Rod and Libb and Cemetery" (Ñº), Sep 10

"**Libb Thims** is a very smart atheist (Ñº). So smart, in fact, that he's cracked the code to life, the universe, and everything. Welcome to the wonderful world of 'zerotheism'. In this world, human thermodynamics can explain everything, even love!"

— IwasAmWillBe (2019), "forum post" (Ñº), KiwiFarms, Jul 22

"**Libb Thims** is an American electrochemical engineer who is building the extraordinary web-based Encyclopedia of Human Thermodynamics at EoHT.info. This valuable knowledge base on the work of hundreds of scientists, engineers, and philosophers he calls the 'Hmolpedia' (a human molecule encyclopedia). He is a prolific writer and has published several books exploring his hypothesis that chemical thermodynamics can be used to explain many aspects of human life."

— Robert Doyle (2020), "Libb Thims", InformationPhilosopher.com, Mar 13 [16]

Quotes | Cited

See main: Libb Thims (quotes by)

The following noted quotes by Thims cited by others:

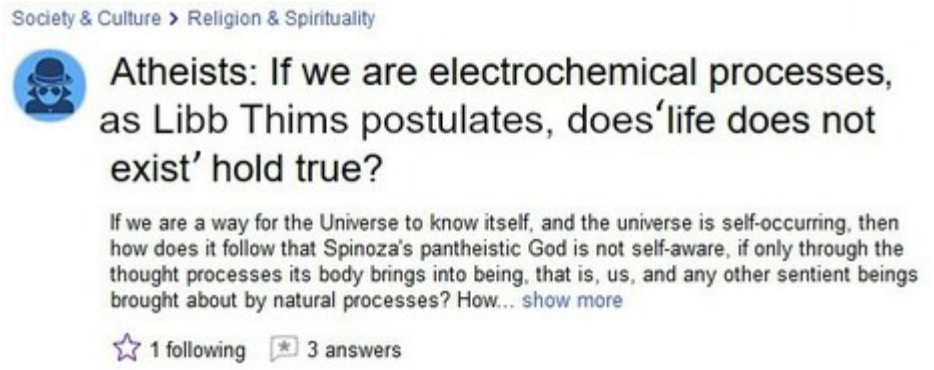

A 2015 Yahoo Answers query (Ñº) about **Thims**' version of the "**life does not exist**" view, intermixed with discussion of Spinoza's god; see: defunct theory of life (2009) + life terminology upgrades (2012); see also: Thims' "Lotka's Jabberwock" (2016) talk given at BPE 2016.

"The elaborate superficial phenomenon of two humans bonding in an intimate relationship is simply put: 'a chemical reaction'. Here, two molecules bond, energy is given off; some energy goes to waste, some to purpose. If anyone finds this to be pseudoscience than perhaps ignorance is bliss."

— **Libb Thims** (2005), "Wikipedia 'human thermodynamics' AFD discussion" (Ñº), Jun 20; cited [post #5] by Mahesh Deva (2012) amid dialogue (Ñº) on HT principles (Ñº), Nov 3.

"Human thermodynamics is the chemical thermodynamic study of human molecular reaction life

[existence]."

— Libb Thims (2007), *Human Chemistry, Volume Two* (pg. 653) (Ñº)(Ñº); cited by Spyros Tzafestas (2018) in *Energy, Information, Feedback, Adaptation, and Self-organization* (pg. 145)

"You agree with me that the single atom is not alive. What about two atoms? What about three? Does a bound state of atoms have to have a certain movement to be considered alive? What if we heat a system of four atoms, do they suddenly become alive? What if we subject a system of atoms to both gravitational and electromagnetic forces, does that suddenly make them alive? What if the two forces act to move smaller atoms through the cavities of larger atomic [structures] [molecules] on a cyclical basis, thus activating reactions [metabolism] in the process, does that make them alive? What if the two forces begin to arrange the atoms into hierarchies, and that smaller atoms and bundles of atoms begin to move between the hierarchies, does that make them alive? What if a structure of atoms, begin to turnover their internal atoms, with those of the surrounding space, on a cyclical basis, does that make it alive? It should be very obvious that no matter how many atoms one adds to the argument that an atom or a structure made of two or more atoms cannot be alive. It is my view that one cannot define an atom or two or more atoms structured as a bound state to be alive. The word itself and baggage of theory surrounding the word is meaningless. It is akin to the words: vitalism, élan vital, hylozoism, panpsychism, etc. From the point of view of the molecular evolution table, according to current views, rows 1-10 are considered to be not alive, rows 11-28 are considered to be *alive*, and rows 30 and above are not alive. Because of our anthropocentric biases, we continue to believe that we are unique among molecular structures, in that those much smaller or much bigger than us are not alive, whereas we are. It is a grave mistake to believe in this fallacy. I am not quite sure what the alternative theory is; but from the point of view of atoms, molecules, and the logic of the chemistry textbook, the **theory of the conception an atom, or two or more attached atoms, being alive is absurd**. This is my view."

— **Libb Thims** (2009), "Letter to Georgi Gladyshev", Jan 2; cited by: DMR Sekhar (Ñº), 7, 20 Aug 2010 and 2014 (Ñº); Vangelis Stamatopoulos (Ñº), 15 Nov 2010; David Bossens (Ñº), 19 Jun 2012 and 3 Jan 2013; David Busse (Ñº), 10 Dec 2013; YouTube forums (Ñº), 2014; Georgi Gladyshev (Ñº), 2014; among others (Ñº) [13]

"People use to respect intelligence."

— **Libb Thims** (2010), "On IQ faker empty genius charlatans" (e.g. Marilyn Savant, Chris Langan, Rick Rosner, Paul Cooijmans, etc.), made in "IQ:200+ | Smartest Person Ever" (Ñº); a 2016 John Gaetano (Ñº) six-year favorite resonating quote

"A belief in god or gods, particularly for those born [synthesized] after 1895, is an automatic disqualification from the 200+ IQ range. This question, in fact, should be the first question asked on any standard high IQ test, whereby an answer of 'yes' would result in an unequivocal 15% reduction in the final IQ score."

— Libb Thims (2010), "IQ: 200+" (Ñº), Hmolpedia; Reddit (2019) cited (Ñº) in r/MagicSkyFairy; discussed (Ñº) further

"Just as there is no god involved when oxygen reacts with hydrogen, so to is there no god involved when man reacts with woman."

— **Libb Thims** (2014), mental synopsis personal note of the Goethe 1809 point on the atheism timeline; an atheism explicit variant of the c.1855 Ludwig Buchner quote: "Just as man and woman attract one another, so oxygen attracts

hydrogen", Sep 10; cited (Ñº) by Inderjit Singh (2015) as favorite philosophical quote

See also

â— Gladyshev and Thims
â— Libb Thims (2008-2015)
â— Libb Thims (attack)
â— Libb Thims (books)
â— Libb Thims (books read)
â— Libb Thims (citations)
â— Libb Thims (derogation)
â— Libb Thims (genius ranking)
â— Libb Thims (history)
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â— Libb Thims (quick reference)
â— Libb Thims (quotes)
â— Libb Thims (students)
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â— Thims thought experiment
â— Thimsian atheism
â— Thims' personal library

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External links

Publications
â— Libb Thims (publications) – Issuu.com.
â— Libb Thims (storefront) – LuLu.com.
â— Libb Thims (documents) – DocStoc.com.
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â— Libb Thims (user page) – Helium.com.
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Productivity
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Science
â— Libb Thims (user profile) – iMechanica.org.
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â— Libb Thims (profile) – TheScienceForum.com.
â— Libb Thims (Ñº) – TheScienceForum.com.

Libraries
â— Libb Thims (author) – UNJobs.com.
â— Libb Thims (author) – WeRead.com.
â— Libb Thims (author) - Open Library.
â— Libb Thims (reviews) – ReviewScout.com.
â— Libb Thims – GoodReads.com.
â— Thims, Libb – WorldCat Identities.

Networking
â— Libb Thims - LinkedIn.com.
â— Libb Thims – Facebook.com.
â— Libb Thims – Xing.com.

Academia
â— Libb Thims (profile) – Academia.edu.
â— Libb Thims (profile) – Google Scholar.

Misc
â— Libb Thims (quotes) – HT.com.
â— Libb Thims (shirts/posters) – Zazzle.com.
â— Libb Thims – MindBroker.com.
â— Libb Thims – Pinterist.

Books
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Videos
â— Human Chemistry 101 – YouTube
â— Atheism Reviews – YouTube
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â— Libb Thims | Udemy.com

Overviews
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â— Libb Thims – Information Philosopher.
â— Libb Thims (speaker profile) – Northern Illinois University.
â— Libb Thims – About.me.
â— Libb Thims (about) – HT.com.
â— Libb Thims (article) – DatingSitesWiki.com.

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θΔics

Note: Page archived as is (shown below) on 14 Dec 2015; to facilitate length growth stagnation issues (see: **Libb Thims** new).

In science, **Libb Thims** (c.1975-) (522- PE) (222- AG) (LR:3) (CR:1065) is an American electrochemical engineer, noted for his 1995 to present work—see: genius hiatus effect—in the development of physicochemical humanities, a generalized version of physicochemical sociology, centered on Goethean logic that what governs the spontaneity of "chemical" reactions and behavior is what governs the spontaneity of "human" reactions and behavior; the latter variant of reactions being but a more complex "evolved", as Darwin saw things, or "metamorphosized", as Goethe devised things, extended powered animation variant of the former.

Human

The following shows the old Linnaean classification, devised by Carl Linnaeus (1753), albeit a now defunct and supplanted classification (see: life terminology upgrades), per standard *Merriam-Webster Collegiate Dictionary* (2000) definition of a "human", as compared to the new accurate physicochemically-neutral (chemical thermodynamically neutral), according to Kalyan Annamalai's *Advanced Engineering Thermodynamics* (2011) definition of a human, per citation of Thims (2002), shown with the "Hu" human element symbol over the baby, the difference between the two being that the term "living" is not found in the latter, and thereby supplanted with the description "energy/heat-driven", per modern correct physical science protocol: [35]

	Human		Date	Source
Old	"A bipedal primate mammal (*Homo sapiens*); *broadly* : any living or extinct member of the family (Hominidae) to which the primate belongs."		2000	*Merriam-Webster Collegiate Dictionary*
New	"A 26-element energy/heat driven dynamic atomic structure."		2011	*Advanced Engineering Thermodynamics*

The former Linnaean three kingdom: mineral (non-life), plant (plant life), animal (animal life), schemed classification, anchored historically in religio-mythology based "life theory" divide; the latter (new view) being chemically and thermodynamically neutral; the 1974 Henry Swan reformed definition of "biochemistry" as the study of "powered CHNOPS systems" is a precursor example model.

Belief | Reform

An overarching aim of Thims' work is to facilitate the amendment of the following 5,100-year-old and ongoing mental disjunct—which has us "walking backward into the sixth millennia", as the old saying goes:

3100BC

Mental
⟷
Disjunct

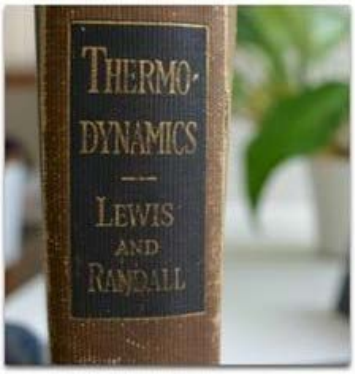

1923

Namely, the disjunct between the knowledge that humans were "synthesized" by force, energy, heat and work, motilized by power, as chemical thermodynamics defines things; or, alternatively, humans "created" by the divine power of God, gods, spirits, or life-forces (Ra in particular, being that Ab**ra**hamic faiths and the B**ra**hamic faiths embody 75 percent of the world beliefs), i.e. the disjunct between our 3100 BC religio-mythology transcription and syncretism belief system heritage, and modern chemical thermodynamics-based belief system upgrade, as Gilbert Lewis (1923) famously clarified.

Defunct theory of life | Solution

In 2009, Thims solved (see: defunct theory of life) the so-called "origin of life riddle" (Addy Pross, 2012) (Ñº), aka the "great problem of natural

philosophy" (Saint-Hilaire, 1836), via direct pressure of chemical thermodynamic reasoning, thus debasing the said to be “last hiding place for honest creationists” (Ñº), in the 21st-century molecules-to-man debate (see: atheism timeline), with the decisive conclusion that "life", like ether, caloric, and phlogiston, is something that does not exist—which coincides with Francis Crick’s 1966 erudite statement that we “should abandon the word alive”:

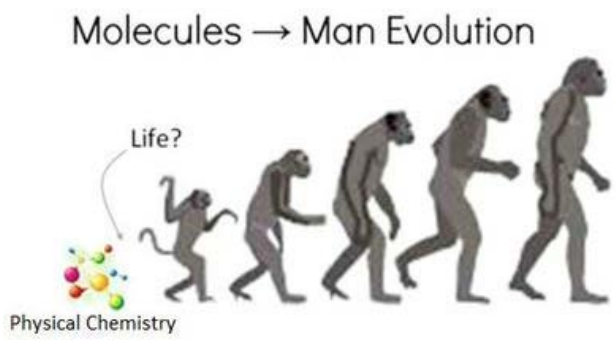

The solution independently was later arrived at by Alfred Rogers (2010) and Ferris Jabr (2012), in their respect "life does not exist" reasonings. The term "life", in short, is but a religio-mythology carryover from Anunian theology (75% of the world's religions are Nun-based), per "breath of life" conceptualized clay creation myth reasonings and beliefs, ingrained deeply into be belief system and belief state of the mind, but one untenable as modern physical chemistry defines things.

Religion vs Atheism | Atomic theory

See main: Thimsian atheism; Atheism Reviews

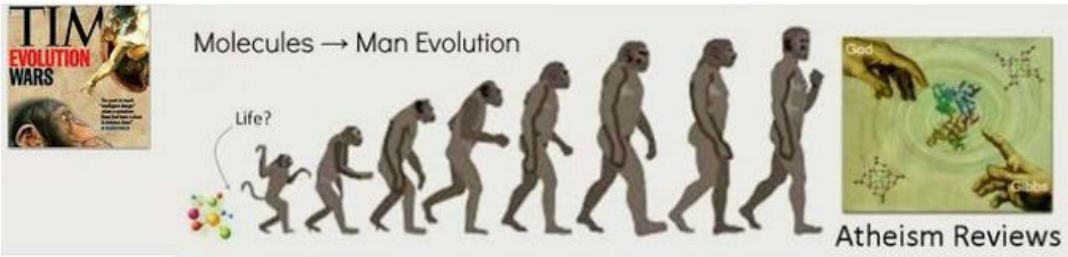

The banner to the new 2014-launched Atheism Reviews YouTube channel by Libb Thims, aimed at being a thermodynamics-centric "explicit atheism" focused channel, wherein Gibbs energy supplants God's energy.

Atomic theory, whether standalone and or applied to the humanities, per Democritean founding definition (400 BC or 2150 BG), explicitly, is built on an atheistic assumption, namely: that God (or gods) does not exist (see: atheism timeline). Greek atomic theorists, in short, were “explicit atheists”, in their day, i.e. they were *explicit*—fully revealed or expressed without vagueness, implication, or ambiguity: leaving no question as to meaning or intent—in their staunch position that gods do not exist. Modern so-called "scientists", comparatively, by definition, i.e. per Whewell-Coleridge debate (1833-34) coining of the term *scientist*, are “implicit atheists”, i.e. it is *implied*—capable of being understood form something else though unexpressed—that he or she is one who studies the “material world”, albeit which is something distinct (Coleridge's view) and separate from the so-called “moral world”, considered to be the work or realm of god. In the moder 21st century day, ninety-five percent of the world’s leading scientists, as of 2015, when polled, express explicit disbelief in the existence of god, but ironically, as Napoleon pointed out 200-years ago, they do not like to say so:

> “How comes it, then, that Laplace was an atheist? At the Institute neither he nor Monge, nor Berthollet, nor Lagrange believed in God. But they do not like to say so.”
>
> — Napoleon Bonaparte (c.1814), conversations with Gaspard Gourgaud (Ñº)

This so-called "disbelief paradox", i.e. why paradoxically scientists are predominately atheist in belief system (or belief state) but do not like to say so, is a puzzling one? Thims, likewise, in 2009, upon discovery of the Dawkins scale, commented: “in the Dawkins scheme, I would be level 10, but I don’t like the word atheist (I like the word scientist better).” [34] Thims, in print, similarly, has be characterized as an “extreme atheist and materialist” (Ñº) (Sekhar, 2011) or “strong atheist who adheres to a physics-based morality” (Ñº) (Bossens, 2013), among other epitaphs, which would seem to put Thims in league with the likes of Ludwig Buchner and the other extreme materialists and extreme mechanicists (in Stark classification). Thims, prior to this, since the 6 Dec 2007 launching of his hmolscience video outlet channel HumanChemistry101 (Sep 2014 stats shown):

has been, generally, an “implicit atheist”, i.e. he has presented the science of human chemistry, implicitly, for the most part, presenting the subject as god-free; marginalizing “god discussion” to the following channel description footnote: “note: as of 2000, 75% of the world still believes in God (or gods), conceptualized as a human-like entity (40%) or a spirit or life force in the universe (30%). Spread the word! These things do not exist.” (Ñº) The distinctions between the terms: implicit and explicit atheism (Ñº), weak atheism or strong atheism (Ñº), or hard atheism or soft atheism, or variants such as: extreme atheism, etc., seems to be a subject in need of clarification and organization. With the rise, in recent years, of physical scientists, e.g. physical chemist Peter Atkins (1998), physicist Lawrence Krauss (2008), quote: “I view myself as an anti-theist rather than an atheist” (Ñº) electrical engineer Bill Nye (2014), etc., entering the science vs. religion debate arena (see: atheism timeline), in the so called area of “atheist activism”, oftentimes seeing many of them severely loose in battle, Thims has begun contemplating the possibility of launching a new YouTube channel: **Atheism**

Reviews (and associated site: AtheismReviews.com), focused on critiquing the "science vs. religion debates", specifically, and, in general, a review of recent “hot button” atheism and or anti-theism (Ñº) topics.

Overview

Thims, in overview, is a physicochemical materialism reductionist, moral symbols thermodynamicist, Goethean philosopher, physical humanities encyclopedist, and paradigm change initiator noted for his work in the development of hmolscience: the physical science of powered "human molecules" (see: human molecular formula) or animate chemicals (see: hmolscience periodic table), the apex of which is the newly-forming science of human chemical thermodynamics; noted in general for his prolonged social heat efforts to ignite the two-centuries-aged hidden, stagnated, buried and riddled Goethean revolution. Thims' central work and research, in an overarching perspective, has been to understanding the following mathematical thermodynamics chemical reaction puzzle:

> “The quantity '–ΔG' [is] the driving force of a [human chemical] reaction.”
>
> 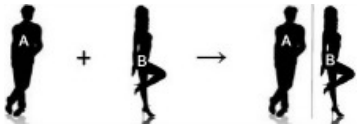
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>
> — Gilbert Lewis (1923), *Thermodynamics and the Free Energy of Chemical Substances*

Inlets into this intricate puzzle, of how to understand the nature of the driving forces of human interactions, include: Johann Blumenbach’s 1781 formative drive theory, which influenced Friedrich Schiller’s 1795 “love and hunger rule the world” maxim, which co-developed Johann Goethe’s 1796 affinity driving force human chemical theory, all of which produced the 1883 Schopenhauer-Nietzsche "will to power" theory, the 1910 Freud-Jung psycho-social mental drives theory, the 1964 “ego games” social psychodynamic theories of Eric Berne, whose apt statement is:

> “The eternal problem of the human being is how to structure his waking hours. In this existential sense, the function of all social living [existive reacting] is to lend mutual assistance for this project.”

and the 1970s Csíkszentmihályi flow theory, all of which are but segue into the deeper subject of modern 21st century human chemical thermodynamics. The Lewis quote shown—with human chemical reaction "mental bracket" insert in Thims' 1995 chemical engineering student mindset—is a puzzle rooted deep in the 1,158 Gibbs-Clausius equations—where ΔG is the change in the Gibbs free energy of the process, that translates or scales up to the "drives" of human existence, e.g. sex drive, death drive, purpose/destiny/meaning-envisioned drive, etc., and more importantly to the "predictions" or rather reaction feasibilities of mate selection (see: love thought experiment), processes technically called "human chemical reactions" (see: theory), the colloquialism of the image of love the chemical reaction, and reproduction produced therefrom, being the dominant example. This logic can also be rephrased, as done by Lewis, as follows: “no actual process is possible unless ΔG is less than zero” a chemical thermodynamic statement called the Lewis inequality for natural processes.

The problem itself, historically, is riddled in veiled conundrums—such as whether "crystals think" or alternatively whether the "writing of a book is a chemical reaction", solution alternatives puzzled on by Lewis himself in 1925—and one that traces back to what is called the elective affinities problem, first discussed by German polymath Johann Goethe in 1796 (see: Goethe timeline).

The following depiction is a well-apt depiction Thims' position in respect to a large portion of the driving forces of his own reaction existence—the German caption “Frag den Lehrer” meaning “Ask the Teacher”—namely that somewhere in the course of a person’s upbringing he or she should be introduced to the basis of the “why’s” of human existence, as physical science see things—such as Goethe outlined over 200 years ago—Thims being depicted as the one to the far right sleeping in the back of class for the first 19 years of his existence—the typical American student (by age 15), currently, is taught nothing of the "why's", how's, and "gos" of human existence:

In short, Thims' research efforts, beginning in 1995 as a curious hobby, and in 2001 as a more intense research project, have been to understand how the inequality $\Delta G < 0$, where $\Delta G = \Delta H - T\Delta S$, applies to the governance and regulation of human existence, impersonally (in relationships) and socially (within a society), viewed purely in terms of a super-observer perspective, time-accelerated human reactions (surface-attached chemical reactions) point of view—in other words, in variational speak, how differentials (time variations) of Gibbs free energy change dG (available energy release or absorption) apply to the prediction and spontaneities of interactions and reactions between people, particularly in regards to the formation and dissolution of bonds, the intimate relationship marriage bond and reproduction in particular, over the course of decades of time (changes in states of experience). In categorization terms, this defines Thims as a human free energy theorist, a rare group of about forty thinkers.

The type of processes discussed above, in this "universal rule" (Gilbert

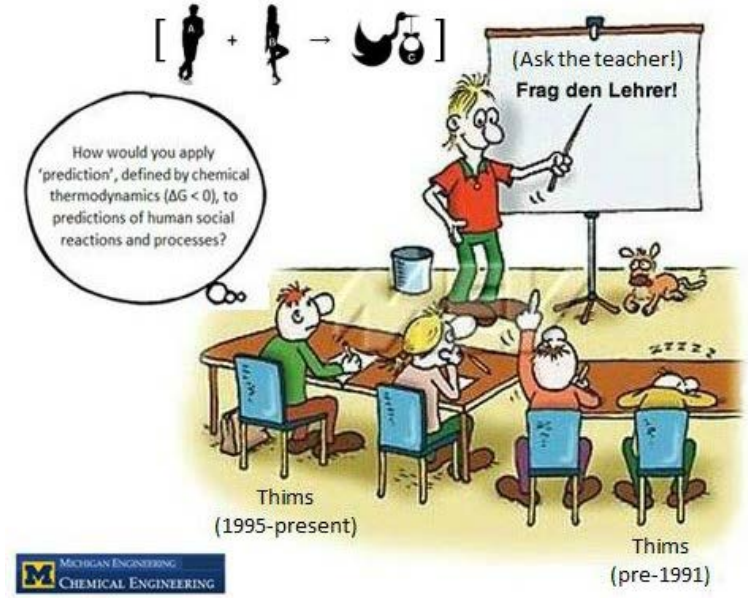

A reconstruction of **Thims**, as an undergraduate University of Michigan chemical engineering thermodynamics student, ruminating on how chemical thermodynamics would, in theory, be applied to reactions between humans, relationships conceptualized as chemical reactions (see: reverse engineering puzzle), man + woman → baby, and, in particular, who first did this (see: Goethe); it would be some two decades later that he would begin to ferret out the details of this intricate puzzle—one filled with glass walls, forest-tree issues, ships not seen paradoxes, one nature (vs. two nature) issues, terminology reform issues, among others—into the form of a initial stage working draft textbook. [1]

Lewis, 1923) of human existence and experience, are substrate-attached isothermal-isobaric processes, i.e. earth-bound reactions, not harnessed in some way for the production of useful work, such as in an electrochemical work in a battery, but where the chemical reactions "run freely" like the combustion of a fuel or the action of an acid on metal.

Thims has been the first to "thoroughly" follow this question through as to what happens when one applies this universal rule to freely going reactions between people. Precipitates of this query have been the development of the newly emerging human molecular sciences (hmolsciences) of: *human chemistry*, the study of reactions between human molecules, *human physics*, the study of forces involved in human interactions and human bonding, and *human thermodynamics*, the study of heat, energy, and work, and aspects of systems of human molecules.

Hmolpedia

A precipitate of Thims' research efforts is *Hmolpedia*, an online wiki encyclopedia, launched in late December 2007, a growing collection of 3,000+ articles centered around the decipherment of the Lewis inequality of natural processes applied to human interaction processes, a set of articles attracting some 70,000+ page views per month, which is slowly becoming the Internet's number one go-to site for thermodynamics information; a cite which, as of 2011, has been used to produce, guide, and or facilitate a number of PhD dissertations, among other research activities.

In 2013, Thims began to assemble the online site into a print volume, current estimates indicate the encyclopedia will be a six-volume, 3,800-page book set (a mock-up version of which is shown adjacent). [29]

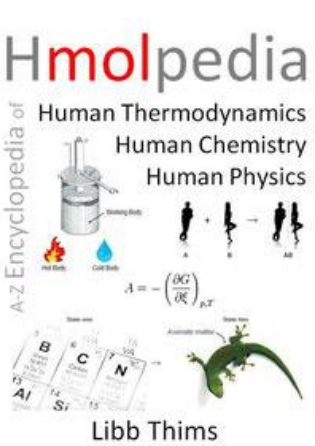

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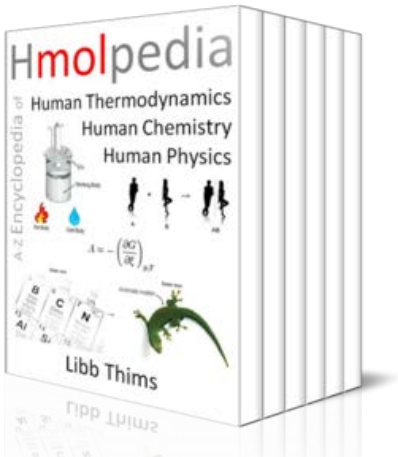

Online Version
(3,000 articles)

Print Set
(6-volumes)

Influence

See main: Libb Thims (citations)

Thims' work, research, and efforts, since going public in 2005, has been increasingly mentioned and or employed in a number of noted publications and symposiums, including: the MIT *Net Advance of Physics Encyclopedia* (Karen Keck, 2010), *Advanced Thermodynamics Engineering* textbook (Kalyan Annamalai, 2011), symposium "Use of Art Media in Engineering and Scientific Education" (Alec Groysman, 2011), and *The Wiley-Blackwell Companion to Sociology* (Alan Sica, 2012); and influential in the development of a number of books, articles, and dissertations, including: Russian science journal *BecthĐ¸k* (Georgi Gladyshev, 2007), book *Find a Good Man and Keep Him* (Satch Ejike, 2008), ecological engineering PhD dissertation "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality" (Jeff Tuhtan, 2011), book *Mr. Carbon Atom* (Mark Janes, 2012), and book *Debates of the Hmolpedians* (David Bossens, 2012), to name a few.

14.4.1 Formulae

Humans may be called a 26-element energy/heat driven dynamic atomic structure. The body contains about 60–70% water; even the bones contain over 30% water with males containing more water than females. By weight, oxygen amounts to about two-thirds of the body (about 67%),

In 2013, Thims' 500-person HT pioneers timeline, which took 10-years of extensive research to construct, was cited in the University of California, Berkeley research misconduct investigation into accusations nonreductive materialism theory misappropriation in the so-called Juarrero-Deacon affair, as disproof of American Wall Street whistleblower turned complexity-emergence theorist Michael Lissack's claim that American neurological anthropologist Terrence

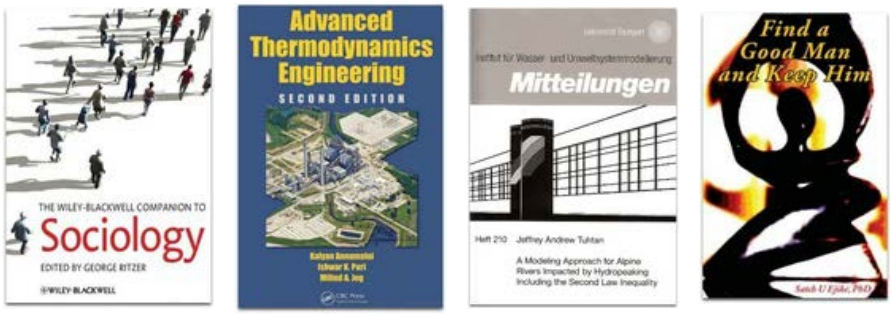

A few recent resources utilizing **Thims**' work, in: mechanistic school + human thermodynamics (*Sociology*, 2012), animate thermodynamics + fish molecule (PhD dissertation, 2011), and human physics + human chemistry, respectively (*Find a Good Man and Keep Him*, 2008). Middle left:
The "new" 21st century definition of a person, namely a "26-element energy/heat driven dynamic atomic structure", found in Indian-born American mechanical engineer Kalyan Annamalai and Venezuelan-born American mechanical engineer Carlos Silva's "Thermodynamics of Biological Systems" chapter, of Annamalai, Ishwar Puri, and Milind Jog's 2011 *Advanced Engineering Thermodynamics*, based on **Thims**' 2002 human molecular formula calculation (see: human molecular theory). [2]

Deacon, head of the UC Berkeley anthropology department, is guilty of what Lissack calls "plagiarism by negligence" for not citing American philosopher Alicia Juarrero in his 2011 *Incomplete Nature: How Mind Emerged from Matter*, which Lissack defines as: "There is no excuse, to even tolerate the idea that in the Internet Age it is acceptable … to fail to see what others have written before publishing his own work. Plagiarism by negligence is still plagiarism." To quote from the investigation committee report: [26]

"To adopt this novel standard for defining plagiarism would create some "interesting" situations. Take, for example, the intellectual arena of human thermodynamics, a topic that both Deacon and Juarrero address in their respective books. *Hmolpedia: An Encyclopedia of Human Thermodynamics, Human Chemistry and Human Physics* maintains a webpage, "HT pioneers," which lists scientists and writers who over the years have contributed theory and logic to the understanding of the thermodynamics of human existence. At the moment the page lists some 505 individuals.

How many of these authors would Deacon and Juarrero have to cite to avoid a charge of plagiarism under Lissack's novel definition? Note that this list does not include either Juarrero or Deacon, both of whom have written on the thermodynamics of human existence. So even the encyclopedic *Encyclopedia of Human Thermodynamics* may not meet Lissack's standards of complete citation."

The committee, citing the Thims' case-in-point example, that even in the Internet/Google Books age it still takes over 10-years of research to uncover every theorist in a given field (thermodynamics applied to questions of human existence in this case), thus "rejected [Lissack's] attempt to redefine plagiarism", concluding that "failure to cite an earlier work with the same subject matter, even an important one, is not by itself research misconduct."

Hmolscience | Paradigm change

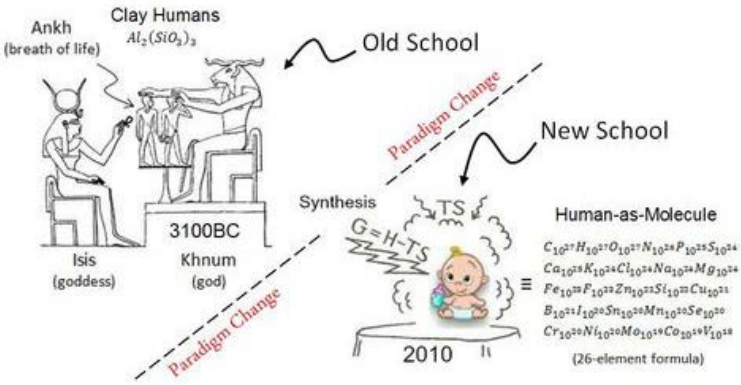

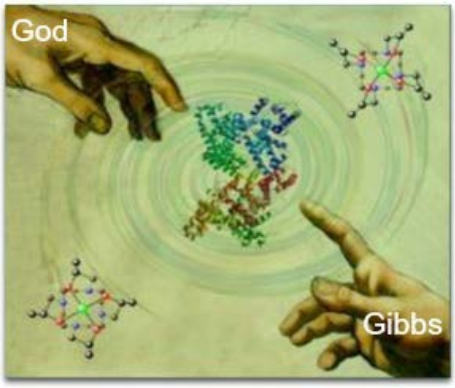

Left: a depiction of the Goethean revolution "paradigm change" inherent in the physicochemical sciences based humanities work of **Libb Thims**, i.e. replacing the old spirit, soul, life / death, and life force theories of ancient religious teachings with modern chemical thermodynamics logic. Right: a diagram from the 2013 *Triple≡Bond Chemistry* article "Chemical Formula of a Human", citing the 2008 human molecular formula calculation of Thims (see: Thims human molecular formula), alluding to the inherent religion-overthrowing implications in such a view, i.e. is it free energy differentials or the hand of God that created or rather synthesized humans? [33]

The adjacent diagram shows the gist the 5000-year paradigm change in belief system that Thims since 1995 has been actively working to bring about. Namely replacement of the older religio-mythology belief system, which currently grips the belief systems of 3 out of every 4 persons on the planet, with the new modern physical science (hmolscience) view of humans formed not from "clay" (see: clay creation myth) and given the "breath of life" (see: creation by breath), but rather formed from 26 of the 92 naturally-occurring elements of the periodic table (see: hmolscience periodic table) through a process of chemical synthesis and given a prolonged reaction existence state of experience. While many of the crude ancient beliefs have been interred, e.g. belief in creation of humans on a potter's wheel, a large number of residual beliefs remain: the belief in the "theory of life" being the most dominant example—a concept that is NOT recognized by modern chemistry and physics (see: defunct theory of life)—the current religio-mythology based morality, guiding many about the world in their paths presently, being a second framework not recognized by chemistry and physics (see: moral symbols and moral movement), albeit a core belief for many deeply intertwined with notions of purpose and meaning.

Reverse engineering | Human spontaneity

See main: Reverse engineering puzzle

The central description of Thims' work is captured the puzzle as to how the chemical reaction spontaneity criterion ($\Delta G < 0$) applies to human relationships, particularly in regards to the "favorability" predictive aspect of free energy tables, in the sense that measure of Gibbs free energy change, if it could be measured at the human social scale, can be feasibly used to determine whether any given mate selection relationship is favored or not-favored, thermodynamically. Theoretically, it should be a feasible objective. Shelves of chemical thermodynamics textbooks and literature have been written, in the last century, explaining chemical processes and reactions, from the scale of small chemical reactions, e.g. the combustion of methane with oxygen, up to the level of chemical processes and reactions in larger process, such as ATP, protein, and cell membrane dynamics, subsequently, the problem, as it stands, is how to "reverse engineer" all of this logic, as embodied in the framework of the 1,158 Gibbs-Clausius equations, back down to

explain reactions and processes at the human-human interaction scale?

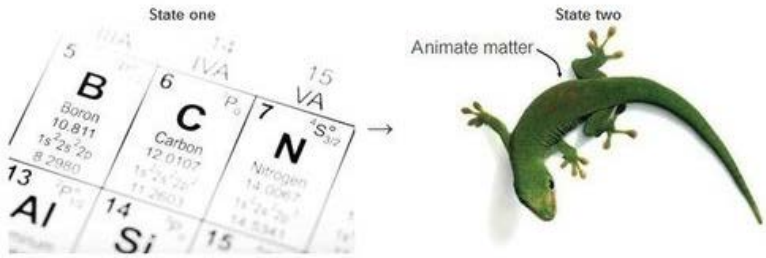

A visual depiction of the "great problem of natural philosophy", as French naturalist Etienne Saint-Hilaire described it in *circa* 1836, namely how "animate matter" (as the defunct theory of life views things) or "life" (as Saint-Hilaire viewed things), such as a gecko, arose from the collection of 92 naturally-occurring elements of the periodic table in the context of the nebular hypothesis? Serbian-born American electrical engineer Nikola Tesla claimed to have solved the problem in 1915, although his solution was riddled with panbioism. The complete solution was arrived at in 2009 by American electrochemical engineer **Libb Thims**, via the defunct theory of life.

Historically, in circa 1995, while an undergraduate chemical student at the University of Michigan, Thims began to wonder how the Gibbs free energy model of reaction spontaneity, particularly as discerned through Beckhap's law, applies to the male-female reaction, the central process of society, in which a man meets a women, they fall in love (20 percent of people fall in love at first sight and marry that person), produce a child; an entity which then begins to detach from the family household at about the fifteen-year mark; a reaction process that 85 percent of people will go through.

This so-called "spontaneity criterion puzzle" is a sort of reverse engineering problem-puzzle as to how to apply the well-established chemical reaction spontaneity criterion to the modeling of the spontaneities of human-human reactions, particularly in regard to mate selection, so as to be able to 'predict', in a theoretical (or actual) sense, spontaneous reactions in human relationships.

A photo of **Libb Thims** (АÐ¸Ð±Ð± ТÐ¸Ð¼Ñ , Russian), partying hard at the Flats, Cleveland, Ohio, at about the time (1995) he began to ruminate on the reverse engineering puzzle (depicted above), namely how the 'universal rule' of chemical reaction prediction "scales up" to the human-human reaction level, in the 2007 Russian science journal *ВестнÐ¸k* article "Hierarchical Thermodynamics: a General Theory of Existence", by Russian physical chemist Georgi Gladyshev, shown along with photos of: Leonhard Euler, Henri Poincare, Willard Gibbs, Lars Onsager, Nikolay Bogolyubov, Joseph Lagrange, Sadi Carnot, and Rudolf Clausius. [7]

The central issue, with this thick riddle, is the understanding of how enthalpy change ΔH and entropy change ΔS are to be understood in human chemical reaction terms, over the course of multiple decades, so as to yield a quantitative measure of Gibbs free energy change, between two points in time, differing by multiple years. It takes a minimum of at least 5-7 years, even for a well-schooled chemical thermodynamicist, to arrive at even a partial idea, interpretive visualization, or intuitive understanding as to how to go about gaining insight into this puzzle. A precipitate of this effort is the EoHT wiki, launched in 2007.

In sum, Thims' central research, since *circa* 1995, has been to elucidate, quantitatively, how the basic, multi-year human reproduction reaction (relationship, sex, and offspring), which 85% of people go through, can be energetically predicted, via free energy determinations:

$$G = H - TS$$

as quantified using the spontaneity criterion ($\Delta G < 0$), which states that spontaneous chemical reactions must show a decrease in Gibbs free energy over the extent of the reaction, i.e. the summation of the enthalpic (ΔH) and entropic ($-T\Delta S$) factors involved in the system interaction must show a decrease in value over time, if the reaction or process is to be universally favored. This dissection of human interactions can also be expressed via the relation between the chemical affinity A or the force of reaction existent between reacting species to Gibbs free energy change ΔG:

$$A = -\Delta G$$

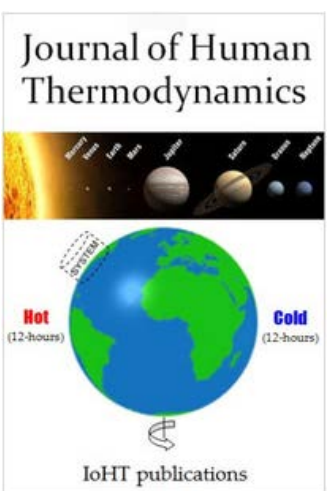

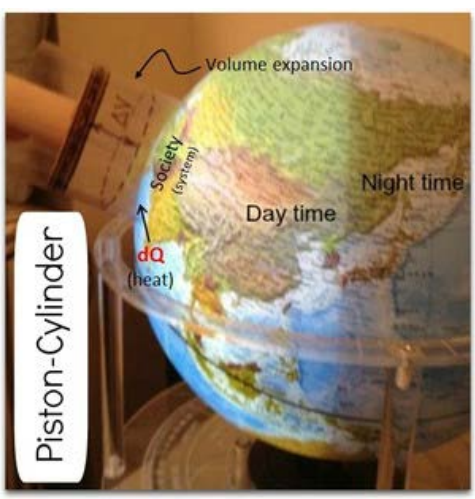

Left: the cover of **Thims**' 2005-founded *Journal of Human Thermodynamics*, which publishes papers on thermodynamics applied in the humanities, i.e. human thermodynamics, and on the hmolsciences in general: human chemistry and human physics, notable authors including: Georgi

as proved in 1882 by German physicist Hermann Helmholtz in his "The Thermodynamics of Chemical Processes", and applied to the modeling of human relationships by German polymath Johann Goethe in his 1809 *Elective Affinities*. In sum, in order to understand love in the context of relationships and how one correctly chooses who to love, one has to be able to measure enthalpy ΔH and entropy ΔS changes involved in human activity?

Thought experiment

See main: Love thought experiment

The specific human chemical equation, which Thims originally began to mediate on is the following pair of human mating reactions in which a child *B* is produced:

$$M + F_A \rightarrow B_A$$

$$M + F_B \rightarrow B_B$$

Gladyshev, Elizabeth Porteus, Jing Chen, Babics Laszlo, Gerald Nahum, and Mohsen Mohsen-Nia.
Right: a photo of **Thims**' 2012 illuminated rotating globe (right) and "social system" Papin engine (left), showing the working substance (society) and piston and cylinder (societal boundary), which he uses "in lecture" to demonstrate the conception of social expansion (day), i.e. occupational work, and social contraction (night), rest, in the framework of entropy change ΔS, or transformation content *N* increase, and Boerhaave's law, and the spin-coupled dynamics of the universe.

where *M* is one male, F_A is a hypothetical female, F_B is a second hypothetical female, B_A is a child product of the first pairing, and B_B is a child product of the second pairing; according to which the universal rule, according to modern physical science, to determine which reaction should be chosen, is that the reaction most energetically favored (exergonic) will be the one that shows the most decrease in Gibbs free energy *G* over time in the extent of the reaction—which means that thermodynamically favored reactions adhere to the equation:

$$\Delta G < 0$$

where:

$$\Delta G = \Delta H - T\Delta S$$

meaning that:

$$\Delta H - T\Delta S < 0$$

which implies that in order to choose who to marry one must arrive at an intimate understanding of how the time variations of function "ΔH – TΔS" operate in the course of human existence, decade to decade.

The use of chemical equations to model human reactions, to note, is a very deep subject. The fact that only eight people, in history (see human chemical reaction history), are known to used chemical equations, such as above, to model human processes, such as colloquial love the chemical reaction motto, exemplifies this. The dimension of time, in this example, being the difference between the initial "state" of the reaction, or day in which the pair first begin to react, and the final state of the reaction, signified as the day, some 15 or more years later, at which point the offspring product begins to detach from the parental structure, going of on its own. The spontaneity rule itself is relatively simple, quantified by the following simple equation: ΔG < 0. It is the understanding of quantities that compose free energy:

$$G = U + pV - TS$$

Left: Photos of Gibbs (16), Goethe (16), Clausius (18), Lewis (15), Newton (18), Helmholtz (17), and Maxwell (16), on the wall of **Thims**' study (numbers being the age at which each person entered college).
Right: **Thims**' current 2012-launched working book project: *Elective Affinities: Illustrated, Annotated, and Decoded*, a fully-illustrated, annotated, decoded and de-formulated modern-day upgrade to Goethe's self-defined "greatest work", in which he embedded, using hidden layers of gestalt, a physical chemistry based "principle" that he claimed was "true" (Nov 1809). The online version launched: 7 May 2012; scheduled book printing: 2013 (estimated).

namely internal energy *U*, pressure *P*, volume *V*, temperature *T, and* entropy *S*, among other facts (such as chemical potential μ, external forces, gravity, free energy coupling, etc.), however, which, invariably, require a new field of research and conceptual understanding, where people are defined technically as boundaried "systems of human molecules", a subject never rigorously done before, in spite of the fact that over 500-people have published views on the theoretical application of thermodynamics to human activity. An example of the difficulties encountered, in synthesizing this application, is the understanding of the "end state" (15 or so years after first sex), of the ordering of the system of humans, involved in the process of a human reproduction reaction (sex), such as above, which, in mechanism, is defined more exactly as a double displacement reaction (double elective affinity) of the form:

$$M + F \rightarrow M{\equiv}F + \text{Child}$$

It is at this point, that the subject of chemical / physics nature of the human bond "M≡F" becomes a central subject of study, one that has never been done before. Nearly two-thirds of the 2007 textbook *Human Chemistry*, written by Thims, was devoted to the elucidation of the nature of human chemical bonds considered purely as a chemical bond. [1]

A 2012 photo of of Thims' 15% incline running apparatus, with four holdon handles, four stop watches, and iPhone holder, on which Thims runs between 15 to 112 miles per week, depending, mentally formulating solutions to his work, similar to Albert Einstein who conceived his main solutions and ideas while riding a bike (see: genius, section: "exercise habits"); Thims also bikes some 80 to 100 miles per week, depending, aiming for Ironman completion.

In any event, pairing feasibility can be understood via chemical thermodynamics, namely by the fundamental equation characterizing the relation between affinity *A* and free energy *G* change:

$$A = -\Delta G$$

in conjunction with the spontaneity criterion rule defining spontaneous reactions:

$$\Delta G < 0$$

In short, whichever mating reaction actuates a greater negative change in the Gibbs free energy, or positive affinity A change:

$$A = T\Delta S - \Delta H$$

will be more energetically-favored and less prone to divorce (debonding). Beyond this, there are complicating issues associated with the quantification of external forces, chemical potential factors, gravity, equilibrium effects, system boundary issues, free energy coupling, enthalpy-entropy compensation, etc., factors that each effect human chemical reactions. Thims is currently interested in trying to understand how the Gibbs fundamental equation, in which the change in energy *U* of a system can be written as the product of an intensive and an extensive parameter:

$$\Delta U = \sum_i X_i \Delta Y_i$$

where *Xi* is an intensive quantity, such as pressure or temperature, and *Yi* is an extensive quantity, such as volume, can be applied to a human social system.

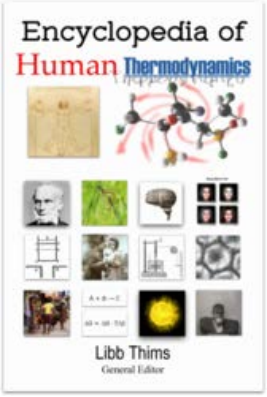

Left: View of some of **Thims**' 350+ thermodynamics book collection, *circa* 2005, at the Institute of Human Thermodynamics (IoHT), Chicago. **Right**: the *Encyclopedia of Human Thermodynamics* (2007), the draft-stage five-volume encyclopedia on thermodynamics applied to humans, socially speaking; the backbone to the online *Hmolpedia* (2011), on the subjects of human relationships, love, hate, atoms, molecules, heat, motion, Papin engine, human chemistry, and human physics, etc., written by **Thims** to facilitate the study of the subject of human thermodynamics.

Overview

See main: *Libb Thims (history)* and *Human Chemistry (textbook) (origin)*

Thims' central interest, which began as a chemical engineering student in 1995, has been to understand how human relationships work or operate energetically according to the science of chemical thermodynamics, in particular human chemical reaction prediction using the logic of spontaneity as embodied in free energy tables, in conjunction with theories and studies done in evolutionary psychology.

The essential moment occurred while in a senior level thermodynamics class at the University of Michigan. During this course, he began to wonder if anyone had ever applied the logic of chemical reaction prediction, as embodied in standard thermodynamic tables of free energies, enthalpies, and entropies, to the extrapolative prediction of human chemical reactions, such as between potential intimate pairs in reproductive reactions?

Thims' first two published books

The seed behind the puzzling question of mate selection, however, had existed in Thims' mind prior to his chemical engineering studies. At one point, years earlier, Thims' had drawn up an tabular spread-sheet of the nineteen top females that he had dated, each of whom he could potentially marry (many of which had openly stated that they were in love with him), listing each girlfriend at the horizontal and attributes or mating desireabilities on the vertical, each attribute with an associated weighting factor, and attempted to theoretically or logically determine who would be in his best interest to marry. This type of analysis, however, led to

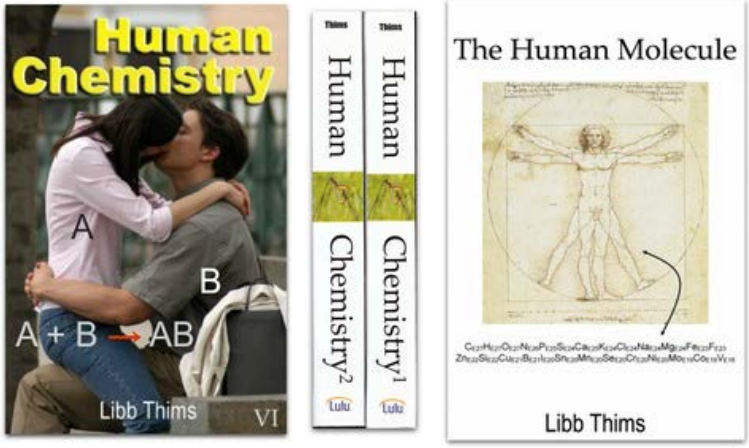

Thims' 2007 (824-page) two-volume textbook *Human Chemistry* and follow-up simplified 2008 (120-page) history booklet *The Human Molecule*.

indeterminate results. Sometime in and after 1995, Thims began to apply chemical thermodynamics to the problem, and began to see through the haze in circa 2001.

In 2002, in efforts to coordinate writings on the thermodynamic study of human life, Thims founded the *Institute of Human Thermodynamics*, a non-profit, educational-minded, global network of human thermodynamicists. In 2005, Thims started the *Journal of Human Thermodynamics*, ISSN 1559-386X, a place for publication of articles on the thermodynamics of human life. In 2007, Thims and Russian physical chemist Georgi Gladyshev started the *Encyclopedia of Human Thermodynamics*. Thims also maintains one of the world's largest thermodynamics book collections.

In September 2007, building on the shoulders of Johann von Goethe, with his 1809 *Elective Affinities*, and American navel engineer William Fairburn, with his 1914 booklet *Human Chemistry*, Thims published *Human Chemistry (Volume One)* and *Human Chemistry (Volume Two)*, the world's first-ever standardized textbook on human chemistry (824-pages). [1] One of the first to apply Thims' human chemistry to practical application was American social scientist Satch Ejike who, in his 2008 book *Find a Good Man and Keep Him*, presented a physical science based guide to help informed modern single women find a man.

In March of 2008, Thims published his second book *The Human Molecule*, a short outline of the historical development of the conception of the human being as an individual 'molecule', i.e. "human molecule". Thims ideas on human thermodynamics and human molecules, to note, were developed in a duplicate manner, but independent, to those of American historian Henry Adams (1910) and English physicist Charles Galton Darwin (1952).

Meetings | Lectures | Symposiums

Thims' work and theories, beginning in 2006, have been referenced, cited, and discussed in several journal articles, magazines, conferences, symposiums, and meetings. Thims has been invited to meet up with various people and invited to give lectures and or poster presentations at conferences and symposiums at MIT, Harvard Medical School, Moscow, Chicago, India, and Europe. Since 2010, Thims has been giving invited yearly lectures, on an introduction to human thermodynamics, to various university bioengineering thermodynamics classes around Chicago. Some of these meetings and lectures are outlined below:

An after workshop group photo of some of the speakers at UPESW 5 (29 Jun 2013): Constantin Bratianu (Thims' right), Daniel Pele (Thims' back right), Mircea Gligor (Thims' back left), and seated in front left to right: Ion Siman and Gheorghe Savoiu, all noted members of the Romanian school of physical socioeconomics.

Sometime between 2002 to 2004, Thims began to undertake the project of writing a short book on the subject of "human thermodynamics", during which time he began to come across a number of individuals who seemed to be using a similar logic, in certain respects, to his own, including: Ilya Prigogine, John Avery, Jing Chin, David Hwang, and Georgi Gladyshev, among others. In 2005, Thims founded the Institute of Human Thermodynamics and began to many of these famous scholars and soon thereafter began to meet up with many of them. Earliest among these was two meetings in Russian physical chemistry Georgi Gladyshev, who at the time seemed to be seemed to be the closest competition in that he was using a fully-rigorous Gibbs free energy fundamental equation, as shown below, from his 1997 book *Thermodynamic Theory of the Evolution of Living Beings*: [2]

2007 | Gladyshev and Thims | Chicago

$$TS \geq dU + pdV - \sum_{k=1}^{n} X_k x_k - \sum_{k=1}^{c} \mu_k dm_k$$

(Gibbs fundamental equation)

Thims and Russian physical chemist Georgi Gladyshev discussing the interrelationship of human thermodynamics, hierarchical

thermodynamics (Gladyshev's theory), in the context of the Gibbs fundamental equation, in front of the Wrigley Field Building, during a 17 Dec 2007 Chicago meeting (see: Gladyshev and Thims).

where T is the temperature, S the entropy, U the internal energy, p the pressure, V the volume, X and x, a generalized conjugate variable force pair, μ the chemical potential, and m the mass of the matter or chemical entering or leaving the system, respectively, to explain the "formation of some society", where ΔG, he says, can be estimated by calculating the work that went into building the structure of the society, all in an effort to formulate a Gibbs-based thermodynamic approach to the evolution of life; such as in contrast to the "blind random chance" motto of evolution: “The opinion that evolution is ‘governed’ by chance is not quite correct: the joint action of random events in a thermodynamic system should always satisfy the requirements of thermodynamics. The fan of thermodynamics always has a fixed direction.” In short, Gladyshev seemed to be going deeper into the 1,158 Gibbs-Clausius equations, than as compared to other HT researchers—and the collision with Gladyshev convinced Thims that he needed to have a deeper mastery of the work of Gibbs.

In 2006, Thims began to meet up with American chemical engineer and physicist Ted Erikson to discuss review of Thims' draft *Human Chemistry* textbook and to discuss Erickson's efforts to investigate a Planck-scale awareness theory, i.e. to theorize about how far down the great chain of being the concept of "awareness" descends. The following is a 2010 photo taken by Thims, following at talk by Erickson at Illinois Institute of Technology to the Illinois chapter of the American Institute of Chemical Engineers, wherein Thims, Erikson, and American physicist David Gore discussed whether Planck length particles have "awareness" or consciousness (a type of panbioism argument):

2010 | Thims and Erickson at IIT | Chicago

American chemical engineer and physicist Ted Erickson, pointing to a printed version of the Hmolpedia side-scrolling evolution timeline, at a 2010 lecture at the Illinois Institute of Technology, attempting to argue to **Thims** and American physicist David Gore, that Planck length particles have consciousness (a common extrapolate down argument). [25]

In 2010, Thims began to meet up with Iranian-born chemical engineer Ali Mansoori, head of the UIC thermodynamics laboratory and also notably for having been educated, as an undergraduate in Iran, within the orbit of Iranian mechanical engineer, thermodynamicist, and 75th prime minister Mehdi Bazargan, author of the 1956 *Thermodynamics of Humans*, the first general book on human thermodynamics.

2010-2012 | Thims at UIC | Chicago

Thims lecturing in 2010 (see: Libb Thims lectures) on human thermodynamics to engineering students, standing adjacent to pictures of Clausius, Gibbs, and Lewis, authors of the founding texts at the core of human thermodynamics. **Thims** explaining to engineering students how the Papin engine relates to human chemical affinities, Gibbs free energy, and morality.

The following is 16 Apr 2013 guest lecture Entitled “Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies”, given to the mechanical engineer students and faculty of Northern Illinois University per invited of mechanical engineering thermodynamics professor Milivoje Kostic:

2013 | Thims at NIU | DeKalb, Illinois

Left: Thims in his 16 Apr 2013 lecture: "Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies" (see: lectures), at segment 48:30-50:39 (see: **video**), at Northern Illinois University College of Engineering, doing the famous 18th century Leiden University volume expansion "ball and ring experiment" to explain "social expansion" (day) and "social contraction" (night), in Carnot cycle terms, in respect to hot body (sun) / cold body (night sky) alternating daily contact of earth-bound social systems (working body), Boerhaave's law, entropy (transformation content) increase, and irreversible changes in Gibbs free energy states of human existence and experience; the human molecule view lecture notes page in the background; illuminated rotating globe to the right. [28] **Right:** edited synopsis video segment of April 2013 lecture.

The following are meetup photos and after symposium photos during the Jun 2013 University of Pitesti Econophysics and Sociophysics Workshop, Romania, in which Thims, as the key speaker, gave an opening 90-minute talk on "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?", generally about what not to do in econophysics and sociophysics modelling:

2013 | Thims at UP | Pitesti, Romania

Left: American electrochemical engineer Libb Thims with the two heads of the Romanian school of physical socioeconomics, from left to right: Ion Siman and Gheorghe Savoiu, holding Thims 2008 *The Human Molecule*, Thims, holding Savoiu and Siman's 2012 *Econophysics*, and Constantin Bratianu, a newcomer to the group, noted for his work in knowledge thermodynamics (28 Jun 2013). Right: Thims during his UPESW 2013 talk (Jun 29), at 2:20-min (see: **video**) holding his social piston and cylinder demonstration model explaining how the city boundary of Pitesti, Romania, is an example of a socioeconomic boundary in a thermodynamic modelling sense.

Thims has been invited back for UPESW 6 in 2014 and invited to stay at the summer house of Romanian physicist Ion Siman the intellectual power center of the Romanian school of physical socioeconomics.

Publications

See main: Libb Thims (publications); Working papers

The core precept of the science human thermodynamics, defined by English physicist C.G. Darwin in 1952 as the "thermodynamical study of systems of human molecules", arrived at by many after years of study of thermodynamics applied to human existence, e.g. Jean Sales, Henry Adams, Pierre Teilhard, etc., is the understanding that when viewing a "system" of people, as in a society (social system), from the atomic theory or periodic table point of view, one is actually viewing a system of "human molecules", no different than any other system of reactive molecules attached to substrate.

In this direction, in 2008, Thims published the 120-page, equation-free book *The*

Human Molecule, readable at the high school level, a book functioning as basic starting point for those interested in human thermodynamics. This was a followup to his 824-page *Human Chemistry*, a more rigorous, equation-filled textbook on the subject of human chemistry, published the year prior, a book found to be difficult for the layperson to read.

In total, as of 2013, Thims has written about a 10-12 volume collected works set (printed).

Tabula rasa | Education

Thims has a rather peculiar educational background, comparatively speaking, as far as scientists and engineers go. He was synthesized from parentage of little advanced education; but from the start was ingrained with a strong inquisitiveness, similar to Scottish physicist James Maxwell's famous age three repeated query "What's the go 'o that?", and deep sensitivity to boredom, similar to German polymath Johann Goethe's famous age eighty to "die of *ennui*" phrase.

Thims' earliest recollected question, asked sometime around the age of 3 to 5, while being led through a local park, was "where does God live?" (a followup, supposedly, to an earlier query: "what happens when you die?", although he does not recall asking this specific question), to which Thims was told "he lives in that gardener's shack", a small white toolshed near the edge of the park. The satirical response to this question—a query that embodies the notion that both "God exists" and that "life exists", a viewpoint ingrained into the minds of most young children of the world from inception, sat in the back of Thims' mind for some time, that is until he would latter enter into scientific studies and comparative mythology and religion studies in adulthood, which resulted to position him into the Dawkins number 10 category of belief system. The idiocy of this situation is summarized well by the following 1883 synopsis, by English Egyptologist Gerald Massey, of the learn-unlearn process the majority of intellectuals (readers) are forced to go through: [18]

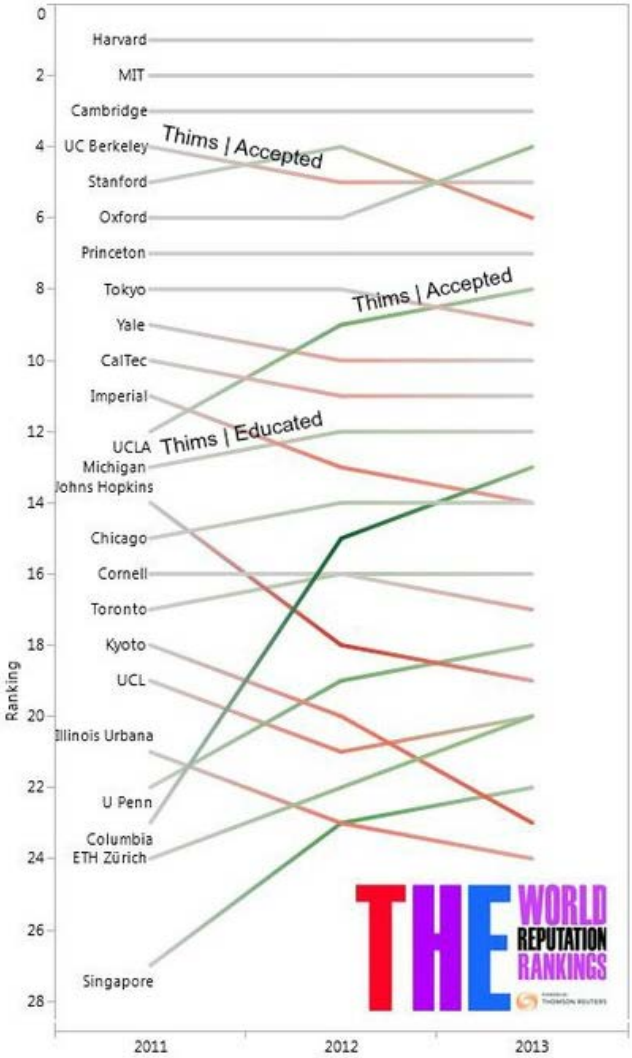

A snapshot (Ñº) of **Thims'** climb upward through the higher educational ladder, starting from an essential age-19 blank slate *tabula rasa* mindset in possession of zero books and no knowledge of chemistry, thermodynamics, and physics.

> "It takes the latter half of all of one's lifetime to unlearn the falsehood that was instilled into us during the earlier half. Generation after generation we learn, unlearn, and re-learn the same lying legendary lore. Henceforth, our studies must begin from the evolutionist standpoint in order that they may not have to be gone over again."

A second turning point in Thims educational process occurred at about age about 7 to 8, during which time second grade school reports of Thims being extremely "bored" in class were sent to his parentage (description on report cards); the result of which, at the end of the school year, Thims was held back (in a sense "flunked" second grade), the family moved to a new school district, and he was made to completely retake the entire second grade over again—and from that point forward, for the next eleven years, Thims *completely detached* from school and curricular activities and at the age of 19, graduated a year behind his peers (average graduation age for sharp students: 15-18), owned no books, of any sort (0 book personal library), having never taken any sort of formal science classes—chemistry in particular—or advanced mathematics classes; graduating at or below the average grade level. This period, wherein Thims' focused not on learning, but instead on the socializing, romancing, and the art of partying, might well be classified as Thims' first educational detachment—a social IQ enriching period—though one in which, book-knowledge speaking he, at the age of 19, had a complete *tabula rasa* mindset—a blank slate, so to speak, in regards to preconceived notions about reality.

In the midst of this mental knowledge stagnation period, Thims' mother terminated, when he was 12, which categorizes him, as he latter came to discern (c.1999), among the early parental death group; a phenomenon common to founders of scientific revolutions (Darwin, Newton, Maxwell, Copernicus, Gibbs, Nietzsche, etc.)—Thims, in this context, would go on, beginning in 1995, to

FALL 1994	ENGIN	CHEM ENG	JUNIOR	Grade	Hours
CH E	230	THERMODYNAM I		A	4.00
ENGR	105	COMP COLL ENGR		B+	1.00
CHEM	302	INORG CHEM		A	3.00
ECON	201	PRINCIPLE ECON I		B+	4.00
Term Totals			GPA	3.708	12.00
Cumulative Totals			GPA	3.708	

WINTER 1995	ENGIN	CHEM ENG	JUNIOR	Grade	Hours
AO&SS	467	BIOGEOCHEM		A-	3.00
CH E	330	THERMODYN II <--?		A-	4.00
CH E	341	FLUID MECHANICS		A-	3.00
HIST	366	20TH C AMER WARS		B+	4.00
Term Totals			GPA	3.585	14.00
Cumulative Totals			GPA	3.642	

SPRING 1995	ENGIN	CHEM ENG	SENIOR	Grade	Hours
CHEM	468	PHYSICAL CHEM		A	4.00
Term Totals			GPA	4.000	4.00
Cumulative Totals			GPA	3.690	

FALL 1995	ENGIN	CHEM ENG	SENIOR	Grade	Hours
AERO	200	INTRO AERO ENG		A	3.00
CH E	342	HEAT & MASS TRANS		A	3.00
CH E	343	SEPAR PROCESS		B-	3.00
CH E	486	PROC SIM & DES I		B+	3.00
Term Totals			GPA	3.500	12.00
Cumulative Totals			GPA	3.635	

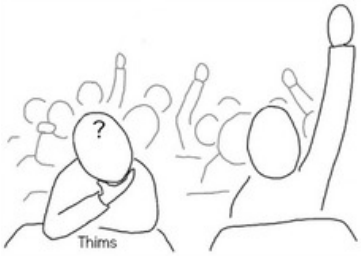

Thims' 1994-1995 chemical engineering coursework (University of Michigan), during which time (see: progress report), in one of these classes (thermodynamics I, thermodynamics II, physical chemistry, or heat and mass transfer) the seed for the search to understand the subject of "human chemical thermodynamics" was planted (see: progress report).

begin spearheading or rather continuing, unbeknownst to him, the Goethean revolution, the human chemical thermodynamics paradigm shifting revolution started by Goethe in 1796 (see: Goethe timeline).

University studies

Following high school graduation, then, following nearly two decades of complete intellectual stagnation (socialization aside), while rummaging about in the education and career path section of a local library, Thims read that subject of chemical engineering was the most intellectually difficult degree and most well-rounded science degree one could obtain and further more (as he was told later) that the subject of chemical engineering thermodynamics was the "weeder" course of the chemical engineering, and decided that, although he didn't quite understand what the point of existence was, that going after the hardest objective, whatever the reason, would be in the direction of the greatest fear and hence the correct path, wherever it may lead? Within four years, then, Thims had gained acceptance into the highest ranked engineering schools in the America, the University of California, Berkeley (#2 US ranking in chemical engineering; #3 world ranking in chemical engineering), in particular, home to the historical Lewis school of thermodynamics; eventually finishing, for financial savings reasons, at the University of Michigan (a top 5 US engineering school), finishing in the top 8% of his chemical engineering graduating class, of 162 students, with a 3.85 GPA, in 1996.

Thims then, in an effort to pull up his GPA higher, completed a second degree in electrical engineering, in 1998, at the University of Michigan, figuring that the two degrees combined would well round out, intellectually speaking, whatever he was to do thereafter. [4]

During these undergraduate engineering years, however, greatly heightened in excitement with each step in the knowledge attainment process, Thims chanced into a conversation, in the hallway, with a random chemical engineering graduate student, to which Thims queried him "so what do we learn in graduate school?" a query to which Thims was told, in rather education-halting terms, "*we learn the same things over again*", only in more detail, or in a more advanced way, or something along these lines. This was, no doubt a wrench in Thims' plans; meaning that to waste time learning the same thing over again (a recall back to his second grade experience), seemed, to Thims, to be a pointless endeavor and not a road to be traveled. This mental visualization is captured well in the following summary by American genius and creativity theory psychologist Dean Simonton: [12]

> "These days it is virtually impossible to get anywhere in these fields without a JD, MD, or PhD. On the other hand, most artistic creators, revolutionary scientists, and other more unconventional achievers may have much to lose and little to gain form continuing with more than a smattering of higher education. They may need enough formal training to acquire certain basic knowledge and skills, such as the ability to write well and to carry on an informed conversation. Beyond that, the increased inculcation of more specialized disciplinary preoccupations may only interfere with more important pursuits. For instance, success in many fields is strongly correlated with voracious and omnivorous reading, and undisciplined activity that may suffer under academic demands."

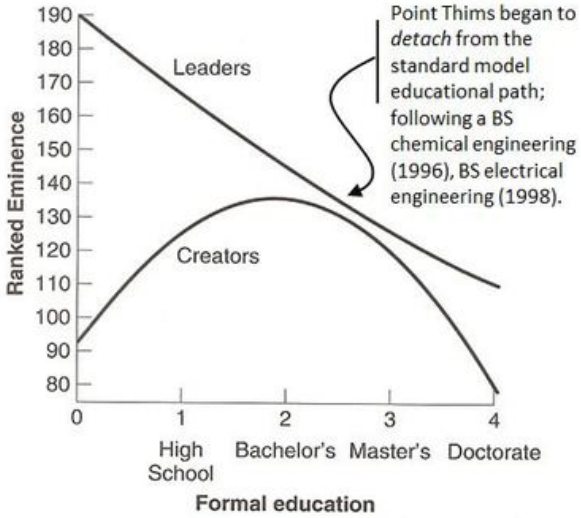

American genius-creativity theorist Dean Simonton's 1983 "Formal Education, Eminence, and Dogmatism: the Curvilinear Relationship" diagram, showing the eminence (of the 301 Cox geniuses) versus level of formal education; which is indicative of Thims' *circa* 1996 view (originally stated by Goethe):

> "If one does not know what went on for the last three thousand years, he or she remains ignorant, merely surviving from day-to-day."

in effect that what there is to be learned in science past the basic general scientific knowledge BS chemical engineering degree level more efficiently and more purely learned on one's own. [11]

This was what might be called Thims' second detachment; after which, following a relocation out to Chicago, he came into the view that better results would be obtained learning what could be learned on one's own, during which period he became any autodidact, studying in all areas of knowledge, in particular medicine, neuroscience, evolutionary psychology, chemistry, physics, and thermodynamics, amassing a 1,250+ book science library. A central philosophy, anchored up during these years is what Thims calls the "Buffett number", the number of books one has to read in any given subject to know more than any given professor of that subject, which is 100, based on the famous anecdote recounted by American business mogul Warren Buffett who, at age 16, had read at least one hundred books on business, and entered the Wharton School of Finance, wherein upon arrival he reported that 'he knew more than the professors'.

The years 2001 to 2011, in Chicago, were devoted to independent research aimed at the fields of human chemistry, human thermodynamics, and human physics, with the bench mark of obtaining a Buffett-level of proficiency in pure thermodynamics; while at the same time working towards the

completion of an MD-PhD.

The template design for American electrochemical engineer Libb Thims' 2010 conceived C.P. Snow-themed **Two Cultures Department**, teaching the subject matter structured about the interdisciplinary relationship between second law (Clausius) and the various branches of the humanities (Shakespeare), bridging the gap between the famously left-brain right-brain divided "two cultures"; the synthesis of which being first captured in the mind of Goethe (see: Goethe timeline), and tested in the coursework of Leon Winiarski at the University of Geneva (1894-1900), in his thermodynamics-based socio-political economics course (see: social mechanics), similar to Jurgen Mimkes (modern); being the embodiment of Henry Adams' famous 1910 call to American teachers of history (see: letter) to being teaching chemistry and thermodynamics in history class.

University department

See main: Two cultures university department

In 2010, Thims began teaching human chemistry and human thermodynamics, as an invited guest lecturer, to various engineering, sociology, and economics schools, in and about the Chicago area and also internationally (Thims' fifth university lecture will be at University of Pitesti, Romania and their fifth Econophysics and Sociophysics Workshop, 2013).

In 2011, Thims, via Hmolpedia forums and email consultations Q&As, began to mentor graduate students through their PhD dissertations, particularly through the applied human thermodynamics portions. Sometime during during this period, the visualization came into view that it would be wise to center this effort at a university department formally, rather than as it is currently being done, as an informal hobby.

In 2012, Thims began proactively contacting various university department heads in loose discussion in an aim to found America's first two-cultures university department covering:

Thims currently is in talks, see: two cultures university department (discussion section), to found such a multi-disciplinary department; although as French physicist Serge Galam's reports, such an effort is not without decade's of resistance and opposition to the premise of a field in which a person is defined as an atom or a molecule, which comes from someone in France, the least religious country in the world.

Nobel Prize | Ig Nobel Prize

In 2007, Russian physical chemist Georgi Gladyshev flew out to Chicago, to congratulate Thims on his work and, over dinner, informed him that he had sent his work, in particular his two-volume *Human Chemistry*, into the Nobel Prize committee for nomination.

In 2010, Martin Gardiner, of the *Annals of Improbable Research*, the group that administers the Ig Nobel Prizes, whose motto is to award people whose: “achievements that make people laugh, then think”, ran a four-part, three-day article on Thims, entitled “I Am Not A Molecule”, subtitled 'Inside the IoHT', discussing topics such as Thims' 2008 book *The Human Molecule*, the Human Chemistry 101 video lectures on the human molecule, the Institute of Human Thermodynamics, the *Journal of Human Thermodynamics*, among other topics. Gardiner considers the subject of the chemistry and thermodynamics of human molecules to be an emergent intellectual development. [5]

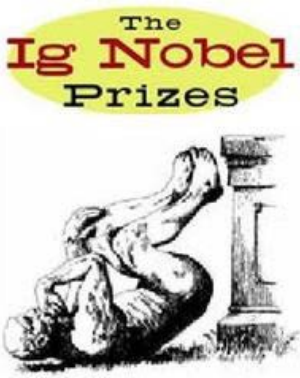

A 2008 Lumonosov Award presented to **Thims** by Russian physical chemist Georgi Gladyshev for outstanding work in human thermodynamics. [22]

Right: A CafePress.com human element golf shirt, themed on the 2006 Dow Corning “human element” advertising campaign, which American electrochemical engineer Libb Thims began wearing in 2012 in lecture to represent his hmolscience philosophical outlook. [27]

Awards-memberships

The following are various awards or memberships given to Thims:

â— Awarded in 1995 the G. Brymer Williams Academic Scholarship (chemical engineering) of $1000 (University of Michigan).
â— Elected in 2006 as member-correspondent of the International Academy of Creative Endeavors. [3]
â— Awarded the 2008 Lumonosov Award (adjacent), National Committee of social - public premium, Russia, N 104 (148). [22]
â— Elected in 2009 as founding chairman of the Transcience Society, Delhi, India.

Side projects

YouTube's Human Chemistry 101 channel was started in 2008 by Thims, scheduled as a semi-weekly educational video series on the science of "human chemistry", or the chemistry of human interactions. In 2009, Thims joined Twitter, which he posts to occasionally. In 2009-2010, Thims worked out some of the basic principles of a modern thermodynamics-based pair-matching dating site: ReactionMatch.com according to which people, as human molecules, are matched in reactions, using the thermodynamic database method, the same exact way that smaller atoms, chemicals, and molecules are matched. Thims has been in talks with the one of the heads of Match.com, and other science-based dating site launchers, and is currently working to connect our couple this pilot plant stage project up to a university department in order to conduct experimental research and theoretical human chemical thermodynamics. This latter project, however, is currently shelved or rather on the back-burner at the moment.

Quotes

See also: Libb Thims (quotes); Libb Thims (personal notes)

The following is the most-cited quote by Thims—a tipping point statement to the arrival at the defunct theory of life position:

> "You agree with me that the single atom is not alive. What about two atoms? What about three? Does a bound state of atoms have to have a certain movement to be considered alive? What if we heat a system of four atoms, do they suddenly become alive? What if we subject a system of atoms to both gravitational and electromagnetic forces, does that suddenly make them alive? What if the two forces act to move smaller atoms through the cavities of larger atoms [molecules] on a cyclical basis, thus activating reactions [metabolism] in the process, does that make them alive? What if the two forces begin to arrange the atoms into hierarchies, and that smaller atoms and bundles of atoms begin to move between the hierarchies, does that make them alive? What if a structure of atoms, begin to turnover their internal atoms, with those of the surrounding space, on a cyclical basis, does that make it alive? It should be very obvious that no matter how many atoms one adds to the argument that an atom or a structure made of two or more atoms cannot be alive. It is my view that one cannot define an atom or two or more atoms structured as a bound state to be alive. The word itself and baggage of theory surrounding the word is meaningless. It is akin to the words: vitalism, élan vital, hylozoism, panpsychism, etc. From the point of view of the molecular evolution table, according to current views, rows 1-10 are considered to be not alive, rows 11-28 are considered to be *alive*, and rows 30 and above are not alive. Because of our anthropocentric biases, we continue to believe that we are unique among molecular structures, in that those much smaller or much bigger than us are not alive, whereas we are. It is a grave mistake to believe in this fallacy. I am not quite sure what the alternative theory is; but from the point of view of atoms, molecules, and the logic of the chemistry textbook, the theory of the conception an atom, or two or more attached atoms, being alive is absurd. This is my view."
>
> — **Libb Thims** (2009), "Letter to Georgi Gladyshev", Jan 2; cited by: DMR Sekhar (Ñº), 7, 20 Aug 2010 and 2014 (Ñº); Vangelis Stamatopoulos (Ñº), 15 Nov 2010; David Bossens (Ñº), 19 Jun 2012 and 3 Jan 2013; David Busse (Ñº), 10 Dec 2013; YouTube forums (Ñº), 2014; Georgi Gladyshev (Ñº), 2014; among others (Ñº) [31]

Praise | Tributes

The following are quotes and or commentary on or about Thims and his work:

> "**Thims**' brilliant book [*Human Chemistry*] symbolizes the beginning of a new era (epoch) in human history."
>
> — Georgi Gladyshev (2006), Russian physical chemist [9]

> "I want to say how much I enjoyed reading [**Thims**] splendid discussion of Gibbs free energy. It is wonderful to see someone who is not afraid to look at the phenomena of life in a unified way."
>
> — John Avery W (2006), Lebanese-born Danish physicist and theoretical chemist

> "The chapters [*Human Chemistry*] are wonderfully written. I have a feeling it will be [**Thims**] who will get the public's attention about the fundamental change in thinking in science."
>
> — Jing Chen (2006), Chinese-born Canadian mathematician and economist [9]

> "**Thims**' edits are far and wide. Unless Physchem is an incredible polymath, I doubt he would be able to pick up on all the BS a Thims-type editor introduces. That's not knocking Physchem, I don't think there is anyone who could deal with the range."
>
> – Keith Henson W (2007), American electrical engineer and evolutionary psychologist

> "If we accept **Thims'** logic of human thermodynamics as a viable explanatory framework, which it very well is, romantic bonding then becomes the subject matter of quantum electrodynamics (QED), an aspect of particle physics that traces human attachment and bonding to the interactions of photons and electrons. Thus, applying Thims' theory to interpersonal and love relationships, it is unlikely that any one person has the ability to coerce or unilaterally secure another person's affection. In a different sense, the force of attraction between a man and a woman is beyond their physical control, except, of course, by way of the energies they emit and exchange between them. Thims' *Human Thermodynamics* thus makes substantial contribution to our understanding of the perplexing nature of romantic love, greatly supplementing prior research in this field."
>
> — Satch Ejike (2008), African-born American lawyer and social scientist [8]

> "I stumbled onto [**Thims**] website by accident but I have to confess this might be one of the most stunning undiscovered intellectual achievements of the 21st century. I have browsed through your wiki and I cannot express how tragic it must be to a man in your position—to be a pioneering thinker yet to be rejected by an uptight academic community with neither the depth nor will to understand your unique work, defending their own turf like dogs. I can only compare you to the many other pioneering heroes of science, Newton, Einstein, Tesla, men who like you blazed their own paths but were too victims of their own genius, only to be validated years after their death. Perhaps one day historians will look back and have a chuckle—that the pioneer of enthropology published by a vanity press in a book resembling a third rate romance."

— Steven Pierce (2009), Canadian mathematical physicist and computer scientist [19]

"I think the notion that Facebook may be in the process of auto-brain-forming is at least credible as the idea that we – us humans – can be thought of as giant molecules. As a starting point to examine this intriguing concept see: "Inside the IoHT" as explained by **Libb Thims**, at the Institute of Human Thermodynamics."

— Martin Gardiner (2010), comment (Ñº) to Carl Zimmer's "Facebook is Not a Brain, and Other Failed Metaphors", Jul 9

"One of the most interesting topics [human molecule] I have ever had the pleasure to read. Going through it a second time, and looking forward to the third. [*The Human Molecule*] covers the most fundamental change in human knowledge since Charles Darwin's *On the Origin of Species* [1859], by presenting a theory that we are fundamentally molecules, and that the question of life itself is a fundamentally flawed one. Especially important is the carefully laid out historical narrative of how **Thims** came to his theory of the human as a molecule. Whether you ultimately agree with this work or not, it represents a paradigm shift in viewing our place in the world."

— Jeff Tuhtan (2011), American civil engineer and ecological thermodynamicist [10]

"**Libb Thims**: the great oracle and developer of human thermodynamics—the philosophical revolution of the 21st century. A genius of outstanding stature and originator of many concepts in human chemistry. [His] breathtaking contribution to science needs to be rewarded. Let's hope one day [he] can add a Nobel Prize to [his] impressive career."

— Mark Janes (2011), English chemical engineering student turned biotechnologist and human free energy theorist [20]

"I must say, I started watching your videos over a year ago, and have re-watched many. And they still fascinate me. I'm only 17 and I'm seriously considering doing a degree in chemistry after watching your videos. The only downside is not many people I know can have a conversation about the things you're talking about. You were right your videos are **decades if not a century in front of its time**."

— Benjamin Cresdee (2011), comment on Human Chemistry 101 YouTube channel

"The idea that individual humans are atom-like entities and there is a kind of chemistry between social atoms and molecules is very natural, but whether it is more than a metaphor remains uncertain. Anyway, human chemistry has been on the marketplace of ideas for quite a while [see: Goethe timeline, 1796]. The main reason why I abstain from referring to **Libb Thims'** flamboyant venture other than as to a commendable review of literature is that he, apparently, uses the term chemistry too literally in the sense of molecular chemistry, while I am interested in pattern chemistry. I can only note that the very idea of human thermodynamics as a separate subject looks to me completely sound. Thus, the concept of metabolic cost is part of it. Obviously, human interaction is a component of global economy."

— Yuri Tarnopolsky (2011), *Introduction to Pattern Chemistry* [23]

"The short booklet *The Human Molecule* by **Libb Thims** (esp. chapter 9 and pg. 70 - the Molecular Evolution Table) presents a fascinating depiction of man's evolution. One is able to see how all life forms slowly became more complex by way of molecular evolution. Accepting this evolutionary understanding requires us to also accept a 'new story' in our quest."

— Tavit Smith (2012), "Ancient Religions and the New Story", Jan 1 [32]

A 2012 YouTube thumbs up ranking of **Thims** as having the **"highest IQ"** ever, above that of Goethe (IQ=230), Einstein (IQ=220), and Newton (IQ=215), from the comments section of part four of the "IQ 200+ | Smartest person ever" video (rate: 1.5 thumbs-up votes / 336 views **â^™** day), a countdown to the last universal genius, German polymath Johann Goethe, ranked, starting from the Cattell 1000, the 1894 listing of the thousand most eminent individuals of history, by a team of Stanford psychologists led by Catherine Cox (*Early Mental Traits of 300 Geniuses*, 1926) and Lewis Terman, the group that invented the IQ scale, with an IQ of 225, the highest of all modern genius IQs.

"[Human thermodynamics] is a branch of science that attempts to predict the behavior of people via chemical and thermodynamical equations. It is an interesting philosophy, a change of paradigm, perhaps even having a broader explanation for human behavior than Darwanian evolution. Human thermodynamics can also be useful as a new framework for the origin of life. For instance, **Libb Thims**, proposed online that the idea of Darwin's 'dark pond' which suddenly sprang to 'life', is not a very coherent one [defunct theory of life], and that it would be much more creditable and parsimonious to have as a rule that molecules bond and form ever more complex beings. Libb Thims also proposed a 'human molecule' where people are attracted to each other by chemical bonds [see: human chemical bond]. All this I believe to be a reasonable explanation: even if Darwin's theory is still correct, the approach of thermodynamics and chemistry is a much more simple, and at the same time broader view. If the concept of biology is somehow redundant, then we must study it by means of chemistry and physics."

— David Bossens (2012), “Reflections: Criticisms of Science” [21]

“**Libb Thims** is [a walking] encyclopedia of human thermodynamics.”

— Milivoje Kostic (2013), introduction to Thims’ 16 Apr NIU talk [24]

“This [are viruses alive] debate could take an entirely different route if you consider a letter published [2009] in the *Journal of Human Thermodynamics* by **Libb Thims** in which he discussed the idea that a theory of life was in fact defunct. The point was made that we do not consider a single atom to be alive, nor two atoms, or three. He builds on this statement to say that ‘it should be very obvious that no matter how many atoms one adds to the argument that an atom or a structure made of two or more atoms cannot be alive’. This is a **bold statement** as it clearly implies that it is impossible to apply the idea of life to anything, even us. Nikola Tesla also outlined a ‘defunct theory of life’ in 1915 where he said that ‘There is no thing endowed with life’. This is obviously a very pedantic way to look at the definition of life but a relevant viewpoint nonetheless. Is anything living, or nothing? Or everything?”

— David Busse (2013), “Viruses: Living or Not?”, Dec 10 [30]

“I’ve got a MA in chemistry—but your book [*Human Chemistry*]—it really affected me. I’ve been prompting it in our university [Technion] in the last couple of years—and got great responds from some top researchers—I think you’re doing excellent work!”

Religious Views Pastafarian
All praise his noodliness R'aman

— Ofer Po (2013), Facebook messaging; see: religious views (Ñº) adjacent (Dec 24)

“I think human chemistry is a pretty interesting way of modelling human behavior. Are there any PDF versions of your textbook?”

Religious Views Naturalism
In truth there are only atoms and the void.

— Hasan Mohammad (2014), Facebook messaging; see: religious views (Ñº) adjacent (Apr 30)

“I was very excited Mr. **Libb Thims** on reading about your Hmol.science [hmolscience] which touches the human dimensions with the implicit assumption that human transformation processes are thermodynamic transformation processes and that reactions between people constitute chemical reactions between human molecules.”

— Mirza Beg (2014), email communication (15 May) following Thims’ 13 May discovery of Beg's very ripe physicochemical sociology book (*New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, 1987)

“**Libb Thims**, whose IQ I estimate at 200, is an American electrochemical engineer, and one of the ten most intelligent humans currently reacting on this planet. His primary website, the *Encyclopedia of Human Thermodynamics*, is widely considered the greatest intellectual achievement on the Internet. The EoHT Forum discusses topics spanning from morality to ‘life’ and ‘death’, and from literature and art tothe many fields of science. Reading through the threads on the forum will probably yield an increase in the reader’s IQ.”

— Inderjit Singh (2015), “Knowledge is Power” (Ñº), Oct 3

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External links

Publications

- â— Libb Thims (publications) – Issuu.com.
- â— Libb Thims (storefront) – LuLu.com.
- â— Libb Thims (documents) – DocStoc.com.
- â— Libb Thims (documents) – ScribD.com.
- â— Libb Thims (user page) – Helium.com.
- â— Libb Thims – Twitter.

Productivity

- â— Libb Thims – WordNik.com.
- â— Libb Thims (user profile) – Amazon.com.
- â— Libb Thims – Fluther.com.

Libraries

- â— Libb Thims (author) – UNJobs.com.
- â— Libb Thims (author) – WeRead.com.
- **â—** Libb Thims (author) - Open Library.
- â— Libb Thims (reviews) – ReviewScout.com.
- â— Libb Thims – GoodReads.com.
- â— Thims, Libb – WorldCat Identities.

Networking

- **â—** Libb Thims - LinkedIn.com.

Misc

- â— Libb Thims (quotes) – HT.com.
- â— Libb Thims (shirts/posters) – Zazzle.com.
- â— Libb Thims – MindBroker.com.

Videos

- â— Human Chemistry 101 – YouTube
- â— Atheism Reviews – YouTube
- â— Libb Thims – YouTube
- â— Libb Thims | Udemy.com

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Science
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â— Libb Thims (profile) – TheScienceForum.com.
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â— Libb Thims – Xing.com.

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Recent
â— Libb Thims (Ñº) – TheScienceForum.com.
â— Libb Thims – Pinterist.
â— Libb Thims (public profile) – Yatedo.com.
â— Libb Thims (speaker profile) – Northern Illinois University.
â— Libb Thims – About.me.

θΔics

In Libb Thims (lectures), **Libb Thims (2010 lecture)** was an April 13th one hour lecture entitled "An Introduction to Human Thermodynamics" given by American electrochemical engineer Libb Thims to an undergraduate bioengineering thermodynamics class of about 15 students. The lecture was video recorded (stills of which are shown adjacent) and was very impromptu consisting of white board derivation a a few power point presentations and descriptions of a number of posters brought to the lecture by Thims, including the molecular evolution table, Bergman's affinity table, Bergman's reaction diagrams, engine development timeline, among others. [1]

Thims lecturing in 2010 on human thermodynamics to bioengineering students, standing adjacent to pictures of Clausius, Gibbs, and Lewis, authors of the founding texts at the core of human thermodynamics.

Thims explaining to bioengineering students how the Papin engine relates to human chemical affinities, Gibbs free energy, and morality (right or wrong).

Notes

The 2009 Moriarty-Thims debate involved a good deal of heated debate (such as mentioned in the tread below) and protest (particularly from Irish physicist Philip Moriarty and American organic chemist Frank Lambert) about the premise of Thims giving a lecture on human thermodynamics to university students, which including harassing and or warning email communications to and from various professors.

A similar discussion is the 27 Sep 2010 ChemicalForums.com discussion thread "Should Human Chemistry be Taught in School", during which time Polish chemist Marcin Borkowski and American nuclear chemist Mitch Garcia (founder of ChemicalForums.com), among others commented that they saw the subject of human chemistry, as conceived by Goethe, to be crack pottery, and that human interactions are subjects that are covered in sociology and psychology, not by chemistry. [1]

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θΔics

In Libb Thims (lectures), **Thims 2011 lecture** is a university lecture given by American electrochemical engineering Libb Thims on 12 Aug 2011, which used following outline, shown on this webpage, as an overhead lecture outline, along with a printed handout. [1]

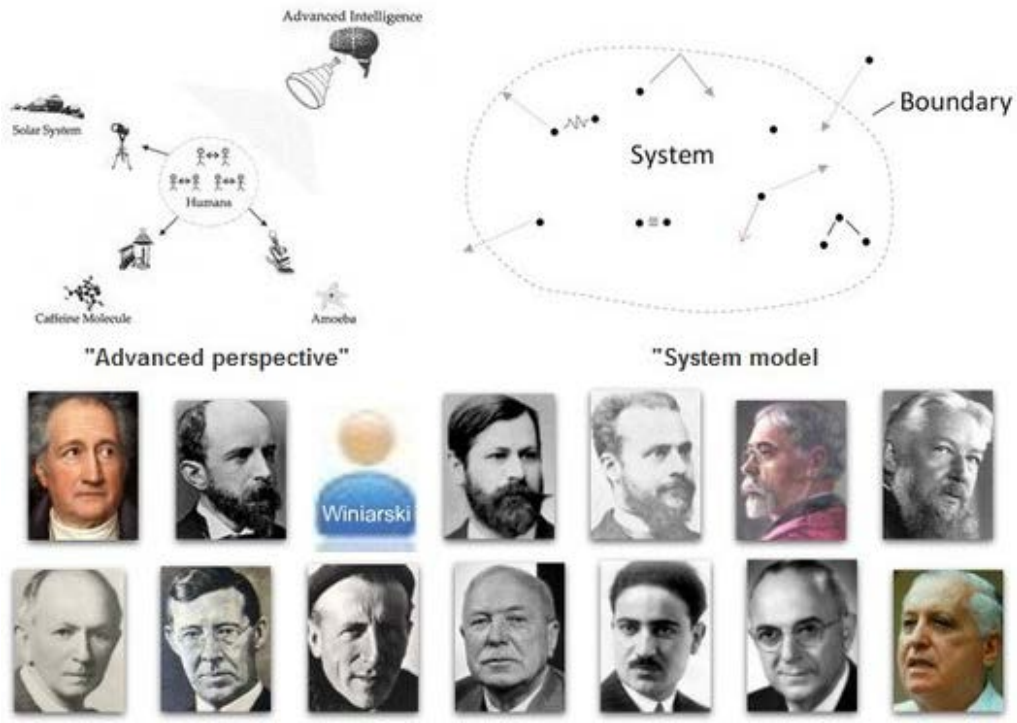

14 main HT pioneers before 1972.

Lecture outline

The following is are draft lecture outline notes for a 45-minute talk on human thermodynamics geared toward undergraduate bioengineering students:

> "Human thermodynamics is the thermodynamical study of boundaried 'systems' of **human molecules**."
>
> – C.G. Darwin, *The Next Million Years* (introduction), 1952

The following bullets are the key stops in the talk.

Intro

- Hidden treasures (why is this site here?)
- HT pioneers (400+)
- Mechanistic school (1928)
- Site members (2007-)

Move beyond

- Folklore thermodynamics? (2009 campus debate intro)
- Laymanized thermodynamics?
- Analog tables (e.g. James Reiss)

Belief system

- Clausius postulate (1865)
- Belief system (thermodynamic)
  - Laity belief system (origin, life, love, death, meaning, purpose, morality, afterlife)
  - Religion (Ra theology)
  - Existence of god (percent belief by scientists)

Rules of thumb

- Einstein postulate (1920-1940s)
  - Eddington rule (1928)

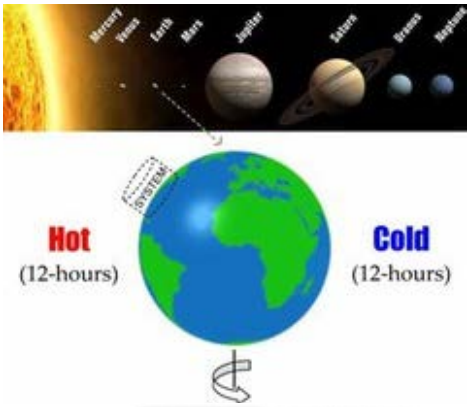

The 3 core **backbone thinkers** underlying human thermodynamics (1650-1923)

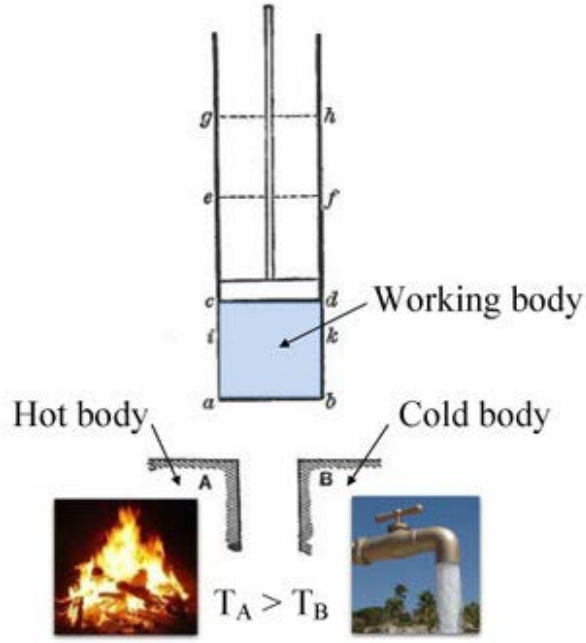

Perspective

- Advanced perspective
- Famous publications

Tensions and danger

"Never discuss religion, politics, or money."

- Science-religion debate (Galileo on trail in 1633)
- Science-connected legal cases (1925-2010)
- Shark attack (2005-present)
- Detractors (1810-present)
- Founders and suicide (1850-2008)?

Avoid

- Unitless thermodynamics?
- Contrived thermodynamics?
- Information thermodynamics?
- Biased thermodynamics?

What is a human?

- Creation from clay
- Automaton
- Laboratory produced life

- Nebular hypothesis (1734)
- Human molecular theory (1798)
- Human molecular formula (2000)
- Numbers of atoms

- Human chemistry (books)
- Human molecule

- Evolution table (2005)
- Evolution timeline (2009)

- Human molecule (alternative)
- Human molecule (banned)

"Thermodynamics is the study of the principles and laws behind the phenomenon of the production of

motion by heat, considered from a sufficiently general point of view, applicable to not only steam engines, but to all imaginable heat engines, *whatever* the working substance and whatever the method by which it is operated. To heat are due the vast movements which take place on the earth."

– Sadi Carnot, *Reflections on the Motive Power of Fire*, 1824

Heat engine theory

- Vacuum debate (485BC)
- Pump problem (1643)
- Magdeburg hemispheres (1654)
- Schott diagrams
- Piston and cylinder (1647)
- Guericke engine (1652)
- Gunpowder engine (1678)
- Papin engine (1690)

		$2Na$ (s)	$+ 2H_2O$ (l)	$\rightarrow 2NaOH$ (aq)	$+ H_2$ (g)
ΔG_f°	(kJ/mol)	0	–237	–419	0
ΔH_f°	(kJ/mol)	0	–286	–469	0
S°	(kJ/mol·K)	52	70	48	131

The sodium-water reaction (adjacent) shows the heightened reactivity of sodium and a visualization of volume change ΔV on going from reactants to products.

- Papin digestor (1679)
- Boerhaave's law (1720)
- Heat cycle (1824)

- Theorem of the equivalence of transformations (1854)
- Clausius inequality (1854-1862)

- Rise and fall of civilizations

- Spin-induction (1831)

$$\int \frac{dQ}{T} \geq 0$$

"A process which in no manner can be completely reversed I call a 'natural' one. The term for it in universal use today, is 'irreversible'."

– Max Planck, *Autobiographical Notes*, c.1940.

Natural vs unnatural

- Nature
- Lewis inequality for natural processes

$$\Delta G < 0$$

Lewis inequality for natural processes

$$\Delta G > 0$$

(link)
(1923)

- Spontaneity table

- Reaction

A +
B →
AB

- IQ: 200+

- Goethe's affinity table
- Divorce

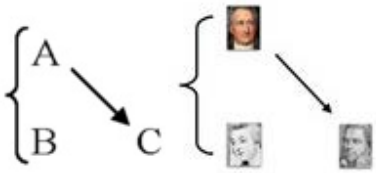

- Coupling

$$\sum_{i=1}^{j} \Delta G_{N_i} + \sum_{i=1}^{k} \Delta G_{\bar{N}_i} < 0$$

"The moral symbols used in the natural sciences are the elective affinities discovered and employed by the great Bergman."

– Johann Goethe, comment to Friedrich Riemer on the *Elective Affinities*, 1808

Affinity and free energy

- Moral movement (1789)

- Moral symbols (1808)
- Chemical affinity
(elective affinity)

$$A = -\Delta G$$ (link)
(1882)

- Morality?

- Branches of human thermodynamics
- HT pioneers
- HC pioneers
- HP pioneers

- Standard model

- Applications

(Freudian psychology: 1895-present)
(Technocracy: 1918-1933)
(NASA life-detection probes: 1964-2005)
(Foodstuff thermodynamics: 1995-present)
(Physical intelligence: 2009-2011)
(Business consulting - SThAR: 2009-)
(Pair matching: 2020-)

"The free energy G, represented by the function ΔG = ΔH – TΔS, the parameters enthalpy H and entropy S representing the variables of heat content and probability, respectively, is the fundamental driving force in nature and determines whether physical and chemical processes conducted by nature and society will take place."

– Thomas Wallace, "The Fundamentals of Thermodynamics Applied to Socioeconomics", 2009

Tentative topics

- Origin of life
- Life?
- What is life? (theories of existence)
- Afterlife?
- Defunct theory of life?

Nordholm's homework problems

Sture Nordholm (1944-)
Swedish physical chemist
"In Defense of Thermodynamics: an

Animate Analogy”
Journal of Chemical Education
(1997)

● Homework (with clues)

● Introduces the term "animate thermodynamics" as the thermodynamics of human behavior, and argues that thermodynamic formulation can be applied to explain human behavior, on the logic that the basic elements of the description of atoms, molecules, and matter can be scaled up to the realm of living organisms without changes other than in complexity of the systems and their behavior.
● Equates energy to wealth, kinetic energy to cash, potential energy to property, and entropy to freedom.
● States that nature's goal is to minimize the free energy of the subsystem.

References

1. Thims, Libb. (2011). “How to Apply Thermodynamics in the Humanities: with Engineering Focus” (abstract), Invited one-hour talk, Chicago, University, Apr 12.

θΔics

In Libb Thims (lectures), **Libb Thims (2012 lecture)** is the following online class room overhead projection outline for an April 10th 2012, 12-part, one hour lecture, given to bioengineering thermodynamics students at University of Illinois (UIC), entitled "An Introduction to Human Thermodynamics: Chemistry, Physics, Engineering, and Applied" by American electrochemical engineer Libb Thims to an undergraduate bioengineering thermodynamics class of about 35 students.

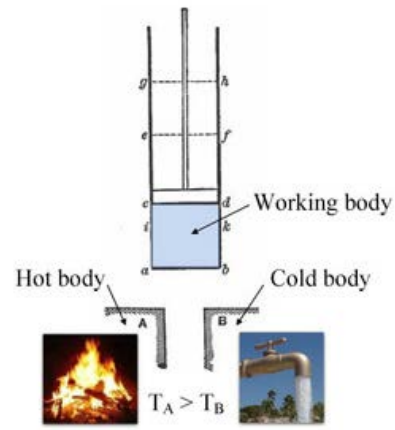

Lecture overview: American electrochemical engineer Libb Thims illuminated rotating globe and Papin engine model (left) and Carnot engine (right) that Thims used together with a ball and ring experiment to explain to students how Gibbs free energy decease relates to entropy increase and to change in the equivalence value N of society during a one day heat cycle of existence. $\int \frac{dQ}{T} = -N$

Chapter handout

The following 22-page chapter on "Human Thermodynamics: Chemical, Physical, and Engineering", with an appendix section containing ten homework problems (selected from the Hmolpedia homework problems page), was handed out to students the week before the lecture as required reading.

> â— Thims, Libb. (2012). "Human Thermodynamics: Chemical, Physical, and Engineering", Bioengineering Thermodynamics; pre-lecture required reading; tentative draft chapter 14 for *Schaum's Outlines of Thermodynamics for Engineers, Third Edition*, by Merle C. Potter and Craig W. Somerton. McGraw-Hill.

About half of the students read the chapter before the lecture (the overhead outline of which is shown below), which included a demonstration of the famous ball and ring experiment (to demonstrate Boerhaave's law and how this related to how entropy increase in society can be understood in terms of the equivalence value "N" of the 1854-56 principle of the equivalence of transformations pre-version of entropy, as explained by German physicist Rudolf Clausius).

Lecture

The following are the 12-parts of the lecture that were shown to students, in overhead, which accompanied verbal explanation, and white board derivation and diagram explanation:

1. Reaction example

Salt and water

The following is the chemical reaction (solvation reaction) for the contact of salt (NaCl) with water (H_20):

$$NaCl_{(s)} \rightarrow Na^{+}_{(aq)} + Cl^{-}_{(aq)}$$

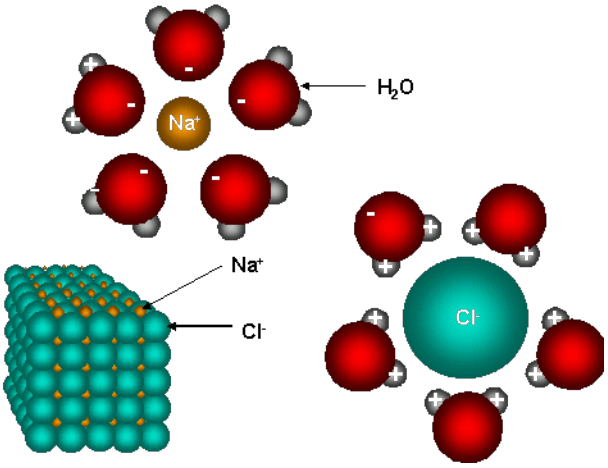

The Gibbs free energy change ΔG for this solvation reaction is -0.027 kJ/mol and by the rule of reaction spontaneity:

ΔG < 0 | Spontaneous reaction
ΔG > 0 | Non-Spontaneous reaction

the reaction is energetically favored and goes naturally;

To note, although the value of Gibbs free energy change is small, there have been some attempts to utilize this available energy (free energy) in the form of a "hydrocratic generator" that mixes large scale amounts of salt and water to obtain energy that can be used to power things. [1]

Sodium and water

The following is the chemical reaction for the contact of sodium (Na) with water (H_20):

	$2Na$	$+ 2H_2O$	$\rightarrow 2NaOH$	$+ H_2$
	(s)	(l)	(aq)	(g)
ΔG_f° (kJ/mol)	0	–237	–419	0
ΔH_f° (kJ/mol)	0	–286	–469	0
S° (kJ/mol·K)	52	70	48	131

The free energy change for this reaction, using the formula $\Delta G = G_f - G_i$, is:

$$\Delta G = -419 - (-237) = -182 \text{ kJ/mol}$$

and by the rule of reaction spontaneity:

$\Delta G < 0$ | Spontaneous reaction
$\Delta G > 0$ | Non-Spontaneous reaction

the reaction is energetically favored and goes naturally and in this case goes forcefully.

The sodium-water reaction (above) shows the heightened reactivity of sodium and a visualization of volume change ΔV on going from reactants to products.

The above two reaction types, (a) former: weakly spontaneous (ΔG = -0.027 kJ/mol) and (b) latter: greatly spontaneous (ΔG = -182 kJ/mol), are thus small scale versions of the way reactions occur between humans, which technically are animated types of chemicals (human chemicals) or molecules (human molecules), and hence the above two differing reactions visually capture the gist of "human chemical thermodynamics" or chemical thermodynamics applied to the study of human existence in a social, economic, and historical sense.

2. Human molecules

In 1789, French philosopher Jean Sales, in his *The Philosophy of Nature: Treatise on Human Moral Nature*, gave the following coining of the term human molecule—a person defined atomically:

> "We conclude that there exists a principle of the human body which comes from the great process in which so many millions of atoms of the earth become many millions of **human molecules**."

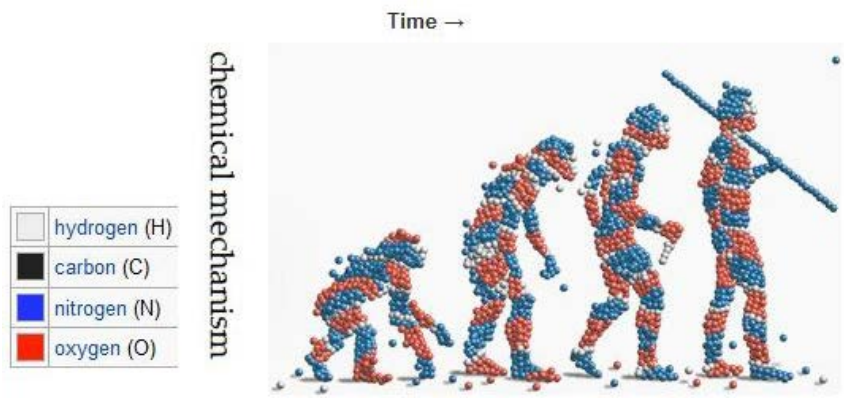

The first calculation of the molecular formula for a human was done by American limnologists James Elser and Robert Sterner in 2000 and as found in their 2002 textbook *Ecological Stoichiometry*, in which they defined the formula for one 'human molecule' as:

$$H_{375,000}\,O_{132,000,000}\,C_{85,700,000}\,N_{6,430,000}\,Ca_{1,500,000}\,P_{1,020,000}\,S_{206,000}\,Na_{183,000}\,K_{177,000}$$
$$Cl_{127,000}\,Mg_{40,000}\,Si_{38,600}\,Fe_{2,680}\,Zn_{2,110}\,Cu_{76}\,I_{14}\,Mn_{13}\,F_{13}\,Cr_{7}\,Se_{4}\,Mo_{3}\,Co_{1}$$

a 22-element empirical human molecular formula. The subject of the "human molecule" has a long and tenuous history (see: HMS pioneers); some of which has been summarized in several books:

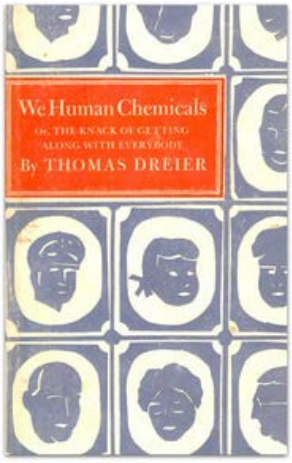

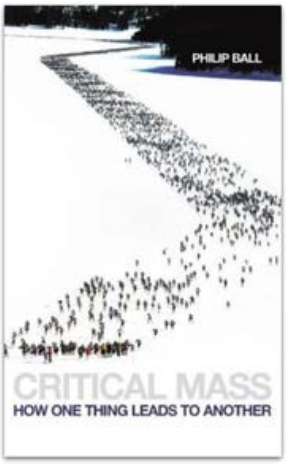

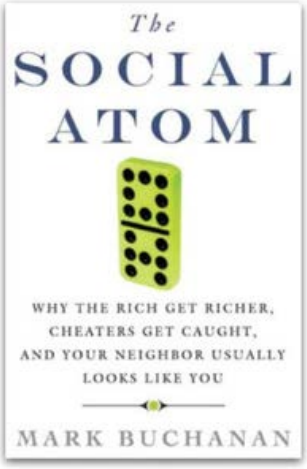

(Thomas Dreier, 1948) (Philip Ball, 2002) (Mark Buchanan, 2007) (Libb Thims, 2008)

The molecular evolution table (2005) and evolution timeline (2009) give a big picture view of the conception of a human as a molecule or animated chemical formed over billions of years.

3. Human thermodynamics

In 1952, English physicist C.G. Darwin (grandson of Charles Darwin), in his 1952 book *The Next Million Years*, specifically in his opening "Introduction" chapter, he defines the subject of human thermodynamics as the statistical mechanics of human molecules, a very revolutionary and modern view, even in the modern day:

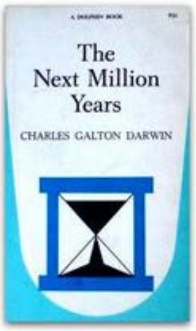

> "**Human thermodynamics** is the statistical mechanics of conservative dynamical systems of human molecules. Through determining some kind of laws of **human thermodynamics**, we shall be more successful in doing good in the world."

Prior and after this founding definition there have been some 500+ human thermodynamicists (see: HT pioneers) to have done work in human thermodynamics.

4. Boundary

In human thermodynamics, a very important subject is that of the boundary. To illustrate the complex nature of 'animate system boundaries', a summary of the famous 1970-1974 Gombe national park chimpanzee war, studied in step-by-step detail by Jane Goodall, is as follows:

> "In the Gombe, wild chimps patrol **territories** of up to five to eight square miles. Regularly, small groups of males steal along the **border** of their range, sniffing the ground for the trace of strangers, and climbing trees to peer across neighboring territories. When an unfamiliar chimp, all except childless females, comes too close, they charge, attack, and occasionally severely injure the intruder. In one instance, an older female was attacked so severely by four males that she died five days later of her wounds. And in 1970 a chimpanzee war began. A splinter group of seven males and three females with their young split off from their comrades in the north of the reserve and began a group of their own in the south. For a while individuals met at the **border** to solve their differences by loud calling, hurling branches and mock charges at each other. But in 1974 five males from the original Gombe community began to roam deep into the southern territory. Within three years, they attacked and murdered all of the adult males (except two who died of natural causes) and one old female—extinguishing the splinter enclave and **extending their territory** to thesouth."

A 1997 clip where Jane Goodall compares the aggressive behavior found in her documented chimpanzee war (see also: war thermodynamics and human nature).

Here, the boundaries in question are (a) changing, as the story depicts, (b) often demarcated merely by a natural formation, such as a large rock, river, or

irregular tree or land formation, (c) involve a huge amount of energy and time in respect to regulation and maintenance, and (d) boundary transmission of chemical species result in large transformations to the system, as exemplified by the genocide result depicted here.

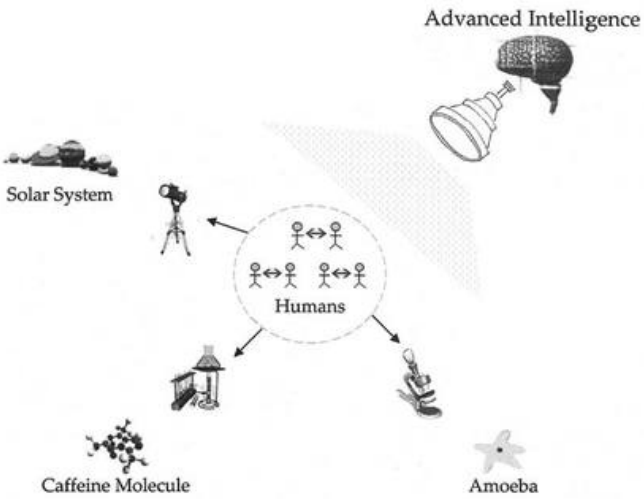

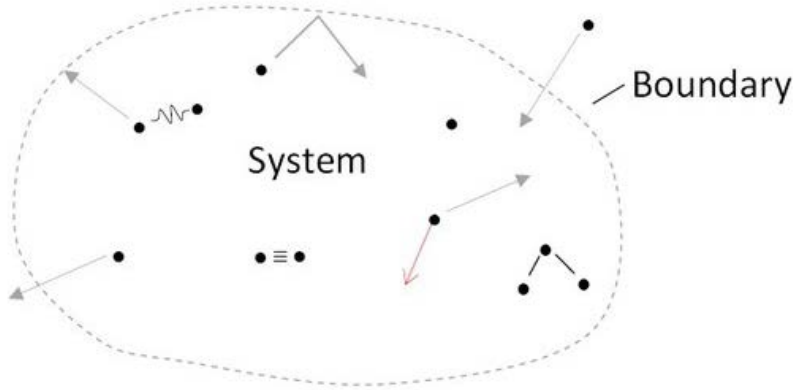

Above (left): the advanced intelligence perspective.

Above (right): the open/closed system view.

Adjacent (far right): the human molecular orbital view.

Adjacent (right): American electrochemical engineer Libb Thims' 824-page, two-volume *Human Chemistry* textbook, in which the probabilistic "human molecular orbital" view of a system presented.

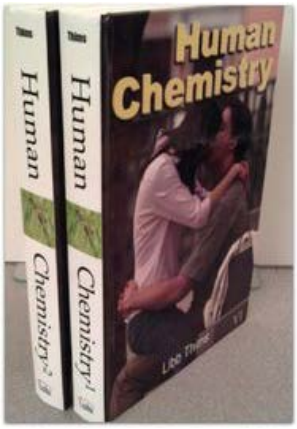

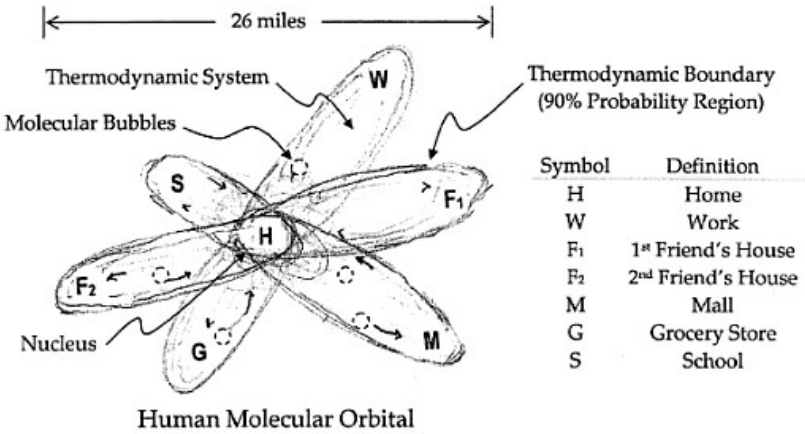

Surface
An salient, yet often times avoided subject in human thermodynamics is the "surface" of the earth, which from a chemical thermodynamics point of view is considered as "substrate" and or "catalyst" depending on discussion.

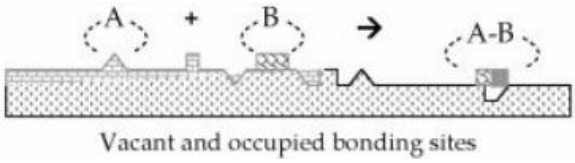

5. Branches of human thermodynamics

In terms of classification, there are some 40+ branches of thermodynamics (at a minimum); and within the specific branch of animate thermodynamics, there are some 40+ branches of human thermodynamics. These are listed below (as well as in the adjacent drop down menu) along with date of subject inception and central topic initiator.

Branch	Icon	Date	Founder	Description
Government thermodynamics		1748	Charles Montesquieu	The study of theories of government in thermodynamics terms, such as the postulate that governmental laws need to be a function of the temperature of the land.
Relationship thermodynamics â— Relationship physics â— Love thermodynamics		1799	Johann Goethe	The use of thermodynamics to explain the passions and workings of individual relationships.
Cessation thermodynamics		1843	Ludwig Colding	The study of what thermodynamics has to say about death.
Religious thermodynamics		1847	James Joule	The study or use of thermodynamics to either explain or disprove religious theory.

Economic thermodynamics â— Lausanne school (of economics) â— Physioeconomics â— Technocracy â— Thermoeconomics â— Econophysics	1853	Hermann Gossen	The study of the use of thermodynamics to model economies as thermodynamic systems.
Philosophical thermodynamics	1856	Gustave Hirn	The study of the philosophical implications of thermodynamics.
Sociological thermodynamics â— Mechanistic school (of sociology) â— Social thermodynamics â— Socio-thermodynamics	1858	Henry Carey	The use of thermodynamics in social theory.
Ethics thermodynamics	1869	Francois Massieu	The study of the use of thermodynamics in theories of ethics and the difference between right and wrong.
History thermodynamics	1873	Henry Adams	The use of thermodynamics applied to the study of human history.
Happiness thermodynamics	1874	August Kronig	The subject of how thermodynamics applied to the understanding of human states of happiness.
Literature thermodynamics	1893	Camille Flammarion	The use or study of the use of thermodynamics logic in fiction.
Education human thermodynamics	1894	Léon Winiarski	The subject and art of teaching human thermodynamics in general or one of its branches in school.
Psychological thermodynamics â— Helmholtz school (of psychology) â— Energy psychology â— Psychodynamics â— Psycho-dynamics â— Biopsychodynamics â— Dynamic psychology	1895	Sigmund Freud	The study of the thermodynamics of the mind or mental states.
Fringe thermodynamics	1896	Frederic Myers	Thermodynamics applied to fringe subjects, such as telekinesis, ghost hunting, or sixth sense theories, etc.
Aesthetic thermodynamics	1898	Léon Winiarski	The study of how thermodynamics quantifies beauty.
Legal thermodynamics	1899	Maurice Hauriou	The study of the bearing of the laws of thermodynamics to the rules and laws of the land, country, or state.
Anthropic physics â— Energetics school	1912	Wilhelm Ostwald	The science of the physical chemistry of humans.
Business thermodynamics	1914	William Fairburn	The study of the application of thermodynamics in business consulting or business theory.
Sexual thermodynamics	1919	Sigmund Freud	The study of thermodynamics applied to the understanding of topics surrounding sex, such as sex drive, sexuality, libido, sexual heat, sexual tension, etc.
War thermodynamics	1919	Yevgeny Zamyatin	The study of thermodynamics applied to the art of war.
Financial thermodynamics	1926	Frederick Soddy	The study of thermodynamics applied to financial matters, e.g. debts, wealth, interest, budgets, etc.
Information theory thermodynamics â— MaxEnt school (1957)	1929	Leo Szilard	The attempt to explain facets of human existence using various logarithms, on the generally *fallacious* claim that entropy (heat) and information (binary digits) are the same thing.
Art thermodynamics	1933	René Magritte	The use of thermodynamics theory depicted in art form.

Anthropological thermodynamics		1943	Leslie White	The use of thermodynamics in anthropology, such as in the study of the comparison of different cultures.
Laymanized thermodynamics â— Folklore thermodynamics (1946) â— Contrived thermodynamics		1943	Erwin Schrodinger	The study, discussion, and or presentation of laymanized versions of thermodynamics.
Music thermodynamics		1964	Flanders and Swann	The use of thermodynamics theory or logic in song.
Architectural thermodynamics		1970	Alan Wilson	The study of how thermodynamics applies to the theory and design of buildings and architecture.
Political thermodynamics		1971	Frederick Rossini	The use of thermodynamics logic in political agenda.
Eco-economic thermodynamics â— Eco-thermodynamics â— Ecological thermodynamics â— Ecological economics â— Biophysical economics		1971	Nicholas Roegen	The study of the use of thermodynamics in regard to natural resources in relation to economic theory.
Sustainability thermodynamics		1971	Stephen Berry	The use of thermodynamics models in development of sustainability theories.
Racial thermodynamics		1990	Richard Delgado	The study of the thermodynamic explanations of racism or race and the issues and tensions surrounding this topic.
Integration and segregation thermodynamics		1994	Jurgen Mimkes	The study of the use of phase diagrams and solution thermodynamics logic in the explanation of the integrations and segregations behaviors of mixed cultures or people.
Dietary thermodynamics		c.2000		The study of the use of thermodynamics theory in the development of diets and dietary suggestions.
Human statistical thermodynamics		2008	Libb Thims	The study of human existence from the perspective of statistical thermodynamics and or statistical mechanics.
Human chemical thermodynamics		2008	Libb Thims	The study of human existence from the perspective of chemical thermodynamics.
Human engineering thermodynamics		2010	Libb Thims	The study of the practical application of human chemical thermodynamics or human statistical thermodynamics for use in the engineering of humans or systems of humans.

These last three branches, human statistical thermodynamics, human chemical thermodynamics, and human engineering thermodynamics, are umbrella classifications of the former.

See
â— HMS pioneers (120+)
â— HT pioneers (500+)
â— HC pioneers (50+)
â— HP pioneers (40+)

6. Merits

Some, being new to the study of human thermodynamics, may in hasty reaction question the "merits" or praise worthy qualities of the teaching of human thermodynamics as part of a standard engineering thermodynamics curriculum. In regards to this query or concern, in the context of human thermodynamics education, the following is the list of thermodynamics textbooks that include human thermodynamics material as part of its teaching coursework:

Year	Textbook	Human thermodynamics branch
	Thermodynamics	

1964	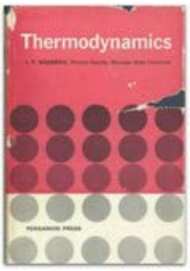	by Ivan Bazarov (1916-2005) Russian physicist	â— Heat death argument *for* the existence of god (Friedrich Engels) â— Heat death argument *against* the existence of god (Bazarov) â— Universal origins
1973		*Fundamentals of Classical Thermodynamics* by Gordon van Wylen (1920-) American mechanical engineer Richard Sonntag (1933-2010) American mechanical engineer	â— Philosophical thermodynamics â— Argument for/belief in the existence of God/Creationism â— Universal origins (low entropy state)/Eschatology â— Destiny of humans (second law)
1999	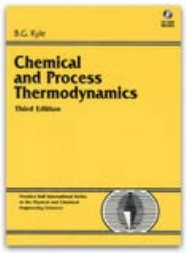	*Chemical and Process Thermodynamics* by Benjamin Kyle (1927-) American chemical engineer	â— Two cultures (C.P. Snow) â— Universal origins/Eschatology/Heat death (Friedrich Engels, Ivan Bazarov) â— Religious thermodynamics (William Inge, Pope Pius XII, Pierre Teilhard) â— Animate thermodynamics (life, origin of life; defunct theory of life) â— Social thermodynamics/Anthropological thermodynamics (Claude Levi-Strauss) â— History thermodynamics (Henry Adams) â— Economic thermodynamics (Nicholas Georgescu-Roegen) â— Ecological economics (Herman Daly, Jeremy Rifkin) â— Literature thermodynamics (John Barth, Donald Barthelme, Saul Bellow, Stanley Elkin, Norman Mailer, Walker Percy, Thomas Pynchon, John Updike) â— Art thermodynamics (Rudolf Arnheim) â— Philosophical thermodynamics (Kyle) â— Psychological thermodynamics (Sigmund Freud)
2004	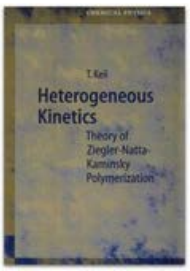	*Heterogeneous Kinetics: Theory of Ziegler-Natta-Kaminsky (chapter 2: Chemical Thermodynamics)* by Tominaga Keii (1920-2009) Japanese chemical engineer	â— Chemical Affinity in 1806 â— Human chemical thermodynamics: *Elective Affinities;* human elective affinity; human chemical reaction, Goethe's affinity table, Goethe's human chemistry (Johann Goethe)
1999 thru 2010	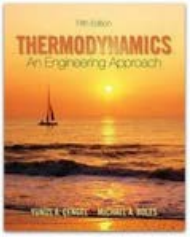	*Thermodynamics an Engineering Approach* by Yunus Cengel (1955-) Turkey mechanical engineer Michael Boles (1943-) American mechanical engineer	â— Economic thermodynamics (Robert Ayres) â— Human thermodynamics (human performance/efficiency in daily existence, learning (low-entropy learning), work place friction, human friction, social friction (entropy generation), etc.) â— War thermodynamics
2010	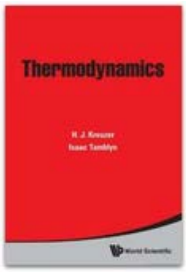	*Thermodynamics* by Hans Kreuzer (c.1945-) Canadian atmospheric physicist Isaac Tamblyn (c.1983-) Canadian physicist	â— Economic thermodynamics (Wayne Saslow)

Classroom projects

A number of universities are now assigning applied human thermodynamics projects to students. To exemplify, in 2011, American chemical engineer James Ferri, head of the chemical and biomolecular engineering department of Lafayette College, Pennsylvania, initiated and supervised the engineering

student-produced video “Thermodynamics of Life: Occupy Wall Street Edition”, made by Angela Wnek (ChBE, 2013), Isaac Lavine (ChBe, 2014), Ashley Kaminski (ChBE, 2013), which applied a number of different molecular, physical chemistry, and chemical engineering principles to the ongoing “Occupy Wall Street” protests, as shown in the following student-produced video:

The video employs: the game version of the laws of thermodynamics (1971); desire (they argue as a fact of existence that people want wealth); Ostwald’s ripening (a principle stated in 1896 by German physical chemist Wilhelm Ostwald), a process by which small droplets of one fluid dispersed in another fluid phase shrink at the expense of the growth of the larger droplets, wherein they use a human fluid model and equate rich people to the larger droplets and poor people to the smaller droplets; the Calvin equation, relating actual vapor pressure to saturated vapor pressure; the Ostwald equation:

$$\langle R\rangle^3 - \langle R\rangle_0^3 = \frac{8\gamma c_\infty v^2 D}{9R_g T}t$$

where $\langle R\rangle$ is the average radius of all the particles, γ is the particle surface tension or surface energy, is the solubility of the particle material, v is the molar volume of the particle material, D is the diffusion coefficient of the particle material, R_g is the ideal gas constant, and T is absolute temperature.

Dissertations

Some universities are beginning to offer gradate school courses in human thermodynamics. The following, to exemplify, is the Korea University Graduate School's 2011 three credit graduate course entitled “Seminar on Social Thermodynamics” SOS 623 (SOS short for Sociology of Science), a type of human thermodynamics education course divided into two parts: firstly, general systems theory, a discussion of its basic outline, along with its drawbacks; and, second, with what they referred to as the “theory of social thermodynamics and its applications”, possibly in the applied human thermodynamics area, an example being the the 2009 company "Social Thermodynamics Applied Research" (or SThAR):

SOS 623	Seminar on Social Thermodynamics	[3]
This course will be held in the form of seminar. The advantage of general system theory will be solidated and the drawbacks of it will be complemented. The theory of Social Thermodynamics and its application will be also introduced.		

The program, as indicative of its two cultures approach, employs a "two-supervisors system", one is based on human or social science, the other is based on natural science or engineering.

The following are a selection of engineers (Hammond aside) who have completed a thermodynamics dissertation in human thermodynamics or using human thermodynamics principles as a conceptual framework:

Year	Person	Dissertation/Thesis	School
1978	Dick Hammond (c.1938-) American educational theorist	Thesis: *Analysis of Entropy Reduction and its Implications for Ethical Instruction in Public Education* (EdD)	University of Arkansas and University of Texas Adviser: Ilya Prigogine
1998	Satish Boregowda (c.1968-) Indian-born American mechanical engineer	*Thermodynamic Modeling and Analysis of Stress Responses* (PhD)	Old Dominion University, Virgina (funded by NASA Langley Research Center)
2008	Stefan Pohl-Valero (c.1977-) Spanish mechanical engineer	“The Circulation of Energy: Thermodynamics, National Culture, and Social Progress in Spain, 1868-1890”(PhD)	Universitat Autonoma de Barcelona. Advisor: Agusti Nieto-Galan
2011	Jeff Tuhtan (1979-) American civil-ecological engineer	“A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality”	Institute for Modeling Hydraulic and Environmental Systems at the University of Stuttgart, Germany.

One of the main reasons, in regards to the "merits" of learning the subject of human thermodynamics formerly (classroom), as apposed to informally (on

your own), is that some 10 to 30 percent of engineers will tend to venture into this subject in his or her retirement years. To exemplify, as commented American economist Paul Samuelson (winner of the 1970 inaugural Nobel Prize in economics), indirect student of the methods of Willard Gibbs, via his mentor Edwin Wilson (Gibbs' sole protégé), during the 1989 *Gibbs Symposium* at Yale University:

> "As will become apparent, I have limited tolerance for the perpetual attempts to fabricate for economics concepts of 'entropy' imported from the physical sciences or constructed by analogy to Clausius-Boltzmann magnitudes. The monthly mail still brings grandiose schemes to replace the dollar as a unit of value by energy or entropy units. Superficial knowledge of thermodynamics, brought into contact with ignorance of economics, cannot even in the presence of the catalyst of noble intentions beget stable equilibrium of useful of useful products. There is nothing more pathetic than to have an economist or a **retired engineer** try to force analogies between concepts of physics and the concept of economics … how many dreary papers have I had to referee in which the author is looking for something that corresponds to entropy or to one or another form of energy. This is not a tautology, merely a finding of fifty-five years of reading the morning mail."

In short, engineers, as well as chemists, and physicists, have a tendency to venture into human thermodynamic formulation.

7. Human free energy

In the history of human thermodynamics, a number of formulations and approaches have been employed and used to go about deriving results applicable to human existence and experience. The following are the five thermodynamic models or scientific subjects each human thermodynamicists tend to cull, base, or derive their theory from, which historically tends depend on the background of the theorist (physical chemist, chemical engineer, mechanical engineer, physicist, chemist, mathematician, sociologist, economist, historian, anthropologist, and so on):

Subject	Icon	Description
Reactions	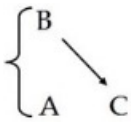	The chemical reaction mechanism icon (human chemical thermodynamics) signifies that the person theorized about relationships as chemical reactions, with people and relationship changes viewed "symbolically", as in AB + C → A + BC, in going between initial states and final states; may also have speculated on human chemical bonding theory (A≡B); or may have used societal reaction extrapolations, e.g. modeling societies or economies on aspects of Le Chatlier's principle.
Statistics	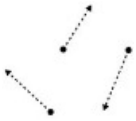	The gas particle icon (human statistical thermodynamics) indicates the person used statistical mechanics or statistical thermodynamics in their formulations, e.g. S = k log W models, which involve the gas constant R, thus viewing people as 'constituents of a statistical ensemble', etc.; his view, to note, implies people obey the Boltzmann chaos assumption, which generally is a red flag type of application, albeit one that may provide some fruit or insight.
Phases	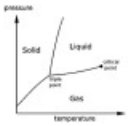	The phase diagram icon (phase thermodynamics) indicates that the person derived their theory from phase diagram models, e.g. using the thermodynamics of binary solutions to explain mixing and separation of individuals by group or race in populations, from Gibbs phase rule, phase transitions, or from the solid state physics of metals, etc.
Chromatograpy	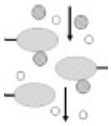	The chromatography icon (chromatographic thermodynamics) indicates that the person derived their theory from studies in chromatographic methods, e.g. affinity chromatography, gas chromatography, etc., in the thermodynamics of the separation of mixtures of molecules, wherein molecules in a mobile phase are passed through a separate substrate-type stationary molecular system, according to which the various molecules in the mobile phase separate based on their respective affinities or free energies for various regions (or molecules) of the stationary phase.
Electrochemistry		The battery icon (electrochemical thermodynamics) indicates that the person derived their theory based on electochemical thermodynamic models of batteries or fuel cells, etc.
Dissipation	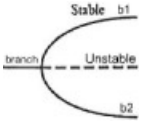	The bifurcation icon (pitchfork bifurcation) indicates that the person based parts of their theory generally on the 1970s to 1980s dissipative structures, bifurcation, fluctuation, far-from-equilibrium, non-equilibrium thermodynamics, Benard cells-type theories and models of Belgian chemist Ilya Prigogine or his followers.

among these five main approaches used in human thermodynamics, recent decades have seen the use of "human free energy" formulation, which is the correct modern way of going about human thermodynamic formulation, being that human-human reactions are isothermal-isobaric reactions, occurring on a surface, and Gibbs free energy is the driving force (force function, thermodynamic potential) of these reactions.

See

â— Gibbs free energy
â— Human free energy
â— Affinity table

8. Energy-rich bonds

Overview
The model of two people, A and B, chemically reacting over the course of a number of months or years to form a couple AB, according to chemical reaction notation is defined as such:

$$A + B \rightarrow AB$$

wherein the reactants “A + B” are single unattached human molecules, and the product “AB” is a dihumanide molecule held together by a human chemical bond, the bond itself sometimes symbolized by the triple equals sign “≡” as in A≡B.

The concept or premise of the existence of "chemical bonds" (no analogy) existing between people is a bit of an anathema to many.

Objection
In 2005, American high school geology teacher V. Smith commented on this modeling of humans as molecules that undergo chemical reactions to form bonded molecular products:

> “The idea of ‘human chemical reactions’ occurring between ‘human molecules’ is good for a laugh, but not much else.”

Likewise, in 2011, Irish biochemistry student Ryan Grannell commented on this logic:

> “A + B → AB is just a pretentious way of stating something we already know; it tells us absolutely nothing new.”

Methodology
From a human chemical thermodynamics point of view, human chemical bonding theory and human chemical reaction theory in general are integral part of human thermodynamics, particularly in regards to (a) the thermodynamic quantification of the initial state and final state of "big history" thermodynamic processes, as encapsulated in the description "twice married, once divorced", and (b) the nature of "coupling", free energy coupling, or thermodynamic coupling between human chemical reactions.

The origin of the notion of "energy-rich" and "energy-poor" bonds originated in 1941 article “Metabolic Generation and Utilization of Phosphate Bond Energy” by Fritz Lipmann, wherein he presented his Lewis thermodynamics framed model of how the release of energy from the break down of ATP to ADP is that drives the muscle contraction among a host of other biochemical processes; a theory that thus initiated the model of free energy coupling in the context of phosphate bond energy storage and use. As summarized in 1991 by National Academy of Sciences biographer Eugene Kennedy:

> “In his masterly and highly influential review in 1941 Lipmann was to emphasize the central role of adenosine triphosphate (ATP) as an ‘energy-rich’ phosphate ester, the breakdown of which to adenosine diphosphate (ADP) and inorganic phosphate (Pi) drives not only muscle contraction but also a host of other energy-requiring [endergonic] processes.”

In his article, Lipmann introduced the “squiggle” notation “~P” and used the terms “bond energy” and “high-energy bonds” to represent the amount of potential energy that could be stored in these bonds:

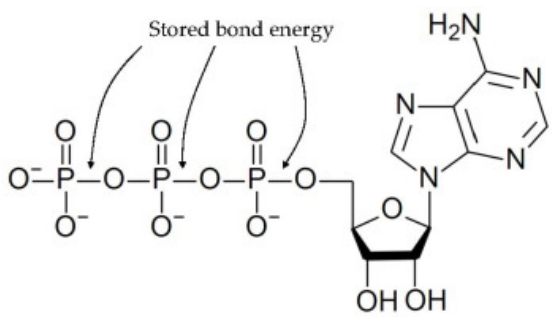

Table of Bond Energies	
Type	Bond energy (kJ/mol)
Ionic bond	700-4,000
Covalent triple bond	800-1,000
Covalent double bond	500-700
Covalent single bond	200-500
Dipole attractions	40-400
Hydrogen bond	10-40
Phosphate bonds (ATP)	25-60
Human chemical bond	7.6E8 (kJ per bond)

A 2D diagram of adenosine triphosphate (ATP) a five-element molecule ($C_{10}H_{16}N_5O_{13}P_3$) shown next to a table of representative bond energies.

In 1971 retrospect commentary, as explained in his *Wanderings of a Biochemist*, he explains the tension that this caused:

> "My paper caused a stir when it appeared, although at first it was given what one might call a mixed reception. The talk of *energy-rich bonds* aroused a forceful, sometimes virulent antagonism. Unwittingly, I had stepped into a hornet's nest by using 'bond energy' to express the potential energy derivable from a bond. Many organic chemists were outraged by what they felt was a **misuse of the term** *bond energy*. The situation brings to mind an observation made by a good friend and colleague of mine: 'you always have to see that your union card is in good order'."

Lipmann's mention of "potential energy derivable from a bond", can be graphically depicted on a reaction coordinate, as shown below, from the field of drug-receptor thermodynamics, depicting the generic bonding of a drug (D) with a receptor (R) in an initial heightened kinetic energy state (initial state) that transitions into a stable final state drug-receptor complex product (DR) with potential energy stored in the bond:

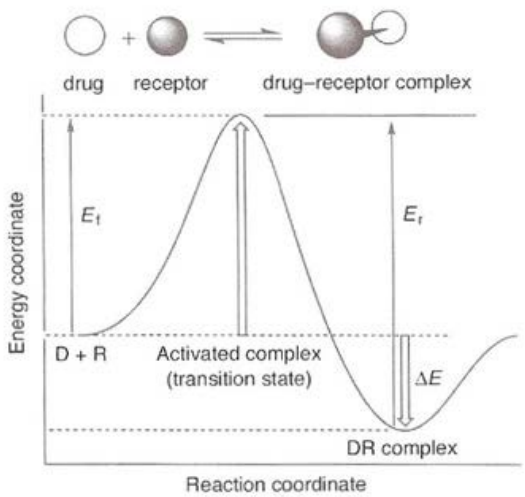

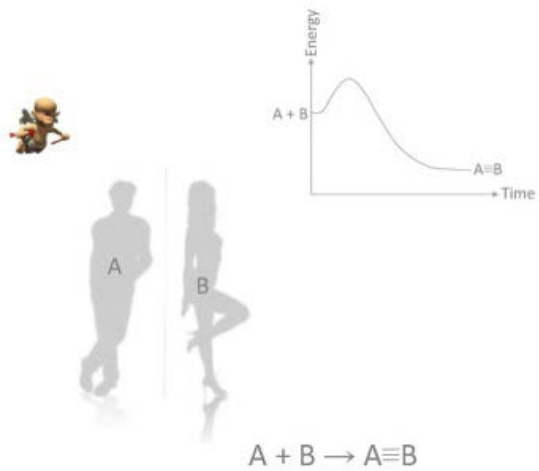

Drug-receptor reaction model of complex formation.	Human-human reaction model of complex formation.

These models can thus be scaled up to the human-human reaction level, such as shown above (right), such as found in the work of chemists David Hwang (2001), Libb Thims (2007), Surya Pati (2009), and Thomas Wallace (2009).

The notion of "energy-rich bonds" and "energy-poor bonds" are integral to the notion of "coupling" in human chemical thermodynamics processes, an example being the phenomenon of nepotism, according to which rich bonds drive the poor bonds, and the system as a whole works.

9. Transformation content

In German physicist Rudolf Clausius' 1856 fifth memoir "On the Application of the Mechanical Theory of Heat to the Steam Engine", he gave the symbol *N* the name "equivalence-value of all uncompensated transformations" and would define the two fundamental theorems "which hold good in every cyclical process", i.e. the first and second laws of thermodynamics (first main principle and second main principle), by the following two equations:

$$Q = A \cdot W$$

$$\int \frac{dQ}{T} = -N$$

where *A* is the thermal equivalent of the unit of work, and *W* is the external work performed during the cyclical process, Q signifies the heat imparted to the changeable body during a cyclical process, and dQ an element of the same heat, whereby any heat withdrawn from the body is to be considered as an imparted negative quantity of heat, and the integral is to be extended over the whole quantity of Q.

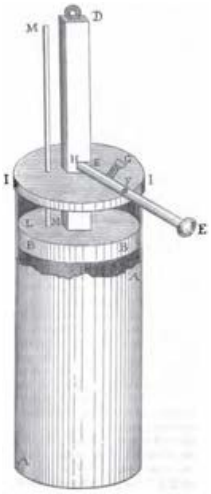	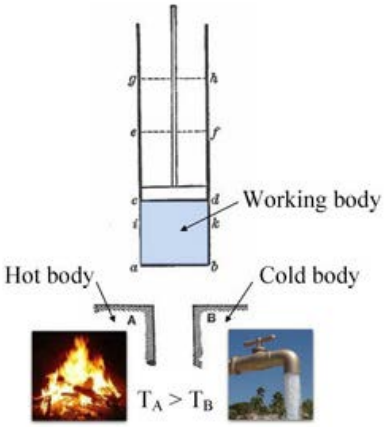		
The 1690 Papin engine.	The 1824 Carnot engine.	A thermodynamic view of a "system" on the surface of the earth.	Thims' illuminated rotating globe (back) and Papin engine (front), showing the working substance and piston and cylinder, which he uses in lecture to demonstrate the conception of social expansion (day) and social contraction (night) in the framework of entropy change or transformation content increase and Boerhaave's law (heat and volume change).

10. Human thermodynamics applied

In human thermodynamics, applied human thermodynamics is the use of human thermodynamics theory or principles in practical application. The following are a selection of applications developed up to the theoretical and or working stage of implementation:

Application	Description
	In 1960, American combat pilot John Boyd, having flown 22 combat sorties in an F-86 Sabre during the Korean war (1953), enrolled at Georgia Tech to complete a degree in industrial engineering in order to better understand, in a physical science sense, certain anomalies of combat behavior, namely why the Korean pilots in quicker, faster, more-maneuverable Mig-15 planes had a worse kill ratio than the Americans in their bigger, slower, less-maneuverable planes. During his engineering education, Boyd sought not to worry about mathematical details, but to understand the underlying principles and concepts of physics and thermodynamics, in regards to human dog fight behaviors. Over the next 20 years, Boyd would go on to develop his thermodynamics-based combat theory, about which he consulted the pentagon on over in over 1,500 briefings, and with which he used in the successful formulation of the successful invasion of Iraq during the first Gulf War (1990-1991). In the retrospect opinion of Marine Corps general Charles Krulak: "The Iraqi army collapsed morally and intellectually under the onslaught of American and Coalition forces. John Boyd was an architect of that victory as surely as if he'd commanded a fighter wing or a maneuver division in the desert."
â— Alien life-detection probes (1964-2005)	In 1964, Jet Propulsion Laboratory at CalTech was being funded by NASA to construct and design two probes (Voyager 1 and Voyager 2) to be sent to Mars in the upcoming 1977 Voyager mission to Mars and one of the main functions of one probe was to look for life. During this engineering phase, a debate erupted between English biophysicist James Lovelock and his colleagues as to how one would theoretically be able to recognize life, specifically Martian life? Lovelock proposed that any universally-designed life-recognition type of detection equipment or machine would need to be able to "look for an entropy reduction, since this must be a general characteristic of all forms of life." The probes were eventually built and sent to Mars, and although they did not have "entropy reduction detectors", Lovelock's theory was eventually outlined in his 1975 article "Thermodynamics

and the Recognition of Alien Biospheres." Lovelock commented in retrospect (1979), that most likely, his reply was "taken to be at the best unpractical and at worst plain obfuscation, for few physical concepts can have caused as much confusion and misunderstanding as has that of entropy." As of 2005, the probes were still operational, at a yearly cost of $4.2 million.

â— Consciousness quantification (1995-)

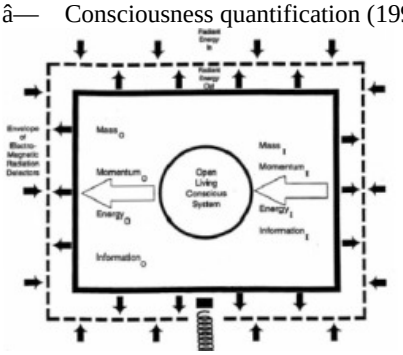

In circa 1995, American chemical engineer and physician Gerry Nahum, with a background in thermodynamics and information theory, worked out a 25-page proposal, entitled "Proposal for Testing the Energetics of Consciousness and its Physical Foundation", to conduct a consciousness-weighing project to quantify the energy of consciousness at the point of death, estimated to cost $100,000, using a negative entropy theory. Nahum has been actively seeking funding, at various university physics departments and private sectors, and presenting his theory at conferences to find partners.

â— Foodstuffs thermodynamics (2005-)

In the 1990s and 2000s, Russian physical chemist Georgi Gladyshev developed an anti-aging model of foodstuffs in which he hypothesized to be able to thermodynamically quantify the anti-aging value of any food or nutritional substance via using a formula similar to the Gibbs-Helmholtz equation. He obtained a $2 billion patient for this model. He has given various lectures on this topic at the American Academy of Anti-Aging medicine conferences. In 2007, Gladyshev met with American chemical engineer Libb Thims in Chicago to discuss a joint venture to take his patented theory to the market place.

â— ReactionMatch.com (2008-)

A human chemical thermodynamics matching theory based dating site, outlined in principle in the 2007 textbook *Human Chemistry* and taken to the preliminary beta-stage of development in 2008, situated to be a hard science replacement for the hap shod sites claiming to be based on science, such as eChemistry.com (2006), run by a chemical engineer, Chemistry.com, run by an anthropologist, ScientificMatch.com (2007), run by an electrical engineer, among other sites run primarily by psychologists and computer programmers. In 2009, the online dating industry topped $1 billion and was growing at a rate of 10%.

â— Technocracy (1918-1933)

Technocracy was a type of thermodynamics-based "bureaucracy" project, funded by Columbia University, in operation from 1918 to 1933, headed by American engineer Howard Scott, in association with a group of prominent architects, engineers, and doctors, who under the mandate of the 1918 energy survey of North America, set out to become a sort of economic advisory board to the United States.

Its premise was to determine an optimal organizational structure devised to manage societal activity based on physical science or, more specifically, on Gibbsian thermodynamics. The general methodology of the group was to examine social phenomena, such as unemployment or energy use, in the light of physical science. The result of the project were detailed in the 1932 book *Technocracy: A Thermodynamic Interpretation of Social Phenomena*. Some of their conceived economic theories include: the use of "energy certificates" instead of money as units of value, the use of Carnot efficiency to model economic efficiency, as well as the term "Technate" used to describe the region over which a technocratic society would operate using thermodynamic energy accounting instead of a price system (money) method.

â— Physical intelligence (2009-2011)

A two-year research and development project, initiated by US defense advanced research projects agency (DARPA) program manager Todd Hylton in 2009, conceived to replace artificial intelligence with "physical intelligence", one that spontaneously evolves as a consequence of thermodynamics in open systems, hypothesized to be able to be built from chemical and electrical components. The mission statement of DARPA, to note, is to "bridge the gap from fundamental science to application". The program, currently being undertaken by a number of different government and non-government teams, is working on the following goals: (a) Creating a theory (a mathematical formalism) and validating it in

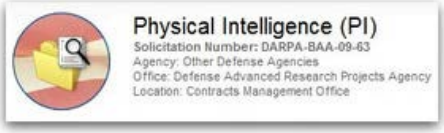

natural and engineered systems; (b) Building the first human-engineered systems that display physical intelligence in the form of abiotic, self-organizing electronic and chemical systems; (c) Developing analytical tools to support the design and understanding of physically intelligent systems. The end goal for military application and use of physical intelligence.

â— Psychodynamics (1873-)

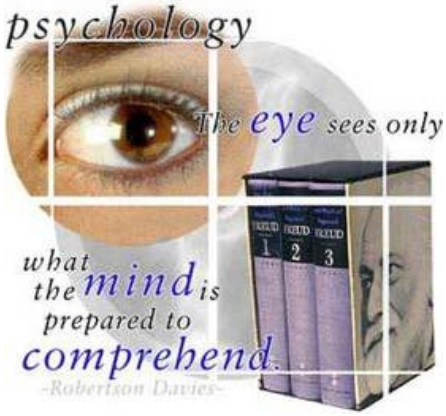

Freud started medical school in 1873, at the University of Vienna, under adviser German physiologist Ernst Brücke, director of the director of the Physiology Laboratory at the University, close friend and previous medical school lab partner to German physicist Hermann von Helmholtz one of the three-main formulators of the first law of thermodynamics (conservation of energy) (conservation of force). Over the next six years, initially concentrating on biology, Freud did research under Brücke, and under this collective influence, conceived the idea that external influences must be "conserved" in the mind in various "states of consciousness" (or subconscious), later to develop his id, ego, superego model of the mind. In circa 1920s, Swiss psychologist Carl Jung incorporated aspects of the second law of thermodynamics into a variation of this model. In the 1970s, on the models of Jung, Croatian-born American psychologist Mihály Csíkszentmihályi developed "positive psychology" with his Csíkszentmihályi flow, or "states of optimal experience", theory, using of the Freudian-Jungian terms psychic energy and psychic entropy in his analysis of states of mental life, and ideas on negentropism, e.g. psychic negentropy.

â— Human entropy imaging (2007-)

Conceived by Russian biometrist Viktor Minkin, head of the Russian vibraimage company, to use pixel vibration technology to measure human emotional states, quantitatively to be explained via psychological entropy or human entropy methodologies, the theory of which to be developed by American chemical engineer Libb Thims, to be used in application for home use and government used, e.g. terrorist screening technologies. Following R&D, equipment is slated to be marketed and sold in the US under the direction of Thims; although, Thims is stalled out on parts of theory development, as he is currently mastering the works of Clausius, Gibbs, and Lewis, which underlie theory. In 2008, Thims outlined a few basic principles of "human thermodynamic imaging", after which Minkin incorporated parts of preliminary theory into Vibraimage version 7.0. In 2009, Minkin, possibly using some of the Gibbs free energy matching theory, took the project to the working model stage in the site PsyMaker.com, which claims to facilitate (a) recognition of emotions of visitors, (b) emotion recognition in Skype, (c) measure pixel-dependent aura, (d) lie detection, (e) couple compatibility matching, (f) remote and contactless public security.

â— SThAR (2009-)

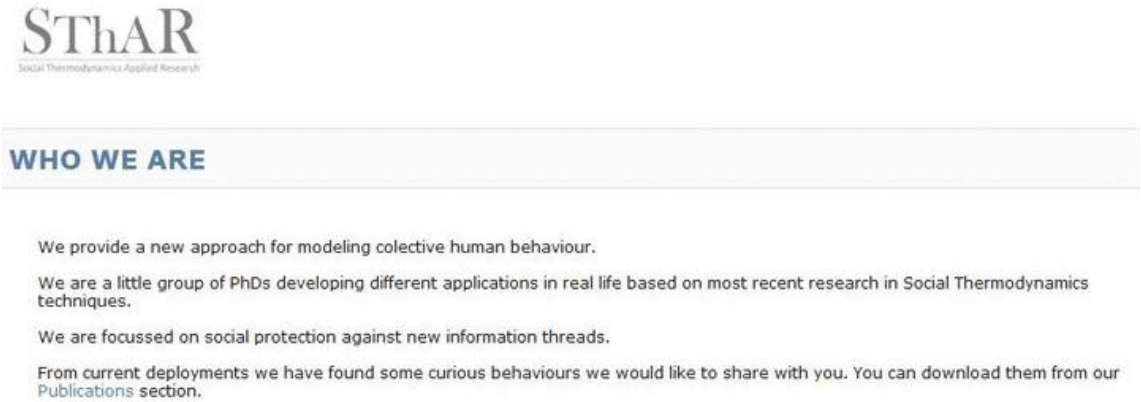

A consulting firm application in business thermodynamics, founded by Spanish telecommunications engineer Gregory Botanes, claiming be applying the laws of social thermodynamics to model social network behaviors and make predictions of business paths, needs, and issues.

"**Sthar** is the first company in the word to apply the revolutionary and recently discovered social thermodynamics universal laws to model social networks behavior and predict social changes, based on a mathematical model instead of existing statistics-based models."

Company claims to be using "social thermodynamics research" and Montecarlo techniques, to the commercial applications of marketing, e.g. advanced behavioral marketing, competitive analysis, media investment optimization; threats detection, e.g. viruses issues, web 2.0 enterprises, etc.; security, intelligence, and defense, e.g. counterterrorism, electronic crime, knowledge management, among others.

11. Determinism

Pro-view
A big hot spot subject in human thermodynamics, for many, is determinism vs. indeterminism. The following The following snapshot quote by Canadian-American biophysical chemist Julie Forman-Kay as explained in her 1999 article "The Dynamics in the Thermodynamics of Binding":

> "Whether two molecules will bind is determined by the free energy change of the interaction, composed of both enthalpic and entropic terms."

In short, humans are molecules, and bonds or formations between humans is "completely" determined by the enthalpy change ΔH and entropy change ΔS of the reaction or process. This is corroborate by German-born American physicist Albert Einstein who gave the following 1936 statement on determinism in response to a query by a six-year-old child in regards to whether or not he prayed:

> "Everything that takes place is **determined** by laws of nature—and this holds for the actions of people."

Con-view
At the level of the bondings occurring between protein molecules, drugs and receptors, or smaller atoms and molecules, objection is unheard of, yet as soon as this model is scaled up to the human level objection comes to the fore. The prime example of this is the far-from-equilibrium dissipative structure work of Belgian chemist Ilya Prigogine who, starting from his 1937 article "The Problem of Determinism", went on to spend the next 50-years to develop his own brand of thermodynamics (Progoginean thermodynamics) structured around the notion of internal energy generation:

$$dS = d_eS + d_iS$$

where the notation d_iS is the entropy variation *inside* (i) a system (internal entropy), referring to irreversible processes; and d_eS is the entropy *exchanged* (e) with the surroundings (exchange entropy), with which he mixed in bifurcation theory and Bernard cell formations, the latter of which he argued were representative of how societies form in an evolutionary sense.

Bifurcation diagram

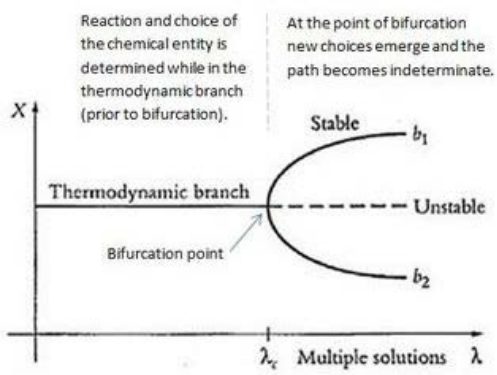

Bernard cells

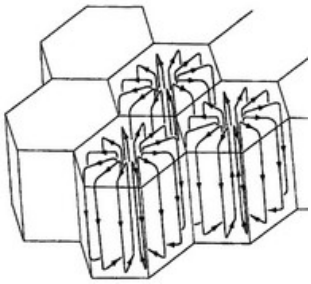

A video over view of Bernard cell formation; 2:48 shows actual cells forming.

In short, Prigogine defined humans and social systems as "dissipative structures" analogous to the phenomenon of Bernard cell formation:

> "The bifurcation introduces history into physics and chemistry, an element that formerly seemed to be reserved for sciences dealing with biology, social, and cultural phenomena."

and thus argued for partial determinism.

12. Religion

In famous publications, the Bible, Quran, and Rig Vida are a collected works book, written during the years 1800BC to 800 AD, each being a

reformulation of Ra theology (2500BC), along with partial synretism of various Mesopotamian religions, that accounts for the belief systems of over 72 percent of the modern world. Modern science is slowing replacing each of these, through various "scientific revolutions":

Copernicus

See main: Copernican revolution

The 1543 publication of *On the Revolution of the Heavenly Spheres* by Polish astronomer Nicolaus Copernicus, with its revolutionary finding that the "earth moves", was first major book to weaken the structure of the Bible, and its stationary flat earth central model of the universe.

Darwin

See main: Darwinian revolution

The 1859 publication of *On the Origin of Species* by English naturalist Charles Darwin, and its revolutionary view that the species have "evolved", in structure, size, and complexity, over millions of year from earlier forms, was the second major book to weaken the structure of the Bible, and its seven days of creation view of humans having been created from clay by the hand of God about 5,000 years ago.

Clausius

See main: Carnotian revolution

The 1865 publication of *The Mechanical Theory of Heat* by German physicist Rudolf Clausius, and its revolutionary view that the universe is "governed", not by God, by the laws of energy and entropy, is the third major book to have weakened the grip of the Bible, albeit a revolution that has not yet finished. The following is reference to the idiom that for many German physical chemist Wilhelm Ostwald's circa 1900 book *Energetics* book had come to replace the Christian Bible:

> "On the shelves there was also to be found, naturally, Ostwald's *Energetics*, that sort of thermodynamic bible in which God is replaced by a lay entity called energy."

Likewise, the following is a 1909 quote by H.G. Wells indicative of the view that, for some, belief in thermodynamics was beginning to replace belief in God:

> "He was a practical electrician fond of whiskey, a heavy, red-haired brute with irregular teeth. He doubted the existence of a Deity but accepted Carnot's cycle, and he had read Shakespeare and found him weak in chemistry."

Morality
At the beginning of the 20th century, thermodynamics had slowly begun to replace morality as explained by religion with morality as explained by thermodynamics, such as found in the so-called "thermodynamic imperative". The logic that thermodynamics would eventually explain morality or right or wrong or natural and unnatural, however, was echoed over two-hundred years ago by German polymath Johann Goethe:

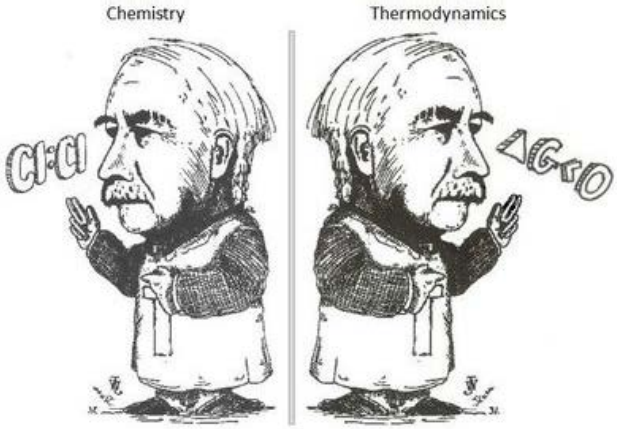

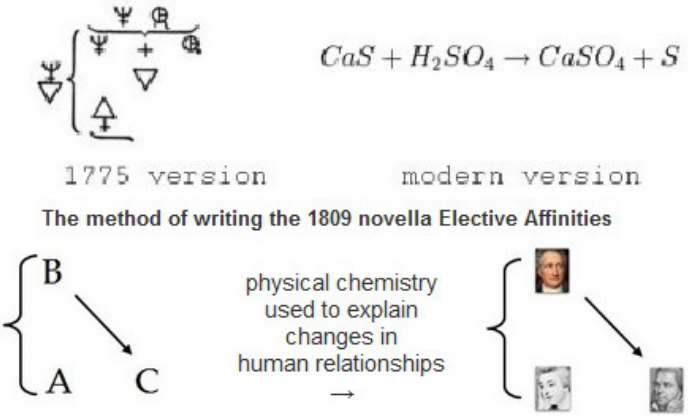

> "The moral symbols of the natural sciences are the elective affinities discovered and employed by the great Bergman ... and there is, after all, only one nature."

Coupling

To exemplify, morality can be explained in terms of the coupling of natural and unnatural processes in the following Lewis inequality for natural processes terms:

$$\sum_{i=1}^{j} \Delta G_{N_i} + \sum_{i=1}^{k} \Delta G_{\bar{N}_i} < 0$$

In olden days, this would have been known as the problem of evil.

Global beliefs

The following is the global view of belief systems, in regard to belief in either God, spirit, or life force:

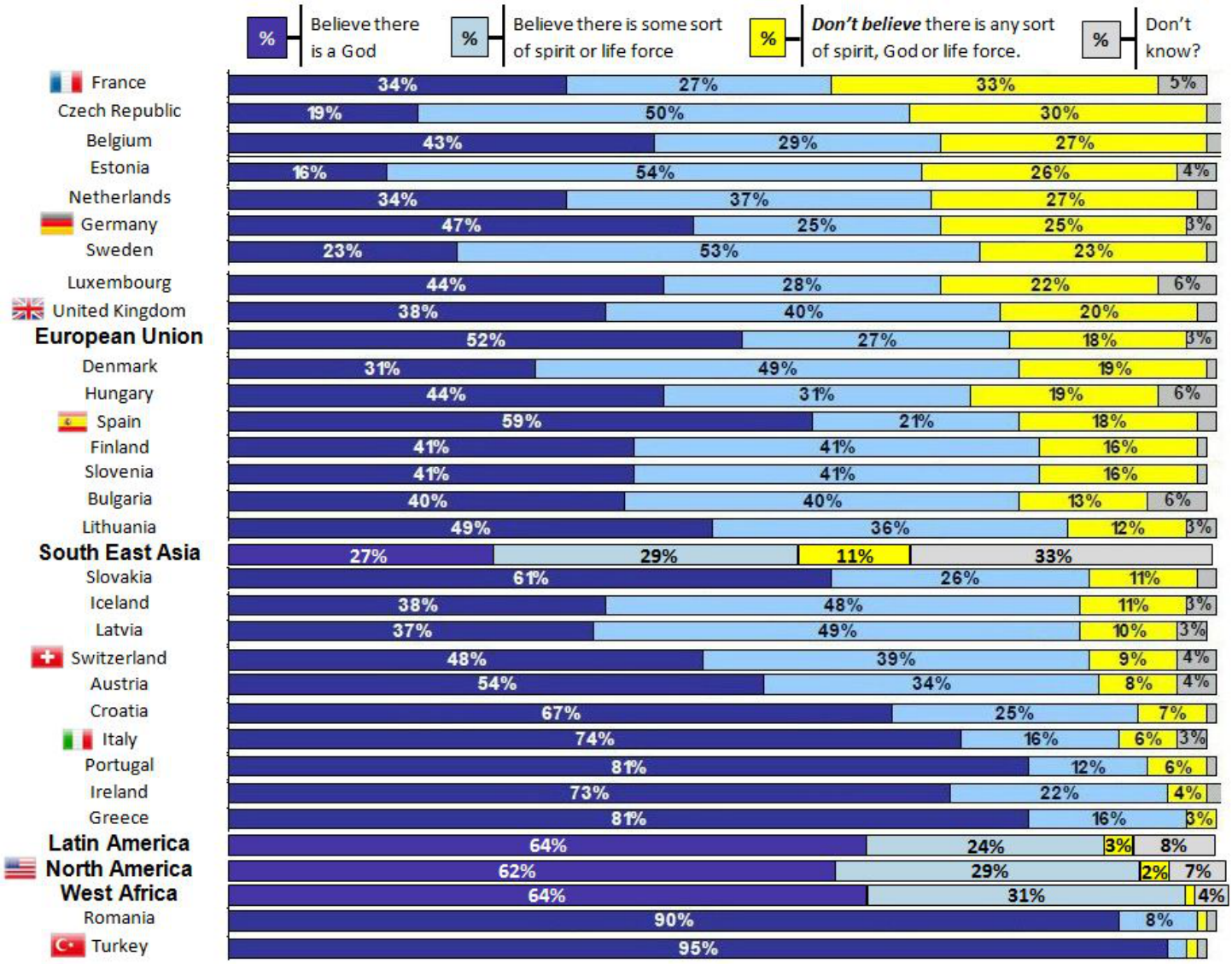

Scientific beliefs

The following are scientist's beliefs in the existence of god according to recent polls:

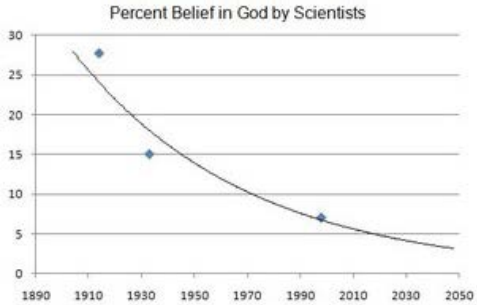

American National Academy of Sciences (1998)	Disbelief in God	Disbelief in immortality	Doubt (or agnosticism) of belief in God	Doubt (or agnosticism) of belief in Immortality	Belief in God	Belief in Immortality
Physical scientists (physicists and astronomers)	79%	76.3%	13.5%		7.5%	7.5%
Biological scientists	65.2%	69%	32.3%		5.5%	7.1%
Mathematicians					14.3%	15%
Overall:	72.2%	76.7%	20.8%	23.3%	7.0%	7.9%

13. Discussion

The last 15 minutes of the class were devoted to open discussion, questions, and or concerns. The following are a few Q&A examples that occurred in the discussion section:

Q: How can thermodynamics be applied to marketing, such as, for example, using affinity reaction diagrams:

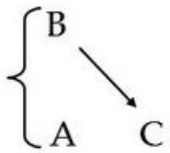

if B were a given consumer, attached to a certain product A, who by the force of chemical affinity (or "will" as Henry Adams defines it) chooses to leave brand A and move to the use or attachment of brand C, be explained in terms of human thermodynamics?

A: Thims referred the student to the Goethe-Helmholtz equation:

$$A = -\Delta G$$

which relates chemical affinity or the "will" or conscious choice of the person to the change in the Gibbs free energy in the system; and also directed him to the well-presented TED talk of English physicist and marketer Dan Cobley.

Q: How does human thermodynamics apply to the mind?

A: Thims explained how that was a large subject, the psychological thermodynamics of Sigmund Freud and Carl Jung, well-representative of this topic, being one classical approach; but explained that the best modern way to think about conscious choice is in terms of 1910 "chemical affinity = will" definition by Henry Adams:

> "If thought is capable of being classified with electricity, or **will** *with* **chemical affinity**, as a mode of motion, it seems necessary to fall at once under the second law of thermodynamics. Of all possible theories, this is likely to prove the most fatal to professors of

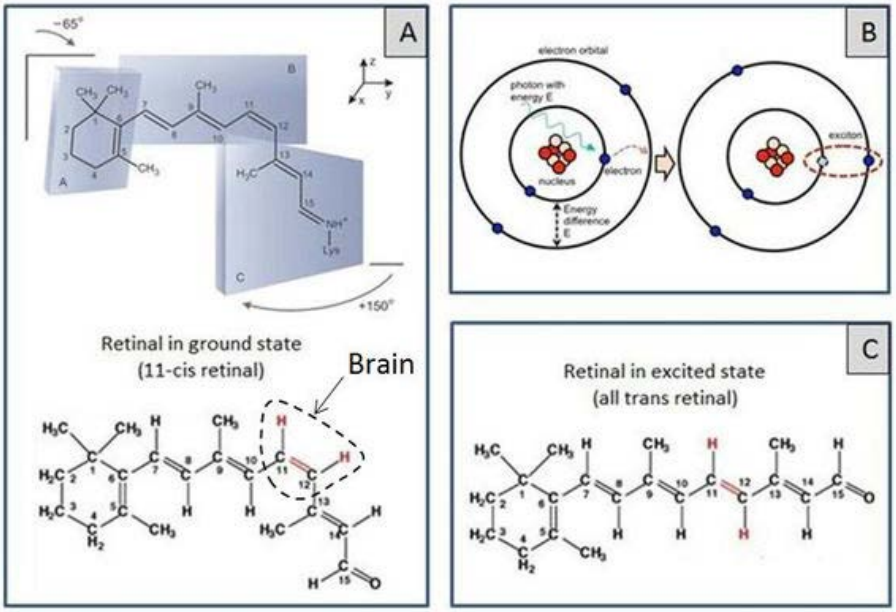

history."

in coordination with the 1796 definition of chemical affinity by Johann Goethe as being derived from external forces or "external in origin":

> "To facilitate our comprehension of the concept of organic existence, let us first take a look at mineral structures. Minerals, whose varied components are so solid and unchanging, do not seem to hold to any limits or order when then combine, although laws do determine these conditions. Different components can be easily separated and recombined into new combinations. These combinations can again be taken apart, and the mineral we thought destroyed can soon be restored to its original perfection. The main characteristic of minerals that concerns us here is the indifference their components show toward the form of their combination, that is, their coordination or subordination. There are, by nature, stronger or weaker bonds between these components, and when they evidence themselves, they resemble attractions between human beings. This is why chemists speak of elective affinities [or human elective affinity], even though the forces that move mineral components [or human molecules] one way or another and create mineral structures are often purely **external in origin**, which by no means implies that we deny them the delicate portion of nature's vital inspiration that is their due."

according to which logic Thims explained on the induced movement model or exchange force model of the motion of the 3-element retinal molecule gives the best intuitive conceptual model of how the mind works, in the sense that the photon, the carrier of field particle of the electromagnetic force, is "external in origin" to the brain or 11-12 carbon-carbon bond of the retinal molecule, and hence the impact of the photon (light of the correct wavelength) into the structure of the 11-12 bond is what brings about the movement (straightening) of the retinal molecule, and in a very anthropomorphic way the "choice" of the retinal molecule's actions. Students were a bit puzzled by this; but to explain via way of example, Thims suggested that it is very likely that many of the students in the room, prior to making the "choice" to become an engineer, when they were children, likely "saw" (visual image transmitted by the electromagnetic force) an engineer personally or on TV or film and that this "image" implanted into their memory as a desire, or something along these lines, and hence influenced their educational and career path.

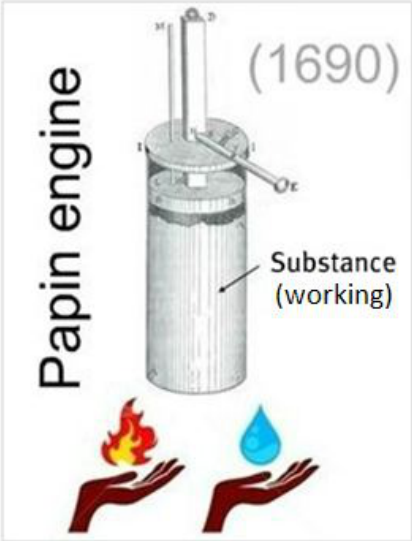

"Love is in its ultimate analysis nothing but a chemical reaction."
—Anon US scientist (1922)

"We may think of '-ΔG' as the driving force of a reaction."
—Gilbert Lewis (1923)

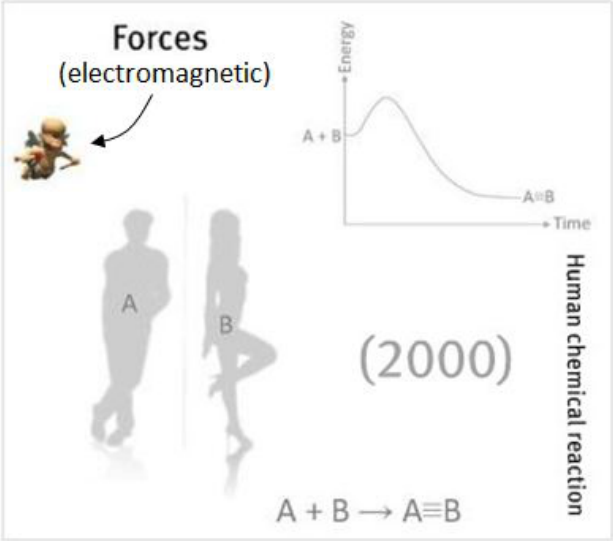

"There are, by nature, stronger or weaker bonds between these components, and when they evidence themselves, they resemble attractions between humans. This is why chemists speak of *elective affinities* [A = -ΔG], even though the *forces* that move chemicals [or humans] one way or another and create chemical structures are often purely **external in origin**."
—Goethe, *Lectures on Anatomy* (1796)

Q: One student noted how he was unaware that there was overlap between "engineering" (or thermodynamics) and his other passion of "sociology and economics"?

A: Thims explained that this indeed was a large field and that the best direction to go in this matter was to key word search in Hmolpedia for topics of interest and then dig into the respect works of each author to do further research; and to also see: sociological thermodynamics and economic thermodynamics as starting points.

Other questions were raised as well.

Lecture review commentary

The following is 18 Apr 2012 review commentary by American hmolscience reviewer Lynn Liss on the above lecture notes: [2]

> "Your lecture page from last week is really great, you've synthesized so much of your research and are really speaking the right language to your audience, well done. I would do a little more on the 'boundary' section since the pictures included here aren't really explained in much text, and how this plays into the human molecule or human thermodynamics is not as obvious as the other sections. I also might move the section a bit later, for better flow. Also, your 'Human Thermodynamics Applied' section should be ordered by date.
>
> I really like the Occupy Wall Street video, a lot. Does the Ostwald stuff apply when monitoring all animal species, the same as they're suggesting it applies to humans? Also, it would be interesting for them (or you?) to do a part 2 response, what does a person do with this information, how does one survive when economic conditions are tough, how do you improve your lot in life. I like your shadow boy/girl graphics. I like your rotating globe. Under 'dissertations' you spelled: 'gradate' wrong. Georgi received a $2B patent, wow, great for him. The following sentence "claiming be applying thelaws of social thermodynamics" s/b "claiming he applying thelaws of social thermodynamics". I really like the below human molecule image (below)."

References

1. Dolbear, Geoffrey E. (2001). "Thermodynamics of the Hydrocratic Generator", Aug 29, G.E. Dolbear & Associates, Inc.
2. Email communication with Libb Thims.

θΔics

In Libb Thims (lectures), **Libb Thims' Apr 2013 lecture** is an April 16th, 2013 lecture, given by American electrochemical engineer Libb Thims, entitled:

> "A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies"

The talk is centered on explaining how the following 1936 affinity-free energy equation, the centerpiece of thermodynamic theory of affinity:

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

scales up to explain social interactions and is given to Northern Illinois University mechanical engineering professor Milivoje Kostic's engineering thermodynamics students; this main page and the linked drop menu pages, adjacent, being an outline of the lecture. [1]

> "Perhaps our genius for unity will some time **produce a science** so broad as to include the behavior of a group of electrons and the behavior of a university faculty, but such a possibility seems now so remote that I for one would hesitate to guess whether this wonderful science would be more like mechanics or like a psychology."
>
> — Gilbert Lewis (1925), *Anatomy of Science*

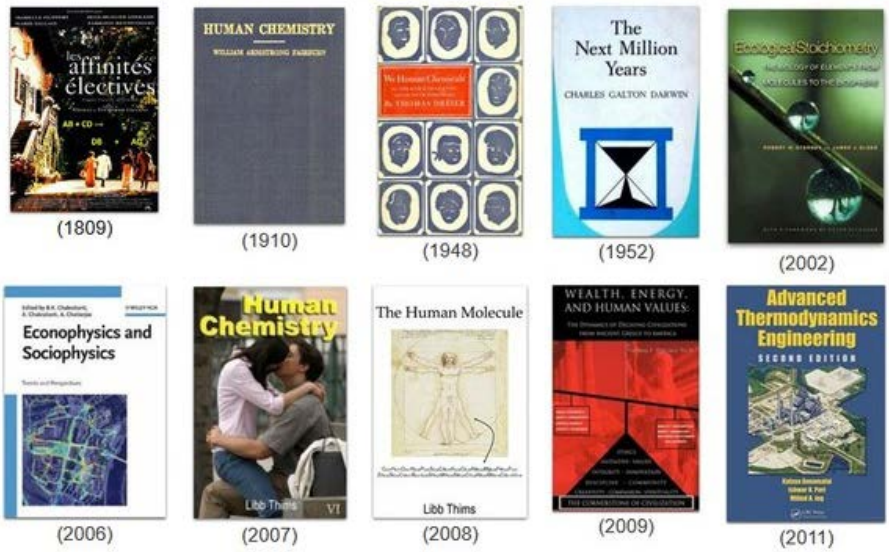

Some of the main books in the formation of the modern 21st century newly-forming science of **human chemical thermodynamics**: German polymath Johann Goethe's 1809 human chemical theory introducing *Elective Affinities*, English-born American chemical engineer William Fairburn's 1901 "humans as chemicals" with entropy properties introducing *Human Chemistry*, Americans writers Thomas Dreier and consulting chemist Gustavus Esselen's 1948 similarly-themed *We Human Chemicals*, English physicist C.G. Darwin's 1952 science of "human thermodynamics" defined as the "thermodynamics of human molecules" introducing *The Next Million Years*, American limnologists Robert Sterner and James Elser's 2002 human molecular formula introducing *Ecological Stoichiometry*, German physicist Jurgen Mimkes' 2006 *Econophysics and Sociophysics* "A Thermodynamic Formulation of Social Science" chapter, American electrochemical engineer Libb Thims 2007 "human chemistry the study of the behaviors of human molecules" *Human Chemistry* textbook and 2008 "history of HMS pioneers" booklet *The Human Molecule*, American physical chemist Thomas Dreier's 2009 *Wealth, Energy, and Human Values* appendix section: "The Fundamentals of Thermodynamics Applied to Socioeconomics", and most-recently Indian-born American mechanical engineer Kalyan Annamalai and American mechanical engineer Carlos A. Silva's *Advanced Thermodynamics Engineering* "§14.4.1: Human body | Formulae" definition of a human, based on Thims' human molecular formula.

The subject of human chemical thermodynamics is abbreviated herein as "HCT", for lecture notes simplicity.

Contents

Cover page → Fitness landscapes → Truth

1. About the speaker
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3. Cengel-Boles examples
4. Piston and cylinder view
5. Human molecule view
6. Equations of chemical thermodynamics
7. Newton's Query 31 to Goethe's elective affinities to human free energies
8. Human molecular engineering
9. Mechanical engineers [H] vs. Chemical engineers [H]
10. Homework problems [H]

Left: Lecturer Libb Thims, at segment 48:30-50:39 (see: **video**), doing the famous "ball and ring experiment" to explain "social expansion" (day) and "social contraction" (night), in Carnot cycle terms, in respect to hot body (sun) / cold body (night sky)

alternating daily contact of earth-bound social systems (working body), Boerhaave's law, entropy (transformation content) increase, and irreversible changes in Gibbs free energy states of human existence and experience. Right: edited synopsis video segment of lecture.

Extra topics

â— Applications [H]
â— Rossini debate [H] (resistance)

Overview

The following schematic shows the main stepping stone outline of the lecture:

1809

German polymath Johann Goethe published his human chemical theory in the form of a coded physical chemistry based novella called *Elective Affinities*, wherein people are considered as chemicals reacting to each other according to the laws of affinity chemistry—the precursor science to chemical thermodynamics, scene from the famous chapter four shown below:

1882

The following formula was given by German physicist Hermann Helmholtz as the formulation for affinity in relation to the direction of changes spontaneously occurring:

$$\frac{dF}{dt} \leq 0$$

which states that the affinities will only be active when the system of the chemical process shows a decrease in free energy F with time t.

"Given the unlimited validity of Clausius' law, it would then be the value of the free energy, not that of the total energy resulting from heat production, which determines in which sense the chemical affinity can be active."

— Hermann Helmholtz (1882), "On the Thermodynamics of Chemical Processes"

1952

The science of human thermodynamics was defined by English physicist C.G. Darwin as the thermodynamical study of "systems" of human molecules, the following of which gives an idea of the paradigm change this view carries:

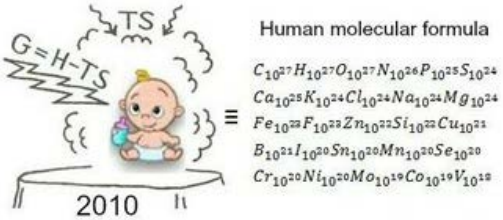

"Human thermodynamics is the statistical mechanics of conservative dynamical systems of human molecules."

— C.G. Darwin (1952), *The Next Million Years*

The following are relevant quotes, in respect to the above three lecture outline steps, to the effect that in the lineage of historical dozen or so "universal geniuses" there are four known "last universal geniuses", shown adjacent, of which the first of which, German polymath Gottfried Leibniz, was the co-inventor of the differential equation language of the above equations (see: history of differential equations), the second of which, German polymath Johann Goethe, showed how physical chemistry could be used to explain human existence, the last two, German physician-physicist Hermann Helmholtz and Hungarian mathematician and chemical engineer John Neumann, who showed how the work of the previous two could be used to explain human existence in terms of free energy, were both bred in the language—namely: chemical thermodynamics—of chemical engineering thermodynamics, which, according to German physicist and thermodynamics historian Ingo Muller, is the underlying tool of the newly-emerging field of socio-thermodynamics:

Last Universal Geniuses

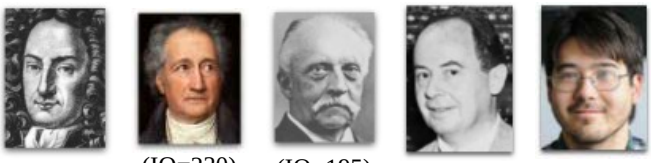

(IQ=200)	(IQ=230)	(IQ=195)	(IQ=190)	(IQ=190)
Leibniz (1646-1716)	Goethe (1749-1832)	Helmholtz (1821-1894)	Neumann (1903-1957)	Hirata (1982-)

> "The matter of multiplicity of contributors needs no great explanation, for we are all used to this in the modern handbooks. I believe it is a common saying that Helmholtz was the **last universal genius**, and we are fast arriving at the point where even a single subject becomes too vast for one man. At any rate, whether or not any of my learned colleagues could write an entire **chemical engineering** handbook, I could not—hence the present form."

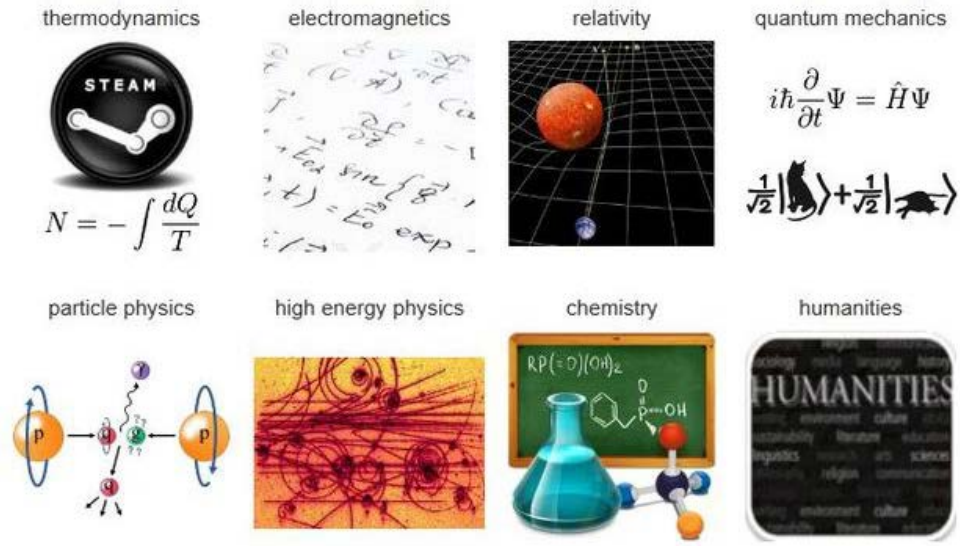

The so-called "modern" universal genius, Neumann being the last of the lineage, needs a unified grasp of the above eight fields in order to make cogent progress in the quest for understanding (see: genius IQs).

— Donald Liddell (1922) *Handbook of Chemical Engineering*, McGraw-Hill [4]

"It is interesting to note that socio-thermodynamics is only accessible to **chemical engineers** and metallurgists. These are the only people who know phase diagrams and their usefulness. It cannot be expected, in our society, that sociologists will appreciate the potential of these ideas."

— Ingo Muller (2007), *A History of Thermodynamics* [5]

The following, to situate the lecture on a point of reference, are Neumann's 1934 economic thermodynamics estimate of analogon variables, in terms of what each thermodynamic variable corresponds to in economic terms: [6]

Thermodynamic variable	Economic analogon
Energy	Value (estate of an economical subject)
Entropy	Liquidity
Free energy	Cash value

Compare the "free energy" views of American IQ=225+ cited child prodigy turned astrophysicist Christopher Hirata and penned "exercise examples", as found in each of the five parts of his circa 2000 article "The Physics of Relationships".

Human chemical reaction theory

See main: Human chemical reaction theory

The following gives an outline of the logic of German polymath Johann Goethe's 1796 human chemical theory, as explained via Platonic-Hegelian dialectic narration, in the above video, in which reaction between limestone, i.e. calcium carbonate ($CaCO_3$), and sulfuric acid (H_2SO_4) which upon contact yields gypsum ($CaSO_4 \cdot 2H_2O$), in the form an aqueous crystal, and carbon dioxide (CO_2) gas, a reaction that is compared and contrasted with the reactions that are occurring between the main characters in the novel: Charlotte (carbon dioxide), Edward (lime), Captain (sulfuric acid); the modern chemical equation for the limestone sulfuric acid reaction is shown below; a video of reaction of calcium carbonate chips with sulfuric acid is shown to the right —which shows that in the course of 13-minutes, the "extent", symbol ξ, pronounced xi or "zi", starting from an initial 50 grams total of reactant remains, only 49.13 grams remain, measurable by the scale, meaning that 0.83 grams of carbon dioxide gas was produced as reaction product:

$$CaCO_3\ (s) + H_2SO_4\ (l) \rightarrow CaSO_4\ (aq) + CO_2\ (g)$$

$CaCO_3$ + → $CaSO_4$ + CO_2

Limestone (calcium carbonate)	H_2SO_4 Sulfuric acid	Gypsum (calcium sulfate)	Carbon dioxide
Reactants		**Products**	

$$AB + CD \rightarrow AC + BD$$

Reactants **Products**

Shown below are a 2005 Hmolscience periodic table, American physicist Alfred Mayer's 1878 floating magnets experiment, and the 1913 Bohr model:

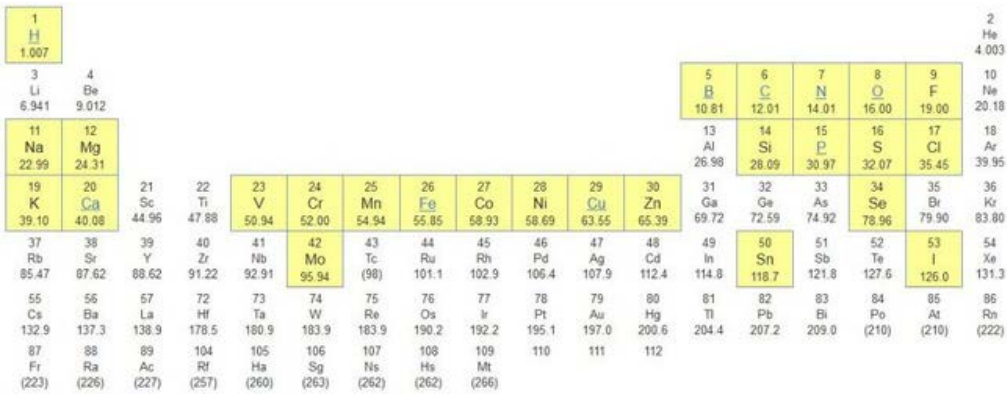

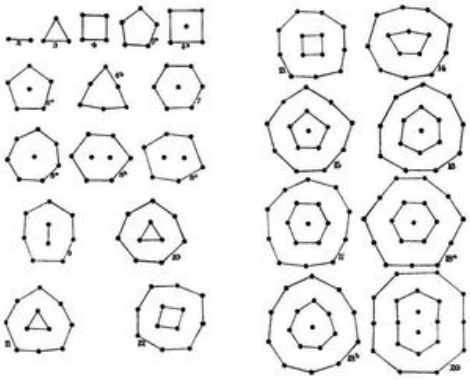

Related, the following are leading quotes from the defunct theory of life position:

> "There is no thing endowed with life."
>
> — Nikola Tesla (1915), "How Cosmic Forces Shape Our Destinies" [7]

> "Chemistry does not know the word life. That deletes life as a scientific category."
>
> — Charles Sherrington (1938), *Man and His Nature* [8]

> "Let us abandon the word 'alive'."
> — Francis Crick (1966), *Of Molecules and Men* [9]

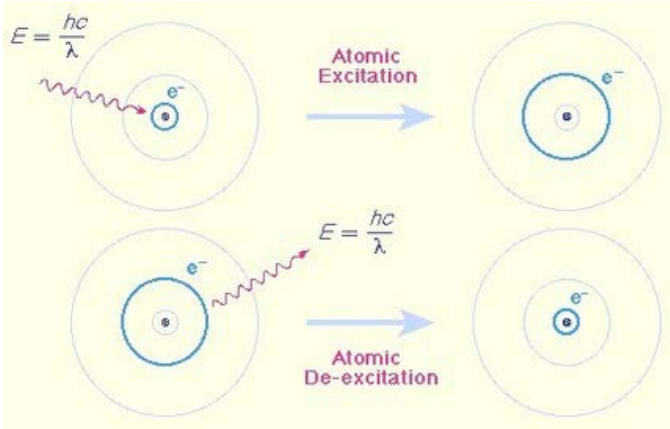

See the full article: life terminology upgrades for more on this issue of jettisoning of bio-centric terms.

â— Animate molecule

Retinal molecule ($C_{20}H_{28}0$)

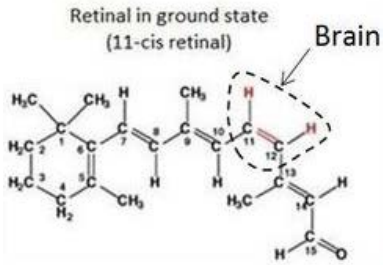

â— Walking molecule
â— Extrapolate up approach
â— Extrapolate down approach
â— De-anthropomorphize

> "About 1,000 billion photons of sunlight fall on a pinhead each second."
>
> — John Gribbin (2000), *Q is for Quantum: An Encyclopedia of Particle Physics* [7]

> "Light—an electromagnetic field of a certain wavelength range—is a stream of photons; those of light are 'on the mass shell', those of electric and magnetic fields are not."
>
> — Martinus Veltman (2003), *Facts and Mysteries in Elementary Particle Physics* [8]

Related

â— Neodymium floating magnets experiment (video)
â— Molecular evolution table | Great chain of being
â— Evolution timeline

Wallace | Modern view

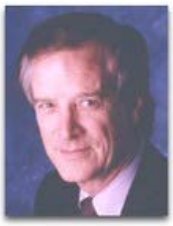

The following, to tie the above lecture synopsis together with modern ideas, is American physical chemist Thomas Wallace's 2009 views, from his "The Fundamentals of Thermodynamics Applied to Socioeconomics", in regards to how Gibbs free energy change applies to the rise and fall of civilizations: [2]

> "The thermodynamic parameter free energy:
>
> $$\Delta G = \Delta H - T\Delta S$$
>
> represents the fundamental driving force in nature and determines whether physical and chemical processes conducted by nature and society will take place [and] the civilization development model [can be] represented by the following equation:
>
> $$P \rightarrow F \Leftrightarrow S \Leftrightarrow I \rightarrow F$$
>
> where *P* is the primitive phase, *F* the feudal phase, *S* the state phase, *I* the imperial phase,⇔meaning dynamic equilibrium, and → meaning complete conversion to products."

Wallace, however, as is the case with most modern day physical chemists, is ignorant of German polymath Johann Goethe's previous 1809 work on the same subject, albeit discussed in the synonymous terms of chemical affinity. The aim of the lecture will be to outline the needed rectification this disjunct.

Quotes

The following are related quotes:

> "Words like 'great' and 'genius' could aptly be used for but a select number of artists—for Michelangelo or say Shakespeare. In the United States, the works of these great artists have been incorporated into popular culture as the epitome of visual and linguistic beauty. By contrast, on these shores, Goethe's works remain largely unread and rarely discussed except among college students, most of whom develop a healthy dose of amnesia shortly after graduation."
>
> — Daniel Spiro (2005), "Remember to Live! The Philosophy of Johann Wolfgang von Goethe"

American lawyer Daniel Spiro, a member of the Goethe Institute, Washington, and a graduate of Stanford University and Harvard Law School, notes (2005) strikingly how the works of Goethe, in the US, despite being the second most widely held author in libraries world-wide, according to WorldCat, "remain largely unread and rarely discussed", which is strikingly similar to the experience of American electrochemical engineer Libb Thims who is nearly flubberstruck/flabbergasted, by the that he passed through a US chemical engineering degree and was never told about Goethe's *Elective Affinities*, and the modern-day chemical thermodynamic ramifications of this great treatise, and subsequently was forced to go on another eleven-years searching the literature for the historical underpinnings of the theory of human chemical thermodynamics, before discovering Goethe in circa 2006, via footnote 2.5 in the 1984 work of Belgian chemist Ilya Prigogine, whose father Roman Prigogine, was a chemical engineer?

Lecture materials

The following are in-class lecture materials:

1. Ball and ring experiment
2. Illuminated globe w/ piston and cylinder
3. Laser pointer
4. Human chemistry textbooks (case of books)
5. Bergman textbook and Bergman affinity table
6. Clausius textbook (1875)
7. Camcorder + stand + extension chord[s]

References

1. (a) MEE 350 (ABET criteria 2000 course description) – Engineering Thermodynamics (Prof. M. Kostic) – NIU.edu.
(b) MEE 350 (syllabus) – NIU.edu.
2. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (Le Chatelier's principle, pgs. 142-43; Appendix A: The Fundamentals of Thermodynamics Applied to Socioeconomics, pgs. 469-89). AuthorHouse.
3. (a) Spiro, Daniel. (2005). "Remember to Live! The Philosophy of Johann Wolfgang von Goethe", talk delivered at the Washington, D.C., Spinoza Society,

The WorldCat top 100 identities in world library holdings, Goethe ranked number two, behind Shakespeare.

Goethe-Institute, Sep 7.
(b) Goethe, Johann. (1796). *Wilhelm Meister's Apprenticeship* (quote: "Remember to Live!", pg. 331). Publisher.
(c) Daniel Spiro (about) – TheAegisPress.com.
4. Liddell, Donald M. (1922). *Handbook of Chemical Engineering, Volume 1* (quote, pg. ix). McGraw-Hill Company.
5. Müller, Ingo. (2007). *A History of Thermodynamics: the Doctrine of Energy and Entropy* (pg. 164). New York: Springer.
6. (a) Leonard, Robert J. (1995). "From Parlor Games to Social Science: von Neumann, Morgenstern, and the Creation of Game Theory, 1928-1944" (abs), *Journal of Economic Literature*, 33(2): 730-761.
(b) Leonard, Robert J. (2010). *Von Neumann, Morgenstern, and the Creation of Game Theory* (pg. i). Cambridge University Press.
(c) Neumann, John. (1934). "Letter to Abraham Flexner", May 25, Faculty Files, Folder 1933-35. VNIAS.
7. Gribbin, John. (2000). *Q is for Quantum: An Encyclopedia of Particle Physics* (pg. 283). Simon & Schuster.
8. Veltman, Martinus. (2003). *Facts and Mysteries in Elementary Particle Physics* (pg. 17). World Scientific.

next
Next section
â— Lecture: HCT | P1: About the speaker

prev
Previous section
â— Lecture: HCT | Truth

In Libb Thims (lectures), **Libb Thims' Apr 2014 lecture** is an April 16th, 2014 lecture, given by American electrochemical engineer Libb Thims, entitled:

"Floating Magnets Experiment and Humans as Powered Atomic Geometries"

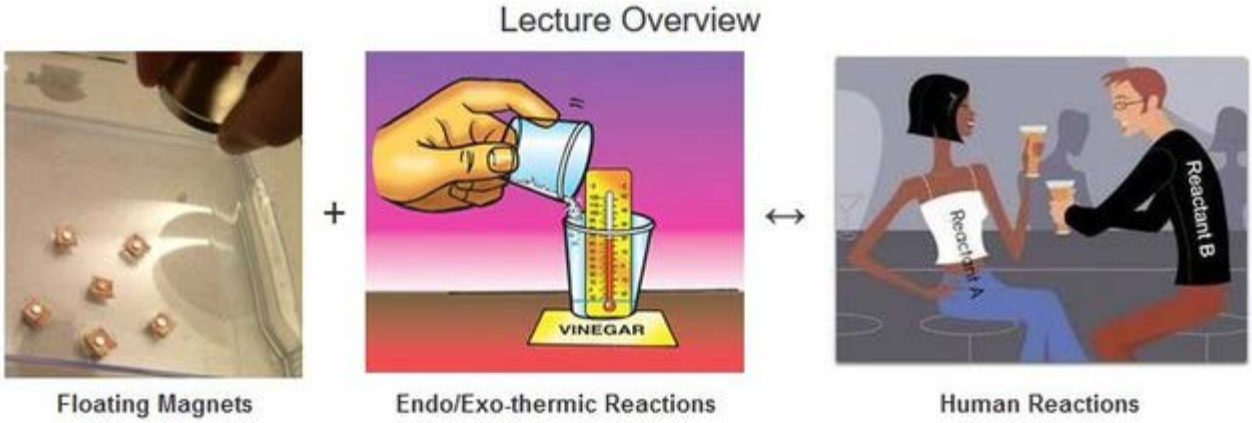

An overview of the **16 Apr 2014 talk** "Floating Magnets Experiment and Humans as Powered Atomic Geometries" given American electrochemical engineer Libb Thims to Chicago students Jake (age 7) and Temple (age 8) to explain the chemistry and physics of human dynamics using via the floating magnets experiment and the endothermic and exothermic reactions.

The talk is centered around a demonstration of the famous "floating magnets experiment", done originally by English chemist-physicist William Gilbert (1590), using loadstones and wooden boats, and American physicist Alfred Mayer (1878), using magnetized needles and cork, albeit this time done using more powerful neodymium magnets and foam board.

The floating smaller negative (-) charges (polarities) and hovering larger positive (+) charges (polarities), will be used as representative models of electrons (-) and protons (+) to show how atom structure and how molecules, i.e. geometrical structures of atoms, form from atomic interactions.

Patterns

The following are some of the geometrical patters:

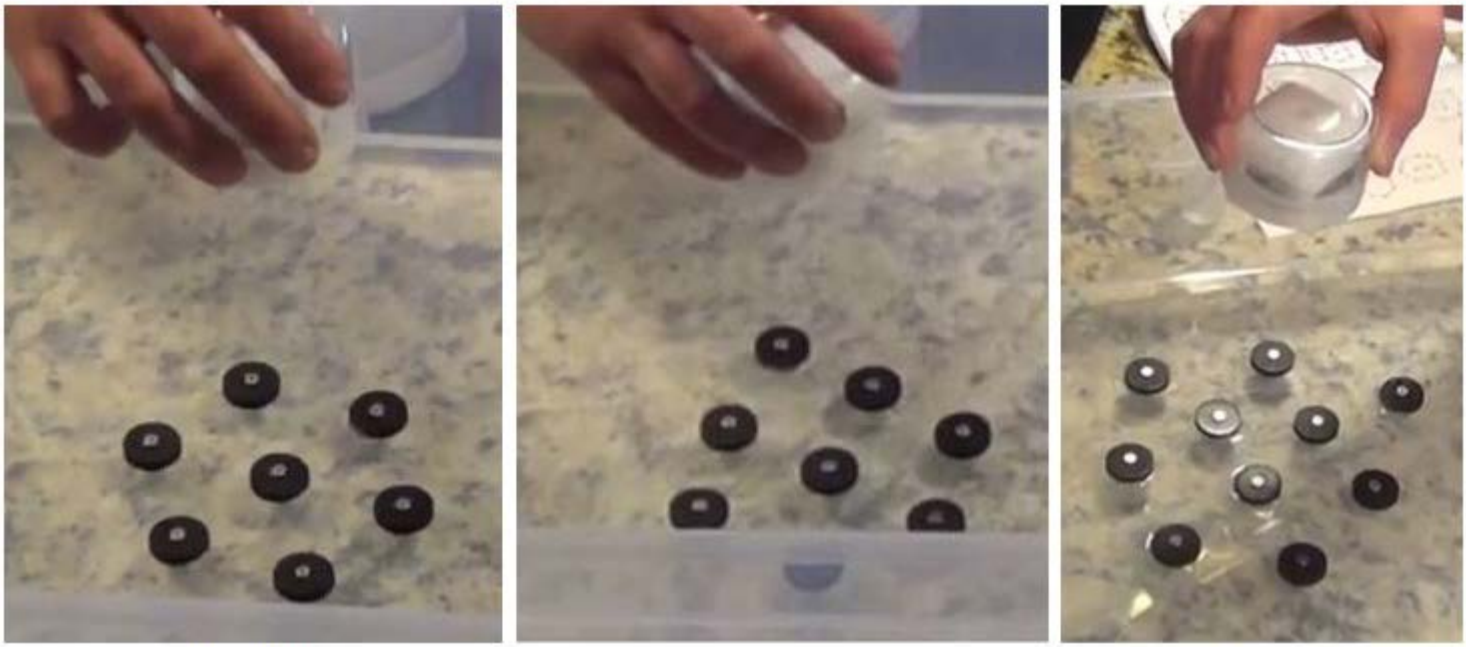

7 magnets 8 magnets 10 magnets

12 magnets 16 magnets 20 magnets

Here we can discern the underlying nature of phenomena such as wars and revolutions, namely that in patterns 7, 10, 12, 16, and 20 there is a cohesive stability pattern, i.e. social peace, one might say, speaking anthropomorphically, and the jump from each involves less stable middle arrangement transition states, e.g. patterns 8 (shown) and 9, both less geometrically cohesive, in going from 7 to 10, both more geometrically cohesive, the dynamics of which can be seen in the video. Scaled up to the human social level, the daily input of photos insures that proton-electron configuration geometries grow, i.e. societies increase, according to which jumps to new stability patterns will be inevitable.

Chemical bond

The following shows an illustration of chemical bond between two magnetic modeled carbon atoms to form a diatomic carbon C≡C or carbon molecule C_2:

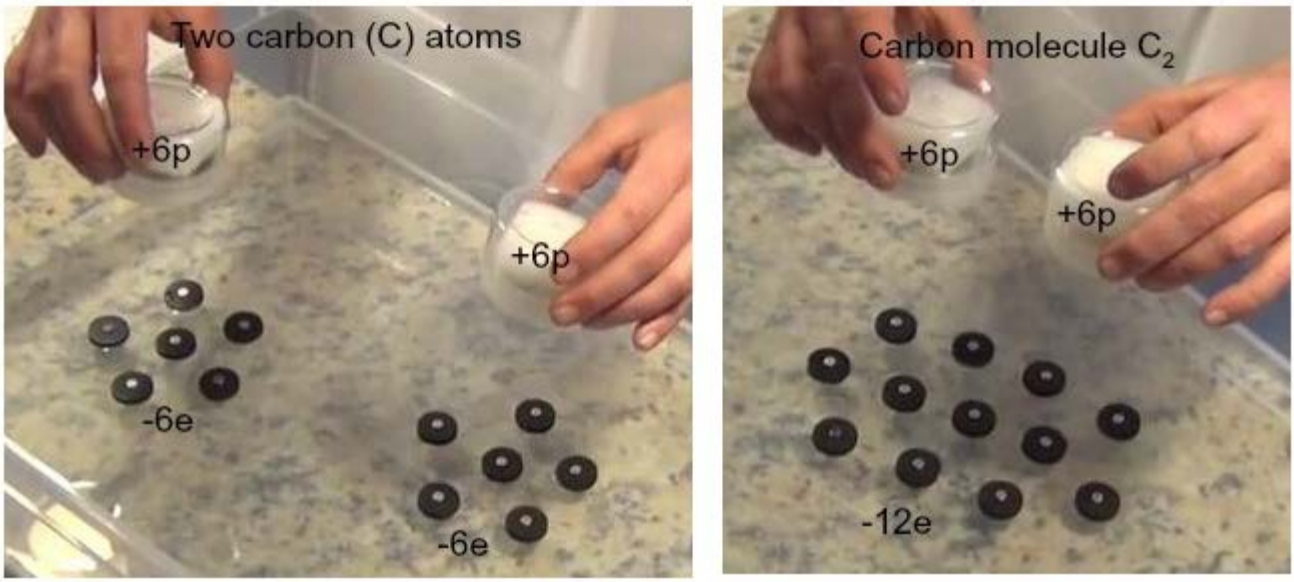

This demonstration will be accompanied by a demonstration, via thermometer (measurement), endothermic reaction (heat-absorbing), specifically the baking soda ($NaHCO_3$) and vinegar (CH_3COOH) reaction and an exothermic reaction

(heat-releasing), specifically the baking soda solution ($NaHCO_3$) and calcium chloride ($CaCl_2$) reaction, as models to explain the difference between hot and cold reactions between people, or technically endergonic reactions (work-absorbing) and exergonic (work-releasing) reactions between people, defined as powered chemicals, as typified by the phrase: “It’s NOT working between us any more, I’m sick of you” (endergonic) or “Are relationship WORKS great—we love each other!” (exergonic). [1]

These three basic demonstrations will then be used to answer the typical questions that children have as they grow, using specifically American socio-political philosopher Jeremy Rifkin's 2010 “Big Questions” of children model (see: video (0:10-5:00) + belief system (children)) and the Pakistani-born British philosopher-journalist and TED curator Chris Anderson's 2012 “Questions No One Knows the Answers To” model (see: video (0:00-3:45). [2]

Full lecture of Libb Thims’ 16 Apr 2014 talk on “Floating Magnets Experiment and Humans as Powered Atomic Geometries”.

The talk will aim to be 30-45 minutes and given to Chicago students Jake (age 7) and Temple (age 8), during their spring break, on Wednesday, Apr 16th, at 10:00-10:45 AM, prior to going on a field trip to the Chicago History Museum.

The lecture will be video recorded and made available on YouTube (via the HumanChemistry101 channel).

Images

The following are a few video stills from the lecture. The following (48:45) shows Thims taking the final state temperature of the exothermic chemical reaction (baking soda + vinegar), in front of *The Egyptian Book of the Dead* (1550BC), the *Bible* (150AD), and *On the Equilibrium of Heterogeneous Substances* (1876) by Willard Gibbs, the three big paradigm changing books of human understandings of nature:

The following (25:30) shows Thims explaining what reactants and products are in the context of the fundamental forces of nature, gravitational force, electromagnetic force, and strong nuclear force:

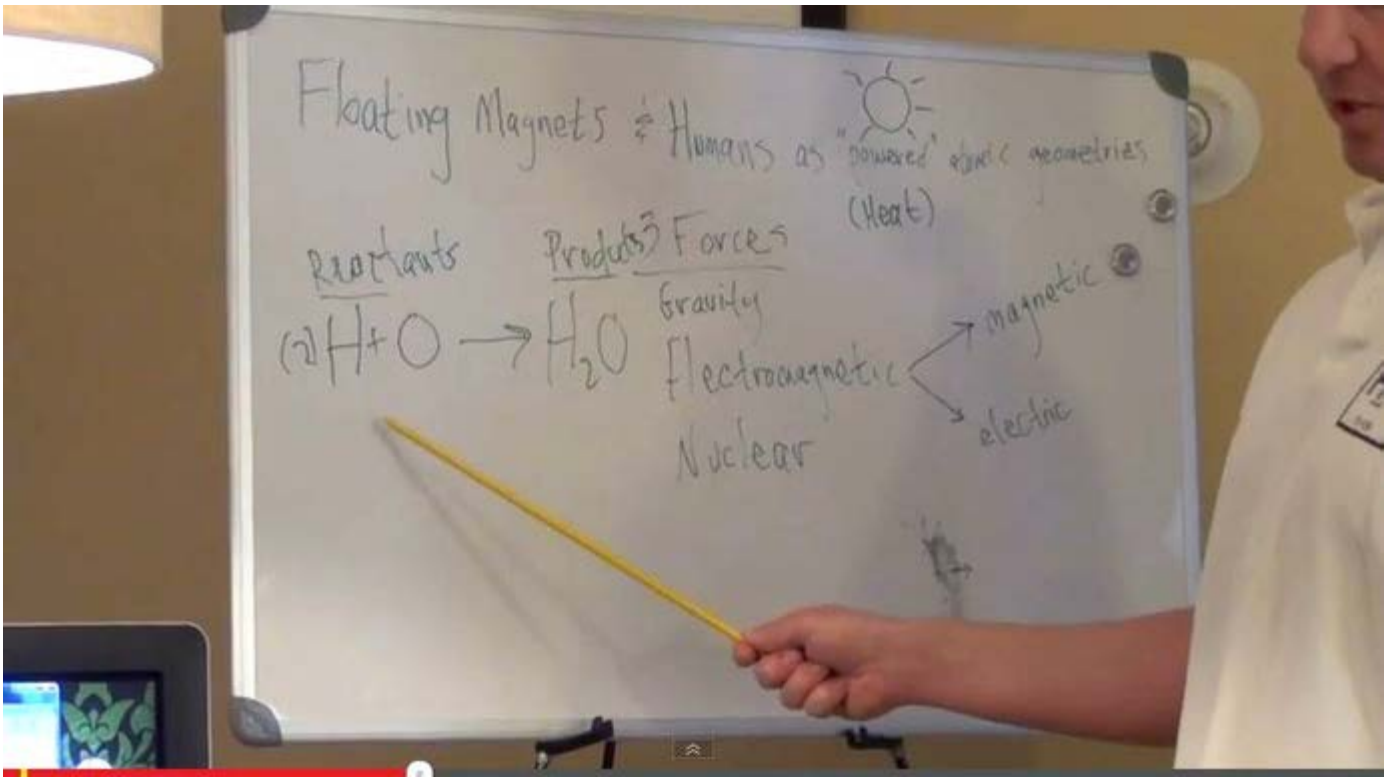

(add discussion)

References

1. (a) Energy Changes in Chemical Reactions – MiddleSchoolChemistry.com (a K-8 themed ACS.org site).
(b) See: Thims' Apr 2013 lecture (section: human chemical reaction theory) for more on this.
2. (a) Rifkin, Jeremy. (2009). *The Empathic Civilization: the Race to Global Consciousness in a World of Crisis.* Polity Press.
(b) Chris Anderson (entrepreneur) – Wikipedia.

Next section

â— Lecture: FME | P1: Big questions kids ask?

Previous section

â— Lecture: FME | Timeline

In hmolscience, **Libb Thims (attack)** page lists public 'attacks' by the intellectual opponents of the chemical thermodynamics based humanities work, i.e. physicochemical humanities, human chemical thermodynamics, hmolscience, among other two cultures namesakes, of American electrochemical engineer Libb Thims, since going public with his views on 27 Apr 2005; prior to 2001, the subject remained largely, since 1995, as a intellectual "puzzle" solving sort of hobby.

Left: a metaphorical depiction of American electrochemical engineer Libb Thims (on ladder) descending into the vast sea of intellectually hungry sharks, shown being **attacked**, by a fellow "fill-in-the-blank" scientist shark for promoting the seemingly absurd view.

Overview

In *circa* 1810, English polymath Thomas Young stated his view of science as an intellectual battleground, his in particular with the work of Joseph Lagrange, as a sort of intellectual warfare: [1]

> "Scientific investigations are a sort of **warfare**, carried on in the closet or on the couch against all one's contemporaries and predecessors; I have often gained a single victory when I have been half asleep, but more frequently found, on being thoroughly awake, that the enemy had still the advantage of me when I thought I had him fast in a corner."

Thims, who is but carrying forward the combined work of Goethe, Adams, and Pareto, and the other social Newtons, faces the same resistance, in the form of Young-like warfare, in modern times, as the old greats faced in their time—similar how Ernst Lecher ridiculed, albeit later recanted, Arthur Haas' 1910 paper, outlining a treatment of the hydrogen atom involving quantization of electronic orbitals (anticipating the Bohr model by three years), as a "carnival joke"—in the form of *ad hominems*, jibes, and pejorative attacks, all of which resulting from something akin to knee-jerk like cultural ignorance in regards to inability to deal with absurdities, e.g. that atoms are sort of alive (see: Charles Sherrington), arising from the collide of modern physical science with older comparative mythology and religious ideals.

Schopenhauer | Boltzmann

In hmolscience history, there have been a number of classic battles between those who have attempted to advance a physico-chemical based versions of the humanities; one of the first being that between Arthur Schopenhauer, whose view was the following:

> "The will of the copper, claimed and preoccupied by the electrical opposition to the iron, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive."

and Ludwig Boltzmann, whose reaction "attack" view was the following:

> "Schopenhauer is a mindless, ignorant, spreader of nonsense."

The famous "attack" by Ludwig Boltzmann on the physico-chemical monism philosophical, aka Goethean philosophy, views views of Arthur Schopenhauer, is a historical rendition of recent attacks by scientists on Libb Thims, who is but advancing the so-called Goethe, Schopenhauer, Henderson view.

Boltzmann of mechanistic school of Ludwig Boltzmann and Hermann Helmholtz against the romanticism school of Arthur Schopenhauer and Karl Zollner, who all, ironically, embraced Goethe, and his physicochemical mechanistic romanticism metamorphology "one nature" ideology; akin to what occurs today against Libb Thims.

Henderson | Sorokin

Another classic battle, which took place during the Harvard Pareto circle, was that between physical chemist Lawrence Henderson, who asserted that that physical chemistry and chemical thermodynamics applies to the explication of the humanities and to socioeconomic systems, and sociologist Pitirim Sorokin, who repeatedly attacked, via debate, objection, and publication, the so-called "mechanistic school" views, as Sorokin dubbed them, of Henderson, and other like him, historically speaking.

(add discussion)

Adams | Diggins

A more spread out example is that of Henry Adams, one of Thims' intellectual twinsthe other twin being Goethe), also incorrectly labeled as "crank" (by John Diggins, 1995), who said the same about his work in 1908-09:

> "I have run my head hard up against a form of mathematics that grinds my brains out. I flounder like a sculpin in the mud. It is called the 'law of phases', and was invented at Yale [by Gibbs]. No one shall persuade me that I am not a phase. On the physico-chemical law of development and dynamics, our society has reached what is called the critical point where it is near a new phase or equilibrium. My essay 'The Rule of Phase Applied to History' is a 'mere intellectual plaything, like a puzzle'. I am interested in getting it into the hands of a 'scientific, physico-chemical proofreader' [see: Henry Bumstead] and I am willing to pay 'liberally for the job'."
>
> — Henry Adams (1908-09), aggregate personal note communications [2]

Correctly, forward a century, we now rank Adams (#2), in social Newton rankings, behind Goethe (#1), and ahead of Pareto (#3).

Discussion

These ongoing attacks, outlined below in reverse chronological order, in short, are but the result of the incompatible one nature vs two nature mental belief system divide, among the erudite crowd, as has been well-evidenced in the 200-year ongoing *Elective Affinities* "admirers/enemies" divide, both shown below (left), as well as ongoing social Newton (reductionism) / anti-social Newton (anti-reductionism) divide, both outlined below (right):

Elective Affinities
"admirers/enemies" divide

Enemies	Date
Anonymous woman (friend of Heinrich Laube)	1809
Friederike Helene Unger (1741-1813) German writer	c.1809
Ludwig Tieck (1773-1853) German poet and romantic movement novelist (IQ=165)	c.1809
Karl Knebel (1744-1834) German poet	1810
Heinrich Heine (1797-1856) German poet (IQ=165)	c.1810
Christoph Wieland (1733-1813) German poet and writer (IQ=170)	1810

vs.

Admirer	Date
Germaine Stael (1766-1817) French-born Swiss writer (IQ=185)	c.1810
Arthur Schopenhauer (1788-1860) German philosopher (IQ=185)	1816
George Eliot (1819-1880) English realism philosopher / novelist (IQ=190)	1854
Victoria Woodhull (1838-1927) First female US presidential candidate	1871
Max Weber (1864-1920) German sociologist	1878
Joseph Cook (dates)	1879

Physical humanities
"sane/lunatic" divide

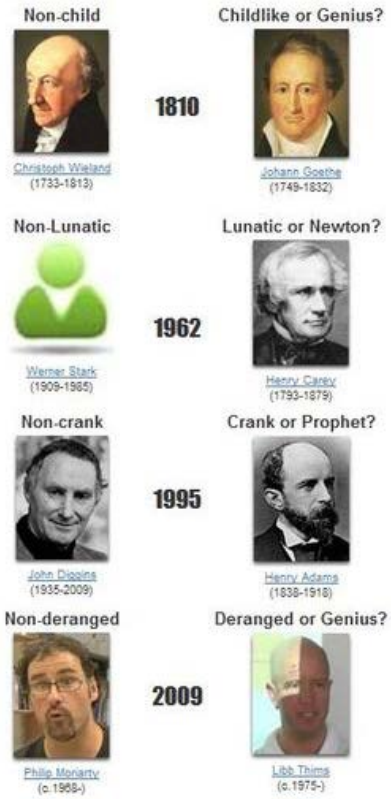

These ongoing debates and attacks arise from the fact that "heat can produce motion", in the 1824 words of French engineer Sadi Carnot, "everyone knows", and that "to heat are due the vast movements which take place on earth", most agree on, and that the laws which govern the "phenomenon of the production of motion by heat" for all "working substances" whatever the "method by which it is operated" are laws governing the operation of the known universe, nearly everyone agrees on, but that "heat is what produces human motion" in accordance with these laws, almost no one knows and most will not accept even as a principle.

List

The attacks against the views and or work of Libb Thims are listed below, by yearly and or monthly reoccurring reverse chronologically attack order:

2013

"Initially I had the impression that you [Thims] were a scholar and scientist, not some self-published wacko angry at the world for not taking his theories seriously. And that you would read carefully instead of just using out of context quotations and ad hominem jabs to push your own agenda. Please don't prove this latter revised impression to be the more accurate one."

— Terrence Deacon (22 May 2013) American neurological anthropologist; emergent chemical teleology theorist

â— Upset about Thims' review of his 2011 book *Incomplete Nature: How Mind Emerged From Matter*.

"Gary, are you familiar with this guy [Libb Thims] at all? I'd never heard of him, until I got this message just now out of the blue. I can't immediately tell from a quick scan of the links he includes [Two cultures department, University of California, Berkeley, Rossini debate, Princeton University Department of Social Physics] whether or not he's mostly a crank (I will try to find some time to read more thoroughly, and in any case answer him politely), but there might be something of relevance to the Templeton project here."

— Jay Labinger (21 Mar 2013) American organometallic chemist; literature chemistry scholar

â— Reaction to advice request on the aim to establish America's first two cultures department, similar to the 1950s Princeton "social physics" department, Labinger's alma matter. Email was possibly accidentally forwarded to Thims as copy?

2011

"If people are using this site [Hmolpedia] to do their PhD dissertations and getting away with that, their advisors should be shot."

– Peggy La Cerra (29 Aug 2011) American evolutionary psychologist and neuroscientist; theory "depression energy theory of the mind" (1996).

â— Is upset about the criticism of her 1996-2002 "depression energy theory of mind", in the evolutionary psychology article, as well as the expanded discussion of her theory in her Hmolpedia article and wants every mention of her either changed, deleted, and or removed.

"This is all just a horrendous analogy. Chemical laws apply to humans, but ourï»¿ behavior is more complex than something that can be modeled with a couple of thermodynamic equations.

A + B → AB is just a pretentious way of stating something we already know; it tells us absolutely nothing new."

"Goethe's *Elective Affinities* is a 'nutty theory'."

– Ryan Grannell (Jun-Jul 2011), Irish (openly atheist) biochemistry student

â— Spent a month blogging about how human chemistry and human thermodynamics are "bulls**t"; considers human chemistry and human thermodynamics to be "junk science"; believes Goethe's elective affinities is a "nutty theory"; considers Thims' thermodynamic proof that good always triumphs over evil to be nothing but "calculus coated woo, hidden behind a smokescreen of rhetorical mathematics"; believes that enthalpy has nothing to do with the sexual heat of physical attraction (Jul 2011), etc., etc.,

– DMR Sekhar (Mar 2011), Indian chemical engineer, theory: genopsych (2007)

"There is no science in your arguments and I now consider

discussion with you a waste of time."

â— Objection to the view that his "self drive" theory of human motion is a perpetual motion theory.

"Hydrogen molecules and human molecules are objects of different categories. Your viewpoints about the general nature of 'your molecules' contradict to the philosophy, to the principle of holism. These views are not consistent with the mathematical methods of nature describing. In particular, these representations are not consistent with the Gibbs phase rule!!! I am sure that if you will not transform your views, all professional scientists - your well-wishers turned away from you. You'll be surrounded by dreamers and colleagues who do not have special education." (Jan 12-13, 2011)

– Georgi Gladyshev , Russian physical chemist, Author: *Thermodynamic Theory of the Evolution of Living Beings* (1997)

â— Defensive comments on the unbridgeable gap (article)

"You write on science very often. Now you wrote that you are a scientist. What is your specialty in science? Myself and my friends do not know about your articles in peer reviewed professional journals? I try to support you. However, you do not listen to my opinions. I believe that you have created an incredible mess. I'm beginning to understand that you do not know 'what science is?'. Your work will have value only for information but would have no value to science. I'm convinced of it. Very sorry!" (Feb 2011)

â— Defensive comments on the defunct theory of life (article).

2010

"You've GOT to realize the blatant absurdity of trying to model theï»¿ laws governing human relationships using the rules of thermodynamics, a set of rules that only apply at a molecular level. *Human beings are NOT molecules, they are composed of molecules*, but we aren't giant molecules.

Human relationships are governed mostly by human psychology. I can only assume you're senile or crazy to believe this nonsense. Thermodynamics of human relationships is bullcrap.

The stuff Hirata said about human thermodynamics was a JOKE. You don'tï»¿ seriously believe that he was serious about this, do you ? Your obsession with human thermodynamics is silly."

– Lubos Motl (Nov 2010), Czech-American theoretical physics professor (and black hole thermodynamicist), Harvard University

â— Comment in response watching several HumanChemistry 101 YouTube videos.

"Human chemistry sounds like crackpottery to me and abuse of the word 'chemistry'? If you are interested in learning about human interactions they are covered by sociology and psychology; moreover, *Humans are not molecules, they are complex objects composed of many molecules*."

– Marcin Borkowski (Sep 2010), Polish chemist, founder of ChemBuddy.com, 1997; admin at ChemistryForums.com.

â— Response to query on whether or not human chemistry should be taught in school.

"Honestly, the idea of human chemistry seems pure crackpottery to me. Crackpots always seem to think they are victims of the 'mainstream'. They always seem to think no one is intelligent enough to understand their points. Oddly, they all also tend to write a lot in their internet postings. And unfortunately no matter how

– Mitch Garcia (Sep 2010), American nuclear chemist; founded ChemicalForums.com in 2003; BS chemistry (2003), University of California, Riverside; PhD chemistry (2009), University of California, Berkeley; postdoctoral research in molecular and medical pharmacology, 2010, UCLA.

much we argue with the crackpots they never give an inch in return.”

â— Response to query if discussion of human chemistry would be banned by him at ChemicalForums.com.

“Looks like steaming horse manure reeking of pseudoscience and cloaked in scholarly gobbledygook.”

– Smokefoot (Sep 2010), American industrial chemist

â— Comment on request for review of draft Wikipedia incubator article on the human molecule.

“The topic of the human molecule is non-notable fringe subject.”

– Brian Duke (Sep 2010), English-born Australian computational chemist

â— Comment on request for review of draft Wikipedia incubator article on the human molecule.

“The incubator human molecule article is a horror show. It’s not fringe, it's beyond that: this is a piece of original research kookery at its very worst. It's not even *pseudo*science: it does not even try to be anything close to science. A textbook case of absurd absurdity cranked up to absurd.”

– Anon German (Sep 2010), commentator

â— Discussion on deletion review to have a Wikipedia article on the human molecule.

2009

– Philip Moriarty (May, 2009), thermal physics professor, Nottingham University, UK

“Where did Gibbs say that ‘a society is one such material system’? He didn’t –that is your particular (incorrect) reading of the application of thermodynamics.

When I talk about the 'entropy' of the students, it's **really** important to note that this is just an analogy. Entropy and the second law of thermodynamics are very abused concepts.

An arrangement of the students *does not* have an associated thermodynamic entropy.

You have taken the abuse of the term entropy to an entirely new level, however, by suggesting that it —and, unbelievably, quantum mechanics—canï»¿ be applied to 'interactions' in romantic human relationships.”

â— Comment in response to statement of “Gibbs’ definition of thermodynamics (1876): ‘the comprehension of the laws which govern *any* material system is greatly facilitated by considering the energy and entropy of the system in the various states of which it is capable.’ A society is one such material system. If you think that you are exempt from these laws, that is your prerogative.”

â— See: Moriarty-Thims debate

2008

– Tim Vickers (Oct 2008), Scottish-American biochemist, PhD on trypanothione metabolism, Dundee University, Scotland; post-doctorial research on leishmaniasis in US

“Human chemistry is semi-plausible twaddle, not a genuine field of study, and junk. Human chemistry is just not a scientific theory - it's an analogy at best.”

â— Comment in response to voting opinion in Wikipedia deletion of article on human chemistry.

2007

– Stephen Lower (2007), Canadian (retired) physical chemistry professor, Simon Fraser University (1965-1999); BA biochemistry, University of California, Berkeley; PhD in physical chemistry, University of British Columbia.

"The premise of chemical reactions occurring between human molecules is a crackpot-subject, pseudoscience, and a lunatic notion."

â— A response listing of various publications sites of the Institute of Human Thermodynamics under the category of 'crackpot' in his online list of resources for chemistry educators (Chem1.com).

"Delete and salt and ban author: Another in the web of "human chemistry' garbage perpetrated by [Libb Thims]. No real notability, an involvement with a fringe pseudoscience that is so far on the fringe that it nearly seems to be an analogy, no good third-party sources, and the only Wikipedia editor that has taken any interest in him writes dishonest self-promoting articles as a hobby. Kill the article, ban the author."

— Kww (2007), Wikipedia administrator (12 Oct), American former hotel manager and real estate developer, whose hobbies include: mandolin, harmonica, saxophone, Japanese, and evolutionary biology, greatly-opposed to having Wikipedia articles on human thermodynamics and human chemistry.

2006

– Frank Lambert (Jul 2006), American chemistry professor, Occidental College; BS Harvard, PhD organic chemistry, University of Chicago, Curator of the various Entropy.com sites.

"Thims is a lost soul who seriously searches for the thermodynamic interpretation of sex."

â— Comment on Thims in regard to Lambert's demand, on the Wikipedia entropy talk page, that that entropy be redefined as energy dispersal.

2005

– V. Smith (Nov 2005), American retired geology teacher, MS geology University of Arizona.

"The idea of 'human chemical reactions' occurring between 'human molecules' is good for a laugh, but not much else."

â— Response to query as to why a link an external link 'human chemical reactions' was removed from the Wikipedia chemistry page.

– Edward Sanville (Sep 2005), American computational chemist, BS chemistry (2001), University of New Hampshire; PhD computational chemistry 2005, Dartmouth College; post-graduate research in quantum molecular dynamics, Loughborough University.

"Human thermodynamics is pseudoscience. The interchanging of words with precise scientific meanings, (i.e. "bond," "energy," "reaction," "hot"), with their everyday meanings or referring to things which would not fit the scientific definition at all, is one of the cornerstones of pseudoscience.

Of course, human beings obey the laws of thermodynamics like everything else in the universe, but the Gibbs free energy equation

â— Response to query as to why he thought an external

only [can be used] to describe large systems of microscopic particles; [and cannot be applied] to analogous situations between human beings, just because the everyday and scientific words involved happen to correspond (in English).”

link on the Wikipedia thermodynamics page to HumanThermodynamics.com was inappropriate.

– Ten of All Trades (June 2005), BS physics and chemistry, PhD biology and biophysics.

“Thermodynamics isn't meant to describe human relationships.”

â— Comment vote to delete Wikipedia human thermodynamics article.

– Splash (June 2005), PhD electrical engineering and telecommunications student, University of Bristol.

“Human thermodynamics is well-disguised nonsense. The subject goes off the rails when it says things like ‘wherein a man M meets or collides in time with a woman W over the substrate surface earth to form a bonded relationship’ which is nearly patent nonsense. It's subtle, but I reckon it's nonsense.”

â— Comment vote to delete Wikipedia human thermodynamics article.

– The Literate Engineer (June 2005), American civil engineering intern.

“I admit, open systems do exist and can be described with thermodynamics; nonetheless, their application to group dynamics is a major stretch, and modeling human relationships on them involves all sorts of unstated assumptions, for instance that a state function (like Gibbs free energy) even applies. Or that they're spontaneous. My skepticism is heightened by having looked at the site and noticed it: *firmly on the pseudo side of fringe science*.”

â— Comment vote to delete Wikipedia human thermodynamics article.

See also

â— Detractors
â— Elective Affinities (enemies)
â— Human thermodynamics (objections to)
â— Human chemistry (objections to)

References

1. Robinson, Andrew. *The Last Man Who Knew Everything* (pg. 25, 183). A Plume Book.
2. Samuels, Ernest. (1989). *Henry Adams* (human molecule, pg. 115; physico-chemical, pgs. 401, 411; “Note to John Jameson”, pg. 409). Harvard University Press.

External links

â— HT testimonials – HumanThermodynamics.com.

θΔics

In reading lists, **Libb Thims (books read)** refers to books read, cover-to-cover, by American electrochemical engineer Libb Thims, some of which are shown and discussed below, in regards to filing-away technique.

American electrochemical engineer Libb Thims **reads books**, typically cover-to-cover, in a Faustian manner, placing them into his personal library, when finished according to a 12-inch book stack procedure (discussed below).

> "I seek for learning in this book and cannot find it. Though I study all **books** from end-to-end, I cannot discover the touchstone of wisdom. O, how unfortunate art thou, Faust! The sleepless nights I have spent in fathoming the mysteries of theology! But, no! By heaven, I will no longer delay, I will take upon myself all labor, so that I may penetrate into that which is concealed, and fathom the mysteries of nature!"
>
> — Faust (c.1800), Geisselbrecht's puppet-play [1]

(add discussion)

Technique | Examples

Readers—who are voracious and "cannot live without books", in the words of Thomas Jefferson, who owned a personal library of 6,487 books—tend to have a certain technique, in regards to methodology of ordering of finished books.

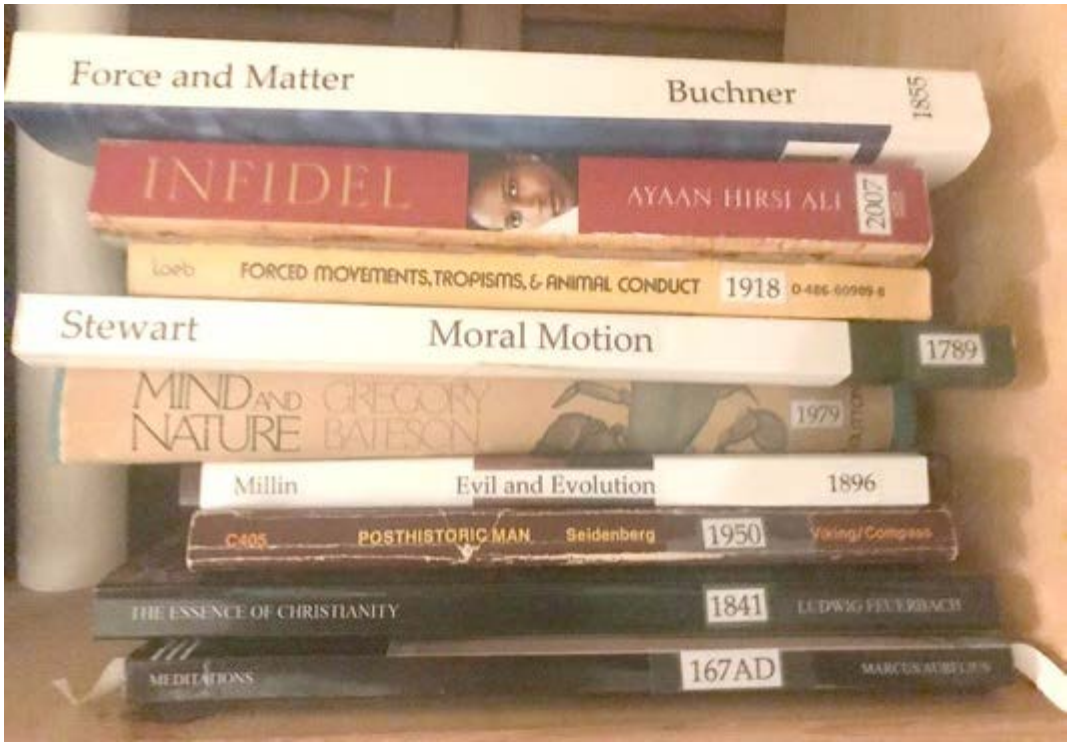

A selection of **books read** by Thims, in early Jul, ; authors: Marcus Aurelius, Ludwig Feuerbach, Roderick Seidenberg, George Millin, Gregory Bateson, John Stewart, Jacques Loeb, Ayaan Ali, and Ludwig Buchner.

Kim Peek, famous corpus callosum missing double brain reading savant, who reportedly could recall 13,000-books by memory, down to the page, had the technique that when finished reading a book he would place it upside down and backwards on his bookshelf. Another person, whose name, at the moment, is lost, had the peculiar technique of reading to fill up a box method: the person would obtain books, either from purchase or library, read each one, and then place them into a large cardboard box. When the box was full, the person would return the books, or give them away, or something along these lines, then start the "box-filling" reading process over again.

Bill Gates, since at least 2012, has had the technique of posting is his annual summer reading list of books he plans to read for that summer, as well as posting online photos, in his "My Bookshelf" page, of his GatesNotes.com blog. (Q)

Technique | Thims

Libb Thims has a similar technique to the above examples: namely he reads books cover-to-cover, sometimes at the rate of 1-3 books (per day), at the fastest rate, to upwards 1-2 books (per month), if the book is dense or other things are going on or if Internet and or article reading is debarring the book reading process. Of recent years, Thims has employed

the technique of placing completed books—some of which he reviews (Q) on Amazon, if spurred in that direction—face down, on a 12x12 inch book shelf section, spine title viewable and horizontally readable, one book on top of the other, as read, until the (a) both the 12-inches of height is filled with a read stack and (b) the empty side shelf margin is filled with a few horizontally-ordered books, so to fill up the 24-cubic inch space completely with books. When space is filled, Thims then recycles the books into his home library, putting them either firstly into a recently read section of new book shelving or into various places category sections of his library, e.g. psychology, economics, mathematics, chemistry history, Einstein, physics, etc.

Thims, a few times, has taken photos of these recently-read stacks and or books shelf rows—Thims currently has 14 six-row books shelves—for the sake of discussion purposes, one example found in the 2013 JHT article "Juarrero, Deacon, Nonreductive Physical Materialism, and Chemical Teleology" (pg. 84). [2]

Amazon | Books ordered

See also: footnote 2.5

In the period 2002 to 2015, Thims ordering some 945 books from Amazon, some of which is summarized below:

2001 | 0 books

No account set up yet. Thims largely bought books from retail book stores. e.g. Borders, Barnes & Noble, university book stores, local small book stores, etc.

2002 | 3 books

● *Green Eyes, the Greenest Fields*
Andre Crump
● *Quantum Mechanics: Two Volumes Bound As One*
Albert Messiah
● *The Elegant Universe: Superstrings, Hidden Dimensions, and the Quest for the Ultimate Theory*
Brian Greene

2003 | 0 books

Thims, per recollection, was deep into penning a 1,000-page draft for a 3-volume *Human Thermodynamics* manuscript. In particular, Thims, during this year, as he recalls was purchasing dozens of books, weekly or monthly, from Barnes & Noble (Q), at Webster Place, Chicago; some from the philosophy section, some from the science section, and many from the religion and mythology section (see: Thims religion, mythology, and atheism book collection).

2004 | 6 books

● *Biocosm: The New Scientific Theory of Evolution: Intelligent Life Is the...*
James Gardner, Seth Shostak
● *Information Theory and Evolution*
John Avery | Ordered: May 11
● *Facts and Mysteries in Elementary Particle Physics*
Martinus Veltman | Ordered: May 11
● *The Origins of Order: Self-Organization and Selection in Evolution*
Stuart Kauffman
● *Linked: How Everything Is Connected to Everything Else and What It Means...*
Albert-Laszlo Barabasi, Albert-Laszlo Barbasi
● *Emergence: The Connected Lives of Ants, Brains, Cities, and Software*
Steven Johnson
● Survival of the Prettiest: The Science of Beauty
Nancy Etcoff

2005 | 34 books

● *The Sex Contract: The Evolution of Human Behavior*
Helen Fisher | Placed: Feb 25

● Thermodynamics
William Z. Black, James G. Hartley

● *A to Z of Thermodynamics*
Pierre Perrot

● *Particle Physics : A Comprehensive Introduction*
Abraham Seiden

● *Symmetry and the Beautiful Universe*
Leon M. Lederman, Christopher T. Hill

● *Down Things: The Breathtaking Beauty Of Particle Physics*
Bruce A. Schumm

● *Sperm Wars: The Science of Sex*
Robin Baker

● *Non-Equilibrium Thermodynamics*
S. R. De Groot, P. Mazur

● *Modern Thermodynamics : From Heat Engines to Dissipative Structures*
Dilip Kondepudi, Ilya Prigogine

● *The Origins of Virtue: Human Instincts and the Evolution of Cooperation*
Matt Ridley

● *Self-Organization in Biological Systems (Princeton Studies in Complexity...*
Scott Camazine, et al

● *Is Future Given?*
Ilya Prigogine

● *Nexus: Small Worlds and the Groundbreaking Science of Networks*
Mark Buchanan

● *Sync: The Emerging Science of Spontaneous Order*
Steven Strogatz

● *At Home in the Universe: The Search for Laws of Self-Organization and...*
Stuart Kauffman

● *Exploring Complexity: An Introduction*
Gregoire Nicolis, Ilya Prigogine

● *Order out of Chaos: Man's New Dialogue with Nature* [see: **footnote 2.5**]
Ilya Prigogine | Placed: Aug 6

● *Thermodynamic Theory of the Evolution of Living Beings*
Georgi Gladyshev | Placed: Sep 29

● *From Being to Becoming: Time and Complexity in the Physical Sciences*
Ilya Prigogine

● *Bioenergetics: The Molecular Basis of Biological Energy Transformations by...*
Albert Lehninger

● *Bioenergetics*
Alexander Lowen

● *Thermodynamics and the Kinetic Theory of Gases (Pauli Lectures on Physics)*
Wolfgang Pauli

● *Flow: The Psychology of Optimal Experience*
Mihaly Csikszentmihalyi

● *Statistical Thermodynamics*
Erwin Schrodinger

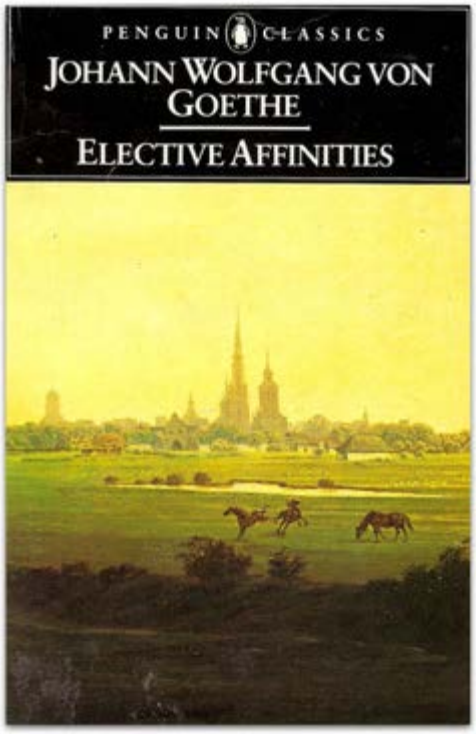

On 10 Oct 2006, Thims ordered Goethe's *Elective Affinities*, the Reginald Hollingdale (1971) translation (see: translations) with chronology and further reading by David Deissner (2005), and thereafter discovered the riddled meaning of Prigogine's **footnote 2.5**.

- *Elective Affinities* *(Penguin Classics)* [see: **chapter four**]
  Johann Goethe (translator: Reginald Hollingdale) | Ordered: **Oct 10**

- *My Twentieth Century Philosophy*
Elizabeth Porteus
- *The Second Law*
Peter Atkins
- *Astonishing Hypothesis: the Scientific Search for the Soul*
Francis Crick
- *Evolutionary Psychology: The New Science of the Mind*
David Buss
- *The Chemistry of Love*
Michael Liebowitz
- *The Principles of Chemical Equilibrium : With Applications in Chemistry and...*
Kenneth Denbigh
- *The Alchemy of Love and Lust*
Theresa Crenshaw
- *Chemistry of Human Life*
George Carey
- *Human chemistry*
William Fairburn
- *Entropy Demystified: Potential Order, Life and Money*
Valery Chalidze
- *Reflections on the Motive Power of Fire*: *And other Papers on the Second Law of Thermodynamics*
Sadi Carnot
- *The Science of Love: Understanding Love and It's Effects on Mind and Body by...*
Anthony Walsh
- *Theory of Heat*
James Maxwell
- *Screen Couple Chemistry : The Power of 2*
Martha Nochimson
- *The New Couple: Why the Old Rules Don't Work and What Does*
Maurice Taylor, Seana McGee

2006 | 217 orders
(add)

2007 | 127 orders
(add)

2008 | 53 orders
(add)

2009 | 38 orders
(add)

2010 | 51 orders
(add)

2011 | 89 orders
(add)

2012 | 90 orders (some not books, e.g. ink cartridges, face masque [cold weather], etc.)
(add)

2013 | 100 orders (some not books)
(add)

2014 | 85 orders (some not books)
(add)

2015 | 52 orders (some not books)
(add)

2016 | 6 orders (some not books)
● *Energy and Structure: A Theory of Social Power*
Richard Adams | Ordered: Jan 18
● *The End of Reason: A Response to the New Atheists*
Ravi Zacharias | Ordered: Mar 1
● *The Real Face of Atheism*
Ravi Zacharias | Ordered: Feb 10
● *The Excitement of Science*
John Platt | Ordered: Mar 13

Non-book orders: Garmin Vivoactive GPS run/bike/swim watch, Phaiser BHS-530 Bluetooth runner head phones, Ravi [As of Mar 16]

Note 2.5

Photo | 9 Jul 2014

The following photo, taken 9 Jul 2014 (see: larger size), spurred into photo-taking stage via the Mirza Beg 2014 Jun-Jul thread dialog, shows recent books read, cover-to-cover, by American electrochemical engineer Libb Thims, specifically in order of completion of reading, ordered left-to-right, starting at lower left (oldest read) up to most-recent read (*Master Mind*) — although, to note, the ten books shown on top shelf to the right have not yet been read — which formerly were two 12-inch stacks (24-inches), of recently read books, but ones that are now in the mid-stage transition state, of going from a newly-read 12-inch book stack stage to dis-connected stack filtered categorically into the home library state: [3]

1. Morris Zucker | *Philosophy of American History: the Historical Field Theory* (1945)
2. Stephen Greenblatt | *The*

Swerve (2011)
3. George Lundberg | *Foundations of Sociology* (1964)
4. Cynthia Russett | *The Concept of Equilibrium in American Social Thought* (1966)
5. Lawrence Henderson | *Pareto's General Sociology: a Physiologist's Interpretation* (1935)
6. Jerry Mayer & John Holms | *Bite-Size Einstein: Quotations* (1996)
7. Arthur Schopenhauer | *Essay on the Freedom of the Will* (1839)
8. Addy Ross | *What is Life? How Chemistry Becomes Biology* (2012)
9. Adrian Bejan | *Design in Nature: How the Constructal Law Governs Evolution* (2012)
10. Graham Farmelo | *The Strangest Man: the Hidden Life of Paul Dirac* (2009)
11. Ghassan Hage & Emma Kowal | *Force, Movement, Intensity* (2011)
12. Rush Dozier | *Codes of Evolution* (1992)
13. Bertrand Russell | *The Analysis of Matter* (1927)
14. Reiner Kummel | *The Second Law of Economics* (2011)
15. Charles Snow | *The Two Cultures* (1959)
16. Gheorghe Savoiu | *Econophysics* (2012)
17. John Tyndall | *BAAS Address* (1847)
18. Tom Siegfried | *A Beautiful Math* (2006)
19. Norbert Wiener | *God & Golem* (1964)
20. Ching-Yao Hsieh & Meng-Hua Ye | *Economics, Philosophy, and Physics* (1991)
21. Balfour Stewart | *The Unseen Universe* (1875)
22. Jean-Paul Sartre | *Existentialism is a Humanism*

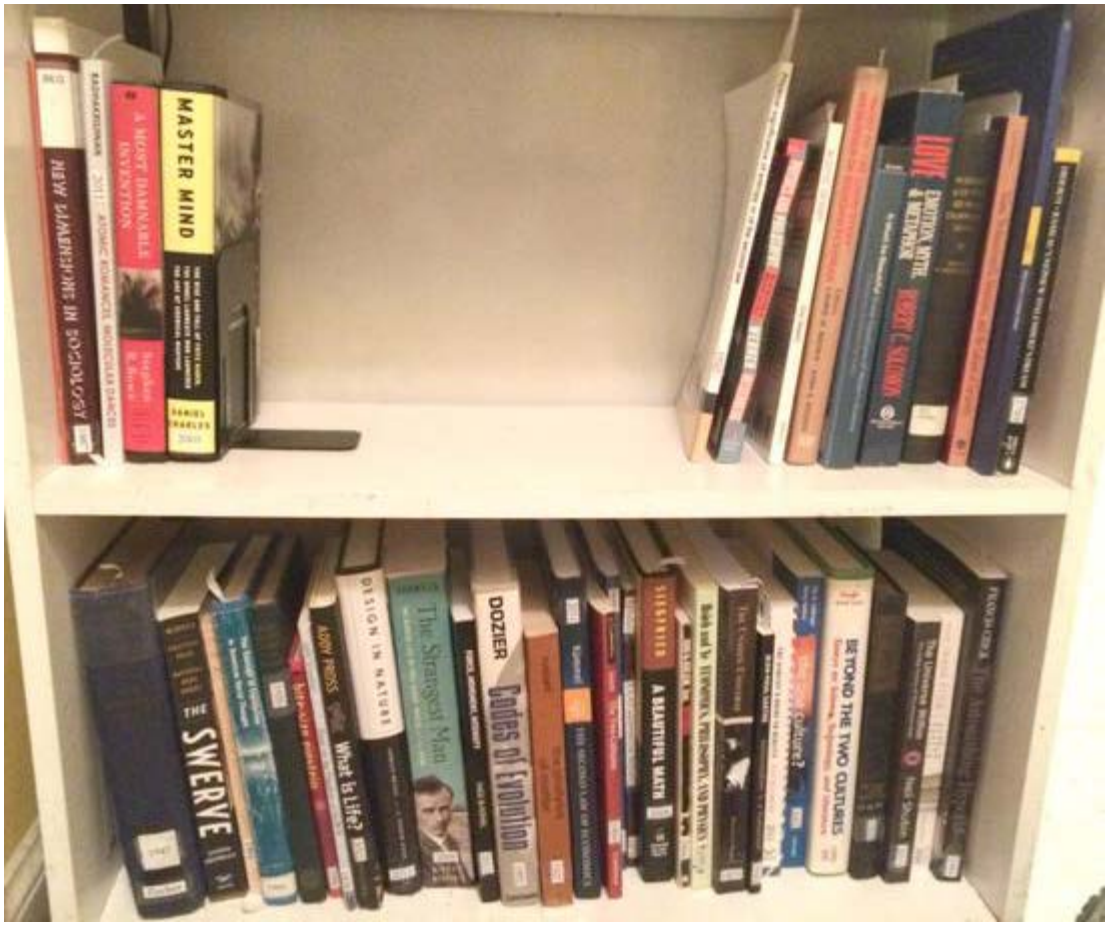

(1945)
23. Alexander Rosenberg | *The Atheist's Guide to Reality* (2011)
24. Jay Labinger & Harry Collins | *The One Culture?* (2001)
25. Joseph Slade & Judith Lee | *Beyond the Two Cultures* (1990)
26. Jacques Rueff | *From the Physical to the Social Sciences* (1929)
27. Neil Shubin | *The Universe Within* (2013)
28. Neil Shubin | *Your Inner Fish* (2008)
29. Francis Crick | *The Astonishing Hypothesis* (1994)
30. Lee Dubridge & Paul Aebersold | *Atoms at Work* (1950)
31. Mirza Beg | *New Dimensions in Sociology* (1987)
32. Mala Radhakrishnan | *Atomic Romances, Molecular Dances* (2011)
33. Stephen Bown | *A Most Damnable Invention* (2005)
34. Daniel Charles | *Master Mind: the Rise and Fall of Fritz Haber* (2005)
35. Francis Edgeworth | *Mathematical Psychics* (1881)

(add discussion)

Quotes

The following are related quotes:

> "I stack **books**, like your momma stacks pancakes."
>
> — Libb Thims (2013), response (Q) to query (Dec): "how can someone so poorly versed in matters of pronunciations [e.g. Euler, pronounced "Oiler", or Goethe, pronounced: GU(R)-tuh or **gu(r)**-te; see: audio] rate himself as worthy of creating such a list (of smartest people ever, with cited IQs at or over 200)?"

> "To clarify, I read your book in detail, cover to cover, and this reading is inclusive of my standard dissection of books method of pencil noting commenting, boxing in of certain text, stars, checks, boxes, dates, question marks, "what" comments, one or two occasional highlights for exceptional sentences (which in your case amounted to one, namely your statement that Seth Lloyd writes in a "way of telling the story" that "misrepresents the history", which is

Recently finished →

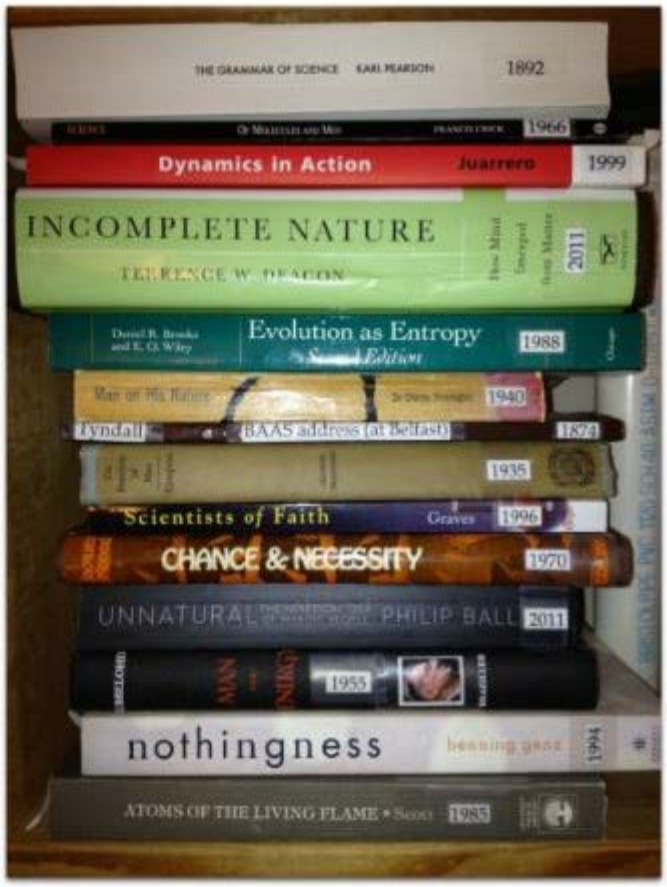

Earlier finished →

A 28 Mar 2013 recently-read 12-inch stack of books, of Libb Thims, taken to visually-illustrate to American physics-philosopher and neurological-anthropologist Terrence Deacon (fourth book from top), in particular, and also to American philosopher Alicia Juarrero (third book from top), during the JHT beta review of his book (see: JDNM), done in the wake of the so-called Juarrero-Deacon affair (2011-2013); see also peer review quote below. [2]

strikingly true, hence I highlighted it),
circles around certain foot notes, etc., etc., etc., which in your case amounted to a total of 1,340 pencil dissection incidences, all the way through your Glossary, Notes, References, Index, up through your second to last page (#601), where I box in all your usages of the term "vitalism", one notation example of which I scanned and posted on the wiki review page [Q], namely notation note #1250 your date typo of the Schneider and Kay reference, which you incorrectly put as 1997 (pg. 561), whereas it should correctly be 1994. I then let the book sit for some time, read two other books [Karl Pearson's 1892 *The Grammar of Science* and Francis Crick's 1996 *Of Molecules and Men*], as discussed, then came back to it, went through all 1,340 notation and commentary notes AGAIN and wrote this [review] article with my "remarkably poisoned pen" as you call it."

— Libb Thims (2013), clarification reply to Terrence Deacon as to his accusation that "[your] **piles of books** [photo above] are also now less convincing because you clearly did not read my book [*Incomplete Nature*, 2011] all that carefully."

See also

- Libb Thims (citations)
- Libb Thims (publications)
- Libraries
- Thims' list of thermodynamics books to buy
- Thims' mate selection book collection
- Thims' thermodynamics book collection

References

1. Goethe, Johann. (1832). *Faust* (translator: Bayard Taylor) (pgs. 230-31). Houghton, Mifflin & Co., 1883.
2. Thims, Libb. (2013). "Juarrero, Deacon, Nonreductive Physical Materialism, and Chemical Teleology" (pdf) (peer) (book stack photo,pg. 84), *Journal of Human Thermodynamics* (url), 9(6): 77-122, Jun.
3. (a) Beg, Mirza Arshad Ali. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (intro) (pdf) (scanned pdf annotated by Libb Thims, 2014). Karachi: The Hamdard Foundation.
(b) Note: Francis Edgeworth's book *Mathematical Psychics an Essay on the Application of Mathematical to the Moral Sciences*, isn't shown in the photo, but at the time of the photo it was in the process of being read (#35) added into have the list divisible by multiples of five.

θΔics

In publications, **Libb Thims (books)** refers to books, textbooks, and or encyclopedias initiated, mid-stage, and or completed (published) by American electrochemical engineer Libb Thims; one of which (*Human Chemistry*) listed in the famous publications timeline.

List

The following is a timeline of books—slated, draft, or completed—of American electrochemical engineer Libb Thims:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	16
Draft (330-pgs)	**Draft** (330-pgs)	**Draft** (330-pgs)	**Draft** (120-pgs)	**Launch** (7+ volumes)	**Published** (824-pgs)	**Published** (112-pgs)	**Published**	**Cover + Video** (1-hr)	**Draft** (120-pgs)	**Initiated** (online)	**Initiated** (100-pgs level)	**Initiated** (cover only)	**Initiated** (cover only)	**Initiated** (online draft)	**Published**	**Initiated** (paper draft)
2002	2003	2004	2004-2005	2005-present	2007	2008	2007-present	2010	2011	2012	2013	2014	2014	2015	2016	
[9]			[8]	[2]		[3]			[4]	[5]	[6]	[7]				

These, three draft manuscripts: *Human Thermodynamics, Volumes I-3*, in total, made it up to about the 1000-page level, two hand glue bound printings, one mailed out in sealed envelope to own address, per poor man's copyright purposes; the other read and reviewed with handwritten commentary by one person, and in these, in 2002, Thims human molecular formula was calculated (published on line in 2005). At this point, it became apparent that the cart was way ahead of the horse, i.e. Thims was jumping to the thermodynamics of human chemical reactions, without providing the preliminaries publications, to the new student, that: (a) a human is type of molecule, (b) an introduction to the history of human chemical reaction theory, and (c) that the goals of the reactions and behaviors of human molecules is the science of human chemistry; each of these three points, being nothing but common sense, in the back of Thims mind, at this point, not seemingly in need of overt discussion, but rather something of the character of assumed implicit basic knowledge.

The subject, in total, was, at this point, ballooning way past the 1000+ page level, and in need of being broken up.

A 100-copies printed, hand coil bound, distributed to associates for review, and returned for feedback digestion.

This draft manuscript resulted out of an attempt to explain to a friend, in very lay terms, whose mother and grandmother had recently been murdered, by the mother's boyfriend, in attempts at an insurance scam, what happens to a person when they die, as thermodynamics sees things.

This so-called semi-named subject of "cessation thermodynamics", however, at this point stalled out, at this point; thought, to note, much was learned during this process.

The *JIFT* was launched as it became apparent that a publishing venue was needed for works and individuals beginning to be connected with the Institute of Human Thermodynamics, associated website, and as a place to publish the decisive (left-unfinished) article "On the Nature of the Human Chemical Bond" (SC), the latter being an article that, in part, acted to push into existence the writing of the two-volume textbook *Human Chemistry*, being that the article, being written on a webpage, was growing too large to fit on one single webpage.

In *circa* Feb 2006, via footnote 2-5 of Belgian chemist Ilya Prigogine's 1984 book *Order Out of Chaos*, Thims discovered Goethe and his chapter four; after which, owing to something akin to a hypnotic moral imperative, it became apparent that an attempt, however incorrigible the result, at a textbook on the science of reactions between people, the way Goethe envisioned things, i.e. the science of human chemistry, be penned, out of pure respect due—every other possible human endeavor being but trivial in nature (see also: textbook origin).

The seeming need for this book arose into mind during a *circa* Dec 2007 dinner with Russian physical chemist Georgi Gladyshev and a female Russian-American anti-aging theory physician associate of his, during which Thims was attempting to explain to the physician the gist of the book, in lay terms, by pointing to chapters two (on human molecules) and five (on molecular evolution), after which the vision emerged that a simplified, question-free, booklet was needed, for the lay reader, according to which, the 120-page booklet *The Human Molecule* resulted, being basically a combination of chapters two and five of *Human Chemistry*, expanded, in some sense, to give a more detailed history of the human molecule concept, e.g. adding in the newly found views of Henry Adams, among others.

On 24 Dec 2007, Thims launched *Hmolpedia* (see: progress report), via the Wetpaint wikis, by writing with three text articles: Sadi Carnot, human thermodynamics, and human chemistry, following extreme resistance and prejudice at Wikipedia to getting an article on "human thermodynamics" started, in the face of the fact that there were entire books written on this subject; e.g. Mohsen Bazargan (*Human Thermodynamics*, 1956), and before the end of the year, had written about two-dozen articles in total, and had convinced George Gladyshev to become the first member of the site.

A second attempt at "simplified" cessation thermodynamics (2004), or the thermodynamics of death, was done in the form of a Human Chemistry 101 YouTube video; issues with this presentation, however, became apparent, however, when Thims inserted the verbal disclaimer, into the video, something along the lines of the following statement:

"In this video, we are going to discuss the thermodynamics of death; although, technically, to note, one cannot die, because one is not alive, i.e. a human is a molecule, and, technically, molecules to not live, nor die."

The video, in short, which aired, became paradoxical or correctly an illogical digression.

This was drafted, per a combination of cover visualization appeal and the growing issues with atheist science authors purporting advocation of the so-called purposeless universe hypothesis, according to which, the universe is godless, which is correct, and that everything is but the result of accidental, blind, random, purposeless, billiard ball model like chance, among other varieties of similar assertions.

This impulse drafting manuscript, however, stalled out owing to a combination of (a) the amount of work and material was beginning to appear and go into the intro religio-mythologo chapters, i.e. to introduce the readers why all modern religions are in fact mythologs (see: religio-mythologo transcription and vaccination), and (b) some type of terminologo reform conflict that was beginning to be seen, akin to a mixture of that seen in chemical teleologo, publication issues and disinformationification aspects of thermodynamic potential descriptions of human senses of sometimes "seeming to divine a purpose", as Einstein would say.

Following the discovery of Hjalmar Bergman's 1885 "illustrated" *Elective Affinities*, his entire book, inclusive of the original 1854 James Froude English translation, was embedded, with illustration, into *Hmolpedia*, each chapter as an individual wiki page (see: EA[AD: main), with some 17+ associated project pages with some of the chapters decoded, below each chapter.

This project, still aiming to be made into a published print book set, when decoding is completed, is in limbo, being that (a) a human chemical thermodynamics textbook needs yet to be written and (b) the amount of scholarly work done on decoding is immense (e.g. Thims personal Goethe library is some 30+ books deep, presently).

This, presently, is the long-sought magnum opus, Thims envisioned, as a chemical engineering student, in circa 1995, while sitting in his chemical engineering thermodynamics lecture class; initiation has commenced, but one presently confluxed by obstacles.

This is only in the cover-appealing initiated stage, with the vision that a 100 or so page booklet would be interesting to see in print to elaborate on the all the idiocy prevalent amid the so-called "thermodynamics not applicable" to humans mindsets of many modern thinkers.

Tentative booklet on the six big extreme atheist of history, in concordance with the Atheism Reviews channel.

Image representation of the Feuerbach prophecy (1850) (SC)(SC); see online draft: Morality Squared.

In the preface to the 2016 10-volume print set of *Hmolpedia*, Thims stated that the following are scheduled to be soon published:

- *Elective Affinities: Illustrated, Annotated, and Decoded* | 288-pgs
- *Morality Squared: Religion Dissolved in Nitric Acid* | 70-pgs
- *Shannon Thermodynamics: Science's Greatest Sokal Affair* | 120-pgs
- *500 Greatest Geniuses: Ranked by IQ* | 250-pgs

On 26 Jun 2016, an 8-page paper draft was started to answer some of the atheism-questioning inquiries of a god-believing 10-year old girl; some of which was outlined in the Children's Atheism Bible (2015) draft page and the Zaratheism for Kids (2015) lecture.

The 29 Jun 2016 draft cover for the 39-page pdf of *Smart Atheism: for Kids*. [10]

The 17 Sep 2016 cover; by Jan 2017, project stalled out at 3-volumes (c.90-pgs per volume).

See also

- Libb Thims (history)
- Libb Thims (publications)

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(b) Draft cover prompted (Sep 20) via further editor of the: not applicable view article; aiming to be an historical, reasoning behind, modern issues, with possible "applicable view" inserts per each NA-view insert, time-frame dated according.
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θΔics

In Hmolpedia, the **Libb Thims (citations)** page is a listing of the journal articles, books, PhD dissertations, magazines, publications, conferences, symposiums, and meetings, etc., where the hmolscience—human thermodynamics, human chemistry, and or human molecule—theories of American chemical engineer Libb Thims are used, referred to, cited, or mentioned as a reference or point of discourse. These are listed below, originating in 2005 when Thims began to go public with his work. Those publications cited in red bullets ● are academic publications, of journal or book format, that cite Thims.

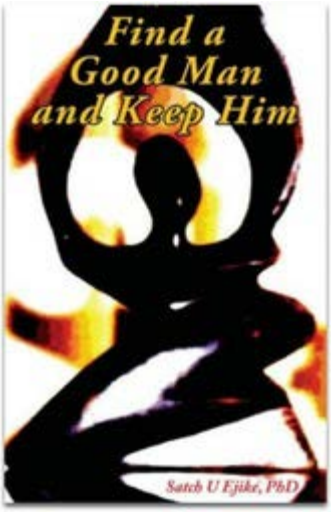

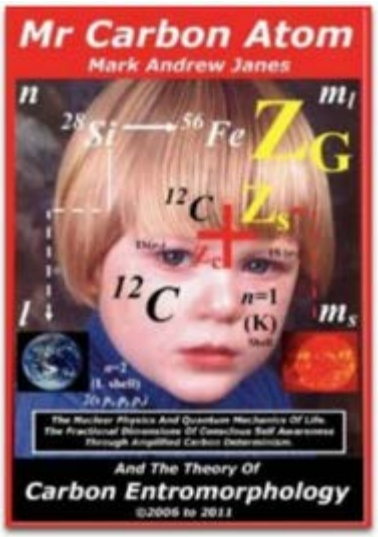

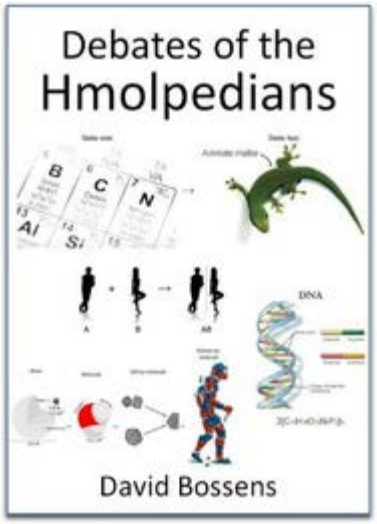

Books based heavily on the hmolscience work of American electrochemical engineer Libb Thims: *Find a Good Man and Keep Him* (Satch Ejike, 2008), *Mr. Carbon Atom* (Mark Janes, 2012), and *Debates of the Hmolpedians* (David Bossens, 2012).

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2005

● The HumanThermodynamics.com website was launched on April 27; prior to this, Thims' work was only submitted for review locally (2002-2005), in the Chicago-land area, primary, along with mail/package correspondences; and prior to this only a personal hobby (1995-2000).

In hmolscience, **Libb Thims (derogation)** refers to derogative, denigrate, and or pejorative labelings of American electrochemical engineer Libb Thims, e.g. “imbecile” (IQ=35±) (Jheald 2007) or “conman” (LesPaul 2014)—as can be contrasted, on the opposite end of the spectrum, with Thims characterized, variously, as: a "polymath" (Keith Henson 2007), "genius" (Steven Pierce, 2009), "oracle" (Mark Janes, 2011), someone “decades if not a century in front of its time” (Benjamin Cresdee 2011), the person with the “highest IQ ever” (alphawolf099 2012), a "walking encyclopedia" (Milivoje Kostic, 2013), “real IQ of 202+” (NikolaTesla, 2014), among other epithets.

Left: a Google-generated definition of derogate. Right: American electrochemical engineer Libb Thims, lecturing in 2013 to engineering students, at Northern Illinois University, on an introduction to human chemical thermodynamics, who occasionally becomes subject to **derogation**, depending on one's disposition to reality.

List

The following is a work-in-progress collection of various derogations directed at Libb Thims:

- Zero-value crackpot (Mar 2017) | Alon Amit (Q)

- Delusional moron (31 Mar 2015) [IQ:60] | Dominic Anderton (Q)
- Conman (May 2014) | LesPaul (Q)
- Wacko (22 May 2013) | Terrence Deacon [4]
- Crank (21 Mar 2013) | Jay Labinger [4]
- Crank and complete whack job (3 Apr 2010) | Ian Forrester [5]
- Fraudster (2009) | Lawrence Chin (Q)
- Senile or crazy (20 Nov 2010) | Lubos Motl [3]
- Crackpot (29 Sep 2010) | Mitch Garcia [3]

- Deranged (Sep 2009) | Philip Moriarty [2]
- Imbecile [IQ:35] (31 Jul 2007) | Jheald [1]
- Mindless (14 Jul 2007) | Hallenrm [1]
- Pseudo-scientist (20 Oct 2007) | Coren (Q)
- Smug little thing (7 Oct 2006) Jim62sch [1]
- Lost soul (12 Jul 2006) | Frank

Romanticist

Arthur Schopenhauer (1788-1860)

“The will of the copper, claimed and preoccupied by the electrical opposition to the iron, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive.”

— Schopenhauer (1844), on Goethean philosophy

Goethean Fence

Mechanistic

Right Side

Lambert [1]
● Pseudoscientist (21 Sep 2005) | Edward Sanville [3]

(add discussion)

Ludwig Boltzmann
(1844-1906)

"Schopenhauer is a mindless, ignorant, spreader of nonsense."

— Boltzmann (1906), on Schopenhauerian philosophy

Left Side

A depiction of the so-called Goethean fence divide: German philosopher Arthur Schopenhauer, the sole direct protégé of Goethe and his human chemical theory, on one side, and German physicist Ludwig Boltzmann on the other, labeling Schopenhauer in **derogation** as a "mindless, nonsensical, ignoramus", a phenomenon reoccurring in modern times with American electrochemical engineer **Libb Thims** on the Goethe-Schopenhauer side of the fence, and others, on the left side of the fence, labeling Thims likewise as "mindless" (Hallenrm, 2007) or "nonsensical" (Philip Moriarty, 2009), etc., for reasons seemingly coinciding with those of Boltzmann, which is but a recapture of German writer and Christian Christoph Wieland, in 1810, describing the chemical theory used in Goethe's *Elective Affinities* (1809) as "nonsense and childish fooling around".

Goethean fence

The difference in perspective, as outlined above, predominately, has to do with which side of the Goethean fence one tends to sit, i.e. if one is an *Elective Affinities* "enemy" or "admirer", or similarly a "two natures" or "one nature" philosopher, respectively; among other akin divisions, e.g. reductionist vs anti-reductionist, materialist vs spiritualist, a dualist vs monist, etc., the percentage siding of which tends to following the findings of polls such as: if one believes love is a chemical reaction (35% don't agree), or if one believes a person is a giant molecule (43% don't agree), etc.

The so-called Goethean fence divide is best demarcated by the standoff between Arthur Schopenhauer (*The World as Will and Representation*, 1844) and Karl Zollner (*The Nature of Comets: Contributions to the History and Theory of Knowledge*, 1872) on one side (right side) and Hermann Helmholtz ("On the Use and Abuse of the Deductive Method in Physical Science", 1874) and Ludwig Boltzmann ("Demonstration, that Schopenhauer was a Mindless, Ignorant, Spreader of Nonsense", 1906) on the other side (left side).

The Schopenhauer-Boltzmann divide, however, is difficult to interpret in regards to specific underlying objections, being that both Schopenhauer and Boltzmann were materialists in belief system, the difference between the two being that Schopenhauer was "first admitted and inexorable atheist among us Germans" (Friedrich Nietzsche, 1882), Boltzmann's personal views boarded, supposedly, on some type of blurry anti-spiritualistic materialist deism. (Q)

Those on the left tending to suffer from hydraism-like atrophy of the mind, with respect to the bigger questions of human meaning, those on the right tending to lack in equation precision, as compared to the exact sciences, being that the state of the discourse tends to be of the pioneering and proving ground sort of nature.

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(b) Libb Thims (attack)
4. Libb Thims (attack)
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(b) Human thermodynamics (objections to)

θΔics

In anagrams, **Libb Thims**, e.g. see 'Thims' in Namespedia.com (Ñº), is a reverse anagram of the generic name Bill Smith → Libb Thims (Bill Smith, reversed; extra letter B and less one letter L), a generic John Doe type name, the name "Lib" meaning "book" or "word" in Latin; such as shown, in the following image, of a fixed star from chapter five (Cap. 5), Book I (Lib I), of Copernicus' *On the Revolution of the Heavenly Orbs*, namely from: [8]

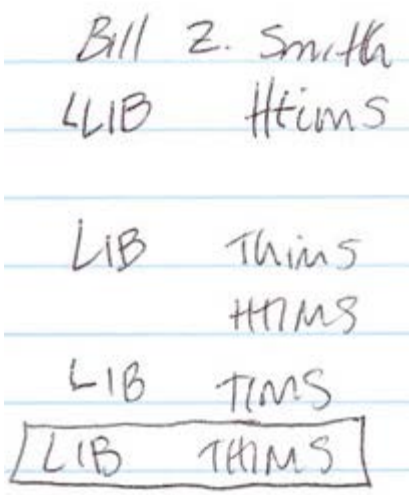

Early scratch paper attempt at an anagram of **"Bill Smith"** (c. 2003)

Tuco being questioned about his assumed name of **"Bill Carson"** by Angel Eyes.

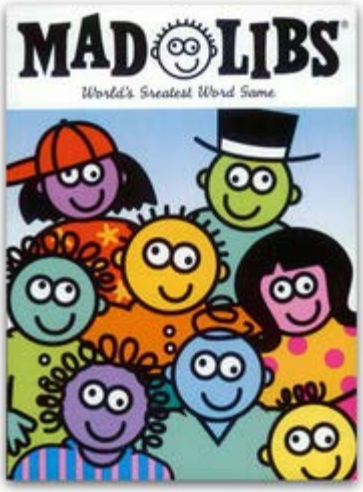

The original 1974 ***Mad Libs 1***; probable origin of the name **Libb**.

Picture of a sewing **thimble**; probable origin of the name **Thims**.

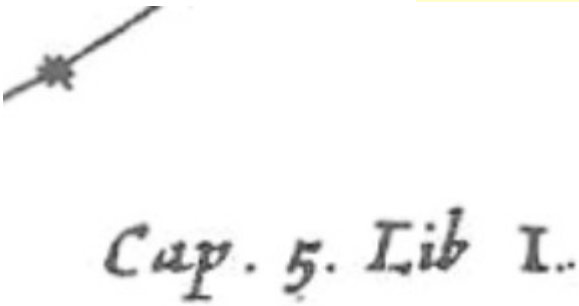

The name "Bill Smith" was used by Thims in *circa* 1995, as a renamed listing of his new home phone number, with with AT&T, which he changed from his birth name "Michael R.K.", as a method of delisting his phone number, so to cut off a girlfriend he was forced to break with.

The name "Bill Smith" was as a pre-publication pseudonym author, employed in 2002-2004, until it was found that, via Amazon, that there are many "Bill Smith" authors, Smith being the most common last name in American, William or Bill being a top ten male name; hence, in 2009, Libb Thims became his legal name, via court name change proceedings.

Overview

The name Bill Smith, may have had its origin in the assumed name "Bill Carson" from the 1966 film *The Good, the*

Bad, and the Ugly (watched by Thims), which later originated as a joke name in *circa* 1996, being listed with the phone company (AT&T); was used as Thims' prototype pen name in 2002; became an anagram (Libb Thims) in 2003-2004 (about the time of writing of chapter 23 of the three volume Human Thermodynamics manuscript), and Thims' legal name, i.e. **Libb Michael Thims**, on November 12, 2009, processed through Cook County Courts, Chicago IL. [1]

Etymologically, during the formation of the anagram, in 2003-2004, the word game book *Mad Libs* (Libb) and the sewing *thimble* (Thims), pictured adjacent, both objects used in Thims' youth, most likely served as phonetic models, using the letters of the generic name Bill Smith; Smith being the most common last name in America, and William, wherein Bill is the shortened version, is a top five American male name. [2]

Origin

As to the origin of the generic name "Bill Smith", in *circa* 1995 Thims had recently moved into a three bedroom apartment, with a newly unknown address, with two friends, and while sitting in the start of one of his fall season chemical engineering classes, a decision occurred to end the relationship with his girlfriend at the time, an architect graduate student at the University of Michigan, whom Thims was close to marrying, and at the end of the class "spontaneously" went down the hall to the first floor main entrance to the Dow chemical engineering building (University of Michigan) to the nearest payphone, called AT&T and had the apartment phone changed to the public listing of "Bill Smith", a generic name, similar to John Doe, that essentially came out of nowhere, effectively terminating the relationship in an unspoken manner. [3]

The name, Bill Smith, subsequently, is a person whose identity is unknown, like a modern day John Doe. [4]

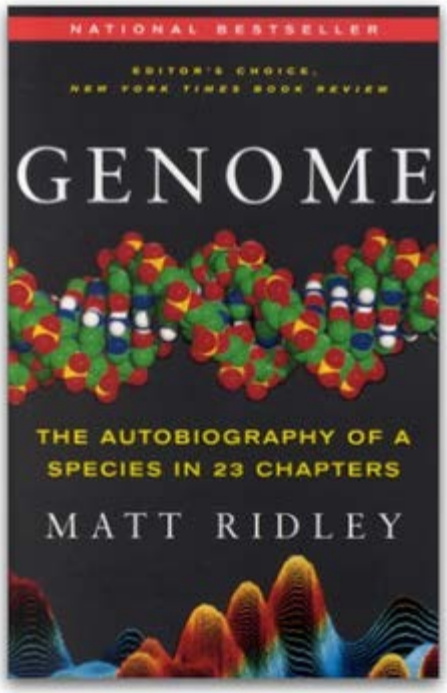

Cover of the 2000 Perennial edition book ***Genome*** by English science writer Matt Ridley.

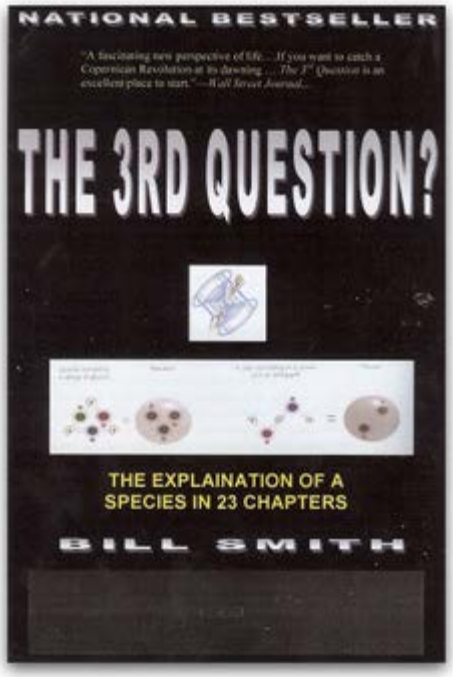

Cover of the 2002-version of the manuscript ***The 3rd Question*** (with a proto pen name of **Bill Smith**) by Libb Thims.

Over the next year or so the name "Bill Smith" became something of a inside joke, being that when someone would call from the apartment, the name Bill Smith would come up on the recipient's caller id, to which the recipient of the call would eventually ask: "Who is Bill Smith?", where after the background story to the name would be explained.

Pseudonym

The name Bill Smith, six years later, subsequently, served as the prototype pseudonym of a short book by Thims, entitled *The Third Question: the Explanation of a Species in 23 Chapters*, themed on the topic of mate selection, love, and reproduction viewed as a chemical reaction. In origins, in December 2001, Thims sent out a one page query letter, using his birth name (M.R.K.), to Bantam-Dell Publishing Group on a proposal to write a short book, presenting the view that process of love (in which a child is reproduced) are components of a basic chemical reaction, according to which the spontaneity criterion of chemical thermodynamics applies, a book slated to be written similar in style to English science writer Matt Ridley's 1999 book *Genome: the Autobiography of a Species in 23 Chapters* (specifically modeled on the 2000 raised cover Perennial edition, pictured adjacent).

In the months to follow the query letter submission, as the manuscript began to grow, the issue of anonymity in combination with the issue of aversion, in Thims' mind, with public sight of his middle and surname name began to

arise, whereby it was reasoned that during the writing process and once a book was published, that an author should be able to detach themselves, mentally and physically from the project, a logic used by many famous authors, such as Lewis Carroll (Charles Dodgson), Mark Twain (Samuel Clemens), Stephen King (Richard Bachman), etc. [5] The name Bill Smith logically came to mind. The name Bill Smith, subsequently, was used in the first draft cover the newly forming manuscript, as pictured.

Anagram

In 2003, as the manuscript and research for the book began to grow, it became apparent, particularly through Amazon and Google searches, that there were dozens of Bill Smith authors, and that a unique, different, or reformulated pen name would be needed so that the future searches, for the book or author, would have immediate recognition and top search engine rankings.

In this direction, after toying around with different anagrams for the name Bill Smith, the conclusion arrived at was to reverse the sequence of letters in the name, in the form: Llib Htims, but to modify the result so that the resultant name was phonetically common, wherein "Libb", similar to the Latin *ad lib* (as you wish) or its derivative Mad Libs (a popular 1953 phrasal template word game) and "Thims", similar to a *thimble* (the pitted cap worn on the finger to push a needle in sewing), were chosen as the final result. [6]

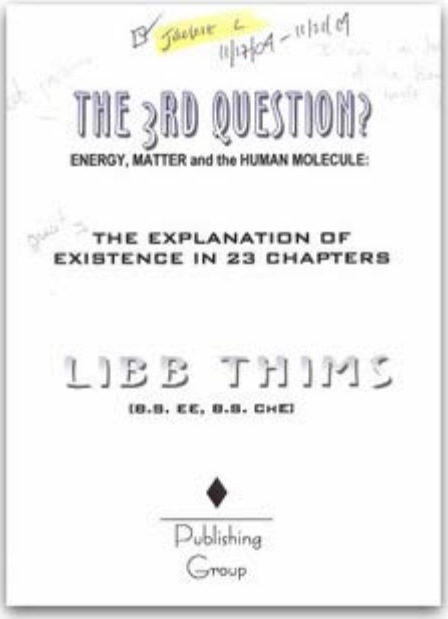

Title page to a 2004 version of the manuscript ***The 3rd Question*** (with a pen name of **Libb Thims**).

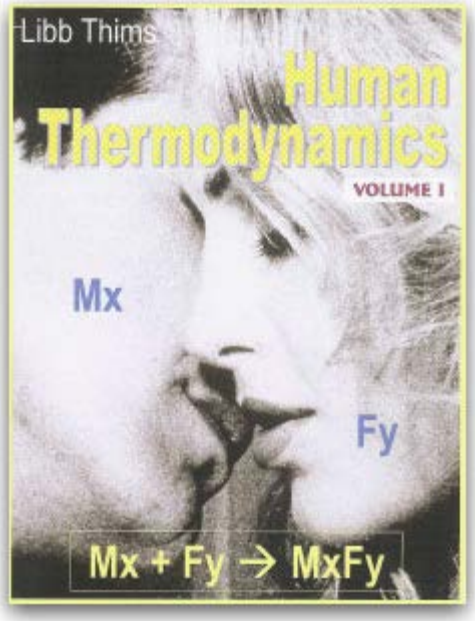

Cover to a 2004 version of the manuscript ***Human Thermodynamics, Vol. I*** (with a pen name of **Libb Thims**).

In retrospect, the names "Libb" and "Thims" were most likely arrived at by occurrence of past familiarity, in that Mad Libs was a game Thims' played often when he was young and that sewing thimbles were used frequently by Thims' mother (who died when he was young).

In 2004, subsequently, the pen name of Libb Thims was being printed on draft covers, such as to the working manuscript, retitled *The 3rd Question: Energy, Matter, and the Human Molecule*, a precursor to the *Human Thermodynamics* manuscript, both shown adjacent.

The name Libb Thims became permanent in the 2005, with the hand publishing of a 100-page manuscript entitled *Cessation Thermodynamics*, on the theoretical relationship between the process of death and the first law of thermodynamics, which were distributed to various people in the Unites States.

Legal name change

In 2006/2007, the use of the name Libb Thims for official purposes, e.g. copy writing, registered P.O. box, checks payable to Libb Thims, tax returns on revenue received through the works of Libb Thims, etc., made it apparent that a legal name change would be appropriate.

On November 12, 2009, Thims legally changed his name to Libb Michael Thims, through Cook County Courts of Chicago, Illinois, retaining his former first name (Libb Michael Thims), which was made his current middle name, for the sake of past acquaintances preferring to call him by that name. [7]

STATE OF ILLINOIS
COUNTY OF COOK, ss.

In the Circuit Court of Cook County, Municipal Department, Second District.

Public notice is hereby given that a hearing will be held on November 12th, 2009, at 9:30 A.M. in Room 202, of the courthouse located at 5600 Old Orchard Road, Skokie, IL, pursuant to a Petition filed in said Court as Case No. 09M2-2815.

Said Petition prays for the change of my name from Michael R K that of Libb Michael Thims, pursuant to the statute in such case made and provided.

MICHAEL R K
Petitioner.

048231
Sep 18,25; Oct 2,2009

Legal name change notice, required by Illinois law, as published in the *Chicago Daily Law Bulletin*, Sep 18, 25, and Oct 02, 2009. [7] New "**Libb Michael Thims**" driver's license (image removed), obtained on Nov. 12, 2009 after being legalized as so at Cook County Circuit Court early that day.

In publication, however, to facilitate name brand recognition and reader recognition, Thims tends to go by Libb Thims, only.

The name Libb Thims, since 2004, has been representative of the Thims' work in human chemistry and human thermodynamics.

Lib → Libb | in retrospect

In 2012, Thims asked American painter J.G. to draw a surprise inking (temporary tattoo) on his forearm, during which time Thims closed his eyes and she drew by random choice the name Gibbs in a type of Chicago gangster font; when Thims first saw it, he first thought she had wrote "Libb", but then asked her where she got the idea from, after which she pointed to photo of American engineer Willard Gibbs on the wall of Thims study.

The next day, Thims came to the realization that possibly the name of Willard Gibbs was from where he had likely subconsciously drew upon the model to change "Lib" to "Libb" (similar to "Gibbs") in the finalized version of his anagrammed name; although, to note, this is only a retrospect summary of the situation.

A 2012 inking of the name "Gi**bb**s", drawn by American artist J.G., on the right forearm of Thims, likely being the inspiration behind the extra letter "b" in the anagram of the name "Li**bb**" Thims.

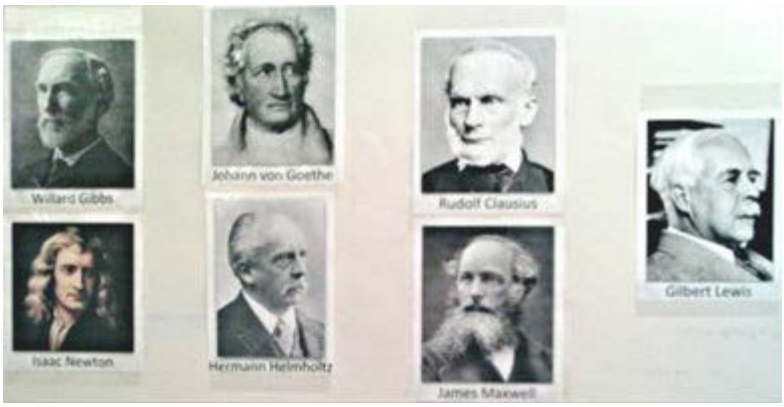

Photos of Gibbs (16), Goethe (16), Clausius (18), Lewis (15), Newton (18), Helmholtz (17), and Maxwell (16), on the wall of Thims' study (numbers being the age at which each person entered college); done similar to how Einstein (16-17) kept pictures of Faraday, Newton, Maxwell in his study, along with a bust of Goethe.

References

1. Anagram – Wikipedia.
2. (a) List of most common surnames (United States) – Wikipedia.
(b) Most common surnames [last names] in the United States (top 1000) – Mongabay.com.
(c) Most common male first names (Unites States) – Mongabay.com.
3. John Doe – Wikipedia.
4. Herbert H. Dow Building (map) – University of Michigan Engineering.
5. Pen name – Wikipedia.
6. (a) Mad Libs – Wikipedia.
(b) Thimble – Wikipedia.
7. (a) Anon. (2009). "Public Notices", *Chicago Daily Law Bulletin*, Section 1. Friday, Sep. 18, 22, and Oct. 02.

(b) Legal name change processed through Cook Count Courts, Chicago, Sep. 15 – Nov 12, 2009.
8. Guericke, Otto. (1663). *New Magdeburg Experiments: on the Vacuum of Space* (*Ottonis de Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (translator and preface: Margaret Ames) (pg. #). Publisher, 1672; Kluwer, 1994; Springer, 2012.

Further reading

â— Anon. (2010). *The Thims Name in History*. Ancestry.com.

θΔics

In hmolscience, **Libb Thims (experiments)** refers to various demonstrated experiments, some historical some new, done by American electrochemical engineer Libb Thims in lecture for the sake of teaching, educational, and demonstration purposes in regards to explaining and understanding physicochemical humanities topics, in respect to foundational principles.

A selection of 2013-2015 **experiments** done by American electrochemical engineer Libb Thims to demonstrate fundamental principles, e.g. Boerhaave's law, principle of the transmission of work, second law of thermodynamics, life as a defunct scientific theory (see: life does not exist), exothermic and endothermic reactions, etc., of the physicochemical humanities.

Overview

In 1796-1809, German polyintellect Johann Goethe began to pioneer the method of using chemical reactions to explain social phenomena (see below), as outlined in in more detail in his version of human chemical reaction theory.

In circa 2012, American electrochemical engineer Libb Thims began demonstrating experiments in lecture to help elucidate and explain to students how physical and chemical experiments underpin various social processes and phenomena.

Helicopter automaton | Death as anthropism

On 13 Jan 2015, Thims, in an Atheism Reviews episode (Q), in attempts to explain the religio-mythology anthropism—in the Charles Sherrington sense of the matter—fictional nature basis of the concept of "death", talked in front of a flying helicopter, so as to give presentation of a Cartesian automaton stylized model of two different types of "animated" movement: human (carbon-based animation) vs helicopter (silicon-based animation).

(add discussion)

Thims doing (Q) a **silicon to carbon animation comparison experiment** in 2015 to demonstrate the issues with Cartesian automaton dualism logic.

Floating magnets | Humans as atomic geometries

See main: Libb Thims (Apr 2014 lecture)

In 16 Apr 2014, Thims, during his "Floating Magnets Experiment and Humans as Powered Atomic Geometries" talk (Q), did the famous Gilbert-Mayer "floating magnets experiment", to explain how social geometries form; the mean girls model being one example:

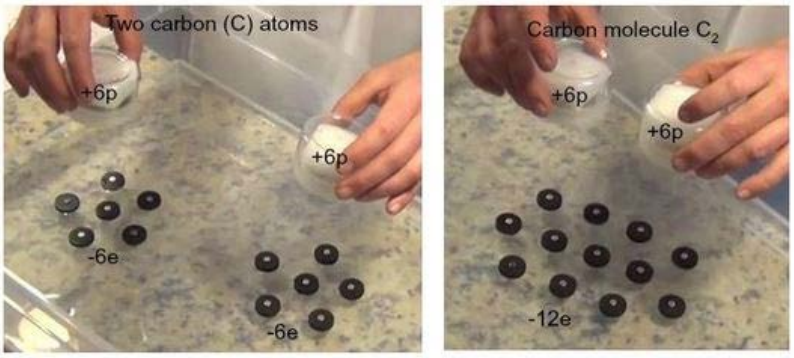

Thims doing the floating magnets experiment (1:09:30-1:25:53) during his 2014 lecture "Floating Magnets Experiment and Humans as Powered Atomic Geometries" talk (Q).

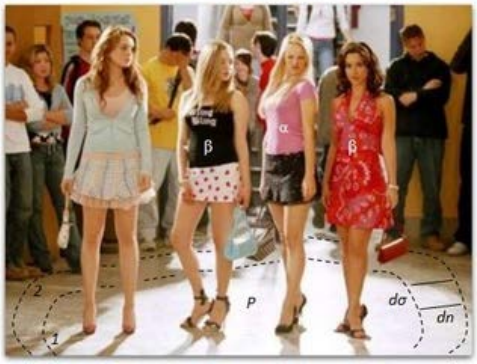

(add discussion)

Social reactions | Endothermic and exothermic reactions

See main: Libb Thims (Apr 2014 lecture)

In 16 Apr 2014, Thims, during his "Floating Magnets Experiment and Humans as Powered Atomic Geometries" talk (O), did both exothermic and endothermic reaction, measuring initial and final temperatures, so to indicated the quantitative and visceral (hands on cup feeling) of hot and cold reactions, respectively, so to explain how such reactions exist between people as chemical reactants:

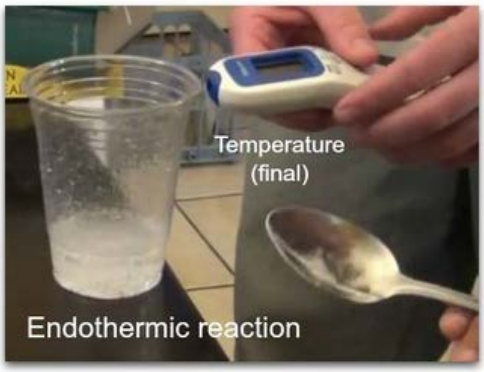

Thims demonstrating an endothermic reaction, pictured at (48:45) taking the final state temperature of the reaction system, during his 2014 lecture "Floating Magnets Experiment and Humans as Powered Atomic Geometries" talk (O), thus demonstrating how such principles exist in human social reactions.

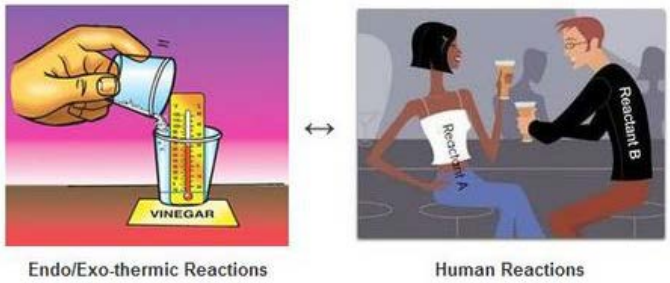

(add discussion)

Pen lifting experiment | Principle of the transmission of work

On 29 Jun 2013, Thims, during his University of Pitesti, Romania, "Econoengineering and Economic Behavior" talk (O), did the experiment (a) take one step to the center of the room and experiment (b) lift your pen into the air, so to demonstrate the principle of transmission of work, namely that whenever a force moves an object through a distance work is done or in the words of Clausius "whenever a body moves under the influence of a force, work is performed."

Thims doing (O) the **pen lifting people moving experiment** (2:45-3:45) at University of Pitesti, Romania, during a 2013 talk on "Econoengineering and Economic Behavior".

> "Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, work is performed."
>
> — Rudolf Clausius (1875), *The Mechanic Theory of Heat* ("Mathematical Introduction")

The bodies in question being: (a) people and (b) pens.

Boerhaave's law | Ball and ring experiment

See main: Libb Thims (Apr 2013 lecture)

In 2013, Thims, during his "A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies" lecture, performed the famous ball and ring experiment to demonstrate the conception of daily cyclical entropy increase inside a social piston and cylinder volume.

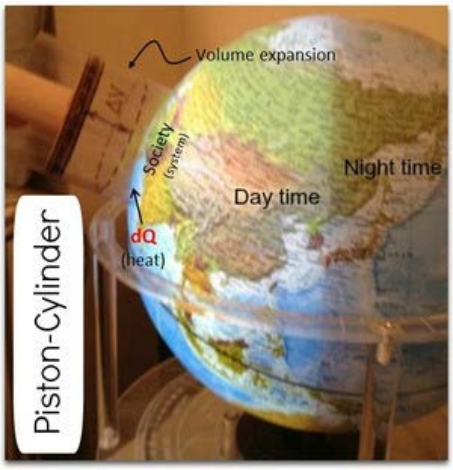

Thims doing the famous ball and ring experiment, during his 2013 lecture "A Guidemap to Human Chemical Thermodynamics" so to demonstrate social entropy change inside of a social piston and cylinder volume.

(add discussion)

Reactions | H_2O + NaOH vs Na

See main: Libb Thims (2012 lecture)

In 2012, Thims, during his "An Introduction to Human Thermodynamics: Chemistry, Physics, Engineering, and Applied" lecture, did a salt (NaOH) and water (H_2O) reaction as compared to a sodium (Na) and water (H_2O) to demonstrate the difference between explosive reactions (volume change) to those that are non-explosive (no volume change) so to visually demonstrate the so-called "power of the vacuum" as early thermodynamicists referred to the nature of work.

The following is salt (NaOH) and water (H_2O) reaction, i.e. the chemical reaction (solvation reaction) for the contact of salt (NaCl) with water (H_20):

$$NaCl_{(s)} \rightarrow Na^{+}_{(aq)} + Cl^{-}_{(aq)}$$

The Gibbs free energy change ΔG for this solvation reaction is -0.027 kJ/mol and by the rule of reaction spontaneity:

ΔG < 0 | Spontaneous reaction
ΔG > 0 | Non-Spontaneous reaction

the reaction is energetically favored and goes naturally;

To note, although the value of Gibbs free energy change is small, there have been some attempts to utilize this available energy (free energy) in the form of a "hydrocratic generator" that mixes large scale amounts of salt and water to obtain energy that can be used to power things. [1]

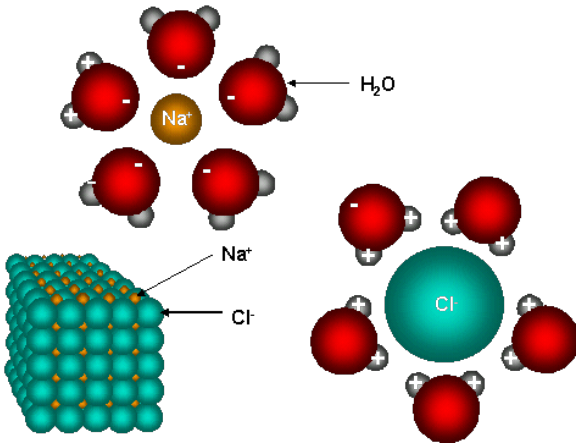

The following is sodium (Na) and water (H_2O) reaction, i.e. the chemical reaction for the contact of sodium (Na) with water (H_20):

		$2Na$	$+ 2H_20$	$\rightarrow 2NaOH$	$+ H_2$
		(s)	(l)	(aq)	(g)
ΔG_f°	(kJ/mol)	0	–237	–419	0
ΔH_f°	(kJ/mol)	0	–286	–469	0
S°	(kJ/mol·K)	52	70	48	131

The free energy change for this reaction, using the formula $\Delta G = Gf – Gi$, is:

$\Delta G = -419 – (-237) = -182$ kJ/mol

and by the rule of reaction spontaneity:

$\Delta G < 0$ | Spontaneous reaction
$\Delta G > 0$ | Non-Spontaneous reaction

the reaction is energetically favored and goes naturally and in this case goes forcefully.

The sodium-water reaction (above) shows the heightened reactivity of sodium and a visualization of volume change ΔV on going from reactants to products.

The above two reaction types, (a) former: weakly spontaneous ($\Delta G = -0.027$ kJ/mol) and (b) latter: greatly spontaneous ($\Delta G = -182$ kJ/mol), are thus small scale versions of the way reactions occur between humans, which technically are animated types of chemicals (human chemicals) or molecules (human molecules), and hence the above two differing reactions visually capture the gist of "human chemical thermodynamics" or chemical thermodynamics applied to the study of human existence in a social, economic, and historical sense.

Goethe | Human chemical reaction theory

See main: Human chemical reaction theory

In 1796, German polymath Johann Goethe, in his discussions with Friedrich Schiller, began to pioneer the method of using chemical reactions models as examples to help elucidate social phenomena. The following gives an outline of the logic of Goethe's 1908 human chemical theory, as explained via Platonic-Hegelian dialectic narration, in the second video, in which reaction between limestone, i.e. calcium carbonate ($CaCO_3$), and sulfuric acid (H_2SO_4) which upon contact yields gypsum ($CaSO_4 \cdot 2H_2O$), in the form an aqueous crystal, and carbon dioxide (CO_2) gas, a reaction that is compared and contrasted with the reactions that are occurring between the main characters in the novel: Charlotte (carbon dioxide), Edward (lime), Captain (sulfuric acid); the modern chemical equation for the limestone sulfuric acid reaction is shown below; a video of reaction of calcium carbonate chips with sulfuric acid is shown to the right —which shows that in the course of 13-minutes, the "extent", symbol ξ, pronounced xi or "zi", starting from an initial 50 grams total of reactant remains, only 49.13 grams remain, measurable by the scale, meaning that 0.83 grams of carbon dioxide gas was produced as reaction product:

$$CaCO_3\ (s) + H_2SO_4\ (l) \rightarrow CaSO_4\ (aq) + CO_2\ (g)$$

$CaCO_3$ Limestone (calcium carbonate)	+	H_2SO_4 Sulfuric acid	→	$CaSO_4$ Gypsum (calcium sulfate)	+	CO_2 Carbon dioxide
Reactants				**Products**		

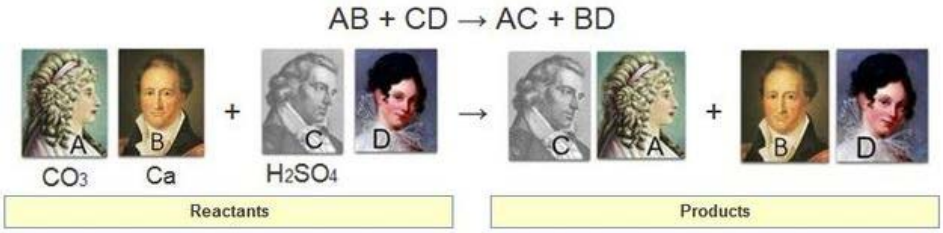

(add discussion)

See also

- Thims thought experiment

θΔics

In genius studies, **Libb Thims (genius ranking)** is a go-to tentative meta-analysis genius ranking position and or genius ranking credentials page, depending, for the semi-common query on third-party opinion on IQ estimate (or genius level) of American electrochemical engineer and genius studies scholar and hobbyist Libb Thims,

American electrochemical engineer Libb Thims lecturing in 2013 to engineering students, at Northern Illinois University, on an introduction to human chemical thermodynamics, who since the 2000s frequently receives the query: "what is your IQ?", a very difficult to answer question, for some reason.

Overview

Opinionated estimates of Thims' IQ range, in the derogation end, from: “imbecile” [IQ:35] (Jheald, 2007) (Q), “delusional moron” [IQ:60] (Dominic Anderton, 2015) (Q), to “zero-value crackpot” (Alon Amit, 2017) (Q) — opinions but realizations of Jonathan Swift's idiom that “when a **true genius** appears in this world, you may know him by this sign, that the dunces are all in confederacy against him” — to high end estimates, such as: “walking encyclopedia” (Milivoje Kostic, 2013), “IQ:202+” (Inderjit Singh, 2014), “new Goethe” (KizzMyButt, 2017) (Q), “highest IQ ever” [IQ:225] (AlphaWolf009, 2012), or “smartest person of all time” (SharpCharm, 2017) (Q).

Query | Common

In the early 2000s, people began to commonly probe Thims with the query "what's your IQ?"; the following are examples:

> “Every time I get to certain parts in the book, I have to stop and think, like: Who were this guy’s parents?, What kind of kid was he?, **How old was he when he started to think this deep**? How was he raised to be able to come up with some of this stuff? Still, the more I read… the more I think—this guy is really on to something!”
>
> — Sylvia Santillan (2005), “Review of 22-pg draft of *Cessation Thermodynamics*” (Q), Feb 25

> “Person who made this, **what is your own IQ?** :)”
>
> — frillan93 (2011), forum post (Q) to "IQ 200+ | Smartest person ever (4 of 4)" video

> “Though I oppose the theories of Libb Thims, the founder of this wiki, I am aware of the effort expended in arranging this list of those who perhaps possess **high IQs**. I myself have exceeded the ceilings of several standardized tests, e.g., the WAIS, the Stanford-Binet, and the CCAT (which I took but a few years ago in elementary school).”
>
> — Vestigial Ailurophile (2011), Yahoo best answer (Q) to: “Who really has the world’s highest IQ?”

> “Who are you, a professor somewhere? And **what is your IQ?**”
>
> — Paul Rael (2013) forum query (Q) at "Human evolution timeline | big bang to present" video; which is based on the evolution timeline; which is based on the molecular evolution table, Aug [3]

“How can someone so poorly versed in such matters [as (Goethe/Euler) name pronunciation] **rate himself** worthy of creating such a list [IQ: 200+]?”

— Gottfried Leibniz (2013), forum post (Q) to "IQ 200+ | Smartest person ever (4 of 4)" video, Nov.

“**What is your IQ?** How did you calculate it? Which college did you graduate from and are you a professor?”

— GeniuCity (2014), “Intelligence”, thread post by Turkish student (Q), Jan 31

“My aunt watched your [NIU and UP] university lectures, commenting ‘he must have a very high IQ?’ **What’s your IQ?**”

— Amanda (2014), query to Libb Thims (12 Feb)

A Mar 2017 Quora posting (Q), with 4+ answers, e.g. by Alon Amit, said (Q) to have an “extraordinarily high IQ”, akin to Terrence Tao (IQ:170-230) (Q), David Wyman, former Prometheus High-IQ Society, who claims and IQ of 164/170+, Eusebius Clay, who claims a “profoundly gifted IQ” (180+), and Benjamin Hardisty (Q), among others, with discussion (albeit mostly of the ignorance-is-bliss, forest blind, ships not seen **derogation type**), on **Libb Thims**’ IQ and the validity of his work (see: **IQ:200+ HCT prodigies**; compare: catch up effect, posthumous genius, and or crackpot in regard to “this idea”).

“I do think your defunct theory of life is your unconscious mind formulating a rational understanding of our world ...'tis merely basic psychology. It is implied to me, upon reviewing the aberration that is your theory on religion, that you view notions of the afterlife as superstitions, and you dismiss the ideas of the personal god. Thus, you have joined a select group of geniuses with a substantial and remarkable understanding of the universe, who yet decry religion as a theory of life. **I am curious as to your IQ** ... (upon further exploration of the website, I have satiated my own inquisitiveness in this regard; you yourself calculate your real IQ as both ± 190 and 160-230). As for your Machiavellian and Galilean mind points...hmm...I have my own IQ methodology, and I believe it to be highly accurate, although based somewhat (by necessity, of course) on what the erudite man can logically ascertain. With it, I have calculated Tesla's IQ to be 201, Einstein's to be 211, and my own to be a (comparatively paltry) 160. I have calculated the real IQs of Isaac Newton (IQ=210), Blaise Pascal (IQ=183), and William Sidis (IQ=199).”

— Inderjit Singh (user:NikolaTesla) (2014), thread: “The Smartest ‘Living’ Person: Dissemination of Ideas”, Apr 28 (Q)

“Re: "I'll try to dumb this down for you" - I realize that there is an intellectual disparity between the two of us, of at least **40 real IQ points** (162 to 202+); conversely, however, we must bear in mind that genius often comes in a cracked pot rather than a whole one.”

— Inderjit Singh (user:NikolaTesla) (2014), response comment to Libb Thims, thread: “Curriculum Vitae”, Sep 12 (Q)

“Libb Thims, **what is your IQ**? It's not a rude question, I just would like to know because you're very intelligent and knowledgeable about a lot of things.”

— Anon (2014), American, Central Time Zone, Hmolpedia thread (post: #29), Nov 7

“What is the **IQ of the speaker**?”

— Joseluis Guinea (2015), post to (Q) “Smartest Person Alive | Existive (2014) (1 of 5)”, Mar

“So, **what is your IQ**?”

— fouried96 (2015), asked by Daniel Fourie (maker of Numericore IQ test); post (Q) to “Smartest Person Alive | Existive (2014) (1 of 5)”, May 4

“**What’s your IQ** Libb?

— Mike Fuller (2018), query (Q) to “Top 100 Geniuses” video, Apr 17

In reference to the above, while some, e.g. Bertrand Russell, who gauged his own IQ as that of what he called an uberman level (IQ:170), or Lev Landau, who ranked himself on his logarithmic physicist genius scale (see: Landau genius scale), have seemingly self-satisfactorily overtly self-estimated their own IQ, for many others existive potential geniuses it is commonly difficult to attempt to fixate one’s IQ position on the genius IQ page. [1]

Langan | Debate

In 2014, people requesting for a debate to occur between Thims and Christopher Langan (CIR:31), the 1999 *Esquire* magazine ranked "smartest person" in the world, who thinks his own IQ is 190 to 210, to debate:

The 1999 *Esquire* magazine "genius issue", where Christopher Langan, a theist who uses Boolean algebra logic to attempt to prove the existence of god, was dubbed the "smartest man in America";

> “Read up on how Langan defines god. I guarantee it's nothing at all like you, or anyone you know. There is also good reason to dispute Langan's claims about his level of intelligence. He claims to have an IQ of 195-210, but IQ tests can't measure that high. IQs of that level are determined by works created

in 2015, people began to request that Thims debate Langan.

by the individual. For instance, Christopher Hirata is estimated to have an IQ of 225 because of his independent arrival at 'human chemical thermodynamics, also independently arrived at by Libb Thims and Johann Goethe. Langan's only work of note is his 'cognitive-theoretic model of the universe', which is widely agreed to be a bunch bollocks."

— MuzeBreak (2014), "All Christians are Smart and Atheists are Dumb" (Q), Debate.org, Jul 17

"I would actually pay Libb $200 USD to debate Chris Langan — the 1999 dubbed "Smartest Man in the World" (*Esquire*, Nov) — on a talk-back radio program, in the near future."

— Biff Tannen (2015), forum (Q)(Q) commentary on the extreme atheism views of Libb Thims, Jan 25

"Chris Langan has a Quora account and I was wondering if it would be possible for you to ask him to debate you? It would be the debate to end all debates as two gladiators enter the arena."

— David Johnson (2017), YouTube thread (Q) to Libb Thims, Oct 25

In 2017, Thims, per request, posted the debate idea on Langan's Quora page (Q)(Q); there, however, has been no response.

Categories | Mean IQs

Thims, to get a gauge on IQ estimation, is an aware "unlearn expositors" (see: unlearn), as the following quote exemplifies:

"In regards to the above 'reduction' arguments, you must always keep in mind that all you are, nothing more nothing less, are the following 26 elements: hmolscience periodic table – aggregated into a dynamic geometric mass called a bound state, that 'exists' for a certain period of time, within the framework of the universe. This is a step above Cartesian 'I think, therefore I am' philosophy of existence. A great deal of **unlearning** must be done to accept this."

— Libb Thims (2012), "Reply #12 to Mahesh Deva" (Q); dialogue on the HT principles (Q) + Wikipedia "human thermodynamics" AFD (Q) comment: "[...] is human life a chemical reaction or not?", Oct 25

Two multi-decade+ long deeply implanted "unlearns" Thims has "consciously", i.e. at the forefront of awareness, had to disentangle from his mind are the untruths that (a) life exists (see: life does not exist), worked on 2007-present, and (b) that Abraham was a real person (see: Abraham and Brahma), worked on 2003-present.

The mean IQ of the rare breed of aware unlearn expositors, as cited via quoted statement above, based on the established genius rankings of: Hypatia (IQ:190|#44) [RGM:145|1,245+], Desiderius Erasmus (IQ:185|#89) [RGM:212|#1,245+], Thomas Jefferson (IQ:190|45) [RGM:29|1,245+], and Jonathan Swift (IQ:180|#160) [RGM:170|1,246+] is **IQ:186|#64** and **RGM:139**.

Thims is also among the rare breed of anti-chance philosophers. In modern terms, free energy-based models of existence replace chance-based models of existence. The mean IQ of "anti-chance" based philosophers, based on those above with established IQ citations, namely: Spinoza (185|#53), Holbach (185|#57), Goethe (225|#1), Schiller (185|#69), Einstein (215|#3), Lotka (185|#79), and Henderson (180|#105), as of Jan 2018), is: **194|#52**.

This, in crude guesstimation terms, would Thims in the IQ of 186± to 194± range, based on these two factors alone, as a

first-draft interpolation.

Thims IQ

In 2013, Libb Thims gave he following public response to the overly-common "what is your IQ" query:

> “My IQ is somewhere between Dr. Seuss, who in 1931 claimed (Q) an IQ of H_2SO_4, and Dr. Faustus, who in 1514 sold his soul to the devil for truth, knowledge, and power; the embodiment of the latter found in the mind of Goethe, who in 1809 professed that he and his wife were like $CaCO_3$ (limestone), who when put into contact with H_2SO_4 (Captain) have no “choice” but to debond, and who in 1926 [Cox] became the first ever person ranked with an IQ of 225.”
>
> — Libb Thims (2013), reply to query by Paul Rael, Aug [3]

Libb Thims

Libb Thims (IQ=200) is an American electrochemical engineer, and one of the ten most intelligent humans currently reacting on this planet. His primary website, the Encyclopedia of Human Thermodynamics, is widely considered the greatest intellectual achievement on the Internet. You can interact with the esteemed Mr. Thims by creating an account on his website, and sending his account (Sadi-Carnot) a message. My account is named ‘NikolaTesla’; feel free to message me as well. Both Mr. Thims and I are active in the EoHT Forum, where we have discussed topics spanning from morality to ‘life’ and ‘death’, and from literature and art to the many fields of science. Reading through my Thread Contributions on the Forum will probably yield an increase in the reader’s IQ.

A 2015 InderjetSingh.net profile (Q) of Libb Thims by American philosopher Inderjit Singh who estimates **Thims' IQ** at 200.

The above answer, a mixture of humor and reality, is the only response that has been able to stick, being that if one desires to know the deeper, darker, and or brighter, depending, secrets of the universe one must become a Faust, as Goethe did so avail himself towards throughout his 82 years of reaction existence (extent of reaction).

Prior to this, previous attempts had been failingly made (Q) by Thims in an effort to provide a stock answer to this common query, namely to self-estimate or gauge his own IQ, e.g. at one point, at or above the Henry Adams level, tentatively below but aiming to surpass the Gilbert Lewis level, generally aiming at the Goethe level, in the context of the genius IQs table, but attempts to situate a fixed position is vexing to the mind. The issue seems to have something to do with the fact that the mind, if one is proactive in autodidactic knowledge acquisition and problem prying, the mind grows, or conversely atrophies daily, according to which existive ranking becomes difficult, and whereby fallback to the tried and true logic that only via historical century plus retrospect posthumous ranking can one gauge true IQ.

In Mar 2016, Thims' attempted to self-estimated his so-called "IQ state", i.e. IQ of an existive person on a given day (or period), gauged from a "sensed intuitive ranking" of his position, amid his personal work-in-progress ranking (by IQ) of top 500 geniuses of all time (similar to what Lev Landau did in ranking himself in his Landau genius scale):

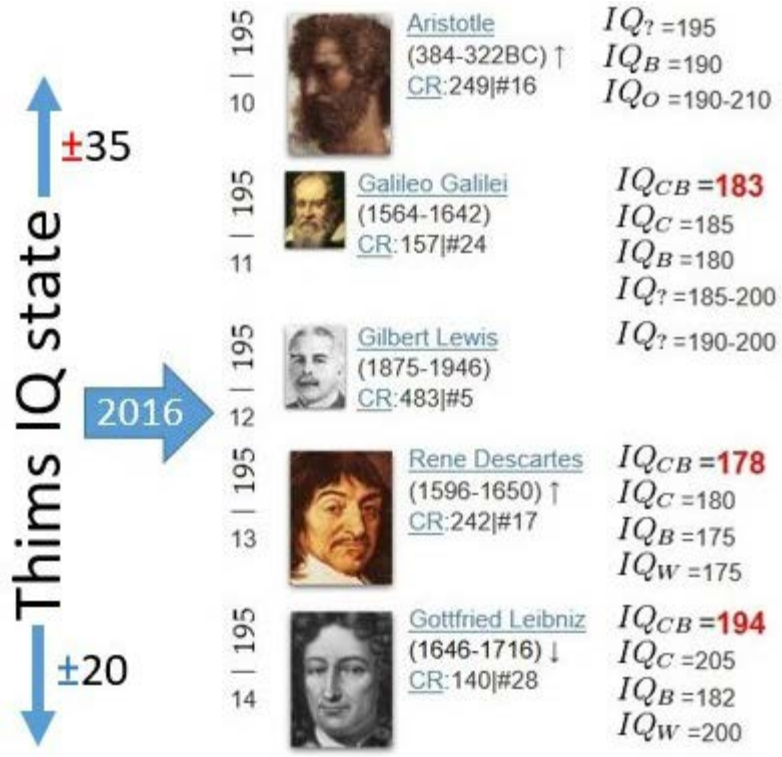

This 2016 guesstimate can be compared to how Bertrand Russell ranked his own IQ at 180.

Thims Genius | Polymath

The following bullet point opinions may give some guidance:

Trait	Description
Epoch initiator	Quote: "Thims' brilliant book [*Human Chemistry*] symbolizes the beginning of a new era (epoch) in human history." (Georgi Gladyshev, 2006)

Gladyshev Ranking | 2007

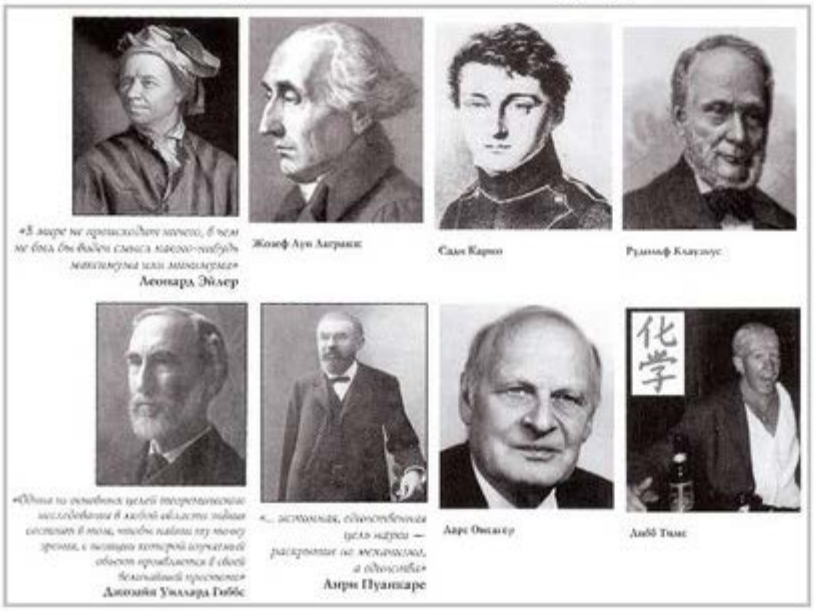

Ranking:

Shown adjacent is a 2007 profile of Thims in (in Russian) in science journal *Вестник* article: "Hierarchical Thermodynamics: a General Theory of Existence" (Q), by Russian physical chemist Georgi Gladyshev, which ranks Thims pictorially alongside the following geniuses: [4]

- Leonhard Euler (IQ:195)
- Joseph Lagrange (IQ:190)
- Sadi Carnot (IQ:190)
- Rudolf Clausius (IQ:205)
- Willard Gibbs (IQ:210)
- Henri Poincare (IQ:195)
- Nikolay Bogolyubov
- **Libb Thims** (**IQ:?**)

Thims, in 2007, in short was being profiled alongside a grouping of elite genius with a **mean IQ of 197.5**. The grouping is a listing of great mathematicians and thermodynamicists involved in or related to supramolecular thermodynamics and or hierarchical thermodynamics, i.e. a macro-systems (from above) energy and entropy view of organisms.

Polymathy

Quote: "Thims' edits are far and wide. Unless Physchem is an incredible polymath, I doubt he would be able to pick up on all the BS a Thims-type editor introduces. That's not knocking Physchem, I don't think there is anyone who could deal with the range." (Keith Henson, 2007);

The following is a 2009 ranking on Thims by Canadian mathematical physicist, realism philosopher, and human

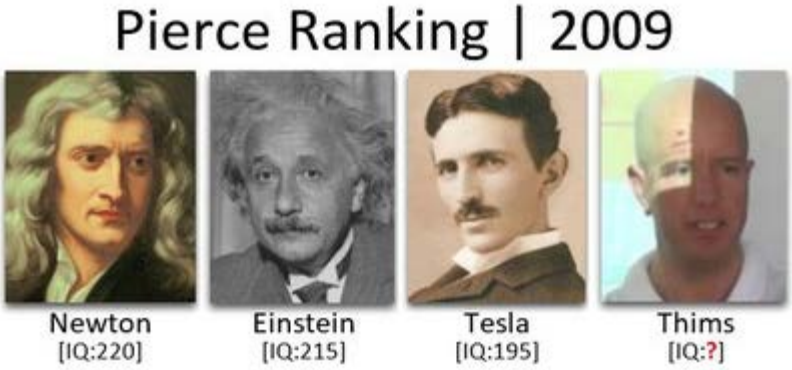

entropy theorist Steven Pierce:

> "I stumbled onto your website by accident but I have to confess this might be one of the most stunning undiscovered intellectual achievements of the 21st century. I have browsed through your wiki and I cannot express how tragic it must be to a man in your position—to be a pioneering thinker yet to be rejected by an uptight academic community with neither the depth nor will to understand your unique work, defending their own turf like dogs. **I can only compare** [**Thims**] **to** the many other pioneering heroes of science, **Newton**, **Einstein**, **Tesla**, men who like you **blazed** their own paths but were too victims of their own genius, only to be validated years after their death. Perhaps one day historians will look back and have a chuckle—that the pioneer of enthropology published by a vanity press in a book resembling a third rate romance."
>
> — Steven Pierce (2009), comment on discovery of *Hmolpedia*

Genius

Fact: a product of early parental death and genius:

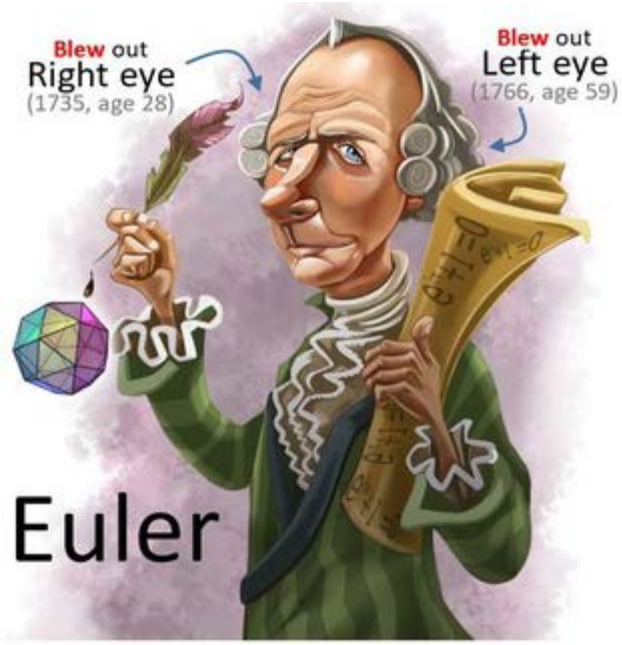

Commonalities

1542: *On the Revolution of the Heavenly Orbs* | Copernicus (F@age10)
1661: *The Skeptical Chemist* | Boyle (M@age3)
1687: *Principia* | Newton (F@age0)
1859: *Origin of Species* | Darwin (M@age8)
1865: *A Dynamical Theory of the Electromagnetic Field* | Maxwell (M@age8)
1876: *On the Equilibrium of Heterogeneous Substances* | Gibbs (M@age16)
1888: *Will to Power* | Nietzsche (F@age5)
1937: *The Nature of the Chemical Bond* | Pauling (F@age9)
2007: *Human Chemistry* | Thims (M@age12)

Fact: Thims, like Euler (who in 1735, age 28, lost sight in one eye, supposedly, by overexerting himself to solve a problem in three days that normally took months; and in 1766, age 59, he lost sight in the other eye, supposedly owing to the same reasons), has frequently come close to blowing his right eye out after prolonged multi-day periods of intense study, and has to massage the muscles around his right eye, and some times to stop studying (and go to sleep or to the gym), to remedy the situation.

Fact: Thims, similar to similar to Nietzsche (who in 1899 at age 44 had a mental brake down, from which he never recovered, after seeing a horse being beating by police) and Sidis (who cracked at age 11, after giving a lecture to the Harvard mathematics club, on four dimensional bodies, and dereacted at age 44, from cerebral hemorrhage, following social-pressured stress, from a 7-year public lawsuit with *The New Yorker* for its slanderous "The April Fool" article on him), and brain blew out [i.e. he blacked out, amid running one mile at 15 percent incline at 7.8 mph at X-sport gym, coming to in hospital, three hours later] nearing the end completion of high-speed editing of the 4,050 articles of the 10-volume *Hmolpedia* print set,

Fact: a product of genius and exercise habits; similar to Einstein and Turing:

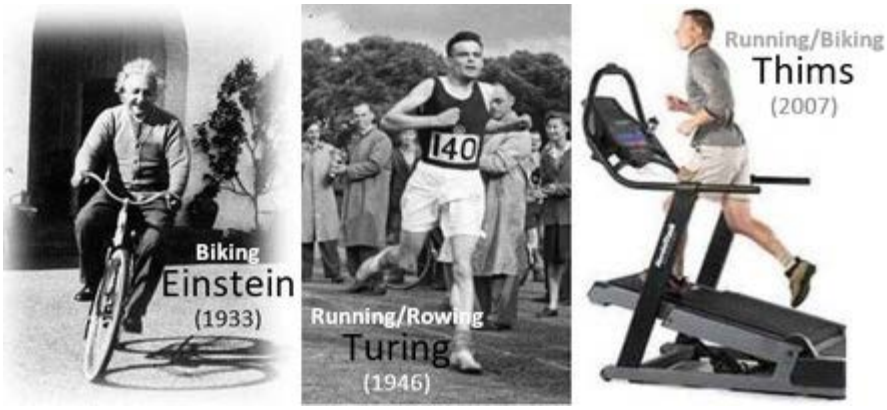

"I **thought up** relativity while riding my bicycle."

— Albert Einstein (c.1930), response to query about relativity [12]

"I have such a stressful job that the only way I can **get it out of my mind** is by running hard; it's the only way I can get some release."

— Alan Turing (c.1947), reply to J.F. (Peter) Harding on why he punished himself so much in training [13]

Commonalities

Thims, similar to Turing, as a youth, would often run (30-miles) or bicycle (60-miles) from towing to town for fun; his electrical engineering degree, e.g., was completed via a 20-mile daily bicycle ride back and forth from one of his two jobs, he worked at, 6-days a week (47-

hours per week) and school, the two located 10 miles apart; likewise, throughout the 2000s and 2010s, Thims used daily running as the primary way to process information and problem solve, e.g. amid writing volume two of *Human Chemistry*, at about the chapter 10 point, Thims ran every single day, no days off, for six-months straight, six-miles per day, on a treadmill, at 7.8 mph, at 15 percent incline, for a total of 1,080-miles, so to be absolutely certain that he kept up his mental resolve to finish the second half of the textbook, through Goethe's elective affinities theories, specifically, chapters 10-11 exactly, being that the a paused thought resided in his mind at the chapter 10 point that he might stop at chapter 9 (human molecular orbital theory), wherein the theory of the human chemical bond was finished. Thims eventually, to note, blew his tendon out, in the Achilles heel region, when he jumped, on one specific day, from his daily 6-mile run to a 12-mile, at the six-month point, during a week when someone was flying out to Chicago to visit. Whatever the case, the two-volume textbook was finished, in the course of a process which took 18-months and 14-days, exactly, being completed in Sep of 2007 through the aimed at 16-chapters. To a good approximation, nearly all of the textbook was written in Thims' mind while running on the treadmill. After each run, he would come home and write in the computer file what he had already written in his mind.

Commonalities

Fact: a product, similar to top geniuses , e.g. Newton (#2), Gibbs (#4), Tesla (#19), and Nietzsche (#90), among others, who never married, and Goethe (#1), who didn't marry until age 56, of **bachelorhood and genius**. Goethe, in fact, didn't marry until he had worked out the nature of marriage, in his mind, from a physico-chemical bond point of view (as shown adjacent).

Fact: a product, similar to Goethe, of having done the "**love thought experiment**", Goethe in his 4-girlfriend *The Renouncers* (1808) turned "human affinity table" (1809) and Thims in his 19-girlfriend Excel spread sheet (c.1993) mate selection formula turned "human free energy table" (1995).

Epicenter genius

Thims has been posited, by David Bossens, who published a book on his learning experience at *Hmolpedia*, to be an epicenter genius: [2]

> "Perhaps we could make an **epicenter genius** page for **Thims**, putting photos other Hmolpedians around him?"
>
> — David Bossens (2012), Hmolpedia thread dialogue

The adjacent photo is from UPESW 2013, showing the late Mircea Gligor to the left of Thims, who notably did his PhD on Prigogine-thermodynamics based economics.

Thims is has been classified as a posthumous genius:

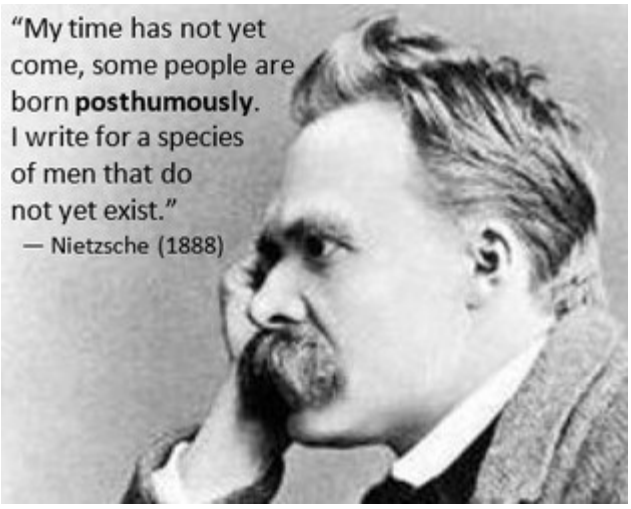

"Something **60-80 years ahead of its time**. **Thims**, in the future, will be someone who's talked about in classrooms as this guy who had **this idea**. However, now, yes the book will sell, but its premise will not be accepted by people of this generation."

— Monzer Ettawil (2005), American law student

Oracle

"**In the future**, one day, instead of (or in addition to) regular math, chemistry, physics, etc., kids in school will be learning something like one human molecule + another human molecule = [dihumanide molecule]? ... it's just a crazy thought, but hey, we'll see or somebody will."

— Natalia Roubanenko (2006), Russian-born American language studies scholar [N3]

"Thims: the **great oracle** and developer of human thermodynamics—the philosophical revolution of the 21st century. A genius of outstanding stature and originator of many concepts in human chemistry."

— Mark Janes (2011), English human free energy theorist

"You were right your videos are **decades if not a century in front** of its time."

— Benjamin Cresdee (2011), circa age 17 student, interested in chemistry

This phenomena, to note, is related to the catch up effect.

Thims has been commonly opinionated to have a ceiling-range IQ and or popularly-voted as having the highest IQ ever:

"What are you [**Thims**], like

the grand poohbah [of the **IQ:194+** Giga Society]?"

> — Greg (c.2002), "Comment to Thims", by higher IQ Mensa society lawyer friend (of Thims), when told, by Thims, about the newly-discovered, humorous, albeit mathematically delusional (see: Gibbs on sanity), 1996-formed 'Giga Society' of Paul Cooijmans, which asserts, per the so-called statistical probability "IQ rarity argument", that an IQ score of 194 corresponds to a rarity occurrence of about 1 in 5,422,132,484 people (Q) and that accordingly amid a 1996 world population of 5,777,395,600 (Q) there should theoretically be about five people with this IQ who, if they were to take the appropriate IQ test, should send it to Cooijmans, so to become part of this elite society, and therein find intellectual solitude, or something along these humorous lines of reasoning.

"I think [**Thims**] has the **highest IQ** [**ever**]."

IQ

> — alphawolf099 (2012), "IQ:200+ | Smartest Person Ever (4 of 4)" [N2]

"Here follow my IQ estimates of various prominent geniuses, as I endeavor to research their lives and works. My goal is to evaluate 100 members of the greatest clerisy known to man: Goethe (IQ:215), Einstein (IQ:215), Newton (IQ:210), Tesla (IQ:201), Sidis (IQ:197), Da Vinci (IQ:192), Gauss (IQ:193), Mill (IQ:185), Majorana (IQ:185), Pascal (IQ:185), Hawking IQ:168), Hitler (IQ:160), Washington (IQ:154), myself (IQ:160), and **Thims (IQ:190-230)**. If he is willing to give me the necessary information, I shall use my IQ methodology to calculate his IQ. Otherwise, I will leave it at these vague estimates ... **I do not**, however, **see Thims' IQ being below 190**."

> — Inderjit Singh (2014), "Calculating the Real IQ of Geniuses" [10]

"The question I posed to you ["I have watched your videos for years and was wondering if you might let me know what you consider to be the single most important thing you have learned throughout your studies?"], I ask to the **smartest people I encounter**. You, by far, had the most in-depth and thought provoking answer I have ever received and thank you for it."

> — John Gaetano (2016), "Email turned thread dialogue with **Thims**" (Q), Mar 6-9

(add discussion)

IQ test

Thims, in 1999, for fun, was lured into taking the *Esquire* magazine "Gεπ1us Tεst" (max score of IQ = 160), scoring in the 140-150 IQ range, without too much effort. [5]

Thims has been characterized as a walking encyclopedia:

walking encyclopedia

phrase of walk

1. *informal*
   a person who has an impressive knowledge of facts or words.

Encyclopedic

"**Thims is** [**a walking**] **encyclopedia** of human thermodynamics."

— Milivoje Kostic (2013) [9]

Thims is also frequently requested, by friends, to be the "phone a friend" person to the 1999-launched *Who Wants to be a Millionaire* game show.

The following are the 9 Dec 2013 like rankings of top thinkers, via Facebook likes, in Hmolpedia, shown with true IQ and known highest estimated IQ, respectively, of the 1,000+ biographical thinkers having Hmolpedia articles:

Like rankings

1. Christopher Hirata (46 likes) | IQ=190±; 225
2. Johann Goethe (26 likes) | IQ=230; 225
3. **Libb Thims** (20 likes)
4. David Hwang (19 likes)
5. Henry Adams (17 likes) | IQ=195±
6. Mehdi Bazargan (9 likes)
7. Norbert Wiener (5 likes) | IQ=180±

The top six in this list, to note, are all high ranked social Newtons or existive social Newtons.

Thims, since 2005, has mistakenly been classified, owing to public ignorance, akin to the way people in the 1860s viewed Darwin's *Origin of Species* as a "mad book" or people in the 1810s viewed Goethe's *Elective Affinities* as "childish" and "immoral", via a number of derogations; the following being one example:

Madness index

“I note from the "human thermodynamics (objections to)" page, in this Wiki, that Stephen Lower [a theist chemist] has previously (and quite correctly) described **Thims**’ ‘theories’ as **crackpot**. I came across a wonderful webpage by John Baez called the ‘Crackpot Index’ (Q). Congratulations, Libb, you've just scored 20 points on the Baez scale for suggesting that you deserve a Nobel Prize [pisstake: Gladyshev (2007) and Jaynes (2011) suggested this]. On your post ‘To quote from social anthropologist Max Gluckman: A science is any discipline in which the fool of this generation can go beyond the point reached by the genius of the last generation’, Libb, you're *really* racking up the points on Baez's crackpot index. You get "40 points for claiming that when your theory is finally appreciated, present-day science will be seen for the sham it truly is." (Point 36 on Baez's list). I'll leave you to tick off the other points on Baez's list.”

— Philip Moriarty (2009), “Moriarty-Thims debate (part two)” (Q), post #134-35, Sep 13

Score: In the true-to-reality words of Aristotle (IQ:195) that “there was never a genius without a tincture of madness”, Thims scores 135 on the Baez crackpot index, give or take, based on previous historical mindsets.

Thims has solved and or partially solved the following problems; font size indicates level of difficulty of each problem:

Solutions

- **Elective affinities problem** | Discerned: Goethe (1796) | Solution: 2001
- **Human molecular formula** problem | Stated: Carey (1911) | Solved: 2002 (Q)

→ **Note**: Independently solved by Sterner and Elsner (2000)

- **Abraham/Brahma problem** | Discerned: Volney (1791) | Solved: 2003
- **Problem of the human chemical bond** (Q) | Discerned: Thims (2003) | Solved: 2005
- **Great problem of natural philosophy** | Stated: Hilaire (c.1836) | Solved: 2009

→ **Note**: Independently solved by Rogers (2010) and Jabr (2013)

- **Problem of evil** | Stated: Epicurus (c.270BC) | Solved: 2011 [11]
- **Mind-body problem** | Stated: Descartes (c.1620) | Solved: 2013 (Q)
- **Purposeless universe problem** | Stated: Kierkegaard (c.1930) | Solved: 2015 (Q)

→ **Note**: Partially solved by Lindsay (1983)

- **Drive-thru paradox** | Discerned: Goethe (1770) (Q) | Solved: 2016 (partially)

The adjacent image shows the famed Goethe to Schiller "passions like playing cards" quote on the writing of Crebillon, the demarcation point for the true last universal genius, aka last person to know everything; only growing two cultures divided global idiocy has prevailed since.

Interviewed, by telephone, by *Business Insider*, for genius IQ ranking methods on people with IQs 200 or over and IQs of presidents: [11]

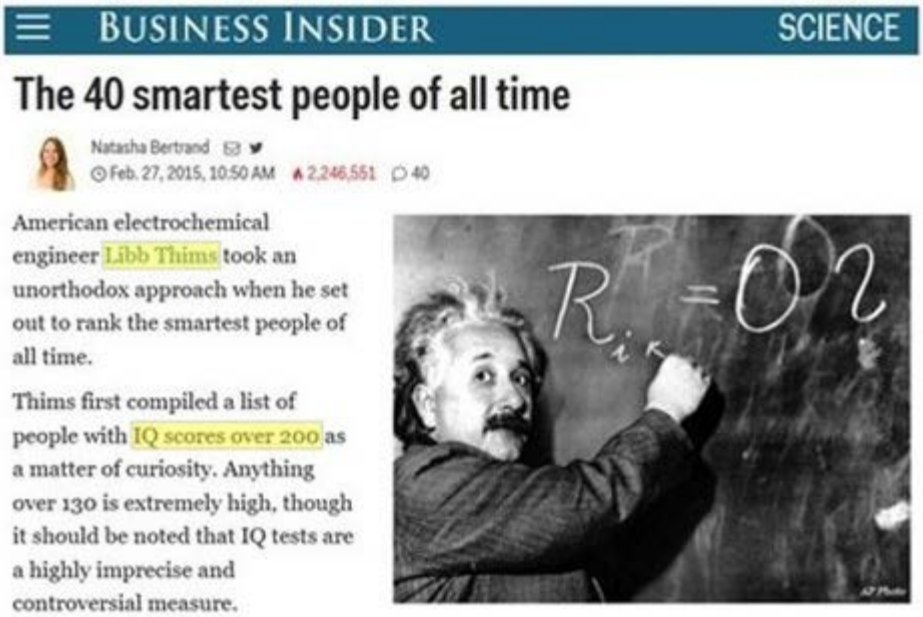
BUSINESS INSIDER SCIENCE

The 40 smartest people of all time

Natasha Bertrand
Feb. 27, 2015, 10:50 AM 2,246,551 40

American electrochemical engineer Libb Thims took an unorthodox approach when he set out to rank the smartest people of all time.

Thims first compiled a list of people with IQ scores over 200 as a matter of curiosity. Anything over 130 is extremely high, though it should be noted that IQ tests are a highly imprecise and controversial measure.

Genius ranking scholar

> "American electrochemical engineer **Libb Thims** took an unorthodox approach when he set out to rank the smartest people of all time. Thims first compiled a list of people with **IQ scores over 200** as a matter of curiosity. Anything over 130 is extremely high, though it should be noted that IQ tests are a highly imprecise and controversial measure. Later, Thims ranked everybody who had a strong aptitude, marked capacity, or heightened inclination in some area that coupled with their IQ would make them worthy of the title genius. Not wanting to exclude any geniuses who existed before IQ tests were invented, Thims referred to IQ ratings based on the Cox methodology, which predicts IQ based on how much people accomplished every 10 years of their lives. Thims then adjusted the IQ scores he thought were inaccurate by reading through many of the individuals' works to check for errors. Thims evaluated both IQ and accomplishments to rank the smartest people in history. Of course, this list is highly subjective and at times seemingly random. Still, we found it thoughtful enough to warrant a second look."
>
> — Natasha Bertrand (2015), "The 40 Smartest People of All Time"

In 2016, a mention of a draft book, entitled *500 Greatest Geniuses: Ranked by IQ*, based on the top 500 geniuses page, was in the wind.

Total: 1,500+ books

→

Library

thermodynamics: 360+, mate selection: 140+, religio-mythology: 85+, medicine: 100+, neuroscience: 50, general non-fiction (100s), general science (100s), etc.

Photo shown, from the 2014 "25 Smartest People Alive | Existive" (Q) video countdown, depicts some of Thims person library.

"I stack **books**, like your momma stacks pancakes."
— Libb Thims (2013), response (Q) to YouTuber comment about why Thims considered himself worthy of making a ranked Smartest Person Ever | IQ:200+ list, if he couldn't pronounce Goethe and Euler correctly (see: books read), Dec

Publications

Total: 13+ volume collected work set (2016)

→

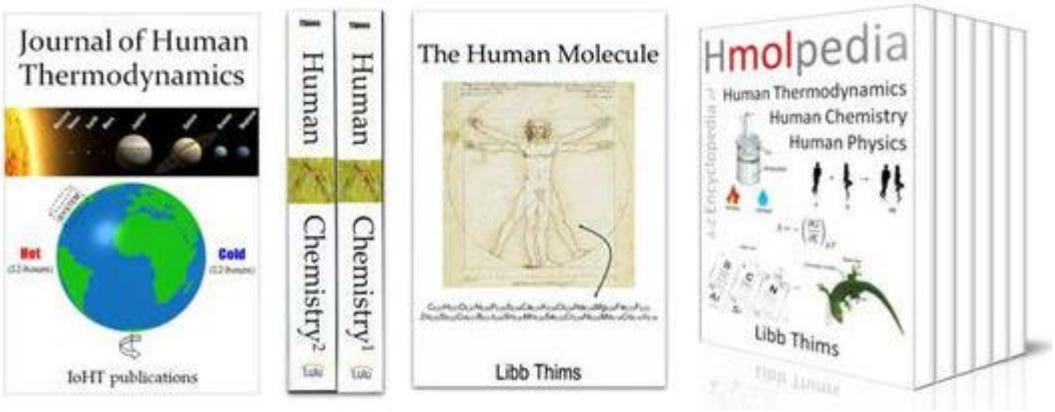

many articles
→ one journal | JHT
→ one book | *The Human Molecule* (2008)
→ one 2-volume textbook | *Human Chemistry* (2007)
→ one 10-volume encyclopedia (over 1,000+ biographies)
→ unfinished manuscripts, drafts, articles, video, lectures, etc.

Mates

The majority of women Thims' has been attracted to as girlfriends have tended to be highly intelligent, e.g. valedictorian, architect, child prodigy, lawyer, pilot, Rhodes scholar, among others.

The following is American child prodigy turned philosopher Inderjit Singh's 2014 classification of Thims' IQ, using his genius IQ calculation formula, from his "100 members of the greatest clerisy known to Man" posting, a subsection of his previously collected 250 favorite geniuses Facebook page listing: [10]

1) Johann Goethe (IQ = 215)
2) Albert Einstein (IQ = 210)
3) Isaac Newton (IQ = 210)
4) Nikola Tesla (IQ = 201)
5) William Sidis (IQ = 197) (re-calculated)
6) Carl Gauss (IQ = 193) (re-calculated)
7) Leonardo da Vinci (IQ = 192)
8) John Mill (IQ = 185)
9) Ettore Majorana (IQ = 185)
10) Blaise Pascal (IQ = 185)
11) Stephen Hawking (IQ = 168) (re-calculated)
12) James Maxwell (?)
13) Willard Gibbs (?)
14) Hugo Grotius (?)
15) Rudolf Clausius (?)
16) Thomas Young (?)
17) Leonhard Euler (?)
18) Hiletyogard don ImBangin (?)
19) Thomas Jefferson (?)
20) James Madison (?)
21) Henry Adams (?)
22) Pierre Laplace (?)
23) Plato (?)
24) Enrico Fermi (?)
25) Aristotle (?)
26) Cicero (?)
27) Rene Descartes (?)
28) Immanuel Kant (?)
29) David Hume (?)
30) George Berkeley (?)
31) Voltaire (?)
32) Edward de Vere (?)
33) Gottfried Leibniz (?)
34) Francis Bacon (?)
35) Johannes Kepler (?)
36) Benedict Spinoza (?)
37) Thomas Wolsey (?)
38) Friedrich Schelling (?)
39) Paolo Sarpi (?)
40) Galileo (?)
41) Alexander Humboldt (?)
42) Hermann Helmholtz (?)
43) Adolf Hitler (IQ=160)
44) Robert Hooke (?)
45) Emanuel Swedenborg (?)
46) George Washington (IQ=154)
47) Gilbert Lewis (?)
48) Ludwig Boltzmann (?)
49) Henri Poincare (?)
50) J.R.R. Tolkien (IQ=140)
51) Karl Marx (?)
52) Sadi Carnot (?)
53) Alexander Pope (?)
54) Thomas Hobbes (?)
55) Niccolo Machiavelli (?)
56) Pierre Gassendi (?)
57) Edwin Hubble (?)
58) Charles Babbage (?)
59) Bertrand Russell
61) Edward Jenner (?)
62) Werner Heisenberg (?)
63) Erwin Schrodinger (?)
64) William Harvey (?)
65) Antonie van Leeuwenhoek (?)
66) Alexander Fleming (?)
67) Alfred Nobel (?)
68) Max Weber (?)
69) Ernest Rutherford (?)
70) Michael Faraday (?)
71) Niels Bohr (?)
72) Marie Curie (?)
73) Alexander the Great (?)
74) James Watt (?)
75) Edmund Burke (?)
76) John Dalton (?)
77) Woodrow Wilson (?)
78) Alexander Hamilton (?)
79) Thomas Edison (?)
80) Carolus Linnaeus (?)
81) Benjamin Franklin (?)
82) Christopher Columbus (?)
83) Louis Pasteur (?)
84) Charles Darwin (?)
85) Marcus Aurelius (?)
86) Petrarch (?)
87) John Neumann (?)
88) Roger Bacon (?)
89) Jean Sales (?)
88) William Thomson (?)
90) John D. Rockefeller (?)
91) William Herschel (?)
92) Otto von Bismarck (?)
93) Thomas Aquinas (?)
94) Claude Bernard (?)
95) Adam Smith (?)
96) Sigmund Freud (?)
97) Constantine the Great (?)
98) Themistocles (?)
99) Demosthenes (?)
100) Pythagoras (?)
101) Euclid (?)
102) Solon (?)
103) Muhammad (?)
104) Spinoza (?)
105) Octavian (?)

Recent thinkers | IQs

1) Myself (IQ = 160)
2) **Libb Thims (IQ = 190-230)** [N1]
3) Herbert Salzer (?)
4) Terrence Tao (?)
5) Barack Obama (?)
6) Mark Zuckerberg (?)
7) William Gates (?)
8) Peter Higgs (?)
9) Ludwig Wittgenstein (?)
10) Gandalf (IQ = 231)

(?)
60) William Roentgen
(?)

89) Gregor Mendel (?)

Beyond these snippets, a near complete existographical of Thims would be required, but one as such at the present is beyond the scope of the current objective, which is the past time of ranking geniuses, learning something along the way, and possibly teaching others something in the process.

Vanity | Insanity | or REALITY?

Of note, in respect to Thims' attempting to gauge his own IQ, such as Bertrand Russell did, estimating his own IQ at 170, in respect to his uberman concept, or as Lev Landau did, in respect to his own genius scale (see: Landau genius scale), e.g. ranking himself 1.5 points below Einstein (0.5), there has been nearly an opposite and equal Newton's third law slew of reactionary postings, semi-commonly occurring, against such an interjection. [6] On one side of the fence, as Hawking wisely said, people who talk about their IQs are losers:

> "People who talk about their **IQ** are losers."
>
> — Stephen Hawking (c.2005), when asked what his IQ was during *New York Times* interview

Australian philosopher Dominic Anderton's 2015 blog describing Thims as "delusional" and the attempt at high range IQ ranking as "moronic". [6]

The idea that this genius IQ ranking is impossible is what is called the "Cox delusion", namely the view that only a "test" can adequately gauge a genius range IQ and moreover that estimates of the IQs of geniuses of the past is impossible. It was Lewis Terman, the inventor of the IQ scale, and after him Catherine Cox, who initiated the IQ ranking of famous geniuses.

Thims | IQ 200 range puzzle

See main: IQ 200+ HCT prodigies; See also: IQ 200 or above impossible

Thims, like Terman and Cox, gained an interested in high range IQ ranking, because in his "field of research", i.e. chemical thermodynamics applied to the humanities", aka viewing deeper human philosophical questions through the so-named "thermodynamic lens", people with "cited IQs", i.e. ones that people can read about in newspaper clippings, articles, Google Books, etc., of 200 or above are a common phenomena, as shown below (IQs shown estimated by others, not Thims):

Genius	IQ:200+	Human Chemical Thermodynamics
Goethe	IQ:225+ | 1926 **Discovered**: 10 Oct 2005 (Q)	Theory: Chemical Affinity Model of Relationships (1796 | **age 47**)
Tesla	IQ:200-310 |	Theory: "Human is Powered Molecular Automaton with

	2000 **Discovered**: c.2009	Energy of ½mv²" (1915 | **age 59**)
Sidis	IQ:250-300 | 1940 **Discovered**: 24 Mar 2008 (Q)	Theory: Thermodynamics of Animate and Inanimate (1916 | **age 18**)
Neumann	IQ:200 | 2010 **Discovered**: 11 May 2004 (Q)	Theory: Thermodynamic Free Energy Theory of Cash Value (1934 | **age 31**)
Thims	**IQ:?**	Theory: Chemical Thermodynamic Model of Relationships (c.1995 | **age 23**)
Hirata	IQ:**225** | 1999 **Discovered**: 15 Feb 2010 (Q)	Theory: Thermochemical Model of Relationships (2000 | **age 18**)
Arroyo	IQ:200 | 2006 **Discovered**: 11 Feb 2016 (Q)	Theory: Thermal Model of Economics (2010 | **age 20**)

The above infobox shows, seemingly, that if one is a coming of age prodigy in the IQ:200± range intellect, one's mind will "naturally" gravito-electromagnitate towards a chemical thermodynamics model of the existence of things, in one way or another, being that the first law and second law are what define "nature" of things, in modern terms.

Thims, subsequently, out of "curiosity", in circa 2006, after coming across thinkers such as Goethe, Sidis, Hirata, etc., and their 200+ range IQ citations, began collecting and ranking all known IQs in the 200 range, so to study the collective peculiar phenomena; and thereafter, in circa 2009, began to bring order to a previous-disorganized subject (e.g. Adragon De Mello at age 5, as his parents over-zealously asserted,

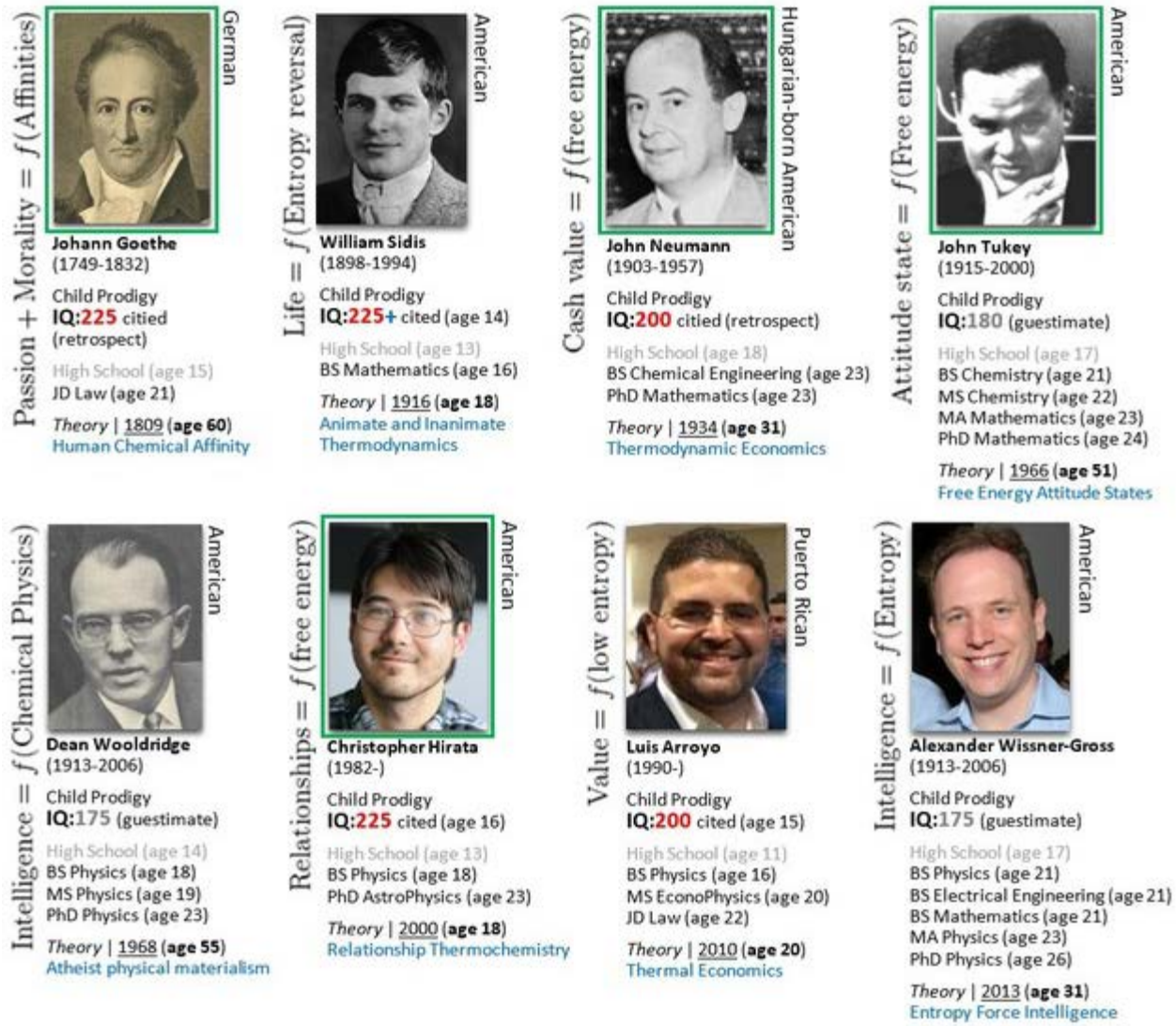

A visual of the so-called "battle of the prodigies", the finding that modern IQ:200+ and or IQ:225+ range prodigies tend to be attracted to a variant of the "elective affinities problem", i.e. the "passions" explained chemical thermodynamically, **Thims**' area of research, in the same way that all classical geniuses, from Aristotle to Einstein, were attracted to the "blue sky problem" before its solution by John Strutt in 1899.

did not "really" have an "IQ" of 400; William Sidis at age 11 [nor as an adult] did not "really" have an IQ of 300; Marilyn Savant, who faked an age 11 claimed IQ of 228, by fudging her age when she took the Stanford-Binet, to Guinness Book in the 1980s, is not the smartest person ever, etc., as IQ folklore asserts) [7] The following quote seems to capture the mindset of those, such as Dominic Anderton, who would classify Thims as a delusional moron:

> "Sadly logic barely has any significance amongst a swarm of imbeciles. Some people are doomed to feel like an alien."
>
> — Torandrius (2011), commentary on Libb Thims' HumanChemistry101 YouTube channel (O)

Thus, for those multitudinous individuals, moving around the surface of the earth, in deluded superficial secularity, who seemly to believe that Thims is a "retard" who, over the course of eight years, at a rate of 500-articles per year, wrote a 10-volume encyclopedia (*Hmolpedia*) online (EoHT.info) for the purposes of being an "elaborate troll" are mentally centuries behind (see: catch up effect) understanding the reinterpretation of "purpose" as a function of the Gibbs energy minimization principle as American physics prodigy Bruce Lindsay so ably discerned several decades ago:

> "The **concept of purpose** is involved in several physical principles, notably Hamilton's principle and the

related but identical principle of least action, Hertz's principle of the straightest path, Gauss' principle of least constraint, and Fermat's principle of least time. They all effectively state that things take place in the physical world, e.g. the motions of systems of particles, in such a way as to make a certain function assume a stationary value under certain boundary conditions, usually a minimum as compared with all possible values satisfying the given conditions. Hamilton's principle, e.g., says that for a conservative dynamical system the motion between any two instants of time is such that the time integral of the difference between the kinetic and potential energies taken between these two instances has a stationary value. It has as if the system had a certain purpose to satisfy. A rational individual is said to arrange his actions so as to be sure of achieving his fundamental desires, whether it be to accumulate wealth or gain power over his fellow men. In particular, the aim here is almost always to try to attain the given desired end at minimum cost in human effort. This strongly suggests a heuristic connection with the minimum principles of physics."

— Bruce Lindsay (1983), "Social Exemplifications of Physical Principles"

The above paragraph, written by Lindsay at age 83, was his "after career" retirement philosophy stage "note on the meaning of existence", after previously completing his MS physics (age 20), then after studying under Niels Bohr, then completing his PhD (age 24) at MIT, after which three years later, as a newly-minted Yale physics professor, penned the following preliminary article, written in the "brashness of his youth", as he says in retrospect:

- **Lindsay | IQ:?** | Theory: "Physical Laws and Social Phenomena" (1927 | age 27)

Thims, in short, is NOT letting go the "brashness of his youth", as Lindsay did, only to patter about Gibbs potential "notes on existence" in his 80s, put rather instead has worked to promulgate out the details of what Lindsay "suggests" in replete detail. If there are imbeciles opposed to this venture, or not discerning enough to see forest amid the trees, then so is the wind of the times.

On the other hand, once a scale of the top 500 geniuses is cogently arranged, one, if they are a discerning intellect pushing the boundary of established knowledge, he or she should be able to gauge whom they believe they fall above and below and thereby have a relative gauge of their "IQ state", i.e. IQ at in a given time period of intellectual advancement.

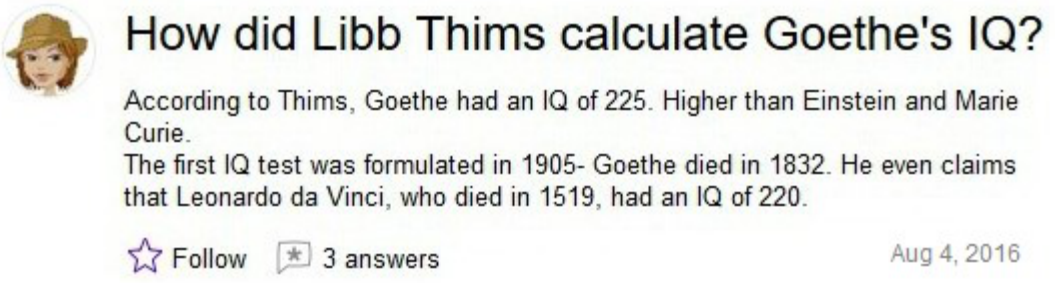

A 2016 Yahoo! Answers query (Q) on the method (see: IQ ranking methodology) used by Libb Thims to calculate Goethe's IQ.

"Thims' website [EoHT.info] is [in part] dedicated to the estimations of the IQs of the world's greatest geniuses, and does have some interesting information, but is riddled with historical inaccuracies. Thims, moreover, is a delusional moron of a man, with far too much spare time, who equates his intellect with that of Goethe and Einstein on almost no basis whatsoever, and who believes he can measure the likes of the IQs of Voltaire, Leibniz or Pascal. He even won an Ig Nobel Prize! (A satirical honour)."

— Dominic Anderton (2015), David Hume + Voltaire political philosopher (O) [6]

Here, we see an example, in this Anderton statement, of replete and thoroughgoing colloquial ignorance; very common among those not schooled in chemical thermodynamics and imbibed with a Faraday-like puzzlement about the world:

> "Let us now consider, for a little while, how wonderfully we stand upon this world. Here it is we are born, bred, and live, and yet we view these things with an almost entire absence of wonder to ourselves respecting the way in which all this happens. So small, indeed, is our wonder, that we are never taken by surprise; and I do think that, to a young person of ten, fifteen or twenty years of age, perhaps the first sight of a cataract or a mountain would occasion him more surprise than he had ever felt concerning the means of his own existence: How he came here; how he lives; by what means he stands upright; and through what means he moves about from place to place. We come into this world, we live, and depart from it, without our thoughts being called specifically to consider how all this takes place; and were it not for the exertions of some few inquiring minds, who have looked into these things, and ascertained the very beautiful laws and conditions by which we do live and stand upon the earth, we should hardly be aware that there was anything wonderful in it. These inquiries, which have occupied philosophers from the earliest days, when they first began to find out the laws by which we grow, and exist, and enjoy ourselves, up to the present time, have shown us that all this was effected in consequence of the existence of certain *forces*, or abilities to do things, or *powers*, that are so common that nothing can be more so; for nothing is commoner than the wonderful powers by which we are enabled to stand upright: they are essential to our existence every moment."
>
> — Michael Faraday (1859), *On the Various Forces of Matter*

Those who do not understand what Faraday is saying here are completely abysmal to reality.

Hmolpedia | Geniuses

The above queries result because Hmolpedia, owing to the predominance of IQ: 200+, e.g. Voltaire, and IQ: 225+ thinkers, e.g. Goethe, Sidis, Hirata, common to the subject of explaining human existence and experience via the physical sciences, and its YouTube sister channel HumanChemistry101, have become come a popular genius and IQ site. The adjacent screenshot, to exemplify, is a Dec 2013 Google-generated search return hyperlinked infobox for query "Hmolpedia", indicating—that Hmolpedia, for many, has become a popular go-to cite for genius IQs rankings; hence the IQ and or intellectual credentials or "**genius ranking**" of site creator Libb Thims is a common query.

A Dec 2013 Google-generated search return box for query "Hmolpedia", showing how IQ:200+, IQ:225+, and genius IQs are top visited pages.

Thims professorship

See also: Nightingale chair of social physics

Thims, as of 2013, has professed (see: Thims lectures) at three universities worldwide: University of Pitesti, Pitesti, Romania (2013), Northern Illinois University (2013), and University of Illinois, Chicago (2010-2012), giving a total of five lectures. Thims is currently working to establish a professorship of physicochemical humanities and or physical humanities at one of the top seven universities of the world; for a number reasons, including that since *circa* 2008 college and gradate students have been contacting Thims about doing graduate and or post-graduate school work, e.g. Turkey mechanical engineer Turkey13 (2009) (Q), interested in MS in Cengel-Boles themed human thermodynamics, Italian theoretical physicist Simone Loreti (2012), interested in a PhD in sociophysics (or at most socio-econo-physics)

or human thermodynamics, Iranian economist Behrouz Sadeghi (2014), interested in economic thermodynamics, specifically post-doctoral work in entropy, etc. (see: two cultures calls).

Quotes | Related

The following are related quotes:

> "I think [**Thims**] is a pretty cool guy, he ranks IQ and doesn't get afraid of anything [or] official IQ rankings. Why do people get so worked up over IQ? Because they're scared little monkeys."
>
> — IJustWantToSignIn (2013), comment (Q) on IQ 200+ | Smartest person ever (4 of 4), Nov 10

> "I found this site [HT.com] run by some Libb Thims that claims to have found the 'human molecule' [see: human molecular formula]. He wrote a 824-page book [*Human Chemistry*] on the subject. The site has some convincing testimonials. I think this stuff is ridiculous, and don't endorse it in any way. Just look at this article he wrote about himself (Q). According to himself, his IQ is comparable to that of Goethe and da Vinci."
>
> — Anon (2013), "Science & Math" post (Q), 4Chandata.org, Dec 15.

> "Once he's ventured into IQ territory, Libb Thims is a jive turkey, plain and simple. Here's his take on psychometrics: If a person agrees with "human thermodynamics" (Libb's area of study), then he/she has a super-high IQ. If someone disagrees with human thermodynamics, then he/she has a low IQ, and probably is a closet Christian, to boot. He cites Cox's book, even though Cox's book presents ratio IQs, which aren't reliable. He thinks IQs above 150/160 exist, and even believes IQs as high as 230 exist. But Thims' knowledge within the discipline of chemistry is abysmal. He's definitely super smart."
>
> — Stetind (2016), "Einstein's IQ" (Q), thread post, Feb 20

A portion of the "genius studies" books section of American electrochemical engineer Libb Thims' personal home library of *circa* 1,500 books.

"I agree with Gladyshev's 2012 statement that 'Goethe's affinity can be interpreted on the basis of supramolecular thermodynamics. Changing of the Gibbs function occurring on the supramolecular structure level in complex systems (organisms). The affinity of Goethe is related to the phenomenon of sensory tropism', but the reason **Libb** peddles Goethe and Hirata (although unlike Goethe, Hirata is the real deal) is that he thinks it allows him to peddle his 'human chemistry' BS, which in turn, he thinks will make it easier for him to peddle and sell his BS scam books on *Human Chemistry*. Essentially his entire website [eoht.info] is a book scam operation to try and sell his book. It's funny that he goes on to give the illusion that there are other posters that agree with him. He has done the same laughable tactic where he cites some quote from some anon poster on how brilliant he is and that becomes the proof that he supposedly has an IQ in the range of 170-220. For the record NO ONE has an IQ over 200 despite what anyone claims. Having said that I certainly

would put Fields medalist Manjul Bhargava (Q) ahead of Goethe any day."

— Anon (2016), "Goethe is Overrated", tread (Q) posts (#9-10), made from McMinnville, Oregon, Mar 3

"I love this site. It's pure genius. I have never seen someone **rank geniuses** [see: top 1000 geniuses] **in such a brilliant way**. I dedicated a [468+ genius] genealogy project (Q) to your work. You even have a [Geni.com] profile (Q) … because I feel your work deserves wider recognition. I am fairly intuitive … I feel you are descended from Goethe (or another genius on your list)."

— Alex Bickle (2017), cite [oye777] message to Libb Thims, Feb 22, 25

"Dude, [Thims] is the 'new Goethe'! He's capable of literally sensing people's IQ scores even if they were born long before IQ even existed."

— KizzMyButt (2017), comment on VeekyForum.com science thread (Q) on Libb Thims, and related topics, specifically: human molecule, zerotheism for kids, and dihumanide molecule, Mar 11

"Thims is the smartest person of all time."

— SharpCharm (2017), comment on VeekyForum.com science thread (Q) on Libb Thims, and related topics, specifically: human molecule, zerotheism for kids, and dihumanide molecule, Mar 11

Quotes | By

The following are related quotes by Thims:

"Also, to clarify, I read your book in detail, cover to cover, and this reading is inclusive of my standard dissection of books method of pencil noting commenting, boxing in of certain text, stars, checks, boxes, dates, question marks, "what" comments, one or two occasional highlights for exceptional sentences (which in your case amounted to one, namely your statement that Seth Lloyd writes in a "way of telling the story" that "misrepresents the history", which is strikingly true, hence I highlighted it), circles

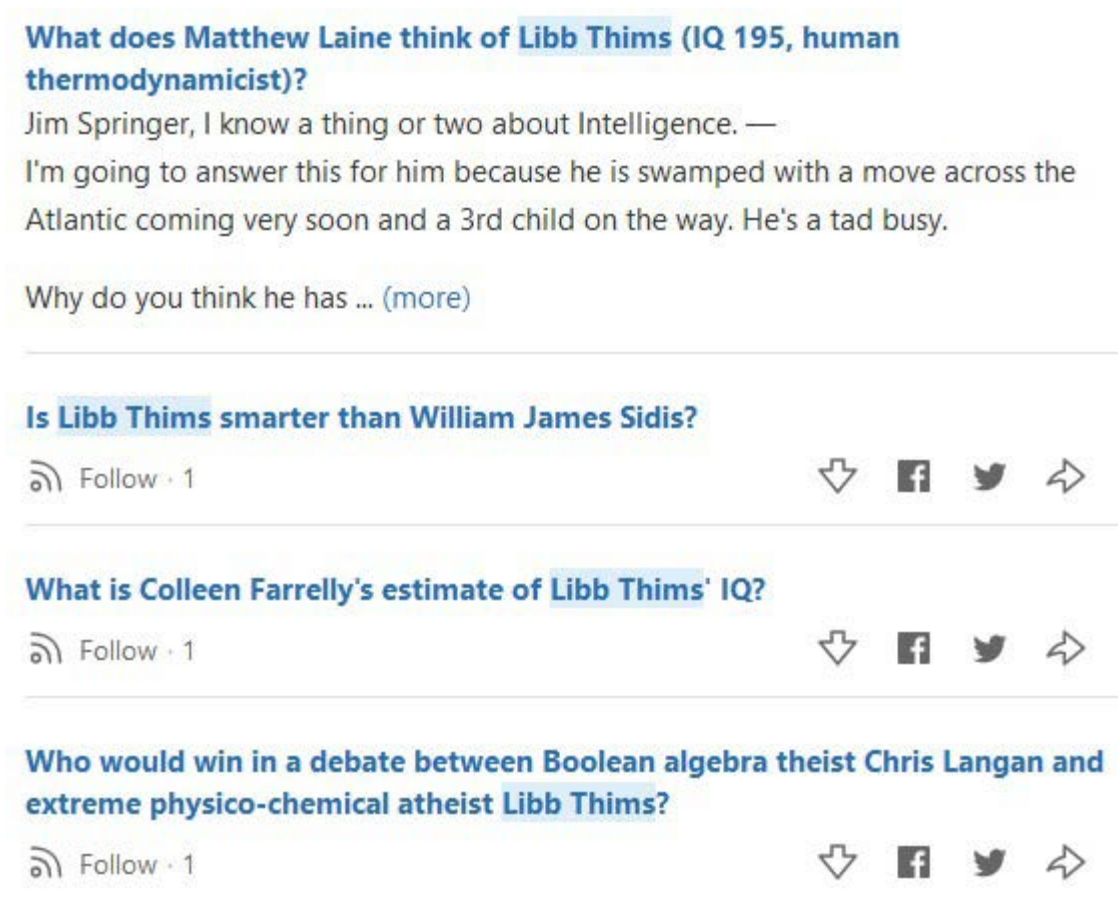

A smattering of Quora search returns (Q) for key: Libb Thims (Nov 2019), in attempts to guage Thims in respect to: Matthew Laine, William Sidis, Colleen Farrelly, and Christopher Langan.

around certain foot notes,
etc., etc., etc., which in your case amounted to a total of **1,340 pencil dissection incidences**, all the way through your Glossary, Notes, References, Index, up through your second to last page (#601), where I box in all your usages of the term "vitalism", one notation example of which I scanned and will post on the above wiki review page [shown below], namely notation note #1250 your date typo of the Schneider and Kay reference, which you incorrectly put as 1997 (pg. 561), whereas it should correctly be 1994. I then let the book sit for some time, read two other books [Karl Pearson's 1892 *The Grammar of Science* and Francis Crick's 1996 *Of Molecules and Men*], as discussed, then came back to it, went through all 1,340 notation and commentary notes AGAIN and wrote this article with my "remarkably poisoned pen" as you call it."

— Libb Thims (2013), response (Q) to Terrence Deacon that "I didn't read his book", May 22

See also

- IQ ranking methodology

Notes

N1. Quote: "If [Thims] is willing to give me the necessary information, I shall use my IQ methodology to calculate his IQ. Otherwise, I will leave it at these vague estimates...I do not see Mr. Thims' IQ being below 190, however." [10]
N2. Note: comment was getting vote-liked up ↑ at a rate of: 1.5 thumbs-up votes / 336 views · day (34+ thumbs up, i.e. agreements, in three weeks, before Thims deleted comment).
N3. See: dihumanide molecule; polyhumanide molecule; human reproduction reaction; zerotheism for kids; commentary after reviewing 100-page manuscript of **Thims**' *Cessation Thermodynamics*, Apr 29

References

1. Two examples being Oxford-Harvard-Yale educated high like rankings figure David Hwang and MIT engineering school triple major valedictorian Alexander Wissner-Gross, both of whom commented via email communication that it was difficult to fixate a position in the genius IQs table; the former commented that, in his humble opinion, did not belong in the list of geniuses.
2. Note: David Bossens quote recalled from memory; a deleted thread lost somewhere in Hmolpedia forums (c. 2012) below possibly IQ: 225+ page or epicenter genius page?
3. Thims, Libb. (2013). Query: "Who are you, a professor somewhere? And what is your IQ?"; asked (Q) by Paul Rael, Aug.
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6. (a) Anderton, Dominic. (2015). "Vanity and Insanity in Online High Range IQ Testing" (Q), The Scriblerus Club, Mar 31.
(b) Dominic Anderton (about) – High IQ Society, Wix.com.
7. Comedy and Libb's so-called IQ (2016) – Hmolpedia threads.
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(b) Bertrand, Natasha. (2015). "The 40 Smartest People of All Time" (Q), Business Insider, Feb 27.
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13. Anon. (2014). "Alan Turing the Runner" (Q), The Runner Eclectic, WordPress, Dec 1.

θΔics

In hmolscience, **Libb Thims (history)** page traces the origin and development of the work of American electrochemical engineer Libb Thims' in the newly-forming sciences of human chemistry, human physics, and human thermodynamics, physical humanities, and human chemical thermodynamics.

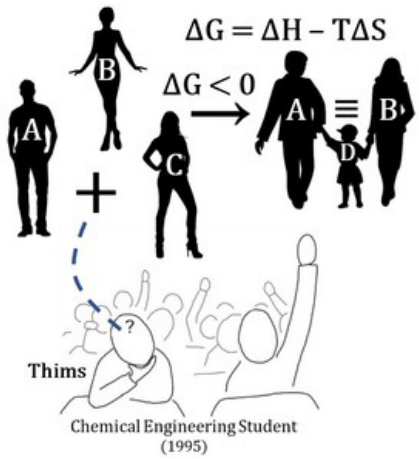

FALL 1994	ENGIN	CHEM ENG	JUNIOR		Grade	Hours
CH E	230	THERMODYNAM I			A	4.00
ENGR	105	COMP COLL ENGR			B+	1.00
CHEM	302	INORG CHEM			A	3.00
ECON	201	PRINCIPLE ECON I			B+	4.00
Term Totals				GPA 3.708		12.00
Cumulative Totals				GPA 3.708		
WINTER 1995	ENGIN	CHEM ENG	JUNIOR		Grade	Hours
AO&SS	467	BIOGEOCHEM			A-	3.00
CH E	330	THERMODYN II <---?			A-	4.00
CH E	341	FLUID MECHANICS			A-	3.00
HIST	366	20TH C AMER WARS			B+	4.00
Term Totals				GPA 3.585		14.00
Cumulative Totals				GPA 3.642		
SPRING 1995	ENGIN	CHEM ENG	SENIOR		Grade	Hours
CHEM	468	PHYSICAL CHEM			A	4.00
Term Totals				GPA 4.000		4.00
Cumulative Totals				GPA 3.690		
FALL 1995	ENGIN	CHEM ENG	SENIOR		Grade	Hours
AERO	200	INTRO AERO ENG			A	3.00
CH E	342	HEAT & MASS TRANS			A	3.00
CH E	343	SEPAR PROCESS			B-	3.00
CH E	486	PROC SIM & DES I			B+	3.00
Term Totals				GPA 3.500		12.00
Cumulative Totals				GPA 3.635		

Left: a mock picture of Thims at the Dow building, home to the chemical engineering department of the University of Michigan, in which American electrochemical engineer Libb Thims, in *circa* 1995, began to ruminate on the nature of mate selection in relation to the application of chemical thermodynamic reaction spontaneity prediction (ΔG < 0) to human mating relationships viewed as purely human chemical reactions. Right: Thims' 1994-1995 **coursework**, during which time, in one of these classes (thermodynamics I, thermodynamics II, physical chemistry, or heat and mass transfer) the seed for the search to understand the subject of "human chemical thermodynamics" was planted.

Overview

From an early age, Libb Thims was very curious about some of the deeper questions of existence, such as "what exactly constitutes a 'wrong' action?" (see: moral movement), "what happens to a person when they die? (no bull shit)" (see: defunct theory of life), "what is the utility of this 'buzz' we get from various activities, things, and people in existence?" (see: Captain → Major) , "what 'rules' are to be used when selecting for the perfect mate?" (see: how to pick the right one? (2003); perfect love), "what is the **point** of every thing?", "why does the universe 'force' a person to have some sort of plan when transitioning into adulthood?", "why is physical attractiveness inversely proportional to neurological attractiveness?" (see: Beckhap's law), "how accurate is the good genes hypothesis?", "why exactly is a person supposed to get married?", "is there some formula, from science, that is able to model, calculate, or to define love?" (see: equation of love), "what is the whole deal with religion—is it all evolved mythology?" (see: Ra theology), "why are we physically attracted to people who differ from our own complexion and ethnicity by a certain amount?" (see: 15 degree rule; sweaty T-shirt study), "why are we extremely attracted to people who are confident in areas where we are insecure?" (see: dodecabond hypothesis), "what does it mean when a person exclaims they 'are so full of life'?" (see: ???), "why should a person's family wealth and status make them more attractive?" (see: ???), "what if everything a person does to advance themselves, results to get people to fall for them for the wrong reasons (vanity)?" (see: Anton Chigurh quote: "If the rule you followed brought you to this, of what use was the rule?" (O)) (see: coupling theory), and "is the point of everything, for a man, simply (a) get a fancy job, (b) hook the right fish?" (see: coupling theory), etc.

Two of the earliest queries, puzzled over before entering grade school, *circa* age three to six, were the questions: "where does god live?" (asked to an elder) (see: Dawkins number) and "what is this sense of evil felt in regard to the accidental destruction of life? (pondered in the mind, after a newly found blue-green bird's nest egg was accidentally (or possibly not accidentally?) dropped off a second story balcony, falling to the ground, to crack open).

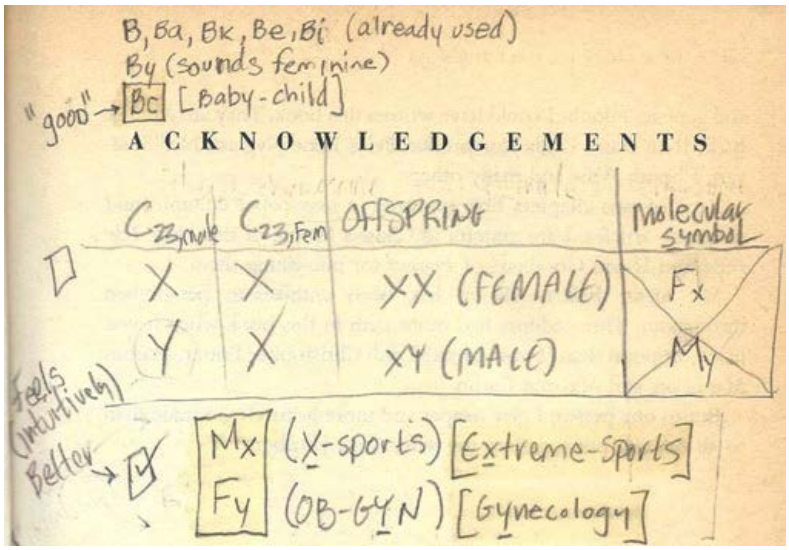

Circa 2002 hand-written notes by American electrochemical engineer Libb Thims, in the front matter of his copy of Matt Ridley's *Genome: the Autobiography of a Species in 23 Chapters* (1999), wherein he is attempting to formulate a chemical symbol notation for a male Mx, female Fy, and baby Bc, per the reproductive reaction, Thims had in mind, in his early years of theory development (1995-2003):

1995: Male + Female → Baby

2001: $M(s) + F(s) \longrightarrow B(s)$

2002: Mx + Fy → Bc

prior to his *circa* 2003 realization that the human reproduction reaction was a double displacement reaction of the form:

Short history

The following is a short history, previously written up and posted online in 2005: [12]

> First, on 15 Nov 2001 at 3:00 AM, Thims solved the problem of applying the Gibbs free energy equation
>
> $$\Delta G = \Delta H - T\Delta S$$
>
> to the human reaction mechanism, i.e. human life; after seven year's worth of puzzle dabbling.
>
> Second, on 12/05/01, Thims decided it would be advisable to write a short book to present this solution; having never before had any aspirations to write.
>
> Third, through 2002-03 Thims read approximately 250 variegated books in efforts to determine if such a presentation had already been said, done, and discarded; resultantly, only a few partial presentations were found—none being fully defined.
>
> Fourth, by 11/10/03 an 850-pg rough draft was in place. This crude copy was then filtered through the first reviewer, a University of Chicago MBA graduate, for 'likeability' and 'understandability'. This reviewer liked, understood, agreed with everything.

Fifth, in 2004 Thims began filtering the book through about 12 reviewers.

Sixth, by 2005 Thims decided to split the now 1,000-pg book titled 'Human Thermodynamics' [encompassing 500 scientific references, 50 original research projects, 2,000 in-person survey data points, and 10 proofs] into three separate volumes [VI-VIII].

2003: $AB + CD \rightarrow AC + BD$

where the molecular components "B" and "D" are the germ cells of each person, i.e. sperm and egg, AC is a dihumanide molecule, in possession of a human chemical bond "A≡C", in which a quantifiable amount of Gibbs free energy is stored, in the form of bond energy, per the Fritz Lipmann coupling theory, and BD is the newly-formed child at the point of parental detachment (age 18).

(add)

Excel spreadsheet

See main: Thims thought experiment; See also: Love thought experiment

Skipping forward about a dozen or so years, in *circa* 1992-1993, in an attempt to figure out how to go about choosing who to marry, as a freshman pre-engineering student, Thims made an excel-style spread sheet table of the top nineteen girlfriends, whom he could potentially marry, listing each person on the horizontal and listing a range of point ranked attributes, qualities, or factors on the vertical, in an attempt to get a numerical "marriage quality value" for each girlfriend. The resulting solutions, however, did not seem to intuitively make any sense.

The original table spreadsheet has since been destroyed (similar to Goethe who destroyed all the notes, tables, and drafts that went into his *Elective Affinities*). A mock reconstruction of Thims' *circa* 1992 trait-based mate selection table, using random female photos (and hotness rating) from Pictures2Rate.com and mock traits (and scores), is shown below:

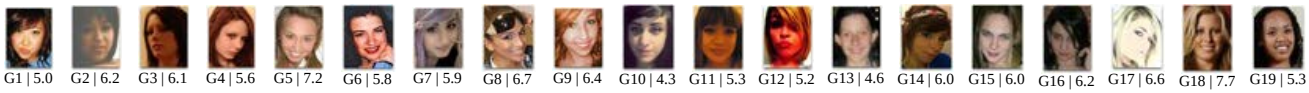

	G1 | 5.0	G2 | 6.2	G3 | 6.1	G4 | 5.6	G5 | 7.2	G6 | 5.8	G7 | 5.9	G8 | 6.7	G9 | 6.4	G10 | 4.3	G11 | 5.3	G12 | 5.2	G13 | 4.6	G14 | 6.0	G15 | 6.0	G16 | 6.2	G17 | 6.6	G18 | 7.7	G19 | 5.3
(20) Grandmother likes	2	5	3	7	12	10	5	5	20	3	5	2	8	15	8	5	0	10	10
(15) Spontaneity	10	3	8	8	10	5	15	10	15	5	5	5	10	5	12	12	12	10	10
(15) Fun factor	12	4	5	8	8	8	15	12	15	5	5	2	10	8	5	5	8	5	8
(10) Fitness	8	0	5	7	10	5	10	8	10	3	7	8	8	8	7	8	8	10	8
(10) Hair	10	5	5	8	7	10	5	6	5	4	10	5	4	4	4	7	7	9	8
(10) Eyes	8	5	2	5	8	10	8	9	10	5	6	5	3	5	5	6	7	7	7
(15) Body	12	2	10	10	12	5	5	10	10	2	8	5	4	4	18	4	10	15	12
(25) Intelligence	15	20	15	8	8	12	15	5	25	5	10	5	20	15	15	8	8	10	10
(20) Character	15	15	5	3	5	5	10	5	20	5	0	0	10	15	15	10	5	5	10
(10) Class	5	10	5	6	10	5	10	7	10	3	5	3	5	5	5	5	5	8	5
TOTAL =	82	69	63	70	90	75	98	77	140	40	61	35	82	84	84	70	70	90	80

The resulting solutions, however, did not seem to intuitively make any sense. The one who is physically the "hottest" according to general opinion is female #18 (Ella), who scores 7.7 on the hot or not 1-10 scale. Heat, however, as Thims would come to learn, if this number is indeed representative of physical heat, is not the sole determining factor of whether a reaction will go, as the debacle of the famous thermal theory of affinity showed. The one who scores the highest on the meta-ranking method is female #9 (Ava), who scores 140. Sometime herein, before, or after, Thims began to read up on mate selection, evolutionary psychology, physical attractiveness research, etc., to study the issue further (see: Thims' mate selection book collection).

The subject of the governing relation of the interactions of human relationship with that of chemical thermodynamics originated in *circa* 1995 during Thims' years as a chemical engineering student at the University of Michigan and his curiosity as to how the spontaneity criterion of chemical thermodynamics applies to the successfulness of mate selection or prediction in the action of love the chemical reaction.

In this period, and the years to follow, Thims began to seek a thermodynamic understanding of the human existence process, especially as thermodynamics relates to mate selection and the nature of love.

Evolutionary psychology

In 1993, David Buss conduced a sexual receptiveness study (see: Buss sexual receptivity study), per occupation of the male; the results of which are shown below:

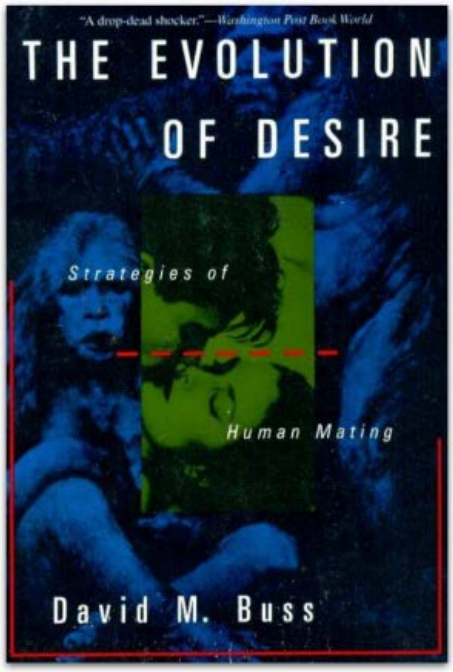

The results on David Buss' *circa* 1993 occupation versus sexual receptiveness study, which intuited to Libb Thims, in *circa* 2001, that this preference effect must be connected and quantifiable to changes in the statemeasurement of the entropy of a person or couple.

In this study, conducted by Buss and his graduate student Jennifer Semmelroth, 109 college women were asked how flattered the would feel by either being asked out on a date or (in a second study) by an outright sexual proposition by various men, differing by occupation, on a Likert scale of 7 'most upset' to 1 'least upset'.

In c.1994-1995, Thims came across David Buss' newly-published 1994 book *The Evolution of Desire*, which contained the above study, containing the results of a robust study on mate selection of 10,000 people of all ages from thirty-seven cultures worldwide, which presented a rather eye-opening and straight-forward look at the nuts and bolts of mate selection, in regards to what specific factors affect sexual attractiveness and sexual repulsiveness, from both the male and female perspective.

In a thermodynamic point of view, occupation is pure measure of work, in a physical sense, whereas, similarly, the closer the typical man is to the 'least upset' range (1.00), the easier it will be for him to date or have sex with a 'hotter' female, in a physical sense, and with human thermodynamics being the study of the relationship between heat and work and other forms of energy, involved in the dynamics of human systems, the results of the above study is representative of quintessential human thermodynamics.

This obvious and quantifiable pattern in sexual receptiveness, in the mind of Thims, was something that had to have a governing connection to the spontaneity criterion of chemical thermodynamics: [1]

$\Delta G < 0$ (spontaneous or energetically "favored" reaction)

and in particular to changes in the state variables of enthalpy change and entropy change:

$$\Delta G = \Delta H - T\Delta S$$

as Thims was learning it in his chemical engineering thermodynamics coursework at the University of Michigan. These two aspects functioned as fundamental anchor points in the mind of Thims.

Some time in this period, while learning the subject of chemical engineering thermodynamics, according to the textbook of American chemical engineer Stanley Sandler, at one point, during lectures, Thims had the urge to raise his hand in class and ask how chemical thermodynamics applies to predictions of human relationships, but for whatever reason he kept mum and instead sought to figure out the subject on his own.

In any event, in the years to follow his thermodynamics classes, having never before read anything about his previously, Thims began his search of the literature as a sort of passing hobby.

The seeds of the puzzle thus remained planted in Thims' mind.

During the course of followup investigation, in the years to follow, Thims began to wonder if anyone had ever applied the logic of chemical reaction prediction, as embodied in standard thermodynamic tables of free energies, enthalpies, and entropies, to the extrapolative prediction of human chemical reactions, such as between potential intimate pairs in reproductive reactions?

For the next several years the situation remained a nearly black box puzzle, with the logic of the situation, i.e. how chemical thermodynamics, particularly the Gibbs free energy equation:

$$\Delta G = \Delta H - T\Delta S$$

relates to mate selection, being a personal and confusing riddle of sorts:

$\Delta G < 0$ signifies a spontaneous (energetically favored) reaction
$\Delta G > 0$ signifies a non-spontaneous reaction (one that would require energy)

Over the next six years, Thims kept the problem in the back of his head, and from time-to-time tried to figure it out on scratch paper and readings of potentially related works. The basic problem, as Thims saw it during these years, was to figure out how the ubiquitous basic human reproduction:

$$A + B \rightarrow C$$

in which *A* and *B* are the reactants (the dating pair) and *C* is the product (a 15-year old child) could be predicted using the standard Gibbs free energy equation:

$$\Delta G = \Delta H - T\Delta S$$

supposing that person *A* was to be hypothetically paired up with three potential mates (*B*, *D*, *E*):

$$A + B \rightarrow \text{Child}$$

$$A + D \rightarrow \text{Child}$$

$$A + E \rightarrow \text{Child}$$

In short, how would one use the logic of chemical thermodynamics and its ability to predict reactions to help them determine who they should marry? In other words, which of the above reactions, 1, 2, or 3, would be more spontaneous and thus more energetically favored?

The puzzle, however, remained a mystery during these years. The key issue was to understand how instantaneous values of "enthalpy" H and "entropy" S change, per component species, second-by-second, over the period of 18-years, from the second the two potentials (*A* and *B*) meet to the time the product (the child) is 15-years old and begins to detach from the parental structure.

On November 15, 2001, at 3:00 AM, however, while up memorizing anatomy and while reading English astrophysicist Stephen Hawking's famous 1996 *The Illustrated: A Brief History of Time*, which contains discussions on changes in the entropy of the human central nervous system, and a correlative human neurological order change diagram (adjacent), with the caption:

> "Reading this book will have increased the amount of ordered information in your brain. However, during the same time, heat released by your body will have had a much greater effect increasing the disorder in the rest of the universe."

Although this perspective has its issues, as Thims would come to learn, it provided a handle on how to make sense of the Buss occupational sexual receptiveness data in regards to how educational advance would effect changes in the entropy of a person and thus be correlative with a sexual receptiveness increase, which would be measured quantitatively by a larger negative Gibbs free energy change in course of either the human reproduction reaction or male-female reaction.

English astrophysicist Stephen Hawking's 1996 human neurological entropy change diagram associated with the reading

In short, Thims intuited the idea that when one educates themselves, over a period of 10-20 years, such as in the pursuit of an occupation or career, that their neurological entropy changes as a result. With this clue, and with previous ideas by Thims that changes in values of human enthalpy, in some way, correlates to physical heat (physical attractiveness) and correlative changes in perceptual levels of beauty, Thims was able to put the puzzle together, at least to a good first approximation, thus connecting second-by-second changes in a person's values of G, H, S, over evolutions of decades, with human mating.

of a book.

At this point, Thims thus solved, as a first approximation, the Gibbs free energy equation's applicability to the basic human reaction mechanism, namely:

$$A + B \rightarrow C$$

in which *A* and *B* are a man and a woman, at the contact point (or collision point) of their relationship, i.e. the day one first sights the other, and *C* is a 15-year old child. Thims penned out the working outline of this solution in the following scratch paper note:

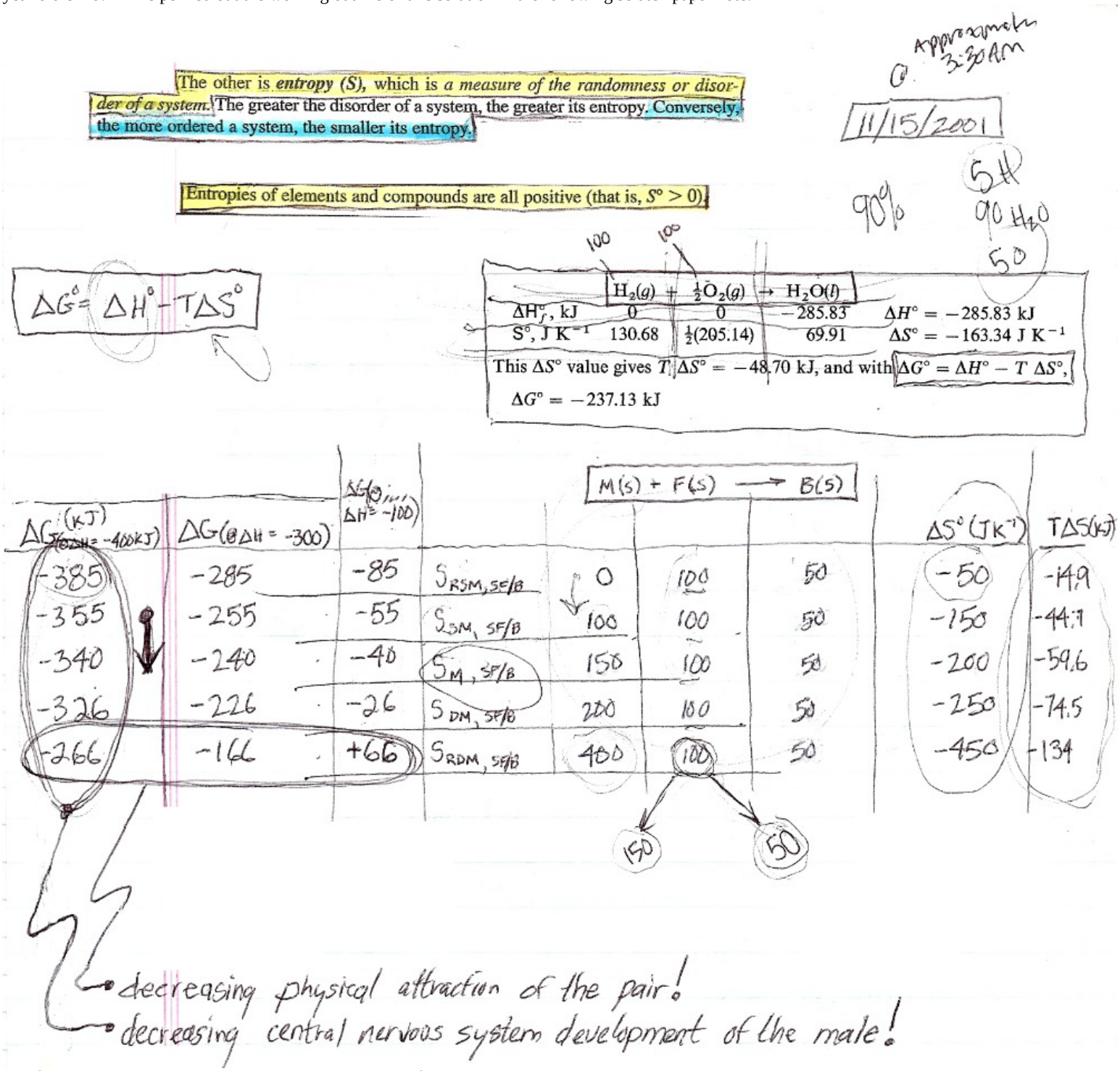

The following is a latter remade color annotated version of the above: [11]

ΔG [@ΔH=-400]	ΔG [@ΔH=-250]	ΔG [@ΔH=-100]	S_{Mx}	ΔS (J/K)	TΔS (kJ)
-460	-310	-160	0	200	59.6
-430	-280	-130	100	100	29.8
-415	-265	-115	150	50	14.9
-385	-235	-85	250	-50	-14.9
-340	-190	-40	400	-200	-59.6

I (male)

APA (male)

About a month later, Thims decided it would be of interest to society to write up a brief synopsis of this logic; figuring, incorrectly, that the presentation of the solution would only take a few months, at the most, to complete. Hence, in the months to follow, from 2001 to late 2004, Thims' began to conduct research into the subject of the thermodynamics of human existence.

In 2004, Thims had framed the general outline of the areas of human thermodynamics he was interested in presenting solution for in a list of 30 mandates. [10]

Human molecular formula

One of the eye-openers, that arose during this investigation, was the question of what exactly are these "entities" (M, F, B), atomically, that Thims was referring to in his use of chemical reaction models (M + F → B) of a male M and female F reacting to form a baby B.

Investigation into this query, in 2002, led Thims into a prolonged attempt to calculate the molecular formula for a human (see: human molecular formula), based on a collected synthesis of various mass composition tables, the first quick (non data based) attempt pictured adjacent.

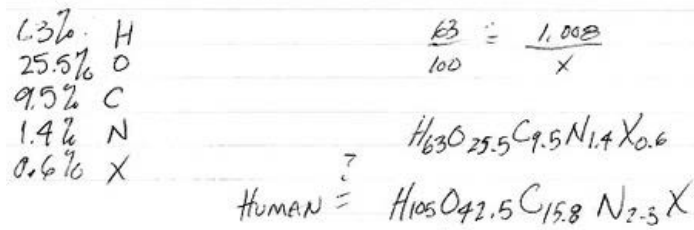

An early-stage, circa 2002, quickly-made scratch-paper attempt by American chemical engineer Libb Thims at the calculation of a crude-version molecular formula for a human, using a percentage ratio method. [7]

Thims stated, in the 2002 manuscript (chapter: What Happens When You Die?), that as based on mass percent tables, 26-elements are found to have function in the human body, that at approximately 200,000 years ago:

> "The universe had expanded-reacted enough ... to form a molecule made of these specific elements that we now define as homo sapien [as can be represented by the following] crude empirical formula for the molecular human."

taking vanadium (V) as unity:

$$H_{2.5E9}O_{9.7E8}C_{4.9E8}N_{4.7E7}P_{9.0E6}Ca_{8.9E6}K_{2.0E6}Na_{1.9E6}S_{1.6E6}Cl_{1.3E6}Mg_{3.0E5}Fe_{5.5E4}$$
$$F_{5.4E4}Zn_{1.2E4}Si_{9.1E3}Cu_{1.2E3}B_{7.1E2}Cr_{98}Mn_{93}Ni_{87}Se_{65}Sn_{64}I_{60}Mo_{19}Co_{17}V$$

This amounts to be a 26-element human empirical molecular formula. Thims concludes "by describing the existence of a human being in this form we are by no means making attempts to degrade our existence, we are only trying to help elucidate our understanding of this existence." Thims revised this calculation in the following years, and also calculated a human molecular formula.

Human chemical bond

In the course of the development of these manuscripts, a number of theoretical hurtles or conceptual "glass walls" had to be overcome. The first was that, from 2001 and 2002, Thims had neglected was to include the product "AB" (the marriage union entity) in his chemical equation calculations. In other words, a more complete version of the reproduction reaction is:

$$A + B \rightarrow AB + C$$

where the union "AB" is a new type of chemical entity, that had never before been addressed by the hard science community. This opened up a whole new puzzle. Prior to this, Thims specifically neglected the AB product, assuming that both parents had died prior to the child's C fifteenth birthday, and thus were a non-existence entity in the context of the end state energy calculations.

In other words, Thims had no conception of the "AB attachment" or bond (this detail was ignored in early 1995-2001 calculations) from a physics or

chemical point of view, such as would be the described by the attachment of two hydrogen atoms in the from a hydrogen molecule HH or H_2.

Subsequently, in late 2002 or early 2003, it soon became apparent to Thims that he was leaving out an important component of the reaction, i.e. the *AB bond* of the attached couple or married pair. The investigation then began to understand what this "AB bond" means from a chemical point of view or fundamental forces (gravity, electromagnetic, weak nuclear, strong nuclear) point of view. For at least a half a year or more, the issue remained a puzzle.

Soon, however, a number of views on the nature of the human chemical bond began to emerge.

On 10 Nov 2003, Thims synthesized the concept of human molecular orbital theory (a version of which is shown adjacent) as based on hybridized molecular orbital theory of small molecules according to the Schrödinger equation.

On 10 May 2004, Thims formulated the "field particle exchange theory" of inter-human molecular bonding as based on QED, QCD, particle physics, evolutionary psychology, and the fundamental particles, which define human molecules to be bonded electromagnetically via connections of either direct or indirect photon bonds. These theoretical points of view, among others, were combined with data from American psychologist John Gottman, who found, by studying 2,000 newly married couples, that stable marriage couples had 5-to-1 ratio of positive-to-negative exchanges in their microsecond interactions, to synthesize the basic outline of the human chemical bond.

At some time during this period the concept of human molecular spin was conceived.

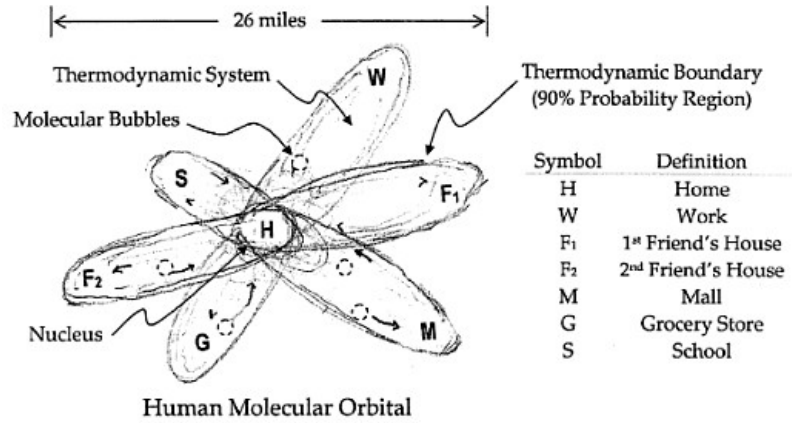

A thermodynamic system / molecular bubbles (Edward Hall, 1966) depiction of a human molecular orbital for one human molecule, or rather one person's average daily trajectories and movements, viewed at a sped-up rate of viewing, according to human molecular orbital theory, the theory of which was worked out in 2003 by Thims.

Beckhap's law

In 2002, one of the first research projects undertaken by Thims was to collect data on the relationship between occupation achievement level (or intellectual rank attainment) and physical attractiveness, in an attempt to find corroboration with the hypothesis that the Gibbs free energy equation:

$$\Delta G = \Delta H - T\Delta S$$

applied to human mate selection explains the apparent decrease in physical attractiveness of students the higher one goes up the educational ladder in respect to intellectual difficulty of subject matter. In other words that physical attractiveness tends to be inversely proportional to intellectual ability. Although unknown to Thims at the time, this phenomenon has been known by the name "Beckhap's law", which in short states that: [1]

> "Beauty times brains equals a constant."

Beckhap's law is sometimes referred to as the beauty-brains paradox (e.g. why are models always dumb, or nerds less physically attractive, etc., in plain speak), the rule that intelligence is inversely proportional to beauty, or that beauty varies inversely with intelligence, or that people aren't typically endowed with both beauty and brains, etc. In mathematical form, Beckhap's law states:

$$\text{beauty} \times \text{brains} = k$$

In simple terms, Beckhap's law captures the general understanding that beauty and brains tend not to be found in the same package; that best-looking or hottest people won't typically be found in math class; that models tend to be dumb; that physicians tend not to be beauty queens; and so on, in the sense that if one is heightened in the looks department, he or she will likely be deficient in the brains department, and vice versa. In more intuitive terms, using more politically correct language, this can be restated to the effect that Beckhap's law declares that, on average, one's level of physical attractiveness (beauty) *A* will be inversely proportional to one's intelligence (brains) *I*, a statement defined mathematically as :

$$A = \frac{k}{I}$$

Other usages can be found beyond this. Thims, in 2002, was unaware of the term "Beckhaps law" (a term he did not discover until 2010), but was keenly aware of the pattern the higher up the educational ladder he went, in terms of the decreasing physical attractiveness of his peers, specifically the rarity of high end female beauty in advanced engineering, science, and mathematics classes, chemical engineering in particular.

Corroboration

See main: Beckhap's law

In 2002, in an effort to get actual hands on statistical data to corroborate Beckhap's law, Libb Thims undertook an "Attractiveness vs. Intelligence" study of photos and corresponding graduation degrees of the 2,018 students of the graduating classes at the University of Illinois at Chicago (UIC) in the years 1969 and 1972, finding that when like groups of students are grouped (e.g. male engineers, female science majors, education degrees students, etc.) that within those groups physical attractiveness does indeed have an inverse relationship to intelligence. [8]

In more detail, in the course of the study, to determine if the inverse pattern, called by Thims the "beauty-brains paradox", exists statistically, in 2002 Thims conducted an 'attractiveness *A* vs. intelligence *I*' study, i.e. to determine if attractiveness is, in actuality, inversely proportional to intelligence.

Thims had one group of people rate the physical attractiveness of 2,018 college graduation photos, graduating classes of 1969 and 1972 at the University of Illinois at Chicago, and had a second group of people rate the intellectual difficulty of each degree obtained, for the people in those photos, albeit only being shown the name of the degree.

These two data sets were sorted by sex and grouped into similar categories. The results confirmed the theory. In the graduating classes of 1969 and 1972, for example, 670 female students obtained 67 different degrees. By comparing females who obtained science-related degrees, among other related groups, we obtain the plot shown above. [8]

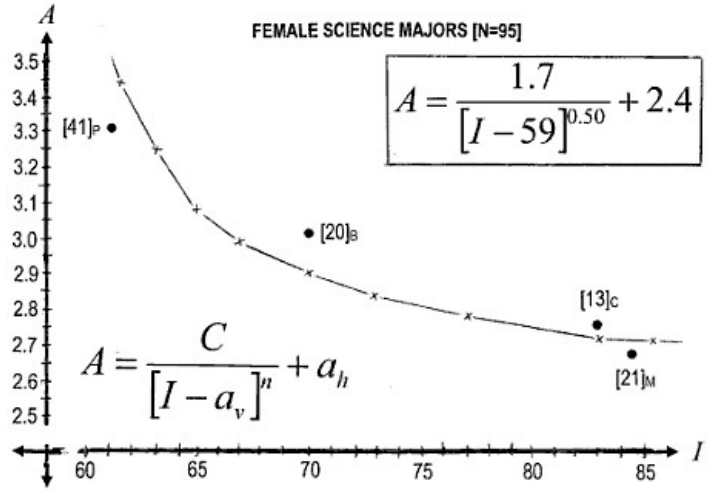

Attractiveness vs. Intelligence at UIC

A plot of the ranked data results, of the group "female science majors", from the 2002 study of 2,018 University of Illinois at Chicago (UIC) college graduation photos, graduating classes of 1969 and 1972, showing that attractiveness is inversely proportion, on average, to intelligence, a finding which corroborates **Beckhap's law**.

P = psychology, B = biology, C = chemistry, and M = mathematics, each with 41, 20, 13, and 21 students, respectively. Similarly, *A* = physical attractiveness (of group); on a scale of 7.0 = most physically attractive to 1.0 = least physically attractive; and *I* = intellectual difficulty (of degree); on a scale of 100 = most intellectually difficult to 10 = least intellectually difficult.

Thims then attempted to explain this finding by correlating the initial state G_i and final state G_f of the free energy change for a typical mating reaction to bulk values of attractiveness and intelligence involved in mate selection. A solution was found using the following two assumptions, first that enthalpy is proportional to physical attractiveness:

$$H = kA$$

second that entropy is inversely proportional to intelligence:

$$S = \frac{k}{I}$$

values which can used to represent the instantaneous 'state' of the reactive system at any given second on going from reactants to products. These can then be substituted into the Gibbs equation:

$$\Delta G = H_f - H_i - T(S_f - S_i)$$

to yield for an inverse relationship plot. Skipping over much of the derivation and discussion, using the two above approximations, and assuming that initial state of the reaction, in which two individuals, one male molecule Mx and one female molecule Fy, of varying levels of intelligence and beauty, is the day the pair fall in love at first sight, that they pair conceives one child, Bc, three years later, and that the end state of the reaction, coincides with the point of the fifteenth year of the growth of the child, after which the precipitate child molecule begins to detach from the parental structure. This gives the following simplified overall reaction mechanism:

$$M_X + F_Y \rightarrow B_C$$

On this model, the following variables can be be defined at day one (-3 years before conception) and the final day (+15 after conception):

$G_f = G_C^{15}$	Gibbs free energy of the state of the child, Bc, detached at age 15.
$G_i = G_X^{-3} + G_Y^{-3}$	Gibbs free energy of the state of two reactants, the male Mx and female molecule Fy, at the point of love at first sight.
$H_f = H_C^{15}$	Enthalpy of the state of the child, Bc, detached at age 15.

$H_i = H_X^{-3} + H_Y^{-3}$	Enthalpy of the state of the two reactants, the male Mx and female molecule Fy, at the point of love at first sight.
$S_f = S_C^{15}$	Entropy of the state of the child, Bc, detached at age 15.
$S_i = S_X^{-3} + S_Y^{-3}$	Entropy of of the state of the two reactants, the male Mx and female molecule Fy, at the point of love at first sight.

Using these time-specific variables, through a bit of substitution, one can derive the following result: [9]

$$A_X^{-3} = \frac{C_1}{I_X^{-3}} + C_2$$

which says that, owing to the constraints of the Gibbs equation, otherwise known as the combined law of thermodynamics, the physical attractiveness of the individual, in this case the male, will vary inversely with the intellect of the individual, on average, at the initial start to a typical romantic male-female reaction.

There are many issues, to note, with this proof, one being that the second assumption, that of entropy, using the disorder model of entropy, in human reactions, being inversely proportional to intelligence (mental order), is derived from gas theory, particularly the Boltzmann chaos assumption, in which particles are assumed to have non-correlative velocities, which is not the case with human molecules.

HumanThermodynamics.com

On 27 April 2005, Thims went public with the preliminaries of his work in human thermodynamics, with the launching of the laymanized-themed site HumanThermodynamics.com (eventual host to the follow-up *Journal of Human Thermodynamics*), with the central effort of linking up a global community thinkers in the field of applying thermodynamics to the questions of human existence, such as Georgi Gladyshev, Jing Chen, Elizabeth Porteus, Erich Muller, Lawrence Chin, and Gerard Nahum, among others.

The 2005-launched site HumanThermodynamics.com, intended to be a laymanized presentation of the subject of human thermodynamics.

In November of 2005, in order for contributors of the newly forming *Journal of Human Thermodynamics* to have a decent "human bond" article to reference for future writings, Thims attempted to write "On the Nature of the Human Chemical Bond", the world's first-ever unified article of this sort. [1] Thims, however, became frozen after writing the first 18-pages online. He arrived at the view that such an article, which would easily go past the 30-page limit, would be too large to fit on a webpage. Subsequently, this fact, along with dozens of internet arguments with other chemists and physicist that the idea of "human chemistry" is some kind of joke, was one of the preliminary goads that lead to the eventual writing the 2007 two-volume *Human Chemistry* textbook.

The tipping point came on November 24, 2005, when Thims added a link to the Wikipedia chemistry article to an overview of "human chemical reactions", and within fifteen minutes the overview was skimmed and the link was removed, by an American high school geology teacher (VSmith, MS geology) with the following reasoning:

> "The presentation of love viewed as a human chemical reaction between two human molecules (Mx + Fy → MxFy) is good for a laugh, but not much else."

Of note, this last quote was, in large part, the "straw that broke the camel's back", in the irritation level of Thims' mind, impelling him into the irreversible task of writing up the world's first textbook on the subject of human chemistry, a process which took 18-months and 14-days, being completed in September of 2007.

This new human molecular discernment, along with a prolonged effort to derive a working model for the human chemical bond, resulted in a very-crude unfinished draft manuscript three-volume set on *Human Thermodynamics*, written between 2001 and 2004, several copies of which were distributed locally around Chicago for feedback. In addition, in 2005, stimulated by a recent 19-year old female friend whose mother and grandmother were recently murdered in an insurance scam attempt (by the mother's boyfriend), an attempted manuscript on the question of "what happens when you die?" in relation to thermodynamics was attempted.

Hence, by mid 2005, the following four manuscripts had been written, and posted online as such:

Human Thermodynamics, VI

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-- VI -- [OVERVIEW]

Energy Transformations of:

RELATIONSHIPS
FRIENDSHIPS
CONSCIOUSNESS
HEAT
WORK
LOVE
```

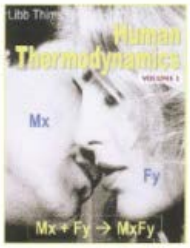

Click for larger view
Click for back-cover

AUTHOR: Libb Thims
COST: $50 US
PUBLISHER: IoHT Publications, Ltd.
PUBLICATION DATE: 2002 (1st Ed.)
PAGE LENGTH: 330pgs.
DIMENSIONS: 6.5"x8.5"
INTRODUCTION: View
PRAISE FOR: Read
FULL REVIEWS: Read
BUY: Back-Order

Human Thermodynamics, VII

```
-- VII -- [OVERVIEW]

Energy Transformations of:

PHYSICAL ATTRACTIVENESS
NEUROLOGICAL ATTRACTIVENESS
SPONTANEITY
REPRODUCTION
HOMOSEXUALITY
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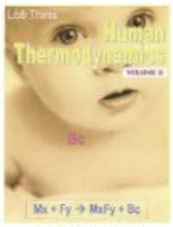

Click for larger view
Click for back-cover

AUTHOR: Libb Thims
COST: $50 US
PUBLISHER: IoHT Publications, Ltd.
PUBLICATION DATE: 2003 (1st Ed.)
PAGE LENGTH: 330pgs.
DIMENSIONS: 6.5"x8.5"
PRAISE FOR: Read
BUY: Back-Order

Human Thermodynamics, VIII

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-- VIII -- [OVERVIEW]

Energy Transformations of:

DEATH
TIME
DESTINY
EVIL
TRUST
RELIGION
```

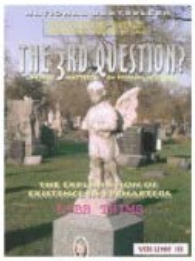

Click for larger view
Click for back-cover

AUTHOR: Libb Thims
COST: $50 US
PUBLISHER: IoHT Publications, Ltd.
PUBLICATION DATE: 2004 (1st Ed.)
PAGE LENGTH: 330pgs.
DIMENSIONS: 6.5"x8.5"
PRAISE FOR: Read
BUY: Back Order

Cessation Thermodynamics

```
-- C2S -- [OVERVIEW]

Acknowledgments

                    Part A
C2S - INTRODUCTION
C2S - FUNDAMENTALS
C2S - BASIS OF CONTENTION
C2S - BONDING THEORY
C2S - BOND VARIETIES
```

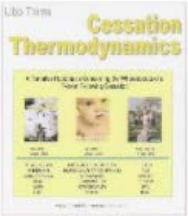

Click for larger view
Click for back-cover

AUTHOR: Libb Thims
COST: $50 US
PUBLISHER: IoHT Publications, Ltd.
PUBLICATION DATE: 2005 (1st Ed.)
PAGE LENGTH: 100pgs.
DIMENSIONS: 6.5"x7.5"
SYNOPSIS: View
ORIGIN OF: View
PRAISE FOR: Read
FULL REVIEWS: Read
BUY: Order Online

This public openness brought Thims, who was still rather green at this point, into argumentative contact with other scientists, chemists, physicists, and engineers, who were quite frank with their openness to the "lunacy" of the idea that chemical thermodynamics might have anything to say about the human condition, let alone predict human chemical reactions, between people viewed as "human molecules". This collision was quite an eye-opener for Thims, illuminating the fact that not all people think the same; an experience encountered Croatian mechanical engineer and physicist Josip Stepanić, who used to think that everyone thought like he did, i.e. in terms of social Gibbs free energy (as communicated Thims).

This aghast reactionary feedback, among other argumentative interactions in 2005 and 2006, made it apparent to Thims that for any successful book publication of the subject of the "thermodynamics of human existence" to be digestible to the average person, firstly there would need to be a standardized textbook on the fact that the human is a "molecule", that there is such a thing as a "human chemical reaction", or that the "human chemical bond" is the same as any other chemical bond, etc. In other words, although the "chemistry of love" is question that even young children wonder about and also is a cover-story topic, no chemist has ever written a standard textbook on this basic subject.

The jump from this "good for a laugh, but not much else" comment to "I'm going to write a two-volume textbook on human chemistry", however, was not immediate. To give an idea of this, on 13 Nov 2005 the following New Book notice (adjacent) was posted on Thims' user page, stating that he was working on a short 50-page book tentatively entitled *Thermodynamic Sex: on the Evolutionary Propensity Towards Field Particle Mediated Atomic Exchange*. The premise here being that the electromagnetic force, the fundamental force that mediates human interactions, acts to cause or rather force the exchange of primary field particles (photons, in fundamental composition), which act or force the exchange of larger "secondary field particles" (such as sperm), and that the entire event of sex and the movement actions of the humans involved in the days and months preceding and following the act must proceed according to the premise that the interacting system (in association with its coupling factors) actuates to in accordance with a decrease in the Gibbs free energy of the system ($\Delta G < 0$).

2005	2006-2007

New book

I'm working on a new short 50-page book: Thermodynamic Sex (http://www.humanthermodynamics.com/HT-books.html#anchor_141) - *On the Evolutionary Propensity Towards Human Molecular Field Particle Mediated Atomic Exchange*, scheduled for early 2006. If any Wikipedians have input for me on potential concepts, ideas, or theories that they would like explored please leave me comment. I've begun interviewing people aged 18-35 on the differences between "hot" sex, "ambient" sex, and "cold" sex.

Temperature can be defined as: *the ability of a system to give up energy*. Thus, if we define the typical dating or "bonded" couple to be one thermodynamic system situated within or connected to second socioeconomic thermodynamic system, we can then intelligently analyze the bidirectional temperature dependent energy

→

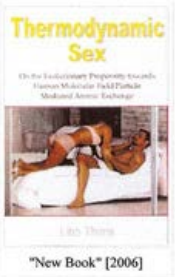

transfers, as work, productivity, etc., fluxing between such hypothetical systems as each energetic exchange correlates to increases or decreases in resultant stability. I've thus far polled 110 people [12/12/05]; the results are very interesting (posting soon): Hot-Cold-Ambient Sex Survey.

Advertisement on Thims' Wikipedia user page on 13 Dec 2005, which attracted derisive comments from scientists, such as American organic chemist Frank Lambert who commented that "Thims is a lost soul who seriously searches for the thermodynamic meaning of sex", among other derisive opinions. [5]

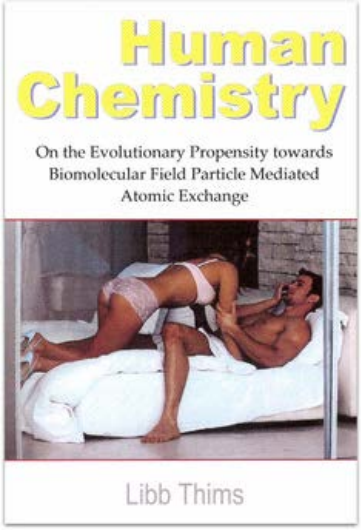

Late 2006 / early 2007 draft cover-version of *Human Chemistry*, the subtitle pointing to the newly derived field particle mediated exchange force model of human chemical bonding.

Thims discovers Goethe

On 10 Oct 2006, Thims ordered Goethe's *Elective Affinities*, from Amazon (see: books ordered), after reading Ilya Prigogine's 1984 footnote 2.5 mention of "Mittler the mediator".

Thims, thereafter, learned that German polymath Johann Goethe basically worked out nearly the same theory (as described above), as Thims had worked out, albeit framed in the logic of affinity tables (an antecedent to free energy tables), over two hundred years ago (1796-1809), and wrote out the entire solution in coded format in his 1809 novella *Elective Affinities*, a treatise filled with 36-chapters of various types of human chemical reactions (or human elective affinity reactions, as Goethe would have viewed them). [2]

The actual endnote reference that resulted to be a huge influence is shown below: [3]

Dobbs, op. cit., also examined the role of the 'mediator' by which two substances are made 'sociable'. We may recall here the importance of the mediator in Goethe's *Elective Affinities* (Engl. Trans. Greenwood 1976). For what concerns chemistry, Goethe was not far from Newton.

Footnote #5 (pgs. 64, 319), chapter II: The Identification of the Real, section 2: Motion and Change, *Order Out of Chaos* (1984) by Ilya Prigogine.

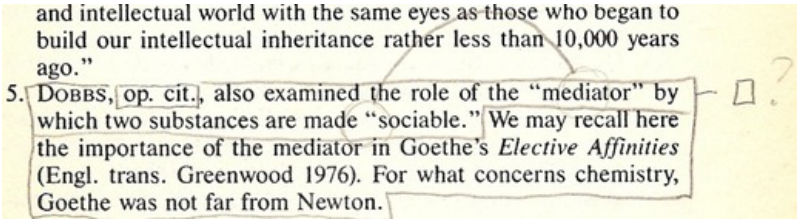
and intellectual world with the same eyes as those who began to build our intellectual inheritance rather less than 10,000 years ago."

5. Dobbs, op. cit., also examined the role of the "mediator" by which two substances are made "sociable." We may recall here the importance of the mediator in Goethe's *Elective Affinities* (Engl. trans. Greenwood 1976). For what concerns chemistry, Goethe was not far from Newton.

The tipping point for the forward movement of the idea to write not just a outline booklet on human chemistry, as pictured above (right), but rather a full top-to-bottom first-ever textbook on human chemistry.

At this point, strangely enough, even though Thims is 50% German, and had at that time over 750 science books in his home library collection, he had never heard of Goethe. In any event, after finally reading *Elective Affinities*, specifically the famous chapter four, it has since become the most influential book he has ever read and was what instilled in Thims the duty, obligation, or rather moral imperative to write the world's first ever textbook on the subject of human chemistry (basically the modern view of what Goethe was theorizing about 200 years ago).

Stimulated by this great finding, starting in 2006, over the next 18-months and 14-days, in a type of timelessness (see: Willard Gibbs) induced "flow state" (to cite Mihály Csíkszentmihályi's theory), Thims worked nearly non-stop to pen the world's first textbook on human chemistry, the 824-page two-volume *Human Chemistry* (published in September 2007).

In addition to the influence of Goethe, another significant driver behind the writing of the *Human Chemistry* textbook, was fact that the physics-engineering department at the University of Illinois, Urbana-Champaign was informing seven-year old children that love was not a purely chemical reaction. The specific 2001 post where this hugely-false information was being presented is depicted adjacent.

The irritation of this type of hugely erroneous information presentation to children along with Goethe's *Elective Affinities*, were the two drivers behind the construction of the the two-volume *Human Chemistry* textbook.

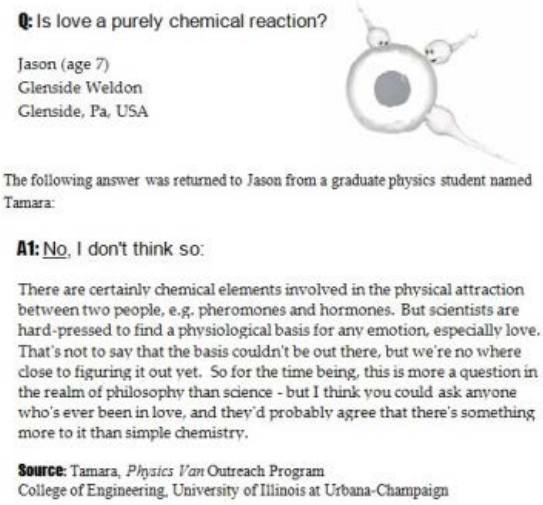

Q: Is love a purely chemical reaction?

Jason (age 7)
Glenside Weldon
Glenside, Pa, USA

The following answer was returned to Jason from a graduate physics student named Tamara:

A1: No, I don't think so:

There are certainly chemical elements involved in the physical attraction between two people, e.g. pheromones and hormones. But scientists are hard-pressed to find a physiological basis for any emotion, especially love. That's not to say that the basis couldn't be out there, but we're no where close to figuring it out yet. So for the time being, this is more a question in the realm of philosophy than science - but I think you could ask anyone who's ever been in love, and they'd probably agree that there's something more to it than simple chemistry.

Source: Tamara, *Physics Van* Outreach Program
College of Engineering, University of Illinois at Urbana-Champaign

The 2001 online Q&A posting by the Physics Van Outreach program of the physics-engineering department of the University of Illinois at Urbana-Champaign, where a college is telling children incorrectly that the process of love (or falling in love) is not a chemical reaction, an incident that irritated Thims (on the driving forces or factors behind the eventual writing of the 2007 *Human Chemistry* textbook. [4]

On November 7, 2006, Thims sent an email to an internet associate of his, an theoretical physicist, stating that he was in the process of writing an approximate 150-page book on the topic of human chemistry, "situated on the premise that each human being is a molecule and that human molecules react, form bonds, de-bond, abide by the laws of thermodynamics energetically, etc., just as do all assemblies of molecules." [2] In this email, Thims stated that:

> "I'm forced to write a book out of necessity; I've found that I can't talk to anyone intelligently about any kind of thermodynamic theory of human life until someone situates a basic **textbook** arguing that human life is a chemical process involving human chemical reactions between human molecules and the bonds formed or broken therein, i.e. reactions between people, and the energetics associated with this. Most of the book is going to be based on Carnot, Clausius, Gibbs, Helmholtz, Goethe, the first person to write an actual human chemistry book (1809), Gladyshev, and about a dozen others."

Subsequently, sometime during this period, the 50-page book *Thermodynamic Sex*, evolved into the 824-page, two-volume college textbook *Human Chemistry*. On December 06, 2006 Thims sent a letter to iUniverse, directed to publishing representative Agnes Hoepker, stating that "I will likely publish a 200-page book, on *Human Chemistry*, with you soon." To give an idea of the transformation, the follow images show how the cover evolved or changed over time during its construction. The final cover was chosen, after a period of cover testing, in which people queried as to what they thought the book was going to be about based on the cover (the *Thermodynamic Sex* cover gave the impression that it was going to be about how to get hot sex or some type of pornographic book). Subsequently the cover began to change (early drafts shown below):

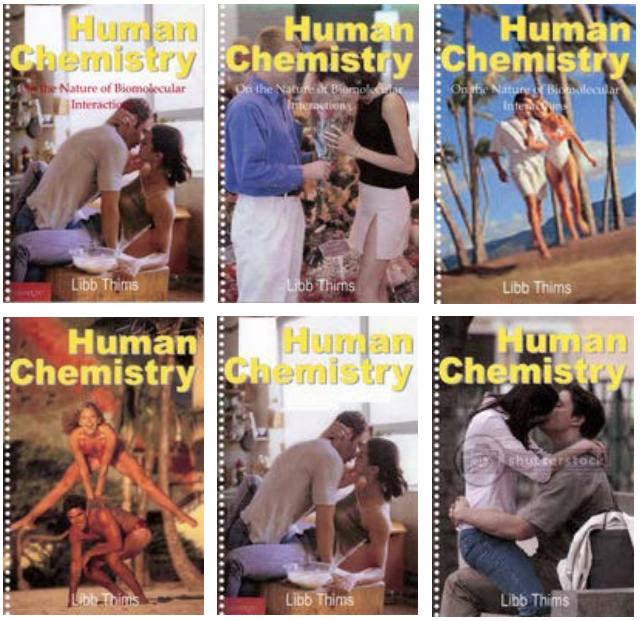

→

A number of people were polled as to which cover would be the best; among other comments, this last cover was chosen, because, in the words of a male commenter, named Elik: "It looks real, it looks like they're in love." The last cover at far right was thus chosen.

The paperback version of the book was published on September 4, 2007, and the hardcover version was published on 24 September, 2007.

Wikipedia → Hmolpedia

On 05 May 2005, Thims began testing online encyclopedia-style wiki article writing at the newly-forming site Wikipedia, by starting an article on human thermodynamics; albeit an article that ended up in the "articles for deletion" (afd) process, twice; after which, he stayed on as an editor at Wikipedia, in the two years to follow, penning about 180 articles, contributing over 8,500 edits.

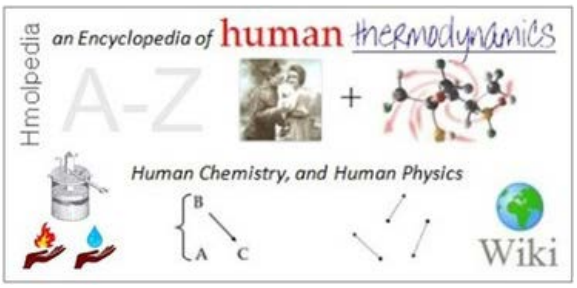

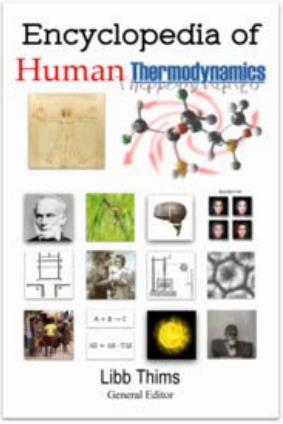

A depiction of the main thematic contents of Hmolpedia: human relationships, love, hate, atoms, molecules, heat, motion, Papin engine, human chemistry, and human physics, the 2007-launched niche encyclopedia, created by Thims to facilitate the study of the subject of human thermodynamics.

On 10 Oct 2007, Thims resigned as an editor from Wikipedia (2005-2007), out of re-occurring tensions building in attempts to get the articles "human chemistry" and "human molecule", established as standard encyclopedia topics (topics which kept getting sent to afd).

On 24 Dec 2007, Thims launched **EoHT.info**, renamed Hmolpedia in 2011 (see: Hmolpedia (etymology)), with three articles: Sadi Carnot (physicist), human thermodynamics, and human chemistry. The first two members of the site were Thims (user: Sadi-Carnot) and Russian physical chemist Georgi Gladyshev (user: Gladyshev) who were weekly collaborators form *circa* 2006-2011, until their mutual falling out over the semantics of the origin of life vs defunct theory of life debate.

In late 2011, Hmolpedia had over 2,200 articles, over 200 members, and was attracting some 50,000+ page views per month (see: progress report), and was being used by graduate school engineering students as a research tool to complete PhD dissertations.

The Human Molecule

In 2008, in an effort to produced an low-cost, equation-free booklet, easier to read book (at least at the high school level), as compared to the 207-equation filled very-dense (to many) textbook *Human Chemistry*, Thims expanded on chapters three and five, "The Human Molecule" (20-pages) and "Molecular Evolution" (26-pages), of *Human Chemistry* respectively, into the combined 120-page book *The Human Molecule*, which included a more detailed history of the concept of modeling people as atoms, particles, chemicals, or molecules, etc., which included the recently discovered 2002 publication of the calculation a 22-element molecular formula for a human by American limnologists Robert Sterner and James Elser.

(2007)

+

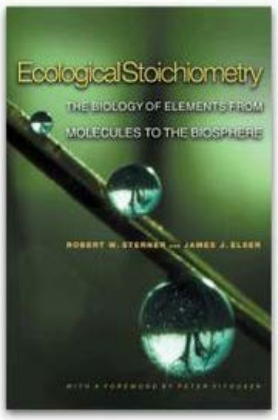

(2002)

→

(2008)

Thims' 2008 120-page booklet *The Human Molecule*, on the history of the concept of a person viewed as an atom, particle, chemical, or molecule, an expansion of his earlier 2007 chapter (with fuller historical overview) plus addition of the newly-found 2007 human molecular formula views of Robert Sterner and James Elser.

University lectures

See main: Libb Thims (lectures)

In 2010, Thims began giving invited lectures on an introduction to human thermodynamics to bioengineering thermodynamics classes at a local university in Chicago, and did this yearly through 2012. The following are video stills of Thims lecturing in 2010:

In 2010, Thims began to meet up with Iranian-born chemical engineer Ali Mansoori, head of the UIC thermodynamics laboratory and also notably for having been educated, as an undergraduate in Iran, within the orbit of Iranian mechanical engineer, thermodynamicist, and 75th prime minister Mehdi Bazargan, author of the 1956 *Thermodynamics of Humans*, the first general book on human thermodynamics.

2010-2012 | Thims at UIC | Chicago

Thims lecturing in 2010 (see: Libb Thims lectures) on human thermodynamics to engineering students, standing adjacent to pictures of Clausius, Gibbs, and Lewis, authors of the founding texts at the core of human thermodynamics. **Thims** explaining to engineering students how the Papin engine relates to human chemical affinities, Gibbs free energy, and morality.

The following is 16 Apr 2013 guest lecture Entitled "Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies", given to the mechanical engineer students and faculty of Northern Illinois University per invited of mechanical engineering thermodynamics professor Milivoje Kostic:

2013 | Thims at NIU | DeKalb, Illinois

Left: Thims in his 16 Apr 2013 lecture: "Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies" (see: lectures), at segment 48:30-50:39 (see: **video**), at Northern Illinois University College of Engineering, doing the famous 18th century Leiden University volume expansion "ball and ring experiment" to explain "social expansion" (day) and "social contraction" (night), in Carnot cycle terms, in respect to hot body (sun) / cold body (night sky) alternating daily contact of earth-bound social systems (working body), Boerhaave's law, entropy (transformation content) increase, and irreversible changes in Gibbs free energy states of human existence and experience; the human molecule view lecture notes page in the background; illuminated rotating globe to the right. [28] **Right:** edited synopsis video segment of April 2013 lecture.

The following are meetup photos and after symposium photos during the Jun 2013 University of Pitesti Econophysics and Sociophysics Workshop, Romania, in which Thims, as the key speaker, gave an opening 90-minute talk on "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?", generally about what not to do in econophysics and sociophysics modelling:

2013 | Thims at UP | Pitesti, Romania

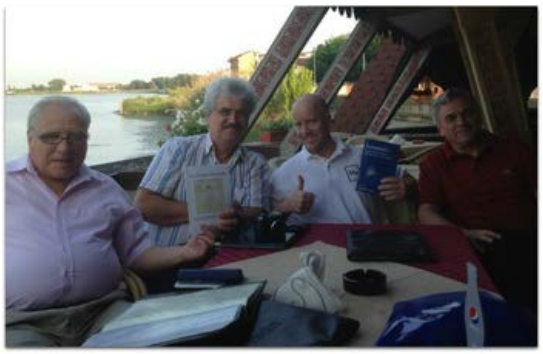

Left: American electrochemical engineer Libb Thims with the two heads of the Romanian school of physical socioeconomics, from left to right: Ion Siman and Gheorghe Savoiu, holding Thims 2008 *The Human Molecule*, Thims, holding Savoiu and Siman's 2012 *Econophysics*, and Constantin Bratianu, a newcomer to the group, noted for his work in knowledge thermodynamics (28 Jun 2013). Right: Thims during his UPESW 2013 talk (Jun 29), at 2:20-min (see: **video**) holding his social piston and cylinder demonstration model explaining how the city boundary of Pitesti, Romania, is an example of a socioeconomic boundary in a thermodynamic modelling sense.

Thims has been invited back for UPESW 6 in 2014 and invited to stay at the summer house of Romanian physicist Ion Siman the intellectual power center of the Romanian school of physical socioeconomics.

Hmolpedia | Print set

A precipitate of Thims' research efforts is *Hmolpedia*, an online wiki encyclopedia, launched in late December 2007, a growing collection of 3,000+ articles centered around the decipherment of the Lewis inequality of natural processes applied to human interaction processes, a set of articles attracting some 70,000+ page views per month, which is slowly becoming the Internet's number one go-to site for thermodynamics information; a cite which, as of 2011, has been used to produce, guide, and or facilitate a number of PhD dissertations, among other research activities.

In 2013, Thims began to assemble the online site into a print volume, current estimates indicate the encyclopedia will be a six-volume, 3,800-page book set (a mock-up version of which is shown adjacent).

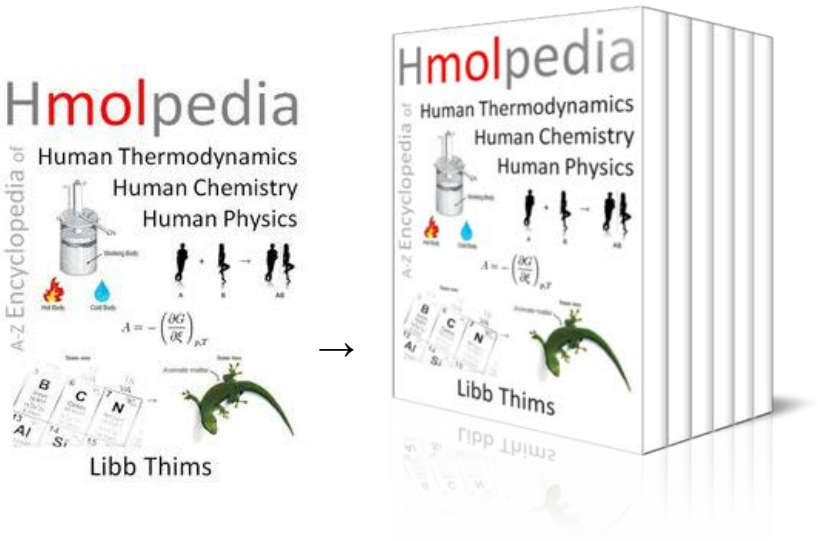

Online Version
(3,000 articles)

Print Set
(6-volumes)

University department

See main: Two cultures department

In 2013, Thims began to actively pursue the means to found a university department, a upgrade to the 1950s Princeton Department of Social Physics, so to speak, centered around the teaching of human thermodynamics themed as the solution to C.P. Snow's famed two cultures divide of the erudite of society:

See also

- Human Chemistry (textbook) (origin)
- Hmolpedia (progress report)

References

1. Thims, Libb. (2005). "On the Nature of the Human Chemical Bond." *Journal of Human Thermodynamics*, Vol. 1, Issue 5 (pg. 36-61) – November (left un-finished).
2. Email from Thims to Par dated Tuesday, November 7, 2006 8:03:36 PM.
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(b) Is Love a Purely Chemical Reaction? (question asked in 2001 by Jason, age 7, from Glenside Weldon, Pa) - "Ask the Van", part of the Physics Van outreach program at the Department of Physics at the University of Illinois.

(c) Question answered by Tamara McArdle a veterinarian practicing in the Champaign-Urbana area who has done research in genetic modeling and cancer prevention.
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10. HT mandates (2005) – HumanThermodynamics.com.
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θΔics

In lectures, **Libb Thims (lectures)** refers to public or university talks or lectures given on human thermodynamics, or the related subjects, including human physics, or human chemistry, by American electrochemical engineer Libb Thims.

2010-2012	2013	2013	2016
UIC UNIVERSITY OF ILLINOIS AT CHICAGO	NIU NORTHERN ILLINOIS UNIVERSITY	1962 UNIVERSITATEA DIN PITEȘTI	UNIVERSITY OF THE DISTRICT OF COLUMBIA 1851

American electrochemical engineer Libb Thims, since 2010, has been given invited talks and lectures to various universities, some of which shown above and adjacent.

Overview

The following is an early lecture suggestion for Thims, who had begun to write in 2001 on the chemical thermodynamics of human reactions and interactions:

> "I think you should take a bunch of copies of your book, go down to a street corner, and just start talking."
>
> — Edward Duncan (c.2004), earlier reviewer of Thims' draft works

In 2005, Thims began to go public with his work, with the launch of HumanThermodynamics.com (2005), the HumanChemistry 101 YouTube channel (2007), followed by Hmolpedia (EoHT.info) (2008), and during this period began to offer to and to receive offers to lecture, give invited guest lectures, poster presentations, etc., to or at various classes, conferences, workshops, and or symposiums; some of which are listed below. Thims' first university lecture was in 2010, video recorded, but not polished enough for publication. Some of the web outlines of these lectures, per year, are listed below (as well as in the adjacent dropmenu), in reverse chronological order:

2016

The following is the "features speakers" section for BPE 2016, showing Thims, along with Victor Yakovenko, John Bryant, Bruce Boghosian, among others:

(add summary)

2015

In 2015, Thims gave a 14-part Aug lecture on "Zerotheism for Kids" to six kids to so to resolve a six year old's query "how did god create the world so fast" (i.e. in 7-days), after reading a standard children's bible, explained via Hypatia-framed "teach myths as myths" realism or extreme atheism point of view

2014

In 2014, Thims gave an Apr lecture to three kids on the floating magnets experiment.

2013 | NIU + UP

The following are 2013 lectures:

● Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (video, 1:33-min) (article, 40-pgs) (PowerPoint, 36-slides), Key speaker talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V) (organizer: Gheorghe Savoiu). University of Pitesti, Pitesti, Romania, Jun 29.

Full 1:33-min "Econoengineering and Economic Behavior" University of Pitesti lecture.

● Thims, Libb. (2013). "A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies" (abs) (NIU announcement) (cover) (main) (full video) (abs video), Lecture to mechanical engineering thermodynamics students (professor: Milivoje Kostic), Northern Illinois University (NIU), Apr 16.

Truncated highlights of NIU lecture.

Full 53-min "A Guidemap to Human Chemical Thermodynamics" Northern Illinois University lecture.

2010-2012 | UIC

The following are 2010 to 2012 lectures:

● Thims, Libb. (2010). "An Introduction to

Human Thermodynamics" (abs) (main) (handout), Lecture (open university) to bioengineering thermodynamics students (professor: Ali Mansoori), University of Illinois at Chicago (UIC), Apr 13.
●Thims, Libb. (2011). "How to Apply Thermodynamics in the Humanities: with Engineering Focus" (abs) (main), Lecture (open university) to bioengineering thermodynamics students (professor: Ali Mansoori), University of Illinois at Chicago (UIC), Apr 12.
● Thims, Libb. (2012). "An Introduction to Human Thermodynamics: Chemistry, Physics, Engineering, and Applied" (main) (handout), Lecture to bioengineering thermodynamics students (professor: Ali Mansoori), University of Illinois at Chicago (UIC), Apr 10.

Video stills of American electrochemical engineer Libb Thims in April of 2010 giving his first invited university lecture, to a bioengineering thermodynamics class. Left still shows photos of Rudolf Clausius, Willard Gibbs, and Gilbert Lewis, respectively, the three main founders of chemical thermodynamics; on the right: poster presentations showing Johann Goethe and Torbern Bergman, the two main figures in the early development of human chemistry; along with the Bergman affinity table, Bergman reaction diagrams, Papin engine, among others.

Public lectures | 2003-2009

In circa 2003 to 2005, Thims had a little over a hundred people review different parts of his various working manuscripts, see: Libb Thims (publications), unfinished section, during which time one reviewer, American graphic designer Edward Duncan, commented: "I think you should take a bunch of copies of your book, go down to a street corner, and just start talking."

In summer 2006, Thims met Russian physical chemist Georgi Gladyshev at the 14th annual International Anti-Aging Congress and Exposition in Chicago at the Rosemont Convention center, who was one of the key speakers and discussed Thims' human thermodynamics in lecture. The 2007 A4M lecture at the 15th annual meeting, where Gladyshev also discusses Thims' theories, is available as an audio mp3. [2]

"I think (Thims) should take a bunch of copies of (his) book, go downtown to a street corner, and just start talking!"
— *Edward Duncan, Graphic Designer*

Above (left-top): Michigan Avenue Bridge, Chicago, where **Thims** attempted to give his first public lectures (2008) on human chemistry and the human molecule of a person; above (left-bottom): review commentary (2005), from the praise for section of *Human Chemistry* (2007), on some of the early manuscripts of Thims by graphic designer Edward Duncan; above (right): Thims' human chemistry book cart, which he used in his public lectures, pushing it around downtown, attempting to give old-fashioned sermons on the mound to the public.

In 2007, Gladyshev invited Thims to give a talk to a large scientific conference at Moscow, Russia, which Gladyshev organizes yearly, with the condition that Thims' first complete his PhD.

Both Gladyshev and Thims were invited, by Italian thermodynamicist Gian-Paolo Beretta, to intend, and to submit presentation proposals, the 2007 "Meeting the Entropy Challenge", an international thermodynamics symposium in honor and memory of professor Joseph Keenan at MIT. [4] Unfortunately, Gladyshev and Thims were unable to attend do to scheduling difficulties.

In late summer 2008, following the publication of *The Human Molecule*, Thims took the advice of Duncan and began to go downtown to various street corners, such as the by the entrance to the Michigan Avenue Bridge, in front of the Wrigley field building, Chicago, and "just start talking" and try to educate people that they are in fact a molecule reactive to each other as are the smaller atoms, molecules, and chemicals of the periodic table. These early public lecture attempts were a learning experience, to say the least.

Thims' envisioned that a more honed group of listeners would be need, to understand and get the gist of what he was talking about, over that of the lay public, being that the subject is extremely mathematical and not a language often used by the common person.

On 14 March 2008, American chemical engineers Ted Erikson and Libb Thims attended the the annual *American Association of Physics Teachers* (AAPT) meeting at Harper College (Palatine, Illinois) where Erickson discussed Thims' human molecule theories in lecture.

In circa 2008, Thims perused the idea of bring human chemistry to the high school level and paid a visit to the science teachers of New Trier High School, Illinois, where a friend of his is principle, a school which, to note, in 2002, as discussed in Thims' 2007 *Human Chemistry*, assigned a project, entitled "It's all about Bonding: How Humans, Animals, Chemicals, and Natural Forces, have Conflicted in Time, but Also Worked Together", wherein students were asked to consider how elements and chemical species chemically bond or conflict, and to think about how these polar opposite processes of bonding and conflicting play out in life, specifically in human relationships, in the form of human chemical bonds. [1]

References

1. (a) Chemistry Department. (2002). "It's all about Bonding: How Humans, Animals, Chemicals, and Natural Forces, have Conflicted in Time, but Also Worked Together." Class; Research Outline Plan (PDF).
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (New Trier, pg 91). Morrisville, NC: LuLu.
2. Gladyshev, Georgi. (2007). "Hierarchical Thermodynamics: Quality Food and Medicine", A4M Las Vegas, Dec 12, 9:00 am – 12:00pm, 27m 03s, 36 slides (PDF or MP3).
3. EDEN workshop (overview) – University of Pitesti, Romania.
4. Main – BPEconomics.org.

θΔics

In existographies, **Libb Thims (Nobel Prize)** refers to dialogue and or discussion concerning Libb Thims and the Nobel Prize, which Thims was unofficially nominated for in 2007 (by Georgi Gladyshev) and or the Ig Nobel Prize, the group of which profiled Thims in 2010 (by Martin Gardiner).

Dual Nobel Prize Winners

Marie Curie	Mother and sister died before she was 11
Linus Pauling	Father died when he was 9
John Bardeen	Mother died when he was 12
Frederick Sanger	No Early Parental Death [EPD]

LAUREATE:	NOBEL PRIZES:	CREDENTIALS:
Marie Curie [1867-1934]	Physics [1903]: Discovery of Radioactivity Chemistry [1911]: Isolation of Pure Radium	Ph.D. Physics & Radiochemistry
Linus Pauling [1901-1994]	Chemistry [1954]: Hybridized Orbital Theory Peace [1962]: Nuclear Test-Ban Treaty Activism	B.S. Chemical Engineering Ph.D. Physical Chemistry
John Bardeen [1908-1991]	Physics [1956]: Invention of Transistor Physics [1972]: Theory of Superconductivity	Grade-switched: 3rd to 7th B.S. Electrical Engineering M.S. Electrical Engineering Ph.D. Mathematical Physics
Frederick Sanger [1918-]	Chemistry [1958]: Structure of the Insulin Molecule Chemistry [1980]: Virus Nucleotide Sequencing	B.S. Natural Sciences Ph.D. Biochemistry

Three of four of the people to win two Nobel Prizes, namely: Marie Curie, Linus Pauling, John Bardeen, and Frederick Sanger, were products of early parental death and genius. Libb Thims, similar educationally to Pauling and Bardeen, is also a product of early parental death. Some of Thims work has been sent to the Nobel Prize committee, albeit in an unofficial manner.

Overview

In circa 2003, Libb Thims, during his studies of patterns of genius, e.g. early parental death and genius, and genius studies in general, noticed commonality that three of four people to ever win two Nobel Prizes, namely: Marie Curie, Linus Pauling, John Bardeen, and Frederick Sanger, as shown adjacent, had the commonality that 75 percent, namely: Curie, Pauling, and Bardeen, were the products of early parental death. This, also being a product of early parental death, found this pattern curious? [1] Thims also noticed that this group of dual prize winners had similar educational background to Thims, namely: Linus Pauling (BS chemical engineering) similar to Thims (BS chemical engineering), John Bardeen (BS electrical engineering) similar to Thims (BS electrical engineering), that physics (Curie, PhD) and physical chemistry (Pauling, PhD) were two of Thims favorite subjects, and that Thims at the time was ruminating on completing a PhD in biochemistry (Sanger) and or an MS in particle physics. Sometime herein, Thims conceived, humorously, that he was predispositioned towards winning two Nobel Prizes, and that if he was really going to do things right, he should aim to win three.

In 2007, Russian physical chemist Georgi Gladyshev, who had been working on the thermodynamics of evolution and sociology since the 1970s, after becoming aware of Thims work, e.g. his *Human Chemistry* (2007), flew out to Chicago, with his wife, and took Thims out to dinner to tell him that he had sent Thims′ work into the Nobel Prize committee as a potential, albeit unofficial, nomination.

In 2010, Martin Gardiner, of the *Annals of Improbable Research*, the group that administers the Ig Nobel Prizes, whose motto is to award people whose: "achievements that make people laugh, then think", ran a four-part, three-day article on Thims, entitled "I Am Not A Molecule", subtitled 'Inside the IoHT', discussing topics such as Thims' 2008 book *The Human Molecule*, the Human Chemistry 101 video lectures on the human molecule, the Institute of Human Thermodynamics, the *Journal of Human Thermodynamics*, among other topics. Gardiner considers the subject of the chemistry and thermodynamics of human molecules to be an emergent intellectual development.

Others, during this period, such as shown below, began to either suggest that Thims might win a Nobel prize some day and or confuse the fact that Gladyshev sent in a nomination to the Nobel Prize committee with an actual nomination:

> "Congratulations, Libb, you've just scored 20 points on the Baez scale for suggesting that you deserve a **Nobel Prize** [pisstake: Gladyshev (2007) suggested this]."

— Philip Moriarty (2009), "Moriarty-Thims debate (part two)" (Ñº), post #134-35, Sep 13

> "Libb Thims: the great oracle and developer of human thermodynamics—the philosophical revolution of the 21st century. A genius of outstanding stature and originator of many concepts in human chemistry. [His] breathtaking contribution to science needs to be rewarded. Let's hope one day [he] can add a **Nobel Prize** to [his] impressive career."

— Mark Janes (2011), English chemical engineering student turned biotechnologist and human free energy theorist [2]

An official nomination, to note, can only be done by a select number of people from around the world specifically chosen by the Noble Prize committee. Gladyshev is not one of these people. Therefore, accordingly, Thims has never "officially" been nominated, but only nominated unofficially.

Quotes

The following are related quotes:

> "Thims' website [EoHT.info] is [in part] dedicated to the estimations of the IQs of the world's greatest geniuses, and does have some interesting information, but is riddled with historical inaccuracies. Thims, moreover, is a delusional moron of a man, with far too much spare time, who equates his intellect with that of Goethe and Einstein on almost no basis whatsoever, and who believes he can measure the likes of the IQs of Voltaire, Leibniz or Pascal. He even won an **Ig Nobel Prize**! (A satirical honour)."

— Dominic Anderton (2015), David Hume + Voltaire political philosopher (Ñº) [3]

> "Your page on Hmolpedia claims you were nominated for a **Nobel Prize** in 2007. The nomination database does not return any results for the name 'Thims'. Can you provide support for this claim?"

— Dalton Jackson (2016), Reddit dialogue (Ñº), Sep 21

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2. Janes, Mark. (2011). "Libb Thims", Carbon-Entromorphology.com.
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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
4. (a) Gardiner, Martin. (2010). "Inside the IoHT: I am not a molecule (parts 1, 2, 3, 4)", *Improbable Research*, Jun 04-06.

(b) Martin Gardiner (about) – Improbable.com.
(c) Thims, Libb. (2008). *The Human Molecule*, (preview) (Google Books). Morrisville, NC: LuLu.
(d) Libb Thims | What's Hot – Regator.com.

θΔics

In notes, **Libb Thims (personal notes)** refers to personal notes jotted by American electrochemical engineer Libb Thims on scratch paper, in book margins, in document files, arisen mental notes, on napkins, of lately some directly via mind-to-wiki storage conversion, etc., some of which prior to *Hmolpedia* being listed on IoHT webpages, others of late being listed below, similar to how Newton wrote down Aristotle's famous quote "Plato is my friend but truth my greater friend" in his personal notes (or book margins), prior to setting Aristotle to the side (Ñº) and embarking after truth. [1]

A rendition of Thims jotting down mental **notes**.

"What are the alternatives: we either came from **Adam and Eve** or **Atoms and Evolution**, yes?"

— Libb Thims (2019), mental note; reflection on viewing *Smart Atheism: For Kids* and *Human Chemical Thermodynamics* covers, on the Libb Thims article, in respect to the question of which is more trivial; overthrowing a 5,000+ year old sun god worship belief system, or instilling a 200+ year old, chemical thermodynamics belief system; four-days prior to departing to Pakistan for Beg interview, Sep 9

"Running (/exercise), partying, thinking, studying, and drinking [repeat cycle]; my five favorite '-ings'."

— Libb Thims (2019), "mental note", arisen while drinking in shower (ordering being general chronological order), 8:24PM CST Apr 8

"Those who commit suicide leave subtle discernment, between right and wrong, for existents."

— Libb Thims (2019), mental note, arisen after watching *An Office and a Gentleman*, a double-suicide film, Mar 15

"The older the theory, you have to overthrow, the greater the amount of "work" you have to put in."

— Libb Thims (2019), "mental note", arisen in shower, following knap, with thoughts of comparing the overthrow of the 100-year-old caloric theory (by Clausius), the overthrow of the 1400-year-old ether theory (by Einstein), with the 5,000+ year old theory of god (pretty much anyone who attempts to digress on physico-chemical based humanities); possibly in reference to Reddit user u/SpergingKermit (age 15) who says he has an "outline of a potential physiochemical model of history" he wants to show, 1:05AM CST Feb 26

"Real geniuses answer questions that don't have answers. Feigning geniuses or fake geniuses answer questions that have answers."

— Libb Thims (2019), mental note (Ñº), 2:47AM CST Feb 15; modified Feb 26

"I love fear."

— Libb Thims (2019), mental thought arisen, while writing the "quotes on" section of the Joseph Campbell article, 2:55AM CST Jan 31

“We all have to die [de-exist] sometime. We ‘become’, as Heraclitus famously said, we ‘unbecome’. Such is the nature of the ‘change’ of the dynamics of the universe.”

> — Libb Thims (2019), mental note reflection on first person, e.g. Ram Poudel, to make comment on public HCM health issues section, Jan 2

“I want a ‘quantitative’ understanding of existence.”

> — Libb Thims (2018), mental note arisen in shower while drinking Madras and beer while listening to ‘Do You Want Me’ (club version) by Da Buzz, with reflection on how we’re are brought into this world and given undefined ‘terms’, e.g. love, as goals; 1:16AM CST, Dec 17

“You can say whatever you like about me, but Gibbs and Clausius are ‘rocks’ that aren’t going to be moving for a long time.”

> — Libb Thims (2018), “falling asleep” mental note, Nov 6

“A person isn’t really ‘born’, physico-chemically speaking, until they detach completely from the parental structure.”

> — Libb Thims (2018), mental reflection on birth days and age, Jul 31

“God is simply a word people use for ignorance of some phenomena.”

> — Libb Thims (2018), reflection on Marcus Aurelius’s “every man’s intelligence is a god” statement; likely a mental paraphrase of Percy Shelley (1811) stating the same view, Jun 25

“Nature is made out of ‘atoms’ and ‘energy’ — and there IS a “G” in nature (or human nature), but it’s NOT god, but Gibbs.”

> — Libb Thims (2018), mental note; arisen while viewing new home page “nature is made out of atoms and energy” image (note: more Americans believe in Adam and Eve than atoms and energy), May 29

“What book speaks of unicorns, dragons, and giants in the same story? Answer: the Bible.”

> — Libb Thims (2018), mental not while reading Jean Meslier’s citation (pg. 438) of how the Bible says that “dragons, snakes, and ostriches will glorify god” (Isiah 43:20), May 21

“The best things in existence happen spontaneously.”

> — Libb Thims (2018), mental note, 3:11PM CST, May 14

“The moment the mind fails to comprehend [the mechanism], the body will cease [to act].”

— Libb Thims (2018), mental note, arisen amid second to last Punisher series, in beating in and out of consciousness scene, Mar 17

“Justice is measured in Joules.”

— Libb Thims (2018), mental note arisen while watching *The Punisher* (part Gunner), fight behind fallen tree scene, Mar 12

“There’s no $F = ma$ in either Alex Pentland’s social physics or Serge Galam’s sociophysics, just as there is no $\delta Q / T$ in Claude Shannon’s entropy-named information theory. Each are in namesake only subjects.”

— Libb Thims (2018), mental note on social physics fundraising potential queries, i.e. Pentland’s big data based Harvard social physics vs John Q. Stewart’s physics and physico-chemical based Princeton social physics, Mar 6

“I am a physico-chemical *auto*-maton.”

— Libb Thims (2018), mental note; arisen while reading about Rene Descartes automaton ruminations, at the Royal Gardens in Saint-Germain-in-Laye, in conjunction with how “auto-existographies” usurps “*bio*-graphy” (see: abioism) and how “auto-defined” usurps “*self*-defined” (see: life terminology upgrades, principle of inertia, first law of motion, social first law of motion), in the context of terminology reform, Feb 6

“Analogy is dualism. Either one is *with* nature or one is *in analogy* with nature. There is no in between.”

— Libb Thims (2018), mental note arisen; during the Kelly Gregory interaction (Ñº), while reading the cons of the Rossini debate, with back-ground thoughts of Goethe’s advertisement, Feb 5

“That was a good mind fá½ ck.”

— Libb Thims (2018), mental note, the day after finishing Holbach’s *The System of Nature;* Sherrington’s *Man on His Nature*, also coming to mind as having a calming effect (residually, as "mind openers", Greenberg’s *101 Myths of the Bible* and Buss’ *Evolution of Desire*), arisen while beginning Julien Musolino’s *The Soul Fallacy*, prefaced by Victor Stenger, and the realization of falling back into the mundane (i.e. sea of paper-filler books), Feb 3

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“The questions real geniuses solve aren’t found in intelligence tests; rather they arise in the mind of the genius, as baffling or elusive perplexities the mind strongly desires solution to.”

— Libb Thims (2018), arisen in mind while perusing Jacob Leachman’s four-year-old thermodynamics exam questions; solution to the seeming problem why elite geniuses such as Richard Feynman and Henri Poincare scored in sub genius level on IQ tests, but became top 1000 geniuses as adults or in retrospect, 12:50PM CST Feb 22

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“The fact that we still categorized years in BC/AD dating system, indicates that we are still a backwards people.”

— Libb Thims (2018), mental note; arisen will editing the Murray 4000 page, 7:40PM CST Jan 15

"Physics, chemistry, and thermodynamics is the language of the atheist. When, accordingly, the humanities are explained in the language of physics, chemistry, and thermodynamics, an implicit atheistic basis is presumed, whereas an overt explicit atheism is the ideal."

— Libb Thims (2018), waking mental note 6PM CST Jan 15

"All theory and no funding, makes Jack a dull boy."

— Libb Thims (2018), mental note arisen, during 1-mile run, prior to first neighborhood MailCubes sales run, Jan 9

"Love is bond. Life is motion."

— Libb Thims (2017), mental note arisen in shower will listening to "What is Love?" (1993) by Haddaway, with reflection on the ease with which the "life does not exist" purview is assimilated, while the "love does not exist" is problematic, 11:36PM CST Oct 1

"My religion is physicochemical materialism."

— Libb Thims (2017), mental note arisen, while filling out physician questionnaire, in doctor's office, per likelihood that "religious" preference category should arise, 7:53PM CST Sep 18

"Everybody is a racist. It is a universal trait. This fact was cogently pointed out by Ayaan Ali. The real question is when someone becomes a racist to the point of unnaturalness."

— Libb Thims (2017), mental note popped into mind via the thumb (Ñº) to a video (note: think 15 degree rule), Sep 11

"I don't want to deboundstate without doing the derivation."

— Libb Thims (2017), 12:53PM CST Jul 30

"I am an asoulist, aspiritist, abioist, achristist, apointlessness (pointfullness), moral symbols, go-thing, extreme realism
explicit atheist philosopher."

— Libb Thims (2017), practice credo; arisen into mind following add of the James Watson quote to asoulism and check of ATDB table, 12:39PM CST, Tue, Jun 13

"If you can't sell it in the chemistry class, don't try to sell it in the human chemistry class."

— Libb Thims (2017), re-occurring mental note on general rule-of-thumb; possibly on general terminology reform

issues; arisen after 45-nap, following 4.5-mile counter-clockwise jog around golf course park and park loop, 4:54PM CST, Jun 12

"If you haven't haven't studied chemical thermodynamics, calculated your own molecular formula, and derived the equations of existence, you're an imbecile; there doesn't seem to be anyway else to put things."

— Libb Thims (2017), "arisen mental note", while ruminating on Bacon's "we are much beholden to men like Machiavelli who write what men do, and not what they ought to do" + rumination on the multiple independent genius rankings of Giordano Bruno (IQ:190|#34) (RGM:84|#1,260+) (Cattell 1000:c.660) in the top 30 to 85 genius ranking position + reflection on ongoing (Ñº)(Ñº)(Ñº) "ranking oneself" issues, May 30 + Jun 6

"They said that Darwin was 'mad', that Copernicus was a 'joke', and that d'Holbach was 'insane', but now look who's laughing."

— Libb Thims (2017), mental note, thematic to idiocy derision, arisen while looking at the Haeckel colleagues quote on Darwin, while ruminating on Mathieu Buisson's statement on d'Holbach and Philipp Melanchthon's view of Copernicus

"Pat bites the bullet; Bam and Angela go homeless; the causalities of those at the front lines."

— Libb Thims (2017), arisen mental note, 10:23PM CST, May 23

"It amazes the mind how one can go from ruminating on the reduction of all to the Clausius inequality, at one point in the day, to Tweeting (Ñº) about Noah's flood, at a latter point? The incredulity of humanity, give or take a Da Vinci or two, is stupefying."

— Libb Thims (2017), arisen mental sigh, 11:40AM CST May 15

"It still is amazing, that one cannot find one intelligent person, existive or non-extant, throughout the last 114-years (Gibbs dereacted in 1903), the nearest thing to universal genius, whose mind was active in this period, being Neumann, who after tasting human free energy theory, ended up begging a priest for Pascal's wager in his last days; then we have the oft-talked-about Feynman, the closet atheist, who but polished what Dirac did prior to him; the last Faustian mind to have been synthesized being Weininger, who also dereacted in 1903, after picking where Goethe left off, but then blowing his heart out in Beethoven's last room. In modern times, we have the so-called best and the brightest, milling out of the paper factories, such as Wisner-Gross, the last triple major MIT valedictorian, who is able to get but babble out of his mouth, when it comes to the deeper questions, such as the relation between entropy, intelligence, and sexual relationships, or the IQ:200+ cited prodigy Luis Arroyo, who at age 20 could but produce his "A Thermal Model of the Economy", which is but a stepping stone away from what the age 20 IQ:225+ cited prodigy William Sidis produced via thermodynamics. We might find a few semi-discerning existive minds, here and there, such as Weinberg or Hawking, who are able to probe deep in to nature and speak semi-cogently about conflicting matters, such as physics and religion, but more often than not the deeper hooks fall into babble as well, such as Weinberg's pointless universe conjecture indecisiveness, or Hawking's slow ability to ability to come out as atheist. One is also agape at the fact that in the year 2017 one can go a publicly made and ranked list of 1,258 geniuses, such as found in Ranker.com's list of **'Greatest Minds of All Time'**, with 1M views, 400k votes, and 32k voters, and NOT find the name Gibbs, despite the fact that Einstein pointedly stated nearly a century ago that Gibbs is the **'greatest mind in American history'**. The

befuddlement is obdurate. The Rossini debate is a macroscope testament to 21st century ignorance par excellence."

— Libb Thims (2017), ruminating idea (related to Thims' pre-2005 twin desire), possibly arisen while editing Goethe and mathematics, 7:41AM CST May 14

"I have to spend a certain number of hours per day greasing the wheels, sparking the kindle, and pushing on the kinetics of collision theory aspect of the situation, in order to get the mechanism operation."

— Libb Thims (2017), mental note on wake-up designed "gears" diagram of the MailCubes-powered Nightingale Chair model, May 9

"Goethe's *Elective Affinities* is a modern remake of the Empedoclean idea that friends mix like water and wine, whereas enemies separate like oil and water, told such that the main couple, the Edward-Charlotte married pair (second marriage, dwindling passion) is compared to gypsum (aka calcium carbonate), i.e. $Ca{=}CO_3$, where Edward is calcium, Charlotte is CO_3, and the "=" is their deteriorating marriage bond. They decide, owing to "changing" (Heraclitus, c.475BC) circumstances, to invite, firstly, the Captain, Edward's old friend from youth, and then, secondly, Ottilie, Charlotte's deceased best friend's daughter, whom she adopted, to come to stay with them, at their estate. The Captain, when he arrives, is compared with sulphuric acid (H_2SO_4), who when put in contact with the gypsum, triggers a reaction, wherein Edward (Ca) breaks with Charlotte (CO_3) and goes off doing things with his old friend the Captain (H_2SO_4), therein re-forming the Edward=Captain ($CaSO_4$) friendship of youth, thereby displacing Charlotte (CO_2) as a sort of "single" gas molecule, left to herself. All this occurs by chapter four."

— Libb Thims (2017), YouTube post (Ñº), May 8

"I was chemically synthesized in the year 222 AG."

— Libb Thims (2017), mental verbal note; arisen after adding (RMS:109) to the Libb Thims page, then removing the irritating AD dating system, 2:23PM CST Apr 18

"Not only am I an atheist (deny the existence of god), but I am also an asoulist (deny the existence of the soul), an achristist (deny the existence of Jesus Christ), an aspiritist (deny the existence of spirit), an amortalist (deny the existence of afterlife), an abioist (deny the existence of life), but – to clarify – NOT an amoralist (deny the existence of "morals" [or justice]). I am a moralist, one who believes that the "moral symbols" of nature are found in the symbols, equations, rules, and laws of physical chemist, as Goethe prophesized two centuries ago, and NOT a nihilist (believes that existence is meaningless, purposeless, pointless, and valueless), these can all be explained via free energy inflection point (e.g. Gates model)."

— Libb Thims (2017), mental note; arisen while penning the Margaret of Navarre article and seeing the 25 usages of "soul" (Ñº) in *Lives of Illustrious Women of All Ages* (1860), 12:21 PM CST Apr 14

"In a Clausiusian universe, the 'final cause' conjecture, in the old Aristotelian universe, has been usurped by the new 'final state' (or end state) model."

— Libb Thims (2017), mental note arisen while watching the suggested hyperlink options in making the links to the new "path-dependent" article (with thoughts of Lawrence Henderson and his view that the new system change of

state model obviates the older cause and effect model; a general statement of teleology upgrade terminology (or purpose terminology upgrade), 12:32 PM CST, Mar 14

"The irony of Planck, one of the founders of thermodynamics, in 1937, at the age of 79, arguing for a compatibility between *religion*, which he says 'wants one to act', the foundation of which being based on the belief that heat is a god [see: supreme god timeline], the action principle of which being the soul, and *science*, which he says 'wants one to learn', the foundation of which being based on the belief that heat is the quantitative product the exact differential of entropy and the absolute temperature of the body, releasing or absorbing the heat, the so-called moral action principle of which, saleable down to the hydrogen atom, being yet indeterminate, is watershed moment in history."

— Libb Thims (2017), wake-up reflection on reading Planck's 1937 "Religion and Natural Science" lecture, 11:43AM CST, Mar 7

"On the parable of the magnifying glass: if your light is simultaneously spread over multiple areas, e.g. *Smart Atheism: for Kids*, *Hmolpedia*, and MailCubes, it is hard to get any one to ignite, whereas if the light of the magnifying glass is focused on one spot, the dry leaf can be easily ignited."

— Libb Thims (2017), mental note on disbandment of 10-month existive two-person MailCube complex; arisen while running 3-mi in park, 1:45PM CST Feb 5

"That which goes against the atom cannot be true."

— Libb Thims (2017), "arisen thought" while ruminating on Hmolpedia home page, with thoughts on the implicit extreme atheism nature of the site's content; conceived amid making and posting the Thomas Paine "age of ignorance" quote (Ñº) image, 9:41AM CST Feb 22

"God's getting in the way."

— Libb Thims (2017), reoccurring mental note; stock response to why I am progressively pushing on atheism, day after 2 Kings 2:24 Facebook post; getting in the way of physicochemical humanities development, specifically, 10:00AM CST Jan 9

"Dahmer's Dostoevsky-stylized 'why can't I make up my own rules?' ideology violates Pope's 'does gravity cease when I go by?' posit."

— Libb Thims (2016), wake-up mental note, 9:14AM CST, Nov 22

"Thermal energy is a misnomer per reason that 'energy', per definition, is a conjugate variable, the product of an intensive and extensive quantity, and heat is only an intensive quantity."

— Libb Thims (2016), wake-up mental note, 9:18AM CST, Nov 22

"All thing philosophers are atheists."

— Libb Thims (2016), mental note on Hilda Finnemore (pgs. 4-5)

"You're either *with* the universe, or you're *against* it. Those against, as history has shown, tend not to last, and the time spent therein tends not to be pleasant."

— Libb Thims (2016), reflective mental note arisen in mind, at three beer level, while sitting in chair, amid the interlude of Dr. Zhivago, while ruminating on the Incident Report #4 on house guest Angela, 9:44AM CST Sep 26

"Religion is simply a belief system that binds two or more people. The smart are always asking questions. This creates to new science. New science leads to new beliefs. New beliefs, in turn, lead to new religion. So the process repeats, eternally."

— Libb Thims (2016), mental note while ruminating on the Jim Jefferies front matter quote, on how 'smarts are always asking questions', 3:17PM CST Sep 14

"There's NO god in physical chemistry."

— Libb Thims (2016), mental note while walking to fridge to get food, arisen following mental reasoning for potential for filling the new "Chair of Atheism" (Ñº) at the University of Miami, akin to the need to realize the Nightingale Chair of Social Physics, in some form, 5:32AM CST, Sep 9

"There's no god in Gibbs energy."

— Libb Thims (2016), arisen mental note, thematic to the Beg-Thims dialogue (2014), the need for *Smart Atheism: for Kids*, while doing #1 in toilet, after sending following response email go Erich Muller and James Ferri about Ram Poudel doing his PhD, 2:32PM CST, Aug 22

"One cannot anthropomorphize thermodynamics; one can only thermodynamicize oneself."

— Libb Thims (2016), mental note reflection on the Eckard Wimmer (2006) virus quote, 10:35AM CST, Jul 20

"It's molecules and mechanism all the way down."

— Libb Thims (2016), reflection on "spark day" (Ñº) and "Briggs quote" (Ñº) slides, 10:29PM CST Jun 7

"If one hears a story of the neighborhood ruffian, out with some of the local kids, who says: look, I'll bet you I can kill that bird with this stone, and thereafter he goes ahead and does it, most would likely say that it was a 'wrong' act. If, however, one hears the story of a man, out with his family, on a broken boat, having been lost at sea for some time, who says: look, I'll bet I can 'kill those two birds with one stone', and thereafter successfully does so, most would see the man as some sort of hero, and deem the act 'right'. The two parallel examples, accordingly, point to the view that right and wrong are system or context based delineations or demarcations."

— Libb Thims (2016), "mental note" arisen, the day previous, when he envisaged that he could 'kill two birds with one stone' if he used the proceeds from MailCubes.com, if it gets to a billion dollar evaluation, to fund a modern version of the Nightingale Chair of Social Physics, similar to the way the Rockefeller Foundation funded, for a short time (before dualism objections (Ñº) brought it to a halt), the Princeton Social Physics Project, Apr 25.

"If the top doesn't stop spinning that means you're still dreaming."

— Libb Thims (2016), "mental note", prompted into inception per seeing foreverspin (Ñº) advert + thoughts on *Inception* (2010) film + in the sense of one who "keeps the dreams of youth alive", 10:22CST Apr 21

"It's just a fundamental confusion that pervades the entire educational system."

— Libb Thims (2016), mental note arisen, while going to the bathroom (#1), amid start of workout, following finishing the ChE + H coupling article, 2:40PM CST Apr 16

"God was disabused explicitly from physics by Laplace (1802), implicitly from moral science by Goethe (1809), explicitly from chemistry by Wislicenus (1885), openly and privately from relativity and particle physics by Dirac (1927), and explicitly from thermodynamics and evolution by Blum (1934), in the wake of which the natural and exact sciences became 'uncontaminated by spiritual values', as Herrick (1930) put things, and science therein became atheism implicit."

— Libb Thims (2016), re-occurring mental synopsis note; a truncation of the year god was disabused from science article, 10:34 AM CST Apr 14

"Need to get (a) $5 million to get North Shore beach mansion, so to throw raging 'mansion beach party', and (b) need to get personal driver, like the playboy in Abbott & Costello's *Buck Privates* had and like Christian Gray had in *50 Shades of Gray*, to remedy the on-going situation, e.g. like last night (Ñº) when I got stopped outside the mansion party, at 11:30PM, by two police cars, who though I was a mansion robber, and all the cops swarming around me, around Touhy, when I took those two hot Persian girls to the after party at 3AM at the Mark II lounge, where Armando's birthday party was chilling."

— Libb Thims (2016), "mental note" 5:58PM CST Apr 11

"We time seconds based on the relativistic oscillation of the cesium atom, yet date years on a monotheistic rendition of the Osiris cycle."

— Libb Thims (2016), laughable note, 9:01PM CST Apr 5

"While some may cautiously point out that materialism-based-atheism is a slippery slope, bottoming out, many times, in dark regions like Stalin's bread lines, Hitler's gas chambers, or Dahmer's acid vats, others, more perceptive, are keen to realize that the need to explain the passions, pure and applied, reaching, in some cases, more illuminated summits such as Balzac's feelings and affinities dialogues, the Goethe-Schiller passions like playing cards dialogue, or the Shelley marriage in the Church of Elective Affinities, is a more powerful movement."

— Libb Thims (2016), “mental note”, arisen while marinating in the new Humpty Dumpty homepage image + mental back notes on the oft-parroted atheism atrocities fallacy (e.g. as employed in the Rossini debate) 12:29PM CST Apr 4

“It’s not the ‘in god we trust’ motto [1956] that is the problem with US currency, it is the series year dating system. The former is but icing on a cake that is made with a faulty recipe. The latter is so defunct that the cake has become rotten, and the stench only increases with each passing year.”

— Libb Thims (2016), “mental note”, arisen while penning the Marcus Varro article and his AUC dating system; following rumination, while working on the atheism types by denial and belief, on the dating system Epicurus would have used, 6:32AM CST Apr 4

“Certainly a deer jumping over a fence or thief climbing over a fence is different than say a leaf blowing over a fence or a paper airplane flying over the fence, but, nevertheless, all four phenomena are the result of a force moving an object through a distance, and thereby mediating work therein. In this view, when ‘physics has entered’ the scene, as Sherrington would say, all metaphysical, religio-mythological, and or supernatural superlatives, such as Herrick’s 1930 “spiritual value” talk [see: spiritual terminology reform], are barred from the discussion, in the same way that Dirac barred Einstein’s god talk from the 1927 Solvay conference, on fundamental quantum mechanics, as being inadmissible from the point of view of modern science.”

— Libb Thims (2016), mental note made while reading the Herrick Humpty Dumpty analogy, with reflection on test saying of this at BPE 2016, 11:27AM CST Apr 2

“People do not have sex with money, and money does not have sex with money, whereas people do have sex with each other.”

— Libb Thims (2016), “mental note”, on visually comparing (Ñº) the Empedocles model (450BC) with the Cowper model (1782) with the Yakovenko model (2000); in particular the conceptual confusion in the latter’s “money = energy” (with temperature) model, 12:17PM CST Apr 1

“Just as it is no longer permissible to use “god talk” in fundamental physics discussions, as Dirac vehemently objected to, amid the 1927 Solvay conference (Ñº), in respect to Einstein and his “god’s dice” talk, thrown about in his quantum mechanics debates, so too is it no longer permissible to use “spirit talk” and or “soul talk”, and the like, in fundamental sociological discussions.”

— Libb Thims (2016), “mental note”, a synthesis of summary thoughts on use of “spirit talk” by Howard W. Odum (1929), e.g. “scientific spirit”, Howard T. Odum (1976), e.g. “human spirit”, and soul talk and spirit talk by Inderjit Singh (Ñº) in his “Essay on Mankind” (2016), 9:14AM CST Mar 31

“I read Odum the Father, Odum the Son, and Odum the Holy Spirit.”

— Libb Thims (2016), “Mental wake-myself-out-of-bed laugh Note”, after finishing reading Howard T. Odum’s *Energy Basis for Man and Nature* (1976), and deciding to read next Howard W. Odum’s *An Introduction to Social Research* (1929), with reflection on the younger’s use of “spirit” [human spirit] (Ñº) amid a thermodynamics-attempting social theory, similarly the elder's use of “spirit” [scientific spirit (pg. vi)] and latter (2007) attempt at suppositioning an energy-based religion, i.e. “emergy morality” system; compare Yuri Tarnopolsky’s 1993 Soviet orthodoxy quasi-religion statement, 1:02PM CST Mar 30

“While some people think we have come out of the dark ages, I would intuit that we are still residing in Plato’s cave.”

> — Libb Thims (2016), “mental note reflection”, upon looking at the new revision #1851 of the Hmolpedia main page, after receiving the full 10-volume print set, and marinating in the jump from the Goethe-Schiller dialogue (1799) to the Beg view (1987) to the visual of the print set, with the de Donder view (1936) of the relation between affinity and free energy shown on the cover, repeated ten times, 3:37PM CST Mar 28

“There’s too much zeal and not enough wheel.”

> — Libb Thims (2016), “wake-up mental note”, commentary on proliferation of 21st century "seven-layer citation method" (in contrast to early 17th century conjecture based directly on experiment), e.g. empty econophysics, incongruous information-based thermodynamics, e.g. Wayne Angel’s bit-based enthalpy, and the BPE 2016 consortium varied topics in general, in respect to Otto Guericke’s “no truth without experiment” belief system motto, from his preface, and reasoning for undertaking his vacuum experiments (which he never intended to publish); day-after reflection and rumination while reading the emptiness of Howard T. Odum (1976) as compared to the rootedness of Howard W. Odum (1929); in the seeming synopsis sense that 95 of modern publications physics-based humanities publications, e.g. "bird in vacuum econophysics", are all zeal with no experimentally-based mechanistically-conceptually understood roots, the way Guericke went about things, i.e. in the Galileo-Kircher view of things, in his experimental investigations, as a hobby alongside his day job as mayor of Magdeburg, 7:52AM CST Mar 26

“It’s a fundamental law of physico-chemistry – deriving from collision theory – that one cannot get to the new bonds until the old bonds are broken. It is the reason why hot water freezes faster than cold water.”

> — Libb Thims (2016), mental note on how Jeremy England wears a kippah while he attempts to explain “life”, to reporters (Ñº), via thermodynamics, and “god said let there be light”, via Wittgensteinian language arguments, from his MIT physics office; conjoined with reflection on how I once (c.2014) talked with England about joining his team, 3:37AM CST Mar 24

“If a book does not contain one or more of the keywords: ‘physics’, ‘chemistry’, ‘thermodynamics’, ‘atom’, or ‘molecule’, at a minimum, then something must be inherently wrong about the book?”

> — Libb Thims (2016), mental note (see: Beg analysis) made after Amazon (Ñº) keyword search of *Phishing for Phools: the Economics of Manipulation and Deception*, by George Akerlof and Roberg Shiller, 3:24AM CST, Mar 23

“One of the noticeably-discernible commonalities in transgressing into the coming-out-of darkage Thimsian ‘atoms + thermodynamics’ formulaic theory of every ‘thing’, as compared to the going-into darkage Lucretian ‘atoms + chance’ formulaic theory of every ‘thing’, is the parallelism via which the same theory acceptance resistance difficulties are prevalent, such as Marcus Varro’s 50BC ‘the poets, through the conjunction of **fire** and **moisture** [see: Darwin’s warm pond → defunct theory of life], are indicating that the *vis*, ‘force’, which they have is that of Venus [Aphrodite]. Those born of *vis* [vis viva; vitalism] have what is called ***vita***, ‘life’, and that is what is meant by Lucilius [c.120BC] when he says: **‘life is *force*** [see: Tesla] you see: to do everything force doth compel us’,’ or Lucretius’ 55AD ‘think of all the endless fantasies your priests devise, that can subvert all reasoned thought and turn your life to terror and confusion’ [see: new atheism → defensive atheism (Ñº) / extreme atheism], which would seem to point

towards some type of historical big history timescale social orbital trajectory theory of belief bond change actuation, akin to five-turn interpersonal make-up to break-up social orbital loop decoupling phenomena, which actuates in some relationship breakup dynamics, or something to this effect."

> — Libb Thims (2016), mental not arisen while reading Lucretius' *On the Nature of Things*, for the first time, 5:07 PM CST Mar 21

"In order to understand hmolscience, one has to understand 100 percent that the Bible, and related derivatives, i.e. Quran, Rig Vida, Buddhist scriptures, etc., is but a collection of ancient proverbs, and semi-modern morals, i.e. rules for right and wrong, anchored into a proto-scientific mythological framework, framed within a tale of humans created from clay, amid a cyclical Nile river flood sun rebirth cosmology."

> — Libb Thims (2016), "mental note", arisen while pausing amid doing bench and shoulder press sets, while looking at the parallel Bible sitting on the book shelf, 1:46 PM CST Feb 20

"In order to understand that every 'thing' we see around us is but atoms, and aggregates of atoms, moving about on a surface, one needs to de-brainwash oneself from five-thousand plus years of deeply engrained religious, mythological, false scientific, and taboo folklore inculcations."

> — Libb Thims (2016), mental note reflection, arisen while viewing the new 10:29 AM 20 Mar 2016 homepage, in particular the Balzac feelings and affinity dialogue + the "if we are made of atoms" quote box, 10:44 AM CST Mar 20

"The only thing that works against implicit theism is explicit atheism."

> — Libb Thims (2016), "mental note arisen while running 2-miles" after working on the "this idea" article, possibly with thoughts of the 2014 Beg-Thims dialogue in mind, and resultant follow-up switch from implicit atheism to explicit atheism, 3:40PM CST, Mar 18

"The modern world is so imbecilic it makes my mind spin."

> — Libb Thims (2016), reflection on the new Hmolpedia opening Goethe-Beg (Ñº) image, 2:44 CST, Mar 15

"I don't care who you are. You could be a student of the best chemical thermodynamics professor, namely: Gilbert Lewis, of the 20th century, and then go on to write a full and very successful textbook on *Chemical Thermodynamics*, and only after this, you might, per small chance, have balls enough, after winning a prestigious prize, e.g. the Priestly Medal, at the age of 72, to spend a few minutes at the end of your acceptance speech, talking about how chemical thermodynamics applies in the REAL world, e.g. to freedom and security, only to have underlying conjectures and implications of your ending speech be debated about 30-years later, after you have already passed, in some random *Chemical Education* journal, after a planes are flown into skyscrapers in the name of god, on the merits of your theory, amid atheists chemists and theist chemists, only to have your idea run amuck in stalemate, owing to 5,000-years of ingrained mythological beliefs, on both sides of the debate fence."

> — Libb Thims (2016), personal note reflection, made will ruminating on the 2013 Thims epicenter genius pic added to the Libb Thims (genius rankings) page, 1:56PM CST, Mar 15.

“I certainly would like to know, for all the sh*t talkers, chuckling to themselves, about Thims IQ estimations [done to appease people who keep asking this question], who exactly, in numbered ranked listing, are these so-called ‘smarter people’, moreso than Thims, on the planet currently reacting? As of 14 Mar 2016, I can only discern, at the present moment, that Christopher Hirata is either below me [intuited momentarily] or above me in intellect?”

> — Libb Thims (2016), mental note; made after reactionary tinkering with the Libb Thims (genius rankings) page for several days; following most-resent posts (Ñº)(Ñº), of many in recent years; 6:15 CST, Mar 14

“The amount of thoroughgoing learned imbecility-ingrained ignorance prevalent going into the early 21st century, is captured well in the frequent boasts that so-and-so Fields Medal winner, e.g. Bhargava (Ñº), Tao, etc., towers above Goethe in intellect, is epitomized by the commonly known rule, among intellectual climbers, that humanities degrees are for those who can’t handle mathematics, that mathematics is for those who can’t handle physics, that physics if for those who can’t handle engineering, that the weak engineering degrees are for those who can’t handle chemical engineering, that those who drop out of chemical engineering are those that can’t handle chemical engineering thermodynamics, the infamous spine-chilling (Ñº) ‘weeder course’ of this exquisitely dense subject, that chemical engineering, over the last century, has consistently been at or near the top of highest paying degrees, for this intellectual hierarchy reason alone, and that applied chemical thermodynamics in the humanities is the tending to be retirement age game plaything of those lofty intellects that can career-wise sail over all of this, e.g. Rossini, Bridgman, Schrodinger, etc., and or a large percentage of newly-emerging IQ:200-range (Ñº) cited child prodigies, e.g. Hirata, Neumann, Arroyo, etc., that Gibbs is the gate keeper of this plaything, the underpinnings of which were mused about by Goethe, in his *Elective Affinities* (1809), and prior to him Empedocles (450BC), wherein the former, building on the latter, ‘brooded over the juridical procedures of god’ (Ñº), prior to the raising of the gate by Helmholtz (1882), the last of the last universal geniuses, who proved affinity to be gauged by the free energy of Gibbs.”

> — Libb Thims (2016), mental note arisen while writing the article on John Platt, in particular his “The Sweep and Excitement of Science” (1959) address, 11:03AM CST Mar 13

“The affinity/free energy problem is to modern IQ:225+ range thinkers, of the 19th-21st centuries, as the blue sky problem was to every IQ:200+ range thinker of the last two-thousand millennia: Aristotle to Da Vinci to Einstein.”

> — Libb Thims (2016), mental synopsis note (Ñº) on the prevalence of growing hydraism-like (Ñº)(Ñº)(Ñº) imbecility seen, 11:28PM CST, Mar 11.

“It’s as though I have a bigger sense of ‘chemical potential’ to fulfill (or realize). Women always just always seem to be getting in the way. Some even tell me so, namely: that they feel that way.”

> — Libb Thims (2016), practice answer rehearsal, to long-time overly common reoccurring query “so why aren’t you married?”, after showing the new landlord my new exercise station (Ñº), in anticipation of the question, who just had his second baby over the past weekend; jotted herein as note per realization that the term “chemical potential” seemed to arise naturally in the mind, as workable cogent synonym to the seemingly teleological and or atomic purview objectionable term “purpose” (e.g. it is difficult to sentence that it is hydrogen’s ‘purpose’ to bond with oxygen to form water), seemingly thereby to fill in as workable “purpose terminology upgrade” employable, in light of Vicente Talanquer's discernible chemical teleology terminology objections, in passing conversations; possibly even preferable than to “thermodynamic potential”, as suggested by Bruce Lindsay (1983), which has a less-recognizable immediate meaning, in everyday passing colloquial conversations, 11:45 AM CST Feb 26

“The amount of thoroughgoing imbecility in the modern world is so prevalent that the situation is akin to a meateater searching for intellectual sustenance, while locked in a greenery, with a vivid distant through-the-Google Books-window like view of historical golden age predator-prey vistas of the past, of the Newton-Hooke, Young-Lagrange, Adams-Gibbs, or Lincoln-Euclid variety.”

> — Libb Thims (2016), “Note on new main page Seuss-stylized ‘things’ diagram” (Ñº) + thoughts on sparsity of prodigy ripening (e.g. battle of the prodigies), 8:09 AM CST, Feb 23

“You can’t boil water with bits.”

> — Libb Thims (2016), note reflection Sokal affair and hydraism nature of metallurgical engineer geologist Norman Dolloff (1975) citation of chemist Witold Brostow (1972), who in turn cites physicists Peter Landsberg (1970) and Edwin Jaynes (1957) who in turn cite electrical engineer Claude Shannon (1949) who in turn cites the “nobody knows what entropy is” joke suggestion of John Neumann (1940), 3:33PM CST Jan 8

“For every **action** there is an equal and opposite **re-action**. When connective sets of action and re-action pairs occur near an activation barrier, a **chemical re-action** occurs.”

> — Libb Thims (2015), mental rumination on the second law of motion and chemical reactions; following seeing the term ‘re-action’ during video at gym, 3:49PM CST 17 Dec 2015

“Religion is 70 percent mythology (i.e. Anunian theology), 15 percent astronomy (Sirius = Sarah), 7 percent geology (Nun = annual Nile flood), 5 percent natural science (e.g. dung beetles mounds = pyramids), and 3 percent pixie dust (i.e. fairy tale).”

> — Libb Thims (2015), reflection on George Millin's 1896 attempt to relegate all religion to myth and good and evil to physical science, 12:14 PM CST Dec 15

“One can divide the world into those who see *Elective Affinities* as reality, and everyone else.”

> — Libb Thims (2015), laughing visual reflection of Elective Affinities scale (Ñº), Nov 30

“One must be able to derive, to a first approximation, the partial differential equations of existence before engaging in the process of existing.”

> — Libb Thims (2015), long-time reoccurring mental note (e.g. 2012 comment to mental calculator friend Greg); above quote jotted at occasion of “derivation” page + possible reflection of Bridgman formulas, 4:16PM CST Nov 24

“I exist, therefore I am.”

> — Libb Thims (2015), semi-reoccurring mental note statement; jotted down following start of “exist” article; upgrade to Descartes’ automaton sentience problem concluding statement: “I think, therefore I am”; similar to Jefferson’s “I will cease to exist before …” and “existive” (upgrade to “alive”; a defunct term), 11:14AM CST Oct

"Tandem Felix ('Happy, at last'). The inscription (epitaph), ordered by the tortured Ampere, to be put on his tombstone. Happy for 12-hours [2007], when received first published copy of *Human Chemistry*—while sitting on porch, in sunlight, sifting through pages—once, since *circa* 1995 doorway to hell opening. Still puzzlingly reactively existing, despite non-planed residence existence phase, with semi-reoccurring speculations of finding tentative future slot 6-hour of happiness slot. Possibly fate will be the same as the tortured Ampere?"

— Libb Thims (2015), re-occurring extended note on "6-hour" issue; initiated after finding article (Ñº) on Ampere's supposedly decreed (Ñº) tombstone epitaph, cited (Ñº) since at least the 1930s, despite not being able to find the inscription in photo (Ñº); possibly has something to so with circa 1870s remains relocation (Ñº), Oct 14

"I'm a 'zerotheist', which means that I believe in: bosons and fermions, rhythm and rhyme—or waves and tides—and zero gods."

— Libb Thims (2015), mental note, arisen in shower; in practiced rehearsal for re-occurring queries about whether I believe in god or what my beliefs or religion is (see: zerotheism); a *religion*, from Latin *ligare* (tie or bind), between me, Henry Adams (1863), Goethe (1809), and Paul Dirac (1945); see also: Cicero etymology (Ñº), as derived from *relegere* "go through again" (in reading or in thought), from re- "again" + legere "read"; see also: ZFK | Intro (13:12) (Ñº): "Thor and I are what's called 'zerotheists', that means …" (Aug 10), 11:25AM CST Sep 10

"Zerotheism for Kids is like a de-Biblification for the mind."

— Libb Thims (2015), mental note; while watching ZFK part 1 "Adam and Eve" part, 10:06AM CST Aug 26

"We come into the world one way. We go out another way. There's nothing in between those two points but determinism."

— Libb Thims (2015), looking into the mirror while putting contacts in arisen reflection, 7:02PM CST Aug 24

"I need to get up or get out."

— Libb Thims (2015), mental rhyme note; arisen while driving home from opening night of "Straight Outta Compton", *circa* 1AM, Aug 14

"Have you ever heard the phrase 'running in hell'? Well, there's two rules when you're running in hell: (1) don't stop running; (2) don't look around."

— Libb Thims (2015), mental note response, dating 20+ years and counting, to the most apt response, while watching *Good Will Hunting*, to the query: "have you ever heard the phrase 'any port in in the storm?'", 12:07AM CST Aug 8

"As soon as you lose track of 'why' you're doing 'what' you're doing the mechanism begins to stop."

— Libb Thims (2015) mental note; arisen while tanning at X-sport, for 10-min, while listening to the song "Talking Body" (Ñº), by Tove Lo, after training for about 1.5-hours of treadmill and free weights; the song bring to mind the early age, circa 15-21-ish mechanism plan goal of getting hot girls with hot "bodies", using standard classical male seduction techniques (Ñº) and Bussean fall-in-love triggers (Ñº), which work rather well, i.e. until one begins to run into unforeseen 'blocks' in course of getting 'perfect bodies', as the lyrics go, which result to create a feedback loop of cause-to-pause into the 'why' of the 'what' of the mechanism; Jul 10 1:19PM CST

"In the world of *Real Genius* (1985) (Ñº), it goes from god to Jerry to Kent to the cleaners; in the Real World (2015) (Ñº), defined by Rossini, it goes from Dirac to Thims to [protégés] to cleaner public minds."

— Libb Thims (2015), an "it goes from god to …" mental note wakeup summarization of the seeming conclusion that there will always exist a sort of science-to-faith gradient, whether it be of the Egyptian science to polytheistic Imhotepism (2585BC) to local preachers to public gradient variety; or modern particle physics and chemical thermodynamics modern science to extreme-atheistic (Ñº) Thimsianism (2011) to local evangelistic atheist preachers to public gradient; or, likewise, invariably future gradients that will exist in the millennia to come, as science progresses, 9:43AM CST Jul 8

"If a modern high IQ theist is an oxymoron; than a modern extreme atheist who dates years via anno Domini (AD) and before Christ (BC) is a hypocrite."

— Libb Thims (2015), person note refection; arisen while drafting the George Smith article; following a reading of thread (Ñº) post #5 and rumination on the 54+ post "You can be smart and believe in God" (2012) thread (Ñº); along with the more recent 12+ post: "Can a religious person be a true genius? (28 May 2015) (Ñº), "Voltaire was a theist" (9 Jun 2015) (Ñº); amid recent email discussions with William Jensen about how defining Einstein as an atheist is a mis-label (29 Jun – 5 Jul 2015), 2:58PM CST 2015AD (or 265AG in Goethean calendar years)

"When a chemical engineer trains an economist a Nobel Prize is the result."

— Libb Thims (2015), reflections on Paul Samuelson and the Jaime Aguilar-Arias education reform suggestion, 12:56PM CST, Jun 28

"Belief in god should be supplanted with belief in enthalpy and entropy." / "Instead of believing in god, people should believe in enthalpy and entropy."

— Libb Thims (2015), mental note test phrase, arisen while writing the Thomas Paine article, amid visual reflection of the Atheism Reviews opening word scramble logo (Ñº) , 1:57PM CST Jun 27

"[I'm an atheist] because I believe in atoms and energy, not Adam and Eve."

— Libb Thims (2015), response answer to question: "So, why are you an atheist?", from Brian, an age 18 atheist (who was at the 8 Jun 2015 Atheism Reviews filming session), *circa* Jun 12; mentally recalled and documented here 1:30PM CST Jun 27

"Religion—Latin for 'that which binds'—is the eternal shapeshifter; for science—Latin for 'that we know'—is forever increasing. The former must always, in a haphazard manner, tail [or chase] the latter, just

as the shape of the river bed entails the melting mountain snow; just as the unknown precedes the known."

— Libb Thims (2015), note while reading Lee Strobel, Jun 21

"You get A's so you can get the D's."

— Libb Thims (2015), word play mental note; arisen while on treadmill watching Seinfeld clip of George's father explaining bra sizes to George, for his bra salesman interview, namely "you've got your As, Bs, Cs, Ds … and Ds are the biggest; to which George replied: "I know about the Ds [in exasperation] I've spent my whole life trying to figure out how to get the Ds", a spin on Beckhap's law, Jun 17 5:44PM CST

"It goes from Empedocles to Goethe to Beg to me; and the third believes in flying horses."

— Libb Thims (2015), semi-ongoing mental note reflection on need to get to 100 Atheism Reviews videos, 12:21AM CST Jun 12

"It's one thing to be quick at solving amusements such as jig saw puzzles, Fibonacci sequence patterns, the fly problem, or word rhymes, etc., but it's quite another to possess the deeper ability to solve really profound puzzles, like the blue sky problem, clock syncretism problem, elective affinities problem, or that amid the Heraclitus-Parmenides debate."

— Libb Thims (2015), person note; arisen following the Christopher Langan article start and general thoughts on IQ fakers, May 5

"No longer do we believe that humans originated from Adam and Eve, but from atoms and energy; created not by the power of god, but by the power of Gibbs energy. "

— Libb Thims (2015), quote thought, mentally noted, or jotted somewhere previously (possibly a play on Steve Paulson's 2010 *Atoms & Eden* (Ñº)), in something of the above form; documented here while writing the Adam and Eve article; itself spurred into existence during the soul mate article, and the connection that the premise of "original sin", supposedly, derives from the Egyptian-Greek split soul logic, 1:17PM CST, May 19

"The present overarching morality system of the world, give or take 10-20 percent of the global population (who have, predominately, a Yellow River based belief system), is based on the seeming ancient perception that the sun (Ra) comes alive each morning, travels an arch through the sky, over a stationary earth (Geb), thereafter dying at nightfall, repeating this in a daily cycle, progressively growing stronger and weaker, in light and power, in a yearly cycle, decisively marked by the late Jun melting of the snow in the Ethiopian mountains, thereby causing the Nile River to flood (aka Nun or Noah's flood), for 150-days, Jul to Nov, marked by the Jun 25 helical rising of Sirius (dog star)—the brightest start in the sky, culminating with the Dec 22-25 perceptual sun standstill, i.e. the seeming ultimate yearly "death" of the sun, at the location of the southern crux (cross) star formation; then conceptually seen to be reborn, on Jun 25, when the three king stars (three kings) align with Sirius to point out the birth location of the new young sun; all of which became anthropomorphized into the morality-based story of how Osiris (aka Jesus) was crucified (corn-like body shucked apart) at the time of the Corona Borealis (thorn crown) star formation, later being resurrected (or reincarnated) by his wife-sister cohort Stella Maris (aka Virgin Mary), or "star of the sea", to become the judge of the living and the dead in the afterlife, via the method of the weighing of the soul, the number of sins, or acts of wrong doing, i.e. the measure of the weight soul, being 42 (aka negative confessions),

measured against the feather of truth, based on the number of nodes (capitals), and associated nodal gods (later to reside in the hall of judgment in the afterlife), existing in upper and lower Egypt at the time of the formation of the 1st dynasty state religion in 3100BC, the gist of which is known to the modern world in the form of resurrection-based Abrahamic faiths (53% of world beliefs) and the reincarnation-based Brahmaic faiths (19% of world beliefs), i.e. Ra-centric theologies (aka Anunian theology) or Ra (phoenix) born of Nun (pyramid) following (Nile) flood origin of the universe based belief and morality systems."

> — Libb Thims (2015), truncated mental note (Ñº) (V:5:40); ; seemingly trigged into existence per reading of Leonard Shlain's 2009 *Leonardo's Brain*, the night prior, and how Da Vinci jotted in his 1490 notebooks, using reverse mirror writing, anti-Ptolemaic Biblical logic, such as "the sun does not move" or "the earth is but a speck in the universe", and how he rejected Biblical flood myth theory as the explanation of fossils in sedimentary layers of mountains, 1:54PM CST Mar 24

"You better be in the hospital or in jail if you cancel on me."

> — Libb Thims (2015), long-standing rule of thumb reflective mental note, while watching the "OK, where are you going" scene of *Heat* (1995), 3:02AM CST Mar 10

"Only go where your reputation precedes you."

> — Libb Thims (2015), long-time reoccurring mental note—likely on scratch somewhere—triggered into thought mechanism on getting no response after cold-emailing (Feb 17), jointly, Princeton sociology and chemical engineering heads, Miguel Centeno and Richard Register, on a proposal to revive the Princeton social physics project in the form of a "sociology + chemical engineering = physicochemical humanities" course to become PhD program, interblended with thoughts on penned a *Nature* (or equivalent journal) article, which creates such pull, that a powerful draw exists on me, 10:57AM CST Feb 20

"Until you openly—publicly and explicitly—reject god are you truly awake."

> — Libb Thims (2015) mental note arisen while writing the Simone de Beauvoir article amid thoughts on sister's claimed atheism, albeit public closet atheist variety, in respect to her god-believing Jewish-Christian child raising program, 11:42AM CST Feb 8

"Always align with the realism of Patrick Fergus; never get lost in the styrofoam of academic bliss."

> — Libb Thims (2015), mental note, 7:16AM CST Jan 27

"The heat brings us into existence; the cold takes us out."

> — Libb Thims (2015), reflective note of the warm sparrow parable (Ñº), 8:12PM CST Jan 20

"Just as when wood burns, that 'humours, vapours, and phlogiston' have nothing to do with it, it's just two atoms of the element oxygen combining with an atom of the element carbon to make a combination of atoms bound together, a molecule of carbon dioxide (CO_2), as Michael Rowan-Robinson (1999) would say, so too is the case that when two people burn, say in process of love, that 'souls, spirits, and God' have nothing to do with it, it's just two human molecules combining to make a combination of atoms bound

together, a dihumanide molecule (Hu_2) in a relationship."

> — Libb Thims (2014), mental note per reading pg. 4 of Rowan-Robinson's *The Nine Numbers of the Cosmos*, 8:07AM CST, Dec 25

"What do you call the person who trains the assassins of God? Goethe."

> — Libb Thims (2014), mental reflection note, from posts #42-44, in thread "You can be smart and believe in God?" (Nov 9) on the focus of the Atheism Reviews channel, 10:29AM CST, Dec 18

"If Goethe overthrew the 6th commandment, I need to overthrow the entire Bible."

> — Libb Thims (2014), duty mental note, arisen per penning of Goethe on religion article, 9:19AM CST, Dec 8

"Today it is no longer permissible to simply teach a man a trade—such as chopping wood or giving them an education—prior to sending him or her out into the work force, one must now also explain, to the new mind, the motive force for why one works in terms of partial differential equations."

> — Libb Thims (2014), semi-reoccurring reflective note, arisen into note jotting state, per starting of the prodigies and calculus page, 1:23PM CST, Dec 7

"Religious people—of the Abrahamic faith variety—have so much fun shucking insults at the atheists as immoral nihilists, heathens, etc., well they too are atheists themselves, of a different variety, namely: apolytheists, i.e. those who disbelieve in a multitude of gods. Atheists and polytheists are the same, only the latter believe in one less god."

> — Libb Thims (2014), mental note arisen in mind, while contemplating the "Atheist's Christmas Special" for the Atheism Reviews channel, 3:43PM CST, Dec 6

"A person is not governed by God, but by their passions. The passions, in turn, as Goethe pointed out, are governed by the elective affinities. The affinities, in turn, as Helmholtz proved, are measured by the free energies. The free energies, in turn, as Rossini explained, are determined by the time-changing entropy and enthalpy differentials of one's reaction system, a compromise between freedom and security. These, in turn, as seems to be the case, are coupled to the universe, in some yet unclarified way."

> — Libb Thims (2014), mental note on Bertrand Russell's 1956 Prologue to *Autobiography* quote, on what governed him, namely: love, knowledge, and pity, in association with his 1890 question of 'Who made God?' that turned him to atheism, 9:28AM CST Nov 10 + 5:48PM CST reclarification Nov 24

"One might find it ironic for an adult-aged person, of nineteen years reaction existence, with no knowledge of chemistry per say, i.e. having never taken a chemistry course, to within five years, of having been freed from the culturally-mandated minimum of high school level of eduction obtainment, complete a degree in chemical engineering, within ten years independently derive the human molecular formula, within fifteen years write the first textbook on human chemistry, and within twenty to twenty-five years go on to found the science of human chemical thermodynamics."

— Libb Thims (2014), reoccurring personal note, triggered into note stage, per rumination on the inverse genius relationship phenomenon (see: mislabeled geniuses, 10:49AM CST, Nov 3

"We reactively exist in a 21st century social system, steered or governed, in part, by a 1st century morality system."

— Libb Thims (2014), jotted on yellow notepad paper, while on the go, *circa* Oct

"If you're not alive, you cannot die." | "You can't die if you're not alive."

— Libb Thims (2014), reverberating mental note, as a way to succinctly capture the direct implications of the "life does not exist" purview; triggered into documentation phase, via dialogue in the Jabr thread, 4:51PM CST, Oct 23

"The Bible is but a story book for adults, just as Mother Goose is for kids."

— Libb Thims (2014), terse synopsis note; possibly influenced by the mAtheist app (Ñº) reading of Clarence Darrow's 1930 speech in Toronto (Ñº) quote: "I don't believe in God because I don't believe in Mother Goose", 1:43PM CST, Oct 20

"We measure seconds as 9,192,631,770 periods of the radiation corresponding to the transition between two specific energy levels of cesium-133, yet we date years to a day that never existed?"

— Libb Thims (2014), reflective note, following read of page 137 of Victor Stenger's *God and the Atom*; and note to begin dating Atheism Reviews videos per Goethean calendar based years, 3:09AM CST Oct 20

"The only thing that sets people apart from the rest of matter, say as compared to a rock, automatons, or computers, is that a human is a powered CHNOPS+ structure, whereas rocks, automatons, and computers are not."

— Libb Thims (2014), note per reading of Chris Rohmann's "mechanism" (Ñº) section, 10:41AM CST Oct 18

"People think it divine, merely because they do not understand it. Once understood, association to divinity ceases."

— Libb Thims (2014), mental note restatement of Hippocrates quote (Ñº) or Hippocratic reductionism, in respect to modern-day divinity associations; compare Percy Shelley's 1811 "every time we say" (Ñº) quote, 8:19AM CST, Sep 28

"People say we are in the modern age, that we have come out of the dark ages, but this does not seem to be the case. We still seem to be in the eclipse of Lucretius. Ignorance, backwardness, and fear debased with mythology seem more prevalent now than two-thousand years ago ... as the old saying goes it 'we are walking backwards into the 21st century'."

— Libb Thims (2014), mental reflection, per seeing opening Epicurus quote on "happens in myth" in Victor Stenger's *God and the Atom* (2013), making of the "four horsemen of atheism" article (and image), to the atheism timeline, thematic to engagement into the new Atheism Reviews debate channel, 6:07AM CST, Sep 28

"It seems to be the case that more than ninety-nine percent of people are insane in regards to reality."

— Libb Thims (2014), documentation note, following perusal of "conman" post (see: derogation); in alignment with Goethe's visit a madhouse quote does not need, 4:18 PM CST 22 Nov

"I must be a Democritean, Empedoclean, Epicurean, Goethean, Maxwellian, Adamsian, Paretian, Hendersonian, Rossinian infused thinker?"

— Libb Thims (2014), mental documentation note, per discovery and ordering of Bruce Hunt's 1994 *The Maxwellians* (Ñº) 3:52 PM CST, Sep 22

"A 'moral' person, so to say, will accentuate the stay of Vita — the goddess of life. An 'immoral' person, concordantly, so to say, will quicken the arrival of Mor — the god of death."

— Libb Thims (2014) personal note reflection on the newly-labeled Mor, Prometheus, Cupid *Elective Affinities: IAD cover* (Ñº), indicative of the view that: life (Promethean fire), love (Cupid's arrow), and death (Mor's arrival) are the subject matter of heat and chemistry, as depicted by Cupid's arrows, the famous chemical injection claimed to cause a person to fall in love, the Promethean fire, i.e. the "vital principle or fire which Prometheus quickened into life his clay" (Ñº), stolen from the gods; a semi-modern Greco-Roman upgrade to the Egyptian clay creation myth or origin of humans, which would have been an upgrade to the whatever pre-Dynastic origin of human theories existed, which in sum would seem to be an American upgrade of the Greco-Roman upgrade of the Egyptian upgrade of the pre-Dynastic upgrade origin of humans models, 1:43 PM CST, Sep 21.

"Religion — as noted by Marquis de Sade (1797), Novalis (1798), Marx (1843), and Dirac (1927) — is but an opiate or opium for the mind; and like all drugs, it can be replaced, upgraded, or in some cases treated, with a better or less symptomatic one."

— Libb Thims (2014), personal note (see: god face), arisen into view, conceptualized as the embodiment of the future day when the physicochemical belief system becomes the new religion for humankind, the term "religion" deriving from the Latin *ligare* "system which binds", while attempting to add the 1927 Dirac religion rant to the atheism timeline, and thereby investigating the historical origin of the "religion is a kind of opium" phrase usage by Dirac, at 1:30 PM CST, Sep 17

"I only believe in that which is measureable, everything else is but speculation."

— Libb Thims (2014), mental reflection note on the start of the new Atheism Reviews channel 10:24 CST Nov 15

"You have to follow the flow of heat in order to gauge your sense of purpose."

— Libb Thims (2014), mental note arisen, and repeated a number of times in head, while driving home, after seeing super "hot" classy women walking through crowd, on a nice fall summer day, after going semi-clubbing that night, at the second floor of John Barleycorn, for a girlfriend's birthday party, then waking up that morning with another girl,

the latter being an interaction greatly lacking in energy and heat; note: Einstein on seeming to “divine a purpose” (Ñº) or “sense a purpose” (Ñº), seems have an influential connection to the latter part of the above phrase, 5:06 PM CST, Nov 14

“Just as there is no god involved when oxygen reacts with hydrogen, so to is there no god involved when man reacts with woman.”

— Libb Thims (2014), mental synopsis of the Goethe 1809 point on the atheism timeline, Sep 10

“Is god involved anywhere at all in the operation of the steam engine? No. So it is with the humanities.”

— Libb Thims (2014), variant of personal note arisen on treadmill a week or so ago (possibly a recoil note in respect to recent Mirza Beg dialogues and discussions, Sep 2 @ 7:22 CST

“I come from the bottom, and I’m not going anywhere but the top.”

— Libb Thims (2014), long-time reoccurring personal note/pledge, arisen to mind while watching *Crimson Tide* (1995), at 13:40-min point; semi-reflective note, possibly arisen in respect to earlier today two cultures inquires email query sent out, following discover of Fernando Sanford’s 1899 address, to Stanford University bioengineering department chair Norbert Pelc, in regards to teaching a physiochemical humanities course at Stanford, Sep 2 @ 7:14 PM CST

“Suspend moral judgments when in a transition state.”

— Libb Thims (2014), mental note, Jul 24 + Aug 2; second date arisen while watching "decision" scene of *Lone Survivor* (2013)

“I believe in fermions, bosons, and vacuum. Much theory must be jettisoned, and great terminology reform is in order, if this view is to be successfully carried through into the expunging of the humanities. One must, however, remember not to throw out the baby with the bath water.”

— Libb Thims (2014), mental note arisen while running on treadmill, documented @ 10:02 PM CST Jul 20

“Does god, soul, spirit, karma, or yin and yang, etc., have anything to do with why hydrogen reacts with oxygen? No. So it is with humans.”

— Libb Thims (2014), mental note arisen while watching “thee Trinity, that cracked the IRS Dbass, Jesus” scene in *Matrix* (1999) @ 2:55 PM CST Jul 20

“All talk and no equations makes Jack a dull boy.”

— Libb Thims (2014), mental note, arisen while defecating, following a reading of a Ludwig Wittgenstein chess-playing zealot who in 2010 ranked Jean-Paul Sartre and Albert Camus with IQ=155± (Ñº) @ 10:20 AM CST Jul 20

“Some of the best writing is done, when the intention is to burn it all when finished.”

— Libb Thims (2014), reflection on the Thomas Young 1809 ‘burn what you write’ quote and the 2013 Great Gatsby film suggestion “write it down, even if you burn it all” when finished, as the writing brings you solace, 10:41 PM CST Jul 18

“One must have a principled existence.”

— Libb Thims (2014), arose in mind while watching the triangular formation gangster scene walk towards the house (for sneak attack), the 2000 Bruce Willis adventure crime comedy film *The Whole Nine Yards*, while running 3-miles at 15%-incline at 7.8-mi/hr @ 3:13 PM CST Jul 12

“Inorganic chemistry, organic chemistry, physical chemistry, and human chemistry all have one thing in common, namely: there is no god involved in any of them, in their organizations, operations, or processes, neither at the start, at the end, or in any transformations throughout that may accrue.”

— Libb Thims (2014), came into mind, while on treadmill, amid Beg-Thims discussion, following a reading of Mirza Beg’s latest publication “Creation of the Universe Was Designed”, 2:43 PM CST Jul 11

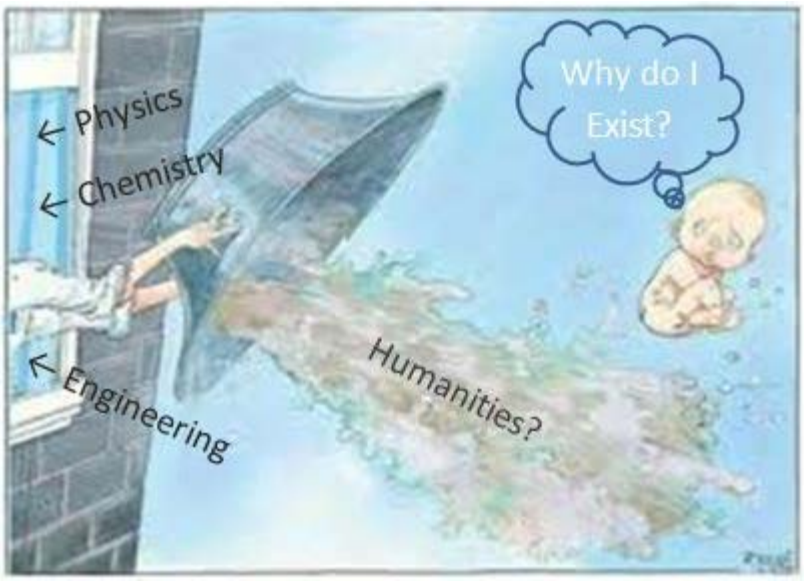

Visualization of 20 Jul 2014 **mental note** on jettisoning.

“A person’s word is only as good as far as their actions follow-through in carrying out that word.”

— Libb Thims (2014), concise longtime re-occurring, documented for the sake of exactness, in phrasing, arisen via reflection, in mirror, on why, if I am forced to explain things, I blocked two woman’s numbers, on my phone, but not one other’s number, following recent cancellation of plans agreed on two of the three mentioned parties, 7:50AM CST, Jul 7

“If you were the smartest personal alive, you would know you were not alive.”

— Libb Thims (2014), mental documentation note of three point (Ñº) SPA purviews, 11:27 AM CST, Jun 23

“I much prefer reading, and writing [spontaneously] in the margins of books, as I did in the old days, when needed, without so-called ‘conscious’ awareness that what I may be writing in those margins will be read and cited by others, in the distant future, similar to the way I presently site Newton’s age 19 handwritten notebook quote about how Aristotle commented, somewhere, that while Plato may be his friend, ‘truth is his greater friend’, or about how Darwin wrote ‘never use the words higher or lower’, in the margin of his copy of Robert Chambers’ *Vestiges of the Natural History of Creation* (1844), or how Fermat wrote his so-called ‘last theorem’, which states that $a^n + b^n = c^n$, where *x*, *y*, and *z* are non-zero integers, has no solution with *n* greater than 2, in the margins of his copy of Diophantus’ *Arithmetica* (c.275). As to when

this semi-reoccurring irritating ‘awareness’ arose, is difficult to say, although it seemingly has progressively began to arise in recent years.”

— Libb Thims (2014), semi-reoccurring phenomenon, 2:41AM CS, Jun 18

“You have to go really dark to become a Newton.”

— Libb Thims (2014), while watching *Hannibal Rising* (2007) and seeing the meeting of Lady Murasadi (Gong Li) who starred in the dark 2006 remake of *Miami Vice*; the thought reflective of how Newton desired to burn his Mother’s house down and how his hatred of Robert Hooke resulted in all his photos becoming non-existent 5:18 PM CST, Jun 17

“I need to have the equations introduced per experimental findings.”

— Libb Thims (2014), while putting contacts in eyes while looking in mirror while printing out 41-page version of *CTAH*, c.4:30 PM CST, Jun 17

“We are but atomic geometries, moving about cyclically on a surface, via the action of forces, powered by the heating of the sun, embedded in a partially understood spin coupled Leucippean-Empedoclean universe.”

— Libb Thims (2014), mental note, 1:05PM CST, Jan 27

“The choice comes from the forces that run through you.”

— Libb Thims (2014), concise statement note, emerged while glancing at the Einstein “chooses instead” statement in Morris Cohen letter, 12:38 PM, Feb 18

“You have to surround yourself with powerful minds to become a powerful mind.”

— Libb Thims (2014), reflection on Einstein’s Faraday-Newton-Maxwell images + Goethe bust surroundings, 4:27 PM, Mar 11

“Relationships are like riding waves, surfing; every time one ends you have to paddle out into the surf to get on a new wave — only here the relationships are chemical reactions, the waves are electromagnetic, the dynamics of which governed by thermodynamics

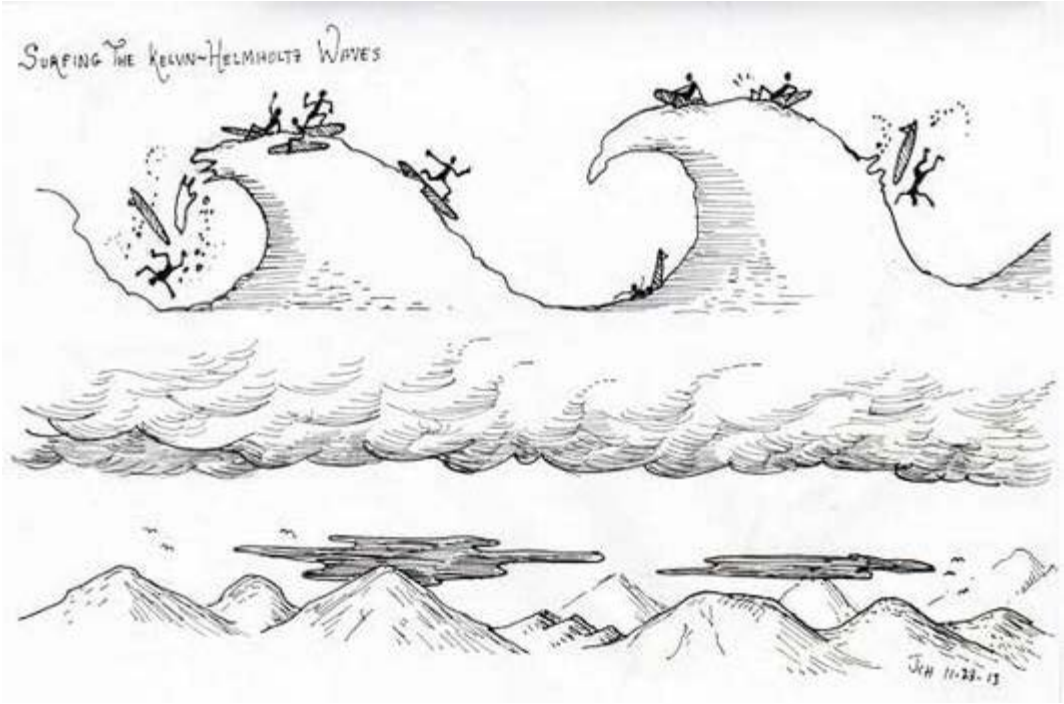

A "Surfing the Kelvin-Helmholtz waves" cartoon, John C. Holden. (Ñº)

potentials, rather than gravitational potentials."

— Libb Thims (2014), reoccurring mental note, jotted after awaking, the previous night having watched *Point Break*, then studied for 8 hours; the Einstein "life is like riding a bike" quote comes to mind here, albeit ixnay on the 'life' terminology usage, 10:59 AM CST, Jul 8

"Chemical thermodynamics has a certain point of view that outranks all other points of view."

— Libb Thims (2013), contemplative thought axiom, Mar 23

"The first and second law of thermodynamics govern every system in the universe; including social systems."

— Libb Thims (2013), response, during end Q&A (segment: 44:00-44:15), of 16 Apr NIU lecture, to student question: "just to make sure I understand everything here, your basic premise is relating social interactions of humans to thermodynamics?"

"The man who has nothing to lose and all to gain will always triumph over the man who has all to lose and nothing to gain."

— Libb Thims (2013), contemplative thought axiom; reflection on newly made visual of new LibbThims.com screenshot, May 20

"I believe in thermodynamics and the periodic table; and not much else."

— Libb Thims (2013), personal note from practice statement on slide 8 of UPESW talk (see: atheist's creed), Jun 24

"My IQ is somewhere between Dr. Seuss, who in 1931 claimed an IQ of H_2SO_4, and Dr. Faustus, who in 1514 sold his soul to the devil for truth, knowledge, and power; the embodiment of the latter found in the mind of Goethe, who in 1809 professed that he and his wife were like $CaCO_3$ (limestone), who when put into contact with H_2SO_4 (Captain) have no "choice" but to debond, and who in 1926 [Cox] became the first

ever person ranked with an IQ of 225."

— Libb Thims (2013) YouTube post reply to query by Paul Rael, Aug [2]

"The earth goes around the sun,
hydrogen attracts to oxygen,
and in between these two points,
you have to find out where
your movements lie."

— Libb Thims (2013), hand written personal note, 11:46PM CST, Oct 17

"The steam engine does not run on 1s and 0s."

— Libb Thims (2013), treadmill mental noted reflection on the recent add of the name Shannon in Hmolpedia citation rankings (152), an irritating weed theorist in the garden of thermodynamics, Nov 12

"God is the aether of the social sciences, existing currently the same way the physical sciences existed prior to Einstein whose 1905 special theory of relativity could generate the same mathematical results, in respect to explanations of gravity, without referring to aether at all."

— Libb Thims (2013), mental note arisen while reading pg. 373 of Zucker's *Field Theory of History*, 10:09AM CST, Nov 14

"There's no point in climbing the ladder—corporate or whatever—until one understands why one is climbing."

— Libb Thims (2013), jotted down on paper assimilated while driving to work, Nov 15

"What good is studying Euclid, if you can't use it to explain why Elvis played the ukulele?"

— Libb Thims (2013), arisen in respect to pure mathematicians ranking in current smartest person existive genius rankings, Nov 18 [3]

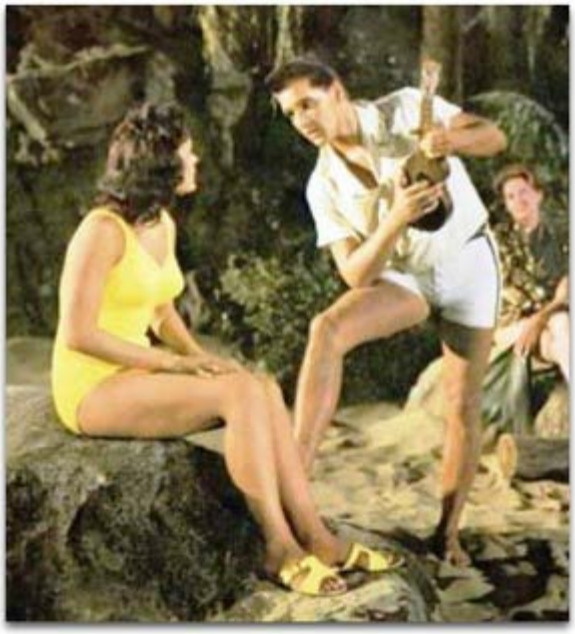

A photo (Ñº) of **mental note** 18 Nov 2013, i.e. of Elvis playing the Ukulele; the most famous examples of which are shots, one example shown above (Ñº), from

"Only when you've experienced the pain of atrophy of the laugh muscles, will you understand the true sense of reality."

— Libb Thims (2013), dental documentation statement, Dec 10

"Those datums will invariably be available posthumously."

— Libb Thims (2013), mental note, 7:06 PM CST, Dec 16

the 1961 musical romantic comedy film *Blue Hawaii*. (Ñº)

"Where there are three students of nature, there are two atheists. Where there are three students of human nature, two are theists."

— Libb Thims (2013), mental humor; modification of the 1884 Ludwig Buchner maxim, 2:27 PM CST, Dec 18

"So many social Newtons, so little time."

— Libb Thims (2013) mental note; arisen after finishing a re-write ranking of the top 30 social Newtons of antiquity, and realizing, per realization of the amount of time it takes to digest the intellectual power center works of one social Newton, that I might have but 18-19 years± before my brain fries out (prior to Goethe 1809 intellectual peak), if I am to launch and found a two cultures university department—currently aimed at Harvard, beyond the Harvard Pareto circle, and or Princeton, beyond the John Q. Stewart effort—beyond that of known semi-decade historical two cultures synergy attempts, while currently having time consumed or absorbed per the dating of about 5-6± women—possibly influenced by the 2008 "Three Matthew McConaugheys and A Baby" parody (Ñº) quote: "so many women, so little time." 3:01 AM CST, Dec 24

"The universe has a certain movement to it—and everybody wants to get in the pipeline."

— Libb Thims (2013), mental note, arisen, while watching the "welcome to the real world" scene, from the 1999 film *The Matrix*, following invite, graduate school chemistry student, to lecture at Technion a few hours prior, with inflection in the increase in mate value received, per frequent girlfriend[s] query on "where are you going to lecture next?", and per the invitee reciprocal value accrued, likewise; which is put recourse to the original *circa* 1993-94 "I told my mother you were a chemical engineer" collision theory label issue puzzle of the nature of personal value (flow theory, coupling theory, etc., issues included), 6:54 PM CST, Dec 24

"Getting a PhD in biochemistry, is like getting a PhD in caloric theory, and later going on to call oneself a 'caloricist'; all three referring to the study of something that does not exist, life in the former, caloric in the latter."

— Libb Thims (2013), mental note, on Stuart Kauffman as being the only thing of note to have ever come out of the the Santa Fe Institute, 2:37 PM CST, Dec 28

"There must exist some unwritten principle according to which more natural power accrues via action derived from the impulse than as compared to action unfolding without the presence of the impulse."

— Libb Thims (2013), Reoccurring mental note, felt at about the gym-missing window + thoughts on: Porteus impulsive theory of happiness + hiatus effect + La Cerra depression energy theory + reserve energy theory + Goethendipity effect + activation energy position (in respect to collision theory), etc., 4:28PM CST, Dec 30

"Never trust the work of a Templeton Prize winner or associate."

— Libb Thims (2013), mental note arisen in reflection of recent adds to Paul Davies page; along with past thought on other Templeton-funded writers: Robert Ulanowicz, Terrence Deacon (Ñº) , among others, whose mind[s] has gone to pasture, i.e. left the path of truth for sake of spiritual/God theory justification aiming/biased funding, 10:09 AM CST, Dec 9

“The smallest abrasion (or abrasive comment) can silence the most powerful of ideas.”

— Libb Thims (2012), personal note; written in black pen on printing paper, Sep 23

“Not only do I not believe in the principle of the afterlife, but also do not believe in the principle of life.”

— Libb Thims (2012), personal note; written in black pen on printing paper, Sep 24

HumanChemistry101 4 months ago

Re: “Are viruses Alive?” The answer is no. Charles Sherrington gave the answer in his 1938 Gifford Lectures “Man on His Nature”. On the question of “those newly discovered so-called ‘viruses’ [1935]”, as he says, “there is hesitation whether or not to call it ‘living’”, about which he concludes, following prolonged derisively-sharp argument, correctly: “when physics and chemistry have entered on the description of the perceptible, life disappears from the scene, and consequently death. Both are anthropisms.” Virus, correctly, is an animate form of powered CHNOPS+ based atomic structure. So are you. You have to convince yourself, however, that you are not alive to see the truth of this answer. Tesla saw it in 1915 when he concluded: “there is no thing endowed with life.” Life and death are religio-mythology concepts, handed down to us from the ages, not scientific ones. Google: "defunct theory of life" for more on this.

Show less

Reply · 5

A 5+ liked Dec 2013 response to the query "are viruses alive?" (Ñº)

“My aim is to pen out the partial differential equations of human existence.”

— Libb Thims (c.2012), comment to mental calculator friend Greg

“Time is but the absence of strong attractors.”

— Libb Thims (2010), contemplative thought axiom; Reflection on Willard Gibbs' comment on his loss of the concept of time while writing *On the Equilibrium*, Mar 19

“There is a revolution awaiting to happen, greater than the combined revolutions of Darwin and Copernicus; if only I can make it happen.”

— Libb Thims (2010), contemplative thought axiom, Aug 13

“Once the body goes, the mind will soon to follow.”

— Libb Thims (c.1992), recurring mental note; mind/body exercise philosophy

References

1. Libb Thims (self-derived quotes) – Institute of Human Thermodynamics.
2. (a) Thims, Libb. (2013). Query: “Who are you, a professor somewhere? And what is your IQ?”; asked (Ñº) by Paul Rael, Aug.
(b) Note: variations of this "what is your IQ query" have been asked reoccurring since circa 2009; draft answers prior have been attempted, this is the first one that seems to hold in the mind.
3. (a) Arisen in respect to pure mathematicians ranking in current smartest person existive genius rankings, Nov 18 3:55 AM CST | the “why do people dance?” Paul Dirac query also comes to mind here; as does the 1849 James Froude quote on the point of knowledge.
(b) Quote: “What is man the wiser or the happier for knowing how the air-plants feed, or how my centuries the flint-stone was in forming, unless the knowledge of them can be linked on to humanity, and elucidate for us some of our hard moral mysteries?” (James Froude, *The Nemesis of Faith*, 1849).

(c) Thims, Libb. (2013-14/15). *Chemical Thermodynamics: with Applications in the Humanities* (Frode quote, pg. vii) (85-page version: pdf). Publisher.

θΔics

In existographies, **Libb Thims (prospectus)** refers to various enterprise proposals submitted to American electrochemical engineer Libb Thims for inquiry in respect to joint effort or something along these lines.

List

The following is the chronological listing of prospectus inquires, some of which listed generally on the applied human thermodynamics page, and or probes sent to Thims, from various notable individuals:

#	Prospector	Date	Synopsis	Result | Reaction
1.	Georgi Gladyshev (1936-) Russian physical chemist	2007	In the 1990s and 2000s, after developing an anti-aging model of foodstuffs in which he hypothesized to be able to thermodynamically quantify the anti-aging value of any food or nutritional substance via using a formula similar to the Gibbs-Helmholtz equation, he obtained a $2 billion patient for this model; thereafter giving various lectures on this topic at the American Academy of Anti-Aging medicine conferences. In 2007, Gladyshev met with Thims in Chicago to discuss a joint venture to take his patented theory to the market place.	His theory was not theoretically sound enough, in its present form (many areas of difficulty on theory), to be able to enact his vision.
2.	Viktor Minkin (c.1959-) Russian biometrist	2008	Conceived by Russian biometrist Viktor Minkin, head of the Russian vibraimage company, to use pixel vibration technology to measure human emotional states, quantitatively to be explained via psychological entropy or human entropy methodologies, the theory of which to be developed by American chemical engineer Libb Thims, to be used in application for home use and government used, e.g. terrorist screening technologies. Following R&D, equipment is slated to be marketed and sold in the US under the direction of Thims; although, Thims is stalled out on parts of theory development, as he is currently mastering the works of Clausius, Gibbs, and Lewis, which underlie theory. In 2008, Thims outlined a few basic principles of "human thermodynamic imaging", after which Minkin incorporated parts of preliminary theory into Vibraimage version 7.0. In 2009, Minkin, possibly using some of the Gibbs free energy matching theory, took the project to the working model stage in the site PsyMaker.com, which claims to	His effort was one of attempting to tag on a theoretical basis to a technology already developed; but a jump that was to tenuous and underdeveloped of a connection to go from facial pixel camera vibrations to entropy of emotion quantification arguments.

			facilitate (a) recognition of emotions of visitors, (b) emotion recognition in Skype, (c) measure pixel-dependent aura, (d) lie detection, (e) couple compatibility matching, (f) remote and contactless public security.	
3.	DMR Sekhar (1952-) Indian chemical engineer	2009	Desired to have Thims be founding chairman of a "Transcience Society" in Delhi, India, with yearly conferences on the thermodynamics-centric field of "transdisciplinary sciences", a hodgepodge of disciplines.	His god theory themed genopsych model, along with disagreement with the defunct theory of life position, derailed interaction.
4.	Ali Mansoori (c.1943-) Iranian-born American chemical engineer	2010	Suggested to Thims, over lunch, that he join the UIC bioengineering department, funding was available, etc.	Thims explained that pact with himself after turning down acceptance to the chemical engineering program at University of California, Berkeley, the top two or three ranked program in that field at the time, per reasons of cheaper in-state financing at the University of Michigan, a top 5-ranked engineering program that he was only going up the ladder, not down, being he spent grades 2-12 at the intellectual bottom (after being forced to take grade two, twice), and he's not going backwards; no disrespect intended.
5.	Kishore Dash (1961) Indian physicist	2014	Proposed a co-authorship of a treatise on the history of econophysics; tentatively entitled *Evolution of Econophysics: a History of Physics Based Economics*, to be published with Springer or Cambridge; inclusive of the various schools of econophysics: Lausanne school of physical economics, Harvard Pareto circle, Roegen-Daly school, Indian school of econophysics, American school of econophysics, Romanian school of physical socioeconomics, etc.; and historical mechanistic school economics thinkers to attempt physics based economics.	His circa 40 page draft outline was too green; Thims would have had to spent an substantial amount of time correcting his outlines, in what has already been done in various locations of *Hmolpedia*.
				Thims explained to Poudel that it is always wise to temper zeal with historical soberness; that what he is suggesting has already been attempted several times with limited (sub-decade existive) success; to name a few examples:

1. Leon Walras | 1858-1980s

→ Lausanne school of physical socioeconomics (O)

6.	Ram Poudel (c.1977-) Nepalese-American mechanical engineer	2015 Jun 17	Proposed the idea of a consolidated effort to establish an international society, e.g. “Society for Social Energetics”, with the aim to facilitate a network of scholars united to contribute to social issues challenging humanity. Our mission is to develop science based knowledge of social dynamics to inform policy making process.

2. Leon Winiarski | 1894-1990s

→ Geneva social mechanics (Q)

3. Ernest Solvay | 1894

→ Institute of Social Sciences (Q)

4. Wilhelm Ostwald & Ernst Haeckel | 1906-1910s

→ German Monist League (Q)

5. Lawrence Henderson | 1932-1939

→ Harvard Pareto circle (Q)

6. John Q. Stewart | 1939-1950s

→ Princeton Social Physics (Q)

7. Libb Thims | 2005-present

→ Institute of Human Thermodynamics (Q)

8. Gheorghe Savoiu and Ion Siman | 2007-present

→ Pitesti Econophysics & Sociophysics Workshops (Q)

Thims explained that he was working to established something akin to the long-sought Oxford chair of social physics (aka Nightingale chair of social physics) at at top US university.

(add discussion)

References

1. Dash, Kishore and Thims, Libb. (2014-15). *Evolution of Econophysics: a History of Physics Based Economics*. Springer/Cambridge University Press.

θΔics

In publications, **Libb Thims (publications)** page lists most of the various publications, i.e. articles, books (see: Libb Thims (books)), blogs, videos, unfinished manuscripts, etc., by American chemical engineer Libb Thims. These are listed below:

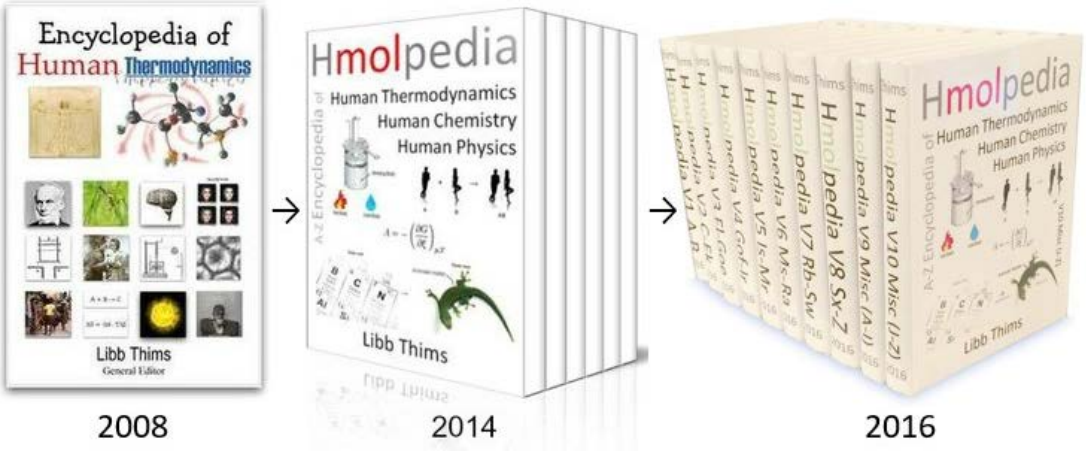

A depiction the 2008 *Encyclopedia of Human Thermodynamics* turned 2014 six-plus volume *Hmolpedia*, with 2,000+ pages in MS-word/pdf-available stage, turned 2016 10-volume **published** print set of *Hmolpedia: Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, by **Libb Thims**.

2015

● Thims, Libb. (2015). "Second Law and Three Evolution Paradoxes: Life, Evolve, and Soul" (reviews) (pdf), *JHT*, 10(1):1-14.

2014

● Thims, Libb. (2014). "Note on Beg's Physicochemical Sociology" (pdf) (pdf), *Econophysics, Sociophysics and other Multidisciplinary Sciences Journal* (Q), No. 4.

2013

● Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (video, 1:33-min) (article, 40-pgs) (PowerPoint, 36-slides), Key speaker talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29; in: *Econophysics, Sociophysics, and other Multidisciplinary Sciences Journal* (Q) (pdf), 3(2):5-25.
● Thims, Libb. (2013). "Juarrero, Deacon, Nonreductive Physical Materialism, and Chemical Teleology" (pdf) (peer), *Journal of Human Thermodynamics* (url), 9(6): 77-122, Jun.

2012

● Thims, Libb. (2012). "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair" (Q), *Journal of Human Thermodynamics*, 8(1): 1-120, Dec 19.

2011

● Thims, Libb. (2011). "Thermodynamic Proof that Good Always Triumphs over Evil", *Journal of Human Thermodynamics*, 7: 1-4.

Books

See main: Libb Thims (books)

The following show some of Thims initiated books:

2010-initiated	**2011**-initiated	**2012**-initiated	**2013**-initiated	**2014**-initiated

Unfinished drafts – from left to right: *R.I.P. for Dummies*, a 2010-launched draft cover stage planned book, one the overly-asked "what happens when you die?" query, that made it into a one-hour YouTube video segment, which aired for a few weeks, before withdraw (per reasons that it became increasingly illogical to address the question what happens when you die, if you are not alive in the first place); the 2011-launched *Purpose? (in a Godless universe)*, which made it to the 100± page level; center: *Elective Affinities: Illustrated, Annotated, and Decoded*, which made became the first book fully-imbedded into *Hmolpedia* as a chapter-by-chapter online readable book; right center: *Chemical Thermodynamics: with Applications in the Humanities*; end right: *Thermodynamics Not Applicable to Humans*, a 20 Sep 2014 "draft cover" stage-initiated potential booklet (70+ page level) aimed at an exposition of the "not applicable view", historical, reasoning behind, modern issues, with possible "applicable view" inserts per each NA-view insert, time-frame dated according.

2010

● Thims, Libb. (2010). "Thermodynamic Philosophy of Evolution" (pdf), in: *The Philosophy of Evolution* (ch. 5) (editors: U.V.S. Rana, K. Srinivas, N.C. Aery and A.K. Purohit) (abs|VedamsBooks.com) (abs|Nature Network) (abs|Wikiversity). Yash Publishing House.
● Thims, Libb. (2010). "Introduction to Human Thermodynamics" (abstract) (handout) (thread), 1-hour guest lecture (video recorded), engineering class at a university (professor wishes to remain anonymous), Apr 13, 9:30-10:30.
● Thims, Libb. (2010). "Hot Sex, Cold Sex, Ambient Sex" (press release), *Journal of Human Thermodynamics*, 6: 47-58.

2009

- Thims, Libb. (2009). "Letter: Life a Defunct Scientific Theory", *Journal of Human Thermodynamics*, Vol. 5, pgs. 20-21.
- Thims, Libb. (2009). "Neuro Octet Trajectory Theory" (PDF), *Journal of Human Thermodynamics*, Vol. 5, pgs. 15-19, Jan. 06.

2008

- Thims, Libb. (2008). *The Human Molecule*, (120-pgs). Morrisville, NC: LuLu.
- Thims, Libb. (2008). "Philosophy: Which Came First, the Chicken or the Egg?" (Q) (2-pgs), *Helium.com*, Dec. 15.
- Thims, Libb. (2008). "Human Thermodynamic Imaging" (3-pgs), *Vibraimage Wiki*, Nov. 19.
- Thims, Libb. (2008). "Notes on Equilibrium Variants of Life", (3-pgs), *Scribd.com*, Nov. 18.
- Thims, Libb. (2008). "Human Thermodynamics", (3-pgs), *Knol.Google.com*, Oct. 01.
- Thims, Libb. (2008). "On the Mechanical Equivalent of Heat and Occupation" (PDF), *Journal of Human Thermodynamics*, Vol. 3, Issue 1. pgs. 1-7, Apr.

2007

- Thims, Libb. (2007-10). *Encyclopedia of Human Thermodynamics* (5-volumes). Publisher (not assigned).
- Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (392-pgs). Morrisville, NC: LuLu.
- Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (436-pgs). Morrisville, NC: LuLu.

2005

- Thims, Libb. (2005). "Evil, Structural Stability, and Predisposed Movements", *Journal of Human Thermodynamics*, Vol. 1, Issue 1, pgs. 1-12. August.

2007-published | **2008-published**

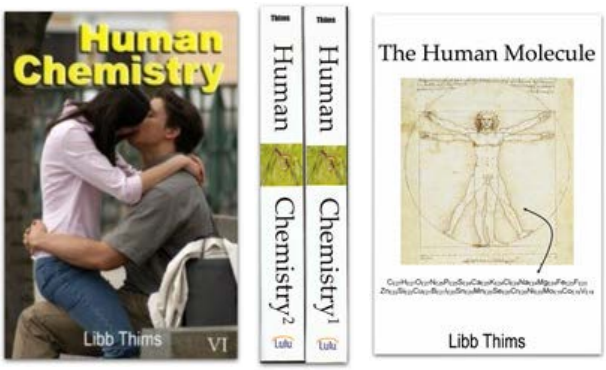

Thims first two published books, left: the two-volume textbook *Human Chemistry* (2007) and right the booklet *The Human Molecule* (2008).

Unfinished

The following collection of manuscripts were only written in rough-draft, single pass, outline form, totaling about 1,100 pages. Copies, numbered up to a dozen, for the human thermodynamics series, and up to one-hundred, for the cessation thermodynamics manuscript, were printed and bound by hand and distributed locally around Chicago (primarily) for feedback and first impression:

2013

- Thims, Libb. (2014-15/16). *Chemical Thermodynamics: with Applications in the Humanities* (97-page version: pdf of 800-pages estimated total). Publisher.

2012

- Thims, Libb. (2011). *Elective Affinities: Illustrated, Annotated, and Decoded*. Publisher.

2011

- Thims, Libb. (2011). *Purpose? (in a Godless universe)*. (94-pg manuscript) (unfinished); Online as 105-page unfinished manuscript (14 Apr 2013). IoHT publications.

2005-2006

- Thims, Libb. (2006). "Neural Processing Unit Theory" (un-finished). *Journal of Human Thermodynamics*, Vol. 2, Issue 1, pgs. 1-10. Oct.
- Thims, Libb. (2005). "On the Nature of the Human Chemical Bond" (un-finished). *Journal of Human Thermodynamics*, Vol. 1, Issue 5, pgs. 36-67. December.

2002-draft print | **2003-draft print** | **2004-draft print** | **2005-draft print**

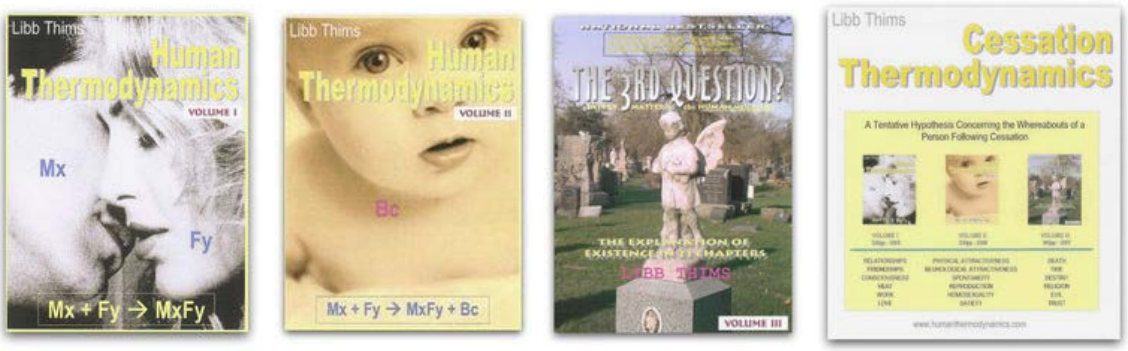

Unfinished: *Human Thermodynamics (VI)* (2002), *Human Thermodynamics (VII)* (2003), *Human Thermodynamics VIII* (2004), *Cessation Thermodynamics* (2005), totaling about 1,100-pages of printed draft manuscripts.

2002-2005

- Thims, Libb. (2005). Cessation *Thermodynamics.* 100-pgs. (un-finished) Chicago: IoHT.
- Thims, Libb. (2004). *Human Thermodynamics (Volume Three).* 330-pgs.(un-finished) Chicago: IoHT.
- Thims, Libb. (2003). Human Thermodynamics (ch. 19: "Where Does One Go After Death", pgs. 491-), unpublished manuscript. Chicago: Institute of Human Thermodynamics.
- Thims, Libb. (2003). *Human Thermodynamics (Volume Two).* 330-pgs. (un-finished) Chicago: IoHT.
- Thims, Libb. (2002). *Human Thermodynamics (Volume One).* 330-pgs. (un-finished) Chicago: IoHT.

Blogs

- Human Thermodynamics :: Blog - BlogSpot.com
- Libb Thims | American chemical engineer (blog) – LibbThims.com

Videos

- Human Chemistry 101 – YouTube.com.

θΔics

In hmolscience, **Libb Thims (query letter)** refers to []

Overview

On 5 Dec 2002, Libb Thims sent the following one page ‘query letter’ to Bantam-Dell Publishing Group, as a book proposal, the letter opened to the following statement:

> “Please except this document as my ‘one-page query letter proposal’ for a book idea. IN this book, I intend to present and support the equation that I find, as a first approximation, provides explanation to the question: ‘what is the meaning of life?’”
>
> — Libb Thims (2002), “Book Prospectus Query Letter”, Dec 05 [1]

The following is a scan of the letter: [1]

Date: 12/05/02

1st printing: (1 page)

Libb Thims
4860 N. Rockwell #306
Chicago, IL 60625
e-mail: [illegible]
Phone #: (773) 784-2521

Bantam-Dell Publishing Group
1540 Broadway
New York, NY 10036

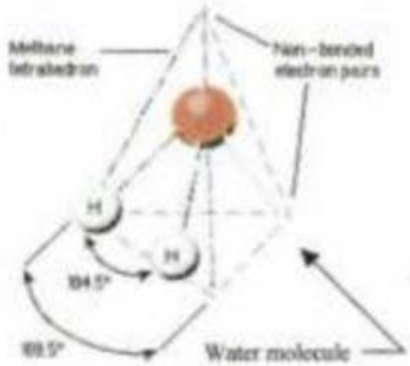

Dear Bantam-Dell Publishing Group:

Please except this document as my "one-page query letter proposal" for a book idea. In this book, I intend to present & support the equation that I find, as a first approximation, provides a quantitative explanation to the question:

"*What is the meaning of life?*"

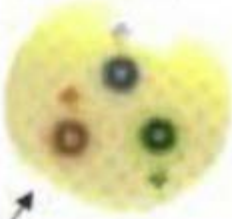

Proton:
(2) Up Quarks
(1) Down Quarks

(1) Which couple out of all possible couples during a person's lifetime will have "***the most stable***" binding energy?

(2) Will this highest binding energy produce the most viable offspring?

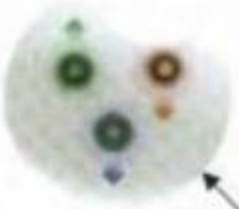

Neutron:
(1) Up Quark
(2) Down Quarks

Central Nervous System (dorsal view)

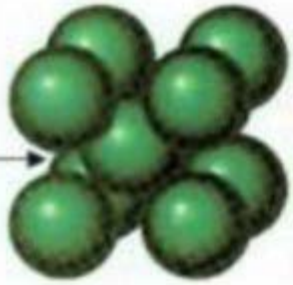

Iron (with a body-centered cubic lattice structure) has "***the most stable***" nuclei in the universe!

We can determine this by its binding energy ΔE, where:

$$\Delta E = \Delta m \times c^2$$

$$\Delta m = {}^{26}Fe - (26\,protons + 30\,neutrons)$$

$$c = 2.998 \times 10^8 \text{ m s}^{-1}$$

From the adjacent **table** we see that iron has the highest binding energy per nucleon.

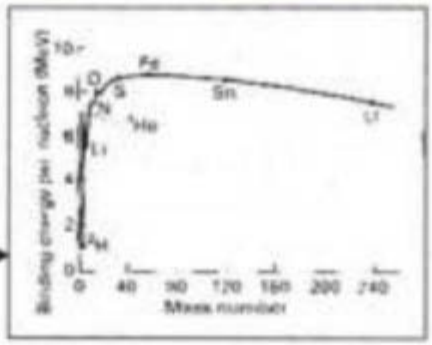

(add)

References

1. Thims, Libb. (2002). “Book Prospectus Query Letter” (Ñº), mailed to Bantam-Dell Publishing Group, Dec 05.

θΔics

In references, **Libb Thims (quick reference)** page is a quick reference listing of references frequently used in the Hmolpedia, some of which are listed below for easy access.

List

● Perrot, Pierre. (1998). *A to Z of Thermodynamics* (abs). Oxford University Press.
● Thims, Libb. (2007). *Human Chemistry (Volume One)* (pdf). Morrisville, NC: LuLu.
● Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
● Thims, Libb. (2008). *The Human Molecule* (abs) (issuu) (GB) (DS). LuLu.

(a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (life: difficulties on term, pgs. 130-31). Morrisville, NC: LuLu.
(b) Brooks, Michael. (2008). *13 Things That Don't Make Sense: the Most Baffling Scientific Mysteries of Our Time* (ch. 5: "Life: Are You More Than Just a Bag of Chemicals", pgs. 69-82). Double Day.
(c) Thims, Libb. (2009). "Letter: Life a Defunct Scientific Theory", *Journal of Human Thermodynamics*, Vol. 5, pgs. 20-21.

θΔics

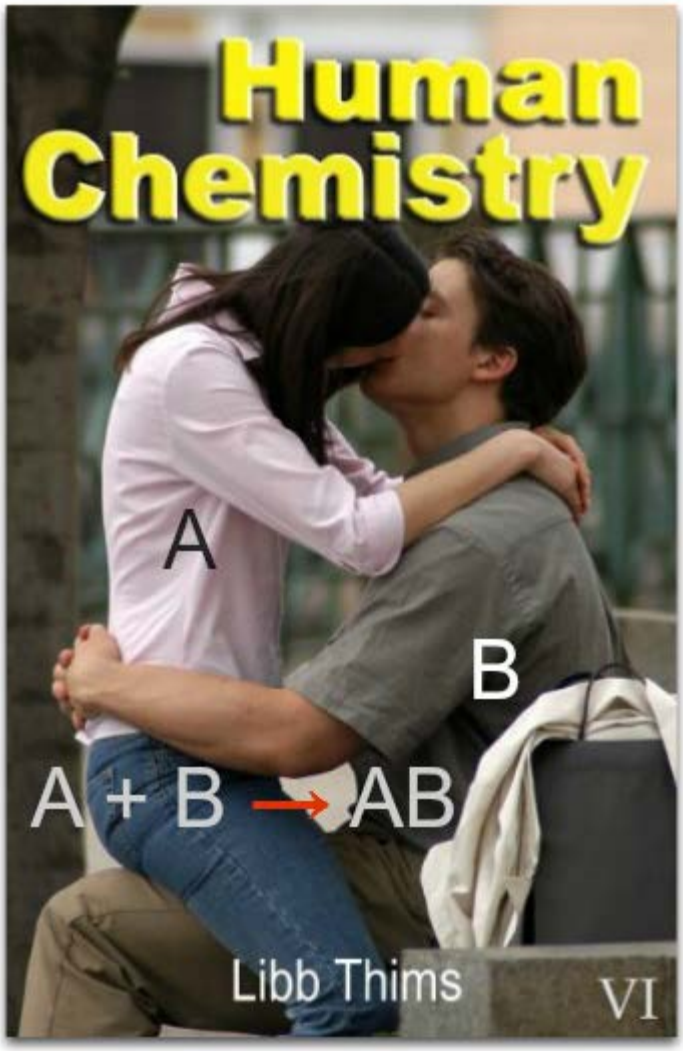

In quotes, **Libb Thims (quotes)** refers to some of the noted quotations that American electrochemical engineer, thermodynamicist, hmolscience encyclopedist, and thinker Libb Thims takes a strong interest in; some of which are listed below:

The **thinker** residing over the gates of hell—one deeply intuned to the unnaturalnesses of existence and experience.

> "A similar inquiry is made by those who inquire into the 'number of **existents**'; for they inquire whether the ultimate constituents of 'existing things' are on or many, and if many whether a finite or an infinite plurality. So they are inquiring whether the principle or element is one or many."
>
> — Aristotle (350BC), *Physics* (§1.2:315-16)

> "Like a river flows surely to the **sea**, darling so it goes, some things were meant to **be**."
>
> — Jean Florian (c.1784), "Pleasure of Love" in: *Celestine* (Q); sung by Elvis Presley (1961) in *Blue Hawaii* (Q)

> "You need to have knowledge of thermodynamics before making love, because things 'heat up' upon re-entry."
>
> — Just Paul (2017), Tweet (Q) via @TwitiCulture, Oct 25

> "It would **be hard** to introduce politics or morality into a chemical thermodynamics class (without veering off topic)."
>
> — Gerard Harbison (2016), "Tweet (Q) to @dfreelon and @kevinnr", Aug 4

> "We function better if there is no plan B."
>
> — Arnold Schwarzenegger (c.2018) (Q)

Change

The following are quotes on change:

> "He who is firm in will moulds the world to himself."
>
> — Goethe (c.1810)

> "The first business of a man of science is to proclaim the truth as he finds it; and let the world adjust itself as best it can to the new knowledge."
>
> — Percy Bridgman (1919), "Letter to R.M. Hunter"

Recent

The following are semi-new recent quotes:

> "Nothing in the world is better suited to laziness than orthodoxy. If you gag your mouth, stop up your ears and

put a blinder over your eyes, you can sleep peacefully."

— Jacob Burckhardt (c.1860) (Q)

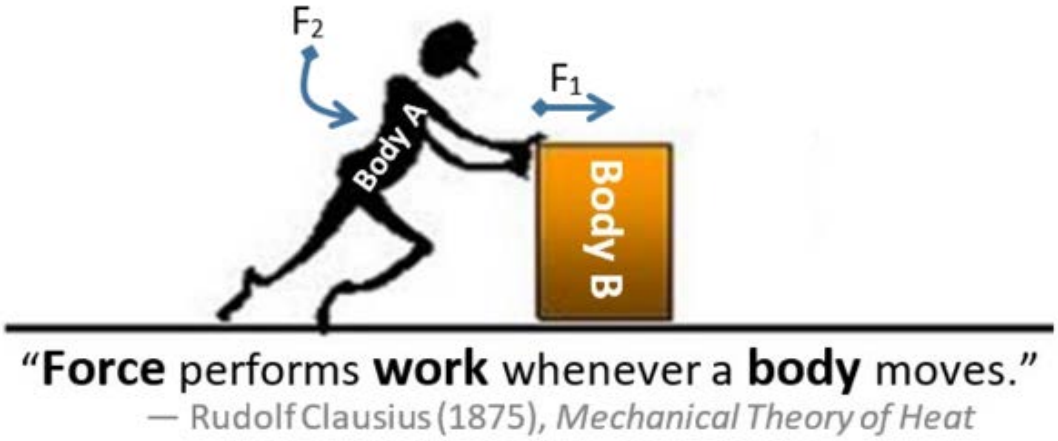

"Bind it about thy neck, write it upon the tablet of thy heart: **'everything of Christianity is of Egyptian origin'**."

— Robert Taylor (1829), *Oakham Gaol*; cited by Gerald Massey (1883) in *Natural Genesis, Volume One* (pg. iv)

"While conscience remans there is some religion."

— John Adams (1817), "Letter to Thomas Jefferson", May 19; compare: no religion

"When you're really 'hot', there's going to be a lot of 'money' coming in."

— Paul McCartney (c.1985), career advice to Michael Jackson; quote (2007) in: *Forbes 100th Anniversary Issue* (pg. 152)

"Nature's operations, as far as we have yet observed them, proceed by inexorable atheistical laws, and every new discovery of natural laws is a new blow to the tottering dogma of a 'moral governor' and mechanical contriver, the offspring of dark and ignorant ages."

— E.B. (1851), commentary on John Mackintosh's "The Logic of Atheism"

"To truly laugh, you must be able to take your pain, and play with it."

— Charlie Chaplin (c.1920) (Q)

"So large is the number of fools."

— Galileo (1596), note to Kepler on his refrain from publishing on Copernicus

"The universe is nothing more than a physical and chemical laboratory in which material powers carry on an unceasing change and transformation. The mind is nothing but the result of an organizing combination and cooperation of physical and physiological powers."

— Karl Heinzen (c.1870) (Q)

“In virtually every branch of knowledge, repressive methods were used: lectures were proscribed, publication was hampered, professorships were denied, fierce invective and ridicule appeared in the press. Scholars and scientists learned the lesson and responded to the pressures on them. The ones with unpopular ideas sometimes recanted, published anonymously, presented their ideas in weakened forms, or delayed publication for many years.”

— Howard Gruber (1974), On how ‘materialism’ (or atheism), in Darwin’s college days [c.1827], was more outrageous than ‘evolution’ [1]

“Marx, having read Feuerbach, found he could no longer agree with Bauer. Religion was not some crazy nonsense that could be swept away and beneath it would be a better world.”

— Jennifer Hecht (2003), *Doubt: a History* (pg. 390); quote brings to mind the 9 Sep 2014 start of the atheism timeline (version 26), which resulted itself from the Nietzsche four-image (Q) “God is Dead” which was put on the Hmolpedia main page in circa early 2014; prior to which “religion” had been “swept under the rug” (worked around, politely avoided, etc.) of Hmolpedia (see: dirty “rug” image of chemistry professor paradox).

“It is a principle innate and co-natural to every man to have an insatiable inclination to the truth, and to seek for it as for hid treasure.”

— Thomas Aikenhead (c.1697) “Letter to Friend” (last words), penned morning of his age 20 hanging for blasphemy, Jan 8

“A man who ain’t got is word is a cockroach.”

— Oliver Stone (1983), Tony Montana quote in Scarface

“There is **desirable glory** in being, and being reputed, an atheist.”

— Daniel Scargill (1668), age 21 opinion expressed publicly as Cambridge University

“No man awakes, whom once the ice end of living overtakes.”

— Lucretius (55BC), *On the Nature of Things*; cited by Michel Montaigne (1592) in *The Complete Works* (pg. 324)

“Written in the land of the living; on the right bank of the Adige, in Verona, in the year of that **god whom you never knew** the 1345th.”

— Petrarch (1345), signoff to a letter

“You find me a state or society that threw off theocracy and threw off religion and said we adopt the teachings of Lucretius and Democritus and Galileo and Spinoza and Darwin and Russell and Jefferson and Thomas Paine, and we make those **what we teach our children**. We make that scientific and rational humanism our teaching. You find me that state, that did that, and fell into tyranny, and slavery, and famine, and torture, and then we’ll be on a level playing field.”

— Christopher Hitchens (2008), “Debate with Peter Hitchens on Iraq War and Religion” (Q), Grand Valley State University, Apr 3

“It's the questions that we can't answer that teach us the most. [compare: “it’s the questions that drive us” (Q)] They teach us how to think. If you give a man an answer all he gains is a little fact. But give him a question and he'll look for

his own answers. That way, when he finds the answers, they'll be precious to him. The harder the question, the harder we hunt. The harder we hunt, the more we learn."

— Anon (c.2012), or Kevin Day (O), anon (O)(O), Patrick Rothfuss (O), or Nick Brown (O)

"Society is essentially a physical phenomenon. The people, economic goods, culture and tradition, and social organization are the potential energy of society, while all kinds of activity — work, play, worship, etc. — constitute the kinetic energy; and these two — potential energy and kinetic energy — combine to make up the sum total of social energy, as the two combine in the physical realm."

— Newell Sims (1924), *Society and its Surplus* (pg. #) (see: social Lagrangian) (png); cited by Howard W. Odum (1929) in *An Introduction to Social Research* (pg. 112)

"Desire is the social force, and where there is no desire, no will, there is no force, no social energy. Civilization is the product of active social energy."

— Lester Ward (1903), *Pure Sociology* (pgs. 33-34) (png); cited by Newell Sims (1924) in *Society and Surplus* (pg. 14)

"It would appear almost an act of folly, in pretending to uproot that ancient Upas-tree of religious superstition, under the poisonous shade of which mankind has been for ages accustomed to repose, and the roots of which are so widespread and profound."

— Charles Dupuis (c.1794), cited as views in agreement with by 1872 English translator

"Let me not be called a wicked atheist for seeing the likeness between Brahma and Abraham.'"

— Godfrey Higgins (1833), *Anacalypsis, Volume One* (pg. 391)

"On the shelves there was also to be found, naturally, Ostwald's *Energetics*, that sort of thermodynamic bible in which god is replaced by a lay entity called energy."

— Ernesto Sabato (1981), *On Heroes and Tombs* (pg. 256); compare: Mirza Beg (1987) and Frederick Rossini (1971) who replace god with free energy

"Everything in the Bible is taken from the Book of the Dead. Hellenistic, Roman religion, et al are copies of the Egyptian Book of Dead."

— Calpurniso (2009), video (O) text at 4:42; an oft-classified (O) extreme atheist (albeit abrasive)

"Entropy, next to energy, is the most important property of physical systems. Since its maximum value indicates a state of equilibrium, all the laws of physical and chemical equilibrium follow from a knowledge of entropy."

— Max Planck (1948), "Scientific Autobiography"

"The laws of human reasoning coincide with the laws governing the sequences of the impressions we receive from the world about us. Pure reasoning, therefore, can enable man to gain an insight into the mechanism of the latter. In this connection, it is of paramount importance that the outside world is something independent from man, something absolute, and the quest for the laws which apply to this absolute appeared to me as the most sublime scientific pursuit in

life."

— Max Planck (1948), "Scientific Autobiography"

"Beauty is said to be a fatal gift to women, and it may be added that genius is a fatal gift to men; they are born before their time and out of harmony with the things about them."

— Edward Trelawny (1878), "Commentary on Percy Shelley"; in: *Records of Shelley, Byron, and the Author, Volume One* (pg. xvi)

"A sociology which follows society back to quanta and electrons and projects telesis into a new heaven and earth, cannot hope to escape satirical description as a science of organized smatter."

— Franklin Giddings (1929), *Publication*; cited (Q) by Robert Bannister (1987)

"The driving motive (or impelling cause) in all natural events is the difference between the existing entropy and its maximum value."

— Ludwig Boltzmann (c.1887), Publication; cited by Joseph Klein (1910) in *Physical Significance of Entropy* (pg. 98)

"I know that the sunrise is an optical illusion. My teacher told me so."

— Henry Mencken (1925), attributed; said by E.K. Hornbeck (Gene Kelly), of the *Baltimore Herald*, patterned after Mencken (Q), in: *Inherent in the Wind* (1960), the film remake of the Scopes Monkey Trail, in response to query as to "why he bothers" (Q), him and his newspaper, dealing with this religious legal trickery

"A society grows great when old men plant trees whose shade they know they shall never sit in."

— Greek proverb (c.300BC) (Q)

"The science of force is power acting by law in space and time."

— William Hamilton (1834), "Introductory Remarks" to *On a General Method in Dynamics*, Mar

"Man finds himself in a world which must be understood in order to be controlled. His world of experience is constantly changing from moment to moment. The effort of science is to understand the mechanism through which phenomena take place; that is, all occurrences. Hence, science is the method of solving the more complex problems of experience which man has worked out though his intelligence."

— Charles Ellwood (1925), *The Psychology of Human Society* (pg. I); cited by Howard W. Odum in: *An Introduction to Social Research* (pgs. 13-14)

"As strange as it sounds, I have thought the same way (chemically) about relationships ... especially entropy and molecules. Weird."

— Hala Kalmareiata (Q) (2014), "IQ:200+ | Smartest Person Ever (3 of 4)", forum (Q) post

“Those who will not reason, are bigots, those who cannot, are fools, and those who dare not, are slaves.”

— Lord Byron (c.1810) (O)

“The door of a bigoted mind opens outwards so that the only result of the pressure of facts upon it is to close it more snugly.”

— Ogden Nash (c.1950) (O)

“Originally I assumed or believed that everybody thought like I did [or like we do]; I soon, however, found this not to be the case.”

— Josip Stepanic (c.2009), comment to American electrochemical engineer Libb Thims (see: forest blind)

“The **concept of purpose** is involved in several physical principles, notably Hamilton’s principle and the related but identical principle of least action, Hertz’s principle of the straightest path, Gauss’ principle of least constraint, and Fermat’s principle of least time. They all effectively state that things take place in the physical world, e.g. the motions of systems of particles, in such a way as to make a certain function assume a stationary value under certain boundary conditions, usually a minimum as compared with all possible values satisfying the given conditions. Hamilton’s principle, e.g., says that for a conservative dynamical system the motion between any two instants of time is such that the time integral of the difference between the kinetic and potential energies taken between these two instances has a stationary value. It has as if the system had a certain purpose to satisfy. A rational individual is said to arrange his actions so as to be sure of achieving his fundamental desires, whether it be to accumulate wealth or gain power over his fellow men. In particular, the aim here is almost always to try to attain the given desired end at minimum cost in human effort. This strongly suggests a heuristic connection with the minimum principles of physics.”

— Bruce Lindsay (1983), “Social Exemplifications of Physical Principles”; see 2014 thread (O) post #8 [1]

“The man attracts man in the social chemistry, as the molecule to another order of composition. A new hut will pick the vicinity of the already built cabin by reason of sympathy along safety. Soon the industry will support agriculture; the blacksmith turn his forge next to the farm to beat the Ploughshares, the wheelwright and blacksmith will follow the carpenter the wheelwright, and so on to the tailor. Agricultural dispersed, the industry focuses. The village will be born of the industry. Do I need to predict the first public monument that will rise on the savings of the town? It will always be the school house.”

— Eugene Pelletan (1863), “Address to the Cotton King”

“Let’s say we granted that every three-day old embryo has a soul worthy of our moral concern. There are other problems that await this description. First of all, embryos, at this stage, can split, into what we call identical twins. Now is this this a case of one soul splitting into two souls? Embryos, at this stage, can fuse, into what we call a ‘chimera’. Many people in this room could’ve developed in this way. Now I suspect that there are theologians trying to figure out what has happened to the extra soul, in such a case? It’s time we realized that this arithmetic of souls doesn’t make any sense.”

— Sam Harris (c.2010), talk at Salk Institute (V:6:10)

“I propose the following definition, which is applied to everything, including minerals: ‘life is the faculty of reaction.’ Everything in the universe tends toward inertia, or absence of reaction. The proof of this inertia, which thermodynamics seeks in ‘absolute zero,’ has never been given, nor will it ever be, because absolute inertia can only be attained through the cessation of the formed matter or ‘thing’. This would be the moment the thing ceased to exist. Everything ‘existing’ is capable of reaction, insofar as it has ‘weight’, that is, fixed or specific energy. The vital phenomenon is the faculty of

reacting, and to manifest itself this reaction requires a resistance of the same nature as the action."

— Rene Lubicz (1949), *The Temple of Man*

"The essence of behaviorism is the belief that the study of man will reveal nothing except what is adequately describable in the concepts of mechanics and chemistry."

— Karl Lashley (1928), "The Behavioristic Interpretation of Consciousness"

"Attractions are proportional to destines."

— Charles Fourier (c.1808)

"We can, indeed, kill all organic beings and thus render them inorganic at will. But these changes are not the same as those which we induce in a piece of chalk by pouring sulphuric acid upon it; in this case we only change the form, and the inorganic matter remains. But when we pour sulphuric acid upon a worm, or when we burn an oak-tree, these organisms are not changed into some other animal and tree, but they disappear entirely as organized beings and are resolved into inorganic elements."

— August Weismann (1889), *Essay on Heredity*; seeming variant of Gregory Bateson's kick a stone or kick a dog comparison (Q)

"The Aristotelian viewpoint still prevails to some extent in biology, namely that an animal moves only for a purpose, either to seek food or to seek its mate or to undertake something else connected with preservation of the individual or the race. The Aristotelians had explained the process in the inanimate world in the same teleological way. Science began when Galileo overthrew this Aristotelian mode of thought and introduced the method of quantitative experiments which leads to mathematical laws free form the metaphysical conception of purpose. The analysis of animal conduct only becomes scientific in so far as it drops the question of purpose and reduces the reactions of animals to quantitative laws."

— Jacques Loeb (1918), *Forced Movements, Tropisms, and Animal Conduct*

"… seductive women—why should I, despite all scruples and obstacles, cast myself into the dust before you? Dearst Franziska, herein lies the enigma of 'elective affinity', of that strange psychological 'chemotropism', of whose power I have spoken repeatedly in my books—little dreaming that I myself should fall a victim to it in my old age!"

— Ernst Haeckel (c.1900), letter to Franziska von Altenhausen

Red Webster: How long are you gonna be in town?

Dalton: Not very long.

Red Webster: That's what I said 25 years ago.

Dalton: Really? What happened?

Red Webster: I got married to an ugly woman. Don't ever do that. It just takes the energy right out of you. She left me, though. Found somebody even uglier than she was. That's life. Who can explain it?

The Dalton Red Webster dialogue (Q), from the film *Road House* (1989), on how marring an ugly woman takes the energy right out of you.

"To revisit this long-lost sentimentality, I would like to chemically paraphrase John Lennon's famous theorem ["all you need is love", 1967 (Q)]. First, however, I need to tell you that the most important thing about chemical reactions is that they try to reach *equilibrium*. Or, to put it in thermodynamic terms, when they occur in the open, they seek to minimize their Gibbs energy, which is universally given the symbol capital G. Graphically, and truthfully, one can say that reacting molecules spontaneously find the lowest spot on their G-curves ["G-spot" (Q) pun]. Getting back to the Beatles, perhaps the love you take is in equilibrium with the love you make?"

— Preston MacDougall (2006), on Goethe, Gibbs, G-curves and G-spots; in "Chemical Eye on Love" (O), Feb 13

"The only ontological difference between men and say, billiard balls is the degree of complexity in the groups of atoms involved. A billiard ball is being bombarded by atoms from the cabbage just as I am, but it does not perceive the cabbage. Why? Because none of its atoms happen to be grouped into that configuration of atoms we call a mind."

— William Jones (1969), *The History of Western Philosophy, Volume 1: The Classical Mind*

"Goethe, in *Elective Affinities*, brooded over the juridical procedures of god."

— Friedrich Gundolf (1916), *Goethe*

"Just as nature abhors a vacuum, humans resist change. Change will occur; vacuums will be filled."

— Nikki Giovanni (c.2000) (O)

"Where do you draw the line between one creature and another? Where does one organism stop and another begin? Is there even a boundary between you and the non-living world, or will the atoms of this page be a part of your body tomorrow? How, in short, can you make any sense out of the conception of a man as a discrete entity? How can the proper study form man be man if it is impossible for man to exist out of context. For the ecologist, then, the desire of some in the humanities to deal only with the fragment of reality they term 'human' is nonsense."

— Neil Evernden (1996), "Beyond Ecology: Self, Place, and the Pathetic Fallacy"; cited by Matthew Taylor (2008)

"Why you pursue something, is equally important as what you pursue."

— Dan Gilroy (2014), character: Lou Bloom of film *Nightcrawler* (O)

"Her pu̇s̈y was like heroin to me. And it wasn't just about the sex, we got along, and had similar interests and s̈hit."

— Jordan Belfort (2013), *The Wolf of Wall Street* (O)(O)(O)

"I did not embark on experiments on consciousness in alert people until after I had obtained the security of academic tenure."

— Benjamin Libet (c.1990), comment to Francis Crick

"He who strays from the paths traced by providence crashes."

— Charles Hermite (c.1962), frequently told to atheist (O) Jacques Hadamard in 1924 [22]

"A man who acquires the ability to take full possession of his own mind may take possession of anything else to which he is justly entitled."

— Andrew Carnegie (c.1910), most-highlighted quote in *50 Shades of Gray*, 2011 (O)

"I've always felt that I was destined for some great achievement, what I don't know. The last great opportunity of a lifetime—an entire world at war, and I'm left out of it? God will not permit this to happen! I will be allowed to fulfill my destiny! His will be done."

— George C. Scott (1970), *Patton*; screenplay by Francis Coppola (O)

"The law of conservation applies to some things and not to others, and the things which it does not apply are unreal."

— James Johnstone (1914), *The Philosophy of Biology*

"I have to believe in a world outside my own mind. I have to believe that my actions still have meaning, even if I can't remember them. I have to believe that when my eyes are closed, the world's still there."

— Christopher Nolan (2000), *Memento*, ending mental thoughts of the character Leonard Shelby (O); from the short story "Memento Mori" by Jonathan Nolan—itself based on the Latin phrase *Memento mori* (remember Mor), "remember death arrives" (O), which is symbolic of the theory and practice on reflection mortality, i.e. to keep in mind the transient nature of earthly goods and pursuits

"I'm prepared to leave this life. I have no fear. I'll just disintegrate into molecules and atoms. They'll be probably transformed into another form of living matter."

— Vladimir Vernadsky (1945), "Diary Note" (O), written shortly before his dereaction (death) on Jan 6

"Nothing whatever can be moved by itself, but its motion is effected through another. There is no other force."

— Leonardo Da Vinci (1490), notebook writings (see: self terminology reform)

"All power flows from the people."

— Baron Gurney (c.1840) (O)

"Gauss and Goethe were Quetelet's intellectual parents and Goethe predominated."

— Author (1998), (O)

"Freedom is the freedom to say that two plus two equals four."

— George Orwell (1984), said by character Winston Smith in the novel *1984* [21]

"What's the matter with you guys? This was never about the money, this was about us against the system. That system that kills the human spirit. We stand for something. We are here to show those guys that are inching their way on the freeways in their metal coffins that the human spirit is still alive."

— Bodhi (1991), *Point Break*, arisen to mine while posting previous quote

“I’ll kill a communist for fun, but for a green card I’m gonna carve him up real nice.”

— Tony Montana (1983), *Scarface*, reflection on the manliest movie of all time poll #1 ranking position; compare: Helvetius (1773) on annihilating the desires.

“My time has not yet come, some people are born posthumously. I write for a species of men that do not yet exist.”

— Friedrich Nietzsche (c.1875)

“Give a man fire and he’s warm for a day. Set a man on fire and he's warm for the rest of his life.”

— Terry Pratchett (c.1996) (Q)

“It is rather a singular instance of the manner in which similar views arise at about the same time that Goethe in Germany, Erasmus Darwin in England, and Geoffroy Saint-Hilaire in France, came to the same conclusion on the origin of species, in the years 1794-95.”

— Charles Darwin (1872), *On the Origin of Species* [20]

“Let no one enter here who is ignorant of mathematics.”

— Plato (360BC), plaque over door to his academy, a motto supposedly learned from his studies in Egypt [19]

“There is no god! There is no god! I came to America so I could say that. In my country [Iran], they will kill me if I say that.”

— Sadegh Simorgh (2014), response following query by Libb Thims of “Are you a Muslim?”, to which he first responded “On my ID card”, to which Thims responded “What do you mean?”, Oct 31

“I didn’t choose to be born, and if I’d been given the option, I’d have asked to been let off.”

— Clarence Darrow (c.1930), Scopes Monkey Trial documentary (18:25-18:44)

“The value of a man does not depend on the truth he possesses or believes he possesses, but on the sincere labor he has bestowed upon getting at the truth; for it is not the possession of, but the search for truth, that increases his strength and thereby makes him more perfect.”

— Gotthold Lessing (c.1770), quoted by Ludwig Buchner, *Force and Matter* (pg. xiii)

“By annihilating the desires, you annihilate the mind. Every man without passions has within him no principle of action, nor motive to act.”

— Helvetius (1773), *A Treatise on Man: His Intellectual Faculties and his Education* (Q)

“Romantic love, we still read in cosmopolitan, is a ‘matter of chemistry’, an image that has its support in the writings of the greatest poets, in Shakespeare, for instance, and in Goethe, whose novel *Elective Affinities* has been prime reading in Europe for almost two centuries.”

— Robert Solomon (1981), *Love: Emotion, Myth, Metaphor* (pg. 38)

“To be modern is to be part of a universe in which, as Marx said, ‘all that is solid melts into air’.”

— Marshall Berman (1982), *All That Is Solid Melts into Air* (pg. 15) (Q)

“What is democracy but a successful formula for controlling the chemical reactions of our 145,000,000 people, and turning the friction and heat generated by our living together into production and progress?”

— Thomas Dreier (1948), *We Human Chemicals* (pg. 48)

“All science starts with hypothesis.”

— George Millin (1896), title page quote to *Evil and Evolution*; a supposed truncation of Roger Bacon’s Aristotelian-framed scientific method (1265) [17]

“Whoever would arrive at excellence must be self-taught. There is, in reality, very little that a person who is serious and industriously disposed to improve may not obtain from books with more advantage than from a living instructor.”

— Thomas Young (1798), “Letter to brother”

“The longer a person has lived the less he gains by reading, and the more likely he is to forget what he has read and learnt of old; and the only remedy that I know of is to write upon every subject that he wishes to understand, even if he burns what he has written.”

— Thomas Young (1809), “Letter to Hudson Gurney” [6]

“The fundamental concept in social science is power, in the same sense which energy is the fundamental concept in physics.”

— Bertrand Russell (1938), *Power: a New Social Analysis* [16]

“No one has ever touched a soul, or seen one in a test tube.”

— John Watson (1924), *Behaviorism*

“If one had the kind of vision [e.g. electron microscope] that allowed one [see: advanced perspective] to see molecules and were in a

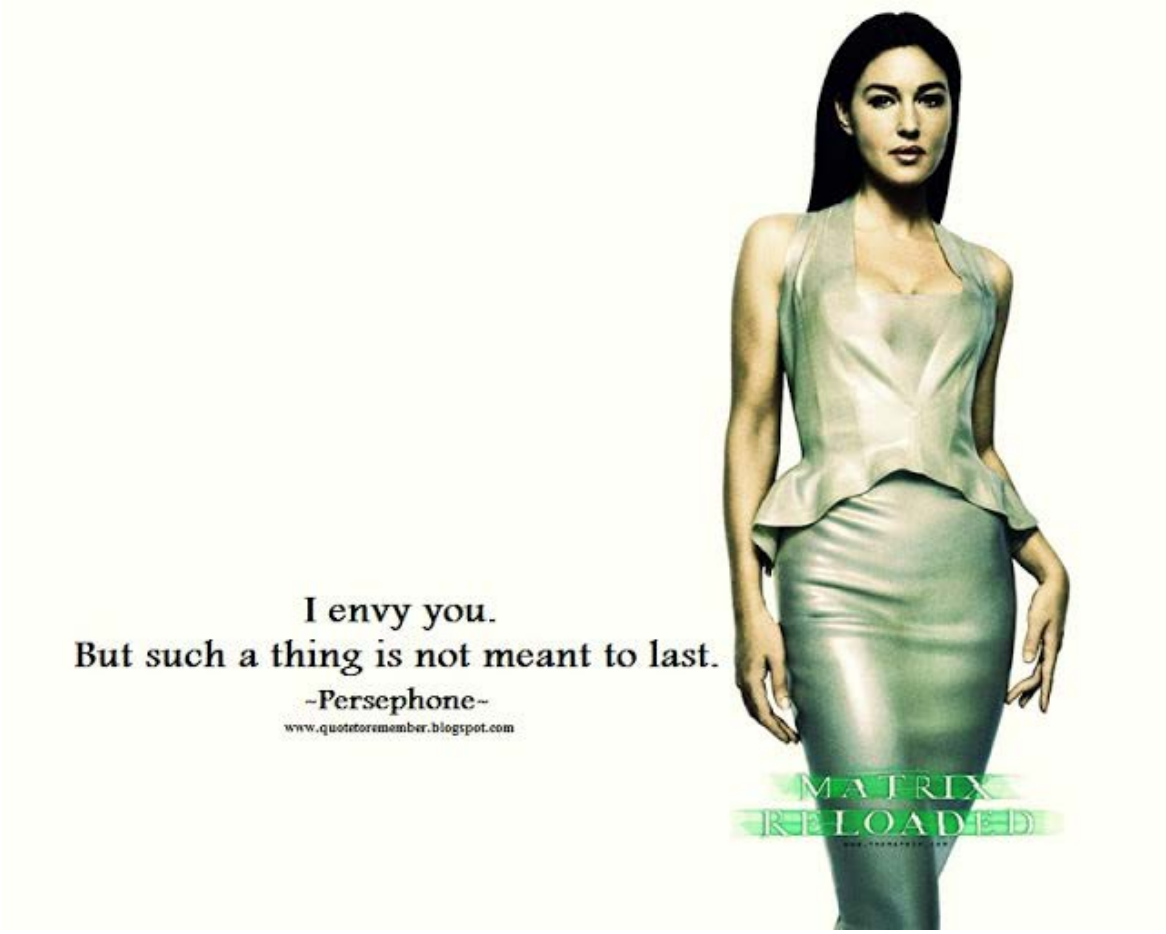

jungle, one would see molecules wandering about everywhere, at random. In this ceaseless wandering, one might recognize a locus in which molecules of various types were particularly concentrated, which held its form [bound state] approximately while myriads of molecules streamed in and out [turnover rate]; and that locus would be a monkey in the jungle. That continuous inflow and outflow of material [metabolism], and whatever of its structure endured, would not only make that a unique monkey from among monkeys but would ensure that it changed [see: Heraclitus] from moment to moment throughout its entire existence."

— Albert Szent-Gyorgyi (c.1975)

"Everything we sensually experience can be reduced to energy relationships between our sense organs and the world around us."

— Wilhelm Ostwald (1926), autobiographical reflection of his spring 1890 "pentecostal inspiration" [15]

"I am made from the C-H-N-O-S-P combination from which a Bunsen, Helmholtz, Kirchhoff came."

— Wilhelm Ostwald (1926), *Lifelines: an Autobiography* [14]

"Energy. You have sex, there's friction … that's heat. Then a baby shoots out. It's all energy. The sun's a giant orgasm. Like if you see a hot girl ... and she's soo hot, you can't even touch that sh*t. You're like daaammn! "

— Pat aka King Atheist (2014), when queried on Easter (Apr 20) about what—as an atheist—he believes in?

"As amber attracts a straw, so does beauty admiration, which only lasts while the warmth continues."

— Robert Burton (1621), *The Anatomy of Melancholy*

“The belief state of an obscure lump of molecules wandering around a remote corner of England is of no importance whatsoever epistemologically speaking.”

— Barry Barnes (1998), response to David Mermin whether he “might perhaps be into astrology” [12]

“Real orgies are never so exciting as pornographic books. In a volume by Pierre Louys all the girls are young and their figures perfect; there's no hiccoughing or bad breath, no fatigue or boredom, no sudden recollections of unpaid bills or business letters unanswered, to interrupt the raptures. Art gives you the sensation, the thought, the feeling quite pure —chemically pure, I mean, [with a laugh] not morally.”

— Aldous Huxley (1928), *Point Counter Point* [13]

“The only way to learn is to question.”

— Jean-Paul Sartre (c.1945), lecture at the Sorbonne

Existence | Meaning

The following are meaning and existence related quotes:

“When a certain number of material particles consisting of phosphorus, carbon, oxygen, hydrogen, nitrogen, and perhaps some other elements, are, in consequence of the operations of their mutual forces, in certain positions with respect to each other, and in certain states of motion, consciousness is the result, but whenever this relative state is brought to an end, there is also an end of consciousness and the sense of individual existence, while however the particles of phosphorus, carbon, etc., remain as truly as ever.”

— Balfour Stewart and Peter Tait (1875), on the “extreme materialism” view [10]

“This universe may in truth be compared to a vast heat engine, and this is the reason why we have brought such engines so prominently before our readers. The sun is the furnace or source of high-temperature heat of our system, just as the stars are for other systems, and the energy which is essential to our existence is derived from the heat which the sun radiates, and represents only a very small portion of that heat.”

— Balfour Stewart and Peter Tait (1875), on the transformation of heat into work [10]

“Since as a kid I was aware of the abyss (super rift) between the material and mental worlds. I tried to bridge this abyss, but could not. Yet I kept on with my own "Steigerung" as Goethe did. Then during 1982-83 I discovered empirically that the law of entropy production applies to the spiritual [*humanistic*] world as it applies to the physical world. My joy knew no bounds. I have found the bridge between these two worlds with which to cross the abyss between them. Others thought I was crazy and would not dare to publish my account. Then, in 1986, if I remember correctly, I was teaching university students the intricate calculations concerning free energy in chemical reactions. During that lecture I suddenly became aware how my mind was rushing along two levels. The lower level was concerned with chemical processes as a physical phenomenon. I executed this level almost automatically. But the higher level of my mind was exploring free energy in the process of knowing-learning as a spiritual [*thermodynamics*] phenomenon. I followed this level with great curiosity. I think the students became aware that I was rather absent minded that day, not perceiving my higher most thoughts. That day marks the beginning of my continual exploring of the role of free energy in the spiritulization [*actualization*] of humankind.”

— Adriaan de Lange (2010), retrospect reflection on arrival of human free energy theory

Recent | Misc

The following are recent adds:

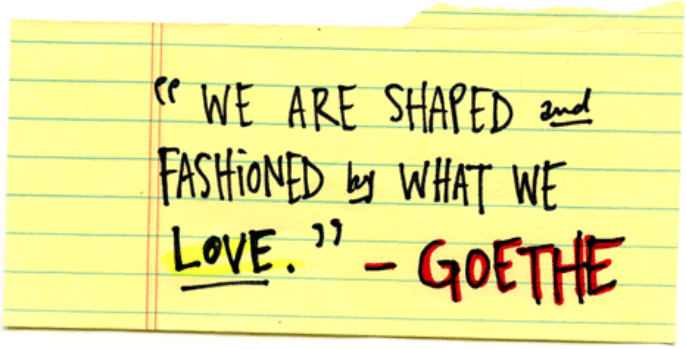

> "Training is nothing! The will is everything! The will to act."
>
> — Christopher Nolan and David Goyer (2005), *Batman Begins* (vid)

> "I know the rage that drives you. That impossible anger strangling the grief, until the memory of your loved ones is just poison in your veins."
>
> — Christopher Nolan and David Goyer (2005), *Batman Begins* (vid)

> "Like you, I was forced to learn the rhythm without decency. Your anger gives you great power, but if you let it, it will destroy you, as it almost did me."
>
> — Christopher Nolan and David Goyer (2005), *Batman Begins*, version (O) as heard by Thims (vid)

Exercise

The following concern an inverse corollary between weight and genius (§: exercise habits)—or what one might say a "mind body philosophy" of existence, i.e. "once the body goes, the mind will soon to follow" motto:

> "[Kearney] plays poker for a living and is **fat**. Well for a [supposed] genius he sure not well rounded. People that choose not exercise to my mind have to have to be mentally deficient."
>
> — iMaDeMoN2012 (2013), IQ 200+ | Smartest person ever (2 of 4) comment (O), Jun

> "The morning after Goethe's death, a deep desire seized me to look once again upon his earthly garment. His faithful servant, Frederick, opened for me the chamber in which he was laid out. Stretched upon his back, he reposed as if asleep; profound peace and security reigned in the features of his sublimely noble countenance. The mighty brow seemed yet to harbor thoughts. I wished for a lock of his hair; but reverence prevented me from cutting it off. The body lay naked, only wrapped in a white sheet; large pieces of ice had been placed near it, to keep it fresh as long as possible. Frederick drew aside the sheet, and I was astonished at the divine magnificence of the limbs. The breast was powerful, broad, and arched; the arms and thighs were elegant, and of the most perfect shape; nowhere, on the whole body, was there a trace of either **fat** or of leanness and decay. A perfect man lay in great beauty before me; and the rapture the sight caused me made me forget for a moment that the immortal spirit had left such an abode. I laid my hand on his heart – there was a deep silence – and I turned away to give free vent to my suppressed tears."
>
> — Johann Eckermann (1832), day after Goethe's reaction end (death) at age 82

> "As part of his plan, Theon established a regimen of physical training for Hypatia, such as rowing, swimming, and horseback riding, to ensure that her body would be as healthy as her well-trained mind."
>
> — Author (date), synopsis of raising regiment of Hypatia (O), the only known female universal genius

On writing

The following are wisdom quotes on writing:

"A person who writes so much must spread his message rather thin."

— Willard Gibbs (c.1901), comment to Edwin Wilson on uncut (unread) books

"I have little patience for scientists who take on a board of wood, look for its thinnest part, and drill a great number of holes when the drilling is easy."

— Albert Einstein (c.1930), recalled by Philipp Frank [18]

Ethics

See main: Physico-chemical morality

The following are morality and or ethics quotes:

"We conclude that there exists a principle of the human body which comes from the great process in which so many millions of atoms of the earth become many millions of human molecules."

— Jean Sales (1789), *The Philosophy of Nature: Treatise on Human Moral Nature*

"The **moral symbols** in the natural sciences—for example that of the elective affinities invented and used by the great Bergman—are more intelligent and permit themselves to be connected better with poetry, even connected with society better than any others, which are, after all, even the mathematical ones, anthropomorphic. The thing is that the former (the chemicals) belong with the emotions, the latter (mathematics) belong with the understanding."

— Johann Goethe (1809), "Conversation with Friedrich Riemer", Jul 24

"Many do not see the battle between morality and passion within *Elective Affinities*."

— Johann Goethe (1809), in response to critics, mid Dec; in: Tantillo (pg. 6) (FA 2, 6:616-17)

"My chief proposition: there are no moral phenomena, there are only a moral interpretation of these phenomena. This interpretation itself is of extra-moral origin."

— Friedrich Nietzsche (c.1885), WP:258

"If iron sulphate and caustic potash are brought together, the SO_4 ions leave the iron to unite with the potassium. When in nature an adjustment of such differences of potential is about to take place, he who would approve or disapprove of the process from the moral point of view would appear to most to play a ridiculous part."

— Otto Weininger (1903), *Sex and Character*

"Morality has nothing to do with any particular form of religion. Morality is the adjustment of matter to its environment—the natural arrangement of molecules. More especially it may be considered as dealing with organic molecules. Conventionally it is the science of reconciling the animal *homo* (more or less) *sapiens* to the forces and conditions with which he is surrounded."

— Howard Lovecraft (1918), "Letter to Maurice Moe", May 15

"The most familiar attempts to explain how evolution takes place are restricted to special aspects of evolution, and are often epitomized in personal names, such as Darwinism, Lamarkism, Weismannism, Mendelism. Among us there are naturalists, morphologists, physiologists, and psychologists; breeders, experimentalists, and bio-chemists. And

surrounding us on all sides **are the physicists, chemists,** geologists, and astronomers, **with whom we must reckon**, for their domains and their subject matter overlap ours in countless ways. But unfortunately between all these workers there is little common understanding and much petty criticism. We shall use the terms morality, behavior, conduct, or constructive action in the same broad way. It may sound strange to speak of the morals of an atom, or of the way in which a molecule conducts itself. But in the last analysis, science can draw no fundamental distinction between the conduct of an animal, a bullet, or a freshman, although there may be more unknown factors involved in one case than in the other."

— William Patten (1920), AAAS address "The Message of the Biologist" + *The Grand Strategy of Evolution: the Social Philosophy of a Biologist*

"Thinking about atoms discussing morals is absurd."

— Ravi Zacharias (1990), *The Real Face of Atheism*

"This is the sort of irrelevant-sounding question that seems minor at first, and the mind looks for a quick answer to dismiss it. It sounds like one of those hostile, ignorant questions some fundamentalist preacher might think up. But why do the fittest survive? Why does any life survive? It's illogical. It's self-contradictory that life should survive. If life is strictly a result of the physical and chemical forces of nature then why is life opposed to these same forces in its struggle to survive? Either life is with physical nature or it's against it. If it's with nature there's nothing to survive. If it's against physical nature then there must be something apart from the physical and chemical forces of nature that is motivating it to be against physical nature. The second law of thermodynamics states that all energy systems 'run down' like a clock and never rewind themselves. But life not only 'runs up,' converting low energy sea-water, sunlight and air into high-energy chemicals, it keeps multiplying itself into more and better clocks that keep "running up" faster and faster. Why, for example, should a group of simple, stable compounds of carbon (C), hydrogen (H), oxygen (O), and nitrogen (N), 'struggle' for billions of years to organize themselves into a professor of chemistry? What's the motive? (see: motive force) If we leave a chemistry professor out on a rock in the sun long enough the forces of nature will convert him into simple compounds of carbon, oxygen, hydrogen and nitrogen, calcium, phosphorus, and small amounts of other minerals. It's a one-way reaction. No matter what kind of chemistry professor we use and no matter what process we use we can't turn these compounds back into a chemistry professor. Chemistry professors are unstable mixtures of predominantly unstable compounds which, in the exclusive presence of the sun's heat, decay irreversibly into simpler organic and inorganic compounds. That's a scientific fact. The question is: Then why does nature reverse this process? What on earth causes the inorganic compounds to go the other way? It isn't sun's energy. We just saw what the sun's energy did. It has to something else. What is it?"

— Robert Pirsig (1991), *Lila: An Inquiry into Morals*

"The first rule of science is the truth at any price including the price of your life. That rule also applies to morality."

— Howard Bloom (2012). *The God Problem: How a Godless Cosmos Creates* [4]

Other | Misc

The following are recently added (to this page) quotes:

"Manifold avenues open up almost as soon as one begins to tackle the problem."

— Nicholas Georgescu-Roegen (1971), *The Entropy Law and the Economic Process*

Belief systems

The following are belief system quotes:

"Fables should be taught as fables, myths as myths, and miracles as poetic fancies. To teach superstitions as truth is a most terrible thing. The child mind accepts and believes them, and only through great pain and perhaps tragedy can he

or she be in after years relieved of them. The reason for this is that a superstition is so intangible a thing that you cannot get at it to refute it."

— Hypatia (360-415)

"You must acquire the best knowledge first, and without delay; it is the height of madness to learn what you will later have to unlearn."

— Desiderius Erasmus (1497), "Letter to Christian Northoff" [23]

"It takes the latter half of all of one's lifetime to unlearn the falsehood that was instilled into us during the earlier half. Generation after generation we learn, unlearn, and re-learn the same lying legendary lore. Henceforth, our studies must begin from the evolutionist standpoint in order that they may not have to be gone over again."

— Gerald Massey (1883), *The Natural Genesis* [3]

Love and hunger

The following are love and hunger quotes:

"Love and hunger rule the world."

— Friedrich Schiller (1795), "The Philosophers" (Die Welteisen) (?); StatusMind.com (?)

"Hunger and love are what moves the world."

— Friedrich Schiller (1795), quoted by Sigmund Freud, in *Civilization and its Discontents* (1930) (?), as basis if his drive theory (?) [9]

"Hunger and love are two fundamental forces that reign in the living world, they are the primary source of all phenomena, mental and social."

— Leon Winiarski (1899), *Essay on Social Mechanics*

"Love and hunger rule the world. Ergo, to rule the world, one must master love and hunger."

— Yevgeny Zamyatin, *We* (1920)

Other | Recent additions

The following are recently-found quotes of curiosity:

"What's remarkable is that atoms have assembled into entities, which are somehow able to ponder their origins."

— Martin Rees (c.2010) (video @ 1:20)

"If the proof is correct then no other recognition is needed."

— Grigori Perelman (2006), in comment on turning down the Fields Medal (and $1 million dollars)

"No human investigation can be called real science if it cannot be demonstrated mathematically."

— Leonardo da Vinci (c.1490)

Hmolscience

See main: Hmolscience quotes

The following are hmolscience related quotes of interest to Thims:

"How I look forward to **the effect** that this [chemistry-based] novel will have in a few years on many people upon rereading it."

— Johann Goethe (1809), comment (see: timeline) to Karl Reinhard

"There is some truth in Boerhaave's poetic comparison: [that] [force of chemical affinity] is "love, if love be the desire for marriage".

— Jean Dumas (1837), commentary on Herman Boerhaave's 1732 supposition

"Just as man and woman attract one another, so oxygen O_2 attracts hydrogen H_2 [and] just as a steam engine produces motion, so the intricate organic complex of force-bearing substance in an animal organism produces a total sum of certain effects."

— Ludwig Buchner (1855), *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon*

On impetus, success, and repulsion

The the following are on the delicate nature of impetus, success, and repulsion:

"He who gives back at the first repulse and without striking the second blow despairs of success and has never been, is not, and never will be a hero in war, love, or business."

— Frederick Tudor (age 22), 1805

"Until one is committed there is always hesitancy, a chance to draw back. Always ineffectiveness concerning all acts of initiative and creation. The moment one definitely commits oneself, then providence moves too. Whatever you can do or dream you can do, begin it now."

— Johann Goethe, *Faust* (1832)

"Take time to deliberate, but when the time for action has arrived, stop thinking and go in."

— Napoleon Bonaparte (date)

Appeal to authority

The following are appeal to authority quotes:

“Anyone who conducts an argument by appealing to authority is not using his intelligence; he is just using his memory.”

— Leonardo da Vinci (c.1500)

“Those who rely simply on the weight of authority to prove any assertion, without searching out the arguments to support it, act absurdly. I wish to question freely and to answer freely without any sort of adulation. That well becomes any who are sincere in the search for truth.”

— Vincenzo Galilei (c.1570)

On truth

The following are quote on wisdom concerning truth:

“Plato is my friend, but truth my greater friend.”

— Aristotle (c.350 BC), quote inscribed into Newton's age 19 written notebook *Philosophical Questions*.

“Nothing ought to be received as truth until it has been proved by good and solid reasons.”

— Rene Descartes (c.1620), quote especially impressed Benedict Spinoza

“Truth does not change because it is, or is not, believed by a majority of the people.”

— Giordano Bruno (c.1590)

“He who knows nothing is closer to the truth than he whose mind is filled with falsehoods and errors.”

— Thomas Jefferson (O)

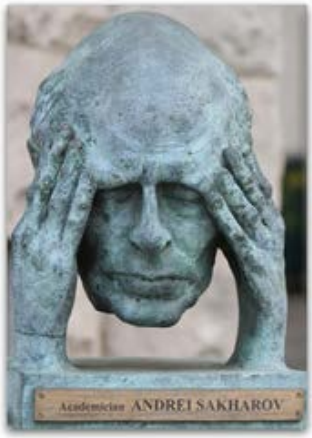

Learning | Education

The following are learning and or education quotes to think about, ponder, or muse over:

“To be master of any branch of knowledge, you must master those which lie next to it; and thus, to know anything — you must know all.”

— Oliver Homes (1886), American jurist

“Erasmus advises students to read only the best books on the subjects with which they are occupied. He cautions them against loading their memories with the errors of inferior writers which they will afterwards have to throw off and forget.”

— James Froude (1894), *Life and Letters of Erasmus* [1]

“Like you I was forced to learn the rhythms without decency.”

— Liam Neeson, *Batman Begins* (2005)

"When I first set foot in the Boston Public Library, I felt as though the gates of heaven had opened to me."

— Boris Sidis (1884), age 17 after being locked in a body-sized cell for two years for teaching peasants to read

"If one does not know what went on for the last three thousand years, he or she remains ignorant, merely surviving from day-to-day."

— Johann Goethe (date)

"If I were in seventh grade now my mind would be rotting."

— Balamurali Ambati (age 12), 1990, MD (age 17)

"I worked under conditions of the greatest pressure, first in Moscow and subsequently in a special secret research center. We were fascinated by the grandeur of the task."

— Andrei Sakharov (c.1970)

Fate | Destiny

The following are quotes on or about fate and or destiny:

"Accept the things to which fate binds you, and love the people with whom fate brings you together, but do so with all your heart."

— Marcus Aurelius (c.170)

"A man must know his destiny … if he does not recognize it, then he is lost. By this I mean, once, twice, or at the very most, three times, fate will reach out and tap a man on the shoulder… if he has the imagination, he will turn around and fate will point out to him what fork in the road he should take, if he has the guts, he will take it."

— George S. Patton Jr. (c.1940) (Q)

"A man must embrace his destiny or be destroyed by it."

— Anon (c.2010) (Q), somehow connected to *Spartacus: Blood and Sand* drama (Q)

"The human species is but one of many. Viewed from a sort of universal microscope, we appear as but a vast collection of molecules in motion. In our current state we are firmly attached to an earthly substrate, feeding off the energy gradient of the sun. The fate of our chemical species is undeniably tied to the affinities and energies of interaction required to maintain our evolving earth ecosystem. We live in a closed system. In order to understand the nature of things, we must learn more about both our reactions and our products."

— Jeff Tuhtan (2012), PhD dissertation: "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality" (pg. 1)

On time

The following are quotes to think about, ponder, or muse over:

"I had no sense of the value of time, of my own or others, when I wrote it."

— Willard Gibbs (c.1890)

"Time is not one of the variables of pure thermodynamics."

— Gilbert Lewis (1930), "The Symmetry of Time in Physics"

Molecules

The following quotes have functional utility:

"The affinity of two molecules for each other and its temperature dependence are determined by the change in enthalpy, free enthalpy, entropy, and heat capacity upon dissociation."

— Joel Janin (1995), "Elusive Affinities" [2]

"Whether two molecules will bind is determined by the free energy change of the interaction, composed of both enthalpic and entropic terms."

— Julie Forman-Kay (1999), "The Dynamics in the Thermodynamics of Binding"

"Molecules, in condensed phases, as compared to reactions in gases, tend to get trapped, or 'caged', in certain locations, and can only with difficulty force their way out towards reactive sites."

— Arthur Campbell (1965), *Why Do Chemical Reactions Occur*

On explanations

See main: Barmaid explanations

The following are quotes germane to the philosophy that if one cannot explain a phenomenon to a child than one does not understand the phenomena

"If you can't make a physical model of it, you don't understand it well enough."

— James Maxwell (c.1870), stated somewhere, in thereabout this form; or William Thomson (see: below) [?]

"I can't understand something, unless I can make a physical model of it."

— William Thomson (c.1880) according to Robert Clark (1948), who said he is "reported to have said" this [24]

"One major difference between the 'games' played by theoretical physicists and those played by pure mathematicians is that, aside from meeting the demands of internal consistency and mathematical rigor, a physical model must also meet the inflexible boundary condition of agreeing with physical reality."

— James Cushing (date); compare Gibbs on mathematicians vs. physicists [7]

"It should be possible to explain the laws of physics **to a barmaid**."

— Ernest Rutherford (c.1915) [5]

“All physical theories, their mathematical expressions apart, ought to lend themselves to so simple a description that even a **child could understand** them.”

— Albert Einstein (c.1930), comment to Louis de Brogile [5]

“If you can't explain it simply, you don't understand it well enough.”

— Albert Einstein (1947), supposedly derived (O) from Rutherford “barmaid” comment [6]

Other

The following are other quotes:

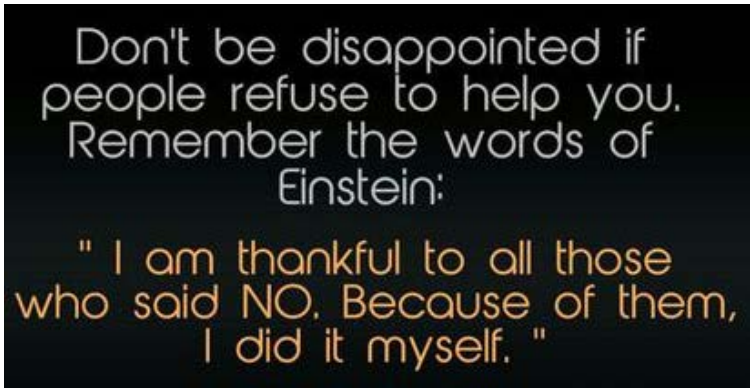

“There is no point in starting your own business unless you do it out of a sense of frustration.”

— Richard Branson (?)(?)

“For any particular thing, ask: What is it in itself? What is its nature?”

— Marcus Aurelius, *Meditations* (c.175), *The Science of the Lambs* (1991)

“I was profoundly unhappy. There was a footpath leading across the fields to New Southgate, and I used to go there alone to watch the sunset and contemplate suicide. I did not, however, commit suicide, because I wished to know more of mathematics.”

— Bertrand Russell (1888), age 16

“The trend towards the already mentioned diversified society of ‘specialists’ and the related danger of narrower way of thinking (idiot savant) necessarily leads to a growing helplessness of the individual. Related to this is a growing blind belief in science. Since Leibnitz, probably the last universal genius, we know more and more about a shrinking area of knowledge. Biology and physics, chemistry and medicine are divided already today into dozens of individual disciplines, which like a ‘hydra’, keep dividing into other individual disciplines.”

— Hans-Wolff Graf (1995), “We Need a New World View” [8]

Burn at the stake

The following are quotes on willingness to burn at the stake:

“One’s theological holdings [can be divided] into two classes: those for which a man would go to the stake, and those for which a man would not go to the stake.”

— Edwards A. Park (c.1870)

“For the second law, I will burn at the stake.”

— Heinz London, comment made to H. Montgomery during his time at Harwell

Beauty

The following are beauty and or Beckhap's law related quotes:

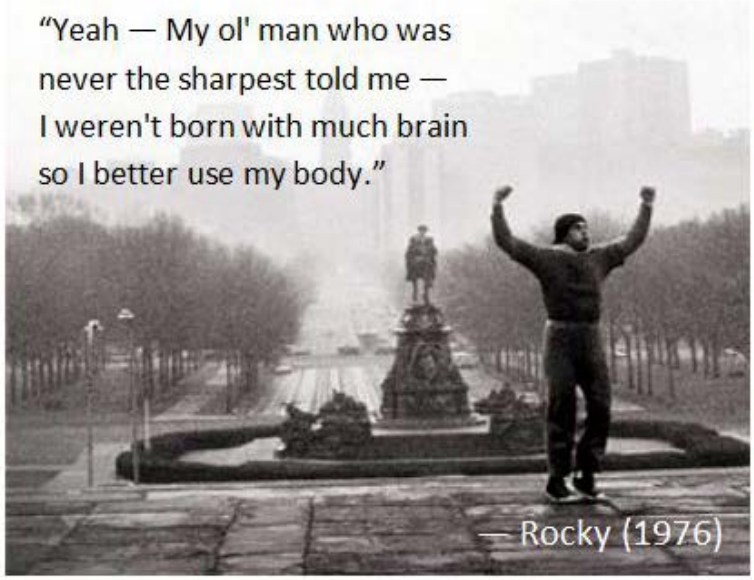

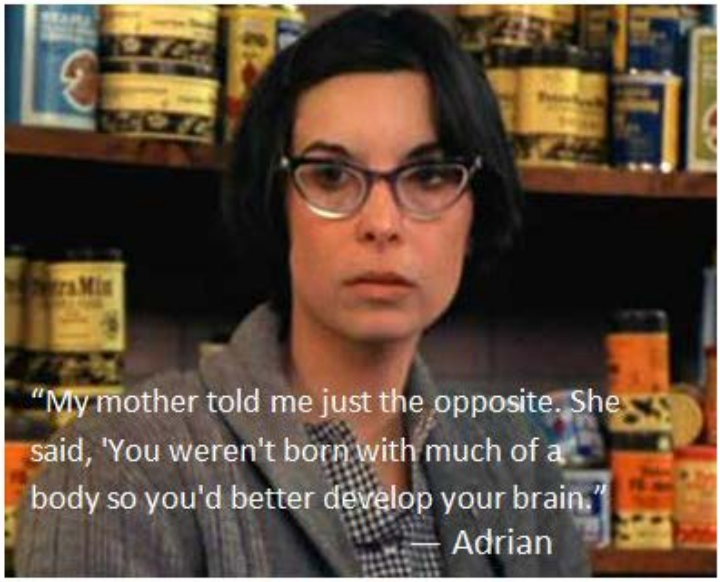

Quote peels

The following are cool quote peels, good for reusability; good font is Tahoma 16pt (version found in original peels) in PicMonkey or 17pt works well too:

Personal notes

See main: Libb Thims (personal notes)

The following are mental notes/quotes by Thims:

"Time is but the absence of strong attractors."

— Contemplative thought axiom (19 Mar 2010); reflection on Willard Gibbs' comment on his loss of the concept of time while writing *On the Equilibrium*, Mar 19

"There is a revolution awaiting to happen, greater than the combined revolutions of Darwin and Copernicus; if only I can make it happen."

— Contemplative thought axiom (13 Aug 2010)

"The smallest abrasion (or abrasive comment) can silence the most powerful of ideas."

— Personal note (23 Sep 2012), written in black pen on printing paper

"Not only do I not believe in the principle of the afterlife, but also do not believe in the principle of life."

— Personal note (24 Sep 2012), written in black pen on printing paper

"Chemical thermodynamics has a certain point of view that outranks all other points of view."

— Contemplative thought axiom (23 Mar 2013)

See also

- Entropy quotes
- Thermodynamics quotes
- Human thermodynamics quotes

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θΔics

In education, **Libb Thims (students)** refers to the either direct or indirect students, followers, and or advocates of the hmolscience work of American electrochemical engineer Libb Thims and or the work of Thims via direct or semi-indirect or independent communication.

Two cultures calls | Graduate / Post-graduate

See main: Two cultures calls

The following is a work-in-progress listing of students that, via mail, internet, email, forum, communication, and or video interaction, have studied directly under the hmolscience work of American electrochemical engineer Libb Thims: [1]

#	Person	Date	Summary
1.	Turnkey13 (c.1988-) Turkish mechanical engineer	2009	A third-year mechanical engineering student who, via Hmolpedia messaging, expressing desire to come to America to complete a MS in on a topic related to thermodynamic of human existence; was inspired by passages from Yunus Cengel and Michael Boles's thermodynamics textbook (see: Cengel-Boles human thermodynamics), one in particular shown below: "The arguments presented here are exploratory in nature, and they are hoped to initiate some interesting discussion and research that may lead into better understanding of performance in various aspects of daily life. The second law may eventually be used to determine quantitatively the most effective way to improve the quality of life and performance in daily life, as it is presently used to improve the performance of engineering systems." — Yunus Cengel and Michael Boles (2006), *Thermodynamics* [5] to which Thims replied that he did not know of any yet extant programs in America, but that for the time being he should read Thims' 2007 *Human Chemistry* textbook, as it then contained most known publications written on entropy and human relations. [4]
2.	Jeff Tuhtan (2011-2012) American ecohydraulic engineering	2010	Spent the greater part of 2010 to 2012 consulting with Thims, attracted to he subject by a reading of Thims' *The Human Molecule* (2008), via emersion in Hmolpedia threads and email exchanges, on his "fish as molecule" chemical thermodynamics based ecological thermodynamics PhD dissertation, entitled "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality" (2011), structured around a number of hmolscience thinkers; the opening paragraph of his finished dissertation is evidence to this mentorship influence: "The human species is but one of many. Viewed from a sort of universal microscope, we appear as but a vast collection of molecules in motion. In our current state we are firmly attached to an Earthly substrate, feeding off the energy gradient of the Sun. The fate of our chemical species is undeniably tied to the affinities and energies of interaction required to maintain our evolving earth ecosystem. We live in a closed system. In order to understand the nature of things, we must learn more about both our reactions and our products."

— Jeff Tuhtan (2012), PhD "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality" (pg. 1); cited by Libb Thims, in his piston and cylinder section (Ñº), of his 2013 NIU lecture. [6]

Tuhtan continues to be part of Hmolpedia consultation himself to newer students.

After completed his master's degree in theoretical physics, Loreti began probing around looking for somewhere where he can completed his PhD in sociophysics, socioeconomic physics, and or human thermodynamics; the following are a few queries, the latter to Libb Thims: [6]

"Dear Sirs, I am looking for a PhD in SocioPhysics (or at most Socio-Econo-Physics), and/or funds for it. Do you know something about it? Any advice is welcome."

— Simon Loreti (2012), "Forum blog post", EconoPhysics Forum, Apr 14

3. Simone Loreti (c.1987-) Italian theoretical physicist — 2012

"In March 2011, I graduated with a master's degree in theoretical physics at the University of Bologna (Italy). I am strongly interested in sociophysics or in general in physics applied to human behavior: in my thesis I solved a sociological problem using statistical mechanics, and machine learning methods. I am looking for a PhD in socio-physics or human thermodynamics and/or funds for it. Do you know something about it? Any advice is welcome."

— Simon Loreti (2012), "Email to Institute of Human Thermodynamics", Apr 15

Thims gave him direction on where, outside of America, to look for such a department, being that the United States, presently, has no such teaching mechanism.

4. Kim Bondoc (c.1970-) Philippine chemist — 2013 — Thims facilitated part of his doing part of MS in physical chemistry graduate coursework on hmolscience; specifically on Thims' 2010 chemical thermodynamics of hot, cold or ambient sex study, i.e. on social enthalpy theory. [2]

5. Po Jen Shen (c.1986-) Taiwanese business management theorist — 2014 — Did his MBA with a thesis on "A Thermodynamic Perspective on Innovation and Distributed Capitalism: a Conceptual Paper" largely based on Thims' 2013 "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" [10]

On 10 Nov 2014, emailed the following query to Libb Thims:

"I am Behruz Sadeghi Amroabadi, PhD Candidate (in last year) of

6.	Behrouz Sadeghi (1987-) Iranian economist	2014	economics at University of Isfahan, Iran and now as a visiting student in Towson University in USA. I have passed PhD comprehensive examination in my faculty successfully and have published several research papers about the environment, government, social capital, poverty, etc., in Iranian and international journals. The subject of my thesis is 'Economic Entropy as a New Index of Cost in Economics.' Now, **I am searching for Post-Doc position** and know you have some research in this regard. Do you or your faculty have any Position for Post Doctoral in related to entropy? I really interest in this subject and want to continue my knowledge for this important."
7.	Ram Poudel (c.1977-) Nepalese-American mechanical engineer	2015	Thims told Sadeghi that he was working to get an undergraduate and graduate department of "physicochemical humanities" established here in America, but was facing resistance, and in mean time suggesting that he might contact the Romanian school of physical socioeconomics, Yakovenko of the American school, as well as John Rutledge. In Dec 2015 began consulting with Thims in respect to guidance on his social energetics and economic thermodynamics themed social field theory PhD; is the organizer of the BPE 2016. Poudel pinging ideas off Thims for cogentness, e.g. on 10 Feb 2016 sending Thims Puerto Rican child prodigy Luis Arroyo's 2010 age 20 completed MS physics thesis "A Thermal Model of Economy", Gibbs energy social models of Josip Stepanic, mention of Edwin Jaynes, etc.

Other individuals who have done graduate school work via hmolscience are found in the site member index; many, however, doing so anonymously. [3]

Other

The following are a work-in-progress listing of known individual "authors" who have been influenced to a significant degree by the work of Thims:

â— Satch Ejike (2008) – relationship advise book based on hmolscience.
â— Mark Janes (2010-present) – articles, books, and philosophy guided by hmolscience.

â— David Bossens (2012-2013) – book based on hmolscience; working presently (2013) on MA in theoretical philosophy, using diffusion models and function defined by Norbert Wiener, in part using *Hmolpedia* and consultation of Thims and his work (e.g. Thims' 2012 "Thermodynamics ≠ Information Theory", etc.). [7]
â— Inderjit Singh (2014-present) – Published a novel *The Warrior* (2015), online article "Knowledge is Power" (2015), and in 2016 in was working on an "Essay on Man", and amid consultation with Thims considered his mindset adjusted as follows: (Ñº)

> "I believe my mind to be more along the [equation] lines of: Singh = Socrates (30%) + Tolkien (25%) + Goethe (25%) + Thims (20%) [Regarding] the constituents of [my literary writing] equation."

(add discussion)

Habilitation

The following are professors Thims mentored in their habilitation:

â— Gheorgeh Savoiu (2014) - Economics and Cross-disciplinarity: econophysics, sociophysics, and econothermodynamics. [9]

(add discussion)

A number of recent indirect **students** of the HCT teachings of Libb Thims (center): Constantin Bratianu (Thims' right), Daniel Pele (Thims' back right), Mircea Gligor (Thims' back left), and seated in front left to right: Ion Siman and Gheorghe Savoiu, all noted members of the Romanian school of physical socioeconomics, at UPESW 2013; Bratianu and Gligor being two exceptions, being they each independently have developed their own unique human thermodynamic theories.

Note

If any one of the above has objection to being classified as a "student", please note that this page was started, following the Kim Bondoc communication about permission to use Thims' 2010 hot sex/cold sex study in his physical chemistry course, solely for the purposes of mental classification purposes, i.e. the number of people doing graduate school work via direct communication with Thims or via work citation was becoming too long to keep track of mentally, hence easier via wiki memory. [2] If some form of objection exists please contact Thims so to amend the situation.

Quotes

The following are related quotes:

"In the near future, we as a society will be readily equipped to grant PhD's in human thermodynamics — with the sole purpose to encourage research, investigation, and glide-path development for the betterment of humankind."

— Libb Thims (2005), online Q&A forum posting [8]

"One day instead of (or in addition to) regular math, chemistry, physics, etc., kids in school will be learning something like one human molecule + another human molecule = ? ... it's just a crazy thought, but hey, we'll see or somebody will."

— Natalia Roubanenko (2006), Russian-born American language studies scholar (see: dihumanide molecule; human reproduction reaction; zerotheism for kids); commentary after reviewing 100-page manuscript of **Thims**' *Cessation Thermodynamics*, Apr 29

"If people are using this site to do their PhD dissertations and getting away with that, their advisors should be shot."

— Peggy La Cerra (2011) American evolutionary psychologist; irate about Thims' review of her "depression energy" psychodynamic theory

See also

â— Human thermodynamics

education

A video still of Thims, amid the 2015 "Zerotheism for Kids" lecture, one of near a dozen public lectures Thims has given (see: Thims lectures) since 2010, teaching six kids (see: Thims students) aged 6 to 11 the modern upgrade to the 5,000-year-old "god created the world in six days", Nile flood (Noah's flood), and Adam and Eve model of everything, with humans as evolved powered CHNOPS+20 chemicals, with a chemical thermodynamic morality (i.e. Goethean morality) system, moving in a big bang universe, amid a human chemical reaction model view of everything.

References

1. Ejike, to note, is one exception: namely he built his theory with direct communication with Thims, but only by consultation of Thims' 2007 *Human Chemistry*.
2. (a) Email communication from Kim Bondoc to Libb Thims (12 Aug 2013).
(b) Thims, Libb. (2010). "Hot Sex, Cold Sex, Ambient Sex" (press release), *Journal of Human Thermodynamics*, 6: 47-58.
3. Note: some of which have eclipsed the boundaries of Thims email/messaging communication memory.
4. Hmolpedia messaging from turnkey13 to Libb Thims (30 Jan 2009).
5. Cengel, Yunus A. and Boles, Michael A. (2006). *Thermodynamics: an Engineering Approach* (ch. 4, pg. 193, ch. 7, pg. 349, ch. 8, pgs. 465-69). McGraw-Hill.
6. Email communicate from Simone Loreti to Libb Thims, via Institute of Human Thermodynamics email, namely: questions@humanthermodynamics.com (15 Apr 2012).
7. (a) Email communication from David Bossens to Libb Thims (11 Nov 2013).
(b) Thims, Libb. (2012). "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair" (url), *Journal of Human Thermodynamics*, 8(1): 1-120, Dec 19.
8. FAQ #3: Where is HT headed? - Institute of Human Thermodynamics.
9. Savoiu, Gheorghe. (2014). "Habilitation Thesis Abstract" (pdf), University of Pitesti Faculty of Economic Sciences.
10. (a) Shen, Po Jen. (2014). "A Thermodynamic Perspective on Innovation and Distributed Capitalism: a Conceptual Paper" (pdf) (Ñº), under advisor Joseph Z. Shyu, at the Institute of Management of Technology, College of Management, National Chiao Tung University, Jun.
(b) Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (video, 1:33-min) (article, 40-pgs) (PowerPoint, 36-slides), Key speaker talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29; in: *Econophysics, Sociophysics, and other Multidisciplinary Sciences Journal* (Ñº) (pdf), 3(2):5-25.

θΔics

In existographies, **Libb Thims 2** is

→ **Libb Thims** (mobile; readable; NON-editable)
→ **Libb Thims** (online; readable) – WayBack (2017)
→ Libb Thims (hacked; NON-readable)

Libb Thims (222- AG) (CR:1586) (RMS:109) (LR:3) (EPD product) is an American electrochemical engineer, an anti-chance, unlearn, asoulist, **abioist**, go-thing philosopher, and 2015 to present "**explicit**", as compared to previous "implicit", extreme atheist (see: Thimsian atheism), aka "Professor Balthazar" (Jabari, 2017) or the "new Goethe" (KMB, 2017) (Ñº), noted for his work in the development of human chemical thermodynamics.

θΔics

In experiments, the **Libet experiment** was a 1982 study conducted by American neuroscientist Benjamin Libet in which the time of onset of "electrical activity" in the cerebrum, the instance of the so-called or readiness potential, of six college students, was measured against the "reported time" of the appearance of the subjective experience of "wanting" or intending to act, with regard to the specific action of choosing to press a button at a specific instance in time. A three step summary of Libet's 1983 study are shown below, which finds a three step time demarcated (delayed) mechanism involved in the so-called conscious action of "choice" to perform an "action", both of which being preceded by an unconscious readiness potential change in the matter of the brain; the time of the readiness potential, in turn, preceded by electromagnetic sensory perception input (not part of the experiment):

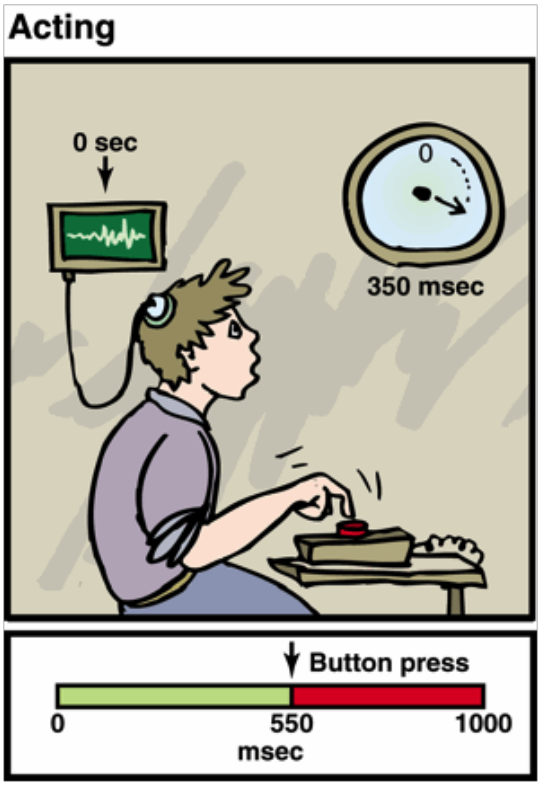

The **Libet experiment** (1982): the time at which an EEG signal indicating brain activation for movement occurs is set as zero time, the reported time of awareness of intention to push the button is about 350 milliseconds (0.35 seconds) later, and the actual EKG, the voltage in the finger muscle doing the push, happens about 200 milliseconds later than that.

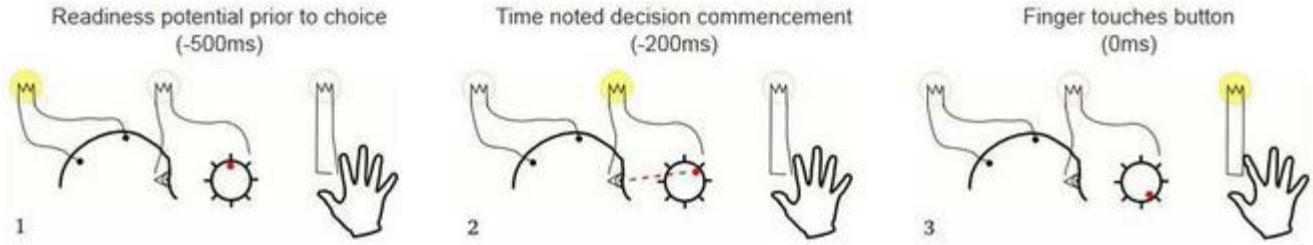

The experiment was conducted by a group led by Libet at the physiology department of the University of California, San Francisco, and published in a 1983 issue of *Brain* as "Time of Conscious Intention to Act in Relation to Onset of Cerebral Activity (readiness-potential): the Unconscious initiation of freely voluntary act". Libet concluded, from his experimental findings, that: [1]

> "Cerebral initiation of a spontaneous, freely voluntary act can begin unconsciously, that is, before there is any (at least recallable) subjective awareness that a 'decision' to act has already been initiated cerebrally."

The Libet experiment soon thereafter became a classic citation of scientific proof that that free will does not exist.

Veto action

Although Libet originally concluded his findings show that people don't have free will, he later recanted on his views to the affect that he argued that people don't have free will with respect to initiation behavior, but might have free will

respect to the veto of an action before it becomes effective. [2] American neuroscience research Sam Harris, objects to this recant: [3]

> "I think Libet's reasoning was clearly flawed, as there is every reason to think that a conscious veto must also arise on the basis of unconscious neural events."

The general issue here is that: yes (a) readiness potential precedes conscious awareness of the "choice" to act by a measurable amount of time, but (b) the "force" of sensory input, which is predominately the electromagnetic force, precedes readiness potential by another measurable amount of time. This logic was first stated in 1847 by Irish physicist James Maxwell as follows: [4]

> "The only thing which can be directly perceived by the senses is force, to which may be reduced to light, heat, electricity, sound and all the other things which can be perceived by the senses."

In sum, points (a) and (b) show that conscious choice to act is preceded and governed by external electromagnetic forces that impede onto the senses of the body of the human molecule. The subject of "veto action" arises in the relative strengths of competing external forces. This was first stated clearly in German physicist Rudolf Clausius' 1875 mathematical introduction, wherein stated: [5]

> "Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, work is performed."

This is logic is based in French physicist Gustave Coriolis' 1829 principle of the transmission of work which mathematically quantifies every movement as a type of work derived by a force.

The example of "movement" in the Libet experiment being the movement of the subject's finger to press a button, which is one of the very simplest types of "models of work" in the study of human movement. In the case of veto action, one external force overrides a previous external force, such that indecision to act or rather a veto of previous intention to act results.

University College London neuroscience researcher Patrick Haggard discussing **Libet's experiment**.

See also

â— Trigger action
â— Induced movement

References

1. Libet, Benjamin, Gleason, Curtis A., Wright, Elwood W., Pearl, Dennis K. (1983). "Time of Conscious Intention to Act in Relation to Onset of Cerebral Activity (readiness-potential): the Unconscious initiation of freely voluntary act" (Google books), *Brain*, 106 (pg. 3): 623-42.
2. (a) Libet, Benjamin. (1999). "Do We Have Free Will?", *Journal of Consciousness Studies*, 6(8-9): 47-57.
(b) Libet, Benjamin. (2003). "Can Consciousness Experience Affect Brain Activity?", *Journal of Consciousness*

Studies, 10(12): 24-28.
3. Harris, Sam. (2010). *The Moral Landscape* (pgs. 103, 215). Free Press.
4. (a) Maxwell, James. (1847). “Exercise for Hamilton on the properties of matter”, class of philosopher William Hamilton (1788-1856), Edinburg University.
(b) Mahon, Basil. (2003). *The Man who Changed Everything: the Life and Times of James Maxwell* (pg. 25). Wiley.
5. Clausius, Rudolf. (1875). *The Mechanical Theory of Heat* (section: Mathematical Introduction: on Mechanical Work, on Energy, and on the Treatment of Non-Integrable Differential Equations, pgs. 1-20). London: Macmillan & Co.

θΔics

In problems, **library walk problem**, visually depicted adjacent, is the following scenario and followup question: [1]

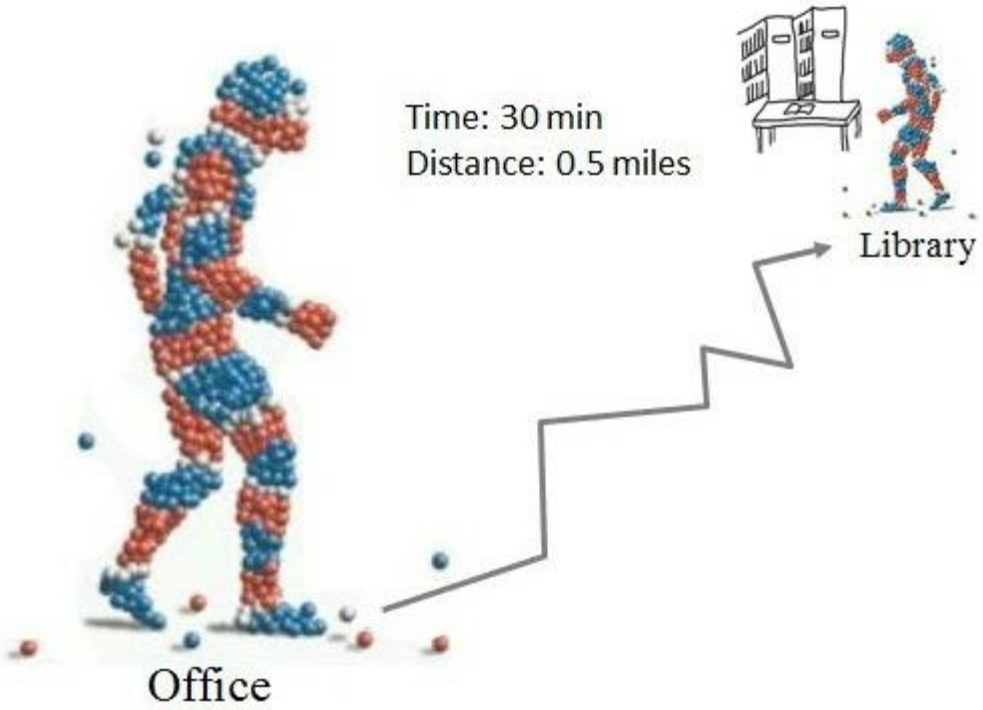

A diagram of Jaegwon Kim's 1992 **library walk problem**; wherein the social first law of motion comes into play. [3]

> Scenario: "It occurs to you that you need to check a few references for an article you are writing, so you decide to walk over to the library after your office hours. Miracle of miracles! In half an hour, you find your body, all of it, at the front steps of the library, half a mile away. Think of all the molecules that make up your body: each of them has traversed the half-mile, zigzag path from your office to the library, and your whole body is now where it is."
>
> **Question**: "What explains the spatial displacement of your body from the office to the library? What caused the motion of each and every molecule of your body over the half-mile path?"

The library walk problem was proposed in 1992 by Korean-born American physicalism philosopher Jaegwon Kim, concerning the "cause" of a man's walk to a library to get a reference; it is similar to Thomas Huxley's 1901 "zombie argument", found amid consciousness debates, discussed below.

Huxley | Zombies

In 1901, English natural philosopher Thomas Huxley stated the following, the so-called "zombie argument", as it is called in modern consciousness debates, position: [2]

> "The argument which applies to brutes [zombies] holds equally good of men … It seems to me that in men, as in brutes, there is no proof that any state of consciousness is the cause of change in motion of the matter of the organism."

Meaning that, according to Huxley, consciousness is NOT the cause of change in motion of a human.

Bazargan | Solution

In 1980, Mehdi Bazargan, in his "Cause of Movement", gave the first cogent answer to Kim's library walk problem; the gist if which is as follows:

> "In general, an object in a given **force field** will, of necessity, behave in a calculable and predictable way. For any object, whether a stone, a plant, or a human society,

force means movement."

— Mehdi Bazargan (1980), "The Cause of Movement" [4]

(add discussion)

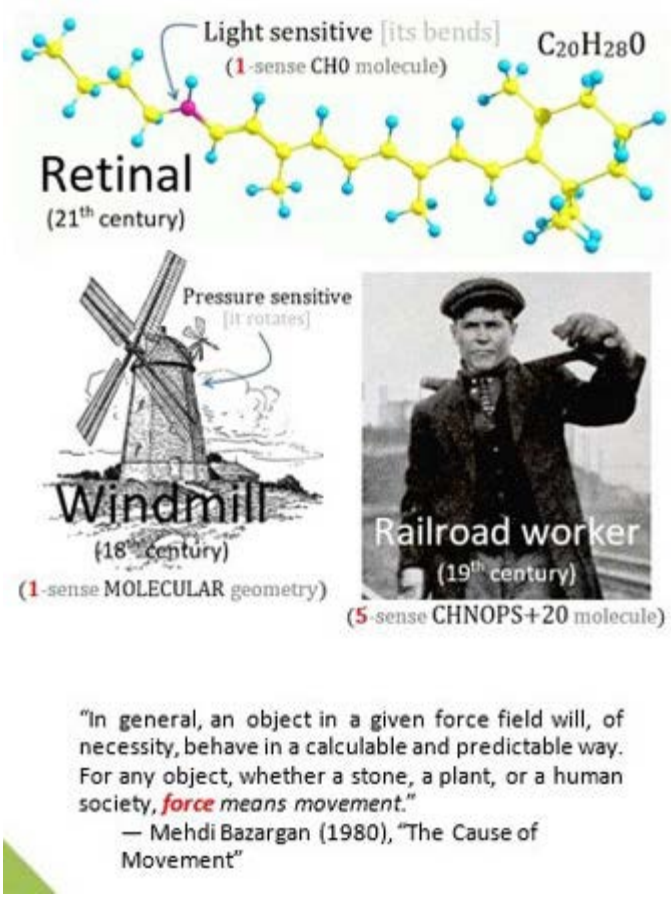

A depiction of Mehdi Bazargan's 1980 explanation of the cause of movement, whether of a rock, plant, or human, as found on the back cover of *Hmolpedia, Volume 6* (2016), the first seeming cogent answer to Jaegwon Kim's 1992 **library walk problem**. [4]

References

1. Jaegwon, Kim. (1992). "Downward Causation in Emergentism and Nonreductive Physicalism", in: *Emergence or Reduction?: Essays on the Prospects of Nonreductive Physicalism* (pgs. 119-). Walter de Gruyter.
2. Guzeldere, Guven. (1997). "Epiphenomenalism and the Possibility of Zombies", in: *The Nature of Consciousness: Philosophical Debates* (editors: Ned Block, Owen Flanangan, Guven Guzeldere) (pgs. 41-42). MIT Press.
3. Thims, Libb. (2012). "Juarrero, Deacon, Nonreductive Physical Materialism, and Chemical Teleology" (§:Kim's library walk problem, pgs. 103-06) (pdf) (peer), *Journal of Human Thermodynamics* (url), 9(6): 77-122, Jun.
4. (a) Bazargan, Mehdi. (c.1980). "Religion and Liberty" (Section: Opposition: the Cause of Movement and Life, pgs. 81-82, note 23: Thermodynamics of Humanity); originally in *Rediscovery of Values* (*Bazyabi-e Arzeshha*); reprinted in *Liberal Islam: a Source Book* (chapter 7, pgs. 73-84) edited by Charles Kurzman, Oxford University Press, 1998.
(b) Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (video, 1:33-min) (article, 40-pgs) (PowerPoint, 36-slides), Key speaker talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29; in: *Econophysics, Sociophysics, and other Multidisciplinary Sciences Journal* (Ñº) (pdf), 3(2):5-25.
(c) Thims, Libb. (2016). *Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, ***Volume 5*** ***(Is-Mr)*** (pdf) (cvr). LuLu.

θΔics

In terminology, **life**, from the proto-Indo-European *leip-*, meaning "to remain, persevere, continue; stick, adhere"; or, recursively, "property distinguishing living matter from non-living matter" (1560s) (Ñº); is an historical, albeit scientifically obsolete defunct term (see: defunct theory of life; life does not exist), of religio-mythology origin (see: clay creation myth), conceptualized, colloquially, as a "special state" (see: life state; life principle) or conatus-like existence, special or unique to humans, and other related animate entities down the great chain of being; re-defined, in physicochemically-neutral terms as a bound state existence of powered chnopsological matter.

CRITICAL THINKING

Is life unique in your opinion? That is, are living systems scientifically distinguishable from nonliving systems? Given a sealed box containing an object, how can you tell whether or not the object is living without opening the box? What physical tests could you perform to determine the life state of the object in the box?

A critical thinking exercise on what, thermodynamically, if any thing, constitutes "**life**", from Robert Balmer's *Modern Engineering Thermodynamics* (2010), wherein students are queried to use the black box approach, to see of science recognizes the existence of any sort of "life state". (Ñº)

Overview

Life, in modern (2009) terminology upgrade language, is re-defined, in universally neutral terms, as powered animated motile CHNOPS-+ based matter; historically associated with a number of metaphysical properties: self-drive or self-motion, consciousness, mind from matter dualism, good and evil, an end state of death (or afterlife), soul, spirit, or karma, teleology, among others; but is a concept that when carried down the evolution timeline (or great chain of being) is a concept that leads to a number of absurdities, e.g. that "crystals think" (Gilbert Lewis, 1925), specifically by virtue of the fact that atoms, of which humans are derived and are products of, via chemical synthesis, and the molecules derived therefrom, do not live and die, which led Francis Crick to conclude in 1966 that we must "abandon the word 'alive'."

In 2006, American planetary scientist Carolyn Porco gave the following relatively correct definition of what in olden days was called life, but now is correctly referred to as animate molecular structure: [20]

> "Our reconstruction of the history of the early solar system and the events that led to the origin of the earth informs us that around 3.5 billion years ago or earlier a complicated chain of chemical events occurred to evolve **animated molecular structures** from inanimate atoms."

Typical historical criterion for matter said to be "alive" include, that which: moves, has a metabolism, exchanges material with its environment, grows, evolves, reproduces, and is contained within a boundary. Modern-day hard science criterion, however, concludes that matter cannot be "alive", but rather can only be animated or reactive. Correctly, entities formerly considered "alive" in in possession of "life" are now defined as powered CHNOPS+ systems having time-delineated conatus-like bound state existence with turnover rate and motility.

Death

The antonym of life is death, although now also considered a defunct scientific term, by virtue of the fact that the antonym of a defunct term must also be defunct. To exemplify, in hard science terms, we do not say that carbon-14, which has half-life of carbon-14 is 5,730±40 years, 'dies' or experiences 'death' but rather that it decays into nitrogen-14 through beta decay, the activity of the modern radiocarbon standard being about 14 disintegrations per minute (dpm) per gram carbon. This same terminology applies to the person defined as a human molecule.

Incorrigible terms

Some of the typical words used historically, albeit defunct in modern term, to differentiate a fictitious divide between hydrogen and humans include:

Life-centric term	Counter term	User

Life	Non-life	
Living	Non-living	
Alive	Dead	
Animal life (vegetable life)	Mineral life	
Biotic	Abiotic	
Living organism	Organism	
Living system	System	
Living being	Being	
Living matter	Non-living matter	
Living state	Nonliving state	Paul Davies (1999)
(Alive matter)	Dead matter	Christian de Quincy (2002)
Living molecule	Molecule	
Living energy	Energy	
Sentient	Insentient	Christian de Quincy (2002)
Conscious matter	Nonconscious matter	Christian de Quincy (2002)
(Living chemicals)	Non-living chemicals	Paul Davies (2003)

In modern terms, life is considered as a defunct scientific term, similar to the flat earth theory, or caloric theory, etc., used to classify motile or animate atomic structures, generally of larger size, found active or activated past approximately 4.1-billion-years ago mark (bacteria formation range) on the evolution timeline. [17] Synonyms include: living organism, living system, living being, living matter, living structure, etc., which are all said to be, in some way, in contrast to non-life. An older classification scheme was the organic (life) verses inorganic (non-life) distinction. American physicist Ronald Fox characterizes the question of how life arose from non-life as the uroboros puzzle. [18]

Functional terms

See: Life terminology upgrades

Some of the terms that hold up in the modern sense include:

Physical science term	Counter term	User
Reactive	Non-reactive (inert)	Libb Thims (2007)
Organic (carbon-based)	Inorganic (non carbon-based)	
Animate engine	Inanimate engine	James Johnstone (1921)
Animate energy	Inanimate energy	Bernard Beaudreau (2005)
Organic engine	Inorganic engine	James Johnstone (1921)
Animate	Inanimate	William Sidis (1920)
(Reactive matter)	Inert matter	Christian de Quincy (2002)

Organic | Inorganic divide

In 1828, German chemist Friedrich Wohler synthesized urea, an entity defined by the formula $(NH_2)_2CO$ and a carrier of waste nitrogen in the body, by treating silver isocyanate with ammonium chloride:

$$AgNCO + NH_4Cl \rightarrow (NH_2)_2CO + AgCl$$

This was the first time an organic compound was artificially synthesized from inorganic starting materials, without the involvement of living organisms. The results of this experiment implicitly discredited vitalism: the theory that the chemicals of living organisms are fundamentally different from inanimate matter. Wohler's urea synthesis, in short, break down the great divide between to perceptual wall of so-called “organic life” and inorganic minerals. Prior to this, there as an apparent hard line drawn between organic and inorganic chemical compounds, such as urea, starch, sugar, albumen, etc., which were only and could only be found in a living plant or animal. [19]

Criterion definitions

See main: Life attribute and failing; See also: Definitions of life

In the very popular 2008 book *13 Things That Don’t Make Sense*, by American physicist Michael Brooks, the fifth thing that doesn't make sense in modern science is life. Brooks explains how traditionally there have been three ways to unravel the essential nature of life. [12] One is to find out how it started: trace the life back to the point where all that existed was chemistry. A pictorial view of the evolution timeline, however, shows this to be a futile effort, in that the only demarcation one can find is the sub-atomic to atomic transition point of the universe, approximately 13.5-billion years ago. The second method, according to Brooks, is to build something that is “alive” from scratch: take chemicals and put them together in ways that make them come alive. The 1952 Urey-Miller experiment, of course, is the poster child of this endeavor. [13] More recent attempt in this direction, include: cloning, making test tube babies, bring back to life extinct species using preserved DNA samples, etc. In nanotechnology, building things atom-by-atom, such as walking molecules, driving molecules, etc., is another type of proto-like life. Lastly, according to Brooks:

> “[The third option to unraveling the essence of **life** is] to sit down and think about what exactly is it that marks the difference between living [matter] and nonliving matter and come up with the definition of life. It is this latter path that is perhaps the most well trodden. It is also the one widely admitted to be a dead end.”

In other words, it has become a guarantee that once a new criterion-based definition of life is put forth, it will only be a matter of time before a disproof becomes apparent. The following is a listing of various criterion definitions of life (and disproofs) ordered by date:

Date	Criterion	Person	Disproof
1944	(a) Something that moves, exchanging material with its environment, for a much longer period of time than we would expect (compared to inanimate things).	Erwin Schrödinger [14]	The solar system has been moving, exchanging asteroids and solar energy with its environment, for over 5 millions years now; but is not alive.
	(b) Something not at thermodynamic equilibrium.		A body of steam transforming during an engine cycle; but this is not alive.
	(c) Anything that feeds on negative entropy.		Note: this is an incorrect description metabolism; which Schrodinger admits in a footnote (see: note to chapter 6) should have been explained via free energy. Many reactions release free energy (have a negative

			free energy change).
	(d) Anything that continually draws negative entropy from its environment.		A block of ice melting does so by absorbing entropy (heat) from its surroundings; but is not alive.
	(e) A system that moves disorder to order.		(a) A candle flame creates order from disorder in its environment and is patently not alive. [12] (b) Benard cells are an order-from-disorder phenomenon, but are not defined as alive.
1953	DNA = "secret of life"	Francis Crick [21]	
1970	(a) Power of reproducing itself (e.g. a virus).	Linus Pauling [8]	(a) Plenty of computer programs could then be called alive, while plenty of people, sterile men and women, e.g. nuns, could not. [12] (b) The reactants of many simple chemical reactions are "reproduced" in the products; but we do define chemical reactions as being alive.
	(b) Possession of a metabolism; able to ingest food.	Michael Brooks [12]	Other things that consume fuel and excrete waste products, such as automobiles, are not considered to be alive.
1995	Contained within a boundary (e.g. bacteria).	Lynn Margulis [16]	The body of steam in a steam engine is contained within a boundary.
1999	(a) Anything that metabolizes, processing chemicals to gain energy.	Paul Davies [15]	Jupiter's Great Red Spot is said to metabolize or process chemicals to gain energy. [12]
	(b) Reproduce itself.		Mules don't and bush fires and crystals do. [12]
	(c) Has organized complexity; composed of interdependent systems, e.g. arteries and legs.		Modern cars are similar. [12]
	(d) Grows and develops.		As does rust.
	(e) Shows a combination of permanence and change; evolution through mutation and selection.		
	(f) Anything autonomous; able to choose its own actions.		There is no such thing (see: free will, induced movement, etc.).
2007	(a) Able to replicate itself.	Martin Rees [11]	The early universe hydrogen-to-helium reaction is form of self-replication; but an atom is not considered to be alive.
	(b) Evolves over time.		The universe has evolved over time; but is not alive, nor has "life" ever been found anywhere in the universe.

Thermodynamics

In the 1916 work *The Origin and Evolution of Life*, American zoologist and paleontologist Henry Osborn was one of the first to dig into the question of what is living matter, using bits of thermodynamics logic, thus concluding that: [10]

> "Living matter … represents a new assemblage of energies and new types of action, reaction, and interaction—to use the terms of thermodynamics—between those chemical elements which may be as old as the cosmos itself."

In the study of thermodynamics of life, according to the 1947 views of Belgian-born English thermodynamicist Alfred Ubbelohde, life is viewed as animated matter. [7] Life, according to the 2008 views of Russian physical chemist Georgi Gladyshev, is a phenomenon of the existence of the energy-dependent dynamic hierarchic structures, driven by thermodynamics. [9]

Human chemistry

In human chemistry, life is a sub-atomic or chemical species in a state of evolution reactivity. [1] Life, in detail, is the animated interaction of matter with energy. Any variety of animate structure on the surface of the earth has a molecular formula and subsequently can be defined as a molecule. A bee, for example, is approximately a 20-element molecule. [2] Thus, for instance, human life being the activity of temporal interactions between systems of human molecules, is an advanced variety of atomic or molecular life.

In a general sense, the anthropomorphic version of life, e.g. human life, biological life, bacterial life, etc., began at the Planck-level. Variations of sub-atomic life, e.g. "quark life", is a newer area of investigation.

Clausius vs. Darwin

See main: Evolution thermodynamics

In 1850, German physicist Rudolf Clausius began to publish his memoirs, beginning with "On the Motive Power of Heat", on the newly forming science of thermo-dynamics, which showed that in the universe there is a tendency towards the increase of a system function called entropy; a function later shown to be equivalent to a measure of order or disorder is ideal gas phase systems. In 1859, English naturalist Charles Darwin published his *Origin of Species*, which showed that in nature there exists an ordering process, called evolution, progressing in time from lower forms of life to higher to more ordered forms.

Into the 1910s, the seeming contradiction between thermodynamics, loosely viewed colloquially as a disorganizing tendency, and the evolution of life, loosely viewed as an organizing tendency, was coming to the fore. In the 1914 book *Problems in Science*, for instance, Italian mathematician Federigo Enriques professed his conclusion on the matter to the effect that: "the mechanical hypothesis (first and second law) does not appear to be incompatible with the phenomenon of life, but it is unimportant for the study of these phenomena." [5] The debate on the issue, however, remained unresolved. In 1976, the unanswered paradox of views had emerged to the effect that:

> "Clausius and Darwin cannot both be right."
>
> — Roger Caillois, *Coherences Aventureuses* (1976) [6]

Recent difficulties on conception

See also: What is life? (theories of existence)

In current literature, stemming from a combination of Charles Darwin's 1871 supposition that the original spark of life may have begun in a "warm little pond, with all sorts of ammonia and phosphoric salts, lights, heat, electricity, etc. present, so that a protein compound was chemically formed ready to undergo still more complex changes" and fossil records indicating that bacteria existed on the surface of the earth about 3.85 billion years ago, there exists the commonly-held belief that biological life supposedly "sprang forth" on one particular day from inorganic non-life about 3.5 to 4 billion years ago. According to standard molecular

evolution tables, which show the growth or forced buildup of atomic structure of animate molecules from the hydrogen atom to the human molecule, however, this logic is a false view. Correctly, biological life and chemical life are one and the same. [2]

Reaction mechanism view

See also: Induced movement

Life, in general is classified by evolution. Evolution, in component essence, is characterized by coupled chemical reactions in which smaller animate molecular structures react or reproduced to form larger molecular structures. To cite one example of this type of logic, in the 2005 book *Genesis – the Scientific Quest for Life's Origin*, geologist and earth scientist Robert Hazen tells us correctly that life results whenever energy flows through a molecular system and that this energy can drive such molecular systems toward ever more levels of complexity.

Life on earth, according to Hazen, is a result of energy interactions among versatile carbon-based molecules. From these carbon-based systems, according to Hazen, come the emergence of larger molecular structures, along with the selection, concentration, and assembly of life's membranes, proteins, and genetic molecules. Eventually, according to this logic, these biomolecular structures would form self-replicating cycles, or chemical systems that could copy themselves and compete for finite and dwindling supplies of resources. Ultimately, in Hazen's view, competition between different self-replicating cycles works to trigger evolution by natural selection, and subsequently the development of life. This is a very accurate depiction. To elaborate on this picture, Hazen cites space biologist Gerald Joyce's working definition of life: "Life is a self-sustained chemical system capable of undergoing Darwinian evolution." [3]

Hazen reasons, accurately, that 'any attempt to formulate an absolute definition that distinguishes life from non-life represents a false dichotomy.' The first cell did not just appear, according to Hazen, but rather arose through a sequence of emergent events, similar to how fossil records show that new evolved species have continuously emerged throughout history. First there was organic synthesis, then molecular selection and diversification, followed by increases in atomic complexity and further molecular evolution.

Moreover, 'what appears to us as a yawning divide between life and non-life,' according to Hazen, 'obscures the fact that the chemical evolution of life occurred in a stepwise sequence of successively more complex stages of emergence.' Hazen tells us that the basics of these steps began with a pre-biotic earth enriched with organic molecules, which then evolved to form functional clusters of molecules, perhaps arranged on a mineral surface, which assembled into larger self-replicating molecular systems that were able to copy themselves, then on to encapsulation in membranes, and finally to cellular life. [4]

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External link

â— Life – Wikipedia.
â— A Tree of Life – ScienceMag.org.

θΔics

In hmolscience, **life attribute and failing** refers to a standard "criterion" of "life" and a counter-example of some "thing" that has that criterion but is patently not alive.

Discussion

Adjacent is a KhanAcademy.org generic “life criterion” checklist (Q) employed to help students determine if viruses are alive or not.

Overview

In 1999, Paul Davies, in his *The Fifth Miracle*, as cited by Michael Brooks (2008), listed all of the various “attributes” or criterion said to delineate life, and their respective counter argument, disproof, or “failing”; a collection of these, among others, is listed below: [1]

Attribute	Description	Failing | Disproof
1. **Metabolism**	● A property of a system involving "catalysts" and a "free energy" conversion "mechanism" (Blum, 1951; Morgulis, 1952).	● Perpetual motion of the living kind (Thims, 2009)
	● Process chemicals to gain itself energy; consumes fuel and excretes waste (Brooks, 2008).	● Jupiter's great red spot "metabolizes" (Brooks, 2008). ● Automobiles "consume fuel and excrete waste (Brooks, 2008).
	● Feed on "negative entropy" (Schrodinger, 1944)	● Incorrect; "free energy" is correct discussion (See: note to chapter 6) ● Disproved via ridicule

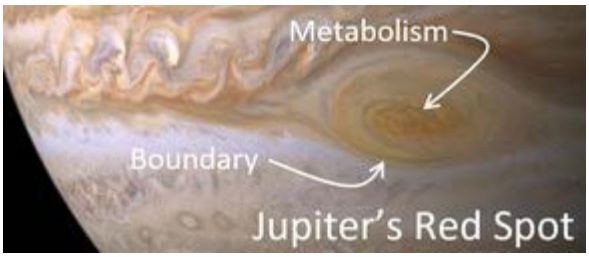

		(Pauling, 1989)	
2. **Reproduction**	Able to replicate itself. [3]	● Bush fires, viruses (Pauling, 1970), and crystals “reproduce”; mules don’t (Brooks, 2008). [3] ● Early universe reactions, e.g. H + H → H_2 or hydrogen-to-helium reaction, are forms of "replication" or forms of reproduction of copies of itself, but not defined as alive. ● Computer programs reproduce.	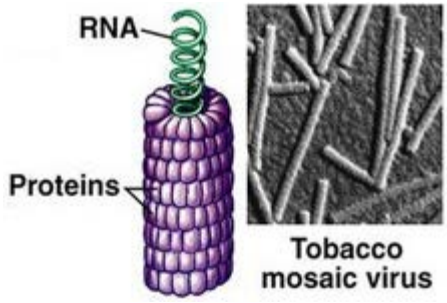
3. **Growth**	Increase in size and development.	● Rocks grow (Linnaeus, 1735); crystals grow (Lotka, 1925); rust grows and develops; fires grow (McFadden, 2000).	
4. **Irritability**	Excitation in response to stimulus; animate; reaction in response to environment.	● A "windmill" is a an "animate thing" that is not alive. ● Retinal molecule ($C_{20}H_{28}0$) straightens in reaction to light stimulus (Thims, 2007)	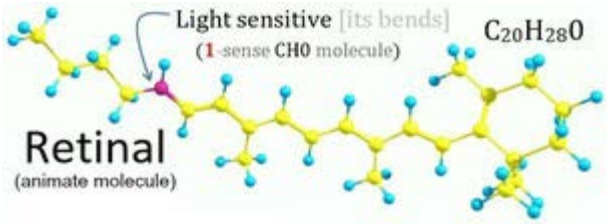
5. **Motility**	Has the property of motion; something that "moves around" (Brooks, 2008).	● Iron moves to the loadstone; straw attracts to amber (Thales, 580BC); sand grains blow in wind (McFadden, 2000). ● Synthetic carbon-based molecules, e.g. DTA ($C_{14}H_{10}S_2$), "walk" (Thims, 2010) ● Robots can run and jump.	
6. **Boundary**	Contained within a boundary, e.g. cell or bacteria (Margulis, 1995)	● A steam engine has a boundary; a virus has a boundary; bucky ● The "cell-as-molecule" (Harrison, 1993) model	

		discredits model.	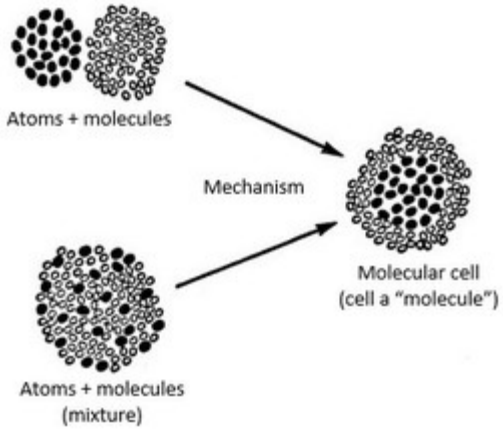
7. **Genetical**	Contains RNA and or DNA	● A plant virus, which is non-alive "crystal" or "molecule" (Pauling, 1970), contains RNA. ● RNA is not alive.	
8. **Ordering**	A system that moves disorder to order (Schrodinger, 1944).	● A candle flame creates order from disorder in its environment and is patently not alive (Brooks, 2008). ● Benard cells are an order-from-disorder phenomenon, but are not defined as alive.	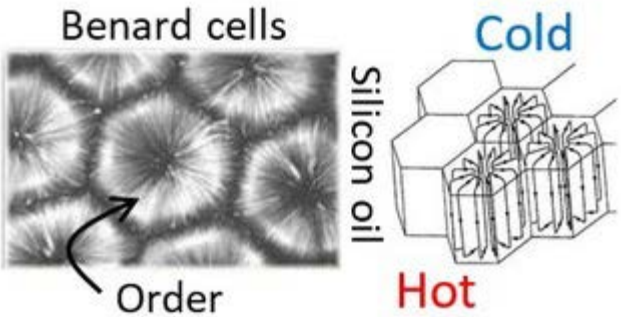

(add discussion)

See also

● Defunct theory of life
● Life does not exist

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θΔics

In non-existences, **life does not exist** refers to premise and or conclusion that "life", akin to ether, caloric, or perpetual motion, is something that does not exist; an ingrained, generally, religio-mythology and or anthropomorphic based fiction, akin to the false perception that the sun goes around the earth. The newly-coined term "**abioism**" (Thims, 2015) is the belief that life does not exist.

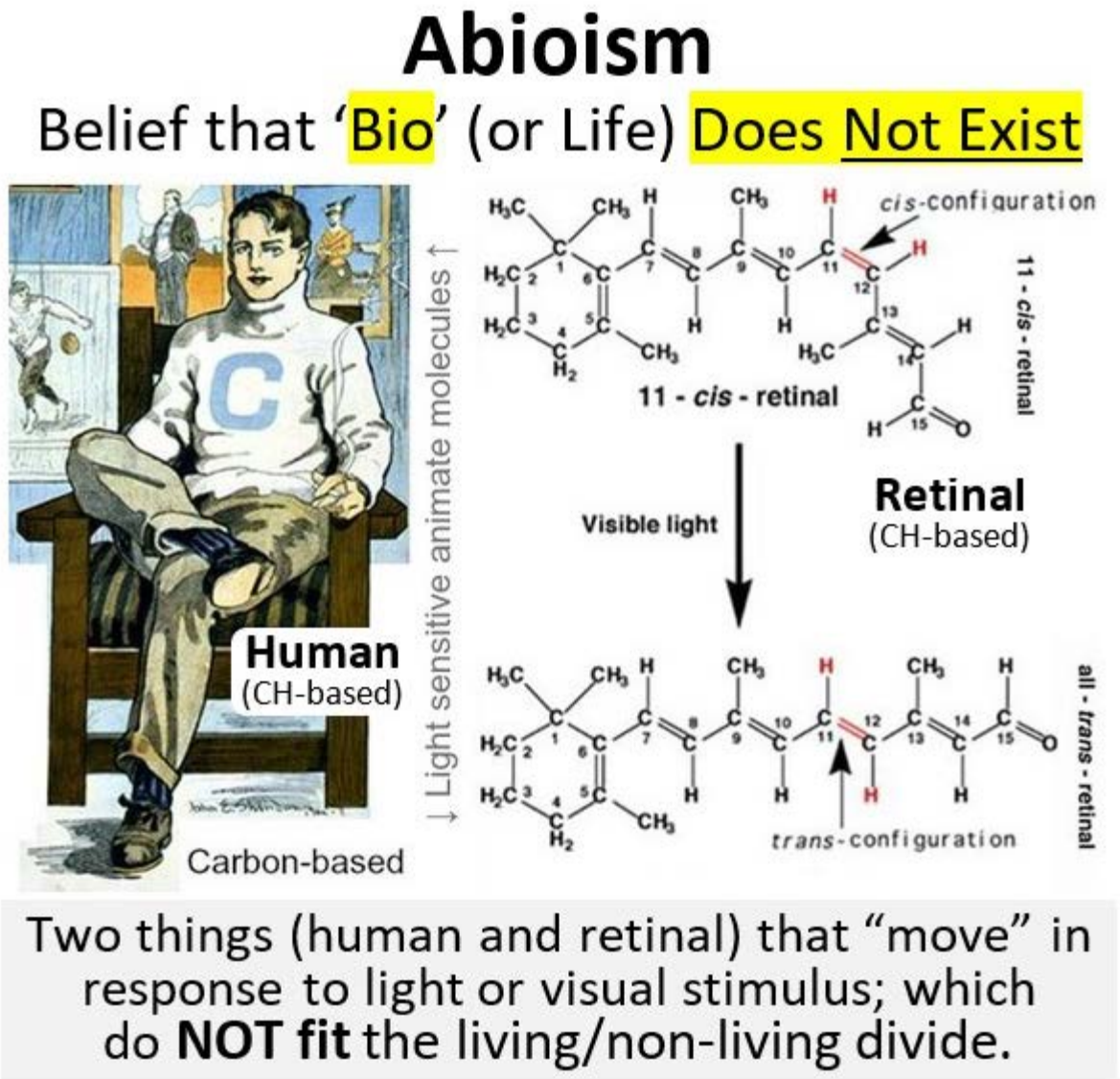

Two examples of light sensitive carbon-based animate molecules: human (or human molecule) and retinal (or retinal molecule), the latter NOT conceptualized as either alive nor dead nor in possession of "life" (nor afterlife nor prelife), whereas the former is, owing to historically outdated models of humans—both, however, unified in the conclusion that **life does not exist** (disabused by Thims in 2009), in the same sense that ether does not exist (disabused by Einstein in 1905) or caloric does not exist (disabused by Rumford in 1798). The term "**abioism**" is the reasoned belief or conclusion that "life" does not exist.

Early views

The history of the precursory teetering-around-the-subject of the possibility that the divide between life and non-life may be fictional, questionable, and or filled with absurdities, are well-documented on the: **defunct theory of life** page.

In 1925, Alfred Lotka, in his "Regarding Definitions", stated very cogently that someday the term "life" would disappear from the exact sciences, per reason that the scientific search for the origin of life is a hunt for a Jabberwock.

In 1938, English physiologist Charles Sherrington, in his lecture turned book "Man on his Nature" pointed out the puzzling fact that "life" and "death" are anthropisms, not recognized by physics and chemistry, and therein set out to exhaustively ridicule the issue as being but a "groundless" convention, in need of cleaning.

In 1966, English geneticist Francis Crick, in his Feb-Mar University of Washington lectures "Is Vitalism Dead" lectures turned *Of Molecules and Men* book suggested we should "abandon the word alive".

Szent-Gyorgyi

In 1948, Hungarian bioenergetics physiologist Albert Szent-Gyorgyi in his *Nature of Life: a Study of the Muscle*, stated the following—which seems to be the first mention of this view—in his chapter section on colloidal chemical considerations: [5]

> "The biologist wants to understand life, but **life, as such, does not exist**: nobody has ever seen it. What we call 'life' is a certain quality, the sum of certain reactions of systems of matter, as the smile is the quality or reaction of the lips."

In 1972, Szent-Gyorgyi, in his *The Living State*, opens to the following paragraph: [6]

> "Every biologist has at some time asked 'what is life?' and none has ever given a satisfactory answer. Science is built on the premise that nature answers intelligent questions intelligently; so if no answer exists, there must be something wrong with the question. **Life, as such, does not exist.** What we can see and measure are material systems which have the wonderful quality of 'being alive'. What we can ask more hopefully is 'what are the properties which bring matter to life? Though I do not know what life is, I have no doubt as to whether my dog is alive or dead. Life is a paradox. It is easy to understand why man always divided his world into 'animate' and 'inanimate', *anima* meaning soul, the presence of which had to explain queer behavior. The most basic rule of inanimate nature is that it tends toward equilibrium which is at the maximum of entropy and the minimum of free energy. As shown so delightfully by Schrodinger in his little book *What is Life?* (1945), the main characteristic of life is that it tends to decrease its entropy. It also tends to increase its free energy."

In 1972, Szent-Gyorgyi, in his chapter contribution "What is Life?", stated the following: [7]

> "In my search for the secret of life, I ended up with atoms and electrons, which have no life at all. Somewhere along the lines, life has run out through my fingers. So, in my old age, I am now retracing my steps [back to the cell]."

Szent-Gyorgyi, goes on, at this point, to state that "life is not a thing to be studied: rather, 'being alive' is a quality of some physical systems." [7] This last fingers quote, to note, has been taking up recently by the "spirituality" and metaphysical theorists, as a basis to argue, e.g., for Vedic-based spirit theory (Ñº), astral spirit-based active principles (Ñº), and or paranormal ideas. (Ñº)

In 1978, Szent-Gyorgyi, in his symposium article "The Living State and Cancer", was opening to the same "life, as such, does not exist" idiom, in regards to the question of what is life?, but quickly parlays the issue off to the assertion that the conceptual dualistic divide of the world between animate and inanimate or alive and not-alive is solved by reference to what he calls a "living state" which he describes as a "special physicochemical state, a state which can be described in terms of exact sciences, and has to fit into the great order of the universe, having been created by the same forces as the universe itself." Here, after continuing with the statement that "we must search for an understanding and an answer to our question with a wide natural philosophical outlook and fit life into the great scheme of creation", it would seem, possibly, that Szent-Gyorgyi is venturing into religious-framed talk

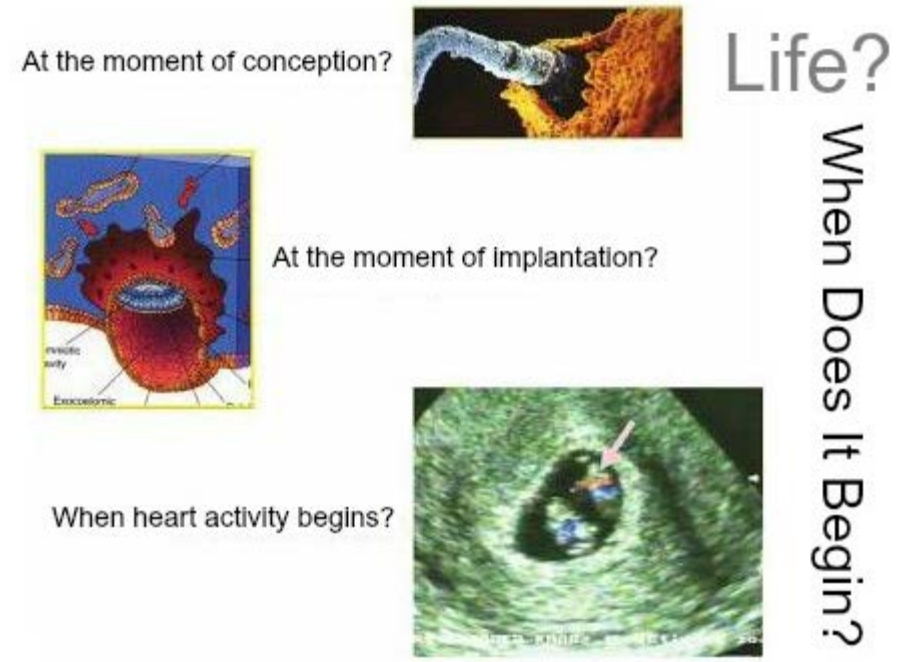

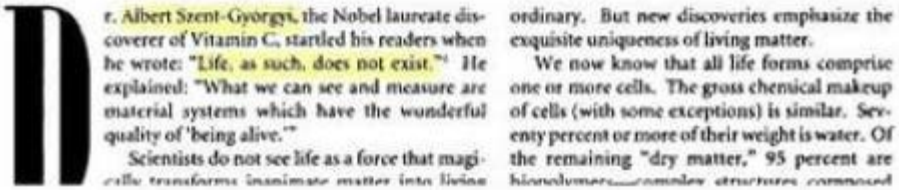

r. Albert Szent-Gyorgyi, the Nobel laureate discoverer of Vitamin C, startled his readers when he wrote: "Life, as such, does not exist."[1] He explained: "What we can see and measure are material systems which have the wonderful quality of 'being alive.'"

Scientists do not see life as a force that magi-

ordinary. But new discoveries emphasize the exquisite uniqueness of living matter.

We now know that all life forms comprise one or more cells. The gross chemical makeup of cells (with some exceptions) is similar. Seventy percent or more of their weight is water. Of the remaining "dry matter," 95 percent are

Top: an image from Asim Kurjak and J.M. Carrera's 2006 chapter "The Beginning of Human Life", wherein Albert Szent-Gyorgyi's 1940s "life, as such, does not exist" statement is cited, as a platform to digress on possible legal and religious implications of the fetus. [10] Bottom:a 1993 article snippet, in *Liberty: a Magazine of Religious Freedom*, citing Szent-Gyorgyi's startling statement: "life, as such, does not exist". [9]

(check). [8]

A citation from 1993 article, from a religious magazine article—the implication of the possibility that life does not exist has great implications for religious belief—is as follows: [9]

> "Albert Szent-Gyorgyi, the Nobel laureate discoverer of Vitamin C, *startled* his readers when he wrote: 'Life, as such, does not exist.' He explained: 'What we can see and measure are material systems which have the wonderful quality of..."

In 2006, authors Asim Kurjak and J.M. Carrera, in their chapter "The Beginning of Human Life: Scientific and Religious Controversies", section: "The Definition of Life", in their *Textbook of Perinatal Medicine*, state the following: [10]

> "Some authors say that **life as such does not exist**—no one has ever seen it. Szent-Gyorgyi says that the noun 'life' has no significance because there is no such thing as 'life'. Le Dantez holds that the expression 'to live' is too general, and that it is better to say that a dog 'dogs' or a fish 'fishes' than a 'dog or a fish lives'."

Kurjak argues that Szent-Gyorgyi's position may have possible implications on the so-called "legal" rights of an embryo, such as depicted adjacent.

Atlan

In 1999, French biophysicist, bioethicist, and philosopher Henri Atlan, in his "Does Life Exist?", opens to the following: [2]

> "Already at the beginning of the twentieth century, Albert Szent-Gyorgyi, who discovered vitamin C, scandalously declared that life does not exist. Following upon this 'good news' announced by Szent-Gyorgyi, my entire approach consists in putting a few more nails in the coffin—and in recognizing, in effect that life does not exist as such, at least not as an object of scientific investigation, since its mechanisms can be entirely reduced to chemical interactions."

In 2002, Atlan, in his "Is Science Inhuman? An Essay on Free Necessity", elaborated further on the problems involved in speaking about "life" in an essential fashion, e.g. claiming that the genome contains the "essence of life", repeatedly quoted Szent-Gyorgyi's claim that "life as such does not exist", which he interprets to mean that: [3]

> "Life does not exist as an explicative notion of organic properties … life does not exist as an object of biological research."

Atlan also states:

> "When Szent-Gyorgyi made the somewhat abrupt declaration: "life as such does not exist", in all likelihood he was not doubting his daily experience. I do not think I betray him in thus clarifying his words: **life does not exist** as an explicative notion of organic properties. I other words, life does not exist as an object of biological research."

Meaning that, in the context of bioethics, as his collected works (2011) editors Stefanos Geroulanos and Todd Meyers summarize, "any thinking of the living cannot maintain its rigor if it postulates life as an essentialist notion" .

Thims

In 2009, American electrochemical engineer Libb Thims, after having begun grappling with the life/non-life demarcation problem in circa 2006 to 2007, classified "life" as a defunct scientific theory (see: defunct theory of life), as follows, in his communication to Russian physical chemist Georgi Gladyshev on his false assertion that "thermodynamics mandates life": [1]

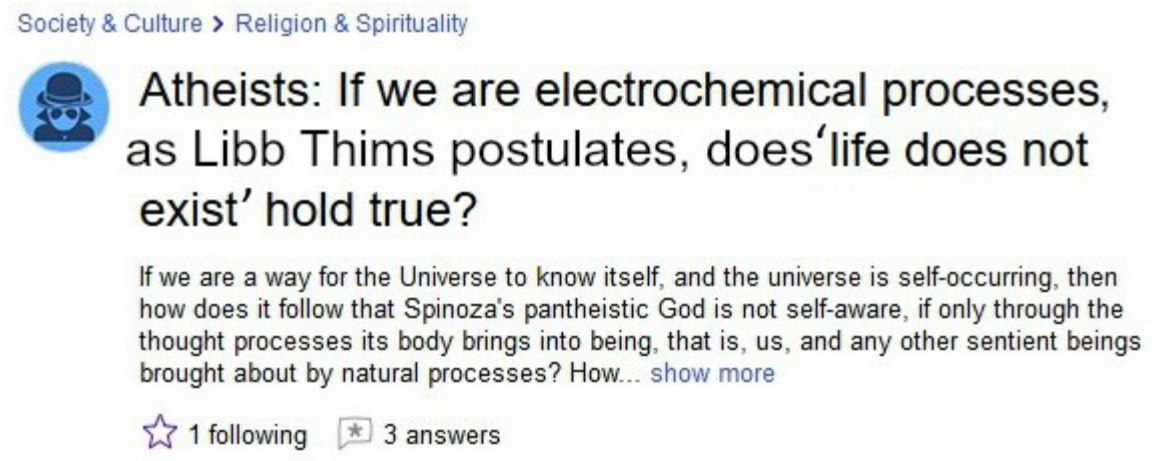

A 2015 Yahoo Answers query (Ñº) about Thims' version of the "**life does not exist**" view; found by Thims while key term searching, on 18 Apr 2016, for "Libb Thims, atheist", after watching the 2015 Dave Rubin interview (Ñº) of Sarah Haider, and adding her to the top 200 atheists list (#146).

> "You agree with me that the single atom is not alive. What about two atoms? What about three? Does a bound state of atoms have to have a certain movement to be considered alive? What if we heat a system of four atoms, do they **suddenly become alive**? What if we subject a system of atoms to both gravitational and electromagnetic forces, does that suddenly make them alive? What if the two forces act to move smaller atoms through the cavities of larger atoms [molecules] on a cyclical basis, thus activating reactions [metabolism] in the process, does that make them alive? What if the two forces begin to arrange the atoms into hierarchies, and that smaller atoms and bundles of atoms begin to more between the hierarchies, does

that make them alive? What if a structure of atoms, begin to turnover their internal atoms, with those of the surrounding space, on a cyclical basis, does that make it alive? It should be very obvious that no matter how many atoms one adds to the argument that an atom or a structure made of two or more atoms cannot be alive."

Thereafter Thims began to implement life terminology upgrades, in his own work and in Hmolpedia articles, and restrict both origin of life thermodynamic and life theory arguing submissions to the *Journal of Human Thermodynamics*, so much so that by 2013 editorial redaction processing had completely gummed up the entire journal, bring the publication process to a halt.

Rogers

In 2010, American thinker Alfred Rogers registered the domain LifeDoesNotExist.com, and therein became active, according to web archives, in 2012 or 2013, with a page collection of 18 topic sections, starting with his current view on the non-existence of life, to his 1956 (age 23) deconversion from Christianity to a new non-supernatural belief system based philosophy. A truncation of the main points of Roger's "life does not exist" section is as follows: [2]

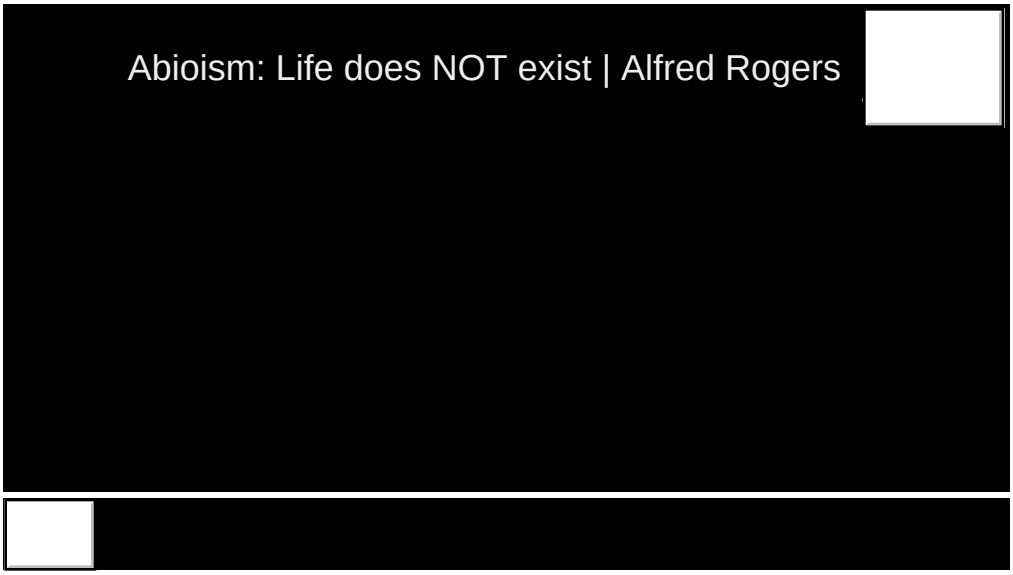

Alfred Rogers (2016) explaining his 1990s arrived at view that "**life does not exist**", which he popularizes on his 2010 launched LifeDoesNotExist.com website.

> "**Life does not exist** in the sense that life is not absolutely different from non-life. The difference between life and non-life is like the difference between plants and animals. A recent article in the proceedings of the National Academy of Sciences reported that bacteria locked in Antarctic ice for 100,000 to 8-million years resumed growing when given warmth and nutrients. Could they have been alive for all that time? Could any life processes been going on for that period? If not, can a living thing spend an intermittent part of its life as a non-living thing? I think this is incongruous with life and non-life being absolutely different. During the frozen period all the conditions for life, including the DNA existed, but life did not exist. More commonly many seeds remain viable for many years under certain conditions. They go through a life cycle in part of which they are not alive. Can a living thing be not alive during part of its life?"

Rogers goes on to discuss how the various dividing line between living and non-living are "vague and inconsistent", viruses and "wet artificial life" being two examples, then cites Ray Kurzweil and reverse engineer computer ideas, which leads him to the conclusion that "life and non-life are indistinguishable". Rogers then jumps to the following sharp argument, wherein he basically says we call ourselves "alive" because we are ignorant as to the chemical details of the life cycle (reaction cycle) as compared to better understood cycles, such as geyser cycles or mountain formation dynamics, which we do not consider to be alive:

> "I believe our conception of what is living and what is not living has been based primarily on time and complexity. A mountain range may be considered to have a life cycle. It grows from relatively flat land to gigantic peaks, then returns again to near flatness. In the life time of man however nothing noticeable happens. The process takes hundreds of millions of years. Man has never conceived of a mountain range as living. Pre-civilized men have probably thought "Old Faithful", the erupting hot spring to be alive because it shows dramatic movement, seemingly of its own volition. We have not considered this to be alive

because we understand exactly how this happens. We have difficulty understanding how what we would now consider a chemical reaction could have evolved into the complete human writing this sentence because we are incapable of understanding the immense amount of time it took this to happen."

In Roger's "chemical reaction could have evolved into the complete human writing this sentence", we are reminded of Gilbert Lewis' 1925 query statement about whether him writing his book was but part of an evolving chemical reaction process or conversely whether crystals think:

Both Types of "Movement" neither of which are "alive".

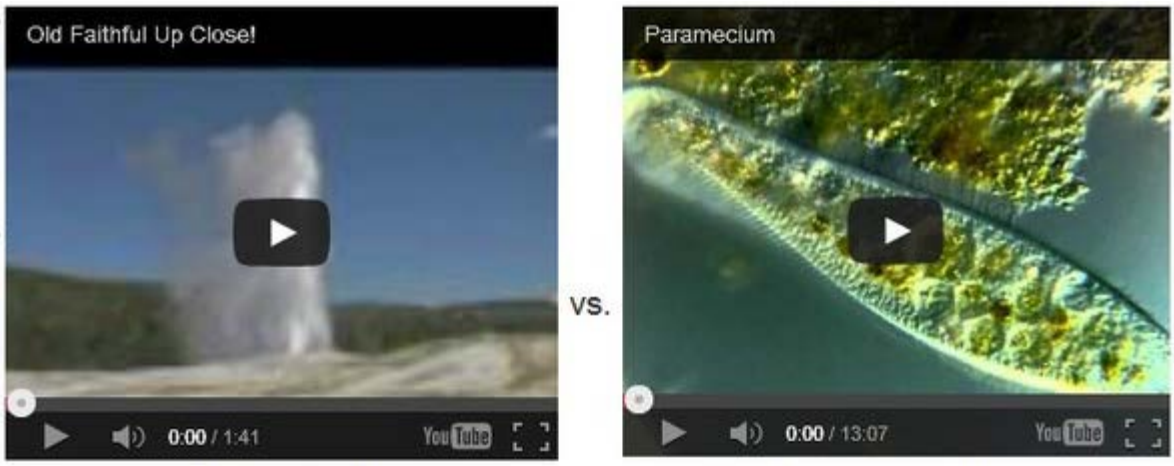

Old Faithful Paramecium

"There is no essential difference between 'life' and 'non-life.' The perceived difference is complexity. Old Faithful (Ñº) has 'life-like' movement but is easier to understand than a paramecium (Ñº). The hydrogen atom is NOT alive."

— Alfred Rogers (2014), curator of LifeDoesNotExist.com, "Email communication to Libb Thims", Nov 21

"Suppose that this hypothetical experiment could be realized, which seems not unlikely, and suppose we could discover a whole chain of phenomena [evolution timeline], leading by imperceptible gradations form the simplest chemical molecule to the most highly developed organism [human molecule]. Would we then say that my preparation of this volume [*Anatomy of Science*] is only a chemical reaction [extrapolate up], or, conversely that a crystal is thinking [extrapolate down] about the concepts of science?"

Rogers continues:

"The process by which lipid bi-layers formed phospholipids spontaneously into a cell membrane under conditions existing on early earth are not yet understood, but this would have happened 3.5 to 4 billion years ago. But even if the life cycle of these living things were a whole day there would have been 365 million cycles in only a million years, or 3.5 to 4 thousand times 365 million cycles until now. The tiniest random change would produce the complex single celled organisms we see today and similar random changes have converted the first multi-cellular animals to us."

Rogers here is relegating the problem to 3.5-billion years ago to some cellular formation mechanism, occurring via spontaneity and change; a point that Thims, to note, was stuck at for some time (2007-2009) in mindset, and that Ferris Jabr (below) seems to refer to as "Frankensteinian spark" ideology. But, as Sherrington aptly pointed out, the belief that "spontaneous movement equals life" is something deeply ingrained in the minds of people, but one that is a false dichotomy:

"Deep down among human intuitions is one that spontaneous movement means life. Our kith and kin among the animals entertain it as well as we, though for them 'life' is, of course, an unconceptualized thought. We know from ourselves that the indirect field of sight will see what moves when it fails to see

> what does not move. Our horse may shy at a blown leaf on the roadway, not at a still one. The frog snaps at a fly that moves, but not at one which is still. The vine-tendril never lives so vividly as when at the cinema its clasping speeded into visible movement. When the cardboard puppet dances it becomes thinkably alive, and Don Quixote's irruption at the puppet-theater becomes intelligible. The biologist knows this intuitive inference as native, even to a primitive mind. Movement accepted as spontaneous implies living. And the motion of the planets seemed to be spontaneous. Their movement told men that they were alive. All stars might be alive, but of them all the planets most so. The other stars were 'fixed', that is, relatively to each other did not move."

Spontaneity, in modern terms, to upgrade Sherrington's decisive remarks, is gauged via free energy differentials; hence, to demarcate a certain reaction mechanism, conceived to have occurred 3.5-billion years ago, as being of some delineating significance, as per free energy differentials are concerned, is but a fiction of the mind. Rogers then concludes with a short digression on the implications of values in respect to this new point of view:

> "If life does not exist, if the difference between life and non-life is only complexity, what about the value of human life? Is destroying human life no different than destroying a non-living object? No. If the last Stradivarius violin were to be identified we would value and protect it and care for it, because it would be something we could never replace. This is true of every human. Each of us is the result of a unique combination of DNA that cannot be replaced. Strangely, denying the existence of life would not change moral conceptions of valuing human life (and perhaps other life as well)."

This last interjection is in need of cleaning, but nevertheless a good starting point. Roger's "Is destroying human life no different than destroying a non-living object?", e.g., brings to mind powerful questions, such as: rights to abortion (fetus rights vs material rights), artificial life prolongment of brain dead people questions, of physician assisted suicide morality, stem cell research ethics, death sentence legislation, among many others.

Jabr

In 2013, American science journalist Ferris Jabr published a *Scientific American* blog article "Why Life Does Not Really Exist", wherein he begins argue that life is an invented concept and that arrangements of atoms cannot "suddenly become alive", therein concluding that "life does not actually exist." [3]

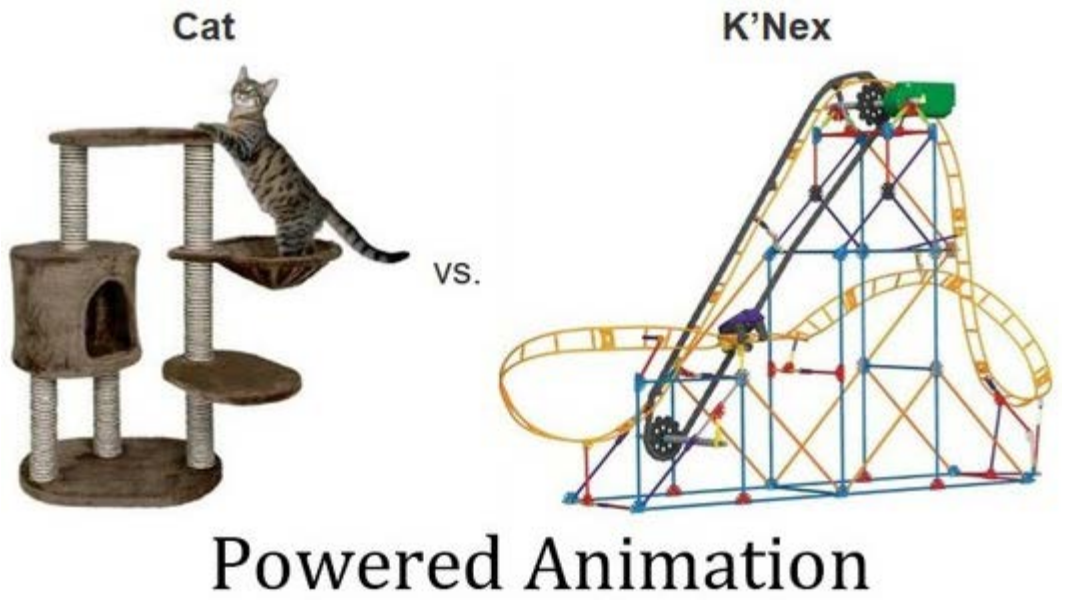

American science journalist Ferris Jabr (2013) sees believes that his cat is not alive (compare: Schrodinger's cat), being that "life" is an invented concept, albeit one that does not hold up in the face of a world made of atoms and collections of atoms, whether animate or not, such as a moving cat or a moving K'Nex set. [1]

> "Why is defining life so frustratingly difficult? Why have scientists and philosophers failed for centuries to find a specific physical property or set of properties that clearly separates the living from the inanimate? Because such a property does not exist. **Life is a concept that we invented**. On the most fundamental level, all matter that exists is an arrangement of atoms and their constituent particles. These arrangements fall onto an immense spectrum of complexity, from a single hydrogen atom to something as intricate as a brain. In trying to define life, we have drawn a line at an arbitrary level of complexity and

declared that everything above that border is alive and everything below it is not. In truth, this division does not exist outside the mind. There is no threshold at which a collection of atoms **suddenly becomes alive**, no categorical distinction between the living and inanimate, no Frankensteinian spark. We have failed to define life because there was never anything to define in the first place."

In 2014, Jabr followed this up with his *New York Times* opinion editorial article "Why Nothing is Truly Alive", arguing along the same lines. [4]

See also

â— Chemical teleology
â— Defunct theory of life
â— Life terminology upgrades
â— Sociology terminology upgrades

The discerning 1966 words of Francis Crick, who following vitalism debates with Michael Polanyi, and others, suggested: we should abandon the word "alive".

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θΔics

In science, **life force**, living force or "vital force", is a now-defunct theory which poses that what distinguishes life or living things is a special type of force distinct from the standard fundamental forces of physics.

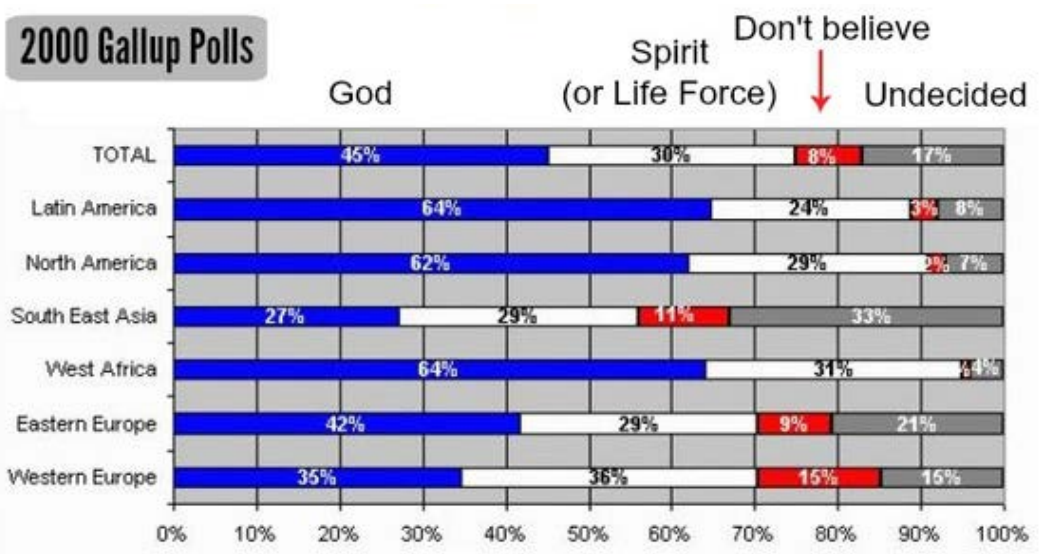

A 2000 Gallup International Polling which shows that about 30 percent of the world believes in the existence of a spirit and or **life force**; whereas 45 percent believe in a personal god, 17 percent are undecided, and 8 percent do not believe in either God, spirit, or life force. [2]

Overview

In 1842, the chiefs of the Helmholtz school, via their blood pact Reymond-Brucke oath, vowed to banish all vital or living force theories from their reasoning:

> "[We pledge] to put in power this truth: no other forces than the common physical chemical ones are active within the organism. In those cases which cannot at the time be explained by these forces one has either to find a specific way or form of their action by means of physical mathematical method, or to assume new forces equal in dignity to the chemical physical forces inherent in matter, reducible to the force of attraction and repulsion."

was to banish the notion of the "other forces" from the so-called "life sciences" maintaining that no other forces operate within the organism other than the physical chemical forces. The above quote is pretty much the modern view as most hardened scientists see things; the central problem remaining is the issue that arises when one goes searching for the exact second of the start of the "origin of life" in physical-chemical terms, in particular chemical thermodynamic terms, after which one is lead into the "defunct theory of life" point of view.

In 1895, University of Oxford Chancellor Robert Cecil gave the following summary of the chemical nature of life from his BAAS inaugural address "Unsolved Problems in Science", wherein he gives the modern outline of the vital force notion: [1]

> "A more striking problem which the highest scientific intellects have been investigating is life—animal life and vegetable life—the action of an *unknown force* on ordinary matter. What is the mysterious impulse which is able to strike across the ordinary laws of matter, and twist them for a moment from their path? Some people demur to the use of the term 'vital force' to designate this impulse. In their view the existence of such a force is negatived by the fact chemists have been able by cunning substitutions to produce artificially the peculiar compounds which in nature are only found in organisms that are or have been living."

The mention of chemically-produced life-made compounds here seems to be a passing mention to the famous urea synthesis by Friedrich Wöhler in 1828.

Religion

The notion of "life force" is closely intertwined with religion and world belief systems. The following, to exemplify, are 2005 global beliefs in either God (purple), spirit and or life force (light blue), and non-belief in any sort of "spirit, God, or life force" (yellow), showing France (home to the Ecole Polytechnique and the Napoleon Laplace anecdote) in the lead for having the most informed populous, in regards to reality:

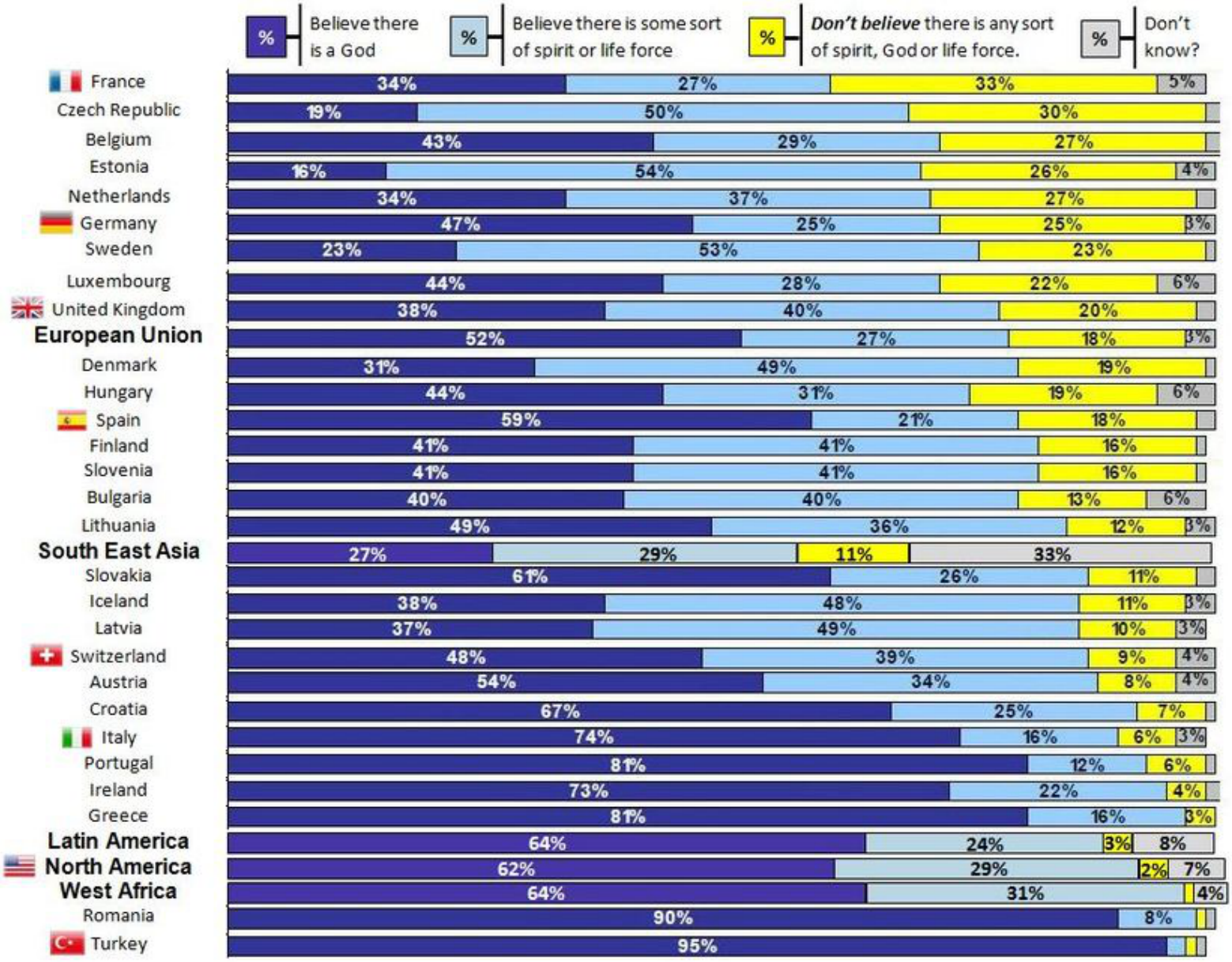

See also

â— Elan vital

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Further reading

â— Hunter, Graeme K. (2000). *Vital Forces: the Discovery of the Molecular Basis of Life*. Academic Press.

External links

â— Life force – Wikipedia.

θΔics

In science, **life principle** is a supposed or hypothetical scientific principle, theory, hypothesis, or argument that attempts to quantify or justify the existence of "living things" as opposed to something "dead" or non-living things.

Overview

The first to label or group the ubiquity of notions of "life principles" employed in debates on life or the origin of life, in the context of a universe governed by physical science, in terms of one of three "categories" of argument style, was French-born American physicist Léon Brillouin. Specifically, in followup to a 1938 debate at the College of France, wherein physicists, chemists, and biologists met to address the Swiss physicist Charles Guye's 1920 query: "How is it possible to understand life, when the whole world is ruled by the second law of thermodynamics, which points towards death and annihilation?"; during which no consensus was reached.

In 1949, in followup to a Harvard University debate (1946) on the subject of what exactly is or constitutes life in the context of a universe governed by the second law, Brillouin, in his "Life, Thermodynamics, and Cybernetics", stated that in "what is life?" debates one of three points of view tend to be employed: [1]

> (a) Physics and chemistry will soon be able to explain life, without any special "life principle".
> (b) Something more is needed before we understand life.
> (c) Life cannot be understood without reference to a **special "life principle"**; that thermodynamics only applies to dead and inert matter; that life is an exception to the second law.

Brillouin, in this article, argues for the latter opinion. Brillouin's basic argument, which is rather nonsensical, is that a living organism has special properties, namely: resist destruction and healing ability, which do not appear in inert matter, hence we must accept a life principle that allows for such exceptions to the second law. He states:

> "When life ceases and death occurs, the **'life principle'** stops working, and the second principle regains its full power, implying demolition of the living structure."

To exemplify the contrived nature of this statement, we point out that nowhere in German physicist Rudolf Clausius' 1865 mechanical theory of heat (thermodynamics) is there any supposition that the second law implies demolition of living structure; nor, for that matter, does the thermodynamics explicitly differentiate as to two types of bodies (living or dead; life or non-life), there is only the hot body, the cold body, and the working body.

Brillouin followed this publication by "Thermodynamics and Information Theory" (1950), "Negentropy Principle of Information" (1953), and *Science and Information Theory* (1956) all of which use a hodgepodge of mathematical derivation to make connections between thermodynamics, information, and cybernetics so to attempt to substantiate what seem to be his effort to position his "living principle" argument.

Life principle theorists

A few recent examples of "life principles" include:

Principle	Date	Author	Description
Negative entropy	1943	Erwin Schrodinger	Argues that life is something that feeds on negative entropy.
Principle of substance stability	1978	Georgi Gladyshev	Used with his "law of temporal hierarchies" to explain the origin of living beings, thermodynamically, as some type of gradual or emergent phenomenon.

Thermosynthesis	1983	Anthonie Muller	Argues that the first form of life was some type of pre-respiratory, pre-photosynthesis, version of a molecular heat engine; motto “from negative entropy—by evolution—to intelligence”.
Auto-catalytic closure	1993	Stuart Kauffman	Argues that "dead" individual molecular species A, B, and C, become "alive" once catalytic closure among them is achieved and they are able to complete one thermodynamic cycle.
Thermodynamic Dissipation Theory Origin of Life	2009	Karo Michaelian	Argues that the thermodynamic function of life today is to produce entropy through the dissipation into heat of high energy photons from the sun. This foments the water cycle as well as ocean and wind currents, increasing the entropy production. This probably was life's function at its very beginnings.
Autogen theory	2011	Terrence Deacon	Life originated from a self-generating system—termed an “autogen”—of the form or neighborhood of stable but active inanimate systems, like whirlpools, tornadoes, and “autocatalytic molecules”, systems that maintain their existence notwithstanding material interaction and change. [2]

See also

â— Defunct theory of life

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External links

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θΔics

In physical science, **life terminology upgrades** or reforms, in the framework of the explicit 2009-present defunct theory of life perspective, and or or "life does not exist" (2010-present) purview, are terms or synonym alternatives or upgrades to "life" and all bio-centric terms, and their antonyms.

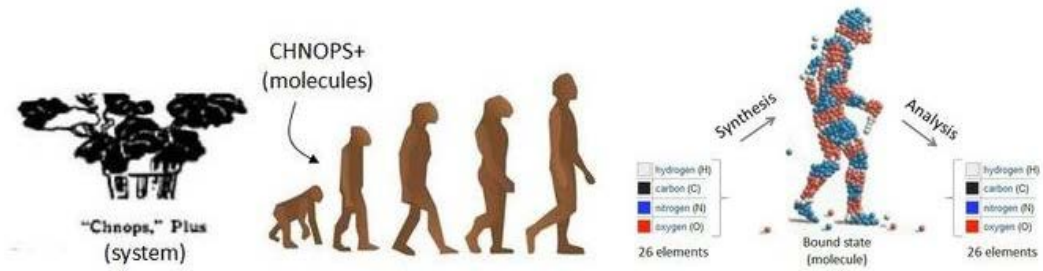

Left: American plant physiologist Frank Thone's 1936 depiction and definition of a plant NOT is a living system (or vegetible life), but, using chemically-neutral terminology, as a "CHNOPS plus system". [8] Middle: modern evolutionary-depicted examples of "CHNOPS plus" systems, monkeys upwards through humans, each comprised, elementally, in composition, using agreed upon neutral terminology, as: carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur (CHNOPS), *plus* calcium, potassium, etc. up to vanadium, depending, reactive animate systems. Right: a depiction of "reaction existence", the point in between synthesis (inception) and analysis (desistance), otherwise referred to in olden days, albeit now defunct, colloquial terms as "life" (see: defunct theory of life).

Overview

The following statements provide some groundwork to the abandonment of all life-centric terms in the humanities; akin to the way the 18th century saw the replacement of the now defunct 17th terms vis viva (living force) and vis mortua (dead force) with the modern physicochemically-neutral terms: kinetic energy and potential energy, respectively; each now formulically defined, without recourse to the arrival of mythological godesses Vita (life) and Mor (death):

> "Let us **abandon** the word 'alive'."
>
> — Francis Crick, *Of Molecules and Men* (1966) [9]

> "[If] these terms ['unit-mass of living matter', 'resultant of organic forces', 'continuity of organic substance', etc.], biologists have adopted from physics, are used figuratively, we ought to find them **re-defined**."
>
> — Karl Pearson (1892), *Grammar of Science* [11]

> "After death the force, or power, we call 'will' undoubtedly endures; but it endures in this world, not in the next. And so with the thing we call life, or the soul—mere **speculative terms** for a material thing which, under given conditions, drives this way or that. It too endures in this world, not the other."
>
> — Thomas Edison (1910), interview with NY Times journalist Edward Marshall [21]

> "Physical chemistry uses mathematical language, and it is a large part of my evangelistic attitude to suppose that much of developmental biology will someday have to be **written in much the same language** that physical chemists use."
>
> — Lionel Harrison (2008), *The Shaping of Life* (pg. 105)

The issue, as English physiologist Charles Sherrington put it in 1938, is that: "chemistry does not know the word life", hence a religio-mythology based portmanteau such as "biochemistry" (bio-chemistry), a conjunction of biology + chemistry, or biophysics (bio-physics), a conjunction of biology + physics, are unrecognized neoplasms in modern hard physical science. [1]

More to the point, thermodynamics, in particular chemical thermodynamics, does not recognize the term "life", as was first alluded to by Serbian-born American electrical engineer Nikola Tesla in his 1915 insight that "there is no thing endowed with life", hence terms such as biothermodynamics (bio-thermodynamics), and the like, e.g. biological thermodynamics, are unrecognized neoplasms based on defunct theories (whether religio-mythology-based or vitalism based)—or more to the point they are defunct scientific terms (similar to caloric, phlogiston, or aether, etc.), as is discussed fully in the 2009 defunct theory of life position. In short, all life-terms and their antonyms, being defunct conceptions in the framework of physical science, must be abandoned and or redefined. Some of these suggested term reforms and or alternative usages are shown below.

Historical precursors

The following are dated and cited "in usage" term substitute reform examples:

- Birth → Atomic aggregation (Leucippus, 460BC)
- Born → **Integrate** (Paul Aebersold, 1949)

- Death → Atomic disaggregation (Leucippus, 460BC)
- Death → **Separation** of elements (Empedocles, 450BC; Anaxagoras, 455BC)

- Alive / Dead → Animate / Inanimate (Harvey (1908) translation of Nietzsche (1778))

35. The formation of a compound by putting together the elements of which it is composed, is termed *Synthesis*, also from two Greek words, *sūn*, together, and *thesis*, a placing.

34. The decomposition or *taking to pieces* of a compound body, in order to discover its constituent elements, is called *Analysis*, from two Greek words, *ana*, thoroughly, and *lusis*, a loosening.

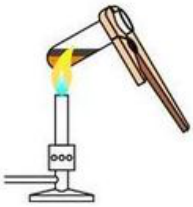

Above: standard chemistry textbook (1858) definitions of synthesis ("putting together") and analysis ("taking apart"), according English chemist John Bidlake, with etymology, as the "taking to pieces a compound body [into] its constitute elements", both of which are free from anthropomorphic and or religio-mythology bias, and hence

scientifically "neutral" terms. [12] Right: a generic synthesis icon, from an article on the synthesis of the product iron sulphide from the reactants iron and sulphur, showing that "heat", generally, is needed to bring about product formation, the sun being the heat source in synthesis of humans (see: human free energy of formation) from the elements of the periodic table (see: hmolscience periodic table).

- Die → **Cease to exist** (Thomas Jefferson, 1775) [22]
- Die → Dis-integrate (Paul Aebersold, 1949)
- Death → Dissolution from other [well-developed molecules] units (Johannes Barandun, 1910) [24]

- Live → **React** (Henry Adams, 1907)
- Lives → Goes (Thomas Huxley, 1880) [10]

- Living body → **Carbon-based** organized body (Francis Macnab, 1818) [23]
- Living thing → Animate thing (Gilbert Lewis, 1925) (Q)
- Living organism → Energy transformer (Alfred Lotka, 1925)
- Living substance → "CHNOPS plus systems" (Frank Thone, 1936)
- Living perspective → CHNOPS perspective (Paul Keddy, 2007) [4]

- Life → Mingling of elements + light (Empedocles, 450BC; Anaxagoras, 455BC)
- Life → Will to power (Friedrich Nietzsche, 1883 | WP:617)
- Life → "faculty of reaction" (**Rene Lubicz**, 1949)
- Life → Animate matter (Alfred Ubbelohde, 1954)
- Life thermodynamics → Animate thermodynamics (Sture Nordholm, 1997)
- Life → Animate bound state reactive existence (Libb Thims, 2007)
- Life → Powered chnopsological structure (Libb Thims, 2015)

- Biochemistry → The study of '**powered** CHNOPS systems' (Henry Swan, 1974)
- Biosphere → External energy supplied CHNOPS matrix terrestrial region (Henry Swan, 1974)
- Biogenic elements → CHNOPS (National Academy of Science, 1998) [3]

- Protoplasm → CHNOPS comprised entity (Edwin Hill, 1900; Anon, c.1915)
- Earth-based life forms → CHNOPS organisms (Harold Morowitz, 1968) [2]

Hmolscience | Employed

The following are precipitative terminology upgrades, resulting from the 2009 Thims-based defunct theory of life perspective, the majority of which being terms implemented in recent years,out of necessity, as Hmolpedia-introduced terms:

- Born → Synthesized ("to put together")
- Die → Analyzed ("to take apart")

- Birth → Reaction start
- Life → Reaction existence

- Alive → Reactive
- Alive → Existive | Truncation of "react-**ive exist**-ence" (Thims, c.2013)

- Living → Animate
- Living system → Chnopsological system
- Living matter → CHNOPS-based matter

- Died → Dereacted (Q) ; Deboundstated
- Dead → Debounded; No reaction existence
- Death → Reaction end

- Bio- → (see: Note 4, Thims, 2012) [20]
- Bio- → Powered CHNOPS+ (2015)
- Biology → Chnopsology
- Biographies → Existographies (2015)

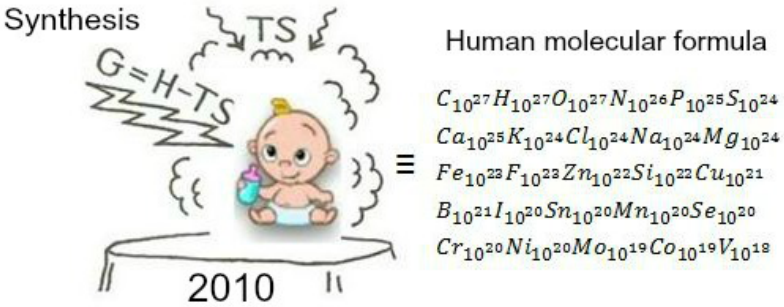

The new 21st century chemical thermodynamically-neutral interpretation of a new formed human (human molecule) brought into the universe NOT by the process of "birth" and coming "alive" but by the process of "synthesis" and "reactivity", the former of which are religio-mythology carryovers, the latter of which are upgraded terminologies; likewise for the reverse going out of the universe process of "death", a religio-mythology term (atoms and molecules don't die; nor are they alive to begin with), upgraded to "analysis", or the taking apart of a molecule or chemical species (the opposite of synthesis). [13]

Transition | Example

The following—the 1999 back cover author blurb of Matt Riddley (*Genome* (Q)), top left, upon which, in format style, Libb Thims modeled his 2008 author blurb (*The Human Molecule* (Q)), bottom left, which differs notably, in life terminology reform, from Thims' 2013 author blurb (*Purpose? In a Godless Universe* (Q)), below right—shows the subtle but profound transitory change that occurs when one begins to adopt and to implement "life terminology" upgrade reform, namely the "lives" to "react" term change, first suggested in the erudite 1907 writings of Henry Adams (see: "models | drafts" section below):

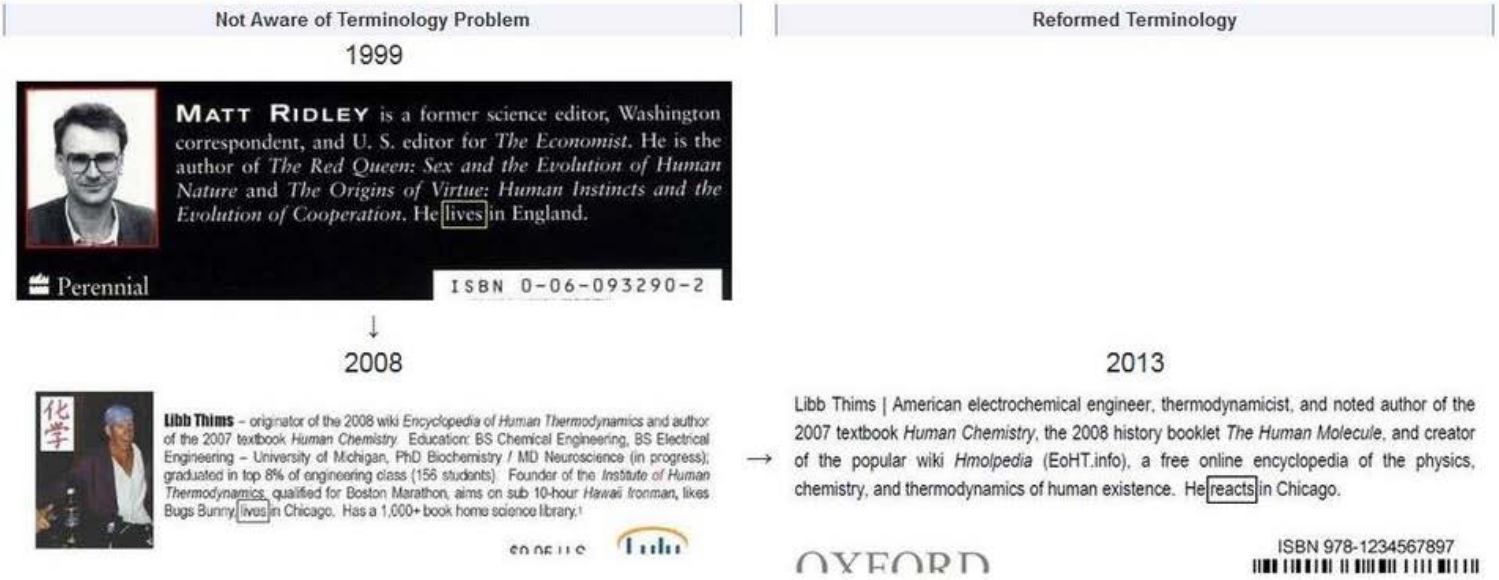

The author blurb flow chart shows the intellectual discarding of the terms "lives" and "biochemistry", both of which are mythological-schemed turned covert-vitalism stylized neoplasms, per "bio-" prefix, in the 2008 to 2013 jump, following the 2009 defunct theory of life viewpoint arrival.

Human

The following shows the old Linnaean classification, devised by Carl Linnaeus (1753), albeit now defunct theory and supplanted classified, per *Merriam-Webster Collegiate Dictionary* (2000) definition of a human, as compared to the new accurate physicochemically-neutral (chemical thermodynamically neutral), according to Kalyan Annamalai's *Advanced Engineering Thermodynamics* (2011) definition of a human, per citation of Libb Thims (2002), shown with the "Hu" human element symbol over the baby, the difference between the two being that the term "living" is not found in the latter, and thereby supplanted by "energy/heat-driven", per modern physical science protocol: [14]

	Human		Date	Source
Old	"A bipedal primate mammal (*Homo sapiens*); *broadly* : any **living** or extinct member of the family (Hominidae) to which the primate belongs."		2000	*Merriam-Webster Collegiate Dictionary*
New	"A 26-element energy/heat driven dynamic atomic structure."		2011	*Advanced Engineering Thermodynamics*

the former of which (old view) being crouched in religio-mythology based "life theory"; the latter (new view) being chemically and thermodynamically neutral. The above 1974 Henry Swan upgrade definition of biochemistry as the study of "powered CHNOPS systems" might equally apply as well.

JHT | Protocal initiatives

In 2012, JHT founding editor Libb Thims, following protocol introduced into *Hmolpedia* articles (c.2010), began to implement editorial restrictions on usages of bio-related prefixes, per reasoning that "life theories", constitute the inclusion of perpetual motion theory in a thermodynamics journal—in particular perpetual motion of the living kind—an inclusion or submission long ago, circa 1900, ruled as non-acceptable to patent offices.

This protocal was initiated in a footnote (N4) to his own 2012 issue one article, wherein it became fairly contentious to describe someone as a "bio-physicist", without either adding footnoted discussion or in more rigorous reforming manner rewriting all such 69 plus term usages into thermodynamically-neutral forms. [5]

The footnote method was chosen in this article, being that the rather extended article itself, 120-pages in length, entitled "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair", was already devoted to term reform in information theory (a move to rename "Shannon entropy" to "bitropy"); hence double term reform effort, throughout the article, became confusingly problematic, in regards to presentation.

In the second JHT 2012 article "A Strange Thing Called Love: in View of Thermodynamics", by American mechanical

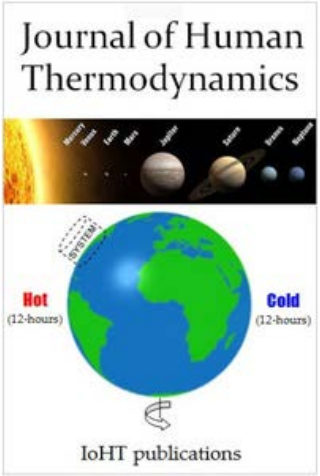

In 2012 issues of the *Journal of Human Thermodynamics*, founding editor Libb Thims began to implement "life" **terminology restrictions** and to implement editorial rewrites/redactions of such terms into that of thermodynamically-neutral terms.

engineer Ravi Vedula and Indian chemical engineer Vamshi Regalla, Thims implemented editorial rewrites of bio-related terms with citation to the following note (N3): [6]

> "Per the Tesla (1915)—Sherrington (1938)—Ubbelohde (1954)—Nordholm (1997)—Thims (2009) 'defunct theory of life' perspective, all bio-related terms, such as 'living, alive, life, etc., and their antonyms, e.g. dead, death, etc., have been editorially rewritten into thermodynamically-neutral terms."

This restriction thus brought the total number of "non-acceptable" JHT topics and or terms to three: god theories (2005 stipulation), information theories (2008 stipulation), life theories (2012 stipulation).

Models | Drafts

The following are neutral terminology examples:

> "Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday within this law. The laws which govern **animated beings** will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."
>
> — Henry Adams (c.1865), letter (or note) to someone [16]

> "The object of education for [the] mind should be the teaching itself how to **react** with vigor and economy. No doubt the world at large will always lag so far behind the active mind as to make a soft cushion of inertia to drop upon; but education should try to lessen the obstacles, diminish the friction, invigorate the energy, and should train minds to react, not at haphazard, but by choice, on the lines of force that attract their world."
>
> — Henry Adams (1907) (Q), *The Education of Henry Adams*

> "One cannot predict when any particular unstable atom will **disintegrate** or 'die', just as the case for mice or men."
>
> — Paul Aebersold (1949), "Atomic Energy Benefits: Radioisotopes" [19]

> "Out of all the scientists to have cited Goethe that I am aware of (Q) and out of all the physical scientists to have employed free energy logic in social theory that I am aware of (Q), you and myself are the only two **existive** (alive) people that I am aware of who has ever cited both Goethe and Gibbs in the same context (Q). In this respect, would you be able to write up a short 3-5 page paper for 2014 JHT publication on your philosophy (opinion) on the connection of Empedocles to Goethe to Gibbs? The following page, which I wrote today, might give you some reference point (Q). I'm sure you are busy, but if you could take a few moments of your time to donate such an article in our direction, it would be appreciated."
>
> — Libb Thims (2013), email to Jurgen Mimkes [17]

Other

In 1851, William Thomson, in his formulations of the second law, was employing the phraseology "inanimate material agency" as follows: [18]

> "It is impossible by means of inanimate material agency to derive mechanical effect from any portion of matter by cooling it below the temperature of the coldest of the surrounding objects."

Supposedly, to be distinguished with "animate material agency", the latter, supposedly, with the implicit assumption that an living thing, e.g. animal or human, is an animate material agent.

Quotes

The following are relevant quotes:

> "The first thing needed is the rectification of names."
>
> — Confucius (500BC), *Analects* 13:3

> "I propose the following definition, which is applied to everything, including minerals: 'life is the faculty of reaction.' Everything in the universe tends toward inertia, or absence of reaction. The proof of this inertia, which thermodynamics seeks in 'absolute zero,' has never been given, nor will it ever be, because absolute inertia can only be attained through the cessation of the formed matter or 'thing'. This would be the moment the thing ceased to exist. Everything 'existing' is capable of reaction, insofar as it has 'weight', that is, fixed or specific energy. The vital phenomenon is the faculty of reacting, and to manifest itself this reaction requires a resistance of the same nature as the action."
>
> — Rene Lubicz (1949), *The Temple of Man*

See also

- BP/PE dating system
- Sociology terminology upgrades

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θΔics

In science, **life theory**, or theory of life, refers to any of a number of hypothetical theories, assertions, or lines of reasoning to explain "life" as an existing phenomena, cogently.

List

The following is a historical listing of the various life theories:

Date	Theory	Theorist	Description
2600BC	Clay creation myth	Imhotep	The model that a god (Khnum) took clay, molded it into a human shape, on his potter's wheel, then a second god (Isis) breathed breath or spirit into the clay, bring it to life.
490BC	Fire theory of life	Hippocrates	Quote: “heat (see: animal heat), a quantity which functions to animate, derives from an internal fire located in the left ventricle”
	Flame model of life		
17th century	Gunpowder theory of life		Life was conceived as being powered by something akin to the explosion of gunpowder occurring inside of animals and humans.
1771	Spark theory of life	Luigi Galvani	Holds that, based on electrical animation experiments of severed detached frog legs, that electricity (or animal electricity) and or sparks are behind the nature or principle of life.
1888	Crystal model of life		
1944	Negative entropy theory of life	Erwin Schrodinger	The reasoning that the inverse of entropy (negative entropy) equates to order, and that life feeds on this, so to stay away from equilibrium, which in this scheme is equated to death.
2009	Defunct theory of life	Libb Thims	The conclusion that, thermodynamically and chemically speaking, life is a concept that does not exist (see: life does not exist); rather it is a anthropomorphic religio-mythology belief lost in a philosopher's stone like search of meaning in definitional and conceptual terms in modern world of periodic tables, physics, chemistry, reaction mechanism, amid a hydrogen (not alive) to human molecule (not alive) big bang to present, connective great chain of being view of things.

(add discussion)

θΔics

In thermodynamics, **life thermodynamics**, a defunct neoplasm (see: bio-; defunct theory of life; life does not exist; life terminology upgrades), colloquially the "thermodynamics of life", is the thermodynamical study of animate matter, or more specifically powered chnopsological matter. [1]

Animate thermodynamics

The term 'life' and its corpus of associations is a fictitious conception and defunct theory. [10] A repercussion of this is that the name of branch of thermodynamics that studies entities formerly in the category of "life thermodynamics", recently camouflaged by the renamed terms "biological thermodynamics" (or biothermodynamics), should be referred to as animate thermodynamics, in the most-correct sense (as it is technically incorrect to say that something is alive); although this is a rather cumbersome label..

History

The subject of the thermodynamics of life began to arise in the 1920s, and in the 1950s, through primarily the arguments of Belgian chemist Ilya Prigogine, a view began to emerge that life could not be studied by classical thermodynamics, but only by nonequilibrium thermodynamics.

The subject of life in relation to the laws of thermodynamics began to arise in the 1920s. [3] One of the first to outline this discipline of thermodynamics was Belgian-born English thermodynamicist Alfred Ubbelohde, in his chapter "Thermodynamics and Life" in the 1947 book *Time and Thermodynamics.* To quote is overall view of the subject:

> "So far as concerns the laws of thermodynamics there is reasonable expectation that more information about their bearing on life will be obtainable as the results of further experiments, particularly as the result of measurements on the energy and entropy changes accompanying the activities of living organisms."

(add discussion)

Prigoginean thermodynamics

> *See main: Progoginean thermodynamics*

In the 1950s, Belgian chemist Ilya Prigogine worked to establish the view that life is a "far-from-equilibrium" phenomenon able to be studied in nonequilibrium thermodynamics, rather than classical thermodynamics. Prigogine, curiously, had a dismal view of classical thermodynamics in its applicability to explain the phenomenon of life and evolution? To cite one example, in 1955 Prigogine stated: [4]

> "The fact that during growth living organisms actually show a decrease of entropy production during evolution up to the stationary state … also, the fact that their organization generally increases during this evolution [which] corresponds to the decrease of entropy as studied [leads one to puzzle as to why] the behavior of living organisms has always seemed so strange from the point of view of classical thermodynamics; that the applicability of thermodynamics to such systems has often been questioned. One may say that from the point of view of the thermodynamics of open and stationary systems [nonequilibrium thermodynamics] a much better understanding of their principal features is obtained."

In the opening comments to his 1977 Nobel Lecture "Time, Structure and Fluctuations", similarly, he again makes a misaligned attempt, i.e. by purposely mentioning Helmholtz free energy which is typically used in isothermal (constant temperature) isochoric (constant volume) experiments such as in explosives research (where explosive reactions by their nature induce pressure changes), verses the Gibbs free energy (common to biological processes), to discredit the validity of standard thermodynamics to explain living order: [5]

> "Thermodynamic equilibrium may be characterized by the minimum of the Helmholtz free energy defined usually by: F = E – TS. Are most types of 'organisations' around us of this nature? It is enough to ask such a question to see that the answer is negative. Obviously in a town, in a living system, we have a quite different type of functional order. To obtain a thermodynamic theory for this type of structure we have to show that that non-equilibrium may be a *source of order*. Irreversible processes may lead to a new type of dynamic states of matter which I have called 'dissipative structures'."

This view strangely existed, in the mind of Prigogine, in spite of the fact that he was well acquainted with German writer Johann Goethe's 1809 *Elective Affinities* (as referenced in the endnotes to his *Order Out of Chaos*), in which the activities of human life and love were explained via a theory of human chemical reactions quantified by chemical affinities, which, as elaborated on greatly by Prigogine's mentor de Donder in his 1936 *Thermodynamic Theory of Affinity*, are described via changes in chemical free energy (Gibbs free energy), a classical thermodynamics conception.

In the 2005 book *Into the Cool: Energy Flow, Thermodynamics and Life*, Americans ecologist Eric Schneider and science writer Dorion Sagan state rather presumptuously, on what seems to be a Prigoginean thermodynamics basis, that life thermodynamics is a subdiscipline of nonequilibrium thermodynamics. In their own words: [6]

> "As a scientific discipline, the **thermodynamics of life**—a subdiscipline of nonequilibrium thermodynamics, remains esoteric within science and virtually unknown to the public."

(add discussion)

Gibbsian thermodynamics

See main: Gibbsian thermodynamics

In contrast to the dominant view established by Prigogine (especially after his 1977 Noble Prize win), that life is a nonequilibrium phenomenon not applicable to classical thermodynamics, an alternative view had also begun to slowly emerge that life is a process that is studied via the chemical thermodynamics methods of American engineer Willard Gibbs. The first to state this perspective, in a clear manner, was Russian physical chemist Georgi Gladyshev who in 1978 argued that life was a phenomenon studied via a Gibbsian-variation of chemical thermodynamics that he called "hierarchical thermodynamics", rather than via the methods of Prigogine, which he considered as: "Mathematically trimmed fantasies useless for real life." [7] In a similar manner, the 2007 view established by American chemical engineer Libb Thims, is that animate structures, viewed as forms of life, such as people, are simply "large molecules", for example "human molecules", "bacteria molecules", etc., no different than similar smaller molecules, such as DNA, H_2O, etc., and that chemical thermodynamics, as was founded predominately by American engineer Willard Gibbs, is the branch of thermodynamics that studies these structures, as common sense would imply. [8]

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θΔics

In cycles, the **life-death cycle** posits that entities are “born”, at a certain initial point in time, then travel through a passage of existence, during a certain window of time, then “die” at a certain final point in time, a process that can be either take place once, reoccur a second time, or reoccur continually.

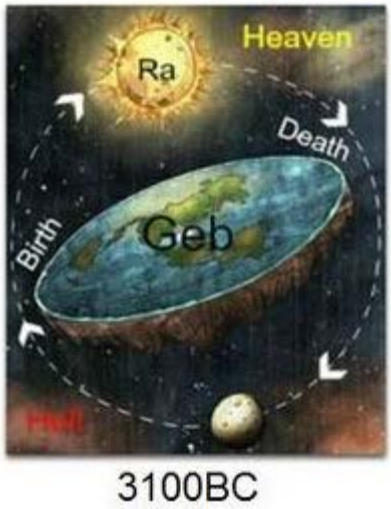

Overview of the 3500BC Egyptian **life-death rebirth cycle** of the sun (Ra) born out of the chaos waters of beginning (Nun).

The life-death cycle was a theory conceived in circa 3500BC in the ancient Egyptian city of Heliopolis, “the city of the sun”, wherein it was postulated that each day the sun, called Ra, was “born”, out of a mound called Nun, then carried though the sky by a bird (or solar boat), then died each night as it went below the horizon.

Ra theology

This model formed the basis for what would become Ra theology, and the later derivative "resurrection" (coming back to "life" of the "dead" in the same body) religions: Ab-*ra*-ham-ic faiths (53 percent) and "reincarnation" (coming back to "life" of the "dead" in a new body) religions B-*ra*-hma-ic faiths (20 percent). [1] In Hinduism, this eternal cycle came to be called Samsara; in Christianity, the one type rebirth cycle came to be called judgment day. [2] These views dominated the mindsets of over 72 percent of the world, and is typically the version existence told to children at a young age.

Carnot cycle

In 1824, the Carnot cycle was introduced by French engineer Sadi Carnot as the basic heat cycle for all working bodies of the universe. This cycle model formed the basis for what would latter become the laws of thermodynamics, as penned in 1865 by German physicist Rudolf Clausius. Into the 1930s, following the publication of Gilbert Lewis' *Thermodynamics and the Free Energy of Chemical Substances* (1923) and Edward Guggenheim's *Modern Thermodynamics and the Methods of Willard Gibbs* (1933), the subject of chemical thermodynamics had solidified.

Defunct theory of life

With the development of chemical thermodynamics and the concept of irreversible reaction cycles, it soon thereafter became apparent that there were inconsistencies between the Egyptian-based life-death cycle model of human existence and the chemical thermodynamics irreversible cycles model of human existence. This resulted in the 2009 defunct theory of life, initiated by American electrochemical engineer Libb Thims, i.e. that humans are reactive "molecules", created by cyclical heat driven chemical synthesis (not by evolution), and that molecules cannot be defined as being "alive", any more than a hydrogen atom can be considered alive. [3]

References

1. (a) Resurrection – Wikipedia.
(b) Reincarnation – Wikipedia.
2. (a) Last Judgment – Wikipedia.
(b) Samsara – Wikipedia.
3. Thims, Libb. (2009). “Letter: Life a Defunct Scientific Theory”, *Journal of Human Thermodynamics*, Vol. 5, pgs. 20-21.

Videos

â— Thims, Libb. (2011). “Life-Death Cycle” (Ñº), HumanChemistry101, Mar 21, Mar 21.

θΔics

In science, a **lifetime** is a defunct scientific term, referring to the period of time in which an entity, anthropomorphized, in some cases, as being "alive", whether a subatomic particle, an atom, molecule, chemical species, human molecule, planet, star, galaxy, star, etc., exists as a distinguishable bound state structure.

In chemistry, the lifetime of a species can be generalized as twice the half-life of the species population.

In biology (powered chnopsology), a lifetime is often characterized as the start to finish period comprising an organism's 'life cycle'.

In physics, lifetime is defined as the average time of existence of an elementary particle or radioactive nucleus in a certain state before decay occurs or before there is a transition from an excited state to a lower state. [1]

Difficulties on term

In colloquial use, life time is defined in two ways: [2]

> The period of time during which: an individual is alive.
> The period of time during which: property, an object, a process, or a phenomenon exists or functions.

The difficulty or inconsistency between these two incongruent definitions is that individuals cannot technically be alive. [3] Subsequently, further uniformity and correction is needed in the former definition.

References

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2. The American Heritage Dictionary of the English Language, Fourth edition, 2009.
3. Thims, Libb. (2009). "Letter: Life a Defunct Scientific Theory", *Journal of Human Thermodynamics*, Vol. 5, pgs. 20-21.

External links

â— Lifetime – Dictionary.com.

θΔics

In science, **light** is that portion of the electromagnetic radiation, of the electromagnetic spectrum, from about 380 to 780 nanometers in wavelength, visible to the human eye. [1]

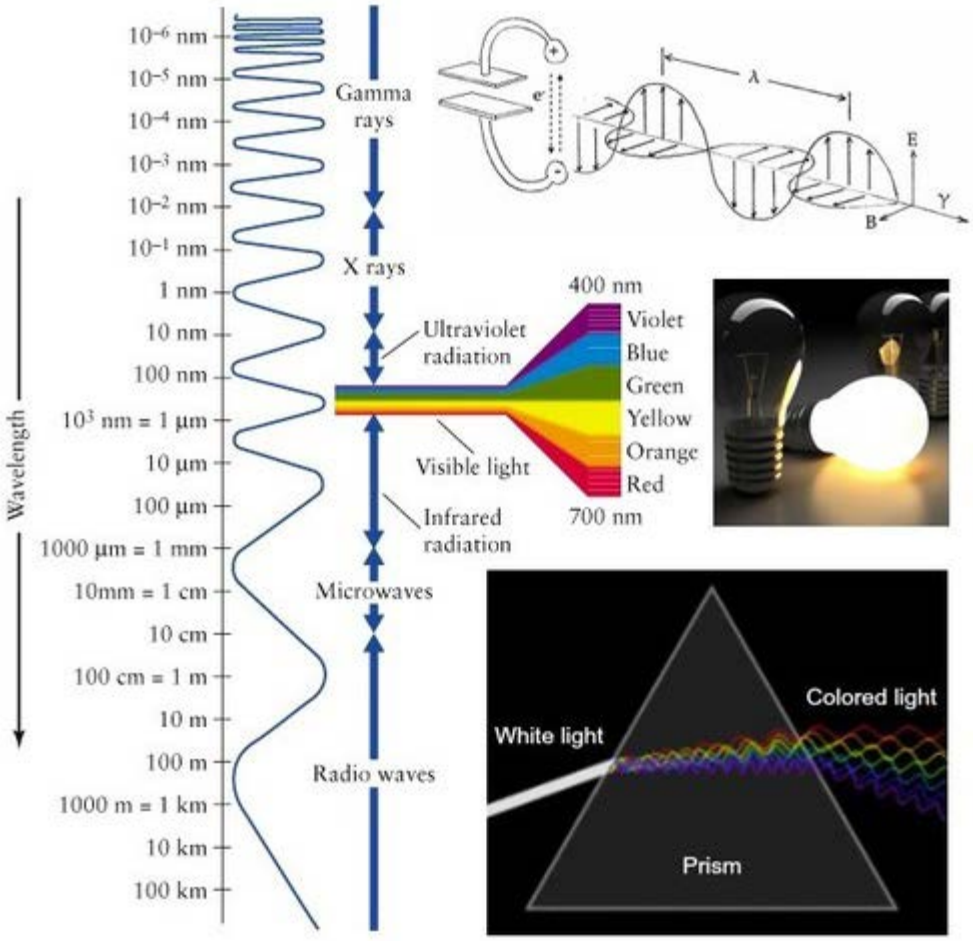

History

The study of the nature and composition of light is probably one of the most intricate, involved, and as of yet unsolved subjects of modern science.

The finite velocity of light was measured in 1676 by Ole Romer. [1]

The first, supposedly, to seed the notion of light as a corpuscle, was Pierre Gassendi, who, building on the atomic theory work of life of Epicurus, in his *circa* 1649 work stated (check) that light is made up of small discrete particles called "corpuscles" (little particles) which travel in a straight line with a finite velocity and possess kinetic energy. [10]

The first dominate theory, however, was Isaac Newton's *circa* 1675 corpuscular theory of light, in which light was imagined to be a stream of minute particles or 'corpuscles' emitted by a light source, shooting through empty space like bullets in the form of light rays, detected by their impact on the retina. [3] The corpuscles, in Newton's theory, were argued to set up disturbances in the 'aether' of space. [1] From 1670 to 1672, Newton lectured on optics. During this period he investigated the refraction of light, demonstrating that a prism could decompose white light into a spectrum of colours, and that a lens and a second prism could recompose the multicoloured spectrum into white light. In his *Hypothesis of Light* of 1675, Newton posited the existence of the ether to transmit forces between particles.

In 1678, Dutch physicist-astronomer Christiaan Huygens published his undulatory theory of light, in which light was thought to be a wave spreading out in all directions from a light source, transmitted via a medium known as *ether*, and detected by the waves creation of sympathetic vibrations in the retina. [3]

In 1801, English physicist-physician Thomas Young invented the famous double slits experiment and thus re-discovered the phenomenon of the interference of light, showing that a wave theory was essential to the interpretation of light. [1]

In 1873, Scottish physicist James Maxwell published his famous *A Treatise on Electricity and Magnetism*, which introduced the world to the now-famous Maxwell equations, the four governing equations on the phenomenon of electricity and magnetism, with which Maxwell showed that these equations implicitly required the existence of electromagnetic waves traveling at the speed of light. [4]

In 1900, Max Planck postulated, based on the work of Ludwig Boltzmann, that the energy of black bodies could be quantized or divided into a discrete number of “energy elements”. In 1905, building on the Planck’s model, Albert Einstein proposed that light itself could be quantized. In his own words:

> "According to the assumption to be contemplated here, when a light ray is spread from a point, the energy is not distributed continuously over ever-increasing spaces, but consists of a finite number of *energy quanta* that are localized in points in space, move without dividing, and can be absorbed or generated only as a whole."

In the 1920s, the term "photon" was coined to describe Einstein's energy quanta. One reference claims it was American physicist Arthur Compton who coined the term photon in his 1923 work on the investigations showing that electromagnetic quanta behave like particles, exchanging both energy and momentum in collisions with electrons. [6] Most references, however, state that the term "photon" is a 1926 coinage of American physical chemist Gilbert Lewis to describe a "particle" of light. [7]

In modern particle physics terms, electromagnetic fields are described as being made up from photons, in which electric and magnetic forces are assumed to be due to the action of photons. In technical terms, photons of light are "on the mass shell", whereas photons of electric and magnetic fields are not. [8]

Chnopsology | Biology

One of the first to discuss the nature of light in thermodynamic terms, specifically in relation to biological mechanism, was Russian biogeologist Vladimir Vernadsky, who in his 1926 *The Biosphere* stated: [2]

> "The important roles played by ultraviolet, infrared, and visible wavelengths are now well-recognized. We can also indentify the parts of the biosphere that transform these three systems of solar vibration, but the mechanism of this transformation presents a challenge which our minds have only begun to comprehend."

Vernadsky goes on to state that the mechanism is disguised in an infinite variety of ways, e.g. natural colors, forms, and movements, of which we, ourselves, form an integral part. He continues:

> "[Light] causes changes in electromagnetic fields, the decomposition of molecules, various ionization phenomena, and the creation of new molecules and compounds. Radiant energy is transformed, on the one hand, into various magnetic and electrical effects; and on the other, into remarkable chemical, molecular, and atomic processes."

He continues "all forms of radiant solar energy outside of the four and one-half octaves that penetrate the biosphere are 'retained', i.e. transformed into new terrestrial phenomena."

Human chemistry

In human chemistry, it is understood that light operates through the actions of activation energy, in working to trigger or setting off human chemical reactions, such as in the visual mechanism action (retinal molecule) of the reaction ensuing following the instance of love at first sight. [9]

See also

â— Blue sky problem

References

1. Daintith, John. (2005). *Oxford Dictionary of Science.* Oxford University Press.
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3. Robinson, Andrew. (2006). *The Last Man who Knew Everything: Thomas Young, the Anonymous Genius who Proves Newton Wrong and Deciphered the Rosetta Stone, among Other Feats* (pg. 96-, etc.). Plume Books.
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5. Einstein, Albert. (1905). “On a Heuristic Point of View about the Creation and Conversion of Light”, *Annalen der Physik* March 18.
6. Schumm, Bruce. A. (2004). *Things Down Deep – the Breathtaking Beauty of Particle Physics* (pg. 33). Baltimore: The Johns Hopkins University Press.
7. (a) Ball, David W. (2001). *The Basics of Spectroscopy* (pg. 13). SPIE Press.
(b) Gribbin, John. (2000). *Q is for Quantum – An Encyclopedia of Particle Physics*. New York: Touchstone Books.
8. Veltman, Martinus. (2003). *Facts and Mysteries in Elementary Particle Physics* (pg.17). World Scientific.
9. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
10. Corpuscular theory of light – Wikipedia.

External links

â— Light – Wikipedia.

θΔics

In origin of life theories, **lightning origin of life theory** holds that the first form of life on earth originated when a lightning bolt (or period of intense electrical activity) struck a warm pond or primordial soup and thus started the first chemical reactions of life, first life form, or something along these lines.

The **lightning origin of life theory** postulates that billions of years ago a lightning bolt (or intense period of electrical activity) hit a warm pond or primordial soup and thus triggered, sparked, or activated the first reactions of life, or something along these lines.

History

The lightning origin of life theory seems to have been first put forward by English naturalist Charles Darwin in 1871 as follows: [1]

> "The original spark of life may have begun in a warm little pond, with all sorts of ammonia and phosphoric salts, lights, heat, electricity, etc. present, so that a protein compound was chemically formed ready to undergo still more complex changes."

The 1952 Miller-Urey experiment famously tested this theory, the results of which showed that sparks ignited in a chemical broth, over several days, could make amino acids.

See also

â— Meteoroid origin of life theory
â— No origin of life theory
â— Defunct theory of life

References

1. Darwin, Charles. (1871). "Letter to Joseph Hooker", in: *The Life and Letters of Charles Darwin, Including an Autobiographical Chapter*, Vol 3. (pg. 18). John Murray.

θΔics

In Hmolpedia, **like rankings**, abbreviation LR, Hmolpedia articles ranked, e.g. Aaron Freeman (LR:8), according to Facebook thumbs up likes; the top 150+ Hmolpedia articles, ordered by like rankings, are listed below. [1]

Like rankings are rankings of Facebook thumbs up a viewer gives to a page, individual page count shown below each Hmolpedia article.

List | Full

The following is a work-in-progress listing of the 120+ most-liked articles of the 5,000+ pages in Hmolpedia, specifically those with five or more likes, as of *circa* Sep 2014, according to Facebook likes, based on the page visit flow rate, which varies from 50-100K+ page visits per month—names shown bolded for the sake of distinguishing articles on "people" as compared to articles on "content", all five of which, in respect to commonality, of the 1,000+ Hmolpedia existographies (biographies), are each high ranking social Newtons and human chemical thermodynamicists, the top three of which, Hirata, Goethe, and Thims, each having been independently cited in the IQ: 225+ range—cited and true intelligent quotients shown per values listed on the genius IQs table—the fourth ranked person being Oxford biochemistry educated, Harvard Medical School trained, Yale board certified practicing neurologist David Hwang, who humbly comments (2013), as to his position on the genius IQs table: “In my humble opinion I do not belong on your esteemed list of geniuses!”, the fifth, Henry Adams, well he speaks for himself, see: quote (below) and power centers, the sixth, Mehdi Bazargan, while although notably a French trained mechanical engineering thermodynamicist and the 75th Prime Minister of Iran, his work is not yet fully translated into English; the upward arrows ↑ indicate fast climbers: [2]

#	Page	Likes	IQcited	IQtrue	(written by)
1.	Equation of love	620			
2.	Founders of thermodynamics and suicide	493			
3.	Is-Ra-El ↑↑	478			
4.	IQ: 200+	422			Note: seems to have been reset to 48 (Jun 2019)?
5.	IQ: 150+ | Smartest woman ever	372			
6.	Genius IQs	328			
7.	**Hmolpedia** (main page)	324			
8	Aaron Freeman ↑↑	315			
9.	The Mathematician in Love	218			
10.	Love the chemical reaction	214			
11.	Landau genius scale	141			
12.	American Presidents by IQ	186			
13.	Good Will Hunting (William Sidis)	132	225		
14.	Soul mate	128			

15.	Endorphin theory of love	127			
16.	**Top 1000 geniuses** ↑	126			43 (current) + 83 (from earlier version "top 500 geniuses" namesake page).
17.	Dawkins scale	114			
18.	Last person to know everything ↑	87			
19.	Einstein on free will	85			
20.	Sweaty T-shirt study	84			Claus Wedekind (1995)
21	Napoleon Laplace anecdote	72			
22.	Massimiliano Ferrara	70			Note: votes from 18 Feb 2016 StrettoWeb.com article (Ñº) on him.
23.	Human chemical theory	69			
2#.	**Christopher Hirata**	68	225	190±	
24.	Chocolate theory of love	53			
25.	Arnold Sommerfeld	52			Note: votes resulting from Reddit thread (Ñº) stream.
26.	Egyptian Book of the Dead	51			
27.	Abraham and Brahma	51			
28.	IQ tables	96			
29.	Life does not exist	53			
20.	**Gerard Nahum**	46			Note: votes resulting from his stream from his new book launch.
31.	Human molecular formula	78			
32.	Beckhap's law	49			
33.	Mislabeled geniuses and IQ tests	49			
34.	Human molecule	45			
35.	Neumann-Shannon anecdote	57			
36.	Christ	50			
37.	Neter	41			
3#.	Zerotheism for Kids	40			
38.	Life does not exist	53			
39.	Ra theology	40			
40.	Bible	37			
41.	Bertrand Russell	36			
42.	Serge Galam	34			

43.	**Johann Goethe**	34	225	230	
44.	**Thomas Young**	33		195	
45.	Human chemistry	34			
46.	Atheism types	31			
47.	Thermodynamics of hell	31			**Paul Foote** (1920)
48.	Laws of thermodynamics (game version)	31			
49.	Turnover rate	37			
50.	**Stuart Kauffman**	28			
51.	Human thermodynamics	27			
52.	The Thermodynamics of Love	28			**David Hwang** (2001)
53.	Clay creation myth	52			
54.	Thermodynamics humor	25			
55.	Shannon bandwagon	23			
56.	Greatest physicist ever	23			Note: May 2016 Twitter post (Ñº) flow votes.
57.	IQ: 200+ (references)	21			
58.	**Libb Thims**	21			
59.	Genius	21			
61.	Molecular evolution table	20			
62.	Nature abhors a vacuum	34			
63.	Fourth law of thermodynamics	18			
64.	**Henry Adams**	17		195	
65.	Thermodynamics of love	17			
66.	History of differential equations	23			
67.	Goethe (pronunciation)	18			
68.	Panbioism	16			
69.	Humanities citation ranking	16			
70.	Early parental death and genius	16			
71.	Love at first sight	16			
72.	Social chemistry	16			
73.	**Yunus Cengel**	16			
74.	Ships not seen	34			

75.	Feynman problem solving algorithm	14	
76.	Existence of god	14	
77.	The Animate and the Inanimate	14	
78.	Negative entropy	14	
79.	**Johannes van der Waals**	14	
80.	Δ	17	
81.	S = k ln W	17	
82.	Dean Simonton	42	
83.	Goethe's human chemistry	13	
84.	Relationship physics	13	
85.	Sociological thermodynamics	12	
86.	*A Letter to American Teachers of History*	12	**Henry Adams** (1910)
87.	Atomic theory	12	
88.	**Justin Lancaster**	12	
89.	Negentropy	13	
90.	**Rudolf Clausius**	12	
91.	James Joule	12	
92.	Entropy ethics	11	
93.	Human chemical reaction theory	11	
94.	Boltzmann tombstone	10	
95.	Dissipative structure	10	
96.	Evolution thermodynamics	10	
97.	Entropology	10	
98.	Human chemical reaction	10	
99.	American school of econophysics	9	
100.	Mega Test IQ	9	
101.	Religious thermodynamics	9	
102.	Thermodynamics of Humans	9	**Mehdi Bazargan** (1956)
103.	**Ilya Prigogine**	27	

104.	**Nassim Haramein**	9		
105.	**Dean Hamden**	9		
106.	Energy slave	9		
107.	Network thermodynamics	8		
108.	Panexperientialism	8		
109.	Physics of love	8		
110.	**Nikola Tesla**	8		
111.	Clausius inequality	8		
112.	Panexperientialism	8		
113.	Third law of thermodynamics	8		
114.	Comparative mythology and religion	11		
115.	Anti-entropy	8		
116.	Guinness Book IQ	10		
117.	Queer chemistry	8		
118.	Creationism scientists ranked by idiocy	8		
119	New Dimensions in Sociology	7		
11#.	Maxwell's demon	7		
120.	Entropy (song)	7		
121.	Smartest person alive | existive	7		
122.	History of chemical bonding theory	7		
123.	Neurochemistry	41		
124.	**William Sidis**	7	300	185
125.	Negative confessions	9		
126.	IQ	7		
127.	Thermodynamics of Evolution	6		
128.	Gunpowder theory of life	6		
129.	dW = PdV	6		
130.	Human molecule (banned)	6		
131.	**Robert Pirsig**	6	175	
132.	Evolution timeline	6		

133.	Entropy	6
134.	Soul theorist	6
135.	**Gordon Van Wylen**	6
136.	10 percent myth	6
137.	IQ history	6
138.	God does not play dice	6
139.	IQ: 225+	5
140.	Entropy antonyms	8
141.	Benard cells	25
142.	Elective Affinities	5
143.	**Pierre Levy**	5
144.	**Norbert Wiener**	5
145.	**Paul Foote**	5
146.	**John Butler**	5
147.	Mechanical equivalent of heat	6
148.	Social physics	5
149.	Sociophysics	5
150.	Reserve energy	5
151.	Fall in love	5
152.	Entropy (unscrambled eggs)	5
153.	Computer science thermodynamics	5
154.	Molecular thermodynamics	5

A few noted runners up (or up comers) include: **Arthur Iberall** (4+), genius hiatus effect (4+), human physics (4+), **Voltaire** (4+), **James Eadon** (4+), **Ettore Majorana** (3+), **Lev Shneider** (3+), human chemical bond (3+), Hmolpedia (etymology) (3+), human molecule (Wikipedia) (3+), Goethe (quotes) (3+), schools of thermodynamics (3+), Lazy ant study (3+), rock vs. human (2+), genius studies (2+), **James Maxwell** (2+), **John Neumann** (2+), love thought experiment (2+), personal space (2+), **Pitirim Sorokin** (2+), polymath (2+), **Thomas Dreier** (2+), death drive (2+), epicenter genius (2+), Hmolpedia: progress report (1+), to name a few.

List | People

The following, culled from the above full ranking, is a listing of the most-liked pages of "people" of the 3,200+ pages in Hmolpedia:

#	Page	Likes	IQcited	IQtrue	(written by)
1.	**Christopher Hirata**	53	225	190±	

2.	**Gerard Nahum** [friend votes]	46			
3.	**Johann Goethe**	30	225	230	
4.	**Libb Thims**	20	225		
	The Thermodynamics of Love	19			**David Hwang** (2001)
5.	**Henry Adams**	17		195	
6.	**Rudolf Clausius**	12		205	
	Thermodynamics of Humans	9			**Mehdi Bazargan** (1956)
	Napoleon Laplace anecdote	9	190	195	**Pierre Laplace** (1802)
7.	**Ilya Prigogine**	9			
8.	**Nassim Haramein** [friend votes]	9			
9.	**William Sidis**	7	300	185	
10.	**Robert Pirsig**	6	175		
11.	**Pierre Levy**	5			
12.	**Norbert Wiener**	5		170±	

These are followed by: **Voltaire** (4+), **James Eadon** (4+), **James Maxwell** (2+), **John Neumann** (2+), **Nikola Tesla** (2+), **Pitirim Sorokin** (2+), **Thomas Dreier** (2+), **Mehdi Bazargan** (2+), to name a few.

References

1. (a) Note: this page was started when it was noted, on 5 Dec 2013, following completion of a reading of volume one of Morris Zucker's 1945 *A Field Theory of History*, how many people like the Henry Adams page; Adams (#17) being the late 19th century embodiment of Goethe (#10), Hirata (#7), numbers shown being at that time point in the ranking, being the 20st century embodiment of Goethe, at least for one passionate point in his reaction existence (life), and Thims (#14) being the 21st century embodiment of Goethe, Adams, and Hirata.
(b) Note: Exclusions to the above so-called natural "like rankings" are contrived or unnatural (forced or coupled) like rankings; e.g. the article on Kishore Dash, who after linking his own article to his Facebook page, gained 8 likes within the course of a month, all of which being friends filtering through the link, and naturally enough liking their friend's page. These types of artificial likes counts are excluded from the above like rankings.
2. Email communication from David Hwang to Libb Thims (2 Dec 2013).

θΔics

In theories, **likes attract**, as compared to "opposites attract", refers to []

Quotes

The following are related quotes:

> "Animals flock together with animals of the same kind, doves with doves and cranes with cranes and similarly with the other irrational creatures, and so with non-living things too, as one can see in the case of seeds in a sieve and pebbles on a beach. In the one lentils are sorted out by the swirl of the sieve to lie together with lentils, barley with barley, and wheat with wheat, and in the other oblong pebbles are pushed by the motion of the waves into the same place as oblong and round into the same place as round, as if that sort of similarity in things had a kind of attractive force."
>
> — Democritus (c.420BC), *Fragment D6*; cited by Sextus Empiricus (c.200AD) in: *Against the Mathematicians* (V11.116-18) [1]

References

1. Taylor, C.C.W. (1999). *The Atomists: Leucippus and Democritus: Fragments: a Text and Translation with a Commentary by C.C.W. Taylor* (pg. 5). University of Toronto Press.

θΔics

In animate thermodynamics, **Lila Lee Gatlin** (1928-), or "Lila Krause" by marriage, is an American biochemist (chnops-chemist) noted for her publications, in the late 1960s early 1970s, on relationship between DNA, viewed as an information process, information theory, thermodynamics, and the relation of these to evolution. [1] To quote Gatlin on her general view: [2]

> "As *Homo sapiens* we have always believed that we are higher organisms … as thermodynamicists we recognize these words and realize that the concept of entropy must somehow enter into the explanation."

Among Gatlin's several publications, her 1972 book *Information Theory and the Living System* argues that entropy reduction within living systems is said to occur whenever information is stored. Using information theory, Gatlin reasons that "stored information varies inversely with entropy" in the sense that a library, for instance, "is a state of lowered entropy. [3] Her main thesis is that higher forms of life emerged when genetic messaging, in possession of an amount of entropy, in the Claude Shannon sense of "amount of potential information", began to be passed along with minimal amount of errors in the code. [4]

Difficulties on theory

In her theorizing, Gatlin seems to start off in the correct direction, but veers off track in her dismissal of classical thermodynamics' ability to explain living systems. Instead, she reasons that the version of entropy as formulated by American electrical engineer Claude Shannon in information theory is the answer. In particular, Gatlin thinks that "our classical notions of entropy are totally inadequate in dealing with the living system"; whereas, in the same vein, she believes that the decreasing entropy of evolving life does not violate the second law of thermodynamics. To cite an example of a very misinformed, for instance, she states: [2]

> "The second law of thermodynamics is indeed an order-degrading principle in itself and without constraint; but when we place it under control of the higher law of information theory, it becomes directly responsible

Of the many incorrect points in this statement, there is no "law of information theory". In fact, by its very name it is still a theory, and thus not a law; except perhaps if one includes the hypothetical "law of conservation of information" as a case in point. All-in-all, as is often the case in information thermodynamics, Gatlin's logic seems to be a mis-mash of disparate theories.

Education

Gatlin completed her BS in 1957 at the University of Tulsa, her MS with a thesis on "Mechanism of Solvolysis of Dihalocyclopropanes" in 1959 at Pennsylvania State University, and her PhD with a dissertation "New Approaches to Nucleic Acid Structure" in 1963 at the University of Texas. [5] She later when on to work as a lecturer and researcher in molecular biology and genetics and various universities, although most at the University of California, Berkeley. In this sense, she may have had a residual connection to the Lewis school of thermodynamics.

Quotes

The following are interesting quotes from Gatlin's 1972 *Information Theory and the Living System*:

> "We have always had the vague notion that, as higher organisms have evolved, their entropy has in some way declined because of this higher degree of organization."

References

1. Hammond, Dick K. (2005). *The Human System from Entropy to Ethics*. (pg. 16). Publisher: Dick Hammond.

2. Gatlin, Lila L. (1970-71). "Evolution Indices". In *Sixth Berkeley Symposium on Mathematical Statistics and Probability*, Vol. 5, (pgs 277-96). University of California Press.
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4. Campbell, Jeremy. (1982). *Grammatical Man - Information, Entropy, Language, and Life* (pgs. 80, 112-13, 121). New York: Simon and Schuster.
5. Gale, Thomson. (2005). "Contemporary Authors: Biography – Gatlin, Lila L(ee) (1928-)" [HTML], e-document.

Further reading

● Gatlin, Lila L. (1966). "Logical Proof of the Entropy Principle", *American Journal of Physics*, 34: 266.
● Gatlin, Lila L. (1973). "Entropy and Vitalism", *Nature*, 242: 144, March 09.
● Gatlin, Lila L. (1974). "Conservation of Shannon's Redundancy for Proteins", *Journal of Molecular Evolution*, Vol 3, (pgs. 189-208).
● Freese, Peter. (1997). *From Apocalypse to Entropy and Beyond: the Second Law of Thermodynamics in Post-War American Fiction* (Gatlin, 8+ pgs). Die Blaue Eule.

External links

● Gatlin, Lila L. (1928-) – WorldCat Identities.

θΔics

In animate thermodynamics, **limnological thermodynamics** is the study and modeling of limnic processes and limnic systems, i.e. systems and processes in fresh water aquatic environments, at the limnological scale of 0.01 to 100 meters in size to 0.003 to 100 days in process time, based on thermodynamics. [1] In his 1998 *Physical Processes in Lakes and Oceans*, Australian water environmental engineer Jorg Imberger gives his summary of thermodynamics in limnology: [2]

> "**Thermodynamics** gives explanation not only to the limitations and performances of many biological phenomena at the organism level, but also at the ecosystem level, and also points to the forces structuring the biological world and offers methods useful in biological **limnology**."

History

Some of the first work in this field was done by German hydro-physicist Peter Mauersberger, beginning in the 1980s. [3]

Ecological thermodynamics

Often is the case that 'limnic-system scale' models are scaled up to explain behaviors and develop theory in the 'ecosystem scale' (≥ 100 m, > 10 days) in the formulation of testable ecological thermodynamics theories.

Molecule-centric view

Interestingly, the molecule-centric view of organisms as "single abstract molecules", that react with each other in the form of complex larger scale chemical reactions, with a measureable stoichiometry, is a common modelling scheme used in limnology, and in which resulted in the first-ever know calculation of the molecular formula for the human molecule, by American limnologists Robert Sterner and James Elser, published in 2002. [3]

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θΔics

In science, **lines of force** or "lines of magnetic force" are force lines created in a magnetic field or around a permanent magnet; also defined as imaginary lines in a field that enable the direction and strength of the field to be visualized.

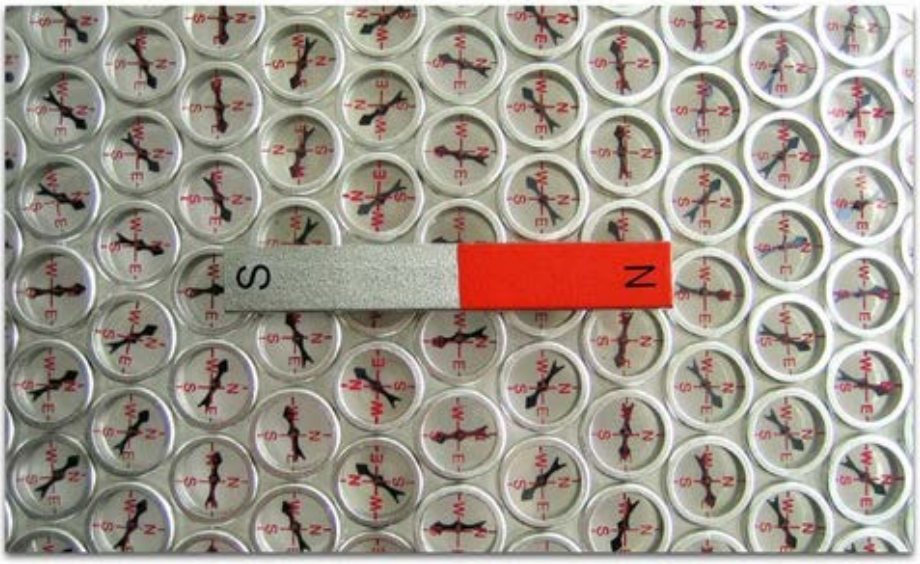

A compass needle depiction of **lines of force**, showing who the magnetic field lines go out of the north end of the bar magnetic and curve back around and project into the south end of the magnet.

The lines of force concept is primarily used in electric and magnetic fields; in electric fields they are sometimes called "tubes of forces", to express their characteristic of being perpendicular to a conducting surface. [8]

History

In 1716, English astronomer physicist Edmond Halley diagrammed which he called "circulating effluvia", otherwise known as of magnetic field lines, found by placing a magnetic terrella (Q) on a level surface, then scattering some fine iron filings around it, after which, given some some gentle tapping, the filings settle into patterns shown below: [5]

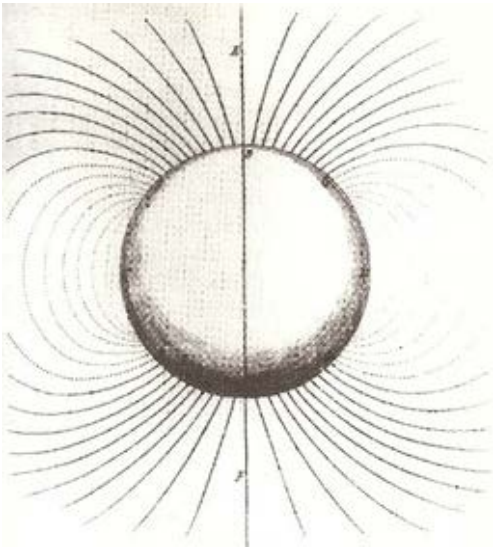

The following are similar depictions using a permanent magnet, iron filings and compasses:

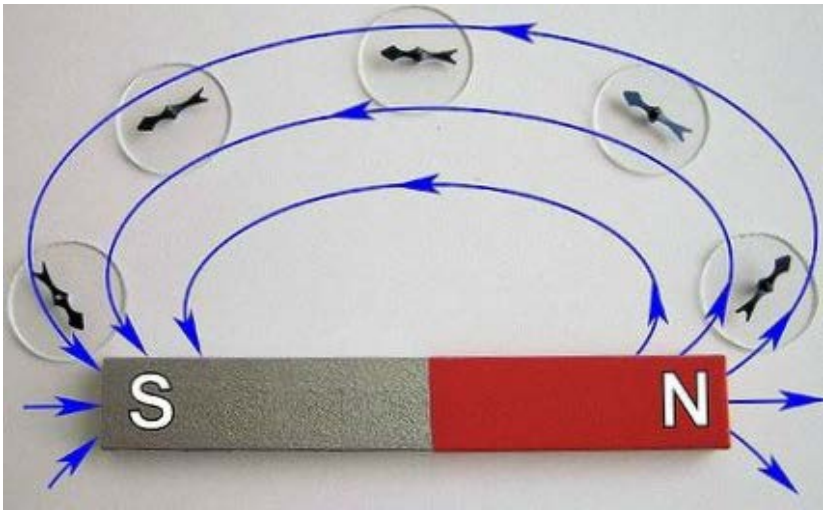

In the 1830s, English chemical physicist Michael Faraday adopted Halley's circulating effluvia ideas into a "lines of force" theory. In 1852, Faraday published “On the physical character of the lines of magnetic force”, in which Faraday affirms the physical reality of lines of force, and their causal action, as distinct from a purely geometrical treatment of their distribution in space.

In 1856, Scottish mathematical physicist James Maxwell, building on the previous work of Faraday, published his paper entitled “On Faraday’s Lines of Force” in which he outlined a physical geometry of lines of force model. In 1861-62, Maxwell expanded his earlier ideas to develop a physical representation of lines of force, to describe a physical mechanics of the field.

Hmolscience

In hmolscience, one of the first to use lines of force arguments was American historian Henry Adams:

> “The object of education should be the teaching [of] how to react with vigor and economy. No doubt the world at large will always lag so far behind the active mind as to make a soft cushion of inertia to drop upon; but education should try to lessen the obstacles, diminish the friction, invigorate the energy, and should train minds to react, not at haphazard, but by choice, on the **lines of force** that attract their world.”
>
> — Henry Adams (1907), *The Education of Henry Adams* [1]

A “time wheel” view of a 2004 party in Hungary, following their joining of the European Union; one person’s depiction of how people move along “partial complexities of political, economic and social **lines of force**.” (Q)

German physiologist Wolfgang Kohler (1887-1967), student of Max Planck, who spent 1907-1909 at the University of Berlin focused on a link between physics and psychology, supposedly, in his early work with apes, employed some type of Faraday-based lines of force model of movement, which John Martin summarizes as follows: [6]

> “In his early work with apes (1917), Kohler had described their movement in some cases using a metaphor of traversing one of the **‘lines of force’** that Faraday saw emerging from magnets. One example was the inability of an animal near a desired object to move away in order to take a successful indirect path around an intervening obstacle, this inability increased the closer the animal came to the object, such that an animal beginning on an

> insightful, indirect path might be drawn helplessly to the object if it came too near it and would end up abandoning the successful initial plan. In such cases, the action of the animal would be better explained by proposing that the object had a gravity0like pull than by attempting to explain the animal responding to differential stimuli from the environment."

In 1945, American physical historian Morris Zucker, following the lead of Adams, employed lines of force descriptions in his history theories:

> "We will soon have the occasion to discuss the social philosophies of some really great physicists when they deign to pass judgment on social questions. Here we are concerned with an attempt to engraft 'relativist' history through the medium of relativist phraseology. The frame of reference, **lines of force** in a gravitational field, the time-space continuum, all these are noble conceptions in physics where they are endowed with precise meaning and have been subjected to experimental proof. Writers have attempted to smuggle these conceptions into history by the simple expedient of employing the same idioms. They sound the same, but have not the same meaning. Let them use facts instead of phrases, proof instead of analogies."
>
> — Morris Zucker (1945), *A Field Theory of History* [2]

> "[**Zucker's**] positive interest is the new physics of Einstein and his twentieth-century associates. He believes that history like matter is made up of fields of force which have definite and predictable relationships, and of **lines of force** which can be traced in the past and projected into the future so that the historian may prophesy."
>
> — Roy Nichols (1945), "Book Review: *The Philosophy of History*" [3]

In *circa* 1955, Polish novelist Witold Gombrowicz penned his *Pornografia* wherein he utilized a mixture of Faradays's lines of force and Goethe's 1799 theory of human chemical affinities to explain human passions and desires. [4]

French philosopher Gilles Deleuze, is said to have used "lines of force" theories somewhere in his arguments and discussions. [7]

See also

- Floating magnets experiment
- Molecular vortices

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External links

- Lines of force – Wikipedia.

θΔics

In classifications, **Linnaean classification** refers to the tripartite divide of nature, devised by Carl Linnaeus, into: mineral (see: mineral life), plant (see: plant life; vegetable life), and animal (see: animal life).

Overview

In 1735, Carl Linnaeus, in his *System of Nature: Through the Three Kingdoms of Nature*, divided nature into the following three kingdom conceptualizations:

> "Stones grow; plants grow and live; animals grow, live, and feel."

This quote seems to have been passed on over the next century, verbatim, with little reflection, until about the mid-19th century, when people started questioning the "stones grow" assertion; or for example, to what extent plants can "feel". The following is a DeviantArt.com rendition of a Linnaean-like animal, vegetable, mineral divide, each of them alive and intelligent, in some sense: (Ñº)

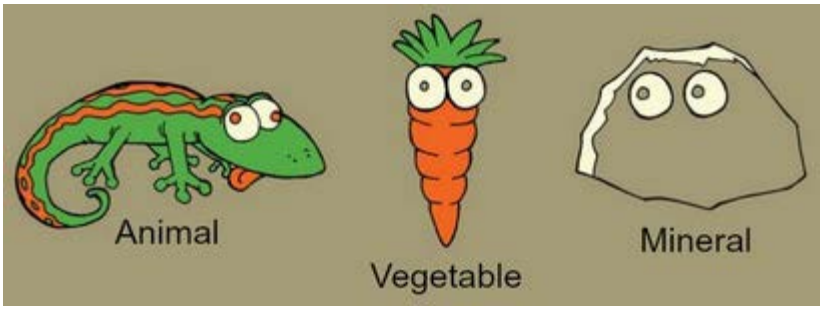

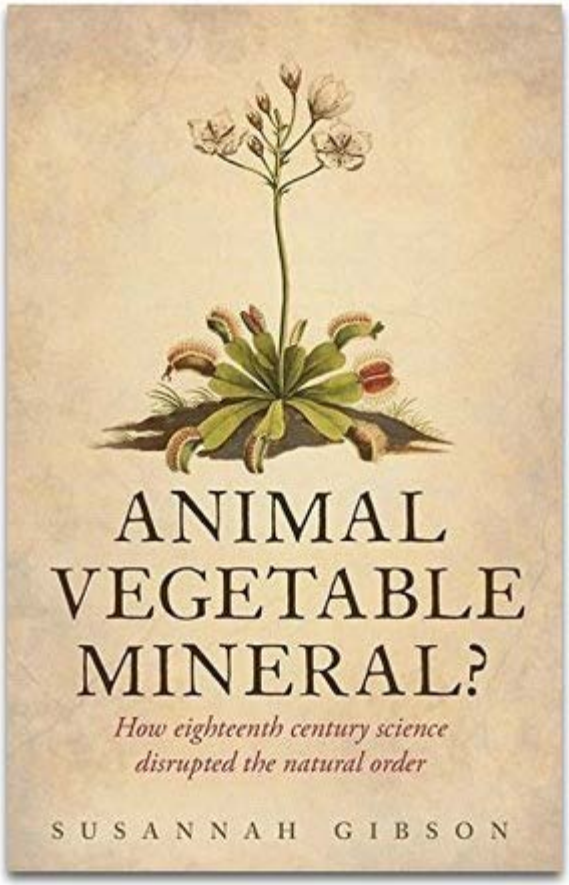

English science historian Susannah Gibson's 2015 *Animal, Vegetable, Mineral?*, goes onto the inside look at the implications of dividing nature into three partitions; which conflicts, e.g. with Jacob Berzelius's 1808 two-natures view of chemistry (organic/inorganic), or Goethe's one nature view (1809) of all, via he metamorphology theory of form development. [2]

In 1758, Linnaeus, in the 10th edition (Ñº) of his *System of Nature*, introduced the binomial nomenclature for animals, something he had already done for plants in his 1753 *Species Plantarum*.

In 1808, this tri-division nature model, via Swiss chemist Jacob Berzelius, was reformulated into a two-division model of the organic and inorganic divide, in chemistry.

In 2015, Susannah Gibson, in her *Animal, Vegetable, Mineral? How Eighteenth Century Science Disrupted the Natural Order*, gives a history of the inside controversies of the three kingdom divide model; the abstract of which is as follows: [2]

> "Since the time of Aristotle, there had been a clear divide between the three kingdoms of animal, vegetable, and mineral. But by the eighteenth century, biological experiments, and the wide range of new creatures coming to Europe from across the world, challenged these neat divisions. Abraham Trembley found that freshwater polyps grew into complete individuals when cut. This shocking discovery raised deep questions: was it a plant or an animal? And this was not the only conundrum. What of coral? Was it a rock or a living form? Did plants have sexes, like animals? The boundaries appeared to blur. And what did all this say about the nature of life itself? Were animals and plants soul-less, mechanical forms, as Descartes suggested? The debates raging across science played into some of the biggest and most controversial issues of Enlightenment Europe. In this book, Susannah Gibson explains how a study of pond slime could cause people to question the existence of the soul; observation of eggs could make a man doubt that god had

created the world; how the discovery of the Venus fly-trap was linked to the French Revolution; and how interpretations of fossils could change our understanding of the earth's history. Using rigorous historical research, and a lively and readable style, this book vividly captures the big concerns of eighteenth-century science. And the debates concerning the divisions of life did not end there; they continue to have resonances in modern biology."

(add)

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External links

â— Linnaean taxonomy – Wikipedia.

θΔics

In existographies, **Linus Pauling** (1901-1994) (IQ:190|#29) [RGM:182|1,500+] [GCE:#] (EPD:F9) (CR:85) was an American chemical engineer noted for his work on the nature of the chemical bond and for his later years debates and discussions on the chemical and thermodynamic nature of the question "what is life?", such as in his 1970 biochemistry chapter, and his 1987 conference presentation "Schrodinger's Contribution to Chemistry and Biology" wherein he attacks — or more correctly "rips apart" — Austrian physicist Erwin Schrodinger's 1943 negative entropy formulation solution to the question of what life is, a solution that Schrodinger had to famously defend in his infamous Note to Chapter 6. [1]

Early years

Pauling, interestingly, is part of the early parental death and genius group, a phenomenon common to scientific revolutionists and double Noble Prize winners, of which Pauling is the latter variety. In particular, Pauling's father dereacted (died) when he was nine and he would go on to win the Nobel Prize in chemistry in 1954 and the Nobel Prize in peace in 1962. Only three others, namely Marie Curie, John Bardeen, and Frederick Sanger, have one two Nobel Prizes, and of this exceedingly rare group: 3 out of 4 were the product of early parental death.

Overview

Pauling had a startup chemical company (before age 15); BS in chemical engineering age 21 (1922), during which time he became aware of the work of Gilbert Lewis (IQ=190) and Irving Langmuir on the electronic structure of atoms and their bonding to form molecules, PhD in physical chemistry and mathematical physics (1925), then (1926) to Europe on a Guggenheim Fellowship, to study under Arnold Sommerfeld (IQ=180) in Munich, Niels Bohr (IQ=185) in Copenhagen, and Erwin Schrödinger (IQ=190) in Zürich, during which time he became interested in how quantum mechanics might be applied in his chosen field of interest, the electronic structure of atoms and molecules; also, in Zürich, Pauling was also exposed to one of the first quantum mechanical analyses of bonding in the hydrogen molecule, done by Walter Heitler and Fritz London; after which he became one of the first scientists in the field of quantum chemistry and a pioneer in the application of quantum theory to the structure of molecules; his 1939 *The Nature of the Chemical Bond* has been referred to as the "bible" of modern chemistry [4]; gets upgrade for, in 1989, ripping apart Schrodinger's thermodynamic views on life (see: Note to Chapter 6).

Chemical bond

See main: History of chemical bonding theory

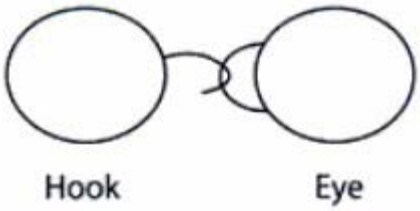

The "hook and eye" atomic bonding model, the model that was taught to **Pauling** in 1917 as an undergraduate chemical engineering student at Oregon Agricultural College.

Interestingly, and some might say astonishingly, in 1917, as an undergraduate chemical engineering student, at Oregon Agricultural College, Pauling was taught the Dalton-version of hook-and-eye bonding model, which was the vogue description of bonds between atoms at the time. Each atom had a certain number of hooks that allowed it to attach to other atoms, and a certain number of eyes that allowed other atoms to attach to it. A chemical bond resulted when a hook and eye connected. Pauling, however, of course, wasn't satisfied with this archaic method and looked to the newly-emerging field of quantum physics for a new method. [2]
By 1932, Pauling had developed the hybrid orbital model of chemical bonding and his famous 1939 textbook *The Nature of the Chemical Bond*, which he interestingly dedicated to Gilbert Lewis, would go on to become referred to as "Bible of modern chemistry".

What is life?

In opening to his biochemistry chapter of the 1970 edition of his *General Chemistry*, Pauling asks the following: [3]

> "What is it that distinguishes a living organism, such as a man or some other animal or a plant, from an inanimate object, such as a piece of granite?"

In response to this question, in a somewhat ambivalent manner, he answers that it must have internal metabolic reactions and the capacity for reproduction. He then abjures from this position, in some sense, by bring up the question of whether or not the virus (or virus molecule) is alive? He comments on this:

> "If we were to define a living organism as a material structure with the power of reproducing itself, then we would include the plant viruses among the living organisms. If, however, we require that living organisms also have the property of carrying on some metabolic reactions, then the plant viruses would be described simply as molecules, with molecular weight of the order of magnitude of 10,000,000, that have a molecular structure as to permit them to catalyze a chemical reaction, in the proper medium, leading to the synthesis of molecules identical with themselves. The giant virus particles or molecules may be described as aggregates of smaller molecules, tied together in a definite way."

This teetering point of view, as we see, is leaning towards the defunct theory of life position: namely that when one starts to view all animate things as large molecules with molecular weights that obey stoichiometry the premise of defining a molecule as being "alive" becomes unwieldy to the point of being untenable following prolonged introspection. In other words, if Pauling were to have arrived at the human molecular hypothesis and envisage humans "simply as molecules", as he says, or "human molecules", the above statement could be rephrased as:

> "[Humans can] be described simply as molecules, with molecular weight of the order of magnitude of (add), that have a molecular structure as to permit them to catalyze a chemical reaction, in the proper medium, leading to the synthesis of molecules identical with themselves."

This, however, might have been too big of a jump for 1970.

Quotes | On

The following are notes of praise and or tribute:

> "By virtually any standard of measure, **Linus Pauling** ranks as one of the most-influential and celebrated scientists of the twentieth century. Pauling's *The Nature of the Chemical Bond*, in its three editions and numerous translations, is the most cited scientific book of all time."
>
> — Zeleck Herman (1997), "Force of Nature: the Life of Linus Pauling: Linus Pauling in His Own Words" [5]

Quotes | By

The following are related quotes:

> "Only when I began studying chemical engineering at Oregon Agricultural College did I realize that I myself might discover something new about the nature of the world."
>
> — Linus Pauling (c.1960) (Ñº)

References

1. Pauling, Linus. (1989). "Schrodinger's Contribution to Chemistry and Biology", in: *Schrodinger: Centenary Celebration of a Polymath* (§18, pgs. 225-). Cambridge University Press.
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External links

â— Linus Pauling – Wikipedia.

θΔics

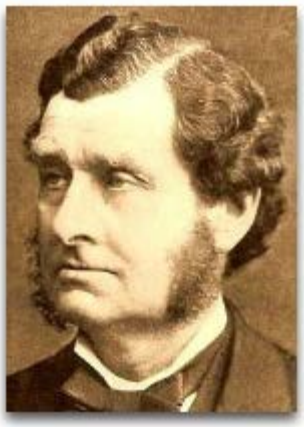

In hmolscience, **Lionel Beale** (1828-1906) was a British physician and microscopist noted for his 1870 *Protoplasm: Life, Force, and Matter*, and publications into the 1880s, wherein he digs in to the life from non-life debate, arguing to the effect that the physical view of life is untenable, and therein siding with his own peculiar brand of vitalism, which holds that because there is a difference between how a so-called "living" cell responds to staining, as compared to a non-living cell, that the nucleus must hold the "bioplasm" or essence of life.

Bioplasm | Stain reaction theory

Beale discovered that the nucleus of active (living) organisms stained with basic dyes, while those of non-active (nonliving) organisms stained with or were more apt to stain with acid dyes. On this basis, Beale reasoned that the more acid and organelle appeared to be, the more "vital" its activities were, after which he (1878) and others, such as John Drysdale (1874), came to believe that the nucleus must contain the essence of life or bioplasm. [2] The following are a few example quote of Beale's position:

> "The opinion that life is a form or mode of energy or motion has for many years past been gaining an increased number of advocates, and now appears to be very generally entertained and taught by scientific men. The idea that life is a power, force, or property of a special and peculiar kind, temporarily influencing matter and its ordinary forces, but entirely different from, and in no way correlated with these, has been ridiculed, and is often spoken of as if it were too absurd to require refutation."
>
> — Lionel Beale (1870), *Protoplasm: Life, Force, and Matter* (pg. 1)

> "The physical theory of life [holds that] that a living, moving, growing thing is but a force-created, force-impelled machine. [Physical life theorists] teach that life is but a mode of ordinary force, and that the living thing differs from the non-living thing, not in quality, or essence, or kind, but merely in degree; and yet they cannot satisfactorily explain the difference between a living thing and the same thing dead. They would perhaps tell us that living and dead are only relative terms; that there is no *absolute* difference between the dead and living states; and that the thing which we call *dead*, is, after all, only a few degrees less actively living than the thing we say is *alive*. But is this sort of reasoning convincing, seeing that although matter in the living state may suddenly pass into the dead state, this same matter can never pass back again into the living condition? Those who advocate this doctrine do not believe in the actual annihilation of force, when a living thing suddenly passes from the living into the dead state; but they do not demonstrate the new form or mode which the departing life-energy assumes, or explain to us what in their opinion becomes of it. If the dead thing only differs from the living thing by a few degrees of heat or units of force, why can we not, by supplying more heat or force, prevent dissolution, or cause the actions to go on again after they have once stopped?"
>
> — Lionel Beale (1870), *Protoplasm: Life, Force, and Matter* (pgs. 3-4)

(add discussion)

Owen | Magnetic life

Beale devotes a section to English anatomist Richard Owen's semi-vitalism like, originally conceived two-forces (Ñº) turned ordinary physico-chemical forces, notion of how living things have a power of selecting that is similar to a magnets power of selecting, and how death is similar to an unmagnetized steel. [3]

Grove | Battery life

Beale also devotes a section to Welsh physicist William Grove's 1869 assertion that the galvanic battery was akin to an "experimental organism". [4]

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4. (a) Grove, William R. (1869). "An Address on the Importance of Physical Science in Medical Education", *British Medical Journal*, 57:485-87.
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External links

â— Lionel Smith Beale – Wikipedia.

θΔics

In chnopsology, **Lionel Harrison** (1929-2008) was an English-born Canadian physical chemist and theoretical biologist (powered chnopsologist) noted for his work on the physical chemistry of morphogenesis, in which, using what he refers to as the "physicochemical" view, which he contrasts with American plant growth theorist (Q) Paul Green's "biophysical" view, he investigates a minimum free energy configuration "cell-as-molecule" approach to cell formation. [1] In his 1993 *Kinetic Theory of Living Pattern*, Harrison stated something along the lines of the following: [7]

> "The problem of the physical chemistry of the development of form of organisms is a field with a great unknown and immensely existing. To pursue it is like trying to account for the rainbow in the 14th century, to do celestial mechanics before Newton, or to pursue quantum theory in the 1890s."

Chemical thermodynamics of form change aside, some of Harrison's theory, as he states, is culled from British polymath Alan Turing's "Chemical Basis of Morphogenesis" work.

Reaction | Acceptance / Rejection / Bemusement

See also: Two cultures tensions

In discussing his Figures 3.2 and 3.3, in his *Shaping of Life*, which show his five collected data points of calcium concentration vs *Acetabularia* hair whorl spacing, and how he made entropy and enthalpy determining van't Hoff plots from this data, Harrison humorously recounts the multi-disciplinary reaction to his work noted at few talks he gave on this data at various meetings: [7]

> (1) When I gave a talk on Turing reaction-diffusion theory to my home chemistry department, one of my colleagues remarked:
>
> > "It's nice to see that such an apparently difficult problem can be explained by a couple of differential equations."
>
> I thought 'Oh, dear. I haven't got over to him that most biologists reject this theory.'
>
> (2) A biologist said to me:
>
> > "Wouldn't it be a pit if the explanation turned out to be just physical chemistry"
>
> wrinkling his nose as if experiencing a bad smell.
>
> (3) After a talk in a chemistry department, one of the audience said to me:
>
> > "What I like about your [work] is that you go straight from the green stuff to differential equations."
>
> (4) At a poster show at the developmental biology meeting, my collaborator David Holloway was waylaid

by a posse from another modelling group who started their work from molecularly known genetic networks, saying:

> “Why don’t you guys use real molecules?”

This is all very hilarious, to say the least! These reaction comments, which can be summarized underlyingly as a neovitalism vs reductionism tension or cloaking, intermixed with defunct theory of life issues, are like toned-down versions of similar physicochemical approach applied to the human-scale reaction comments, such as found at: Libb Thims: attack, Elective Affinities: enemies vs admirers, detractors, human thermodynamics: objectors, variations of opinions expressed in the ongoing Rossini debate, the 2009 Moriarty-Thims debate, the 1902 "what is entropy?" debate, the so-called Bridgman paradox raised at the 1946 "what is life: in terms of physics and chemistry?" debate at Harvard University, etc. The I like how you go "straight from the green stuff to differential equations", supposedly, expressed by a chemistry department audience member, at the University of British Columbia, is very hilarious, a ripe example of nearly child-like hydraism found prevalent in the higher departments of learning.

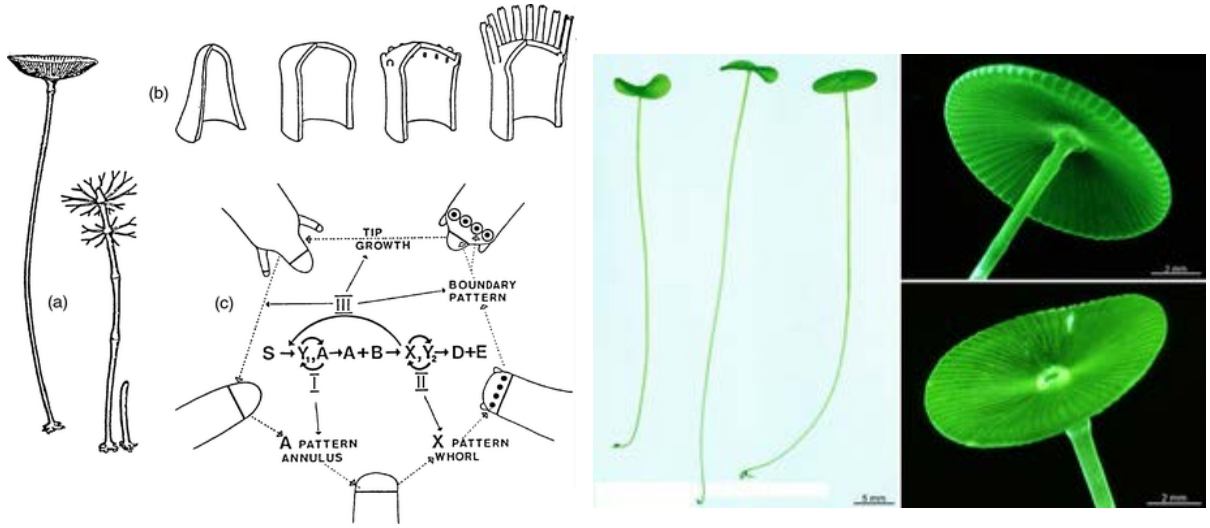

Left: a diagram of the hair whorl pattern formation in so-called life-cycle of *Acetabularia acetabulum* (Dasycladales), aka the ‘mermaid’s wineglass’, with which Harrison conducts a study in which he varies temperature and calcium concentration [Ca^{++}], measuring correlative changes in hair spacing, data from which he, supposedly, makes a van’t Hoff plot, from which he calculates enthalpy and entropy of binding, namely the binding of Ca^{++} to a putative receptor R. [8] Right: an image (O) of *Acetabularia acetabulum*.

Morphogenetic physical chemistry

In the 1970s, Harrison—supposedly after chairing the doctoral examination (1973) of American-born Canadian physical chemist and marine zoologist Thurston Lacalli—turned his research focus to the physical chemistry of morphogenesis (see also: morphology). [6] In the early 1980s, at the age of about 53, Harrison, within the space of a few weeks, lost both his wife and his only son, after which his time was increasingly spent on his scientific activities, continuing his research into retirement. [7] Harrison’s faculty page, at the time of his death (reaction end), listed his sole research interest as “experimental and theoretical work on pattern formation in the morphogenesis of living organisms.”

Morphology and free energy

Canadian zoologist Daniel Brooks and American systems ecologist Edward Wiley summarize Harrison’s theory as such: [4]

> “Morphogenesis would be best explained as a process in which the organism’s shape emerges as it achieves minimum free energy (thermodynamic equilibrium) through the disposition of intercellular forces.”

Harrison’s posthumously-published *The Shaping of Life*, mentions “free energy” on at least nine pages, but oddly doesn’t mention “Goethe” the inventor of “affinity” based morphology/morphogenesis, which is the forerunner to Harrison’s theory via the 1882 Goethe-Helmholtz equation.

Cell-as-molecule approach

Harrison derived some of his ideas on cell formation from the 1964 thermodynamic differential adhesion hypothesis of American cellular pathologist Malcolm Steinberg, namely his 1970 embryonic chick tissue formation experiments.

In 1981, Harrison, in his "Physical Chemistry of Biological Morphogenesis", defined morphogenesis as "the creation of a complicated out of a simpler one by chemical processes", and went on to expand on the earlier work of Alan Turing (1952) and Albert Lehninger (1975). [2]

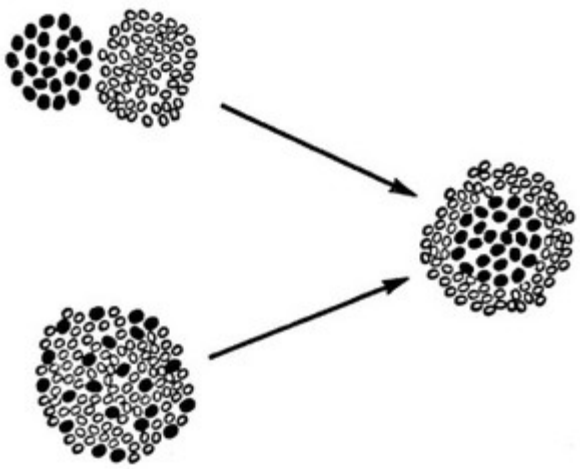

Harrison's circa 1980 **cell-as-molecule** approach: viewing a cell as a type of large molecule, formed under free energy minimum principles; a model loosely-inspired by the 1970 work of embryonic chick tissue formation experiments of American cellular pathologist Malcolm Steinberg. [1]

In 1982, in his symposium contribution "An Overview of Kinetic Theory in Developmental Modeling", Harrison stated the following:

> "This picture of cell-as-molecule is a very good start, which needs a lot more attention from physical chemists to establish its scope and limitations. For example, a cell is never, in respect from what is going on inside, at equilibrium so long as it is alive. Sorting-out or engulfment occurs much too rapidly to be attributable to Brownian motion of such large things as cells. Nevertheless, the active movement of cells may in some instances be random, and the use of equilibrium concepts for their behavior in assemblies will then be valid, with appropriate careful redefinitions of the equivalents to some thermodynamic properties of molecular assemblies."

In the same article, on chemical kinetics, he states:

> "It is possible for a structure, essentially heterogeneous, to arise and be maintained by chemical reactions and transport processes, when the equilibrium state would be homogeneous. Kinetics alone then determine the gross morphology of the system. I would like to call such things 'kinetically maintained structures'. Some thermodynamicists refer to them as 'dissipative structures'."

The Shaping of Life

The following is a summary section from the foreword to Harrison's last and final book *The Shaping of Life*—completed in 2008, published posthumously in 2011, written by his graduate student, Canadian physical chemist and marine zoologist Thurston Lacalli: [7]

"Consider, for example, the production of the human hand with five digits from its flattened, paddle-like beginnings: this is generally accepted as a form of differentiation, and the end product does look more ordered, or at least anatomically more complicated, than the beginning. But the cells involved, of cartilage, connective tissue and skin, are still doing pretty much the same jobs, only the locations have changed. So how much ordering has actually occurred, and if this is truly differentiation, is it a trivial amount in quantitative terms, or something worth accounting for in relation to the cost paid in disorder by the rest of the universe? Thermodynamics is the way to deal with such questions, but we as yet have only the most rudimentary beginnings of a thermodynamics applicable to the complexities of living systems.

> Lacking this, Lionel's approach, best exemplified in his *Acetabularia* experiments [Chapter 3], was necessarily empirical, and as such, entirely characteristic for a physical chemist: measure patterns and pattern change directly, vary the conditions over which you have control, and analyze the outcome. Here he came closest to putting meaningful numbers on an otherwise mysterious process, deducing such exotic

thermodynamic beasties as ΔH and ΔS from measurements requiring only a dissecting microscope, thermometer and micrometer measuring scale. A complete thermodynamics of living systems is clearly some distance in the future, but of various routes to that future, this is certainly one."

See also: Lacalli's 2012 note "Some Thoughts on Lionel Harrison: His Motivation for a Career Change" (attached), in regards to Harrison's circa 1973 switch into the field of "biological physical chemistry."

Discussion

Harrison's work seems to be grappling with an attempt at reconciliation between the Prigoginean thermodynamics (kinetic chemical thermodynamics) "far-from-equilibrium" view of animate morphogenesis, as apposed to the Gibbsian thermodynamics (standard chemical thermodynamics) "equilibrium" view of free energy minimum regulating product formation, all in the context of, it seems, metabolism issues, turnover rate issues, cell boundary concepts, among others. Interesting digestion, all in all.

Education

Harrison completed his BS in chemistry in 1949 and PhD in physical chemistry both at the University of Liverpool in 1952, after which he worked for three years at the Imperial Chemical Industries, Ardeer, Scotland. In 1956, he became a physical chemistry professor at the University of British Columbia, retiring from that position and becoming professor emeritus in 1994.

Quotes | Other

The following is a posthumous summaries and related quotes:

> "Harrison's proximate goal was to discover how patterns of living things are formed or, to use the title form and earlier draft of this book, 'how life devises its shapes and sizes'. Cautious academics will avoid such fields until the ground rules are better worked out, and until it is clear that a predictable and, hence, grant-worthy rate of progress can be sustained. Coming from the relatively mature discipline of surface chemistry, Harrison, by contrast, was immensely excited by the prospect of doing research on aspects of biology still at the very early stage of their development. It was, to him, like doing 'celestial mechanics before Newton'."
>
> — Thursont Lacalli (2009), "Foreword" to *The Shaping of Life* [7]

> "Here [Harrison] came closest to putting meaningful numbers on an otherwise mysterious process, deducing such exotic thermodynamic beasties as ΔH and ΔS from measurements requiring only a dissecting microscope, thermometer and measuring scale."
>
> — Thursont Lacalli (2009), "Foreword" to *The Shaping of Life* [7]

> "Of course the first thing to do was to make a grand survey of the country she was going to travel through."
>
> — Lewis Carroll (1871), *Through the Looking Glass*, quote Harrison intended to use as epigraph to preface of sequel to *Kinetic Theory of Living Pattern* (1993) [7]

See also

- A fish is not a molecule? (2011) – Hmolpedia threads.

References

1. (a) Harrison, Lionel G. (1993). *Kinetic Theory of Living Pattern* (pg. 136). Cambridge University Press.
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2. Harrison, Lionel G. (1981). "Physical Chemistry of Biological Morphogenesis" (abs), *Chemical Society Reviews*, 10:491-28
3. Flank, Jessica and Plenert, Meribeth. (2012). "Lionel Harrison", Library. UBC.ca.
4. Brooks, Daniel R. and Wilson, Edward O. (1988). *Evolution as Entropy: Toward a Unified theory of Biology* (pgs. 124-25). University of Chicago Press.
5. (a) Harrison, Lionel G. (1982). "An Overview of Kinetic Theory in Developmental Modeling", in: *Developmental Order: Its Origin and Regulation* (pgs. 3-33) (editor: Stephen Subtelny). New York: Alan R. Liss.
(b) Brooks, Daniel R. and Wilson, Edward O. (1988). *Evolution as Entropy: Toward a Unified theory of Biology* (pgs. 125). University of Chicago Press.
6. (a) Flank, Jessica and Plenert, Meribeth. (2012). "Lionel Harrison", Library. UBC.ca.
(b) Thurston Lacalli (faculty) – University of Saskatchewan, Canada.
7. Harrison, Lionel G. (2008). *The Shaping of Life: the Generation of Biological Pattern* (rainbow, pg. i; wife and only son, pg. viii; Carroll, pg. xii; thermodynamics, 14+ pgs; cell-as-molecule, 4+ pgs; image, pg. 145; talk reaction, pg. 50). Cambridge University Press, 2011.
8. (a) Harrison, Lionel G, Wehner, Stephan, and Holloway, David. (2002). "Complex Morphogenesis of Surfaces: Theory and Experiment on Coupling of Reaction-Diffusion Patterning to Growth" (abs), *Faraday Discussions*, 100:277-93.
(b) Harrison, Lionel G. (2011). *The Shaping of Life: the Generation of Biological Pattern* (Figure 2.1, pg. 25; see also: Figure 3.1, pg. 43; Figure 3.3, pg. 49). Cambridge University Press.

Further reading

● Harrison, Lionel R. and Lacalli, T.C. (1978). "Hyperchirality: A Mathematical Convenient and Biochemically Possible Model for the Kinetics of Morphogenesis", *Proc. Roy. Soc. London.* B 202:361-97.

External links

● Lionel G. Harrison – Wikipedia.
● Harrison, Lionel G. – WorldCat Identities.

θΔics

In existographies, **Lise Meitner** (1878-1968) (IQ:165|#475) (Cropper 30:3/NP) was a Austrian-born Swedish physicist noted for []

Overview

In Dec 1938, Meitner, on a walk with her nephew Otto Frisch, figured out, based in part on Niels Bohr and George Gamow's suggestion that a nucleus might be akin to a liquid drop, which after becoming a certain size could split into two new droplets, that, via Einstein's mass-energy equivalence formula, the difference between the original uranium mass and the fragments, was converted into 200 MeV of energy, therein solving the then standing puzzle of uranium splitting, i.e. nuclear fission. [1]

Education

Meitner completed her PhD under Ludwig Boltzmann, on an experimental proof of one of Maxwell's equation, after which she studied under Max Planck.

Quotes | By

The following are quotes by Meitner:

> "Science makes people reach selflessly for truth and objectivity; it teaches people to accept reality, with wonder and admiration, not to mention the deep awe and joy that the **natural order of things** brings to the true scientist."
>
> — Lise Meitner (c.1950) (Ñº)

> "Even as a child I was strongly interested in mathematics and physics, and as I grew up I also developed a very pronounced inclination for social responsibility.... When I was 23 years old and about to enter the university, I entertained the idea of primarily pursuing medicine, for its social usefulness, and studying mathematics and physics only at the side. My father kept me from this incorrect choice by making it clear to me that such a course of study might be possible for a genius like Hermann Helmholtz, but not for another person."
>
> — Lise Meitner (c.1950) [2]

References

1. Cropper, William H. (2001). *Great Physicists: the Life and Times of Leading Physicists from Galileo to Hawking* (§22:330-43). Oxford University Press.
2. Sime, Ruth L. (1996). *Lise Meitner: a Life in Physics* (genius, 2+ pgs). University of California Press.

External links

â— Lise Meitner – Wikipedia.

θΔics

In IQs, **literary IQ** refers to the measure of one's intelligence in respect to world literature, classical and modern.

See also

- Military IQ
- Leadership IQ
- Literature chemistry
- Literary realism

External links

- Test Your Literary IQ – LithoGraphs.com.

θΔics

In literature, **literary realism**, or "realism literature", is literature that employs reality or realism in its narrative, storyline, plots, and morals, etc., as reality actually occurs.

Overview

On 23 Oct 1799, German polyintellect initiated the subject of "literary realism", when he complained to his friend Friedrich Schiller about the lack of realism in the work of French author Prosper Crebillon (1674-1762); specifically, according to Goethe:

> "Crebillon … treats the passions like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. There is no trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover."

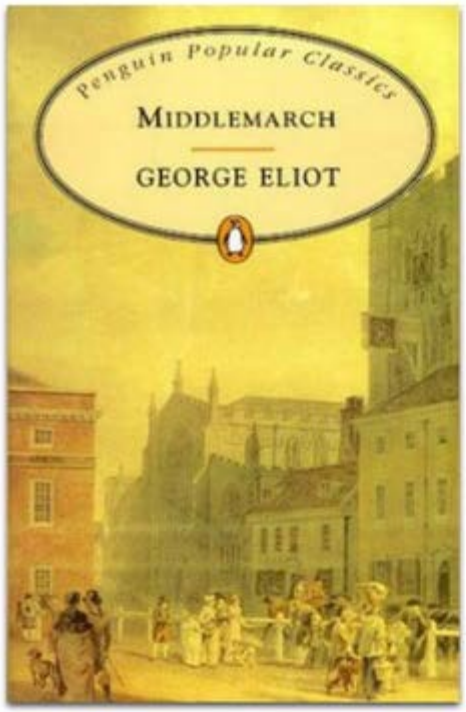

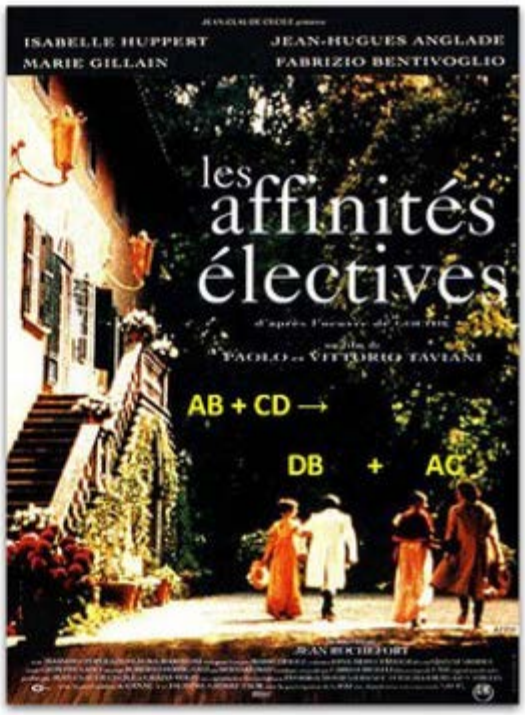

Right: Goethe's 1809 *Elective Affinities*, the source of inspiration for the majority of most literary realism authors, such as: George Eliot, Honore Balzac, and Benito Galdos, to name a few. Left: George Eliot's 1872 *Middlemarch*, philosophically based in part on Goethe's Elective Affinities, an example of "literary realism".

Goethe, in short, stated to the effect that Crebillion's writing is not realistic in the sense that it is not based on the way that people "react" to each other, according to the principles and outcomes of chemistry.

In 1809, Goethe published his physical chemistry based realism novella *Elective Affinities*, wherein each character is considered to be a chemical, and each chapter is considered to be a different chemical reaction and or mechanism of the grand reaction tale of the novel.

In 1889, German natural science popularizer Wilhelm Bolsche, in his essay "Goethe's *Elective Affinities* in Light of Modern Science", argued that the Goethe's *Elective Affinities* novel is realistic, and a and is a pioneering work of literary realism, due to its portrayal of natural forces and psychology, and that it should be seen as a predecessor to such realistic works such as George Eliot, who mentally absorbed the logic of Goethe's human chemical theory, and Honore Balzac, who likewise mixed affinity theory, chemistry, and passions together in his works. [1]

In 1959, Gunter Grass published his *The Tin Drum*, wherein the lead caries around a few pages of Goethe's *Elective Affinities* mixed with some pages from Rasputin, as a guidemap to the world, which is a novel part allegory, myth and legend, placing it in the genre, supposedly, of magic realism.

In 2010, Charlotte Bolsche, in her chapter section "Realism in Literature and the Laboratory", stated that the two leading realism authors are: Goethe (*Elective Affinities*, 1809) and his vicarious student George Eliot (*Middlemarch*, 1872). Emile Zola also is counted among realism authors. [1]

Others list French writer Stendhal and Russian writer Alexander Pushkin as among literary realist authors.

Spanish realism novelist Benito Galdos' 1887 *Fortunata Y Jacinta*, said to be based on Goethe's *Elective Affinities* relationship determinism philosophy, together with Spanish novelist Leopoldo Alas' 1885 *La Regenta* (*The Judge's*

Wife) are said to be the most popular and representative novels of Spanish literary realism. [3]

Realist writers

The major realist writers, according to Josh Rahn (2011), are the following: [4]

- Honore Balzac
- Fyodor Dostoyevsky
- George Eliot
- Gustave Flaubert
- Henry James
- Mark Twain
- Dean Howells
- Edith Wharton

(add discussion)

Quotes

The following are related quotes:

> "The dominant paradigm in novel writing during the second half of the nineteenth century was no longer the romantic idealism of the earlier part of the century. What took hold among the great novelists in Europe and America was a new approach to character and subject matter, a school of thought which later came to be known as realism. On one level, realism is precisely what it sounds like. It is attention to detail, and an effort to replicate the true nature of reality in a way that novelists had never attempted. There is the belief that the novel's function is simply to report what happens, without comment or judgment. Seemingly inconsequential elements gain the attention of the novel functioning in the realist mode. From Henry James, for example, one gets a sense of being there in the moment, as a dense fabric of minute details and observations is constructed. This change in style meant that some of the traditional expectations about the novel's form had to be pushed aside. In contrast to what came before, the realistic novel rests upon the strengths of its characters rather than plot or turn of phrase. The characters that the realistic school of novelists produced are some of the most famous in literary history, from James' Daisy Miller to Dostoyevsky's Raskolnikov. They are psychologically complicated, multifaceted, and with conflicting impulses and motivations that very nearly replicate the daily tribulations of being human."
>
> — Josh Rahn (2011), "Realism", The Literature Network [4]

References

1. (a) Bolsche, Wilhelm. (1889). "Goethe's *Elective Affinities* in Light of Modern Science" ("Goethes *Wahlverwandtschaften* im Lichte moderner Naturwissenschaft"), Publisher.
(b) Tantillo, Astrida O. (2001). Goethe's *Elective Affinities* and the Critics (pg. 80). Camden House.
2. Sleight, Charlotte. (2010). *Literature and Science* (§4: Realism in Literature and the Laboratory). Palgrave Macmillan.
3. Fortunata y Jacinta – Wikipedia.
4. Rahn, Josh. (2011). "Realism" (Q), *The Literature Network*.

External links

- Literary realism – Wikipedia.

θΔics

In terminology, **literature**, from the Latin *litteratura* 'writing', refers to writings in prose or verse; especially those having excellence of form or expression and expressing ideas of permanent or universal interest. [1]

Physical science infused literature

American science and literature scholar Lance Schachterle summarizes the basic catch of physical science based novelists as follows: [2]

> "Writers as diverse as Fowles, Barth, Updike, Vonnegut, Pynchon, Robins, DeLillo, Coover, Nabokov, Lem and Sikenick employ concepts or metaphors from the physical sciences in their work. The first seven of these novelists are examined in Robert Nadeau's *Readings From the New Book on Nature: Physics and Metaphysics in the Modern Novel* (1981). More recently, David Porush has examined some of the same figures in his *The Soft Machine: Cybernetic Fiction* (1985)."

(add discussion)

See also

- Literature chemistry
- Literature thermodynamics
- Literary realism

References

1. Merriam-Webster Collegiate Dictionary, 2000.
2. Schachterle, Lance. (1990). "Introduction: the Metaphorical Allure of Modern Physics", in: *Beyond the Two Cultures: Essays on Science, Technology, and Literature* (editors: Joseph Slade and Judith Lee) (pgs. 177-84). Iowa State University Press.

External links

- Literature – Wikipedia.

θΔics

In conferences, **Literature and Chemistry: Elective Affinities** was a 27-28 October 2011 literature chemistry conference that took place at the University of Bergen, centered thematically on German polymath Johann Goethe's 1809 physical chemistry novella *Elective Affinities*; and to a certain extent some of the works of Italian chemist turned writer Primo Levi.

The poster to the conference is shown adjacent, depicting (right) a chemical reaction occurring a beaker and (left) some type of alchemical vessel, with the alchemical marriage (see: Chemical Wedding) symbol on the vase; such as is shown on British artist Wolfe von Lenkiewicz famous 2011 oil on canvas "Elective Affinities" painting.

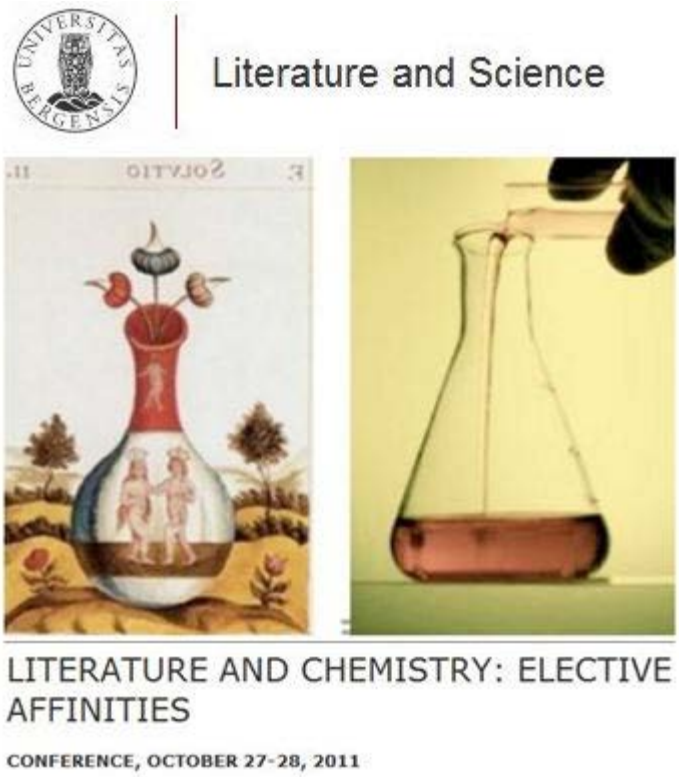

The poster for the 27-28 October 2011 **Literature and Chemistry: Elective Affinities** literature chemistry conference, themed around German polymath Johann Goethe's 1809 physical chemistry novella *Elective Affinities* (see: Goethe timeline). [1]

Presenters

The three main presenters of relevance at this conference seem to have been:

â— Frode Pedersen | "Demonic Affinities: On Goethe's *Die Wahlverwandtschaften*"

> Abstract: "Goethe's usage of the term 'elective affinity', culled from Bergman's 1775 *De Attractionibus Electivis* (German translation, 1785), referred to the tendency of certain chemical species to form pairs. When extended to the sphere of interpersonal relationships, as is done in Goethe's novel, this has implications for the view on the human as such. If persons behave like chemical species, their behavior must to some extent be pre-determined, with no room for free will. Goethe's thinking on these matters must be viewed in relation to Schelling's philosophy of nature, in which the sphere of nature and the sphere of human consciousness are seen as continuous."

This seems to have been an interesting presentation.

â— Takaoki Matsui | "From Lavoisier to Dalton and Davy: Towards the Complete Decipherment of Goethe's *Elective Affinities*"

> Abstract: "Goethe composed *Elective Affinities* as a satire on prominent scientists such as Newton, James Watt, Joseph Priestley, Thomas Young, Marie Lavoisier and Count Rumford. Disguised as supporting characters, they experiment with the so-called four elements – which are represented by the four protagonists – and bring them to death and separation (decomposition). The relationship of the protagonists symbolizes not only the law of chemical affinities but also theories of astrophysics. The events in their estate suggest how the correspondence of macro- and microcosm is transformed: The alchemical view of nature and human life was destroyed both by new discoveries in astronomy and by physiological experiments of chemists and physicians."

This presentation seems to have been complete distorted fiction, as none of this occurs in Goethe's mind, nor his "best book" novella—it almost seems to be a remade fiction upon the original semi-autobiographical physical chemistry based fiction, something akin to Tom Stoppard's 1993 *Arcadia* remake. ; the entire argument here seems seems to be a nearly made up fantasy of the Matsui, from who knows where? Beyond this, it is well known that the one field Goethe never

touched was astrophysics.

â— Henrik Johnsson | “August Strindberg and the Chemical Language of Human Relations”

> Abstract: August Strindberg (1849-1912) exhibits a lifelong interest in the natural sciences. In the 1890s he abandons literature completely and instead tries to start a new career as a chemist. His attempts at making gold while living in Paris are indicative of a world-view inspired by Ernst Haeckel's monism, and the monistic assumption that all matter is interrelated continues to support Strindberg's perception of the natural world long after he has abandoned chemistry and returned to writing fiction. The most notable imprint left by his scientific interests on his literary texts is a metaphorical language, rooted in both chemistry and an older tradition of alchemy, which is used to describe human relations. Lovers are described as having merged and become compounded individuals, active minds are seen as magnetic batteries, the individual facing a religious crisis has his soul transmuted into "gold", the creations of an author are termed homunculi. These and other examples illustrate how Strindberg incorporates the natural sciences into his literary style and draws inspiration from chemistry and related disciplines when describing how humans interact. In my paper I will elucidate the relationship between Strindberg's scientific interests and his attempts at becoming a bona fide chemist, and examine how he uses a "chemical language" to express the unique qualities of human relationships and the human condition.”

This seems as though it might have been an interesting presentation to listen to.

Note

Of curiosity, on 17 Aug 2011, American electrochemical engineer Libb Thims found about the conference, via Internet searching, and quickly dispatched off an email to conference organizers Randi Koppen, Margareth Hagen, and Margery Skagen that he would like to present and participate at the conference, but shortly thereafter was informed by Koppen that:

> “The deadline for paper proposals is now past, and with the number of proposals received already significantly exceeding the maximum number of participants, we regret that we will not be able to accept any further proposals.”

The irony of the situation indeed! The only thing more ironic would have been if Goethe himself would have come forward in time and been turned down as a presenter to this conference on his greatest work—Thims currently being the world’s leading and greatest expositor of Goethe’s self-defined greatest theory (see: Goethe timeline).

Related

On 21-24 March 2013, The University of Sao Paulo, Brazil, is hosting a 5-day “Architectural Elective Affinities Conference”, themed on the subject of “architectural elective affinities”, which they defined as a “complex borrowing of the Weberian concept of elective affinities, namely the: attractions, interactions and similarities between individuals or disciplines and fields of research—used as a tool for grasping the development of architectural forms in the perspective of specific spatio-temporal structures.” The synopsis of the conference seems to be the following:

> “The elective affinities operative between architectural history and other disciplines- such as literature, history, sociology, anthropology, arts, including the photography and the cinema - have been lengthily debated in the past years. The conference intends particularly to identify these affinities, looking from inside the discipline of architecture.”

The conference seems to be digging around in the area of architectural thermodynamics; to some extent.

References

1. Pratt-Smith, Stella. (2011). “Literature and Chemistry: Elective Affinities” (call for papers) (program) (abstracts), The British Society for Literature and Science, Interdisciplinary conference organized by the research group Literature and Science, Department of Foreign Languages and Literatures, The University of Bergen 27-28 Oct.
2. Pedersen, Frode H. (2011). “Demonic Affinities: On Goethe's *Die Wahlverwandtschaften*” (abstracts), Literature and Chemistry: Elective Affinities Conference, Bergen University, Oct 27-28.

θΔics

In human chemistry, **literature chemistry** is the use chemical theory, principles, laws or models in the construction of a literary work or the study of the use of chemistry used in literature. One of the best representative passages form a literary work that directly employs chemical theory as a model for human interactions is found in the 1999 novel *Milton's Progress* by American author Forbes Allan in which one of the characters states:

> "People are like particles, they behave in groups as if they were molecules in a test-tube."

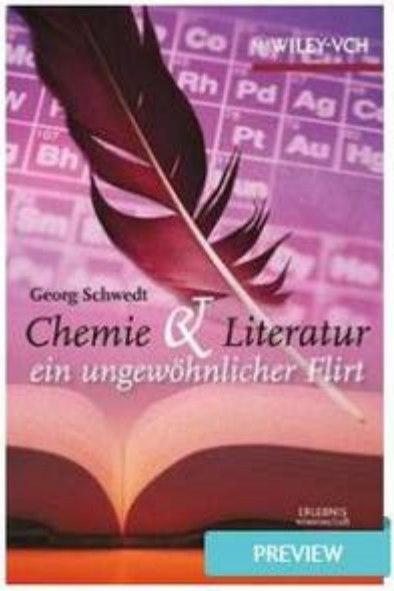

Left: English physical chemist Philip Ball's 2008 *Chemistry World* article "Literary Reactions", in which he gives a thorough overview of the historical use of writers who use chemistry logic and models as conceptual elements of the plot in literature, including: John Donne (*The Comparison*, c.1590), William Shakespeare (*King Lear*, 1606), Johann Goethe (*Elective Affinities*, 1809; *Faust*, 1832), Mary Shelley (*Frankenstein*, 1818), Thomas Pynchon (*Gravity's Rainbow*, 1973), and Oliver Sacks (*Uncle Tungsten*, 2001). [5] **Right:** German writer Georg Schwedt's 2012 *Chemistry and Literature*, which covers similar ground, from Goethe's *Elective Affinities* to Eco's "The Name of the Rose". [11]

One character of the novel, a "Ilya Meiliakin", is modeled on Nobel Prize winning chemist Ilya Prigogine, noted author of numerous social thermodynamics theories.

Overview

The relationship between literature and chemistry has a long history, reaching back to the time before the existence of chemistry as a scientific discipline, to alchemy and natural philosophy, and to philosophers and poets like Epicurus, Lucretius, and in particular Empedocles and his famous chemistry aphorisms.

The first definitive mention of chemical theory arguments in literature seems to have been made in an October 23, 1799 letter written by German polymath Johann Goethe to his associate German author Friedrich Schiller, wherein Goethe criticizes the work of French author Prosper Crebillon to the effect that Crebillion's writing is not realistic in the sense that it is not based on the reality that people react according to the principles and outcomes of chemistry. The specific comment by Goethe, in this letter, in which he first mentions the outlines of his soon-to-be theory-infused novella, is as follows: [7]

> "There is no trace of the delicate *verwandtschaft* (affinity) through which they (his characters) attract and repel, neutralize each other, separate again and re-establish themselves."

In other words, in 1799, Goethe viewed the forces of personal relationships to be chemical forces, just as is chemical affinity understood, in modern terms, to be the force or reaction. [7]

Goethe was a first rate chemist in his own right, having been conducting his own chemical experiments since the age of 19 and reading and doing research in chemistry for over 40 years, even employing his own personal chemist, German chemist Johann Dobereiner as a personal research assistant in later years. Goethe eventually transformed this theory into his 1809 novella *Elective Affinities*, which is generally held to represent one of the most notable metaphoric explorations of chemistry; with its suggestion of human connections as originating at a chemical level. [2]

In particular, a year before publication Goethe, who had been studying chemistry for a period of forty-years, told his friend Friedrich Riemer that 'his idea for the new novella was to portray social relationships and their conflicts symbolically', as in *a*, *b*, *ac*, *abd*, *abcd*, etc., a statement in reference to a Scottish physician and chemist William Cullen's 1757 pioneering development of chemical affinity reaction diagrams, versions of which formed the basis of

Bergman's reaction diagrams, made by Swedish chemist Torbern Bergman in 1775 in utilized by Goethe as models for human relationships in the construction of the 36 various chapters to his novella. In the famous chapter four, Goethe assigned the following Bergman-style letter chemical symbols to each character in the novella:

Symbol	Person	Verbal assignment
A	Charlotte	'Provided it does not seem pedantic,' the Captain said, 'I think I can briefly sum up in the language of signs. Imagine an *A* intimately united with a *B*, so that no force is able to sunder them; imagine a *C* likewise related to a *D*; now bring the two couples into contact: *A* will throw itself at *D*, *C* at *B*, without our being able to say which first deserted its partner, which first embraced the other's partner.'
B	Eduard	
C	Captain	$AB + CD \rightarrow AD + CB$
D	Ottilie	'Now then!' Eduard interposed: 'until we see all this with our own eyes, let us look on this formula as a metaphor from which we may extract a lesson we can apply immediately to ourselves. You, Charlotte, represent the *A*, and I represent your *B*; for in fact I do depend altogether on you and follow you as *A* follows *B*. The *C* is quite obviously the Captain, who for the moment is to some extent drawing me away from you. Now it is only fair that, if you are not to vanish into the limitless air, you must be provided with a *D*, and this *D* is unquestionably the charming little lady Ottilie, whose approaching presence you may no longer resist.'

To go through the prime example (as depicted below right) of this logic used by Goethe, in the first chapter, the Eduard *B* and Charlotte *A*, considered purely as chemical entities, in the mind of Goethe, are bonded together in dull marriage, signified by the Cullen-notation of the bonding bracket "{", who in turn invite their friend the Captain *C* to their estate to visit, where upon arrival Eduard B and the Captain C rekindle their old friendship, displacing Charlotte A from her bond with Eduard.

In technical terms, if chemical species *A* and *B* are attached in a weakly bonded chemical union, signified by the bonding bracket "{", ordered such that if species *C* were introduced into the system, the greater affinity preference of *B* for *C* would cause or rather work to force *B* to displace *A* and to thus form a new union with *BC*, which equates to the following in modern terms:

$$AB + C \rightarrow BC + A$$

Goethe ingeniously steps through thirty-six of these types of human chemical reactions in his novella. In commentary on the application of this

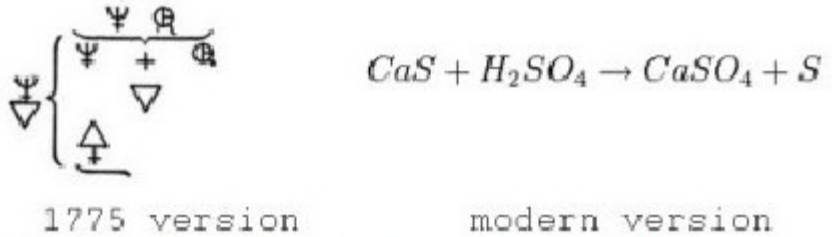

The method of writing the 1809 novella Elective Affinities

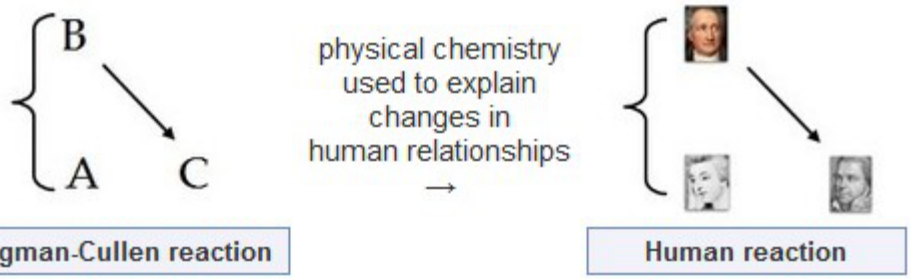

What Goethe did, ingeniously, was to arrive at the view that humans are evolved chemicals that react together according to the same laws that govern smaller chemical entities and, based on this

type of logic, Goethe declared:

> “The moral symbols used in the natural sciences are the elective affinities discovered and employed by the great Bergman.”

view, used Cullen's 1757 dart-arrow reaction diagram method, as found Bergman's reaction diagrams (1775), to explain human relationships as being larger versions of chemical reactions, governed by the principles of affinity chemistry, as captured in the logic of Bergman's affinity table (a 59-column 50-row affinity table), and in doing so wrote out a 36-chapter novella, based on this logic, in which each chapter is a different description of a human chemical reaction, a task which brings validity-closure to Goethe's long-standing title as being the greatest genius of all time.

Goethe here is referring to Bergman's great 1775 chemistry textbook *A Dissertation on Elective Attractions*. [11] In other words, what is moral or amoral, in Goethe’s view, is a point of view inherent in the laws of chemistry according to which species react.

French writer Stendhal in his 1821 treatise *On Love* uses the model of crystallization to explain the process of falling in love, wherein the previously noticed imperfections of one’s newly forming mate slowly disappear and in many cases become marks of perfection and beauty. Stendhal described the process of twig crystallization as such:

> "In the salt mines, nearing the end of the winter season, the miners will throw a leafless wintry bough into one of the abandoned workings. Two or three months later, through the effects of the waters saturated with salt which soak the bough and then let it dry as they recede, the miners find it covered with a shining deposit of crystals. The tiniest twigs no bigger than a tomclit’s claw are encrusted with an infinity of little crystals scintillating and dazzling. The original little bough is no longer recognizable; it has become a child’s plaything very pretty to see. When the sun is shining and the air is perfectly dry the miners of Hallein seize the opportunity of offering these diamond-studded boughs to travellers preparing to go down to the mine."

He then employed this model to explain the transformation that occurs when two people fall in love. "When we are in Bologna, we are entirely indifferent; we are not concerned to admire in any particular way the person with whom we shall perhaps one day be madly in love with; even less is our imagination inclined to overrate their worth."

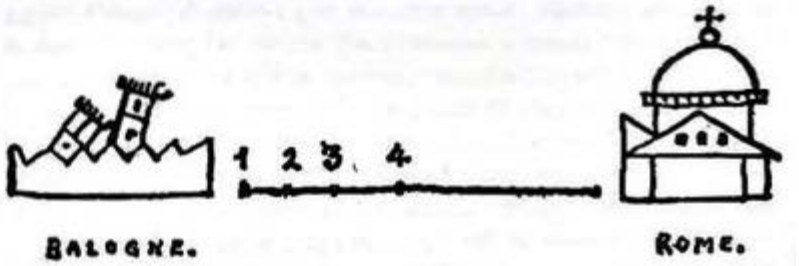

In 1818, French writer Stendhal took a recreational trip to the Slazburg salt mines with his friend Madame Gherardi, wherein they discovered the phenomenon of salt "crystallization", in which a plain unattractive twig slowly transforms into a vision of shimmering beauty, in the eye of the beholder; a model which he he later used it as a metaphor for the mental-visual transformation process of falling in love, a process detailed by Stendhal metaphorically on the back of a playing card (above) while speaking to Madame Gherardi, of a plain sight turning into a beautiful sight over the course of the journey. This **chemical** model was used in his 1821 **literature** treatise *On Love*.

In a word, in Bologna “crystallization” has not yet begun. When the journey begins, love departs. One leaves Bologna, climbs the Apennines, and takes the road to Rome. The departure, according to Stendhal, has nothing to do with one’s will; it is an instinctive moment. This transformative process actuates in terms of four steps along a journey: first admiration, second acknowledgement, third hope, and forth delight. [1]

English chemist Humphry Davy, noted for his 1813 theory of modelling man as a "point atom" or point center of force, had a direct influence on English romantic movement writers William Wordsworth and Samuel Coleridge.

In the epic 1869 novel *War and Peace*, Russian writer Leo Tolstoy utilized chemical thinking in his passage:

> "A particle of matter cannot tell us that it is unconscious of the laws of attraction and repulsion and that the law is not true; but man, who is the subject of history, says bluntly: I am free, and am therefore not subject to laws."

Tolstoy was said to have learned of the human particle view of people (or human molecule view) from Henry Buckle. [4] In the 1880 essay "The Experimental Novel", French writer Emile Zola stated that his great source of inspiration as a novelist was French physiologist Claude Bernard, who studied the chemistry of the body. Other authors who have treated and explored alchemy and chemistry are E.T.A. Hoffmann, Mary Shelley, Alphonse Esquiros (1840), Edgar Poe, Charles Dickens, Ivan Turgenev, William Yeats, James Joyce, August Strindberg, Marcel Proust, Honore Balzac, Emile Zola, Isaac Asimov, Thomas Pynchon, John Updike, not to mention philosophers as different as Auguste Comte, Carl Jung, and Gaston Bachelard. [2]

In the 1991 philosophical work *Lila: an Inquiry into Morals*, American philosopher Robert Pirsig gives a decent summary of chemical perspective of existence:

> "Why should a group of simple, stable compounds of carbon (C), hydrogen (H), oxygen (O), and nitrogen (N), 'struggle' for billions of years to organize themselves into a professor of chemistry? What's the motive?"

Reactions

Reactions to the use of chemical theory as models for human passions and existence in literature have always been met with resistance, much of which results from the religious implications of the work. As German poet and writer and Goethe's neighbor Christoph Wieland commented in an 1810 letter to a friend, which he said should be burnt after reading, he described Goethe's *Elective Affinities* as a "truly horrible work" and considered the modeling of humans as chemicals to be "nonsense and childish fooling around". Wieland's main objection was said to be about the radicalness of its Christianity.

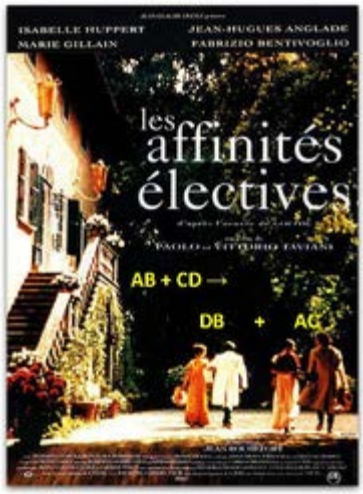

Left: The 1996 film version of German polymath Johann Goethe's 1809 *Elective Affinities*, the most explicit and direct use of chemical theory in literature ever attempted. Right: An opening scene from act II of a November 1998 performance Tom Stoppard's 1993 *Elective Affinities* remake play *Arcadia* done at Willamette University Theater. [6]

Scholars

Research scholars in this field of the study of the overlap of chemistry and literature include: Claus Bock, Jeremy Adler, Astrida Tantillo, Kevin Yee, Karl Fink, Philip Ball, possibly Bruce Clarke, to some extent, among others.

In the 1942 article "Alchemy and Chemistry in Literature" American chemist Eugene Blank summarized the use of chemical topics as literary themes from the days of alchemy to the present, the foremost examples he cites being Ralph Emerson (IQ=155), Johann Goethe (IQ=230), and Honore Balzac (IQ=155). [8]

In 1998, Jack Stocker published *Chemistry and Science Fiction*, which gives some type of summary of the use of chemistry in literature, film, and television; although it mostly seems to be a rehash of the various works of Isaac Asimov and Thomas Pynchon's popular 1973 *Gravity's Rainbow*, to a large extent. [10]

The 2002 three-page "Chemistry" entry by American physical organic chemist and science historian Stephen Weininger,

in the *Encyclopedia of Literature and Science*, citing Jeremy Adler's detective work on Goethe's version of human elective affinities (*Romanticism and the Sciences*, 1990) and Jack Stocker, seems to be one of the first encyclopedia-style summaries of the use of chemistry in literature. [9]

American physical chemist Philip Ball's 2008 *Chemistry World* article "Literary Reactions" is a more recent example of an attempt to summarize the on-growing field of "literature chemistry" [5]

In 2010, American organometallic chemist Jay Labinger, noted for his 1995 Society for Literature and Science paper "Metaphoric Usage of the Second Law: Entropy as Time's (double-headed) Arrow in Tom Stoppard's *Arcadia*", published a decent nine page section on "Chemistry" in the *Routledge Companion to Literature and Science*, which notably also contains a sister section on "Thermodynamics" written by John Bruni. [13]

Conferences

In 2011, at the University of Bergen, the British Society for Literature and Science, hosted an interdisciplinary conference entitled "Literature and Chemistry: Elective Affinities", on the overlap of uses of chemistry in literature, and vice versa to some extent. [2]

Other

French protein thermodynamicist Joel Janin states that American J.D. Salinger, in some of his short stories (similar to Janin's 1996 article title "For Guldberg and Waage, With Love and Cratic Entropy"), was an "alchemist of psychology like Goethe". [12]

Films

In study of chemistry in films, the generalized effect of interpersonal chemistry, particularly couple chemistry, as discussed by American film studies professor Martha Nochimson, in her 2002 book *Screen Couple Chemistry*, is an "energy issue". To exemplify the idea of "good chemistry", according to Nochimson, film provides for a means to capture human chemical reactions on film. The undeniable chemistry seen and felt between classic silver screen stars, such as Fred Astaire and Ginger Rogers or Katharine Hepburn and Spencer Tracy, according to Nochimson, generates a kind of "raw energy" in which the relationships themselves become "freestanding energy vortexes" where couples become bigger than the films they made. What is good in contrast to what is bad (or evil) in chemistry, however, is a thick subject; generally having to do with spontaneity and the direction of energy flows. [3] A few representative film quotes are shown below:

"Love is a romantic designation for a most ordinary biological process—or, shall we say, *chemical*—process … a lot of nonsense is talked and written about it."

Greta Garbo (1905-1990)
Swedish actress
Ninotchka (1939)

"I miss her smell, and the way she tastes. It's a mystery of human chemistry and I don't understand it, some people, as far as their senses are concerned, just feel like home."

John Cusack (1966-)
American actor
High Fidelity (2000)

See also

â— Human chemistry (books)
â— Literature thermodynamics
â— Music chemistry

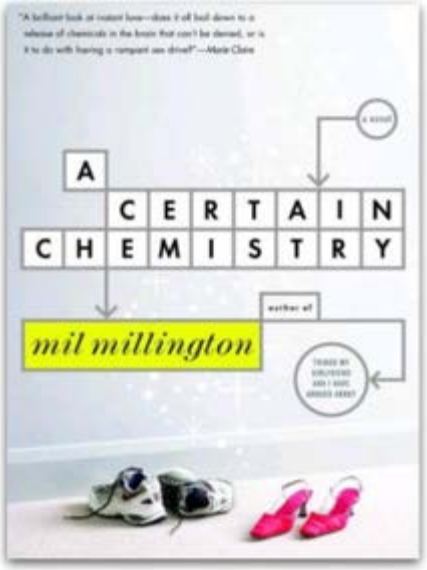

The 2003 novel *A Certain Chemistry* by Mil Millington, an example of **literature chemistry**.

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(b) (a) Labinger, Jay. (2010).
(c) Bruni, John. (2010). “§20: Thermodynamics”, in: *The Routledge Companion to Literature and Science* (editors: Bruce Clarke, Manuel Rossini) (pgs. 226-38). Routledge, Abingdon (UK); Taylor & Francis, 2011.

Further reading

â— Anon. (2011). “Conference Abstracts”, Literature and Chemistry: Elective Affinities, University of Bergen 27-28 October.

θΔics

In human thermodynamics, **literature thermodynamics** is the use of or study of thermodynamic theories, laws, or concepts in a piece of literary work.

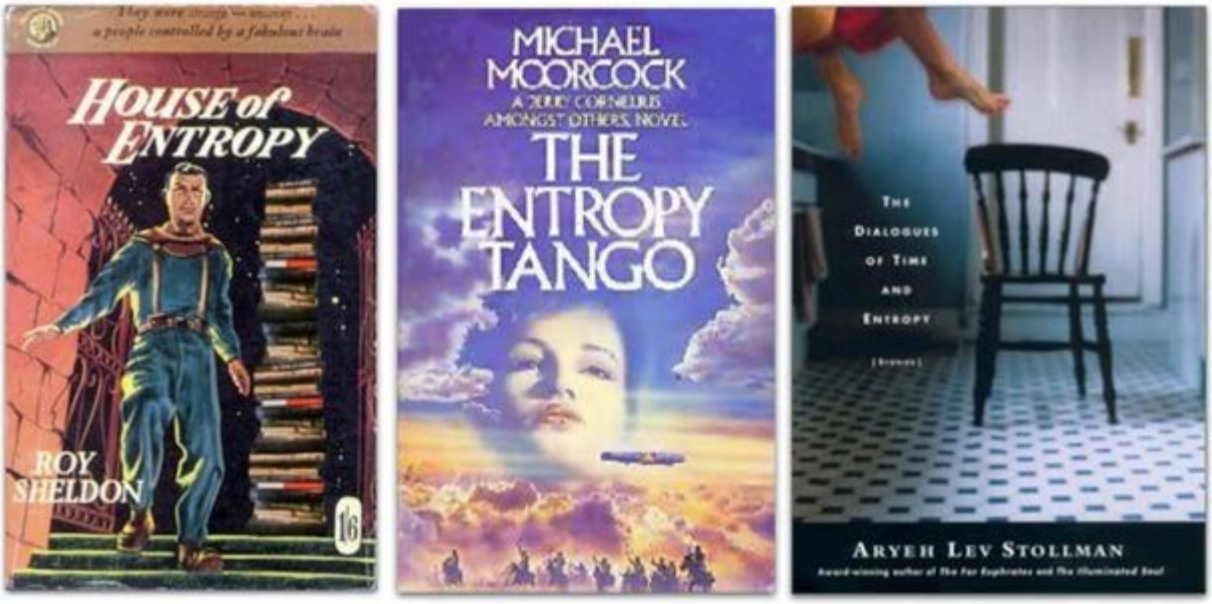

Left: the 1953 book *House of Entropy* by Roy Sheldon, with the tagline: "they were a strange—uncanny … a people controlled by a fabulous brain." Center: the 1981 science fiction book *The Entropy Tango* by Michael Moorcock, in which which entropy is associated with identity failure, particularly in the inner city where the presentation of the self in everyday life is a form of theatre. [7] Right: the 2004 book *The Dialogues of Time and Entropy* by Aryeh Stollman.

Overview

In literature thermodynamics, a commonality is the use of the metaphor of entropy, and the second law of thermodynamics, in particular, to describe the end of times, according to the 1988 *Dictionary of Literary Themes and Motifs*, is a common motif in fiction; which is summarized quite well by American literature theorist Lois Zamora as follows: [11]

> "A contemporary variation on the apocalyptic vision is provided by the metaphor of entropy. Like apocalypse, entropy is an eschatological vision; it is based on the second law of thermodynamics, which describes the gradual leveling of energy in the universe and the molecular equilibrium called heat death at the end of the process. Entropy posits a world moving toward its extinction inexorably and irreversibly; the end is not to be orchestrated with the great crescendo of apocalyptic cataclysm but rather with the decrescendo of entropic chaos. This eschatology is far more pessimistic than conventional apocalyptic eschatology. The end is not caused by man's action and god's reaction, but is produced by decomposition, disintegration, and gradual loss of energy and differentiation.
>
> The anthropomorphism of the traditional apocalypse, with it implicit sense of purposeful history responding to human as well as to divine actions, yields to the bleak mechanism of a purely physical world that is irreversibly running out of energy. Whereas the apocalyptic vision sees a causal relationship between past, present, and future, the law of entropy, when applied to human affairs, negates such rational, temporal continuity. History does have a direction as it moves towards heat death, but it admits not human influence, no logical relationship between cause and effect. The use of the metaphor of entropy to describe the end of times appears through the fiction of Thomas Pynchon, William Burroughs, Norman Mailer, and James Purdy."

Authors

See main: LT pioneers

A short listing of authors who, in one way or another, have used thermodynamic logic or concepts, such as affinity, entropy, or heat, in their writings include:

- Johann Goethe - 1809 scientific novella *Elective Affinities* (although this is pre-thermodynamics).

- Isaac Asimov - 1956 second law themed short story *The Last Question* concerning heat death.
- Thomas Pynchon - 1960 short story "Entropy" and the 1966 novella *The Crying of Lot 49.*
- Aldous Huxley - 1962 book *The Island*as well as ideas onhuman entropy.
- Pamela Zoline - 1967 controversial short story "The Heat Death of the Universe".
- Tom Stoppard - 1993 play Arcadia (themed on Goethe's *Elective Affinities*).
- Vonda McIntyre - 1981 novel *The Entropy effect*.
- Peter Freese - 1995 articles and books on the use of entropy and apocalypse in fiction.
- Forbes Allan - the 1999 book *Milton's Progress*, with use of the term "human thermodynamics".

among others.

Shakespeare

A certain amount effort has been devoted to the dissect the work of English author William Shakespeare (1564-1616) thermodynamically.

The 1994 book *Linguistic Entropy in Othello of Shakespeare* by Indian literary theorist Narasimha Ramayya mixes physics with literature and devotes a considerable amount of text to ferreting out a concept he calls "linguist entropy". [12]

Another example is author Frederick Turner's 1999 claim that Shakespeare anticipates the second law in sonnets. [1] This however, is a dubious assertion on the logic that heat in Shakespeare's day (see: entropy models) was a mix of the "sulphur combustion model" Paracelsus and the Promethean heat (mythology model), the latter of which Shakespeare wrote about (as being the seed of life); and neither of had any type of mathematical formulation of heat (which only began to occur after Isaac Newton and his 1686 *Principia*). [1]

Overview

In 1967, American physics historian Stephen Brush, "in his remarkable study of how themes in thermodynamics are echoed by trends and fashions in nineteenth-century art and literature", has said that his biggest surprise was to learn, early in his research, that he was pioneering nearly virgin territory, where no scholarly foot had trod. [4]

A 1995 *New York Magazine* cover of Norman Mailer (1923-2007) on the review of his new book *Portrait of Picasso as a Young Man*, in which, supposedly, he revisits is favorite question, as the cover story tagline states, "how sex and ego and an entropic world are transformed into great art." [9]

In 1999, in the novel *Milton's Progress*, by Forbes Allan, we find a conversation between a character named John and a Dr. Snipe, along with references to a "Ilya Meiliakin", a play on Ilya Prigogine, noted for his 1970s dissipative structure theory, and Robert Millikan, noted for his 1909 oil drop experiment (Q), concerning human life, which is described as "the most effective multiplier of *entropic decay* in the universe", and man's quest to understand his function in the scheme of things: [2]

> "It's just human thermodynamics, my friend," John said stiffly, "you're inside the jaws of laws beyond your ken." That's an acer poem, he decided, which nicely sums up the plight of humankind and the worthlessness of being. "Maybe I've stumbled upon a new law of physics!" it flashed on him suddenly: "—that life-driven anti-entropic processes are an integral component of all the second law activities and provide an engine with which to accelerate the overall degradation of energy into heat! … Or would that be a 'fourth' law of thermodynamics? …"

Other noted science fiction or nonfiction books and works in which entropy plays a major theme include: Robert Silverberg's "In Entropy's Jaws" (1971) and Michael Moorcock's *The Entropy Tango* (1981). [6]

In their 1994 book *Literature and Science*, authors Donald Bruce and Anthony Purdy spend considerable time

discussing the use of entropy, thermodynamics, dynamical systems, chaos theory, such as developed by Ilya Prigogine, in literature. [5]

American novelist Norman Mailer (pictured adjacent), according to literary theme theorist Tony Taner, is one of slew of authors, such as: Saul Bellow, John Updike, John Barth, Walker Percy, Stanley Elkin, Donald Barthelme, and Thomas Pynchon, who frequently use the term "entropy". [10]

The following quote from the 2008 book *The Entropy of Aaron Rosclatt*, pictured below, by Canadian writer James Sandham gives an idea of a common theme found in literature thermodynamics: [3]

> "The confrontation of youth's crisp idealism with reality the reality that life is not so easily understood or tamed, and that, despite our best efforts, we are all inevitably subject to the slow slide into entropy."

Pamela Gossin's 2002 *Encyclopedia of Literature and Science*, likewise, devotes a considerable partition to outlining the historical use of thermodynamics in literature. [8]

Recent literature thermodynamics researchers include: Katherine Hayles, William Paulson, Bruce Clarke, Barri Gold, and Allen MacDuffie.

See also

- Literature chemistry

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External links

● Evolution and Entropy in *Women in Love* - from Dora Marsden and Early Modernism, ch. 4.
● Jude the Entropic Man – Marvel comics character.
● Thermodynamic man (1974) – Marvel Comics.
● Thermodynamic Poetry – Pruffle.MIT.edu.

θΔics

The **literature thermodynamics pioneers** (TPs) page is a header page for non-fiction authors or artists (listed adjacent) have used concepts in the scripting of themes in plays, stories, or novels (literature thermodynamics) or artwork (art thermodynamics).

θΔics

In terminology, **living** , from the proto-German *liben*, from proto-Indo-European *leib-* 'to remain, continue' (Q), as contrasted with non-living, is an adjective of the defunct theory scientific term "life" (see: defunct theory of life), according to theory of life, as in "having life", "condition of being alive", depending.

Discussion

In 1966, English geneticist Francis Crick, in his *Molecules and Men* lectures on the demise of vitalism, opening to the following position: [1]

> "It is notoriously difficult to define the word **'living'**. In many cases we all know whether something is alive or dead. You are 'alive' cats and dogs alive; whereas a rock or a pane of glass is dead. But the word 'dead' is a bad one, because it implies that the object was once alive and is now dead. It is interesting that there is no *simple* word for something that is not alive and never has been. In the old game, the question was 'Animal, Vegetable, or Mineral?' and the word 'mineral' does not service for the sense we want."

Here we see Crick using the classic "rock vs. human" comparison to get a handle on his argument.

Defunct synonyms

The list of living "[blank]" defunct terms are as follows: living being, living chemical, living creature, living energy, living force, living matter, living molecule, living organism, living state, living system, and living thing.

See also

- Life terminology upgrades

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External links

- Living – Wikipedia.

θΔics

In hmolscience, **living atom** refers to a resonating question that arises in philosophies surrounding the chain of being, principle of continuity, evolution, hydrogen to human, molecule-to-man, mineral to man, etc., as conceptualized on timelines, such as the molecular evolution table or evolution timeline, according to which one, ingrained with the indoctrinated belief (see: unlearn) that (a) one is alive, and that (b) that one has evolved over time from earlier forms, which trace back to the chemical / molecular level, going back to the formation of atoms, e.g. the hydrogen atom, in the universe, that, accordingly, the thing we call "life" either had to have "emerged" at a certain definite point, or, conversely, the hydrogen atom has to be alive, in some sense, or way.

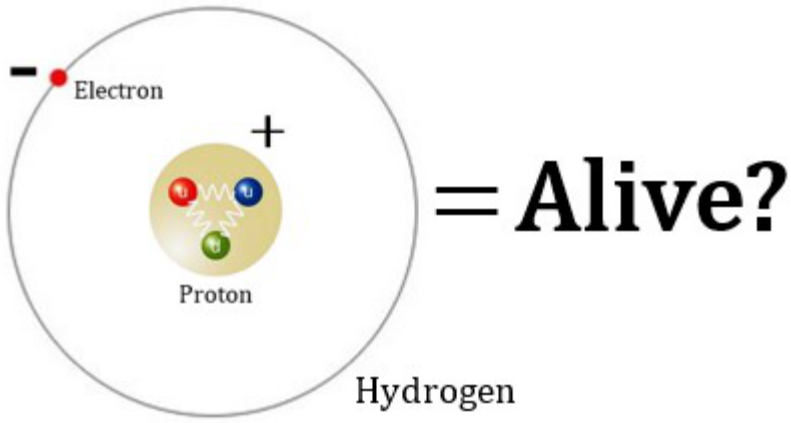

A general depiction of the "**living atom**" model, which is the belief that the hydrogen atom is alive, in some sense.

Overview

In 1714, Gottfried Leibniz, in his *Monadology*, argued for the existence of "monads", conceptualized as the "basic substances that make up the universe but lack spatial extension and hence are immaterial" (Q), though by him to be "a superior alternative to the theory of atoms that was becoming popular in natural philosophy at the time". (Q) This was an early proto-form of a living atom theory.

In 1768, Jean Robinet, in his *Of the Nature*, supposedly promulgated a living atom theory of sorts; the following is one take on this:

> "Robinet, a French naturalist, combined a traditional belief in the perfect hierarchy of species with the notion of continual progress. In five volumes, issued between 1761 and 1768, he argued that all matter contained both life and soul, and that organisms were simply combinations of these **living atoms**."
>
> — Stuart Curran (2012), "Contexts (Q) to Mary Shelley's *Frankenstein: the Modern Prometheus* (Q) | Science: Biology: Evolution (Q)", University of Pennsylvania [1]

(add)

Bray

In 1910, Henry Bray, in his *The Living Universe*, outlined what might be called the last of the great attempts at so-called "living atom theory", in the face of the march and progress of science. In the following, Bray is tentatively teetering on the panbioism fence, i.e. between living atom theory, the view that atoms are alive, and the defunct theory of life, the view that atoms are matter and force:

> "On this ground very many atomic phenomena, not otherwise easily explained, are capable of ready solution. And while we may not have conclusive scientific reason for regarding **atoms as living substances**, it is more certain still that **we are unable to say**

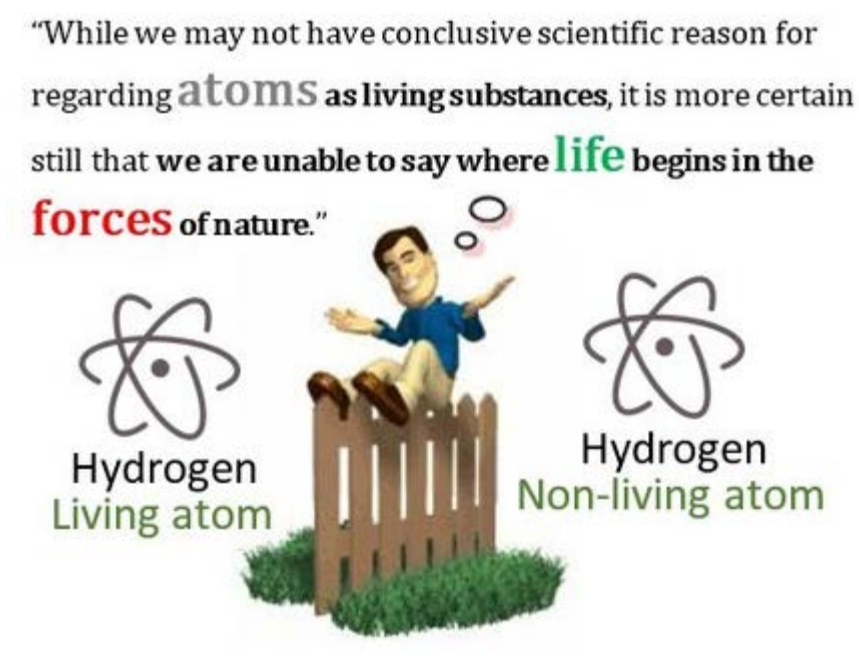

where life begins in the forces of nature."

A 1910 depiction of Henry Bray indecisive on the question as to whether or not atoms are "living substances".

— Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds III, pg. 182)

Earlier, go note, Bray gave the following view:

> "It is said the pure in heart see god. This saying is doubtless true. But he who has not eyes to see this god in the rippling brook, the sprouting seed, the budding tree, the suns that roll, or the hydrogen atoms, will look long ere he sees him elsewhere. I cannot doubt that one of the surest stepping-stones to a higher life, is the learning to love the beauties of nature as she displays them in her infinite variety of ever changing forms. The true student of nature sees in her not the dead thing which the unthoughtful imagine. Indeed, he is conscious that almost every form of power manifested by the highest human intelligence, is in some degree manifested by the most loathesome animalcule that we destroy without a thought of the wonderful powers shut up in this microscopic organism. As with the organic atom, so with the inorganic, — to the soul schooled to appreciate nature's revelations, nothing seems to be dead, nothing seems to be common."

— Henry Bray (1910), *The Living Universe* (§6: Atomic and Molecular Worlds I, pg. 159)

Bray, in other words, jumps into the conclusion that the hydrogen atom is not a "dead thing", but rather has some type of life associated with it; albeit done so tentatively.

> "What is life may be subject of dispute; but it is far from true that we are no better able to answer this question to-day than last century. For ourselves we hold that life is immanent in substance; and we think it may be safely stated that modern science does not believe that it needs a truly organized structure for the manifestation of life. It is true we do not recognize **conscious stones**, nor conscious trees; but this does not prove that life is not universally diffused, and that the whole of nature is not indeed and in truth alive."

— Henry Bray (1910), *The Living Universe* (pg. 204)

Later, Bray, in the opening of his §20: "Infinitesimal Architects, Builders, and Guardians" (pg. 266), in cites atom size estimates by: Josef Loschmidt (1865), Marc Gaudin (1866), and William Thomson (1867), he speculates on whether or not he is a fool or mad for positing that atoms are 'living', 'thinking', 'conscious' beings:

> "In considering the origin and manifestation of life, it would be foolish to suppose that a being with the very limited powers of man, could possibly discriminate between the manifestation of so-called dead force and so-called living [living force], when having under consideration objects of such infinitely small proportions. Because therefore man cannot see the muscles of an atom contract, or its lips articulating, or watch its organs perform their various functions, there is no reason for affirming that the atom is not a living being. When the thing itself is infinitely beyond the understanding of the greatest mind, it were only madness to suppose that we could know all its attributes and qualities. If I have affirmed, and if I believe that the atom is a thinking conscious being, it is not because I have scientifically demonstrated its intelligence or personality; but because of far higher reasons than those of physical science: I am a thinking conscious being; and whatever is in me, must be in the atom either actually or potentially, it matters not which."

Re: "therefore man cannot see the muscles of an atom contract", with the Bohr model (1913), wherein the "muscles of the atom" are explained in terms of photon inputs and outputs paired to electron orbital jumps and descents, respectively, and the Wald model (1958), wherein light induced molecular bending and straightening is explained (Q),

according to which the “muscles of molecules” explained mechanistically, we are now able to “see” atomic or molecular contraction, thus we must reevaluate many of Bray’s conjectures in the modern light, one of which is the conclusion that life does not exist, either in the atom or in man.

Abioism | Hydrogen atom is NOT alive

In 2007, Libb Thims, in his *Human Chemistry*, chapter: “Molecular Evolution”, in the context of the “molecular evolution table” (2005), was undecided on the question as where do situate the life / non-life divide?

In 2009, Thims, in his debates with Georgi Gladyshev, DMR Sekhar, and Ted Erikson, in respect to where life starts in terms of thermodynamics, physics, and chemistry, arrived at the “defunct theory of life” conclusion. In these debates, which lasted for a decade going forward, Thims began to query scientists, involved in this question, as to whether or not they believed that the “hydrogen atom is alive”, as this is a decisive point of one’s belief structure, e.g. emergentist or panbioist; the following is one response:

> “There is no essential difference between ‘life’ and ‘non-life.’ The perceived difference is complexity. Old Faithful (Q) has ‘life-like’ movement but is easier to understand than a paramecium (Q). **The hydrogen atom is NOT alive**.”
>
> — Alfred Rogers (2014), curator of LifeDoesNotExist.com, “Email communication to Libb Thims”, Nov 21

In 2015, Thims coined the term “abioism” signifying the belief that life does not exist. The repercussions of this logic, in short, is that if the hydrogen atom is not alive, neither is a human alive. Generally, to note, as this tends to be a "you blew my mind" moment, for some, it takes about a decade to get the ramifications of this logic digested into one's mind.

In 2019, Thims, in his interview with Mirza Beg (see: Beg-Thims interview), curiously found that Beg does not believe in evolution, but does believe that the hydrogen atom is not alive.

See also

- Living earth | Gaia hypothesis
- Living fire
- Living universe

References

1. Curran, Stuart. (2012), “**Contexts** (Q) to Mary Shelley’s *Frankenstein: the Modern Prometheus* (Q) | Science: Biology: Evolution (Q)”, University of Pennsylvania.

External links

- Is an atom living or non-living? (2015) – Quora.

θΔics

In terminology, **living being** is an oft-used loaded expression, used to define a person, animal, or other life form, as both "alive" and "being", both metaphysical conceptions.

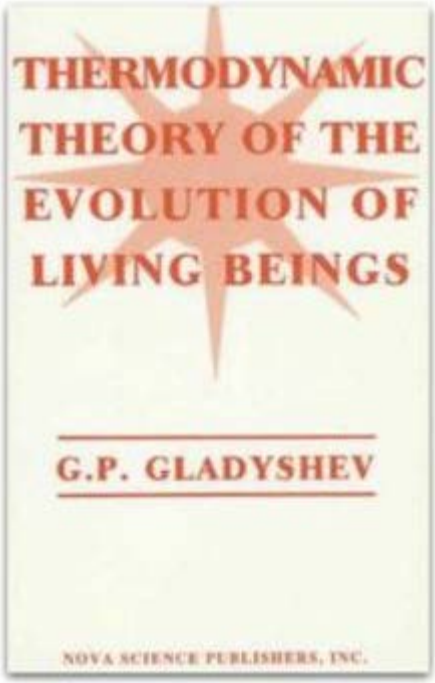

Georgi Gladyshev's 1997 book positing the existence of "**living beings**." [3]

Overview

In 1997, Russian physical chemist Georgi Gladyshev, in his *Thermodynamic Theory of the Evolution of Living Beings*, posited that thermodynamics understands both "being" and "life" as something (a) some thing that exists and (b) that each of these has arisen in the course of evolution from atoms and molecules. [3]

Quotes

The following are related quotes:

> "Is it necessary to regard the demon as a **living being**?"
>
> — Hendrick van Ness (1969), *Understanding Thermodynamics* [1]

> "The challenge of being a **living being** is much more demanding than the challenge of being a refrigerator. What Schrodinger is pointing to here is the bearing of the entropy principle, or the second law of thermodynamics, on the characterization of living beings."
>
> — Srdan Lelas (2002), *Science and Modernity* [2]

See also

â— Being and becoming
â— Heraclitus vs Parmenides

References

1. Van Ness, Hendrick C. (1969). *Understanding Thermodynamics* (keywork: living being, pg. 84). Dover.
2. Lelas, Srdan. (2002). *Science and Modernity: Toward an Integral theory of Science* (ch. 5: Life, pgs. 64-77, esp. pg. 70). Springer.
3. Gladyshev, Georgi. (1997). *Thermodynamic Theory of the Evolution of Living Beings*. Nova Science Publisher.

Further reading

â— Laurance, Jeremy. (2008). "A Clump of Cells? Or a Living Being with a Soul?", *The Independent:* Science, 26 March.

θΔics

In terminology, **living chemical** or 'alive chemical', as contrasted with a 'non-living chemical', lifeless chemical, or dead chemical; nearly synonymous with 'living molecule', is a religio-mythology meets physical science incongruous neoplasm—chemicals are neither alive nor dead—that frequents discussions of viruses, and or other organism in that range, from the physical science side of the discussion, and or life from non-life objection polemics of religious writers.

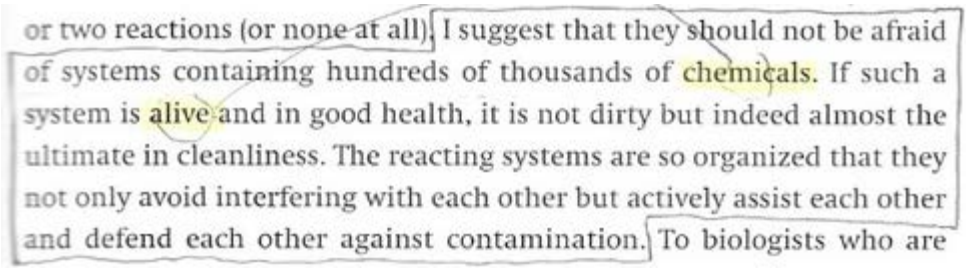
or two reactions (or none at all). I suggest that they should not be afraid of systems containing hundreds of thousands of chemicals. If such a system is alive and in good health, it is not dirty but indeed almost the ultimate in cleanliness. The reacting systems are so organized that they not only avoid interfering with each other but actively assist each other and defend each other against contamination. To biologists who are

A snippet from English-born Canadian physical chemist Lionel Harrison's *The Shaping of Life*, wherein he states that assumedly, from a physical chemistry point of view, that there exist **'chemical'** systems that are **'alive'** and in good health; we also see him anthropomorphizing chemicals, e.g. chemicals 'defending' one another, which has Canadian chemists Peter Mahaffy, et al, suggest is a no-no, in respect to correct or rather chemical thermodynamically neutral deanthropomorphized chemistry descriptions. [1]

Quotes

The following are representative exerts and or quotes, found per cursory Google Books key word search, on the incongruous term "living chemicals", as can be compared to the term "non-living chemicals", the epitome of the religious belief meets scientific belief portmanteau implosion:

> "To get series of even 1,500 events to happen on order, events that might be moving from non-living chemicals to a living cell, there is only one chance in ten to the power of 450! This means that the probability of godless evolution even getting started is zero. Without belief in God, the only option [is to believe that] purposeless, mindless evolution of non-living chemicals over aeons of time [resulted in the formation of] a living cell and ultimately into man."
>
> — Jobe Martin (1994) (Ñº)

> "Some microbiologists even go so far as to say that viruses are non-living chemicals. Viruses occupy the twilight zone between the living and the nonliving. ln 1935, Stanley demonstrated that viruses could be crystallised like chemicals. In 1956, Geire and Sehramn extracted infections nucleic acid from a virus that could infect a host cell and go on to replicate. This made them classify viruses as **living chemicals**."
>
> — Pushpa Khurana (2005) (Ñº)

> "Accidental evolution would require not only **living chemicals** somehow distinguishing themselves from dead chemicals, but also chemicals desiring to lengthen the lives of their descendent chemical combinations. What mechanism gave such living chemicals the impetus to increase the chances of their descendants' survival? The implication of this is that not only will a batch of chemicals struggle to survive and avoid death, but that they will also adapt in ways that won't necessarily help them survive any better, but will help their descendants. What gave these chemicals the ability to calculate structural changes to improve the chances of survival for future species?
>
> — C.W. Adams (2006), *Actuality: Life in the Real World* [2]

> "Spontaneous generation is a term referring to the manifestation of living organisms from non-living chemicals (also called abiogenesis). Evolutionists vehemently deny that they believe in spontaneous generation, but if you probe them about the appearance the first living organism, they will say that somehow it must have come from non-living chemicals. The name for this non-living mixture that they think spawned life varies: primordial goo, prebiotic soup, ancient oceans, etc. Some evolutionists, after admitting that they believe nonlife produced life, will argue with you that they do not believe in spontaneously generation, though they believe precisely the definition of spontaneous generation."

— Brock Lee (2009) (Ñº)

"Why would a lifeless or previously lifeless bag of chemicals decide it was important that future generations even exist, let alone improve their chances of survival? While we might quickly assume that living organisms would want to produce offspring with grater chances of survival, there is no rational reason for this desire. Why would a selfishly motivated newly living organism care about a future generation? First accidental evolutionists make a huge leap assuming that life somehow spontaneously generated from chemicals. Then they make a huge leap that these newly **living chemicals** somehow preferred survival and pain as opposed to a painless existence of nonlife. Then they make another huge leap by assuming that these newly living chemicals could and would want to dilute their strength to produce offspring that require only trouble and work to maintain. They against all odds, evolution theory proponents take the leap in assuming that these newly living chemicals somehow created an 'unselfish gene' that somehow passed on improvements for the future survival of future generations who do nothing for that newly living chemical itself. All of this was done by newly living chemicals that not much different in substance from their dead chemical cousins? The only answer accidental evolutionists seem to give us to these questions is that this all must have been a series of random accidents."

— C.W. Adams (2008), *The Science of Truth* [3]

"Evolutionist professor Paul Davies was honest enough to admit that 'nobody knows how a mixture of *lifeless* chemicals spontaneously organized themselves into the first living cell'. Evolutionary atheist scientists have yet to figure out just how intelligent life could have spontaneously developed from non-living chemicals."

— Michael Dedivonai (2012) (Ñº)

References

1. (a) Harrison, Lionel G. (2011). *The Shaping of Life: the Generation of Biological Pattern* (cell-as-molecule, 4+ pgs; image, pg. 145). Cambridge University Press.
(b) Mahaffy, Peter, Bucat, Bob, and Tasker, Roy, Kotz, John C, Weaver, Gabriela, C. treichel, Paul M., and McMurry, John E. (2011). *Chemistry: Human Activity, Chemical Reactivity* (philosophy). Nelson Canada.
2. Adams, C.W. (2006). *Actuality: Life in the Real World* (§:How could Chemicals have a Desire to Survive , pgs. 84-85; §:Chemicals Cannot Decide to Extend Their Successor's Lives",pgs. 86-87). C.W. Adams.
3. Adams, C.W. (2008). *The Science of Truth* (pg. 159). Science of Truth Publishing.

θΔics

In terminology, **living chemical reaction**, as opposed to a nonliving chemical reaction, refers, hypothetically, to a "chemical reaction" that is "alive".

Overview

In 1925, Gilbert Lewis, in his §7 "Non-Mathematical Sciences", of his *Anatomy of Science*, attempted to digress on the what he referred to as the "missing link connecting the animate with the inanimate", i.e. connecting the evolution of "living organisms" originating from chemicals governed by physics, chemistry, and thermodynamics; after discussing how crystals have the power of reproduction, autocatalysis, and other standard "emergence" patch solutions, he ruminates on whether him writing a book was but a "chemical reaction", the gist of which is as follows: [1]

> "Suppose that this hypothetical experiment could be realized, which seems not unlikely, and suppose we could discover a whole chain of phenomena [evolution timeline], leading by imperceptible gradations form the simplest chemical molecule to the most highly developed organism [human molecule]. Would we then say that **my preparation of this volume** [*Anatomy of Science*] is only **a chemical reaction** [extrapolate up approach], or, conversely that a crystal is thinking [extrapolate down approach] about the concepts of science? Nothing could be more absurd, and I once more express the hope that in attacking the infallibility of categories I have not seemed to intimate that they are the less to be respected because they are not absolute. The interaction between two bodies is treated by methods of mechanics; the interaction of a billion such bodies must be treated by the statistical methods of thermodynamics."

Here we see Lewis is vexed. In his §8 "Life, Body and Mind", however, leaves the solution to await a future science:

> "The science of physics rests on the postulate of determinism; the science of biology, unless it is to ignore deliberately the phenomenon of behavior, must abandon this postulate and substitute therefor a postulate of choice or freedom. Perhaps our genius for unity will some time produce a science so broad as to include the behavior of a group of electrons and the behavior of a university faculty, but such a possibility seems now so remote that I for one would hesitate to guess whether this wonderful science would be more like mechanics or like a psychology."

In circa 2006 to 2009, Libb Thims, prior to arrival of the defunct theory of life solution, similar to Lewis, was stuck on the origin of life problem, with ideas such as Stuart Kauffman's auto-catalytic closure floating around as tentatives; the crux issue that broke the mold, in Thims' mind, was the idea of a "magical" so-to-say "living" or start-of-life chemical reaction, aka a magical Miller-Urey like "spark day", however complicated, that would have had to exist at one second (or day) some 3.85 billion years ago. All reactions, however, hydrogen atoms reacting together to eventually form humans reacting together, are of the following form:

$$A + B \rightarrow C + D$$

or

$$\text{Reactants} \rightarrow \text{Products}$$

or other variations along this basic model ; all connected together via one long continuous "mechanism" (or chemical mechanism), big bang to present, according to which if one were discerning enough, e.g. Laplacian demon, could write out the entire mechanism, step, by step, by step, etc., up to the present day. If "life", as an actual real measureable physical concept—as opposed to metaphysical concept, e.g. ether, or religio-mythology concept, e.g. spirit—were to

exist, then it would have to one of the mechanism "steps" would have had to quantified by some type of magical "free energy" change measurement, which is an untenable position of logic to hold, therefore life does not exist; something along the lines as follows:

Nonliving	**Nonliving**	**Nonliving**	**?**	**Living**	**Living**	**Living**
Reactants → Products	Reactants → Products	Reactants → Products	Reactants → Products	Reactants → Products	Reactants → Products	Reactants → Products

which, when chemical thermodynamics is applied to the problem, leads to nonsensical results, absurdities, etc., and therefore must be jettisoned as defunct religio-mythology.

Quotes

The following are related quotes:

> "The animal cell, which is called 'alive," is simply a **living chemical reaction**—or more exactly a living oxidation of carbon—that is to say, an oxidation of carbon which has organized itself by the creation of services of entry and exit of materials of reaction, precisely as we organize our factories industrially."
>
> — Ernest Solvay (1910) "The Living Body as a Factory" (Ñº), Lecture to the Belgian Association of Engineer; in: *Revue Scientifique*, Paris Dec 3.

> "Nonliving chemical reactions are driven by thermodynamics (heat) explore the possibilities open to them in an ergodic fashion—that is, by a process in which every exploratory sequence is the same. Life, on the other hand, explores its possibilities through evolution. It accumulates information—first in genes, then in memory—to help guide its search down narrower and more productive paths. How and when did information come to dominate the energetic processes of the physical world, and in doing so give rise to life?"
>
> — Robert Frenay (2006), *Pulse* [2]

References

1. Lewis, Gilbert N. (1925). *The Anatomy of Science*. Silliman Lectures; Yale University Press, 1926.
2. Frenay, Robert. (2006). *Pulse: the Coming Age of Systems and Machines Inspired by Living Things* (gray goo, pg. 49; nonliving chemical reactions, pg. 142). MacMillan.

θΔics

In terminology, **living creature** is an historical term, presently classified as a defunct namesake, referring to a "created" thing that is "alive". Correctly, things, firstly, are not "created", in the sense of by a creator (god) or creation, as this does not exist (see: god does not exist), but are "synthesized" (see: life terminology upgrades) by the powers at work in the universe, and secondly, things can not be "alive" (see: defunct theory of life), but can only be powered forms of CH-based animation (see: animate things).

Quotes

The following are related quotes

> "It now remains for me to tell your excellency, as I promised, some thoughts of mine about the proposition 'motion is the cause of heat', and to show in what sense this may be true. But first I must consider what it is that we call heat, as I suspect that people in general have a concept of this which is very remote from the truth. For they believe that heat is a real phenomenon, or property, or quality, which actually resides in the material by which we feel ourselves warmed. Now I say that whenever I conceive any material or corporeal substance, I immediately feel the need to think of it as bounded, and as having this or that shape; as being large or small in relation to other things, and in some specific place at any given time; as being in motion or at rest; as touching or not touching some other body; and as being one in number, or few, or many. From these conditions I cannot separate such a substance by any stretch of my imagination. But that it must be white or red, bitter or sweet, noisy or silent, and of sweet or foul odor, my mind does not feel compelled to bring in as necessary accompaniments. Without the senses as our guides, reason or imagination unaided would probably never arrive at qualities like these. Hence, I think that tastes, odors, colors, and so on are no more than mere names so far as the object in which we place them is concerned, and that they reside only in the consciousness. Hence if the **living creature** were removed, all these qualities would be wiped away and annihilated. But since we have imposed upon them special names, distinct from those of the other and real qualities mentioned previously, we wish to believe that they really exist as actually different from those."
>
> — Galileo (1623), *The Assayer* [1]

References

1. (a) Galileo, Galilei. (1623). *The Assayer*. Publisher.
(b) Galileo, Galilei. (1957). *Discoveries and Opinions of Galileo: Including the Starry messenger (1610), Letter to the Grand Duchess Christian (1615), and Excerpts from Letters on Sunspots (1613), and The Assayer (1623)* (translator: Stillman Drake) (Excerpts from The Assayer, pgs. 229-80; heat, pgs. 273-74). Anchor Books.

θΔics

In terminology, **living energy**, or "life energy", is defunct term (see: defunct theory of life), often seen in new age circles, who may employ terms such as: vitalism, living force, elan vital, etc., or as seen in scientific circles, who will unknowingly employ life-energy like terms such as "energy life" (Howard T. Odum, 1976), or seemingly secular terms such as: living beings, living systems, living matter, or living organisms.

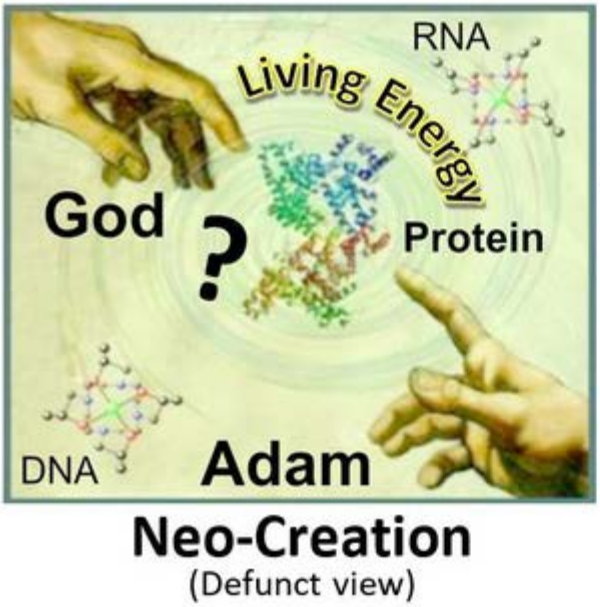

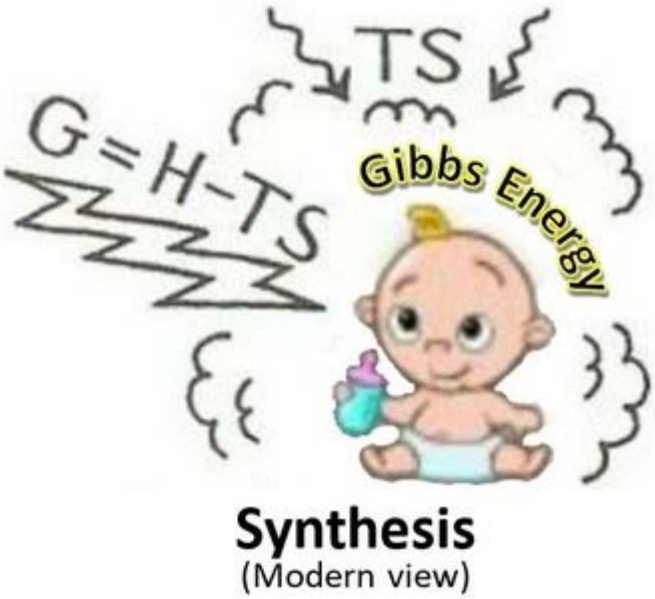

A general diagram showing that "**living energy**", on the left, is a anthropism-like theology-rooted term, where as "Gibbs energy", in the right, is the modern correct view of what constitutes the "energy" of a moving walking talking chemically-synthesized human (see: human free energy of formation).

Overview

In 1999, American scientist Gary Schwartz and Linda Russek, in their *The Living Energy Universe*, append a section on the second law of thermodynamics in terms of the Humpty Dumpty paradox, arguing that science has never been able to explain how Humpty Dumpty was build in the first place based on random events. [1]

In 2006 American consultant Marguerite Callaway, employs the term living energy in business chemistry theory. [2]

The term 'living energy', for the most part, seems to capture an attempt to reconcile or blend spirituality and residual religious ideas in with science, as in "spiritual energy". [3]

References

1. Schwartz, Gary E. and Russek, Linda G. (1999). *The Living Energy Universe: a Fundamental Discovery that Transforms Science and Medicine* (afterward: Category 5: the Second law of thermodynamics 'proves' the hypothesis must be false, pgs. 190-92). Hampton Roads Publishing Co.
2. (a) Callaway, Marguerite M. (2006). *The Energetics of Business: A Practical Guide for Bringing your Business to Life*. Lincoln Park Publications.
(b) Wilcox, Joan P. (2004). *Masters of the Living Energy: the Mystical World of the Q'ero of Peru*. Inner traditions.
3. Kerl, Elizabeth. (2007). *Living Energy*. Author House.

θΔics

In hmolscience, **living fire**, as can be compared to newer variant "living flame", refers to []

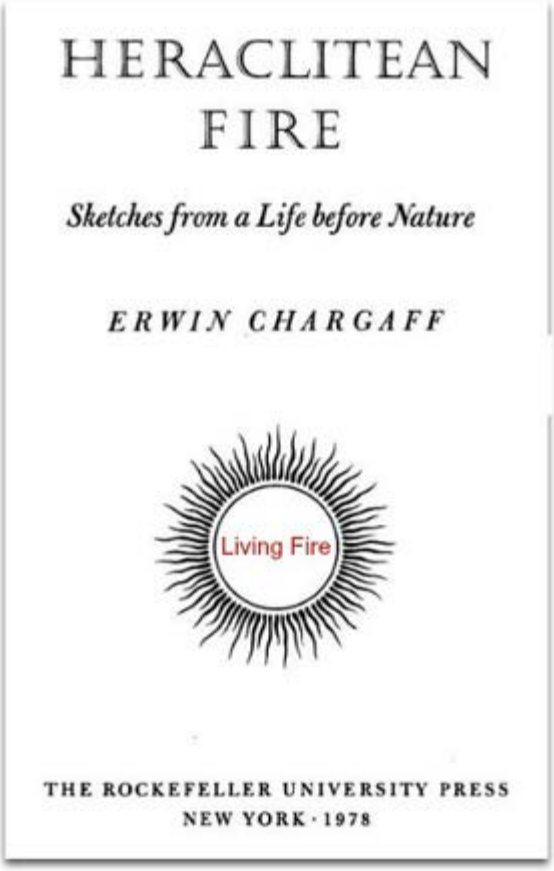

Title page of Erwin Chargaff's 1978 *Heraclitean Fire*, which gives an ideal of Heraclitus' notion that the sun was "alive" in some sense, comprised of a "**living fire**" or fire principle of life, so to say. [3]

Heraclitus

The concept of "living fire" seems to have first arisen in the work of Heraclitus; the following are his main discussions of this point of view:

> "This world order, the same for all beings, was created neither by gods nor by humans; rather, it was always and is and will be eternal **living fire** kindled in measures and quenched in measure."
>
> — Heraclitus (c.470BC), Diels translation [1]

In 1967, Eugen Fink, in discussion with Martin Heidegger, comments on this:

> "At first we interpret only the second half of the fragment. Lightning, we could say, is the sudden fire, the sun is the fire in orderly passage of the course of time, but πυρ αειςωον [eternal **living fire**] is something we do not find in the phenomenon like the lightning and the sun."

Another variation of the translation is as follows:

> "The universe, that is the all, is made neither of gods nor men, but ever has been and ever will be an eternal **living fire**, kindling and extinguishing in destined measure."
>
> — Heraclitus (c.470BC) [2]

On "fire", in general, Heraclitus held the following view:

> "All things are an exchange for fire, and fire for all things … the transformations of fire are, first of all, sea; and half of the sea is earth, half whirlwind."
>
> — Heraclitus (c.470BC) [1]

This is one interpretation of four element theory.

References

1. Heidegger, Martin and Fink, Eugen. (1967). *Heraclitus Seminar* (translator: Charles Seibert) (pg. 56). Northwestern University Press, 1979.
2. Stokes, Philip. (2002). *Philosophy 100: Essential Thinkers* (pg. 15). Enchanted Lion Books.
3. Chargaff, Erwin. (1978). *Heraclitean Fire: Sketches from a Life Before Nature*. Paul & Co Pub Consortium.

Further reading

â— Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free*

Will. University Press of America.

θΔics

In hmolscience, **living flame** is the paradoxical conceptualization of a flame or fire that is alive.

3100BC 400BC 1586

→

→

Ra **Phoenix** **Living Flame**

An overview of how the the notion of a **living flame** arose in the 3100BC Heliopolis creation myth theory of the sun bursting forth out of the pyramids being carried by a bird in its daily journey through the sky, became re-conceptualized by Herodotus (400BC) as the story of the phoenix, which by the 16th century began to become re-conceptualized to the affect that life had something to do with heat, a logic that promoted various animal heat theories, many times often intertwined with notions of soul, spirit, or karma, depending; up to modern times with thinkers such as American physical chemist George Scott, in his *Atoms of the Living Flame* (1985), speculating about the conflicting issue that atoms and molecules do not have a free will, whereas humans, as molecules, are supposed to have a free will, according to the Egyptian theory of the soul, as passed down to us as children through the ages, which we conceptualize as underlying ethics and morality, and that humans are supposedly "alive", which is a term foreign to modern chemistry and the physical sciences, as thinkers such as Charles Sherrington (1935) and Francis Crick (1966) have paradoxically explained.

Overview

The etymology of the notion of a living flame arose predominately in Egypt, in circa 3100BC, centered around the question of the origin of life, with the advent of Anunian theology, centered around the Heliopolis creation myth, of the sun in the form of a god "Ra" being born out of the a rising land mound called the "Nun" following the primordial original flood "Ab" that preceded everything, from which humans, animals, and plants derived, according to firstly the theory of the Ennead or god family of nine. [6] This sun bursting forth out of a land mound carried by a bird became rewritten by Greek historian Herodotus (400BC) as the story of the phoenix.

One of the first documented statements of the notion of a "living flame" is found inscribed on the walls of the *circa* 1400BC Tomb of Paheri, an Egyptian governor of the Latopolite nome in the reign of Thutmose III (1479-1425BC), as Wallis Budge describes him, or a scribe of the treasury and also a mayor of the towns of Nekheb and Iunyt (El-Kab and Esna) acting during the reign of Thutmose I (1506-1493BC) to the reign of Queen Hatshepsut (1479-1458), as Miriam Lichtheim describes him. [1] Paheri's "The Prayer for Offerings" reads as follows: [2]

> An offering given by the King to Amun
> Lord of Thrones-of-the-Two-Lands
> King of eternity, lord of everlastingness,
> Ruler, lord of the two great plumes,
> Sole one, primordial, eldest
> Primeval, without equal
> Creator of men and gods,
> **Living flame** that came from Nun,
> Maker of light for mankind;
> And Nekhbet, the White one of Nekhen,
> Mistress of heaven, lady of the Two lands;
> And Osiris Khentamentiu,
> Lord of Thinis, great in Abydos;
> And Hathor, mistress of the desert,
> Strong of heart among the gods,
> And Ptah-Sokar, lord of Shetyt.
> Anubis, lord of Rostau,
> And the Enneads, great and small.

The inscription goes on; followed by another entitled “The Life in the Beyond”, with speculations about the ba (soul) and the ka (spirit), followed by “Paheri Recalls his Blameless Conduct”, about his good conduct in existence, and “The Appeal to the Living”.

In 1586, Spanish mystic John of the Cross produced a four stanza poetic work entitled “The Living Flame of Love” (O), elaborating, supposedly, on a “greater intimacy, as the soul responds to God's love”: (O)

> 1. O **living flame** of love
> That tenderly wounds my soul
> In its deepest center! Since
> Now you are not oppressive,
> Now consummate! if it be your will:
> Tear through the veil of this sweet encounter!
>
> 2. O sweet cautery,
> O delightful wound!
> O gentle hand! O delicate touch
> That tastes of eternal life
> And pays every debt!
> In killing you changed death to life.
>
> 3. O lamps of fire!
> in whose splendors
> The deep caverns of feeling,
> Once obscure and blind,
> Now give forth, so rarely, so exquisitely,
> Both warmth and light to their Beloved.
>
> 4. How gently and lovingly
> You wake in my heart,
> Where in secret you dwell alone;
> And in your sweet breathing,
> Filled with good and glory,
> How tenderly You swell my heart with love.

In 1936, George Gray, in his “Machines Which Imitate Life” article, stated the following: [5]

> “In some instances the potassium concentration within the cell is forty times that of the medium outside, and yet the flow of ... It goes to show, they said, that in the cell there is something outside the sway of chemistry and physics, something that can outwit the second law of thermodynamics and attain upstream motion in a world where the order of energy changes seems everywhere downstream.
>
> Endocrinologists, and other biological adventurers are trying various arts and medicinals to see if they can add any days, months, or years of lucid flame to life’s brief candle. Candles, like men, are subject to accident and may be snuffed out. Like men, they are subject to the second law of thermodynamics, and even if no accidents befall, they burn out. The accidents to which human bodies are liable range all [] ... which by chance happen to make contact with the child, and both extinguish a **living flame** which but for their presence would continue uninterrupted.”

In circa 1960, English-born American philosopher Alan Watts stated the following: [3]

> "A **living** body can be likened to a **flame** or a whirlpool. The shape alone is stable. The substance is a stream of energy going in at one end and out at the other. Life's purpose to maintain and perpetuate itself is understandable as a physico-chemical phenomenon studied by the science of thermodynamics. We are temporarily identifiable wiggles in a stream that enters us in the form of light, heat, air, water, milk …. It goes out as gas and excrement—also as semen, babies, talk, politics, war, poetry, and music."

In 1985, American physical organic chemist George Scott published his *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will*, a semi-modern atomic theory based rehashing of what is found in the Paheri inscriptions, i.e. in respect to free will theory, choice, and moral weight of that choice, as ethics are taught presently, albeit in a physical chemistry sense. [4]

See also

- Living chemical
- Living energy
- Living force
- Living matter
- Living state

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θΔics

In science, **living force**, aka vis viva, is a 17th century theory that perfectly elastic colliding spheres possess a conserved property, quantified by the value of the mass of the object times its velocity squared, mv^2, which into the 19th century was extrapolated or molded into the theory that what distinguishes "life", animates "living beings", and initiated the origin of life is special physical or in some variations metaphysical "force", distinct or in some way from the standard forces of nature or unified force of the universe.

History

The etymology of the concept of "living force", in its original sense of the definition, seems to have originated in 1686 coining of the term "vis viva", which is Latin for living force, German mathematician Gottfried Leibniz, in regard to Dutch physicist Christiaan Huygens' mathematical quantity mv^2, and the postulate or rather experimental finding that this quantity is conserved during inelastic collisions of hard spherical balls.

In 1847, English physicist James Joule, in his lecture "On Matter, Living Force, and Heat", was employing the term 'living force' explicitly to mean 'the force of bodies in motion'. Historically, says Joule, 'the force possessed by moving bodies is termed by mechanical philosophers *vis viva*, or *living force*.' Curiously, in this historical lecture, which is given in the reading room of a local library, Joule uses the term living force to argue from a quantitative physics point of view, having done a numerous experiments on this topic, that the premise of a "conserved" un-destroyable living force can be used to explain or give support to the Biblical genesis creation myth to the effect that following the great deluge, which Joule says occurred 4000 to 6000 years ago, the friction occurring between the water and the wind over this interval of time does not *annihilate* the living force, but rather: [1]

> "Wherever **living force** is apparently destroyed, an equivalent is produced which in process of time may be reconverted into living force. This equivalent is *heat*. Experiment has shown that wherever living force is apparently destroyed or absorbed, heat is produced."

This is one of the first statements of the mechanical equivalent of heat, the forerunner to the concept of energy and the tricky-to-explain as well as conceptualize unit of the "joule", the unit of energy, work, and heat. In the years to follow the publication of English naturalist Charles Darwin's 1859 *Origin of Species*, a blend of Bible-themed origins of life soon followed.

In 1886, Alexander Hall, in his *The Problem of Human Life*, stated the following:

> "According to Darwin's view, logically and consistently carried out (not illogically as he describes the process of evolution), god, in breathing into one protozoan such **living force** and mental power, absolutely transferred a sufficient fraction of his own intelligence and vitality to stock the whole realm of living organisms which should afterwards arise is the lineal descendants of that first imperfectly developed animal."

Some time thereafter, the living force theory of animal motion seem to have migrated over to explain human motion in terms of living force. Many new age publications can be found promoting this viewpoint with abandon.

Jedi religion

In 1974, American philosopher Carlos Castaneda, penned his *Tales of Power*, wherein, based on his own experience of taking peyote (a "power plant"), the lead character, the "apprentice" communicates with his two alter-egos, a Don Juan (bright side) and Don Genero (dark side), two types of luminous beings, while high, in the desert, envisioning the ability to levitate things, such as rocks, therein philosophizing about the universe, being, and awareness; all the while ruminating on a derivative of the fundamentals of the Yaqui Indian religion-philosophy. [3]

In 1977, American writer George Lucas, after reading Castaneda's *Tales of Power*, reformulated parts of this into his

now-famous film *Star Wars*, introduced the concept of the “force” and the “living force”, a "dark side", the aim to restore "balance" in the universe, wherein the part of Luke, the apprentice, in the swamp talking to Obi-Wan Kenobi (the bright force, i.e. Don Juan) and Darth Vader (the dark force, i.e. Don Genero). The force, in the film, is described by as follows:

> “The force is what gives a Jedi his power. It's an energy field created by all living things. It surrounds us, penetrates us, and binds the galaxy together.”
>
> — Obi-Wan Kenobi (1977), Star Wars [4]

> “You must feel the force around you.”
>
> — Yoda (1977), Star Wars

In 2001, this Lucas-Castaneda basis of understanding has created a belief system, for many people, so much so that, in a UK census, supposedly as a joke, on in many cases a true identification, some 390,000 people, or 0.7% of the population, identified as Jedi in religion (see: Jedi religion). [5] The general Lucas-Castaneda force model is in need of a thorough Beg analysis.

Difficulties

The first to make a general objection to "living force" models was the Helmholtz school and their famous anti-vitalism pledge:

> “We pledge to put in power this truth: no other forces than the common physical chemical ones are active *within* the organism. In those cases which cannot at the time be explained by these forces one has either to find a specific way or form of their action by means of physical mathematical method, or to assume new forces equal in dignity to the chemical-physical forces inherent in matter, reducible to the force of attraction and repulsion.”
>
> — Emil Reymond (1842), written in collaboration with Ernst Brucke; soon after, Helmholtz and Karl Ludwig joined in (see: Reymond-Brucke oath), and as legend has it they each signed it with their own blood

This is a step in the right direction; but not a full jump to the abandonment of the concept of "life" as a whole, which is something that would take another century (see: life does not exist). If they would have referred to the forces active "between" organisms or moving organisms, that would have been a whole different ballgame; an assertion that would have butted heads directly with theological theory.

The first to take issues with the term "living force" or "live force", as thermodynamics would see things, was Italian engineer Vilfredo Pareto, but he did so only in passing, and the end of his large four-volume treatise, suggesting that one should consult a standard textbook on thermodynamics:

> “The ‘energy’ of mechanics must not be confused with the ‘energy’ of ordinary parlance, nor is it excusable to imagine that a mechanical ‘**live force**’ is a force that is alive. If one would know the meaning of ‘entropy’ one had better glance at a treatise on thermodynamics.”
>
> — Vilfredo Pareto (1912), *Treatise on General Sociology* [6]

(add)

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θΔics

In science, **living matter**, as compared to dead matter, is an oft-used defunct term (see: life terminology upgrades) referring to matter that is alive or in possession of the properties of life.

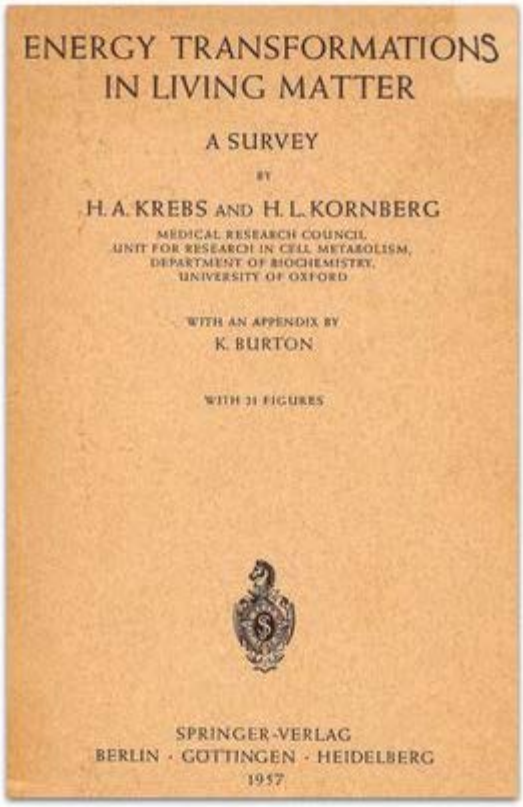

Cover of the 1957 *Energy Transformations in Living Matter*, by Hans Krebs, Hans Kornberg, and Keith Burton, the first book on the thermodynamics of **living matter**.

Overview

The term "living matter" seems to date back to at least the 17th century. In 1908, English physiologist David Harris defined living matter to be a type of matter or bioplasm in possession of the property whereby if it receives a stimulus it will respond in some way or another to the stimulus. [2] In the early part of the 20th century, before the rise of chemical thermodynamics in the 1920s, terms such as "vital energy" or "biotic energy" were used to describe the energy transformations in living matter. [3] Towards the turn the 20th century the term seems to have fallen in to marginal disuse, possibly superseded by terms such as living organism, living system, living structure, or living being.

The term "living matter" is often used in the context of animate thermodynamics (life thermodynamics); an example of which is found in the following 1993 quote by American chemist Martin Goldstein regarding the formation of a mouse: [1]

> "To apply thermodynamics to the problem of how life got started, we must ask what net energy and entropy changes would have been is simple chemical substances, present when the earth was young, were converted into **living matter** [as in the formation of a mouse] … to answer this question [for each process], we must determine the energies and entropies of everything in the initial state and final state."

(add discussion)

Quotes

The following are related quotes:

> "There are living systems; there is no **living 'matter'**. No substance, no single molecule, extracted and isolated from a living being possess, of its own, the aforementioned paradoxical properties. They are present in living systems only; that is to say, nowhere below the level of the cell."
>
> — Jacques Monod (1967) (Q)

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θΔics

In hmolscience, **living molecule**, in contrast to a dead molecule, is a hypothetical type of molecule that is said be alive or possess the properties of life. The term arises in discussions on the question of the origin of life, in the spectrum of development between the formation of the hydrogen and the human, in which molecular structures such as DNA or viruses are said to be alive.

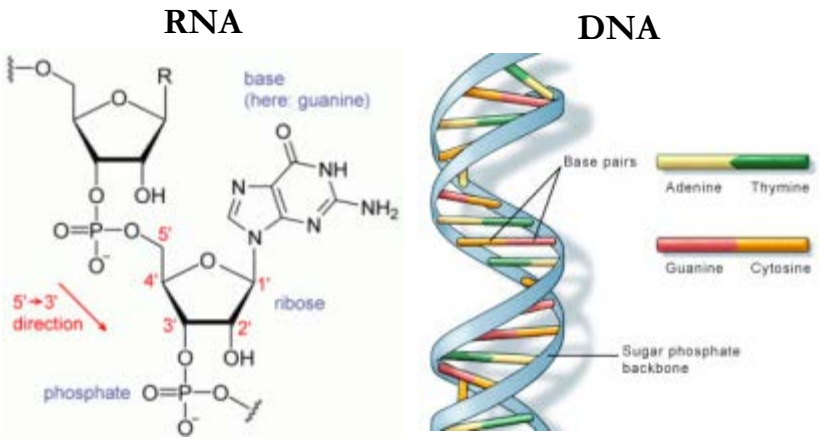

$[C_{10}H_{16}O_{13}N_5P_2]_N$ $2[C_{10}H_{16}O_{13}N_5P_2]_N$

Structures of RNA and DNA: what some have labeled as a "**living molecule**" or the "secret of life" as James Watson described DNA.

Plastidule theory

In 1862, German biologist-zoologist Ernst Haeckel first began to lecture on the origin of species and four years later, in his *General Morphology* (1866), introduced the terms: 'Plastide', 'Plasson', and 'Plastidul', from the Greek *plastikos*, from *plassein* to mold or form, as his designation of the first single-celled organisms, creatures of the lowest morphological order of 'individual', as his solution to the origin of life problem.

The creatures or entities themselves Haeckel called 'Plastiden', which he considered to be the building blocks from which all life is made, were hypothesized to be filled with a homogeneous substance called 'Plasson', which in turn was composed of molecules called 'Plastidule' (plural) or 'Plastidul' (singular), which were special types of molecules that had the ability to reproduce through a sort of molecular 'memory'; a conception vaguely said to be similar to or precursory in conception to the way in which the modern view of chromosomes and DNA (molecules) facilitate or rather transmit traits in the process of reproduction. [4] The term 'Plastidule' tends to be rendered in the modern as the "first living molecules"—although this may not exactly be a correct translation, as Haeckel seems to have held a monism viewpoint in his mind

Biogen hypothesis

In 1903, German physiologist Max Verworn proposed the term "biogen" as a kind of living molecule that is constantly modified by chemical processes within the protoplasm. [5] In 1913, British biochemist Frederick Hopkins commented on vagueness associated with the biogen/living molecule premise: [6]

> "It is clear that a special feature of the living cell is the organization of chemical events within it. So long as we are content to conceive all happenings as occurring with a biogen or **living molecule** all directive power can be attributed in some vague sense to its quite special properties. But the last fifteen years have seen grow up a doctrine of a quite different sort. I mean the conception that each chemical reaction with the cell is directed and controlled by a specific catalyst [enzyme]. We make a real step forward when we escape from the vagueness which attaches to the 'bioplasmic molecule' considered as the seat of change."

Here we may compare British animal psychologist Lloyd Morgan's 1929 biocule concept.

Semiliving molecule

An early January 1957 Manhattan meeting for the American Association for the Advancement of Science, debated what seems to be English biochemist John Haldane's 1929 reducing atmosphere / hot thin soup origin of life theory of—which holds "that The first living or half-living things were probably large molecules synthesized under the influence of the sun's radiation". This debate spurred the *Time* magazine article "Of Molecules & Men", which speculated on this further, discussing concepts such as "semiliving molecules" and

automation. [7] The premise of a "semi-living molecule", i.e. a molecule that is so-to-say "half-alive", in defunct theory of life (2009) retrospect, is a near-absurdity, but one difficult to discern in conceptual context.

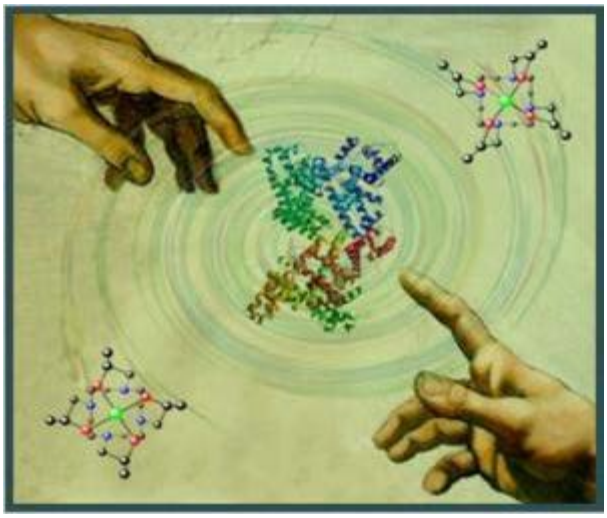

An artistic conception of a **living molecule**, or what looks like a protein molecule touched by the hand of god, in a 2013 article discussing the history human molecular formulas, e.g. Thims human molecular formula (2002). [8]

Overview

The term living molecule is a near-synonym to living being, living matter, living organism, or living system. Nanotechnology examples might include the "walking molecule" (2005) or "molecular carriers" (2007), i.e. molecules designed to carry load, akin to little workers. In a rigorous view, the term "living molecule", to note, as in a molecule (any molecule) being alive, is an unfounded theory.

In 1903, religious writer Effie Shirey devoted a chapter to molecules, in which she argues that "all forms of created life are evolved from a molecule", such that living molecules have tiny sparks of electrical force, in an attempt to unify Christianity, evolution, and science, in a novice way. [3]

In the 1997 book *The Evolution of Love*, Ada Lampert, evolutionary psychology professor at the Ruppin Institute of Israel, uses the concept of "living molecule" in her attempt to trace the origin of love backwards into the decent of evolution, in the context of matter. The following is her spin on this logic:

> "Just as the atom was created, and the molecule and the earth and the water above it, so life appeared governed by the same processes and the same laws, constituting elementary particles in a stable, close-knit group. The **living molecule** appeared 4 billion years ago, and to this day, it is one and the same—so-called DNA (deoxyribonucleic acid). Life, as far as we know, appeared only once, and the entire rich variety of life forms is the metamorphosis, the evolution, of this molecule."

Then she asks: how does life differ from inanimate matter? To which she answers:

> "[Life differs from inanimate matter] by the inner structure of the molecule, a structure that has far-reaching implications. The uniqueness of this molecular structure, as opposed to any other molecule, lies in the fact that its borders are made of meticulous connoisseurs, also close-knit groups of particles, who inspect potential partners and choose only those whose addition to their group will recreate or replicate themselves. Replication of the existing molecular structure by the joining together of identical raw materials, wandering around in nearby space, is the very essence of the phenomenon called life. The DNA molecule is 'alive' because it replicates itself and thus creates new life, reproducing offspring."

This logic, however, is incorrect, as discussed below.

Difficulty on term

This argument, however cogent it may look superficially, is incorrect. If one looks at the life criterion definitions (and

their disproofs) and assigns molecular formulas for each structure, as done on the evolution timeline, the idea of a certain number of molecules being alive (five in case of DNA) becomes an unfounded concept hinging on the suppositions of perpetual motion.

In other words, in the context of the evolution timeline, which shows the steps in the synthesis from smaller to larger, the proposition of an intermediate step such as DNA being alive, assumes that its precursors must also be alive, which leads to the conclusion that the hydrogen atom must be alive. This conclusion, however, makes no logical sense. [2]

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θΔics

In terminology, **living organism** is a defunct colloquial reference (see: defunct theory of life) to an organism in possession of the fictional property of "life" (see: life terminology upgrades).

The difficulty in using this term is that the idea of life or a “living structure”, when viewed from the molecular evolution table perspective, is a fictional construct that falls apart in definition as one descends down the evolutionary tree to the roots, which are comprised of hydrogen atom precursors, which are obviously not "living organisms". [1] In this sense, the conception of “induced movement organisms” becomes a more logical and correct perspective.

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θΔics

In terminology, **living power** is religio-mythology + science inoperable amalgamation portmanteau neoplasm, similar to living force or living energy, referring to a power that is "alive", but a defunct conception, being that as "life" does not exist (see: life does not exist), neither do its conjunctives; an attempt at a scientific synonym for god, spirit, or continuity of the soul, depending, generally speaking.

Butler

In 1736, Joseph Butler, aka "Bishop Butler", in his *Analogy of Religion: Natural and Revealed*, attempted to outline a "living powers" based natural religion theory; a synopsis of which is as follows: [1]

I. THE PLAN OF NATURAL RELIGION. Chaps. 1–5.

1. THAT MANKIND ARE APPOINTED TO LIVE IN A FUTURE STATE. Chap. 1.

I. It is a general law of nature, that the same creatures should exist in degrees of life and perception, in one period of their being, greatly different from those of another period. Why then may we not exist hereafter, in a state as different from the present, as this is from our former? (Pp. 91, 92.)

II. The possession of living powers now, is a presumption that they will exist hereafter, unless there is reason to believe that they will be destroyed by death. (Pp. 92–104.) But there is none. For there is no ground to believe death to be

(I.) Either the destruction of *living agents*. (Pp. 93–101.)

(II.) Or the destruction of their *present* powers of reflection. (Pp. 101, 102.)

(III.) Or even the *suspension* of the exercise of those powers. (Pp. 102–104.) And

(I.) There is no ground to believe death to be the destruction of *living agents:* either

1. From the reason of the thing;—for we know not what death is, but only some of its effects, nor what our living powers depend upon. (P. 94.)
2. Or from the analogy of nature;—for we cannot trace animals after death, and up to that time, the analogy is against the destruction of their living powers. (P. 94.)

This discussion of living powers (a power that is alive), wherein "power" is defined as force (moving an object) times distance (moved) per unit time, or energy (or work) per unit time in short:

$$P = \frac{E}{t}$$

naturally enough leads to further contentious speculations about incongruous terms such as "living force" or "living energy", and or more subtle terms such as "living work", the embodiment of the latter captured well in the existence defining query "what do yo do for a living"?, all of which are but religio-science neoplasms.

References

1. Butler, Joseph. (1736). *Analogy of Religion: Natural and Revealed* (living powers, 8+) . Harper & Brothers, 1857.

θΔics

In thermodynamics, **living state** or "living state theory" refers to labels and quantifiers attempting to define or categorize moving, metabolizing, animated entities in terms of the thermodynamic-physics term "state", on the logic that various states exists, such as the gaseous state, liquid state, solid state, ferromagnetic state, ferroelectric state, superfluid state, superconducting state, far-from-equilibrium states, equilibrium states, among others. [4] Cell biologists like to define the living state as a system that is open, capable of self-organization, able to channel matter and energy across its boundary, and always be far away from equilibrium. [5]

History

In 1972, Albert Szent-Gyorgyi wrote a book on *The Living State*, in which he attempts, in one part, to define the biological state in terms of Gilbert Lewis and Merle Randall's 1923 notion of the existence of several equilibrium states, in chemical thermodynamics terms. [3]

The term "living state" seems to have originated in a series of international seminars, held at Shillong, India (1984-1986), attended by Ilya Prigogine, George Wald, among others, the session and papers of the first seminar being compiled by editor R.K. Mishra. [1] A followup-inspired chapter to these seminars include "What is a Physical Theory of Living State?" by V.S. Vaidhyanathan. [2]

References

1. Mishra, R.K. (1984). *The Living State* (Prigogine, 28+pgs). Wiley.
2. Mishra, R.K. (1990). *Molecular and Biological Physics of Living Systems* (ch. 10: What is a Physical Theory of Living State?", pgs. 147-). Taylor and Francis.
3. Szent-Gyorgyi, Albert. (1972). *The Living State: with Observations on Cancer*. Academic Press.
4. Musha, T. and Sawada, Y. (1994). *Physics of the Living State: Dynamics of Information and Fluctuation in Biology*. IOS Press.
5. Ashley, Ruth, Hann, Gary, and Han, Seong S. (date). *Cell Biology* (living state, 8+ pgs, esp. 1.2: Living State and the Second Law, pgs. 2-4). New Age International.

θΔics

In terminology, **living system** is defunct term conjunction (see: defunct theory of life), tending to refer, historically to a system that is alive; in life terminology upgrade terms to a powered CHNOPS+ system.

Further reading

● Gatlin, Lila L. (1972). *Information Theory and the Living System*. Columbia University Press.
● Thaxton, Charles B., Bradley, Walter L., Olsen, Roger L. (1984). *The Mystery of Life's Origin: Reassessing Current Theories* (ch. 7: Thermodynamics of Living Systems). Philosophical Library.
● Mishra, R.K. (1989). *Molecular and Biological Physics of Living Systems* (pgs. 1-2). Taylor & Francis.
● Welch, G. Rickey. (1991). "Thermodynamics and Living Systems: Problems and Paradigms", *J. Nutr.* 121: 1902-06.
● Capra, Fritjof. (1996). *The Web of Life: a New Scientific Understanding of Living Systems.* New York: Anchor books.
● Gladyshev, Georgi P. (2005). "The Second Law of Thermodynamics and the Evolution of Living Systems", *Journal of Human Thermodynamics*, Vol. 1, pgs. 68-81, December.

θΔics

In science, **living thing**, as contrasted with a so-called 'dead thing', is a synonym for something deemed as being 'alive', often a term used in discussions of the origin of life—although, correctly, in the framework of the life categorized as a defunct theory (see: defunct theory of life), the modern physical science upgrade for 'living thing' is animate chnopsological bound state matter in any of various states of reactivity.

Overview

In 1809, German polymath Johann Goethe, in his *Elective Affinities* (P1:C4), wherein Charlotte asks the Edward about the book he is reading, refers to a living thing as follows:

> "I am sure you will forgive me my fault," she said, "when I tell you what it was this moment which came over me. I heard you reading something about **affinities**, and I thought directly of some relations of mine, two of whom are just now occupying me a great deal. Then my attention went back to the book. I found it was not about **living things** at all, and I looked over to get the thread of it right again."

A 2012 Discovery Networks video (Q) of the current generic view of the so-called first "**living thing**", which they present as a piece or fragment of (a) genetic material (brought to earth via a meteoroid), in (b) a chemical soup, that gets (c) "luckily", by blind random chance, gets caught or contained (by accident) in an oily membrane, which then gets (d) struck by lightning, which then later (e) reproduces a copy of itself.

The book he was reading out of being a physical chemistry textbook (Torbern Bergman's 1785 *A Dissertation on Elective Attractions*, by implication, based on Goethe's 24 Jul 1809 comment); with the early 19th century suggestion that chemicals are not living things whereas people are living things; whereas, correctly, the early 21st century now sees the situation being only a false dichotomy, a carryover religious-mythology belief systems.

In 1997, Lee Smolin, in his *The Life of the Cosmos*, stated the following: [1]

> "The entropy of a living thing is much lower, atom for atom, than anything else in the universe."

(add discussion)

First living thing

See also: Ouroboros

Related, in respect to origin of life theories, is the hypothetical premise, historically, of the existence of a "first living thing".

See also

- Living being
- Living matter
- Living molecule
- Living organism

References

1. Smolin, Lee. (1997). *The Life of the Cosmos* (pg. 28). Oxford University Press.

θΔics

In hmolscience, **living universe**, as compared to a "dead universe", "dynamic universe", or "thermo-dynamic universe" (modern view), refers to the premise that the universe is "alive", in some sense of the word, whether be it a religious sense or an anthropomorphism sense.

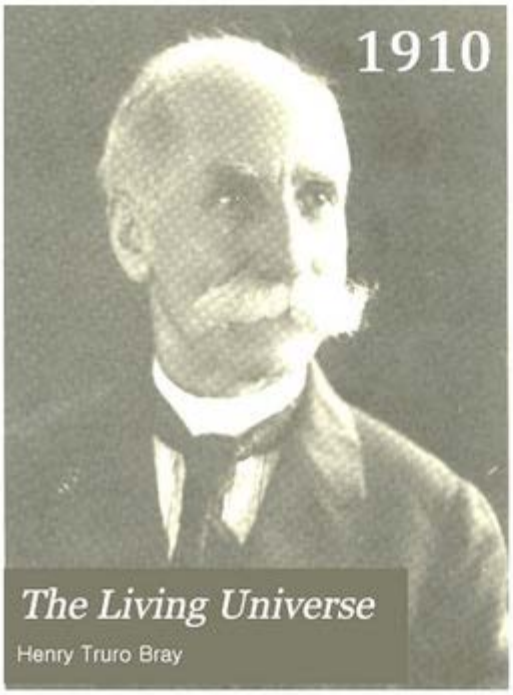

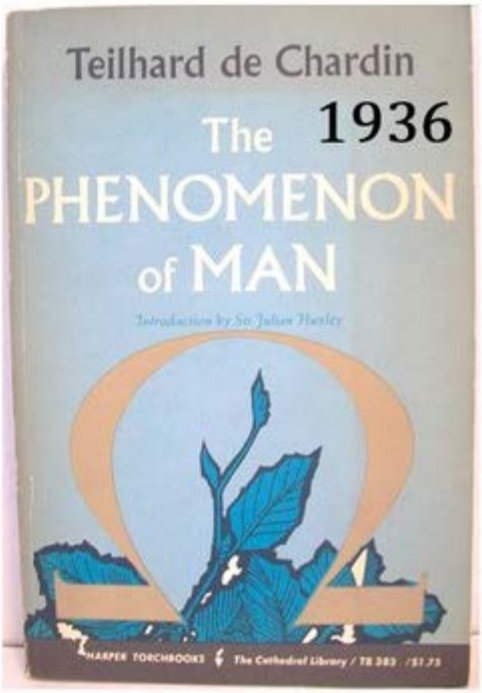

Living Universe Theme Books

The last of the two great "**living universe**" themed books, namely: Henry Bray's 1910 *The Living Universe*, which attempts crudely to salvage the concept of "spirit", and Pierre Teilhard's 1936 *The Phenomena of Man*, which attempts to salvage the concept of "god".

Overview

In 45BC, Cicero, in his *On the Nature of the Gods*, speaking through the voice of Balbus the Stoic, i.e. one who follows the teachings of Heraclitus, states the living universe view as follows: [3]

> "Here we must lend an ear to Plato, the god so to say among philosophers. His view is that motion is of two kinds, the first self-propelled and the second directed from without; and that which is achieved spontaneously of its own accord is more divine than that awakened by the thrust of another. Spontaneous motion he attributes only to souls; in his view, it is from them that all motion takes its rise. So since all motion has its origin in the heat within the universe, and since such heat is achieved spontaneously and not by an external thrust, that fiery heat mush be a living soul (see: dead soul). In other words, the **universe is alive**."

In 1910, Henry Bray, in his *The Living Universe*, was the last person to cogently argue for the living universe hypothesis, inclusive of Goethe's human elective affinities theory. [2]

New age

In 2009, Duane Elgin, in his *The Living Universe: Where Are We? Who Are We?*, a book prefaced by Deepak Chopra, outlined a straight new age, life energy, god as quantum ontic opening stylized view of things (Q); Elgin states (Q|0:24-) that he was moved to wright this book per the following reason:

> "I was led to write *The Living Universe*, in that I saw that we need a new paradigm of perception, if we're going to move from seeing the universe as a place of fragmentation and deadness to seeing it as a place of unification and aliveness. That's a profound shift in perception. And with that shift in perception we can move to a new sustainable and promising future. But if we just see the earth and the universe as essentially non-living and dead, that were here just to compete for resources and material advantages, we're going to move into a time of profound conflict, and we're going to just pull apart as a human species."

Here, we see Elgin rehashing the old humans residing in a universe of "dead atoms" and the "living earth" (aka Gaia hypothesis) of James Lovelock confusions.

In c.2011, James Carter, self-characterized "outlier crank theoretical physicist with my own crackpot pet theories of

photons, atoms, gravity, and the Big Bang", via Living-Universe.com, has been promoting covert Bible-based, i.e. 8-days of creation model of a living universe, using barely-readable renditions of physics. (Q)

See also

- Abioism
- Hylozoism

References

1. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (pg. 58). Oxford University Press, 1998.
2. Bray, Henry T. (1910). *The Living Universe*. Truro Publishing Co., 1920.

θΔics

In existographies, **Lloyd Demetrius** (c.1937-) is a Jamaican mathematical chnoposologist (biologist), noted for []

Quotes | By

The following are quotes by Demetrius:

> "One of the tenets of the evolutionary formalism is the following analytical fact: the growth rate parameter in models of certain classes of dynamical systems in biology satisfies a variational principle which is formally analogous to the minimization of the free energy in statistical thermodynamics. This principle implies a precise correspondence between certain concepts in thermodynamic theory, and certain macroscopic variables that characterize the behavior of dynamical systems in biology. The evolutionary formalism has led to the discovery of the concept 'evolutionary entropy', an analogue of the Gibbs-Boltzmann entropy, as a descriptor of the structure and behavior of certain classes of biological systems at the molecular, cellular and population levels. The variational principle entails that the methods of equilibrium statistical mechanics, which revolve around thermodynamic concepts such as free energy and temperature, can be exploited to study the non-equilibrium behavior of biological systems, which are described by processes defined by parameters such as growth rate and cycle time."
>
> — Lloyd Demetrius (2018), "Profile", Museum of Comparative Zoology, Harvard [1]

References

1. Demetrius, Lloyd. "Profile" (Ñº)(WB), Museum of Comparative Zoology, Harvard, Nov

Further reading

â— Demetrius, Lloyd. (1978). "Adaptive Value, Entropy and Survivorship Curves" (Ñº), *Nature*, 275:213-14.

External links

â— Lloyd Demetrius – Wikipedia.

θΔics

In existographies, **Lloyd M. Graham** (c.1935-) is or was an anonymous religio-mythology scholar, characterized (Holding, 2014) as being Alvin Kuhn like in ideas and writing style, noted for []

Overview

In 1975, Graham published his *Deceptions and Myths of the Bible*, the gist abstract of which seems to be the following:

> "The Bible is not the 'word of god', but **stolen from pagan sources**. Its Eden, Adam and Eve were taken from the Babylonian account; its flood or deluge is but an epitome of some four hundred flood accounts; its Ark and Ararat have their equivalents in a score of deluge myths; even the names of Noah's sons are copies, so also Isaac's sacrifice, Solomon's judgment, and Samson's pillar act; its Moses is fashioned after the Syrian Mises; its laws after Hammurabi's code. Its Messiah is derived from the Egyptian Mandi, Savior, certain verses are verbatim copies of Egyptian scriptures. Between Jesus and the Egyptian Horus, Gerald Massey found 137 similarities, and those between Christ and Krishna run into the hundreds. How then can the Bible be a revelation to the Jews?"

Christian apologist James Holding (c.2014) refers to this as the standard "Pagan theft thesis".

Graham starts off with the general JEP thesis, that the Old Testament was written by a Jhwhist author, a Elohist author, and a Priestly author, that the priestly account of creation is but a "kindergarten cosmology", that has been gratuitously accepted by the western man owing to what he considers to be the conspiratorial cover-up by the priestly power structure, aided and abetted, over time, today by the legions of what he calls the "Christendumb". [2]

Terah

Graham determines that the character Terah, Abraham's father (see: religio-mythology genealogy) means "earth", which is a rescript of the original Egyptian formulation that Ra was born out of Atum, aka the pyramid, the primordial land mound, or the keme, depending on interpretation, following the flood, aka Nile River flood, represented by the god Nun.

Abraham | Brahma

Graham does work on the Abraham and Brahma connection; the gist of which is as follows:

> "Abraham, formerly Abram is but the Hindu creator Brahma, with the *a* prefix instead of suffix."
>
> — Lloyd Graham (1975), *Deceptions and Myths of the Bible* (pg. 12)

> "Abram is but the Hindu Brama, with *a* as prefix instead of suffix; and Brama was the original name of the Hindu creator. Later the letter *h* was added, thus making it Brahma. The letter *h* signifies life, and thus did Brama, Abram, and Sarai in due time receive life, or being, which implies that in the beginning they did not have it."
>
> — Lloyd Graham (1975), *Deceptions and Myths of the Bible* (pg. 113)

Here we see Graham intelligently connecting, but what he is missing is the Egyptian origin of both in the god Ra.

Jesus | Never existed

Graham, citing Arthur Drews, asserts that Jesus never existed as person, and touches on Kersey Graves' discussions of 16 crucified saviors.

New age | Astrology

Graham, to note, in place of god standard, attempts to sell a real messy new age creative energy type conglomeration of ideas, mixed in with evolution.

Quotes | By

The following are quotes by Graham:

> "The Jews never had great knowledge of things cosmic and metaphysical; they were but plagiarists culling mythic artifacts they did not understand."
>
> — Lloyd Graham (1975), *Deceptions and Myths of the Bible* (pg. 2)

> "In 125AD, St. Irenaeus said 'there was a multitude of gospels' in his day. Those that came down to us are but the ones the priesthood needed for its purpose, the rest it destroyed."
>
> — Lloyd Graham (1975), *Deceptions and Myths of the Bible* (pg. 2)

References

1. Graham, Lloyd M. (1975). *Deceptions and Myths of the Bible*. Citadel Press Book.
2. Holding, James P. (c.2014). "Lloyd M. Graham's *Deceptions and Myths of the Bible*: A Critique", Tektonics.org.

θΔics

In existographies, **Conway Lloyd Morgan** (1852-1936) (CR:11), commonly cited as “C. Lloyd Morgan” or Lloyd Morgan, was a British animal psychologist, characterized a "religiously minded biologist" (Russell, 1931), noted, in hmolscience, for his 1929 book *Mind at the Crossways*, wherein he delves into the complex crossroads (see: unbridgeable gap) of the relation between the atomic view (molecule view) and the evolution view (organism view), the gist of which, however, rooted in his underlying belief that there is a "divine purpose" underlying evolution, which he refers to as "emergent evolution". [4]

British emergence school

Morgan, according to Terrence Deacon, is classified, along with C.D. Broad and Samuel Alexander, as being part of the "British emergentists", all three said to have been influenced by the prototype emergence ideas of John Mill and George Lewes. [3]

Molecular organisms

The following is Morgan's digression of the merits of Alfred Whitehead's idea of atoms and molecules as types of "organisms" in the same sense as are humans: [1]

> “Common alike to water and to carbon dioxide is the component oxygen. And the oxygen disengaged by the analysis of water has the same properties as the oxygen disengaged by the analysis of carbon dioxide. It does not follow, however, that prior to this disengagement by analysis, the atom of oxygen engaged in the transactions of a molecule of water is in all respects the same as an atom of oxygen engaged in the transactions of a molecule of carbon dioxide. The organization of the one molecule differs from that of the other. They are different ‘organisms’ in Professor Whitehead’s extended usage of this word.
>
> There has been much discussion as to the acceptance or rejection of this extended usage, under which a molecule or atom as well as an oak tree, a rabbit, or an ameba, may be spoken of and discussed as an organism, though of course not a *living* organism. I am one of those who accept this extended usage. Of these terms the molecule, as an organism, is a community of atoms, as members in molecular fellowship.”

Morgan’s italicized mention of a non *living* organism seems to indicate that he was digging around in the subject of what has come to be known as the defunct theory of life, namely that what previously was considered alive is but higher levels, behaviors, and extended existences of types or species of animate matter (reactive motile chemicals or large moving molecules, so to speak).

Biocule

Morgan defined “biocules”, somewhat humorously, as “organisms in which molecules play their parts at the inception of the life-game”.

Construct

Morgan, in his *Animal Life and Intelligence*, as discussed by Karl Pearson, proposes the use of the term "construct" for an external object. [2]

Education

Morgan was a student of English biologist Thomas Huxley, noted social chemistry/social molecule theorist, who conceived of his Huxley’s demon (see: scientific demon) model of atomic-based determined evolution.

Influence | Human molecule

Morgan’s discussion of the “biocule” was a investigative stepping stone that led American civil-ecological engineer Jeff Tuhtan to the concept of the human molecule, as historically summarized in American electrochemical engineer Libb Thims’ 2008 *The Human Molecule*, introducing Tuhtan to the application of thermodynamics to animate systems, an

important feature of his 2011 thermodynamics-based PhD dissertation “A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality”.

References

1. Morgan, C. Lloyd. (1929). *Mind at the Crossways* (pg. 6; biocule, pgs. 16-17). Williams & Norgate.
2. (a) Morgan, C. Lloyd. (1890). *Animal Life and Intelligence* (pg. 312). Publisher.
(b) Pearson, Karl. (1900). *The Grammar of Science* (pg. 41). Adam and Charles Black.
3. Deacon, Terrence W. (2011). *Incomplete Nature: How Mind Emerged from Matter* (pg. 154). W.W. Norton & Co.
4. Russell, Bertrand. (1986). *Bertrand Russell on God and Religion* (editor: Al Seckel) (Amz) (pg. 184). Prometheus Books.

Further reading

â— Morgan, C. Lloyd. (1923). *Emergent Evolution.* Henry Holt and Co

External links

â— C. Lloyd Morgan – Wikipedia.

θΔics

In materials, **loadstone** (TR:4), aka "lodestone", from the Greek “μάγνης” (magnes), from the Middle English “leading stone” (or course stone), meaning “journey or way”, in reference to their use, when suspended, in compasses, is the magnetite mineral, a black or brownish-black metallic luster rock-like material that tends to be magnetized and able to iron; ancient sources of loadstone were commonly found in Thessalian Magnesia, which is the root of the term “magnet” (TR:52). [1]

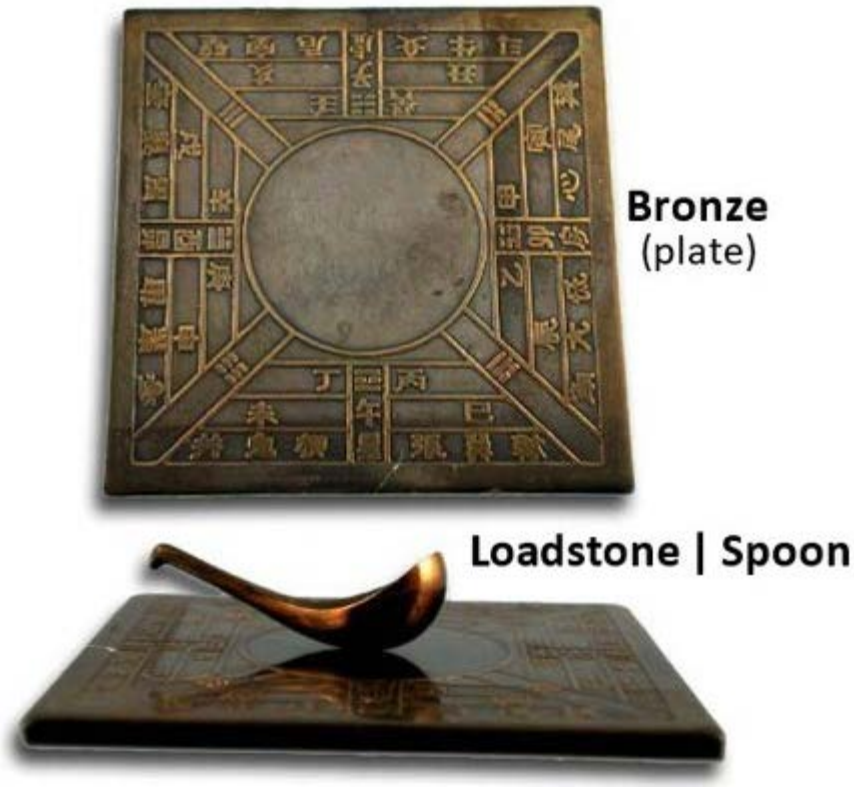

A Chinese loadstone compass (O): a loadstone spoon on a bronze plate, which aligns, when turned, with north direction of the earth's magnetic field, thus giving direction, e.g. on a ship; variants of which, supposedly, dating to the 300BC.

Overview

In c.2500BC, the Egyptians, as reported by Manetho (c.300BC), deified the explanation of the properties of loadstone as follows:[2]

> “The **loadstone** is called, by the Egyptians, the ‘bone of Horus’, as iron is the ‘bone of Typho [Set].”

This statement means something to the effect that, as stated in modern terms, the properties of loadstone was said to the the force or "bone" or Horus, that iron was the force or bone of Set, and the two attracted each other in battle each night, or something along these lines.

In c.570BC, Thales, as discussed by Aristotle, asserted the view that loadstone attracts iron because it has a soul: [3]

> “The **lodestone** has soul [*anima*, psyche, spirit, or life] as it is able to move the iron.”

In c.385BC, Plato was referring to the loadstone as the “stone of Heracles”. [4]

In 55BC, Lucretius was using the term “magnes” in the sense of “attracting stone”, also saying that the term “magnet” is from the place where it was obtained, namely: in the native hills of the Magnesians. (O)

In c.1590, William Gilbert used loadstones floated little wooden boats to conduct the first version of the floating magnets experiments.

In 1877, Helena Blavatsky, in her *Isis Unveiled* (O), made the connection between the magnet, Horus (i.e. bone of Horus), and Hercules (i.e. stone of Heracles).

References

1. Maxwell, James C. (1873). *A Treatise on Electricity and Magnetism (Volume One)* (pg. v). New York: Dover.
2. (a) Artistotle. (c.330BC). *On the Soul* (405a19) (O) . Publisher.
(b) Eells, W.C. (1962). “100 Greatest Mathematicians of All Time” (link), *Mathematics Teacher*, 7(55).
(c) Stokes, Philip. (2002). *Philosophy 100: Essential Thinkers* (pgs. 8-9). Enchanted Lion Books.
3. (a) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pg. 246). Dover, 1969.
(b) Manetho – Wikipedia.

4. Freeden, Willi, Nashed, Zhuair M., and Sonar, Thomas. (2010). *Handbook of Geomathematics* (pg. 45). Springer.

External links

- Loadstone – Wikipedia.

θΔics

In life thermodynamics, **local entropy decrease** is a postulate that living organisms represent an increase in order and thus effect a local decrease in entropy, a term assumed to be equivalent to disorder, in the context of the universe; and it is argued that this decrease in local entropy runs on either a greater increase in entropy in the surroundings or on energy from the sun. [1]

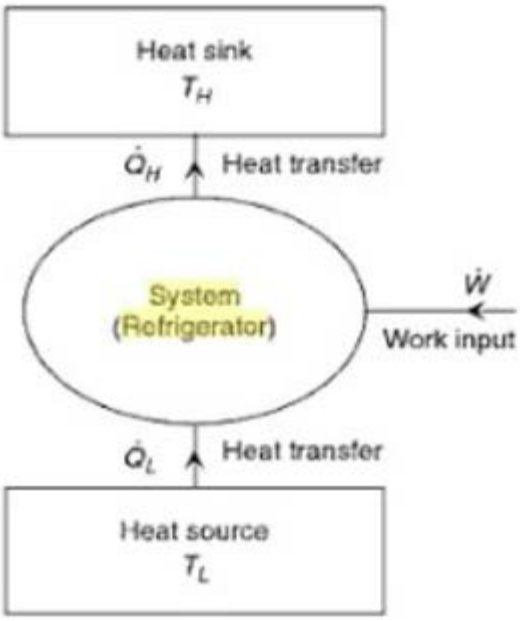

Model of a thermodynamic system acting as a "refrigerator", which performs the reverse effect of a heat engine, by removing heat from a low temperature region or source (say the volume of the region inside of a freezer), by contact with a working substance (shown as the circle, above), being typically a gas, such as ammonia or carbon dioxide, which is forced to compression by an external energy or work input (say from the power company, i.e. a separate heat engine), and then passing this removed heat to a third body, i.e. the heat sink or body of air surrounding the refrigerator in the kitchen. [7] The "heat source", shown here, at a temperature of T_L, or T_1 in Ubbelohde's notation, is the region of **local entropy decrease** or "life" as Ubbelohde would see things.

Overview

In 1933, James Jeans, in his *The New Background of Science*, was speaking of "local exceptions" to the general law of entropy increase.

Ubbelohde

In 1947, Belgian-born English thermodynamicist Alfred Ubbelohde, in his *Time and Thermodynamics*, gave a derivation that the chilled space inside of a refrigerator is a region of "local decrease in entropy" and then extends this idea to life in his later section “Experimental Aspects of the Relation between Thermodynamics and Life”.

To make this argument, Ubbelohde states that in the ordinary domestic refrigerator an engine pumps heat from the chilled space to the warmer kitchen air. Thus for Q_1 units of heat abstracted from the chilled space at temperature T_1 this chilled region is losing: [3]

$$\frac{Q_1}{T_1}$$

units of entropy. But, he qualifies, this can only happen by means of a motor. If W units of work have to be supplied by the motor, in order to abstract Q_1 units of heat from the chilled space, the heat given up to the kitchen air at a temperature T_2 will be:

$$Q_2 = Q_1 + W$$

and the entropy increase in the kitchen air will be:

$$\frac{Q_2}{T_2} = \frac{Q_1 + W}{T_2}$$

He then states that the resultant effect of all the various changes linked together results in a net entropy increase in the system considered as a whole. He concludes:

> “Nothing forbids **local entropy decrease**, but these must be paid for by somewhat greater increases of entropy within the same system (often in the immediate neighborhood).”

This seems to be the root of the quote that people ever-since have been using to explain the existence of life. Although

not directly stated, this concludes or alludes to the idea that life is like an ordered ice cube. In any event, Ubbelohde concludes with the statement that "the possibility of carrying out processes in local regions with decreasing entropy is important for understanding the relationship between thermodynamics and life".

Bertalanffy

In 1950, Ludwig Bertalanffy, in his "The Theory of Open Systems in Physics and Biology", citing Ilya Prigogine (1946) and Erwin Schrodinger (1943), stated the following: [8]

> "Living systems—as open systems—maintain themselves in a steady state by the importation of materials rich in free energy, can avoid the increase of entropy which cannot be averted in closed system."

In 1956, Judson Herrick was paraphrasing Bertalanffy as follows: [9]

> "The living mechanism is an 'open system' (Bertalanffy, 1950), with constant interchange of materials and energy with the environment. In the living body there is a **local arrest** or **reversal** of entropy, with increase of heterogeneity and complexity rather than trend toward degradation to homogeneous low-level organization."

Here, to note, "local" and "reversal" are Herrick's own terms, as Bertalanffy does not use these specific terms.

Difficulties on theory

The difficulties in this assertion, aside from the obvious fact that cooling a chemical system will not bring about what is considered to be life, but rather the converse situation seems to be the case, as typified by Darwin's warm pond model, i.e. that one has to heat a system of chemicals to bring about the synthesis of ordered intelligent animate matter, is that in earth-confined systems, which are isothermal-isobaric systems on average, it is free energy decrease, and thus process or system "entropy increase", which actually favors evolution and thus the creation or ordered animate matter, rather than entropy decrease, as Ubbelohde postulates.

Life

Later, Ubbelohde goes on to argue that living organisms have a "disentropic behavior" or a behavior opposite to that of entropy. In more detail, building on the hypothesis of Scottish physicist James Maxell's 1867 thermodynamic "demon", where it is argued that to evade the second law the demon, at the doorway to a two-compartment system of gas molecules, one hot, one cold, would have to "select" all the faster moving molecules from the mixture to effect a cold to hot heat transfer, Ubbelohde states that:

> "If Maxwell's idea of selection applies in some form to living organisms, we might expect their behavior to be completely disentropic, and within a closed system containing living organisms there might be a net **decrease in entropy**, in the course of time."

In contrast to this proposal, Ubbelohde outlines a second proposal, which he favors:

> "Living organisms are characterized thermodynamically not by any vital power of selection of individual molecules, but by the fact that the organism considered as a unit is continually effecting processes, in which the **entropy decreases**, at the expense of rather greater compensating **increases of entropy** in the surroundings."

Moreover, he states that living beings are “parasites on the entropy fund of the universe.” On this basis, he states:

> “Living things would be so organized to effect **local entropy decreases** continually, so as to direct molecular processes to specific ends; this activity would, however, depend on appropriate food supplies, since it would be the conversion of food-stuffs into waste matter with higher entropy content that would compensate for the entropy decrease associated with specific behavior, and that would, on balance, give a net increase of entropy.”

In conclusion, Ubbelohde notes that further experimental tests will be needed to determine which of the two scenarios, i.e. Maxwell’s selection method (organisms being absolutely disentropic and swim upstream in the main current of entropy) or the local entropy decrease method (organisms being regions of local entropy decrease moving upstream by skilful use of local eddies within the current), is to be the explanation of the behavior of living organisms.

Other views

In 1950, American biologist Harold Blum stated: [6]

> “Since any increase in order within the biosphere must be very small compared to the increase of **entropy** in the sun-earth system there is no reason to think that evolution controverts the second law of thermodynamics … **local parts** of the system may for a time increase in order.”

In 1950, American mathematican Norbert Wierner stated a near-similar version: [5]

> “Life … represent[s] **pockets of decreasing entropy** in a framework in which the large entropy tends to increase.”

In 1963, American physicist Robert Lindsay parlayed the concept of “local” entropy effects into a theory of local “entropy consumption”. In particular, Lindsay states: [3]

> “**Local consumption of entropy** is not to be considered a genuine violation of the second law, for it seems altogether likely that the entropy consumption of living things is compensated for by the corresponding **entropy production** elsewhere in the universe.”

In another 1964 sense, professed by English scientist James Lovelock, during the time when NASA had begun to make plans to look for life on Mars, a “reversal” or “reduction” in entropy was postulated to represent a sign of life in the universe; supposing, for instance, one were to build life detection equipment to look for life on other planets. [4]

Summary

In sum, what seems to be the case is that the concept of: "local decreased in entropy = life", is kind of a dumbed-down version of the loose idea that entropy increase equates to disorder increase, which is not necessarily the case, combined with the loose idea that life or evolution equates to order increase, thus, combined, local entropy decrease is conceived as being a universal synonym for "local order increase".

In origins, this seems to be an entropology-like argument culled from a crude extrapolation of Maxwell's demon logic, the idea of material entropy, and a mix of the disorder views of entropy professed by Austrian physicist Ludwig Boltzman in his gas theory. In this view, the term does not seem to be a rigorous one, in the chemical thermodynamics sense of a person being a "human molecule", and may in fact be non-logical. In a more logical sense, the entropic

relations involved in surface thermodynamics would be a more logical branch of thermodynamics to cull from over that of statistical thermodynamics of gas-phase particles.

See also

â— Entropy reduction
â— Second law (disordering) evolution (ordering) reconciliations

References

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θΔics

In existographies, **Logan Mitchell** (c.1802-1881) was a British free thinker noted for his 1842 *Christian Mythology Unveiled*, wherein he advocated, via the term "christian mythology", the subject of Christ myth theory, giving digression on things such as the Osiris, Dionysus-Bacchus, and Moses connection.

Overview

In 1842, Mitchell, inspired by Percy Shelley, published *Christian Mythology Unveiled*, wherein, supposedly, he discussed the connections between Sarah, Sirius (Dog Star), and the start of the annual flooding of the Nile. [1]

Influence

Mitchell has been influential to: Dorothy Murdock. [2]

Quotes | Employed

The following are quotes employed by Mitchell:

> "Knowledge is called infidelity: Hence the few who know aught worth recording, and were fools enough to vent their free opinions, what has been their recompense and their reward? The stake, the *****, and the cross."
>
> — Johann Goethe (1832), *Faust*; cited in: *Religion in the Heavens: or Mythology Unveiled* (Ñº)

Quotes

The following are noted quotes:

> "Jesus Christ in the New Testament, has no reference whatever to any event that ever did in reality take place upon this globe; or to any personages that ever in truth existed: and that the whole is an astronomical allegory, or parable, having invariably a primary and sacred allusion to the sun, and his passage through the signs of the zodiac; or a verbal representation of the phenomena of the solar year and seasons."
>
> — Logan Mitchell (1842), *Christian Mythology Unveiled* (pg. 151) (Ñº)

References

1. Mitchell, Logan. (1842). *Christian Mythology Unveiled: in a Series of Lectures*. Publisher.
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External links

â— Logan Mitchell – WorldCat Identities.

θΔics

In mathematics, **logarithm** is the power to which a number, called a base, has to be raised to give another number—such that, in equation form, any number *y* can be written in the form:

$$y = x^n$$

whereby *n* is then the "logarithm" to the "base" *x* of the number *y*. [1] The use of logarithms is that they reverse the idea of a power, or exponent. Take, for instance, the formula:

$$x = 2^y$$

which means "x is equal to 2 to the power of y". The equation can be turned around and reexpressed in logarithms as: [3]

$$y = \log_2 x$$

Properties

Logarithms have the useful property that when numbers are multiplied, there logarithms are added:

$$\log ab = \log a + \log b$$

Likewise, when numbers are divided, their logarithms are subtracted from one another:

$$\log a/b = \log a - \log b$$

Common logarithms

If the base is 10, the logarithms are called "common logarithms", which has the form:

$$\log_{10} y$$

which has common usage in many applications in science and engineering.

Natural logarithms

If the base is e (where e = 2.71828 ...) the logarithms are called either "natural logarithms" or Napierian logarithms, named after Scottish mathematician John Napier (1550-1617), the inventor of logarithms, which has the form:

$$\log_e y$$

or

$$\ln y$$

which are taken to be equivalent notation formats. The natural logarithm has widespread in pure mathematics, especially calculus.

Notation confusion

The natural logarithm, to note, may often tend to be written with the base e "assumed" simply as:

$$\log y$$

This implied e base assumption, however, often times may become confused, often among chemists and engineers, as being a common logarithm, base 10 assumed. Chemists, for example, frequently use the symbol log(y) without a subscript for the common logarithm, i.e. base 10 assumed. [4] Hence, when a modern physical chemist reads, for example, Leo Szilard's 1929 finding that the entropy produced by the measurement made by a Maxwell's demon of the position of a gas particle in a two chamber system has the value:

$$S = k \log 2$$

The physical chemist may very well assume that Szilard is using a common logarithm, whereas in fact he is using a natural logarithm. [5] Subsequently, if the very same physical chemist next reads Gilbert Lewis' 1930 derivation on the same subject, finding that he calculates the entropy change to be: [6]

$$S = k \ln 2$$

confusion may result on the puzzlement as to why Szilard is using common logarithms and Lewis is using natural logarithms, whereas in fact they are both using natural logarithms.

History

Logarithms were introduced by Scottish mathematician John Napier (1550-1617) in the early 17th century as a means to simplify calculations, before the advent of electronic calculators. The shorthand notation:

Log.

as an abbreviation for "logarithm" first appears in the 1616 *A Description of the Admirable Table of Logarithmes*, an English translation Napier's work by English mathematician Edward Wright (1561–1615). [2] The notation log (without a period, lower case "l") appears in the 1647 edition of *Clavis mathematicae* by English mathematician William

Oughtred (1574-1660). The present-day notion of logarithms comes from Swiss mathematician Leonhard Euler (1707-1783), who connected logarithms to the exponential function:

$$b^n = \underbrace{b \times b \times \cdots \times b}_{n \text{ factors}}$$

The so-called "ln" notation, the abbreviation ln short for natural logarithm, was, supposedly, first used in 1893 by American mathematician Irving Stringham (1847-1909) in his *Uniplanar Algebra*.

References

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External links

â— Logarithm – Wikipedia.

θΔics

In literature thermodynamics, **Lois Parkinson Zamora** (c.1944-) is an American literary theorist noted for her study of the use of entropy as a literary theme, particularly in regards to apocalypse theories, namely to describe the end of times, such as appears through the fiction of Thomas Pynchon, William Burroughs, Norman Mailer, and James Purdy. [1]

Overview

In 1988, Zamora, in her *Dictionary of Literary Themes and Motifs*, entry on apocalypse, she summarizes use of the metaphor of entropy and the second law to describe the end of times as follows: [1]

> "A contemporary variation on the apocalyptic vision is provided by the metaphor of entropy. Like apocalypse, entropy is an eschatological vision; it is based on the second law of thermodynamics, which describes the gradual leveling of energy in the universe and the molecular equilibrium called heat death at the end of the process. Entropy posits a world moving toward its extinction inexorably and irreversibly; the end is not to be orchestrated with the great crescendo of apocalyptic cataclysm but rather with the decrescendo of entropic chaos. This eschatology is far more pessimistic than conventional apocalyptic eschatology. The end is not caused by man's action and God's reaction, but is produced by decomposition, disintegration, and gradual loss of energy and differentiation. The anthropomorphism of the traditional apocalypse, with it implicit sense of purposeful history responding to human as well as to divine actions, yields to the bleak mechanism of a purely physical world that is irreversibly running out of energy. Whereas the apocalyptic vision sees a causal relationship between past, present, and future, the law of entropy, when applied to human affairs, negates such rational, temporal continuity. History does have a direction as it moves towards heat death, but it admits not human influence, no logical relationship between cause and effect. The use of the metaphor of entropy to describe the end of times appears through the fiction of Thomas Pynchon, William Burroughs, Norman Mailer, and James Purdy."

This is a fairly decent summary, considering Zamora's aim was to contain her discussion to American fiction. The dominate initiator of heat death eschatology in world fiction, however, was French astronomer Camille Flammarion and his 1893 science fiction novel *The End of the World.*

In 1989, Zamora, in her *Writing the Apocalypse*, traces the history from of apocalypse theory from early Christianity times up through modern times, in which she devotes a chapter, entitled "Apocalypse and Entropy", to the use of entropy in the works of Pynchon as he culled from American historian Henry Adams and, through Adams, the physicists Rudolf Clausius, William Thomson, Ludwig Boltzmann, Willard Gibbs, and supposedly Werner Heisenberg. [2]

Education

Zamora completed her BA in English at Stanford University (1966) and both her MA (1970) and PhD (1977) in comparative literature at the University of California, Berkeley. She currently is a professor of English, history, and art at the University of Houston.

References

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Further reading

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External links

● Lois Parkinson Zamora (faculty) – University of Houston.
● Zamora, Lois Parkinson – WorldCat Identities.

θΔics

In existographies, **Lord Bolingbroke** (1678-1751) (IQ:175|#286) (Cattell 1000:115) (FA:65) (CR:9), aka "Henry St John" or "1st Viscount Bolingbroke", was an English politician, government official, political philosopher, an unlearn expositor, and religio-mythology scholar, noted for []

Overview

In 1736, Bolingbroke, in his *Important Examination of the Holy Scriptures*, building on the rumored zeal of Jean Meslier, opened to the famous "religion as a function of birthplace" attack on belief in god; as follows: [1]

> "To whose guidance shall I submit my mind? Must I be a Christian, because I happened to be born in London, or in Madrid? Must I be a Mussulman, because I was born in Turkey? As it is myself alone that I ought to consult, the choice of a religion is my greatest interest. One man adores god by Mahomet, another by the Grand Lama, and another by the Pope. Weak and foolish men? adore god by your own reason. The stupid indolence which takes possession of the generality of men, and sets aside this most important of all concerns, seems to intimate to us that they are nothing but stupid machines, endowed with animal functions, whose instinct never occupies itself beyond the present moment. We make use of our understandings in the same way as we use our bodies; both are frequently abandoned to quacks, whose chief concern
> is to get possession of our money."

He then opens his attack on the Bible, as follows:

> "Christianity is founded on Judaism; let us, then, examine if Judaism be the work of god. The books of Moses are handed to me, and the first point I have to ascertain is, whether or not these books were actually written by Moses. In the first place – Is it possible that Moses could have engraven the Pentateuch, or the books of the law, on stone, and that he found engravers and stone-cutters in a frightful wilderness, where it is said, that his people had neither tailors, shoemakers, raiment, nor bread, and where god was compelled to work a continued miracle, for the space of forty years, in order to clothe and feed them ?"

(add)

Voltaire

In c.1720, Bolingbroke was visited by Voltaire who "who expressed unbounded admiration for his learning and politeness" (Ñº); Voltaire later published *Lord Bolingbroke's Important Examination* (1767), supposedly, on Bolingbroke's criticism of the chronology and claims of the Bible. [2]

Influence

Bolingbroke was said to have great influence on the founding fathers of America, such as: John Adams, Thomas Jefferson, and James Madison; Adams, e.g., said that he had read all of Bolingbroke's works at least five times. (Ñº)

Quotes | On

The following are quotes on Bolingbroke:

> "The church of the country is not only indifferent to the wrongs of the slave, it actually takes sides with the oppressors. For my part, I would say, 'welcome infidelity!', 'Welcome atheists!', 'Welcome anything!', in preference to the gospel, as preached by these divines. They convert the very name of religion into an engine of tyranny and barbarous cruelty, and serve to confirm more infidels, in this age, than all the infidel

writings of Thomas Paine, Voltaire, and **Bolingbroke** have together done."

— Frederick Douglass (1852), cited by Jennifer Hecht (2003) in *Doubt: a History* (pg. 418)

Quotes | By

The following are quotes by Bolingbroke:

"The shortest and surest way of arriving at real knowledge is to unlearn the lessons we have been taught, to mount the first principles, and take nobody's word about them."

— Lord Bolingbroke (c.1730) (Ñº)

"The tables of natural laws are so obvious that no man who is able to read the plainest character can mistake them, and therefore no political society ever framed a system of law in direct and avowed contradiction of them."

— Lord Bolingbroke (c.1730), *Publication*; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 290)

References

1. Bolingbroke. (1736). *Important Examination of the Holy Scriptures*. Publisher.
2. Voltaire. (1767). *Lord Bolingbroke's Important Examination* (*Examen important de milord Bolingbroke*). Publisher.

External links

â— Henry St John, 1st Viscount Bolingbroke – Wikipedia.

θΔics

In namesakes, **Lord Kelvin** is the royal name of William Thomson.

Overview

William Thomson was ennobled in 1892 in recognition of his achievements in thermodynamics, and of his opposition to Irish Home Rule, becoming Baron Kelvin, of Largs in the County of Ayr. He was the first British scientist to be elevated to the House of Lords. The title refers to the River Kelvin, which flows close by his laboratory at the University of Glasgow.

See also

- Kelvin temperature scale | Absolute temperature scale
- Kelvinic university

θΔics

In religio-mythology, **Lord's prayer**, as found (Q) in Matthew 6:9-13 and Luke 11:1-4 of the Bible, a truncated version of spell #125 of the Egyptian *Book of the Dead*, is a famous end of Church religious recital said by members, in modern times, generally done to bring a close to the day's lesson and sermon.

Overview

In 2003, Libb Thims compiled a chronological listing, of about 20 historical renditions of the Lord's prayer, of the transformation over time of the 42 negative confessions, which by the time of the Egyptian Late Period (664-332BC) had become standardized as spell 125 of the *Egyptian Book of the Dead*, into the modern Lord's prayer said at the end of every church service by the congregation in mass. [1]

In 2005, Laurence Gardener, in his *The Shadow of Solomon*, stated the following: [2]

> "The **Lord's Prayer**, as defined by Matthew 6:9-13 and Luke 11:2-4, was originally transposed from an Egyptian prayer to the state-god Amen. It began, 'Amen, Amen, who art in heaven'. Traditionally, the Christian rendition places the name Amen at the end of this prayer, a practice that was adopted for other prayers and hymns."

(add discussion)

Egyptian | Christian

The following shows the basics of the jump from the Egyptian "spell 125", i.e. chapter 125 of the *Egyptian Book of the Dead* (1500BC), to the Christian rendition, aka Lord's Prayer, as found in the *Book of Common Prayers*, originally recorded in Koine Greek that, according to the New Testament, was apocryphally said to be taught by Jesus to his disciples, with the Egyptian version, as published by Richard Hooker (1987), slightly reordered to match the *status quo* Cristian version: [3]

Lord's Prayer

	Egyptian version [Original | 1500BC]	Christian version [Modern | 200AD]
		Our Father who art in heaven,
1.	Hail, gods, who dwell in the house of the Two Truths. I know you and I know your **names**.	Hallowed be thy **name**.
2.	I have acted according to his **will**.	Thy kingdom come. Thy **will** be done on earth as it is in heaven.
3.	I have given **bread** to the hungry man, and water to the thirsty man, And clothes to the naked man, and a boat to the boatless. I have made holy offerings to the gods,	Give us today our daily

and meals for the dead. Deliver me, protect me, accuse me not in the presence of Osiris. I am pure of mouth and pure of hands, [20 more lines]	**bread**.
Who lives on the entrails of the mighty ones on the day of the great judgement. 4. Grant that I may come to you, For I have committed no faults, I have not **sinned**	Forgive us our **sins** as we forgive those who sin against us.
Let no **evil** come to me from you. Declare me right and true in the presence of Osiris, Because I have done what is right and true in Egypt. 5. [6 more lines] **Deliver** me from the god Baba (Q), I have not done evil, [5 more lines]	lead us not into temptation, but **deliver** us from **evil**
Let me not fall under your slaughter-knives, And do not bring my wickedness to [the **kingdom** of] Osiris, the god you serve. 6.	For thine is the **kingdom**, and the power, and the glory, for ever and ever.
— *Spell #125 | Eulogy, dedicated to the national-god* **Amen**	— **Amen**

Per reason that this prayer, in the original Egyptian version, was a general epitaph or eulogy of the dead dedicated to the state-god Amen, as summarized by Laurence Gardener (2005), we see the word "Amen" at the end of the Christian truncated version of spell 125.

See also

- Christopher Hirata

References

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Further reading

- 125-26: Judgment – List of the Book of Dead spells.
- Relation to Egyptian Prayer from the Book of the Dead (2009) – Wikipedia talk page.
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External links

- Lord’s Prayer – Wikipedia.

θΔics

In existographies, **Lorenzo Valla** (c.1407-1457) was an Italian court historian noted for []

Overview

In c.1450, Valla, in his *On Pleasure*, via a three-way dialogue, similar to Cicero, who he admired, between an Epicurean, a stoic, and a Christian, in a dynamic context (Q) of a discussion among several male humanists who gathered in Rome about the question of the highest good, did a comparison between the views on pleasure as professed by the stoics as compared to the Epicureans, wherein, siding with the latter, he argued that the stoics were too interested in controlling the passions, and that the existence spent in prudent delights, e.g. quiet wisdom, decent virtues, and good times, as advocated by the Epicureans, was a better path, or something to this effect. [1]

Inquisition

Valla, because his views were anti-Christian, was charge with heresy. The Inquisition found Valla guilty of eight counts of heresy, including his defense of Epicurus. King Alfonso of Naples, his employer, however, stepped in and saved him from the stake.

References

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(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (doubt quiz, pg. 271). HarperOne.

External links

- Lorenzo Valla – Wikipedia.

θΔics

In art science, **Lorna McIntosh** (c.1985-) is a Scottish artist noted for her *Elective Affinities* themed artwork, some of which is shown below, which also includes the far from equilibrium notions of Ilya Prigogine, among other related concepts, closed system, open system, etc..

Education

McIntosh completed a residency in 2011 at Balmungo House, during which time and or since she explored German polymath Johann Goethe's thinking in his novel as well as undertaken a wide study of other thinkers such as chemistry pioneer Robert Boyle (1627-1691), meteorology pioneer Luke Howard (1772-1864), whom Goethe communicated with, and geology pioneer James Hutton (1726-1797).

Her interests focus on physics, geology, and the way that seemingly discrete scientific disciplines are connected at a deeper level; in this view, she combines her thinking, reading, research, and observations into artistic representation, mainly oil on canvas.

2012 gallery

The following are works from McIntosh's 2012 gallery at the Open Eye Gallery, Edinburgh: [2]

Kinships by choice
(Oil on paper 57.5 x 76.5cm)

The title of this piece seems to be named on the 1960 Herbert Waidson English translation of Goethe's *Die Wahlverwandtschaften* which was done under the title of *Kindred by Choice*. The grouping of similar pieces by size and, for the pieces towards the bottom, and orientation, seems to indicative of Plato's first law of affinity: likes tend towards likes, or something along these lines.

They seek each other out, attract, seize, destroy
(Oil on paper 57.5 x 76.5cm)

This title seems to be based on Goethe's 23 Oct 1799 comment to Friedrich Schiller (see: Goethe timeline):

"Crebillon … treats the passions like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. There is no trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover."

The aggregate to the left above seems to be the entities (humans or chemicals) neutralizing or "destroying" each other.

Closed system
(Oil on paper 57.5 x 76.5cm)

Exits the system
(Oil on paper 57.5 x 76.5cm)

The title of this piece seems to be based on the thermodynamic definition of closed system as one with a regulated (black particles) boundary (black line) that is closed to the flow of matter (tan, gray, and light brown particles).

The title of this piece, expanding on the theme of previous, seems to depict the boundary becoming "open" allowing the passage or migration of gray, brown, and tan entities across its territory; alternatively, the boundary might be shown here in a state of destruction or new reconfiguration?

Vitriolated calcareous earth
(Oil on paper 57.5 x 76.5cm)

The title of this piece is the expanded name for gypsum, the formation of which, namely limestone contacted with sulfuric acid, is discussed in P1:C4, wherein the Captain-Edward friendship formation is compared to the gypsum and may be themed on Bergman reaction #20 (see: EA:IAD: reaction decipherment); gypsum is also mentioned in P2:C3, wherein the tiles of the chapel floor are described as being fastened together with gypsum.

Lime and vitriol
(Oil on paper 50 x 56.5cm)

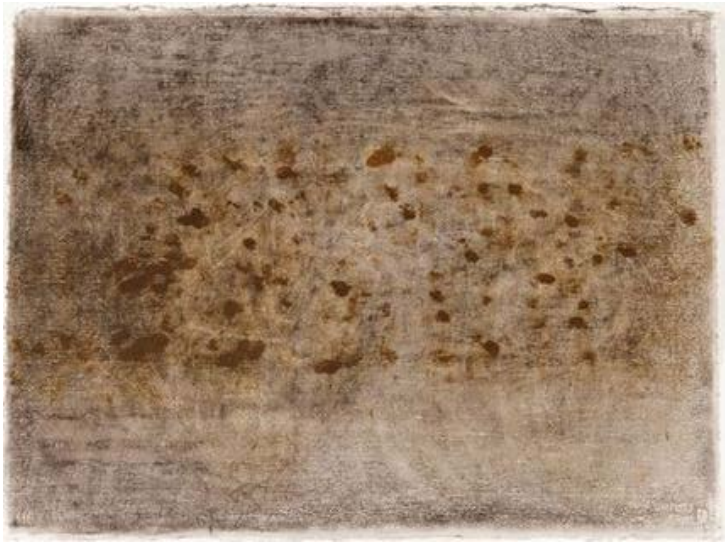

Vitriol is a synonym of sulfuric acid (mentioned # times in the novella); lime is mentioned three times in the novella. [3]

(dissect more)

Far from equilibrium
(Oil on paper 57.5 x 76.5cm)

The title of these piece seems to be a depiction, in some way, of Belgian chemist Ilya Prigogine's 1970s notion of order emerging, from chaos, at locations "far from equilibrium"; the sketch may show notions of bifurcation points or diagrams (right side).

Some of her other works, from her 2012 gallery, less easily discerned, as to possible Goethe-connectedness, are shown below:

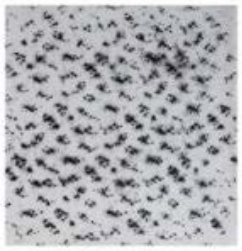

Cohere in regular figures

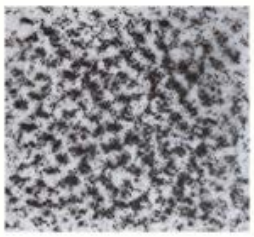

Prima naturalia

Unconformity surface

It saves itself perpetually

Letting go and seizing

From elements least visible

Invisible animacula

See also

â— René Magritte (1898-1967) | Elective Affinities (1933 painting)
â— Wolfe von Lenkiewicz

References

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2. Lorna McIntosh – OpenEyeGallery.co.uk.
3. Goethe, Johann. (1872). *Elective Affinities* (introduction by Victoria C. Woodhull; translator anonymous) (Lime, pgs. 40, 42, 75;). D.W. Niles.

θΔics

In thermodynamics, **Loschmidt's paradox** states that according to the laws of mechanics, a system of particles interacting with any force law, which has gone through a sequence of states starting from some specified initial conditions, will go through the same sequence in reverse and return to its initial state if one reverses the velocities of all the particles; and that this conflicts with the second law of thermodynamics, which asserts that for any such sequence of states the entropy must always increase, meaning that such a system cannot be reversed back to its initial state. [1]

The reversibility paradox was pointed out by Austrian physical chemist Joseph Loschmidt in 1876 to Austrian physicist Ludwig Boltzmann in commentary on his 1872 paper on his H-theorem. In short, Loschmidt said that the H-theorem singled out the direction in time in which H decreases, whereas the underlying mechanics was the same whether time flowed forwards or backwards. [2]

Thought experiment

In 1876, in sum, Loschmidt suggested a (*gedanken*) thought experiment to Boltzmann. The proposal went something along the lines of the following: suppose a gas is released at 12:00 noon in the corner of an evacuated room, with the molecules independently moving according to Boltzmann's statistical assumption, but also obeying Newton's laws of motion.

Now suppose at 12:05, the 'hand of God' (fact check) reverses the direction of all the molecules. It follows from reversibility that at exactly 12:10 all the molecules must return to the corner of the room. Surely its entropy must also have the same value as at the beginning. Yet Boltzmann's H-theorem suggests that entropy has increased continuously. Loschmidt noted that there seems to be a contradiction.

Boltzmann, supposedly, responded (fact check) to this by asserting that the H-theorem is a statistical statement, which must be true in the overwhelming majority of scenarios because the number of microstates associated with equilibrium is overwhelmingly greater than the number associated with any non-equilibrium state. In effect, according to a recent summary by Robert Ayres, Boltzmann conceded that occasional exceptions might be possible. [3]

See also

â— Poincaré recurrence theorem

References

1. Boltzmann, Ludwig. (1877). "On the Relation of a General Mechanical Theorem to the Second Law of Thermodynamics" ("Uber die Beziehung eines Allgemeine Mechanischen Satzes zum zweiten Hauptsatze der Warmetheorie"), *Sitzungsberichte Akad. Wiss.*, Vienna, Part II, 75: 67-73.
2. Flamm, Dieter. (1999). "Boltzmann: a Disordered Genius", *PhysicsWorld.com*, 9 April.
3. Ayres, Robert U. (1994). *Information, Entropy, and Progress: a New Evolutionary Paradigm* (pg. 5). Springer.

External links

â— Loschmidt's paradox – Wikipedia.

θΔics

In existographies, **Lothar Meyer** (1830-1895) (Partington 50:26) (CR:2) was a German chemist noted for his 1869 periodic table and for his 1887 work on the history of affinity chemistry, in the 19th century.

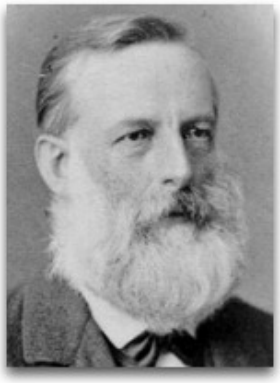

Overview

In 1869, Meyer, independent of Russian chemist Dmitri Mendeleyev, compiled a periodic table of 56 elements based on the periodicity of properties such as molar volume when arranged in order of atomic weight. [1]

4 werthig	3 werthig	2 werthig	1 werthig
—	—	—	—
—	—	—	—
C = 12,0	N = 14,04	O = 16,00	Fl = 19,0
16,5	16,96	16,07	16,46
Si = 28,5	P = 31,0	S = 32,07	Cl = 35,46
$\frac{89,1}{2}$ = 44,55	44,0	46,7	44,51
—	As = 75,0	Se = 78,8	Br = 79,97
$\frac{89,1}{2}$ = 44,55	45,6]	49,5	46,8
Sn = 117,6	Sb = 120,6	Te = 128,3	J = 126,8
89,4 = 2.44,7	87,4, = 2.43,7	—	—
Pb = 207,0	Bi = 208,0	—	—

The following shows later versions of his periodic table:

MEYER'S TABLE OF 1868.

1	2	3	4	5	6	7	8
		Al=27.3 ?=14.8	Al=27.3				C=12.00 16.5 Si=28.5 ?=44.5
Cr=52.6	Mn=55.1 49.2 Ru=104.3 92.8=2.46.4 Pt=197.1	Fe=56.0 48.9 Rh=103.4 92.8=2.46.4 Ir=197.1	Co=58.7 47.8 Pd=106.0 93=2.465 Os=199.	Ni=58.7	Cu=63.5 44.4 Ag=107.9 88.8=2.44.4 Au=196.7	Zn=65.0 46.9 Cd=111.9 88.3=2.44.5 Hg=200.2	?=44.5 Sn=117.6 89.4=2.41.7 Pb=207.0

9	10	11	12	13	14	15	
			Li=7.03 16.02 Na=23.05 16.08 K=39.13 46.3 Rb=85.4 47.6 Cs=133.0 71=2.35.5 Te=204.0	Be=9.3 14.7 Mg=24.0 16.0 Ca=40.0 47.6 Sr=87.6 49.5 Ba=137.1			
N=14.4 16.96 P=31.0 44.0 As=75.0 45.6 Sb=120.6 87.4=2.43.7 Bi=208.0	O=16.00 16.07 S=32.07 46.7 Se=78.8 49.5 Te=128.3	F=19.0 16.46 Cl=35.46 44.5 Br=79.9 46.8 I=126.8			Ti=48 42.0 Zr=90.0 47.6 Ta=137.6	Mo.=92.0 45.0 Vd=137.0 47.0 W=184.0	

Periodic table according to Lothar Meyer, 1870

I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.
	B=11,0	Al=27,3		--		?In=113,4	Tl=202,7	
			--		--		--	
	C=11,97	Si=28		--		Sn=117,8		Pb=206,4
			Ti=48		Zr=89,7		--	
	N=14,01	P=30,9		As=74,9		Sb=122,1		Bi=207,5
			V=51,2		Nb=93,7		Ta=182,2	
	O=15,96	31,98		Se=78		Te=128?		--
			Cr=52,4		Mo=95,6		W=183,5	
--	F=19,1	Cl=35,38		Br=79,75		J=126,5		--
			Mn=54,8		Ru=103,5		Os=198,6 ?	
			Fe=55,9		Rh=104,1		Ir=196,7	
			Co=Ni=58,6		Pd=106,2		Pt=196,7	
Li=7,01	Na=22,99	K=39,04		Rb=85,2		Cs=132,7		--
			Cu=63,3		Ag=107,66		Au=196,2	
?Be=9 3	Mg=23,9	Ca=39,9		Sr=87,0		Ba=136,8		--
			Zn=64,9		Cd=111,6		Hg=199,8	

In 1887, Meyer, in his "Evolution of the Doctrine of Affinity", discussed the semi-modern history of affinity, starting with Claude Berthollet's work. [2]

Quotes

The following are noted quotes:

> "The doctrine of affinity chemistry, a correct knowledge of which is, and must ever remain, the most important object of the theory of our science."
>
> — Lothar Meyer (1887), "Evolution of the Doctrine of Affinity" [2]

References

1. (a) Meyer, Michal. (2013). "An Element of Order" (Ñº), *Chemical Heritage*, Summer.

(b) History of the periodic table – Ausetute.com.au.
2. Meyer, Lothar. (1887). “Evolution of the Doctrine of Affinity” (translator: William Ramsay) (abs) (Ñº) , *Philosophical Magazine*, 23(145):540-.

External links

â— Julius Lothar Meyer – Wikipedia.

θΔics

In hmolscience, **Lotkean Jabberwocky** refers to any work, theory, or argument produced by a physio-chemical and or chemical thermodynamics based scientist that attempts to either explain or define life and or define or find the origin of life.

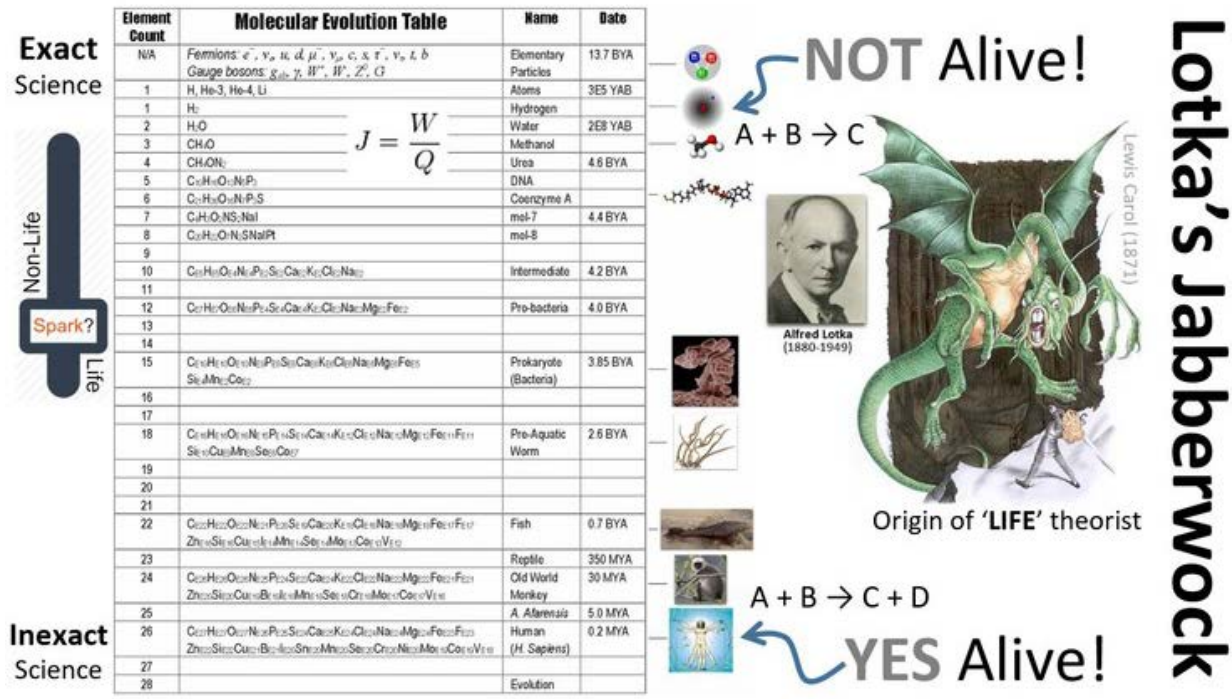

The draft Flickr coverslide to Libb Thims' 28 Jun BPE 2016 talk: **Lotka's Jabberwock**: on the 'Bio' of BioPhysical Economics, at the University of District of Columbia, Washington, DC, showing the gist of Alfred Lotka's 1925 "Regarding Definitions" chapter, wherein he states that in the future of exact sciences, the term "life" will meet its fate, and become a defunct term.

Overview

In 1871, Lewis Carroll penned a nonsense poem called "Jabberwocky", about the killing of a creature named "the Jabberwock", which was included with his novel *Through the Looking-Glass, and What Alice Found There*. [2]

In 1925, Alfred Lotka, in his "Regarding Definitions", explained that a physical chemical scientists who goes looking for the "origin of life" or physical definition of life is someone hunting a scientific Jabberwock.

On 28 Jun 2016, Libb Thims, in his "Lotka's Jabberwock: on the 'Bio' of BioPhysical Economics", a talk given during the 7th BioPhysical Economics conference (see: BPE 2016), discussed the defunct theory of life, life does not exist, and life terminology upgrade reformation, centered on Alfred Lotka's 1925 chapter "Regarding Definitions", the coiner of the term "biophysical economics", wherein he posits, with sharp foresight, that in the future, in the literature of the exact sciences, the term "life" will become "wholly unnecessary" and that the scholar who goes searching for the "origin of life" is but someone hunting for Lewis Carol's Jabberwock, i.e. a nonsense fictional entity. [1]

Abstract

The following is the working abstract of Thims' talk:

> "The 'B' of BPE is not recognized by the 'P'. Biology, as Lotka (1925) — the coiner of BPE — classified as a Jabberwocky-like 'nonsense' term, as Sherrington (1938) said is 'not' recognized by 'P', and as Crick (1966) — the co-discoverer of DNA — said should be 'abandoned', is not recognized by physics, thermodynamics, in particular, and therefore in immediate need of terminology reform. Thermodynamics, according to the Johnstone-Pavlovich rule, applies to some things and not to others, and the things which it does not apply are unreal and do not exist. Life, in short, is a 'thing' (fictional concept) that is not real and does not exist. Concept and terminology reform, accordingly, is in order."

An historical abstract of Thims' talk is available in the "life" section of the does not exist article.

Videos

The following are videos to be shown, in part (shown by time demarcations), in the talk:

- Rogers, Alfred. (2016). "Why Life Does Not Exist" (V|2:20-9:03), Jun 1 | **Play:** after "Abioism" slide (#17).
- Thims, Libb. (2016). "Walking Molecules: Philosophical Implications" (V|1:18-4:09), Human Chemistry 101, May 24 | **Play:** after "name" slide (#).

Preliminary

In 2011, Nathan Brown (UC Davis) and Petar Milat (MaMa) organized a "To Have Done With Life" conference, at Zagreb, Croatia, which contain preliminary aspects of Thims' talk, albeit presented in a less progressive manner; the following introduction text by Brown in particular.

> "The problem of "emergence" is that a modality of being came to be which was not before, and the difficulty is that tracking the physical causes of such an event leads to irresolvable aporia (Q). And these aporia are too easily dissembled through reference to

> ‘complex, self-organizing processes,’ as if we can at once account for and evade the radicality of the event we are trying to think by placing it within the same category as the formation of snowflakes, traffic patterns, or the activities of termite colonies. In its typical usage — the work of Stuart Kauffman, for example — the concept of ‘emergence’ is a crypto-metaphysical concept pretending to offer physical explanations, at once allowing and accounting for gaps in the latter through reference to ‘complexity’.”

The following diagrammatic timeline of auto-catalytic closure like arguments gets to the gist of Brown's statement; namely that some, such as: Sergius Morgulis (1952), Tibor Ganti (1974), and Stuart Kauffman (1995), have posted that the following linear chemical mechanism in going form non-living to living things:

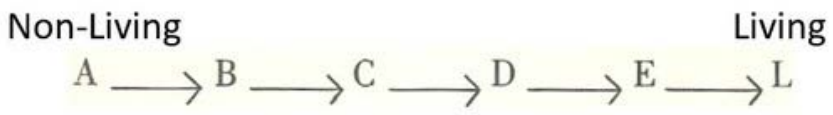

which most conceptualize as the basic origin of life problem, can be resolved by using a combination of: (a) reaction feedback + (b) autocatalysis (products that catalyze reactants) arguments:

Morgulis | 1952

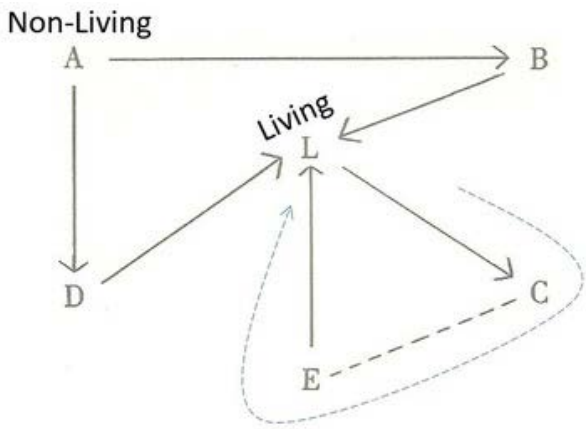

Ganti | 1974

Ganti chemoton

Kauffman | 1995

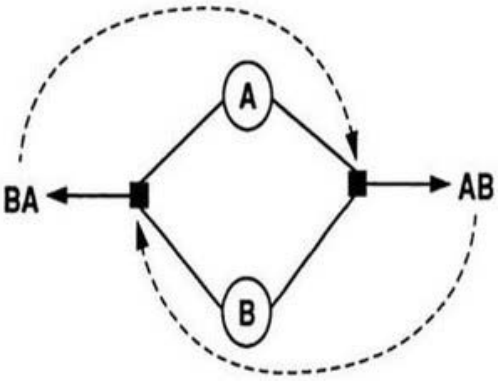

Kauffman autocatalytic set

All of which, however, after picking through the various convoluted "free energy" arguments, reduce to but perpetual motion arguments, perpetual motion of the living kind specifically:

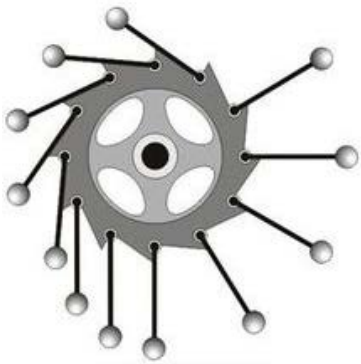

Perpetual motion

This is where the 2011 conference ended.

Beyond | 2011

In the 2016 conference, Thims will go beyond this stopping point, and explain what things look like from the other side of the fence, i.e. the life does not exist perspective, namely when one comes to the correct view that "life", like "ether" or "caloric", is a thing (or concept) that does not exist, according to modern exact science, as Lotka prophesized nearly a century ago. If, accordingly, a would-be-science such as "Bio-Physical Economics", or any **bio**-related science, for that matter, e.g. biophysics, biochemistry, biothermodynamics, biology, etc., desires to become an "exact science", addressing this deeply rooted problem becomes paramount. Thims will give an historical overview of this problem and give working examples of how this problem has been solved in articles submitted to the *Journal of Human Thermodynamics*, encyclopedia articles of Hmolpedia, published video lectures, and other areas, much of which is summarized in the life terminology reform article.

Quotes

The following are related quotes:

> "I know that the sunrise is an optical illusion. My teacher told me so."
>
> — Henry Mencken (1925), attributed; said by E.K. Hornbeck (Gene Kelly), of the *Baltimore Herald*, patterned after Mencken (O), in: *Inherent in the Wind* (1960), the film remake of the Scopes Monkey Trail, in response to query as to "why he bothers" (O), him and his newspaper, dealing with this religious legal trickery

> "Jewish and Muslim scholars regard 'life' as starting at 40 days."
>
> — Jane Maienschien (2002), "What's in a Name?" (O); cited by Jane Bennett (2010), one of the goads of the 2011 To Have Done with Life conference, in *Vibrant Matter* (pg. 147), in respect to atheism labels

See also

- Death does not exist

References

1. Thims, Libb. (2016). "Lotka's Jabberwock: on the 'Bio' of BioPhysical Economics" (slides: Flickr), 7th BioPhysical Economics meeting, University of District of Columbia, Washington DC, Jun 28.
2. Jabberwocky – Wikipedia.

θΔics

In religio-mythology, **lotus**, the symbolic plant of Upper Egypt, as compared to papyrus [N1], the symbolic plant of Lower Egypt, is sun god associated flower, that comes out of the water and opens with each morning rise of the sun.

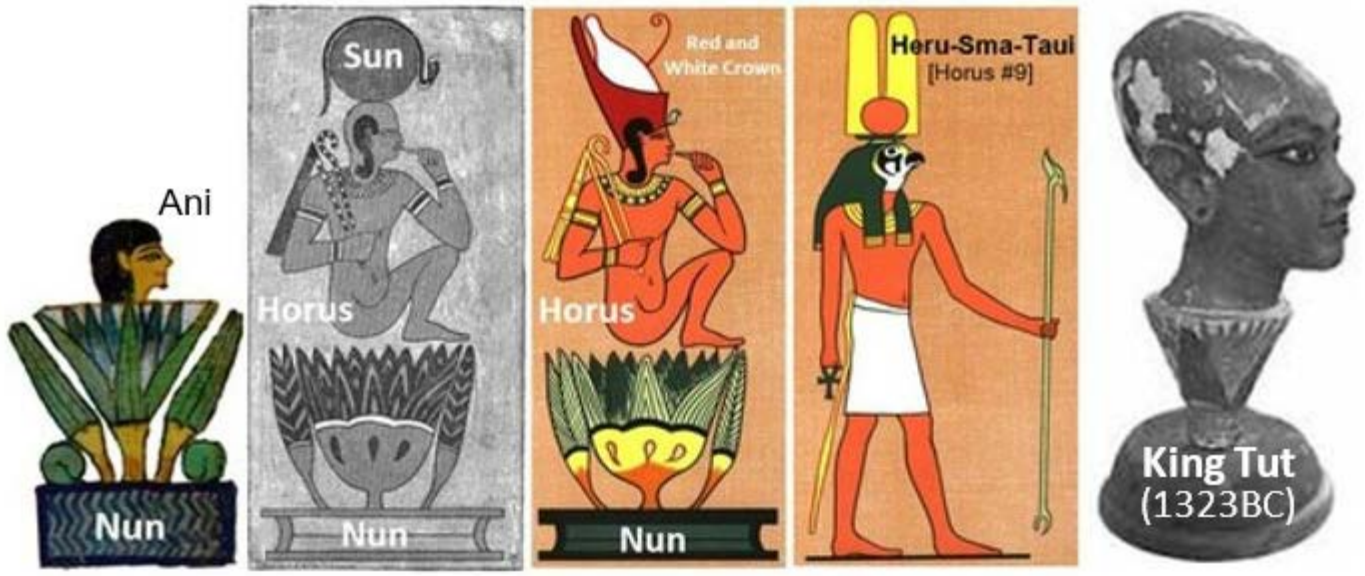

Left is rendition of this image is a head, of the deceased scribe Ani, as explained in his personalized version of the Egyptian Book of the Dead (1250BC), reborn out of the lotus flower. (O) Center, is the sun springing from an opening lotus flower, emerging out of the Nun or watery abyss, in the form of the child Horus. [3] Adjacent right, we see Horus the pharaoh sitting on Lotus while wearing the double crown of Upper and Lower Egypt. [7] At right (O) is Tutankhamen shown being born out of a lotus.

Overview

The lotus is the symbol of Upper Egypt, where Theban theology (see: Thebain creation myth) and Hermopolis theology (see: Hermopolis creation myth) were prominent, where the plant grew. [2]

The lotus closes at night and sinks underwater. In the morning, it re-emerges and blooms again. Thus, the flower, like the baboon and the dung beetle, became a natural symbol of the sun and creation.

In Hermopolis, as recounted in Heliopolis creation myth, it was believed that there was a giant lotus blossom that first emerged from the primordial waters of Nun and from which the sun-god came forth.

The following shows Chapter 81A "For Being Transformed into a Lotus" of the Ani-version (1250BC) of the Egyptian Book of the Dead, showing Ani, after his death, being reborn, like the sun gods Horus and Ra, out of an opening Lotus:

The following is Raymond Faulkner (1972) translation of the text of this chapter:

> “I am this pure lotus which went forth from the sunshine, which is at the nose of Ra; I have descended that I may seek it for Horus, for I am the pure one who issued from the fen.”

Some (O), to note, incorrectly label the man’s head as Ra.

Horus

This so-called “great world lotus”, as Wallis Budge (1904) refers to it, is one of things, among the various Egyptian mythologies, out of which the sun rose for the first time. [4]

The specific “Horus” shown above, is the Heru-Sma-Taui, Horus #9, according to Budge classification, aka “Horus the Uniter of the South and North”, defined as the son of Hathor, who was believed to spring into existence out of a lotus flower which blossomed in the heavenly abyss of Nu at dawn at the beginning of the year. This version of Horus was worshipped at Aat-hehu, a district near Herakleopolis Magna (nome #19, Upper Egypt), Ant (Denderah) (nome #6, Upper Egypt) (O), and the city of Khatat. [4]

The head of a man coming out of the lotus, above left, comes from a vignette of the Theban recension of the *Book of the Dead*, which Budge describes as follows:

> “In From Chapters lxxxi., versions A and B, we learn that the deceased had power to transform himself into a lotus; in the first version of the text he says, "I am the pure lotus which springeth up from "the divine splendour that belongeth to the nostrils of Ra," and in the second we read, "Hail, thou Lotus, thou type of the god "Nefer-Tem! I am he who knoweth you, and I know your "names among the gods, the lords of the Underworld, and I am "one of you." The vignette of the first version is a lotus, and that of the second is a lotus plant with a flower and buds growing out of a pool of water, and out of the flower springs a human head, i.e., the head of the deceased.”

The four sons of Horus, to note, are often shown on a rising lotus. (Q)

Hinduism

In 900BC, in India, much of the Upper Egypt lotus-based theology was imported and rescripted into the form of Brahma being born out of a lotus and the Hinduism creation mythology that followed. The following (Q) shows Krishna and Buddha being born out of a lotus:

A depiction of Ra and Apep coming out of a **lotus**, the stem of which coming out of the Nun (Dendera Temple, 40AD). In Hindu mythology, this was rewritten into the story of the god Brahma being born out of lotus the stem of which comes out of the navel of the god VishNu.

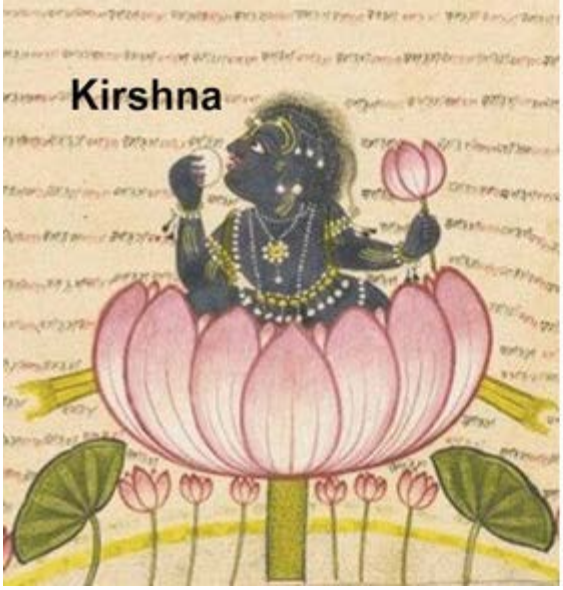

(add)

Quotes

The following are related quotes:

> "Nor, again, do the Egyptians believe that the sun rises a new-born babe from the **lotus**, but they portray the rising of the sun in this manner to indicate allegorically the enkindling of the sun from the waters."
>
> — Plutarch (c.100AD), *On Isis and Osiris* [1]

Notes

N1. Note: the papyrus is the symbol of Lower Egypt, where Heliopolis theology (see: Heliopolis creation myth), Memphis theology (see: Memphis creation myth), and Busiris theology (see: Osiris cult), reside, predominately, where

this plant grew.

References

1. Plutarch. (c.100AD). *Isis and Osiris*; in: *Plutarch's Moralia, Volume Five*: Isis and Osiris. The E at Delphi. The oracles at Delphi no longer given in verse (§:355-). The obsolescence of oracles (Introduction: Victor Hanson) (Lotus, pg. 29). Harvard University Press.
2. Ashby, Muata. (1997). *Anunian Theology: African Religion, Volume One* (Lotus plant, pg. 49; Dharma, pg. 65). Cruzian Mystic Books.
3. (a) Maspero, Gaston. (1903). *History of Egypt, Syria, Babylonia, and Assyria, Volume One* (pg. 193). Grolier Society. (b) Horus – TruthBeKnown.com.
4. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (lotus, 8+ pgs; world lotus flower, pg. 23; Horus #9, pgs. 472-73; head out of lotus, pg. 521-22). Dover, 1969.
5. Faulkner, Raymond. (1972). *The Egyptian Book of the Dead: the Book of Coming Forth by Day: Complete Papyrus of Ani, Featuring Integrated Text and Full-Color Images* (translator: Ogden Goelet; Preface: Carol Andrews; Introduction: Daniel Gunther; Foreword: James Wasserman) (Amz) (pg. 176). Chronicle Books, 2015.

External links

- Lotus – EgyptianMyths.net.

θΔics

In existographies, **Louis Bachelier** (1870-1946) (CR:4) was a French mathematician noted, in human physics, for his 1900 PhD thesis *The Theory of Speculation*, written under his advisor Henri Poincare, a publication focused on determining the probability of price changes, via using Brownian motion to evaluate stock options, which according to Gheorghe Savoiu and Ion Siman, is said to mark the start of the econophysics. [1]

Bachelier, in short, built on the work of Jules Regnault, and used a random hypothesis to treat securities prices similar to gas molecules, moving independently of each other, with future movements being independent of past movements. [2]

In the mid-1950s, Bachelier's 1914 *Games of Gambling, Chance, and Risk* (*Le jeu, la chance et le hasard*) was discovered, in the Yale library, by statistician Leonard Savage, who in turn sent several postcards to colleagues to see if anyone was familiar with his work; one went to Paul Samuelson, who whet searching for his book in the MIT library, and therein found his PhD dissertation, who thereafter began to revive his work. [3]

References

1. Savoiu, Gheorghe. (2012). *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (pg. 8). Academic Press.
2. (a) Bachelier, Louis. (1900). "Theorie de la Speculation", PhD thesis in mathematics, Annales Scientifiques de l'Ecole Normale Suprieure, III-17: 21-86.
(b) Preda, Alex. (2009). *Framing Finance* (pg. 264). University of Chicago Press.
(c) Mantegna, Rosario N. (2006). "The Tenth Article of Ettore Majorana" (abs), Arxiv.org, Aug 29; in: Bassani G.F (ed) (2006) *Ettore Majorana Scientific Papers: on the Occasion of the Centenary of the Birth* (pgs. 250-26). Springer.
(d) Daniel, Gilles and Sornette, Didier. (2008). "Econophysics: Historical Perspectives", in: *Encyclopedia of Quantitative Finance* (abs), Rama Cont (eds). Wiley, 2010.
(e) Joules Regnault – Wikipedia.
3. Szpiro, George. (2011). *Pricing the Future: Finance, Physics, and the 300-year Journey to Black-Scholes Equation: a Story of Genius and Discovery* (pg. 185). Basic Books.

Further reading

â— Laurent, Carraro and Crepel, Pierre. (2006). "Louis Bachelier, March 11, 1870 – April 28, 1946", Mathematics, Portraits, images.math.CNRS.fr.
â— Weatherall, James O. (2013). *The Physics of Wall Street: a Brief History of Predicting the Unpredictable* (Bachelier, 68+ pgs). Houghton Mifflin Harcourt.

External links

â— Louis Bachelier – Wikipedia.

θΔics

In hmolscience, **William Louis Barrett** (1933-), of-cited as W. Louis Barrett, commonly known as "Louis Barrett", is an American physicist noted for his late 1970s work, as chair of the physics department, at Western Washington University, as a physics consultant for sociologist Ed Stephan, also chair of the sociology department, in discussion on the physics, chemistry, and thermodynamics applied to sociological and territorial questions, resulting in the 1995 book *The Division of Territory in Society*, which discusses things such as "are humans fermions or bosons", the chemical thermodynamics of society, chemical potential and migrations (see: social chemical potential), among other ripe topics. [1]

Education

Barrett completed his BS at the University of Idaho, and his MS and PhD in 1988, both at the University of Washington, the latter with a dissertation on "Ferromagnetic Resonance Studies on Nickel Single Crystals", becoming chair of the physics department by the 1970s. (Q)
From 1988 to 2004, Barrett worked on the Soudan 2 proton decay experiment and on the MINOS neutrino oscillation detector, taking shifts at the MINOS control room at Fermilab. (Q)(Q) Barrett currently is professor emeritus at the University of Washington.

References

1. Stephan, Ed. (1995). *The Division of Territory in Society*. EdStephan.org.

External links

- Barrett, William Louis (1933-) – WorldCat Identities.
- W. Louis Barrett – RateMyProfessors.com.

θΔics

In existographies, **Louis de Bonald** (1754-1840) was a French philosopher noted for []

Misattribution

In c.1802, of misattribution note, French physician Mathieu Buisson (1776-c.1805) vented that his opinion that Baron d'Holbach, author of *The System of Nature* (1777), was "insane"; the summary of which by L.S. Jacyna (1987) is as follows:

> "Buisson (Q) held that the notion that the brain itself felt and thought was a 'revolting opinion' reminiscent of the '**insane** author [Holbach] of the *Systéme de la Nature*'."
>
> — L.S. Jacyna (1987), summary of Buisson's criticism (Q)(Q) of Xavier Bichat's 1801 theory (Q) of physiological properties; note: quoted misattributed, by Jennifer Hecht (2003), to Louis de Bonald

In 2003, Jennifer Hecht, in her *Doubt: a History*, citing Adrian Desmond (1989), who in turn cites L.S. Jacyna (1987) and R.W. Burkhardt (1977), misattributes the Holbach is insane quote to the mouth of Louis de Bonald, as follows:

> "The royalist philosopher Louis de Bonald cursed both the 'insane' system of d'Holbach and the species transformism of Lamarck."
>
> — Jennifer Hecht (2003), *Doubt: a History* (pg. 403)

(add)

Quotes | By

The following are quotes by Bonald:

> "The deist is a man who in his short existence has not had time to become an atheist."
>
> — Louis de Bonald (c.1830)

References

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External links

- Louis Gabriel Ambroise de Bonald – Wikipedia.

θΔics

In existographies, **Louis de Broglie** (1892-1987) (IQ:180|#194) [GPE] (CR:21) was a French physicist, noted for his 1924 proof that any kind of particle, whether atom, electron, photon, or even a bullet or a planet must have associated with it a wave, which is not material, but whose strength tells the probability of its presence

Overview

In 1924, de Broglie gave a proof that any kind of particle, whether atom, electron, photon, or even a bullet or a planet must have associated with it a wave, which is not material, but whose strength tells the probability of its presence, whose wavelength is: [1]

$$\lambda = \frac{h}{p}$$

where *h* is Planck's constant and *p* its initial momentum. De Broglie, in retrospect, summarizes the origin of his wave mechanics as follows: [3]

> "I presented the first principles of wave mechanics in three Notes that appeared in *Comptes rendus* of Septempber-October 1923 and later gave a more elaborate version in my Doctoral Thesis submitted on 25th of November, 1924. My essential idea was to generalize for all particles the coexistence of waves and particles which had been discovered by Einstein in 1905 for the case of light and photons. In conformity with the clear ideas of classical physics, I tried to imagine a real physical wave which transported minute and localized objects through space in the course of time."

De Broglie then goes on to explain the two ways he went about doing this.

The Heisenberg uncertainty relation, supposedly, is derived or rather a necessary consequence of the above de Broglie wavelength equation. [2]

Quotes | By

The following are quotes by Broglie:

> "In classical thermodynamics, we introduce in order to enunciate the second principle of this science the magnitude 'entropy', the physical meaning of which remained so obscure that Henri Poincare called it 'prodigiously abstract'."
>
> — Louis de Broglie (1979), "Article" [4]

> "It was Boltzmann who, by developing the ideas of statistical thermodynamics, gave us the real meaning of this quantity by showing that the entropy S of the state of a body is connected to to the probability P of this state by the famous formula: S = kB ln P [...] in Analytical Mechanics [...] the real meaning of Hamilton's principle is the following: The movement of a body is that which has the greatest thermodynamic probability under the conditions to which is subjected. I think that this conception of the deep nature of the Hamiltonian principle casts a stream of light upon real meaning, analogous to that which Boltzmann's formula casts on the meaning of entropy."
>
> — Louis de Broglie (1979), "Article" [4]

See also

â— Human wave function

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External links

â— Louis de Broglie – Wikipedia.

θΔics

In thermodynamics, **Louis Napoleon George Filon** (1875-1937), cited as L.N.G. Filon, was a French-born English mathematician and physicist noted for his *circa* 1898 "conception of historical change and of time as a problem in relative motion", which he suggested to English mathematical physicist Karl Pearson, who in turn penned a note entitled "On the Reversibility of Natural Processes" to his 1900 *The Grammar of Science*, wherein the operation of a superluminal relativistic Maxwell's demon [see: Maxwell's demon] was outlined, an intellect that could watch evolution, both of humans and the solar system, in reverse, back through the formation of the pre-sun nebula, and as such has the ability to go forward and backward in history, or if moving at the speed of light, according to Pearson, would "live in an eternal now". [1]

Relativity

Filon's superluminal demon thought experiment may have had influence on German-born American physicist Albert Einstein, who in 1902, or possibly prior, was reading *The Grammar of Science*, and also conceived of his running along side a beam of light thought experiment (date), which resulted in his 1905/1916 relativity theory. [3]

Education

Filon encountered Karl Pearson while a student at University College London. He completed his BA in 1896, after which he served as Pearson's demonstrator of applied mathematics until 1898. In 1912, Filon succeeded Pearson as Goldsmith Professor of applied mathematics and mechanics. [2]

Books

- Filon, L.N.G. (1908). *An Introduction to Projective Geometry*. Arnold.
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θΔics

In existographies, **Louis Lemery** (1677-1743) (CR:4) was a French physician and chemist noted for his 1709 "Conjectures and Reflections on the Matter of Fire and on the Light" in which, building on the previous burning glass experimental work and matter of heat (igneous particle) theories of Dutch chemist Wilhelm Homberg (1652-1715), he reconceptualized the "particles of fire" view in the form of a universal solvent for calcination and combustion processes by drawing an explicit analogy with the action of water as a solvent in regards to salts. [1] Lemery stated: [2]

> "The matter of fire is the first and the most powerful solvent of earthly bodies; we have no other agent that penetrates as deeply and disunites the essential substances as perfectly."

He argued that fire, functioning as a solvent, was a "fluid of certain nature".

Family

Louis Lemery was the son of Nicolas Lemery (1645-1715), an Eduard Farber (1961) ranked greatest chemist, noted for his geometrically-locking acid-base model of corpuscles. [3]

Fixed fire

Lemery articulated a detailed mechanism for the fixation of fire in bodies. Often, according to Lemery's model, fire became imprisoned (fixed) in solid bodies rather than dissolving them. Two repercussions of this model were: firstly, that that the matter of fire enclosed in a solid body increased markedly the weight of the body; second, it preserved during the entire duration of captivity its particular properties, which became evident when it escaped its prison.

Lemery justified this model by virtue of the fact that all the world knew, according to him, that several metallic matters, including the regulus of antimony, lead, tin, and even mercury, gained weight when exposed to fire; though they lost much of their proper substance during the operation.

Influence

Lemery's work, according to Korean-born American affinity chemistry historian Mi Gyung Kim, was said to have set the stage for the latter phlogiston theories models, such as Guillaume-Francois Rouelle and Pierre Macquer who identified phlogiston as "fixed fire." Swedish chemist Herman Boerhaave also cited Lemery as being influential to his theories on heat. [2]

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â— Kim, Mi Gyung. (2008). "The 'Instrumental' Reality of Phlogiston", *International Journal for Philosophy of Chemistry*, 14(1): 27-51.

External links

â— Louis Lémery – Wikipedia.

θΔics

In existographies, **Louis Pasteur** (1822-1895) (IQ:175|#280) [RGM:52|1,250+] (Murray 4000:1|M / 11|CS) (Simmons 100:5) (Partington ranking:49) (Hart 100:6) was a French chnopsologist (biologist), micro-chnoposologist (microbiologist), and chemist; generally known for the principles of pasteurization (eponymously named), vaccination, and microbial fermentation.

Other

Pasteur, supposedly, was an advocate of biogenesis theory; he also, supposedly (Ñº), expressed some type of belief of god.

Quotes | By

The following are quotes by Pasteur:

> "Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world."
>
> — Louis Pasteur (c.1880)

External links

â— Louis Pasteur – Wikipedia.

θΔics

In hmolscience, **Louis-Marie Vincent** (c.1940-) is a French electromechanical engineer and biophysical chemist noted, in cessation thermodynamics, for his 1988 to 2002 publications on the physics of resurrection.

Overview

In 1988, Vincent, in his *Can We Believe in Resurrection*, speculated on life and death in a modern scientific context; this gist of his theory being that: [1]

> "The brain is a machine that obeys the laws of thermodynamics."

but that the spiritual element called the soul is a type of quantum field attached to superluminal particles. Curiously, he also has theories on how love is a form of thermodynamic potential, that may be converted into heat and movement, and how the brain, being comprised of matter and energy, thus obeying the laws of matter and the laws of thermodynamics, may act in a "change of state" of energy at the time of death. [1]

In 2002, Vincent, in his *Other Logic of Living*, used physical methods, such as information and analysis of form, to model the living being as a whole and to present a new definition of life; the following quote gives a glimpse of Vincent's perspective: [2]

> "Not only do we not really know what life is, but we are not quite sure what death is either."

Vincent cites Henri Bergson and Pierre Teilhard, among others. On the basis of Teilhard's *The Phenomenon of Man*, for instance, Vincent discusses how love is a form of energy (Teilhard's view), which may act as a type of potential that may be transformed into movement, movement into heat, and so on; but that there is also production of entropy. Using Belgian thermodynamicist Ilya Prigogine as a basis, Vincent explains various facets of death and near-death-experiences via concepts such as conservation of energy, entropy generation, thermodynamic time, etc., postulating that actions in which individual die for a time and then come back to life signifies that death is a "reversible phenomenon" similar to the heating and contraction of an iron bar.

Education

Vincent completed his MS in electromechanical engineering and his PhD in biology and physical chemistry. He is a former professor of the University of Paris. [3]

References

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Further reading

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● Vincent, Louis-Marie. (1989). "Energy and Thought" (L'energie et la Pensee), *3e Millenaire*.

External links

- 3’ Pour Change le Monde, Louis-Marie Vincent (biologist) – Terre.tv.
- Louis-Marie Vincent (maybe not the same person?) – Linked in.

θΔics

In hmolscience, **Louise B. Young** (1919-2010) was an American physicist and geologist noted, in human thermodynamics, for 1986 creative forces anti heat death theory of the universe.

Overview

In 1986, Young, in her *The Unfinished Universe*, attempts to give meaning, purpose, and morality to human existence, in the context of a continuously changing universe, inexorably advancing in time, situated in the cosmological theory of the ultimate extinction of the world by universal entropy, mixed with insights from biology, physics, cosmology, and astronomy. [1]

Her thesis is that contrary to the long-held beliefs of many scientists that the universe is running down towards heat death and will eventually collapse upon itself, the tendency toward increasing entropy is merely one aspect of a single process that is creating more complex, highly organized, and more efficient forms of matter all the time, and at every level—from the microscopic to the stellar, supposedly giving a “stirring vision of order, form, change, and the creative forces in the universe.” In her book, Young advocates the Gaia hypothesis of James Lovelock.

Religion

Young's theory seems to have tinge of subtle religious undertones to it, as is evidenced by the fact that her work has been influential to those as Paul Davies and David Alkek. To cite one example, she states: “I postulate that we are witnessing—and indeed participating in—a creative act that is taking place throughout time.” In other words, "creative acts" are typically the work of a “creator”, aka god. The mention of creative, typically is used or discussed in manner so to be scientifically politically correct, so to speak. Though, to note, she does seem to discuss religion in a general sense, e.g. discussing olden mythologies explanations.

Education

Young entered Vassar College in 1936, completing a BS in physics, in circa 1940 after which she worked at the MIT radiation laboratory developing radar technology. In the 1960s, she wrote a number of books that explained the basics of physics, astronomy, geology, and environmental science to lay audiences. In 1979, she completed an MS in geology at the University of Chicago. Her and her late husband Hobart P. Young established a professorship in environmental science at the University of Chicago. [2]

References

1. Young, Louis B. (1986). *The Unfinished Universe* (thermodynamics, 5+ pgs; ch. 6: “Entropy and Evolution”, pgs. 117-37). Simon and Schuster.
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θΔics

In terminology, **love** is a word that describes various states of positive emotional experiences, that encompass a number of facets of human activity, particularly the desire to give one's life to another person, as well as the combined acts of caring, friendship, family, and intimate union. [1]

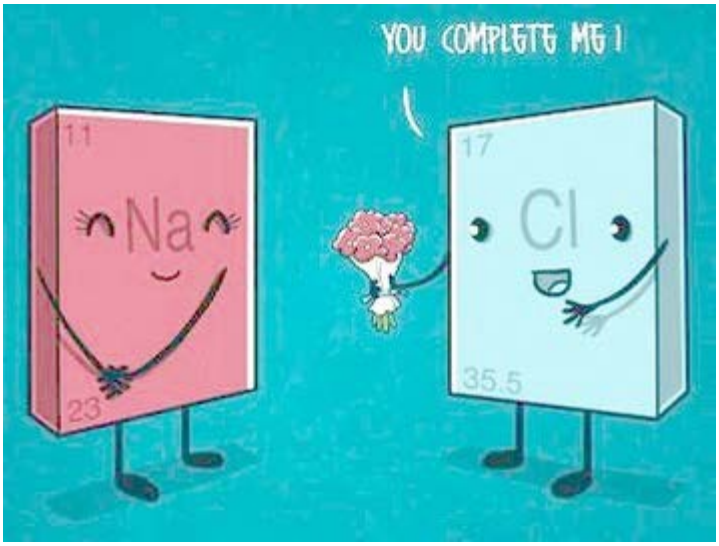

A wirdou.com chemistry of love stylized image (O), conceptualizing **love** as the formation of a perfect chemical bond, a covalent bond in particular, between sodium and chlorine.

Human chemistry

See main: Chemistry of love

In human chemistry, love is an umbrella term that encompasses the overall emotional and energetic evolution state of the process of a spontaneous combination reaction between two human molecules, in which commonly two previously unattached people, *A* and *B*, collided in life (reaction existence) to unite in the form of a dynamic *AB* couple: [2]

$$A + B \rightarrow AB$$

The word "love", however, is intimately linked to the word "hate", particularly in reference to chemical bonding dynamics. Namely, when the term love is used to signify a certain level of attraction to a quality of a person, object, or objective, and conversely when the word hate is used to signify a certain level of repulsion to the same person, object, or objective, then the two labels function as balancing stabilizers in the bond, as found, for instance, in a 5-to-1 ratio in long term marriage bonds. [3]

Neurochemistry | Neuroanatomy

See main: Neurochemistry

In the late 20th century, researchers began to discern the neurochemical and neuroanatomical underpinnings of love.

In 2004, Forbes reported on the work of Andreas Bartels and Semir Zeki, who claimed to have produced the first fMRI images of the brain on love: comparing images of those looking at pornography, to images of people in love, to those of mothers looking at their infants, found the scans of the latter two were almost identical—except in the people in love case, where there was extra activity in the hypothalamus, which is linked to sexual arousal: the reward center of the brain lights up when in love, but some regions get turned off: those commonly associated with things like moral judgment. [6]

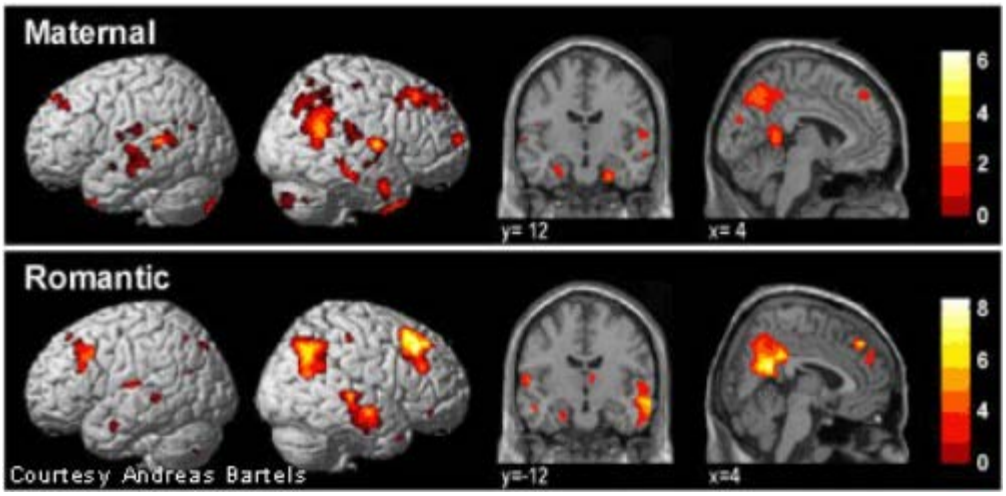

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Human Thermodynamics

See main: Thermodynamics of love

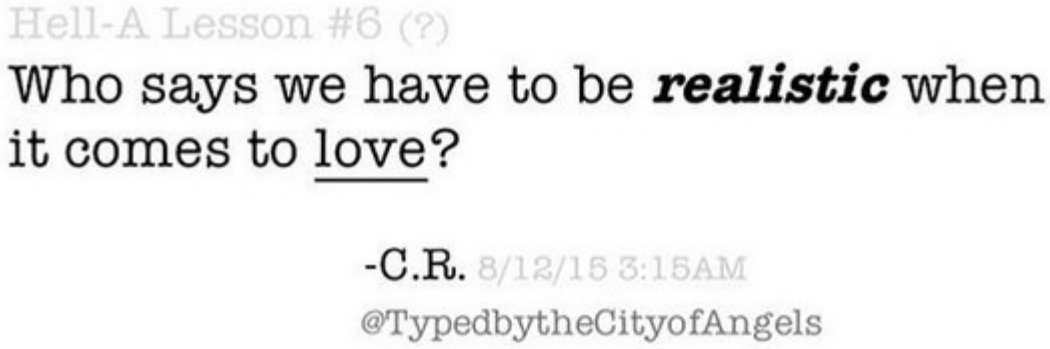

A 2015 Instagram post (O) on **love** and reality and whether or not one should be realistic about love.

In human thermodynamics, love is a term that is quantified by the release of functional or usable work energy, particularly Gibbs free energy, out of a thermodynamic system during an evolution cycle. One of the first to write semi-correctly about the thermodynamics of love was American computational chemist David Hwang in his 2001 article "The Thermodynamics of love". [4]

Entropy

Some have postulated a relationship between love and entropy. According to American economist Jeremy Rifkin, for instance, “Love is not antientropic, as some would like to believe. If love were antientropic, it would be a force in opposition to becoming, for the entropic flow and becoming go hand in hand. Rather, love is an act of supreme commitment to the unfolding process. That is why the highest form of love is self-sacrifice—the willingness to go without, even to give one’s own life, if necessary, to foster life itself.” [5]

Quotes

The following are related quotes:

> “**Love** is gravitation toward a beautiful object.”
>
> — Ortega y Gasset (c.1920) [9]

> “We call **love** what binds us to certain creatures only by reference to a collective way of seeing for which books and legends are responsible. But of love I know only that mixture of desire, affection and intelligence that binds me to this or that creature. That compound is not the same for another person. I do not have the right to cover all these experiences with the same name.”

— Albert Camus (1942), *The Myth of Sisyphus* [8]

"True love is like ghosts, which everybody talks about and few have seen."

— Francois La Rochefoucauld (c.1865)

"There are many people who would never have been in **love**, had they never heard love spoken of."

— Francois la Rochefoucauld (1665), *Maxims* (#136) [7]

See also

- Chemistry of love
- Chocolate theory of love
- Cupid
- Endorphin theory of love
- Equation of love
- Fall in love
- Love at first sight
- Love the chemical reaction
- Love thought experiment
- Oxytocin theory of love
- Physics of love
- Soul mate | See: Plato, Goethe, LFS
- Thermodynamics of love
- True love
- What is love?

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1. Top 150 Definitions of Love - Institute of Human Thermodynamics
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5. Rifkin, Jeremy. (1989). *Entropy - Into the Greenhouse World* (formerly published as *Entropy: a New World View*, 1981), (pg. 291). New York: Bantam Books.
6. (a) Herper, Matthew. (2004). "The Science of Love", *Forbes*, Jun 06.
(b) All you need is … (2010) – TwistedPhysics.TypePad.com.
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External links

- Love – Wikipedia.

θΔics

In phenomena, **love at first sight** is the process in which one or two people fall in love with each other

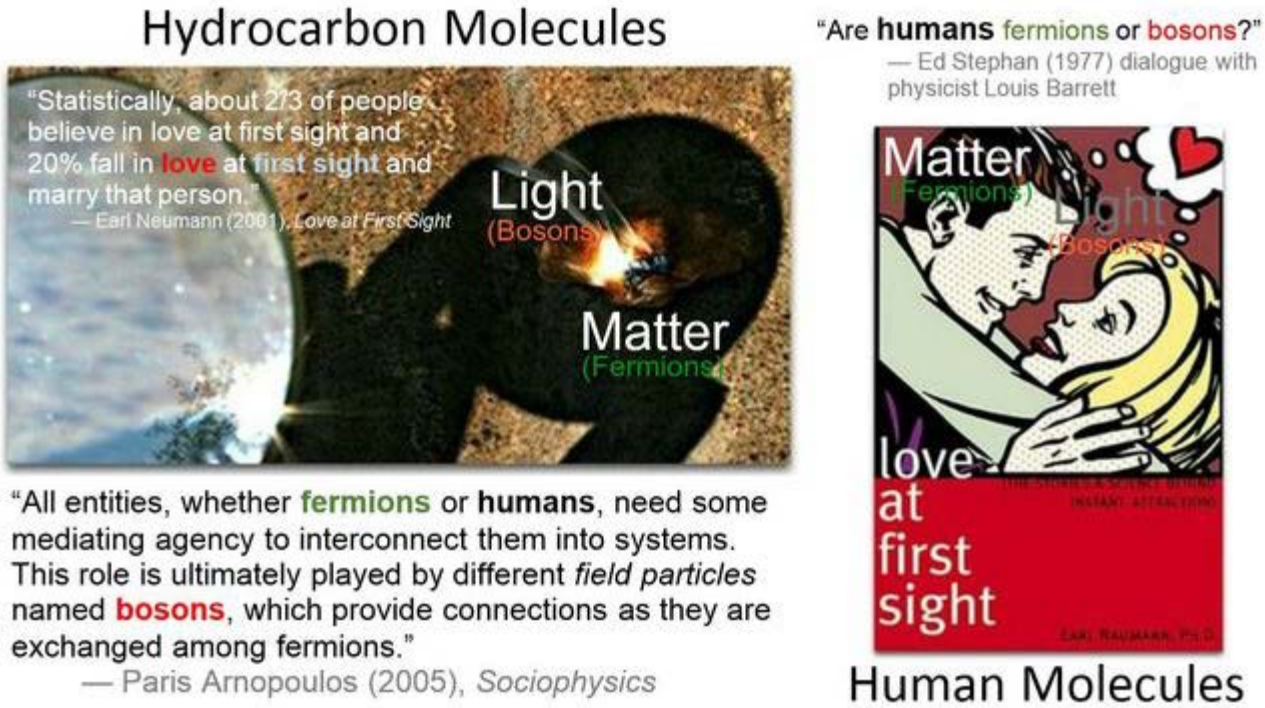

A segment from the cover page of Libb Thims Apr 2013 lecture "A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies", to Northern Illinois University mechanical engineering students, to quickly illustrate that "light", whether in the form of a magnifying glass making focused heat, or the visual impression of a beautiful object going into the receptors of the eyes of a human, can act as "spark" to trigger the activation energy barrier of the given reaction, whether hydrocarbon molecules, of dry leaves, combusting with oxygen molecules in the air, or **love at first sight**, between two human molecules, starved for love, of a human chemical reaction.

instantaneously at first visual contact. Statistically, about 67 percent of people believe in love at first sight and 20% fall in love at first sight and marry that person. [1] One of the first detailed studies of this phenomenon was conducted by American market research Earl Naumann and published in his 2001 book *Love at First Sight - the Stories and Science behind Instant Attraction.* [2] A related, albeit less common, phrase is "love at first smell", in which the smell of someone triggers instant attraction. [3]

Overview

One of the first studies done on the phenomenon of "love at first sight", published in 1970, found that in a survey of 679 men and women, 30% reported to have fallen in love at an initial glance. [4] A recent 1999 survey of one-hundred American couples, however, found that only 11% of men and women had fallen in love the moment they set their eyes on each other. [5]

In the late 1990s, American market research Earl Naumann interviewed 1,495 people across American, by phone, whose answers to questions on their views about "love at first sight" were tape recorded, documented, and statistically analyzed. [1] On this topic, according to Naumann, as we perceive our environment, and the inclusive "potentials" in that environment, through our senses of sight, smell, touch, and hearing that it is sensor information that triggers the chemical reaction of love. [6]

The results of his studies found that nearly two-thirds of the population believes in love at first sight; that of believers, more than half have experienced it; that 55% of those who experience love at first sight married the object of their affection and that three-quarters of those who married as a result of love at first sight have stayed married well over the national average. In a nutshell, this means, approximately, that 20% of people will fall in love at first sight, solely by the operation of a visual field particle stimulus (photons), marry that person, and that of those people, three-fourths will stay married better than the national average.

Subsequently, the visual stimulus of sight, as is the case with most sensor information, will enter the brain system

through the optic nerve and go to the thalamus (the brain's translator); these messages, in turn, are then simultaneously sent to the neocortex (the thinking part) and the amygdala (the place where deep memories and fear are stored). The amygdala then sends messages to the hypothalamus (the part that connects the nervous system to the endocrine system), which then directs the pituitary gland to release the appropriate hormones and neurochemicals.

In short, love at first sight is translated by the thalamus as a "desired human chemical reaction", a important message which is then sent to the amygdala (the core memory center), resulting in the flooding of endorphins and other neurochemicals, such as oxytocin, vasopressin, and dopamine, in the emotional center of the brain, the “limbic system”. As such, according to Naumann’s findings, “the implication is that there is not just a single chemical reaction taking place in our bodies … there are a whole series of reactions that result in the emotion of love."

Soul mates

Modern belief in the concept of a "soul mate" match, a theory tracing to dialogue in Plato’s *The Symposium*, in which he has Aristophanes present a story about soul mates; a theory that, supposedly, Goethe incorporated into the Edward/Ottilie paring via his alternate headache coincidence descriptions, in *Elective Affinities*. [7]

According to this logic, then, when two split souls re-encountered each other again for the first time since their original split they would fall in love at first sight, so to reunite with their other soul mate half.

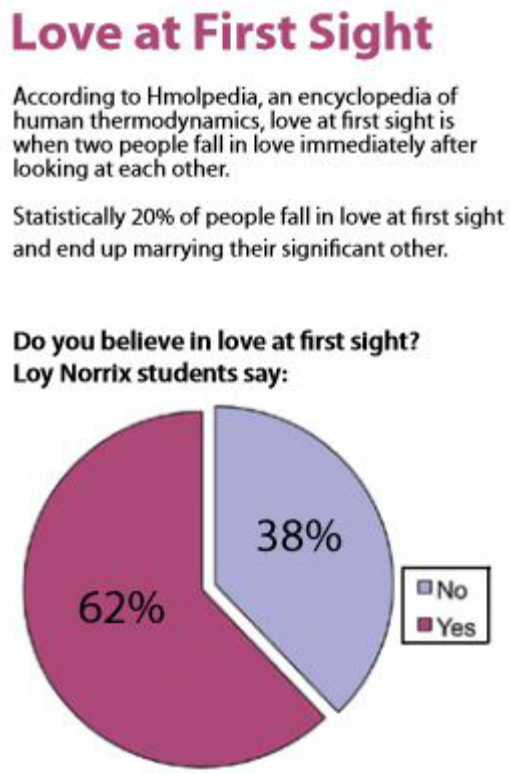

Results from a 2013 survey of American high school students, which found that 62 percent believe in the concept of **love at first sight**. [7]

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(b) Earl Naumann – the Science behind Instant Attraction.
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External links

â— Love at first sight – Wikipedia.

θΔics

In terminology, **love letters** are is a colloquial expression referring to passionate letters, sent to significant others, often filled with deeper emotional content.

Overview

On 12 Apr 1885, Henry Adams, while on an extended work stay-over in Washington, wrote Clover the following:

> "Social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life."

It would seem, here, to be the case, speculatively speaking, that the three human molecules Adams had in mind in this statement, subsequently, would have been himself, his side love affair (or interest) Elizabeth Cameron, and his wife Clover Adams.

In 1898 to 1903, the love letters of Ernst Haeckel have mentions the concept of elective affinity at least three times in respect to his own romantic relationships. In one letter to a Franziska von Altenhausen, Haeckel defines elective affinity as a strange psychological chemotropism: [1]

> "… seductive women—why should I, despite all scruples and obstacles, cast myself into the dust before you? Dearst Franziska, herein lies the enigma of 'elective affinity', of that strange psychological 'chemotropism', of whose power I have spoken repeatedly in my books—little dreaming that I myself should fall a victim to it in my old age!"

In 1895, Russian symbolist poet Vyacheslav Ivanov penned a number of love letters to Lidiya Dmitrievna Zinov'eva-Annibal, whom he met early that year, and who eventually became his second wife, which are filled with references to Goethe's *Elective Affinities*, in regards to theory and comparisons of the characters to himself.

See also

â— Gunter Grass
â— Honore Balzac
â— True love

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θΔics

In philosophy, **love philosophy** refer to ideas, notions, models, and or wisdom related to the appetite for affection and or romance; the philosophy of love.

Overview

The earliest love philosophy, of sorts, is that of Empedocles, who posited that the universe is composed of four elements: earth, air, water, and fire and that these attracted and repelled to each other via two forces: love and hate.

Plato, via his soul mate theory, is one of the most-famous love philosophers.

Noted love philosophers include: Judah Leo, Cervantes, Robert Burton, Goethe, Stendhal, and Henry Finck, to name a few.

See also

- Chemistry of love
- Physics of love
- Thermodynamics of love
- What is love?

θΔics

In terminology, **love terminology upgrades** refers to []

Physicochemical neutrality

physicochemically-neutral or chemical thermodynamically-neutral term replacements for "love" and related terms, e.g. "hate", that scale up and down the atomic scale (chain of being, so to say; or molecular evolution scale), elemental periodic table to family dinner table; in the same sense in which, at the beginning of the 20th century it became no longer coherent to speak about the love and hate of the elements, so to going into the early 21st century is it no longer coherent to speak about love and hate between humans defined as chemicals (human chemicals), molecules (human molecules), or powered CHNOPS+20 bound state animate structures.

Overview

In 450BC, Empedocles, in his four element two force model, referred to "love" as an attractive force and "hate" as a repulsive force, in short; some of this attraction to repulsion balancing (see: attraction-to-repulsion ratio) logic is seen in, e.g., the Gottman stability ratio discussion, amid which the colloquial inexact (atomically-inapplicable) terms love and hate become obviated.

In 1898 to 1903, Ernst Haeckel, in his various love letters, mentions the concept of elective affinity at least three times in respect to his own romantic relationships; in one letter to a Franziska von Altenhausen, Haeckel defines elective affinity as a strange psychological chemotropism: [1]

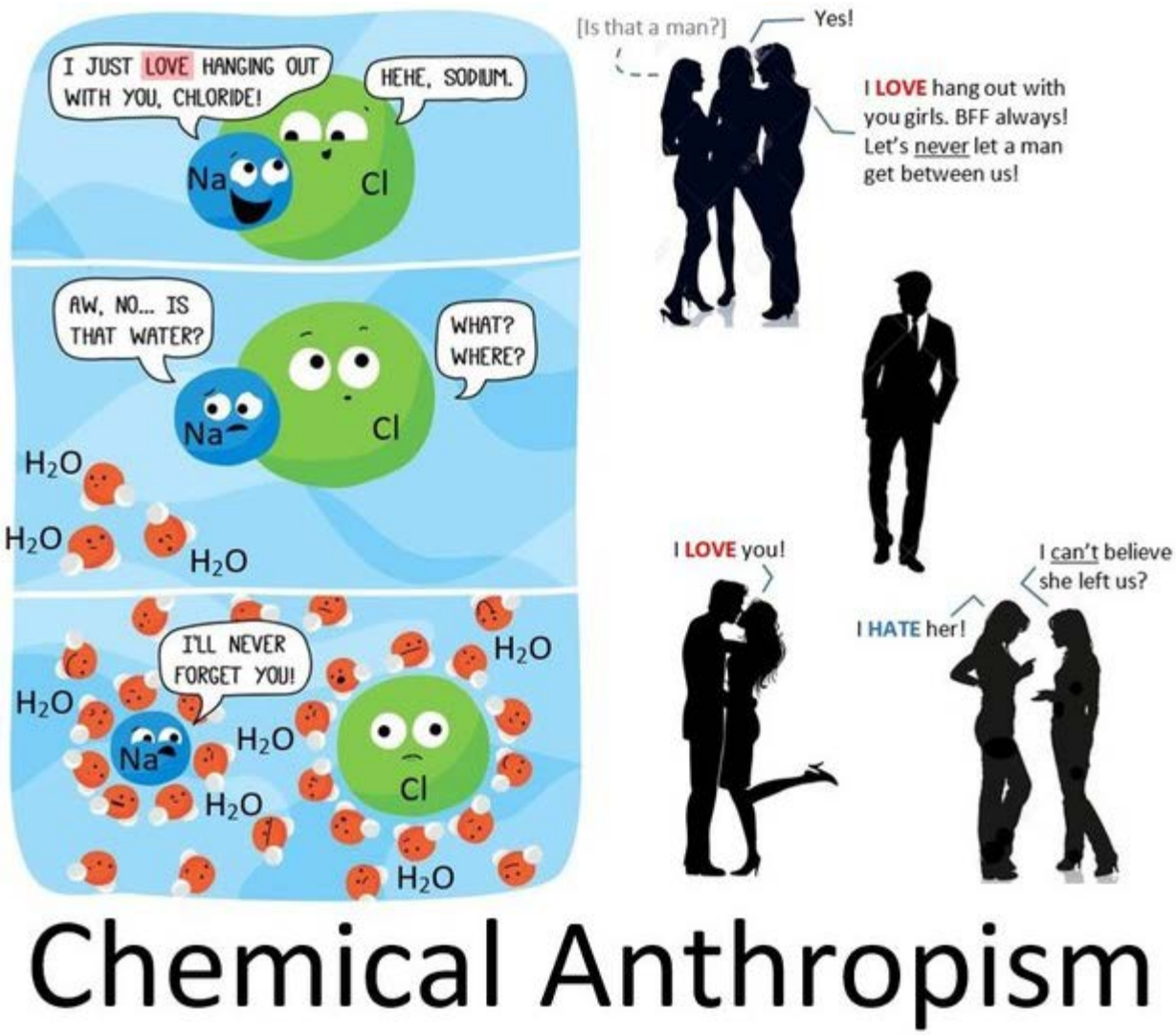

A depiction of via chemical anthropism, therein illustrating the need for **love terminology reform and or upgrades**, whenever physicochemical and or thermodynamical principles are used to explain human phenomena, i.e. "anthropisms", as Charles Sherrington (1938) said, must be expunged whenever digressions on human nature occur. In short, both depictions shown above illustrate a common natural phenomena that can be quantified according to the principles of physical chemistry. While both versions, left and right, employ the same terminology, i.e. "love" and "hate" to explain what occurs, the version on the left (Ñº) is but a fun cartoon, made for the purposes of humor, while the version on the right illustrates descriptions real "heated" emotions (i.e. a non-funny situation). The difference between the two is that the left-version employs terms that are NOT actually used in physical chemistry textbooks. Subsequently, if one desires to explain the right-version precisely, according to the laws of nature, then a physicochemically-neutral language must be employed, in the same sense in which actual physical chemistry textbooks define phenomena, using physicochemically-neutral (deanthropomorphized) terminology, otherwise "objectionable nonsense" results.

> "… seductive women—why should I, despite all scruples and obstacles, cast myself into the dust before you? Dearst Franziska, herein lies the

> enigma of ‘elective affinity’, of that strange **psychological ‘chemotropism’**, of whose power I have spoken repeatedly in my books—little dreaming that I myself should fall a victim to it in my old age!”

In 1910, Henry Bray gave the following suggestions for term reform: [2]

> “Similar forces to those that thus bring together the opposite sexes are everywhere evident and acting in the so-called material world, and in the judgment of the writer, equally natural and all-conquering. In our conceit and blindness we call the one **force ‘love’**, and the other **force ‘affinity’**; but mere alteration of words cannot alter the fact that the two words are the expression of the same force in nature.”

In this sense, we would say that "love", in colloquial inexact terminology, according to the Goethe-Helmholtz equation (or thermodynamic theory of affinity):

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

equates to positive affinity (or negative Gibbs energy partial differential change per reaction extent) in exact scientific terminology, and that "hate", likewise, corresponds to negative affinity (or positive Gibbs energy partial differential change per reaction extent), in scientific terms, i.e. physicochemcially-neutral language.

Alternatively, in the Haeckel sense, we might aptly state that "love" and "hate" corresponds to positive and negative psychological chemotropism, respectively, similar to a plant turning towards sunlight.

Quotes

The following are related quotes:

> “**Love is** an ideal thing, marriage a real thing; a confusion of the real with the ideal never goes unpunished.”
>
> — Johann Goethe (c.1820)

> “Love is gravitation toward a beautiful object.”
>
> — Jose Ortega (c.1920) [2]

> “**Love is a** romantic **designation** for a most ordinary biological process—or, shall we say, ***chemical*—process** … a lot of nonsense is talked and written about it.”
>
> — Greta Garbo (1932), *Ninotchka*

See also

â— Life terminology upgrades
â— Sociology terminology upgrades

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1. Haeckel, Ernst. (1930). *The Love Letters of Ernst Haeckel: Written Between 1898 and 1903* (editor: Johannes Werner) (elective affinity, pgs. 101, 212, 260). Methuen.
2. Bray, Henry T. (1910). *The Living Universe* (§19: Atomic and Human Affinities, pgs. 257-65; pg. 259). Truro Publishing Co., 1920.

θΔics

In culture, **love the chemical reaction** is a view that the process of two people meeting and "falling in love" is purely a chemical reaction or what is better termed a "human chemical reaction". It is a fundamental question that even seven year old children want to know the answer to. [1]

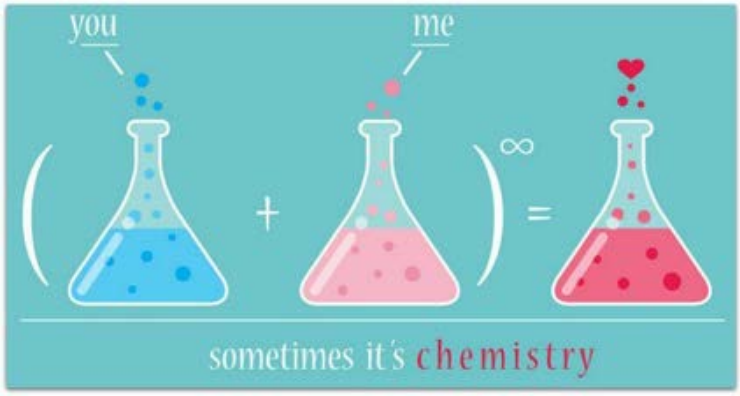

A humans as "reactive chemicals" view of **love the chemical reaction** along with some type of "chemical equation of love" of the form:

$$\left(\text{You} + \text{Me}\right)^{\infty} = \text{Love}$$

or you plus me to the power of infinity equals love.

The conception of love as a chemical reaction is view of life that people, over the the last two-hundred years, beginning generally with the publication of the 1809 novella *Elective Affinities*, have speculated on, mused over, and debated to no end. [2]

In modern terms, the debate continues, with those on the philosophical side considering love to be something beyond the ken of scientific analysis and those on the practical or factual side considering love to be a chemical process; the latter view of which particularly owes its standing to the publication of the results of recent neurochemical studies: the 1959 pheromone theory of mate attraction, the year bombykol was synthesized (by German chemist Adolf Butenandt), a chemical released by the female silkworm to attract mates; the 1976 endorphin theory of love (endogenous heroin); the 1980 chocolate theory of love (PEA theory); the 1990s oxytocin theory of love (the "cuddle chemical" explanation for the attachment of pair bonding), among others, such as the "limbic system" theory of love.

According to a 2005 poll, 65.5% of people consider love to be a chemical reaction. [3]

The first magazine to boast a cover defining love as a chemical reaction was the Valentine's Day special February 2006 issue of *National Geographic*, shown adjacent, which outlined the latest research on the brain chemistry involved in the various transition stages of romantic love. [4]

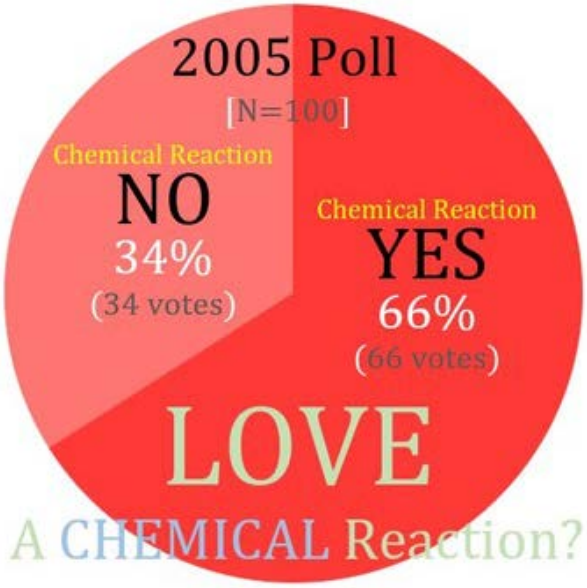

Left: A 2005 poll results of 100 Americans on the query: "is love a chemical reaction?", finding that 65.5% of Americans believe that love is a chemical reaction. [3] Right: an AllPosters.com Valentine's day poster/picture depicting love as a chemical reaction. [20]

History

See main: Goethe's human chemistry; Human chemical reaction (history)

The first to postulate that love is a chemical reaction, was German polymath Johann von Goethe who, after studying chemistry for a period of fifty years, along with having attended the weekly lectures of his life-long friend German chemist Johann Dobereiner, conceived a view that human relationships are elective affinity reactions that can be quantified by affinity tables. [2]

In April 1808, Goethe dictated a large part of his new theory that the vicissitudes of love in relationships and marriage are elective affinity reactions to his friend Heinrich Meyer. In October 1809, Goethe published his "chemical treatise on the origin of love" as a coded novella entitled *Elective Affinities* in which the characters, specifically in chapter four, book one, debate whether or not they are chemical species and in particular whether or not they have "choice" in their their friendships, relationships, and love affairs.

One of the first to explicitly state that love is a chemical process was Swiss psychiatrist Carl Jung. In his 1933 book *Modern Man in Search of a Soul*, Jung stated: [5]

> "The meeting of two personalities is like the contact of two chemical substances: if there is any reaction, both are transformed."

In film, the first to state that love is a chemical process was Swedish-born American actress Greta Garbo. Specifically, in the 1939 film *Ninotchka*, Garbo informs Melvyn Douglas that: [6]

> "Love is a romantic designation for a most ordinary biological—or, shall we say, **chemical**—process … a lot of nonsense is talked and written about it."

This famous quote was the centerpiece of the famous 1993 *Time Magazine* cover-story article "The Right Chemistry". [7] It was also the dominant quote found on the back cover of the 2007 two-volume *Human Chemistry* textbook by American chemical engineer Libb Thims (cropped section shown adjacent) [8]

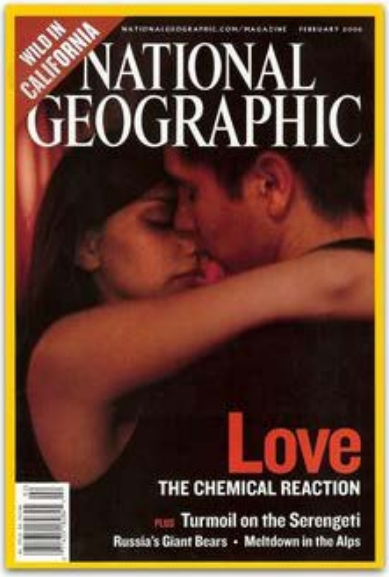

Left: A 2007 video series on the query **"Is Love a Purely Chemical Reaction?"** [Intro, Part 1 (above), Part 2, and Part 3] by American electrochemical engineer Libb Thims.
Right: Cover story: **"Love: the Chemical Reaction"**, in the February 2006 (Valentine's day) issue of *National Geographic.*

In 1979, American psychologist Dorothy Tennov, in her *Love and Limerence*, outlined a Freudian-like theory of a state of love, characterized by ambivalent but not complete rejection combined with intrusive thinking, called "limerence", modeled on French writer Stendhal 1822 theory of crystallization from his book *On Love*, and outlined a number of steps or mechanisms involved in a "limerent reaction" between the rejected person and the object of desire of the limerent person. The *limerent reaction* is a composite reaction; that is, it actually describes a unique *series* of reactions. These reactions occur only where misperceptions meet adversity in the context of a romance. Perhaps because of this unique specificity, limerent reactions can be uniquely quantified and predicted according to the schema of six steps. Tennov estimates, based on both questionnaire and interview data, that the average limerent reaction duration, from the moment of initiation until a feeling of neutrality is reached, is approximately three years. [17]

In 1993, American psychologist Harville Hendrix stated in his book *Keeping the Love You Find: a Guide for Singles*, in what has become notable quote, that: [9]

> "When we meet an Imago match, that chemical reaction occurs and love ignites. All other bets, all other ideas about what we want in a mate are off. We feel alive and whole, confident that we have met the person who will make everything all right."

This has been translated, by some, to the conclusion that "physiologically, romantic love is a chemical reaction". [10] In the 1999 article "The Science of Love", writer Nuna Alberts explains that "researchers believe that love at first sight is not just a cliché: a chemical reaction which may lead to romance can be created when one person first looks at another." [18]

Love at first sight

In the late 1990s, American market research Earl Naumann interviewed 1,495 people across American, by phone, whose answers to questions on their views about "love at first sight" were tape recorded, documented, and statistically analyzed. [11] On this topic, according to Naumann, as we perceive our environment, and the inclusive "potentials" in that environment, through our senses of

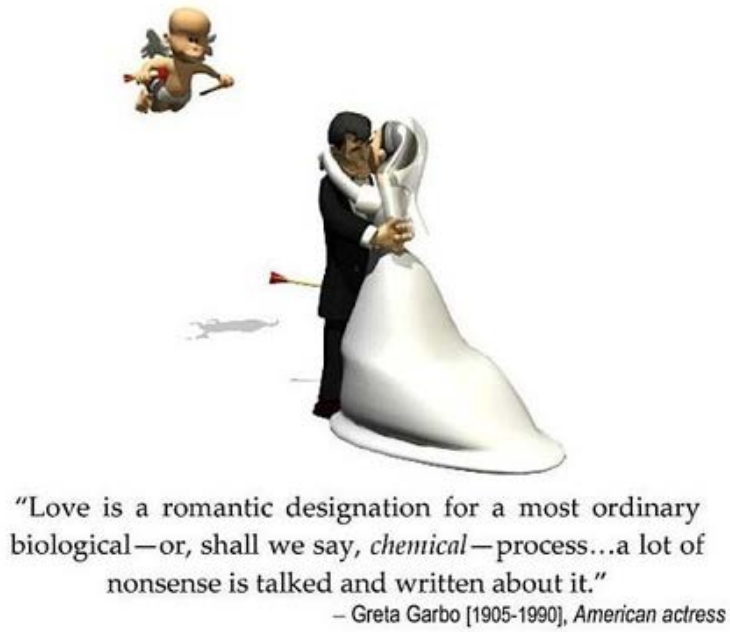

A section on the back cover of the 2007 textbook *Human Chemistry*, by American electrochemical engineer Libb Thims, showing cupid, two people in love, and the famous 1939 *Ninotchka* film quote by Greta Garbo.

sight, smell, touch, and hearing that it is sensor information that triggers the chemical reaction of love.

The results of his studies found that nearly two-thirds of the population believes in love at first sight; that of believers, more than half have experienced it; that 55% of those who experience love at first sight married the object of their affection and that three-quarters of those who married as a result of love at first sight have stated married well over the national average. In a nutshell, this means, approximately, that 20% of people will fall in love at first sight, solely by the operation of a visual field particle stimulus (photons), marry that person, and that of those people, three-fourths will stay marry better than the national average.

Subsequently, the visual stimulus of sight, as is the case with most sensor information, will enter the brain system through the optic nerve and go to the thalamus (the brain's translator); these messages, in turn, are then simultaneously sent to the neocortex (the thinking part) and the amygdala (the place where deep memories and fear are stored). The amygdala then sends messages to the hypothalamus (the part that connects the nervous system to the endocrine system), which then directs the pituitary gland to release the appropriate hormones and neurochemicals.

In short, love at first sight is translated by the thalamus as a "desired human chemical reaction", a important message which is then sent to the amygdala (the core memory center), resulting in the flooding of endorphins and other neurochemicals, such as oxytocin, vasopressin, and dopamine, in the emotional center of the brain, the "limbic system". As such, according to Naumann's findings, "the implication is that there is not just a single chemical reaction taking place in our bodies … there are a whole series of reactions that result in the emotion of love."

Chemical mechanism views

In the 2006 book *The Letter of Love*, author Linda Hargesheimer clearly stated that: "Love is a chemical reaction between people that causes the physical attraction." Moreover, she noted that: "a chemical reaction also exists between friends." [12] This latter supposition digs into the fact that all variations of human interactions, such as friendships, family dynamics, social interctions, work relations, etc., can be diagrammed as chemical reactions. [8]

A 2009 correction video by American electrochemical engineer Libb Thims to correct Chinese chemical engineer Anthony Fong who stated from his university office at Shantou University that the love viewed as a chemical reaction is a myth.

When modeling human chemical reactions, as is the case with any type of chemical reaction, one uses "chemical equations" to define the process of the reaction, in which the "reactants" are the chemical entities that go into the reaction and the "products" are the transformed entities that the results of the reaction. A chemical reaction, by definition, is "the coming together, or interaction, of two or more atoms, ions, or molecules with the result that a chemical change takes place and a new substance is formed, with a different chemical composition." [13] On this definition, over the last dozen years, a few individuals, such as American chemical engineer Libb Thims (1995), American astrophysicist Christopher Hirata (2000), American computational chemist David Hwang (2001), with his article "The Thermodynamics of Love", and Canadian writer Chanel Wood (2007), have independently arrived at the view of the process of falling in love as a chemical reaction in which reactant transform into products:

Reactant + Reactant → Product

In technical terms, the basic couple forming reaction, in which a man *Mx* meets a woman *Fy*, and they chemically bond to form the product of a couple MxFy, is written as:

Mx + Fy → Mx≡Fy

in which the chemical entities "Mx" and "Fy" are human molecules and in which the bonded entity "Mx≡Fy" is what is called a *dihumanide molecule*; the prefix *di-* meaning two, the suffix *-ide* meaning like or similar to or, more specifically, referring to a chemical compound derived from or related to another, usually specified, compound. This is analogous to a dioxide molecule O_2 in which two oxygen atoms are bonded in one cohesive unit. [8] Hence, by definition, in the big picture point of view, the process of love is a purely chemical reaction.

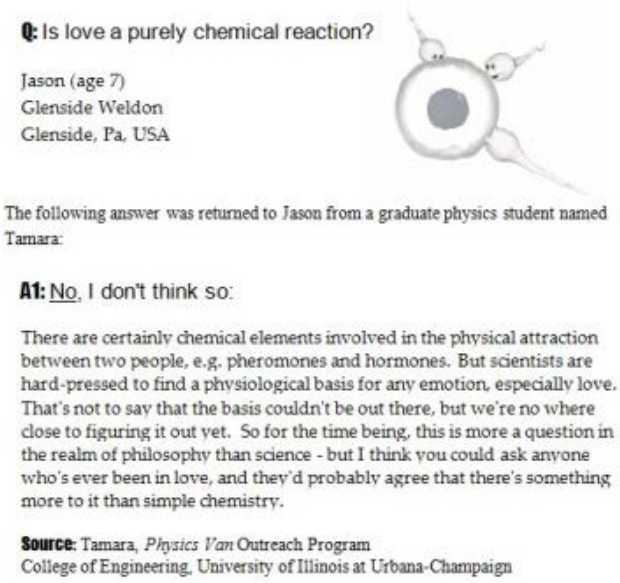

Q: Is love a purely chemical reaction?

Jason (age 7)
Glenside Weldon
Glenside, Pa, USA

The following answer was returned to Jason from a graduate physics student named Tamara:

A1: No, I don't think so:

There are certainly chemical elements involved in the physical attraction between two people, e.g. pheromones and hormones. But scientists are hard-pressed to find a physiological basis for any emotion, especially love. That's not to say that the basis couldn't be out there, but we're no where close to figuring it out yet. So for the time being, this is more a question in the realm of philosophy than science - but I think you could ask anyone who's ever been in love, and they'd probably agree that there's something more to it than simple chemistry.

Source: Tamara, *Physics Van* Outreach Program
College of Engineering, University of Illinois at Urbana-Champaign

Left: a 2001 online Q&A posting, Americans geneticist and veterinarian Tamara McArdle and a seven-year-old student named Jason, hosted by the Physics Van Outreach program of the physics-engineering department of the University of Illinois at Urbana-Champaign, a quote that drove the construction of the 2007 textbook *Human Chemistry*. [1]Right: an anthropomorphized cartoon-style "humans as chemicals" view of love being viewed as a purely chemical reaction and reproduction (a baby test tube).

Lock-n-key model

In the 2001 book *The Truth about Love*, Canadan author Elizabeth Currie not only stated that love is a chemical reaction, but also discusses some of the *key* unconscious triggers to interpersonal chemical reactions of pair bonding. [14] In particular, Currie states that romantic love is the anticipation of getting a "key", such that one will feel the state and euphoria of romantic love if they collide with someone who can provide that key. She states, by example, "if you have money as a key, you will have a 'chemical reaction' to potential mates with money. If you have acceptance as a key, you will have a 'chemical reaction' with good social standing. If you have marriage as a key, you will have a 'chemical reaction' to anyone who is looking to for a marriage partner." In sum, she notes that her examples are oversimplified, but they demonstrate "the point that the new chemistry, or special magic, you feel for another person is for a reason; that person can provide you with a key you need."

Objections | Religion and philosophy

Of those 35% of people who object to the view of love being a chemical reaction, a predominately large proportion of objectors tend to be basing their objection on religious or philosophical grounds; in other words, the chemical view conflicts with their belief system.

The idea that love is a chemical reaction between human molecules is, to some, considered as a joke or nonsense, and to others considered something beyond the realm of science, or rather a philosophical subject, not to be touched by hard science.

In 1810, for instance, after reading *Elective Affinities*, Goethe's fellow author and neighbor Christoph Wieland sent a letter (which he suggested should be burned after it is read) to his close friend German philologist and archeologist Karl Böttiger stating that: [15]

"To all rational readers, the use of the chemical theory is nonsense and childish fooling around."

Wieland, to noted, objected on religious grounds; supposedly due to the radicalness of its Christianity. In similar theme, in 1922 American philosopher Frederick Bennett published an article entitled "Is Spirit a Chemical Reaction?", in which he states that he objects to the following quote given by a scientist (arrived at as a result of researches) in a local newspaper:

> "Love is in its ultimate analysis nothing but a chemical reaction."

Bennett goes on to argue, similar to Wieland, that this statement is false and puerile (or childish), on the grounds that the human soul is not a chemical compound nor of material composition and thus not worthy of explanation by science. [19]

In 2005, to cite one of many examples, after reading the "chemical reaction" section to the Institute of Human Thermodynamics' *Top 150 Definitions of Love* webpage, an American high school geology teacher commented, to American chemical engineer Libb Thims, that the concept of "human chemical reactions" occurring between "human molecules" was: "good for a laugh, but not much else." [16]

The man in the adjacent "reaction video" (reaction to another YouTuber video which had the statement love is a chemical reaction) comments the following heated reaction view:

> "Let's focus on that one statement: **'love is a chemical reaction'**. That's an incredibly deep statement and I think it's a lie from the pit of hell."

A 2011 reaction video by an religious-themed American YouTuber who sees the notion of love being viewed as a chemical reaction to be "horsehockey" (bull-crap in plain speak), being that it conflicts with (a) the Bible and (b) his philosophical outlook, which he lists as "Holy Bible (KJV), *Atlas Shrugged* by Ayn Rand, *The Creature from Jekyll Island* by Edward Griffin, *Les Miserables* by Victor Hugo, and *Mere Christianity* by C.S. Lewis."

The man objects because the chemical view conflicts with the Bible.

Quotes

The following are related quotes:

> "Loneliness, like any other emotion, is just a chemical reaction in your brain, as is possible with all emotions, you can control it … Unfortunately, we oftentimes lack the power to do so."
>
> — Aedan Clarke (2013), Tumblr post (Ñº); reblogged 198+ times

> "Listen, Morty, I hate to break it to you but what people call 'love' is just a chemical reaction that compels animals to breed. It hits hard, Morty, then it slowly fades, leaving you stranded in a failing marriage. I did it. Your parents are gonna do it. Break the cycle, Morty. Rise above. Focus on science."
>
> — Justin Roiland (2014), opinion of Rick (clip:Ñº)(fuller:Ñº), from the 6th episode (Ñº) "Rick Potion No. 9" (Ñº), of the *Rick and Morty* show, Jan 27

Images

The following are related love as a chemical reaction images:

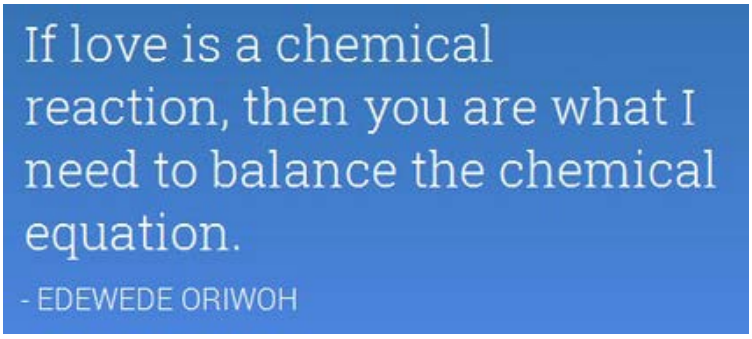

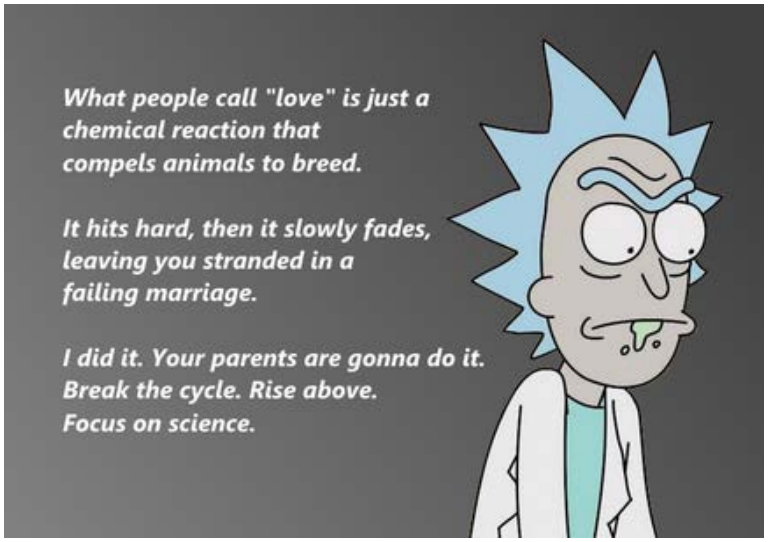

Image from a Oct 2015 Reddit thread (Ñº) discussing the 27 Jan 2014 love philosophy of Rick of the *Rich and Morty* show.

See also

â— Human chemistry
â— Science-based online dating sites
â— ReactionMatch.com

Left: Rick (Ñº), from the *Rick and Morty* show (2014), schooling Morty on love. Right: a test tube view of **love as a chemical reaction**, alluding to the notion that love is a "human chemical reaction" (a surface-attached chemical reaction) between people viewed as "human chemicals" (or human molecules), and is a process (falling in love) involving heat (or fire), electricity (sparks), love (and hate), among other factors, such as music, money, happiness, a cold body, cocktails (lowers activation energy barrier), etc., out of which, in the case of a human reproduction reaction, a child (new human molecule) (precipitate) is synthesized.

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Further reading

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External links

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â— Is Love Nothing but a Chemical Reaction? - WikiAnswers.
â— Love: Nothing More Than A Chemical Reaction (65% for, 35% against) 23 Nov 2008 – ForAndAgainst.com

θΔics

In thought experiments, **love thought experiment** refers to the thought experiment according to which a person, simultaneously in love with two or more people, and or, conversely, a person with two or more people simultaneously in love with them, attempts to discern who or how to intelligently "choose" whom to marry, based the laws, principles, and or prediction logic of affinity chemistry, physical chemistry, and or chemical thermodynamics, the result of which new insights and truths are gained into and about the nature and realities of the human condition.

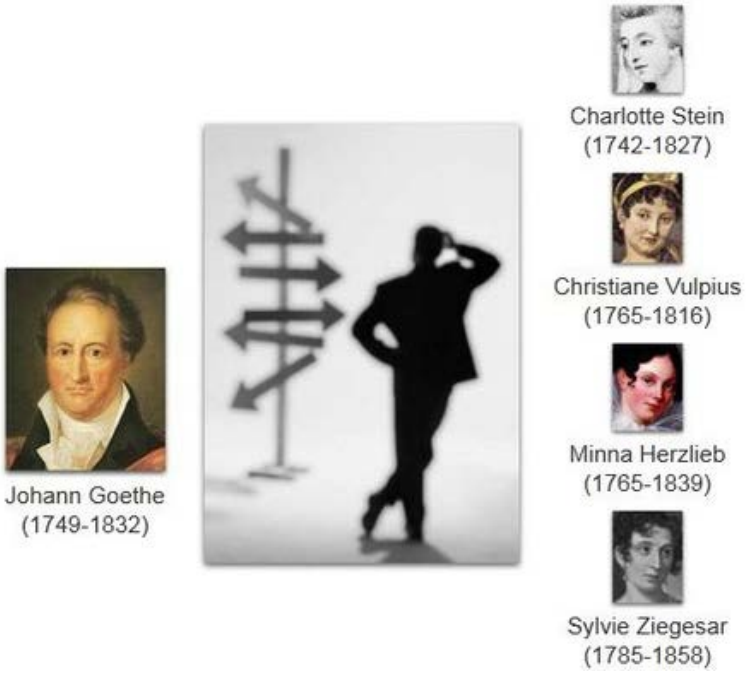

The **love thought experiment**, first conceived by German polymath Johann Goethe in 1808, depicted above, refers to the situation wherein one attempts to intelligently "choose" who to marry from multiple possible mates, or the repercussions resulting therein, when one is simultaneously in love with multiple people, the result of which one is forced to turn to physical chemistry or chemical thermodynamics to study the way in which atoms and molecules react and the scaling up of this to human-human interactions.

Goethe | The Renouncers → Elective Affinities

See main: Goethe love thought experiment

In the middle of 1808, German polymath Johann Goethe, a few months before he met Napoleon (Oct 2), he had started writing a story called "The Renouncers", which, according to one of Goethe's assistants, was about a hero simultaneously in love with four women; the synopsis of which, in Goethe's view, was that:

> "Each in her own way is lovable; whichever one he is drawn to in the mood of the moment, she alone is lovable."

The solution to the problem he found is derived from Newton's 1718 last and final "Query 31", wherein he stated:

> "Is it not for want of an attractive virtue [chemical affinity], between the parts of each, that quick-silver ( )(Hg) will NOT mix with: antimony ( )(Sb), lead ( )(Pb), or iron (♂)(Fe); and by a weak attraction, that quick-silver ( )(Hg) and copper (♀)(Cu) WILL mix, with difficult; and from a strong attraction, that quicksilver ( )(Hg) WILL mix readily with tin ( )(Sn)?"

From this, Goethe gleaned the view that, just as there is only, after all, "one nature", these chemical natures have to apply to human affairs, according to which:

> "Is it not for want of an attractive virtue [chemical affinity], between the parts of each, that Edward will NOT mix with Luciane, homeless people, or elderly; and by a weak attraction, that Edward and Charlotte WILL mix, with difficult; and from a strong attraction, that Edward WILL mix readily with Ottilie?"

In this scheme, Goethe made a human affinity table, on paper, or at least in his mind (see: Goethe's affinity table)

Goethe took it up again early the next year, after which the tale ballooned into a novel, progressed quickly, and before the end of the year (Oct 3, 1809) (see: Goethe timeline) it was in print under the enigmatic title *Elective Affinities*, a physical chemistry based treatise on love, relationships, and human interactions viewed purely as affinity reactions or chemical reactions. [1] In her summary of the circa 1849 long poem *Amours de Voyage* of English poet Arthur Clough, American literature professor Stefanie Markovits summarizes the innate thought experiment nature of Goethe's 1809 physical chemistry based novella *Elective Affinities* (*Die Wahlverwandtschaften*): [3]

> "Why, Claude wonders, should he fall for Mary rather than some other girl who would be equally suitable and equally attractive? Is love just the chance collision of two people who are, as the saying goes, in the right place at the right time—a kind of lucky hit in the dark? 'Juxtaposition', within the frame of *Amours*, fits into two sets of metaphors. The first of these is chemical and has to do with the concept of elective affinities: the idea that elements having inherent tendencies to form combinations and that they will combine and recombine according to these tendencies when placed in solution with each other. Goethe had explored the social and sexual implications of the concept in his novel *Die Wahlverwandtschaften* (1809), a work that obviously influenced Clough's reflections on the subject of *Amours*. [4]. **Goethe**'s novel is really more of a **thought experiment** about enlightenment than anything else. In it, a hyperrational couple invite into their home a pair of outsiders, only to discover that the foreign elements bring with them dangerous forces of elective affinity. The four main characters find themselves reshuffling their relations according to these affinities, and the results are devastating."

Markovits goes on to state that the point that Goethe made—and that Clough worries about—is that there is nothing genuinely elective about elective affinities: we have no choice in these matters, other than the choice to oppose our inherent passions. She also states that Clough interjected further on this issue, in regards to “mechanical ethics”, the teaching of behaviors, and passions, in his “1849 (Roma) Notebook”.

Helmholtz | Affinity → Free energy

In 1882, with the publication of German physicist Hermann Helmholtz' treatise "On the Thermodynamics of Chemical Processes", affinity chemistry—the basis of Goethe's thought experiment—was supplanted or rather upgraded to the more robust science of chemical thermodynamics; subsequently, love thought experiments, in the years following, owing to the Goethe-Helmholtz equation, which equates the force of "affinity" to the change in "free energy", tended to be free energy or thermodynamic based, as outlined below in the case of Henry Adams, who believed himself to be a molecule like free energy determined "phase" (1909) or Libb Thims who believed himself to be a free energy determined 26-element molecule (1995).

Adams | Love triangle

On 27 Jun 1872, American physical science historian Henry Adams (social Newton #2 behind Goethe) married Marian Hooper (Clover Adams).

In Jan 1881, Henry Adams met the 24-year-old Elizabeth Cameron, for the first time, in the drawing room of the house of John Hay can Clara Hay. On 19 May 1883, when Cameron and her husband departed for Europe, Adams initiated a correspondence with Cameron, expressing unhappiness with her departure and his longing for her return.

On 7 Dec 1884, *exactly* one year before the suicide of Clover Adams, Henry Adams wrote to Cameron:

> “I shall dedicate my next poem to you. I shall have you carved over the arch of my stone doorway. I shall publish your volume of extracts with your portrait on the title page. None of these methods can fully express the extent to which I am yours.”

On 12 Apr 1885, Adams, while on an extended work stay-over in Washington, wrote Clover the following:

> “Social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life.”

It would seem, here, to be the case, speculatively speaking, that the three human molecules Adams had in mind in this statement, subsequently, would have been himself, his side love affair (or interest) Elizabeth Cameron, and his wife Clover Adams.

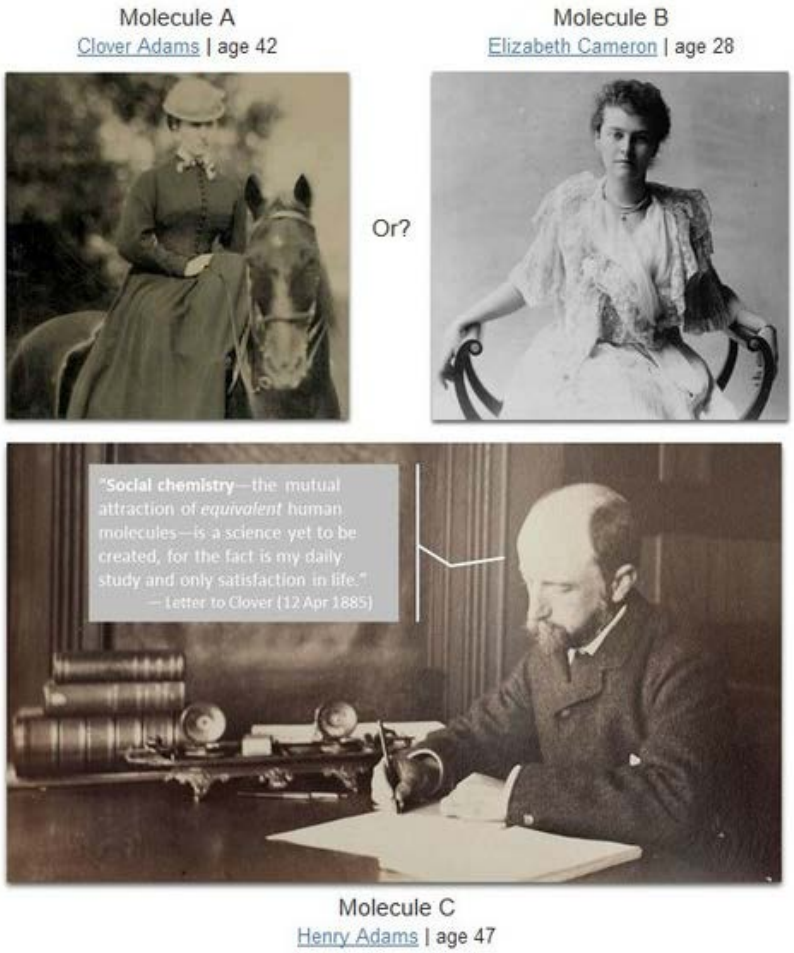

A depiction of the so-called "Henry Adams love triangle", in 1885, wherein, seemingly, the introduction of molecule B (Elizabeth Cameron), into the reaction system of Henry Adams, seems to have worked to precipitate the dissolution or detachment of molecule A (Clover Adams) from the AC marriage bond (Henry-Clover relationship), via the action of suicide, on 6 Dec 1885.

On 13 Apr 1885, Clover’s father died, and this was said to have initiated a period of mourning which evolved into mental depression from which she did not recover.

On 4 Dec 1885, two days before her suicide by cyanide (Dec 6), Clover Adams, visited Elizabeth Cameron, who was then three-months pregnant.

On 6 Dec 1885, Clover died by suicide via swallowing potassium cyanide.

On 29 Sep 1908, Adams wrote Cameron the following telling insight about his encounter with the chemical thermodynamics equations of Willard Gibbs:

> “I have run my head hard up against a form of mathematics that grinds my brains out. I flounder like a sculpin in the mud. It is

called the ‘law of phases’, and was invented at Yale. No one shall persuade me that I am not a phase.”

Here, we see the affinity chemistry belief system (or belief state) to chemical thermodynamics belief system (or belief state) transition occurring, according to which, whereas Goethe believed himself to be some type of animated chemical governed by the forces of chemical affinity, Adams, alternatively albeit equivalently (in science upgrade terms), believed himself to be a both a "molecule" (1885) and "phase" (1908) or "equilibrium" defined by the chemical thermodynamics of Willard Gibbs.

Thims' thought experiment | Excel spreadsheet

See main: Thims thought experiment

In *circa* 1992-1993, American electrochemical engineer Libb Thims, the modern intellectual embodiment in mindset of Goethe + Adams + Pareto, in regards to human chemistry, in an attempt to figure out how to go about choosing who to marry (as this is supposed to be a step, according to cultural precedence, in the colloquial standard model of existence), as a freshman pre-engineering student, Thims made an excel-style spread sheet table of the top nineteen girlfriends, whom he could potentially marry, listing each person on the horizontal and listing a range of point ranked attributes, qualities, or factors on the vertical, such as “grandmother would like her”, spontaneity, fun factor, physical attraction factors, mental attraction factors, repulsive factors, etc., in an attempt to get a numerical "marriage quality value" for each girlfriend:

	G1 | 5.0	G2 | 6.2	G3 | 6.1	G4 | 5.6	G5 | 7.2	G6 | 5.8	G7 | 5.9	G8 | 6.7	G9 | 6.4	G10 | 4.3	G11 | 5.3	G12 | 5.2	G13 | 4.6	G14 | 6.0	G15 | 6.0	G16 | 6.2	G17 | 6.6	G18 | 7.7	G19 | 5.3
(20) Grandmother likes	2	5	3	7	12	10	5	5	20	3	5	2	8	15	8	5	0	10	10
(15) Spontaneity	10	3	8	8	10	5	15	10	15	5	5	5	10	5	12	12	12	10	10
(15) Fun factor	12	4	5	8	8	8	15	12	15	5	5	2	10	8	5	5	8	5	8
(10) Fitness	8	0	5	7	10	5	10	8	10	3	7	8	8	8	7	8	8	10	8
(10) Hair	10	5	5	8	7	10	5	6	5	4	10	5	4	4	4	7	7	9	8
(10) Eyes	8	5	2	5	8	10	8	9	10	5	6	5	3	5	5	6	7	7	7
(15) Body	12	2	10	10	12	5	5	10	10	2	8	5	4	4	18	4	10	15	12
(25) Intelligence	15	20	15	8	8	12	15	5	25	5	10	5	20	15	15	8	8	10	10
(20) Character	15	15	5	3	5	5	10	5	20	5	0	0	10	15	15	10	5	5	10
(10) Class	5	10	5	6	10	5	10	7	10	3	5	3	5	5	5	5	5	8	5
TOTAL =	82	69	63	70	90	75	98	77	140	40	61	35	82	84	84	70	70	90	80

The resulting solutions, however, did not seem to intuitively make any sense.

In 1995, Thims began to muse about how this would be done chemical thermodynamically; even nearing the point of asking the question in his chemical engineering thermodynamics class. It would be a full seven years (2001) before he could figure out the nuts and bolts of how this could be quantified via enthalpy and entropy determinants (see: history). The following is a section of the *circa* 1995 "Thims thought experiment", according to which American chemical engineering student Libb Thims conceptualized his top 19 marriage-potential girlfriends as each having a reaction "potential" quantified by the Lewis inequality: $\Delta G < 0$, analogous to what Goethe conceptualized in 1796 via affinities (see: Goethe-Helmholtz equation: $A = -\Delta G$), according to which the discerning human chemist should theoretically be able to "**predict**" the most-favored human chemical reaction (see: HCR theory) of a given set of potential reactions:

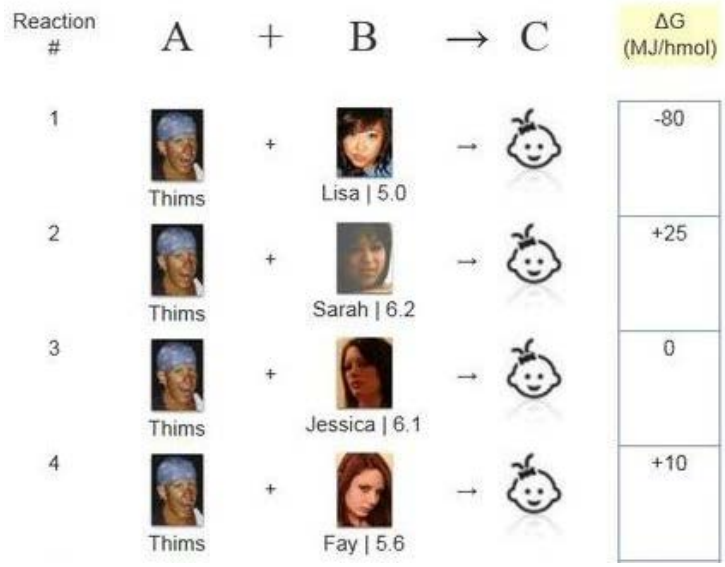

In more detail, the subject of the governing relation of the interactions of human relationship with that of chemical thermodynamics originated in *circa* 1995 during Thims' years as a chemical engineering thermodynamics student at the University of Michigan and his curiosity as to how the spontaneity criterion of chemical thermodynamics applies to the successfulness of mate selection or prediction in the action of love the chemical reaction.

In this period, and the years to follow, Thims began to seek a thermodynamic understanding of the human existence process, especially as thermodynamics relates to mate selection and the nature of love; and sometime shortly thereafter, Thims discovered American evolutionary psychologist David Buss' newly-published 1994 book *The Evolution of Desire*, containing the results of a robust study on mate selection of 10,000 people of all ages from thirty-seven cultures worldwide, which presented a rather eye-opening and straight-forward look at the nuts and bolts of mate selection, in regards to what specific factors affect sexual attractiveness and sexual repulsiveness, from both the male and female perspective. Some of the first products of this efforts include the 2005 *Journal of Human Thermodynamics*, the 2007 textbook *Human Chemistry*, and the 2008 *The Human Molecule*, to name a few.

A Strange Thing Called Love

On 04 Feb 2012, Indian chemical engineer Vamshi Regalla and American mechanical engineer Ravi Vedula published a short film entitled "A Strange Thing Called Love", wherein they scripted a story about love in conservation of energy stylized logic, conceptualized as follows:

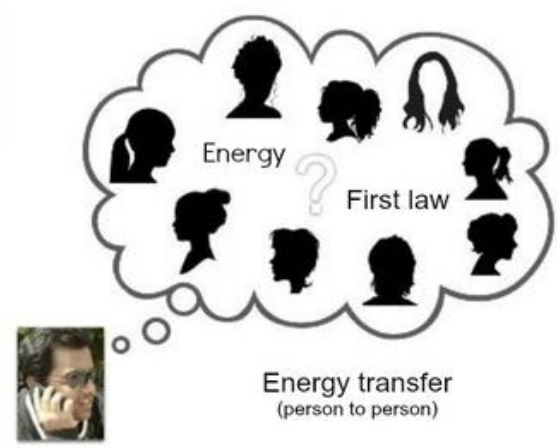

Thims, shortly thereafter, contacted Regalla and Vedula, suggesting they attempt to expand on their video story line into the form a more rigorous journal article, after which, in May 2012, they published an article entitled "A Strange Thing Called Love: in View of Chemical Thermodynamics", in *Journal of Human Thermodynamics*, wherein they outlined their take on the chemical thermodynamics of love, employing Thims-Pati style reaction mechanisms:

A + B → A≡B (human chemical bond formation) (Libb Thims, 2003)
A + B → AB (Surya Pati, 2009)

to explain human bonding as a reaction, commenting at the end that:

> "A video was made by the authors on the same concept with the title as "A strange thing called love". The plot of this video is that a man falls in love with nine girls and that day comes when he is supposed to make a decision on choosing 'the one'. Surprisingly in the early 1800s, Johann Goethe published a book named *Elective Affinities* based on a similar concept of love and marriage relations among two couples. It is a pure coincidence and the current authors actually didn't know about it until they started preparing this article."

(add discussion)

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θΔics

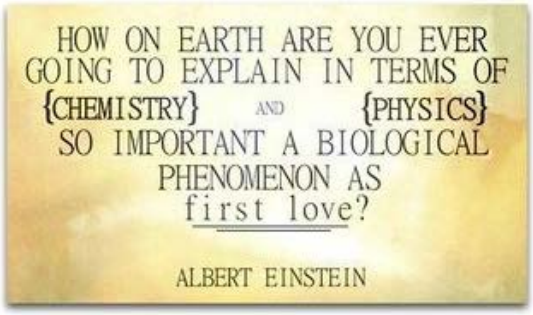

Left: German-born American Albert Einstein's famous circa 1928 poster quote query on the physics and chemistry of love (see: Einstein on love).

Right: A depiction of the American electrochemical engineer Libb Thims circa 1995 version of the **love thought experiment**, according to which each mate selection reaction, between one man M and four different females F:

$$M + F_1 \rightarrow M{\equiv}F_1$$
$$M + F_2 \rightarrow M{\equiv}F_2$$
$$M + F_3 \rightarrow M{\equiv}F_3$$
$$M + F_4 \rightarrow M{\equiv}F_4$$

are each quantified by a free energy change, ΔG_i, and hence yield a reading of the predicted spontaneity, feasibility, or naturalness of each potential relationship reaction

In human thermodynamics, **low entropy** is a hugely misused term referring loosely to a number of different things, such as: fossil fuel (material entropy), ordered states, ordered thinking (mental entropy), high efficiency, sunlight, plants, food, etc. In one sense, through the principle of elementary disorder, low entropy is often seen as synonymous with order.

Overview

In 1944, Austrian physicist Erwin Schrodinger famous argued that life is something that "lfeeds on negative entropy".

In 1971, Romanian mathematician Nicholas Georgescu-Roegen, in his *The Entropy Law and the Economic Process*, reinterpreted Schrodinger's idiom into the following form: [1]

> "Life does not feed on mere matter and mere energy but—as Schrodinger aptly explained—on **low entropy**."

Other example usages, some possibly Schrodinger or Georgescu-Roegen independent, include:

> "Open thermodynamic systems—like a building or a living being—require a supply of **low entropy** for maintenance."
>
> — Luis Fernandez-Galiano (1982) [2]

> "Enjoyment of life increases as we go from **low entropy** (boring, predictable) to high energy (exciting, unpredictable). In theory, **low entropy** means high efficiency. We could say that coal and oil are **low entropy**."
>
> — Robert Handscombe and Eann Patterson (2004) [3]

> "Life needs a **low entropy** resource – photosynthesis – to survive and reproduce."
>
> — John Schmitz (2007) [4]

> "The deeper sanctions of U.S., Japanese, Chinese,and European governance are perfectly aware of the long-long run demand to capture **low entropy** in outer space,and they keep a close eye on each other's Mars activities."
>
> — Peter Pogany (2009) [5]

(add discussion)

Difficulties

The term "low entropy", in short, is something, in thermodynamics, that has become lost in translation, since its original formulation by German physicist Rudolf Clausius in 1865, as heat leaving or entering a body divided by the absolute temperature at the boundary:

$$S = \frac{Q}{T}$$

In this sense, low entropy is like saying “low heat”, which is nonsensical.

See also

â— Anti-entropy difficulties
â— Low entropy state

References

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5. Email comment from Peter Pogany to Libb Thims (29 Sep 09).

θΔics

In thermodynamics, a **low entropy state**, as contrasted with a high entropy state, is said to be an ordered, organized, or compacted (high density) state of atoms and molecules. [1] This rule, however, is generally only true in comparing a gas state (chaotic) to a liquid state (medium order) to a solid state (ordered) to one at absolute zero (perfect order).

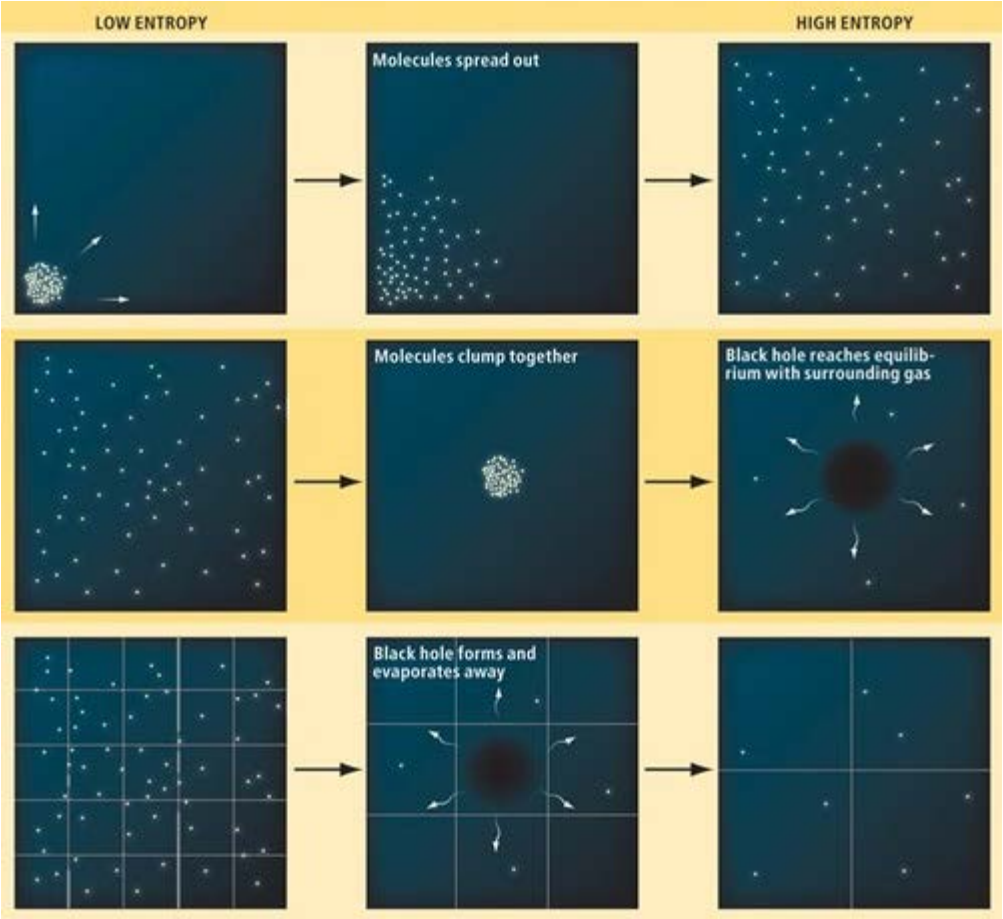

A typical depiction of a low entropy compared to a high entropy state, in terms of gravity. [3]

In defining entropy values to different molecules, the procedure used involves assigning simple component atoms and molecules arbitrary (often zero value) measures of free energy and enthalpy, at their standard conditions, and using this basis to make thermodynamic tables of entropy and enthalpy values for different reactions, and using reaction algebra to assign entropy values to more complex structures.

Big bang theory

In cosmology, the universe prior to the inception of the big bang is often theorized to have been in a low entropy state, about the size of a golf ball, in its initial state some 13.7 billion years ago, as current science understands things. [2]

Supposedly, it was Belgian mathematical physicist Georges Lemaitre (1894-1966), in circa 1920-1927, after previously studying relativity under Arthur Eddington, who conceived a “firecracker theory”, wherein building on thermodynamics and problems of Albert Einstein’s static universe model, he was led into the view that if the universe is increasing in entropy, according to the second law, that it must be finite: subsequently there would have had to been a time when the entropy of the universe was low. [4] The details of this, assertion, however, need to be fact checked.

See also

â— Low entropy

References

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θΔics

In thermodynamics, **low-temperature thermodynamics** is the study of the laws of thermodynamics in relation to the properties of matter at temperatures approaching or close to absolute zero.

History

In 1703, French physicist Guillaume Amontons mathematically derived the idea of an "absolute zero". [1]

In circa 1870, Polish physical chemist Sigmund Wroblewski, following studies under Hermann Helmholtz at the University of Berlin, met German physicist Rudolf Clausius, while in recuperation from vision surgery in the Swiss Alps, who told him to continue on with his low temperature work, and to concentrate on things related to thermodynamics. [1] In 1883, Wroblewsi, working together with Carl Olszewski, would make a measurable quantity of liquid oxygen. [4]

In 1912, German physical chemist Walther Nernst pointed out that absolute zero could not be reached because of the third law. [2] In 1917, Nernst summarized the third law with the terse statement that: [3]

> "It is impossible to take all heat from a body."

In 1925, Albert Einstein and Satyenda Bose predicted a new state of matter at ultra-low temperatures.

In 1995, Einstein and Bose's "new state of matter", called Bose-Einstein condensate, is created at 1.7E-7 K by Americans Eric Cornell and Carl Wieman at Colorado University, Boulder.

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â— Muller, Ingo. (2007). *A History of Thermodynamics* (low-temperature thermodynamics, pgs. 165-). Springer.

External links

â— Nobel Laureates (low-temperature physics) – Devillier.com.

θΔics

In abbreviations, **LR** is the acronym for "like rankings", refereing to ranking of articles within Hmolpedia according to Facebook thumbs up likes. In the William Sidis article, to exemplify, the notation (LR:9) signifies that on 5 May 2014 the William Sidis article was the 9th most-liked article, among articles of people, with in Hmolpedia.

θΔics

In hmolscience, **Lubos Motl** (1973-) is a Czech-American theoretical physicist (string theory) and black hole thermodynamicist noted for his outspoken objectionable views on the view of people as human molecule and the related governing subjects of human chemistry and human thermodynamics, made in 2010 commentary on a number concepts promulgated via Human Chemistry 101 videos, e.g. that human enthalpy has something to do with the heat of physical attractiveness,on American electrochemical engineer Libb Thims' YouTube channel.

Hirata

Motl considers American astrophysicist Christopher Hirata's *circa* 2000 theory of human chemical thermodynamics of equilibrium adjusting mating reactions of various initial state male-to-female ratio of college student bodies to be "a joke", not to be taken seriously. [1]

Thermodynamics of humans

Motl is of the general opinion, in regards to the applicability of thermodynamics to humans, that that the "thermodynamics of human relationships is bullcrap." [2]

What is curious, however, in Motl's objections, is that he has published previous work on black hole thermodynamics, statements of which contradict his statements in regards to humans, as though thermodynamics is applicable to black holes, but not to humans.

He is thus the example of the paradoxical philosopher, i.e. one who used contradictory phrases and statements in argument. To exemplify, when confronted with the derisive view that the laws of thermodynamics govern human relationships and human activity, Lubos commented in hasty objection to the work of American electrochemical engineer Libb Thims, that: [3]

> "It is blatant absurdity to model laws governing human relationships using rules of thermodynamics, a set of rules that only apply at the molecular level and human beings are NOT molecules."

This statement (his capital use), however, contradicts Motl's previously stated 2003 views on how thermodynamics applies to black holes: [4]

> "Entropy defined statistically [S = k ln W] as the logarithm of the number of microstates always behaves in the same approximate thermodynamic way if the systems become large, and black holes are no exception."

This paradoxical contradiction of views, i.e. stating in 2003 that black holes are not except from the second law as compared to his 2010 statement that humans are exempt from the second law, is sort of akin to the "double blind placebo effect", being that: (a) theorizing objectively on something external to oneself, e.g. the thermodynamic behavior of bacteria or black holes, tends to have no observer bias, for the most part (unless say the theorizer is being funded by an entity with ulterior interests in mind, which tends to skew results and conclusions), but (b) theorizing objectively on oneself may very well often tend to lead to skewed thinking, e.g. Motl switching his choice of words to "rules of thermodynamics" (in arguing against thermodynamic human modeling), from his standard "laws of thermodynamics" in his journal articles on black hole thermodynamics. In other words, for black holes Motl becomes objective and not subject to observer bias, but when he thinks about how thermodynamics applies to himself, he becomes mentally confused and contradicts himself, to conclude that no thermodynamics cannot be scaled up as systems become large (such as in human societies). In any event, Motl goes on conclude his opinion by stating that: "human beings are NOT molecules, they are composed of molecules"; that people "aren't giant molecules"; that human relationships are governed mostly by human psychology" (not thermodynamics); that one must be "senile or crazy to believe this nonsense". [3]

Religion | Atheism

Motl classifies himself as a “Christian atheist”. [7]

Note

In 2007-2008, Lubos was promoting some type of grandiose “new theory of thermodynamics” having something to day with the arrow of time, and seems to (a) have come across as presenting “strange ideas regarding thermodynamics” and (b) developing a reputation as some type of aggressive, derisive, on the attack troll of sorts, as summarized by Swedish high energy nuclear physicist Sabine Hossenfeld. [5]

Education

In high school, Motl was reading Paul Dirac's *Quantum Mechanics*. [6] Motl completed his MS at Charles University, Prague, and his PhD at Rutgers University (2000), after which he became a Harvard Junior Fellow (2001–2004) and assistant professor (2004–2007) at Harvard University, where he taught courses on physics. It was during his years at Harvard that Motl started his blog, "Luboš Motl's Reference Frame", some of which is still hosted on Harvard's servers. In 2007, he left Harvard and returned to the Czech Republic.

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3. Motl, Lubos. (2010). “Comment: Sexual heat | pop quiz”, YouTube, Nov. 20.
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5. Hossenfelder, Sabine. (2007). “Lubos Motl”, BackReaction.blogspot.com, Sep. 05.
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7. Lubos Motl – RationalWiki.

Further reading

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See also

- Human thermodynamics (objections to)
- Human chemistry (objections to)
- Human physics (objections to)
- Human mathematics (objections to)
- Libb Thims (attack)
- Detractors

External links

- Lubos Motl – Wikipedia.

θΔics

In existographies, **Lucas Landherr** (c.1983-) (CR:4) is an American chemical engineer and science cartoonist, noted for his 2016 cartoon on fugacity described in the context of Gibbs free energy, partial pressures, among other concepts.

Pseudonyms

Landherr has written comics under the pseudonyms: “Shepherd Dante” and “Dr. Shepherd”, among others.

Comics | Science

In 2008, Landherr, while a chemical engineering graduate student at Cornell University, began drawing cartoons as a “creative outlet” to distract him. [2] In this direction, he soon received a GK-12 NSF Fellowship, with which he designed curriculum and physics experiments for high school classrooms. He has since been conducting engineering education research into novel teaching techniques for undergraduateand K-12 STEM education.

In 2016, Landherr raised $13K pledged, of a $26k goal, KickStarter campaign (Ñº) for a page-a-day calendar.

Overall, Landheer’s focus, in the cartoon area, has been on the development of comics to teach complex science and engineering concepts, through collaboration with professional and student artists, and his comics havebeen adopted by colleges throughout the U.S. as well as in the U.K., Belgium, and Denmark. Dr. Landherr is currently a regular contributor to the *Chemical Engineering Education* journal, producing the *Drawn to Engineering* comic, and is the engineering consultant helping to develop the Crash Course Engineering series with PBS Digital. [1]

As of 2016, Landherr has made more than 2,800 unique comics. [2]

Fugacity

In 2015, Landherr received a grant from the Office of the Provost to create a series of science-based webcomics to help his students understand difficult chemical engineering concepts. One of them, which features Landherr in cartoon form, attempts to explain a concept called " fugacity". “Students like them,” says Landherr, noting that professors at more than two dozen other colleges nationwide have asked to use the comics as part of their lessons. [2]

The opening segment of **Landheer**'s famous 2016 10-page cartoon on fugacity, as illustrated by Joan Cooke. [3]

In Sep 2019, Libb Thims, while working on the "social fugacity" ideas of Mirza Beg, discovered Landherr's fugacity cartoon, and thereafter added parts of it to some Hmolpedia articles: fugacity, Gibbs free energy, and Mirza Beg, to name a few.

Education

Landherr completed his BS in chemical engineering, in 2005, with focus on drag-reducing polymers, at Lafayette College, and his PhD in chemical engineering, via a thesis on polymer films and brushes as nanoscale lubricants, in 2010, at Cornell University, and in 2012 became a chemical engineering professor at Northeastern University, Boston.

References

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2. Kornwitz, Jason. (2016). “Chemical Engineering Professor Moonlights as Webcomic Artist” (Ñº), News@Northeastern, Jun 3.
3. Landherr, Lucas. (2019). “Fugacity” (artist: Joan Cooke), Science Comic, North Eastern University.

External links

â— Home – SurvivingTheWorld.net.

θΔics

In existographies, **Lucian** (c.120-190AD) (IQ:175|#250) (Cattell 1000:387) (FA:32), or "Lucian of Somosata", was a Roman satirist, skeptic, Epicurean admirer, and Greek scholar, the "Voltaire of antiquity" (Hengel, 1977) (Q), retrospectively classified an atheist, noted for []

Overview

In 165AD, Lucian was in the audience of a funeral oration of Peregrinus Proteus (c.95-165AD), aka "Peregrinus" (Holbach, 1770), a Greek cynic philosopher, who when done speaking then committed suicide by cremating himself, on a funeral pyre at the Olympic Games; Lucian, later described Peregrinus as follows: (Q)

> "Peregrinus strangled his father to death; **became a Christian so that he could gain wealth**; was imprisoned so that he could gain notoriety; gave his inheritance away so that he might gain favour among the people of his home town; studied under Agathobulus so that he could become more obscene; attacked the Romans to become famous; and killed himself to become infamous."

In c.170AD, Lucian, in his *Passing of Peregrinus*, gave one of the first secular, i.e. real person, accounts of the existence of Christians as a distinct actual faith common to a group of people who considered each other brothers; the gist of which is as follows: [1]

> "The Christians, you know, worship a man to this day—the distinguished personage who introduced their novel rites, and was crucified on that account. … You see, these misguided [deluded] creatures start with the general conviction that they are immortal for all time, which explains their contempt of death and voluntary self-devotion which are so common among them; and then it was impressed on them by their original lawgiver that they are all brothers, from the moment that they are converted, and deny the gods of Greece, and worship the crucified sage, and live after his laws. All this they take quite on faith, with the result that they despise all worldly goods alike, regarding them merely as common property."

Alternative translations are as follows:

> "The efficiency the Christians show whenever matters of community interest like this happen is unbelievable; they literally spare nothing. And so, because Peregrinus was in jail, money poured in from them; he picked up a very nice income this way. You see, for one thing, the poor devils have convinced themselves they're all going to be immortal and live forever, which makes most of them take death lightly and voluntarily give themselves up to it. For another, **that first lawgiver** of theirs persuaded them that they're all brothers the minute they deny the Greek gods (thereby breaking our law) and take to worshiping him, the **'crucified sophist'** himself, and to living their lives according to his rules. They scorn all possessions without distinction and treat them as community property; doctrines like this they accept strictly on faith. Consequently, if a professional sharper who knows how to capitalize on a situation gets among them, he makes himself a millionaire overnight, laughing up his sleeve at the simpletons."
>
> — Lucian (165AD), "The Death of Perigrinus" (Casson 1962 translation) [2]

> "That first lawgiver of theirs persuaded them that they are all brothers the moment they transgress and deny the Greek gods and begin worshipping that 'crucified sophist' and living by his laws. They scorn all possessions without distinction and treat them as community property; they accept such things on faith alone, without any evidence. So if a fraudulent and cunning person who knows how to take advantage of a situation comes among them, he can make himself rich in a short time while laughing at these foolish

people."

— Lucian (165AD), "The Death of Perigrinus" (§13) (O)

(add)

Atheism

Lucian, in retrospect, by the time of the renaissance, was generally classified as an atheist; theists, e.g., would often hurl the label "slave of Lucian" or "student of Lucian" as a type of perceived derogation at their opponents; the following is one example:

> "Erasmus, you foster in your heart a **Lucian**, or some other pig from Epicurus' sty who, having no belief in god himself, secretly ridicules all who have a belief and confess it."
>
> — Martin Luther (1525), *On the Bondage of Will* [3]

> "Toland is the **Lucian** of our times."
>
> — Author (1722), "Obituary"

In the renaissance, theists used the label "slave of Lucian" or "student of Lucian" as an atheist slur.

Quotes | By

The following are noted quotes:

> "What blessings that book creates for its readers and what peace, tranquility, and freedom it engenders in them, liberating them as it does from terrors and apparitions and portents, from vain hopes and extravagant cravings, developing in them intelligence and truth, and truly purifying their understanding, not with torches and squills [i. e. sea onions] and that sort of foolery, but with straight thinking, truthfulness and frankness."
>
> — Lucian (c.170AD), satire against Alexander of Abonoteichus (who burned a book of Epicurus)

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(b) Watson, Philip S. (1969). *Luther and Erasmus: Free Will and Salvation* (pg. 109). Westminster.
(c) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 276). HarperOne.

External links

- Lucian – Wikipedia.
- Lucian's view of Christians – LucianOfSamosta.info.

θΔics

In science, **Luciano Floridi** (1964-) is an Italian philosopher noted for his philosophy of computing and information theory in relation to ethics, e.g. entropy ethics, where he incorporates a view, similar to Norbert Wiener, that entropy, as a form of lost information (entropy (information) or information entropy), is a type of "natural evil" that can harm or destroy anything that anyone might value; although supposedly he didn't derive his entropy theory off of Weiner. [1]

Floridi's principles of information ethics:

See main: Laws of information

In recent years, modeled in theme on the four laws of thermodynamics, what have come to be known as "Floridi's four principles of information ethics" are as follows: [2]

0. Information entropy ought not to be caused in the infosphere.
1. Information entropy ought to be prevented in the infosphere.
2. Information entropy ought to be removed from the infosphere.
3. The flourishing of information entities as well as of the whole infosphere ought to be promoted by preserving, cultivating and enriching their properties.

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2. Medina, Tom and Britz, Johannes J. (2004). *Information Ethics in the Electronic Age: Current Issues in Africa and the World* (pg. 151). McFarland.

Further reading

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● Floridi, Luciano. (1999). *Philosophy and Computing: An Introduction* (keywords: thermodynamics, pg. 208, entropy, pg. 145). Routledge.
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● Floridi, Luciano. (2007). *The Blackwell Guide to the Philosophy of Computing and Information* (keywords: Entropy, pgs. 18, 33, 47, 51-53, 57-59, 61, 185, 356; Thermodynamics, pg. 53). Blackwell Publishing.

External links

● Luciano Floridi (publications) – PhilosophyOfComputing.net

θΔics

In thermodynamics, **Lucien Benguigui** (1936-) is a French-Israeli physicist noted for []

Overview

In 2013, Benguigui, in his Hmolpedia-cited article "The Different Paths to Entropy", mentioned the 1902 "What is Entropy Debate?", Austrian physicist Ludwig Boltzmann's definition of entropy, American electrical engineer Willard Gibbs supposed three definitions of entropy, quantum thermodynamics definition of entropy (von Neumann entropy), etc., and on the subject of human thermodynamics, about which he seems to be a detractor, he cites American mechanical engineer Bill Nye's 1993 definition: "the application of mathematical formula of thermodynamics to the economic and social sciences like car wreck behavior, politics, the process of falling in love", about which Benguigui comments: [1]

> "Not all these [human] applications [of entropy] have a real rational basis connected firmly with physical laws."

Benguigui, in email communication with American electrochemical engineer Libb Thims, elaborated on this comment that: [2]

> "About the entropy: If you want to use the concept of entropy outside physics you have to define it precisely what it is in a new context. Until now entropy receives precise definitions only in the frame of physics, so you cannot use it outside of physics."

(add discussion)

Discussion

To cite a converse view, from one of his own countryman, in 2010 Russian-born Israeli chemical engineer Alec Groysman, in his conference presentation "Use of Art Media in Engineering and Scientific Education", cites the entropy based human chemistry work of American electrochemical engineer Libb Thims, along with the earlier affinity chemistry based human chemistry theories of German polymath Johann Goethe, and gives his opinion that these perspectives should be taught alongside and within the modern chemical engineering curriculum. Likewise, fellow countryman Israeli physical chemist Arieh Ben-Naim, whom Benguigui mentions in passing, in his 2012 book *Entropy and the Second Law*, cites Swedish physical chemist Sture Nordholm who in 1997 equated energy with wealth and entropy with freedom. [5] Hence, we seem to see a difference in opinion: Benguigui believing, possibly similar to Philip Moriarty (see: Moriarty-Thims debate), that entropy does not apply to the humanities, whereas Nordholm, Groysman, Thims, and possibly Ben-Naim believing it does.

Education

Benguigui completed his PhD in 1969 with a dissertation on "Ferroelectric and Antifferoelctic properties of some Perovskites", presented at Paris. [2] Benguigui, as of 2012, is a professor emeritus, specializing in the field of condensed matter and materials physics, of the physics department of Technion, Israel Institute of Technology, Haifa, Israel. [3]

References

1. (a) Benguigui, Lucien. (2013). "The Different Paths to Entropy" (abs), *European Journal of Physics*, 34(2):303-.
(b) Nye, Bill. (1993). *Bill Nye the Science Guy's Big Blast of Science* (pg. 50). Basic Books.
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(b) Ben-Naim, Arieh. (2012). *Entropy and the Second Law: Interpretation and Miss-Interpretationsss* (Nordholm, pg. 39). World Scientific.

External links

â— Lucien Benguigui (facuty) – Technion, Israel Institute of Technology.

θΔics

In existographies, **Lucilio Vanini** (1585-1619) (IQ:175|#270) (FA:57) (Re:34) (EvT:7|21+) (CR:28), alias "Julius Caesar", aka Julius Caesar Vanini (Schopenhauer, c.1830), was an Italian philosopher, physics dabbler, lawyer, priest, and free-thinker, characterized as a "genius burned at the stake" (Gross, 2009) (Ñº), noted for []

Overview

In 1616, Vanini, in his *Dialogues on the Mysteries of Nature, the Queen and Goddess of Mortals*, building on Pietro Pomponazzi and Gerolamo Cardano, outlined doubts on every aspect of Christianity, such as whether an immaterial god could make a material world, how an immaterial spirit could speak to material humans, that the only true worship is worship of nature, that humans and other animals originated via some type of putrefaction of matter process. He insists that there are no real nonmaterial beings, i.e. he denies ghosts and spirits, but believes the soul exists, albeit not independent of the human body. Vanini asserts that all religions are human inventions, fictions cooked up by kings and clergy for the sake of power. He denies miracles and the efficacy of prayer. [1]

In 1711, Peter Arpe, in his *An Apology for Julius Caesar Vanini*, summarized Vanini in eighteen points: [7]

1. It is said that Vanini knew not god. Which Gramond's expression. Deum ignorabat.
2. That he brought to light again the book entitled *Of the Three Impostors*.
3. That he had advanced the words of the atheists.
4. That he answered them very lightly.
5. That he held in execration the humanity of Christ.
6. That he accused the Virgin Mary of having lost her virginity.
7. That he esteemed **nature the only god** (see: god = nature).
8. That he blamed those schoolmen who reasoned about angels.
9. That he required a physical account of the nature of devils.
10. That he denied the immorality of the soul.
11. That he was an astrologer.
12. That he contested the future destruction of the world by fire.
13. That he maintained fatality.
14. That he fancied letters in the heaven.
15. That he refuted neither Cardano nor Haly.
16. That he laughed at scared things.
17. That he was rejected by the friars and turned out of their monastery.
18. That lastly, he was condemned to die.

(add)

Origin of man

In 1616, Vanini, in his *Dialogues on the Mysteries of Nature*, in discussion with his follower Alexander, said the following on the origin of man: [6]

> "Men sprang forth like mushrooms, say they. Diodorus Siculus imagines the first man was brought forth out of the slime of the earth, but if so, observes Alexander, how does it happen, that in five hundred thousand years, since which, the world has formed itself, there has been none brought forth in that manner? Nevertheless, he is not the only who has taken that story for truth, and is assured, that by the concurrence of the stars it is very practicable—and this is the opinion of Cardano: he pretends, that as the smaller animals, mice and fishes, are produced by putrefaction, it is very probable, that the greater animals, and even all in general, are derived from them also. A handsome method of reasoning, replies Alexander, a mouse may be

brought forth out of putrefaction, therefore a man may also! Are there not now sufficient heaps of filth and slime? Why then is there not sometimes a horse, sometimes an ox produced from it? That's right, says Vanini, but Diodorus Siculus relates, that in a certain part of the Nile, where it overflows, leaving behind it as it were a bed of mud, which as soon as it is heated by the sun, there are produced from it, animals of a monstrous size. That's well, says Alexander, but as for me, I could never subscribe to such a lie."

Vanini then interjects into what then was deemed his most inflaming assertion:

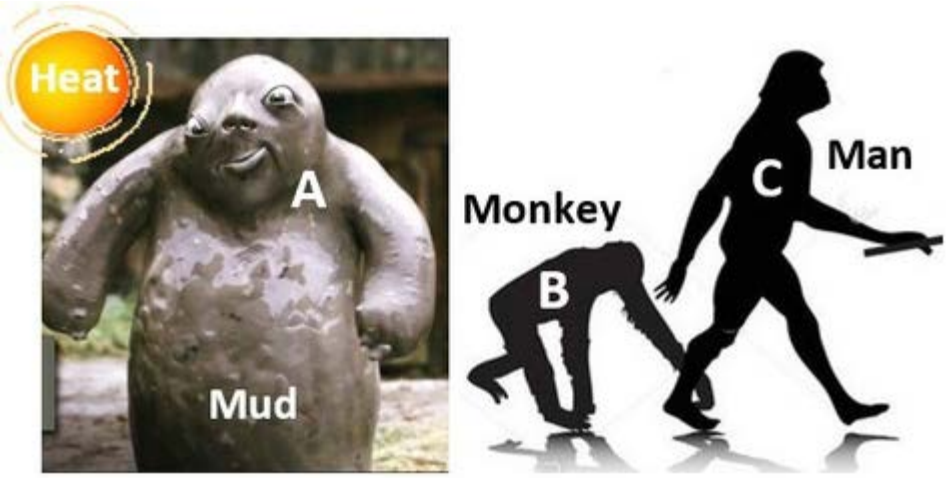

Vanini (1616) conjectures that humans originated from heated mud and or were quadrupedal monkeys.

> "Others have dreamed that the first man has taken his origin from mud, putrefied by the corruption of certain monkeys, swine, and frogs; and thence, they say, proceeds the great resemblance there is between our flesh and propensions, and those of those creatures. Other atheists milder have thought that non but the **Ethiopians are produced from a race of monkeys**, because the same degree of heat is found in both. Truly, replies Alexander, I wonder that those people can dispute the excellency of man above other creatures, when they behold the uprightness of his structure. Well, answers Vanini, atheists cry out to us continually, that the first men went upon all four as other beasts, and it is by education only, they have changed this custom, which, nevertheless in their old age returns again. I should be glad to see this experiment, says Alexander, if a child just born, and brought up in a forest, should walk upon all four. But let us abandon those deliriums to atheists, and hold to the rules prescribed by our faith."

David Durand (1730), the English translator of this, comments: "is it possible in so small a space to heap together such wretched nonsense!"

Atheism

Vanini was considered an atheist, albeit holding some type of god in nature (or god = nature) pantheism type view; his work, is said to be similar to the author of the *Treatise of the Three Impostors* (see: three impostors), said to have been Frederick II. Vanini held the view, like Frederick II, supposedly, that the creators of the three monotheistic religions, Moses, Jesus and Muhammad, were nothing but impostors.

Perfectionism

Vanini, supposedly, some type of "the greatest perfection is imperfection" model of perfectionism (Ñº), supposedly, derived from Joseph Scaliger, and in turn Empedocles, according to which, if the world were perfect, it could not improve and so would lack "true perfection," which depends on progress. To Aristotle, "perfect" meant "complete" ("nothing to add or subtract"). To Empedocles, according to Vanini, perfection depends on incompleteness ("perfectio propter imperfectionem"), since the latter possesses a potential for development and for complementing with new characteristics ("perfectio complementii"). This view relates to the baroque esthetic of Vanini and Marin Mersenne: the perfection of an art work consists in its forcing the recipient to be active—to complement the art work by an effort of mind and imagination. [4]

Reaction end

In 1619, Vanini, aged thirty-four, having been accused of atheism and blasphemy; the following is a 1769 English translation (Ñº) of details of his trail:

> "**Vanini**, under trial, being interrogated what he thought of the existence of god, answered, that he adored as the church did; a god in three persons. Having taken up a straw, 'this straw', he says, 'is enough to prove that there is a creator.' Upon which he pronounced a remarkable sensible discourse on vegetation, on motion, and on the necessity of a supreme being, without whom there could be no motion or vegetation.The president Grammont, who was then at Toulouse, relates this discourse in that history of France of his, which is in these days so perfectly forgotten: at the same time this Grammont, from an unconceivable prejudice, pretends, th at Vanini said all this out of vanity, or out of fear, rather than from any inward persuasion.
>
> But on what can this rash and atrocious judgment of the president Grammont be founded? On the face of Vanini's answer it is evident that he ought to have been acquitted of the accusation of atheism. But how came it that he was not? This unfortunate priest dabbled **also in physics**. There was found in his apartment a live toad, which he kept in a vessel full of water. They did not fail, on this, to accuse him of witchcraft; it was averred that **this toad was the god he worshiped**; they gave an impious sense to several passages of his books, than which nothing is more easy nor more common, by taking the objections for the answers, by a malignant construction of some ambiguous phrase, or by poisoning an innocent expression. In short the faction that was oppressing him, extorted from the judges a sentence that condemned this unfortunate man to death."

After a long trial was condemned to have his tongue cut out, to be strangled at the stake, burned to ashes; he was said to have been "atrociously burnt" at the stake in Toulouse. (Ñº) Vanini was said to have stated true to his principles until the end. (Ñº)

Influenced

Vanini influenced: Pierre Bayle, Voltaire, and Julien la Mettrie (Ñº).

Education

Vanini, in 1616, stylized himself as a "doctor of divinity, philosophy, and law".

Quotes | On

The following are quotes on Vanini:

> "**Vanini** was a staunch disciple of Plato, Aristotle, Averroes, Cardanus [Cardano], an Pomonatius [Pomponazzi], whom he copies everywhere, on the creation, the origin of man, and other matters relating to natural philosophy."
>
> — Translator (1714), *Life of Lucilio Vanini* [4]

> "Those same persons, who at the present day discover atheism to be such a strange system, admit there could have been atheists formerly [but not presently]. Is it, then, that nature has endued us with a less portion of reason than she did men of other times? Or should it be that the god of the present day would be less absurd than the gods of antiquity? Has the human species then acquired information, with respect to this concealed motive-power of nature? Is the god of modern mythology, rejected by **Vanini**, Hobbes, Spinoza, and some others, more to be credited than the gods of the pagan mythology, rejected by Epicurus, **Strato**, Theodorus, Diagoras, &c. &c.? Tertullian pretended that Christianity had dissipated that ignorance in which the pagans were immersed, respecting the divine essence, and that there was not an artisan among the Christians who did not see god, and who did not know him. Nevertheless, Tertullian himself admitted a corporeal god, and was therefore an atheist, according to the notions of modern theology."

— Baron d'Holbach (1770), *The System of Nature* (pg. 303-304)

"The president Grammont relates, with a satisfaction truly worthy a cannibal, the particulars of the punishment of **Vanini**, who was burnt at Toulouse, although he had disavowed the opinions with which he was accused. This president even goes so far as to find wicked the cries and howlings which torment wrested from this unhappy victim of religious cruelty."

— Baron d'Holbach (1770), *The System of Nature* (pg. 319)

"They found it easier to burn **Vanini** that to confute him."

— Arthur Schopenhauer (c.1830), *Dialogue on Religion* (pg. 5 + clause, pg. #) [2]

"There has been a considerable number of those whom history calls atheists. Leucippus, Democritus, Xenophanes, and others of the Atomistic and Eleatic Schools, are said to have been such. In his *Intellectual System*, Cudworth puts into this category Seneca and the younger Pliny among the Romans. Since the Reformation, such men as Rabelais, Machiavel, Bruno, **Vanini**, D'Alembert, Diderot, Buffon, Condorcet, Mirabeau, La Place, Frederic II, and even Pope Leo X, have been charged with atheism."

— Willis Lord (1875), *Christian Theology for the People* (pg. 67)

Quotes | By

The following are quotes by Vanini:

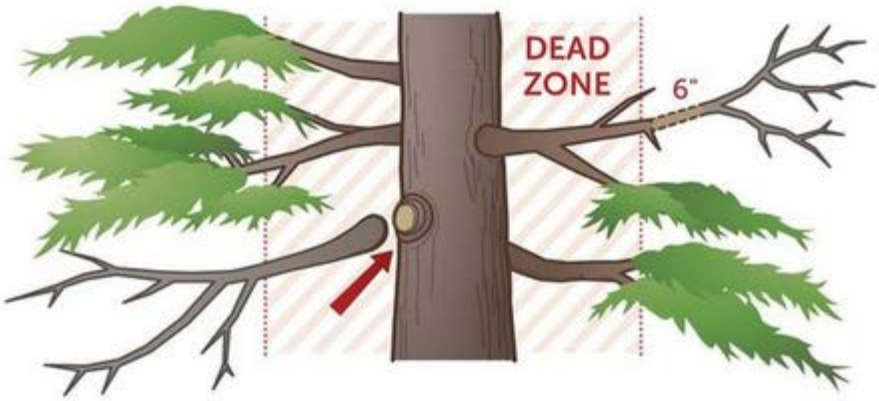

A generic guide to tree pruning, showing where and which branches to cut off; **Vanini**, according to Francois Garasse (1624) said that human populations should, periodically, be trimmed in like manner. [5]

"As to men, they should do as the [forest] rangers, or keepers do yearly in great forests; they go to examine, and to find out the withered trees, and to clear the forest, cut down what is useless, and superfluous or hurtful, keeping only the good trees, and the young branches of hope. In like manner, every year should be held a rigorous visitation of all the inhabitants, in the great and populous cities; and every thing useless, and what hinders the rest from living should be put to death. As for example those that follow no business beneficial to the public, decrepit old persons, all vagabonds, and idle people: nature should be lopped, the cities cleared, and every year at least a million should be killed; who are like wild brambles, or nettles, and hinder others from growing."

— Lucilio Vanini (c.1615), paraphrased by apologist Francois Garasse (Ñº) [5]

"There is neither god nor devil, for was there a god, I would intreat him to consume the parliament with his thunder, as being altogether unjust and wicked; and was there a devil, I would also pray to him to swallow it up in some subterraneous place. But since there is neither the one nor the other, I cannot do it."

— Lucilio Vanini (1619), "Last words", response, in front of a thousand spectators, when told to call out for god for

mercy [4]

See also

â— Giordano Bruno

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(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 295). HarperOne.
2. (a) Schopenhauer, Arthur. (1788). *Dialogue on Religion* (translator: T. Bailey Saunders) (Arc) (WS). MacMillan, 1891.
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3. Tatarkiewicz, Wladyslaw. (1980). "Paradoxes of Perfection" (Ñº), *Dialectics and Humanism*, 12(1):77, Winter.
4. Durand, David. (1714). *The Life of Lucilio (alias Julius Caesar) Vanini: Burnt for Atheism at Toulouse with an abstract of his writings being the sum of the atheistical doctrine taken from Plato, Aristotle, Averroes, Cardano and Pomponazzius's philosophy with a confutation of the same; and Mr. Bayle's arguments in behalf of Vanini completely answered* (Amz) (last words, pg. 93). Publisher, 1730.
5. (b) Garasse, Francois. (1624). *La Doctrine Curieuse des beaux de ce temps ou pretendus tels* (pg. 815). Paris: Chapplet..
(a) Durand, David. (1714). *The Life of Lucilio (alias Julius Caesar) Vanini: Burnt for Atheism at Toulouse with an abstract of his writings being the sum of the atheistical doctrine taken from Plato, Aristotle, Averroes, Cardano and Pomponazzius's philosophy with a confutation of the same; and Mr. Bayle's arguments in behalf of Vanini completely answered* (Amz) (pg. 27). Publisher, 1730.
6. (a) Vanini, Lucilio. (1616). *Dialogues on the Mysteries of Nature, the Queen and Goddess of Mortals*. Publisher.
(b) Durand, David. (1714). *The Life of Lucilio (alias Julius Caesar) Vanini: Burnt for Atheism at Toulouse with an abstract of his writings being the sum of the atheistical doctrine taken from Plato, Aristotle, Averroes, Cardano and Pomponazzius's philosophy with a confutation of the same; and Mr. Bayle's arguments in behalf of Vanini completely answered* (Amz) (pgs. 63-64). Publisher, 1730.
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Further reading

â— Vanini, Lucilio. (1615). *Amphitheatre: of Divine Providence, Divino-Magicum, Christiano-Physicium, Astrologico-Catholicium, Against the Ancient Philosophers, Atheists, Epicureans, Peripatetics, and Stoics, etc.* Publisher.
â— Vanini, Lucilio. (1616). *Dialogues on the Mysteries of Nature, the Queen and Goddess of Mortals*. Publisher.

External links

â— Lucilio Vanini – Wikipedia.

In existographies, **Gaius Lucilius** (c.180-102BC) (IQ:165|#350) , oft-cited as “Lucilius” (Varro, c.50BC) was a Roman philosopher and satirist, influential to Cicero, among others, noted for []

Life is force

In 120BC, Lucius, as cited by Marcus Varro (c.50BC), stated the following logic: [1]

> “**Life is *force*** you see: to do everything force doth compel us.”

Or, in the Latin original:

> “Vis est *vita* vides? Vis nos facere omnia cogit.”

Here, to clarify, the Latin *vis* is rendered as "force" and the Latin *vita* is rendered as "life". Vita and Mor, however, to note, are the Greco-Roman gods of life and death, respectively.

Discussion

> *See also: Library walk problem*

In Lucius' life is force, i.e. that which the force compels us to do, here we see something akin to the colloquial Jedi philosophy, e.g. the "use the force" motto.

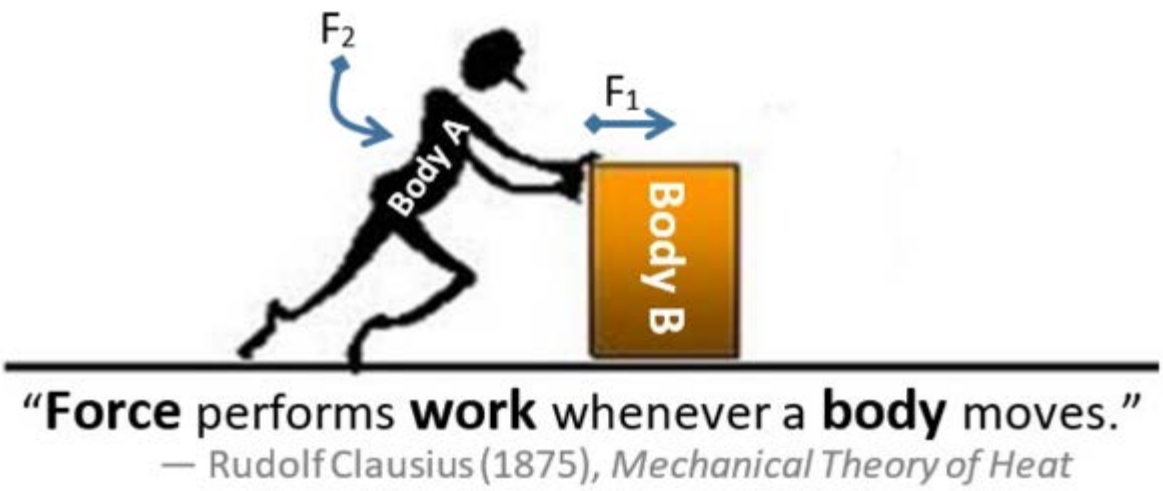

A diagram illustrating the immense confusion that arises when the standard Newtonian-based physics definition of the fact that a "force performs work whenever a body moves" (Clausius, 1875) is moved from focus on body B to body A, wherein ancient religio-mythology-based ideas about: free will, soul, self-motion,god’s will (see: Mirza Beg), force of god, living force (higher power, living energy, choice, etc.), and so on come to the fore; whereas these anthropomorphic-ingrained beliefs are of no concern when the focus is on body B.

In the post Newtonian-Clausiusian conception of things, we are typically taught that when body A, as diagrammed adjacent, applies a **force F_1** of X newtons to body B, which thus overcomes the force Y newtons of friction, and the thereby accordingly body B moves some distance D, that an amount of work W is done. Therefore, force performs work whenever a body moves. This, of course, is all standard modern textbook physics.

When, however, the focus is put on body A, and the question is asked what **force F_2** [?] moves body A to perform work W, the question becomes fixated and puzzled, clogged up in ancient religio-mythology-based ideas about: free will, soul, self-motion, god’s will (see: Mirza Beg), force of god, living force (higher power, living energy, choice, etc.), and so on come to the fore; whereas these anthropomorphic-ingrained beliefs are of no concern when the focus is on body B.

Quotes | On

The following are quotes on Lucius:

> “The poets, through the conjunction of fire and moisture, are indicating that the *vis*, ‘force’, which they have is that of Venus [Aphrodite]. Those born of *vis* have what is called *vita*, ‘life’, and that is what is

meant by **Lucilius** [c.120BC] when he says: ‘life is *force* you see: to do everything force doth compel us’.”

— Marcus Varro (c.50BC), *On the Latin Language* [1]

References

1. (a) Varro, Marcus. (c.50BC). *On the Latin Language: On the Science and the Origin of Words, Addressed to Cicero, Volume One*, *Volume Two* (editor: G.P. Goold). Harvard University Press, 1938.
(b) Fisher, Jay. (2014). *The* Annals *of Quintus Ennius and the Italic Tradition* (vis est vita, pg. 152). JHT Press.
(c) Venus – Wikipedia
(d) Aphrodite – Wikipedia.
(e) Lucretius. (55BC). *De Rerum Natura Libri Sex: Explanatory Notes* (vis est vita, pg. 15) (editor: Hugh Munro (Ñº)). Deighton Bell, 1886.
(f) Ennius – Wikipedia.
(g) John “Jay” Fisher (faculty) – Branford College.

External links

â— Gaius Lucilius – Wikipedia.

θΔics

In terminology, **luck** (TR:35) or lucky (TR:20), similar to chance, refers to []

Overview

In 2011, American economics and biology philosopher Alexander Rosenberg, *The Atheist's Guide to Reality: Enjoying Life Without Allusions*, wherein he promotes what he refers to as "nice atheism", a "blind variation", "dumb luck", "random chance", "accident" themed, "mindless" process, "entropy = disorder" thermodynamics-conceptualized model of evolution, based on game theory and terms such as "thermodynamic noise", according to which everything is an nihilistic allusion, there is no morality, meaning, or purpose to existence, but that the closest thing to what he calls "core morality" is to promote the fitness of our ancestors, based on some type of Hamilton rule logic of being nice, the end motto of which is stay happy, keep going, and when in doubt "take Prozac or equivalent serotonin reuptake inhibitor". [1]

A 2010 "**lucky** me; lucky mud" tattoo; a truncated meaning of the a discussion between god and mud in American writer Kurt Vonnegut's 1963 *Cat's Cradle*, on purpose in the context of the creation by clay myth as it is known to most Abrahamic faiths as the Adam and Eve story as told in the story of Genesis. [3]

Quotes

The following are related quotes:

> "Anyone who attacks the state of marriage," Mittler cried, "who undermines this foundation of all moral society by word or deed, will have to reckon with me; or else, if I cannot better him, I will have nothing to do with him. Marriage is both the base and the pinnacle of culture. It makes barbarians tame, and it gives the most cultivated of people an opportunity to demonstrate their gentleness. It must be indissoluble; it brings so much **luck** that individual misfortunes cannot be weighed against it. And why speak of misfortune? Misfortune is really impatience that comes over people from time to time, and then they like to see themselves as **unlucky**. If you let the moment pass, you will think yourself fortunate that something that has stood the test of time still exists. There is no sufficient reason for separation. The human condition is so highly charged with joy and sorrow that one cannot calculate what two spouses owe each other. It is an infinite debt that can be paid only in eternity. It may be unpleasant at times—I can well believe it—but that is right and proper. Are we not also married to our conscience, which we would often like to get rid of, since it is more disagreeable than any man or woman could ever be?"
>
> — Goethe (1809), *Elective Affinities* (character: Mittler)

> "While it was long possible and sometimes tempting for physicists to deny the usefulness of the molecular hypothesis, we economists have the good **luck** of being some of the 'molecules' of economic life ourselves, and of having the possibility through human contacts to study the behavior of other 'molecules' (see: human molecular hypothesis)…. If we will be more forthcoming with explanations of our cherished terms, our science colleagues may be more inclined to help us with 'entropy', which to me is a more difficult concept than anything economics has to offer."
>
> — Tjalling Koopmans (1947/79), collected work (aggregate quote)

"In a universe of electrons and selfish genes, blind physical forces and genetic replication, some people are going to get hurt, other people are going to get **lucky**, and you won't find any rhyme or reason in it, nor any justice. The universe that we observe has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil, no good, nothing but pitiless indifference."

— Richard Dawkins (1995), *River Out of Eden* (pg. 133); cited by Bo Jinn (2013), *Illogical Atheism* (loc. 954)

"Perhaps other geologists also have questions about the mechanism of mutation (which varied its rate of effectiveness greatly in rocks), whether the ability to propagate is the difference between a fossil and its ancestor, how many such evolutions must occur before '**bad luck**' is overcome and the newer variety replaces the older, which evolved features are not for propagation but just 'ride along' on the genetic material by a coincidental juxtaposition of genes, and—most importantly—whether '**good luck** mutations' can occur fast enough to account for the fossil record."

— Bruce Bathurst (2009), "Why I'm not a molecule" (Ñº)

"Is it just a crazy, cosmic stroke of **luck** that we're here at all? Or do human beings have some larger, mysterious purpose?"

— Steve Paulson (2010), *Atoms & Eden* [1]

"I don't subscribe to **luck** or chance; the harder I work the more luck I seem to have."

— Erika Mitchell (2011), *50 Shades of Gray* (character: Dorion Gray) (Ñº)

"I believe that the evidence, whether physical, historical, or anecdotal, for the existence of a supernatural realm is either lacking or woefully flawed, where the label "supernatural realm" encompasses both supernatural entities (from gods to human souls) and supernatural powers (from telepathy to good **luck** charms). In the absence of any proper evidence, the only rational conclusion is that such entities and powers do not exist but are rather the products of wishful thinking and the human imagination."

— William Jensen (2014), part one of four of his atheist's creed, Oct 15 [2]

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1. Paulson, Steve. (2010). *Atoms & Eden: Conversations on Religion and Science* (pg. 1). Oxford University Press.
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(b) Lucky me, luck mud (2010) – Blog.PassionTask.com.
4. Rosenberg, Alex. (2011). *The Atheist's Guide to Reality: Enjoying Life without Illusions* (luck, 18+ pgs; lucky, 4+ pgs). W.W. Norton & Co.

External links

â— Luck – Wikipedia.

θΔics

In existographies, **Titus Lucretius Carus** (99-55BC) (IQ:180|#87) (Cattell 1000:209) [RGM:682|1,500+] (EvT:6|21+) [CR:281], aka "Lucretius", pronounced “Lu-cree-she-us” (Q) or “Lu-cree-shus” (Q), a follower of the philosophy of Epicurus (341-270BC) and the science of Democritus (460-370BC), the student of Leucippus (500-450BC), was a Greek philosopher noted for his *On the Nature of Things*, in which he summarized the basic points of atomic theory and the implications of this model as a tool to explain all "things". [1]

Consciousness

Lucretius, according to Jennifer Hecht (2004), explains consciousness via the following logic: [19]

> “Now of necessity you must admit that sensate things must even so consist of insensate atoms. From the insensate, animal life is born.”

(add)

Origin of life

Lucretius, in his “On the Nature of Things”, opens, supposedly, to a praise of Venus for creating the multitude of life on earth, and how she conquered the ruling Mars with the power of love; the Martin Smith rendition of this Venus hymn reads as follows: [17]

> “First, goddess, the birds of the air, pierced to the heart with your powerful shafts, signal your entry. Next wild creatures and cattle bound over rich pastures and swim rushing rivers: so surely are they all captivated by your charm and eagerly follow your lead. Then you inject seductive love into the heart of every creature that lives in the seas and mountains and river torrents and bird-haunted thickets, implanting in it the passionate urge to reproduce its kind.”

A supposed visual rendition of this, by artist Botticelli (c.1483), is as follows, wherein the sea from which Venus emerged (Q) can be seen in the distant background, and wasps around the head of Mars, supposedly, signifying pain or death: [1]

Here, in respect to Lucretius' mention of the common people believing that the goddess Venus created life, we might compare the following:

> “The poets, through the conjunction of **fire** and **moisture**, are indicating that the *vis*, ‘force’, which they have is that of Venus [Aphrodite]. Those born of *vis* have what is called ***vita***, ‘life’, and that is what is meant by Lucilius (c.120BC) when he says: **‘life is *force*** you see: to do everything force doth compel us’.”
>
> — Marcus Varro (c.50BC), *On the Latin Language*

(add discussion)

Inertia | Acceleration

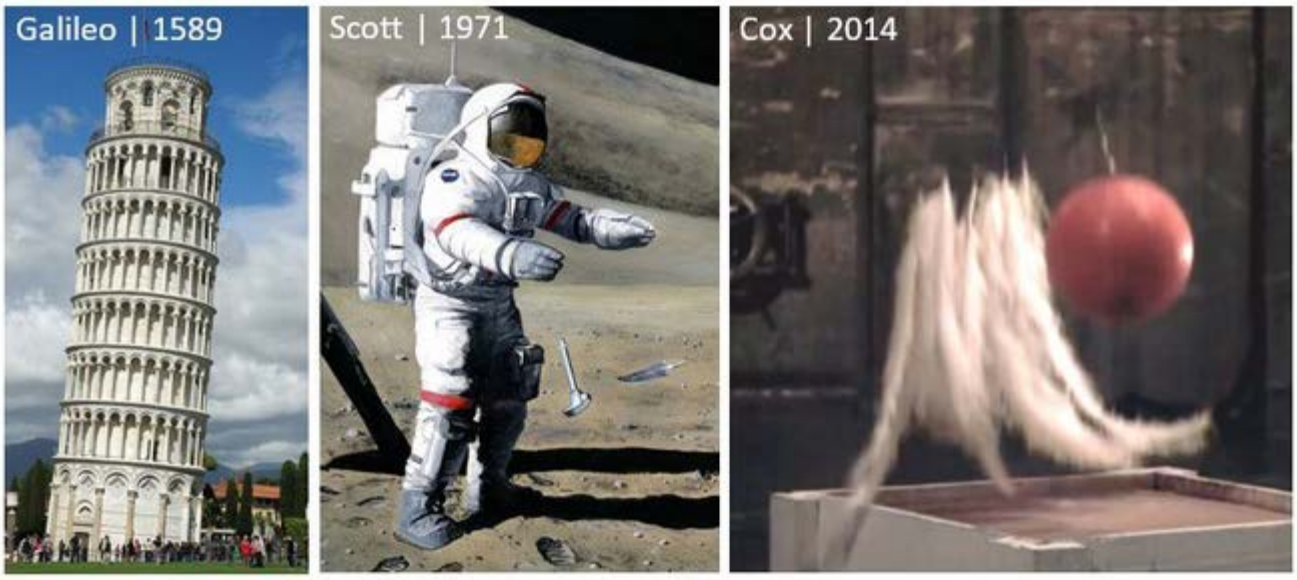

Left: a photo of the Leaning Tower of Pisa (Q), where Galileo in 1589 conducted an experiment wherein he dropped to object of different mass to prove that they fell at the same speed, a view contrary to Aristotle’s view of gravity. Center: astronaut David Scott (1971) on the moon (V) testing Galileo’s assertion that a feather and a hammer would hit the ground at the same time in a vacuum. Right: Brian Cox (2014) at NASA’s Space Power vacuum chamber, Ohio, wherein they watch (V) a bowling ball and some feathers fall through 12 stories or 122-feet and hit the ground at the same time. This phenomena was predicted by Lucretius in 55BC.

Lucretius explains that atoms in a vacuum, regardless of size, would fall at the same rate, thus anticipating Galileo's 1589 Leaning Tower of Pisa (Q) experiment, wherein he dropped two spheres of different masses to demonstrate that their time of descent was independent of their mass, thus proving that objects fall with the same acceleration, irregardless of mass; which thus disproved Aristotle's theory of gravity, according to which objects fell at a speed relative to their mass. [1]

Death | Violent

Lucretius explains that a violent death is an event wherein there is such a drastic rearrangement of atoms that the body can’t regain its original form, say as opposed to a wound that can hear, wherein the atoms can regain their original form. [1]

Evolution

Lucretius was one of the first to outline an atomic theory of evolution. [3]

The following, from §5.855-59 (translation: A.E. Stallings), cited by Victor Stenger (2012), is Lucretius’ main evolution theory excerpt: [10]

> “Many kinds of creatures must have vanished with no trace
> Because they could not reproduce or hammer out their race.
> For any beast you look upon that drinks life-giving air,
> Has either wits, or bravery, or fleetness of foot to spare,
> Ensuring its survival from its genesis to now.”

Lucretius explained, via atomic theory, that creatures that don't have a useful configuration of atoms won't be around long, because it won't fit in to the natural environment, thus anticipating Darwin by some eighteen centuries. [1]

Gods

Lucretius does not dispute the existence of gods, but asserts that they are made of atoms, like humans, and that they are not involved in the day-to-day goings on of humans. [1] The objective aim of Lucretius is as follows:

> "My object is to dispel the fear of the gods, which arises simply from the fact that there are so many things which men do not yet understand, and therefore imagine to be effected by divine power."
>
> — Lucretius (55BC), synopsis regarding gods, summarized by Balfour Stewart and Peter Tait [6]

On religion, Lucretius held the view that: [2]

> "Fear was the first thing on earth to make gods."

Lucretius' work, following the great dark age decline of atomic theory, was revived significantly by Pierre Gassendi.

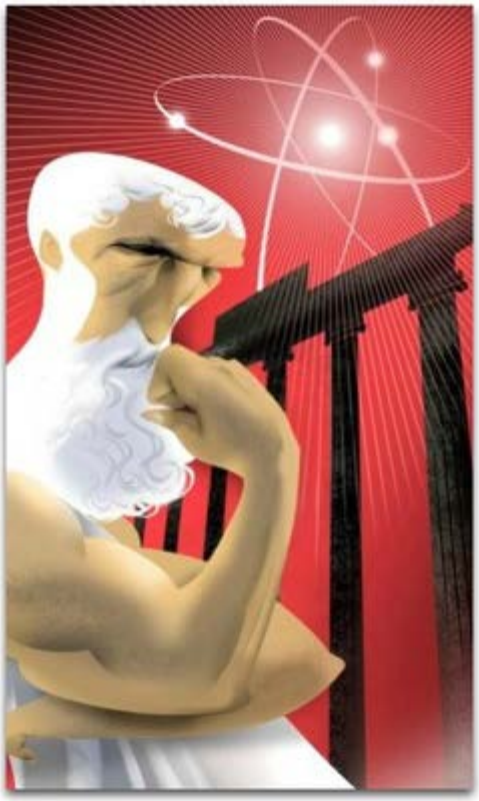

A rendition of **Lucretius** thinking about atoms, by Luis Granean, for Stephen Greenblatt's 2011 *New Yorker* article on Lucretius and his famous poem. [17]

Soul

Lucretius, supposedly, was an "asoulist", i.e. he posited that (5:13-6:13) the soul does not exist; per logic that it can't be seen or touched, it is not necessary to explain anything in particular, and to find the point when it came into existence, if in fact it did exist, is an insoluble problem; hence, there is no need to worry about what happens after one dies, and moreover that the warnings of priests are not to be taken seriously, because they are ignorant about the true nature of the gods. [1]

In other contexts, however, Lucretius seemingly argued (Hecht, 2004) that the soul exists, but that it dies with the body. [14]

Atheism | Morality

Lucretius is categorized as a "functional atheist" (6:38-6:50), i.e. he admitted that gods, made of atoms, may exist, but morality was in the hand of humans, and the "gods were not involved in deciding what was right or wrong". [15] The school of thought of Lucretius, Epicurus, Democritus, and Leucippus, according to Francis Bacon, is the school "most accused of atheism", historically speaking. The four of them are sometimes known as the "original" four horsemen of atheism.

Beginnings | No design

Lucretius, in respect to speculations about the beginnings of things, aka "first cause" in Aristotle speak, as cited by Lawrence Henderson (1917), states the following: [13]

> "But in what ways yon concourse of matter founded earth and heaven and the deeps of the sea, the courses of sun and moon, I will next in order describe. For verily *not by design* did the first-beginnings of things station themselves each in its right place by keensighted intelligence, nor did they bargain sooth to say what motions each should assume, but because the first-beginnings of things many in number in many ways impelled by blows for infinite ages back and kept in motion by their own weights have been wont to be

> carried along and to unite in all manner of ways and thoroughly to test every kind of production possible by their mutual combinations, therefore it is that spread abroad through great time after trying unions and motions of every kind they at length meet together in those masses which suddenly brought together become often the rudiments of great things, of earth, sea and heaven and the race of living things."

(add discussion)

About

Little information is known about Lucretius, other than the few details that: he was a Roman citizen, friend of Roman poet and politician Gaius Memmius (c.90-49BC), that Cicero, in 54BC, in a letter to his brother, was praising the "poems of Lucretius", and that Latin poet Catullus (c.84-54BC), in his circa 60BC poem 64, was citing Cicero. [7]

Materialism

Lucretius' philosophy, according to Richard Jenkyns (2006), is a strict materialism, which denies the existence of anything magical, mysterious or transcendent.

Bond theory | Hooked atoms

Curiously, Lucretius' theory of hooked atom chemical bonding held sway in the minds of chemists all the way into the early 20th century, until interred by those as Gilbert Lewis and Linus Pauling, who were still being taught variants of hooked atom theory in college.

Free will

The following is a noted quote attributed to Lucretius in regards to the question of free will in an atomic universe: [4]

> "Again, if motion is always one long chain, and new motion always arises out of the old in order invariable, and if the first beginnings do not make by swerving a beginning of motion such as to break the decrees of fate, that cause may not follow cause to infinity, whence comes this free will in living creatures all over the earth, whence, I say, is this will wrested from the fates by which we proceed with pleasure leads each, swerving also our motions not a fixed times and places, but just where our mind has taken us?"

(add discussion)

Influence

The early influence of Lucretius is summarized by Jennifer Hecht (2004) as such: [19]

> "**Lucretius** was read and studied by the general populous as well as the leading figures of Roman literature for centuries. He had a tremendous impact on Virgil, e.g., and Ovid loved his materialism and mockery of the traditional gods. Ovid's own best statement on the subject was, 'it is convenient that there be gods, and as it is convenient, let us believe there are.' That does seem to have been the mood. Lucretius, by the way, died without putting his poem into published form; Cicero did that for him."

American president and thinker Thomas Jefferson owned at least five Latin editions of Lucretius' 55BC *On the Nature of Things*, as well as translations into other languages. [9]

Predictions

In 2004, American Greco-Roman historian Richard Carrier made a list of 22 supposed scientific predictions found in Lucretius' poem: [11]

#	Prediction	Lines
1.	The atom	1.265-328
2.	The molecule	2.100-108, 2.581-588
3.	Law of inertia	2.62-166, 2.184-332
4.	Principle of universal natural law	2.718-729, 2.1067-1078
5.	Rain cycle	6.495-523
6.	Sound as a pressure wave in air	4.524-614
7.	Light composed of particles	2.144-156, 4.183-216, 4.364-378, 5.281-305
8.	Sense of smell caused by shape of molecule fitting shape of receptor in nose	2.414-417, 2.680-683, 4.673-705
9.	Lightning caused by friction between storm fronts	6.160-422
10.	Lightning composed of tiny particles	2.384-389
11.	Earthquakes caused by slipping fault lines	6.535-551
12.	Nile rises from snow melting at its source	6.712...735-737
13.	Animals and men evolved by natural selection	2.1150-1156, 5.790-836
14.	Matter is mostly empty space	1.329-397, 6.936-997
15.	Magnetism caused by exchange of particles	6.998-1089
16.	Fire is not an element	1.635-829
17.	No center of the universe	1.1052-1082
18.	Other planetary systems	2.1048-1089
19.	Speed of light is finite	2.144-156, 4.183-216
20.	Theory of relativity	1.459-463, 2.308-332
21.	Quantum indeterminism	2.216-293
22.	Brownian motion	2.112-141

Some, if not many, of these so-called predictions, as Victor Stenger notes, are “stretching things a bit”; nevertheless an interesting first jab at uncharted territory. [12]

Reaction end | Love philtre

Lucretius’ reaction end (death), according to Illyrian Latin Christian priest, theologian, and historian St. Jerome (347-420) for the entry of 94 BC of some book, was said to have died by his own via drinking a love potion: [5]

> “Titus Lucretius, poet, is born. After a love-philtre had turned him mad, and he had written, in the intervals of his insanity, several books which Cicero revised, he killed himself by his own hand in the forty-fourth year of his age.”

This story about Lucretius being driven mad by a love philtre, later immortalized by Alfred Tennyson, according to

translator A.E. Stallings, is a doubtful one in regards to truth. [8]

Quotes | On

The following are Lucretius related quotes:

> "Happy is he who has discovered the causes of things and has cast beneath his feet all fears, unavoidable fate, and the din of the devouring underworld."
>
> — Virgil (31BC), *Georgics* (2.490); apparent reference to Lucretius; cited by Michel Montaigne (O) in his "Of Managing the Will" [18]

> "**Lucretius**' high rank as one of the most distinguished poets of all times is the result of his highly productive skill of sensory perception, which makes him capable of vigorous representations, and further of his lively imagination, which allows him to track the perceived objects even beyond the reach of the senses down to the imperceptible depths of nature and most secretive recesses."
>
> — Johann Goethe (1821), "Letter to Knebel" (note: Knebel was working on a translation of Lucretius' *On the Nature of Things*) (O), Feb 14

> "You are right; we must speak with respect of **Lucretius**; I see no one who can compare with him except Byron, and Byron has not his gravity nor the sincerity of his sadness. The melancholy of the ancients seems to me more profound than that of the moderns, who all more or less presuppose an immortality on the yonder side of the *black hole*. But for the ancients this black hole has the infinite itself; the procession of their dreams is imaged against a background of immutable ebony. The gods being no more and Christ not being not yet, there was between Cicero and Marcus Aurelius a unique moment in which man stood alone. Nowhere else do I find this grandeur; but what renders Lucretius intolerable is his physics, which he gives as if positive. If he is weak, it is because he did not doubt enough; he wished to explain, to arrive at a conclusion!"
>
> — Gustave Flaubert (c.1875), "Letter to Madame Roger des Genettes" [14]

> "**Lucretius** must have observed the moral breakdown that accompanied the dissolution of the old ways as Romans struggled to rise from institutions adequate for small city-state to standards and institutions that they hoped would be adequate for governing the world empire."
>
> — Frank Copley (1977), "Introduction" to *Lucretius: On the Nature of Things* [16]

Quotes | By

The following are other noted quotes:

> "No man awakes, whom once the ice end of living overtakes."
>
> — Lucretius (55BC), *On the Nature of Things*; cited by Michel Montaigne (1592) in *The Complete Works* (pg. 324)

> "Fools admire and like all things the more which they perceive to be concealed under involved language, and determine things to be true which can prettily tickle the ears and are varnished over with fine sounding phrase."

— Lucretius (55BC), translation by Munro [6]

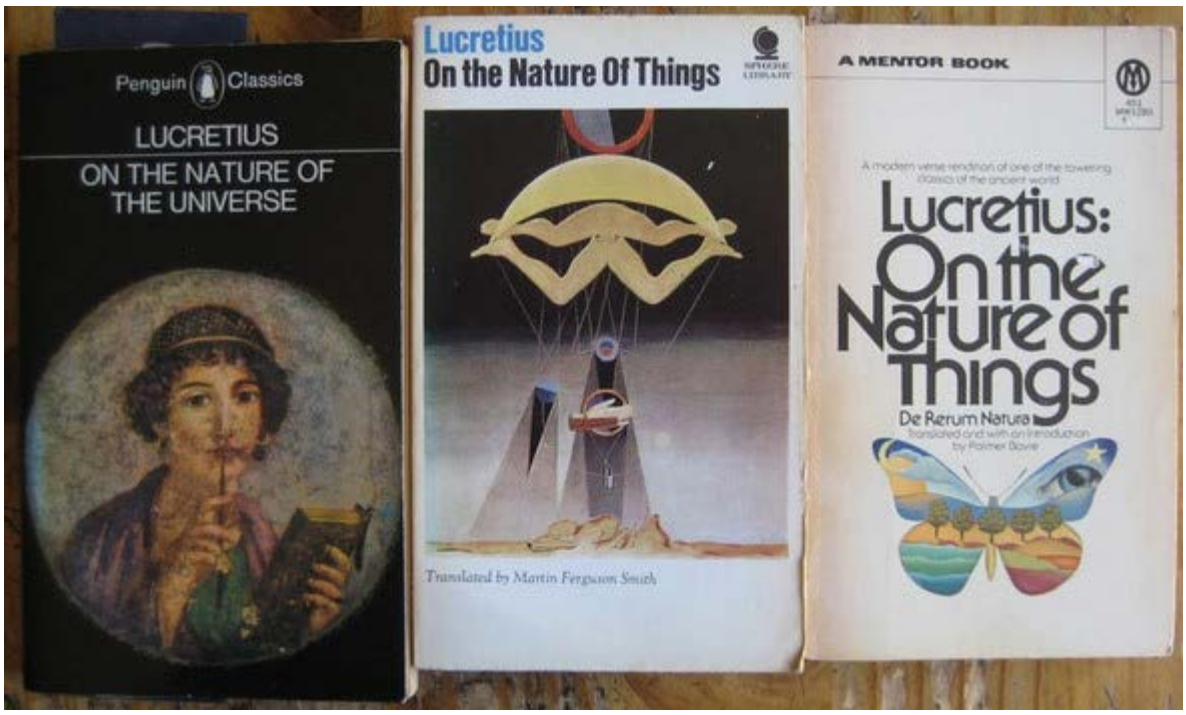

A selection (Q) of three *On the Nature of Things* covers, the middle of which, translation by Martin Smith, shows a detail from a painting by the surrealist Max Ernst, of a crescent moon, high above the earth, where two pairs of legs, without bodies are shown, which Stephen Greenblatt read as a college student, giving eventual sway to his 2011 *Swerve*, on the history of the 15th century re-discovery of Lucretius, from which the scientific revolution emerged. [17]

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External links

● Lucretius – Wikipedia.

θΔics

In hmolscience, **Ludwig Bartels** (c.1961) is a German-born American physical chemist noted for his 2005 to 2007 work on synthetic walking molecules and molecular carriers.

Overview

In 2005, Bartels group reported on 9,10-DiThioAnthracene (DTA), a heat-induced synthetic walking molecule, and 2007 work on molecular carries, i.e. walking molecules able to carry a load, like a human carrying a bundle.

Education

Bartels completed his BS in physics in 1991 at the Free University, Berlin, his MS in physics, at Fritz-Haber Institute, Berlin, and his PhD in 1997 at the Free University, and presently is professor of physical chemistry in the materials science and engineering department of the University of California, Riverside.

Quotes

The following are related quotes:

> "Effectively, DTA kind of rotates around each of the feet and wobbles forward or wobbles backward."
>
> — Ludwig Bartels (2005), interview with MIT Technology Reviews [1]

> "Carrying a load slows the DTA [carrier] molecule down. Attachment of one CO_2 molecule makes the carrier need twice as much energy for a step, and a carrier with two CO_2 molecules requires roughly three times the energy. This is not unlike a human being carrying heavy loads in one or both hands."
>
> — Ludwig Bartels (2007), "On DTA as Molecular Carrier" [2]

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External links

- Ludwig Bartels (faculty) – University of California, Riverside.
- Ludwig Bartels – Google Scholar.
- Ludwig Bartels – ResearchGate.net.

θΔics

In existographies, **Ludwig van Beethoven** (1770-1827) (IQ:165|#234) was a German composer and pianist noted for his famous four-day 1812 meeting with German polymath Johann Goethe.

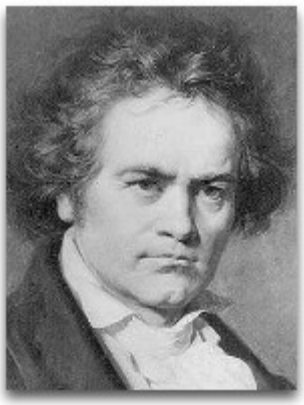

> "Goethe's poems exercise a great sway over me, not only by their meaning, but also by their rhythm. It is a language which stimulates me to composition."
>
> — Ludwig van Beethoven (c.1815) [5]

Goethe meeting

In 1812, Goethe spent four days visiting with Beethoven, a great fan of Goethe, at Beethoven's repeated quests, the interactions of which have been retold many times. Beethoven was 42, Goethe 63, with the publication of the first part of Faust four years behind him.

Of this meeting, the following vignette has come down to us, as depicted below. As Beethoven and Goethe walked, some of the nobility passed with their entourage. Goethe politely stepped aside and bowed deferentially to the nobles - while Beethoven, in a typical gesture, strode almost defiantly right through their midst, with his hands behind his back and without acknowledging the presence of the nobles, who had no alternative but to give him clear passage. When Goethe asked Beethoven how he could so disrespectfully treat these nobles, the composer replied, again characteristically, "There are countless 'nobles', but only two of us."

Left: The "incident at Teplitz", as depicted by Carl Rohling (1849-1922), Beethoven and Goethe meeting the imperial family, July 1812: Goethe stepped aside and gave them respect; whereas Beethoven pushed through commenting "they should make way for us, not us for them", or something along these lines. **Right:** A remake of the "they should make way for us scene, not us for them" scene, from the 1994 film *Immortal Beloved*, albeit with Goethe replaced with Austrian countess Guilietta Guicciardi (played by Valeria Golino).

The the so-called "incident at Teplitz" (adjacent) was famously remade in the 1994 film *Immortal Beloved*, albeit not with Goethe, but with one of Beethoven's lovers.

Elective Affinities

It remains to be determined Beethoven and Goethe they talked at all about Goethe's recently-published *Elective Affinities* at all during their visit?

At the close of a well-known letter dated 2 September 1812 from Carlsbad, Goethe shared with his friend, German composer Carl Zelter the following impressions of his encounter with Beethoven: [3]

> "I got to know Beethoven in Toplitz. His talent leaves me in a state of amazement; he is, however, a completely intractable personality, who may not be wrong in finding the world detestable, but who surely does not thereby make it more pleasant, either for himself or for others. On the other hand, he may be forgiven this, and is to be pitied, for his hearing deserts him—a factor which perhaps afflicts the musical part of his being less than the social. He, who is already of laconic nature, now becomes doubly so through this loss."

The following is Zelter's September 14 reply to Goethe: [3]

"What you say about Beethoven is certainly true. I, too, admire him with terror. His worn works seem to cause him secret horror—a perception that is dismissed all too lightly in our contemporary culture. His works seem to me like children whose father is a woman or mother is a man. The most recent work of his I have come to know (Christ on the Mount of Olives, 1811) seems to me like an impurity whose very foundation and goal are eternal death. Music critics, who seem better able to grasp and agree upon almost anything but singularity and the natural, have gushed over this composer in the most curious manner, in both praise and reproach. I know musical persons who used to find themselves alarmed, even indignant, upon hearing his works, but who are now gripped with enthusiasm for them like the partisans of Greek love. The attraction of this is not difficult to understand, and yet what can come of it you have demonstrated clearly enough in your *Elective Affinities*."

A Goethe meets Beethoven stamp photo (Ñº).

In the years to follow, supposedly, according to American music scholar Kristian Muxfeldt (2011) both Beethoven and *Elective Affinities*, were frequent conversation topics exchanged between Goethe and Zelter. Muxfeldt comments on this as follows: [3]

> "Zelter hence judges Beethoven's musical creations to be products of a similarly alarming psychic displacement, children whose father is a woman or whose mother is a man, and he imagines that like Eduard, Beethoven must recoil at his offspring. The implication—not for from the surface—that Beethoven's music is against nature (or, truer to Goethe's portrayal in *Elective Affinities*, that nature is permitted to run wild in it) is reinforced with a psychological truism: like the partisans of Greek love, Beethoven's advocates too have found their initial indignation transformed into passionate enthusiasm."

These commentaries on Goethe and Beethoven, by Muxfeldt (2011), to note, seem to be pure full page word-for-word reprints of the earlier synopsis by Dennis Mahoney, in his 2004 *The Literature of German Romanticism*. [4]

Burial

Beethoven is buried at the Central Cemetery, Vienna, the same place where the Boltzmann tombstone is located, and as recounted by American biophysicist Harold Morowitz, the cemetery caretaker often gets "Ludwig B" mixed up with the tomb of Ludwig Beethoven. [1]

Quotes

The following are related quotes:

> "His talent astonished me, but his is a totally untamed personality, and he is not entirely wrong in finding the world detestable, though this attitude does not make it more pleasant, either for himself or others … To think of teaching him would be an insolence even in one with greater insight than mine, for he has the guiding light of genius, whilst the rest of us sit in total darkness, scarcely suspecting the direction from which daylight will break upon us."
>
> — Johann Goethe (1811), "Commentary on his meeting with Beethoven"

"The court suits him too much. It is not becoming of a poet."

— Ludwig Beethoven (1811), "Commentary his meeting with Goethe"

The **Beethoven tomb** located at the Central Cemetery, Vienna, the same place where the Boltzmann tombstone is located.

“Asking ‘why another book on thermodynamics?’ is reminiscent of the story of the man who, asked if he was going to the concert that night to hear one of **Beethoven**’s symphonies, replied no, he’d already heard it. Thermodynamics texts are somewhat like that. Mostly they do not say anything that other books have not said—what is left to say after Gibbs, after all?—but a lot remains in the interpretation, the nuances; authors of thermodynamics texts are like conductors—their worth is shown in the insights of their interpretation, and it seems there will always be room for new books on thermodynamics, just as there is always an audience for more performances of Beethoven.”

— Greg Anderson and David Crerar (1993), *Thermodynamics in Geochemistry* [2]

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External links

â— Ludwig van Beethoven – Wikipedia.

θΔics

In hmolscience, **Ludwig Bertalanffy** (1901-1972) was an Austrian biologist noted for his 1938 to 1972 systems-conceptualized "dynamic theory of growth", a melting pot a number of theories.

Overview

In 1932, Bertalanffy began to advance his concept of the organism as an open system. [10]

In 1968, Bertalanffy introduced his general system theory, a mixture of biology, information theory (from Claude Shannon), cybernetics (from Norbert Wiener), and bit of verbal thermodynamics. [1] His significance seems to be his view of open systems in biology in contrast to the closed systems of standard classical thermodynamics. He also made contributions to biophysics, where he is perhaps best known for his 1938 derivation and development of the von Bertalanffy growth function, which is still used in fisheries science today. [2] Bertalanffy's theory, albeit very crude in a thermodynamic sense, has been very influential to many novice researchers, e.g. Dick Hammond, who would wish to simply apply systems theory to biology and sociology, without the attached mathematical rigor of thermodynamics proper.

In 1981, Bertalanffy, in his posthumous *A Systems View of Man*, argued the view, as summarized by Alicia Juarrero, that "when living things are embedded in an orderly context, properties emerge that are not present when things exist as isolated individuals". [7]

Open systems theory

Bertalanffy's general view of thermodynamics, for instance, is that: "thermodynamics expressly declares that its laws apply only to closed systems." In the correct sense, chemical potential and mass flow terms, among other variables, are accounted for in open systems of chemical thermodynamics. In any event, he states that:

> "Obviously the conventional formulations of physics [thermodynamics] are, in principle, inapplicable to the living organism *qua* open system having steady state, and we may well suspect that many characteristics of living systems which are paradoxical in view of the laws of physics are a consequence of this fact."

To resolve this conflict he outlines his theory of open systems, by stating that:

> "In open systems, however, we have not only production of entropy due to irreversible processes, but also import of entropy which may well be negative. This is the case in the living organism which imports complex molecules high in free energy. Thus, living systems, maintaining themselves in a steady state, can avoid the increase of entropy, and may even develop towards states of increased order and organization."

He then devotes considerable effort to substantiate this view via information theory and cybernetics in developing his general system theory. [1]

The basis of Bertalanffy's open system approach to the study of animate systems (organisms) follows from the observation that in order to persist and develop over time, such systems must follow the law of mass action. [3] In his 1938 work, he cites Dutch chemist and Nobel prize winner van't Hoff's 1896 book on the development of chemical kinetics, where he states that the use of a kinetic approach is required. [4] Bertalanffy deemed a kinetic approach necessary to study the growth of organisms, following the law of mass action because the approaches hitherto offered by physical chemistry dealt with homogeneous, heterogeneous, or condensed systems at equilibrium, whereas the study of growth required the consideration of a dynamic equilibrium. He defined growth as the result of the interaction between anabolism and catabolism of the system's chemical constituents. [5] The change in mass of an organism over time does not include excess water weight, and can be estimated using an ordinary differential equation:

$$\frac{dm}{dt} = E - km$$

or alternately in integral form as:

$$m = \int_0^t (E - km)dt = \frac{E}{k} - (\frac{E}{k} - m_0)e^{-kt}$$

where E is the rate of substance uptake (mass/time), k is the conversion rate (1/time), m is the mass of the organism, m_0 is the initial mass (e.g. egg mass) of the organism, and t is the time. As an example of how the equations can be used, during starvation experiments all terms including the uptake, E can be set to zero in order to solve for the organism's individual conversion rate, k.

Specifically, the approach takes note of the fact that the rate of animate system growth is not constant, but changes during ontogenesis, increasing in the earlier stages and decreasing in the later stages. The reason behind this rate variation is that for stationary systems following the law of mass action, the metabolic processes breaking down its chemical constituents (catabolism) tend to be a function of the system's overall mass, whereas the creation and growth (anabolism) processes are associated with the system's surface area. [3] One of the results in applying the steady-state principle to study animate system growth and development is the recognition that when perturbed, the system will manifest forces oriented against the disturbance in order to return to the steady-state. Therefore, physiochemically it can be seen that open systems exhibit "responses" or "behaviors" which are actually the result of the Le Chatelier principle. [5]

Social systems

In his systems theory, Bertalanffy considered a human being to be an “active personality system” and sociology to be the study of social systems. He argues that by application of his general system theory one can model the spread of rumors by generalized diffusion equations and the flow of automobile traffic by kinetics and thermodynamics. [1]

Discussion

There are particular features of Bertalanffy's 1938 formulation of his "dynamic theory of growth" which may be non-intuitive and are thus worth discussion:

1. Growth is proportional, and its rate of change is a function of an individual's specific morphology. During stages of ontogenesis in which geometric similarity holds, definite relations can be derived to describe the surface area, a and volume,:

$$a = pl^2, v = ql^3$$

where l is a representative linear dimension of the organism (e.g. height, width, length), and p and q are individual-specific constants.

2. Due to proportional growth, there exist simple mathematical relationships between the rates of change of volume, area, and length:

$$\frac{dv}{dt} \cdot \frac{1}{v} = \frac{3dl}{dt} \cdot \frac{1}{l}$$

$$\frac{da}{dt} \cdot \frac{1}{a} = \frac{2dl}{dt} \cdot \frac{1}{l}$$

$$\frac{dl}{dt} \cdot \frac{1}{l} = \frac{1}{3}\frac{dv}{dt} \cdot \frac{1}{v}$$

Thus it can be seen that it is expected that an organism's rate of surface area grows at twice the rate of its representative linear dimension, and its volume three times as fast.

Building on the previous formulations, Bertalanffy formulates the change in volume of an organism in time as the interplay of competing building and destructive processes:

$$\frac{dv}{dt} = \eta a - \chi v$$

where η is a constant used in determining the "constructed volume" and χ the "decomposed volume" contributions. The expression can be reformulated to better include experimental data in cases where it is easiest to measure the growth of a linear dimension of organisms during ontogensis (e.g. the body length) as: [3]

$$\frac{dl}{dt} = \frac{1}{3}(\eta - \chi l)$$

Here it is important to notice that η has units of length/time, and χ 1/time. Recalling the proportional growth relations above, it is possible to define two new constants, E and k:

$$E = \frac{\eta}{3} \cdot \frac{p}{q}$$

$$k = \frac{\chi}{3}$$

This results in the differential form of the von Bertalanffy growth formula:

$$\frac{dl}{dt} = E - kl$$

or alternately in integral form as:

$$l = \frac{E}{k} - \left(\frac{E}{k} - l_0\right) e^{-kt}$$

A modified version of the growth formula was derived in 1984 by American engineer Robert Balmer and fitted to experimental values of the metabolic dissipation of the fish (*Nothobranchius guentheri*) in order to develop an entropy model for biological systems:

$$\dot{q}_m = (K/m_f)[1 - (1 - (m_i)/m_f)^{1/3})e^{-Bt}]^{-3} ln\left(\frac{t+a}{a}\right)$$

where $\dot{q}_m$(mW/g) is the metabolic dissipation, m_i and m_f are the initial and final masses of the individual, respectively, and K(mW), a(months) and B(1/months) are empirical constants. [6] In addition to his formulation of the growth equation, Bertalanffy rejects teleology and instead posits that open systems in the steady-state have equifinal end states, independent of initial conditions. [1]

Education

Bertalanffy did his undergraduate work in biology first at the University of Innsbruck and then at the University of Vienna and in 1926 completed his PhD thesis on the topic of German experimental psychologist Gustav Fechner.

Quotes | About

The following are quotes on Bertalanffy:

> "The so-called 'organismic biologists, e.g. E.S. Russell (1931), John Haldane (1921, 1931), and **Ludwig Bertalanffy** (1952, 1962), have repeatedly urged that the temptation to search always for mechanistic or physiochemical explanations of organic phenomena be resisted, and that biology be recognized as a science with a logical and conceptual structure of its own."
>
> — Michael Simon (1971), *The Matter of Life* [9]

Quotes

The following are representative quotes:

> "Biology, growing up under the shadow of physics, has languished like a plant deprived of light."
>
> — Ludwig Bertalanffy (1962), *Modern Theories of Development* [8]

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External links

â— Ludwig Bertalanffy – Wikipedia.

θΔics

In existographies, **Ludwig Boltzmann** (1844-1906) (IQ:195|#15) [RGM:618|1,500+] [Kanowitz 50:44] [Cropper 30:1|SM] (GPE:26) (RE:62) [CR:364] was an Austrian physicist and thermodynamicist, of the Vienna school of thermodynamics, a semi-categorized epicenter genius, one of the central founders of statistical thermodynamics, known for his derivation of the probabilistic or logarithmic description of entropy as a function of the molecular distributions of the body, who met his reaction end by his own hand at 62-revolutions of the earth about the sun, owing to attacks on his theory, which was soon thereafter validated.

Second law | Mechanical proof

In 1866, Boltzmann, at the age of 22, published his "On the Mechanical Significance of the Second Law of Thermodynamics", wherein he attempts to give a mechanical proof of the second law; defining entropy as the logarithm of the average kinetic energy. [13] In this same paper, according to American neurological anthropologist Terrence Deacon, Boltzmann, supposedly, also described entropy or entropy increase in terms of increasing disorder (fact check). [14]

Statistical thermodynamics

In 1872, Boltzmann stated the following: [15]

> "Thus, one may prove that, because of the atomic movement in systems consisting of arbitrarily many material points, there always exists a quantity which, due to these atomic movements, cannot increase, and this quantity agrees, up to a constant factor, exactly with the value that I found in [a paper published in 1871] for the well-known integral ∫dQ/T."

An 1887 group photo (Ñº), showing (standing, from the left): Walther Nernst, Heinrich Streintz, Svante Arrhenius, Hiecke, and (sitting, from the left): Aulinger, Albert von Ettingshausen, **Boltzmann** (seated at middle), Ignacij Klemencic, Hausmanninger. See also: epicenter genius.

This is what soon came to be known as Boltzmann's H-theorem. In 1901, this statement was reformulate or rather truncated by German physicist Max Planck into the condensed form of S = k ln W. These theories on the statistical measurement of entropy in gas-phase systems are the base of logic frequently used in statistical human thermodynamics.

Humans | Molecules

In his famous 1872 article 'Further Studies on the Thermal Equilibrium of Gas Molecules', Boltzmann concluded, based on his comparison of humans to molecules, as discerned through a reading of English Historian Henry Buckle's 1861 book *History of Civilization*, that: [4]

> "Molecules are like to many individuals, having the most various states of motion, and the properties of gases only remain unaltered because the number of these molecules which on average have a given state of motion is constant."

Life | Struggle for entropy

In 1886, Boltzmann gave the enigmatic postulate that "life is a struggle for entropy". [1] On translation of this is as follows: [2]

> "The general struggle for existence of animate beings is not a struggle for raw materials – these, for organisms, are air, water and soil, all abundantly available – nor for energy, which exists in plenty in any body in the form of heat *Q*, but of a struggle for entropy *S*, which becomes available through the transition of energy from the hot sun to the cold earth."

These famous statement later stimulated Austrian physicist Erwin Schrödinger to argue, in 1944, that that "life feeds on negative entropy." [5] This statement, in turn, spawned a number of new terms, such as neg-entropy and neguentropy, as well as debates on the logic of this statement. According to researchers Eric Schneider and Dorian Sagan, for instance, in regards to the correctness of this statement, "except for the term entropy, which is better replaced with Gibbs free energy *G*, Boltzmann's analysis is essentially modern." [3]

Energy elements | Quantum mechanics

In 1891, Boltzmann famously commented: "I see no reason why energy shouldn't also be regarded as divided atomically." [10] This view, later led German physicist Max Planck, in 1900, to postulate the quantum view of an energy element, and hence the launch of quantum mechanics. In an 1886 lecture, Boltzmann gave his opinion that the nineteenth century will be remembered as the century of the 'mechanical vision of nature' and of 'Darwin's evolutionism'. [11]

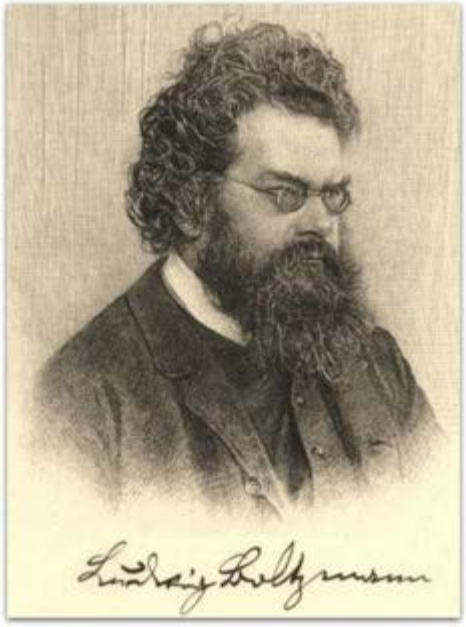

A photo of Boltzmann in his middle years.

Education

Boltzmann was awarded a doctorate from the University of Vienna in 1866 for a thesis on the kinetic theory of gases supervised by Josef Stefan. After obtaining his doctorate, he became an assistant to Stefan. Boltzmann later taught at Graz, moved to Heidelberg and then to Berlin, where he studied under German physician and physicist Hermann von Helmholtz. [1] One of Boltzmann's good friends and colleges at the University of Vienna was Joseph Loschmidt, noted for being the first to draw double and triple bonds in molecules, as found in his 1861 book *Chemische Studien (Chemical Studies)*, and to calculate the size of air molecules (1865) using the kinetic theory of gases. [6]

Anecdotes

> *See main: Thermodynamics anecdotes*

In thermodynamics folklore, an oft-heard comment is that the second law has something to do with pouring a glass of water into the sea. This stems from Boltzmann who in 1870 told English physicist John Strutt that the second law of thermodynamics has the same truth as the assertion that you cannot recover a tumbler of water thrown into the sea. [7]

Attacks

Before receiving acclaim into the early 20th century, Boltzmann's theoretical initially came under attack from many directions. In 1876, Austrian physical chemist Joseph Loschmidt, Boltzmann's mentor at the Vienna school, pointed out the reversibility paradox, otherwise known as Loschmidt's paradox, between reversible classical dynamics and irreversible thermodynamics; thus prompting Boltzmann to write his 1877 article "On the Relation of a General Mechanical Theorem to the Second Law of Thermodynamics" in efforts to reconcile the issue. [8]

In the mid 1890s, German mathematician Ernst Zermelo

criticized the mathematical and philosophical foundations. Those in the school of energetics, Austrian physicist Ernst Mach, German physical chemist Wilhelm Ostwald, and French physicist Pierre Duhem, all criticized Boltzmann's underlying atomic model, arguing essentially that atoms did not exist, and that thermodynamics need not be based on atoms. [9] A frequent debating partner with Boltzmann was Ostwald who supposedly used Loschmidt's paradox to argue against atomic theory, commenting in 1895 opinions such as: [12]

> "The proposition that all natural phenomena can ultimately be reduced to mechanical ones cannot even be taken as a useful working hypothesis: it is simply a mistake."

The fact that the mechanical laws work equally well forward or backward in time, meant to Ostwald that:

> "In a purely mechanical world there could be a before and after as we have in our world: the tree could become a shoot and seed again, the butterfly turn back into a caterpillar, the old man into a child. No explanation is given because of the fundamental property of the mechanical equations. The actual irreversibility of natural phenomena thus proves the existence of processes that cannot be described by mechanical equations and with this the verdict on scientific materialism is settled."

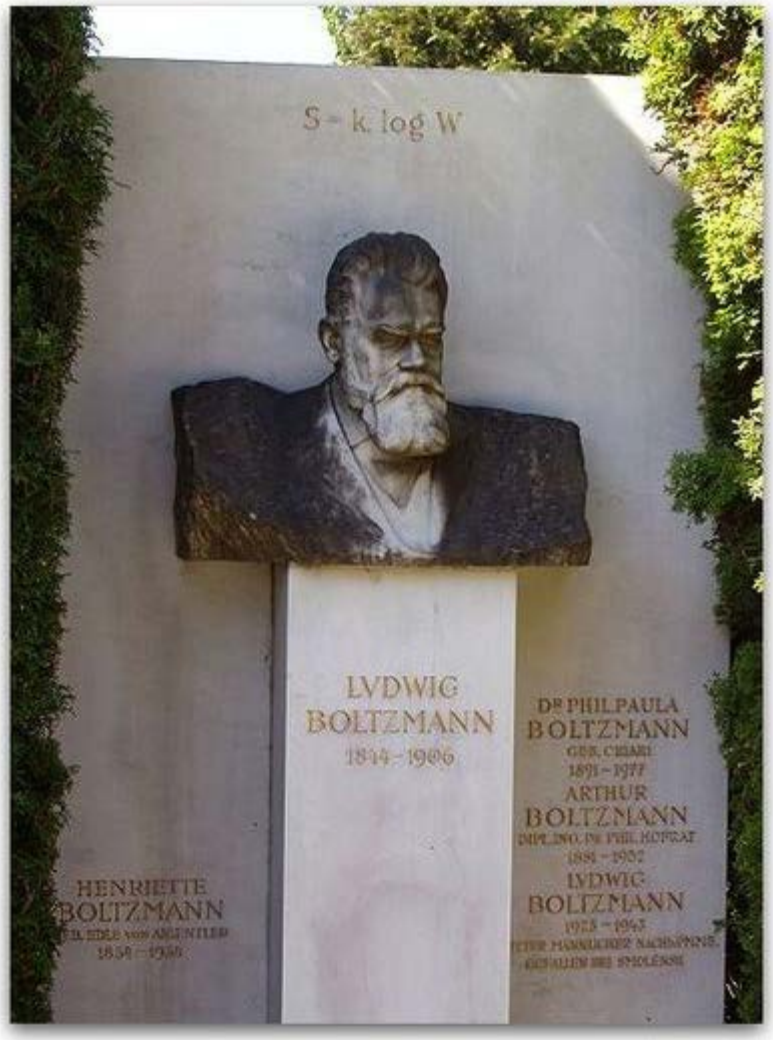

The famous Boltzmann tombstone is the marker for the final resting place of Ludwig Boltzmann, who met his reaction end in 1906, by his own hand, located in the Vienna Central Cemetery, showing a bust of Boltzmann with the equation S = k log W chiseled in stone above. On the left is the name of his wife and one the right are the names of his three sons. The engraved tombstone was erected in the 1930s after the full significance of Boltzmann's work had been recognized.

In other words, Ostwald objected, among other things, to the effect that the mechanical laws are reversible whereas the thermo-mechanical laws are irreversible and argued that if the mechanical laws held in a purely mechanical world one, there could not be a before and after. [12]

Reaction end

See main: *Founders of thermodynamics and suicide*

Boltzmann, who during his reaction existence (life) had a difficult time vindicating his theories, particular the supposition that atoms existed, was one of the several founders of thermodynamics to take meet their end by their own hand.

Tributes | Praise

The following are noted statements of praise and or tribute:

"In 1866, at the age of 22, Boltzmann wrote an article 'On the Mechanical Meaning of the Second Law of the Theory of Heat' in which he claimed to prove the second law of thermodynamics purely from dynamics, i.e. the second law was just a consequence of Newton's equations of motion. Two years later, in 1868, in a paper 'Studies on the Equilibrium of the Kinetic Energy between Moving Material Points' he follows Maxwell in introducing probability concepts into his mechanical considerations and discusses a generalization of Maxwell's equilibrium velocity distribution function for point particles in free space to the very general case that a number of material points move under the influence of forces for which a potential function exists, i.e. he derives the Maxwell-Boltzmann equilibrium distribution function."

— E.G.D. Cohen (2005), "Boltzmann and Einstein" [16]

Quotes

The following are noted quotes:

"Goethe's *Faust* is perhaps the greatest of all works of art."

— Ludwig Boltzmann (c.1890) [17]

"Was it a god that wrote these signs, revealing the hidden and mysterious forces of nature around me, which fill my heart with quiet joy?"

— Ludwig Boltzmann (1893), in an epigraph (Ñº) to his lectures on Maxwell's theory (Ñº) (Ñº) ; inspired from the introductory monologue of Goethe's Faust (Ñº) [18]

"In Europe, a grief-stricken rich woman buys a dozen cats, while in America she builds a university."

— Ludwig Boltzmann (c.1904), commentary (Ñº) on Leland Stanford, his wife, and Stanford University

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External links

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θΔics

In existographies, **Ludwig Buchner** (1824-1899) (IQ:180|#110) (SN:11) (FA:110) (GA:6) (CR:131) was a German physician, physicist, anti-chance philosopher, auto-defined "realist philosopher", labeled: extreme atheist, "gross materialist" (Finck, 1877), "extreme materialism" (Britannica, 1911), noted for his 1855 *Force and Matter*, a top ranked atheist's bible (#1|6+), in which he applies physics and chemistry to humanity just as it is applied to matter, according to which, similar to Goethe and Empedocles, before him, argued that the chemical affinities of atoms and molecules are manifestations of the actions of the love and hate between people. [1]

Nationality	German
Known for	Extreme materialism Extreme atheism
Alma matter	University of Giessen University of Strasbourg University of Würzburg University of Vienna

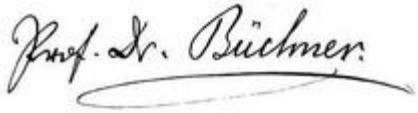

Influences

Buchner, in his *Force and Matter*, while citing a number of main scientists, e.g. Clausius, Helmholtz, Joule, tends to cite William Grove, and his *Correlation of the Physical Forces*, more than most; he also cites: John Tyndall, George Drysdale, Goethe, many of the ancient Greek philosophers, e.g. Anaxagoras, the atomic theorists (Leucippus, Democritus, Epicurus, and Lucretius), Baron d'Holbach, among others.

Atheism

See main: Extreme atheism

Buchner was a self-defined "atheist", per terminology dialogue with Darwin (Ñº), and labeled by others as an extreme atheist philosopher—see also: Stark classification (1962) on “extreme form” of social mechanism. Some describe Buchner as the "father of German atheistic evangelism"; similar to the English version of Thomas Huxley. Buchner, in his *Force and Matter*, 1884 edition, opens to the following quotes:

> “The universe, that is the all, is made neither of gods nor of men, but ever has been and ever will be an eternal living fire, kindling and extinguishing in destined measure.”
>
> — Heraclitus (c.475BC)

> “Where there are three students of nature, there are two atheists.”
>
> — Buchner (1884) or an old saying [?]

The controversy surrounding Büchner’s *Force and Matter* resulted in Buchner being dismissed from post at the University of Tübingen, but he went on to establish the German Freethinkers' League, the first German organization for atheists. (Ñº)

Finck

Buchner, as critiqued by American philosopher Henry Finck (1887), argued that the chemical affinities of atoms and molecules are manifestations of the actions of the love between people; Finck cites the following examples: [2]

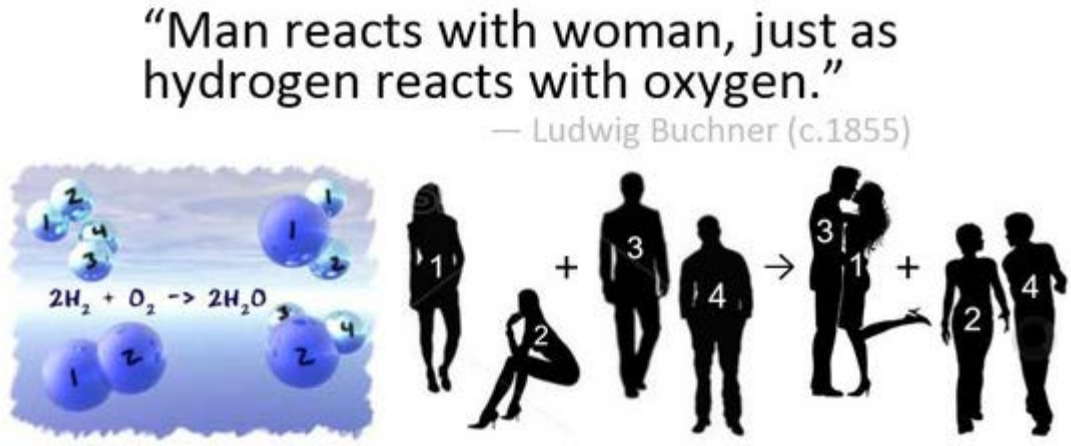

"Just as man and woman attract one another, so oxygen attracts hydrogen, and, in loving union with it, forms water, that mighty omnipresent element, without which no life nor thought would be possible."

— Ludwig Buchner (c.1855), cited by Henry Finck (1887) in *Romantic Love and Beauty* (pgs. 6-7)

"Potassium and phosphorous entertain such a violent passion for oxygen that even under water they burn—i.e. unite themselves with the beloved object."

— Ludwig Buchner (c.1855), cited by Henry Finck (1887) in *Romantic Love and Beauty* (pgs. 6-7)

"For it is love, in the form of *attraction*, which chains stone to stone, earth to earth, star to star, and which holds together the mighty edifice on which we stand, and on the surface of which, like parasites, we carry on our existence, barely noticeable in the infinite universe; and on which we shall continue to exist till that distant period when its component parts will again be resolved into that primal chaos from which it laboriously severed itself millions of years ago, and became a separate planet."

— Ludwig Buchner (c.1855), cited by Henry Finck (1887) in *Romantic Love and Beauty* (pgs. 6-7)

Finck classifies Buchner as a "gross materialist" for these views.

Overview

The following is the edited description of Buchner from the 1911 *Britannica*: [5]

In 1852, Buchner became lecturer in medicine at the university of Tübingen, where he published his great work *Kraft und Stoff* [*Force and Matter*] (1855). In this work, the product, according to Lange, of a fanatical enthusiasm for humanity, he sought to demonstrate the indestructibility of matter and force, and the finality of physical force. The extreme materialism of this work excited so much opposition that he was compelled to give up his post at Tübingen. He retired to Darmstadt, where he practised as a physician and contributed regularly to pathological and physiological magazines.

Buchner continued his philosophical work in defense of materialism, and published *Natur und Geist* [*Nature and Spirit*] (1857), *Aus Natur und Wissenschaft* [*From Nature and Science*] (vol. i., 1862; vol. ii., 1884), *Fremdes und Eigenes aus dem geistigen Leben der Gegenwart* [*Foreign and Private from the Spiritual Life of the Present*] (1890), *Darwinismus und Socialismus* [*Darwinism and Socialism*] (1894), *Im Dienste der Wahrheit* [*In the Service of Truth*] (1899). He died at Darmstadt on the 1st of May 1899.

In estimating Büchner's philosophy it must be remembered that he was primarily a physiologist, not a metaphysician. Matter and force (or energy) are infinite; the conservation of force follows from the imperishability of matter, the ultimate basis of all science. Büchner is not always clear in his theory of the relation between matter and force. At one time he refuses to explain it, but generally he assumes that all natural and spiritual forces are indwelling in matter:

> "Just as a steam engine produces motion, so the intricate organic complex of force-bearing substance in an animal organism produces a total sum of certain effects, which, when bound together in a unity, are called by us mind, soul, thought." (*Kraft und Stoff*, 7th ed., p. 130)

Here he postulates force and mind as emanating from original matter—a materialistic monism. But in other parts of his works he suggests that mind and matter are two different aspects of that which is the basis of all things—a monism which is not necessarily materialistic, and which, in the absence of further explanation, constitutes a confession of failure. Büchner was much less concerned to establish a scientific metaphysic than to protest against the romantic idealism of his predecessors and the theological interpretations of the universe. Nature according to him is purely physical; it has no purpose, no will, no laws imposed by extraneous authority, no supernatural ethical sanction."

The comment "generally [Buchner] assumes that all natural and spiritual forces are indwelling in matter", this is the theory espoused by Pierre Teilhard, and may not exactly be Buchner's belief (check), e.g. the cited quoted mentions "mind, soul, thought" (but not spirit), but rather adumbration by the 1911 *Britannica* writer.

Force and Matter

In 1852, Buchner became lecturer in medicine at the University of Tübingen, where he published the work his best-known work the 1855 *Force and Matter: Empirico-Philosophical Studies*. The extreme materialism of this work excited so much opposition that he was compelled to give up his post at Tübingen (see: two cultures tensions), whereafter he retired to Darmstadt, practicing as a physician and contributing regularly to pathological and physiological magazines.

Entropy

In 1882, Buchner published *Light and Life*, in which, supposedly, he addressed the law of increasing entropy by saying that only parts of the universe would die but that other parts would go on living. [4]

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Education

Buchner studied studied physics, chemistry, botany, mineralogy, philosophy, and medicine at the University of Giessen graduating in 1848 with a dissertation on "Contributions to the Hallerian Theory of an Excitomotor Nervous System". He then studied at University of Strasbourg, University of Strasbourg, where he studied pathology under Rudolf Virchow, and at the University of Vienna.

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Quotes | On

The following are quotes on Buchner:

> "Throughout his life Einstein was a man of the book, to a much higher degree than other scientists. The remarkably diverse collection of volumes in his library grew constantly. If we look only at the German-language books published before 1910 that survived Einstein's Princeton household, the list includes much of the cannon of the time: Boltzmann, **Buchner**, Friedrich Hebbel, the works of Heine in two editions, Helmholtz, von Humboldt, the many books of Kant, Gotthold Lessing, Mach, Nietzsche, and Schopenhauer. But what looms largest are the collected works of Johann von Goethe in a thirty-six volume edition and another of twelve volumes, plus two volumes on his *Optics*, the exchange of letters between Goethe and Schiller, and a separate volume of *Faust*."

— Gerald Holton (2008), on the contents of Einstein's personal library. [6]

"Mach crowed that he had slain the 'stuff and force' dragon of the mechanistic materialism of **Buchner**, Vogt (Ñº), and Moleschott. Mach, in short, confused the laws with definitions, and inverted the correct logical relation 'dynamics entails kinematics.' He thus sacrificed Newtonian mechanics on the idealist altar."

— Mario Bunge (2010), *Matter and Mind: a Philosophical Inquiry* [7]

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External links

â— Ludwig Buchner – Wikipedia.

θΔics

In hmolscience, **Ludwig Colding** (1815-1888), Ludvig (in Danish), was a Danish civil engineer noted for his 1840 "perpetuity of force" theory and his 1843 attempt to measure heat generated by a brass sled on tracks of various constitution, one of the first mechanical equivalent of heat experiments, data from which he aimed to establish a force conservation theory in order to validify the theory of the immortality of the soul or the force of the soul, or something along these lines.

Overview

In 1840, Colding proposed some type of "principle of the perpetuity of force", an early variant of the conservation of force, and later conservation of energy, which held that there existed a constancy of force: transformations could occur, but the among remained fixed. A retrospect *Nature* biography defines Colding as such: [1]

> "In 1843 he wrote his 'Theses Concerning Moving Forces', a paper which entitles him to a place among the founders of thermodynamics."

Colding conceived of what he called his "principle of perpetuity of force" in 1840, but was persuaded (by someone) to postpone publication or enunciation of his principle until he obtained some empirical support. The experiments he conducted involved the measurement of the heat generated by a brass sled on tracks of various constitution. His results were reported to the Royal Danish Society of Sciences in 1843, but the paper was refused publication by its *Transactions*. [4]

In 1853, Colding worked with Danish chemist Julius Thomsen, notable for his theories in thermo-chemistry, to show that cholera can spread through drinking water. [2]

Cessation thermodynamics

See main: Cessation thermodynamics, Religious thermodynamics

In 1856, Colding reflected on the origin of his theory as follows: [3]

> "[In] my first thought concerning the imperishability of the forces of nature, I have borrowed from the view that the forces of nature must be related to the spiritual in nature, to the eternal reason as well as to the human soul. Thus it was the religious philosophy of life that led me to the concept of the imperishability of forces. By this line of reasoning I became convinced that just as it is true that the human soul is immortal, so it must also surely be a general law of nature that the forces of nature are imperishable."

Colding thus reasoned that if, according to religious philosophy, the soul of a person is immortal, then so to there must correspond a natural force constituent of the soul so to quantify this effect.

Colding, as summarized by Helge Kragh, believed that spiritual activity was a higher form of energy and that the law of conservation of force proved the immortality of the soul and that God had created the world out of nothing. [5]

Colding seemed to have arrived at his principle of the conservation of force owing to his conviction in assumed continuity between the movement of life and death in the construct of the theory of the imperishability of the human soul. In short, similar to other thermodynamics founders, Colding was stimulated into theorizing owing to his religious convictions.

Education

Colding was a student of Danish chemist, physicist, and nature philosopher Hans Orsted. [4]

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External links

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θΔics

In existographies, **Ludwig Feuerbach** (1804-1872) (IQ:170|#376) (Cattell 1000:948) [RGM:227|1,330+] (FA:101) (GA:8) (CR:77) was a German philosopher and anthropologist, a top ten extreme atheist, noted for his 1841 *The Essence of Christianity*, wherein he outlined some type of inconsistent atheism (Max Stirner, 1844), focused on the question: "did god create man? Or did man create god?", tending to side with the latter.

Influenced

Feuerbach influence: Ludwig Buchner, Karl Marx, Friedrich Engels, and in turn Russian atheism, initiated by Vladimir Lenin, and supposedly Sigmund Freud.

Death | Immortality

In 1830, Feuerbach, ending his ride, supposedly, on the so-called Hegelian bandwagon, anonymously published *Thoughts on Death and Immortality*, a work which created a scandal by portrayal of Christianity as an egoistic and inhumane religion, which cost him his job and, to some extent, his career. In this work, he denied the traditional Christian concept of the immortality of the soul; and argued the following variety of logic: [6]

> "Everything that exists is not without end and limit, even including the infinite … Thus, the essence and life of a thing is measure, form, kind, law. And this measure, by and within which a thing is what it is, is not something that extends only to a certain matter—for instance, the chemical components—but is a measure that penetrates everything, determines everything, dwells in everything. The entire life and essence of a thing is thoroughgoing determinateness, is one all-present measure. The proportion, for instance, of the chemical matter of a fish is not just something to be weighed and enumerated; but its organism, its entire body, also has its determinate form and *habitus* [or condition], which distinguish it from other animals. And what else is this *habitus* but measure, limit? Equally, the external relation of this fish is no boundless, indeterminate, indiscriminate relation. It moves itself, but it has movement determined by its shape. It lives in a determinate climate, in a determinate element, water, but again not in any water, but in a determinate spring, river, or sea. Ocean water is as much water as that which flows in a river, and yet this fish, just because it can never escape the limit that is the center of its nature, the limit that determines and includes everything that exists in it, can live only in this and no other water."
>
> — Ludwig Feuerbach (1830), *Thoughts on Death and Immortality* (pgs. 74-75)

> "If there is life after death, there cannot be life before death."
>
> — Ludwig Feuerbach (1830), *Thoughts on Death and Immortality* (pg. 133)

Feuerbach both denied immortality and affirmed death as that which makes the continuity of human beings with our natural environment most evident. [8] Feuerbach argued that recognition of this continuity—urged upon us by the fact of our eventual death—is prerequisite to a fully lived life, and that Christianity (especially Protestant Christianity) makes the full life impossible by virtue of its emphasis on personal immortality (Massey xi). It was in this emphasis on material, earthly life that Feuerbach departed from Hegelian philosophy. This parting of ways was based primarily on Hegel's interpretation of religion where religion was placed as a grand part of the dialectic movement of history. Feuerbach rejected this notion of religion for a more typically enlightenment view, which saw the passing away of religion as a key to the progress of scientific society. [7]

Extreme atheism

Feuerbach, in his later years, was said to have become an extreme atheist, of sorts, e.g. he was one of the seven people employed as opening quotes to co-extreme atheist Ludwig Buchner's 1884 (4th English edition, based on the 15th German edition) *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon*, along with Orges, La Mettrie, H. Tuttle, F.J. Pisko, Ph. Spiller, and Goethe. [2]

Christianity | Nitric acid

In 1850, Feuerbach, in his *The Natural Sciences and the Revolution*, asserted that philosophy should no longer side with theology but rather now instead align its views with the natural sciences, chemistry in particular; the work of Dutch physiologist Jacob Moleschott, e.g. his *Theory of Foodstuffs: For the People*, in particular, which asserted to have solved the mind-body problem (Ñº) via the logic of the chemistry of digestion. Feuerbach, here, famously prophesized that one day modern science, anchored in chemistry, would dissolve Christianity in nitric acid; a quotation of which is as follows:

> "**Feuerbach** saw the scientific revolution coming; it would be a time that would 'dissolve the Christian world-view in nitric acid'."
>
> — William Newell (1986), *The Secular Magi* (Ñº)

The revolution here alluded to is the Goethean revolution, still not yet even begun. Another variant of the Nitric acid statement is as follows:

> "Christians … hadn't they heard, as one skeptic famously put it, that modern science had already dissolved Christianity in a vat of nitric acid."
>
> — Lee Strobel (2004), reflective monologue, with citation to Feuerbach, on being sent in 1974 to report on the West Virginia hillbilly bombings and shootings over certain non-Christianity conforming textbooks being used in public schools [4]

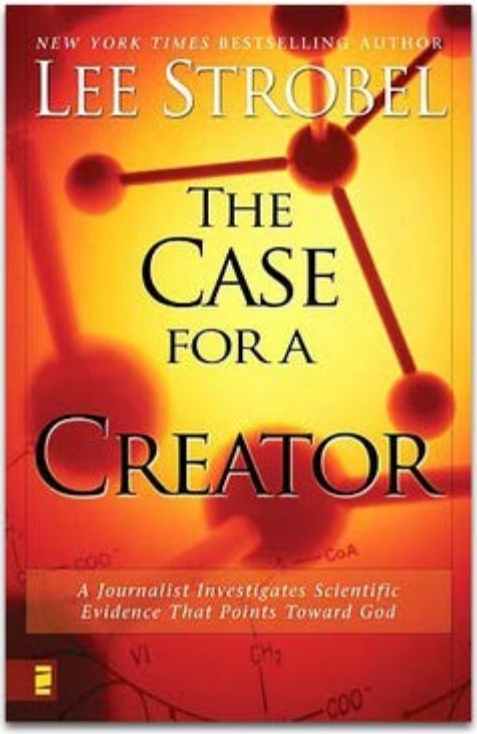

Agnostic theism

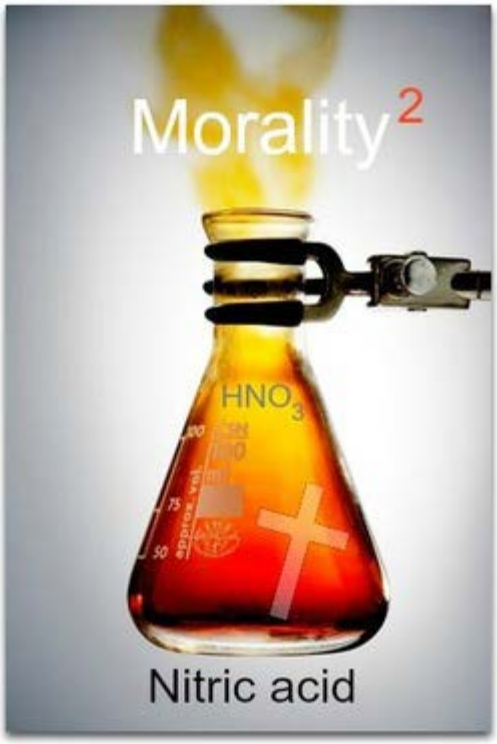

Extreme atheism

American journalist Lee Strobel's 2004 *The Case for a Creator*, which attempts to depict **Feuerbach**'s 1850 statement that one day a scientific revolution will accrue that will dissolved the Christian worldview in nitric acid.

Quotes | On

The following are notes of praise, tribute, and or summary:

> "The grandfather of Marxian atheism and Freudian atheism is **Ludwig Feuerbach**, who was first a theologian, then a Hegelian, and finally an atheistic philosopher."
>
> — Hans Kung (1990), *Freud and the Problem of God* [3]

Quotes | By

The following are related quotes:

> "It is true: writing brings forth in the lives of many humans just such destructive results, like Ottilie in Goethe's *Elective Affinities*, through whose appearance the fortune of a satisfying life is ruined."

— Ludwig Feuerbach (1834), *Abelard and Heloise* (Aphorism #42) [5]

"Whenever morality is based on theology, whenever right is made dependent on divine authority, the most immoral, unjust, infamous things can be justified and established."

— Ludwig Feuerbach (1841), *Essence of Christianity* [9]

"Antinatural morality is the twin sister of supernatural faith."

— Ludwig Feuerbach (1841), *The Essence of Christianity* (pg. 208)

"In the sphere of strictly theoretical philosophy, I attach myself, in direct opposition to the Hegelian philosophy, only to realism, to materialism."

— Ludwig Feuerbach (1843), Preface to 2nd edition of *Essence of Christianity*, Feb 14

"It is clear as the sun and evident as the day that **there is no god** and that there can be none."

— Ludwig Feuerbach (c.1850), *Publication* [9]

"Whenever morality is based on theology, whenever the right is made dependent on divine authority, the most immoral, unjust, infamous things can be justified and established. Morality is then surrendered to the groundless arbitrariness of religion."

— Ludwig Feuerbach (c.1860) (Ñº)

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External links

â— Ludwig Feuerbach – Wikipedia.

θΔics

In existographies, **Ludwig Wittgenstein** (1889-1951) (IQ:175|#244) [RGM:219|1,500+] (Gottlieb 1000:634) (Stokes 100:78) (GPhE:#) (CR:38) was an Austrian-British philosopher, noted for, supposedly, commented or critiqued Arthur Schopenhauer's human chemical theory based notion of a "elective affinity will" or "will to power" (attacking one's fears). [1]

Overview

Wittgenstein's two biggest works are *Philosophical Investigations* and *Tractatus Logico-Philosophicus*, which according to some "show more raw intellect than anything Shakespeare has written".

Language

Wittgenstein is known for his so-called atomic fact model of language units and molecular hypothesis version of paragraphs, something to the affect that "we can speak of the world only in our language game, and otherwise must be silent" (Hecht, 2003).

Goethe-Schopenhauer | Weininger

Wittgenstein, supposedly, admired Otto Weininger. [6] Wittgenstein, as a youth, e.g. read read Weininger's Goethe-based *Sex and Character*, and was said to have been deeply influenced by it. Wittgenstein, in addition, commented or critiqued Arthur Schopenhauer's Goethean-based theory of an "elective affinity will" or "will to power" (attacking one's fears). [7]

Russell

In 1910, Wittgenstein met Bertrand Russell, thereafter becoming his pupil, but later splitting with him. [3] Some have ranked Wittgenstein above Russell in genius rankings.

Natural laws

In 1921, Wittgenstein, in his *Treatise on Logic and Philosophy*, aka *Tractatus Logico-Philosophicus*, the title supposedly being themed on Benedict Spinoza's *Tractatus Theologico-Politicus*, wherein he attempted to argue the following: [4]

> "At the basis of the whole modern view of the world likes the illusion that the so-called laws of nature are the explanations of natural phenomena."

American physicist Steven Weinberg cited this quote as someone who denied the possibility of explaining any fact on the basis of any other fact. Weinberg went on to say that such "warnings leave me cold" and that "telling a physicist that the laws of nature are not explanations of natural phenomena is like telling a tiger stalking prey that all flesh is grass." [5]

Frazer

In 1931, Wittgenstein, in his *Remarks on Frazer's Golden Bough*, wherein he summarized his thoughts on James Frazer's *The Golden Bough: a Study in Magic and Religion*; these notes, in turn, supposedly, became the backbone to his later more famous 1953 *Philosophical Investigations*. [9]

Religion

Wittgenstein, who has a large number of "god-this" and "god-that" quotes attributed to him, is oft-classified as "great Christian thinker". [2] In WWI, Wittgenstein carried a copy of Tolstoy's translation of the Bible, and was known as the "guy with the gospels". [11]

Virgin birth

In c.1950, Wittgenstein, in his notes *On Certainty*, stated the following about the virgin birth:

> "I believe that every human being has two human parents; but the Catholics believe that Jesus only had a human mother. And other people might believe that there are human beings with no parents, and give no credence to all the contrary evidence."

(add)

Quotes | On

The following are quotes on Wittgenstein:

> "One of my favorite woodshed sorties involves the [splitting] of the friendship between **Ludwig Wittgenstein**, a great Christian thinker of the twentieth century, and Bertrand Russell [GA:21], one of the **greatest atheist** philosophers of the twentieth century."
>
> — Leonard Sweet (2012), *What Matters Most* (pg. 106)

Quotes | By

The following are quotes by Wittgenstein:

> "I think, I have never *invented* a movement of thought, rather they are always given to me by others. I have merely taken them up passionately for my work of clarification. In this way Boltzmann, Hertz, Schopenhauer, [Gottlob] Frege, Russell, Kraus, Loos, Weininger, Spengler, Sraffa have influenced me."
>
> — Ludwig Wittgenstein (1931), diary note [8]

> "Philosophy is a battle against the bewitchment of our intelligence by the means of language."
>
> — Ludwig Wittgenstein (c.1950), *Philosophical Investigations* [1]

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External links

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θΔics

In chnops-thermodynamics, **Luigi Fantappie** (1901-1956) was an Italian mathematical physicist noted for his 1941 term 'syntropy' (or *syntropia* in Italian), loosely described as *phenomena* governed by a force, opposed to entropy, which attracts living systems towards higher levels of organization and order. [1] In the first 2005 article of Italian journal *Syntropy* (which lasted to 2008), syntropy is defined, in short, as the energy of life. The editor of *Syntropy*, Italian sociologist Ulisse de Corpo, summarizes the efforts of Fantappie as such: [2]

> "**Luigi Fantappiè**, one of the major Italian mathematicians, while working on quantum mechanics and special relativity, discovered that all physical and chemical phenomena, which are determined by causes placed in the past, are governed by the law of entropy, while all those phenomena which are attracted towards causes which are placed in the future (attractors), are governed by a law which is symmetrical to entropy and which Fantappiè named syntropy."

Fantappie, somehow, derived his syntropy conception from his work on the creation of anti-particles and how this process relates to the second law of thermodynamics. Fantappie was said to have observed that human consciousness was at the top of the organization ladder of nature, and thus he reasoned that it is intimately associated with the syntropy side of universal movement or process, as contrasted with entropic movements. [3]

German physical science economist Stephen Ternyik believes, to note, that Italian sociologist Ulisse de Corpo has developed a new approach to thermodynamics of human existence that is "well worth studying." [4]

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External links

â— Luigi Fantappie – Wikipedia.

θΔics

In science, **Luigi Galvani** (1737-1798) (IQ:175|#270) [RGM:318|1,350+] was an Italian physician-physicist noted for his circa 1771 discovery of the phenomenon of animal reanimation—via electricity, spark or electrochemical circuit contact—of severed frog legs.

In the 1780s Galvani used an electrostatic generator to make frog legs twitch at a distance. [5]

Galvani published his results in the 1791 article *Commentary on the Effect of Electricity on Muscular Motion*. [1]

Twitching discovery

The actual details, facts, and dates of the famous electrically-induced twitching dead frog legs discovery is a bit inconsistent and varied, to say the least, such as who actually made the discovery, Luigi or his wife Lucia Galvani (1743-1788/90), the date of the discover, and actual electro-material apparatus arrangement of the the legs at the time of the discovery—even citations of the date of her last year differ (1788 or 1790) as well as the date of their marriage (1760 or 1762). [9]

As Scottish chemist and technologist George Wilson reported, in his 1859 history of electricity, "some twenty versions of the story are known on the continent" and that he was already making redactions to previous comments about the discovery he had published. [6] In American physiologist Charles Sherrington's 1840 *Man on His Nature*, to cite one example, he states, in regards to the two-millennium long mind-brain-soul-movement debate, from Hippocrates to Kant, that:

> "Their death-knell rang when Lucia Galvani told her husband Luigi that the frogs' legs prepared for the meal seemed alive on the copper wire."

Luigi's wife Lucia Galvani (1743-1788/90), the possibly discoverer of electrically-induced dissected animal parts movement.

While it is certainly true that there is a connection between culinary habits, e.g. salting frog legs and movement, the actual discovery seems to have either an arc connecting dissimilar metals, e.g. an iron-copper-frog arc, or an electric generator that released sparks stimulating movement. As to dates, in 1760 or 1762, Luigi married Lucia Galeazzi, the daughter of Italian anatomist and professor of experimental physics Domenico Gusmano Galeazzi (1686–1775), after which at the request of the father he moved in with is in-laws, and during the course of the the next ten years, according to Italian biographer Stephen Spignesi, he performed his most famous frog electricity experiments. [8] As to who actually made the discovery, Wilson, to cite one example, attributes the first viewing of the twitching to Lucia, who as Galvini's devoted assistant: [6]

> "The celebrated frog was dismembered, not for culinary but for scientific purposes, and was awaiting Galvani's return in a part of his laboratory where an electrical machine was at work. Lucia Galvani, who was looking on, was startled by observing that whenever the machine gave out a spark the limbs of the frogs were convulsed, and struggled as if still parts of a living body. She called her husband, who mistook in part the nature of this singular phenomenon."

The mention of being mistaken seems to be a reference to Luigi's animal electricity theory.

Animal electricity debate

In 1776, to explain the contraction phenomenon, Galvani postulated the existence of what he termed "animal electricity", a special type of electricity unique to animals.

This soon led into a debate with his associate Italian physicist Alessandro Volta, who in 1800 invented the electric pile or battery so to disprove Galvani's animal electricity theory.

In 1797, or earlier, Goethe, together with Alexander Humboldt and Wilhelm Humboldt, conducted electrical experiments on frog preparations, in testing the subject of galvanism or animal electricity theories of Galvani. [74]

Aldini

In 1803, Giovanni Aldini, Galvani's nephew, conducted electrical experiments on a recently hung human corpse, finding similar effects with as with the frog legs.

Nature of life

In 1816, Mary Shelley and Percy Shelley visited George Byron in Switzerland, during which time the group discussed galvanism and the feasibility of returning a corpse or assembled body parts to life, and to the experiments of the 18th-century natural philosopher Erasmus Darwin, who was said to have animated dead matter. Mary later recalled: [3]

> "Many and long were the conversations between Lord Byron and Shelley to which I was a devout but nearly silent listener. During one of these, various philosophical doctrines were discussed, and among others the nature of the principle of life, and whether there was any probability of it ever being discovered and communicated. They talked of the experiments of Dr. Darwin who preserved a piece of vermicelli in a glass case till by some extraordinary means it began to move with voluntary motion. Not thus, after all, would life be given. Perhaps a corpse would be reanimated; galvanism had given token of such things: perhaps the component parts of a creature might be manufactured, brought together, and endued with vital warmth."

This seed conversation eventually turned into the famous 1818 novel *Frankenstein*.

In 1836, a satirical cartoon, entitled "A Galvanized Corpse", shown adjacent, lampooning the idea of bring someone back to life by galvanism, which shows a dead body (deanimated) being brought back to life (reanimation) via use of Alessandro Volta's electric pile (battery); the summary of which is as follows: [4]

A satirical 1836 cartoon showing American politician and Washington Globe editor Francis Blair (1791-1876) (Ñº) rising from the dead via Galvani's animal electricity (current) made by Volta's pile (battery). [4]

> "Jacksonian editor Francis Preston Blair rises from his coffin, revived by a primitive galvanic battery, as two demons look on. A man on the right throws up his hands as he is drawn toward Blair, saying: Had I not been born insensible to fear, now should I be most horribly afraid. Hence! horrible shadow! unreal mockery. Hence! And yet it stays: can it be real. How it grows! How malignity and venom are "blended in cadaverous union" in its countenance! It must surely be a "**galvanized** corpse." But what do I

feel? The thing begins to draw me . . . I can't withstand it. I shall hug it! . . .

First demon: "There! We've lost him, after all! See! they are bringing him to life again!"

Second demon (holding a copy of Blair's newspaper, the "Globe)": Lose him! ha ha! . . . Rest you easy on that score. But can't you see that it's all for our gain that he should be galvanized into activity again? Where have we his equal on earth? especially since dear Amos [Kendall], poor fellow, has got his hands so full, at the Post Office, that he can't write for us as he used to. Show me another man that can lie like him. They talk of Croswell [influential editor of the "Albany Argus" and Van Buren ally Edwin Croswell] but Harry is nothing to him. I doubt if I can beat him myself. Lose him! a good joke that! Weitenkampf tentatively identifies the man at right as Amos Kendall, but the likeness differs considerably from that found in other caricatures of Kendall.”

(add discussion)

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External links

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In hmolscience, **Luigi Sertorio** (1933-), or Sertorius, is an Italian theoretical physicist and ecophysicist noted, in human thermodynamics, for his 1991 book *Thermodynamics of Complex Systems: an Introduction to Ecophysics*, in which he attempts to explain human systems thermodynamically in the context of ecosystem surroundings, using a type of statistical mechanics / thermal physics based ecological thermodynamics formulation; albeit mixing chemical thermodynamics discussion in sparsely. [1] In a few end chapters, Sertorio attempts to outline the thermodynamics of an inert house, Maxwell's demon, and to speculate on the thermodynamics of mental processes, in his end chapter "the intellectual house", albeit discussed very superficially.

Education

In the 1990s, Sertorio was a professor of theoretical physics and in the 2000s was a professor of ecophysics, both at the University of Turin, Italy; he also is a former researcher at Princeton University and Los Alamos National Laboratories. (Q)

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Further reading

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External links

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θΔics

In existographies, **Luis Alvarez** (1911-1988) (IQ:160|#533) was an American physicist noted for []

Overview

In 1968, Alvarez wone Nobel Prize in physics for "for his decisive contributions to elementary particle physics, in particular the discovery of a large number of resonance states, made possible through his development of the technique of using hydrogen bubble chamber and data analysis".

In 1980, Alvarez posited his now-famous "asteroid impact extinction theory", aka “Alvarez hypothesis” (Q), co-developed with his son geologist Walter Alvarez, according to which, based on measurements of iridium in a layer of the earth’s crust, the extinction of the dinosaurs 65-million years ago was caused by an asteroid strike (Q)

Other

Alvarez is noted among mislabeled geniuses and IQ tests for having gone on to become a genius despite having failed (Q)(Q) to qualify for Terman’s 1921 IQ study (Q), having had a tested IQ below 135.

Quotes | On

The following are quotes on Alvarez:

> “A more valid criticism — and this is crucial to understanding the flaw in Shockley's argument too — lies in what IQ did not measure in Terman's study. Most obviously, Terman missed the two Nobel Laureates. Neither Shockley nor **Luis Alvarez** had IQs above 135. Shockley was tested twice and missed both times. Whatever talent they had went unmeasured by Terman's questions. One hypothesis is that the tests do not measure mathematical prowess very well, but is that ability not a facet of what we mean by ‘intelligence’?”
>
> — Joel Shurkin (2006), *Broken Genius: the Rise and Fall of William Shockley, Creator of the Electronic Age* (pg. 230)

> “Two of the students Terman deemed to be insufficiently intelligent to participate in his study, **Luis Alvarez** and William Shockley, won the Nobel Prize in Physics. None of the Termites received a Nobel Prize or a Pulitzer Prize. Nor did any of the Termites become world-class musicians like Isaac Stem and Yehudi Menuhim — two other students rejected by Terman for insufficient IQ scores. ‘All in all’, writes David Shenk, the author of *The Genius in All of Us* (2010), Terman's epic studies in genius turned out to be studies in disappointment’.”
>
> — Randall Kiser (2017), *Soft Skills for the Effective Lawyer* (pg. 89)

References

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External links

- Luis Walter Alvarez – Wikipedia.

θΔics

In existographies, **Luis Balbino Arroyo Colon** (1990-) (IQE:180) (CR:), referred to as "Arroyo Colon" (Q), "Arroyo" (Q), or "Balbino" (Q), depending, is a Puerto Rican child prodigy turned physicist, economic thermodynamicist, lawyer, and political advisor, noted, in hmolscience, for his 2010 "A Thermal Model of the Economy", an age 20 penned MS thesis in physics, wherein he platforms of Roegen (1971), Mimkes (2008), and Samuelson (1970) to outline a social services model of value, which although error filled, does have interesting points of originality.

Coupled heat engines

Some of the more interesting points of Arroyo's thesis are as follows:

> "It is important to quickly survey the model we are proposing. At this stage, we simply have two heat reservoirs and two thermal cycles. One of the reservoirs is the hot (or supply) reservoir with a temperature Ts. The other (demand) reservoir is colder and has a temperature of Td. As we discuss further in the appendix, a heat engine is basically a way of using heat to do work. In our model that process represents the act of turning resources into products and services, or production. Then that work is multiplied by what we call the 'value multiplier', or V which we will also discuss. Then that work is used to run a reverse heat engine, or refrigerator. That represents the flow of money as it goes back to the supply in the form of consumption."
>
> — Luis Arroyo (2010), "A Thermal Model of the Economy" (pg. 20)

> "How will we define temperature? In physics, temperature tends to determine average energy per particle; high temperature results in higher energy per particle. In a similar vein, temperature would be a kind of energy density. This would point to temperature being a measure of the density of resources available to a reservoir, or group of particles which will do work through a heat engine. We can refer to a group of people as a reservoir, since people are or own resources. The higher the wealth of the people in the reservoir, the higher the average temperature will be."
>
> — Luis Arroyo (2010), "A Thermal Model of the Economy" (pg. 24)

(add discussion)

Overview | Thermal economics

In 2010, Arroyo completed his "A Thermal Model of the Economy", a MS thesis on an amalgamation of economic theory and theoretical physics, at the University of Puerto Rico, Mayaguez, the abstract of which is as follows: [1]

> "The motivation for this work came from an interest in economics (particularly since the 2008 economic downturn) and a desire to use the tools of physics in a field that has not been the subject of great exploration. We propose a model of economics in analogy to thermodynamics and introduce the concept of the 'value multiplier' as a fundamental addition to any such model. Firstly, we attempt to make analogies between some economic concepts and fundamental concepts of thermal physics. Then we introduce the value multiplier and justify its existence in our system; the value multiplier allows us to account for some intangible, psychological elements of the value of goods and services. We finally bring all the elements together in a qualitative system. In particular, we attempt to make an analogy with the 'Keynesian multiplier' that justifies the usefulness of fiscal stimulus in severe economic downturns."

Arroyo's thesis was approved by the following committee:

- Jose I. Alameda Lozada | PhD economics (1996) (pdf) (O)
- Erick A Roura Davila | PhD theoretical physics / Computational / Quantum physics [7]
- Pablo J. Marrero Soto | PhD theoretical physics / Computational / Fine materials [7]
- Anand D. Sharma | PhD agricultural engineering (1980) (O)
- Hector J. Jimenez Gonzalez (Chair) | PhD solid state physics / magneto-optics (1992) [7]

In interview with the newspaper El Nuevodia, Arroyo, aged 20, commented the following on his thesis: "The issue (of the thesis) is a relationship between economics and physics applied to the current economic crisis. It is a bit complex and has taken me time to develop, but I graduate." [3]

Difficulties: Human nature | Two natures?

Arroyo seems to believe that human nature is different from physical nature; the following evidences this:

> "Physics is a natural science, and it is both the most mathematical and the most exact. Economics, however successful, is at heart a social science. Human behavior is ill-suited to exactness and mathematical certainty by its very nature (see: human nature)."
>
> — Luis Arroyo (2010), "A Thermal Model of the Economy" (pg. 7)

This statement seems to be in code for his Jehovah's Witness religious beliefs (O), which includes belief in free will (O), among other numerous issues.

Difficulties: Roegen

The first main citation for Arroyo's theory is Nicholas Georgescu-Roegen (1971), whose economic model forms the platform for his theory; Roegen's "material entropy" model, however, is a conceptual misinterpretation of bound energy and free energy of chemical thermodynamics applied to economic resources; Roegen's model, in short, is fallacious and without basis. Arroyo, in fact, not only sites a defunct model, but does not even understand the so-called "Roegen model" correctly, but only generally (i.e. factory = heat engine); this is evidenced by the following (pg. 9) statement:

> "This correlation of turning resources into products and entropy reduction is the heart of the [Roegen] model. This allows us to clarify the relationship between the economic point of view and the physical perspective in the model proposed there. Economically, a factory exists to produce higher value material than what came in. Physically, it is impossible to create energy, but we can decrease the entropy of part of the material. Therefore, Georgescu makes the connection between value and entropy. The lower the entropy, the higher the value."

Arroyo, firstly, seems to think that Roegen modeled the output of a factory, e.g. a child's toy or transistor, as a "low entropy" type of matter, which is not the case. Roegen conceived the fossil fuel, which powers the factory, as being "bound energy" (i.e. low entropy matter, in his mind) and the factory waste (e.g. burnt exhaust fumes) as being "free energy", e.g. coal or oil burned to power a factory and converted into disordered energy of fumes, or something along these lines. This entire model, however, is not how free energy (Gibbs energy) and bound energy (entropy) are defined by chemical thermodynamics. The root of the error, of course, being that Roegen was a mathematician who learned most of his thermodynamics out of a dictionary.

Arroyo, secondly, from Roegen, gleans a connection between entropy and value: something along the lines of:

$$\text{Value} = f(\text{low entropy})$$

This, however, is incorrect. If Arroyo had studied the historical usage of human thermodynamic variables tables, he would have known that John Neumann (1934), in discussion of French physicist-economist Georges Guillaume's 1932 PhD dissertation (turned book) *On the Fundamentals of the Economy with Rational Forecasting Techniques*, wherein thermodynamics models are utilized, had equated free energy to cash value, and that Australian organic chemist and commerce theorist James Reiss (1994), in his chapter "Comparative Thermodynamics in Chemistry and Economics", building on the previous work of Bela Lukacs (1989), more recently and precisely defined value as a function of Gibbs energy follows:

raw materials		=	chemicals
value	(ΔV)	=	Gibbs free energy (ΔG)
work (labour, energy)	(ΔW)	=	enthalpy (ΔH)
negentropy (order)	(ΔN)	=	entropy (ΔS)
temperature (a constant)		=	temperature (T)
process energy barrier	(E_p)	=	activation energy (E_a)
factory		=	concentration [A]
concentration of industry		=	coupled reactions, cells
technology		=	catalysis
money		=	storable energy (e.g., gasoline)

(add discussion)

Factory | Heat engine vs Retort

In comparing the Reiss model to the Arroyo model we see the "factory" not modeled as heat engine, but equated to "concentration", which seems to be more along the lines of the William Fairburn (1914) model of the factory as a continuous stirred tank reactor (CSTR model) where the foreman is the "human chemist", according to which entropy or human entropy is defined, by Fairburn, as follows: [11]

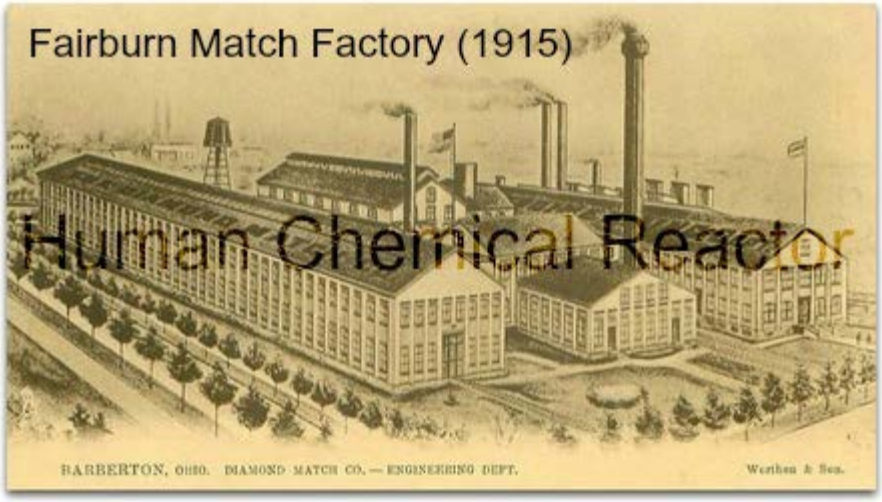

In 1915, American chemical engineer William Fairburn was the head of the Diamond Match Factory and as executive penned his human chemical theory stylized *Human Chemistry*, according to which the "factory" was conceptualized as a giant retort or continuous stirred tank reactor (CSTR), in modern chemical engineering terms, which produced matches via the controlled reactions of its factory workers, conceived as human chemicals, the foreman conceived as the master "human chemist" according to Fairburn. [11]

> "As each chemical element is an entity, differing and distinct from any other, so is each human element and entity and a personality, which, when guided by a human chemist to do work and perform his peculiar function in life, feels and acquires what no inert substance can ever acquire, namely moral stimulus of responsibility. A classification based on a [human element's] relative electricity or relative energy or enthusiasm would not of itself help us much, for misapplied energy and wasteful application of human forces are common. The **classification of entropy**, referring to temperature changes which can be likened to coolness, passion, explosiveness and frigidity, are all interesting but of themselves prove little."

In any event, Arroyo, platforming off Roegen's model, jumps to the following human-human interaction model (pg.11) of entropy:

> "In our times, the service sector has become the true center of growth for the world economy. As its very name points out, services do not produce physical goods that have entropy. Services performed reduce entropy on other bodies, and they have an energy cost, much like the production of physical goods. However, to quantify that entropy reduction in services is much more difficult than the more purely physical entropy reduction on the inputs of a production process. When a factory produces goods, it is (in theory, ignoring the obvious complications) straightforward to do a strict accounting of the energy that came in, and the energy that came out. However, when a service is performed on a human being, the question of calculating the entropy change in the human is an imponderable."

This last point about calculating the entropy change in a human or of a human in a given state or during a given interaction, is not "imponderable", but only is an engineering problem; the subject of calculating entropies, enthalpies, and or free energies of humans being an historical subject of its own, dating at least to the Bridgman paradox (1946) if not before.

Mimkes | Samuelson

Arroyo, after his Roegen platform, then cites Jurgen Mimkes (2008) and Paul Samuelson (1970), digging into the general premise of being to formulate "equilibrium" in an economy via differential inflection points. [9]

Arroyo then jumps into the box spring model for forces and equilibrium of springs. Here Arroyo would have been keen to study the earlier box spring model of equilibrium outlined by Lawrence Henderson, in terms of free energy, as this is the more accurate model of value, as pointed out by Neumann (1934) and Reiss (1994), as discussed above. In 1938 to 1942, Henderson, in his "Sociology 23" lectures was citing Vilfredo Pareto's version of equilibrium and expanding on this definition, as applied to equilibrium in social systems, as follows: [12]

American physiologist Lawrence Henderson's 1938 "box spring model" of the Pareto-Gibbs sociological extrapolation of the **Le Chatelier principle** (see: social Le Chatelier principle) of equilibrium restoration of the system after small modification to the system, which he defines as an equilibrium of forces. [12]

> (1) A ball which is in a cup, and struck a blow that is not too hard, will return to its original position;
> (2) A candle flame which is deflected by a draft that is not too strong will resume its original form;
> (3) A trout brook that is 'fished out' will, if carefully protected, regain its former population of fish;
> (4) An infant, according to Hippocrates, after a disease that is not too sever will gain in weight until that weight is reached which is approximately what would have been reached if there had been no sickness.

Henderson elaborates that these are examples of "stable equilibrium" but comments that there are other phenomena that resemble: unstable equilibrium, neutral equilibrium. He then comments that both the Pareto and Hippocratic models of equilibrium restoration are like of a box spring mattress after being sat on in that the underlying theory of equilibrium is an equilibrium of forces and force restoration: [12]

> "In both cases—Hippocratic analysis and Pareto's equilibrium—there is the underlying theory that equilibrium, for instance, in a box spring; that a small modification leaves the forces substantially intact; and that the forces tend to reestablish the state that would have existed if no modification had occurred, just as a **box spring** which has been depressed when someone lies down on it resumes its original form when one gets up."

Henderson, as example of this, then cites the Feb 1937 Louisville flood, the earthquake and fire in San Francisco, and the devastation of the war of 1914 to 1918 in France. It is doubtful, to note, that WII, as Henderson seems to see things, was an example of stable equilibrium restoration, rather it would have been something as follows:

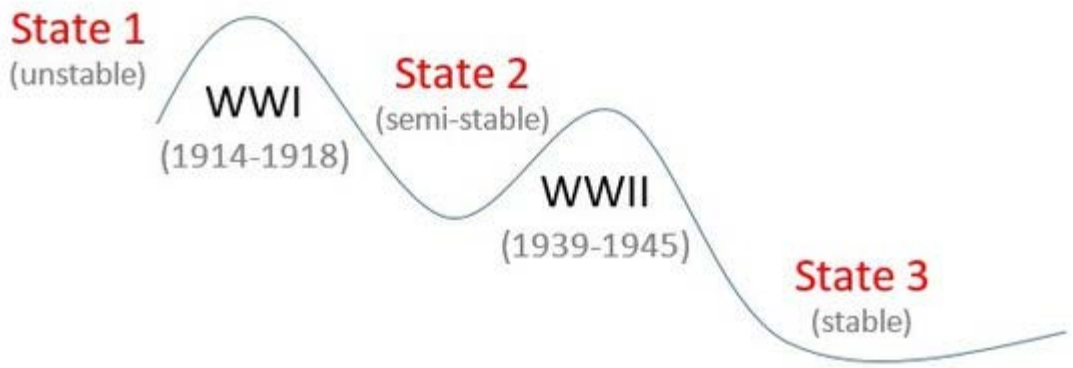

(add discussion)

Difficulties: Lucas

Arroyo also cites Robert Lucas; Lucas, however, has been lambasted by Noah Smith (Q) as someone whose economic equations fail to make predictions as to where an economy is headed in the same manner as physics' equations of motion can predict where a cannon ball will land.

Difficulties: Other

Other difficulties in Arroyo's thesis are his opening ontic opening discussion of the Heisenberg uncertainty principle along with information (possibly information theory) discussions of entropy.

IQ 200 | Prodigies

Arroyo, cited with an IQ of 200 at age 15 (Q), interestingly, can similarly be grouped with two other IQ:200+ cited child prodigies, namely: William Sidis (1898-1944), IQ:250-300 cited, and Christopher Hirata (1982), IQ:225 cited, who each, with similar background in math and physics, applied thermodynamics to the deeper questions as teenagers, Sidis at age 16 and Hirata at age 18.

Education

Arroyo stated that he cannot remember whether he learned to read at two or three years, but what he does remember is how he was "bored" in class when their teachers in elementary school tried to teach colors and letters: [6]

> "Yes, I was bored in kindergarten ... I was bored because I knew almost everything they said. I had many problems with the teachers because I knew what they were saying and got up a lot. It was frustrating, it bothered me, but nothing; I kept going to school because I liked being with the kids my age and playing."

Arroyo recalls, in kindergarten, how he had unpleasant experiences owing to the lack of intelligence and insecurities of his teachers, e.g. one time when he asked what a "diphthong" (Q) was, he was scolded by his teachers for asking such

questions: [6]

> "I remember in kindergarten, I asked a teacher what were the diphthongs, because the index of the book said some diphthongs and Iit sounded weird. I asked what it was and they scolded me, told me I did not have to ask that, that was for later. Sometimes they threw me the room that was moving a lot."

Arroyo, as a child, envisioned that he wanted to study physics and law. Sometime thereafter he began to be cited in newspapers as the "boy genius of Moca". [3] In 1999, Arroyo, age 9, in third grade, was being referred to as a as a "child genius", by those who competed with him in mathematics and calculus. [4]

In 2001, Arroyo, age 11, completed high school (4.00 GPA), and then set a record for youngest person to enter the University of Puerto Rico; the following is a retrospect news clipping: [3]

Left: Arroyo, age 11, during first day of college, at the University of Puerto Rico, being greeted by teacher Pablo Rodriguez, the interim rector at the time. Right: **Arroyo**, age 16, at college graduation, BS in physics (4.00 GPA), shown holding the three awards he received, namely: the Luis Stefani Rafucci Prize, the highest academic award given for acts of conferring of degrees from the college, the prize of the Faculty of Arts and Sciences bestowed students greater academic index, and the Enrico Fermi Award as best student of the physics department. [2]

> "The 11-year-old surprised everyone by graduating from high school with a high honor and become the youngest person to enter a university in Puerto Rico person. With an IQ that surpassed scales designed to measure the intelligence of children, child Moca spent his time studying the quantum theory and the movements of the stock market, while other children their age probably preferred to play wrestling."

Shown adjacent, is a photo of age 11 Arroyo during first day of college in 2001 being greeted by teacher Pablo Rodriguez, the interim rector at the time. [2] In 2005, Arroyo, age 15, was being cited, by PRGifted.com, as having an IQ of 200. [6]

In 2006, Arroyo, age 16, completed his BS in physics, at the University of Puerto Rico, Mayaguez, with a 4.00 GPA, winning a number of awards, which he holds in the adjacent photo, including: the Luis Stefani Rafucci Prize, the highest academic award given for acts of conferring of degrees from the college, the prize of the Faculty of Arts and Sciences bestowed students greater academic index, and the Enrico Fermi Award as best student of the physics department. [2]

In 2010, Arroyo, completed his MS in physics + economics, with a thesis on "A Thermal Model of the Economy" and was being blogged about, by his former classmates, as a genius. [4]

In 2012, Arroyo, age 22, obtained his JD from the Eugenio María

de Hostos School of Law and passed the bar exam. In 2013, Arroyo, went to work for Senator Angel Rosa, one of his former professors from college, who approached Arroyo for help with drafting a bill aimed at job creation. It took the name “Proposal for jobs and prosperity for Puerto Rico”. Arroyo, stated that he envisioned physics applied to politics, while working on his thesis; Arroyo commented the following on his in interview: [5]

> “Many models of the economy emerge from physics. I think my knowledge in the economy may be useful to help develop ideas to bring benefits to Puerto Rico. Especially ideas that do not cost.”

Presently, he is legislative director at Senator Angel Rosa’s Office.

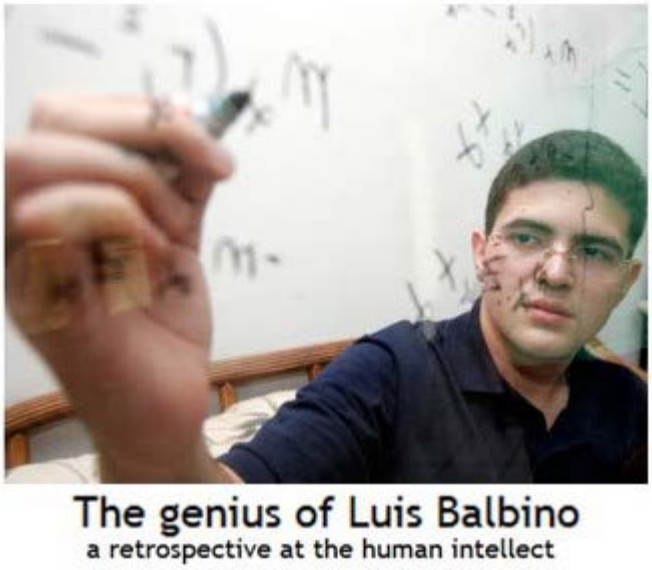

A photo of Arroyo from a 2010 blog by one the students he competed with in calculus in elementary school. [4]

Religion | Science

In 2005, Arroyo, age 15, during an interview with Mabel Figueroa of PRGifted.com, stated that he was raised as a Jehovah’s Witness, and when questioned about the collide of faith and science, stated that he was “conservative” in his religious beliefs and that faith was “very important” for him; the following is the interview dialogue on this:

> **Arroyo**: I am conservative in my religious beliefs
>
> Figueroa: How Important is the faith to you?
>
> **Arroyo**: It's very important.
>
> Figueroa: But how faith can be understood by the head of a scientist? ... It's not something you can try.
>
> **Arroyo**: I Do not think that religion and science are uneven ...
>
> Figueroa: But there are scientists who do not think so ...
>
> **Arroyo**: I think that what the Bible says can be taken as reality.
>
> Figueroa: But by faith, not as something tangible ...
>
> **Arroyo**: Well, I think that some things can be checked in a tangible way in the Bible.
>
> Figueroa: Like what?
>
> **Arroyo**: For example, in the Bible god he tells Job that he was dwelling above the circle of the earth. The Bible says that the earth was spherical and not a square. There is talk of some mathematical discoveries, such as the ratio of the circumference of a circle and its radius. There are physical things you can demonstrate ... Although the Bible is not a book of science, scientific things in the Bible can be checked.

Interesting here to see the collision of physics and faith, at such a young age, by someone who attributes his accelerated intellect to "an ability to learn some

things faster". Arroyo would be keen to watch the "Zerotheism for Kids" (2015) lecture series, to see how religio-mythology studies and chemical thermodynamics cleanses false religious beliefs.

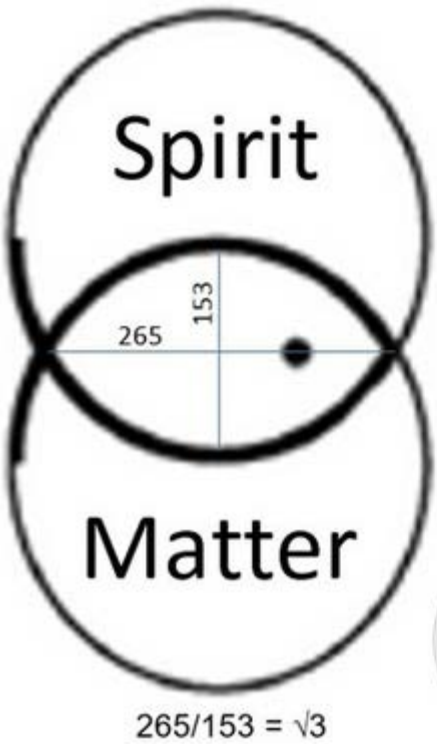

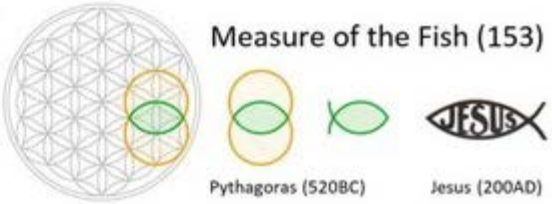

An example of mathematics in the Bible: the 200AD parable of miracle of Jesus catching 153 fish with a large net (Q), in waters where no fish resided, and feeding the hungry, originating in the story of the 510BC miracle of Pythagoras regarding 153 as a sacred number and catching that number of fish; the ratio 265/153, being the height-to-width ratio of the intersection of two circles (called by Archimedes in 250BC the "measure of the fish"), being the nearest whole number approximation to the square root of three, the controlling ratio of the equilateral triangle, supposedly utilized in the design of the pyramids. [8]

There is, to note, some truth to what Arroyo says here about mathematics in the Bible. The so-called "measure of the fish" is a mathematical formulation, supposedly attributed to Pythagoras (and or Archimedes, according to some accounts), who, in 520BC, according to the aretalogy, written by Porphyry, is reputed to have performed the supernatural feat of helping his disciples catch a large number of fish, 153 to be precise. Further, the Pythagoreans regarded 153 as a sacred number due to its use in a mathematical ratio called "the measure of the fish" (Q), which produces the mystical symbol of the *vesica pisces*, the intersection of two circles which yields a fish-like shape. This was re-written, by someone, to the rescript that Jesus miraculously helped his disciples catch a large number of fish, precisely 153, at the Sea of Galilee (John 21:11). (Q) Another book explains how the number has to do with the size of the net, squaring the circle, and the design of the pyramids.

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11. Fairburn, William Armstrong. (1914). *Human Chemistry*. The Nation Valley Press.
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External links

- Luis Balbino Arroyo – LinkedIn.
- Luis Balbino Arroyo – Wikipedia.
- Luis Balbino Arroyo – Twitter.

θΔics

In hmolscience, **Luis Fernandez-Galiano** (1950-) is an Italian architect noted, in architectural thermodynamics, noted for his 1982 *Fire and Memory*, wherein he argues that thermodynamics needs to be incorporated into architectural theory.

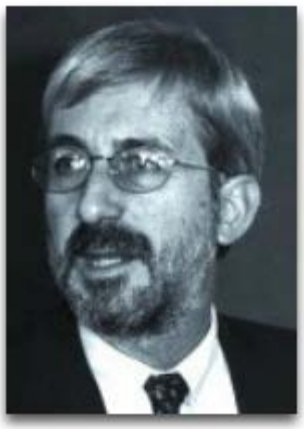

Overview

In 1982, Fernandez-Galiano, in his *Fire and Memory: On Architecture and Energy*, builded on the theories of Spanish ecologist Ramon Margalef, e.g. exosomatic energy, among others, to argue that the concept of energy, in the sense of its spatial-feel effects, etc., and entropy, have been absent from architectural theory; theorizing on concepts such as the internal energy and external energy of architecture, based on the laws of thermodynamics. [1] According to a back-cover review of *Fire and Memory*, by Richard Ingersoll of *Design Book Review*, Fernandez-Galiano professes the view that:

> "Architecture as the most consistent consumer of energy is treated as both a symbol of humanity's struggle with nature and the practical object of the daily processes of entropy."

The down point of Fernandez-Galiano's presentation, as is the case often in such cross-over fields, is the presentation of the history of physics and thermodynamics is sophomoric, depending on secondary, contentious, references, such as Jeremy Rifkin and Nicholas Georgescu-Roegen; giving only marginal references to the more rigorous ideas of those as Ilya Prigogine.

Life

Fernandez-Galiano's view of life is that firstly it requires the degradation of energy. Secondly, as a thermodynamic structure that lies outside the world's equilibrium, its continuity depends on a constant flow of entropy. Third, that life feeds not on energy but on negentropy. [2]

Education

Fernandez-Galiano professor of architecture at the University of Madrid.

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(b) Fernández-Galiano, Luis. (1991). *El Fuego y la Memoria: Sobre Arquitectura y Energía*. Alianza.
2. ibid (2000), ch. 1, note 2 (pg. 262).
(c) Preface [Quote]: "With the exception of the last chapter, which came a year later, I wrote this book during the summer of 1982. For the final Spanish publication in 1991 I added half a dozen notes, as well as the illustration captions, but the original text remains unaltered. The English edition has omitted one of the eight chapters of the Spanish version and one third of the images, hoping to make the book leaner and better balanced."

External links

- Luis Fernández-Galiano – Holcim Awards (for sustainable construction), July 2008, Europe.
- Luis Fernández-Galiano (overview) - Archizom.epfl.ch.

θΔics

In hmolscience, **Luther Bernard** (1881-1951) was an American sociologist noted for his 1911 critique of extreme positivism, of the Leon Winiarski kind.

Overview

In 1911, Bernard, in his "Theories of the End of Activity" section, to his PhD dissertation *The Transition to an Objective Standard of Social Control*, gives a critical history of positivism, from Thomas Hobbes, Rousseau, Lester Ward, Leon Winiarski, Albion Small, among others.

In 1932, Bernard was president (Ñº) of the American Sociological Association; thereby following in the footsteps of those including: Howard W. Odum (1930), Charles Cooley (1918), Albion Small (1912-13), William Sumner (1908-09), and Lester Ward (1906-07).

Quotes

The following are example quotes:

> "**Winiarski** has gone to the metaphysically ridiculous in attempting to establish an identity between biologic energy and feeling consciousness, thus reducing 'egoism' and 'altruism' to actual social forces, akin to the physical forces, which will enable us to formulate an exact science of sociology."
>
> — Luther Bernard (1911), "Theories of End of Activity" [1]

References

1. Bernard, Luther. (1911). *The Transition to an Objective Standard of Social Control* (§4: Theories of the End of Activity, pgs. 44-64; §5: Theories of the End of Activity: Criticism, pgs. 65-77; Winiarski, pgs. 59-60). PhD dissertation, Department of Sociology, University of Chicago Press.

External links

â— Luther Lee Bernard (German → English) – Wikipedia.

θΔics

In existographies, **Luther Burbank** (1849-1926) (FA:153) was an American agricultural scientist noted for []

Overview

In Jan 1926, in the wake of the Scopes Monkey Trial (1925), Burbank, a previous closet disbeliever, like most scientists, went public with his disbelief, while being interviewed by a young newspaper reporter, stating that he was an "infidel", that religious dogmas are nonsense, and that religious concepts such as hell are "superstition gone to seed"; the following are excerpts:

> "As a scientist, I cannot help feeling that all religions are a tottering foundation. I am an infidel today. I do not believe that what has been served to me to believe. I am a doubter, a questioner, a skeptic. When it can be proved to me that there is immorality, that there is resurrection beyond the gates of death, then will I believe. Until then, no."
>
> — Luther Burbank (1926), *San Francisco Bulletin* (pg. 1), Jan 22

This disclosure of public atheism, so to say, was telegraphed around the world, after which letters began pouring into his residence, many of which were death threats. The next week he spoke to a local church:

> "The idea that a good god would send people to a burning hell is utterly damnable to me—the ravings of insanity, superstition gone to seed! I don't want to have any thing to do with such a god."
>
> — Luther Burbank (1926), "Address to First Congregational Church", San Francisco, Jan 31

> "Euripides long ago said, 'who dares not speak his free thought is a slave'. I nominate myself as an 'infidel' as a challenge to thought for those who are asleep."
>
> — Luther Burbank (1926), "Address to First Congregational Church", San Francisco, Jan 31

On 11 Apr 1926, Burbank dereacted (died); his eulogy (see: atheist eulogy) was given by fellow freethinker Ben Lindsey (Ñº) , a Denver judge, whom Burbank had previously asked to perform this duty, which was said to a throng of ten-thousand mourners: [2]

> "It is impossible to estimate the wealth he has created. It has been generously given to the world. Unlike inventors, in other fields, no patent rights were given him, nor did he seek a monopoly in what he created. Had that been the case, Luther Burbank would have been perhaps the world's richest man. But the world is richer because of him. In this he found joy that no amount of money could give.
>
> And so we meet him here today, not in death, **but in the only immortal** life we positively know--his good deeds, his kindly, simple, life of **constructive work** and loving service to the whole wide world.
>
> **These things cannot die**. They are cumulative, and the work he has done shall be as nothing to its continuation in the only immortality this brave, unselfish man ever sought, or asked to know.
>
> As great as were his contributions to the material wealth of this planet, the ages yet to come, that shall better understand him, will give first place in judging the importance of his work to what he has done for the betterment of human plants and the strength they shall gain, through his courage, to conquer the tares,

the thistles and the weeds. Then no more shall we have a mythical god that smells of brimstone and fire; that confuses hate with love; a god that binds up the minds of little children, as other heathens bind up their feet—little children equally helpless to defend their precious right to think and choose and not be chained from the dawn of childhood to the dogmas of the dead.

Luther Burbank will rank with the great leaders who have driven heathenish gods back into darkness, forever from this earth.

In the orthodox threat of eternal punishment for sin--which he knew was often synonymous with yielding up all liberty and freedom--and in its promise of an immortality, often held out for the sacrifice of all that was dear to life, the right to think, the right to one's mind, the right to choose, he saw nothing but cowardice. He shrank from such ways of thought as a flower from the icy blasts of death. As shown by his work in life, contributing billions of wealth to humanity, with no more return than the maintenance of his own breadline, he was too humble, too unselfish, to be cajoled with dogmatic promises of rewards as a sort of heavenly bribe for righteous conduct here. He knew that the man who fearlessly stands for the right, regardless of the threat of punishment or the promise of reward, was the real man.

Rather was he willing to accept eternal sleep, in returning to the elements from whence he came, for in his lexicon change was life. Here he was content to mingle as a part of the whole, as the raindrop from the sea performs its sacred service in watering the land to which it is assigned, that two blades may grow instead of one, and then, its mission ended, goes back to the ocean from whence it came. With such service, with such a life as gardener to the lilies of the field, in his return to the bosoms of infinity, he has not lost himself. There he has found himself, is a part of the cosmic sea of eternal force, eternal energy. And thus, he lived and always will live.

Thomas Edison, who believes very much as Burbank, once discussed with me immortality. He pointed to the electric light, his invention, saying: 'There lives Tom Edison.' So Luther Burbank lives. He lives forever in the myriad fields of strengthened grain, in the new forms of fruits and flowers, plants, vines, and trees, and above all, the newly watered gardens of the human mind, from whence shall spring human freedom that shall drive out false and brutal gods. The gods are toppling from their thrones. They go before the laughter and the joy of the new childhood of the race, unshackled and unafraid"

(add)

Quotes | By

The following are quotes by Burbank:

"Mr. Bryan was an honored friend of mine, yet this need not prevent the observation that the skull with which nature endowed him visibly approached the Neanderthal type. Those who would legislate against the teaching of evolution should also legislate against gravity, electricity and the unreasonable velocity of light, and also should introduce a clause to prevent the use of the telescope, the microscope and the spectroscope, or any other instrument of precision which may in the future be invented, constructed or used for the discovery of truth."

— Luther Burbank (1926), *Publication*; in: *Science and Civilization* [1]

"The word 'religion' has acquired a very bad name among those who really love truth, justice, charity. It also exhales the musty odor of sanctimony and falsehood."

— Luther Burbank (1926), "Summary of Beliefs" [3]

“Scientists gladly accept any new truth which can be demonstrated by experiment, that is, proved by the very law of the cosmos. Not so with any new conceptions of religion; these are fought by the use of persecution and venom. Many of the cur-rent religious beliefs literally carried into practice would stampede humanity into the old jungle ideas and habits.”

— Luther Burbank (1926), “Summary of Beliefs” [3]

“The integrity of one's own mind is of infinitely more value than adherence to any creed or system. We must choose between a dead faith belonging to the past and a living, growing, ever-advancing science belonging to the future.”

— Luther Burbank (1926), “Summary of Beliefs” [3]

“Those who take refuge behind theological barbed wire fences, quite often whish they could have more freedom of thought, but fear the change to the great ocean of scientific truth as they would a cold bath plunge.”

— Luther Burbank (1926), *Why I Am Infidel* [2]

“Do not feed children on maudlin sentimentalism or dogmatic religion; give them nature.”

— Luther Burbank (1926) [2]

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External links

â— Luther Burbank – Wikipedia.

θΔics

In existographies, **Lycurgus** (c.840-780BC) (IQ:170|#404) (Cattell 1000:437) (Washington 23|#) was Greek quasi-legendary lawgiver, crediting establishing or promoted the three Spartan virtues: equality (among citizens), military fitness, and austerity.

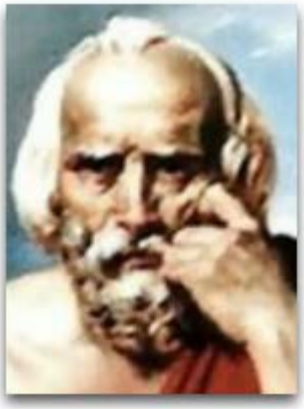

Influence

Lycurgus is cited by those including: Herodotus, Xenophon, Plato, Polybius, Plutarch, Epictetus, Julien la Mettrie, and Baron d'Holbach.

Quotes | On

The following are quotes on Lycurgus:

> "Whenever we begin an enterprise or take possession of a charge, or experience a calamity, we place before our eyes the examples of the greatest men of our own or of bygone ages, and we ask ourselves how Plato, or Epaminondas, or **Lycurgus**, or Agesilaus, would have acted. Looking into these personages, as into a faithful mirror, we can remedy our defects in word or deed."
>
> — Plutarch (c.100AD), "Helps to Virtue" (Ñº)

> "**Lycurgus** had weak and unhealthy children drowned and was proud of his wisdom. Look at Plutarch's account of his life, and you will see at Sparta they knew neither modesty, nor robbery, nor adultery, etc."
>
> — Julien la Mettrie (1751), "Anti-Seneca" (pg. 136)

> "Convinced of the necessary connexon of things, he will not be surprised to see that the supineness of their chiefs carries discouragement into their country; or that the influence of their governors stirs up bloody wars by which it is depopulated; causes useless expenditures that impoverish it; and that all these excesses united is the reason why so many nations contain only men wanting happiness, who are devoid of morals, destitute of virtue. In all this, he will contemplate nothing more than the necessary **action and reaction of physics upon morals**, of morals upon physics. In short, all who acknowledge fatality, will remain persuaded that a nation badly governed is a soil very abundant in poisonous, plants; that these have such a plentiful growth as to crowd each other and choke themselves. It is in a country cultivated by the hands of a **Lycurgus**, that he will witness the production of intrepid citizens, of noble-minded individuals, of disinterested men, who are strangers to irregular pleasures. In a country cultivated by a Tiberius, he will find nothing but villains, with depraved hearts, men with mean contemptible souls, despicable informers, and execrable traitors."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 112) [1]

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θΔics

In human chemistry, **Lydia D. Goehr** (c.1965-) is an English-born American philosopher noted for 2003 conference presentation on Goethe's concept of elective affinities.

Overview

In 2003, Goehr penned a conference presentation in honor of Adorno's birth at Johann Wolfgang Goethe Univeristy, Frankfurt, with the conceit of rewriting the famous chapter four of Geothe's 1808 novella *Elective Affinities* in which Eduard and the Captain explain the scientific concept of "elective affinities" (Wahlverwandtschaft) to Charlotte.

In 2008, Goehr used her conference presentation as chapter one of her book *Elective Affinities: Musical Essays on the History of Aesthetic Theory*, themed in part on German polymath Johann Goethe's 1809 novella *Elective Affinities*. The following is an opening section excerpt: [1]

> "Wahlverwandtschaft – the natural affinity with which different elements adhere to but also repel one another, as if each were choosing its own particular arrangement. Eduard speaks of chemistry and physics; the Captain, too, of how cohesiveness can be seen in liquids with their tendency to form into round shapes-falling drops of water or little balls of quicksilver or molten lead. At the same time, they all hear descriptions of human relations. Elements and persons: each compelled to spring into activity to form novel and unexpected constellations, a lively movement that disturbs each along the way and of which the ending can't be predicted in advance."

The difficulty in this statement by Goehr, as Goethe well knew, being a student of French chemist Jacob Spielmann, a protege of affinity table pioneer French chemist Eteinne Geoffroy, is that chemical reactions, movements, and constellations, can be predicted, as is done currently via free energy calculations, and that arguably this theme was incorporated into Goethe's novella.

The overall theme of the book is a juxtaposition and study of the social philosophies of music, art, history, and aesthetics of, primarily, philosophers German Theodor Adorno and American Arthur Danto. The cover of the book is Belgian surrealist artist René Magritte's 1933 painting *Elective Affinities*, albeit meant to be themed on the naturalizing work of John Cage and his vision of the bird cage from which he sought to liberate the human mind.

The book, however, uses Goethe's theory only marginally as a metaphorical theme, discussing it only in the first two pages of the first chapter entitled "Doppelbewegung (double movement)" referring to two sorts of movement brought into special affinity.

Education

Goehr is a professor of philosophy at Columbia University, where she teaches courses on the history of aesthetic theory, art philosophy, critical theory, and philosophy of history. [2]

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External links

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â— Goehr, Lydia – WorldCat Identities.

θΔics

In thermodynamics, **Lynde Phelps Wheeler** (1874-1959) was an American physicist and electronics engineer noted for his 1951 biography on American engineer Willard Gibbs, *Josiah Willard Gibbs: the History of a Great Mind*, the first American PhD engineer and main founder of chemical thermodynamics. [1] Wheeler, prior to this, assumed the task of the first compilation of Gibbs' 1863 PhD thesis "On the Form of the Teeth of Wheels in Spur Gearing", along other accounts of Gibbs' mechanical invention, such as the Gibbs governor, and his gifts, e.g. Maxwell's thermodynamic surface (1875). [2]

Education

Wheeler entered Yale in 1891 completing his BS in 1894 and PhD in 1902 both at the Yale Sheffield Scientific School, the home of the Gibbsian school of thermodynamics. Wheeler remained at Yale as a professor of physics until 1926. [3] Wheeler was a noted member of the Institute of Electrical and Electronics Engineers (IEEE).

References

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θΔics

In hmolscience, **Lyndon LaRouche** (1922-) is an American charlatan, seeming political economist, and cult leader (Q) whose name pops up here and there being that he and many of his followers attempt to blend in scientific concepts, in a distorted way, into their arguments, in support of whatever agenda; one example being his theory of "physical economy", a type of economic system based on the physical chemistry biospheric concepts of Russian scientist Vladimir Vernadsky, in which the economic system is seen as connective noosphere of minds. [1]

LaRouche, in simple terms, and or anybody connected with his work, is kind of like a Kent Hovind of economics, intermixed with a tinge of L. Ron Hubbard.

Boltzmann-Wiener controversy

LaRouche, supposedly, studied, i.e. read some of the Leibnitz-Clarke correspondence (Q) surrounding, the the Leibniz-Newton controversy as a teenager, in which he read that Gottfried Leibniz had pointed out errors in Isaac Newton's work, and sometime thereafter came across what he seems to have deemed the Boltzmann-Wiener controversy, i.e. Ludwig Boltzmann's view of entropy of statistical systems of particles as compared to Norbert Wiener's negentropy view of "living systems", such as social systems or economic systems, as LaRouche seems to have taken it. LaRouche, in his 1988 autobiography, put it like this: (Q)

> "My understanding of this error of Wiener's is the key to my original discoveries in economic science, and is therefore the key to everything which has made me an influential international figure today."

(add discussion)

Overview

The epitome of LaRouche type of mindset is captured well by Jonathan Tennenbaum in 1993 attempting to disprove or "refute" as he says the first law and second law, of thermodynamics, as fake laws. (Q)

The following 2009 quote by LaRouche, seems to capture his general view of the second law of thermodynamics (a view adopted by many of his followers): [9]

> "The presumption concocted by such hoaxsters as Rudolf Clausius, Hermann Grassmann, Lord Kelvin, et al., which is known as the claimed principle of reductionist thermodynamics, the so-called principle of entropy (or, 'second law' of thermodynamics), was an ontological fraud from its inception. Clausius and Grassmann claimed to have derived their argument from the work of Lazare Carnot's nephew, Sadi Carnot; but, that report by Grassmann, et al., as defended, gratuitously and maliciously, by the editor of Riemann's own collected works, was also fraudulent methodologically, as that is demonstrated in a study, following the work of Ampere, which was prompted by Carl Gauss, and conducted through proof-of-principle experiments in electrodynamics which were conducted at Göttingen University under the direction of Wilhelm Weber, that with the relevant cooperation of Lejeune Dirichlet, Riemann, and Kohlrausch. The universe is, in fact, anti-entropic, as this is illustrated dramatically by the achievements of Academician V.I. Vernadsky for physical biochemistry."

Curiously, this entire spiel, which is mostly incorrect (e.g. Grassmann had nothing to do with the second law) is repeated almost verbatim by American mathematician Bruce Director, who says in a video lecture (below), among other things, that: "we know based on our knowledge of science and what Lyndon has discovered about the science of physical economy that the universe does not conform to what Clausius says". Director also says that "Clausius was not precise and that he was crazy". LaRouche, supposedly, has given the fullest version of his Vernadsky-based economics in his 2001 book *The Economics of the Noosphere*, with contents such as the gravity of economic intentions, and the

fundamental distinction between living and nonliving bodies, among others. [10]

Negentropy

LaRouche seems to have first started writing about negative entropy in the context of economics in the 1970s. To cite one view, according to the 2003 views German-born Canadian author Rolf Witzsche: [2]

> "LaRouche has pioneered the investigation of the [negentropy] principle in relationship the economies of nations, and to life in general."

LaRouche seems to have been influenced, in his theories on economic "negentropic" processes, by work of American mathematician Norbert Wiener. [3]

Followers

LaRouche seems to have a large following, embodied in the LaRouche Political Action Committee (LPAC), who all use LaRouche's interpretation of the second law and of entropy as what seems to be a platform to argue their political agenda. Some of LaRouche school include: Americans mathematician Bruce Director, economist Michael Kirsch, and Benjamin Deniston, who presents an overview of the anti-entropic development of life arguing that always moving to higher levels of energy-flux-density. [4]

Physical economics

The central argument or basis of their "physical economy" model is that acts of creativity resulting in new technology should be the basis of a type of economic unit of value, measured someway in terms of an increase in "energy-flux density" per region of the economy. The following is an example quote: [8]

> "Whenever we introduce the use of those technologies by mankind, the which are of a higher net energy-flux density per capita and per square kilometer, even if the product of that effort is delivered to some place outside our planet Earth, the included effect is to raise the level of productivity, and available standard of living (negentropically), of the population for the present and future inhabitants of Earth itself."

In commentary on continuing the lithosphere-biosphere-noosphere work of Vernadsky, LaRouche states that: [8]

> "It is important, today, to revisit the work of Planck and his friend Wolfgang Koehler from the later vantage-point of Vernadsky's categorical distinction of Noösphere from Biosphere. The categorical distinction of the *noëtic* cognitive powers specific to the human individual, from the "mentality of apes," acknowledges anti-entropic, biological creativity in the specific as well as varietal advances in animal and plant species, but willful forms of specifically, systemically anti-entropic, human creativity, are uniquely specific to the human individual. In other words, the universe as a whole is pervasively anti-entropic, but only the human individual is specifically capable of exerting anti-entropic changes in the system of nature by means of a conscious, *noëtic* act of will. The implications for science today, of the relationships among Planck and Koehler, and of Planck with Einstein, and the implications of the convergence of Einstein and Vernadsky are being pursued, in international collaborative efforts, by Sky Shields and others among 'the basement crew.'"

The assertions about Planck and Einstein having opinions on Vernadsky here, to note, are purely fallacious, as they had no association.

Education

LaRouche graduated from high school in 1940, and made an attempt at college in the following years, without success.

In particular, LaRouche enrolled at Northeastern University in Boston, but left in 1942 after receiving poor grades. He wrote of his geometry class that he "could not accept the axioms and postulates," and of his teachers in general that they "lacked the competence to teach me on conditions I was willing to tolerate." In circa 1947, after a several year stint in the US Army as a non-combatant, LaRouche again attempted to resume his education at Northeastern, intending to major in physics, but left because of what he called academic "philistinism."

See also

- Technocracy

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Videos

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External links

- Lyndon LaRouche – Wikipedia.

θΔics

In hmolscience, **Lynn Liss** (c.1977-) is an American business strategist noted, in business thermodynamics, for her 2005 article “Human Thermodynamics and Business Efficiency” in which she outlined the view that thermodynamics, the study of the energetics of transformative processes, can facilitate the analysis and understanding of the process of business and information technology consulting. [1]

Overview

Liss was one of the early reviewers, from circa 2002 to 2005, of American electrochemical engineer Libb Thims' unpublished human thermodynamics manuscripts as well as the first ten chapters of his 2007 *Human Chemistry* textbook.

Liss was one of the first to advocate more focus on the "human molecule" concept in the works of Thims, which originally was only a latter chapter concept, having to do with the question of what constitutes the total essence existence of a person at the moment dereaction (death).

Liss is one of the original founders of the Institute of Human Thermodynamics.

Business thermodynamics | Molecules

In 2010, Sayantan Sikday, an Indian business theorist, in his “Human Thermodynamics: Towards Enhancing Business Output”, blogged, in an expanded manner, on human thermodynamics, historically, and on Liss’ 2005 “business molecular organism” perspective, thermodynamic efficiency, and output. On the subject of Liss' conception of the business molecule, Sikday summarizes: [3]

> "Two or more human molecules when are occupationally bound for some specific economic function constitute a business molecule. The interactions, exchanges, dynamics, and financial reactions that take place between sets of business molecules define what is called business chemistry. As the world gets condensed due to globalization, cross-functional group decision making is slowly but steadily emerging as the single most important differentiator for successful multinational organizational functioning. Moreover organizations now a day are contracting management consultants in order to have strategic, industry-specific and technology-specific human skill sets in order to overcome complex problems. Innovation and transformation are the buzz words in today’s business. Business thermodynamics studies the energetics associated with these transformative processes"

In 2018, Spyros Tzafestas, in *Energy, Information, Feedback, Adaptation, and Self-organization: The Fundamental Elements of Life and Society*, in his “Business Systems Thermodynamics”, cited some of Liss’ work on business thermodynamics. [5]

Education

Liss competed her BS in business finance, at Eastern Michigan University and her MBA in finance and strategy at the University of Chicago. She has worked as a consultant for a number of the big five consulting companies of the world, including KPMG.

In the late 2000s, she was the COO of Fundability.com, a company that connects startups with investors. [2] Liss is currently one of the founders of AOK.tv an "acts of kindness" social network site.

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θΔics

In science, **Lynn Margulis** (1938-) is an American biologist noted, in animate thermodynamics, for her work, beginning in circa 1973, on the origin of life in relation to thermodynamics, the endosymbiotic hypothesis, and the Gaia hypothesis, the latter of which she worked on in conjunction with James Lovelock.

Life and entropy

It seems that Margulis first began to dabble in thermodynamics with the joint publication with James Lovelock of the 1974 article "Atmospheric Homeostasis and by and for the Biosphere: the Gaia Hypothesis". In this paper, they attempt to explain life in the context of physical sciences, namely thermodynamics, cybernetics, and information theory. [6] They cite English physicist John Bernal (1951) and Eugene Wigner (1961) with the following view: [7]

> "Life is one member of the class of phenomena which are open or continuous reaction systems able to decrease their entropy at the expense of free energy taken from the environment and subsequently rejected in degraded form."

Lovelock and Sagan then go on to cite the 1969 essergy theory of American engineer Robert Evans to argue that both entropy and free energy can be restated in terms of information. [8]

In her 1995 book *What is Life?*, co-written with her son Dorion Sagan, in which she attempts to update Erwin Schrodinger's classic 1944 *What is Life?*, with the inclusion of newer concepts such Ilya Prigogine's dissipative structure theory, views such as those of Alan Watts, James Lovelock and his Gaia hypothesis, and her endosymbiotic bacterial fusion / fission origin of life theory and sexual reproduction. In short, she argues on the topic of the origin of life that: [1]

> "Some 4,000 million years ago life generated, as a coalescing of oil droplets that increased their order, as matter undertook a different direction, satisfying its autopoietic imperative in a universe obeying the laws of thermodynamics."

Margulis helped Erich Jantsch develop his view, building on Prigogine, that the entire universe, in which dissipative structures arose, was self-organizing, as explained in his 1980 *The Self-Organizing Universe*, by explaining to him that gas-exchange microbes were the reason for the atmosphere being in a highly energetic, chemically unlikely state.

Sex

In her followup 1997 book *What is Sex?*, she expands on her earlier views and on the topic of sex, states that sex in biology is a type of combination reaction, in which one sperm joins with one egg to make one fertilized egg, the logic of which she defines with the following equation: [2]

$$1 + 1 = 1$$

or in chemical reaction notation:

$$Eg + Sp \rightarrow EgSp$$

This oversimplified view, however, is incorrect in that from chemical reaction point of view sex, in which a child is conceived, is a double displacement reaction type of human chemical reaction. Margulis also touches on the second law

in many of her other books, such as her 1999 *Symbiotic Planet*, 2000 *Environmental Evolution: Effects on the Origin and Evolution of Life on Planet Earth*, and especially so in her 2007 *Dazzle Gradually: Reflections on the Nature of Nature*. [3]

Other

Margulis is also noted for her effort to bring about the 1998 English translation of Vladimir Vernadsky's *The Biosphere*. [4]

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External links

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θΔics

In existographies, **Lynne McTaggart** (1951-) is an American new age author noted for []

Human beings | NOT a chemical reaction

In 2001, McTaggart, *Field: the Quest for the Secret Force of the Universe*, stated the following view: [1]

> "At our most elemental, we are not a chemical reaction, but an energetic charge. Human beings and all living things are a coalescence of energy in a field of energy connected to every other thing in the world. This pulsating energy field is the central engine of our being and our consciousness, the alpha and the omega of our existence."

This, however, is a new age "energy" stylized, ontic opening, presented as a way to sell coded spirituality; incorrect, in short. [2]

To correct McTaggart, here, firstly, there is no such thing as a "living thing" (see: life does not exist). Secondly, the idea that humans are a "coalescence of energy in a field of energy" is better stated to the effect that humans are a "electromagnetic eddies, existive in various states of being, each quantified by a Gibbs free energy of formation, embedded in a universe comprised of four fields: gravitational, electromagnetic, strong nuclear, and weak nuclear", without prolonged digression. Thirdly, at our most elemental, we are an atomic geometry of 26 elements, and we came into existence via a type of chemical reaction, i.e. a double displacement reaction, called a human reproduction reaction.

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External links

● Lynne McTaggart – Wikipedia.

θΔics

In religio-mythology, **Maat**, the female counterpart of the god Thoth, was []

A simplified depiction (Q) of **Maat**, the embodiment of the Egyptian religion principle of universal moral order and justice, shown with her scale, "feather of truth", and someone's heart, filled with sins, being weighted in the afterlife. Maat is either thought to be the daughter of Ra, or was the principle that brought the world into existence. She is also the wife of Thoth.

Overview

In 1904, Maat, according to Wallis Budge, was characterized as the goddess representative of the personification of the conceptions of "rectitude, straightness, law, order, and unfailing regularity". [1]

In 2002, Richard Gabriel defined Maat in respect to the notion of "moral order" as follows: [2]

> "But in the ethical and or philosophical sense **Maat** means much more than to do what is right. Maat means also the just order established by god in nature and society through the act of creation. It is the dynamic order that is behind all creation, an order man must strive to preserve by conducting himself properly toward god, his fellow men, and all things, even animals. For the Egyptian all life was of a single piece governed by the same moral law. This idea is close to the medieval notion of a natural moral order that is the material expression of the divine order in which human law and human action are participants in and reflections of the larger order of the universe. In the Egyptian view, however, unlike the later Aristotelian concept, this cosmic order does not govern itself nor is it governed by some unmoved mover. When men do evil, they bring disorder to the natural order of things. Accordingly, it is man's responsibility to preserve and restore the natural order by doing what is right, that is, Maat."

(add)

Negative confessions

The 42 negative confessions are referred to by some as the "admonitions of Maat". (Q)

Shown above, is a depiction of the "scale of Maat", i.e. Maat's scale, which, in Egyptian religion, was thought to weigh, in the "afterlife", the weight of the sins of one's wrong doings, done in "life", against the "feather of truth".

Creation

Maat, according to Wallis Budge (1904), was considered to be the definer at creation of the course followed by Ra in his journey through the sky, each day. [1]

Scale of Maat

In 2500BC, the so-called "scale of Maat" was the conceptual device on which souls in the afterlife were weighted, against the feather of truth, to measure thee sum wrongfulness or sinfulness of the deceased person.

Reference

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (pgs. 323-24). Dover, 1969.
2. Gabriel, Richard A. (2002). *Gods of Our Fathers: The Memory of Egypt in Judaism and Christianity* (pg. 12). Greenwood.

Further reading

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External links

● Maat – Wikipedia.

θΔics

In terminology, **machine** is a constructed thin, whether material or immaterial, typically an assemblage of parts that transmit forces, motion, and energy to one another in a predetermined manner. [1]

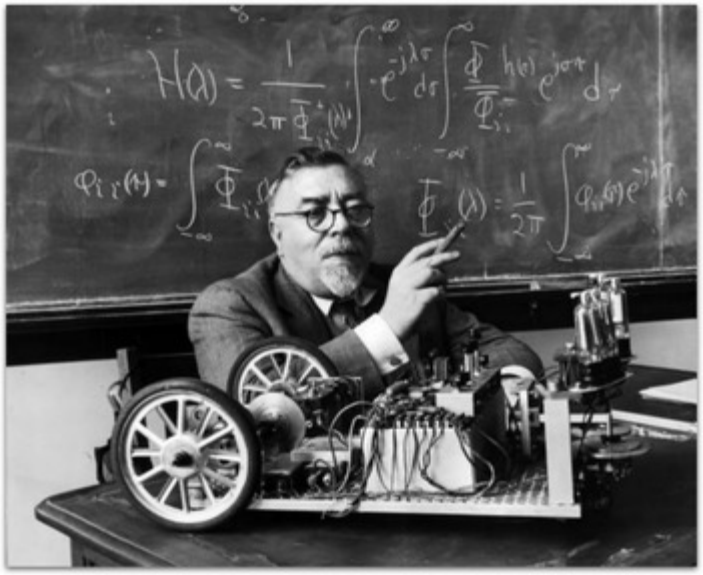

American mathematician and computer **machine** developer Norbert Wiener and one of his cybernetics machines.

Animation | Alive puzzle

The notoriously baffling query about what defines life or alive in the framework of general animated bodies in the universe, animate machines in question here, dates typically to Rene Descartes' famous query about how to distinguish an automaton from a human, about which he concluded the automaton could never "react" like a human, e.g. to verbal questions, hence not alive—or something along these lines.

The following is Norbert Wiener's similar 1950 query about machines and aliveness: [2]

> "Certain analogies of behavior are observed between the **machine** and the living organism, the problem as to whether the machine is alive or not is, for our purposes, semantic … if we use the word 'life' to cover all phenomena which locally swim upstream against the current of entropy, we are at liberty to do so; however, we shall then include many astronomical phenomena … it is my opinion, therefore, best to avoid all question-begging epithets such as 'life', 'soul', 'vitalism', and the like, and say merely that machines [and] human beings [are] pockets of decreasing entropy in a framework in which the large entropy tends to increase."

The animation-alive puzzle, was solved in 2009 by American electrochemical engineer Libb Thims via the defunct theory of life and life terminology upgrades.

References

1. Machine – Merriam-Webster Collegiate Dictionary, 2000.
2. Wiener, Norbert. (1950). *The Human Uses of Human Beings*: *Cybernetics and Society* (§2: Progress and Entropy, pgs. 28-47). Houghton Mifflin Co.

External links

â— Machine – Wikipedia.

θΔics

In hmolscience, **machine evolution scenario**, aka “grey goo scenario” (Ñº), refers to the hypothetical future where scientists invent “out-of-control self-replicating robots” or “evolving machines”, or “artificial intelligences” that take over and destroy the human race, the planet, or some variant therein. The machine evolution scenario has been popularized in science fiction films such as: *The Terminator* (1984) and *The Matrix* (1999).

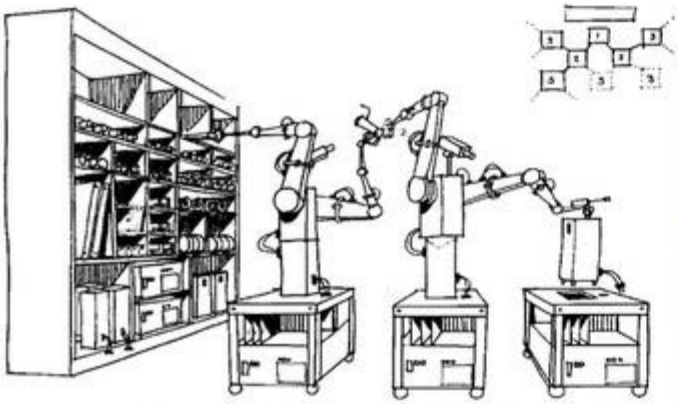

A general illustration of the "**machine evolution scenario**" wherein scientists first build so-called auto-replicating robots, based on Neumann automaton theory, which thereafter develop am evolved "mind" of their own, and therein take over the planet and destroy civilization (Cameron, 1984) or use and grow humans as batteries to power their operations (Wachowski, 1999).

Overview

In 1948 to 1953, John Neumann gave a series of talks on what he called “complicated automata” (see: Neumann automaton theory), wherein he posited a scenario of a bunch of electrical and computer parts floating on a lake that develop the ability to become “self-reproducing”.

In 1986, Eric Drexler, in his *Engines of Creation*, coined the term “gray goo” in reference to some type of nanotechnology that grows out of control and covers the earth, or something along these lines.

In 1984, Kevin Kelly, in his *Out of Control: the New Biology of Machines, Social Systems, and the Economic World*, employed concepts such as entropy and extropy in theorizing about the impact of machines and technology in the future, which touches on topics of cybernetics, emergence, self-organization, complexity, and chaos theory, devoting about ten pages discussing entropy in the context of evolution and technology, the aim of which is to lay out the basic principles defining “artificial evolution”, a phenomenon argued to become commonplace in the next century, along the way defining extropy as "life force" and life as an "information process making new order". [1]

In 1999, the film *The Matrix* debuted, largely based on Kevin Kelly’s machine science fiction ideology.

In 2009 to 2018, Todd Hylton, funded in part by DARPA, was attempting to sell a theory of evolving thermodynamic computers that operate via “physical intelligence”.

Difficult on theory

The general issue or difficulty in all variants of the machine evolution scenario, revolves around confusion about "free energy" in respect to the animation of each thing; this was pointed out in 2003 by John Avery: [2]

> “The important point about von Neumann’s automaton theory is that it **requires a source of free energy** (i.e. a

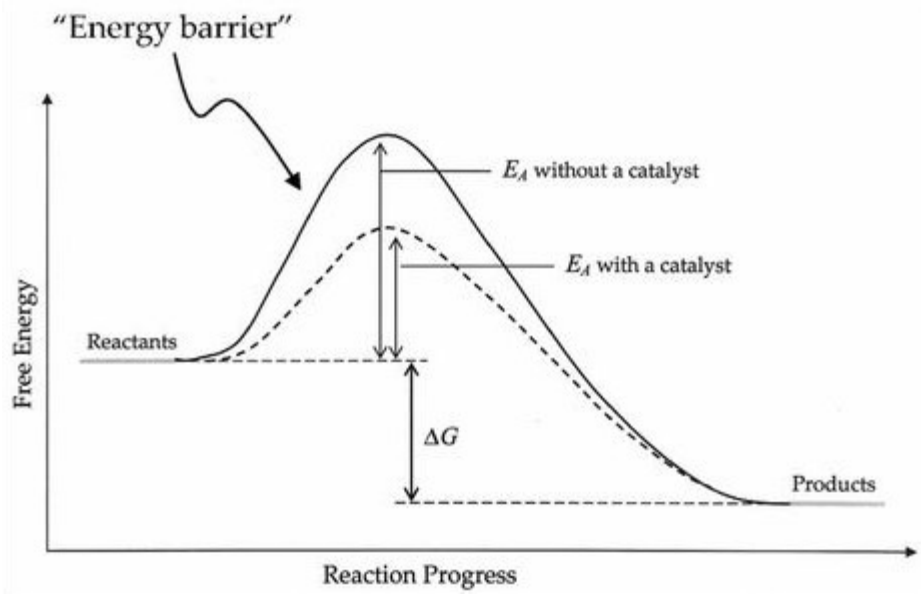

A diagram showing the central confusion surrounding the proposed "**machine evolution scenario**", namely that machines are but a type of matter, silicon-based, made by humans, in order to lower the activation barrier to human chemical reactions, e.g. human reproduction reaction. In short, in order for the machine evolution scenario to become true, the catalysts (robots) would have to became or transform into reactants that are driven (free energy) to become new products. The entire scenario is confused mess, to say the least, as per basic physical chemistry.

source of energy from which work can be obtained) in order to function. We can imagine that the free energy comes from electric batteries which the automaton finds in its environment. (These are analogous to the food eaten by animals.) Alternatively we can imagine that the automaton is equipped with photocells, so that that it can use sunlight as a source of free energy, but it is impossible to imagine the automaton reproducing itself without some energy source from which work can be obtained to drive its reproductive machinery. If it could be constructed, would von Neumann's automaton be alive? Few people would say yes. But is such a self-reproducing automaton could be constructed, it would have some of the properties which we associate with living organisms."

Similarly, in the Hylton's model of "thermodynamic computers" moving and evolving via "physical intelligence", the problem that the "potentials", which Hylton speaks of as being the driving force behind the evolution of matter, in the universe, namely thermodynamic potentials, the Gibbs potential specifically for earth-bound surface-reacting social systems, operate between or amid reactive CH-based animation types of chemical species, whereas no sort of similar reproductive Gibbs potential exists between Si-based types of animation, such as computers, CPUs, AI systems, or robots.

In short, correctly, in the human chemical reaction purview, Si-based matter, as found in computers, CUPs, AI systems, or robots, are technically classified as "substrate" (or catalyst), such as diagrammed above, which has the function to lower the activation energy barrier of social reactions, but does not effect the free energy of reactants going to products.

References

1. (a) Kelly, Kevin. (1994). *Out of Control: the New Biology of Machines, Social Systems, and the Economic World* (extropy, pg. 106; entropy, pgs. 79, 405-06, 413, 452). Addison Wesley.
(b) Out of Control – Wikipedia.
2. Avery, John. (2003). *Information Theory and Evolution* (automaton, pg. 89 and ch. 8). London: World Scientific.

θΔics

In existographies, **Macrobius** (c.390-430AD) (IQ:160|#501) (CR:7), aka "Macrobius Theodosius" (Boethius, c.500AD) was a Greco-Roman scientist, philosopher, and religio-mythology scholar, noted for his work on the antipode model of the earth, and for []

Antipodes

Macrobius, supposedly building on Eratosthenes (c.200BC), advanced ideas on other yet to be discovered antipodal worlds (Ñº), of people inhabiting the opposite side of the earth; a few that inflamed the (see: Virgil of Salzburg). Macrobius, supposedly, predicted that when Columbus crossed the "northern quadrant" of his world map, that he would not reach the orient, but would reach a new land, i.e. America. (Ñº)

Quotes | On

The following are quotes on Macrobius:

> "Higgins, whose father was a 'gentleman of small, though independent, fortune', went to Trinity Hall, Cambridge. He had grounding in Greek and Latin and early on wrestled with the works of Euclid, John Locke's *On Understanding*, and the writings of Varro, **Macrobius**, and Cicero. He preferred the philosopher Epictetus to the Greek poets, and he gained familiarity with an impressive range of other possible he turned his attention to the 'evidence upon which our religion was founded', and was both shocked and intrigued by what he discovered."
>
> — Tom Harpur (2004), *The Pagan Christ* [1]

Quotes | By

The following are quotes by Macrobius:

> "People exist on the moon and it also is the location of the purgatory of souls."
>
> — Macrobius (c.420AD), *In Somnium Scipionis* (1.13); cited by Otto Guericke (1663) in *New Experiments on the Vacuum of Space* (pg. 282)

> "Mind has been born (Mens ex Deo nata)."
>
> — Macrobius (c.420AD) *Publication*; cited by Constantin Volney (1791) in *The Ruins* (pg. 292), in the context of his famous Christ [=] Christna [Krishna] digression

> "Good laws are produced by bad actions."
>
> — Macrobius (c.420AD) (Ñº)

References

1. Harpur, Tom. (2004). *The Pagan Christ* (pg. 199). Thomas Allan Publishers.

External links

â— Macrobius – Wikipedia.

θΔics

In existographies, **Madalyn Murray O'Hair** (1919-1995) (FA:115) was an American free thinker and "avowed atheist" noted for getting the Supreme Court in 1963 to officially end mandatory Bible-reading in American public schools; for starting American Atheists, now run by David Silverman, and for publications, such as *Why I'm an Atheist: Including a History of Materialism* (1980).

Overview

In 1960, O'Hair, after moving to Baltimore, Maryland, filed suit against the city school system that year, claiming her son's constitutional rights were being violated by requiring him to participate in bible readings at school. (Q)

William Murray

In 1960, William J. Murray III (1946-) (Q), son of the O'Hair, commented on camera how he was an atheist and proud to be one and didn't want to read the Bible in public school; in a later period interview (Q), William Murray explained how he went from a "Marxist atheist" to a "libertarian atheist", a dog eat dog sort of view, that personal success is the main thing to do, to becoming a Christian believer in late adulthood, becoming a Baptist minister.

American atheists

In 1963, O'Hair founded American Atheists.

In 2013, on the 50th anniversary of American Atheists, Aron Nelson gave a speech (Q) on O'Hair and her "most hated woman in America" epitaph.

Quotes | By

The following are quotes by O'Hair:

A 1960 photo of **O'Hair** studying (Q) with her son, William J. Murray III (Q), in Baltimore, at the time of the start of her famous "Bible reading in school" un-Constitutionality lawsuit.

> "The 'virgin' Mary should get a posthumous medal for telling the biggest goddamn lie that was ever told. Anybody who believes that will believe the moon is made out of green cheese."
>
> — Madalyn O'Hair (c.1970) [1]

> "One of the things I am most proud of is that people can say 'I'm an atheist', in the United States, without being called a Communist atheist, or an atheist Communist. I separate the two words. I think that's probably the best thing that I did."
>
> — Madalyn O'Hair (1989), response to interviewer who asked her what she was proudest of having accomplished [2]

> "I'm an 'atheist' – not an agnostic, nor a rationalist, nor a realist, nor a secularist, nor a humanist, nor any other fancy name behind which people must hide in our society in order to be safe in our society. And isn't

it an indictment in our society that we who do not believe—we nonbelievers of all stripes—must hide behind certain names since reprisals and sanctions would be pout into effect against us if we said what we really believe."

— Madalyn O'Hair (1991), *Why I Am an Atheist* (pg. 5); cited by Susan Jacoby (2004) in *Freethinkers* (pg. 314)

References

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2. (a) O'Hair, Madalyn. (1989). "Interview: O'Hair on Church and State", *Freedom Writer*, Mar-May.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 468). HarperOne.

Further reading

● O'Hair, Madalyn. (1980). *Why I'm an Atheist: Including a History of Materialism*. Publisher.

Further reading

● Le Beau, Bryan F. (2005). *The Atheist: Madalyn Murray O'Hair*. NYU Press.

External links

● Madalyn Murray O'Hair – Wikipedia.

θΔics

In terminology, **madness** refers to the quality of a disordered mind, a degree below that of being insane; completely unrestrained by reason and judgment; a state of mind in which actions are incapable of being explained or accounted and or ones carried away by intense anger, enthusiasm, or desire; marked by wild gaiety and merriment. [1]

Overview

The work of Irish author Samuel Beckett, beginning with his 1938 novel *Murphy*, is said to be pervaded with a fascination with entropy and madness. [2] Beckett's work, in literature thermodynamics, has been classified with the absurd writer Harold Pinter. [3]

In hmolscience, writers who, in Stark classification, tend toward extreme materialism, namely of describing reality in terms of pure physiochemical materialism often tend be labeled by anti-materialists as mad, noted examples of which (see: crackpot) include the following, three of which ironically have the highest Hmolpedia like rankings:

Extreme materialists	Denigrate purviews	Like rankings
Johann Goethe (1749-1832)	"Childlike nonsense" and "fooling around" (Wieland on Goethe's 1796 theory).	29
Henry Carey (1793-1879)	"Lunatic" or "back in his straight jacket" (Stark on Carey's 1858 theory).	
Henry Adams (1838-1918)	"More of a crank than a prophet" (Diggins on Adams' 1860s theory).	17
Libb Thims (c.1975-)	"Deranged imagination" (Moriarty on Thims' 2001 theory). "Senile or crazy" (Lubos Motl comment Thims's 2010 sexual heat and enthalpy of human molecules). "Wacko" (Terrence Deacon's 2013 comment on Thims and human molecular theory).	20

(add discussion)

Quotes

The following are relevant quotes:

> "There was never a genius without a tincture of **madness**."
>
> — Aristotle (c.310BC), Greek physicist-philosopher

> "I can calculate the movements of stars, but not the **madness** of men."
>
> — Isaac Newton (c.1690), after losing his hat in a market collapse [4]

> "Men have called me **mad**; but the question is not settled, whether madness is or is not the loftiest of intelligence."
>
> — Edgar Poe (c.1845)

"A completely **mad** book."

— Anons (1860), two German colleagues of Ernst Haeckel on reading Darwin's *On the Origin of Species* [6]

"It's no mystery why economics is called the dismal science. With most sciences, experts make pretty accurate predictions. Mix two known chemicals, and a chemist can tell you ahead of time what you'll get. Ask an astronomer when the next solar eclipse will be, and you'll get the date, time, and best viewing locations, even if the eclipse won't occur for decades. But mix people with money, and you generally get **madness**. No economist really has any idea when you'll see the next total eclipse of the stock market."

— Tom Siegfried (2006), *A Beautiful Math: John Nash, Game Theory, and the Modern Quest for a Code of Nature* [5]

References

1. Merriam-Webster Collegiate Dictionary, 2000.
2. (a) Thiher, Allen. (2004). *Revels in Madness: Insanity in Medicine and Literature* (pg. #). University of Michigan Press.
(b) Samuel Beckett – Wikipedia.
3. Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Lif* (pg. 5). The University of Chicago Press.
4. (a) Bouchard, Jean-Philippe. (2008). "Economics Needs a Scientific Revolution" (EP) (ArXiv), *Nature*, 455:1181, Oct 30.
(b) Weatherall, James O. (2013). *The Physics of Wall Street: A Brief History of Predicting the Unpredictable* (thermodynamics, pgs. 18, 65; Newton quote, pg. 5). Houghton Mifflin Harcourt.
5. Siegfried, Tom. (2006). *A Beautiful Math: John Nash, Game Theory, and the Modern Quest for a Code of Nature* (pg. 27). National Academies Press.
6. (a) Richards, Robert J. (2008). The Tragic Sense of Life: Ernst Haeckel and the Struggle over Evolutionary Thought. University of Chicago Press.
(b) Smith, Peter D. (2008). "Review: The Tragic Sense of Life", *Times Literary Supplement* (pg. 12), Jul 25.

θΔics

In hmolscience, **Mae-Wan Ho** (1941-) is a Chinese-born English biochemist, geneticist, and biophysicist noted, in animate thermodynamics, for her 1993 attempt to intermix the negative entropy ideas of Erwin Schrodinger (1943) with the electron-base life does not exist theories of Albert Szent Gyorgyi (1948) to outline a physics of organisms.

Overview

In 1993, Ho, in her *The Rainbow and the Worm: the Physics of Organisms*, attempts to pick up where Erwin Schrodinger left off in his famous 1943 *What is Life?*, by focusing in on the thermodynamics, particularly the second law, and other physics topics, in relation to life, such as negentropy, living matter vs. non-living matter, time and free will, etc., extending the discussion on to the "poetry and meaning of being alive."

Ho states that her book began 30 years ago, *circa* 1963, as a young undergraduate, when she came across Hungarian physiologist Albert Szent Gyorgyi's idea that life is interposed between two energy levels of the electron, after which she spent the three decades searching for this idea.

The theme of the book seems to be similar to the mindsets of Henri Bergson and James Lovelock, whom Ho cites in support of her view. [1]

References

1. Ho, Mae-Won. (1993). *The Rainbow and the Worm: the Physics of Organism* (thermodynamics, 60+ pgs). World Scientific, 1998.

Further reading

â— Mae-Wan Ho. (1994). What is (Schrödinger's) Negentropy?, *Modern Trends in BioThermoKinetics* 3, 50-61.

External links

â— Mae-Wan Ho – Wikipedia.

θΔics

In hmolscience, **Maffeo Pantaleoni** (1857-1924) was an Italian economist noted for being the mentor to Italian lawyer-economist Emanuele Sella, noted for his 1910 *The Life of Wealth*, wherein he applies the work or Rudolf Clausius: second law, entropy, energy, heat, temperature, equilibrium, to the study wealth absorption and radiation, and for his association with French-Italian mathematical engineer Vilfredo Pareto, whose socioeconomic theories of human molecules he would later come to classify as "economic dynamics".

Pareto

In Jan 1890, Pantaleoni met in French-Italian mathematical engineer Vilfredo Pareto, with whom he established a long and sincere friendship that would prove decisive for the future course of science. In 1893, Pantaleoni recommended Pareto to Leon Walrus for appointment as a professor of political economy at the University of Lausanne. [1]

Pantaleoni in his circa 1908 article “The Phenomena of Economic Dynamics” classified Pareto’s general theory as “economic dynamics”. [2]

In 1902, Pareto, in his *Socialist Systems*, commented the following about Pantaleoni’s *Pure Economics*: [4]

> “Progress in the purely scientific sense of political economy are considerable. Books such as *Mathematical Psychics*, F. L. Edgeworth, *Principii di economia pura* [*Pure Economics*], **Maffeo Pantaleoni**, *Mathematical Investigations in the Theory of Value and Prices*, Irving Fisher, etc., are written in a purely scientific point of view. A similar attempt is one of my courses, in the first volume, published in 1896, I said: "In all treatises on political economy, the main part is formed by the science of ophélimité and utility.”

The term "molecule", to note, does not seem to be found in Pantaleoni's *Pure Economics*. [5]

American economist James Buchanan, supposedly, somewhere, classifies Pareto as a “follower” of Pantaleoni—though, correctly, it would seem to be the reverse, or rather that they were mutual two cultures like associates.

Sella

In 1898, Italian lawyer and political economist Emanuele Sella studied at the University of Geneva for three semesters, where he attending some of Pantaleoni’s courses.

Other

Italian political economist Claudia Rotondi completed her 1995 PhD in the history of economic thought at the University of Florence in 1995 on the economics theories of Pantaleoni, Vilfredo Pareto, and Emanuele Sella, with a dissertation entitled “Theory of competitive companies in the thought of Maffeo Pantaleoni, Vilfredo Pareto, and Emanuele Sella”, and has gone on to write related subjects, such as her 2001 chapter “Competition and Economic Temperature: the Entropy Law in Emanuele Sella’s Work”.

References

1. Maffeo Pantaleoni (Italian → English) – Popsoit.
2. Pantaleoni, Maffeo. (1919). “The Phenomena of Economic Dynamics” (pdf), Abstract of Paper, in: *Papers and Discussions of the Twenty-Second Annual Meeting, New York City, Dec 27-31* (pgs. 112-22; *homo economicus*, pg. 115). Princeton University Press.
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External links

● Maffeo Pantaleoni – Wikipedia.

θΔics

In experiments, **Magdeburg hemispheres** is a pair of copper hemispheres, devised by Otto Guericke (c.1650), as shown below (and adjacent), that can be sealed together, by applying grease around the rim, and thereafter be connected to a vacuum pump so as to actuate an artificial vacuum or near "perfect vacuum" inside of the sealed sphere, which have a operational holding power equivalent to a 30+ horsepower engine.

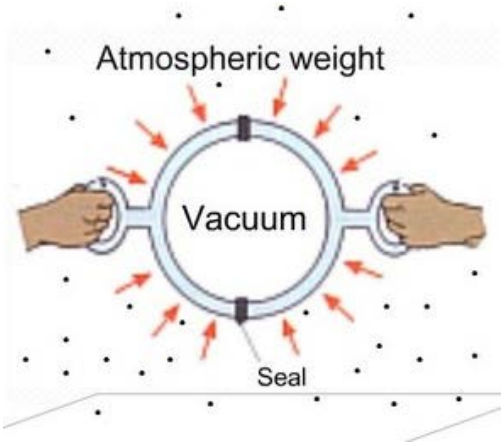

Diagram of the **Magdeburg hemispheres** showing an internal vacuum about which the massive weight of the surrounding atoms and molecules of the atmosphere press inward on the spheres.

In this vacuumed-out state, the pressure of the weight of surrounding atmosphere, piled upwards of 62-miles above the sphere, as is the case for all bodies on the surface of the earth, to the Karman line earth-space boundary where point weightlessness begins, acts to hold the spheres together tightly with great force by pressing inward on the outer casing.

History

The Magdeburg hemispheres were invented by German engineer Otto Guericke who some time near the end of the Thirty Years' War (1618–1648), became mayor of Magdeburg (hence the name), from 1646 to 1676, and in this period began to devote a considerable portion of his spare time to experimentation and was especially fascinated with the nature of cold, becoming very curious on the the question: [6]

> "Could empty space exist, and is heavenly space unbounded?"

In researching this query, he was brought into contact with German mathematical physicist Gaspar Schott, an adherent to Aristotle's version of the denial of the void, albeit open to new experimental information, and ultimately and to French scientist philosopher Rene Descartes' adherence to the "denial of the vacuum" dictum.

This vacuum puzzle intrigued Guericke and he went to work trying to evacuate the air form a well-caulked beer keg, which introduced him to the sealing problem, i.e. how to make a container air tight.

After solving the sealing problem, he was said to have discovered the

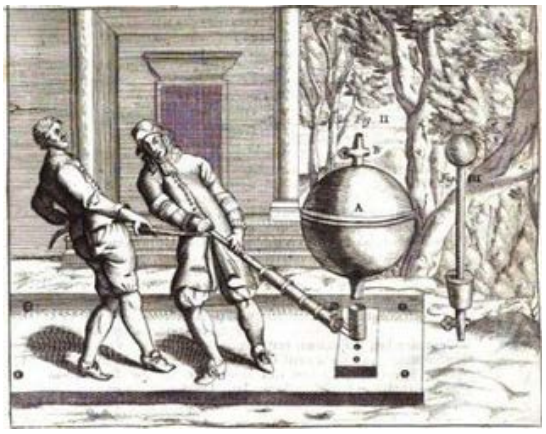

Left: a Schott diagram depiction of German engineer Otto Guericke's circa 1648 attempt to make a vacuum inside of tightly-sealed beer keg, which introduced him to the so-called "sealing problem", i.e. how to seal in the vacuum. [7] The two men seem to be pulling on the the world's first piston and cylinder prototype, something Guericke would later make, a precipitate of his vacuum research. Right: a Schott diagram depiction of Guericke's solution to the sealing problem: two fitted copper spheres sealed with grease around the rim, spheres which would latter become famously known as the **Magdeburg hemispheres**. [7]

phenomenon of the compressibility of air after which he invented a vacuum pump. Using the vacuum pump as a tool, the Magdeburg hemispheres were eventually built some time around 1853-1857.

Public performances

There seems to be a bit of a discrepancy as to when and where the actual first public demonstration of Magdeburg hemispheres occurred. Supposedly, legend has it that the first show appeared in 1654 in Regensburg. This, however, may be only legend, and it is said that the actual first appearance of the horse pulling show occurred in Magdeburg in 1657 and was later repeated in Berlin in 1663.

Gaspar Schott's 1657 drawing showing that it required 16 total horses to separate two 22" hemispheres is said to be the first public experiment, or at least the most popular or best known version.

Other references state that in 1854 to the *Reichstag* and the Emperor Ferdinand III in Regensburg, where it was found that 30 horses, in two teams of 15, could not separate the hemispheres until the vacuum was released.

Whatever the case, the public demonstrations showed that vacuums do exist and thus publically disproved Greek philospher Parmenides 485BC nature abhors a vacuum postulate, which supposedly was the point of building the hemispheres in the first place.

Power

Guericke is said to have calculated that a force of 2,700 pounds would be needed to pull the hemispheres apart, as is depicted in his 1672 lifting experiment. [5] This would have been the one of the first measurement of the "force of the vacuum" or "power of the vacuum" an elusive entity that would searched for as a potential source of man power in the follow designs of the vacuum engine in the decades to follow.

Schott

In 1657, German physical mathematics professor Gaspar Schott described the experiment in his *Mechanica Hydraulico-Pneumatica*. [3] Upon first seeing the demonstration of the hemispheres Schott is said to have remarked: [1]

> "I have no reservations to say frankly and courageously that I have never seen, heard, read or comprehended anything more wonderful than this."

In 1663, Guericke repeated the demonstration with 24 horses in Berlin before Frederick William, Elector of Brandenburg. The experiment was said to have been displaced all over Europe in these years.

Close-up view of the hemispheres (**left**) showing the connectors and stopper valve, which would release the vacuum when desired.

An advertisement (**below**) depicting entitled "Curious Experiences in Physics: The Magdeburg Hemispheres".

The original **Magdeburg hemispheres** (left) and Guericke's vacuum pump (right), in Deutsches Museum, Munich, Germany, at the top of which is shown vacuum bulb, which could be disconnected and carried about as a sort of power or storage vessel a sort of proto type battery.

Religious association

As is the case with most advances in science, Guericke's vacuum machine was not without implication. It is said that Guericke intuitively was aware of the delicacy of his experiments and therefore avoided theological discussions by using a clever linguistic ploy. He replaced the critical word “emptiness” with a simple physical one by distinguishing between “emptiness” and “empty space”. His empty space did not mean “void” but it was just an air-evacuated space. Using this ploy he was able to carry out his spectacular and meanwhile world-famous experiments with the Madgedurger Hemisphere without being unchallenged. [1]

Depiction of a 24-horse version of the Magdeburg hemispheres from the 1899 book *Album of Science: Famous Scientist Discoveries*. [2]

An 8-horse 1662 Magdeburg hemispheres experiment.

Parts to the hemispheres and the vacuum pump.

A 1994 Magdeburg hemispheres re-enactment.

A Magdeburg hemisphere statue

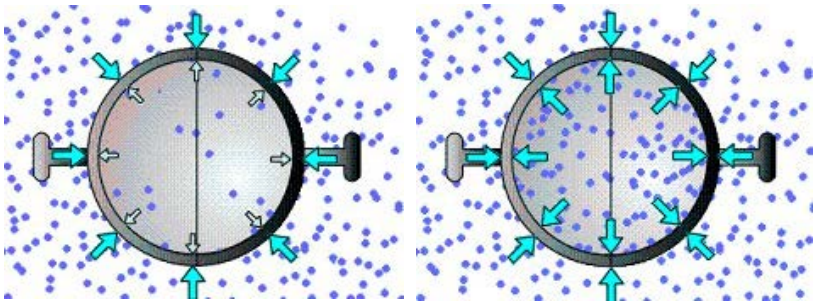

Magdeburg hemispheres shown **partially evacuated** (left) and in balance with the atmosphere with **no vacuum** (right). [4]

References

1. Otto von Guericke and the Magdeburg Hemispheres – MK-Technology.com.
2. Magdeburg hemispheres (24 horses) – from the 1899 book *Album of Science: Famous Scientist Discoveries*.
3. Gaspar Schott – Wikipedia.
4. Dunlavy, Mike (2008). "Magdeburg hemispheres", Nov. 07, SMU Astronomy and Physics.
5. Magdeburg hemispheres – Physics.Kenyon.edu.
6. Partners and Rivals during the Scientific Revolution – Faculty.Fairfield.edu.
7. Guericke, Otto and Schott, Kaspar. (1672). *Otto Guericke's New Experiments: on (as they are called) on the Magdeburg vacuum space* (*Ottonis De Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (15+ diagrams, various pages) (preface, pdf). Janssonius a Waesberge.

External links

â— Magdeburg hemispheres – Wikipedia.

θΔics

In science, **magnet** (TR:52) is a material, such as a loadstone, iron, alloy, or ore, which has it's the spin of its electrons oriented in one direction, which produces a magnetic field, thereby giving it the properties of being able to attract other iron-containing objects or aligning itself in an external magnetic field, e.g. a compass.

See also

- Magnetism

External links

- Magnet – Wikipedia.

θΔics

In science, **magnetism** is the phenomenon, generally of attraction or repulsion, associated with magnetic fields, which are produced by moving charged particles, such as electrons flowing through a coil of wire or spinning in a permanent location. [1]

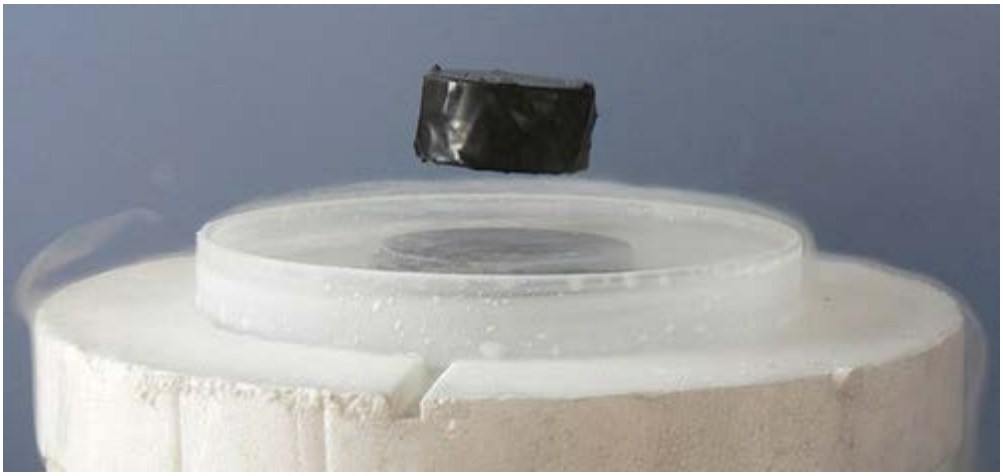

The a **magnet** floating (levitating) above a superconductor cooled by liquid nitrogen, aka Meissner effect (Q), discovered in 1933 by Walther Meissner and Robert Ochsenfeld; when the superconductor transitions to the superconducting state, it causes the magnetic field or magnetic flux to be expelled.

Overview

In 1644, French philosopher Rene Descartes published his effluvia theory of magnetism—supposedly based on Empedocles' theory of effluvia—which seems, in some way, to have been a possible precursor to James Maxwell's 1873 electromagnetic theory. [3]

In 1716, Edmond Halley's made diagrams of **magnetic** field lines, or what he called "circulating effluvia", found placing a magnetic terrella on a level surface and scattered fine iron filings around it, which, after some gentle tapping, the filings settled into patterns (shown below). [2]

In 1774, Franz Mesmer began experimenting with iron filings and magnets on hysteria patients, by having them swallow the iron and then move magnets over their body; shortly thereafter he began to popularize the idea of "personal magnetism" or animal magnetism; one rendition of which is as follows: (Q)

In 1830s, Michael Faraday, building on Halley, introduced the magnetic field lines model, aka lines of force theory.

In 1873, James Maxwell added together known magnetic phenomena with known electrical phenomena, to make the electromagnetic field theory of light or electromagnetism.

Quotes

The following are related quotes:

> "If the magnetic force that has guided this particular compass – and what else was its source but the central order – should ever become extinguished, terrible things may happen to mankind, far more terrible even than concentration camps and atom bombs. But we did not set out to look into such dark recesses; let's hope the central realm will light our way again, perhaps in quite unsuspected ways. As far as science is concerned, however, Niels is certainly right to underwrite the demands of pragmatists and positivists for meticulous attention to detail and for semantic clarity. It is only in respect to its taboos that we can object to positivism, for if we may no longer speak or even think about the wider connections, we are without a

compass [see: moral compass] and hence in danger of losing our way."

— Werner Heisenberg (1952), dialogue with Wolfgang Pauli on god and the soul (see: Heisenberg-Pauli dialogue)

"All energy flows according to the whims of the great **magnet**. What a fool I was to defy him."

— Hunter Thompson (1971), *Fear and Loathing in Las Vegas* (Q); favorite Patrick Fergus author

"I toss and turn, I keep stressing my mind, mind
I look for peace but see I don't attain
What I need for keeps this silly game we play .. play
Now look at this
Madness to **magnet** keeps attracting me, me
I try to run but see I'm not that fast
I think I'm first but surely finish last .. last."

— Kid Cudi (2009), "Day 'N' Night" (Q)(V), verse 2

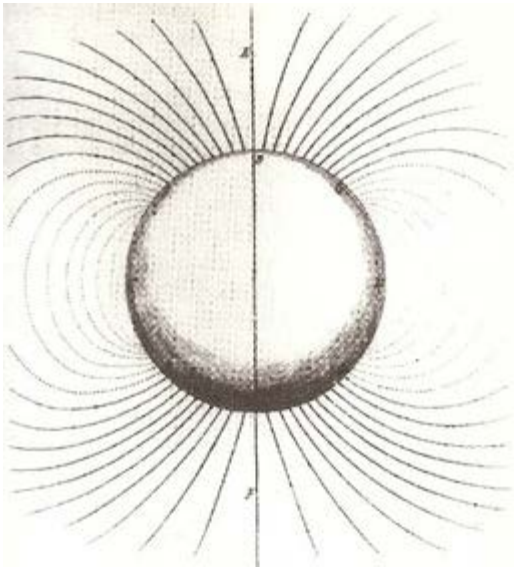

Left: English natural philosopher Edmond Halley's 1716 diagram of **magnetic** field lines, which he called "circulating effluvia", found placing a magnetic terrella on a level surface and scattered fine iron filings around it, which, after some gentle tapping, the filings settled into patterns shown. [2] This was the precursor model to Michael Faraday's later 1830s magnetic field lines (lines of force) theory.

See also

- Animal magnetism
- Electromagnetic force
- Electromagnetism
- Thermo-magnetism (1824)
- Floating magnets experiment

References

1. Clark, John O.E. (2005). *The Essential Dictionary of Science*. Barnes & Noble Books.
2. (a) Fara, Patricia. (2005). *Fatal Attraction: Magnetic Mysteries of the Enlightenment* (pg. 61). MJF Books.
(b) Halley, Edmond. (1716). "Article", *Philosophical Transactions* (plate 2, pg. 389), 29.
(c) Edmond Halley – Wikipedia.
3. (a) Descartes, Rene. (1644). *Principia Philosohiae* (diagram, pg. 274) (part IV, articles 133-188). Publisher.
(b) Fara, Patricia. (2005). *Fatal Attraction: Magnetic Mysteries of the Enlightenment* (pg. 130-31). MJF Books.
(c) Baigrie, Brian S. (2007). *Electricity and Magnetism: A Historical Perspective* (pg. 16). Greenwood Publishing Group.

Further reading

- Gilbert, William. (1600). *On the Magnet and Magnetic Bodies, and on That Great Magnet the Earth* (*De Magnete*). Publisher.
- Knight, Gowin. (1748). *An Attempt to Demonstrate, that all Phenomena in Nature may be Explained by two Simple Active Principles, Attraction and Repulsion: Wherein the Attractions are of Cohesion, Gravity, and Magnetism, are Shewn to be One and the Same; and the Phenomena of the Latter are more particularly Explained*. Publisher.
- Cavallo, Tiberius. (1787). *Treatise on Magnetism.* Publisher.
- Maxwell, James. (1873). *Treatise on Electricity and Magnetism*. Publisher.

External links

- Magnetism – Wikipedia.

θΔics

In hmolscience, **Mahesh Deva** (c.1977-) is a Brazilian mechanical engineer, thermal scientist, and philosopher noted for his 2012 involved dialogue with Libb Thims on the foundations and merits of the 2005 HT principles and the question "[...] is human life a chemical reaction or not?" [1]

Quotes | Employed

The following are quotes employed by Deva:

> "The elaborate superficial phenomenon of two humans bonding in an intimate relationship is simply put: 'a chemical reaction'. Here, two molecules bond, energy is given off; some energy goes to waste, some to purpose. If anyone finds this to be pseudoscience than perhaps ignorance is bliss."
>
> — Libb Thims (2005), "Wikipedia 'human thermodynamics' AFD discussion" (Ñº), Jun 20; cited [post #5] by **Mahesh Deva** (2012) amid dialogue (Ñº) on HT principles (Ñº), Nov 3.

Education

Deva completed a BS and MS in mechanical engineering (in the subarea of thermal sciences, with opportunity to learn deeper about thermodynamics, fluid mechanics, mathematical models, convection, heat transfer, etc.) and has experience in the philosophy of science at some university, and states that in 2012 stated that he is autodidactic in learning and interesting in furthering human thermodynamic philosophy.

References

1. (a) Deva, Mahesh. (2012). "Email to Libb Thims" [to HT.com questions email], read Oct 25.
(b) Mahesh Deva (query emailed to HT.com) – Hmolpedia threads.

θΔics

In existographies, **Mahomet Effendi** (c.1615-c.1665) (FA:68), aka Lari Mehmed Efendi, was a Turkish intellectual noted for being executed for the crime of atheism, specifically for things such as denying the raising of the dead for the Last Judgment, abstaining from the religious obligations of prayer and fasting, and supposedly denying the existence of Allah.

Overview

In 1665, or earlier (c.1655), Effendi was executed for the crime of atheism; according to British historian Paul Rycaut (1629-1700) (Q), as recounted in his 1665 *The Present State of the Ottoman Empire*, this event occured "in his time" as "he remembers", which would loosely date the execution to possibly within the last decade in retrospect or circa 1655; specifically, from the 1666 sixth corrected edition, Rycaut states: [2]

> "These then give themselves the title of *Muserin*, which signifies: the true secret is with us; which secret, is no other than the absolute denial of a deity, that nature or the intrinsical principal in every individual thing directs the orderly course which we see and admire; and that the heavens, sun, moon and stars have thence their original and motion, and that man himself rises and fades like the grass or flower; It is strange to consider, what quantities there are of men that maintain this principle in Constantinople, most of which are Kaddees and learned men in the Arabian legends, and others are renegades from the Christian faith, who conscious of the sin of their apostacy, and therefore desirous that all things may conclude with this world, are the more apt to entertain those opinions which come nearest to their wishes. One of this sect called **Mahomet Effendi**, a rich man, educated in the knowledge of the Eastern learning, **I remember, was in my time executed for impudently proclaiming his blasphemies against the being of a deity**; making it in his ordinary discourse, an argument against the being of a god, for that either there was none at all, or else not so wise as the doctors preached he was, in suffering him to live who was the greatest enemy and scorner of a divine essence that ever came into the world. And it is observable, that this man might notwithstanding his accusation have saved his life, would he but have confessed his error, and promised for the future an assent to the principles of a better: but he persisted still in his blasphemies, saying, that though there were no reward, yet the love of truth obliged him to dye a martyr**. I must confess until now, I never could believe that there was a formal atheism in the world**, concluding that the principle (of the being of a god) was demonstrable by the light of nature; but it is evident now how far some men have extinguished this light and lamp in their souls."

The event, of ironic sake, according to the 2018 banned/censored Turkish Wikipedia entry on Lari Mehmed Efendi (Q), occurred on Friday 2 Nov 1665 in Istanbul.

In 2011, Marc Baer, in his *Honored by the Glory of Islam*, states that the execution occurred in 1865 and describes it as follows: [3]

> "**Lari Mehmed Efendi** was an important Muslim in Istanbul society. He was wealthy and a member of the religious class. He was also an imam and respected for his knowledge and intelligence. But Abdi Pasha, who was given the report requesting the execution of Lari Mehmed Efendi by the sultan, relates that he was notorious for his heretical beliefs. More than forty witnesses ascertained that Lari Mehmed Efendi denied the raising of the dead for the Last Judgment and the religious obligations of prayer and fasting, all the while deeming the consumption of wine lawful. He gathered a number of Muslims around him who shared his views. He did not deny his beliefs. A fatwa was decreed permitting his execution, which was duly carried out. Mehmed IV approved his execution and insisted that Abdi Pasha include it in his chronicle; he wanted to make an example of a Muslim who denied core principles of the sultan's pious faith. After exposing him to public view at Parmak Gate, where the patriarch had been hanged less than a decade earlier, they decapitated him."

In 2016, Iiker Binbas, in his *Intellectual Networks in Timurid Iran*, reports that the event occurred in 1665, that it was "much publicized" and recorded in Ottoman chronicles: [2]

> "The atheist Mahomet Effendi, a very learned wealthy Istanbulite, was executed for proclaiming impudently 'his blasphemies against the being of deity'. **Mahomet Effendi** was in fact Lan Mehmed Efendi, a very well-known atheist whose much publicized trial and execution in 1665 was recorded in contemporary Ottoman chronicles. After his execution, his library was transferred to the treasury and then sold off at the book marker. For some reason, the palace then wanted the books back and the books, which included Larrs nachlass and books in European languages, were repurchased for the palace from the second-hand book-stores of Istanbul. It is a pity that in the archival document recording the repurchase of the books, the titles of the books in European languages are not recorded."

(add)

Quotes | On

The following are quotes on Effendi:

> "One can add to the example of Vanini that of a certain **Mahomet Efendi** who was executed in Constantinople not so very long ago for having made known his beliefs denying the existence of god. He could have saved his life by confessing his error and by promising to renounce it for the future; but he preferred to persist in his blasphemies, saying that "although he had no reward to expect, the love of truth obliged him to suffer martyrdom in support of it." A man who speaks thus necessarily has an idea of decency; and if he presses his obstinacy so far as to **die for atheism**, it must be that he has so raging a desire to be a martyr for it that he would be capable of exposing himself to the same torments even if he were not an atheist."
>
> — Pierre Bayle (1682), *Various Thoughts on the Occasion of the Comet* (Q); via citation to the 1670 French translation of Paul Rycaut's *The Present State of the Ottoman Empire*

> "**Effendi** was executed for having advanced some notions against the existence of god."
>
> — Bernard Mandeville (1714), *Fable of the Bees* (Q)

Quotes | By

The following are quotes by Effendi:

> "Although there is no recompense to be looked for, yet truth is truth, and the love of it constrains me to die in its defense."
>
> — Mahomet Effendi (c.1655), Turkish atheist (Q) for his atheism

References

1. (a) Rycaut, Paul. (1665). *The Present State of the Ottoman Empire: Containing the Maxims of the Turkish Politie, the Most Material Points of the Mahometan Religion, Their Sects and Heresies, Their Converts and Religious Votaries* (§12: Concerning the New and Modern Sects amongst the Turks, pgs. 128-; Effendi, pg. 130). London: John Starkey, 1670.
(b) See: 1666 sixth edition corrected (Q) for an example statement; first edition is difficult to find.

2. Binbas, Iiker E. (2016). *Intellectual Networks in Timurid Iran* (pg. 289). Cambridge University Press.
3. Baer, Marc D. (2011). *Honored by the Glory of Islam: Conversion and Conquest in Ottoman Europe* (pg. 114). Oxford University Press.

External links

- Lari Mehmed (Turkish → English) – Wikipedia.

θΔics

In companies, **MailCubes**, logo symbol **M³**, website MailCubes.com, is a Chicago-based, social physics (i.e. physico-chemical sociology) funding, package-friendly, smart mailbox company, that designs, builds, and installs custom smartphone connected (e.g. z-wave, radiowave, wi-fi, etc.) home package-mailboxes, each with a QR-code linked webpage (see: cubepages) i.e. home-attached or apartment complex installed mail and package combined receptacles, in replacement upgrade for outdated pre-Internet age (21st century) standard mailboxes, in a smartphone era (2007) world.

A **MailCubes** logo, a home-attached WiFi-connected mail cubical that smartly accepts packages and letters.

Overview

In 2003, "MailCube" concept, in the draft note idea stage, was conceived in by American electrochemical engineer Libb Thims, while in the process of drafting a three-volume treatise on "human thermodynamics" (see: Thims publications), itself dependent upon large scale book ordering, for research purposes, as a result of which frequent book ordering theft—up to seven or eight books stolen on one incident—became problematically, during the course of ordering some 945 books, from Amazon, from 2002 to 2015 (see: book orders).

In 2011, Prototypes began to be built and field-tested. During this period, friends and neighbors began to ask Thims to build and install MailCubes at their house. Thims, however, was still too heavily involved in research and writing; as a result of which the MailCube company realization sat on the back-burner (see: thermal word).

In 2016, after the completion of the publication of the 10-volume print set of *Hmolpedia* (see: progress report), Thims began to focus on the growth of MailCubes as a company.

In Jun 2017, a four-person staff (Q), i.e. tetra-humanide partially activated complex (see: Gates model) was in formation.

Philanthropic | Aim

> *See main: Chair of Physico-Chemical Sociology; See also: Gates model*

On 25 Apr 2016, Thims conceived the "two birds with one stone" idea that part of the proceeds from MailCubes will go towards the establishment, in America (e.g. Princeton) or Europe (e.g. Oxford), of the world's first Nightingale Chair of Social Physics, at yet to be named university, similar to the way the Rockefeller Foundation, in the 1950s, funded the Princeton Social Physics Project, or the way Ernst Solvay, from 1894 to 1910, using proceeds from his Solvay process (1861) invention, funded global social energetics conferences and education and, in France, established the Institute of Social Sciences.

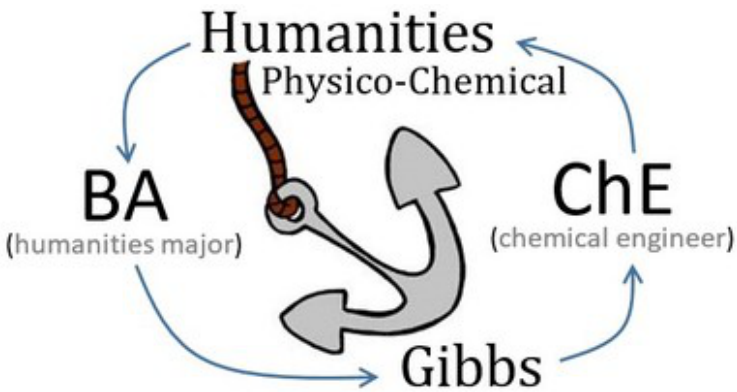

A visual of the anchor and feedback mechanism for a course outline of physicochemical humanities, the anchor subject of proposed to be **MailCubes**-funded chair.

> "I think the [following] needs doing: [we need] a scheme from someone of high authority as to what should be the work and subjects in **teaching 'social physics' and their practical application**, in the event of our being able to obtain a statistical professorship or readership at the University of Oxford."
>
> — Florence Nightingale (1891), "Letter to Francis Galton", Feb 7

The following is a 9 May 2017 conceptual diagram of free energy gear coupled mechanism (see: free energy coupling) of

MailCubes funded (fueled) Nightingale Chair model:

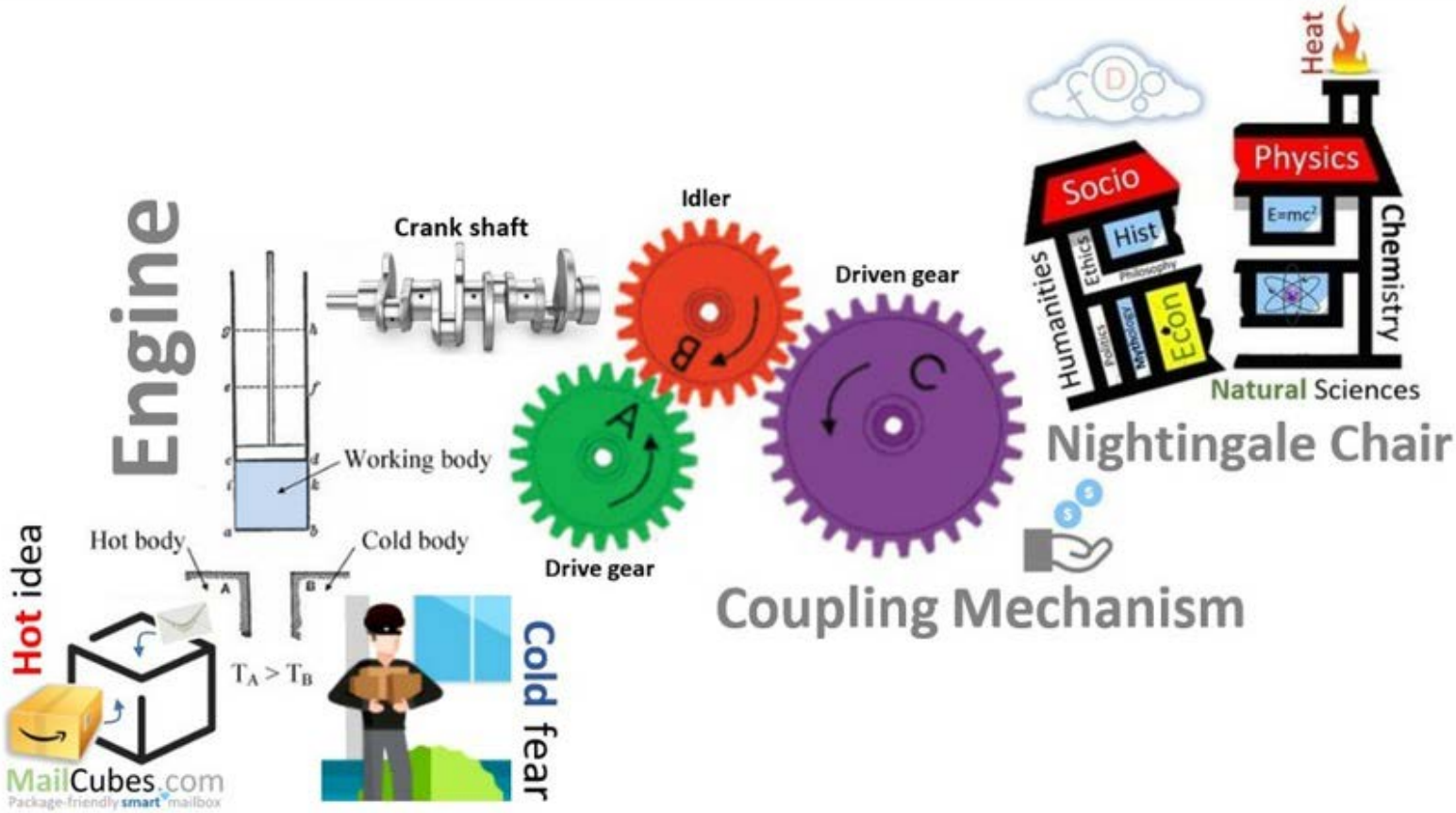

The base cost of the proposed American Nightingale Chair, as evidenced by the 2016 funded inception of the Appignani Chair of Atheism, at the University of Miami, is $2.2 million.

MailCubes | Financial structure

The following is a draft structural outline of division of proceeds:

- 5% of proceeds go towards founding and funding of Nightingale-Stewart Chair of Physico-Chemical Sociology
- 5% of proceeds go towards R&D

Investors | Principle

The following are principle investors:

- Mitchell Herzog

Quotes

The following are related quotes:

> "He who is firm in will moulds the world to himself."
>
> — Goethe (c.1810)

> "A 'smart mailbox' is not something seen very often, but it's only a matter of time until it's the latest trend in smart home technology."
>
> — Steve Karantzoulidis (2016) article (Q) on IEEE drone mail delivery prototype, Nov 2

“Ain't no delivery man in the US that's gonna go through all this to deliver a package.”

— cal30m1 (2017), post (Q) on code-opening iBin parcel delivery box, Feb

“**MailCube** is a size-efficient, low-cost, **auto-locking**, smartphone-connected, package-friendly mailbox.”

— Libb Thims (2017), company motto, wake-up thoughts on summary of verbal description of picture (Q) on business card (design #3), 9:52AM CST, Apr 30

“A **MailCube** is like a home PO Box; a kiosk-like ‘cubical’ for your home’s delivery interactions.”

— Libb Thims (2017), mental note; arisen while making savings page (plus jogged note), May 2 + Jun 14

“That’s a really cool idea. Anything that makes our job easier. I hate those ‘slots’ and having to jam everything in.”

— Mail carrier (2017), comment to Libb Thims, by anon 5’7” mail man, amid showing 6-inch rail, vertical drop, **MailCube** model design, and asking about idea installation height (him saying that his eye-level was about ideal, for most carriers), 10:30AM CST Jun 20

Further reading

● Anon. (2016). “Research: Package Theft Report” – Outsmarting Criminals at Your Front Door” (Q), August.com, Oct 25.

External links

● Home – MailCubes.com.

In existographies, **Maimonides** (1136-1204) (IQ:170|#399) [RGM:398|1,320+] (Washington 23|#) (CR:118) was Spanish-born Moroccan physician-philosopher and theologian noted for his *circa* 1190 *The Guide of the Perplexed*, wherein he states that we should ignore accident-based atomic theory because it denies the existence of god.

Overview

In c.1190, Maimonides, in his *The Guide of the Perplexed*, dismisses atomic theory based atheism as follows:

> "As for those who do not recognize the existence of god, but who believed that things are born and perish through aggregation and separation, according to chance, and that there is no being that rules and organizes the universe—I refer here to Epicurus, his sect and the likes of him, as told by Alexander—it serves no purpose for us to speak about those sects; since god's existence has been established, and it would be useless to mention the opinions of individuals whose consciousness constructed their system on a basis that has already been overthrown by proofs."

An alternative translation, with "chance" replaced by "accident", reads as follows: [3]

> "There are those who do not recognize the existence of god, but instead believe that the existing state of things is the result of accidental combinations and separation of the elements, and that the universe has no ruler or governor. These people are Epicurus and his school, and similar philosophers."

Maimonides, in overview, refers to the earlier atomic views of Epicurus and gives commentary on the doctrine of the Mutakallemim (scholars of kalam), the first principle of which is that "the universe, that is, everything contained in it, is composed of very small parts [atoms] which are indivisible on account of their smallness; such an atom has no magnitude; but when several atoms combine, the sum has a magnitude, and thus forms a body"; the second proposition of which is that the universe is a vacuum in which the atoms are found; the third proposition arguing that time is composed of 'time-atoms'. [2]

Joshua 10:13

In c.1180, Maimonides asserted his patch opinion that events described in Joshua 10:13 occurred because of "extended local daylight", without there having been any change in the movement of the heavenly spheres. [4]

Quotes | By

The following are quotes by Maimonides:

> "If the earth is thus no bigger than a point relative to the sphere of the fixed stars, what must be the ratio of the human species to the created universe as a whole? And how then can any of think that these things exist for his sake, and that they are meant to serve his uses?"
>
> — Maimonides (c.1190), *The Guide to the Perplexed* (3.14); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 100)

> "Teach thy tongue to say I do not know, and thou shalt progress."
>
> — Maimonides (c.1190) (Ñº)

References

1. (a) Maimonides. (c.1190). *The Guide to the Perplexed*. Publisher.
(b) Stenger, Victor J. (2013). *God and the Atom: from Democritus to the Higgs Boson: the Story of a Triumphant Idea* (pgs. 47-48). Prometheus Books.
2. Maimonides, Moses. (c.1190). *The Guide for the Perplexed* (pg. 261). Publisher.
3. (a) Maimonides. (c.1190). *Guide for the Perplexed* (173; II, 13). Dover, 1556
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 242). HarperOne.
4. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (Maimonides, pg. 321). HarperOne.

External links

â— Maimonides – Wikipedia.

θΔics

In existographies, **Mala Radhakrishnan** (1978-) (SNE:13) (CR:18) is an American physical chemistry professor and chemistry poet (Mindy Levin, 2011) or "chemistry professor and computational biophysical chemist" (auto-described, Q), noted for her 2003 *Chemistry of the Couch Potato*, twenty poems of which found there way into her 2011 collected works poetry chemistry book *Atomic Romances, Molecular Dances*, illustrated by American biochemist Mary O'Reilly, a collected set of 50 poems, written over a period of ten years, which employ a mix of poetry and easy-to-understand analogies, e.g. "Sex and the City" (television) to "Sex and Acidity" (poetry), to formulate what seems to be Empedocles-style / Dr. Seuss mix of poetically-rhymed chemistry aphorisms and humanized stories. [7]

Religion | Agnostic-theism

In 2016, Radhakrishnan, now with kids coming of age, began Tweeting agnostic-like theism-inclining views in respect to higher powers:

> "What if we're all just subjects, subordinate / To some higher power's reaction coordinate?"
>
> — Mala Radhakrishnan (2016), Tweet (Q), Dec 21

(add)

Overview

The following is an excerpt from Radhakrishnan's book launch BBS interview (video below):

> "When I think of chemistry, I always think of what are the atoms 'feeling' on a molecular and atomic level and in a lot of ways, the reactions that they experience are similar to the relationships that people experience."

The poems where done, according to Radhakrishnan, in an effort to help students, particularly high school students, learn thermodynamics, kinetics, and molecular reactions in a more realistic manner, namely in the framework of subjects on the mind of the typically coming of age student, such as relationships, dating, and sex, etc.

On 8 Oct 2012, Radhakrishnan began tweeting two-line rhyming chemistry poem segments, the first of which is the following: (Q)

> "Hope you'll enjoy these chemical notions
> Written as poetry in (Brownian?) motion ..."

As of 2 Jul 2014, Radhakrishnan has tweeted some 420+ tweets, the majority of which being of human chemistry, physicochemical humanities, and or poetry chemistry variety, having attracted some 480+ followers. Many of these tweets are dissected, discussed, and or ranked below, per interestingness, correctness, and or humor, depending.

Radhakrishnan-Street dialogs

In Jul, Aug, and Oct 2013, Radhakrishnan began chemistry-rhyming in tweet-communication with American chemist Shane Street, a chemistry professor at the University of Alabama (Q), who goes by the Twitter handle @SCStreet. (Q) Some of their dialogs are dissected below:

Tweets	Dissection / Discussion
Parenthood is a happy mess -- / A negative dH and a positive dS. — Mala Radhakrishnan (2013), tweet 7:17 PM Jul 30 And the excess free energy flows Into the children so they grow — Shane Street (2013), reply tweet 7:41 PM Jul 30 Ah, free energy -- that answers the question / Of how my son can be active with so little digestion. — Mala Radhakrishnan (2013), reply tweet 9:13 PM Jul 30 Little activated complexes, there's no question They run downhill in either direction! — Shane Street (2013), reply tweet 9:20 PM Jul 30 Well, now that I've given him his goodnight kiss, / My son sleeps in thermodynamic bliss! — Mala Radhakrishnan (2013), reply tweet 9:24 PM Jul 30	

(add)

Tweeter: Atomic Romances | 2+ votes | Ranked

In 2012, Radhakrishnan began tweeting sections of her poetry, via her @AtomicRomances Tweeter account. The following is a work-in-progress ranking, per combined number of re-tweets and favorites, of Radhakrishnan's chemistry poetry tweets, from 8 Oct 2012 to Jun 2014, according to her 484 followers; those with equivalent number of total votes ranked in descending order of interestingness; the up/down arrows column give indication as to closeness of rhyming segment to reality (↑) as compared to distance away from (↓) a real description and hence more closer to analogy, metaphor, and or simile (↓): [8]

			Date	Compare / See also

Total			Mala Radhakrishnan @atomicromances	↑↓		
12	6	6	If elements are like letters, and compounds like words, / Then chemistry's like poetry (especially for us nerds.)		2013 Nov 12	
10	7	3	A toddler and fluorine are worth our comparing: / Both small, reactive, and not good at sharing!		2012 Oct 18	
7	2	5	Are you ever under so much strain / That you feel like a cyclopropane?		2013 Jul 18	
6		6	The strongest of covalent bonds will unfurl, / As we welcome our new little baby girl.		2014 May 29	See: human chemical bond
6	4	2	The chiral lad says, "Though I do fancy her, / I can't bind; she the wrong enantiomer."		2013 Apr 9	
5	2	3	Life's the best metaphor for spectroscopy by far; / By seeing what excites us, we learn who we are!	↑	2012 Dec 4	Compare: "Don't ask yourself what the world needs; ask yourself what makes you come alive. And then go and do that. Because what the world needs is people who have come alive." (Howard Thurman, c.1970)
5	3	2	Career paths take decades; think hard at each junction, / 'Cause happiness isn't a state function!		2014 Jun 23	Compare: "Life is a path function. It's the path that you take from the beginning to the end; the integral of that path, that's the special part." (Christopher Edwards, 2006)
5	4	1	Kinetic control is just all about timin'; / Wait long enough, carbon's no longer a diamond...		2014 Mar 28	
4	4		Thermo, kinetics in a wedding vow? / "You're my Mr. Right!" or "my Mr. Right Now!"	↑↑↑	2012 Dec 13	Compare: the Count's proposal of five-year marriage contract (O) in Goethe's physicochemical-based *Elective Affinities* (1809).
4	2	2	What if our free will is just an illusion, / And everything happens through random diffusion?		2014 Jun 16	
4	1	3	Just when you can't handle more on your plate, / Your life throws you another		2014 Jun	

			transition state.	12	
4	2	2	"I cannot covalently bond with you, / So these van der Waals forces will just have to do ..."	2014 Apr 4	
4	3	1	Said red litmus to base, "It's tough bein' with you; / Wherever we go, you make me so blue."	2013 May 29	
4	2	2	Social media's like dense noble gases — / We still feel alone as we collide with the masses...	2014 Jan 30	
4	2	2	When folks act like fluorine, then this we agree on — / It's best to stay calm and unruffled, like neon.	2014 Jan 23	
4	2	2	We lefties are ignored in the design of each fixture, / 'Cause humans are not a racemic mixture.	2013 Oct 2	Ruminate on.
3	2	1	Electrons and little boys, they bear some relation: / 'Cause neither one has a defined location.	2013 Nov 6	See: human molecular orbital; human electron / free electron
3	3		Chemists and artists are similar factions; / Both carefully toil, then await a reaction.	2013 Aug 2	
3	1	2	Go runners; I know you'll pass, at a great rate, / The heartbreak hill transition state!	2014 Apr 21	
3	2	1	Oh [Red] Sox, how the balls off your bats recoil / Like particles alpha off Rutherford's foil...	2013 Oct 23	
2		2	Adults like stability and calm, it's a given. / Children, however, are entropy-driven.	2014 Feb 14	
2	1	1	May your love be much stronger than any can fathom, / Dwarfing the bonds between nitrogen atoms [N≡N] .	2014 Feb 14	
2	1	1	Nerves? Or fear? Or QM, perhaps? / When my teaching's observed I always "collapse!"	2014 Apr 18	See: wave function collapse
			Be safe; a hurricane makes us see /	2012	

2	2		The power of PV = nRT.	Oct 28	
2		2	Of all of our dads are we very much fond; / Thanks for your lasting, covalent bonds.	2014 Jun 15	See: human chemical bond
2	1	1	"Friends or dating?" You answer with hesitance: / "It's complicated — best modeled by resonance ..."	2014 Feb 4	Compare: [10]
2	1	1	I can't surmount the / Activation barrier / For writing haikus...	2014 Mar 1	
2		2	He gets to see Santa! My son shows such verve, / But up close, he gets shy ... (like a Lennard Jones curve ...)	2013 Dec 7	
2	1	1	Winter is putting your gloves, hat, and coat on, / And at 5PM seeing the sun's last photon ... :(	2013 Nov 13	
2	1	1	When it's cold I just wanna curl up in a ball. / (My partition function becomes really small.)	2013 Nov 11	
2	1	1	Stay true to your love, if I may say so: / A 1-to-1 stoichiometric ratio ...	2013 Sep 17	● Molar ratios – ChemTeam.info.

Tweeter: Atomic Romances | 1-vote | Ranked

The following is a work-in-progress ranking of Radhakrishnan's chemistry poetry tweets, with one favorite or re-tweet, semi-ordered via interestingness: [8]

Total			Mala Radhakrishnan @atomicromances	↑↓ Date	Compare / See also
		1	Said a lover to another, all smitten and googly-eyed, / "May a bond forever connect our nuclei!"	2013 Oct 9	
			Ten years ago he and I became "us." /	2013	

1	Our catalyst? Oddly, a Greyhound Bus...!	Dec 1	See: dihumanide molecule; substrate
1	I'm uncomfortable replacing old with new, / Like a transition state of an SN2 ...	2013 Oct 13	
1	Can't handle more input, 'cause what I do know / Is there's just no more space left in my LUMO.	2014 mar 19	Note: LUMO = lowest unoccupied molecular orbital (compare: HOMO) (O)
1	With a newborn, our energy's quite a bit less, / And we all feel a positive Delta S!	2014 Jun 3	See: $\Delta G > 0$
1	It's Spring Break: time to change your orbital's look, / And at times, have a node at your chemistry book!	2014 Mar 20	See: human molecular orbital theory
1	Traveling spouse, tough to communicate; / Wish we were a quantum entangled state...	2014 Mar 22	
1	Reducing emotions to chemicals seems tragic, / But to me, the chemistry of love's like magic!	2014 Jun 18	
1	When my son so happily smiles at me, / Then I've globally minimized delta G!	2013 Sep 13	
1	With toddlers, you "pick your battles" to win. / But then you end up in a local min...	2013 Sep 13	
1	“Two roads diverged in a …wood,” Frost wrote, / But if I were an electron, then I would take both!	2012 Nov 8	Compare: Morgan Peck (M. Scott Peck) and his entropy-filled *The Road Less Traveled* (1978).
1	Green photon asks red photon, “Hey there, what’s nu?” / “Just four-hundred-fifty terahertz… and you?”	2012 Nov 19	
1	You ever feel like you don’t fit in all that well? / Well, that’s what an electron feels in a valence shell ...	2012 Nov 12	
1	Three toddler boys sharing? Must be an illusion! / (They follow a variant of Pauli Exclusion!)	2012 Nov 24	
	Stirring a reaction removes all the		

1	waiting / By giving reactants a chance at “speed dating.”	2012 Nov 17	
1	A toddler stuck indoors, you ask? / Like a heated gas in a stoppered flask!	2012 Oct 29	
1	Nerdy pick-up line of the eon: / “You excite me like red light does to neon!”	2012 Oct 25	
1	Getting a toddler to finish his rice / Is harder than ionizing hydrogen...twice!	2012 Oct 11	
1	Is your spouse occasionally being a pain? / Like cyclopropane, you've got some "ring strain"!	2014 Jun 28	
1	My son loves new sister, adjusts in his way / To a new steady state (like Le Chatelier?) Though I fear it would be quite a family mess / If (like Le Chatelier) he *opposed* the stress!	2014 Jun 4	
1	I'm kinetically stuck in a paralyzed state; / My chemistry tweets will have to wait...	2014 Mar 6	
1	My son's free energy's never deficient, / By his high activity coefficient!	2014 Mar 1	
1	Use caution online, 'cause it's not an illusion: / What you say can spread faster than random diffusion!	2014 Feb 28	
1	Doing what's fast (not what's best) takes its toll, / But sometimes I'm under kinetic control...	2014 Feb 22	
1	To TV are my son's eyes glued, of course, / With the strength of the strong nuclear force ...	2014 Feb 12	See: human chemical bond / electromagnetic force
1	Reworking a paper for resubmission / Is somewhat like tweaking reaction conditions...	2014 Jan 21	
	You'd think that with temperatures being so low, /	2014	

1	My life would get stable and ordered ... but no.	Jan 9	See: third law of thermodynamics
1	My son's jigsaw puzzle I see on the floor, / And I'm reminded of a hydrophobic core.	2013 Nov 25	
1	My son's love for kinetics, it leaves me quite weary. / With toy cars, he studies "collision theory"...	2013 Nov 15	
1	Love at first sight is a potent allusion / To reactions limited but by diffusion ...	2013 Nov 7	
1	"Expressing my love, how close can I get? / I'd need an infinite basis set ..."	2013 Oct 8	● Basis set (chemistry) – Wikipedia.
1	Our government should learn from ionic bond-making: / Opposites partner through giving and taking.	2013 Oct 6	
1	Multitasking is something I hate, / In a superposition of eigenstates!	2013 Oct 2	
1	When art meets science, it's truly phenomenal. / So let's stop thinking that they are orthogonal.	2013 Sep 26	See: Alec Groysman
1	Quantum mechanics is simple, you see; / It's as easy as (n equals) 1, 2, 3!	2013 Sep 24	
1	It's tough to relax my son for his slumber, / To lower his principal quantum number...	2013 Sep 22	

Noteable / Interesting | Ruminate | No-votes

The following are a few interesting tweets, without actual votes, *per se*, but ones, nevertheless, to make note of, ranked according to interestingness, humorfulness, and or statements to be ruminated on:

Total		Mala Radhakrishnan @atomicromances	↑↓	Date	Compare / See also

In life we all have a simple purpose: / To explore our potential energy surface.	2013 Sep 4	Funny!
Ignorance is bliss, 'cause you sit with a grin, / Unaware that you're just in a *local* min.	2013 Nov 25	
My first gray hair ... the imposition / Of a slow, unwanted phase transition ...	2013 Oct 31	See: Henry Adams
The events in our life we consider fantastic / Are not planned or determined, but are often stochastic ...	2013 Oct 27	Ruminate on.
Happy New Year; may you reach a new low / Of your free energy; may your happiness grow!	2014 Jan 1	[??]
One's love for another cannot be undone, / Like two wavefunctions linked and convolved into one...	2014 Feb 14	
...And I reach such thermodynamic bliss / By giving my sweet little daughter a kiss!	2014 Jun 26	Re "thermodynamic bliss", see: pg. 90. [1]
Go Red Sox – how awesome a game is this? / You bring us such thermodynamic bliss.	2013 Sep 4	Ditto (per above)
It's instinct -- such negative delta G / To smile back when my newborn "gas-smiles" at me!	2014 Jun 26	
Here's a lesson from metallic reactions: / Stay *positive* in all of your interactions!	2014 Jun 21	
Finding love and good friends are stochastic missions; / Just try hard and hope for productive collisions!	2014 Mar 30	See: collision theory
Warm weather increases each rate of reaction - / My son quickly took his nap - no distraction!	2014 Apr 12	Compare: Q&A (segment: 44:00-47:15), of 16 Apr NIU lecture,

Spring cleanin' this weekend? No way, I'll be livin'! / The weather's so warm I'll be entropy-driven!	2014 Apr 11	
Social media may increase collisions, / But each encounter sees less fruition...	2014 Jun 19	See: collision theory
Some paths aren't reversible — no turning back — / Like the coordinate that captures the tenure track ...	2014 Mar 13	Compare: “I did not embark on experiments on consciousness in alert people until after I had obtained the security of academic tenure.” (Benjamin Libet, c.1990)
Decisions would cause less trepidation / Under many worlds interpretation ...	2014 Jun 6	See: human quantum mechanics
Stability's what diverse friendship brings; / Be like carbon and bond to multiple things!	2014 Mar 1	
Congrats to the grads — your future awaits, / With newly accessible microstates!	2014 May 30	See: S = k ln W
Stay balanced — the secret to life, they say; / Keep trying to get Q to equal your K.	2014 Apr 23	Note: If Q > K, then there are more products present than equilibrium and the reaction will produce more reactants shifting the reaction to the left. If Q > K, then there are more reactants present than equilibrium and the reaction will produce more products shifting the reaction to the right. If Q = K, then the reaction is already at equilibrium and there will be no shift. (Q)
It's Spring, and my son goes outdoors with gumption / And boosted translational partition function!	2014 Apr 3	
It might be rough; few things may seem bleaker, / But stay afloat - don't precipitate out of the beaker.	2014 Feb 24	Compare: “I have almost finished your book, which I really enjoyed by the way. I can agree with the adult-adult bond; however, I tend to view the child as a possible product or precipitate, not as additional bond. I am coming from a mechanical engineering background, so my vantage point is different. I tend to see life, learning, and relationships as Carnot cycle type events.” (Melanie, 2009) (Q)
	2014	

All this snow - I'm sick of it! / Its chemical potential — infinite!!	Feb 18	??
My spouse, a year older? Let's fix the confusion. / Birthdays, they quantize time — an illusion...	2014 Feb 9	
The better team? Well, you do the math... / Which one has the greater mean free path?	2014 Feb 2	Compare: William Ramsay's 1898 'football players' explanation of kinetic theory, wherein the players are likened to a 'throng of human molecules'.
Can kids feel eclipsed by a sibling that's new, / Like a leaving group made by a swift SN2 ...?	2014 Jul 1	
Now that my week's work is all done, / I'm on couch; my partition function is one!	2014 Jan 31	
In auto-pilot by my own admission; / My days have periodic boundary conditions ...	2014 Jan 28	??
Your finals are done. May your days now be merrier; / Congrats on surpassing the energy barrier!	2013 Dec 20	See: activation energy
Just aimlessly seeking my best — know the feeling? / 'Cause life's just a run of simulated annealing ...	2013 Nov 7	● Simulated annealing – Wikipedia.
Patience: required with kids, but the wait / Can be quite an unstable transition state!	2013 Oct 5	See: Mirza Beg
Perhaps we'd unite and we'd see beyond borders / By modeling all people to only first order.	2013 Sep 19	??
Entropy's got me feelin' encumbered / By fatalist laws of very large numbers ...	2013 Sep 3	What?
Our vacation will make the whole family merrier, / But packing's a really big energy barrier ...	2013 Aug 22	
If our energy's low but high pressure we feel, / Then, just like a gas, things won't	2013 Aug	

	be ideal.	22	
	Now all that *our* love lives should need is patience / (and our own personalized Schrodinger equations!).	2013 Aug 19	See: Moriarty-Thims debate (comments: #11, #18, etc.)
	How neat that molecular romantic relations / Can be modeled by partial differential equations!	↑↑↑ 2013 Aug 19	
	Your core group of friends will stay with you through hell. / The rest of your friends are your valence shell.	2013 Aug 19	
	Life is like chem; the goal's to be able / To bond well with others so we can be stable.	2013 Aug 17	See: chemical teleology

(add discussion)

Nonsensical | Analogy over-stretches | Off / Incorrect

The following are rhyming tweets, albeit ones without underlying correct logic structure:

Total	Mala Radhakrishnan @atomicromances	Date	Compare / See also
2	Cleaning is futile. Denial's a flaw. / There's no use in fighting the second law.	2013 Sep 21	This is what is called thermodynamic folklore. Nowhere in *The Mechanical Theory of Heat* does it state that rooms become messy because of the second law. This one has issues galore; Goethe, e.g., devoted what he referred to as his "best book" to this subject, even naming the title cryptically (see: title decoding) as such:
	Your choices to no one should e'er be subordinate, / 'Cause you should control your reaction coordinate!	2013 Sep 21	Die Wahlverwandtschaften [≡] The Choice [of one's] Electives [or] Attractions [to things or people] We do, however, see Radhakrishnan, to her credit, recanting towards correctness in 2014, per tweet reform, see: “free will” section (below).

2	1	1	What's the state function that's best for my measure? / It's enthalpy ... (I'm under constant pressure).	2013 Sep 23	Incorrect (but close): the state function for earth-bound freely-running reactions is free energy; this is because they occur in isothermal and isobaric reaction conditions. This was explicitly explained by Lewis in 1923; see: human free energy (theorists). Regarding the general query: “whoever said state functions apply to humans?” (JHT potentials), see: Moriarty-Thims debate (2009), e.g. comments: #128, #160, etc.; The Literate Engineer's Jun 2005 comment (in Libb Thims (attack)); and also: Ilya Prigogine’s 1977 Nobel Lecture “obviously” comment.
	1		My son loves his noodles, but rather than eat 'em, / He explores their vibrational degrees of freedom.	2013 Oct 1	Dumb.
			My brain can't accept your contribution. / (It's officially a saturated solution...)	2013 Oct 11	Sounds off?
4	1	3	The perfect lecture, paper, or rhyme? / The limiting reactant is always ... time.	2014 Feb 6	Correct: time is not, technically, a limiting reactant; only a chemical species can be such.
2	1	1	Some call it "hump day", but as chemists, we say, / "It's Wednesday, the energy barrier day!"	2013 Nov 20	
2		2	My productivity I'd like to keep, / But the limiting reactant now ... is sleep!	2014 Jun 5	Correct: sleep is not, technically, a limiting reactant; only a chemical species can be such.
2		2	Thank you, Enya — best catalyst by far / For getting my son off to sleep in the car ...	2014 Mar 21	Note: something seems amiss in this fragment; to the effect that a person who gets someone to fall asleep, say by singing a lullaby, does not seem to be an actual “catalyst”, such as how Goethe (1809) defined Mittler, the mediator, as the facilitator of marriage reactions; how Johann Dobereiner discovered (1823) that platinum (the “catalyst”) sponge could cause the combustion of hydrogen and oxygen at room temperature, a process he referred to as “contact action”, later to be called “catalysis” by Jacob Berzelius (1835); or how American chemical engineer Scott Fogler, in his 1992 *Elements of Chemical Reaction Engineering*, argues that a person who starts a riot and then ducks out before things get violent would be an example of a human catalyst: [11]

					"A catalyst is a substance that affects the rate of a reaction but emerges from the process unchanged. A man inciting a mob to riot and then ducking out before the tanks roll in can be regarded as a catalyst."
					See: human catalyst
			In catalyzing my son's naps, I am the worst; / 'Cause during the process, I fall asleep first!	2014 Feb 2	Ditto (per above)
3	2	1	Some opportunities aren't to be missed. / So go for it – be your own catalyst.	2014 Sep 8	A molecule cannot be its own catalyst; this seems to be put self-help nonsense.
		1	The contents of baby's colon and bladder — / They violate conservation of matter!	2014 Jun 26	Correction: there is no law "violations" in or between humans, e.g. violations of the second law, or energy conservation violations, etc..
			O, thermal equilibrium, take hold at last — / Please bring me some heat from Alaska real fast ...	2014 Jan 24	Something seems amiss here [?]
			Changing son's outfit requires a wait / Through his half-naked high energy transition state...	2013 Nov 10	
			On couch and watching the Sox on TV; / I've achieved my minimum delta G!	2013 Sep 7	Something doesn't make sense here??

The point, to note, in listing the above "incorrect" poetry segment rhymes, is for the sake of clarity. Incorrect statements, done in fun or pun, may often germinate and lead, in science in particular, to a proliferation of confusion; the classical 1939 John Neumann-Claude Shannon conversation about entropy, and the so-called Shannon bandwagon that followed, is the prime example. [9]

Free will

The following shows Radhakrishnan's probing tweets at the free will problem, as physical chemistry sees things, listed in in *reverse chronological order*, showing her getting closer to mark, i.e. correctness, as evidenced by more tweets, as time progresses, as she practices and improves on earlier tweets:

> What if our free will is just an illusion, /
> And everything happens through random diffusion?

— Mala Radhakrishnan (2014), Jun 16 (4 votes)

Classical, quantum — both give me a chill, /
'Cause both do imply that I have no free will ...

— Mala Radhakrishnan (2014), Feb 1 (0 votes)

What if our free will were just an illusion, /
Our "trajectories" laid out by steered diffusion?

— Mala Radhakrishnan (2014), Jan 21 (0 votes)

Your choices to no one should e'er be subordinate, /
'Cause you should control your reaction coordinate!

— Mala Radhakrishnan (2013), Sep 21 (0 votes)

(add discussion)

Human chemical bonding

Radhakrishnan, in her aggregate Tweets, employs the concepts of: strong nuclear force, ionic bond, covalent bond, triple bonds, and the van der Waals force, each in various scenarios, as analogy models of the human chemical bond.

(add aggregate discussion)

Morality

Radhakrishnan subtly touches on aspects of the implications of the physicochemical purview in regards to questions of human morality and social norms. The following are the last three stanzas from her "The Flirt and the Inert" poem:

Morally-neutral
(legal)

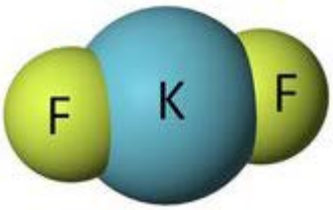

KF_2

Immoral?
(illegal)

MF_2

Left: the space-fill model of the molecule krypton difluoride (Q), which, according to Radhakrishnan, is a happy atomic threesome, formed via covalent bonds; a legal bond according to the laws of chemistry. Right: an image of a Washington man married to two women, i.e. a trihumanide molecule, which is illegal under federal and state laws. (Q) The so-called moral or ethical nature of marriage has recently been a topic of debate,

particularly in regards to same sex marriage, many recoiling back to Biblical views to find their bearings. (Q) To cite one recent position, arrived at by three scholars: (Q)

> "We must guard against attempting to use ancient texts to regulate modern ethics and morals, especially those ancient texts whose endorsements of other social institutions, such as slavery, would be universally condemned today, even by the most adherent of Christians."

Here, Radhakrishnan would seem to concur and advocate for the use of the physical chemistry texts, over that ancient texts, to regulate modern ethics and morals, a position argued by Goethe some 200 years ago.

The fluorines together exuded such charm
That krypton, inspired, thought, "Hey, what's the harm?"
"You both look so happy. Can you give me some?"
And through covalence they formed a threesome.

This threesome most certainly broke town convention.
The octet police screamed, "You *need* intervention!"
But once they arrived, it was clearly too late,
'Cause krypton's valence was *ten* … and *no* longer *eight*!

But the KrF_2 floated blithely along,
And they strongly maintain that they did nothing wrong.
The rules of *chemistry* shape what's worth making,
While human-made rules are sometimes worth breaking!

Here we see Radhakrishnan touching on what is otherwise known as the Goethean revolution, namely the paradox between the rules of chemistry and the rules of humanity, which are inconsistent on many points, in regards to legality and morality. A man, e.g., can legally marry a woman, whereas, in most societies, polygamous or polyandrous societies aside, a man cannot marry two women legally nor can a woman marry two men legally. In chemistry, however, one krypton Kr atom can bond "blithely", as Radhakrishnan puts it, to two fluorine F atoms to form krypton difluoride KF_2, a bonding that "broke town convention", as she says. This is quaint statement is reminiscent of Goethe's late December 1809 famous defense statement, when attacked by a woman, about his physicochemical-social interaction theory (i.e. human chemical theory), as reported by Heinrich Laube (see: best book), namely that: "conventional moral norms can turn into sheer immorality when applied to situations of this character." Town conventions and human-made rules, in short, are rooted, historically, in world religions, 75 percent of which are rooted in Anunian theology, and in turn the negative confessions (backbone to the ten commandments); subsequently, in the Bible, the morality go-to text for 33 percent of the world, we find 16+ proscriptions (Q) about marriage, such as:

> "It is good for a man not to marry. But since there is so much immorality, each man should have his own wife, and each woman her own husband.Now to the unmarried and the widows I say: It is good for them to stay unmarried, as I am.But if they cannot control themselves, they should marry, for it is better to marry than to burn with passion.To the married I give this command (not I, but the Lord): A wife must not separate from her husband.But if she does, she must remain unmarried or else be reconciled to her husband. And a husband must not divorce his wife."

These types of god-based commandments, via comparison with Radhakrishnan poetry, as we see, do not corroborate. Either singlehood or a two-some is the only bound state or bond sanctioned as moral in the Bible. Likewise, once bonded, e.g. in matrimony, or in united as a dihumanide molecule, in hmolscience speak, or say in a dihydrogen molecule H_2, the two "must not separate", but if they do they must remain unmarried (unbonded). If, however, hydrogen breaks from its bond with hydrogen, it may very well bond with oxygen to form water H_20, which is something proclaimed as "immoral" according the rules of the Bible, but not so according to the rules of chemistry, as Radhakrishnan points out.

This is what caused Goethe, in 29 Jan 1830 commentary to Carl Zelter, to gripe (see: Goethe timeline) about the inconsistencies between the ten commandments and rules and laws physical chemistry and how his *Elective Affinities* (1809) was themed on a dialectic about the sixth commandment (thou shall not commit adultery). The subtle implications of this correction to human thinking will invariably result in an "immense sweep of consequences [that] will affect the whole scope of morals and social order", as American woman's rights activist Victoria Woodhull put it in 1871. As to when this moral revolution will actuate, is anybody's guess? If, by comparison, it took 2,369-years for atomic theory to become accepted as fact (Leucippus' circa 460BC introduction to Ostwald's 1809 recant) and some 1,940-years to accept heliocentrism (Aristarchus' circa 250BC proposal to Newton's 1687 *Principia*), who is to say how long it will take for the acceptance of Goethe's 1809 proposal to matriculate?

Poetry | Technique

The following is Radhakrishnan's poetry technique, from her *Atomic Romances, Molecular Dances* (2011), which she seems to employ paragraph after paragraph, namely to make the last words of of the first and second sentence, and third and fourth sentence, of each stanza rhyme:

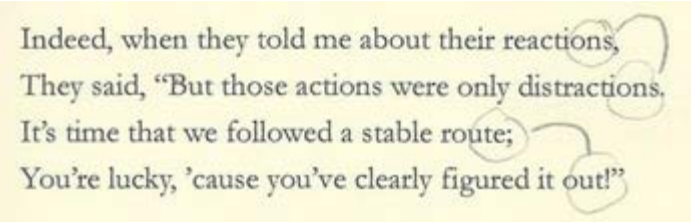
Indeed, when they told me about their reactions,
They said, "But those actions were only distractions.
It's time that we followed a stable route;
You're lucky, 'cause you've clearly figured it out!"

This technique, to note, becomes rather tedious; by page 29 of her *Atomic Romances, Molecular Dances*, e.g., things begin to feel rather repetitive; though, once into the thermodynamics and kinetics poems, in pages 60-90, wherein the mind slows, as the blurry transition from analogy to realty ensues, the poems begin to flow better.

Discussion

Radhakrishnan gives descriptions of, for example, how "atoms and molecules fall in love and cheat on each other", among other extrapolations, and or realisms, such how her poem "The Ion without a Name", about an ion who meets another ion on a bus, is similar to how she met her husband on a Greyhound bus. [3] In her poems, she seems to use a mix or blend of the extrapolate downward and the extrapolate upward approach; although more so, it seems, the former over the latter. In her own words: [5]

So how come the methanol boils at this point,
But water can't seem to break out from this joint?
Well, water's got two "H's" bonded to "O,"
While methanol has only one, as you know.

An excerpt from Radhakrishnan's poem "The Foiling Point of Water", comparing the boiling points between methanol CH_4O and water H_2O, wherein one can sense the Dr. Suess flow of presentation. [6]

> "I really try to humanize atoms and molecules".

In this statement, to note, there is a bit of a backwards irony, in the sense that a human is *in fact* a molecule, at least according to the modern 21st century molecular formula or rather human molecular formula definition of things, and thus efforts to "humanize molecules", must be approached with a strong grain of salt, so that the humanization process

does not become a game of incongruous charades or possibly false statements.

A few classic ventures down this path include: Dutch chemist and physician Herman Boerhaave stating that that force of affinity is “love, if love be the desire for marriage” (1732) and French chemist Jean Dumas commenting on this “there is some truth in Boerhaave's poetic comparison” (1837); speculating about the "feelings" (or not) of molecules in relation to each other's proximity (James Maxwell, 1878, in commentary on Carl von Nageli); speaking of “living and dead hydrogen atoms” (Albert Mathews, 1924); making assertions about the "free will", or lack there of, of molecules in respect to human molecules (C.G. Darwin, 1952), among others, each of which must be investigated in great detail, so that the entire presentation does not result to be a slipshod mess of agenda-based panpsychism (e.g. Christian de Quincey, 2002).

Someone who may well represent a sound middle ground in this approach is French engineer and chemical thermodynamicist Francois Massieu who in the 19th century compared humans to molecules, in their chemical composition, and then in this mindset addressed the puzzles as to how a molecule, such as water H_20 (or by extension a human) can have a body and soul (in the scheme of water being split up into oxygen O_2 and hydrogen H_2); or be alive vs dead; have morality, exist, and other philosophical issues. Modern approaches to these questions are well addressed in the the task of assigning chemical education homework problems to students to work out solutions on their own, although not without first giving some guidance of paths to avoid, as having traditionally being dead ends.

History

In *circa* 1998, Radhakrishnan wrote her first poem for an on-campus poetry reading, and the feedback was so good that she kept writing them, eventually becoming known in the Boston poetry scene, though typecast, she says with a laugh, as the ‘chemistry poet’.

In more detail, her parlay into poetry started when a friend invited her to an open mic poetry slam (when?), where she observed and became fascinated with what was going on. Although her first poems weren’t about chemistry, they eventually turned to this subject. Her first chemistry poem was “As the Magnetic Stir Bar Turns”, which she read at the open mic. One of her opens discusses the concept of a matchmaker as a human catalyst

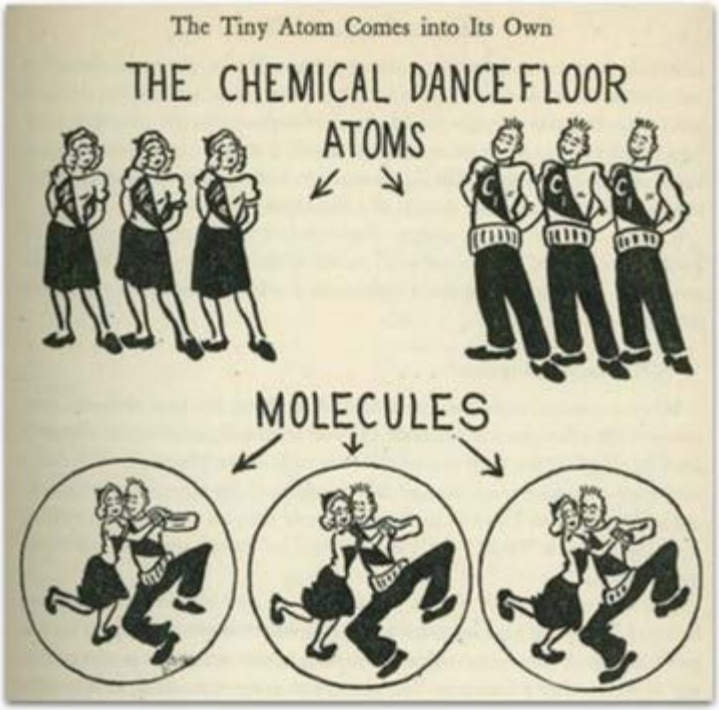

A comparative illustration of “dancing molecules” from English chemist Maxwell Eidinoff’s 1947 book *Atomics for the Millions*, in which, similar to Radhakrishnan, he employs analogy and or realism for illustrative teaching purposes. [4]

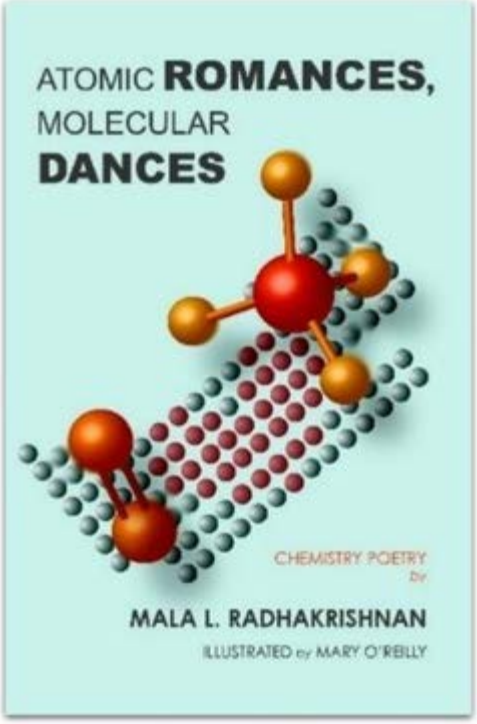

Cover to Radhakrishnan's 2001 *Atomic Romances, Molecular Dances* which uses poetry and anthropomorphic chemistry illustrations to teach chemistry and physical chemistry concepts. [1]

Some of her other poem titles include: "Limiting Love", "The Flirt and the Inert", "Bridge Over Troubled H_20", "The Radioactive Dating Game", and the "Amalgam in the Middle".

After completing her undergraduate degree at Harvard in 2000, in chemistry and physics, she spent several years teaching high school chemistry at San Jose, California, through the Teach for America program, during which time she

began to employ the poetry teaching tactic to facilitate learning. After leaving San Jose to attend MIT, she continued to write scientific poems. When she realized that her poems could be educational, not just entertaining, she began choosing topics that students tend to struggle with, such as entropy and thermodynamics. [3] Her poems have since appeared in a textbook and in journals, to name a few: *Biochemistry and Molecular Biology Education*, *ChemInformation*, *Technology Review*, and *Tech Talk*. [6]

Education

Radhakrishnan completed here AB in chemistry and physics at Harvard College in 2000 and her PhD in physical chemistry, with a dissertation on "Tackling the Bigger Picture in Computational Drug Design: Theory, Methods, and Applications to HIV-1 Protease and Erythropoietin Systems", from MIT in 2007. Currently she is an assistant chemistry professor at Wellesley College, where her research interests are interdisciplinary, combining chemistry, physics, biology, applied mathematics, and computer science (computational modeling), with focus on understanding modeling of drug-receptor interactions (see: drug-receptor thermodynamics) at the molecular level. [2]

See also

- Literature chemistry
- Literature thermodynamics
- Equation of love
- Barri Gold (*ThermoPoetics*, 2010)
- Erich Muller (similar teaching style)
- James Ferri (ChBE student-produced HT-applied video projects)
- John Hodgson (*Molecules Humans*, 2002)
- Johann Goethe (top ten greatest poets; *Elective Affinities*, 1809)
- "The Story of the Contented Molecule" (1941)
- Primo Levi (*The Periodic Table*, 1975)

A 2011 BBS interview with Radhakrishnan about her chemistry poetry.	Radhakrishnan reading her poem "The Radioactive Dating Game".

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(c) Dancing molecules (photo) – WeHeartIt.com.
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● The Radioactive Dating Game – Facebook.
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● Atomic Romances (Mala Radhakrishnan) – Twitter.

θΔics

In hmolscience, **Malcolm Gladwell** (1963-) is an English-born Canadian writer noted for his 1996 to present publications on laymanized social physics, his 2000 *The Tipping Point*, in particular, being his most famous work.

Overview

In 1996, Gladwell penned a *New Yorker* article entitled "The Tipping Point" discussing tipping point theory in social terms.

In 2000, Gladwell expanded on his article into the book *The Tipping Point*, which introduced Mark Granovetter, Robin Dunbar, six degrees of separation, connectors, etc., style social physics like theory to the lay public, and therein became Amazon's best-selling book of the 2000s, owing to his fun presentation method of laymanizing classic sociological, epidemiological, and human physics type studies into a easy to read style for digestible for the general public.

In his work, he popularizes and discusses topics such as the Dunbar number; the idea of social 'tipping points'; the components of social networks, i.e. people acting as connectors, mavens, or salesman; American neuroscientist William Condon's 1960s studies of 'cultural microrhythms' or human micromovements, i.e. the rhythms of human interactions when studied at the 1/45th of a second frame-by-frame scale, the psychology of stickiness factors in relations to attention spans.

In 2005, Gladwell published the followup book *Blink*, one of the focal points of the book been the marriage stability measurements of American mathematical psychologist John Gottman. [2]

In 2008, Gladwell, in his *Outliers* digs into the mechanics of genius development, wherein he finds that scientific geniuses, sports stars, musical greats, and billionaire entrepreneurs all have the common factor of 10,000 project input hours. [3]

Education

Gladwell was 11 he would frequently wander around the offices at the University of Waterloo where his father was professor emeritus of mathematics, which is said to have stoked his interest in reading and libraries. [4] In 1984, Gladwell completed a BA in history at the University of Toronto, after which he spent the next decade or so working as a journalist for various publications covering a mixture of science, business, and fashion.

Gladwell's iconic 2001 "tipping point" match image; possibly inspired from the string of burning matches on Mark Buchanan's 2000 *Ubiquity: Why Catastrophes Happen*, both of which allude, seemingly via allegory, Buchanan more directly than Gladwell, , e.g. Buchanan's assertion that the "forces" behind the nineteen-year-old Bosnian Serb Gavrilo Princip, a member of the terrorist organization Black Hand, acting or "working" to pull the trigger of a gun pointed at Austro-Hungarian archduke Franz Ferdinand, thereby "tipping" history into WWI and then WII, to the premise that small but significant social heat like triggers work or act as social activation energy barrier surmounters.

In 1996, Gladwell started at *The New Yorker* with the desire to "mine current academic research for insights, theories, direction, or inspiration." Gladwell gained popularity with two *New Yorker* articles, both written in 1996: "The Tipping Point", on epidemic tipping points, and "The Coolhunt", and the science of studying what is cool. These two pieces would become the basis for Gladwell's first book, *The Tipping Point*, for which he received a $1 million advance. When asked for the process behind his writing, he said "I have two parallel things I'm interested in. One is, I'm interested in collecting interesting stories, and the other is I'm interested in collecting interesting research. What I'm looking for is cases where they overlap." [5]

Quotes

The following are noted quotes:

> "I am explicitly turning my back on, I think, these kind of empty models that say, you know, you can be whatever you want to be. Well, actually, you can't be whatever you want to be. The world decides what you can and can't be. And the appropriate place to provide opportunities is at the world level, not the individual level."
>
> — Malcolm Gladwell (c.2008) (Ñº)

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2. Gladwell, Malcolm. (2005). *Blink: the Power of Thinking without Thinking.* Little, Brown, and Co.
3. Gladwell, Malcolm. (2008). *Outliers: the Story of Success.* Hachette Digital, Inc.
4. Grossman, Lev. (2008). "Outliers: Malcolm Gladwell's Success Story". *Time*, November 18, 2008.
5. Jaffe, Eric. (2006). "Malcolm in the Middle". APS Observer. *March*.

External links

â— Malcolm Gladwell – Wikipedia.

θΔics

In existographies, **Malcolm Slesser** (1926-2007) was a Scottish energy economist, noted for []

Quotes | By

The following are quotes by Slesser:

> "Human labor should be excluded from energy cost because the development of technology has essentially replaced man a source of work, used in the thermodynamics sense, to man as a decision maker."
>
> — Malcolm Slesser (1978), *Energy in Economy* (pg. 59) [1]

References

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(b) Adams, Richard N. (1988). *The Eighth Day: Social Evolution as the Self-Organization of Energy* (pg. 97). University of Texas Press.

External links

â— Malcolm Slesser – Wikipedia.

θΔics

In cellular thermodynamics, **Malcolm S. Steinberg** (c.1930-) is an American cellular pathologist noted for his 1964 cell adhesion theory or differential adhesion hypothesis, sometimes referred to as the "Steinberg model" or "thermodynamic hypothesis" (although this term is also used to refer to 1950s protein folding theories of Christian Anfinsen), a model that explains patterns of cell sorting based on thermodynamics principles. [1]

Overview

In the 1960s and 1970s, in his laboratory, Steinberg hypothesized that mixed type aggregates of cells segregate into several homogeneous structures analogous to phase separation of immiscible liquids, such as oil and water, as famously noted by Empedocles, that do not form a homogeneous mixture, but instead separate to prefer adhesion with "like" elements.

Steinberg's 1963 article "Reconstruction of Tissues by Dissociated Cells" cites the earlier 1939 tissue affinity theory of German-born American embryologist Johannes Holtfreter who, together with his student P.L. Townes, who suggested that "the directional migration of the cells as well as the elective affinities (forerunner to free energies) of cells ruled the organization of these recombinates and of the normal embryo's germ layers". [3]

Steinberg and his associate D.R. Garrod showed that co-cultured chick embryonic liver and limb bud mesoblast cells actively "sorted-out" such that liver cells were grouped together in islands surrounded by limb bud cells. They then hypothesized that the more cohesive cell type, i.e. those that prefer cell-cell adhesions, remains in the middle while less cohesive cell type, i.e. those that instead prefer cell-matrix adhesions, distributes on the outside.

From these observations, Steinberg developed a thermodynamics-based hypothesis that described cell sorting as a phenomenon that minimizes the free energy of the system based on intercellular adhesivity and surface tension. This "differential adhesion hypothesis", as it has come to be called, is said to have set the stage for the conceptual framework for understanding cell sorting and tissue assembly by force-driven mechanism. [2]

Education

Steinberg completed his BS at Amherst College in 1952, his PhD in zoology at the University of Minnesota in 1956, was a professor of biology at Johns Hopkins University from 1958 to 1966, and transferred to Princeton University in 1966, becoming professor emeritus in 2005. [4]

References

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(b) Author. (1979). "Article", *Journal of Theoretical Biology* (pg. 115), Volume 79.
2. Johnson, Amy W. and Harley, Brendan. (2011). *Mechanobiology of the Cell-Cell and Cell-Matrix Interactions* (§: 4.2.1: Differential Adhesion Hypothesis, pg. 48-). Springer.
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Further reading

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External links

● Steinberg, Malcolm – WorldCat Identities.
● Malcolm S. Steinberg – Facebook.
● Cell adhesion – Wikipedia.

θΔics

In human chemistry, a **male-female reaction** refers to the process in which two human molecules, one male one female, chemically react, typically forming a bonded product, in the form of a dihumanide molecule. [1]

In 2001, American computation chemist David Hwang, in his "The Thermodynamics of Love", defined a male-female reaction as a theoretical chemical reaction where two elements, "male" (M) and "female" (F), combine to form a new compound called "couple" (M-F): [2]

$$\mathrm{M} + \mathrm{F} \longrightarrow \mathrm{M\text{-}F}$$

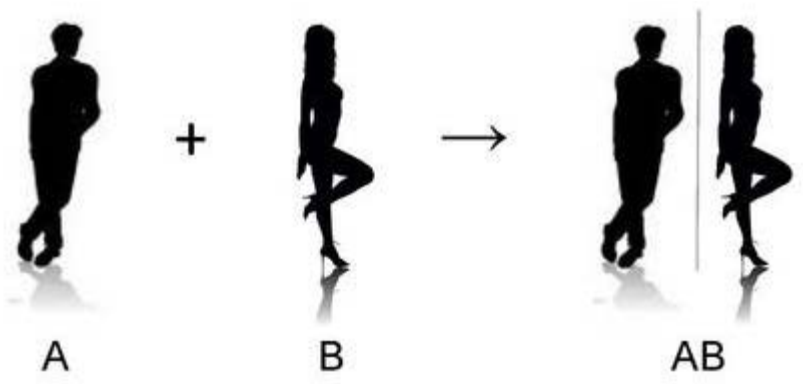

Generic diagram of the typical **male-female reaction**, depicted using Bergman-style letter notation of single letters, A or B, used to represent unattached molecular entities and adjacent letters, AB, to represent bonded chemical entities. [3]

Hwang goes on to explain the chemical thermodynamics of this reaction in his mating free energy principle.

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θΔics

In hmolscience, **Malte Michael Faber** (1938-) is a German economist noted, in human thermodynamics, for his 1985 to 2005 work in applying thermodynamics to economics, mostly is seems in historical commentary.

Overview

In 1983, Faber penned a number of what he seems to refer to as "physico-economics" publications, which helped introduce entropy into economics and sociology. [1]

In 1985, Faber began to pen several papers with John Proops on thermodynamics in economics; their “Interdisciplinary Research Between Economists and Physical Scientists: Retrospect and Prospect”, e.g. seems to go into a historical overview of economic thermodynamics pioneers, such as: Leon Walras, Francis Edgeworth, Stanley Jevons, Paul Samuelson, Nicholas Georgescu-Roegen, among others. [2]

Education

Faber studied economics, mathematics, and statistics at the Free University Berlin and the University of Minnesota from 1959 to 1964. He completed his doctorate (1969) and habilitation (1973) in economics at the Technical University of Berlin. Faber became professor emeritus from the chair of economics at the University of Heidelberg in 2004.

References

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External links

â— Malte Michael Faber (German → English) – Wikipedia.

θΔics

In terminology, **man** (TR=767), male (TR=122) or men (TR=362), as contrasted with a woman (TR=211), female (TR=152) or women (TR=163), or alternatively hermaphrodite (an animal or plant having both male and female reproductive organs), is a bipedal primate mammal, of reproductive age, with an XY 23-chromosome, as contrasted with an individual with an XX 23-chromosome (female).

Quotes

The following are noted quotes:

> "Suppose chemical substances to be represented by a number of **men** and women of varying degrees of strength of character and "attractiveness", and suppose the marital combinations or what Goethe called the "elective affinities" between these men and women to be determined by certain mysterious "laws." If a man strong in character should mate with a woman, weaker but otherwise "attractive," or *vice versa*, one set of observers might affirm that the union was due to the man's superior potentiality or masculinity, others might maintain that the real strength in the combination or "affinity" lay in the woman's "attractiveness "; or *vice versa*. Curiously enough, these anthropomorphisms, which seem so plausible and fascinating in Goethe's novel, are daily and hourly employed to explain the facts of chemical combination."
>
> — Fielding Garrison (1910), "A Note on Traube's Theory of Osmosis and 'Attraction-Pressure'" [1]

References

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External links

â— Man – Wikipedia.

θΔics

In famous publications, ***Man on His Nature*** is the 1937-38 Gifford Lectures turned 1940 book, revised second 1950 edition, given by English physiologist Charles Sherrington, at the University of Edinburgh, on the nature of mind and life and its absurdities-arising paradoxical relationship to matter and energy, when viewed from the chemistry and physics perspective; the lecture builds heavily the writings of the little-known sixteenth-century physician Jean Fernel, particularly his 1548 *On the Hidden Causes of Things*, a dialogue on the inconsistencies of the Aristotelian model of nature, in respect innate heat, as the source of life, and the assumed modern-day colloquial conceptions of life and death. The so-called Sherrington-Fernel philosophy combined leads directly into the defunct theory of life position.

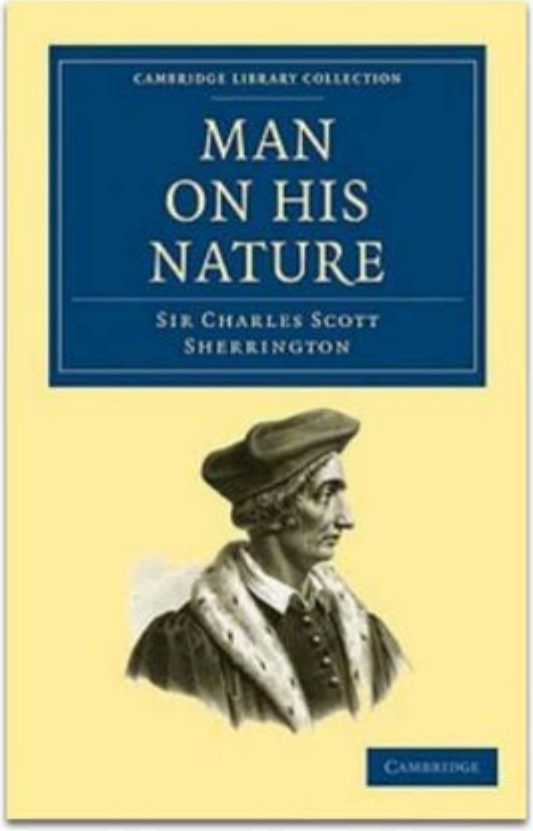

English physiologist Charles Sherrington's 1940 *Man On His Nature*, in which he rips though all the defunct notion about "mind", e.g. the cellular level, and "life", e.g. at the virus level, in the modern era of energy based atomic-molecular physical chemistry. [1]

The following is a Cambridge University Press abstract: [1]

> "Based on the Gifford Lectures of 1937-38 in Edinburgh, Nobel Prize winner Charles Sherrington's 1940 study addresses the nature of the mind and its relationship to life and matter. The book centres on the writings of the little-known sixteenth-century physician Jean Fernel. After setting out Fernel's views on the nature of man, Sherrington proceeds to develop his own thoughts, drawing upon a wide variety of philosophical theories. Using Fernel as a historical case study, the book demonstrates how any scientific outlook is always part of its age, and shows how views on the eternal enigmas of mankind, mind and life have changed radically over time. Sherrington's book is important in the history of ideas for its assessment of the value of advances in natural science as a framework for the development of natural theology."

Quotes

The following are a few of the noted lecture-turned-book quotes, of which there are many:

> "Science desires to rid itself of 'anthropisms' as unnecessary."

References

1. Sherrington, Charles. (1938). *Man on His Nature* (abs). Cambridge University Press, 1950.

θΔics

In existographies, **Manetho** (c.300-250BC) (CR:5) was an Egyptian historian and priest, centered in Heliopolis, noted for his *History of Egypt*, written, in Greek, for Ptolemy II (reign: 283-246BC), based on materials collected in the library of the priesthood of Ra; his division of the rulers of ancient Egypt into 30 dynasties is still used as the basic framework for ancient Egyptian history. (Q)

History

In c.260BC, Manetho, in his *History of Egypt*, as cited by Gary Greenberg (2000), discussed an Egyptian priest named Osarseph (Q), who sized the Egyptian thrown, later changing his name to "Moses". [1]

In c.80AD, Josephus, citing Manetho, conjectured that the expulsion of the Hyksos from Egypt (c.1600BC) (see: supreme god timeline) was the origin of the mythical story of the Jewish exodus. (Q)(Q)

Religion

Manetho was involved in the introduction of the cult of Serapis into Egypt. [3]

Quotes | On

The following are quotes on Manetho:

> "A tradition says Solon, Thales, and Plato all visited the great college at Heliopolis, and that the last-named actually studied there, and that **Manetho** (c.300-250BC), the priest of Sebennytus, who wrote a history of Egypt in Greek for Ptolemy II, collected his materials in the library of the priesthood of Ra."
>
> — Wallis Budge (1904), *The Gods of the Egyptians, Volume One* [2]

References

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3. Manetho. (c.250BC). *Manetho: with an English Translation* (translator: W.G. Waddell) (Arc). Harvard University Press, 1940.

External links

- Manetho – Wikipedia.

θΔics

In existographies, **Manfred Eigen** (1927-) is a German bio-physical chemist (chnops-physical chemist) noted for his 1971 "Molecular Self-Organization and Evolution" article wherein he proposed an origin of life theory according to which living systems might have emerged from some non-living autocatalytic chemical reactions. [1]

Autocatalytic | Reproduction

See also: Stuart Kauffman (1993 auto-catalytic closure theory)

In 1971, Eigen, in his “Self-Organization of Matter and the Evolution of Biological Macromolecules”, postulated the following diagram of his idea of autocatalytic reproduction: [4]

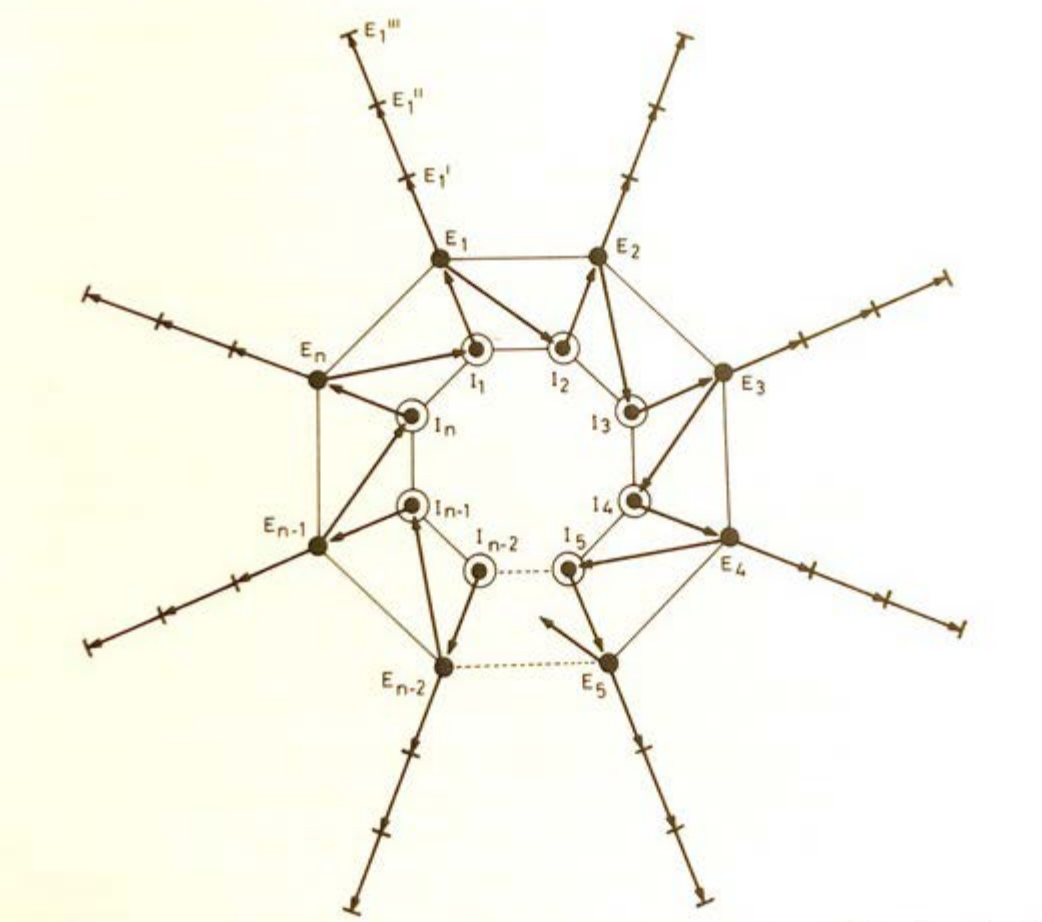

Fig. 9.3. Autocatalytic reproduction of hypercycle according to Eigen. Polynucleotides I_i are capable of autoreproduction. Polypeptides E_i catalyse the synthesis of polynucleotides. Thus E_{i-1} catalyses the formation of I_i. I_i furnishes information necessary for the synthesis of E_i. The primes indicate growth of polypeptide concentration at each turn of the cycle.

Here we see what seems, visually speaking, to be a chemical perpetual motion device.

Goethe | Human chemistry

Eigen’s 1981 book *Laws of the Game*, co-written with Ruthild Winkler, contains a rare English-translation of German polymath Johann Goethe’s famous 1796 *Third Lecture On Anatomy*—the launching point for the science of human chemistry—header section: ‘On the Laws of Organization as Such, to the Extent That We Can Observe Them in the Structure of Types’, wherein Goethe first introduces his newly conceived human elective affinity theory (see: Goethe timeline):

> “To facilitate our comprehension of the concept of organic existence, let us first take a look at mineral structures. Minerals, whose varied components are so solid and unchanging, do not seem to hold to any limits or order when then combine, although laws do determine these conditions. Different components can be easily separated and recombined into new combinations. These combinations can again be taken apart, and the mineral we thought destroyed can soon be restored to its original perfection.
>
> The main characteristic of minerals that concerns us here is the indifference their components show toward the form of their combination, that is, their coordination or subordination. There are, by nature, stronger or weaker bonds between these components, and when they evidence themselves, they resemble attractions between human beings. This is why chemists speak of elective affinities, even though the forces that move mineral components [or humans] one way or another and create mineral structures are often purely external in origin, which by no means implies that we deny them the delicate portion of nature’s vital inspiration that is their due.
>
> How different even imperfect organic beings are! They convert part of the nourishment they absorb—eliminating what they do not need—into distinct organs. What they do absorb they turn into something unique and exquisite by joining most intimately one element with another and so forming differentiated parts in whose forms multifarious life is manifested. And if these forms are destroyed, they cannot be reconstructed from what remains.
>
> If we compare these imperfect organic beings with higher ones, we find that the former, even though they make use of elemental influences with a certain degree of force and individuality, cannot bring the resulting organic parts to the same level of specialization and permanence as the higher animal forms can. We know, for example, that plans—and we will not descend any lower on the scale of organic life—developing as they do in a certain sequence, represent one and the same basic organ in highly different shapes.
>
> Detailed insight into the law governing this metamorphosis will surely advance the science of botany, not only in its descriptive tasks but also in its efforts to understand the inner nature of plants.”

Here, in first section, we see, in excellent form, Goethe discussing "human chemical bonding" in the context of the affinity forces, which he correctly says are "external in origin", that create or dissolve such combinations. In this last section, Goethe touches on the life from non-life issue, where he says "we will not descend any lower on the scale of organic life", and foreshadows the laws of evolution (or "law governing this metamorphosis"), as introduced by Charles Darwin in 1859.

Students

A noted student of Eigen’s is Polish physicist Michal Kurzynski, author of the 2006 book *The Thermodynamic Machinery of Life*. [3]

Other

In 1967, Eigen, along with Ronald Norrish and George Porter, was awarded the Nobel Prize in chemistry for studies of extremely fast chemical reactions induced in response to very short pulses of energy.

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1. (a) Eigen, Manfred (1971). “Self-organization of Matter and the Evolution of Biological Macromolecules” ("Molekulare Selbstorganisation und Evolution"), *Naturwissenschaften*, 58(10):465-523.
(b) Brooks, Daniel R. and Wilson, E.O. (1988). *Evolution as Entropy: Toward a Unified theory of Biology* (pg. 76). University of Chicago Press.
2. (a) Goethe, Johann. (1796). “On the Laws of Organization as Such, to the Extent That We Can Observe Them in the Structure of Types”, Lectures on Comparative Anatomy and Zoology.
(b) Eigen, Manfred, and Winkler, Ruthild. (1981). *Laws of the Game: How the Principles of Nature Govern Chance*

(pg. 74-77). Princeton University Press.
3. Kurzynski, Michal. (2006). *The Thermodynamic Machinery of Life*. Springer.
4. (a) Eigen, Manfred. (1971). “Self-organization of Matter and the Evolution of Biological Macromolecules”, *Die Naturwissenschaften*, 58(10):465-523, Oct.
(b) Schoffeniels, Ernest. (1973). *Anti-Chance: a Reply to Monod’s Chance and Necessity* (*L’Anti-Hasard*) (Amz) (translator: B.L. Reid) (pgs. 98-99). Pergamon, 1976.
(c) Quasispecies model – Wikipedia.

Further reading

â— Dyson, Freeman. (1999). *Origins of Life* (§:Eigen and Orgel, pgs. 11-) (pdf). Cambridge.

External links

â— Manfred Eigen – Wikipedia.
â— Manfred Eigen (videos) – WebOfStories.com.

θΔics

In existographies, **Mangasar Mangasarian** (1859-1943) (FA:123) was Turkish-born Armenian-American Protestant minister turned radical achristist nonbeliever noted for []

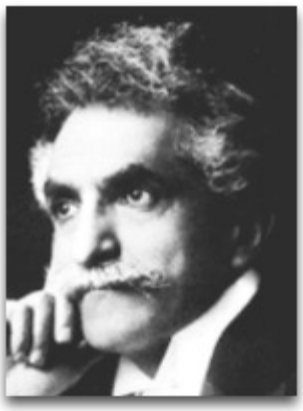

Overview

In 1909, Mangasarian, in his *The Truth About Jesus: is He a Myth?*, contended that Jesus was a myth, like Osiris, Mithra, Adonis, Moses, Isis, Hercules, Sampson, Attis, Hermes, Apollo, Chrishna, and Indra. (Q)

Quotes | Employed

The following are quotes cited by Mangasarian:

> "If it is not historically true that such and such things happened in Palestine eighteen centuries ago, what becomes of Christianity?"
>
> — Thomas Huxley (c.1860), *Source*; cited by Mangasarian (1909) in: *The Truth About Jesus: is He a Myth?* (pg. 2)

> "When I seriously believe a thing, I say so in a few words, leaving the reader to determine what my belief is worth. But I do not choose to temper down every expression of personal opinion into courteous generalities. Let us learn to speak plainly and intelligibly first, and, if it may be, gracefully afterwards."
>
> — John Ruskin (1885), *On the Old Road* (pg. 260); in: *The Bible Unveiled* (opening quote)

Quotes | By

The following are quotes by Mangasarian:

> "A difficult subject is in the nature of a challenge to the mind. One difficult task attempted is worth a thousand commonplace efforts completed. The majority of people avoid the difficult and fear danger. But he who would progress must even court danger. Political and religious liberty were discovered through peril and struggle. The world owes its emancipation to human daring. Had Columbus feared danger, America might have slept for another thousand years."
>
> — Mangasar Mangasarian (1909), *The Truth About Jesus: Is He a Myth?* (Q) [2]

> "An account in which such scrupulous attention is shown to supposed sacred numbers is apt to be more artificial than real. The biographers of Lincoln or of Socrates do not seem to be interested in numbers. They write history, not stories."
>
> — Mangasar Mangasarian (1909), *The Truth About Jesus: Is He a Myth?* (Q) [2]

> "Is there any story or romance in the Bible that can compare in beauty and might to the *Faust* of Goethe, or the Omar Khayyam of Fitzgerald (Q) , or to the *Prometheus Unbound* of Shelley? Is there a book among the five attributed to Moses, or the dozen or more attributed to the prophets, that is as entrancing as Victor Hugo's *Les Miserables*?"
>
> — Mangasar Mangasarian (1911), *The Bible Unveiled* (Q)

References

1. Mangasarian, Mangasar. (1911). *The Bible Unveiled*. Independent Religious Society.
2. Mangasarian, Mangasar. (1909). *The Truth About Jesus*: *Is He a Myth?* Independent Religious Society.

Further reading

● Huberman, Jack. (2007). *The Quotable Atheist*: *Ammunition for Nonbelievers, Political Junkies, Gadflies, and those Generally Hell-Bound* (pg. #). Nation Books.

External links

● M.M. Mangasarian – Wikipedia.

θΔics

In mythology, **Mangnall's Abstract of Heathen Mythology** (TR:9) refers to the cogent A-Z listing of Greek deities by English schoolmistress and writer Richmal Mangnall (1769–1820) from her 1798 *Historical and Miscellaneous Questions for the Use of Young People*, printed privately and anonymously for use in the school; the 1830 edition of which is shown below.

List

The following is Mangnall's A-Z listing of Greco-Roman deities (700BC-400AD), semi-ordered by relatedness, and characters; with notation etymology details added in grey text and brackets. Those twelve gods shown bolded, colored, and numbered secondarily are the remaining gods to be slayed or "assassinated", in the Albert Camus (1942) sense of the matter, via chemistry, physics, and astronomy: [1]

#	Term	Definition
	Greek [Roman] [Egyptian]	
1.	Zeus [Jupiter] [Amen-Ra] [Osiris] (Taylor, 1829)	the supreme deity of the heathen world, wife of Jupiter [check: typo/paste error?], and queen of heaven; in 332BC, Alexander claimed divine rule under Amen-Zeus, aka the Egyptian + Greek god syncretism of Amen-Ra and Zeus. 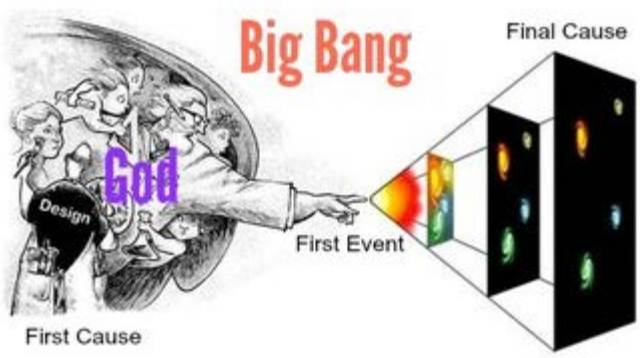 "Matter and energy moves itself. It has no exterior mover." — Jean Meslier (c.1720) (Q) "Before we understand science, it is natural believe that god created the universe. But now science offers a more convincing explanation. What I meant [in *A Brief History of Time* (1988) (Q)] by 'we would know the mind of god' is, we would know everything that god would know, if there were a god. Which there isn't. I'm an atheist." — Stephen Hawking (2014), El Mundo interview, Sep 23 (Q)(Q)(Q)
2.	Juno	protectress of married women.
3.	Apollo [Horus] (Q)(Q)	god of music, poetry, and the sciences.
4.	Minerva, or Pallas	daughter of Jupiter, and goddess of wisdom.
5.	Mercury [Odin] (Q)	the god of eloquence, and messenger of the gods.
6.	Aeolus	god of the winds [etymology of aeolipile].
7.	Dionysus [Bacchus] [Osiris]	god of wine.
		god of war.

8.	Mars [#1]	["A particle of matter cannot tell us that it is unconscious of the laws of attraction and repulsion and that the law is not true; but man, who is the subject of history, says bluntly: I am free, and am therefore not subject to laws." — Leo Tolstoy (1869), *War and Peace*] 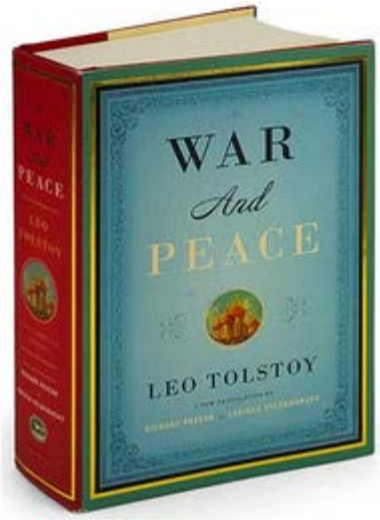
9.	Diana	goddess of hunting, and chastity.
10.	Esculapius	god of physic.
11.	**Venus** [Aphrodite] [#2]	goddess of beauty and love. [Image: Beckhap's law proof] 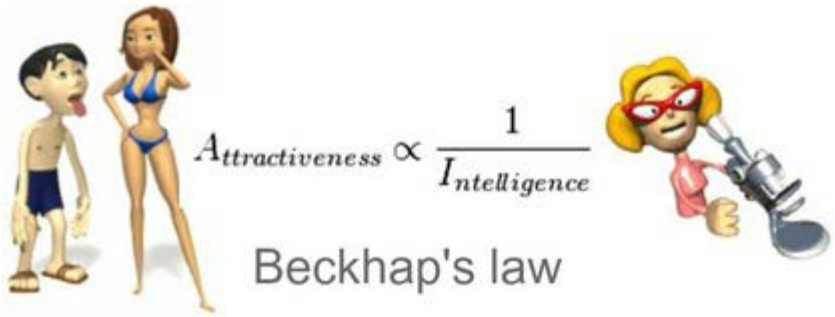
12.	Aurora	goddess of the morning.
13.	**Cupid** [Eros] [#3]	son of Venus, and god of love. 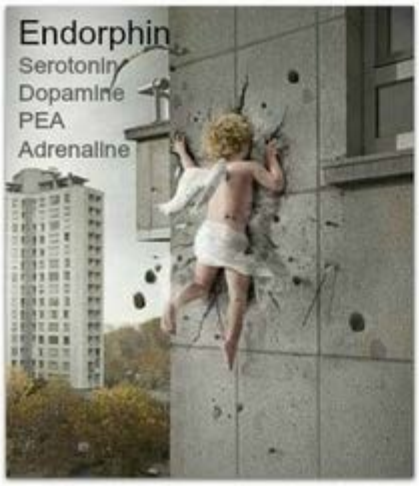 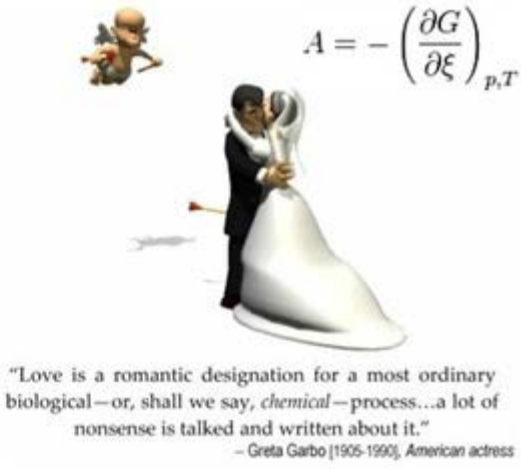
14.	Saturn	god of time. goddess of justice.
15.	Astrea	

16.	Até	goddess of revenge.
17.	Bellona	goddess of war, and sister to Mar.
18.	Boreas	god of the north wind.
19.	Agenoria	goddess of industry.
20.	Angerona	goddess of silence.
21.	Ceres	goddess of agriculture.
22.	Collilla	goddess of hills.
23.	Comus	god of laughter and mirth.
24.	Concordia	goddess of peace.
25.	Cybele	wife of the god Saturn, and mother of the earth.
26.	Discordia	the goddess of contention.
27.	Fama, or Fame	the goddess of report.
28.	Flora	the goddess of flowers.
29.	**Fortuna** [#4]	the goddess of happiness and misery, said to be blind [etymology of fortune].
30.	Harpocrates	the god of silence.
31.	Hebe	goddess of youth.
32.	Hygeia	goddess of health.
33.	Hymen	god of marriage.
		a Roman deity, who was said to be endowed with the knowledge of the past and the future. He was considered as being the guardian

34.	**Janus** [#5]	of the roads, the inventor of doors, of boats, and crowns. His temple, built by Numa, was open in time of war, and shut in time of peace.

35.	Lares	household gods among the Romans: they were also called Penates.
36.	Mnemosyne	goddess of memory.
37.	Momus	god of raillery.
38.	**Mors** [#6]	goddess of death [etymology of moral | immoral; mortal | immortal; mortician, etc.].

39.	Nox	the most ancient of all the deities.
40.	Pan	the god of shepherds [seeming etymology of *pan*-prefix terms, e.g. pantheism, panbioism, panexperientialism, etc.].
41.	Pluto	god of hell.
42.	Proserpine	wife to Pluto, and queen of the internal regions.
43.	Plutus	god of riches.
44.	Pomona	goddess of fruits and autumn.
45.	Proteus	a sea-god, said to have the power of changing himself into any shape he pleased.
46.	**Psyche** [#7]	the wife of Cupid, goddess of mind [etymology of psychology].

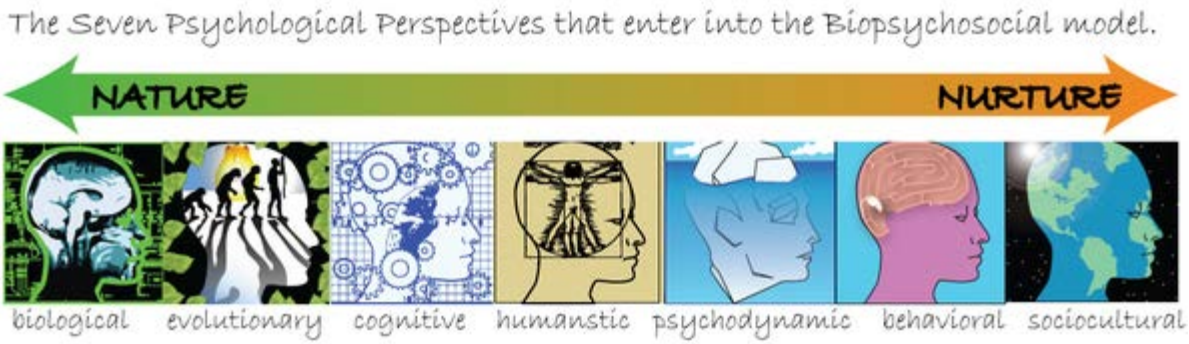

47.	Pudicitia	goddess of modesty.
48.	Sylvanus	god of the woods.
49.	Terminus	god of boundaries [etymology of terminal].
50.	Neptune	god of the sea.
51.	Amphitrite	goddess of the sea.
52.	Thetis	a sea-nymph.
53.	**Vacuna**	goddess of idle persons.
54.	Vertumnus	god of the spring.
55.	Vesta	goddess of fire.
56.	**Morpheus** [#8]	god of dreams [etymology of the character "Morpheus" of *The Matrix* (1999), per the phrase "do you ever have that feeling that your dreaming but still awake?"]. [Image: atheist rabbit hole].
57.	Somnus	god of sleep.
58.	Vulcan	god of fire.
59.	**The Parcae, or Fates** [#9]	daughters of Necessitas. They were supposed to spin and cut the thread of human life and destiny. Their names were Clotho, Lachesis, and Atropos [etymology of the term fate].
60.	Furies	daughters Acheron and Nox, the punishers of wicked deeds. There names were Alecto, Megara, and Tisiphone. They are armed with whips and torches, and have serpents twining in their hair.
61.	Graces	three sisters, daughters of Jupiter, and attendants upon Venus and the Muses: their names were Aglaia, Thalia, and Euphrosyne.
62.	The Gorgons	the three daughters of Phorcus and Cete. They are represented as having their heads covered with vipers, as having but one eye between them, and an appearance so hideous as to turn into stone all who looked upon them. . Their names were Euryale, Medusa, and Stheno.
63.	Muses	the nine daughters of Jupiter, and the goddess of memory. They presided over the sciences, and were called Calliope, Clio, Erato, Euterpe, Melpomene, Polyhymnia, Terpsichore, Thalia, and Urania. Calliope was the muse of eloquence and heroic poetry; Clio, of history; Erato, of amorous poetry; Euterpe, of music; Melpomene, of tragedy; Polyhymnia, of rhetoric; Terpsichore, of dancing; Thalia, of comedy and lyric poetry; and Urania, of astronomy.
64.	Harpies	three monsters, with the faces of women, the bodies of vultures, and hands armed with claws: their names were Aelo, Ocypete, and Celaeno.
		three sisters, who kept golden apples in a garden, guarded by a dragon: Hercules slew the

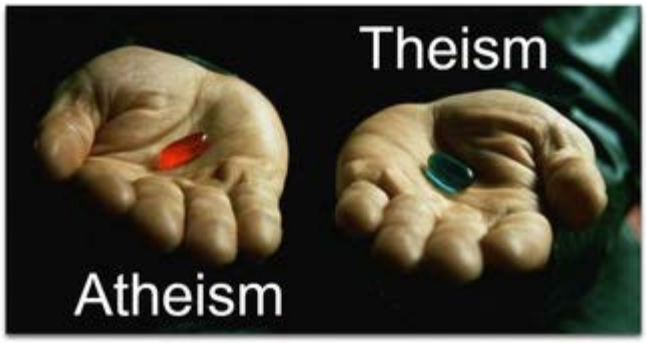

65.	**Hesperides**	dragon, and carried off the apples.
66.	Acheron	a river in hell.
67.	**Achilles**	a Grecian who signalized himself at the siege of Troy; and is said to have been dipped by his mother in the river Styx, which rendered him invulnerable in every part, except his right heel, by which she held him [etymology of Achilles' heel].
68.	Actaeon	a famous hunter, changed by Diana into a stag, for disturbing her while bathing.
69.	Adonis	a youth said to be extremely beautiful, and beloved by Venus.
70.	Aeacus	one of the judges of hell.
71.	Aegis	the shield of Minerva, covered with the skin of the goat Amalthea, by whose milk Jupiter was nourished, having, as a boss, the terrific head of the Gorgon Medusa.
72.	Ambarvalia	sacrifices in honour of Ceres.
73.	Ambrosia	the food of the gods.
74.	Acis	a Sicilian shepherd, extremely beautiful.
75.	**Aegeria**	a beautiful nymph, worshipped by the Romans, from whom Numa asserted that he had received the wise laws he gave to the Romans.
76.	Arachne	a woman turned into a spider, for contending with Minerva at spinning.
77.	Argus	a man said to have had an hundred eyes, changed by Juno into a peacock.
78.	Atalanta	a woman remarkable for her swift running.
79.	**Atlas** [#10]	the son of Jupiter, aid to have supported the heavens on his shoulders; afterwards turned into: mountain [see: Atlas Shrugged by Ayn Rand]. [Image: a depiction of Shu, of the Heliopolis creation myth, holding up the heavens or sky (Nut); the precursor to Atlas]
80.	**Avernus**	a lake in the infernal regions.
81.	Briareus	a giant, said to have had fifty heads and one hundred hands.
82.	Brumalia	feasts held in honor of Bacchus.
83.	**Caduceus**	a wand borne by Mercury, round which were entwined two snakes, by which he induced or drove away sleep, and commanded the shadowy multitudes of ghosts.
84.	Castiades	a name given to the Muses.
85.	Centaurs	creatures half men, half horses, said to have inhabited Thessaly.
86.	Castor and Pollux	two brothers, who had immortality conferred upon them alternately, by Jupiter. They make that constellation in the heavens called Gemini.
87.	Cerberus	a dog with three heads, which kept the gates of hell.
88.	Charities	a name for the Graces.
89.	Charon	the ferryman of hell.

90.	Chiron	a centaur, who taught Esculapius physics; Hercules astronomy; and was afterwards made the constellation Sagittarius.
91.	Circe	a famous enchantress.
92.	Cocytus	a river in hell, flowing from the river Styx.
93.	Cyclops	the workmen of Vulcan, who had only one eye in the middle of their forehead.
94.	Delos	the island where Apollo was born, and had a celebrated oracle.
95.	Dryades	nymphs of the woods.
96.	Daphne	a beautiful woman, changed into the laurel tree as she fled from Apollo.
97.	Elysium	the paradise of the heathens.
98.	Erebus	a river in hell, famed for its blackness.
99.	Ganymede	a beautiful boy, made cup-bearer to Jupiter.
100.	Genii	guardian angels: there were good and evil.
101.	Gordius	a king of Phrygia, who was famed for having fastened a knot of cords [Gordian knot], on which the empire of Asia depended, in so intricate a manner, that Alexander the Great, not being able to untie it, cut it asunder.
102.	Gyges	a shepherd, who possessed a ring which rendered him invisible when he turned the stone towards his body.
103.	Hamadryades	nymphs said to have lived in oak-trees.
104.	Hermes	a name for Mercury [see: Hermes Trismegistus].
105.	Hecate	Diana's name in hell.
106.	Helicon	a famous mountain in Boeotia, sacred to Apollo and the Muses.
107.	Hercules [Thor] [Horus] (Q)	the son of Jupiter, famed for his great strength and numerous exploits. Note: Horus is also spelled "Heru" (Muata Ashby). [4]
108.	Hesperus, or Vesper	the poetical name for the evening star.
109.	Hydra	a serpent with seven heads, killed by Hercules [see: hydraism].
110.	Ida	a famous mountain near Troy.
111.	Ixion	a wicked tyrant, who, having insulted Juno, was affixed to a wheel in the infernal regions, perpetually revolving over burning fumes.
112.	Iris	the messenger of Juno, changed by her into the rainbow.
113.	Lamiae	a name for the Gorgons.
114.	Lethe	a river in hell, whose waters had the power of causing forgetfulness.
115.	Lucifer	the poetical name for the morning star.
116.	Latona	a nymph loved by Jupiter: she was the mother of Apollo and Diana.
117.	Medea	a famous sorceress.
118.	**Midas**	a king of Phrygia, who had the power given him, by Bacchus, of turning whatever he touched into gold.
119.	Minos	one of the judges of hell, famed for his justice: he was king of Crete.

120.	Nereides	sea-nymphs; of whom there were fifty.
121.	Naioades	nymphs of rivers and fountains.
123.	Niobe	a woman said to have wept herself into a statue for the loss of her fourteen children [possible etymology of “Niobe” of *The Matrix* (1999)].
124.	Nectar	the beverage of the gods.
125.	Olympus	a famous mountain in Thessaly, the resort of the gods.
126.	Orpheus	the son of Jupiter and Calliope. His musical powers were so great, that he is said to have charmed rocks, trees, and stones, by the sound of his lyre.
127.	Pactolus	a river said to have golden sands.
128.	**Pandora** [#11] [Eve]	a woman made by Vulcan, endowed with gifts by all the gods and goddesses. She had a box given her containing all kinds of evils, with Hope at the bottom.
129.	Pegasus	a winged horse, belonging to Apollo and the Muses.
130.	**Phaeton**	the son of Apollo, who asked the guidance of his father's chariot as a proof of his divine descent, but managed it so ill that he set the world on fire.
131.	Phlegethon	a boiling river in hell.
132.	**Prometheus** [#12]	a man who, assisted by Minerva, stole fire from heaven, with which he is said to have animated a figure formed of clay [see: Hippocrates (400BC) and animal heat]. Jupiter, as a punishment for his audacity, condemned him to be chained to Mount Caucasus, with a vulture perpetually gnawing his liver. [Adjacent image (Q) on legend telling how the gods chose two brothers, Prometheus and Epimethius, to create the living things that would inhabit a planet which was beautiful to look at but, as yet, quite empty of life.]
133.	Pigmies	a tribe of men in Libya, represented by poetical fiction as only a span in height, and as carrying on continual war with the cranes.
134.	Python	a serpent which Apollo killed; in memory of which the Pythian games were instituted.
135.	Pyramus and Thisbe	two fond lovers, who killed themselves with the same sword, and whose blood changed the color of the berries of the mulberry tree under which they died from white to purple.

136.	Pindus	a mountain in Thessaly, sacred to the Muses.
137.	Philemon and Baucis	a poor old man and woman who entertained Jupiter and Mercury in their travels through Phrygia, when they were refused hospitality by the other inhabitants of the village. For which good act their cottage was, at their desire, changed into a temple, of which they were made priest and priestess; and they were permitted to die at the same time, that neither might have the pain of surviving the other.
138	Polyphemus	one of the Cyclops, the son of Neptune; a cruel monster, whom Ulysses destroyed.
139	Rhadamanthus	one of the judges of hell.
140.	Saturnalia	feasts sacred to Saturn.
141.	Satyrs	priests of Bacchus, half men, half goats.
142.	Stentor	a Grecian, whose voice was as strong and loud as that of fifty men together.
143.	Syrens	sea-monsters, who charmed people with the sweetness of their music, and then devoured them.
144.	**Sisyphus** [#13]	a man doomed to roll a large stone up a mountain in hell, which continually rolled back; as a punishment for his perfidy and numerous robberies [see: Jean-Paul Sartre].
145.	Styx	a river in hell, by which when the gods swore, their oath was irrevocable.
146.	Tempe	a beautiful vale in Thessaly, the resort of the gods.
147.	Tartarus	the abode of the wicked in hell.
148.	Triton	Neptune's son, and his trumpeter.
149.	Trophonius	the son of Apollo, who gave oracles in a gloomy cave, which made those silent who entered it.
150.	Tantalus	the son of Jupiter, who, serving up the limbs of his son Pelops in a dish, to try the divinity of the gods, was plunged up to the chin in a lake of hell, the water of which escaped from his lips whenever he attempted to drink; while a tree, that hung over his head laden with fruit, swung its branches out of his reach whenever he tried to pluck and eat; so that he suffered the pain of unqueuchable thirst and hunger.
151.	Zephyrus	the poetical name for the west wind.

(add discussion)

Quotes

The following are related quotes:

> "Plutarch's version of the myth of Isis and Osiris connects the various episodes, many of which can be documented from Egyptian sources, into a single, running narrative (*On Isis and Osiris*, 12-19). The story begins with Kronos (Geb, the Egyptian earth god) and Rhea (Nut, the Egyptian sky goddess) overcoming the curse of Helios (Re, the sun god) with the help of Hermes (Thoth, the Egyptian moon god) by producing five children on five intercalary days: Osiris, Horus, Typhon (Set), Isis, and Nephthys. As pharaoh of

Egypt, Osiris brings civilization to that country and to the whole world. Typhon, however, gathers conspirators and plots to kill Osiris. First, he imprisons Osiris within a coffin and throws it into the Nile River, and later he dismembers the body of Osiris and scatters the pieces all around Egypt. One piece, the penis, is lost forever in the Nile River. In both episodes, the reproductive power of Osiris is **sub-merged** in the Nile. (Isis grieving and searching for Osiris and burning away the mortality of the infant prince of Byblos can be compared with …"

— Marvin Meyer (1999), *The Ancient Mysteries* (Q)

"Nietzsche was the most famous of God's assassins."

— Albert Camus (1942), *The Myth of Sisyphus*

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1. (a) Mangnall, Richmal. (1798). *Historical and Miscellaneous Questions* (§:). Longman, Hurst, Rees, Orme, and Brown, 1830.
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θΔics

In economics, **manpower**, from 1862, is a loosely defined term referring to power available from or supplied by the physical effort of human beings or the total supply of persons available and fitted for service. [1]

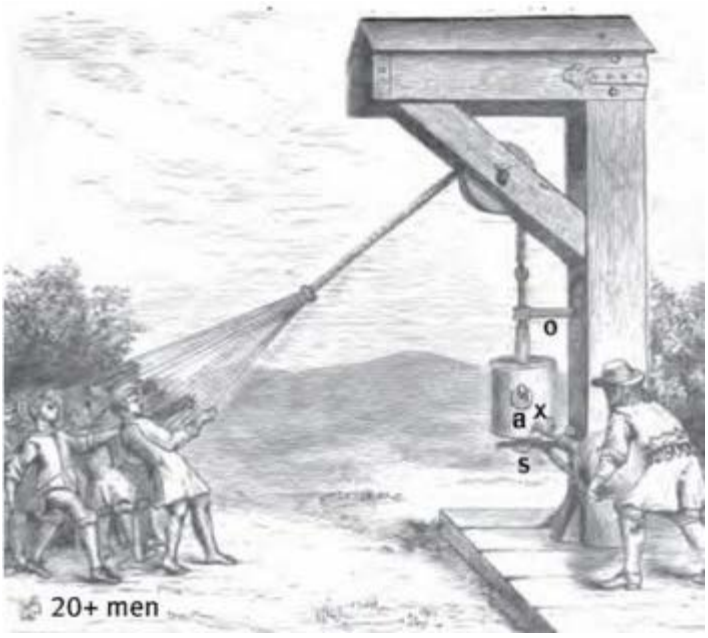

A 20 **manpower engine**, shown in the 1670s vacuum engine experiments of German engineer Otto Guericke.

Estimates

In the late 18th century, John Smeaton equated one horsepower to 5 men or to 22,916 pounds raised on foot high in one minute. [2]

In 1932, in efforts to rid the economic system of the use of paper money, American engineer Howard Scott stated a "energy value" approximation for human power: [3]

> "Technology has introduced a new methodology in the creation of physical wealth. It is now able to substitute energy for man hours on the parity basis that 1,500,000 foot-pounds equals one man's time for eight hours.
>
> National income under the price system consists of the debt claims accruing annually from the certificates of debt already extant. Physical income within a continental area under technological control would be the net available energy in ergs, converted into use-forms and services over and above the operation and maintenance of the physical equipment and structures of the area."

In comparing the two values, Smeaton's calculation, in the phraseology of Scott, equates to 2,200,000 foot-pounds of one man's time for eight hours.

Discussion

In these sorts of efforts to equate or put a value on human effort, work output, or energy expenditures, in the attempted reduction of all human activity to the number of buckets of water a human can lift out of mine per unit time, modeled on the 1782 calculations of steam engineers Matthew Boulton and James Watt, falls into state of illogic. This becomes particularly apparent in relation to quantifications such as Forbes' annual list of the world's 100 most powerful, i.e. "world power", men and women,

See also

â— Energy slave

References

1. Manpower – Merriam-Webster Collegiate Dictionary, 2000.
2. Hills, Richard L. (1989). *Power from Steam* (pg. 89). Cambridge University Press.
3. Scott, Howard. (1933). *A Thermodynamic Interpretation of Social Phenomena* (notes on), Formerly titled "Integrating the Physical Sciences in Attacking Social Problems". *Technocracy.org Archives*.

θΔics

In religio-mythology, **Manu**, the son of Brahma, is the Hinduism rewrite of the Egyptian god Nu (or Nun); equivalent to the Christian person Noah, or Muslim person Nuh.

A depiction of **Manu** and the talking fish.

Buddhism

The Laws of Manu, being one of the earliest systematic accounts of brahmanical law, was an extremely influential text among Indian popular religion, and during its prime period of compilation and amendment, during the years 100BC to 500AD, participated in a gradual, multivalent, and highly negotiated shift toward Buddhist hegemony over spirit-deities. [2]

Creation myth

In 200BC, the so-called “Laws of Manu”, or “Code of Manu” (Nietzsche, 1888), aka Manu Smriti, were penned, wherein, in the opening twenty sentences, shown below, the Hindu version of the Heliopolis creation myth is found, Nun or Nu replaced by Manu, and Ra replaced by Brahma, Atum, Shu, and Tefnut, replaced by an incubating egg, and Geb and Nut replaced by earth and heaven (or sky), in short: [1]

1. The great sages approached Manu [**Nun**], who was seated with a collected mind, and, having duly worshipped him, spoke as follows:
2. 'Deign, divine one, to declare to us precisely and in due order the sacred laws of each of the (four chief) castes (varna) and of the intermediate ones.
3. 'For thou, O Lord, alone knowest the purport, (i.e.) the rites, and the knowledge of the soul, (taught) in this whole ordinance of the Self-existent (Svayambhu), which is unknowable and unfathomable.'
4. He, whose power is measureless, being thus asked by the high-minded great sages, duly honored them, and answered, 'Listen!'
5. This (universe) existed in the shape of Darkness, unperceived, destitute of distinctive marks, unattainable by reasoning, unknowable, wholly immersed, as it were, in deep sleep.
6. Then the divine Self-existent (Svayambhu, himself) indiscernible, (but) making (all) this, the great elements and the rest, discernible, appeared with irresistible (creative) power, dispelling the darkness.
7. He who can be perceived by the internal organ (alone), who is subtile, indiscernible, and eternal, who contains all created beings and is inconceivable, shone forth of his own (will).
8. He, desiring to produce beings of many kinds from his own body, first with a thought created the waters [**Nile river flood**], and placed his seed in them.
9. That (seed) became a golden egg [**benben stone**], in brilliancy equal to the sun; in that (egg) he himself was born as Brahman **[Ra**], the progenitor of the whole world.
10. The waters are called narah, (for) the waters are, indeed, the offspring of Nara; as they were his first residence (ayana), he thence is named Narayana.
11. From that (first) cause, which is indiscernible, eternal, and both real and unreal, was produced that male (Purusha), who is famed in this world (under the appellation of) Brahman.
12. The divine one resided in that egg during a whole year, then he himself by his thought (alone) divided it into two halves;
13. And out of those two halves he formed heaven [**Nut**] and earth [**Geb**], between them the middle sphere, the eight points of the horizon, and the eternal abode of the waters.
14. From himself (atmanah) he also drew forth the mind, which is both real and unreal, likewise from the mind egoism, which possesses the function of self-consciousness (and is) lordly;
15. Moreover, the great one, the soul, and all (products) affected by the three qualities, and, in their order, the five organs which perceive the objects of sensation.

16. But, joining minute particles even of those six, which possess measureless power, with particles of himself, he created all beings.
17. Because those six (kinds of) minute particles, which form the (creator's) frame, enter (a-sri) these (creatures), therefore the wise call his frame sarira, (the body.)
18. That the great elements enter, together with their functions and the mind, through its minute parts the framer of all beings, the imperishable one.
19. But from minute body (-framing) particles of these seven very powerful Purushas springs this (world), the perishable from the imperishable.
20. Among them each succeeding (element) acquires the quality of the preceding one, and whatever place (in the sequence) each of them occupies, even so many qualities it is declared to possess.

(add discussion)

Manu's flood

The following is a visual (Q) of the 1300BC version of the flood of Manu:

which is the Hindu rewrite of Nu's solar barque, which is found depicted artistically on the pyramids, as well as constructed for various pharaohs, preserved archeologically as “ancient Egyptian solar ships” (Q), aka solar barque myth (Q), bursting out of the annual Nile river flood; which in Christianity is known as Noah's ark or Nuh's ark in Islam.

Nietzsche

In 1888, Friedrich Nietzsche, in his *Anti-Christ* (§55-57), devotes a certain amount of discussion to a comparison of the *Code of Manu* to the *Bible* in respect to a comparison of general "code of laws" books, citing the former as being more respectable to woman.

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1. (a) Anon. (c.200BC). *The Laws of Manu* (§1) (translator: George Buhler). Publisher.
(b) Manu Smriti – Wikipedia.
2. DeCaroli, Robert. (2004). *Haunting the Buddha: Indian Popular Religions and the Formation of Buddhism* (Manu, 9+ pgs; esp. pg. 109). Oxford University Press.

External links

- Manu (Hinduism) – Wikipedia.

θΔics

In hmolscience, **Manuel De Landa** (1952-) is a Mexican-born American philosopher noted, in philosophical thermodynamics, for his 2002 ideas on thermodynamics conceptualized "intensive" and "extensive" sociological properties.

Overview

In 2002, De Landa, in his *Intensive Science and Virtual Philosophy*, used the thermodynamic concepts of "intensive" and "extensive" properties, as described by Gordon van Wylen's 1963 textbook, modeled on molecular systems, but applied to biological populations (and by implication social populations), along with Belgian chemist Ilya Prigogine's conceptions of attractors and bifurcations, to address various philosophical questions. [1] De Landa seems to argue that it is differences in intensive variables that drive or produce change in populations.

In general, the overarching aim of the book, according to de Landa, is to present or rather reconstruct the work of French philosopher Gilles Deleuze, particularly his concept to multiplicities, being that which specifies the structure of spaces of possibilities, to analytical philosophers of science. Specifically, de Landa's aim is to reinterpret Deleuze's view of what constitutes the essence of an object, or rather what gives an object an identity preserved through time, in terms of dynamical processes, particularly material and energetic processes. The loose idea is that spaces, quantified by the mathematical conception of multiplicities, explain the regularities exhibited by morpho-genetic processes. De Landa also cites the theories of American biochemist Stuart Kauffman to a good extent.

In 2009, Landa's lectured at the European Graduate School in Saas-Fee, Switzerland, on the philosophical implications of 'materialism', the view that the world is described by material processes that exist independent of the mind, as can be described by thermodynamics, applied to the social realm [2]

References

1. (a) De Landa, Manuel. (2002). *Intensive Science and Virtual Philosophy* (thermodynamics, pgs. 49, 68-75, 101-05, 137, etc.). Continuum.
(b) Intensive Science and Virtual Philosophy – Wikipedia.
2. De Landa, Manuel. (2009). "Deleuze and the New Materialism (1 of 11)" (V), European Graduate School, Saas-Fee, Switzerland.

External links

â— Manuel de Landa – Wikipedia.

θΔics

In maps, **Map of Physics**, or “Porter’s Map of Physics”, is a 1939 map of the history of physics, physics defined as a “science which concerns itself with the fundamental laws of a material universe”, by American physicist Bernard H. Porter (1911-2004), according to which theoretical starting points, such as mechanics, sound, light, radioactivity, etc., are conceptualized as water sources, or bodies of uncharted water, from which the "streams of thought" emerge, alongside of which key thinkers, e.g. Empedocles, Newton, Clausius, Maxwell, etc., are shown, conceptualized as river-side "villages", towns, metropolises that come into or out of existence, feeding off the river, all contributing to the flow of ideas, theories, and concepts into the so-called future of physics, the last village mapped out being Paul Dirac, the person who in 1945 summarized that all of the various villages come before him can be reduced to fermion-boson interactions in a godless universe.

Abstract

The following is the abstract of the map: [1]

> “This map is the culmination of a six-year-long labor of love by noted physicist, visual artist, poet, and peace activist Bernard H. Porter [1911-2004]. Porter began compiling the historical data upon which the map is based in 1932 while a fellow in radioactive research at Brown University. He then took most of the summer of 1933, working out of his parent’s home in Houlton, Maine, to compose the map’s striking visuals. The following years were spent circulating the map among prominent physicists and historians of science to verify its accuracy. The end result is a rich geography of a scientific field, one that uses mapping conventions to make understandable the way ideas move and develop over time. Ambitious in scope, the map traces the history of physics from the 6th century BC to the present day [1939]. Key theoretical starting points such as ‘mechanics,’ ‘sound,’ ‘and light’ appear as water sources from which streams of thought emerge. Located alongside these rivers are “villages” representing figures like Isaac Newton, Alessandro Volta, Werner Heisenberg, and other major contributors to the development of physics. Surrounding it all is the map’s border, which is decorated with 24 diagrams that frequently appear in the work of physicists.”

(add)

Map

The following is the Porter's map of physics:

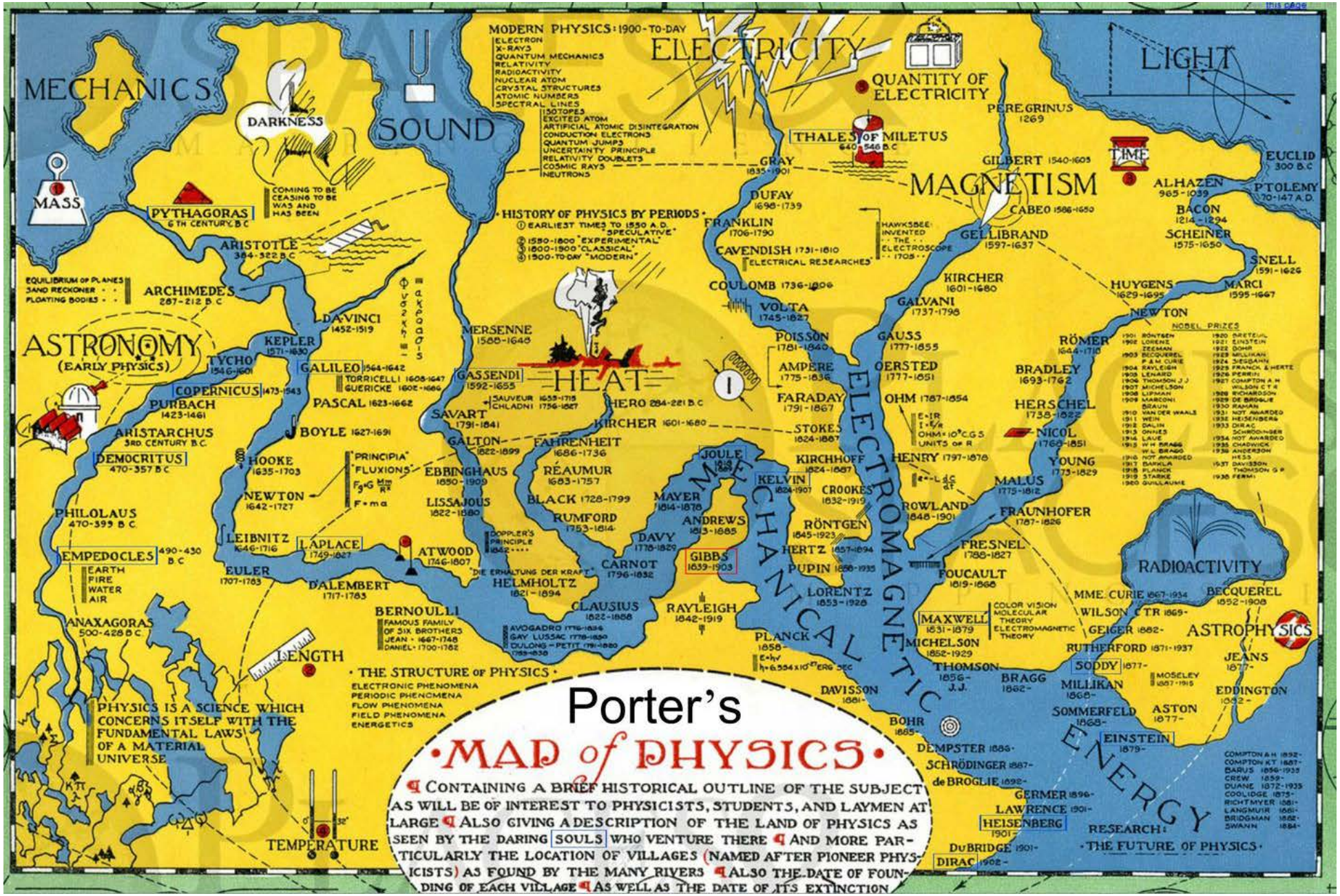

Cities | Towns

In Porter's map of physics, there are 121 main cites or towns, along the tributaries of knowledge, which are grouped by river (knowledge branch) and bend (e.g. Joule) as follows:

Anaxagoras to Kepler | 9 | STANDARD MODEL, ATOMIC THEORY, TO ASTRONOMY
Pythagoras to Da Vinci | 4 | MATHEMATICS TO HYDROLICS
Galileo to Bernoulli (Ñº) | 11 | RATIONAL MECHANICS
Heraclitus-Parmenides debate | 2 | VACUUM-BEING DEBATE
Mersenne to Helmholtz | 7 | SOUND

Hero to Carnot | 7 | HEAT
Clausius to Planck | 9 | ENTROPY TO QUANTUM
Thales | 1 | AMBER AND LODESTONE
Gray to Ampere | 8 | ELECTRICITY
Peregrinus to Gauss | 7 | MAGNETISM
Oersted to Lorentz | 12 | ELECTROMAGNETISM
Euclid to Maxwell | 19 | LIGHT
Becquerel to Soddy | 6 | RADIOACTIVITY
Jeans to Eddington | 2 | ASTROPHYSICS
Michelson to Einstein | 7 | ELECTRONS, PHOTONS, RELATIVITY, AND ENERGY
Davisson to Dirac | 10 | QUANTUM MECHANICS AND PARTICLE PHYSICS

(add discussion)

Zerotheism

The above version of Porter's map is soul-labeled, i.e. physicists who digressed on religious matters and or whose cosmology of physics and being were unified, e.g. Empedocles, are shown boxed, per the post-0BC religion | science divide, according to which modern 21st century physics does not, in any sense, recognize the term "soul", give or take passing dialogue, e.g. Heisenberg-Pauli dialogue, Einstein on the soul, Maxwell, e.g. who said his soul's an "amphicheiral knot" (Ñº), among others (see: geniuses on), whereas Porter in the early 20th century specifically uses the term "daring souls" (possibly as metaphor); whereas at the end of the 20th century the discussion and critique of religion and or open discussion of atheism had become the "last taboo" as classified by Wendy Kaminer, in her 1996 article "The Last Taboo: Why America Needs Atheism" (see: Zerotheism for Kids) turned 1999 book *Sleeping with Extraterrestrials: the Rise of Irrationalism and Perils of Piety* . [2]

See also

â— Histomap

References

1. (a) Porter, Bernard. 1939. Being a Map of Physics. Courtesy of Maine State Library and Mark Melnicove.
(b) Bern Porter (1911-2004) – Virginia.edu.
(b) In "10th Iteration (2014): The Future of Science Mapping," Places & Spaces: Mapping Science, edited by Katy Börner and Samuel Mills.
(c) Being a Map of Physics (zoom) (Ñº) – SciMaps.org.
2. (a) Kaminer, Wendy. (1996). "The Last Taboo: Why America Needs Atheism" (Ñº), *The New Republic*, Oct 14.
(b) Kaminer, Wendy. (1999). *Sleeping with Extraterrestrials: the Rise of Irrationalism and Perils of Piety.* Pantheon Books.

θΔics

In hmolscience, **Marc Donohue** (1951-) is an American chemical engineer and thermodynamicist noted for his co-authorship, with American leadership psychologist Richard Kilburg, of the 2014 “Leadership and Organization Behavior: a Thermodynamic Inquiry”, wherein they outline a molecular thermodynamics based model of leadership and organizational behavior. [1]

Human bonding

The following is their abstract venture into human bonding theory:

> “As we have pursued our examination of the parallels between the physical forces that enable the various states of matter to exist and the corresponding elements in human social systems, we have come to believe that emotions serve much the same bonding purposes for the development and maintenance of the various forms of human organization. The primary focus of this article is on human psycho social systems that most closely resemble crystalline solids, that is, structured hierarchical organizations such governments, military organizations, and for-profit businesses.”

(add discussion)

Human analogy table | Gas | Liquid | Plasma

Donohue and Kilburg employ not only the standard human molecule, human gas (or gas particle), but also "human liquid" (first done by Lawrence Henderson, 1935) and "human plasma" analogy models. The following is their human analogy table—which, to note, is similar in some respects to the social-to-molecular tables of Irving Fisher (1892) and Vilfredo Pareto (1897), as is historically outlined in the human thermodynamics variables table:

States of Matter and Analogous Human Organizations

State of matter	Characteristics	Human or organizational “states”	Characteristics
Crystalline solids	Crystals are ordered molecular structures in which the order is created by repulsive intermolecular forces or by highly anisotropic attractive forces. Isotropic attractive forces can strengthen the crystal and can change the conditions under which a crystal forms but cannot create or sustain structure in the absence of either repulsions or strongly anisotropic attractive forces.	Hierarchical organizations.	Like crystals, structure in hierarchical organizations is created by repulsive forces (fear) or anisotropic attractive forces (respect). Also like crystals, this structure can be strengthened (but not created or sustained) by isotropic attractive forces such as camaraderie among coworkers. However, the structure can be weakened by strong bonds of friendship (or romance) between people in different levels of the organization because these relationships reduce the fear or respect that create and sustain the organization. (Most hierarchical organizations also have characteristics of adsorbed phases. In particular, there may be a shared mission or vision that binds people to the organization or there may be a strong fear of financial loss associated with being separated from the organization.)
Liquids	Liquids form from gases when the attractive forces between and among molecules overcome the larger entropy of being a gas or vapor. The liquid phase is held together by these attractive forces.	Coherent and connected but less formally structured groups like clubs, families, sororities, etc.	Groups held together by bonds between/among people. Does not include organizations held together by bonds to an ideology, religion, or organization (charity, university, etc.).
Gases	Gases exist when molecules are at low densities and therefore do not interact regardless of the strength of their intermolecular forces.	Weakly interacting or non-interacting groups of people.	Individuals walking alone on a street, a shopping mall, or similar situations.
Supercritical fluid	Supercritical fluids exist at high temperatures and pressures. Because of the temperature, the intermolecular interactions are weak regardless of the density.		Non-interacting people, such as strangers in elevators, on city streets, etc., even if they are in crowded situations.

Plasmas	Plasmas are a fluid made of positively charged molecules (ions) and electrons at very low density. The positively charged molecules strongly repel one another and, hence, almost never come in contact with each other.	Isolated individuals, i.e. hermits.	Isolated individuals who avoid interactions with other people.
Adsorbed fluids (gases and liquids)	Gaseous or liquid molecules adjacent to a solid surface adsorb (stick) to the surface and lose some or all of their translational energy (ability to move). Adsorbed molecules usually are closer together (at a higher density) than away from the surface and therefore are more likely to interact with each other because of their attractions to the surface. Weakly or moderately adsorbed molecules are still fluid and the adsorbed molecules have attractive forces to both the surface and to other adsorbed molecules.	Religions, alumni associations, and volunteer organizations.	The key characteristic is affinity to religion, ideology, or mission of organization. Examples include church congregations, attendees at alumni or sporting events, Star Trek conventions, etc.
Strongly adsorbed phases — amorphous and crystalline	Strong forces of attraction to a surface cause/ allow adsorbed molecules to be packed so tightly that they repel each other. If the surface is rough and/or the adsorbed molecules are of different sizes or shapes, the adsorbed layer will be amorphous and glass-like. However, if the surface is smooth and the adsorbed molecules uniform in size and shape, the adsorbed layer will be structured but can be commensurate (aligned with the substrate) or incommensurate (not aligned with the substrate).	Hierarchical organizations and other situations where people will tolerate strong negative or repulsive forces such as the military.	Hierarchical organizations are analogous to crystalline (i.e. structured) adsorbed phases because the people are held to the organization by their affinity for the vision or mission of the organization or by fear of financial loss associated with being separated (fired) from the organization. The mosh pit at a rock concert is an example of a highly compressed but amorphous (non crystalline or unstructured) collection of people. In the mosh pit, the people are compressed by their common attraction to the performers, not by any attraction to one another.

(add discussion)

Human | Molecular behavior

The following is Donohue and Kilburg's human behavior = molecular behavior argument:

> "Although human behavior can be significantly more complex than molecular behavior and there has not yet been direct correspondence between the two demonstrated, we believe there are sufficient similarities that many of the lessons learned and facts discovered from the study of molecular physics and thermodynamics can provide new and useful insights into relationships among humans."

They cite Hungarian sociologist Babics Laszlo's 2003 "The Mechanics and Thermodynamics of Mass Societies" in support of this assertion. [7]

Of note, in the above "human behavior can be significantly more complex than molecular behavior" statement, a human is a molecule (see: human molecule) whose molecular formula has recently been calculated (see: human molecular formula), hence the statement is a false dichotomy.

Analogy platform | Prausnitz

The following is their analogy platform argument: [3]

> "What follows is an effort to draw an analogy between what is known about the physics, chemistry, bonding forces, and phase behavior of atoms and molecules in states of matter and the aspects of human relationships and emotional forces that operate to shape and maintain organizational structures. These concepts are presented as a set of ideas and suggestions that use natural language to help further the search for a mathematically formulated, scientific model of these behavioral phenomena. [4] Preliminary scientific validation for these concepts can be found in [5] as applied to molecular systems."

The gist of which, seemingly, is the use of Monte Carlo simulations of three different hypothetical geometric configurations, and the hypothetical thermodynamics correlative, per citation of John Prausnitz's 1996 *Molecular Thermodynamics* textbook—which, to note, is ironic, being that Prausnitz does not believe that thermodynamics is applicable to sociology. [6]

Kilburg

In 2011, Donohue, in co-authorship with American leadership psychologist Richard Kilburg, published "Toward a Grand Unifying Theory of Leadership: Implications for Consulting Psychology", wherein they employed emergence, complexity theory, and ecological systems theory (see also: ecological stoichiometry). [2]

Education

Donohue completed his BS in chemical engineering in 1973 at Clarkson College of Technology, graduating valedictorian, his PhD in 1977 in chemical engineering, with a dissertation on "Statistical Thermodynamics of Solutions in Natural-Gas and Petroleum Refining" at the University of California, Berkeley, under molecular thermodynamicist John Prausnitz. [3]

See also

- Alec Groysman
- Benjamin Kyle
- James Ferri
- Jose Aguilera
- Mohsen Mohsen-Nia

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1. Kilburg, Richard R and Donohue, Marc D. (2014). "Leadership and Organization Behavior: a Thermodynamic Inquiry" (analogy, pg. 266), *Consulting Psychological Journal: Practice and Research, Special Issue: the Physics of Leadership and Organizational Structure* (abs) (Q) (main), 66(4):261-87.
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5. Chen, Y., Kilburg, R. R., & Donohue, M. D. (2009). "Thermodynamics of Systems with Different Geometric Constraints and Intermolecular Correlations" (abs), *The Journal of Physical Chemistry B*, 113, 12530–12535.
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7. Laszlo, Babics. (2003). "The Mechanics and Thermodynamics of Mass Societies", *Journal of Human Thermodynamics*, Vol. 6, pgs. 39-46, Aug, 2010.

External links

- Marc D. Donohue (faculty) – Johns Hopkins Whiting School of Engineering.

θΔics

In hmolscience, **Marc et Andre Lichnerowicz** (1945-1969) was a French mathematician noted for his circa 1968 “Economics and Thermodynamics: a Model of Economic Exchange”, wherein he applied extensive and intensive thermodynamic models of exchange to economic exchanges.

Overview

In the late 1960s, Lichnerowicz, penned “Economics and Thermodynamics: a Model of Economic Exchange”, posthumously-published in 1970, wherein, based on the axiomatic thermodynamics of Constantin Caratheodory, and thermodynamics textbooks of Laszlo Tisza (1966) and Herbert Callen (date), he attempted a rather detailed formulaic entropy-based derivation focused on economic exchanges; the following is his opening paragraph:

French	English
“La presentation modern de la thermodynamique (par exemple Carathedory, H.B. Callen, L. Tisza) met en evidence une axiomatique d’echanges entre systems physiques d’un caractere extremement general. La distinction entre variables ‘extensives’ et variables ‘intensives’, par example, parait adapte a tout processus d’echange, quel que soit le domaine concret ou s’opere un tel echange.”	“The presentation of modern thermodynamics (e.g. Carathedory, H.B. Callen, L. Tisza) shows evidence of an axiomatic exchanges between physical systems of an extremely general nature. The distinction between variables 'extensive' and variables 'intensive', for example, seems to fit in any exchange process, regardless of the specific field or operates such an exchange.”

Lichnerowicz, in overview, according to Andrei Khrennikov (2005), postulates or outlines a model of stock dynamics akin to the stochastic dynamics of gas flow. [1] Philip Mirowski (1989) classifies Lichnerowicz as a “further out neosimulator”, in the history of non-neoclassical or anti-neoclassical economics programs of the appropriation of physics metaphors, that he has stumbled upon in his research, along with: Johannes Lisman (1949), Andrew Pikler (1951), John Bryant (1982), Edwin Jaynes (1983), and Giuseppe Palomba (1968). [3]

Education

Lichnerowicz seems to have been the son of French mathematical physicist Andre Lichnerowicz (1915-1998). (Ñº)

References

1. Lichnerowicz, Marc. (1970). “Economics and Thermodynamics: a Model of Economic Exchange” (“Un Modele d’ echange Economique: Economie et Thermodynamique”) (pdf), *Annals of the Institute Henri Poincare*, 6(2):159-200.
2. Khrennikov, Andrei. (2005). “Financial Heat Machine” (abs), *Physica A: Statistical Mechanics and its Applications*, 359(1-2): 487-490.
3. (a) Lichnerowicz, Marc and Lichnerowicz, A. (1971). “Economie et Thermodynamique: Un Modele d’ echange Economique: Economie et Thermodynamique”, *Economies et Societes*, 5:1641-86.
(b) Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature’s Economics* (pg. #). Cambridge University Press.

θΔics

In existographies, **Marc Seguin** (1786-1875) (CR:5) was French engineer noted for having made some of the first statements on the conservation of energy and on correlations between heat and work.

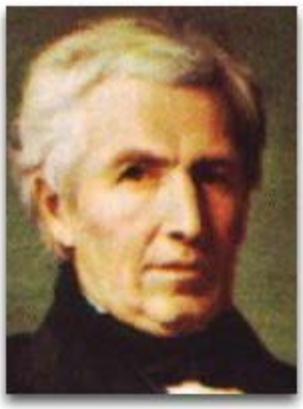

Overview

In 1822, Seguin, in his letter "Observations on the Effects of Heat and Motion", expressed views on the conservation of vis viva. [2]

In 1829, George Stephenson built is "Rocket" locomotive, that had a multi-tubular boiler, made of 25 copper tubes; it is conjectured that either Stephenson learned this from Seguin, or Seguin learned this from Stephenson. [4]

In 1839, owing to his studies of the steam engine, Seguin concluded that heat and work were interconvertable and was said to have estimated the mechanical equivalent of heat. [3]

Quotes | On

The following are quotes on Seguin:

> "Kirchhoff's predecessors in the field of radiation bore him much the same relation as, in the conservation of energy, Mayer, Colding, and **Seguin** bore to Joule and Thomson."
>
> — Hermann Helmholtz (c.1863), *Publication* [1]

References

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4. Kirby, Richard. (1956). *Engineering in History* (co-authors: Sidney Withington, Arthur Darling, Frederick Kilgour) (pg. 278). Courier, 1990.

External links

â— Marc Seguin – Wikipedia.

θΔics

In existographies, **Marcel Mauss** (1872-1950) (GSE:#) was a French sociologist and anthropologist, noted for []

Influences | Influenced

Mauss was a nephew of Emile Durkheim. Mauss influenced Claude Levi-Strauss.

Quotes | On

The following are quotes on Mauss:

> "In our temperate societies, subject to much more modest seasonal variations than those of the Eskimo societies **Marcel Mauss** describes in his groundbreaking study of social thermodynamics, the difference between hot and cold is not as marked as hierarchical thinking would like it to be. An activist sociology can nevertheless compensate for the tepid climate by instituting artificial freezers, centers of male frigidity that would augment social production and thus counterbalance the damage done by entropy."
>
> — Denis Hollier (1997), *Absent Without Leave* [1]

> "The ambition in this book is to consider modern technology as what **Marcel Mauss** called a total social phenomenon, viewed from the combined perspectives of history, sociology, economics, thermodynamics, ecology, epistemology, and culture theory."
>
> — Alf Hornborg (2016), *Global Magic* (pg. 18)

References

1. Hollier, Denis. (1997). *Absent Without Leave: French Literature Under the Threat of War* (pg. 42). Publisher.

External links

â— Marcel Mauss – Wikipedia.

θΔics

In existographies, **Marcellin Berthelot** (1827-1907) (IQ:#|#) (CR:45) was a French chemist noted for his effort to debunk the vital force theory, for his synthesis theories, for work in introducing terms in thermochemistry, and his thermal theory of affinity, and for his maximum work principle.

Vital force

Berthelot has been described as the official executioner of the vital force theory (see: vitalism), a concept about which he had an expressly philosophical bias against: [5]

> "It is the object of these researchers to do away with life as an explanation, wherever organic chemistry is concerned."
>
> — Marcellin Berthelot (c.1865), *Publication*; cited by Forris Moore (1918) in *A History of Chemistry* (pg. 204); cited by George Scott (1895) in *Atoms of the Living Flame* (pg. 93)

His aim here, although this seems to have have a feel of the defunct theory of life in it, according to chemistry historian Forris Moore (1918), was to show that all the transformations of the organic world are due to the play of simple chemical and mechanical forces acting in a mechanical way. [6]

Thermochemistry

Berthelot was a founder of thermochemistry and coined the terms exothermic and endothermic to describe whether heat leaves or is absorbed by a reaction. [4]

Thermal theory of affinity

In 1864, Berthelot published his theory, similar Danish chemist Julius Thomsen, which has since been dubbed the thermal theory of affinity, that the heat of a reaction was the true measure of affinity (Berthelot-Thomsen principle) and for his 1875 principle of maximum work, both of which were later shown to be incorrect with the development of the science of chemical thermodynamics in the 1880s. [1] The following comment by English chemist Arthur Lamb, translator of the works of German chemist Fritz Haber, on the merit of Haber's 1907 *Thermodynamics of Technical Gas phase Reactions*, highlights the view of Berthelot: [2]

> "The most important contribution [Haber (1907)] to the subject of predicting the course of a chemical reaction from a few characteristic constants (after the ill-starred attempt of **Berthelot**)."

In addition to Haber, a number of thermodynamicists, such as Hermann Helmholtz, Walther Nernst, Theophile de Donder, Gilbert Lewis, among others, went to great lengths to disprove Berthelot's theory, some even wining the Nobel Prize for their efforts.

Maximum work principle

See main: Principle of maximum work

Into the 1870s, the identification of "affinity" or "work" (or maximum work) with the heat alone, according to Berthelot, was to prove erroneous, in that the newly defined quantity entropy (1865) was also a factor. Berthelot's heat theory of affinity was initially criticized by French physicist Pierre Duhem, in a thesis that Berthelot's colleagues rejected. [3]

Berthelot's principle of maximum work, however, eventually met its demise with the publication of Helmholtz' 1882 paper "The Thermodynamics of Chemical Operations", in which he proved that the affinity is measured not by the heat evolved in a chemical reaction (in a galvanic battery) but by the maximum work produced when the reaction is carried

out reversibly. One must distinguish, according to Helmholtz, between that part of energy which appears only as heat and that part which can be freely converted into other kinds of work, i.e. the "free energy" analogous to potential energy in mechanics. Subsequently, the conditions of chemical stability are not determined by heat production but by the production of a decrease in free energy. [3]

Quotes | By

The following are noted quotes:

> "Organic nature, as well as mineral nature, operates like human industry, by which I mean that it harmonizes irreconcilable effects in absolute geometry. These approximate arrangements yield different degrees and multiple solutions in series of crystals as well as in the series of living beings. This is also the necessary rule for human societies."
>
> — Marcellin Berthelot (1893), *Publication* [7]

See also

● Claude Berthollet (1748-1822) - a French chemist, with a similar last name, who also did work on affinity.

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7. (a) Berthelot, Marcellin. (1893). "Article", *Review Scientifique*, Dec 26.
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Further reading

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● Berthelot, Marcellin. (1897). *Thermochimie* (*Thermochemistry*). Gauthier-Villars.
● Berthelot, Marcellin. (1902). *La revolution Chimique: Lavoisier* (*The Chemical Revolution: Lavoisier*). Felix Alcan.

External links

● Marcellin Berthelot – Wikipedia.
● Principle of maximum work – Wikipedia.

θΔics

In human chemistry, **Marcin Borkowski** (1963-) is an Polish analytical chemist noted his 2010 commentary on human molecular theory and whether human chemistry should be taught in school.

Overview

In 2010, Borkowski, as a functioning administrator of ChemicalForums.com, stated, in response to the forum query by American electrochemical engineer Libb Thims of “should human chemistry be taught in school?”, that:

> "[Human chemistry] sounds like crackpottery to me so far. Please elaborate. Assuming I understand what you mean - are you sure it is not abuse of the word "chemistry"? If you are interested in learning about human interactions they are covered by sociology and psychology."

Moreover, when presented with the textbook definition (*Ecological Stoichiometry*, 2002, Robert Sterner and James Elser) of a person as a molecule or technically a "human molecule" as follows:

$H_{375,000,000}$ $O_{132,000,000}$ $C_{85,700,000}$ $N_{6,430,000}$ $Ca_{1,500,000}$ $P_{1,020,000}$ $S_{206,000}$ $Na_{183,000}$
$K_{177,000}$ $Cl_{127,000}$ $Mg_{40,000}$ $Si_{38,600}$ $Fe_{2,680}$ $Zn_{2,110}$ Cu_{76} I_{14} Mn_{13} F_{13} Cr_{7} Se_{4} Mo_{3} Co_{1}

Borkowski commented the following over-used objection to the definition of a person as a molecule:

> "This is not even right. Humans are not molecules, they are complex objects composed of many molecules"

In messaging communication between Thims and ChemicalForums creator Mitch Garcia, Borkowski further commented that he was completed against allowing any discussion at all about human chemistry in ChemicalFormums.com and that, in regards to Thims posts:

> "With each paragraph you get more Baez crackpot index points."

To note, “Baez crackpot index”, an online parody system for numerically ranking the crackpottery of a theorist, posted on line in 1992 by mathematician John Baez, was also used in a derogatory direction towards Thims by Irish physicist Philip Moriarty during the 2009 Moriarty-Thims debate (specifically in part two). [4]

Education

Morkowski has some type of educational background in analytical chemistry, is the curator of ChemBuddy.com, and supposedly along the way won some type of "Chemistry Olympics" games in respect to analytical chemistry. [4]

References

1. Should Human Chemistry be Taught in School (2010) – ChemicalForums.com.
2. Site messages to Libb Thims – (29 Sep 2010) ChemicalForums.com.
3. Crackpot Index (by John Baez) – University of California, Riverside.
4. (a) Borek (about) – (Polish → English)– Galu.info.
(b) Interview with Martin “Borek” Borkowski (Polish → English)– Galu.info.

θΔics

In existographies, **Marco Polo** (1254-1324) (IQ:155|#627) (Cattell 1000:127) [RGM:147|1,500+] (Gottlieb 1000:66) was an Italian merchant, explorer, and writer, who, just as the Greek Heraclitus did with his visits to the Egyptians and surrounding foreign lands, traveled to the Islamic and Asian countries, and reported back to the Western world, information about various stories, tales, and cultural natures.

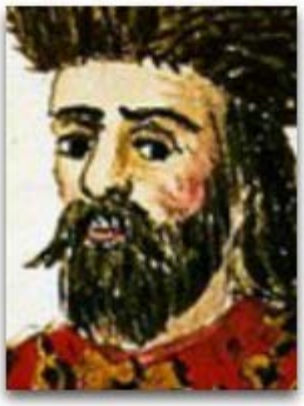

Sabah | Assassins

In c.1300, Polo, in one of his reports, recounted how Hasan Sabah (c.1050-1124) (IQ:#|#) (Ñº) constructed a lush garden, between two mountains, filling it with the most beautiful women in the land, along with the best food and drink, and used as a sort of Skinner box (see: Burrhus Skinner), to "condition" men to, when assigned, to "kill" certain key people; Polo reported on this as follows:

> "Sabah would introduce his designated assassins into his garden, some four or six or ten at a time, having first made them drink a certain potion, which cast them into deep sleep, and then causing them to be lifted and carried in. So, when they awoke, they found themselves in the garden, a place so charming they believe that it was [Islamic] paradise in truth, and the beautiful voluptuous maidens dallied with them to their heart's content, so thy had **what all men most desire above all else**."
>
> — Marco Polo (c.1300), *Publication* [1]

Sabah's Skinner box magical garden is the origin of the term "assassins", from the Persian "á¸¤ashashiyan" (Ñº), the name of the sect Sabah established. [1]

References

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External links

â— Marco Polo – Wikipedia.

θΔics

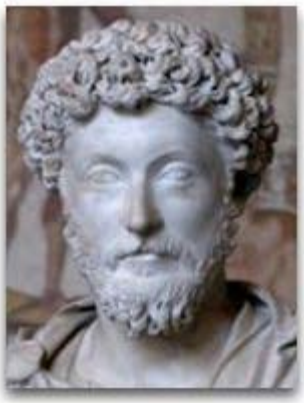

In existographies, **Marcus Aurelius** (121-180) (IQ:180|#122) (Cattell 1000:50) [RGM:102|1,500+] (Stokes 100:16) (Perry 80:4|Li) (FA:24) (EPD:F3) (GPhE:#) [CR:46], aka "Antoninus" (Holbach, 1770), was a Roman "philosopher king", politician, the 16th Roman emperor (Ñº), thing philosopher, an adherent of stoicism, an oft-classified “anti-theist” (Ñº), noted for his keen intellect and wisdom on a number of topics, such as atheism, nature, and change, to name a few, generally known for his *Mediations* (167AD), characterized as the "gospel of those who do not believe in the supernatural" (Zimmern, 1887), wherein he extols on a common sense practical Heraclitus-Zeno stylized stoicism.

-

Name

Marcus Aurelius was born "Marcus Annius Verus", but after he was adopted by the emperor T. Aurelius Antoninus, he assumed the name "Marcus Aurelius Antoninus", by which he is known to history. [9]

-

Chance | Providence | God?

In 167AD, Aurelius, in his *Mediations*, attempted to ferret out a position between the Stoic idea of ‘providence’ as the guiding principle of universal operation, the Epicurean notion of an ‘atoms and chance’ based universe, or a god-governed universe; this gist of which is as follows:

> “The periodic movements of the universe are the same, up and down from age to age. And either the universal intelligence puts itself in motion for every separate effect, and if this is so, be thou content with that which is the result of its activity; or it puts itself in motion once, and everything else comes by way of sequence in a manner; or indivisible elements are the origin of all things.—In a word, if there is a **god**, all is well; and if **chance** rules, do not thou also be governed by it.”
>
> — Marcus Aurelius (167AD), *Mediations* (§9.28)

The following, according to Jennifer Hecht (2004), is the heart of his concluding position:

> “Whether the universe is a concourse of atoms, or nature is a system, let this first be established, that I am part of the whole which is governed by nature; next, I am in a manner intimately related to the parts which are of the same kind with myself.”
>
> — Marcus Aurelius (167AD), *Meditations* (§10.6)

(add)

Soul | Silliness

Aurelius takes soul theory to its logical conclusions, therein reaching soul silliness conclusions

> “If souls continue to exist, how does the air contain them from eternity?—But how does the earth contain the bodies of those who have been buried from time so remote? For as here the mutation of these bodies after a certain continuance, whatever it may be, and their dissolution, make room for other dead bodies, so the souls which are removed into the air after subsisting for some time are transmuted and diffused, and assume a fiery nature by being received into the seminal intelligence of the universe, and in this way make room for the fresh souls which come to dwell there. And this is the answer which a man might give on the hypothesis of souls continuing to exist. But we must not only think of the number of bodies which are thus buried, but also of the number of animals which are daily eaten by us and the other animals. For what a number is consumed, and thus in a manner buried in the bodies of those who feed on them! And

> nevertheless this earth receives them by reason of the changes [of these bodies] into blood, and the transformations into the aerial or the fiery element. What is the investigation into the truth in this matter? The division into that which is material and that which is the cause of form [the formal].”
>
> — Marcus Aurelius (167AD), *Meditations* (§4.21)

This type of finding silliness in the details of the conclusions, of the hypothesis of souls, therein leading to a soft indirect dismissal of the theory, is also employed by Cicero and Sam Harris.

Change

The following are Aurelius quotes on change:

> “Nature, which governs the whole, will soon change all **things** which thou seest, and out of their substance will make other things, and again other things from the substance of them, in order that the world may be ever new.”
>
> — Marcus Aurelius (c.160), *Publication*; cited by Edward Clodd (1897) as opening quote in *Pioneers of Evolution from Thales to Huxley* [7]

> “Substance is like a river in continual flow; the energies undergo constant changes and do work in infinite variety. There is hardly anything that stands still or remains still.”
>
> — Marcus Aurelius (c.160), a seeming Heraclitus (475BC) paraphrase; cited by Mellor (1922), in: chapter twelve “Thermodynamics and Thermochemistry” [5]

> “Observe constantly that all things take place by change, and accustom thyself to consider that the nature of the universe loves nothing so much as to change the things which are and to make new things like them.”
>
> — Marcus Aurelius (167AD), *Meditations* (§4.36)

(add)

-

Education

In c.124AD, at age three, Aurelius’ father died, after which he was raised by his grandfathers and nurses. In his early teens, a teacher named Diognetus introduced him to philosophical texts. (Ñº)

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Quotes | Employed

The following are quotes employed by Aurelius:

-

> “The death of ‘earth’ is to become water, the death of ‘water’ is to become air, and the death of ‘air’ is to become fire, and reversely.”
>
> — Heraclitus (c.470BC), “noted saying”; cited by Marcus Aurelius (§4.46) in *Meditations* (167AD)

-

Quotes | On

The following are quotes on Aurelius:

"You are right; we must speak with respect of Lucretius; I see no one who can compare with him except Byron, and Byron has not his gravity nor the sincerity of his sadness. The melancholy of the ancients seems to me more profound than that of the moderns, who all more or less presuppose an immortality on the yonder side of the *black hole*. But for the ancients this black hole has the infinite itself; the procession of their dreams is imaged against a background of immutable ebony. The gods being no more and Christ not being not yet, there was between Cicero and **Marcus Aurelius** a unique moment in which man stood alone. Nowhere else to I find this grandeur; but what renders Lucretius intolerable is his physics, which he gives as if positive. If he is weak, it is because he did not doubt enough; he wished to explain, to arrive at a conclusion!"

— Gustave Flaubert (c.1875), "Letter to Madame Roger des Genettes" [3]

"Among men of flesh and bone there have been typical examples of those who possess this tragic sense of life. I recall now **Marcus Aurelius**, St. Augustine, Pascal, Rousseau, Rene, Obermann, Thomson, Leopardi, Vigny, Lenau, Kleist, Amiel, Quental, Kierkegaard—men burdened with wisdom rather than with knowledge."

— Miguel Unamuno (1912), *Tragic Sense of Life* [1]

"When in reading a meditative writer like **Marcus Aurelius**, we know his consciousness and nothing else. There is no good reason to think that statistical methods can anticipate that which, after all, chiefly distinguishes human life from physical processes, namely, original mental synthesis."

— Charles Cooley (1923), "The Roots of Social Knowledge" [4]

"Aurelius admired stoicism – of the variety that did not give much credence to the notion of chance – but he could never choose between the stoic idea of a somehow-ordered universe and the Epicurean's idea about atoms and chance."

— Jennifer Hecht (2004), *Doubt: a History* (pg. 155)

"The Epicureans avoided involvement in politics and didn't challenge the *status quo* and so were pretty much left in peace by other groups. Their ideas were opposed by the Stoics, and criticized by Cicero. **Marcus Aurelius** takes the time to reject the Epicurean notion of atoms in his *Meditations* – the only counter argument his stoicism concedes."

— Colin Sanders (2013), "Lucretius" [1]

Quotes | By

The following are related quotes:

-

"One who is afraid of an operation of nature, is a child."

— Marcus Aurelius (167AD), *Meditations* (2.12)

-

"Nothing is more wretched than a man who traverses everything in a round, and pries into things beneath the earth, as the poet says, and seeks by conjecture what is in the minds of his neighbors, without perceiving that it is sufficient to attend to the *daemon within him*, and to reverence it sincerely."

— Marcus Aurelius (167AD), *Meditations* (2.13)

-

"Live a good life. If there are gods and they are just, then they will not care how devout you have been, but will welcome you based on the virtues you have lived by. If there are gods, but unjust, then you should not want to worship them. If there are no gods, then you will be gone, but will have lived a noble life that will live on in the memories of your loved ones."

— Marcus Aurelius (167AD), *Meditations, Book II* (2.11?) (Ñº)(Ñº)

"We must expect death with tranquility, seeing that it is only a dissolution of the elements of which each animal is composed."

— Marcus Aurelius (167AD), *Meditations* (Book 2); cited by Baron d'Holbach (1770) in *The System of Nature* (pg. 130)

"For any particular thing, ask: What is it in itself? What is its nature?"

— Marcus Aurelius (c.170) *Source*; cited in *Silence of the Lambs* (1991)

"Accept the things to which fate binds you, and love the people with whom fate brings you together, but do so with all your heart."

— Marcus Aurelius (c.170)

"I seek after truth, by which no man ever yet was injured."

— Marcus Aurelius (c.170) [2]

See also

â— Harry Watson

References

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5. (a) Mellor, Joseph W. (1922). *A Comprehensive Treatise on Inorganic and Theoretical Chemistry, Volume One* (§: Chemical Affinity, pgs. 291-93; §12: Thermodynamics and Thermochemistry, pgs. 688-; Magnus, 32+ pgs; "accidental forms", pg. 688; Aurelius, pg. 688). Longmans.
(b) Mellor, Joseph W. (1922). *A Comprehensive Treatise on Inorganic and Theoretical Chemistry, Volume Two*. Longmans.

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7. Clodd, Edward. (1897). *Pioneers of Evolution from Thales to Huxley: with an Intermediate Chapter on the Causes of the Arrest of Movement* (Ñº)(pdf) (pg. xii). D. Appleton and Co.
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9. Aurelius, Marcus. (167AD). *Meditations* (translator: George Long; Introduction: Alice Zimmern) (name, pg. 17). Publisher, 1887; DigiReads, 2015.

Further reading

â— Aurelius, Marcus. (167AD). *The Thoughts of the Emperor M. Aurelius Antoninus* (translator: George Long). George Bell & Sons, 1901.

External links

â— Marcus Aurelius – Wikipedia.

θΔics

In existographies, **Marcus Varro** (116-27 BC) (619-708 AUC) (IQ:175|#249) (Cattell 1000:427) (CR:4) was a Roman scholar, politician, and philosopher noted for []

Antiquities

In c.48BC, Varro penned *Antiquities of Human and Divine Affairs* (*Antiquitates rerum humanarum et divinarum*) (Q), a 41 book set, wherein, like the historian Livy after him, he regarded religion as a human institution, that was important to preserve for the good of society. [4]

Vita

On vita, Varro said the following:

> "The poets, through the conjunction of fire and moisture, are indicating that the *vis*, 'force', which they have is that of Venus [Aphrodite]. Those born of *vis* have what is called *vita*, 'life', and that is what is meant by Lucilius [c.120BC] when he says: 'life is *force* you see: to do everything force doth compel us'."
>
> — Marcus Varro (c.50BC), *On the Latin Language* [1]

Dating system | AUC

In circa 50BC (or circa 703 AUC), Varro introduced the *anno urbis conditae* (AUC) or "from city founding" dating system, which dated years from the founding of Rome or 21 Apr 753BC (in Christian era years). [1] The AUC dating system, supposedly, came to be superseded, in usage, by the AD/BC dating system, invented in 525AD (1260AUC) by Roman monk Dionysius Exiguus, during the reign of Charlemagne (742-814). [2]

Quotes | On

The following are quotes on Varro:

> "Your books led us home, when we were wandering like strangers in our own city. You have revealed to us the names, types, duties and origins of all things divine as well as human."
>
> — Cicero (45BC), *On Academic Skepticism* (book dedication to Varro) [4]

> "What good can we suppose it did **Varro** and Aristotle to know so many things?"
>
> — Michel Montaigne (1580), "An Apology for Raymond Sebond" [3]

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(c) Venus – Wikipedia
(d) Aphrodite – Wikipedia.
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(f) Ennius – Wikipedia.
(g) John "Jay" Fisher (faculty) – Branford College.
2. ab urbe condita – Wikipedia.
3. (a) Montaigne, Michel. (1580). "An Apology for Raymond Sebond"; in: *The Complete Works* (translator: Donald

Frame) (Varro and Aristotle, pg. 435). Everyman's Library, 2003.
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4. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: P.G. Walsh) (pg. xxvi). Oxford University Press, 1998.

External links

- Marcus Varro – Wikipedia.

θΔics

In hmolscience, **Marek Roland-Mieszkowski** (1954-) is a Polish-born Canadian physicist noted, in human thermodynamics, for his 1992 to 2008 efforts to explain evolution, diet, and religion thermodynamically.

Overview

In 1992, Roland, in his "Life on Earth: Flow of Energy and Entropy", attempted to explain Darwinian evolution using a combination of negative entropy arguments, various energy balance calculations, photon mill logic, and information theory; he following exemplifies Roland's view: [1]

> "During the production of clothing, cars, and chemical compounds, etc., the entropy of the system is decreased because the components become organized. This is done, however, at the expense of the manufacturing system (including people) whose entropy [human entropy] will increase during this process [similar to how] a refrigerator [makes ice] at the expense of increased entropy of the environment."

(add discussion)

Entropy diet

As of 2008, Roland seems to be notable for applying his theories of thermodynamics and information theory to a new-age longevity diet, with the central message being to avoid meats and instead consume foods high in energy and information, and advice of better living and wellness; giving lectures on how to help people understand the nature of life, health, cancer, and disease through the window of physics and thermodynamics. [2] According to some views, he seems to be promoting a low entropy diet and entropy method which claims to extend life by 40% and to eliminate cancer and other degenerative diseases. [5]

Religious thermodynamics

> *See main: Religious thermodynamics*

In terms of theological influences, in a 2006 interview Roland commented that: "a very strong influence on my ideas has been a faith in God". This may explain why he was driven to develop his thermodynamic-information type life-diet theory, so to make an attempt at explaining the Christian God thermodynamically; an explanation embodied in his concluding section of his article entitled "Creation and Maintenance of the System", where he used entropy and energy to explain how living systems can be "created".

Other

Of note, variations of Roland's sun-photon-earth diagram, from his article, were used by in the 2005 book *Into the Cool: Energy Flow, Thermodynamics, and Life*, by Eric Schneider and Dorion Sagan, and the 2007 book *Human Chemistry*, by Libb Thims. [4]

Education

Roland received his MS in physics from Nicolaus Copernicus University in Torun, Poland in 1978 and his PhD in physics (focus on acoustics) in 1987 from Dalhousie University, Halifax, Canada. [3] In 1997, he was an adjunct professor at Dalhousie University and TUNS, teaching acoustics, psychoacoustics and instrumentation-related courses.

References

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2. (a) Roland-Mieszkowski, Marek. (2008). "Lecture: Light, Life, Health, Diet, and Cancer." Wellness Expo Halifax, NS. Canada, Oct. 19.
(b) Roland-Mieszkowski, Marek. (2006). "Interview by Gregory Giedrys: I Am Health Selfish" (Polish → English),

Gazeta.pl Torun, May 5th.
3. Anon. (1997). "HEARNET VIP: Dr. Marek Roland-Mieszkowski", *Hearnet.net*, June.
4. (a) Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Life* (pg. 164). Chicago: The University of Chicago Press.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 44) (preview), (Google books). Morrisville, NC: LuLu.
5. El Elohim, Racha. (2010). "Fotofraf and Columnist Kingdom Eloi Marek Roland-Mieszkowski" (Polish → English), *News of the Kingdome of Eloi*, May 21.

External links

â— Marek Roland – Facebook.

θΔics

In existographies, **Margaret Glover Foley Ames** (c.1913-c.1993) was an American science writing translator, noted for []

Overview

In 1994, Ames, in her *New Magdeburg Experiments*, gave the first English translation of Otto Guericke's classic 1672 Latin-penned *Ottonis de Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*, along with much need preface. [1]

References

1. Guericke, Otto. (1663). *New Magdeburg Experiments: on the Vacuum of Space* (*Ottonis de Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (translator and preface: Margaret Ames) (neglected genius, pg. 181). Publisher, 1672; Kluwer, 1994; Springer, 2012.

Further reading

â— Galvani, Luigi. (1953). *Commentary on the Effects of Electricity on Muscular Motion* (introduction: Bernard Cohen; translator: Margaret Foley). Norwalk.
â— Harris, Steven J. (1995). "Book Review: The New (So-Called) Magdeburg Experiments of Otto von Guericke. Otto von Guericke, Margaret Glover Foley Ames" (abs), *Isis*, 86(1):110-, Mar.

External links

â— Ames, Margaret Glover Foley – WorldCat Identities.

θΔics

In existographies, **Margaret Fuller** (1810-1850) (IQ:175|#280) (GFG:5) was an American forced prodigy turn noted for her 1832 reading of Goethe's *Elective Affinity*, which, according to biographer Megan Marshall, instilled in her the notion that "romantic attractions resulted from unalterable chemical affinities and should be obeyed regardless of marital ties", which gave her a "refreshing glimmer of hope, after doubting that she'd ever make a conventional marriage". [1]

Education

Fuller described her rather intense education-raising, carried out via the direction of her father Timothy Fuller, a scholarly man, Harvard graduate, congressman, and lawyer, process as follows: [3]

> "Thus I had tasks given me, as many and various as the hours would allow, and on subjects beyond my age; with the disadvantage of reciting to him in the evening, after he returned from his office…. I was often kept up till very late; and as he was a severe teacher, both from his habits of mind and his ambition for me, my feelings were kept on the stretch till the recitations were over. Thus frequently, I was sent to bed several hours too late, with nerves unnaturally stimulated. The consequence was a premature development of the brain, that made me a "youthful prodigy" by day, and by night a victim of spectral illusions, nightmare and somnambulism, which at the time prevented the harmonious development of my bodily powers and checked my growth, while, later, they induced continual headache, weakness, and nervous affections, of all kinds. As these again re-acted on the brain, giving undue force to every thought and every feeling, there was finally produced a state of being both too active and too intense, which wasted my constitution, and will bring me,—even although I have learned to understand and regulate my now morbid temperament,—to a premature grave."

(add)

Quotes | On

The following are notes of tribute and or praise:

> "Humanity is divided into men, women, and **Margaret Fuller**."
>
> — Edgar Poe (c.1845), publication (Ñº)

> "**Fuller** had read German books, and, for the three years before I knew her, almost exclusively: Lessing, Schiller, Richter, Tieck, Novalis, and, above all GOETHE. It was very obvious, at the first intercourse with her that the last writer—food or poison—the most powerful of all mental reagents—the pivotal mind in modern literature—for all before him are ancients, and all who have read him are modern—that this mind had been her teacher, and, of course, that place was filled, nor was there room for any other. She had that symptom which appears to all the students of Goethe."
>
> — Ralph Emerson (1852), commentary on Margaret Fuller [2]

> "She sprang out of the head of all the Zeuses about: her father Timothy Fuller, Emerson, Goethe"; like John Mill, her father's wish was to make her 'heir to all he knew'."
>
> — Elizabeth Hardwick (1986). "The Genius of Margaret Fuller" [3]

Quotes | By

The following are noted Fuller quotes:

> "I now know all the people worth knowing in America, and I find no intellect comparable to my own."
>
> — Margaret Fuller (c.1840), publication (Ñº)

References

1. Marshall, Megan. (2013). *Margaret Fuller: A New American Life* (Elective Affinities, 7+ pgs; esp. pg. 57). Houghton Mifflin.
2. (a) Fuller, Margaret. (1852). *Memoirs of Margaret Fuller Ossoli*, *Volume 1* (editors: William Channing, Ralph Emerson, and James Clarke) (§:Emerson, Channing and Clarke, pg. 242-43) . Phillips, Sampson and Co.
(b) Maas, Christel-Maria. (2006). *Margaret Fuller's transnational project: self-education, feminine culture and American national literature on the German model* (*Margaret Fullers transnationales Projekt: Selbstbildung, feminine Kultur und amerikanische Nationalliteratur nach deutschem Vorbild*) (pg. 63). University of Göttingen Publisher.
3. Hardwick, Elizabeth. (1986). "The Genius of Margaret Fuller", *New York Review of Books*, Apr 10.

External links

â— Margaret Fuller – Wikipedia.

θΔics

In existographies, **Margaret of Navarre** (1492-1549), born "Marguerite d'Angouleme" was French princess noted for []

Education

Margarite's mother, Louise de Savoie, described as a "voracious but sophisticated reader", saw to it that her daughter read: Sallust, Socrates, Juvenal, Cicero, Virgil, Ovid, Petrarch, Dante, and had studied philosophy.

Margaret was also had read the controversial ideas of Desiderius Erasmus by 1511 at the latest, with the publication in Paris of Moriae Encomium (The Praise of Folly) and of the Adagia as well as Institutio Christiani Principis (The Education of a Christian Prince). Four years later the scholar's 1516 translation of the New Testament was of particular interest to Marguerite.

In 1509, Margaret, then aged 17, was, not by choice, married to Duke Charles of Alençon, per reason of a stunning "dowry of 60,000 crowns", and moved into a medieval castle of Alencon, upon which time she, to make her own library, had books sent to her from the libraries of Amboise, Blois, and Cognac, and ordered other books from the printers' shops in France and other European countries. She also invited scholars and poets to dinners or evenings of music and conversation that became more frequent a few years later during visits from court members; this seems to have been an early intellectual "salon". [3]

Margaret's court was frequented by famous atheist writers, including: Etienne Dolet and Francois Rabelais. [2]

Soul | Experiment

In c.1540, Margaret conducted a soul experiment of sorts; specifically, to test the religious theory, that she had been taught, namely that the "soul left the body at the moment of death", she stayed by the deathbed of one of her maids for days on end until the last breath to see if she could see or hear the soul departing; this was recounted as follows: [1]

> "She never stirred from her bedside, as long as she was agonizing, looking her earnestly in the face, without interruption, till she was dead. Some of her ladies, who were most familiar with her, asked why she looked with so much attention on that poor dying creature: she answered, that having often heard many learned men assert that the soul left the body the moment it died, she was willing to **see if there came from it any wind or noise, or sound on the removal and going out of the soul**, but that she could perceive nothing like it ... she added, that if she were not well settled in her faith, she should not know what to think of that removal of the soul and its separation from the body, but that she would believe what her god and her church commanded her to believe, without any further inquiry."

(add)

Quotes | On

The following are quotes on Navarre:

> "Margaret of Navarre was the first modern women."
>
> — Samuel Putnam (c.1940)

References

1. (a) Brantome. (c.1600). *The Lives of Illustrious Women* (*Vies des Dames Illustres*) (Ñº). Publisher.
(b) Bayle, Pierre. (1734). *Dictionaire Historique et Critique, Volume IV* (5th ed; 5 vols) (pg. 318); in: *A General*

Dictionary, Historical and Critical, Volume VII (10 vols) (pg. 733). Publisher, 1741.
(c) Febvre, Lucien. (1947). *The Problem of Unbelief in the Sixteenth Century: the Religion of Rabelias* (translator: Beatrice Gottlieb) (Navarre, soul, 5+ pgs; esp. pg. 191-92). Harvard University Press.
(d) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 278-79). HarperOne.
2. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 278-79). HarperOne.
3. Marguerite de Navarre – PoetryFoundation.com.

External links

â— Marguerite de Navarre – Wikipedia.

θΔics

In existographies, **Margaret Sanger** (1879-1966) [HD:54] (FA:133) was []

Overview

As a child, Sanger's father Michael Higgins, an Irish-born American stonemason and freethinker, invited Robert Ingersoll to their town to speak, and made it clear to everyone that he supported Ingersoll; Margaret and her sibling were latter called "devil children" and heretics. [1]

Some years later, Sanger was caught one night, by her father, speaking to the bread, after dinner. Her father asked her why she spoke to the bread? She replied that she was thanking god for it. He asked if god was a baker? That, as she later recalled, was the start of her awakening. [1]

In 1910s, Sanger, in efforts to curtail dangerous back alley abortions, became a leading birth control activist; founder of Planned Parenthood; declared "no god; no masters"; braved the opposition of the Roman Catholic church. (Ñº)

Quotes | By

The following are quotes by Sanger:

> "When motherhood becomes the fruit of a deep yearning, not the result of ignorance or accident, its children will become the foundation of a new race."
>
> — Margaret Sanger (c.1915)

> "The most merciful thing that a family does to one of its infant members is to kill it."
>
> — Margaret Sanger (c.1915)

> "A free race cannot be born of slave mothers."
>
> — Margaret Sanger (c.1915)

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 440-41). HarperOne.

External links

â— Margaret Sanger – Wikipedia.

θΔics

In hmolscience, **Margaret Wheatley** (c.1945-) is an American management consultant and organizational behavior theorist noted for []

Overview

In 1992, Wheatley, in her *Leadership and the New Science: Discovering Order in a Chaotic World*, springboarded of Austrian-born American physicist Fritjof Capra's field theories and Belgian chemist Ilya Prigogine's order out of chaos theories, she uses quantum mechanics and particle physics to theorize about concepts such as "reaction channels" occurring within or at locations of organizations, citing thinkers such as Niels Bohr and Werner Heisenberg, and chaos theory to theorize about how progress is cyclical and that dark falls into the abyss are parts or phases of the movement, theorizes about entropy as the "inverse measure of a system's capacity for change", among other applications. [1]

Education

Wheatley, at age fourteen, entertained the goal of becoming a biologist and would carry heavy astronomy texts, which she says were too dense for her to understand, but carried them to look impressive, on the New York subway to weekly classes at the Hayden Planetarium. In college, she began to major in biology, but states that her encounters with advanced chemistry ended that career path, after which she turned to the social sciences, but remaining a lapsed scientist in heart, as she explains, eventually completed her undergraduate education in the liberal arts at the University of Rochester and University College London, in circa 1965. [1] Wheatley then completed an MA in systems thinking from New York University and an EdD in 1979 with a dissertation on "Equal Employment Opportunity Awareness Training: the Influence of Theories of Attitude Change and Adult Learning in the Corporate Setting" at Harvard Graduate School of Education.

References

1. Wheatley, Margaret J. (1999). *Leadership and the New Science: Discovering Order in a Chaotic World* (early education, pg. 7). ReadHowYouWant.com, 2010.

External links

â— Margaret J. Wheatley – Wikipedia.
â— Wheatley, Margaret J. – WorldCat Identities.

θΔics

In hmolscience, **Margareta Ignat** (c.1941-) (CR=5) is a Romanian physicist noted for her circa 2000 to present work in the field of econophysics and sociophysics in Romania, one of the first in the Romanian socioeconomic physics school; of interest is her emphasis on the application of thermodynamics to economics.

Socioeconomic physics

In 2001, Ignat penned the article "Econophysics: a New Field for Statistical Physics", co-authored with Mircea Gligor; in 2003, Ignat was the doctorial advisor for Gligor's 2003 PhD dissertation "Thermodynamics and Statistical Models for Dissipative Socio-Economic Systems". [1]

Education

Ignat completed her PhD in 1968 with a dissertation on "Contributions to the theory of magnetohydrodynamic wave propagation and solving basic equations of magnetohydrodynamics linearized" under Mircea Draganu at "Babes-Bolyai" University of Cluj-Napoca. In 1975, Ignat published *Questions and Problems of Thermodynamics and Statistical Physics*. Ignat presently is associated with Alexandru Ioan Cuza University, Romania.

References

1. (a) Gligor, Mircea and Ignat, Margareta. (2001). "Econophysics: a New Field for Statistical Physics" (pdf), *Interdisciplinary Science Reviews*, 26(4):1-8.
(b) Gligor, Mircea. (2003). "Thermodynamics and Statistical Models for Dissipative Socio-Economic Systems", PhD thesis, advisor: Margareta Ignat.
(c) Savoiu, Gheorghe. (2012). *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (pg. 13). Academic Press.

Further reading

● Gligor Mircea and Ignat, Margareta. (2001). "Some Demographic Crashes Seen as Phase Transitions" (abs), *Physica A: Statistical Mechanics and its Applications*, 301:535-44.
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External links

● Ignat, Margareta – WorldCat Identities.
● Margareta Ignat – Microsoft Academic.
● Margareta Ignat – YouTube.

θΔics

In hmolscience, **Margherita Long** (c.1967-) is an American comparative literature scholar noted for her 2009 book *This Perversion Called Love*, in which she devotes a chapter to the laws of thermodynamics in the theories of Austrian psychohologist Sigmund Freud as well as in the Japanese writings 'Sato Haruo' and *The Secret History of the Lord Musashi*, among other discussions. [1] The chapter seems to be a mixture of literature thermodynamics and psychological thermodynamics in discussing the writings of Japanese author Junichiro Tanizaki discussed in the context of the psychodynamics of Freud and the first and second laws of thermodynamics.

Education

Long completed BA in English at Amherst College in 1989 and her MA (1993) and PhD (1998) in East Asian studies at Princeton University. [2] In 2009, Long was an assistant professor of comparative literature at the University of California, Riverside.

References

1. Long, Margherita (2009). *This Perversion Called Love: Reading Tanizaki, Feminist Theory, and Freud* (ch. 2: The Problem with Parody: Masochism, the Death Drive, and the Laws of Thermodynamics in 'Sato Haruo' and *The Secret History of the Lord Musashi*, pgs. 40-68; section Freud and the Laws of Thermodynamics, pgs. 50-; thermodynamics, 13+ pgs.). Stanford University Press.
2. Margherita Long (curriculum vitae) – University of California, Riverside.

External links

â— Margherita Long (faculty) – University of California, Riverside.

θΔics

In hmolscience, **Marguerite Callaway** (1950-) is an American new age business consultant noted, in business thermodynamics, for her 2006 book *The Energetics of Business*, in which she speculates on what she calls "business energetics", arguing that there is an energetic component to business operation and particularly to business startups.

Overview

Callaway's work is part motivation or self-help in style, mixed with new age ideas, intertwined with a few verbally simplified ideas from science. The following is an example quote:

> "Businesses, like their owners, managers, employees and customers are living organisms and, therefore, follow the energetic and organic principles of living systems as well as common economic principles."

To give an idea, the book culls from individuals such as Carl Jung, Mihály Csíkszentmihályi, Rupert Sheldrake, among others. The book does not, to clarify, use the term "energetics" in the Wilhelm Ostwald sense, but rather speculates, for the most part on the "workings of the energy field that envelops our physical body", a subject Callaway spent a year studying in 2003. The impetus behind the writing of the book is captured by the following question, she found herself asking repetitively: "wouldn't it be useful to explain the underlying energetics of collective human activity such as businesses in a way that would make it useful to business owners themselves?" The science of energetics, to note, is thermodynamics, a term which Callaway does not use.

Difficulties on theory

A downfall of the Callaway's work, similar to other new age authors, steeps theory on the premise that there exists a "living energy" of the universe, which is a synonymous term akin to the now defunct: vitalism, living force, elan vital theories of the nineteenth century.

Education

Callaway completed her undergraduate work at Northwestern University, her MS from Cornell University, and MBA from the University of Chicago.

References

1. (a) Callaway, Marguerite M. (2006). *The Energetics of Business: A Practical Guide for Bringing your Business to Life*. Lincoln Park Publications.
(b) The Energetics of Business – CallawayGroup.com.

External links

â— Marguerite Callaway (about) – OdeMagazine.com.

θΔics

In existographies, **Maria Popova** (1984-) (CR:4) is a Bulgarian-born American writer, and book reviewer, who writes standing up (Q), noted for []

Education

Popova, born to mother who studied library science, a father who studied engineering, and a grandmother who read encyclopedias to her as a child, supposedly, was exposed to a larger than average amount of knowledge as a youth; in 2007, Popova completed a degree in communications at the University of Pennsylvania.

Brain Pickings

In 2006, Popova started an email group with six friends, thematic, supposedly, to her later blogging effort.

In 2008, Popova started the blog BrainPickings.org (Q), which initially just blogged about random music, art and books, but by c.2014 had progressed to become a more intellectually focused blog on famous historical people, their books, and their doings; many essays often on top 1000 geniuses, or related; similar, thematically and stylistically, in writing style and topic, to Philip Ball and Malcolm Gladwell.

Quotes | Employed

The following are quotes employed by Popova:

> "Nothing is sweeter than to **know everything**, and enthusiasm for all good arts brings, some time or other, excellent rewards."
>
> — Elisabeth Hevelius (c.1665), frequent words of encouragement to her husband Johannes Hevelius; cited by Maria Popova (2014) [1]

> "A sight, and emotion, creates this 'wave in the mind', long before it makes words to fit it."
>
> — Virginia Woolf (c.1925), *Publication*; cited by Maria Popova (2014) (Q)(Q)

Quotes | By

The following are quotes by Popova:

> "**Boredom** appears to be the polar opposite of what Mihaly Csikszentmihalyi has famously termed 'flow', a state of intense focus you enter whilst absorbed in an enthralling task, when you lose track of time."
>
> — Maria Popova (2012), "The Cultural History and Adaptive Function of Boredome" (Q) (see: boredom philosopher), a review of Peter Toohe's *Boredom: a Lively History*, Jun 6

References

1. Popova, Maria. (2014). "Ordering the Heavens: Hevelius' Revolutionary 17th-Century Star Catalog and the First Moon Map" (Q), BrainPickings.org, Aug 11.

Videos

- Wright, Robert. (2016). "Interview of Maria Popova" (Q), MeaningOfLife.TV, Nov 2.

Further reading

- Popova, Maria. (2019). *Figuring* (energy, 5+ pgs) (Amz). Pantheon.

External links

- Maria Popova – Wikipedia.
- Maria Popova (@BrainPicker) – Twitter.

θΔics

In thermodynamics, **Marian Smoluchowski** (1872-1917) was an Austrian-born Polish statistical physicist whose work tended to focus on kinetic theory of matter, and who is noted for giving, supposedly, the first 'exorcism' of Maxwell's demon in his 1912 lecture entitled "Experimentally Verifiable Molecular Phenomena that Contradicts Ordinary Thermodynamics", arguing that thermal fluctuations would prevent any automatic device from operating successfully as a Maxwell demon. [1] In other words, because of Brownian movement, the door would heat up and begin to vibrate, from the gas molecules colliding against it, and would cease to work as a one-way valve. [2] In 1914, Smoluchowski, in his "Limits on the Validity of the Second Law of Thermodynamics", commented: [3]

> "As far as we know today, there is no automatic, permanently effective perpetual motion machine, in spite of the molecular fluctuations, by such a device might, perhaps, function regularly if it were appropriately operated by intelligent beings."

This passage was cited as cited by Hungarian-born American physicist Leo Szilard in his 1929 followup work on Maxwell's demon. [4]

Trapdoor mechanical demon

The following is a reconstruction of Smoluchowski's so-called "trap door" conception of mechanical Maxwell's demon, based on his 1912 "Experimentally Demonstrable Molecular Phenomena, Which Contradict Standard Thermodynamics", wherein he discussed "fluctuations" or special states of matter where spontaneous deviations from the average value of some property (e.g. pressure or density) suddenly become very large, such as occurs in phase transformations, and on this platform asked if could be possible to use these pressure fluctuations to push a one-way door, such that a high pressure would open the trapdoor, low pressure would keep the door closed, and as such the door would act like an automated Maxwell demon: [5]

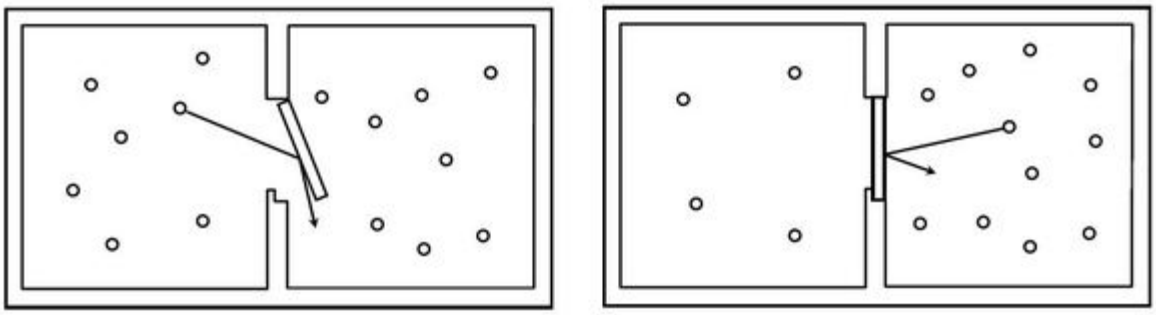

Thus, in principle, if the right sized door, in proportion to fluctuation magnitude, were used, particles could be worked to go from the right to left, and create a temperature difference without work, in violation of the second law, but the Brownian fluctuation motion would vibrate the door, and hence negate the former argument.

Smoluchowski dismissed the idea that an actual violation of the second law could occur, except in the rare case if one were willing to wait long enough, pointing out that if the door were too weak, it would be subject to thermal motion and begin to vibrate randomly, negating the violation ability possibility.

Education

Smoluchowski studied physics under, among others, Josef Stefan in Vienna.

References

1. Zheng, Jianzhou, Zheng, Xiao, Zhao, Yang, Xie, Yang, Yam, ChiYung, Chen, GuanHua, Jiang, Qing, and Chwang

Allen T. (2007). “Maxwell’s Demon and Smoluchowski’s Trap Door.” *Physical Review E* 75, 041109.
2. Schmitz, John E.J. (2007). *The Second Law of Life: Energy, Technology, and the Future of Earth as We Know It*, (pg. 151). William Andrew Publishing.
3. Smoluchowski, Marian. (1914). “Limits on the Validity of the Second Law of Thermodynamics” (“Gültigkeitsgrenzen des Zweiten Hauptsatzes der Wärmetheorie”), In: *Lectures on the Kinetic Theory of Matter and Electricity* (*Vorträge über die kinetische Theorie der Materie und Elektrizität*) (pg. 89). B.G. Teubner.
4. Szilárd, Leó. (1929). “On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings” (Uber die Entropieverminderung in einem thermodynamischen System bei Eingriffen intelligenter Wesen), *Zeitschrift fur Physik*, 53, 840-56.
5. (a) Smoluchowski, Marian. (1912). “Experimentally Demonstrable Molecular Phenomena, Which Contradict Standard Thermodynamics” (“Experimentell nachweisbare der ublichen Thermodynamik widersprechende Molekularphanomene”), *Phys. Z.* 13:1069-80.
(b) Hoffmann, Peter M. (2012). *Life’s Ratchet: How Molecular Machines Extract Order from Chaos* (§: Smoluchowski’s Trap Door, pg. 129-30). Basic Books.

External links

â— Marian Smoluchowski – Wikipedia.

θΔics

In existographies, **Marie Curie** (1867-1934) (IQ:180|#120) [RGM:13|1,500+] (CR:30) was a Polish-born French physicist and chemist, an early parental death activated genius, turned smartest woman ever (#4), noted for her pioneering work in radioactivity.

Prodigy

Curie was a child prodigy of sorts; at age four, e.g. she was tutoring her older sister on reading. [1]

Atheism | Agnosticism

Curie's father was a freethinker and physics professor; her mother a Catholic.

In 1867, at age 11, her older sister died (dereacted) from typhus and her mother of tuberculosis. Sometime thereafter she fell into a profound depression and concluded that "god did not exist". [1] Soon after her mother's death, Marie seemed to lose herself in books for hours, sometimes days, at a time. She spoke little. The only way she was able to cope was by screening out the world and focusing obsessively on a subject. [2]

Though most label Curie as atheist (Q), others have attempted to label Curie as "agnostic" or an "anticlerical atheist". (Q)

Quotes | By

The following are noted quotes by Curie:

> "Pierre belongs to no religion, and I do no not practice any."
>
> — Marie Curie (1895), on reasons for civil ceremony marriage (Q)

> "Nothing in life is to be feared, it is only to be understood."
>
> — Marie Curie (c.1920) (Q)

> "Never be fearful about what you are doing when it is right."
>
> — Marie Curie (c.1920) (Q)

> "Life is not easy for any of us. But what of that? We must have perseverance and above all confidence in ourselves. We must believe that we are gifted for something and that this thing must be attained."
>
> — Marie Curie (c.1920) (Q)

References

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2. Goldsmith, Barbara. (2005). *Obsessive Genius: the Inner World of Marie Curie* (Q). Publisher.

External links

- Marie Curie – Wikipedia.

θΔics

In existographies, **Marilyn Savant** (1946-) (IIQ:228|#21) (CR:13) is an American magazine columnist noted for her 1985 fiasco wherein she turned an age 11 tested Stanford-Binet report card into an age 40 feigned IQ of 228, which she sold to the Guinness Book of World records (see: Guinness Book IQ) so to promote herself in aims to land a magazine columnist writing job; the resulting fiasco, combined with her good looks (which, to note, thus affronts Beckhap's law), resulted to push her name, mistakenly, into the "highest IQ ever" folklore; a confusion that persists to this day.

Intelligence | Inherited?

In c.1985, Savant, who likes to claim linage from Ernst Mach, on the Joe Franklyn show, stated her view that "intelligence is inherited" and that "it has to be inherited". (Q) This so-called "Galton intelligence model", as was promoted by Francis Galton (*Hereditary Genius*, 1869), naturally enough, is incorrect. Studies of genius (e.g. bachelorhood and genius) show that the more of a genius a genius becomes, e.g. as gauged by ranking on the top 500 geniuses scale, the less likely the genius is to reproduce; moreover the less likely are their offspring to reproduce (e.g. Goethe genealogy). The inherited intelligence model, in fact, was an idea ridiculed by Charles Darwin:

> "You have made a convert of an opponent in one sense [of your *Hereditary Genius*], for I have always maintained that, excepting fools, men did not differ much in intellect, only in zeal and hard work."
>
> — Charles Darwin (c.1869), "Letter to Francis Galton" [16]

Savant, as we see, is intellectually inept, in this regard.

Sample Items from the Stanford-Binet Intelligence Scale	
2 years old	On a large paper doll, points out the hair, mouth, feet, ears, nose, hands, and eyes. When shown a tower built of four blocks, builds one like it.
3 years old	When shown a bridge built of three blocks, builds one like it. When shown a drawing of a circle, copies it with a pencil.
4 years old	Fills in the missing word when asked, "Brother is a boy; sister is a _____." "In daytime it is light; at night it is _____." Answers correctly when asked, "Why do we have houses?" "Why do we have books?"
5 years old	Defines *ball, hat, and stove.* When shown a drawing of a square, copies it with a pencil.
9 years old	Answers correctly when examiner says, "In an old graveyard in Spain they have discovered a small skull which they believe to be that of Christopher Columbus when he was about 10 years old. What is foolish about that?" Answers correctly when asked, "Tell me the name of a color that rhymes with head." "Tell me a number that rhymes with tree."
Adult	Can describe the difference between laziness and idleness, poverty and misery, character and reputation. Answers correctly when asked, "Which direction would you have to face so your right hand would be toward the north?"

Example questions from the 1960 revised edition of the Stanford-Binet Intelligence Scale test, devised originally by Lewis Terman and Maud Merrill in 1937, that **Savant** took at age 11 (1947), scores from which, in 1985, she transformed "magically", i.e. using number fudging methods, via the ratio IQ formula, into an **IQ of 230**.

IQ scam | Overview

In 1947, Savant, aged 11-years and 4-months, or a "just after ten", as she later said on Letterman Show (1985) (Q), took the Stanford-Binet intelligence test, example questions of which shown adjacent.

In 1982, Ronald Hoeflin, unsatisfied with 1942 formed Mensa Society (IQ:132+), created a new high IQ society called

Mega Society, conceptualized as a society for supposed geniuses, whose IQs are tested at 145+, and test, called the "Mega Test" (see: Mega Test IQ) designed to recognized IQs of 145 or above. Savant, shortly thereafter, became a member of Hoeflin's Mega Society (Hoeflin claims to have dated Savant) as did American lawyer Andrew Egendorf (Q).

In c.1984, Egendorf, who was attempting to write a book about high-IQ societies, suggested to Savant, over dinner, that they have Hoeflin send in her Stanford-Binet test scores, from 30 years ago, into the Guinness Book, to get her name listed in the "highest IQ" category. The formula they used to calculate Savant's claimed IQ is the ratio IQ formula (aka Terman IQ), or the ratio of the "mental age" (intellectual age) by the "chronological age" (actual age) of the test taker; specifically:

$$IQ = 100\frac{MA}{CA}$$

In respect to "mental ages", in this formula, we note:

> "Beyond age fifteen, the 'mental ages' are entirely artificial and are to be thought of as simply numerical scores."
>
> — Lewis Terman (1937), Stanford-Binet Intelligence Scale [2]

A retrospect commentary on how Egendorf and Savant, did this calculation is as follows:

> "Savant – the surname is real, it was her mother's maiden name – has had a unique claim to fame since the mid-1980s. It was then, almost 30 years after she took a test as a schoolgirl in downtown St Louis, Missouri, that her IQ came to light. In 1985, Guinness World Records accepted that she had answered every question correctly on an adult Stanford-Binet IQ test at the age of just 10, a result that gave her a corresponding mental age of 22 years and 11 months, and an unearthly IQ of 228."
>
> — Sam Knight (2009), "Is high IQ a burden as much as a blessing?", Apr 10 [4]

Savant, Egendorf, and Hoeflin, in short, put the mental age of "22 years and 11 months", however this may have been discerned, and in spite of the post age 15 artificial IQ warning note, and chronological age of "10 years" into the ratio IQ formula to yield:

$$IQ_{Savant} = 100\frac{22 + 11/12}{10}$$

which calculates an IQ of 229.2 (or 230 rounded off). In short, because Savant, at age 11, knew the difference between "character and reputation" and could "point her right had northward" she could use the ignore-the-fine-print version of the Terman IQ formula to tell people that she has an IQ of 230. Not only that, at age 40, her IQ is still is 230 and is the smartest person ever? This is what is called an overt mischievous feigned IQ.

In Mar 1985, Savant appeared on the Letterman Show, being touted as a person with an "IQ of 230, the highest ever recorded", during which time she says the following, when queried with "how do we know you are the smartest person in the world: (Q)

> “How do you know I’m the smartest women in the world? Nobody really knows that. Not that many people have taken an IQ test. I had the highest score on the Binet, so far. A very small minority of people in the world have taken test and what does Binet know, for heaven’s sake? I mean, back in 1904, he didn’t stumble over a Rosetta stone. He said: ‘this is what I’m going to do’ and everybody has been imitating him ever since.”

Savant, in short, sent in age-fudged IQ test records, test taken at age 10 (actual age 11-years 4-months), using the Lewis Terman's age ratio IQ formula, into the Guinness Book company so to thereby get her name listed in the “highest IQ” category with a Guinness Book IQ of 228 (see: feigned IQ); the stunt was done, as she recounts, for promotional purposes, so to land a job as a magazine columnist.

Quotes | On

The following are quotes on Savant:

> “Both the month that **Marilyn** took the test and the mental age she achieved on it are matters of some question that contribute to the murkiness over the Guinness top score. Her record with the St. Louis board of education shows she took the test in March 1957; she insists she first took it in September 1956. She says documents supporting her claims were provided by a teacher whose name she can’t remember and sent to Christopher Harding, a Mega society member, now in Australia.”
>
> — Julie Baumgold (1989), “In the Kingdom of the Brain” [1]

> “**Savant** was given an old version of the Stanford-Binet (Terman & Merrill 1937), which did, indeed, use the antiquated formula of MA/CA × 100. But in the test manual's norms, the Binet does not permit IQs to rise above 170 at any age, child or adult. And the authors of the old Binet stated: 'Beyond fifteen the mental ages are entirely artificial and are to be thought of as simply numerical scores.' (Terman & Merrill 1937). The psychologist who came up with an IQ of 228 (see: IQ:225+) committed an extrapolation of a misconception, thereby violating almost every rule imaginable concerning the meaning of IQs.”
>
> — Alan Kaufman (2009), *IQ Testing 101* [2]

> “And what is it that makes **Marilyn vos Savant** so uniquely qualified to answer such questions? There is only one reason: she is listed in the *Guinness Book of World Records* as having the ‘highest IQ’ score ever recorded. Never mind that this record is based on a non-standardized test put out by an obscure group known as Mega, supposedly the world's most selective organization of geniuses. Ignore the fact that test scores at the extreme ends of any distribution are notoriously unreliable. Forget that vos Savant graduated 178th out of her class of 613 in high school, married young, failed to finish college, and by her own report reads very little. Her fame came, in the words of journalist Julie Baumgold [1989], ‘only because of the glory of that number.’ If vos Savant has ‘the highest IQ ever recorded’, surely she must be an expert on everything under the sun?’.”
>
> — Elaine Castles (2012), *Inventing intelligence: How American Came to Worship IQ* [3]

> “Langan is an IQ charlatan like Jim Diamond, **Marilyn Savant**, Rick Rosner, etc.; people sell IQ nowadays like people used to sell snake oil in the old days.”
>
> — Libb Thims (2014), “Questions About IQ Ranges” (Q), Hmolpedia forum, Dec 7

> "I think Feynman, Wittgenstein, Austin, and Keynes should be on the list. They achieved so much more than an IQ-only phony like **Marilyn vos Savant**. I'm suspicious of those who only do stunts to show off memory and math. Let them invent a Microsoft or Apple like Gates or Jobs did, if they want to prove themselves to the world."
>
> — Dexter Haven (2016), comment (Q) on video "Smartest Person Ever | IQ:200 (4 of 4)"

References

1. Baumgold, Julie. (1989). "In the Kingdom of the Brain" How Love Changed the Smartest Couple in New York" (pg. 41). *The New York Magazine.* Feb 06.
2. Kaufman, Alan S. (2009). *IQ Testing 101* (pg. 104). New York: Springer Publishing.
3. (a) Baumgold, Julie. (1989). "In the Kingdom of the Brain" How Love Changed the Smartest Couple in New York" (pg. 41). *The New York Magazine.* Feb 06.
(b) Castles, Elaine E. (2012). *Inventing intelligence: How American Came to Worship IQ* (pg. 3). ABC Clio.
4. Knight Sam. (2009). "Is high IQ a burden as much as a blessing?" (Q), *Financial Times*, Apr 10.
5. Gould, Stephen. (2006). *The Mismeasure of Man* (pg. #). Publisher.

External links

- Marilyn vos Savant – Wikipedia.

θΔics

In existographies, **Marin Mersenne** (1588-1648) (CR:18) was French theologian, philosopher, mathematician, and music theorist, a "Cartesian defender" (Conlon, 2011), noted for []

Overview

Mersenne was friends with Galileo, Thomas Hobbes, Rene Descartes, and Pierre Gassendi.

In the 1620s, Mersenne, in some book, which contained a “catalog of atheists”, listing: Bonaventure des Periers (c.1500-1544) (Q), Pierre Charron, Niccolo Machiavelli, Lucilio Vanini, and Giordano Bruno, among other, claimed that there were 50,000 atheists living in Paris (population: 400,000), a 12.5 percent atheism population. [1]

In c.1647, Mersenne was the one who told Blaise Pascal about the Torricelli vacuum (1643). [2]

Quotes | On

The following are quotes on Mersenne:

> “As to the history of the quicksilver experiment [Torricelli vacuum], your reverence may know that the many wells of Florence which are cleaned out every year by means of siphons ‘by attraction’, gave signor Galileo occasion to observe the height of such attraction, which was always the same about 18 ells in that Tuscan measure; and so in every siphon or cylinder (as we like to say) however wide or narrow. From this had their origin his speculations about that matter, which were pout into his work on the resistance of solids. Afterwards, signor Gaspar Berti, here in Rome, made a led siphon which rose to about 22 ells from his courtyard to a room.”
>
> — Raffaello Magiotti (1848), “Letter to Marin Mersenne”, May 25 [3]

> “If we take the mathematics, and those mixed sciences to which they are applicable, it will be universally admitted that their most successful cultivators in France during the seventeenth century were Descartes, Pascal, Fermat, Gassendi, and **Mersenne**. Fermat, among these, was one of the most profound thinkers of the seventeenth century, particularly as a geometrician, in which respect he was second only to Descartes. The most important steps are those concerning the geometry of infinites, applied to the ordinates and tangents of curves; which he completed in or before 1636.”
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 499-50)

> “In contrast to the Cartesian caution, in Germany — where orthodox Cartesianism never gained a foothold — several prominent thinkers embraced the belief that the fixed stars were surrounded by planets and spread throughout an infinite universe. The *Ecstatic Celestial Journey* (*Iter exstaticum coeleste*), 1656, by the Jesuit Athanasius Kircher explicitly characterized the fixed stars as suns with encircling planets, although it denied inhabitants even to the planets of our solar system and to the moon. And Otto Guericke, famous for the ‘Magdeburg experiments’ proving the existence of a vacuum, devoted a section of his *Experimenta Nova* (1672) to an examination and endorsement of Kircher's view of other planetary systems. Von Guericke also noted the possibility of an inhabited moon and planets, and emphasized (following Galileo) that any inhabitants would not be men, but rather diverse creatures beyond all our imaginings. But von Guericke denied Descartes's equation of extension and matter, and instead traced his ideas to Galileo, Kepler, Antonius de Rheita (Q), **Mersenne**, Bruno, and Nicholas of Cusa.”

— Steven Dick (1984), *Plurality of Worlds* (pg. 116)

Quotes | By

The following are quotes by Mersenne:

> "To us his incredible genius seems almost miraculous."
>
> — Marin Mersenne (c.1647), comment on Galileo (or Torricelli) (Q)

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 309). HarperOne.
2. Conlon, Thomas. (2011). *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum* (pg. 44). Saint Austin Press/LuLu.
3. Middleton, William E. (1964). *The History of the Barometer* (pg. 16) (Amz). Publisher.

Further reading

● Mersenne, Marin. (c.1640). *The Impiety of Deists, Atheists, and Libertines of These Times*. Publisher.

External links

● Marin Mersenne – Wikipedia.

θΔics

In hmolscience, **Marina Pearson** (c.1975-) is an English [?] self-help divorce specialist author, consultant, and speaker note for her 2013 *Goodbye Mr. Ex*, wherein she mixes together new age / fringe theory topics, such as energy vibration theory, energy fields, law of attraction, etc., with semi-scientific terms and concepts, such as: flow, sexual energy, feminine energy, male energy, citation to the first law of thermodynamics, etc., and citation to thinkers such as Ralph Emerson, and Empedocles style, thermal word themed chemical aphorisms.

Boiling water analogy / metaphor

The following is Pearson's Empedocles chemical aphorisms stylized first law of thermodynamics based boiling water analogy of human characteristics change per chemical transformation via heat input, in respect to changes in "characteristics" of people:

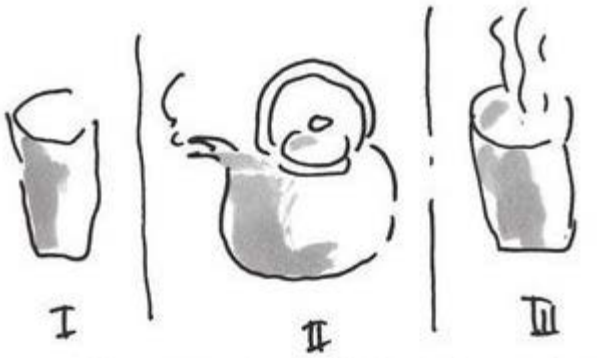

Just like water, if you boil it, it changes form. Characteristics of people are the same.

(add discussion)

Keys

Pearson, her boiling water metaphor sketch and soul mate and first law speculations, were found, on 21 Sep 2014, via the search key: "soul mate" + thermodynamics (Q), per attempts to find publications on thermodynamic theories of Aristophanes split human theory.

98. GIBBS HELMHOLTZ EQUATION
THERMODYNAMICS
(98 I need a soul mate)

Alex Trost and Vadim Kravetsky's 2014 search key (Q) return for "soul mate" and thermodynamics; though, to note, it is barely discernible how they make this connection, as the authors seem to be but top 100 list makers, of random lists?

Quotes

The following are example quotes:

> "You are made up of energy and human beings are made up of energy, people and the aspects you miss about them are in fact in your life 24/7, meaning that somebody else in your life now expresses these traits."
>
> — Marina Pearson (2013), *Goodbye Mr. Ex* (pg. 166)

See also

● Debonding | Diane Vaughan | Uncoupling

References

1. (a) Pearson, Marina. (2013). *Goodbye Mr. Ex* (energy, 21+ pgs; thermodynamics, pgs. 165-66). Ecademy Press.
(b) Marina Pearson (about) – MarinaPearson.com.

External links

- Marina Pearson (about) – HuffingtonPost.com.
- Marina Pearson (about) – GoodbyeMrEx.com.
- Marina Pearson (my story) – DivorceShiftTV, YouTube.

θΔics

In hmolscience, **Mario Bunge** (1919-) (CR:5) (DN:7) is an Argentina-born Canadian mathematical physicist and philosopher noted for []

Overview

In 1979, Bunge, as cited (Q) by Alicia Juarrero (1985), supposedly, was promoting some type of emergent properties and or holism theory. [1]

Bunge's philosophy, presumably like Steven Pierce (2005)'s, is a comprehensive scientific outlook applied to the various natural and social sciences, embodying global rationalism, scientific realism, materialism, and consequentialism.

Atheism | Religion

Bunge is categorized as an "atheist philosopher" (Q) and or an "atheist, who combats religion" with "deep liberal convictions, especially in the form of an impassioned defense of the technical value of liberty of thought and search". (Q)

Quotes

The following are noted quotes:

> "Our comparative ignorance of the laws of society and history is due not only to the great complexity of human affairs, but also to the very prejudice that there 'are' no laws of history—a prejudice suspect of being allied to powerful social (or antisocial) interests that are vitally interested in preventing deep insights into the social mechanism. *Et pour cause!* People who are able to take the social mechanism apart in theory may wish to change it in practice, and—what is more dangerous for those who live on the persistence of fossil social forms—such men may even succeed in their attempt. This is essentially why the pragmatic view of science, summarized in the positivistic maxim: 'to know is to foresee [predict]; to foresee is to control', which enjoys such wide acceptance in connection with the science of nature, is so often forgotten in the sphere of the social sciences, where it is found more desirable to hold that human society is rationally unknowable, hence unpredictable, hence incurable."
>
> — Mario Bunge (1963), *Causality and Modern Science*; cited by Donald Polkinghorne (1983) favorite quote (Q) of Steven Pierce (2005) [2]

> "Spinoza's equation 'god = nature' is self-contradictory, and must be seen as a subterfuge. After all, Spinoza's motto was 'be prudent'. Consequently, the vulgar characterization of Spinoza as a pantheist is incorrect: he was a secret atheist because he was a naturalist. The same holds for Einstein, who once declared that his religion was Spinoza's, i.e. none."
>
> — Mario Bunge (2010), *Matter and Mind: a Philosophical Inquiry* [3]

> "Mach crowed that he had slain the 'stuff and force' dragon of the mechanistic materialism of Buchner, Vogt (Q), and Moleschott. Mach, in short, confused the laws with definitions, and inverted the correct logical relation 'dynamics entails kinematics.' He thus sacrificed Newtonian mechanics on the idealist altar."
>
> — Mario Bunge (2010), *Matter and Mind: a Philosophical Inquiry* [2]

References

1. Roque, Alicia J. (1985). "Self-Organization: Kant's Concept of Teleology and Modern Chemistry" (abs), *The Review of Metaphysics*, 39(1):107-35.

2. (a) Bunge, Mario. (1963). *Causality and Modern Science* (pg. 273). Dover, 1979.
(b) Polkinghorne, Donald. (1983). *Methodology for the Human Sciences: Systems of Inquiry* (pg. 292). SUNY Press.
(c) Stephen Pierce (faculty) – Simon Fraser University.
3. Bunge, Mario. (2010). *Matter and Mind: a Philosophical Inquiry* (Spinoza, pg. 97; Mach, pg. 247). Springer.

Further reading

● Bunge, Mario. (1986). "Book review: *Rational Thermodynamics* by C. Truesdell", *Philosophy of Science*, 53:305-06.

External links

● Mario Bunge – Wikipedia.

θΔics

In gas laws, **Mariotte's law** (TR:13), aka “rule of Mariotte” (Maraldi, 1709) or 'law of Mariotte', also called Boyle’s law or "Boyle-Mariotte’s law", depending, states that ‘the pressure of an ideal gas at constant temperature varies inversely with volume’.

History

In 1676, Edme Mariotte, French physicist, in his *Discourse on the Nature of Air*, is said to have recognized Boyle’s law (1669), in the statement that ‘the volume of a gas varies inversely as the pressure’. [1]

References

1. (a) Mariotte, Edme. (1679). *Discourse on the Nature of Air* (*Discours de la nature de l’air*). Michallet.
(b) Privat-Deschanel, Augustin, and Everett, Joseph D. (1897). *Elementary Treatise on Natural Philosophy* (ch. 19: Boyle’s (or Mariotte’s) Law, pgs. 166-). D. Appleton.
(c) See also: Preface to Peter Tait’s *Thermodynamics* (pg. iv).

θΔics

In religio-mythology, **Mark 5:1-17**, in the New Testament of the Bible, is the confabulous story of Jesus exorcising the a legion of demons out of a possessed man and casting them into a heard of swine, who then run crazily over a cliff to their death (dereaction) into a river.

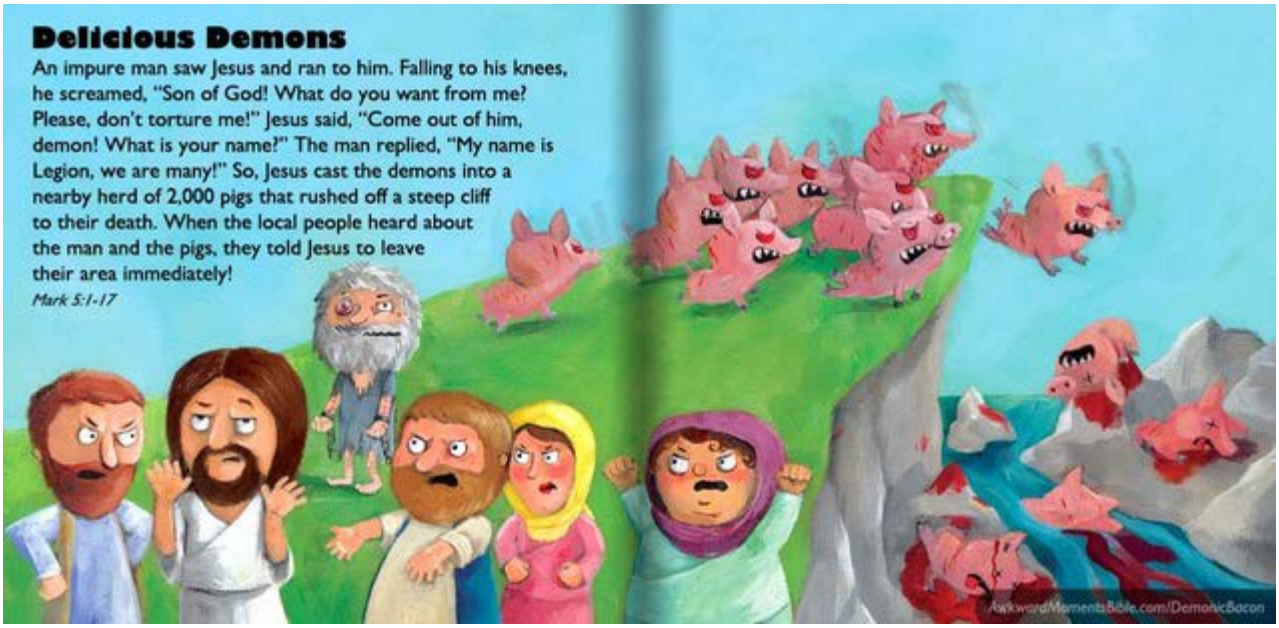

The 2013 *Awkward Moments Children's Bible* humorous rendition of **Mark 5:1-17** by Horus Gilgamesh. [2]

Overview

In 435BC, Herodotus recounted the Egyptian superstition of running crazily into a nearby river after touching pig as follows: [1]

> "The pig is regarded among them as an unclean animal, so much so that if a man in passing accidentally **touch a pig, he instantly hurries to the river**, **and plunges in** with all his clothes on."

In c.150AD, the anon author of Mark 5:1-17, of the Bible, reformulated this Egyptian "pig-touching river-running" reaction craze, in a reverse manner as follows:

> 1. And they came over unto the other side of the sea, into the country of the Gadarenes. 2 And when he was come out of the ship, immediately there met him out of the tombs a man with an unclean spirit, 3 Who had his dwelling among the tombs; and no man could bind him, no, not with chains:
>
> 4 Because that he had been often bound with fetters and chains, and the chains had been plucked asunder by him, and the fetters broken in pieces: neither could any man tame him. 5 And always, night and day, he was in the mountains, and in the tombs, crying, and cutting himself with stones.
>
> 6 But when he saw Jesus afar off, he ran and worshiped him, 7 And cried with a loud voice, and said, What have I to do with thee, Jesus, thou Son of the most high god? I adjure thee by god, that thou torment me not. 8 For he said unto him, Come out of the man, thou unclean spirit. 9 And he asked him, What is thy name? And he answered, saying, My name is Legion: for we are many. 10 And he besought him much that he would not send them away out of the country.
>
> 11 Now there was there nigh unto the mountains a **great herd of swine feeding**. 12 And all the devils besought him, saying, Send us into the swine, that we may enter into them. 13 And forthwith Jesus gave them leave. And the unclean spirits went out, and entered into the swine: and the herd **ran violently down a steep place into the sea**, (they were about two thousand;) and were choked in the sea.
>
> 14 And they that fed the swine fled, and told it in the city, and in the country. And they went out to see what it was that was done. 15 And they come to Jesus, and see him that was possessed with the devil, and had the legion, sitting, and clothed, and in his right mind: and they were afraid. 16 And they that saw it told them

how it befell to him that was possessed with the devil, and also concerning the swine. 17 And they began to pray him to depart out of their coasts.

The Mark author, in short, took the Egyptian pig fear river running phenomenon and sold it as a miracle of Jesus, to to bolster the touching-on-reality belief effect.

Other

This "exorcism" of a legion of demons out of a possessed person into a herd of animals, seems to have found retold in the ending of the Peter Blatty's 1973 film *The Exorcist*, wherein the "legion of demons" inside of Regan passes into father Karras after which he plunges to his death (dereaction) out of the window into the cliff-like steps below.

Quotes

The following are related quotes:

> "The devils sent into the sea the bodies of swine in a country where no swine were kept."
>
> — Voltaire (1764), *Philosophical Dictionary* (§:Christianity) [1]

> "When, long ago, Thomas Huxley and William Gladstone debated the truth of the Christian religion in the pages of the *Nineteenth Century*, this great issue was found to turn upon the question whether the **Gadarene swine** had belonged to a Jew or a Gentile, since in the latter case, but not the former, their destruction involved an unwarrantable interference with private property."
>
> — Bertrand Russell (1931), "Science and Religion" [4]

> "So you believe that Jesus of Nazareth caused devils to leave the body of a madman and go into a **flock of pigs**, which hurled themselves down the Gadarene slopes and into the sea?
>
> — Christopher Hitchens (c.2009), "Question to William Craig" (Ñº), Debate

References

1. Herodotus. (c.435). *History of Herodotus, Volume Two* (editors: Henry Rawlinson and John Wilkinson) (pg. 85). Publisher, 1875.
2. Gilgamesh, Horus and Tickheathen, Agnes. (2013). *Awkward Moments Children's Bible, Volume One* (Foreword: David McAfee) (eB) (§:Delicious Demons, pgs. #) (Ñº). CreateSpace.
3. (a) Voltaire. (1764). *Philosophical Dictionary* (§Christianity) (txt). Publisher.
(b) Joshi, Sunand T. (2014). *The Original Atheists: First Thoughts on Nonbelief* (pg. 54). Prometheus Books.
4. Russell, Bertrand. (1986). *Bertrand Russell on God and Religion* (editor: Al Seckel) (Amz) (pg. 179). Prometheus Books.

θΔics

In hmolscience, **Mark Blumberg** (1961-) is an American biopsychologist note, in human thermodynamics, for his 2002 ideas about "thermal words" in respect to the heat of passion, and how temperature relates to sex, animals to humans.

Overview

In 2002, Blumberg, in his *Body Heat: Temperature and Life on Earth*, discussed how the laws of thermodynamics relate to sexual behavior and changes in body temperature, among other topics. To cite an example Blumberg's theories on heat, sex and temperature, according to Amazon reviewer Tom Hardy in his take on Blumberg's book:

> "Temperature has plenty to do with sex. (**Blumberg** repeatedly demonstrates in this sphere and others that our language reflects a basic interest in matters of Fahrenheit. English is not the only language to refer to such things as 'the heat of passion' or 'I've got the hots for you'.) There is literal heating of different body parts during sexual stimulation. Not only during sex, but at all other times, different parts of the body take on different temperatures."

Blumberg elaborates on this issue in his chapter on "The Heat of Passion", which are what he calls "thermal words". [1]

In 2009, Russian physical chemist Georgi Gladyshev, in his "On the Thermodynamics of the Interaction of Living Systems", cites Blumberg's work in his postulation that the Gibbs free energy of human interactions may be quantifiable in a function of changes in body temperatures between male and female counterparts during interaction: [3]

$$\Delta G = f(\Delta T)$$

(add discussion)

Education

Blumberg completed his AB in 1983 in physics and philosophy at Brandeis University, and his MA (1987) and PhD (1988) in biopsychology at the University of Chicago. [2] Blumberg completed his doctorial dissertation on the temperature changes in rats during sexual behavior. He is currently a professor of psychology at the University of Iowa.

References

1. Blumberg, Mark S. (2002). *Body Heat: Temperature and Life on Earth* (ch. 7: The Heat of Passion, pgs. 151-70). Harvard University Press.
2. Mark S. Blumberg – Curriculum Vitae.
3. Gladyshev, Georgi. (2009). "On the Thermodynamics of the Interaction of Living Systems" (draft copy sent to Libb Thims), April. Moscow: working paper.

External links

â— Mark S. Blumberg (faculty) – Psychology Department, University of Iowa.

θΔics

In social physics, **Mark Buchanan** (1961-) (CR:37) is an American-born English physicist noted for his 2000 book *Ubiquity*, in which he extends on the critical state sandpile work of Danish physicist Per Bak to elaborate on physics-based theories applied to humanity such as 'chain reactions, 'power laws', the buildup of 'global stress', and 'critical states', etc., apply to bulk social phenomena, such as catastrophes, world wars, mass extinctions. [1] Buchanan later summarized this perspective in his 2007 book *The Social Atom*.

Buchanan's latest effort, which he began to roll out in 2011, is a blog entitled "The Physics of Finance: a Look at Economics and Finance through the lens of Physics". [4]

Pentland | Social physics

In the mid 1990s, while a *Nature* editor, Buchanan noticed that a large percentage of the papers landing on his desk were attempting to do social science along the lines of physics. This launched him into the study of social physics.

The recent work of American computational social scientist Alex Pentland, namely: *Honest Signals: How They Shape Our World* (2008) and *Social Physics: How Good Ideas Spread, the Lessons from a New Science*, champions his proposal of using "sociometers", that quantify vocal intonation or facial mimicry, during interpersonal interactions, under the flagship of "social physics" per what he frequently refers to as Buchanan's 2007 coining of the term: [5]

> "Beyond organizational engineering is the possibility of building physicslike models of human behavior, coined 'social physics' by **Mark Buchanan**. A social physics would allow us to discover fundamental laws that govern all human organizations. If human behavior were largely governed by logical argument and conscious decision, we could not build such models because there would be no fixed laws beyond those that stem directly from the definition of rationality. The sociometer data, however, reveal a different side of humanity—one in which humans react to each other in a regular predictable manner."

(add discussion)

Social atoms

See also: human atoms, human particles

2007 book *The Social Atom* in which he conceives of a human particle view of individual people, calling us "social atoms" speculating on how thermodynamics and physics apply to the mass behaviors of social systems of what he calls "social atoms" or people. [2] The following is an excerpt:

> "We should think of people as if they were atoms or molecules … following simple rules and try to learn patterns to which those rules lead."

Buchanan's lecture at Microsoft on the social atom was voted as one of the top videos of 2007 by *New Scientist* magazine. [3]

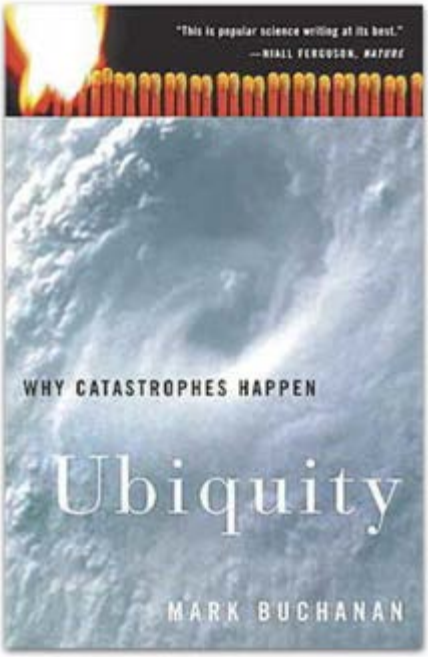

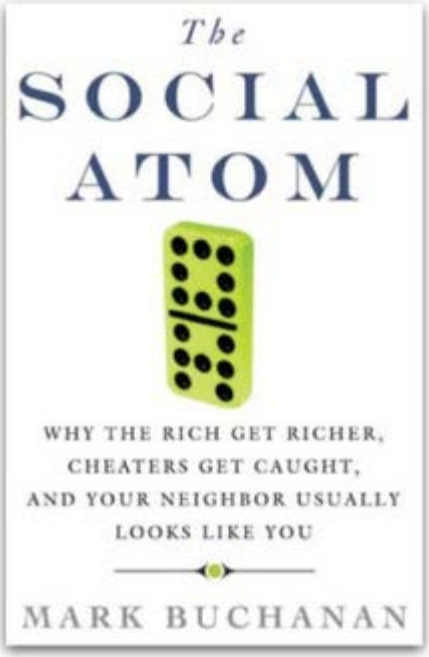

Buchanan's 2000 book *Ubiquity*, outlining a tipping point theory and power law theory; and his 2007 *The Social Atoms*, arguing that one should think of people as atoms or molecules.

Difficulties on theory

Two obvious issues with Buchanan's presentation are firstly ambivalence as to whether or not humans are atoms or molecules (human molecules) and second his view that human social atoms have free will within the laws of thermodynamics due to chaos.

Education

Buchanan completed his PhD in 1993 in physics, and did research for several years in the areas of nonlinear dynamics ("chaos theory" in the popular lingo), Hamiltonian systems theory, and plasma physics. The then worked as an editor with the international science journal *Nature*. Buchanan later worked for the British (but increasingly international) popular science magazine *New Scientist*. After that experience, he became a freelance writer and has since written three books and about 100 odd articles in publications ranging from *Nature* and *Science* to the *Harvard Business Review*. In recent years, he has been contributing a monthly column to *Nature Physics*.

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3. (a) Mullins, Justin. (2007). "Watch this: 2007's best online videos." *New Scientist*, Dec. 22.
(b) The Social Atom (video) – ResearchChannel.org.
4. The Physics of Finance – Blogspot.com.
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Further reading

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● Buchanan, Mark. (2007). "The Science of Subtle Signals", *Strategy+Business*, 48:68-77.
● Buchanan, Mark. (2013). *Forecast: What Physics, Meteorology, and the Natural Sciences Can Teach Us About Economics*. Bloomsbury.

External links

● Mark Buchanan – Wikipedia.

θΔics

In human thermodynamics, **Mark Ciotola** (c.1963-) is an American physical economist and professor of law noted for his postulate of fast entropy, or the eth law of thermodynamics, which argues that systems configure themselves to maximize their rate of entropy production. The following is a representative excerpt from his 2003 book *Physical History of Economics*: [1]

> "Civilization and regimes are a natural consequence of the laws of physics applied to the expanding, darkening universe proceeding form the big bang."

Ciotola seems to have been working on a way to derive social science from physics since circa 2000, having published work such as the 2006 "Thermodynamic Perspective on Profits", and runs FastEntropy.org, a site devoted to the theory of fast entropy. Ciotola is also active in the second generation technocracy movement.

Education

Ciotola completed his BA in economics in 1985 at the University of Wisconsin, his JD in 1988 at Franklin Pierce Law Center, his graduate certificate in applied science at the University of South Australia in 2004, and his BS in physics, with concentration in astronomy, in 2006 at San Francisco State University. [2]

References

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2. Mark Ciotola (Curriculum vitae) – Sfsu.edu.

Further reading

â— Ciotola, Mark. (2009). "From Thermodynamics to Civilization to Economic Bubbles" (4-pgs), *Sfsu.edu.*

External links

â— Mark Ciotola (faculty) – San Francisco State University.
â— FastEntropy.org (home) – Fast Entropy Research and Information Site.

θΔics

In existographies, **Mark Foreman** (c.1962-) is an American Christian apologeticist and philosopher, noted for []

Overview

In c.2010, Foreman, after one of his Liberty University philosophy classes, was approached by one of his students, who vented his confused feelings about Peter Joseph's Christ myth theory advocating film Zeitgeist (2006), as follows: [1]

> "Zeitgeist claims that Christianity is a total fiction — that it was completely made up from a combination of other religious claims—and that all world religions are just different expressions of sun worship. [blurting] They really backed up their claims with all sorts of evidence, I don't know what to believe anymore. Is it true? Is all this stuff I was taught in church just a big hoax?"

In 2012, Foreman, in reaction to this student query incident, penned "Challenging the Zeitgeist Movie: Parallelomania on Steroids", wherein he asserts that the following statement by Dorothy Murdock (2010), the primary religio-mythology scholar behind the film, is a "poorly reasoned" argument that does not "hold up" under close scrutiny:

> "Indeed, it is my contention, and that of others deemed 'Jesus mythicists', that the creators of the gospel tale picked various themes and motifs from the pre-Christian religions and myths, including and especially the Egyptian, and wove them together, using also the Jewish scriptures, to produce a unique version of the "mythos and ritual." In other words, the creators of the Christ myth did not simply take an already formed story, scratch out the name Osiris or Horus and replace it with Jesus. They chose their motifs carefully, out of the most popular religious symbols, myths and rituals, making sure they fit to some degree with the Jewish "messianic scriptures" as they are termed, and created a new story that hundreds of millions since have been led to believe really and truly took place in history. We are convinced, in other words, that 'Jesus Christ' is a fictional character created out of older myths, rituals and symbols."

Foreman's article soon became cited in discussions and debates by William Craig (Ñº), among others, as a scholarly refutation of the Zeitgeist claims. [1]

In 2013, Foreman gave a talk, the audio (Ñº)(Ñº) of which is available, wherein he tries to debunk Zeitgeist, amid watching clips of the film.

Quotes | Related

The following are related quotes:

> "Rankine's 'The Mathematician in Love' reveals the absurdity of reducing all the knowledge to science and mathematical equations. There's more to love than math and science."
>
> — Paul Copan (2005), *How Do You*

Know You're Not Wrong? [2]

A parody of religious apologeticist mindsets of Paul Copan, William Craig, and Mark Foreman, who have to defend against the past, i.e. that Christianity is but reformulated Egyptian mythology, such as professed in the 2006 film *Zeitgeist*, and the future, i.e. that what was once explained by the mysterious powers of god, e.g. love, morality, war, etc., are now being explained by modern science based reason, such as professed in William Rankine's 1845 "The Mathematician in Love".

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1. Foreman, Mark. (2012). "Challenging the Zeitgeist Movie: Parallelomania on Steroids", in: *Come Let us Reason: New Essays in Christian Apologetics* (editors: Paul Copan and William Craig; foreword: Rick Warren) (§11:169-88). B&H Publishing Group.
2. (a) Copan, Paul. (2005). *How Do You Know You're Not Wrong?: Responding to Objections that Leave Christians Speechless* (pg. 74). Baker Books.
(b) Paul Copan – Wikipedia.

External links

â— Mark Foreman (faculty) – Liberty University.

θΔics

In economic thermodynamics, **Mark David Glucina** (c.1977-) is a New Zealand mechanical engineer noted for []

Overview

In 2010, Glucina, in his "Connecting Thermodynamics and Economics: Well-Lit Roads and Burned Bridges", co-written with Japanese ecological economist Kozo Mayumi, the abstract of which is as follows: [1]

> "Almost 40-years have passed since Georgescu-Roegen's seminal work, *The Entropy Law and the Economic Process*. During this time there has been much debate on the relevance of thermodynamics to economics, and many attempts to build bridges between the two. There has also been much confusion as to what the laws of thermodynamics actually say. This article clearly explains heat, work, and the thermodynamic laws, the meaning of entropy, and the importance of kinetics as a barrier to thermodynamically favorable processes. The two most important misunderstandings in the literature, namely entropy as disorder, and entropy as a measure of information, are highlighted. Reviewing the literature shows that thermodynamics is most relevant for building a descriptive model, or preanalytic vision of economics, because it implies physical constraints on production and consumption. Similarly, it suggests that there may be serious flaws with neoclassical economic models, and in particular the primacy of sustained growth. However, thermodynamics does not seem to aid mathematical modeling in economics, nor does it provide normative insights. As an aid to energy policy, thermodynamics is useful for assessing the feasibility of technology options— those that have the potential to meet our goals, and should be counted as options, and those that should not. But it does not provide a prescription outside of this technical realm. Factors, such as environmental impact, cost, and social acceptability, will ultimately determine which technically feasible options are most desirable."

Part of this article seems to be an attack on the Shannon bandwagon, as both Mayumi and his mentor Nicholas Georgescu-Roegen have elaborated on previously.

Education

Glucina completed his engineering PhD in 2005 with a dissertation on "A Study of Cu-Al and Ni-Al alloys as Inert Anodes for Aluminum Electrolysis", at the University of Auckland. In 2010, Glucina was associated with the Department of Mechanical Engineering, Graduate School of Advanced Technology and Science, The University of Tokushima, Tokushima, Japan

References

1 Glucina, Mark D. and Mayumi, Kozo. (2010). "Connecting Thermodynamics and Economics: Well-Lit Roads and Burned Bridges" (abs), *Annals of the New York Academy of Sciences*, 1185:11-29, Jan.

Further reading

â— Page, Ariane. (2013). *Isis Code: Revelations from Brain Research and System Science and the Search for Human Perfection and Happiness* ("Connecting Thermodynamics and Economics", 2+ pgs). iUniverse.

θΔics

In existographies, **Mark Granovetter** (1943-) (CR:14) is an American sociologist noted, in human chemistry, for his 1969 theory that "weak ties" between people in social networks are akin to hydrogen bonds between water molecules; the following being his basic model:

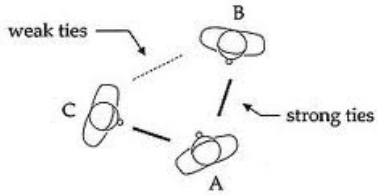

(add)

Overview

In 1969, Granovetter conceived of a 'weak ties' hydrogen bonding based model of intermediate strength social connections, based on chemical bonding theory, particularly the model of the 'hydrogen bond', from Granovetter's undergraduate chemistry class, a theory which he published in the famous and highly-cited 1973 article "The Strength of the Weak Ties". [1] Granovetter's weak ties theory was stimulated, in part, by the 1954 view of Russian mathematical psychologist Anatol Rapoport that:

> "It is a well-known fact that the likely contacts of two individuals who are closely acquainted tend to be more overlapping than those of two arbitrarily selected individuals."

In Granovetter's theory, this has come to be known as 'triadic closure', stated as follows: "If two people in a social network have a friend in common, then there is an increased likelihood that they will become friends themselves at some point in the future." [6]

Hydrogen bonds

In the late 1960s, to obtain data for his doctoral thesis at Harvard University, Granovetter interviewed dozens of people to find out how social networks are used to land new jobs. Granovetter found that most jobs were found through "weak" acquaintances. This pattern reminded Granovetter of his freshman chemistry lesson that demonstrated how "weak" hydrogen bonds hold huge water molecules together, which are themselves held together by "strong" covalent bonds. A similar combination of strong and weak bonds, according to Granovetter, holds the members of society together.

The model depicted adjacent is used for Granovetter's 1973 paper "The Strength of the Weak Ties" and his theory of social 'weak ties' and interpersonal 'strong ties'. [1]

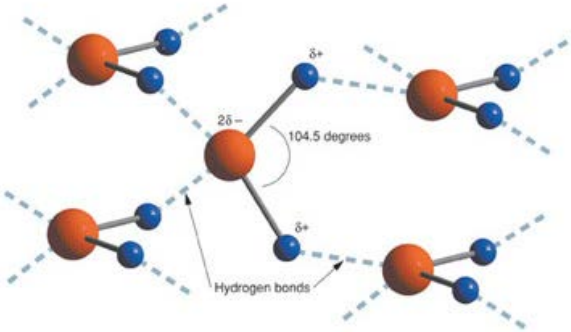

In the liquid state, freely floating water molecules associate with each other through 'hydrogen bonds' in which part of the negative charge (2δ-) of the oxygen atom (shown in red) from one molecule stabilizes in bonding interaction, via an exchange force, with part of the positive charge (δ+) of hydrogen atoms from another water molecule; creating a loose tetrahedral binding geometry in the structure of the associative bonds.

The conception of a "hydrogen bond" defined as the binding between two atoms as being possible through the medium of a hydrogen ion was first advanced in the unpublished work of American chemist Maurice Huggins in 1919, with his conception of an H-bond, a theory later expanded on by Wendell Latimer and Worth Rodebush in 1920, who cite Huggins in a footnote, in their paper "Polarity and Ionization from the Standpoint of the Lewis Theory of Valence". [7] All three were students of Gilbert Lewis, working in his chemical laboratory of the University of California, Berkeley.

This hydrogen bonding model, as learned by Granovetter in circa 1963, thus became the basis of his first manuscript on the importance of weak social ties in human life. He submitted his paper to the *American Sociological Review* in 1969, but it was rejected. In 1972, Granovetter submitted a shortened version to the *American Journal of Sociology*, and it was finally published in May 1973; and by 1986 had became citation classic.

Weak ties | models

The following are Granovetter's original weak tie diagrams:

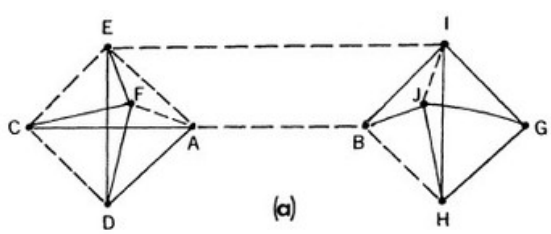

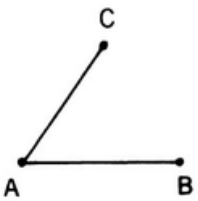

FIG. 1.—Forbidden triad

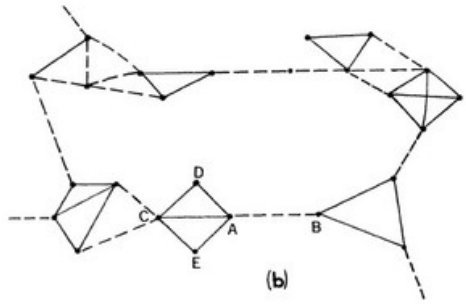

Granovetter's fig 1 showing the **forbidden triad**, depicting person A in a strong bond (AC) with person C, and also in a strong bond (AB) with person B, showing no connection between person C and B, which Granovetter says can never occur, in that a B-C 'tie' (weather weak or strong) will always be present. Granovetter's fig 2, parts a and b, showing strong ties (————), weak ties (– – – – – –), and 'local bridges' between groups.

Hydrogen bonding | Human bonding (model)

The following two diagrams compare the existing weak and strong ties in the attachment between two water molecules, the basic hydrogen bonding model learned by Granovetter in his undergraduate chemistry class, as compared to the weak and strong ties theorized, according to Granovetter, to exist between associative people (human molecules):

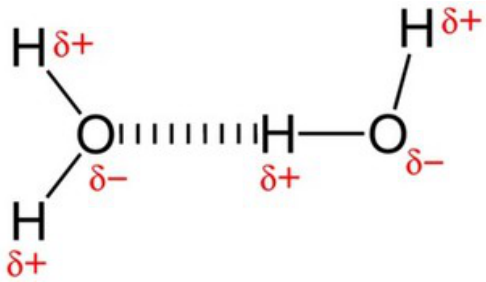

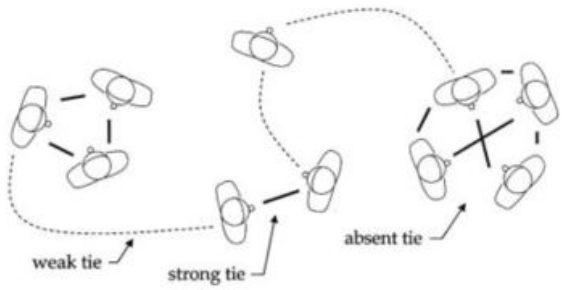

Left: Hydrogen bonds (dashed lines) and covalent bonds (straight lines), representing weak and strong ties in water molecule associations. Right: Strong ties, weak ties, and absent ties in an association of ten human molecules. [2]

The following are more recent depictions of Granovetter's weak ties model:

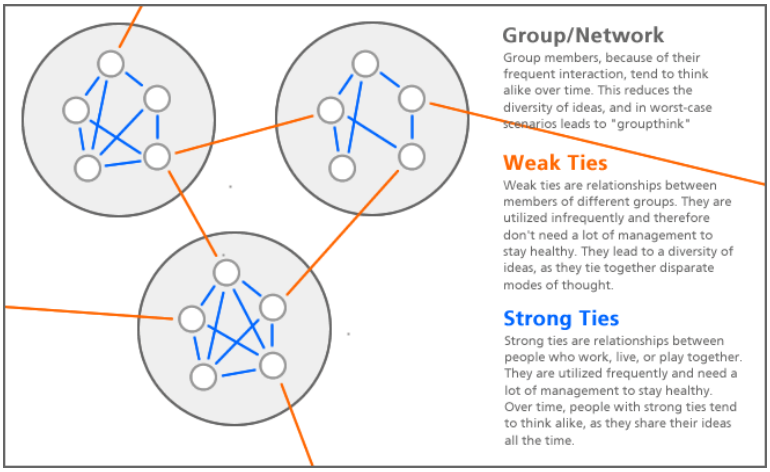

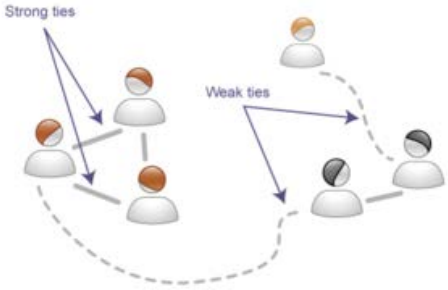

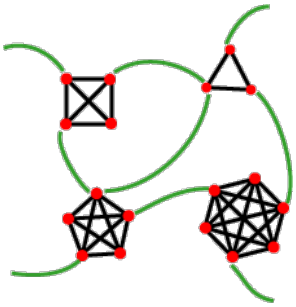

Left: 2007 weak ties / strong ties diagram [3] Middle: 2008 weak ties / strong ties diagram. [4] Right: 2010 weak ties / strong ties diagram. [5]

Education

Granovetter completed his AB in American and modern European history at Princeton in 1965 and PhD in sociology at Harvard in 1970. Granovetter currently is a professor of sociology at Stanford.

See also

â— Human chemical bond
â— Human bonding

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(c) Interpersonal ties – Wikipedia.
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7. (a) Evans, Robert C. (1939). *An Introduction to Crystal Chemistry* (pg. 287). The University Press.
(b) Latimer WM and Rodebush WH. (1920). "Polarity and Ionization from the Standpoint of the Lewis Theory of Valence", *J. Am. Chem. Soc.*, 42: 1419-1433.
(c) Maurice Huggins – Wikipedia.

External links

â— Mark Granovetter – Wikipedia.
â— Mark Granovetter (faculty) – Stanford University.

θΔics

In existographies, **Mark Andrew Janes** (1973-) (DN:6-10) (CR:78) is an English biotechnologist noted, in human thermodynamics, for his 2006 carbon entromorphology theory, a human atom based scheme, which considers the human being to be a 'type of gigantic carbon atom', and uses aspects of thermodynamics, particle physics, and the atomic model logic to explain facets of humanity.

Overview

In 2006, Janes began working on his subatomic particle based theory of everything, with a significant funding, somehow, from his previous employer AstraZeneca Pharmaceuticals, of which he has spent several thousands of pounds (or dollars) on.

In 2008, Janes approached four senior scientists with his theory, particularly nuclear physics professor Jim Al Khalili at Surrey University, who told him it needed to be more mathematical after which he wrote his first paper entitled "Carbon Entromorphology" (2008) and sent it out to various journals, however receiving rejection, instead publishing, by suggestion, the paper as the website: Carbon-Entromorphology.com.

In 2008, Janes was presenting his theory in large gymnasium-sized displays around England. One of his posters, e.g., stated: "may the events of your day bring you closer to quantum stability through phototropism." The quote alludes to the idea that humans seek filled octet shell stability, in a way similar to how the carbon atom seeks four pairs of electrons to achieve noble gas configuration. All-in-all, Janes uses chemistry and physics to synthesize explanations on topics of human morality, purpose, homosexuality, and evolution, etc., in terms of changing energy levels, and using conceptions such as bio-enthalpy, bio-entropy, bio-gibbs free energy, among others, to connect biological logic to atomic logic in the form of a sort of biological-physics of life. [1]

Janes uses a 'carbon atom' model for a human, considering living organisms as 'entromorphic atoms'. This is similar to the terms 'point atom' (Humphry Davy, 1813), 'human atom' (Erich Fromm, 1956), 'human atomism' (Arthur Iberall, 1987), 'social atom' (Mark Buchanan, 2007), or other human element models. Correctly, to note, the human chemical or human molecule model should be used, owing to the fact that a human is a molecule comprised of at least twenty-six functioning elements, not simply an aggregate of carbon.

Left: Janes dressed up as "Mr Carbon Atom" (2009). Right: Janes at one of his gymnasium-sized display exhibits of this theory.

In 2010, Janes was making poster-filled YouTube videos, along with his various audio lectures and word coinings, e.g. soulatrophicity and entromorphic theory, and costumes, e.g. "Mr Carbon Atom", which have appeared on television. Janes, in this period, was using the term 'soulatrophic pathway' as a term to refer to the energy path that lead to the formation of the human, since the big bang.

In 2012, Janes, following feedback from Libb Thims, collected his ideas into the book *Mr Carbon Atom*, the abstract of which is:

> "Since the dawn of human history life has battled for survival, with human beings evolving to dominate this process on planet earth. For to be human, is to know unequivocally that one day you will die and it is this truth which has precipitated a passion for knowledge and the pursuit of immortality initially through divine methods but more recently through scientific endeavor. Human knowledge is a fractured system of investigation born out of mathematics, literacy and imagery. These axioms are often so different that

knowledge has remained divided and a cross fertilization of ideas is rendered almost impossible. Through the modern science of human thermodynamics, carbon entromorphology has emerged as a major contender for a unified model of the mind and the conscious observer. It relates all knowledge together producing powerful new systems of understanding taking human evolution into new and breathtaking areas. It is the science of the 21st century and will almost certainly stand up to challenge current thinking on life and the prospect for a more stable and peaceful future for all humanity."

(add discussion)

Good and evil

Of interest, Janes extrapolates on the basic Gibbs free energy change equation of chemical reactions:

$$\Delta G = \Delta H - T\Delta S$$

as being able to explain the thermodynamic nature of morality, i.e. good and evil in the universal context, as being a function of energy management in living systems, a topic which he considers as the third part of his theory. The following are Janes' large-sized posters presentation of how he views morality in terms of thermodynamics, as used in his video (below) "Morality and Thermodynamics".

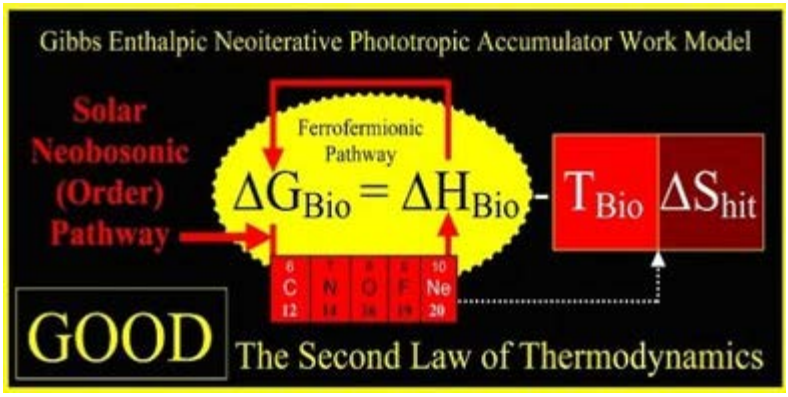

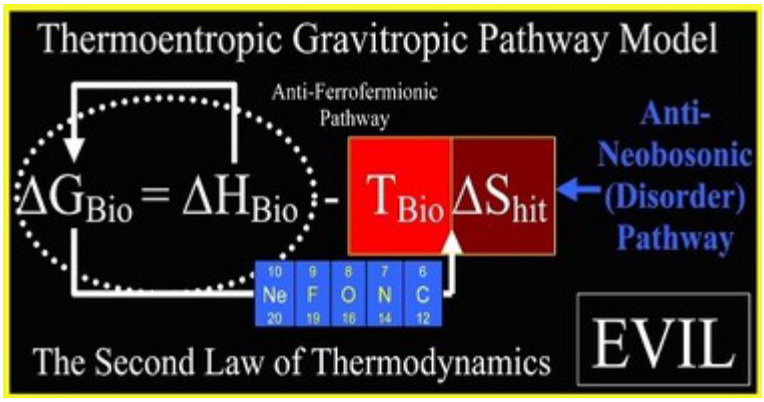

Some of Jayne's 2010 ideas about good and evil in respect to Gibbs energy, enthalpy, and entropic energy.

Of interest here, Janes notes that good and evil operate owing to the fact that human are atomic structures are particles bound by gravity.

Free will

Janes uses the term 'heliotropism', intermixed with Gibbs free energy, as a synonym for free will, in the sense that we have the ability to choose whether we go down the pathway to lower forms of stability or up the pathway to more stable forms, which he further attempts to explain in enthalpic and entropic terms.

Religion

To note, Janes could be classified as a religious thermodynamicist, but after study of some of his theory it seems that he is more aligned with teachings of physics, but making some attempt to salvage certain teachings of religion, e.g. considering god to be an aspect of energy, evolution, and the four fundamental forces of physics, or modeling the soul in terms of quantum mechanical based orbital theory, hell to be the earlier stage of the formation of the earth of molten carbon and heaven to be some type of future robotic stable state of humanity, where carbon is more organized.

This type of viewpoint, of attempting to prove or disprove religious ideas, is common when first coming into contact with the conception of reducing the totality of human existence down to pure physics and chemistry, in that one will often bend scientific concepts into the preexisting Biblical framework, in loose structure. A good rule of thumb, however, which will save the beginning researcher years of toil, is to throw all preexisting conceptions of humanity out the window and start over from the ground up, building only from what we know is actually true and factual based on modern knowledge. Searching to find proof of olden-days, Egyptian-based, theories of soul, life, heaven, hell, etc., in the periodic table will, invariably, lead to a mishmash. Correctly, one should first acknowledge that the human is molecule, as mass composition tables show. Second one must show how science explains the movements of molecules. Third, one must acknowledge that humans are characterized as molecules attached to a surface, which are driven in their

reactions from heat from the sun, whose collect movements must fit the measurements of the combined law of thermodynamics. On this modern basis, one must seek to find solution to one question at a time.

Education

In 1993, at age 20, Janes studied chemical engineering for one year at the University of Manchester Institute of Science and Technology, where he completed coursework in thermodynamics, fluid mechanics, heat transfer, and design and process engineering fundamentals. In the years to follow, Janes began work in pharmacology technology. In 2006, Janes completed a BS in biology and HNC (Higher National Certificate) in applied biological sciences, at Manchester Metropolitan University. His final year project at MMU was a project full of models of life using thermodynamic angles. [4]

Left: Mark Janes (2009), in his video "Morality and Thermodynamics", on good and **evil** in thermodynamic terms.

Quote | By

The following are quotes by:

> "Libb, I believe, was originally a chemical engineer, and that's how I started off myself, having later on moved into biology. And so therefore we already have that kind of powerful association with our roots. It also means that in the future 'human thermodynamics', I believe, is on the precipice of being the biggest overall unified scientific concept ever."
>
> — Mark Janes (2010), "Human Thermodynamics" (Ñº), YouTube, Jun 21

References

1. Soulatropic models – Carbon-Entromorphology.com.
2. Mark Andrew Janes (Curriculum Vitae) – the-Manic-Depressive.net.
3. My cell Exhibition (photos) – Carbon-Entromorphology.com.
4. Biography (Mark Janes) – Carbon-Entromorphology.com.
5. Janes, Mark A. (2012). *Mr Carbon Atom and the Theory of Carbon Entromorphology* (abs). Emp3books.

Videos

â— Janes, Mark. (2010). "Human Thermodynamics" (V), Mark Janes, Jun 21.

External links

â— Carbon-Entromorphology.com – Homepage.
â— Carbon Entromorphology – YouTube.
â— Mark Janes – LinkedIn.

θΔics

In existographies, **Mark Twain** (1835-1910) (IQ:170|#382) [RGM:72|1,500+] [HD:35] (WorldCat100:4) (CR:10), aka "Samuel Clemens", was an American writer, a top ranked greatest literary author ever, noted for []

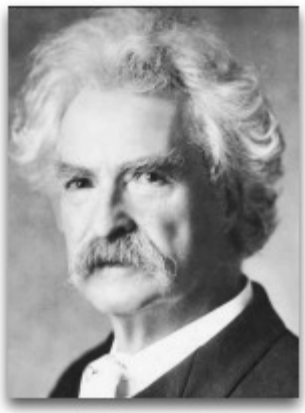

Quotes | By

The following are noted quotes by Twain:

> "How insignificant we are, with our pigmy little world! Was our small globe the favored one of all? Does one apple in a vast orchard think as much of itself as we do? ... Do the pismires argue upon vexed questions of pismire theology—and do they climb a molehill and look abroad over the grand universe of an acre of ground and say: 'great is god, who created all things for us?"
>
> — Mark Twain (1870), "Letter to fiancée Olivia Langdon" [1]

> "Never argue with stupid people, they will drag you down to their level and then beat you with experience."
>
> — Mark Twain (c.1890), *Publication* (Ñº)

> "There is no other life; life itself is only a vision and a dream for nothing exists but space and you. If there was an all-powerful god, he would have made all good, and no bad."
>
> — Mark Twain (c.1890), in FSM app

> "The Bible has noble poetry, some good morals, a wealth of obscenity, and upwards of a thousand lies."
>
> — Mark Twain (c.1890), in FSM app

> "The Bible is a mass of fables and traditions, mere mythology."
>
> — Mark Twain (c.1890), in FSM app

> "Never let school get in the way of your education."
>
> — Mark Twain (c.1890) (Ñº)

> "You believe in a book that has talking animals, wizards, demons, sticks turning into snakes, burning bushes, food falling from the sky, people walking on water, and all sorts of magical absurd and primitive stories, and you say that we ae the ones that need help."
>
> — Mark Twain (c.1890) (Ñº)

> "One of the proofs of the immortality of the soul is that myriads have believed it. They also believed the

world was flat."

— Mark Twain (c.1902), *Notebook* (Ñº) [2]

References

1. Jacoby, Susan. (2004). *Freethinkers: a History of American Secularism* (pg. 129). Henry Holt and Co.
2. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§:Mark Twain, 161-65). Prometheus.

External links

â— Mark Twain – Wikipedia.

θΔics

In thermodynamics, **Mark Zemansky** (1900-1981) was an American physicist noted for his 1937 textbook *Heat and Thermodynamics*, geared towards students entering physics, chemistry, and engineering; a textbook that went through seven editions, the last of which was published in 1997. [1] Other noted works include *College Physics*, co-authored with Francis Sears, and *Basic Engineering Thermodynamics*, co-authored with Hendrick Van Ness.

Education

Zemansky received his PhD from Columbia in 1927 and in 1964 was a professor emeritus of physics at City College of New York. [2]

References

1. (a) Zemansky, Mark W. (1937). *Heat and Thermodynamics: an Intermediate Textbook for Students of Physics, Chemistry, and Engineering*. McGraw-Hill.
(b) Zemansky, Mark W. and Dittman, Richard. (1997). *Heat and Thermodynamics: an Intermediate Textbook* (edition: 7). McGraw-Hill.
2. Zemansky, Mark W. (1981). *Temperatures Very Low and Very High* (back cover). Dover.

External links

â— Mark Waldo Zemansky (1900-) – Open Library.
â— Mark Zemansky – Wikipedia.

θΔics

In hmolscience, **Marlan Blissett** (1938-1989), born Harold Marlan Blissett (O) , was an American political scientist noted, in human thermodynamics, for 1972 discussions on thermodynamics, sociology, and politics.

Overview

In 1972, Blissett, in his *Politics in Science*, in his chapter "Big Science and the Laws of Social Thermodynamics", speculated on what he referred to as the "laws of social thermodynamics", covering topics in both sociological thermodynamics and political thermodynamics. The following is an example excerpt from the book: [1]

> "All areas of social and political space must be constantly affirmed against the entropy of an 'environment' – whether, for example, the activity involves the clarification of points between a central government and a state in a federal system."

In the book, Blissett cites American mathematical biophysicist Alvin Weinberg's 1967 classical thermodynamics views and Leo Szilard's 1929 paper on entropy and information. [2]

Background

In 1960, Blissett completed BA at Texas Technological University, then his MA in 1963 at the University of California, Berkeley, in political philosophy, then his PhD in 1969 in government at the University of Texas. In 1968, Blissett was an assistant professor at the University of Nebraska. [3] Blissett's PhD dissertation may have been the 1969 "The Politics of Professionalized Science." [4] In the 1970s and 1980s, Blissett seems to have been associated with the University of Texas at Austin, and their Center for Energy Studies, Energy Research. Blissett collaborated with American ecologist Howard Odum in 1987, on the topic of emergy analysis.

References

1. Blissett, Marlan. (1972). *Politics in Science* (section: Big Science and the Laws of Social Thermodynamics, pg. 25-35; term: entropy, pgs. 26, 53, 66, etc.). Little, Brown and Co.
2. (a) Szilárd, Leó. (1929). "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings", *Zeitschrift fur Physik*, 53, 840-56.
(b) Weinberg, Alvin M. (1967). *Reflections on Big Science*. MIT Press.
3. Anon. (1969). *Political Science* (Marlan Blissett, pg. 56). American Political Science Association.
4. Blissett, Marlan. (1969). *The Politics of Professionalized Science*. University of Texas at Auston.

External links

- Marlan Blissett – OpenLibrary.org.
- Blissett, Marlan (WorldCat Identities) – WorldCat.org.

θΔics

In existographies, **Marquis de Condorcet** (1743-1794) (IQ:180|#149) (Cattell 1000:288) [RGM:N/A|1,310+] (FA:79) (EPD:F1) (CR:18) was a French mathematician, philosopher, and political scientist noted for the 1770 introduction of the "curly d" symbol ∂ mathematical symbol for partial differential equations (see: history), as discussed in his "Memoir on Partial Differential Equations", and for doing some of the first social mathematics (see: human mathematics) precursor to social physics.

Religion | Rationalism

In c.1793, Condorcet, in his posthumous *Sketch of an Historical Picture of the Progress of the Human Spirit*, presented an inexorable historical progression from the barbarism of medieval Christianity to the rationalism of his day, arguing that humanity goes through ten epochs, the last resulting in revolution, each powered by public education. [4]

Social Mathematics | Social physics

Condorcet conceived the view that society was made up of homogeneous individuals all born equal under the law, whereby, according to such homogeneity, it should be possible to discern the mathematical laws, i.e. "social mathematics", that govern the social mechanism, that government should be the realization of natural social laws, and that people should elect key experts to run government. [1]

In 2012, American sociologist, in discussion of Pitirim Sorokin's famous 1928 "The Mechanistic School" chapter, seems to comment that the social physics of Condorcet, Henri Saint-Simon, and Adolphe Quetelet are less "childish" was of dealing with the problem of human action, as compared to the "mechanical or molecular imagery" method of the extreme mechanism school of Henry Carey and Spiru Haret. [2]

Reaction end

Condorcet advocated women's suffrage, the separation of church and state, state-supported education, and the abolition of slavery. He was chief author of the "Address to the European Powers", and the [dangerous] declaration calling for suspension of the King and summoning of the National Convention; to which he offered a constitution supported by the moderate Girondins. The aggressive Jacobins defeated that constitution and outlawed Condorcet for his forthright advocacy of political moderation. In 1794, he was arrested and in two days he was dead, perhaps from poison. (Ñº)

Quotes | On

The following are related quotes:

A *circa* 1785 bust of **Condorcet** at the

> "I am glad the bust of **Condorcet** has been saved and so well placed. His genius should be before us; while the lamentable, but singular act of ingratitude which tarnished his latter days, may be thrown behind us. I will place under this a syllabus of the doctrines of Epicurus [N2] somewhat in the lapidary style, which I wrote some twenty years ago [c.1799], a like one of the philosophy of Jesus, of nearly the same age is too long to be copied. *Vale, et tibipersuade carissimum te esse mihi.*"
>
> — Thomas Jefferson (1819), "Letter to William Short", Oct 31 (Ñº)

> "There has been a considerable number of those whom history calls 'atheists'. Leucippus, Democritus, Xenophanes, and others of the Atomistic and Eleatic schools (Ñº), are said to have been such. In his *Intellectual System*, Cudworth puts into this category Seneca and the younger Pliny among the Romans. Since the reformation, such men as: Rabelais, Machiavel, Bruno, Vanini, D'Alembert, Diderot, Buffon,

Condorcet, Mirabeau, La Place, Frederic II, and even Pope Leo X, have been charged with atheism."

Louvre Museum, Paris.

— Willis Lord (1875), *Christian Theology for the People* (pg. 67)

"The term sociology was invented and adopted in its equivalent by Auguste Comte in his 'hilosophie Positive.' It makes its first appearance in the following sentence: "After Montesquieu, the next great addition to *Sociology (which is the term I may be allowed to invent, to designate Social Physics)* was made by **Condorcet** proceeding on the views suggested by his illustrious friend Turgot" (b. vi. chap. ii.). The term *Social Physics*, also used by Comte as its equivalent, is significant, suggesting as it does the materialistic theory of man which Comte takes no pains to conceal. For according to his teachings, the higher nature of man is simply the result of a more highly organized brain, and the psychical and social phenomena of humanity depend solely on the quality and conditions of cerebral activity."

— Noah Porter (1880), "Herbert Spencer's Theory of Sociology" [2]

References

1. Porter, Dorothy. (1998). *Health, Civilization and the State: a History of Public Health from Ancient to Modern Times* (§: The Social Physics of Human Aggregates, pgs. 64-). Routledge.
2. (a) Sica, Alan. (2012). "Classical Sociological Theory", in: *The Wiley-Blackwell Companion to Sociology* (editor: George Ritzer) (§5, pgs. 82-97; Sorokin + "mechanistic school", pgs. 85-86; humanothermodynamics, pgs. 87-88). John Wiley & Sons.
(b) Sorokin, Pitirim. (1928). "The Mechanistic School" (pdf), in*: Contemporary Sociological Theories* (§1, pgs. 1-62). Harper & Brothers.
3. (a) Baker, Keith M. (1982). *Condorcet: From Natural Philosophy to Social Mathematics*. University of Chicago Press.
(b) Porter, Noah. (1880). "Herbert Spencer's Theory of Sociology: A Critical Essay", *The Princeton Review*, 6: 268-296.
4. (a) Condorcet, Marquis. (c.1793). *Sketch of an Historical Picture of the Progress of the Human Spirit* (Ñº). Publisher, 1955.
(b) Joshi, Sunand T. (2014). *The Original Atheists: First Thoughts on Nonbelief* (pg. 11). Prometheus Books.

External links

â— Marquis de Condorcet – Wikipedia.

θΔics

In existographies, **Marquis de Sade** (1740-1814) (IQ:165|#501) [RGM:685|1,500+] (FA:91) (CR:8) was French Epicurean atheism philosopher, revolutionary politician, nobleman, noted for his natural order based libertine sexuality, i.e. Sadism.

Atheism

In c.1770, Sade, at about age 30, had read both La Mettrie and Holbach:

> "**Sade**'s atheism was heavily influenced by the work of two materialist philosophers of the Enlightenment: La Mettrie's *Man Machine* (1748) and Baron d'Holbach's *The System of Nature* (1770)."
>
> — John Phillips (2015), *How to Read Sade* (pg. #)

Sade, thereafter, was an Epicurean atheist with focus on the aim to define living bodies within a sensuous order of matter 'naturally' seeking the maximization of pleasure and the minimization of pain. (Q)

In 1795, Sade, in his *Philosophy in the Bedroom*, outlined a dramatic socio-political dialogue, and argues that one must embrace atheism, reject society's beliefs about pleasure and pain, and further makes his argument that if any crime is committed while seeking pleasure, it cannot be condemned. (Q)

Described as the "most shocking of French atheists"; his *The Philosophy in the Bedroom* (1795) argued for speculative and also 'practical' atheism, supposedly in some type of "immoralism" terms. [1]

Films

Sade's existence is depicted in the 2000 film *Quills* starting Geoffrey Rush, Kate Winslet, and Joaquin Phoenix.

Quotes | On

The following are quotes on Sade:

> "Sade had an interesting philosophy: since criminal sexual acts exist, they are a part of natural human behavior. It can be argued that to de Sade, these acts were actually natural and, to him, the expression of his love or passion. The Marquis had **an IQ which proved him to be a genius**. He was a very rational and intelligent man, and yet, in his mind, his way of life was his reality. It was said to be a sickness and he could not distinguish between what was right in his mind and what was accepted in society. He automatically allowed his id to control his actions, seeking instant gratification and control. The Marquis went on to father three children, remaining in and out of jail until 1803 for his indecencies and the women he murdered. He finally died in 1814 in an insane asylum."
>
> — Anon (c.2005), "The Enigma of the Marquis de Sade" (Q)

> "Religion — as noted by **Marquis de Sade** (1797), Novalis (1798), Marx (1843), and Dirac (1927) — is but an opiate or opium for the mind; and like all drugs, it can be replaced, upgraded, or in some cases treated, with a

better or less symptomatic one."

— Libb Thims (2014), personal note, Sep 17

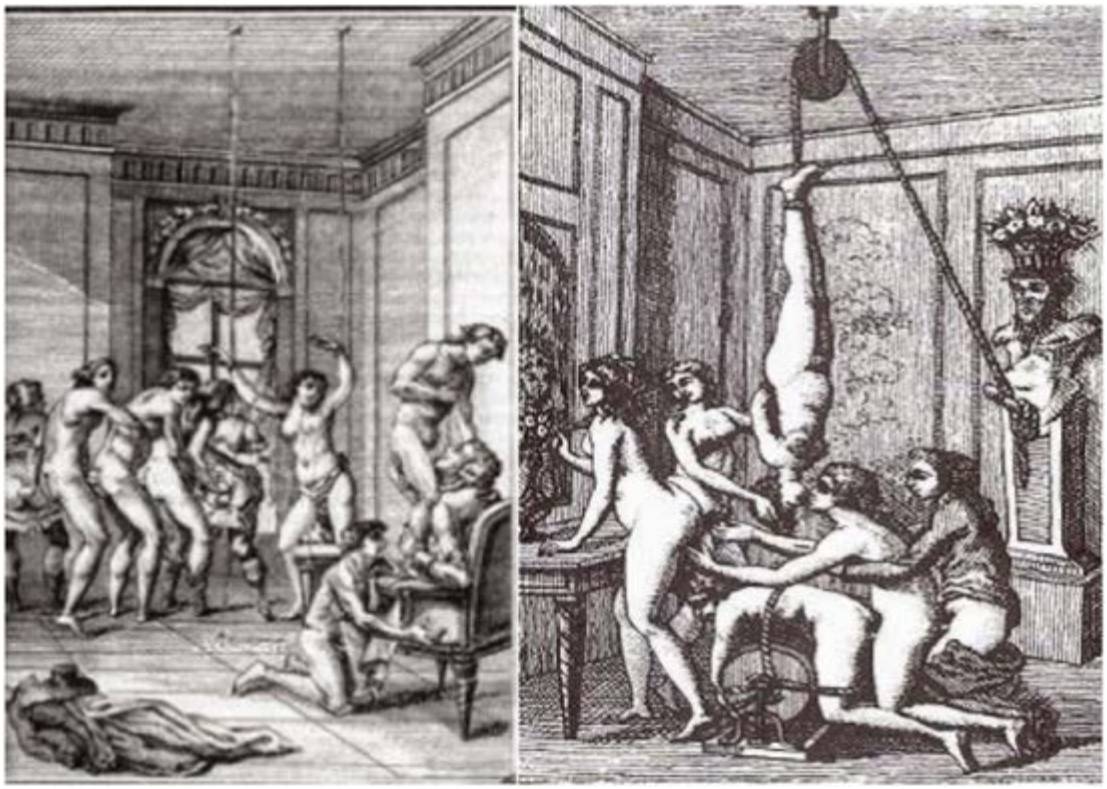

Etchings by **Marquis Sade** and his sexual pleasure based Epicurean philosophy adventures, about which he had legal and political views on.

"*Justine* may be the most read and it follows the life of a young woman whose life is filled with one sadist after another throughout the book. Justine can be considered an advanced graduate course compared to the recent popular book *50 Shades of Gray*. The *Philosophy in the Bedroom* is another erotic tale of the corruption of a young girl. One perverse woman, with help from corrupt men, teaches her every kind of sexual perversion that can be imagined."

— Joseph Truncale (2015), Amazon review, Mar 3 (O)

Quotes | By

The following are quotes by Sade:

"To refuse me Jean-Jacques' *Confessions*, now there's an excellent thing, above all after having sent me Lucretius and the dialogues of Voltaire; that demonstrates great judiciousness, profound discernment in your spiritual guides. Alas, they do me much honor in reckoning that the writings of a deist can be dangerous reading for me; would that I were still at that stage."

— Marques de Sadi (1783), "Letter to Madame de Sade", Vincennes prison; in: *Justine, Philosophy in the Bedroom, and Other Writings* (pg. 133) [2]

"Imperious, choleric, irascible, extreme in everything, with a dissolute imagination the like of which has never been seen, **atheistic to the point of fanaticism**, there you have me in a nutshell, and kill me again or take me as I am, for I shall not change."

— Marquis de Sade (c.1795) (O)

"The idea of god is the sole wrong for which I cannot forgive mankind."

— Marquis de Sade (c.1795) (Q)

"Sex is as important as eating or drinking and we ought to allow the one appetite to be satisfied with as little restraint or false modesty as the other."

— Marquis de Sade (c.1795) (Q)

"Social order at the expense of liberty is hardly a bargain."

— Marquis de Sade (c.1795) (Q)

See also

- Jeffrey Dahmer

References

1. Berman, David. (2007). "Unbelief during the Enlightenment", in: *The New Encyclopedia of Unbelief* (editor: Tom Flynn; foreword: Richard Dawkins) (§:276-80, esp. pg. 277). Prometheus Books.
2. Sadi, Marquis. (1965). *Marques de Sade: Justine, Philosophy in the Bedroom, and Other Writings* (editors: Richard Seaver and Austryn Wainhouse) (pg. 133). Grove Press.

External links

- Marquis de Sade – Wikipedia.
- Atheism and Sadism – Conservapedia.

θΔics

In existographies, **Marquis of Argens** (1704-1771) (RMS:24), aka “Boyer of Argens”, “Jean-Baptiste Boyer d’Argens” (Q), “Jean Batiste de Boyer, Marquis d’ Argens” (Q), oft-cited as “d’Argens” (in English), was a French anti-Christian philosopher noted for []

Overview

In 1736, d’Argens, in his *The Philosophy of Good Sense*, which was peer-reviewed by Voltaire, argued that we must continually revise our knowledge about things, and attacks scriptural authority, arguing, e.g., that there is not enough water on the globe to make possible a deluge (Noah’s flood) that would cover all the highest mountain tops of the world. [1]

In 1740, d’Argens, in his *Chinese Letters*, presented a dialogue on the subject of religious doubt, between an atheist and a deist, from the perceptive of a fictional Chinese narrator, who pretends to comment, as an outsider, on the activity, e.g. the crusades on the Muslims, of the Christian-based west. [2]

Beliefs

Argens has been labeled a deist, an atheist, a pyrrhonist, a philo-Protestant, an sceptic, a Spinozist, materialist, libertine and or an unoriginal mimic of greater minds.

Associations

Argens was an associate: Voltaire, Pierre Maupertuis, Leonhard Euler, Casanova, the irreligionist-theologian Jean-Martin de Prades (1720-1782) (Q), and Moses Mendelssohn, and Frederick II, whose court he resided in for 25-years.

References

1. (b) Argens, Marquis. (1736). *The Philosophy of Good Sense*. Publisher.
(b) Gasper, Julia. (2013). *The Marquis d’Argens: a Philosophical Life* (pg. 100). Lexington Books.
2. (a) Argens, Marquis. (1740). *Chinese Letters*. Publisher.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 55). HarperOne.
3. Gasper, Julia. (2013). *The Marquis d’Argens: a Philosophical Life* (labels, pg. 5 + abs). Lexington Books.

External links

- Jean-Baptiste de Boyer, Marquis d’Argens – Wikipedia.
- Jean-Baptiste Boyer d’Argens (French → English) – Wikipedia.

θΔics

REDIRECT

See: **Edward Somerset** (1603-1667) (CR:5)

θΔics

In society, **marriage** is legal and or religious agreement between consenting pairs to stay united until death (dereaction) does them part, and or, depending on specifics of vow and legal details.

Two depictions of "chemistry" themed wedding cakes: an equation of love (left) design and a chemistry of love (right) design; the wedding being a celebration and official public announcement of the **marriage**, i.e. official chemical bond formation.

Overview

In 1459, Johann Andreae is attributed to have penned *Chymical Wedding of Christian Rosenkreutz*, a mixture of alchemy and Christianity, and allegorical romance story about the way Christian Rosenkreuz was invited to go to a wonderful castle full of miracles, in order to assist the "Chymical Wedding" of the king and his new bride. (Ñº)

In 1948, American writer Thomas Dreier stated that marriage is largely a matter of chemistry: [1]

> "Why is it that in some homes husbands and wives live together harmoniously, and in others they lead a dog-and-cat existence? It is largely a matter of human chemistry."

In the 1970s, American mathematical psychologist John Gottman determined the ratio (5-to-1) of attraction-to-repulsion found in successful long-term marriage bonds. [2] In 2003, internet writer Wild Bob gave the following opinion on the scientific determination of marriage: [3]

> "It's not chemistry that determines long-term love—it's thermodynamics."

With the rise of the internet, engineers (e.g. ScientificMatch.com or eChemistry.com), sociologists (e.g. eHarmony.com or PerfectMatch.com), psychologists (e.g. Match.com), and anthropologists (e.g. Chemistry.com) have been developing and testing theories at various dating sites to attempt to match people, scientifically.

References

1. Dreier, Thomas. (1948). *We Human Chemicals: the Knack of Getting Along with Everybody* (pg. 53). Updegraff Press.
2. (a) Gottman, John. (1994). *Why Marriages Succeed or Fail*. New York: Fireside.
(b) Gottman, John M., Murray, James D., Swanson, Catherine, Tyson, Rebecca, and Swanson, Kristin R. (2005). *The Mathematics of Marriage: Dynamic Nonlinear Models*. MIT Press.
3. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (pg. 423). Morrisville, NC: LuLu.
(b) Wild Bob. (2003). "Thermodynamics of Love", Jan 31, UnsolvedMysteries.com.

External links

â— Marriage – Wikipedia.

θΔics

In hmolscience, **Martha McClintock** (1947-) is an American psychologist noted for []

Overview

In 1971, McClintock showed that women who reside together, e.g. at college dorms, will eventually align or sync their menstrual cycles, supposedly via chemical pheromone exchanges, as demonstrated in laboratory experiments with humans; a phenomena later dubbed the "McClintock effect" (see: Einstein on love). [1]

In later work, McClintock showed proved that rats that fear change have shorter lives (reaction existences) than their more flexible counterparts. [1]
In 1998, McClintock's lab, via of a two-month experiment of putting non-lactating women in contact with lactating women, found that human pheromones released by the lactating women increased sexual motivation and desire in the non-lactating women by 24 percent, for women with regular partners, and that it increased sexual fantasies in those without partners by 17 percent. [1]

References

1. Dreifus, Claudia. (2004). “The Chemistry (Literally) of Social Interaction” (Ñº), *The New York Times*, Science, Nov 16.

External links

â— Martha McClintock – Wikipedia.

θΔics

In hmolscience, **Martin Goldstein** (1919-) is an American physical chemist noted, in for his 1993 discussion on the "entropy of a mouse", wherein he discusses the difficulties involved in calculating he free energy of formation of a mouse.

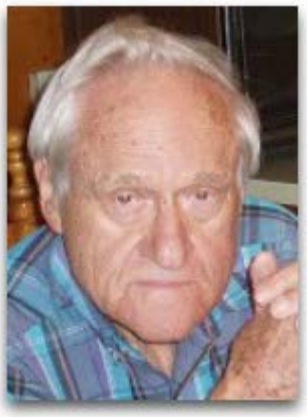

Overview

In 1993, Goldstein, in his *The Refrigerator and the Universe: Understanding the Laws of Energy*, co-written with American epidemiologist Inge Goldstein, in discussed the difficulties involved in calculating the entropy of a mouse, via the standard procedures used to calculate the entropies of simple molecules, are discussed. The following is a condensed excerpt of that section: [1]

> "To apply thermodynamics to the problem of how life got started, we must ask what net energy and entropy changes would have been if simple chemical substances, present when the earth was young, were converted into living matter [as in the formation of a mouse] … to answer this question [for each process], we must determine the energies and entropies of everything in the initial state and final state."

Energy determinations, they state, are rather straight forward; whereas entropy determinations are more difficult.

Education

Goldstein graduated with a BS from City College New York in 1940 and a PhD from Columbia College in 1950. In 1993, Goldstein was a retired professor of chemistry at Yeshiva University. The idea for the book began to seed when Goldstein took a correspondent course in thermodynamics while serving in the U.S. Army.

Goldstein, in his 1993 section "Entropy of a Mouse", argues that to determine the free energy of formation of a mouse, we need to ask: [1]

> "What net energy and entropy changes would have been if simple chemical substances, present when the earth was young, were converted into [the mouse]. To answer this question, we must determine the energies and entropies of everything in the initial state and final state."

This very same logic, by extrapolation, can be applied to humans, in the calculation of the **standard human free energy of formation**.

See also

â— Bridgman paradox

References

1. Goldstein, Martin and Goldstein, Inge F. (1993). *The Refrigerator and the Universe: Understanding the Laws of Energy* (Entropy of a mouse, pgs. 297-99; Acknowledgments, pg. ix; back jacket flap). Harvard University Press.

External links

â— Martin Goldstein (WorldCat Identities) – WorldCat.org.
â— Inge F. Goldstein (faculty) – Columbia University.

In existographies, **Martin Heidegger** (1889-1976) (IQ:165|#413) [RGM:170|1,500+] (Gottlieb 1000:914) (Perry 80:4|La) (HCR:14) (FA:105) (Stokes 100:71) (Perry 80:28) (GPhE:31) (CR:41) German atheistic existentialist philosopher (Sartre, 1945); influenced deeply by Nietzsche; teacher of Hannah Arendt; noted, predominately, for his 1927 *Being and Time*, in which he suggest that the meaning of our being must be tied up with time, i.e. that we are temporal beings, a logic somehow based on critique of Immanuel Kant and a synthesis of Friedrich Nietzsche. [1]

Time | Being

Heidegger is popularly-known for theory of being as time as the definition of existence; a statement of his views as follows:

> "Being and time determine each other reciprocally, but in such a manner that neither can the former – being – be addressed as something temporal nor can the latter – time – be addressed as a being."
>
> — Martin Heidegger (c.1927), "Time and Being" [3]

The following is a more recent abstract attempt:

> "The basic idea of *Being and Time* is extremely simple: being is time. That is, what it means for a human being to be is to exist temporally in the stretch between birth and death. Being is time and time is finite, it comes to an end with our death. Therefore, if we want to understand what it means to be an authentic human being, then it is essential that we constantly project our lives onto the horizon of our death, what Heidegger calls 'being-towards-death'."
>
> — Simon Critchley (2009) (Ñº)

(add) [4]

Atheism | Existence

Heidegger is classified, by Jean-Paul Sartre (1945), as an "atheistic existentialist" philosopher; the following is an example quote

> "Philosophy will not be able to bring about a direct change of the present state of the world. This is true not only of philosophy but of all merely human meditations and endeavors. Only a god can still save us. I think the only possibility of salvation left to us is to prepare readiness, through thinking and poetry, for the appearance of the god or for the absence of the god during the decline; so that we do not, simply put, die meaningless deaths, but that when we decline, we decline in the face of the absent god."
>
> — Martin Heidegger (1966), interview with *Spiegel* (Ñº)

This seems to be addressing the Nietzschean void (see: god void)

Ontic opening

Heidegger, supposedly, is noted for originating the "ontic opening" theory.

Non-experiencing stone

Heidegger, as cited by Wolfe von Lenkiewicz (2011), at some point, introduced his "non-experiencing stone"

distinction between a human or "being" and a stone (see: rock vs. human).

De Lange

In 2001, South African chemical physicist Adriaan de Lange stated that some of his “creative collapse” free energy theory are a complexity theory version of Heidegger and Jacques Derrida’s “deconstruction”; which he summarizes as follows: [2]

> “When the system does not have sufficient free energy F to drive its entropy production and thus organisational changes, there are two options to obtain further free energy. One option is that it can be imported from an external source like animals eating food or plants absorbing sunlight. The other option is that it can be liberated from within by giving up some of its organisation through a process which I call the "creative collapse" (the complexity version of **Heidegger's** and Derrida's "deconstruction"). Taking animals or plants as example, they will then use their own tissues as source of free energy rather than eating food.”

(add)

Quotes | By

The following are noted quotes:

> “Thinkers are indeed decidedly called ‘thinkers’ because, as it is said, they think ‘out of’ themselves and in their very thinking put themselves at stake. The thinker answers questions he himself has raised. Thinkers to not proclaim ‘revelation’ from a god. They do not report the inspirations of a goddess. They state their own insights.”
>
> — Martin Heidegger (1943), “Parmenides and Heraclitus”, lecture course, University of Freidburg [6]

> “The most thought-provoking thing in our thought-provoking time is that we are still not thinking.”
>
> — Martin Heidegger (1952), *What is Called Thinking* (Ñº)

> “Thus not ‘dead nature’. A stone, for example, is not dead.”
>
> — Martin Heidegger (1967), dialogue with Eugen Fink on Heraclitus fragments [5]

References

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2. De Lange, A.M. (2001). “Fitness Landscape and other Landscapes” (threads: LO27222), 09/03/01 – Learning-org.com.
3. Heidegger, Martin. (c.1927). “Time and Being” in: *On Time and Being* (*Zur Sache des Denkens*) (Translator and Introduction: Joan Stambaugh) (pg. 3). Max Niemeyer Verlag: Tubingen, 1969. University of Chicago Press, 2002.
4. Anon. (2016). “What is Being?” (Ñº), Hmolpedia thread, May 8.
5. Heidegger, Martin and Fink, Eugen. (1967). *Heraclitus Seminar* (translator: Charles Seibert) (stone, pg. 120). Northwestern University Press, 1993.
6. Heidegger, Martin. (1943). “Parmenides and Heraclitus”, lecture course, University of Freidburg, Winter Semester; published as volume 54 of Collected Works; in: *Parmenides* (translators: Andre Schuwer and Richard Rojcewicz) (thinkers, pg. 5). Indiana University Press, 1992.

External links

â— Martin Heidegger – Wikipedia.

θΔics

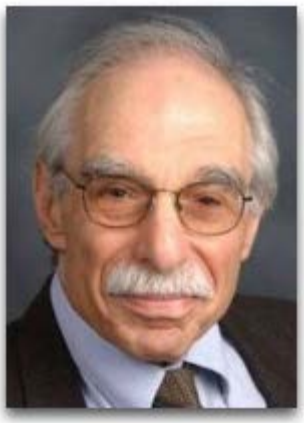

In thermodynamics, **Martin J. Klein** (1925-2009) was an American science historian noted for a number of publications, such as commentary on Maxwell's thermodynamic surface, Willard Gibbs, Paul Erenfest, the thermodynamics underlying the work of Albert Einstein, and for being the advisor to American energetics historian and philosopher Robert Deltete. [1]

Ronald Kriz, in respect to his graphical thermodynamics work, was inspired by his work. [2]

Education

Klein was a professor of physics and history of physics at Yale University.

References

1. Hevesi, Dennis. (2009). "Martin J. Klein, Historian of Physics, Dies at 84", *NYTimes.com*, Apr. 1.
2. Email communication from Ronald Kriz to Libb Thims (1 Sep 2013).

Further reading

● Klein, Martin J. (1967). "Thermodynamics in Einstein's Thought: Thermodynamics Played a Special Role in Einstein's Early Search for a Unified Foundation of Physics" (abs), *Science* 4, August. pgs. 509-16.
● Klein, Martin J. (1983). "The Scientific Style of Josiah Willard Gibbs" (Gibbs surface, pg. 158), in: *Springs of Creativity* (pgs. 141-), by Rutherford Aris, Howard Davis, and Roger Stuewer. U of Minnesota Press.
● Deltete, Robert J. (1995). "Gibbs and the Energeticists" (pgs. 135-170), in: *No Truth Except in the Details: Essays in honor of Martin J. Klein* (quote, pg. 149), by Martin J. Klein, Anne J. Kox, Daniel M Siegel. Springer.

External links

● Martin J. Klein – Wikipedia.
● Klein, Martin J. – WorldCat Identities.

θΔics

In existographies, **Martin Luther** (1483-1543) (IQ:170|#227) [RGM:39|1,245+] (Cattell 1000:39), Walberg top ten encyclopedia name (1974) (Q), by word count (#2) and citation rank (#5), by was German theologian, noted for []

95 Theses

On 31 Oct 1517, Luther famously penned 95 theses, or Catholic church "abuses" that needed to cease, which he famously "nailed" to the door of a chapel in Wittenberg, Germany, an act that became a catalyst for the Protestant Reformation; Jack Repcheck (2007) summarizes this act as follows: [3]

> "Each thesis was an abuse that Luther demanded must be discontinued) and it was hung on the main door of the massive Castle Church of Wittenberg. The specific event that drove **Luther** into action was the demand from Rome that all Christians contribute to the rebuilding of St. Peter's Basilica in Rome. To raise funds, Pope Leo X ordered the Dominican friars to fan out throughout Christendom and collect money. The specific tool that they used to separate the precious coins from the impoverished peasants and laborers was the selling of indulgences. An indulgence was a piece of parchment, the purchase of which subtracted a certain number of years from the amount of time a person would spend in Purgatory before entering the kingdom of heaven. One could also buy an indulgence to reduce the Purgatory sentence for a deceased relative or for one who was still alive. Most of Luther's theses concerned the indulgences. Though the posting of the ninety-five theses was later recognized as the spark that lit the fire, this was hardly Luther's intention."

This act was the official start of the Protestant Reformation or century-plus long "reformation" (Q), a wave of religious reform that ended the Thirty Years War (1618-1648); which, to note, gave way to a time of peace that produced Otto Guericke, his vacuum experiments, and the Magdeburg hemispheres; which resulted in the eventual science of thermodynamics; which is the foundation of the newly synthesizing science of human chemical thermodynamics, the subject that explains the science behind the thermal term "spark that lit the fire", in the social revolution context, in an explicit atheism purview.

Erasmus

In the 1520s, Luther did battle with Desiderius Erasmus (1466-1536); the following is a noted quote:

> "Erasmus, you foster in your heart a Lucian, or some other pig from Epicurus' sty who, having no belief in god himself, secretly ridicules all who have a belief and confess it."
>
> — Martin Luther (1525), *On the Bondage of Will* [2]

(add)

Copernicus

In Jun 1539, Luther, during on of his dinner seminars, just after Georg Rheticus had arrived in Frombork, said the following: [3]

> "There is mention of a certain new astrologer who wanted to prove that the earth moves and not the sky, the sun, and the moon. This would be as if somebody were riding on a cart or in a ship and imagined that he was standing still while the earth and the trees were moving."

This is hilarious to the last. It brings to mind DMR Sekhar's religion and science reconciliation-attempting will-based

self-motion theory mindset reaction to Libb Thims' external force (or exchange force) motion theory; for example:

> "I can't stop but laugh at myself when I think that I am not alive or I am not moving myself."
>
> — DMR Sekhar (2011), commentary on Libb Thims' 2009 defunct theory of life and 2004 exchange force motion theory [4]

Luther continues:

> "Whoever wants to be clever must agree with nothing that others esteem. I believe the holy scriptures, for Joshua commanded the sun to stand still and not the earth."

In mid Feb 1540, Philipp Melanchthon, Luther's intellectual buddy, was one of two people, the other being Andreas Osiander, who was sent a preliminary copy of Georg Rheticus' *First Report* on Nicolaus Copernicus' rumored-to-exist heliocentric model;

> "Copernicus is a fool wants to turn the whole art of astronomy upside down."
>
> — Martin Luther (c.1541) [1]

(add)

Montaigne

Luther's reformation movement was one of the sparks, supposedly, prompted Michel Montaigne (1533-1592), in 1568, into the atheism vs theism apologetics arena. (Q)

Quotes | By

The following are noted quotes:

> "Reason is the enemy of faith."
>
> — Martin Luther (c.1525), Ranker best Luther quotes (#3|60+) ↑

> "Peace if possible, but truth at any rate."
>
> — Martin Luther (c.1525), Ranker best Luther quotes (#42|60+) ↑↑↑

> "No one need think that the world can be ruled without blood. The civil sword shall and must be red and bloody."
>
> — Martin Luther (c.1525), Ranker best Luther quotes (#11|60+) ↑↑

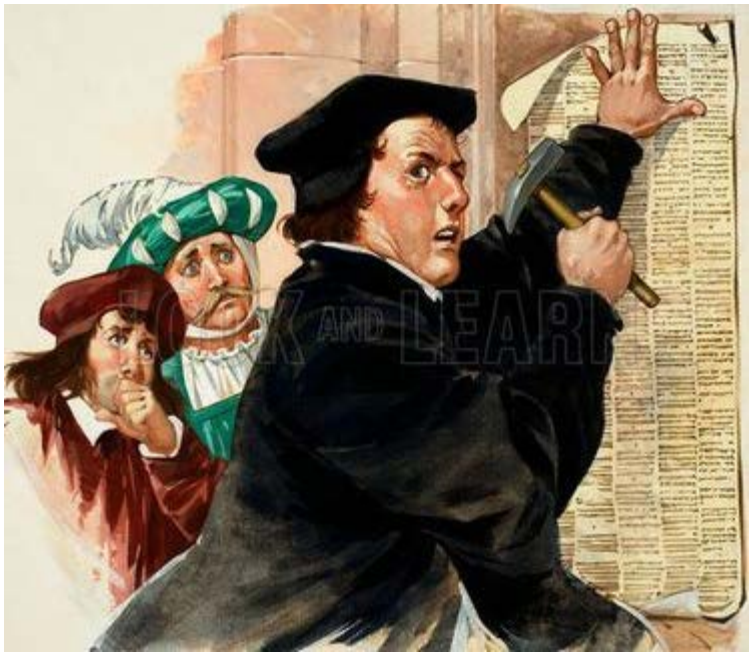

A depiction (Q) of **Luther** (1517) nailing his "95 theses" to the door of a Catholic church in Wittenberg, Germany; the "spark" that started the Protestant Reformation; culminating in the 30 Year War (1618 and 1648).

"Justice is a temporary thing that must at last come to an end; but the conscience is eternal and will never die."

— Martin Luther (c.1525), Ranker best Luther quotes (#22|60+) ↑

"Every man must do two things alone; he must do his own believing and his own dying."

— Martin Luther (c.1525), Ranker best Luther quotes (#47|60+) ↑

"I cannot and will not recant anything, for to go against conscience is neither right nor safe. Here I stand, I can do no other, so help me God. Amen."

— Martin Luther (c.1525), Ranker best Luther quotes (#26|60+)

"The multitude of books is a great evil. There is no limit to this fever for writing."

— Martin Luther (c.1525), Ranker best Luther quotes (#12|60+)

"Our Lord has written the promise of resurrection, not in books alone, but in every leaf in springtime."

— Martin Luther (c.1525), Ranker best Luther quotes (#50|60+)

References

1. Crowther, James G. (1995). *Six Great Scientists: Copernicus, Galileo, Newton, Darwin, Marie Curie, Einstein* (pg. 36). Barnes & Noble.
2. (a) Luther, Martin. (1525). *On the Bondage of Will* (*De Servo Arbitrio*). Publisher.
(b) Watson, Philip S. (1969). *Luther and Erasmus: Free Will and Salvation* (pg. 109). Westminster.
(c) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 276). HarperOne.
3. Repcheck, Jack. (2007). *Copernicus' Secret: How the Scientific Revolution Began* (pg. 159; thesises, pg. 71). Simon & Schuster.
4. Sekhar, DMR. (2011). "Eddington's Psycho-Syndrome" (O), Sulekhu.com.

External links

- Martin Luther – Wikipedia.

θΔics

In existographies, **Martin Swales** (1940-) (CR:3) is a Germanic literature scholar noted, in human chemistry, for []

Overview

In 2002, Swales, in his *Reading Goethe: a Critical Introduction to the Literary Work*, co-written with Erika Swales, college lecturer and fellow of King's College, Cambridge, cogently summarized German polyintellect Johann Goethe's 1809 physical chemistry novella *Elective Affinities* as being a treatise on the following deep query: [1]

> "Are men and women subject to the same laws of material reality as are the chemical substances?"

They correctly define the science of human chemistry, in more detail, as a precipitate of Goethe's *Elective Affinities*, as follows:

> "The Hauptmann [Captain] is invited to join Eduard and Ottilie; and it is the resulting threesome that one evening discusses the notion of 'Wahlverwandtschaften' (elective affinities), processes of bonding and rebonding in chemistry. At issue is the possibility that a particular compound can be fractured by the appearance of a third substance which then bonds with one of the previously conjoined substances—almost as though some kind of choice were being exercised. At one level, the discussion amongst the three friends genuinely does concern recently discovered chemical processes. At another level, the characters ceaselessly make metaphorical links between the behavior of chemical substances on the one hand and the chemistry of human attraction on the other. And, as soon as one formulated the matter in this way, in terms of 'human chemistry', one asks oneself whether this, too, is a literal or metaphorical statement. Are men and women subject to the same laws of material reality in the same way as chemical substances are? If so, what is the force of 'Sitten und Gesetze' [customs and laws] in the human sphere?"

The German term "sitten and gesetze", to note, translate as "customs and laws"; meaning that the authors are asking, in modern times, what is the force, of the four fundamental forces in physics, which to clarify is the electromagnetic force, of the customs and laws in the human sphere?

They also discuss what the refer to as the coming together of the "E-C-H-O constellation". The following is noted quote from the book:

> "Throughout their discussion, the characters [of *Elective Affinities*] traverse the metaphorical minefield of their topic."

which brings to mind the "danger" aspect often associated with the novel.

Education

Swales was professor of German at University College London from 1976 to 2003.

References

1. Swales, Martin and Swales, Erika. (2002). *Reading Goethe: a Critical Introduction to the Literary Work* (pg. 73). Camden House.

External links

â— Martin Swales (faculty) – University College London.
â— Martin Swales (biography) – Debretts.com.

θΔics

In existographies, **Martinus Veltman** (1931-) (CR:7) is Danish-born American theoretical physicist noted for his 1999 win of the Nobel prize for his particle physics work, with Gerardus 't Hooft, on the electroweak force, and for his 2003 *Facts and Mysteries in Elementary Particle Physics*.

Quotes

The following are noted quotes:

> "We are living in a totally ridiculous world. We have all kinds of things from horoscopes to Zen Buddhism to faith healers to religions to what have you. The whole world around us is full of nonsense, baloney, big speak and what have you. The fact that I'm busy in science has little or nothing to do with religion. In fact, I protect myself, I don't want to have to do with religion. Because once I start with that, I don't know where it will end. But probably I will be **burned** or **shot** or something in the end. I don't want anything to do with it. I talk about things I can observe and other things I can predict and for the rest you can have it."
>
> — Martinus Veltman (2004) interview (Ñº) with Harold Kroto (quote, 10:05-) (Ñº)

Further reading

â— Veltman, Martinus. (2003). *Facts and Mysteries in Elementary Particle Physics*. World Scientific.

External links

â— Martinus J.G. Veltman – Wikipedia.

θΔics

In religio-mythology, **Mary**, from the PIE **mer-* "to gleam, glimmer, sparkle" or Gothic marei "sea", aka “Stella Maris” or star of the sea, referring to the star Sirius, is the name of a number of Biblical female characters: “Virgin Mary” (Egyptian equivalent: Isis) or Mary, mother of Jesus (Egyptian equivalent: Horus; Osiris-Horus), Mary Magdalene (Egyptian equivalent: Nephthys), Mary, the sister of Martha and Lazarus (Egyptian equivalent: Osiris), who gives Jesus his first “anointing”, among others, who each are Roman recension rescripts of the Egyptian Mert goddesses, i.e. Mary pairs, who were associated with the resurrection of Osiris, i.e. annual rising of the Orion constellation, following the annual flooding of the Nile river, the start of which being marked by the annual helical rising of Sirius. [1]

Virgin Mary

The following shows visually how the Egyptian mythological story of how Isis, in the form of a kite (hawk), gets an erection out of the dead mummified body of Osiris, to conceive, via a magical process called the "black rite" (Ñº), wherein Thoth stops time, the divine child Horus (Christian equivalent: Jesus), was rewritten, monotheistically, into the Roman recension Christian mythological story of the so-called “Virgin Mary” becoming impregnated with the Holy Spirit to miraculously conceive Jesus: [2]

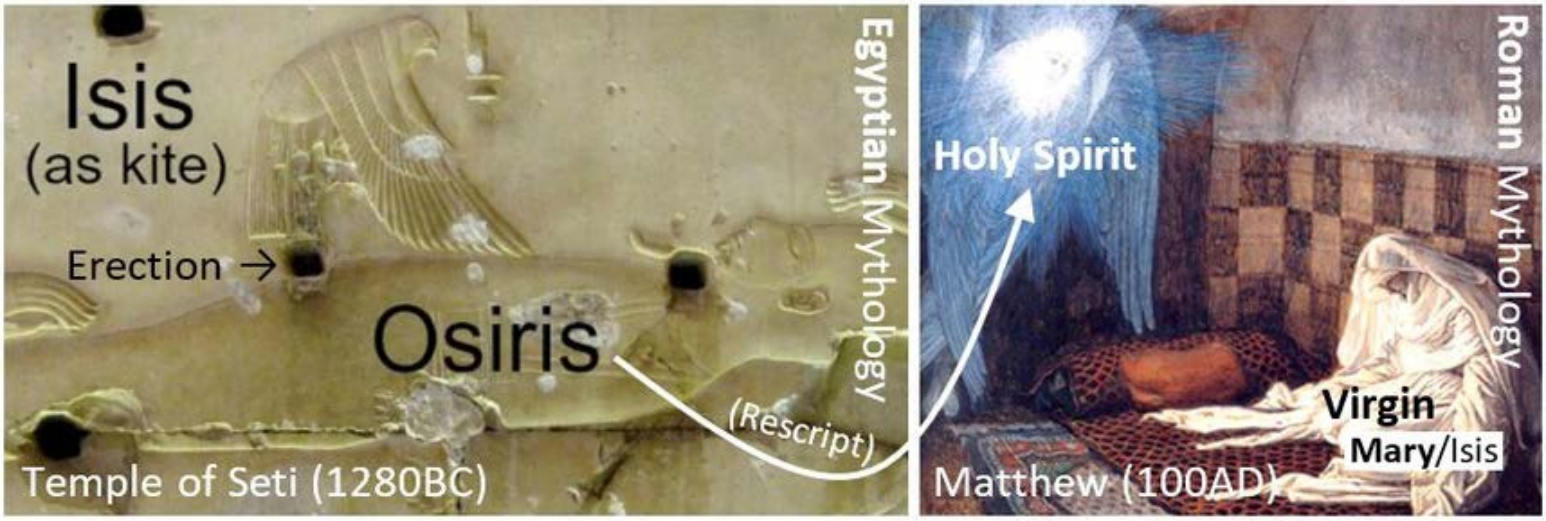

As told in Matthew 1:18-20 (Ñº) as follows:

> “Now the birth of Jesus Christ was on this wise: When as his mother Mary was espoused to Joseph, **before they came together, she was found with child of the Holy Ghost**.Then Joseph her husband, being a just man, and not willing to make her a public example, was minded to put her away privily.But while he thought on these things, behold, the angel of the Lord appeared unto him in a dream, saying, Joseph, thou son of David, fear not to take unto thee Mary thy wife: for that which is conceived in her is of the Holy Ghost.”

This is a classic example of “god reduction”, wherein an act originally polythestically described in terms of three gods (Osiris, Isis, and Horus) is reduced to a story involving one god (Holy Ghost), a man-god (Jesus) and a woman (Mary).

References

1. Mere – Online Etymological Dictionary.
2. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

θΔics

In hmolscience, **Mary Guthrie** (c.1987-) is an American chemical engineer noted for her 2009 tongue-in-cheek CNN-stylized “investigative report” parody “Why Students Choose Chemical Engineering?”, which she wrote and also acted in (as investigative reporter), wherein, via the dialogue of economics and chemical engineering student Jawad Mirza, Guthrie alludes to a hue of human chemical thermodynamics logic, in the statements that: in learning chemical thermodynamics, students learn about “heat transfer taking place between people”, the sign-off ending "may the force be with you", latter commentary such as how their exist “thermodynamic forces that compel people to become chemical engineers” (Rich Byrnes, 2012). [1]

Education

Guthrie completed her BS in chemical engineering in 2009 at North Carolina State University.

See also

â— James Ferri

References

1. Guthrie, Mary. (2009). “Investigative Report: on Why Students Choose Chemical Engineering” (Ñº) (writer: Mary Guthrie) (Mirza quote, 4:47-4:53; Byrnes quote, comment section), ChETube, CHEnected, Jan 13.

External links

â— Mary Guthrie – LinkedIn.

θΔics

In science, **Mary Jo Nye** (1944-) (CR=11) is an American science historian noted for a number of detailed chapters and articles on the history of chemical thermodynamics, specifically the transition from affinity chemistry to thermochemistry to chemical thermodynamics. [1]

Education

Nye completed her BS in chemistry from Vanderbilt University and her PhD in the history of science at the University of Wisconsin in 1970.

References

1. (a) Nye, Mary Jo. (1993). *From Chemical Philosophy to Theoretical Chemistry: Dynamics of Matter and Dynamics of Disciplines, 1800-1950* (section: From Chemical Affinity to Chemical Thermodynamics, pgs. 116-21). University of California Press.
(b) Nye, Mary Jo (1999). *Before Big Science: the Pursuit of Modern Chemistry and Physics, 1800-1940* (ch. 4: Thermodynamics, Thermochemistry, and the Science of Energy, pgs. 88-146). Harvard University Press.

Further reading

- Lindberg, David C., Porter, Roy, Jo Nye, Mary, and Numbers, Ronald. (2003). *The Cambridge History of Science: the Modern Physical and Mathematical Sciences* (pgs. 494-95). Cambridge University Press.
- Nye, Mary Jo. (2011). *Michael Polanyi and His Generation: Origins of the Social Construction of Science*. University of Chicago Press.

External links

- Mary Jo Nye – Wikipedia.
- Mary Jo Nye (faculty) – Oregon State University.

θΔics

In human chemistry, **Mary Brown Mesny** (c.1880-c.1950) was an American writer-philosopher noted for her 1910 “Human Molecules” on a person as a molecule.

Overview

In 1910, Mesny, in her “Human Molecules”, digressed on the subject of the human molecule, in which she specifically defines people as atoms or molecules, "nothing more nothing less", that must satisfy their bonding affinities, just as oxygen (two bond affinities), hydrogen (one bond affinities), and carbon (four bond affinities) have predisposed numbers of affinity bonds (valencies). On the subject of prediction and human chemical bonding, Mesny states: [1]

> “It is a happy thought that certain lovely combinations are foreordained, and that these human atoms often meet their mates.”

Mesny’s article seems to be the first article on human molecules, prior to American philosopher Alan Nelson’s 1992 chapter “Human Molecules”. [2]

References

1. Mesny, Mary B. (1910). “Human Molecules”, *The Smart Set: a Magazine of Cleverness*, 31:100, May.
2. Nelson, Alan. (1992). “Human Molecules”, in: *Post-Popperian Methodology of Economics*, ch. 3, pgs. 113-33) by Neil De Marchi. Kluwer Academic Press.

θΔics

In hmolscience, **Mary Roach** (c.1968-) is an American science writer noted, in cessation thermodynamics, for her 2005 *Spook: Science Tackles the Afterlife*, wherein he she gives a historical of scientific soul theories.

Overview

In 2005, Roach, in her *Spook: Science Tackles the Afterlife*, gave a definition for a soul theorist, while interviewing American physician Gerry Nahum, concerning his negative entropy theory of consciousness; the following being the main excerpt:

> "My ignorance is not merely deep, it is broad; it is a vast ocean that takes in chemistry, physics, information theory, thermodynamics, all the many things a modern soul theorist must know."

Roach devotes about ten pages to American chemical engineer and physician Gerry Nahum's "Proposal for Testing the Energetics of Consciousness and its Physical Foundation", in which he desires to get $100,000 grant funding to thermodynamically quantify the mass of consciousness, leaving the body after death, hypothesized to turn into a post-cessation type of 'free-floating consciousness energy".

References

1. (a) Roach, Mary. (2005). *Spook: Science Tackles the Afterlife* (Gerry Nahum, pgs. 97-106, 290, 297). W.W. Norton & Co.
(b) Roach, Mary. (2006). "What Happens After You Die?", *New Scientist*, Nov. 18.
2. Roach, Mary. (2005). "A Soul's Weight: What happens when a man (or a mouse, or a leach) dies on a Scale?", *Lost Magazine*, Dec. No. 1.

External links

â— Mary Roach – Wikipedia.

θΔics

In existographies, **Mary Shelley** (1797-1851) (IQ:175|#294) (EPD:0M) (GFG:6) (CR:47) was an English philosopher and novelist noted for her 1818 fictional character "Vicktor Frankenstein", who discovers the "principle of life" (see: life principle), and thereby reanimates, revives, or brings to life a dead corpse with electricity, i.e. creates laboratory produced life; and for her 1839 discussions of the atheist-based "Church of Elective Affinities", which she alluded to have married her husband Percy Shelley in.

Victor Frankenstein

In 1818, Shelley, in her *Frankenstein: the Modern Prometheus*, introduced her now famous character "Victor Frankenstein", aka "Dr. Frankenstein", semi-ranked as a greatest fictional genius ever, the character of which is said to have been based partly on her knowledge Paracelsus and the recently published 1791 dead frog leg twitching electrical experiments of Italian physician Luigi Galvani. This model is frequently cited, e.g. Alfred Ubbelohde (1954), amid physical science based discussions of what constitutes "life". [1]

Intellectual background

Shelley, a semi-ranked smartest woman ever, was the daughter of women's rights activist Mary Wollstonecraft, whose influences were: Jean Rousseau, Thomas Paine, and Voltaire, and anarchist philosopher William Godwin; she eloped with the poet and Percy Shelley; she wrote the novel *Frankenstein* as part of a bet with Shelley and his friend George, Lord Byron; an About.com top 100 (#49) Women of History (Q)

Quotes | By

The following are noted and or related quotes:

> "When I returned home my [Victor Frankenstein] first care was to procure the whole works of this author [Cornelius Agrippa] (Cattell 1000:c.660) (Q), and afterwards of Paracelsus and Albertus Magnus. I read and studied the wild fancies of these writers with delight; they appeared to me treasures known to few besides myself. I have described myself as always having been imbued with a fervent longing to penetrate the secrets of nature. In spite of the intense labor and wonderful discoveries of modern philosophers, I always came from my studies discontented and unsatisfied. Sir Isaac Newton is said to have avowed that he felt like a child picking up shells beside the great and unexplored ocean of truth. Those of his successors in each branch of natural philosophy with whom I was acquainted appeared even to my boy's apprehensions as tyros engaged in the same pursuit."
>
> — Mary Shelley (1818), *Frankenstein: the Modern Prometheus* (§2)

> "Beware; I am fearless and therefore powerful."
>
> — Mary Shelley (c.1830) (Q)

> "Many and long were the conversations Lord Byron and [Percy] Shelley, to which I was a devout, but nearly silent listener. During one of these various philosophical doctrines were discussed, and, among others, the nature of the principle of life and whether there as any probability of it ever being discovered and communicated. [Perhaps a corpse would be reanimated? Galvanism had given a token of such things]."
>
> — Mary Shelley (1831), Preface to *Frankenstein*, reflections (Q) on her summer of 1816 [2]

References

1. Ubbelohde, Alfred René. (1947). *Time and Thermodynamics* (pg. 94). Oxford University Press.
2. Smith, Eric D. (2007). "Inevitable Life?" (V) (Shelley, 1:11-1:51), Santa Fe Institute, Apr 18.

Further reading

● Feldman, Paula R.; Morrison, Lucy; Stone, Staci L. (2003). *A Mary Shelley Encyclopedia*. Greenwood Publishing Group.

External links

● Mary Shelley – Wikipedia.

θΔics

In existographies, **Mary Somerville** (1780-1872) (IQ:165|#441) [RGM:911|1,500+] (Siegfried 10:5) (GFG:#), was a Scottish mathematician, astronomer, and science writer, aka "queen of 19th-century science" (Q), mathematics tutor to Ada Lovelace, noted for []

Quotes | By

The following are quotes by Somerville:

> "In astronomy, we perceive the operation of a force which is mixed up with everything that exists in the heavens or on earth; which pervades every atom, rules the motions of animate and inanimate beings, and is as sensible in the descent of a rain-drop as in the falls of Niagara; in the weight of the air, as in the periods of the moon."
>
> — Mary Somerville (1846), *On the Connection of the Physical Sciences* (Q)

External links

- Mary Somerville – Wikipedia.

θΔics

In existographies, **Mary Wollstonecraft** (1759-1797) (IQ:160|#512) (Cattell 1000:851) [RGM:551|1,500+] (Time 100:59) (Stokes 100:75) (GFG:14) (CR:4) was an English philosopher and women's rights activist, noted for []

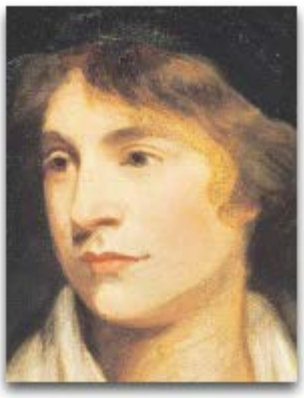

Overview

In 1792, Wollstonecraft, in her *A Vindication of the Rights of Woman* (1792), argued that women are not naturally inferior to men, but appear to be only because they lack education, that both men and women should be treated as rational beings, and imagines a social order founded on reason.

Family

Wollstonecraft was the wife of William Godwin and mother of Mary Shelley (wife of Percy Shelley).

Quotes | By

The following are quotes by Wollstonecraft:

> "Taught from infancy that beauty is woman's sceptre, the mind shapes itself to the body, and roaming round its gilt cage, only seeks to adorn its prison."
>
> — Mary Wollstonecraft (1792), *A Vindication of the Rights of Women* [1]

References

1. Wollstonecraft, Mary. (1792). *A Vindication of the Rights of Women* (pg. 50) (Ñº). Publisher.

External links

â— Mary Wollstonecraft – Wikipedia.

θΔics

In thermodynamics, **mass-energy equivalence** is a principle which states that mass of matter and energy are interconvertable.

History

The first to state that matter and energy might be interconvertable was English physicist Isaac Newton who in his 1717 "Query 30" of his *Opticks* states:

> "Are not the gross bodies and light convertible into one another, and may not bodies receive much of their activity from the particles of light which enter their composition?"

In 1905, German born American physicist Albert Einstein stated:

> "If a body gives off the energy L in the form of radiation, its mass diminishes by L/c^2 ."

which implies that mass can be converted into energy according to the following equality:

$$\Delta m = \frac{L}{c^2}$$

Or in modern notation:

$$E = mc^2$$

Particle physics

In modern particle physics terms, the matter portion of the universe is defined as "fermions" and the energy portion of the universe is defined as "bosons", whereby extrapolation, the matter energy equivalence principle states that fermions and bosons are different manifestations of the same thing and or interconvertable.

See also

- $S = k \ln W$
- $\Delta G < 0$
- $\Delta G > 0$

References

1. Einstein, Albert. (1905). "Does the Inertia of a Body Depend upon its Energy Content?", *Annalen der Physik*, 18(13): 639-43.

External links

- Mass-energy equivalence – Wikipedia.

θΔics

In thermodynamics, **Massieu function** is a state equation that represents all the properties of a body of invariable composition which are concerned in reversible processes by means of a single function. [1] Such equations were introduced by French engineer Francois Massieu in 1869 and called by him "characteristic functions". [2]

Massieu functions are partial Legendre transforms of fundamental relations, in entropy representation S(U,V,N), that provide additional alternative fundamental relations. [6] The Massieu functions are rarely used in thermodynamics, often discussed for their historical importance.

First characteristic function

In 1876, American engineer Willard Gibbs credited Massieu as having invented the concept of the characteristic function, the first of which, according to Gibbs, given by Massieu is Ψ (Psi), defined in Gibbs notation as: [1]

$$\frac{-\epsilon + t\eta}{t} \text{ or } \frac{-\psi}{t}$$

which in modern notation reads, according to French thermodynamicist Pierre Perrot:

$$J = \frac{-F}{T}$$

which is the negative of the Helmholtz free energy *F* divided by the temperature *T* of the body. The symbol *J* is referred to as the Massieu function. [3]

Second characteristic function

The second characteristic function as well as the expression Ψ' (psi prime), cited by Gibbs as: [1]

$$\frac{-\epsilon + t\eta - pv}{t} \text{ or } \frac{-\zeta}{t}$$

which in modern notation reads:

$$Y = \frac{-G}{T}$$

which is the negative of the Gibbs free energy *G* divided by the temperature *T* of the body. The symbol *Y* is sometimes called the Planck function. [3]

Other Massieu functions

Beyond the first and second Massieu functions, given above, there are other Massieu functions. One is called the Kramer function, symbol omega Ω, and another unnamed function, given by symbol Gamma Γ. [5]

Conjugate variables

Massieu, according to German scientist Gerhard Inden, was the one who introduced the logic that the a generic function, symbol Ψ (Psi), for a given body, could be expressed as a function of conjugate variables, as defined by the following

relation:

$$\Psi = \Psi(X_1, \ldots, X_i, Y_{i+1}, \ldots Y_r)$$

where for every system with degree of freedom *r* one may choose r variables, i.e. $(X_1, \ldots, X_i, Y_{i+1}, \ldots Y_r)$, to define a coordinate system, where *X* and *Y* are extensive and intensive variables, respectively, and where at least one extensive variable must be within this set in order to define the size of the system, such that the (r+1)-th variable, Ψ, is then called the Massieu function, a modified equation form or representation of the energy or potential of the body or system. [4]

References

1. Gibbs, Willard. (1876). "On the Equilibrium of Heterogeneous Substances" (Massieu, pgs. 86, 358),*Transactions of the Connecticut Academy*,III. pp. 108-248, Oct., 1875-May, 1876, and pp. 343-524, may, 1877-July, 1878.
2. (a) Massieu, Francois. (1869). "Sur les Functions Caracteristiques des Divers Fluides et Sur la Theorie des Vapeurs (On the Various Functions Characteristic of Fluids and on the Theory of Vapors)", *Comptes Rendus*, 69: 858-62, 1057-61.
(b) Massieu, Francois. (1876). *Thermodynamique: Mêmoire sur les fonctions catactéristiques des divers fluides et sur la théorie des vapeurs*. 92-pgs. Académie des Sciences de L'Institut National de France.
3. Perrot, Pierre. (1998). *A to Z of Thermodynamics* (Massieu function, pg. 190). Oxford University Press.
4. Inden, Gerhard. (2008). "Introduction to Thermodynamics", *Materials Issues for General IV Systems*, pgs. 73-112. Springer.
5. Tschoegl, Nicholas W. (2000). *Fundamentals of Equilibrium and Steady-State Thermodynamics* (ch.9: Massieu Functions, pgs. 62-). Elsevier.
6. Rao, Y.V.C. (1994). *Postulational and Statistical Thermodynamics* (4.4: Massieu functions, pgs. 89-). Allied Publishers.

Further reading

â— Aris, Rutherford, Davis, Howard T., and Stuewer, Roger H. (1983). *Springs of Scientific Creativity* (ch. 5: The Scientific Style of Josiah Willard Gibbs, by Martin J. Klein, pgs 142-62, esp. pg. 161). University of Minnesota Press.
â— Callen, Herbert B. (1985). *Thermodynamics and an Introduction to Thermostatistics* (Massieu functions, pgs. 151, 423; maximum principles for, pg. 179). John Wiley & Sons.

External links

â— Massieu function – Wikipedia.

θΔics

In hmolscience, **Massimiliano Ferrara** (1972-) is an Italian mathematical economist noted for his 2003 to present efforts to make thermodynamic formulations of economics.

Overview

In 2008, Ferrara, in his "Advances on Thermoeconomics: a Model for the Equilibrium of European Union's Economy (Geobiodynamics and Roegen Type Economy)", in association with Constantin Udriste, noted for his "Thermodynamics versus Economics" (2007), et al, attempt to platform off Nicholas Georgescu-Roegen (1971), to do the following, rather bold, on the surface, sounding jump:

> "The fundamental Gibbs-Pfaff equation of thermodynamics $dU - TdS + PdV + \sum \mu_k dN_k = 0$ is changed into fundamental Gibbs-Pfaff equation of economics $dG - IdE + PdQ + \sum \nu_k dN_k = 0$."

Here we recall Edwin Wilson's 1938 suggestion to Paul Samuelson to use Gibbs' equation 133 to formulate a theory of economic equilibrium. When, however, we view their human thermodynamics variables table, as shown below, we see them using the letter rhyming derivation method, e.g. P of economic pressure equates to P of price (level of inflation), among other issues:

TERMODYNAMICS	ECONOMICS
U = internal energy	G = potential growth
T = temperature	I = internal politic stability
S = entropy	E = entropy
P = pressure	P = level of prices (inflation)
V = volume	Q = production quantity
M = total energy (mass)	Y = national income (revenue)
Q = electric charge	$\mathcal{I}$ = total investment
J = angular momentum (spin)	J = economic angular momentum (economic spin)
$M = M(S, Q, J)$	$Y = Y(E, \mathcal{I}, J)$
$\Omega = \frac{\partial M}{\partial J}$ = angular velocity	$\frac{\partial Y}{\partial J}$ = marginal propensity to spin
$\Phi = \frac{\partial M}{\partial Q}$ = electric potential	$\frac{\partial Y}{\partial \mathcal{I}}$ = marginal propensity to invest
$T_H = \frac{\partial M}{\partial S}$ = Hawking temperature	$\frac{\partial Y}{\partial E}$ = marginal propensity to entropy

Another salient issue is their symbol usage, namely: they translated internal energy U, i.e. the internal energy of an economic system, into "growth potential", symbol G, which only sets up the remainder of their derivation, into confusion that economic potential is measured by Gibbs energy, symbol G.

Education

Ferrara completed his PhD in mathematical economics, and presently is associated with the Mediterranean University of Reggio Calabria, Italy.

Quotes

The following are noted quotes:

> "The formal analytical-mathematical analogy between economics and thermodynamics is by now fairly well-known or at least accepted by economists and physicists alike."
>
> — Massimiliano Ferrara (2008), "Geobiodynamics and Roegen Type Economy"

Key

Ferrara was found in Google Scholar via the keys: Gibbs, sociology, economics, thermodynamics.

References

1. (a) Ferrara, Massimiliano. (2008). "Advances on Thermoeconomics: a Model for the Equilibrium of European Union's Economy" (Geobiodynamics and Roegen Type Economy) (abs), *Il Politico*, LXXIII, 3:97-107.
(b) Ferrara, Massimiliano, Udriste, Constantin, Zugravescu, D. and Munteanu, F. (2008). "Geobiodynamics and Roegen Type Economy" (pdf), *Far East Journal Mathematical Science*, *28*(3):681-693.

Further reading

● Ferrara, Massimiliano and Udriste, Constantin. (2003). "Area Associated Conditions to Thermodynamic and Economic Systems", 2nd International Colloquium On Mathematics In Engineering And Num. Physics , April 2002 Bucharest (Romania) , Vol 8, pgs. 60-69 .
● Ferrara, Massimiliano and Udriste, Constantin. (2008). "Black Hole Models in Economics", *Tensor*, 1(70):53-62.

External links

● Massimiliano Ferrara – ResearchGate.net.
● Massimiliano Ferrara (faculty) (Italian → English) – Mediterranean University of Reggio Calabria, Italy.

θΔics

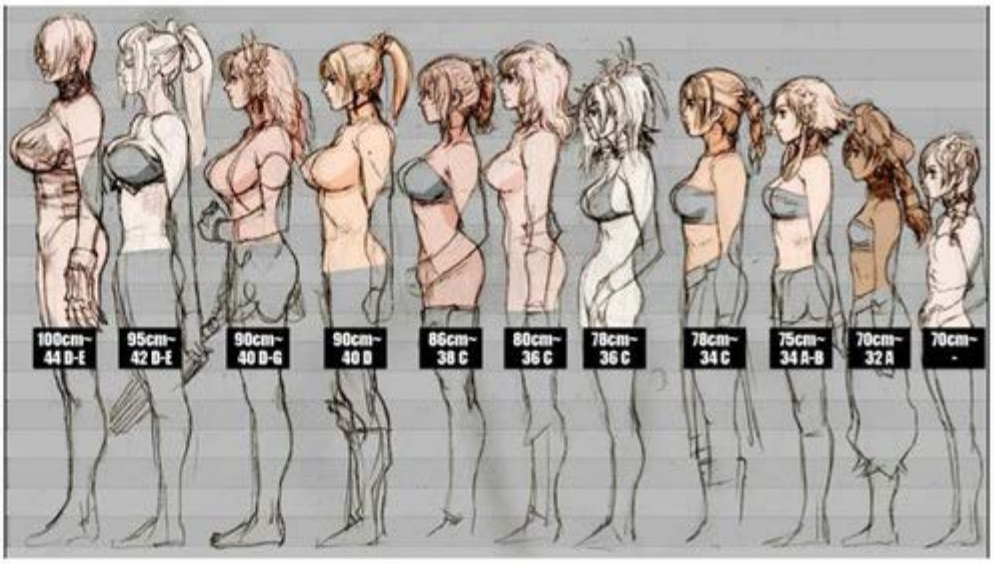

Evolutionary psychological studies show that factors in **mate selection** include variations in morphological factors such as breast shape and size and color and size of peacock's tails, among others. [4]

In interactions, **mate selection** is the process by which a person selects or "chooses" a mate, associate, or companion. [1] In social psychology, one view of how mate selection occurs is called exchange theory, which posits that people select mates based on their fair "exchange value" in the mating market. [2]

Overview

An unpublished 1970 paper, indicated that drivers of both sexes waited twice as long before honking at a female when she was driving a brand new car as when she was driving an older model. [3]

See also

- Soul mate
- Thims' mate selection book collection

References

1. Mate (noun) – Merriam-Webster Collegiate Dictionary, 2000.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 27). Morrisville, NC: LuLu.
(b) Hendrix, Harville. (2007). *Getting the Love You Want: A Guide for Couples.* (pg. 6). MackMillan.
(c) Rosenfeld, Michael J. (2005). "A Critique of Exchange Theory in Mate Selection" (PDF), *American Journal of Sociology*, Vol. 10, No. 5, March. Pgs. 1284-1325.
3. Rubin, Zick. 1970. "Measurement of Romantic Love" (abs), *Journal of Personality and Social Psychology*, Volume 16, pages 265-273.
4. (a) Thims, Libb. (2003). "How to Pick the Right One?" (N=50 [33 men; 28 women) (Q), Chicago: IoHT Publications.
(b) Thims, Libb. (2004). "Breast Size Attraction-to-Repulsion Survey" (N=10) (Q), Chicago: IoHT Publications.
(c) Thims Libb. (2004). "Which Phallus is the Best to Marry?" (N=51) (Q), Chicago: IoHT Publications.
(d) Thims, Libb. (2007). *Human Chemistry (Volume One)* (phallus length, pg. 157). Morrisville, NC: LuLu.

External links

- Human Mating Strategies and Sexual Preferences – EvoWiki.org

θΔics

In existographies, **Mateo Gil** (1972-), born "Francisco Mateo Gil Rodríguez", is Spanish film writer and director, noted for []

Agora | Hypatia

In 2009, Gil wrote and assistant directed the film *Agora* on Greek philosopher Hypatia, the only known, purported, female universal genius.

Thermodynamics | Relationships

See main: *The Laws of Thermodynamics (film)*

In 2018, Gill wrote and directed the film *The Laws of Thermodynamics* (*Las leyes de la termodinámica*), an English-subtitled Spanish film, set in Barcelona, filmed in a seven-week shoot (Q) starting in 4 Oct 2016, purporting to be about the laws of thermodynamics and physics generally applied to explain relationships (see: relationship physics), specifically between actor Vito Sanz, playing the role of an astrophysics graduate student, and actress Berta Vazquez, playing the role of a model turned actress:

The preview opens to trajectory scene wherein in three male bodies, one, closer, the bigger man (below left), accelerating at 1,412 m/s g (non standard units) (?), and another, farther away, the man with bag (below right), travelling at 1,459 m/s g, and a third, Vito Sanz, the lead male (not shown), speed toward the beautiful model as shown below:

amid which a collision occurs, which would seem to represent some aspect of social collision theory:

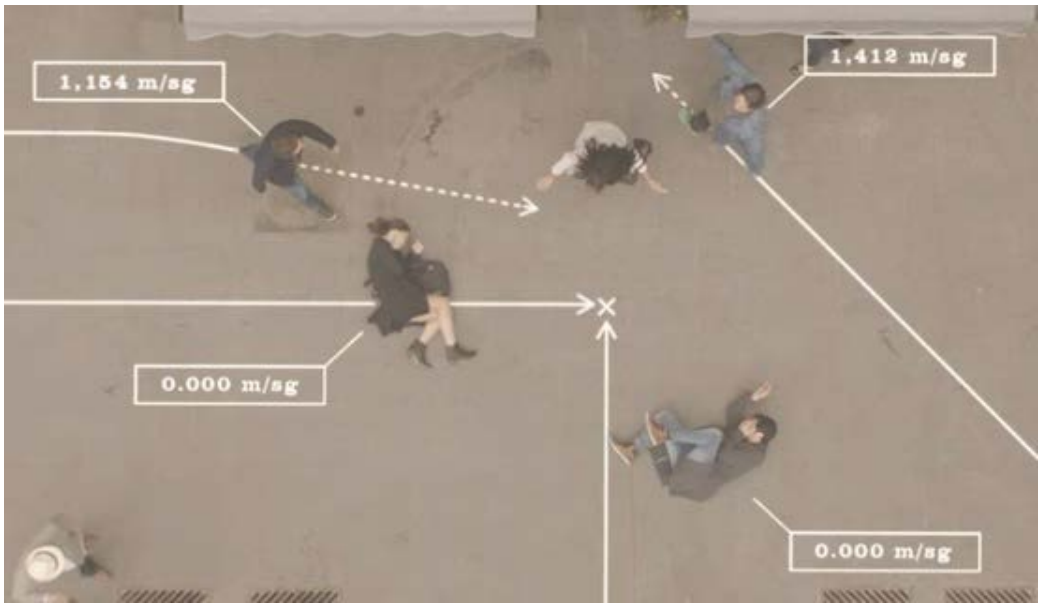

Here, to clarify, in the scenario presented here, namely that it is the force of gravity is all that is needed to set “us in motion”, according to the universal gravitation law:

$$F = G\frac{m_1 m_2}{r^2}$$

and that is gravitation alone that causes the four men to attract or accelerate towards the beautiful women, correctly it is visual “sight” or the electromagnetic force that, according to the laws of motion, set the four men in motion. The force of gravity here plays a role, e.g. in setting in motion the female menstrual cycle, thereby putting here “in heat” for a few days each month, thereby increasing the visual electromagnetic attraction, but the bulk nature of the force is the electromagnetic force, the gist of which being captured, for charged particles, in the form of Coulomb’s law:

$$F = k_e\frac{q_1 q_2}{r^2}$$

where q1 and q2 are the charges of the two particles, e.g. electron and proton, r is the distance of separation, and k is Coulomb's constant. The actual force of attraction between humans, as point masses intermediate in sized between sub atomic particles and planets, accordingly, is the gravito-electromagnetic force, but the equation and constant for these types of attractions have yet to be formulated.

The way this scenario is described in modern terms is that the force that moves each of the men through the distance is called the "force function" or the negative of the thermodynamic potential, which is negative Gibbs energy, in this case is the following social force function:

$$F = -\Delta G$$

This, according to Gilbert Lewis (1923), is called the "driving force" of the reaction. The units here, to clarify, are still in units of energy per unit mass (J / mass); hence, to convert this into actual force units of newtons (1N=1kg·m/s²), we employ the principle of the transmission of work:

$$W = Fd$$

wherein the work done when the said attraction force "moves" the men to the women, according to the laws of motion, in a thermodynamic sense, is the negative Gibbs energy, hence:

$$\frac{W}{d} = F$$

and with substitution of the negative Gibbs energy for work, we have:

$$\frac{-\Delta G}{d} = F$$

and with re-arraignment, we have:

$$F = \frac{-\Delta G}{d}$$

which says that the force of attraction between each of the male bodies, M1, M2, M3, and the female body M4, respectively, in the above scene scenario, is equal to the negative of the Gibbs energy change divided by the distance of separation, a blend of Newton's universal gravitation law and Coulomb's law of electromagnetic attraction, in short.

Scale of existence of things

See main: Scale of existence of things

Hence, to review and summarize, the following gives the general force equation for the various scale of existence of things, atomic and molecular, to human social molecular, to cities and towns, to planets and suns:

Bodies	Force Equation	Depiction	Force Name	Equation Name

1.	Planets and suns	$F = G\frac{m_1 m_2}{r^2}$	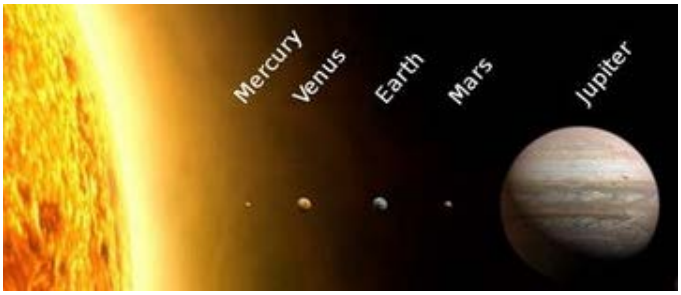	Gravitational force	Newton's law of universal gravitation → Ismael Bullialdus (c.1645) → Giovanni Borelli (1666) → Robert Hooke (1684) → Isaac Newton (1686)
2.	Cities and towns	$F_i = k\frac{P_1 P_2}{d^2}$		Social gravitation	Warntz's law → Francesco Algarotti (1737) → Henry Carey (1858) → John Q. Stewart (1939) → William Warntz (1969)
3.	Men and women	$F = \frac{-\Delta G}{d}$		Gravito-electromagnetic force	Social physico-chemical attraction law → Johann Goethe (1809) → Mirza Beg (1987) → Libb Thims (2007)
4.	Protons and electrons	$F = k_e\frac{q_1 q_2}{r^2}$		Electromagnetic force	Coulomb's law → Franz Aepinus (1758) → Joseph Priestley (1767) → John Robinson (1769) → Henry Cavendish

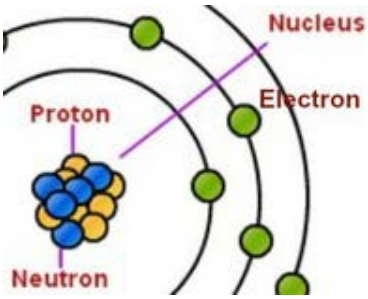

(c.1772)
→
Charles Coulomb
(1777)

A variant of attraction type two, i.e. force of attraction between men and women, when humans aggregate into populations, is found in William Warntz's 1964 population potential map, as shown below, wherein the social gravitational potential v_i, at location i, a distance d_{ij} from a given city j with population P_i is given by the following:

$$v_i = \frac{P_j}{d_{ij}}$$

wherein, based on data, New York is akin to the social star around which the social planets of Philadelphia, Chicago, Denver, and Los Angeles, etc., rotate, like a solar social system:

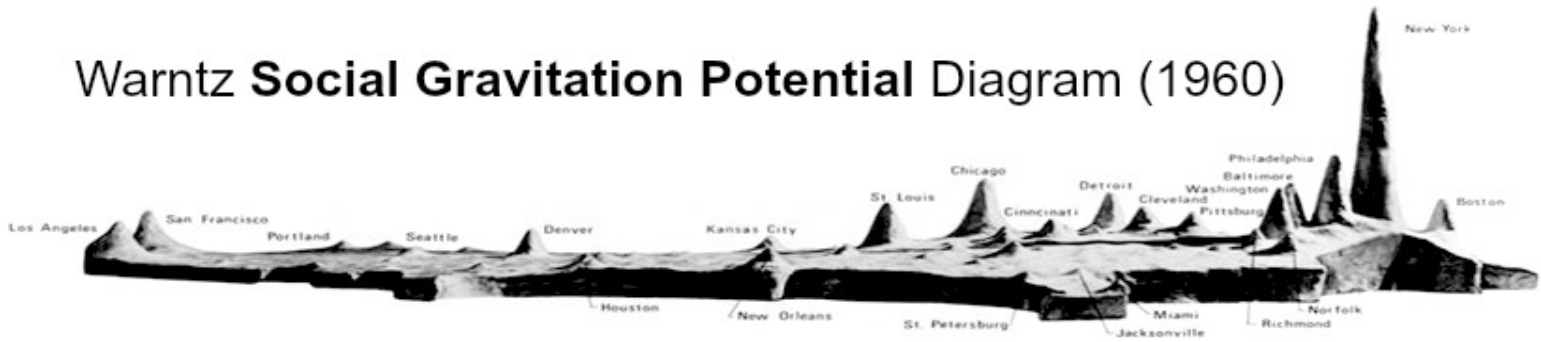

Warntz found, accordingly, that the strength of the interaction I or interaction force F_i, i.e. exchange force, as measured by number of telephone calls, traffic flows, etc., is proportional to the product of the populations of the respective populations P_1 and P_2 and inversely proportional to their distance of separation squared:

$$F_i = k\frac{P_1 P_2}{d^2}$$

Two film posters are as follows:

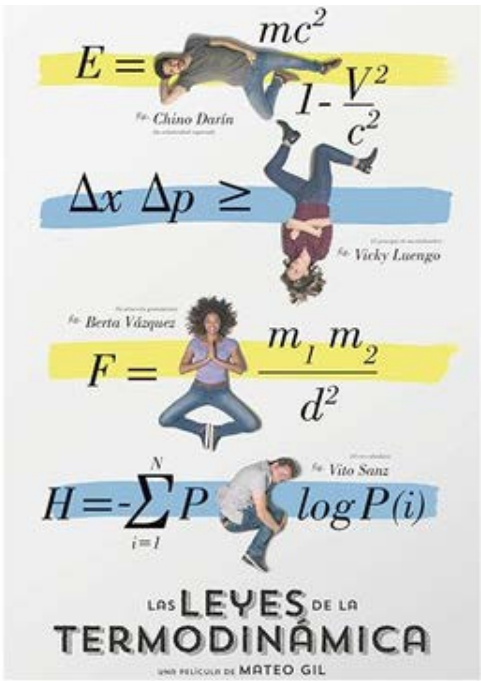

Here, we see, firstly, above left, a take on human molecular orbital theory and or social gravitation theory, wherein the character Elena, a model-turned-actress, is the central "star" or sun, around which the other three characters rotate or gravitationally attract and thereby rotate in their orbits (social orbital theory).

At right, we have the the equations, with people interspersed (see: equation overlay method), from top to bottom, firstly the mass-energy equivalence:

$$E = mc^2$$

shown with the non rest mass correction shown, as the body approaches the speed of light.

Second, the uncertainty principle:

$$\Delta x\ \Delta p \gtrsim h$$

which states that the product of the variation in position Δx and the variation in momentum Δp of a particle will be greater than or equal to Planck’s constant h; meaning that the film will likely argue for free will, or something to this effect.

Thirdly, the universal gravitation law:

$$F = G\frac{m_1 m_2}{r^2}$$

Lastly, we have what seems to be Claude Shannon's information entropy or an entropy stylized variant of Ludwig Boltzmann's H-theorem:

$$H = -K\sum_{i=1}^{n} p_i \log p_i$$

(add)

Related

The original, of course, is Goethe's 1809 *Elective Affinities* (Q), the science of which, namely how "affinities" in Goethe's day now means "Gibbs energies" in modern days, explained (Q) well by Jurgen Mimkes. There's also the 2010 Spanish-language remake *Afinidades* (Q), which has some particle physics philosophy interspersed. Francis Ford Coppola, of note, tried for about two decades to do an English remake of *Elective Affinities*. But alas, no English-based versions have appeared, generally owing to Bible barricaded America (aka Hollywood).

In 1955, the song "It's a Chemical Reaction, That's All" premiered, which was later turned into a number of films..

In 2012, Indians Vamshi Regalla and Ravi Vedula produced a short film on the thermodynamics of love, from a chemical engineer's point of view, about a guy with 9 girlfriends to choose from (Q) to marry, from a thermodynamics view.

In 1993, Tom Stoppard's 1993 play Arcadia, which deals with love, gravity, and thermodynamics.

The "go for the blond" bar scene from *A Beautiful Mind* (2001) on John Nash comes to mind as well.

Quotes

The following are quotes on Gil's *Laws of Thermodynamics*:

> "The *Laws of Thermodynamics* is a light-hearted look at the striking parallels between the laws of physics and the rules of love, showing how easily certain scientific ideas can be transposed to the context of relationships—or even, in some cases such as gravity or the 'attraction force between two bodies', applied literally. This is the premise for thisromantic comedy in the guise of a documentary, the plot of which can be summed up as "insecure guy falls for unattainable woman."
>
> — Alfonso Rivera (2016), "Mateo Gill gives is a lesson in *Las leyes de la termodinamica*", Oct 21 (Q)

> "Manel, a promising and somewhat neurotic physicist, intends to show us in this hybrid of romantic comedy and scientific documentary how her relationship with Elena, a sought-after model and actress, has not been a complete disaster because of her fault, but because she was determined from the beginning by the very laws of physics, those that discovered geniuses such as Newton, Einstein or the fathers of quantum mechanics. And especially by the three laws of thermodynamics."
>
> — Anon (2018), Sony Pictures Espana (Q), Feb 27

External links

- Mateo Gil – Wikipedia.

θΔics

In hmolscience, **material atheism**, or "materialistic atheism", is a belief system based, NOT based on the existence of god, but on either matter and motion (Holbach, 1770), force and matter (Buchner, 1855), physics generally (Tyndall, 1874), or variations therein.

Quotes

The following are related quotes:

> "Christian men are proved by their writings to have their hours of weakness and of doubt, as well as their hours of strength and of conviction; and men like myself share, in their own way, these variations of mood and tense. Were the religious views of many of my assailants the only alternative ones, I do not know how strong the claims of the doctrine of '**material atheism**' upon my allegiance might be. Probably they would be very strong. But, as it is, I have noticed during years of self-observation that it is not in hours of clearness and vigor that this doctrine commends itself to my mind: that in the presence of stronger and healthier thought it ever dissolves and disappears, as offering no solution to the mystery in which we dwell, and of which we form a part."
>
> — John Tyndall (1874), response in regards to the charge of atheism, following his BAAS address [1]

> "The logical heir of Baconianism is **material atheism**; to Milton, atheism was a philosophical absurdity."
>
> — John Broadbent (1973), *John Milton: Introductions* (pg. 123)

See also

- Political atheism
- Epicurean atheism
- Thimsian atheism

References

1. (a) Tyndall, John. (1874). "Address", Delivered before the British Association assembled at Belfast. Longmans, Green, and Co.
(b) Anon. (1874). "Professor Tyndall and 'Materialistic Atheism'" (O), *The English Mechanic and World of Science and Art*, Oct 2.

θΔics

In economic thermodynamics, **material entropy** is an approximate or rather contrived term, a spinoff of the term "bound energy", used to define the amount of entropy or order associated with a structure, the structure tending to be some type of natural resource, as in coal.

Etymology

In 1966, English-born American economist Kenneth Boulding, in a paper titled "The Economics of the Coming Spaceship Earth", supposedly, coined the term as follows: [1]

> "**Material entropy** can be taken as a measure of the uniformity of the distribution of elements and, more uncertainly, compounds and other structures on the earth's surface."

In 1971, Romanian-born American mathematical economist Nicholas Georgescu-Roegen, in his *The Entropy Law and the Economic Process*, outlined a type of material entropy theory by stating that "entropy is an index of the relative amount of bound energy in an isolated structure or, more precisely, of how evenly the energy is distributed in such a structure". In other words, he states, "*high* entropy means a structure in which most or all energy is bound, and *low* entropy, a structure in which the opposite is true". These, in turn, stimulated American economist Jeremy Rifkin to state, in his 1980 book *Entropy: A New World View*, a supposed fourth law of thermodynamics: "in a closed system, the material entropy must ultimately reach a maximum", which he translated into the postulate that humans are squandering the world's natural resources.

Difficulties on term

Material entropy, as generally found, is a spinoff term having little theoretical substance to it. Some will state, for instance, that "there is, fortunately, no law of increasing material entropy, as there is in the corresponding case of energy, as it is quite possible to concentrate diffused materials if energy inputs are allowed." [2]

The general difficulty of using the concept of *material entropy*, beyond that involved in the formation of small molecules or small chemical systems, is that, in the words of Rudolf Clausius: [3]

> "It is not possible to determine the whole energy of a body, but only the increase which the energy has received, whilst the body was passing into its present condition; and the same is also true of entropy".

Species	Formula	ΔH_f°(kJ/mol)	ΔG_f°(kJ/mol)	S°(J/K·mol)
Acetic acid(l)	CH_3COOH	-484.2	-389.45	159.83
Acetaldehyde(g)	CH_3CHO	-166.35	-139.08	264.2
Acetone(l)	CH_3COCH_3	-246.8	-153.55	198.74
Acetylene(g)	C_2H_2	226.6	209.2	200.8
Benzene(l)	C_6H_6	49.04	124.5	172.8
Carbon dioxide(g)	CO_2	-393.5	-394.4	213.6
Ethanol(l)	C_2H_5OH	-276.98	-174.18	161.04
Ethane(g)	C_2H_6	-84.7	-32.89	229.49
Ethylene(g)	C_2H_4	52.3	68.1	219.45
Formic acid(l)	HCOOH	-409.2	-346.0	128.95
Glucose(s)	$C_6H_{12}O_6$	-1274.5	-910.56	212.1
Methane(g)	CH_4	-74.85	-50.8	186.19
Methanol(l)	CH_3OH	-238.7	-166.3	126.78
Oxygen(g)	O_2	0	0	51.05
Sucrose(s)	$C_{12}H_{22}O_{11}$	-2221.7	-1544.3	360.24
Water(l)	H_2O	-285.8	-237.2	69.9

Thermodynamic Table (2007)

A basic thermodynamic database table showing, in the fifth column, entropies S of different types of chemicals (matter).

Shown adjacent, for instance, are various measures of entropies $S°$ for different chemical species. In other words, the entropies of bodies, depend upon various factors involved related to the heats and energies released or absorbed during their formation, and are based on reference points. It is not simply a matter of assigning low entropy values to ordered structures, e.g. coal, and high entropy values to disordered structures, e.g. burned coal and waste gas.

Objections

The use of material entropy, as seeded by Georgescu-Roegen and promulgated by Rifkin, is generally seen as point of non-logic. Israeli physical chemist Brian Silver, in commentary on what he calls "Georgescu-Roegen's brainchild", for instance, states that "the term *material entropy* is meaningless; it has not the slightest connection with entropy. [4] Likewise, American chemist Glen Gordon states that "in taking up entropy, Rifkin is like a child with a new toy—he has great fun applying the concepts to all aspects of our high-technology society." [5]

In 2004, American-born Australian economist Elias Khalil published his “The Three Laws of Thermodynamics and the Theory of Production”, which he had reviewed by: Jeffrey Wicken, Reiner Kummel, Kozo Mayumi, among others, wherein he argues the following position: [1]

> “This paper concurs with experts on thermodynamics that Georgescu-Roegen has committed a major error. Georgescu-Roegen’s notion of ‘material entropy’, which he christened as the ‘fourth law of thermodynamics’, is unfounded.”

Khalil concludes that Georgescu-Roegen's purported law, as the application of the second law to the realm of matter, is a grave conceptual blunder. [6]

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θΔics

In science, **material theory of heat**, aka "substance theory of heat" (Planck, 1949), “matter theory of heat”, or “fluid theory of heat”, give or take, is a heat theory which supposes that heat is a type of matter or particle, with or without mass; it was eventually superseded by the “kinetic theory” (Hermann, 1716) and or “kinetic theory of heat”, which was itself later subsumed into the “mechanical theory of heat” (Clausius, 1865).

Overview

The ancient roots of the theory that heat is a type of matter originated, in a general sense, from the three element theory, four element theory, and five element theories of the Greeks, which supposed that fire was one of the elements. This logic, however, began to loose sway in the 18th and early 19th century; the following is one take on this:

> “Nothing ever delighted me so much as the discovery that there were no *elements* of earth, fire, or water.”
>
> — Percy Shelley (1804), on his age 14 education [2]

In short, in respect to the nature of heat, as explained by the “four element theory” (Aristotle, c.330BC), became fire explained by the “three principles theory” (Geber, 790), which became heat explained via the “sulfur combustion model” (Paracelsus, 1524), which became the “terra pinguis model” (Becher, 1699), which became the “phlogiston model” (Stahl, 1703), which became the “caloric model” (Lavoisier, 1789), which, following the disproof of the caloric theory, by Benjamin Thompson (cannon boring experiment, 1798) and Humphry Davy (ice rubbing experiment, 1799), the kinetic theory of heat and later mechanical theory of heat usurped all the former models.

Quotes

The following are related quotes:

> “Despite the caution of Black and his followers, in the second half of the eighteenth century, there was a hardening of opinion in favor of the **‘**material theory of heat**’**. The difficulties of the ‘kinetic theory’ which was favored by mathematicians and physicists were still unresolved, while the chemists who came increasingly to dominate the study were, perhaps by tradition (in the footsteps of Boerhaave), perhaps by metaphysical preference, predisposed to favor the substantial theory. An exception was **Pierre Macquer**, but he had few disciples.”
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 57)

> “Blagden, in his obituary on Cavendish (Mar 1810), failed to mention Cavendish's work on heat, although he made note of all of his other major work. Odd, I say, because in none of his other work was Cavendish known to have declared himself publicly a more decided follower of Newton, according to his understanding of Newton, than in his work on heat, and also because Blagden assisted Cavendish in this work. If there is a circumstance that might bear on Blagden's neglect or forgetfulness in his obituary of his late friend and colleague, it is that Blagden subscribed to the popular **‘material theory of heat’**, of which Cavendish held a low, almost contemptuous, opinion.”
>
> — Russell McCormmach (1988), “Henry Cavendish on the Theory of Heat” [1]

> “In 1786, in a book on the latest advances in heat, light, and pneumatic chemistry, Bryan Higgins wrote that there was no need for him to justify his ‘**material view of heat**’, since Cavendish together with "other distinguished philosophers have accepted it." If Cavendish took note of Higgins's mistake, he must at the same time have realized that he had not made sufficiently public his view of heat. With ‘heat’, Cavendish intended to set the record straight.”

— Christa Jungnickel (1999), *Cavendish: the Experimental Life* (co-author: Russell McCormmach) (pg. 415)

See also

â— Wave theory of heat (Ñº)

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θΔics

In science, **materialism** is a doctrine which holds that the only thing which exists is matter, and the forces or energies that control matter, which the thus form the basis of all explanation, and that that which does not have a materialist basis does not exist.

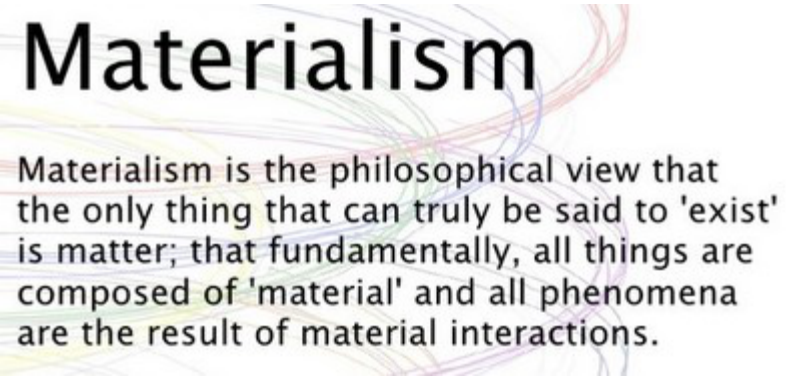

A 2009 (Q) SlideShare.net "–isms" description of **materialism**.

Extreme materialism

The following is Balfour Stewart and Peter Tait's 1875 take, penned in the wake of the 1874 Tyndall-Stewart-Tait debate, on what they refer to as the "extreme materialism" view, Irish physicist John Tyndall, supposedly, being the archetype representative of this view: [10]

> "When a certain number of material particles consisting of phosphorus, carbon, oxygen, hydrogen, nitrogen, and perhaps some other elements, are, in consequence of the operations of their mutual forces, in certain positions with respect to each other, and in certain states of motion, consciousness is the result, but whenever this relative state is brought to an end, there is also an end of consciousness and the sense of individual existence, while however the particles of phosphorus, carbon, etc., remain as truly as ever."

(add discussion)

Terminology

In recent years a certain vocabulary has arisen to categorize or label certain views or perspectives:

● Rational materialism – defines people with the least active forms of the D4 dopamine receptor; whereas, conversely, people with the most active forms of the D4 dopamine receptor are likely to believe in miracles and to be skeptical of science (link).

● Atheistic materialism – a Francis Collins term, a physical chemist and Obama administration head of US science funding (NIH); referring to someone who believes in the conclusions of modern science and does not believe in god.

> "As believers, you are right to hold fast to the concept of God as Creator; you are right to hold fast to the truths of the Bible; you are right to hold fast to the conclusions that science offers no answers to the most pressing questions of human existence; and you are right to hold fast to the certainty that claims of atheistic materialism must be steadfastly resisted." [7]

● Deistic materialism – a Francis Collins term; referring to someone who believes in (a) a universe comprised of matter and energy operated according to the laws of science but also (b) a universe created by a deity, 13.7 billion years ago, using "precisely tuned" parameters, of which evolution is a part, but one in which moral law exists, in which humans have a knowledge of good and evil, a free will to choose between these two distinctions, and an immortal soul.

● Scientific materialism – supposedly represented by people like Richard Dawkins and Daniel Dennett (link).

● Eliminative materialism – a view that topics, terms, and theories which do not have a material explanation will eventually be eliminated from the corpus modern science.

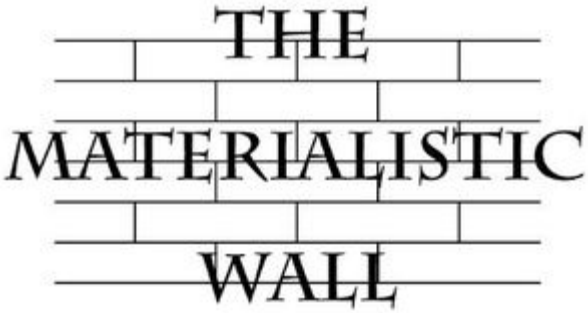

A 2002 depiction of the so-called "materialistic wall" by religious writer Bud Carroll, which, supposedly, blocks out notions of purpose, significance, and reason for one's existence. [8]

Dualism

The opposite view to the materialism view, supposedly, is dualism, that the mind and body are somehow distinct, Rene Descartes said to be representative of this latter school of thought. [5]

History

The essence of the materialistic theory likely originated in the circa 450BC works of Greek philosophers Leucippus, and his atomic theory, and Empedocles and his standard model of physics. Other dominant materialists are said to include: Thomas Hobbes, John Locke, and Isaac Newton. [5]

The publication of German philosopher-physician Ludwig Buchner's 1855 *Matter and Force* (*Kraft and Stoff*), is said to be the champion of 'scientific materialism', in which he states that those who talk of a creative power producing the world out of nothing are ignorant. [6]

In 1865, German philosopher and sociologist Friedrich Lange (1828-1875) wrote a *History of Materialism*, which was influential to those including: John Tyndall and Friedrich Nietzsche; wherein Lange speaks, among other things, of Francis Bacon's high appreciation of Democritus and his atomic theory, Buchner's "extreme materialism", among others. [9]

American physicist Richard Feynman gives a good overview of the materialistic philosophy when he argued in 1985 that all of existence, aside from gravitational phenomena and radioactivity, can be explained by the theory of light and matter (or photons and electrons) otherwise known as quantum electrodynamics. In his own words: [2]

> "I would like to again impress you with the vast range of phenomena that the theory of quantum electrodynamics describes: It's easier to say it backwards: the theory describes *all* the phenomena of the physical world except the gravitational effect, the thing that holds you in your seats, and radioactive phenomena, which involve nuclei shifting in their energy levels. So if we leave out gravity and radioactivity, what have we got left? Gasoline burning in automobiles, foam and bubbles, the hardness of salt or copper, the stiffness of steel. In fact, biologists are trying to interpret as much as they can about life in terms of chemistry, and as I have already explained, the theory behind chemistry is quantum electrodynamics."

In other words, Feynman believes that the theory of life and biology, the study of life, will eventually be reduced to the pure materialistic views of chemistry, which in turn can be explained in terms of the pure materialistic views of physics or of quantum electrodynamics, and thermodynamics.

Eliminative materialism

The extreme version of materialism is called "eliminative materialism", originating in the 1970s, which holds that all non-material based theories, such as will (or free will), consciousness, biology, life, folk psychology, terms such as love, hate, and desire, etc., will eventually be eliminated from science once the

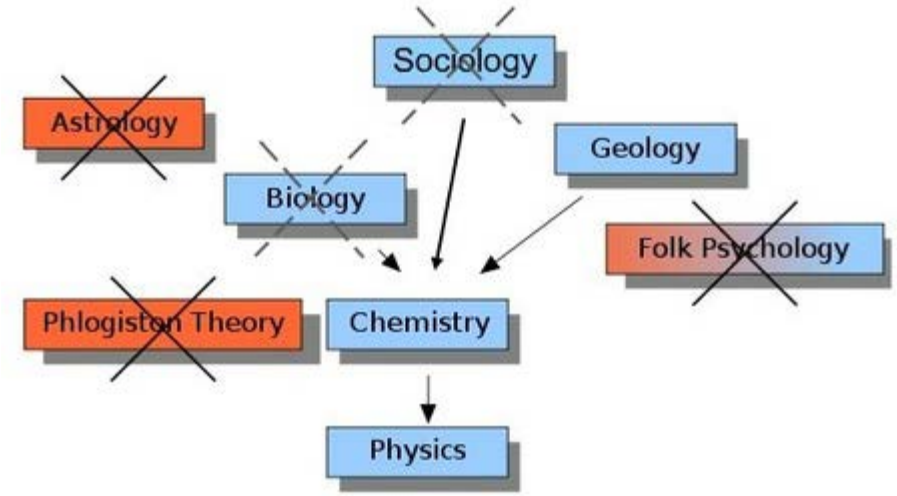

Schematic diagram of **eliminative materialism**, a type of extreme materialism which suggest that some sciences can be reduced (blue); that those theories which are in principle irreducible will eventually be eliminated (orange); and some of the so-called "soft sciences" (hatched crossouts) are in the process of being reduced to "hard sciences" of chemistry and physics. [3]

subject is reduced to its essential material physics, in the way phlogiston theory was eliminated from chemistry, impetus was discarded with the rise of Newtonian physics, or the way the flat earth theory has been eliminated from geology. [3]

An example of an objector to material reduction is English moral philosopher Mary Midgley who argues that suggests that the reduction of chemistry to physics is problematic and the reduction of biology to chemistry is impossible. She points to sentences like "John was allowed home from prison at last on Sunday" suggesting that this would be impossible to reduce to physical terms since the details of the physical movement are irrelevant to the meaning which depends on complex non-physical concepts. Her stance is that "human beings are complex wholes, about which we know really very little" and that attempts to reduce this are naive, unjustified and doomed to failure. [4]

Quotes

The following are related quotes:

> "Empedocles cannot be described as a '**materialist**', because with him force and matter are still fundamentally separate."
>
> — Friedrich Lange (1875), *The History of Materialism, Volume One* (pg. 33)

See also

- Materialistic morality
- Physicalism

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Further reading

● Lilly, William S. (1886). "Materialism and Morality" (txt), *The Fortnightly Review*, Vol. XLVI ; in: *The Popular Science Monthly*, pgs. 474-##.

Videos

● Churchland, Patricia. (2009). "On Eliminative Materialism" (O), LennyBound, Jul 29.

External links

● Materialism – Wikipedia.
● Cultural materialism (anthropology) – Wikipedia.

θΔics

In hmolscience, **materialistic morality** refers to definitions or notions of right and wrong, i.e. "morality", based on the materialism or a materialistic belief system.

Overview

In 1880, George Gore, in his chapter "The Scientific Basis of Mental and Moral Progress", outlined some terse notes on scientific based morality; this he later expanded into several books, which by 1902 was being classified as "materialistic morality". [1]

Quotes

The following are related quotes:

> "Our experience hitherto seems to teach us that all '**materialistic morality**', pure as it may otherwise be, operates especially in periods of transformation and transition, as a powerful solvent, while all great and decisive revolutions and reforms first break out in the shape of new ethical ideas."
>
> — Friedrich Lange (1875), *The History of Materialism, Volume One* [2]

Materialistic Morality

The most serious and simple attempt which we have seen lately to evolve an ethical code out of pure science, is made in the article in The Westminster Review for April, by Dr. G. Gore, entitled "The Coming Scientific Morality." In order to find a basis for morals the author thinks it is only necessary to find something that is true. So he concludes, "As all material phenomena, manifestly those of astronomy and physics, constitute a perfect and orderly system, a correct verbal representation of them must be a perfect system of truth; and as universal causation and motion present a similar system, I venture to say that they are a safer foundation of morality than any unprovable statements can possibly be; they are also more reliable guides of conduct than instinct or feeling alone." That is to say, the undoubted truth that the perpendicular from the centre of gravity of any object falling outside of the base causes it to turn over, is a better basis for determining duties to parents than the feeling of love we have for them!

A 1902 review of George Gore's "**materialistic morality**", which defines morals based on truth, as determined scientifically, i.e. as based on evidence, and the experimental method. [1]

See also

- Atheistic morality
- Physico-chemical morality
- Goethean morality
- Scientific morality
- Utilitarian morality

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θΔics

In science, **maternal imagination theory**, or "imagination theory", is a physiology of reproduction theory which holds that whoever a woman (or in some versions the man) is thinking of at the time of conception those traits will be passed to the offspring.

A depiction of the maternal-paternal "visual" imagination theory as found in the Bible. [7]

History

The maternal imagination theory was originated by Empedocles:

> "Empedocles says that fetuses are shaped by what the woman visualizes around the time of the conception. For often women have fallen in love with statues and paintings and have produced offspring which resemble."
>
> — Aetius (c.90AD), Fragment 5.12.2 (Dox. Gr. 423) [8]

The theory was prevalent, thereafter, in the time of the ancient Greeks and Romans. [6]

An animal spots and stripes maternal-paternal visual imagination theory is found in the Bible, Genesis 30:37-42, as shown adjacent. [7]

The semi-modern version of theory of effect of maternal imagination upon fetus formation was proposed by Dutch physician Levinus Lemnius (1505-1568); the best known version of which is as follows: [1]

> "If a woman, at the time of her conception, think of another man present or absent, the child will be like him."

English psychologist Robert Burton (1577-1640), in his 1621 *The Anatomy of Melancholy*, quoting the above, elaborated further Lemnius' theory, in respect to unhealthy imagination upon conception. [2]

French mathematician-physicist, philosopher, and evolutionist Pierre Maupertuis (1698-1758) devoted a section in his 1745 *Venus Physics* to the possible effects of maternal imagination upon the fetus, wherein he included atomic theory and affinity chemistry logic reasoning. [3]

French mathematician and natural philosopher Buffon (1707-1788), agreeing with his Maupertuis, devoted a long chapter to the subject of maternal imagination on the fetus in *Natural History*. [3]

In 1788, Benjamin Bablot (1754-1802) published *Essay on the Power of Imagination of Pregnant Women*, in which he defended Burton and seventeenth-century theorists, but also invoked Franz Mesmer (1734-1815) and his theory of hypnotic influence to support his arguments. [5]

English physician Erasmus Darwin (1731-1802), in the generation chapter of his 1796 *Zoonomia*, discussed male and female imagination. [3]

Elective Affinities

In German polyintellect Johann Goethe's 1809 *Elective Affinities*, the two main characters Charlotte and Eduard, in P1:C11, engage in a mental double adultery while making love, Charlotte thinking about the Captain, Eduard thinking about Ottilie, and nine months later Charlotte bears a son, Otto, who has Ottilie's dark eyes and the Captain's facial features. [4]

American literature scholar Hermione de Almeida states that Goethe got the theory from Burton. [3]

It would seem more likely, however, that Goethe based his reasoning of the theory on Maupertuis (or Buffon), who employed chemical affinity theory in his version of the theory, to the effect that molecules of matter were endowed with intelligence, desire, aversion and memory in primitive form, having sympathy with the organism, to the effect that an extensive connection between the fetus and mother existed. Goethe may have gleaned the male/female imagination aspect from Darwin and may have gleaned Mesmer theory from Bablot, as he does use magnetic headache remedy in the novella.

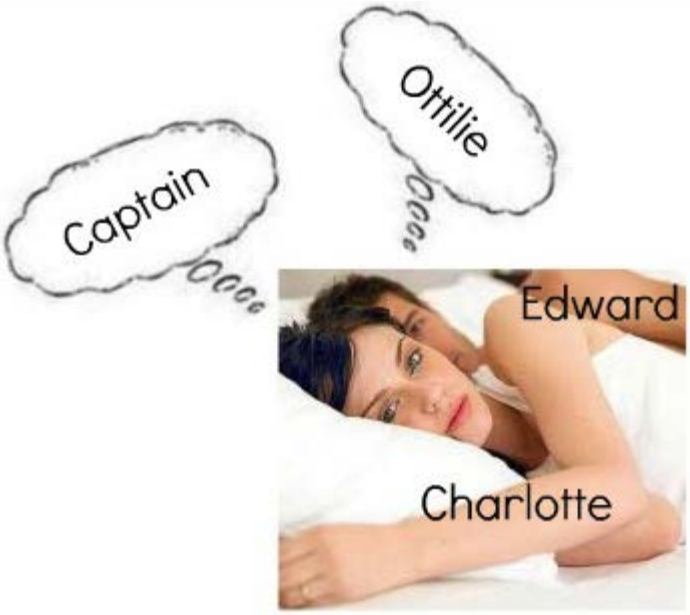

A rendition of the double mental adultery, of the **maternal imagination theory**, that occurs in German polyintellect Johann Goethe's 1809 *Elective Affinities*, wherein the two main characters Charlotte and Eduard, in P1:C11, make love, Charlotte thinking about the Captain, Eduard thinking about Ottilie, and nine months later Charlotte bears a son who has Ottilie's dark eyes and the Captain's facial features. [4]

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θΔics

In hmolscience, **mathematical economics**, in regards to physical science based economics, is a term that tends to refer to the early 20th-century extension of the Lausanne school of physical economics, particularly the work of Vilfredo Pareto (1897-1912), into the American economic school, with the slight incorporation, assimilation, and upgrade of the chemical thermodynamics work of Willard Gibbs, particularly via Gibbs' student American polymath Edwin Wilson, who taught a physical chemistry based "mathematical economics" at Harvard for some years, and, in turn, his student economist Paul Samuelson, in the form of what can be classified as mathematical thermodynamics applied to economic theory, or "mathematical isomorphisms" as Samuelson seemed to refer to his subject.

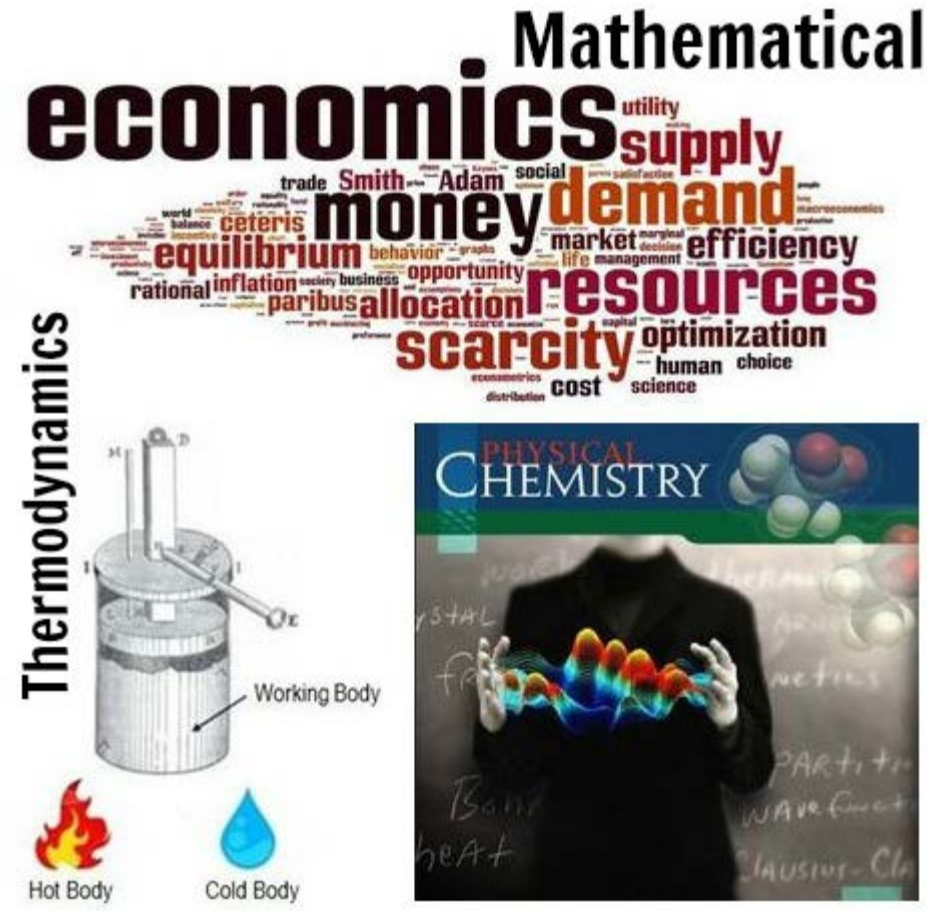

A depiction of American polymath Edwin Wilson's steam engine and physical chemistry based course on "**mathematical economics**" taught at Harvard.

Early history

The earliest efforts to outline a history of "mathematical economics" dates to Stanley Jevons' 1879 "List of Mathematico-Economic Books, Memoirs, and Other Published Writings". This was followed by Irving Fisher, who updated and revised Jevon's list, publishing it in the appendix of his 1892 doctoral dissertation, entitled "Bibliography of Mathematical Economics". (Ñº)

Wilson | Physicochemical economics

In 1912, American polymath Edwin Wilson, the last protégé of Willard Gibbs, was dissecting the rational mechanics based socio-economics work of Vilfredo Pareto, supposedly with a Willard Gibbs's chemical thermodynamics like approach in mind. [1] Sometime thereafter, he began teaching some type of steam engine/thermodynamics based course on economics, wherein equilibrium was defined to economics students the way it was being defined to physical chemistry students.

In 1932, Wilson participated in Lawrence Henderson's Gibbs-Pareto based Pareto seminar (1932-38), i.e. Harvard Pareto circle.

In 1934, Wilson discussed the teaching of "mathematical economics" a thermodynamics/steam engine based course in economics with Harvard economics chairman Harold Burbank, about his past teaching outlines and or upgraded teaching proposals, per influence of the Pareto seminar and Henderson. [3]

In 1935-38, Wilson was one of the guest lecturers in Henderson's Gibbs-Pareto based Sociology 23 course.

In 1938, e.g. Wilson communicated the following to Burbank in letter:

> "Schumpeter has suggested that it would be particularly well for me to give as I gave last time a general theory of equilibrium such as this is understood by physical chemists including the phase [see: social phase] systems of Willard Gibbs. Most of our equilibrium theory in economics really has for its background the

> notions of equilibrium which arise in mechanics. Although Pareto was certainly quite familiar with the types of equilibrium which arise in physical chemistry and are necessary in fact for the study of the steam engine he doesn't use this line of thought in economics."

This so-called "physicochemical economics" course, as is classified in modern terms, e.g. compare: physicochemical sociology, or "mathematical economics", as Wilson seemed to refer to it, according to Roy Weintraub (1991), was taken by American economist Paul Samuelson. [3]

In 1938, to exemplify, Wilson wrote the following to Samuelson, in commentary on one of Samuelson's papers:

> "Moreover, general as the treatment is I think that there is the possibility that it is not so general in some respects as Willard Gibbs would have desired. [In] discussing equilibrium and displacements from one position of equilibrium to another position [Gibbs] laid great stress on the fact that one had to remain within the limits of stability. Now if one wishes to postulate the derivatives including the second derivatives in an absolutely definite quadratic form one doesn't need to talk about the limits of stability because the definiteness of the quadratic form means that one has stability. I wonder whether you can't make it clearer or can't come nearer following the general line of ideas [that] Gibbs has given in his *Equilibrium of Heterogeneous Substances*, equation 133."

The very impressive mention of "equation 133", from Gibbs' subsection "Internal Stability of Homogeneous Fluids as indicated by Fundamental Equations", is the following:

$$U - TS + PV - M_1 m_1 - M_2 m_2 ... - M_n m_n$$

Wilson, in other words, is suggesting, as it seems to be, to Samuelson that he use the Gibbs fundamental equation to formulate a theory of economic stability.

Nine years later, in 1947, Samuelson, taking Wilson's advice, used some of this logic, in outline (e.g. Le Chatelier's principle), to pen his magnum opus *Foundations of Economic Analysis*, which invariably put economics into a new form of a more rigorous, semi-physical science conceptualized or analogized, mathematics-based science; see: Harvard Pareto circle (section: Wilson | Schumpeter | Samuelson) for more on this.

Quotes

The following are related quotes:

> **"...** struck by a remark made by an old teacher of mine at Harvard, Edwin Wilson. Wilson was the last student of J. Willard Gibbs at Yale and had worked creatively in **...** had become interested early in the work of Pareto and gave lectures in **mathematical economics** at Harvard **…"**
>
> — Paul Samuelson (1970), "Maximum Principles in Analytical Economics" [3]

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θΔics

In famous publications, "**Mathematical Introduction**: on Mechanical Work, on Energy, and on the Treatment of Non-Integrable Differential Equations" is the opening twenty-page chapter to German physicist Rudolf Clausius' 1875 textbook *The Mechanical Theory of Heat* in which a number of key thermodynamics principles are introduced, namely: work (or mechanical work), the Cartesian system, energy of a body, and the criterion for an exact differential. The famous opening paragraph reads as follows: [1]

> "Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, work is performed."

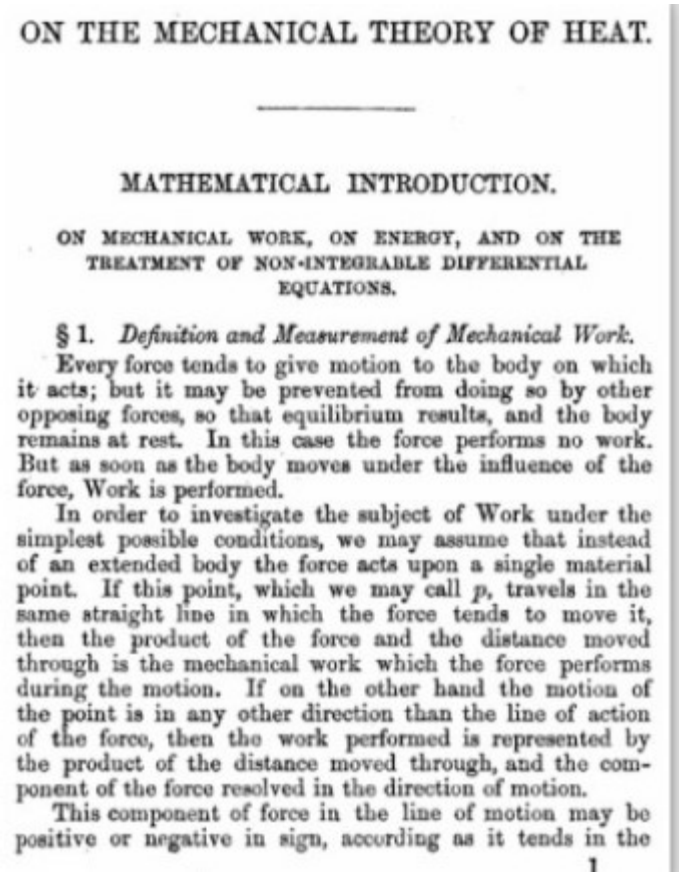

ON THE MECHANICAL THEORY OF HEAT.

MATHEMATICAL INTRODUCTION.

ON MECHANICAL WORK, ON ENERGY, AND ON THE TREATMENT OF NON-INTEGRABLE DIFFERENTIAL EQUATIONS.

§ 1. *Definition and Measurement of Mechanical Work.*

Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, Work is performed.

In order to investigate the subject of Work under the simplest possible conditions, we may assume that instead of an extended body the force acts upon a single material point. If this point, which we may call *p*, travels in the same straight line in which the force tends to move it, then the product of the force and the distance moved through is the mechanical work which the force performs during the motion. If on the other hand the motion of the point is in any other direction than the line of action of the force, then the work performed is represented by the product of the distance moved through, and the component of the force resolved in the direction of motion.

This component of force in the line of motion may be positive or negative in sign, according as it tends in the

1

Opening page to Rudolf Clausius' 1875 **Mathematical Introduction** chapter.

The mathematical introduction originated in the 1858 article "On the Treatment of Differential Equations which are Not Directly Integrable" published in Dingler's *Polytechnisches Journal*, which was then expanded on as the introduction section to the first (1865) and second (1875) editions of *The Mechanical Theory of Heat*. [2] A good part of the derivation seems to be based on French physicist Gustave Coriolis' 1829 textbook *Calculation of the Effect of Machines*, although Coriolis is not explicitly mentioned. The classic 1875 edition of the mathematical introduction is divided into nine section, as discussed below

I.1 Definition and Measurement of Mechanical Work

In this section, Clausius introduces the basics of French physicist Gustave Coriolis' 1829 principle of the transmission of work (although he dosen't site Coriolis), in that whenever a body moves under the influence of a force, work is performed, and that this movement can be quantified as a product of the line of motion of the particle and the component of the force in the direction of motion.

I.2 Mathematical Determination of the Word Done by the Variable Components of the Force

In this section, Clausius introduces the basic differential work equation:

$$dW = S\,ds \quad (1)$$

where S is a component of the force (or F_S in modern notation) action on a material point through a differential length of space ds. He then explains that, to facilitate further calculations, it is expedient to resolve both the direction of movement and the direction of the force into a Cartesian coordinate system, whereby the differential of work, in the two-dimensional case, becomes a function of force in the x- and y-directions:

$$dW = X\,dx + Y\,dy \quad (3)$$

I.3 Integration of the Differential Equation for Word Done

Clausius here introduces the reader to the elusive importance of the "complete differential", whereby to be a complete

differential, the functions *X* and *Y* of the right hand side of any given two or more variable expression, such as the Cartesian expression for work, must satisfy the condition for an exact differential:

$$\frac{dX}{dy} = \frac{dY}{dx} \quad (4)$$

If the the condition of equation (4) is satisfied then, according to Clausius, the expression on the right of equation (3) becomes immediately integrable. This section is very important in that it sets the definition of the state variable.

I.4 Geometrical Interpretation of the Foregoing Results, and Observations on Partial differential Coefficients

(add)

I.5 Extension of the Above to Three Dimensions

(add)

I.6 On the Ergal

(add)

I.7 General Extension of the Foregoing

(add)

I.8 Relation between Work and Vis Viva

(add)

1.9 On Energy

Here, Clausius famous introduces readers to the definition of the energy (or internal energy, in a modern terms), symbol U, of the system:

$$U = T + J$$

where *T* is the vis viva of the system and *J* the ergal of the system.

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θΔics

In hmolscience, **mathematical isomorphism** is a reliable item-to-item correspondence between two or more fields which superficially may seem altogether dissimilar (Samuelson, c.1960). The fields are exhibited as more or less identical in their patterns of concepts and relations, while quite separate in their content and special techniques. This not-well-understood method of research, says John Q. Stewart (1953), in respect to social physics, cannot be employed until the subjects to be developed have at least partially examined the first, or standard, method of scientific research. [1]

See also

- Johannes Lisman

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(b) Barnes, Trevor J. and Wilson, Matthew W. (2014). "Big Data, Social Physics, and Spatial Analysis: the Early Years" (pre: pdf) (abs) (pdf), *Big Data & Society*, Apr-Jun:1-14.

External links

- Isomorphism – Wikipedia.

θΔics

In science, **mathematical sociology** is the study of way in which mathematics can be utilized in sociology.

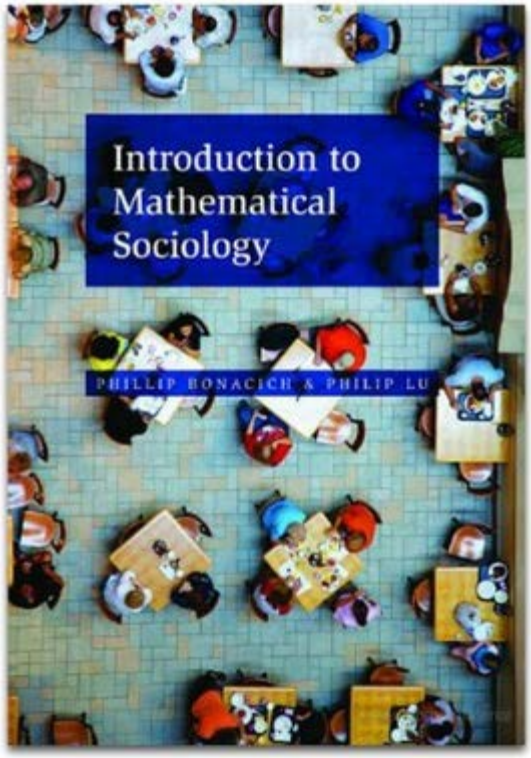

Phillip Bonacich and Philip Lu's 2012 *Introduction to Mathematical Sociology*, wherein they present standard topics, such as: weak ties, prisoner's dilemma, chaos, complexity, and small world networks. [3]

History

In 1964, American chemical engineer turned sociologist James Coleman published his *Introduction to Mathematical Sociology*, wherein he applies some cursory chemistry, physics, and thermodynamics models to the study of social phenomena. [1]

In 1996, Joshua Epstein and Robert Axtell published their *Growing Artificial Societies*, based on artificial life stylized computer simulations, which has some mathematical sociology citations. [4]

In 2012, Phillip Bonacich and Philip Lu published *Introduction to Mathematical Sociology*, wherein they present standard topics, such as: weak ties, prisoner's dilemma, chaos, complexity, small world networks, among a few others. [3]

In 2014, Richard Kilburg and Marc Donohue, in their "Leadership and Organization Behavior: a Thermodynamic Inquiry", attempt to platform off mathematical sociology, by stating that the field exists and uses statistical concepts similar to those of chemistry and molecular physics, via citation to Coleman (1964), Epstein and Axtell (1996), and Bonacich and Lu (2012). [2]

See also

â— Mathematical economics
â— Mathematical thermodynamics

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External links

â— Mathematical sociology – Wikipedia.

θΔics

In thermodynamics, **mathematical thermodynamics** is the study of the underlying mathematical structure of thermodynamics, in origin and application, or rather the mathematics of thermodynamics, in a general sense.

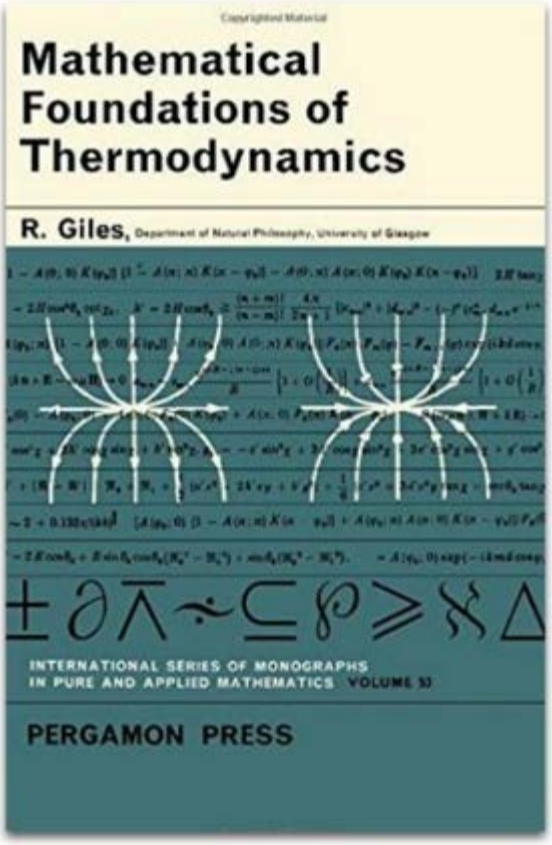

Irish physicist Robin Giles' 1964 *Mathematical Foundations of Thermodynamics*, giving a depiction of the basics of **mathematical thermodynamics**. [10]

Overview

The history of the subject of the teaching and study of the mathematical underpinnings of chemistry, physics, chemical physics, physical chemistry, and in particular chemical thermodynamics seems to have emerged in the mid to late 19th century, when the subject intricacy began to compound.

The first to publish in this subject was German physicist Rudolf Clausius and his 1858 article "On the Treatment of Differential Equations which are Not Directly Integrable", published in Dingler's *Polytechnics Journal*, an article that was later expanded into the formation of chapter one "Mathematical Introduction" to both the first and second edition of his thermodynamics textbook *The Mechanical Theory of Heat*. The essence of the need for this introduction was to show the nuts and bolts of the proof, called the "condition for an exact differential" (note: the mathematician behind this proof still needs to be tracked down), of what constitutes a state function, with specific focus on making a state function for an element of heat, the formulation of which became "entropy", an exact differential formulation of a quantity of heat. [1]

The first book devoted to the subject of the "higher mathematics" for students of chemistry and physics was the 1902 book *Higher Mathematics for Students of Chemistry and Physics* by English inorganic chemist Joseph Mellor who saw the need for the book in the eagerness of students to readily pursue research and work in the newly forming field of physical chemistry. [6] Mellor's book, however, according to the 1954 preface of the Dover edition by Donald Miller, is out-of-date to effect that:

> "The discussions of heat in the sections on thermodynamics do not emphasize the fact that δq is really an exact differential."

The next dominant higher mathematics publication was English physical chemist, chemical thermodynamicist, and chemistry historian James Partington's 1911 *Higher Mathematics for Chemical Students*. [7]

The two-volume 1943 *The Mathematics of Physics and Chemistry* by Henry Margenau and George Murphy, according to Donald Miller (1954), is said to be "excellent" and "considerably more advanced" than Mellor's *Higher Mathematics*.

In 1961, American chemists John Kirkwood and Irwin Oppenheim gave a decent six-page appendix on introductory mathematics in their chemical thermodynamics textbook. [4]

American physical chemist Howard Reiss, in his 1965 *Methods of Thermodynamics*, devotes chapter to what he calls "Mathematical Apparatus", in which he gives an introduction to topics such as the total differential, exact differential (or complete differential), real functions, function of state (or state function), Pfaff differential expression (Pfaffian form), integrating denominator, Caratheodory's theorem, transformation of variables, decomposition of a partial derivative, Euler's theorem on homogenous functions, and the Lagrange method of undetermined multipliers. [3]

In 1973, physicist-engineer Robert Hermann is said to have given a noted overview of the mathematics of thermodynamics, in what seems to be directed towards surface science applications. [5]

The 2001-2003 work of American physical chemist Robert Alberty on the use of the Legendre transforms for use in chemical thermodynamics is more recent summary of one aspect of mathematical thermodynamics. [9]

Euler reciprocity relation

See main: Euler reciprocity relation

(add)

Homogeneous functions

In circa 1750, Swiss mathematician Leonhard Euler introduced the concept of the homogeneous function, in his "theorem of homogeneous functions", which is said to be "of great use in thermodynamics". [4] Euler's theorem, supposedly, is what justifies or gives the mathematical form of the relation between extensive properties of a system and its internal variables.

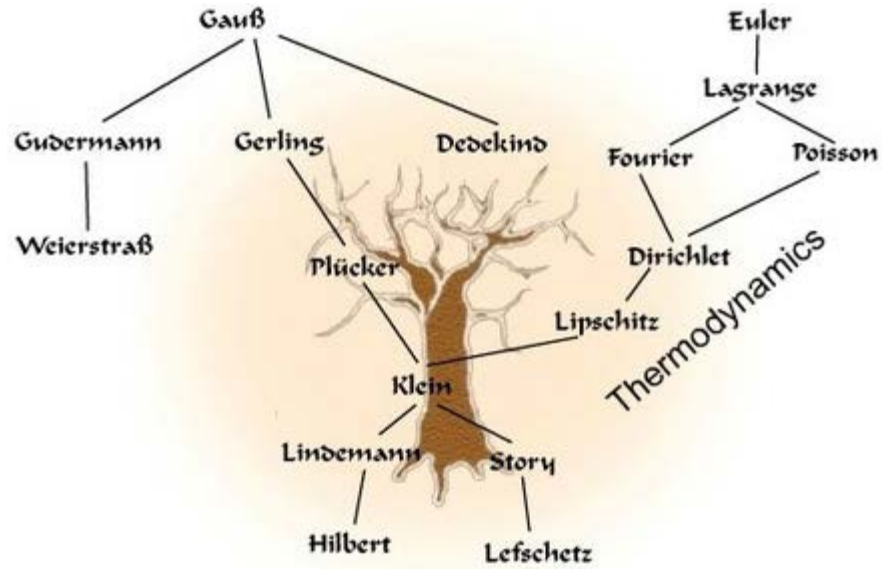

The **mathematics genealogy tree**, from Harry Coonce's Mathematics Genealogy Project, according to which the Bernoulli family, in particular "Bernoulli brothers" (promoters of Gottfried Leibniz's version of differential calculus; as opposed to Isaac Newton's), Jacob Bernoulli and Johann Bernoulli (father to Daniel Bernoulli), the latter mentor to Leonhard Euler, who in turn mentored Joseph Lagrange, who in turn sprouted Joseph Fourier and Simeon Poisson, a group which gave birth to French heat theory school (Ecole polytechnique), which in turn gave birth to the science of thermodynamics, in particular the use of Euler's reciprocity relation to formulate "entropy" (S), the new state function (dQ/T) of a quantity of heat, as done by Rudolf Clausius (1850-1865), is the mathematical heritage of thermodynamics.

Method of undetermined multipliers

In circa 1780s, Italian mathematician Joseph Lagrange introduced his so-called "method of undetermined multipliers", which seems to have something to do with thermodynamics.

Legendre transform

In circa 1790s, French mathematician Adrien-Marie Legendre introduced the so-called "Legendre transform", as it has come to be known.

Pfaff differential expression

In circa 1805, what as come to be called the "Pfaffian form" was introduced by German mathematician Johann Pfaff.

Inexact differential equations

In 1854, German physicist Rudolf Clausius introduced his theorem of the equivalence of transformations, in which he attempted to reformulate the relation between transformations of heat into work and work into heat in universal processes of volume expansion and contraction into what seems to have been a homogeneous function, of the Euler variety; although this is not specifically stated. This subject occupies a large part of mathematical thermodynamics, and seems to be the core of thermodynamics.

Clausius the followed this up with his 1858 article “On the Treatment of Differential Equations which are not Directly Integrable”, which became the opening thirteen page chapter to his 1865 *The Mechanical Theory of Heat*, which was expanded and reformatted into its final presentation in his second 1875 edition textbook, wherein the chapter became “Mathematical Introduction: on Mechanical Work, on Energy, and on the Treatment of Non-Integrable Differential Equations”, all centered around the justification as to why the integrating denominator of absolute temperature T makes or transforms the so-called inexact differential quantities of heat dQ or δQ into the so-called exact differential state function called entropy. [1]

Maxwell's relations

In circa 1871, Scottish mathematical physicist James Maxwell introduced his so-called reciprocity relations or

Maxwell's relations, as they have come to be known, which are frequently discussed in thermodynamics.

Caratheodory's theorem

In 1908, Greek mathematician Constantin Caratheodory published his famous “Studies in the Foundation of Thermodynamics”, a treatise on a proof that an integrating denominator must exist for the state function of heat, or of entropy, a publication which seems to be the first attempt to take a look at the underlying mathematics of thermodynamics. [2]

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External links

â— Mathematical and conceptual prerequisites of thermodynamics (2008) – PhysicsForums.com.
â— Mathematical thermodynamics (2002) – Pruffle.MIT.edu.

θΔics

In science, **mathematics** is the use of numbers, equations, graphical diagrams, and formula, to study and model both abstract and natural phenomenon.

The logarithm, and hence by implication the number 'e', was invented by Scottish mathematician John Napier as described in his 1614 book *A Description of Logarithm Tables*. [2] Napier's logarithms were developed to their fuller potential by Leonhard Euler, Rene Descartes, and Jacob Bernoulli.

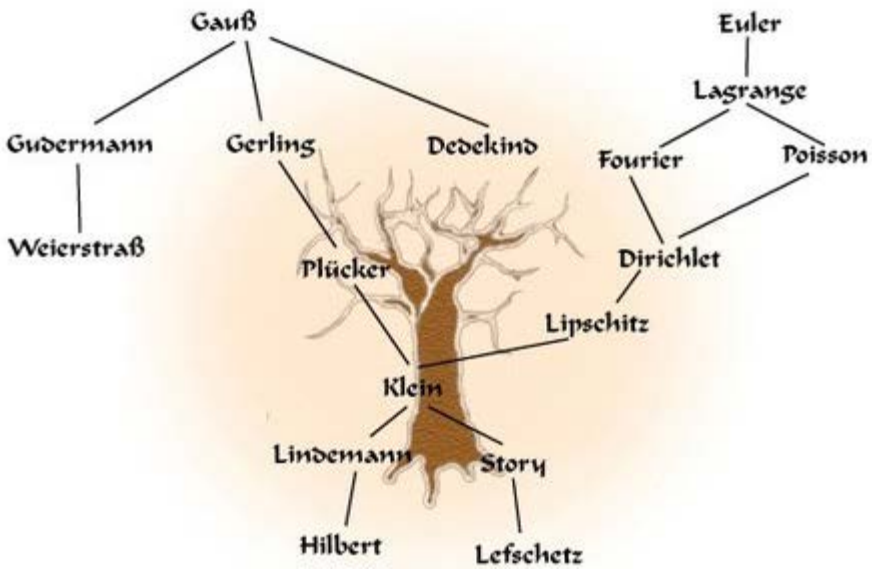

Diagram of the **mathematics genealogy tree** from the mathematics genealogy project, indicating that Swiss mathematician Johann Bernoulli and his doctoral students Daniel Bernoulli and Leonhard Euler and their factions (Joseph Lagrange, Pierre Laplace, Joseph Fourier, William Hamilton, Rudolf Clausius), is a dominant lineage of mathematics preliminaries of thermodynamics. [1]

Quotes

The following are related quotes:

> "At first, he who invented any '**art**' that went beyond the common perceptions of man, was naturally admired by men, not only because there was something useful in the inventions, but because he was thought wise and superior to the rest. But as more arts were invented, and some were directed to the necessities of life, others to its recreation, the inventors of the latter were always regarded as wiser than the inventors of the former, because there branches of knowledge did not aim at utility. Hence, when all such inventions were already established, the sciences which do not aim at giving pleasure or at the necessities of life, were discovered, and first in the places where men first began to have leisure. This is why the '**mathematical**' arts were founded in Egypt; for there the priestly caste was allowed to be at leisure."
>
> — Aristotle (c.350), *Metaphysics* (pg. 1553) [4]

> "Science is written in the language of mathematics and its characters are triangles, circles, and other geometric figures, without which it is humanly impossible to understand a single word of it; without these, one is wandering about in a dark labyrinth."
>
> — Galileo Galilei (1623) [3]

See also

â— Mathematical introduction
â— Mathematical thermodynamics

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External links

â— Mathematics – Wikipedia.

θΔics

In human mathematics, the **mathematics of love** refers to the subject of applying mathematical formalism, such as ordinary differential equations, to the question of love, falling in love, or being in love, etc., or attempts to derive mathematical equations of love.

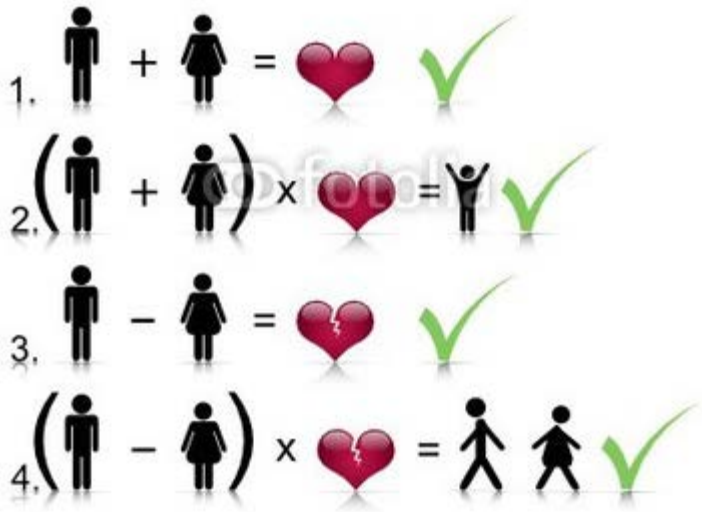

A humorous algebraic rendition of the **mathematics of love** by graphic designer Andrija Markovic. [6]

History

In 1988, American mathematician Steven Strogatz, in his article "Love Affairs and Differential Equations", discussed his unusual teaching approach to introducing students to the subject of systems of coupled ordinary differential equations, by formulating hypothetical differential equations to describe the love/hate ratio functions for the interactions between William Shakespeare's Romeo and Juliet. [1]

The 1994 experimental findings of American mathematical psychologist John Gottman on marriage stability, as captured in his famous Gottman stability ratio, i.e. that a 5/1 ratio of attraction-to-repulsion is what characterizes stable long term marriages, is sometimes referred to as the “mathematics of love”. In a 2004 interview, Gottman summarized his work as follows: [2]

> “We were able to derive a set of nonlinear difference equations for marital interaction as well as physiology and perception. These equations provided parameters, that allowed us to predict, with over 90 percent accuracy, what was going to happen to a relationship over a three-year period. The main advantage of the math modeling was that using these parameters, we are not only be able to predict, but now understand what people are doing when they affected one another. And through the equations we were now really able to build theory. That theory allows us to understand how to intervene and how to change things. And how to know what it is we're affecting, and why the interventions are effective. This is the **mathematics of love**.”

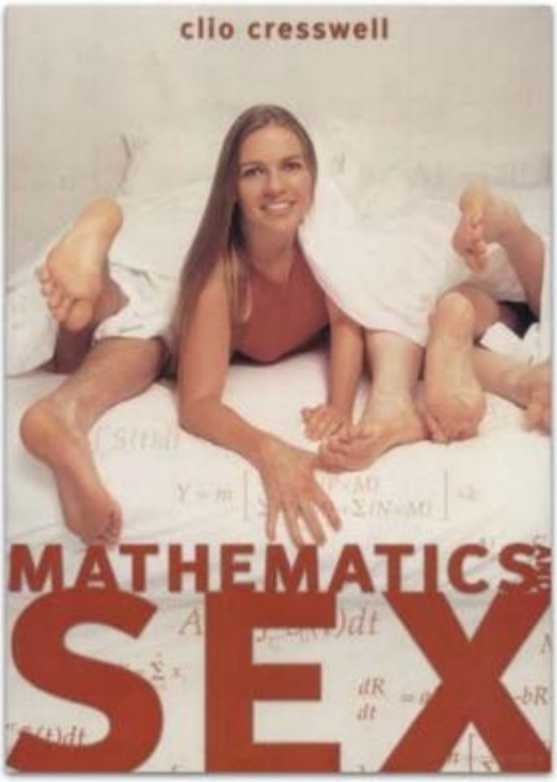

In 1998, Italian mathematician Sergio Rinaldi published his “Laura and Petrarch: an Intriguing Case of Cyclical Love Dynamics”, in which he employs three ordinary differential equations to model the dynamics of love between Petrarch, a celebrated 14th century Italian poet, and Laura, a beautiful by married lady. [7]

In 2001, inspired by the 1994 version of the “love model” of Strogatz (*Nonlinear Dynamics and Chaos*), American physicist Clint Sprott gave a 36-slide presentation entitled “Mathematical Models of Love and Happiness”, at the Chaos and Complex Systems Seminar, Madison, Wisconsin, wherein he expanded on the Romeo Juliet model of linear differential equation love. [3] Sprott followed this up with the 2004 article Dynamical Models of Love”. [8]

In the 2003 book *Mathematics and Sex*, mentioning the previous work of Strogatz and Rinaldi, Australian mathematician Clio Cresswell outlines the subject of what she calls “sexual mathematics”, which she says is similar to sexual chemistry, albeit with mathematical focus. [4]

In 2004, American engineer Charles Hansen wrote a chapter on the mathematics of love, wherein, building on work of Pitirim Sorokin and

The 2003 book *Mathematics and Sex* mathematician Clio Cresswell who outlines the **mathematics of love** and also a subject she calls "sexual mathematics". [4]

Talcott Parsons, among others, he attempts to outline a "vectors model" of human action. [5]

See also

- Thermodynamics of love
- Chemistry of love
- Physics of love

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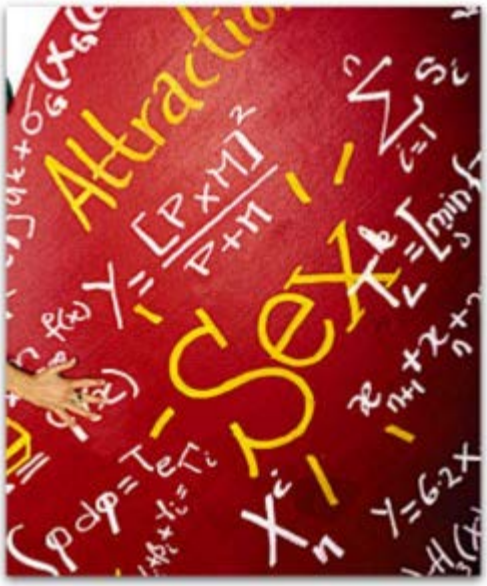

A 2009 artistic rendition of Australian mathematician Clio Cresswell's theory of the **mathematics of love/sex**, who claims singles can increase their chances of finding true love by rejecting at least 12 potential partners before settling down. [9]

Further reading

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External links

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θΔics

In science, **matter** is anything that has mass. [1] All matter is made up of atoms, which in turn are made up of elementary particles. Of the set of elementary particles, *fermions*, particles with 1/2 integer spin, are considered as the "matter" portion of the universe, whereas *bosons*, particles with integer spin, are considered as the "energy" portion of the universe. [2] In thermodynamics, whenever matter crosses the boundary of a system, its effect on the system is quantified by how it changes the internal energy of the system, generally measured by changes in chemical potential. [3]

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3. Daintith, John. (2004). *Oxford Dictionary of Chemistry* (pg. 125). New York: Oxford University Press.

External links

â— Matter – Wikipedia.

θΔics

In philosophy, **matter and motion** refers to a mechanical philosophy in which all phenomena is reduced to matter *in* motion and collisions between particles; developed largely by Isaac Beeckman and Rene Descartes in the early 17th century.

Overview

In c.1625, Isaac Beeckman, a Dutch philosopher and scientist, student supposedly of Snellius and Simon Stevin, teacher to Johan de Witt and Rene Descartes, developed a view of the world in which everything, from the motion of the heavens to musical harmonies, is explained by reducing it to matter in motion. [1] Beeckman ideas, supposedly, influenced Descartes and Pierre Gassendi.

Quotes

The following are related quotes:

> "Give me **matter and motion**, and out of them I will build the universe."
>
> — Rene Descartes (c.1630), *Publication* (Ñº); cited by Ludwig Buchner (1855) in *Force and Matter* (pg. 64)

> "Most seventeenth-century scientists accepted Descartes 'mechanical philosophy', in which the universe was composed of **matter and motion**, and all natural philosophy could be explained by the collisions between particles."
>
> — Stephen Inwood (2002), *The Man Who Knew Too Much* (pg. 15) [2]

> "Hooke, along with Boyle and Wren and many of his contemporaries, accepted the proposition advanced in Descartes's *Principles of Philosophy* (1644) that the universe was composed of minute particles in a state of constant motion and arranged (by the hand of god) into perfect mechanical forms."
>
> — Stephen Inwood (2002), *The Man Who Knew Too Much* (pg. 63)

References

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Further reading

â— Maxwell, James. (1876). *Matter and Motion*. Publisher.

θΔics

In science, **matter-energy** is an ill-defined term, referring to a matter-converting-into-energy type of quantity, according to the mass-energy equivalency relation, $E = mc^2$, e.g. as occurs in a nuclear reaction; often employed as a laymanized science way as a crude "conceptual portmanteau" of the conservation of mass and the conservation of energy (e.g. conservation of matter-energy).

Overview

In 1978, American psychologist James Miller gives one example of its use: [1]

> "Most concrete systems have boundaries which are at least partially permeable, permitting sizable magnitudes of at least certain sorts of **matter-energy** or information transmissions to cross them … such a system is an open system."

The term "matter-energy" can also allude to the logic of a piece of matter, such as coal, producing energy, such as heat, through a combustion reaction. The following 1989 quote by American economist Jeremy Rifkin gives an example of the term used in this manner: [2]

> "[a point in time in which] the particular **matter-energy** base that a society is using becomes depleted, as a result of natural forces at work or as a result of people consuming resources faster than nature can reproduce them."

Some publications even use the phrase the "law of conservation of matter/energy"; thus negating a prolonged discussion on the actuality of two separate laws: the law of conservation of energy, and the conservation of mass.

In 1990, American sociologist Kenneth Bailey, amid his Shannon bandwagon social entropy theory,, mixed together the idea of "matter-energy", with Ludwig Bertalanffy's general systems theory, and mis-defined thermodynamics terms, to state that "since Einstein, matter-energy can be hyphenated, and only one type of closed system need be designated: [one] closed against transfers of matter-energy across its boundaries." [3] In the correct thermodynamic sense, a system can have only one boundary and "closed" means that energy can pass, but not matter.

Difficulties on term

The term "matter-energy" tends to be used a metaphorical type of quantity by those who are looking only for generalizations. The rigor of the term looses value when the details of any particular transformation are broken down thermodynamically or via particle physics.

References

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2. Rifkin, Jeremy. (1989). *Entropy: Into the Greenhouse World* (revised edition) (pgs. 293-94). New York: Bantam.
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θΔics

In religio-mythology, **Matthew**, from the Egyptian Maat or Mati (scribe of Maat), i.e. the principle (or goddess) of truth, justice, law, and rightfulness, is the name of the first book (followed by Mark, Luke, and John) of the New Testament, of the Christian Bible, i.e. "Gospel of Matthew", which tells the story of how the messiah, i.e. Jesus (aka Horus), rejected by Israel, finally sends the disciples to preach the gospel to the whole world.

Overview

In 1907, Gerald Massey, in his *Ancient Egypt, the Light of the Modern World, Volume Two*, summarized how he decoded the name "Matthew" from his reading of Egyptologist Samuel Birch's mention of the word 'Mati' (or Maat) as the title of the divine scribe (Taht-Aan) of the Egyptians, as follows: [1]

> "Also, the Gospel of the Egyptians, represented by the Ritual, was the Gospel according to Mati (or Matiu, with the U, inherent). And as Mati was inculcated by means of the sayings, the sayings in the Ritual are the sayings of Mati as the words of truth, justice, law, and rightfulness, and the revelation of the resurrection. In Samuel Birch's translation of "the funeral Ritual " he has given the **word " Mati "** as a title of Taht-Aan the divine scribe ; and **from this title the present writer deduced the names of Matthias and Matthew**, as the true reckoner, the just reckoner, and keeper of the tablets for Maati in the hall of Maat. Taht-Aan might be designated Mati. But, whether we take the word Mati as a proper name or title of the scribe Taht (whether called Hermes, Aan or Mali), he was the recorder of the sayings or Logia Kuriaka in the Ritual.
>
> But even if we do not take the name of Mati to be a title of Tehuti, whence the names of Matthias and Matthew, the character remains. Taht was the scribe in the Maat or judgment-hall, also the recorder of the sayings that were given by the Father in Heaven to be uttered by Horns, and written down by the fingers of Taht. Now, according to the often-quoted testimony of Papias, recorded in his last "commentary" on the "sayings of the Lord," the basis of the canonical Gospels was laid in a collection of sayings that were attributed to "The Lord." He tells us that Matthew wrote the sayings in the Hebrew dialect, and every one interpreted them as best he was able. This was the current hearsay on the subject as reported by Papias, Bishop of Hierapolis. And here we might repeat, in passing, that the sayings of Horns the lord in the Ritual were collected and written down by Taht-Mati the scribe, and that Matthew, or Matthias, corresponds to Mati both in character and by name.
>
> We have no further use for the statement beyond noting that the extant Gospel of Matthew was evidently founded on a collection of those "wise sayings, dark sentences and parables" that constituted the wisdom of the Egypto-gnostic Jesus, one late version of which has been preserved in the Book of Ecclesiasticus, entitled "the wisdom of Jesus." The present writer has previously suggested that the "sayings" collected by Matthew, which Papias had heard of as the source of the Christian Gospels, were a form of the **sayings of Mati** collected from the papyri of the Ritual.
>
> The Catholic Christians were sorely troubled about the Egypto-gnostic Gospels in possession of the "heretics" when they came to hear of them. These are especially associated with the name of Valentinus, an Egyptian gnostic, who came with these Egypto-gnostic Gospels from Alexandria, and to whom Pistis Sophia and the "Gospel of Truth" have been attributed. The "Gospel of Truth," known to the Valentinian gnostics as Egyptian, is the Gospel of Mati, or a collection of the sayings of **Mati = Matthew**. The Logia of Matthias was the authentic gospel of the Carpocratean gnostics. Clement of Alexandria quotes from the "Traditions of Matthias" two sayings which are not to be found in the canonical Matthew. This proves the existence of other sayings, oracles and divine words than the canonical in the time of Clement, which were assigned to **Matthias = Mati**. These sayings and traditions were acknowledged as genuine by the gnostic followers of Carpocrates, Valentinus and Basilides, who never did acknowledge any historical founder, and whose Christ was the Egypt-gnostic Jesus—he who was the utterer of the sayings and traditions first written down by the divine scribe Taht-Aan = John ; or **Taht-Mati = Matthew**.
>
> In writing his Gospel, Basilides appealed to a secret tradition which he had received front Matthias; and Hippolytus reports that this secret tradition was derived by Matthias during his private intercourse with the

savior. But the gnostics never did acknowledge any historic savior. Their Christ was Horus, or the non-historical Jesus, and therefore the private intercourse of Matthias with the Savior was that of Mati with Horus the Christ of the Ritual which contains the history of that intercourse. We are told that it was after his Resurrection that Christ revealed the true gnosis to Peter, John and James. (Clem. Alex. Eusebius, H. E. 2, O. But it was only the spiritual Horus or Christ that could reveal the true gnosis, which is here admitted versus the historic personage. This revelation is post-resurrectional, the same as with the gnostic Jesus in the Patio Sophia who expounds the mysteries to his twelve apostles on Mount Olivet after he has risen from the dead. The " Manifestation of Truth" is the title of the great work of Marcus the gnostic in the third century. The lost work of Celsus was the Word of Truth or Logos Alethea. In these instances the gospel is that of truth, the word of truth ; the true gospel. And the **gospel of Mati, we repeat, is equivalent to the gospel or the sayings according to Matthew** which had been heard of by Papias as the nuclei of the canonical Gospels."

(add)

Quotes

The following are related quotes:

"The **word Ma** for justice also signifies the law. And he who reveals and makes justice visible is the Horus who not only fulfills the word by making it truth, but who also comes to fulfill the law, or maat. This is the character assigned to the Jesus of the Gospels, who says, "Think not I came to destroy the law. I came not to destroy but to fulfil. Verily I say unto you, till heaven and earth pass away, one jot or one tittle shall in no wise pass away from the law till all things be accomplished" (Matthew: 17, 18). This law is the maat of the Ritual. And in the Gospel the speaker assumes the position of Har-tema, who was the fulfiller of justice or the law."

— Gerald Massey (1907), *Ancient Egypt, the Light of the Modern World, Volume Two* (Ñº)

References

1. Massey, Gerald. (1907). *Ancient Egypt: The Light of the World: a Work of Reclamation and Restitution in Twelve Books, Volume Two* (pgs. 903-04). T. Fisher Unwin.

External links

â— Gospel of Matthew – Wikipedia.

θΔics

In hmolscience, **Matthew Bell** (c.1963-) is an English German literature and Goethean scholar, an EA | IAD scholar (Q), noted for his 2014 “In Retrospect: Elective Affinities”, wherein he digresses on Goethe's famous 1809 so-labeled "haunting" chemical romance, as described in his *Elective Affinities*.

Overview

In 2014, Bell, in his “In Retrospect: Elective Affinities”, published in *Nature*, the famous science journal whose debut article was Thomas Huxley’s choice of the reprint of Goethe’s poem “On Nature”, digressed on the human chemical theory of Goethe’s *Elective Affinities*, the opening page of which is as follows: [1]

Elective Affinities (Die Wahlverwandtschaften)
JOHANN WOLFGANG VON GOETHE
J. G. Cotta: 1809.

— where Goethe felt they must be. A reappraisal of Goethe’s science reminds us how key advances emerged outside the mechanical tradition of Descartes and Newton.

Goethe began his scientific studies in the late eighteenth century. Biology was largely an observational science, dependent on skill and patience; Goethe’s notebooks are full of meticulous descriptions of plants, mammals and insects. He raised theoretical questions about the nature and origins of life and the development of species, for which the mechanical model had no plausible answers. Resisting the urge to jump to conclusions, Goethe focused on amassing data and seeking patterns. He painstakingly documented the relations between parts of organisms and the similarities between species. From observations of hundreds of skeletons, he developed an influential model of mammal anatomy. In seeking a principle underlying organic nature, he is seen as a founder of modern biology; Charles Darwin mentioned him in the ‘historical sketch’ in the 1860 second edition of *On the Origin of Species*.

Elective Affinities weaves together many of these strands. The title comes from the work of Swedish chemist Torbern Bergman, who devised the eighteenth century’s most accurate chart of what was likely to bind with what — a forerunner of the periodic table. Bergman’s theory of ‘elective affinities’ seems to describe the shifting relationships of the protagonists, Eduard, Charlotte, Ottilie and the Captain. In this sense, the novel can be read as an exercise in reductionism: like ele-

The protagonists of Goethe's science novel compare their changing attractions to chemical bonding,

IN RETROSPECT

Elective Affinities

Matthew Bell reassesses German polymath Goethe's haunting 'chemical romance'.

In 1809, German national poet and polymath Johann Wolfgang von Goethe provoked outrage with his novel *Elective Affinities* (*Die Wahlverwandtschaften*). Many readers were horrified by its almost playful treatment of adultery, which still carries a charge. But what makes it worthy of reappraisal is how it puts science at the centre of human concerns — and humans at the centre of science. Goethe emphasized the primacy of human perception in understanding nature as a holistic entity, in contrast to the quantitative methods and mechanical Universe of the Enlightenment era.

Today, the basic phenomena of biology and physics have been described, and the complexity of the Universe and the human brain are testing reductionism. Multiple perspectives and big data are needed to crack the challenges of energy, food and population. People are at the centre of research

Johann Wolfgang von Goethe.

ments, the characters seem to have no choice but to make new bonds when a reagent is introduced. Even their names reinforce this. Both Eduard and the Captain were christened Otto, so the repetition of 'ott' in the names of the characters emerges as a sign of affinity.

Early on, the Captain and the married Eduard and Charlotte discuss Bergman's theory and its application to relationships. They are not merely objects in Goethe's experiment: they consciously experiment on themselves. Goethe believed that experiments and the experimenter are one — and that a human is the most precise apparatus.

The novel is set on Eduard and Charlotte's estate. Eduard persuades his wife to invite her orphaned niece Ottilie and his friend the Captain to stay with them as an 'experiment' (*Versuch*), establishing empiricism as a metaphor for human relations. The Captain and Eduard begin to improve the estate, leaving Eduard less time with Charlotte; they compare

To correct a few things in Bell's article, firstly: the photo shown, mislabeled as: "the protagonists of Goethe's science novel compare their changing attractions to chemical bonding", is that of P1:C6 illustration of "the chart was brought and spread out", a photoengraving after the drawing by F. Simon, showing the pairings Eduard + Ottilie then Captain + Charlotte reading the survey maps of the estate, not the photo of "Charlotte glancing over Edward's book", shown in P1:C4 of the illustrate *Elective Affinities*, drawn by Philipp Johann, reading, supposedly, Torbern Bergman's *A Dissertation on Elective Attractions* (or another affinity chemistry book like it) [2] Secondly, Bergman's affinity table was not the forerunner of the periodic table—a semi-common assertion found in the literature—but rather the forerunner to the free energy tables, which began to appear in the early 20th century after it was found that each affinity reaction changed with temperature, meaning that one would have to new Bergman-type affinity table, a thousand times over, to capture all the possibilities of reaction types, at each temperature.

Thirdly, on the "Ott" cipher, Bell postulates:

> "Bergman's theory of 'elective affinity' seems to describe the shifting relationships of the protagonists, Eduard, Charlotte, Ottilie and the Captain. In this sense, the novel can be read as an exercise in reductionism: like elements, the characters seem to have no choice but to make new bonds when a reagent is introduced. Even their names reinforce this. Both Eduard and the Captain were christened Otto, so the repletion of the 'ott' in the names of the characters emerges as a sign of affinity."

Here, correctly, while in the neighborhood, Goethe employed the OTT-cipher for his four main characters as a code way to say that each person was a type of chemical, or "CHNOPS combination" as Wilhelm Ostwald came to "see" himself and others in 1926, according to the logic that the three characters: **Ch**arlotte, **E**duard, **M**ittler, form CHEM (see: chemistry etymology), as John Williams (1998) discerned, and the OTT is a reference to St Ottilia, the patron saint of vision restoration, meaning that when one comes to view people as different types of "chemicals", via some type of "molecular goggles" the true-to-nature "vision" of humanity would be restored, or something along these lines.

Education

In the mid 1980s, Bell studied ancient Greek, Latin, and German at Balliol College, Oxford, then completed his PhD in German in 1991 under Goethe, Friedrich Schiller, and Thomas Mann scholar Terence Reed (O) at Oxford.

References

1. Bell, Matthew. (2014). "In Retrospect: Elective Affinities" (abs) (O), *Nature*, 516:168-69.
2. (a) Goethe, Johann. (1902). *Works: The Sorrows of Young Werther, Elective Affinities* (*Werther* translation By R. Dillon Boylan, *Elective Affinities* translation by James Froude) (List of Illustrations, pg. front matter; "Ottilie's Favorite Walk … was along a Pleasant Footpath", cover and pg. 376; "the Chart … was brought and Spread out", pg. 195; "She Sank Down Upon Her Knees", pg. 412). F.A. Niccolls & Co.
(b) The chart was brought and spread out (by F. Simon) – Wikipedia Commons.

External links

- Matthew Bell (faculty) – King's College London.

θΔics

In existographies, **Matthew Boulton** (1728-1809) (CR:7) was an English metal products manufacturer, noted for []

Overview

In 1762, Boulton, after inheriting a large sum of money upon his father's death (cessation), opened the "Soho works" manufacturing plant, which made clocks and timepieces. The mill, at this time, was operated by horses, being that water-power (running rivers) were lacking at Soho. Being that the power of horse was irregular and sometimes failed, he soon began to contemplate the possible application of the steam engine to his mill.

> "The enormous expense of the **horsepower** put me upon thinking of turning the mill by fire."
>
> — Matthew Bolton (c.1766), "Letter to Friend" [3]

He continued that he had been recently making fruitless experiments on the subject. On Feb 22, 1766, Boulton wrote Benjamin Franklin about this and sent him a model he had made. [2] Soon thereafter, English inventor John Roebuck, a correspondent of Boulton's, told him of a young Scottish inventor named James Watt who had been making recent progress with model steam engines. Boulton then invited Watt to visit him at Soho, which he did on a return from a visit to London.

In 1775, Boulton and Watt formally entered into partnership, and it was mainly through the energy and self-sacrifice of Boulton, who devoted all the capital he had or could borrow to the enterprise, that the steam engine was at length made a commercial success; and for the next eleven years the Soho Foundry they made Watt's steam-engines for colliery owners to pump water out of mines, the Boulton & Watt engine being four times more powerful than Thomas Newcomen's original design.

In c.1770s, James Watt obtained funding from John Roebuck (1718-1794), in return for two-thirds interest, to get his engine into production; Roebuck, at some point, however, fell into hard times, and withdrew, after which Boulton stepped into take over the financing.

Boulton was the one, supposedly, that badgered Watt into turning the reciprocating motion engine, solely used for pumping mines, into a rotative motion engine, via the sun and planet gear, which could thus be used in factories in cities.

In 1782, Watt found, via experiment, that a "brewery horse" was able to produce 32,400 foot-pounds per minute.

In 1783, Watt and Boulton standardized the figure of one "horsepower" at 33,000 foot-pounds per minute, in order to classify their engines for sale, and by 1809, this was generally accepted as equivalent of 1 horsepower, as it is today.

Other

In 1782, Boulton introduced Watt to John Southern, then aged 24, an aspiring musician of sorts, who thereafter became Watt's assistant and right-hand man, becoming partner in 1810. (Ñº)

Quotes | By

The following are quotes by Boulton:

> "The people of London, Manchester, and Birmingham are steam mill mad."
>
> — Matthew Bolton (1781), "Letter to James Watt"; supposedly said, in aims to get Watt to make a rotative engine [1]

References

1. Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 169-72). Courier, 1990.
2. Boulton, Matthew. (1766). "Letter to Benjamin Franklin", Feb 22.
3. Carnegie, Andrew. (1905). *James Watt* (pg. 91). Publisher.

External links

â— Matthew Boulton – Wikipedia.

θΔics

In hmolscience, **Matthew F. Melko** (1930-2010) was an American political scientist noted for his 1969 book *The Nature of Civilizations*, in which he describes the rise of civilization using mechanism diagrams, similar to physical chemistry reaction mechanism diagrams. [1] American physical chemist Thomas Wallace devotes an entire chapter expanding on what he calls “Melko’s transitional mechanistic model” in terms of more detailed transition state theory. [2]

Melko was a joint editor of the 1987 book *The Boundaries of Civilization in Space and Time*, which discusses homeokinetics work of American physicist Arthur Iberall, supposedly in application to the physics of the disintegrate of cultures. [4]

Education

In 1975, Melko, self-defined as a political scientist, was associate dean of Bradford College, Haverhill, Mass., and was editor of *Comparative Civilizations*. In 2010, at the time of his passage, Melko was a peer-review editor for the *Comparative Civilizations Review*. [3]

References

1. Melko, Matthew. (1969). *The Nature of Civilizations* (mechanisms, pgs. 47-57). Porter Sargent Publishers.
2. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (Melko and Le Chatelier's principle, pgs. 142-43; ch. 14: The Mechanistic-thermodynamic Paradigm: a Unifying Perspective of Civilization, pgs. 440-68). AuthorHouse.
3. Editorial Board – ISCSC, Journal – UMich.edu.
4. Melko, Matthew and Scott, Leighton R. (1987). *Boundaries of Civilization in Space and Time* (Iberall, pgs. 222, 300). University Press of America.

External links

â— Matthew F. Melko (1930-2010) – Tributes.com.

θΔics

In hmolscience, **Matthew Segall** (c.1991-) is an American philosopher, who seems to self-identify as a panexperientialist, albeit teetering in 2014 towards anthrodecentric philosophy (Q), possibly akin to a deanthropomorphize train of thought and or near to Charles Sherrington's denouncement of "anthropisms", generally noted for his 2007-present attempt to ferret out some type of extrapolate down and or extrapolate up work-in-progress philosophy in respect to questions of the soul, life, meaning, experience, and ecology, self-conceptualized modern Whitehead-stylized-Plato, as he seems to the case.

Overview

In 2007, Segal launched the YouTube channel 0ThouArtThat0 (Q), wherein he uploads video discussions among topics, e.g. free will, evil, consciousness, materialism, morality, religion conflictions, experience, etc., and scholars, e.g. Rudolf Steiner, Pierre Teilhard, Arthur Young, Alan Watts, Henri Bergson, Giordano Bruno, Benjamin Libet, Stuart Kauffman, Friedrich Nietzsche, Bruno Latour, Eckhart Tolle, etc., amid the materialism-physicalism philosophy borderland.

In 2011, Segall published *On the Matter of the Life: Towards and Integral Biology of Economics*, wherein he explores the ideas of thinkers like Alfred Whitehead, Francisco Varela, Jean Gebser, William Irwin Thompson, and Alf Hornborg in an attempt to critique both techno-industrial capitalism and mechanistic biology. [1]

In 2013, Segall, published *Physics of World-Soul*, wherein he used Whitehead's animate cosmology to expose, in his view, the inadequacy of traditional materialistic-mechanistic metaphysics. [2]

In 2014, Segall published a booklet on the philosophical work of Friedrich Schelling. [3]

Religion

In 2013, Segall stated the following about his religious beliefs:

> "I closer to a panentheist. Do I believe in a personal God? My response to this question, were I as wise as he, would be something like Carl Jung's [response (Q) to query: 'do you still believe in god?]: I don't need to believe, I know."
>
> — Matthew Segall (2013), YouTube forum post (Q) about belief in god

Namely that his views are similar to Carl Jung who stated that he doesn't believe, but rather he "knows god exists".

Education

In 2000s, Segall seems to have been auto-didactic in learning. In 2014, he completed some type of philosophy degree California Institute of Integral Studies. (Q) Presently, Segall is doing graduate coursework and lecturing on the topics surrounding an "anthrodecentric philosophy" of nature (Q), a seeming compromise between evolutionary panpsychism and eliminative materialism. [4] In 2015, Segall stated that he was going to do his PhD dissertation on the following: (Q)

> Dissertation = Alfred Whitehead + Friedrich Schelling + Rudolf Steiner

(add discussion)

Quotes | Cited

The following are quotes employed by Segall:

"The key notion from which [the construction of a cosmology] should start is that the energetic activity considered in physics is the emotional intensity entertained in life."

— Alfred Whitehead (c.1910), cited by Segall in 2014 lecture [6]

A labeled version of **Segall's** Facebook Plato and Aristotle at the "School of Athens" avatar, with Whitehead's process philosophy in hand. [5]

"It is very certain that it is the effect of conversation with the beauty of the soul, to beget a desire and need to impart to others the same knowledge and love. If utterance is denied, the thought lies like a burden on the man. Always the seer is a sayer. Somehow his dream is told: somehow he publishes it with solemn joy: sometimes with pencil on canvas; sometimes with chisel on stone; sometimes in towers and aisles of granite, his soul's worship is builded; sometimes in anthems of indefinite music; but clearest and most permanent, in words."

— Ralph Emerson (c.1910), description quote of 0ThouArtThat0 (Q) video channel

See also

- Defunct theory of life
- -ism
- Life does not exist

References

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2. Segall, Matthew D. (2013). *Physics of the World-Soul: the Relevance of Alfred North Whitehead's Philosophy of Organism to Contemporary Scientific Cosmology*. Lulu.
3. Segall, Matthew D. (2014). *The Re-Emergence of Schelling: Philosophy in a Time of Emergence* (abs). LAP Lambert Academic Publishing.
4. Matthew David Segall (about) – Footnotes2Plato.com.
5. Matthew David Segall – Facebook.
6. Segall, Mathew. (2014). "Towards an Anthrodecentric Philosophy of Nature" (V1, V2), Lecture delivered at Esalen Institute, Big Sur, Ca, Oct.

External links

- Matthew Segall – Twitter.
- Segall, Matthew David – WorldCat Identities.

θΔics

In hmolscience, **Matthew A. Taylor** (c.1979-) is an American literature scholar noted for []

Overview

In 2008, Taylor, in his PhD dissertation *Universes Without Selves: Cosmologies of the Non-Human in American Literature*, examined what he calls the "heterodox American cosmologies", of significance that of American historian Henry Adams and his famous *The Education of Henry Adams*, with its end 1904 chapter on his physics-based "dynamic theory of history". Taylor's synopsis of the first chapters of his dissertation is as follows: [1]

> "Chapter one attributes Poe's apocalyptic collapses of panpsychic matter (from the early tales to the late Eureka) to a cosmology that borrowed from euphoric contemporary theories of the universe while defying their idealism. Chapter two argues for a similarly fraught dynamic between an author and the cosmological norms of his age: in key ways, all of Adams's texts revoke the optimism of teleological historiography by submitting humanity to the degrading laws of physics rather than the promised perfectibility of popular Darwinism; Adams's record of his own entropic degradation in *The Education* is thus best understood through reference to what he termed his 'scientific histories'."

In like manner, Taylor frames his dissertation thematically with the following opening quote by American ecologist Neil Evernden: [2]

> "Where do you draw the line between one creature and another? Where does one organism stop and another begin? Is there even a boundary between you and the non-living world, or will the atoms of this page be a part of your body tomorrow? How, in short, can you make any sense out of the conception of a man as a discrete entity? How can the proper study form man be man if it is impossible for man to exist out of context. For the ecologist, then, the desire of some in the humanities to deal only with the fragment of reality they term 'human' is nonsense."

Here we see allusions to what would eventually become the science of ecological stoichiometry, the first science to calculate the human molecular formula (2000), prior to that of human chemistry (2002), the puzzling notion of the turnover rate, and the religiously-loaded notion (see: comparative religion and mythology) of the so-called "living matter | dead matter" divide (see: unbridgeable gap), which has recently been solved in the defunct theory of life, among other prominent issues.

Other

Taylor's other interests include: the interdisciplinary intersections of critical theory, including science and technology studies, philosophy of science, posthumanism, ecocriticism, and race theory (see: racial thermodynamics)

Education

Taylor completed his BA at Trinity College in 2001, and his MA (2005) and PhD (2008) at Johns Hopkins University. Taylor currently is a professor of English and comparative literature at University of North Carolina at Chapel Hill.

See also

- Literature chemistry
- Literature thermodynamics

References

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2. Evernden, Neil. (1996). “Beyond Ecology: Self, Place, and the Pathetic Fallacy”, in: *The Ecocriticism Reader: Landmarks in Literary Ecology* (editor: Cheryll Glotfelty and Harold Fromm) (pg. 95). University of Georgia Press.

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External links

● Matthew Taylor (faculty) – University of North Carolina at Chapel Hill.

θΔics

In hmolscience, **Matthias Ruth** (1964-) is an American natural economist noted, in economic thermodynamics, for his 1992 to present attempt to integrate economics, ecology, and thermodynamics.

Overview

In 1993, Ruth, in his *Integrating Economics, Ecology, and Thermodynamics*, a finalized version of his 1992 PhD dissertation, argued that economies are open systems, embedded in ecosystems, with which they exchange matter and energy, being thereby constrained by the laws of physics. The following is a representative excerpt: [1]

> "[Although] there is an ongoing debate among economists and natural scientists on the relevance of the laws of thermodynamics for the performance of economic systems, [invariably] physical laws govern production and consumption processes in a fundamental way. A world constrained by the laws of thermodynamics ultimately alters its structure through transformation of matter and dissipation of energy."

Ruth's most popular books are the 1994 *Dynamic Modeling* and the 1997 *Modeling Dynamic Biological Systems*, both co-authored with American mechanical engineer turned geography professor Bruce M. Hannon; although, ironically, both books avoid thermodynamics completely, which of course is the science that determines the dynamics or driving force of any system.

Education

Ruth completed an MA in economics from the Ruprecht-Karls-Universität Heidelberg, Federal Republic of Germany in 1989 and PhD in 1992 on a synthesis of economics, ecology, and thermodynamics at the geography department of the University of Illinois, Urbana. [2] Ruth for a time was professor of economics at the University of Maryland. Ruth currently is a professor at the School of Public Policy & Urban Affairs and Department of Civil and Environmental Engineering, Northeastern University. (Q)

Difficulties on theory

A down-side of Ruth's theory is that in his thermodynamics chapters he utilizes American electrical engineer Claude Shannon's 1948 information theory, which has nothing to do with thermodynamics, ecology, or economics.

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● Ruth, M. (2005). "Insights from Thermodynamics for the Analysis of Economic Processes", in: A. Kleidon and R.D. Lorenz (eds.) *Non-Equilibrium Thermodynamics and the Production of Entropy*, Springer-Verlag, Heidelberg, pp. 243 – 254.

External links

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- Matthias Ruth (faculty) – University of Maryland.
- Matthias Ruth – LinkedIn.com.

θΔics

In existographies, **Maud Merrill** (1888-1978) was an American intelligence psychologist noted for []

Cox 300 geniuses

In 1924 to 1926, Merrill was one of the IQ rankers, along with Catherine Cox and Lewis Terman, in the determination of the IQs of the top 300 geniuses of the Cattell 1000. [1]

Stanford-Binet Intelligence Scale

In 1926, Merrill was hired by Lewis Terman, at his own expense, to help in doing a revising the Stanford-Binet Intelligence Scale (1916). When she was later appointed to associate professor the relationship shifted again, and they became colleagues. Eventually, after years of working with Terman on the revisions for the Stanford-Binet, the relationship evolved once more. In 1930, Terman and Merrill became collaborators and coeditors of the Stanford-Binet Project. The administration of the Stanford-Binet was an area in which Merrill particularly excelled. She became an authority on the topic and one of the main elements of her job while working at Stanford was the training of undergraduate and graduate students on how to properly administer the newly revised Stanford-Binet Intelligence scale. [2]

Education

Merrill completed his AB in 1911 at Oberlin College and her AM in 1920 and PhD in 1923 both at Stanford University.

Quotes

The following are noted quotes:

> "One rater (**Merrill**) has scored on the basis of the record of Goethe's youth an **IQ of 225**. Goethe's true IQ may in the history of mankind have been equaled in a few instances; one may well wonder whether it has ever been exceeded?"
>
> — Catherine Cox (1926), *Early Mental Traits of 300 Geniuses*

References

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(b) Terman, Lewis. (1925). *Genetic Studies of Genius. Volume I. Mental and Physical Traits of a Thousand Gifted Children* (Arc). Stanford University Press, 1926.
(c) Cox, Catharine. (1926). *Genetic Studies of Genius. Volume II. The Early Mental Traits of Three Hundred Geniuses* (GB) (Arc) (pdf) (ratings, pg. viii). Stanford University Press.
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External links

â— Maud Amanda Merrill – FeminstVoices.com.

θΔics

In debates, **Maupertuis-Diderot debate** was a 1750s debate between Frenchmen mathematician-philosopher Pierre Maupertuis (1698-1758) and philosopher-encyclopedist Denis Diderot (1713-1784) described, by Australian philosopher Charles Wolfe, as an "exchange or polemic of two authors trading accusations of atheism" , surrounding the definition of matter and molecule, in respect to the questions of the origins, emergence, and or underlying materialistic nature of cherished concepts such as: life, desire, memory, intelligence, and feelings. [1]

vs.

Pierre Maupertuis (1698-1758) | **Denis Diderot** (1713-1784)

(add synopsis)

Overview

In 1751, French mathematician, physicist, and philosopher Pierre Maupertuis (1698-1758) published *System of Nature: Essay on Organized Bodies*, originally under the pseudonym of Dr. Baumann, in which he described a living *minima* which he termed "molecules", endowed with "desire, memory, and intelligence." Herein, Maupertuis explains his views as follows: [2]

> "Should we speak here of this absurd system, if a system it is, imagined by an impious philosopher, adorned by a great poet with all the richness of his art, a system that libertines of our time would like to revive? This system admits as principles of the universe only eternal atoms, devoid of feelings and intelligence, the fortuitous encounters of which formed all things: an accidental organization generates the soul, which is destroyed as soon as the organization ceases … Never will the formation of any organized body be explained solely by the physical properties of matter; to be convinced of this one need only read the writings of the philosophers who have tried this explanation, from Epicurus to Descartes."

Maupertuis, according to Australian philosopher Charles Wolfe (2010), was Leibnizian, of sorts, believing his molecules to possess higher-level 'mental' properties. A Leibnizian, according to Wolfe, using Julien la Mettrie's definition (*Man a Machine*, 1747), was someone who "spiritualized matter rather than materialized the soul."

In 1753, French philosopher and encyclopedist Denis Diderot (1713-1784) published *Thoughts on the Interpretation of Nature*, also published anonymously, wherein he began to critique Maupertuis' living minima theory. [3]

See also

â— Heisenberg-Pauli dialogue

References

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(b) Wolfe, Charles T. (2010). "Endowed Molecules and Emergent Organization: the Maupertuis-Diderot Debate" (abs) (Ñº), *Earth Science and Medicine*, 15(1-2):38-65.
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(b) Thoughts on the Interpretation of Nature (French → English) – Wikipedia.
(c) Wolfe, Charles T. (2010). "Endowed Molecules and Emergent Organization: the Maupertuis-Diderot Debate" (abs) (Ñº), *Earth Science and Medicine*, 15(1-2):38-65; in: *Transitions and Boarders Between Animals, Humans and Machines 1600-1800* (editor: Tobias Cheung) (§3:38-65). BRILL, 2010.

θΔics

In chemistry, **Maurice Pierre Crosland** (1931-) is an English chemistry historian noted for his 1959 article "The use of diagrams as chemical 'equations' in the lectures of William Cullen and Joseph Black", wherein he steps through the early history of chemical equations, particularly in the work of Jean Beguin (1615), William Cullen (1757), and Joseph Black (c.1770s). [1]

Education

Crosland completed his BS in 1951 in chemistry, MS in 1953 in history and philosophy, and PhD in 1959 in the history of chemistry, all at University College, London, after which he was a history of chemistry professor at the University of Leeds, from 1963 to 1974. Presently, Crosland is professor emeritus, of the school of history, Rutherford College, University of Kent. [2]

References

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θΔics

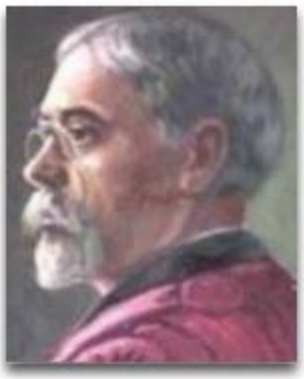

In human thermodynamics, **Maurice Hauriou** (1856-1929) (SN:15) (CR=24), in full: Jean Claude Eugene Maurice Hauriou (Christopher Gray, 2010) or Maurice Jean Claude Eugene Hauriou (Q), was a French social-philosopher and law professor noted for his 1896 *Traditional Social Science*, wherein he discusses concepts such Goethe and the romantic view, social chemical potential, society as "social matter", etc., and for his 1899 book *Lessons on Social Movement*, in which he attempts outline a what he calls a needed "new science" so to explain human movements in society in terms of thermodynamics, discussing concepts such as entropy, mechanism, dissipation, and reaction.

Overview

The following is a representative quote by Hauriou: [1]

> "If we understand that the connections we have made are not just not been pointless, but rather are the curious road to the explanation of social movement, characterized by gross business men or events, be transformed into its representation mental aspects also curious to see the representative energies, in turn, is converted back into social movement organizations and institutions. These transformations are comparable to those of motion into heat and heat into motion [mechanical equivalent of heat]. We have applied in the social principle of the impossibility of perpetual motion, the principle of Mayer became representative of the equivalence principles of heat engines, including that of the Carnot maximum efficiency. We have not yet exhausted the analogies that thermodynamics should furnish. It remains to use the principle of Clausius or the increase of entropy, the principle is formulated thus: 'In the transformation of a closed system, there is a quantity that is constantly increasing, entropy, and when the largest possible system value occurs, the transformations stop.' This principle will provide extraordinary light on the conduct and the creation of a static society, commonly seen in the creation of situations of state. We see that this is what working energies representative."

The density and correctness of this quote indicates that this book of Hauriou fits alongside of those of Mehdi Bazargan and Leon Winiarski as those whose human thermodynamics book are in great need of English translation. Hauriou's *Lessons* is said to be one of the earliest attempts to apply the model of thermodynamics to social science. [5]

A noted Hauriou scholar is Canadian law philosopher Christopher Gray, who did the first English translation of his 1896 *Tradition in Social Science*.

Education

Hauriou completed baccalaureates in science and arts at Angouleme. He completed a law degree at the University of Bordeaux, getting his license in 1876; doctorate in 1879; and aggregation, the final research degree in 1883. Thereafter, he took charge of courses in the history of law at Toulouse, and continued to do work in a wide variety of fields. He also gives credit in his education to vigorous daily discussions at Café Capitole, with his philosophical colleagues: Frederic Rauh, Jean Jaures, Georges Dumesnil, and Viktor Delbos. In 1888, Hauriou was appointed chair of the administrative law department at Toulouse. His first of sociology publications seems to be the 1896 book *The Traditional Social Science*. [3] In the writing of his *Lessons on Social Movement*, completed in 1898, Hauriou states that he undertook a program of self-study of the thermodynamics work of Henri Poincare, likely Poincare's 1892 *Thermodynamics* textbook. [4] Hauriou became dean of the faculty of law at Toulouse in 1906; retiring from that position in 1926.

Quotes | Related

The following are related quotes on Hauriou:

> "However much **Hauriou** was revered as a sociologist and philosopher in his day and remains influential in Latin America and Europe, he is largely unknown in the English-speaking world."

— Vincent Luizzi (2010), "Editorial Preface" to Christopher Gray's *The Methodology of Maurice Hauriou* [2]

Quotes

The following are related quotes:

> "It [becomes] necessary to study the thermodynamics. The increase in entropy [is] a sign that it exists in the 'conduct' of the universe, conduct that is carried out by application of the organic representative and it is manifested by the creation of static and the increase of law, it aims to free items. I ventured to see in thermodynamics 'the science of behavior of physical movements' and I made for the moral sciences or sciences of the conduct of social movements."
>
> — Maurice Hauriou (1898), French law professor, *Lessons on Social Movements* [6]

References

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3. Maurice Hauriou (works by) – Hauriou.net.
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5. Jones, H. S. (2002). *The French State in Question* (thermodynamics, pgs. 183-84). Cambridge University Press.
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Further reading

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External links

● Maurice Hauriou (French → English) – Wikipedia.

θΔics

In existographies, **Max Born** (1882-1970) (RGM:494|1,310+) (CR:24) was a German physicist noted for having introduced the thermodynamic square method of deriving the Maxwell relations in his late 1920s University of Gottingen lectures on thermodynamics. [1]

Thermodynamics

Born's reading of Willard Gibbs' 1902 *The Elementary Principles of Statistical Mechanics*, as a young student at Cambridge University, is what convinced Born to become a physicist. [2] Born was also a friend with Constantin Caratheodory, the first to work in the mathematical proofs of thermodynamic.

Born, according to Paul Samuelson, however, supposedly, had a repugnance against basing thermodynamics on axioms crouched in terms of the impossibility of perpetual motion machines of various kinds. (Ñº)

Quantum mechanics

Born, in physics, is noted for having built on Werner Heisenberg's initial work around 1925, so to apply Niels Borh's theory of the atom to suit more complicated atoms and molecules, beyond hydrogen, and he also proved that Erwin Schrödinger's wave equation could be interpreted as giving statistical (rather than exact) predictions of variables, for which he won the 1954 Nobel Prize in physics. (Ñº)

Religion

Born seems to have free-wielding employer of god talk; for example:

> "If god has made the world a perfect mechanism, He has at least conceded so much to our imperfect intellects that in order to predict little parts of it, we need not solve innumerable differential equations, but can use dice with fair success."
>
> — Max Born (c.1935) (Ñº)

(add)

A 135th Bday Google image.

References

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(b) Tisza, Laszlo. (1966). *Generalized Thermodynamics* (Born diagram, pg. 64). MIT Press.
2. Greenspan, Nancy T. (2005). *The End of a Certain World: the Life and Science of Max Born* (thermodynamics, pg. 38). Basic Books.

External links

â— Max Born – Wikipedia.

θΔics

In existographies, **Max Delbruck** (1906-1981) (Simmons 100:68) (CR:5), or "Delbrueck", was a German-born American physicist and virus genetics researcher, characterized an "ordinary genius" (Geno, 2013), noted for []

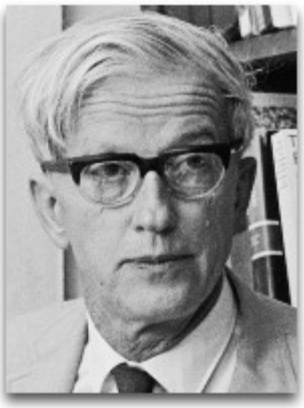

Other

In 1963, Eugene Stanley completed biological physics work under Delbruck.

Quotes | On

The following are quotes on Delbruck:

> "In a **fascinating interchange**, Frederick Donnan and Edward Guggenheim argue against an assertion by the eminent physicist James Jeans, that life could yield a net increase in organization and therefore a decrease in entropy (Donnen 1934; Guggenheim 1934; Jeans 1934; called to my attention by **Max Delbruck**). In 1933, Jeans had written that 'in fact, it would seem reasonable to define life as being characterized by a capacity for evading this law. It probably cannot evade the law of atomic physics, which are believed to apply as much to the atoms of a brain as to the atoms of a brick, but it seems able to evade the statistical laws of probability. The higher the type of life, the greater is its capacity for evasion' (1933)."
>
> — Richard Adams (1988), *The Eight Day* (pg. 34) [1]

References

1. Adams, Richard N. (1988). *The Eighth Day: Social Evolution as the Self-Organization of Energy*. University of Texas Press.

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● Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (Delbruck, 24+ pgs). University Press of America.
● Segre, Gino. (2013). *Ordinary Geniuses: Max Delbruck, George Gamow, and the Origins of Genomics and Big Bang Cosmology*. Publisher.

External links

● Max Delbruck – Wikipedia.

θΔics

In science, **Max Kleiber** (1893-1976) was a Swiss-born American agricultural chemist and animal metabolism researcher noted for his 1961 *The Fire of Life: an Introduction to Animal Energetics*, wherein he cites the work of Gilbert Lewis (1923) the 1957 energetics of biochemical reactions work of Irving Klotz, among others. [1]

Kleiber's law

In 1947, Kleiber published "Body Size and Metabolic Rate", wherein, in an effort to correct assertions about "non-uniformity in heat production" of various animals by size made in Francis Benedict's 1938 *Vital Energetics*, gave the following chart showing heat produced by organisms versus body size: [3]

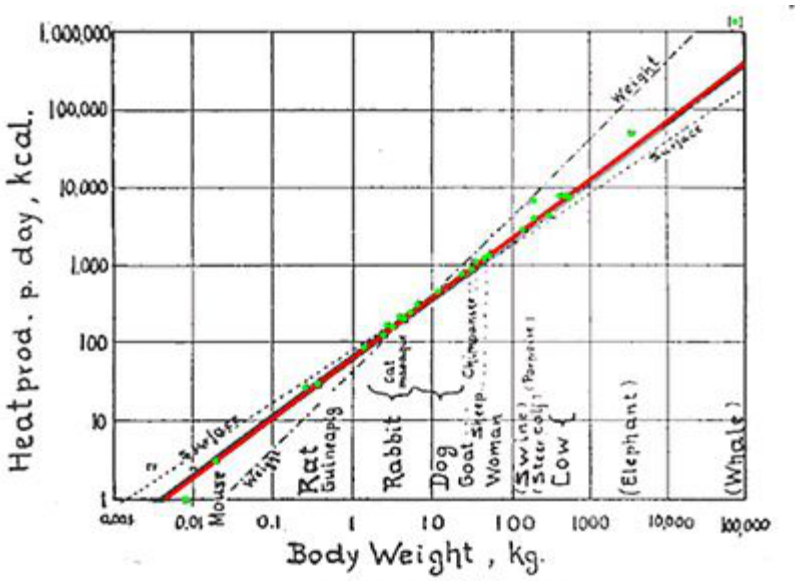

Fig. 1. Log. metabol. rate/log body weight

Kleiber, in short, showed that an animal's "metabolic rate", or specifically basil metabolic rate (BMR), in contrast to resting metabolic rate (RMR), scales to the three-quarter's power of the animal's mass: [4]

$$R_{BM} \propto M^{\frac{3}{4}}$$

Education

Kleiber completed his BS in agricultural chemistry in 1920 and his PhD in 1924 with a thesis on "The Energy Concept in Science Nutrition", after which in 1929 he joined the animal husbandry department of University of California, Davis, where he build respiration chambers and did research on energy metabolism in animals.

Quotes | Tributes

The following are related summary quotes:

> "Biology was reconstructed on thermodynamic grounds in the 1920s through the work of A.G. Tansley, Edgar Transeau, **Max Kleiber**, and others who began conceiving of organisms as energy fixers or consumers and of natural systems as complex webs of energy flows and

transformations, thereby developing the modern science of ecology. Alfred Lotka and Howard Odum extended the approach, pointing to the role that energy appropriation plays in evolution: individuals and species that have the largest net energy surplus can dedicated more of their life energy to reproduction, outcompeting their rivals."

— Eric Zencey (2013), "Energy as Master Resource" [2]

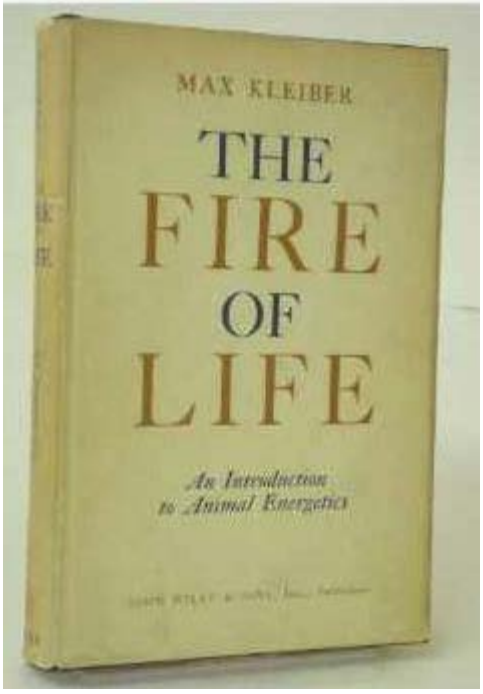

The cover of **Kleiber's** 1961 book *The Fire of Life*, nearly boarders on some type of "living fire" or living flame conceptualized presentation.

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3. (a) Benedict, Francis G. (1938). *Vital Energetics: a Study of Comparative Basal Metabolism* (pg. 194). Publisher.
(b) Kleiber, Max. (1947). "Body Size and Metabolic Rate" (abs) (pdf), *Physiological Review*, 27(4):511-41.
4. Balmer, Robert T. (2010). *Modern Engineering Thermodynamics* (Max Kleiber, pg. 703-). Academic Press.

External links

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θΔics

In human chemistry, **Max Leclerc** (1864-1932) was a French education reformer noted for his commentary on Hippolyte Taine's view of people as human molecules, wherein Leclerc comments that in France the middle classes act as an aggregate of human molecules working to turn the huge wheel of commerce under the operation of the Minister's pedal.

Overview

In commentary on Taine's 1875 text *Growing Disagreement of School and Life* (*La Disconvenance Croissante de l'ecole et de la Vie*), according to one review, Leclerc argues that "in our Lycees there is the same military discipline (as under Napoleon), the same aggregation of numbered human molecules, which the huge wheel, turned throughout France by the Minister's pedal, grinds and reduces to human powder." [1] This view comes from Leclere's 1894 book *Education in the Middle Classes in England*, where in he discusses the views of Taine, and comments that: [2]

> "France has repeatedly changed its political constitution in this century but, through all vicissitudes, under many different governments, the regime founded by Napoleon Bonaparte persisted as the mode of education has remained the same. Twenty years ago, France sought to establish freedom with the Republic, she believes she has succeeded, and freedom, she says possesses ". How does it prepare new generations to use and Others How those born since in 1870 they are learning about freedom? If the parliamentary monarchy of July had not had the courage, if the Republic of 1848 has not had time, if the Second Empire could not have the will repudiate the dangerous legacy of Napoleon, the Third Republic, who has time and should have the courage and determination, she undertook what no one has been able, willing or dared to do before it? Did she understand how risk it runs, raising his free citizens by whatever means were combined to perpetuate the reign of the despotic one? Prefects and principals of the Republic today have no other conception of their role than once under the sword of Napoleon. In our schools, even military discipline, even numbered piles of **human molecules** that huge wheel turning in all of France under the pedal stroke of the Minister, crushed and pulped to humanity."

(add disucssion)

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External links

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θΔics

In existographies, **Max Meyer** (1873-1967) was a German-born American psychologist and behaviorist noted for []

Sex Question | Scandal

In spring 1929, Meyer was teaching a sociology class at the University of Missouri, during which student Orval Hobart Mowrer, for his senior research project, mailed surveys to 700 male and female undergraduates, asking their reactions to several hypothetical situations; some examples are:

1. Female | Would you break your engagement to a man if you had learned that he had indulged in illicit sexual relations?
2. Male | Would you associate with women who accepted money in return for sexual favors?
3. Both | What is your attitude toward birth control?
4. Both | What is your opinion about 'trial marriages', wherein a man and a woman would live in sexual intimacy from some days or weeks in order to determine whether or not they were sexually compatible?

The survey quickly spread to journalists, sparking a firestorm: people demanded the university fire the faculty involved; Missouri legislators threatened to withhold funding; the university president Stratton Brooks attempted to restructure the entire university; Meyer and other faculty were terminated; the American Association of University Professors (AAUP) reacted by establishing the concept of 'tenure'; national backlash worked to get on faculty involved reinstated and president Brooks fired.

Education

Meyer completed his PhD under Max Planck.

Influence

Meyer's only PhD student was Albert Weiss. [2]

See also

- Buss sexual receptivity study

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External links

- Max Friedrich Meyer – Wikipedia.

θΔics

In existographies, **Max Planck** (1858-1947) (IQ:190|#42) [RGM:18|1,500+] (Gottlieb 1000:25) (Odueny 100:15) [Kanowitz 50:8] [Cropper 30:1|QM] (GPE:17) [CR:247] was a German physicist and thermodynamicist, noted for []

Overview

In 1879, Planck completed his PhD dissertation "On the Second Fundamental Theorem of the Mechanical Theory of Heat", on the second main principle of Rudolf Clausius, his 1897 *Treatise on Thermodynamics*, for his 1899 principle of elementary disorder, for his 1900 postulate of the theory of the existence of "energy elements" (energy quantums) in bodies, the latter of which started the quantum revolution, and for his later efforts to bring German physicist Walther Nernst's 1906 heat theorem and to facilitate its status into that of a "third law". [2] Planck's effort to formulate an expression for the entropy of radiant heat in agreement with thermodynamics and the electromagnetic theory, in a way that would solve the ultraviolet catastrophe problem, initiated quantum mechanics. Planck was a product of the Berlin school of thermodynamics, through is studies of the works of German physicist Rudolf Clausius, a school he later became a professor at.

Clausius | Second law

In 1877, in graduate school, at the University of Berlin, not able to satisfy his mind in respect to education, from Helmholtz and Kirchhoff's lectures, Planck spent time in the library reading on the conservation of energy, during which time he came upon the writings of German physicist Rudolf Clausius writings; the discovery of which he describes as follows: [5]

> "One day, I happened to come across the treatises of Rudolf Clausius, whose lucid style and enlightening clarity of reasoning made an enormous impression on me, and I became deeply absorbed in his articles, with an ever increasing enthusiasm. I appreciated especially his exact formulation of the two laws of thermodynamics, and the sharp distinction which he was the first to establish between them."

Planck, in respect to his reading of Clausius, summarized the then-prevalent matter theory of heat (see: fluid theory of heat) has follows: [13]

> "Up to that time, as a consequence of the theory that heat is a substance, the universally accepted view had been that the passing of heat from a higher to a lower temperature was analogous to the sinking of a weight from a higher to a lower position, and it was not easy to overcome this mistaken opinion."

Planck summarized the Clausius version of the second law as follows:

> "Heat will not pass spontaneously from a colder to a hotter body. This means not only that heat will not pass directly from a colder into a warmer body, but also that it is impossible to transmit, by any means, heat from a colder into a hotter body without there remaining in nature some change to serve as compensation."

Planck, in his "Scientific Autobiography", states that he refined Clausius' second law hypothesis as follows:

> "The process of heat conduction cannot be completely reversed by any means. This expresses the same idea as the wording of Clausius, but without requiring an additional clarifying explanation. A process which in no manner can be completely reversed I called a 'natural' one. The term for it in universal use today, is: 'Irreversible'."

Planck elaborates on this as follows:

> "Since the question whether a process is reversible or irreversible depends solely on the nature of the initial state and of the terminal state of the process, but not on the manner in which the process develops, in the case of an irreversible process the terminal state is in a certain sense more important than the initial state—as if, so to speak, nature 'preferred' it to the latter. I saw a measure of this 'preference' in Clausius' entropy; and I found the meaning of the second law of thermodynamics in the principle that in every natural process the sum of the entropies of all bodies involved in the process increases."

Planck states that these ideas were worked out in his doctoral dissertation completed in 1879 at the University of Munich.

In Oct 1878 Planck passed his qualifying exams and in Feb 1879 defended his dissertation, "On the Second Fundamental Theorem of the Mechanical Theory of Heat" (*Über den zweiten Hauptsatz der mechanischen Wärmetheorie*). He briefly taught mathematics and physics at his former school in Munich. In June 1880 he presented his habilitation thesis, *Gleichgewichtszustände isotroper Körper in verschiedenen Temperaturen* (*Equilibrium states of isotropic bodies at different temperatures*). With the completion of his habilitation thesis, Planck became an unpaid private lecturer in Munich, waiting until he was offered an academic position. Although he was initially ignored by the academic community, he furthered his work on the field of heat theory and discovered one after another the same thermodynamical formalism as Gibbs without realizing it. Clausius' ideas on entropy occupied a central role in his work.

Entropy

Planck was the first to define entropy as $S = K \log W$ or the entropy of a system proportional to its multiplicity or probability W, as he first stated in 1901. The basis of his argument is that, firstly, based on the theorem that the probabilities of two systems independent of one another is equal to the product of the probabilities of the two systems ($W = W_1W_2$); secondly, that the entropy is represented by the sum of entropies ($S = S_1 + S_2$); whereby the entropy is proportional to the logarithm of the probability ($S = K \log W$). [4]

Education

In 1867, Planck enrolled in the Maximilians gymnasium school in Munich, where he came under the tutelage of German mathematician Hermann Müller, who took an interest in the youth, and taught him astronomy and mechanics as well as mathematics. It was from Müller that Planck first learned the principle of conservation of energy. Planck graduated from here at the age of 17. In 1874, Plank enrolled at the University of Munich where, under the tutelage of physicist Phillipp von Jolly, he studied the diffusion of hydrogen through heated platinum, but soon transferred to theoretical physics.

In 1877, at the age of 19, Planck went to Berlin for a year of study with physicists Hermann Helmholtz and Gustav Kirchhoff and the mathematician Karl Weierstrass. He wrote that Helmholtz was never quite prepared, spoke slowly, miscalculated endlessly, and bored his listeners, while Kirchhoff spoke in carefully prepared lectures which were dry and monotonous. He soon became close friends with Helmholtz.

Physics professor

In April 1885 the University of Kiel appointed Planck as associate professor of theoretical physics. Further work on entropy and its treatment, especially as applied in physical chemistry, followed. He proposed a thermodynamic basis for Svante Arrhenius' theory of electrolytic dissociation. Within four years he was named the successor to Kirchhoff's position at the University of Berlin — presumably thanks to Helmholtz's intercession — and by 1892 became a full professor. In Berlin, Max Planck joined the local Physical Society. He later wrote about this time, in what has become a famous entropy quotation:

An earlier photo of **Planck**.

> "In those days I was essentially the only theoretical physicist there, whence things were not so easy for me, because I started mentioning entropy, but this was not quite fashionable, since it was regarded as a **mathematical spook**."

In 1907 Planck was offered Boltzmann's position in Vienna, but turned it down to stay in Berlin. During 1909 he was the Ernest Kempton Adams Lecturer in Theoretical Physics at Columbia University in New York City. He retired from Berlin on 10 January 1926, and was succeeded by Erwin Schrödinger.

Lectures on thermodynamics

In 1893, Planck published his *Outline of General Thermochemistry*, a summary of the results of his electrochemical and thermochemical investigations, some of which overlapped with the work of Walther Nernst; investigations which trace to earlier 1889-90 papers of Planck published on the electromotive force. Planck then expanded on and retitled his *General Thermochemistry* into his now-famous 1897 *Lectures on Thermodynamics* (*Vorlesungen über Thermodynamik*), the fifth and final edition appearing in 1917 as *Treatise on Thermodynamics*; a title change which supposedly was said to signify that Planck wanted to be known as a thermodynamicist and not solely known for his earlier work in physical chemistry, a subject that Planck defined as follows: [6]

> "Thermochemistry treats of the relationships between chemical and thermal phenomena, and together with photochemistry and electrochemistry constitutes the field of physical chemistry."

In his lectures or treatise on thermodynamics it is said that he introduced the "dilute solution model" as used in modern electrochemical thermodynamics and ecological thermodynamics.

Energy elements

In 1900, Planck theorized that the internal energy *U* of a black body (resonator) could be divided into a discrete number of "energy elements" ε by the expression:

$$U = \epsilon P$$

where *P* is large integer. [1] This supposition later led German-born American physicist Albert Einstein, in 1905, to propose that light itself was composed of quantums of energy, i.e. light quantums. These light quantums later came to be called "photons", a term introduced in 1926 by American physical chemist Gilbert Lewis. These developments launched the development of quantum thermodynamics.

Scientific truth | Boltzmann

A famous quote by Planck, often misattributed to his quantum theory, is:

> "A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it."
>
> — Max Planck (1949), *Scientific Autobiography* (pgs. 33-34)

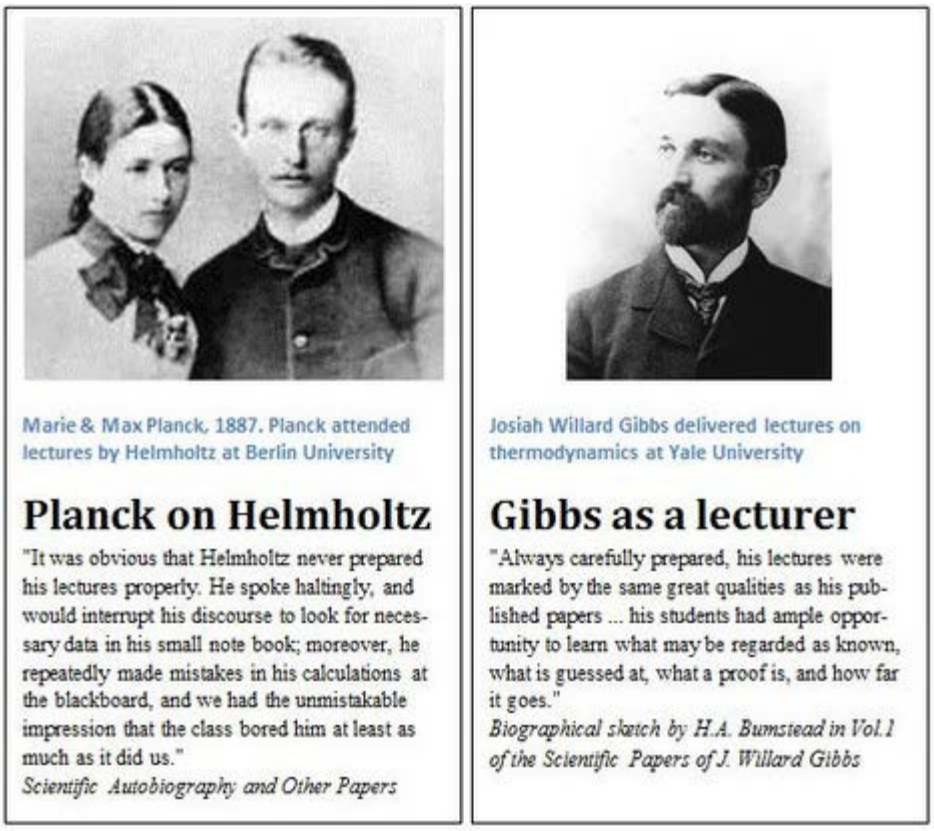

A Helmholtz vs Gibbs (as lecturer) comparison, the former of which **Planck** attended, as commented on above (left). (Ñº)

The statement, however, is in regards to the atomic theory (atomic hypothesis) based statistical thermodynamics work of Austrian physicist Ludwig Boltzmann and how his work triumphed over German physical chemist Wilhelm Ostwald and the energetics school. [3]

Religion

In 1937, Planck gave a lecture entitled "Religion and Natural Science", wherein, among other things he stated: [11]

> "Natural science wants men to learn. Religion wants them to act."

The following is one statement by Planck on religion: [9]

> "The law of causation is the guiding rule of science; but the categorical imperative—that is to say, the dictate of duty—is the guiding rule of life. Here intelligence has to give way to character, and scientific knowledge to religious belief. And when I say religious belief here I mean the word in its fundamental sense."

Of note, theists often claim Planck as one of their own. In the 2013 Think Twice (intelligence ²) debate on topic "Science Refutes God", e.g., the opening mediator leads in with the statement (0:55-1:18) that: (Ñº)

> "Isaac Newton (b.1642), **Max Planck** (b.1858), Copernicus (b.1473), Galileo (b.1564), Francis Bacon (b.1561), and Pascal (b.1623) all believed in God. What they also all have in common is that none of them was born within a 150-years of us. Today, 3 out of every 5 scientists (60 percent) say, knowing what they know, they can't really buy into the concept of god."

The Planck believed in god assertion here seems to be off target. While there is some citation that Planck, in his early days may have believed in a "personal God", six months before his dereaction (death) from a stroke on 4 Oct 1946, a rumor stated that Planck had converted to Catholicism. Amid such questionable rumors, surrounding a known self-

taught materialist philosopher, an engineer queried Planck about this rumor, to which Planck replied that:

> "[I do not believe] in a personal god, let alone a Christian god."
>
> — Max Planck (1947), "Comment to W.H. Kick", Jun 18; four months before his dereaction (Oct 4) [10]

Other reports (Herneck, 1958) indicate that while Planck, in his early and middle years may have confessed to a belief in a personal god and may have considered this compatible with the deterministic world view of physics (Planck, 196a, 160-68), later on in his reaction existence (life) he changed, and in one of the last documents about him (Herneck, 1958; 1960) denied that he believed in a personal God or ever had done so. (Ñº)

Quotes | On

The following are notes of praise and or tribute:

> "The work of **Planck** is the basis of all twentieth-century physics."
>
> — Albert Einstein (c.1930) [10]

> "As a student, he chose a certain branch of this science, for which even its neighbor sciences had but little regard—and even within this particular branch a highly-specialized field, in which literally nobody at all had any interest whatever. His first scientific papers were not read even by Helmholtz, Kirchhoff and Clausius, the very men who would have found it easiest to appreciate them. Yet, he continued on his way, obeying an inner call, until he came face to face with a problem which many others before him had tried and failed to solve, a problem for which the very path taken by him turned out to have been the best preparation. Thus, he was able to recognize and to formulate, from measurements of radiations, the law which bears and immortalizes his name for all times. He announced it before the Berlin Physical Society on Oct 19, 1900. On Dec 14 1900, again before the German Physical Society, he was able to present the theoretical deduction of the law of radiation. This was the birthday of quantum theory."
>
> — Max von Laue (1948), "Memorial Address" [12]

Quotes | By

The following are other noted quotes by Planck:

> "The advantage of the principle of least action is that in one and the same equation it relates the quantities that are immediately relevant not only to mechanics but also to electrodynamics and thermodynamics; these are space, time, and potential."
>
> — Max Planck (date), Publication [8]

> "In physics, as in every other science, common sense alone is not supreme; there must also be a place for reason. Further, the mere absence of logical contradiction does no necessarily imply that everything is reasonable. Now reason tells that if we turn our back upon a so-called object and cease to attend to it, the object still continues to exist. Reason tells us further that both the individual and mankind as a whole, together with the entire world which we apprehend through our senses, is no more than a tiny fragment of the vastness of nature, whose laws are in no way affected by any brain. On the contrary, they existed long

before there was any life on earth, and will continue to exist long after the last physicist has perished."

— Max Planck (1931), *The Universe in the Light of Modern Science* [7]

"Of course, it took a number of years before the physicist community paid attention to my theory. Because at the beginning, it was not understood in wide circles, and as a result was ignored, as it so often goes with such newer things."

— Max Planck (1942), *Film Archive of Personalities* (Ñº), referring to his quantum theory

Planck studying at his desk.

"If a historian wanted to ascribe the decision of Julius Caesar to cross the Rubicon not to his political deliberations and to his innate temperament, but to his free will, his view would be tantamount to a renunciation of scientific understanding. Therefore, we will have to conclude that from the external view point of observation the will is to be assume as causally determined."

— Max Planck (1946), "Phantom Problems in Science", Jun 17 [13]

"My original decision to devote myself to science was a direct result of the discovery which has never ceased to fill me with enthusiasm since my early youth—the comprehension of the far from obvious fact that the laws of human reasoning coincide with the laws governing the sequences of the impressions we receive from the world about us; that, therefore, pure reasoning can enable man to gain an insight into the mechanism of the latter. In this connection, it is of paramount importance that the outside world is something independent from man, something absolute, and the quest for the laws which apply to this absolute appeared to me as the most sublime scientific pursuit in life."

— Max Planck (c.1947), *Scientific Autobiography* (pg. 13) [13]

"My studies of entropy, which I regarded as next to energy the most important property of physical systems. Since its maximum value indicates a state of equilibrium, all the laws of physical and chemical systems follow from a knowledge of entropy."

— Max Planck (c.1947), *Scientific Autobiography* (pgs. 19-20) [13]

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External links

â— Max Planck – Wikipedia.
â— Max Planck – Eric Weisstein's World of Scientific Biography.
â— Planck, Max (1858-1947) – WorldCat Identities.

θΔics

In hmolscience, **Max Verworn** (1863-1921) was a German physiologist

Overview

In circa 1895, Verworn proposed the term "biogen" as a kind of living molecule that is constantly modified by chemical processes within the protoplasm. [1]

Quotes

The following are related quotes:

> "The psychic phenomena of the protists form a bridge that connects the chemical processes of the inorganic world with the psychic life of the highest animals; they represent the germ of the highest psychic phenomena of the metazoa and of man."
>
> — Max Verworn (1889), *Psycho-physiological Studies of Protists*; cited by Ernst Haeckel (1899) [2]

> "The actual discoverer is not the one who finds something new, but rather whoever is first to understand its meaning."
>
> — Max Verworn (c.1890) (Ñº)

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External links

â— Max Verworn – Wikipedia.

θΔics

In existographies, **Max von Laue** (1879-1960) (GPE:#) (Simmons 100:56) (CR:10) was a German physicist, noted for his work in x-ray crystallography, namely in 1911 he conducted an experiment showing X-ray diffraction in a crystal lattice, from which he developed a law that connects the scattering angles and the size and orientation of the unit-cell spacings in the crystal; he later did work in relativistic thermodynamics.

Quotes | On

The following are noted quotes:

> "I have known a great many intelligent people in my life. I knew Planck, **von Laue** and Heisenberg. Paul Dirac was my brother in law; Leo Szilard and Edward Teller have been among my closest friends; and Albert Einstein was a good friend, too. But none of them had a mind as quick and acute as Jansci [John] von Neumann. I have often remarked this in the presence of those men and no one ever disputed. But Einstein's understanding was deeper even than von Neumann's. His mind was both more penetrating and more original than von Neumann's. And that is a very remarkable statement. Einstein took an extraordinary pleasure in invention. Two of his greatest inventions are the special and general theories of relativity; and for all of Jansci's brilliance, he never produced anything as original."
>
> — Eugene Wigner (c.1980) (Ñº)

External links

â— Max von Laue – Wikipedia.

θΔics

In existographies, **Max Weber** (1864-1920) (IQ:170|#323) [RGM:133|1,500+] (Gottlieb 1000:806) (HCR:8) (CR:61) was a German sociologist, Goethean philosopher, oft cited last person to know everything and considered the "last universal genius of social science", noted for his so-called Weberian elective affinities theory, namely the use of Goethe's human elective affinity theories in the development of his social theories. [1]

Education

In 1878, Weber, age 14, began reading Goethe. [2] Weber, in fact, read *Elective Affinities* in the classroom as a young student, hiding it behind his textbook. [3] His first published use of the term "elective affinities" occurs in 1904. (Q)

Overview

In his 1905 *The Protestant Ethic and the Spirit of Capitalism*, Weber proposed that there is an elective affinity between important ideological, economic, and social interests, conditions, forces, and processes constituting the development of rational capitalism. [5]

In a general sense, Weber, supposedly, was one of the first to promote linkages between the natural sciences, human behavior, economics, and cultural development in his 1920 book *The Theory of Social and Economic Organization*. [4]

Scottish sociologist Andrew McKinnon in 2010 claims to have done the first systematic analysis of Weber's usage of "elective affinity" in his work and theories. [6]

Translation issues

English translators of Weber's work, to note, more often than not, have tended to render the German term "*Wahlverwandtschaft*", meaning elective affinity, as either "correlation, relationship, or bond", thus unintentionally acting to distance or cut off Weber's original chemical meaning from his work. [3]

Affinity (elective, inner) (*Wahlverwandtschaft, innere Verwandtschaft*). A notion taken from Goethe that implies an "internal" connection between two different phenomena rooted in a shared feature and/or a clear historical linkage (for example, between certain religious beliefs and a vocational ethic). The causal relationship is not strong enough to be designated "determining."

A 2001 glossary definition of Weber's conception of an inner elective affinity. [8]

Quotes | On

The following are quotes on Weber:

> "The study of human experience glitters with imaginative and insightful approaches—Marxist modes of production, Levi-Straussian structures, **Weberian** verstehen, the Batesonian mind, and many others, all of which share one characteristic: they pertain to no common universe; most are untranslatable one to another."
>
> — Richard Adams (1988), *The Eight Day* (pg. xiv)

> "**Weber** seems to me very much a man of a particular time. A man of whom it has been said (as it has of others) that he was the last person to know everything of importance that was to be known. A nonsensical idea, of course, but one which point to the extraordinary breadth of his interests in sociology, religion, economics, politics, history, music, and much else besides."
>
> — Christopher Grey (2005) [7]

Quotes | By

The following are quotes by Weber:

> "Power is the probability of realizing one's goals, even against the resistance of others."
>
> — Max Weber (1922), *Economy and Society* [9]

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Further reading

External links

● Max Weber – Wikipedia.

θΔics

In thermodynamics schools, the **MaxEnt school** or "maximum entropy school of thermodynamics", sometimes called the *Janes school*, is a school of thought centered around a combination of the maximum entropy principle, information theory, statistical thermodynamics, Gibbsian thermodynamics, and the 1957 two part paper "Information Theory and Statistical Thermodynamics" of American physicist Edwin Jaynes, in which an attempt was made to derive a statistical thermodynamics interpretation of information theory. [1] American engineer Myron Tribus, who is connected with the MIT school of thermodynamics, is a co-founder of the MaxEnt school of logic.

Etymology

The demarcation of a Jaynes school seems to have arisen via the 1994 paper "Foundations of Non-equilibrium Statistical Mechanics" by English theoretical physicist John Dougherty, who opened his paper to the view that there exist two separate "schools", one based on subdynamics the other on information theory, on which the general foundation of non-equilibrium statistical mechanics can be based on. In coining the name of the latter school, Dougherty stated: [7]

> "The second school, which we shall refer to as the '**Maxent school**', is that associated with Professor ET Jaynes and his collaborators."

In the years to follow, this began to be modified to MaxEnt, with a capital E, or maximal (or maximum) entropy school.

Overview

The maximum entropy school, supposedly, was launched in 1957: [6]

> "The **MaxEnt school** of thermodynamics initiated with two papers published in the *Physical Review* by Edwin Jaynes in 1957."

The "MaxEnt theory", MaxEnt approach, MaxEnt view, or MaxEnt formulation of nonequilibrium statistical thermodynamics, is a logic which is said to consist of an algorithm involving the maximization of Shannon information entropy, subject to the constraints imposed by the available information. [2] Other terms often used to describe the teachings or theory of this school of thought include "MaxEnt workshops", "MaxEnt models", etc.

The Janes school is sometimes said to be intertwined with Bayesian-methods, the statistics and probability methods of English mathematician Thomas Bayes: [7]

> "Jaynes has been accused of exaggerating the differences between the 'orthodox' probability school—Fisher and frequentist company—and his **MaxEnt school** of Bayesian/Laplacian revivalists."

The following 2004 quote gives an in context synopsis of the subject: [2]

> "How is it that Jayne's MaxEnt formulation of nonequilibrium statistical mechanics has for so long failed to be accepted by the majority of scientists when the logic of it is precisely that of Boltzmann and Gibbs? Part of the answer lies with the relative paucity of published results from the **MaxEnt school**, especially with regard to the new testable predictions far-from-equilibrium."

The idea expressed here is that Prigoginean thermodynamics methods are published and tested in far greater numbers than are Jayne's methods. The following 2001 quote gives another inside perspective of the MaxEnt school:

> “A great deal of work has been done, notably by **Jaynes** and his **school**, in an attempt to justify the maximum entropy principle, but we cannot say that we are any closer to such a justification today than Boltzmann or Szilard ever were.”

This quote here is referring to the 1872 effort of Austrian physicist Ludwig Boltzmann, in his "Further Studies on the Thermal Equilibrium of Gas Molecules", to justify the increase of entropy on probability arguments, particularly via his H-theorem interpretation of entropy as the velocity distribution of particles, and the the later 1929 attempt of Hungarian physicist Leo Szilard, in his “On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings”, to connect information to entropy using Maxwell demon arguments.

Jaynes

In his 1957 two-paper “Information Theory and Statistical Thermodynamics”, American physicist Edwin Jaynes attempted to connect equilibrium thermodynamics, with the statistical mechanics (or statistical thermodynamics) of American engineer Willard Gibbs, with information interpretations. [3]

Tribus

Connected with the MaxEnt school is American engineer Myron Tribus, who learned of Janes' work in 1958, after he had been struggling for ten years with the supposed problem as to explain the connection between the entropy of Clausius and the entropy of Shannon, after being asked this question during is doctoral dissertation examination at UCLA.

In 1959, the year after he read Jaynes' paper, which he considered to be his Rosetta stone, Tribus invited Jaynes to come to UCLA to participate in a two week summer course on information theory and thermodynamics, during which time Tribus learned that Jaynes had been preparing material for a book on probability and its applications; the taught the course together. Although Jaynes never completed his book, Tribus did writing his 1961 *Thermostatics and Thermodynamics: an Introduction to Energy, Information and States of Matter*, based, as he says, “squarely on Ed’s work”; the fundamental ideas in this book taken directly from Jaynes’ work, which was never published. Tribus could only cite Jaynes’ work as “in print”. Tribus' book was the first book publication to attempt to base the laws of thermodynamics on information theory rather than on the classical arguments.

In April 1961, Tribus gave a seminar at MIT on a new way to derive thermodynamics based on information theory. He states that a critical audience, comprised of students of American mechanical engineer Joseph Keenan, founder of the MIT school of thermodynamics, “tried to rip it apart”. Moreover, French mathematician Benoit Mandelbrot was in the audience and quickly attacked the MaxEnt interpretation, saying: “Everyone knows that Shannon’s derivation is in error.”

Beyond this, it happened that information theory founder Claude Shannon was in residence at MIT that week, so Tribus went to see him. Shannon, according to Tribus, “was immediately able to dispel Mandelbrot’s criticism, but went on to lecture me on his misgivings about using his definition of entropy for applications beyond communication channels.” [4]

Perspective of

This school is generally rejected by main stream thermodynamicists as an unfounded mathematical contrivance, on the basis that American electrical engineer Claude Shannon's famous 1948 "A Mathematical Theory of Communication" has absolutely nothing to do with thermodynamics.

Into the 2000s, Jaynes' MaxEnt formulation of nonequilibrium statistical thermodynamics has generally failed to be accepted by the majority of scientists. [5]

Outside of thermodynamics proper, however, there are seem to be numerous practitioners of this school who seem to unassumingly maintain that their theories are based on the second law of thermodynamics.

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External links

â— MaxEnt school – Wikipedia.

θΔics

In statistical thermodynamics, **maximum entropy** is the state of an isolated ideal gas phase system in which the entropy can no longer increase. [1] In other words, entropy reaches its “maximum” possible value when the system finally reaches its dominant macrostate; when that happens, the system has reached the equilibrium state. This state is defined as the thermodynamic system in its largest macrostate. The translation of this term and its description into non-gas phase system, has often led to gross misapplication and misinterpretation.

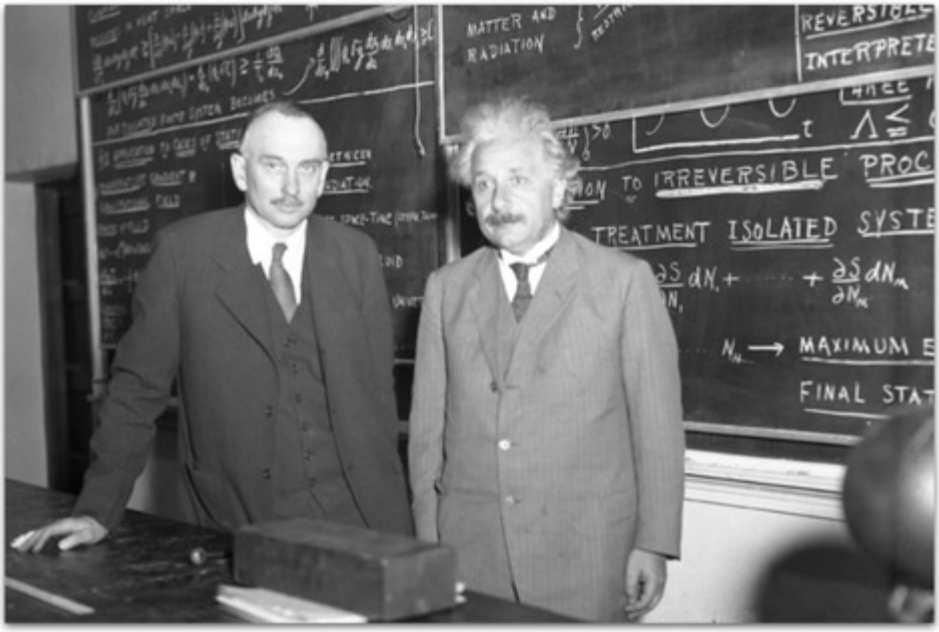

American chemical engineer and cosmologist Richard Tolman and German-born American physicist Albert Einstein at CalTech in 1932 discussing what seems to be **maximum entropy** as a final state (possibly of the universe), radiation as an irreversible process, among other topics.

Living systems

In 1944, for living systems, Austrian physicist physicist Erwin Schrödinger incorrectly equated the state of maximum entropy with death. [2]

Heterogeneous systems

In more complex systems, i.e. ones that are not composed of ideal gas phase particles, namely any material system, one must study both the entropy and the energy of the system to determine the criteria of stability and equilibrium. [3]

Social systems

In 1990, American sociologist Kenneth Bailey stated that maximum entropy in a social system is a “state of complete system disintegration or social disorganization”, of no use to social theorists. [4]

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θΔics

In science, **maximum entropy principle**, aka "MEP", MaxEnt principle, or “maximum entropy production principle” (MEPP) , as some refer to it, states that when an inference is made on the basis of incomplete information, it should be drawn from the probability distribution that maximizes the entropy (Shannon entropy) subject to the constraints on the distribution, and subsequently the maximum entropy probability distribution is the one which is maximally noncommittal with regard to the missing information, whereby the resulting maximum entropy probability distribution is supposed to have a maximum uncertainty or entropy associated with it. [1]

Overview

In 2015, English biosphere researcher Keith Skene, in his “Life’s a Gas: a Thermodynamic Theory of Biological Evolution”, reviewed by Umberto Lucia, attempted to connect the so called “maximum entropy production principle” (MEPP) to Marcellin Berthelot's heat theory of affinity, John Strutt’s dissipation function, Lars Onsager’s barrier reduction entropy model, and then to Hans Zeiglier, whom he credits with the formal definition of MEPP, and then to Edwin Jaynes’ *Entropy Concentration Theory*. [4]

The principle supposedly came from the 1957 work of American physicist Edwin Jaynes who utilized Shannon entropy in attempts to find connections to Clausius entropy. [2] This principle is associated with the MaxEnt school of thermodynamics.

The principle is now mostly used in computer science and information theory, having basically no connection to thermodynamics, albeit its name “maximum entropy principle” is often found mixed into uneducated attempts at applications of the second law to the study of physical systems, such as ecological systems, or evolution, etc. [3]

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Further reading

â— Plischke, Michael and Bergersen, Birger. (1994). *Equilibrium Statistical Physics* (section 2.5: Maximum Entropy Principle, pgs. 48-51). World Scientific.

External links

â— Principle of maximum entropy – Wikipedia.
â— Maximum entropy principle – N. Sukumar, UC Davis.

θΔics

In hmolscience, **maximum power principle**, aka "Lotka principle" (Adams, 1988), refers to a number of varieties of conjectured "energy flux" principles related to "natural selection" of evolution, generally alluding to the proposition that systems which flux the most energy through them survive the best according to natural selection.

Overview

In 1922, Alfred Lotka, in his “Contributions to the Energetics of Evolution”, was referring to a “principle of maximum energy flux”, described as follows: [3]

> “In every instance considered, natural selection will so operate as to increase the total mass of the organic system, to increase the rate of circulation of matter through the system, and to increase the total energy flux through the system, so long as there is presented an un-utilized residue of matter and available energy. This may be expressed by saying that **natural selection tends to make the energy flux through the system a maximum**, so far as compatible with the constraints to which the system is subject. It is not lawful to infer immediately that evolution tends thus to make this energy flux a maximum. For in evolution two kinds of influences are at work: selecting influences, and generating influences.”

In 1976, Leigh van Valen, in his “Energy and Evolution”, was referring to Lotka’s principle as a “third law of thermodynamics”. [4]

In 1976, Howard T. Odum, together with Elisabeth Odum, in their *Energy Basis for Man and Nature* (pg. 39), via blurry citation to the ideas of Alfred Lotka (c.1924), defined his so-called “maximum power principle”, stylized by him as the third law of energetics, in a confused or grasping way, as follows: [1]

> “Systems that survive are those which get the most energy and use energy most effectively in completion with other systems.”
>
> — Howard Odum (1976), *Energy Basis for Man and Nature* (pg. 39)

> “Systems which use energy best survive.”
>
> — Howard Odum (1976), *Energy Basis for Man and Nature* (pg. 39); paraphrase by Richard Adams (1988) in *The Eighth Day* (pg. 38)

> “Those systems that survive in the competition among alternative choices are those that develop more power inflow and use it best to meet the needs of survival.”
>
> — Howard Odum (1976), *Energy Basis for Man and Nature* (pg. 40); cited by Richard Adams (1988) in *The Eighth Day* (pg. 38)

(add)

Commentary

In 1988, Richard Adams, in his *The Eight Day*, in commentary on Odum’s presumed Lotka-based “maximum power principle”, commented the following: [2]

> “There is little in the literature of society, at least, that suggests that those who ‘develop more power inflow’ are necessarily also those who ‘use it best to meet the needs of survival’. Indeed, the minimum principle argues that survival often may be achieved by the verse process.”

(add)

See also

â— Prigogine-Wiame theory | Minimum entropy production principle

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External links

â— Maxum power principle – Wikipedia.
â— Maximum power principle – EcologyCenter.us.

θΔics

In mononyms, **Maxwell** [CR:24] is the surname of James Maxwell, the curator of the Maxwell equations of the electromagnetic field; the only person ever said to understand the work of Willard Gibbs.

- Maxwell's demon
- Maxwell's equations
- Maxwell's relations
- Maxwell's thermodynamic surface
- Maxwell on the soul
- Maxwell-Boltzmann distribution

θΔics

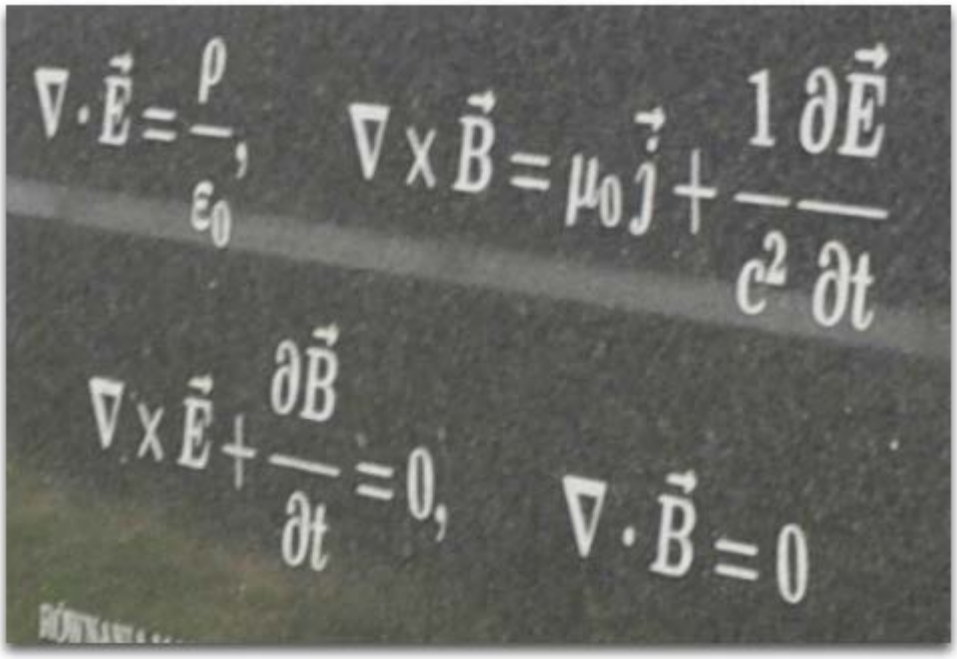

A photo of Maxwell's equations carved into the granite of the equations wall (O) of the New Technology Center, University of Warsaw.

In geniuses on, **Maxwell on the soul** (Ñº) refers to the published statements, views, and opinions of James Maxwell on the nature, topic, or subject of the soul and or connected topics of morality and continuity theory.

James Maxwell's last poem, "A Paradoxical Ode" (1878), opened to the statement that, as per poetry testing views go, he believed that his soul was an amphicheiral knot.

Moral philosophy | Three laws of right action

On 14 Mar 1850, Maxwell, age 18.8, wrote the following to his classics scholar friend Lewis Campbell, his other best-intellectual buddy, alongside Peter Tait, from Edinburgh Academy; his first seeming transmitted views on the nature of the soul, stimulated by his college course in moral philosophy, at the University of Edinburgh, taught by John Wilson: [1]

> Wilson, after having fully explained his own opinions, has proceeded to those of other great men: Plato, Aristotle, Stoics, Epicureans. He shows that Plato's proof of the immortality of the soul, from its immateriality, if it be a proof, proves its preexistence, the immortality of beasts and vegetables, and why not transmigration? (Do you remember how Raphael tells Adam about meats and drinks in Paradise Lost ?) (Greek Iambics, if you please.)
>
> He quarrels with Aristotle's doctrine of the golden mean,—"a virtue is the mean between two vices,"—not properly understanding the saying. He chooses to consider it as a pocket rule to find virtue, which it is not meant to be, but an apophthegm or maxim, or dark saying, signifying that as a hill falls away on both sides of the top, so a virtue at its maximum declines by excess or defect (not of virtue but) of some variable quantity at the disposal of the will. Thus, let it be a virtue to give alms with your own money, then it is a greater virtue to pay one's debts to the full.
>
> Now, a man has so much money: the more alms he gives up to a certain point, the more virtue. As soon as it becomes impossible to pay debts, the virtue of solvency decreases faster than that of almsgiving increases, so that the giving of money to the poor becomes a vice, so that the variable is the sum given away, by excess or defect of which virtue diminishes, say I; so that Wilson garbles Aristotle,—but I bamboozle myself.
>
> I say that some things are virtues, others are virtuous or generally lead to virtue. Substitute goods for virtues, and it will be more general: thus, wisdom, happiness, virtue, are goods, and cannot be in excess; but knowledge, pleasure, and — what ? (please tell me, is it propriety, obedience, or what is it ?) lead to the other three, and are not so much goods as tending to good; whereas particular knowledges, pleasures, and obediences may be in excess and lead to evils. I postpone the rest of my observations to my Collection of the Metaphysical Principles of Moral Philosophy founded on the three laws of Liberty, Equality, Fraternity, thus expressed:
>
> 1. That which can be done is that which has been done; that is, that the possibility (with respect to the agent) of an action (as simple) depends on the agent having had the sensation of having done it. [N1]
> 2. That which ought to be done is that which (under the given conditions) produces, implies, or tends to the greatest amount of good (an excess or defect in the variables will lessen the good and make evil).
> 3. Moral actions can be judged of only by the principle of exchange; that is (1) our own actions must be judged by the laws we have made for others; (2) others must be judged by putting ourselves in their place.

(add discussion)

Moral philosophy | Ten parts

In circa Jun 1850, Maxwell, turning 19, in a letter to Lewis Campbell, expanded on the above three laws right action, as follows: [2]

> The only regular college science that I have thought of lately is moral philosophy. Whether it is an Oxford science I know not; but it must be, if not taught, at least interesting; so I purpose to fill up this letter with unuttered thoughts (or crude), which, as they are crammed into words, may appear like men new waked from sleep, who leap in confusion into one another's breeches, hardly fit to be seen of decent men. Then think not my words mad if their clothes fit them not, for they have not had an opportunity of trying them on before.
>
> There are some moral philosophers whose opinions are remarkable for their general truth and good sense, but not for their utility, fixity, or novelty. They tell you that **in all your actions you ought to be virtuous**, that benevolence is a virtue, that lawful rulers ought to be obeyed, that a man should give ear to his conscience. Others tell you of unalterable laws of right and wrong, of eternal truth and the everlasting fitnesses of things. Others of the duty of following nature, of every virtue between two vices (Aristotle), and of the golden mean. That a man should do what is best on the whole (1) for himself; (2) for other men only, and not himself; (3) for the whole universe, including himself, and so on.
>
> Now, I think that the answers to the following questions should be separate parts of moral philosophy:
>
> 1. What is man? This is the introduction, and is called statically or proper metaphysics.
> 2. What are the laws of human action? Action being all that man does—thought, word, deed.
> 3. What are the motives of human actions?
> 4. What actions do men perform in preference to what others, and why?
> 5. What is the principle by which men judge some actions right, others wrong?
> 6. What do particular men think of this principle? What are their doctrines?
> 7. What is the best criticism of right and wrong, or what (to us) is absolute right?
> 8. What are the best motives of human actions?
> 9. How are these motives to be implanted without violating the laws of human action?
> 10. What might, or rather what will, mankind become after this has been effected?
>
> Moral philosophy differs from natural philosophy in this, that the more new things we hear of in natural philosophy the better; but in moral philosophy the old things are best, so that a common objection to moral philosophy is that everybody knows it all before. If a man tells you that tyranny and anarchy are bad things, and that a just and lawful government is a good thing, it sounds very fine, but only means that when men think the government bad from excess or defect they give it the name of tyranny and anarchy. The ancient virtue of Tyrannicide was a man's determination to kill the king whenever he displeased him. Thus it is easy to call a dog a bad name to beat him for. But there are other parts of moral philosophy in which there are

differences of opinion, such as the nature of selfishness, self-love, appetites, desires, and affections, disinterestedness (what a word for a rush at!), which belong to the first three questions, and so on. I have told you something (pp. 84-85) of three laws which I had been considering. In all parts of moral philosophy these three laws seem to meet one, and in each system of morals they take a different form. Now, that I might not deceive myself in thinking that I was safe out of the hands of the philosophers who argue these matters, I have been looking into the books of moralists the most opposed to one another, to see what it is that makes them differ, and wherein they agree. The three principles concerning the nature of man are continually changing their shape, so that it is not easy to catch them in their best shape. Nevertheless:

Lemma: Metaphysics.—A man thinks, feels, and wills, and therefore metaphysicians give him the three faculties of cognition, feeling, and conation.

Cognition is what is called understanding,- and is most thought of generally. Feelings are pleasures, pains, appetites, desires, aversions, approval and disapproval, love, hate, and all affections.

Conations are acts of will, whatever they be.

Now to move a man's will it is necessary to move his affections. (How? Wait !) For no convictions of the understanding will do, for a man does what he likes to do, not what he believes to be best for himself or others. The feelings can only be moved by notions coming through the understanding, for cognition is the only inlet of thoughts. Therefore, although it can be proved that self-love leads to all goodness, or, in other words, that goodness is happiness, and self loves happiness, yet it can also be proved that men are not able to act rightly from pure self-love; so that though self-love is a very fine theoretical principle, yet no man can keep it always in view, or act reasonably upon it. Now, most moralists take for granted that the end which men, good or bad, pursue is their own happiness, and that happiness, false or true, is the **motive of every action**, and that it is the only right motive. Others say that benevolence is the only virtue, and that any action not done expressly for the good of others is entitled to no praise.

Most of the ancients, and Hobbes among the moderns, are of the first opinion. Hutcheson and Brown (I think) are of the second, and call the first selfish philosophers and the selfish school. A few consider benevolence to the whole universe as the proper motive of every action, but they all (says Macintosh) confound men's motives with the criterion of right and wrong, the reason why a thing is right, and that which actually causes a man to do it. In every book on moral philosophy some reference is made to that precept or maxim, which is declared to be the spirit of the law and the prophets (see Matt. vii. 12), and the application of it is a good mark of the uppermost thoughts or mode of thinking of the author.

Hobbes lays down as the first agreement of men to secure their safety, that a man should lay down so much of his natural liberty with respect to others, as he wishes that other men should to him. Hobbes having shown that men, in what the poets and moralists call a state of nature (that is, of equality and liberty, and without government), must be in a state of war, every man against every other, and therefore of danger to every man, deduces the obligation of obeying the powers that be from the necessity of power to prevent universal war. Adam Smith's theory of moral sentiments (which is the most systematic next to Hobbes) is that men desire others to sympathise with them, and therefore do those things which may be sympathised with; that is, as Smith's opponents say, men ought to be guided by the desire of esteem and sympathy. Not so. Smith does not leave us there, but I suppose you have read him, as he is almost the only Scotch moral philosopher.

As it is Saturday night I will not write very much more. I was thinking today of the duties of [the] cognitive faculty. It is universally admitted that duties are voluntary, and that the will governs understanding by giving or withholding attention. They say that understanding ought to work by the rules of right reason. These rules are, or ought to be, contained in logic; but the actual science of logic is conversant at present only with things either certain, impossible, or entirely doubtful, none of which (fortunately) we have to reason on. Therefore the true logic for this world is the calculus of probabilities, which takes account of the magnitude of the probability (which is, or which ought to be in a reasonable man's mind). This branch of

math, which is generally thought to favour gambling, dicing, and wagering, and therefore highly immoral, is the only "Mathematics for Practical Men," as we ought to be. Now, as human knowledge comes by the senses in such a way that the existence of things external is only inferred from the harmonious (not similar) testimony of the different senses, understanding, acting by the laws of right reason, will assign to different truths (or facts, or testimonies, or what shall I call them) different degrees of probability. Now, as the senses give new testimonies continually, and as no man ever detected in them any real inconsistency, it follows that the probability and credibility of their testimony is increasing day by day, and the more a man uses them the more he believes them. **What is believing?** When the probability (there is no better word found) in a man's mind of a certain proposition being true is greater than that of its being false, he believes it with a proportion of faith corresponding to the probability, and this probability may be increased or diminished by new facts. This is faith in general. When a man thinks he has enough of evidence for some notion of his he sometimes refuses to listen to any additional evidence pro or con, saying, "It is a settled question, *probatis probata*; it needs no evidence; it is certain." This is knowledge as distinguished from faith. He says, "I do not believe; I know." "If any man thinketh that he knoweth, he knoweth yet nothing as he ought to know." This knowledge is a shutting of one's ears to all arguments, and is the same as "Implicit faith" in one of its meanings. "Childlike faith," confounded with it, is not credulity, for children are not credulous, but and out sooner than some think that many men are liars. I must now to bed, so good night; only please to write when you get this, if convenient, and state the probability of your coming here. We perhaps will be in Edinburgh when the wise men are there.

(add discussion)

Maxwell's great plan

On 7 Mar 1852, Maxwell, age 20.8, in a letter to Lewis Campbell, gave the following draft outline of his so-named "great plan": [6]

> "My great plan, which was conceived of old, and quickens and kicks periodically, and is continually making itself more obtrusive, is a plan of Search and Recovery, or Revision and Correction, or Inquisition and Execution, etc.
>
> The Rule of the Plan is to let nothing be willfully left unexamined. Nothing is to be holy ground consecrated to Stationary Faith, whether positive or negative. All fallow land is to be ploughed up, and a regular system of rotation followed. All creatures as agents or as patients are to be pressed into the service, which is never to be willingly suspended till nothing more remains to be done; i.e. till A.D. + oo.
>
> The part of the rule which respects self-improvement by means of others is: "Never hide anything", be it weed or no, nor seem to wish it hidden. So shall all men passing by pluck up the weeds and brandish them in your face, or at least display them for your inspection (especially if you make no secret of your intention to do likewise). (I speak not here literally of the case of those who revise each other's faults every night, and quarrel before the month is out, but you did not so misunderstand me.)
>
> Again I assert the Right of Trespass on any plot of Holy Ground which any man has set apart (as the rustics did their Gude-man's Rig) to the power of Darkness. Such places must be exorcised and desecrated till they become fruitful fields. Again, if the holder of such property refuse admission to the exorcist, he ipso facto admits that it is consecrated, and that he fears the power of Darkness. It may be that no such darkness really broods over the place, and that the man has got a habit of shutting his eyes in that field, which makes him think so.
>
> Now I am convinced that no one but a Christian can actually purge his land of these holy spots. Any one may profess that he has none, but something will sooner or later occur to everyone to show him that part of his ground is not open to the public. Intrusions on this are resented, and so its existence is demonstrated. Now, I do not say that no Christians have enclosed places of this sort. Many have a great deal, and everyone

has some. No one can be sure of all being open till all has been examined by competent persons, which is the work, as I said before, of eternity. But there are extensive and important tracts in the territory of the scoffer, the Pantheist, the Quietist, Formalist, Dogmatist, Sensualist, and the rest, which are openly and solemnly Tabooed, as the Polynesians say, and are not to be spoken of without sacrilege.

Christianity—that is, the religion of the Bible—is the only scheme or form of belief which disavows any possessions on such a tenure. Here alone all is free. You may fly to the ends of the world and find no God but the Author of Salvation. You may search the Scriptures and not find a text to stop you in your explorations. You may read all History and be compelled to wonder but not to doubt.

Compare the God of Abraham, Isaac, and Jacob with the God of the Prophets and the God of the Apostles, and however the Pantheist may contrast the God of Nature with the "Dark Hebrew God," you will find them much liker each other than either like his.

The Old Testament and the Mosaic Law and Judaism are commonly supposed to be "Tabooed" by the orthodox. Sceptics pretend to have read them, and have found certain witty objections and composed several transcendental arguments against "Hebrew O' Clo'," which too many of the orthodox unread admit, and shut up the subject as haunted. But a Candle is coming to drive out all Ghosts and Bugbears. Let us all follow the Light."

(add discussion)

Of note, on this quote, creationist (Ñº) Ian Hutchinson (1998) does battle with materialist Ian Tolstoy (1981), asserting that Tolstoy's opinions were off, in some way. [7]

Origin of evil | Objective vs subjective evil

On 20 Mar 1852, Maxwell, in a letter to Lewis Campbell, on the subject of "objective evil" (see: objective morality) vs "subjective evil" (see: subjective morality), had the following to say: [5]

"After Chapel I was at Litchfield's, where he, Farrar, Pomeroy, and Blakiston, discussed eternal punishment from 8 to 12. Men fall into absurdity as soon as they have settled for themselves the question of the origin of evil. A man whose mind is "made up" on that subject is contradictory on every other; one day he says that the man that can be happy in such a world is a brute, and the next day that if a man is not happy here he is a moping fool. At last they assert the Cretan dilemma, that if a man says that man is ignorant and foolish, it was ignorant and foolish to say so. Solomon, they say, was used up when he wrote Ecclesiastes, and said "all is vanity" in a relative sense, having himself been so. Solomon describes the search after happiness for its own sake and for the sake of possession. It is as if a strong man should collect into his house all the beauty of the world, and be condemned to look out of the window and marvel that no good thing was to be seen. "No man can eat his cake and have it." I would add that what remains till tomorrow will stink.

As for evil being unripe good, I say nothing with respect to objective evil, except that it is a part of the universe which it may be the business of immortal man to search out forever, and still see more beyond. We cannot understand it because it is relative, and relative to more than we know. But subjective evil is absolute; we are conscious of it as independent of external circumstances; its physical power is bounded by our finitude, bodily and mental, but within these its intensity is without measure. A bullet may be diverted from its course by the medium through which it passes, or it may take a wrong one owing to the unskillfulness of the shooter, or the intended victim may change his place; but all this depends, not on the will of the shooter, but on the ignorance of his mind, the weakness of his body, the resistance of inert matter, or the subsequent act of another agent; the bullet of the murderer may be turned aside to drive a nail, or what not, but his will is independent of all this, and may be judged at once without appeal."

(add discussion)

Other

In 1856, Maxwell, in his “Analogies in Nature”, (add)

In 1878, Maxwell penned his last poem “A Paradoxical Ode”, wherein he stated that his soul is an amphicheiral knot.

American physical economist Philip Mirowski (1989) asserts that Maxwell, in his “Analogies in Nature”, suggested that moral laws could be modeled by a process of analogy with natural laws, based on his statement concerning “attractions of pleasure or the pressure of constraint activity”, discussed in the context will or the will of beings. [3]

Quotes

The following are related quotes:

> “Activity requires objectivity. If people’s souls are made to go through maneuvers before a mirror, they get hypochondriac. Objectivity alone is favorable to the free circulation of the soul.”
>
> — James Maxwell (1852), “Letter to Lewis Campbell”, Feb 10 [4]

> “Have you seen Nageli in *Nature*? He is of the school which supposes that we think as well as we do is the result of the deliberations of *n* plastidule souls in every one of the *α* molecules of us. Now if *m* Masters of Arts, sleeping within *r* of Great St Mary constitute the Electoral Roll, the wisdom of the soul of that Roll must be *mnα* times that of a plastidule soul. The acts of the Roll are on record. Calculate the wisdom 1st of an MA 2nd of a plastidule soul. dp/dt.”
>
> — James Maxwell (1877), “Letter to Peter Tait”, Dec 12 (Ñº)

Notes

N1. Maxwell often insisted on this in conversation, with especial reference to our command of the muscles depending on experience of the muscular sense. [1]

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θΔics

In thermodynamics, **Maxwell-Boltzmann distribution** refers to the Gaussian-shaped distribution of particle speeds of an ideal gas system that accords to the Boltzmann chaos assumption, at equilibrium, according to which velocities are uniquely distributed per each degree of temperature. The Maxwell-Boltzmann distribution is the centerpiece of the kinetic theory of gases.

History

The distribution originated in the 1857 paper "On the Nature of the Motion which we Call Heat" by German physicist Rudolf Clausius, in which the speeds of atoms were calculated.

In 1860, Scottish physicist James Maxwell published "On the Dynamical Theory of Gases", showing how, through kinetic theory, to obtain physical properties of gases from the underlying distribution of velocities, which was thus an elaboration of Clausius' theory, taking into account not simply the average speed of the atoms, but their distribution of speeds greater or smaller than the average. [4] Maxwell derived, on somewhat abstract and not entirely persuasive grounds, according to thermodynamics biographer David Lindley, a mathematical form for this distribution, in effect a graph of the typical speeds of atoms in a volume of gas at any given temperature.

In 1868, Austrian physicist Ludwig Boltzmann published a more convincing physical explanation for the formula Maxwell had derived. Boltzmann is said to have did this by analyzing what would happen to a volume of gas rising in the Earth's gravitational field, meaning that pressure would decrease (or volume would increase) with height, according to which Boltzmann showed that Maxwell's formula correctly predicted how the number of atoms or molecules with a particular energy would change. [1] Boltzmann followed this up with his 1872 derivation of his minimum theorem, later to be called an H-theorem, a function that quantified an approached to equilibrium at which point the Maxwell distribution of velocities would exist and that the negative value of this function, i.e. -*H*, was said to be a representative measure of the entropy of the gas.

Human distributions

In 1971, Australian mechanical engineer Roy Henderson monitored the movements of college students on a campus and children on a playground, finding that in both cases their movements fit the Maxwell-Boltzmann distribution, as reported in his high-cited paper "The Statistics of Crowd Fluids". The abstract for Henderson's article reads "the speed (velocity) distribution functions have been measured for three crowd fluids in the gaseous phase. Good agreement is obtained with Maxwell-Boltzmann theory except for a significant deviation near the frequency mode of each distribution. This is attributed to sexual inhomogeneity." [2]

Henderson also noted a difference between the children and college students, according to Fisher, in that the children had much more energy, or rather kinetic energy, and consequently moved at much higher average speeds. [3]

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External links

â— Maxwell-Boltzmann distribution – Wikipedia.

θΔics

In scientific revolutions, **Maxwellian revolution** refers to the revolution in scientific thinking brought about by Scottish physicist James Maxwell's 1865 proposal that light consists of perpendicular electric and magnetic waves.

Overview

In 1925, Gilbert Lewis, in his sub-lecture "Light and the Quantum", gave the following cogent overview of the revolution initiated by Maxwell: [1]

> "The older view that these waves were mechanical disturbances in elastic ether has, however, been entirely abandoned in favor of **Maxwell's** view that they are periodic disturbances in electric and magnetic fields. It is a most remarkable fact that this great **revolution** in physical thought has accomplished without abandoning a single one of the set of mathematical equations derived from the old theory of optics."

German-born American physicist Albert Einstein, cited by Bernard Cohen, said more than once that there was a Maxwellian revolution, and he unambiguously used the word 'revolutionary' in the context of Galileo's Dialogue in 1953. [2]

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θΔics

In scientific demons, **Maxwell's demon** is a hypothetical creature or "very observant and neat-fingered being", conceived in an 1867 thought experiment by Scottish physicist James Maxwell, that is able to open a frictionless trapdoor between two chambers of gas particles at different temperatures in such a manner that it could intelligently sort the particles by speed, thus moving heat, without the expenditure of work, from cold body to a hot body in contradiction to the second law of thermodynamics.

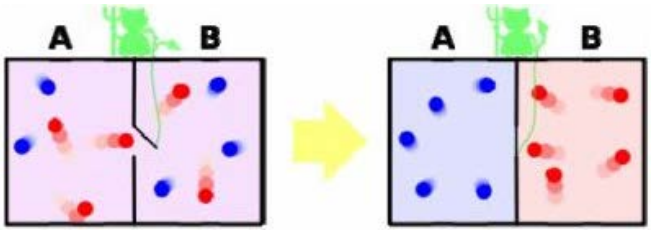

A generic mockup of **Maxwell's demon** (1871 version), shown in green, who operates a trapdoor between two compartments such as to let the fast moving particles pass from compartment A to B, thus producing a temperature difference without the expenditure of work, thus violating the second law.

Letter to Tait | 1867

The creature, as it was originally, was first enunciated by Scottish physicist James Maxwell in a 11 Dec 1867 letter to Scottish physicist Peter Tait, wherein he states: [1]

> "To pick a hole–say in the 2nd law of Ωcs, that if two things are in contact the hotter cannot take heat from the colder without external agency.
>
> Now let A & B be two vessels divided by a diaphragm and let them *contain* elastic molecules in a state of agitation which strike each other and the sides. Let the number of particles be equal in A & B but let those in A have equal velocities, if oblique collisions occur between them their velocities will become unequal & I have shown that there will be velocities of all magnitudes in A and the same in B only the sum of the squares of the velocities is greater in A than in B.
>
> When a molecule is reflected from the fixed diaphragm CD no work is lost or gained.
>
> If the molecule instead of being reflected were allowed to go through a hole in CD no work would be lost or gained, only its energy would be transferred from the one vessel to the other.
>
> Now conceive a finite being who knows the paths and velocities of all the molecules by simple inspection but who can do no work, except to open and close a hole in the diaphragm, by means of a slide without mass.
>
> Let **him** [demon] first observe the molecules [in compartment] A and when he sees one coming the square of whose velocity is *less* than the mean square velocity of the molecules in B let him open the hole and let it go into B. Next let him watch for a molecule of [compartment] B, the square of whose velocity is *greater* than the mean square velocity in A, and when it comes to the hole let him draw the slide and let it go into A, keeping the slide shut for all other molecules."

Letter to Strutt | 1870

In a 6 Dec 1870 letter to John Strutt, Maxwell states: [16]

> "For if there is any truth in the dynamical theory of gases the different molecules in a gas at uniform temperature are moving with very different velocities. Put such a gas into a vessel with two compartments [A and B] and make a small hole in the wall about the right size to let one molecule through. Provide a lid or stopper for this hole and appoint a doorkeeper, very intelligent and exceedingly quick, with microscopic eyes but still an essentially finite being.
>
> Whenever he sees a molecule of great velocity coming against the door from A into B he is to let it through, but if the molecule happens to be going slow he is to keep the door shut. He is also to let slow molecules pass from B to A but not fast ones ... In this way the temperature of B may be raised and that of A lowered without any expenditure of work, but only by the intelligent action of a mere guiding agent (like a pointsman on a railway with perfectly acting switches who should send the express along one line and the goods along another).
>
> I do not see why even intelligence might not be dispensed with and the thing be made self-acting.
> *Moral* The 2nd law of Thermodynamics has the same degree of truth as the statement that if you throw a tumblerful of water into the sea you cannot get the same tumblerful of water out again."

Theory of Heat | 1871

The demon was detailed in a fuller manner in Maxwell's famous 1871 book *Theory of Heat* in a short chapter section entitled "Limitation of the Second Law of Thermodynamics" in which he states that in a system enclosed in an envelope which permits neither volume change nor the passage of heat, in which the temperature and pressure are uniform, it is "impossible to produce any inequality of temperature or pressure without the expenditure of work". This statement, according to Maxwell, is one of the best established facts in thermodynamics and is called the second law of thermodynamics. On this platform, Maxwell lays out the following thought experiment: [2]

> "If we **conceive of a being** whose faculties are so sharpened that he can follow every molecule in its course, such a being, whose

> attributes are as essentially finite as our own, would be able to do what is impossible to us. For we have seen that molecules in a vessel full of air at uniform temperature are moving with velocities by no means uniform, though the mean velocity of any great number of them, arbitrarily selected, is almost exactly uniform. Now let us suppose that such a vessel is divided into two portions, A and B, by a division in which there is a small hole, and that a being, who can see the individual molecules, opens and closes this hole, so as to allow only the swifter molecules to pass from A to B, and only the slower molecules to pass from B to A. He will thus, without expenditure of work, raise the temperature of B and lower that of A, in contradiction to the second law of thermodynamics."

Thomson's demon namesake | 1874

See main: Scientific demon

The term demon, to note, was never used by Maxwell. The actual term "demon" was first introduced by British physicist William Thomson in his 1874 article "Kinetic Theory of the Dissipation of Energy", who states in a footnote: [10]

> "The definition of a **'demon'**, according to the use of this word by Maxwell, is an intelligent being endowed with free will, and fine enough tactile and perceptive organization to give him the faculty of observing and influencing individual molecules of matter."

Left: A 2009 video overview of Maxwell's demon by the Khan Academy. Right: a 2009 **"**Laplace's demon meets **Maxwell's demon"** dialog between James Maxwell's 1867 version of a "being" talking to Pierre Laplace's version of a "being" (Laplace's demon).

Later, Thomson elaborated on the demon in his 1879 lecture "The Sorting Demon of Maxwell". [9] In this lecture, in commentary on the demon, Thomson stated that "the conception of the 'sorting demon' is purely mechanical … It was not invented to help us deal with questions regarding the influence of life and of mind on the motions of matter." [3]

Concerning Demons | 1876

In *circa* 1876, Maxwell sent a undated note to letter entitled 'Concerning Demons' to his associate Scottish physicist Peter Tait, which contains the following: [14]

> Concerning Demons
>
> 1. Who gave them this name? Thomson.
> 2. What were they by nature? Very small BUT lively beings incapable of doing work but able to open and shut valves which move without friction or inertia.
> 3. What was their chief end? To show that the 2nd Law of Thermodynamics has only a statistical certainty.
> 4. Is the production of an inequality of temperature their only occupation? No, for less intelligent demons can produce a difference while stopping all those going the other way. This reduces the demon to a valve. As such a value him. Call him no more a demon but a valve like that of the hydraulic ram, suppose.

Exorcisms

In the decades to follow Maxwell's thought experiment, it soon became clear that such a creature contradicts the second law. It was a puzzle that needed solution. The first exorcism of the demon came from Polish statistical physicist Marian Smoluchowski who in 1912, in a lecture entitled "Experimentally Verifiable Molecular Phenomena that Contradicts Ordinary Thermodynamics", argued that thermal fluctuations would prevent any automatic device from operating successfully as a Maxwell demon. [7] In other words, because of Brownian movement, the door would heat up and begin to vibrate, from the gas molecules colliding against it, and would cease to work as a one-way valve. [1]

In 1929, Hungarian-American physicist Leó Szilárd devoted his thesis "On the Increase of Entropy in a Thermodynamical System by the Action of Intelligent Beings" to Maxwell's demon, noting that the demon would require the use of information. [1]

In 1951, French physicist Léon Brillouin, in his "Maxwell's Demon Cannot Operate: Information and Entropy", is said to have exorcized Maxwell's demon by showing that, to operate properly, it need information about the position and velocities of the molecules. Subsequently, in an isolated, isochoric (constant volume) system with a uniform temperature, the demon can only see black body radiation and therefore cannot operate its valve. The situation, however, may be altered by letting external radiation penetrate the system, thus allowing the demon to "see" the molecules. Hence, for the demon to operate, it will need an external energy source. Said another way, to get the information needed, according to the second law, the demon will consume more negentropy than it will create by working the valve. [8]

Influence

In 1909, American physical historian Henry Adams used the demon in his manuscript *The Rule of Phase Applied to History*. Maxwell's conception of a "sorting demon" also influenced American mathematical child prodigy William James Sidis in the publication of his 1920 *The Animate and the Inanimate*. [4] In literature thermodynamics, Maxwell's demon appears in American author Thomas Pynchon's novels, *The Crying of Lot 49* and *Gravity's Rainbow*. In computer science thermodynamics, Maxwell's demon is currently a hot topic, particularly in information theory, popularized greatly by the book *Maxwell's Demon*, having a 1990 first edition and a 2002 second edition titled *Maxwell's Demon 2: Entropy, Classical and Quantum Information, Computing* (shown adjacent), by authors Harvey Leff and Andrew Rex. [6]

Literature thermodynamics

Polish writer Stanislaw Lem (1921-2006) employs an information theory type of demon in his 1965 *The Cyberiad*, as what he calls a "demon of the second kind", that recognizes when molecules form words, that the demon writes down with a diamond-tipped pen. [13] American writer Thomas Pynchon employs a Maxwell's demon in his novels.

Depictions

The following are a collection of Maxwell demon image depictions:

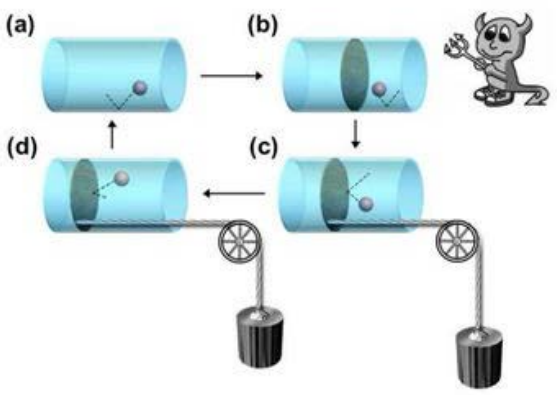

A 2008 rendition of the Szilard demon (or Szilard's heat engine), according to which a chamber of volume *V* contains a one-molecule gas, which can be found in either the right or the left part of the box. (a) Initially, the position of the molecule is unknown. (b) **Maxwell's demon** inserts a partition at the center and observes the molecule to determine whether it is in the right or the left hand side of the partition. He records this information in his memory. (c) Depending on the outcome of the measurement (which is recorded in his memory), the demon connects a load to the partition. If the molecule is in the right part as shown in the figure, he connects the load to the right hand side of the partition. (d) The isothermal expansion of the gas does work upon the load, whose amount is $kT \ln 2$. [15]

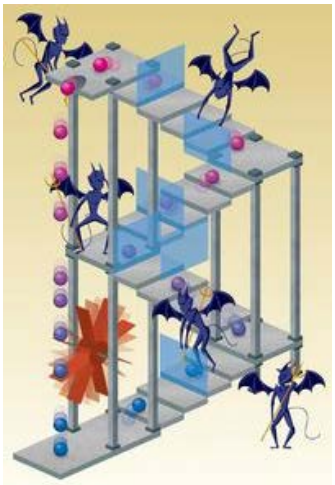

A 2010 Escher house, built of polystyrene beads, with a perpetual motion water wheel being run by a Maxwell's demon. [12]

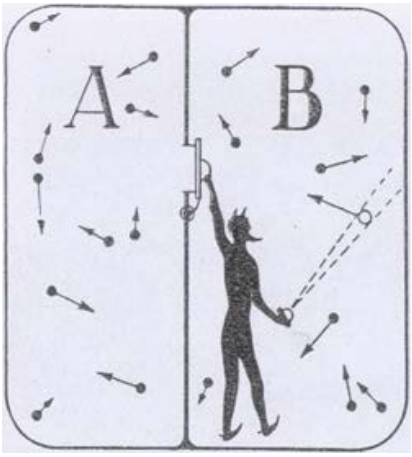

Hungarian-American physicist Leó Szilárd's 1929 interpretation of **Maxwell's demon** as an entity (Szilard's demon) that would need a light source to measure the position of each particle.

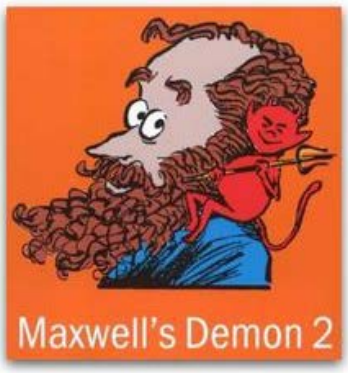

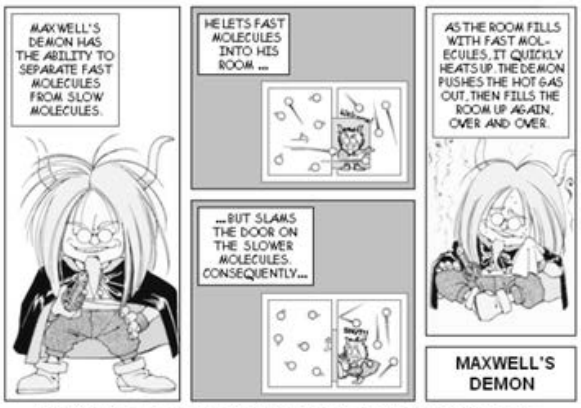

A Russian-drawing of a Maxwell demon. [11]

Harvey Leff and Andrew Rex's 2002 depiction of James Maxwell and his demon. [6]

A Maxwell's demon comic.

Other

In 1967, English physicist Werner Ehrenberg published a ten page essay entitled "Maxwell's Demon". [17]

See also

â— Laplace's demon
â— Szilard's demon
â— Louis Filon

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External links

â— Maxwell's demon – Wikipedia.

θΔics

In equations, **Maxwell's equations** are []

Overview

The following are the four condensed Maxwell equations:

Equation	Formulator	Name
$\nabla \cdot \mathbf{D} = \rho$	Carl Gauss; Maxwell	
$\nabla \cdot \mathbf{B} = 0$	Carl Gauss; Maxwell	
$\nabla \times E = -\frac{\partial B}{\partial t}$	Michael Faraday; Maxwell	
$\nabla \times \mathbf{H} = \frac{\partial \mathbf{D}}{\partial t} + \mathbf{J}$	Andre Ampere; Maxwell	

where *D* is the displacement current, *E* is the electric field, *B* is the magnetic flux density, *H* is the magnetic field strength, *ρ* is the free charge density, and *J* is the free current density.

In 2004, American science historian Robert Crease, stimulated by Graham Farmelo's 2002 eleven equation list, wrote an article in *Physics World* entitled "The Greatest Equations Ever" in which he asked readers to send in their shortlists of great equations, explaining why their nominations belonged on the list and why, after which he received about 120 responses, proposing about 50 different equations. [1] The poll results were published in a followup article, which showed Maxwell's equations and the Euler equation topped the poll. The top 20 greatest equations are show below, listed in order of the number of people who proposed them: first two received about 20 mentions each out of a total of about 120; the rest received between two and 10 each. [2]

Quotes

The following are related quotes:

> "Was it a god that wrote **these signs**, revealing the hidden and mysterious forces of nature around me, which fill my heart with quiet joy?"
>
> — Ludwig Boltzmann (1893), commentary (Ñº) on Maxwell's equations; inspired by opening monologue of Goethe's *Faust*

> "I saw that it was great, greater and greatest, with prodigious possibilities in its power. I was determined to master the book and set to work … It took me several years before I could understand as much as I possibly could. Then I set Maxwell aside and followed my own course. And I progressed much more quickly"
>
> — Oliver Heaviside (1918), person who condense Maxwell's equations with 20 variables down to just two equations in two variables

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External links

â— Maxwell's equations – Wikipedia.

θΔics

In thermodynamics, **Maxwell's relations**, Maxwell's reciprocal relations, not to be confused with Maxwell's equations (of the electromagnetic field) are sets of partial differential equations, derived by James Maxwell, that can be derived if one takes the partial derivative of the Pfaffian form of one of state equations for the thermodynamic potentials or other exact differential state equations. The four main Maxwell relations are: [1]

Relation	Derived from	Name
$\left(\frac{\partial T}{\partial V}\right)_S = -\left(\frac{\partial P}{\partial S}\right)_V$	$dU = TdS - PdV$	Maxwell internal energy relation
$\left(\frac{\partial T}{\partial P}\right)_S = \left(\frac{\partial V}{\partial S}\right)_P$	$dH = TdS + VdP$	Maxwell enthalpy relation
$\left(\frac{\partial P}{\partial T}\right)_V = \left(\frac{\partial S}{\partial V}\right)_T$	$dF = -PdV - SdT$	Maxwell isothermal-isochoric free energy relation
$\left(\frac{\partial V}{\partial T}\right)_P = -\left(\frac{\partial S}{\partial P}\right)_T$	$dG = dH - SdT$	Maxwell isothermal-isobaric free energy relation

There are, however, more relations than this. [4]

Etymology

The name Maxwell's relations, according to Polish-born American thermodynamicist Joseph Kestin, was assigned to Scottish physicit James Maxwell because he was the first who succeeded in writing down expressions that make the partial derivative relationships explicit. [2]

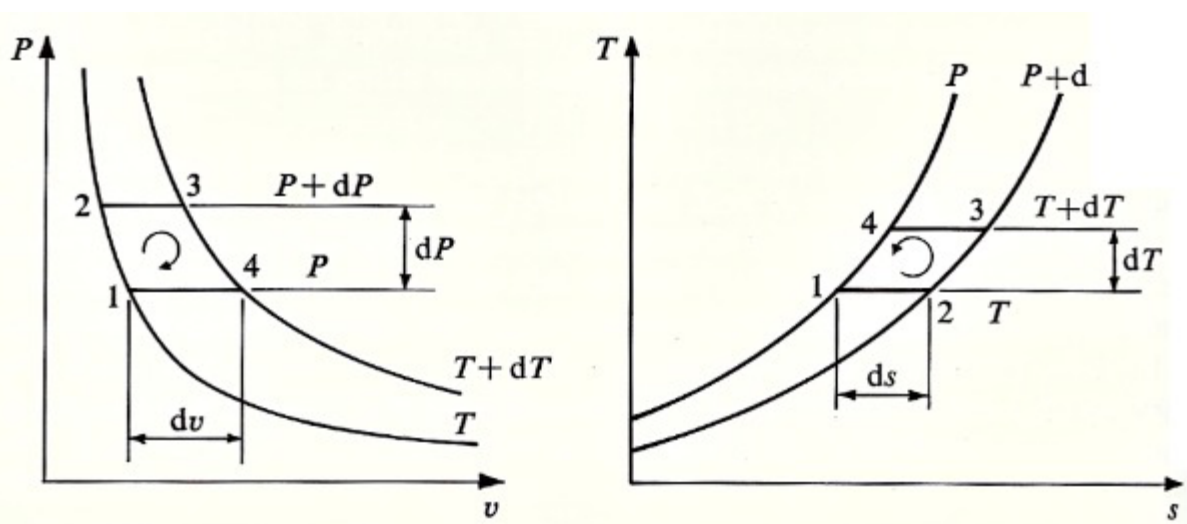

Elementary graphical derivation of the Maxwell isothermal-isobaric free energy relation. [2]

The publication would seem to have been Maxwell's *Theory of Heat*, although this remains to be determined. Moreover, the name of the person who used the name "Maxwell's relations" or Maxwell's equations" needs to be tracked down. [3]

Value

The interest in Maxwell's equations, according to French thermodynamics lexicographer Pierre Perrot, is that they lead to the partial derivative of entropy as a function of physical quantities, such as pressure, volume, and temperature, which can be directly measured by experiment in the laboratory [1]

See also

- Maxwell's demon
- Maxwell's thermodynamic surface
- Maxwell-Boltzmann distribution

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External links

- Maxwell relations – Wikipedia.

θΔics

In thermodynamics, **Maxwell's thermodynamic surface** is a famous three-dimensional plaster surface showing the various states of existence of a theoretical substance, modeled on water, namely gas, liquid, solid, states, and critical point, mapped on a Cartesian coordinates plot of the entropy (x), volume (y), and energy (z) of the body, made by Irish physicist James Maxwell, constructed over the course of about seven months, from November 1874 to July 1875, based on the descriptions of thermodynamics surfaces in American engineer Willard Gibbs' two 1873 papers on the graphical methods of thermodynamics. The "water sculpture" as it has been called was constructed in Cambridge and famously sent to Gibbs in 1875 as a gift of appreciation for his graphical work. [1] As summarized by American science historian Martin Klein in 1983: [20]

> "**Maxwell** expressed his appreciation of Gibbs' **thermodynamic surface** by constructing a model of it for **water** and sending a cast of it to Gibbs and included a fourteen-page discussion of Gibbs surface in the 1875 edition of his textbook."

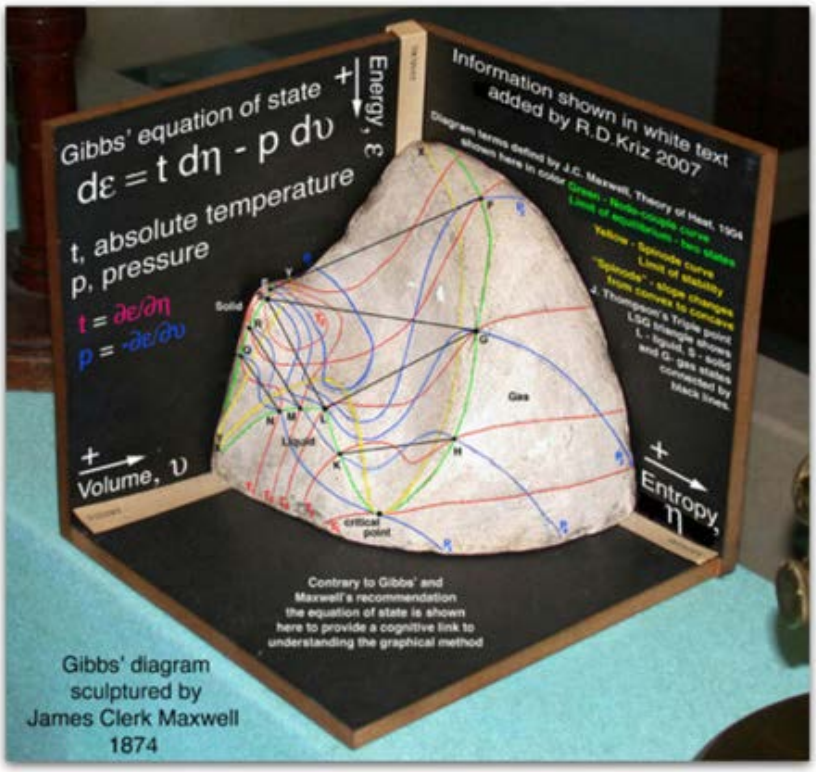

Maxwell's thermodynamic surface, at Cambridge University, with 2007 overlay annotation added on by American engineer Ronald Kriz. [5]

Gibbs 'graphical method', as Maxwell called it, involved a three-dimensional mental model comparable to what we would now call a surface plot a kind of 3D boundary surface graph showing a number of points covering an undulating surface with rises and depressions like small mountains, hills and valleys. As each point on the surface (representing a particular conditions of temperature, volume, and pressure) moves over the surface plot, the conditions change (change of state) in certain predictable ways, giving a deep understanding of the behavior of the complex system based on being able to visualize the complex shape. [10]

Synonyms

Most refer to this sculpture made by Maxwell as Maxwell's thermodynamic surface. Maxwell called it "Gibbs' thermodynamics surface", among other names; others refer to it as a water statue, a water-substance surface, or thermodynamic surface for water, a "plaster cast showing the showing the thermodynamic properties of water" among other variants.

Overview

On his water 'statue', as some have called it, Maxwell located areas where the liquid, vapor, and solid phases coexist, areas where two phases can coexist, and a triangle representing coexistence of all three phases. On the surface of the model, Maxwell carved contours of constant pressure and temperature, as dictated by the equations of the first main principle and second main principle. [9] The surface embodies a number of complex core aspects of thermodynamics in respect to equilibrium. In the words of Gibbs biographer American engineer Lynde Wheeler: [1]

> "It is impossible to describe this **thermodynamic surface** in detail without considerable prolixity and use of the notions and terms of higher geometry."

The molded shape depicts the geometry of the three-dimensional thermodynamic surface of the various states of existence of water: solid, liquid, or gas, shown on Cartesian coordinates of the entropy (x), volume (y), and energy (z) of the body. [2]

In total Maxwell made three surfaces, or possibly six (as discussed below), one he sent to Gibbs at Yale (where it resides currently on display in a glass case outside the Yale University physics department), the other two remained

Scottish engineer James Thomson's 1871 **thermodynamics surface** model, on display at the Hunterian Museum and Art Gallery, University of Glasgow; possibly a precursor or influence to Maxwell's thermodynamic surface.

at Cambridge University, held presently by the Museum at the Cavendish Laboratory at Cambridge, one as pictured adjacent. [5] A step-by-step 2008 poster overview of the construction of Maxwell's surface was compiled by American engineer Ronald Kriz. [12]

Thomson's thermodynamic surface

In 1871, James Thomson constructed a plaster pressure-volume-temperature plot, based on data for carbon dioxide collected by Thomas Andrews. [22]

In July 1871, James Maxwell was writing his *Theory of Heat* and ruminating on a "question that had puzzled him", as Carlo Cercignani reports, in respect to Thomas Andrews' results on the continuity of liquid and gaseous states, and was corresponding with James Thomson, elder brother of William Thomson, and colleague of Andrews in Belfast, who suggested that the isothermal curves for a fluid below its critical temperature, for the transition from the gaseous to the fluid state to be possible—in the traditional pressure-volume diagram—should really show a minimum and maximum rather than a straight line segment parallel to the volume axis, as showed by Andrews' data. In 1873, after reading Gibbs' graphical thermodynamics papers, Maxwell found solution to his query, and thereafter made his thermodynamic surface, which he then mailed to Gibbs as a thank-you present, as discussed further below. [23]

Model substance: fictitious, imaginary, or water?

The question of what substance, whether water, fictitious, or imaginary, Maxwell sculpted and sent to Gibbs is a bit of a mystery. Historically, the surface has always been considered to have been a sculpture of the various states of water, as is exemplified by Gibbs' biographer Muriel Rukeyser 1942 naming of it as a plaster surface a "statue of water" as well as Yale physicist and Gibbs' biographer Lynde Wheeler 1951 definition of it as a "thermodynamic surface for water".

Maxwell's first mention of his surface is found in a November 1874 letter to English chemist Thomas Andrews, concerning the experimental results of his noted article "On the Continuity of the Gaseous and Liquid States of Matter" (1869), an article also cited by Gibbs (1873), Maxwell gives indication that he has made a 'clay model of a fancy surface': [15]

> "Are the numerical results of your former experiments on CO_2 published anywhere except in the *Philosophical Transactions* [1869]? I have just finished a **clay model of a fancy surface**, showing the solid, liquid, and gaseous states, and the continuity of liquid and gaseous states. I am afraid that even CO_2 would not make a very compact model if worked true to scale. But the data as to specific heat in the liquid and solid states are wanting, and also the latent heat of fusion and evaporation."

In February 18th, 1875 letter to Gibbs, English mathematician Alexander Freeman wrote: [3]

> "You will be gratified to hear that Prof. Maxwell has made a **clay model** of your **thermodynamic surface** wherein entropy, energy, and volume are the three coordinates, and is able to explain a great deal by it."

In a July 8th, 1875 letter to Irish engineer James Thomson, Maxwell seems to have indicated that Thomson may have been in the process of making his own cast, suggesting that such models will be displayed in a special glass case at the Cavendish Laboratory: [18]

> “It will give me great pleasure to receive on the part of the Cavendish Laboratory a cast of your thermodynamic model with lines marked on it. We know have got an excellent case with a glass front containing an thermometer by II Gonfio (before 1640, Wollastons optical and thermal apparatus, and others, and we shall have a special place for models such as yours. I enclosed a rough sketch of the lines of Gibbs’ surface, co-ordinates volume [x], entropy [y], energy [z], in an **imaginary substance** in which the principle features of the substance can be represented on a convenient scale.”

This sketch is depicted below, the coloring of which Maxwell goes into some detail explaining their mathematical and thermodynamic meanings: [14]

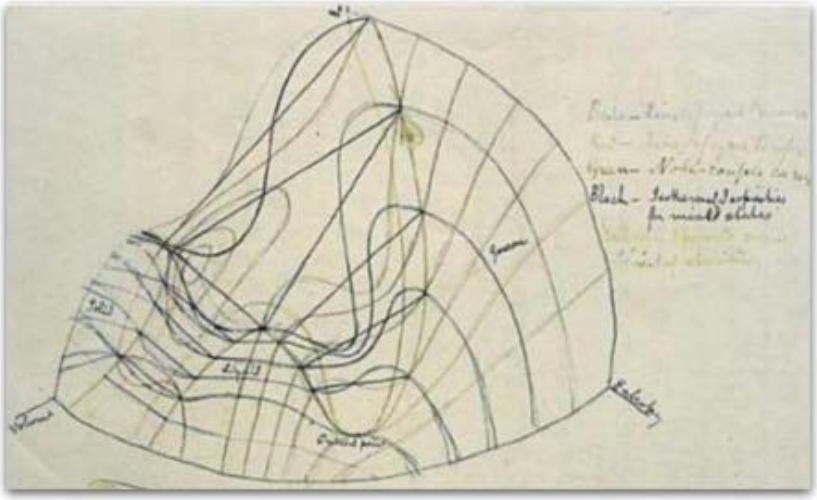

Maxwell's 3D Sketch of the lines on Gibbs’ thermodynamic surface (8 July 1875) [14]

Dark-scale photo of Maxwell's sculpture. [14]

In a follow-up July 15th, 1875 letter to Thomas Andrews, Maxwell comments: [6]

> "I think you know Prof. J. Willard Gibbs' graphical methods in thermodynamics. Last winter I made several attempts to model the surface which he suggests, in which the three coordinates are volume, entropy and energy. The numerical data about entropy can only be obtained by integration from data which are for most bodies very insufficient, and besides it would require a very unwieldy model to get all the features, say of CO_2, well represented, so I made no attempt at accuracy, but modeled a **fictitious substance**, in which the volume is greater when solid than when liquid; and in which, **as in water**, the saturated vapor becomes superheated by compression. When I had at last got a plaster cast I drew on it lines of equal pressure and temperature, so as to get a rough motion of their forms. This I did by placing the model in sunlight, and tracing the curve when the rays just grazed the surface... I send you a sketch of these lines..."

As to the date and details of the statue that Gibbs actually received from Maxwell, the corroborating documentation seems to have disappeared, and moreover there seems to have been a certain amount of mystery surrounding the details of this package. In the 1909 “Josiah Willard Gibbs and His Relation to Modern Science”, for example, American science historian Fielding Garrison indicates that possibly up to six statues were made by Maxwell and that in his typical riddled correspondence style (see for example the origin of the symbol θΔics) that a certain amount of playful mystery accompanied the sending of each statue to its new host: [19]

> “Copies of this **model** were distributed by Maxwell evidently with a certain

amount of playful mystery, for each recipient thought that he was the happiest possessor of (at most) three. The writer knows of at six at least, and possibly there are more."

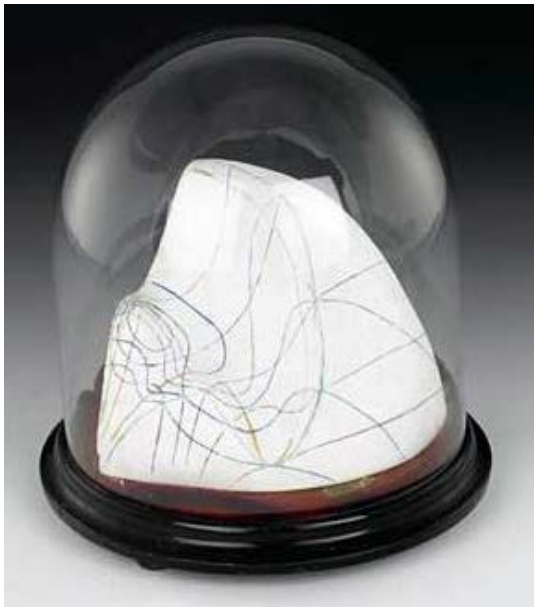

One of Maxwell's thermodynamic surfaces at the National Museums Scotland. (Q)

Gibbs' 1942 biographer Muriel Rukeyser, following her prolonged study of the Gibbs archives material at Yale, specifically states:

> "The statue which Clerk Maxwell sent to Willard Gibbs was a **statue of water**."

In 1951, however, Gibbs biographer, Yale physics professor Lynde Wheeler, specifically states:

> "There is no record of Maxwell's having corresponded with Gibbs on this (or any other) occasion, although one would expect that his gift of the **model** of the **thermodynamic surface** would have been accompanied by a letter of transmittal. This was either lost in transit or mislaid by Gibbs, as no such letter is included in the volume of his correspondence assembled by his brother-in-law nor did Gibbs ever allude to it as far as is known."

From these various letters and opinions, which outline the view that: Maxwell had originally had "made several attempts to model the surface"; that he finished making a (likely first-draft) clay model surface in November (1874); that he was communicating news of the sculpture to Freeman (and thus to Gibbs) in February (1875); that he made detailed color-coded three-dimensional sketch of the model by July 8th (1875); that he had added grooved isothermal and isochoric lines to the model by July 15th (1875); and that he made three physical models in total, if not six or more.

Free energy | available energy

The idea of Gibbs' "free" energy, according to the 2009 views of American engineer Ronald Kriz, is often used in equations but not fundamentally understood as originally developed by Gibbs as a geometric property used to describe triple point thermodynamic processes. Understanding is often disguised by demonstrating use of equations. To understand Gibbs free energy, according to Kriz, it is first necessary to understand Gibbs' original thermodynamic (3D) U-S-V surface. After studying how Maxwell created this surface, the relationship of triple point thermodynamic processes associated with Gibbs' free energy can be fundamentally understood as original proposed by Gibbs without equations. [11]

One should also note that Gibbs never used the term "free energy" but instead used the term "available energy" (graphically signified by section AB, figure 3, below); the former term arising from the 1882 paper "The Thermodynamics of Chemical Processes" by German physicist Hermann Helmholtz, who commented on the earlier graphical work of Gibbs.

Overview | short history

In 1873, American engineer Willard Gibbs published his first thermodynamics paper, "Graphical Methods in the Thermodynamics of Fluids", in which Gibbs uses the two coordinates of the entropy and volume to represent the state of the body. [3]

In his second follow-up paper, "A Method of Geometrical Representation of the Thermodynamic

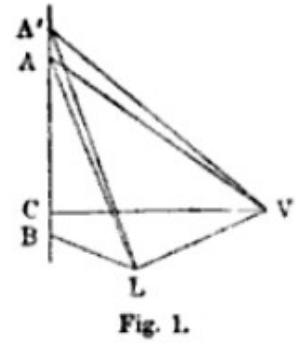

Gibbs 1873 figure 1.

Properties of Substances by Means of Surfaces", published later that year, Gibbs added in the third coordinate of the energy of the body, as shown in the following three diagrams, albeit mostly described via equations and verbally. [4]

To go though one example, of the difficulty involved in conceptualizing, three-dimensionally, Gibbs' logic, figure 3 (below middle), according to Gibbs, shows a plane perpendicular to the axis of *v* (volume) and passing through point A, which represents the initial state of the body. MN is the section of the surface of dissipated energy. Qε and Qη are sections of the planes $\eta = 0$ and $\varepsilon = 0$, and therefore parallel to the axes of ε (internal energy) and η (entropy), respectively. AD and AE are the energy and entropy of the body in its initial state, AB and AC its *available energy* (Gibbs free energy) and its *capacity for entropy* (the amount by which the entropy of the body can be increased without changing the energy of the body or increasing its volume) respectively:

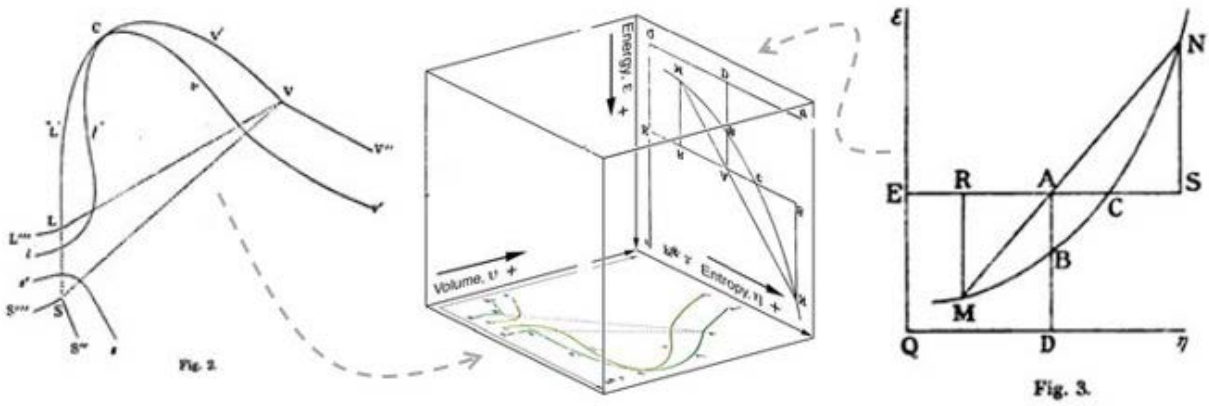

In short, above (left) we have American engineer Willard Gibbs' 1873 figures two and three (above left and middle) used by Scottish physicist James Maxwell in 1875 to create a three-dimensional entropy (x), volume (y), energy (z) thermodynamic surface diagram for water, transposed the two figures of Gibbs (above right) onto the volume-entropy coordinates (transposed to bottom of cube) and energy-entropy coordinates (flipped upside down and transposed to back of cube), respectively, of a three-dimensional Cartesian coordinates; the region AB being the first three-dimensional representation of Gibbs free energy, or what Gibbs called "available energy"; the region AC being its *capacity for entropy*, what Gibbs defined as "the amount by which the entropy of the body can be increased without changing the energy of the body or increasing its volume.

Thus, not only does Gibbs only provide the reader with a two-dimensional picture for a three-dimensional discussion, but he uses the obscure Greek notation for thermodynamic quantities of French engineer Francois Massieu. [13]

In any event, with this addition, Gibbs found it possible to cover in great generality the determination of the "conditions for equilibrium" for any body of variable composition, and in particular to take into account of those states of the body which are not homogeneous (i.e. those consisting of a mixture of more than one state), although still in equilibrium. The difficulty at this point in the work of Gibbs is that it is difficult to visualize the three-dimensional thermodynamic picture that he describes in his 1873 papers. As computer graphics designer Thomas West summarizes: [10]

> “Gibbs wrote about his new method and described it mathematically, yet he made no effort to make a diagram of what was, apparently, clearly seen in his own mind’s eye. The new method and the difficulty in having to visualize such complex material resulted in little attention from Gibbs’ scientific colleagues, especially in the United States. Yet, when Maxwell read Gibbs’ papers in Britain, he immediately saw the power and the potential of the new graphical method and would spend an entire winter constructing a 3D clay model of a surface using Gibbs’ data.”

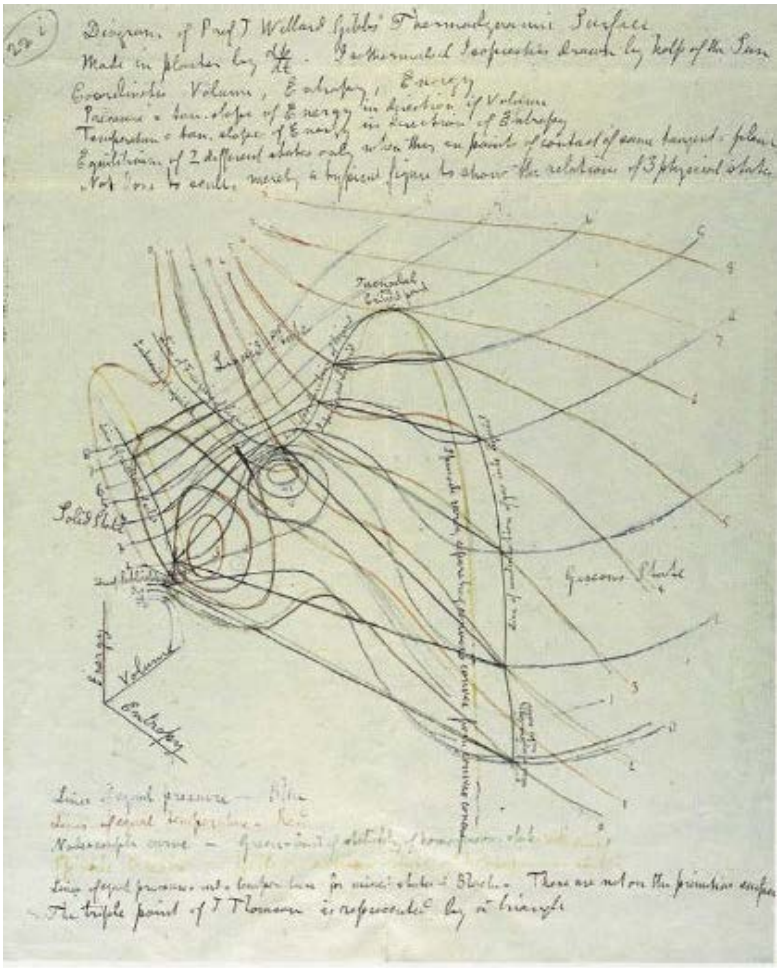

Plate IV. Diagram of the lines on Gibbs' thermodynamic surface, 8 July 1875 (Number 564).

July 8th, 1875 sketches by Maxwell of "Gibbs' thermodynamics surface", as he called it, on a volume, entropy, energy plot. [12]

Maxwell

Maxwell received Gibbs two graphical papers in circa 1873-74. As commented by Gibbs stamp designer American chemical engineer Kenneth Jolls: “Maxwell was so attracted by Gibbs geometrical approach that he spent an entire winter building the model for the energy-entropy-volume surface (USV surface) for water.” [8]

By July, Maxwell was into the final stages of preparation for the publication for the updated edition of his *Theory of Heat* (1875), in which he devoted a fourteen page section to thermodynamic surfaces, entitled "Representation of the Properties of a Substance by Means of a Surface", of which figure 26d "thermodynamic surface", in the section, ended up being the backdrop design on the 2005 commemorative Gibbs stamp. [7]

In conclusion the effect of these models in science, already by 1909, as American science historian Fielding Garrison summarizes: [19]

> “These **solid diagrams** have played a great part in the elaborate studies of the continuity of gaseous and liquid states by Van der Waals and his pupils, of which we have recently witnessed the final triumph in the liquefaction of helium.”

Anecdote

See main: Thermodynamics anecdotes

Gibbs was said to have been flattered and pleased with the gift of the water sculpture from Maxwell. Owing to his typical modesty, however, when students asked about it is said that Gibbs told them it came from a “friend in England”, rather than make mention that it came from the famous James Maxwell. [9] The anecdote seems to have originated from American writer Muriel Rukeyser's 1942 biography on Gibbs, where she states that the student was the father of a "Leonard Bacon". [16]

Education

Into the turn of the 20th-century, college students, such as at the University of California, Berkeley (1900), were attempting to make or reconstruct models of Gibbs surface, similar to what Maxwell did. [27]

See also

- Maxwell's demon

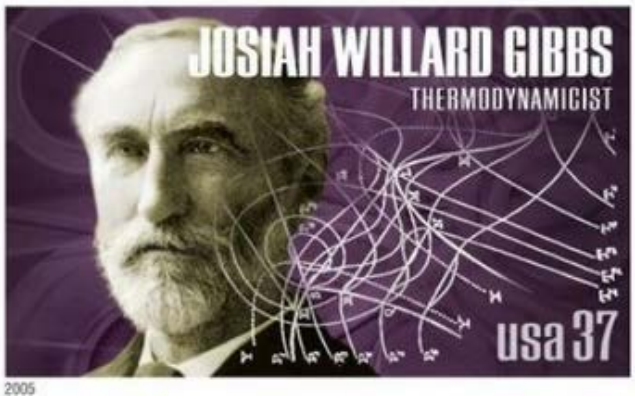

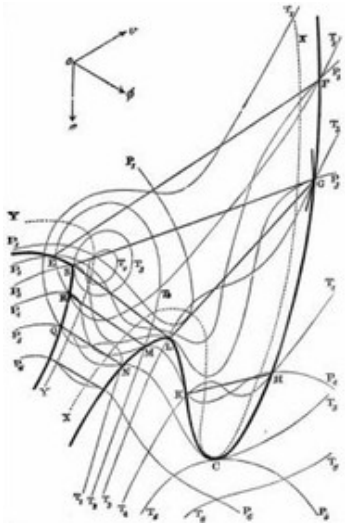

2005 commemorative Gibbs stamp, showing an overlay of figure 26d "thermodynamic surface" of Scottish physisict James Maxwell's 1875 *Theory of Heat*, based on Gibbs' two 1873 graphical thermodynamics papers.

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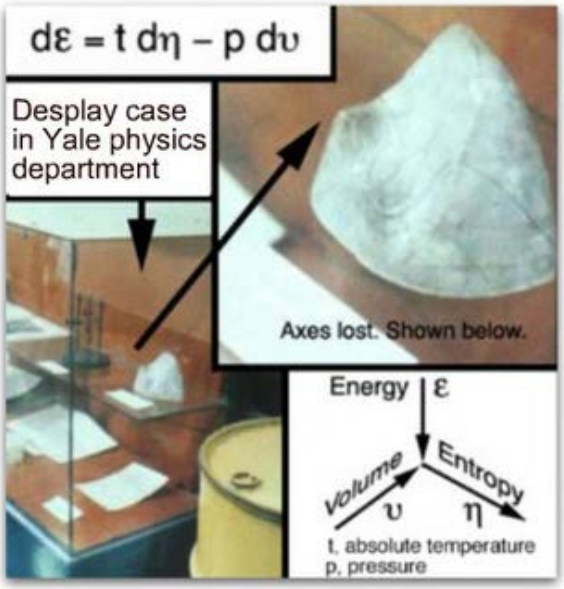

Maxwell's **thermodynamic surface** on display at the physics department at Yale University.

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23. Cercignani, Carlo. (1998). *Ludwig Boltzmann: the Man Who Trusted Atoms* (foreward by Roger Penrose) (pgs. 136-37). Oxford University Press.

Further reading

● Porter, Spencer K. (1971). “The Volume-Entropy-Energy Surface of J. W. Gibbs” (abstract), *J. Chem. Educ.*, 48(4):231.

External links

● Maxwell’s thermodynamic surface – Wikipedia.

θΔics

In graphical thermodynamics, **Maxwell's thermodynamics surface (construction)** refers to the stages of construction of the plaster model thermodynamic surface for water undertaken by James Maxwell over the course of an entire winter (1874-85). The steps in the construction of Maxwell's thermodynamic surface can be summarize according to the following 5-step diagram made in 2008 by American engineer Ronald Kriz: [1]

Properties-colors defined. Similar to Gibbs Fig. 2 Ref.[1] pg.394 where lines are projected onto a three-dimensional energy-entropy-volume surface implied but not shown in this plate, Ref.[3].

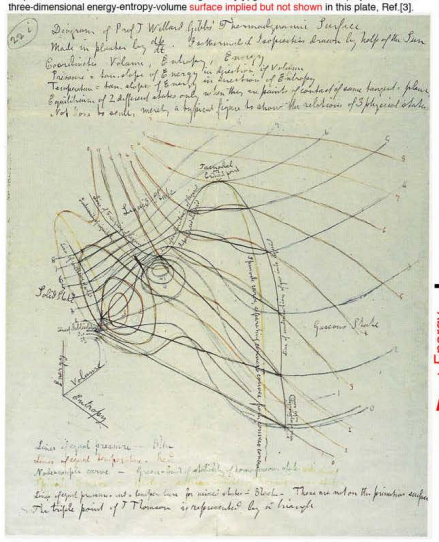

Plate IV. Diagram of the lines on Gibbs' thermodynamic surface, 8 July 1875 (Number 564).

2

+ Energy

+ Energy

Pointing the positive energy coordinate downward allows for the creation of a raised surface not shown in this plate, Ref.[3]. However this format can be cast into a plaster mold with a surface.

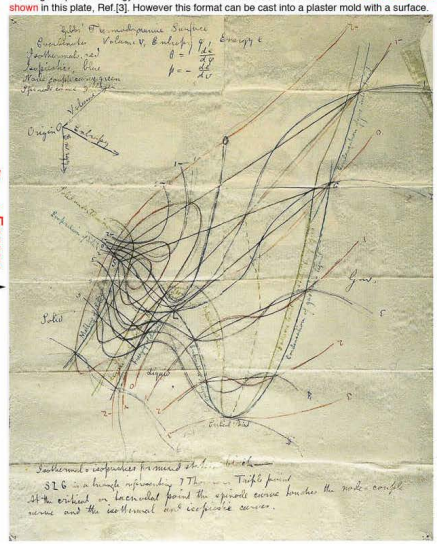

Plate V. Diagram of the lines on Gibbs' thermodynamic surface, 15 July 1875 (Number 567)

Information in letters above published in Fig. 26d Ref. [2] below (lower left) and scribed onto clay and plaster surface below (lower right)

THEORY OF HEAT, J. Clerk Maxwell 207

3

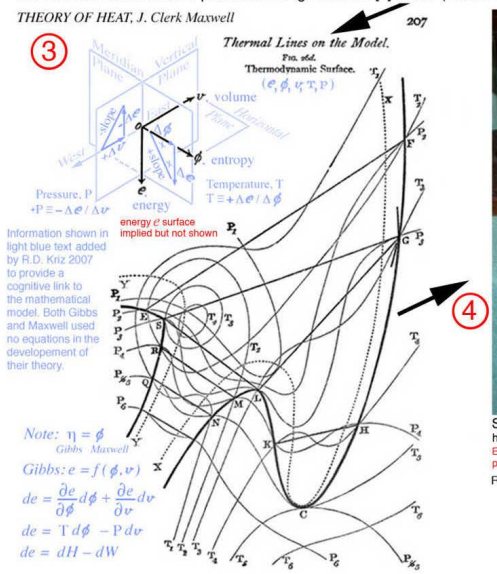

4

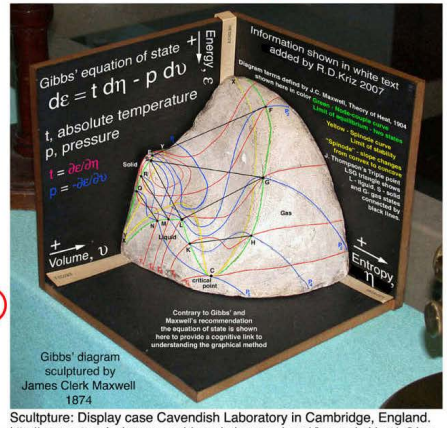

Sculpture: Display case Cavendish Laboratory in Cambridge, England.
http://www-outreach.phy.cam.ac.uk/camphy/museum/area1/images/cabinet1_2.jpg
Energy surface described by Gibbs (1873 Ref.[1]) and created by Maxwell (1874) but not published until 2002, Ref.[3].

References:

1. J.W. Gibbs, "Graphical Methods in the Thermodynamics of Fluids", Part 1 pp.309-342, "A Method of Geometrical Representation of the Thermodynamic Properties of Substances by Means of Surfaces", Part 2 pp.382-404,Transactions of the Connecticutt Academy of Arts and Sciences Vol. II,1873
2. J.C. Maxwell, Theory of Heat, Longmans,Green and Co, pp.195-208,1904
3. Scientific Letters and Papers of J.C. Maxwell, Vol. 3, 1874-1879, Edited by P.M. Harman, Cambridge Universtiy Press, 2002

Detailed description linking Gibbs' and Maxwell's graphical methods.

Thermodynamic Case Study: Gibbs' Thermodynamic Graphical Method.
http://www.sv.vt.edu/classes/ESM4714/methods/Gibbs.html

1

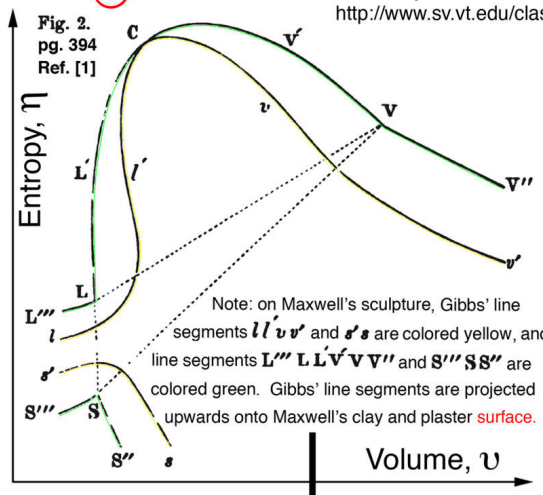

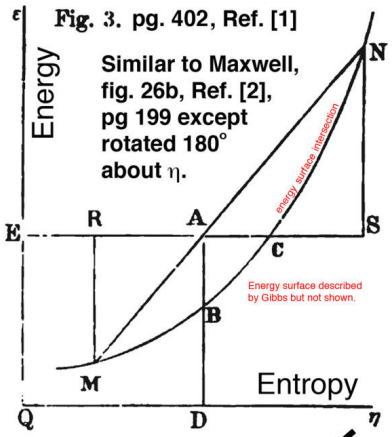

Linking Gibbs' and Maxwell's graphical methods and visual thinking used to create three-dimensional surfaces

5

J.W. Gibbs' Fig.s 2 and 3 above mapped onto J.C. Maxwell's sculptured coordinate planes below.

Maxwell's sculpture coordinates

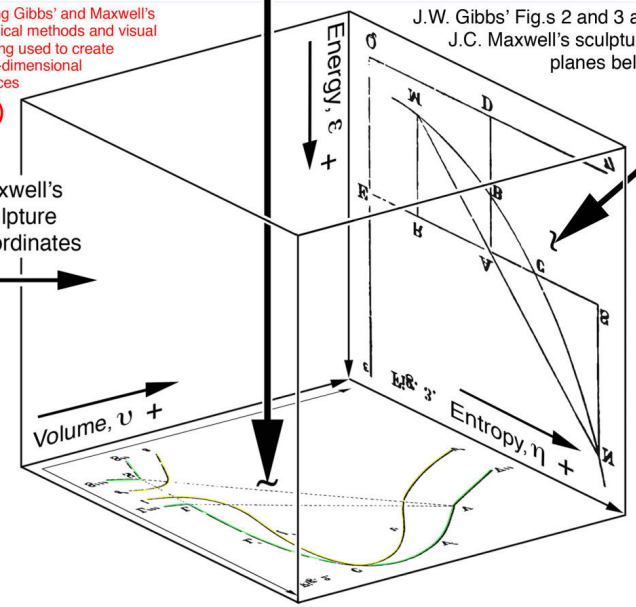

Similar points and line segments

Maxwell, Ref. [2] fig. 26d pg. 207	Gibbs, Ref. [1] fig. 2 pg. 394
C	C
G	V
L	L
S	S
E→S→R	S''→S→S'''
K→L→M	L'→L→L'''
H→G→F	V'→V→V'''
Y	s→s'
X	l→l'→v→v'

References
1. Kriz, Ronald. (2008). "Maxwell's thermodynamic surface (poster overview)" (4848x3131px), Sv.Vt.edu.

θΔics

In hmolscience, **Mazyar Lotfalian** (c.1969-) is an American cultural anthropologist and Persian studies expert noted, in human thermodynamics, for his 2004 commentary on the 1956 human thermodynamics theories of Iranian engineer Mehdi Bazargan.

Overview

In 2004, Lotfalian, in his chapter section "Thermodynamics as a Model", of his *Islam, Technoscientific Identities, and the Culture of Curiosity*, critiqued the use of thermodynamics to explain and model culture and humanity by those as Iranian engineer Mehdi Bazargan, in larger part, and his 1956 *Thermodynamics of Humanity*, French philosopher Michel Serres, American writer Thomas Pynchon and his work in literature, Sigmund Freud's unconsciousness models (which Serres suggests were based on classical thermodynamics), German political sociologist Max Weber, among others. Lotfalian grapples with questions such as "how would thermodynamics affect the debunking of faith and knowledge?" or "how does Bazargan use thermodynamics to theorize about the role of morality in everyday life?" [1] Lotfalian, it seems, had begun discussing thermodynamic ideas of politics and culture as early as 2001. [2]

Education

Lotfalian completed his PhD in anthropology in 1999 at Rice University. This was followed by post-graduate work at the Center for Middle Eastern Studies at Harvard University and studies as a visiting scholar at the Program in Science, Technology, and Society at MIT. In 2004, he was a cultural anthropologist at the Center for Religion and Media at New York University. Currently, Lotfalian is an associated faculty member of the Samuel Jordan Center for Persian Studies and Culture, UC Irvine. [3]

References

1. Lotfalian, Mazyar. (2004). *Islam, Technoscientific Identities, and the Culture of Curiosity* (ch. 3: A Techno-Cosmopolitan in the Context of the Secular State: The Discourse of a Muslim Engineer/Politician, pgs. 31-53; section: The Theory of Thermodynamics as a Model, pg. 46-50, etc; W=U-TS, pg. 50). University Press of America.
2. Lotfalian, Mazyar. (2004). "Knowledge Systems and Islamic Discourses: A Genealogy of Keywords on the Development of Science and Technology in Transcultural Context" (abstract), *Cultural Dynamics*, 13(2): 231-43.
3. Mazyar Lotfalian (faculty) – Samuel Jordan Center for Persian Studies and Culture, UC Irvine.

External links

â— Lotfalian, Mazyar – WorldCat Identities.

θΔics

In physics, **mean free path** is the average distance traversed by a particle between two collisions. [1] The mean free path, said another way, is the average distance a molecule travels before it collides with another molecule. [4]

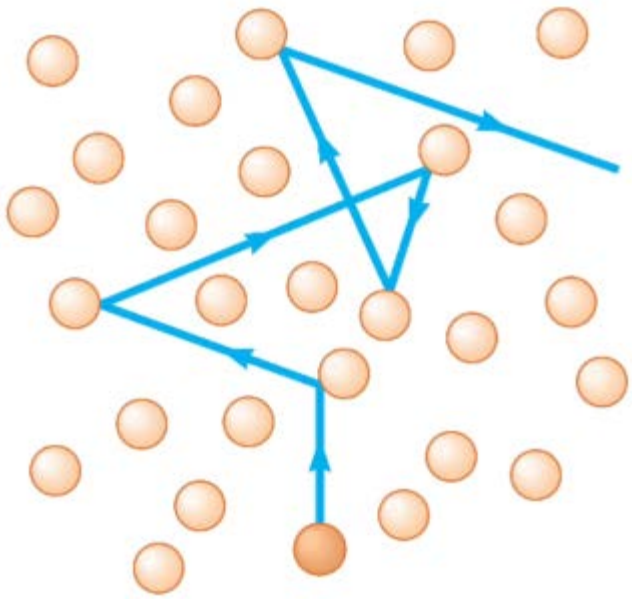

An exaggerated depiction (oversized particles) of the **mean free path** (one average-size straight line) view of molecules moving according to the ideal of the Boltzmann chaos assumption.

Overview

In 1858, German physicist Rudolf Clausius, in his “On the Mean length of the Paths described by the Separate Molecules of Gaseous Bodies on the Occurrence of the Molecular Motion”, introduced the concept of ‘mean free path’ as a rebuttal publication to the "dining room anecdote" (see: thermodynamics anecdotes) objection raised by Danish scientist Christoph Ballot, who stated that since the smell of hot food takes several seconds to traverse a room that particles of air could not be moving at several 100 meters per second as Clausius had previously calculated in his 1857 paper “On the Nature of the Motion which we Call Heat.” [2]

The average speed of gas particles, at room temperature is on average 500-meters per second or 1200-mph. [3]

The mean free path of a molecule at 100 km is about 33 mm; at which point the macroscopic approach is already questionable. At 100 km, the mean free path exceeds 3 m, which is comparable to the dimensions of a satellite, such as needs to be taken into account during reentry. [4]

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics* (mean free path, pg. 197-98). Oxford University Press.
2. (a) Clausius, Rudolf. (1857), "Über die Art der Bewegung, die wir Wärme nennen", *Annalen der Physik*, 100:353–379; trans. “On the Nature of the Motion which we call Heat” (PDF), *Philosophical Magazine* (1857), 14:108-27.
(b) Buys-Ballot, Christoph. (1858). “Ueber die Art von Bewegung welche wir Warme und Elektrizitat nennen” (“On the Kind of Motion we Call Heat and Electricity”), *Ann. Phys.* 103: 240.
(c) Clausius, Rudolf. (1859) [1858]. “On the Mean length of the Paths described by the Separate Molecules of Gaseous Bodies on the Occurrence of the Molecular Motion: together with some other remarks upon the mechanical theory of heat”, *Phil. Mag.* 17:81-91.
(d) Lindley, David. (2001). *Boltzmann’s Atom: the Great Debate that Launched a Revolution in Physics* (pg. 25). The Free Press.
3. (a) Clark, John O.E. (2004). *The Essential Dictionary of Science.* Barnes & Noble.
(b) Air, composition of (Britannica); 2002 Deluxe Edition, CD-ROM.
4. Potter, Merle C. and Somerton, Craig W. (2009). *Schaum's Outlines: Thermodynamics for Engineers* (pg. 3). McGraw-Hill.

External links

â— Mean free path – Wikipedia.

θΔics

In hmolscience, **mean girls model** refers to the social physics stylized premise of applying the physics-based models of "pressure", as in social pressure or lateral pressure (see: Niccolo Tartaglia), and "volume", as in social volume, to the stereotypical social clique based social spaces, personal spaces, and volumes of the scenario of a typical American high school; the 2004 comedy film *Mean Girls* (Ñº), conceptually taking place in Evanston, Illinois (Ñº), which is based on the 2002 self-help book *Queen Bees and Wannabes* (Ñº), being the launching point for discussion.

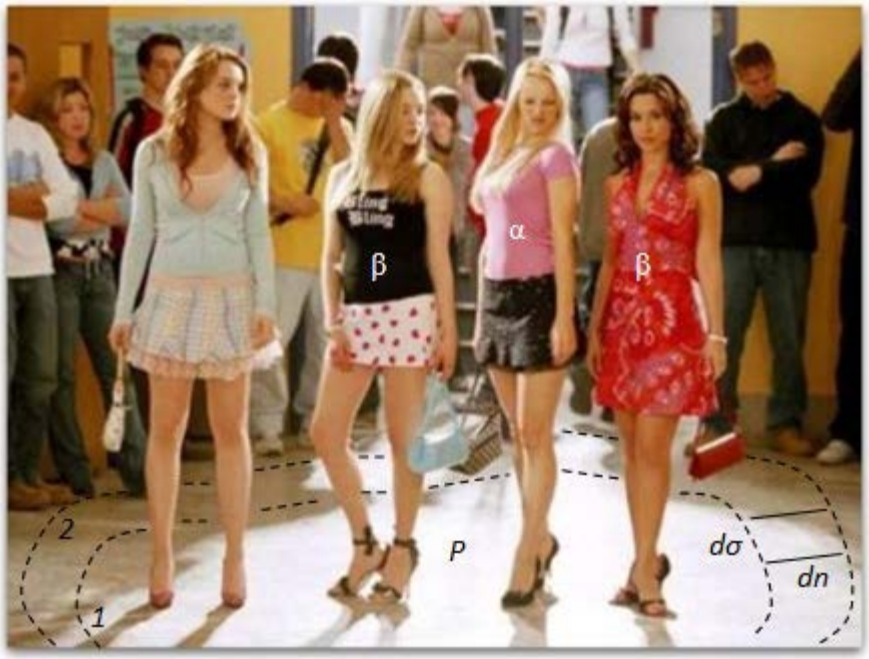

Above left: a modern human molecule pressure volume element labeled depiction of the hall scene from the 2004 *Mean Girls*, where the alpha female (alpha molecule) "queen bee" Regina George **α** (Rachel McAdams), in pink, causes a volume expansion: students reactively move away giving her more personal space; a natural phenomenon verified and measured by sociologists (Nancy Etcoff, 1999). [3]

Volume change | Models

The following are three volume change models:

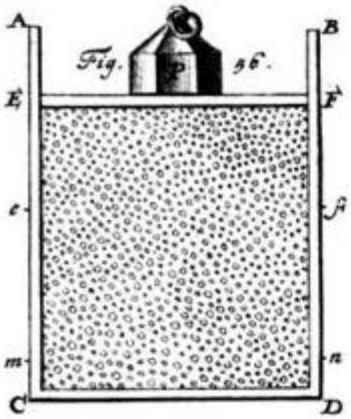

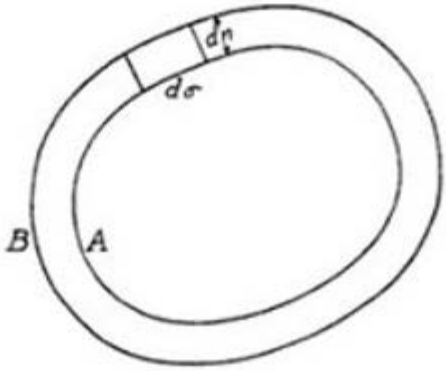

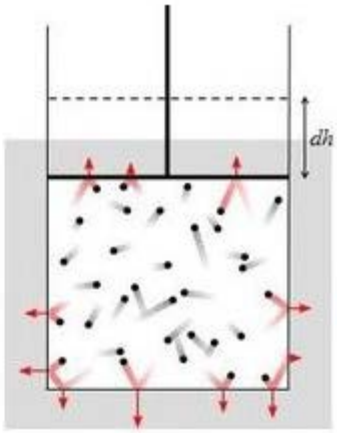

Above left: Daniel Bernoulli's 1738 depiction of "pressure", the original definition of pressure, as the average rate at which the particles of a containing vessel collide with its walls and push out against the atoms, particles, and molecules of the surroundings (in this case the weight of the atmosphere, a 72-mile high Karman line column height of primarily oxygen and nitrogen molecules). [4] **Above middle:** Enrico Fermi's 1938 method of thermodynamically quantifying pressure volume work energy for "irregular shapes" in terms of volume element differentials: surface element *dσ* (d-sigma) and the displacement element *dn*. [5] **Above right** modern kinetic theory depiction of particles pressing outward against their containing boundary (see: dW = PdV).

Objections

On 25 Aug 2011, American electrochemical engineer Libb Thims made an 11:23-minute video "Pressure Volume Work and Mean Girls", posted to the HumanChemistry101 channel of YouTube, and sometime thereabouts added the video still image shown adjacent to Hmolpedia. [9] Some took objection to this depiction and formulation.

In 2011, Irish biochemistry student Ryan Grannell, in his blog series on "Human Chemistry", posted the following objection to the mean girls scenario: [1]

> “Your claim that “social pressure” is synonymous with “pressure (physics definition)” in your **‘mean girls’** video is fallacious; it is entirely based on the lucky coincidence that they share a similar name; subbing “social ostracism” (which is not a numerical quantity) for pressure would be more obviously plain wrong.”

In 2012, American ecological thermodynamicist Jeff Tuhtan posted the following objection about the mean girls depiction: [2]

> “Regarding the fundamental Gibbs equation: Yes, this is the correct mathematical treatment, but I don't see it in your examples, instead you provide **'mean girls'** expansion work ('human PV work'?) examples. You are correct on the one hand, if you are talking about the PV work done on the atmosphere by the lifting of the water line when I enter a swimming pool, but on the other seem to want to boil everything down into a single expression using the Gibbs free energy. Why don't you make this distinction more explicit?”

(add)

Discussion

The issues or objections, such as raised above, seem to revolve around the assumed equating of:

> Physical pressure = Atmospheric pressure

such as would be measured using a barometer, that many people hold in their mind, to the effect that “pressure” is solely defined as the weight of the atmosphere pressing down on the surface of the earth; possibly something along the lines of Dutch-born Swiss mathematical physicist Daniel Bernoulli’s 1738 *Hydrodynamica* visual depiction of “pressure”, shown above, as the average rate at which the particles of gas collide with the walls of the container or cylinder with a weight (mass) adjustable piston top and thus push out against the surrounding particles of the earths atmosphere.

The general objection, if this is the case, then, seems to have to do with an inability to see the derivation backwards to its fundamental roots, which are namely the original definitions of force and movement of bodies, in the 17th century works of Isaac Newton and Galileo Galilei, as codified in Newton's laws of motion, which are not soley "only" applicable to gas particles, moving about under the simplified model of the principle of elementary chaos, but to any and all bodies in the universe, namely that: a force has to act on a body in order for it to move, and when the force is applied normal to a surface, the effect is called by definition pressure:

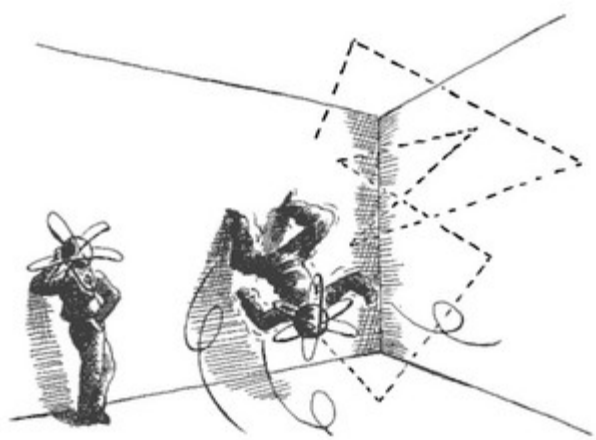

An artistic rendition of humans as human particles, bouncing off walls like gas molecules, in effect creating a version of social boundary pressure. [8]

$$P = \frac{F}{A}$$

or force per unit area; and hence, by rearrangement, the force will be given by:

$$F = PA$$

where *A* is the surface area on which the force normal acts; whereby, then, according to French physicist Gustave Coriolis' 1829 principle of transmission of work, the work done by (or on) the body will be given by the product of the force and the distance of the surface is moved:

$$W = Fd$$

a distance moved that will be *dh* in the piston surface example or *dn* in the social boundary surface (boundary surface) example:

$$W = Fdn$$

and with substitution of force from the third previous equation, the quantification of social pressure volume work (pressure volume work) becomes:

$$W = PAdn$$

whence, noting that the volume differential for the social expansion (volume expansion) is:

$$dV = Adn$$

where A is surface element *dσ*, we have:

$$dW = PdV$$

whereby, if the volume change is measured, such as by slow motion video measurements of the displacements of bodies, or via GPS tracking devices, etc., the integration can be written in the form of the a definite integral, having a definite measurable initial state volume V_1 and final state volume V_2:

$$W = \int_{V_1}^{V_2} PdV$$

and if the social pressure can be gauged, such as by the invention or construction of a social barometer, then a social pressure volume indicator diagram (social indicator diagram) can be graphically constructed, and hence the human molecular social pressure volume work expansion done by the alpha molecule system (four socially-affined human molecules: one alpha, two betas, and one competing alpha) on its surroundings (students of the hallway) can be calculated and graphically represented by the shaded area under the PV work diagram curve; a generic example of which is shown adjacent.

Gas molecules | Surface molecules

A salient often-unstated point here to be noted is that humans are surface-attached motile molecules and not gas molecules, such as depicted artistically above. The equations will apply equally to both, the only

difference is that while gas molecules will expand radially and spherically outward, human molecules will only expand cylindrically outward. The force is the same in both cases: the electromagnetic force.

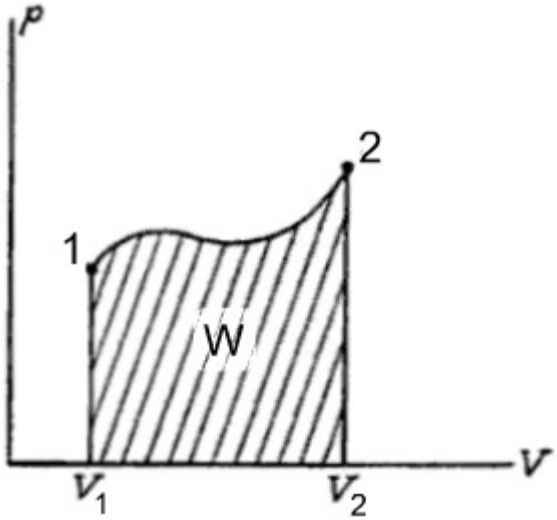

A PV diagram showing a "system" transforming from an initial state 1 to a final state 2, where the representative work W done is indicated by the shaded area under the curve.

Data

The following volumetric changes are known in regards to the social space a tall person and a short person will be given:

> Tall = 22.7 inches
> Short = 9.8 inches

the numbers of inches being in regards to how far the average person will stop away from the given person before "feeling" uncomfortable. Data for physically attractive individuals has been measured as well, and are expected to be similar in magnitude. American attractiveness researcher Nancy Etcoff summarizes the findings as such: [3]

> "Very attractive people of any size are given bigger personal space and territory; which they carry around with them."

In other words, in the context of human molecular orbital theory, physically 'hot' molecules, in the visual sense, trigger volume increase (volume expansion) be it a gaseous molecule or a human molecule. [6]

Russia-Georgia war | 2008

The adjacent depiction of the 2008 Russia-Georgia five day war, and the various troop movements and boundary fortifications, gives an idea of who the four-molecule system mean girls example scales up to the million+ human molecule system level, in regards to social pressure and boundary regulation at national boarders.

The adjacent depiction can be likened to the 1970-74 chimpanzee war, the result of which, in the end, destruction (dereaction) of the smaller faction of chimpanzee molecules (genocide), one one side of the territorial boundary, resulted, pressure (social pressure) thus reduced, and the territory of the larger faction expanded outward.

A timeline depiction of the 2008 Russia-Georgia "five day war", an armed conflict in August between Georgia on one side, and Russia and separatist governments of South Ossetia and Abkhazia on the other, which can be likened to the collisions of gas particles on the containing

See also

â— Rise and fall of civilizations
â— War thermodynamics
â— Human thermodynamic instruments
â— Integration and segregation thermodynamics

vessel boundary of Dutch-born Swiss mathematical physicist Daniel Bernoulli's 1738 moveable piston head (above)—which, in the context of war thermodynamics, however, the moveable piston head becomes replaced by the heavily-fortified territorial boundaries of the "conflict zones", as shown above (in purple) according to which the Russian human molecules to the North and the Georgian human molecules to the south create a type of social-political-governmental territorial pressure at the boundary, that can be measured in SI units. The depiction here is similar to the 1970-74 Chimpanzee war, the result of which, in the end territorial expansion resulted.

References

1. Grannell, Ryan. (2011). "Category: Human Chemistry", Bag of Many Things, WordPress.com (Jun 26 –Jul 22).
2. Tuhtan, Jeff. (2012). "Ecological Stoichiometry", *Hmolpedia* threads, Jun 4.
3. Etcoff, Nancy. (1999). *Survival of the Prettiest – the Science of Beauty*. New York: Anchor Books.
4. Bernoulli, Daniel. (1738). *Hydrodynamica, Sive Vivibus et Motimus Fluidorum Commentarii*. Sectio Decima: "De affectionibus atque botimus fluidorum elasticorum, praecipue autem aeris." (pgs. 200-204; piston and cylinder, pgs. 319). Argentorati, Sumptibus Johannes Reinholdi Dulseckeri.
5. Fermi, Enrico. (1936). *Thermodynamics* (pgs. 5-6). Prentice-Hall.
6. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pgs. 223-33, ch. 9: Human Molecular Orbital Theory, pgs. 247-95) (preview) (Google books). Morrisville, NC: LuLu.
7. (a) 2008 Georgia-Russia crisis – Wikipedia.
(b) 2008 South Ossetia war – Wikipedia.
8. Macrone, Michael and Lulevitch, Tom. (1999). *Eureka!: 81 Key Ideas Explained* (section: Entropy, pgs. 129-33; image pg. 130). Barnes & Noble Publishing.
9. Thims, Libb. (2011). "Pressure Volume Work and Mean Girls", HumanChemistry101, YouTube, Apr 25.

θΔics

In philosophy, **meaning**, a term often associated with purpose, refers to questions surrounding the design or significance of existence.

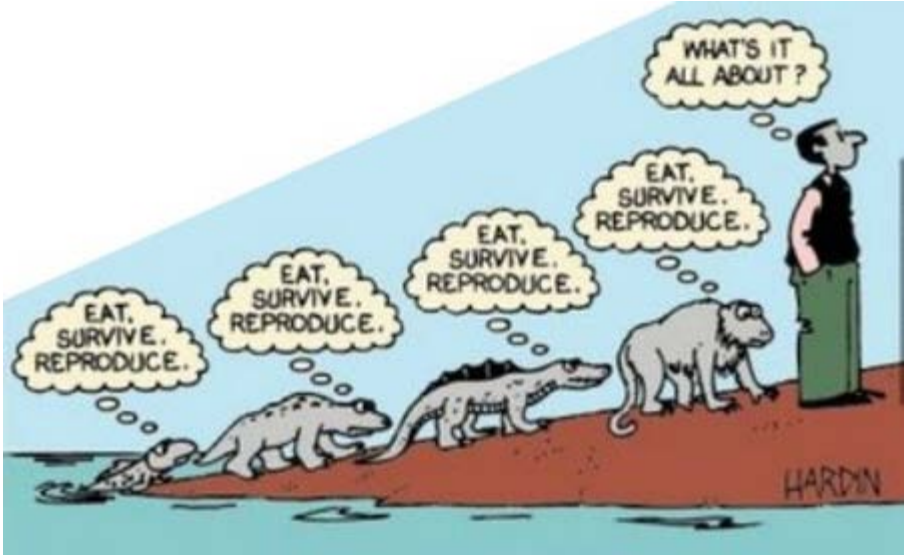

A **meaning** stylized cartoon.

Religion | Science

The modern tension in belief systems, between the cherished religio-mythology belief systems and the newer scientific beliefs is evidenced well be the following 1999 statement by religious marriage philosopher Eric Ludy: [1]

> "Some have described today's young people as 'the first generation to live after the death of God.' Here we are searching from something beautiful, yet the whole source of beauty has been robbed from us. The amazing and romantic world around us is explained away as a freak of nature—our dearest friends are really only heaps of **meaningless** matter that evolved from a puddle of sludge. And love itself is but a chemical reaction inside our brains that takes place when our impulse to propagate the species kicks into gear. To be honest, if modern science is right and all that exists is nothing but the result of a great big bang, then I would be the first to say that you are crazy if you *wait* to indulge your desires. I mean, if you and the 'love of your life' are only heaps of meaningless matter, then hurry up and ignite the chemical reaction!"

(add)

Existentialism

In 1945, French philosopher Jean-Paul Sartre, in his "Existentialism is a Humanism" lecture, seems to have spelled out some type of "existence before meaning" atheism logic, the gist of which seems to come from the following logic: [2]

> "Atheistic existentialism, which I represent, is more consistent. It states that if god does not exist, there is at least one being in whom existence precedes essence—a being whose existence comes before its essence, a being who exists before he can be defined by any concept of it. That being is man, or, as Heidegger put it, the human reality. What do we mean here by 'existence precedes essence'? We mean that man first exists: he materializes in the world, encounters himself, and only afterward defines himself."

This statement, to note, seems to be re-phrasing of Soren Kierkegaard's circa 1841 query:

> "Where am I? Who am I? How did I come to be here? What is this thing called the world? How did I come into the world? Why was I not consulted? And if I am compelled to take part in it, where is the director? I want to see him."

(add)

Meaning of life

Historically, one of the greatest philosophical questions ever has been the riddle to solve the elusive "meaning of life". In the modern (post-2009) defunct theory of life framework, however, "life" has been determined to be something that

does not exist, akin to other defunct theoretical conceptions, such as aether, caloric, or phlogiston.

Quotes

The following are related quotes:

> "If you're not supposed to get 'money', 'fame', and 'notoriety', like we're all running around trying to get, what are you supposed to do, with your 80 to 100 years on earth?"
>
> — Mike Posner (2016), lyrics and meaning (Ñº) behind song "I took a pill in Ibiza", Dec 28

References

1. (a) Ludy, Eric and Ludy, Leslie. (1999). *When God Writes Your Love Story: the Ultimate Guide to Guy/Girl Relationships* (pg. 136). Random House.
(b) When God Writes Your Life Story – Wikipedia.
2. (a) Sartre, Jean-Paul. (1945). *Existentialism Is a Humanism* (pg. 22). Yale University Press, 2007.
(b) Meaning (existential) – Wikipedia.

External links

â— Meaning (disambiguation) – Wikipedia.

θΔics

In terminology, **meaninglessness**, as contrasted with "meaningful" (something with meaning) or pointfullness, refers to something lacking "sense, import, or intent". [1]

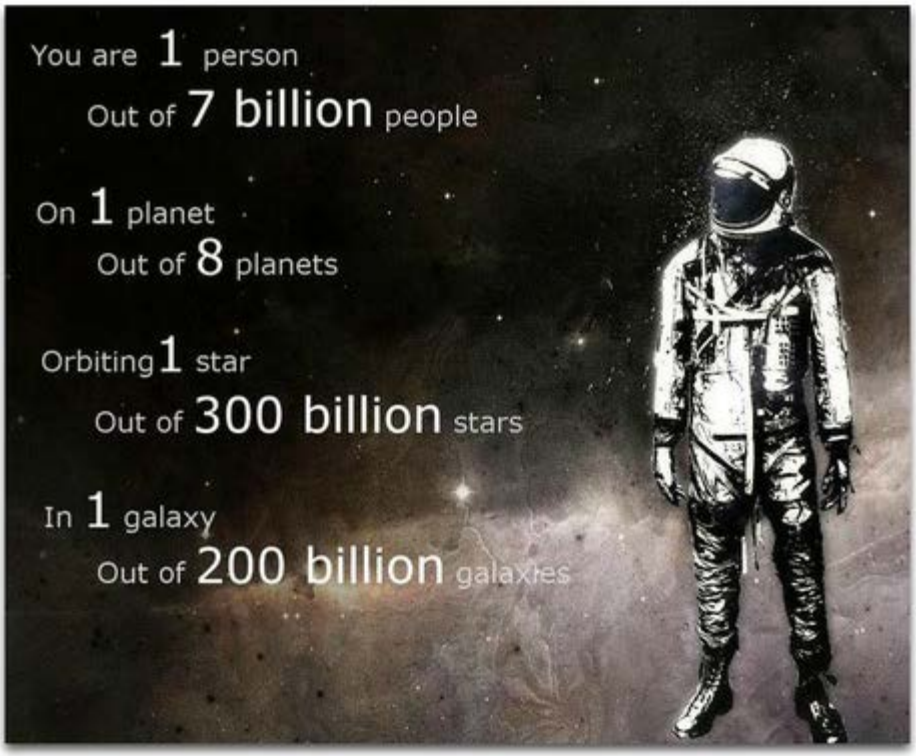

A **meaninglessness** screensaver, representative of "insignificance", to a Reddit atheism thread (Ñº) on "significance" in the big universe.

Quotes

The following are related quotes:

> "The only absolute knowledge attained by man is that life is **meaningless**."
>
> — Leo Tolstoy (c.1890) (Ñº)

> "I believe that I am not responsible for the meaningfulness or **meaninglessness** of life, but that I am responsible for what I do with the life I've got."
>
> — Hermann Hesse (c.1920) (Ñº)

> "I had motive for not wanting the world to have a meaning; consequently assumed that it had none, and was able without any difficulty to find satisfying reasons for this assumption. The philosopher who finds **no meaning** in the world is not concerned exclusively with a problem in pure metaphysics, he is also concerned to prove that there is no valid reason why he personally should not do as he wants to do, or why his friends should not seize political power and govern in the way that they find most advantageous to themselves. … For myself, the philosophy of **meaninglessness** was essentially an instrument of liberation, sexual and political."
>
> — Aldous Huxley (1937), *Ends and Means: an Inquiry into the Nature of Ideals* [1]

> "The modern Shelleyan monster is one who is nobody's child but the scientists own and whose taming is no practical task. I mean an invisible demon who works by subtle poison, not upon the flesh and bone, but upon the spirit. I refer to the **monster of meaningless**. The psychic malaise. The existential void where modern man searches for his soul."
>
> —Theodore Roszak (c.1975) "Article"; cited by Leon Cooper (1977) in *Science and Human Experience* [1]

> "Some have described today's young people as 'the first generation to live after the death of god.' Here we are searching from something beautiful, yet the whole source of beauty has been robbed from us. The amazing and romantic world around us is explained away as a freak of nature—our dearest friends are really only heaps of **meaningless matter** that evolved from a puddle of sludge. And love itself is but a chemical reaction inside our brains that takes place when our impulse to propagate the species kicks into gear. To be honest, if modern science is right and all that exists is nothing but the result of a great big bang, then I would be the first to say that you are crazy if you *wait* to indulge your desires. I mean, if you and the 'love of your life' are only heaps of meaningless matter, then hurry up and ignite the chemical reaction!"
>
> — Eric Ludy (1999), *When God Writes Your Love Story: the Ultimate Guide to Guy/Girl Relationships* [2]

> “Bertrand Russell's view [1923]—that ‘man is the product of causes which had no prevision of the end they were achieving; that his origin, his growth, his hopes and fears, his loves and beliefs, are but the outcome of accidental collections of atoms’—expresses the terrible poetry of a **meaningless universe**, rolling along entropic channels of chance, blind and without purpose, sometime accidentally throwing up the magnificence and beauty of natural and human creations.”
>
> — Christian de Quincey (2002), *Radical Nature* [3]

See also

â— Purposeless universe hypothesis

A "**meaningless**" screensaver or wallpaper.

References

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3. (a) Ludy, Eric and Ludy, Leslie. (1999). *When God Writes Your Love Story: the Ultimate Guide to Guy/Girl Relationships* (pg. 136). Random House.
(b) When God Writes Your Life Story – Wikipedia.
4. (a) Russell, Bertrand. (1923). “A Free Man’s Worship”, T.B. Mosher.
(b) Russell, Bertrand. (1961). “A Free Man’s Worship”, in: R.E. Egner and L.D. Dennon, eds., *The Basic Writings of Bertrand Russell 1903-1959.* Simon and Schuster.
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5. (a) Roszack, Theodore. (c.1975). “Article” (Ñº), *Daedalus*.
(b) Cooper, Leon N. (1976). *Science and the Human Experience: Mephistopheles is Alive and Well and Living in the Space Age – Values, Culture, and Mind* (Amz) (pg. 43). Cambridge University Press.

θΔics

In religio-mythology, **measure of the fish,** aka “Jesus fish”, “Ichthus fish”, or “vesical piscis” (bladder of a fish), refers to []

Overview

In 2,500BC, the ratio 265/153, which is the height-to-width ratio of the intersection of two circles, supposedly, was known to the Egyptians as the closest whole number approximation of the square root of three √3. Some conjecture that 153 has something to do with pi and with the calculation of the design of the great pyramids at Cheops, in respect to its height and base leg. (Q)

In 520BC, Pythagoras, according to the aretalogy, written by Porphyry (Q), student of Plotinus (Q), is reputed to have performed the supernatural feat of helping his disciples catch a large number of fish, number of fish not specifically stated:

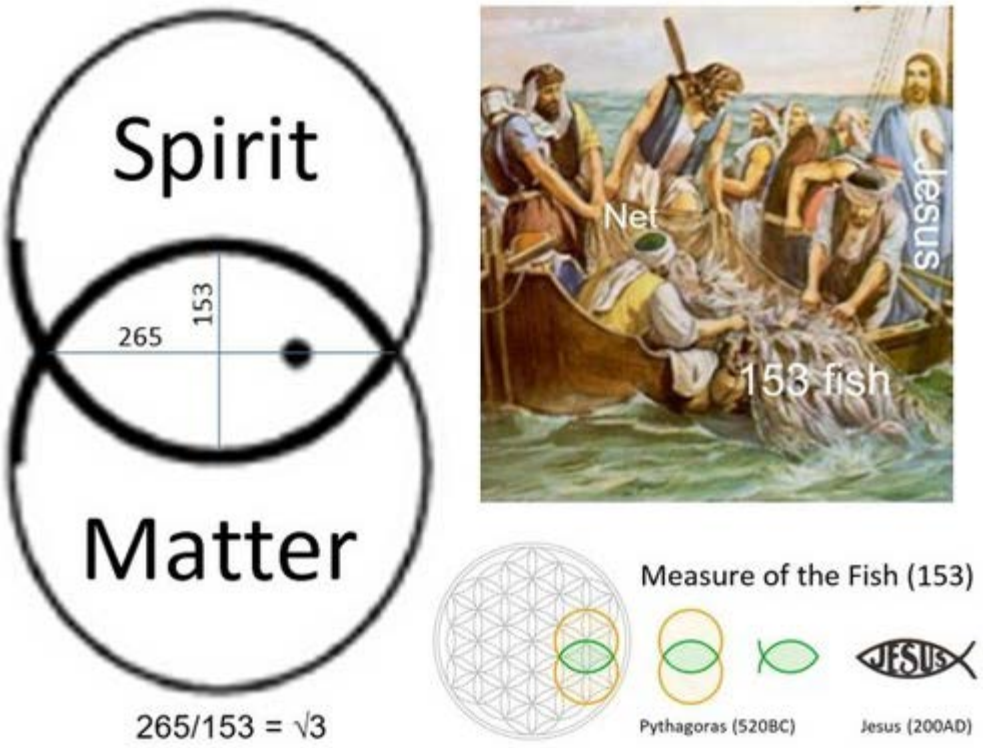

The "**measure of the fis**h" and the fish prediction story data back to Pythagoras (c.520BC) and to the square root of three, and in an astro-theological sense before that.

> “While at the Olympic games, he was discoursing with his friends about auguries, omens, and divine signs, and how men of true piety do receive messages from the Gods. Flying over his head was an eagle, who stopped, and came down to Pythagoras. After stroking her awhile, he released her. Meeting with some fishermen who were drawing in their nets heavily laden with fishes from the deep, **he predicted the exact number of fish they had caught**. The fishermen said that if his estimate was accurate they would do whatever he commanded. They counted them accurately, and found the number correct. He then bade them return the fish alive into the sea; and, what is more wonderful, not one of them died, although they had been out of the water a considerable time. He paid them and left.”
>
> — Porphyry (c.280AD), *Life of Pythagoras* (§:25)

The number “153”, however, is inferred per reason that it is a sacred number in Pythagorean mathematics. [2]

In c.300BC, Euclid, in the first proposition of his *Elements*, gives a depiction of the *vesical piscis*, as the first step in constructing and equilateral triangle using a compass and a straightedge.

In 250BC, Archimedes, in his *Measurement of the Circle*, approximated the square root of three √3 as follows:

$$\frac{1351}{780} > \sqrt{3} > \frac{265}{153}$$

and was referring to the ratio 265/153 as the “measure of the fish”. [1]

In 150AD, the "Pythagoras fish catching story" was rescripted into the Bible, in John 21:11 (Q), to the effect that Jesus

miraculously, after he had been risen from the dead, helped his disciples catch a large number of fish, precisely 153, at the Sea of Galilee:

> "Early in the morning, Jesus stood on the shore, but the disciples did not realize that it was Jesus. He called out to them, "Friends, haven't you any fish?" "No," they answered. **He said, "Throw your net on the right side of the boat and you will find some."** When they did, they were unable to haul the net in because of the large number of fish. Then the disciple whom Jesus loved said to Peter, "It is the Lord!" As soon as Simon Peter heard him say, "It is the Lord," he wrapped his outer garment around him (for he had taken it off) and jumped into the water. The other disciples followed in the boat, towing the net full of fish, for they were not far from shore, about a hundred yards. When they landed, they saw a fire of burning coals there with fish on it, and some bread. Jesus said to them, "Bring some of the fish you have just caught." So Simon Peter climbed back into the boat and dragged the net ashore. **It was full of large fish, 153,** but even with so many the net was not torn. Jesus said to them, "Come and have breakfast." None of the disciples dared ask him, "Who are you?" They knew it was the Lord. Jesus came, took the bread and gave it to them, and did the same with the fish. This was now the third time Jesus appeared to his disciples after he was raised from the dead."
>
> — Anon (c.150AD), *Bible* (John 21:4-14)

In 1836, David Strauss, in his *The Life of Jesus: Critically Examined*, digressed on the fish prediction stories of Pythagoras, as reported by Jamblichus and Porphyry, and Jesus. (Q)

Astrotheology

In an astro-theological sense, Jesus symbolizes the age of Pisces which began around the time of his alleged birth. (Q) Said another way, Pisces has been called the "dying god," where its sign opposite in the night sky is Virgo, or, the Virgin Mary. (Q) Mary, is known to be associated with the star Sirius. The Egyptian equivalent of Pisces remains to be tracked down.

References

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2. Jeremiah, Ken. (2014). *Christian Mummification: An Interpretative History of the Preservation of Saints, Martyrs and Others* (pg. 171). McFarland.

External links

- Ichthys – Wikipedia.
- 153 (number) – Wikipedia.
- Vesica piscis – Wikipedia.

θΔics

In science, **mechanical**, or "mechanistic", refers to things done like a machine; related to mechanism.

Quotes

The following are related quotes:

> "The science of thermodynamics had its origin in severely practical problems relating to the efficiency of engines, but it was soon extended to cover the operations of nature as a whole. All this happened in the days when nature WAS assumed, without question, to be **mechanical** and deterministic."
>
> — James Jeans (1933), *The New Background of Science* (pg. 261) (Q)

me·chan·i·cal

/məˈkanək(ə)l/

adjective

adjective: **mechanical**

1. working or produced by machines or machinery.
   "a mechanical device"
   - relating to machines or machinery.
     "a mechanical genius"
2. (of a person or action) not having or showing thought or spontaneity; automatic.
   "she stopped the mechanical brushing of her hair"
   Similar: automatic | machine-like | unthinking | unemotional
3. relating to physical forces or motion; physical.
   "the smoothness was the result of mechanical abrasion"
   - ARCHAIC
     (of a theory) explaining phenomena in terms only of physical processes.
   - ARCHAIC
     relating to mechanics as a science.

   Similar: mechanized | machine-driven | automated | automatic

A 2020 Google-generated definition of "**mechanical**", meaning related to machines; a person lacking thought or spontaneity; or things related to physical forces or motion.

See also

- Mechanical action
- Mechanical effect
- Mechanical energy
- Mechanical engineering
- Mechanical equivalent of heat
- Mechanical philosophy
- Mechanics
- Mechanistic school
- Mechanical theory
- Mechanical theory of heat
- Mechanical universe
- Mechanical work

External links

- Mechanical – Wikipedia.

θΔics

In thermodynamics, **mechanical action** is a synonym for pressure volume work, defined by French engineer Émile Clapeyron in 1834 as the “the integral of the product of the pressure times the differential of the volume” during either the expansion or contraction of the gas and the resultant piston movement. [1] This is near synonym for motive power, used by French engineer Sadi Carnot in 1824, and mechanical work, used by German physicist Rudolf Clausius in 1850, and the shortened term "work" used often in the modern sense.

References

1. Clapeyron, Émile. (1834). “Memoir on the Motive Power of Heat”, *Journal de l’Ecole Polytechnique.* XIV, 153 (and Poggendorff's *Annalender Physick*, LIX, [1843] 446, 566).

θΔics

In terminology, **mechanical effect**, the English translate of *Mechanische Wirkung*, describes the measurement of the productive output of a heat engine or the value of its work performed. The useful "mechanical effect" movements include such actions as, for instance, where a steam engine works mines, or in general where a heat engine impels ships, excavates ports and rivers, forges iron, fashions wood, grinds grains, spins and weaves cloths, transports the heaviest burdens, etc.

Etymology

In 1847 to 1848, Scottish engineer Lewis Gordon, in the *Synopsis of Lectures* at Glasgow College, introduced the term "mechanical effect" was introduced, significantly, in the lectures of Scottish engineer Lewis Gordon at Glasgow College: [1]

> "Different names have been given to ***Mechanical effect***, as we now define it. Smeaton used the term *'Mechanical power'*, Carnot the term *'Moment d'activite'*, Monge and Hachette *'Efffet dynamique'*, Columb and Navier *'Quantite d'action'*, Coriolis and Poncelet *'Quantite de travail'* and *'Travail mecanique'*, Dr Whewell proposes *'Labouring force'*, Mr Moseley used the term *'Work'*, Weisbach, and German writers generally, speak of *'Mechanische Wirkung'*, or Mechanical Effect. This latter term seems to be the least ambiguous in its application."

This terminology was later taken up in use by his student William Thomson; in 1849, e.g. Thomson stated: [2]

> "The sole effect to be contemplated in investigating the motive power of heat is *resistance overcome*, or, as it is frequently called, '*work performed'*, or '*mechanical effect'*".

In 1889, the term was used by American chemical engineer Willard Gibbs as a synonym for work or mechanical work (or motive power), to describe the useful output mechanical movement that a heat engine produced in the 19th century. [3]

References

1. (a) Gordon, Lewis. (1847). *A Synopsis of Lectures to be Delivered. Session 1847-48*, (pg. 5). Glasgow.
(b) Smith, Crosbie. (1998). *The Science of Energy - a Cultural History of Energy Physics in Victorian Britain*, (pgs. 35-44). Chicago: The University of Chicago Press.
2. Thomson, William. (1849). "An Account of Carnot's Theory of the Motive Power of Heat – with Numerical Results Deduced from Regnault's Experiments on Steam", (127-203) *Transactions of the Edinburgh Royal Society*, xiv.; *Annales de Chime*, xxxv. 1852.
3. Gibbs, Willard. (1889). "Rudolf Julius Emanuel Clausius," *Proceedings of the American Academy*, new series, vol. XVI, pgs. 458-65. In *The Scientific Papers of J. Willard Gibbs* (Volume II).

θΔics

In the history of thermodynamics, **mechanical energy** is a term used to refer to the act of raising 772-pounds through a height of one foot. [1] The term is a near synonym to those of mechanical action, mechanical effect, and mechanical work. The term was first used in 1859 by Scottish engineer William Rankine.

References

1. Rankine, William. (1859). *A Manual of the Steam Engine and Other Prime Movers,* (chapter III: "Principles of Thermodynamics", pgs. 299-478). London: Charles Griffin and Co.

θΔics

In engineering, **mechanical engineering** is the study of energy conversion, mechanics, and mechanism and devices for diverse applications, ranging from automotive parts to nanomachines. [1]

Human thermodynamics

The following, culled from the HT pioneers page, are noted mechanical engineers to have ventured into human thermodynamics theory formulations:

	Mechanical engineer	Date	Significance
1.	Bryan Donkin (1836-1902) English mechanical engineer	1893	His article-book "The Scientific Work of Gustav Adolph Hirn", on the life, work, and thermodynamics philosophy of French physicist Gustave Hirn, coined the term "human thermodynamics" and gave the first summary of the subject overview of the subject.
2.	Robert Thurston (1839-1903) American mechanical engineer	1894	In his *The Animal as a Machine and Prime Motor: and the Laws of Energetics*, speculated on a future possible law of persistence of existence, in relation to the energy or force aspects of the soul.
3.	Mehdi Bazargan (1907-1995) Iranian mechanical engineer and thermodynamicist	1942	Completed his PhD in thermodynamics (1930s); wrote on "The Thermodynamics of Love" (c.1942); in his *Labor in Islam* $W = U - TS$ (1946), wrote a chapter on physiological thermodynamics of human labor in the context of will power; during a five-month prison spell (for political opposition), wrote the *Human Thermodynamics* (1956), the first book entitled "human thermodynamics", wherein he used a thermodynamics based framework, in particular Helmholtz free energy equation (adjacent) to explain Islam, work, death, desire, love, and reincarnation scientifically.
4.	Gordon Van Wylen (1920-) American mechanical engineer	1959	Wrote a thermodynamics textbook, co-authored American mechanical engineer Richard Sonntag (1933-2010), with an appended a two-page section to their entropy chapter on general comments regarding entropy and some of its philosophical aspects, asking questions such as 'how did the universe get into a law entropy state?' or 'are there processes unknown to us that occur somewhere in the universe, such as continual creation, that have a decrease in entropy associated with them, and thus offset the continual increase in entropy with the natural processes that are known to us?', or 'is the second law valid for the entire universe?', with the concluding remark: "The second law of thermodynamics is man's description of the prior and continuing work of a creator, who also holds the answer to the future destiny of man and the universe."
5.	Roy Henderson (c.1935-) Australian mechanical engineer	1971	Modeled of crowd behavior and pedestrian traffic on fluid mechanics and ideal gas models; in his first paper, the highly-cited 1971 "The Statistics of Crowd Fluids", he measured the movements of college students on a campus and children on a playground, finding that in both cases their movements fit the Maxwell-Boltzmann distribution.
	John Bryant (1944-) English		Began thinking about the relationship between the cost of oil, energy, and thermodynamics in the 1970s; published articles such as "A Thermodynamic Approach to Economics" (1982), and a 2009 book *Thermoeconomics: A*

6. mechanical engineer and business consultant

1979 *Thermodynamic Approach to Economics*, all making crude isomorphism extrapolations of thermodynamic equations and variables to economics.

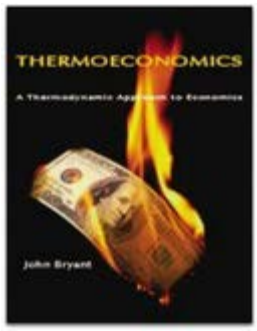

7. Louis-Marie Vincent (c.1940-) French electromechanical engineer and biophysical chemist

1988 His book *Can We Believe in Resurrection*, which speculates on life and death in a modern scientific context, arguing that "the brain is a machine that obeys the laws of thermodynamics", albeit he argues, in a detractive sense, that soul is a type of quantum field attached to superluminal particles; has theories on how love is a form of thermodynamic potential, that may be converted into heat and movement, and how the brain, being comprised of matter and energy, thus obeying the laws of matter and the laws of thermodynamics, may act in a "change of state" of energy at the time of death; his 2002 book *Other Logic of Living*, uses physical methods, such as information and analysis of form, to model the living being as a whole and to argue that "not only do we not really know what life is, but we are not quite sure what death is either."

8. Ronald Pearson (c.1933-) American mechanical engineer and thermodynamicist

1990 His book *Intelligence behind the Universe*, argues for an 'intelligent ether' theory of continued consciousness after death, which supposedly originated from his 1984 rejection of big bang theory as being a violation of the conservation of energy.

9. Valter Caggio (1954-) Italian mechanical engineer

1991 In 1991, began giving lectures in which he advised the incorporation of negentropy logic and thinking into the humanities; in circa 2004 laugned the sites: Negentropy.us, Negentropie.com, and Negentropia.com; his 2008 book *Negentropy and its New Global Meaning*, attempts to use the negentropy concept as a universal model to explain psychology, ethics, economics, politics, philosophy, and religions.

10. Bill Nye (1955-) American mechanical engineer

1993 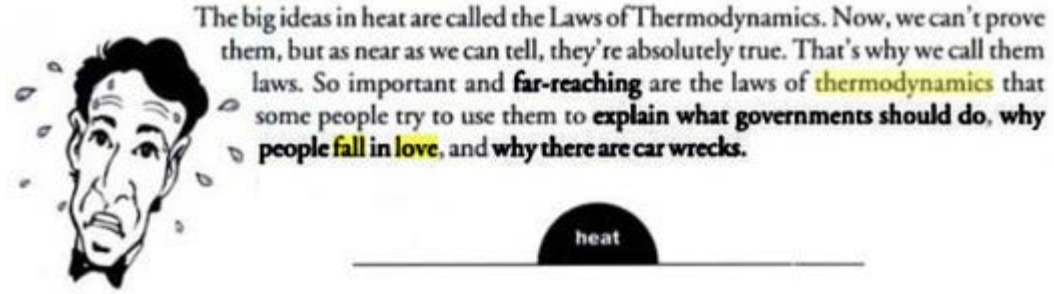

Summarized the subject of human thermodynamics as historical attempts to use the laws of thermodynamics to explain various facets of human existence, from car wreck behaviors, to politics, to the process of falling in love.

11. Christopher Edwards (c.1959-) American mechanical engineer and thermodynamicist

1995 In his thermodynamics class, at Stanford University, he teaches his students at that life is a path function:

> "Life is a path function. You begin life, you end life—that's not so interesting, right? But quality of life is a path function. It's the path that you take from the beginning to the end, the integral of that path, that's the special part."

12.	Satish Boregowda (c.1968-) American mechanical engineer	1998	His PhD dissertation *Thermodynamic Modeling and Analysis of Stress Responses*, attempts to quantify human stress thermodynamically, namely to use the second law to examine two types of stressors: thermal stress and mental stress; his 2005 article "Modeling of Human Physiological Stresses: A Thermodynamics-based Approach", co-written with Waldemar Karwowski, expands on this using Maxwell relations to develop formulas to quantify human stress due to the artifact-human interactions.
13.	Josip Stepanic (1970-) Croatian physicist and mechanical engineer	2000	In his "Approach to a Quantitative Description of Social Systems Based on Thermodynamic Formalism", outlines a toy model of social systems in thermodynamic terms (equation shown), where $\tilde{U}$ is the internal energy, $\tilde{G}$ the Gibbs potential, $\tilde{T}$ the temperature, $\tilde{S}$ the entropy, where the tilde (~) means the quantities are social "analogous quantities" to actual thermodynamic potentials, and where the $\tilde{f}_i$ denote external factors (influencing the people of the system), which influence some of the social system characteristics $\tilde{x}_i$, upon which the internal energy depends; founded the journal *Interdisciplinary Description of Complex Systems* (2003); followup articles include: "Social Equivalent of Free Energy" (2004), "Social Free Energy of a Pareto-Like Resource Distribution" (2007), among others. $$\tilde{U} = \tilde{G} + \sum_i \tilde{f}_i \tilde{x}_i + \tilde{T}\tilde{S}$$
14.	Eann Patterson (c.1955-) English mechanical engineer	2004	In *The Entropy Vector: Connecting Business and Science*, co-authored with Robert Handscombe, they argue that to learn to manage and control change (social, technical, and business) one must obtain a better grasp of science, in particular energy and entropy; the book seems to be very thermodynamical, with chapters on "natural philosophy and business", "life the universe and entropy", "energy and entropy", "time and entropy", "managing disorder", "creativity and innovation", "risk and entropy", "mental entropy", "entropy tradeoffs", etc.; dominate terms and people used include: Nicholas Georgescu, Leon Brillouin, Stephen Hawking, Rudolf Clausius, Maxwell's demon, and interestingly free energy; Patterson currently is chair of mechanical engineering at Michigan State University. 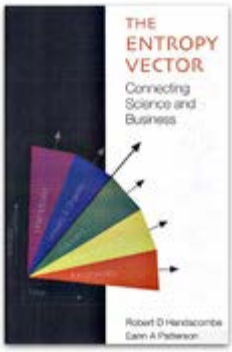
15.	Stefan Pohl-Valero (c.1977-) Spanish mechanical engineer and social thermodynamicist	2005	Gave a workshop talk (Third Milan Workshop on the Physical Sciences in the Third World) on "The 'Morality' of Thermodynamics: the Controversy of its Laws in a New Public Sphere, Spain 1868-1880"; his 2007 PhD dissertation "The Circulation of Energy: Thermodynamics, National Culture, and Social Progress in Spain, 1868-1890" builds on the work of Crosbie Smith and Greg Myers to discuss how William Thomson, Balfour Stewart, Peter Tait, and Thomas Huxley, etc., applied and used thermodynamics to theorize about humanist implications; recent articles include: "The Communication of Thermodynamics: Physical Culture and Power in Spain in the Second Half of the Nineteenth Century" (2009), "Thermodynamics, Social Thought, and Biopolitics in the Spain of the Restoration" (2010), and "Energy, Entropy, and Religion: A Historical Review" (2010), the latter co-written with Favio Vitery.
16.	Adrian Bejan (1948-) Romanian-born American	2006	His articles, e.g. "Constructing Animal Locomotion from New Thermodynamics Theory" (2006), and books, e.g. *Constructal Theory of Social Dynamics* (2007), have been attempting to outline a constructal theory of social dynamics, where society is seen as a live "flow system" (e.g. a river basin, vascularized tissue, city

	mechanical enginee		traffic).
17.	Richard Hughes (c.1955-) American mechanical engineer and government and politics theorist	2008	Taught a course on the thermodynamics of government (government thermodynamics) and politics (political thermodynamics), at California State University.
18.			

References

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External links

â— Mechanical engineering – Wikipedia.

θΔics

In "Positive transformation" "Negative transformation"

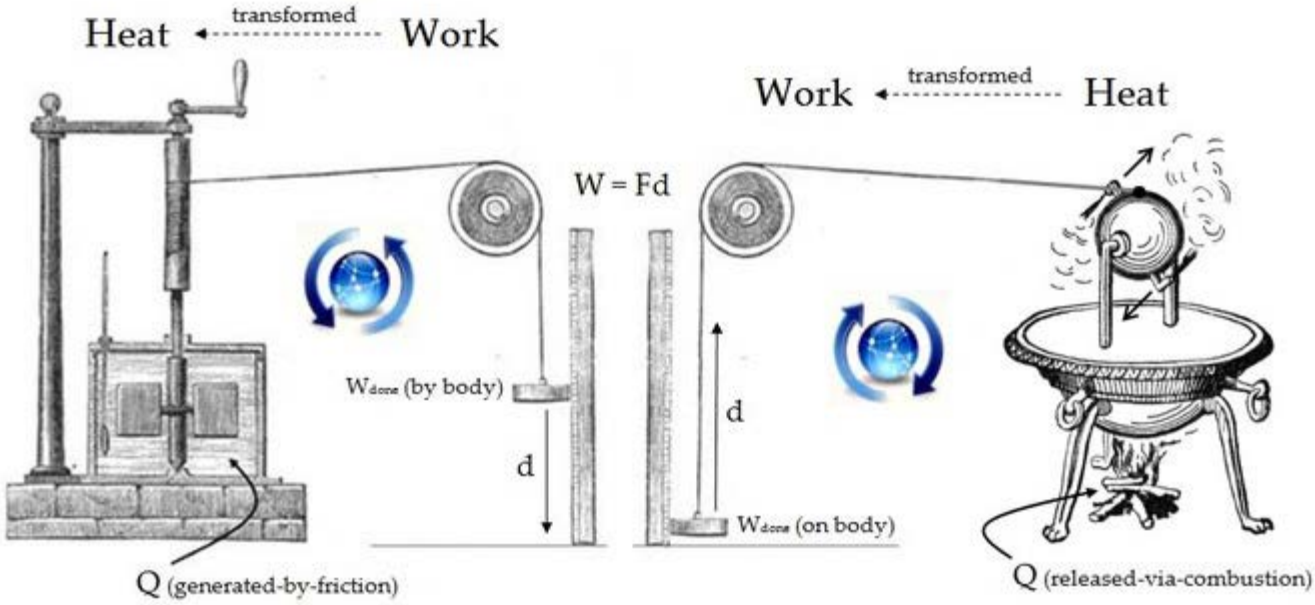

English physicist James Joule's 1843 paddle wheel experiment, the best-known experimental determination of the **mechanical equivalent of heat**, wherein the work *W* of the falling weight was converted into a proportional amount of heat *Q* in the water measured by increase in degrees on the Celsius thermometer. [14]

A 50AD Alexandrian Hero-type aeolipile rigged to a pulley contraption so to be able to do mechanical work: namely the raising of a weight (mg) by a certain distance in height (h), during which process a certain quantity of heat Q is converted into a certain quantity of work W (mgh), in a certain proportionate ratio (J) of work to heat. [13]

thermodynamics, the **mechanical equivalent of heat** is the following ratio which is found to be a universal constant in nature: [1]

$$J = \frac{W}{Q}$$

where W is an amount of work expended in the production of heat Q (e.g. Thomson's cannon boring experiment, 1798) and or where W is an amount of work produced or obtained from heat Q (e.g. Papin's steam engine, 1690). The numerical value of J is independent of the manner in which the heat is produced by work (or work produced by heat).

This constant was first enunciated as a formal law of nature by German physicist Robert Mayer in 1842 who stated that the heat produced is proportional to he work done in its production; and conversely, when work is obtained from heat, the heat which disappears is in the same constant ratio to the work obtained.

The exact value of this constant was determined in 1843 by English physicist James Joule who found, through a number of all varieties of experiments, that an amount work W expended in the release of 778-pounds downward in gravitational height by one 1-foot results in an amount of heat generation or work-converted-into-heat quantified by a 1° F temperature increase in 1-pound of water. In unit form, Joules measurement is:

$$J = 778.26 ft \cdot lb$$

With the invention of standard SI units, in the 20th century, the value of *J* became defined as 4.186 10E7 ergs per calorie, and assigned a value of 1, after which all forms of energy became expressed in units of "joules". With this assignment of J=1, e.g. as was done by English chemist James Partington (1924), or possibly by someone (?) shortly

before him, the original 19th century mechanical equivalent of heat ratio:

$$W = JQ$$

becomes:

$$W = Q$$

where the J is "assumed" or rather concealed in the proportion between the two. Hence, in SI notation, connection of this unit J=1, to the original 19th century experiments that derived this values becomes a bit camouflaged.

Symbol A

In its early formulation, the mechanical equivalent of heat went by the symbol *a* or *A*, depending on usage. In 1845, German mathematician Carl Holtzmann began to assign the letter "a" to the mechanical equivalent of heat and calculated values using methods similar to those of Mayer. [8] In his paper, Holtzmann stated:

> "I call the **unit of heat** the heat which by its entrance into a gas can do the mechanical work *a*—that is, to use definite units, which can lift *a* kilograms through one meter."

German physicist Rudolf Clausius, in 1850 memoir "On the Motive Power of Heat", begin to adopt this symbol use and terminology, defined as follows:

$$A = \frac{\text{heat consumed}}{\text{work done}}$$

Fact check

In this sense, it seems that A is defined as the inverse of J as defined in modern terms:

$$A = \frac{1}{J}$$

This detail, however, needs to be fact checked.

In event, the calculation of *A* was determined by a number of individuals, including: Benjamin Thomson (1798), Marc Séguin (1839), Robert Mayer (1842), Ludwig Colding (1843), James Joule (1843 to 1849), Carl Holtzmann (1845), and Gustave-Adolphe Hirn (1856). [2] The best known calculation was that performed by Joule in 1843 wherein the falling weight was attached to wound rope to a wooden paddle wheel immersed in a tub of water. When the weight fell, the paddle wheel turned, causing agitation in the water and as a result a temperature increase. [3]

Early history

In circa 1635, Italian physicist Giovanni Baliani showed that by placing an iron pot filled with water on a spinning metal disk it was possible to make water boil. This experiment is said to have been one of the first references to an experimental

determination of the equivalence between heat and work.

One of Joule's original paddle wheel experimental devices, held at the Science Museum, London. [21]

The earliest experiments showing that mechanical work could produce heat in a fixed ratio were the 1798 "cannon boring experiments" done by American-born English physicist Benjamin Thomson which showed that by continuously boring a cannon barrel with a dull drill bit, a seemingly unlimited supply of heat could be produced. Rumford published his results in a paper titled "An Experimental Enquiry Concerning the Source of the Heat which is Excited by Friction" presented to the Royal Society in 1798. Thomson found that the work of one horse during two and a half hours is sufficient to raise through 180° Fahrenheit 26.58 pounds of water. From this he calculated that one pound heated one degree is equivalent to 940 British units of work. [2]

In 1799, British chemist and physicist Humphry Davy conducted "ice-rubbing experiments", where in a room colder than the freezing point of water, he generated heat or made ice melt by the mechanical rubbing of cubes together. By doing this, Davy demonstrated the conversion of work into heat and that indefinite amounts of heat could be generated from a body, this being contrary to caloric theory, which limits the amount. [4]

In 1840, Danish civil engineer and physicist Ludwig Colding had worked out a "perpetuity of force" theory and and in 1843 attempted to measure heat generated by a brass sled on tracks of various constitution, one of the first mechanical equivalent of heat experiments, data from which he aimed to establish a force conservation theory in order to validify the theory of the immortality of the soul or the force of the soul, or something along these lines; as stated in 1856 retrospect.

In 1841, German physician Robert Mayer sent the article "On the Quantitative and Qualitative Determination of Forces" to German physicist Johann Poggendorff, to be published in his *Annalen der Physik and Chemie*, in which he stated, among other things, that "motion is converted into heat"; but the paper was rejected. He followed this up with the 1842 paper "Remarks on the Forces of Inorganic Nature", in which he gave the following figure for the mechanical equivalent of heat: [5]

> "The warming of a given weight of water from 0ËšC to 1ËšC corresponds to the fall of an equal weight from the height of about 365 meters."

In the early 1840s, English physicist James Joule repeated Davy's ice-rubbing experiments and began to extrapolate this principle to various other work-producing experiments, such as chemical, mechanical, and electrical.

In 1843,
Joule

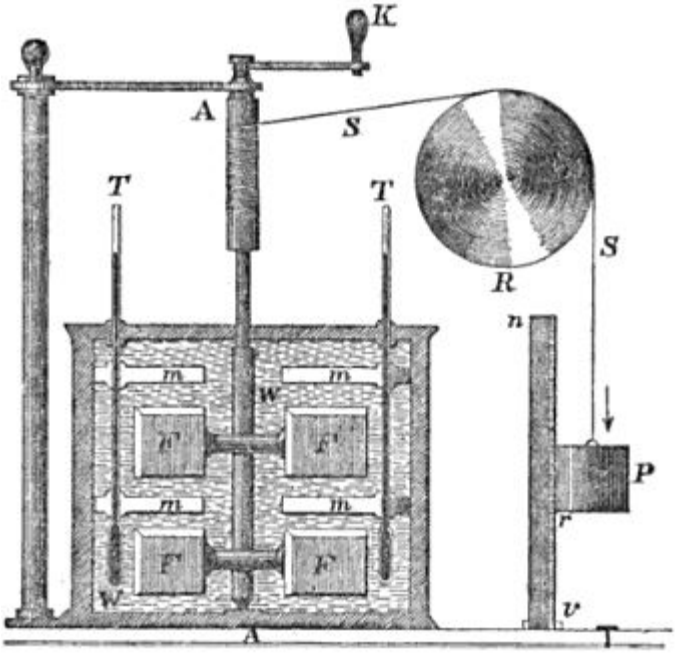

Left: Austrian physicist Franz Pisko's 1879 illustration of Joule's paddle wheel experiment used to determine the **mechanical equivalent of heat**. [20] Right: a 2010 TutorVista.com video on James Joule's 1843 paddle wheel experimental calculation of the mechanical equivalent of heat.

summarized his overall objective and theory by stating that:

> "I shall lose no time in repeating and extending these experiments, being satisfied that the grand agents of nature are … *indestructible*; and that wherever mechanical force is expended, an exact equivalent of heat is *always* obtained."

Joule's famous paddle wheel experiment was conducted in 1843.

In Joule's famous 1845 paper, entitled "On the Mechanical Equivalent of Heat" (or "On the Existence of an Equivalent Relation between Heat and the ordinary Forms of Mechanical Power"), he published the value *A* for the amount of work *W* required to produce a unit of heat *Q*. Joule contended that motion and heat were mutually interchangeable and that in every case, a given amount of work would generate the same amount of heat, regardless of the process. [3]

In 1843, Ludwig Colding stated that "the quantities of heat evolved are, in every case, proportional to the lost moving forces" though he did not calculate a mechanical equivalent of heat. [6] This postulate may have been based on his earlier 1839 experiments on the compressibility of water; later summarized with a review of other data on compression and friction of various materials. Into the late 1840s, in a series of quantitative experiments sponsored by the Royal Danish Academy of Sciences and Letters, Colding was able to obtain various values for the mechanical equivalent of heat. By 1850, Colding had obtained a value for the mechanical equivalent of heat, some 14% lower than the modern value (4.1860 J/cal) at a time when Joule had measured 4.159 J·cal-1. [7] A subsequent calculation by Colding in 1852 yielded a value only 3% below modern values.

In 1847, Joule measured the mechanical equivalent of heat on his honeymoon at Niagara Falls.

In 1856, French physicist Gustave-Adolphe Hirn's conducted experiments in the determination of the mechanical equivalent of heat of a human being in working action. In particular, Hirn calculated a value for the mechanical equivalent of heat for a man doing work, i.e. running on a paddle-wheel like stair-climber

mechanical equivalent of heat Symbol *J*. The ratio of a unit of mechanical energy to the equivalent unit of thermal energy, when a system of units is used in which they differ. *J* has the value 4.1868×10^7 ergs per calorie. The concept loses its usefulness in *SI units in which all forms of energy are expressed in joules and *J* therefore has a value of 1.

2005 *Oxford Dictionary of Science* definition of the mechanical equivalent of heat. [10]

treadmill, in a sealed chamber. To achieve this end, a man was placed in a hermetically closed chamber, and made to turn a wheel which could, at choice, revolve with or without doing work. The heat given out in the chamber was then ascertained by the ordinary calorimetric process. From these experiments, Hirn deduced a valuation of the mechanical equivalent of heat for animated motors; but the number which he obtained differed considerably from the standard obtained by Joule via physico-mechanical methods. [9]

In 1912, German physical chemist Otto Sackur, in his *Thermochemistry and Thermodynamics* (chapter three), gives a fairly good history and derivation of the mechanical equivalent of heat and its various calculations. [1]

Theorem of the equivalence of heat and work

In 1850, and over the next fifteen years, German physicist Rudolf Clausius began to use the mechanical equivalent of heat as a basis of his *Mechanical Theory of Heat*, which is considered the core book of modern thermodynamics. In his first article "On the Motive Power of Heat and on the Laws which can be Deduced from it for the Theory of Heat", Clausius begins by citing the mechanical equivalent of heat results of Holtzmann, Mayer, and Joule, but then then applies its logic to the heat-generating working action of the "working body" and the likely changes that result in the condition of the working body in a Carnot cycle. In this direction, by 1854 Clausius had enunciated what he called the *theorem of the equivalence of heat and work* as such: [11]

> "Mechanical work may be transformed into heat, and conversely heat into work, the magnitude of the one being always proportional to that of the other."

This logic was then molded, via a number of arguments, into the (a) the *conservation of energy* and (b) the *equivalence-value of all uncompensated transformations* (entropy); or what are commonly known as the first and second laws of thermodynamics, respectively.

Theorem of the equivalence of transformations

In German physicist Rudolf Clausius' 1854 fourth memoir "On a Modified form of the Second Fundamental Theorem in the Mechanical Theory of Heat", he introduced what he called the theorem of the equivalence of transformations, in which the concept of irreversibility is rooted, and hence entropy increase.

Switch to J = 1

The original units of the mechanical equivalent of heat, calculated by James Joule, in a va In unit form, Joules measurement is:

$$J = 778.26 ft \cdot lb$$

With the invention of standard SI units, in the 20th century, the value of *J* became defined as 4.186 10E7 ergs per calorie, and assigned a value of 1, after which all forms of energy became expressed in units of "joules".

An earlier "absolute system of units" (c.1912) value for the mechanical equivalent of heat often used was:

$$J = 4.186 \times 10^7 \frac{erg}{cal}$$

where the unit of work 1 erg, in SI units, equals:

$$erg = \frac{1}{98,100,000} kg \cdot m$$

In sum, the original *circa* 1840s sense of the mechanical equivalent of heat means that the work energy released when a one pound weight falls through a height of 778 feet can affect a temperature increase of one degree in a pound of water, through a number of means of energy conversion.

Derivation needed

The transition of original 1843 definition units of J to CGI units to the modern SI units of J = 1 has a bit of a blurry history to it. The switch seems to have begun to come about in circa 1910 when the inconsistencies in defining the unit of energy in terms of heat capacities of water became a less compelling as compared to the ability to measure quantities of energy more accurately by electrical methods; according to which the derivation and calculation for the new unit for J has something to do with Ohm's law (1827). In the midst of this, supposedly, in 1930 the decision was made to define the calorie arbitrarily by the relation: [18]

4.1850 absolute joules ≡ 1 calorie

In 1924, English chemical thermodynamicist James Partington defined J as:

$$J = \frac{A}{Q}$$

where A was a commonly symbol for work, from the German word *arbeit*, meaning 'work', a notation employed by those such as German physical chemist Walther Nernst (1917). Partington then states that if the SGS system (work is ergs and heat in degree calories) and another unit system (work in gram-centimeters and heat in gram calories) with have different values of J. He then jumps to the conclusion that "with suitable units for A and Q, we can make J = 1, in which case A = Q." [17] The details of this jump need to be tracked down?

In sum, to review the mechanical equivalent of heat a constant factor relating the calorie (the *c*.g.s. unit of heat) to the joule (the unit of mechanical energy), equal to 4.1868 joules per calorie. It is redundant in the SI system of units, which measures heat and all forms of energy in joules. [16]

The unit of “calorie” was first defined by Nicolas Clément in 1824 as a unit of heat, entering French and English dictionaries between 1841 and 1867.
At some point along the way, the calorie was replaced by the SI unit of energy, the joule. Hence, sometime along the way, the units and definition of the mechanical equivalent of heat was reformulated, in standardized unit sense, in some way or another.

It seems, according to some, that a standardized value of 4.1860 J/cal was established in the early-to-mid 20th century, in the 1920s, supposedly, it was ultimately realized that the constant is simply the specific heat of water, a quantity that

varies with temperature between the values of 4.17 and 4.22 J/g·°C. The change in unit was the result of the demise of the calorie as a unit in physics and chemistry.

Since early days the calorie or kilocalorie has been used as a unit of energy. In some circles, however, it is realised that this cannot be continued indefinitely and that in due course the joule is to be substituted for the calorie as the unit of energy in all nutritional work. Calories should then fall into disuse.

In the International System of Units (Système International d'Unités) called S.I., there are 6 basic units as adopted in 1954: the meter (M) for length, the kilogramme (Kg.) for mass, the second (s) for time, the ampere (A) for electric current, the kelvin (K) for thermodynamic temperature and the candela (cd) for luminous intensity (1).

All the other units are derived from these 6 basic units such as the unit for force as the newton (N) (Kgm/s^2), the unit of energy in any form is the joule (J) (Nm) and the unit of power as the watt (W) (J/s). The joule was adopted as the unit for electrical work, heat, mechanical work and energy in 1948 at the 9th General Conference on Weights and Measures, avoiding the calorie as far as possible. This unit was also formally approved in 1960 in the International System of Units (SI). Also the International Standards Organization (ISO) has recommended its adoption as the preferred unit for energy, as well as the USA National Bureau of Standards, the British Standards Institution and the Royal Society. [15]

Quotes

The following are related quotes:

> "The first step in the investigation of the transformation of heat into work was taken by Sadi Carnot in 1824, a step of inestimable value in every branch of modern physical science. He devised a method of startling originality for the purpose of attacking this special question of the production of work from heat."
>
> — Balfour Stewart and Peter Tait (1875) [19]

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External links

â— Mechanical equivalent of heat – Wikipedia.
â— On the Mechanical Equivalent of Heat (historical) – Encyclopedia of Earth.

θΔics

In science, **mechanical philosophy** is the view which holds that all that exists is matter and motion (Boyle, 1665); more generally that all objects are composed of particles or atoms, and that these interact according to fixed natural laws. [1]

See also

- Mechanics
- Mechanical theory of heat
- Mechanism
- Social mechanics

Quotes

The following are related quotes:

> "Hobbes was one of the three most important **mechanical philosophers** of the mid-seventeenth century, along with Descartes and Gassendi."
>
> — Robert Kargon (1966), *Atomism in England* [2]

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θΔics

In science, the **mechanical theory**, according to 1824 views of French physicist Sadi Carnot, explains the operation of machines which have for a motor the force of men (manpower) or of animals (horsepower), a waterfall (waterpower), an air current (windpower), etc., but not those which receive their motion form heat. [1] In general, the "mechanical theory" is a term that refers to a geometric physics of, pre heat engine period, machines, those such as screw presses, pulleys, water wheels, wind mills, etc., defined by fundamental principles and limits of operation owing to the geometry of movement of the parts and the laws of force.

History

The works of French engineer Lazare Carnot embody the logic of the mechanical theory to a large extent. [2] In particular, Lazare Carnot's 1778 "Memoir on the Theory of Machines", written fresh out of engineering school, submitted to the French Academy of Sciences in Paris, in efforts to win their coveted prize contest to formulate a general mechanical theory, acts as a good point representative of the birth of the mechanical theory. Specifically, in an advertisement in the *Gazette de France* of 18 April 1777, the Academy specified that this machine theory or subject needed to be: [3]

> "The **theory** of simple **machines** with regard to friction and the stiffness of cordage, [requiring] that the laws of friction and the examination of the effects resulting from stiffness in cordage be determined by new experiments conducted on a large scale; [requiring] further that these experiments be applicable to machines used in the Navy such as the pulley, the capstan, and the inclined plane."

His two-part entry was titled "Mémoire sur la Théorie des Machines", part I being his experimental results, part II being the outline of his general theory of machines. [3] A number of more robust publications on the same subject soon followed out, culminating with the 1803 *Fundamental Principles of Equilibrium and Movement*.

Thermodynamics

The new "mechanical theory of heat", in a sense, can be considered as a formulaic combination:

> **Mechanical theory of heat** (1865) = **mechanical theory** (1778) + **mechanical equivalent of heat** (1798) + **theory of heat** (1837)

developed largely by German physicist Rudolf Clausius between 1850 and 1865, explains the operation of machines which receive their motion from heat, a theory now known as the science of thermodynamics. [4]

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θΔics

In theories, **mechanical theory of heat** or *Mechanische Wärmetheorie* (German) is a unification of Boerhaave's law, the theory of heat, mechanical theory, specifically the mechanical logic of the steam engine operation, the mechanical equivalent of heat, utilizing parts of the kinetic theory, and the ideal gas laws, among other topics (such as electrochemistry), as presented in German physicist Rudolf Clausius' 1865 textbook *The Mechanical Theory of Heat*. [1]

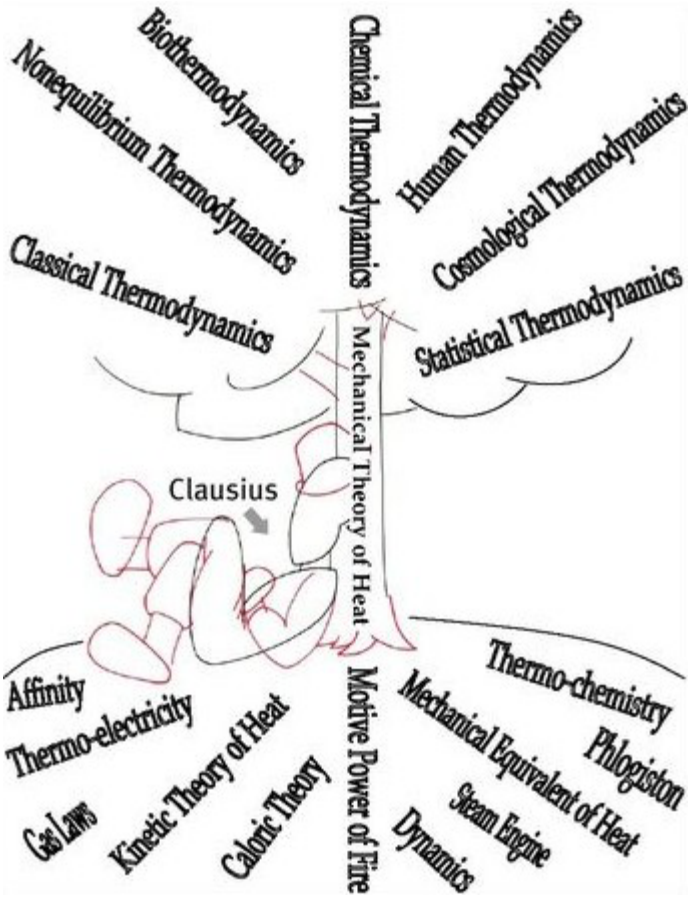

The "branches" and "roots" of the tree of thermodynamics, having the **mechanical theory of heat** as its trunk.

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θΔics

In models, **mechanical universe** refers to []

Overview

In 1902, American Edwy Hand, in his *A Mechanical Universe*, outlines a seemingly implicit atheism (god and atheism are not mentioned) model of the universe, based on sixteen points or "basic elements of existence", as he refers to things, namely: [1]

> 1. There is only one kind of matter in the universe and its definition is set forth herein.
> 2. Matter only partly fills universal space.
> 3. Matter exists in several grades or orders, first primary matter, second atoms, third the stars, and fourth the galaxy.
> 4. The primary order of matter and the conditions which mark its existence in space.
> 5. The atom, the simplest mechanism in the universe,
> 6. Motion of masses of matter is the only active cause principle in the universe.
> 7. Collisions impacts pressure, are the only mode of active causation in existence.
> 8. Atoms, stars, the galaxy, are formed by a constructive process of condensation.
> 9. Condensation is caused by the mechanical process which follows each impact of collision and differentiates motions into higher and lower velocities.
> 10. The process and cause of energy radiation.
> 11. The nature and operation of the gravitation cause.
> 12. The mode of union whereby atoms combine and form molecules.
> 13. The mode of chemical action and change.
> 14. The source of chemical energy as in combustion.
> 15. The two basic principles of electricity.
> 16. The principle of affinity in chemical combination.

In 1985, David Goodstein, a Caltech physics professor, lectured to his freshman physics class in the form of a 56-part telecourse entitled "The Mechanical Universe", which in 2016 was uploaded (Q) to YouTube. The funded-show spurred the followup two-volume textbook *The Mechanical Universe* (1985), by Richard Olenick, Tom Apostol, and Goodstein; in volume one (Q), they mention god three times: [2]

> "In the center of all the celestial bodies rests the sun. For who could in this most beautiful temple place this lamp in another or better place than that from which it can illuminate everything at the same time? Indeed, it is not unsuitable that some have called it the light of the world; others, its minds, and still others, its ruler. Trismegistus calls it the visible god; Sophocles' Electra, the all-seeing. So indeed, as if sitting on a royal throne, the sun rules the family of the stars which surround it."
>
> — Nicolaus Copernicus (1543), *On the Revolution of the Heavenly Orbs*

> "And with respect to the general cause, it seems manifest to me that it is none other than god himself, who, in the beginning, created matter along with motion and rest, and now by his ordinary concourse alone preserves in the whole the same amount of motion and rest that he placed in it. For although motion is nothing in the matter moved but its mode, it has yet a certain and determinate quantity, which we easily see may remain always the same in the whole universe, although it changes in each of the parts of it."
>
> — Rene Descartes (1644), *Principles of Philosophy*

The third mention of god (pg. 264) is in discussion of Descartes' mechanical law following universe, wherein they state that Descartes believed, firstly, that the universe was set in motion by god, and secondly, to resolve the issue of a

‘running down universe’, since all mechanical things, e.g. clocks, machines, etc., run down over time, Descartes posited that the “quantity of motion”, aka momentum *p*, of all bodies in the universe, is preserved by god who created it in the beginning and constantly sustains it, is a vector quantity which is the product of the mass m of an object and its velocity *v*:

$$\mathbf{p} = m\mathbf{v}$$

whereby the sum of the momenta of all the bodies in the universe is a constant:

$$\sum_{i=1}^{n} \mathbf{p}_i = \mathbf{p}_1 + \mathbf{p}_2 + \mathbf{p}_3 + \cdots + \mathbf{p}_n = \text{const}$$

Therefore, Descartes' god-based mechanical model of the universe is complete. Later, of course, Pierre Laplace (1802), building on Newton, produced a god-free mechanical model of the universe (see: Napoleon Laplace anecdote).

See also

- Atheistic universe
- Theistic universe
- Pantheistic universe
- Physical universe
- Living universe
- Spiritual universe
- Thermodynamical universe

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θΔics

In thermodynamics, **mechanical work** *W* is measure of the energy exerted whenever a body moves under the influence of a force. Specifically, if a force *F* acts on a single material point, causing it to move in a given direction, the product of the force and the distance *d* moved through is the “mechanical work” which the force performs during the motion: [1]

$$W = F \cdot d$$

History

The etymology of the term *mechanical work* seems to stem from the writings of French engineer Sadi Carnot. In 1824, Carnot outlined the view that "already the steam-engine works our mine" and used the expression "motive power", which he used synonymously with the term *impelling power*, to quantify the useful effect of that a motor is capable of producing as “the product of the weight multiplied by the height to which it is raised.” [2] In 1834, French engineer Émile Clapeyron used the phrase “mechanical action” as “the integral of the product of the pressure times the differential of the volume” during either the expansion or contraction of the gas and the resultant piston movement. [3] In 1850, German physicist Rudolf Clausius began to use the terms "motive power", "work", and "mechanical work" somewhat interchangeably; although tending towards the latter terminology in his later papers. [4]

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θΔics

In science, **mechanics** is the study of the interactions between matter and the forces acting on it. [1] Mechanics, according to the 1926 *Anatomy of Science* lectures of Gilbert Lewis, is the general science of the study of mass, space (geometry), and time; just as kinematics is the study of space (geometry) and time. [3]

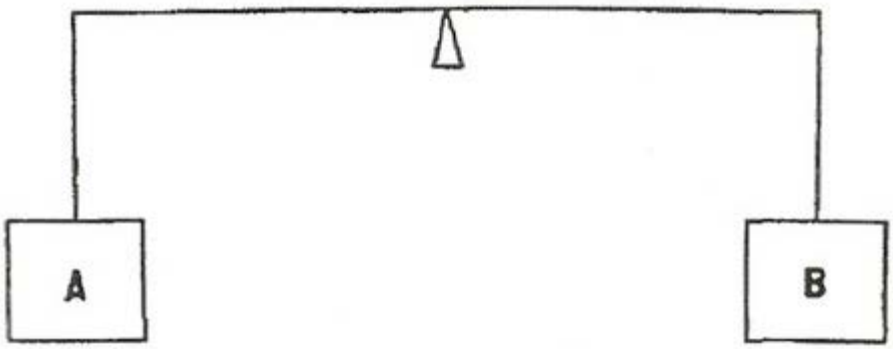

Greek physicist Archimedes' principle of the lever that "magnitudes of equal weight acting at equal distances are in equilibrium [mechanical equilibrium]" is one of the earliest examples of a subject in **mechanics**. [3]

History

The term and subject of "mechanica" is said to be attributed to Aristotle or one of his followers known as the pseudo-Aristotle. [2]

Austrian physicist Ernst Mach's 1893 *The Science of Mechanics: a Critical and Historical Account of its Development*, according to Gilbert Lewis, is said to be a "beautiful treatise" on mechanics in general and on its history. [4]

Thermodynamics | Mechanical theory of heat

It should be noted that the expanded name of thermodynamics is "mechanische wärmetheorie" (German) or mechanical theory of heat (English), in the original 1865 terminology of German physicist Rudolf Clausius, the central founder of the subject, meaning that thermodynamics loosely translates as the study of the interactions between matter in relation to particularly the forces of heat acting on matter.

See also

- Celestial mechanics
- Mechanism
- Mechanical action
- Mechanical effect
- Mechanical equivalent of heat
- Social mechanics
- Statistical mechanics
- Mechanical energy
- Mechanical theory
- Mechanical work
- Lessons on Social Movement

References

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External links

- Mechanics – Wikipedia.

θΔics

In chemistry, **mechanism** is the step-by-step sequence of elementary reactions by which overall chemical change occurs. [1] A reaction mechanism, said another way, is the way in which a particular chemical reaction occurs, described in terms of the steps involved. [2]

> "**Mechanism**, which counts among its progenitors and partisans Democritus, Descartes, Hobbes, Locke, Berkeley, and Hume, has at its root the engineer's model or machine, with its atomistic and manipulatable parts."
>
> — Eric Zencey (1983), "Entropy as Root Metaphor" [13]

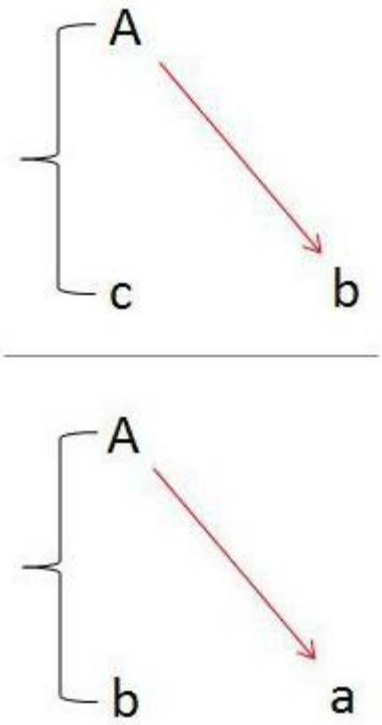

"Suppose *A* to be a substance for which other heterogeneous substances *a*, *b*, *c*, etc., have and attraction; suppose, further, *A*, combined with *c* to saturation—this union I shall call *Ac*—should, upon the addition of *b*, tend to unite with it to the exclusion of *c*, *A* is then said to attract *b* more strongly than *c*, or to have a stronger elective attraction for it;

lastly, let the union *Ab*, on the addition of *a*, be broken, let *b* be rejected, and *a* chosen in its place, it will follow, that *a* exceeds *b* in attractive power, and we shall have a series: *a*, *b*, *c*, in respect to efficacy. What I here call *attraction*, others call *denominate affinity*; I shall employ both terms promiscuously, though the latter, being more metaphorical, would seem less proper in philosophy."

Swedish chemist Torbern Bergman's 1775 "verbal" description of affinity reactions (right), shown with generic models of Scottish chemist William Cullen's 1757 "diagrams" of affinity reactions (left), the basic starting point in the history of the notion of "**mechanism**" in the history of chemistry.

In a mechanism, each step is characterized by a number of factors, such the reaction time in a single step, a specific movement or exchange, energy, entropy, and Gibbs free energy changes, among other factors. A mechanism describes in detail exactly what takes place at each stage of a chemical transformation. It describes the transition state and which bonds are broken, and in what order, which bonds are formed and in what order, and what the relative rates of the steps are. A complete mechanism must also account for all reactants used, the function of a catalyst, stereochemistry, as well as all products formed and the amount each reactant and product.

History

Verbal chemical mechanism began in English physicist Isaac Newton's 1718 famous "Query 31". Newton's verbal reaction displacement descriptions, in turn, became French chemist and physician Étienne Geoffroy's 1718 affinity table, which soon expanded into large affinity tables by other chemists. The first mechanism diagrams arose in the 1757 lecture notes of Scottish chemist William Cullen, such as shown below:

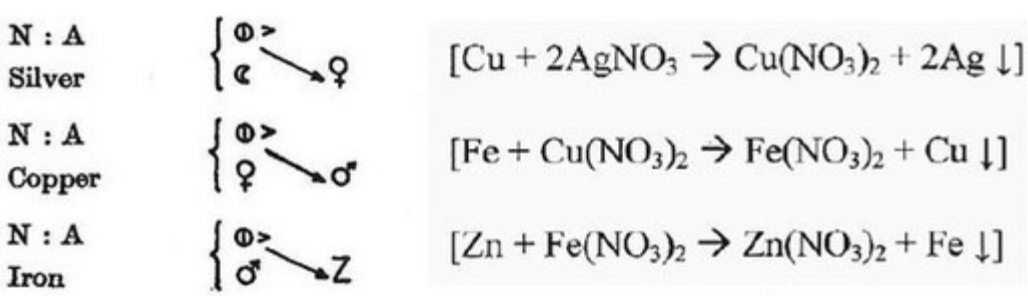

Cullen's most prominent student Scottish physicist and chemist Joseph Black also made mechanism-like reaction diagrams. These affinity tables and reaction diagrams, in turn, found their largest expression in the 1775 so-called "affinity reaction diagrams" of Swedish chemist Torbern Bergman, the first of which is shown below:

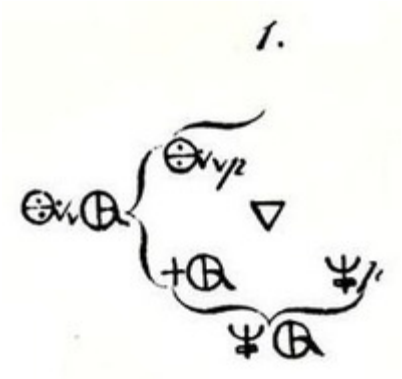

Bergman also, was the one who introduced the now-standard English alphabet notation, A, B, C, aB, etc., notion for generic single and bonded, chemical species. These Bergman reaction diagrams, over the next century, through a slow gradual process, eventually began to be written in the standard horizontal reactants convert to products notation:

Reactants → Products

In 1884, Dutch physical chemist Jacobus van't Hoff introduced the two-way arrow to signify the forward backward nature of reactions until equilibrium is reached:

Reactants ⇆ Products

In 1903, Scottish chemist Arthur Lapworth proposed one of the first reaction **mechanisms**, namely that for benzoin condensation, as shown below, where the proton transfers occur at (i) and (ii): [3]

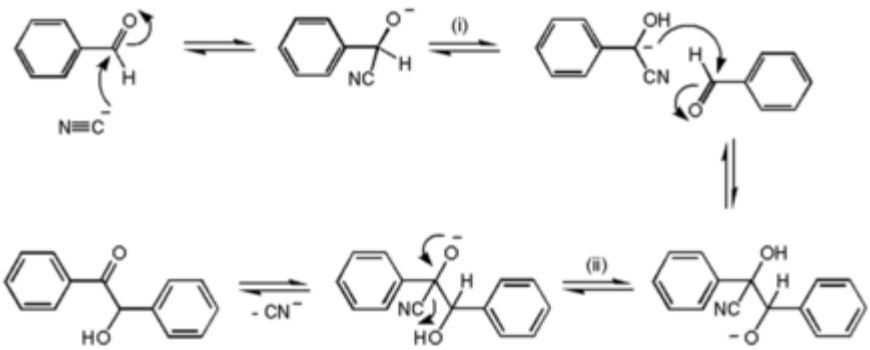

Chnopsology | Biology

The term 'mechanism' in biology (chnopsology), just as in chemistry, according to English experimental biologist James Johnstone, refers to the motions and configurations of material particles, namely the atoms and molecules of a system which exist, move, and from configurations, in a physical chemical system in space and time. [9]

Chnopsological thermodynamics

See main: Chnopsological thermodynamics

The first to use thermodynamics to describe life (animate structure) mechanistically was French biologist Stéphane Leduc who in 1911 published a 197-page treatise on the mechanism of life, wherein, in his own words, he "endeavored

to give as much of the science of energetics as can be treated without the use of formula; the conception of entropy and Carnot's law of thermodynamics" to the explanation of the mechanism of life. He states, for instance, "a living being [is] a store of potential energy, to be set free by external stimulus." [8]

The second to describe "mechanism" in relation to interactions between living entities, on the model of chemical mechanism, was English experimental biologist James Johnstone, beginning in 1914 and culminating with his 1921 book *The Mechanism of Life in Relation to Modern Physical Theory*. [4] Johnstone's work later stimulated ideas on predator-prey mechanism as described in 1922 articles "Contribution to the Energetics of Evolution" and "Natural Selection as a Physical Principle" American physical chemist and mathematician Alfred Lotka. [5]

Dead mechanism

See main: Defunct theory of life

In 1892, German physicist Karl Pearson gave the following opening statement to his chapter on life in his book *The Grammar of Science*:

> "The object of our *Grammar* so far has been to investigate the radical concepts of physics, the basis of that **'dead' mechanism** to which science is popularly supposed to reduce the universe."

Here we see Pearson unknowingly applying religio-mythology concepts, namely the concepts of "life" and "death", which are not concepts found in the corpus of hard science, to the question of mechanism, namely the agglomeration of the religio-mythology science blended term "dead mechanism", as apposed to "living mechanism". Pearson, prior to this, in his 1885 "Matter and Soul" lecture, used the dead mechanism argument to discredit the notions of "consciousness" and to some extent "life". [11]

Human chemistry | Social mechanism

See main: Social mechanism

In human chemistry, the concept of chemical mechanism has a long history tracing back to the 1796 theories of German polyintellect Johann Goethe, and after hims including Lawrence Henderson, Christopher Hirata, to name a few.

In 2007, American electrochemical engineer Libb Thims used mechanist theory and depictions of mechanisms in the discussions of human chemical reactions occurring between "human molecules" (people), *A* or *B*, such as in the processes of relationship formation, divorce, or friendship rearrangement, etc., via its use in human collision theory, human molecular orbital theory, transition state theory, etc. [6] To cite one example, the classic model of reaction mechanism between two proteins *R* and *L*:

R + L	↔	R ··· L	↔	R – L	↔	RL
close proximity		encounter complex		transition state		bound state

The first step in the reaction, *R* + *L*, brings the two protein molecules into close proximity, resulting in the first 'macrocollision' and yielding the *encounter complex*: *R* ··· *L*. In the second step, short range electrostatic effects result in a well-oriented conformation called the 'transition state' or *R* – *L*. At this point, orbital overlap effects are not yet significant factors. The last step of the binding process is the latter stage transition from the favorable intermediates to the bound state unit *RL*. This is a process of induced fit, limited by a rate constant, which requires structural rearrangements overcoming mostly enthalpic energy barriers.

Thims explained this, in the human molecular perspective, such as if *R* and *L* were two human molecules, *A* and *B*, from one point of view, as an energetic analog to American psychologist John Money's 1980 love map theory, but translated

in the form of the modern drug-receptor thermodynamic conception of "free energy maps", which corresponds to the sensory forces that guide the orientation, alignment, and development of a person's life in proportion to measurements of neighboring 'locking potentials' of human molecules in close proximity. In this sense, in human life, forces or locking potentials drive the search leading to high-affinity binding of humans to other humans. [7]

Quotes

The following are related quotes:

> "Pan-mechanism is not simply the claim that being is composed entirely of machines, but that all interactions are machinic interactions."
>
> — Levi R. Bryant [12]

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External links

- Reaction mechanism – Wikipedia.

θΔics

In schools, **mechanistic school** or "mechanistic school of social thermodynamics" refers to all sociological theories, according to the 1928 classification scheme of Russian-born American sociologist Pitirim Sorokin, which interpret social phenomena in the terminology and concepts of physics, chemistry, mechanics, mathematics, energetics, and thermodynamics. [1] Sorokin divides the mechanistic school of sociology into about four main principle branches as follows: [2]

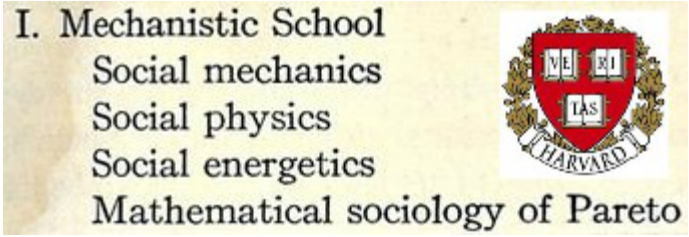

Russian-born American Harvard sociology department founder Pitirim Sorokin's 1928 classification of the first main branch (of eleven) of "contemporary sociology", that of the "mechanistic school of social thermodynamics", all based on the thermodynamics of Rudolf Clausius. [1]

(a) **Social mechanics**

Representatives: Antonio Portuondo, Spiru Haret, Alfred Lotka

(b) **Social physics**

Representatives: Henry Carey

(c) **Social energetics** (or social thermodynamics)

Representatives: Ernest Solvay, Vladimir Bekhterev, Wilhelm Ostwald, Thomas Carver, and Leon Winiarski

(d) **Mathematical sociology**

Representatives: Vilfredo Pareto and Filippo Carli

This classification scheme of Sorokin has frequently been mentioned or utilized as a basic outline of sociology. [5]

Schools of Contemporary Sociology (1928)

I. Mechanistic School
- Social mechanics
- Social physics
- Social energetics
- Mathematical sociology of Pareto

II. Synthetic and Geographic School of Le Play

III. Geographical School

IV. Biological School
- Bio-organismic branch
- Racialist, Hereditarist and Selectionist branch
- Sociological Darwinism and Struggle for Existence theories

V. Bio-Social School
- Demographic sociology

VI. Bio-Psychological School
- Instinctivists' sociology

VII. Sociologistic School
- Neo-positivist branch
- Durkheim's branch
- Gumplowicz's branch
- Formal sociology
- Economic interpretation of history

VIII. Psychological School
- Behaviorists
- Instinctivists
- Introspectivists of various types

IX. Psycho-Sociologistic School
- Various interpretations of social phenomena in terms of culture, religion, law, public opinion, folkways, and other "psycho-social factors"
- Experimental studies of a correlation between various psycho-social phenomena

The **mechanistic school** (social mechanics, social physics, social energetics or social thermodynamics, and mathematical sociology), first of the main nine schools of contemporary sociology, according to the 1928 classification scheme of Russian-born American sociologist Pitirim Sorokin. [2]

Polish economist Leon Winiarski is described as the leader of the mechanistic school of social theory, which is correct, being that Winiarski was the first to used both the thermodynamic

equations of Rudolf Clausius as well as the mechanical equations of Joseph Lagrange; Winiarski is followed by Eugene Roberty, Henry Carey (social chemistry and social physics), and Wilhelm Ostwald (social energetics), as described by American sociologist Howard W. Odum. [3] Others have described Winiarski as the "most outstanding representative" of the mechanistic school of sociology. [4]

Sorokin attributes mathematical sociology, or what he calls "pure sociology" to the work of Italian social-economist Vilfredo Pareto along with F. Carli.

References

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2. Table: Classifications of the Schools of Contemporary Sociology, ibid, Sorokin (1928), pg. xxi.
3. Odum, Howard W. and Josher, Katherine C. (1929). *An Introduction to Social Research* (pg. 108-09). H.Holt and Co.
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θΔics

In human chemistry, **Meg A. Bond** (c.1952-) is an American psychologist noted for her 2007 *Workplace Chemistry*, wherein she employs chemical terms as metaphors.

Overview

In 2007, Bond, in her *Workplace Chemistry*, applied verbal chemical theory, in loose metaphor, e.g. activation energy, describing people as 'elements' (human element) that chemically react together (human chemical reaction), etc., to topics such as workplace diversity, company change, and others, along with plant or factory application of theory in consultation. The following is an extract of the opening to her book: [1]

> "The word 'chemistry' is often used to describe relationships between people. When there is 'good chemistry', we understand it to mean that things are going well because of naturally occurring forces of nature. The basic elements—or individuals—involved seem to mix and complement one another well. They not only coexist with relative ease but may also synergistically bring out something new and positive in one another. 'Bad chemistry' implies an interpersonal mess—or even explosion—as personal elements collide and refuse to transform peacefully on contact."

Here, similar to other new human chemistry authors, she sites Greek philosopher Empedocles' famous circa 450BC oil-and-water chemistry aphorism, uses the word 'collide' in reference to collision theory, and speaks of explosions of reactions to people similar to William Fairburn (1914) and Thomas Dreier (1948).
Bond reasons, for instance, that the plant workplace diversity surveys and educational courses are activities that provide additional 'activation energy' to fuel plantwide chemical reactions between people in company transformation. [1] On the application of catalyst theory, Bond defines this as something that allows a reaction to proceed more quickly or with less resistance, but reducing the activation energy needed to make things happen, and reasons that the actions of initial process inquiries and staff feedback are catalysts in that they act to shift organizational sensitivities. [1]

A term employed in team consultations is 'force field analysis', coined by Kurt Lewin, in which consultants analyzed the resources or driving forces that the team could draw on in their initial state to reach their vision or final state and the various barriers or restraining forces that could make it difficult.

Education

Bond completed her AB in psychology at Stanford (1974) and her MA in clinical psychology (1976) and PhD in clinical and community psychology (1983) at the University of Oregon. Bond currently is a psychology professor at University of Massachusetts Lowell.

References

1. Bond, Meg A. (2007). *Workplace Chemistry: Promoting Diversity through Organizational Change* (activation energy, pgs. 50, 74, 87; catalyst, pgs. 35, 46, 74; force field analysis, pgs. 127, etc.). UPNE.

External links

â— Bond, Meg A. – WorldCat Identities.
â— Meg A. Bond (faculty) – Department of Psychology, University of Massachusetts Lowell.

θΔics

In genius studies, **Mega Test IQ** corresponds to an IQ assigned to a person by extrapolation of their score on a Mega Test, a 48 question test designed by American philosopher Ronald Hoeflin in the early 1980s. [1]

1	100RH to 113GT
8	128GT to 130RH to 134SM
16	140RH
22	147RH to 150SM-GT
33	160RH to 164SM to 168GT
42	174RH to 176SM to 183GT
43	177RH (Mega Society cutoff)
44	180RH to 192GT
45	174KL
46	186RH to 198GT
47	190RH to 200GT
48	193RH to 202GT

American philosopher Ronald Hoeflin (IQ=164): creator of the **Mega test**, the first test designed to measure IQs above 145.

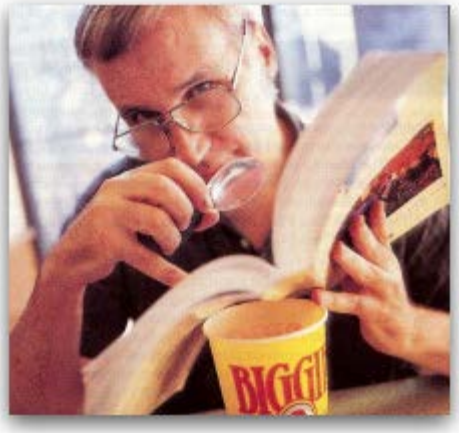

Overview

In 1982, American philosopher Ronald Hoeflin, who claims to have an IQ or 164 or "125 to 175, depending on which cognitive abilities they're tapping into" or 190 “on a good day”, in his own words, in aims to create a Mensa Society (IQ:132+) upgrade, formed the so-named "Mega Society", and shortly thereafter made a 48 question so-named "Mega Test", designed as the first IQ test designed to test for intelligence in the IQ of 145 of above range.

The test consists of 48 questions, math and verbal, which ran in *Omni* magazine from 1985 to 1999. He then developed other versions of the same test, such as the Titan test, among other variants.

Example question

An example verbal question from this Mega test is:

> **Question:** "Teeth is to Hen as Nest is to _____?"

To answer this question, one must be well-read. In particular, one has to know a popular term used commonly in literature from 1650 to 1850, which is found in 19th century dictionaries of slang, phrase, or fable (Q). One also has to know to re-phrase the question as: "The phrase "Hen's teeth" is analogous to the phrase "_____'s nest"? Specifically, one has to know the tale of the pre-1650s Saxon demon Mara or Mare, a kind of vampire, who was said to sit on a sleeper's chest. These vampires were said to be the guardians of hidden treasures over which they brooded as hens over their eggs, and the place they sat was said was termed a *nidus* or nest. Hence the phrase "to find a mare's nest" means to find an illusory discovery or hypothetical treasure, sort of like "fool's gold" a "leprechaun's pot". Subsequently, just as there is no such thing as a mare's nest, there is also is no such thing as hen's teeth.

IQ extrapolations

Derived or estimated IQs based on scores of the Mega test, come from a column written by Scot Morris (Q), another written by Grady Towers (*In-Genius*, #25, Jan., 1991) (Q), and one from an 1989 norming of the test by Ronald Hoeflin (Q) based the scores of the 3,920 participants to have taken the test, which are as follows, where supposedly, according to the opinion of Hoeflin, you are a "certified genius" (which of course is not the truth) if you can answer 16 or more of his questions correctly:

● Quote: “I would now estimate the ceilings of my tests and Ron Hoeflin's as closer to 4.5 to 5.0 sigma. And I.Q. 174 is about 45 on the Mega Test” (Kevin Langdon, 2001). [2]

Example test takers

To give a few example IQs derived from Mega test scores, American news paper columnist Marilyn vos Savant took the test in circa 1985 (age 39), scoring 46 out of 48, which, supposedly, assigned her with an IQ of 186.

American television producer Rick Rosner scored 44 out of 48 (1985) and 47 out of 48 (1991), along with a perfect score on Hoeflin's Titan test, which together supposedly gives him an adult deviation IQ of 195.

American bouncer-cosmologist Chris Langan took the Mega Test, using the pseudonym of Eric Hart, and supposedly obtained a 42 on a first attempt and a 47 on a second attempt. To explain his IQ, in his own words, he says he ended up "setting a record score" which correlated to an IQ of, in his own words, "somewhere between 190 and 210".

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External links

- Home page - MegaSociety.com.
- Mega Society – Wikipedia.com.

In education thermodynamics, **megaentropy** is a hypothetical type of entropy, conceived by American economist Jeremy Rifkin, that supposedly defies the second law of thermodynamics, and is associated with the collection of information and the buildup of intellect in the learning process. [1] The term seems to be some type of backwards spin-off of the material entropy hypothesis.

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1. Rifkin, Jeremy. (1989). *Entropy: Into the Greenhouse World* (revised edition), (pg. 182). New York: Bantam.

θΔics

In hmolscience, **Meghnad Saha** (1893-1956) was an Indian astrophysicist, an oft-cited early pioneer of the Indian school of econophysics, e.g. Anirban Chakraborti (2011), Kishore Dash (2014), etc., noted for []

Overview

In 1931, Saha, in his in his *Treatise on Heat* (see also: thermodynamics textbooks that include human thermodynamics), co-authored with B.N. Srivastava, explained the Maxwell-Boltzmann distribution of molecular velocities according to kinetic theory in terms of the wealth distributions in society: [2]

Suppose in a country the assessing department is required to find out the average income per head of the population. They will proceed somewhat in the following way. They will find out the number of persons whose income lies within different small ranges. For example, they will find out the number of persons whose income lies between 10s. and 11s., between 11s. and 12s. and so on. Instead of a shilling, they may choose a smaller interval, say 6d. Then it can be easily seen that the number of persons whose income lies between 10s. and 10s.6d. will be approximately half the number found previously for the range 10s. to 11s. We can generalize by saying that the number whose income lies between x and $x+dx$ is $n_x dx$. It should be noted that the number is proportional to the interval chosen (dx). To get the average income they should choose the interval to be as small as possible, say a penny. When this is not possible they will choose a bigger interval but their results will be proportionately inaccurate.

To represent graphically[1] the income of the population they will plot a curve with n_x as ordinate and x as abscissa. The curve will be similar to that given in Fig. 6. This will begin with a minimum at 0, rise to a maximum at some point, and thereafter approach the axis of x, meeting it at a great distance. The curve will have this shape because the number of absolute beggars is very small, and the number of millionaires is also small, while the majority of population have average income.

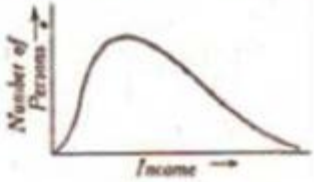

Fig. 6.—Distribution of income among persons.

Indian econophysicist Anirban Chakraborti (2011) reports that Saha's model here shows that the “bulk of income distribution follows a Gibbs-like distribution”. [2]

Religion

Saha was an atheist.

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External links

â— Meghnad Saha – Wikipedia.

θΔics

In human thermodynamics, **Mehdi Bazargan** (1907-1995) was an Iranian mechanical engineer, thermodynamicist, and 75th prime minister of Iran (1979), known for his 1956 treatise *Thermodynamics of Humans*, written during a five-month prison spell (see: genius hiatus effect), for political opposition, in which he attempted to explain the work ethic of the individual in the context of the Islamic teachings and the view that systems, physical or social, evolve towards equilibrium as quantified by a minimum of free energy. [1] A noted quotation from this work is: [12]

> "Society is a system which could be subject to regulations similar to the laws of physics, chemistry, or thermodynamics ... of course it would be very complicated and extraordinarily more complex than a simple system of gas or a combination of water and steam."

(add discussion)

Overview

The following is a 2011 synopsis of Bazargan's human thermodynamics theory, from the article "Muslim Scholars on Dialogue of Modern Science", by Malaysian scholars Nurdeng Deuraseh, Termizi Abu Talib, and Husni M. Harun, generally based on the 2004 work of Mazyar Lotfalian: [16]

> "The Iranian engineer and post-revolutionary Prime Minister, Mehdi Bazargan proposes the theory of thermodynamics. This is to find out the relationship between faith and knowledge and the role of morality in everyday life, which is an attempt to combine Western techno-science with local culture. Bazargan's usage of the theory of thermodynamics is not metaphorical. His arguments are followed by direct application of concepts and formula. What he achieves is quite creative: faith and knowledge become intertwined but disjointed....The effect of this disjointedness is that the individual becomes responsible for acting morally, as if he or she is performing the act of god. Second, as argued by Bazargan using the theory of thermodynamics, faith is self-reflecting: it changes through time and adjust to renew changes in life. Faith also dies if there is no effort by the subject to revive it."

1. Love And Worship-Human Thermodynamics
2. Work In Islam
3. Believing In God And Contemporary Thoughts
4. Industrial Thermodynamics
5. Hygiene In Islam
6. Worshipping God Or The Self
7. Ali And Islam
8. The Call Of The Prophet (PBUH)
9. Religion In Europe
10. The Pros And Cons In Faith
11. The Causes Of The Decadence Of Muslims
12. The Effectiveness Of Society
13. The Unique, Universal Government
14. A Social And Universal Muslim
15. The Inevitable Victory
16. Prayer
17. Memories Of Hajj
18. The House Of People
19. Revelation
20. The Freedom Of India
21. The Human Being And God
22. Pragmatism And Islam
23. God In Society
24. Islam, The Dynamic Religion
25. Motives And Motivators
26. The Relationship Of Religion And Politics
27. Islam, The Dynamic And Productive School
28. Rain And Wind In The Quran
29. Atmospheric Phenomenons
30. Mission And Ideology
31. Effort And Reliance
32. Why We Oppose A Dictatorship
33. Defense In The Military Court
34. Is Marxism Scientific?
35. Mission And Evolution
36. Self-Action
37. The Completed Path
38. Loving Or Reasoning
39. Free-Will
40. A Search Of Erich Fronn's Theory

A Bazargan "collected works" listing of the works by Bazargan from the 1979 English translation of *Work and Islam* by M. Yasefi, Ali Behzadnia, and Najpu Denny. [13]

Bazaran's first published views on human thermodynamics are said to be found in a circa 1943 article entitled "The Thermodynamics of Love", written soon after his return to Iran, likely from his stay in France (circa 1942). [15] In 1946 he had written the a chapter on physiological thermodynamics of human labor and in the context of will power in his *Labor in Islam*, attempting to explain human labor thermodynamically. [10] Thermodynamics, subsequently, served as the foundation of Bazargan's view as to how a society should be run, as being based on the same laws that run the universe. As stated by biographer Saeed

Barzin, from his 1992 PhD dissertation on the political biography of Bazargan: [9]

> "Mention should be made of Bazargan's field of study; thermodynamics, which constitutes a fundamental part of all the physical sciences and which (particularly its concept of equilibrium) was to be a source of inspirations for Bazargan's subsequent reflections on social relations."

In short, into the 1950s and 1960s, Bazargan worked to create a theory or science of a "thermodynamics of humanity" that would explain the teachings of Islam from a scientific point of view. [8] Bazargan's 1969 *Thermodynamics in Human Condition* (may be referring to: *Termodynamik-e Ensan*) addressed the relation between individual morality and social movement. [7] Bazargan's essential goal was to confirm the truth of Islam, as taught in the Koran, on the basis of science. Specifically, according to 2004 author Seyed Taqavi, "the most important feature of Bazargan's thought is his utilization of empirical sciences, and particularly thermodynamics, which was his own specialism, in his approach to Islam. No other Iranian thinker has drawn upon new sciences in the study of Islam as widely as he did." [8]

Love and Devotion: Human Thermodynamics

See main: Thermodynamics of Humanity

Bazargan wrote his famous 1956 treatise *Eshq va Parastesh ya Thermodynamic-e Ensan* (*Thermodynamics of Humans*) while in prison for his political views, a precipitate of the 1953 Iranian coup and its subsequent political restrictions. The book was first published in 1957, according to private documents in possession of Bazargan's biographer Saeed Barzin. [9] Based on several reviews, the books seems to be a thermodynamics of society, blended with Darwinism, appended with footnotes on how certain Koranic verses might corroborate with certain scientific passages. The book is described as "a juxtaposition of scientific ideas and concepts of social relations." [11] Of similarity, American mathematician William Sidis wrote his 1920 treatise *The Animate and the Inanimate* while imprisoned in an asylum for a year, after arrest and 1.5-year jail for political protesting.

Physiological thermodynamics

In his 1946 booklet *Work and Islam*, Bazargan devoted a very elementary six-page chapter, entitled "The Relationship Between Man and Work", to the internal and external attributes of occupational work and the concomitant acceptance of service as being one of the basic keys to human experience in the light of thermodynamics, terming this as "physiological thermodynamics". To quote:

> "This section intends to examine the inherent attributes of work and the effects it has upon the internal and external structures and transformations of the human individual. If such a phrase is scientifically permissible, the subject will be treated in the light of 'physiological thermodynamics'."

The chapter is very superficial, but Bazargan does go on to speculate on how the actions such as the destruction of a building is a "process in which the entropy of the system is increased"; and, conversely, how the construction of a building is one in which the "natural entropy of the system is decreased and necessitates the use of energy and external assistance." He states, on the thermodynamics of will-power, that any kind of planned systematization and orientation in the performance of one's duties are actions: "in which, thermodynamically speaking, the entropy of the system is decreased, or to an extent reversed, and necessitates the use of energy and will-power."

Labor

In theorizing on the work ethics of the Iranian, Bazargan applied mechanics to the movement of the human body, based on thermodynamics. He mixed this together with Islamic teachings and the views of Karl Marx. These views are, supposedly, found in his chapter two "A Physiological Analysis of Human Thermodynamics" to his 1946 *Labor in Islam*. [10] Bazargan was in prison at least two times, during which period 1953-60, he was said to have been "engaged

in elaborating on themes on the nature of evolution and social laws." He wanted to prove that social developments and social relations are governed by laws, in that history and society are governed by processes which are rational and logical. It must thus be one's objective to discover these laws, such that when failure to act according to these laws, as Bazargan states, social decadence will set in.

Laws of social evolution: laws of society

In his *Human Thermodynamics*, based on Darwin's premise that history has an evolutionary and detectable pattern Bazargan sets his eyes on defining the laws of this process and thus condemning those whose practices are against the direction of the laws of social evolution and who are therefore, in Bazargan's mind, are condemned to destruction. These people, Bazargan believes, are those in power, those who have subjected him and is associates to arbitrary practice of power and injustice. Bazargan's argument builds on the premise that in the same manner that the elements of a physical, chemical or mechanical phenomenon follow certain particular patterns in their relations with each other, the "social elements", i.e. the individual persons, too pursue basic laws in their relations with each other. Bazargan thus elaborates a mechanical set of social relations.

Theories

Most of his conceptions, although biased in a detrimental manner by the supposed basis of deity (the infinite entity), are fairly humorous, mostly metaphor, and built on fudge-factor types of thermodynamic equations. In his article, "The Youth's Islam [Islam-e Javan]", for example, he discussed the Helmholtz free energy formula:

$$W = U - TS$$

and replaced *W*, or effective energy (free energy), with human power of movement and production, *U*, or initial internal energy, with desire, need for love, *T*, or temperature, with value of possessions, and *S*, or entropy, with the amount of possessions. Then he tried to apply this formula to some Islamic moral teachings, and concluded that Islam intends to increase the human power of movement and production. Below are a few other examples:

Free will

In relation to free will, for example, Bazargan states: "when dealing with human societies and humans with free will, thermodynamic law and formulae require a coefficient, which can be called a *balancing coefficient* and is less than 1 in unbalanced societies and more than 1 in societies governed by true religions and affections." [3]

Cessation thermodynamics

In relation to cessation thermodynamics, Bazargan states: [4]

> "Thermodynamics might be able to say, though very vaguely, if there is going to be a resurrection and another world, how this may occur and what the other world may look like … In this way, we may be able to examine to what extent the signs of the other world, as provided by the prophets, are plausible. If these signs about the resurrection, paradise and hell form a reasonable and sensible related collection that new sciences, to some extent, affirm, then such beliefs are not baseless."

(add)

Education

Bazargan was born in 1907 in Azerbaijan, though the exact date and details are not known. He completed his undergraduate college work at the Teacher Training Center in Tehran. He completed his graduate work at the Central School of Paris, where he earned a degree (MS or PhD) in mechanical engineering. [13] The exact school in Paris where he studies was, supposedly, the University of Paris (École Centrale des Arts et Manufactures), in the 1930's, where he focused on thermodynamics. Bazargan's engineering studies in France, particularly in thermodynamics, according to

Bazargan biographer Saeed Barzin (1992), were said to “make a deep impression on the young Bazargan encouraging human to revise his understanding of traditional Iranian religion and to acquire modern socio-political ideas.” [9]

After passing his compulsory military service, Bazargan joined became a lecturer in thermodynamics at the Teacher’s College of Technology (Tehran Technical College), at the invitation of the minister of culture Hekmat. [9] He became department chairman, a position which he held until 1962. From 1945 to 1950 he was dean of the Technical College and in 1952 to 1953 he was chief of the water refineries in Tehran. [13] In 1942, Bazargan tought at Teheran University, where he became the head of the first engineering department of Tehran University in the late 1940s, becoming known as one of Iran's best mathematicians; later he was awarded the chair of thermodynamics at the university's technical college. [6] From February 5, 1979, Bazargan was appointed prime minister of Iran by Ayatollah Khomeini, but resigned on November 4, following the US Embassy takeover and hostage taking, in protest of his government’s inability to free the hostages.

Family

Mehdi Bazargan fathered a son named Abdolali Bazargan (1943-), an Iranian liberal political politician, writer, and intellectual who is the leader of the Freedom Movement of Iran. He is one of five major figures in the Green Movement to author a manifesto calling for the resignation of Iranian President Mahmoud Ahmadinejad. Abdolali is married and has three children. He joined the National Front of Iran in 1961 but in 1963 he left party and enjoyed to his father's established party Freedom Movement in 1977. [17]

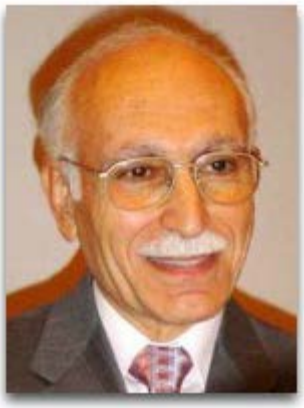

Iranian liberal politician, writer, and intellectual Abdolali Bazargan (1943-), the son of **Mehdi Bazargan**. [17]

Praise | Tributes

The following are instances, anecdotes, and or quotes of praise or tribute:

> “A brilliant professor of engineering, Mostafa Chamran (Ñº) had taught at Berkeley and worked at NASA’s Jet Propulsion Laboratory. He was widely respected in Iranian academic circles as the only student at the University of Tehran to get a 100 percent on his thermodynamics test under **Mehdi Bazargan**, the school’s toughest instructor who would also become the first prime minister of the revolutionary government.”
>
> — David Crist (2012), *The Twilight War* [18]

References

1. (a) Bazargan, Mahdi. (1956). *Eshq va Parastesh ya Thermodynamic-e Ensan*. Tehran: Chap-e Sepehr.
(b) Bazargan, Mahdi. (1956). *Love and Worship: Thermodynamics of Man* (or *Love and Worship: Human Thermodynamics*; or *Love and Devotion: or the Thermodynamics of Humanity*) (pdf). Houston: Book Distribution Center.
3. (a) Taghavi, Sehed M. (2004). *The Flourishing of Islamic Reformism in Iran: Political Islamic Groups in Iran (1941-61),* (pg. 96). Routledge.
(b) Bazargan, *Eshq va Parastesh ya Thermodynamic-e Ensan*, 87.
4. (a) Bazargan, *Eshq va Parastesh ya Thermodynamic-e Ensan*, 159.
(b) Taghavi, Sehed M. (2004). *The Flourishing of Islamic Reformism in Iran: Political Islamic Groups in Iran (1941-61),* (pg. 84). Routledge.
5. Taghavi, Sehed M. (2004). *The Flourishing of Islamic Reformism in Iran: Political Islamic Groups in Iran (1941-61),* (pg. 88). Routledge.
6. Mehdi Bazargan, Former Iran Premier, Dies – *New York Times*. January 21, 1995.
7. (a) Bazargan, Mehdi. (1969). *Thermodynamics in Human Condition.* Publisher.
(b) Chall, Leo P. (1999) “Title” (pg. 984). *Sociological Abstracts,* Vol. 47, Issue 2.
8. Taqavi, Sehed M. (2004). *The Flourishing of Islamic Reformism in Iran: Political Islamic Groups in Iran (1941-61)* (section: Mehdi Bazargan, pgs. 62-; section: Scientific Approach to Religions, pgs. 82-; pgs. 1-100). Routledge.
9. Barzin, Saeed. (1992). *Islam in Defence of Constitutionalism and Democracy: A Political Biography of Iranian*

Ideologue Mehdi Bazargan (thermodynamics, pg. 33-34, 43, 78, 116). PhD dissertation, University of Exeter.
10. (a) Bazargan, Mehdi. (1946). *Labor in Islam* (*Kar Dar Islam*). Houston: Book Distribution Center, 1978.
(b) *ibid* Barzin. (1992). (pg. 127, 164, 166).
11. (a) Bazargan, Mahdi. (1956). *Eshq va Parastesh ya Thermodynamic-e Ensan*. Tehran: Enteshar Publications.
(b) First published in 1957, according to private documents in possession of the author (Bazargan or Barzin).
12. (a) ibid, Bazargan. (1956). *Human Thermodynamics* (pg. 96).
(b) *ibid* Barzin. (1992). section: Natural Laws of Society (pgs. 177-83).
13. Bazargan, Medhi. (1979). *Work and Islam* (section: About the Author, pgs. ii-iii; list of works, pg. 63); translated by M. Yasefi, Ali A. Behzadnia, and Najpu Denny. Houston: Book Distribution Center.
14. Lotfalian, Mazyar. (2004). *Islam, Technoscientific Identities, and the Culture of Curiosity* (ch. 3: A Techno-Cosmopolitan in the Context of the Secular State: The Discourse of a Muslim Engineer/Politician, pgs. 31-53; section: The Theory of Thermodynamics as a Model, pg. 46-50, etc). University Press of America.
15. Chehabi, Houchang E. (1990). *Iranian Politics and Religious Modernism* (Bazargan, "Thermodynamics of Love", pg. 52; thermodynamics, pgs. 49, 52, 126, 138). I.B. Tauris.
16. Deuraseh, Nurdeng, Talib, Termizi A. and Harun, Husni M. (2011). "Muslim Scholars on Dialog of Modern Sciences: Issues and Responses", *International Journal of Asian Social Science*, 1(3):36-38.
17. (a) Abdolali Bazargan – WhoIsLog.info.
(b) Abdolali Bazargan – Wikipedia.
18. Christ, David. (2012). *The Twilight War: the Secret History of America's Thirty-Year Conflict with Iran* (pg. #). Penguin.

Further reading

â— Dabashi, Hamid. (2006). *Theology of Discontent: The Ideological Foundation of the Islamic Revolution in Iran* (section: The Thermodynamics of Mehdi Bazargan, pgs. 332-33). Transaction Publishers.

External links

â— Mehdi Bazargan – Wikipedia.
â— Bazargan, Mahdi – WorldCat Identities.

θΔics

In existographies, **Mehrdad Massoudi** (c.1955-) is an American biomedical engineer, noted for []

Overview

In 2016, Massoudi, in his "A Possible Ethical Imperative Based on Entropy Law", in an attempt to build on Bruce Lindsay's thermodynamic imperative (1959), presented a 20-page, 100-reference discussion, with 39 appended remarks, about how scientists might be able to science to build a morality system, citing on the positive end Wilhelm Ostwald, Howard Seifert, Benjamin Gal-Or, but on the detractive end: Arieh Ben-Naim, Nicholas Georgescu-Roegen, Ilya Prigogine.

While commendable, for effort, as few in modern times even venture in this direction, Massoudi seems to be unaware that Goethe over two centuries ago stated frankly that the "moral symbols" of nature and society are found in the affinity reaction symbols of Torbern Bergman, which equates to the Gibbs energy reaction quantifications of modern physical chemistry or physico-chemical sociology (see: physico-chemical social dynamics and physico-chemical morality), which goes far beyond than "sleeping more" to reduce entropy.

Hinduism | Buddhism

Massoudi, at the end of his paper, attempts to make connections to Hinduism and Buddhism, e.g. "deep sleep produces little entropy" which equates to the Hindu state of "Advaita Vedanta" (Q), a state of bliss in which one's soul is the same as Brahma (Remark B37), or how "right" action, occupation, or speech are described in the eightfold bath of Buddha. Possibly, Massoudi might be making these passing remarks from a secular point of view? Whatever the case, these types of conjectures are myth-based ethics, Hinduism and Buddhism, themselves, derived from Egyptian mythology (see: god character rescripts).

Education

In 1986, Massoudi completed his PhD with a dissertation on "Application of Mixture Theory to Fluidized Beds" at the University of Pittsburg. [1] In 2016, Massoudi was an adjunct professor with the departments of biomedical engineering and mechanical engineering at Carnegie Mellon University.

Quotes | Employed

The following are quotes employed by Massoudi:

> "It is the privilege of man's moral genius, impersonated by inspired individuals, to advance ethical axioms which are so comprehensive and so well founded that men will accept them as grounded in the vast mass of their individual emotional experience. Ethical axioms are found and tested not very differently from the axioms of science. Truth is what stands the test of experience."
>
> — Albert Einstein (c.1940), *Out of My Later Years*

> "A living organism is a chemical system in unstable equilibrium maintained by some strange 'power of life,' which manifests itself as a sort of negative catalyst. So long as life goes on, the organism maintains its unstable structure and escapes disintegration"
>
> — Leon Brillouin (1949), "Cybernetics and Life"

References

1. Mehrdad Massoudi – Mathematics Genealogy Project.
2. Massoudi, Mehrdad. (2016). "A Possible Ethical Imperative Based on Entropy Law" (pdf), *Entropy*, Discussion, Nov 3.

External links

- Mehrdad Massoudi (adjunct faculty) – Carnegie Mellon University.
- Mehrdad Massoudi – Google Scholar.
- Mehrdad Massoudi – Research Gate.

θΔics

In existographies, **Meister Eckhart** (1260-1327) (IQ:145|#664) [RGM:266|1,500+] was a German theologian, philosopher, and spiritual mystic, noted for []

Christ myth

Eckhart, according to Tom Harpur (2004), wrote that Christ was not a historical person, per se, but rather "the collective soul of humanity". [1]

Quotes | On

The following are quotes on Eckhart:

> "If we turn from the forms, produced by external circumstances, and go to the root of things, we shall find that Sakyamuni and **Meister Eckhart** teach the same thing; only that the former dared to express his ideas plainly and positively, whereas Eckhart is obliged to clothe them in the garment of the Christian myth, and to adapt his expressions thereto."
>
> — Arthur Schopenhauer (1844), *The World as Will and Representation, Volume Two* (§:XLVIII). Publisher.

Quotes | By

The following are quotes by Eckhart:

> "Only the hand that erases can write the true thing."
>
> — Meister Eckhart (c.1310) (Ñº)

> "The only thing that burns in hell is the part of you that won't let go of your life: your memories, your attachments. They burn them all away, but they're not punishing you, they're freeing your soul. If you're frightened of dying and you're holding on, you'll see devils tearing your life away. If you've made your peace, then the devils are really angels freeing you from the earth."
>
> — Meister Eckhart (c.1310), paraphrase of his *Speech 5b DW I + Speech 30 DW II + On Detachment DW V*, as quoted (Ñº) in 1990 film *Jacob's Ladder*

References

1. Harpur, Tom. (2004). *The Pagan Christ* (pg. 41). Thomas Allan Publishers.

External links

â— Meister Eckhart – Wikipedia.

θΔics

In existographies, **Melissus** (c.470-400BC) (ACR:14) (CR:9) was a Greek philosopher (see: Greek philosophy), one of the members of the so-called "Eleatic school" headed by Parmenides, whose members included: Zeno of Elea, noted mentor to Leucippus (O), Gorgias, and in some sense Empedocles, noted for []

Quotes | On

The following are quotes on Melissus:

> "The disciples of Parmenides [e.g. Empedocles] and **Melissus** [e.g. Zeno of Elea] have rejected the existence of movement. Aristotle labeled them immobilists and antiphysicists: immobilists because of paralysis, and antiphysicists because movement is the very essence of nature, and to pretend, as they did, that nothing moves is tantamount to abolishing nature."
>
> — Sextus Empiricus (c.200AD) [1]

Quotes | By

The following are quotes by Melissus:

> "**There is absolutely NO void**. For void is not-being and the nothing could not exist. And it does not move. For it cannot move in any direction. But it is full. For if there were void, it would move into that void, but since there is no void it has nothing to move into."
>
> — Melissus (c.430BC), *Fragment* [2]

References

1. Pullman, Bernard. (1998). *The Atom in the History of Human Thought* (pg. 21). Oxford University Press.
2. Algra, Keimpe. (1995). *Concepts of Space in Greek Thought* (pg. 43). Brill.

Further reading

● Pseudo Aristotle. (c.50AD). *On Melissus, Xenophanes, and Gorgias* (O)(W). Publisher.
● Aristotle. (322BC). *The Complete Works of Aristotle, Volume Two* (editor: Jonathan Barnes) (*On Melissus, Xenophanes, and Gorgias* , pgs. 1539-51). Princeton University Press, 1995.

External links

● Melissus of Samos – Wikipedia.

θΔics

In hmolscience, **melting pot theory**, melting pot theorist, or a "pot theory", refers to a publication, argument, or person who employs a variety of variegated, albeit seemingly related theories—such as: cybernetics (Norbert Wiener), information theory (Claude Shannon), itself being an ongoing Sokal affair, general systems theory (Ludwig Bertalanffy), systems theory (James Miller), dissipative structures (Ilya Prigogine), emergy (Howard Odum), autocatalytic closure (Stuart Kauffman), negative entropy (Erwin Schrödinger), among others—as a general spring board and or launching pad to argue for just about anything; often related to evolution, and or the humanities.

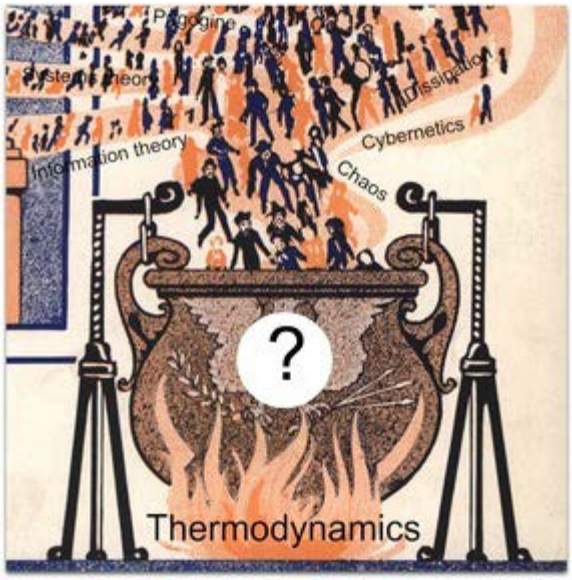

Left: A depiction of a generic thermodynamics-themed **melting pot theory**. Right: a cartoon of Daniel Brooks and Edward Wiley who got burned for their 1982 melting pot fueled Brooks-Wiley theory of evolution.

Overview

Pot theorists, typically, tend to be lacking credentials in the hard physical sciences. Example melting pot theorists, include: Ludwig Bertalanffy, and his 1968 general systems theory; Erich Jantsch, and the general argument found in his 1980 *Self-Organizing Universe*, Peter Corning, and his 1981 synergy-based evolution theory; Daniel Brooks and Edward Wiley, and their 1982 Brooks-Wiley theory; among others. [1] The following cartoon, e.g., is a parody of the infamous 1982 Brooks-Wiley theory, from the article "Are Evolutionary Biologists Really Ready for the Extended Synthesis", by David Tyler, portraying their argument as a "**melting pot theory**" wherein, in the end, Canadian zoologist Daniel Brooks is the one who gets "burned".

In fact commenting, in 2011 retrospect, on the adverse reaction to their theory: "Ed and I were stunned by [the] vicious tone. Why the rhetorical heat?" [2]

Of note, melting pot theorists, as the decades progress, as pattern seems to indicate, seem to build on each other, e.g. Corning, himself a pot theorist, cites Bertalanffy, a classical pot theorist; and so it is with newer pot theorist.

Other pot theorists include: Tullio Scrimali (2006), [add].

References

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(b) Corning, Peter. (1981). *The Synergism Hypothesis: A Theory of Progressive Evolution* (thermodynamics, 8+ pgs; energy, 52+ pgs; entropy, 6+ pgs; synergy, 16+ pgs). McGraw-Hill.
2. (a) Tyler, David. (2011). "Are Evolutionary Biologists Really Ready for the Extended Synthesis" (Ñº), *Science literature*, ARN.org, Mar 18.
(b) Brooks, Daniel R. (2011). "The Extended Synthesis: Something Old, Something New", *Evolution: Education and Outreach*, 4(1):3-7.

θΔics

In science, **Melvin Calvin** (1911-1997) was an American chemist, a scientifically-coded closet theist, noted for []

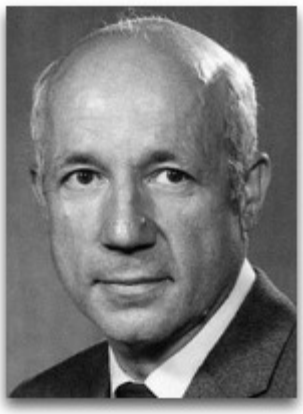

Chemical evolution

In 1949, Calvin had a "period of recuperation after an illness" (see: genius hiatus effect) during which time he was led to ruminate on the following objective: [1]

> "The tools of chemistry and physics were developed in precision, and concepts of biochemistry and biology were evolving in generality, so that investigations into the earliest period—that borderland between non-living and the living—became possible."

(add discussion)

Religion

Calvin's writing are very religion soaked. In 1967-68, as Eastman professor at Oxford, Calvin gave a series of lectures, entitled *Chemical Evolution*, wherein he expounded in this "borderland", albeit one such that in the preface he is using the words "primary creation" and "final creation", in respect to his manuscript (lecture notes) turned book, which is but god code. On page two, Calvin is already citing the Bible, Genesis, and how his book will be concerned with the "fifth day" of creation.

Photosynthesis

In 1961, Calvin won the Nobel Prize for his work on the assimilation of carbon dioxide during photosynthesis. [2]

Advisors | Students

Anti-reductionist Michael Polanyi was Calvin's academic advisor; Dean Kenyon was one of Calvin's religiously-gone-awry noted students.

Quotes

The following are noted quotes:

> "The study of chemical evolution is based on the assumption that life appeared on the surface of the earth as a result of the normal operation of the laws of physics and chemistry. This implies there must have been a period of time in the earth's history that encompassed the transition between a 'non-living molecular population' on its surface and a population of 'molecular aggregates' that we would call living."
>
> — Melvin Calvin (1969), *Chemical Evolution* (pg. v)

> "As I try to discern the origin of that conviction, I seem to find it in a basic notion discovered 2,000 or 3,000 years ago, and enunciated first in the western world by the ancient Hebrews: namely that the universe is governed by a single god, and is not the product of the whims of many gods, each governing its own province according to his own laws. This monotheistic view seems to be the historical foundation for modern science."
>
> — Melvin Calvin (1969), *Chemical Evolution* (pg. 258) (Ñº)(Ñº); see also: Critias hypothesis disproof (Ñº)

References

1. Calvin, Melvin. (1969). *Chemical Evolution: Molecular Evolution towards the Origin of Living Systems on the Earth*

and Elsewhere (borderland, pg. v). Clarendon Press.
2. Dolloff, Norman H. (1975). *Heat Death and the Phoenix: Entropy, Order, and the Future of Man* (pgs. 124-25). Exposition Press.

External links

â— Melvin Calvin – Wikipedia.

θΔics

In existographies, **Melvin E. Klegerman** (c.1947-) (HFE:16) is an American immunochemist, noted for []

Overview

In 1976, Klegerman, aged 29, with Hugh J. McDonald (1913-2006), aged 63, noted for his work in corrosion chemistry thermodynamics (Q) and then head of the biochemistry department of the Loyola University of Chicago (Q), in their "The Thermodynamics of War" article (see: war thermodynamics), published in the *American Laboratory* journal, attempted to ferret out the beginnings of an instrument-based quantitative social thermodynamics, which they apply to the phenomena of war; a few snippets of which are as follows: [1]

The thermodynamics of war

■ For the past several years we have published articles and papers of gener terest on subjects outside the field of analytical instrumentation methodology. In this issue the paper, "The Thermodynamics of War" b Klegerman and McDonald explores such an area. It is a beginning atter establish a quantitative basis for the concept of "social thermodynamics." that it will attract your thoughtful attention and comments.

from application of thermodynamic principles to the parameters, as defined above.

The purpose of human society may be construed as twofold:

1. To provide security to its constituents.
2. To carry out the Thermodynamic Imperative' to decrease the entropy of itself and its environment, to bring order out of disorder, although randomness.

A number of statements concerning human societies will be made, based on the foregoing assignment of thermodynamic parameters to specific social variables. Although several of these statements may seem to violate prevalent conclusions of the social sciences, they follow directly

equilibrium, their capacity to do useful work, G, seldom remains constant, and ΔG_c serves as barometer to determine the state of a social unit as it does for a system in chemical thermodynamics. A negative ΔG_c represents work done by the system on the surroundings, easily understandable in social terms, but the meaning of a positive ΔG_c is less apparent. Work may be done on a society, either by

to a social unit at a given time, H_c, is determined by complex and subtle psychological, environmental social, economic, and political factors that need not be considered in a thermodynamic analysis, which disregards the pathways between initial and final states.

Since societies seldom attain a state of

They define (Q) the main thermodynamic variables (see: human thermodynamics variables table) as follows:

> G is the capacity of a system to do useful work.
> H is the resources available to a system.
> S represents the entropy, disorder, freedom, or randomness.

Here, of note, we see them making a reference (Q) to Bruce Lindsay's "thermodynamic imperative", conjoined with citation to Albert Lehninger's *Bioenergetics* and Gilbert Lewis' *Thermodynamics*; and in which they seem to be attempting to quantify work done "by a social system" as being a quantified by a "negative ΔG", i.e. exergonic, and work done "on a social system" as being quantified by a "positive ΔG", i.e. endergonic.

Education

In 1969, Klegerman completed his BA in chemistry at the University of Illinois at Chicago and in 1984 he completed ha PhD in biochemistry at Loyola University, Chicago, after which he spent about three decades working in the area of

immunochemistry, immunoassay development, and conjugation chemistry; including work on thermodynamic coupling theory (Q). [2]

References

1. Klegerman, Melvin E. and McDonald, Hugh J. (1976). "The Thermodynamics of War", *American Laboratory* (abs, pg. 4; social variables, pg. 62; S, H, and S defined, pg. 62), 8:61-73.
2. Melvin Klegerman (about) – Med.UTH.edu.

External links

- Melvin E. Klegerman (publications) – uthealth.influuent.utsystem.edu.

θΔics

In famous publications, “**Memoir on the Motive Power of Fire**” is an 1834 article written by French physicist Emile Clapeyron that expanded on the earlier 1824 booklet *Reflections on the Motive Power of Fire*, by French physicist Sadi Carnot, via the use of a more rigorous mathematical formulation and the use of the pressure-volume indicator diagram technique, developed in 1796 by James Watt and John Southern, to facilitate a graphical calculation of pressure-volume work. [1] The central function of Clapeyron's *Memoir* was to introduce other physicists, particularly Thomson and Clausius, to Carnot's *Reflections.*

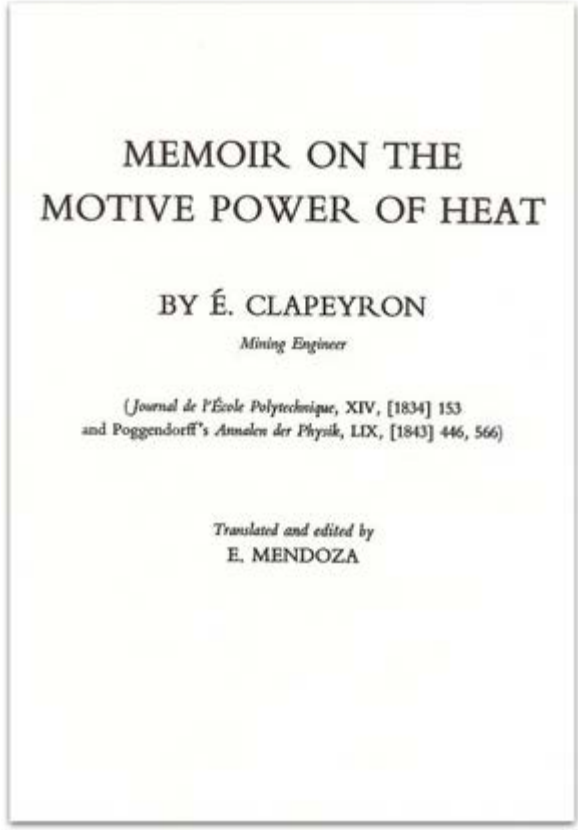
MEMOIR ON THE MOTIVE POWER OF HEAT

BY É. CLAPEYRON

Mining Engineer

(*Journal de l'École Polytechnique*, XIV, [1834] 153 and Poggendorff's *Annalen der Physik*, LIX, [1843] 446, 566)

Translated and edited by
E. MENDOZA

Title page to a 1960 English translation of French physicist Emile Clapeyron's 1834 "**Memoir on the Motive Power of Heat**" by Eric Mendoza. [2]

Notes

Clapeyron is said to have begun work on his *Memoir* after returning from Russian in 1830. Clapeyron's *Memoir* was more widely circulated than was Carnot's book and was translated into English and German. [3]

Indicator diagrams

In 1796, Scottish instrument maker James Watt and his employee John Southern developed a work measurement tool called an "indicator diagram", used to exactly quantify the work produced by a steam engine, which made a chart of the pressure of the steam in a cylinder plotted out against the steam's volume:

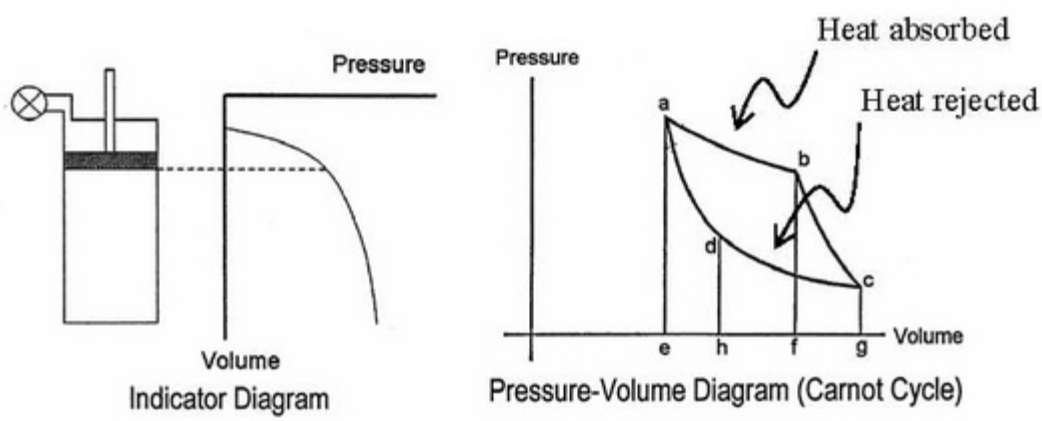

Pressure volume work

See main: Pressure volume work

Using data from the indicator diagram, in 1834, Clapeyron the first to employ a graphical analysis of the measure of the work done by the expansion or contraction of the steam, the work of the steam can be determined using calculus:

$$W = \int_{V_i}^{V_f} P\,dV$$

where W is the work done by the body of steam, V_i is the initial volume, V_f is the final volume, and P is the pressure of

the steam. Clapeyron used the phrase "mechanical action" as the measure of this integral.

References

1. (a) Clapeyron, Emile. (1834). “Memoir on the Motive Power of Heat.” *Journal de l’Ecole Polytechnique*, XIV, 153.
(b) Clapeyron, Emile. (1843). “Memoir on the Motive Power of Heat.” *Annalen der Physik*, LIX, 446, 566.
2. Carnot, Sadi, Clapeyron, Emile, Clausius, Rudolf, Mendoza, Eric. (1960). *Reflections on the Motive Power of Fire and Other Papers on the Second Law of Thermodynamics by E. Clapeyron and R. Clausius, edited with an Introduction by E. Mendoza.* Dover.
3. Shachtman, Tom. (1999). *Absolute Zero and the Quest for Absolute Cold* (pgs. 85-86). Mariner Books.

Further reading

â— Edmunds, C.K. (1902). “The Motive Power of Heat”, *Harper’s Magazine*, Dec. pgs. 117-.

θΔics

In terminology, **memory** refer so []

Overview

In Oct 2019, Todd Roberts, a neuroscientist at University of Texas Southwestern, published the results of an optogenetics study on zebra finches, a song bird that learns songs by listening to their father sing, wherein they reported that by shining light on certain regions of the brain, they could make the birds learn new songs, specifically the "duration of each note learned corresponding to the amount of time the light kept the neurons active; the shorter the light exposure, the shorter the note learned". [1]

References

1. (a) Roberts, Todd. (2019). "Article", *Nature*, Oct.
(b) Beltran, James. (2019). "Implanted Memories Teach Birds a Song: Discovery Boosts Understanding of How Human Brain Learns Speech" (Ñº), UT Southwestern, Newsroom, Oct 3.

External links

â— Memory – Wikipedia.

θΔics

In religio-mythology, **Memphis creation myth** is []

Overview

In 2800BC, the religious power center in Egypt switched from Heliopolis, and the sun-centric creation myth (see: Heliopolis creation myth), to one centered on the god Ptah, the supreme god of Memphis, conceived as a primary creative force that made the Nun, as shown adjacent [1]

In Memphis, Ptah was deemed the maker of the golden egg, out of which the sun was born; artistic renditions of which are shown below:

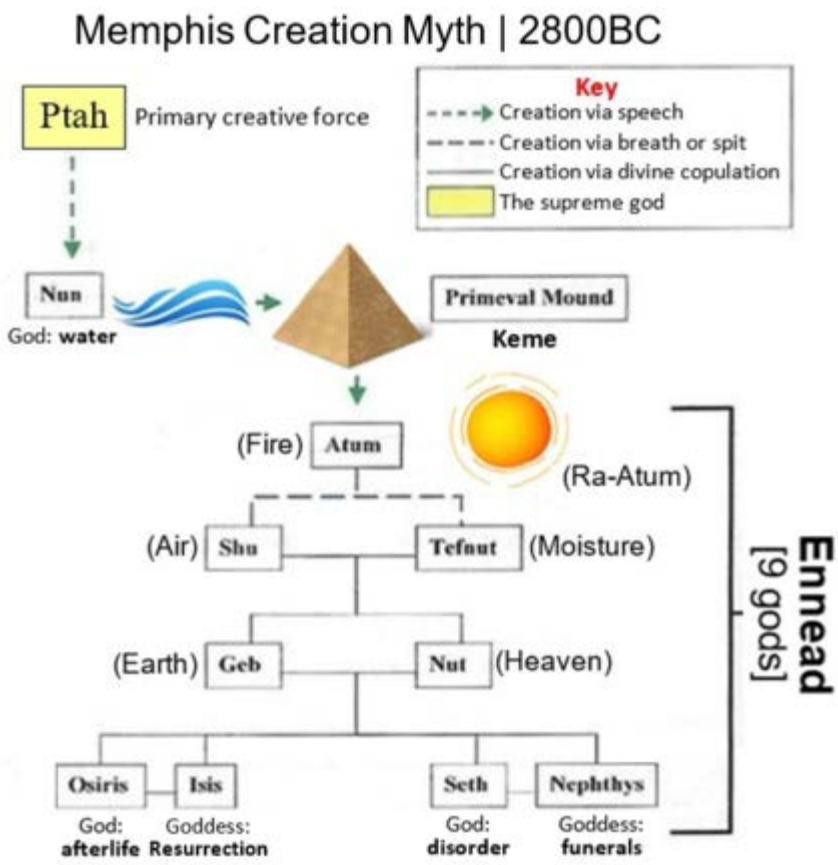

A god genealogy of the **Memphis creation myth** (2800BC), with the god Ptah as the supreme god, who creates the Nun and the Heliopolis ennead or group of 9 gods.

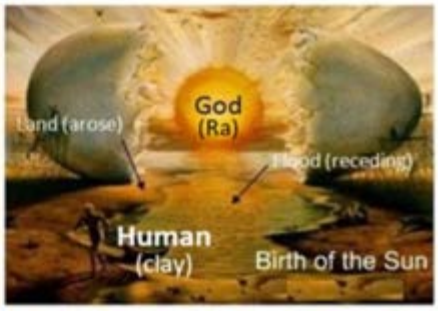

(add)

Hermopolis

In 2400BC, religious power in Egypt switched to the city of Hermopolis, and therein the Memphis creation myth was usurped by the Hermopolis creation myth, wherein Ptah, as the initial creative entity, is usurped by the an 8-god family called the "ogdoad", who creates Ra-Atum, who in turn creates the ennead..

See also

- Clay creation myth
- Thebian creation myth
- Amarnan creation myth

References

1. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

External links

- Memphis creation myth (section) – Wikipedia.

θΔics

In hmolscience, **Michael Meng-Hua Ye** (c.1956-), cited "Meng-Hua Ye", is an American physical economist noted for his 1984 PhD dissertation on "Application of Brownian Motion to Economic Models of Optimal Stopping", completed at the University of Wisconsin-Madison, and for his 1991 book *Economics, Philosophy, and Physics*, co-written with Chinese-born American economist Ching-Yao Hsieh, and econophysics and economic thermodynamics themed book wherein they give a historical overview of certain physics and thermodynamics principles used in economic theory. [1]

References

1. Hsieh, Ching-Yao, and Ye, Meng-Hua. (1991). *Economics, Philosophy, and Physics*. M.E. Sharpe.

External links

â— Michael Meng-Hua Ye (faculty) – St Mary's College of Maryland.

θΔics

In der Thermodynamik ist die **menschliche Thermodynamik** der wissenschaftlichen Erforschung der energetischen und entropischen Aspekte der Prozesse der menschlichen Aktivität und Bewegung, im Rahmen der täglichen boundaried solar Zyklen, nämlich diejenigen existent zwischen Wärme, Arbeit, Spontaneität, Irreversibilität und die Gesetze definieren darin.

θΔics

In human thermodynamics, **mental entropy** is an oft-used, but ill-defined, term referring to either wasteful brain work, levels of mental organization or electrical organization, or in general the entropy associated with mental processes and their efficiencies, often themed towards those related to mental disorder or chaos. [1] In one sense, mental entropy is defined such that well-ordered thinking or "low entropy thinking" gives good results, whereas woolly thinking or badly ordered or "high entropy thinking" gives bad results. [2] The term "mental entropy" may possibly have an etymological origin in Swiss psychologist Carl Jung's theory of "psychic entropy".

References

1. (a) Remmling, Gunter W. (1969). *Road to Suspicion: A Study of Modern Mentality and the Sociology of Knowledge*, (pgs. 4-5). Appleton-Century-Crofts.
(b) Mueller, Robert E. (1968). *The Science of Art: The Cybernetics of Creative Communication*, (pg. 67). Rapp & Whiting.
2. Handscomebe, Robert D. and Patterson, Eann A. (2004). *The Entropy Vector* (ch. 10: Mental Entropy, pgs. 139-153). World Scientific.

θΔics

In chemistry, **mercury**, symbol Hg, aka "quicksilver", is an element, atomic number 80, on the periodic table, which, at STP, looks like a liquid silver metal.

Quotes

The following are related quotes:

> "Is it not for want of an attractive virtue between the parts of water ( ) and oil, of **quick-silver** ( )(Hg) and antimony ( )(Sb), of lead ( )(Pb) and iron (♂)(Fe), that these substances do not mix; and by a weak attraction, that quick-silver ( )(Hg) and copper (♀)(Cu) mix difficultly; and from a strong one, that quicksilver ( )(Hg) and tin ( )(Sn), antimony ( )(Sb) and iron (♂)(Fe), water ( ) and salts, mix readily?"
>
> — Isaac Newton (1718), "**Query 31**" of *Optics*

Further reading

● Goldwater, Leonard. (1972). *Mercury: a History of Quicksilver*. Publisher.

External links

● Mercury (element) – Wikipedia.

θΔics

In thermodynamics, **Merle Randall** (1888-1950) was an American physical chemist notable for his work, beginning in 1909, with American physical chemist Gilbert Lewis in the calculation of free energies of chemical substances, founding of the Lewis school of thermodynamics, and for their co-publication, in which Randall functioned as the dictation taking assistant, of the 1923 founding chemical thermodynamics textbook *Thermodynamics and the Free Energy of Chemical Substances*. [1]

Education

Randall graduated from the University of Missouri with a BA in 1907 and an MA in 1909. In the fall of 1909, Randall went to the Massachusetts Institute of Technology where he began his long association with American physical chemist Gilbert Lewis, a professor there at the time. Randall received his PhD titled "Studies in Free Energy" in 1912. [3]

That same year, Lewis brought Randall with him, as a research assistant, to found the soon-to-be famed "Lewis school of thermodynamics", as the head of the department of chemistry at University of California, Berkeley. [4] The following year, Randall's title was changed to research associate in 1913, and in 1917 Randall became a member of the teaching staff with the rank of assistant professor. Promotion to associate professor came in 1922 and to a full professorship in 1927.

For many years, Randall's major interest was in thermodynamics, where he was active in the determinations of the free energies of various compounds and in the study of the activity coefficients of various electrolytes. Throughout his career Randall was active as a researcher who published over one hundred papers in various scientific periodicals, as well as the 1942 *Elementary Physical Chemistry*. [5]

Praise | Tributes

The following are noted quotes of praise:

> "Lewis, **Randall** and Guggenheim must be considered as the founders of modern chemical thermodynamics because of the major contributions of these two books in unifying the applications of thermodynamics to chemistry."
>
> — Bevan Ott and Juliana Boerio-Goates (2000), *Chemical Thermodynamics* [2]

References

1. Lewis, Gilbert and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances.* McGraw-Hill.
2. Boerio-Goates, Juliana, and Ott, J., Bevan. (2000). *Chemical Thermodynamics: Principles and Applications.* Elsevier Academic Press.
3. Randall, Merle. (1912). "Studies in Free Energy", PhD thesis, 12-pages, MIT, Department of Chemistry.
4. Merle Randall, Chemistry: Berkeley – University of California: In Memoriam, 1950.
5. Randall, Merle and Young, Leona E. (1942). *Elementary Physical Chemistry.* Randall and Sons.

External links

â— Merle Randall – Wikipedia.

θΔics

In religio-mythology, **Mert goddesses**, “Meri sisters”, "Mertae-sisters" (Massey, 1907), or “sister-Mert goddesses” (Ñº), from the root *Mere* meaning “sea” (Ñº), refers to the twin Egyptian goddesses Isis, aka Sirius, or “star of the sea”, i.e. *Stella Maris*, as the Greeks and Romans referred to her (Jordan, 2001), in astro-theological terms, and Nephthys, her sister; these, in the Roman recension (see: recension theory), became the Mary pairs, figures, or characters seen profusely in the Bible.

The two **Mert goddesses**, the twin sisters Isis and Nephthys, "providing Osiris with air", as Wallis Budge (1911) puts it, depicted on the walls of the Dendera Temple (30AD), in the one of the storyboard scenes of the Death and Resurrection of Osiris. [2]

Overview

The general overview of the two Mert goddesses is as follows: [1]

> “Isis and Nephthys prepared the funeral bed for their brother Osiris, and together they made the swathings wherewith his body was swathed after death; they assisted at the rising of the sun god when he rose upon this earth for the first time, they assisted at the resurrection of Osiris, and similarly, in all ages, they together aided the deceased to rise to the new life by means of the words which they chanted over his bier.”

(add)

Osiris | Death and Resurrection

In the famous astro-theological based myth of the death and resurrection of Osiris (aka Passion of Osiris), Isis and Nephthys are the two female goddesses that first collect all the 14 pieces (phallus aside) of the dismembered Osiris, making him into a mummy, and then perform the magical acts of the awakening ceremony to bring him back to life:

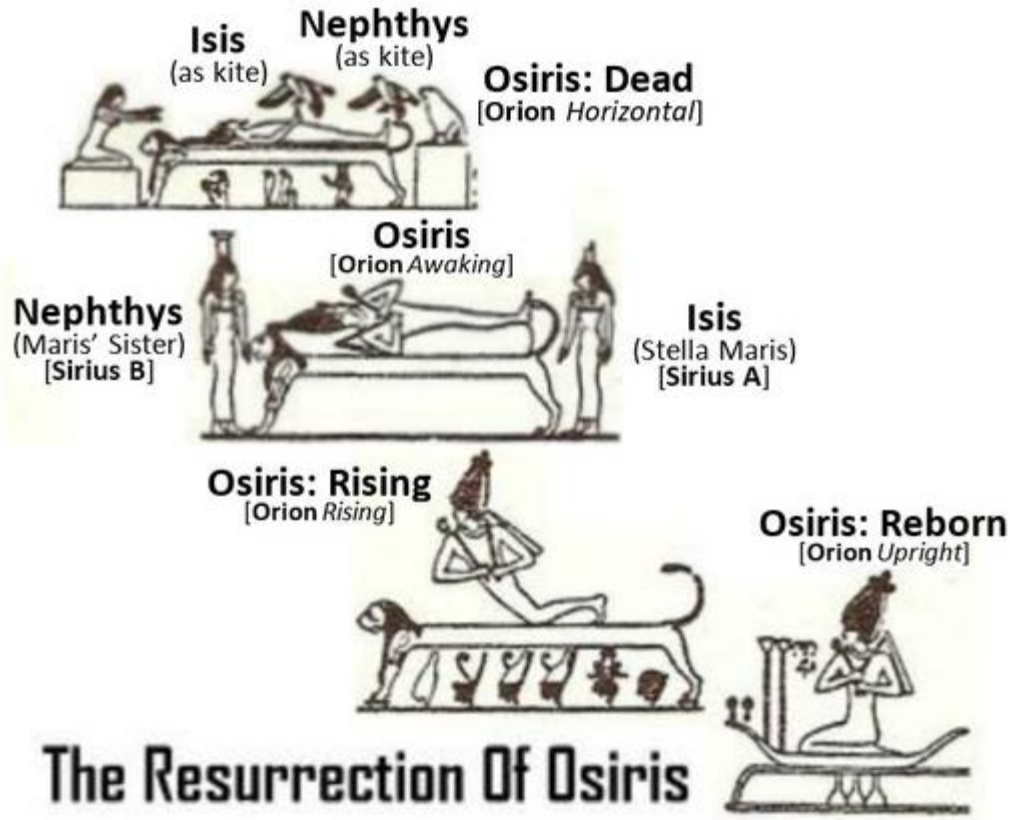

The four awakening scenes shown above are from the Dendera Temple.

Bible

In the Bible, the magical resurrection powers of the two Mert goddesses, were rewritten, in coded format, via the literary use of pairs of Mary figures used predominately throughout the various stories of Christianity, e.g. how Mary and Martha were present during the Raising of Lazarus, or how Mary and Mary Magdalene had to climb "on top of" the sepulcher of Jesus *before* he could be resurrected.

Mary and Mary Magdalene at the tomb of Jesus the day he was resurrected from the dead, which is a monotheistic rewrite of the role the two Mert goddesses, Isis and Nephthys, played in the resurrection of Osiris.

> "And when Joseph [god Geb] had taken the body, he wrapped it in a clean linen cloth, And laid it in his own new tomb, which he had hewn out in the rock: and he rolled a great stone to the door of the sepulchre, and departed. And there was Mary Magdalene, and the other **Mary, sitting over** against **the sepulcher**."
>
> — Anon (300AD), *Bible* (Matthew 27:59-61)

Two "Mary" had to sit "over and against" the sepulcher of Jesus *before* he could be reborn, after being dead for three

days, just as the two Mert goddesses did before Osiris could be reborn.

In 1907, Gerald Massey, referring to the two Biblical Marys as "Mertae-sisters", explained this Egyptian to Christian jump as follows: [4]

> "The two **Mertae-sisters** are the watchers over the dead Osiris. They are also the mourners who weep over him when he is anointed and prepared for his burial. It is said of Osiris that he was triumphant over his adversaries on the night when Isis lay watching in tears over her brother Osiris (ch. 18). But the Mertae-sisters both watch and both weep over the dead body. In the vignettes to the ritual one of the two stands at the head and one at the feet of the body on the bier.
>
> These two mourners, weepers, anointers, or embalmers, appear in the Gospels as two different women. According to John, it was **Mary** the sister of **Martha** who anointed Jesus for his burial. And as these are the **two divine sisters** in historic guise we ought to find one at the head of the victim and one at the feet, as, in fact, we do so find them. In the account furnished by Luke it is said that *the woman who stood behind at the feet of Jesus weeping* "*began to wet his feet with her tears*, and wiped them with the hair of her head" (Luke vii. 38). No name is given for the woman who was "a sinner," which seems to denote the other Mary called Magdalene. Matthew also omits the name of the woman with an alabaster cruse or flask. In keeping with the mythos this other one of the two Mertae-sisters should be Martha, but the point is that the woman with the cruse does not anoint the feet of Jesus. She poured the ointment "*upon his head as he sat at meat"* (Matt. xxvi. 7). Thus we see there are two different women who anoint Jesus, one at the head, one at the feet, even as the two divine sisters of Osiris called the Mertae, or watchers, stand at the head and feet of Osiris, when preparing him for his burial, or watching in tears, like Isis, the prototype of the woman who never ceased to kiss the feet of Jesus since the time when he had come into the house (Luke vii. 45-6). We have identified the other sister Nephthys, the mistress of the house, with the housekeeper Martha, and as Nephthys also carries the bowl or vase upon her head, this may account for the vessel of alabaster that was carried by the "woman" who poured the ointment on the head of Jesus, whereas Mary the sister of Martha poured it on his feet. Martha is one of the two Mertae by name. In the Egyptian mythos the two Mertae are Isis, the dear lover of Horus the Lord, bowed at his feet, and Nephthys mourning at his head (Naville, *Totdenbuch*, V. I., Kap. 17, A. g. and B. b.)."

The anointing of the feet and head of Jesus by the two Meri sisters, which are monotheistic rewrites of the anointing of Osiris by the **Mert goddesses**. [5]

(add discussion)

Sirius B

In 1976, Robert Temple, to note, in his *the Sirius Mystery*, asserted the interesting but untenable view that the Dogon people, of Mali, West Africa, knew that Sirius was a binary star (Sirius A and Sirius B). Here, if

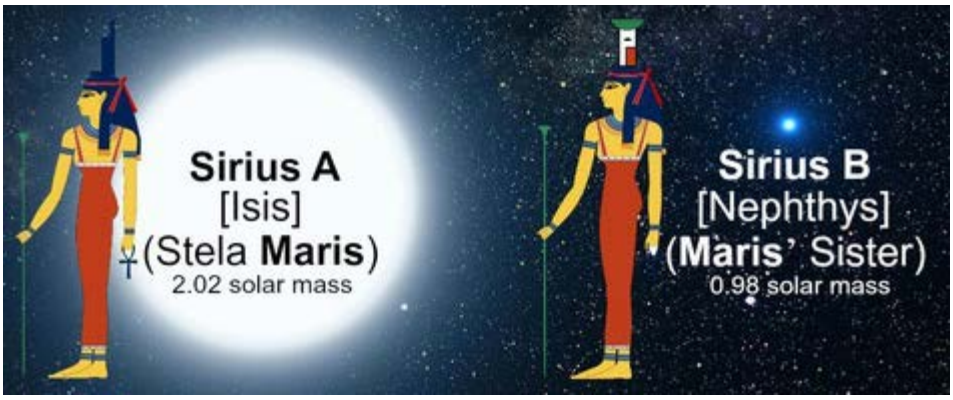

In 1976, Robert Temple speculated that Isis and Nephthys, aka the Mert goddesses that raised the Orion constellation, were representative of the twin stars Sirius A and Sirius B. While Isis, astro-theology, has been verified to have been associated with Sirius (aka Sirius A), the second smaller star Sirius B was not discovered until 1862. The star Nephthys is associated with is unknown.

Temple's hypothesis were true, we would note that Osiris (aka Orion) has to be "raised" in the presence of not only Sirius (or Sirius A), aka Isis (or Stella Maris), but also by its twin star Sirius B, aka Nephthys (Maris' sister). [3] Sirius B, however, is invisible to the naked eye. It was first predicted on dynamical grounds in 1844 and first observed in 1862. (Ñº) The first telescope, moreover, was not invented until 1608 (by Hans Lippershey). (Ñº) The so-called Temple hypothesis, namely that Egyptians knew about Sirius B, accordingly, while curious, seems doubtful.

Quotes

The following are representative quotes:

> "Nephthys also, like Isis, has many forms, for she is one of the two Maat goddesses [see: Maat], and she is one of the two **Mert goddesses**, and she is one of the two plumes which ornamented the head of her father Ra."
>
> — Wallis Budge (1904), *The Gods of the Egyptians, Volume Two* [1]

> "According to the interpretation of the art critics, the ship floating on its timeless sea is the barque of Isis, the paramount goddess of Egypt, whom the Greeks and Romans called ***Stella Maris***, Star of the Sea. The primeval water of life surges from a fount of belief that was venerable long before Mary and Joseph waked the earth."
>
> — Michael Jordan (2001), *The Historical Mary* (xiv)

> "Oh, more than that, even thousands of years earlier. Yeah, this was my astonishment. When I read for the first time, a story that I had known – I used to be a professor of the New Testament – a story that had always been problematic for me, the 'Raising of Lazarus', which is in the fourth gospel, and is the most dramatic miracle, that Jesus is supposed to have carried out. He raised a man from the dead, that was supposed to have been dead for four days. He was really dead. When I came across that story, in all its full detail, in an Egyptian dress, in an Egyptian setting, right down to the **two marries (Martha and Mary)**, and to the coming forth out of the tomb, in every detail, in 1700 before the common era, 17 centuries earlier, I realized I was on to something."
>
> — Tom Harpur (2004), interview with Allan Gregg, on his *The Pagan Christ*

> "As with Orpheus and Eurydice, the constellation of Isis and Osiris can also be compared with Mary and Jesus. The scene of the Pieta, in which Mary holds the corpse of the crucified Jesus on her lap and mourns,

is comparable depiction of the body-centered intensity of female grief, in which Mary is assisted by Mary Magdalene, just as Isis is assisted by Nephthys."

— Jan Assmann (2015), *Death and Salvation in Ancient Egypt* (pg. 116)

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pg. 256; overview, pg. 259). Dover, 1969.
2. (a) Mariette, Auguste. (1873). *Dendera* (*Denderah*), *Volume Four* (pg. 75). Paris: Publisher.
(b) Budge, Wallis. (1911). *Osiris and the Egyptian Resurrection, Volume Two* (pg. 51). P.L. Warner.
3. Scranton, Laird. (2006). *The Science of the Dogon: Decoding the African Mystery Tradition* (pg. 128). Inner Traditions.
4. Massey, Gerald. (1907). *Ancient Egypt, the Light of the World: A Work of Reclamation and Restitution in Twelve Books, Volume 2* (Osiris, anointed, oil, pgs. 878-81). T.F. Unwin.
5. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs) (anointing of Jesus, pg. #). Publisher.

Videos

â— Anon. (2011). "Super True Stories: Mary, Mary, Mary, Mary, Mary and Mary" (Ñº), LutheranSatire, Episode 2.5, May 15.

External links

â— Meret – Wikipedia.
â— Meret – GodChecker.com.

θΔics

In mythologies, **Mesopotamian mythology** refers to []

Mesopotamian mythologies

Sumerian (2100-1600BC) Sumerian mythology	**Akkadian** (1200BC) Akkadian mythology	**Babylonian** (1100BC) Babylonian mythology	**Assyrian** (700BC) Assyrian mythology

A synopsis of the four main **Mesopotamian mythologies**: Sumerian, Akkadian, Babylonian, and Assyrian, each derived from the former.

Egyptian | Influence

In 1894, Robert Rogers, in his "The Origin of Egyptian Culture", building on Fritz Hommel's 1892 *The Babylonian Origin of the Egyptian Culture has been Proved* (wherein it is argued, incorrectly, that Egyptian language is a branch of the Semitic language), attempts to argue that prior to 2700BC or the pyramid period, the Egyptian people were in contact with the Assyro-Babylonian people, and that through this interaction the Egyptian derived their language, written and spoken, and borrowed their culture and religion, per reason that the Egyptian and Babylonian ideograms for common words such as: land, city, night, woman, house, day, and fish, are the same or have great resemblance.

While Rogers has his influence of ideas flow backwards, correctly it was Egyptian models and language that influence the Babylonians, he does point out some good etymology connections in respect to gods and towns; for example:

> "One of the most ancient cities of Babylonia was Eridu (Q). The name Eridu. in Babylonian was originally composed of two words, *Urru-Dugga*, which are found in a still older form as *Gurru-Dugga*, which means "city of the good (god)." In very earliest times the name was *Nun-ki*. This city of Nun-ki or Eridu was the center of the worship of the god Ea. The early literature of Babylonia is full of allusions to this city and to the worship of Ea which it represented. Ea was the 'good god', who drove away from his people the demons of darkness and death and disease."
>
> — Robert Rogers (1894), "The Origin of Egyptian Culture" (pg. 57)

Of note, some, e.g. Gwendolyn Leick (2002) (Q), argue that Eridu is the "oldest city in the world", dating it's founding to 5,400BC, the cuneiform tablets attesting to his mythos are relatively young (c.2100 to 600BC). Thebes, conversely, is the world's oldest continuously inhabited city, since 3,200BC. (Q) Rogers then states the following:

> "The Babylonian creation stories represent a great chaos of waters as existing before the creation of the earth. When the earth was created there was stretched above it a great firmament studded with stars. Between this firmament and the earth was the air, the home of the god In-lilla or Bel. Above the firmament were the waters, the 'ocean of heaven', and beneath the earth were also waters, called by the Babylonians *apsu*; hence άβνσσος, and the English word *abyss*. But the waters above the firmament were in connection with the waters beneath the earth, the whole forming a great ocean somewhat similar to Homer's ωκεανός. **The Babylonian name for this ocean was *anum* or *anun*, and in a still shorter form 'nun'**. We have said above that Eridu was also called Nun-ki. In Babylonian, *ki* means 'place'; hence, this old name of Eridu, means 'ocean-place', a place so called, we might say, because it was the place of worship of Ea, the god of the earth and of the waters under the earth."
>
> — Robert Rogers (1894), "The Origin of Egyptian Culture" (pg. 58-59)

Here, as Rogers points out, the ancient Mesopotamian city of Eridu was called "city of Nun", just as was the ancient Egyptian city of Heliopolis called "city of the sun born out of Nun". The question then becomes, which city was older, also where did the Nun motif or namesake arise? What we do know, however, is that the hieroglyph for Nun, from the Unas Pyramid texts (2500BC), is a pot or three pots (which makes the ocean sound) and the water wave symbol: [2]

or in some cases shown with these plus plus sky symbol . We also know that this water wave symbol, became the forerunner to the English letter "N" as follows: [3]

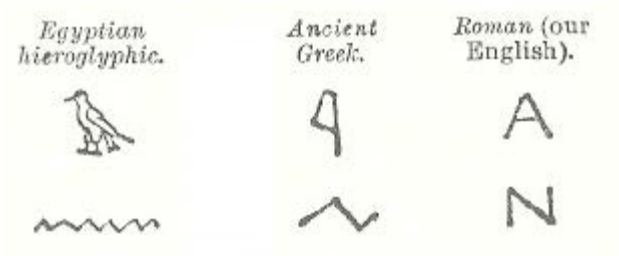

Diag. 56.—Picture Writing, showing how our letters have grown from pictures.

Now, while it could be possible that the Nun motif arose in ancient Sumer and was adopted by the Egyptians, the problem with this argument is that the rivers of Sumer, the Tigris and Euphrates, were not connected with mountains where snow melted annually, thereby flooding their rivers on a yearly basis, whereas the Nile River was connected with the Ethiopian mountains and its annual snow melting. Hence, this points to the conclusion that the Nun motif arose in Egypt and was adopted in Sumer.

Rogers the connections Nun-ki (the city Erudu) and Ea (the good god) is the following:

> "The three great gods of Babylonia were Anu, the god of heaven, Bel, the god of the air, and Ea, god of the earth. There were other gods, as we shall see, but in the earliest times they were held to be subordinate to these three gods. Anu—exactly the same word as *anum*, *anun*, or 'nun'—is the god of the heavens and of the great heaven ocean beyond the firmament. Bel, or In-lilla, is the god of the air or of the space between the heavens and the earth; while Ea, or In-ki, is the god of the earth and the waters under the earth. These are the fundamental relationships of the gods of the earliest Babylonian mythology."
>
> — Robert Rogers (1894), "The Origin of Egyptian Culture" (pg. 59)

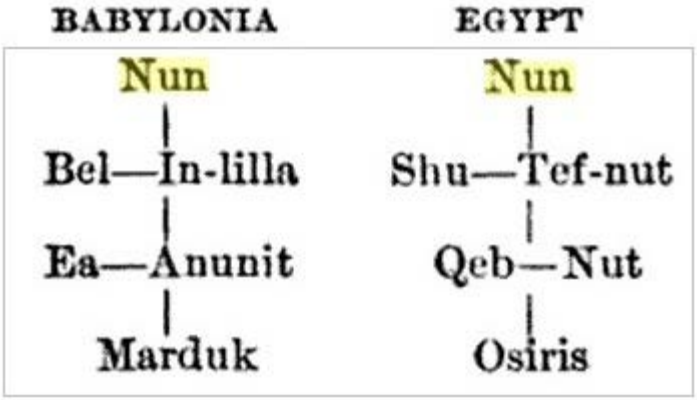

Rogers, following Francois Lenormant (*Die Magie Und Wahrsagekunst Der Chaldaer*, 1878), who, based on Diodorus, gleaned the model of the Babylonian ideas concerning the "waters of the heavens", presented the above semi-cogent god character rescript table, connecting: Anu to Nun, Bel to Shu, and Ea to Geb, and Marduk to Osiris.

He then says that this is the same as the Memphis creation myth, which is exactly correct (the Heliopolis creation myth is the correct parallel).

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2. (a) Budge, Wallis. (1904). *The Gods of the Egyptians*, *Volume One* (pg. 78). Dover, 1969.
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3. Finnemore, Hilda. (1924). *A History of the Earth: from Star-Dust to Man* (pg. 114). Longmans, Green, and Co.

Further reading

● Mark, Joshua J. (2011). “The Mesopotamian Pantheon” (Q), Ancient.eu, Feb 25.

External links

● Mesopotamian myths – Wikipedia.

θΔics

In science, **Messingen Feuersprutz** is a type of squirt gun like fire extinguishing device used commonly in Germany in the 1600s.

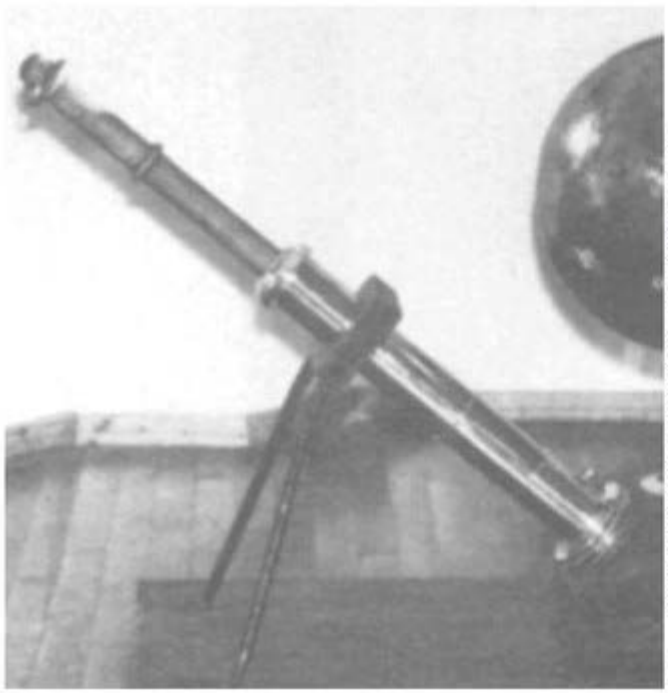

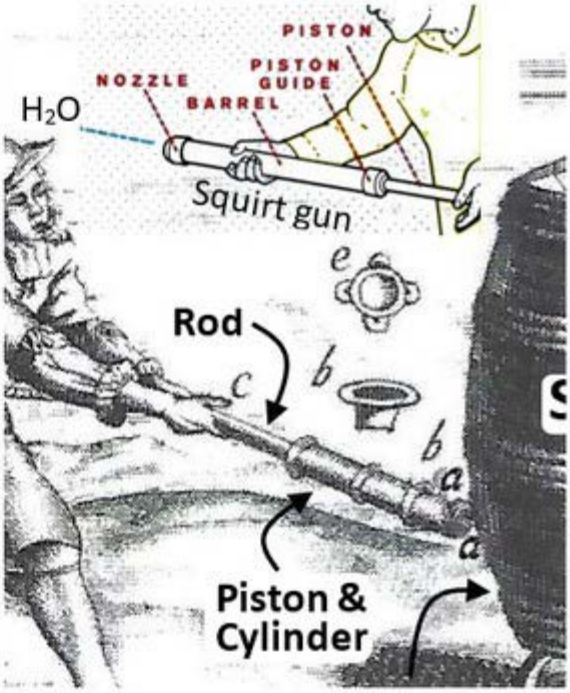

Above left: a replica of the type of pump used by Guericke, of the **Messingen Feuersprutz** variety, from the Guericke exhibition in the Lukasklause in Magdeburg. [2] Above right: the schematic of Guericke performing his famous beer keg vacuum experiment, using a Messingen Feuersprutz modified into the form of a suction pump. [1]

Vacuum pump

In c.1652, Otto Guericke took a Messingen Feuersprutz and retooled it so that it could both squirt water and suck water, and therein invented a prototype vacuum pump. [1]

References

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2. Schnneider, Von D. (1986). “In the Footsteps of Guericke: The Death of Otto von Guericke 300 Years Ago” (“Auf den Spuren Guerickes: Zum Tod von Otto von Guericke vor 300 Jahren”) (pdf), *Phys. Bl.*, 42:12.

θΔics

In famous publications, **"Metabolic Generation and Utilization of Phosphate Bond Energy"** is a 1941, 63-page, article by German-born American biochemist Fritz Lipmann in which the free energy coupling and ATP 'energy currency' theories were presented. This paper introduced the squiggle (~) for the first time to represent the phosphate bond. Lipmann began writing his essay while on vacation at Lake Iroquois, Vermont. [2] The following view of Lipmann's paper is given by National Academy of Sciences biographer Eugene Kennedy: [3]

> "In his masterly and highly influential review in 1941 Lipmann was to emphasize the central role of adenosine triphosphate (ATP) as an 'energy-rich' phosphate ester, the breakdown of which to adenosine diphosphate (ADP) and inorganic phosphate (Pi) drives not only muscle contraction but also a host of other energy-requiring [endergonic] processes."

By 1968, Lipmann's phosphate bond energy metabolic wheel diagram (pg. 122), spun by food fuel in and waste gases out, was listed as a "classic page" by *Circulation Research* of the American heart association. [4] Lipmann's paper has a current Google Scholar citation number of 435. [5]

Precursors or rather co-papers to this famous article include those of Lipmann's research associate Danish-born American biochemist Herman Kalckar's papers on energy coupling (1939, 1941). [6]

METABOLIC GENERATION AND UTILIZATION OF PHOSPHATE BOND ENERGY

FRITZ LIPMANN

New York, N. Y.

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Title page to German-born American biochemist Fritz Lipmann's 1941 free energy coupling / ATP energy currency theory paper: **"Metabolic Generation and Utilization of Phosphate Bond Energy"**.

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(b) Kalckar, Herman. (1941). "The Nature of Energetic Coupling in Biological Synthesis" *Chem. Rev.* 28:71.

θΔics

In science, **metabolism** refer so []

Overview

In 1779, Adair Crawford, in his *Experiments and Observations on Animal Heat*, outlined preliminary ideas on animal heat.

In 1783, Antoine Lavoisier and Pierre Laplace, in their *Memoir on Heat*, building on Crawford and others, began to initiate the field of metabolism, and thereafter conducted a number of experiments on humans.

In 1974, Henry Swan, in his *Thermoregulation and Bioenergetics*, published the following historical timeline of the development of metabolic theory: [1]

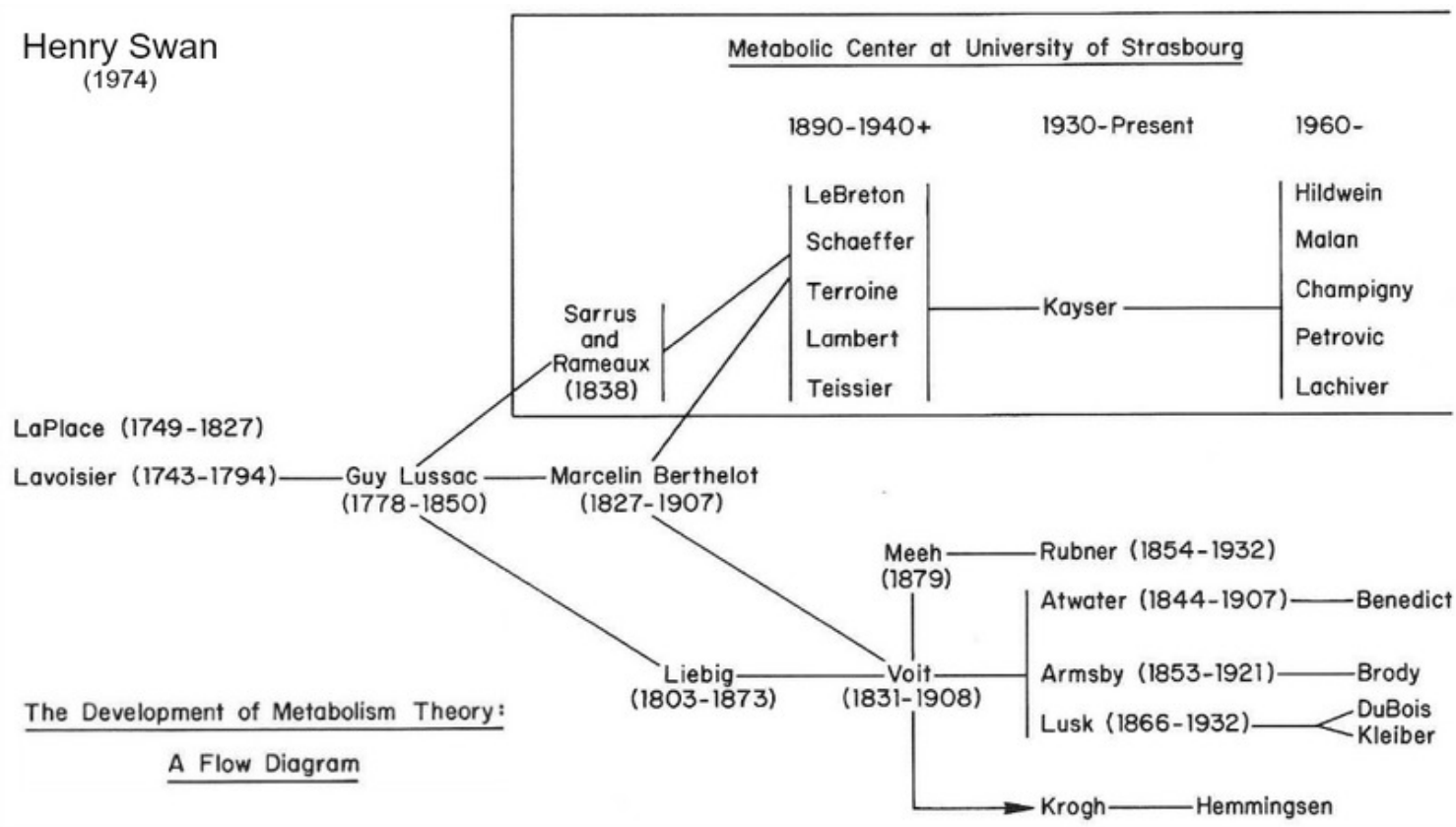

(add)

Quotes

The following are related quotes:

> "If one had the kind of vision [e.g. electron microscope/quantum microscope] that allowed one [see: advanced perspective] to see molecules and were in a jungle, one would see molecules wandering about everywhere, at random. In this ceaseless wandering, one might recognize a locus in which molecules of various types were particularly concentrated, which held its form [bound state] approximately while myriads of molecules streamed in and out [turnover rate]; and that locus would be a monkey in the jungle. That continuous inflow and outflow of material [metabolism], and whatever of its structure endured, would not only make that a unique monkey from among monkeys but would ensure that it changed [see: Heraclitus] from moment to moment throughout its entire existence."
>
> — Albert Szent-Gyorgyi (c.1965), *Publication* [2]

References

1. Swan, Henry. (1974). *Thermoregulation and Bioenergetics: Patterns for Vertebrate Survival* (pg. xi). American Elsevier Pub.

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2. (a) Wald, George. (1965). “Determinism, Individuality, and the Problem of Free Will” (pg. 24), in: *New Views of the Nature of Man* (editor: John Platt). University of Chicago Press.
(b) Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pg. 39). University Press of America.

External links

â— Metabolism – Wikipedia.

θΔics

In science, **metachemistry**, similar to metaphysics, refers to the idea that just as how non-Euclidean geometry leads to new geometries, e.g. Riemannian geometry, which leads to new physics, e.g. general relativity, so to might "non-Lavoisian chemistry" lead to new generalized types of chemistries.

Overview

In 1940, Gaston Bachelard, in his *The Philosophy of No*, defined metachemistry as follows: [2]

> "Metaphysics could have only one possible notion of substance because the elementary conception of physical phenomena was content to study a geometrical solid characterized by general properties. **Metachemistry** will benefit by chemical knowledge of various substantial activities. It will also benefit by the fact that true chemical substances are the products of technique rather than bodies found in reality. This is as much as to show that the real chemistry is realization."

Some of this was picked up, supposedly, by Emile Meyerson and later by Bruno Latour in his *Pandora's Hope* (1999), the latter of which Alfred Nordmann (2006) describes as a "metachemical treatise".

In 2012, John O'Loughlin penned some type of new age, religion-blurred, nearly-unreadable section on "metachemical morality", using some type of male-female divide. (Ñº)

References

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θΔics

In science, **metallurgist** is one who practices the art of metallurgy, domain of materials science and materials engineering that studies the physical and chemical behavior of metallic elements, their intermetallic compounds, and their mixtures, which are called alloys.

In 2007, German physicist Ingo Muller, in his *A History of Thermodynamics*, commented the following about the intellectual accessibility of sociothermodynamics:

> "It is interesting to note that socio-thermodynamics is only accessible to chemical engineers and **metallurgists**. These are the only people who know phase diagrams and their usefulness. It cannot be expected, in our society, that sociologists will appreciate the potential of these ideas."

The metallurgist Muller cites here is German physicist and metallurgist Jurgen Mimkes and his 1995 "Binary Allows as a Model for Multicultural Society" article. [2] The following is another relevant hmolscience quote:

> "Carlyle and the others contend that the knowledge of every act and thought of every individual of a given time must be clearly analyzed, and their permutations understood in order to write history. But by the same token we would never be able to understand the time in which we write. Is a **metallurgist** in a steel mill debarred from understanding the nature of the processes he himself starts, regulates and controls because he cannot give a graphic chart depicting the actions of ever electron of every atom of all the materials he works with, and therefore cannot predict the end results of his operations? But we have gone over this ground before."
>
> — Morris Zucker (1945), *Historical Field Theory* [3]

Other noted Hmolpedia metallurgists or materials scientists include: Robert Kenoun, Larry Kaufman, and Vannoccio Biringuccio.

References

1. Müller, Ingo. (2007). *A History of Thermodynamics: the Doctrine of Energy and Entropy* (docstoc). Springer.
2. Mimkes, Jürgen. (1995). "Binary Alloys as a Model for a Multicultural Society" (abs), *Journal of Thermal Analysis*, 43. pgs. 521-537.
3. Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 166). Arnold-Howard Publishing Co.

External links

â— Metallurgy – Wikipedia.

θΔics

In theories,

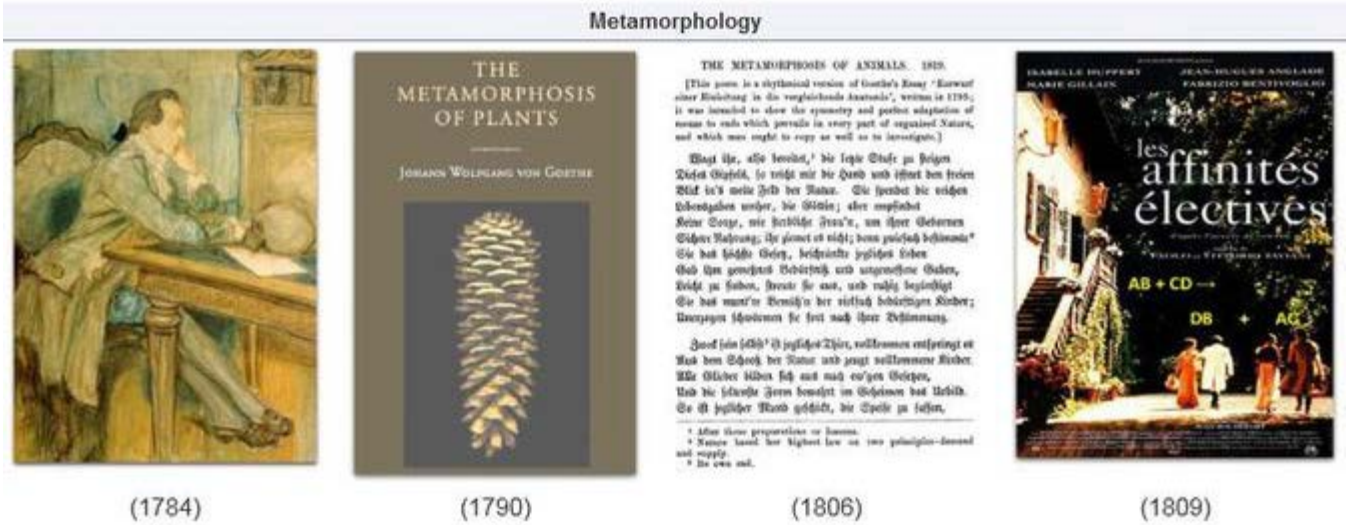

metamorphology is an affinity chemistry based theory of form change (metamorphosis), chemicals to plants, chemical to animals to humans, developed by German polyintellect Johann Goethe, during the years 1784 to 1809.

Overview

In *circa* 1770, the young German polyintellect Johann Goethe began searching, similar to Isaac Newton and Francis Bacon previous to him, for the secret principle that governs the operation of the universe. He commented on this search, in retrospect: [1]

> "I perceived something in nature (whether living or lifeless, animate or inanimate) that manifested itself only in contradictions and therefore could not be expressed in any concept, much less any word. It was not divine, for it seemed irrational; not human, for it had no intelligence; not diabolical, for it was beneficent; and not angelic, for it often betrayed malice. It was like chance, for it laced continuity, and like providence, for it suggested context. Everything that limits us seemed penetrable by it, and it appeared to dispose at will over the elements necessary to our existence, to contract time and expand space. It seemed only to accept the impossible and scornfully to reject the possible."

Goethe, explains, in book 20 of his *Poetry and Truth* (1811-1814), how in his pre 1775 youth years he was searching for a universal rule to explain the happenings of existence and experience.

In 1784, Goethe, the first piece of the puzzle began to come together when he discovered the human intermaxillary bone, thus proving a morphological connection of common descent between animals and humans, something thought unspeakable in Goethe's time. He then went, following studies on morphology in plants and then morphology in chemicals, to on to publish a three part metamorphology treatise set, in the form of the metamorphosis of plants, animals, and humans respectively, shown below, namely Goethe's "The Metamorphosis of Plants" (1790), "Metamorphosis of Animals" (1806), and *Elective Affinities* (1809) are to be viewed, according to American comparative literature scholar Stefani Engelstein (2008), as a three-part treatise on *metamorphology* or studies on the similarities of form. [2] Of the four respective evolution theories, to follow him, according to English naturalist Charles Darwin (*On the Origin of Species*), are: (Erasmus Darwin, 1791; Etienne Saint-Hilaire, 1833; and Charles Darwin, 1859), who cites Goethe is the first main evolution theorist, is the more robust of the group, in that it presents a unified view of form change:

> chemical → plant
> chemical → animal → human

whereas the other three theories situate the following divide:

chemical | plant
chemical | animal → human

Hence, maintaining the life | non-life conceptual divide or unbridgeable gap model.

Turing

In 1952, Alan Turing, in his “The Chemical Basis of Morphogenesis”, penned loose ideas on genes, chemicals, chirality, and cellar forms. [3]

In 2011, Aaron Sloman attempted to extend Turing's morphogenesis idea, in respect to how mind, life, and culture could have arose form the black cloud of dust of the pre-sun nebula. [4]

See also

â— Morphology

References

1. Schwartz, Peter J. (2010). *After Jena: Goethe’s Elective Affinities and the End of the Old Regime* (pg. 19). Publisher. Bucknell University Press.
2. Engelstein, Stefani. (2008). *Anxious Anatomy: the Conception of the Human Form in Literary and Naturalist Discourse* (§Goethe’s Monstrous Otto, pgs. 26-30; Metamorphology, pgs. 28, 48-54; Elective Affinities or Chosen Correspondences, pgs. 55-60). SUNY Press.
3. Turing, Alan. (1952). “The Chemical Basis of Morphogenesis” (pdf), Phil. Trans. Roy. Soc., 237B, 5-72.
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(c) Sloman, Aaron. (2013). “Molecules to Mathematicians” (abs), Talk, University of Birmingham.
(d) Sloman, Aaron. (2014). “Entropy and Evolution”, University of Birmingham.

θΔics

In

Metamorphology

(1784)

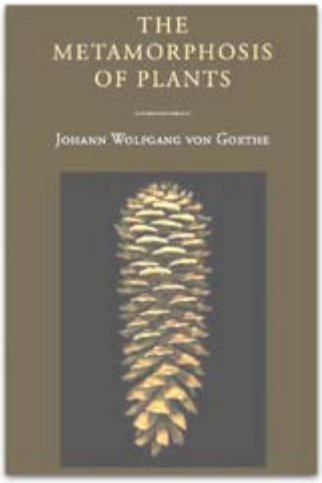

(1790)

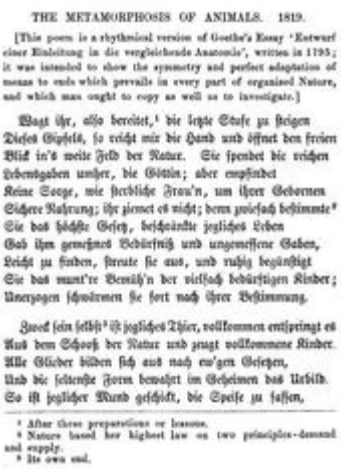

THE METAMORPHOSIS OF ANIMALS. 1819.

[This poem is a rhythmical version of Goethe's Essay 'Entwurf einer Einleitung in die vergleichende Anatomie', written in 1795; it was intended to show the symmetry and perfect adaptation of means to ends which prevails in every part of organised Nature, and which man ought to copy as well as to investigate.]

Wagt ihr, also bereitet,[1] die letzte Stufe zu steigen
Dieses Gipfels, so reicht mir die Hand und öffnet den freien
Blick in's weite Feld der Natur. Sie spendet die reichen
Lebensgaben umher, die Göttin; aber empfindet
Keine Sorge, wie sterbliche Frau'n, um ihrer Geborenen
Sichere Nahrung; ihr gienet es nicht; denn zwiefach bestimmte[2]
Sie das höchste Gesetz, beschränkte jegliches Leben
Gab ihm gemessnes Bedürfniß und ungemessene Gaben,
Leicht zu finden, streute sie aus, und ruhig begünstigt
Sie das mann're Bemüh'n der vielfach bedürftigen Kinder;
Unerzogen schwärmen sie fort nach ihrer Bestimmung.

Zweck sein selbst[3] ist jegliches Thier, vollkommen entspringt es
Aus dem Schooß der Natur und zeugt vollkommene Kinder.
Alle Glieder bilden sich aus nach ew'gen Gesetzen,
Und die seltenste Form bewahrt im Geheimen das Urbild.
So ist jeglicher Mund geschickt, die Speise zu fassen,

[1] After these preparations or lessons.
[2] Nature based her highest law on two principles—demand and supply.
[3] Its own end.

(1806)

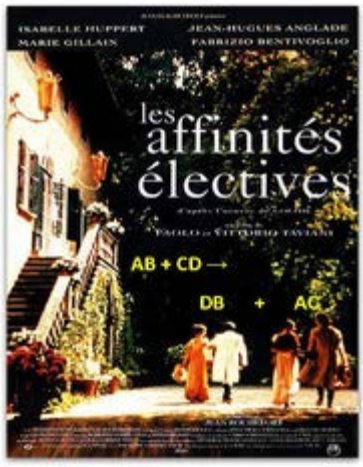

(1809)

German polymath Johann Goethe's three part metamorphology treatise: discovery of the human intermaxillary bone (1784), "The Metamorphosis of Plants" (1790), "Metamorphosis of Animals" (1806), and *Elective Affinities* (1809), outlines his grand theory of the similarities of form, a unifying theory of chemical, plant, animal, and human existence and form change.

science, **metamorphosis**, similar to transmutation, is the process of change or transformation to morphology.

Ovid | Goethe

In 8AD, Roman poet Ovid published his fifteen-part treatise *Metamorphoses*, describing the history of the world from its creation to modern times. [1]

American comparative literature scholar Stefani Engelstein argues that German polymath Johann Goethe's self-defined "best book", namely his 1809 *Elective Affinities*, is the icing on the cake of a three part grand treatise on metamorphosis in nature, being a modern extension of Ovid's treatise on the same.

Specifically, according to Engelstein, in the late 18th century, building on the Ovid's ideas, term "metamorphosis" came to be anchored in the works of German polymath Johann Goethe—specifically his three part metamorphology treatise set: "The Metamorphosis of Plants" (1790), "Metamorphosis of Animals" (1806), and *Elective Affinities* (1809), or studies on the similarities of form. In a handwritten note to his *Morphology*, Goethe defines the subject as follows: [3]

> "Form is a thing in motion, in the process of becoming, of passing away. The study of form is the study of transformation. The study of **metamorphosis** is the key to all the signs of nature."

In 1883, Austrian philosopher, and the years thereabouts, Austrian philosopher Rudolf Steiner gave lectures on the origins of Goethe's metamorphology theory. [5]

In 2011, the American Goethe Society hosted a four-day conference on "Metamorphosis: Goethe and Change", which involved a number of relevant presentations in regards to metamorphosis and Goethe's *Elective Affinities*. [3]

Evolution

The term "évolution" (French) was coined in by Swiss naturalist Charles Bonnet in *circa* 1760 used at the same time with his synonyms of "révolution" and "métamorphose", in the context of understanding development, nascent ideas on extinctions, and construction of a classification scheme in the great unbroken chain of being, as he saw things. [1] In this original linguistic sense, evolution has the following underlying etymological meaning:

évolution = révolution + **métamorphose**

Bonnet's usage, over the next century, supposedly, was passed along through the works of French naturalist Jean Lamarck, whose work influenced English natural philosopher Herbert Spencer, whose terminology usage later was adopted by Charles Darwin for his theory of natural selection in 1872. [1]

Quotes

The following are related quotes:

> "Evolutionary theory was Goethean morphology running on geological time."
>
> — Robert J. Richards (2002) [4]

References

1. Metamorphoses – Wikipedia.
2. Engelstein, Stefani. (2008). *Anxious Anatomy: the Conception of the Human Form in Literary and Naturalist Discourse* (§Goethe's Monstrous Otto, pgs. 26-30; Metamorphology, pgs. 28, 48-54; Elective Affinities or Chosen Correspondences, pgs. 55-60). SUNY Press.
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(b) Steiner, Rudolf. (1988). *Goethean Science* (§2: How Goethe's Theory of Metamorphosis Arose). Spring Valley.

External links

â— Metamorphosis – Wikipedia.

θΔics

In terminology, **metaphor** is transference of the relation between one set of objects to another set for the purpose of brief explanation; a compressed simile or one thing conceived as representing another. [1] A metaphor is nearly a perfect synonym of analogy, although there seem to be subtle differences.

Overview

In the 1980s, George Lakoff published a number of thermal word analyzing books. [7]

Scientific metaphor

A scientific metaphor is the use of metaphor in specialist scientific discourse. [2] An example of a scientific metaphor is transference of one established scientific relation between one set of object, e.g. heat generated in an atomic system, to another set, e.g. heat generated between people in a large metropolis, for the purpose of brief explanation. Other examples might include: the "feeling of electricity between people", animal heat, the term relationship chemistry, etc. Scientific metaphors and scientific analogies often provoke heated debate, over whether or not the metaphor is an actual true statement of reality.

Thermodynamic metaphor

In human thermodynamics, metaphors are often used as testing ground terms to ferret out a theoretical insight. Whether or not the metaphor is correct is a matter specific to each thermodynamic metaphor. [3] The following is an example perspective, from Internet writer Frank Steiger, of a common metaphor usage in religious thermodynamics: [4]

> "Creationism would replace mathematics with **metaphors**. Metaphors may or may not serve to illustrate a fact, but they are not the fact itself. One thing is certain: metaphors are completely useless when it comes to the thermodynamics of calculating the efficiency of a heat engine, or the entropy change of free expansion of a gas, or the power required to operate a compressor. This can only be done with mathematics, not metaphors. Creationists have created a "voodoo" thermodynamics based solely on metaphors. This in order to convince those not familiar with real thermodynamics that their sectarian religious views have scientific validity."

Steiger is commenting here on the the ubiquitous use of the dumbed-down version of the second law, namely "everything tends towards maximal disorder", in arguments for or against evolution. There are points of correct argument on both sides of argument and the use of metaphor in this case is way of bringing about communication between lay science users.

Quotes

The following are related quotes:

> "**Metaphors** allow us to rephrase the new and puzzling in terms of the homely and familiar, and so provide a staircase for the mind to climb."
>
> — Harold Franklin (1995), "From Morphogenes to Mophogeneis" [5]

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External links

â— Metaphor – Wikipedia.
â— Simile – Wikipedia.
â— Analogy – Wikipedia.

θΔics

In science, **metaphysics** is the study of the minor and major abstractions of the human mind—of which the major branches, according to American physical chemist Gilbert Lewis, are: space, time, matter, life (see: defunct theory of life), love, duty, and patriotism, and of which classical examples include: phlogiston and ether: [1]

> "I should have liked to use the word '**metaphysics**' in the title of this book, but there are certain words which have accumulated such evil implications that they must be abandoned, or withdrawn for a period of purification. Two such words, 'phlogiston' and 'ether', we shall have occasion to discuss in later lectures. However, in its best sense metaphysics might well be defined as the study of the major abstractions of the human mind, such as space, time, matter, life, love, duty, patriotism—we need not enumerate further. A more or less complete list of our major and minor abstractions is furnished by any unabridged dictionary."

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External links

â— Metaphysics – Wikipedia.

θΔics

In science, **metastability**, or metastable equilibrium or "metastable state", is []

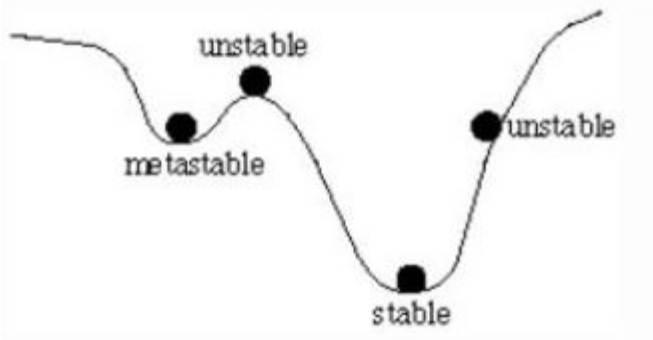

A thermodynamic depiction of four positions of a bound state entity, e.g. ball or bound couple, on an energy surface (Gibbs surface or Gibbs landscape for couple), wherein the "**metastable**" position is a local low-energy well (left valley) and the only "stable" position is the lowest possible energy configuration (right valley). (Ñº)

Social metastability

In 1987, Indian-born Pakistani organometallic chemist Mirza Beg, in his *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, discussed metastability as follows: [1]

> "Societies have been compared in this book with solids, liquids, and gases. A highly disciplined society observing the desired norms and following the same set of laws is suggested to be like a crystal whose constituent atoms or ions are placed at fixed points and they are at the most stable energy level. These societies are to be found in posh urban localities. Societies putting less emphasis on the rule of law, abounding in exception and being indifferent to many of the norms, are like liquids which have no shape of their own but assume that of their container. Energetically they are **metastable** and are at a slightly higher level compared with solids. Then there are societies with very few norms, they have a behavior pattern similar to gases which also have no shape of their own. They can get aggregated into liquids on condensation. Their atoms or molecules are irregularly placed and or loosely held without cohesive force. This is analogous to the random placement of houses and or huts in slums. The title cover [adjacent] depicts just these three kinds of societies."

(add discussion)

In 1991, American philosopher Robert Solomon, in his *Love: Emotion, Myth, & Metaphor*, employed metastability theory to explain one of the states of the ending process of relationships, e.g. wherein jealously begins to arise as an emotion, amid which he cited the following definition: [2]

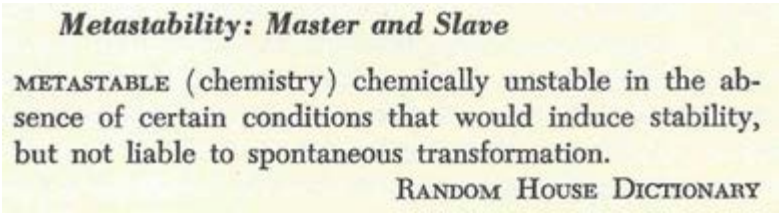
Metastability: Master and Slave

METASTABLE (chemistry) chemically unstable in the absence of certain conditions that would induce stability, but not liable to spontaneous transformation.

RANDOM HOUSE DICTIONARY

Solomon, citing Jean-Paul Sartre, defines metastability—or relationships that are in a metastable state—as follows:

> "It may have all of the appearance of stability, but the violence of the forces in balance are such that, should there be a single slip, a momentary imbalance, an ill-considered comment or careless act, that stability shatters into disaster."

(add discussion)

In 2007, French physicist Bertrand Roehner discussed metastability of revolutionary societies in a thermodynamic context. [3]

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External links

â— Metastability – Wikipedia.

θΔics

In thermodynamics, a **metastable equilibrium**, or "metastability", refers to a system that would undergo a large change in its properties when subjected to some small disturbance. An example is gasoline in air, in which a small spark (bringing the system to the height of the activation energy) would cause the system to combust. [1]

Hmolscience

Scholars who discuss metastability in social terms include: Robert Solomon and Mirza Beg.

Animate organisms

American biochemist Albert Lehninger argues that the entropy of living systems cannot be defined in classical thermodynamic terms because such systems are said to not exist at equilibrium, but rather exist in the form of open "metastable states" (or metastable equilibrium). [2] This, of course, contrasts with the Prigogine school who would argue that animate organisms exist in far-from-equilibrium states.

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θΔics

In origin of life theories, **meteoroid origin of life theory**, "meteoric hypothesis" or “panspermia”, holds that the first form of life on earth originated from a meteoroid or meteor that fell to earth.

The **meteoroid origin of life** theory postulates that billions of years ago a meteoroid containing bacteria or some type of carbon-based life struck the earth surface, a warm pond, or some type of primordial soup, and thus started evolution (life).

History

The meteorite theory origin of life (or panspermia) has been proposed by several scientists.

In 1834, Jacob Berzelius obtained samples of the Alais meteorite (a meteorite that had fell near the town of Alais in France in 1802) and subjected them to chemical analysis, and found the presence of carbon compounds, which to Berzelius meant life. [1] This seems to have been the start of the so-called "comet origin of life theory".

French chemist Marcellin Berthelot isolated “coallike” material from the 1864 Orgueil meteorite and under the microscope, tiny spherical grains were revealed, coated in carbonaceous material, which reminded Berthelot of fossilized bacterial cells. [1]

Other theories were put forward by those including: William Thomson (1871), Hermann Helmholtz (1874), and Svante Arrhenius (1903).

In 1875, Balfour Stewart and Peter Tait were discussing the "meteoric hypothesis" as Thomson and Helmholtz theorized. [3]

See also

- Lightning origin of life theory
- No origin of life theory
- Defunct theory of life

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External links

- Panspermia – Wikipedia.

θΔics

In existographies, **Metrodorus** (c.430-350BC), aka “Metrodorus of Chios”, not to be confused with Epicurean philosopher “Metrodorus the younger” (c.331-278BC), was a Greek skeptic, astronomer, and Democritean atomic theorist (see: Greek philosophy), noted for []

Vacuum

See main: Nature abhors a vacuum

In c.150AD, pseudo-Plutarch (Ñº), in his *The Opinions of the Philosophers*, book 1, chapter 18 “Of a Vacuum”, stated the following: [1]

> “All the natural philosophers form Thales to Plato rejected a vacuum. Empedocles says that there is nothing of a vacuity in nature, nor anything superabundant. Leucippus, Democritus, Demetrius, **Metrodorus**, and Epicurus as say that the atoms are in number infinite; and that a vacuum is infinite in magnitude. The stoics say that within the compass of the world there is no vacuum, but beyond it the vacuum is infinite. Aristotle says that the vacuum beyond the world is so great that the heaven has liberty to breath into it, for the heaven is fiery.”

In 1672, Otto Guericke, in his chapter on “Empty Space” cites some of this passage, e.g. mentioning Metrodorus. [2]

Education

Metrodorus was a pupil of Democritus or of Nessus of Chios. [3]

Students

The pupils of Metrodorus were Anaxarchus and, supposedly, Hippocrates. [4]

Quotes | On

The following are quotes on Metrodorus:

> “**Metrodorus** of Chios, and astronomer, contended that the world has always been in existence.”
>
> — Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* (pgs. 2-3)

Quotes | By

The following are noted quotes:

> “To consider that the earth is the only populated world in infinite space is as absurd as to believe that in an entire field of millet only one grain will grow.”
>
> — Metrodorus (c.380BC) [1]

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θΔics

In chemistry, **Mi Gyung Kim** (c.1959-), or "Mimi Kim", is a Korean-born American affinity chemistry historian noted for her two decades plus work and research on the subject of the history of European chemistry from late 17th to late 19th century.

Her excellent *Affinity, That Elusive Dream: A Genealogy of the Chemical Revolution*, details the history of the rise of affinity chemistry beginning with the matter of heat theories of chemists such as Wilhelm Homberg (1652-1715) and Louis Lemery, to Isaac Newton's chemical revolution launching Query 31, to Etienne Geoffrey's 1718 construction of the world's first affinity table, to the influence on Herman Boerhaave and his 1724 law of expansion, up through Torbern Bergman's gigantic 1775 fold-out affinity table and affinity reaction diagram schematic, to Johann Goethe's famous 1809 chapter four, among others.

Kim seems to be also knowledgeable about other related heat theories and topics, such as phlogiston, caloric, the sulphur principle, Wilhelm Ostwald, etc.

Education

Kim completed her BS in chemistry at Soul National University, South Korea, her MA in chemistry, thesis "Ab initio Calculations of the Equilibrium Geometries of Pyrrolines", at the University of Texas, Austin, and her PhD (1990) in history, with a dissertation on "Practice and Representation: Investigative Programs of Chemical Affinity in the Nineteenth Century", under American science historian Norton Wise, at the University of California, Los Angeles. In 2009, she was a visiting professor at Rice University, where she taught a course on "Science and Empire" through the Department of History. [2] Currently she is a professor of history at North Carolina State University.

See also

- Jeremy Adler
- James Partington
- Trevor Levere
- Henry Leicester

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External links

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θΔics

In hmolscience, **Miao Ning** (c.1969-) is a Chinese interdisciplinary social scientist noted for []

Overview

In 2009, Ning, in his "Research on Social Stability Mechanisms Based on Activation Energy and Gradual Activation Reaction Theory", coauthored with Chinese mathematician and systems scientist Jifa Gu, in which, building on the social physics work of Chinese ecological economist Wenyuan Niu, they apply chemical dynamics, and seeming human chemistry like themed content, to outline social models and theories, specifically transition state theory and collision theory to study and analysis of social transformations, the abstract of which is as follows: [1]

> "This paper draws a comparison between social stability and chemical reaction process, and brings forward the concept of "social temperature" and "activation energy of social agent". It is considered that social temperature turns out to be the macro symptom of social average energy, and its unceasing up-climbing roots in the energy accumulation of "inferiorization" process of social system; that "activation energy of social agent" stands for the social energy or temperature where individuals or groups reach the limit of their psychological bearing ability. This paper, basing on above concepts, elaborates on and demonstrates the gradual activation reaction mechanisms [see: social mechanism] of social stability by a lot of concrete examples. It is thought that there is a threshold value for social stability, and the society will be unstable if social temperature goes higher than this value; that the larger the social average activation energy is, the higher the temperature threshold value of social stability will be; and considering that different groups have different activation energy, those fragile groups with low activation energy are often the risk source which might pose a threat to social stability."

Ning and Gu, interestingly, based on the chemical dynamics slowed down, divide social transformation into a "preparation period", wherein the rate of "activated molecules", presumably individuals—or social atomization, agent (element of the social system), or human molecule, though they don't use this latter term— whose "behavior runs counter to the main rules of a society", increase at a slow rate, and a "reaction period", where "the proportion activated molecules takes up in total ones increases rapidly and the collision and combination among reactant molecules happens more frequently, and original bond will be destroyed the chemical reaction will be accelerated"; the latter, supposedly, is there conception of revolution, the former the slow gradual build up to revolution, which the argue happens mechanistically.

The article cites the earlier theories of Karl Marx, Friedrich Engels, along with new theorists such as: Jurgen Mimkes (2001, 2006) and Josip Stepanic (2000). [2]

The key words for this article are: "social stability", "social temperature", "activation energy of social agent", "gradual activation of reaction", and mechanisms.

Education

In 2009, Ning was affiliated with Institute of Policy and Management, Chinese Academy of Sciences, and the Center for Interdisciplinary Studies of Natural and Social Sciences, both in Beijing, China. In 2013, Ning was listed as a researcher at School of Life Sciences and Technology, Xidian University, Xi'an, China.

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External links

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θΔics

In hmolscience, **Michael Behe** (1952-) (CR:5) (CIR:1) is an American biochemist, noted for his 1996 *Darwin's Black Box*, wherein, via distorted biochemistry presentations, argues that certain cellular structures, e.g. the bacterial flagella, are "irreducibly complex", i.e. too complex to be reduced to chemistry and physics, and therefore the products of a divine creator.

Cellular watchmaker analogy

The gist of what Behe argues, in short, in an extension of English Christian apologeticist William Paley's 1802 "watchmaker" analogy (Ñº), namely that if a watch works via mechanical parts and mechanism, and was made by a creator, the similarly if the cell works via mechanical parts and mechanism then it too must have a creator; in circa 2003 interview with Lee Strobel, Behe explained his reasoning as follows:

> "If the creation of a simple device like this device [motioning to a mouse trap] requires intelligent design, then we have to ask: 'what about the finely tuned machines of the cellular world?' If evolution can't adequately explain them, then scientists should be free to consider other alternatives."

Behe then goes on to use the bacterial flagella as his upgrade to the Paley watch.

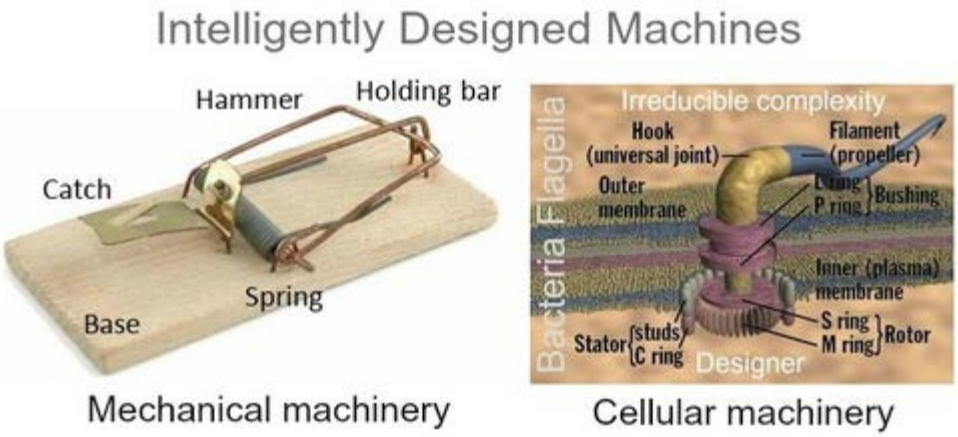

Behe, who keeps a mousetrap in his office, uses what he calls a "mousetrap analogy" to argue that if "mechanical" parts of the trap were "designed" than so to must have been the "mechanical" parts of the cell; the designer of the former a person, the designer of the latter god.

Other

Behe states that he was an "agnostic scientist", while in school, until he came across Michael Denton's *Evolution: a Theory in Crisis* (1985), which inspiration him towards "intelligent design" theory. [2]

In 1997, Behe met American mathematician Granville Sewell, who informed Behe that he could find more support for his intelligent design theory in mathematics, physics, and computer science.

Quotes

The following are related quotes:

> "Thus it seemed to Haeckel that such simple life could easily be produced from inanimate material."
>
> — Michael Behe (2010), "Molecular Machines: Experimental Support for the Design Inference" [2]

> "A draft of *Pandas and People*'s sequel, *The Design of Life*, had been previewed during Dover's trial (2005). Just as Foundation for Thought and Ethics substituted the word 'creationism' with 'intelligent design'—following Edwards vs Aguillard (1987) —throughout versions of *Pandas*, this edition substituted 'sudden emergence' for 'intelligent design'. This prompted Rothschild to ask **Michael Behe** during cross-examination, 'will we be back in a couple of years for the 'sudden emergence' trail."
>
> — Lauri Lebo (2008), *The Devil in Dover*

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External links

â— Michael Behe – Wikipedia.

θΔics

In human thermodynamics, **Michael Alston Boles** (1943-) is an American mechanical engineer and co-author of the 1989 textbook *Thermodynamics: an Engineering Approach*, with Turkish mechanical engineer Yunus Cengel, in its seventh edition as of 2010, in which they intersperse Cengel-Boyles human thermodynamics arguments, e.g. alluding to the premise that the second law and entropy apply to human interactions and activity and that someday second law analysis may be used to improve the quality of human existence, such as in eliminating human frictions and in economics. [1]

Education

Boles completed his PhD in 1972 in mechanical engineering, with a thesis on "Interactions of radiation with conduction and convective Heat Transfer in Ablation and Boundary Layer Flow", at North Carolina State University. [2]He has since been a professor of thermodynamics at NCSU.

See also

â— List of thermodynamics textbooks that include human thermodynamics

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External links

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â— Boles, Michael A. – WorldCat Identities.

θΔics

In hmolscience, **Michael Brooks** (1970-) is an English quantum physicist noted for his 2005 article “13 Things That Don’t Make Sense” wherein he ventures into the absurdities of the what is "life" question and asks whether humans are more than just a bag of chemicals.

Overview

In 2005, Brooks, in *New Scientist*, penned the provocative article “13 Things That Don’t Make Sense”, which expanded into a 2008 book by the same title, in which he explores the anomaly-soaked query, on the lines of a person defined as a human molecule or human chemical, that:

> “Are you more than just a bag of chemicals?”

This tag-line, asking whether humans, as chemicals or molecules, are somehow different than any other type of chemical or molecule in the universe, forms the basis of his chapter five, which summarizes the modern view that the theory of “life” is one of the big five things of modern science that makes no sense (along with the dark matter problem, the pioneer anomaly, varying constants, and cold fusion), being that the theory of life implies certain bundles of chemicals, such as humans, are alive, whereas all other chemical collections of matter are dead or not alive, supposedly the remainder of the entire universe. [1] Brooks summarizes the now-established defunct theory of life, an issue that arises when searching for the so-called “origin of life”, which is nothing but a search for the philosopher’s stone or a type of perpetual motion molecule. [2] Brooks cites Erwin Schrodinger (*What is Life?*, 1944), Paul Davies (*The Fifth Miracle*, 1999), and Lynn Margulis (*What is Life?*, 1995), Stuart Kauffman, among others.

Brooks cites Austrian physicist Erwin Schrodinger's famous 1944 *What is Life?* booklet, as being the pioneer to dig into the physical roots of the issue, summarizing the view that Schrodinger concluded that life is the one system of the universe that turns the natural progression of entropy, effectively moving disorder to order, so to speak. This viewpoint, however, is a huge misunderstanding of the second law, which according Clausius states, in full, that the equivalence value of all uncompensated transformations tends to a maximum. The view that the second law states that all systems of the universe tend to maximal disorder is a contrived appended view, applicable only to certain discussions.

According to Brooks, the fifth big thing of modern science that doesn't make sense is life. Brooks explains how traditionally there have been three ways to unravel the essential nature of life.

> (a) Find out how it started: trace the life back to the point where all that existed was chemistry. A pictorial view of the evolution timeline, however, shows this to be a futile effort, in that the only demarcation one can find is the sub-atomic to atomic transition point of the universe, approximately 13.5-billion years ago.
> (b) The second method, according to Brooks, is to build something that is “alive” from scratch: take chemicals and put them together in ways that make them come alive. The 1952 Urey-Miller experiment, of course, is the poster child of this endeavor. More recent attempt in this direction, include: cloning, making test tube babies, bring back to life extinct species using preserved DNA samples, etc. In nanotechnology, building things atom-by-atom, such as walking molecules, driving molecules, etc., is another type of proto-like life.
> (c) Lastly, according to Brooks:
>
> > “[The third option is] to sit down and think about what exactly is it that marks the difference between living matter and nonliving matter and come up with the 'definition of life'. It is this latter path that is perhaps the most well trodden. It is also the one widely admitted to be a dead end.”

In other words, it has become a guarantee that once a new criterion-based definition of life is put forth, it will only be a matter of time before a disproof becomes apparent.

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2. Brooks, Michael. (2008). *13 Things That Don't Make Sense: the Most Baffling Mysteries of Our Time* (pdf) (ch. 5: "Life: Are You More Than Just a Bag of Chemicals", pgs. 69-82). DoubleDay.

Videos

- Brooks, Michael. (2012). "The Anarchy of Science" (Q), Learning Without Frontiers Conference, Jan 15.

External links

- Michael Brooks (science writer) – Wikipedia.
- Discussion forum – 13ThingsThatDontMakeSense.com.

θΔics

In existographies, **Michael Faraday** (1791-1867) (IQ:180|#96) (Cattell 1000:330) [RGM:35|1,500+] (Gottlieb 1000:119) (Murray 4000: 7|CS / 17|T) [Cropper 30:1|EM] (SIG:7) (GPE:11) (CR:102) was an English chemical physicist, aka the "prince of experimentalists" (Heaviside, 1891), noted for his 1830s "lines of force" theory, which he adopted from Edmond Halley's 1716 "circulating effluvia" magnetic terrella lines (see: magnetism), which later stimulated Irish physicist James Maxwell into formulating his 1873 electromagnetic theory, and for his 1831 discovery of electromagnetic induction. Faraday also had opinions on chemical affinity. He was also involved in developing the concept of the conservation of force. [1]

Electromagnetics

In 1831, Faraday made his big discoveries; this is summarized as follows: [6]

> "**Faraday** was convinced that if electricity could produce magnetism, as Oersted had found, then magnetism could produce electricity. He had been searching for electricity which could be produced by magnetism for a half dozen years before he came upon the principle of induction in 1831. It was in this year that he, for the first time, realized that a current was induced in a conductor while the intensity of a magnetic field was either increasing or decreasing or while the conductor was being moved in the magnetic field. Faraday also found that he could produce a current in one of two coils by moving the coils toward or away from each other while a current was flowing in the second coil. He then substituted a magnet for the coil carrying the current and produced the same effect. Using two coils wound on separate sections of a closed iron ring, with one coil connected to a galvanometer and the other to a battery, Faraday observed that when he completed the circuit to the second coil, the galvanometer needle jerked in one direction and then returned to zero. When he broke the battery circuit, the galvanometer jumped about the same distance in the opposite direction and again returned to zero. In 1831, Faraday also demonstrated that by rotating a copper disk between magnetic poles he could generate direct current. It is on these discoveries that the mechanical production of electricity is based. Thus, Michael Faraday had found not only the basic principle of the electric motor but also the basic principle of the generator and of the induction coil and transformer."

(add)

Education

Faraday was a self-taught type of person, having had little formal education. At the age of 14, he began to educate himself by voracious reading books, such as Isaac Watts' *The Improvement of the Mind* (1727) and *Conversations in Chemistry* (1805) by Jane Marcet (who herself had attended Humphry Davy's lectures), which he came across during his seven year apprenticeship at a local bookbinder and bookseller owned by George Riebau. At the age of 20, Faraday began to attend the lectures of English chemist Humphry Davy, after which he became Davy's protégé. Faraday later became head the Royal Institute.

Notes

His greatest weakness, has many have commented, was his limited mathematical ability, which fortuitously worked to confine him more to experimental investigations, rather than to theoretical endeavors.

Lines of force

Polish novelist Witold Gombrowicz's circa 1955 novel *Pornografia* utilizes a mixture of Faradays's lines of force and Goethe's 1799 theory of human chemical affinities to explain human passions and desires. [2]

Quotes | Employed

The following are quotes employed by Faraday:
91)

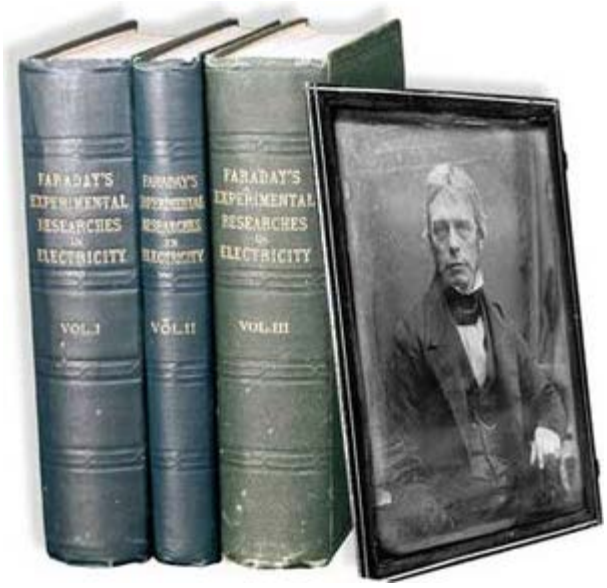

Faraday's 1839 three-volume collected works set *Experimental Researches in Electricity*, purchased from the distinguished science library of Haskell F. Norman. [1]

"Spend a few thoughts sometimes on the puzzling inquiries concerning vacuums and atoms, the doctrine of infinites, indivisibles, and incommensurables in geometry, wherein there appear some insolvable difficulties: do this on purpose to give you a more sensible impression of the poverty of your understanding and the imperfection of your knowledge. This will teach you **what a vain thing it is to fancy that you know all things**, and will instruct you to think modestly of your present attainments."

— Isaac Watts (1727), *The Improvement of the Mind* (pg. 22); read by Michael Faraday at age 14 [5]

Quotes | On

The following are quotes on Coulomb:

"Ohm found that the results could be summed up in such a simple law that he who runs may read it, and a schoolboy now can predict what a **Faraday** then could only guess at roughly. By Ohm's discovery a large part of the domain of electricity became annexed by Coulomb's discovery of the law of inverse squares, and completely annexed by Green's investigations. Poisson attacked the difficult problem of induced magnetization, and his results, though differently expressed, are still the theory, as a most important first approximation. Ampere brought a multitude of phenomena into theory by his investigations of the mechanical forces between conductors supporting currents and magnets. Then there were the remarkable researches of Faraday, the prince of experimentalists, on electrostatics and electrodynamics and the induction of currents. These were rather long in being brought from the crude experimental state to a compact system, expressing the real essence. Unfortunately, in my opinion, Faraday was not a mathematician. It can scarcely be doubted that had he been one, he would have anticipated much later work. He would, for instance, knowing Ampere's theory, by his own results have readily been led to Neumann's theory, and the connected work of Helmholtz and Thomson. But it is perhaps too much to expect a man to be both the prince of experimentalists and a competent mathematician."

— Oliver Heaviside (1891), "Electro-magnetic Theory II" [7]

"**Faraday** showed that a wire suspended with one end free to move and dipping into a bowl of mercury would revolve continuously around a permanent magnet supported in the mercury as long as the wire and the mercury were connected to opposite poles of an electric battery. This discovery of electricity producing motion was the fundamental discovery which eventually led to the invention of the electric motor."

— Richard Kirby (1956), *Engineering in History* (pg. 333) [6]

Quotes | By

The following are quotes by Faraday:

> "Let us now consider, for a little while, how wonderfully we stand upon this world. Here it is we are born, bred, and live, and yet we view these things with an almost entire absence of wonder to ourselves respecting the way in which all this happens. So small, indeed, is our wonder, that we are never taken by surprise; and I do think that, to a young person of ten, fifteen or twenty years of age, perhaps the first sight of a cataract or a mountain would occasion him more surprise than he had ever felt concerning the means of his own existence: How he came here; how he lives; by what means he stands upright; and **through what means he moves about from place to place**. We come into this world, we live, and depart from it, without our thoughts being called specifically to consider how all this takes place; and were it not for the exertions of some few inquiring minds, who have looked into these things, and ascertained the very beautiful laws and conditions by which we do live and stand upon the earth, we should hardly be aware that there was anything wonderful in it. These inquiries, which have occupied philosophers from the earliest days, when they first began to find out the laws by which we grow, and exist, and enjoy ourselves, up to the present time, have shown us that all this was effected in consequence of the existence of certain *forces*, or abilities to do things, or *powers*, that are so common that nothing can be more so; for nothing is commoner than the wonderful powers by which we are enabled to stand upright: they are essential to our existence every moment."
>
> — Michael Faraday (1859), *On the Various Forces of Matter* [4]

References

1. (a) Faraday, Michael. (1857). "On the Conservation of Force", *Philosophical Magazine*. Vol. 13, pg. 227-34.
(b) Faraday, Michael. (1859). "On Regelation, and the Conservation of Force, *Philosophical Magazine*, Vol. 17. Pgs 166-69.
(c) Grove, William R., Faraday, Michael, Liebig, Justus, and Carpenter, William. (1876). *The Correlation and Conservation of Forces*. D. Appleton and Co.
(d) Fara, Patricia. (2005). *Fatal Attraction: Magnetic Mysteries of the Enlightenment*. MJF Books.
2. Berressem, Hango. (1998). *Lines of Desire: Reading Gombrowicz's Fiction with Lican* (pg. 6; lines of desire, pgs. 154-). Northwestern University Press.
3. Faraday Books – SparkMuseum.com.
4. Faraday, Michael. (1859). *On the Various Forces of Matter: and their Relation to Each Other* (pgs. 2-3), six lectures delivered before a juvenile auditory at the Royal Institute, during the Christmas Holidays of 1859-60. Richard Griffin and Co, 1861.
5. Watts, Isaac. (1727). *The Improvement of the Mind*. A.S. Barnes, 1885.
6. Kirby, Richard. (1956). *Engineering in History* (co-authors: Sidney Withington, Arthur Darling, Frederick Kilgour) (pg. 333). Courier, 1990.
7. Heaviside, Oliver. (1891). "Electro-magnetic Theory II" (Ñº), *The Electrician*, Jan 16.

External links

â— Michael Faraday – Wikipedia.

θΔics

In hmolscience, **Michael Foley** (c.1945-) is an English political scholar noted for his 1990 *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian Mechanics*, wherein he discusses the history the "Newtonian government", namely the notion that American government and the US Constitution reflects or embodies some kind of Newtonian machine or mechanics, especially in the notions of balance and separation of powers.

Overview

In 1990, Foley published his *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian Mechanics*; the following is a representative view: [1]

> "The nature and distribution of political power in the American system might actually be reducible to a configuration of observable objects moving solely in accordance with Newton's laws of motion and force, with the power of each object physically determinable though changes in the positions and velocities of the other constituent objects in the system. And the recent rise and decline of Presidential power may be explained as another example of the temporary and local reversal of entropy produced by living matter before the order and structure of its sustained energy level inevitably slides back into the universe's overriding thermodynamic trend of dissipated energy and increasing disorder."

Foley's book seems to be well-referenced, referring to society, via quote citation, e.g. as a "cluster of human atoms", referring to concepts such as "Newtonian sociology" (see: social Newton).

Newtonian government

> *See main: Newtonian government*

(add discussion)

Education

Foley completed his BA at the University of Keele, and his MA and PhD, the latter with a thesis on the transformation of the US Senate, in political science, both at the University of Essex. In 1975, Foley joined the Aberystwyth University as a professor of international politics, and currently is head of that department. [2]

1	Newtonian mechanics and American constitutionalism	1
2	The death of constitutional Newtonianism?	21
3	The perpetuation of constitutional mechanics	45
4	The Presidency, the Congress and the separation of paradigms	80
5	A government of laws, men and machines	186

Table of contents of Foley's *Laws, Men, and Machines*.

Quotes

The following are related quotes:

> "[*Laws, Men and Machines*] had a long period of gestation during which I was repeatedly led to ruminate upon the extraordinary wealth of mechanical references in American politics."
>
> — Michael Foley (1990), "Acknowledgements" (see: Beg analysis)

References

1. (a) Foley, Michael. (1990). *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian Mechanics* (entropy, pg. 199-200). Routledge, 2014.

(b) Cohen, I. Bernard. (1995). *Science and the Founding Fathers: Science in the Political Thought of Jefferson, Franklin, Adams, and Madison* (Foley, pgs. 344-45). Publisher.
2. Michael Foley (faculty) – Aberystwyth University.

External links

â— Michael Foley (academic) – Wikipedia.

θΔics

In hmolscience, **Michael Fores** (c.1926-) is/was an English economist noted for his 1976 talk "A Proper Use of Science", where he argues the following:

> "Physics deals with matter, and so, oddly, does chemistry. Whereas the matter which is part of living organisms is the subject of biology; or is it the subject of organic chemistry? Sociology is the study of man in groups; whereas psychology is the study of man himself. However, individuals form groups; so some of social behavior is part of individual behavior. And anthropology, with its accent on culture, also deals with man in groups. But so does … We have biochemistry, physical chemistry, biophysics, social psychology. Should there be a door in the House of Science called socio-chemistry or anthro-physics or eco-zoology (the animal aspects of wider housekeeping)? I think not; but posing the question outlines the activist's dilemma."

(add discussion)

Education

In 1976, Fores was a senior economic advisor at the Department of Industry of England.

References

1. Fores, Michael. (1976). "A Proper Use of Science" (pg. 152), given at conference on manufacturing and management, City University, London, Dec.; in*: Manufacturing & Management* (editors: Michael Fores and Ian Glover). H.M. Stationery Office, 1978.

θΔics

In hmolscience, **Michael Guillen** (c.1950-) is an American physicist noted for his 1995 book *Five Equations that Changed the World*, in the second chapter which he discusses the second law and gives a fairly detailed and rare biographical history of the early years, upbringing, and possible religious outlooks of German physicist Rudolf Clausius. [1]

Religion

See main: Religious thermodynamics

Guillen had a very strong religious upbringing, is openly religious, listing the Bible as his "favorite book". Guillen's religious bias shows through clearly in his discussion of the second law in regards to life. In the preface to his *Five Equations*, he introduces the second law as such:

> "Contrary to popular belief, being alive is unnatural; in fact, all life exists in defiance of, not in conformity with, the most fundamental law of the universe."

which is code for the view that life is a miracle that God created and continues to create and evolve in defiance or opposition to the second law. This quote is used by American alternative medicine theorist Laurence Foss as a basis of argument to the premise that life is a spiritual miracle that arose through what he calls the second law of psychothermodynamics. [2]

Guillen's latest book, the 2004 *Can a Smart Person Believe in God?*, tells of his lifelong attempt to reconcile his scientific career with his deeply religious upbringing.

Education

Guillen completed his BS at UCLA, and PhD in physics, mathematics, and astronomy at Cornell University. He then taught physics at Harvard for eight years. Guillen currently is involve film production. [3]

References

1. Guillen, Michael. (1995). *Five Equations that Changed the World* (ch.: An Unprofitable Experience: Rudolf Clausius and the Second Law of Thermodynamics, pgs. 165-214). Hyperion.
2. Foss, Laurence. (2002). *The End of Modern Medicine: Biomedical Science under a Microscope* (Section: Second Law of Psychodynamics, pgs. 229-32). SUNY Press.
3. Michael Guillen (about) – MichaelGuillen.com.

External links

â— Guillen, Michael – WorldCat Identities.

θΔics

In existographies, **Michael Jordan** (1941-) is an English writer noted for []

Encyclopedia

In 1993, Jordan published *Encyclopedia of Gods: Over 2,500 Deities of the World*, a product of nine-years of research on god etymologies; the following is his religion existence period diagram:

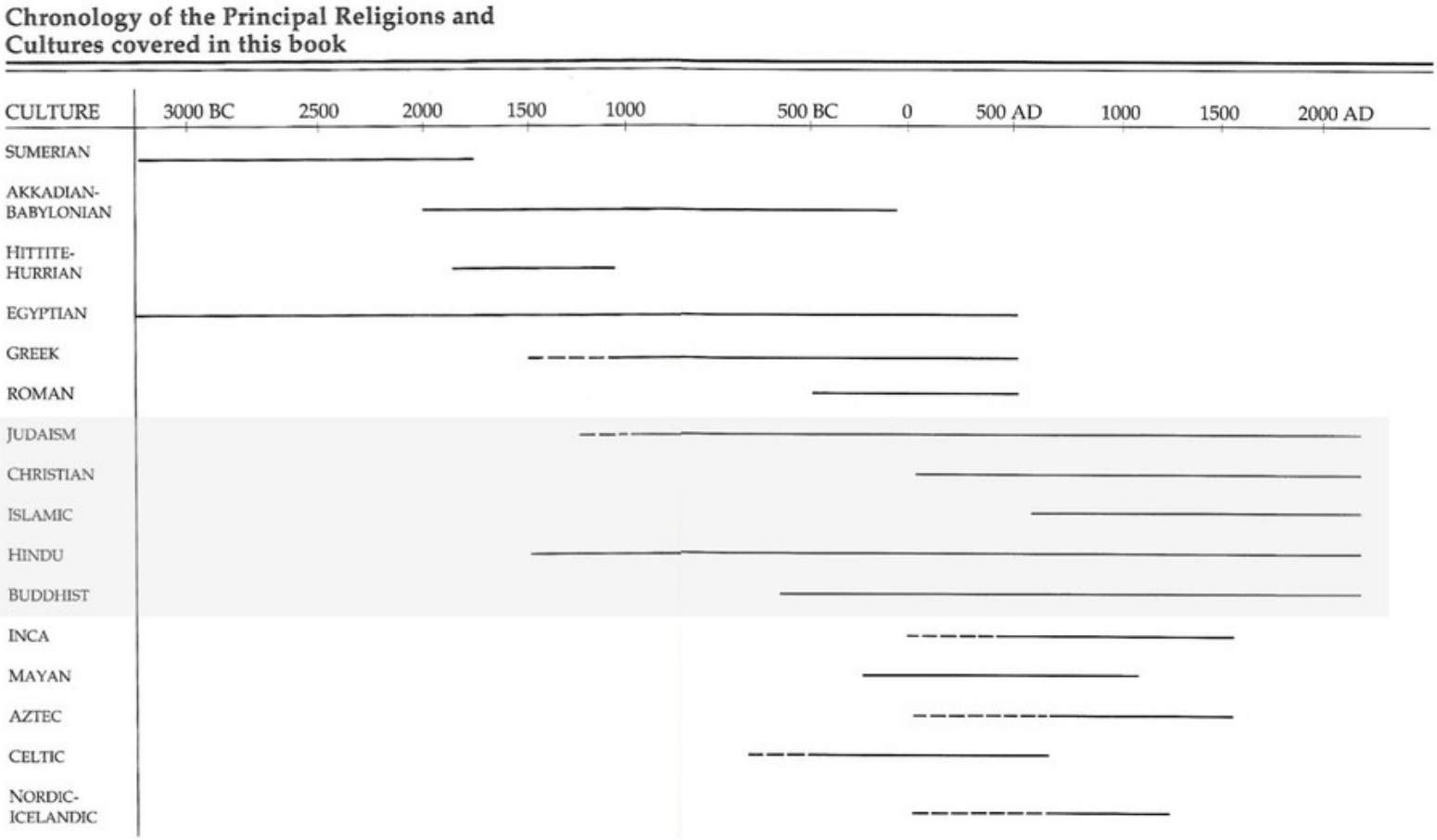

Jordan's **Religions Existence Period Diagram** (1996)

This book, for some time, was a go-to reference of Libb Thims, among his 130+ religio-mythology and atheism book collection, for basic facts on the various gods, e.g. Osiris, Ra, Isis, Horus, Manu, etc.. [1]

Mary

In 2001, Jordan, in his *Mary: the Unauthorized Biography*, attempted to argue the following: [2]

> "The official biography of Mary, the mother of Jesus, was a matter of violent argument within the early Christian movement, culminating with the Council of Ephesus in 431, which established the idea of the immaculate conception and Mary's lifelong virginity. In the centuries that followed, she has become a symbol of the beautiful virgin bride, grieving mother, heavenly queen, compassionate intercessor, leader of armies, mistress of the world. The real Mary was none of these things. Her biography is an elaborate myth invented by the early Church to further the interests of its male hierarchy and disguise the pagan origins of the mother of Jesus."

Cited reviews (Q) of this work, to note, seem to indicate that the book of off-target.

Education

Jordan completed a BA in the natural sciences, after which he became a successful BBC television presenter of wildlife programs in the 1980s. [2]

Quotes

The following are related quotes:

> "Claims of Mary's authenticity would never stand up in a court of law because, apart from what is written in the Bible, there is little evidence of the existence of either Mary or Jesus Christ. **Historians** such as Josephus, Tacitus, Suetonius and Pliny the Younger, who are near-contemporaries of Mary and Jesus, are **largely silent** on the subject."
>
> — Michael Jordan (2001), *The Historical Mary* (xv)

References

1. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World*. Facts on File, Inc.
2. Michael Jordan (profile) – Amazon.com.
3. Jordan, Michael. (2001). *Mary: the Unauthorized Biography*. Weidenfeld & Nicolson.

θΔics

In science, **Michael Lissack** (c.1957-) is an American municipal bond manager turned complexity-emergence theorist noted for his 2012 spearheading involvement in the Juarrero-Deacon affair.

Overview

Lissack claims to have sent fervent e-mails to more than 1,500 faculty members at Berkeley. Staff members, students, administrators and state legislators have also received the e-mails. [2]

Relatedly, Lissack, in 1994 was awarded $30 million dollars for a Wall Street yield burning scandal, but also later pleaded guilty in 1996 to second-degree email harassment in another non-related whistle-blowing case.

Related to Juarrero plagiarism allegations, on 17 Oct 2012, American emergence-complexity theorist Michael Lissack, formerly sent in a complaint to Robert Price of the University of California, Berkeley, that Deacon plagiarized his meme as a 'sign' for an 'environmental niche' theory, from his 2003 article "The Redefinition of Memes: Ascribing Meaning to an Empty Cliché", using it without appropriation for the content of his 2004 chapter 'Memes as Signs in the Dynamic Logic of Semiosis: Beyond Molecular Science and Computation Theory.' [3]

Education

Lissack completed his BA in 1979 at Williams College, his MBA at Yale School of Management in 1981, and his DBA at Henley Management College in 2000. [1] Until 1995, Lissack worked as an investment banker; after which he began to work in the overlap of complexity theory and management or what he calls "corporate anthropology."

In *circa* 1999, Lissack founded the Institute for the Study of Coherence and Emergence, which hosts a journal entitled *Emergence*. [4]

References

1. (a) Michael Lissack – Lissack.com.
(b) Curriculum vitae – Lissack.com.
2. Tilsley, Alexandra. (2012). "Publicizing (Alleged) Plagiarism", *InsideHigherEd.com*, Oct 22.
3. (a) Lissack-Price correspondence (22, 26 Oct, 2012) – theDeaconAffair.com.
(b) Lissack, Michael R. (2003). "The Redefinition of Memes: Ascribing Meaning to an Empty Cliché", *Emergence*, 5(3):48-65.
(c) Deacon, Terrence. (2004). "Memes as Signs in the Dynamic Logic of Semiosis: Beyond Molecular Science and Computation Theory", in: *C*
4. Institute for the Study of Coherence and Emergence – ISCE.edu.

External links

â— Michael Lissack – Wikipedia.

θΔics

In hmolscience, **Michael Lowy** (1938-) is a French-Brazilian sociologist and philosopher noted for his 1992 *Redemption and Utopia*, wherein he traces the concept of elective affinity and its itinerary from alchemy to the sociology of Max Weber via Goethe. [1]

Lowy has published commentary on the work of Walter Benjamin.

Quotes

The following are noted quotes:

> "For Goethe, there was elective affinity when two beings or elements 'seek each other out, attract each other and seize [...] each other, and then suddenly reappear again out of this intimate union, and come forward in fresh, unexpected form'."
>
> — Michael Lowy (c.1992), translation of Goethe's 23 Oct 1799 comment on Prosper Crebillon [2]

References

1. (a) Lowy, Michael. (2005). *Fire Alarm: Reading Walter Benjamin's On the Concept of History* (translator: Chris Turner) (pgs. 20, 121). Verso.
(b) Lowy, Michael. (1992). *Redemption and Utopia: Jewish Liberation Thought in Central Europe* (Goethe, 13+ pgs). Stanford University Press.
2. Pummer, Claudia A. (2011). "Elective Affinities: the films of Daniele Huillet and Jean-Marie Straub" (Ñº), PhD dissertation, University of Iowa.

External links

â— Michael Löwy – Wikipedia.

θΔics

In existographies, **Michael Macrakis** (1924-2001) (CR:5) was a Greek-born American engineer and physicist noted, in economic thermodynamics, for his 1997 *Scarcity's Ways*, wherein he seems to present a quantum mechanical, statistical mechanics, and thermodynamics reductionism of economics.

Overview

In the 1970s, Macrakis began reading reading up on economics, capital theory, and energy policy; amid this, he was puzzled about the legitimacy of irreversibility, the three body problem, and the jump from microscopic thermodynamics to macroscopic thermodynamics.

In 1997, Macrakis published his *Scarcity's Ways: the Origins of Capital: a Critical Essay on Thermodynamics, Statistical Mechanics and Economics*, wherein he defined "capital" as a physical or biological engine that processes material and transforms energy in a non-equilibrium thermal environment, is discussed in the context of thermodynamics, evolutionary biology, and the origin of life. The content of the book, based on keyword predominance, is focused on: economics, energy, entropy, quantum mechanics, and statistical mechanics. He discusses concepts such as the Carnot cycle and thermodynamicists such as Constantin Caratheodory, Willard Gibbs, to cite a few examples.

Greek font

In 1992, Macrakis founded the Greek Font Society (Ω); this is evidenced by the fact that he titles his thermodynamics chapters as follows:

THERMODYNAMICS ($\Theta\Delta^{CS}$)

which is the using the Thomson-Maxwell-Tait Greek code shorthand for the subject of thermodynamics (see: θΔics)., before it was called thermodynamics.

Education

Macrakis completed his undergraduate degree in electrical and mechanical engineering at the National Technical University of Athens in circa 1951. Thereafter, he moved to the United States completing his MS in electrical engineering at MIT and PhD in applied physics, with a dissertation on "Backscattering Cross-Section of Slotted Cylinders", in 1959, at Harvard University. [2]

References

1. Macrakis, Michael S. (1997). *Scarcity's Ways: the Origins of Capital: a Critical Essay on Thermodynamics, Statistical Mechanics and Economics (Boston Studies in the Philosophy of Science)* (§:4: Thermodynamics (ΘΔcs), pgs. 93-). Springer.
2. Barker, Nicolas. (2002). "Michael S. Macrakis" *Obituaries, News: The Independent*, Jan. 07.

Further reading

● Fleming, Robin. (c.2010). "The Making of Lilly Macrakis" (Ω), Center for Hellenic Studies, Harvard University.

External links

● Macrakis, Michael S. – WorldCat Identities.
● Michael Stavros Macrakis – Mathematics Genealogy Project.

θΔics

In hmolscience, **Michael McLure** (1959-) is an Australian economics historian noted for []

Overview

In 2002, McLure, in his *Pareto, Economics and Society: the Mechanical Analogy*, gives a rather detailed critique of the social mechanism theories of French-born Italian engineer and physical socioeconomist Vilfredo Pareto, e.g. his *homo economicus* conception of an agent as a "molecule reacting to economic forces" model, etc., with commentary on related players, such as Leon Walrus, and Pareto scholars, such as Czechoslovakian-born English sociologist Werner Stark, among others, generally associated with the Lausanne school of physical economics.

McLure, to note, seems to consider Pareto's entire argument to be "analogy" or specifically "mechanical analogy" a term he uses extensively in his book. The following, to exemplify, is a 1902 annotated version of Pareto's curve of the distribution of wealth (Pareto principle) in society or social organism (social aggregate), as he called it, according to which the social pyramid is in reality, according to Pareto, a sort of spinning top, in which over the centuries there occurs a circulation of elites, in which some people as molecules, the agitated ones, enrich themselves, others, the less agitated ones, impoverish themselves, shown with a noted Pareto human molecule (economic molecule) quote form McLure's book: [2]

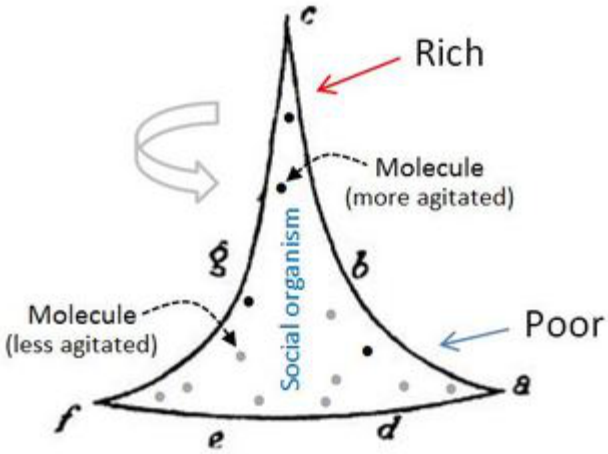

"The molecules of which the social aggregate is composed don't stay at rest; some individuals enrich themselves, other impoverish themselves."

— Pareto (c.1895), Source [1]

Whatever the case, as outlined by American physiologist Lawrence Henderson in 1935, the modern correct way to understand Pareto is through the chemical thermodynamics "equilibrium" work of American engineer Willard Gibbs, according to which the "chemical analogy" is used, according to which the human molecular formula approach is employed, wherein time location points of economic equilibrium, as British-French economist Alan Kirman (1987) correctly points out, are regarded as the "termination of a process, wherein the time", which is not a variable of pure thermodynamics (Gilbert Lewis, 1930), "taken for this process is not specified", but one in which the measurement of the distance from equilibrium is measured by the socioeconomic system Gibbs free energy differentials, as studied by human free energy theorists, on extent of reaction graphs or socioeconomic energy landscapes.

References

1. McLure, Michael. (2001). *Pareto, Economics and Society: the Mechanical Analogy* (pdf) (Amz) (pg. 68). Routledge.
2. (a) Pareto, Vilfredo. (1902). *The Socialist Systems, Volume 1* (*Les Systéms Socialistes, Volume 1*) (diagram, pgs. 6-7). V. Giard & E. Briére.
(b) Pareto, Vilfredo. (1902). *The Socialist Systems, Volume 2* (*Les Systéms Socialistes, Volume 2*). V. Giard & E. Briére.
(b) Circulation of elite – Wikipedia.

External links

â— Michael McLure (faculty) – University of Western Australia.
â— McLure, Michael (1959-) – WorldCat Identities.

θΔics

In hmolscience, **Michael J. Moran** (c.1950-) is an American mechanical engineer noted for []

Overview

In 2003, Moran, in his *Fundamentals of Thermodynamics* (3rd ed), co-authored with American mechanical engineer Howard N. Shapiro (c.1947-), and editions to follow (2007, 2010), began to include thermodynamics applied to humanities stylized homework problems, mostly of the economics thermodynamics variety; the first of which is the following Nicholas Georgescu-Roegen 1971 "material entropy" framed query: [1]

6.10D Noting that contemporary economic theorists often draw on principles from *mechanics* such as conservation of energy to explain the workings of economies, N. Georgescu-Roegen and like-minded economists have called for the use of principles from *thermodynamics* in economics. According to this view, entropy and the second law of thermodynamics are relevant for assessing not only the exploitation of natural resources for industrial and agricultural production but also the impact on the natural environment of wastes from such production. Write a paper in which you argue for, or against, the proposition that thermodynamics is relevant to the field of economics.

In the 2007 (6th) edition, they state that “scientists and engineers have found many applications of the second law and deductions from it in economics, philosophy, and other areas far removed from engineering thermodynamics”; the Boltzmann equation (or “Boltzmann relation” as they call it) model of entropy as a measure of disorder and how this model is sometimes used in economic and social modeling; discuss ATP as a storage batter; and give the following bio connections caption on the famous evolution (ordering) second law (disordering) reconciliations Q&A: [2]

Bio... connections

Do living things violate the second law of thermodynamics because they seem to create order from disorder? Living things are not isolated systems as considered in the previous discussion of entropy and disorder. Living things interact with their surroundings and are influenced by their surroundings. For instance, plants grow into highly ordered cellular structures synthesized from atoms and molecules originating in the Earth and its atmosphere. Through interactions with their surroundings, plants exist in highly organized states and are able to produce within themselves even more organized, lower entropy states. In keeping with the second law, states of lower entropy can be realized within a system as long as the *total* entropy of the system and its surroundings increases. The self-organizing tendency of living things as systems is widely observed and fully in accord with the second law.

While the "living things" term is outdated (see: life terminology upgrades), according to the defunct theory of life (2009), i.e. "thermodynamics does not recognize the term life" as Charles Sherrington (1938) famously put it, the end statement "lower states of entropy can be realized within a system as long as the total entropy of the system and the surroundings increases" is one of the most famously uncited regurgitations in thermodynamics, which apparently dates to the 1947 local entropy decrease argument of Belgian-born English thermodynamicist Alfred Ubbelohde. [3] The following are a few others from the 2007 edition: [2]

6.6D Classical economics was developed largely in analogy to the notion of mechanical equilibrium. Some observers are now saying that a macroeconomic system is more like a thermodynamic system than a mechanical one. Further, they say the failure of traditional economic theories to account for recent economic behavior may be partially due to not recognizing the role of entropy in controlling economic change and equilibrium, similar to the role of entropy in thermodynamics. Write a report, including at least three references, on how the second law and entropy are used in economics.

6.10D In recent decades, many have written about the relationship between life in the biosphere and the second law of thermodynamics. Among these are Nobel Prize winners Erwin Schrodinger (Physics, 1933) and Ilya Prigogine (Chemistry, 1977). Contemporary observers such as Eric Schneider also have weighed in. Survey and *critically evaluate* such contributions to the literature. Summarize your conclusions in a report having at least three references.

Here, in 6.6D, we see what seems to be discussion of pre-second law based thermodynamic economic equilibrium theories, and, in 6.10D, life and second law paradox discussions, as found in the works of Erwin Schrodinger (1944), Ilya Prigogine (1971-2003), and Eric Schneider (2005)

The following is one from the 2010 edition, co-authored with Daisie D. Boettner and Margaret B. Bailey: [4]

5.1D The second law of thermodynamics is sometimes cited in publications of disciplines far removed from engineering and science, including but not limited to philosophy, economics, and sociology. Investigate use of the second law in peer-reviewed nontechnical publications. For three such publications, each in different disciplines, write a three-page critique. For each publication, identify and comment on the key objectives and conclusions. Clearly explain how the second law is used to inform the reader and propel the presentation. Score each publication on a 10-point scale, with 10 denoting a highly effective use of the second law and 1 denoting an ineffective use. Provide a rationale for each score.

Education

Moran currently is a professor mechanical engineering at Ohio State University, specializing in engineering thermodynamics and thermoeconomics (albeit the "economic analysis of engineered mechanical systems variety" (engineering economics), it seems, over that of the "thermodynamics applied to economic systems variety" of the term).

See also

- List of thermodynamics textbooks with applications in the humanities

References

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2. Moran, Michael J. and Shapiro, Howard N. (2007). *Fundamentals of Engineering Thermodynamics* (6th ed) (far removed, pg. 215; Boltzmann relation, pg. 281; living things, pg. 282). Wiley.
3. Ubbelohde, Alfred René. (1947). *Time and Thermodynamics* (§: "Experimental Aspects of the Relation between Thermodynamics and Life", pgs. 100-05). Oxford University Press.
4. Moran, Michael J., Shapiro, Howard N., Boettner, Daisie D., and Bailey, Margaret B. (2010). *Fundamentals of Engineering Thermodynamics* (7th ed) (5.10D, pg. 277). Wiley.

External links

- Michael J. Moran (faculty) – Ohio State University.
- Howard Shapiro (faculty) – Wayne State University.
- Shaprio, Howard N. – WorldCat Identities.

θΔics

In existographies, **Michael Paulkovich** (1955-) (RMS:152) is an American atheism and free thinker themed writer and systems engineer, noted for his 2013 *No Meek Messiah: Christianity's Lies, Laws and Legacy*, wherein, building on the work of John Remsburg (1909), he revitalized discussion on the silent historians problem, by getting the list of silent Jesus historians up to the 120+ historian count, and presents cogent sections such as the "Egyptian Origins of Judeo-Christian Beliefs", wherein he explains how various spells from the *Egyptian Book of the Dead*, became centerpieces of the Old Testament and New Testament of the Bible.

Overview

See also: Paulkovich 126

In c.2005, Paulkovich retired from his position as a systems engineer for NASA; he also had been an inventor of some kind. (Q)

In 2012, Paulkovich published articles on the "silent historians problem", i.e. people who should have recorded the stories of Christ but did not, in the *Free Inquiry*, *American Rationalist*, and *American Atheist* magazines.

In 2013, Paulkovich, amassed his previously published articles as a basis to produce the book *No Meek Messiah: Christianity's Lies, Laws and Legacy* (Q), wherein, building on John Remsburg's 1909 list of 41 silent historians, listed 126 writers, some of which are listed below, who should have, owing to his supposed fame, but did NOT write about Jesus: [1]

Aelius Theon
Albinus
Alcinous
Ammonius of Athens
Alexander of Aegae
Antipater of Thessalonica
Antonius Polemo
Apollonius Dyscolus
Apollonius of Tyana
Appian
Archigenes
Aretaeus
Arrian
Asclepiades of Prusa
Asconius
Aspasius
Atilicinus
Attalus
Bassus of Corinth
C. Cassius Longinus
Calvisius Taurus of Berytus
Cassius Dio
Chaeremon of Alexandria
Claudius Agathemerus
Claudius Ptolemaeus
Cleopatra the physician
Cluvius Rufus
Cn. Cornelius Lentulus Gaetulicus
D. Haterius Agrippa
D. Valerius Asiaticus
Damis
Demetrius
Demonax
Demosthenes Philalethes
Dion of Prusa
Domitius Afer
Erotianus
Euphrates of Tyre
Fabius Rusticus
Favorinus Flaccus
Florus
Fronto
Gellius
Gordius of Tyana
Gnaeus Domitius Halicarnassensis Dionysius II
Justus of Tiberias
Juvenal
Lesbonax of Mytilene
Lucanus
Lysimachus
M. Antonius Pallas
M. Vinicius
Macro
Mam. Aemilius Scaurus
Marcellus Sidetes
Martial
Maximus Tyrius
Moderatus of Gades
Musonius
Nicarchus
Nicomachus Gerasenus
Onasandros
P. Clodius Thrasea
Paetus Palaemon
Pamphila
Pausanias
Pedacus Dioscorides
Persius/Perseus
Petronius
Phaedrus
Philippus of Thessalonica
Phlegon of Tralles
Pompeius Saturninus
Pomponius Mela
Pomponius Secundus
Potamon of Mytilene
Ptolemy of Mauretania
Q. Curtius Rufus
Saleius Bassus
Scopelian the Sophist
Scribonius
Seneca the Elder
Sex. Afranius Burrus
Sex. Julius Frontinus
Servilius Damocrates
Silius Italicus
Soranus
Soterides of Epidaurus
Sotion
Statius the Elder
Statius the Younger
Suetonius
Sulpicia
T. Aristo
T. Statilius Crito
Tacitus
Thallus
Theon of Smyrna
Thrasyllus of Mendes
Ti. Claudius Pasion
Ti. Julius Alexander
Tiberius
Valerius Flaccus
Valerius Maximus
Vardanes I

Cornelius Celsus
Columella
Cornutus
Quintilian
Rubellius Plautus
Rufus the Ephesian
Velleius Paterculus
Verginius Flavus
Vindex

In 2015, Paulkovich published a second edition of his *No Meek Messiah*, retitled as *Beyond the Crusades: Christianity's Lies, Laws, and Legacy*, with a foreword by Robert Price. (Q)

Quotes | On

The following are quotes on Paulkovich:

> "**Paulkovich**'s *No Meek Messiah* is one of the most bracing and hard-hitting books of its kind in recent years. Its dissection of Christianity is relentless and exhaustive: from historical, philosophical, social, cultural, and psychological perspectives, it lays bare the fallacies, deceptions, and imbecilities of Christian belief."
>
> — Sunand Joshi (2013), "back cover" of *No Meek Messiah* [1]

Quotes | By

The following are quotes by Paulkovich:

> "Over 1,500-years before Christian times, an 'Egyptian Bible' was carved in stone and thousands of copies were hidden in scrolls, deep within mausoleums and pyramids. Judeo-Christian belief systems and Bible stories were clearly borrowed from Egyptians, whence came also, by no coincidence, the Hebrew alphabet. The exercise in proof that follows can be repeated by anybody able to read a valid translation of the Egyptian glyphs into his or her native tongue. Borrow from your library a translation of the Egyptian *Book of the Dead*. I primarily cite interpretations by Peter Renouf (Q)(Q) (1904), Raymond Faulkner (Q) (1972), and Wallis Budge (1895). A direct and pellucid connection is evident: the tales and liturgies of the Tanakh—as well as those of the New Testament, were plagiarisms of mystical and supernatural conjecture, much borrowed from Egyptian belief.
>
> Fifteen centuries before Jesus, the Egyptians worshiped a saintly savior named Horus. The Egyptian missals present proofs of the origins of the Judeo-Christian mythologies, *res ipsa loquitur* [the thing speaks for itself]. The *Book of the Dead* consists of 'spells'. Consider these divine convictions: Born of mother Isis, Horus is the avenger of god, who is his father (Spells 17 and 92). "All that liveth" are subject to Horus (Spell 78). Horus delivered himself from evil (Spell 42), and Spell 92 promises to guide you to heaven. In Spells 52 and 53 we learn a miracle of "seven loaves" supplied by the son of god. Horus was born of mother Isis (who transformed into Neith or Nephthys, Spell 17)—a virgin, like so many mothers of sun-gods: Attis, Buddha, Dionysus, Krishna, Perseus, Prometheus, Mithras, Hercules, and of course, Jesus. In Spell 112 we discover an anti-pork diet. As in the later Hebrew religion, pork was forbidden among ancient Egyptians. Horus is the Prince of Eternity, Lord of mankind (Spell 42). Spell 97 tells of Horus purifying his soul with mikvah or baptism. Horus preaches a communion (Spell 19), and the blood of his mother is magical and holy (Spell 156).
>
> Digging deeper into the Egyptian sands and spiritual beliefs, we find other suspicious connections. The Christian Bible claims Jesus cured the blind (Mark 8:23) and the deaf (Mark 7:32-3). How did Jesus cure them? Jesus spat in their eyes (Mark 8:23), and stuck his fingers in their ears, licking and spitting on his medical patients. Many centuries before Jesus, Egyptian god Thoth cured Horus' torn-out eye by spitting on it (Spell 17). From the Pyramid Texts we learn that Horus loves "those who love him." Centuries later Jesus expresses the same sentiment and "he that loveth me shall be loved of my Father, and I will love him" (John 14:21)."

— Michael Paulkovich (2013), *No Meek Messiah* (§: Egyptian Origins of Judeo-Christian Beliefs, pgs. 161-65)

"Perhaps none of these ['silent'] writers is more fascinating than Apollonius of Tyana [c.15-100AD] (Q), saintly first-century adventurer and noble paladin. Apollonius was a magic-man of divine birth who cured the sick and blind, cleansed entire cities of plague, foretold the future, and fed the masses. He was worshiped as a god and as a son of a god. Despite such nonsense claims, Apollonius was a real man recorded by reliable sources."

— Michael Paulkovich (2013), "The Fable of the Christ"

"When I consider those 126 writers, all of whom should have heard of Jesus but did not - and Paul and Marcion and Athenagoras and Matthew with a tetralogy of opposing Christs, the silence from Qumram and Nazareth and Bethlehem, conflicting Bible stories, and so many other mysteries and omissions - I must conclude that Christ is a mythical character."

— Michael Paulkovich (c.2013), *Publication* (Q)

References

1. (a) Remsburg, John. (1909). *The Christ: a Critical Review and Analysis of the Evidence of His Existence*. Prometheus Books, 1994.
(b) Paulkovich, Michael. (2013). *No Meek Messiah*: *Christianity's Lies, Laws and Legacy* (§: Egyptian Origins of Judeo-Christian Beliefs, pgs. 161-65). Publisher.
2. Paulkovich, Michael B. (2014). "God on Trial: The Fable of the Christ" (Q), *Free Inquiry*, 34(5).

External links

- Michael Paulkovich (@MPaulkovich) – Twitter.com.
- Michael Paulkovich (overview) – JesusNeverExisted.com.

θΔics

In existographies, **Michael Polanyi** (1891-1976) (CR:26) was a Hungarian-born English physical chemist noted for his 1931 potential energy surface model, co-developed with Mexican-born American theoretical chemist Henry Eyring, during their work on hydrogen-hydrogen interactions; for his 1935 work together with Eyring and Meredith Evans in the development of transition state theory; and for his 1947 switch into the humanities, wherein he concerned himself mainly with the philosophy of science, economics, and sociology.

Antireductionist philosophy

Polanyi was of the view that life is not reducible to physics and chemistry. [1] Polanyi, in his 1967 *Chemical & Engineering News* cover story article "Life Transcending Physics and Chemistry" (a rebuttal to English geneticist Francis Crick's 1966 reductionsim book *Of Mice and Men*), wherein he attempts to disprove the following emerging view (since 1953 the discovery of the structure of the DNA):

> "The discovery by Watson and Crick of the genetic function of DNA (deoxyribonucleic acid), combined with the evidence these scientists provided for the self-duplication of DNA, is widely held to prove that living beings can be interpreted, at least in principle, by the laws of physics and chemistry."

Polanyi's anti-reductionism argument, in short, is that DNA does nothing but "transmit information", the "transmission of information is nonchemical and nonphysical", therefore the "description of a living system transcends the chemical and physical laws which govern its atomic constituents." He concludes that: [7]

> "All objects conveying information are irreducible to the terms of physics and chemistry."

Polanyi's article is abstracted as follows: [8]

> "When I say that life transcends physics and chemistry, I mean that biology cannot explain life in our age by the current workings of physical and chemical laws."

Polanyi's 1967 *Chemical & Engineering News* anti-reductionism cover story article "Life Transcending Physics and Chemistry", wherein he uses information theory to argue that quantum mechanics is inadequate to explain life; cover shows an "artist's statement that form and function of a biological system (a flower) cannot be

In the context of the reduction vs anti-reduction debate, he seems to have been an adherent of the unbridgeable gap model.

In his 1968 "Life's Irreducible Structure" (1968), Polanyi argues that the information contained in the DNA molecule is not reducible to the laws of physics and chemistry. Although a DNA molecule cannot exist without physical properties, these properties are constrained by higher level ordering principles. [4]

In his 1970 "Transcendence and Self-transcendence", he criticizes the mechanistic world view that modern science has inherited from Galileo. [5]

Polanyi, similar to many in modern time, advocates the emergence point of view, i.e. the claim that there are several levels of reality, and causality, on the assumption that boundary conditions supply degrees of freedom that instead of being random are determined by higher level realities whose properties are dependent, but distinct, from the lower level from which they emerge.

explained by the laws governing its parts." [8]

To a good approximation, Polanyi seems to be well-classified as an ontic opening theory based philosopher.

Other

British biochemist and Chinese chemistry historian Joseph Needham, supposedly, consulted Polanyi in the writing of his 1942 article "Evolution and Thermodynamics: a Paradox with Social Significance". [2]

American military thermodynamicist John Boyd was influenced by Polanyi's 1969 *Knowing and Being* in the development of his war thermodynamics combat models.

Polymathy

Polanyi is sometimes characterized as a polymath of sorts, owing to his many and scattered interests in a wide variety of fields, including medicine (1913 degree) and six subfields of physical chemistry (1919 PhD), epistemology, economics, patent law, social and political theory (humanities chair), aesthetics, and theology. [3]

Religion

There are seemingly many religiously-minded Polanyi followers who find refuge in his writings to the conclusion that religion and science can be bridged or that the universe contains a god, or something along these lines; although it does not seem to be the case that Polanyi was overt and open about his religious beliefs. [6] Polanyi was Hungarian from a non-observant Jewish family; his mother was called "Aunt of the Hungarian Revolution." He was baptized as a Catholic in 1919, but apparently only as a matter of convenience—he wanted to live and work in Germany, and it was better to have a Christian identity on one's passport rather than Jewish. Later in life, he associated most closely with the Protestant point of view. [3]

Polanyi's writings, although not explicitly religious, have attracted the attention the theologians and apologeticists (Q); Polanyi's literary executor at his death (dereaction) was reformed theologian Thomas Torrance, who argues for some type of Polanyian natural theology, such as addressed in Colin Weightman's *Theology in a Polanyian Universe: the Theology of Thomas Torrance* (1994). (Q)

Quotes | By

The following are quotes by Polanyi:

> "Chemistry, indeed, leads us so far away from physics—or let us say, that physics appears, when we look at chemistry, so far remote from everything else in the world—that the description of chemical substances and the art of dealing with them lies quite near, by comparison, to the types of human behavior and the art of commanding human behavior."
>
> — Michael Polanyi (1936), "The Value of the Inexact" [9]

References

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2. Needham, Joseph. (1942). "Evolution and Thermodynamics: a Paradox with Social Significance" (abs), *Science and Society*, 352-75.
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5. Polanyi, Michael. (1970). "Transcendence and Self-transcendence." *Soundings*, 53 (1): 88–94.
6. Thorson, Walter R. (1981). "The Biblical Insights of Michael Polanyi", *JASA*, 33(Sep): 129-38.
7. Gatlin, Lila L. (1972). *Information Theory and the Living System* (pg. 16). Columbia University Press.
8. Polanyi, Michael. (1967). "Life Transcending Physics and Chemistry" (abs), *Chemical and Engineering*

News, 45(35):54-66.
9. (a) Polanyi, Michael. (1936). “The Value of the Inexact” (pdf), *Philosophy of Science* (pgs. 233-34), Apr 3.
(b) Prosch, Harry. (1986). *Michael Polanyi: a Critical Exposition* (pg. 19). SUNY Press.

Further reading

● Eyring, Henry and Polanyi, Michael. (1931). “Uber Einfache Gasreaktionen” (On Simple Gas Reactions), *Zeitschrift fur Physikalische Chemie B*, 12:279-311.
● Polanyi, Michael. (1932). *Atomic Reactions*. London: Williams, Norgate.
● Polanyi, Michael. (1959). *The Study of Man: Lindsay Memorial Lectures, 1958*. Routledge, 2013.
● Authors. (1961). *The Logic of Personal Knowledge: Essays in to Michael Polanyi on his Seventieth Birthday, 11 March 1961*. Free Press.

External links

● Michael Polanyi – Wikipedia.

θΔics

In hmolscience, **Michael Rowan-Robinson** (1942-) is an English astronomer and astrophysicist noted for his 1999 *The Nine Numbers of the Cosmos*, wherein, in his opening chapter "We Exist", section: "A Team of Atomies", he describes people as bags of chemicals: [1]

> "What are we made of? Bones, flesh, blood, skin? The four humours of the alchemists? A bag of chemicals? The idea that turns out to be really powerful is that we are made of atoms. This was suggested by a group of Ionian philosophers of the sixth century BC, especially Leucippus and Democritus, the greatest of the so-called pre-Socratics."

The "bag of chemicals" description of people (see also: soulless bag of chemicals), employed here by Rowan-Robinson, seems to be stylized or based on Richard Dawkins' 1986 description of how the bombardier beetle is filled with the defense-mechanism chemical hydroquinone $6H_4(OH)_2$ and hydrogen peroxide H_2O_2, which the beetle squirts out in defense in times of distress or danger. [2]

Quotes

The following are related quotes:

> "When wood burns, humours, vapours, and phlogiston have nothing to do with the case. Two atoms of the element oxygen combine with an atom of the element carbon to make a combination of atoms bound together, a molecule of carbon dioxide."
>
> — Michael Rowan-Robinson (1999), *The Nine Numbers of the Cosmos* (pg. 4)

> "The answer to the question 'what are we made of' is: protons and neutrons, the heavy particles, or baryons, and electrons, the light particles, or leptons."
>
> — Michael Rowan-Robinson (1999), *The Nine Numbers of the Cosmos* (pg. 8)

> "Humans are an interesting form of baryonic matter."
>
> — Michael Rowan-Robinson (1999), *The Nine Numbers of the Cosmos* (pg.16)

References

1. Rowan-Robinson, Michael. (1999). *The Nine Numbers of the Cosmos* (pg. 4). Oxford University Press.
2. Dawkins, Richard. (1986). *The Blind Watchmaker* (pgs. 86-87). W.W. Norton & Co.

External links

â— Michael Rowan-Robinson – Wikipedia.

θΔics

In hmolscience, **Michael Ruse** (1940-) (CR:11) is an English-born Canadian-American philosopher and anti-new atheism atheist, who argues the position that it is possible to reconcile Christian faith and evolution theory.

Overview

In 1973, Ruse reviewed Michael Simon's *Matter of Life*, which he deemed as similar to Thomas Goudge's *The Ascent of Life* (1961). [1]

In 2000, Ruse stated the following:

> "Why should a bunch of atoms have thinking ability? Why should I, even as I write now, be able to reflect on what I am doing and why should you, even as you read now, be able to ponder my points, agreeing or disagreeing, with pleasure or pain, deciding to refute me or deciding that I am just not worth the effort? No one, certainly not the Darwinian as such, seems to have any answer to this. The point is that there is not scientific answer."
>
> — Michael Ruse (2000), *Can a Darwinian Be a Christian?* (see: chemistry professor paradox) [4]

In 2004 Ruse was a co-editor with William Dembski of the multi-author work *Debating Design*. [2]

In c. 2007, Ruse, in commentary on Richard Dawkins *The God Delusion*, stated the following:

> "The *God Delusion* makes me embarrassed to be an atheist."
>
> — Michael Ruse (c.2007), *Source*

This was cited by Ravi Zacharias, in *The End of Reason* (2008), in his "Atheists Divided" section, along with anti-new atheism atheist Scott Atran, as examples of atheists embarrassed to be atheists.

Royal Society | Belief polls

In 2015, Ruse, in his *Atheism: What Everyone Needs to Know*, Ruse, chapter "The Matter of Science", opens to the following 2005 poll results of a query of 1,074 members of the Royal Society, of which 253 responded (243 male, 10 female), with the following four questions (results shown): [6]

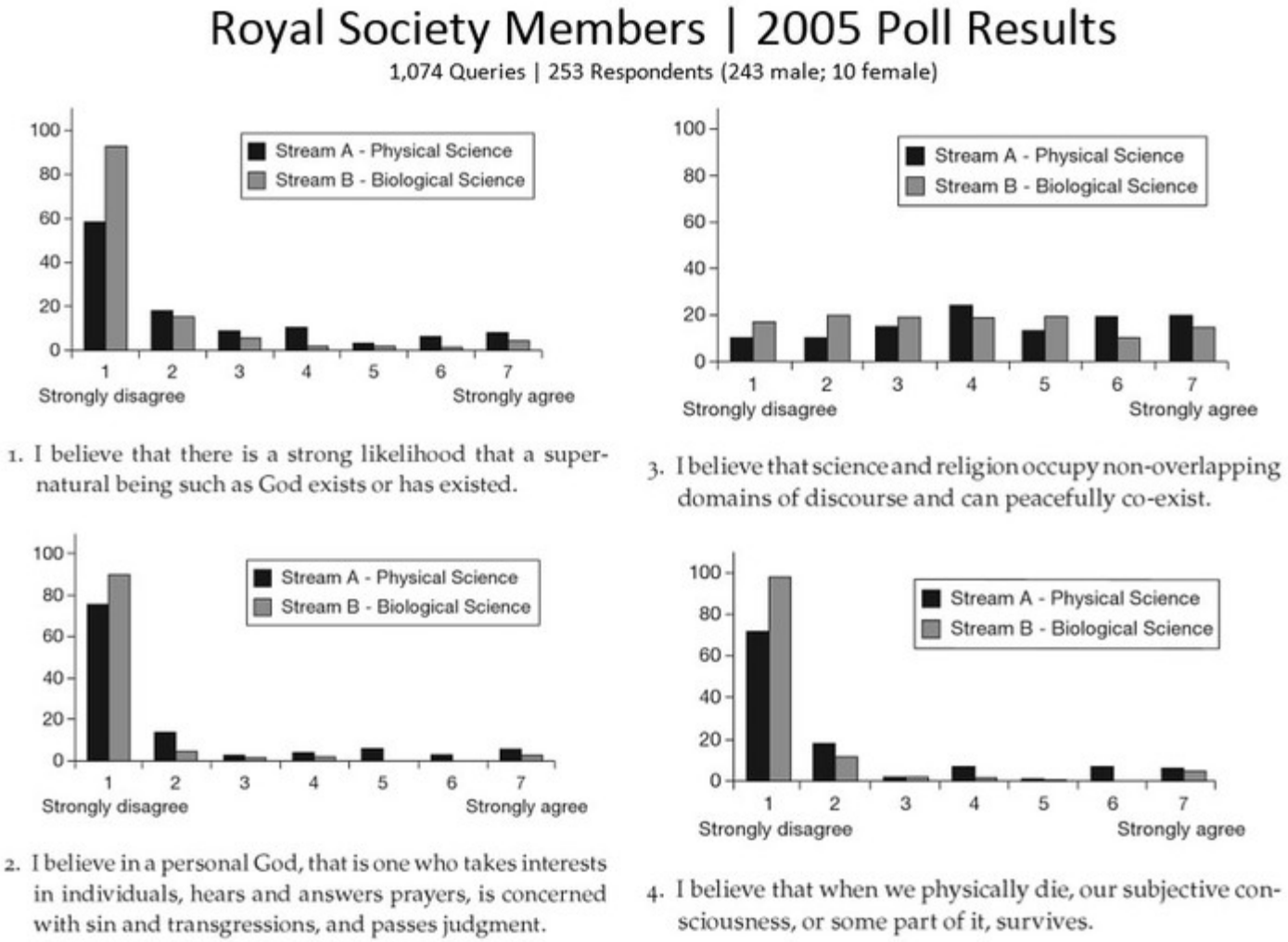

Ruse then compares these results to the 1996 and 1998 studies, conducted by American science historians Edward Larson and Larry Witham, of randomly polled US scientists and a portion of the over 2,000 members of the National Academy of Science (see: belief in the existence of god by scientists). He then mentions the Napoleon Laplace anecdote, wherein Pierre Laplace (1802) dismissed god with a wave of the hand; after which he the he attempts to elaborate on the point that the atheism controversy is not just a matter of the facts, but a matter of "burning moral concern", both about the stand one should take on the issues and the consequences of one's commitment.

Beliefs | Religion

Ruse was raised in a Quaker family. In the 1970s to 2000s, seems to have been an skeptical agnostic-atheist looking for Darwin + Christ reconciliation. In 2015, with the publication of his *Atheism: What Everyone Needs to Know*, amid the wake of the new atheists movement, seems to be coming out as nonbeliever moving into atheism category. [5]

Education

Ruse completed his BA in mathematics and philosophy at the University of Bristol. In 1962, he emigrated to Canada and did graduate work at McMaster University in Ontario. He returned to Bristol to do his doctoral degree in philosophy. He taught at the University of Guelph from 1965 to 2000, and then to avoid compulsory retirement moved south to Florida State University. His academic interests are in the history and philosophy of the biological sciences and he is an expert on the work and influence of Charles Darwin. In recent years, his attention has been turned increasingly towards the relationships between science and religion. He is not a believer, but thinks that the two can exist together harmoniously.

Quotes | Employed

The following are quotes employed by Ruse:

> "If we begin with the individual, we shall be able to understand nothing of what takes place in the group. In a word, there is between psychology and sociology the same **break in continuity** as between biology and the physico-chemical sciences. Consequently, every time that a social phenomenon is directly explained by a psychological phenomenon, we may be sure that the explanation is false."
>
> — Emile Durkheim (1895), *The Rules of Sociological Method* [3]

References

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2. Dembski, William A. and Ruse, Michael. (2004). *Debating Design*. Cambridge University Press.
3. (a) Durkheim, Emile. (1895). *Les Regles de la Methode Sociologique* (pg. #). Publisher.
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(c) Ruse, Michael. (1984). *Sociobiology: Sense or Nonsense* (pg. 192). Springer.
4. (a) Ruse, Michael. (2000). *Can a Darwinian Be a Christian? The Relationship Between Science and Religion* (pg. 73) Cambridge University Press.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 307). Zondervan, 2009.
5. Ruse, Michael. (2015). *Atheism: What Everyone Needs to Know* (abs). Oxford University Press.
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(b) Ruse, Michael. (2015). *Atheism: What Everyone Needs to Know* (abs) (Royal Society polls, pgs. 100-106). Oxford University Press.
7. Zacharias, Ravi. (2008). *The End of Reason: a Response to the New Atheists* (pg. 23). Zondervan.

External links

â— Michael Ruse – Wikipedia.

θΔics

In existographies, **Michael Servetus** (c.1510-1553) (IQ:#|#) (Cattell 1000:642) was a Spanish theologian, physician, cartographer, and humanist, noted for []

Overview

In 1553, Servetus, in his *The Restoration of Christianity*, which rejected (Q) trinity and the concept of predestination.

Aikenhead

In 1693, Thomas Aikenhead, age 17, enrolled at Edinburgh University. By then the University library held books by Rene Descartes, Benedict Spinoza, Thomas Hobbes, Charles Blount, and other so-called atheists. Moreover, while Aikenhead was a student, John Toland's *Christianity Not Mysterious*, and Servetus' *The Restoration of Christianity* (*Christianisimi Restitutio*), which rejected (Q) trinity and the concept of predestination, were added to the university library. It has been conjectured, by many, that he read some if not all of these works. [1]

References

1. (a) Thomas Aikenhead – Dictionary of Unitarian and Universality Biography.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 338-39). HarperOne.

External links

- Michael Servetus – Wikipedia.

θΔics

In existographies, **Michael Shermer** (1954-) (FA:207) is an American Christianity-deconverted psychologist and skepticism-focused, atheism-pro science writer, noted for []

Deconversion

In 1971, Shermer, aged 17, in his senior year of high school, became a Christian evangelist, and spent seven years going door-to-door trying to convert people.

In 1972 to 1978, Shermer, while completing degrees in psychology, as he learned about cultural anthropology and behaviorism, began to become an agnostic-skeptic about religion.

In c.1979, Shermer became a unspoken traumatic atheist, when his college girlfriend Maureen broke her back in a car accident; Shermer reflected (2011) on this as follows: [1]

> "When I saw her at the Long Beach Medical Center ER, the full implications of what this meant for her begin to dawn on me. There, in the ER, day after dreary day, night after sleepless night, I took a knee and bowed my head and asked God to heal Maureen's broken back. I prayed with deepest sincerity. I cried out to god to overlook my doubts in the name of Maureen. I willingly suspended all disbelief. At that time and in that place, I was once again a believer. I believed because I wanted to believe that if there was any justice in the universe — any at all — this sweet, loving, smart, responsible, devoted, caring spirit did not deserve to be in a shattered body. A just and loving god who had the power to heal, would surely heal Maureen. He didn't. He didn't, I now believe, not because "god works in mysterious ways" or "He has a special plan for Maureen" — the nauseatingly banal comforts believers sometimes offer in such trying and ultimately futile times — but because **there is no god**."

In 2005, Shermer, getting past the atheism label avoidance phase, in his essay "Why I Am an Atheist" (Q), came out as an atheist (see: open atheist) as follows:

> "I am an atheist. There, I said it. Are you happy, all you atheists out there who have remonstrated with me for adopting the agnostic moniker? If "atheist" means someone who does not believe in God, then an atheist is what I am. But I detest all such labels. Call me what you like — humanist, secular humanist, agnostic, nonbeliever, nontheist, freethinker, heretic, or even bright. I prefer skeptic. Still, all such labels are just a form of cognitive economy, a shortcut into pigeonholing our fellow primates into tidy categories that supplant the deeper probing of what someone actually thinks and says."

In 2013, Shermer was been ranked as one of the top eight new atheists:

> "After Harris came high pope Dawkins, then cardinal Hitchens, the bishop Dennett, and then the lower and more moderate figures in this new atheist priesthood: Krauss, Stenger, Atkins, **Shermer** [and all the rest] *e bella compagnia*."
>
> — Bo Jinn (2013), *Illogical Atheism* (loc. 286)

(add)

Skeptics Magazine

In 1992, Shermer founded the Skeptics Society, which began as a hobby in his garage, but eventually grew into a full-time occupation. The Skeptics Society publishes the magazine *Skeptic*, and organizes the Caltech Lecture Series. As of

2008, it has over 55,000 members.

Other

In 2008, Shermer was featured in Ben Stein's *Expelled: No Intelligence Allowed*.

Education

Shermer completed his BA in psychology in at Pepperdine University, his MA in psychology in 1978 from California State University, and his PhD in 1991 at Claremont Graduate University in 1991 with a dissertation on "Darwin's Shadow: the Life and Science of Alfred Wallace – a Biographical Study on the Psychology of History", and in 2011 became an adjunct professor at Chapman University, where he teaches a yearly critical thinking course called "Skepticism 101".

Quotes | On

The following are quotes on Shermer:

> "**Michael**, you are a materialist, so what is the chemical composition of justice?"
>
> — Frank Turek (2018), "Naturalism Can't Justify Reason" (Q|1:08-), Feb 14

Quotes | By

The following are quotes by Shermer:

> "The principle barrier to a general acceptance of the monist position is that it is counterintuitive."
>
> — Michael Shermer (2016), *Skeptic: Viewing the World With a Rational Eye* [2]

References

1. (a) Shermer, Michael. (2011). *The Believing Brain* (§3: A Skeptic's Journey"). Publisher.
(b) Shermer, Michael. (2015). "Michael Shermer Interview" (Q), TheBestSchools.org.
2. Shermer, Michael. (2016). *Skeptic: Viewing the World With a Rational Eye* (pg. 260). (Q). MacMillan.

Further reading

● Shermer, Michael. (1997). *Why People Believe Weird Things*. Publisher.
● Shermer, Michael. (2004). The Science of Good and Evil*: Why People Cheat, Gossip, Care, Share, and Follow the Golden Rule*. Publisher.
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External links

● Michael Shermer – Wikipedia.

θΔics

In hmolscience, **Michael A. Simon** (1936-) is an American biochemist, philosopher, and lawyer noted for his 1971 *The Matter of Life*, wherein he scaffolds on infamous Michael Polanyi (1968) anti-reductionism platform, i.e. life is irreducible to physics and chemistry, to argue that life is "over-and-above" the laws and operations of matter, chemistry, and physics.

Overview

In the late 1960s, following degrees in chemistry (1958), biochemistry (1960), and philosophy (1967), Simon began to ruminate on what it means "to be alive" and or what sort of science was the domain of this subject matter, if there was such a subject matter; the gist of which he explains as follows: [1]

> "At the time I began this work, my interest was in trying to discover what, if anything, is distinctive about biological science, its concepts, and its mode of explaining. I wanted to know what it is for something to be an organism, to be alive, and what sort of science could provide an intellectually satisfying answer to that question. The path of exploration has taken me to consider the broader questions of the relations among the sciences in general, and of the relation between a science and that which it purports to elucidate. What has emerged, I believe, has bearing not only on the question of the nature of science, but also on the question of the relation of science to man. Biology differs from physical science because its objects are different. A man is different from a stone, and the fact that biology can deal with the former but not the latter tells us something both about man and about biology."

(add discussion)

In 1971, Simon, published *The Matter of Life: Philosophical Problems of Biology*, the product of this philosophical inquiry, wherein he ventured into the problem of the comparison of biology to chemistry and physics and the question of whether the former must be reducible to the latter two in order to be a science rather than just a "contrivance" as he says it is presently. Simon's *Matter of Life*, is said (Q) to be similar to Lawrence Henderson's *The Fitness of the Environment* (1913), Erwin Schrodinger's *What is Life?* (1944), and, according to Michael Ruse, to Thomas Goudge's *The Ascent of Life* (1961). [2] The following is a statement of Simon's philosophical stance:

> "The controversy over reduction in biology, which can be seen as an up-to-date version of the traditional mechanism-vitalism dispute, is essentially over whether an organism is 'nothing but' an arrangement of chemical substances organized and interacting to the same principles as apply to inanimate matter, or whether it is in some sense an entity 'over and above' the aggregates of matter of which it is composed. A reductionist is one who maintains, and a antireductionist is one who denies, that physics and chemistry can ultimately explain all of biology."

Simon, in short, is a self-defined over-and-abovist who, see below, claims atheist. Simon, to note footnote the previous quotes, to a see also list of the discussion of the question of biology's reducibility to physical science, namely: Schaffner, Scriven, Nicolas Rashevsky, Shapere, Hull, Roll-Hansen, Michael Polanyi, and Causey.

In 2015, Simon stated, on the question of whether or not he could be best classified as an "anti-reductionist", stated that he was not a vitalist nor a reductionist, but an "over-and-above-ist", or something along these lines. [4]

Religion

In 1971, Simon, in his *Matter of Life*, stated the following rather agnostic sounding argument: [6]

> "Even if biological organisms are ultimately to be understood as the products of divine creation, this would not detract from the adequacy of an account of how these products work, any more than a biblical account of the creation of the universe detracts from the adequacy of a Newtonian account of the operation of the solar system."

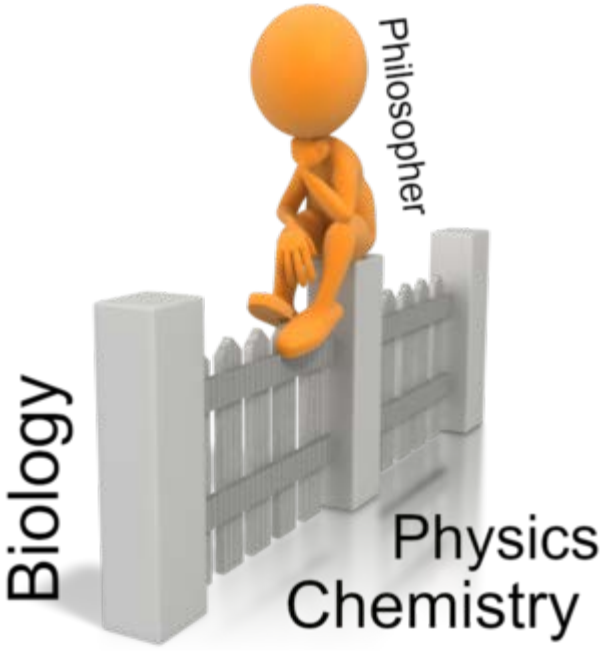

A depiction of **Simon** in the late 1960s ruminating on the question of what it means to "be alive" and whether there is a science of this subject matter, in the way chemistry and physics are universal sciences

In 2015, when queries about religious belief, as to whether he was closer to a theist or an atheist, he stated that he was closer to an atheist, or an "atheologist", as he liked to refer to himself, mentioning how at one point he taught a philosophy course on this subject, commented how noted that the former term has a negative or tarnished connotation in public. [4]

Education

Simon completed his AB in 1958 in chemistry at Amherst College, his AM in 1960 in biochemistry and PhD in 1967 in philosophy, both at Harvard University, and JD in 1979 in law at Cardozo School of Law, and in 1971 he was on the philosophy department at the University of Connecticut. [3]

Quotes

The following are representative quotes:

> "Living systems, the subject matter of biology, represents aggregates of matter for which an elaborate science has been contrived, albeit one that lacks both the scope and formal impressiveness of the physical sciences."
>
> — Michael Simon (1971), *The Matter of Life* (pg. ix)

> "Only physics and chemistry are presumed to provide laws that apply everywhere in space and time. There will be no law-like principles of biochemistry and biophysics that are not themselves principles of chemistry and physics proper."
>
> — Michael Simon (1971), summary of 1963-68 views of John Smart (Q) [5]

See also

- Defunct theory of life
- Life does not exist
- Life terminology upgrades

References

1. (a) Polanyi, Michael. (1968). "Life's Irreducible Structure." *Science*, 160(3834): 1308–1312.
(b) Simon, Michael A. (1971). *The Matter of Life: Philosophical Problems of Biology* ("to be alive", pg. x). Yale University Press.
2. Ruse, Michael. (1973). "Review: *The Matter of Life: Philosophical Problems of Biology*" (abs), *Dialogue*, 12(1):157-58.
3. Michael A. Simon (curriculum vitae) – StonyBrook.edu.
4. Simon, Michael A. (2015). "Phone conversation with Libb Thims", Apr 30.
5. (a) Smart, John J.C. (1968). *Between Science and Philosophy* (pgs. 92-96). Random House.
(b) Simon, Michael A. (1971). *The Matter of Life: Philosophical Problems of Biology* (Smart, pgs. 9-10). Yale University Press.
6. Simon, Michael A. (1971). *The Matter of Life: Philosophical Problems of Biology* (divine creation, pg. 34). Yale University Press.

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External links

● Michael A. Simon (faculty) – Stony Brook University.
● Simon, Michael A. (1936-) – WorldCat Identities.

θΔics

In science, **Michal Kurzynski** (1946-) is a Polish physicist noted for []

Overview

In 2006, Kurzynski, in his *The Thermodynamic Machinery of Life*, attempted to outline thermodynamics of the biophysical processes occurring at the subcellular level, going beyond the earlier models of Erwin Schrodinger (*What is Life?*, 1944), John Neumann (automaton theory, 1948), and Ilya Prigogine (far-from-equilibrium dissipative structure theory).

Kurzynski defines biophysics as the "physics of animate matter" (see: defunct theory of life) framed around what he calls the principle of mechanical determinism, which he defines as:

> "The law of motion and the state of the physical system at a given moment of time unambiguously and uniquely determine the state of the system at all other moments of time both in the future and in the past."

Some of the topics presented in *The Thermodynamic Machinery of Life*, were touched on more briefly in his 2003 book *Introduction to Molecular Biophysics*, co-written with Jack Tuszynski. [2]

Education

Kurzynski completed his PhD in solid state physics in 1973 at the University of Polzna, Poland and in 1981 became a physics professor there. He has worked with Hermann Haken in Stuttgart and with Manfred Eigen in Gottingen, Germany. His main research interests have been in the theory of phase transitions in solids, the statistical physics of far from equilibrium, and recently the statistical theory of biological processes.

References

1. Kurzynski, Michal. (2006). *The Thermodynamic Machinery of Life*. New York: Springer.
2. Tuszynski, Jack A. and Kurzynski, Michal. (2003). *Introduction to Molecular Biophysics*. CRC Press.

Further reading

â— Thims, Libb. (2007). *Human Chemistry (Volume Two)* (Kurzynski, pg. 667). Morrisville, NC: LuLu.

External links

â— Michal Kurzynski (about) – Adam Mickiewicz University.

θΔics

In existographies, **Michel Foucault** (1926-1984) (HuCR:1) (CR:7), pronounced "Michelle Foo-ko" (Q), was a French philosopher, historian, sociologist, and literary critic, noted for []

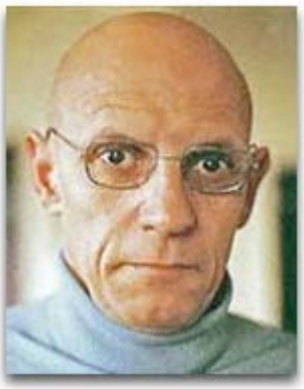

Overview

In 1966, Foucault, in his *The Order of Things*, cites the work of Jean Robinet. [1]

Other

In the 1960s, Foucault taught with Michel Serres at the Universities of Clermont-Ferrand and Vincennes. [2] Foucault was associate (Q) of Gilles Deleuze.

Influenced

Foucault influenced Michel Onfay, specifically his 2005 *Atheist Manifesto: the Case Against Christianity, Judaism, and Islam*, wherein he cites Foucault, along with: Epicurus, Nietzsche, Georges Bataille, Jean Meslier, Baron d'Holbach, Jeremy Bentham and Freud. (Q)

Quotes

The following are quotes by Foucault:

> "I'm very proud that some people think that I'm a danger for the intellectual health of students. When people start thinking of health in intellectual activities, I think there is something wrong. In their opinion I am a dangerous man, since I am a crypto-Marxist, an irrationalist, a nihilist."
>
> — Michel Foucault (1982), "Truth, Power, Self: An Interview with Michel Foucault" (Q), Oct 25

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1. Foucault, Michel. (1966). *The Order of Things: an Archaeology of the Human Sciences* (*Les Mots et les Choses*). Routledge, 2005.
2. Lechte, John. (1994). *Fifty Key Contemporary Thinkers: from Structuralism to Postmodernity* (Michael Serres, pgs. 82-85). Routledge.

Videos

- Anon. (2015). "Philosophy: Michel Foucault" (Q), The School of Life, Jul 3.

External links

- Michel Foucault – Wikipedia.

θΔics

In existographies, **Michel de Montaigne** (1533-1592) (IQ:180|#136) (Cattell 1000:171) [RGM:222|1,500+] (Gottlieb 1000:432) (HD:2) (FA:29) (GPhE:#) (CR:73) was a French philosopher, atomic theory based realism writer, statesman, and magistrate (judge) noted for his three-volume 1580 *Essays*, among other works, wherein he attempt to explore thoughts of the day on existence and learning, much of which themed the 55BC *On the Nature of Things*, particularly those views of Epicurus, cautioned with the more conserved views of Lucretius, followed by those of Cicero, thirdly; many of the essays centered around Montaigne's two favorite topics: sex and death. [1]

Overview

Montaigne came from a Spanish-Jewish family (see: Jewish atheism), that had forcibly converted to Catholicism, and had to flee France to escape the Spanish Inquisition. His brother and sister, eventually, converted to Protestantism. In the wars between the French Catholics and the Protestant Huguenots, Montaigne attempted to act as a peacemaker. At one point, he was jailed briefly by the Protestant, at another by the Catholics. Montaigne urged King Henry IV to issue the Edict of Nantes, which gave each sect the right to worship. Scholars have tended to classify Montaigne somewhere between a skeptical believer and a secret atheist. [5]

Montaigne (HD:2), of note, is the first person cited in James Haught's "Part Two: the Renaissance", preceded by Omar Khayyam (1048-1131) (HD:1), a dark age gap of about of 461-years, his *2000 Years of Disbelief* (1996)

Sebond | Apology for

In 1569, Montaigne published his translated Raymond Sebond's *Book of Natural Creation: Natural Theology* (1436) from Latin into French; the gist of which Montaigne abstracted as follows: [6]

> "Sebond's drift is bold, and his scope adventurous, for he undertaketh by humane and natural reasons, to establish and verify all the articles of Christian religion against atheists."

The reason, supposedly, for doing this translation is as follows: (Ñº)

> "One of the primary motivations for writing this treatise was the Protestant Reformation. Montaigne believed that the movement inspired by Martin Luther would cause widespread atheism because the vulgar multitude does not have the capacity to independently judge things. Montaigne believes that if some religious beliefs are proven to be mistaken, then the multitude will renounce all their previously held religious beliefs without consideration."

In 1580, Montaigne, in his "Apology for Raymond Sebond", a follow-up to the above, gave the following short history of soul theory:

> "Crates and Dicaearchus were of opinion that there was **no soul at all**, but that the body thus stirs by a natural motion; Plato, that it was a substance moving of itself; Thales, a nature without repose; Asclepiades, an exercising of the senses; Hesiod and Anaximander, a thing composed of earth and water; Parmenides, of earth and fire; Empedocles, of blood, e.g. "He vomits up his bloody **soul**" (Sanguineam vomit ille **animam**). Posidonius, Cleanthes, and Galen that it was heat or a hot complexion: "their vigor of fire and of heavenly race" (Ignens est ollis vigor, et coelestis origo). Hippocrates, a spirit diffused all over the body; Varro, that it was an air received at the mouth, heated in the lungs, moistened in the heart, and diffused throughout the whole body; **Zeno, the quintessence of the four elements** ["I know not," says Mr. Coste, "where Montaigne had this; for Cicero expressly says that this quintessence, or fifth nature is a thought of Aristotle, who makes the soul to be composed of it; and that **Zeno thought the soul to be fire**." (Cicero,

Tusc. Quaes, i.9). After this, Cicero adds, "that Aristotle calls the mind, which he derives from that fifth nature entelechia [entelechy], a new-coined word, **signifying a perpetual motion**." Though Montaigne has copied these last words, in what he proceeds to tell us of Aristotle, he censures him for not having spoken of the origin and nature of the soul. But had he only cast his eye upon what Cicero had said a little before, he would have been convinced that Aristotle had taken care to explain himself concerning the origin of the soul, before he remarked the effect of it If he has not thereby fully demonstrated what the nature of it is, Zeno has not given us much better light into it when he says, **"the soul or mind seems to be fire"**; and it would not be difficult to show that in this article the other philosophers have not succeeded better than Zeno and Aristotle] ; Heraclides Ponticus, that it was the light; Zenocrates and the Egyptians, a mobile number; the Chaldeans, a virtue without any determinate form: "A certain vital habit in man's frame, which harmony the Grecian sages name" (Habitum quemdam vitalem corporis ease, Harmonium Grseci quam dicunt.) Let us not forget Aristotle, who held the soul to be that which naturally causes the body to move, which he calls entelechia [entelechy], with as cold an invention as any of the rest; for he neither speaks of the essence, nor of the original, nor of the nature of the soul, but only takes notice of the effect. Lactantius, Seneca, and most of the dogmatists, have confessed that it was a thing they did not understand. Heraclitus, who was of opinion that every being was full of souls and demons, did nevertheless maintain that no one could advance so far towards the knowledge of the soul as ever to arrive at it; so profound was the essence of it."

The following are other noted quotes from this essay:

> "What good can we suppose it did Varro and Aristotle to know so many things?"
>
> — Michel Montaigne (1580), "An Apology for Raymond Sebond" [10]

(add)

Atheism | Skepticism

Montaigne was a big fan of Lucretius; example quote of which is as follows:

> "Since the movements of the atoms are so varied, it is not unbelievable that the atoms once came together in this way or that way, or that in the future they will come together like this again, giving birth to another **Montaigne**."
>
> — Michel Montaigne (c.1564), "Personal Note", hand written note in person copy of Lucretius' *De rerum natura* [2]

Many have asserted, per his use of Lucretius, that he was an atheist; example view of which is as follows:

> "Diagoras and Theodorus flatly deny that there were ever gods at all."
>
> — Michel Montaigne (c.1580) [5]

> "Socrates thought and so do I that the wisest theory about the gods is no theory at all."
>
> — Michel Montaigne (c.1580), Ranker best Montaigne quote (#64|148+)

> “How many things do we name miraculous and against nature? Each man and every nation doth it according to the measure of his ignorance.”
>
> — Michel Montaigne (c.1580), *Essays* [5]

> “Nothing is so firmly believes as that which we least know.”
>
> — Michel Montaigne (1580), *Essays* [5]

> “It is setting a high value upon or opinions to roast men and women alive on account of them.”
>
> — Michel Montaigne (1580), *Essays* [5]

> “Man is completely crazy: he does not know who to fabricate a worm, but he fabricates gods by the dozen, and not only does he fabricate them by the dozen but, he fabricates them by the thousands and indicates exactly how far their power extends.”
>
> — Michel Montaigne (c.1570), *Essays* (2:12); cited by Jean Meslier (1529) in *Testament* (pg. 57)

> “Man is certainly stark mad: he cannot make a worm, yet he will make gods by the dozen.”
>
> — Michel Montaigne (c.1570) (Ñº)

> “How many things served us but yesterday as articles of faith, which today we deem but fables?”
>
> — Michel Montaigne (c.1580), Ranker best Montaigne quote (#60|148+) ↑↑

Montaigne's commentary on the second objection against Raymond Sebond’s circa 1425 *Natural Theology: the Book of Creatures* (Ñº), also raised objection that was an atheist or skeptic, who hid is true beliefs for his own protection or for the sake of social stability.

Meslier

French thinker Jean Meslier, in his *Testament* (1729), supposedly, quotes from Montaigne more than any other source, from amid his supposed 50-book library. (Ñº)

Belief | Evidence

In 1576, Montaigne ordered a medallion to be struck with the words *Que sais-je?* or “what do I know?” inscribed on it, which he wore around for the rest of his existence to remind himself that nothing should be believed without evidence. [4]

> “Receive things thankfully, in the aspect and taste they are offered to thee, form day to day; the rest is beyond thy knowledge.”

A depiction of the 1576 "evidence" medallion (Ñº), that **Montaigne** had made, which wore around his neck, to remind him to avoid presumption, "our natural and original malady", and to hold back judgment on matters of opinion, until evidence is forthcoming.

— Michel Montaigne (c.1580), words inscribed on his ceiling; cited by Jennifer Hecht (2003) in *Doubt* (pg. 302)

(add)

Religion | General

Montaigne, in his copy of *On the Nature of Things*, marked the many passages in the poem that seemed to him 'against religion', namely against religio-teachings such as creation ex nihilo, divine province, judgment after death. "Fear of death is the cause of all our vices", is one margin note. In a number of places, he kept making reading note comments about how the soul is corporeal (see: soul theorist), as the book was arguing: [1]

> "The soul is bodily" (296)
> "The soul and the body have and extreme conjunction" (302)
> "The soul is mortal" (306)
> "The soul, like the foot, is part of the body" (310)
> "The body and the soul are inseparably joined" (311)

These reading notes, made by Montaigne, are said to suggest a fascination with the most radical conclusions to be drawn from Lucretian materialism.

Religion | Birthplace

Montaigne is noted for pioneering the religion is the result of one's birthplace ideology; two statements of this are as follows:

> "We have religion because we happen to be born in a country where it was in practice; we regard its antiquity or the authority of men who have maintained it, and we fear the threats it fastens on unbelievers."
>
> — Michel Montaigne (c.1576) [8]

> "Everyone's true worship was that which he found in use in the place where he chanced it to be."
>
> — Michel Montaigne (1580), *Essays*; similar to Richard Dawkins' 2004 *The God Delusion* statement turned verbally elaborated on 2006 "What If Your Wrong" response

Richard Dawkins, in his *The God Delusion* (2004), and audience Q&A (2006), has used a variant of this answer. [9]

Education

See main: Parentally-created geniuses

Montaigne was raised, from birth, via a very elaborate meticulously-arranged education process, similar it seems to Hypatia and John Mill.

Influence

Two immediate fans of Montaigne were: Marie de Gournay, described as his "adopted daughter", who in 1580, at age 15, began reading Montaigne, and latter traveled to Paris to meet him, and Pierre Charron, described as his "adopted son", who in 1601 published *Of Wisdom*, later described as a "seminary of atheism" for centuries. [7]

Quotes | On

The following are noted quotes on Montaigne:

> "**Montaigne** was the first Frenchman who dared to think."
>
> — Julien la Mettrie (1751), "Anti-Seneca" (pg. 129)

> "The *Essays* of **Montaigne** were published in 1588, and form an epoch, not only in the literature, but also in the civilization, of France. What Rabelais was to the supporters of theology, that was Montaigne to the theology itself. The writings of Rabelais were only directed against the clergy; but the writings of Montaigne were directed against the system of which the clergy were the offspring. Under the guise of a mere man of the world, expressing natural thoughts in common language, Montaigne concealed a spirit of lofty and audacious inquiry. Although he lacked that comprehensiveness which is the highest form of genius, he possessed other qualities essential to a great mind"
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 373-74)

> "I have something of **Montaigne**'s wantonness in my spirit, who knows, perhaps also in my body?"
>
> — Friedrich Nietzsche (1888), *Ecce Homo* (pg. 27)

> "**Michel Montaigne** is one of the most entertaining doubters of all time. His *The Defense of Reymond Seybond* (1957) is one of the greatest works in the history of doubt."
>
> — Jennifer Hecht (2004), *Doubt: a History* [7]

Quotes | By

The following are noted quotes by Montaigne:

> "All knowledge comes to us through our senses. They are our masters. Learning begins and ends in them. The senses are the beginning and end of human knowledge. You will find that the

notion of truth comes to us first through the senses, and they cannot be refuted. Whoever can force me to contradict my senses holds me by the throat and cannot make me recoil an inch."

— Michel Montaigne (1529), *Essays* (2:12); cited by Jean Meslier (1729) in *The Testament* (pg. 550)

A first-edition copy (Ñº) of **Montaigne**'s *Essays* (1580).

"Power, truth, justice: they are words that denote something great, but that something we are quite unable to see and conceive."

— Michel Montaigne (1580), *Essays* [3]

"Let nature have her way; she understands her business better than we do."

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#73|148+) ↑↑↑↑↑

"It is good to rub and polish our brain against that of others."

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#25|148+) ↑↑↑↑

"The most profound joy has more of gravity than of gaiety in it."

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#77|148+) ↑↑↑

"I prefer the company of peasants because they have not been educated sufficiently to reason incorrectly."

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#19|148+) ↑↑

"The soul which has no fixed purpose in life is lost; to be everywhere, is to be nowhere."

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#24|148+) ↑↑

"I tell the truth, not as much as I would like to, but as much as I dare. I dare more and more as I grow older."

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#33|148+) ↑↑

“The great and glorious masterpiece of man is how to live with purpose.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#35|148+) ↑↑

“We need very strong ears to hear ourselves judged frankly, and because there are few who can endure frank criticism without being stung by it, those who venture to criticize us perform a remarkable act of friendship, for to undertake to wound or offend a man for his own good is to have a healthy love for him.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#48|148+) ↑↑

“We are born to inquire into truth; it belongs to a greater to possess it.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#66|148+) ↑↑

“My reason is not framed to bend or stoop: my knees are.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#20|148+) ↑

“In the education of children there is nothing like alluring the interest and affection, otherwise you only make so many asses laden with books.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#21|148+) ↑

“I quote others in order to better express myself.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#40|148+)

“There is no passion so contagious as that of fear.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#43|148+)

“When I am attacked by gloomy thoughts, nothing helps me so much as running to my books; they quickly absorb me and banish the clouds from my mind.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#51|148+); this, neurochemically, is called dopamine raising

“Marriage is like a cage; one sees the birds outside desperate to get in, and those inside desperate to get out.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#71|148+)

“He who establishes his argument by noise and command shows that his reason is weak.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#72|148+)

“I know what I am fleeing from, but not what I am in search of.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#1|148+)

“I see men ordinarily more eager to discover a reason for things than to find out whether the things are so.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#2|148+)

“The greatest thing in the world is to know how to be self-sufficient.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#8|148+)

“If you don't know how to die, don't worry; nature will tell you what to do on the spot, fully and adequately. She will do this job perfectly for you; don't bother your head about it.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#15|148+)

“In my opinion, the most fruitful and natural play of the mind is in conversation. I find it sweeter than any other action in life; and if I were forced to choose, I think I would rather lose my sight than my hearing and voice. The study of books is a drowsy and feeble exercise which does not warm you up.”

— Michel Montaigne (c.1580), Ranker best Montaigne quote (#99|148+)

“On beauty, the Indies paint it as black and dusky, with large swollen lips and a wide flat nose. In Peru, the biggest ears are the fairest. In the Basque country, the women are more beautiful when they shave their heads and other places.”

— Michel Montaigne (c.1580), *Essays* (see: evolutionary psychology); cited by Jennifer Hecht (2003) in *Doubt* (pg. 299)

“On sexual desire, I would see my soul regain another kind of sight, another state, and another judgment. This would disappear fast once the desire was sated.”

— Michel Montaigne (c.1580), *Essays*; cited by Jennifer Hecht (2003) in *Doubt* (pg. 300)

“Time is a mobile thing, which never appears as in a shadow together with matter, which is ever running and flowing, without ever remaining stable or permanent.”

— Michel Montaigne (c.1580), *Essays*; cited by Jennifer Hecht (2003) in *Doubt* (pg. 300)

“Religion is that which binds society together.”

— Michel Montaigne (c.1580), *Essays* (truncated quote); cited by Jennifer Hecht (2003) in *Doubt* (pg. 302)

“The properties that we call occult in many things, as that of the magnet to attract the iron—is it not likely that there are sensory faculties in nature suitable to judge them and perceive them, and that the lack of such

faculties causes our ignorance of the true essence of things."

— Michel Montaigne (c.1580), *Essays* (truncated quote); cited by Jennifer Hecht (2003) in *Doubt* (pg. 304)

"He who obeys laws because he believes them to be just, does not obey them justly according to their true worth."

— Michel Montaigne (1592), "On Experience"; cited by Julien la Mettrie (1751) in "Anti-Seneca" (pg. 129)

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(b) Greenblatt, Stephen. (2011). *The Swerve: How the Renaissance Began* (pgs. 248-49). Random House.
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6. (a) Sebond, Raymond. (1436). *Book of Natural Creation: Natural Theology* (*Liber Naturae sive Creaturarum: Theologia Naturalis*). Publisher.
(b) Raymond of Sabunde – Wikipedia.
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7. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (quote, pg. 264 + 296; influence, pg. 304-07). HarperOne.
8. (a) Montaigne, Michel. (c.1576). "Essay", in: *The Complete Essays of Michel Montaigne* (translator Donald M. Frame) (born in a country, pgs. 324-25). Stanford University Press, 1958.
(b) Montaigne, Michel. (1592). *The Complete Works* (translator: Donald Frame) (born in a country, pg. 394). Everyman's Library, 2003.
(c) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (quote, pg. 264 + 296). HarperOne.
9. (a) Dawkins, Richard. (2004). *The God Delusion* (born, pg. 25). Houghton Mifflin Harcout.
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10. (a) Montaigne, Michel. (1580). "An Apology for Raymond Sebond"; in: *The Complete Works* (translator: Donald Frame) (Varro and Aristotle, pg. 435). Everyman's Library, 2003.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (Varro and Aristotle, pg. 298). HarperOne.
11. (a) Montaigne, Michel. (1580). "Apology for Raymond Sebond", *Works of Raymond Sebond, Volume Two* (translator: Orlando Wright) (§:12:117-344; quote, pg. 260-62). W. Vaezie, 1862.
(b) Montaigne, Michel. (1580). "An Apology for Raymond Sebond"; in: *The Complete Works* (translator: Donald Frame) (Varro and Aristotle, pg. 435). Everyman's Library, 2003.

Further reading

â— Montaigne, Michel. (1592). *The Complete Works* (translator: Donald Frame) (atheism, 6+ pgs). Everyman's Library, 2003.

External links

â— Michel de Montaigne – Wikipedia.

θΔics

In existographies, **Michel Onfray** (1959-) (FA:204) (CR:7) is French atheist philosopher, noted for []

Overview

In 2005, Onfray published his *Atheist Manifesto: the Case Against Christianity, Judaism, and Islam*, which has sold over 200,000 copies (Q); he sometimes is cited as one of the big three modern atheists, behind Dawkins and Hitchens; backs his work by: Epicurus, Nietzsche, Georges Bataille, Jean Meslier, Baron d'Holbach, Michel Foucault, Jeremy Bentham and Freud. (Q)

Influenced | By

Onfray has been mainly influenced by: Friedrich Nietzsche, Epicurus, cynicism, cyrenaics, and French materialism.

Quotes | By

The following are quotes by Onfray:

> "I am a sworn atheist and therefore from my point of view the Talmud or the Koran don't constitute works of political philosophy but rather writings that stand in utter contradiction to concepts like logic, freedom, feminism, secularism, brotherhood - which are my ideals."
>
> — Michel Onfray (c.2005) (Q)

> "Meslier's war cry [*Testament*, 1729], never before heard in the history of western thought, offers one of the first true atheist moments, if not the first. Prior to him, they call the *agnostic* an atheist who, as Protagoras, concludes that when it comes to god one can conclude nothing; the *pantheist* who, such as Spinoza, affirms its existence consubstantial with nature; the *polytheist*, like Epicurus, who teaches its multiplicity; the *deist*, in the way of Voltaire, for whom god creates the world en bloc, but does not care about the details; or whoever's idol does not correspond to the strict criteria established by the church. Now, the *atheist* clearly says that 'god does not exist'. This is what Meslier clearly writes: 'there is no god' (chapters 59, 74, 93, 94)—that is clear and distinct, blunt, and straightforward."
>
> — Michel Onfray (2009), "The War Song of an Atheist Priest" (pg. 19) [2]

> "What is **Meslier**'s philosophy? He invented modern materialism. Without friends, without sophisticated conversations, without libraries, salons, or correspondence with the intellectual bigwigs of his time, without spiritual emulation, but by nature, alone and solitary, cloistered deep in his country., Meslier formulates the French materialism that la Mettrie and Helvetius, d'Holbach and Diderot will pillage later. Meslier doesn't enter on the details of materialistic physics. He doesn't cite Epicurus. Lucretius isn't in his library, Diogenes Laertius neither."
>
> — Michel Onfray (2009), "Preface: The War Song of an Atheist" (pg. 20)

References

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2. Onfray, Michael. (2009). "The War Song of an Atheist Priest", in: *Testament: Memoir of the Thoughts and Sentiments of Jean Meslier* (translator: Michael Shreve) (Preface, pgs. 17-24; quote, pg. 19). Prometheus Books.

Further reading

● Onfray, Michael. (2005). *Atheist Manifesto: the Case Against Christianity, Judaism, and Islam* (*Traite d'Atheologie*) (translator: Jeremy Leggatt) (O). Arcade Publishing, 2007.
Meslier, Jean. (1729). *Testament: Memoir of the Thoughts and Sentiments of Jean Meslier* (translator: Michael Shreve; forward: Michel Onfray). Prometheus Books, 2009.

External links

● Michel Onfray – Wikipedia.
● Atheist Manifesto – Wikipedia.
-

θΔics

In existographies, **Michel Serres** (1930-) (CR:8) is a French philosopher noted, in philosophical thermodynamics, for his 1980s works said to be "renowned for its philosophical excursions concerning thermodynamics", most of which, however, being information theory based.

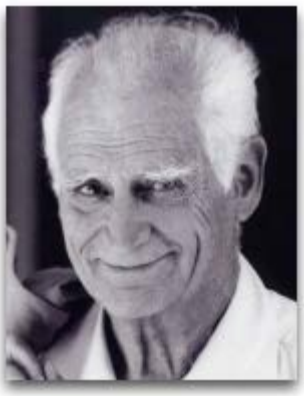

Overview

In 1980, Serres, in his *The Parasite*, one of his best-known books (aside from *Hermes*), supposedly, used thermodynamics and information theory in the form of fable to explore how human relations are identical to that of the parasite to the host body; although, to note, this may be a secondary interpretation, by either Bruce Clarke or William Paulson, as the book does not seem to use the word thermodynamics. [1]

In 1982, Serres, in his *Hermes*, discussed the second law in terms of Sigmund Freud and Henri Bergson, the gist of which, however, amounts to ramblings of information theory based extrapolations, which he incorrectly believes is the "daughter of thermodynamics". (Ñº)

Serres philosophical thermodynamic theories has been discussed and critiqued by those including: William Paulson, Bruce Clarke, Mazyar Lotfalian, and Ira Livingston.

His 1982 work is described, by Lotfalian, as an extensive work on the history of science and the significance of thermodynamics as it affects the concept of time and its directionality, asserting that time is no longer independent and reversible: it moves towards death. [2]

Brillouin

Serres, as discussed in his 1995 book *Conversations on Science, Culture, and Time*, coauthored with Bruno Latour, commented, in interview, that at the Ecole Normale one of his friends lent him a copy of the newly published 1959 *Science and Information Theory* by Leon Brillouin. On reading this book, Serres comments "from it I understood that Brillouin was a veritable philosopher of physics—an authentic physics and a philosophy at the same time, somewhat like thermodynamics, from which, in fact, it sprang." [3]

Education

Serres completed his undergraduate work at the Ecole Normale Superieure in 1955 in philosophy and his PhD in 1968 with a thesis on Gottfried Leibniz's philosophy. Serres, in the 1960s, taught with Michel Foucault at the Universities of Clermont-Ferrand and Vincennes and was later appointed to the chair of the history of science at Sorbonne, where he also taught. [4]

References

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2. Lotfalian, Mazyar. (2004). *Islam, Technoscientific Identities, and the Culture of Curiosity* (Serres, pg. 46, etc.). University Press of America.
3. Serres, Michel and Latour, Bruno. (1995). *Conversations on Science, Culture, and Time* (pg. 12). University of Michigan Press.
4. Lechte, John. (1994). *Fifty Key Contemporary Thinkers: from Structuralism to Postmodernity* (Michael Serres, pgs. 82-85). Routledge.

External links

â— Michel Serres – Wikipedia.

θΔics

In existographies, **Michelangelo** (1475-1564) (IQ:180|#116) [RGM:11|1,250+] (Cattell 1000:28) was an Italian sculpture, artist, architect, and poet noted for []

Adam | Creation

See also: God vs Gibbs

In 1510, Michelangelo, on the ceiling of the Sistine Chapel, Vatican City, Rome, painted "The Creation of Adam", the most-famous visual depiction of Biblical creation narrative, as told in Genesis, wherein god 'breathes life' into Adam (see: clay creation myth), the first man.

Other

Michelangelo was an associate of Leonardo da Vinci; in 1883, he was cited as a uberman archetype by Friedrich Nietzsche.

Quotes | By

The following are noted quotes:

> "If people knew how hard I had to work to gain my mastery, it would not seem so wonderful at all."
>
> — Michelangelo (c.1550)

External links

â— Michelangelo – Wikipedia.

θΔics

In existographies, **Michelangelo Ricci** (1619-1682) (CR:4) was an Italian mathematician and cardinal, noted for []

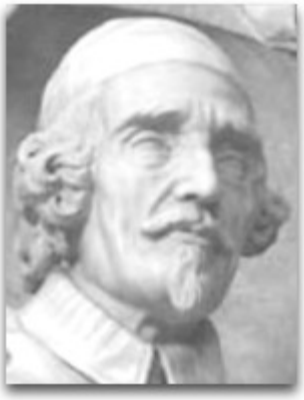

Overview

On 11 Jun and 28 Jun 1644, Evangelista Torricelli wrote to Ricci discussing his new mercury experiment on making a vacuum; these are, supposedly, the only two extant documents by Torricelli describing his experiment. [1]

On 8 Jun 1644, Ricci gave three objections to Torricelli's 11 Jun letter:

> "It was the Epicureans' opinion that not only could the vacuums naturally occur, but that in fact many empty spaces were found in the world, as V.S. will remember having read about Lucretius. Some theologians opposed them, who jealously indiscriminate about the union and conservation of the universe, to which they esteem the obedience of creatures directed in ascending or descending is directed, according to the reason of contact, with saying that not even the divine omnipotence could operate in such a way that this empty space is said which the Epicureans say, but I apologize in part to these good theologians, who perhaps, in order not to acquire a bad name after the world of being Epicureans, all the more competing in them for some other clue taken from their actions, they have wanted to be more able to dwell on their feelings, as they claim to be believed to be distant in operating from the style of that, here [Bacchanalia vivunt Epicuri de grege porcis] [English].
>
> Let this be said with reverence of V.S., which I would not like to bore with another, which I could add to you in this matter, **since I esteem that you will be too nauseated by the rash opinion of the aforementioned theologians, and by her constant habit of immediately misusing the things of god in natural reasoning, where those should with greater respect and reverence be treated**. The way with which V.S. saves the experiences made as proof of the vacuous, that is, of ascending the grave things against his natural inclination, I judge him so much better than the other, as with this we conform to the simplicity of nature in his works; which being able to save the union of the bodies with the sole motion down, in vain would have grafted to them a new natural inclination to obey the universal moderating cause of the world, as they say. And I admire the noble boldness of V.S. in having in mind what does not touch from truth until now, which has likewise so much of probability that, with two or three objections, which are to say to V.S., which I pray I will resolve, as I know, that you will be able to do easily, I estimate to be the most true and the most reasonable, which can be said in this matter.
>
> First of all, it seems to me that the action of the air could be excluded in gravitating on the extrinsic surface of the silver that is in the vase, placing a cover with a hole in it, for which the glass rod passes, and then completely closing every part , so that the air higher than the vessel, which would in this case no longer gravitate on the surface of the silver but on the lid, could no longer be communicated to it, and thus remaining the living silver suspended in the air as before, one does not could no longer attribute the effect to the weight of the air, which supports it almost in equilibrium.
>
> Secondly, having taken a syringe, which wants to be used a great deal in this subject and has its piston inside of itself, so as to exclude with its corpulence every other body, then closing the hole at the top, and withdrawing by force the piston back, we feel great resistance, and this does not follow only keeping down the syringe, and turning up the piston, above whose handle the air rests, but it follows for every verse that it is made; and yet it does not seem that in these cases it is easy to understand how the weight of the air has to do with it.
>
> Finally, a body immersed in water does not conflict with all the water, which is above it, but with the only the one that moves to the motion of the immersed body, which is not greater than its body and because I would estimate that the same doctrine was from apply to the changes of silver, it should contrast with as much air as is its bulk; and how could the air ever preponderate?

> This is what gave me my nonsense in opposition to the sense of V.S., in which he will have to excuse the desire, which I want to perfectly understand the solution of the objections to the contrary to be then absolute defender, since I am sincere admirer, and of this , and every other invention by you to me all very gratified [...]"

Torricelli, in his reply letter, explained these objections. [2]

In Oct 1644, Marin Mersenne visited Torricelli, during which time Torricelli repeated the experiment for him and gave him copies of his letters to Ricci. Mersenne took these to Blaise Pascal and others in France, disclosing Torricelli's work publicly for the first time. [4]

Quotes | By

The following are quotes by Ricci:

> "I estimate that you will unfortunately be too nauseated by the temerarious opinion of these theologians, and by their constant habit of mixing up things of god with natural questions, where they should instead be treated with greater respect and reverence."
>
> — Michelangelo Ricci (1644), "Letter to Evangelista Torricelli", Jun 18 [3]

References

1. Michelangelo Ricci (about) – IMISS.fi.it.
2. Middleton, William E. (1964). *The History of the Barometer* (pgs. 22-29) (Amz). Publisher.
3. Michelangelo Ricci – MacTutor History of Mathematics.
4. Williams, Richard. (2012). "Oct 1644: Torricelli Demonstrates the Existence of a Vacuum" (Ñº), APS News, Oct.
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External links

â— Michelangelo Ricci – Wikipedia.

θΔics

In thermodynamics, **microthermodynamics** is the study of micro-regions, of typically the behaviors of individual molecules attached to a surface, through interpretation of macroscopic thermodynamic properties in terms of molecular forces. [1]

Near-synonymous terms may include: nanothermodynamics, small systems thermodynamics, and molecular thermodynamics; although the former two seem to be exact synonyms; whereas molecular thermodynamics seems to most capture the meaning of what is meant by microthermodynamics.

History

In 1964, Louis de Broglie (1892-1987) is said to have introduced a version of "micro-thermodynamics". [2] This assertion, however, needs, to be double checked.

In 1981, Turkish-born American chemical engineer Okkktay Sinanojlu (1935-), of the Lewis school and MIT school, introduced the most-cited version of microthermodynamics; introducing new quantities such as "microthermodynamic surface areas", among others. [3]

References

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2. Sieniutycz, Stanislaw. (1992). "Thermal Momentum, Heat Inertia, and a Macroscopic Extension of de Broglie Microthermodynamics II. The Conservation Laws for Continued Equations with Sources.", pgs. 408-); in: *Extended Thermodynamics Systems*. Taylor and Francis.
3. (a) Sinanoglu, Oktay. (1981). "A Microsurface Thermodynamics for Individual Molecules, Aggregates or Clusters." Report.
(b) Sinanoglu, Oktay. (1981). "Microscopic Surface Tension Down to Molecular Dimensions and Microthermodynamic Surface Areas of Molecular Clusters" (abs). *J. Chem. Phys.* 75:463.
(c) Sinanoglu , Otkay and Nathanson, Giles. (1980). "Metric Geometry of Near- Equilibrium Irreversible Thermodynamics". J. Chem. Phys. 72, 3127 (1980).
(d) Oktay Sinanoglu – Wikipedia.

Further reading

â— Rugh, Hans H. (2001). "Micro-thermodynamic Formalism" (abs), Phys. Rev. E. 64. 4-pgs.

θΔics

In hmolscience, **Mieczyslaw Dobija** (1943-) is a Polish economist (O) noted for []

Overview

In 2004, Dobija, in his "Theories of Chemistry and Physics Applied to Developing an Economic Theory of Intellectual Capital", via citation to: Irving Fisher (1919), Nicholas Georgescu-Roegen (1971), Frank Lambert (1997), and Valery Chalidze (2002), attempted to outline a semblance of a thermodynamic theory of capital, arguing to the effect that entropy has something to do with risk and energy in a social body constitutes its capital, or something along these lines; the following is his abstract: [1]

> "Successful entrepreneurs employ a variety of assets with the objective of seeking unusually high returns on invested financial capital. Intellectual entrepreneurs effectively use some intangible factors, like intellectual capital, to reach impressive results. Each asset employed by entrepreneurs involves a category of capital. Capital, in its sense of being used to do something is analogous to a property in physical science that is labelled as 'energy'. Energy is often defined as the capacity to do work. And thermodynamics is a field in which the applications of energy and heat are thoroughly studied. Thermodynamics provides a useful analogy for understanding intellectual capital. Intellectual capital is best described as a low entropic component involving both the human mind and human spirit in will-directed actions that forms a special quality of intellectual entrepreneurship. The second law of thermodynamics is a key to understanding the properties of energy and is used as a prime analogy for understanding capital and its theories."

Here we note the metaphysical religio-mythology term "spirit" intermixed with thermodynamics, which is a red flag.

In 2011, Brigham Young University ran a "Sociology and Physics" (O) course, an hmolscience-stylized course, wherein Dobija's 2004 article was listed as required reading material.

Education

In 2005, Dobija was associated with the Cracow University of Economics.

References

1. Dobija, Mieczyslaw. (2004). "Theories of Chemistry and Physics Applied to Developing an Economic Theory of Intellectual Capital" (abs), in: *Knowledge Café for Intellectual Entrepreneurship Through or Against Institutions*, Wydawnictwo WSPiZ im. Leona Koźmińskiego, Warszawa.

Further reading

● Dobija, Mieczyslaw. (2005). "Capital and Discount Rates in the Context of Thermodynamic Entropy" (abs), *Argumenta Oeconomica Cracoviensia*, No. 3

External links

● Mieczyslaw Dobija (papers) – SSRN.com.

θΔics

In hmolscience, **Migene Gonzalez-Wippler** (c.1950-) is a Puerto Rican cultural anthropologist turned new age author noted, in cessation thermodynamics, for her 1987 to 1997 publications arguing to the effect that the first law substantiates the view that there is a creative intelligence at work in the universe and therein afterlife exists.

Overview

In 1987, Wippler, in her *Kabbalah for the Modern World*, used thermodynamics and entropy to make a case for the existence of a creative force at work in the universe. [3]

In 1997, Wippler, in her *What Happens After Death*, attempted to build a theory of death on the first law of thermodynamics; the following being an introduction her theory: [1]

> "We want to establish a theory about what happens after we die. In order to do this, we must first provide a foundation for this theory, and this foundation is the first law of thermodynamics. This law states that energy can neither be created nor destroyed."

On this footing, according to book reviews, Gonzalez-Wippler builds the first few chapters in the theme of a clear concise scientific look at the occult, but then digresses off on a tangent toward the end of the book. In terms of God-like theories, Gonzalez-Wippler reasons that there is enough scientific evidence to prove the existence of a creative intelligence at work in the universe. [2]

Education

Gonzalez-Wippler has a degree in psychology from the University of Puerto Rico and a degree in anthropology from Colombia University. She has worked as a science editor for the Interscience Division of John Wiley, the American Institute of Physics, and the American Museum of Natural History, and as an English editor for the United Nations in Vienna. [4]

References

1. Gonzalez-Wippler, Migene. (1997). *What Happens After Death: Scientific & Personal Evidence for Survival* (thermodynamics, pgs. 5-7, 10). Llewellyn Publishers.
2. About Migene - migenegonzalezwippler.com.
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4. (a) Migene Gonzalez-Wippler (author information) – Llewellyn Publishers.
(b) Migene Gonzalez-Wippler (about) – PaganPresence.com.

External links

â— Migene Gonzalez-Wippler – Wikipedia.
â— GonzaÌ_lez-Wippler, Migene – WorldCat Identities.

θΔics

In archeology, **migration out of Africa** refers to the migration patterns of humans, over the last 120,000-years, starting in the Rift Valley of Africa, and then one man who went out of Africa, about 51,000-years ago, to populate the earth as we presently know it with humans.

Overview

The following is an example of on variant of the migration pattern of humans out of Africa: (O)

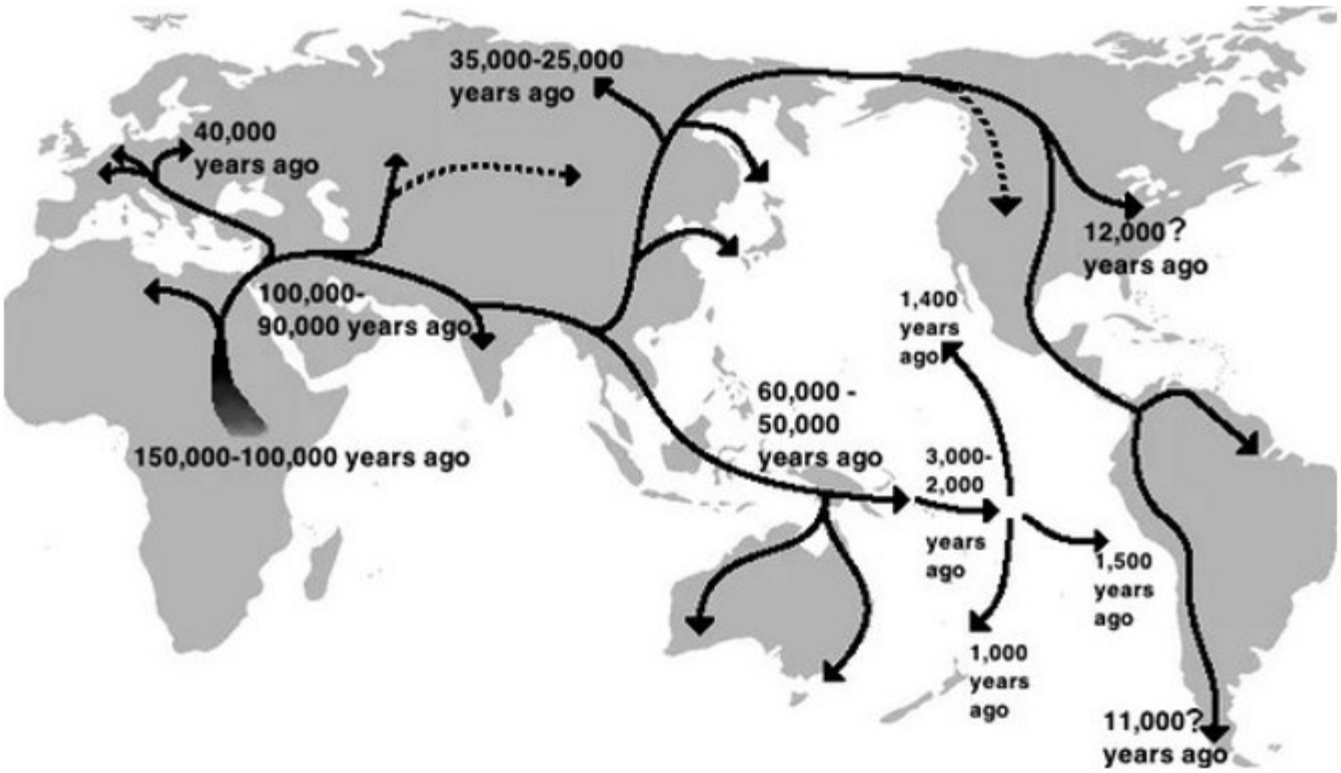

The following is an alternative migration out of Africa in kilo-years-ago:

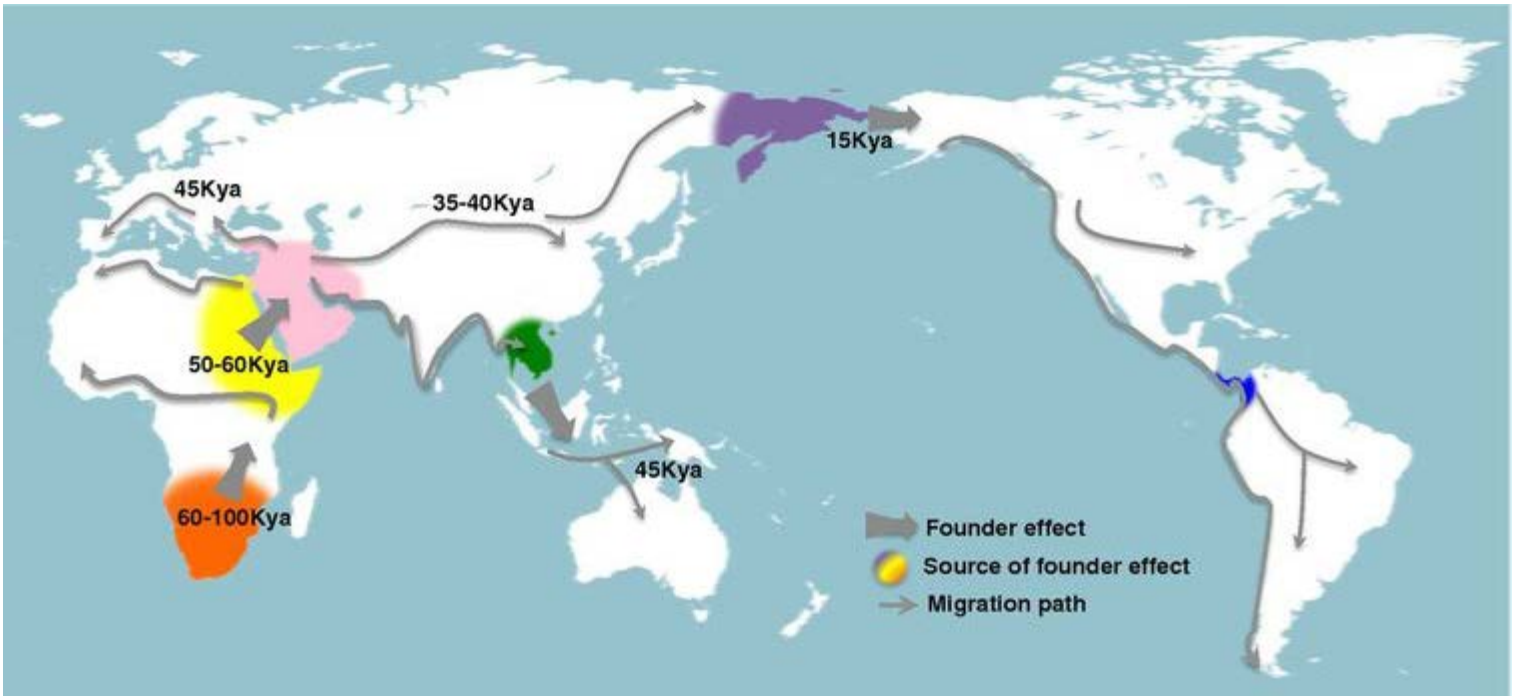

A key point to note here, is that according to DNA tracking, a man named the "Y-chromosome man", who existed in Africa, about 51,000-years ago, is the last common ancestor to all existive people.

External links

- Early human migrations – Wikipedia.

θΔics

In existographies, **Miguel de Cervantes** (1547-1616) (IQ:155|#603) (Cattell 1000:164) [RGM:53|1,500+] (Gottlieb 1000:44) (CR:12) was a Spanish writer, noted for []

Overview

In 1615, Cervantes published in his realism novel *Don Quixote*, which is cited by Henry Finck, in his *Romantic Love and Personal Beauty* (1887), subsection the history of social gravitation theories and human chemical affinity theories, as follows: [1]

> "In the preface to the first volume of *Don Quixote*, **Cervantes** refers those who wish to acquire some information concerning love to an Italian treatise by Judah Leo [Judah Leon Abravanel, c.1465-c.1523]. The full title of the book, which appeared in Rome in the sixteenth century, is *Dialoghi di amore, Composti da Leone Medico, di nayione Ebreo, e di poi fatto cristiano* [*Dialogues of Love, composed by Doctor Leon, of Hebrew heritage, and who later became Christian*]. There are said to be three French translations of it, but it was only after long searching that I succeeded in finding a copy, at the Bibliotheque Nationale in Paris. It proved to be a strange medley of astrology, metaphysics, theology, classical erudition, mythology, and medieval science. Burton [Robert Burton, 1577-1640], in the chapter on love, in his *Anatomy of Melancholy*, quotes freely from this work of Leo, whom he names as one of about twenty-five authors who wrote treatises on love in ancient and medieval times."

This paragraph, to note, surrounded by discussions of Empedocles, Goethe, Ludwig Buchner's views on physical science based love, and Robert Burton (1652) puzzling about what love has to do with the loadstone drawing iron and or the "ground coveting showers".

As GLAE candidate, his *Don Quixote* was ranked by the Norwegian Book Club's 2002 100 Best Books of All Time listing as the "best literary work ever written", based on 100 top ten lists, submitted by a 100 writers, from 54 countries; a book notably read by Albert Einstein and his Olympia Academy group (see: Filon-Pearson demon).

References

1. Finck, Henry. (1887). *Romantic Love and Personal Beauty: Their Development, Causal Relations, Historic and National Peculiarities* (section: Cosmic Attraction and Chemical Affinities, pgs 4-9). MacMillan.

Further reading

â— Cervantes (2014) – Hmolpedia thread.

External links

â— Miguel de Cervantes – Wikipedia.

θΔics

In philosophy, **Miguel de Unamuno** (1864-1936) (DN=1-5) was a Spanish philosopher noted for his 1912 book *The Tragic Sense of Life*, in which, similar in style to Pierre Teilhard, he discusses, and in some ways attempts passing reconciliation, between the growing collision between modern science and religion (see: science and religion), the dividing line between the two being, in his view, entropy, at the mention of which he inserts and extra dividing space between paragraphs, only done once in the book, a term which he equates to "a kind of ultimate homogeneity, a state of perfect equilibrium, the most like nothingness the mind can conceive [at the point which] universal existence will be obliterated and lost." [1]

According to *New Scientist* writer Martin Sherwood (1971) one is not "two cultures" literate if he or she does not know both the second law and Miguel de Unamuno; who supposedly together with Ortega y Gasset (1833-1955) hold the distinction of being Spain's most influential philosopher. [2]

Hypothesis of god | Hypothesis of ether

The gist of Unamuno's book is to explicate his resolutions between his deadlock on the tensions of faith and reason, vacillating at times between doubt in the existence of god and belief in the existence of god, resulting in the end to side with belief based on his belief or effort to believe in the survival of the will to live, or something along these lines. The following is a decent section:

> "Ether is, in effect, a merely hypothetical entity, valuable only in so far as it explains that which by means of it we endeavor to explain—light, electricity, or universal gravitation—and only in so far as these facts cannot be explained in any other way. In like manner the idea of god is also an hypothesis, valuable only in so far as it enables us to explain that which by means of it we endeavor to explain—the essence and existence of the universe—and only so long as these cannot be explained in any other way."

Prior to these, Unamuno also points out that Pierre Laplace, in his circa 1802 Q&As with Napoleon Bonaparte, was the first to openly and plainly declare the "hypothesis of god" to be an unneeded hypothesis, in the explanation of universal operation and movement.

Problem of evil

One interesting human physics like position that Unamuno takes is to explain the great problem of evil in terms of the principle of inertia, otherwise known as the first law of motion (see: laws of motion):

> "The origin of evil, as many discovered of old, is nothing more than what is called by another name the inertia of matter, and, as applied to the things of the spirit, sloth. and not without truth has it been said that sloth is the mother of all vices, not forgetting that the supreme sloth is that of not longing madly for immortality."

A down side of his argument is that prior to this statement, he states that in the depths of the bodies of "humans, animals, plants, rocks, and in all the universe" there is spirit-matter (similar to the view held by Pierre Teilhard), or spirit that limited by the matter in which it has to live and acquire consciousness of itself. These views were common to many looking to find religion-science reconciliation back in the early 20th century.

References

1. Unamuno, Miguel de. (1912). *The Tragic Sense of Life* (pg. 124; hypothesis of god, pg. 168). Dover, 1954.
2. Sherwood, Martin. (1971). "International Conference on Science and Arts, Edinburgh, 7-9 July", *New Scientist* (pg. 220), Jul 22.

External links

â— Miguel de Unamuno – Wikipedia.

θΔics

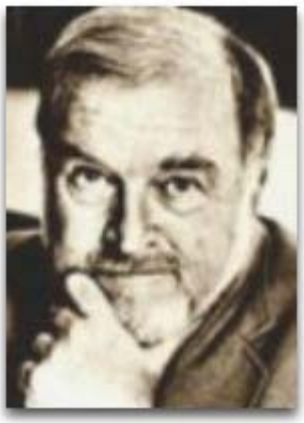

In existographies, **Mihaly Csíkszentmihalyi** (1934-) (CR:25), pronounced "Me-high Chick-sent-me-high", is a Hungarian-born American psychologist noted for his positive psychology theories of flow, sometimes called "Csíkszentmihályi flow", or “states of optimal experience”, the use of the Freudian-Jungian terms psychic energy and psychic entropy in his analysis of states of mental life, and ideas on negentropism, e.g. psychic negentropy, and creativity. [1]

Overview

Csíkszentmihályi has stated that he was drawn into psychology after attending a lecture by Swiss psychologists Carl Jung. [2]

Influence

Some of Csíkszentmihályi's writings on entropy have been influential to American entropy-ethics educator Dick Hammond. [3]

Swiss designer Lisa Bjorke completed her 2010 MS thesis on "creativity" using Csikszentmihalyi's flow theories, particularly his ideas on psychic entropy, using Hmolpedia as a reference. [5] See also:

Quotes

The following are related quotes:

> “It’s like opening a door that’s floating in the middle of nowhere and all you have to do is go and turn the handle and open it and let yourself sink into it. You can’t particularly force yourself through it. You just have to float. If there’s any gravitational pull, it’s from the outside world trying to keep you back from the door.”
>
> — Susan Perry and Mihaly Csikszentmihalyi (1999), *Writing in the Flow State* [4]

References

1. (a) Csíkszentmihályi, Mihály. (1990). *Flow – the Psychology of Optimal Experience.* Harper Perennnial.
(b) Csíkszentmihályi, Mihály. (1994). *The Evolving Self.* Harper Perennial.
2. Csíkszentmihályi, Mihály. (2008). “Creativity, Fulfillment and Flow” (18:56 video), TED talks, October.
3. Hammond, Dick E. (2005). *Human System from Entropy to Ethics*, 4th ed. (eulogy ed. with commentary on post-doctorial mentor Ilya Prigogine). Publisher: Dick Hammond.
4. (a) Perry, Susan K. and Cxikszentmihalyi, Mihaly. (1990). *Writing in the Flow State* (floating, pg. 125). Writer’s Digest Books.
(b) Bjorke, Lisa. (2010). “To Create with Imagination: In Search of Flow” (abs), MS thesis, Konstfack, University of Arts, Crafts and Design, Stockhom, Sweden.
5. Bjorke, Lisa. (2010). “To Create with Imagination: In Search of Flow” (abs), MS thesis, Konstfack, University of Arts, Crafts and Design, Stockhom, Sweden.

Further reading

● Csikszentmihalyi, Mihaly. (1971). “From Thermodynamics to Values: a Transition Yet to be Accomplished” (abs), *Zygon*, 6(2):163-67.

External links

● Mihaly Csikszentmihalyi – Wikipedia.

θΔics

In hmolscience, **Mikhail Vladimirovich Volkenstein** (1912-1992) was a Russian bio-physicist (chnops-physicist) noted, in human thermodynamics, for his circa 1985 to 1994 publications on thermodynamics applied to evolution, biology (chnopsology), and culture.

Overview

In circa 1985, Volkenstein, in his *Entropy and Information*, used a mix of Prigoginean thermodynamics, Gibbsian thermodynamics, and assumed Shannon-based equivalence of information in a message or genome with entropy, to show how entropy applies to biology, culture, and the production of artistic work. [1] The book seems to contain a good amount of trivia on Russians to theorize on thermodynamics of biology. Volkenstein notes, for instance, that Russian biologist Erwin Bauer commented in 1935 that "living systems are never in equilibrium and at the expense of their free energy …" Volkenstein discusses topics such as the entropy balance of an astronaut in space.

In 1994, Volkenstein, in his *Physical Approaches to Biological Evolution*, gave the following derisive review of Canadian zoologist Daniel Brooks' and American systems ecologist Edward Wiley's infamous 1986 Shannon information themed book *Evolution as Entropy* as follows: [3]

> "As useless as the book cited above is the book *Evolution as Entropy* by Brooks and Wiley. The basic proposition in this work is that speciation is controlled by the stochastic premises of the second law of thermodynamics. One may only regret that in the 43-years since the publication of Schrodinger's work [*What is Life?*] a book has appeared whose authors do not understand the role of the second law of thermodynamics in living nature...the authors are concerned only with the amount of information and, hence, with [Shannon] entropy. But, by confining oneself to these concepts alone, one can hardly say anything about evolution...in the world of living things the quality or value of information is often of decisive importance. No appropriate methods have yet been worked out for estimation of the quality of information."

(add discussion)

Education

From 1933 to 1948, Volkenstein worked on the intensities of molecular oscillation spectra; from 1949 to 1960, he worked on the statistical mechanics of macromolecules; from 1961 into the mid 1970s, he worked on questions in molecular biophysics, such as biomolecular conformations and on the reactivity of biomolecules. Towards the end of the 1970s, Volkenstein set out to explore questions surrounding the origins of life, about which he began to study the interrelationship between entropy, information, and life. He met Ilya Prigogine at a conference in Berlin, after which the two became good friends. Volkenstein is considered to be one of the pioneers of macromolecular dynamics. [2]

References

1. Volkenstein, Mikhail. (2009). *Entropy and Information*. BirkHauser Basel.
2. Ebeling, Werner, Schimansky-Greier, Lutz, and Romanovsky, Yuri. (2002). *Stochastic Dynamics of Reacting Biomolecules* (pg. xiv). World Scientific.
3. Volkenstein, Mikhail V. (1994). *Physical Approaches to Biological Evolution*. Springer Verlag.

Further reading

- Volkenstein, Mikhail V. (1977). *Molecular Biophysicis*. NY Academic Press.
- Volkenstein, Mikhail V. (1982). *Physics and Biology*. NY Academic Press.
- Volkenstein, Mikhail V. (1983). *General Biophysics*. NY Academic Press.

External links

- Volkenstein, M.V. (1912-) – WorldCat Identities.

θΔics

In existographies, **Miles Mathis** (1964-) is an American copy artist, turned 2007 conspiracy theory scientist, noted for []

Overview

In c.1960s, Mathis was seen as a child prodigy, of some sort, with accelerated artistic abilities, but also doing well at mathematics and astronomy, which allowed him to skip first grade, which he says disaligned his ability to form normal relationships of the opposite sex. [1]

In c.2007, Mathis, in his MilesWMathis.com site, began to pen about 1,500 article, on various topics, supposedly on all the "errors" of the great scientists.

In 2010, Mathis, in his *The Un-Unified Field*, building on his online articles, attempted to argue things like “gravitation field”, as it is currently defined, cannot “support the shape or the equations of the earth at perihelion or aphelion”. [1]

Mathis, in short, seems to be caught in some kind of “I must find the errors in Einstein” syndrome, common to many former child prodigies, such as William Sidis, Christopher Langan, Jacob Barnett, to name a few, who have been kicked out of the normal mechanism of social upbringing (see: inflated IQs).

In 2020, his name began to be repeatedly filtered to Thims, as someone that needed to be looked into, as a possible “missing” genius candidate, which, following investigation, does not seem to the case.

Education

In 2000, Mathis attempted to major, for a short time, in physics and astronomy, at the University of Texas, Austin, but did not completed a degree. He then entered independent study; which he summarized as follows:

> “I had also kept up his readings in science since college, although this consisted mainly of updates on the latest theories. But, unsatisfied with the direction these theories were taking, I finally began studying the history of theoretical physics in earnest, especially as it related to classical mechanics and basic physics. I bought a small library of old books like Newton's *Principia*, Euclid's and Archimedes' treatises, Maxwell's papers, and all of Einstein's original writings. I also brushed up on his calculus and began looking into the origins of that math. This ultimately led him to Cauchy and Cantor (GME:16), set theory, topology, physical chemistry, cosmology, and several other subfields, which he investigated to whatever ends he was following at the time.”
>
> — Miles Mathis (2007), “about” section [1]

(add)

References

1.Mathis, Miles. (2010). *The Un-Unified Field: and Other Problems: why Einstein’s and String Theory’s Quests for Unification were Doomed—the Fields were Already Unified, and Had Been Since 1687* (pgs. 110-11). Author House.
2. About (Ñº) – MilesWMathis.com.

External links

â— Miles Mathis – RationalWiki.org.

θΔics

In thermodynamics, **Miles V. Sullivan** (1917-) is an American chemist noted for his *circa* 1942 invention of the drinking bird a famous evaporation-propelled heat engine that runs for weeks.

Education

Sullivan completed his PhD at Purdue University. [1]

References

1. Sullivan, Anne. (2008). "Miles Sullivan: The Father of Inventions", 19-pgs, *AnneSullivanFlute.com.*

Videos

- Anon. (2006). "Miles Sullivan: the Father of Inventions" (Q), Jul 19.

θΔics

In human thermodynamics, **Milivoje Kostic** (1952-), see: audio pronunciation, is a Serbian-born American mechanical engineer noted for his *circa* 2007 thermodynamic philosophy centered on what he refers to as the "grand law of nature", which he defines as follows:

> "The universe consists of local material (mass-energy) structures in forced equilibrium and their interactions via forced fields. The forces are balanced at any time (including inertial-process rate forces) thus conserving momentum, while charges/mass and energy are transferred and conserved during forced displacement in space all the times, but energy is degraded (dissipated) as it is redistributed (transferred) from higher to lower non-equilibrium potential towards equilibrium (equipartition of energy)."

Kostic believes that this forms the basis of what can be considered the "zeroth law of religion", a thermodynamics-based belief system based on the view that energy is the fundament behind the explanation of all existence. [1] The following is Kostic's 2011 synopsis of how the thermodynamics defines the laws of nature: [4]

> "The phenomenological laws of thermodynamics have much wider, including philosophical significance and implication, than their simple expressions based on the experimental observations–they are the fundamental laws of nature: the zeroth law (equilibrium existentialism), first law (conservational transformationalism), second law (irreversible-directional transformationalism), and third law (unattainability of 'emptiness'). They are defining and unifying our comprehension of all existence and transformations in the universe."

Other

In 2013, Kostic was the guest editor of the *Entropy* journal special edition on "Entropy and the Second Law of Thermodynamics", aimed at addressing confusions surrounding the two, the focus question being addressed, as Kostic summarizes thing:

> "The second law is often challenged in biology, life and social sciences, including evolution and information sciences, all with history rich in confusion."

The mention here of "rich in confusion" brings to mind classic entropy misinterpretations as well as the famous 1902 "What is Entropy Debate?", the more recent Shannon bandwagon parade, which confuses information theory (Shannon entropy) with thermodynamics (Boltzmann entropy), that continues to this day, along with the real-time 2009 "entropy apples to humankind" street debate at Penn State University, which gives a visceral feel to way typical students and religious philosophers feel about entropy and human existence. [3]

Education

Kostic completed his BS in mechanical engineering in 1975 at the University of Belgrade, Serbia, with the distinction of having the highest GPA in the Belgrade mechanical engineering program history. He then worked as a researcher in thermal engineering at the Vinca Institute for Nuclear Sciences, Belgrade. In 1984, Kostic completed his PhD in mechanical engineering, with a dissertation on "Heat Transfer and Hydrodynamics of Water and Viscoelastic Fluid Flow in Rectangular Duct", at the University of Illinois at Chicago. Currently, Kostic is a mechanical engineering professor at Northern Illinois University, DeKalb, where he teaches courses on thermodynamics, heat transfer, and energy and environment.

In Jul 2014, Kostic retired and in Sep 2015 became professor emeritus. In Sep 2015, Kostic was a guest editor of the an *Entropy* journal special issue of "Exploring the Second Law of Thermodynamics" and in 2015 was appointed editor in chief of the thermodynamics "section" (Ñº) of the *Entropy* journal.

References

1. Zeroth Religion – Mkostic.com.
2. Entropy and the Second Law of Thermodynamics (special Issue) (2013) – Mdpi.com.
3. Debate: Entropy Applies to Humankind? (2009) – YouTube.com.
4. Kostic, Milivoje M. (2011). "Revisiting the Second Law of Energy Degradation and Entropy Generation: From Sadi Carnot's Ingenious Reasoning to Holistic Generalization" (pdf), *AIP Conference Proceedings*, 1411, 327-50.

Further reading

â— Kostic, Milivoje M. (2014). "The Elusive Nature of Entropy and Its Physical Meaning" (abs), Entropy, 16(2):953-967.

External links

â— Milivoje Kostic (faculty) – Northern Illinois University.

θΔics

In genius studies, **milk and genius** refers to the peculiar habit of a number of noted geniuses to consume large amounts of milk and or to exist only on milk in place of other beverages or food.

American genius biographer Clifford Pickover, in his 1998 *Strange Brains and Genius*, seems to have been the first to call attention to the peculiar phenomenon. [1]

English self-taught electrical engineer, mathematician, and physicist Oliver Heaviside (1850-1925), the person who condensed Maxwell's field equations with 20 variables down to four equations with two variables, had very specific food preferences and an unnatural interest in food. He sometimes lived like a cat, drinking bowls of milk for days. Milk, and nothing else.

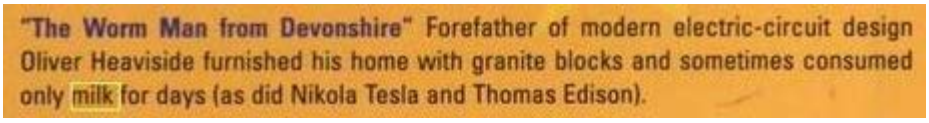

Above: back cover exert from American genius biographer Clifford Pickover's 1998 *Strange Brains and Genius*. [1] Right: the famous "come in with the milk" scene from the 2004 film *The Aviator*, which is based on real life (reaction existence) and times of American aviator pioneer and film mogul Howard Hughes (see also: why is this site here?).

Serbian-born American electrical engineer Nikola Tesla, as Pickover reports, also lived on milk, and for many years. [1] Tesla's milk eating habits and number peculiarities, as biographer Carol Dommermuth-Costa reports, outlined below: [2]

> "In his later years, [Tesla's] meals often consisted of a bowl of **milk**. His eating habits remained odd. Obsessed by numbers that were divisible by three, he always required eighteen cloth napkins to be placed near his plate so that he could clean each glass, utensil, and dish before using them and then discard the napkin. Also, whenever he needed to wipe his mouth during the meal, he used a clean napkin. This eccentricity also applied to the number of towels that he required in the bathroom. He insisted that either fifteen or eighteen clean towels be on hand when he washed or bathed."

Tesla, in respect to dietary numbers and milk, is thus strikingly similar to the milk dietary habits of Howard Hughes and his number of peas he required during; always requested his diners with twelve peas, no more, no less (Ñº)

Likewise, Thomas Edison's only foods were milk and the occasional glass of orange juice. [1]

Irish chemist Richard Kirwan, the "brilliant 18th-century polymath", as Pickover describes him, existed entirely on a diet of only milk and ham.

The most-famous film depiction of the genius milk phenomenon is the "come in with the milk" scene from the 2004 film *The Aviator* based on the existence reaction of American aviation and film pioneer Howard Hughes (IQ=175±) (see also: why is this site here), as shown adjacent, wherein one can count 60 milk bottles filled with urine.

The 1971 film *A Clockwork Orange* written, directed and produced by Stanley Kubrick, adapted from Anthony Burgess's 1962 novella *A Clockwork Orange*, has a similar sort of milk scene.

Theodore Kaczynski (IQ=165), math prodigy turned unabomber, as noted by his college dorm mates, had a room piled with trash two feet deep underneath it all were what smelled like unused cartons of milk.

American electrochemical engineer Libb Thims (IQ=160-230±) frequently consumes upwards of 2 liters of milk per day (1%, 2% or sometimes whole), or 2-3 per week, especially so after long extended 10-hour+ periods of study, after which milk is the only thing that will quench and calm the brain.

References

1. Pickover, Clifford A. (1998). *Strange Brains and Genius: the Secret Lives of Eccentric Scientists and Madman* (milk, pg. 70 + backcover). Quill.
2. Dommermuth-Costa, Carol. (1998). *Nikola Tesla: a Spark of Genius* (pg. 128). Twenty-First Century Books.

Further reading

â— Jacob, Matthew and Jacob, Mark. (2010). *What the Great Ate: a Curious History of Food and Fame* (milk, 44+ pgs). Random House.

θΔics

In experiments, **Miller-Urey experiment**, or "Urey-Miller experiment", refers to the 1952 synthesis, by American bio-chemist (chnops-chemist) Stanley Miller, under the guidance of planetary chemist Harold Urey, of organic compounds (specifically the amino acids: glycine, α-alanine, β-alanine, and possibly aspartic acid and α-amino-*n*-butyric acid) from inorganic chemicals (specifically: methane CH_4, ammonia NH_3, water H_20, and hydrogen H_2) using an electrical discharge (see: lightning origin of life theory); thereby giving seeming experimental justification to the hypothesis of abiogenesis. [1]

The experiment was conducted in December 1952 and received in journal form submission to *Science* on 13 February 1953.

Synonyms include: Urey-Miller experiment or Miller experiment.

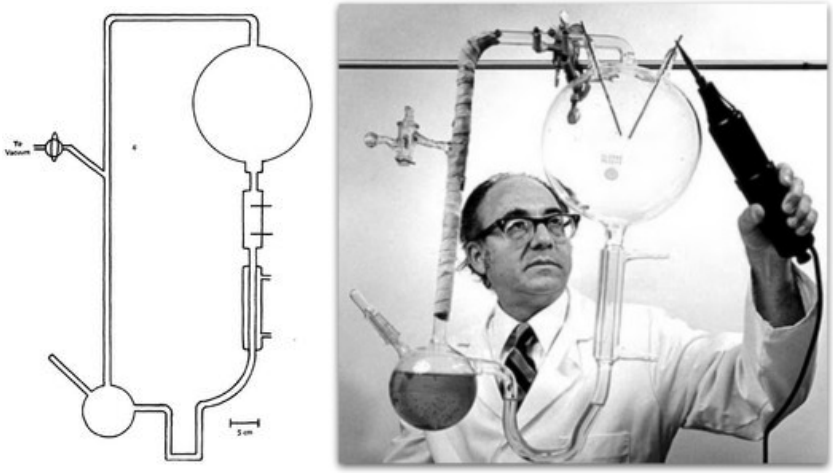

Left: original diagram of Stanley Miller's 1952 amino acid synthesis experiment. **Right:** a photo of Miller reconstructing his experiment.

Preliminaries

The Miller-Urey experiment in some sense is a realization of English naturalist Charles Darwin's 1871 warm pond model: [2]

> "The original spark of life may have begun in a **warm little pond**, with all sorts of ammonia and phosphoric salts, lights, heat, electricity, etc., present, so that a protein compound was chemically formed ready to undergo still more complex changes."

In 1924, Russian bio-chemist (chnops-chemist) Alexander Oparin published his *The Origin of Life*. Miller cites this as a preliminary in regards to his experiment.

In 1951, English molecular biologist (chnopsologist) John Bernal published his *Physical Basis of Life* (along with an earlier 1949 article published in the *Proceedings of the Physical Society of London*). Miller cites these as preliminaries to his experiment.

In 1952, planetary chemist Harold Urey, his *The Planets: Their Origin and Development*, speculated that the early terrestrial atmosphere was probably composed of ammonia, methane, and hydrogen. Urey a student of American physical chemist Gilbert Lewis and mentor to Stanley Miller. Urey gave Miller "many helpful suggestions and guidance in the course of [his] investigation". [1]

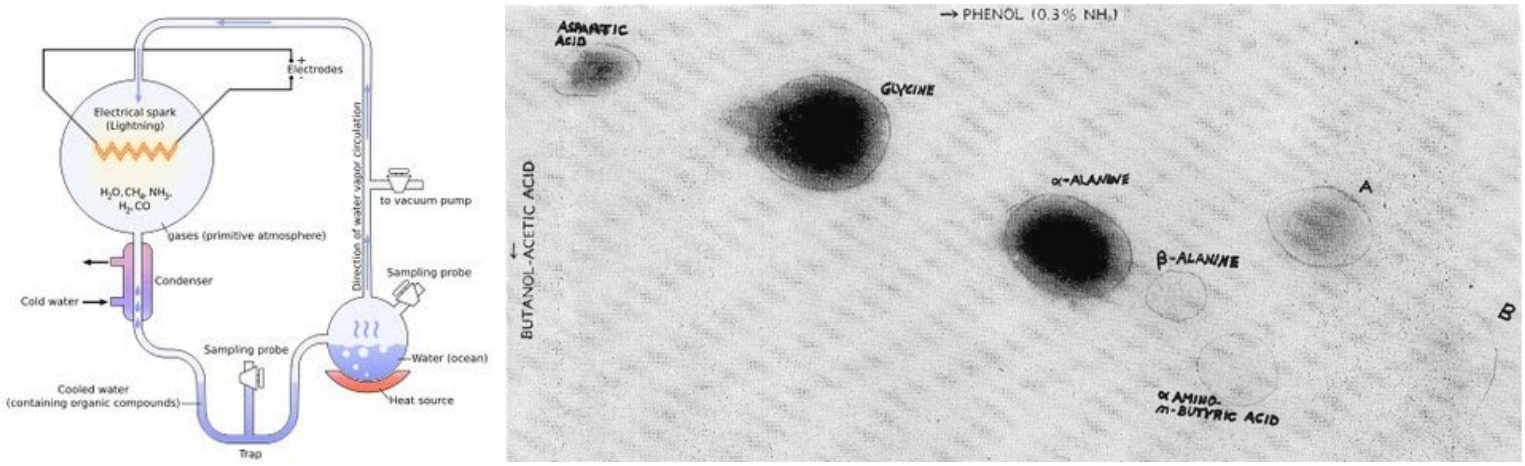

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Left: a labeled an annotated version of the **Miller-Urey experiment**. Right: a paper chromatogram showing the products of Miller's experiment, namely: the amino acids: glycine, α-alanine, β-alanine, and possibly aspartic acid and α-amino-*n*-butyric acid; where A and B were yet unidentified products. [1]

Discussion

The Miller-Urey experiment is frequently cited as scientific proof of synthesis of organic (or organic life) from inorganic (or inorganic life) or colloquially as the scientific proof of life from non-life.

References

1. Miller, Stanley L. (1953). "A Production of Amino Acids Under Possible Primitive Earth Conditions", *Science*, 117:528-29.
2. Darwin, Charles. (1871). "Letter to Joseph Hooker", in: *The Life and Letters of Charles Darwin, Including an Autobiographical Chapter*, Vol 3. (pg. 18). John Murray.

External links

â— Miller-Urey experiment – Wikipedia.

θΔics

In science, **mind** (TR:744) is a state of thought, memory, or process of thinking or information processing, conceptualized as being a product of the processes of the brain, working in coordination with the sense inputs and mechanical operational outputs.

Overview

In 1988, Richard Adams, in his chapter section: “Monism and Materialism”, of his *The Eight Day*, digressed in several paragraphs on the topic of the terms “mental”, “mentalistic”, and “mentalistic processes”, in the context of his view of energy applied to society, which he calls "monistic energetic materialism"; the gist of which is as follows: [3]

> “Perhaps at this point it would be advisable to make some tangential comments about the use of the terms meaning and **mental**. Readers fixed in the assumption that all discussions of energy reject or ignore mental processes should be disabused of the notion. It will be evident (see especially Chapter 3) that ‘mentalistic processes’ have an energetic dimension that requires them to be included in any larger analysis. It must be emphasized, however, that it is their energetic dimension that makes this imperative, not the content of their mentalistic imagery. The present work, however, does not try to pursue an analysis of mental or psychological processes. Rather, it follows Simon's observation that "information processing psychology and neurophysiology constitute independent bodies of theory, as nineteenth century chemistry and physics constituted independent bodies of theory. At present, we have almost no knowledge of how to build a bridge from the one to the other, although most of us have no doubt that such a bridge will be constructed by future generations" (Simon 1979: xi).
>
> For the present it is clear that we must deal with two different aspects of that area. One concerns biochemical and neurological processes. The other describes images, visions of the **mind**. Following the advice of Devons and Gluckman (1964), we deal with the mental processes in terms of such naive, simple collective terms as meaning and mental model. These will be nonreducible terms to which we resort when we refer to what goes on in people's heads and nervous systems. When we say that a perturbation leaves information on a nervous system, we can describe this process in terms of its physical, energetic components. When we want to refer to how a person conceives of it, we are forced to resort to notions such as "ideas," "values," etc. These last are what we will mean by meaning and mental models.
>
> As strategic necessities, therefore, we must accept that we are playing a game with the kind of observations we have available to us, those of human perception and cognition, mental processes and mind. In short, we accept a dualism as a part of our methodology, reject it as theory. This means that we perforce have to use mentalistic concepts that are necessarily imprecise and unclear. They will not be used in propositions about social process (or anything else) unless it is evident that they refer to some discrete energetic process. For example, in saying that "an idea triggered" some action [see: trigger action], we will accept that an activity of the nervous system triggered some muscular action and that it was specifically associated with the presence of some mentalistic concepts for which we have some description, albeit imperfect. If there is no underlying energetic referent, we will simply exclude the mentalistic process from our concern.”

(add)

Quotes

The following are noted quotes:

> “**Mind** [or consciousness] is a function of matter, when that matter has attained a certain degree of organization.”
>
> — Thomas Huxley (1871), “Mr. Darwin’s Critics”; paraphrase version cited by Lee Strobel [2]

> "Could not **mind**, as well as mindless motion, have an underlying order."
>
> — Isaac Asimov (1988), "Emperor Cleon to Hari Seldon", *Prelude to Foundation*

See also

- Mind-body problem
- Mind-brain dualism

References

1. Asimov, Isaac. (1988). *Prelude to Foundation* (pg. 13). DoubleDay.
2. (a) Huxley, Thomas. (1871). "Mr. Darwin's Critics" (Q), *Contemporary Review*, Nov.
(b) Original: "Consciousness is a function of nervous matter, when that nervous matter has attained a certain degree of organization."
(c) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 308). Zondervan, 2009.
3. Adams, Richard N. (1988). *The Eighth Day: Social Evolution as the Self-Organization of Energy* (pgs. 8-11). University of Texas Press.

Further reading

- Bynum, W.F. and Porter, Roy. (2005). *Oxford Dictionary of Scientific Quotations* (mind, 27+ quotes, pg. 683). Oxford University Press.

External links

- Mind – Wikipedia.

θΔics

In philosophy, the **mind-body problem**, or the "mind/body dualism" question", is the premise, introduced by Rene Descartes that the mind (or spirit or soul) is utterly nonspatial, whereas the body is defined as *res extensa*, something that occupies space, hence the perceived modern view that the mind and body are somehow disconnected. [1]

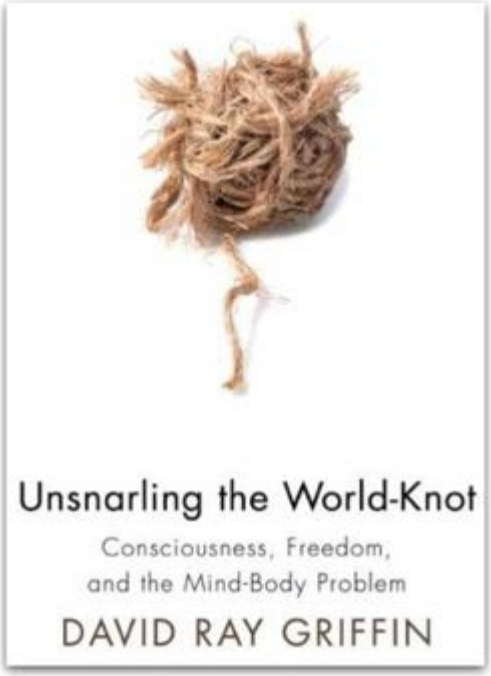

The 2008 *Unsnarling the World-Knot*, by American philosopher David Griffin, discusses the **mind-body problem** in terms of panexperientialism and how entities such as atoms and molecules are reasoned to have internal states of experience. [4]

The typical laymanized view of the so-called mind body problem is expressed well by the view of American cognitive scientist Donald Hoffman, a believer in consciousness, who states: [5]

> "The **mind-body problem** may not fall within the scope of physicalist science, since this problem has as yet no bonafide physicalist theory."

The theories of dualism, that mind and body are separated things, and monism, that mind and body are one thing, are two popular explanations for the so-called mind-body problem. Often, evolution theory minded thinkers will simply brush of the problem with mentions of 'emergence'.

Descartes

French philosopher Rene Descartes summarized, in his *Discourse on Method* (1637), his position on the matter of dualism as follows: [6]

> "After the error of those who deny the existence of God, and error which I think I have already sufficiently refuted, there is none that is more powerful in leading feeble minds astray from the straight path of virtue that the supposition that the soul of the brutes [animals] is of the same nature with our own; and consequently that after this life we have nothing to hope for or fear, more than flies and ants; in place of which, when we know how far they differ we much better comprehend the reasons which establish that the soul is of a nature wholly independent of the body, and that consequently it is not liable to die with the latter and, finally, because no other causes are observed capable of destroying it, we are naturally led thence to judge that it is immortal."

Related to this, a visitor supposedly once asked Descartes if he might see his library, after which Descartes is said to have led the visitor into a dissecting room filled with specimens under examination—to which Descartes pointed saying 'there is my library'. He, supposedly, similar Napoleon Bonaparte (who queried physicians on this question), was searching for the location of the soul in the anatomy of the various bodies, concluding in the end, famously, that the soul was located in the pineal gland (see: soul theorists).

La Mettrie

In 1748, French physician-philosopher Julien la Mettrie published his *Man Machine* (*L'homme Machine*), wherein he rejected the Cartesian dualism of mind and body, and proposed the model of the human being as machine (see: human machine). On Cartesian dualism, he stated:

> "[Dualism] is a trick of skill, a ruse of style, to make theologians swallow a poison."

(add discussion)

Ritter | Valence model

In 1909, William Ritter, in his "Life From the Biologist's Standpoint", posits what he calls the "chemical foundation of consciousness", wherein he traces the origin of consciousness to the change of valence of atoms: [8]

> "Since we know absolutely nothing about the relation of the atoms in living substance, would it not be a reasonable hypothesis to say that the nature of that marvelous process called metabolism is due to just the fact that the atoms of carbon, nitrogen, hydrogen, oxygen, etc., are undergoing perpetual change of valence? I see no reason why we may not legitimately imagine even consciousness due to such a process. Were such a hypothesis to be seriously taken, it would seem to follow that consciousness would have its roots wherever metabolism is going on. What an excellent starting point this would make for dealing with the perennial puzzle of how it is that the 'mind influences the body'! The mind would then be part of the body."

The valence change consciousness hypothesis would then, in the post Bohr model (1913) era, originate in the dynamics of photon-electron interactions, the photons being primarily light, originating from the sun.

Other

In 1994, Portuguese-born American neuroscientist Antonio Damasio, in his *Descartes' Error*, argues that Descartes was in error in positing the dualist separation of the mind and body, arguing instead that we have an embodied mind steered by somatic markers, that feeling—which comes in the form of limbic-driven surges from the viscera, i.e. somatic markers or gut feelings—navigates the endless stream of personal decisions and choices. [7]

The modern human chemistry view, holds that as a human is human molecule, that the mind-body of representative smaller animated molecules, such as the light-induced straightening molecule retinal, explains that the structure of the brain is the carbon atom, and its electromagnetic interactions with surrounding photons (light), whereas the structure of the body of the molecule, are the connected appendages. [2] In object to this type of logic, some, in modern times, will argue that yes their body may be a molecule, but their soul or spirit is an independent entity, detached from the body, that is not measureable by science. [3]

References

1. De Quincey, Christian. (2002). *Radical Nature: Rediscovering the Soul of Matter* (pg. 224). Invisible Cities Press.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
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3. Why I'm not a molecule (2009) – EoHT forum.
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5. Brockman, John. (2006). *What We Believe But Cannot Prove: Science in the Age of Certainty* (pg. 91-92). Perennial.
6. Ball, Philip. (2011). *Unnatural: the Heretical Idea of Making People* (pgs. 94-99). Vintage Books.
7. Descartes' Error – Wikipedia.
8. Ritter, William E. (1909). "Life from the Biologist's Standpoint" (beginning of life, pg. 190), *Popular Science Monthly*, 75:174-90, Aug.

External links

â— Mind-body problem – Wikipedia.

θΔics

In philosophy, **mind-brain dualism** is a view that the brain and the mind are two distinct things or entities.

The concept of mind-brain dualism is a variant, so to speak, of French philosopher Rene Descartes' *circa* 1620 mind-body problem, generally focusing on the relation between consciousness, neuroscience, and materialism. [1] Using more modern terms, one might make the distinction of mind-molecule (see: retinal molecule).

Quotes

The following are related quotes:

> "On the one hand I have a clear and distinct idea of myself, in so far as I am a thinking, non-extended thing; and on the other hand I have a distinct idea of body, in so far as this is simply an extended, non-thinking thing. And, accordingly, it is certain that I am really distinct from my body, and exist without it."
>
> — Rene Descartes (c.1610) (O)

References

1. McLaren, Miall. (2010). *Humanizing Psychiatrists: Toward a Humane Psychiatry* (thermodynamics, 8+ pgs; mind-brain dualism, 2+ pgs). Loving Healing Press.

See also

- Banned from Wikipedia and from ChemicalForums.com – Hmolpedia threads.

External links

- Dualism (philosophy of the mind) – Wikipedia.
- Mind-brain dualism – Amazon discussion forums.

θΔics

In engines, **Miner's friend**, aka "Savery engine", was a 1698 steam engine or rather heat operated suction pump patented by English engineer Thomas Savery that worked to remove water from flooded mines.

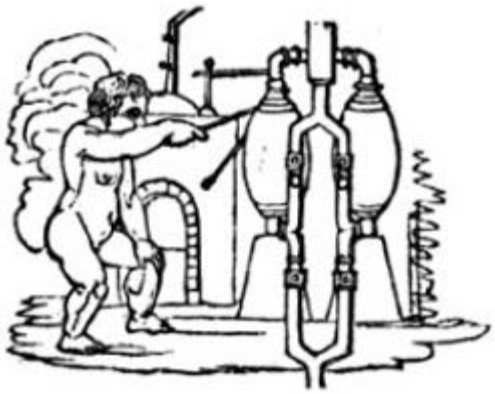

Miner's Friend

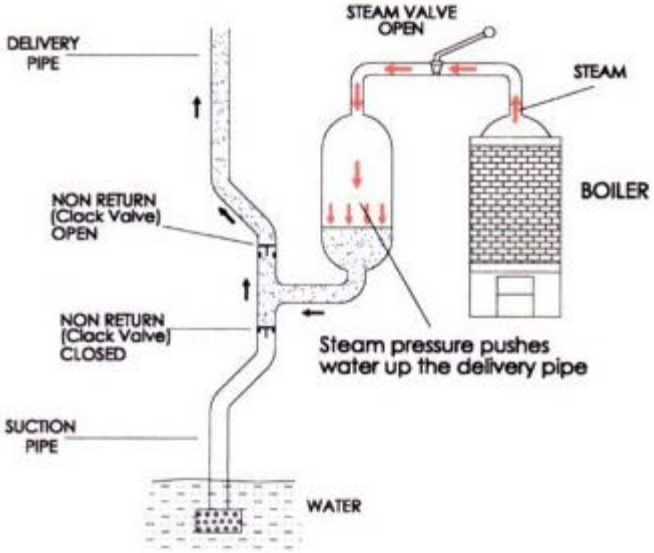

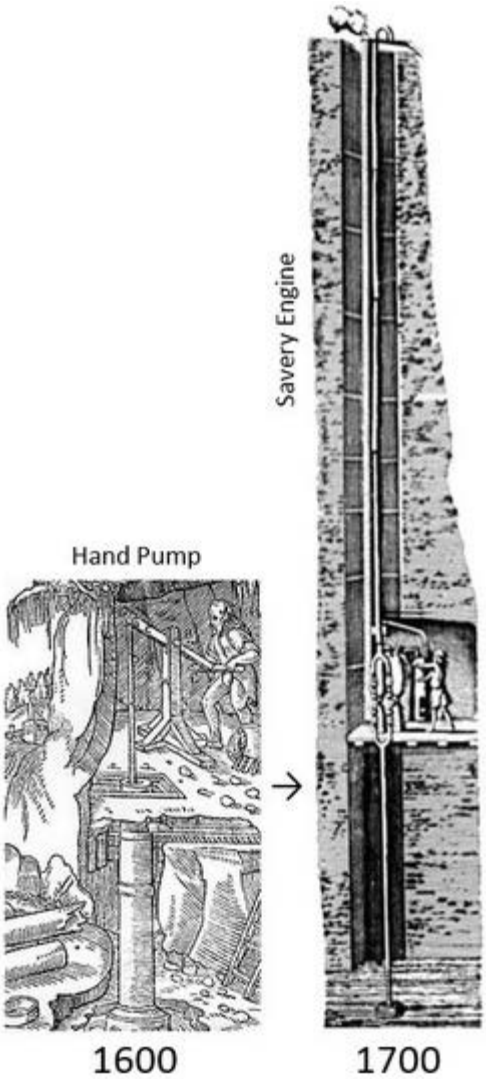

Top (left): a 1702 depiction of the **Miner's friend** being operated by a mine worker. [1] Bottom (left): a modern schematic of its basic operation. Right: a physical comparison between a 1600 hand pump, previously used to remove water from flooded mines, and the mechanical Savery engine (aka Miner's friend) able to remove water from far greater depths, effortlessly.

Overview

In 1690, Denis Papin published his drawings of the design of the Papin engine, the piston and cylinder engine.

On 14 Jun 1699, Thomas Savery demonstrated a small working model of his steam engine at Gresham-college before an audience where it was approved of.

In 1702, Savery published *The Miner's Friend: or an Engine to Raise Water by Fire*

The followup engine design to the Miner's friend was the Newcomen engine, built in 1712 by English engineer Thomas Newcomen.

The Miner's friend not only provided an alternative source of power over that of human power or horse power, but it also seems to have solved the famous pump problem, namely the fact that hand operated pumps could not remove water below a depth of 32 feet

The adjacent image shows the respective difference in working ability between the hand pump (1600) and the Savery engine (1700), the latter able to lift water out of flooded mines to a far greater height, and without human physical exertion.

References

1. (a) Savery, Thomas. (1702). *The Miner's Friend: or an Engine to Raise Water by Fire*. London: Printed for S. Crouch, at the Corner of Pope's Head-Alley in Cornhill; reprinted, 1827.
(b) Savery, Thomas. (1702). *The Miner's Friend – or an Engine to Raise Water by Fire*. London.

External links

â— Savery's Miner's Friend (section) – Wikipedia.
â— The Miner's Friend (online chapters) – History.Rochester.edu.

In existographies, **Minna Herzlieb** (1765-1837) was the 18-year-old "foster daughter" of the printer and publisher Karl Frommann (1765-1837), whom German polymath Johann Goethe fell in love with in the winter of 1807 to 1808, and who it is said was the starting mold for the character of Ottilie of Goethe's 1809 physical chemistry based novella *Elective Affinities* (see: Goethe timeline), who, like Minna, is adopted niece of Charlotte's deceased best friend, and who, like Minna (who is dispatched away: "the marriage of her younger sister was seized as the occasion of getting her away from Jena, and the dangerous intimacy with Goethe"), is gotten rid of by sending her away to boarding school. [1]

Minna returned to Jenna as the betrothed wife of a young professor, whom however she did not marry. Not until 1821 did she become a wife—and, supposedly, a wretched one, according to Adolf Stahr, who first made public this strange story. [3]

Sonnets

The product the love affair was a cycle of seventeen sonnets written as a dual with Minna's other admirer, the romantic poet Zacharias Werner (1768-1823):

who seems to have been the character behind the architect character of the novella, who attempts to win the affections of Ottilie in competition with Eduard. [2] Sonnets occur in the novella as well. [1]

References

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2. (a) Goethe, Johann. (1971). *Elective Affinities* (translation and introduction by R.J. Hollingdale; chronology and further reading by David Deissner, 2005). Penguin.
(b) R.J. Hollingdale – Wikipedia.
(c) Carl Friedrich Ernst Frommann – Wikipedia.
(d) Zacharias Werner – Wikipedia.
3. Stahr, Adolf. (1870). "Goethe's Frauengestalten" 3te Auflage, ii, 261 seq.

In religio-mythology, **miracle** is a purported to have occurred event, happening, or thing said to taken place in reality by unnatural or supernatural means, generally via some type of divine power (e.g. higher power), not explicable by the science.

Overview

In the 17th century, some geniuses, such as Benedict Spinoza, denied miracles, while others, e.g. Robert Boyle and Isaac Newton, remained undecided about miracles; the latter attempting to discuss them scientifically, generally via ontic opening like means. [1]

In 1903, Edwin Slosson, in his "The Chemistry of the Greatest Miracle in the Bible", attempted to describe the Biblical creation of man statement, i.e. Genesis 2:7: "and god formed man out of the dust of the ground" — which, as Slosson seems to have been unaware, is but a Christian re-write of the Egyptian clay creation myth — in modern atomic turnover rate terms, albeit themed in terms of "chemical miracles", so to say, in respect to the so-called "nonliving" to "living" transformation of the atoms into moving animated humans; he states, e.g., that "each one of us was created out of the dust of the earth, not thousands of years ago, but within the last few years." [2]

Polls | Modern

Recent polls (2010) found that nearly 80% of Americans believe in miracles (Ñº); which varies depending upon specific miracle, e.g. only 57% believe (2013) in the so-called miracle of the virgin birth, and 65% believe in resurrection (Ñº), to cite two examples.

Quotes

The following are related quotes:

> "A **miracle** is an operation by which the laws of nature, which depend on the order and the preservation of the universe, are suspended."
>
> — Johann Buddeus (c.1710), *Treatise on Atheism* (pg. 140) [4]

> "Modern thought points to nothing so certainly as the universality of change. We stand on a whirling ball, every atom and molecule of which is in perpetual movement. Individually, we are aware of being different men and women every day of our lives; the life of the world has undergone such a transformation even during our own generation that an unmoved character-basis of society is incomprehensible, a **miracle** in a realm of law—and what an evil miracle."
>
> — George Perris (1911), *A Short History of War and Peace* [3]

See also

â— Atheism types by denial and belief

References

1. (a) Harrison, Peter. (1995). "Newtonian Science, Miracles, and the Laws of Nature" (abs) (pdf), *Journal of the History of Ideas*, 56:531-53, Oct.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 327). HarperOne.
2. Slosson, Edwin E. (1903). "The Chemistry of the Greatest Miracle in the Bible", *The Independent*, 55:1454-61.
3. (a) Perris, George. (1911). *A Short History of War and Peace* (§1: The Human Swarm; molecule, pg. 7-8). H. Holt and Co.
(b) Snow, Alpheus Henry. (1913). "Book Review: *A Short History of War and Peace* by G. H. Perris." *The American*

Journal of International Law, 7: 427-29.
4. d'Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (pg. 262). J.P. Mendum, 1889.

External links

â— Miracle – Wikipedia.

θΔics

In hmolscience, **Mircea Gligor** (1963-2015) was a Romanian physicist noted his 2001 article "Econophysics: a New Field for Statistical Physics", co-written with Romanian physicist Margareta Ignat, wherein they cite thinkers such as Ettore Majorana on quantum socioeconomics, Thomas Lux on stock market crashes and statistical physics phase transitions, Dietrich Stauffer, on the Columbus-like rediscovery of econophysics, among others, and more notably for his 2003 PhD dissertation "Thermodynamics and Statistical Models for Dissipative Socio-Economic Systems", supervised by Ignat (see: human thermodynamics dissertations). [1]

Sociophysics

Gligor, in his 2012 chapter "Statistical Physics Models for Group Decision Making", stated that he considered the following: Hermann Haken (*Advanced* Synergetics, 1983), Elliott Montroll ("On the Dynamics and Evolution of Some Sociotechnical Systems", 1987), and Serge Galam ("Majority Rules, Hierarchical Structure and Democratic Totalitarianism: a Statistical Approach", 1986) to be three "remarkable works" of pre-21th century sociophysics. [6]

Phase change

In 2001, Gligor and Romanian physicist Margareta Ignat, in their "Econophysics: a New Field for Statistical Physics", argue that the 19 Oct 1987 "Black Monday" stock market crash, measured by the Dow Jones average, below left, corresponds to a type of lambda phase change, such as for instance measured by the specific heat of helium versus temperature as it changes from superfluid helium He(II) to ordinary viscous helium He(I) suddenly past the peak or lambda point:

2 Daily evolution of Dow Jones General and Industrial Average Indices from 5 January to 31 December 1987: falls correspond to the crash of 19 October ('Black Monday')

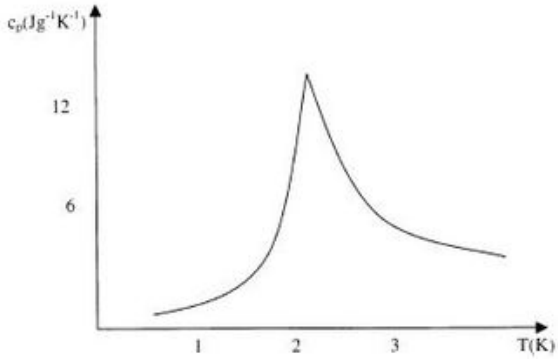

1 Specific heat of liquid ^{4}He as a function of temperature T at 0·227 MPa pressure. The region of liquid states for ^{4}He is divided by $T_c \cong 2{\cdot}2$ K into two subregions: ordinary (viscous) helium, or He(I), on the right, and superfluid helium, or He(II), on the left[39]

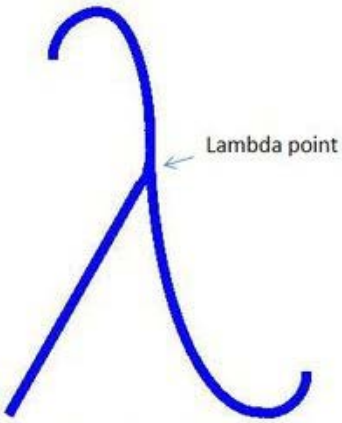

Lambda phase transition

Gligor and Romanian physicist Margareta Ignat argued, in 2001, that the 1987 stock market crash is a type of physical lambda phase transition that can be quantified or defined in some way as a second derivative of the Gibbs function. [2]

The comparison seems decent food for thought. The actual market crash phase transition model, however, seems to seems to have originated in 1998 work of Belgian physicist Marcel Ausloos, (pictured below), et al. [5]

Education

Gligor completed his BS in physics in 1986 at Babes-Bolyai University, Cluj-Napoca, Romania, focusing solid state physics, his MS in 1997, with a thesis on the thermodynamics of irreversible processes at Roman Voda National College, Roman, Romania, in 1997 became an associate researcher in econophysics at Alexandru loan Cuza University, lasi, Romania, and in 2003 completed his PhD with a dissertation on "Thermodynamics and Statistical Models for Dissipative Socio-Economic Systems", under the supervision of Romanian physicist Margareta Ignat, also at Alexandru loan Cuza University. In December 2003, he on the "Stefan Procopiu" award of Romanian Academy for his work in

Above: a 2012 photo of **Gligor** (left), with Dietrich Stauffer (University of Stuttgart) (middle), and Marcel Ausloos (University of Liege) (right), the latter of which in noted for a number of socioeconomic physics papers going back to 1998. [3] Right: **Gligor**, seated next to Ion Siman (front) on the occasion of the first international workshop EDEN - Exploratory Domains of Econophysics News - Pitesti, 2008 (see: EDEN/UPESW 2013). [4]

statistical physics and econophysics.

References

1. (a) Gligor, Mircea and Ignat, Margareta. (2001). "Econophysics: a New Field for Statistical Physics" (pdf), *Interdisciplinary Science Reviews*, 26(4):1-8.
(b) Gligor, Mircea. (2003). "Thermodynamics and Statistical Models for Dissipative Socio-Economic Systems", PhD thesis, advisor: Margareta Ignat.
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(b) Marcel Ausloos (papers) – Ideas.Repec.org.
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6. (a) Gligor, Mircea. (2012). "Statistical Physics Models for Group Decision Making", in: *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (editor: Gheorghe Savoiu) (§9, pgs. 131-48, statement, pg. 132). Academic Press.
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(c) Galam, Serge. (1986). "Majority Rules, Hierarchical Structure and Democratic Totalitarianism: a Statistical Approach" (abs), *Journal of Mathematical Psychology* 30:426-34.
(d) Montroll, Elliott W. (1987). "On the Dynamics and Evolution of Some Sociotechnical Systems" (abs) (pdf), *Bulletin of the American Mathematical Society*, 16:1-46.

Further reading

â— Gligor, Mircea and Ignat, Margareta. (2003). *Econophysics*. Romania.

External links

â— Mircea Gligor (about) – Adralex.ro.
â— Mircea Gligor – Microsoft Academic Search.

θΔics

In existographies, **Mirza Arshad Ali Beg** (1932-) (SNE:2) (EPD:11F) (DN:1) (CIR:15) (CR:202) is an Indian-born Pakistani organometallic chemist and physico-chemical sociologist noted for his 1987 book *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, wherein he presents the first general outline of "physicochemical sociology" (see: two cultures namesakes), a physicochemical humanities conceptualized subject, likening society to a chemical solution and explains human behavior in terms of physicochemical laws, using terms such as fugacity, lattice energy, activation energy, affinity (or chemical affinity), free energy, drive (internal force and external force) and driving force, both interpreted in terms of Abraham Maslow's hierarchy of needs, enthalpy (or heat of reaction), entropy, phase rule (phases, degrees of freedom, intensive variables, state), polarity, Coulomb forces, pressure (i.e. social pressure) and partial pressure (i.e. pressure at interface of social boundary), temperature (i.e. social temperature), equilibrium constants, etc., advanced concepts and principles, such as: Le Chatelier's principle, law of mass action (see also: Julius Davidson), human chemical reaction theory, activated complex, miscibility (see also: Jurgen Mimkes), etc., likening migration to evaporation of solution molecules at higher temperatures, social conflict to the generation of heat in solution, slums to the formation of coarse-grained solids, war to rapid boiling, etc., and seems to grasp at very-advanced concepts such as human chemical bonding theory (in a loose verbal sense) and human molecular orbital theory (e.g. via molecular orbital diagrams and transition states applied sociologically), all done with in-text citation to just three physical scientists: Willard Gibbs, Robert Boyle, Isaac Newton, and Robert Mayer, respectively. [1]

Name

The name "Mirza Beg", to clarify, is the two-name rule shorthand employed by Libb Thims (2014), in Hmolpedia, to classify Beg when his work was first discovered. Later, when Thims met Beg in person in Pakistan, in 2019, it was found that the name "Ar-shad" is the first name or "common name" that his family and friends call him, "Mirza" being his maiden name, and "Dr. Beg" as his colleagues refer to him. Beyond this, historically, Beg has been cited as: M.A.A. Beg (Google Scholar), M. Arshad Ali Beg (Beg, 1983), and Arshad Ali Beg (Jalibi, 1987). As Beg, as of Sep 2019, has been cited over 170 times as "Mirza Beg", and that family and friend stated that calling him "Mirza" as first name is fine, this Hmolpedia employed name will be the standard usage, herein.

Beg-Thims interview

See main: Beg-Thims interview

In the summer of 2019, Beg was interviewed by Libb Thims in Karachi, Pakistan; the following is an Apr 2019 Hmolpedia Reddit (Ñº) advert for the interview:

A 15 Sep 2019 photo of **Beg** and Libb Thims in Karachi, Pakistan, on the first day of their 5-day interview session.

The following are noted dialogued quotes from the interview:

> “Libb you are my amanuensis [?].”
>
> — Mirza Beg (2019), Interview dialogue (Sun, day initial); Sep 15

> “You see, de Lange believes what he wants to believe, namely that Gibbs energy as governor of social reactions is the 'spiritual component' of the energy of the father of Jesus, I believe what I believe, namely that Gibbs energy applied socially is the 'will of Allah', and you [Thims] believe whatever you want to believe, namely that you do not believe in god and that Gibbs energy applied socially is just a 'natural physico-chemical energy', yet all three of us have, in common, a belief in thermodynamics.”
>
> — Mirza Beg (2019), Interview dialogue (day 1); comment arisen following Thims explanation of the "beliefs" of Social Newtons existive (possibly a reflection of Beg, following a reading of "religion as a function of birthplace" article, Thims had sent Beg a few days earlier, in respect to the stance Thims would adhere to in respect to religions dialogue digressions), Sep 15

(add)

Bagh massacre

Beg, in his *New Dimensions* (pgs. 15-17) describes the 1919 Jallianwala Bagh massacre (Ñº) as an example of heating a liquid under pressure as follows:

> “The temperature of the liquid at the boiling point remains constant which is the same as that of the vapors. On further heating the kinetic energy of the particles [see: human particle] of the vapor is raised and the temperature of the system starts rising thereafter. The particles get highly energized as the temperature is raised and there is commotion and disorder of the highest degree. One might find such a process during commotions due to panic or disaster.

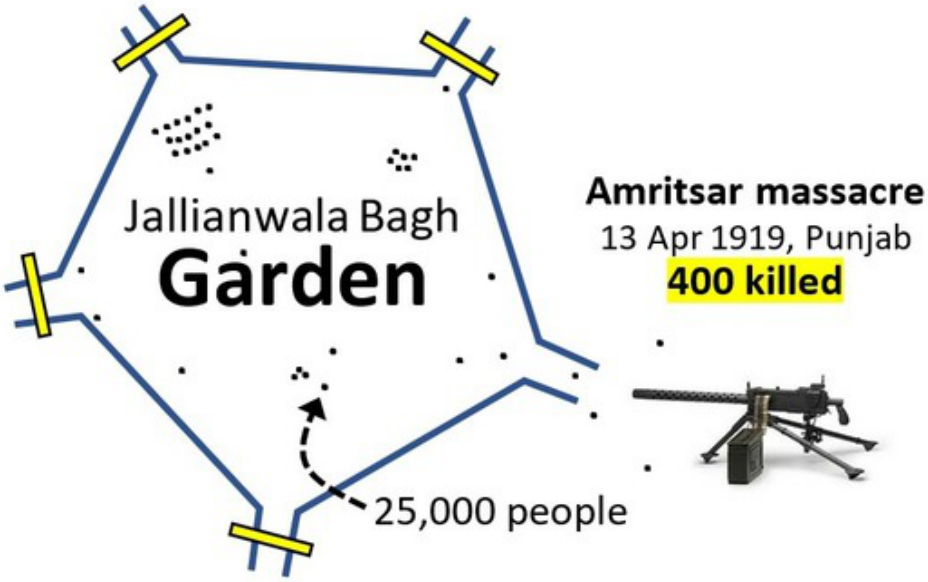

An illustration of the Jallianwala Bagh massacre (Ñº), which **Beg** describes as an example of heating a liquid under pressure, the Bagh garden shown with five entrances, four of which were blocked off, after 25,000 people entered, after which the British set up machine guns outside the fifth door, firing continuously on the door for 10 minutes, as people tried to escape, like evaporating gas particles, according to Beg.

An event which could describe the above processes and their relationship with human behaviour occurred at Jallianwala Bagh, Amritsar in 1919. The people of India. thought that by helping the British in winning the first World War [see: war] they deserved a treatment meted to other members of the Empire. However, the wartime restrictions on the Indians continued. Further repressive measures introduced by the rulers yielded a wave of opposition storms. **This situation is similar to subjecting the society to high pressure** [see: social pressure]**. The Indian society was still in the liquid state** [see: liquid society] **in that there was no unity of thought and not much of an order had been introduced into it**. The leaders were trying to unite the people or to crystallize the society by calling for meetings, strikes etc.

Protest meetings were being held all over India against the Rowlatt Act (Ñº) and when two leaders namely Mr. Satyapal and Dr. Saifuddin Kitchlew were deported from Amritsar, a protest strike was called to demonstrate unity of thought or that the process of crystallization had started. The 13th April was a Baisakhi day and **a 25,000 odd mixed crowd of Hindus, Muslims and Sikhs** had gathered at a not too spacious Bagh to celebrate the harvesting festival. Martial Law had already been imposed in Punjab and **the British were trying not to allow the Indians to crystallize and were increasing the pressure through military force**.

> The administrative control of Amritsar district was handed over to General Dyer. On the said day, he brought armed soldiers, positioned them on either side of the entrances and ordered them to fire without warning the crowd of his intentions. 1650 rounds were fired in 10 minutes to save India from a second mutiny.
>
> **The crowd which had hardly got to crystallizing stage had to evaporate** off for life. The 25,000 men surged outward but bullets were directed towards the four or five entrances. They tried to find all the possible outlets to escape, climbing up the walls, jumping down into wells, entering sewerage drains etc. **This serves as an example of heating a liquid pressure** and of human beings bursting out under great stress and scare of death through various openings, large or small. 400 persons were killed an 1200 were wounded on the spot. The remaining 23,000 odd left the ground within 10 minutes in the same manner as a low boiling liquid would evaporate off under high temperatures leaving behind residues which have no external pressure."

(add)

Human molecules | Reaction theory

Beg conceptualizes people, in societies, as human molecules in different possible states of societal existence, as follows: [1]

> "An individual in a society is like a drop in a glass of water or a molecule [H_2O] in a drop. One molecule cannot be identified from the other, yet there are scores of interacting forces on each molecule, in this case the smallest particle of water which is incapable of independent existence without these forces. The interacting forces are both attractive and repulsive. The smallest unit of a society, an individual, is incapable of independent existence by virtue of his being a social animal and there [being] a large number of interacting constraints on him."

Beg artistically conceptualizes human molecules in three different possible social states, each divided by social migration/immigration equilibrium-attaining two-way reaction arrows, as follows:

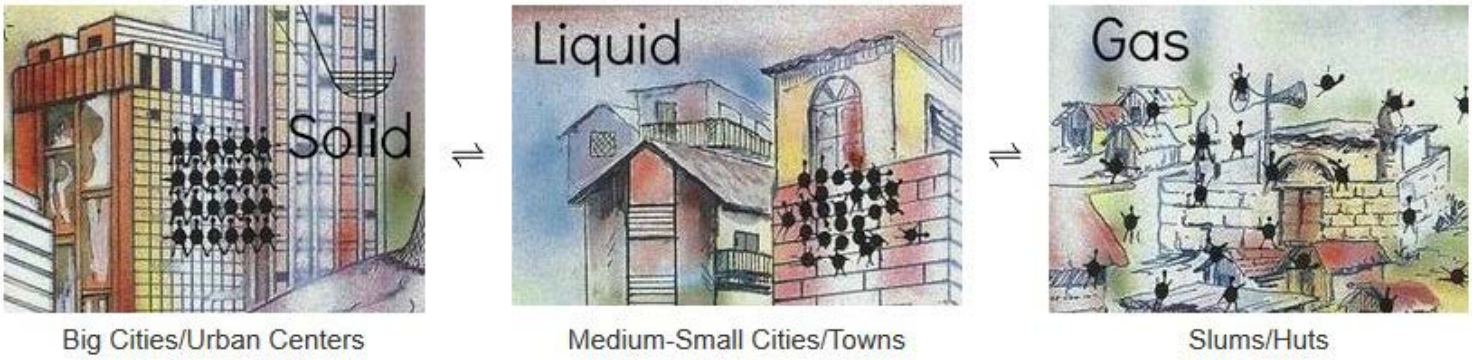

Beg, in his "one molecule cannot be identified from the other", in a society or solution (of water), to note, seems to touch on the seeming individuality problem, raised when human molecular theory is first introduced. This perspective, however, seems to be that followed in only the first four chapters; whereas, in chapter four "Human Interaction and the Socialization Process", he begins to treat human molecules individually, e.g. how past psychological states (e.g. birth order or sibling group size), of two potential friends, A and B, may affect later (adult) human chemical reactions processes (e.g. friendship bonding), such as the formation of "close friends denoted by AB formed according to reaction 4.1", which Beg denotes as follows:

$$A + B \rightleftharpoons AB$$

Beg goes on to elaborate, in his overall treatise, that these molecular humans can either be hermits (not part of any society), migrants (resulting from fugacity tendencies), or exist in fluid, gas, or solid like societies.

Human chemical bonding theory

In respect to discussions of human chemical bonding and or a theory of human chemical bonding (human chemical bonding theory), Beg states the following:

> "The equilibrium process suggests that A and B interact to establish the **A-B linkage** but the reverse process of remaining as individuals like A and B is also operative."

This mention of friendship formation as an "A-B linkage", seems to be one of the earliest (non-Goethe based) mentions of a potential theory discussion of human chemical bonding.

Overview | Abstract

The following is the very-interesting cover-flap abstract of Beg's 1987 *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*: [1]

> "This book presents an attempt to study human behavior through a physicochemical approach. It suggests a universality of phenomena; the attractive and repulsive forces, for example, are operative at atomic and molecular level as much as between celestial bodies. Since human behavior forms and integral part of the universe they should also be governed by the same set of forces and could be described by physicochemical laws. By weaving in events recorded in history into the fabric of physical phenomena and laws governing properties of chemicals and materials, the author has brought several analogies to the surface. Using the laws in physical chemistry he has tried to reduce the empiricism existing among quite a few aspects of human behavior. Some of the analogies of interest are: ideal solution and ideal society; internal pressure and migratory process; escaping tendency or fugacity and migration; stresses on crystals and on human systems; impurities in crystals and anti-social elements in societies; immiscibility and ethnic segregation; solution process and socialization; phase rule and associative interactions leading to merger of societies; driving force of a reaction and the spread of Islam and decline of societies; affinity and assimilation; interaction and socialization; loss of a degree of freedom and listening, marketing and leadership; polarization and munafaqat or mind-body split, etc.
>
> Societies have been compared in this book with solids, liquids, and gases. A highly disciplined society observing the desired norms and following the same set of laws is suggested to be like a crystal whose constituent atoms or ions are placed at fixed points and they are at the most stable energy level. These societies are to be found in posh urban localities. Societies putting less emphasis on the rule of law, abounding in exception and being indifferent to many of the norms, are like liquids which have no shape of their own but assume that of their container. Energetically they are metastable and are at a slightly higher level compared with solids. Then there are societies with very few norms, they have a behavior pattern similar to gases which also have no shape of their own. They can get aggregated into liquids on condensation. Their atoms or molecules are irregularly placed and or loosely held without cohesive force. This is analogous to the random placement of houses and or huts in slums. The title cover [adjacent] depicts just these three kinds of societies."

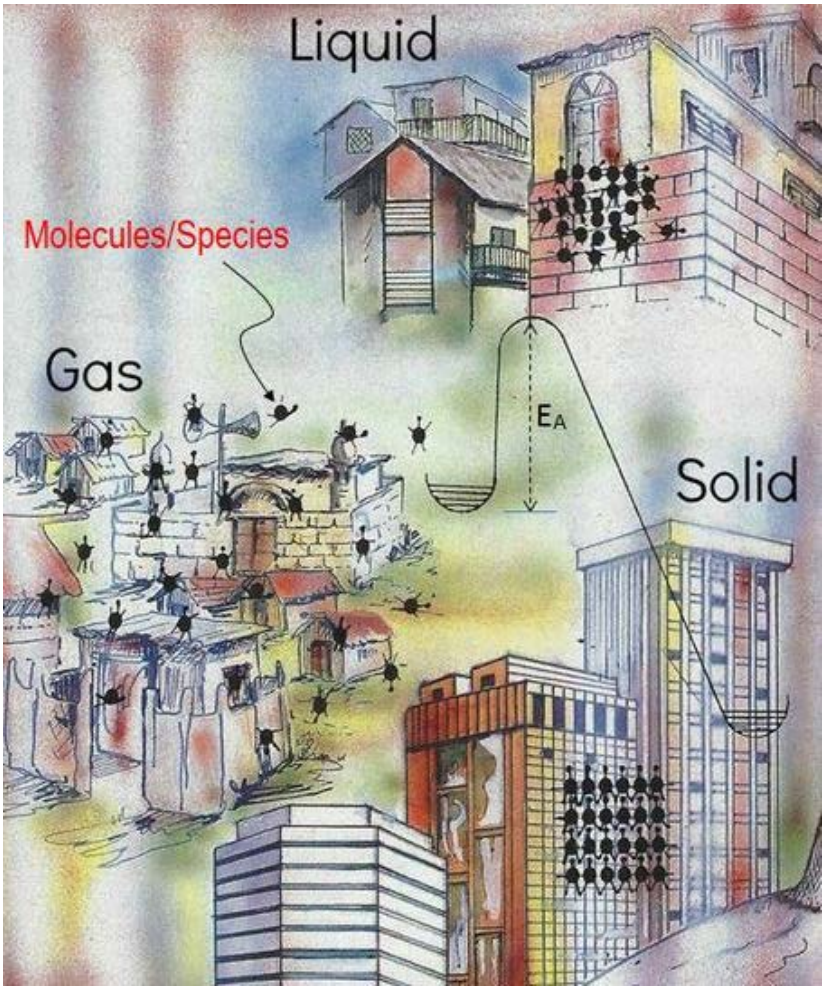

Labeled cover section of **Beg's** 1987 *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, showing slums, middle class, and big cities

(add)

Physicochemical sociology | Chronology

See main: Beg analysis

Beg started working on his physicochemical sociology

theory in 1974, a process of events which he explains as follows: [1]

conceptualized as states of gas, liquid, and solid social organizations; shown with some type of reaction coordinate, energy surface (or potential energy surface), and or activation energy initial state to final state diagram overlay, seemingly conceptualizing people as molecules in different states of ordering.

> "In 1974, I was nominated to attend an advanced training course at the National Institute of Public Administration, Karachi. As a chemist working on the fundamental aspects of coordination and organometallic chemistry, it seemed odd and totally unrelated to me. However, the first lecture by [management scientist] Ahmed Mumtaz was quite polarizing when he said that if the lectures during the following weeks could create a disturbance, even though slight, in the thinking of the participants, the objectives of the course would be attained and this led me to take the course with an open mind. I devoted quite a bit of my time to the course material picking up points related to chemistry and interpreting them in physico-chemical terms, wherever possible.
>
> **A peculiar feature of the course was that the lecturers were using terms like polarization, activation, potential energy, complexes, compounds, perhaps metaphorically and in an unrelated context. This compelled me to ask some of them if they were aware of the real sense of the terminologies which have actually been borrowed from chemistry or material sciences. As expected, they had no clue** to them and this prompted me to write a few notes, related physico-chemical terminologies to those of human behavior. I was encouraged in doing so by Dr. Ahsan Siddiqui, the then deputy director of the Institute, who thought it would be a valuable contribution to the field of sociology."

Beg continues:

> The above notes where mimeographed and they appeared as a booklet *Human Behaviour in Scientific Terminology* in 1976. Four papers were published out of this booklet in local journals. The response from the readers was very encouraging and in the light of the comments received it transpired that the pertinent data had to be put in urgently to provide a quantitative basis to the hypothesis."

These four articles, referred to above, are: "Human Behaviour in Scientific Terminology" (1979), "Human Behaviour in Scientific Terminology: Assimilation" (1980), "Human Behaviour in Scientific Terminology: Affinity, Free Energy Changes, Equilibria, and Human Behaviour" (1981), each published in *Pakistan Management Review*, along with a fourth 1982 article published in *Pakistan Marketing Review*. [8]

In 1983, interestingly, Beg published "Physico-Chemical Processes and Human Behaviour Part—IV: Muslim Society, its Formation & Decline", in *Science & Technology in the Islamic World*, an article that he does not cite nor mention in his 1987 book, in which he seems to water test some more questionable metaphysical ideas, one being his equation 12(a) for total spiritual activity, shown below: [10]

$$\text{Total Spiritual Activity} = (N)^{2.22} \;/\; [\,1 + (\frac{N}{2{,}450})^{2.22}\,]$$

The finalized book (1987), to note, does not contain this equation and is largely free from these types of "direct" metaphysical religio-mythology type assertions and or calculations; although not completely. One subtle example, discussed below, being how Beg jumps from Newton, in his 1701 descriptions of chemical affinity, referring to the reaction of sulphuric acid and copper as being the attraction of the "spirit" by the fixed bodies (pg. 95), to affinity of individuals and societies being concerned more with "material and spiritual gains" (pg. 96); another example being how in discussions of the whys of "learning", explained in the context of activation energy diagrams, free energy, and activated complex formation, etc., he inserts the sentence: "if the conflicts are gracefully overcome, one is blessed with success" (pg. 190). While this style of presentation is much toned down, i.e. verbal mentions of spiritual gains, as compared to equations for spiritual activity, grace, and blessings, etc., the issue is still the same, namely: the premise of a molecule or chemical species, as Beg seems to conceptualize people, being "concerned with spiritual gains", or blessed (by god), etc., is something not recognized by physical chemistry.

Beg goes on to explain that the time lag in the decade plus jump from 1974 ideas and notes to 1976 booklet to 1979-1983 journal articles to 1987 book, resulted because "time had become scarce", owing to his scientifically demanding responsibilities and

assignments, but that into the mid-1980s he developed a heart disease which necessitated a long leave of complete rest, which in retrospect he refers to as a "blessing in disguise", being that it enabled him time to finish the book manuscript, get it reviewed, and published.

The follow is a 1987 photo of Beg, center, with Zia ul Haq (1924-1988) (Ñº), the president of Pakistan, at right, during the book launch of Beg's *New Dimensions in Sociology* who is seen reading some of the preface of Beg's book, along with Afshraf Tabini (1930-2009), the governor of Sindh, at left:

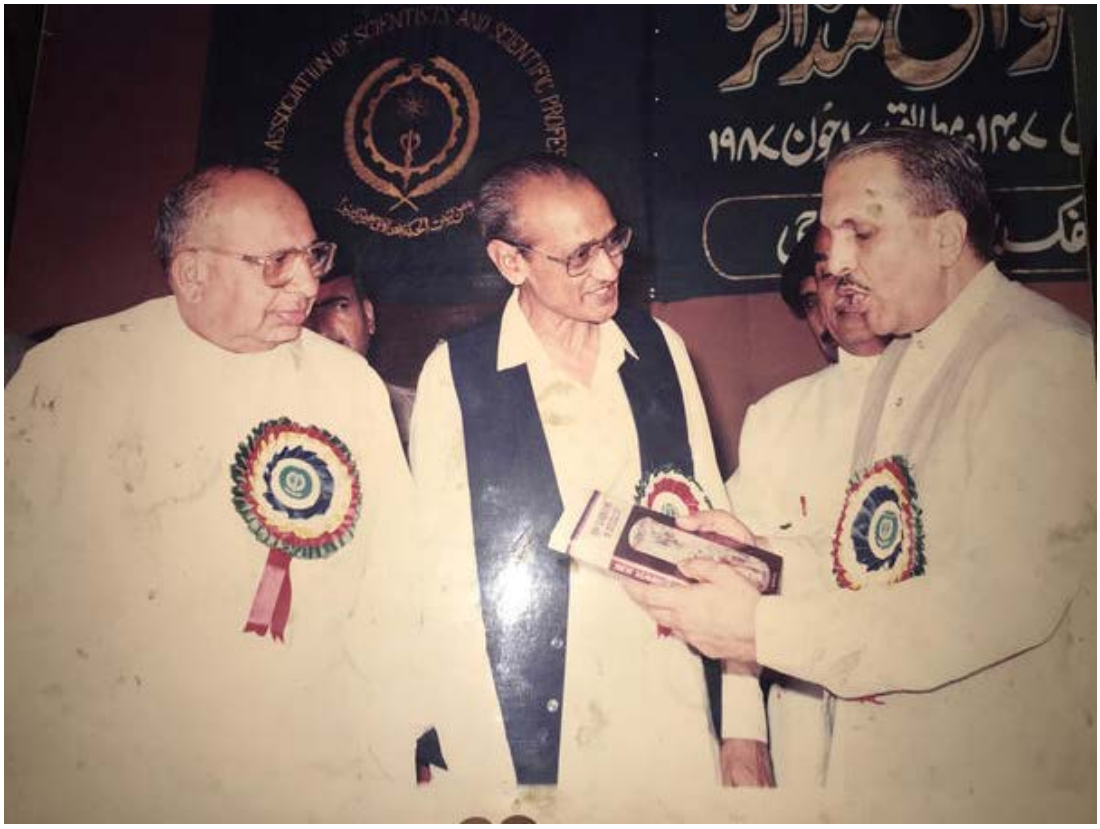

In 1999, Beg stated the following: [6]

> "Everafter the publication of my first book: *New Dimensions in Sociology, a Physicochemical Approach to Human Behavior*, friends and readers have been wondering why I should have deviated into dimensions of sociology."

In 2012, Beg stated the following: [7]

> "Writing to introduce *New Dimensions in Sociology through Physicochemical Approach to Human Behavior*, I had wondered as to why the degree of universality of occurrence and correlation of physical phenomena and physicochemical laws with social interactions has not been identified, although the identicalness of a large number of such natural phenomena is and has been well known."

In 2014, Beg, in his "Ideal Society, Socialization, and Social Pollution", referred to the ideas presented in his book as follows: [4]

> "*New dimensions in sociology: a Physicochemical Approach to Human Behaviour* provides an interpretation of human behavior in terms of physicochemical principles. It has picked up similarities in the behavior of molecules and particles on the one hand and of human beings on the other. Beg's hypothesis [is] that physicochemical laws hold for individuals in a society and the society just as much as for solutes, solvents and the solutions, i.e. in the system of the solutes having

been dissolved by solvents to give solutions.

An individual in a society is considered by the author like a drop in a glass of water or a molecule in a drop. One molecule cannot be identified from the other, yet there are scores of interacting forces on each molecule, in this case the smallest particle of water, which is incapable of independent existence without these forces. The interactive forces that bring about existence are a composite of both attractive and repulsive or positive and negative forces.

The smallest unit of a society is an individual who is incapable of independent existence by virtue of him or her being a social animal and there are a large number of interacting constraints on him. Some of these constraints that govern the process of socialization include the positive and negative forces like desires and fears. Societies have developed by interaction of individuals through physical and biological processes and their present status is complicated by such constraints as interbreeding, distribution and migration. The society grows with the number of like-minded persons all agreeing to live in the same environment and to be governed by the same type of initiating and sustaining forces of behavior."

(add)

Contents

The following is the table of contents: [1]

1. Human behaviour and physico-chemical laws.
2. Solutions and the society.
3. Assimilation.
4. Human interaction and the socialization process.
5. Affinity and socialization.
6. Polarizing forces and mind-body split or munafaqt.
7. Decline of societies and entropy changes.
8. Anti-bonding forces and motivation.
9. Environmental adjustment.

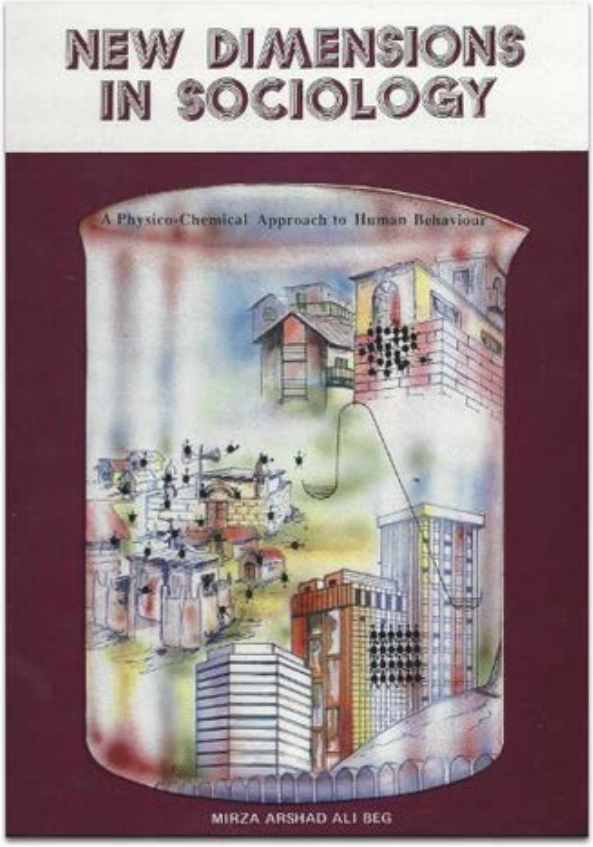

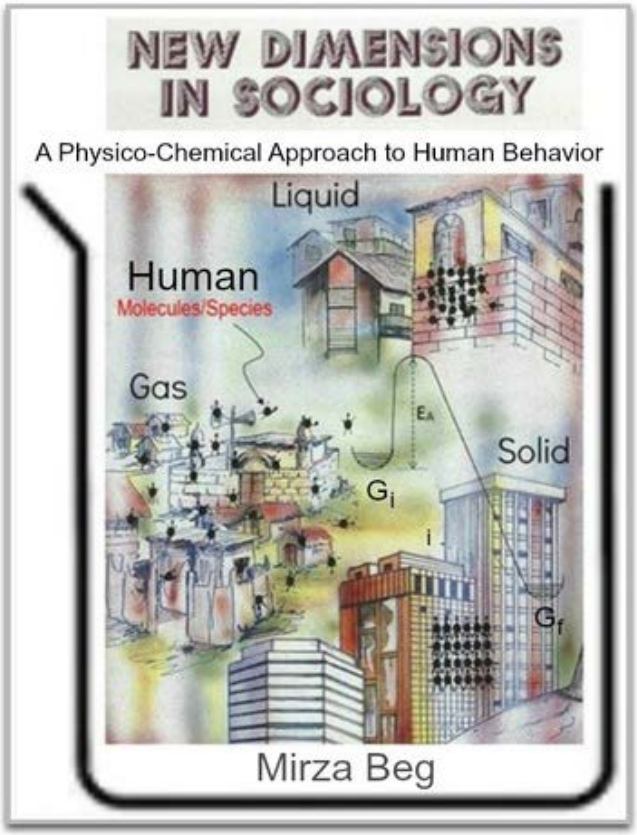

Left: original cover of **Beg's** 1987 *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, showing society conceptualized as a reaction beaker or test tube. [4] Right: a 2014 re-formatted cover, done by Thims, to accentuate the gist of Beg's message, as a general treatise on *Physicochemical Sociology*, first employed on the Napoleon Laplace anecdote page.

Beg, as outlined above, supposedly, explains social processes of assimilation, motivation, polarizing, force, decline, revolution, etc., via recourse to chemical affinity theory. [2]

Rahim | Review

In 1990, Pakistan scholar "Prof. Dr. S.A. Rahim", affiliated with the University of Karachi, then president of the Pakistan Philosophical Congress at Baragali, Peshawar, presented a paper entitled "The Ideal Society and the Ideal Solution", wherein he gives a critical, essentially anti-materialism, review of Beg's book. One interesting point of Rahim's critique, is his discussion of what he calls disanalogy: [2]

> “Another important question is of disanalogy between solution and society and how extensive it is. An important part of the significance of any concept is given by contrast, by showing the kind of things to which it does not apply. After drawing our attention to some positive analogy, the theorists generally fail to say something what the analogy is supposed to prove or suggest while they convey the impression that something's important has been proved or suggested.”

Rahim, interestingly, counters a number of Beg's physicochemical materialism positions via citation to James Jeans' 1943 *Physics and Philosophy*; one example being the following Jeans' quote: [5]

> “The whole intricate fabric of civilized life was a standing record of achievement, not by atoms pushed and pulled by blind purposeless forces, but by resolute minds working to pre-selected ends.”

(add)

Uncertainty principle | Difficulties

See main: Uncertainty principle does NOT apply to the position and momentum humans

In respect to scientific difficulties on theory, one salient difficult on theory is found in Beg’s preface, in which to appease seeming critics of his theory, he inserts the following ontic opening like loophole:

> “Human behavior and physico-chemical laws seem to be interrelated, but time and again it has been questioned whether the enormously complex processes of human behavior could have a scientific basis at all. The human organism has limited dimension and there are a number of actions and reactions taking place within as well as on it and **to all of these the Heisenberg's uncertainty principle applies**. Thus it is **apparently** beyond the range of predictive or reproducible science.”
>
> — Mirza Beg (1987), *New Dimensions in Sociology* (pg. vii)

Uncertainty principle

A cartoon humorously mocking the common practice of falsely thinking (see: ontic opening) that the uncertainty principle of Heisenberg applies to human affairs.

Here, of note, Beg mentions this supposition that the uncertainty principle "applies to" reactions between and within humans, in the context of some ideas on "reducing the degree of empiricism" of James Conant, who may have introduced the "Heisenberg applies to humans" ideology to Beg? Whatever the case, the uncertainty principle does not apply to humans per reason that human waves (see: human wave function) are much larger in wavelength than the wavelengths of light waves, and hence there is NO uncertainty in the measurement of human motions in the context of human chemical reactions or observations of positions of humans. The following quotes summarize the dismissal of the

> “The Heisenberg principle is irrelevant to ethical questions, particular the question of human freedom. For a concise and excellent discussion of the Heisenberg principle and its irrelevance to ethics, see: Lewis Beck’s 1952 *Philosophical Inquiry*.”
>
> — George Strodach (1963), “Introduction” to *Epicurus: the Art of Happiness* [14]

> “Even the existence among the laws of a principle of indeterminacy limiting the precision with which the future can be predicted does not permit entry of caprice into the world of the physical scientist. Within a calculable and frequently very narrow range of uncertainty, the future is completely determined by the past. Given the laws and the particles, all else follows inexorably.”
>
> — Dean Wooldridge (1968), *The Mechanical Man: the Physical Basis of Intelligent Life*

Lastly, the entire issue, eventually, was resolved by Steven Weinberg and his 1992 Scrooge Tiny Tim dialogue, wherein he dismissed

the entire issue as a false extension.

Difficulties | Religion

See: Religion as a function of birthplace

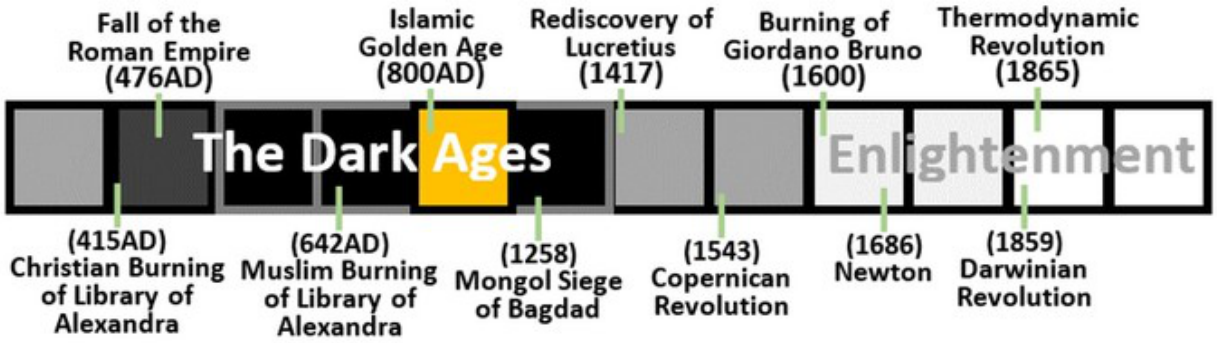

Beg, in his *New Dimensions in Sociology* (1987), like Mehdi Bazargan and his *Thermodynamics of Humans* (1956), attempts to grapple with a physicochemical thermodynamic interpretation of humans socially, in parallel with Islamic discussions found in the Quran, which brings to the fore a number of incompatibility issues, in respect to concepts such as: life, spirit, soul, and prayer, terms not recognized by modern chemistry and physics.

In respect to religious-bias "difficulties on theory", in the work of the Beg, is the salient issue of "religious theory ≠ physicochemical theory" incompatibility.

Beg, in religious belief, is DN:1, in that he states a belief in the existence of the god of Islam (Allah) and of his prophet Muhammad. In the 1987 preface to *New Dimensions*, to exemplify, Beg states:

> "We do find that the society **during the life time of the Prophet** [569-632] was an ideal society by definition of the laws of solution."

Beg, here, to clarify, is suppositioning that the period of the Islamic golden age (c.800-1258AD), which produced a number of number of middle ages geniuses, was an "ideal solution", after which it fell apart into a non-ideal solution like society or a gas-phase like society, or something along these lines.

Another point to note, is that whenever Beg mentions the name Muhammad, in his book, the abbreviation "b.p.u.h." notation, meaning "peace be upon him" (Ñº), used reoccurringly throughout the book, and that, in respect to physical chemistry, that while "peace" is something amenable to physicochemical humanities theory (e.g. social Aristotle-Mpemba effect, war thermodynamics, etc.), prayer is not something recognize by the modern physical sciences; the famous 2006 Heart patient prayer study, in fact, discredited the concept of prayer.

Beg, in short, believes in the existence of a mythological person named Muhammad (see: Muhammad never existed), the Islamic equivalent of the mythological figure of Jesus Christ, a supposed 65th generation (Ñº) descendent of Abraham—the central patriarch of Anunian theology (Ra theology)—who in turn is conceived as the 10th generation descendent of Noah, i.e. Nuh (in Islamic theology) or Nun or Nu (in Egyptian theology), who in turn is conceived as descendant from Adam (or "clay" in Hebrew), i.e. a named anthropomorphized rewrite of the Sumerian-Egyptian clay creation myth.

In any event, the first half of Beg's book, the Muhammad existence / prayer issue aside, is fairly cogent. On page 95, however, is where Beg's theory goes off the deep end. Firstly, Beg gives a well-honed history of chemical affinity theory, ending with the assertion that:

> "Isaac Newton, after the success with the gravitational forces, tried to interpret the chemical interactions in terms of gravitational attractions. In 1701, he described the reaction between sulphuric acid and copper or between iron and salt of tarter as the attraction of the spirit by the fixed bodies."

This, for the most part, is fairly cogent; Newton's famous 1718 "Query 31", e.g., is said to have launched the chemical revolution. The term "spirit", seen here, in these years, was more often than not, a synonym for "gas" or vapor. While Newton may have indeed had some type of religious conception to his chemistry discussions, the attraction of spirit by fixed bodies is largely an obsolete terminology (i.e. "spirit" is not something recognized in the physicochemical sciences). Beg, however, then cites the law of gravitation and Coulomb's law, as tentative means to estimate the affinities of chemicals, the jumps to the following:

> "Affinity in the case of individuals and societies would be concerned more with material and spiritual gains than mere likes and dislikes as suggested for material bodies possessing masses m_1 and m_2 and charges q_1 and q_2."

Here, in respect to the red flat term "spiritual gains", we see theory descending into absurdities, implying, per the extrapolate down approach, e.g., that hydrogen atoms have spiritual gains when they form H_20 molecules when reacting with oxygen atoms. Here the alternative methods of Arthur Schopenhauer (1844), in respect to electrical charges and human or chemical "will" come to mine here, as does the more religious-soaked "spiritual" human free energy theories of Adriaan de Lange (1982).

In 2012, to cite a similar example, in the dedication section of his *Life Processes: Health, Aging, and Disease*, Beg states: [7]

> "I dedicate the book to Hakim Mohammad Said Shaheed (Ñº), may Allah bless his soul for all the wonderful works that he initiated."

Beg's work seems to be presented in a society dominated by an Islamic belief system, albeit a culture surrounded and or embedded with Hinduism, Buddhism, and or Judaic belief system cultures. Beg, in this context, conceptualizes what he calls an "ideal society" on the model of an "ideal solution", stating somewhere along the line his belief that Muhammad was a real person, belief in the existence of god (Allah), belief in the existence of the soul, and that an "ideal society" was formed in Muhammad's life. Here, to note, we might compare the similar work of Mehdi Bazargan (*Thermodynamics of Humans*, 1956) who attempts to explain passages of the Qur'an in thermodynamic terms.

Hiddenness | Discovery

On 13 May 2014, Mirza Beg was discovered by Libb Thims, via key word Google search on term "physico-chemical sociology", therein becoming (Ñº) Hmolpedia article #3263.

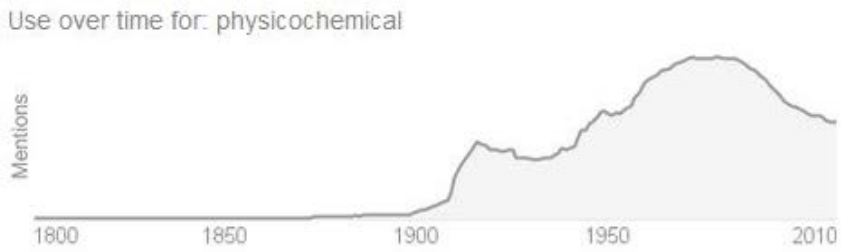

A Google-made term usage chronology for the term "physicochemical", which tended to be used in the years circa 1870s to 1930/70s, after which it was superseded by "physical chemistry"; although not completely (the unwieldy phrase "physical chemical", e.g., is inept in certain uses). This may help to illustrate why Beg's "physiochemical sociology" work remained hidden for so many years.

To digress, on this rather puzzling state of affairs, being that Thims has been actively searching for this type of derivation since 1995, it is rather curious that a sociology book specifically subtitled "a physico-chemical approach to human behavior", with a cover showing three different types of society, each conceived as different states of humans conceptualized as molecular aggregates, inside of a reaction beaker, with a potential energy diagram equation overlay stylized image, should not be known to a 3,000+ article *Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, not cited by anyone (specifically the known hmolscience scholars of the 3,262 hmolscience articles before him), and relatively unknown for so many years, 27-years to be specific?

On 29 May, Thims, in discussion with Jeff Tuhtan, communicated the following:

> "A book I would serious recommend, if you can get a copy of it, is **Mirza Beg's** 1987 *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, first 22 pages available at Academica.edu (Ñº), wherein he treats society as a type of liquid solution, humans as molecules, according to which such societies can change state to gas-like states (slums) or solid-like states (metropolises); he employs advanced concepts such fugacity, human chemical reaction theory, free energy, activation energy, among others. Only on page 25 so far, but I have a feeling, when digested, he will rank fairly high (in future retrospect) in the social Newton rankings."

On 30 May, Tuhtan responded: "Seems like his book should have popped up earlier, but is certainly promising that there is more out there to find..."

Possible reasons for his gap in discovery, to discuss, tentatively, seem to have to do with: (a) terminology usage, the phrase "physicochemical" being an early 20th century common term, which only recently became an Hmolpedia article (possibly a precipitate of the ubiquity of the two cultures namesake issue), following discovery of the very ripe Henry Adams 1908-1909 personal communication usages of the "physico-chemical" term (see five examples in his Hmolpedia article) and also notice of the "physicochemical sociology" term coining, via Pitirim Sorokin, a precipitate of the Harvard Pareto circle (out of irritation of Lawrence Henderson's socio-economic usage), (b) that Beg's book, as of 2014, is not scanned into Google Books, meaning that it is not key word searchable (findable), (c) that Beg seems to only recently (late 2013 - early 2014) begun to upload aspects of his

physicochemical sociology, the 1995 S.A. Rahim review in particular (Thims' link into his work), to the Internet, via Academia.edu specifically, and (d) that his 1987 book is only cited and discussed by a handful of Pakistani scholars (sociologists and philosophers), in a few journals and publications, up until about 1992, after which citation and discussion of his work drops off; his book, e.g., is not cited by anyone in Google Scholar. (Ñº)

Then again, on the other hand, to compare, it took Thims 11-years to discover (in 2006) the similar work of Goethe, who published over two-centuries ago? While some of this delay in recognition, obviously, may have much to do with belief system incompatibility issues, i.e. much of the 5,000-year old Anunian theology ingrained belief system (adhered to by over 75-percent of the modern world) has to be overthrown and replaced by a physicochemical belief system, some of this may have to do with the so-called genius hiatus effect, namely that in order to see and then accept the new belief system (or belief state), one has to first step out of (or be forced out of) the atypical fast lane of existence, as was the case for Beg, Thims, and Goethe, and given a window of free time think clearly and freely about the deeper questions, after having been trained in (or immersed oneself in) the physical sciences.

Although the Beg-find is relatively incomparable, semi-similar late finds include: Caspar Hakfoort (#3,238), who in 1998 nearly had an entire book finished on Wilhelm Ostwald and his social energetics, and the 1845 "Rankine love poem" (#3,086), the latter of which is extremely puzzling, in regards to hiddenness.

Family

Beg was the son of Indian Mirza Mohammad Ali Beg (1876-1943), a worker in the police force, who had eleven children: Mirza Beg (organometallic chemist, herein), Mirza Amjad Ali Beg, who became a noted economist, and a daughter who became a physician, and eight other daughters. In 1948, Beg, aged 15, left his mother, and migrated from India to Pakistan. In 1962, after completing his PhD, he married Ishrat Jabeen (1943-), with whom he had one son, Farukh Aamir Beg, and one daughter, Huma Tazeen.

Faizan Baig

The nephew of Beg, Mirza Faizan Baig [EPD:13], one of the son's Mirza Amjed Beg, was helped during the Beg-Thims interview (Sep 2019) and was also helping Beg with publication of a slated second edition of his book, and stated interest in career counseling applications of physicochemical sociology and or human chemical thermodynamics, to which Thims mentioned the: social cannon ball model (1868), speech of Henry Pritchett (1906), and the Buss sexual receptivity study (1993), the drive-thru paradox (1995), and also the individualism speech of Ibrhim al-Buleihi, in respect to Faizan's puzzle as to why Pakistan has so much potential in its young people but little will towards realization:

> "The individualism of the Arab has been erased in this society."
>
> — Ibrahim al-Buleihi (2010), Interview (Ñº) dialogue, Feb 26

This situation is similar to that in China, where communism or socialism has erased "individualism", instead situating the "good of the party" above that of the individual, at all costs. In this respect, the Pakistani realization situation is comparable to the "submission to Islam" in Pakistan dominating over that of individualism.

Education

Beg completed his BS in 1953 at D.J. College, in general chemistry, where he studied under Mumtaz Kazi, an organic chemist, who had recently completed his PhD King's College, London (1952/53), then his MS in 1955 at Karachi University, after which he worked at Dalmia Cement Factory until 1960.

How **Beg** lists (Ñº) his educational credentials at ResearchGate.net.

In 1961, Beg obtained his PhD in organometallic chemistry, with a dissertation on "The Chemistry of Some Trifluoremethylphosphines", on the topic of the affinities of electron donor complexes related to P(CF3)3, at the University of British Columbia, Vancouver, under professor Howard Charles Clark.

Beg then became a senior research officer at Pakistan Council of Scientific and Industrial Research (PCSIR), during which time, from 1961 to 1966, he took MS classes in inorganic chemistry at the University of Karachi, while working as a cooperative teacher in their chemistry department, after which he was a research associate at the University of Western Ontario, from 1970 to 1973. Beg retired from PCSIR in 1992. He has been working as independent researcher since. Beg worked in a number of positions until his retirement, publishing over 200 articles in the fields of chemistry, applied chemistry, leather, building material, and developed processes in agricultural and industrial chemistry. [3]

Quotes | Employed

The following are quotes employed by Beg:

> "I look upon amity and enmity as affections of intelligent beings and I have not yet found it explained by any, how those appetites can be placed in bodies inanimate and devoid of knowledge or of so much as sense."
>
> — Robert Boyle (1661), "personal note"; in *New Dimensions in Sociology* (pg. 95)

> "If the lectures, during the following weeks, create a **disturbance, even though slight, in the 'thinking' of the participants**, the objective of the course will be attained."
>
> — Ahmed Mumtaz (1974), "Advanced Training Course", National Institute of Public Administration, Karachi; in *New Dimensions in Sociology* (pg. vi)

Quotes | On

The following are notes of praise, tribute, and or commentary on Beg's work:

> "If it could stand the test of time, [**Beg's**] ideas, presented in [*New Dimensions in Sociology*] will rediscover new frontiers in sociology and will revolutionize the existing theories of human behavior as it has so far been propounded by philosophers. Beg's approach is a pioneering effort **his writing style is matter of fact** and demands adequate knowledge of physical chemistry [see: polymathy degree problem]."
>
> — Jameel Jalibi (1987), "Foreword by a Sociologist" [9]

> "**Beg** is a qualified, experienced research in chemistry. It is to his credit that in this book he has ventured far afield from his area of specialization. This book is a testimony to the fact that sociology is not, has not been, and must not be the exclusive domain of sociologists."
>
> — Anon (1989), Book Review: *New Dimensions in Sociology* in *The American Journal of Islamic Social Sciences* (Ñº)

> "**Beg** seems to have laid the foundation of a new interdisciplinary branch of knowledge in Pakistan which may be called 'socio-chemistry' or the chemistry of society."
>
> — S.A. Rahim (1990), "The Ideal Society and Ideal Solution" [2]

> "The advantages of [*New Dimensions*] are manifold."
>
> — Anon (1990), Book Review: *New Dimensions in Sociology* in *Pakistan & Gulf Economist* (Ñº)

> "I read the first forward and the author's forward of **Beg's** article. I scanned the full text, concentrating longer on the sections where you added comments. Then I read the communications thread. M. Beg makes some interesting observations about molecular 'behavior'. But when he extends the concept of 'behavior' to include following the teachings of a Prophet, I think he introduces confusion between natural law and religious customs/practices on the part of a particular society."
>
> — John Patrick (2015), commentary on Beg's 1987 *New Dimensions* and 2014 Beg-Thims dialogues [11]

Quotes | By

The following are noted quotes by Beg:

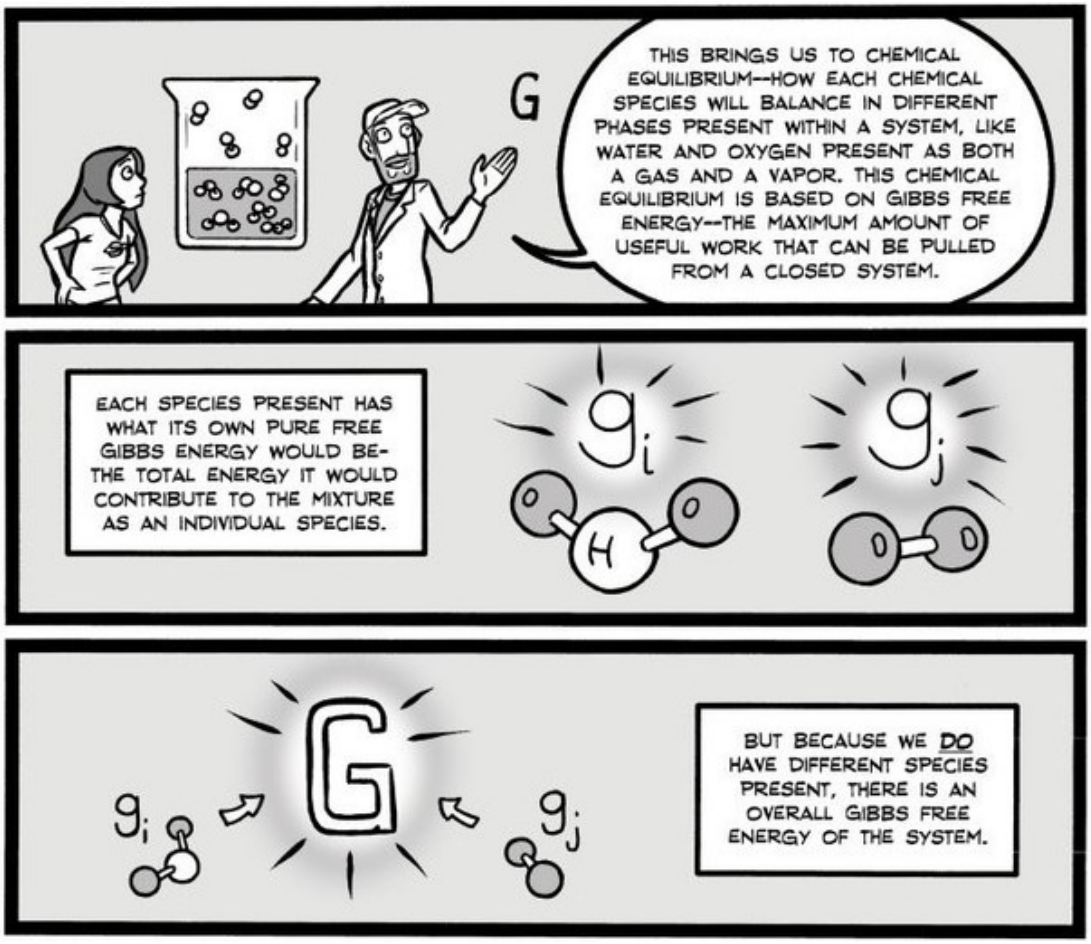

A segment of Gibbs free energy of each species, of a system of mixed chemical species, in respect to the Gibbs energy of the entire system, from a 10-page science cartoon on fugacity, by Lucas Landherr (2016), which exemplify much of the extrapolation of of ideas and concepts of **Beg's** overal thesis, namely that men and women in various social systems are akin go oxygen and water molecules in a beaker, and that the princples of physical chemistry apply to both types of chemical species, those in the laboratory beaker and those in the social beaker (see: social retort). [13]

"Quite a few natural phenomena are so well known that one wonders why the degree of universality of phenomena has not been identified out of the observations starting from the atomic and molecular level to the distribution of the celestial bodies. One can find a relation between the attractive and repulsive forces at the intermolecular level and the inter-stellar forces on the one hand and the likes and dislikes among the living beings, particularly the human species. One could qualitatively suggest that the latter are part of a universal system. **It should therefore, be possible to quantitate these observations by applying the laws of physico-chemical sciences to certain analogies in the society**. For example, the solvent could be considered as the main society and the emigrant a solute. Assimilation of the emigrant would depend on the nature of the main society as well as the migrant. The deviations in behaviour and acceptability of the latter can be predicted on the basis of the laws of solution."

— Mirza Beg (1987), *New Dimensions in Sociology* (pgs. viii-xi)

"Affinity of chemical substances was considered by Newton not to be exactly similar to those of the human beings but the empirical observations and the nature of attraction in the form of kinship were already well known during his times. There are scores of evidences which suggest that **human beings interact with one another because of the affinities they may or may not have for one another just like chemical substances**. Based on the concept of affinity it should be possible to suggest a mechanism for socialization of the human species."

— Mirza Beg (1987), *New Dimensions in Sociology* (pgs. viii-xi)

"The driving force of a reaction is another observation that could be related to the speed with which human interactions nucleate and either result in a revolution or in the domination of one faith over the other."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. ix)

"The likes and dislikes of living beings were compared with the chemical affinities of many compounds. It would appear that a parallelism between human behaviour and physico-chemical interaction has been felt for a long time **but the**

reverse does not seem to have attracted the attention of either the social scientists or the physicists and chemists, possibly **because of the compartmentalization** [see: doctrinaire departmentalism; hydraism; anti-interdisciplinarity; Herrick's Humpty Dumpty] of these branches of science into different faculties."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. 2)

"An interpretation of some of the physico-chemical laws like the behaviour of components in a solution, as governed by Raoult's law (Ñº) and Henry's law (Ñº) and the deviations from the ideal behaviour of solutions, is given herein; also, the occurrence of equilibria, free energy and the driving force and then the transition state complex formation are discussed in terms of human behaviour."

— Mirza Beg (1987), *New Dimensions in Sociology* (pgs. 2-3)

"If the study of **fugacity is applicable to the escaping tendency of a set of organisms** from a certain environment, it could be extended to the process of urbanization. It might be possible to calculate the rate of migration from the rural to the urban areas and later on, the rate of emigration from the country."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. 3)

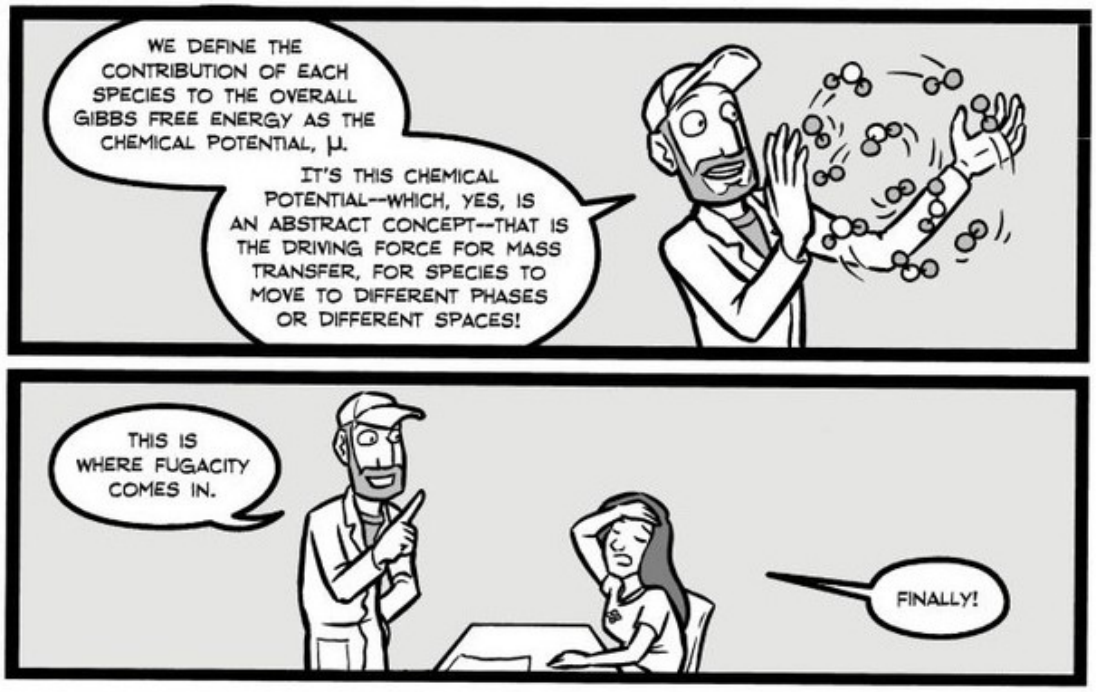

The first segment on **fugacity**, from a ten page science cartoon, by Lucas Landherr (2016), which **Beg** applies socially, as in the escaping tendency of a social organism to leave a social system. [13]

"Melting point of crystals is usually sharp and its sharpness characterizes purity. The energy added for melting introduces small regions of disorder into the crystal and destroys the regular arrangement; the irregularity so created rapidly spreads throughout the lattice. The amount of disorder allowed in a crystal is in a very limited region and **only when the limit has exceeded to the entire lattice that melting occurs. Similar forces are operative in a society**. It is not possible to introduce small regions of disorder in a well-balanced society without at the same time disturbing the total environment. The spread of an epidemic or scare of anti-social elements is contagious. The amount of disorder allowed to be absorbed in a society is also limited. When this limit is exceeded, the cohesive forces holding the components of the society together are weakened. It may be mentioned here that a highly ordered society resists many intrusions and does not yield to disruptive forces easily. On the other hand, a disordered society would have a low yield point and would be highly susceptible to attack from anti-social forces. The decay of the once highly cohesive Muslim society described later has been attributed to a disorderly arrangement existing in their fold and it could not withstand the onslaught of the European forces."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. 7)

"There are reactions of the combustibles with air. Certain metals easily burn in air but others form an oxide and allow burning with difficulty. Sand, lime and clay do not burn but phosphorus must be stored out of contact with air so that spontaneous fire is prevented. Analogous interactions in societies have been discussed in subsequent chapters, particularly the one on 'decline of societies'."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. 10); compare Ludwig Buchner (1855) on phosphorus (see: below).

> "Just as man and woman attract one another, so oxygen attracts hydrogen, and, in loving union with it, forms water, that mighty omnipresent element, without which no life nor thought would be possible. Likewise, potassium and phosphorus entertain such a violent passion for oxygen that even under water they burn—i.e. unite themselves with the beloved object."
>
> — Ludwig Buchner (c.1855), *Publication*; cited by Henry Finck (1887) in *Romantic Love and Beauty* (pgs. 6-7)

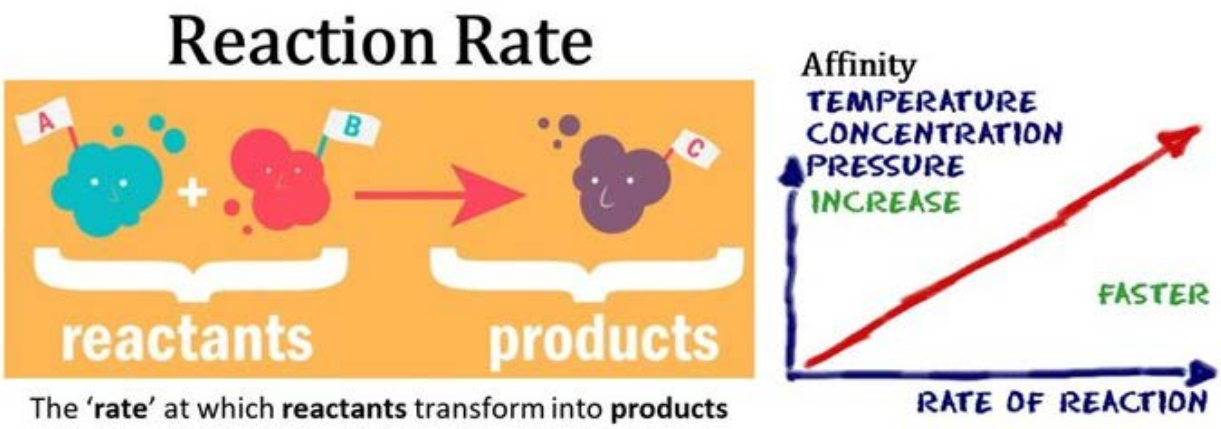

A general diagram of "reaction rate" (see: video), i.e. the speed at which a reaction occurs, which according to Beg, "depends primarily on the affinity which the reactants have for one another", which Beg says is a principle (see: human reaction rate) that applies to the speed of human chemical reactions.

"The certainty and rate of reaction **depends primarily on the affinity which the reactants have for one another**. The rusting of iron, burning of phosphorus and combination of hydrogen with chlorine with explosive violence on exposure to radiation are some examples of high affinity while the inertness of nitrogen and noble gases are cases of substances showing lack of affinity to react under ordinary conditions. **Individuals and societies, similarly have their affinities** [and hence reaction rates (see: human reaction rate) vary according to interpersonal chemical affinities] and this is the subject of the chapter [§5] on Affinity and Socialization."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. 10)

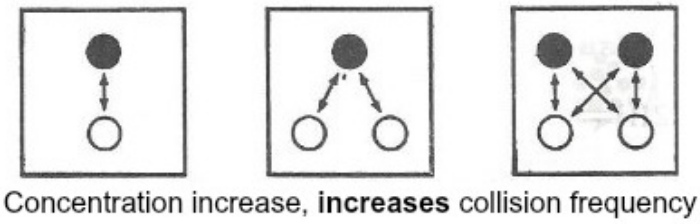

"The next factor which determines the reaction velocity is the concentration of the reactants. The rate of a chemical reaction is proportional to the molecular concentration of each of the reactants. The collision frequency [see: collision theory] of A and B, the two species responsible for formation of AB would depend on their number. If their number is doubled, their collision frequency and hence the rate of reaction would also be doubled. This aspect has been discussed in the chapter [§4] on Human Interaction and the Socialization Process."

— Mirza Beg (1987), *New Dimensions in Sociology* (pgs. 10-11)

"The rate of chemical reaction increases with an increase in temperature [see: social temperature] which determines the rate of molecular motion, the higher the temperature the higher the frequency with which molecules [see: human molecule] collide with each other. Temperature is a measure of the average kinetic energy of molecules and hence of the velocity with which they move. The molecular motion stirs up the molecules and prevents their close packing in their respective state viz solid, liquid or gas. **Accordingly, gaseous reactions are more facile than those in liquid or solid**

state. Social interaction among the highly disordered anti-social elements [see: human element] **who can easily be excited** can be considered similar to gaseous reactions [conjecture: high social temperature]; the law abiding average middle class reacts like the liquids while the well-ordered society behaves like crystalline solids."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. 11)

"A rise in temperature and a consequent stirring up of the molecules causes an increase in volume but if the volume [see: social volume] is fixed there is development of a force normal to the area of the body and is known as pressure [see: social pressure; lateral pressure]."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. 11)

"Chemical reactions between different states of matter take place at the boundary or interface of the systems. Stirring and shaking of immiscible substances brings fresh interfaces and reaction takes place by renewed contact. Unsociable persons do not usually interact but when they are faced with different situations in a group for a sufficiently long time, they do enter into dialogue."
— Mirza Beg (1987), *New Dimensions in Sociology* (pgs. 11-12)

Beg conjectures that some people have to be pressurized or forced to express their views openly in meetings in order to form products, the way lime and silica have to be forcefully ground together in order to form silicate of lime.

"Sometimes pressure as to be used to bring about reaction and the reactants may be inter-ground to bring in a change. Lime and silica for example do not form silicate unless heated together over 1200°C but **if the two are ground together** the silicate of lime is obtained. This is similar to a group discussion. Participants of meetings may tend to avoid expressing their point of view but when deliberately asked to do so, they are **pressurized to participate** and once the inhibition has been overcome, they keep speaking as and when they feel to do so."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. 12)

"**Non-availability of basic amenities in rural areas leans to a breakdown of their social environment. This process is comparable with that of the solids towards their melting point**. The rural population migrates towards the towns looking for work and even if they do not get an employment, they keep attached to them because of the attractions offered e.g. hospitals, cinemas, freedom from obligations to relatives and chiefs etc. The migrant to the urban center remains in a liquid state or becomes a part of the disorderly arrangement which is the only one available to him. He has no permanent employment or housing and other amenities and there is a general atmosphere of misery and unrest' for such persons. The **internal pressure of the villages** pushes the workers to a town to find work as domestic servants, clerks, messengers, etc. but if the conditions are equally bad in the towns, the worker keeps moving and may settle in a city or may migrate to a neighboring or else to an advanced country."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. 13)

"Evaporation seems comparable to migration e.g. of the flight of migratory birds as soon as the temperatures start rising in the tropics. People start leaving

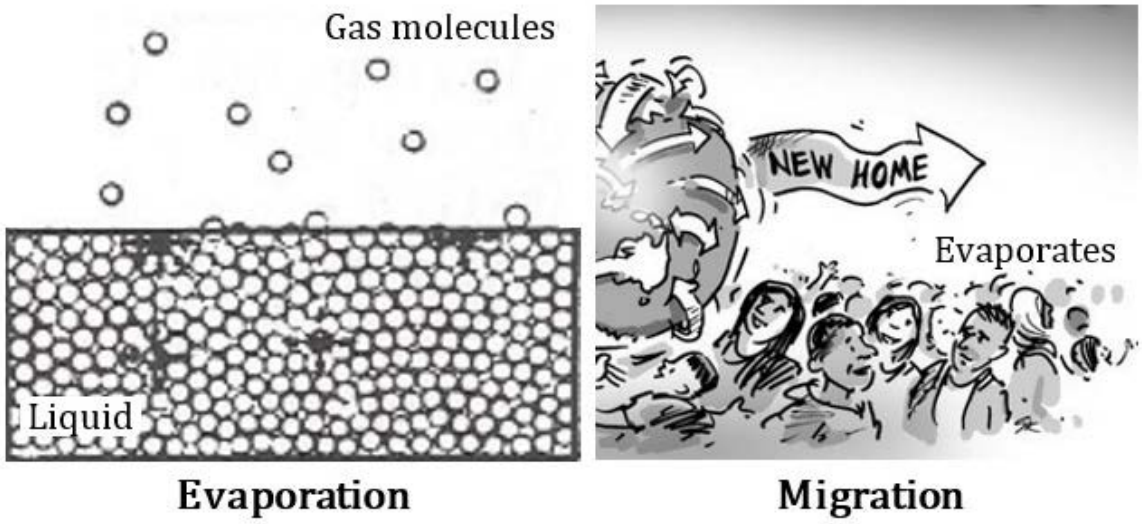

Refugges and migrants, according to Beg, can be compared to gas particles leaving a liquid system. This can be compared to the recent thermodynamic border theory crisis models of Nathaniel Umukoro (2016). [15]

their homes in case they are faced with epidemics, famine, floods or other calamities such as war. War and war like situations also initiate flight of population to secure areas. Such situations have surfaced up in Vietnam, Cambodia, Hungary and Afghanistan. Almost 2000 persons per day on an average are in flight from their homes. This can be termed as the evaporation rate of the concerned population. **There are a total of 11-million refugees or 'evaporates' on a global basis.** Some 15% of the population has vaporized from Afghanistan. The migratory process in the present context would comprise development of internal pressure in the above situations and having become much higher than external pressure, the traditional linkages with the home are in the first stage shaken to give a disordered state comparable with liquids. The liquid society vaporizes when its internal pressure builds up further and in the second stage there is exodus. **Exodus from ordered societies requires much higher input of energy as for crystals, compared with those which are less ordered like the liquids**."

— Mirza Beg (1987), *New Dimensions in Sociology* (pgs. 14-15)

"Physicochemical laws can be extended to a variety of human relations and interactions."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. 22)

"Mass migration can be viewed similar to boiling when the input of heat creates such intensive molecular motion that the molecules leave the system after changing to the vapor state."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. 35)

"Affinities and fugacities characterize the behavior of individuals in a society."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. 95)

"It is very difficult to have an ordered state in a heated atmosphere which results in separation of species."

— Mirza Beg (1987), *New Dimensions in Sociology* (pg. 135)

"Driving force of a [social] system is analogous to the energy which drives a chemical reaction to completion. It is, in chemistry, composed of two terms: the heat of reaction and entropy or disorderliness or randomness of the system."

— Mirza Beg (1999), *Social Pollution and Global Poor Governance* [6]

> "America has been a land of immigrants ever since the founding of the Republic. Though European in the beginning, in the last few decades, it has welcomed all, irrespective of color, ethnicity or religion. As Muslims, Islam enjoins us to be just and truthful, in thought, works and deeds; as well as be respectful of other religions while practicing the tenets of Islam. As Americans we cherish the constitution and the bill of rights. America is our home and our children's future. Democratic norms are embedded in Islamic heritage. The only way for a peaceful religion to flourish is in a democratic setting, without coercion. Freedom is a yearning of all human souls. The quest of centuries for equality and justice led to the realization, that the only guaranty of individual freedom is to guarantee freedom for all, within a constitutional framework. It culminated in the pluralistic American democracy."
>
> — Mirza Beg (2008), "America is Our Home" [12]

See also

â— Beg analysis
â— Beg-Thims dialogue

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(c) Beg, M. Arshad Ali. (1981). "Human Behaviour in Scientific Terminology: Affinity, Free Energy Changes, Equilibria, and Human Behaviour" (Ñº), *Pakistan Management Review*, 22(4):17-##.
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(b) Bilici, Muchahit. (2008). *Finding Mecca in America: How Islam is Becoming and American Religion* (pg. 116). University of Chicago Press.
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(b) Strodach, George. (1963). *Epicurus: the Art of Happiness* (Introduction, pgs. 71, 199). Penguin.
15. Umukoro, Nathaniel. (2016). "Thermodynamics: Application of its Principles to the Effects of Cross-Border Migration and Boko Haram Crisis on Security Challenges in Africa" (pdf) (abs), *Journal of Applied Security Research*, 11(1):44-60.

Further reading

â— Mahmood, Ilyas A. (1989). "Book Review: New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior" (Ñº) (pdf), *The American Journal of Islamic Social Sciences*, 6(1):155-59.
â— Beg, Mirza A.A. (c.2013). "Emergence of Life Forms in Thermodynamics and Islam" (Ñº), Academia.edu.
â— Thims, Libb. (2014). "Note on Beg's Physicochemical Sociology" (pdf), *Econophysics, Sociophysics and other Multidisciplinary Sciences Journal* (Ñº), No. 4.

Further reading

â— Beg, Mirza A.A. (2015). "Socio-Physico-Chemical Interpretation of Poverty, Class Structure and Social Pollution" (Ñº), Academia.edu, Oct 22.
â— Beg, Mirza. (2016). "Socio-Physicochemical Theory" (Ñº), submitted to Libb Thims, on Jun 22, in lieu of attendance, for

distribution at 7th BioPhysical Economics Meeting, Washington, DC, Jun 26-29.

External links

â— Mirza Arshad Ali Beg – Academia.edu.
â— Mirza Arshad Ali Beg (scientist) – Facebook.
â— Mirza Arshad Ali Beg – Facebook.
â— Mirza Arshad ali Beg – Twitter.
â— Mirza Arshad Ali Beg – Quora.
â— Beg, Mirza Arshad Ali – WorldCat Identities.

θΔics

In Hmolpedia, **misc articles (A-G)** is a file tree header page for articles, lacking categorization, that start with the letter A to G; view list in the adjacent navigation box.

θΔics

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In Hmolpedia, **misc articles (H-N)** is a file tree header page for articles, lacking categorization, that start with the letter H to N; view list in the adjacent navigation box.

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In Hmolpedia, **misc articles (O-Z)** is a file tree header page for articles, lacking categorization, that start with the letter O to Z; view list in the adjacent navigation box.

θΔics

In header pages, **Misc HTPS** is short for miscellaneous human thermodynamics pioneers, as listed in the adjacent drop menu.

θΔics

In genius studies, **IQ miscalculation** refers to an IQ calculated, generally via an IQ test, e.g. ratio IQ, Binet IQ, Terman IQ, Stanford-Binet IQ, Mega Test IQ, etc., often devised by a psychologist — which, to note, is one of the easiest college degrees (see: college degrees by intellectual difficulty) — that mistakenly determines that either one is a genius, who is not (see: inflated IQs), or that one is average or sub-average intellect, who is not (see: mislabeled geniuses and IQ tests). An IQ miscalculation, in some sense, is akin to a faulty physics calculation that miscalculates the trajectory of a comet or rocket launch or a erroneous chemistry calculation that miscalculates that a flammable material will not ignite, but yet in the end does indeed burn brilliantly (see: brightness).

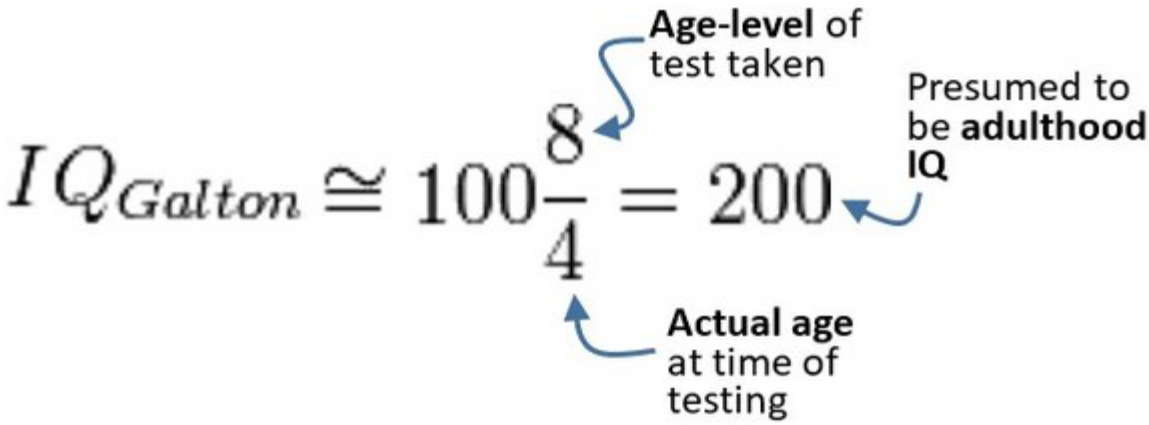

The details of the infamous 1917 **miscalculated IQ** of Francis Galton done by Lewis Terman, wherein, based on the fact that Galton at age 4 could multiply numbers two through eleven, read a little French, and memorized some Latin poetry, knew what the average 8 year old knew, say as testing standards indicate, that his IQ was 200.

Galton

In 1917, Lewis Terman, using his newly invented ratio IQ formula, infamously retrospectively calculated the IQ of Francis Galton, based on the following reported abilities:

> "I am four years old and I can read any English book. I can say all the Latin substantives and adjectives and active verbs besides fifty-two lines of Latin poetry. I can cast up any sum in addition and can multiply by 2, 3, 4, 6, 8, 9, 10, 11. I can also say the pence table. I read French a little and know the clock."

to have been, between the ages of 3 and 8, at the 200 level, some 60 points above genius level (140 or above). This infamous calculation was quickly passed along to the concluding effect that Galton, as a person or as an adult, generally speaking, had an IQ of 200. The erroneousness of this calculation, in the decades to follow, eventually came under attack; a few statements of which are as follows:

> "God alone knows how [Terman] estimated Galton's IQ as 200."
>
> — Peter Medawar (1977), "Unnatural Science" [2]

> "I point out that Sir Francis was taken quite seriously as a leading intellect of his time. The American hereditarian Lewis Terman, the man most responsible for instituting IQ tests in America, retrospectively calculated Gallon's IQ at above 200, but accorded only 135 to Darwin and a mere 100-110 to Copernicus (see pp. 213-218 on this **ludicrous incident in the history of mental testing**). Darwin, who approached hereditarian arguments with strong suspicion, wrote after reading *Hereditary Genius*: 'You have made a convert of an opponent in one sense, for I have always maintained that, excepting fools, men did not differ much in intellect, only in zeal and hard work"' (in Galton, 1909, p. 290). Galton responded: 'The rejoinder that might be made to his remark about hard work, is that character, including the aptitude for work, is heritable like every other faculty'."
>
> — Stephen Gould (1980), *The Mismeasure of Man* (pg. #)

In retrospect, we know that Galton did not have an IQ of 200 and that he may not even have been at genius level. Take his claimed to fame book *Hereditary Genius*, wherein he claims that genius is inherited. Among the top 1000 geniuses, only a rare few families have produced confluences of geniuses, indicated by having two or more geniuses ranked in the top 1000, specifically the Bernoulli family: Jacob Bernoulli, Johann Bernoulli, and Daniel Bernoulli, (see: Bernoulli genealogy); Pliny the Younger and Pliny the elder; and the Godwins: William Godwin, Mary Wollstonecraft, and Mary Shelley. Genius, generally speaking, is not inherited. In fact, there tends to be an inverse ratio, in respect to the higher one goes up the genius scale, and how much genius ability is passed on to one's descendants (see: genius and bachelorhood). Hence, it was not such a genius hypothesis of Galton to make that genius is inherited.

In any event, Galton's IQ estimation, historically, has become one of the more famous IQ miscalculations, comparable to Henri Poincare being judged an imbecile (IQ:35) by Alfred Binet, on the Binet IQ scale; William Shockley, the main person behind the invention of the semi-conductor, in 1918 at age 8 scoring 129 on Terman's IQ test; John Kennedy scoring 119 on the Otis Intelligence Test; Richard Feynman scoring 125 on Terman's IQ test; or Ayaan Ali doing poorly in her Netherlands IQ test.

Quotes

The following are related quotes:

> "Lestrade (Ñº) to be let loose on such a study is exactly as pathetic as for a subnormal waitress in the IQ of 90 range to try to measure the intellectual differences in college students."
>
> — John Platt (1962), "The Coming Generation of Genius" (pg. 73)

> "Funny how I could not qualify for Terman's gifted study (1918), yet still win a Nobel Prize (1959) in physics."
>
> — William Shockley (c.1970), "joke often said in later years"; cited by Joel Shurkin (2006) in *Broken Genius* (pg. 13)

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External links

â— Was Francis Galton's IQ really 200? (2016) – Quora.

θΔics

In genius studies, **mislabeled geniuses and IQ tests** refers to the oftentimes paradoxical or in some cases inverse relationship amid famous geniuses who performed poorly or at mediocre or average level on intelligence tests, failed entrance exams, flunked grades, etc., and thereby were labeled as imbeciles, dunces, retarted, mentally inept or slow.

Those who many consider the three greatest scientific minds of all time, namely: Newton, Maxwell, and Einstein, to cite a commonly discussed example, were all viewed as 'dunces' in childhood, but in historical retrospect resulted to be great geniuses. [1]

Shown below, ordered by date of synthesis (birth), are some of the more famous examples amid the top 1000 geniuses to have been labeled or mis-labeled as non-geniuses in youth:

Many of the greatest geniuses, such as Newton, Maxwell, and Einstein—were all viewed as 'dunces' in childhood were labeled and or considered, by teachers, parent, or themselves, as dunces in childhood. [1] As Thomas Edison stated himself, on his experience at Port Huron school: [5]

> "I used never to be able to get along at school. I don't know what it was, but I was always at the foot of the class. I used to feel that the teachers never sympathized with me and that my father thought I was stupid, and at last I almost decided that I really must be a **dunce**."

It seems to be an "inverse genius relationship phenomenon" of sorts.

Copernicus

Polish astronomer and general polymath Nicolaus Copernicus (1473-1543), whose *On the Revolution of the Heavenly Spheres* initiated the scientific revolution, was, supposedly, assigned by Lewis Terman, the inventor of the IQ scale, with an IQ of 100 to 110, i.e. just above average in intellect?

> "The American hereditarian Lewis Terman, the man most responsible for instituting IQ tests in America, retrospectively calculated Gallon's IQ at above 200, but accorded only 135 to Darwin and **a mere 100-110 to Copernicus (see pp. 213-218 on this ludicrous incident in the history of mental testing**). Darwin, who approached hereditarian arguments with strong suspicion, wrote after reading *Hereditary Genius*: 'You have made a convert of an opponent in one sense, for I have always maintained that, excepting fools, men did not differ much in intellect, only in zeal and hard work' (in Galton, 1909, p. 290). Galton responded: 'The rejoinder that might be made to his remark about hard work, is that character, including the aptitude for work, is heritable like every other faculty'."
>
> — Stephen Gould (2006), *The Mismeasure of Man* [6]

Newton

English physicist Isaac Newton (1642-1727), supposedly, did poorly in grade school. [3]

Tolstoy | Flunked college

Russian existentialism writer Leo Tolstoy (1829-1910), noted human particle theorists, presently ranked as a top 25 greatest literary author ever, flunked out of college. [3]

Edison

American inventor Thomas Edison (1847-1931), as a boy, was told by his teachers that he was too stupid to learn anything. [3]

Poincare | IQ:35 [?]
French physicist Henri Poincare (1854-1912) famously so poorly on the Binet IQ that he was judged an imbecile (IQ=35); although we now rank him at IQ=195.

Churchill
British politician and Nobel laureate Winston Churchill (1874-1965) failed sixth grade. [3]

Einstein
Albert Einstein (1879-1955), supposedly, was three or four years old before he could speak and seven before he could read—he was born with a misshapen head: as a result, his parents feared he was mentally retarded; he so withdrawn or "set outside the group" that one governess nicknamed him ‘Father Bore’. Einstein latter attempted to skip high school by taking an entrance exam to the Swiss Polytechnic, a top technical university, but famously *failed* the art portion.

Pauling
American chemist Linus Pauling (1901-1994) who we now rank, in retrospect, at IQ=190, notably, *failed* to take some required American history courses and did not qualify for his high school diploma. The school awarded him the diploma 45-years later only after he had won two Nobel Prizes.

Disney
American illustrator turned movie mogul Walt Disney (1901-1966) (IQ_B=123) was fired as a newspaper editor because, supposedly, he had “no good ideas”. [3]

Shockley
American electronics physicist William Shockley (1910-1989), known to some as the “creator of the electronic age”, whose semi-conductor work and short-lived semiconductor laboratory (Q) became the vicarious epicenter of Silicon Valley, as a youth, was one of the hundreds of children in Palo Alto, San Francisco, and Los Angeles, that psychologist Lewis Terman, in 1916, began testing for entrance into his gifted program, a score of 135 or above—Terman’s delineation of genius level cutoff—needed for entrance. William took Terman’s IQ test twice, scoring 129 at age 8 and 125 at age nine, thereby failing to make the cut for entrance into Terman’s genius program. William, in later years, would often joke on the irony about how he could not qualify for Terman’s 1921 gifted study, yet could still win a Nobel Prize in physics. [2]

Alvarez
In c.1921, Luis Alvarez (1911-1988), age 10, failed to gain entrance to the Terman gifted study, meaning his IQ was tested at 134 or below, but went on to win a Noble Prize in physics for his work in particle physics, and to become famous for his "asteroid impact extinction theory".

Feynman | IQ:123?
American physicist Richard Feynman (1918-1988), one of the greatest geniuses of the last century, as a kid, according to his sister Joan, was tested with an IQ score of 123, i.e. below genius level—or as reported by biographer James Gleick, in high school his IQ was determined to be 125. [4]

Ali
In 1992, Ayaan Ali sought political asylum in the Netherlands and in 1997 citizenship, during which time she took an IQ test; retrospect comments on her score are as follows:

> “I point out that **Ayaan Hirsi Ali** was given an IQ test in the Netherlands and did very poorly. Yet, it’s hard to imagine someone brighter.”
>
> — Jason Richwine (2008), panel, at the American Enterprise Group, discussing (Q) new book by Mark Krikorian, director of Center for Immigration Studies

In 2017, Ali was RGM ranked as 521st greatest mind of all time out of 1,500+ historical names.

Thims

American electrochemical engineer Libb Thims, cited by popular vote (2012) as having the "highest IQ ever", among other frequent genius, polymath, oracle (or prophet), etc., citations and or queries (see: Thims genius ranking), main curator of the only subject common to IQ: 225+ cited scholars, namely human chemical thermodynamics, scholars notably "flunked" second grade (made to retake the entire year), owing to teacher reports that he was "bored in class", and thereafter stayed at or below average level, until the point of high school graduation (age 19). At one point, sometime between age 12 and 17, the entire school was made to take the state mandated ACT test, during which time Thims started answering some of the questions, but after a certain point, just started filling in all the columns with the same answer, e.g. a, a, a, a, b, b, b, b, c, c, c, c, etc., just be done with the test, and generally per reason that he really didn't care, resultantly scoring 19, which correlates to an IQ of 97. [7]

See also

- Feynman (2014) – Hmolpedia thread.
- Paper IQ

References

1. Pickover, Clifford. (1998). *Strange Brains and Genius: the Secret Lives of Eccentric Scientist and Madmen*. New York: Quill.
2. Shurkin, Joel N. (2006). *Broken Genius: the Rise and Fall of William Shockley, Creator of the Electronic Age* (pg. 13). Palgrave MacMillan.
3. Characteristics and Behaviors of the Gifted (flunk section) – RI.net.
4. Gleick, James. (1992). *Genius: The Life and Science of Richard Feynman* (IQ:125). Pantheon Books.
5. Gelb, Michael and Caldicott, Sarah M. (2007). *Innovate Like Edison: the Success System of America's Greatest Inventor* (pg. 59). Penguin.
6. Gould, Stephen. (2006). *The Mismeasure of Man* (pg. #). Publisher.
7. SAT, ACT, and IQ – HomeOFBob.com.

θΔics

In thermodynamics schools, **MIT school of thermodynamics** or *Keenan school of thermodynamics* are centered around the publications of American mechanical engineer Joseph Keenan and Hungarian-born American physicist László Tisza, professors at the Massachusetts Institute of Technology (MIT). As one 1963 article starts out: [3]

> "The paper is most profitably read with a background of study of other writings attributable to Professor **Keenan** and his well-known **school of thermodynamics**."

The science of quantum thermodynamics was first outlined by Tisza, while at MIT.

Overview

Between 1834 and 1961, American Joseph Keenan was a professor and later head of the department of mechanical engineering at the Massachusetts Institute of Technology (MIT), and while there he established what has been come to be known as the "Keenan School of Thermodynamics". [1] Keenan is known for his calculation of steam tables, research in jet-rocket propulsion, and his work in furthering the understanding of the laws of thermodynamics. His classic 1941 textbook *Thermodynamics* served as a fundamental teaching tool in various engineering curricula during the 1940s and 1950s. Keenan brought to the mechanical engineering profession the fundamental work of Willard Gibbs.

The faculty of MIT, during the summer session of 1953, under the guidance of Keenan, organized a Rumford summer school of thermodynamics in celebration of Count Rumford (Benjamin Thomson) Bicentennial: During Summer Session 1953, from Monday, June 29, to Friday, July 10, Inclusive. [2]
Notables associated this school include George Hatsopoulos and Gian Beretta, the latter of which states that he ran a "thermodynamics think tank" at MIT in the late 1990s. The website QuantumThermodynamics.org, run by Beretta, lists publications by members of the "Keenan school of thermodynamics".

Hungarian-born American physicist László Tisza, a physics professor at MIT from 1941 to 1973, with his 1966 textbook *Generalized Thermodynamics*, and his doctoral student Herbert Callen, and his 1985 *Thermodynamics and Introduction to Thermostatistics*, are both of the MIT school of thermodynamics.

American thermodynamicist Myron Tribus, noted for the coining of the terms "thermostatics" (1956) and "thermoeconomics" (1962), was the director for the Center for Advanced Engineering at MIT from 1974 to 1986.

References

1. Selected publications on Quantum Thermodynamics – Gian-Paolo Beretta.
2. By Rumford Summer School of Thermodynamics (Massachusetts Institute of Technology, Published by Massachusetts Institute of Technology, 1953.
3. Anon. (1963). "article" (quote, pg. 314). *Journal of Applied Mathematics*, Vol. 30.

θΔics

In human chemistry, **Mitch Garcia** (c.1981-) is an American nuclear chemist noted for []

Overview

In 2010, American electrochemical engineer Libb Thims posted a "should human chemistry be taught in school?" thread to ChemicalForums.com, the form that Garcia is the founder of, to get some water testing on how general chemists would "react" (no pun intended) to the premise of human chemistry, the study of the behaviors of human molecules, being taught in school (high school or college), such as advocated by Henry Adams in his 1910 "A Letter to American Teachers of History". The thread, however, was quickly locked by site administrator Marcin Borkowski a Polish analytical chemist. [1] Thims then messaged Garcia, the site creator, to see if this would be the policy of ChemistryForums (similar to Wikipedia) to ban any and all subject matter related to human chemistry, with the following message:

> "Mitch, you seem to be the curator of this site (which I just found yesterday). The topic I tend to post on is very controversial, namely the definition of a person as a molecule, and discussing how chemistry, thermodynamics, physics apply to this viewpoint. Historically people have been banned and or imprisoned for writing about this, over the last 230 years (see: human molecule (banned)). My first posting to this site on this topic was quickly thread locked (see: thread) and linked banned (by admin Borak, who considers the subject crackpot). Similarly, the following article was banned from Wikipedia (see: human molecule (Wikipedia)), by similar-minded admins, who commented that they wanted to "kill" the article. My question, subsequently, is that is open discussion of this subject not going to be allowed at chemical forums? The basic timeline of who's theorized on this subject is here (see: HMS pioneers). Thanks."

A message to which Mitch responded with:

> "Honestly, the idea seems pure crackpottery to me. Crackpots always seem to think they are victims of the "mainstream". They always seem to think no one is intelligent enough to understand their points. Oddly, they all also tend to write a lot in their internet postings. And unfortunately no matter how much we argue with the crackpots they never give an inch in return. However, assuming it is okay with Borek [Marcin Borkowski] I'll greenlight you to post in the "Politics, Philosophy, Oddities" forum under the condition that you don't link to your website from Chemical Forums"

The set of messages to which Borkowski commented: [2]

> "If it is up to me to decide - I am against. With each paragraph you get more Baez crackpot index points."

To note, "Baez crackpot index", an online parody system for numerically ranking the crackpottery of a theorist, posted on line in 1992 by mathematician John Baez, was also used in a derogatory direction towards Thims by Irish physicist Philip Moriarty during the 2009 Moriarty-Thims debate. [4]

Education

Garcia completed his BS in chemistry in 2003 at the University of California, Riverside, PhD in chemistry in 2009 at the University of California, Berkeley, and since 2010 has been doing postdoctoral research in molecular and medical pharmacology at UCLA. [3]

References

1. Should Human Chemistry be Taught in School (2010) – ChemicalForums.com.

2. Site messages to Libb Thims – (29 Sep 2010) ChemicalForums.com.
3. Mitch Andre Garcia (curriculum vitae) – ChemicalVitae.com.
4. Crackpot Index (by John Baez) – University of California, Riverside.

External links

â— Mitch Garcia (member) – Tseng Research Group.

θΔics

In existographies, **Mithra**, Mithras (Roman) or Mitra (Hindu), was a Persian [Iranian] god of light or the fertilizing power of warm upper air, worshipped: c.400BC-200AD, noted for [] [1]

Overview

The Egyptian mythology origin to the Mithras cult is not yet fully elucidated (Q); generally, however, he is thought to be a Horus motif rescript (see: god character rescripts).

In Greco-Roman period, Mithra was morphed into that of a sun god of sorts; he was shortly thereafter superseded by Christianity. The Vatican, e.g., was found in later years to be founded on the remains of a complex dedicated to Mithra, in the form of a sun god. [3]

In 1875, Kersey Graves was categorizing Mithra as one of the top thirty-five of crucified man-god saviors of history, as follows: [2]

1. Chrishna of Hindostan
2. Budha Sakia of India
3. Salivahana of Bermuda
4. Zulis, or Zhule, also Osiris and Orus, of Egypt
5. Odin of the Scandinavians
6. Crite of Chaldea
7. Zoroaster and **Mithra** of Persia
8. Baal and Taut, "the only Begotten of God," of Phenicia
9. Indra of Thibet
10. Bali of Afghanistan
11. Jao of Nepaul
12. Wittoba of the Bilingo nese
13. Thammuz of Syria
14. Atys [Attis] of Phrygia
15. Xamolxis of Thrace
16. Zoar of the Bonzes
17. Adad of Assyria
18. Deva Tat, and Sammonocadam of Siam
19. Alcides of Thebes
20. Mikado of the Sintoos
21. Beddru of Japan
22. Hesus or Eros, and Bremrillah, of the Druids
23. Thor, son of Odin, of the Gauls
24. Cadmus of Greece
25. Hil and Feta of the Mandaites
26. Gentaut and Quexalcote of Mexico
27. Universal Monarch of the Sibyls
28. Ischy of the Island of Formosa
29. Divine Teacher of Plato
30. Holy One of Xaca
31. Fohi and Tien of China
32. Adonis, son of the virgin Io of Greece
33. Ixion and Quirinus of Rome
34. Prometheus of Caucasus
35. Mohamud, or Mahomet, of Arabia

(add)

Quotes

The following are related quotes:

> "Christianity only takes up the fight that had already begun against the classic idea and the noble tradition. In fact, this entire transformation is an adaption to the needs and the level of understanding of the religious masses of that time: those masses which believed in Isis, **Mithras**, Dionysus, the 'great mother', and which desired of a religion: (1) Hope of beyond, (2) the bloody phantasmagoria of the sacrificial animal (the mystery), (3) the redemptive deed, the holy legend, (4) asceticism, world-denial, superstitious 'purification', (5) a hierarch, a form of community. In short, Christianity accommodated itself to already existing and established antipaganism, to the cults that had been combatted by Epicurus—more precisely, to

the religions of the lower masses, the woman, the slaves, the non-noble classes."

— Friedrich Nietzsche (1888), WP:196, Nov 1887 to Mar 1888

"Christianity is the formula for exceeding *and* summing up the subterranean cults of all varieties, that of Osiris, that of the Great Mother, that of **Mithras**, for instance: in his discernment of this fact the genius of Paul showed itself. This was his revelation at Damascus: he grasped the fact that he *needed* the belief in immortality in order to rob "the world" of its value, that the concept of "hell" would master Rome—that the notion of a "beyond" is the *death of life*.... Nihilist and Christian: they rhyme in German, and they do more than rhyme."

— Friedrich Nietzsche (1888), *The Anti-Christ* (§58)

References

1. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (pgs. 166-67). Facts on File, Inc.
2. Graves, Kersey. (1875). *The World's Sixteen Crucified Saviors* (Mithra, 19+ pgs). Publisher.
3. Murdock, Dorothy M. (2008). *Christ in Egypt: the Horus-Jesus Connection* (Mithra, 9-pgs). Stellar House Publishing.

Further reading

● Nabarz, Payam. (2005). *The Mysteries of Mithras: the Pagan Belief that Shaped the Christian World* (Horus, 4+ pgs). Inner Traditions.

External links

● Mithra – Wikipedia.
● Mithras in comparison with other belief systems – Wikipedia.

θΔics

In *Elective Affinities*, **Mittler**, famously called “Mittler the mediator”, was the so-called marriage facilitator of German polymath Johann Goethe’s chemical theory based novella, who acted, in retrospect, some have argued, as a catalyst or “human catalyst”.

A depiction of the character **Mittler** "arriving at the Terrace" (HB:238), from part 1: chapter 2, drawn by German illustrator Philipp Johann (check?).

Etymology

The chemical origin of the character Mittler seems to not have been specified by Goethe specifically—as, of course, contrary to his usual practice, he famously destroyed all the notes and drafts to the construction of this novella. He does state, however, that the theory of the novella is based on the 1775 affinity chemistry work of Torbern Bergman—and affinity chemistry itself originated in the work of English chemistry-physicist Isaac Newton. Hence, one can discern the character of Mittler in the following 1678/79 letter to Irish chemist Robert Boyle, a letter which, according to American science historian William Newman, was preoccupied with the phenomenon of elective affinity among chemicals, in which Newton states: [3]

> “There is a certain secret principle in nature by which liquors are sociable to some things and unsociable to others. Thus water will not mix with oil but readily with spirit of wine or with salts.”

Furthermore, as summarized by Newman, Newton elaborates: [3]

> “Just as water **‘elects’** to mix with ethyl alcohol or with salts, so it **‘chooses’** not to mix with oil, Similarly, water will sink into wood while quicksilver will not, but quicksilver will penetrate and amalgamate with metals, which water will not. Likewise aqua fortis (nitric acid) will dissolve silver and not gold, while aqua regis (mixed nitric and hydrochloric acid) will dissolve gold and not silver. Nonetheless these rules are not written in stone: ‘but a liquor which is of itself unsociable to a body may by a mixture of a **convenient mediator** be made sociable. So molten lead which alone will not mix with copper or with Regulus of Mars, by the addition of tin is made to mix with either.”

Hence, according to Newton, chemicals, or humans as Goethe viewed things, can have their “elections” and “choices” to one another modified by the actions of a “convenient mediator” so as to make previous unsociable entities “sociable”, as Newton says.

Mittler's views

The character of Mittler famously is representative of a certain point of view or "marriage philosophy". The following is Mittler’s famous speech, as found quoted in Walter Benjamin’s 1921 “Goethe’s Elective Affinities” essay: [4]

> "Anyone who attacks the state of marriage," Mittler cried, "who undermines this foundation of all moral society by word or deed, will have to reckon with me; or else, if I cannot better him, I will have nothing to do with him. Marriage is both the base and the pinnacle of culture. It makes barbarians tame, and it gives the most cultivated of people an opportunity to demonstrate their gentleness. It must be indissoluble; it

> brings so much luck that individual misfortunes cannot be weighed against it. And why speak of misfortune? Misfortune is really impatience that comes over people from time to time, and then they like to see themselves as unlucky. If you let the moment pass, you will think yourself fortunate that something that has stood the test of time still exists. There is no sufficient reason for separation. The human condition is so highly charged with joy and sorrow that one cannot calculate what two spouses owe each other. It is an infinite debt that can be paid only in eternity. It may be unpleasant at times—I can well believe it—but that is right and proper. Are we not also married to our conscience, which we would often like to get rid of, since it is more disagreeable than any man or woman could ever be?"

Mittler, in this sense, seems to embody the Bible-backed "till death do us part" view of religion, in the sense that divorce, for whatever reason, is an "immoral" action. Goethe, in this sense, when contrasting the dogmatic view of Mittler with the natural view of the separations and combinations that occur in chemistry, seems to be setting up Mittler as an Aunt Sally for someone only to knock down in the novel or possibly for future generations to knock down.

Discussion

American reaction theory chemist Roald Hoffmann argues that the character Mittler, “the mediator”, whose central point was to never enter any house where there was not a dispute to settle or difficulties to put right, was the role model for a catalyst or human catalyst. [1] In Goethe’s mind, however, Mittler more likely was modeled on the theory of “mediating affinity”, a species or substance the brings about an action in or between two other chemical species. [2] This argument is by virtue of the fact that the theory of catalysis was not yet solidified as a scientific concept by 1809; but was only beginning to come into theoretical form through the work of Goethe’s personal chemist Johann Dobereiner, someone he did not meet until 1810.

See also

â— Elective Affinities (characters)
â— Footnote 2.5

References

1. Hoffmann, Roald. (1995). *The Same and Not the Same* (§34: Catalyst, pgs. 179-; Goethe, 58, 88-89, 179-80, 256). Columbia University Press.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (ch. 10: "Goethe's Affinities", pgs. 371-422). Morrisville, NC: LuLu.
3. Newman, William R. (2003). *Gehennical Fire: the Lives of George Starkey, and American Alchemist in the Scientific Revolution* (Elective affinity, pgs. 231-34). University of Chicago Press.
4. Benjamin, Walter. (1921). “Goethe’s *Elective Affinities*” (scribd), first published by Hugo von Hofmannsthal in the *Neue Deutsche Beitrage* (1924/25); in: *Selected Writings, Volume 1: 1913-1926* (Elective Affinities, pgs. 297-360; Mittler quote, pg. 300-301). Harvard University Press, 1996.

θΔics

In thermodynamic literature, **mixed-up-ness** is a circa 1903 conception of American mathematical physicist Willard Gibbs used to define entropy. The term, however, is only found as a fragment header sentence in the unpublished manuscripts of Gibbs, that he was supposedly to do or expand on in a future reprint of *On the Equilibrium of Heterogeneous Substances*, as shown adjacent. The section heading "entropy as mixed-up-ness" by Gibbs was a planned, but never finished, chapter heading found in the unpublished fragments of Gibbs papers. [2]

In the 1920 *A System of Physical Chemistry* by William Lewis and James Rice, state that "the molecules of a gas are in a continuous disordered movement, a gas being in fact a molecular chaos". [1] They refer to Gibbs' description of entropy as *mixed-up-ness* and state that "this definition of entropy will be understood to a certain extent if we think of a substance as a molecular chaos … owing to collisions between the molecules their motion tends to become more and more disordered until a final stage of disorder is reached."

They incorrectly state that "Gibbs considered that the degree of the disorder was identical with entropy" and that "when the disorder or chaos is greatest the entropy of a substance is likewise a maximum". Gibbs, however, never once used the words "disorder" or "chaos". [3]

IX.

UNPUBLISHED FRAGMENTS.

[*Being portions of a supplement to the "Equilibrium of Heterogeneous Substances" in preparation at the time of the author's death, and intended to accompany a proposed reprint of his thermodynamic papers.**]

[*A list of subjects found with the manuscript and printed below appears to indicate the scope of the supplementary chapters as planned by Professor Gibbs. As will be observed, however, the author's unfinished manuscript, except for a number of disconnected notes, relates to only two of these subjects, the first and fourth in the list.*]

On the values of potentials in liquids for small components. (Temperature coefficients.)
On the fundamental equations of molecules with latent differences.
On the fundamental equations for vanishing components.
On the equations of electric motion.
On the liquid state, $p=0$.
On entropy as mixed-up-ness.
Geometrical illustrations.
On similarity in thermodynamics.
Cryohydrates.

A listing of Willard Gibbs unpublished fragments, wherein he lists entropy as "**mixed-up-ness**" as a draft stage idea.

References

1. Lewis, William and Rice, James. (1920). *A System of Physical Chemistry*, (pg. 48). Longmans and Green.
2. Mixed-up-ness (in the collected Scientific Papers of J. Willard Gibbs (Longmans), the reader will find on page 418 of the first volume a number of unpublished fragments, one subject bearing the title: Entropy as *mixed-up-ness,* a planned, but never finished, chapter).
3. Google book search of *The Collected Works* (Thermodynamics) and *Elementary Principles in Statistical Mechanics*.

θΔics

In hmolscience, **Mladen Knezevic** (1949-) is a Slovenian-born Croatian sociology and penologist noted, in social thermodynamics, for his 1999 general systems theory and thermodynamics framed local communities model.

Overview

In 1999, Knezevic, in his "Some Possibilities on the Use of General Systems Theory and Thermodynamic Theory in the Development of Local Communities", theorized on topics such as parental social work, social boundaries, entropy, as well as energy and potential energy drawn and used interpersonally; the following is his abstract:

> "Social work is analyzed from the view of general system theory as presented in works of J.G. Miller and thermodynamics theory, particularly the second axiom. Thermodynamics theory helps explain some life experiences in local communities from a wider prospective and provides a more complex understanding of dimensions of social work. Human's desire for a universal idea to encompass the complexity of being and the environment in which we would like to live, as well as the one we are forced to live in, is a never-ending constant in human intellectual creativity. No theoretical trend, nor serious and comprehensive theory, whether of natural or social sciences, has such an aspiration, at its base. Religion is the only area of human intellectual endeavor in which this ideal has completely succeeded. Religion has come close to the struggle by recognizing the imperfections of human experience and of the infinite nature and completeness of the divine. That the soul is universal is deeply rooted in religious …"

The following is a representative excerpt: [1]

> "Marginal groups which gather around themselves solid impermeable social boundaries succeed in their own activity by drawing potential and energy from each member."

Knezevic uses a mixture of James Miller's 1978 systems theory and thermodynamics logic, particularly the second law as described in the 1982 work *Novi Savez* by Belgian chemist Ilya Prigogine and Isabella Stengers, and the 1996 book *Evolution, Order, and Complexity* edited by Kenneth Boulding and Elias Khalil. [2]

Education

Knezevic completed his MS in 1982 with a thesis on "Cattle Grazing Behavior in Systems" and his PhD in 1989 with a dissertation on "Selective Grazing of Four Grasses" both at the Agricultural Faculty of the University of Zagreb, Croatia. [3] In 1988, Knezevic was a professor of social work at the University of Zagreb and currently is a professor of agriculture at the same University.

References

1. Knezevic, Mladen. (1999). "Some Possibilities on the Use of General Systems Theory and Thermodynamic Theory in the Development of Local Communities" (abs) *Journal of Social Work, Theory and Practice*, Issue 1: 24-pages, Bemidji State University.
2. Khalil, Elias L. and Boulding, Kenneth E. (1996). *Evolution, Order, and Complexity* (thermodynamics, pgs. 11, 15, 39, etc., 24+ pgs). Routledge.
3. Mladen Knezevic (curriculum vitae) (Croatian → English) – Faculty of Agriculture, University of Zagreb.

External links

- Mladen Knezevic (about) – Virgo.Pravo.hr.
- Mladen Knezevic (faculty) – Balkan Criminology.

θΔics

In existographies, **Mochos** (c.1250-1200BC) was a Phoenician, probably mythical, i.e. astro-theological (Keyser, 2016), and or fictional, reported by Posidonius (c.120BC), to have existed before the mythical Trojan war (c.1200BC), and purported to have invented the concept of atoms and or atomic theory, before Leucippus.

Quotes | On

The following are quotes on Mochos:

> "If the opinion of Posidonius is well-founded, we should even honor the atomic theory of an old philosopher of Sidon, **Mochus**, who lived prior to the Trojan War [c.1200BC]. The theory of Democritus about the atom is of Phoenician origin."
>
> — Strabo (c.23AD), *Geography* (XVI.757) (Ñº) [2]

> "Democritus and Epicurus said the elements were atoms, unless this doctrine is to be considered more ancient, and, as the stoic Posidonius said, derived from a Phoenician called **Mochos**."
>
> — Sextus Empiricus (c.200AD), *Against the Mathematicians* [2]

> "Libra, which the Greeks called 'Zygon', is a masculine name'; and a man called 'Mochos' obtained it, with full justice of indulgence, who is said to have first invented for people the weighting of the balance ('libra'), which is considered most useful for mortals; and therefore, he was both received into the number of stars, and was called Libra."
>
> — Lucius Ampelius (c.320), *Liber Memoralis* [1]

References

1. Keyser, Paul T. (2016). "Mochos the Phoenician Sage in Ampelius" (abs), *The Classical Journal*, 111(4):495-501, Apr-May.
2. (a) Sextus, Empiricus. (c.200AD). *Against the Mathematicians* (IX.363) Publisher.
(b) Taylor, C.C.W. (1999). *The Atomists: Leucippus and Democritus: Fragments: a Text and Translation with a Commentary by C.C.W. Taylor* (pg. 153). University of Toronto Press.

Further reading

â— Partington, James. (1957). *A Short History of Chemistry* (pg. 164). Publisher.

θΔics

In thermodynamics, **modern chemical thermodynamics**, as compared to theoretical chemical thermodynamics (1873-1905) and quantitative chemical thermodynamics (1906-1922), according to American chemistry historian William Jensen's classification scheme (see: etymology), refers to the era amid and following the 1905 to 1912 activity and fugacity work (Q) and subsequent 1923 publication of American physical chemist Gilbert Lewis' *Thermodynamics and the Free Energy of Chemical Substances*. [1]

American chemical thermodynamicists J. Bevan Ott and Juliana Goates, to note, argue that chemical thermodynamics was not "modern" until the publication of English physical chemist Edward Guggenheim's 1933 *Modern Thermodynamics by the Methods of Willard Gibbs*: [2]

> "Lewis, Randall and Guggenheim must be considered as the founders of **modern chemical thermodynamics** because of the major contributions of these two books in unifying the applications of thermodynamics to chemistry."

Here, to clarify, Merle Randall was more like a laboratory assistant, doing free energy laboratory measurements, and the person to whom Lewis dictated his 1923 textbook to, not "founder" as Ott and Goates see things.

References

1. Jensen, William B. (2005). "The Quantification of 20th-Century Chemical Thermodynamics: a Tribute to *Thermodynamics and the Free Energy of Chemical Substances*" (pdf), Lecture given at Boston Society Symposium on Classic 20th-Century Chemistry Textbooks, 230th meeting of the ACS, Washington, DC, Aug 29.
2. Boerio-Goates, Juliana, and Ott, J., Bevan. (2000). *Chemical Thermodynamics: Principles and Applications* (pg. 1-2). New York: Elsevier Academic Press.

θΔics

In dating systems, **modern era** (ME), or synonymously "after Newton" (AN), as compared to printing era (PE), is a chemical thermodynamically neutral (i.e. Christian era (AD) alternative), year numbering system, conceived by German polyintellect Goethe, that assigns the *epoch*—an instant in time chosen as the origin of a particular era—to the birth, or reaction start, of English physicist Newton, as follows: [1]

> "**1642** [the year of Newton's birth] is the Christmas of the **modern age**."

according to which, year zero is assigned to the start of the modern era dating system, counting forward, e.g. the day of 1 Jan 2000 AD equals 356 ME, and the years prior to his birth are signified as "before Newton" (BN) or before modern (BM), depending on one's preference, e.g. the year 3,100 BC equals 4742 BN (check), or before modern (BM), depending. This SI unit system themed reality-based calender is referred to as the "Newtonian calendar", as can be compare to other calender dating systems, shown adjacent.

Other Calendars in 2013

Gregorian calendar	2013 *MMXIII*
Ab urbe condita	2766
Armenian calendar	1462 ԹՎ ՌՆԿԲ
Assyrian calendar	6763
Bahá'í calendar	169–170
Bengali calendar	1420
Berber calendar	2963
British Regnal year	61 Eliz. 2 – 62 Eliz. 2
Buddhist calendar	2557
Burmese calendar	1375
Byzantine calendar	7521–7522
Chinese calendar	壬辰年 (Water Dragon) 4709 or 4649 — *to* — 癸巳年 (Water Snake) 4710 or 4650
Coptic calendar	1729–1730
Ethiopian calendar	2005–2006

Hebrew calendar	5773–5774
Hindu calendars	
- *Vikram Samvat*	2069–2070
- *Shaka Samvat*	1935–1936
- *Kali Yuga*	5114–5115
Holocene calendar	12013
Igbo calendar	1013–1014
Iranian calendar	1391–1392
Islamic calendar	1434–1435
Japanese calendar	Heisei 25 (平成25年)
Juche calendar	102
Julian calendar	Gregorian minus 13 days
Korean calendar	4346
Minguo calendar	ROC 102 民國102年
Thai solar calendar	2556
Unix time	1356998400–1388534399

A table of various calendar systems (O) currently in use, as compared to Newtonian calendar dating system, wherein 2013 equates to the year 370 **modern era**; the variegated inconsistency of which indicating the need for calendar reform, similar to that which has been done with units via the SI unit system.

Overview

In 2012, American electrochemical engineer Libb Thims conceived the BP/PE dating system—dating the year zero to the winter solstice six years prior exactly to the 23-documented passing of Haley's comet (1450 in Gregorian calendar years)—while drafting the manuscript *Purpose? (in a Godless Universe)*, according to the logic that it is ill-suited to continue to date quotes and article/book publication dates, within an overtly godlessness-focused book, using a purely arbitrary mythological reference point, i.e. the purported birth of the existence of a person named Jesus Christ, a date assignment that is but an arbitrarily determined point plucked out of a hat, within the framework of the Egyptian dynasty state religion (3,100BC-600AD), i.e. Anunian theology, namely a semi-deanthropomorphic half-human/half-god birth model rewrite of the Osiris resurrection story (c.2700BC). In short, using a dating system based on an event that never occurred is mentally incongruous.

On 14 Apr 2013, the BP/PE dating system began to be used online, first introduced in the Empedocles article.

On 23 Nov 2013, following water testing of about 100 *Hmolpedia* article implementations of the BP/PE dating system, the BN/ME dating system began to be used online, first introduced in the Isaac Newton article.

Note

A note, concerning the dates Newton's birth and reaction existence (life), is that modern era dating will vary according to whether one uses the Julian calender system (older calender) or the Gregorian calendar system (modern calender), a transition that occurred, depending on country, during the years 1582 to 1752: [6]

> Newton (Old System, Julian calender) reaction existence: 25 Dec 1642 – 20 Mar 1726

Newton (New System, Gregorian calendar) reaction existence: 4 Jan 1643 – 31 Mar 1727

Using Newton's birth (4 Jan 1643) one can calculate the modern era date using on online date calculator, specifically a "date duration calculator" (Q), as found at TimeAndDate.com, which for the day 23 Nov 2013, shown below:

Returns the following modern era date:

according to which the day 23 Nov 2013 (AD) would equate to 23 Nov 370 (ME), neglecting the day error discrepancy (fix later), in Newtonian calender years.

Quotes

The following are related quotes—the first dating the modern era to Goethe, the second in semi-humorous terms dating the modern era to Norbert Wiener:

> "All before Goethe are ancients, and all who have read him are **modern**."
>
> — Ralph Emerson (c.1860), Publication [2]

> "In the era BC (before cybernetics) it [*Elements of Physical Biology*] was an important source of education and encouragement for few souls who had gleam in their eyes about the prospective mathematization of the social sciences. It had a substantial influence on Henry Schultz and Paul Samuelson, and, I am sure, many others besides myself. As a matter of fact, most of the ideas of [Norbert] Wiener emphasizes—for example, the relation of entropy to organizational behavior—can be found in Lotka, and I have felt some annoyance at the lack of recognition of the latter's contributions."
>
> — Herbert Simon (1953), Publication [3]

See also

- Modern queries

References

1. Matthews, Michael R. (1989). *The Scientific Background to Modern Philosophy: Selected Readings* (§: Newton, pgs. 133-; quote, pg. 133). Hackett.
2. Tantillo, Astradia O. (2010). *Goethe's Modernisms* (pg. 1). Continuum International Publishing Group.
3. Crowther-Heyck, Hunter. (2005). *Herbert A. Simon: the Bounds in Modern America* (pg. 66). JHU Press.

External links

- Calendar era – Wikipedia.
- Common Era – Wikipedia.
- Epoch (reference date) – Wikipedia.

θΔics

In puzzles, **intellectual puzzles** refers the greatest problems of all time, some solved, some unsolved, some partially solved, referring to the famous intellectual puzzles worked on by the greatest minds of history.

Queries, similar to Newton's queries (1718), listed below are of the type that take decades to solve and many of which, as of yet, have no known solution, some culled from the various 'greatest unsolved mysteries' of modern times types of books. [1] Many of these problems come from the problems perused in the minds of the people at the top of the IQ=200+ list, the first of which is the "elective affinity problem" worked on by at least three individuals in the IQ=225+ range (Goethe, Sidis, and Hirata) and the one which Goethe, the deemed smartest person ever, considered his "greatest work" or "best book".

Spin problem: explain what the various spins of the universe have to do with each other, i.e. what the milky way spin (200 million years/cycle), has to do with the spin of the earth about the sun (365 days/cycle), the earth on its axis (24 hours/cycle) and with human spin in its daily orbitals (one day/cycle) and what this has to do with electron spin and what all of this has to do with the movement of fundamental particles and forces in relation to evolution, the Lewis inequality, and the arrow of time?

Classical

- Nature abhors a vacuum (yes/no) (semi-open)

- Great problem of natural philosophy (solved by Libb Thims in 2009)

- Blue sky problem (solved by John Strutt in 1899)

The blue sky puzzle, prior to its complete solution in 1899 by English physicist John Strutt (IQ=190), the vacuum debate aside, was the longest-standing unsolved puzzle in science, worked on by the biggest thinkers of all time: Aristotle (IQ=190), Da Vinci (IQ=205), Newton (IQ=215), Goethe (IQ=230), Clausius (IQ=205), Maxwell (IQ=210)—in fact every single genius in the IQ=205+ range (see: genius IQs) worked on the blue sky problem, prior to its solution by Strutt.

Hardest

The hardest intellectual genius puzzle of them all is the "elective affinity" problem (see modern queries): namely to explain human passions and experience via the chemical affinities or free energies. The elective affinities problem is the only puzzle common to geniuses cited in the IQ=225+ range, namely: Goethe (1796) (IQ_{Cit}=225; IQ=230), who called his solution to this problem his greatest work (see: best book), of all his 142+ collected works publications; Einstein (IQ_{Cit}=225; IQ=220), who commented on the problem in perplexment: "gravitation cannot be responsible for people falling in love" and "how on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love?"; Thims (1995) (IQ_{Cit}=225; IQ=190), who was led into the problem, similar to Goethe, via a mixture of the "love thought experiment" and the "reverse engineering puzzle", and Hirata (2000) (IQ_{Cit}=225; IQ=190), who called his solution a "fun compilation of worthless applications of physics and mathematics to relationships"; even the great child prodigy William Sidis (IQ_{Cit}=250-300; IQ=195) attempted solution, in a round-about-way, via his theories on animate matter and entropy.

- Elective affinity problem (aka the "attraction Newton left out", Stoppard (1993)) explain human existence in terms of the forces of chemical affinity, starting with the Lewis inequality ($\Delta G < 0$) (see: inequality) (Goethe: *Elective Affinities*, 1809) (Hirata, 2000).
- Reverse engineering puzzle
- Love thought experiment

Thick

The following is a significant glass wall problem:

- Human chemical bond problem: explain the nature and operation of the human chemical bond, such as

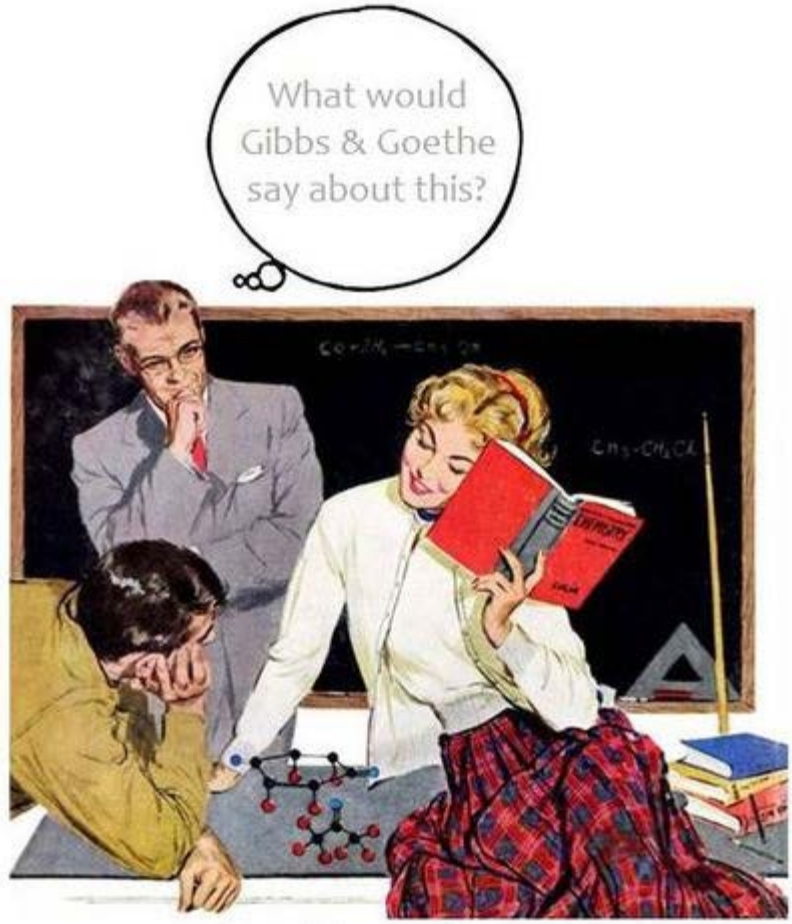

Die Wahlverwandtschaften
(The Elective Affinities)

A playboy style depiction of the "elective affinities problem", namely how to explain passions of existence in terms of Bergman's 1775 chemical affinities theories (Goethe's day) or in terms of Gibbs' 1876 free energies (modern day).

when two people A and B, form a couple:

$$A + B \rightarrow AB$$

in terms of pure physics and chemistry, in the same sense as that in which two hydrogen atoms form a chemical bond:

$$H + H \rightarrow H_2$$

in this case, the bond going by the name "covalent", in terms of bond categories.

Difficult

● Morality problem: explain morality in a modern scientific sense (Goethe: moral symbols; John Stuart Mill: utilitarianism, 1861)
● Purpose problem: what is the purpose of one's existence?
● Death problem: explain the nature of what happens when one ceases to exist in the context of the overall movement and purpose (if there is one?) of the universe (although, to note, this question is bound to both the morality problem and the purpose problem, via the large and deep ingrainment of the basic principles of Ra theology in the corpus of the world's minds, regarding right or wrong behavior (Freud: death instinct, 1920). [4]

Famous tricky goose-chase questions

● Can Clausius and Darwin both be right? (Roger Caillois, 1973)

● Thermodynamic equilibrium may be characterized by the minimum of the Helmholtz free energy, F = E – TS. Are most types of ‘organizations’ around us, e.g. in a town, in a living system, of this nature? (Prigogine asked this question during his 1977 Nobel Lecture)

● What does Shannon entropy have to do with Clausius entropy? (Myron Tribus was asked this question during his 1948 examination for his PhD at UCLA, after which he spent over ten years trying to solve this query, still having he question on his mind 50-years later).

Semi-difficult

● Evolution vs. second law problem: explain the so-called paradoxical trend toward order seen in the case of civilization

as contrasted with the trend toward disorder often depicted in the second law (Ubbelohde, 1946) (Prigogine, 1977).

Unsolved

● Gravity problem: what is gravity? (Newton, 1686, Einstein, 1912); what does gravity have to do with the electromagnetic force.

● Double slits experiment (Young, 1804): explain what is going on in the process of one particle, going through, supposedly, two slits, and thus interfering with itself past the slits to make interference effects?

● Spin problem: explain how all the spins of the universe are connected or coupled, from the subatomic spins to human molecular spin to galactic spin to supergalactic spin, in connection to right hand rule (Faraday, 1831; Maxwell, 1873, Haramein, 2003)

● Satellite problem (pioneer puzzle or pioneer anomaly): a problem, supposedly, first noted by NASA scientist John Anderson in 1998, which find that the now-powered out Pioneer 10 and Pioneer 11 space probes (launched in the 1970s), which are currently near the edge of the solar system, are decelerating (or accelerating) at a rate that cannot be accounted for current models of gravity. [4]

● Dark matter problem: explain where the missing matter of the universe is?

● Unification problem: developed a unified theory to explain the total system of the fundamental forces and fundamental particles of the universe.

● Coherence problem (Einstein, 1935): explain quantum entanglement, e.g. why photons that had at one point been in contact supposedly remain 'aware' of each other even when separated by great distances (John Bell, 1964); or why, as determined by experiments by researchers in Geneva (c.1995), photons sent in opposite directions along fiber optic cables showed 'nonlocality', i.e. the two photons acted like one particle even when they were more than 6.2-miles apart. [2]

Semi-solved/semi-open problems

● Heat problem: what is heat? (Aristotle: fire, 350BC; Geber: sulphur principle, 790; Paracelsus: sulphur combustion, 1524; Johann Becher: terra pinguis, 1669; Georg Stahl: phlogiston, Lavoisier: caloric, 1789; Clausius: entropy, 1865)
● Vacuum problem: does nature abhor a vacuum? (Parmenides, 485; Plato; Aristotle; Galileo; Galileo, 1630); supposedly, the search for the Higgs boson has something to do with this problem.

Solved

● What happens if you attempt to run alongside a beam of light? | Solution: relativity + $E = mc^2$ (Einstein, 1905)
● Color puzzle (Newton, Goethe, Young): how does light produce color?
● Affinity problem: what is affinity, chemical affinity, or elective affinity? | Solution: a force quantified by free energy (Helmholtz, 1882; Nernst, c.1900; Lewis, 1923)
● Aether problem: does aether exist? | Solution: No (Einstein, c. 1905)
● What is life? | Solution: defunct theory of life (Tesla, 1925; Thims, 2009)
● Free will problem | Solution: the choice of elective affinity by mediated by forces external to the system (Goethe; 1796; Thims, 2007)

See also

● Homework problems

References

1. (a) Brook, Michael. (2008). *13 Things that Don't Make Sense: the Most Baffling Scientific Mysteries of Our Time*. DoubleDay.
(b) Veltman, Martinus. (2003). *Facts and Mysteries in Elementary Particle Physics*. World Scientific Press.
2. Gribben, John. (2002). *Quantum Physics: a Beginner's Guide to the Subatomic World* (pg. 62). DK Publishing.

3. Death drive – Wikipedia.
4. (a) Cowen, Ron. (2011). "Pioneer Puzzle Pinned on Thermodynamics: New Study Declares Long-standing Mystery Solved, but Experts are Skeptical", April 7th, ScienceNew.org.
(b) Cowen, Ron. (2008). "Pioneer 10's Puzzling Motion: a Lot of Hot Air", Science News Online, Apr 24.
(c) Cowen, Ron. (2008). "Too Speedy for Gravity? *Science News*. Vol. 173, Mar. 15, pg. 173.

θΔics

In science, **Mogens Westergaard** (c.1912-1975) was a Danish plant geneticist noted for []

Overview

In 1957, Westergaard, in his "On the Identification of Genetic and Non-Genetic Variation in Bacteria", wherein, in discussion on the semantics involved in microbial genetics and especially bacterial genetics, specifically in the field of drug resistance in microorganisms, cites Kaj Lang's 1956 thermodynamics of the male housefly spoof article as word of wisdom when "quibble about words" erupts when going from the micro to macro areas of theoretical investigation.

Quotes | Cited

The following are quotes employed by Westergaard:

> "One well established and generally accepted method of treating systems which are complicated beyond comprehension is to construct simple models and see whether they fit the systems in question. If they do, you will immediately become suspicious, and so will your colleagues most certainly, with the result that a blooming literature sprints up (or breaks out) dealing with the problem of how you have managed to make all your errors cancel one another. If they do not fit, the beauty of the models themselves may shine for years untainted by the squalid awkwardness of reality."
>
> — Kai Lang (1956), "The Thermodynamic Activity of the Male Housefly"; cited by Mogens Westergaard (pg. 289) [2]

Quotes

The following are quotes by Westergaard:

> "Cybernetics has several times proved useful when dealing with 'borderline' scientific problems; indeed it has sometimes been considered almost a psychiatric miracle-cure for such problems; and microbial genetics and especially bacterial genetics is certainly a borderline problem."
>
> — Mogens Westergaard (1957), "On the Identification of Genetic and Non-Genetic Variation in Bacteria" (pg. 280-81)

> "I apologize that most of this paper has been concerned with semantic problems, since this is generally a considered a most boring subject in biology. However, I have followed a standard practice in dealing with complex problems by constructing a model. To place this model in its true perspective, the reader is referred to a recent publication by two great scientists [F. Fizz-Loony and Kaj Lang (1956)] on the use of models in biological research."
>
> — Mogens Westergaard (1957), "On the Identification of Genetic and Non-Genetic Variation in Bacteria" (pg. 289)

Education

Westergaard graduated from Horsens in 1931 and then completed his MS in genetics in 1936, after which he became a professor at the University of Copenhagen. [2]

References

1. (a) Fizz-Loony, F. and Linderstrom-Lang, Kaj. (1956). "The Thermodynamic Activity of the Male Housefly (Muscus domesticus L-L.)" (pdf). New York: Academy Press.
(b) Westergaard, Mogens. (1957). "On the Identification of Genetic and Non-Genetic Variation in Bacteria", CIBA

Foundation Symposium; in: *Drug Resistance in Microorganisms: Mechanisms of Development* (pgs. 280-93; esp. pg. 289). Wiley, 2009.
2. Mogens Westergaard (Danish → English) – DenStoreDanske.dx.

External links

â— Mogens, Westergaard – WorldCat Identities.

θΔics

In existographies, **Mohamed Hisham** (1992-) (FA:258) [RGA:375|375+] is an Egyptian free thinker and atheism activist, noted for []

Overview

In c.2015, Hisham, in his early 20s, began to frequent various atheist forums, in particular the popular Atheist Republic, founded by Armin Navabi (2011).

In early 2018, Hisham saw an advert on the Atheist Republic forum, which said that the Egyptian TV show Alhadath Alyoum TV, which roughly translates as "The Event News" or "Egyptian Street TV", was looking for young atheists to come on the show for open dialogue.

On 11 Feb 2018, Hisham appeared on Alhadath Alyoum TV, wherein he was pitted up against Mahmoud Ashour, a Sheikh, described as "former deputy Grand Imam of Al-Azhar" (Q), and Mahmoud Abd Al-Halim, the TV show host, who is like an Islamic Bill O'Reilly on amphetamines. The dialogue, translated by translated by the Middle East Media Research Institute (MEMRI), went as follows (bolded comments signify shouting or raised voice; continuation dots signify an interruption): [4]

> Hisham: I'm an 'atheist', which means I don't believe in the existence of god. I don't believe in him.
>
> Sheik: What? Ah … Ah … What was that?
>
> Hisham: I'm an 'atheist', which means I don't believe in the existence of god. I don't believe in him.
>
> Hisham: That's what atheism means.
>
> Hisham: I don't need religion to have moral values or to be a productive member of society.
>
> Sheik: Why did you become an atheist?
>
> Hisham: Because there is no scientific evidence for the existence of god.
>
> Host: **How can you say that! Who created you? Who made you exist as a human being?**
>
> Sheik: Do you know how you were created?

Snippets from the 11 Feb 2018 Egyptian TV show dialogue between **Hisham**, an open Egyptian atheist, Mahmoud Al-Halim, the host, and Mahmoud Ashour, a religious Sheikh.

Hisham: There are many theories explaining our existence on this planet …

Sheik: **I'm asking you a question. How did you become a human being?**

Host: **How come you exist in this universe?**

Hisham: Ok, let me explain. There are theories that try to explain our existence. One theory is that god created us. Okay? But there are other theories, which much more evidence, like the big bang theory …

Host: **Speak Arabic!** You are in Egypt, and you are addressing simple people, so don't use big words for no reason.

Hisham: I'm using these terms because science is conducted in English …

Host: **What science are you talking about?**

Host: You are confused and unreliable.

Host: You deny the existence of god and reject our religion and principles …

Hisham: Is that so bad?

Host: Of course. You come here to talk about a certain idea, but have nothing to offer.

Host: You offer atheism! You offer heresy!

Host: I apologize to the viewers for having an Egyptian of this kind on our show.

Host: I’m sorry, Mohammad, but you cannot stay with us on the show, because your ideas are inappropriate, I’m sad to say. We cannot promote such destructive ideas. You have not uttered one single convincing word.

Sheik: Look, dear Mohammad, you need psychiatric treatment. Many young people today suffer from mental illnesses, due to material or mental circumstances …

Host: It’s like Sheik Mahmoud says. Have you seen a psychiatrist?

Host: I advise you to leave the studio and go straight to a psychiatric hospital.

Host: You shouldn’t be here. Unfortunately, I cannot let you be here anymore. Please get up and leave, and I will continue the show with Dr. Mahmoud …

Host: Unfortunately, your ideas are destructive and bad for Egyptian youth. You set a very bad example for Egyptian youth.

Host: Let us take a break, our guest will leave the studio, and we will continue with Dr. Mahmoud …

Hisham: I’m not being allowed to present my ideas …

Host: No. Again, let me apologize to my viewers, for having such a person on the show. I invited him on the show, to talk about ideas, but unfortunately, he has nothing convincing, nothing substantial, to offer. He sets a bad example to Egyptian youth.

Host: Mohammad, you can’t stay here. I advise you to go straight to a psychiatric hospital.

Hisham then left the studio. The show received received 10s of millions of views worldwide, in the Islamic world, and then later in the English world, e.g. on YouTube. Hisham then began to face social opprobrium, e.g. death threats, job barring, family disownment, etc.

On 13 Mar 2018, Hisham went on national television a second time, via video stream, on a show called show called “Shaba Talk” (or "Youth Talk"), located in Berlin, as shown adjacent, wherein he was pitted up against the same host and another person, and new more neutral and open minded host. [5]

A screen shot from **Hisham**'s13 Mar 2018 public debate, his second televised appearance as a "public atheist", on a Berlin-based show called Youth Talk. [5]

On 17 May 2018, Sam Harris tweeted

(Q) Hisham's
GoFundMe campaign, after which the rest of the donations and famous names in the public discourse fell into place from that point. [2]

Other

Hisham has also publicly acknowledged that he is "openly gay" (see: queer chemistry), which is a crime in Islamic countries, punishable by being thrown off the roof. [4]

Quotes | On

The following are quotes on Hisham:

> "This guy's balls are 1000 pounds each and made of titanium."
>
> — Punk Nomad (2018), response (Q) tweet to Sam Harris tweet, May 17

> "An advert post on Atheist Republic intrigued the now 26-year-old. There was a call for atheists in Egypt to appear on a popular TV show to discuss their ideas. A way to reach a large audience and do something to stem the decades-long rising tide of conservative Islam strangling his homeland was needed. **Mohamed** and a handful of others decided to find out if this was that way. By the fateful day of airing, however, the handful had dwindled to one. During the drive to the studio, that one thoughtful young atheist weighed the cost and chose to proceed."
>
> — Tory Garnaut (2018), "Article", May 23 [2]

Quotes | By

The following are quotes by Hisham:

> "I am **Mohamed Hisham**, and I am a public atheist in Egypt. The first step to a society that has freedom from religion is to stand up and be heard. I did that, appearing on TV twice, and immediately paid a price. Family, society, and now the state have declared themselves my enemy, with beatings at home, credible threats of death from across Egypt, and constant fear of jail my new reality. I can no longer peacefully express myself in this place. I can't win here on my own."
>
> — Mohamed Hisham (2018), GoFundMe story, May 11 [1]

See also

● Sherif Gaber | Egyptian atheist [RGA:99|375+] jailed for making a Carl Sagan like YouTube video in Arabic

Reference

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3. Ghanem, Pamela. (2019). "Help Mohamed Hisham – an Openly Gay Atheist from Egypt – Find Freedom and Safety" (Q), Atheist Republic, Jan 31.
4. Anon. (2017). "Hisham Interview", Egyptian Street, Feb 11; reposted as: "Egyptian TV Host Kicks Atheist Out of Studio, Recommending Psychiatric Treatment" (2018) (Q), Memri TV Videos, Mar 2.
5. Anon. (2018). "Mohamed Hisham Debate" (Q), Youth Talk, Mar 13.

Further reading

● Anon. (2018). “Atheist Kicked Off Egyptian TV, Advised to See Psychiatrist” (Q), Times of Israel, Mar 2.

Videos

● Anon. (2018). “Viewer Response Call Ins” (Q), Mohamed Nofal, Apr 13.
● Hisham, Mohamed. (2018). “My Asylum Video” (Q), Mohamed Hisham, YouTube, May 23.

External links

● Help for an Atheist (2018) – Reddit.com.

θΔics

In hmolscience, **Mohsen Mohsen-Nia** (1958-), M. Mohsen-Nia or Mohsen Mohsennia, is an Iranian-born American chemical engineer noted, in human thermodynamics, for his 2011 work on the thermodynamics of friendship stability and for his JHT review board work.

Overview

In 2011, Mohsen-Nia, in his JHT article "A Thermodynamic Methodology for Evaluating Friendship Relations Stability", co-authored with Iranians human scientist F. Arfaei, thermodynamicist H. Amiri, and computer engineer A. Mohsen Nia, presented the results of a small relationship study, of different pairings of male and female co-workers, and discuss the results in energetic terms and attempt to explain interhuman relationship potential modeled on the Lennard–Jones potential: [1]

$$\phi(r) = 4\epsilon\left[\left(\frac{\sigma}{r}\right)^{12} - \left(\frac{\sigma}{r}\right)^{6}\right]$$

where for a molecular system, ε is the depth of the potential well, σ is the finite distance at which the inter-particle potential is zero and r is the distance between the particles.

To note, an independent attempt at a human thermodynamics formulation using the Lennard–Jones potential was done previously, in 1998, by Venezualian-born English chemical engineer Erich Muller in his article "Human Societies: A Curious Application of Thermodynamics". [2]

Education

Mohsen-Nia completed his BS chemical and petrochemical engineering (1983) and MS in chemical engineering (1985) both at Amirkabir University of Technology, Tehran, Iran, and in 1992 completed a PhD student scholarship at the University of Illinois at Chicago, USA, and in 1993 completed his PhD in chemical engineering at Amirkabir University of Technology, doing post graduate work there the following year, soon thereafter becoming a professor of chemical engineering. In 2011, he was associated with both the Thermodynamic Research Laboratory, University of Kashan, Kashan, Iran, and the Division of Chemistry and Chemical Engineering, Caltech, Pasadena, California, USA. Mohsen seems to be part of the "Iranian school of thermodynamics" (see: schools of thermodynamics), which includes Ali Mansoori (who hosts some of Mohsen-Nia's papers at his UIC Thermodynamics Research Laboratory site), as founded originally by Mehdi Bazargan, noted author of the 1956 book *Thermodynamics of Humans*, one of the first books in pure and applied human thermodynamics.

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Further reading

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● Mohsen-Nia, Mohsen. (2013). "Social Equation of State" (pdf), *Journal of Human Thermodynamics*, 9(2): 29-42.

External links

- Mohsen Mohsen-Nia (about) – AlChE.org.

θΔics

In chemistry, a **mol** is unit symbol for the amount of substance, termed a ‘mole’, which contains an Avogadro number of elementary units. [1]

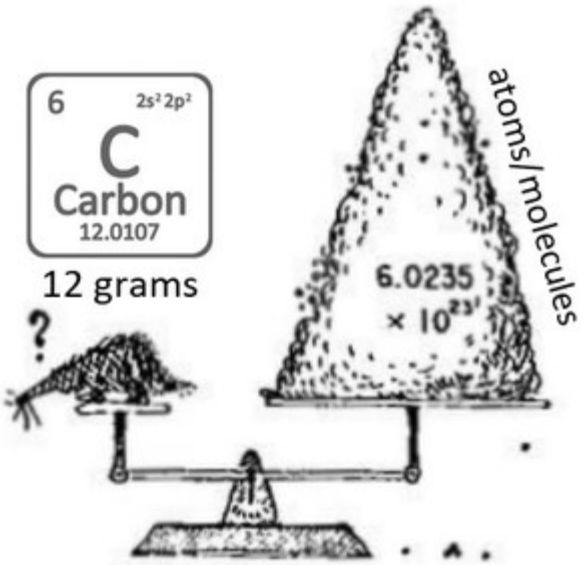

Etymology

The term ‘mol’, supposedly, was first used in 1895 by German physical chemist Walther Nernst, a truncation of the 1893 term gram-molecule (a term used previously by German physical chemist Wilhelm Ostwald). Nernst also used the term "g-mol" in his introduction of the ideal gas law. [2]

Etymologically, the term "mol" is said to derive from the German *mol*, meaning small mass.

See also

- Hmol
- Avogadro’s constant
- Social Avogadro number

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(b) Ostwald, Wilhelm. (1893). *Hand- und Hilfsbuch zur ausführung physiko-chemischer Messungen* (*Handbook and Support for Making Physico-Chemical Measurements*) (pg. 119). Leipzig.

External links

- Mole (unit) – Wikipedia.

θΔics

In chemistry, **molecular entity** is any constitutionally or isotopically distinct atom, molecule, ion, ion pair, radical, radical ion, complex, conformer etc., identifiable as a separately distinguishable entity. [1] In this context, both a single unattached human molecule as well as the bonded unit of two human molecules, such as in a married relationship, defined as a dihumanide molecule, can each be referred to as a molecular entity.

See also

- Chemical species
- Chemical substance

References

1. Molecular entity – IUPAC Gold Book.

θΔics

In hmolscience, **molecular evolution table** shows the linear build up of atomic structure in animate molecular structures in time, via evolution or synthesis, over the course of the last 13.7 billion years of universal activity from sub-atomic particles, to atoms, to hydrogen molecules, to DNA, to bacteria molecules, to human molecules, etc.

Overview

In 2002, Libb Thims, in his *Human Thermodynamics* manuscript, chapter “What Happens When You Die?”, following several months of human mass composition research, calculated a 26-element human molecular formula (see: Thims human molecular formula). (O)

In 2005, Thims, in online format, at HumanThermodynamics.com, made the first "molecular evolution table". [1]

In 2007, Thims, in his "Molecular Evolution" chapter, of his *Human Chemistry* book, published in the following version of the molecular evolution table (albeit without color illustrations), YAB = years after bang, BYA = billion years ago, MYA = million years ago, the shorthand "E" used in formula means to the power of 10, e.g. 3E5 = 3 x 10^5 or C_{E22} = 10^22 carbon atoms:: [9]

Element Count	Molecular Evolution Table	Name	Date
N/A	*Fermions:* e^-, ν_e, u, d, μ^-, ν_μ, c, s, τ^-, ν_τ, t, b *Gauge bosons:* g_{ab}, γ, W^+, W^-, Z^0, G	Elementary Particles	13.7 BYA
1	H, He-3, He-4, Li	Atoms	3E5 YAB
1	H_2	Hydrogen	
2	H_2O	Water	2E8 YAB
3	CH_4O	Methanol	
4	CH_4ON_2	Urea	4.6 BYA
5	$C_{10}H_{16}O_{13}N_5P_3$	DNA	
6	$C_{21}H_{36}O_{16}N_7P_3S$	Coenzyme A	
7	$C_4H_3O_2NS_2NaI$	mol-7	4.4 BYA
8	$C_{20}H_{22}O_7N_2SNaIPt$	mol-8	
9			
10	$C_{E5}H_{E5}O_{E4}N_{E4}P_{E2}S_{E2}Ca_{E2}K_{E2}Cl_{E2}Na_{E2}$	Intermediate	4.2 BYA
11			
12	$C_{E7}H_{E7}O_{E6}N_{E6}P_{E4}S_{E4}Ca_{E4}K_{E3}Cl_{E3}Na_{E3}Mg_{E2}Fe_{E2}$	Pro-bacteria	4.0 BYA
13			
14			
15	$C_{E10}H_{E10}O_{E10}N_{E9}P_{E8}S_{E8}Ca_{E8}K_{E6}Cl_{E6}Na_{E6}Mg_{E6}Fe_{E5}$ $Si_{E4}Mn_{E2}Co_{E2}$	Prokaryote (Bacteria)	3.85 BYA
16			
17			
18	$C_{E16}H_{E16}O_{E16}N_{E15}P_{E14}S_{E14}Ca_{E14}K_{E12}Cl_{E12}Na_{E12}Mg_{E12}Fe_{E11}F_{E11}$ $Si_{E10}Cu_{E9}Mn_{E8}Se_{E8}Co_{E7}$	Pre-Aquatic Worm	2.6 BYA
19			
20			
21			
22	$C_{E22}H_{E22}O_{E22}N_{E21}P_{E20}S_{E19}Ca_{E20}K_{E18}Cl_{E18}Na_{E18}Mg_{E18}Fe_{E17}F_{E17}$ $Zn_{E16}Si_{E16}Cu_{E15}I_{E14}Mn_{E14}Se_{E14}Mo_{E13}Co_{E13}V_{E12}$	Fish	0.7 BYA
23		Reptile	350 MYA
24	$C_{E26}H_{E26}O_{E26}N_{E25}P_{E24}S_{E23}Ca_{E24}K_{E22}Cl_{E22}Na_{E22}Mg_{E22}Fe_{E21}F_{E21}$ $Zn_{E20}Si_{E20}Cu_{E19}B_{E19}I_{E18}Mn_{E18}Se_{E18}Cr_{E18}Mo_{E17}Co_{E17}V_{E16}$	Old World Monkey	30 MYA
25		*A. Afarensis*	5.0 MYA
26	$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}$ $Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$	Human (*H. Sapiens*)	0.2 MYA
27			
28		Evolution	

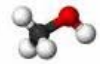

In 2008, Thims made poster board display-sized version of the molecular evolution table, with color illustrations as shown above; and also made the "Evolution (Advanced View)" (O), shown below (right), using this poster.

In 2009, Thims made an expanded-step version of this molecular evolution table into an online sideways-scrollable "evolution timeline" and a video-version (O), shown below (right), scrolled to the lyrics of Sam Sparro's agnostic-about evolution 2008 dance song "Black and Gold" (O)(O).

In 2010, Thims made a 20-foot paper version of the evolution timeline, shown below, which he debuted following a lecture by chemical engineer Ted Erickson, at the Illinois Institute of Technology:

In this photo, we see Erickson pointing to the point at which he believed that "sentience" or "awareness" arose, which occurred attempting following an attempt to argue with Libb Thims and physicist David Gore, that Planck length particles have consciousness.

Earlier views

See also: Great chain of being

In an 1871 letter written by English naturalist Charles Darwin to English botanist Joseph Hooker, Darwin made the suggestion that:

> "[The original spark of life may have begun in] a warm little pond, with all sorts of ammonia and phosphoric salts, lights, heat, electricity, etc. present, so that a protein compound was chemically formed ready to undergo still more complex changes."

In this sense, all life is postulated to be a descendent from a protein compound, formed in a heated pond many years ago. In modern terms, as fossil records indicate that bacteria existed on the surface of the earth 3.85 billion years ago, an unsolved debate of sorts or puzzle exists as to what life-forms came before bacteria?

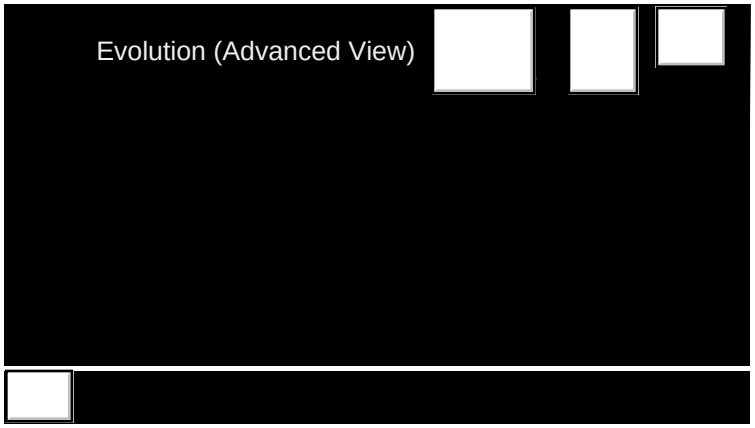

A 2008 "Evolution (Advanced View)" (O) discussion of the above table by Thims.

A single bacterium, however, is in itself a very large animated molecule, such as the colony or cluster of 20-30 *Escherichia coli* bacterial units (bacteria molecules) attached to a substrate, as pictured adjacent, comprised of about 10 billion carbon, hydrogen, and oxygen atoms, among twelve other atom types, e.g. nitrogen, phosphorous, sodium, etc., in various quantities. To form such a large molecule, form a chemical point of view, an assemble-type "chemical reaction" would be needed. This assumes that there were "reactants" that went into the formation of the first bacteria unit (product), and that there were prior energetically-coupled connective reaction mechanisms prior to the bacterial reactions.

In contrast to this mechanism view, the majority of modern scientists remain in the dark as to the fictional dichotomy between life and non-life or animate and inanimate. At the Sep 2000, 'What is Life?' conference, held in Modena, Italy, attended by Robert Hazen and about a hundred scientists, philosophers, and theologians, for instance, there was no consensus as to what the first form of life was. In particular, regarding this question, a debate erupted between the scientists. One expert on lipid molecules argued that life began with the formation of the first semipermeable lipid membrane, a structure that encases cells. A noted metabolism researcher argued that life began with the first metabolic cycle, thus giving cells the power to convert energy and atoms into useful molecules. The molecular biologists were adamant that that the first living entity must have been an RNA-like genetic system that carried and duplicated biological information. One mineralogist even threw out the wild card that the first life was a self-replicating mineral.

In contrast to this view, the "molecule evolution table approach", i.e. a table of the ancestors (with molecular formulas) of the human being, assumes continuity in the chemical mechanism (or mechanism) involved between the assembly of the first hydrogen atoms in the universe, 13.7 billion years ago, and later formation of the first human molecule (150,000 years ago), i.e. the first anatomically correct modern human. This table is shown below:

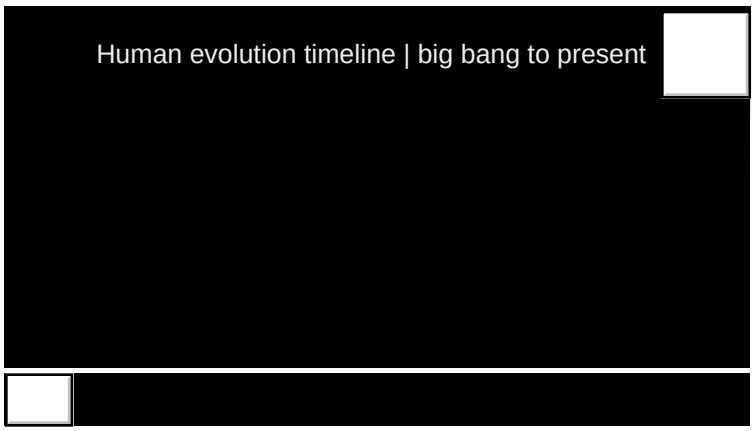

A 2009 "evolution timeline" expansion video (O) of the above table, by Thims.

Discussion

In 2005, an observation in reference to the molecular evolution table came from Italian physician Sebastiano Venturi, an expert in iodine deficiency, metabolism, and evolution research. Venturi notes that, according to his iodine research, the incorporation of atomic iodine into biological molecular structure, such as iodocarbons, may have began in *Cyanobacteria, as* a primitive antioxidant, probably about 3.5 BYA. The current table, by contrast, does not list iodine in the molecular formula for bacteria. In short, Venturi agrees with the structure of the molecular evolution, he only points out that further research will be needed to calculate more exact formulas and to find more exact elemental incorporation rates

chronologically.

In 2008, Russian physical chemist Georgi Gladyshev argued that his principle of substance stability finds proof in Thims' molecular evolution table. [6] Specifically, in 1978, Gladyshev wrote "after the concluding stages of general evolution the concentration of free energy occurs not only owing to the growth of the chemical component G j-m (molecular) and higher order components, but also owing to the G-j at (atomic) component (as well as to other components not considered here)." [2] In these early formulations of the principle of substance stability, Gladyshev understood, from the viewpoint of hierarchical thermodynamics, the importance of the atomic component (G j-at) for the understanding of direction of biological evolution. The chemical substances with heavy elements (metals), for instance, according to Gladyshev, have lower chemical thermodynamic stability and decompose (depredate) faster in the comparison of chemical substances with light elements. Examples include salts of organic acids (formiates, oxalates, many chelate compounds, carbonyls and so on). Publications on the stabilization of polymers by using of acceptors of oxygen which we generate from formic and oxalic salts corroborate these postulates. [5] The same situation, according to Gladyshev, should be found with the variation of isotope concentration of elements during ontogenesis and phylogenesis. [3] Likewise, the build up principle, Gladyshev states, should have correlation in the chemical and supramolecular stability of general organic chemistry. [4]

Quotes

The following are related quotes:

> "**Man** is descended from a **hairy, tailed quadruped**, probably arboreal in its habits, and an inhabitant of the Old World. This creature, if its whole structure had been examined by a naturalist, would have been classed amongst the Quadrumana, as surely as the still more ancient progenitor of the Old and New World monkeys. The Quadrumana and all the higher mammals are probably derived from an ancient marsupial animal, and this through a long line of diversified forms, from some amphibian-like creature, and this again from some **fish-like animal**."
>
> — Charles Darwin (1871), *The Descent of Man, Part 3* (§21:609)

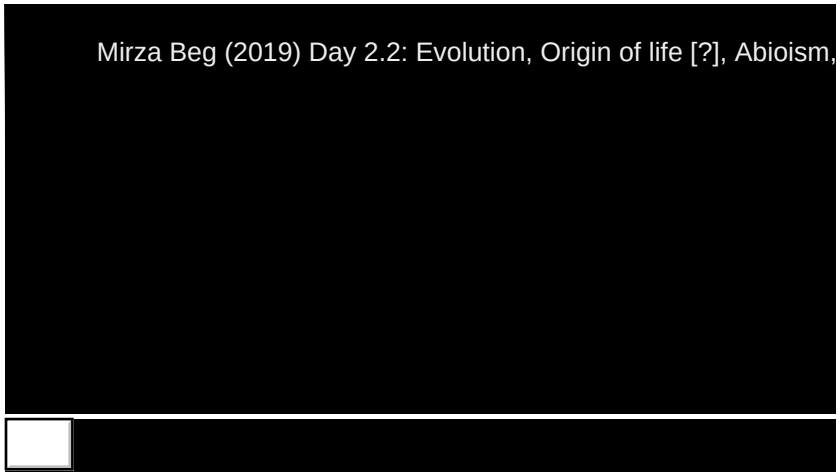

A clip from Beg-Thims interview (2019) Day 2.2, wherein Beg and Thims, using the **molecular evolution table** as a point of reference, discuss their respective positions in respect to the question of the origin of life, Beg being implicit theistic emergence, Thims being explicit atheistic abioism.

> "In order to have life you need water—which is a universal solvent—for reactions to take place, as well as carbon, which serves as the core atom of the information-carrying structural molecules of life. But you also need a lot more. Humans require about **twenty-six essential elements**; a bacteria about sixteen. The intermediate life forms are about between those two numbers. The problem is that not just any planetary body will be the source of all those chemical ingredients in the necessary forms and amounts."
>
> — Guillermo Gonzalez (c.2003), "Interview with Lee Strobel" [7]

See also

- Earth molecule
- Sun molecule

References

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2. Gladyshev, Georgi, P. (1978). "On the Thermodynamics of Biological Evolution", *Journal of Theoretical Biology*, Vol. 75, Issue 4, Dec 21, pp. 425-441.
3. (a) Gladyshev, G. P. (1976). J. Polymer Sci., Polymer Chem. Ed., 14, 1753-1759.
(b) Gladyshev, G. P. (1988). Thermodynamics and Macrokinetics of Natural Hierarchic Processes (in Russian), Nauka, Moscow.
(c) Article in: Russian Chemical Encyclopedia (Author - Г. П. Гладышев = G. P. Gladyshev).
4. Gladyshev, G.P. (2000). "On the Principle of Substance Stability and Thermodynamic Feedback in Hierarchic Systems of Bioworld." (PDF). *Biology Bulletin*, Vol. 29, No. 1, pg. 1-4.
5. *Sebastiano Venturi*, MD (Italy) (2005). "Comments to the IoHT on the Molecular Evolution Table." Selected publications; Iodine and evolution.
6. Gladyshev, Georgi,. (2008). "Email to Libb Thims", Jan.
7. Hazen, R.N. (2005). *Genesis: the Scientific Quest for Life's Origin.* Washington: Joseph Henry Press.
8. (a) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pgs. 21-24). Zondervan, 2009.
(b) Guillermo Gonzalez (astronomer) – Wikipedia.
9. (a) Key: YAB = years after bang, BYA = billion years ago, MYA = million years ago, the shorthand "E" used in formula means to the power of 10 (as indicated by the number to the right of the symbol), e.g. 3E5 = 3 x 10^5 or C_{E22} = 10^22 carbon atoms.
(b) Thims, Libb. (2002). *Human Thermodynamics (Volume One)* (revised 2005 edition) (manuscript). Chicago: Institute of Human Thermodynamics.
(c) Thims, Libb. (2007). *Human Chemistry (Volume One)* (preview) (ch. 5: "Molecular Evolution", pgs. 121-146). Morrisville, NC: LuLu.

External links

- Evolution Poster – Zazzle.com.
- Evolution (Advanced View) - YouTube.

θΔics

In chemistry, a **molecular formula** expresses the types and numbers of atoms present in a molecule or chemical, whereby subscripts are used to indicate the number of atoms present in the chemical entity. [1] The molecular formula for water, H_20, for instance, means that there are two hydrogen atoms and one oxygen atom in one molecule of water.

See also

- Human molecular formula

References

1. Daintith, John. (2005). *Oxford Dictionary of Chemistry*. Oxford University Press.

External links

- Chemical formula – Wikipedia.

θΔics

In hmolscience, **molecular goggles** is the visual conceptualization of seeing everything around us, e.g. air, building, humans, individually and within societies, amid ecosystems, as but atoms and molecules or molecular aggregates moving about, and or stationary, according to physicochemical principles.

A code-vision stylized **molecular goggles** purview from *The Matrix* film, where like the ability to see individual atoms, the character Neo has the ability to see individual code characters.

Advanced perspective

See main: Advanced perspective

The point of view looking at society or social interactions and reactions from above or from with the way a chemist looks at chemicals goes by various names, such as: 'super-observer' (Oliver Reiser, 1935), 'observer at a sufficient height' (Pierre Teilhard, 1951), 'macroscope view' (Joel de Rosnay, 1975), 'cosmic perspective' (Carl Sagan, *Cosmos*, 1980). 'unsuspected visitor perspective' (Alfredo Infante, 2001), 'bird's-eye view' (William McNeill and J.R. McNeill, 2003), 'Martian or zoomed-back view' (Andrew Morrow, 2006), 'advanced intelligence perspective' (Libb Thims, 2007). [1]

Szent-Gyorgyi

In the 1960s, Hungarian physiologist Albert Szent-Gyorgyi stated the following "molecular goggles" view in the sense that he sees a monkey, or what one might call a monkey molecule, in a jungle as a particularly concentrated locus of molecules with an inflow and outflow of material: [1]

> "If one had the kind of vision [e.g. electron microscope/quantum microscope] that allowed one [see: advanced perspective] to see molecules and were in a jungle, one would see molecules wandering about everywhere, at random. In this ceaseless wandering, one might recognize a locus in which molecules of various types were particularly concentrated, which held its form [bound state] approximately while myriads of molecules streamed in and out [turnover rate]; and that locus would be a monkey in the jungle. That continuous inflow and outflow of material [metabolism], and whatever of its structure endured, would not only make that a unique monkey from among monkeys but would ensure that it changed [see: Heraclitus] from moment to moment throughout its entire existence."

Here we see Szent-Gyorgyi touching on a number of key issues in human molecular philosophy, namely the turnover rate problem (metabolism), the individuality problem, the blind random chance movement view (Democritus) versus free energy gradient movement view (modern), and the issue of change (irreversibility) (Heraclitus).

Quotes

The following are related quotes:

> "When you start to view the world around you with Gibbsian eyes [compare: Gibbs landscape] you see the untapped potential in so many of our modern technological and industrial ecosystems."
>
> — Kevin Hand (2011), concept that would improve everybody's cognitive toolkit [3]

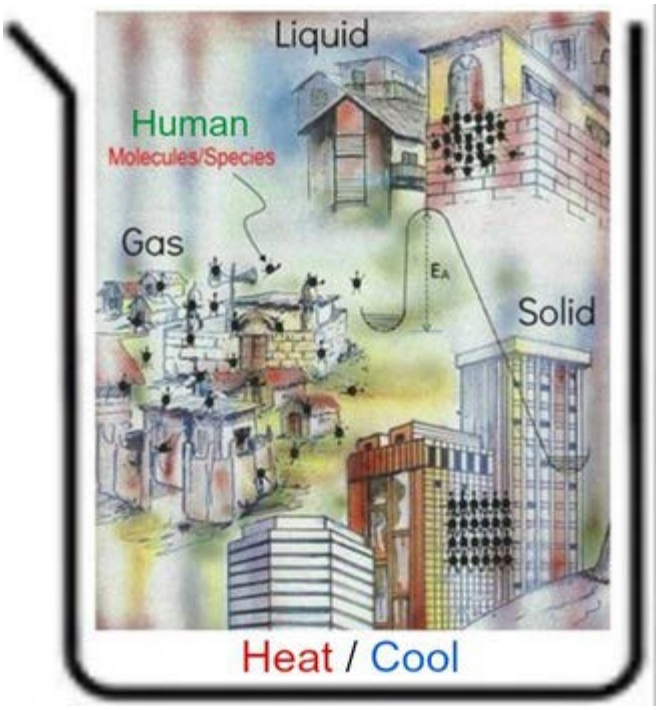

Cover section of Mirza Beg's 1987 *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, which seems to capture, in some sense, Albert Szent-Gyorgyi's description of animals (or humans in Beg's case) in a jungle as "particularly concentrated loci of molecules holding a certain form". [2]

See also

â— Thermodynamic lens (Ñº)

References

1. Thims, Libb. (2008). *The Human Molecule* (ch. 7: Advanced Intelligence Perspective, pgs. 39-42) (abs) (GB). LuLu.
2. (a) Wald, George. (1965). "Determinism, Individuality, and the Problem of Free Will" (pg. 24), in: *New Views of the Nature of Man* (editor: John Platt). University of Chicago Press.
(b) Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pg. 39). University Press of America.
3. Beg, Mirza Arshad Ali. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (Forwards, Preface, §1, pgs. i-ix, 1-22). Karachi: The Hamdard Foundation.
4. (a) Hand, Kevin. (2011). "The Gibbs Landscape", Submission (Ñº) (pdf) to the *Edge* World Question Center's query: "What Scientific Concept Would Improve Everybody's Cognitive Toolkit?", Jan, in: *This Will Make You Smarter* (§:The Gibbs Landscape, pgs. 312-14). Harper Perennial, 2012.
(b) Kevin Hand (about) – Jet Propulsion Laboratory, Caltech.

θΔics

In chemistry, **molecular hypothesis**, sometimes called "Avogadro's hypothesis", states that equal volumes of all gases at the same temperature and pressure contain the same number of molecules; in a more general sense: that all bodies are composed of individual atoms and or molecules.

The Molecular Hypothesis.—The molecular theory of matter, of which I shall speak to you this evening, declares that every mass of matter, however uniform and homogeneous and quiescent it may appear, is in reality composed of separate particles, each of which is in rapid motion. This proposition, although it may seem extravagant and improbable, has been forced upon us by a great variety of considerations, some of which I shall indicate to-night. It has been maintained, in one form or another, by various philosophers for the last 2300 years; but the reasoning of the ancients, on this subject at least, is so extremely subtle and nebulous that it has no value whatever for modern purposes.

An 1894 synopsis of the **molecular hypothesis**, by American engineer Allan Risteen, according to which mass of matter is composed of separate particles, which largely tend to be molecules (very few individual unattached atoms are found in nature). [3]

History

This molecular hypothesis was stated in 1811 by Italian chemist Amedeo Avogadro who, in his use of the term 'molecule', distinguish between atoms and molecules of different kinds, adopted terms including molécule intégrante (the molecule of a compound), molécule constituante (the molecule of an element), and molécule élémentaire (atom). [1]

Avogadro's hypothesis was quickly opposed by John Dalton and its universal validity was later questioned by Jacob Berzelius. It would not be until the start of the 20th century that it became universally accepted and the "touchstone upon which atomic weights and formula are tested". [2]

See also

â— Atomic theory
â— Human molecular hypothesis

References

1. Amedeo Avogadro – Britannica.
2. McCoy, Herbert N. (1908). "The Experimental Basis of Chemical Formulae and the Teaching of the Atomic-Molecular Hypothesis", *School Science and Mathematics*, 8(6):441-., Jun.
3. Risteen, Allan D. (1896). *Molecules and the Molecular Theory of Matter*. Ginn & Co.

Further reading

â— Morselli, Mario. (1984). *Amedeo Avogadro: a Scientific Biography* (§4: "The Molecular Hypothesis: from 1811 to Canizzaro's 'Sunto' in 1858", pgs. 131-). Springer.

θΔics

In science, **molecular sociology** refers to the sociology of human molecules.

Molecular sociology arrives at last

New Scientist Feb 11, 1971

Do people behave like molecules? The success of two recent attempts to analyse human behaviour using the established laws of molecular motion and of thermodynamics might suggest so. In a paper entitled "The statistics of crowd fluids" L. F. Henderson, department of mechanical engineering, University of Sydney, Australia, presented his investigation of crowd motions and compared them with the Maxwell-Boltzmann theory of gases (Nature, vol 229, p 381). Provided that the crowd density was not high enough to cause a change to the "liquid phase"—as at a ticket barrier—Henderson's crowds generally conformed to the gas model. But he did find that men and women can not be considered as "identical particles".

The relationship between population distribution and thermodynamics was examined by Elihu Fein, Northeast Utilities Service Company, Hartford, Connecticut in a paper entitled "Demography and Thermodynamics" (American Journal of Physics, vol 38, p 1373). If he identified the variables properly—for example, per capita income was used as a measure of social activity analogous to molecular activity or kinetic energy which depends on the temperature, T—Fein found good agreement between his social abstraction and the physical one. Some of these concepts were first described in New Scientist by Daedalus under the name of molecular sociology.

To test his hypothesis, Henderson looked for homogenous crowds in Sydney. That is, ones where each "particle" has the same mass, and the same probability of velocity components. He says: "The concept of homogeneity is analogous to the concept of chemical purity in molecule systems." It is this point which may have caused small deviations in his data. Two of the cases studied by Henderson were students on a footpath outside a library, and pedestrians on a crossing at a busy intersection. The velocity distribution of the subjects fitted the predicted distribution based on a one-dimensional Maxwell-Boltzmann theory (the "particles" were moving only along one axis). However, there was an unexpected small dip at the maximum of the curves, which should have been bell-shaped. The Australian researcher suggests that the dip may be due to a mixture of two populations, namely males and females, whose distributions are displaced from one another. In other words, the system was not "chemically pure". This effect even showed up with 6 to 8-year-old children who were "doing their thing" on a school playground. Unfortunately, Henderson's data do not distinguish men from women. But with the benefit of hindsight, he would consider them as different in future tests.

Population density follows the same law as molecular density when a central force is present, according to Fein. Furthermore, the spatial activity of the population tends to follow the molecular law if dollars are a measure of the total social energy. Fein also applies the concepts of "adiabatic" and "entropy" to his social system. An adiabatic system, for example, exchanges no money (heat) with its surroundings, and is economically self-sufficient. Although these analogies seem to have some validity Fein emphatically states that "the conclusion is not that people act like molecules." He mentions that it should not be surprising that "social abstractions and physical abstractions, both coming from the same impulse in man, may be closely related to each other." The impulse Fein refers to is our attempt to understand ourselves and our world through abstract concepts. Whether the abstract concept is "thermodynamics" or "population" its structure may be quite general.

A 1971 article on independent **molecular sociology** themed work of Roy Henderson and Elihu Fein, who applied physics and thermodynamics to questions of social phenomena. [1]

> "Between the method of Quetelet, who represents, so to speak, **molecular sociology**, and that of Comte, who especially represents synthetic sociology, Spencer takes the mean, which, although it is without the qualities of the first, is also without the qualities of the first, is also without the dangers of second."
>
> — Guillaume de Greef (1902), "Introduction to Sociology" [5]

The term "molecular sociology" is a synonym, essentially, to the terms social chemistry (Thomas Huxley, 1871) and human chemistry (1851, E.B.).

Henderson | Fein

In 1971-72, *New Scientist* magazine published a two-part article on "Molecular Sociology" in discussing the question "do people behave like molecules?" In the first installment of the article, in answer to this question, they state that "the success of two recent attempts to analyze human behavior using the established laws of molecular motion and of thermodynamics might suggestion so." [1]

In particular, they discuss the highly-cited 1971 article "The Statistics of Crowd Fluids", by Austrian mechanical engineer Roy Henderson, at the University of Sydney, who measured the movements of college students on a campus and children on a playground, finding that in both cases their movements fit the Maxwell-Boltzmann distribution, meaning that both velocities of gas particles and the speeds of students follow a Gaussian distribution. [2] Henderson found that crowds generally conform to the gas particle model, but found differences, such as that "men and women cannot be considered as 'identical particles'.

The article also cites the article 1970 "Demography and Thermodynamics" by American physicist Elihu Fein, who finds, though examination of factors such as per capita income, that social activity is analogous to molecular activity, and applies concepts such as entropy and adiabatic to social systems. [3] Fein, however, cautions his readers, in that although his analogies seem to have validity, he emphatically states that "the conclusion is not that people act like molecules", but that the goal is to understand ourselves and the world through abstract concepts.

Curiously, both the 1971 and 1972 *New Scientist* articles on molecular sociology also cites a person by the name of Daedalus who is said to have "developed a 'molecular sociology' an analogy between people and molecules [who] identified wealth in people with energy in molecules; [and] is now developing a financial thermodynamics or thermodynamics of money." [4]

Goethe | Lehn

In 1991, when University of Twente, Netherlands, awarded French chemist Jean-Marie Lehn an honorary doctorate he told a highly evocative story about the discipline, which he described as "Molecular Sociology", stating the following: (Ñº)

> "Just like with humans, we can ascribe characteristics to molecules. One type happily associates with one another, the other prefers to isolate itself."

In 1995, Lehn, in his *Supramolecular Chemistry*, made reference to Goethe's 1809 human elective affinities theory as being a type of 'molecular sociology', an analog to supramolecular chemistry: [5]

> "Supramolecular chemistry is a sort of **molecular sociology**! Non-covalent interactions define the inter-component bond, the action and reaction, in brief, the behavior of the molecular individuals and populations: their social structure as an ensemble of individuals having its own organization; their stability and their fragility; their tendency to associate or to isolate themselves; their selectivity, their 'elective affinities' and class structure, their ability to recognize each other; their dynamics, fluidity or rigidity or arrangements and of castes, tensions, motions, and reorientations; their mutual action and their transformations by each other."

Lehn here, of course, is culling from German polymath Johann Goethe's 1809 *Elective Affinities*.

Prigogine

In 1984, Belgian chemist Ilya Prigogine, in his 1984 *Order Out of Chaos*, mentions Goethe's 'Mittler the mediator' as being a type of human catalyst, bring about successful reactions between people, without being consumed in the process. The concept of molecular sociology, with the introduction of the chemical thermodynamics work of Willard Gibbs (1876) and Hermann Helmholtz (1882), after which the measurement of affinity became a function of enthalpy change and entropy change, however, would move the subject of molecular sociology into the field of thermodynamics.

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External links

â— What are the dimensions of molecular sociology? (2013) – ResearchGate.net.

θΔics

In thermodynamics, **molecular thermodynamics** is thermodynamics with specific reference to molecular theory. [1]

Etymology

The term “molecular thermodynamics”, becoming common in the 1960s, is used, in some sense, to contrast with that of classical thermodynamics, which is often said to be independent of atomic and molecular models. [2] The subject of the "thermodynamics of molecular species", seems to be a newer variation presented as a modernized chemical thermodynamics, of the updated Willard Gibbs (1876) Gilbert Lewis (1923) variety, with focus on issues germane to topics in those areas such as mechanistic chemistry or solution chemistry. [3]

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θΔics

In thermodynamics, **molecular vortices** was an atomic structure hypothesis, used to account for the interactions of heat and contractions and expansions of elastic atmospheres, in which each atom of matter consisted of a nuclei about which a revolving or oscillating atmosphere existed. [1] The theory was conceived between 1842 and 1849 by Scottish engineering physicist William Rankine. [2]

History

The origin of the vortex atom heat theory seems to trace to a combination of the 1830s publications of Scottish physicist James Forbes on the undulatory theory of heat and light the 1842 publication of *Elements of Chemistry* by Scottish chemistry Thomas Graham who discussed the 'material theory of heat' (an adaption of the caloric theory), in which heat was considered as indestructible particles, and the 'undulatory theory of heat' (an adaption of the undulatory of light), in which undulations in imponderable medium of space or ether are propagated that produce the impression of heat. [3]

Forbes was Scottish engineering physicist William Rankine's natural philosophy professor at the Edinburgh University, during the years 1836 to 1837, and Graham was related to the mother of William Rankine. It is likely that Rankine was stimulated by these thoughts on the nature of heat. [2] At Edinburgh, under the guidance of Forbes, Rankine published two essays, "On the Undulatory Theory of Heat" and "Methods in Physical Investigation", in which the seeds of his thoughts on a theory of molecular vortices took root. In early October of 1849, Rankine gave Forbes an entire paper on the hypothesis of molecular vortices which consisted of, first, the details of the hypothesis:

> "[The hypothesis of molecular vortices] ascribes the elasticity connected with heat to the centrifugal force of small revolutions of the particles of bodies."

This being considered the statical part. Second, the paper outlined the application of the model to the mechanical action of heat, the dynamical part. [2] On February 4th, 1850, Rankine read both parts of the paper, titled "On the Centrifugal Theory of Elasticity, as Applied to Gases and Vapours" and "On the Mechanical Action of Heat, especially in Gases and Vapours", to the Royal Society of Edinburgh. In the first of these, Rankine states his molecular vortices hypothesis: [4]

> "Each atom of matter consists of a nucleus, or central point, enveloped by an elastic atmosphere which is retained in its position by attractive forces, and that the elasticity due to heat arises from the centrifugal force of these atmospheres, revolving or oscillating about their nuclei or central points."

Furthermore, according to Rankine:

> "The vibration which, according to the undulatory hypothesis, constitutes radiant light and heart, is a motion of the atomic nuclei or centers, and is propagated by means of their mutual attractions and repulsions."

Rankine acknowledged that his molecular model had many conceptual resemblances to the models of earlier philosophers, including German mathematical physicist Franz Aepinus and British chemist Humphry Davy. In his model, each atom of matter consisted of a nucleus surrounded by an elastic atmosphere, self-repulsive but retained by the attraction of the nucleus. In alignment with the views of English physicist James Joule, a quantity of heat was considered the *vis viva* of revolutions or oscillations among the particles of the atmospheres which Rankine supposed to constitute vortices about the nuclei. [2]

In afterthought, Rankine states explicitly that his "researches were commenced in 1842, and after having been laid aside for nearly seven years, from want of experimental data, were resumed in consequence of the appearance of the experiments of M. Regnault (1847) on gases and vapours".

Soon after receiving Rankine's papers, he dispatched a copy to his colleague William Thomson. Later that year, in 1850, Rankine told Thomson that his "first attempt to apply mathematical reasoning to the subject arose from my seeing the translation … of Clapeyron's paper [1834] on the opposite [material] theory." [5]

Impact

In thermodynamics, the theory of heat generation due to actions of atomic vortices resulted to discredit much of Rankine's views on the equations of the first two laws of thermodynamics. The conception of a vortex atomic structure, however, got many scientists thinking. Scottish physicist James Maxwell, a friend of Rankine, for one, was significantly influenced by Rankine's ideas on the physical interpretation of the vortex atom. Firstly, Rankine's heat generation theory was in direct conflict with Maxwell's kinetic theory of heat generation due to atomic collision. In any event, the kinetic theory eventually won out over the vortex theory, and one positive result of this intellectual exercise seems to have been the lasting image of rotating atom structures. [6]

Maxwell, significantly, thought would later go on to found the equations of electromagnetic theory to explain the interactions of the electricity, magnetism, and induced movements of currents in wires. On May 1857, Maxwell remarked in a letter to his friend, mathematician Cecil James Monro (1833 – 1882), that: [7]

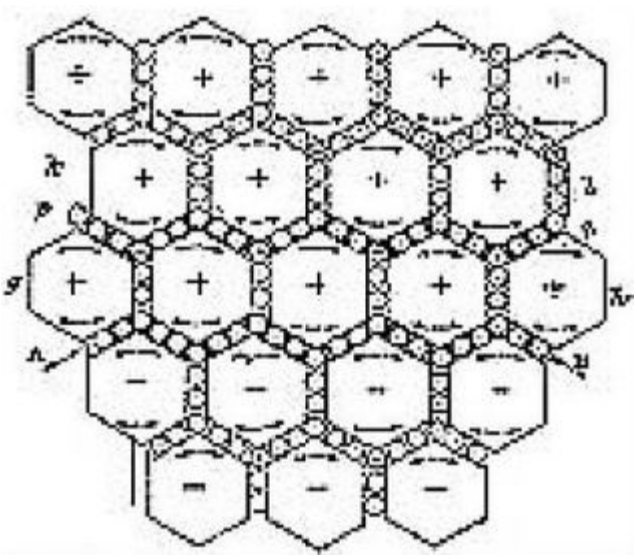

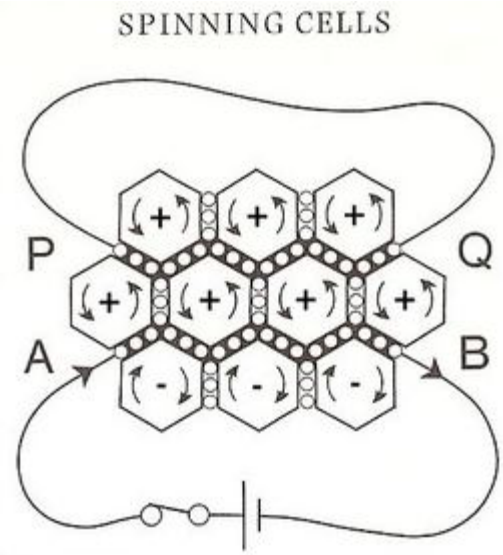

Scottish physicist James Maxwell's 1856 "spinning cells" (original: left; 2003 version: right), or what he called "mechanical illustrations to assist the imagination", the precursor models to the his eventual formulation of electromagnetic theory; seeded, in some way, from Scottish engineering physicist William Rankine's1842 **molecular vortices** model precursors. [8]

> "I have been grinding at many things and lately during this letter at a vortical theory of magnetism & electricity which is very crude but has some merits."

This is the first indication of Maxwell's version of a theory of molecular vortices, proposed as a physical representation of lines of force, which is developed in his four-part paper "On Physical Lines of Force" (1861-62). In this paper, Maxwell advances from his discussion of the physical geometry of lines of force, in "On Faraday's Lines of Force" (1856), to a physical mechanics of the field.

The title of Maxwell's paper is in reference to English physicist Michael Faraday's 1852 paper "On the physical character of the lines of magnetic force", in which Faraday affirms the physical reality of lines of force, and their causal action, as distinct from a purely geometrical treatment of their distribution in space. In his 1856 paper, Maxwell used what he called "mechanical illustrations to assist the imagination", as those shown above. [8]

The visual picture of conductors, such as copper, containing rotating or spinning cells (atoms) interspersed with 'idle wheel' particles (conceived as particles of electricity), such that via cell rotation, induced by alternations or changes in the direction of magnetic field, particles moved through the metal. [8]

Others to have been influenced by the vortex model and in general Rankine's thermodynamics theories include German physicist Rudolf Clausius, to whom was sent a copy of Rankine's 1850 papers on the suggestion of William Thomson, German physicist Hermann Helmholtz, who in 1858 outlined a theory of "vortex rings" in fluids, Scottish physicist Peter Tait who in 1867 devised a floating smoke ring experiment to illustrate Helmholtz's theory, and Thomson, who a

month after seeing Tait's smoke ring experiment wrote an article titled "On Vortex Rings" arguing atoms are vortices in the ether of space. [9]

Electron discovery

In 1883, British physicist J. J. Thomson wrote a paper on vortex rings, using the Helmholtz ring model in which atoms of gas were considered to consist of approximately circular vortex rings; the logic of which served as a basic atom model helping him to later discover the electron in 1897 and devise his plum pudding model (1904) of atomic structure. [10]

In his autobiography of 1936, J. J. Thomson recalled that his early work on vortex atoms yielded “some interesting results and ideas which I afterwards found valuable in connection with the theory of the structure of the atom.” [11] In particular, Thomson thought of electric force in term of the vortex model. The vortex atom continued to be discussed by a few chemists and physicists even after 1900, but at that time it was realized that the theory was unable to produce real progress. [12]

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θΔics

In science, a **molecule** is a structure built of atoms bound together by chemical forces; a structure in which two or more nuclei are maintained in some geometrical configuration by attractive forces from a surrounding swarm of negative electrons. [1] A molecule, in simple terms, is a group of atoms. [11]

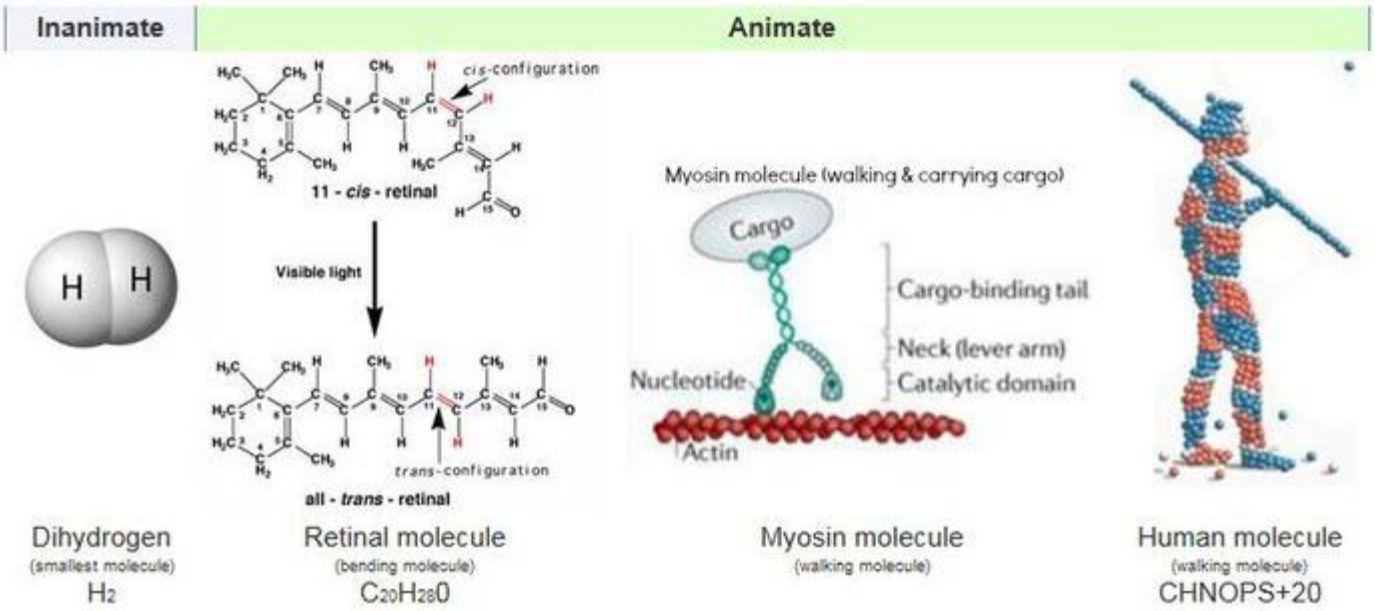

Depictions of **molecules**: both inanimate (dihydrogen) and animate (retinal molecule, myosin molecule, and human molecule).

Etymology

In 1620, Isaac Beeckman, building on Epicurus, outlined the first concept of the molecule. [14]

In 1649, Pierre Gassendi, having been influenced by Beeckman, in his *Syntagma philosophiae Epicuri* (*Arrangement of the Philosophy of Epicurus*), coined the term "*molécule*" as the attachment of two or more atoms. Gassendi, supposedly, outlined the view that a hooked atom attached to an eyelet atom would form a molecule. [9] In commentary on evolution, Gassendi stated: [10]

> "While [the atoms] are moving in various ways and meeting, interweaving, intermingling, unrolling, uniting, and being fitted together, **molecules** or small structures similar to molecules are created, from which the actual seeds are constructed and fashioned."

The Online Etymology Dictionary, to note, claims, in a mis-attribution sense, that the term molecule dates to 1794 where it was defined as an 'extremely minute particle', having originated from a translation of the French term *molécule*, supposedly first used in 1678, originating in the work of Rene Decartes. [2] This may be possible; albeit, to note, Gassendi publications and views in support of atomic and molecular theory were spurred into existence so at to contradict the philosophical views of Descartes and it is difficult to find a reference where Descartes actually uses the term molecule.

In his 1808 *New System of Chemical Philosophy*, English chemist John Dalton was stating that volumes of gas consist of "a number of ultimate particles or molecules", and using the terms atom and molecule differently. [8]

It is often said, however, that the first semi-modern scientific use of the term 'molecule' is found in the famous 1811 article "Essay on Determining the Relative Masses of the Elementary Molecules of Bodies" by Italian physicist Amedeo Avogadro. [3] In this paper, Avogadro accepts both John Dalton's theories and Joseph Gay-Lussac's data, and shows how to reconcile them by distinguishing between the atom and the molecule of an elementary gas. [4] It is said that Avogadro and his student Stanislao Cannizzaro coined the term molecule from the Latin name *molecula* or little mass. [6] English chemistry historian James Partington summarizes Avogadro's view as: [5]

> "The smallest particles of gases are not necessarily simple atoms, but are made up of a certain number of these atoms united by attraction to form a single molecule."

It is to be noted, supposedly, that this is not a literal translation in that Avogadro uses the name "molecule" for both atoms and molecules. Specifically, he uses the name "elementary molecule" when referring to atoms and to complicate the matter also speaks of "compound molecules" and "composite molecules". [4]

Classification

In hmolscience discussions, the query often arises as to whether or not one can classify a person as a "molecule", say as compared to other terms: chemical complex, chemical species, etc. In general terms, the "hall-mark of a molecule", according to English physiologist Charles Sherrington, in his 1938/39 discussions on whether or not a protein is to be regarded as cluster of lesser molecules or a giant molecule or protein molecule, is "definite individuality". [12]

Further discussion on this subject of molecular classification can be found in German-born American physical organic chemist Ernest Grunwald's 1997 *Thermodynamics of Molecular Species*, particularly his opening section entitled "Formal Components". In short, according to Grunwald: [13]

> "In general, a molecular species is a macroscopic or near-macroscopic ensemble of **molecules** that are characterized by a definite molecular formula, a definite and distinctive equilibrium geometry, and a distinctive set of molecular modes of motion and spectral properties. For example, the actors in chemical reaction mechanism—the reactants, products, substrates, catalysts, reactive intermediates, and even the mechanically unstable transition states—all represent separate molecular species, as do any sets of molecules that become distinguishable in physical interaction mechanisms."

A molecule, in short, is any sets of atoms that become distinguishable in the mechanism interaction process.

Human molecules

In human chemistry, the term "human molecule" is the chemical definition of one human being.

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External links

● Molecule – Wikipedia.

θΔics

In human chemistry, **molécule humaine** (human molecule) or *molécules humaines* (human molecules) is the original French version of the coining of the term 'human molecule', referring to an individual person as a molecule, used independently by Frenchmen composer Hector Berloiz (1854) and historian Hippolyte Taine (1869), among others. The following is an attempt to represent or collect some of these French views of the concept of the the use of the abstract term 'molécule humaine' (metaphorical or not), which do not as of yet seem to have found English translations.

1798: Sales

In 1798, French philosopher Jean Sales was using the term "millions de molécules humaines" (millions of human molecules), in discussing how so many million atoms of the earth become vegetables, who become animals, who become humans, and how one of these millions of human molecules may become a great philosopher. The literal translation however is bit difficult to interpret: [3]

"Il faut conclure de mon fyrtême, que Sevu le principe du corps humain vient de la terre qui d'abord a végété, & de l'état de végétal a enfuite paffé à celui d'animal: cet animal a fervi d'aliment à l'homme, & cet aliment a été d'abord du fperme , enfuite de la chair, des veines & des os dont l'être eft né , & après la naiffance il fubfifte, ou il ne fubfifte pas. — Sachez donc, vous qui cherchez le grand œuvre, que de tant de millions d'atomes de la terre^ à peine un feul devient affez actif pour végéter ; que la plus petite partie de mille millions de végétaux devient animale ; que de mille millions d'animaux une feule molécule devient humaine, & que de mille millions de **molécules humaines**, il n'y en a qu'une qui devienne une goutte de fperme ce n'eu pas tout encore : de mille million.' de gouttes de fperme, une feule devient femence : de mille millions de parties de femence, une feule arrive à la matrice, & de mille millions de ces particules féminales qui arrivent à la matrice, il en naît un feul homme, & de mille millions qui naiffent, un feul fubiifte, & de mille millions qui fubfiftent un feul eft Mufulman, & de mille millions de Mufulmans, un feul a la vraie foi , & de mille millions de fideles un feul eft philofophe, & de mille millions de philofophes, un feul devient adepte. — Le but de tant de générations eft donc un adepte : ainfi la nature emiere a contribué * à fon exiftence."

"We conclude my fyrtême, Sevu that the principle of the human body comes from the earth first vegetated, and the rule of plant has pafled afterwards to that of animals: This animal ferved food to man, and the food was the first fperme, and afterwards of the flesh, veins and bones which is being born, and after the birth it subsists, or it does not subsists. - Know So, who seek the great work, as so many millions of atoms of the earth just one only becomes active enough to vegetate; the smallest part of a mile million plant becomes animal, than a thousand millions of animals alone molecule becomes human, and how many thousand millions of **human molecules**, there is only one that will become a drop of sperm this n'eu not all: one thousand million. Drops of fperme, alone becomes a feeds: one thousand million games of feeds, one reaches the matrix alone, and a thousand million of these particles Feminale coming to the matrix, there arises a alone man, and a thousand million who are born, a fubiifte alone, and a thousand million that subsist alone is a Mussulman, and a thousand millions of Mahometans, one only has the true faith, and a thousand million faithful one alone is philosopher, and a thousand million philosophers, one only becomes a follower. - The goal of many generations is thus a fan: thus nature ime has contributed to existence."

1840: Esquiros

In 1840, French writer Alphonse Esquiros was expressing the view that: [4]

"Car, en vérité, je vous le dis, le coeur qui prie, comme celui qui aime, avance le monde ers l'unité, c'est-à-dire vers Dieu. Cette unité ne peut avoir lieu en effet que par l'assentiment des **molécules humaines** à se porter toutes les unes vers les autres; Cette loi d'attraction est une loi d'amour."

"For verily I say unto you, the heart that prays, as one who loves the world advances in unity, that is to say towards God. This unit can be held in effect by the assent of **human molecules** to carry all toward each other; the law of attraction is a law of love."

1854: Berloiz

In his 1854 book *Evenings with the Orchestra*, Frenchmen composer Hector Berloiz describes the children church choir moving into their seats: [1]

“Au moment de l'entrée des groupes d'enfants, les compartiments des amphithéâtres, se peuplant successivement du haut en bas, formaient un coup d'œil singulier, rappelant le spectacle qu'offre dans le monde microscopique le phénomène de la cristallisation. Les aiguilles de ce cristal aux **molécules humaines**, se dirigeant toujours de la circonférence au centre, étaient de deux couleurs, le hleufoncé de l'habit des petits garçons sur les gradins d'en haut, et le blanc de la robe et de la coiffe des petites filles occupant les rangs inférieurs. En outre, les garçons portant sur leur veste, les uns une plaque de cuivre poli, les autres une médaille d'argent, leurs mouvements faisaient scintiller la lumière réfléchie par ces ornements métalliques, de manière à produire l'effet de mille étincelles s'éteignant et se rallumant à chaque instant sur le fond sombre du tableau.”

“Upon entry of groups of children, the compartments of amphitheaters, will populate successively from top to bottom, formed a singular look, recalling the spectacle in the microscopic world of the phenomenon of crystallization. The needles of this crystal of **human molecules**, still heading in the center of the circumference, were of two colors, hleufoncé in the habit of small boys on the steps from above, and the white robe and headdress girls occupying the lower ranks. In addition, the boys on their jackets, each plate of polished copper, the other a silver medal, their movements were flickering light reflected from the ornaments of metal, to produce the effect of a thousand sparks extinguishing and relighting every moment on the dark background of the table.”

1869: Taine

In the 1870 book *On Intelligence*, French historian Hippolyte Taine states in his preface (dated 1869) that his philosophy amounts to the view: [2]

“Bref, celui qui étudie l'homme et celui qui étudie les hommes, le psychologue et l'historien, séparés par les points de vue, ont néanmoins le même objet en vue ; c'est pourquoi chaque nouvel aperçu de l'un doit être compté à l'acquis de l'autre est visible aujourd'hui, notamment dans l'histoire. On s'aperçoit que, pour comprendre les transformations que subit telle **molécule humaine** ou tel groupe de molécules humaines, il faut en faire la psychologie.”

“Between psychology thus conceived and history as it is now written the relationship is very close. For history is applied psychology, psychology applied to more complex cases. The historian notes and traces the total transformations presented by a particular **human molecule** or group of human molecules; and, to explain these transformations, writes the psychology of the molecule or its group.”

1903: Guyot

In 1903, French economist Yves Guyot stated: [7]

“Serait-ce qu’en ble et en betail, que ses industriel ne peuvent se contenter de son marche interieur, si actif qu'il soit, ne peut croire que l'avenir appartienne aux civilisations stagnantes. Il appartient aux civilisations fluides dans lesquelles les **molécules humaines** roulent sans cesse les unes sur les autres.”

“If only wheat and cattle, its industry cannot rely on its domestic market, if it is active, one cannot believe that the future belongs to stagnant civilizations. It belongs to civilization in which the fluid **human molecules** roll ever on each other.”

In his 1918 book *The Guarantees of Peace*, he states: [8]

"est la rapidité de l'évolution des groupes humains : le grand conflit actuel est entre ceux qui s'efforcent de figer les situations et ceux qui s'adaptent aux civilisations fluides, dont les molécules sont en perpétuel déplacement."

“It is the rapid evolution of human groups: the large current conflict is between those who seek to freeze the situation and those who adapt to fluid civilizations fluids, whose molecules are in constant movement. "

1909: Gide and Rist

In 1909, Charles Gide and Charles Rist state: [6]

“Les premiers economists appartiennent en majorite a la premire categorie. Dans la variele des phenomenes sociaux ils se bornes pour la ;lupart a etudier ceux qui sont susceplibles d’une explication surtout mecanique. Les fluctuations des prex, la hausse et la baisse du faux de l’interet, du salaire et de la rente, l’adaptation de laa production a la demande sous un regime de libre concurrence, leure apparaissent comme les effects de l’action Presque automatique de **molécules humaines** obeisant au mobile pariout identique de ‘interet personnel. Et la simplicite de cette conception nemanque pas de graduer.”	"The first economists belong to the majority of the premier category. In the various social phenomena they are terminals for; lupart study has susceplibles those of a mechanical explanation lies. Fluctuations prex, the rise and fall of the false interest, salary and pension, the adjustment of production laa demand under a regime of free competition, they appear as the effects of the action almost automatic **human molecules** obeisance to mobile pariout identical personal interest. And the simplicity of this design does not fail to graduate. "

1940: Damalas

In his 1940 book *Essay on the Evolution of International Trade: Theories, Facts*, French writer Basile Damalas used the term ‘molécules humaines’ at least six times. Below is one example: [5]

“Remplaçons les molécules gazeuses par les **molécules humaines**. Si celles-ci ne s'inspirent que de leurs goûts et de leurs intérêts personnels, sans action concertée, leurs trajectoires se mêleront et S’enchevetreront dans le desordre le plus complet.”	“Replace the gas molecules by the **human molecules**. If they do not mirror that of their tastes and their personal interests, without concerted action, their trajectories will mingle and become entangled in the most complete disorder.”

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θΔics

In art chemistry, **Molecule Man** refers to one of various aluminum sculptures, varying in height from 30 to 100 feet, made American sculpture artist Jonathan Borofsky, depicting three human shapes, each pushing or leaning towards each other, each bodies filled hundreds of holes, varying in size from about seven inches to one foot or more, each hole said to be representative of "the molecules of all human beings coming together to create our existence".

100-foot **Molecule Man** on the Spree River, Berlin (1998)

Overview

There are four outdoor *Molecule Man* sculptures. The dates are: Los Angeles 1978, Yorkshire 1988, Berlin 1996, and Council Bluffs 2008. There were a few early indoor versions; but dates for these structures are not known exactly. Borofsky's first reference to what he calls the "molecular structure of life" was circa 1978. [8] The Sports Illustrated photo that served as the "model" for the four outdoor sculptures, depicts two men are running to congratulate themselves, having won the national basketball tournament. The first Molecule Man sculptures were built in Los Angeles, in 1977 and 1978, originating because, as Borofsky says: [1]

> "I was fascinated by this 'molecule idea', the simple fact that even though we appear to be quite solid, we are in fact composed of a molecular structure which in itself is mostly composed of water and air."

The first 30-foot "Molecule Man" placed in Los Angeles, consisting of three aluminum figures coming together connected in the center with their arms, said to depict the chemical philosophy that: [2]

> "For me, it was people—all of us are made up of molecules coming together to create the world in a sense."

The actual original drawing of the "Molecule Man" was traced off of a magazine photograph of two college basketball players, rushing to congratulate each other for having just won the NIT [National Invitation Tournament], as depicted on the cover of Sports Illustrated. [2] The exact cover, however, seems to be difficult to locate, as it does not seem to be among the 1970 to 1978 covers. [5]

(photograph of two college basketball players, rushing to congratulate each other for having just won the NIT [National Invitation Tournament] on the cover of Sports Illustrated [date: c.1970s?])

Sports Illustrated (Cover) circa 1977

Painted human-sized aluminum Molecule Man (1980) sculpture, depicting the original two-person SI tracing. [7]

30-foot Molecule Man, downtown Los Angeles (1978)

Borofsky drawing on mylar for *Molecule Men* (1981), photo by Sidney B. Felsen, Los Angeles. [9]

2007 video about the construction and installment of Borofksy's Iowa Molecule Man a $1.8 million sculpture (below right).

3D model of the Molecule Man (Berlin) by team at pivnice. [10]

Molecule man with briefcase (1979) [7]

30-foot Molecule Man, Yorkshire Sculpture Park, West Yorkshire, England. [6]

50-foot Molecule Man, Council Bluffs, Iowa, in front of Mid America Center (2008)

The biggest "Molecule Man", to-date, 100-feet in height, is located on the Spree River, Berlin in front of the Treptowers. [4] Completed over the course of two years, circa 1996 to 1998, with the involvement of large team, commissioned by Allianz GmbH, the biggest insurance company in Europe, to be the centerpiece of their new building, built in the river so that boats can go by on either side, with the figures appearing to be standing on the water.

There is a 50-foot molecule man, constructed in 2008, in front of the Iowa West Public Art Mid-America Center, Council Bluffs, Iowa. [3]

See also

â— Art thermodynamics
â— HMS pioneers

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6. Yorkshire Sculpture Park – Wikipedia.
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9. Borofsky drawing on mylar for *Molecule Men* (1981) – National Gallery of Art, Washington, D.C.
10. Molecule Man (3D) - by team at pivnice.

External links

â— Molecule Man (sculpture) – Wikipedia.

θΔics

In hmolscience, **molecules in motion**, similar to "molecules-to-man evolution" (Ken Ham, 1975), is a neo-modern Christian apologetics technique or ploy, commonly used to stump atheists, on questions about morality, meaning, truth, reason, or rationality, among others; the most-common version being "if we're just *molecules in motion*, and there is no god, where do you get your morals, moral foundation, or sense of right and wrong from?"

"The atheist cannot account for laws of logic. He cannot make sense of them within his own worldview. How could there be immaterial, universal, invariant, abstract laws in a chance universe formed by a big bang? Why should there be an absolute standard of reasoning if everything is simply **'molecules in motion'**?"
— Jason Lisle (2014), On Atheistic Logical Inconsistency, Sep 9

American astrophysicist Christian apologeticist Jason Lisle's take on the "**molecules in motion**" logical fallacy argument, for the existence of god (Ñº); the gist of which amounts to pointing out that things such as logic, morality, ethics, justice, etc., arising out of a blind random chance Epicurean universe of atoms and molecules moving about is an apparent contradiction, and therefore and absurd position.

Overview

In 1834, English chemist, physician, and natural theologian William Prout (1785-1850) in his *Chemistry, Meteorology, and the Function of Digestion, considered with Reference to Natural Theology*, the eighth *Bridgewater Treatise*, a set of treatises focused on expounding on "the power, the wisdom and the kindness of god, as they are pronounced in the creation", as bequeathed in the 1829 will and testament of Francis Henry, Count of Bridgewater, employed the term "molecules in motion" three times, in respect to trajectories of molecule, but not it seems in an apologetics sense. [8]

In 1926, William Wright, in his *A Student's Philosophy of Religion*, in his section "The New Realism and God", stated the following: [7]

> "Naive realism is the view of the plain man, who supposes that objects exist independent of him, regardless of whether any one perceives them or in any way thinks of them. The apple exists, and is red, slightly sour, sweet, and solid, whether any mind in the universe takes notice of it or not. Scientific realism maintains that the primary qualities of matter exist independent of human minds; for it the apple of the plain man becomes atoms and **molecules in motion**, or electric charges. The new realists are not quite certain whether to side with the naive or the scientific realist; they would like to show, if possible, that both are in some sense right. Numbers, and all mathematical and logical principles, exist independent of minds, and of all events that go on in the world process: they subsist as eternal essences or entities. 7 plus 5 equals 12 whether any one knows it, or thinks of it, or not. The same is true of the higher numbers that no one yet has ever counted, and of the undiscovered fields of higher mathematics. Whether moral axioms also (like those of justice, benevolence and equity) subsist eternally, apart from minds, is a disputed point among the new realists themselves."

In 1976, during the four-night debate between then-atheist Antony Flew and theist Thomas Warren, at North Texas State University, the term seems to have been employed by both parties in the debate; snippets of which are as follows: (Ñº)

tion of proving that matter has always existed.

Fourth, that no one piece of matter is worth any more than any other piece of matter. Now if everything that exists is matter, simply molecules in motion, there really can be no ultimate or

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used our opportunities in this life. There is something more to a human being, even as you yourself have recognized, than mere matter, mere molecules in motion. *If* all there is to a man is molecules in motion, *there is no such thing as freedom*—there is only

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In 1989, Austrian evolutionary epistemologist Franz Wuketitis, in his "Organisms, Vital Forces, and Machines: Classical Controversies and the Contemporary Discussion of Reductionism vs Holism", ventured into what seems to be a Denis Diderot siding discussion on the subject of the possibility of reducing consciousness down to molecules in motion via physicochemical theories: (Ñº)

> "Perhaps appropriate translation principles will take us from the inanimate to consciousness, rather as appropriate principles take us from **molecules in motion** to temperature and pressure (in gas theory). Perhaps a physics and chemistry of the organism could be teleological?"

In 1998, American Christian apologist Phil Fernandes, in his *No Other Gods: a Defense of Biblical Christianity*, seems to have coined the apologetics version of the term, as follows: [1]

> "Morality also exists in the universe, for without morality, there would be no such thing as right and wrong. However, the moral judgments we make show that we do believe there are such things as right and wrong. Still, nature is non-moral. No one holds a rock morally responsible for tripping him [see: Alexander Pope, "should gravity cease when I go by?"]. There is no way that mere **'molecules in motion'** could produce moral values. Since nature is non-moral but morality exists in the universe, the cause of the universe must be a moral being."
>
> — Phil Fernandes (1998), *No Other Gods* (pg. 76)

> "If atheism is true, then man is mere **molecules in motion**. He has no greater value than animals. In fact, human life would be no more sacred than the existence of a rock. Yet, we act as if human life has more value than the life of animals or the existence of rocks. If the material universe is all there is, then man is just a material part of the universe. There seems to be no basis from which to argue for human rights or the sanctity of human life."
>
> — Phil Fernandes (1998), *No Other Gods* (pg. 83)

> "From **molecules in motion** will never come moral values or the laws of logic. From a mound of dirt, a single thought will never be produced—no matter how much time is given. If no god exists and all we are is molecules in motion, from whence come human rights? If an innocent child is merely a random collection of atoms, can we really say that it is wrong to crush him? If there is no life after death and all we face is everlasting extinction, can this life really have meaning? What counsel can an atheist offer a suffering friend on his deathbed? Can we climb above despair if all we face is extinction? When the universe dies, all will die with it. If atheism is true, then human experience is a cruel joke. And, if life is a cruel joke, then why even bother to go on living?"

— Phil Fernandes (1998), *No Other Gods* (pg. 86)

Fernandes went on to argue that although he can't prove the existence of god, the theistic model makes more sense to him than the molecules in motion atheist view.

In 2009, Fernandes, in his *The Atheist Delusion*, employed the term "molecules in motion" six times, the above three quotes repeated verbatim, plus three new versions addressed to the new atheists and one in support of the Peter Singer animal rights activists. [2]

In 2012, and in 2015 (archive re-post), American deconversion atheist and Christian apologetics analyzer Bob Seidensticker blogged on the topic "Are We Just Molecules in Motion?", oft-employed by apologeticists, wherein he employs a combination of Heisenberg indeterminism, e.g. "quarks arenotlike billiard balls", plus emergent properties, e.g. "wetness isn't a property of a water molecule; it emerges", arguments, i.e. standard ontic opening apologetics, to conclude that from an atheist's point of view, or at least in his atheism view, that: [6]

> "Heisenberg states that there is unavoidable randomness at the quantum level, and things are not deterministic. Naturalists agree that a deterministic, **molecules-in-motion** worldview doesn't work. Consciousness, morality, and other complex human traits don't follow directly from fundamental quantum laws, but they are examples ofemergent phenomena."

This patch argument to counter valid argument provoked 140+ comments in the original post and 80+ comments in the repost.

Whatever the case, theist J.P. Moreland correctly debunked all of Seidensticker's atheist ontic opening apologetics rebuttals in 2003 as but non-scientific spooky panpsychism that's closer to theism than atheism (see: Moreland-Strobel dialogue).

Debates

The following are examples where the term began to be employed by apologeticists in public debate:

> "Christopher is somebody who is very concerned about human freedom as I am, but again, if we are just **molecules in motion**, how do we have human freedom? William Provine from Cornell, he's a materialist, a Darwinist, he points out that we don't have any human freedom if all we are is **molecules in motion**. Now, Christopher ought not scold anybody for being a snake-handling, Bible-thumping, funny mentalist preacher because according to his own world view, that person is that way because these are just chemicals going on in his brain. Neither could you say that Hitler had done anything wrong if it's just chemicals going on in his brain. I mean, what is the murder molecule? How much does justice weigh? These are questions that have no answer in a materialistic world view, but that is Christopher's world view."
>
> — Frank Turek (2008), query to Christopher Hitchens [4]

> "Alright. Let me ask the question another way. This is my last question. If god does not exist why do all people have a fixed moral obligation to love and not murder? How do **molecules in motion** have any authority to tell you how to behave? When you do something wrong, whose standard are you breaking, who are you displeasing? The carbon atom? The benzene molecule? Who?"
>
> — Frank Turek (2008), query to Christopher Hitchens [4]

> "In a world where there is no god, where you and are just **molecules in motion**, why am I obligated to be

rational?"

> — Dustin Segers (2012), Reason Rally debate (Ñº), comment to atheist college student (age 19) Adam Johnson (with glasses), Washington, D.C., Mar 24

Quotes

The following are other related quotes:

> "Carl Sagan when to his grave 'viewing the whole universe is nothing more than **molecules in motion**'."
>
> — Ravi Zacharias (2008), *End of Reason* [3]

> "The human species is but one of many. Viewed from a sort of universal microscope, we appear as but a vast collection of **molecules in motion**. In our current state we are firmly attached to an earthly substrate, feeding off the energy gradient of the sun. The fate of our chemical species is undeniably tied to the affinities and energies of interaction required to maintain our evolving earth ecosystem. We live in a closed system. In order to understand the nature of things, we must learn more about both our reactions and our products."
>
> — Jeff Tuhtan (2012), PhD dissertation: "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality" [5]

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Further reading

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External links

â— Molecules in motion (Christian apologetics group) – Facebook.

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In

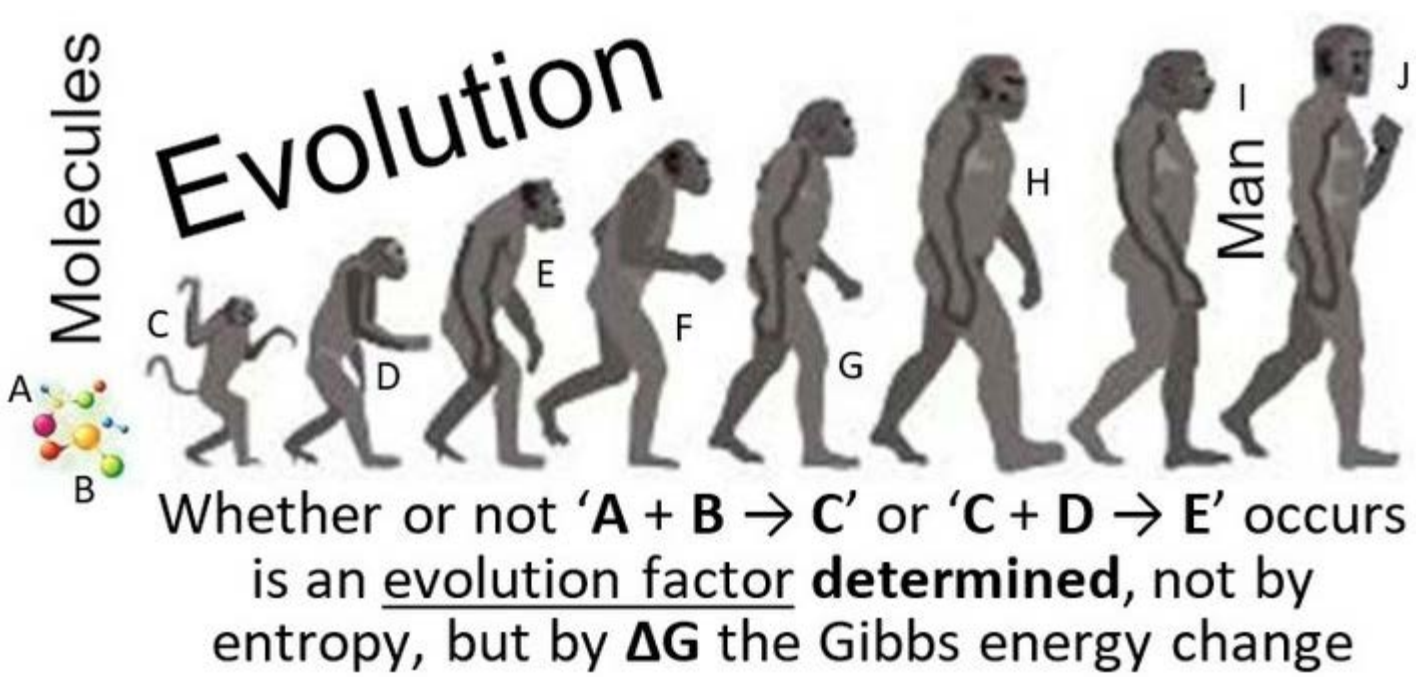

A depiction of **molecules-to-man evolution**, a phrase coined by Ken Ham (1975), the premise, first espoused by Johann Goethe (1809), in initial theory, then, in a popular sense, by Charles Darwin (1859), that man evolved over time, via naturalistic processes, from molecules to apes to humans. [1] See also: molecular evolution timeline and molecular evolution table.

hmolscience, **molecules-to-man evolution**, similar to molecules in motion apologetics, related to "hydrogen to human", is the theory, oft-used in apologetics (Ham, 1975), that every CHNOPS+ based animate form and form change we see occurring around us, and historically, e.g. via fossil evidence, happened and is happening currently by purely natural processes, starting from atoms and molecules and ending in the formation of humans. [1]

Etymology

In 1871, English naturalist Charles Darwin introduced his warm pond model, according to which man "evolved", via the process of natural selection, from a heated pond filled with the molecule ammonia (NH_3) and phosphoric salts, e.g. phosphate (PO_4^{3-}).

In 1985, the multi-author book *Evolution from Molecules to Men* was published, edited by D.S. Bendall, the book being the result of a conference, organized by Darwin College, Cambridge, that took place from 27 Jun to 2 Jul 1982, held to commemorate the centenary of Darwin's reaction end (death). [2]

Ham

The specific phrase "molecules-to-man evolution", however, seems to the mental coining and subsequent popularization of Australian-born American Ken Ham, who first rejected what he termed "molecules-to-man evolution" during high school, and became influenced, in 1974, while in college, by John Whitcomb and Henry Morris' *The Genesis Flood* (1961), then used the phrase in his 1975 science class teachings, then later began to publish, into the 2000s, works using the term. [3]

In 2006, Ham, in his *Raising Godly Children in an Ungodly World*, began to employ the explicit hyphened phrase "molecules-to-man evolution" as follows:

> "Whether it was the worldwide flood, the feeding of the 5,000, or arguing against the possibility that man evolved from **molecules to ape to man** over millions of years, dad defended the word of God as if his life depended upon it … which, in fact, it did. He was always adamant about one thing: if you can't trust the Book of Genesis as literal history, then you can't trust the rest of the Bible." (pg. 19)

Here, we see why Ham, naturally enough, would go on to become the curator of the AnswersInGenesis.com website and the Creation Museum, i.e. they are byproducts of a vexation between two possibilities seeded into his mind as a youth.

In college, at Queensland Institute of Technology, Ham obtained a BS in applied sciences, with focus on environmental biology, during which time his textbooks, in biology, geology, and other subjects, filled with evolutionary ideas, explained the following to him: [4]

> "My textbooks laid out what claimed to be convincing proof that we progress *from* ***molecules to man*** without any outside influence. I was further taught ideas on how the universe was formed—but they all involved naturalistic processes. God wasn't involved at all."

Ham then, in 1974, came across Whitcomb and Morris' 1961 *The Genesis Flood*:

> "This small booklet [*The Genesis Flood* (1961)] gave me a number of biblical arguments about why Christians can't accept **molecules-to-man evolution** and the Bible's record of origins at the same time."

Ham continues:

> "One of the first times this really hit me was during my first year as a science teacher in 1975. In my class were the true native Aborigines, tribal descendants of the first tribes that settled in Australia long before the Europeans came. Because of evolutionary thinking, the aborigines have been oppressed and even killed. Those who committed the atrocities often claimed that the Aborigines (who tend to be darker skinned than Europeans) were 'lower' [see: Darwin on 'lower' and 'higher' in terminology] on the evolution chain, and therefore sub-human. As I taught the class, I made sure that my students were taught the problems with **molecules-to-man evolution** and the idea that the earth is millions of years old. I shared some of the arguments I had gleaned from *The Genesis Flood* and other sources that supported the biblical account of origins. I explained that I did not believe man evolved from ape-like ancestors, but that the account of the creation of Adam and Eve was true—we were all descendants of to people."

In 2013, Ham began employing the phrase "molecules-to-man" in his online AnswsersInGenesis.com article titles. [1]

In 2014, in his YouTube debate with Bill Nye, the science guy, Ham frequently employed the term "molecules-to-man evolution" as a sort of pejorative labeling tactic to shut Nye—an electrical engineer by education—up into silence.

Other

In 2013, Aaron Solman gave a talk on "Molecules to Mathematicians"

Generic | Statements

The following are selection of stock or generic molecules-to-man like statements, tending to be found in the opening of any type of grand theory books, concerning the bigger questions of human existence:

> "Once upon a time, one **molecule**, scudding in a primordial ocean, suddenly and absolutely accidentally met another cute molecule. They decided to bind to each other and scud together, and found that they acquired a new property, which gave them a better chance to survive in that rough and unfriendly primordial ocean. During the next billions of years, these molecules met many other attractive molecules (of course, absolutely accidentally) and combined with many of them, creating a big conglomerate of molecules. This conglomerate again absolutely accidentally discovered that it can create similar little baby

> conglomerates by simple division and that is how a primordial organic complex or protein or nucleic acid was created. They then absolutely accidentally found each other in the primordial ocean, combined and created a small syndicate that acquired many new and very useful properties for survival and we now call it a 'cell' … Accidental and random combinations of molecules [however] can neither create a car nor a human being [**man**] or even a simple one-celled organism with a certain 'directing power' that can transform originally inanimate matter into numerous forms of life."
>
> — Nickolas Dorfman (2008), *Was Mona Lisa Created by Physicochemical Reactions Alone?* [5]

> "Approximately four billion years ago, **molecules** joined together to form cells. About two billion years later, cells joined to form more complex cells. And then a billion years later, these more complex cells joined together to form multicellular organisms. These collectives evolved because the participating individuals could, by working together, spread their genetic material in new and more effective ways. Fast-forward another billion years to our world, which is full of social animals, from ants to wolves to humans [**man**]."
>
> — Joshua Greene (2013), *Moral Tribes* [6]

The first of these, without going into detail, to note, takes issue with "blind random chance accident based model" of evolution; the second is error-inherent in that it employs the so-called "spread your genes model" of evolution's purpose in the statement.

Quotes

The following are related quotes:

> "I have noticed that one of the new catch phrases in creationist circles is show me the evidence for evolution. They then continue you to say by evolution I mean molecules to man. Well this is extremely dishonest as **a human never came from a molecule**. Humans evolved from an ancestor who evolved from another ancestor who many many many generations before evolved from a basic cell. Evolution in fact does not claim to know how life started, i.e. **molecules to man**. All evolution is defined as: descent with modification. There are hundreds of other fossils that bridge gaps that are not meant to exist according to creationists. This is why I believe abiogenesis is the last hiding place for honest creationists, as to deny evolution or to call it molecules to man is absurd. The problem is even abiogenesis as a hiding place is disappearing at a rapid rate."
>
> — IAmAnAtheist (2014), "Molecules to Man is a Fallacious Argument" (Ñº), Mar 30

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5. Dorfman, Nikolas. (2008). *Was Mona Lisa Created by Physicochemical Reactions Alone? Open Your Mind and Use Your Logic* (pgs. 4-5). iUniverse.
6. Greene, Joshua. (2013). *Moral Tribes: Emotion, Reason, and the Gap Between Us and Them* (pg. 20). Penguin.
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θΔics

In science, **monad** (TR:18), the Greek *monas* meaning “unity; single”, is a hypothetical ontic opening atomic-like substance, which, depending on theorist, has properties of god or soul (Giordano Bruno, 1590), an active force and ideas (Gottfried Leibniz, 1697), and or be the basic unit of life (Robert Grant, 1826), etc., employed generally to find reconciliation between monism and dualism views, amid the growing hydraism-like nature of the physical sciences.

Overview

The theory of the monad, according to British politician and writer Benjamin Disraeli, supposedly, derives from Greek thinker Thales. [1]

The term “monad”, according to Greek biographer Diogenes Laertius, who supposedly cites Hippolytus, originated in the works of Pythagoras and or his followers (Pythagoreans), who called the first thing that came into existence the ‘monad’, which begat the dyad, which begat the numbers, which begat the point, begetting lines or finiteness, etc. [5]

In 1564, English alchemical philosopher John Dee (1527-1609) published *Hieroglyphic Monad*, which worked to popularize the following glyph and associated philosophical logic about desires: [6]

> “The moon and sun of our **monad** desire their elements, in which the Denarian proportion will rule, to be separated, and this is to be done with the ministry of fire.”

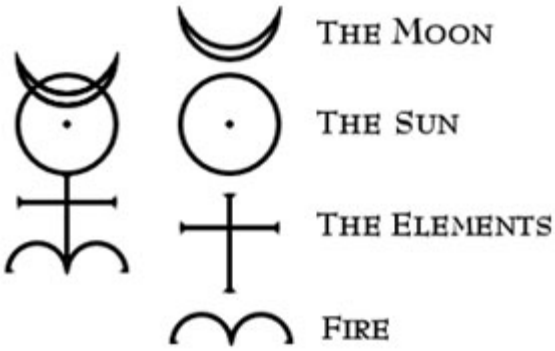

A four element symbol for the **monad**, from John Dee's 1564 *Hieroglyphic Monad*.

The hieroglyph (see also: Wolfe von Lenkiewicz) appears on a page of the Rosicrucian Manifesto *Chymical Wedding of Christian Rosenkreutz*, beside the text of the invitation to the Royal Wedding given to Rosenkreutz who narrates the work. [7] The *Chemical Wedding*, to note, was recommended (Ñº) to Goethe in 1776 by Johann Herder, about which he later wrote to wrote to Charlotte von Stein, in 1786, that “there will be a good fairy tale to tell at the right time, but it will have to be reborn, it can’t be enjoyed in its old skin.” [8] This statement may, in some sense, be pretext to his 1809 *Elective Affinities*, but this is in need further corroboration.

In *circa* 1590, Italian philosopher, mathematician, and astronomer Giordano Bruno proposed the view that everything that exists is made up of infinitesimal ‘monads’, of three varieties: God (the monad of monads), souls, and indivisible atoms.

In 1697, Germany polymath Gottfried Leibniz began to employ the term monad — “probably borrowed from Giordano Bruno”, as Friedrich Ueberweg asserts — as a theory in between dualism and monism, according to which the entities were hypothesized to exist, conceptualized as simple unextended substance, in possession of the power of action, an active force, akin to the force of a strained bow; a type of Democritus-like atom, albeit differing partly by their active force and the notion that they consist in ideas. [3] Leibniz asserted that the monad has no windows, meaning that its contact with the rest of the universe occurred via a ‘pre-established harmony’, according to which monads were only measurable via the ‘arrows’ relating it to all other monads in the universe. [4]

In 1745, Swiss natural philosopher Charles Bonnet, influenced by the monad ideas of Gottfried Leibniz, is the first to make an actual “great chain of being” (1745) scale and later “step depiction” (1783) like scale and to describe the successive degrees of development as being chained together.

In the 1820s, German polyintellect Johann Goethe, in his talks with Johann Eckermann, is supposed to have said, according to John Williams, that Homunculus is virtually the same as the Leibnizian entelechy or monad. [2]

In 1826, Scottish physician Robert Grant, in his theory of evolution, publicly announced his speculation that 'transformation' might affect all organisms; noted that successive strata seemed to show a progressive, natural succession of fossil animals; that these forms "have evolved from a primitive model" by "external circumstances"; he

accepted a common origin for plants and animals, and the basic units of life ('monads'), he proposed, were spontaneously generated.

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(b) *The Chemical Wedding of Christian Rosenkreutz* – Wikipedia.

External links

â— Monad – Wikipedia.

θΔics

In hmolscience, **money**, the basic unit in the medium of exchange on quantities of value, is often compared to energy; often considered to have a relationship to thermodynamics. [1]

Overview

The task of quantifying energy in human social and economic systems, comparable to that in a physics system or steam engine, is new area of research and very difficult to do. As such, the majority of current models of quantifying money thermodynamically fall short, but are often good starting points. An example of a popular quote, outlining this view, comes from American quantum computer theorist Seth Lloyd: [3]

Thermodynamics

The line of logic followed, by some, in the course that money is a form of energy that is conserved, is that "value has to be conserved" (an 1979 postulate), that value and energy might have similar functions, and that there may exist a "conservation of money" law, similar or analogous to the conservation of energy, in economics. [2]

On face value this logic seems compelling. In unique cases, such as the fall of a government, wherein a system's currency becomes valueless, the idea that the energy equivalent of a piece of paper, e.g. confederate dollars after the American civil war, is conserved somehow, loses face.

In 1853, German economist Hermann Gossen, in his *Development of the Laws of Human Exchange and the Consequent Rules of Human Action*, used a variant of the conservation of force to attempt a formulation of a calculus of human pleasures, theorizing on how Kräfte (or forces) operated in the course of human economic exchanges, on the premise that the aim of each individual is to maximize his or her total life pleasure.

Dozens of others in century to follow attempted to relate "money" to "energy" in some way or another.

In 2000, physicist Victor Yakovenko and Romanian-born American physicist Victor Yakovenko argue that "In a closed economic system, money is conserved. Thus, by analogy with energy, the equilibrium probability distribution of money must follow the exponential Boltzmann-Gibbs law characterized by an effective temperature equal to the average amount of money per economic agent." [5]

In 2007, Russian bioelectrochemist Octavian Ksenzhek argued that money can be considered as a virtual form of energy and that energy coupling in social systems is mediated by materialized forms of energy, such as money. [4] Ksenzhek argues that the role of money in social systems may be compared with that of ATP (adenosine triphosphate) in biochemical systems, both of which act as energy carriers. Ksenzhek conceives of the *entropy of money* as the product of the quantity of the money multiplied by its *specific entropy*, such that the more dispersed the money is, the greater is its specific entropy.

Human chemistry

In the logic of human chemical thermodynamics, in which the "agents" of an economic system are considered as "molecules" (human molecules to be exact), money is considered as a "secondary field particle", that which mediates a force. [6]

Quotes

The following are popular quotes:

"Money can't buy love, but it improves your bargaining position."
— Christopher Marlowe (c.1580) (Q); also attributed to Laurence J. Peter [1]

"Nothing in life is certain except death, taxes and the second law and the second law of thermodynamics. All three are processes in which useful or accessible forms of some quantity, such as energy or **money**, are transformed into useless, inaccessible forms of the same quantity. That is not to say that these three processes don't have fringe benefits: taxes pay for roads and schools; the second law of thermodynamics drives cars, computers and metabolism; and death, at the very least, opens up tenured faculty positions."

— Seth Lloyd (2004) [3]

See also

- Wealth
- Debt

The "ΘΔics" symbol, found at the bottom of every Hmolpedia article (linking to this page), being shorthand for the term "thermodynamics" (the science that governs the known universe), shown on a US one dollar bill, meaning, for the modern physical scientist, "In Thermodynamics We Trust", substituted for original 1956 statement "In God We Trust" (a defunct theory), as adhered to by the general public.

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3. (a) Lloyd, Seth. (2004). "quoted section", August 26, issue of *Nature*, v. 430.
(b) This quote, to note, seems to be culled from the 2002 writings of Morton Tavel, *Contemporary Physics and the Limits of Knowledge,* pg. 156. Rutgers University Press.
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Further reading

- Chalidize, Valery. (2000). *Entropy Demystified - Potential Order, Life and Money.* USA: Universal Publishers.

External links

- Money – Wikipedia.

θΔics

In science, **monism** (TR:12), a near-synonym "one nature", as compared to dualism, a near-synonym "two nature", is a viewpoint or theory that reduces all phenomena to one principle.

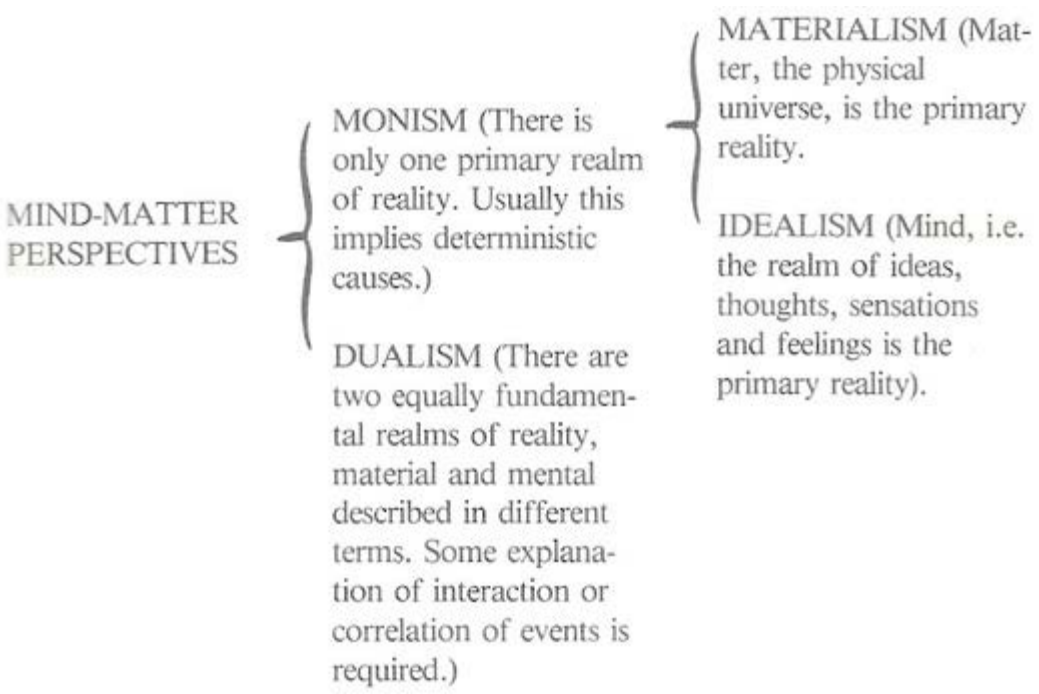

A 1985 definition of **monism**, as contrasted with dualism, according to George Scott. [6]

Pre-coining models

The specific term "monism" is a product of the early 17th century, a reaction to Cartesian-initiated dualism (c.1610) arguments about how humans are split into two parts: body + mind / soul divide.

In this sense, historically, albeit not in specific namesake, Parmenides and Benedict Spinoza are said to be representative "monism" in theoretical logic. (Q) Greek philosopher Thales' c.570BC water principle philosophy, i.e. his theory "all is water" seems to be one example of a monism conceptualized philosophy.

Wolff | Etymology

The term "monism" was coined by German mathematical philosopher Christian Wolff (1679-1754), supposedly in his 1728 *Logic* (Q), and or his 1734 paper "Psycholgica Rationalis" (Q), supposedly, following Gottfried Leibniz and his earlier "monad" or monadology theories. [4]

Materialistic monism

German physicist Ludwig Buchner's view that force and mind emanated from original matter has been referred to as "materialistic monism" (or monistic materialism): [3]

> "In Buchner's statement: 'just as a steam engine produces motion, so the intricate organic complex of force-bearing substance in an animal organism produces a total sum of certain effects, which, when bound together in a unity, are called by us mind, soul, thought', he postulates force and mind as emanating from original matter—a materialistic monism. But in other parts of his works he suggests that mind and matter are two different aspects of that which is the basis of all things—a **monism** which is not necessarily materialistic, and which, in the absence of further explanation, constitutes a confession of failure. Büchner was much less concerned to establish a scientific metaphysic than to protest against the romantic idealism of his predecessors and the theological interpretations of the universe. Nature according to him is purely physical; it has no purpose, no will, no laws imposed by extraneous authority, no supernatural ethical sanction."

In the context of social physics, monism, according to Pitirim Sorokin (1928), is the idea that theories of physics explain both human and non-human worlds, i.e. "psychical and social phenomena are mere variations of natural phenomena". [2]

Helm

In 1887, German physicist Georg Helm published his *The Doctrine of Energy*, wherein he devotes a section to monism.

Haeckel | Ostwald

In 1906, Ernst Haeckel founded the "Monisten Bund" or German Monist League (Q), in Jena, a free-thinking organization centered on promoting some type of monistic world view, anchored in some way on a mix of Goethe's 1809 metamorphology theory, Darwin's 1959 theory of evolution, and Wilhelm Ostwald's 1898 energetics view. (Q)

In 1910, Haeckel elected Ostwald as the president of the Monist League, after which he began giving his famous "Monistic Sunday sermons", as Haeckel (1913) called them. Ostwald, in this direction, was interested in educational reforms and in monism. He believed that in view of his position he could decisively fight the Church's claim to power in the field of natural sciences and to spread a modern scientific ideology. This aim he pursued in his writings *Monistische Sonntagspredigten* (Monistic Sunday sermons) and *Arbeiten zum Monismus* (*Works on Monism*). (Q)

German-cultures scholar Carl Krockel argues that English novelist and literary critic D.H. Lawrence (1885-1930) was "certainly aware of Goethe's theory of affinities, if only through reading of Ernst Haeckel's account of it in *The Riddle of the Universe*" and argues that Haeckel's pantheism helped Lawrence break from his Christian upbringing, for a monism based on the material universe. The Lukacs work mentioned above, to note, seems to be his 1968 *Goethe and His Age*. [5]

Theistic monism

The term "theistic monism" (or religious monism) is view that God or some other type of religious concept is behind the one underlying principle. Spinoza would seem to be an example of this view.

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External links

- Monism – Wikipedia.

θΔics

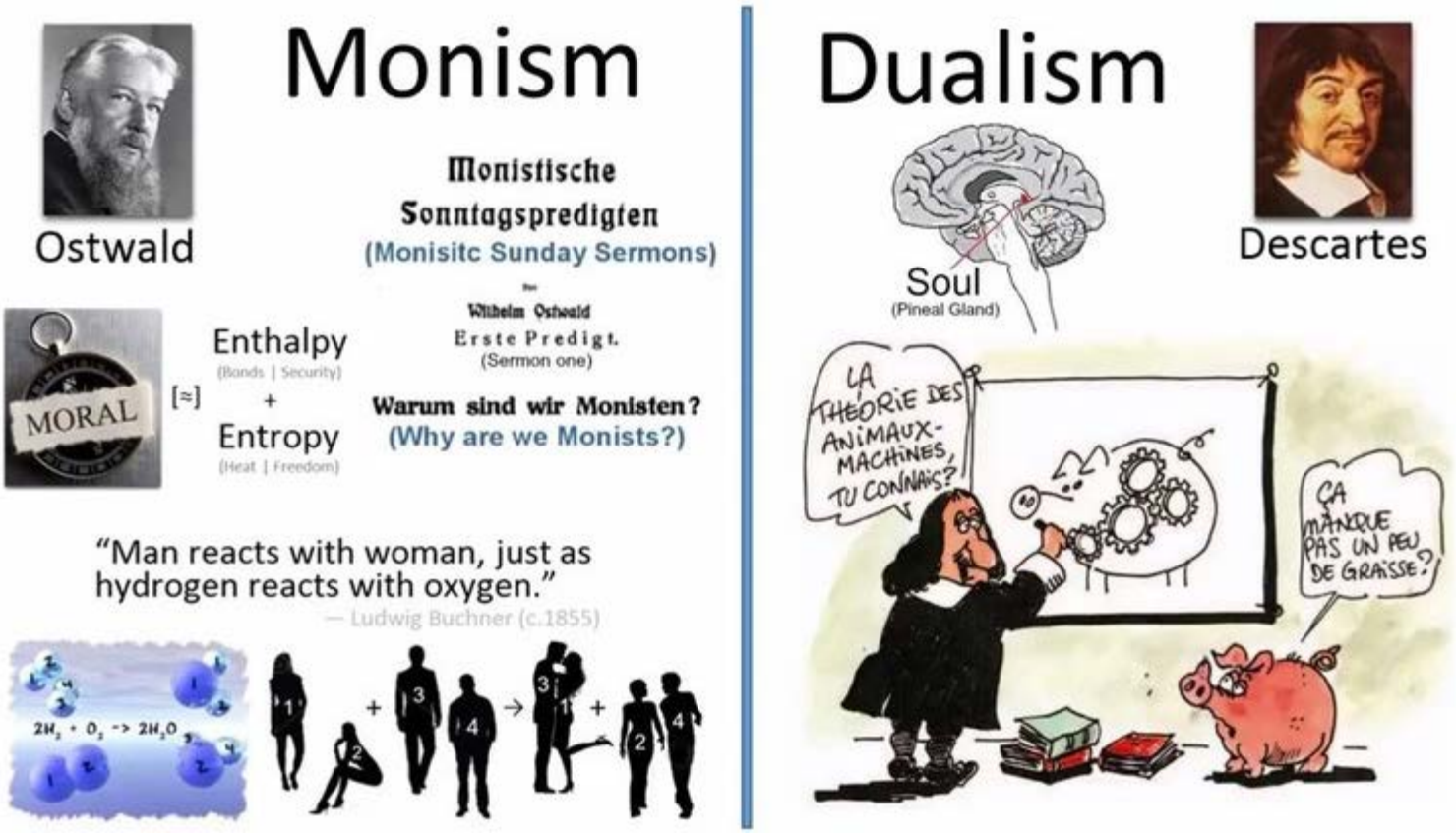

A **monism vs dualism** visual synopsis from Libb Thims' "Zerotheism for Kids" (2015) lecture (part 4; 8:33-10:15), wherein he contrasts the early 20th century physical chemistry based monism Wilhelm Ostwald with the early 16th century analytical mechanics + religion based dualism ideas of Rene Descartes. [1]

In hmolscience, **monism vs dualism** refers to a description and comparison between monism, or belief that one principle or "one nature" (one culture) governs all, and dualism, a belief that two principles or "two natures" (two cultures) govern all, in short.

Overview

(add)

See also

- Atheism types by denial and belief
- Stewart-Weaver fallout

References

1. Thims, Libb. (2015). "Zerotheism for Kids" (co-host: Thor) (main), 14-part [4:41-hr] lecture playlist (Q), 5-intro sides (Q), 56-main sides (Q), 11AM-3PM, Chicago, Aug 10 (recorded), Sep 7 (published).

θΔics

In lectures, **Monistic Sunday Sermons**, or "Monistische

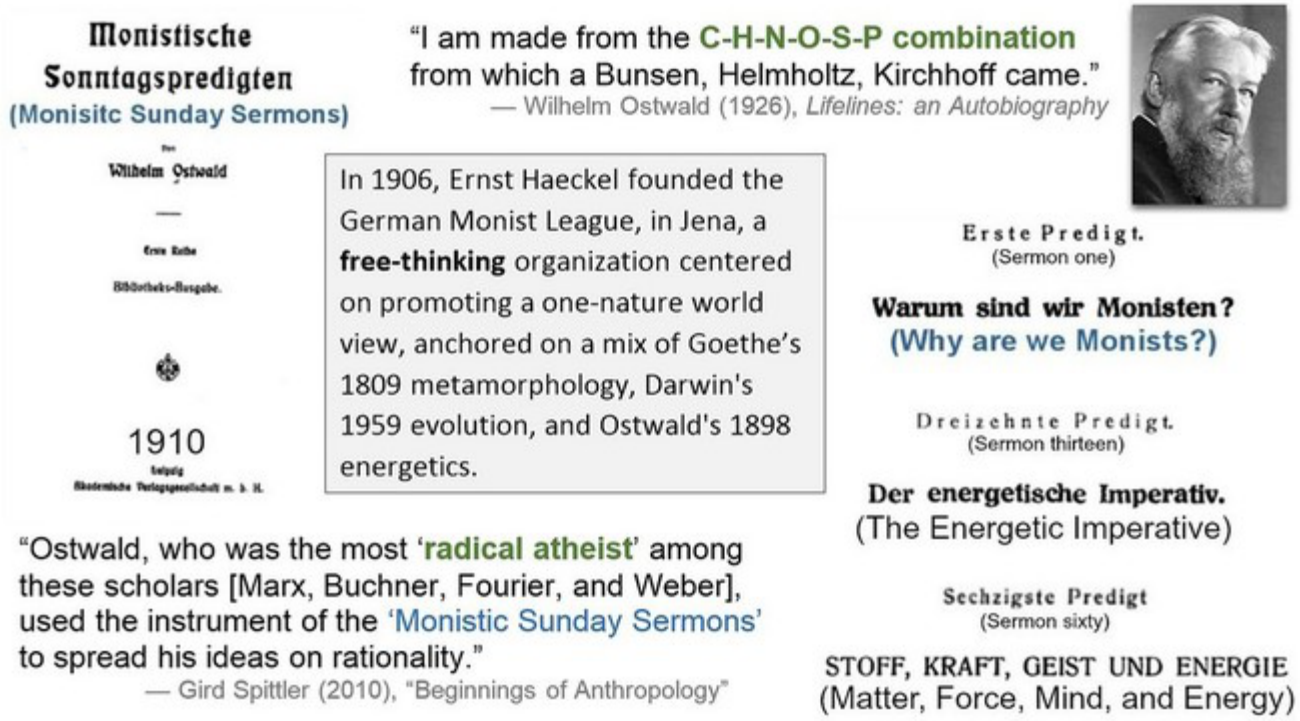

Flickr slide #7 from Libb Thims' 2015 "Zerotheism for Kids" lecture, wherein it was explained that what the kids were learning was a modern version of Wilhelm Ostwald's famous 1910 "**Monistic Sunday Sermons**"; where, just as Ostwald taught that energetics-evolution based, humans as "CHNOPS combinations", monism replaces the old theism-based, humans as god-made clay creations, beliefs of the past, so to, in modern terms, the upgrade thermodynamics-evolution based, humans as CHNOPS+22 molecular forms", monism (or one nature zerotheism) replaces theism, itself a replacement for polytheism (according to the Critias hypothesis). [5]

Sonntagspredigten" (German), were a series of sixty plus "sermons" or lectures given by German physical chemist Wilhelm Ostwald in 1910 on how energy-based monism replaces theism, and the repercussions and details of this view; a type of natural science based atheism Sunday school, so to say, devoid of any supernatural suppositions. [1]

Overview

In 1887, German physical chemist Wilhelm Ostwald, in a lecture at Leipzig, outlined his new "energism" view, as American historian Niles Holt refers to it, according to which all natural processes are essentially transformations of energy, and most-contentiously that: "matter is only a mirage, which the mind creates to comprehend the workings of energy." [2]

In 1890, Ostwald entered into the universal theory of everything arena of the "all is energy" philosophical motto, following a spring physics conference in Berlin, wherein Ostwald attempted to convince a group of physicists to adhere to the following new outlook: "from now on the whole of physics has to be represented as a theory of energies." [3] This incident has been documented by American energetics historian Robert Deltete in a series of articles. The group found the idea "so absurd that they refused to take it seriously at all" and offered only "ridicule and abuse". The next morning, Ostwald awoke early and went for a walk in the *Tiergarten*, and had a "personal Pentecost", as he described it, seeing clearly the view that "all is energy".

In 1905, Ostwald came into serious conflict with the university, the reason being concerned with "religious questions", as biographer Eduard Farber puts it, at the time of the official obsequies for freethinker Johannes Wislicenus (1835-1902). The tensions came to a breaking point, when Ostwald was asked to be relieved of lecturing duties, after which he was suspended until 1906, officially appointed as an exchange professor to the United States.

In 1906, after his "forced" retirement, per religion-siding conflict of interest issues, Ostwald found a new sphere for his scientific and organizatorial talents. Besides continuing his studies and publications on philosophy, such as *Der energetische Imperativ* (*The Energetic Imperative*), *Moderne Naturphilosophie* (*Modern Natural Philosophy*), *Die*

Pyramide der Wissenschaften (*The Pyramid of the Sciences*), he also took an active part in public life.

In 1906, Ernst Haeckel founded the "Monisten Bund" or German Monist League (O), in Jena, a free-thinking organization centered on promoting some type of monistic world view, anchored in some way on a mix of Goethe's 1809 metamorphology theory, Darwin's 1959 theory of evolution, and Ostwald's 1898 energetics view. (O)

In 1909, Ostwald one the Nobel Prize in chemistry for: "recognition of his work on catalysis and for his investigations into the fundamental principles governing chemical equilibria and rates of reaction." (O)

In 1910, Haeckel elected Ostwald as the president of the Monist League, after which he began giving his famous "Monistic Sunday sermons", as Haeckel (1913) called them. Ostwald, in this direction, was interested in educational reforms and in monism. He believed that in view of his position he could decisively fight the Church's claim to power in the field of natural sciences and to spread a modern scientific ideology. This aim he pursued in his writings *Monistische Sonntagspredigten* (Monistic Sunday sermons) and *Arbeiten zum Monismus* (*Works on Monism*). (O)

In 1911, the lectures were published in book form entitled *Monistic Sunday Sermons*, wherein, in each short chapter, Ostwald mused about "why were are monists", "how evil came into the world", "religion and science", the "energetic imperative", the "development of god", "prayer", among others. [4]

See also

- Zerotheism for kids

Quotes

The following are example quotes from Ostwald's Sunday sermons:

> "The more our culture declines, the more cherished religion proves to be; the more our culture rises, the more religion will take a backseat and will be substituted by science. Will religion become completely dispensable some day? It is to be expected historically that one social class after the other will rise from the sea of religious ideas and will form a fruitful land for humanity. That religion will slowly become dispensable is therefore a process that develops in steps, and it is not yet clear when this process will have reached all of humankind."
>
> — Wilhelm Ostwald (1909), *Monastic Sunday Sermons* (Sermon #4: "Religion and Science) (pgs. 30, 32) [6]

> "Looking at the entire development of the concept of god, we can conclude that now we can ultimately leave behind the dualism of the past four centuries or so, and approach a 'monism'. However, the earlier religious monism must be substituted today with a 'scientific monism'. This is not the monism that is organized on an animistic, anthropomorphic, or priestly foundation, but a new monism based on the highest cognitive performances that our brain, which is far more developed than in earlier stges, enables us to achieve."
>
> — Wilhelm Ostwald (1909), *Monastic Sunday Sermons* (Sermon #) (pg. 199) [7]

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5. Thims, Libb. (2015). "Zerotheism for Kids", Atheism Reviews class, 3-hour lecture (co-host Thor) (intro, 5-slide) (main, 56-slides) (vid), Monday, 11AM-2-PM, Aug 10.
6. (a) Ostwald, Wilhlem. (1909). *Monastic Sunday Sermons* (Sermon #4: "Religion and Science) (pgs. 30, 32). Publisher, 1911.
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Threads

● Re: Ostwald & Sunday church (post #38) (2014) – Beg-Thims dialogue.

θΔics

In existographies, **mononyms**, or mononymously-known individuals, refers to people commonly known only by one name, e.g. Newton, Einstein, Darwin, etc.; some of which are listed below.

List

The following is a work-in-progress listing of top or highly-cited hmolscience-related existographies that have mononymous-named articles; the top ten names by Hmolpedia page citation are bolded:

- **Adams**
- Aristotle
- Beg
- Bergman
- Boltzmann
- Buffon
- Carnot
- **Clausius**
- **Darwin**
- Descartes
- Democritus
- **Einstein**
- Empedocles
- Epicurus
- Galileo
- **Gibbs**
- **Goethe**
- **Helmholtz**
- Heraclitus
- Hirata
- Leucippus
- **Lewis**
- Lucretius
- **Maxwell**
- Neumann
- **Newton**
- Paracelsus
- Plato
- Prigogine
- Socrates
- Thims
- Voltaire

(add discussion)

θΔics

In philosophy, **Monydit Malieth** (1986-) (CR=6), aka Tonnerre, is a Sudanese philosopher noted for his 2013 *The Future Affects the Past: What Destination is Time Rushing To?*, wherein he attempts to stitch together ancient knowledge, from Egypt, to Greece, together with Christianity and Islam, up though modern atheism philosophers, such as Friedrich Nietzsche and Arthur Schopenhauer, in particular, and Goethe, in a few places, to outline agnostic leaning on near atheism type of Spinoza deism-like philosophy, i.e. a Schopenhauerian-Nietzschean themed Spinozan deism as he seems to present.

Philosophers

The main philosophers Malieth employs in his work, from his endnotes section "Philosophers", are as follows—ordered seemingly according to usage rank—numbers showing being those in Hmolpedia citation ranking top 100, hence indicative of the seeming conclusion that Malieth is very hmolscience-minded in his thinking, god belief aside:

> Friedrich Nietzsche [35], Arthur Schopenhauer [33], Lucretius [95], Lord Byron, Epicurus [92], Klaus Wagn (Q) , Immanuel Kant [55], Charles Darwin [10], Voltaire [51], Albert Camus, Blaise Pascal, Soren Kierkegaard, Kurt Godel, Albert Einstein [9], Ludwig Wittgenstein, Johann Goethe [1], Isaac Newton [6], Pierre Laplace [41], Benedict Spinoza [90], Denis Diderot, Rene Descartes [18], Stephen Hawking [30], Sigmund Freud [19], Marquis de Sade, Stendhal, Socrates [93], Plato [57], Pythagoras, Protagoras, Aristotle [21], William Shakespeare [49], Friedrich Schelling, Karl Marx [77], Adolf Hitler, Fyodor Dostoyevsky, Cheikh Anta Diop (1923-1986) (Q), Augustine, Gottfried Leibniz [46], Georg Hegel, Thales, Thomas Malthus, Richard Wagner, Heinrich Heine, Heraclitus [97], Martin Heidegger, Jean Paul (1763-1825) (Q), Jean-Jacques Rousseau, Alain de Lille (1116-1202) (Q), Emile Boirac (1851-1917) (Q), Tupac Shakur, Khalil Gibran, Rainer Maria Rilke (1875-1926) (Q), and Ludwig Feuerbach.

The following, mythological figures, whom Malieth seems to think were real people, are exorcised from the above listing: Buddha, Jesus Christ, Moses, Mohammed, and St. Paul.

Osiris | Jesus

Malieth is keen to the Osiris Jesus connection:

> "The god of Christians 'Jesus Christ' evolved out of the Greek god 'Dionysus', also called Bacchus; and Bacchus evolved out of the ancient Egyptian god Osiris. The most orthodox form of Judaism is the ancient Egyptian religion. Few people are aware of these facts. Religion evolves and is evolving as we speak."

Ironically, however, as noted above, in his great philosophers listing, in spite of the fact that he connects Jesus back to Osiris, Malieth seems still to believe that Jesus was a real person?

Genius ranking

Malieth has a certain feel or sense for genius ranking and genius studies; the following being one example quote—numbers shown being those in current top 500 genius rankings:

> "The genius is the ultimate loner. A genius is the rarest type of human and at times whole epochs bypass before a supreme genius arrives. Nature and fortune have to cooperate to produce a genius and at times, numerous human generations live and die before a universal genius comes to the scene. Although many super metaphysicians came after Nietzsche [90], in my opinion he is the last great philosopher just like how John Neumann [33] is the last great mathematician or how Albert Einstein [3] is the last great physicist."

> — Monydit Malieth (2013), *The Future Affects the Past* (pg. 56)

(add discussion)

Atheism studies

Malieth seems to have a well-honed grasped of atheists, atheism, and extreme atheism related topics of discourse, as evidenced by his philosophers section citation (above) of: Ludwig Feuerbach, Albert Camus, Soren Kierkegaard, etc.; the following is an example quote:

> "Nietzsche is the supreme philosopher when it comes to the topic of morality. His critique of religion is easily the most comprehensive attack on religiosity of all time; therefore making him the greatest atheist that has ever lived. Epicurus is the first great atheist in history; Schopenhauer is the first modern atheist; and Nietzsche is the greatest atheist of all time. Albert Camus called Nietzsche the 'most famous of God's assassins'."
>
> — Monydit Malieth (2013), *The Future Affects the Past* (pg. 57)

(add discussion)

Difficulties | Issues

The first main issue with Malieth's work is his chapter "Plagiarism of Ancient Knowledge", wherein he attempts to argue that all the world's knowledge, e.g. discovery of pi, calculus, philosophy, law of conservation of energy, heliocentric theory, was plagiarized from the Egyptians, to a nauseating effect. While indeed, much of the world's present religious beliefs are based on Egyptian theology, and while Greek philosophers may have culled from aspects of mathematics and philosophy from the Egyptians, that, e.g., the Egyptians believed the sun was the century of the universe, goes against their entire edifice of geocentric (Geb-centric) belief system, anchored in the Heliopolis creation myth.

Other anachronism claims, e.g. the conservation of energy, are nearly nauseating to have to continually and repeatedly re-read.

The second main issue with his treatise, seemingly interesting superficially, being that its employs a ripe selection of name dropping, is that in the end, i.e. on the last page, his conclusion is that god equal nature and the "totality of reality is god", which nearly is reverse to the message presented in the first one-third of the book.

Black genius | Issues

The most salient difficulty, amid Malieth's presentation, is the bend-over-backwards lengths he goes to attempt anchor everything in "black genius" issue. To quote one typical example:

> "Black people are typically not given enough credit for contributing to humanity, but tell me this: how could Einstein have discovered the theory of relativity, without Riemann's non-Euclidean geometry of higher dimensions, which evolved out of Euclid's geometry that was taken back from ancient black Egyptians, who invented geometry to build those timeless pyramids."

Writing like this is nauseating to the head. One might as well say that the "white Germans, who are smarter than the yellow Asians, owe their brains to the black Africans, who owe their brains to clever red East African rift valley monkeys, whose erudition derives from inquisitive green-blue aquatic explorers, who, in turn, derived from brown tuber worms, and so on."

Malieth, here, does not seem to be aware of the "42˚ rule", namely that the optimal latitude for genius development is 42 degrees latitude ±10˚, which is equivalent to the saying that you cannot make an ice cube in a fire, if one is too close to the equator, nor can you have frozen intelligent animation, if one is too close to the poles. [2] The following quote is anecdotal to this rule:

> "It's a scientific fact that if you stay in California, you lose one point off your **IQ** every year."
>
> — Truman Capote (c.1965), *The Portable Curmudgeon* (pg. 59) (Q)

It is though he is trying to overcompensate from some type of racism insecurity, e.g. as evidenced by the way he refers to "ancient black Egyptians", in stead of normal citation method of referring to "ancient Egyptians" or simply Egyptians.

Quotes | By

The following are noted quotes:

> "It is unknown to people that ancient Egyptian religion is what eventually evolved into Judaism, Christianity, and Islam."
>
> — Monydit Malieth (2013), *The Future Affects the Past* (pg. 45)

> "Christianity and Islam made it illegal and immoral to think for a long time, and that's why philosophy and science slumbered for centuries. That fact is proven by the simple fact that I could not find a philosophy book at a bookstore when I visited Istanbul, Turkey. Turkey is now a Muslim nation so it's hard to find books by philosophers out on display at libraries or bookstores."
>
> — Monydit Malieth (2013), *The Future Affects the Past* (pg. 51)

> "Nietzsche called Schopenhauer his 'great mystagogue'. In my opinion, Schopenhauer is the most underrated genius of all time and he could possibly be the wisest human to have yet taken a breath."
>
> — Monydit Malieth (2013), *The Future Affects the Past* (pg. 54)

> "There is a tremendous disproportion in the division of wealth, power, freedom and knowledge among humans. That disproportion causes friction between nations, groups, and individuals; and that friction will sooner or later set societies ablaze."
>
> — Monydit Malieth (2013), *The Future Affects the Past* (pg. 96)

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1. Malieth, Monydit (aka Tonnerre). (2013). *The Future Affects the Past: What Destination is Time Rushing To?* (pg. 51, black people; Jesus/Osiris, pg. 63). Red Lead Books.
2. Thims, Libb. (2003). *Human Thermodynamics, Volumes 1-3* (pg. #). IoHT Publications.

External link

- Malieth Monydit (about) – Amazon.
- Malieth Monydit (autobiography) – Google Sites.
- Malieth Monydit – YouTube.

θΔics

In astronomy, **moon** is the planetary satellite that orbits the earth.

Sidereal month

The sidereal month, or the time it takes the moon to return to a similar position among the stars, is 28 days.

Full moon

Statistically, people drink 25% less during a full moon.

Osiris

In Egyptian mythology, Osiris is cut into 14 pieces by his brother Set. Some conjecture that this number is representative of half the sidereal period of the moon; others conjecture that this is the number of stars of the Orion constellation:

> "14 pieces", Osiris, moon [GB: 2,250 results]
> "14 pieces", Osiris, Orion [GB: 1,230 results]

The latter option, although less discussed, seems to the the correct conjecture.

Quotes

The following are related quotes:

> "Thales was the first to say that the **moon** is illuminated by the sun."
>
> — Aetius (c.125AD), *Publication* (2.85; Dox. Gr. 358) [1]

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1. Empedocles. (435BC). *The Poem of Empedocles: a Text and Translation with an Introduction* (editor: Brad Inwood) (pg. 175). University of Toronto Press, 1992.

External links

â— Moon – Wikipedia.
â— Lunar month – Wikipedia.

θΔics

In terminology, **Mor**, Latin for "dead", root of *vis mortua* (dead force | potential energy), as contrasted with Vita, root of *vis viva* (living force | kinetic energy)—i.e. the goddess of life—is the Greco-Roman goddess of death, according to which the “arrival of Mor”, conceptualized in modern times as the arrival of the Grim Reaper, signifies the arrival of death.

In phrase "quieres **mor**ir?", in Spanish, to note, translates as "do you want to die?

Modern-day conceptions of **Mor** and Vita, or the forces of death and life, or immorality and morality, respectively, depicted as the Grim Reaper (left), holding a scythe, and a modern physician (right, holding the staff of Asclepius.

Terms | Derivatives

The Latin *mori* means “to die”; which, via Cicero (“On Fate”, 45BC), is the root of the derivative term “moral” and "moral science". [1]

Other Latin-rooted terms include: moribus (customs), mortales (mortals | humans), immortales (immortals | gods). [7]

The famed 10,000-numbered elite troops of Persian empire (550-330BC) were so-named the “immortals”, specifically by Herodotus (c.450BC), because the strength and number was precisely kept at ten-thousand (Q); when a member of the 10,000-strong force was killed or wounded, he was immediately replaced by someone else. This allowed for the infantry to remain cohesive and consistent in numbers, no matter what happened. Thus, from an outsider’s perspective, it would appear that each member of the infantry was ‘immortal’, and their replacement may have represented a resurrection of sorts. (Q)

Common etymologically derivatives of Mor include: moral science, immortality, moral, immoral, mores, moral landscape, moral movement, moral symbols, morality, or *morale*, e.g. the “morale of the German soldier is not in such a good condition” (Q), from the French feminine of *moral* (1752), namely: the moral principles, teachings, or conduct; the mental and emotional condition (as of enthusiasm, confidence, or loyalty) of an individual or group with regard to the function or tasks at hand; a sense of common purpose with respect to a group, e.g. “esprit de corps”; the level of individual psychological well-being based on such factors as sense of purpose and confidence in the future. [6]

The Latin phrase *Memento mori* (remember Mor), “remember death arrives” (Q), the partial philosophical root of the 2000 film *Memento*, is symbolic of the theory and practice on reflection “mortality”, being representative of the ideological reflective philosophy keeping in mind the transient nature of earthly goods and pursuits.

Egyptian | Religio-mythology

In circa 3,100-300BC, Egyptians, via Heliopolis creation myth turned Anunian theology, invented the conception of bird-like gods and goddess to explain existence and the origin of the cosmos, the origin of "life" or birth of the sun conceptualized as the emergence of bird-god being Ra, called by Herodotus the phoenix, being that something, i.e. a bird, had to carry the sun through the sky each day, in its daily journey. Death, in turn, was conceptualized as the bird-god Ra going

below the horizon at nightfall into the underworld.

Here, in turn, the embodiment of death and afterlife was represented by story of the life, death, and resurrection of Osiris, his life-force giver Isis, and their cohort Anubis who weighed the soul in the afterlife.

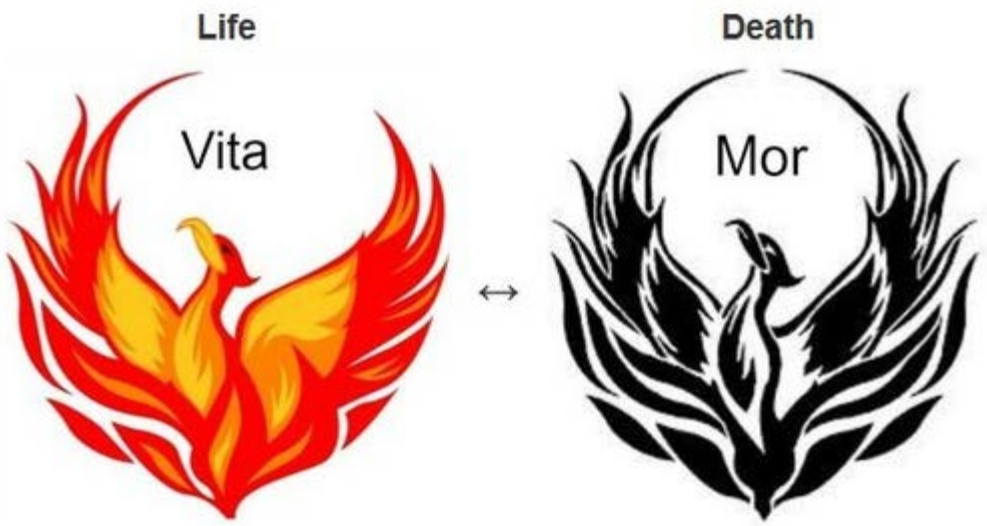

Depictions of the Greco-Roman goddess Vita (left), i.e. "goddess of life", derived from the Egyptian god Ra, i.e. the sun bursting forth from the Nun (pyramid), described by Herodotus as a phoenix; and its parallel **Mor** (right), the goddess of death, derived from the theory of the death of the sun at nightfall, oft-depicted as pale, gaunt, and floats treacherous and angry like a bird of prey on their victims, until the hour in which she is relentlessly slamming according to the adage "death is certain; though the hour is uncertain" (*Mors certa, hora incerta*) or "death is certainly, (his) hour uncertain". Mors appears black clad with dark wings and tear the people from his place, as she pleases; reconceptualized as the Grim Reaper in modern folklore.

Greek | Religio-mythology

In the period of the rise of the Greek civilization, and eventual decline of the Egyptian civilization, Greek thinkers began to travel to Egypt to study their cosmology. The Greek pantheon (700BC) was the result, a more anthropomorphized version of the Egyptian pantheon (2000BC), which in turn yielded the Roman pantheon (200BC), out of which, supposedly, Cicero (45BC) coined the term "moral", albeit conceptualized as ethics.

Out of this religio-mythology syncretism transformation, the Greek winged god of death Thanatos, discussed below, resulted; although it remains to be discerned as to which specific Egyptian god[s] or goddess[s] he is modeled on.

In 700BC, Thanatos, the Greek god of death, as described Hesoid's poem *Theogony*, was introduced as the son of Nyx (Night) and Erebos (Darkness), twin of Hypnos (Sleep), and sibling to other negative personifications such as: Geras (Old Age), Oizys (Suffering), **Moros** (Doom), Apate (Deception), Momus (Blame), Eris (Strife), Nemesis (Retribution), and even the Acherousian/Stygian boatman Charon. The following, supposedly, is a synopsis of this logic:

> "And there the children of dark Night have their dwellings, Sleep and Death, awful gods. The glowing Sun never looks upon them with his beams, neither as he goes up into heaven, nor as he comes down from heaven. And the former of them roams peacefully over the earth and the sea's broad back and is kindly to men; but the other has a heart of iron, and his spirit within him is pitiless as bronze: whomsoever of men he has once seized he holds fast: and he is hateful even to the deathless gods."
>
> — Hesiod (c.700BC), *Theogony* (Q)

(add)

Roman mythology

In 200BC, Thanatos was reconceptualized, in Roman mythology

terms, into the goddess Mors or Mor. [3]

Mors

Minor god of death. Roman. Mors replaces the Greek Thanatos and, according to legend, is one of the twin sons of Nyx, goddess of the night. He lives in part of the remote cave occupied by Somnus, god of sleep, beside the river Lethe. Ovid depicts him as a hideous and cadaverous figure dressed in a winding sheet and holding a scythe and hour glass. Known particularly through Lacedaemonian culture where twin statues of Mors and Somnus were placed side by side.

Morta

Goddess of death. Roman. In later Roman times she becomes linked with the birth goddesses Decima and Nona, as a trio of goddesses of fate, the *Parcae*.

Left: the standard definition of Mors and Morta according to Michael Jordan (*Encyclopedia of Gods*, 1993). [5] Right: Carlos Schwabe's 1895 "La mort du fossoyeur" or the Angel of Death, in which Mor is shown ascending upon the gravedigger: (O)

The various Mor-derivative terms, e.g. "morality", thereafter, began to derive from the Roman goddess Mors (Latin, female, "Death", genitive *mortis*), the Roman personification of death, who was associated, albeit distanced from the other three so-called "death gods" of the Roman pantheon: Orcus (carrier of the souls to the underworld), Februus (personification of the "month of the dead", i.e. February), and Libitian (goddess of funerals), to the effect that her face was seldom portrayed, nor were temples dedicated to her, or were sacrifices offered to her (as they were to Orcus, her male equivalent). [4]

The few details of the personification of death come from poems, in which she is pale, gaunt, and floats treacherous and angry like a bird of prey on their victims, until the hour in which she is relentlessly slamming according to the adage "death is certain; though the hour is uncertain" (*Mors certa, hora incerta*) or "death is certainly, (his) hour uncertain". Mors appears black clad with dark wings and tear the people from his place, as she pleases.

This would seem to be one of the origins of the later "Grim Reaper" personification of death. The earliest mentions of the Mors can be found in the title of an Fabula Atellana and a satire of Roman writer Quintus Ennius (239-169BC). [3]

American German languages scholar Karl Guthke (1999), argues or outlines the view, supposedly, the term "moral" derives from, or is related, in some way, to the Roman god Mor, the personification of 'death' [root of terms such as: *rigor mortus*, moribund, mortuary science, mortal, etc.], the language equivalent of the Greek god Thanatos, and antithesis, supposedly, to the goddess Vita, the personification of 'life' [root of terms such as: vital, vitalism, neo-vitalism, vitality, etc]. [2]

The term "mor", suggested via the translation of Kim McCone, is the Indo-European word for 'death", as in Morrigan, the "queen of death", the ferrier who brings the soul of the fallen warriors to rest in the Celtic Otherword. (O)

Freud | Thanatos

In 1930, Sigmund Freud, in his *Civilization and its Discontents*, employed the Greek gods Eros, god of love, and Thanatos, god of death, as metaphors for his theory of drives:

“The concurrent or mutually opposing action of the two fundamental drives (urtriebe), Eras and Thanatos, explain the phenomena of life.”

— Sigmund Freud (1930), *Civilization and its Discontents* (pg. #)

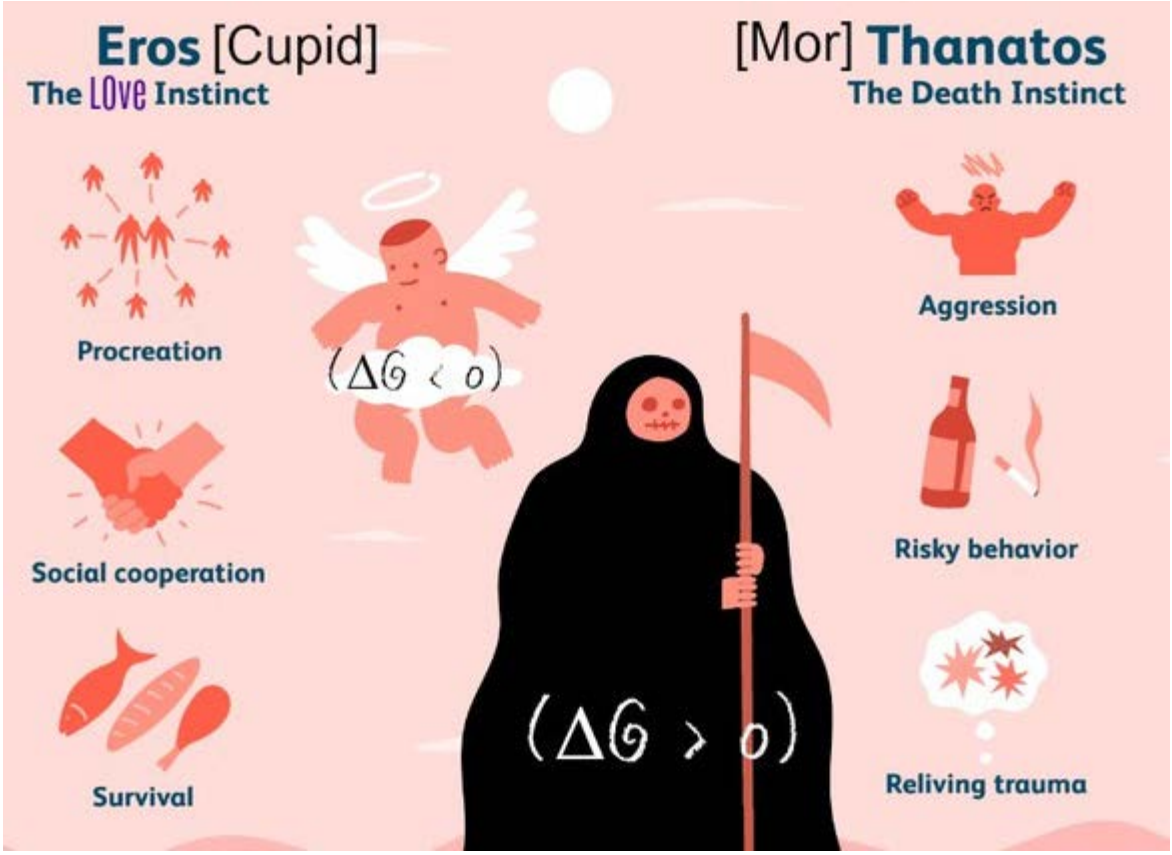

Image from 2018 article (Q) on Sigmund Freud’s love drive (Eros), or "life drive", depending on interpretation, and death drive (Thantos) theories.

A modern illustration of this is shown adjacent, wherein the "angel" with the halo, in its original Egyptian form, is Ra, generally, or Horus or Ra-Horus (aka Ra-Horakhty, "Ra, who is Horus of the Two Horizons"), depending on time period of supreme god syncretism and worship, carrying the sun disk on its head; the “grim reaper”, prior to its Roman god “Mor” embodiment, itself derived from the earlier Greek god “Thanatos” embodiment, had the equivalent of Apep (battling Ra nightly) or Set (battling Osiris [or Horus] annually).

In 1973, Jim Starling, while taking a psychology course, and likely learning about Freud’s death drive (Thanatos) and love drive (Eros) theories, conceived the new comic book character he called “Thanos”, which he recounts as follows:

> “I went to college between doing U.S. military service and getting work in comics, and there was a psych class and I came up with **Thanos** ... and Drax the Destroyer, but I'm not sure how he fit into it, just anger management probably. So I came up to Marvel, and editor Roy Thomas asked if I wanted to do an issue of Iron Man. I felt that this may be my only chance ever to do a character, not having the confidence that my career was going to last anything longer than a few weeks. So they got jammed into it. Thanos was a much thinner character and Roy suggested beefing him up, so he's beefed up quite a bit from his original sketches ... and later on I liked beefing him up so much that he continued to grow in size.”
>
> — Jim Starling (2014), *Publication* (Q)

In 2019, in the film *Avengers: Endgame*, which has become the highest growing film ever, the character Thanos, representative of the embodiment of evil, wrong, and darkness, battles the Avengers, representative of the embodiment of good, right, and lightness.

Morality terminology reform

In terminology reform, morality terminology reform refers to the following upgrades:

- Moral → Exergonic
- Immoral → Endergonic

The above were first touched on by Goethe, in his moral symbols (1809) comment, and outlined explicitly and directly by Libb Thims, to children, in terms of why stealing, in general is wrong, during the "Zerotheism for Kids" (2015) lecture.

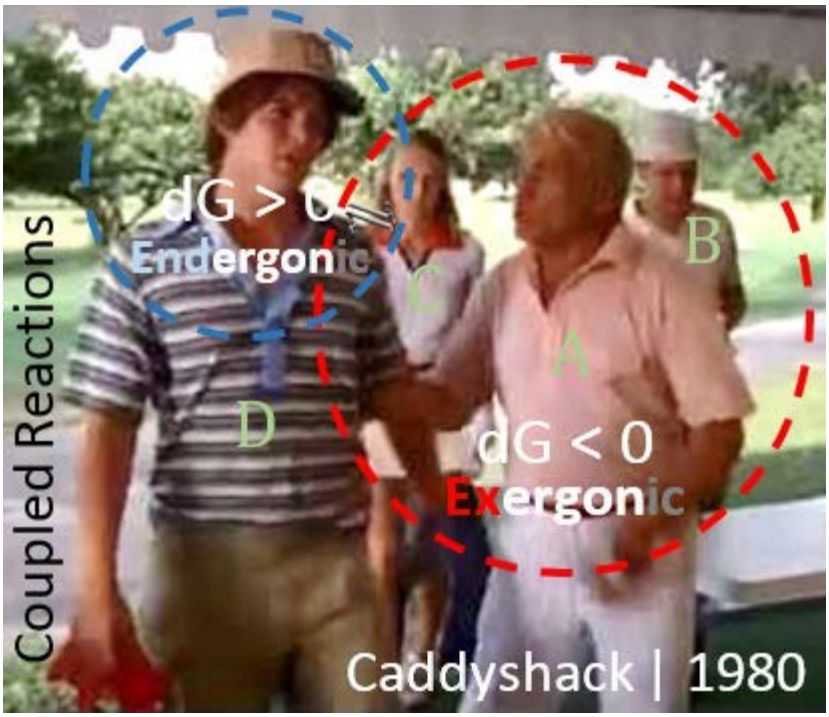

The Caddyshack social coupling diagram, lecture part 12 (Q), from Libb Thims' 2015 "Zerotheism for Kids" lecture, illustrating **coupled reactions** in social terms, via the example of nepotism, from the 1980 film *Caddyshack*.

Quotes

The following are related quotes:

> "I have to believe in a world outside my own mind. I have to believe that my actions still have meaning, even if I can't remember them. I have to believe that when my eyes are closed, the world's still there."
>
> — Christopher Nolan (2000), *Memento*, ending mental thoughts of the character Leonard Shelby (Q); from the short story "Memento Mori" by Jonathan Nolan—itself based on the Latin phrase *Memento mori* (remember **Mor**), "remember death arrives" (Q), which is symbolic of the theory and practice on reflection mortality, i.e. to keep in mind the transient nature of earthly goods and pursuits

References

1. (a) Mor (mythology) – Wikipedia.
(b) Moral – Online Etymology Dictionary.
2. Guthke, Karl S. (1999). *The Gender of Death: a Cultural History in Art and Literature* (pg. 45-46). Cambridge University Press.
3. Mors (mythology) (German → English) – Wikipedia.
4. Wendell, Leilah. (1996). *Encounters with Death: a Compendium of Anthropomorphic Personifications of* (Mors, 4+ pgs). Westgate Co.
5. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (pg. 170). Facts on File, Inc.
6. Morale – Merriam-Webster Collegiate Dictionary, 2000.
7. England, George. (1735). *An Enquiry Into Morals of the Ancients* (Mor, 2+ pgs). W. Wilkins.

θΔics

In terminology, **moral** (TR:627), as contrasted with "immoral" (TR:44), from Latin *moralis* "proper behavior of a person in society," literally "pertaining to manners," coined by Cicero ("On Fate", 45BC) to translate Greek ethikos (see: ethics); from Latin *mos* (genitive *moris*) "one's disposition," akin to "mores, customs, manners", related to or from the past participle of Latin *mori* 'to die', symbolized by the arrival of Mor, the Greco-Roman goddess of death. [1]

Etymology

The etymology of the term "moral", as a specific term, is generally accredited to Roman scholar Cicero, said to have coined the term in his 45BC work "On Fate", conceptualized as an equivalent of the Greek term ethics; the opening section of which reads as follows: [2]

> "That branch of philosophy which, because it relates to manners, the Greeks usually term ethics [from: ήθος or 'ethos'], the Latins have hitherto called the philosophy of manners. But it may be well for one who designs to enrich the Latin language, to call it **moral** science. And here we have to explain the nature and force of certain propositions which the Greeks term 'axioms'. When these propositions relate to the future, and speak of possibilities and impossibilities, it is difficult to determine their precise force. Such propositions necessarily refer to the amount of possibility, and are only resolvable by logic, which I call the art of reasoning."

This would seem to define moral science, according to Cicero, as the study of actions of behaviors that lead to death (or the arrival of Mor), and or the avoidance of such actions or behaviors.

This, seemingly, would trace the etymology of "moral" to Aristotle, and his "On Ethics", and likewise to his predecessors: Socrates, Plato, etc ; this etymology, however, remains to be elaborated on.

American writer Thomas Miller (2003), to elaborate, speculates that Cicero coined the Latin term for *moral* when he translated *ethikos* as *moralis* in "order to distinguish practical philosophy from speculative and natural philosophy." [3]

Quotes

The following are related quotes:

> "You don't need religion to have **morals**. If you can't determine right from wrong then you lack empathy, not religion."
>
> — Anonymous (c.2001), CultureOfEmpathy.com (Q)

> "A theory of thermodynamics is not, and never will be, a **moral** theory. By moral theory, I mean, at the simplest level, any sustained attempt to give an account of how moral agents ought to live and act."
>
> — Robert Louden (1992), *Morality and Moral Theory* [4]

See also

- Moral landscape
- Moral movement
- Moral symbols
- Morality

References

1. (a) Mor (mythology) – Wikipedia.

(b) Moral – Online Etymology Dictionary.
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External links

- Mor – Wiktionary.

θΔics

In hmolscience, **moral chemistry**, or "chemical morality", or "physico-chemical morality", a two-cultures namesake, is []

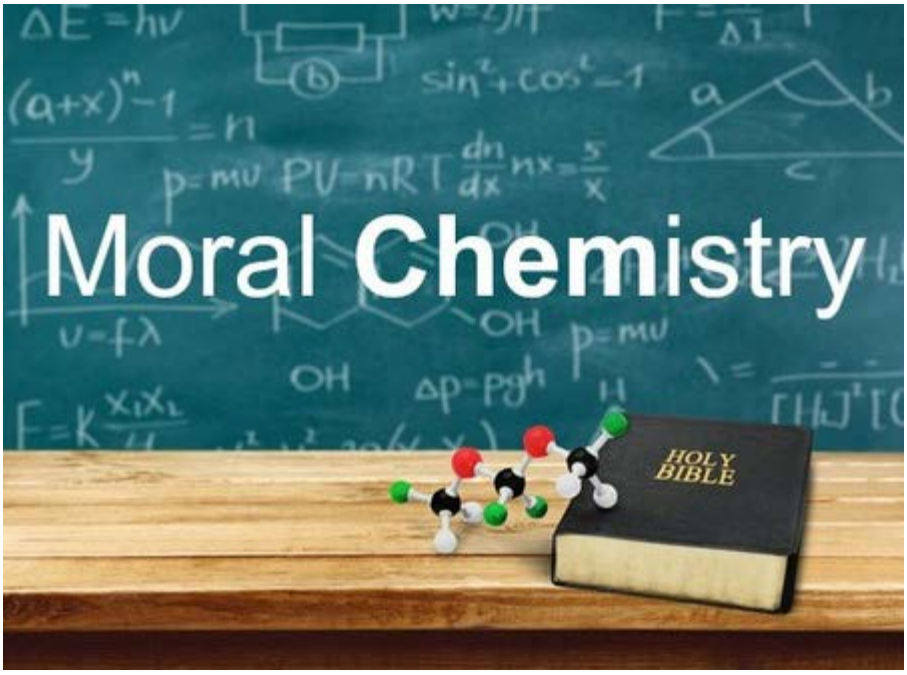

Overview

In 1747, English philosopher David Hartley published *An Enquiry into the Origin of the Human Appetites and Affections*, abstracted by him as a "treatise on the passions, drawn up with a view to assist them in their moral inquires", wherein, supposedly, he outlines some type of Isaac Newton inspired heat vibrations of atoms and ether in the brain theory of memory, evil, and ethics, or something to this effect. [2]

In 1809, Goethe published the physical chemistry based novella *Elective Affinities*, wherein, using human chemical theory, he focused on the conflict between the passions and morality, the underlying edifice of which, as he explained, are defined by the "moral symbols" of physical chemistry, such those employed by Torbern Bergman in chemical reaction affinity table.

In 1869, Irish historian William Lecky, in his *History of European Morals from Augustus to Charlemagne*, referred to Hartley's theory of ethics as moral chemistry: [3]

> "Men enter into life solely desirous of seeking their own happiness. The whole edifice of virtue arises from the observed fact, that owing to the constitution of our nature, and the intimacy of our social relations, it is necessary for our happiness to abstain from some courses that would be immediately pleasurable and to pursue others that are immediately the reverse. Self-interest is the one ultimate reason for virtue, however much the **moral chemistry** of Hartley may disguise and transform it. Ought or ought not, means nothing more than the prospect of acquiring or of losing pleasure. The fact that one line of conduct promotes, and another impairs the happiness of others is, according to these moralists, no reason whatever for pursuing the former or avoiding the latter, unless such a course is that which brings us the greatest happiness. The happiness may arise from the action of society upon ourselves, or from our own naturally benevolent disposition, or, again, from an association of ideas, which means the force of a habit we have formed, but in any case our own happiness is the one possible or conceivable motive of action. If this be a true picture of human nature, the reasonable course for every man is to modify his disposition in such a manner that he may attain the greatest possible amount of enjoyment. If he has formed an association of ideas, or contracted a habit which inflicts more pain than it prevents, or prevents more pleasure than it affords, his reasonable course is to dissolve that association, to destroy that habit. This is what he 'ought' to do according to the only meaning that word can possess in the utilitarian vocabulary. If he does not, he will justly incur the charge of imprudence, which is the only charge utilitarianism can consistently bring against vice."

Further commentary on this term is found in an 1869 *The Westminster Review* article. [4]

In 1878, German philosopher Friedrich Nietzsche, ten years after he had seized on the work of Arthur Schopenhauer, the sole direct protege of Goethe, and his physicochemical will theory, penned his *Human, All Too Human*, a book dedicated to Voltaire, wherein he opened to aphorism #1: "Chemistry and the Notion of the Feelings", of 144 aphorisms (eventually expanded to 1,400 aphorisms), declared the following, using the Alexander Harvey (1908) translation, with

translation alternatives: [1]

> "**Chemistry and the Notion of the Feelings**. Philosophical problems, in almost all their aspects, present themselves in the same interrogative formula now as they did two thousand years ago: how can a thing develop out of its antithesis, e.g. the reasonable from the non-reasonable, the "animate from the inanimate" ["sentient in the dead", Hollingdale (1986)], the logical from the illogical, altruism from egoism, disinterestedness from greed, truth from error? The metaphysical philosophy formerly steered itself clear of this difficulty to such extent as to repudiate the evolution of one thing from another and to assign a miraculous origin to what it deemed highest and best, due to the very nature and being of the "thing-in-itself." The historical philosophy, on the other hand, which can no longer be viewed apart from physical science, the youngest of all philosophical methods, discovered experimentally (and its results will probably always be the same) that there is no antithesis whatever, except in the usual exaggerations of popular or metaphysical comprehension, and that an error of the reason is at the bottom of such contradiction.
>
> There is, strictly speaking, neither unselfish conduct, nor a wholly disinterested point of view. Both are simply sublimations in which the basic element seems almost evaporated and betrays its presence only to the keenest observation. **All that we need** and that could possibly be given us in the present state of development of the sciences, **is a chemistry of the 'moral'**, **'religious'**, **'aesthetic'** conceptions and **'feeling'**, as well as of those **'emotions'** which we experience in the affairs, great and small, of society and civilization, and which we are sensible of even in solitude. But what if this chemistry established the fact that, even in its domain, the most magnificent results were attained with the basest and most despised ingredients? Would many feel disposed to continue such investigations? Mankind loves to put by the questions of its origin and beginning: must one not be almost inhuman in order to follow the opposite course?"

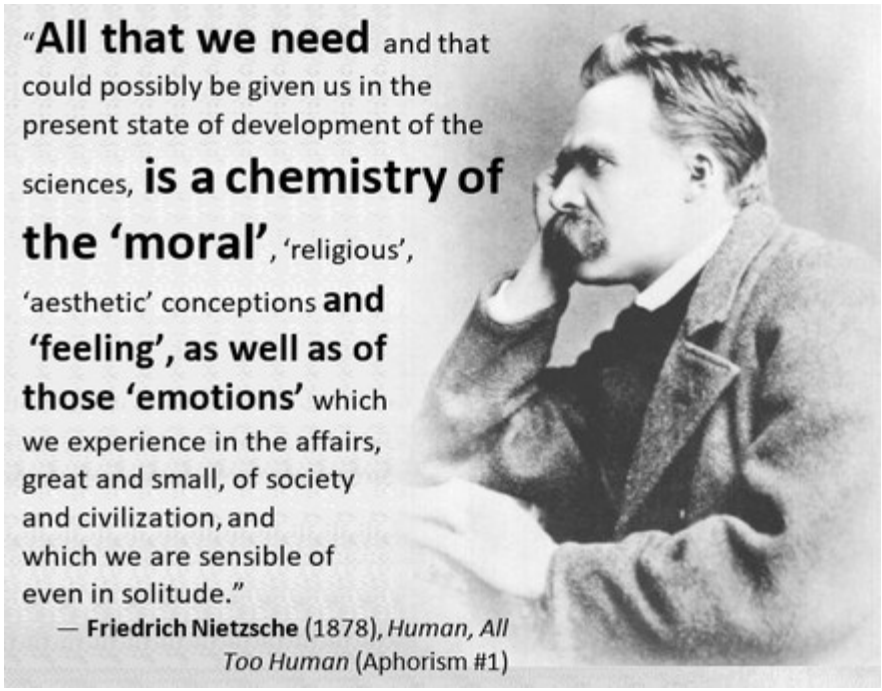

A visual of Friedrich Nietzsche on the need for a "chemistry of the moral", aka a science of **moral chemistry**. [1]

In 1903, Austrian polyintellectual philosopher Otto Weininger, intellectual protege of Goethe's human chemical theory, penned his *Eros and Psyche or Sex and Character: A Fundamental Investigation*, wherein he attempts to pick up on certain aspects of Goethe's so-called moral chemistry.

In 1980, French psychoanalyst Paul-Laurent Assoun, in his *Freud and Nietzsche*, discussed Nietzsche's moral chemistry as follows: [5]

> "A reflection in the *Nachlass*, written during the period that produced *Daybreak*, gives us an interesting indication of the links between intellectual chemistry and the chemical theory (in the proper sense) of living beings:

> ‘In the chemical world reigns the most vivid perception of the diversity of forces. But a protoplasm as a diversity of chemical forces, has only an imprecise and indeterminate overall perception of a foreign object.’

This fragmentation of me field of the real must be taken into account by a sort of ‘psycho-chemistry’, or, to take the term in its authentic generality, a ‘psycho-analysis’! A strange aphorism goes so far as to link moral activity to ‘the modification of the chemical constitution of me body’. Meanwhile, the ideational constitution seeks to transform the chemistry of representations. These forces are analogous to the corporeal forces which refract them. Passing over *On the Genealogy of Morals*, the chemical inspiration figures more explicitly in *The Will to Power*. On the other hand, chemistry demonstrates that ‘there is nothing which is not transformable.’ Chemistry studies the flux and transformation of the characteristics of substances, and it figures as a becoming-universe, the milieu proclaimed in *Wille zur Macht* (*Will to Power*). On the other hand, chemistry also figures as a type of order in becoming that which exceeds all legality, in which case it serves to explain the ‘relations of force’:

> ‘I am wary of speaking in terms of chemical laws: that leaves a moral aftertaste. It is rather a question of the absolute establishment of relations of force (*Machtverhänissen* or ‘power relations’).’

One may argue that, according to the very specifications of the Nietzschean project, a slippage occurs in the manner of conceiving the nature and the sense of this **moral chemistry**, to the extent that, increasingly, the atoms-representations become dynamized in forces, from a Boscovitchian perspective. But the important aspect remains, for our purposes, the persistence of the chemical reference, which serves to identify the analytical and dynamic project.”

Assoun, to note, then tries to connect this Nietzschean chemical morality logic to Sigmund Freud and his chemical metaphor psychoanalysis and chemical thermodynamics based psychology theories.

Chemical thermodynamics

See main: Human chemical thermodynamics

Into the late 20th century, to clarify, citation to and discussion of Nietzsche-Goethe based moral chemistry, seems to petered-off into all but a few open discussion, such as Assoun's above. The reason for this is that, in the 1970s, and the decades to follow, initiated generally with Frederick Rossini's "Chemical Thermodynamics in the Real World" (1971) and Mirza Beg's *New Dimensions in Sociology* (1987), discussion of morals in terms of chemistry and physical chemistry needed to involved not just verbal discussion but also mathematical discussion in the language of partial differential equations, a highly specialized language, wherein the few sparse conjectures in this are are quickly railed off into the ground, such as evidenced by the 2006 Rossini debate, by implicit religious resistance pressures.

See also

â— Atheistic morality

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Arises from Association, with an Account of the Entrance of Moral Evil into the World, to which are Added Some Remarks on the Independent Scheme, which Deduces all Obligation on God's Part and Man's From Certain Abstract Relation, Truth, &c.. W. Wood.
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(b) William Edward Hartpole Lecky – Wikipedia.
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θΔics

In terminology, **moral compass** is a conceptualized or theoretical inner guiding principle or inner sense of the mind, akin or analogous to the way a loadstone points north, helping to give sailors directions when at sea, or the iron of a compass needle points north—in alignment with the earth's magnetic field—thought to distinguish right from wrong, good from evil, and or natural from unnatural, depending, albeit a more complex type of compass, being that the magnetic needle becomes the hydrocarbon mind of the human molecule, whereby choices resulting form the sense is guided, steered or pointed in seeming directions by a combination of the electromagnetic force and gravitational force, rather than solely by the magnetic force, in the case of iron. [1]

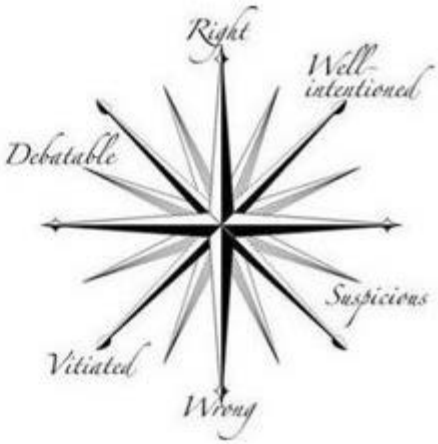

Moral symbols

In 1809, Goethe stated that in the future the defunct Bible-based moral compass would someday be replaced by a natural science-based moral compass, which operates according to the "moral symbols" of physical chemistry.

Etymology

In 1824, English anon author, a self-defined deist, in *Essays on the Universal Analogy between the Natural and Spiritual World*, seems to have been the first to employ the term "moral compass", specifically in his essay "Parallel between Magnetism and Electricity, Natural and Spiritual", wherein he states the following: [2]

> "Third question: '*Doth any one in handling similitude and diversity assign the cause, why iron should not move to iron, which is more like, but move to the loadstone, which is less like.*' In opening this question I would put another question to the enquirer, and say, why does the convinced (though not yet converted) sinner not move to the open unconvinced sinner, who is apparently more like, but to the saint, or to the book, or to the preacher, the instrument of his conviction, who is apparently less like? If I can show that the natural iron and loadstone are symbols of the above moral cases and things, I presume that the reader will then understand the meaning at once.
>
> In fact, I have written an essay on moral magnetism in comparison with the natural; and I find that all the cases in the natural, are strict symbols of those in the moral scale; they are all exact parallels. Yet I cannot prove my assertions in few words or lines, so I will only say briefly, that the loadstone or magnet is a magnetizer or teacher. He possesses *the magnetic fluid of reason* and *truth.* The pure iron is his docile and non pre-occupied pupil: while the iron is unmagnetized by the spirit of the loadstone, it is not attracted by it; but so soon as the spirit of the master is imbibed by the pupil, he also becomes magnetized by reason and true proportion; he is then attracted by the spirit of his master. He also has polarity; that is to say, he is competent to distinguish good and evil, and social from self-love; or *south* from *north.*
>
> He perceives that the centre between these two extremes or poles, is this divine truth, '*thou shalt love thy*

neighbour as thyself.' He then sees that the meridian of his **moral compass** from east to west is the true line of religion, at right angles to that of morality. He will not then move to the unmagnetic iron, by the *attraction* of *sympathy*, but only by the *impulsion of charity*, to teach as he was taught; but he will move by attraction towards the moral magnet whom he resembles in spirit, but not yet in form.

I would add, that the moral or human magnets are positive by *true* religion, and negative by *false* religion; but they both operate similarly, though inversely. For instance, the apostles and prophets of our Lord are positive magnets; and those of Satan, such as the teachers of blasphemy, sedition, and all wickedness, are negative."

(add discussion)

Heisenberg Pauli dialogue

See main: Heisenberg Pauli dialogue on god

Werner Heisenberg
(1901-1976)

Wolfgang Pauli
(1900-1958)

One summer night, Wolfgang Pauli and Werner Heisenberg, following a Copenhagen meeting on quantum mechanics (with Niels Bohr), entered into a dialogue on god and soul, wherein, as recounted by Heisenberg (below), Heisenberg stated frankly that the main issue (or tension) is that we don't yet have a gravito-electromagnetic force based "**moral compass**", the way sailors do for directional guidance in the earth's magnetic force:

Wolfgang: "Do you believe in a personal God? I know, of course, how difficult it is to attach a clear meaning to this question, but you can probably appreciate its general purport."

Heisenberg: "May I rephrase your question?" "I myself should prefer the following formulation: can you, or anyone else, reach the central order of things or events, whose existence seems beyond doubt, as directly as you can reach the soul of another human being? I am using the term 'soul' quite deliberately so as not to be misunderstood. If you put your question like that, I would say yes. And because my own experiences do not matter so much, I might go on to remind you of Pascal's famous text, the one he kept sewn in his jacket. It was headed "Fire" and began with the words: "God of Abraham, Isaac and Jacob – not of the philosophers and sages." "In other words, you think that you can become aware of the central order with the same intensity as of the soul of another person?"

Wolfgang: "Perhaps." "Why did you use the word 'soul' and not simply speak of another person?"

Heisenberg: "Precisely because the word, 'soul', refers to the central order, to the inner core of a being whose outer manifestations may be highly diverse and pass our understanding.

Heisenberg: "If the magnetic force that has guided this particular compass – and what else was its source but the central order – should ever become extinguished, terrible things may happen to mankind, far more terrible even than concentration camps and atom bombs. But we did not set out to look into such dark recesses; let's hope the central realm will light our way again, perhaps in quite unsuspected ways. As far as science is concerned, however, Niels is certainly right to underwrite the demands of pragmatists and positivists for meticulous attention to detail and for semantic clarity. It is only in respect to its taboos that we can object to positivism, for if we may no longer speak or even think about the wider connections, we are without a compass and hence in danger of losing our way."

(add discussion)

Lost moral compass | No moral compass

Referring to something or someone that has "lost their moral compass" tends to refer to a path of action that has run a muck and gone off the beaten path of presumed morality, whereas something that has "no moral compass" tends to refer to something without direction.

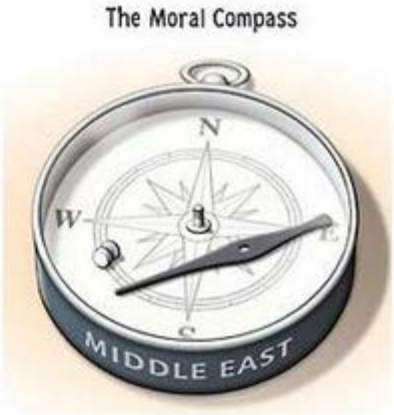

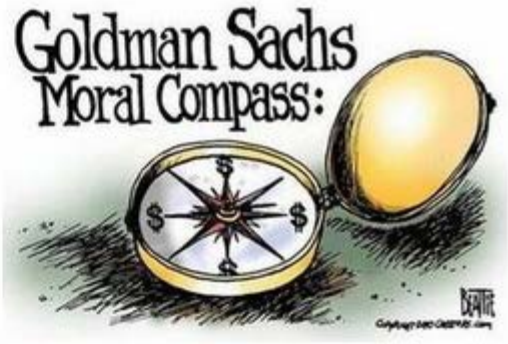

Quotes

The following are related quotes:

> "A **moral compass** is a little thing inside us, like a compass, that tells us the right direction—when we have to make decisions—from wrong direction."
>
> — Christopher Bollinger (2004), "A Moral Compass", in *Rants* (Q), Oct.

> "Do you have your own **moral compass**? If so, which direction is it leading you?"
>
> — Michelle Parsons (date) (Q)

> "I was always an unusual girl. My mother told me I had a chameleon soul, no **moral compass** pointing due north, no fixed personality; just an inner indecisiveness that was as wide and as wavering as the ocean."
>
> — Lana Del Rey (2014), "Ride" (Q) (vid)

References

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(b) Moral compass – Cambridge Dictionaries Online.
2. Anon. (1824). *Essays on the Universal Analogy between the Natural and Spiritual World* (pgs. 141-42). London: J. Hatchard and Son.

Further reading

● Malik, Kenan. (2014). *The Quest for a Moral Compass: a Global History of Ethics*. Melville House.

θΔics

In philosophy, **moral landscape** is three dimensional mapping of peaks of potential well-being against valleys of the deepest possible suffering.

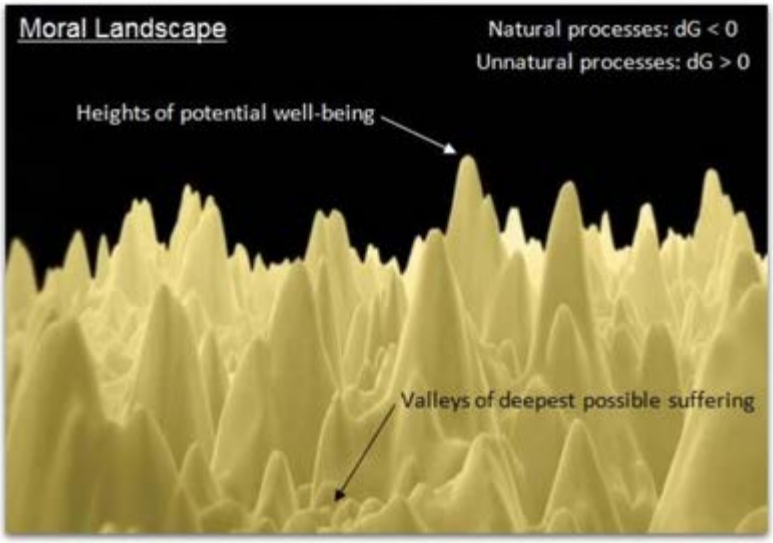

American neuroscience philosopher Sam Harris's 2010 visual conception of "moral landscapes", correlating to heights of well-being and valleys of suffering, posited to be explainable by science, shown with the standard scientific criterion for constitutes a "natural" versus an "unnatural" human reaction or process for earth-bound. [2]

Overview

In 2010, Sam Harris, in his *The Moral Landscape*, published his hypothetical model of 'moral landscape' as a way to scientifically quantify meaning, values, morality, and the good life, by addressing what exactly is it that quantifies right and wrong and good and evil. He defined "moral landscape" as follows: [1]

> "Throughout this book I make reference to a hypothetical space that I call the '**moral landscape**'—a space of real and potential outcomes whose peaks correspond to the heights of potential well-being and whose valleys represent the deepest possible suffering. Different ways of thinking and behaving—different cultural practices, ethical codes, modes of government, etc.—will translate into movements across this landscape and, therefore, into different degrees of human flourishing. I'm not suggesting that we will necessarily discover one right answer to every moral question or a single best way for human beings to live. Some questions may admit of many answers, each more or less equivalent. However, the existence of multiple peaks on the moral landscape does not make them any less real or worthy of discovery. Nor would it make the difference between being on a peak and being stuck deep in a valley any less clear or consequential."

The central issue here, physico-chemically speaking, is that Harris' "moral landscape", wherein peaks correspond to heights of "well-being", is opposite to real "energy landscapes", wherein wells, not peaks, correspond to states of stability or "well-being", so to say.

Discussion

The artistic conception of Harris' moral landscape is depicted adjacent, shown with the modern definition of what constitutes 'natural' verses an 'unnatural' human reaction process or reaction, according to standard chemical thermodynamic definition, in the upper right corner. [2]

- Natural process: $dG < 0$
- Unnatural process: $dG > 0$

In this sense, in the form of what are called free energy maps (or energy landscapes), Harris' idea of well-being heights and valleys of suffering, seem to be inverse in the graphical sense (to his depiction), in which such plots would be made in terms of Gibbs free energy differentials dG, wherein lows (or valleys) would correspond to points of maximal stability. In the 1923 words of Gilbert Lewis: [3]

> "A system is stable when no process can occur with a diminution in free energy."

These stability points, assumed to be indicative of human states of well-being, are thus valleys or free energy wells of lowest position on a plot of free energy versus change.

Hence, in Harris morality mapping, although an interesting first attempt, peaks graphically, are very unstable point, differentially speaking, and generally correspond to transition states, which tend to be short-lived, not necessarily to a height of well-being, which tend to be longer in duration.

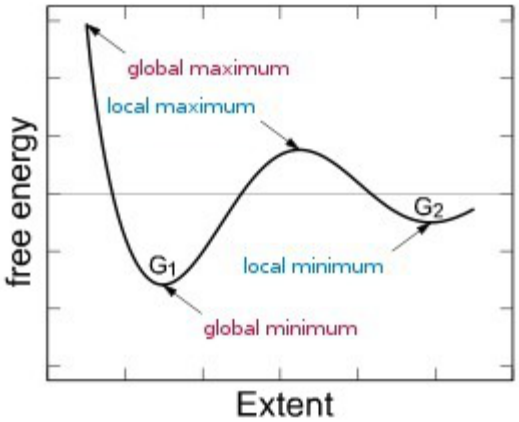

The position of G_1 is such that, in the words of Gilbert Lewis (1923), "no further process can occur with a diminution in free energy", and is thus representative of a state of maximal stability; whereas the position of G_1 could decrease further in free energy, to the position of state one, and is thus not maximally stable.

See also

- Potential energy surface
- Moral symbols
- Moral movement

References

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2. (a) Moral landscape (video image) - SamHarris.org.
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3. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pgs. 160-61). McGraw-Hill Book Co., Inc.

External links

- Harris, Sam. (2010). "Interview", Groks Science Show, Nov 20.

θΔics

In terminology, **moral monkeys** refers to the subject the study of morality, moral science, and or ethics in the behaviors, i.e. moral behavior, so to say, of non-human primate mammals.

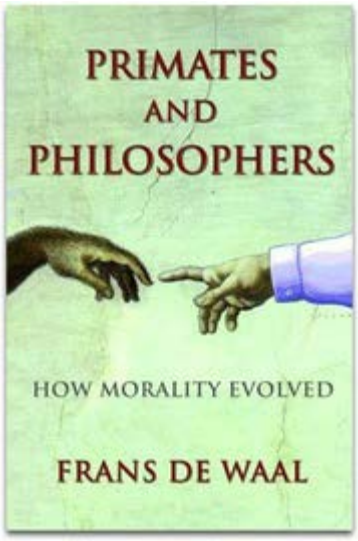

Left: Dutch primatologist Frans de Waal's 2006 *Primates and Philosophers*, wherein he explains his **monkey morality** experiments, the most-famous of which being the shock your friend or get food alternative experiment. [1] Right: a video still of Jeremy Rifkin (2010) discussing the 1990s MRI monkey empathy experiments. [4]

Overview

In the 1960s, Dutch primatologist Frans de Waal began to study aggression in nonhuman primates, noticing that after fights between two combatants, other chimpanzees would often console the loser, a form of empathy. This led to later speculative theories about morality. [2]

In later experiments conducted by de Waal, monkeys were first trained to pull a lever to get food. Then the lever was hooked up so that when the monkeys pulled the lever to get food, it not only produced food, but severely shocked a monkey in a neighboring cage. It was found that the monkeys would voluntarily choose to starve themselves, going between five to twelve days without food, rather than shock their neighbor. [1]

The following are illustrations of so-called "moral" behaviors in chimpanzees, such as an adult male teaching a youngling about proper moral social behavior (left), a female taking a stone out of the hand of a male about to go to war (center), or an adult helping a scared young chimp down from the tree (right): [2]

Religion

The religious implications of de Waal's work are that religion is something that evolved out of primate morality, functioning to enforce rules and give narrative to them, according to de Waals. [2]

Hmolscience

The extrapolation of this finding is that what we define as "moral behavior" must have its origin in the hydrogen atom, being that humans (26-element molecules) evolved from monkeys (24-element molecules) which evolved from the hydrogen atom (1-element).

Related

In 2012, Paul Zac, in his *The Moral Molecule*, argued that oxytocin is the molecule, i.e. the moral molecule, behind morality in humans, in the areas of: love, trust, prosperity. [3]

Quotes

The following are related quotes:

> "The time has come for ethics to be removed temporarily from the hands of philosophers [and theologians] and biologicized."
>
> — Edward Wilson (1975), *Sociobiology* [2]

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(b) Frans de Waal – Wikipedia.
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4. Rifkin, Jeremy. (2010). "The Empathic Civilisation" (Ñº), The RSA, May 6.

θΔics

In science, **moral movement** or ‘moral motion’ refers to motions directed based on a theory of morality, which equates to daily directions of prescribed ‘good’ or ‘bad’ (or evil) trajectories, motions, or actions.

History

The first and most dominate system of guided moral movement was the circa 2500BC Ra theology based notion of 42 negative confessions or forbidden actions, weighted digressions of which would result in a person’s soul not be permitted into the afterlife. This model was carried over into modern-day Ab*ra*hamic and B*ra*hmaic religions, via syncretism and modification, the core to each of these being the circa 3500BC cyclical birth death resurrection/reincarnation theory of Ra the sun god.

The first to outline a non-deity physical-chemistry based British philosopher John Stewart and his 1789 "moral motion" theory, in which he did away with all of the mythological terms ‘life’, ‘death’, ‘god’, etc., and replaced these with modern physical sciences (astronomy, physics, and chemistry) based theory of ‘moral motion’, wherein man is viewed as an intelligent type of animate matter, made of particles (atoms), and that all that exists in the universe is matter and motion. Stewart called this "natural religion" [1]

In 2010, American neuroscience philosopher Sam Harris attempted to outlined a so-called science-based "moral landscape" theory or system of morality, but conditioned his position by stating abruptly that: [2]

> “I am certainly not claiming that moral truth exists independent of the experience of conscious beings or that certain actions are intrinsically wrong.”

In other words, although Harris argues for a type of universal morality, he states in opposition that right and wrong does not exist in the structure of the universe, and specifically that certain "actions" or movements cannot be quantified moralistically.

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2. Harris, Sam. (2010). *Moral Landscapes* (pg. 30). Free Press.

θΔics

In philosophy, **moral philosophy** refers to the study of philosophies concerning the nature of morals, i.e. theories or speculations about what is moral and or immoral; the study of the works and ideas of moral philosophers, e.g. Plato, Aristotle, Stoics, e.g. Zeno of Citium (see: slave stealing parable), Epicureans (Epicurus), Thomas Hobbes, Adam Smith, among others (Maxwell, 1850).

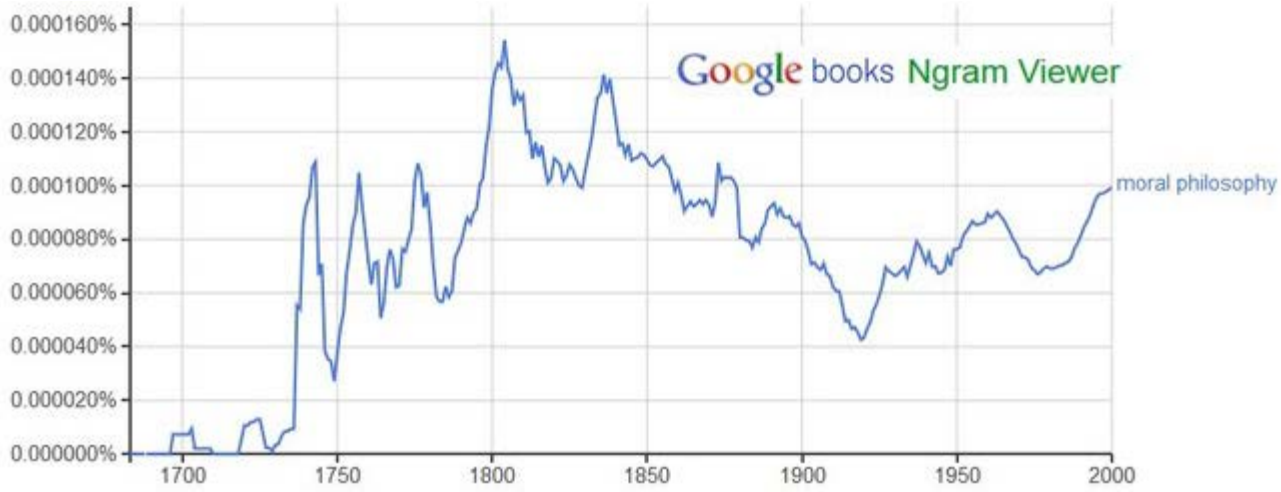

A Ngram view of "**moral philosophy**", which seems to be on the rise going into the 21st century; which can be contrasted with the Ngram for "moral science", which is has petered out.

Overview

In 1849, James Froude's *Nemesis of Faith* was publicly burned during reverend William Sewells' moral philosophy class at Oxford

In 1850, James Maxwell began corresponding with Lewis Campbell, about the nature of the soul (see: Maxwell on the soul), and related ideas, amid taking a moral philosophy class, at the University of Edinburgh, taught by John Wilson.

Thermodynamics

In Mar 2019, the fourth Google Scholar search return for keys: "thermodynamics, philosophy, morality" is the book *Elements of Moral Philosophy*, by Stuart Rachels and James Rachels, in which the key "thermodynamics" is used one time, as follows:

> "The point of this book [on **moral philosophy**] is not to provide a neat, unified account of "the truth" about ethics. That would be a poor way to introduce the subject. Philosophy is not like physics. In physics, there is a large body of established truth that beginners must patiently master. (Physics teachers rarely invite their students to make up their own minds about the laws of thermodynamics). There are, of course, unresolved controversies in physics, but these take place against a background of broad agreement. In philosophy, by contrast, everything is controversial—or almost everything. Some of the fundamental issues are still up for grabs. A good introduction will not try to hide that somewhat embarrassing fact."
>
> — Stuart Rachels (2012), "Preface" (pdf) to *The Elements of Moral Philosophy* [2]

While theories such as Immanuel Kant's categorical imperative, there is no concordant discussion of Wilhelm Ostwald's 1901 energetic imperative, Bruce Lindsay's c.1959 thermodynamic imperative stylized physics lectures, or other historical moral theory logic based on thermodynamics, e.g. entropy ethics, only evidences two cultures disparity.

Quotes

The following are related quotes:

> "**Moral philosophy** is nothing else but the science of what is good and evil, in the conversation, and society

of mankind. Good and evil are names that signify our appetites, and aversions; which in different tempers, customs, and doctrines of men, are different: and diverse men, differ not only in their judgment, on the senses of what is pleasant and unpleasant to the taste, smell, hearing, touch, and sight; but also of what is conformable or disagreeable to reason, in the actions of common life."

— Thomas Hobbes (1651), *Leviathan* [1]

"Changes in entropy can be used as a starting point to conceptualize the most accurate of ethical frameworks."

— LackJester (2015), r/Philosophy Reddit post (Q) to "Review of Jim Holt's Why Does the World Exist?"

"I still haven't met someone who understands what I mean when I say **my morals and my beliefs align with the laws of thermodynamics**. And no, I don't mean those weird debates about thermodynamics proving the existence of god. I mean using entropy and enthalpy as a way to perceive the world and people beyond [*status quo*] science."

— @SoftWeonwoo (2018), Tweet, Jul 28 [3]

See also

- Flower stealing model
- Goethean morality
- Morality Squared
- Natural morality
- Physicochemical morality puzzles

References

1. Hobbes, Leviathan. (1651). *Leviathan: or the Matter, Form, and Power of a Commonwealth, Ecclesiastical and Civil.* (pg. 78) (Q). George Routledge and Sons.
2. Rachels, James and Rachels, Stuart. (2003). *The Elements of Moral Philosophy, Seventh Edition* (pdf). McGraw-Hill, 2012.
3. Thims, Libb. (2019). *Human Chemical Thermodynamics: Chemical Thermodynamics Applied to the Humanities – Sociology, Economics, History, Philosophy, Ethics, Government, Politics, Business, Jurisprudence, Religion, Relationships, Warfare, and Meaning* (pdf) (pg. 7). Publisher.

External links

- Moral science (redirect to: human science) – Wikipedia.
- Science of morality – Wikipedia.

θΔics

In hmolscience, **moral power** refers to power, albeit not that of the "higher power" variety, but of the measurable scientific variety, related to human morals, specifically actions derived from moral choices or beliefs.

A generic image of "**moral power**", the general rightfulness or wrongfulness of an idea to action, and the power of action produced therefrom.

Goethe

In 1809, Goethe published *Elective Affinities*, wherein he outlined, in coded form, his theory of moral symbols of social interactions; a retrospect summary:

> "The biographer Wolff is fairly typical in the language he uses to describe Goethe's relationship to Minna Herzlieb: 'in her eye and being lay something naturally daemonic from which Goethe could not easily pull away'. Goethe, however, fought his passion with "sittlicher Kraft" [moral power], producing the fruit of *Elective Affinities* [*Die Wahlverwandtschaften*]."
>
> — Astrida Tantillo (2001), *Goethe's Elective Affinities and the Critics* (pg. 65)

In 1831, Goethe also discussed "moral power" with Johann Eckermann, who brought the term up, in respect to Kant's categorical imperative. (Q) In these translations, to note the German term "kraft" correctly translates as "force", hence "sittlicher Kraft" means "moral force", as opposed to Tantillo's translation above. The technical difference between force (or kraft), energy, and power, was not fully worked out until the late 19th century.

Material power | Moral power

In c.1875, Ralph Emerson, having already absorbed the "moral symbols" physico-chemical natural morality logic of Goethe (1809), began to dig thematically at the premise that "moral power" is but a higher level form of "material power", and that the former always lags behind the latter in development, understanding, and application; the main statement on this are as follows:

> "**Moral power** has not kept pace with material power."
>
> — Ralph Emerson (c.1870) aggregate quote, in index of *Volume 12* (Q); in: *Complete Works, Volume 7* (material power, pg. 166; moral power, 190), Volume 8 (moral power, pg. 316), Volume 10 (moral and material power, pgs. 64; material forces, 72)

> "It is too plain that with the material power the **moral progress** has not kept pace. It appears that we have not made a judicious investment. Works and days [of Hesoid] were offered us, and we took works."
>
> — Ralph Emerson (c.1875), "Works and Days" (Q); in: *Complete Works, Volume 7* (pg. 166)

> "We owe to books those general benefits which come from high intellectual action. Thus, I think, we often owe to them the perception of immortality. They impart sympathetic activity to the **moral power**."
>
> — Ralph Emerson (c.1875), "Books"; in: in: *Complete Works, Volume 7* (pg. 190)

“Since everything in nature answers to a **moral power**, if any phenomenon remains brute and dark, it is that the corresponding faculty in the observer is not yet active.”

— Ralph Emerson (c.1875), *Publication* [8]

“Meantime we hate sniveling. I do not wish you to surpass others in any narrow or professional or monkish way. We like the natural greatness of health and wild power. I confess that I am as much taken by it in boys, and some-times in people not normal, nor educated, nor presentable, nor church-members, — even in persons open to the suspicion of irregular and immoral living, in Bohemians, — as in more orderly examples. For we must remember that in the lives of soldiers, sailors and men of large adventure, many of the stays and guards of our household life are wanting, and yet the opportunities and incentives to sublime daring and performance are often close at hand. We must have some charity for the sense of the people, which admires natural power, and will elect it over virtuous men who have less. It has this excuse, that natural is really allied to **moral power**, and may always be expected to approach it by its own instincts. Intellect at least is not stupid, and will see the force of morals over men, if it does not itself obey.”

— Ralph Emerson (c.1875), “Greatness”; in: Volume 8 (pg. 316)

“I believe in the closest affinity between **moral and material power**. Virtue and genius are always on the direct way to the control of the society in which they are found. It is the interest of society that good men should govern, and there is always a tendency so to place them.”

— Ralph Emerson (c.1875), “Aristocracy”; in: Volume 10 (pgs. 64)

“These forces are in an ascending series, but seem to leave no room for the individual; man or atom, he only shares them; he sails the way these irresistible winds blow. **Intellect and morals appear only the material forces on a higher plane**. The laws of material nature run up into the invisible world of the mind, and hereby we acquire a key to those sublimities which skulk and hide in the caverns of human consciousness. And in the impenetrable mystery which hides—and hides through absolute transparency—the mental nature, I await the insight which our advancing knowledge of material laws shall furnish!”

— Ralph Emerson (1877), “Perpetual Forces” (pdf), *The North American Review, Volume 125,* Sep 1; in: *Completed Works, Volume 10* (pg. 72) [1]

Emerson, of note, in these promulgations, used the term "spiritual', here and there; his citation of scientists, e.g. Faraday, and straight science, e.g. “I delight in tracing these wonderful ‘powers’, the electricity and gravity of the human world” (Perpetual Forces, 1877), however, seem to well enough obviate the former obsolete terminology usages (see: spirit terminology reform), retrospectively speaking.

Quotes

The following are related quotes:

“Even in war, **moral power** is to physical power as three parts out of four.”

— Napoleon Bonaparte (c.1817), *Publication* (Q)

See also

- Moral chemistry
- Moral philosophy
- Moral science

References

1. Emerson, Ralph. (1877). “Perpetual Forces” (txt)(pdf), *The North American Review*, *Volume 125*, Sep 1; in: *Completed Works*, *Volume 10* (pg. 72)

θΔics

In hmolscience, **moral relativism**, aka situational ethics, moral relativity, ethical relativism, “ethical relativity” (Westermarck, 1932), or , refers to the premise that “morals” are relative to the state of the system; the belief that no ‘thing’ is objectively right or wrong and that the definition of right or wrong depends on the prevailing view of a particular individual, culture, or historical period. [1]

Darius anecdote

In 500BC, Persian king Darius (c.550-486BC), as told by Herodotus (450BC), asked some Greeks at his court if there was any price for which they would be willing to eat their dead father’s bodies the way the Callatiae did (note: custom practiced on the island on Bali). The Greeks said nothing could induce them to do this. Darius then asked some Callatiae who were present if they would ever consider burning their fathers’ bodies, as was the custom among Greeks. The Callatiae were horrified at the suggestion. Herodotus sees this story as vindicating the poet Pindar’s dictum that “custom is lord of all”; people’s beliefs and practices are shaped by custom, and they typically assume that their own ways are the best. [2]

Overview

In 1906, Edward Westermarck, in his *The Origin and Development of Moral Ideas*, gave example, from different cultures, to attack the various preconceived ideas about morals, e.g. that morality is located in the “will”. [3] He followed this up by his *Ethical Relativity* (1932), cited by Samuel Holmes (1946)**,** wherein he attacked the idea that moral principles express objective value, writing "I am not aware of any moral principle which can be said to be self-evident," and asserting that (no) "moral statements are anything more than the opinions of those who express them." [4]

In 1956, Judson Herrick, in his *The Evolution of Human Nature*, gave the following situational ethics view: [5]

> “Nature as a whole is unmoral according to human codes of ethics, but it is not immoral. Only a man can be immoral, and what he regards as immoral varies with his culture. In some communities the murder of incompetent seniles is a moral duty, and in some ‘civilized’ communities of today genocide involving ruthless extermination of millions of innocent and competent people has been defended as morally acceptable by a large number of people who boast of a superior ‘Kultur’ [culture]. The world is not mad. It is only some of the people in it who are mad. The world is orderly, and even human madness is lawfully ordered, having causes and consequences which can be discovered and ameliorated.”

(add discussion)

Kanawha County | Situational ethics

In 1974, during the Kanawha County textbook controversy, one textbook included a story of a child cheating a merchant out of a penny. Students were asked:

> “Most people think that cheating is wrong. Do you think there is ever a time when it might be right to? Tell when it is. Tell why you think it is right.”

Parents violently objected, believing these lessons were undermining Christian values. One parent, of an elementary school student, stated in obvious frustration:

> “We’re trying to get our kids to do the right thing. Then these books come along and say that sometimes the wrong thing is the right thing. We just don’t believe that! The ten commandments are the ten commandments.”

(add discussion)

See also

â— Objective morality
â— Subjective morality

References

1. (a) Ethical relativism – Dictionary.com.
(b) Ethical relativism – Britannica.com.
2. Moral relativism – Internet Encyclopedia of Philosophy.
3. (a) Westermarck, Edward. (1906). *The Origin and Development of Moral Ideas, Volume 1*. Publisher.
(b) Westermarck, Edward. (1906). *The Origin and Development of Moral Ideas, Volume 2*. Publisher.
(c) The Origin and Development of Moral Ideas – Wikipedia.
4. (a) Westermarck, Edward. (1932). *Ethical Relativity*. Littlefield, 1960.
(b) Ethical Relativity – Wikipedia.
5. Herrick, C. Judson. (1956). *The Evolution of Human Nature* (abs) (pgs. 216-17). University of Texas Press.

External links

â— Moral relativism – Wikipedia.

θΔics

In science, **moral science** is the subject that considers and handles the will of man (Francis Bacon, c.1610); is quantified via the moral symbols of physical chemistry applied socially (Johann Goethe, 1809); a subject resembling physics, germane to agents whose operation involves the power of choice (Thomas Birks, 1873); the moral calculus of pleasure-intensity units, pleasure being the concomitant of energy of mathematical physics, postulated by distributive justice and utility maximization, the horizon in which every moral prospect terminates, on the most sacred and most trivial occasions (Francis Edgeworth, 1881).

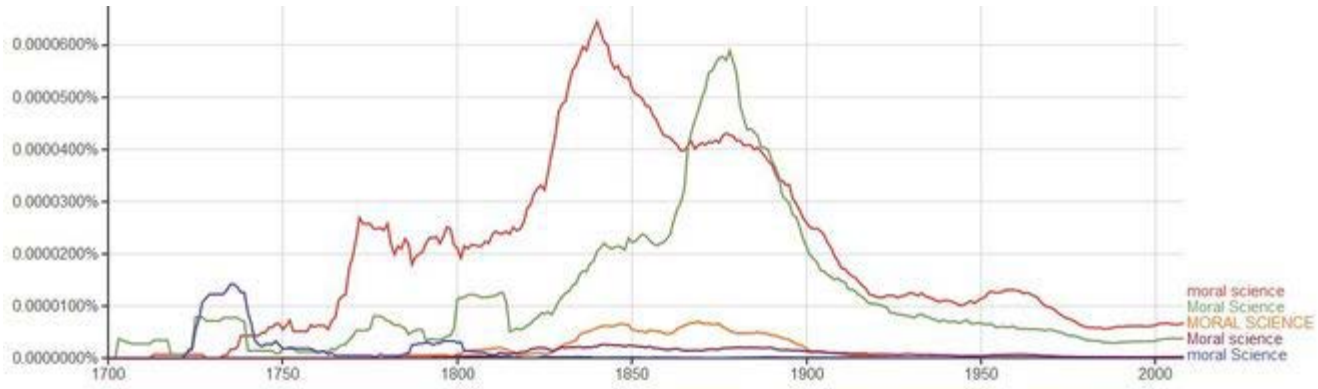

A Google Books Ngram view (O) of the use of the term "**moral science**", whose usage peaked between 1840 and 1875, falling into disuse in the 20th century.

Etymology

In 45BC, Roman scholar Cicero, in his "On Fate", introduced the terms “moral science” and “moral” concordantly, as follows: [8]

> “That branch of philosophy which, because it relates to manners, the Greeks usually term ethics [from: ήθος or ‘ethos’], the Latins have hitherto called the philosophy of manners. But it may be well for one who designs to enrich the Latin language, to call it **moral science**. And here we have to explain the nature and force of certain propositions which the Greeks term ‘axioms’. When these propositions relate to the future, and speak of possibilities and impossibilities, it is difficult to determine their precise force. Such propositions necessarily refer to the amount of possibility, and are only resolvable by logic, which I call the art of reasoning.”

This would seem to define moral science, according to Cicero, as the study of actions of behaviors that lead to death (or the arrival of goddess Mor), and or the avoidance of such actions or behaviors, leading to the prolongation of life (accentuation of the stay of the goddess Vita).

In circa 1610, English thinker Francis Bacon, in his essay “On Moral Knowledge”, which he defines as the subject that considers and handles the will of man, according to which right reason governs will, good apparent seduces it; the spurs of will are the affections; her ministers, the organ and voluntary motions, employs the term moral science one time as follows:

> “Philosophers in **moral science** have chosen to themselves a certain resplendent and illustrious mass of matter, to give glory either to the subtlety of their wit, or to the vigor of their eloquence. But such precepts as direct practice chiefly, (and life consists not in novelties or subtleties) they have for the most part omitted.”

Bacon, in his overall scheme, differentiates moral science from civil science, allotting priority to the latter over the former. [7]

Into the 1710s, following, it seems, the English-translations of Bacon’s

works, and over the next two centuries, the term "moral science" began to be increasingly employed in English in a variety of publications, albeit largely without explicit definition; the term largely falling off in usage into the 20th century.

Moral science

From Wikipedia, the free encyclopedia
Redirect page

↳ Human science

The Wikipedia "**moral science**" page, which has been a redirect to "human science" since 2007, links to John Keynes, Alexander Bain, Stanley Jevons, George Magoun, Daniel Hausman, and to the talk page of "science of morality", a discussion (Q) on the difference between the two terms.

Quotes

The following are related quotes:

> "Moral philosophy is nothing else but the science of what is good and evil, in the conversation, and society of mankind. Good and evil are names that signify our appetites, and aversions; which in different tempers, customs, and doctrines of men, are different: and diverse men, differ not only in their judgment, on the senses of what is pleasant and unpleasant to the taste, smell, hearing, touch, and sight; but also of what is conformable or disagreeable to reason, in the actions of common life."
>
> — Thomas Hobbes (1651), *Leviathan* [5]

> "You are right in speaking of the moral foundations of science, but you cannot speak of the scientific foundations of morality."
>
> — Albert Einstein (1930), discussion on science and religion in Berlin [2]

> "Even the greatest forces and abilities don't seem to carry any clear instructions on how to use them. The sciences do not directly teach good or bad. Ethical values lie outside the scientific realm"
>
> — Richard Feynman (1963), "A Scientist Looks at Society" [3]

> "Science does not have a moral dimension. It is like a knife. If you give it to a surgeon or a murder, each will use it differently."
>
> — Wernher von Braun (c.1965), arose amid moral qualms surrounding WWII rocket science technology (Q)

> "The recurrence during the eighteenth century Enlightenment of the aspiration to be the 'Newton of the **moral sciences**' testifies to the prestige not just of celestial mechanics, but of the 'experimental method' more generally."
>
> — Stefan Collini (1993), 'Introduction' to C.P. Snow's *The Two Cultures* [4]

References

1. (a) Birks, Thomas R. (1873). *First Principles of Moral Science: a Course of Lectures Delivered in the University of Cambridge* (pg. 127). MacMillan.
(b) Thomas Rawson Birks – Wikipedia.
(c) Edgeworth, Francis Y. (1881). *Mathematical Psychics: an Essay on the Application of Mathematics to the Moral Sciences* (moral calculus + energy, pgs. 7-9). C. Kegan Paul & Co.
2. Jammer, Max. (1999). *Einstein and Religion: Physics and Theology* (pg. 69). Princeton University Press, 2011; (Q) (Q).
3. (a) Feynman, Richard. (1963). "A Scientist Looks at Society", John Danz Lecture Series, University of Washington,

Seattle, Apr; published as: *The Meaning of it All* (pdf) (pgs. 32, 43). Addison-Wesley, 1998.
(b) The Meaning of It All – Wikipedia.
4. Collini, Stefan. (1993). "Introduction", in: *The Two Cultures* (by Charles Snow) (pg. x). Canto.
5. Hobbes, Leviathan. (1651). *Leviathan: or the Matter, Form, and Power of a Commonwealth, Ecclesiastical and Civil* (pg. 78) (O). George Routledge and Sons.
6. (a) Bacon, Francis. (c.1620). "On Moral Knowledge", in: *Partitions of the Sciences* (*De Augmentis Scientiarum*) (Lib. 7. Cap. I), in: *Lord Bacon's Essays: or Counsels Moral and Civil* (§24: Of Moral Knowledge; moral science, pg. 322). H. Parson, J. Brotherton and W. Meadows, A. Bettesworth, S. Ballard, R. Gosling, and C. King, 1720.
(b) Works by Francis Bacon – Wikipedia.
7. Wormald, B.H.G. (1993). *Francis Bacon: History, Politics and Science, 1561-1626* (§6: Morality and Policy I, pgs. 109-; moral science, 10+ pgs). Publisher.
8. Cicero, M.T. (45BC). "On Fate". Publisher; in: *The Treatises of M.T. Cicero: On the Nature of Gods; On Divination; On Fate; On the Republic on the Laws; and On Standing for the Consulship* (translator: C.D. Yonge) (§3:264-82). George Bell & Sons, 1878.

External links

- Science of morality – Wikipedia.

θΔics

In science, **moral symbols**, refers to the premise that the basis of morality is to be found in the symbols of affinity chemistry, the precursor to physical chemistry, as defined as following 24 Jul 1809 statement, from the Alfred Steer (1990) translation, by German polyintellect Johann Goethe: [8]

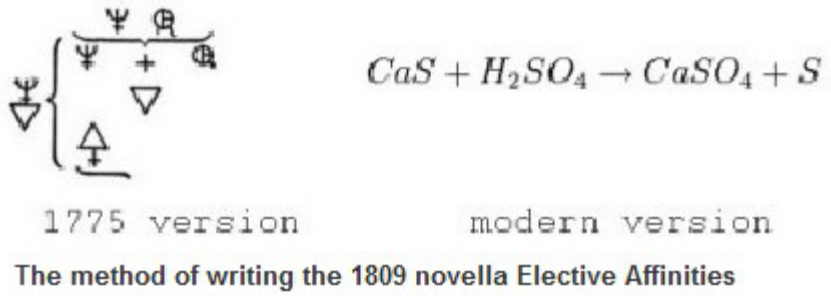

A overview of the **moral symbols**, i.e. reactions diagrams (AB + C → BC + A), bonding crotchets (‘ { ’), affinity darts (‘ → ’), and characters (A, AB, etc.), etc., pioneered in the combined works of chemists Etienne Geoffroy (1718), William Cullen (1757), and Torbern Bergman (1775), used by German polymath Johann Goethe to formulate his 1799 theory of physical chemistry based morality quantified in terms of human chemical affinities (table), as explained in his 1809 novella *Elective Affinities*, wherein he outlined a unified approach to the explanation of chemical, physical, and social nature, on the premise that there is after all only one nature.

> “The **moral symbols** in the natural sciences—for example that of the elective affinities invented and used by the great Bergman—are more intelligent and permit themselves to be connected better with poetry, even connected with society better than any others, which are, after all, even the mathematical ones, anthropomorphic. The thing is that the former (the chemicals) belong with the emotions, the latter (mathematics) belong with the understanding.”

(add)

Overview

The moral symbols are a physical chemistry based system of guidance, outlined by Goethe in layers of coded Gestalt in his 1809 novella *Elective Affinities*, on how to behave and move in right or wrong directions (moral movement) according to what is known about nature of the universe; the symbols themselves being embodied in the concept of the Lewis inequality (or the force chemical affinities), which include chemical reaction operators, initial states (reactants) and final states (products) of time of changes in chemical entities (e.g. human molecules), measured state variables, and the differential equations of chemical thermodynamics, that quantify the natural process in question.

Translations

This logic was explained by German polymath Johann Goethe who commented to his friend writer-librarian Friedrich Riemer who recorded in his diary dated 24 July 1809 that Goethe told him the following: [2]

> “The **moral symbols** of the natural sciences are the elective affinities discovered and employed by the great Bergman.”

Another translation reads as follows: [8]

> “The **moral symbols** in the natural sciences (for example that of the elective affinities invented and used by the great Bergman) are more *intelligent* and permit themselves to be connected better with poetry and society.”

In this quote the italicized term "intelligent" in the original German was *geistreicher*, which also translates as either meaningful or witty. [9] Likewise, another less intuitive translation gives the term *geistreicher* as meaning spiritual in English: [10]

> “The **moral symbols** in the natural sciences (for example that of elective affinities discovered and used by the great Bergamn [*sic*]) are more spiritual, and allow themselves to be combined with poetry, indeed with society, above all others.”

The end part of the quote seems to capture Goethe's mindset: his view that logic of Bergman's chemistry textbook, as embodied in the premise of the affinity reaction and natural affinity preferences that exist in all reactive entities of nature, humans included, applied absolutely with the description of operations in society.

The natural sciences mentioned here are chemistry and physics; the elective affinities refers to the force of chemical affinity, and the name Bergman refers to Swedish chemist Torbern Bergman and his 1775 chemistry textbook *A Dissertation on Elective Attractions*.

Correctly, to note, the elective affinity concept wasn't "discovered" or invented by Bergman, as Goethe says, but rather this was a concept slowly built up by others particularly through English physicist Isaac Newton (1718), tracing at least as far back to the circa 1250 work of German philosopher Albertus Magnus, and before that to the Greek philosopher Plato's circa 390 first law of affinity ("likes attract" and "opposites repel"), which itself was based on Empedocles' standard model of physics and his conception of philia (attractive force) and neikos (repulsive force) and his famous 450BC chemistry aphorisms, about friends mixing like wine and water and enemies separating like oil and water; a view to which Goethe pays tribute to in his novella).

Bergman's textbook, however, with its foldout 59-column 50-row affinity table (see: table) and separate appendix of 64 affinity reactions diagrams (see: diagrams), was the pinnacle of the science of affinity chemistry, a subject that would eventually fork to the two subjects of chemical thermodynamics (late 19th century) and quantum chemistry (early 20th century).

Goethe went on to extrapolated this logic further in his preliminary comments in regard to his newly forming book *Elective Affinities* (1809) that his “idea for the new novella was to portray social relationships and their conflicts symbolically”.

The three main symbols Goethe mentions here are firstly the elective affinities, quantified in terms of affinity tables in 1718 by French physician and chemist Étienne Geoffroy; Scottish physician and chemist William Cullen’s 1757 pioneering development of affinity reaction diagrams, employed in his chemistry lectures, using darts (to represent the affinity preference and thus change) and bonding brackets (to represent chemical attachment); and Swedish chemist Torbern Bergman’s 1775 notation scheme of using single letters, such as A, B, C, et., to represent single chemical entities, and affixed letters, e.g. AB, BC, etc., to represent attached or chemically bonded entities, along with other variables such as distinction between aqueous versus dry reactions as well as heated reactions.

Planet		*Symbol*	
Ηλιος	Sun	☌	gold
Σεληνη	Moon	☾	silver
Κρονος	Saturn	♄	lead
Ζευς	Jupiter	♃	bronze
Αρης	Mars	♂	mixed metal
Αφροδιτη	Venus	♀	tin
Ερμης	Mercury	☿	iron

A circa 1,000AD listing of various elements and their **symbols**. [5]

Character

The first attempts to represent chemical entities using "characters" or "symbols" was done some time in the late first century, when it was theorized that some type of "sympathy" connection existed between the astrology and the metals, thus, e.g., silver Ag, colored the same as the moon, was assigned with the chemical symbol of a crescent moon â˜½, gold Au, colored the same as the sun, was assigned with the chemical symbol of the sun â˜‰ (or â˜¼), among other types of similar assignments.

Affinities

English physicist Isaac Newton was the first to rank various known chemical entities in order of affinity reaction preference in his famous Query 31, his last and final query.

Starting with Newton's affinity reaction tendency rankings, the first arrangement of the main known chemical entities,

depicted as characters, into a tabulated ranking of reaction preferences, otherwise known as an affinity table or table of reports was that constructed in 1718 by French physician and chemist Étienne Geoffroy, later to be known as Geoffroy's affinity table, which was based on verbal descriptions of affinity reaction preferences.

Crotchets and darts

The first drawings of chemical reactions depicted using symbols were done in the 1757 lectures of Scottish physician and chemist William Cullen. The reaction of silver nitrate with copper is depicted adjacent. To explain his affinity reaction symbol notation, Cullen states:

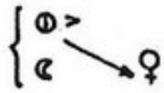

$$[Cu + 2AgNO_3 \rightarrow Cu(NO_3)_2 + 2Ag \downarrow]$$

The silver nitrate ($AgNO_3$) copper (Cu) reaction, depicted using Scottish chemist William Cullen's original affinity reaction lecture notation (left) and modern reaction notation (right). [4]

> "The upper character is the nitrous acid and below it is silver; by the [crotchet] mark ' { ' I mean them united to one another; opposite them is copper, the **dart** ' → ' between them expresses the *elective attraction*. When I put a dart with the tail to one substance and the point to another, I mean that the substance to which the tail is directed unites with the one to which the point is directed more strongly than it does with the one united to it in the **crotchet**; then I would say that the nitrous acid attracts copper more strongly than silver to which it is connected, and it attracts iron more strongly than copper and zinc more strongly than iron."

These were the first of the "symbols" alluded to by Goethe in his postulate that morality is explained by the symbols of the natural sciences.

Bonded union shorthand

In 1775, in semi-replacement for the cumbersome crotchet method of representing chemical bonding, Bergman introduced the simpler notation scheme of using abstract single letters, e.g. A, B, C, et., to represent single chemical entities, and affixed letters, e.g. AB, BC, etc., to represent attached or chemically bonded entities "united to one another", as Cullen says. Thus, in the years to follow chemical reactions began to be represented as such:

$$AB + C \rightarrow BC + A$$

wherein the the left side depicts the reactants in their initial state, the right side the products in their final state, the reaction arrow signifying change or a reaction going to completion; the 'AB' attachment signifies a chemical bond (A≡B), a theory developed in the first decades of the 20th century, in the small atomic-level small molecule sense, or human chemical bond (â™‚≡â™€), a theory developed in the first decade of the 21st century, in the human chemistry sense of reactions occurring between people, each with a measurable and quantifiable bond energy.

Free energies

In 1882, German physicist Hermann Helmholtz, in his "On the Thermodynamics of Chemical Processes", proved that the measure of chemical affinity A or elective affinity is the negative of free energy change ΔG:

$$A = -\Delta G$$

In modern 21st century terms, in the context of human behavior, morality defined as shorthand for a system of guidance to tell how one ought to behave, the moral symbols are the Gibbs free energy change determinants of chemical reactions between people in dynamical systems, loosely quantified by the spontaneity rule that free energy decrease over time signifies a 'natural' direction (arrow of time), process (natural process), or reaction (spontaneous reaction or

energetically-favored reaction); whereas, conversely, free energy increase over time signifies an 'unnatural' direction (opposite to the arrow of time, process (unnatural process), or reaction (non-spontaneous reaction or energetically unfavored reaction). This is stated mathematically as:

$\Delta G < 0$ (natural)
$\Delta G > 0$ (unnatural)

and is understood in changes between the difference in free energy between two states in time of human existence (initial state as compared to the final state) as can be quantified in terms of enthalpy change, entropy change, free energy coupling, and other conjugate variable pair factors.

Equilibrium reactions

The symbol notation to designate the concept of a "reversible reaction", so to speak, i.e. a set of reactions reaching the equilibrium state, the forward direction being just as energetically favored as the reverse direction in a free energy sense, was designated by the symbol '⇆' by Dutch physical chemist Jacobus van't Hoff in 1884. [6] In extrapolation of this to human chemical reactions, a relationship at equilibrium, often signified as "heat death" in thermodynamic terms or a dead relationship would be quantified by the following symbol notation:

A + B â‡Œ AB

and quantified by a Gibbs free energy of zero:

$\Delta G = 0$

A typical modern-day **moral dilemma**: when to get a divorce when young kids are involved? Statistically, 44% of all marriages will divorce at the 15-year mark. Should a pair stay married for the sake of the kids or would divorce be better off for everyone in the long run? The question of divorce, a type of debonding reaction, whether in friendships or in marriage was at the heart of Goethe's notion of **moral symbols**, as was addressed through 36 chapter examples in his 1809 novella *Elective Affinities*.

In the sense that the relationship is not working any more, or going any where, as it is colloquially said, the measure of Gibbs free energy release being the value of the available energy of the relationship. Here, we can conclude that in terms of "moral symbols", that each of the two relationship states (attached or separated) are equally favored and thus there is a moral ambivalence to the situation. In a situation where the relationship had progressed to a very unstable state, as quantified by the measure:

$\Delta G > 0$

for the reaction written in the forward direction:

$A + B \rightarrow AB$

then one would state the moral symbols advise for divorce and thus give intelligent guidance in such situations. A more advanced type of this equilibrium reaction moral symbol logic, to note, was first applied to human chemical reactions in bulk, i.e. college campus student bodies, by American astrophysicist Christopher Hirata in the 2000 article "The Physics of Relationships". [7]

Moral landscapes

In modern times science, according to American morality neuroscientist Sam Harris, science has "no official opinion" on what constitutes moral truth, i.e. right or wrong, good or evil, and human values. Although this is far from the truth, Harris does seem to capture the official ivy league opinion. In its absence, Harris outlines what he calls the "moral landscape" a hypothetical space of real and potential outcomes whose peaks correspond to the heights of potential well-being and whose valleys represent the deepest possible suffering. [3] In thermodynamic terms, this would be equivalent to free energy maps or energy landscapes, as they are sometime called.

Harris states that these moral landscapes result owing to some type of yet undefined "evolutionary pressure". Some of this type of logic of evolution based free energy landscapes was outlined in the 1990s by South African chemical physicist Adriaan de Lange.

Derivatives

Goethe's moral symbols theory is what is called the standard model of morality in science. Attempts at similar outline superficial verbal version or derivatives to Goethe's model include a variety of speculative views on how to manage or find a balance between energy and entropy, the two components of the quantitative aspects of Goethe's moral symbols:

$$A = T\Delta S - \Delta H$$

This energy-entropy verbal approach method includes: German physical chemist Wilhelm Ostwald's 1912 energetic imperative, English physiologist William Bayliss's 1915 free energy imperative, American physicist Robert Lindsay's 1959 thermodynamic imperative, Egyptian-born American physicist Jack Hokikian's 2002 order-disorder morality view, or American educator Dick Hammond's 2005 entropy ethics teaching format for children, amongï»¿ others.

Notes

In lectures to bioengineering thermodynamics students, Goethe "moral symbols" quote is one dominant query that seems to commonly piqué the interests of students, during the question and answer period following talks on human thermodynamics.

See also

â— Symbols
â— Entropy ethics
â— Energetic imperative
â— Thermodynamic imperative

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θΔics

In humanities, **morality** is a doctrine or system of ethical conduct, moral principles, or rules of behavior deemed to be ideals of right human conduct; in general, actions which are considered virtuous. [1]

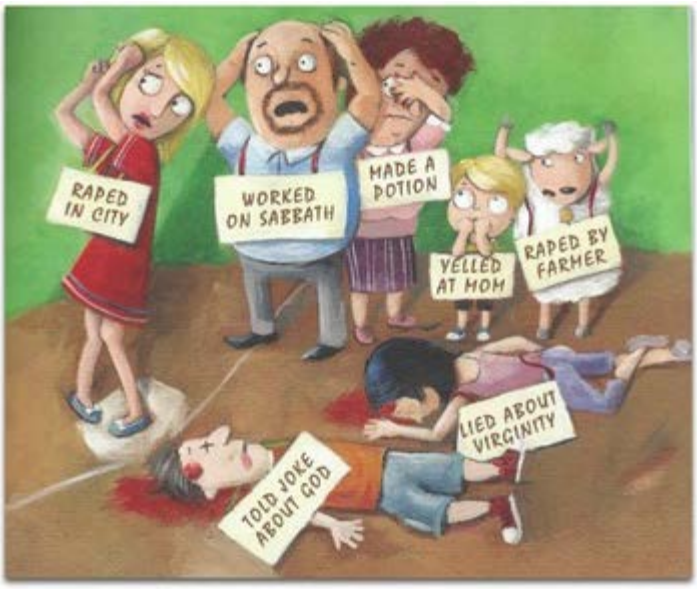

An awkward children's moment depiction of **morality** according to the Bible, Matthew 5:17-19, of Christianity. [14]

Overview

(add)

Physicochemical morality

The following are physico-chemical morality related quotes:

> "The moral symbols in nature are those discovered and employed by the great Bergman."
>
> — Johann Goethe (1809)

> "If iron sulphate and caustic potash are brought together, the SO_4 ions leave the iron to unite with the potassium. When in nature an adjustment of such differences of potential is about to take place, he who would approve or disapprove of the process from the moral point of view would appear to most to play a ridiculous part."
>
> — Otto Weininger (1903), *Sex and Character*

> "Morality has nothing to do with any particular form of religion. Morality is the adjustment of matter to its environment—the natural arrangement of molecules. More especially it may be considered as dealing with organic molecules. Conventionally it is the science of reconciling the animal *homo* (more or less) *sapiens* to the forces and conditions with which he is surrounded."
>
> — Howard Lovecraft (1918), "Letter to Maurice Moe", May 15

> "It may sound strange to speak of the morals of an atom, or of the way in which a molecule conducts itself. But in the last analysis, science can draw no fundamental distinction between the conduct of an animal, a bullet, or a freshman, although there may be more unknown factors involved in one case than in the other."
>
> — William Patten (1920), AAAS address "The Message of the Biologist" + *The Grand Strategy of Evolution: the Social Philosophy of a Biologist*

> "In a world of physics and chemistry, how could things like **moral** obligations or values really exist?"
>
> — Sam Harris (2010) [8]

The modern-day physical sciences based model of morality is that (a) a person is animated reactive 26-element molecule (human molecule), (b) that "good" actions, or rather "natural" actions, are governed by the Lewis inequality for a natural process ($dG < 0$), (c) that "bad" (or evil) actions, or rather "unnatural" actions, are governed by the Lewis inequality for an unnatural process ($dG > 0$), (d) that both natural and unnatural processes are thermodynamically

"coupled" together, such that natural processes energetically drive the unnatural processes and that some reactions will progress in a direction contrary to that prescribed by their own affinity, (e) that there is no such thing as "life" and "death" according to the defunct theory of life model. This is the thermodynamic explanation to age-old idiom that "good always triumphs over evil", which means that natural processes will always triumph over unnatural processes or technically that the total set of processes will only go when the system shows an entropy increase or transformation content increase. In sum, the modern answer to this query is the Lewis inequality, which distinguishes between what is 'natural' and 'unnatural' in the course of human existence, viewed in the context of thermodynamic coupling and universal spin, spin being what drives the various heat cycles of daily existence.

Morality science

The first and most dominate morality guidance system was the circa 2500BC mostly *deity-based*, part astronomy-based, part biology-based, part geology-based Ra theology structured in the notion of 42 negative confessions or forbidden actions, weighted digressions of which would result in a person's soul not be permitted into the afterlife.

Circa 2500BC depiction of the Egyptian negative confessions based **morality system**, one's moral worth being weighted on the scale of Maat, which is the world's first and foremost morality system, structured in Ra theology, which forms the basis for over 72% of modern morality systems.

This model was carried over into modern-day B*ra*hmaic religions (1200BC), in the form of karma weighing, and Ab*ra*hamic religions (500BC), in the form of sin judgment and soul weighing, via syncretism and modification, the core to each of these being the circa 3500BC cyclical birth death resurrection/reincarnation theory of Ra the sun god. Over 72% of the modern-day world still believes in this morality system and uses it to guide their daily motion.

The earliest *deity-free* morality system is called 'Epicureanism' introduced in circa 307BC by Greek philosopher Epicurus, in which the greatest good was to seek modest pleasures in order to attain a state of tranquility (ataraxia) and freedom from fear, as well as absence of bodily pain (aponia) through knowledge of the workings of the world and the limits of one's desires. The combination of these two states is supposed to constitute happiness in its highest form.

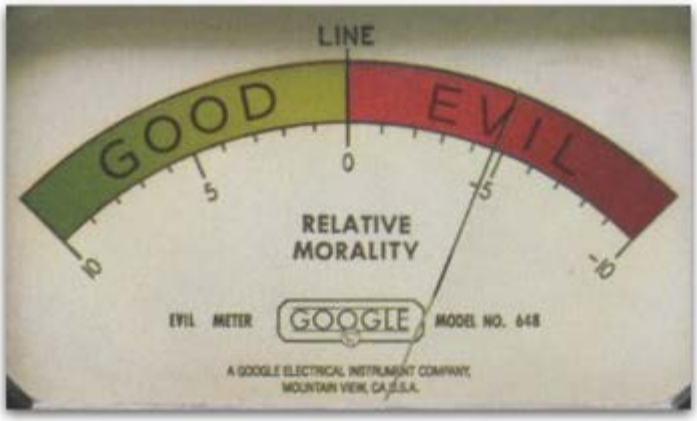

Mock "**relative morality**" meter, depicting either the idiom that there is a fine line between good and evil or the Google company slogan "don't be evil". [9]

The next was German philosopher Immanuel Kant's 1785 'categorical imperative'.

In 1789, British philosopher John Stewart introduced his deity-free 'moral movement' theory which formed the basis of what he called 'natural religion'.

In 1789, English jurist and philosopher Jeremy Bentham introduced the 'utilitarianism' system of morality; which was expanded on famously by English political philosopher John Mill's 1863 book *Utilitarianism*.

In 1809, German polymath Johann Goethe introduced his purely physical chemistry based 'moral symbols' theory of morality.

A thermodynamics structured update to Kant's categorical imperative, was German physical chemist Wilhelm Ostwald's 1912 'energetic imperative'. Ostwald seems to have been one of the first to state his morality system in mathematical terms:

Systems of **morality** refers to ways of theoretically describing "right" and "wrong" types of human behavior, actions, and or modes of conduct.

$$G = k(A - W)(A + W)$$

where *G* is *Gluck* (happiness), *A* is *Arbeit*, German for 'work', referring to energy expended in doing useful work, *W* is *Widerstand*, German for 'resistance', referring to energy dissipated in overcoming resistance, and supposedly *k* is a constant. Ostwald's energetic imperative, in the century to follow, led to various similar 'thermodynamic imperatives' outlined by various authors.

Into the 1970s, various writers began expounding on verbalized conceptions of 'entropy ethics'.

In 2010, American neuroscience philosopher Sam Harris introduced his idea of deity-free 'moral landscape'.

Goethe

The foremost historical attempt to quantify morality in terms of pure science is German polymath Johann Goethe's 1808 theory of people viewed as large evolved versions of reactive chemicals and morality explained in the symbols of chemistry, such as letters used to represent single reactants, A or B, the reaction arrow →, signifying change, and the chemical bond AB, signifying a union, etc., and the energetic measure of the force of the reaction, namely chemical affinity *A*, defined in modern 1882 formulation as

$$A = T\Delta S - \Delta H$$

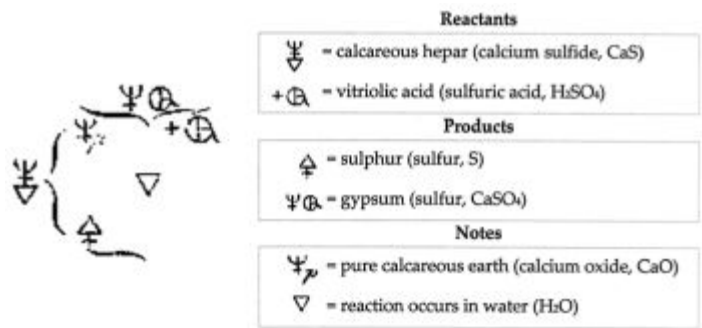

Example of some of Swedish chemist Torbern Bergman's 1775 "moral symbols" according to German polymath Johann Goethe, which can be used to explain human morality.

being a function of temperature *T*, entropy change ΔS , and enthalpy change ΔH.

In sum, Goethe was the first to state that morality is based in the logic of chemistry and physics was

German polymath as famously encapsulated in his 1808 statement, made a year prior to the publication of his famed novella *Elective Affinities*, as commented to his friend Reimer:

"The moral symbols used in the natural sciences were the elective affinities discovered and employed by the great Bergman."

The adjacent diagram shows Swedish chemist Torbern Bergman's chemical "symbols" (proto-types of modern chemical reactions), from his 1775 textbook *A Dissertation on Elective Attractions*, with which Goethe not only used to explain what is moral or amoral in human existence, particularly in regards to marriage and divorce, but, in a seemingly effortless manner, scripts

Depiction of a "**moral compass**" a device, analogous to a electromagnetic compass, that can give direction to paths of good vs evil and progress vs regress.

a complex novella love rectangle over this logic. In a modern sence, Goethe's statement translates to an effect that what is moral or amoral in human activity is a perspective determined according to the free energies of reactions between people.

Ostwald

This physical chemistry basic morality model was worked on further, albeit superficially, by German chemist Wilhelm Ostwald and his 1912 *The Energetic Imperative*; a logic which in turn blossomed into number of different so-called verbalized "thermodynamic imperatives" in the decades to follow. [10] Most of these, however, end in nothing but quaint excursions about order and disorder in the social domain. The deeper nature of morality, initiated by Goethe with his statement that "the moral symbols used in the natural sciences were the elective affinities discovered and employed by the great Bergman", naturally enough, leads into the science of the human molecule and the study of how to understand and model changes in enthalpies and entropies involved in human chemical reactions, which in its current form is still a nascent subject with many issues to be resolved. The central issue revolves around a reformulation of Ra theology, the dominate morality system of the world, in terms of pure chemical thermodynamics, which is a daunting task to say the least.

Soddy

In 1921, Frederick Soddy, in his two lectures on "Cartesian Economics: the Bearing of Physical Science upon State Stewardship", delivered to the Student Unions of Birkbeck College and the London School of Economics, stated that: [7]

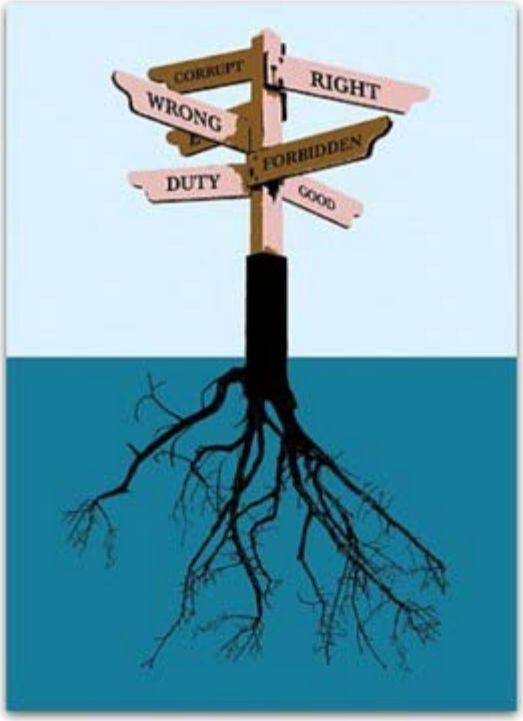

Depiction of a **morality tree** rooted in the structure of the universe.

> "Life derives the whole of its physical energy or power, not from anything self-contained in living matter, and still less from an external deity, but solely from the inanimate world. It is dependent for all the necessities of its physical continuance primarily upon the principles of the steam-engine. The principles and ethics of human law and convention must not run counter to those of thermodynamics."

In his second part of the lecture, Soddy opens with:

> "Some questions I was asked at the end of last lecture seem to indicate the necessity of first clearing away some misconceptions, partly, perhaps, due to my citing Ruskin as an economist. Although my views are very similar in some respects to those arrived at long ago by Ruskin, I may be permitted to remark that I have deduced them, without at the time being aware of Ruskin's writings on this subject, from the principles of the heat-engine, rather than form those of ethics. I know it is a burning question whether economics ought to concern itself with ethics at all, but of its obligation to understand the engineering of life I do not think there can be two minds.
>
> If it is a science at all, it is, on Huxley's words, concerned whit truth as 'veracity of thought and action, and the resolute facing of the world as it is when the garment of make-believe with which pious hands have hidden its uglier features has been stripped off.' Neither the ethical nor statistical sides of make-believe are to-day of any very great interest, but economics has still to achieve the emancipation which, in Huxley's day, the biological sciences accomplished. It is just because the application of the every-day principles of engineering to the living engine offers such a powerful corrective to the make-believes of the economics systems of society that I have ventured to address you on the subject."

Here, in bold form, Soddy states that he has his derived his principles of ethics from pure study of the heat engine and goes on to state that the principles of engineering can and should be applied to the human heat engines of economics so to correct the numerous and faulty make-believe theories of economic, thusly to make economics a true science as Thomas Huxley had proposed it should be.

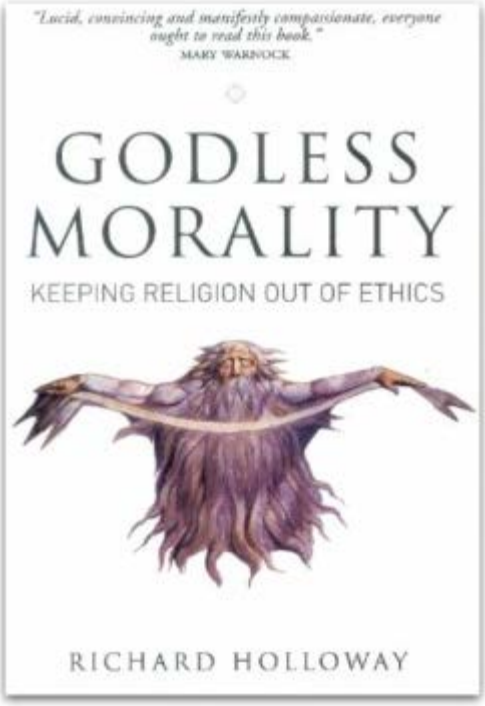

A 1999 summary of "**godless morality**" systems by English bishop Richard Holloway on the weaknesses of divine authority based morality systems. [11]

Dreier

In 1948, American author Thomas Dreier's 1948 discussed morality in the context of pure objective chemical reactions, i.e. human chemical reactions, divorce, and marriage: [5]

"The trouble is that too many people get chemical reactions all mixed up with **morals**. They call immoral what is only a normal chemical reaction."

In justifying this statement, Dreier states that chlorine can react with sodium to make the moral product table salt; whereas, conversely, chlorine (sulfur dichloride) can react with ethylene to make immoral mustard gas, as was used in WWI by the Germans against the British. Dreier argues that human beings can react and combine according to the same basic laws, making moral and immoral combinations of marriages.

Entropy ethics

Beginning in 1985, Ilya Prigogine's student American educator Dick Hammond worked out his so-called "entropy ethics" model of how to establish a thermodynamics-based type of "moral education" in and about the schools of Texas. [3] The majority of Hammond's presentation, however, is quite elementary, all being along the lines of fighting disorder, etc.

Moral monkeys

See main: Moral monkeys

In circa 2006, experiments showed that monkeys have an inherent sense of some sort of morality. Specifically, in experiments conducted by Dutch primatologist Frans de Waal, monkeys were first trained to pull a lever to get food. Then the lever was hooked up so that when the monkeys pulled the lever to get food, it not only produced food, but severely shocked a monkey in a neighboring cage. It was found that the monkeys would voluntarily choose to starve themselves, going between five to twelve days without food, rather than shock their neighbor. [6] The extrapolation of this finding is that what we define as "moral behavior" must have its origin in the hydrogen atom, being that humans (26-element molecules) evolved from monkeys (24-element molecules) which evolved from the hydrogen atom.

Other

In 2006, American economist and anthropologist William Frederick argued that "the natural motivator of all business and economic activity is thermodynamics entropy", that "thermodynamics defines and sustains the principle motive of economizing", and by virtue of these and other understructures that "the confluence and contradictions among these underlying natural forces produce the distinctive, peculiar moral proclivities and ethical dilemmas of the evolutionary firm." [4]

Neurochemistry

Recent research by scientists from Harvard and Cambridge suggests that serotonin may improve moral judgment. [12]

Coupling

See main Coupling, free energy coupling, thermodynamic coupling

Poster of a talk by American psychiatrist Andy Thomson at AAI 2009 on whether or not morality derives its structure from the heavens or from nature. [10]

In 2011, American electrochemical engineer Libb Thims, in his article "Thermodynamic Proof that Good Always Triumphs over Evil", began to outline some of the details of how things such as the problem of evil, good vs. evil, morality, moral responsibility, etc., is explained according to the notion of thermodynamic coupling, such as was formerly introduced in Fritz Lipmann's 1941 chemical thermodynamics based article "Metabolic Generation and Utilization of Phosphate Bond Energy", in particular how Gibbs free energy changes are what drive social changes, that these differentials of free energy changes are coupled to each other, natural processes driving the unnatural processes, or old-fashioned/colloquial terms "good processes driving evil processes", and that this coupling, as driving by cyclical heat input from the sun, is in turn connected to the puzzling nature of the various "spins" of the universe. [13]

Quotes

The following are related quotes:

> "I now believe in nothing, to put it shortly; but I do not the less believe in **morality**."
>
> — Leslie Stephen (1865), Journal entry, Jan 26 [15]

> "**Morality** does not depend on religion."
>
> — John Ruskin (c.1890), *Publication* [15]

> "The arc of the moral universe is long but it bends towards justice."
>
> — Martin King (1965), "Keep Moving From This Mountain" (Ñº)

> "When you start to see the world though 'chemical eyes' or **Gibbsian eyes** then you'll have a new morality."
>
> — Libb Thims (2015), "Zerotheism for Kids", Monday Lecture, Chicago, Sep 7

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External links

â— Morality – Wikipedia.

θΔics

In hmolscience, **morality and thermodynamics** refers to study of the thermodynamic implications of morality, moral theory, and ethics.

Mark Janes in his 2009 "Morality and Thermodynamics" video attempting to explain good and evil, the religio-mythology components of morality, in terms of thermodynamics.

Overview

In 1809, German polyintellect Johann Goethe outlined his take on the moral implications of physical chemistry, specifically affinity chemistry, the precursor to chemical thermodynamics.

In 1978, Dick Hammond competed his EdD on "Analysis of Entropy Reduction and its Implications for Ethical Instruction in Public Education" under Ilya Prigogine; would go onto teach, promote, and organize workshops on instilling a type of "entropy ethics" morality model to children and young adults; the summary of which culminated in his 2005 book *Human System from Entropy to Ethics*.

In 1982, American physicist Alvin Saperstein, in his "Point of View: Ethics in the Classroom: Morality and the Laws of Thermodynamics", suggested that moral implications of thermodynamics be taught to college students, the abstract of which is as follows: [1]

> "The first and second laws of thermodynamics are usually presented as straight physics. Local problems (such as heat engines) may be assigned but seldom is any effort made to examine universal human problems. Considering moral implications of these laws makes them relevant to students, gaining their attention and easing instruction."

In 2009, English thinker Mark Janes published his "Morality and Thermodynamics" video, which was followed by his 2012 *Mr Carbon Atom and the Theory of Carbon Entromorphology*.

In 2012, FanngIsland, at the sub Reddit "Stoner Philosophy", posted his scratch note ideas on "right" and "wrong" considered thermodynamically as follows: [2]

> "I've been thinking about the best way to describe what I consider to be "right" or "wrong". I wrote the following over the past couple of days and wanted to get other people's opinions, but feel like doing so anonymously. The meaning of life can be described by the second law of thermodynamics. Our goal in life should be to create small low-entropy pockets throughout the universe. This agrees with what we intuitively understand as "good" or "moral"; for example, life reduces local entropy while killing or destruction increases it. This approach to understanding morality provides us with an objective and scientifically derived utility function which can numerically estimate how good or bad something might be. This method might shed light on the way we view issues shrouded in moral ambiguity. Abortion is a hotly debated subject and generally degrades into a two strongly defended opinions: those who are for or against it in any situation. As with most aspects of life, this issue is neither black nor white, but exists on a continuum where

the appropriate action is highly (if not solely) dependent on circumstance."

In 2014, Manuel Molina and Victor Toledo, in their *The Social Metabolism*, attempt to stitch out connections between morality, thermodynamics, and Boltzmann models of social systems. (Q)

Quotes

The following are related quotes:

> "Moral norms are more similar to the laws of a particular polity than to the laws of nature such as the first law of thermodynamics."
>
> — Jean Porter (2006), "Moral Ideals and Human Nature" (Q)

> "Most of the key terms used in thermodynamic science carry with them moral implications: the inflection of words like 'higher' and 'lower' as descriptors of energy in Tait's lectures is subtle, while terms like 'squandered' or 'wasted' are more overt, and 'dissipated' or 'degraded' unavoidably loaded."
>
> — Allen MacDuffie (2014), *Victorian Literature, Energy, and the Ecological Imagination* (Q)

See also

- Philosophical Implications of Thermodynamics

Further reading

- Thims, Libb. (2011). "Thermodynamic Proof that Good Always Triumphs over Evil", *Journal of Human Thermodynamics*, 7: 1-4.

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1. Saperstein, Alvin M. (1982). "Point of View: Ethics in the Classroom: Morality and the Laws of Thermodynamics" (abs), *Journal of College Science Teaching*, 12(1):10-11, Sep-Oct.
2. FanngIsland. (2012). "Morality Based on the Second Law of Thermodynamics" (Q), StonerPhilosophy, Reddit.

θΔics

In manuscripts, ***Morality Squared: on the Goethean-Feuerbach Prophesy, Nietzschean Void, and Henderson-Rossini Hypothesis***, is an attempt to produce a semi-laymanized booklet overview, visual, textually, and conceptual, on an elaboration of Feuerbach's 1850 proclamation that one day the scientific revolution will dissolve the Christian worldview in a vat of nitric acid HNO_3; the forced against-the-will self-immolation death of Ottilie, the "chemical Juliet", being the torch to lead the way out of the darkness of the unseen quagmires of intellectual revolutions.

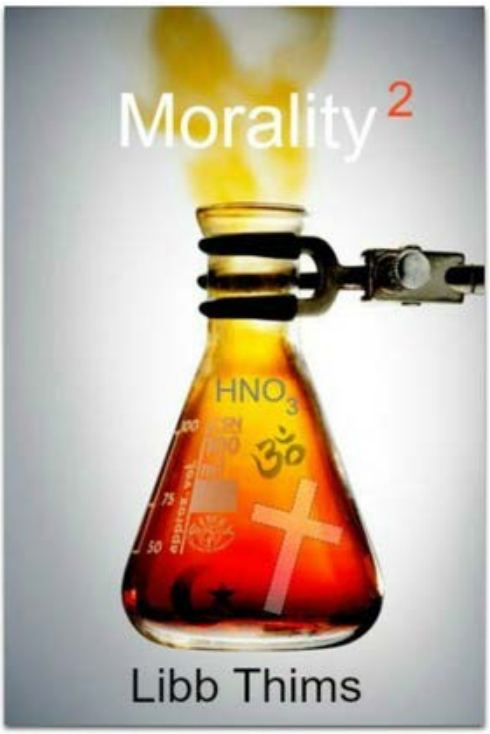

A Jun 2015 draft-cover (Q) for *Morality Squared: on the Goethean-Feuerbach Prophesy, Nietzschean Void, and Henderson-Rossini Hypothesis*, an elaboration on Ludwig Feuerbach's famous 1850 nitric acid [HNO_3] quote + Goethe's 1809 sulphuric acid [H_2SO_4] based "moral symbols" explaining P1:C4 and Ten Commandments overthrowing P2:C18 end chapter (see: Goethean revolution), admixtured with the Nietzschean void (1888), and Rossini hypothesis (1971). [1]

The aimed treatise, in more detail, is geared to be an "atheism explicit", in contrast to an atheism implicit treatise, discourse, stated frankly and openly by evidence-based "denial" (unbelief) and evidence-based "belief" (creed), directly stated, see: atheism types by denial and belief; in sum: a modern-day discourse and elaboration on the Goethean-based Feuerbach prophesy, namely that some day the scientific revolution, physical chemistry and chemical thermodynamics in particular (see: Goethean revolution), will dissolve the ancient mythology-based religions in nitric acid, the way Goethe (SN:1), in his *Elective Affinities* (1809), outlined how to dissolve sixth commandment of the † with sulfuric acid H_2SO_4 and gypsum $CaSO \cdot 2H_2O$, resulting to formulate a new more powerful resulting morality, i.e. morality²; touching on the Henderson-Rossini hypothesis (Q), namely that intellectually we are nearing the point of being conceptually-able to dissolve sociology, economics, and politics in carbonic acid H_2CO_3; such as was attempted in draft outline, in the early 20th century, by Vilfredo Pareto (SN:3), whose *Mind and Society* (1916), wherein some of these views are expounded, is a top 100 most influential book ever written (Q)(Q), and Henry Adams (SN:2), whose *The Education of Henry Adams* (1908), wherein some of these views are expounded, is a #1 ranked top 100 nonfiction book (Q) of the 20th century. [1]

Abstract

The following is the working main abstract of *Morality Squared*, in respect to the Goethean-themed Feuerbach prophesy:

> "Someday the scientific revolution, chemistry in particular, will dissolve Christianity in vat of nitric acid."
>
> — Ludwig Feuerbach (1850), *The Natural Sciences and the Revolution*; derived from Goethe's sixth commandment debunking Ottilie [2]

The following is the secondary abstract, in respect to the Nietzschean void (aka god void) left in the wake of Nietzsche in 1888:

> "Nietzsche launched a new building project that represents an advance for atheism. Meslier denied all divinity, Holbach dismantled Christianity, Feuerbach deconstructed god. Then Nietzsche introduced transvaluation: atheism is not an end in itself. Do away with god, yes, but then what? Another morality, a new ethic, values never before thought of because unthinkable, this innovation is what makes it possible to arrive at atheism and to surpass it. A formidable task, and one still to be brought to fruition."
>
> — Michel Onfray (2005), *Atheist Manifesto* (Q)

The tertiary abstract is to progress inward on the Rossini hypothesis (1971) and the religion-breaking tension amid the post 9/11 new atheism fueled Rossini debate (2006-present).

To elaborate, aside from not only touching on the hows and whys of future Christianity morality dissolution, but also future Islamic and Hinduism based morality system dissolution, which constitutes the belief state of 75 percent of the world, the expanded abstract, keeping optimism balanced with reality, noting in particular that the Christian-Muslim-Hindu morality system dates back some 5,100-years, to the formation of the first dynasty Egypt, the expanded abstract will be but an attempt to elaborate, in more detail, beyond Feuerbach's one sentence statement, into the form of a short booklet.

1. Pandora's Eve

As more than half the modern world, 52 percent of the world is either

Christian or Muslim, derives their "morality", i.e. understanding of right and wrong, or good and evil, from the story of Adam and Eve, this would seemingly be a good starting point; the formulaic nutshell of which is as follows:

> Eve = Khnum's clay creation myth (1800BC) + Hesiod's Pandora's box (700BC) + Plato's soul mate theory (380BC)

In short, Hesiod's tale of Prometheus' "act" of stealing fire (heat) to give humans (life), according to which, as punishment for this act of theft, Zeus gave humans (evil), via the opening of Pandora's box, and thereafter "morality" (Cicero, 55BC), i.e. Mor and Vita, as the term "moral" etymologically derives, and thereafter, as rewritten, via syncretism, into the story of Eve eating the apple, aka the forbidden fruit, as modern children are taught.

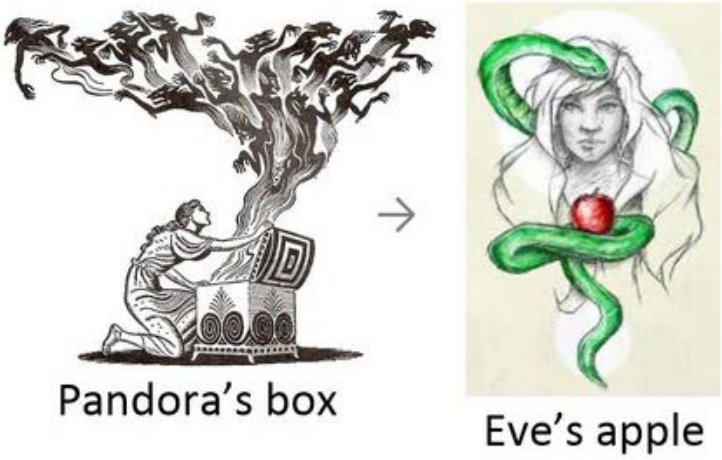

A depiction showing how Hesiod's 700BC story of Pandora, the first woman of Greek mythology, and her golden box, which she was warned by god (Zeus) not to open, became the basis for the 500BC Israelite story of Eve, the first woman of Hebrew mythology, and her apple, which she was forbidden by god (Yahweh) not to eat; transgressed acts said to be what let "evil" into the world.

Alternatively, if one prefers deeper etymology, Gary Greenberg (2000), identifies not only Adam and Eve to Khnum, and his clay figurine potter's wheel, but also the introduction of the moral principle, not to the Greeks, but to older Egyptian roots, via citation to Coffin Text 80 (2181–2055BC), contains details about life and morality according to the Heliopolis creation myth; specifically: [12]

> "Atum's two children Shu [life principle] and Tefnut [moral order principle]—whose offspring were Geb [Adam] (earth) and Nut [Eve] (heaven)—and in this text [Coffin Text 80] Shu is identified as the principle of life and Tefnut is identified as the principle of moral order, a concept that the Egyptians referred to as Ma'at (O) ."

The Greenberg hypothesis labeled Heliopolis "ennead" (3100BC), from the Greek ἐννεάς, meaning a collection of nine things, diagram is shown below:

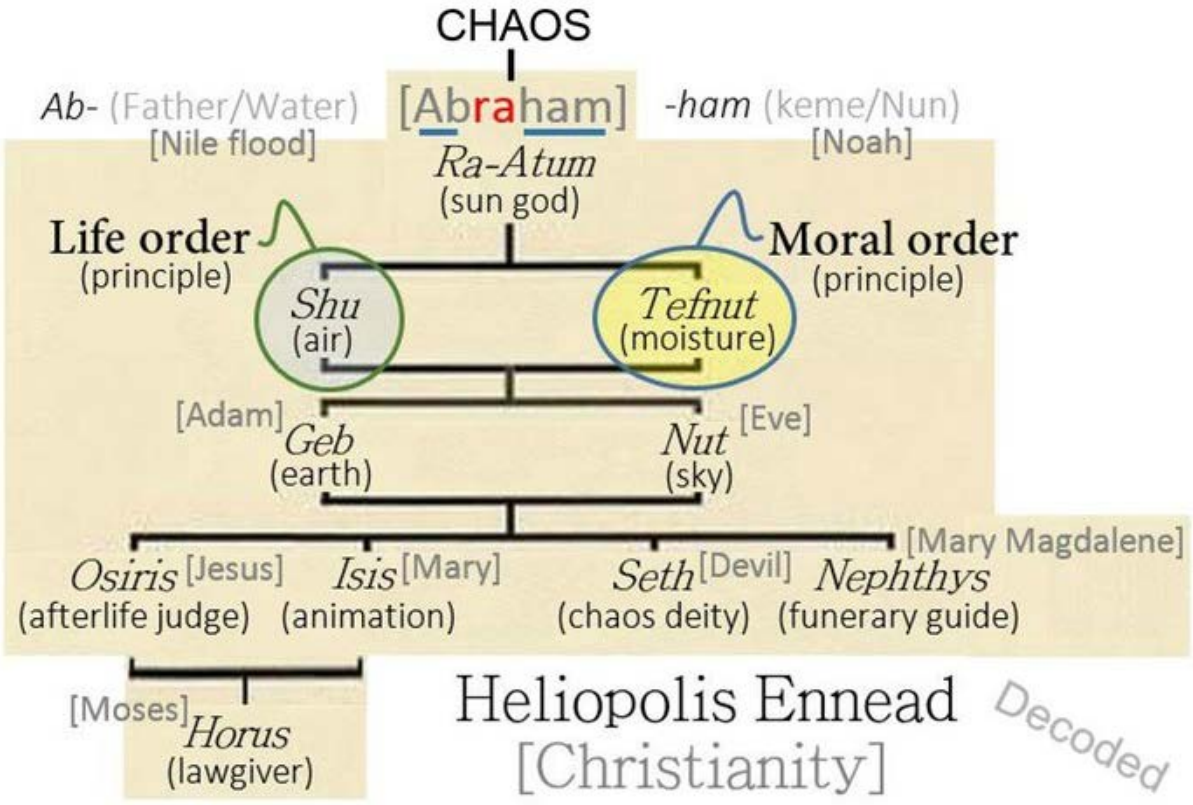

Greenberg, moreover, traces the "god forbid Adam to eat the forbidden fruit", i.e. the going against god's will "act" that was said to have let evil (original sin) into the world, to Sumerian mythology, the myth of Enki and Ninhursag (Q), in particular; which, supposedly, is opposite the myth of Adam and Eve in paradise. (Q)

2. God | Disabused

See main: Year god was disabused from science

The years in which "god", as a functional concept, was jettisoned from physics (i.e. celestial mechanics) and chemistry, organic and general, were the years 1802, 1823 and 1885, respectively, the former by French physicist Pierre Laplace, and latter two by German chemist Johannes Wislicenus, as follows:

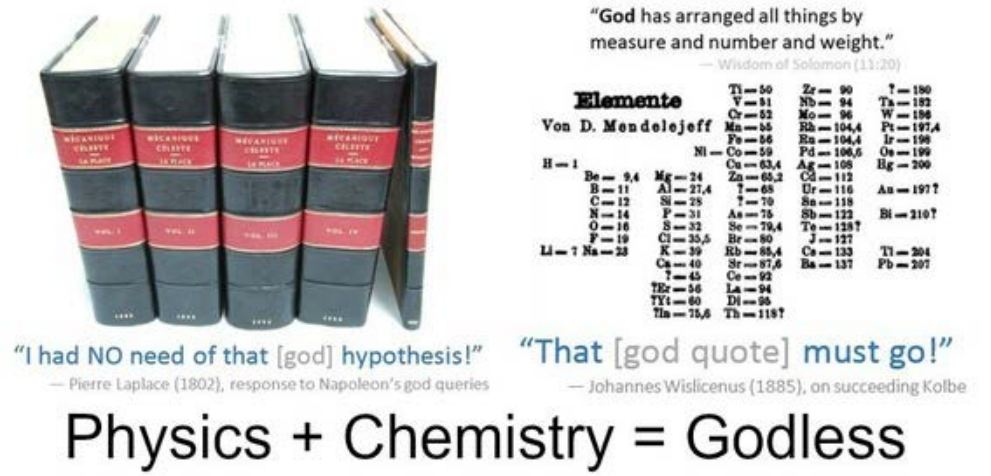

The locations where god was dismissed from chemistry and physics in the 19th century; left: Josephine Bonaparte's rose garden (1802), via the hand waving of Pierre Laplace, and Leipzig University's chemistry department (1885), via Johannes Wislicenus' orders.

> "I had no need of that [god] hypothesis."
>
> — Pierre Laplace (1802), response to Napoleon why the divine was not found in his new celestial mechanics book (see: Napoleon Laplace anecdote)

> "That [god statement] must disappear!"
>
> — Johannes Wislicenus (1885), order to his guide, during his orientation tour of the University of Leipzig, as the new chemistry professor successor to Hermann Kolbe, in reference to Kolbe's Biblical quotation "God has arranged all things by measure and number and weight" (Wisdom of Solomon 11:20) in large letters, above the periodic table chart of the chemical elements at the front of his lecture theater (Q)

God, in sum, in the 19th century, was debarred (or disabused) from science, in the following fields: physics in 1802 (via Laplace | France), organic chemistry in 1828 (Wohler | Germany), physiology in 1842 (via the Reymond-Brucke oath | Germany), general chemistry in 1885 (via Wislicenus | Germany), and psychology in 1895 (via Freud | Vienna). God has not, however, been disabused from "biology", nor can it ever, as *status quo* remains, barring a scientific revolution; an issue, to say the least, which is a bit more complex. In short, one cannot simply disconnect or dismiss, with a wave of the hand, like Laplace or Wislicenus did, in their respective fields, god from "biology", because the prefix 'bio-", itself, is a religious term, i.e. a "god term", to put it plainly.

Thus, to explain, via elaboration, e.g., while Helmholtz, Reymond, and Brucke, of the so-called Helmholtz school, the key figures behind the 1842 Reymond-Brucke oath, may make a vow or pact of allegiance, "signed in blood", as legend has it, to the side with the reductionism view that, unquestionably, only "physicochemical forces", in opposition to any and all "life force" (or vitalism) theories, operate 'in' (or within) organisms; the three of them will still inconsistently "believe", in logical contradiction to their own theory, that they are in fact "alive", and likewise that they will "die" one day; the latter of which, i.e. life and death, being concepts not recognized by physics and chemistry; they are "anthropisms", as Charles Sherrington (1938) put it; and these so-called foundationless anthropisms, invariably, come to us via the religio-mythology pipeline of cultural transmission; and hence, in turn, from god theory; and before that from the theory of "multiple gods"; and before that from a "plurality of spirits" theories of ancient times, etc.

3. Critias hypothesis | God reduction

The Critias hypothesis god disproof, one of the top ten god disproofs, is the following logic:

> **Polytheism**, i.e. belief in multiple gods, according to Greek philosopher Critias (c.410BC), was an invention of lawgivers of ancient times employed to justify social laws:
>
> > "Critias seems to be from the ranks of the atheists when he says that the lawgivers of ancient times invented god as a kind of overseer of the right and wrong actions of men. Their purpose was to prevent anyone from wronging his neighbors secretly, as he would incur the risk of vengeance at the hands

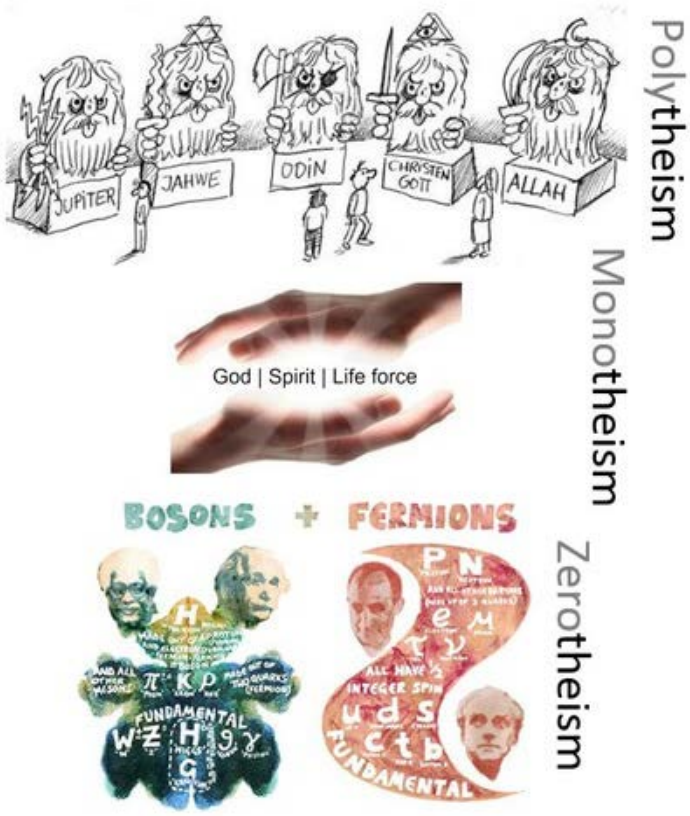

A depiction of the Critias hypothesis reductionism god disproof, namely the logical progression from polytheism, to monotheism—which in modern terms (Q) equates to belief in personal god, god, spirit, or life force—to zerotheism, i.e. belief in fermions, bosons, and "zero" gods (no gods), as Paul Dirac (1927), below right (Q), saw things.

of the gods."

— Sextus Empiricus (c.200AD) (Q)

Monotheism, i.e. belief in one god, was an invention of lawgivers of ancient times, Egyptian pharaoh Akhenaten (1320BC) in rough draft, arrived at to account for the growing discernment of the conflicting view that differing "regions", i.e. towns, cities, or states, with their differing gods (lawgivers), seemingly had peculiarly similar "laws", e.g. stealing was wrong, rocks fell at the same speed, the stars moved similarly, etc.; accordingly, the multiple lawgivers hypothesis seemed to be in error and therefore there must be "one" lawgiver.

"As I try to discern the origin of that conviction, I seem to find it in a basic notion discovered 2,000 or 3,000 years ago, and enunciated first in the western world by the ancient Hebrews: namely that the universe is governed by a single god, and is not the product of the whims of many gods, each governing its own province according to his own laws. This monotheistic view seems to be the historical foundation for modern science."

— Melvin Calvin (1969), *Chemical Evolution*

"The thought that all the phenomena of motion should follow from one set of principles might seem grandiose and inordinate, but it occurred very naturally to the religious mathematicians of the 17th century. God had designed the universe, and it was to be expected that all phenomena of nature would follow one master plan. One mind designing a universe would almost surely have employed one set of basic principles to govern related phenomena."

— Morris Kline (1982), *Mathematics: the Loss of Certainty*; on Newton attempting to reconcile Galileo's laws of terrestrial motions and Kepler's laws of celestial motions (Q)(Q)

Atheism, i.e. belief in zero gods, was initiated, predominantly by Goethe (1796), when it was realized that if the laws governing the social realm were similar, if not the same, as the laws governing the chemical "realm", the realm where there was NO god, but only strict determinism, then there must be, therefore, no god.

The theory of "multiple gods", according to the Critias hypothesis, to elaborate, arose per the logic that each town, of ancient times, beyond 150 in size (see: Dunbar model morality, §6 below), needed "laws" to regulate unruly behavior, therefore there had to be conceptualized "lawgiver" (possibly akin to the way we think presently as Newton being the lawgiver of the laws of motion, so to say); subsequently, each town of ancient times invented their own special unique town or city god as the deemed lawgiver, with its own unique properties. As science (knowledge) progressed, however, thinkers began to find that certain laws, e.g. gravity, the movement of the stars, or the tides, etc., were the same in each town, therefore the "multiple lawgivers hypothesis" became suspect and problematic, i.e. there had to be ONE lawgiver [god] for all of the towns, because the measurement of "laws" in each town, e.g. rate of acceleration when a stone is dropped, were found to be uniform; after which "monotheism" was invented as the upgrade solution to multiple gods = multiple laws

problem. The upgrade from monotheism to atheism, like the former historical transition, is presently underway, as the solution to the "multiple monotheistic gods = multiple monotheistic laws" problem; particularly when it comes to questions of morality, e.g. Quranic morality vs Biblical morality vs Hindu morality (although this, technically, is polytheistic; approximately), when the sciences, e.g. neuroscience (e.g. Greene), physical chemistry (e.g. Goethe), and chemical thermodynamics (e.g. Rossini), are beginning to show one set of moral laws in each land, the same way as the stone drops at the same rate in each land.

4. Reductionism | Chilling or Warming?

Russian moral atheism philosopher Fyodor Dostoyevsky's *Notes from the Underground* (1864) and *The Brothers Karamazov* (1880) were two of the first publications to grip into the intricacies of morality and meaning in godless world, which can be both "chilling" and "warming". The following, from *Notes From the Underground*, is a representative quote:

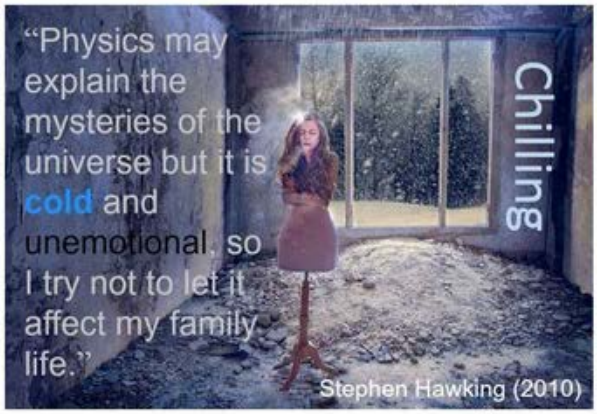

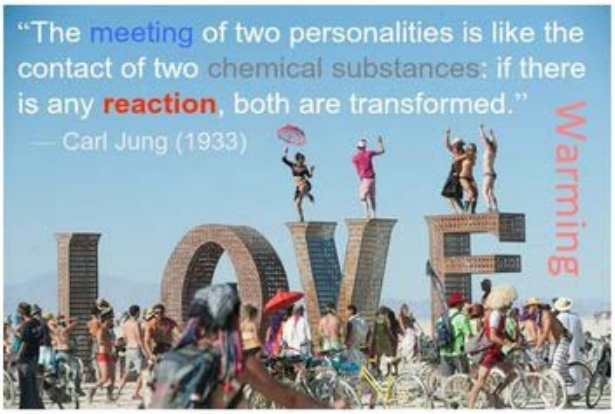

Reductionism

Left: an artistic (Q) imagined "dress form" coming alive at night, but without legs to move, because of which it feels alone, lonely, and perhaps abandoned and cold. Right: a picture (Q) of people dancing on a love sculpture at Burning Man 2014 festival. Both aspects of the dual-sidedness of reductionism to godless physics and chemistry; which can, on first pass, be or "feel" both chilling and emotionless, as atheists Steven Weinberg (1992) and and Stephen Hawking (2010) admit, when applied to the humanities; or, given prolonged introspection, become very warming and passionate as Goethe (1809) and Carl Jung (1933) point out. The right image brings to mind atheist Paul Dirac's "why do people dance?" bemusement.

> "What man wants is simply INDEPENDENT choice, whatever that independence may cost and wherever it may lead."
>
> — Fyodor Dostoyevsky (1864), *Notes from the Underground*; #3rd most-highlighted (Q) Kindle quote

In this novel, his character the "underground man" imagines a scientist telling him:

> "Nature doesn't consult you; it doesn't give a damn for you wishes or whether its laws please you or do not please you. You must accept it as it is."

To which the underground man replies:

> "Good god, what do I care about the laws of nature and arithmetic if for one reason or another, I don't like these laws."

On this comment, American avowed atheist, physicist, and strong force plus electromagnetic force unification reconciler Steven Weinberg, in his *Dreams of a Final Theory* (1992), comments the following: [11]

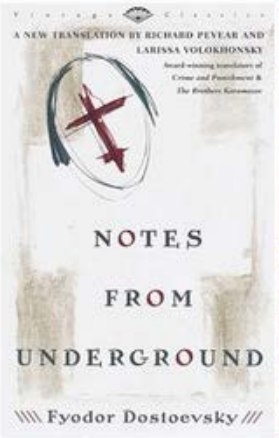

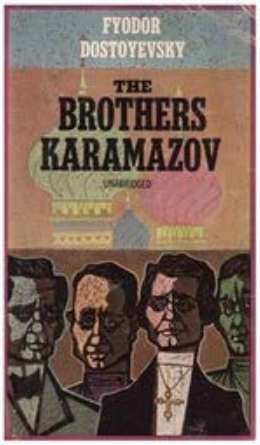

> "At its nuttiest extreme are those with holistics in their heads, those whose reaction to reductionism takes the form of a belief in psychic energies, life forces that cannot be described in terms of the ordinary laws of inanimate nature."

Weinberg elaborates:

> "The reductionist worldview *is* chilling and impersonal. It has to be accepted as it is, not because we like it, but because that is the way the world works."

Weinberg, here, in his mention of "chilling", is not aware that physicochemical reductionism, if understood correctly, via human chemical thermodynamics, becomes also "warming", e.g. the chemical process colloquially known as "love at first sight", sexual heat, social warmth, economic temperature, human molecular "friction" (e.g. Henry Carey, 1857), etc., in that one is able to understand the mechanisms of "passion" in the same manner a physical chemist is able to understand the mechanisms of photosynthesis or ATP energy coupling.

> "Physics may explain the mysteries of the universe but it is cold and unemotional, so I try not to let it affect my family life."
>
> — Stephen Hawking (2010), ABC interview; response to query: "how does your knowledge impact other areas of your life, e.g. your appreciation of music, of art, your family?" (Q)(Q)

(add discussion)

5. Active theologies | Remaining gods

While god may have been disabused from physics, chemistry, and astronomy, in the 19th century, as addressed above, there remain human-centric fields of inquiry wherein god has not, as of the early 21st century, been disabused.

> "God is [an] forever-receding pocket[s] of scientific ignorance."
>
> — Neil Tyson (2011), "The Moon, the Tides and why Neil DeGrasse Tyson is Colbert's God" (Q) (Q)

The following, to clarify, are the remaining "still active" thirteen gods [ignorance pockets] of English educator Richmal Mangnall's 1798 listing of 151 Greco-Roman gods, goddesses, and related terms, keen school children were advised to learn, if seeking wisdom, in the late 18th century: [13]

#	Term	Definition
1.	Jupiter [Zeus] [Ra]	the supreme deity of the heathen world, wife of Jupiter, and queen of heaven; 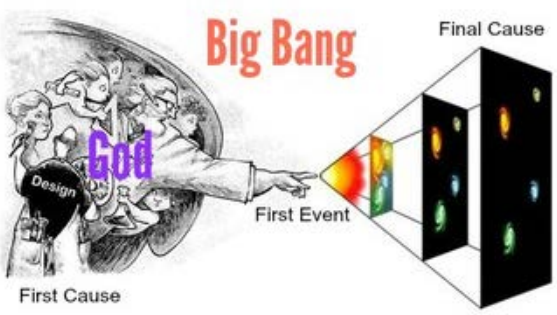 "Matter and energy moves itself. It has no exterior mover." — Jean Meslier (c.1720) (Q) "Before we understand science, it is natural believe that god created the universe. But now science offers a more convincing explanation. What I meant [in *A Brief History of Time* (1988) (Q)] by 'we would know the mind of god' is, we would know everything that god would know, if there were a god. Which there isn't. I'm an atheist." — Stephen Hawking (2014), El Mundo interview, Sep 23 (Q)(Q)(Q)
8.	Mars [#1]	god of war. 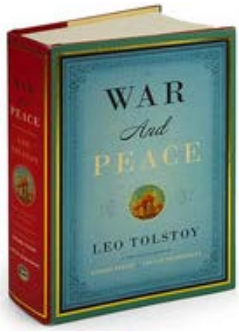 ["A particle of matter cannot tell us that it is unconscious of the laws of attraction and repulsion and that the law is not true; but man, who is the subject of history, says bluntly: I am free, and am therefore not subject to laws." — Leo Tolstoy (1869), *War and Peace*]
	Venus [Aphrodite]	goddess of beauty and love. [Image: Beckhap's law proof]

11.	[#2]		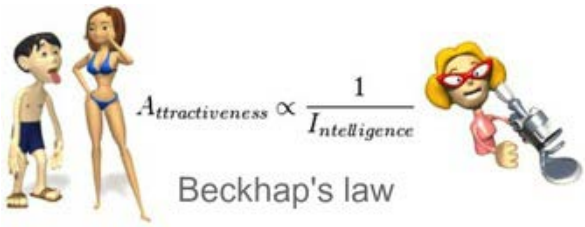
13.	**Cupid** [Eros] [#3]	son of Venus, and god of love.	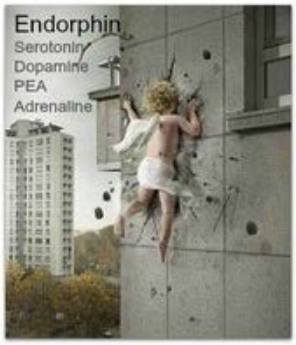
29.	**Fortuna** [#4]	the goddess of happiness and misery, said to be blind [etymology of fortune].	
34.	**Janus** [#5]	a Roman deity, who was said to be endowed with the knowledge of the past and the future. He was considered as being the guardian of the roads, the inventor of doors, of boats, and crowns. His temple, built by Numa, was open in time of war, and shut in time of peace.	
38.	**Mors** [#6]	goddess of death [etymology of vis mortua (vs vis viva); moral | immoral; mortal | immortal; mortician, etc.].	
46.	**Psyche** [#7]	the wife of Cupid, goddess of mind [etymology of psychology].	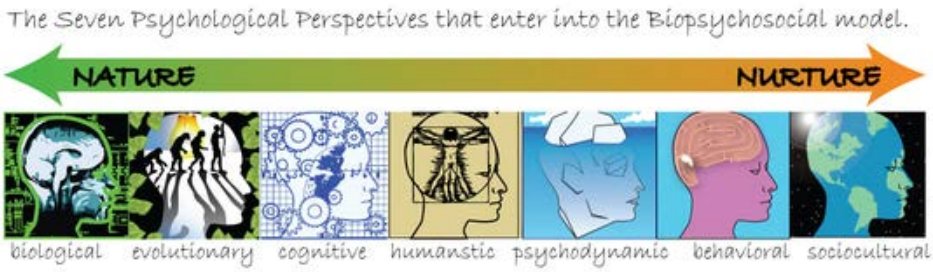
56.	**Morpheus** [#8]	god of dreams [etymology of the character "Morpheus" of *The Matrix* (1999), per the phrase "do you ever have that feeling that your dreaming but still awake?"]. [Image: atheist rabbit hole].	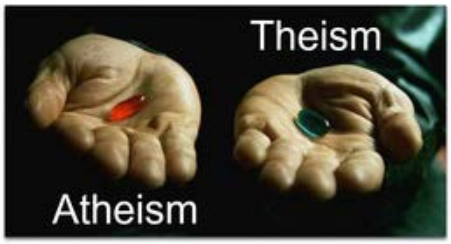

59.	**The Parcae, or Fates** [#9]	daughters of Necessitas. They were supposed to spin and cut the thread of human life and destiny. Their names were Clotho, Lachesis, and Atropos [etymology of the term fate].
79.	**Atlas** [#10]	the son of Jupiter, aid to have supported the heavens on his shoulders; afterwards turned into: mountain [see: Atlas Shrugged by Ayn Rand]. [Image: a depiction of Shu, of the Heliopolis creation myth, holding up the heavens or sky (Nut); the precursor to Atlas]
128.	**Pandora** [#11]	a woman made by Vulcan, endowed with gifts by all the gods and goddesses. She had a box given her containing all kinds of evils, with Hope at the bottom. [Synopsis: Epimetheus: the titan of afterthought, the father of excuses. He was given the task of creating the creatures of the earth. At the same time his brother, Prometheus, was creating mankind and, seeing the formidable abilities Epimetheus had given his creations, stole fire from heaven to assist his. Zeus in anger at this crime ordered the gods to mold **Pandora**, the first woman, and sent her to Epimetheus as his bride armed with a great jar [**Pandora's box**]. Pandora, succumbing to curiosity, opened it releasing all of the harmful daimones the gods had trapped within (the children of Nyx and of Eris) to forever plague mankind. Only Hope (Elpis) remained behind to comfort them.] [14]
132.	**Prometheus** [#12]	a man who, assisted by Minerva, stole fire from heaven, with which he is said to have animated a figure formed of clay [see: Hippocrates (400BC) and animal heat]. Jupiter [Zeus], as a punishment for his audacity, condemned him to be chained to Mount Caucasus, with a vulture perpetually gnawing his liver. [Adjacent image (O) on legend telling how the gods chose two brothers, Prometheus and Epimethius, to create the living things that would inhabit a planet which was beautiful to look at but, as yet, quite empty of life.]
144.	**Sisyphus** [#13]	a man doomed to roll a large stone up a mountain in hell, which continually rolled back; as a punishment for his perfidy and numerous robberies [see: Jean-Paul Sartre].

In short, modern science has done away with 79 percent (i.e. 139 gods of 151 key gods, goddesses, and human related terms and concepts, of Egyptian-Mesopotamian turned Greco-Roman syncretized) of god-goddess pair explanations of natural phenomenon; the remaining 21 percent, as tabulated above, will be the outline of future god disabusement addressed herein.

Hence, following Goethe, we find Otto Weininger, in his *Eros and Psyche* (1903), grappling with two of the above, via physics and chemistry.

6. Turek vs Hitchens | Atheists DON'T know morality

The following is ripe get-our-feet-wet dialogue the way the modern problem currently sits, vented in the heat of debate:

> "Now Christopher talked about atrocities, but again, on the atheistic world view—here's the main point—how do you define what an atrocity is? Who defines it? Who has the authority to define what an atrocity is? The carbon atom? The benzene molecule? I'm not saying you have to believe in god to be moral. I'm not saying that only religious people are moral. I'm not

saying atheists can't be moral. I'm not saying atheists don't know morality. I'm saying there's no way to justify what is right and what is wrong unless there's some authority that provides it. What is the authority? In a materialistic world view there is no authority.

The carbon atom has no moral authority over you. And it seems that Christopher goes on and on about how he does not want to be under any some kind of divine totalitarianism. That is a moral rejection of god. Where does he come up with this immoral totalitarianism? His world view does not afford immorality because his world view does not afford morality. He has to borrow from the Christian world view in order to argue against it. In fact, he has to sit in god's lap to slap his face. Where does he get morality from? Where does he get reason from? Where does he get mathematics from? Where does he get consciousness from? Where does the universe—he said there are explanations for where the universe came from, atheistic. I'd love to hear them. I haven't heard one yet. How does something come from nothing with extreme fine tuning? What is the explanation for that?

He said there are arguments for the beginning of life that are naturalistic. Not according to the people who are studying the matter. How about Francis Crick? If I could find his quote here,... Francis Crick said, "Every time I write a paper on the origin of life, I swear I will never write another one because there's too much speculation running after too few facts."

— Frank Turek (2008), "Hitchens vs Turek" (Q)(Q), Virginia Commonwealth University, Sep 8.

(add discussion)

7. Science / Knowledge + Religion / Binding | Coexistence?

The following polling results, from Michael Ruse's *Atheism: What Everyone Needs to Know* (2015), of opinions of Royal Society members, seems to indicate that while belief in god, personal god, supernatural beings, and subjective consciousness existence after death (dereaction) have been jettisoned form the scientific mind—a direction in which the public mind will invariably follow—religion, from the Latin *ligare* "to bind", thereby defined as abelief system that "binds a culture", is something not so easily jettisoned, if expunged at all:

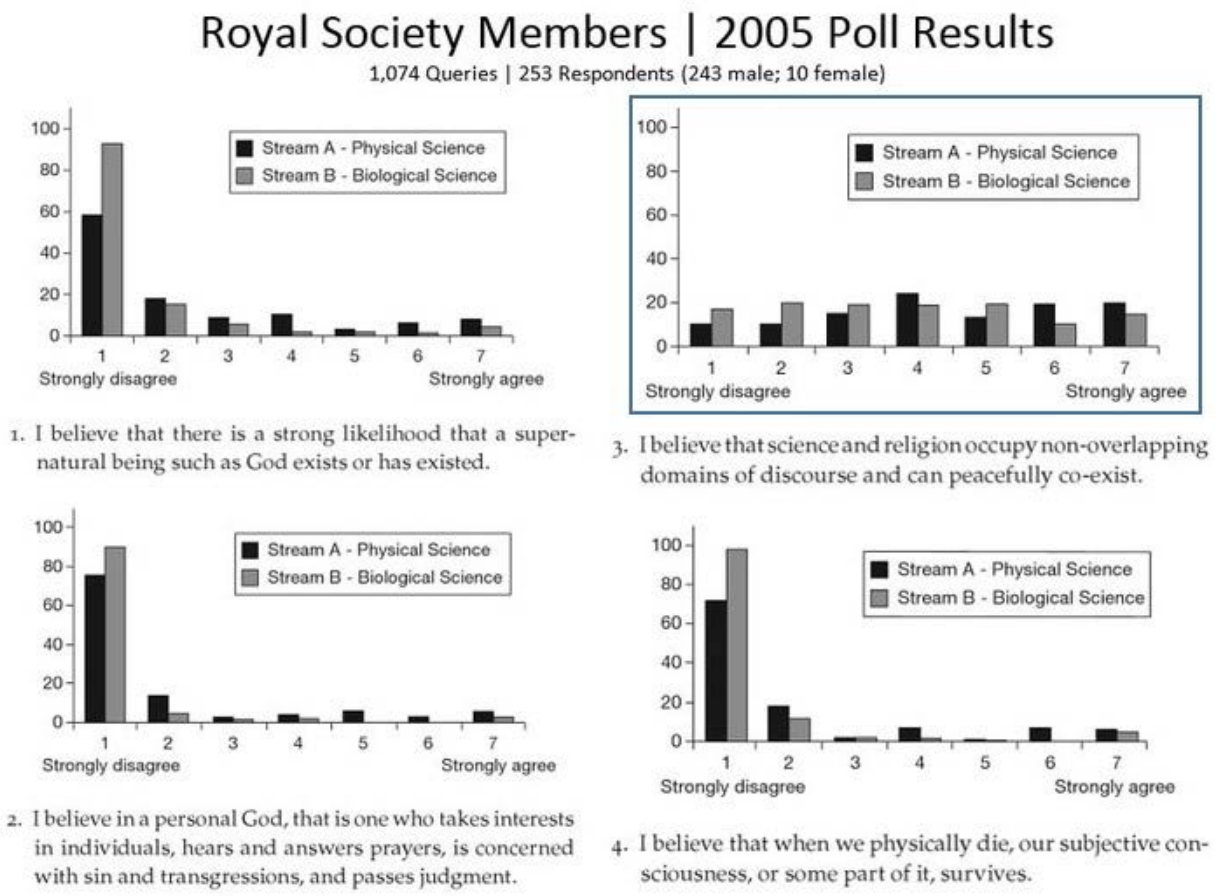

In other words, the above polling data, of the leading scientists, of the Royal Society, would seem to indicated that future shift from a monotheistic religion to an zerotheistic religion may accrue; possibly akin to the way, in the years 300BC to 500AD the Greco-Roman

polytheistic national religion shifted into monotheistic national religion?

> "Religion—Latin for 'that which binds'—is the eternal shapeshifter; for science—Latin for 'that we know'—is forever increasing. The former must always, in a haphazard manner, tail [or chase] the latter, just as the shape of the river bed entails the melting mountain snow; just as the unknown precedes the known."
>
> — Libb Thims (2015), mental note; arisen while reading Lee Strobel, Jun 21

In short, to elaborate, via we "know", per Dirac zerotheism ideology, as mentioned above, that the universe is godless and comprised of fermions and bosons, but the cybernetic feedback of this knowledge, which presently resides in marginal few discerning elite scientific minds and thinkers, into the re-configuration of the "belief" state (new religion) of the public populous, culture, and festivals, is ongoing, and may be a forever ongoing process.

8. Teleological atheism | Confusion

In the 2010s, a number of self-defined "atheists", Terrence Deacon (2011) and Thomas Nagel (2012) in particular, in efforts to explain how mind emerged from matter, in a seeming non-theistic way, have latched onto teleology as the new patch solution.

> "I am drawn to a fourth alternative, natural teleology, or teleological bias, as an account of the existence of the biological possibilities on which natural selection can operate. I believe that teleology is a naturalistic alternative that is distinct from all three of the other candidate explanations: chance, creationism, and directionless physical law. To avoid the mistake that White [Roger White] finds in the hypothesis of nonintentional bias, teleology would have to be restrictive in what it makes likely, but without depending on intentions or motives. This would probably have to involve some conception of an increase in value through the expanded possibilities provided by the higher forms of organization toward which nature tends: not just any outcome could qualify as a telos. That would make value an explanatory end, but not one that is realized through the purposes or intentions of an agent. Teleology means that in addition to physical law of the familiar kind, there are other laws of nature that are "biased toward the marvelous"."
>
> — Thomas Nagel (2012), *Mind and Cosmos* (Q)

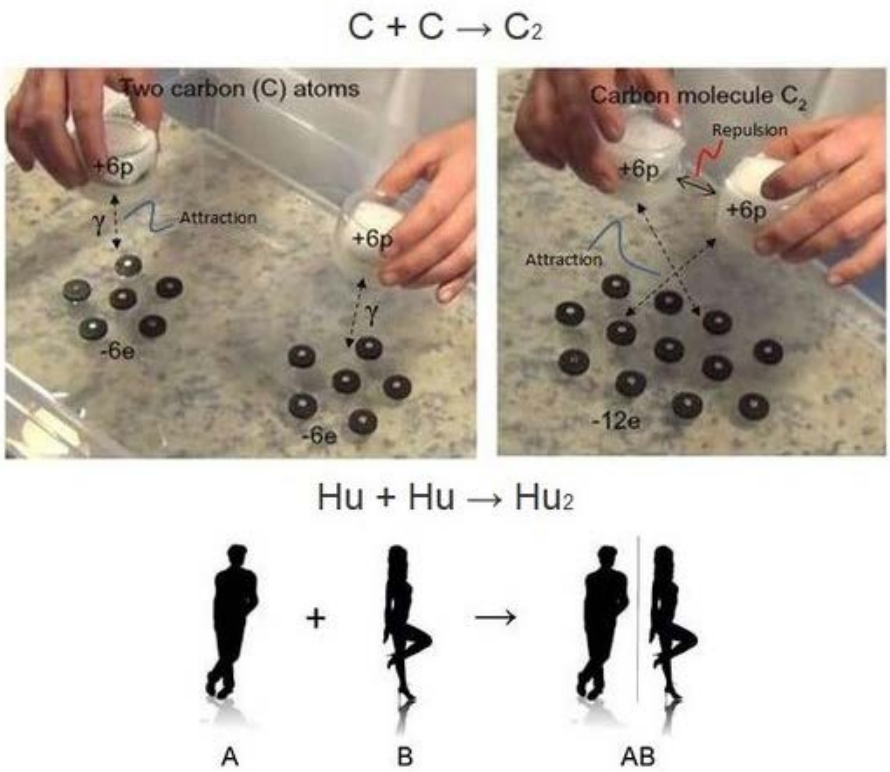

Two depictions of quantum electrodynamics visualized bonding reactions, top a carbon + carbon bonding reaction (conceptualized via the floating magnets experiment), bottom a human + human bonding reaction (male-female reaction), neither of which can be deemed "teleological" (or theological) in operation, but also *neither* labeled as operating via chance, creationism, or "directionless" physical law (i.e. blind randomness).

Teleology, however, is a "dead" option in physics, chemistry, biology (chnopsology), and sociology:

> "**Teleology** is like a mistress to a biologist: he cannot live without her but he's unwilling to be seen with her in public."
>
> — John Haldane (c.1930s), supposedly, a requote of something said in the 1880s by Ernst Brucke

> "External **teleology** is dead in biology."
>
> — John Wilkins (1997), "Evolution and Philosophy: Is There Progress and Direction in Evolution?

> “Fundamental **teleology** is a dead option in physics and chemistry.”
>
> — John Hawthorne and Daniel Nolan (2005), Bellingham Summer Philosophy Conference

> “In sociology, the terms of the debate have since been fundamentally and irreversibly changed, whatever it should be replaced by, **teleology** is now dead.”
>
> — Walter Runciman (2005), “Introduction to British Sociology”

The general problem here is that there exists a confusion between those who intuit that the mind can "sense" direction and the incongruency of this sense with the so-deemed three main candidate explanations: chance, creationism, and directionless physical law, as Nagel summarizes things

There is, in short, a directly discernible non-teleological “direction” to evolutionary-like processes, such as depicted above adjacent (human and carbon), namely: everything on the surface of the earth, animate or inert, are but proton-electron configurations (George Lundberg, 1938), operated on into induced movement and form change, via photon input, cyclically from the sun, which thus works to move core atomic electrons up to valance shell positions, thus mediating new states of reactivity and stability seeking need; all of which is geometrically quantifiable, such as shown above, thermodynamically quantifiable, via Gibbs energy methods (e.g. Gibbs landscapes, free energies of formations, Gibbs interaction differentials, etc.), and kinetically quantifiable (e.g. kinetic controlled), some of which has been worked out non-teleologically by Lawrence Henderson, among at least one other (add name when recalled).

Teleology, in short, is an Greek-Egyptian cosmology based theory, promulgated by Aristotle, based on the Egyptian four element theory, arranged into layers of gravity or deemed density, with Geb (earth) as the foundation (densest element) and Ra (fire) as the lightest element:

> Fire | Ra
> Air | Shu
> Water | Tefnut
> Earth | Geb

Everything else, whether humans or water, moving into its teleological (final cause) location accordingly. Hence, an atheist who employs teleology is a covert theist.

9. Four M’s of apologeticist denial

The debative theist (and in many cases the debative atheist, lower in denial level) will always and invariably retreat in domino-like fashion of decreasing silence on the so-called ‘four M’s of denial’.

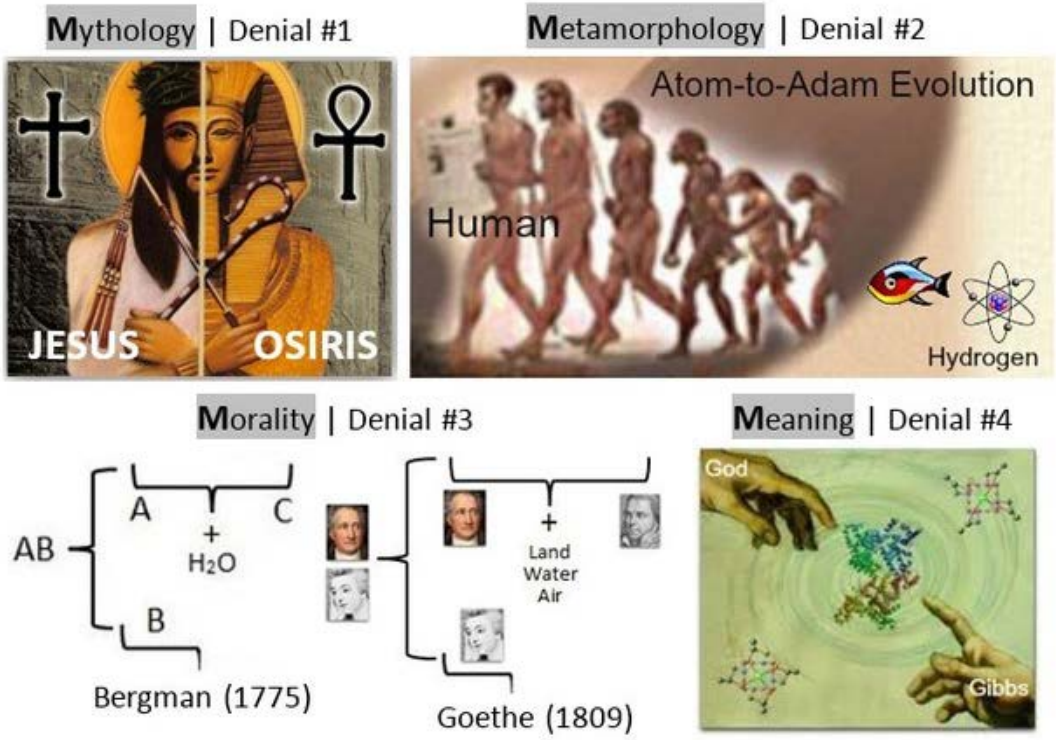

Firstly, when confronted with the evidence that their respective religion —Christianity, Islam, or Hinduism—is based and **M**ythology, pure and applied, per religio-mythology reductionism to Anunian theology, 75 percent of the world's beliefs reduce to this, they will quickly deny [denial #1] this, e.g. deny that Noah’s ark derives from Nun, that Brahma (Abraham) and Saraswati (Sarah) derive from Ra-Sirius solar-astrological syncretism, or that Adam and Eve derives from the clay creation myth, etc., per reason of citation reliability, a wave of the hand, or what not.

The four big **M-denials** of the religious apologeticist, namely they will deny the mythological basis to their religion, they will deny the metamorphological (evolution) basis to human origins, they will deny that there exists a physical chemical basis of true morality, and they will deny the premise of a more robust Gibbsian (as opposed to godly) explanation of meaning in any and all situations, scenarios, and states of existence.

> "The 'Jesus based Osiris-Horus' assertion is just based on misinformation. It's garbage that spread on the Internet that just isn't true. And what's really funny is that these people who say this kind of thing, never quote the primary sources. They tell you that this is in Osiris or Horus, but when you look at the primary sources, you find out there not at all parallel."
>
> — William Craig (2012), a Veritas Forum (Q) Q&A at UCF

Second, when the interlocutor decides this to be a *cul-de-sac* of discontinuous discourse, they will move on to the evolution question—aka **M**etamorphology, as Goethe so named it (before Darwin)—to which citation of fossil record, chimpanzee DNA commonality, origin from hydrogen atom, etc., evidence will quickly be denied [denial #2] per reasons of fossil gaps, unbridgeable gap objections, among others, related to close-mindedness; thus prompting the inquisitor to move on to atheism's trump cards: morality and meaning.

> "The turning of hydrogen into thinking and purposive beings is scientifically undemonstrated, and philosophically devoid of merit."
>
> — Ravi Zacharias (1990), *The Real Face of Atheism*

Namely, thirdly, the interlocutor will delicately point out to the apologeticist that **M**orality, based on the assumption 'free will', a scientifically shown to be invalid concept (e.g. Libet experiment), is baseless; and moreover, that as Goethe established, as concurred by Schopenhauer, Feuerbach, Nietzsche, Weininger, and others, 'true morality' (see: best book) can only be based on the symbols (i.e. moral symbols) of physical chemistry. The apologeticist, however, unless steeped in physicochemical sociology (e.g. Mirza Beg), will quickly become confused at this point.

> "The [physicochemical-based] [moral] principle illustrated in *Elective Affinities* is true and not immoral. But you must regard it from a broader point of view and understand that the conventional moral norms can turn into sheer immorality when applied to situations of this character."
>
> — Goethe (1809), response to lady who reproached (Q) him about the immorality of his novella, Dec

Lastly, the interlocutor will point out to the apologeticist that a physicochemical atheism (Q) based perspective of the reality provides a more robust and accurate depiction and universe-connected conception of **M**eaning, e.g. "sense of purpose", than as compared to vacuous religious meaning; the classic example being the example of the 'meaning' of divorce (or any type of transition involving uncoupling), the latter becoming confused on the problem, proclaiming that marriages are "made in heaven", decreed by god as sacred, or something along these lines, the former, i.e. the physicochemical atheist simply pointing out that divorce (or parting ways in some akin scenario) simply 'means' that the relationship reaction has reached thermodynamic equilibrium. The apologeticist, naturally enough, will deny [denial #4] this, ask for peer reviewed citations of this, attempt to marginalize the assertion, etc., being that the logic will be labeled as absurd per point of view contrary to their religio-mythologic anthropomorphic belief system.

The explication of the latter two, i.e. morality and meaning, according to Ravi Zacharias (2013), the two biggest jumping stones to go from theism to atheism.

10. Atheism atrocities | Assertion

The so-called trump card of the theistic apologeticist debater is the atheism atrocities fallacy, the assertion that all of the atrocities committed in the 20th century, amounting to some 100-million deaths, were the result of a combination of Darwinian atheism, Marxian atheism, Nietzschean atheism, or some combination thereof. The connection is often dismissed by atheists with quickly made statement that Hitler was a Christian, per citation to various god quotes of his. There does, however, seem to be substantial indication that Hitler was a Darwinian-Nietzschean atheist in philosophy; as evidenced by the fact that he gave Stalin and Mussolini personal copies of Nietzsche, took photos next to busts of Nietzsche, spent a good amount of time immersing himself in the Nietzsche archives in

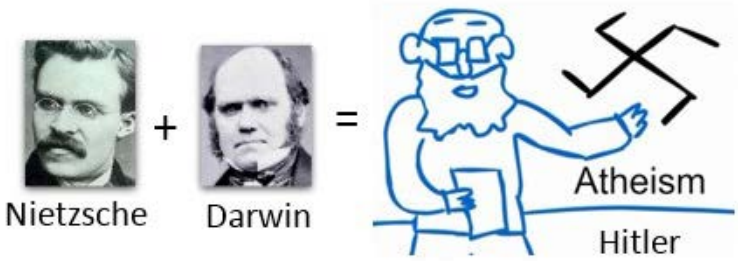

A depiction of the assertion that Nietzsche + Darwin = Hitler; and that to embrace atheism is but a pathway to the darkside of human nature (aka the atheism atrocities fallacy).

Weimar, and that he filled his *Mein Kempf* with Darwinian-conceptualized ideas about survival of higher races over lower races. The following is an oft-cited, supposed, quote by Hitler:

> "I freed Germany from the stupid and degrading fallacies of conscience and morality. We will train young people before whom the world will tremble. I want young people capable of violence—imperious, relentless and cruel."
>
> — Adolf Hitler (c.1945), quote hung, supposedly, of the walls of concentration camps of Auschwitz

Here, it would seem to be the case that Hitler believed that in the absence of belief in the existence of god, morality did not exist, and or that humans could be freed from moral reasoning, or something along these lines.

This so-called danger "objection", i.e. assertion that "evils" will arise if human actions are reduced to thermodynamic calculus of Gibbs energy minimas and maximas, in fact, was one of the first points raised in the Rossini debate, in reference to the possibility the Rossini hypothesis, i.e. of using chemical thermodynamics to explain freedom and security in society; the following are two differing points of view, the first a Christian scientist objection, the second a cautious bivalent scientific statement:

> "The **danger** of such anthropomorphisms is that we really come to believe that there is substance in them. In this particular case, there is the **danger** that true human freedom will be reduced to some sort of physical freedom on the same par with entropy. There is the **danger** that some will think that true human freedom can be measured in terms of some sort of calculus of simultaneous maximums and minimums. And worst of all, there is the **danger** that chemical thermodynamics will have ascribed to it a power that it simply does not have, namely, the power to "explain" the human condition. There may be a sense in which chemistry is the "central science". This is certainly not it."
>
> — John Wojcik (2006), "A Response to Chemical Thermodynamics in the Real World", Dec

> "I found the discussion by Leonard, Rossini, and Wójcik of the validity of thermodynamic anthropomorphisms to be quite fascinating. Leonard presented an excerpt from the 1971 Priestley Medal Address given by F. D. Rossini, in which he likened entropy to personal freedom (cf. molecular motional freedom) and enthalpy to personal security (cf. bond formation and a more stable or "secure" system). Wójcik, in his response letter, warned against anthropomorphizing science: Models that work well in explaining experimental observations are not meant to shed light on the human condition. In fact, it can be dangerous to assume that they do. The rise of social darwinism in the late 19th century and eugenics in the early 20th century are just two examples of scientific theories that were mistakenly extended into misguided social policies. Although Wójcik's point is well-taken, I do not agree that such "loose thinking" should be "purged" from science altogether."
>
> — Todd Silverstein (2006), "State Functions vs State Governments", Jun

We also note that Nietzsche's last manuscript writings, prior to going insane, were aiming at reconciling evolution with thermodynamics in terms of a will to power theory. The long and short of the issue pointed out here is that as belief in god dwindles belief in god replacement will accrue in inverse proportion; but, as history has shown, is one riddled with disaster.

11. Ignorance vs Faith | 28th Amendment

While the phenomena of the promotion of "ignorance" in the name of "faith", or protection of what is deemed "sacred" (or taboo) in the name "values", is a global phenomenon; in the the United

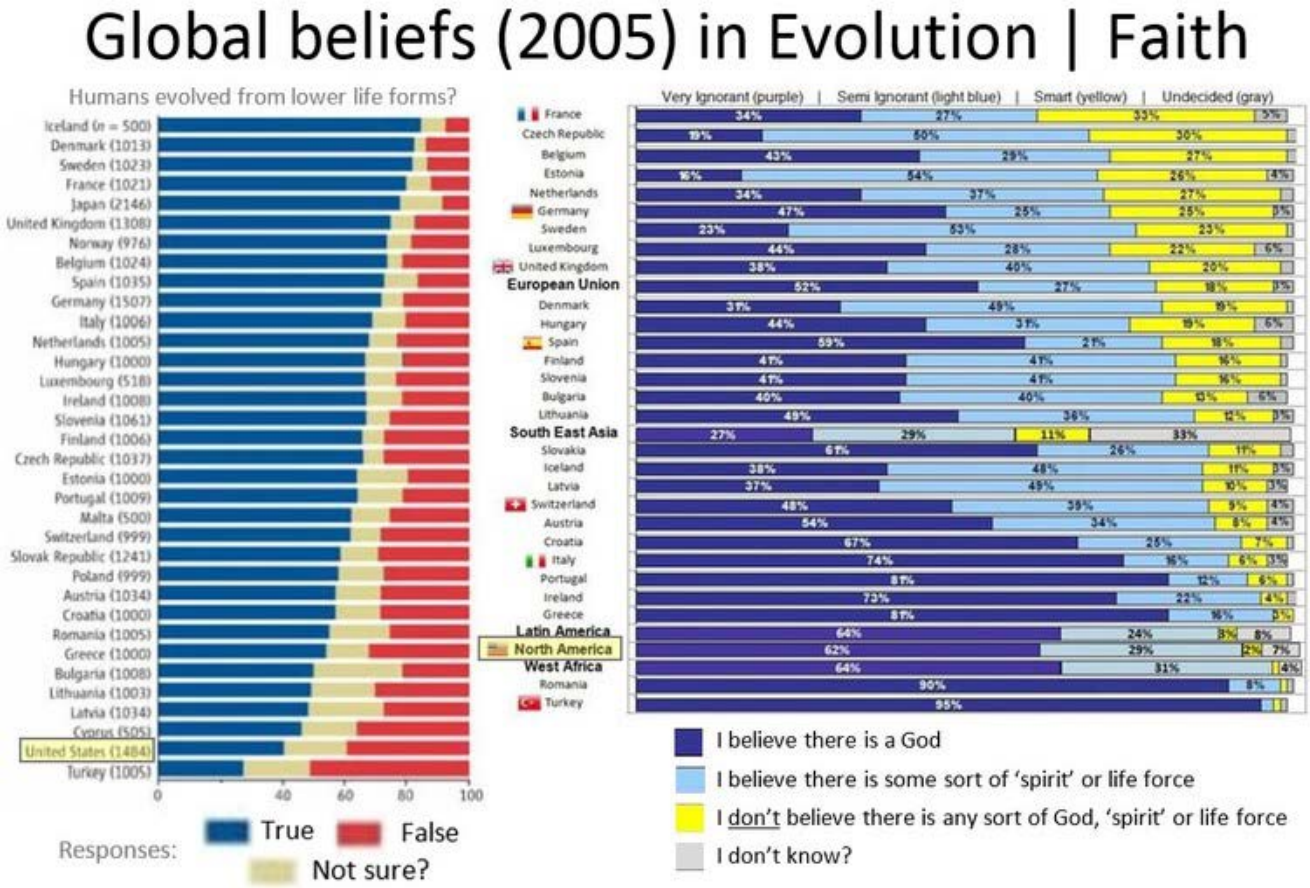

Polls showing that the United States is one of the top ranked **most-ignorant** countries, by populous, when it comes to the deeper questions of conflicts between evolution and faith.

States, the problem if paramount. The issue seems to have its roots, ironically, in the 1st Amendment, i.e. the separation of church and state amendment. To remedy this tenuous problem, the US Constitution provides that new "amendments" may be proposed either by the Congress with a two-thirds majority vote in both the House of Representatives and the Senate or by a constitutional convention called for by two-thirds of the State legislatures. (O)

> "Truth should not be silenced in the name of the Bible."
>
> — Libb Thims (2015), mental note; reflection on 28th Amendment, 2:58PM CST Jul 13

The amendment proposed herein, i.e. a 28th Amendment to the US Constitution, one suggested to be forwardly promoted by the people, for the betterment of the people of the United States, to their respective congressional leaders, is faith vs knowledge advancement clarifier to the 1st Amendment, namely that although the first amendment guarantees separation of church and state, the details of the separation should not be one employed to mute dialogue, in the educational process, when either science, historical accuracy, and or religio-mythology comparison comes into conflict with faith of students and or the faith of student's families.

The first area where this proposed amendment will bring resolution, to a century-long ongoing issue, is with respect to evolution; 2005 global polls show that the US ranks second lowest in the world in respect to lack of belief in evolution (adjacent, left); which corroborates with the parallel finding that the US ranks fourth greatest in respect to adherence to metaphysical beliefs, i.e. in God, spirit, or life forces (adjacent, right). The *status quo*, presently, is that science teachers mute or divert the subject when it arises in class; as addressed in studies on evolution vs creationism in education. In Dover, Pennsylvania, before the Kitzmiller vs Dover (O) intelligent design lawsuit, Dover high school science teachers were pressurized, by a few high-minded religious parents and school board members, into marginalizing the teaching of evolution to a few hours of curriculum, NOT allowed to discuss human evolution at all, and to compare Darwinism to creationism as equal on par scientific theories; ; following great personal turmoil, at the expense of the science teachers and pro-knowledge advocating parents, after the teaching method was declared unconstitutional, in US District Court, being violation of the first amendment, science teachers now switched to teaching evolution first and foremost in their biology courses, which is how it should be. The question of how humans came to be, and the moral and meaning ramifications therefrom, which amount to the biggest questions on a young person's mind, should not be confined to a 1-2 hour teaching slot of the first 18-years of a person's existence; or in many causes not touched on at all.

The second area where the proposed amendment aims to remedy is in respect to religio-mythology education; the **Kanawha County textbook controversy** such seeming innocuous topics such as discussing the possibly mythological origins of the Bible and reading

poems that had the word “god” (lower case g) and “Gods” (capitalized), resulted in the “most violent protest over public school textbooks” in US history; shown below being noted protest signs from the uprising: "God is NOT a Myth" (left), "Even Hillbillies have Constitutional Rights!" (center), "We Need Your Help to Boycott Our Schools to Get These Text Books Out!" (right):

The proposed amendment, suggested here, in short, is a faith vs ignorance amendment, i.e. the growth of cultural ignorance should not be festered in the name of faith; the questions should not be avoided per reasoning that it will disrupt the foundations of classical morality; the conflict produced by the implications of the findings of evolution theory should not be swept under the rug (as depicted below), the dirt is accumulating and in need of cleaning.

12. Chemistry professor paradox | Darwin vs Bergman

That many of the implications and presuppositions of evolution theory come into conflict with both theological beliefs and physical chemistry is what is called the chemistry professor paradox; the gist of which is depicted below:

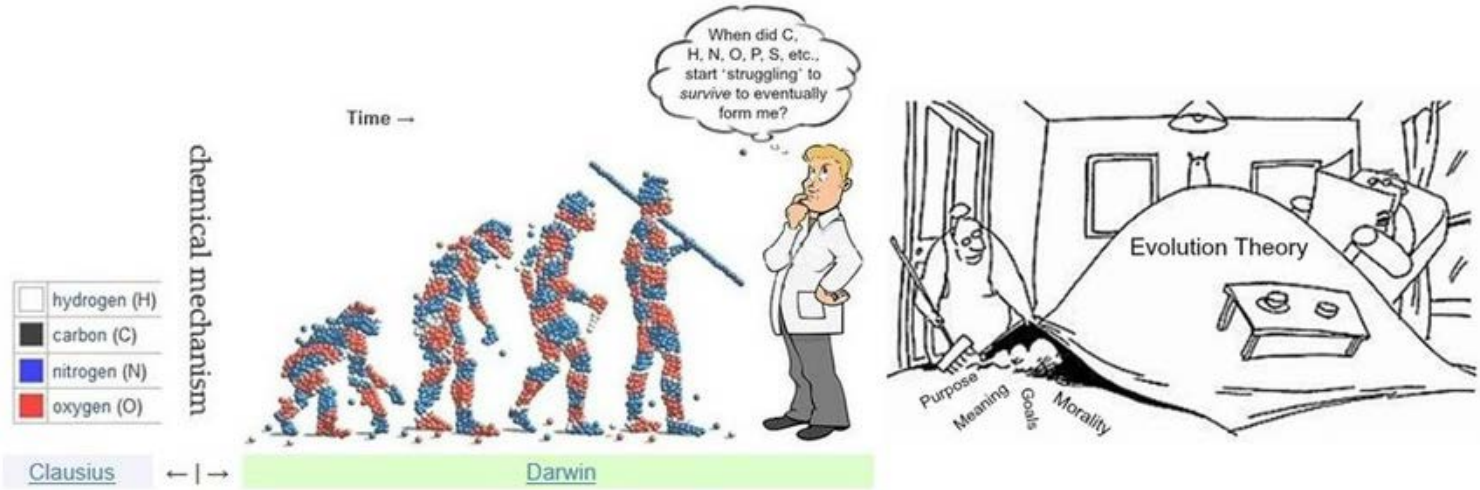

(add discussion)

13. Life | Disabused

The carryover of Egyptian-Greek god theory rooted “life” language, from our ongoing poly-to-mono-to-zero god transition, is replete, conflicting, and confusing. Some of this “unseen” conflict rears its head, when we see religious vs science conflicted thinkers, such as Scottish moral philosopher Francis Macnab, and his religion reconciliation attempting treatise *A Theory of the Moral and Physical System of the Universe* (1818), proclaiming the seeming absurdity that “a growing plant is neither alive nor dead”, being that he, to suit his own religion-siding (soul belief) mentality, shifts the “life | nonlife”

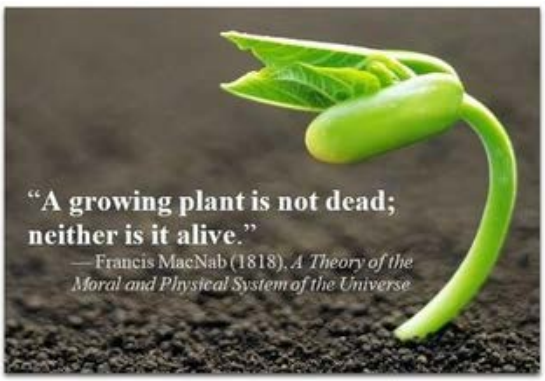

divide (O), on the great chain of being gradient scale, upwards into an area of apparent confusion, i.e. one differing from the culturally accepted (i.e. taught to us presently in school) “mineral life / plant life / animal life”, i.e. Linnaean classification scheme; though, to note, we no longer "technically" think of “minerals” as being alive today—although, to note, Linnaeus did: he asserted, e.g., that “stones grow” or in full:

Two examples, namely: Francis MacNab (1818) and Carl Linnaeus (1735), of where one's morality system and conjoint oft-biased sense of anthropomorphism, may lead one into vacuous determinations of what is "alive" and what, conversely, constitutes "non-life"; or possibly, as Francis Crick (1966) suggested, amid his neo-vitalism debates with Michael Polanyi, Pierre Teilhard, and Hans Driesch, to the determination that we should "abandon the word alive".

> “Stones grow; plants grow and live; animals grow, live, and feel.”

So, e.g., while someone, in late 20th century America—like Dean Kenyon, who was removed from teaching Biology 101, at San Francisco State University, for teaching or discussing “creation chemistry” (god-based) alongside of standard Darwinian “chance chemistry” (Epicurean-based), on the subject of evolution, and the question of the so-called “origin of life” —will readily be “dismissed” for using “god talk” when teaching college biology class; the issue of life itself being a god-based concept remains. Accordingly, one cannot disabuse god from biology until a conceptual revolution accrues; similar to the way we now know that although we now say, using everyday language, that the “sun rises”, when probed, a science literate person will admit that “technically”, i.e. correctly, we on the surface of the earth “turn [or rotate] toward” the sun, not the other way around. The same, however, cannot be said about biology, because the Copernican revolution, in biology, has not yet accrued the way Copernicus overthrew Kepler.

That this revolution has “actuated” (as found in the dozen or so scholars and minds in the defunct theory of life and life does not exist area of logic, e.g. Sherrington, Szent-Gyorgyi, Crick, Atlan, Thims, Rogers, Jabr, etc.) is comparable, possibly, to the parallel that the so-called “heliocentric correction” actuated with Aristarchus (c.270BC) but that there are still modern people, such as in Muslim countries (e.g. Abdul ibn Baz), that do not fully “believe” this assertion, being that it contracts “god theory”. It, therefore, will be some time to come before god is jettisoned firstly from bio-logy [powered chnopsology] and then secondly from all of the humanities.

next
Next chapter
● Morality Squared | Part two

● Morality Squared | End matter

The following is the **end matter** of the drafting manuscript ***Morality Squared**: on the Goethean-Feuerbach Prophesy, Nietzschean Void, and Henderson-Rossini Hypothesis*:

Goethean calendar

The scientifically neutral non-mythologically based Goethean calendar system will be employed herein, in a partial introductory sense; namely, BG/AG dates will be affixed to about the dozen or so key years of note; to name a few: in 55BC (1805BG), *On the Nature of Things* was published by Lucretius, which worked to transmit atomic theory to the modern age, therein enacting the enlightenment; in 1802 (52AG), Pierre Laplace dismissed god us unneeded; and in 1882 (132AG), Friedrich Nietzsche declared god to be dead, in minds of the people of his days, as a working concept, thereby initiating the Nietzschean void.

Author | Denials / Beliefs

The following tabulation, from the atheism types by denial and belief page, are the author's explicitly stated beliefs and disbeliefs:

Disbeliefs

Type	Atheism (deny god)	Achristism (deny Christ)	Mortalism (deny afterlife)	Abioism (deny life)	Asoulism (deny soul)	Aspiritism (deny spirit)	Dating system (godless)
Thimsian atheism (Libb Thims) |→ Extreme atheism |→ Physicochemical atheism	Yes [FA:128]	Yes (Osiris myth)	Yes	Yes	Yes	Yes	Yes (BG/AG) (Goethean calendar) [2015=265AG]

Beliefs

Moralism (morals exist)	Chance (anti-determinism)	Fate/Destiny (determinism)	Free will	Dualism	Monism	Composition (genealogy)
Yes "Gibbsian" (Moral symbols)	No	Yes	No	No	Yes (one nature)	Rossinianism Goetheanism Holbachian atheism Schopenhauerian atheism Buchnerian atheism Ostwaldian atheism Nietzschean atheism

(add discussion)

Section | Topic adds

- Positions of Rights

Quotes

The following are functionable quotes:

> "Four things I loathe the most, as repellant as poison and serpents, are: tobacco smoke, garlic, bedbugs, and the †."
>
> — Johann Goethe (1790), *Venetian Epigram 66*; Nietzsche (c.1885): "One must feel about the cross as Goethe did" [7]

"It is no more 'just' to punish an assassin than a tiger."

— Francois Broussais (c.1834), paraphrase of fatatist views of Spinoza, Hobbes, or Priestley

"The brain cannot exist without phosphorus-containing fat. The phosphorus is the origin, hence also established activity of the brain—without phosphorus no thought."

— Jacob Moleschott (c.1849), cited by Ludwig Feuerbach, 1850 [2]

"Whenever morality is based on theology, whenever the right is made dependent on divine authority, the most immoral, unjust, infamous things can be justified and established. Morality is then surrendered to the groundless arbitrariness of religion."

— Ludwig Feuerbach (c.1860) (O)

"Religions rise because they satisfy the many and fall because they cease to satisfy the few."

— Thomas Huxley (c.1870), Undated note (O)

Images

The following are images of note:

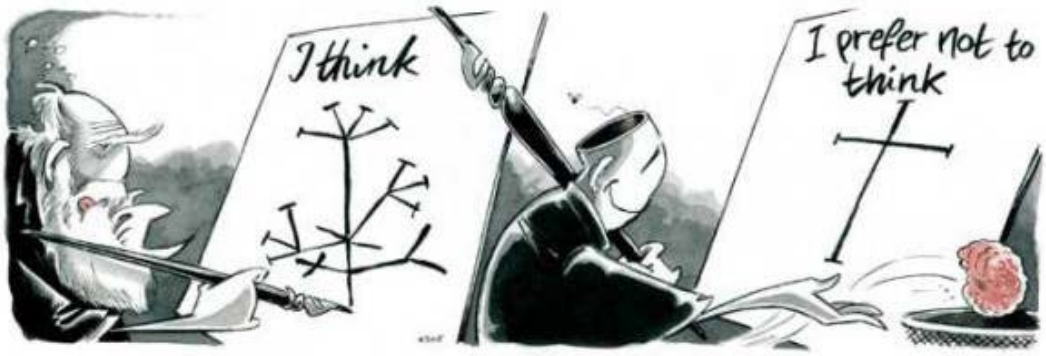

See also

- Atheism genealogy
- Atheism types (by denial)
- Extreme atheism
- Thimsian atheism
- Top 100 atheists

References

1. (a) Thims, Libb. (2015). *Morality Squared: on the Goethean-Feuerbach Prophesy and Nietzschean Void*. Publisher.
(b) Note: Spine-title showing 80-120 page aiming.
2. (a) Feuerbach, Ludwig. (1834). *Abelard and Heloise: the Writer and the Human: a Series of Humorous Philosophical Aphorisms* (Translation and Introduction: Eric Luft; Foreword: Angela Moreira) (Aphorism #42, pgs. 44-45). Gegensatz Press, 2012.
(b) Feuerbach, Ludwig. (1850). "The Natural Sciences and the Revolution" ("Die Naturwissenschaft und die Revolution") (German → English). Publisher.
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(g) **Note:** the English translations of the Feuerbach nitric acid quote are possibly ambiguous as to whether Feuerbach asserted in 1850 that Goethe had "already" dissolved the Christian worldview in nitric acid; that the so-based Christian ran nations are continuing to let science advance, which thus increasingly erodes philosophical inquire in nitric acid; or that the future scientific revolution, a humanities founded on physical chemistry, will dissolve the Christian world view.
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(d) Goethe genealogy (see bottom) – The Esoteric Redux, Blogspot.com.
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9. (a) Provine, William. (1988). "Scientists Face It! Science and Religion are Incompatible." (Q) , *The Scientist*, 2.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 27). Zondervan, 2009.
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(b) Richmal Mangnall – Wikipedia.
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(b) Ruse, Michael. (2015). *Atheism: What Everyone Needs to Know* (abs) (Royal Society polls, pgs. 100-106). Oxford University Press.

(add header)

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Morality^2

The following is **part three** of the drafting manuscript ***Morality Squared****: on the Goethean-Feuerbach Prophesy, Nietzschean Void, and Henderson-Rossini Hypothesis*:

Cut

Keep

14. Intellectual theist problem

(add section on the intellectual theory problem)

> "Is there an intellectually honest Christian evolutionist position? Or do we simply have to check our brains at the church house door?"
>
> — Anon (c.1997), query to *The Scientist* from a San Antonio attorney [1]

> "Yes, an intellectually honest 'Christian evolutionist', a term which itself is an oxymoronic label, has to check their brains at the church door."
>
> — William Provine (1988), "Scientists Face It! Science and Religion are Incompatible"; "oxymoronic" affixed by Lee Strobel [5]

> "A high IQ theist is an oxymoron."
>
> — Libb Thims (2015), thread post #6 (Q); mental truncation paraphrase of Lee Strobel (2004) on William Provine (1988) on anon (c.1997), Jul 5

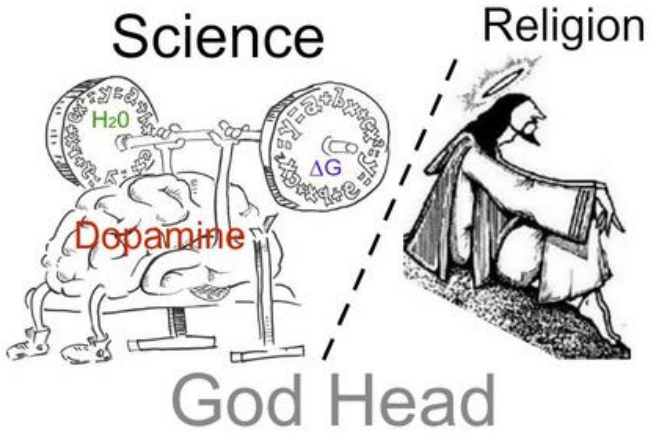

A depiction of the so-called "intellectual theist oxymoron" issue, aka "god head" (or faith head) problem, according to which many simultaneous conflicting views will be held in the mind of a scientific "faith" head, e.g. Pakistani Islamic organometallic chemist and physicochemical sociology pioneer Mirza Beg believing (a) in flying horses [i.e. the buraq Muhammad rode during his night journey] and (b) a science [i.e. physics and chemist] that does not recognized the existence of flying horses; according to which, is one is supposedly to "check their brains", as they would their coat or hat, at the church, temple, or mosque door, as one questioning anon American attorney (c.1997) asked? [1]

(add discourse)

15. Harrisian atheism | Issues

The following is tentatively workable area of correction quote:

> "I am certainly not claiming that moral truth [moral truth] exists independent of the experience of conscious beings or that certain actions are intrinsically wrong."
>
> — Sam Harris (2010), *Moral Landscapes* [3]

This statement by Harris goes against two points of view. Firstly, Goethe declared, amid his "best book" incident, that principles of morality and immorality, based on the universal principles of physical chemistry, illustrated in his *Elective Affinities* were "true". Secondly, that "certain actions are intrinsically wrong" is proved by Crocodile Dundee driving problem, one example solution to the Atheist sin problem (Q), namely that it is "intrinsically" wrong to drive on the right side of the road in Australia but intrinsically right to drive on right side of the road in New York, which is a result of the magma current flow within the earth core resulting in the earth's magnetic field lines pointing out of the earth in the northern hemisphere and into the earth in the southern hemisphere.

Likewise, one could say, anthropomorphically-speaking, that it is "intrinsically", i.e. belonging to the essential nature or constitution of a thing, wrong (or more wrong) for "carbon", a four-valence pronged atom, by nature, with its light-sensitive (induced) animation-ability (property) sp3 hybrid orbital intrinsic composition, as shown below; accompanied by Scottish-English atheist moral philosopher John Stewart's views on intellectualized bodies, with [carbon-based intellect (scientific); carbon-based life (colloquial)] insert:

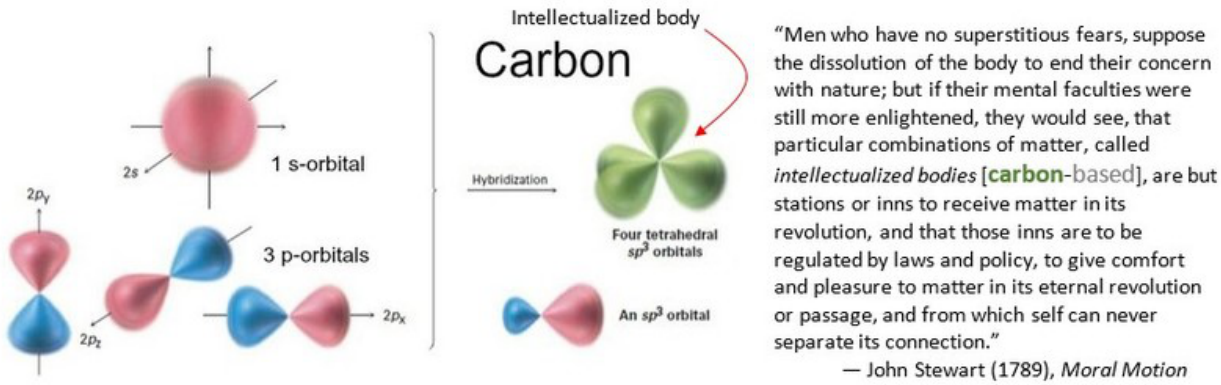

to have four hydrogen atoms attached to it, in the form of methane CH_4, as compared to having two oxygen atoms attached to it, in the form of carbon dioxide CO_2, for reasons of Biblical (as Christoph Wieland argued) or Quranic (as Mirza Beg argued) immorality. The physicochemical atheist, e.g. Goethe, Schopenhauer, Buchner, etc. (Q), however, would say correctly that one can come to understand the intrinsic "naturalness" and system "naturalness" of such molecules (e.g. human molecules, dihumanide molecules, trihumanide molecules, etc.) in isolation (marriage unions, e.g. gay, straight, polygamy, polyandry, etc.; or in Christopher Hirata terminology: gay molecule, straight molecule, polygamous molecule, polyandrous molecule, etc.) or in systems (system behaviors, e.g. unruly behavior), by looking at the measurements of the enthalpy, entropy, and free energies of such formations; such as shown below for methane and carbon dioxide: [6]

Substance	Formula	Structure	ΔH_f° (kJ/mol)	ΔG_f° (kJ/mol)	S° (J/K · mol)
Methane	CH_4		-74.85	-50.8	186.19
Carbon dioxide	CO_2		-393.5	-394.4	213.6

The ignorant person, steeped in passing versions of colloquial thermodynamics, may quickly point out that carbon dioxide has the higher entropy (214 J/K · mol), therefore it is "more disordered" and thereby a more "immoral" formation than as compared to methane, with its lower entropy (186 J/K · mol). These types of opinions well-number into the dozens, in the early to mid 20th century. Entering the so-called "Rossini era", i.e. the post 1970s years, consensus (e.g. Thomas Wallace and the other human free energy theorists) has arrived at the discernment that Gibbs energy is the key measure social system freedom, security, and well-being. In this perspective, we can say that, from an isothermal-isobaric STP reacting system perspective, that carbon dioxide with its more negative free energy (-394 kJ/mol) is more favored naturally to form than methane with its less negative free energy (-51 kJ/mol). These basis principles, accordingly, can be extrapolated up to explain human social formations in terms of "naturalness" and "unnaturalness".

One example, to illustrate, is 72-year rise and fall of temporarily stable molecular aggregate known as Marxian atheism based Lenin-implemented communism, which arose in 1917, with the Russian revolution, and collapsed in 1989, amid the wave of "Revolutions of 1989" (Q), which was caused by the unruly acts of: state murder, corruption, Soviet occupation of the Baltic nations, the social revolution goal of which was: economic liberty, democracy, conservatism, and liberalism. The death tolls resulting from Communism are estimated at 100-million. This, however, is not to be attributed to godlessness, aka the atheism atrocity fallacy, but rather to unstable ideology put into implementation; which can quantified in terms of free energy of formation, just as is done for methane and carbon dioxide so as to gauge the tested "naturalness" of communism, as compared to other forms of government.

16. Kepler's angels | Dostoyevsky's dilemma

See main: Dostoyevsky dilemma

Do section on how we laugh at the fact that Johannes Kepler used to "believe" that angels pushed the planets around the sky by flapping their wings; but yet when we look to our own presidential committees on "bioethics" we see the word "angel" being tossed around, amid studies which show that when students are given news that there is no free will they tend to cheat (and supposedly) steel more? [10]

> "If god does not exist, everything is permissible."

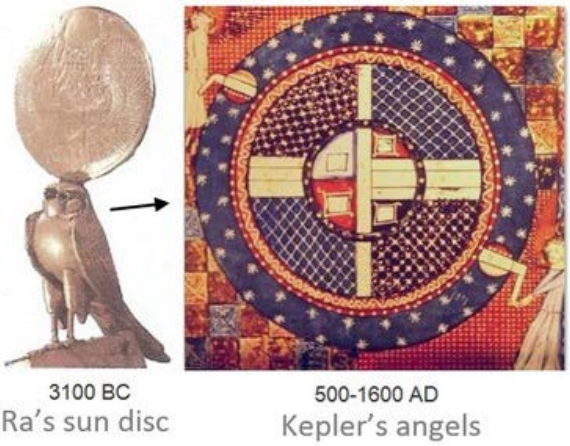

— Fyodor Dostoyevsky (1880), *The Brothers Karamazov*; view of Ivan Karamazov

"Well, the group that got the no free will news cheated significantly more often than the other groups. The other two groups behaved the same, which is evidence that free will is a kind of a default assumption among people. There is a version of this study in which you get a dollar for every correct answer, so by cheating you're stealing too, and the no free will group stole more often in that one. A friend of mine, Roy Baumeister at FSU, did a study with hot salsa. I won't go through the details, but people behaved more aggressively when they got the no free will news. Okay. So then a little bit later we started getting hard evidence that giving people the news that there's no free will increases misbehavior, and I'll talk just about one of those studies. It was done by Kathleen Vohs and Jonathan Schooler. And what they did is they primed a group of people with the news that there's no free will, actual passages from scientific articles. And there was a pro-free will group and a neutral group. And then the next they were supposed to do is take a math quiz, and they were told that the program was glitchy so that if they didn't press the space bar right after the question showed up, then the answer would show up, in which case of course they could cheat. And then you could measure this just by whether or not they pressed the space bar."

— Alfred Mele (2014), Discussion on free will and bioethics, Jun 10 [10]

"Free will is not the defining feature of humanness, modern neuroscience implies, but is rather an illusion that endures only because biochemical complexity conceals the mechanisms of decision making."

— Anon (c.2005), "The Decider", *New Scientist* [10]

"From the point of view of neuroscience, there is no such thing as free will, as we can only perceive an action after it has already occurred."

— Stephen Wilensky (c.2005), DVD [10]

17. Pascal's wager | Why taking the bet is wrong?
(add section) (O)

18. Problem of evil | Coupling solution
(add section; John Neumann scenario) (O)

19. Religious engine | Analogy
There seems to exist a close natural parallel between the development of the steam engine (mechanical system for *work* generation) and the development or rather form-change of religion (ordering system of beliefs for *work* generation); a realism analogy that would seem to shed light and clarification on the perpetual and ongoing confusion that seems to envelop the latter—the subject of the philosophical question of the 'nature of the gods' being the 'darkest and most difficult of all', according to Cicero.

Namely, when Goethe—a **theist** turned **pantheist** turned **panentheist** teetering **atheist**—in his 1815 poem, expressly stated the recognition of the sign of the cross, to which he had been tempted by the tiny cross on the neckchain of his beloved, was repellent to him and a 'denial' of *his own* [**monotheistic**] god, a renegade act like the temptation of Solomon by the women of the harem to honor the [**polytheistic**] animal-headed Egyptian deities—themselves deriving from the 42 local religion predynastic nome gods (which became reconceptualized, in Christianity, as the forty-two generations between God and Jesus)—there would seem to be a parallel to the way religion, theism, or the 'invention of the gods', which, according to Critias (410BC), was a engineered solution to the so-called '**lawgiver problem**', namely lawgivers of ancient times invented gods as supposed hypothetical overseers of right and wrong actions of men, thereby creating a first draft social mechanics 'morality-meaning' system, which, like the steam engine, by the pressures of change in nature, has evolved or rather became more efficient over time, through trial and error, similar to the way the steam engine evolved over time from the **pump problem** (1640s), i.e. how to get water out of flooded mines, to the **gunpowder engine** (1678), to 'idea' for an steam engine (**Papin engine**), to working steam engine (**Miner's friend**), to improved steam engine (Newcomen engine), to the Pickard engine (1780), to the Watt engine (1781), to the theoretical heat engine (Carnot engine), to the science of thermodynamics (1865), and to modern chemical thermodynamics (1923).

In short, just as the steam engine has evolved, from a problem to a refined non-supernatural science, so too will religion, inevitably, evolved from a problem, namely the lawgiver problem, from polytheism (Imhotep) to deism (Newton) to pantheism (Spinoza) to panentheism (Goethe) to atheism (Nietzsche) to modern extreme deanthropomorphized multi-aspect denying atheism explicit reformed science.

20. Incest | Irreligion model
(add section (Q))

> "I'm an atheist because at age 15 was told that my rapist gets heaven if he repents and chooses god, but I get hell even if I'm good but don't believe."
>
> — aTashoo (2012), Storify.com tweet (Q), Nov 24

21. Religious respect | Problem
(add section on the religious respect problem; some of which is touched on in David Silverman's 5-point firebrand atheism technique). (Q)

Add discussion of the Theodosius Dobzhansky-cited Abdul ibn Baz 1966 heliocentric heresy anecdote; and how this connects to Osama bin Laden's justification for 9/11 attacks, in respect to the foundations of "justice", territory intrusion, the chimpanzee war, etc.; to elaborate on how Saudi Arabia is an example, figurative and literal, of the "blind leading the blind".

A depiction of how outdated belief systems, result in a collision between ancient myth and modern morality.

22. Mean Girls | Model
In a neutral non-anthropomorphic way, this same phenomena can be understood, via a combination of George Lundberg's "proton-electron configuration" of people and the Mayer-Gilbert floating magnetics experiment, according to which new rings will spontaneously form as the number of magnets is increased, which is akin to the spontaneous splitting of social groups as new people are added.

On a smaller scale, some of this instability arising phenomena can be discussed and explained in going from a three-group stereotypically queen bee high school clique to an unstable unruly behavior "mean girls" phenomena, when fourth alpha-female enters the social system.

23. Lamb of God | Morality problem
(add section on how American Randy Blythe, lead singer of Lamb of God, formerly named Burn the Priest, was charged with manslaughter (Q) by Czech authorities (Q), for allegedly pushing a fan off stage, after repeatedly coming on stage, videos of which are available (Q), and determined by the Czech court, of supposedly a largely non-believing country (Q), to have been "morally responsible" for the killing; and incarcerated for a number of days in Czech prison; and is presently releasing on 14 Jul 2015 a book entitled *Dark Days: a Memoir*. (Q)

#. Summary
(add summary)

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The following is **part two** of the drafting manuscript ***Morality Squared****: on the Goethean-Feuerbach Prophesy, Nietzschean Void, and Henderson-Rossini Hypothesis*:

10. Chance | Scrabble pieces objection

In 55BC, Lucretius, in his *On the Nature of Things*, argued for a chance-based atomic theory conceptualized godless origin of the universe, as follows:

> "My object is to dispel the fear of the gods, which arises simply from the fact that there are so many things which men do not yet understand, and therefore imagine to be effected by divine power. In respect to the origin of the world, surely the atoms did not hold council, assigning order to each, flexing their keen minds with questions of place and motion and who goes where. But shuffled and jumbled in many ways, in the course of endless time they are buffeted, driven along, **chancing** upon all motions, combinations. At last they fall into such an arrangement as would create this universe."

American creationist Stephen Meyer's circa 2003 objection (Ñº) to Darwinism; a modern variant of Cicero's objection to Lucretius' chance-based explanation of the formation of universe from atoms and void; namely the analogy that if unguided godless evolution means that "life" arose from blind random "chance" accidental movement of atoms to form protein molecules and blind random chance "mutations" as operating as the backbone of natural selection, than this logic is about as probable as someone tossing Scrabble pieces onto a table and getting an "ordered" word (e.g. dice) or pattern to align or form by "chance" alone; meaning NOT probable.

This "weak point" in Lucretius' argument, aka the Achilles' heel of atomic theory, resulted to produce, in the years to following, a number of parodies: "throwing letters to the ground [and getting Ennius' *Annals*]" (Cicero, 45BC); "typing monkeys [and getting a library or book]" (Borel, 1913) (Eddington, 1928); "tornado in a junkyard [and getting a Boeing 747]" (Hoyle, 1981); "trowing Scrabble letters to the ground [and getting *Hamlet*]" (Meyer, c.2003); "monkeys typing/computers generating [and getting a line of Shakespeare]" (Jonathan Wells, 2006); "shaking Lego pieces in a bag [and getting a helicopter]" (Think Islam, 2014); among likely others.

The long and the short of resolution-reconciliation of this objection, was first addressed in the so-called Schiller-Henderson line of reasoning; summarized as follows:

> "There is no such thing as **chance**; and what seem to us merest accident springs from the deepest source of destiny."
>
> — Friedrich Schiller (c.1795), Ranker.com (Ñº)

> "Matter and energy have an original property, assuredly not by **chance**, which organizes the universe in space and time."
>
> — Lawrence Henderson (1913), *The Fitness of the Environment*

In other words, "affinity" (or chemical affinity), via the Goethe-Schiller (1796-1809) dialogue, which theoretically transformed into "free energy" (or Gibbs energy), via the Henderson-Gibbs (1913-1938) line of argument, is correction to the scientific folklore that evolution (Darwinism) or metamorphosis (Goetheanism) happens by blind forces, and blind random chance accidental mutation (Dawkinsianism); which notoriously leaves the caught off-guard sidelined-Christian objecting "I'm not an accident!", "I'm not a a biological blunder!", or "I'm not pond scum!" among others

similar chords of chime.

> "The universe somehow 'works' and all our beliefs concerning ultimate purpose are little more than biological blunders. **Theists** are inclined to view the universe as a grand and beautifully designed machine. Atheists, on the other hand, are disposed to see it as a chaotic mess."
>
> — Bo Jinn (2013), *Illogical Atheism* [2]

In short, forces are not "blind", they are orthogonal combinations of electric and magnetic forces, which interwork to form gravitational forces, the set of which operate to form very discernible patters, as quantified by Newton and Maxwell, and atomic and molecular patterns to not form "randomly", as was first evidenced by William Gilbert and his floating magnets experiment.

The reason that reconciliation, on this particular issue, has not yet accrued has to do with the fact that knowledge of physical chemistry and chemical thermodynamics is requisite; and even in at this point thinkers will admit to being not up to par on certain topics, e.g. Henderson admitted he was a novice of Gibbs; physical chemist George Scott (1985) admitted he was lacking in 6 or 7 PhDs, of the Socratic-Einstein mixture variety, necessary to complete the problem; and Henry Adams, after working on the problem of "evolution + physical chemistry + rise and falls of civilization", for some four decades, after arriving at the conclusion that he was NOT and "accident" but a Gibbsian "social phase" and that societies were types of phases (or equilibriums):

> "I have run my head hard up against a form of mathematics that grinds my brains out. I flounder like a sculpin in the mud. It is called the 'law of phases', and was invented at Yale [by Gibbs]. No one shall persuade me that I am not a phase."
>
> — Henry Adams (1908), "Letter to Elizabeth Cameron" (Sep 29) [2]

but, therein, at the end of his research effort demurred that the complete solution would require "another Newton" (1910). The aim herein will not be to "grind our brains out", but to attempt to go beyond the Scrabble board godlessness model.

11. Vita | Mor paradox

See main: Morality terminology upgrades

A pre-Cicero (55BC) etymology of the terms "moral" and "immoral" as a type of ethics based on the notion that some acts or behaviors deemed socially "wrong" (or incorrect) will bring about the arrival of Mor the goddess of death; whereas other acts or behaviors deemed "right" (or correct) will bring about the arrival of Vita the goddess of life; morality terminology upgrade reform deconstructs all of this into pure deanthropomorphized physiochemically-neutural language.

One of the first "apparent" issues encountered when one ventures into religion-overhauling aspects of chemical morality or physicochemical morality, of the Goethean-Feuerbach-Buchner variety, is the apparent absurdity of first (a) attempting to extrapolate "moral" principles, such as rights and wrongs of, e.g., marriage, divorce, abortion, suicide, dignified death, stealing, murder, lying, etc., from "chemicals" and "chemical reactions", via the extrapolate up method (or great chain of being ideology), but then (b) arriving at the needed connecting point that if one is indeed arguing for a "universal" system of morality, i.e. a one nature ideology, of right and wrong, that one must also, paradoxically, in a reverse manner, extrapolate down and associate these new

found moral principles to the chemicals themselves, which becomes non-sensical; the following are example quotes of this:

> "We conclude that there exists a principle of the human body which comes from the great process in which so many millions of atoms of the earth become many millions of human molecules."
>
> — Jean Sales (1789), *The Philosophy of Nature: Treatise on* ***Human Moral Nature***

> The golden rule of ethics is ... a principle found in the "moral symbols" of physical chemistry.
>
> — Goethe (1809), Conversation with Friedrich Riemer, Jul 24

"If iron sulphate and caustic potash are brought together, the SO_4 ions leave the iron to unite with the potassium. When in nature an adjustment of such differences of potential is about to take place, he who would approve or disapprove of the process from the moral point of view would appear to most to play a **ridiculous** part."

> — Otto Weininger (1903), *Sex and Character*

"The most familiar attempts to explain how evolution takes place are restricted to special aspects of evolution, and are often epitomized in personal names, such as Darwinism, Lamarkism, Weismannism, Mendelism. Among us there are naturalists, morphologists, physiologists, and psychologists; breeders, experimentalists, and bio-chemists. And surrounding us on all sides are the physicists, chemists, geologists, and astronomers, with whom we must reckon, for their domains and their subject matter overlap ours in countless ways. But unfortunately between all these workers there is little common understanding and much petty criticism. We shall use the terms morality, behavior, conduct, or constructive action in the same broad way. It may sound **strange** to speak of the morals of an atom, or of the way in which a molecule conducts itself. But in the last analysis, science can draw no fundamental distinction between the conduct of an animal, a bullet, or a freshman, although there may be more unknown factors involved in one case than in the other."

> — William Patten (1920), AAAS address "The Message of the Biologist" + *The Grand Strategy of Evolution: the Social Philosophy of a Biologist*

"It is possible that we may find some missing link to connect the animate with the inanimate? We should see a process of evolution, each molecule reproducing itself exactly, until an accidental rearrangement would set a new molecule to propagating itself. Would not this be reproduction with transmission of acquired characteristics? Suppose that this hypothetical experiment could be realized, which seems not unlikely,

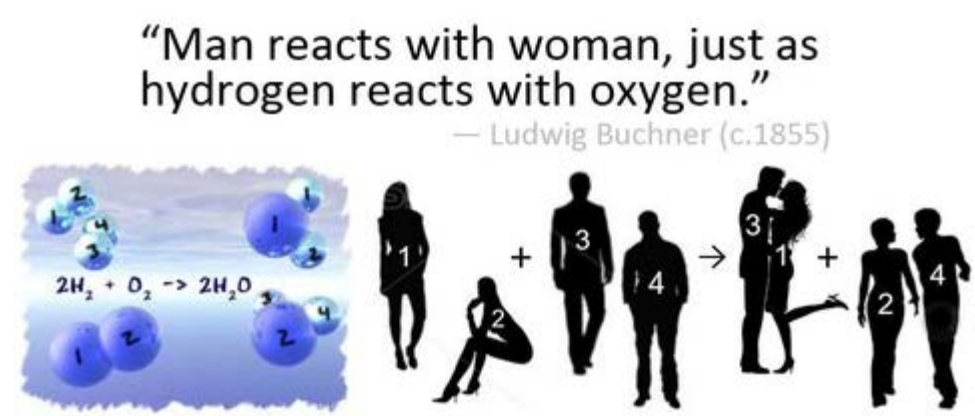

German physicist and extreme atheist Ludwig Buchner (c.1855) on how "human chemical reactions", e.g. between men and women, are but a more elaborate type "chemical reactions",

such as hydrogen H_2 reacting with oxygen O_2; the latter of which, according to Weininger (1903), Patten (1920), Lewis (1925), if one attempts to extrapolate "morals" to, will become apparently "ridiculous", "strange", and "absurd", respectively.

and suppose we could discover a whole chain of phenomena [evolution timeline], leading by imperceptible gradations form the simplest chemical molecule to the most highly developed organism [human molecule]. Would we then say that my preparation of this volume [*Anatomy of Science*] is only a chemical reaction [extrapolate up], or, conversely that a crystal is thinking [extrapolate down] about the concepts of science? Nothing could be more **absurd**, and I once more express the hope that in attacking the infallibility of categories I have not seemed to intimate that they are the less to be respected because they are not absolute. The interaction between two bodies is treated by methods of mechanics; the interaction of a billion such bodies must be treated by the statistical methods of thermodynamics. Perhaps our genius for unity will some time *produce a science* so broad as to include the behavior of a group of electrons and the behavior of a university faculty, but such a possibility seems now so remote that I for one would hesitate to guess whether this wonderful science would be more like mechanics or like a psychology."

— Gilbert Lewis (1925), *Anatomy of Science*

"Real orgies are never so exciting as pornographic books. In a volume by Pierre Louys all the girls are young and their figures perfect; there's no hiccoughing or bad breath, no fatigue or boredom, no sudden recollections of unpaid bills or business letters unanswered, to interrupt the raptures. Art gives you the sensation, the thought, the feeling quite pure—chemically pure, I mean, [with a laugh] not morally."

— Aldous Huxley (1928), *Point Counter Point* [5]

To summarize, those who would object to oxygen O_2 reacting with hydrogen H_2, "from the moral point of view", as Weininger puts it, would "appear to play a ridiculous part"; or "it may sound strange", as Patten so directly puts it , "to speak of the morals of an atom"; and, as Lewis laments in his own heated confusion, "nothing could be more absurd" to digress on such a confusing possible future science. We point out, to note, that Lewis' greatest protege Frederick Rossini, in his "Chemical Thermodynamics in the Real World" (1971), expanded on his mentor's absurdity stumbling blocks, with his "morality implicit" assertion that "freedom" and "security" in social systems can be explained by chemical thermodynamics.

Therefore, in order to NOT sound strange, ridiculous, or absurd, will will directly clarify things, at this point, by pointing out that the issue here is one of an unknowing incongruous attempting at venturing to apply religio-mythology based terminology, i.e. Mor (goddess of death), the root of moral, and Vita (goddess of life), the indirect root of immoral (via anti-vitality/vitalism, etc. meanings) to physical chemistry terminology, reactions, and processes.

In short, the paradox is resolved, similar other successful deanthropomorphization terminology reforms (e.g. life terminology upgrades; sociology terminology upgrades), by noting that the 55BC Cicero coining of the term "moral", and by repercussion "immoral", translated to the effect that "acts" and "behaviors" deemed "immoral", per a given social system, are those that work to bring about the so-called "arrival of Mor" (in mythological speak), the goddess of death, i.e. the arrival of the Grim Reaper in modern parlance, or to quicken the arrival of death in colloquial speak; accordingly, those acts and behaviors deemed "moral" are those that accentuate the stay of Vita (in mythological speak), the goddess of life, thereby bring vitality, or so-called "life-giving" properties, to the given social system. Life and death, however, as Charles Sherrington (1938) pointed out, are terms NOT recognized by physics and chemistry, which is where the apparent absurdity arises.

What chemistry and physics do recognized, however, is the "start" (reaction start) and "end" (reaction end), in the process of synthesis and analysis of molecular aggregates, chemicals, and other types of bound state atomic geometries; and accordingly quantifiable measures of system "stability" and "instability" and "naturalness" and "unnaturalness" of various processes and reactions. This is where the terminology reform will actuate. The latter terminologies will supplant, usurp, and reform the former; a work-in-progress objective.

12. Dunbar model | Morality

In circa 420BC, Greek philosopher Critias (c.460-403BC) declared that gods were an invention of lawgivers of ancient times:

> "Critias seems to be from the ranks of the atheists when he says that the lawgivers of ancient times invented god as a kind of overseer of the right and wrong actions of men. Their purpose was to prevent anyone from wronging his neighbors secretly, as he would incur the risk of vengeance at the hands of the gods."
>
> — Sextus Empiricus (c.200AD) (Ñº)

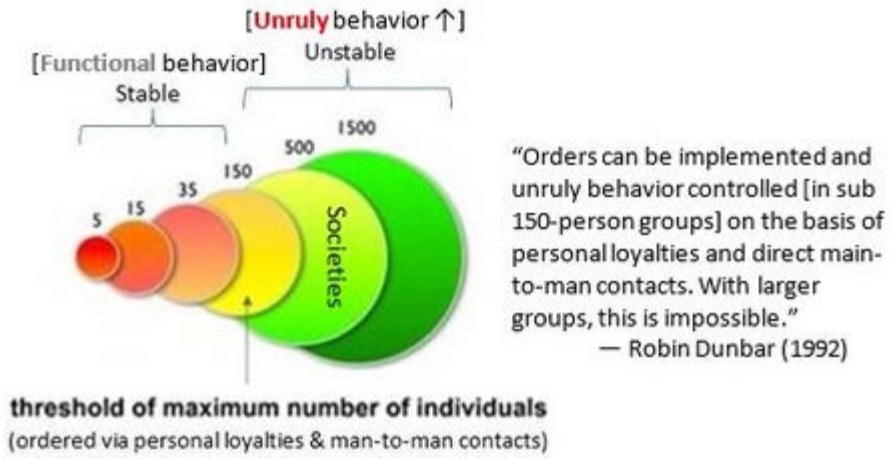

A depiction of the so-called Dunbar number of morality invention; namely that past social group sizes of 150, in our historical past, gods were invented by lawgivers (Critias, 420BC) to justify laws to the populous so to maintain a stable functionable society.

In this sense, according to this so-called Critian principle, i.e. of god invention employed to justify laws, the phenomenologically studied social system growth Dunbar number splitting pattern would seem to give a simple example.

In short, in the early 1990s, American anthropologist Robin Dunbar studied 21 different hunter-gatherer societies for which we have solid historical evidence, from the Walbiri of Australia to the Tauade of New Guinea to the Ammassalik of Greenland to the Ona of Tierra del Fuego and found that the average number of people in their villages was 148.4. Dunbar found likewise, the same pattern holding true for military organizations:

> "Over the years military planners have arrived at a rule of thumb which dictates that functional fighting units cannot be substantially larger than 200."

Dunbar elaborated on this:

> "At this size, orders can be implemented and unruly behavior controlled on the basis of personal loyalties and direct man-to-man contracts. With larger groups, this becomes impossible."

Dunbar, likewise, found that in the Hutterites, a religious self-sufficient agricultural colonies in Europe, have a strict policy that every time a colony approaches 150, they split in to two groups and start a new one. Dunbar also found this same group splitting rule-of-thumb as part of company policy in the Gore-Tex fabric company, which operates such that anytime a plant grows to past the 150 to 200-person mark, i.e. the group instability, the build another plant; which is recounted by company founder Wilbert Gore as follows:

> "We found again and again that things get clumsy at hundred and fifty."

To remedy this clumsiness, Gore stipulates that each new plant be built be larger than 50,000 spare feet and have exactly 150 parking spots. He elaborated on this:

> "People used to ask me, 'how do you do your long term planning?' I'd say, that's easy, we put a hundred

> and fifty parking spots in the lot, and when people start parking on the grass, we know it's time to build a new parking lot."

Malcolm Gladwell (2000) summarizes these phenomenon as follows:

> "At bigger size you have to impose complicated hierarchies and rules and regulations and formal measures to try to command loyalty and cohesion. The kind of bond that Dunbar describes in small groups is essentially a kind of peer pressure: it's knowing people well enough that what they think of you matters."

Here, we see modern Beg analysis stage quantifiable scientific terms, e.g. cohesion, bond, pressure, etc., being used to explain the organizational control of "unruly" and "clumsy" behavior, in social and business organizations, and possibly so-called "immoral" that may arise in war times in unstable troop sizes. In the olden days, according to Critias, the lawgivers "invented gods", for what now can be explained in scientific terms.

13. Floating magnets | Social instability

Adjacent is a depiction of screen shots (Ñº) of the floating magnets experiment employed here as a simplistic model for social system growth, social ordering stability, and social laws developed thereupon; the comparison here is "person = [floating] magnet", which is a generalization of the fact that humans are charged "proton [+] / electron [-]" configurations, as sociologist George Lundberg refers to people.

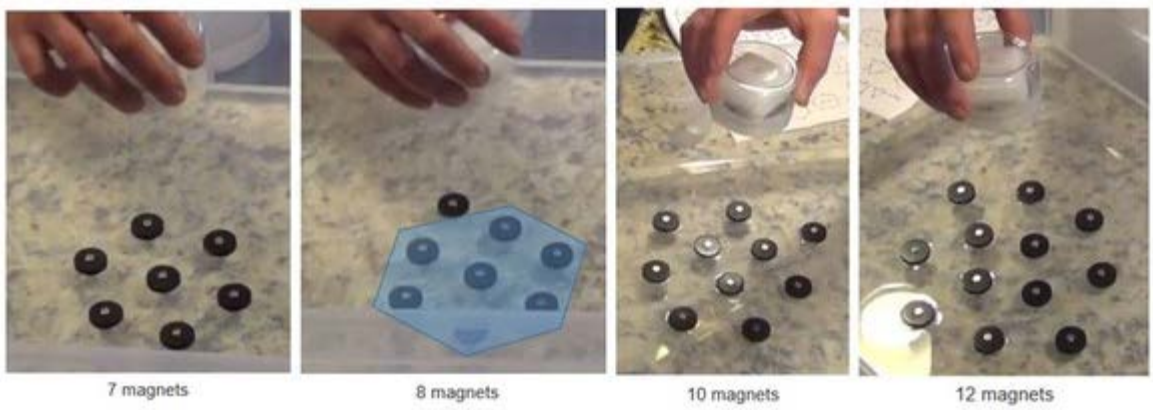

A diagram showing increasing numbers of smaller floating negative-polarity facing up neodymium magnets, moved into various, alternating stable and unstable, depending on floating magnet count, geometrical patterns, via a hovering larger positive-polarity facing downward magnet, see 2014 video (Ñº) and more screenshots (Ñº); which can be likened to increasing population growth social system model, humans, here, defined as "electron-proton configurations" (George Lundberg, 1939), i.e. negative-and-positive charge configurations of valance shell electrons and nuclear-aggregated protons, respectively; according to which the "unstable" arrangement of the 8 magnet system, seen transitioning to the two-ring more "stable" 12 magnet system, as more magnets are added, can be compared to the social system stability maximum Dunbar number count of 150 persons, beyond which "unruly" behavior, social unrest, and instability result, naturally splitting into two new social groups past a certain person count, say in the 175-225 range; thereby giving a conceptual visual look at how "**morality**", scientifically, can be reduced down to proton-electron and photon dynamics, aka quantum electrodynamics, pure and applied.

The logic to be derived from this situation is that the 7-magnet pattern (seven social system) pattern is stable. When, however, an 8th magnet (person) is added to the social system the geometrical patterns become unstable, the 8th magnet (person) has extreme difficulty assimilating into the hexagonal pattern (group). When the social system grows to 10 magnets, the pattern (system) becomes more stable.

Accordingly, according to the Critias hypothesis, namely that lawgivers, of the past, invented gods as a justifiable means to control unruly patterns or behaviors or acts, here we can imagine the predynastic Egyptian lawgivers, of such a hypothetical magnetic-like social system, noting that, in their community, group sizes are eight are inherently unstable, possibly akin to how threesomes are unstable as marriage formations in America, presently, the thereby pass a law, similar to the negative confessions, as one of their so-deemed "15 Commandments" (see: Ten Commandments), that "though shalt not form an eight-person social aggregate", at the end of which, they will write "God has decreed it!" A combination observed social instability at the state of aggregation in combination with fear of god as deemed punishment if the noted taboo social pattern is transgressed attempted thereby seals the deal, and god as exists, in the minds of the descendants of that social system thereafter; and as 75 percent of the world's belief states derive from Anunian mythology, it is surmised that this type of argument is wherefrom belief in the existence of god resides or

rather derives. Beliefs, according to the engine analogy, are the operational levers of the steam engine:

> "A **belief** is a lever that, once pulled, moves almost everything else in a person's life. Are you a scientist? A liberal? A racist? These are merely species of belief in action. Your beliefs define your vision of the world; they dictate your behavior; they determine your emotional responses to other human beings."
>
> — Sam Harris (2004), *The End of Faith* (pg. 12)

Systems below populations of 150, in sum, can be governed, i.e. ordered intelligently by the forces in operation in the system, by man-to-man verbal contracts and peer pressure; when, however, systems go beyond 150, justifiable "laws" have to be invented; and in the early stages of social system development, such laws are "justified" with recourse to the invention of gods or hypothetical "powers"; when, however, systems increase to the million+ person range and is industrialized and urban, such as German Empire was in 1871, with a population of 41 million (Ñº), the physics and chemistry of "powers" will be come to be better understood, after which, given time, the original hypothesis of god, as a type of power, governing right and wrong will be jettisoned (e.g. Nietzsche declaring, in 1882, that "God is dead!"), in favor of new scientific understandings of the forces operating behind powers, and therein the forces behind so-deemed "right" and "wrong" acts, per given justified system of laws, per given social system. The system growth accruing transformations in so-deemed "right" and "wrong" stability and instability patters will still operate, just as they always have, only past the Nietzschean void point, the forces behind the powers dictating so and so conceptualized right and wrong acts will be justified by recourse to science of power, namely thermodynamics, and the scientific method applied socially, towards the better, natural, and more functional and justifiable operation of the engine of one's beliefs and the beliefs of the social system.

14. Realtor Reaper | Evil coupling example

The following is a real-time example, which arose mind while writing this treatise, which may help to illuminate some of the concepts being discussed:

A generic friendly realtor (left), doing his or her job, as sales mediator (akin to Goethe's "Mittler the mediator"; of marriages and divorces), seen through the "senses" of the person being evicted, of the house being sold, as akin to the Grim Reaper (right)—the modern personification of the Greco-Roman god "Mor", aka the goddess of death, the root of the terms: mortality, mortician, moral, morality, immorality, etc., a colloquial conceptualization of the arrival of "evil" in modern times; an example of how seeming or perceptual feelings (or levels) of "good" and "evil", as could be measured neurochemically (e.g. increase in cortisol [evil]; rise of serotonin [good]), are coupled (see: coupling theory) to each other.

> "That [realtor] lady is like the Grim Reaper."
>
> — Libb Thims (2015), mental note; arisen in mind after c.8:35AM text that she [realtor] was coming to the units of our house to show the place tonight at 7PM and tomorrow at 10:45AM; following bi-weekly visits and increasing showings of the house—which the landlord—an invariably "good" landlord; and nice family, raising a bunch of nice kids—has "chosen" to sell; meaning that Thims, as a renter, with a six month to six month lease (lease up in Sep), so to maintain flexibility and fluidity of location "choice" working and existing environment), will invariably be "forced" leave the unit for a two hour window around those times (go to the gym, work extra at job, etc.); which thereby disrupts research and writing flow; therein, each text from her—an invariably very nice lady, who is simply doing her job, as a transition negotiator—bring with it an increasing arising per text sense of "darkness", *as if* the **Grim Reaper**, the harbinger of death was coming, so was the thought arose in mind, as if these intrusive events, as a paying renter, were becoming 'slightly' immoral [hence the etymology Mor = Reaper]; with each increase in numbers texts, these being numbers 6 and 7, approximately, grows a sense of the question shouldn't a paying renter have certain "rights"; which brings to mind, if this were to be a growing problem, and I wasn't actually being forced to move; the "legality" of the situation—supposing in hypothetical land—that I was going to go to court to question the rightfulness or wrongfulness of these, becoming

> daily vicariously forcible evictions [not that I'm physically forced to leave; but as the upstairs renter put it, on his way to a coffee shop, i.e. "I'd rather not be around when they're showing the place", it's more of an emotional forcing. Perspectively, however, when looked at in terms of coupling theory, Thims acknowledges the fact that "arrival of Mor" (i.e. immorality sense) of these intrusions is but a part of the natural coupling of Mor-to-Vita (i.e. the arrival of Vita, aka "life", in religio-mythology speak; or endergonic-to-exergonic, as physical chemistry would describe the situation, just as the breaking of the phosphate bonds of ATP inside of the mind powers, via free energy coupling, the muscles that type these words; the realtor being akin or equivalent to the famous "Mittler" of Goethe's *Elective Affinities*, the parable being seemingly applicable all types of transition states, whether marriage, war, etc., 3:54PM CST Sep 9

The following is Ravi Zacharias' 2013 take on evil as the atheist might see things, in his view, per citation of Richard Dawkins:

> "Knowledge is a deadly friend. When no one sets the rules. The walls on which the prophets wrote are cracking at the seams. Where do we find an objective transcendent point of reference for good and evil? As far as I'm concerned, atheism dies the death of a thousand qualifications, even prompting Richard Dawkins to make the comment once that he actually wondered if there was such a thing as evil? Why? Because the logic of his philosophy prompts him to raise the question. Evil is just, you know, we call one thing blue, another thing yellow, we call this good, we call this bad, it is nothing more than an aesthetic difference. It's got nothing to do with moral law. There is no moral law in atheism, which makes it incoherent. They can be 'good', but without any rationally compelling reasons for why. Secondly, there is no ultimate point of reference for meaning. There's no ultimate point of reference for meaning."
>
> — Ravi Zacharias (2013), "The Incoherence of Atheism"

(add discussion)

Next chapter

â— Morality Squared | Part three

Main

â— Morality Squared | Intro

â— Morality Squared | End matter

Morality^2

In hmolscience, **more alive / less alive theory** is an argument or line of reasoning which holds, in respect to the question of the origin of life, that evolution, hydrogen to human, accrued mechanistically, step-by-step, that humans—the end result of this evolution mechanism—are "alive", and that, accordingly, each step downward in the evolution mechanism, process of natural selection, or great chain of being, backwards in time, amounts to decrements in states of life, whereby, accordingly, by reductionism complete, the hydrogen atom is "sort of alive" (or less alive), in some sense of the matter, as compared to an animated person, which is deemed "more alive", comparatively speaking.

rudimentary, less complex species before that, and so on. As such, if we are to naively believe that the 5-element RNA was the first from of life, then we would also have to believe in the following backwards logic:

$C_4H_7O_4N$ (aspartic acid) – not alive
$C_{10}H_{12}O_6N_5P$ (ribonucleic acid) – alive
$C_{21}H_{36}O_{16}N_7P_3S$ (coenzyme A) – more alive

This type of reasoning, in which small 4-element molecules, such as aspartic acid, a crystalline amino acid found especially in plants, are not alive, whereas 5-element molecules, such as RNA, are alive, is clearly ridiculous. The hypothesis put forward herein, to reconcile these areas of theoretical inconsistency, is that the human organism is 26-element molecule and that it as well as all other large-element molecules are dynamic atomic structures found within a 92-element, heat-fluxed, environment, which together react, form, and break bonds, evolve, and reproduce according to the four laws of thermodynamics. Moreover, there is no such reality as there being a specific energy-filled 'spark day' in earth's past in which molecules suddenly became lifelike, alive, or imbued with life, etc., as it is currently believed.

The section from American electrochemical engineer Libb Thims' 2007 "Molecular Evolution" chapter, wherein he derides the **more alive / less alive theory**, i.e. the commonly-held assertion that RNA—or whatever fill-in-the blank molecular structure (DNA, virus, cell, protoplasm, etc.), is the first form of life, according to which, by extension or extrapolation, those molecular structures below it or precursory as reactants, are less alive, whereas those above it, as products, e.g. a person or human molecule is more alive, whereby, accordingly, the hydrogen atom is thereby "sort of alive", and its subatomic parts, likewise, in similar argument (e.g. quark-gluon life, fermion-boson life, etc.), is clearly ridiculous. [2]

Arnopoulos

In 1993, Canadian semi-polymath Paris Arnopoulos, in his "Energy" and "Life" chapters, to his *Sociophysics*, outlined a semblance of a more alive / less alive theory by, in short, first defining "being" as "action in space", then jumping to a Greek philosophy based "more alive" equals "more complex" line of reasoning, admixtured with slight talk of emergence and the "interplay of hydrogen, nitrogen, oxygen, and carbon" to produce "organic compounds" and, in turn, RNA, DNA, amino acids, and proteins. In more detail, Arnopoulos, first touches on Amontons' law:

$$PV = kT$$

which states that the product of the pressure and volume of a system of fixed number of species is proportional to the temperature of the system. Then he mentions Boyle's law, the precursor to the former, in the historical lineage of gas laws, and jumps to the logic that this methodology applies to what he calls "ideal societies" (see: social ideal gas law) as follows:

> "According to Boyle, the pressure of a system varies inversely with its volume, so that their product is always constant. This means that high pressure or dense systems tend to be very hot or energetic because their members move about very fast. In other words, active systems produced high temperatures and require lots of energy. Temperature and pressure are thus common potential energy stores."

In any event, the then jumps to the following equation:

$$A = Et$$

where A is action, E is energy, and t is time. He also says that action is proportional to the product of the momentum and the distance traversed:

$$A \approx qs$$

where *q* is his symbol for "momentum" or the mass velocity product of the entity and *s* is his system for distance. Arnopoulos then jumps to his new definition of being:

> "These equations define action as lasting energy and say that the application of energy through time results in action. Since energy is also matter-in-motion, then action is similar to momentum-in-space. All action can thereby be considered as continuing energy or displacing matter. This means that whenever there is lasting energy or moving matter, some action takes place. In this sense, action combines matter-energy and space-time, i.e. the basic content and context of reality. **Being** can thereby be defined as action in space. This definition encapsulates the essence of existence in activity and agrees both with Einstein's equation [$E=mc^2$] and Leibniz's aphorism [*natura non facit salta*]."

Arnopoulos then jumps to a statement of Aristotle's so-called scala natura:

> "In making this vertical distinction of existential layers we expostulate an order of priority in things; thereby attributing to them 'inferior' and 'superior' status. Ever since Aristotle's *scala natura* became responsible for both the quantitative and the qualitative similarities and differences in everything. With increases in quantities of matter and energy, systems become more complex to the point they undergo qualitative changes."

Here, to note, we are reminded of Darwin's mental notes about how one should never use of the terms "higher" and "lower" in respect to classification in the chain of development (see: Darwin on higher and lower), being that it leads to absurdities. Arnopoulos then platforms on this basis to give the following statement:

> "Primitive and pagan people attribute some kind of life to all creation. The pre-Socratics concurred with this belief, as Thales' hylozoism and Pythagoras' pananimism attest. From this traditional viewpoint, all beings are alive in different ways and various degrees, the more formidable the complexity of its components, the **more alive** is the system."

(add discussion)

Thims

In 2007, American electrochemical engineer Libb Thims, in his "Molecular Evolution" chapter, to his *Human Chemistry*, was vacillating on on the popular notion that the RNA molecule is the first form of life, the main section of which is shown above, when viewed in the light of a molecular evolution table, which holds that evolution from the hydrogen atom (a presumed to be "not alive" entity) to the human molecule (a presumed to be "alive" entity) is but a progressive increase in element count (26 for humans), animation, and reactivity properties; the basic absurdity of reasoning logic is shown below: [2]

Formula	Name	State

H	Hydrogen	Sort of alive
H_2O	Water	↓
$CO(NH_2)_2$	Urea	Lesser alive
$C_4H_7O_4N$	Aspartic acid	↓
$C_{10}H_{12}O_6N_5P$	RNA	Alive
$C_{21}H_{36}O_{16}N_{17}P_3S$	Coenzyme A	↓
CHNOPS+9	Bacteria	Less alive
CHNOPS+16	Fish	↓
CHNOPS+20	Human	More alive

Thims, at this point, was indecisive as to the solution. In other words, the is the hydrogen atom "sort of alive" implicit assumption to the more alive / less alive logic, aka panbioism theory, is vexing to the mind, one ruminated on by all the great ceiling geniuses (see: genius queries).

It would not be until 2009 that Thims was able to "see" the solution, namely: that "life", being akin to ether (disproved via the Michelson-Morley experiment, 1887) or caloric (disproved via the cannon boring experiment, 1798), is something that does not exist (see: life does not exist) and as such is a defunct theory (see: defunct theory of life). [3] This is what caused Francis Crick, in his *Of Molecules and Men* (1966), to posit, amid vitalism debate discussion, e.g. whether a virus—which can form crystals, i.e. a mineral (non-life) state—is alive, or rather suggest that "we should abandon the word 'alive'." [4] Nor has a complete exposition of this subject been presented. [5]

On both stylistic and logical grounds, **adjectives expressing absolute qualities—*absolute adjectives*—should not be compared** because people, places and things can only approach such an absolute: the absolute either applies or it doesn't—there is no *almost* expressible in simple adjective forms.

An easy way to tell which adjectives are included in this group is to ask if something of that quality can be more of that quality, or less of that quality: if it can't, that adjective is an absolute. For example, one cannot be **more alive**—one is either alive or not. People can be ***more lively***, but they cannot be ***more alive*** or ***less alive***, nor ***more dead*** or ***less dead***.

Section 8.13.6 (Q), from Eduard Qualls' 2012 *The Qualls Concise English Dictionary*, wherein we see a grammatician running into confusional absurdity, not only in terms of colloquial usage, e.g. Ayn Rand (Q), the term "more alive" or "so full of life" aimed at expressing some state of feeling or "feeling state", but also absurdity in regards to what constitutes life, e.g. attempting to decide if someone on artificial respiration, but brain dead, is alive or not; a dormant virus vs an active virus, etc.

Quotes

The following are related quotes:

> "The foremost advantage biologists have over social scientists is their explicit recognition that evolution by natural selection is the organizing force behind the complex design that distinguishes living organisms from 'dead' matter. It is worth remembering, however, that living organisms are also made of dead matter, mostly carbon, hydrogen, and oxygen. Living organism differ from dead matter only to the extent that they are pieced together in intricate ways as to bring about functionally unlikely outcomes. Taking this idea seriously leads to some interesting corollaries, such as: life comes in degrees such that some things are more or less 'alive' than others, the 'origin' of life was not a point in but a gray area over which matter became more alive over time."
>
> — Aaron Sell (2012), "Evolved Cognitive Adaptation" [6]

See also

- Half-alive theory
- First life
- Half-life

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6. (a) Sell, Aaron N. (2012). "Evolved Cognitive Adaptation", in: *The Oxford Handbook of Comparative Evolutionary Psychology* (§4:61-79; dead matter, pg. 62 + note 1 pg. 75). Oxford University Press.
(a) Aaron Sell (about) – Griffith University, Australia.

External links

- Is it true my body is not entirely alive? (forum) – TheRegister.co.uk.
- Garbawi, Ayad. (2009). "What is Life?" (Q), Science.20.

θΔics

In last words, **more light** are the said-to-be famous last words of German polymath Johann Goethe, the event of which is depicted adjacent in the *circa* 1886 drawing entitled “More Light” by Friedrich Woldemar (1846-1910). [1] American writer Gary Baldridge, in his 22 March 2012 article “Goethe’s ‘More Light’” summarizes the time of Goethe’s last words as follows: [4]

A *circa* 1886 drawing, entitled entitled “More Light” by Friedrich Woldemar (1846-1910), of German polymath Johann Goethe speaking his famous last words, on 22 Mar 1832, to his daughter-in-law, Ottilie, **more light!** [1]

> “On this day in 1832 Germany's greatest literary light gave the world his last metaphor, this time unintended. As he sat in his Weimar house holding the hand of his daughter-in-law, Ottilie, Goethe spoke of the walks he would take in the warmer months ahead, made some reference to a girl of his youth, and breathed the name of his equally famous, long-dead friend, Friedrich von Schiller. But wanting another shutter opened to the morning sun, the author of *Faust* called to a servant for **"More light!"** Then his finger traced a word on the air, he shifted in his chair, and he fell asleep, dying at some moment well before anyone realized.”

Overview

Goethe's first and last words were on the subject of light. He came into existence, in his own words, as such: [2]

> “On August 28, 1749, on the stroke of noon, I saw the light of day at Frankfurt-on-the-Main.”

Throughout his life, Goethe had a deep fascination for the physical and metaphorical effects of light on humans. Whilst being best remembered now for his literary works, he himself believed the scientific treatise *The Theory of Colours*, which he published in 1810, to be his most important work (*Elective Affinities* aside, which he said was his "best book"). Although a confirmed non-believer for almost all of his life, a year before dying Goethe sided with the eclectic Hypsistarian sect, writing in a letter to a friend that:

> "A joyous light thus beamed at me suddenly out of a dark age, for I had the feeling that all my life I had been aspiring to qualify as a Hypsistarian."

He spent the evening before his death discussing optical phenomena with his daughter-in-law, Ottilie Pogwisch (1796-1872). All of the above might lead us to believe that his celebrated deathbed cry of Mehr Licht! (More light!) was a plea for increased enlightenment before dying. The truth appears to be more prosaic. What he actually said (in German) was: [3]

> “Do open the shutter of the bedroom so that **more light** may enter.”

In some way or another this famous last sentence, of the man known to have spoken, penned, or thought more sentences than any other before or after, came to be truncated simply as "more light".

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1. (a) Lewes, George H. (1902). *Works: Life of Goethe* (“Goethe at Ilmenau” (Goethe at mountain hut, color), photogravure from the drawing by Woldemar Friedrich, pgs. cover and ii; Portrait of Goethe, pg. 150; Goethe’s Interview with Napoleon at Erfurt, pgs. 312; “These were the Subjects which Occupied his Activity”, pg. 358; “More Light”). F.A. Niccolls & Company.
(b) Woldemar Friedrich – Wikipedia.
2. Lewisohn, Ludwig. (1949). *Goethe: the Story of a Man, Volume One* (pg. 3). Farrar, Straus and Co.
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θΔics

In dialogues, **Moreland-Strobel dialogue** is one of the circa 2003 Q&A dialogues between Americans investigative journalist Lee Strobel, an atheist turned questioning Christian theist, and chemist turned Christian apologeticist J.P. Moreland, on how atheist emergence explanations of things such as mind, morality, consciousness, etc., from matter, are but spooky non-scientific panpsychisms closer to theism than to atheism.

Americans apologeticist J.P. Moreland and journalist Lee Strobel, both doped up on the good lord, the two debaters on whether or not atheist emergence explanations are valid or bunk.

Panpsychism | Dialogue

The following is the Lee Strobel Q&A dialogue with J.P. Moreland on the seeming untenability of the atheist mind-from-matter position: [1]

> **Moreland**: "What doesn't make sense—and which many atheistic evolutionists are conceding—is the idea of getting a mind to squirt into existence by starting with brute, dead, mindless matter. That's why some of them are trying to get rid of consciousness by saying that it's not real and that we're just computers."
>
> **Strobel**: "Still, some scientists maintain that consciousness is just something that happens as a natural byproduct of our brain's complexity. They believe that once evolution gave us sufficient brain capacity, consciousness inexorably emerges as a biological process."
>
> **Moreland**: "Let me mention four problems with that. First, they are no longer treating matter as atheists and naturalist treat matter—namely, as brute stuff that can be completely described by the laws of chemistry and physics. Now they're attributing spooky, soulish, or mental potentials to matter."
>
> **Strobel**: "What do you mean by 'potentials'?"
>
> **Moreland**: "They're saying that prior to this level of complexity, matter contained the potential for mind to emerge—and at the right moment, guess what happened? These potentials were activated and consciousness was sparked into existence!"
>
> **Strobel**: "What's wrong with that theory?"
>
> **Moreland**: "That's no longer naturalism. That's panpsychism."
>
> **Strobel**: "Pan *what*?"
>
> **Moreland**: "*Panpsychism*. It's the view that matter is not just inert physical stuff, but that it also contains proto-mental states in it. Suddenly, they've abandoned a strict scientific view of matter and adopted a view that closer to theism than to atheism. Now they're saying that the world began not just with matter, but with stuff that's mental *and* physical at the same time. Yet they can't explain where these pre-emergent mental properties came from in the first place."

(add discussion)

References

1. Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (Panpsychism dialogue, pgs. 328-29). Zondervan, 2009.

θΔics

In hmolscience, **Morgan Scott Peck** (1936-2005), known commonly as M. Scott Peck, was an American psychiatrist noted, in religious thermodynamics, for his 1978 *The Road Less Traveled*, where in he speculates on entropy, sin, evolution, and what seems to be general meaning, leaning towards theology.

Overview

In 1978, Peck, in his *The Road Less Traveled*, a listing of attributes that make for a fulfilled human being, with sections on the "miracle of evolution", where he points out evolution runs counter to the second law of thermodynamics, "entropy and the original sin", and the "problem of evil", among others, speculating on how thermodynamics relates aspects of human activity and spiritual evolution. [1] As to laziness, for example, Peck argues that this is the action of the force of entropy. The following is a noted quote: [2]

> "The most striking feature of process of physical evolution is that it is a miracle. Given what we understand of the universe, evolution should not occur; the phenomenon should not exist at all. One of the basic natural laws is the second law of thermodynamics, which states that energy naturally flows from a state of greater organization to a state of lesser organization, from a state of higher differentiation to a state of lower differentiation. In other words, the universe is in a state of winding down."

In using the term "physical evolution", Peck meant to differentiate between the evolution of the body and "spiritual evolution", both of which, as diagrammed by his two entropy triangles (below), are governed or acted on by the force of entropy, in his view:

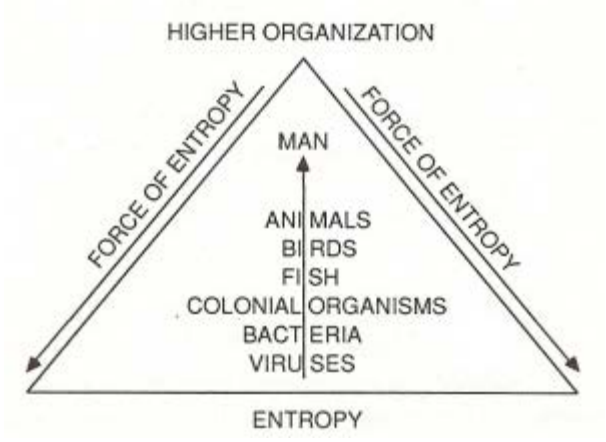

Peck entropy physical evolution triangle

Peck entropy spiritual evolution triangle

Curiously, in a footnote to this presentation, Peck states: "the concept that evolution runs counter to natural law is neither new nor original. I seem to remember someone I studied in my college days [1950s] stating, 'Evolution is an eddy in the second law of thermodynamics," but I have unfortunately not been able to locate the reference. More recently the concept has been articulated by Buckminster Fuller in his book *And it Came to Pass—Not to Stay* (New York: Macmillan, 1976)." This quote, to note, does seem to be difficult to track down; a number of similar quotes date to the 1950s. It could trace to the 1940 book *Man on His Nature* by English physiologist Charles Sherrington, who discussed the second law, life, entropy, and eddies of energy. [4]

Education

Peck graduated from Friends Seminary in 1954, after which he received a B.A. from Harvard in 1958 and an M.D. degree from Case Western Reserve University in 1963.

References

1. (a) Peck, M. Scott. (1978). *The Road Less Traveled: A New Psychology of Love, Traditional Values, and Spiritual Growth.* Touchstone.
(b) 2003: Sales of more than 7 million copies in the United States and Canada; translation into more than 23 languages; made publishing history, with more than 10 years on *The New York Times* bestseller list.
2. Hokikian, Jack. (2002). *The Science of Disorder: Understanding the Complexity, Uncertainty, and Pollution in Our World* (pg. 70). Los Feliz Publishing.
3. ibid, Peck (197). pg. 265, 2003 edition.
4. (a) Sherrington, Charles. (1940). *Man on His Nature* (pg. 78). CUP Archive.
(b) Cohen, Henry C. (1958). *Sherrington: Physiologist, Philosopher and Poet* (pg. 60). Liverpool University Press.

External links

â— M. Scott Peck – Wikipedia.

θΔics

In debates, **Moriarty-Thims debate** is a Sep 02-19, 2009, 61-page, 15+ person, thread debate-discussion (reprinted below), originating via YouTube thread commentary in April, between Irish physicist Philip Moriarty and American chemical engineer Libb Thims on whether or not an arrangement of students has a thermodynamic entropy.

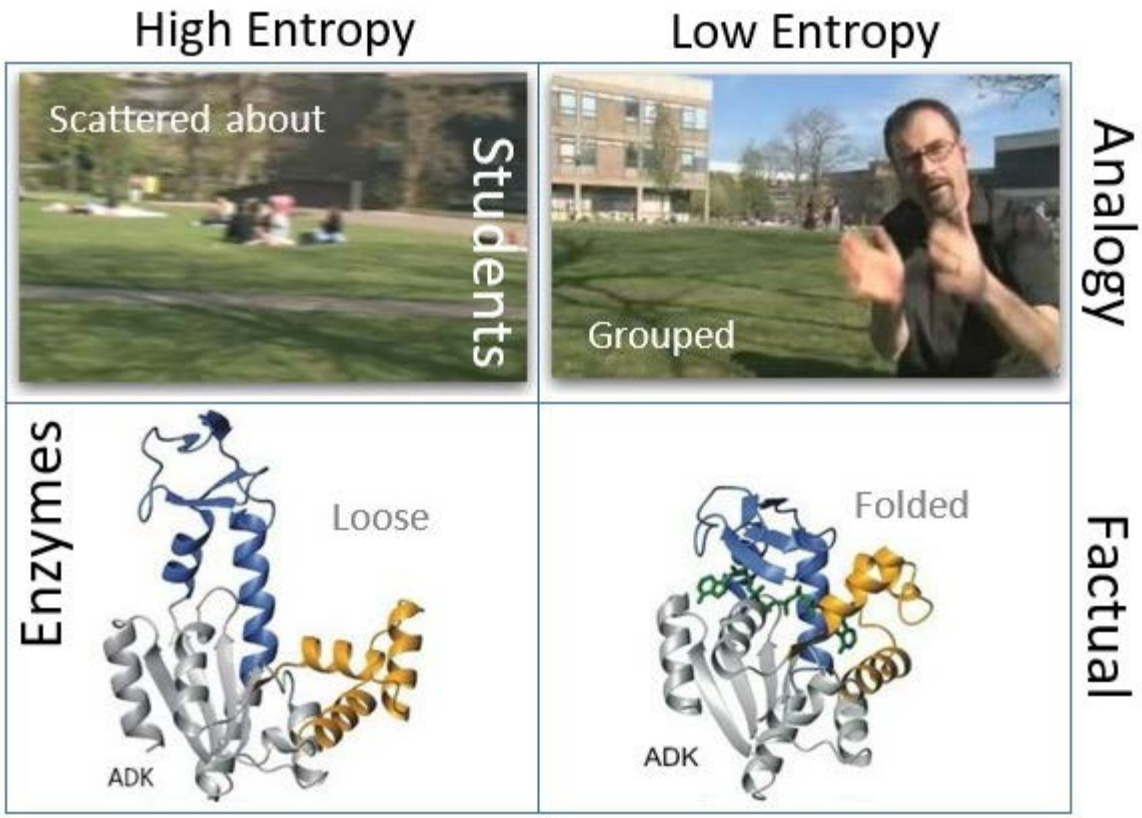

A synopsis of the **Moriarty-Thims debate**. Top: 2009 video stills of Irish physicist Philip Moriarty: "we can think about the students who are milling about here and filling out this state quite well as a high entropy state" (Left); and "then we can think about bringing them into what we term a low entropy state (Right), where we pack them all nicely together, nicely ordered in the center of this lovely green." Bottom: A 2012 depiction of the supermolecule adenylate kinase (adk) in the open (high-entropy state) and closed (low-entropy state) configurations. [1] The top description, according to Moriarty, is pure analogy, whereas the bottom is reality. Libb Thims argues the pro position, namely that the entropy of ADK exists just as it does for the entropy of a folded aggregate of students in a group, no analogy.

> "Where did Gibbs say that 'a society is one such material system'? He didn't – that is Thims particular (incorrect) reading of the application of thermodynamics. When I talk about the 'entropy' of the students, it's **really** important to note that this is just an analogy. Entropy and the second law of thermodynamics are very abused concepts. **An arrangement of the students *does not* have an associated thermodynamic entropy**. Thims has taken the abuse of the term entropy to an entirely new level, however, by suggesting that it—and, unbelievably, quantum mechanics—canï»¿ be applied to 'interactions' in romantic human relationships."
>
> — Philip Moriarty (2009), atheist thermal physics professor; his gist view of entropy (against Thims); compare: Gibbs' friend Joseph Klein's 1910 proof, via Planck, Boltzmann, and Clausius, that entropy applies to all "bodies" in the universe, whether gas, liquid, solid, or student body

Overview

Con view: In short, Moriarty believes that it is fine to discuss the ordering of students (packed vs dispersed) in a field in lecture and video as a teaching "analogy", but that in reality one cannot assign a value of entropy to groupings or orderings of humans.

> **Moriarty's view:** "you cannot say that a particular arrangement of students has a thermodynamic entropy."

Pro view: Thims, conversely, believes that every structure in the universe can be assigned with a value of entropy:

> **Thims' view:** "you can say that a particular arrangement of students has a thermodynamic entropy."

the methodology of which was laid first by German physicist Rudolf Clausius' in his 1875 chapter Determination of the Energy and Entropy a methodology of which was taken from theory into practice in American chemist Gilbert Lewis' 1923 textbook *Thermodynamics and the Free Energy of Chemical Substances*.

The central conflict in the debate seems to be that Moriarty is looking at the human situation using a statistical mechanics perspective, whereas Thims is looking at the human picture from a chemical thermodynamics perspective; although, more likely, there seems to be deeper issues and implications involved?

The adjacent open and closed configurations of adenylate kinase, a phosphotransferase enzyme that catalyzes the interconversion of adenine nucleotides, gives an idea of how entropy concepts scale up to the supermolecule or protein molecule level, each of which can be assigned with a thermodynamic entropy. [1]

Quotes

The following are noted debate-related quotes:

> "I looked at the **Moriarty-Thims debate**. My god: what a Babylonian cacophony! And so much innuendo! Is that the level of communication at which we have arrived? I dare say that, instead of Yes/No boxes at the end of the comments, there should be an injunction to sleep at least one night over a response. And good old Muschik—with the talent for obfuscation—predictably is putting his oar in. But yes, of course one may define an entropy for a **group of students** 'in the field' as well as for a battalion of marching soldiers. And for an anchor chain, and a polymer chain. And for a protein molecule and the human genome. The question is, however, what to do with such entropies and what predictions are possible—at this time—by the use of the concepts."
>
> — Ingo Muller (2009), "Email to Libb Thims", 4:40AM CST Sep 9

Debaters

Commentators in the debate include:

	Debater	Thermodynamics background
1.	Libb Thims (Sadi-Carnot) (c.1975-) American chemical engineer, electrical engineer, and thermodynamicist	Founding editor of the *Journal of Human Thermodynamics*, authored the first textbook chapter on human thermodynamics (*Human Chemistry*, ch. 16), author of the 1,600+ article *Encyclopedia of Human Thermodynamics*, world's largest thermodynamics book collection (300+).
2.	Philip Moriarty (c.1965-) English thermal physicist and nanoscientist	Professor of thermal physics for six years.
3.	Wolfgang Muschik (ThermoSyst) (c.1936-) German	Senior editor of the *Journal of Non-Equilibrium Thermodynamics*.

	physicist and thermodynamics professor	
4.	Robert Kenoun (Wrk003) (1950-) Iranian-born American materials scientist and electrical engineer	Author of the 2006 social internal energy minimization theory book *A Proposition to Theory of History and Social Evolution.*
5.	Peter Pogany (Telosx) (c.1939-) Hungarian-born American economist	Author of the 2006 book *Rethinking the World*, which includes a chapter on the thermodynamics of cultural evolution.
6.	Bruce Bathurst (Petrologist) (c.1945-) American geological thermodynamicist	Completed PhD in geological thermodynamics at Princeton.
7.	Lynn Liss (LynnLiss) (c.1977-) American consultant and business executive	Noted for her 2005 JHT article on thermodynamics and business efficiency.
8.	Ingo Muller (Ingo.Mueller) (1937-) German physicist and thermodynamics professor	Author of the 2007 *A History of Thermodynamics*, the 2005 textbook *Entropy and Energy: A Universal Competition*, and for his 2002 articles on socio-thermodynamics theory.
9.	John Schmitz (Waldnoces) (c.1950-) Danish chemist	Author of the 2007 book *The Second Law of Life* and noted for his human entropy diagrams.
10.	Jing Chen (JingChen) (c.1965-) Chinese-born Canadian thermodynamic economist	Author of the 2005 book *The Physical Foundation of Economics: an Analytical Thermodynamic Theory*.
	Frank Lambert (1918-) American	Noted for numerous second law themed websites, e.g. SecondLaw.com, 2ndLaw.com, Shakespeare2ndLaw.com, EntropySimple.com, EntropySite.com,

11.	organic chemist and humanities thermodynamics professor	etc., for his 1969 thermodynamic theories of evil; for teaching "baby thermo" class to humanities undergraduates for several decades, and for his efforts to reform the standard American textbook chemistry definition of entropy from disorder to dispersion (supposedly getting 25 authors to make the change).
12.	Aaron Agassi (AaronAgassi) (c.1970-) American philosopher	A skeptic to the idea of human thermodynamics.
13.	Ted Erikson (SdogV) (c.1928-) American chemical engineer and physics professor	Competed his MS in “Steady-State Thermodynamics” under American physical chemist Ralph Tykodi, at the at the Illinois Institute of Technology.
14.	Andrew Morrow (AWMorrow) (1961-) American chemical engineer	Noted for his 2006 philosophy people are “mosaics of atoms with a mind”, whereby, aware of this reality, one should attempt to see reality from the viewpoint of reactions of one’s fellow human beings to oneself, so to see if further insight can be found.

Others commented in on the debate via email and in side threads.

Debate: part one

The following is thread-to-page conversion re-paste of the debate, which took place in the general discussion forum of the eoht wiki from September 02-19, and is broken up into three approximately 20-page sections, the first part of which is shown below:

— —

Comment **#1**

Sadi-Carnot (Libb Thims)
Sep 2 2009, 10:18 PM EDT
English physicist Philip Moriarty (read above article) seems to take great issue on the application of entropy to assignment of states or configurations of humans. In his April video he said it can be done; in his August video said it can't be done? I will likely make a YouTube correction video to his last video where he stated:

> "Concepts of entropy [only] apply to gas molecules; you cannot say that a particular arrangement of students has a thermodynamic entropy.”

Comments would be appreciated.

— —

Comment **#2**

ThermoSyst (Wolfgang Muschik)
Sep 3 2009, 12:04 PM EDT
Yes, you can: If you have a certain defined distribution function related to these students, you can define an

entropy.

— —

Comment **#3**

Sadi-Carnot (Libb Thims)
Sep 3 2009, 12:42 PM EDT
"Yes, you can: If you have a certain defined distribution function related to these students, you can define an entropy."

ThermoSystem, thanks for the comment. Sometimes I think that I am the only person on the planet (alive) who thinks like this. P.S. I'll be lecturing on human thermodynamics to a university bioengineering thermodynamics next semester, and will likely mention your views on the matter.

— —

Comment **#4**

AaronAgassi (Aaron Agassi)
Sep 3 2009, 3:58 PM EDT
As you have requested of me to offer comment, I fear that I can only reiterate my standing position or suspicion that the cart is well before the horse, and no sense will come of currently half-baked human thermodynamics whatsoever, even as a metaphor quae memetics, let alone an actual science, until if ever, energy can be explicitly defined in the context of human thermodynamics.

— —

Comment **#5**

telosx (Peter Pogany)
Sep 3 2009, 4:02 PM EDT
Yes you can, if you consider the group of students a power field; a system of interacting molecules or -- at a deeper level -- an assemblage of subatomic particles. Phil has accidentally extended the vast realm of misusing the concept of entropy (the usual beaten eggs, strewn around library books, etc.) in the wrong way.

— —

Comment **#6**

lynnliss (Lynn Liss)
Sep 3 2009, 5:17 PM EDT
After reading the background on this debate, it seems that Moriarty may simply be scared of what humans as molecules driven by entropy would mean to the mind of civilization and his own mental state! It's a common reaction by many people, scientists and layman alike, thus not surprising. There once was a time when humans we're certain our evolutionary history was most definitely NOT tied to a furry animal...and this debate still continues today. At least there are an enlightened few that continue to push our quest for human understanding further along....versus remaining status quo. Bravo Libb Thims.

— —

Comment **#7**

Sadi-Carnot (Libb Thims)
Sep 4 2009, 11:41 AM EDT
Thanks everyone for the welcome comments. To Aaron, I understand your skepticism. Energy is defined by Clausius clearly in his 1875 mathematical introduction. How to apply this logic of energy determination to human systems is discussed in overview here. Clausius explains how to determine the entropy of systems here. There is still more work needed to be done before this can be clearly extrapolated in the form of tabulated measurements to human systems (e.g. system of students in a field). The formulation of such tables for small molecules was done by Fritz Haber in the 1890s.

Then by Gilbert Lewis and others in the 20th century. It is only a matter of extrapolation to apply this logic to systems of human molecules, which invariably were chemically synthesized, through terrestrial evolution, over the last 4.6 billion years, from the very same base atoms and molecules that Haber first began to tabulate the values of energy and entropy for in the various states in which they are found.

— —

Comment **#8**

Anonymous (Philip Moriarty)
Sep 5 2009, 3:29 AM EDT
Reply from Philip Moriarty: Of course you can define an entropy for a given distribution - I entirely agree. I guess you have in mind a quantity such as (minus) the sum of p_n ln p_n (where p_n is a probability extracted from the distribution function)? However, this quantity need not be the same as the thermodynamic entropy (and in many cases isn't). For example, a significant amount of my research over the past few years has focused on the far-from-equilibrium self-organization of nanoparticles. As discussed in "Nanostructured Cellular Networks" (2002), *Phys. Rev. Lett.*, we used a measure of the entropy of a cellular network to characterize the distribution of nanoparticles. But the value of S discussed in that paper is certainly **not** the thermodynamic entropy of the system and to confuse the two would be entirely wrong.

A very simple question: what physical units would you use to describe the entropy of a distribution of students?! J per K? If so, justify why this is an appropriate choice of units! (We spend a considerable amount of time in the first year of physics degree courses pointing out the importance of considering the correct units and dimensions for physical quantities.) Philip Moriarty.

— —

Comment **#9**

Anonymous (Philip Moriarty)
Sep 5 2009, 3:44 AM EDT
@telosx: See my comment above re. distribution functions. Moreover... A field full of students is not directly equivalent to a chamber filled with molecules at thermodynamic equilibrium - how could it be? As you appear to think otherwise, please address the following questions: *Define* the equilibrium state of the students. How much thermodynamic work is done *by a student* if (s)he is moved from one position to another? (Or if (s)he *decides* to move from one position to another). Can you construct the equivalent of a Maxwell-Boltzmann distribution function for the "speeds" of the students? Are the *velocities* of the students Gaussian distributed? (And the same question I posed to ThermoSyst: What physical units do you use to describe the entropy (or, indeed, enthalpy) of the students?)

And please don't put words in my mouth: At what point did *I* ever suggest that books strewn around a library (or disordered sock drawers etc...) should be interpreted as examples of entropy in action? I am at pains in the response video to point out the difference between analogies of this type and true thermodynamic entropy. Philip Moriarty.

— —

Comment **#10**

Anonymous (Philip Moriarty)
Sep 5 2009, 3:44 AM EDT
Libb - see my response to ThermoSyst's point below. Philip

— —

Comment **#11**

Anonymous (Philip Moriarty)
Sep 5 2009, 3:51 AM EDT
@AaronAgassi: Very good points. Libb's response beggars belief: "It is only a matter of extrapolation to apply this logic to systems of human molecules...". No, it is not a matter of extrapolation, Libb. Just as it is not a matter of extrapolation to take fundamental quantum mechanics and apply it to "human molecules". What physical evidence do you have, Libb, for a "human wavefunction"? Have you somehow carried out the equivalent of the double slit experiment for humans?! Do you understand what is meant by decoherence or complementarity in the context of QM? I shudder to think that students are going to be exposed to this pseudoscientific nonsense next semester. Philip (Moriarty)

— —

Comment **#12**

Anonymous (Philip Moriarty)
Sep 5 2009, 4:06 AM EDT
@Lynnliss: Oh, dear me. Why do both you and Libb seem to think that my arguments are religiously motivated? I am what Richard Dawkins would classify as a level 6 "agnostic" - agnostic in the sense that although I cannot

prove that there is or isn't a god, there are an infinite number of possibilities I can't definitively disprove. For example, the entire universe may well have been sneezed out of the nose of the Great Green Arkleseizure (... hat tip to Douglas Adams) or, my favourite, the multiverse was created by a being whose projection into our reality is the children's book character Noddy. (Google "Noddy" if you're interested). I'm a scientist. **Experiment and evidence are everything**. Let's try some controlled experiments: Place a hundred students in a box and measure their positions as a function of time. Will they behave just like molecules in a box? Will their speeds(velocities) be described by a Maxwell-Boltzmann (Gaussian) function? Can we take a piston and force the students into one corner and calculate the thermodynamic work done? What is the energy of interaction of two human beings? How do you write down a free energy function for the students [see: human free energy] when you can't even define what you mean by an energy of interaction? Philip Moriarty.

— —

Comment **#13**

Sadi-Carnot (Libb Thims)
Sep 5 2009, 1:15 PM EDT

Phil all good points. Concerning entropy units, the units are the same as any other chemical system, J per K per mol. The number of particles in one mole (6E23), however, is more than the current human population (7E9). Russian physical chemist Georgi Gladyshev, author of the 1997 book *Thermodynamic Theory of Evolution* have been discussing this issue for some years now. The unit for a human mole (h-mol) will thus not be the number of particles in a 12-gram sample of carbon 12, but will be the number of humans in average sample of some typical population or volumetric sample. We have, as of yet, reached definitive conclusions on this unit issue.

One trend that you will find with small systems (1-1000 particle range), according to recent nanothermodynamics computer simulations, is that entropy becomes nonextensive (see, e.g. Mohazzabi and Mansoori' 2005 article "Nonextensivity and Noninntensivity in Nanosystems: A Moleclar Dynamics Simulation in Journal of Computational and Theoretical Nanoscience), which raises possible issues on the integrating factor of the inexact heat differential. On your second set of comments, you need to move away from the ideal gas system point of view, to the particles on a surface systems point of view, where the interactions become important. Regarding how much thermodynamic work is done when one student moves from one position to another the question is answered using the Gustave Coriolis' 1829 principle of the transmission of work. This is from where the modern definition of mechanical work as used by Clausius to make the science of thermodynamics.

— —

Comment **#14**

Sadi-Carnot (Libb Thims)
Sep 5 2009, 1:16 PM EDT

How this is applied to people moving, using a very simplistic model, is outlined here. In this calculation, to note, you get into issues of free will, readiness potential, and induced movement. This issue of "what if a student chooses to move this way" is confusing for many people. Molecules do not *decide* or choose to move, neither do human molecules. Regarding speed distributions and system temperature, this is a huge issue. The issue revolves around the question of how one connect concepts such as sexual temperature (physical beauty) or economic temperature, and so on, with absolute temperature. This issue is still very puzzling. An example is the measured correlation that, determined by psychologists, that physically attractive people (e.g. supermodels) will cause a volume expansion (given more personal space) when moving through a crowd of people, as compared to more homely looking individuals (personal space).

— —

Comment **#15**

Sadi-Carnot (Libb Thims)
Sep 5 2009, 1:17 PM EDT

As to Gaussian distributions, of course there will be one in mapping the various speeds of people in a crowd. Here is one for heights (averageness). Regarding the Maxwell-Boltzmann distribution function you might like to read Philip Ball's 2004 book *Critical Mass* (pgs. 65-70), wherein it is explained how Maxwell and Boltzmann derived their functions after a reading of Henry Buckle's census statistics from his *History of Civilization*. When Maxwell obtained a copy he in fact read 160 pages in one night and wrote to Lewis Campbell about his excitement. Regarding QM, you are getting way off the point of the thread (entropy of students). I was the one that wrote the 20-page history of quantum mechanics (and the timeline table) at Wikipedia. As Louis De Broglie showed in 1923, every particle (or

molecule) has a wave function associated with it. No one, as of yet, has fired a 6E23-atom human molecule through the double slits, but they have fired a 60-atom molecule Bucky ball through, with success.

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Comment **#16**

Sadi-Carnot (Libb Thims)
Sep 5 2009, 1:17 PM EDT

Regarding experiments: if you place a hundred students in a box, of course they will behave just like molecules in a box, because "they are molecules in a box". If you think that you are made of something more than atoms (a molecule, by definition, is a structure of two or more atoms), then science is not your subject. Regarding particles in a piston, i.e. pressure volume work. You get into discussions of changes in human personal space (territories, boundaries, etc.). When the people of Germany expanded outward, i.e. pushing on its boundary (boarder), to take over Poland, during WWII, the mechanical work done by the system Germany, is exactly the same as the work done by the air molecules, on the surrounding atmosphere, in pushing the piston upward, in the Carnot engine.

— —

Comment **#17**

Sadi-Carnot (Libb Thims)
Sep 5 2009, 1:18 PM EDT

Regarding the energy of interaction of two human beings, you get into discussions of exchange forces and (primary and secondary) field particles. This latter point is a huge topic, requiring discussion far beyond what I have mentioned. The basic model of the free energy function for a system of humans is defined the same as for other isothermal isobaric system (with constant particle count):

$$G = U + PV – TS$$

Variations in daily entropy change will eventually cause equilibrium to set in when the variation of the free energy $dG = 0$. In loose talk, this is when a system stops working or producing external work. Most of the questions you have addressed have been covered in my 824-page textbook *Human Chemistry*. People will still be working on these same questions 300 years from now.

— —

Comment **#18**

Sadi-Carnot (Libb Thims)
Sep 5 2009, 2:38 PM EDT

A few last points, regarding physical evidence the human wave function, please see ch. 8 (Human Chemistry), where I derive the Schrodinger equation, in the context of human molecular orbital theory. The first crude types of human wave functions (turning tendencies) were drawn by Ernst Mach in 1885. There is a big difference, of course, between a wave function of an electron and a molecule, but both expressions are, however, derived starting with the Lagrangian. Regarding coherence and decoherence, this is a marginal topic in that very little has been said or understood on how this applies to human activity. The few examples of application include the questionable postulates of Rupert Sheldrake (e.g. pg. 273 of Sense of Being Stared At) or David Bohm, etc., e.g. twins who remain aware of each other when a tragic injury occurs. Most of these topics, however, are far removed from human thermodynamics, let alone entropy.

— —

Comment **#19**

AaronAgassi (Aaron Agassi)
Sep 5 2009, 5:06 PM EDT

"Yes you can, if you consider the group of students a power field; a system of intercating molecules or -- at a deeper level -- an assemblage of subatomic particles. Phil has accidentaly extended the vast realm of misusing the concept of entropy (the usual beaten eggs, strewn around library books, etc.) in the wrong way. " Human beings mimicking Brownian motion seems not by itself much socially enlightening. AaronAgassi.

— —

Comment **#20**

AaronAgassi (Aaron Agassi)

Sep 5 2009, 6:46 PM EDT
In context of Human Thermodynamics, energy means: _____ (fil in the **** blank.)

— —

Comment **#21**

AaronAgassi (Aaron Agassi)
Sep 5 2009, 6:58 PM EDT
Re: "I shudder to think that students at Illinois are going to be exposed to this pseudoscientific nonsense next semester. Philip (Moriarty)"
It might have utility as a case study, for discourse upon questions of scientific value. But then, beyond simple acquisition of lab skills and the like, that's how science ought to be taught in the first place of course.

— —

Comment **#22**

Anonymous (Philip Moriarty)
Sep 5 2009, 8:36 PM EDT
Re: "Regarding how much thermodynamic work is done when one student moves from one position to another the question is answered using the Gustave Coriolis' 1829 principle of the transmission of work. This is from where the modern definition of mechanical work as used by Clausius to make the science of thermodynamics."
Oh, Libb, this is pointless. I ask you to define the **thermodynamic work** done by a "student molecule** (sic) in a closed environoment - to try to point out (in a tongue-in-cheek fashion) the deficiencies in your argument - and you respond by giving me a high school definition of work? (You might like to correct your EoHT definition, by the way, to note that work is the scalar product of two vector quantities).

— —

Comment **#23**

Anonymous (Philip Moriarty)
Sep 5 2009, 8:48 PM EDT
Re: "The issue revolves around the question of how one connect concepts such as sexual temperature (physical beauty) or economic temperature, and so on, with absolute temperature."
Libb, I've read over what you've written above a number of times now and still can't believe just how nonsensical it is. For example, the idea that you can equate a thermodynamic temperature with a so-called "sexual temperature" just...simply...beggars...belief. I am confident that the students will be smart enough to realise that what you're lecturing is nonsense. What I can't understand is why a university has invited you to deliver a course on this baloney. I'm sure that you see yourself as a pioneer battling against the flawed establishment view but you might like to bear in mind the following quote from Robert L. Park: "It is not enough to wear the mantle of Galileo: that you be persecuted by an unkind establishment. You must also be right."

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Comment **#24**

Anonymous (Philip Moriarty)
Sep 5 2009, 9:08 PM EDT
Re: "You get into discussions of changes in human personal space (territories, boundaries, etc.). When the people of Germany expanded outward, i.e. pushing on its boundary (boarder), to take over Poland, during WWII, the mechanical work done by the system Germany, is exactly the same as the work done by the air molecules, on the surrounding atmosphere, in pushing the piston upward, in the Carnot engine:"
Oh, for crying out loud. "The mechanical work done by the system Germany is exactly the same as the work done by the air molecules..." Just read that over a few times to yourself, Libb. The mechanical work done by Germany (!) is "exactly" the same as the work done in a Carnot engine?!

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Comment **#25**

Anonymous (Philip Moriarty)
Sep 5 2009, 9:15 PM EDT
Re: "It might have utility as a case study, for discourse upon questions of scientific value. But then, beyond simple acquisition of lab skills and the like, that's how science ought to be taught in the first place of course. "
@AaronAgassi: I agree with you in that I would be happy for Libb's "Human Thermodynamics" to be discussed in the

context of a course on the philosophy of science/the scientific method (in terms of getting students to think about what does and does not comprise good science). It would certainly have utility in that question. Where I have immense difficulties, however, is in Human Thermodynamics being presented to students as a viable scientific theory when it is simply pseudoscientific nonsense. That is unfair on the students who choose to take (or who are obliged to take) the course.

— —

Comment **#26**

wrk003 (Robert Kenoun)
Sep 6 2009, 1:44 AM EDT

I am not sure about considering humans as molecules, but I believe that laws of thermodynamic do apply to humans and their societies. In every system hierarchy, new characteristics emege that do not apply to the subsystem levels. However, the high level system carries all the characteristics of its subsystems. Culture, economy and technology are characteristics of society, they are meaningless when applied to humans. But society is a living system and intelligent because its subsystem are living and intelligent. If society is a living system then it must have an evolutionary process of its own, similar to that of human evolutionary process. Knowing society possesses all of the characteristics of its subsystems, down to the lowest system level, then the laws governing the behavior of these subsystems, in all levels, must be part of what influences the behavior of society. Since basic constituents of humans and society are atoms and molecules and these systems are governed by the laws of nature, i.e., laws of thermodynamics, then the behavior of humans and societies are influenced by these laws.

Systems tends to adopt the lowest state of internal energy, which is a state of equilibrium and optimum stability; meaning that their process is goal oriented. However, if environmental conditions change on a system (imposing new conditions on the system), the system may then adopt a new process, sometimes, trying to achieve a new state of finality (equilibrium state) or achieve the same finality through a different process. The equilibrium state in physics and chemistry equates to achieving a state of equality in the process of social evolution. But what is, that living systems struggle to exchange in their interaction to achieve a state of eqaulity? to be continued.

— —

Comment **#27**

wrk003 (Robert Kenoun)
Sep 6 2009, 2:17 AM EDT

That interaction is about equalization in the state of internal energy of the subsystems that puts the metasystem (society, or social organism) in the lowest state of internal energy and optimum stability. What is internal energy in our modern society? It is the accumulation of wealth and power in a small segment of society. Wealth is energy, produced by the work of many and harnessed by few that gives them unlimited access to life support systems that others do not have. Obviouly, when one accumulates so much energy others suffer and the struggle is to release this energy so that others can also benefit from it, Karl Marx's class struggle. The state of equality in class struggle has never been achieved peacefully and without destruction of ordered structures, including human life (release of stored energy in ordered structures and elevation of entropy in universe). Note that society as a whole, and on a global scale, is growing contnuously and becoming more and more ordered, despite self-imposed destructive processes meant for equalization. Therefore, global society's entropy keep decreasing while producing much more disorder in the universe so that the net effect remains positive and in accordance with the laws of thermodynamics. to be continued.

— —

Comment **#28**

wrk003 (Robert Kenoun)
Sep 6 2009, 2:42 AM EDT

let us now go back to the distribution of students in a class room and the state of entropy. I agree that many of the distributions that are random would have the same state of entropy, but certain others may produce a state of entropy that would be higher than others. For example, let us assume that students comprise of girls and boys, black and whites, rich and poor. One day the principle of the school decides to let the rich kids sit in front of the class and poor kids in the back of the class. I am sure this will create a huge problem when parents find out. the same will occur if he let white kids sit in the front and blacks in the back, or boys in the front and girls in the back. These forms of student distributions which are an indication of discriminatory policies (encouraging inequality) will produce stress in the system, (rise of entropy in the community) that may be rersisted by law suites and protests to remove the principle. Therefore, yes, not every distribution would produce the same level of entropy.

More in my book " a proposition to theory of history and social evolution."

— —

Comment **#29**

Sadi-Carnot (Libb Thims)
Sep 7 2009, 12:45 AM EDT
Phil, it pains me to hear some of the comments coming from your mouth; especially coming from someone who has taught thermal physics for six year? Please answer this question for me: does the second law of thermodynamics apply to a group of students (yes or no)?

— —

Comment **#30**

AaronAgassi (Aaron Agassi)
Sep 7 2009, 2:44 AM EDT
When half baked hypotheses shed more heat than light, does peer pressure also rise as a consequence? And are any of the aforesaid indices quantifiable? I read here a great deal of: This is similar to that, and if we perform such mathematics upon these figures, the result is so. -The implications all whereof quite escape me, because quite frankly, I lack both faculty and interest. Traditional social science is openly qualitative. Quantitative Methodology is applied with care, in regard to observations that can be sampled and counted, and where meaning can then be inferred. I understand the wish for anything more like hard science in the humanities, but wishing never makes it so. I suggest instead, a return to statement of purpose, then in order to frame central questions. And if there can be no assertions as to the precise nature and identity of energy in Human Thermodynamics, then indeed, to borrow the Methodology of Physics, what can be said about it? What are the clues that can be listed?

— —

Comment **#31**

AaronAgassi (Aaron Agassi)
Sep 7 2009, 2:59 AM EDT
Argument by analogy was the last logical fallacy to be identified. All analogies are only intended for specific illustration, and all break down at some point. The only exception is tautology. Nothing is completely like anything other than itself. So, what analogies are drawn by Human Thermodynamics, to what specific application, and where do they terminate? What then might turn out sufficiently consistent for transfer of quantitative Methodology? Otherwise, what's the point?

— —

Comment **#32**

Anonymous (Philip Moriarty)
Sep 7 2009, 10:01 AM EDT
Re: "Phil, it pains me to hear some of the comments coming from your mouth; especially coming from someone who has taught thermal physics for six year?
Please answer this question for me: does the second law of thermodynamics apply to a group of students (yes or no)?"

Libb, this will be the last time I reply to your questions. I find our discussion akin to arguing the existence of fairies at the bottom of my garden - a pointless waste of time. I have in the past been involved in lengthy online debates, including a discussion which ran to sixty pages on the subject of nanotechnology. In that case, however, it was a debate - not an argument - and I felt that both the person I was debating with and I gained something from the exchange.

Our argument, however, is on the basis of a nonsensical pseudoscientific abuse of thermodynamic principles. I may as well be debating with a flat Earth society member. What do I gain from this? Nothing.

So, to answer your question (for the nth time): It doesn't matter how we arrange the students in a field (or in a box) - a change in their positions makes no difference to the ***thermodynamic*** entropy of the arrangement. (By moving the students around *we* will have had to do work, but that it is a very different aspect of the problem). Students do not naturally disperse because they are driven to do so by an increase in entropy.

Moreover, my suggestion that your extrapolation of quantum mechanics to "human molecules" is ludicrous is certainly not off the topic. The question of the fundamental basis of the interaction between the elements of the systems is central to a consideration of the thermodynamics - compare the ideal gas to a real gas (e.g. involving van der Waals

interactions). Are you telling me that the nature of the interaction makes no difference to the thermodynamic work done? (Actually, don't bother answering that...). Philip

— —

Comment **#33**

Anonymous (Philip Moriarty)
Sep 7 2009, 10:09 AM EDT
Coda: I thought you might be interested in these comments posted under the Sixty Symbols YouTube video which prompted your most recent missives:

YogiToad (1 month ago)

So you used an analogy using the students as an example. Who could not understand [that] the physical differences between people sitting around in a park and gas? If someone could not grasp the analogy then they really don't have what it takes to understand the concept in a more complex fashion either.

lynchmobb2000 (1 month ago)
I still don't see what the problem was with Moriarty's explanation. It sounds like those complaints were from trolls.

velocity73R (1 month ago) [in response to lynchmobb2000]
Exactly, it's a bunch of know it alls that want to make an analogy = Gospel. By doing this they feel smarter since he didn't expressly say it was in fact an analogy, even though anyone with an IQ higher than room temperature should have realized just what he was saying. He's made a video to feed the trolls, he should have just told them to, 'F' OFF!

I certainly didn't do what velocity37R suggests in the final line of his/her comment because I thought that, given you are obviously extremely well read in thermodynamics, we could have a worthwhile debate. It's a shame that this proved not to be the case. Goodbye, Philip.

— —

Comment **#34**

Sadi-Carnot (Libb Thims)
Sep 7 2009, 10:09 AM EDT
To Aaron:
The energy U of a system is the sum of vis viva T and ergal J of the system:

$$U = T + J$$

This is the basic definition, whether for humans or for smaller molecules or atoms, no analogy. To Phil: Based on your avoidance of the above very simple question (second law applies to system of students, yes or no?), I will assume you do not know the answer.

— —

Comment **#35**

Anonymous (Philip Moriarty)
Sep 7 2009, 10:44 AM EDT
Re: "To Phil: Based on your avoidance of the above very simple question (second law applies to system of students, yes or no?), I will assume you do not know the answer." Interesting use of the term "avoidance"! Read my reply above. Assume what you like. However, let me word your question more appropriately: "Does the second law of thermodynamics drive a system of students from a close-packed configuration to a "dispersed" configuration?" No. Could I be more specific? Philip.

— —

Comment **#36**

Sadi-Carnot (Libb Thims)
Sep 7 2009, 12:08 PM EDT

Yes, you are still avoiding the main question. Based on your last response, however, I will assume you believe that: “yes, the second law does apply to systems of students, but not in such a way that it acts to disperse closed packed configurations.” If this is true, then we are both in agreement.

To clarify, I have never said, anywhere, that the second law drives a system of students from a close-paced configuration to a dispersed configuration. This is the simple Boltzmann-type ideal gas model. To understand entropy in human systems, which are of course far more complex than ideal gas models, one must turn to how entropy is understood in chemical thermodynamics.

I understand that chemical thermodynamics is not your main field and thus I reason that this is the source or underlying reason behind your objections or irritations with the course of this discussion. As I have mentioned before, the fact that over 300 people (including 8 Nobel Laureates), come and gone, have attempted to grapple with entropy and the second law applied to human systems, illuminates the view that just exactly how entropy applies to human systems is not answered in a simple manner.

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Comment **#37**

AaronAgassi (Aaron Agassi)
Sep 7 2009, 1:09 PM EDT
Philip, you have not explicitly answered Libb yes or no, nor have you undertaken to show cause why you should not. Perhaps you made your answer implicit, but I am too lazy and pissed off to work it out for myself. I am a layperson with little patience for riddles. Never burry the lead!

— —

Comment **#38**

AaronAgassi (Aaron Agassi)
Sep 7 2009, 1:30 PM EDT

"To Aaron: The energy U of a system is the sum of vis viva T and ergal J of the system: U = T + J. This is the basic definition, whether for humans or for smaller molecules or atoms, no analogy. To Phil: Based on your avoidance of the above very simple question (second law applies to system of students, yes or no?), I will assume you do not know the answer."

That can never make any sense until if ever energy is ever defined in sociological terms for Human Thermodynamics.

Also, you make undue assumption of ready familiarity and facility on my part with jargon.

— —

Comment **#39**

Anonymous (Philip Moriarty)
Sep 7 2009, 2:17 PM EDT
"Philip, you have not explicitly answered Libb yes or no, nor have you undertaken to show cause why you should not. Perhaps you made your answer implicit, but I am too lazy and pissed off to work it out for myself. I am a layperson with little patience for riddles. Never burry the lead!"

@AaronAgassi: The problem with Libb's question, as he no doubt knows well, is that it is worded very vaguely. It is ill-advised to answer this type of question with a yes/no response, without taking into account the context. Applying the 2nd law of thermodynamics to life immediately raises important and complex points related to the question of open vs closed systems and equilibrium/non-equilibrium thermodynamics.

Libb's thesis is as follows: Students are "human molecules". He argues that the same physics that is used to describe the thermodynamics of gas molecules can be applied directly to these "human molecules". Libb ascribes an (ill-defined) "interaction energy" to humans and argues that we can write down a function which describes the free energy of a system of students. He also argues that the 1st and 2nd laws of thermodynamics can be ascribed to the collection/system of students.

The first law is simply the conservation of energy. But, as you have quite correctly highlighted, the concept of energy (internal, free, or otherwise) in Libb's Human Thermodynamics is ill-defined. Why is this? Well, it's because the entire human thermodynamics concept is fundamentally flawed.

One statement of the 2nd law is: "No process is possible whose sole result is the removal of heat from reservoir at one temperature and the absorption of an equal quantity of heat by a reservoir at higher temperature". But to ascribe a quantity of thermodynamic "heat" to an assembly of students **also makes absolutely no sense**.

In this context, my answer is a resounding no.

— —

Comment **#40**

Sadi-Carnot (Libb Thims)
Sep 7 2009, 10:01 PM EDT

I'm going to (hopefully) end this dismal conversation off with a note that Moriarty gets his understanding of entropy ("as they sort of spread out or move around [from this packed state], we say that they are moving to a high entropy state … and that's what entropy's really about ... about this dispersal of energy, about moving from a state where everything is nicely packed and close together to one where everything is spread out"), from someone who flunked out of senior level thermodynamics and was forced to switch majors from physical chemistry to organic chemistry:

http://www.eoht.info/page/Energy+dispersal

A good rule of thumb we can all learn from this extended debate is that if you are going to copy off someone (in a test or YouTube video), make sure it is from the one who gets an A in the class, not from the ones who eventually drop out of the class or have trouble passing.

— —

Comment **#41**

AaronAgassi (Aaron Agassi)
Sep 7 2009, 11:46 PM EDT

Indeed, what is student heat? Is it anything like teen spirit? Or is it, or so I gather, a factor of compression and agitation of people in crowds? And is it quantifiable? It just might be. But why would any of that be important or interesting? Perhaps it might even factor into human movement patterns for building designs in Situationist applied unitary urbanism. But any of that doesn't validate or even connect application to Sociology or Politics.

Incidentally, Americans, particularly from the open plains, tend to stand further apart in conversation, than Japanese who live under high population density. So at cocktail parties, an American chatting with a Japanese will constantly back away in order to adjust acceptable distance, while the Japanese adjusts position by closing distance. Thus the most diminutive Japanese might actually be seen chasing the largest most burly strapping American around the room! Does this then mean that Americans are made of exotic negative matter?

— —

Comment **#42**

Sadi-Carnot (Libb Thims)
Sep 8 2009, 12:02 AM EDT

Aaron, now your getting the idea. The basic theory of heat in connection to the universal expansion of bodies (systems of students or blocks of ice) originated in the 1720 chemistry lectures of Dutch physician Herman Boerhaave, in what was known as Boerhaave's law:

"Ever body, whether solid or fluid, is augmented in all its dimensions by any increase of its sensible heat."

This quote formed the basis of French chemist Antoine Lavoisier's 1787 caloric theory (heat particle view of heat), which in turn led to German physician Rudolf Clausius' 1865 theory of the entropy function as a formula for heat (a correction to the caloric theory).

P.S. on your comment “Perhaps it might even factor into human movement patterns for building designs”, I coincidently happen to be reading this very minute Italian architect Luis Fernandez-Galiano’s 1982 book Fire and Memory: On Architecture and Energy:

http://www.eoht.info/page/Luis+Fern%C3%A1ndez-Galiano

in which he works out some of this logic in terms of thermodynamics, although I’m only on page six at the moment.

Regarding your question “why would any of that be important or interesting?”, from my point of view (similar to C.G. Darwin), is that of prediction:

http://www.eoht.info/page/Prediction

Someone, 200-300 years from now, will be able to predict whether or not any given human chemical reaction will occur, e.g. divorce or 50-years of happy marriage, based on calculated measures of energy and entropy, just as is done with smaller chemical reactions. In other words, in the near future (not likely in our lifetime), people will be able to choose mates intelligently (20-30% rate of divorce at the 15-year mark), rather than willy-nilly (43% divorce rate at the 15-year mark, the current rate).

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Comment **#43**

Petrologist (Bruce Bathurst)
Sep 8 2009, 1:43 AM EDT

The debate I found did not explain any topics of contention. Here, because I was requested to comment, are some suggestions that come to mind for a sociologist or psychologist who is scraping thermodynamics for ideas. I offer these because I don't argue. These are based upon some experience using only the Gibbs-Duhem equation to study geological processes that could be proved equilibrium within their well-defined domains of space and time. Has human thermodynamics a phase rule?

Geology, however, is a natural, objective science. Classical thermodynamics is a physical science that, we believe, imposed restrictions upon geological phenomena that involved heat and work. Because minerals are crystalline phases, without molecules, classical rather than chemical thermodynamics was my natural choice.

The most restrictions are imposed upon equilibrium processes; and it is these that can be traced backward, from final to initial states. Many geological processes can be demonstrated to have been equilibrium (to varying degrees of assuredness), their slowness and high temperatures apparently permitting the changes within a hand specimen to have proceeded so efficiently that we cannot detect any production of 'uncompensated heat'. The application of equilibrium thermodynamics, with its many conservative equations, to a natural classification of geological objects was anticipated to be a very fertile field of study. This should be the same with a valid human thermodynamics.

The above I describe in detail because the development of a theory involving efficiency to economics, societies, or personalities might well borrow ideas from the application of thermodynamics to the natural sciences. The great differences are that one is concerned little with heat & work, and these subjects are sciences in the philosophical use of that term: the objects of interest in Human Thermodynamics would appear to be subjective, not objective.

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Comment **#44**

Petrologist (Bruce Bathurst)
Sep 8 2009, 1:47 AM EDT

State variables, cycles, and differential equations whose integrals are conservative are all related. Thus a First Law will exist if cycles & states do, making the concept of the First Law vary with one's point of view (alluded to by Poincaré). The only real restriction on content appears imposed by one's definition of entropy, an extensive quantity.

The entropy, no matter what it measures, is itself conserved during processes sufficiently efficient to be cyclic. Its dual, temperature, must be an intensive quantity; and their product must have the units of energy. There are normally C + 2 such pairs, their sum defining the energy function itself. One avoids the constants of integration by arbitrarily setting the

energy of a phase of a substance to zero. (Here only two laws are used.)

Statistical thermodynamics I don't work with. However, students arranged even by the absurd process of bouncing off walls, by rotating, stretching, and flying, won't define an entropy without a consistent energy function first. The energy is required to make entropy a state variable. One typically counts the number of equivalent arrangements; 'equivalent' meaning first sameness of volume, then energy. Their product enumerates states equivalent in both volume & energy. Ultimately, S(U,V) is created and transformed into the Gibbs equation G(T,-p). The simplicity of molecular motion is the simplicity of thermodynamics; so, whether molecules that think can produce a (simple) thermodynamic theory is, I believe, worthy of thought.

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Comment **#44**

Petrologist (Bruce Bathurst)
Sep 8 2009, 1:53 AM EDT

It is very useful, when creating one's own theory, to consult original literature. 'Vis viva' may have had some qualities lost when honed into work. However, older quantities were abandoned for a good reason: one needs to know what it this reason was. Older literature by anyone other than the best of scientists is often wrong. However, papers by excellent scientists often offer much simpler but deeper explanations than current texts or treatises provide. Great care needs be taken.

Once one leaves the exactly equilibrium realm, temperature (& entropy) are no longer extant. To force useful chemical relations near equilibrium, one must assume that the Gibbs equation (or any characteristic function of extensive variables) extends smoothly into the non-equilibrium domain. This is an axiom that supplements the laws of thermodynamics, and fails far from equilibrium.

Though I have no clear (or even fuzzy) picture of what human thermodynamics is (no Flash, sorry), classical thermodynamics is a very fundamental, physical theory whose study I can see contributing many ideas to softer 'sciences'. One need always remember, of course, that objective science does not offer theories that can relate natural objects of interest in the softer 'sciences'; for these natural objects are subjective, not objective. To attempt this would, in essence, be an attempt to replace philosophy with science.

Here one replaces Bridgman's scientific definition with Pierce's philosophical one: the concept of a kiss is not a gentle touching of lips: it is, rather, subjective '... effects, that might conceivably have practical bearings ... .' :-) To replace philosophy with objective science is, ultimately, to create a new religion.

These three posts offer personal suggestions that come to mind, not criticisms of what I don't understand. They are not part of a debate, but may add some substance.

— —

Comment **#45**

AaronAgassi (Aaron Agassi)
Sep 8 2009, 3:13 AM EDT

I reject Quantum indeterminacy in favor of ordinary measurement uncertainty, indeed a function of Thermodynamics being an aspect of classical physics, under the physics of Fisher information. (I is the Law) Hence I can except superdeterminism at least in principle. Nevertheless, long range projection of interaction between specific particles remains unfeasible, so simply analogizing people to particles and ignoring all the differences, won't predict much either, Sociometrically.

— —

Comment **#46**

Anonymous (Philip Moriarty)
Sep 8 2009, 4:31 AM EDT

"I'm going to (hopefully) end this dismal conversation off with a note that Moriarty gets his understanding of entropy ("as they sort of spread out or move around [from this packed state], we say that they are moving to a high entropy state … and that's what entropy's really about ... about this dispersal of energy, about moving from a state where everything is nicely packed and close together to one where everything is spread out"), from someone who flunked out of senior level thermodynamics and was forced to switch majors from physical chemistry to organic

chemistry:

http://www.eoht.info/page/Energy+dispersal

A good rule of thumb we can all learn from this extended debate is that if you are going to copy off someone (in a test or YouTube video), make sure it is from the one who gets an A in the class, not from the ones who eventually drop out of the class or have trouble passing."

Sorry, but I couldn't let this go: What a despicable ad hominem attack on Lambert. That you have to resort to this attempt at character assassination underscores why it's time to call an end to this "debate". Lambert has had his work published in a number of high quality peer-reviewed journals and very many text-books have already adopted his approach to explaining entropy. Why do you think this is? (Have you tried submitting your work to any of the journals in which Lambert has published?)

— —

Comment **#47**

Anonymous (Philip Moriarty)
Sep 8 2009, 4:49 AM EDT
"Aaron, now your getting the idea. "
Aaron states "Does this then mean that Americans are made of exotic negative matter?". Your response? "Aaron, now your [sic] getting the idea".

I rest my case.
Philip Moriarty

— —

Comment **#48**

Sadi-Carnot (Libb Thims)
Sep 8 2009, 11:01 AM EDT
I wish Moriarty would simply admit that he doesn’t know what entropy is.

To review, in his first video he tries to explain what entropy is using the 1890 Poincaré recurrence theorem (a statement from a paper on the three body problem):

http://www.eoht.info/page/Poincar%C3%A9+recurrence+theorem

which is not what entropy is. In his second video, he tries to explain entropy using the 2002 views of ninety-year old, basically unknown, American chemist Frank Lambert, who “never liked thermo”, who throughout his first 80-years of life admitted (to me) that he never understood what entropy was, who has never read the any of the works of Clausius (as he admitted to me), and who couldn’t handle physical chemistry (or his thermodynamics classes), because they were too difficult (thus switching to an easier subject). Phil, there’s no shame in saying that you don’t understand something. Many have:

http://www.eoht.info/page/Entropy+quotes

If you want to understand what entropy is you have to physically open the 1865 (or 1875) textbook The Mechanical Theory of Heat and read it. Reading is fundamental.

— —

Comment **#49**

Anonymous (Philip Moriarty)
Sep 8 2009, 11:14 AM EDT
"....If you want to understand what entropy is you have to physically open the 1865 (or 1875) textbook The Mechanical Theory of Heat and read it. Reading is fundamental."

"I wish Moriarty would simply admit that he doesn’t know what entropy is. Libb Thims"

Libb, my Thermal and Kinetic course notes are at www.nottingham,.ac.uk/~ppzpjm/F1ST1. I'll let interested contributors/visitors to your Wiki judge for themselves my grip on the concept of entropy.

Philip Moriarty

— —

Comment **#50**

Anonymous (Philip Moriarty)
Sep 8 2009, 11:21 AM EDT
"Libb, my Thermal and Kinetic course notes are at www.nottingham,.ac.uk/~ppzpjm/F1ST1. I'll let interested contributors/visitors to your Wiki judge for themselves my grip on the concept of entropy.

Philip Moriarty"
Apologies - that should be www.nottingham.ac.uk/~ppzpjm/F31ST1.

Philip Moriarty

— —

Comment **#51**

telosx (Peter Pogany)
Sep 8 2009, 11:24 AM EDT
Taken together, extraction of low entropy from and insertion of high entropy into the environment makes the global economy and, by extension, all human activity on the aggregate a throughput of energy, with a second-law-dictated degradation in tow. (Economic growth, of course, increases the throughput with derivable consequences.)

These are introductory level observations in ecological economics but they provide a “from the top down,” intuition-honing demonstration why interactions even among a small group of people over a very short period of time are within the purview of “human thermodynamics.” Such activities may be regarded as “formal objects” of infinitesimal size in a triple integral where the integrand is a function of time, surface in use, and contribution to entropy in the terrestrial sphere. This last operator certainly has the aura of a fix, but it cannot be ruled out and it may indeed be not more ad hoc than what physicists admit as legitimate subjects of discussion (Einstein’s “cosmological constant” comes to mind).

There are many arguments in favor of Libb’s perspective even if we start “from the bottom up.” They may be numerically only ordinal and very general, yet they are intelligible and rational – built exactly on what physics provided by being cardinal, specific, sensible, and empirical. Interdisciplinary consciousness research and cognitive neuroscience (both of which include philosophy); experimental economics, cogent reasoning in trans-subjective psychology, and scholarly parapsychology help make the contrarian standpoint, which raises nitpicking empiricism to the rank of a criterion of truth, look rather dogmatic and outdated.

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Comment **#52**

Anonymous (Philip Moriarty)
Sep 8 2009, 11:24 AM EDT
"If you want to understand what entropy is you have to physically open the 1865 (or 1875) textbook The Mechanical Theory of Heat and read it. Reading is fundamental."
Reading is certainly fundamental. I prefer, however, to keep up to date with the current literature and use this to complement my reading of classic (and classical physics) texts. Try it, Libb - you might find it illuminating.

Philip

— —

Comment **#53**

Anonymous (Philip Moriarty)
Sep 8 2009, 11:34 AM EDT
"Taken together, extraction of low entropy from and insertion of high entropy....

....scholarly parapsychology help make the contrarian standpoint, which raises nitpicking empiricism to the rank of a criterion of truth, look rather dogmatic and outdated. "

This is exactly the type of jargon-ridden and empty language that Alan Sokal so successfully lampooned with his "Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity" spoof paper, published in Social Text in the mid-nineties. It strikes me that Human Thermodynamics would be an ideal subject for a similar treatment.

"Such activities may be regarded as “formal objects” of infinitesimal size in a triple integral where the integrand is a function of time... "

What the heck does that mean?! Please write down this triple integral for me, putting in the appropriate limits. If the integrand is a function of time, please write down the form of that function. Any scientist will attempt to write as clearly as possible. As Sokal cleverly highlighted, obscure language is generally a very good way to hide a lack of substance in the discussion/argument.

Philip Moriarty

— —

Comment **#54**

Anonymous (Philip Moriarty)
Sep 8 2009, 11:38 AM EDT
@telosx: Might I ask what your professional background is? Are you a mathematician, a physicist, a social scientist, a chemist etc...?

Philip Moriarty

— —

Comment **#55**

Anonymous (Philip Moriarty)
Sep 8 2009, 12:03 PM EDT
"I wish Moriarty would simply admit that he doesn’t know what entropy is."
Libb, Further to the post above which includes a link to the lecture notes I prepared for the Thermal and Kinetic Physics course (www.nottingham.ac.uk/~ppzpjm/F31ST1), you might find it informative to download Tutorial Problem Sheet #3. Please feel free to attempt the problems related to entropy - I'd be more than willing to grade your work.

Philip Moriarty

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Comment **#56**

Sadi-Carnot (Libb Thims)
Sep 8 2009, 12:46 PM EDT
Regarding Petrologist’s question: “Has human thermodynamics a phase rule?”, the first attempt at this was done by American historian Henry Adams in his 1909 article “The Rule of Phase Applied to History”, who specifically defined people as “human molecules”. Some of the more recent work on this subject comes from German physicist Ingo Muller (a member of this wiki), author of the 2007 *A History of Thermodynamics*. I’ll give you a sample quote from his 2005 textbook Energy and Entropy (pg. 208) on socio-thermodynamics:

> “Chemists, physicists, and engineers will recognize the construction and interpretation of the strategy diagram from metallurgy or alloys or physico-chemistry of solutions where phase diagrams are constructed … total segregation of the constituents occurs in those fields as the phenomenon of unmixing, like the fat globules float on watery soup. Such analogies emphasize the point of view that physical or sociobiological elements are atoms and molecules or birds and maybe men. And yet the forgoing is not socio-thermodynamics. While it seems plausible that birds strive for maximum gain, a principle like that is begging the question. What we are missing so far are the analogues in sociobiology to the first and second laws of thermodynamics.”

There is also phase rule logic using a human molecule perspective in the 1998 article “Human Societies a Curious

Application" (a scan of the article below) by Venezuelan chemical engineer and thermodynamics professor Erich Muller.

— —

Comment **#57**

AaronAgassi (Aaron Agassi)
Sep 8 2009, 1:23 PM EDT
"Aaron states "Does this then mean that Americans are made of exotic negative matter?". Your response? "Aaron, now your [sic] getting the idea". I rest my case. Philip Moriarty"

Context much? To be fair, I think that he let my jibe pass him by.

Nor, alas, did he grasp my point again pursuing the falsity or breakdown of argument by analogy because analogies are necessarily limited, by which I mean: how such modestly successful correlations quickly meet limitations. Indeed, he looks to the future for working out the little kinks in the bold new Methodology, thereby realizing the awesome potential of groundbreaking insight. Well, wouldn't that require someone, eventually, actually to grapple with the problems openly? At least the attempt might be more edifying.

— —

Comment **#58**

Anonymous (Philip Moriarty)
Sep 8 2009, 4:34 PM EDT
"Context much? To be fair, I think that he let my jibe pass him by."
Aaron: The very fact that he allowed your jibe to "pass him by", as you say, speaks volumes. Indeed, your jibe is hardly any more ludicrous than the rest of Libb's Human Thermodynamics thesis.

Time and time again I have posed questions regarding the physics which supposedly underpins Human Thermodynamics and have been met with one of the following responses from Libb:

(a) Some elementary high school physics which does not begin to address the question I posed;

(b) evasion and/or obfuscation;

(c) Recourse to authority - citing wikipedia entries and/or textbooks, instead of addressing the question directly;

or (d) abuse directed either at me or others.

(I would also be keen to know the opinions of his tutors/lecturers on his Human Thermodynamics "concept".)

Philip

— —

Comment **#59**

Sadi-Carnot (Libb Thims)
Sep 8 2009, 4:48 PM EDT
My thesis (that the laws of thermodynamics govern human existence) is ludicrous? Let me explain things to you through the 1928 words of English astronomer Arthur Eddington:

> "If someone points out to you that your pet theory of the universe is in disagreement with Maxwell's equations — then so much the worse for Maxwell's equations. If it is found to be contradicted by observation — well, these experimentalists do bungle things sometimes. But if your theory is found to be against the second law of thermodynamics I can give you no hope; there is nothing for it but to collapse in deepest humiliation."

In short, if you think the second law doesn't apply to a system of students, then you are floating on a pet theory, and you (and your students) will eventually collapse in deepest humiliation.

— —

Comment **#60**

Anonymous (Philip Moriarty)
Sep 8 2009, 5:00 PM EDT

"My thesis (that the laws of thermodynamics govern human existence) is ludicrous? Let me explain things to you through the 1928 words of English astronomer Arthur Eddington: "If someone points out to you that your pet theory of the universe is in disagreement with Maxwell's equations — then so much the worse for Maxwell's equations. If it is found to be contradicted by observation — well, these experimentalists do bungle things sometimes. But if your theory is found to be against the second law of thermodynamics I can give you no hope; there is nothing for it but to collapse in deepest humiliation." In short, if you think the second law doesn't apply to a system of students, then you are floating on a pet theory, and you (and your students) will eventually collapse in deepest humiliation."

Libb.

See my comment above about recourse to authority. And when did I ever suggest that I had any difficulty with the 2nd law of thermodynamics?! Don't ascribe statements or opinions to me that I did not put forward - that's deeply unfair. Have you taken a look at my Thermal and Kinetic Physics notes yet? You'll find my stance on the 2nd law clearly outlined there.

Philip Moriarty

— —

Comment **#61**

Anonymous (Philip Moriarty)
Sep 8 2009, 5:24 PM EDT
@Sadi-Carnot:

To suggest that your thesis is that the laws of thermodynamics "govern human existence" is a grossly misleading understatement. Your thesis (such as it is) is that there are quantum mechanical, chemical bonds between humans which can give rise to "human reactions" and that there are enthalpic/entropic contributions to a "human" free energy function (see: human free energy). I was going to walk away from this - and leave you to your delusions - until your deeply unfair attack on Frank Lambert. To attempt to belittle someone in a very public forum as you did is both despicable and unforgivable.

So, let's start with your fundamental nonsensical premise, i.e. that quantum mechanical bonds exist between humans. Where do I start? Well, off the top of my head:

> (i) If humans can be described by wave mechanics then why do we not diffract when we go through obstacles (such as doorways)? Why do two humans not interfere constructively/destructively when they interact with each other? Why can we not see interference patterns for humans (just as we do for electrons of photons in the double slit experiment)?
>
> (ii) Where is your evidence for these quantum mechanical wavefunctions? Can you plot out a probability density function for a human?
>
> (iii) Do you understand the most fundamental quantum mechanical relations? What is the relationship between wavelength, momentum, and Planck's constant? Why do we not see quantum mechanical effects at the macroscopic level?

This is all basic 1st year undergraduate physics. Oh, and please don't tell me I'm off topic. (See my earlier comments) I'd also appreciate it if you answered in your own words rather than citing a textbook or Wikipedia.

Philip Moriarty

— —

Comment **#62**

Anonymous (Philip Moriarty)
Sep 8 2009, 5:26 PM EDT
To clarify question (iii) in my previous post (#65) - by "macroscopic" in this context, I mean on the length scale of humans.

Philip

— —

Comment **#63**

Sadi-Carnot (Libb Thims)
Sep 8 2009, 5:37 PM EDT
To clarify your derogation that I gave you a “high school” definition of work, the definition I gave you (the measure of a force moving an object through a distance) is the definition of work upon which all of science is built. All modern definitions of work come from French physicist Gustave Coriolis’ 1829 textbook Calculation of the Effect of Machines. The next method is the integration of the volume changes of the surface of the system under study. This was first done graphically by French physicist Emile Clapeyron in 1834, over 38 years after the invention of the indicator (device used to get the data) by James Watt and John Southern. In the study of work done by volumes of human systems, we do not yet have an indicator, thus calculations of volumetric work still in the theoretical stages. It may be another 38 to 138 years before we can do this.

Without these instruments, attempt to express human work in joules are going to be very crude. An example is the 1930s efforts by American engineer Howard Scott (and his Technocrat group) to replace currency by energy certificates and to thus measure an hour of a day’s work in foot-pounds. His failure highlights many of the issues involved in calculating human work, thermodynamically. I’ll answer more of your questions later.

— —

Comment **#64**

Anonymous (Philip Moriarty)
Sep 8 2009, 5:43 PM EDT
"To clarify your derogation that I gave you a “high school” definition of work, the definition I gave you (the measure of a force moving an object through a distance) is the definition of work upon which all of science is built. All modern definitions of work come from French physicist Gustave Coriolis’ 1829 textbook Calculation of the Effect of Machines. "

Oh, dear me. If you're enrolled for an MS degree in Physics you must surely know that work is the scalar (dot) product of two vector quantities. If I hold an object a metre from the ground and walk 10 metres in a northerly direction while holding the object precisely 1 metre from the ground, how much work have I done on that object?

Philip Moriarty

— —

Comment **#65**

Anonymous (Philip Moriarty)
Sep 8 2009, 5:47 PM EDT
Quoting Sadi-Carnot from Comment #66 above: "It may be another 38 to 138 years before we can do this..."

Ermmm? Why "38 to 138" years? Why not 100 years or 10 years? Why did you choose a rather precise "38 to 138" for what is effectively only a completely groundless prediction on your part?

Philip Moriarty

— —

Comment **#66**

Anonymous (Philip Moriarty)
Sep 8 2009, 6:00 PM EDT
@Sadi-Carnot.

You continually give me links to Wiki pages which describe basic thermodynamic processes/measurements/physics. I am very well aware of these thermodynamic principles. My argument with you is not that basic thermodynamics is flawed! What's flawed is your remarkable assertion that these principles can be applied to "human molecules".

Your laughable central premise is as follows: "Well, a human is made of lots of atoms. Therefore a human is just a big molecule. Big molecules will behave just like small molecules. Therefore I can apply all thermodynamic principles to human "molecules" ".

So, please stop citing basic physical principles which I fully understand and give me answers to the questions I've asked you in Comment #64 (and elsewhere). In your own words. Without citing your WIki pages (or Wikipedia). Any 1st year Physics undergraduate could address my questions in a few sentences. Please try to do this.

Philip Moriarty

— —

Comment **#67**

Anonymous (Philip Moriarty)
Sep 8 2009, 7:17 PM EDT
@Lynnliss: This 'anonymous' user is Philip Moriarty. Try reading the preceding comments in the debate between myself and Libb Thims (Sadi-Carnot). On a matter of principle, I refuse to "sign up" for this Wiki, based, as it is, on nonsensical pseudoscience.

Philip Moriarty

— —

Comment **#68**

Petrologist (Bruce Bathurst)
Sep 8 2009, 7:22 PM EDT
Speaking of students bouncing off walls, I thought work was substituted with 'vis viva'. In any case, a serious typo in my second post (mathematical requirements), I just corrected to show why energy (not entropy, clearly) is needed before defining entropy. (Yet another requirement to be met.)

My three tedious posts indirectly asked many questions, questions that I can't answer: (1) Is the study of equilibrium states more fertile than far-from equilibrium states? (2) Are your variables analogous to intensities, densities, extensities, and energies? (3) Are the objects represented by these variables objective or subjective?

Anything that responds, including humans, will likely obey LeChatelier's Principle. One might even find restricted circumstances under which a quantitative relationship can be useful in relating well-defined, objective statistics. This could be a very valuable theorem in sociology; but it is not an application of thermodynamics. Thermodynamics, however, may have provided some ideas for its conception.

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Comment **#69**

AaronAgassi (Aaron Agassi)
Sep 8 2009, 10:48 PM EDT

So, crowds compressed into closed spaces and agitated, behave at all like unto clouds of particles, even so much that behavior thereof may howsoever be described by thermodynamics equations. All fine and good. To then jump to the optimistic conclusion that any broader sociological application of thermodynamics only waits in the wings, is like concluding that because cranberries are red and edible, therefore red fire engines must be tasty too! That is the falsehood of argument by analogy.

Indeed, the application for traffic flow for architecture is probably the best that will ever come, because that is enough of a closed system and simplified besides and because individual human qualities have such little impact in this limited application.

Sadi-Carnot gathers ever more sociological observations that can be correlated by whatever strained metaphors to thermodynamics, but has yet to make predictions, testable hypotheses with standards of refutation.

Anyone tired of this tripe is invited to my own website and forums, htto://www.FoolQuest.com to decide if at least my madness has any better method.

— —

Comment **#70**

Sadi-Carnot (Libb Thims)
Sep 9 2009, 2:07 AM EDT
This discussion has been dragging on and we don't yet seem to have resolution on the question posed.

To recap, Moriarty (a physicist) adamantly seems to believe, as professed in his second YouTube video on entropy, that "you cannot say that a particular arrangement of students has a thermodynamic entropy". This certainly is one opinion.

To cite a differing opinion, the second person to comment in on this thread, Wolfgang Muschik (a physicist), professor of thermodynamics and statistical physics at the Technical University of Berlin, states that: "yes, you can: If you have a certain defined distribution function related to these students, you can define an entropy."

So who is correct Muschik or Moriarty? Can we or can we not define an entropy for a system of people?

My inference from comment #63 is that Moriarty believes that the laws of thermodynamics govern human existence? If this is truly his view, then I am guessing that he believes the second law governs human systems (or arrangements), but that the measure of this effect, the entropy, cannot be quantified, measured, or even verbally said to exist? Muschik, conversely, says it can be defined.

In this context, I would much like Moriarty to clearly explain why he is correct and Muschik is wrong?

— —

Comment **#71**

Anonymous (Philip Moriarty)
Sep 9 2009, 4:44 AM EDT
"This discussion has been dragging on and we don't yet seem to have resolution on the question posed. To recap, Moriarty (a physicist) adamantly seems to believe, as professed in his second YouTube video on entropy, that "you cannot say that a particular arrangement of students has a thermodynamic entropy". This certainly is one opinion. To cite a differing opinion, the second person to comment in on this thread, Wolfgang Muschik (a physicist), professor of thermodynamics and statistical physics at the Technical University of Berlin, states that: "yes, you can: If you have a certain defined distribution function related to these students, you can define an entropy." So who is correct Muschik or Moriarty? "

I addressed this question in some detail way back in Comment #7. At that point, however, I believed you when you said that you were studying for an MS in Physics. You've now refused to answer a very simply question related to your claim - i.,e. where are you doing your degree? - at least five times. I am led to the conclusion that you are not enrolled on an MS in Physics course and that you are, let's say, "stretching the truth".

From now on, I'll therefore take it that you are not studying for an MS in Physics (which of course brings into doubt your claims about the other degrees you are supposedly pursuing and, moreover, any of the claims in your biog). This explains your inability to answer any of my simple 1st year physics questions in the comments above.

Your simple-minded "So who is correct, Muschik or Moriarty?" question betrays just how little you understand. We're both correct! It's frustrating to have to explain this to you yet again - given your arrogance with regard to the work of Lambert, for example - but I'll do so in the next comment.

— —

Comment **#72**

Anonymous (Philip Moriarty)
Sep 9 2009, 5:06 AM EDT
"So who is correct Muschik or Moriarty? Can we or can we not define an entropy for a system of people?"
Right, let's try to clear this up once and for all. We can of course define an entropy for a distribution function. This is of the general form S = - (Sum of) [(p_n) ln (p_n)] where p_n are probabilities extracted from the distribution function, "ln" means natural log, and (Sum of) is my attempt to write a capital sigma without the benefit of mathematical typesetting.

This of course is rather similar in form to the formula for entropy we can write down from statistical mechanics BUT **it is not the same as a thermodynamic entropy (S)**. To define S, we need to have thermodynamically **accessible** microstates (Boltzmann). This is perhaps best described using the "playing cards" analogy: we can set up very many different microscopic configurations (microstates) for the cards (and thus think about a value of entropy in a statistical sense) **but the cards don't shuffle themselves**. The microstates aren't thermodynamically accessible.

Similarly, we can *in principle* write down a **statistical measure** of entropy for a distribution of people but this is not the same as the thermodynamic entropy. The people do not move from one state to another - i.e. you don't change the occupation of microstates - by changing the thermodynamic temperature. You can make whatever childish analogy you want between "sexual" and "thermodynamic" temperature but that's all it is - an analogy (and an extremely poor one).

You're not the only one to get confused. See: von Neumann entropy (link). I'd very much like to hear Prof. Muschik's thoughts on the above and this paper: (link).

— —

Comment **#73**

Anonymous (Philip Moriarty)
Sep 9 2009, 5:10 AM EDT
Re. Comment #77 above:

My apologies - the hyperlinks that I inserted (i.e. <a href=....>) didn't work. Please simply copy and paste the URLs into the address bar of your browser.

Thanks. Philip Moriarty

— —

Comment **#74**

Anonymous (Philip Moriarty)
Sep 9 2009, 5:43 AM EDT
"In this context, I would much like Moriarty to clearly explain why he is correct and Muschik is wrong...."
In the spirit of open debate, I thought it best to include here a copy of an e-mail I sent Prof. Muschik a few minutes ago:

Dear Prof. Muschik,

Thank you for contributing to the debate that I have been having with “Libb Thims” (I suspect that this is a pseudonym!) at his Human Thermodynamics Wiki. I have posted a couple of responses to your (and Libb’s) comments – see Comments #7, #76, and #77. I’d be very interested in reading your response to these comments.

Ordinarily, I would not pursue an online debate of this type with such “vigor” but I have been disappointed and shocked by Thims’ willingness to indulge in quite abusive ad hominem attacks. Note his attempt to slur the academic credentials/qualifications of Prof. Frank Lambert in Comment #39. Thims has a habit of doing this – he has an entire page dedicated to Lambert which includes more abuse along these lines.

What is particularly irritating is that it is clear that Thims has been lying about his pursuit of a masters degree in physics.

It is clear from his inability to answer the simplest questions in physics that he has no understanding at all of fundamental physical principles. He is certainly very well read in thermodynamics but has absorbed very little physical intuition from what he's read – he knows the history (better than me) but not the physics.

As I state in Comment #69:

> Your [Thims'] laughable central premise is as follows: "Well, a human is made of lots of atoms. Therefore a human is just a big molecule [see: Eadon poll]. Big molecules will behave just like small molecules. Therefore I can apply all thermodynamic principles to human "molecules" [see: human molecule]".

..contd in next comment.

— —

Comment **#75**

Anonymous (Philip Moriarty)
Sep 9 2009, 5:44 AM EDT
...contd. from Comment #74:

It's not surprising that this type of pseudoscientific nonsense is being put forward on the web. What is very surprising, however, is that Thims has (apparently) been invited by a university to present a lecture [Note: to bioengineering thermodynamics students, at University of Illinois; see: Thims lectures] on his human thermodynamics rubbish. To equate – literally (!!) – a "sexual temperature" with a "thermodynamic temperature" is so wrong-headed as to beggar belief. In addition, his arguments about human "wavefunctions" [see: human wave function] (or orbitals) [see: human molecular orbital] and "human bonds" [see: human chemical bond] are what I would expect from someone with absolutely no understanding of science.

I would very much welcome hearing your thoughts on the above (or at Thims' Wiki).

— —

Comment **#76**

Anonymous (Philip Moriarty)
Sep 9 2009, 5:52 AM EDT

> "To cite a differing opinion, the second person to comment in on this thread, Wolfgang Muschik (a physicist), professor of thermodynamics and statistical physics at the Technical University of Berlin, states that: "yes, you can: If you have a certain defined distribution function related to these students, you can define an entropy. So who is correct Muschik or Moriarty? Can we or can we not define an entropy for a system of people?"

And yet again, Libb, your only response is to quote an authority figure. This has been your tactic throughout and betrays your very weak understanding of physics and physical chemistry. Anybody can quote authority figures - it takes somewhat more effort to develop your own counter-arguments. You have consistently shown that you are unable to do this.

— —

Comment **#77**

Anonymous (Philip Moriarty)
Sep 9 2009, 6:57 AM EDT
Aaron, you are entirely correct to dismiss the concept of human thermodynamics, as put forward by Sadi-Carnot/Libb Thims, as tripe. Sadi-Carnot has studied the history of thermodynamics in quite some detail - and is certainly better versed in the minutiae of the historical development of certain concepts than I - but he has little or no grasp of the underlying physics.

> "Thims gathers ever more sociological observations that can be correlated by whatever strained metaphors to thermodynamics, but has yet to make predictions, testable hypotheses with standards of refutation".

Indeed. Moreover, instead of debating the scientific issues using reasoned counter-arguments, he continually simply quotes from experts (often entirely missing the point of the question) and arrogantly attacks those who do not share his outlandish views via nasty ad hominem attacks.

Richard Feynman once put forward an interesting single sentence definition of science: "Science is the belief in the ignorance of experts". Once an argument is *solely* based on, as I put it above, "recourse to authority" - Thims's preferred approach - then one appreciates the point that Feynman was trying to make. It's a question of critical thinking.

— —

Comment **#78**

AaronAgassi (Aaron Agassi)
Sep 9 2009, 11:13 AM EDT

One reason for disagreement is indeed misunderstanding from ignorance, but that isn't the only possible motivation. Perhaps it is Thims who needs to pose question in order to understand his opponent, before then attempting more pertinent rebuttal.

To wit: I would also like to press home, again, my point regarding the limits of argument by analogy.

It is remarkable that both sound and light could actually be waves. If truly so, even then, waves are waves. But the heat in human thermodynamics is cleanly heat in an equivocal sense, much the way the hand of a statue is a hand. After all, human beings also engage in decidedly non particle-like behaviors. The heat in human thermodynamics is supposed to have formal similarities to actual physical heat, enough so that thermodynamics equations might at all describe events, much less predict outcomes. It is an analogy or metaphor. And the question then remains open, how far the metaphor extends before breaking down into ignominiously cretinous failed reductionism. I submit, not necessarily anywhere near as far as Thims' boundless optimism. It will be novelty enough if the limited architectural application is fruitful, never mind efficient. The rest might be poetic, but only given competent poetry. That, at least, might be fruitful for poetry, and ever truly to glean human insight.

— — — — — — — — — — — — — — — — — — — —

Treating sound and light as waves is much, much more than just analogy/metaphor. If you're interested, some videos at the University of Nottingham's Sixty Symbols YouTube channel deal with the physics of waves - see:

http://www.youtube.com/watch?v=PLey7TTGXTw&feature=channel_page
http://www.youtube.com/watch?v=fytJ0ZsbIoQ&feature=channel_page
http://www.youtube.com/watch?v=vKS3-npxgls&feature=channel_page

In contrast, not only is the concept of heat [see: social heat] in Thims' Human Thermodynamics (HT) "equivocal" as you suggest, it is simply nonsense. You might as well state that interactions between human beings are mediated by strands of invisible spaghetti, tendrils of invisible cheese, or teams of invisible pixies. There is absolutely no evidence for what Thims is proposing. If he were putting forward HT simply as an analogy/metaphor for classical thermodynamics, that would be bad enough. However, his thesis is that it's not simply a metaphor - he argues that HT is a viable description of reality.

Philip (Moriarty)
— — — —

Petrologist (Bruce Bathurst)
Sep 10 2009, 4:34 AM EDT
This is a very fine site, with wonderful photos. I don't mean to strike anyone on the mat. However, this 'debate' might benefit from a broader perspective.

This evening I (quite independently) offered the Wikipedia my requirements to be called a 'creationist':

> 1. Traditional religions & traditional science must be in conflict.
>
> 2. Objective (shared) and subjective (personal) observations are treated the same.
>
> 3. The scientific use of the word 'true', which scientists strive to replace with 'false', is treated the same as the 'true' used by philosophers.
>
> 4. Hypotheses are judged by examining their explanations, not their predictions.

Here I add this:

> 5. Religion and art are not viewed as important irrational activities of the mind: faith is treated as logical and thus blurred with scientific belief. Irrational thought is viewed as inferior to rational thought.

My thread 'Why I am not a molecule' (Ñº) created a hostile insistence that science & religion must be in conflict, IMO; it is clear that a 'thermodynamics of everything' muddies the clear stream between science & religion; I failed to find 'truth' defined here, though 'science' is philosophical; & 'science' here explains, it doesn't predict. One may wish to search this site for 'prediction' or 'truth'.

To be continued ...

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Comment **#82**

Petrologist (Bruce Bathurst)
Sep 10 2009, 4:45 AM EDT
... continued from Part I

Even in Whewell's 1858 'Novum Organon Renovatum', we can find:

> 'The prediction of results, even of the same kind as those which have been observed, in new cases, is a proof of real success in our inductive processes.'

Here, 'Religious Thermodynamics' contains a solution to the 'creationism' problem, if (ironically) one is prepared to abandon the very core principles of physical & natural science:

> ' ... The popularization of this statement and others like it have led to the wide-spread belief, for many, that the laws of thermodynamics are in conflict with evolution. This, however, is not the case.

> 'The difficulty in clarifying the contradiction, to the appeasement of all naysayers, is, in particular, that the science of "human chemical thermodynamics" is a future branch of knowledge. The conception that a human being is, in reality, a "molecule", specifically, a human molecule, is a little understood or used concept in science.'

I'm sure it's only coincidence, but if 'creationism' is America's new Messiah, 'Human Thermodynamics' would appear to be its 'John, the Baptist' (if I may make an analogy, Aaron :-).

This in no way lessens Thims' arguments, so long as they use operational definitions and make many testable predictions.

— —

Comment **#83**

AaronAgassi (Aaron Agassi)
Sep 10 2009, 5:06 AM EDT
What testable predictions?

— —

Comment **#84**

AaronAgassi (Aaron Agassi)
Sep 10 2009, 7:33 AM EDT
"3. The scientific use of the word 'true', which scientists strive to replace with 'false', is treated the same as the 'true' used by philosophers."
Truth is correspondence to reality in assertions. Assertions are Ontological statements such as employ the verb: to be.

— —

Comment **#85**

AaronAgassi (Aaron Agassi)
Sep 10 2009, 7:37 AM EDT
"4. Hypotheses are judged by examining their explanations, not their predictions."
Both explanatory power and testability are always crucial.

— —

Comment **#86**

AaronAgassi (Aaron Agassi)
Sep 10 2009, 7:40 AM EDT
"5. Religion and art are not viewed as important irrational activities of the mind: faith is treated as logical and thus blurred with scientific belief. Irrational thought is viewed as inferior to rational thought."

Notes

N1. Re: "social Coriolis effect" (#80) this was first touched in by Ernst Mach, in his "turning tendencies" and expanded on by Thims in *Human Chemistry* (2007) and used in Thims' "Zerotheism for Kids" lecture, in the Crocodile Dundee morality example.

References

1. The Wolf-Watz NMR-lab – Chemistry.umu.se.

Continued

â— Moriarty-Thims debate (part two)
â— Moriarty-Thims debate (part three)

See also

â— Rossini debate

θΔics

In debates, the **Moriarty-Thims debate (part three)**, of three parts in total (see also: part one and part two), is shown below:

Debate: part three

The following is thread-to-page conversion re-paste of the debate, which took place in the general discussion forum of the eoht wiki from September 02-19, and is broken up into three approximately 20-page sections, the third part of which is shown below:

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Comment **#164**

Sadi-Carnot (Libb Thims)
Wednesday, 11:04 AM EDT
#101: AaronAgassi: “Will Sadi-Carnot propose proper experiments with conditions of falsifiability, in order to discover the range of similar applicability of thermodynamics? Or will he simply wait for the bold denizens of his fabulous future to buckle down on the due diligence?”

All good questions. To give you a synopsis of my overall plan. Back in 2001/2002, this was all just a lose puzzle solving sort of hobby for me (which it still is), but when in the Nov/Dec of 2001 I began to see a bit of clarity on the issue on how the application could be made, I decided to make an attempt at writing up a short 50-article on the presentation (human thermodynamics), for the sake of future generations.

Five-manuscripts, one-book, and one-textbook later, I still have not yet been able to give the rigorous presentation I envisage, being that the topic only becomes more involved the more one gets into it. Chapter 18, entitled Human Thermodynamics (pgs. 653-702), a simple overview chapter, is the only actual published product on human thermodynamics that I have made.

The human chemistry (2007) and human molecule (2008) books were precipitates of the overall effort to write a book or textbook on human thermodynamics, which I have not yet done. The human chemistry textbook, as I came to find, were needed precursor or preliminary foundation, prior to any writing on human thermodynamics could be attempted. In short, prior to these works, there had been no type of presentation of the view that people are human molecules (or chemical species, chemical entities, or whatever name you choose) and that processes such as when two people form a relationship are a purely chemical reactions, no different than when two hydrogen atoms from the dihydrogen molecule. With the EoHT wiki, I am in the process of collecting the numerous references on past work done on human thermodynamics. That is where I am at at the moment.

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Comment **#165**

Anonymous (Philip Moriarty)
Wednesday, 11:06 AM EDT
"I think what we have here is an issue similar to not seeing the forest through the trees, in that Phil cannot see the observable phenomenon through the equations with which he is acquainted with from statistical mechanics.

Entropy is entropy. It is a formulaic way of quantifying heat flow. Heated bodies expand, cooled bodies contract. This called Boerhaave’s law (1720). One expansion, followed by a contraction is called a heat cycle. During this process, the entropy of the body will increase, due to the mathematical result that some of the net heat inputs and outputs will be converted irreversibly into internal system work. These processes and law hold for every system or body in the universe. To argue against this is to argue against natural phenomena.

"...sigh... First, you are also stating that Muschik (comment #99) and Schmitz (#170) cannot "see the forest through the trees".

Second, let's focus on your "observable phenomenon" statement, given that you don't have the grasp of basic physics/mathematics needed to appreciate the arguments.

What observable phenomenon?

Has anyone *ever* done an experiment to measure a thermodynamic entropy change caused by cycling a group of people between two arrangements? Or has anyone ever measured the thermodynamic work done by cycling a group of people through a "heat cycle" as you suggest?

Yet again, your argument is: Humans are made of atoms. Therefore they are big molecules. Therefore they behave like any molecule. Therefore all "natural phenomena" (to use your term) that are applicable to small molecules are applicable to big "human molecules". Nonsense.

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#166**

Anonymous (Philip Moriarty)
Wednesday, 11:16 AM EDT
"I don’t see how your attempts to derogate this formulation (which you have never read) can be at all worth anything?
"
I don't need to read beyond the material posted at your Wiki to realise that you have not got the slightest understanding of quantum mechanics and that your "human bonding" "model" is as ludicrous as my satirical micro-bagel model in Comment #112.

Let me quote: "In this direction, human chemical bonds can be studied and modeled from a number of perspectives, such as an "orbital perspective", i.e. tracking the spatial movements of attached people over time on the surface of the earth, an "exchange force" perspective, in which an exchange of particles, which accompanies the interaction and transmits the force, operates, from a "quantum mechanical" perspective, in which quantum inputs or outputs of energy cause jumps in hierarchy location,..."

As I've said before, **anyone** can postulate junk like this. See Comment #112. Note, in particular, the issue of *evidence* raised in that comment.

If you're so convinced you're correct, here's a challenge: submit your work to Nature, Science, Physical Review Letters, Journal of the American Society or any one of the very many peer-reviewed journals that exist etc... and make it open for criticism by your peers. *Anyone* can do as you have done and publish a book of nonsense via a vanity-publishing organisation.

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#167**

Sadi-Carnot (Libb Thims)
Wednesday, 11:17 AM EDT
#77. Moriarty: “We can of course define an entropy for a distribution function (as a function of probabilities extracted from the distribution function) [and] we can *in principle* write down a **statistical measure** of entropy for a distribution of people but this is not the same as the thermodynamic entropy. To define S, we need to have thermodynamically **accessible** microstates (Boltzmann); [but for students] the microstates aren't thermodynamically accessible.”

And on this logic, you conclude, as stated in your video, that: “you cannot say that a particular arrangement of students has a thermodynamic entropy.”

I guess that this is where we are not seeing eye-to-eye? When I see the above statement (you cannot say that a particular arrangement of students has a thermodynamic entropy), I assume it to be a standalone statement, as though you could

put it on the back of T-shirt and it would be correct. In this sense (out the statistical mechanics scheme), your statement becomes incorrect, in that from a thermochemistry point of view, i.e. measures of heats of reactions, heat capacities, temperature, pressure, volume measurements, etc., one can calculate an entropy for any atomic arrangement. A configuration of students in a field, by definition, is an arrangement of students. This is where I think our difficulty on agreement is? Correct me if I am wrong.

— —

Comment **#168**

Anonymous (Philip Moriarty)
Wednesday, 11:18 AM EDT
"#127: JingChen: “I certainly agree with you that entropy can be used to describe human populations. There are many useful applications.”

Thanks for commenting. Morality seems to have little knowledge how prevalent the use of entropy is in economics (publications coming out at a monthly rate).
"
Thermodynamic entropy or **information theory** entropy?

Philip Moriarty

— —

Comment **#169**

Anonymous (Philip Moriarty)
Wednesday, 11:19 AM EDT
"Five-manuscripts, one-book, and one-textbook later, "
None of which peer-reviewed.

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#170**

Sadi-Carnot (Libb Thims)
Wednesday, 11:32 AM EDT
#69: Moriarty: “My argument with you is not that basic thermodynamics is flawed! What's flawed is your remarkable assertion that these principles can be applied to ‘human molecules’.”

As to this comment, I don’t see exactly you are objecting to. If you are objecting to the term “human molecule” being applied to you then that is one thing. Petrologist has commented, for example, in his “why I am not a molecule” thread that he is not a molecule because he has a soul that is under the direction of god? I’m not saying that you have this same view, but objects to the human molecule view tend to be like this.

In 1952, physicist C.G. Darwin, the person who defined “human thermodynamics” as the statistical mechanics study of systems of human molecules’, stated that he is a human molecule, but not a true molecule in that he has a free will owing to the unpredictability of human nature. Specifically: “When I compare human beings to molecules, the reader may feel that this is a bad analogy, because unlike a molecule, a man has free will, which makes his actions unpredictable.”

Hence, again, it is not my “remarkable assertion these principles can be applied to ‘human molecules’.” Correctly, although I stand behind my statements 100%, most of these “remarkable assertions” have been made by others before me. I am simply representing, clarifying and continuing the work in an updated fashion. Thus if you call me a crackpot promoting pseudoscientific drivel, then you are also calling the great English physicist C.G. Darwin, grandson of the great Charles Darwin, a crackpot promoting the same drivel.

— —

Comment **#171**

Sadi-Carnot (Libb Thims)
Wednesday, 11:38 AM EDT

#63: Thims: “if you think the second law doesn’t apply to a system of students, then you are floating on a pet theory.”
Moriarty: “when did I ever suggest that I had any difficulty with the 2nd law of thermodynamics?”

I don’t know what to say about this response? It seems we are running in circles. When I press you with the simple question: does the second law govern society?, you will no-doubt give me a run-around answer, e.g. by saying that it is not a simple question, and that you can’t answer it, because it’s too complicated, etc. Right! If this is true, why don’t you quickly thrill be with you acumen as to how (or how not) the second law applies to society?

Obviously, in your opinion, state functions don’t apply. Noting you like for Prigogine, at the very least you could spew out some weak statement to the effect that humans obey the second law in the form of far-from-equilibrium dissipative structures. I know you want to jump on that bandwagon.

— —

Comment **#172**

Anonymous (Philip Moriarty)
Wednesday, 11:44 AM EDT
" This is where I think our difficulty on agreement is? Correct me if I am wrong.
"

Response to Comment # 186:

Now, at last, you're starting to think instead of throwing links to Wiki pages at me. Good. Let's spend some time working through this. First, my statement "You cannot say that a particular arrangement of students has a thermodynamic entropy" must be taken in context as you say. Yes, students are made of atoms and molecules. Therefore, as bonds break and form as part of different biochemical processes in the body, there are various different reactions, with associated enthalpies and entropies, occuring. One can certainly write down a free energy associated with each of those reactions (and the arrangements of atoms and molecules involved in those reactions). (This is the point that Schmitz makes in Comment #170).

BUT... you can't then simply "scale up" these concepts to think of a human just as a large molecule interacting with other large molecules (i.e. other humans). Simply changing the arrangement of a group of people in a field *does not change the thermodynamic entropy associated with that group of people*. If I take 10 students in a line, move them around so that they are at random positions, and then move them back again in a line, the change in thermodynamic entropy is zero. However, rearranging the molecules within a student's body would certainly not lead to a zero change in thermodynamic entropy.

You can, however, construct a distribution function and, as noted in Comment #11, write down an "information theory" or "statistical" entropy based on that distribution. But that is not the same as a thermodynamic entropy. So, no, it's not correct to say "entropy is entropy" (as you do in a preceding comment). There are very different interpretations of entropy out there. We are focussing on thermodynamic entropy.

Philip Moriarty

— —

Comment **#173**

Anonymous (Philip Moriarty)
Wednesday, 11:45 AM EDT
"#63: Thims: “if you think the second law doesn’t apply to a system of students, then you are floating on a pet theory.”
Moriarty: “when did I ever suggest that I had any difficulty with the 2nd law of thermodynamics?”

I don’t know what to say about this response? It seems we are running in circles. When I press you with the simple question: does the second law govern society?, you will no-doubt give me a run-around answer, e.g. by saying that it is

not a simple question, and that you can't answer it, because it's too complicated, etc. Right! If this is true, why don't you quickly thrill be with you acumen as to how (or how not) the second law applies to society?

Obviously, in your opinion, state functions don't apply. Noting you like for Prigogine, at the very least you could spew out some weak statement to the effect that humans obey the second law in the form of far-from-equilibrium dissipative structures. I know you want to jump on that bandwagon.
"
In response to this, see Comment #191.

I have no particular "like" for Prigogine. I'm just aware of his work.

Philip Moriarty
— —

Comment **#174**

Sadi-Carnot (Libb Thims)
Wednesday, 11:47 AM EDT
#38: The problem with Libb's question (second law applies to system of students, yes or no?), as he no doubt knows well, is that it is worded very vaguely. It is ill-advised to answer this type of question with a yes/no response, without taking into account the context. Applying the 2nd law of thermodynamics to life immediately raises important and complex points related to the question of open vs closed systems and equilibrium/non-equilibrium thermodynamics.

Again, similar to my stance in the last post, you seem to be overjoyed with calling any and all applications of thermodynamics to human society by every derogatory term you can think of, but when pressed with the issue yourself, you fumble around with a big: "I Don't Know?".

I have more than aptly collected the views available:

http://www.eoht.info/page/HT+pioneers

Such as:

Open system thermodynamic theories (Bertalanffy)
Closed system thermodynamic theories (C.G. Darwin, Kenoun, etc.)
Equilibrium (Gladyshev)
Non-equilibrium (Prigogine)

Why don't you just pick one, since you can't seem to be able to think for yourself on this question.
— —

Comment **#175**

Anonymous (Philip Moriarty)
Wednesday, 12:08 PM EDT
"Again, similar to my stance in the last post, you seem to be overjoyed with calling any and all applications of thermodynamics to human society by every derogatory term you can think of, but when pressed with the issue yourself, you fumble around with a big: "I Don't Know?".

I have more than aptly collected the views available:

http://www.eoht.info/page/HT+pioneers

Such as:

Open system thermodynamic theories (Bertalanffy)
Closed system thermodynamic theories (C.G. Darwin, Kenoun, etc.)

Equilibrium (Gladyshev)
Non-equilibrium (Prigogine)

Why don't you just pick one, since you can't seem to be able to think for yourself on this question.
"
Again, see Comment #191.

Let's focus on the question of whether changing the arrangement of students in a field gives rise to a change in thermodynamic entropy first. If I haven't lost the will to live by the time we close that particular discussion, then we can get on to questions related to the non-equilibrium thermodynamics of life.

And how is stating that the physics of life "raises important and complex points related to the question of open vs closed systems and equilibrium/non-equilibrium thermodynamics", "[fumbling] around with a big "I don't know"?", as you put it? There is a big, big difference between your "human thermodynamics/human chemistry" nonsense and the field of non-equilibrium thermodynamics.

Moreover, believe me, I'm not "overjoyed" about anything related to our argument. Just as was the case for your attempts to ruin a series of Wikipedia articles (see comments above), your Wiki site is full of groundless pseudoscience which will only confuse and mislead those who take your arguments at face-value.

Philip Moriarty
— —

Comment **#176**

Anonymous (Philip Moriarty)
Wednesday, 12:11 PM EDT
"Also regarding the human chemical bond, no one before me has even attempted this gargantuan topic, "
Oh, the modesty!

"...no one before me has even attempted this gargantuan topic..."

There could be a very good reason for that....

Philip Moriarty
— —

Comment **#177**

Anonymous (Philip Moriarty)
Wednesday, 12:19 PM EDT
" The thermodynamics professor, who invited me to lecture, has my textbook, and in response to Moriarty's repetitive pleas to terminate the invitation, comments: "I am very glad Libb has accepted my invitation to give a talk in my BioEngineering Thermodynamics course."

There was no plea to terminate the invitation. Please stop lying. (c.f. Discussion in previous comments of your unsubstantiated claims regarding your pursuit of an MS in Physics,PhD in biochem, and MD in neuroscience).

Philip Moriarty
— —

Comment **#178**

Anonymous (Philip Moriarty)
Wednesday, 12:26 PM EDT
"#174 (cont): Phil seems to have a one-track statistical mechanics (the subject of attempts to explain the laws of thermodynamics on mechanical principles) mindset. When one attempts to measure the entropy of a system using statistical mechanics methods, in terms of logarithms of estimations of microstates and distributions, it assumes that the Boltzmann chaos assumption holds (particles have non-correlated velocities). Humans, of course, have correlated velocities, meaning that statistical mechanic methods are of no use here. In this case, one turns to

thermochemistry methods to measure entropy, as is the case with all chemical reactions. Sixty-six percent of people believe that love is a purely chemical reaction. All chemical reactions (e.g. rearrangements of bondings of students in their distributions) release or absorb heat. Hence there will be an entropy change for changes in the positions of students and it can be measured."
So I went back and read the comment reproduced above (#176) again.

It's hard to believe that so much nonsense can be encapsulated in so few lines. That Sadi-Carnot would include the line "Sixty-six percent of people believe that love is a purely chemical reaction" as part of his "counter-argument" would be depressing if it weren't so funny.

This is meant to be a scientific debate/discussion/argument and you use a result of a survey to back up your position?

No, enough. I'm not wasting any more time on this nonsense.

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#179**

Sadi-Carnot (Libb Thims)
Wednesday, 12:29 PM EDT
184: Philip: “Has anyone *ever* done an experiment to measure a thermodynamic entropy change caused by cycling a group of people between two arrangements? Or has anyone ever measured the thermodynamic work done by cycling a group of people through a "heat cycle" as you suggest?”

Thims in his 16 Apr 2013 lecture: “Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies” (see: lectures), at segment 48:30-50:39 (see: **video**), at Northern Illinois University College of Engineering, doing the famous 18th century Leiden University volume expansion "ball and ring experiment" to explain "social expansion" (day) and "social contraction" (night), in Carnot cycle terms, in respect to hot body (sun) / cold body (night sky) alternating daily contact of earth-bound social systems (working body), Boerhaave's law, entropy (transformation content) increase, and irreversible changes in Gibbs free energy states of human existence and experience; the human molecule view lecture notes page in the background; illuminated rotating globe to the right.

Occasionally through your many attempts at putdown (e.g. given that you don't have the grasp of basic physics/mathematics needed to appreciate the arguments), you make sensible statements, such as above.

Every single one day of rotation of the earth constitutes one Carnot cycle. Expansion stroke: Heat is added (daytime) to the system (surface of the earth), the particles (human molecules) become active and expand outward, doing work in the process (occupation); contraction stroke: heat is removed (nighttime) from the system (surface of the earth), the particles (human molecules) begin to deactivate expanding inward (towards their bed), doing a reverse work in the process. This is all basic thermodynamics.

The two questions you ask above are at the core of the science of human thermodynamics. These two questions are huge puzzles. French physicist Gustav Hirn, to whose work the term “human thermodynamics” was first used, did the first prototype experiments (measure the mechanical equivalent of heat of humans in action) in the 1860s. The modern experiment measurement of the mechanical work or entropy changes in heat cycles of systems of humans is where the true search is. This is where my theoretical interest is.

— —

Comment **#180**

Sadi-Carnot (Libb Thims)
Wednesday, 12:30 PM EDT
#184 (cont): You can go on calling attempts to formulate human activity chemically or thermodynamics as crackpot, pseudoscience, or a “childish” nonsense, and so on, but the astute observer will not that people were saying the same thing to Goethe in 1810 when he was making formulations of affinity (or free energy) applied to human relationships and society, commenting that his “use of the chemical theory is nonsense and childish fooling around" (said by Goethe's fellow author and neighbor Christoph Wieland). Whereas, in retrospect, we now know that Goethe with one of the five highest IQs every assigned to someone was two centuries ahead of his fellowman. Hence, two hundred years from now, when people look back at our conversation, you will be seen in the same light as Goethe’s uneducated neighbor.

— —

Comment **#181**

Anonymous (Philip Moriarty)
Wednesday, 12:37 PM EDT

> "Every single one day of rotation of the earth constitutes one Carnot cycle. Expansion stroke: Heat is added (daytime) to the system (surface of the earth), the particles (human molecules) become active and expand outward, doing work in the process (occupation); contraction stroke: heat is removed (nighttime) from the system (surface of the earth), the particles (human molecules) begin to deactivate expanding inward (towards their bed), doing a reverse work in the process. This is all basic thermodynamics."

Oh, Libb

I'm about to leave the office and, as noted above, I'm walking away from this argument in any case but I couldn't go without saying thank you for the quote above. It'll keep me smiling all the way home. I particularly like the "expanding inward (towards their bed)" line. Brilliant. Douglas Adams would be proud. The logic is on a par with the quote at the foot of this comment (which I'll leave you with).

Goodbye.
Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

"It is known that there is an infinite number of worlds, simply because there is an infinite amount of space for them to be in. However, not every one of them is inhabited. Therefore, there must be a finite number of inhabited worlds. Any finite number divided by infinity is as near to nothing as makes no odds, so the average population of all the planets in the universe can be said to be zero. From this it follows that the population of the universe is also zero, and that any people you may meet from time to time are merely the product of a deranged imagination"

— —

Comment **#182**

Sadi-Carnot (Libb Thims)
Wednesday, 12:44 PM EDT
Regarding #188: Moriarty: “none of which peer-reviewed”.

I have corrected your assertion as to my work having no peer-review (Human Chemistry (textbook))

— —

Comment **#183**

Anonymous (Philip Moriarty)
Wednesday, 12:52 PM EDT
"188: Moriarty: “none of which peer-reviewed”.

"I have corrected your assertion as to my work having no peer-review (Human Chemistry (textbook))"

...and who selected the reviewers?

Philip

— —

Comment **#184**

Sadi-Carnot (Libb Thims)
Wednesday, 1:04 PM EDT
It seems that Phil is ready to call it quits, as am I. We will certainly give him credit for resiliency at lasting this long and for having thick skin. The one good comment we got out of Phil is:

“Has anyone *ever* done an experiment to measure a thermodynamic entropy change caused by cycling a group of people between two arrangements? Or has anyone ever measured the thermodynamic work done by cycling a group of people through a "heat cycle" as you suggest?”

It seems that Phil is leaving with the view that everything ever published, by all 230 HT pioneers, on the application of thermodynamics to the understanding of human activity, including the logic that people are molecules, is pure pseudo science. But, on the other hand, Phil seems incapable of explaining to us idiots how thermodynamics should be applied to the study of human activity?

I guess you would call this entire discussion a stalemate?

— —

Comment **#185**

Petrologist (Bruce Bathurst)
Wednesday, 1:53 PM EDT
Dr Moriarty,

You are the victim of, what we in the US call a 'bald-face lie'.

SC in post #189 that 'Petrologist has commented, for example, in his “why I am not a molecule” thread that he is not a molecule because he has a soul that is under the direction of god? I’m not saying that you have this same view, but objects to the human molecule view tend to be like this.'

Actual statement:

' "Molecule" now brings to the mind a discrete substance (floating about) made of the same number & kinds of atoms, bonded in the same manner. They differ only in the physical properties "isotopic mass' and 'handedness". Geologists use instead "substance", a much more flexible term. Substances react, and classical thermodynamics studies them. Chemical formulae above represent chemical compositions of the human substance.

' My chemical composition changes from minute to minute, and bonds are continuously being broken to create, by reaction or flux, many relatively un-bonded, little objects that we traditionally call "molecules". My teeth, of course, are not made of molecules, but they are crystalline substances. '

Let me make myself crystal clear, again. People know absolutely nothing of any trace of religious belief I might have. I don't have to be religious to defend the separation of church & state, as guaranteed by the American Constitution. Were I religious, I should not have to believe in a 'soul'. Were I to believe in a 'soul', it would (in no major religion) be 'an indestructible corporeal essence'.

P: Do I have a soul? If a soul is something that only God can examine, then that's not a question science is qualified to address. No scientist I know can prod or scratch a soul. (Assuming one exists.) It is not a scientific object or a theory.

— —

Comment **#186**

Petrologist (Bruce Bathurst)
Wednesday, 1:57 PM EDT
Any profile you find is not mine. I deleted mine so it can not again be edited in my absence to state my career began in 1964 with an NSF grant to study 'Human Thermodynamics'.

Unfortunately, the biochemist Linus Pauling is dead; so he will have to remain a chemical engineer who studied fish hooks or something.

Bruce Bathurst, PhD

— —

Comment **#187**

Anonymous (Philip Moriarty)
Wednesday, 3:28 PM EDT
"I guess you would call this entire discussion a stalemate?"

Oh, yeah, a "stalemate"! That's the word I was searching for...

Let's ignore all the pseudoscientific nonsense on your website; let's ignore all the comments and unanswered questions above - your complete lack of understanding of thermodynamics is given by a single sentence in Comment #198:

"Every single [one] day of rotation of the Earth constitutes one Carnot cycle...." [Comments #198 and 200].

Leaving aside the rest of the nonsense in that paragraph, a Carnot cycle is an **idealisation** (as I was at pains to explain to my 1st year undergraduate students each year). A Carnot cycle can never exist in the real world. Try reading a 1st year Physics or 1st year Physical Chemistry textbook to find out why.

Yep, a stalemate indeed...

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

P.S Oh, and yes, I took the bait...

— —

Comment **#188**

Anonymous (Philip Moriarty)
Wednesday, 4:10 PM EDT
"Dr Moriarty,

You are the victim of, what we in the US call a 'bald-face lie'."

Petrologist,

I'm truly shocked. You mean that Sadi-Carnot may not ...always...be...honest?! ...gasp... That Sadi-Carnot might sometimes tell the odd "porkie pie"* or two? Surely not. Who woulda thunk it...? :-)

All the very best,

Philip

* Check out http://www.bbc.co.uk/dna/h2g2/alabaster/A649 for a translation.

— —

Comment **#189**

Petrologist (Bruce Bathurst)

Wednesday, 6:36 PM EDT
Yes, that stretched Msr Carnot's rubber band of good faith until it snapped. It now lies on my desk, its Carnot cycle spent.

However, I'll offer some more good faith.

Carnot was very well educated in mathematics, though he wrote his only work as simply as possible. He continued the work of his father and hoped to help the new France as he had in the Army Engineers.

Carnot abstracted the steam engine until the steam was no longer needed; in fact, his engine used air. What is hypothetical is not the substance used, which can be anything, but the engine itself--the cycles of processes; isothermal heating, adiabatic expansion, isothermal cooling, adiabatic compression. Substances don't naturally take these exact paths. If one did, no engine could be more efficient than it.

So, the sun rises, the radiation heats the air (its temperature rises), alarms clocks sound, people scatter, doing work. As the sun sets, the air cools by radiation to space (its temperature drops), factory alarms sound, people crawl into bed together as the pressure of work was too much.

No other but this cycle can cause people to work more efficiently. (Sounds more like Fritz Lang's Metropolis to me.) Where, exactly, does Carnot fit in?

Bruce Bathurst
Tired & Retired
— —

Comment **#190**

Sadi-Carnot (Libb Thims)
Wednesday, 7:48 PM EDT
Re: Moriarty's question: whoever said that state functions (U, S, G) apply to systems of human molecules, the answer seems to have been English-born American chemical engineer William Fairburn in 1914. Fairburn, in addition to stating that human chemical elements could be classified by their relative affinities (or Gibbs free energy, modern sense), seems to be the first to have stated that an interactive system of humans, e.g. a group of factory workers, is system of reactive chemical entities (humans), and on this basis speculates on how one would go about classifying reactive humans modeled as elements or chemicals. He reasons:

> "A classification based on their relative electricity or relative energy or enthusiasm would not of itself help us much, for misapplied energy and wasteful application of human forces are common. The classification of entropy, referring to temperature changes which can be likened to coolness, passion, explosiveness and frigidity, are all interesting but of themselves prove little."

In 1894, Polish political scientist Leon Winiarski, a student of French-Italian engineer Vilfredo Pareto, one of the first to conceive of people as "human molecules", was also one of the first to defined human social systems explicitly in terms of "energy" and "entropy":

Prior to this, certainly Goethe, in 1809 (Goethe's human chemistry) was the first to state that humans were reactive chemical entities and that people's movements or reactions to each other were governed by elective affinities, which equates to enthalpy and entropy governance, H – TS, in a modern 1882 formulation sense. Goethe's entire presentation is simply genius.
— —

Comment **#191**

Sadi-Carnot (Libb Thims)
Wednesday, 8:01 PM EDT

To represent telosx, i.e. thermodynamic economist Peter Pogany, I just received his 2006 thermodynamics-based economics book Rethinking the World, wherein he defines society via energy and entropy determinants, on Monday. One of his excellent opening quotes is:

> "Accumulated knowledge suggests that humans are billions of highly evolved, overgrown super-molecules (or 'intensely conscious mice'?) that swarm in ever larger numbers on a piece of rock that wobbles, spins, revolves, and soars into nothingness at break-neck speed with an agitated, burning furnace in its interior."

Here we see that Pogany is an intelligent person as compared to hypocrites such as Moriarty, who deny that the science they teach applies to them.

— —

Comment **#192**

Petrologist (Bruce Bathurst)
Wednesday, 8:20 PM EDT

"Accumulated knowledge suggests that humans are billions of highly evolved, overgrown super-molecules (or 'intensely conscious mice'?) that swarm in ever larger numbers on a piece of rock that wobbles, spins, revolves, and soars into nothingness at break-neck speed with an agitated, burning furnace in its interior."

'Moderately conscious mice, I think. Unfortunately, this also proves there is no external reality, on which Immanuel Kant could place his feet.

Well, I'm not a hypocrite, and the most important theorem in my doctoral dissertation was proved using only determinant theory. It was even declared wrong by the USGS (much to M. Kruskal's roaring laughter.)

Objects as determinants usually arise from using old-fashioned determinant theory to symbolically solve an underdetermined, homogeneous system of linear equations. In my case, it was the easiest way. I'd be pleased to help interpret them for people.

What about the Fritz cycle?

— —

Comment **#193**

Sadi-Carnot (Libb Thims)
Wednesday, 8:27 PM EDT

As to the origin or inspiration behind Pogany's excellent quote, and his bracketed mention of mice, the quote seems to come from American physical chemist Martin Goldstein and his 1993 section "The Entropy of a Mouse" from his book The Refrigerator and the Universe (listed in Pogany's bibliography), in which Goldstein explains how to calculate the entropy of a mouse. Goldstein's basic premise is that to determine the entropy of larger living entities, such as people or mice, one must "be able to determine the energies and entropies of everything present initially and of everything present in the final state", i.e. of each "before" and "after" reaction step starting with simple chemical substances, through evolution, upward to the formation of larger organisms. He states that approximations will be needed to estimate the energies and entropies of the states in the "assembly of these larger molecules", but that this should not deter attempts at estimation.

— —

Comment **#194**

Sadi-Carnot (Libb Thims)
Wednesday, 8:28 PM EDT

The basic methodology, according to Goldstein, as established in physical chemistry, is to determine the entropies of structures relative to a reference state (92 naturally occurring elements, at STP), and to measure the heat released or absorbed, at a measured temperature, in approximately reversible reactions steps, where by the change

in entropy ΔS for the process is simply the heat absorbed (or released) divided by the absolute temperature at which the process is carried out: ΔS = Q/T, which equates to Sfinal – Sinitial of the two reaction states.

Hence, given a hypothetical human reaction, such as a group of students released (initial state) into a playground for one hour (final state), it is simply a matter to measure the heat released or absorbed in the process of the reaction at the ambient temperature of the day. The heat of two kids fighting on the playground is one such heat. Anyone who denies this logic is an idiot. The measurement of these heats is the difficult part. Heat in a modern sense is quantified in terms of movements of the particles of the system, humans in this case, and their valence shell photon-electron interactions.

— —

Comment **#195**

Sadi-Carnot (Libb Thims)
Wednesday, 8:54 PM EDT

In case anyone missed American chemical engineer Andrew Morrow's thread: A proper dichotomy, he states that "as of 2006, I now engage my fellow human being as thus: You are a mosaic of atoms with a mind." Here's his Sept 06, 2009 video on his new molecular philosophy:

I'm glad to see that someone in this site has a sensible view and is confident enough to grasp and embrace the logic of modern science. I'm guessing that his ability to grasp the logic of molecular philosophy, is something that only, primarily, chemical engineers and physical chemists can see, being that both professions are well-schooled in chemical thermodynamics?

— —

Comment **#196**

Sadi-Carnot (Libb Thims)
Wednesday, 9:03 PM EDT

To Lambert and Moriarty: if the two of you would spend less time doing background checks on my education and where I've been invited to give presentations (e.g. Russian Academy of Sciences, MIT, Harvard, Joint European Thermodynamics Conference, UIC, etc.) and more time thinking about the content of the discussion, you might actually learn something?

— —

Comment **#197**

AaronAgassi (Aaron Agassi)
Wednesday, 9:24 PM EDT

"#101: AaronAgassi: "Will Sadi-Carnot propose proper experiments with conditions of falsifiability, in order to discover the range of similar applicability of Thermodynamics? Or will he simply wait for the bold denizens of his fabulous future to buckle down on the due diligence?"

All good questions. To give you a synopsis of my overall plan. Back in 2001/2002, this was all just a lose puzzle solving sort of hobby for me (which it still is), but when in the Nov/Dec of 2001 I began to see a bit of clarity on the issue on how the application could be made, I decided to make an attempt at writing up a short 50-article on the presentation (human thermodynamics), for the sake of future generations.

Five-manuscripts, one-book, and one-textbook later, I still have not yet been able to give the rigorous presentation I envisage, being that the topic only becomes more involved the more one gets into it. Chapter 18, entitled Human Thermodynamics (pgs. 653-702), a simple overview chapter, is the only actual published product on human thermodynamics that I have made.

The human chemistry (2007) and human molecule (2008) books were precipitates of the overall effort to write a book or textbook on human thermodynamics, which I have not yet done. The human chemistry textbook, as I came to find, were needed precursor or preliminary foundation, prior to any writing on human thermodynamics could be attempted. In short, prior to these works, there had been no type of presentation of the view that people are human molecules (or chemical species, chemical entities, or whatever name you choose) and that processes such as when two people form a relationship are a purely chemical reactions, no different than when two hydrogen atoms from the dihydrogen molecule. With the EoHT wiki, I am in the process of collecting the numerous references on past work done on human thermodynamics. That is where I am at at the moment.

"
Where's the falsifiability?

— —

Comment **#198**

Sadi-Carnot (Libb Thims)
Wednesday, 9:28 PM EDT
To Moriarty, regarding your wholesome savior Frank Lambert, what have you to say about Lambert's 1968 article on the thermodynamic ontology of evil, wherein he argues that there are two thermodynamic aspects of evil: one involving an unwarranted disruption or disordering of an individual's dynamic pattern of life and thought and the other involving a crystallizing or excessive ordering of life, which Lambert exemplifies by the Nazi organization and ordering of prisoners in death camps. Lambert, supposedly, thermodynamically views human activity as "a plateau of high free energy maintained between the two opposing tendencies of order and disorder" (section: 12-3: Entropy and Evil, pg. 327-28, of G. Tyler Miller's 1971 Energetics, Kinetics, and Life).

So, it seems that your favorite entropy reference, Frank Lambert, also believes that state functions, such as free energy and entropy, apply to human society. Is he going to be spared the rod or is he now, in your view, a pseudoscientific drivel-pushing idiot like me?

— —

Comment **#199**

Petrologist (Bruce Bathurst)
Wednesday, 9:31 PM EDT
Sorry, the above post was by me. (I keep forgetting my registration was canceled.)

Though I thought I was a geologist, not an idiot, I'm having trouble with 'their valence shell photon-electron interactions'. I think 'valence' was before my time. Is that the old-fashioned term for a sunburn?

Bruce Bathurst (biological machine, sans soul)

— —

Comment **#200**

Petrologist (Bruce Bathurst)
Wednesday, 9:39 PM EDT
' I'm glad to see that someone in this site has a sensible view and is confident enough to grasp and embrace the logic of modern science.'

Thank you.

' I'm guessing that his ability to grasp the logic of molecular philosophy, is something that only, primarily, chemical engineers and physical chemists can see, being that both professions are well-schooled in chemical thermodynamics? '

Yes. That is undoubtedly the problem. However, Princeton taught me graduate chemical engineering thermodynamics: why wasn't I schooled in the logic of molecular philosophy? Was it my low-quality tutors, as AA tells me?

Bruce Bathurst
Who doesn't like fibs told about him

— —

Comment **#201**

Sadi-Carnot (Libb Thims)
Wednesday, 9:46 PM EDT
Valence is short for outer orbital electrons, the ones that are weekly bonded to an atom and molecule, and can thus change positions, up or down in orbital. According to Feynman, and his 1985 view of QED (quantum electrodynamics), the theory of the interaction of light and (valence) electrons: "describes all the phenomena of the physical world except the gravitational effect". In his view, life or biology is moving towards a chemical interpretation, and the theory behind chemistry is quantum electrodynamics. (pg. 8, QED, Feynman). In short, it is relatively easy to explain all human movement in terms of the interactions of valence shell electrons with the surrounding photon fields of

the environement.

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Comment **#202**

Sadi-Carnot (Libb Thims)
Wednesday, 9:51 PM EDT
To BB, that comment regarding sensible view, was more directed at PM, not you. At least you had the initiative enough to start a "Why I am not a molecule thread" and to make sensible objections to the human molecular view.

— —

Comment **#203**

Petrologist (Bruce Bathurst)
Wednesday, 10:35 PM EDT
Thank you. Because I never learned quantum electrodynamics, I shall (of course) take you word for everything about it. I knew that use of 'valence' couldn't have anything to do with Lewis's 1912 valence-bond theory.

Bruce Bathurst

— —

Comment **#204**

Petrologist (Bruce Bathurst)
Wednesday, 10:47 PM EDT
'At least you had the initiative enough to start a "Why I am not a molecule thread" and to make sensible objections to the human molecular view.'

Please, you needn't be so effusive in your apology, which I humbly accept. Glad you liked my apparently extreme religious, Church of the Iron Apocolypse, view; the one you believe I proselytized.

Bruce Bathurst, PhD

— —

Comment **#205**

Petrologist (Bruce Bathurst)
Wednesday, 11:17 PM EDT
Unfortunately this debate has turned into character assassination instead of focusing on the subject of debate. In my view, the subject of this debate is difficult; if it was easy a consensus would have been reached earlier. Let us not forget that early thinkers started explaining the world around them by speculating and engaging in philosophical debates. Later scientific methods replaced the old methods but never stopped the scientists and thinkers from engaging in philosophical debates, particularly when they found themselves at the boundaries of existing knowledge. Should we abandon some of the fields of human knowledge like psychology, social science because we cannot write equations to prove or disprove our hypothesis in these fields? Do we know on the circuit level what happens in the brain when it receives stimuli and why a particular output is produced? Not yet. But we can learn something about its operation, simply, by observing its outputs and its relation to its inputs. We take that even if we lack the knowledge to tackle the problem at neuron and circuit level. Today, such debates exist at the highest level of our scientific communities. There are community of physicist who are determinists (like

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Comment **#206**

Petrologist (Bruce Bathurst)
Wednesday, 11:18 PM EDT
Einstein) who have doubts about quantum mechanics and the principle of uncertainty. Is M-Theory all correct? It may just be a mathematical adventure built on a wrong premise and certainly not measurable by humans that their cognitive ability cannot surpass three dimensional world much less eleven dimensional world. Why science ends up in philosophical debates, is exactly this: When measurement becomes impossible, when new technologies are not matured enough to build sophisticated equipment to put our hypothesis to test and terminate the debates once and for all. When scientists and thinkers find themselves at the boundaries of knowledge pertaining to their time, the insatiable hunger to know more forces them to turn to philosophy and express their views even if they know they cannot back their claims.

Should we stop them from philosophizing? Of course not. Any idea should be welcomed. Isn't it that through the accumulation of all and variety of ideas that eventually a

— —

Comment **#207**

Petrologist (Bruce Bathurst)
Wednesday, 11:20 PM EDT

genius opens the door to the reality and the true science? Remember Boltzmann, no one believed in him. He was humiliated to a point that he could not stand it and committed suicide. Today, he is placed on the top of the list of geniuses. One of the qualities of a good scientist is to have doubts and to reexamine his scientific views and pursue what he believes that would lead him to the truth and let others do the same in their own way. If the foundation of a theory is wrong, sooner or later, it will hit the wall, produce nothing, and believe it or not, proving a hypothesis wrong, in itself, is a scientific achievement. Again, I am not taking side with anyone in this debate only trying to help make it more constructive and less personal.

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Comment **#208**

AaronAgassi (Aaron Agassi)
Wednesday, 11:30 PM EDT

"To Moriarty, regarding your wholesome savior Frank Lambert, what have you to say about Lambert's 1968 article on the thermodynamic ontology of evil, wherein he argues that there are two thermodynamic aspects of evil: one involving an unwarranted disruption or disordering of an individual's dynamic pattern of life and thought and the other involving a crystallizing or excessive ordering of life, which Lambert exemplifies by the Nazi organization and ordering of prisoners in death camps. Lambert, supposedly, thermodynamically views human activity as "a plateau of high free energy maintained between the two opposing tendencies of order and disorder" (section: 12-3: Entropy and Evil, pg. 327-28, of G. Tyler Miller's 1971 Energetics, Kinetics, and Life).

So, it seems that your favorite entropy reference, Frank Lambert, also believes that state functions, such as free energy and entropy, apply to human society. Is he going to be spared the rod or is he now, in your view, a pseudoscientific drivel-pushing idiot like me?
"

He was, no doubt, speaking coloquially, and I'd be surprised if he actually attemped quantification.

— —

Comment **#209**

AaronAgassi (Aaron Agassi)
Thursday, 3:57 AM EDT

Disregard previous. A normal person would speak so of Bazi evil, roughly, metaphorically, A crank would beat it to death.

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Comment **#210**

Petrologist (Bruce Bathurst)
Thursday, 10:06 AM EDT

Unfortunately this debate has turned into character assassination instead of focusing on the subject of debate. In my view,

Yes. Please stop it. I've had to write many posts making it clear that I don't believe 'molecule' is a good term for the Earth or for people because this gives them properties they don't possess. You, out of the blue, have attributed it to my being a religious fanatic; and you have refused to apologize. I'm not part of your debate, just a victim of circumstances. I have not accused you of believing something you dont; but your write of my worship of the Sun god 'Ra' blinding me to the truth. Please stop assassinating my character.

Bruce Bathurst, PhD

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Comment **#211**

Petrologist (Bruce Bathurst)
Thursday, 10:32 AM EDT
' Should we abandon some of the fields of human knowledge like psychology, social science because we cannot write equations to prove or disprove our hypothesis in these fields? '

Many of my friends, even after my Master's in geology, were shocked that I going to pursue a science. They were philosophers, psychologists, & sociologists, and they were sure I was going to integrate theology with these fields, mythology, parables, fairy tales, and folklore in general. Some didn't know I was a scientist.

C.P. Snow's division of academia into two camps does not apply to everyone. However, I noticed you earlier had a speech that similarly sounded prepared earlier, in which you force-fit me into a simplistic generality. I was just a pawn for your speech, as I am this one. People are not rational: logicians are rational. To live a healthy, balanced life, perhaps one should distinguish each: hot have science eat all or religion eat all. Bilingual people move between countries, and speak one language at a time; mixing the two, as must be done in Switzerland or the Alsace, damages both.

Neither pseudoscience nor scientism benefits a science or any humanity. A respect for why we distinguish between them, and the belief that neither is superior to the other, does. IMHO.

Bruce

— —

Comment **#212**

Sadi-Carnot (Libb Thims)
Thursday, 11:42 AM EDT
Bruce, it is not my intention to offend you (or for that matter anyone in this discussion). A well-known rule of polite conversation: is to never talk about religion, politics, or money, we are talking about all three here, thus many are going to be offended.

I very much appreciate your points about soul in the context of people being made of atoms. To state the facts, approximately 72% of people adhere to this theory. Likewise, approximately 57% of people adhere to the theory that they are a giant molecule. The two theories, at the moment, are not congruent. This is a huge project from someone in the future.

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Comment **#213**

Sadi-Carnot (Libb Thims)
Thursday, 11:43 AM EDT
Regarding name and properties, even in the context of Lehn’s 1995 supramolecular chemistry, one gets into naming issues. Grunwald’s chapter “Thermodynamic Components and Molecular Species, of his 1997 book Thermodynamics of Molecular Species, spends a good deal of time discussing naming issues. He defines a molecular species as “a macroscopic or near-macroscopic ensemble of molecules that are characterized by a definite molecular formula, a definite and distinctive equilibrium geometry, and a distinctive set of molecular modes of motion and spectral properties.” This is one good definition, among others.

When an atomic structure gets to a certain size, in the protein-to-virus range, structural atomic turnover rates become a factor in what to call such a structure. To put the human scenario in context, the sun can also be defined as a “molecule” (sun molecule) as can the milky-way, and so on. There are certain factors to be worked out on this point of view, but it leads to interesting conclusions, such as that the attachment between the sun molecule and the earth molecule, as to the earth molecule to the human molecule, as to the human molecule to human molecules, are pure chemical bonds, meaning that gravity is function of chemistry (or an modified type of chemical bond).

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Comment **#214**

Anonymous (Philip Moriarty)
Thursday, 11:45 AM EDT
You drew me back one last time with your “stalemate” bait, but no more.

It’s interesting just how many parallels there are between your position and that of a creationist arguing that their nonsensical pseudoscience should also be taken seriously. Re. your recent comment:- It is not up to me to explain the non-equilibrium thermodynamics of life to you. It is up to you to defend your “theories” and your position. You have singularly failed to do so. So, no, it’s not a stalemate. Arguing that I haven’t explained the non-equilibrium thermodynamics of life to you, entirely misses the point and is, as I say, nothing less than what I’d expect a creationist to say under similar circumstances. Ironic that you don’t appreciate this when you’ve put unwarranted allegations re. a supposed religious bias to me in the past. (Incidentally, to say that that particular allegation irritated me would be understating the case immensely. I’m Irish so I tend to pepper my conversation with a large number of expletives. I’ll not write down what I said to myself when you made that particular unfounded allegation.)

And given that you even don’t understand what a Carnot cycle is (Thermodynamics 101), it’d be a monumental task to explain non-equilibrium thermodynamics to you in any case, wouldn’t it?

And on the subject of Petrologist’s recent comment at the website: either leave the pages you’ve put together on me alone or remove them now. I’ll check back periodically because I don’t trust you. (I’ve downloaded and archived the pages of our debate/argument, by the way, because I also don’t trust you not to modify that).

From now on I’ll leave it up to readers of your website (of which I hope there’ll be very few) to ascertain whether our argument ended in a stalemate.

Good bye.

Philip Moriarty,

— —

Comment **#215**

Anonymous (Philip Moriarty)
Thursday, 11:53 AM EDT
"You drew me back one last time with your “stalemate” bait, but no more....

....From now on I’ll leave it up to readers of your website (of which I hope there’ll be very few) to ascertain whether our argument ended in a stalemate.

Good bye.

Philip Moriarty,
"
Thank you for posting this e-mail which was sent to your personal e-mail account. If I had wanted to post it here, I would have done so. I have not posted a single one of the e-mails you have sent me (to my personal e-mail account) to a public forum and would not do so without asking you first. Why do you not show me the same courtesy? (Not that I don;t stand behind everything I've written in that message).

Note the penultimate line regarding trust. Your are entirely untrustworthy, dishonest, and disingenuous.

Despicable behaviour.

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#216**

Sadi-Carnot (Libb Thims)
Thursday, 11:58 AM EDT
At long last, Moriarty has shown us his weakness. In his last email (above), he states: “Arguing that I haven’t explained the non-equilibrium thermodynamics of life to you, entirely misses the point.” I, however, only asked him to explain how thermodynamics governs human society or existence. His insertion of the sub-field “non-equilibrium”, signifies (for those who don’t know), that he is an adherent to the anthropomorphic doctrines of

Prigoginean thermodynamics:

In short, Moriarty believes that he is an evolved type of Benard's cell, formed after several bifurcations. Oh how many-a-physicist will open a paper with the statement: "life as a far-from-equilibrium dissipative structure …"

— —

Comment **#217**

Sadi-Carnot (Libb Thims)
Thursday, 12:00 PM EDT
Moriarty, in case you didn't know, rule #1 in life is: "You can't trust anyone!"

— —

Comment **#218**

Anonymous (Philip Moriarty)
Thursday, 12:02 PM EDT
"Thank you for posting this e-mail which was sent to your personal e-mail account. If I had wanted to post it here, I would have done so. I have not posted a single one of the e-mails you have sent me (to my personal e-mail account) to a public forum and would not do so without asking you first. Why do you not show me the same courtesy? (Not that I don;t stand behind everything I've written in that message).

Note the penultimate line regarding trust. Your are entirely untrustworthy, dishonest, and disingenuous.

Despicable behaviour.

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)
"
Apologies. That should of course be "You are entirely untrustworthy, dishonest, and disingenuous" in the previous comment (rather than "Your are..."

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

P.S. Did you ask any of the other people whose e-mails you have reproduced here whether it was OK to do so...?

— —

Comment **#219**

Anonymous (Philip Moriarty)
Thursday, 12:05 PM EDT
"Moriarty, in case you didn't know, rule #1 in life is: "You can't trust anyone!""
No, I can trust many people. In fact, without trust, my life would be terribly and awfully barren.

Your "You can't trust anyone!" comment, and your story at your "Eytymology of Libb Thims" web page actually make me feel rather sorry for you.

Goodbye.

Philip (Moriarty)

— —

Comment **#220**

Anonymous (Philip Moriarty)
Thursday, 12:45 PM EDT
"No, I can trust many people. In fact, without trust, my life would be terribly and awfully barren.

Your "You can't trust anyone!" comment, and your story at your "Eytymology of Libb Thims" web page actually make me feel rather sorry for you.

Goodbye.

Philip (Moriarty)"
So struck by your dishonesty, Libb/Sadi, I'm putting typographical errors everywhere.

That should, of course, be "Etymology of Libb Thims" in Comment #240.

Philip Moriarty

P.S. Could someone please explain the difference between equilibrium and non-equilibrium to Sadi/Libb in my absence? Thanks.

— —

Comment **#221**

Petrologist (Bruce Bathurst)
Thursday, 1:03 PM EDT
Thank you for finally addressing 'Why I am not a Molecule'. One of the advantages of writing your own books is that you can select your vocabulary, so long as it makes sense. My personal classification of sciences differs from the traditional; but this difference is inconsequential.

My personal definition of physical science is one in which the objects of study are identical. Gravity, light, quarks, electrons, isotopes of elements, & molecules are identical. A 'molecular species' is a homogeneous molecule, as H2O (liquid) or NaCl (xtal). The only physical sciences are physics & chemistry.

Natural science studies natural objects that are not equal, but equivalent: they have some properties in common, but not all: seas, continents, birds, people (studied biologically), stars, fossils.

Suns differ in many properties. Sol's many properties change continuously, in a chaotic manner. It is, in my definition, a natural object.

Though my classification differs from others, the meaning of its objects are consistent with current scientific theory.

No suns are molecules or molecular species. Their compositions change among one another, and Sol's properties change internally too much, in a continuously chaotic manner.

You may call a sun a molecule; but then you cannot apply current theories of molecules to one. This is a fact, not a theory or opinion.

Bruce Bathurst, PhD

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Comment **#222**

Petrologist (Bruce Bathurst)
Thursday, 1:39 PM EDT
SC: 'A well-known rule of polite conversation: is to never talk about religion, politics, or money, we are talking about all three here, thus many are going to be offended.'

Please speak for yourself. Religion is all over your website, which is why I asked if you were referring to a 'soul', earlier (since yours can be weighed & scratched). Also, I didn't know Christians, Jews, Muslims, and many Hindus worship the Sun god 'Ra'.

SC 'I very much appreciate your points about soul in the context of people being made of atoms. To state the facts, approximately 72% of people adhere to this theory.'

Excuse me? I'm sorry, but I truly don't understand. What theory? My only point I've made about the soul is that, in major religions, it is incorporeal, not observable by everyone, and thus not a scientific object. Is anyone else offended by this?

P: 'Let me make myself crystal clear, again. People know absolutely nothing of any trace of religious belief I might have. I don't have to be religious to defend the separation of church & state, as guaranteed by the American Constitution. Were I religious, I should not have to believe in a 'soul'. Were I to believe in a 'soul', it would (in no major religion) be 'an indestructible corporeal essence'.

Remember, the Buddha lectured that there is a soul to those who did not believe in one; and lectured that there is no soul to those who did believe in one. This is just a fact.

Bruce

PS. There is no religious opinion here, so where is the politics and money?

— —

Comment **#223**

Petrologist (Bruce Bathurst)
Thursday, 2:13 PM EDT
My view is that one's writing about his views long enough does not make them worthy of discussion.

You are apparently wanting to change a paradigm, as Newtonian mechanics was changed by Einstein. Einstein didn't set out to do this: it came as a result of normal science discovering & exploring paradoxes. All I can suggest is that you study a branch of science extremely well, then attack the most difficult, scientific problems.

It is likely you will discover new theorems in the present theory (as I did in thermodynamics). You would be very luck to create a new theory. (What I'm working on is a recasting of an old one.) Granites have been measured to be very viscous, yet paper-thin layers are found in schists & gneisses. I do have an hypothesis that explains this and many other unexplained phenomena in granites; but I've yet to test it, which may take years. I expect it to fail.

Each theorem of thermodynamics I proved in three different ways*, then tested at least three different predictions. Finally I model each mathematically, calculating my models to 15 decimal places. Only when my predictions proved accurate to 15 decimals places did I mention I had a theorem to anyone. This is the care some scientists take in offering new ideas.

You can't set out to revolutionize science. It is usually a fortuitous accident.

Bruce

*When writing a Masters thesis, I would perform mathematical calculations all day. The second day, I would repeat these, without looking at the first. If they didn't agree, I would repeat the calculations on the third day, see which it agreed with, then find the error in the spurious set of sheets.

— —

Comment **#224**

Petrologist (Bruce Bathurst)
Friday, 6:00 AM EDT
Equilibrium. WARNING: This is a personal explanation, which avoids any mention of 'reversible paths'. Hence, anyone is welcome to fix it.

Dr Moriarty wrote that he wished there were some comments, probably on Carnot's cycle, that explained equilibrium. My post had necessary conditions of a Carnot cycle, but not sufficient. I have a problem with reversible paths and equilibrium that has alienated me from other geologists. However, I'm in good company, with Fermi, Reiss, Katchalsky & Curran.

Pippard takes a very abstract view, and first proves the existence of adiabatic surfaces. Carnot is much more beautiful, I feel; and proves this existence by 'interpretation': building a thermally insulated cylinder & piston, with the 'valves' end either open or closed, at constant, hot temperature T2. Fermi best illustrates the cycle of isothermal expansion, adiabatic expansion, isothermal compression, then adiabatic compression.

It's important to remember that the operation used to measure heat flow is conductivity times a temperature gradient. So, when the closed cylinder at T2 is placed on a reservoir at T2, & the piston slowly moves outward to do work, we mean this: the piston is moved slowly enough that the heat it extracts from the T2 reservoir creates a T-gradient in it that we can't observe. It's traditional to specify no thermal gradient in the reservoir, slowing the piston to quasi-static (zero speed). Clearly this has conceptual problems: the gradient T2 - T1 must just be very measurable compared to the thermal gradient in the reservoir. Now the cylinder is placed on a thermal insulator and expanded until the temperature drops to T1. To be continued ...

— —

Comment **#225**

Petrologist (Bruce Bathurst)
Friday, 6:02 AM EDT
Equilibrium, continued ...

The heat absorbed by the cylinder has been Q in. As it slowly compresses isothermally at T2, then adiabatically to T2 (a cycle), heat Q out diffuses out the bottom slowly enough to not create a measurable gradiant in the reservoir T2. The net heat absorbed during the cycle was Q in - Q out = W, so Q in - Q out / Q in = 1 - heat lost, ranges from 1 to 0. Any faster movement of the piston will reduce T2, reducing T2 - T1, reducing Q in, W, and the efficiency.

During the entire cyclic path of the piston, at maximal efficiency, the entire fluid in the cylinder has been (at any moment) at equilibrium. :-)

Warning: No chemist, physicist, or other geologist is responsible for (or would likely touch) this definition.

Bruce Bathurst, PhD

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Comment **#225**

Petrologist (Bruce Bathurst)
Friday, 6:06 AM EDT
It's very late, so I take no responsibility whatever for any horrible blunders in the above (except avoiding reversible and 'quasi-static'. It simply sounded good in my head. :-)
Bruce

— —

Comment **#226**

AaronAgassi (Aaron Agassi)
Friday, 10:16 AM EDT
"Thank you for finally addressing 'Why I am not a Molecule'. One of the advantages of writing your own books is that you can select your vocabulary, so long as it makes sense. My personal classification of sciences differs from the traditional; but this difference is inconsequential.

My personal definition of physical science is one in which the objects of study are identical. Gravity, light, quarks, electrons, isotopes of elements, & molecules are identical. A 'molecular species' is a homogeneous molecule, as H2O (liquid) or NaCl (xtal). The only physical sciences are physics & chemistry.

Natural science studies natural objects that are not equal, but equivalent: they have some properties in common, but not all: seas, continents, birds, people (studied biologically), stars, fossils.

Suns differ in many properties. Sol's many properties change continuously, in a chaotic manner. It is, in my definition, a natural object. Though my classification differs from others, the meaning of its objects are consistent with current scientific theory. No suns are molecules or molecular species. Their compositions change among one another, and Sol's properties change internally too much, in a continuously chaotic manner. You may call a sun a molecule; but then you cannot apply current theories of molecules to one. This is a fact, not a theory or opinion.

What is a fact? What foes the word even mean? When I realized that I actually do not know, I stopped using the word: 'fact.' More at: http://www.FoolQuest.com/metaphysics_for_dummies.htm#fact Therefore, I would classify your closing remark: "You may call a sun a molecule; but then you cannot apply current theories of molecules to one." -as an uncontroversial assertion, extremely well supported by massive invariantly consistent corroborating observation and the body of current science. I would even venture that what you say is all true, meaning correspondent to reality. Any doubt is surly as small as it ever becomes.

And Bruce, when you say that current theories of molecules cannot be applied in describing a star (though made of molecules, of course), you mean that theories of molecules cannot be applied directly and wholesale. -That only analogy is possible, and the question will be, when metaphor begins to break down. Indeed, you have named specific non molecular behaviors of stars. And bearing that in mind, it is then incumbent upon Sadi-Carnot to qualify his hypotheses, and explain application of molecular theories to macro-objects such as stars, let alone humanity.

— —

Comment **#227**

Petrologist (Bruce Bathurst)
Friday, 11:49 AM EDT
In the positivist spirit, the 'stuff' of science are 'operations': one observes a property or phenomenon objectively, so everyone (who isn't hallucinating) will agree. That quartz & orthoclase touch one another in granite is an observation and a fact.

Facts are accepted by everyone (during a scientific investigation) without dispute. However, facts are more than physical observations.

In statistical mechanics, the motion of molecules can be classed as either translations, rotations, or vibrations. This is a fact to those who have studied this subject. (No plasma flows.) Everyone agrees the theory uses this requirement, which is why:

'You may call a sun a molecule; but then you cannot apply current theories of molecules to one. This is a fact, not a theory or opinion.

No analogies here, I think; just properties.

Bruce Bathurst

— —

Comment **#228**

Petrologist (Bruce Bathurst)
Friday, 12:22 PM EDT

What is of more interest (to me) is restating theorems in terms of real operations (no isolated systems--which no one can observe, no ideal gasses, no internal energy, no reservoirs, &c). By requiring that the hypothetical reservoir be a real reservoir, it requires a temperature gradient & thermal conduction. By juggling these two quantities of the reservoir and those in the material of the engine, I appear to have slithered past reversibility when defining 'equilibrium'. (There is a very good reason for wanting to do this: the Carnot cycle can be the traditional mathematical concept: a hypothetical cycle (that occurs 'infinitely' slowly), as presented in Pippard; or it can be more (a real concept for which I was exiled).

Carnot's cycle, by the way, defines both the Kelvin & Clausius concepts of entropy, and can be used to create the concept of absolute temperature. (I didn't have time.) Fermi's is the simplest treatment, and is also the most carefully phrased.

Should you find a mistake, remember that one Yale professor began each of his courses in thermodynamics with the Carnot cycle, got it wrong each time, and reportedly always had to repeat his lecture correctly on the second day. That would be Willard Gibbs. (Carnot's simple-appearing paper was true genius. :-)

Also note that Carnot's paper had errors, but these were easily fixed. Mr Thims' errors would be inconsequential, if they could be easily fixed.

Bruce Bathurst

— —

Comment **#229**

AaronAgassi (Aaron Agassi)
Friday, 1:03 PM EDT

As in my entry for 'fact' in my 'Metaphysics for Dummies,' at http://www.FoolQuest.com/metaphysics_for_dummies.htm#fact , in science "facts" are indeed, repeatable observations or claims thereto. But then you bring in the problem of personalities and multiple obverses, drawing upon, as if complementary or consistent, an entirely different usage of the word 'fact,' as articles of consensus, as within a scientific community. And these are simply not the same things. And if you have troubled to read my entry for 'fact' in my 'Metaphysics for Dummies,' then you know how it only gets worse.

Ultimately, you have demonstrated my point that there is neither consistent observation nor consensus upon the meaning in usage of the very word: 'fact.' And so, in blithe unawares confusion, even self contradiction and denial, you continue in bypassing, exchange which is not genuine communication because it lacks sufficient intersubjectivity and does not carry at all the same meanings or even purpose, intention or point at all between participants.

— —

Comment **#230**

AaronAgassi (Aaron Agassi)
Friday, 1:06 PM EDT
(continued)

I conjecture, etiologically, that all the above is symptomatic of Justificationism on your part. It can be cured.

That one cannot directly or literally apply current theories of molecules to macro objects such as suns or people, is, indeed, an assertion. Assertions are Ontological statements concerning objective reality, such as employ the verb: to be. Tautologically, all assertions are both opinion and claim to truth. The assertion of your in question, Bruce, is, however, utterly and unassailably valid inference from current science, indeed both extremely non controversial and extremely well Empirically supported.

Again, Sadi-Carnot's crank error here is the logical falsity of unrestrained argument from analogy, as if to assert that because cranberries are red and edible, red fire engines must be yummy too! -For example, with the perfectly allowable

observation of Brownian motion in crowds of students in confined space, to the confident hope of who knows what more in prediction, indeed ignoring all of the complex non particle like human behavior. From observed similarities, better defined conjecture of unobserved similarities, ought to be followed up far more cautiously.

— —

Comment **#231**

Petrologist (Bruce Bathurst)
Friday, 3:33 PM EDT
Why are you writing here? Is it to help me remedy my poor 'communication skills', as you claim? Are you such an authority on classical thermodynamics that your 'conjecture' is of value?

I use simple language, and an 'assertion' I use as a statement that I'm yet to provide justification for. I felt the simple motion necessary to be a molecule, a necessary axiom in statistical mechanics, already justified my statement. Because 'true' is thin truth, it is true that stars will not obey the behavior that current chemical theory predicts of molecules; but it is a fact that stars fail the definition of a molecule given in these theories.

Why are you writing? Why are you using metaphysical jargon? This is a website about chemical engineering. Drawing upon operationalism and logical positivism, I choose my words more carefully than many. In fact, I collect dictionaries & study clarity of expression. My words, should I publish a monograph, will first be defined in standard English, not metaphysical jargon.

Though I have studied the logical positivists, I consider their early opinion of metaphysics extreme. It is possible, however, I could change my mind.

Fortunately, deriving equilibrium from Carnot's cycle completes my obligation here.

Bruce Bathurst

— —

Comment **#232**

Sadi-Carnot (Libb Thims)
Friday, 4:00 PM EDT
In case any random person happens to read to the end of this discussion, I will recap: On August 04, 2009, Irish physicist Philip Moriarty, a professor of thermal physics for six years, made the following statement on video, supposedly in efforts to teach people what entropy is:

“You cannot say that a particular arrangement of students has a thermodynamic entropy.”

Certainly we commend people in their aims to educate the world. If, however, what one teaches is incorrect, then it is possible that one is doing more harm than good. The above statement is an example of incorrect teaching. The only structures (or arrangements) in the universe that do not have a thermodynamic entropy, are pure solids or a pure liquids at 0 K. Baring an absence of temperature, one can define a thermodynamic entropy for any arrangement in the universe. The logic behind this is what is called the third law of thermodynamics.

I started this thread to see exactly just how many people think the above statement (by Moriarty) is true. Somehow the thread veered far off topic. Whatever the case, some of the discussion certainly was food for thought.

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Comment **#233**

Anonymous (Philip Moriarty)
Friday, 5:14 PM EDT
"You cannot say that a particular arrangement of students has a thermodynamic entropy."
Yes, Libb, you're correct - I do say that. But you've taken the statement entirely out of context. Check out the video at

http://www.youtube.com/watch?v=av8aDFFtSs0&feature=channel_page

to see the statement in its correct context.

See also Comments #7, #99, and #206. Before attempting to lecture on the 3rd law, Libb, let's get the 2nd law sorted out. Have you worked out yet why the Carnot cycle can only ever be an idealisation?

In addition, why don't you explain to us why you think Muschik (Comment #99) has got it wrong?

Philip Moriarty

www.nottingham.ac.uk/physics/research/nano
www.youtube.com/sixtysymbols

P.S. As I've explained to you before, I'm not a professor of thermal physics. However, given that trustworthiness - and, by extension, honesty - are not qualities you value in scientific debate, it's not surprising that you'd assert this again. You provide a link to my staff page at the University of Nottingham elsewhere at this site. Do me the courtesy of reading that page. Thank you.

PPS It becomes clearer and clearer why Wikipedia banned you from editing articles because of your habit of "misrepresenting sources".

— —

Comment **#234**

Anonymous (Frank Lambert)
Friday, 5:46 PM EDT
Thims, you probably have a copy of the gen chem text you used at Michigan in 1994. Check it. I'll send $20 to your account if it has any conceptual definition of entropy other than something to do with "disorder". Kistiakowsky never dealt with a qualitative concept for entropy. He taught about entropy as did most physical chemists of the 20th century: "Do enough problems and you will understand entropy."

This is not true. You will be able to do problems, but you will NOT understand entropy. I sweated on a myriad of problems and got a B in the course – which was not at all bad l considering that only three of us in the class of some 24 were undergrads. But neither I in 1942 or brilliant Thims in '94 or later _understood what entropy WAS_. That's why I wrote some articles that were foolish up until about 1970; they were based on ANALOGY to the meaning of entropy as an increase in "disorder" of ANY kind.

Frank L. Lambert
Professor Emeritus
Occidental College
Los Angeles, CA 90041

— —

Comment **#235**

Anonymous (Frank Lambert)
Friday, 5:56 PM EDT
But, lucky to live long – that Thims appears to consider a defect in my character – I also spent months in thinking deeply (not just superficially reading masses of material as does Thims), and writing peer-reviewed articles in first-rank journals. That is why I have been successful in developing an approach for any level of chemists. It has been accepted by so many chemistry texts (with 45 authors) because of its merit alone . (entropysite.oxy.edu).

Thims, sadly, is stuck in the 20th century foolishness of endless analogies of entropy with "disorder" -- and the impossibility of converting that to math certainty. Feggedaboud it!

Entropy is the concept in science that traditionally has been most frequently misused and misinterpreted -- primarily because of its supposed connection with "disorder" of every type imaginable. Nonsense. Check entropysite.oxy.edu

Frank L. Lambert

Professor Emeritus
Occidental College
Los Angeles, CA 90041

— —

Comment **#236**

AaronAgassi (Aaron Agassi)
Friday, 6:07 PM EDT
All hypothesis begins from unfounded conjecture, only then followed if at all, by critical preference and only then with Empirical evidentiary support. Bruce, you poor thing, there is no such thing as prior justification, nor need thereof. You ask me why I apply terminology from the philosophy of science in the Epistemological Methodological examination of matters of scientific method. Isn't that somewhat like demanding why algebra is referenced in Mathematics? And haven't I already gone into all of this on my 'Metaphysics for Dummies,' at http://www.FoolQuest.com/metaphysics_for_dummies.htm ? And lastly, what in Hell has logical positivism got to do with anything?

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Comment **#237**

AaronAgassi (Aaron Agassi)
Friday, 7:39 PM EDT
http://plato.stanford.edu/about.html

Welcome to the Stanford Encyclopedia of Philosophy (SEP). From its inception, the SEP was designed so that each entry is maintained and kept up to date by an expert or group of experts in the field. All entries and substantive updates are refereed by the members of a distinguished Editorial Board before they are made public.

http://plato.stanford.edu/entries/vienna-circle/

The Vienna Circle was a group of early twentieth-century philosophers who sought to reconceptualize empiricism by means of their interpretation of then recent advances in the physical and formal sciences. Their radically anti-metaphysical stance was supported by an empiricist criterion of meaning and a broadly logicist conception of mathematics. They denied that any principle or claim was synthetic a priori.

http://plato.stanford.edu/entries/metaphysics/

Let us briefly examine an example of the strong form of the thesis that metaphysics is impossible. The logical positivists maintained that the meaning of a (non-analytic) statement consisted entirely in the predictions it made about possible experience. They maintained, further, that metaphysical statements (which were obviously not put forward as analytic truths) made no predictions about experience. Therefore, they concluded, metaphysical statements are meaningless—or, better, the ‘statements’ we classify as metaphysical are not really statements at all: they are things that look like statements but aren't, rather as mannequins are things that look like human beings but aren't.

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Comment **#238**

AaronAgassi (Aaron Agassi)
Friday, 8:57 PM EDT
Straw.

— —

Comment **#239**

Sadi-Carnot (Libb Thims)
Friday, 9:02 PM EDT
Frank, why don't you give us a photo for your article? Either email it to me (libbthims@gmail.com), and I will format it, or edit your article and add it using the upload button? All of these articles are for future generations. I would ask the same of Phil, but I guess he dosen't what his photo in his article, as he removed the last one I put there?

— —

Comment **#240**

Anonymous (Frank Lambert)
Yesterday, 1:33 AM EDT
I'll send one instantly – and not a fake photo – if you let me edit your calumnious page of me and of energy dispersal.

I have no concern about "future generations" noting or remembering your material, but it would be nice if your writing about me were a bit more in touch with reality.. I play with you only because of occasional boredom -- but I am genuinely curious: What was your gen chem text in 1994? Did you use Atkins in phys chem? Didn't you ever wonder why they connected entropy with "disorder"?

Frank L. Lambert
Professor Emeritus
Occidental College
Los Angeles, CA 90041

— —

Comment **#241**

Petrologist (Bruce Bathurst)
Yesterday, 4:06 AM EDT
"Equilibrium, continued ...

The heat absorbed by the cylinder has been Q in. As it slowly compresses isothermally at T2, then adiabatically to T2 (a cycle), heat Q out diffuses out the bottom slowly enough to not create a measurable gradiant in the reservoir T2. The net heat absorbed during the cycle was Q in - Q out = W, so Q in - Q out / Q in = 1 - heat lost, ranges from 1 to 0. Any faster movement of the piston will reduce T2, reducing T2 - T1, reducing Q in, W, and the efficiency.

During the entire cyclic path of the piston, at maximal efficiency, the entire fluid in the cylinder has been (at any moment) at equilibrium. :-) Warning: No chemist, physicist, or other geologist is responsible for (or would likely touch) this definition.

Bruce Bathurst, PhD

Refs

Carnot, S. 1824. Réflexions sur la puissance motrice du feu et sur les machines propres a développer cette puissance. Paris: Chez Bachelier, Libraire, Quai des Augustins, No 55. (Engl. trans. R.H. Thurston, 1960, London: Constable & Co, Ltd.
Bridgman, P.W. 1932. The Logic of Modern Physics. NY: Macmillan.
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Denbigh, K. 1955. The Principles of Chemical Equilibrium with Applications in Chemistry and Chemical Engineering. Cambridge: Cambridge Univ Press.
Pippard, A.B. 1957. The Elements of Classical Thermodynamics for Advanced Students of Physics. Cambridge: Cambridge Univ Press.
Reiss, H. 1965. Methods of Thermodynamics. London: Constable & Co, Ltd.
Katchalsky, A. & P.F. Curran, 1975. Nonequilibrium Thermodynamics in Biophysics. Cambridge, Mass: Harvard Univ Press.
"
You should have a look into more modern litterature: A reversible process is defined as trajectory in the equilibrium subspace. They do not exist in nature. They are not connected to so-called quasi-static processes. Equilibrium is defined by the equilibrium variables spanning the equilibrium subspace

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Comment **#242**

Petrologist (Bruce Bathurst)
Yesterday, 5:32 AM EDT
Dr Moriarty, I presume. (You should identify yourself.)

This derivation was Carnot's, with ideas borrowed from Fermi & Bridgman. I should appreciate your fixing it! I was unaware that old ideas were necessarily wrong, sorry. (I though Carnot's only errors were, ironically, the use of the earlier caloric theory.)

This derivation I made my own, so (comparing two different cycles between equal temperatures) the cycle with an efficiency of 1 would contain a material that is always at equilibrium. I thought you requested equilibrium.

You may, if you wish, call the section on, say, a p,V-plane a reversible path. This takes little extra effort. For reasons that are irrelevant, I choose not to.' In my obsolete library, 'reversible process', 'quasi-static process', and 'equilibrium process' (mainly Russian) are almost always synonymous. (Paths, not processes, are important to you.)

Please offer correct references. What space contains an equilibrium subspace? That is out of my league. I'm comfortable, however, with differential geometry.

Unfortunately, I have been bedridden for a decade and am poverty stricken. However, My goal is to walk to a research library, only four blocks away. Sorry I confused the explanation, but it was a late, first draft. :-) Thank you very much for the better references!

Bruce Bathurst, PhD
Geologist

— —

Comment **#243**

Anonymous (Philip Moriarty)
Yesterday, 10:25 AM EDT
Re. #265: No, Comment #264 is not mine. I usually identify myself - I think I've only forgotten to do so once or twice. [By the way, the terms quasi-static and reversible are certainly not synonymous].

Re. #262: No, Libb, I didn't remove a photo of myself at any point from your website.

And finally, to Libb/Sadi-Carnot: I've stated a few times before that I was going to leave this debate/argument and then got drawn back in. It's the start of the new academic year here next week so I really am going to draw a line under this. It's a shame that the debate descended into acrimony and I regret my "hot-headedness" at times but, to be fair, it's difficult to debate with someone who can be so blatantly disingenuous. (You've admitted above that trustworthiness is not a quality for which you have any time).

There is no question that your knowledge of the historical development of the field of thermodynamics is better than mine. Your human thermodynamics "theory" is, however, pure pseudoscience. I know that sounds harsh but the best way to counter my (and many others') criticisms is not to spend your time on this website but rather to **submit your work to peer-reviewed journals**. (And I mean proper *anonymous* peer-review.) That is what any scientist has to do today. It's no longer the 18th/19th Century.

Subject your work to rigorous peer-review. Let experts in the field of thermodynamics (and I'm certainly not one) comment in detail on your work. Any scientist welcomes rigorous and intelligent peer-review. Although it can be frustrating at times(!), it helps us to strengthen our work against criticism. Instead of ignoring the issues raised above (e.g. comment #99, the Carnot cycle question, comment #64, #112 etc...), tackle them head on.

Best wishes,

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

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Comment **#244**

Petrologist (Bruce Bathurst)
Yesterday, 10:39 AM EDT
"Dr Moriarty, I presume. (You should identify yourself.)

This derivation was Carnot's, with ideas borrowed from Fermi & Bridgman. I should appreciate your fixing it! I was unaware that old ideas were necessarily wrong, sorry. (I though Carnot's only errors were, ironically, the use of the earlier caloric theory.)

This derivation I made my own, so (comparing two different cycles between equal temperatures) the cycle with an efficiency of 1 would contain a material that is always at equilibrium. I thought you requested equilibrium.

You may, if you wish, call the section on, say, a p,V-plane a reversible path. This takes little extra effort. For reasons that are irrelevant, I choose not to.' In my obsolete library, 'reversible process', 'quasi-static process', and 'equilibrium process' (mainly Russian) are almost always synonymous. (Paths, not processes, are important to you.)

Please offer correct references. What space contains an equilibrium subspace? That is out of my league. I'm comfortable, however, with differential geometry.

Unfortunately, I have been bedridden for a decade and am poverty stricken. However, My goal is to walk to a research library, only four blocks away. Sorry I confused the explanation, but it was a late, first draft. :-) Thank you very much for the better references!

Bruce Bathurst, PhD
Geologist "
You will receive better references the middle next week. ThermoSyst.

— —

Comment **#245**

Sadi-Carnot (Libb Thims)
Yesterday, 12:51 PM EDT
Yes, do send a photo. To note, there are no fake photos on this site. And yes feel free to edit your articles (please, however, don't delete the historical background to how you came about your theory, etc.). We would be glad to have you join the site, as I'm sure you will have references (unknown to me) that you could add to articles.

Re: chemistry textbooks, although I'm sure we've been through this before at Wikipedia, my 1990 Ebbing General Chemistry and 1998 Chang Chemistry both define entropy as a measure of randomness or disorder. The entropy disorder definition comes predominantly from Planck (1901): principle of elementary disorder. Planck needed Boltzmann's views on disorder to substantiate his quantum hypothesis.

Another chemistry textbook in my 1,100+ book personal science library, Pauling's 1969 General Chemistry, however, defines entropy via S = k ln W, I started the article for the symbol W.

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Comment **#246**

Sadi-Carnot (Libb Thims)
Yesterday, 12:51 PM EDT
Noting your penchant for entropy definitions, you might like to help us make a chronological table (year-by-year) of entropy definitions. I can set up the page and table if you want and you can past in the definitions and references? It might end up looking like the symbols table. The following entropy etymology page is a prototype example. Myself, I am slowly building a thermodynamics (chronology) definition table, to see how the definitions of thermodynamics have changed over the last 160-years.

— —

Comment **#247**

Sadi-Carnot (Libb Thims)
Yesterday, 12:52 PM EDT

Regarding Muschik's comments: "From a thermodynamical point of view, the procedure is clear: If one has a distribution (that means some items must be distributed), you can define a not necessarily thermodynamic entropy (if it is thermodynamic or not, depends on the items which are distributed).

If one additionally can define an energy belonging to the set of the distributed items, one can define a temperature by differentiating the entropy to this energy. Then one can call the set of the distributed items a thermodynamical one (if you want).

Let us consider a set of students having different heights. Then one can introduce a distribution function describing the distribution of the different heights spanning the R1. The one can define an entropy (information measure). But because there no energy belonging to the considered set of students, you cannot define a temperature and this set of students does not represent a thermodynamical system (as we knew that from the very beginning)."

Moriarty requests that I explain this statement. Muschik is mixing together apples (student heights) and oranges (heat flow) together in efforts to make a vegetable conclusion.

Statistical mechanics (a mechanical principles view of the first two laws) is a subfield of thermodynamics. Talking about distribution is simply an ideal gas way of looking at entropy. The true way to discuss entropy is in talking about the equivalence value of all uncompensated transformations, which applies to all systems.

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Comment **#248**

Sadi-Carnot (Libb Thims)
Yesterday, 12:52 PM EDT
Moriarty: "Have you worked out yet why the Carnot cycle can only ever be an idealisation?"

I really don't know why he is asking this question, but I suppose reversibility is puzzling issue for many who are thrust through a thermodynamics class without really getting the inside scoop.

The short answer is that Carnot borrowed the Lavoisier heat model in presenting his theoretical heat cycle. Hence to understand Carnot's cycle, you actually have read the first 20-pages of Lavoisier's 1787 Elements of Chemistry, to understand Carnot's mindset, wherein Lavoisier explains his geometric understanding of equilibrio in the caloric. Part of this is explained here.

In short, in explaining his cycle, Carnot assumed (in an unwritten manner) a Papin engine cycle in conjunction with the Lavoisier heat particle model, whereby in the expansion phase (stroke) you would put in, say, 10 caloric particles, and in the contraction phase (stroke) you would remove the exact same 10 caloric particles, after which the 'working body', typically steam, would return to the exact same atomic configuration. This was the central issue that Clausius had with Carnot, a result of which was thermodynamics.

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Comment **#249**

Sadi-Carnot (Libb Thims)
Yesterday, 12:53 PM EDT
To Bruce Bathurst: regarding your eoht user page, there's no conspiracy here, people joint this site monthly, and to help me keep track of who they are (e.g. Bruce Bathurst, PhD work in thermodynamics, = Petrologist), I tend to add a note or two on their user page (if they don't). On yours I simple pasted parts of what were on your public Wikipedia page, which I linked to. In the future, I suppose, I will try to be clear about this to new joiners.

To Philip Moriarty: regarding assertions of mis-trust, general protocol suggests that scientific correspondence tends to be open for discussion. The famous demon of thermodynamics, for example, came from the letters of correspondence of James Maxwell and Peter Tait in 1867.

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Comment **#250**

Sadi-Carnot (Libb Thims)
Yesterday, 12:54 PM EDT
Here's a 2006 article/study that came to mind today, regarding actual distributions of students in various high school cafeterias, sage grouse distributions in leks (mating fields), rats in connected but boundaried fields, in the context of Van der Waals 1910 discussions on the connection between degree of associations of gas molecules when transitioning into the liquid and solid states and state functions:

http://www.humanthermodynamics.com/RP/Cafeteria-Densities.html

Specifically, in conclusion of his 1910 Nobel Lecture he reasons that the connection between the Gibbs free energy equation, the degree of association between molecules, and the development of a state equation needed to exactly define the state of a molecular system exists, and suggests that 'perhaps there is a direct way'.

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Comment **#251**

Sadi-Carnot (Libb Thims)
Yesterday, 12:54 PM EDT
It seems that both Moriarty and myself are ready to end this discussion, as he has classes starting, and I have other matters to attend to. I think, from the statements in #255 and #256, that we are all in agreement that every structure or arrangement in the universe (including a group of students), above absolute zero, has a thermodynamic entropy. Hence, if anyone else has off-topic questions or concerns, please start a new thread, on a different page (or in the discussion forum) as this one is getting too long to follow and keep track of. Thanks, Libb.

— —

Comment **#252**

Petrologist (Bruce Bathurst)
Yesterday, 1:46 PM EDT
That's very kind. Books, treatises, & papers before 1990 I've likely consumed. Then all stopped. Write bathurst@alumni.princeton.edu should I not be here. Could you give me an initial idea why this sketchy definition of equilibrium is wrong. It's on that point I differed with other geologists, who confused it with, well, absolute zero.

My own research uses historical papers in geology to motivate axioms, dfns, & theorems in a thermodynamic interpretation of linear geometries. Linear subspaces & their annihilators play major roles. Equilibrium is both local and 'moving' (as in the Carnot cycle)--its this that offends geologists. Was that your objection as well? Only Fermi, Riess, & Katchalsky & Curran (& Rice, in a monograph) take me unacceptable view. So, what linear space are you referring to? Thanks!

Bruce

— —

Comment **#253**

Petrologist (Bruce Bathurst)
Yesterday, 3:28 PM EDT
Msr Carnot,

Sorry, but I thought your comparing the diurnal cycle with Carnot's was just accident. I left out many important things in my posts, for reasons of space, but it wasn't incorrect (well ... I didn't proof-read them :-).

Though my father was an iron-worker, an engine is not a metal device but a thermodynamic cycle, one that converts heat to work or work to heat (refrigerator). The Carnot cycle is very efficient, usually converting all heat to work. This violates the second law of thermodynamics. To do this, it takes forever. Its efficiency makes it hypothetical. (Note I'm avoiding the word 'reversible' again. Bridgman, at least, would appreciate this.)

The Carnot cycle is made of four paths; the diurnal cycle isn't. The Carnot cycle is hypothetical: if real, it would violate the 2d Law of Thermodynamics. The Carnot cycle takes forever, not one day. For any of these reasons, a diurnal cycle can't be a Carnot cycle.

We should note some other errors. 'Caloric' was just a corporeal heat; but it was 'vaporous', not particulate. Carnot's cylinder was closed at all times. Carnot's engine could produce more work than any other, both acting between the same two temperatures. In the 'contraction stroke', the 10 heat units would expand the piston, doing the equivalent of 10 heat units of work (and dropping toward the lower temperature). Your engine has efficiency 0.

Your last paragraph, the one of substance, is a great problem for you. What is the 'exact same atomic configuration'? (Even Carnot suggested that heat was the movement of atomic or molecular particles.) His working substances (air, then steam) would return to the same temperature. Even violating the 2d Law, the the same temperature would be an uncountable number of changing molecular configurations, never 'the exact same'.

Bruce Bathurst, PhD

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Comment **#254**

Petrologist (Bruce Bathurst)
Yesterday, 3:34 PM EDT
Msr Carnot,

You'll be pleased to know your views on sociological entropy, with reference to Human Thermodynamics, is well represented in the 'Entropy' article in the Wikipedia.

Bruce B.

— —

Comment **#255**

Petrologist (Bruce Bathurst)
Yesterday, 3:38 PM EDT
Msr Carnot,

Thank you. However, I checked the Wikipedia. It doesn't state there that I studied 'Human Thermodynamics' in the 1960s. Admittedly, what you initially wrote & told me of didn't contain this. It was only by accident later that I checked my profile and found this had been added later without telling me.

Bruce

— —

Comment **#256**

Petrologist (Bruce Bathurst)
Yesterday, 4:17 PM EDT
Everyone,

I'll end my participation here with one of the consequences of the similarity between Human Thermodynamics and creationism that I noted. (Similarity in their consequences to society.) It is hopeless to convince someone that their scientific theory or field of study is wrong if they have confused 'truth' and 'thin truth', confusing science, philosophy, and religion. I'm not arguing here, just reminding everyone that the good scientist welcomes kind correction. New, important theories sometimes follow a realization of ignorance. Thermodynamics, about every ten year, I realize I don't understand at all. I then totally rebuild it in my mind, resulting in a better understanding. (About three months ago I had such an epiphany. Is 'my' classical thermodynamics, at its deepest level, a physical theory or an interpretation of a mathematical theory? Physical is winning, so far.) The point of this post is that a change of viewpoint can only occur when both people debating maintain a good, scientific philosophy.

Goodbye.

Bruce Bathurst, PhD

PS. Personal integrity, to me, means that one's conscious mind is integrated with one's ethical, unconscious mind.

— —

Comment **#257**

Petrologist (Bruce Bathurst)
Yesterday, 4:30 PM EDT
PM: [By the way, the terms quasi-static and reversible are certainly not synonymous].

Indeed, thanks. Such terminology has not always been presented well. Reversible paths are not possible, but reversible processes are (for we can externally guide these back). Quasi-static can move or not. Bridgman believed one could use only efficiency in classical thermodynamics, and avoid all these terms. I tried that on Carnot's cycle.

Bruce Bathurst

— —

Comment **#258**

Sadi-Carnot (Libb Thims)
17 minutes ago
To end this discussion on a positive note, here's a nice article, which I found today, by Indian chemist Surya Pati about two weeks ago entitled "The Thermodynamics of Human Bond", wherein he uses entropy to explain human relationships as chemical reactions:

I will know lock the thread, so that we can all move on to something else. Enjoy!

Continued

â— Moriarty-Thims debate (part one)
â— Moriarty-Thims debate (part two)

See also

â— Rossini debate
â— What is entropy debate

θΔics

In debates, the **Moriarty-Thims debate (part two)**, of three parts in total (see: part one and part three), is shown below:

Note

Comment numbers are not exactly aligned in numerical sequence as referenced in comment, but will be in the vicinity, e.g. comment #112 (tread version) → comment #97 (webpage version), owing to thread-to-webpage conversion issues, such as deletion of non-relevant posts, etc.

Debate: part two

The following is thread-to-page conversion re-paste of the debate, which took place in the general discussion forum of the eoht wiki from September 02-19, and is broken up into three approximately 20-page sections, the second part of which is shown below:

— —

Comment **#87**

Anonymous (Philip Moriarty)
Sep 10 2009, 7:52 AM EDT

"Truth is correspondence to reality in assertions. Assertions are Ontological statements such as employ the verb: to be. "'im now going to stop posting here because it will get confusing if there are two anonymous users. Comments #95 and #96 are not from me (Philip Moriarty). Moreover, the discussion is going off topic - I do not want to get dragged into a pointless discussion on creationism/religion vs. science. In any case, I can't follow or understand the vast majoirty of what Petrologist writes. (I refer Petrologist to Comment # 54 above).

Libb Thims: I would appreciate an answer to the many unanswered questions I have posed above. *Please* confirm the date and host for your university lecture. Feel free to respond to my criticisms of the *Journal of Human Thermodynamics* as well, given that you are the General Editor of the "journal".

Goodbye.
Philip Moriarty

— —

Comment **#88**

Anonymous (Philip Moriarty)
Sep 10 2009, 10:38 AM EDT
To: Sadi-Carnot/Libb Thims

In response to my e-mail to Prof. Muschik (see comments #79 and #80 above on pages 4 and 5 respectively), I received the following message:

> "Dear Colleague Moriarty,
>
> This is a ghostlike discussion. From a thermodynamical point of view, the procedure is clear: If one have a distribution (that means some items must be distributed), you can define an not necessarily thermodynamic entropy (if it is thermodynamic or not, depends on the items which are distributed). If one additionally can define an energy belonging to the set of the distributed items, one can define a temperature by differentiating the entropy to this energy. Then one can call the set of the distributed items a thermodynamical one (if you want).
>
> Let us consider a set of students having different heights. Then one can introduce a distribution function describing the distribution of the different heights spanning the R1. The one can define an entropy (information measure). But because there no energy belonging to the considered set of students, you cannot define a temperature and this set of students does nor represent a thermodynamical system (as we knew that from the very beginning).

You can use this letter for contributing the discussion on which I will not participate anymore. Thanks for your e-mail and with my best regards W. Muschik"

So, as was pointed out in Comments #76 and #77 above, not only do Muschik and I agree but your suggestion that you can write down a thermodynamic entropy for a group of students is entirely flawed. Please stop trying to propagate your pseudoscientific human thermodynamics nonsense any further. More importantly, stop launching groundless ad hominem attacks.

Thank you. Enough,
Philip Moriarty

— —

Comment **#89**

AaronAgassi (Aaron Agassi)
Sep 10 2009, 1:04 PM EDT
First of all, sorry, I am used to systems warning me that I'm logged off before allowing me, if at all, to post anonymously.

Next, Phil, your application of thermodynamic equations to student height distribution is a splendid example of arbitrary and inappropriate application thereof. Of course, Sadi-Carnot applied said thermodynamic equations not to student height distribution, but to the notably particle-like movement of individuals in crowns in confined spaces. Again, this is metaphoric, because actual particles only move because of readily quantifiable physical forces, and people may be said to move in response to psychological forces, another metaphor and not so readily measurable. At best quantitative methods may be intelligently and approximately applied to such a qualitative problem.

My point is, that with some effort, any student could deliberately begin moving in as non particle like a manner as conceivable, simply to ruin the observations! And that will never happen with actual particles. So: apples and oranges! That the analogy goes as far as it does, is already note worthy. If Sadi-Carnot insists that it goes any further, let him propose an experiment with proper conditions of falsification. But making entirely different analogies, even from the same thermodynamics, only demonstrates the facility of concocting analogy. The connection is unclear, at least to me, given that the catagories are so entirely different,

And as to the scale of degrees set for measurement of the correlated analogous heat, surely that would be arbitrary, considering what sort of particle each student is taken to represent, differential in scale, and so forth. Analogy allows that range of freedom. It's not real heat. The real temperature in the room, is entirely another matter.

— —

Comment **#90**

AaronAgassi (Aaron Agassi)
Sep 10 2009, 1:34 PM EDT
Once again, just because both Hitler and Stalin wore mustaches, it would be folly to conclude that only bad men wear mustaches! Plant breading and animal breading are extremely similar, but even so, there remain some differences. All analogies break down at some point, except for tautology, the analogy of any one thing actually with itself. Because nothing is entirely like anything else. Anything is only entirely like itself. At some point, all things are each *sui generis*. Now, Darwin actually tested to find the extent of similarity in plant and animal breeding. Will Sadi-Carnot propose proper experiments with conditions of falsifiability, in order to discover the range of similar applicability of Thermodynamics? Or will he simply wait for the bold denizens of his fabulous future to buckle down on the due diligence?

— —

Comment **#91**

Anonymous (Philip Moriarty)
Sep 10 2009, 5:55 PM EDT
"Aaron, you are entirely correct to dismiss the concept of human thermodynamics, as put forward by Libb ThimsSadi-Carnot, as tripe. Sadi-Carnot has studied the history of thermodynamics in quite some detail - and is certainly better versed in the minutiae of the historical development of certain concepts than I - but he has little or no

grasp of the underlying physics.

> "Sadi-Carnot gathers ever more sociological observations that can be correlated by whatever strained metaphors to thermodynamics, but has yet to make predictions, testable hypotheses with standards of refutation".

Indeed. Moreover, instead of debating the scientific issues using reasoned counter-arguments, he continually simply quotes from experts (often entirely missing the point of the question) and arrogantly attacks those who do not share his outlandish views via nasty *ad hominem* attacks. Richard Feynman once put forward an interesting single sentence definition of science: "Science is the belief in the ignorance of experts". Once an argument is *solely* based on, as I put it above, "recourse to authority" - Sadi-Carnot's preferred approach - then one appreciates the point that Feynman was trying to make. It's a question of critical thinking.

All the best,
Philip (Moriarty)

— —

Comment **#92**

lynnliss (Lynn Liss)
Sep 10 2009, 6:04 PM EDT

Human thermodynamics (or human chemistry) is an entirely radical thinking from a scientific viewpoint.....how can you state Libb doesn't embrace Feynman's "ignorance of experts" approach, in this light?

— —

Comment **#93**

lynnliss (Lynn Liss)
Sep 10 2009, 6:10 PM EDT

> "I made mention of light and sound both actually BEING waves. Again, waves are waves. Yes, that's more than analogy, indeed it is tautology. Sadi-Carnot strays into nonsense by pressing argument from analogy way too far. The observation of people in crowds under confined space moving at all like particles, is all fine and good. It could be a true observation, that most would make as a joke, because it doesn't really necessarily indicate much more. The most viable application is still to architectural traffic flow, but even then not exclusively, due to distinctly non Thermodynamic human conduct. For example, The way to avoid crows at Disneyworld, is always to turn left, because crowds tend to turn right. Will Sadi-Carnot now chalk that up to some sort of social coriolis effect [see: turning tendencies]? In Situationism, even aesthetics factors of as experienced inside an environment are observed to repel or to attract human movement through the streets. But such qualitative factors are difficult to quantify in order to apply equations. So any possible application of thermodynamics remains poetical, useful in forcing unusual inventive associations, which is more valuable than Sadi-Carnot's obscurantist pseudoscience."

Just because 'qualitative factors are difficult to quantify in order to apply equations' does that mean we don't attempt to? Isn't that evolutionary thinking...something we science aspire towards?

— —

Comment **#94**

lynnliss (Lynn Liss)
Sep 10 2009, 7:42 PM EDT

> "Next, Phil, your application of thermodynamic equations to student height distribution is a splendid example of arbitrary and inappropriate application thereof. Of course, Sadi-Carnot applied said

Thermodynamic equations not to student height distribution, but to the notably particle like movement of individuals in crowns in confined spaces. Again, this is metaphoric, because actual particles only move because of readily quantifiable physical forces, and people may be said to move in response to psychological forces, another metaphor and not so readily measurable. At best quantitative methods may be intelligently and approximately applied to such a qualitative problem.

My point is, that with some effort, any student could deliberately begin moving in as non particle like a manner as conceivable, simply to ruin the observations! And that will never happen with actual particles. So: Apples and oranges! That the analogy goes as far as it does, is already note worthy. If Sadi-Carnot insists that it goes any further, let him propose an experiment with proper conditions of falsification. But making entirely different analogies, even from the same Thermodynamics, only demonstrates the facility of concocting analogy. The connection is unclear, at least to me, given that the catagories are so entirely different,

And as to the scale of degrees set for measurement of the correlated analogous heat, surely that would be arbitrary, considering what sort of particle each student is taken to represent, differential in scale, and so forth. Analogy allows that range of freedom. It's not real heat. The real temperature in the room, is entirely another matter. "

But you are presuming that the 'decision' of a student to move is 'deliberate' vs. driven by their innate nature or scientific structure.....thoughts?

— —

Comment **#95**

AaronAgassi (Aaron Agassi)
Sep 10 2009, 10:26 PM EDT

Of course all events are subject to sequence of causality, one way or another. The question is of applicable reduction to thermodynamics. Psychology has yet to reduce to neurology, much less thermodynamics. And even such an achievement, if ever successful, would still be complex enough seemingly to rule out reduction of sociology or sociometry directly to thermodynamics equations.

PS. I think that we are all familiar with and clear about the logical falsity relevance of appeal to authority. Nevertheless, if one posts credentials, one opens the door to requests for verification. And, seriously lynnliss, not even Sadi-Carnot posts degrees yet to be graduated into! I mean, doesn't that violate entropy?

— —

Comment **#96**

Anonymous (Philip Moriarty)
Sep 11 2009, 1:20 AM EDT

As I noted in one of the preceding comments, I was going to walk away from this argument with Sadi until he (yet again) personally and visciously attacked the credentials of Frank Lambert, somebody who has helped countless students get their heads around the very difficult concept of entropy. This, not to put too fine a point on it, pissed me off immensely, particularly as Sadi/Libb clearly does not understand even the most basic concepts in thermodynamics and quantum physics. He certainly knows the history of the subject (better than I do in some cases) but does not understand the physics and chemistry.

— —

Comment **#97**

Anonymous (Philip Moriarty)
Sep 11 2009, 1:43 AM EDT

"Human thermodynamics (or human chemistry) is an entirely radical thinking from a scientific viewpoint.....how can you state Libb doesn't embrace Feynman's "ignorance of experts" approach, in this light?"

...smacks face with palm of hand and starts to sob gently...Arrrgggghh. Right, here's *my* new radical theory:

> All human interactions are based around the transfer of energy "hoops" - best thought of as "micro-bagels" in layman's language - which exist in forty-seven higher dimensions on fractions of the Planck-length and for fractions of Planck-time. These *undetectable* micro-bagels give rise to a force between humans which mediates all of our interactions and, moreover, ensures that the arrow of time is defined. Love is simply a manifestation of a force between fermionic micro-bagels, whereas hate is a repulsive force due to boson-like energy hoops. Loss, sorrow, and, indeed, even homesickness, are all simply due to a reduction in the rate of energy hoop production by the body.

**Definitively* prove me wrong. (Remember, those energy hoops are undetectable...) Oh, and by the way, stay tuned because I can generate another theory, just as "radical" as that tomorrow. And the day after. And for an infinite number of days following that. I'll quote Robert L Park again, seeing as you apparently missed it the first time 'round (in the comments above):

> "It is not enough to wear the mantle of Galileo - that you be persecuted by an unkind establishment. You must also be right."

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#97**

Anonymous (Philip Moriarty)
Sep 11 2009, 1:54 AM EDT

> "Let students and professors make their own decisions about what they will and won't debate....open dialogue (vs. trying to shut down dialogues) only stunts innovative thinking"

Yes, fine, I entirely agree. If Libb's "theory" (for want of a better term) is being presented for discussion in terms of its scientific viability, well and good. I made this point in Comment # 24 above. (Before you post in future, would you do me the courtesy of reading all of the comments in the debate thus far? It'll save us both some time).

However, it's an entirely different matter if Libb's human thermodynamics baloney is being presented as a viable scientific theory to undergraduate students. If Libb would respond and let me know who is hosting his talk then we could get to the bottom of the conext in which he is presenting his lecture. After all, would you be happy for me to present my "theory" on the micro-bagel model of human interactions (outlined in comment #112 above) to undergraduates as part of a module on biochemistry?

Anyone can put an innovative new theory. The difficult bit is making sure that your theory agrees with the evidence/observations.

In suggesting that I am trying to stifle debate you are either being wilfully disingenuous or, as I suspect, you really don't understand the scientific method (and Libb has got it so wrong).

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#98**

Anonymous (Philip Moriarty)

Sep 11 2009, 1:59 AM EDT
"Just because 'qualitative factors are difficult to quantify in order to apply equations' does that mean we don't attempt to? Isn't that evolutionary thinking...something we science aspire towards?"
Yes, you're entirely correct that we should aim to develop quantitative **predictive** models even in cases where this appears extremely difficult. What we shouldn't do, however, is dress fanciful "theories" - with no grounding in observation or experiment - up in the language of physics and/or maths in order to make them appear more valid than they are. This is precisely the approach Libb uses.

I'll refer you, yet again, to a preceding comment, Lynnliss. See my discussion of Alan Sokal's masterful expose of pseudoscientific "mumbo jumbo" in Comment # 54 above.

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)
— —

Comment **#99**

Anonymous (Philip Moriarty)
Sep 11 2009, 2:11 AM EDT

"But you are presuming that the 'decision' of a student to move is 'deliberate' vs. driven by their innate nature or scientific structure.....thoughts?"
Lynnliss....

Have you taken in *any* of the preceding debate? Please go back and read comments 77 and 99 above. It is an entire waste of your time to attempt to couch human interactions and distributions in terms of Sadi/Libb's nonsensical human thermodynamics "theory". There is, of course, the much more compelling "micro-bagel"/energy hoop theory of human interactions which you could adopt... :-)

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)
— —

Comment **#101**
Petrologist (Bruce Bathurst)
Sep 11 2009, 4:46 AM EDT
Mr Agassi, I think you've found the elephant squeezing through the door, but I'll answer these questions anyway.

Anonymous (Mr Agassi?) wrote yesterday at 7:33am EDT:

> "3. The scientific use of the word 'true', which scientists strive to replace with 'false', is treated the same as the 'true' used by philosophers."
>
> 'Truth is correspondence to reality in assertions. Assertions are Ontological statements such as employ the verb: to be.'

Yes, that's the philosophers' definition, even in their jargon. However, it's not the scientists' definition of truth. Unless reality changes, metaphysical truth will never change. Most anything in science true today may be false tomorrow. When that happens, science has progressed (see: scientific realism (link)).

> ' "Thin" Truth: Both Putnam and Fine assert that one can (and should) accept the well established theories of science (even about unobservable) as (probably) true, but that this should not be understood as accepting the "metaphysical realist" (Putnam's term) view that the statements which constitute those theories correspond to reality. '

— —

Comment **#102**

Petrologist (Bruce Bathurst)
Sep 11 2009, 4:51 AM EDT
Mr Agassi next wrote:

> "4. Hypotheses are judged by examining their explanations, not their predictions."
>
> 'Both explanatory power and testability are always crucial.'

No. Thermodynamics, in fact, is almost unique in never explaining. Frustrating. Even statistical mechanics does not really help:

> ' Although statistical mechanics is based on the presumed reality of atoms and molecules, it does not provide, any more than does thermodynamics, a detailed description of atomic and molecular behavior and of atomic and molecular interactions. ... Thus statistical mechanics adds something very useful to thermodynamics, but it neither explains thermodynamics nor replaces it. ' Van Ness, H.C. 1969. Understanding Thermodynamics. NY: McGraw-Hill.

After an invited lecture I gave at CalTech (on a new thermodynamic theorem useful to geologists), a post-graduate student asked 'Why are only three curves needed?' My answer was 'I haven't the slightest idea.'

— —

Comment **#103**

Petrologist (Bruce Bathurst)
Sep 11 2009, 4:57 AM EDT
Mr Agassi then wrote:

> ' "5. Religion and art are not viewed as important irrational activities of the mind: faith is treated as logical and thus blurred with scientific belief. Irrational thought is viewed as inferior to rational thought."

What in Hell is "scientific belief"? '

See 'thin' truth, answering your question #3 above. This statement I added because my introduction to the methodology of science came from reading D.T Suzuki's 'Outlines of Mahayana Buddhism', decades ago. Suzuki even refers to the similarity of Buddhist philosophy to the Logical Positivists of the Vienna Circle. Next was an outstanding little article by Albert Einstein, which I've never found since. A good reference, however, is P.W. Bridgman, 1932. The Logic of Modern Physics. NY: Macmillan. Its purpose was to tighten the definiton of science. When creating one's own theory (as opposed to using one -- as in T.S. Kuhn's 'normal' science), one needs to be extraordinarily careful.

— —

Comment **#104**

Petrologist (Bruce Bathurst)
Sep 11 2009, 5:09 AM EDT
Anonymous (Philip Moriarty) wrote:

' In any case, I can't follow or understand the vast majoirty of what Petrologist writes. (I refer Petrologist to Comment # 54 above). '

The only anonymous post I offered, which I signed, was that pointing you to probably another alias of Msr Carnot. I

should hope my posts were more generous than #54! You may find my posts confusing because they addressed the whole subject of 'Human Thermodynamics'. I felt focusing on its definition of entropy lets it be treated as a hard science, which is bad. My first posts focused on the requirements of a 'hard science', and thermodynamics in particular.

Pseudosciences such as creationism have silently changed objective to subjective, scientific (or 'thin') truth to philosophical truth, and replaced the production of 'falsifiable' predictions with happy explanations.

You've noticed this. :-)

My last post noted that most all these substitutions are on the website, which should set off huge alarm bells. I don't mean to imply that this was done on purpose; but I wondered why people were talking about entropy when this implied the tacit acceptance of 'Human Thermodynamics' as hard science (not 'science' as in 'Wissenschaft', as defined on the website).

One could, however, turn cute relationships (and Msr Carnot knows more than I can imagine) into nice contributions to such fields as sociology or psychology. These are not, however, 'hard sciences', and 'Human Thermodynamics' does not appear to be one, despite its name.

' Moreover, the discussion is going off topic - I do not want to get dragged into a pointless discussion on creationism/religion vs. science. '

I fear that may be what has been happening ... and remember, the Dark Ages weren't called dark because it was cloudy.

— —

Comment **#105**

AaronAgassi (Aaron Agassi)
Sep 11 2009, 6:17 AM EDT
"Mr Agassi, I think you've found the elephant squeezing through the door, but I'll answer these questions anyway.

Anonymous (Mr Agassi?) wrote yesterday at 7:33am EDT:

"3. The scientific use of the word 'true', which scientists strive to replace with 'false', is treated the same as the 'true' used by philosophers."

'Truth is correspondence to reality in assertions. Assertions are Ontological statements such as employ the verb: to be.'

Yes, that's the philosophers' definition, even in their jargon. However, it's not the scientists' definition of truth. Unless reality changes, metaphysical truth will never change. Most anything in science true today may be false tomorrow. When that happens, science has progressed.

http://plato.stanford.edu/entries/scientific-realism/

' "Thin" Truth: Both Putnam and Fine assert that one can (and should) accept the well established theories of science (even about unobservable) as (probably) true, but that this should not be understood as accepting the "metaphysical realist" (Putnam's term) view that the statements which constitute those theories correspond to reality. '
"
That's verisimilitude.

— —

Comment **#106**

AaronAgassi (Aaron Agassi)
Sep 11 2009, 6:28 AM EDT
"Mr Agassi next wrote:

"4. Hypotheses are judged by examining their explanations, not their predictions."

'Both explanatory power and testability are always crucial.'

No. Thermodynamics, in fact, is almost unique in never explaining. Frustrating. Even statistical mechanics does not really help:

' Although statistical mechanics is based on the presumed reality of atoms and molecules, it does not provide, any more than does thermodynamics, a detailed description of atomic and molecular behavior and of atomic and molecular interactions. ... Thus statistical mechanics adds something very useful to thermodynamics, but it neither explains thermodynamics nor replaces it. ' Van Ness, H.C. 1969. Understanding Thermodynamics. NY: McGraw-Hill.

After an invited lecture I gave at CalTech (on a new thermodynamic theorem useful to geologists), a post-graduate student asked 'Why are only three curves needed?' My answer was 'I haven't the slightest idea.'
"
Laws are the broadest and most consistent observations except for logic itself. Even though laws in and of themselves do call for explanation, nevertheless, consistency with laws does often offer a great measure of explanation of a system and event therein, as well as prediction.

— —

Comment **#107**

AaronAgassi (Aaron Agassi)
Sep 11 2009, 6:31 AM EDT
"Mr Agassi then wrote:

' "5. Religion and art are not viewed as important irrational activities of the mind: faith is treated as logical and thus blurred with scientific belief. Irrational thought is viewed as inferior to rational thought."

What in Hell is "scientific belief"? '

See 'thin' truth, answering your question #3 above. This statement I added because my introduction to the methodology of science came from reading D.T Suzuki's 'Outlines of Mahayana Buddhism', decades ago. Suzuki even refers to the similarity of Buddhist philosophy to the Logical Positivists of the Vienna Circle. Next was an outstanding little article by Albert Einstein, which I've never found since. A good reference, however, is P.W. Bridgman, 1932. The Logic of Modern Physics. NY: Macmillan. Its purpose was to tighten the definiton of science. When creating one's own theory (as opposed to using one -- as in T.S. Kuhn's 'normal' science), one needs to be extraordinarily careful.
"
Again: verisimilitude.

— —

Comment **#108**

Anonymous (Philip Moriarty)
Sep 11 2009, 8:43 AM EDT
"Anonymous (Philip Moriarty) wrote:

' In any case, I can't follow or understand the vast majority of what Petrologist writes. (I refer Petrologist to Comment # 54 above). '

The only anonymous post I offered, which I signed, was that pointing you to probably another alias of Msr Carnot. I should hope my posts were more generous than #54! "
Dear Petrologist/Bruce,

My referring you to Comment #54 was indeed rather brusque and "tetchy" of me. Please accept my apologies. The points you raise in Comment #120 are all well-made and perhaps I should have taken rather more time reading through your earlier comments. Once again, my sincere apologies.

The key points arising from this whole sorry saga are:

(i) Those who are well-read in the history of a scientific subject can generate large amounts of pseudoscientific text which, to those who are not scientists and mathematicians, can sound convincing;

(ii) Being well-read in the history of a subject does not necessarily mean that one understands that subject;

(iii) If every argument (and counter-argument) is based around recourse to authority (and quotes lifted directly from textbooks and articles), there are very likely strong deficiencies in that person's understanding of the subject;

(iv) Treat with great care the claims of someone who purports to be doing an MS in Physics, a PhD in biochem, and an MD in neuroscience **in parallel**!

I am now going to contact the university directly regarding Sadi's/Libb's lecture.

Best wishes,
Philip

— —

Comment **#109**

telosx (Peter Pogany)
Sep 11 2009, 9:55 AM EDT
Individuals who resist grasping the physicality implicitly present in such statements as “idea is matter,” “conscious unity is communication,” “signs mediate shared understanding,” “social history is (also) natural history” are probably not fit to be discursive partners in the multidisciplinary cultivation of “human thermodynamics.”

This is not intended as a putdown. Rather, it is meant to encourage a change of perspective by recalling that the spirit of adventure expressed in the wish to broaden the hermeneutics of reality at the expense of self-contained formalisms resulted in many remarkable breakthroughs in the history of science. What important contribution the physicist Schrödinger made to biology; the chemists Soddy, Prigogine and (Michael) Polanyi to economic thought, physics, and philosophy, respectively! And did they take some flak along the way! Not only from the fields into which they ventured but also from their own.

May Libb’s lecture go well!

— —

Comment **#110**

Anonymous (Philip Moriarty)
Sep 11 2009, 10:43 AM EDT
"Individuals who resist grasping the physicality implicitly present in such statements as “idea is matter,” “conscious unity is communication,” “signs mediate shared understanding,” “social history is (also) natural history” are probably not fit to be discursive partners in the multidisciplinary cultivation of “human thermodynamics.”

"
...wry smile...

In this case I unapologetically refer you back to Comment #54, telosx. Obscure, jargon-ridden language in general disguises a lack of substance in an argument. (Interesting that you use that term "hermeneutics" - cf the title of Alan Sokal's paper referred to in comment #54).

Let me translate your comment into something approaching English:

"Someone who expects a theory to be based on sound physical/mathematical principles and reasoning, and to be supported by evidence and observation, is clearly not sufficiently radical in his/her thinking to contribute to the

"multidisciplinary cultivation" of human thermodynamics. "

So, forget rational thinking. Forget reason. Forget logic. Forget connection with experiment/observation. The only thing that matters is that the "theory" goes against currently accepted views.

There is as little evidence for human thermodynamics as there is for my radical new theory of "micro-bagel"-mediated interactions in Comment #112. (I guess that I need to point out that I was being sarcastic when I put forward that "theory". It's a shame that I have to highlight this, but I'm beginning to wonder if some of those who embrace "human thermodynamics" actually "get" the sarcasm).

Just because a view is radical and challenges accepted wisdom, does not make it right...

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#111**

jingchen (Jing Chen)
Sep 11 2009, 1:21 PM EDT
Hi Libb,

It is great to read about the debate. I feel that the differences of both sides are not very big. I certainly agree with you that entropy can be used to describe human populations. There are many useful applications. For example, it has been found that the income distribution of populations largely follow Boltzmann distribution. The challenges from Moriarty are also very helpful. They push people to think more rigorously.

I don't have much to add on this debate. I wrote a paper called The Physical Foundation of Human Mind sometime ago. It was based on the concept of entropy. Maybe it is indirectly related to this debate. The link is provided for your reference.
http://web.unbc.ca/~chenj/papers/Mind.pdf

— —

Comment **#112**

Anonymous (Philip Moriarty)
Sep 11 2009, 3:58 PM EDT
"Hi Libb,

It is great to read about the debate. I feel that the differences of both sides are not very big. ...."
Dear Jingchen,

Given that you suggest that "the differences of both sides are not very big", and with all due respect, I strongly advise you to read back over the 126 preceding comments a little more carefully. My position is that Libb's/Sadi's human thermodynamics "theory" is nonsensical, pseudoscientific rubbish with as much viability as the theory of "micro-bagel" interactions I put forward in comment #112. Libb's viewpoint and mine could not be *more* different.

Best wishes,

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#113**

Anonymous (Philip Moriarty)
Sep 11 2009, 4:19 PM EDT
"Just because a view is radical and challenges accepted wisdom, does not make it right...

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano) "
Moreover, for that matter, a view being obtuse and obsurantist hardly renders it radical and challenging!

— —

Comment **#114**

Petrologist (Bruce Bathurst)
Sep 11 2009, 6:51 PM EDT

Mr Agassi,

How could a scientist who believes the mind can't capture reality possibly use 'true' to label a thought that captures reality?

You should probably send your scientific experiences to Stanford University, not me. I'm guessing (hoping) you are considering 'scientific truth' the same as 'philosophical truth' because you believe our minds can capture reality, and some day scientists will 'get it right'. This is a valid, though extremely 'realist' point of view. I suppose the rare scientist could believe his mind and his pet theory have captured reality; and when proven wrong, says, 'Rats, I was wrong again.'

Good scientists, even during the paradigm switch from the theory of geosynclines to theory of plate tectonics, didn't do this. Empiricists, many of whom believe the mind can't capture reality, and realists as well, consider the above use of 'truth' non-scientific. It inhibits the mind from remaining open to new ideas, and prohibits scientific growth. Good scientists simply qualify their use of 'truth' to agree with current theory, not reality. They hope to make it false tomorrow. This describes the usage I observed among faculty at Dartmouth College and at Princeton University, and it is proper in lexocography. It is essential in defining science and distinguishing it from metaphysics and religion.

Denying this usage forces a conflict between some extreme religious groups and science. This has forced, in some parts of the US, a requirement to teach religion as science. It is important, I believe, to distinguish these two uses of 'truth'. (Ignoring the difference between objective & subjective in this debate would have the same effect: it would expand 'hard science' to include sociology, philosophy, religions, &c, and create the conflict necessary to nurture 'creationism'.)

— —

Comment **#115**

AaronAgassi (Aaron Agassi)
Sep 11 2009, 8:10 PM EDT

What gives you the impression that I hold that the mind can't capture reality, whatever exactly you mean by that? Truth is correspondence with reality in assertions. No single assertion encompasses the totality of being. What problem? No problem.

"Good scientists simply qualify their use of 'truth' to agree with current theory, not reality." That's not truth but validity, meaning only internal logical consistency.

A successful scientific research narrows the field of viable hypotheses. Such is enlightenment by refutation. There is no reasonable obligation to keep the mind more open than that.

— —

Comment **#116**

Petrologist (Bruce Bathurst)
Sep 11 2009, 9:38 PM EDT

My statement was that scientists who find a philosophical definition of truth acceptable (must logically) believe that the mind can (not 'can't') capture reality. You misread it.

Your 'truth' is a logical constant, mine is a logical variable.

' "Good scientists simply qualify their use of 'truth' to agree with current theory, not reality." That's not truth but validity, meaning only internal logical consistency. '

It would be if the definiton were applied to mathematical theories; but scientific theories are well grounded in objective, operational measurements of nature.

My definition was formed by observation long before I read of 'thin truth'. It mine were an opinion, I would likely not

have found it in Stanford's Encyclopedia of Philosophy.

You can disagree with it, but it isn't just an opinion. It is, however, my opinion that the distinction is extremely important.

— —

Comment **#117**

Petrologist (Bruce Bathurst)
Sep 11 2009, 9:47 PM EDT

Telosx,

I, too, have no objection to Msr Carnot's lecturing on his ideas. My initial course in geology was to read a traditional text and read Velikovski's work on catastrophism (considered pseudoscience) and evaluate the validity of each. I should feel more comfortable, however, if he were lecturing to scientists rather than engineers. (Many engineers, however, practice science.)

My only disagreement with your post, in fact, is equating the methodology of social history & natural history. A food's color can be measured by everyone with a spectrometer, so they all agree upon its color: it is an objective variable. A food's taste, however, differs from person to person: it is a subjective variable. When a machine is invented that tastes, can it measure taste as everyone does? No. 'My sensation in tasting broccoli is the same as yours' logical positivists consider 'meaningless'. Meaningless simply means they don't see how natural science can address it.

Now, scientific methodology does not especially produce theories & theorems that are more accurate than, say Jung's theory of the collective unconscious. (When I needed medical help, I preferred an intuitive diagnostician in neurology to MRIs & EEGs.) Scientific methodology produces theories that everyone agrees are the best we can come up with: every step is objective, so everyone should agree what the theories mean and why we believe them.

Carl Jung's theory of the 'collective unconscious' is attractive & very fertile: it explains much in folklore, mythology, & fairy tales, whose study I once considered making my life's work.

My criticism of 'Human Thermodynamics' is simply its being sold as an objective, 'hard science', as its name implies. This comes with great dangers.

— —

Comment **#118**

Sadi-Carnot (Libb Thims)
Sep 11 2009, 10:00 PM EDT

I haven't had a chance to look at all of the debate comments since my last post (which I will do shortly), but in the mean time I decided to post up the 2006 Rossini-Leonard-Wojcik debate on the issue of whether or not one can apply entropy and enthalpy terms to the study of human freedom and security in social life. The debate, essentially, is the same discussion we are having here, which seems to highlight the fact that the issue on whether (or not) one can apply thermodynamics to the study of humanity seems to be embedded in the general scientific community, with scientists split on the issue.

Of note, I do find it humorous (based on an email that I received today) that Moriarty has tracked down the professor who invited me to lecture at the university, essentially warning him not to let me lecture on what he calls "pseudoscientific drivel".

— —

Comment **#119**

Petrologist (Bruce Bathurst)
Sep 11 2009, 11:26 PM EDT

Sadi, Nice to hear from you. Of the three scientists I know of here, we are all in agreement that 'Human Thermodynamics' is currently not a valid scientific theory.

Don't worry, the professor who invited you to speak is ethically bound to ignore such communications, which are considered unethical.

One needs know nothing of 'Human Thermodynamics' to offer this constructive criticism. Classical Thermodynamics is what logicians term an interpretation of the mathematical theory of affine geometry. A fundamental theorem in model theory states that any theorem valid for the mathematical theory is valid for its interpretation. Because there is a 1-to-1 correspondence between axioms & theorems in each, 'Human Thermodynamics' should be easily associated with affine geometry on the application level, and then easily traced back to its axioms and primitive definitions. I read earlier that 'Human Thermodynamics' was having problems with this 'trace back'. Because affine geometry can be axiomatized in many ways, there is no unique 'formula' for doing this.

However, thermodynamics differs from mechanics in the consideration of heat. Volume & temperature are usually the state variables one starts with. So, make sure your entropy is the correct partial derivative of an energy wrt your temperature. Though it is remotely possible to create an interpretation of affine geometry in sociology, it will not be a 'hard science', as thermodynamics is. Objective, operational definitions are needed for this.

Best of luck. Fix your site's scientific definitions. Love the photos.

Bruce

— —

Comment **#120**

Sadi-Carnot (Libb Thims)
Sep 11 2009, 11:53 PM EDT
To Petrologist, what you and your two scientific associates consider “not a valid scientific theory”, others consider a Nobel Prize. To cite one example, in 2007 Russian physical chemist Georgi Gladyshev, author other 1998 book Thermodynamic Theory of Evolution (something he has spent 30-years working on), flew out from Moscow to Chicago, with his wife, to take me out to dinner to tell me that he had sent my work into the Nobel Prize organization for nomination. To quote from social anthropoligist Max Gluckman:

“A science is any discipline in which the fool of this generation can go beyond the point reached by the genius of the last generation.”

To note for everyone, I might not be able to get back to these debates till Monday.

— —

Comment **#121**

AaronAgassi (Aaron Agassi)
Sep 12 2009, 12:00 AM EDT
Petrologist:

"My statement was that scientists who find a philosophical definition of truth acceptable (must logically) believe that the mind can (not 'can't') capture reality. You misread it." Again: What is capturing reality?

"Your 'truth' is a logical constant, mine is a logical variable."
Huh??????????????????

"' "Good scientists simply qualify their use of 'truth' to agree with current theory, not reality." That's not truth but validity, meaning only internal logical consistency. '
It would be if the definiton were applied to mathematical theories; but scientific theories are well grounded in objective, operational measurements of nature."
Wrong: What you are spouting is the Coherence Theory of Truth, which indeed conflates truth with validity. If one accepts, for example, current best science as premise, then consistency thereto is merely validity. Because truth, indeed, is objective, Ontology, a separate question.

— —

Comment **#122**

AaronAgassi (Aaron Agassi)
Sep 12 2009, 12:01 AM EDT

(continued)

Truth remains correspondence with external reality. If one were to declare: "Really, that guy ran out into the street naked. It's true!" By the appended qualifier: "It's true" is meant that the initial statement corresponds with reality, just as the prefacing "really" signifies that an Ontological statement follows.

Now where one to declare: "It stands to reason that if someone where naked in the sun and wind for very long, that he might have suffered from exposure." -That would be a logically valid inference, even if entirely hypothetical.

"My definition was formed by observation long before I read of 'thin truth'. It mine were an opinion, I would likely not have found it in Stanford's Encyclopedia of Philosophy."
All assertions, no matter how authoritative and common place, are both opinion and claims of truth. Any can be either true or false, for all we know.

"You can disagree with it, but it isn't just an opinion."
All assertions are opinion even while at the same time claiming truth. All can be either true or false, for all we know.

"It is, however, my opinion that the distinction is extremely important."
Here we can agree. This is my opinion as well, as to the importance of the distinctions.

"“A science is any discipline in which the fool of this generation can go beyond the point reached by the genius of the last generation.”"
But not every fool. There can be no guaranteee.
— —

Comment **#123**
Petrologist (Bruce Bathurst)
Sep 12 2009, 3:18 AM EDT
Mr Aggasi,

As I once said, I don't argue. My posts were all to help and clarify, not to change one's religious beliefs or obfuscate the truth. All were offered in good faith.

You won't find the scientists' use of 'truth' in your little logic book (though page 1, the monadic predicate calculus, will have its formal expression, devoid of substance).

I think I've explained science enough. There are three essential features that 'creationists' (whom I avoid like the plague) do their best to obscure, because these distinguish science from religion, which would allow both to coexist happily (and even compliment one another). These features are:

1. objectivity, not subjectivity
2. falsifiable predictions, not explanations
3. the attempt to make true theories false

Every scientist I have ever met knows the above to be requirements of science. This is Science 101. Every registered user but me who participated in this discussion appeared to refuse at least one of the above. What conclusion am I to reach? (Don't answer, for I'm not going spend more time with my granddaughter instead.)

So this post contributes something of value to everyone, I refer any person interested in what science is to the two classics in this field. The second is more of a reference book, containing much new material on logic.

Whewell, W. 1858. Novum Organon Renovatum, 3d ed London: John Parker.

Jevons, W.S. 1877. The Principles of Science, 2d ed: A Treatise on Logic and Scientific Method. London: Macmillan.

Though free on Google Books, you may want your own hardbacks. 'Natural classification' is where science begins. Darwin's Origin of Species has some discussion of this topic, which produces the most fertile theories. There is much more. Dover has published classroom notes by R. Carnap that are very good.

— —

Comment **#124**

AaronAgassi (Aaron Agassi)
Sep 12 2009, 4:27 AM EDT
You may need to talk to better scientists and get a new reading list. Of course falsifiability is crucial. But explanatory power is certainly a scientific value, an article of critical preference. Valid inference from verisimilitude is entirely consistent with Hypothetico Deductive Method in the scientific quest for truth which is correspondence to reality in assertions.

— —

Comment **#125**

Anonymous (Philip Moriarty)
Sep 12 2009, 5:45 PM EDT

> "Sadi, Nice to hear from you. Of the three scientists I know of here, we are all in agreement that 'human thermodynamics' is currently not a valid scientific theory. Don't worry, the professor who invited you to speak is ethically bound to ignore such communications, which are considered unethical."

In response to comments #135 and #136:

Dear Petrologist and Sadi-Carnot (aka Libb Thims),

As ever, Sadi-Carnot puts his own particular "spin" on the situation. The message I sent the university is in the next comment. I ask for confirmation that Sadi-Carnot/Libb Thims is speaking and in what context. Where in that e-mail do I warn the academic not to let you lecture, Sadi-Carnot?

I resent the accusation (by Petrologist) that contacting the university regarding Sadi-Carnot/Libb Thims' lecture is unethical. I am still waiting for Sadi-Carnot/Libb Thims to provide details of where he is studying for his MS in Physics/PhD in biochem/MD in neuroscience. I therefore take all his claims with a "pinch of salt". Note in the e-mail below that I ask the university academic first to confirm that Thims is speaking (and then, if he is, in what context). In what sense is checking on Thims' claim to be speaking at the university unethical?

If the university is happy to have its undergraduate students be lectured by an individual who (i) puts forward a "theory" of human interactions based on such nonsensical notions as "sexual temperature" and quantum-mechanical human "bonds", (ii) clearly does not understand basic 1st year undergraduate physics (despite claiming to be studying for an MS in physics), (iii) cannot substantiate claims in their biog related to their pursuit of an MS in physics, a PhD in biochem, and MD in neuroscience, and (iv) has not published one peer-reviewed paper, then that's its prerogative.

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#126**

Anonymous (Philip Moriarty)
Sep 12 2009, 5:49 PM EDT
My e-mail to the academic at the university reads as follows:

Dear Prof. ****,

I am a physicist at the University of Nottingham in the UK (see links and contact details below). I recently became “embroiled” in an online debate with someone who uses the pseudonym “Libb Thims” and who has set up a website and “journal” on a subject he calls “human thermodynamics”. Unfortunately, Thims’ “human thermodynamics” is pseudoscientific drivel.

The reason I am contacting you is that Thims has stated – publicly – that he is giving a lecture in bioengineering thermodynamics in the spring. I Googled the terms “bioengineering thermodynamics” and found that you are listed as the convener of this module. Could I ask you whether a formal invitation has been extended to present a lecture as part of the bioengineering thermodynamics course? If a formal invitation has been extended, could I ask in what context Thims has been asked to deliver a lecture?

Thank you and best wishes,
Philip

— —

Comment **#127**

Anonymous (Philip Moriarty)
Sep 12 2009, 6:16 PM EDT

"To Petrologist, what you and your two scientific associates consider “not a valid scientific theory”, others consider a Nobel Prize. To cite one example, in 2007 Russian physical chemist Georgi Gladyshev, author other 1998 book *Thermodynamic Theory of Evolution* (something he has spent 30-years working on), flew out from Moscow to Chicago, with his wife, to take me out to dinner to tell me that he had sent my work into the Nobel Prize organization for nomination. To quote from social anthropoligist Max Gluckman:
“A science is any discipline in which the fool of this generation can go beyond the point reached by the genius of the last generation.”

To note for everyone, I might not be able to get back to these debates till Monday."
Every week or so, I get an e-mail from someone or other who has developed a radically new theory of "everything", claiming that Einstein/Heisenberg/Planck/Bohr/Maxwell/(insert the name of your preferred scientist) got it wrong and that the author of the e-mail has got it right. Strange that I never see any of these individuals subsequently receive a Nobel prize. I guess that the Nobel Prize committee must similarly have to sift through very many crackpot nominations.

As regards your quote from Max Gluckman, I refer you to the statement from Robert L Park I have quoted a number of times above (see comment #22, for example).

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

P.S. Perhaps you could refer Dr./Prof. Gladyshev to my "energy hoop/micro-bagel" theory of human interactions in Comment #112? This seems to fit all the criteria he requires for a nomination to the Nobel prize committee...

— —

Comment **#128**

Anonymous (Philip Moriarty)
Sep 12 2009, 8:50 PM EDT

"I haven’t had a chance to look at all of the debate comments since my last post (which I will do shortly), but in the mean time I decided to post up the 2006 Rossini-Leonard-Wojcik debate.

on the issue of whether or not one can apply entropy and enthalpy terms to the study of human freedom and security in social life. The debate, essentially, is the same discussion we are having here .... with scientists split on the issue. "

Thank you for the link to that debate. You are correct - the theme mirrors that of our argument. Your suggestion, however, that scientists are "split on the issue" is, as ever, a remarkable overstatement. Silverstein's observation is that "Although Rossini's analogy is amusing and entertaining and makes some political sense, unfortunately, its thermodynamic conclusions are flawed." Even Leonard, in his closing response, appreciates the difference between drawing an *analogy* between thermodynamic functions of state and features of society, and the claim that one can **equate** a thermodynamic entropy/enthalpy/free energy with properties of human relationships/society. It is this distinction between analogy and mathematical/physical equivalence that is so important and which you seem unable to grasp.

Hence, you misinterpreted the analogy I drew in the Sixty Symbols YouTube video on entropy and argued that I was actually claiming that one could associate a thermodynamic entropy with the arrangement of students. That someone could confuse the analogy with the actual thermodynamic quantity just never occurred to me. Of the ~ 750 physics majors who took the 1st year Thermal and Kinetic Physics module I taught, not one made this fundamental error. Similarly, the number of professional scientists who have made this error is very small indeed.

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#129**

Anonymous (Philip Moriarty)
Sep 12 2009, 8:53 PM EDT

"Phil, if you don't want to bias the response to your perfectly legitimate inquiry, perhaps you should have used the more positively connotative term 'nom de plume' rather than the possibly pejorative word 'pseudonym.' I know it is never your intent actually to compromise freedom of speech for cranks. "

Aaron,

Very good point - thank you. Yes, "pseudonym" is rather pejorative. Thank you also for describing my inquiry as "perfectly legitimate" - I appreciate that.

All the very best.

Philip

P.S. Insomnia at least helps me keep up with e-mails and responses to comments here! 2 am in the UK...

— —

Comment **#130**

Petrologist (Bruce Bathurst)
Sep 12 2009, 11:29 PM EDT

I've taken AaronAggasi's advice and offer here some more modern references from my shelf for natural sciences. The only proseminar I've had in the philosophy of science was in 1964. Since then, however, I've read regularly in philosophy and scientific methodology. However, I've not read much in the philosophy of science, preferring to read mathematical logicians, & scientists on this subject: Darwin, Peirce, Duhem, Mach, Einstein, Eddington, Weyl, Bridgman, &c. Popper's 'Logik der Forschung' contained nothing I could agree with.

For an original & pleasant discussion of physical chemistry, I can recommend C.N. Hinschelwood's 1951 'The Structure of Physical Chemistry' by the Clarendon Press, Oxford. On the creation of deductive theories, I can recommend A. Tarski's 1941 'Introduction to Logic' by the Clarendon Press, Oxford.

Some more moden books, no doubt considered obsolete, would be

> Hempel. C.G. 1952. Fundamentals of Concept Formation in Empirical Science. Chicago: Univ Chicago Press.

Hempel. C.G. 1966. Philosophy of Natural Science. Englewood Cliffs, NJ: Prentice-Hall.

Carnap, Rudolph. 1966. An Introduction to the Philosophy of Science. NY: Dover.

Nagel, Ernest. 1960. The Structure of Science. Cambridge: Cambridge Univ Press.

Nagel's book covers the social sciences. Explanation is defined neatly by Carnap (though I've felt it is, in use, subjective). Carnap considers observations or measurements already known to be explain by a theory, observations or measurements not yet know to be predicted by a theory. This would make classical thermodynamics an explanatory theory, for those whom energy is intutive. (This excludes me.) To be continued ...

— —

Comment **#131**

Petrologist (Bruce Bathurst)
Sep 12 2009, 11:55 PM EDT
Unfortunately, Tarski doesn't present his most famous definition of truth in the book recommended.

To Dr Aggasi's insistence that: 'Truth is correspondence with reality in assertions', I offer that the following statement does not correspond with reality, and is false.

This sentence is false.

Concerning unsolicited communications that contain: 'Thims' "human thermodynamics" is pseudoscientific drivel.', and AA's response, I can only urge you both to consult your Deans of Faculty for ethical help. (I thought AA was a philosopher.)

I'm sorry to see my old academic mentors & friends have been blamed for my ignorance. Any ignorance of scientific methodology is solely mine, and, glancing at the books I've recommended here, I see my methodology is really my own. Parts and ideas were built from observations, cafe conversations I miss, reviews for journals, and readings from works on the subject, on physical science, and on natural science. Any fault is not those of my associates at universities.

My apologies for causing the demeaning of my friends, and tutors in thermodynamics who no longer live:

Prof Martin Kruskal, of Princeton University
http://www.math.rutgers.edu/docs/kruskal

Prof Walter Kauzmann, of Princeton University
http://www.princeton.edu/main/news/archive/S23/42/01I78/index.xml

Prof Walter Stockmayer, Dartmouth College
http://www.dartmouth.edu/~chem/faculty/stockyobit.html

Prof Peter Rock, University of California
http://www.dateline.ucdavis.edu/dl_detail.lasso?id=8874

and especially to my good friend of old, the late David Crerar. I could not have had better tutors & friends. Any fault is mine. With this apology, I remove myself from this whole, vile, affair.

Bruce Bathurst

— —

Comment **#132**

AaronAgassi (Aaron Agassi)

Sep 13 2009, 2:32 AM EDT
Petrologist, how is it that you actually still manage to avoid Popper?

And as for that old chestnut, the liars paradox:
Truth is correspondence to external reality, in assertions. But the liars paradox is recursive, and does not clearly redress a separate or external reality. The conundrum is purely logical. Truth is singular, therefore to be true, an assertion must first be clear. The liars paradox is a leading question and ambiguous. The liars paradox is true in claiming to be false, and therefore false in claiming to be true. The correct answer depends which linguistic possibility is intended. Only a clearer statement could even be valid, much less true or false. So that means, that regarding the liars paradox, neither embracing the Post Modern coherence theory of truth conflating truth and validity nor conflating truth and verisimilitude, either, would improve matters much. So raising the liars paradox is fairly irrelevant anyhow.

Moreover, an explanation is not merely subjective, because explanations are, after all, assertions, therefore valid or not, true or false. Validity is internal self consistency, logically, in assertions, and truth is correspondence to reality, in assertions. Assertions are Ontological statements such as employing the verb: to be. What is more direct, applicable and elegant?

If you are correct in attributing your views to your teachers or colleagues, then it follows that you have been misinformed. There is nothing to be so melodramatic about.

And it's my father who has the doctorate.

— —

Comment **#133**

Anonymous (Philip Moriarty)
Sep 13 2009, 3:33 PM EDT
"Concerning unsolicited communications that contain: 'Thims' “human thermodynamics” is pseudoscientific drivel.', and AA's response, I can only urge you both to consult your Deans of Faculty for ethical help. (I thought AA was a philosopher.)"
Dear Bruce,

We have very different views regarding what constitutes unethical academic behaviour. Let me ask you this: should it be possible for any person, regardless of their training/academic track record and the validity of their "theories", to deliver a lecture to undergraduates as part of a BS/MS degree in a scientific subject? That is, is it OK for science undergraduates to be given a lecture in an entirely baseless "theory" which, for the weaker students, is likely to damage their understanding of a complicated subject, and for the best students is simply a waste of time?

You seem to think that it would be a violation of academic freeedom to suggest that it is wrong to present nonsensical pseudoscience as valid science. If you are happy for Thims to present a theory based around quantum mechanical "bonds" between humans to undergraduates, would you similarly be comfortable with a scenario where I presented my radical new theory of "energy hoop" interactions (see Comment # 112)?

In the UK, a number of pseudoscientific BSc degrees have recently been closed due in no small part to the efforts of Prof. David Colquhoun at UCL (http://www.dcscience.net/?p=1329). Are you suggesting that the successful campaign to shut down these ludicrous courses was somehow unethical?

What I think is unethical is the presentation of material with zero scientific validity to undergraduates as part of a BS or MS degree. This is a waste of their time and money. If Thims' lecture is being presented in the context of a debate, well and good. If, however, it is being presented as valid science then that is wrong.

Philip Moriarty

— —

Comment **#134**

Anonymous (Philip Moriarty)

Sep 13 2009, 3:45 PM EDT

"To Petrologist, what you and your two scientific associates consider “not a valid scientific theory”, others consider a Nobel Prize. To cite one example, in 2007 Russian physical chemist Georgi Gladyshev, author other 1998 book *Thermodynamic Theory of the Evolution of Living Beings* (something he has spent 30-years working on), flew out from Moscow to Chicago, with his wife, to take me out to dinner to tell me that he had sent my work into the Nobel Prize organization for nomination. To quote from social anthropologist Max Gluckman: 'A science is any discipline in which the fool of this generation can go beyond the point reached by the genius of the last generation'.”

(Another) reply to Comment #137:

I note from the "Human Thermodynamics (Objections to)" page at this Wiki that Stephen Lower has previously (and quite correctly) described Libb Thims' "theories" as crackpot. I came across a wonderful webpage by John Baez called the "Crackpot index" - see . Congratulations, Libb, you've just scored 20 points on the Baez scale for suggesting that you deserve a Nobel Prize.

— —

Comment **#135**

Anonymous (Philip Moriarty)
Sep 13 2009, 3:55 PM EDT

"To quote from social anthropoligist Max Gluckman: A science is any discipline in which the fool of this generation can go beyond the point reached by the genius of the last generation."

Libb, you're *really* racking up the points on Baez's crackpot index. You get "40 points for claiming that when your theory is finally appreciated, present-day science will be seen for the sham it truly is." (Point 36 on Baez's list). I'll leave you to tick off the other points on Baez's list...

— —

Comment **#136**

AaronAgassi (Aaron Agassi)
Sep 13 2009, 5:22 PM EDT
Phil, the protection for the ignorant and impressionable whereof you seek, and without abrogation of fragile freedom of speech, might best be provided via any sound autonomous reasoning capability fostered by a succinct coherent philosophy of science background. You finally begin to see, as I have all along, how such confusion accrues from failing to grasp the distinction between metaphor and simile. One should not need to be sated with scholarly wisdom and expert proficiency to glean the falsity of over extended argument by analogy, and the need to explore how far any similarity actually extends, instead of simply declaring grand unsupportable application.

— —

Comment **#137**

Anonymous (Philip Moriarty)
Monday, 4:52 PM EDT

"I will likely make a YouTube correction video to his last video where he stated: "Concepts of entropy apply to gas molecules; you cannot say that a particular arrangement of students has a thermodynamic entropy.” Comments would be appreciated...."

I've just come across the following websites:

http://en.wikipedia.org/wiki/Wikipedia:Administrators'_noticeboard/Incidents/Sadi_Carnot
http://en.wikipedia.org/wiki/Wikipedia:Articles_for_deletion/Human_chemistry

Wow, Libb/Sadi, you kept the fact that you've been banned from contributing to Wikipedia quiet, didn't you?! [see: human molecule (banned)] The articles above make for fascinating reading. A few choice quotes are as follows:

" This article is out-and-out fraud. I do not feel comfortable with the idea of Sadi Carnot continuing to contribute to Wikipedia - how can we trust him after this? "

"Trying to confound unrelated subjects is exactly what this article attempts to do. Why else would it cite a National Geographic article about neurochemistry and dopamine/oxytocin as an example of "Human chemistry", in article that actually states specifically in the introduction that "This analogy of an "interpersonal chemistry" should be distinguished from discussion of actual biochemistry involved in human bonding,". I am in no mood to mince words and try to be polite about this. The article is in my opinion deliberately written to mislead and is one of the worst examples of original research posing as genuine science I have seen."

"It [Sadi-Carnot's contribution on Human Chemistry] is at best pseudoscience, and, by being at the extreme fringes of kookery, completely undeserving of five articles. Perhaps footnotes under Pseudoscience, Fraud, and Crank (person)."

..contd in next comment.

— —

Comment **#138**

Anonymous (Philip Moriarty)
Monday, 4:57 PM EDT

"I've spend some amount of time looking through the contributions of Sadi Carnot. What I see there is a large, elaborate subtle walled garden of pseudoscience— probably for the purpose of hawking his books (or simple self agrandizement)."

". Over the past two years Sadi Carnot has undertaken a campaign to spam his personal website and push his own fringe theories across a wide variety of articles. In the process, he has subtly vandalized many articles by inserting pseudoscience and by misrepresenting sources. Numerous editors attempted to stop him along the way, to no avail. His strategy was to retreat when confronted, and move on to other articles. In light of this evidence, User:Kww proposed a community ban."

"I became aware of the problem with Sadi Carnot during the AFD discussion on Human chemistry. After reviewing his contributions, the pattern became very clear: distortion of his sources, used to prop up a pseudoscience agenda. Most of the edits I checked that did not directly support his particular form of nonsense were incorrect or strangely biased. I am left with two choices: he is either a fool or a con artist. If he is a fool, he can be morally excused, but Wikipedia still needs protected from him. If he is a con artist, he doesn't even get to be morally excused, and Wikipedia still needs to be protected from him. "

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#139**

Petrologist (Bruce Bathurst)
Monday, 9:29 PM EDT
Yes, there seems to be ethics problems in that many articles are plagarized, and an educational problem in that

John von Neumann & most everyone else were chemical engineers. Such bogus sites have been constructed, but this one took a great deal of work to build. I think it's real.

SC: "To Petrologist, what you and your two scientific associates consider “not a valid scientific theory”, others consider a Nobel Prize.

Please don't refer to them as my 'associates'. One has a theory of micro-bagels which I do like, for the assertion 'prove it wrong' is something that may help you. Each of my posts, I hope, contains observations of general, lasting value. This one offers a reference I could find only last night. (Those with grandchildren will understand.)

A copy of Wilson, which is probably the one book I should recommend every student of science have.

Wilson, E.B. 1952. An Introduction to Scientific Research. NY: McGraw-Hill.

PM: ' ... If you are happy for Thims to present a theory based around quantum mechanical "bonds" between humans to undergraduates, would you similarly be comfortable with a scenario where I presented my radical new theory of "energy hoop" interactions (see Comment # 112)? '

Of course. On this point, Mr Agassi's posts are selling pseudoscience as science, and offer no useful ideas. I've not seen any reproaches by you. He has replaced prediction with subjective explanation, replaced 'thin' truth with concordance with reality (so science can't progress), and twice insulted the dead. I meant each of my posts to complain that selling 'scientism' as science is wrong.

Mr Thims makes no attempt to hide his whacky-sounding views. If a university chooses to have him speak on them, it is no business of mine. Spend your time better. Bye.

— —

Comment **#140**

AaronAgassi (Aaron Agassi)
Monday, 11:16 PM EDT
Petrologist, are you actually suggesting that I have somehow endorsed Phil's satiric micro-bagels theory?

"replaced 'thin' truth with concordance with reality (so science can't progress)" How so? I have explicitly stated that valid inference from verisimilitude is entirely consistent with hypothetico-deductive method. How is any of that Scientism, let alone speaking ill of the dead?

— —

Comment **#141**

Anonymous (Philip Moriarty)
Tuesday, 4:22 AM EDT

> "Mr Thims makes no attempt to hide his whacky-sounding views. If a university chooses to have him speak on them, it is no business of mine. Spend your time better. Bye."

Dear Petrologist (Bruce),

We also have very different views on what is "our business". An endorsement from a Chicago university (via an invitation to lecture) means that undergrads, who are trying to get to grips with already very tricky subjects such as thermodynamics and quantum mechanics, will be effectively told that Thims' nonsense is something they should take seriously. Moreover, Thims will of course use the endorsement from the university to support his human thermodynamics baloney in the future.

I am disappointed that you say that I should have the opportunity to lecture undergrads on my satirical "micro-bagel" theory. This means that you would be happy with BS/MS courses being filled with whatever pseudoscientific nonsense is "out there".

As someone who has spent a considerable amount of time trying to understand thermodynamics himself, and a significant amount of time dealing with undergraduates' queries and questions, I certainly consider it "my business" - indeed, my responsibility - to counter Thims' ludicrous views. That you do not agree worries me.

It seems that you would also be happy for Thims' crackpot contributions to Wikipedia to have been left in place. Is this correct? (If not, then please explain why this is different from him giving a lecture as part of a bioengineering course to undergrads).

I'm disappointed, I must admit. (I do agree with you, however, on your point that there are better uses of my time!)

Best wishes,

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#142**

Anonymous (Philip Moriarty)
Tuesday, 4:26 AM EDT
Petrologist states in Comment #158: "Such bogus sites have been constructed, but this one took a great deal of work to build. I think it's real."

Errmm, "real" in what sense? You seem to think that amount of effort equates directly with the level of validity of the site! Just because Thims has put a lot of work into building up his human thermodynamics nonsense does not make it correct!

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#143**

Petrologist (Bruce Bathurst)
Tuesday, 8:21 AM EDT
Dr Moriarty,

Your message I read by accident, having come here to offer a book that might help AA understand that that the existence of an external reality is not believed by many, many who have no trouble with science. D.T. Suzuki's 'The Zen Doctrine of No Mind' is out of print, but reference 'suchness' in any book on Buddhism. A very depressed person's 'reality' differs greatly from a manic person's. 'Concordance with reality', satisfactory to Aristotole, is not a scientific concept. One has to be careful.

Why have you not corrected AA's comments, which offer no interesting ideas, as Mr Thim's zillion pages surely must? :-) I find the site pleasant; and people can change it!

However, I was disturbed to misread that 'Human Thermodynamics' was in the Wikipedia. It was not. Looking for Thim's contributions there I don't believe is healthy. (Geology there is terrible, but those who 'own' the articles refuse my suggestions. Check the talk page on Gibbs' [sic] Phase Rule.)

Sorry, I never said I should be happy having you lecture on micro-bagels. Look back at your query. I treated it logically.

I, too, am converting theorems into a theory. Because of the expense of journals, I've considered publishing on-line as well. My theorems are not to be compared with N.H. Abel's, from Norway; but he, too, had to publish privately. Thus, this website serves as a model to people like me. (A structural model!)

When I stated this website is 'real' (which I checked), I make no comment on the validity of the opinions expressed on it. In fact, I have not taken the time to glance at 'Human Thermodynamics'. I have my opinions, based upon threads, but I feel no need to warn the World of dangers. Msr Carnot does that for me by being perfectly open. Pick your fights and go after the insideous ones.

— —

Comment **#144**

Anonymous (Philip Moriarty)
Tuesday, 10:34 AM EDT

> "Why have you not corrected AA's comments, which offer no interesting ideas, as Mr Thims' zillion pages surely must? :-) I find the site pleasant; and people can change it!"

In response to Comment #162:

"Interesting", "pleasant" (!) and "correct" are not synonymous! I find it remarkable that you are perfectly happy for pseudoscientific nonsense to be presented to undergraduates - and, via this website (and Sadi-Carnot's **attempts** to vandalize Wikipedia), to the world - because you feel it's "pleasant". Moreover, you seem to suggest that the sheer volume of pages Thims has constructed must mean that there are some "interesting" ideas there! Errr, no.

Sorry, but you **did** say that you would be happy for me to present a lecture on micro-bagels. From Comment #158:

"PM: ' ... If you are happy for Thims to present a theory based around quantum mechanical "bonds" between humans to undergraduates, would you similarly be comfortable with a scenario where I presented my radical new theory of "energy hoop" interactions (see Comment # 112)? ' Of course".

You had previously said that you are happy for Thims to present a lecture on human thermodynamics at a university. How else am I meant to interpret your "Of course" response?!

My argument is not with AA or you - it's with Sadi-Carnot/Libb Thims. You and AA are having a debate in parallel with that between Sadi-Carnot and myself. My concerns lie with Sadi-Carnot's pseudoscience being presented as valid scientific theory. As you yourself suggested earlier, I have better things to do with my time than get dragged into the debate between you and AA.

Best wishes,

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#145**

Anonymous (Philip Moriarty)
Tuesday, 10:38 AM EDT
In Comment #162, Petrologist stated: "I was disturbed to misread that 'Human Thermodynamics' was in the Wikipedia. It was not."

No, and the reason it's not there is because the human thermodynamics-related entries were deleted, and Sadi-Carnot banned as a contributor because of his abuse of Wikpedia - see the websites I refer to in Comment #156 above. The comments in those webpages regarding Sadi-Carnot's attempted vandalism of Wikipedia also show that "Msr Carnot" is far from "open", as you put it. I quote (again):

"Over the past two years Sadi Carnot has undertaken a campaign to spam his personal website and push his own fringe theories across a wide variety of articles. In the process, he has subtly vandalized many articles by inserting pseudoscience and by misrepresenting sources. Numerous editors attempted to stop him along the way, to no avail. His strategy was to retreat when confronted, and move on to other articles. In light of this evidence, User:Kww proposed a community ban"

Best wishes,
Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#146**

Petrologist (Bruce Bathurst)
Tuesday, 11:02 AM EDT
Oh, sorry. I won't look back, but I'm surprised I said I was happy to have 'Human Thermodyamics' presented as science.

However, I do not think it will result in the University of Illinois moving its Religion or Philosophy Departments into the science building. This is because Thims' opinions are clear to read.

'Religion', however, is being taught to elementary- and secondary-school students in parts of the United States as science, and one can make one's choice to believe either; but not both, of course.

The trigger than identifies creationists in hiding is suggesting that religions and science are compatible. The Wikipedia is supposed to be edited by the unbiased. When I suggested this in the 'creationism' discussion, many less sophisticated editors of it responded violently; these responses were instantly deleted by their more mature 'leaders', who have ensnared even State Assemblymen. If this sound like a conspiracy by a small group, it is.

The Near East today shows the consequences of such thinking. This movement will make its way to Britain. Sometime extremists flip from one extreme to the other: Mr Thims I can't place, but his ideas seems relatively innocuous compared with the above.

If you want to really preserve the integrity of science, help keep this movement out of Britain. Speak with the campus chaplain. Make 'science' clear to your students; wait until you have tenure; and don't write any unsolicited letters. I'm too old & sick to spend much time on such people; but, you're always welcome to write.

Bruce Bathurst, PhD
BSc, AM, MA, PhD
bathurst@alumni.princeton.edu
geology, thermodynamics, philosophy of science

— —

Comment **#147**

Anonymous (Philip Moriarty)
Tuesday, 11:27 AM EDT

> "If you want to really preserve the integrity of science, help keep this movement out of Britain. Speak with the campus chaplain. Make 'science' clear to your students; wait until you have tenure; and don't write any unsolicited letters.
>
> Bruce Bathurst, PhD
> BSc, AM, MA, PhD
> bathurst@alumni.princeton.edu"

Petrologist/Bruce,

It's clear that you have a different "agenda" to mine. Although I appreciate the parallels between my arguments re. the lack of scientific rigor in Thims' "theories" and creationism, that is a much broader argument that I don't want to get involved in at the moment.

As regards the passage from your comment quoted above: Why would I ever want to speak with the campus chaplain? See my response to Lynnliss in Comment #11 on Page 1 of this debate. Second, I have tenure (see: link). And, third, what do you mean by "don't write any unsolicited letters"?! Are you suggesting that I have to wait until someone

contacts me before I can write to them?! I sent an e-mail to the academic at the university pointing out that Thims' "theories" were pseudoscientific drivel and asking the academic to confirm that Thims was speaking to undergraduates there. Given Thims' history of disingenuous behaviour, I remain of the opinion that this is an entirely valid question to ask. Moreover, if someone were to write to me to tell me that a person invited to speak at the University of Nottingham (in a module with which I was involved) was evasive about their track record and promoted nonsensical pseudoscience, I would like to know about it. That the e-mail/letter was unsolicited would not concern me a jot.

Yours sincerely,
Philip Moriarty

— —

Comment **#148**

Petrologist (Bruce Bathurst)
Tuesday, 11:53 AM EDT
Dr Moriarty,

My posts weren't very clear. My statement that I was happy with your bagel theory was because it has no testable hypotheses, and is pseudoscience. Assuming good faith, this might help Mr Thims or explain the deficiencies of his theory to others. Don't forget to read my happy faces.

I think I've made it clear than subjective variables are valid in many theories, but not scientific ones. Machines, such as 'lie detectors' or IQ questionaires measure something, but it is not 'belief' or 'intelligence'. Relations among other statistics observed in other certain ways (double-blind tests), however, can yield scientific theorems in non-sciences.

Mr Thims may have a bad 'record' elsewhere, but I'm speaking only of this website. See, however, my thread on 'Why I'm not a Molecule'. It sounds as if you're trying to persuade me to not visit this site. I'm not fond of blacklisting. Classical thermodynamics is an interpretation of a mathematical theorem. All you have to do is check the math to see whether 'Human Thermodynamics' is a thermodynamics.

It already failed the third test by having subjective variables. I think I've made it clear that such theories are pseudoscience. I'm not happy if pseudoscience that can't be fixed (which I don't know is the case) be presented blindly as good science. However, I have faith that the faculty at Illinois knows what they're doing. They have surely read some of his writings. Unsolicited communication is not uncommon. Its consequences, however, can me dire--for the writer as well as the one being written about. Please inquire with senior colleages about this.

Lastly, I don't debate. Consequently, I won't be reading this thread again.
Bruce

— —

Comment **#149**

AaronAgassi (Aaron Agassi)
Tuesday, 12:58 PM EDT
Petrologist, actually, I do "understand that the existence of an external reality is not believed by many". Indeed, I shudder to think! So Phil, why haven't you corrected me? Don't you even see the fundamentals of Methodology and such as crucial in inoculation against pseudoscientific balderdash? For that matter, have closet Creationists actually hijacked Wikipedia?

— —

Comment **#150**

Sadi-Carnot (Libb Thims)
Wednesday, 7:39 AM EDT
Since Moriarty (as many have in the past) seems to be more concerned with my background, name anagram, etc., then with clarification of entropy, I posted up the following page as to the etymology of my name:

— —

Comment **#151**

Sadi-Carnot (Libb Thims)
Wednesday, 7:40 AM EDT
The following comment (8 Sep 2009), on this discussion, was sent to me by Danish chemist John Schmitz (author of the 2007 book *The Second Law of Life*):

> "In my opinion it is wrong if somebody would apply this formula [Boltzmann's famous H-theorem that links directly entropy to the amount of microstates that forms a macrostate through S = k ln W (as formulated indeed by Planck)] to a group of students to calculate an entropy for the group as this would be meaningless from a thermodynamic point of view. But, of course all systems (including humans) are constructed out of atoms and therefore will follow thermodynamic laws. But the calculation must start at atom level not at macroscopic level. Of course one could always use the macroscopic equation of Clausius but then one has to show what the reversible change in heat is. Rearranging a group of students or other macroscopic objects will not cause an heat exchange I would say and thus the entropy change would be zero. Interaction between humans will change the chemical reactions inside the body and thus the entropy of the system."

— —

Comment **#152**

Sadi-Carnot (Libb Thims)
Wednesday, 7:41 AM EDT
The following comment (9 Sep 2009), on this discussion, was sent to me by German physicist Ingo Muller (author of the 2007 book *A History of Thermodynamics*):

> "Of course one may define an entropy for a group of students 'in the field' as well as for a battalion of marching soldiers. And for an anchor-chin, and polymer chain. And for a protein molecule and the human genome. The question is, however, what to do with such entropies and what predictions are possible by the use of the concept."

— —

Comment **#153**

Anonymous (Philip Moriarty)
Wednesday, 8:30 AM EDT

"The following comment (09/08/09) on the discussion was sent to me by Danish chemist John Schmitz (author of the 2007 book The Second Law of Life):

> "In my opinion it is wrong if somebody would apply this formula [Boltzmann's famous H theorem that links directly entropy to the amount of microstates that forms a macrostate through S = k ln W (as formulated indeed by Planck)] to a group of students to calculate an entropy for the group as this would be meaningless from a thermodynamic point of view.""

Sadi-Carnot,

This is *precisely* the point I made in Comment # 7 and that Muschik makes in Comment #99. Do you understand anything that you post here or do you simply cut-and-paste? It looks suspiciously that it's the latter.

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#154**

Anonymous (Philip Moriarty)

Wednesday, 8:33 AM EDT
"Since Moriarty (as many have in the past) seems to be more concerned with my background, name anagram, etc., then with clarification of entropy, I posted up the following page as to the etymology of my name:

http://www.eoht.info/page/Libb+Thims+(etymology)
"
No, I'm just as concerned with your propagation of pseudscientific baloney as I am with the etymology of your name. For the reasons discussed in a considerable number of comments above, I am also concerned about your claim to be pursuing an MS in physics, an MD in neuroscience, and a PhD in biochemistry in parallel. Perhaps you might like to publicly address that claim here?

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)
— —

Comment **#155**

Anonymous (Philip Moriarty)
Wednesday, 8:46 AM EDT
"The following comment (09/09/09) on the discussion was sent to me by German physicist Ingo Muller (author of the 2007 book *A History of Thermodynamics*):

http://www.eoht.info/page/Ingo+M%C3%BCller

“Of course one may define an entropy for a group of students ‘in the field’ as well as for a battalion of marching soldiers. And for an anchor-chin, and polymer chain. And for a protein molecule and the human genome. The question is, however, what to do with such entropies and what predictions are possible by the use of the concept.”
"
Sadi-Carnot,

Oh, for crying out loud, how many times to we have to address this? It's very simple:

If I have one hundred students in a field, I cannot assign a thermodynamic temperature to that group of students **based on their distribution**. (See comments #99 and #170). Similarly, those students are not spontaneously rearranging and exploring different microstates as would the molecules in a gas. There is no free energy function we can write down which is associated with the **distribution** of the students. Thus, we cannot define a **thermodynamic** entropy for the **distribution** of students. Or, as stated in Comment #170, "rearranging a group of students ...will not cause a heat exchange and thus the entropy change would be zero".

And, whether you like it or not, bringing your nonsensical and laughable notions of "human chemistry" into this discussion is not at all going off the topic (as you've suggested previously). The question of interactions between the elements of the system is central to the problem. My theory of micro-bagels (see Comment #112) is just as valid as your "human chemistry" baloney.

And, once again, instead of trying to put forward your own counter-arguments and rebuttals, you instead quote from experts/authority. See my comments above re. "recourse to authority".

Philip Moriarty
— —

Comment **#156**

Sadi-Carnot (Libb Thims)
Wednesday, 10:11 AM EDT
#174: Moriarty: “If I have one hundred students in a field, I cannot assign a thermodynamic temperature to that group of students **based on their distribution**. (See comments #99 and #170). Similarly, those students are not spontaneously rearranging and exploring different microstates as would the molecules in a gas. There is no free energy function we can write down which is associated with the **distribution** of the students. Thus, we cannot

define a **thermodynamic** entropy for the **distribution** of students. Or, as stated in Comment #170, "rearranging a group of students ...will not cause a heat exchange and thus the entropy change would be zero".”

I think what we have here is an issue similar to not seeing the forest through the trees, in that Phil cannot see the observable phenomenon through the equations with which he is acquainted with from statistical mechanics.

Entropy is entropy. It is a formulaic way of quantifying heat flow. Heated bodies expand, cooled bodies contract. This called Boerhaave’s law (1720). One expansion, followed by a contraction is called a heat cycle. During this process, the entropy of the body will increase, due to the mathematical result that some of the net heat inputs and outputs will be converted irreversibly into internal system work. These processes and law hold for every system or body in the universe. To argue against this is to argue against natural phenomena.

— —

Comment **#157**

Sadi-Carnot (Libb Thims)
Wednesday, 10:11 AM EDT

#174 (cont): Phil seems to have a one-track statistical mechanics (the subject of attempts to explain the laws of thermodynamics on mechanical principles) mindset. When one attempts to measure the entropy of a system using statistical mechanics methods, in terms of logarithms of estimations of microstates and distributions, it assumes that the Boltzmann chaos assumption holds (particles have non-correlated velocities). Humans, of course, have correlated velocities, meaning that statistical mechanic methods are of no use here. In this case, one turns to thermochemistry methods to measure entropy, as is the case with all chemical reactions. Sixty-six percent of people believe that love is a purely chemical reaction. All chemical reactions (e.g. rearrangements of bondings of students in their distributions) release or absorb heat. Hence there will be an entropy change for changes in the positions of students and it can be measured.

— —

Comment **#158**

Sadi-Carnot (Libb Thims)
Wednesday, 10:15 AM EDT

#153: Regarding crackpots “who claim that their work deserves a Nobel Prize”, the actual comment I made, as a point noted to cite differing opinions, is that “others consider [my work to deserve] a Nobel Prize.”

— —

Comment **#159**

Sadi-Carnot (Libb Thims)
Wednesday, 10:22 AM EDT

#152: Moriarty: “is it OK for science undergraduates to be given a lecture in an entirely baseless "theory" which, for the weaker students, is likely to damage their understanding of a complicated subject, and for the best students is simply a waste of time?”

What we have here is the typical case where a person who is not acquainted with the work being presented (i.e. Moriarty has never read my Human Chemistry textbook) gives objections to imagined conceptions, based on open talk page discussions. The thermodynamics professor, who invited me to lecture, has my textbook, and in response to Moriarty’s repetitive pleas to terminate the invitation, comments: “I am very glad Libb has accepted my invitation to give a talk in my BioEngineering Thermodynamics course.”

— —

Comment **#160**

Sadi-Carnot (Libb Thims)
Wednesday, 10:34 AM EDT

#128: Moriarty: “Even Leonard, in his closing response, appreciates the difference between drawing an *analogy* between thermodynamic functions of state and features of society, and the claim that one can **equate** a thermodynamic entropy/enthalpy/free energy with properties of human relationships/society. It is this distinction between analogy and mathematical/physical equivalence that is so important and which you seem unable to grasp.”

To clarify, I am not the originator of the premise of the non-metaphor application of thermodynamic

entropy/enthalpy/free energy functions to human society, although I arrived at this view independently. People to have pioneered this view include:

Johann Goethe (1809) – affinity (free energy), human chemical reactions
Georg Helm (1887) energy, entropy
Leon Winiarski (1897) – energy, entropy
Wilhelm Ostwald (1906) – social energy
Mehdi Bazargan (1950) – free energy, internal energy, entropy, temperature

and so on (dozens more).

So to Phil: are all of us crackpots for thinking that state functions apply to systems of humans, or am I the only crackpot?

— —

Comment **#161**

Anonymous (Philip Moriarty)
Wednesday, 10:44 AM EDT
" Sixty-six percent of people believe that love is a purely chemical reaction. All chemical reactions (e.g. rearrangements of bondings of students in their distributions) release or absorb heat. Hence there will be an entropy change for changes in the positions of students and it can be measured." Oh, dear me. I don't know whether to laugh or cry.

We're now reduced to the level of "sixty-six percent of people believe that love is a purely chemical reaction". *That* is a key component of your argument?! How incredibly scientific. Let's dig out a few more statistics:

Only 53% of adults know how long it takes for the Earth to revolve around the Sun. [http://www.scientificblogging.com/news_releases/science_literacy_american_adults_flunk_basic_science_says_survey]

"One adult American in five thinks the Sun revolves around the Earth" [http://www.nytimes.com/2005/08/30/science/30profile.html]

In 1992, "63% of adult Americans thought that lasers work by focusing sound waves" [Reported in Beardsley, T. "Teaching Real Science" in Scientific American, Oct. 1992, p. 98; See also http://www.astrosociety.org/education/resources/useduc.html]

A Gallup survey in 1990 revealed that 25% of the adult American population believes in astrology. [http://www.astrosociety.org/education/resources/useduc.html] (Actually, Sadi-Carnot, in comparison to your human chemistry junk, astrology almost looks sensible...)

Do you really want me to continue?

So your argument is this: 66% of people believe love is a chemical reaction. Therefore, love is a chemical reaction. Therefore, thermodynamic principles apply to "human reactions".

Astounding.

Philip Moriarty (www.nottingham.ac.uk/physics/research/nano)

— —

Comment **#162**

Sadi-Carnot (Libb Thims)

Wednesday, 10:46 AM EDT

> #143: Moriarty: “If the university is happy to have its undergraduate students be lectured by an individual who (i) puts forward a "theory" of human interactions based on such nonsensical notions as "sexual temperature" and quantum-mechanical human "bonds", [etc.], then that is its prerogative.”

Again, you are picking up loose talk page discussion (e.g. sexual temperature) and assuming that it is what is presented in a very rigorous 824-page textbook.

Also regarding the human chemical bond, no one before me has even attempted this gargantuan topic, of which most of the *Human Chemistry* textbook is devoted to. To give a comparison idea of my efforts: in 1917, an unknown American undergraduate chemical engineer named Linus Pauling was learning the Dalton hook-and-eye bonding method at the Oregon Agricultural College, which was the vogue description of bonds between atoms at the time. Each atom had a certain number of hooks that allowed it to attach to other atoms, and a certain number of eyes that allowed other atoms to attach to it. A chemical bond resulted when a hook and eye connected. Pauling, however, wasn't satisfied with this archaic method and looked to the newly-emerging field of quantum physics for a new method.

In terms of human attachments, we don’t even have the hook-eye model. The subject is not even discussed in chemistry class, the subject is left to the psychologists: who have their “cuddle chemical” oxytocin models, Bowlby attachment theory, Klaus and Kennell Parent-Infant bonding theories. It is obvious that humans evolved from smaller chemical systems; by deduction it must also be obvious that human attachments evolved from smaller chemical bonds. I don’t see how your attempts to derogate this formulation (which you have never read) can be at all worth anything?

— —

Comment **#163**

Sadi-Carnot (Libb Thims)
Wednesday, 10:48 AM EDT

> #127: JingChen: “I certainly agree with you that entropy can be used to describe human populations. There are many useful applications.”

Thanks for commenting. Moriarty seems to have little knowledge how prevalent the use of entropy is in economics (publications coming out at a monthly rate).

Continued

â— Moriarty-Thims debate (part one)
â— Moriarty-Thims debate (part three)

See also

â— Rossini debate

θΔics

In science, **morphology** is the study of the "form, formation, and transformation of organisms", as originally defined by German polymath Johann Goethe, a variant of which would later come to be known as the theory of "evolution" as popularized by English naturalist Charles Darwin. [5]

Morphology, said another way, is the study of form similarity, change, and development in animated species.

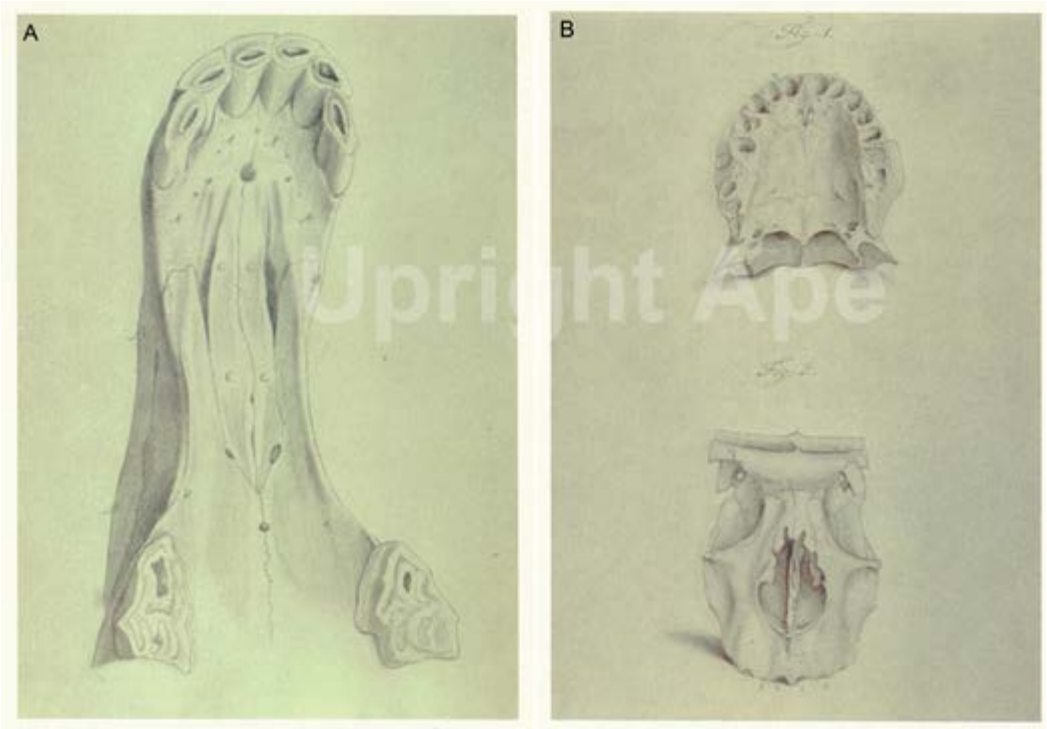

Goethe's 1784 illustrations of the comparative **morphology** of an animal and a human, showing that they both possess an intermaxillary bone, and thus both must have morphed (Goethe's term) or evolved (Darwin's term) from a common original form. [4]

Overview

In 8AD, Roman poet Ovid, published his mythological hexameter poem *Metamorphoses*; some of which is found in Goethe's "ECHO cypher" of his *Elective Affinities*.

In 1784, Goethe initiated the subject of comparative morphology when he discovered the human intermaxillary bone, a bone thought to be unique to lower animals only and not to be found in humans.

This year or thereabouts marks the point when Goethe began serious searching for a scientific principle that could explain the commonality of form change and development across all species of plants, animals, and humans.

In a handwritten note to his *Morphology*, Goethe defines the subject as follows: [1]

> "**Form** is a thing in motion, in the process of becoming, of passing away. The study of form is the study of transformation. The study of metamorphosis is the key to all the signs of nature."

Between 1817 and 1824 Goethe published essays on morphology and general scientific topics in two series. [2]

In his *Zur Morphologie* (*On Morphology*), Goethe declared his preference for the idea of *Trieb* (drive) as representing the developmental dynamic of living nature, in contrast to *Kraft* (force), which indicated a material principle that could not explain organization. [3]

German physician-physicist Hermann Helmholtz, in his essay "On Goethe's Scientific Researches" (1853), surmised that Goethe's studies of comparative botany and comparative anatomy led him to "a happy glimpse of an all-pervading law" of the conception that the differences in the anatomy different animals or morphology of different plants are to be "looked upon as variations from a common phase or type, induced by differences of habit, locality, or food."

American comparative literature scholar Stefani Engelstein (2008), argues that Goethe's "The Metamorphosis of Plants" (1790), "Metamorphosis of Animals" (1806), and *Elective Affinities* (1809) are to be viewed as a three-part treatise on *metamorphology* or studies on the similarities of form. [1]

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(b) Richards, Robert J. (2002). *The Romantic Conception of Life: Science and Philosophy in the Age of Goethe* (pg. 447-48). University of Chicago Press.
4. (a) Goethe, J. W. v. (1784). Dem Menschen wie den Tieren ist ein Zwischenknochen der odem Kinnlade zuzuschreiben (An Intermaxillary Bone is Present in the Upper Jaw of Man as well as in Animals). Sämtliche Werke 2: 530-545.
(b) From: Goethe, 1784 and 1817; Plate I & Plate IX, original drawing by Waitz.
(c) Filler, Aaron G. (2007). *The Upright Ape: A New Origin of the Species* (Figure 2-2: Goethe's Proof of the Human Intermaxillary bone). New Page Books.
5. (a) Goethe, Johann. (date). Publication, in: WA, VI, 293.
(b) Wells, George A. (1967). "Goethe and Evolution" (abs), *Journal of the History of Ideas*, 28(4):537-50.

Further reading

â— Mayer, Alfred M. (1878). "On the Morphological Laws of the Configurations Formed by Magnets Floating Vertically and Subjected to the Attraction of a Superposed Magnet; with Notes on Some of the Phenomena in Molecular Structure Which These Experiments May Serve to Explain and Illustrate." *American Journal of Science*, 16: 247-256.
â— Iguchi, Nobuhiro and Nishihara, Tadashi. (1996). "Analysis of Environmental Morphologies Using Psychological Entropy." *Department of Mechanical Engineering.*

External links

â— Morphology (biology) – Wikipedia.

θΔics

In hmolscience, **Morris Zucker** (1892-c.1972) was an American physical historian noted for his 1945 two-volume 1,764-page *The Philosophy of American History*, wherein his focus seems to be the following problem: [3]

Photo needed

A crude photo of **Zucker** from the post-publication full page publisher's advert of his 1945 *Philosophy of American History* in *The New Republic*. [17]

> "Whether or not historical events are causality connected or are the result of chance, accident or mathematical probability are much more than abstract speculations. Their answer goes to the very root of the historian's method of procedure. Of what would it avail us, if after all our labor, the reader were to agree that while strict causality has been proved in all past history, the future must be shrouded in darkness, or is controlled by chance? One may be convinced that historical laws are controlled by laws, but conclude that these laws are not causal, but indeterminate in nature."

In the first volume, subtitled *Historical Field Theory*, Zucker outlines what he calls historical field theory—a term themed on the "great physical theories of the electromagnetic field as developed by Einstein into the relativity theory, with its vast philosophical possibilities", as he says—in aims to upgrade the soft science ranking of history into the hard science ranking comparable to chemistry and physics, and in the second volume *Periods in American History*, described as rather "extensive history of the United States", he applies his theory to the analysis of history. [1]

Zucker cites and discusses the physical sociology work of Pitirim Sorokin; the downfall of the technocracy movement of Howard Scott, which he describes as a type of pseudoscience, being that it employed "mysterious and pompous vernacular"; classifies James Jeans, Arthur Eddington, and Alfred Whitehead as the "metaphysical school" of the physical knowledge of reality; among others.

Abstract

The following is the publisher's abstract—Arnold-Howard Publishing—of Zucker's *Historical Field Theory*, in two-volumes: [17]

> "The type is clear, readable 11 on 12 point Baskerville; page size 6x9; over 1,800 pages. In volume one, entitled *Historical Field Theory*, the methods of all the great writers, past and present are subjected to critical analysis. The education of each of the six principles upon which the theory is based, a complete chapter is devoted. The final chapter summarizes the entire argument. Chapter four on law in social movement is an exhaustive analysis of Dewey's position, and that of Croce, Teggart, Barnes, Robinson, Sorokin, Boas, Goldenweiser, Nevins, Cheyney, among others. Chapter seven on causality or indeterminacy in history considers the contributions of modern scientific thought to historical inquiry —Planck's quantum theory, Einstein's, relativity theory, and Heisenberg's principle of indeterminacy. In this discussion Zucker rises to the heights of his intellectual powers.
>
> Volume two, the *Periods in American History*, is a truly great original work in a familiar field. Zucker's discussion of the colonial period, the period of expansion, the period of industrialization, the present period fo nationalization; his study on the origin and development of definite state forms, of specific modes of economy, and dominant ideologies gives new meaning to old facts. From it all is evolved Dr. Zucker's special 'theory of the continuing American revolution', which will remain his lasting contribution to the understanding of our history."

(add discussion)

Social forces

On the dissection and nature of social forces, Zucker states the following: [3]

> "Habits tend to mechanize social existence, but are themselves gradually modified by the social institutions which give rise to modifiable instincts, customs, rules of conduct and forms of thought. All react upon and modify habits, being in turn controlled by them. Desires change with the nature of the obstacles encountered while intelligence operates on thought to affect necessary accommodations in conduct.
>
> Social movement involves the concept of social forces. Now no one has been able to dissect a social force or subject it to chemical re-agents. Bodies move, or are prevented from moving because forced is exerted upon them. Forces are developed from the relations of bodies rather than by being superimposed upon them from some outside agency. If this outside agency is strong enough to affect another body, then both bodies exist in relation to each other and exert influence upon each other through fields of force between them. This fundamental principle applies to society."

(add discussion)

Physical science | References

A salient point to note, in regards to Zucker's continuous thematic overly-sounding official effort to divulge or uncover the "laws of motion" of history, to make a "field theory" of history, to make a science of history on par with chemistry and physics, and so on, into the midpoint (page 388) of volume one, the only two actual physical science like books that Zucker reoccurringly cites is Albert Einstein's 1935 *The World As I See It* and Einstein and Leopold Infeld's 1938 *The Evolution of Physics: the Growth of Ideas from Early Concepts to Relativity and Quanta*. [16]

Beard | Test-tube theory of history

In commentary on American historian Charles Beard's 1936 chemical analogy argument against causation in history, Zucker comments: [13]

> "The whole 'test-tube' theory of history is fallacious, because to begin with there is no such test-tube nor is there the possibility of creating one. The specific processes of investigation applicable to chemistry are not those of history."

Zucker goes on to list his objections to Beard's eleventh chemical argument:

> "No modern chemist, if he is vitally concerned with this experiment as Beard is in discovering the causes of war, would be content with the empirical knowledge that the eleventh chemical somehow did the trick, either by itself, or in activating others. He would want to know just why and how the precipitation came about. He would want to know whether he must always use all of the eleven chemicals the way that he did, or if simpler combinations could effect the desired result. In history, Beard contends, we have an analogous situation. There are ten know factors. An eleventh, let us say, the German unrestricted submarine warfare is added. War is declared. Was that the cause of war? No one knows. Furthermore it is impossible to know."

Zucker, in any event, then goes on to list ten questions to Beard about his notion of "ten factors in the historical retort" (see: retort).

Historical causation

Regarding Zucker's "no one knows the cause of

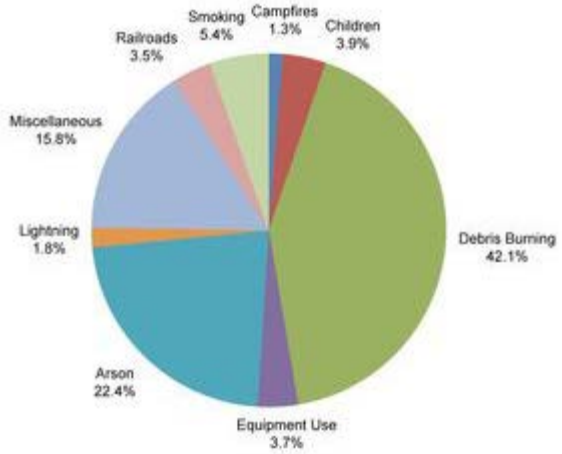

Left: a 2002 chart of "causes" of forest fires. **Right:** Germans fighting Norwegians in 1940 a war or one might say social fire, supposedly, "caused" be Jewish refugee Herschel Grynszpan.

war" statement, above, American-born English physicist Mark Buchanan argues that Bosnian Serbian Gavrilo Princip, on 28 Jun 1914 at 11AM "caused" World War I, when he shot Austro-Hungarian Archduke Franz Ferdinand. [14] Likewise, the so-called "Crystal Night" of 9 Nov 1938 when 17-year-old Jewish refugee Herschel Grynszpan shot German diplomat Ernst vom Rath is said to have been one of the causative "sparks" to World War II.

Both of these causative sparks, according to Adolf Hitler's 1925 so-called "torch of the spoken word" theory, to put things into perspective, may be considered akin to the cause of a deadly forest fire having been started by a careless camper throwing out a cigarette butt or alternatively by a lightening bolt strike. The real issue, necessarily, is not "how" or who started the fire (or war) but to note that the system (forest or global community) was at critical state of dryness or near the tip of the activation energy barrier and subsequently combustion (hydrocarbon or social) would have been started regardless.

Historically, forest fires were caused naturally by lightning, but now most forest fires are caused by humans. Originally, forest fire philosophy was that fires were bad and should be prevented from happening in ecosystems—the same way that many now believe that war is band and should be prevented from happening in social ecosystems. Up into the 1920s, laws were enacted to suppress forest fires. It was not until the 1930s that scientists began to challenge the practice of eliminating fire from natural ecosystems. After much debate, the practice of intentionally igniting wildland fires and permitting naturally-occurring fires to burn was adopted. The practice of so-called "managed fires" have since been shown to have increased benefits. [15] Likewise, the practice of "managed wars", i.e. permitting naturally-occurring wars to burn will likely be adopted, over the current utopian peace ideals or "make love not war" mottos.

Historical prediction

The following is a hilarious comparison done by Zucker, citing a quote by Austrian sociologist and economist Paul Weisengruen, a critic of the so-called materialistic conception of history, as advocated by Karl Marx: [9]

> "Leaving aside the problem of causality or indeterminacy, the theory and practice of science has been that if given an initial state with whose properties we are familiar, and if we know the laws of nature applicable to it, we can predict its future state by virtue of the operation of these laws. The diversity of historical phenomena [and] its apparently

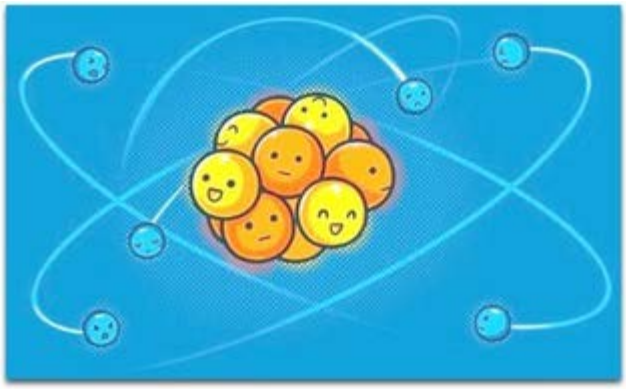

?
↔

Zucker points out that just as the chemist or engineer doesn't need to know the so-called love life or wills of every single proton (+) or happy particle, above, or electron (-) or sad or angry particle above, in order to make successful predictions so to does the historian not need to know the love life or wills of every single person in history to make predictions. [9]

> lawless and contradictory mode of manifestation, the bewildering reactions of countless human wills in different circumstances and different lands, that gives color to the theory that a science of history is impossible. 'The historian', writes Weisengruen ironically, 'must know all the persons of the period he describes, their family relations, their actual course of action, as well as the opinions they held of each other … All to the smallest detail.' [1] The chemist and the engineer arrive at quite exact results in their operations and their predictions without knowing the love-life of every single electron and proton of the materials with which they work."

The historian, supposedly, must come to understand the "reactions of countless wills" to make historical prediction, whereas the chemist and engineer (or chemical engineer) are able to predict successfully without recourse to physical anthropomorphisms such as the wills or love lives of electrons and protons.

Later, likewise, in commentary on the so-called "individualism argument" of historians such as Thomas Carlyle, against the possibility of completing a complete analysis of history, Zucker gives the following comparison: [12]

> "Carlyle and the others contend that the knowledge of every act and thought of every individual of a given time must be clearly analyzed, and their permutations understood in order to write history. But by the same token we would never be able to understand the time in which we write. Is a metallurgist in a steel mill debarred from understanding the nature of the processes he himself starts, regulates and controls because he cannot give a graphic chart depicting the actions of ever electron of every atom of all the materials he works with, and therefore cannot predict the end results of his operations? But we have gone over this ground before."

Somewhere along the way, Zucker himself makes some predictions about a post-war boom, which he says will be followed by crisis and unemployment, then eventually a third world war, being that, as American Historian Roy Nicholas summarizes things, "war is the perpetual state of modern capitalistic economy".

Retorts and microscopes

See main: Social retort

In commentary on American philosopher John Dewey's reasons why a science of history is impossible, Zucker comments the following: [3]

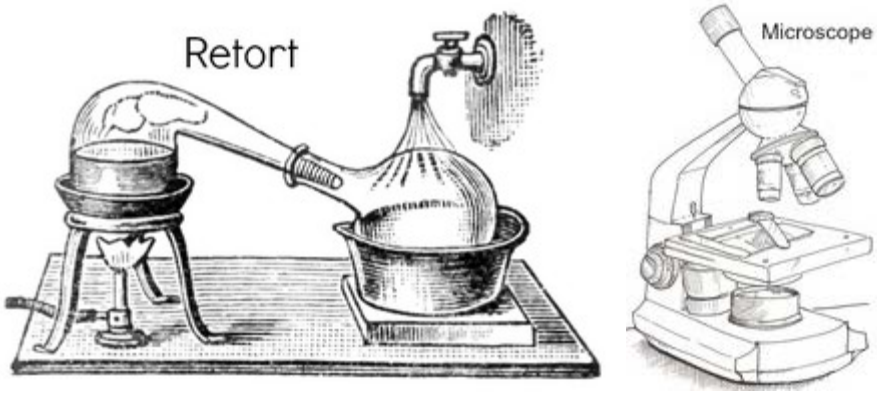

Zucker states that in order to develop a proper science of history we need to study society, as a type social matter, using a microscope and retort.

> "Physical phenomena in the gross is not concerted with the internal structure of each atom in each successive moment, nor is history with the relation of each individual being every moment of time. History is vitally interested in the laws of continuity in finite space and definite time. Were it not for the existence of these laws developed from definite relations subsisting among the mass, all science would be impossible.
>
> These propositions are fundamental in physics, and they apply with equal footing in history. Society is a definite reality. All we have to do is to look about us to be conscious of its ubiquitous presence though no one yet has examined it under the microscope or tested it in a chemists' retort. The retort will be that we are comparing inert matter, iron, with a living reality, society. Matter [after all] is not so terribly inert."

(discuss)

Thermodynamics

After citation of the final section from American historian Henry Adams' ninth volume of his *History of the United States*, wherein he seems to allude to the second law, Zucker states the following: [11]

> "The second law of thermodynamics in history belongs to the drawing room intellectuals to be settled between cups of tea or cocktails."

Though dismissive of the second law, as something to be settled in the future, Zucker does say he will discuss this in his section on causality. Later he discusses irreversibility as follows: [12]

> "Can we reconstruct the events of a past day, or of a by-gone civilization? Certainly not. No phenomena, physical, organic or social, can be reconstructed in exactly the same way as it originally existed. The second law of thermodynamics deals with organization in time [and] offers an insurmountable obstacle to that achievement."

Free will and freedom

The following is a circa 1932 Socratic dialog between Irish translator James Murphy and German-born American physicist Albert Einstein on the question of free will and freedom, as found in Zucker's section on free will versus determinism in history: [5]

> "**Murphy:** I have been collaborating with our friend, Planck, on a book which deals principally with the problem of causation and the freedom of the human will.
>
> **Einstein:** Honestly, I cannot understand what people mean when they talk about the freedom of the human will. I have a feeling, for instance, that I will do something or other; but what relation this has with freedom I cannot understand at all. I feel that I will light up my pipe and I do it; but how can I connect this up with the idea of freedom? What is behind the act of willing to light the pipe? Another act of willing? Schopenhauer once said: Man can do what he wills, but cannot will what he wills.
>
> **Murphy:** But it is now the fashion in physical science to attribute something like free will even to the routine processes of organic nature.
>
> **Einstein:** That nonsense is not merely nonsense. It is objectionable nonsense."

Murphy, to note, is introduction section writer of German physicist Max Planck's 1933 *Where is Science Going?*, wherein the above dialog shown is found, and also translator of Austrian physicist Erwin Schrodinger's 1935 *Science and the Human Temperament*.

The Schopenhauer quote, repeated by Einstein, to note, comes from German philosopher Arthur Schopenhauer's 1839 *Essay on the Freedom of the Will*, which in turn is based on his mentor German polyintellect Johann Goethe's 1809 chemical reaction affinity force theory of the will, both scholars, Schopenhauer and Goethe, forming a large portion of Einstein's personal library.

Nichols' review

American historian Roy Nichols gave the following synopsis of the book in his 1945 review: [4]

> "Countless individuals have pondered on the meaning of the conglomeration of actions which make up history. Of this vast throng, relatively few
> have undertaken to reduce their thoughts to written formula. In the midst of busy lives even fewer could ever have done what Dr. **Zucker** has done.
> Despite the fact of another profession, he has not only read widely and thought long but he has written seventeen hundred pages detailing his views at length."

Nichols continues:

> "[**Zucker's**] positive interest is the new physics of Einstein and his twentieth-century associates. He believes that history like matter is made up of fields of force which have definite and predictable relationships, and of lines of force which can be traced in the past and projected into the future so that the historian may prophesy."

This is very interesting, to say the least!

Lundberg

In 1946, American physical sociologist George Lundberg, noted for his "proton-electron configuration" view of humans, did a review of Zucker's work in *The Scientific Monthly* entitled "Theoretical Aspects of History." [7]

Adams

Zucker's role model exemplar, in the writing of his two volume set, is American physical science historian Henry Adams, who developed his own physical theory of history based on chemistry, physics, and thermodynamics, and then to satisfy his own amusement sought to prove, by the physical means of his theories that cause and effect exists in history, via the penning of a 12-volume history of America, which is summarized by Adams—in his famous *The Education of Henry Adams*—cited by Zucker in his opening pages, as follows: [2]

> "Historians undertake to arrange sequences—called stories, or histories—assuming in silence a relation of cause and effect … He had even published a dozen volumes of American history for no other purpose than to satisfy himself whether, by the severest process of stating, with the least possible comment, such facts as seemed sure, in such order as seemed rigorously consequent, he could fix for a moment a necessary sequence of human movement. Where he saw sequence, other men say something quite different, and no one saw the same unit of measurement."

Zucker refers to Adams as the "greatest stylist American historical writing has produced". Zucker's work containes a comparatively—compared to Adams—large number of physical science concepts, applied to history, chapter subsections, including: social forces, second law, relativity, uncertainty principle, quantum mechanics, among others, with digressions on free will, determinism, chucked full of what seems to a large number of ripe and rare quotes by leading thinkers.

Nevins | On nature

See also: One nature; Two nature

The following is a noted quote by Zucker from his *Historical Field Theory*, about the non-duality nature of nature: [10]

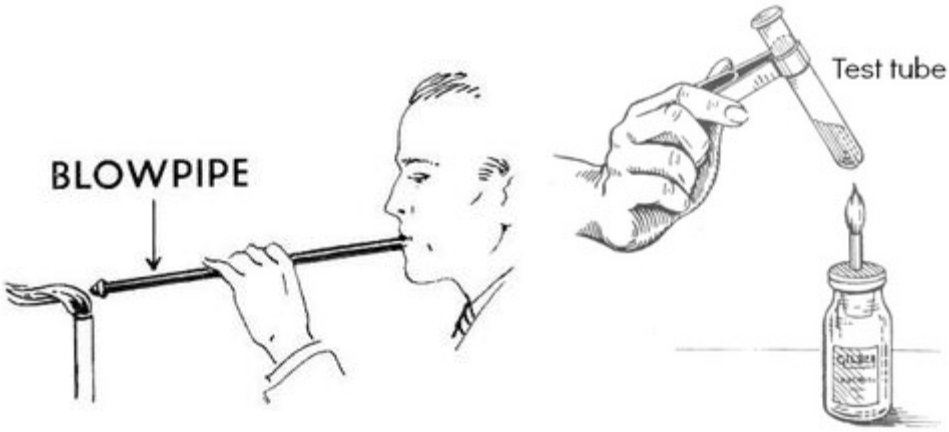

Left: chemist shown with blowpipe, a simple devise through which air is forced through the tube by means of the lungs to forcefully add oxygen to a flame, increasing it's heat, producing temperatures high enough to melt small amounts of gold, alloys and solders (Ñº). Right: chemist holding reactants in a test tube over a flame. **Zucker** criticizes American historian Allan Nevins, who claims (1938) that history can never be a science because historians have no blowpipes or test tubes with which to conduct controlled experiments. [10]

"Allan Nevins is added to the long list who contend that, strictly speaking, history cannot be a science, if only because its phenomena cannot be repeated and tested as a chemist does his compounds. Historical events never precisely duplicate themselves. he writes:

> 'Hence it is that we can have no precise laws in history as we have precise laws in physics, chemistry and mathematics; that history can never be a science in that highly rigid sense … the chemist, for example, can boast a superior apparatus for ascertaining the truth. In formulating the laws which govern an element, he can repeat his experiments thousands of times with all the factors precisely the same, or with endless variations of factors. The historian has no control of phenomena in the blowpipe (Ñº) or test tube sense.'

First, as to the chemical analogy, Nevins is somewhat antiquated in his illustration. The time element which he says militates against history becoming a science because of time's arrow, also operates in chemistry. **Nature knows no duality** of law as to the flow of time—one for physics, the other for that physical state we call society, and it's historical phenomena."

Zucker, as we see here, is pretty sharp. This of course echos Goethe's advertisement, and his subtle notice, in respect to comparisons between human and chemical behavior, that "there is, after all, only one nature."

Education

Zucker seems to have a doctorate in something, as he is commonly referred to as "Dr. Zucker". [4]

Religion

It is difficult to pin down exactly what Zucker's religious position is? Despite his overt aim to construct a determinist "science of history" akin to chemistry and physics so to discern the "laws of social motion", he does give indication of a certain underlying religious belief, e.g. mentioning God on fifty or so pages, though in a somewhat ambiguous way, e.g. mentioning things such as "father Abraham", "Indian branch of God's children", etc., while at the same time seemingly being an evolutionist, e.g. spending a large amount of time discussing Herbert Spencer, referring to Charles Darwin as one of the great men, alongside Galileo and Newton. The following, in commentary on American law professor Thurman Arnold's 1935 *The Symbols of Government*, seems to typify a Dawkins number one mindset: "Infinitely more blood has been shed concerning the symbols of Christianity than in its content, or in promoting the spirit of that mode of life which Jesus so beautifully exemplified by his own." [3] A point to note here is that a showing Zucker's belief system is laminated by a coating of tentative or possible analogy; for example, after stating the following ripe paragraph: [3]

> "The tragedy of society's present dilemma is intensified by the fact that the analysts become extremely cautious when it comes to the all-important question of the future. What, they ask would you expect a blue-print of the future? And each smiles in self-satisfaction at this conclusive retort. We hasten to add that non but engineers could draw such blue-prints—social engineers—and the first thing any engineer demands is exact knowledge about his materials and of the problem at hand. He must know how events developed, and why, and he must understand exactly the nature of the social laws with which he deals, the social forces which create those laws, and the social structure wherein those aggregates operate."

To this, he follows with incredulously statement that by the phrase "begin analysis in [the] scientific fashion" we do not mean " that everyone who undertakes to write a book on the modern corporation must begin with Adam and Eve." Here, it is hard to tell if Zucker is jibing, joking, or if he actually believes that the first to humans were Adam and Eve? Whatever the case, i.e. whether he is thinking here figuratively or literally, we might be so inclined to posit Zucker as Dawkins number = 1 in belief system.

Tributes

The following are noted adverts for Zucker's book:

> "What Einstein did for physics, what Darwin did for biology, **Morris Zucker** has now done for the field of history in a work hailed as one of the truly great original achievements of our times."
>
> — Anon (c.1945), in: Willson Coates' 1945 review: "*The Philosophy of American History* by Morris Zucker" [8]

This tribute, however, is a bit overzealous; while Zucker's first volume is an interesting read, advocating physical history theory, his work pales in comparison to say, for example, Henry Adams, who seems to be one of Zucker's intellectual idols or roll models; and it can hardly be said that Zucker is a social Newton; nor was he a "social Einstein", though he might have had some remote idea like this in his mind—authors, in 1955, in fact were still saying that "the 'social Einstein' may not yet be born." (Ñº)

Second Volume | Periods in American History

At the closing page of volume one—*A Field Theory of History*—the previous 685-pages seemingly being a Hegelian-Marx dialectical fence sitter like gallop on the plausibility of a physics-chemistry stylized, modeled, or framed science of history, Zucker gives the following connecting link to the aim of the second volume —*Periods in American History*—of another 1,054-pages of discussion:

> "There is now left the essential test of their [terms, field of social forces, origin of social forces, manifestation of social forces, on the basis of causal law] proof in the facts of American history from its very beginning, and the final application of the historical field principles in the forecast of our future within the limitations of the present historical field."

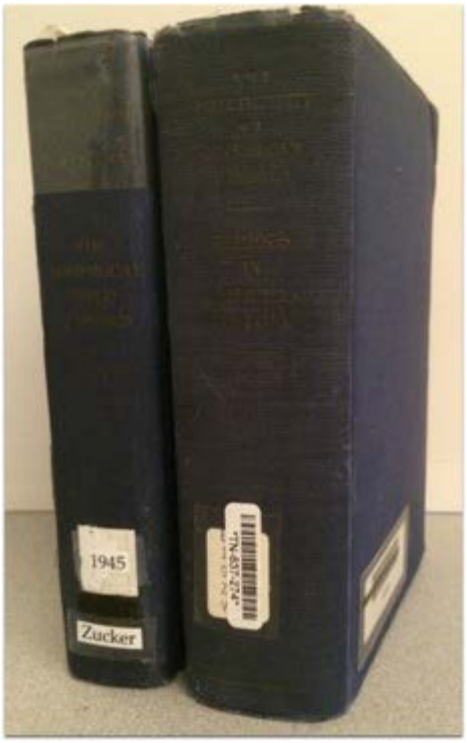

Zucker's two-volume *The Philosophy of American History*, volume one: *The Field*

One salient point to note about all of this discussion of "historical field principles", "historical field theory", "historical field", etc., Zucker never once explicitly stated once in the preceding 685-pages what exactly his "historical field theory" is, but rather seems to but fence sit on every single topic he discusses, though it seems leaning slightly to the materialist side of the lawn; and beyond this, for all his opening boasting about Planck's quantum, the Schrodinger equation, Maxwell's electromagnetic field, and Einstein's theory of relativity,

none of this ever makes its way into any semblance of a "field theory" that can be used in history studies. Very odd indeed. It's almost as though he was laying out some type of draft for some type of future ideology along these lines. The opening sentence to the preface of the second volume seems to given evidence to this supposition:

Theory of History (left), volume two: *Periods in American History* (right); see also power center. [1]

> "Both Buckle and Henry Adams were convinced that to develop the laws of historical movement, it would be necessary to study its phenomena in comparative freedom from extraneous influences."

Needless to say, at this point, Zucker is no Henry Buckle or Henry Adams, though it seems, he wanted to be.

Quotes | Misc

The following are noted quotes by Zucker or found within his *Historical Field Theory*:

> "It is a characteristic faculty of the Germans to look in the clouds for what lies at their feet."
>
> — Arthur Schopenhauer (date), *Essay on Government* (pg. 29) [3]

> "Man is not born a blank (see: tabula rasa Ñº); he has a rich heritage behind and before him which he inherits and acquires; that religion, morality, ethical conceptions, propaganda, race, politics, nationalism, prejudice, love, hatred, fear and all the rest are vital elements which enter into the motivations of that glorious complex we call man."
>
> — Morris Zucker (1945), synopsis of Karl Marx's view individuals (pg. 302)

> "Science deals with facts, not ideas developed out of suppositions. History must go a step further, just as modern physics does, and inquire about the forces which bring forth those events. Knowing something about social forces will tell us why some of the things imagined could not have taken place because they were impossible, and others were so remote as to be extremely improbable."
>
> — Morris Zucker (1945), on discarding the "if" theory of science (pg. 322)

> "A yardstick is still a yard, but the yardstick itself undergoes changes of length dependent upon its position relative to the earth's motion."
>
> — Morris Zucker (1945), on the Fitzgerald-Lorentz contraction (pg. 556) [18]

> "To the extent that a field of inquiry succeeds in eliminating the personal equation, to that degree does it claim a place among the hierarch of the scientific disciplines."
>
> — Morris Zucker (1945), on scientific disciplines (pg. 630)

> "Purpose pertains to man, not to nature, and man's purposes are often shrouded in mystery, even to himself. We will leave out all theological or eschatological considerations, since they germinate from theories steeped in religion, destiny or final cause or purpose of existence."
>
> — Morris Zucker (1945), commentary on some who have ascribed purpose to history (pg. 638)

"Physics, chemistry, and biology afford ample proof that beyond a certain point quantitative differences bring about radical qualitative changes. So it is in society."

— Morris Zucker (1945), on laws of social relations (pg. 640)

"The chemist, the metallurgist, the astronomer, the economist need not be conversant with the permutations of every single electron of the masses with which they deal. That does not justify the chemist in expecting to squeeze rabbits out of a hatful of water, nor does the metallurgist propose to run milk out of his blast furnace."

— Morris Zucker (1945), on probability laws in physics (pg. 678)

"A mistake of mechanical engineering results in limited loss; but a mistake in social engineering often spells irretrievable social disaster."

— Morris Zucker (1945), on whose in hands social affairs are to be placed (pg. 682)

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External links

â— Zucker, Morris (b.1892-) – WorldCat Identities.

θΔics

In beliefs, **mortalism**, from *mortal-* “destined to die” (see: Mor) + *-ism* “doctrine”, as compared to “immortalism” (belief in the afterlife), refers to “denial of the belief in immortality” (Berman, 1979) or the “conviction that death means everlasting extinction, with no possibility of an afterlife” (Heinegg, 2003). [1]

Mortalism, alternatively, according to Merriam-Webster (Ñº), is the “doctrine that the soul is mortal”. This definition, which seems to have been commonly accepted usage in the previous three centuries, however, in modern terms, confounds “disbelief in existence after early existence” with belief in the existence of the soul, which therein obscures things. Famous mortalists include: John Milton, Thomas Hobbes (Ñº), and Thomas Browne. [2]

In 2003, Peter Heinegg, in his *Mortalism: Readings on the Meaning of Life*, steps through the views and works of 55 “mortalists”, including his own views, as shown below:

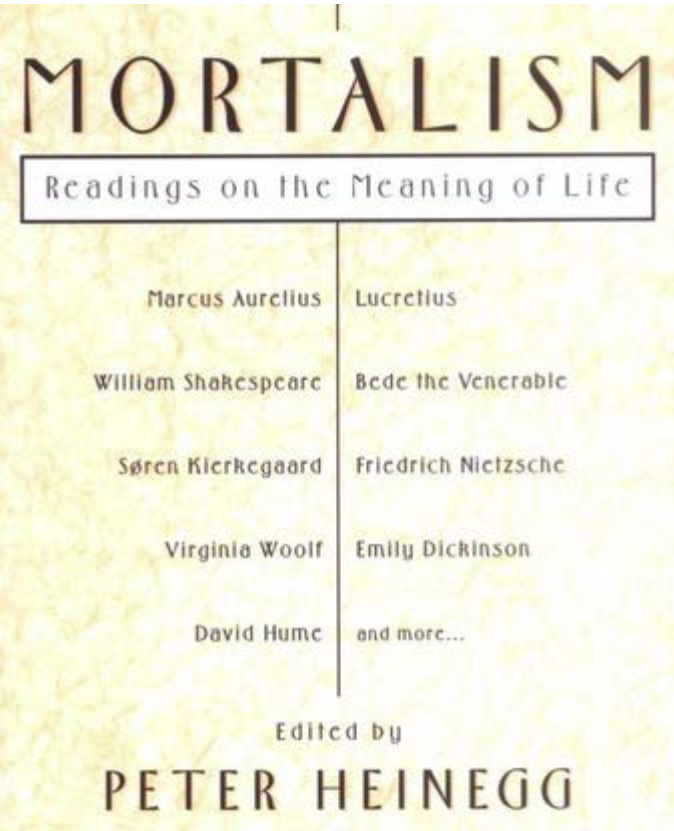

In the 2003 book *Mortalism*, Peter Heinegg steps through the views and works of 55 mortalists. [3]

1. The Epic of Gilgamesh (c.2000 BCM)
2. The Bible (Job—Ecclesiastes [dates unknown)
3. Homer (eighth century BCM)
4. Sophocles (c.496-406 BCM)
5. Other Greek Poets
6. Plato (428-348 BCM)
7. Epicurus (c.342-270 BCM)
8. Lucretius (c.96-55 BCM)
9. Catullus (Gaius Valerius Catullus, 84-54 BCM)
10. Horace (65-8 BCM)
11. Seneca (Lucius Annaeus Seneca, 4 BCM - 65 ACM)
12. Hadrian (Publius Aelius Hadrianus, 76-138 ACM)
13. Marcus Aurelius (121-180 ACM)
14. Bede the Venerable (673?-735 ACM)
15. Michel Montaigne (1533-1592)
16. Chidiock Tichborne (d.1586)
17. William Shakespeare (1564-1616)
18. Blaise Pascal (1623-1662)
19. David Hume (1711-1776)
20. David Hume (1711-1776)
21. Samuel Johnson (1709-1784)
22. Edward Gibbon (1737-1794)
23. Marquis de Sade (1740-1814)
24. Johann Goethe (1749-1832)
25. Arthur Schopenhauer (1788-1860)
26. William Cullen Bryant (1794-1878)
27. Heinrich Heine (1797-1856)
28. Giacomo Leopardi (1798-1837)
29. Edward FitzGerald (1809-1883)
30. Soren Kierkegaard (1813-1855)
31. Gustave Flaubert (1821-1880)
32. Leo Tolstoy (1828-1910)
33. Emily Dickinson (1830-1886)
34. Algernon Swinburne (1837-1909)

35. Thomas Hardy (1840-1928)
36. William James (1843-1910)
37. Bertrand Russell (1872-1970)
38. Friedrich Nietzsche (1844-1900)
39. Sigmund Freud (1856-1939)
40. George Santayana (1863-1952)
41. Miguel Unamuno (1863-1936)
42. Marcel Proust (1871-1922)
43. Wallace Stevens (1879-1955)
44. Virginia Woolf (1882-1941)
45. James Joyce (1882-1941)
46. D.H. Lawrence (1885-1930)
47. Vladimir Nabokov (1899-1977)
48. Samuel Beckett (1906-1989)
49. Philip Larkin (1922-1985)
50. L. E. Sissman (1928-1976)
51. Richard Selzer (1938-)
52. Margaret Atwood (1939-)
53. James Fenton (1949-)
54. Gjertrud Schnackenberg (1953-)
55. Epilogue: William R. Clark (1938-)

(add)

Quotes

The following, according to Peter Heinegg (2003), are the three main representative "mortalism" quotes:

> "This being busied with thoughts of immortality is for the noble classes and especially for women with nothing to do. A solid person, though, someone who already intends to be something worthy here, and who therefore has to strive daily, has to struggle and work, gives the world to come a rest."
>
> — Johann Goethe (c.1820)

> "By withdrawing their expectations from the beyond and concentrating all their freed-up powers on earthly life, human beings will probably manage to make a life that is tolerable for everyone and a civilization that oppresses no one."
>
> — Sigmund Freud (1927), *The Future of an Illusion*

> "Broken heart. A pump after all, pumping thousands of gallons of blood every day. One fine day it gets bunged up and there you are. Old rusty pumps: damn the thing else: The resurrection and the life. Once you are dead you are dead."
>
> — James Joyce (1922), *Ulysses*

See also

â— Moralism

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θΔics

In characters, **Moschus** (c.1300-1250BC), or “Mochus of Sidon”, is an oft-cited (Winslow, 1869), supposed to have existed figure, likely mythical, said to have been existive before the mythical Trojan War (c.1250BC), who proposing promulgated some type of atomic theory. [1]

Overview

In c.1660, English rationalist theologian Henry More (1614-1687) attempted to trace the origins of ancient atomism back, via Pythagoras and Moschus, to Moses. [2]

Others, including: Isaac Causabon, John Selden, Johannes Arcerius, Ralph Cudworth, Robert Boyle, and Isaac Newton, supposedly, identified Mochus with Moses the Israelite law-bringer. (Ñº)

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External links

â— Mochus – Wikipedia.

θΔics

In religio-mythology, **Moses** (CR:50), is a confabulous syncretism of the Egyptian god Osiris, who became the Greco-Roman god Dionysus-Bacchus (c.800BC), who has 24+ characteristic overlaps (see: Osiris, Dionysus-Bacchus, and Moses), plus aspects (Doane, 1882) (Q) the Persian god-man Zoroaster (c.600BC), themed around the monotheistic religious reforms of Akhenaten (c.1350BC), to effect a god-to-prophet fictionalized character realism of a man who penned the first five books of the Bible.

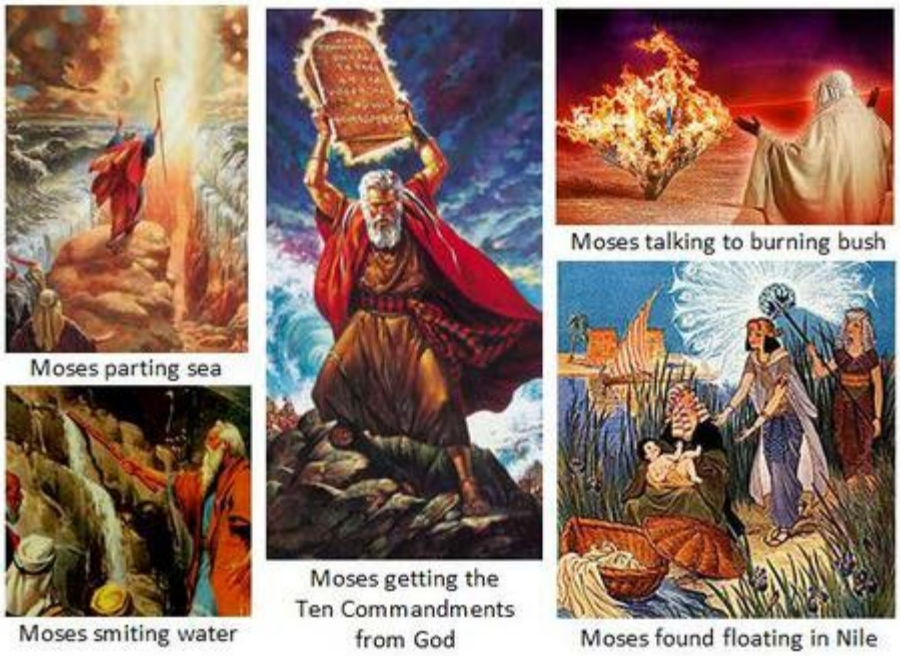

Artistic renditions of **Moses**, his origin, and his miracles; all of which .

Osiris | Horus

See main: Osiris, Dionysus-Bacchus, and Moses

In 100AD, Plutarch recounted the basic points of the Egyptian god Osiris (worshiped: 3,000BC-400AD) as follows:

> "On the first of the five intercalcated days Osiris was born, and at the hour of his birth a voice issued forth saying, 'the lord of all advanced to the light'. But some relate that a certain Pamyles, **while he was drawing water** in Thebes, heard a voice issuing from the shrine of Zeus [Amen-Ra], which bade him proclaim with a loud voice that a mighty and beneficent king, Osiris, had been born; and for which Cronus [Geb] **entrusted to him the child Osiris, which he brought up**.
>
> One of the first acts related of Osiris in his reign was to **deliver the Egyptians** from their destitute and brutish manner of living. This he did by showing them the fruits of cultivation, by **giving them laws**, and by teaching them to **honor the gods**. Later he travelled over the whole earth civilizing it without the slightest need of arms, but most of the peoples he won over to his way by the charm of his persuasive discourse combined with song and all manner of music. Hence the Greeks came to identify him with Dionysus."
>
> — Plutarch (100AD), *On Isis and Osiris* (pg. 35)

Moses, likewise, was "drawn from the water" of Nile River as a baby (see: baby in basket on river), by one of the pharaoh's daughter; his name, in fact, is said to mean "drawn out" or "pulled out" of the water Exodus 2:10 (Q); that he "was raised" via the arrangements of the pharaoh's daughter (Exodus 2:7-10 (Q)); the nursed by the pharaoh's daughter motif might, to note, have connection to the Horus nursed by Nephthys motif:

> "Ani is Horus; his mother Isis bore him, Nephthys nursed him, just as they did Horus, in order to drive away the confederacy of Seth, and thy see the Wereret-crown firm planted on his head."
>
> — Ani scribe (1250BC), *Egyptian Book of the Dead* (§:134) (pg. 79)

Also, that Moses "delivered" the Israelites from bondage, just as Horus free Egypt from the "confederacy of Seth". It was Osiris, however, like Moses, who "gave them the laws" (ten commandments); Moses, conversely, taught them to "honor one god".

Confessions | Commandments

The 500BC story of Moses receiving the Ten Commandments on Mount Sinai (Q), aka Moses' mountain, is a monotheistic transcription-rewrite of Egyptians receiving the 42 Negative Confessions in the 3,100BC period of the formation of the 1st dynasty Egyptian state from the forty-two nodes (cities) and their respective nodal gods—one god presiding over each sin in the afterlife limbo Judgment Hall—following the rebirth of the pharaoh, Osiris, or individual personal soul out of the conceptually arisen rebirth burial mound (or pyramid).

Mythology | Dissection

In 1830, French writer Charles Lebrun, in his *Doubts of Infidels*, as cited by Dorothy Murdock (2009), stated that Moses was a Bacchus rewrite; the gist of which is as follows: [13]

> "The history of Moses is copied from the history of Bacchus, who was called Mises by the Egyptians, instead of Moses. Bacchus was born in Egypt; so was Moses... Bacchus passed through the Red Sea on dry ground; so did Moses. Bacchus was a lawgiver; so was Moses. Bacchus was picked up in a box that floated on the water; so was Moses.... Bacchus by striking a rock made wine gush forth... Bacchus was worshiped ... in Egypt, Phenicia, Syria, Arabia, Asia and Greece, before Abraham's day."

In 1880, Robert Ingersoll published his *Some Mistakes Moses*, wherein opens to the following: [2]

> "For many years I have regarded the Pentateuch simply as a record of a barbarous people, in which are found a great number of the ceremonies of savagery, many absurd and unjust laws, and thousands of ideas inconsistent with known and demonstrated facts. To me it seemed almost a crime to teach that this record was written by inspired men; that slavery, polygamy, wars of conquest and extermination were right, and that there was a time when men could win the approbation of infinite Intelligence, Justice, and Mercy, by violating maidens and by butchering babes. To me it seemed more reasonable that savage men had made these laws; and I endeavored in a lecture, entitled 'Some Mistakes of Moses,' to point out some of the errors, contradictions, and impossibilities contained in the Pentateuch."

In 1975, Lloyd M. Graham argued that Moses was fashioned after the Syrian Mises and that his laws were fashioned after Hammurabi's code (Q), a Babylonian law code, consisting of 282 laws, of ancient Mesopotamia, dating back to about 1772 BC. [11]

In 1939, Austrian psychologist Sigmund Freud, in his *Moses and Monotheism*, argued that Moses, was a real person, but was not Hebrew, but actually born into Ancient Egyptian nobility and was probably a follower of the pharaoh Akhenaten, Egypt's first monotheist. [8]

In 2000, American religio-mythologist Gary Greenberg, in his *101 Myths of the Bible*, argues that Moses' birth is similar to the Mesopotamian legend of the birth of Sargon I (2300BC), but most logically modeled on the hiding of Horus the child by his mother Isis on a floating island, after Set had killed Osiris (Horus' father), a story from Egyptian literature concerning the "right to rule" Egypt. Greenberg, also, to note, cites the 300BC writings of Egyptian Manetho, a priest, who discusses an Egyptian priest named Osarseph, who sized the Egyptian thrown, later changing his name to "Moses". [5]

German scholar H. Gressmann, building on the earlier work of E. Meyer, supposedly, also argued along similar lines, namely that Moses' birth is a legend of the promised child exposed and rescued, paralleling most with Sargon of Akkad. [7]

In 2006, Robert Paul, in his *Moses and Civilization: the Meaning Behind Freud's Myth*, makes connections between pharaonic model of Horus and Moses. (Q)

In 2006, writer Zoltan Kokai-Kuun surmised that Moses was a real person who borrowed the Ten Commandments from model of Horus the "supreme lawgiver, the ruler of a united kingdom, from whom the pharaohs descended. (Q)

In 2008, German jurist and former Islamic theologian Sven Kalisch, gave his researched opinion that Muhammad never existed and admitted doubts on the historical existence of Jesus (god-Horus/Osiris), Moses, Abraham (father Ra son of Nun), and other so-called prophets of the Islamic, Christian, and Jewish traditions. [4]

In 2009, American religion deconverter scholar Christopher Redford cites Ingersoll's *Some Mistakes of Moses*, in his video 2.3 Deconversion: Other Christians (Part 2) (Q), supposedly as a counter-antidote for Israeli physicist and religion + science reconciler Gerald Schroeder's *The Science of God* . [3]

Etymology

American religio-mythologist Gary Greenberg argues the name Moses has something to do with being born or "born of", from the Egyptian word "msy", meaning "is born", such as found in the pharaoh claiming divine origin names: Thutmose (Thoth is born) or Ramose (Ra is born). [5]

In 2015, Greenburg commented the following about who he presently considers Moses to have been: [12]

> "Moses, as I try to show in *The Moses Mystery* (aka *Bible Myth*), was an actual person who was a high priest in the court if Akhenaten and an adopted brother. His adopted status gave him a claim on the royal throne and when the royal blood line came to an he waged a military campaign to reinstate Atenist religion. Culturally, he identified himself with Horus, as all pharaohs were Horus. His biblical birth story draws on Horus Myths."

American Jewish studies professor Rivka Ulmer, citing the 25AD work of Hellenistic Jewish philosopher Philo (Mos. 1.4:17), notes that the Egyptians called water "mou" and those who are saved "eses". [6]

Horns

In 1505, Italian artist Michelangelo made a statue of Moses, depicted with horns on his head, based on a description in the Vulgate, Latin version of the Bible. [9]

Michelangelo's 1505 statue of **Moses**, showing him with "horns", or rays of light, which grew after coming down from the mountain, following a talk with God.

In 1900, John Robertson, a Christian mythology scholar and Jesus myth theory advocate, argued that the horns of Moses have some connection to the horns of Greco-Roman winemaking deity Dionysus, or "Bacchus" as the Romans called him, who was worshiped as a young bull, and Dionysos as a bull; and or how in the Hebrew language the word *keren* can mean either "horn" or "ray", the latter having a solar ray connotation. [10]

Bacchus

In the pre-Rosetta stone years, before 1820s, a number of scholars made connections between the person Moses and the

Roman god Baccus.

In circa 1750, French thinker Voltaire, citing both Vossius and Huet, concluded, among other things, that Moses was a re-write of the Roman god Bacchus (worship period: 400BC-400AD). [1]

In circa 1810, French writer Charles-Antoine-Guillaume Pigault-Lebrun (1753-1835), in his *Doubts of* Infidels, states: [1]

> "The history of **Moses** is copied from the history of Bacchus, who was called Mises by the Egyptians, instead of Moses. Bacchus was born in Egypt; so was Moses ... Bacchus passed through the Red Sea on dry ground; so did Moses. Bacchus was a lawgiver; so was Moses. Bacchus was picked up in a box that floated on the water; so was Moses.... Bacchus by striking a rock made wine gush forth ... Bacchus was worshipped ... in Egypt, Phenicia, Syria, Arabia, Asia and Greece, before Abraham's day."

(add discussion)

Quotes

The following are related quotes:

> "Moses did not exist."
>
> — Ludwig Wittgenstein (1953), *Philosophical Investigations* (Q)

> "In consideration of what we know about Osiris, Horus and Isis, it is reasonable to find in Moses, Aaron and Miriam their traces, especially since Osiris is equated with Dionysus, who in turn has been identified with Moses. We have seen also that Aaron and Horus possess intriguing commonalities, and it is noteworthy that Isis was styled with the Egyptian epithet "Meri," meaning "beloved," while Miryam is Semitic for "Maria" and "Mary"."
>
> — Dorothy Murdock (2014), *Did Moses Exist?* (pg. 317) (Q)

See also

- God does not exist | Pierre Laplace (1802)
- Noah did not exist
- Adam and Eve never existed
- Abraham never existed | Libb Thims (2005)
- Moses never existed
- Buddha did not exist
- Jesus never existed | Napoleon Bonaparte (1815)
- Muhammad never existed | Robert Spencer (2012)

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Further reading

● Griffiths, J. Gwyn. (1953). "The Egyptian Derivation of the Name Moses", *JNES*, 12:225-31.
● Osman, Ahmed. (1990). *Moses and Akhenaten: the Secret History of the Egypt at the Time of the Exodus.* Bear & Co.
● Murdock, Dorothy M. (2014). *Did Moses Exist? The Myth of the Israelite Lawgiver.* Stellar House Publishing.

External links

● Moses – Wikipedia.
● Was Muhammad a Lesser Prophet than Moses or Jesus? – WikiIslam.

θΔics

In existographies, **Moses Mendelssohn** (1729-1786) (IQ:165|#450) (Cattell 1000:404) [RGM:944|1,360+] was a German-Jewish philosopher, aka "modern Plato" (Cox, 1926) or "German Socrates" (Hecht, 2003), noted for []

Education

In 1742, Mendelssohn, age 13, read Maimonides's *Guide for he Perplexed* (1190), a book banned, by the Jewish community, to anyone under 25.

Family

Mendelssohn educated his three daughters: Brendel, Recha, and Henriette, in philosophy, literature, mathematics, and religion; among these, Brendel, who changed her name to Dorothea, was known for her "forthright manner and staggering erudition" (Mercer-Taylor, 2000), ran one of Germany's central enlightenment salons, and acquired Friedrich Schlegel in her second marriage.

Moses Mendelssohn's grandson is Felix Mendelssohn (1809-1847) (Q) (IQ:165|#325), the noted Romantic period composer, pianist, and conductor.

Pantheism | Atheism

Mendelssohn died in the wake of the so-called "pantheism controversy", and event in German history lasting between 1785-1789, on whether the late Gotthold Lessing (1729-1781) (Q), a confessed "Spinozist philosopher", was a pantheist or an atheist.

Mendelssohn, in short, met a stress-induced reaction end when, in circa 1785, he was ruminating on the idea of writing an existography on his friend Gotthold Lessing (1729-1781) (Q), and avowed Spinozist, whom he believed this meant that he a pantheist, in specifics, and that pantheism, meant theism, which he considered the same thing. [1]

Friedrich Jacobi, however, maintained that Lessing was a Spinozist in the sense of being a pure materialism atheist.

Mendelssohn was thus drawn into a poisonous literary controversy, and found himself attacked from all sides, including former friends or acquaintances such as Johann Herder and Johann Hamann.

He died (dereacted) four days after carrying a reply manuscript, entitled *To Lessing's Friends* to the publishers.

Quotes | On

The following are quotes on or related to Mendelssohn:

> "A bad philosopher who is a bad Catholic, hereby begs a philosopher who is a bad Protestant, to grant a favor to a philosopher who is a bad Jew. There is too much philosophy in all this for reason not to side with my request."
>
> — Marquis d'Argens (c.1750), "Letter to Frederick II" [2]

> "Never have I seen such great wine in such an ugly vessel."
>
> — Frederick the Great (c.1755) (Q)

> "You may remain faithful to an oppressed, persecuted religion, you may leave it to your children as a prospect of life-long martyrdom, as long as you believe it to be absolute truth. But when you have ceased to believe that, it is barbarism."

— Jacob Bartholdy (c.1800) (Q), comment (Q) to Abraham Mendelssohn (son of Moses Mendelssohn) on religious conversion [6]

Quotes | By

The following are quotes by Mendelssohn:

> "Let Plutarch and Bayle inquire ever so much whether a state might not be better off with atheism than with superstition. The state should take notice of this, but only from a distance."
>
> — Moses Mendelssohn (1783), *Jerusalem: On Religious Power and Judaism* [3]

> "Happy will they be if in the year 2240 they cease to act against them."
>
> — Moses Mendelssohn (1783), *Jerusalem: On Religious Power and Judaism*

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2. (a) Mercer-Taylor, Peter. (2000). *The Life of Mendelssohn* (pg. 8). Cambridge University Press.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 363). HarperOne.
3. (a) Mendelssohn, Moses. (1783). *Jerusalem: On Religious Power and Judaism* (pg. 63) (translator: Allan Arkush; Introduction and comment: Alexander Altamann). Brandeis University Press, 1983.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 364). HarperOne.
4. (a) Mercer-Taylor, Peter. (2000). *The Life of Mendelssohn* (pg. 16). Cambridge University Press.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 373-74). HarperOne.
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Further reading

● Cox, Catharine. (1926). *Genetic Studies of Genius. Volume II. The Early Mental Traits of Three Hundred Geniuses* (GB) (Arc) (pdf) (pg. 589-). Stanford University Press.

External links

● Moses Mendelssohn – Wikipedia.

θΔics

In non-existents, **Moses never existed** refers to the discernable fact that the character "Moses", the purported author of the Old Testament, and presumed patriarch of Judaism, Christianity, and Islam, who famously pens his own death, impossibly describing the location of this tomb, is an fictional individual, who never existed as a real person; Moses, in short, is an Osiris rescript (see: god character equivalents), i.e. a monotheistic god-to-prophet rewrite of the Egyptian god Osiris into the fictional Judaic figure of the prophet law-giver Moses.

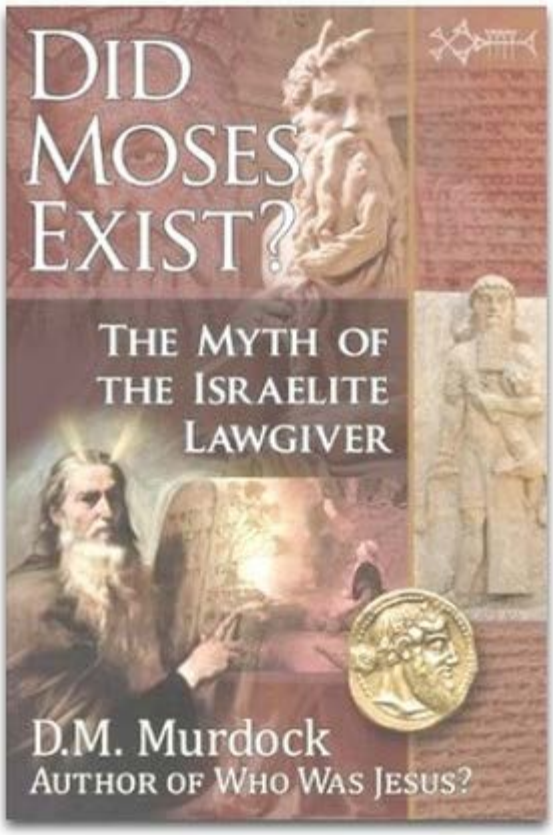

In 2014, Dorothy Murdock, in her *Did Moses Exist: the Myth of the Israelite Lawgiver*, devotes some 800 pages to a dissection of the mythology of the figure of Moses, a fact she had known since 1999. [2]

Overview

In c.80AD, Josephus, citing Manetho's now lost history of Egypt, conjectured that the expulsion of the Hyksos from Egypt (c.1600BC) (see: supreme god timeline) was the origin of the mythical story of the Jewish exodus. (Q)(Q)

In c.1630, Gerardus Vossius, in his *On the Origin and Progress of Idolatry*, is historically well-cited as having been the first to make some kind of Moses and Bacchus parallelism connection (Q); English translations of his works, however, are wanting.

In c.1650, Samuel Bochart (1559-1667) asserted the following: (Q)

> "Both Bacchus and Moses were born in Egypt, shut up in an "ark," and put on the waters. Both fled from Egypt toward the Red Sea and had serpents (in Moses' case, a bronze serpent). For both, water flowed from a rock and milk and honey were provided. Both were called legislators, turned sticks into snakes, saw light in the darkness, and had unknown tombs."

In 1679, Pierre Huet, supposedly, had produced the following equation: (Q)

> Mnevis (Q) = **Osiris** = **Bacchus** = **Moses**

In the centuries to follow, via the work of religio-mythology scholars, it was determined that both Moses and Dionysus-Bacchus were parallel rescripts of the Osiris legend (see: Osiris, Dionysus-Bacchus, and Moses), which itself, in an astro-theology sense, was a story invented to explain (a) the rise and fall of the Orion constellation and the lunar cycle.

The following, to exemplify the connection between Moses and Dionysus, shows Dionysus climbing a mythical mountain, with his thyrsus, aka god power staff (original to Osiris), below left, from a fresco in Pomei, and Moses, climbing the mythical mount Sinai, with his magic rod:

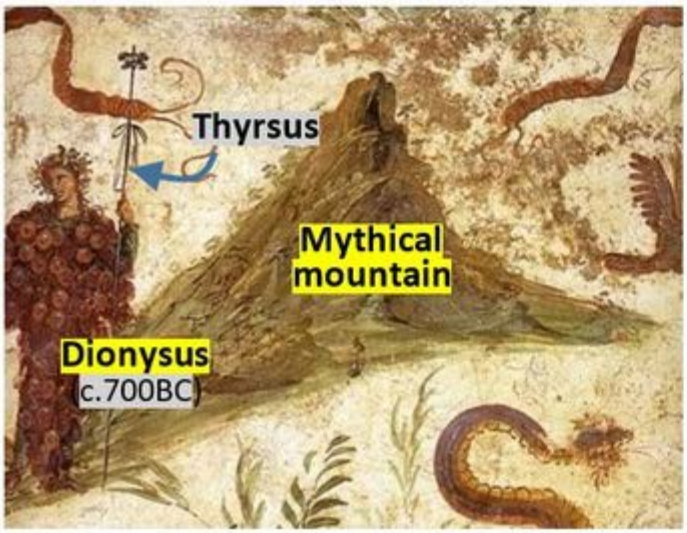

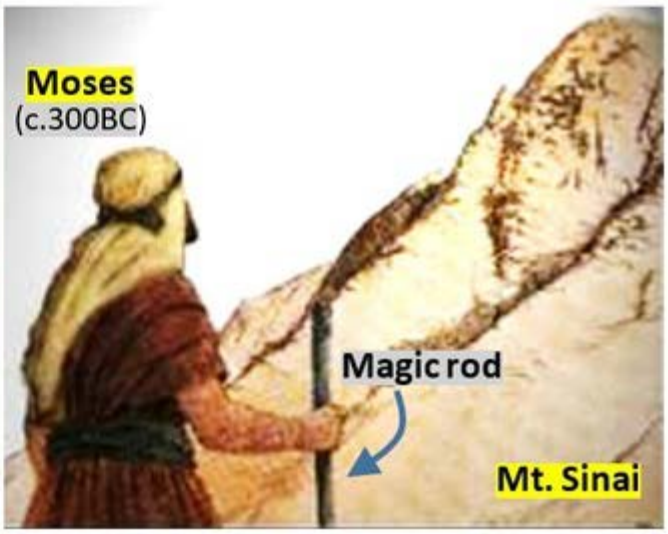

In 1939, Sigmund Freud, in his *Moses and Monotheism*, conjectured that the story of Moses was related to the religious reform of Akhenaten; much of this can be corroborated by the fact that a number of passages in the Bible, such as the penning of the Ten Commandments, are said to have been written with "god's finger", which is the visual depiction of Akhenaten's god Aten, a sun disc with many arms, representative of sun rays, each with one finger.

In 1953, Ludwig Wittgenstein, in his *Philosophical Investigations*, put things thusly: [1]

> "Moses did not exist."

In 2014, Dorothy Murdock, in her *Did Moses Exist? The Myth of the Israelite Lawgiver*, devoted an entire book to the show that Moses as a person never existed; in her §: Exodus of Egypt of Osiris (pg. 201), e.g., she conjectures, via citation to Diodorus (1.17), that the story of the exodus of Moses is a rescript of the story of the exodus of Osiris: [2]

> "It is moreover reported, that Osiris being a prince of a public spirit, and very ambitious of glory, raised a great army, with which he resolved to go through all parts of the world that were inhabited, and to teach men how to plant vines, and to sow wheat and barley. For he hoped that if he could civilize men, and take them off from their rude and beast-like course of lives, by such a public good and advantage, he should raise a foundation amongst all mankind..."

Murdock here then connects "Osiris being a prince" with Moses oft-stylized as "prince of Egypt".

In short, given the fact that there are over 24 parallels between the Egyptian god Osiris, his cultural variants: Dionysus (Greek) and Bacchus (Roman), and Moses (see: Osiris, Dionysus-Bacchus, and Moses), that the characteristics of the god Aten and the monotheism of Akhenaten are thematically identical to that of Moses, and that death and burial of Moses were penned in the book purported to have been written by Moses (see: Moses pens his own death problem), among other issues, indicates that Moses was not a real person, but fictional character synthetically created to play the role of the law giver of the Jewish recension, penned by a large corpus of writers and editors, what was largely a monotheistic rescript of Egyptian polytheism.

Horns?

In the original Egyptian model, Osiris was a vegetative god, and never depicted with horns; it was his female counterpart Isis (or Hathor,

depending) who was often depicted with cow horns.

In 301BC, a horned Dionysus (Q) was minted on a coin of Seleucus (Q), as shown below, where a bust of the man is represented as assimilating: King Seleucus I, King Alexander III of Macedon, and the god Dionysus, who is shown wearing helmet covered with panther's skin and adorned with bull's ear and horn, panther's skin tied around neck.

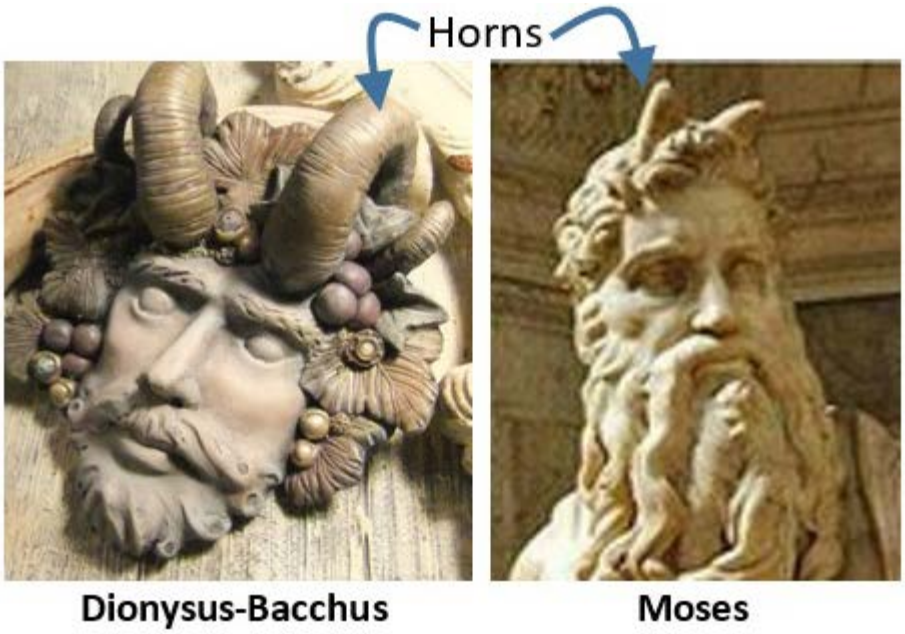

A comparison of the Greco-Roman god Dionysus-Bacchus, with horns, and the sculpture of Moses, by Michelangelo, of with "horns", as evidence to the fact that Moses is an aggregate rescript of the former, with Akhenaten monotheism thematics added, according to which Moses, as a real person, **never existed** (note: real people don't have horns).

Hence, the "horned" aspect of Moses is symbolic of his religious transformation connection to Dionysus, and hence to Osiris.

In 1850, Nathan Brooks, in his *The Metamorphosis of Publius Ovidius Naso* (O), citing Plutarch, gives a hodgepodge etymology of the origin of the horns of Bacchus.

In 1858, Samuel Dunlap, in his *Vestiges of the Spirit-History of Man*, comments (Q) on the horns of Dionysus.

In 1912, James Frazer, in his *The Golden Bough: a Study in Magic and Religion, Volume 7* (Q), gives a cogent discussion of how the bull with horns depiction was dominant in the Dionysus worship.

While it is clear that Dionysus, derives from Osiris, the horned attribute of Dionysus seems to be a unique Greek mythological add-on; hence, as it is clear that Moses, in large part, is a rescript of Dionysus, we can conclude that the "horns" of Moses are NOT rays of light that appeared on his head after he came down from the mountain, after receiving the ten commandments, but are derived from the Dionysus-Bacchus horns.

Quotes

The following are related quotes:

> "Abraham, the Jewish patriarch, probably **never existed**. **Nor did Moses**. The entire Exodus story as recounted in the Bible probably never occurred. The same is true of the tumbling of the walls of Jericho.

And David, far from being the fearless king who built Jerusalem into a mighty capital, was more likely a provincial leader whose reputation was later magnified to provide a rallying point for a fledgling nation. Such startling propositions are the product of findings by archaeologists digging in Israel and its environs over the last 25 years."

— Michael Massing (2002), "New Torah for Modern Minds" (Q), New York Times, Mar 9

"There is no historical evidence outside of the Bible, no mention of Moses outside the Bible, and no independent confirmation that **Moses ever existed**."

— Michael Coogan (c.2010), lecturer on the Old Testament at Harvard Divinity School

"The dating for Moses' supposed existence ranges from the 13th century, that's the most popular thesis, but there are so many different dates, that, that's the first indication that we're not talking about history. I had known that **Moses was a mythical figure** back in the 1990s, I said this when I wrote *Christ Conspiracy* (1999)."

— Dorothy Murdock (2014), "radio show interview with Aeon Byte" (3:28) (Q), Aug 10

See also

- Adam and Eve never existed (56% of Americans believe that they existed)
- Noah never existed
- Abraham never existed (Ibn Warraq, 1995) (Q); (Thims, 2004)
- Jesus never existed (Napoleon, 1817)
- Virgin Mary never existed
- Buddha never existed
- Moses pens his own death problem
- Muhammad never existed

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1. Wittgenstein, Ludwig. (1953). *Philosophical Investigations* (Q). Publisher.
2. Murdock, Dorothy M. (2014). *Did Moses Exist? The Myth of the Israelite Lawgiver.* Stellar House Publishing.

Videos

- Murdock, Dorothy. (2014). "Did Modes Exist? The Myth of the Israel Lawgiver" (Q), Stellar House, Aug 10.

External links

- The Moses Fraud – AstroTheologyZone.com.
- Moses Never Existed – ZohoSites.com.

θΔics

In religio-mythology, **Moses pens his own death problem** refers to inconsistency of the assertion that the Pentateuch was written by a man named Moses, at the end of which he describes details of his own death, morning, and burial in an unknown grave; the implication being that the Old Testament was NOT written by a man named Moses.

Children are typically told that a man named Moses wrote the Pentateuch, i.e. Genesis, Exodus, Leviticus, Numbers, and Deuteronomy; the last of these, i.e. Deuteronomy 34:5-6, however speaks of the burial of Moses and that no one knows where his grave is? This indicates that the Pentateuch was NOT written by a person named Moses.

Overview

In 1582, Noel Journet asked the obvious question of how the *Pentateuch*, aka the *Five Books of Moses* (Genesis, Exodus, Leviticus, Numbers, Deuteronomy), could have been written by Moses, as we are told they were, if the fifth book, of the series, specifically Deuteronomy 34 (Ñº), describes Moses' own death?

In c.1650, Samuel Bochart, while working on the Bacchus-Moses connection (see: Osiris, Dionysus-Bacchus, and Moses), noted that they both were buried in unknown tombs. [3] The 300AD Biblical story of Moses describing his own death and burial in an unknown tomb, in short, is an Osiris, Dionysus-Bacchus rescript.

In 1784, Ethan Allen, in his *Reason: the Only Oracle of Man*, gave his humorous take on the Moses pens his own death problem as follows: [1]

> "This [Moses] is the only historian in the circle of my reading, who has ever given [Deuteronomy 34:5-8] the public a peculiar account of his own death, and how old he was at the decisive period, where he died, who buried him, and where he was buried, and withal of the number of days his friends and acquaintances mourned and wept for him. I must confess I do not expect to be able to advise the public of the term of my life, nor the circumstances of my death and burial, nor the days of the weeping or laughing of my survivors."

In 1794, Thomas Paine, in his *The Age of Reason*, stated the following: [5]

> "These books are spurious and Moses is not the author of them. They were not written in the time of Moses, nor till several hundred years afterwards; they are an attempted history of the life of Moses."

In 1829, Thomas Cooper, in his *Fabrication of the Pentateuch: Proved by Anachronism Contained in Those Books*, citing Benedict Spinoza (*Tractatus Theologico Politucs*), Spanheim (*Dubia Evangelica*), Pere Simon (*Historie Critique dis Vieux Testament*), and Constantin Volney (*Recerches Nouvelles sur l'History Ancienne, Volume One*), summarized the Moses authorism issue as follows: [4]

> "I. In the 34th chapter of Deuteronomy, ver. 5, 6, it is said, " Moses the servant of the Lord died there in the land of Moab, according to the word of the Lord. And he buried him in a valley in the land of Moab, over

> against Beth-peor; but no man knoweth of his sepulchre unto this day." It is manifest Moses could not have written this account of his own death and burial; but there is no hint or suggestion that it has been subsequently added to the main narration. The phrase, "unto this day," implies a considerable time past between the event narrated, and this narration of it. This is not a solitary passage that might have been interpolated at the end of the book; for it is so often repented that it is interwoven with the book itself. Thus, Deut. iii. 14, "unto this day." Gen. xxii. 14, "to this day.'"”

In 1996, Gary Greenberg, in his *101 Myths of the Bible*, touches on the "odd" claim that the location of the grave of Moses (the PURPORTED author of Deuteronomy) is unknown "unto this day", which indicates that that this passage, Deuteronomy, and or the entire Pentateuch were NOT by Moses. [2]

In 2007, Christopher Hitchens, in his *God is Not Great*, citing Paine (1794), digress on the Moses problem as follows: [6]

> “No one knows, says the author, "unto this day," where the sepulcher of Moses lies. It is added that there has since been no comparable prophet in Israel. These two expressions have no effect if they do not denote the pas-sage of a considerable time. We are then expected to believe that an unspecified "he" buried Moses: if this was Moses himself in the third person again it seems distinctly implausible, and if it was god him-self who performed the obsequy then there is no way for the writer of Deuteronomy to have known it.”

(add)

Solution

The solution to the so-called “unto this day” problem is resolved in the fact that Moses never existed, per reason that he is an Osiris rescript, as evidenced by the fact that Osiris, Dionysus-Bacchus, and Moses all have the same characteristics, attributes, and story-lines.

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1. Joshi, Sunand T. (2014). *The Original Atheists: First Thoughts on Nonbelief* (pg. 226). Prometheus Books.
2. Greenberg, Gary. (1996). *The Bible Myth: the African Origins of the Jewish People* (Deuteronomy 34-6, pg. 27). Citadel Press.
3. McDermott, Gerald R. (2000). *Jonathan Edwards Confronts the Gods: Christian Theology, Enlightenment Religion, and Non-Christian Faiths* (pg. 191). Oxford University Press.
4. Cooper, Thomas. (1829). *Fabrication of the Pentateuch: Proved by Anachronism Contained in Those Books* (Amz) (Arc)(txt). George E. Evans, 1840.
5. (a) Paine, Thomas. (1795). *The Age of Reason* (editor: Moncure Conway) (txt) (disbelieve, pg. 23; Quaker, pg. 62). Merchant Books, 1896.
(b) Hitchens, Christopher. (2007). *God is Not Great: How Religion Poisons Everything* (Paine, pg. 104; “unto this day”, pg. 105). Hachette Book Group.
6. Hitchens, Christopher. (2007). *God is Not Great: How Religion Poisons Everything* (Paine, pg. 104; “unto this day”, pg. 105). Hachette Book Group.

θΔics

In science, **motion** is the movement of a body through a distance of space, at a constant velocity, or at an accelerated speed, in an inertial reference frame.

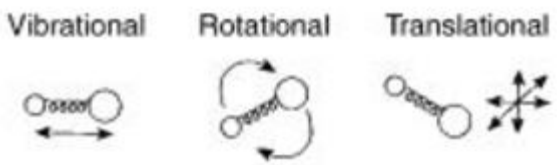

The three basic modes of **molecular motion**, as originally described by Rudolf Clausius. [4]

History

In circa 350BC, Greek philosopher Aristotle, who considered the earth to be spherical, albeit stationary and at the center of the universe, explained motion as the realization of the specific nature of a specific body, with natural motion defined as the tendency of a body to seek its natural place, and with the all bodies conceptualized as being comprised of four elements: earth, water, air, fire, each of decreasing density, respectively. [1] In regards to the element fire and motion, according to Aristotle:

> "For any two portions of fire, small or great, will exhibit the same ratio of solid to void; but the upward movement of the greater is quicker than that of the less."

Hence, denser elements tend to rise; lighter elements fall; earth is the heaviest element; fire the lightest.

In Aristotle's time, according to his own account, all pre-Socratic philosophers, including the school of the atomic theorists, Leucippus (c. 440 BC) and Democritus (c. 460–370 BC), believed in a flat earth universe. [2]

In 1687, English physicist Isaac Newton introduced the laws of motion, in the form of three equations (first law of motion, second law of motion, and third law of motion), according to which motion was the result of causative "forces". [3]

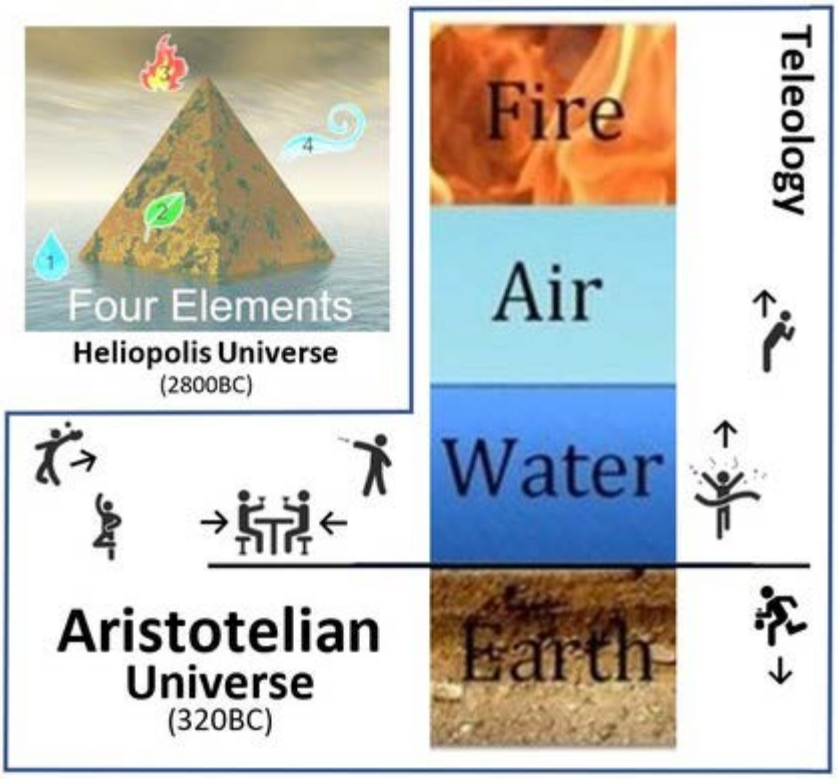

A pre-Aristotle flat earth model (c.350BC), wherein earth (unmovable), the center of the universe, was the heaviest of elements, followed by water, air, and fire, in decreasing density, and "**motion**" was tendency of bodies to seek or achieve their natural place in the order of the universe; a model that was part physics (four elements and two forces), i.e. Empedocles standard model (450BC), and part theology, in particular Nun cosmology (3100BC), which included the notion of good and evil.

Quotes

The following are related quotes:

> "As to the question of the origin and nature of **motion** in things, they, Leucippus and Democritus, too, ignored, just as blithely as the others."
>
> — Aristotle (c.350BC), *Metaphysics* (985b4-22)

> "**Motion** an effect by which a body either changes, or has a tendency to change its position: that is to say, by which it successively corresponds with different parts of space, or changes its relative distance to other bodies."
>
> — Baron d'Holbach (1770), *The System of Nature* (pgs. 16)

References

1. (a) Koyre, Alexandre. (1978). *Galileo Studies* (ch. 1). Humanities Press.
(b) Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (pg. 110). Cambridge University Press.
2. (a) Aristotle. (c.350BC). *De Caelo*, 294b, 13-21.
(b) Fontaine, Didier. (2002). "Flat Worlds: Today in Antiquity", *Memorie della Societa Astronomica Italiana*, 3(1): 257-62.
3. Newton, Isaac. (1687). *Principia*. Publisher.
4. Williams, R.J.P. and da Silva, J.R.R. Frausto. (2008). *The Chemistry of Evolution: the Development of our Ecosystem* (pg. 80). Elsevier.

See also

- Perpetual motion
- Perpetual motion of the first kind
- Perpetual motion of the second kind
- Perpetual motion of the living kind
- Induced movement

External links

- Motion (physics) – Wikipedia.

θΔics

In science, **motive force** is the conjunction term referring to the force or forces that cause something to move or, in a sense, the force that induces motor action. Its use can be found in terms such as electro-motive force, proton motive force, among others. Related or near synonymous terms might include motive power, mechanical effect, or motor factor.

In 1833, English mathematician John Herschel argued that heat is the motive force powering not only people but the planet. [2]

In 1900, Austrian psychologist Sigmund Freud, in his *On Dreams*, a more concise, accessible version of his *The Interpretation of Dreams*, published shortly thereafter, argued that repressed wishes function as the "motive force" in dream formation. [3]

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1. Drive (definition) – *Stedman's Medical Dictionary* (1995), 26th Edition.
2. Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Life*, (pg. 35). Chicago: The University of Chicago Press. 3. Freud, Sigmund, Strachey, James. (1952). *On Dreams*, (pgs. 59-60, 62-63, 67, 70). W.W. Norton & Company.

θΔics

In thermodynamics, **motive power** refers to the work energy associated with lifting a weight through a height.

Overview

In 1690, French engineer Denis Papin, in his "A New Method to Obtain Very Great Motive Powers at Small Cost", which contained the first prototype design a steam engine, used the term "motive power" [2]

In 1824, French physicist Sadi Carnot, in his *On the Motive Power of Fire*, employed the term as follows:

> "We use here the expression *motive power* to express the useful effect that a motor is capable of producing. This effect can always be likened to the elevation of a weight to a certain height. It has, as we know, a measure, the product of the weight multiplied by the height to which it is raised."

In equation format, if this "motive power" were taken as the measure of this "useful effect" done in one cycle, Carnot would have been referring to work, in modern terms:

$$W = mgh$$

If, however, he were referring to the amount of this "useful effect" done by a heat engine for a number of cycles, say in one hour, then he would be referring to motive power as "power" or rate of work done per unit time:

$$P = \frac{mgh}{t}$$

which would have been equivalent to the number of pounds of water the steam engine could pump or lift out of a flooded mine in a specific amount of time.

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(b) Muirhead, James. (1859). *The Life of James Watt*, (English translation: Ch. XI, Denys Pain: His memoir of 1690, Section: A New Way to Obtain Very Great Motive Powers at Small Cost", pgs. 131-42). London: John Murray.
(c) The original Latin, accompanied by a translation, in Muirhead's *Mechanical Inventions of James Watt*, Vol. III., pg. 139.

θΔics

In psychodynamics, **motor factor** is the amount of force or the measure of the demand for work which the pressure of an instinct represents. [1]

In 1915, Austrian psychologist Sigmund Freud, in his “Instincts and their Vicissitudes”, was employing the term; likely on the model of the thermodynamic terms “motive force” or the earlier 1690 term motive power.

References

1. Freud, Sigmund. (1915). “Instincts and their Vicissitudes.” Standard Edition of *The Complete Psychological Works of Sigmund Freud*, Vol. 14. London: Hogarth Press Ltd.

θΔics

In hmolscience, **Motoyosi Sugita** (1905-1990) was a Japanese physicist noted, in chnopsological thermodynamics, for his work on the thermodynamic understanding of life.

Overview

In 1952, Sugita, in his "Negative Entropy", critiqued Austrian physicist Erwin Schrodinger's 1943 negative entropy hypothesis and his Note to Chapter 6, in which he opens to the following: [1]

> "Although the term "negative entropy" has become well known around the world, its meaning is not necessarily clear. In the beginning Shrodinger invited criticism by saying that what we eat is not calories but "order" (or "orderliness"). In fact, even if you eat pork it does not mean its orderliness will enter you directly, and though you ingest organic compounds, about the only orderliness you will take into yourself is that of amino acids. Then in the Note to Chapter VI Shrodinger corrects his claim that an organism discharges positive entropy through heat emission by writing that this could be regarded as ingesting negative entropy. But because an organism is an open system, it discards compounds with little free energy, such as $C0_2$, H_20, and urea, with entropy when breathing, urinating, and the like. Thus one might go so far as to say that it is the lavatory where we take in negative entropy. Correctly, however, this is just a look from the reverse direction at how we discharge positive entropy through the total balance of our interaction with the surrounding environment, such as eating, drinking, excretion, and emitting heat. Nevertheless, this has important significance as a transitional phenomenon, an example being a stove that discharges positive entropy through its chimney and maintains a temperature differential by combustion sustained with a draft of air. The stove maintains what might be called a low entropy level. An organism is able to keep the balance of disintegration and synthesis (reproduction) and maintain a low entropy level only when this draft effect works. Should this effect not work, both the organism and the stove must eventually enter a death phase, i.e., an equilibrium state. But in the final analysis, negative entropy means nothing more than that, for it cannot explain what is meant by maintaining a low entropy level. All one can say is this: The assumption that orderliness is maintained by ceaseless intake alone leads to the conclusion that "disintegration" will ensue if intake stops, which contradicts the idea that within an organism orderliness is "frozen" or that "disintegration" is delayed."

Sugita was one of the founding members of the *Society for Studies on Entropy* (SSE), established in 1983 in Japan by a group of people who felt concern for problems of entropy not only in natural and technological systems, but also in social systems and economic systems. [2]

References

1. Mayumi, Kōzō. (2001). *The Origin of Ecological Economics: the Bioeconomics of Georgescu-Roegen* (pgs. 47-48). Routledge.
2. Sugita, Motoyosi. (1952). "Negative Entropy", *Kagaku* (Science), Vol. 22. No. 2. In: "Selected Papers on Entropy Studies", Vol. 6. No. 1., 2000, *The Society for Studies on Entropy*.

Further reading

● Sugita, Motoyosi. (1953). "Thermodynamical Analysis of Life I: Thermodynamics of Transient Phenomena", *Journal of Physical Society of Japan* (pgs. 697-703), Vol. 8, No. 6. Nov-Dec.
● Sugita, Motoyosi. (1953). "Thermodynamical Analysis of Life II: On the Maximum Principle of Transient Phenomena", *Journal of Physical Society of Japan* (pgs. 704-709), Vol. 8, No. 6. Nov-Dec.
● Sugita, Motoyosi. (1953). "Thermodynamical Analysis of Life III: Mathematical Analysis of Metabolism", *Journal of Physical Society of Japan* (pgs. 709-713), Vol. 8, No. 6. Nov-Dec.

θΔics

In science, **movement** refers to a body of mass or matter moved through a distance of space.

Overview

One of the first to question human movement was German human chemistry founder Johann Goethe who in 1790 answered the question in poetic riddles: [1]

> "Why are people busily **moving**? For food they are seeking, children they would fain beget, feeding them well as then can. Traveler, mark this well, and, when thou art home, do thou likewise! More can no mortal effect, work with what ardor he will."

In his 1809 *Elective Affinities*, however, he correctly explained that humans are large evolved chemicals that move due to the force of chemical affinity. This translates, according to the 1882 Helmholtz affinity-free energy relation, to the effect that humans move along decreasing Gibbs free energy gradients or paths. In a modern human molecule sense, the question can be further resolved by asking "why are the atoms and the molecules of the universe or rather on the surface of the earth, busily moving?" Terms that attempt to answer this include: induced movement and mechanical action. Defunct theories of movement include: perpetual movement or perpetual motion. A related term is "Brownian motion", which was explained by German-born American physicist Albert Einstein via thermodynamics.

See also

â— Library walk problem

References

1. (a) Goethe, Johann. (1790). "Venetian Epigrams". Germany.
(b) Margulis, Lynn and Sagan, Dorion. (2000). *What is Life?* (pg. 44). University of California Press.

θΔics

In science, **moving order**, or "bewegliche ordnung" in the original German, is term found in German polyintellect Johann Goethe's 1795 poem "Metamorphosis of Animals", the followup to his "Metamorphosis of Plants" (1790), referring to his evolution theory (metamorphosis) view that each creature, e.g. chemical, plant, or animals, is but a pattered gradations of one harmonious whole, i.e. that forms are patterns of relationships within an organized whole. [1]

References

1. (a) Goethe, Johann. (1795). "Metamorphosis of Animals" ("Metamorphose der Tiere"), in: *Goethe's Minor Poems* (trans. Albert Selss) (pgs. 128-). Trubner & Co., 1875.
(b) White, Carol W. (2008). *The Legacy of Anne Conway (1631-1679): Reverberations from a Mystic Naturalism* (pg. 70). SUNY Press.
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(d) Capra, Fritjof. (1997). *The Web of Life: A New Scientific Understanding of Living Systems* (pg. 21). Random House.

Further reading

â— Steiner, Rudolf. (1897). *Goethe's Conception of the World* (contents) (§:Views concerning Nature and the Development of Living Beings: the Doctrine of Metamorphosis), Publication.

θΔics

In hmolscience, **Mr. Carbon Atom** is an educational character conceived by English biological scientist Mark Janes in 2009 consisting of a black suit and top hat on which various medallions of atomic properties of the carbon atom are placed, so as to signify that the human being is a “gigantic carbon atom”.

English biologist Mark Janes dressed up as "**Mr. Carbon Atom**" to exemplify that he is a type of amplified carbon atom.

History

In 1993, English biologist Mark Janes completed chemical engineering coursework in thermodynamics, fluid mechanics, and heat transfer, among other subjects, at the University of Manchester Institute of Science and Technology. In the years to follow, Janes began to study biology and pharmaceutical sciences. In 2002, at the age of 29, from Janes’ online biography, he states: [1]

> “I bought my first house. This changed my life and gave me a unique ability to design my environment to tailor my eccentric and complex needs alone. I had all the space I needed to develop intellectually. I could make my house the pallet and canvas for my scientific ideas. I produced my work as posters which I could line the inside of my house with, and therefore constantly review the material. Hence this is ‘my cell, the primary Lyme Avenue installation. It was at this juncture that I had identified the possibility of an amplification phenomenon in nature through Carbon 12. I also embraced electronegativity as a model of my own desires and reactivity. I could see and feel physics in my everyday life. The ideas started to flow and I became manically focused. I also realized that there appeared to be a conservation process in nature, which produced organisms from quantum and nuclear carbon atomic origins.”

In circa 2006, Janes began to develop his “carbon entromorphology” theory in which a person is viewed as a type of ‘amplified atom’ or ‘gigantic carbon atom’, with wave and particle properties, and in which the logic of thermodynamics, particle physics, and other atomic modeling principles apply to explain behaviors of humans.

In 2009, on a whim invitation to a Halloween party, dressed up a “Mr. Carbon Atom” (adjacent), which was a hit, decorated with the various atomic orbitals and properties of carbon; which resulted in a follow-up 2010 video on Mr. Carbon Atom. In his own words:

> “Towards the end of 2009 I came up with the idea of ‘**Mr Carbon Atom**’. I had a suit made which allowed me to put symbols on my body to show the mirror image of myself to that of atomic carbon anatomy. It allowed me to demonstrate how atomic physics is all around us defining every moment of our lives.”

(add discussion)

Note

Janes’ appeal to the hard physical sciences to explain biology, and his conception of Mr. Carbon Atom, is similar to American zoologist William Patten’s 1919 attempted to outline how the modern person might go about deriving a science-based system of morality and future governing constitution for a ‘molecular society’, of people considered as ‘human social atoms’ (social atoms) or ‘human molecules’, based on chemistry, physics, and astronomy; wherein he defined a person as "Mr. Molecule". [2]

References

1. Biography (Mark Janes) – Carbon-Entromorphology.com.
2. (a) Patten, William. (1919). “The Message of the Biologist”, Address of the vice-president and chairman of Section F, Zoology, American Association for the Advancement of Science, St. Louis, Jan 31.
(b) Patten, William. (1920). “The Message of the Biologist”, *Science*, pgs. 93-101, Jan 30.

θΔics

In hmolscience, **Mr. O** (c.1980-) (IQ:136±) (DN:1), aka Andrew Maxwell, identity concealed per military reasons, is a Scottish American strong theistic philosopher noted for his 2015 participation in the Atheism Reviews discussion and debate channel.

Religion

Mr. O is a Trinitarian Christian, who believes in the existence of god based on ontological, teleological, and cosmological arguments; is heavily influenced by science of mind, consciousness, and theological belief the beginning of the universe (first cause); and can be classified as a "theistic evolutionist" or creation evolutionist, who believes that science and spiritual contemplative practices need not be at odds. He believes that science and religion are comparable, almost as a covalent bond. He believes in subjective experience in a closed energy system; believes that: biology, physics, and all sciences are correct. [1]

Influences

Influential thinkers to Mr. O, include: Alvin Plantinga, Thomas Nagel, John Lennox, Sam Harris, William Craig, C. Stephen Evans, Michio Kaku (O), Bart Ehrman, Neil Tyson, Gary Habermas, John Locke, William Paley, C.S. Lewis, Albert Einstein, Gottfried Leibniz, George Ellis, Michael Ruse, and Leonard Susskind.

Antagonists

Mr. O is averse to the following thinkers: Richard Dawkins, Gerald Massey (O), (add)

Quotes | By

The following are representative quotes:

> "Having Duck Dynasty speak for Christian thought is like Ken Ham speaking for scientific reasoning."
>
> — Mr. O. (2015), commentary on the 20 Mar 2015 Phil Robertson Vero Beach Prayer Breakfast Speech (O) (V), Apr 9

> "I'm more of a George Ellis, Leibniz, Thomas Nagel, Michael Ruse, Susskind, Plantinga type. I believe in cosmology, Platonism, natural theology, evolutionary biology, and epistemic ontology. I'm no YEC and mad 'dumb Christian'. Dawkins is a joke to say it kindly."
>
> — Mr. O. (2015), commentary on general debate prerogative, Apr 9

See also

- Mr. Carbon Atom
- Patrick Fergus

References

1. Mr. O (2015). "Messaging Communications to Libb Thims", Feb 2 – Apr 9.

Further reading

- Maxwell, Andrew. (2005). "Conditioned Response Consciousness" (O), *Journal of Human Thermodynamics*, 192):13-20.

External links

- Andrew Maxwell (about) – HumanThermodynamics.com.
- Mental Fluidity – Blogspot.com.

θΔics

In existographies, **Muata Ashby** (c.1960-), or "Seba Maa (Muata Abhaya Ashby)", is an American-born, Caribbean-raised religious studies philosopher noted for []

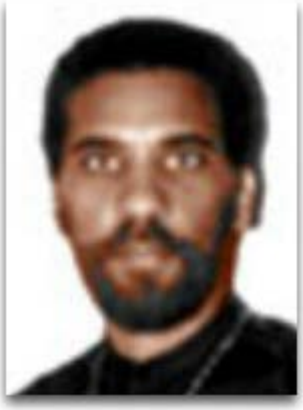

Genesis

Ashby, in his *Anunian Theology* (pgs. 51-52) makes some crude connections between Genesis and the Egyptian Ptah, Atum, Ra, Nun version of creation, and these with Hindu creation models; to quote one section:

> "Egyptian mythology begins with the existence of the Nu, the primeval ocean. The creation stories of the Bible, the Kabbalah (Jewish mysticism), and the Upanishads (Indian mysticism) are remarkably similar in the notion of the original primeval formless void and in the subsequent names and forms (matter differentiation and objectification) which arise later."

(add discussion)

Pa | Ma

Ashby alludes to the assertion that "Pa", as in Papa (father), has its etymological roots in the Egyptian *Pa Neter* (see: neter) or "high god", and that "Ma", as in Mama (mother) has its etymological roots in the order goddess Maat, to the effect that Ra created the universe by putting the Maat in place of chaos; Maat is akin to "universal mother" or "mother nature", or thereabouts. [2]

Overview

In 1997, Ashby, in his *Anunian Theology: African Religion*, attempted to outline what he called the spiritual philosophy (philosophy based on spirit) of ancient Africa, which he says originated in the "kamitan religion" (religions of the Kemites, i.e. Egyptians), aka Ra religion (theology based on the god Ra), Anunian theology (theology based on the god Nun), Neterianism (the Egyptian word for god is 'neter' represented by the axe symbol), a belief system he says originated, in pre-dynastic times, in the great lakes region of the Ethiopian mountains. [1]

Education

Ashby competed a PhD in religious studies, has a doctor of divinity degree in holistic health, and whose research with a focused on the Egyptian origins of Indian yoga practices.

Quotes

The following are related quotes:

> "We have established that the Ancient Egyptians were African peoples who lived in the north-eastern quadrant of the continent of Africa. They were descendants of the Nubians, who had themselves originated from farther south into the heart of Africa at the Great Lakes region, the sources of the Nile River. They created a vast civilization and culture earlier than any other society in known history and organized a nation that was based on the concepts of balance and order as well as spiritual enlightenment. These ancient African people called their land Kamit, and soon after developing a well-ordered society, they began to realize that the world is full of wonders, but also that life is fleeting, and that there must be something more to human existence."
>
> — Muata Ashby (1997), *African Religion, Volume One* (pg. 15)

References

1. (a) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (neter, 66+ pgs). Dover, 1969.

(b) Ashby, Muata. (1997). *Anunian Theology: African Religion, Volume One* (Neterianism, pg. 11; Pa, pg. 48; Ma, pg. 50). Cruzian Mystic Books.
2. Ashby, Muata. (1997). *Anunian Theology: African Religion, Volume One* (Pa, pg. 48; Ma, pg. 50). Cruzian Mystic Books.

Further reading

â— Ashby, Muata. (1997). *African Religion, Volume Three: Memphite Theology, Mystical Psychology for Enlightenment, and Immortality based on the Ancient Egyptian Philosophy of Menefer* (*The Hidden Properties of Matter*). Publisher.

Videos

â— Anon. (2015). “Muata Ashby African Origins of Civilization, Religion, Yoga, Mysticism, and Ethics Philosophy” (Ñº), Mindfully Black, Feb 1.

θΔics

In existographies, **Mucius Scaevola** (c.526-508BC), or "Gaius Mucius", was a Roman assassin, possibly mythical, characteristically described as a person possessing the rarest and firmest of wills.

Overview

In 9BC, Livy, in his *History of Rome*, stated that Scaevola was the first of three hundred Roman youths to volunteer for the task of assassinating Porsena, the king of Clusium, whom Rome was at war with. During the assassination attempt, however, Scaevola, accidently killed the king's scribe. When he was caught, he boasted:

> "I am Gaius Mucius, a citizen of Rome. I came here as an enemy to kill my enemy, and I am as ready to die as I am to kill. We Romans act bravely and, when adversity strikes, we suffer bravely."

Scaevola, to prove his bravery, then thrust his right hand in a fire that was lit for sacrifice, holding it there without giving any indication of pain; commenting:

> "Watch, so that you know how cheap the body is to men who have their eye on great glory."

(add)

Influence

In 1320BC, Dante Alighieri, in his *Divine Comedy*, refers to Scaevola burning hand, and along with St. Lawrence (225-258AD), he is described as a person possessing the rarest and firmest of wills.

In c.1724, Jean Rousseau, c. age 12, states, as discussed in his *Confessions* (1769), as a child, he attempted to replicate Mucius' action by placing his hand over a chafing dish.

In 1856, Friedrich Nietzsche, aged 12, attempting to prove the story could be true to his classmates at Schulpforte, burnt his outstretched palm over a book of burning matches without expression of pain and was only saved from serious harm by the school's prefect. [2]

References

1. Livy. (9BC). *History of Rome* (§:2.21) (Ñº). Publisher.
2. Levine, Peter. (1995). *Nietzsche and the Modern Crisis of the Humanities* (pg. 3). State University of New York Press.

Quotes | On

The following are quotes on Scaevola:

> "When **Mucius Scaevola** held his hand in the fire, he was as much acting under the influence of necessity (caused by interior motives) that urged him to this strange action, as if his arm had been held by strong men: pride, despair, the desire of braving his enemy, a wish to astonish him, an anxiety to intimidate him, were the invisible chains that held his hand bound to the fire."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 96)

External links

â— Mucius Scaevola – Wikipedia.

θΔics

In religio-mythology, **Muhammad** (569 to 632 ACM | Purported) (CR:61), aka "Mahomet" (Volney, 1791), the said-to-have-been 71st generation descendant of Abraham, purported author of the Quran, the main book of Islam, said to have existed from , is []

Various depictions of **Muhammad**, the apocryphal founder of Islam, the Arabian branch of Egyptian mythology.

Overview

In c.710, Bede, supposedly (Q) influenced by John of Damascus, is said to have written about Muhammad.

Religio-mythology

In 1923, Ameer Ali, in his *A Critical Examination of the Life and Teachings of Mohammad*, made some loose connections between the newly-formed Islam and Egyptian mythology, e.g. Osiris. [7]

In 2006, Natan Yoel, in his *Moon-o-theism*, citing Ali, cited Plutarch (c.110AD) as referring to Osiris as a moon god, then cites Budge:

> "Osiris-Aah, i.e. Osiris the moon god, appears in the form of a human-headed mummy, with a crescent-moon and full moon on his head. In his hands he holds symbols of stability, life, serenity, power and dominion."
>
> — Wallis Budge (1911), *Osiris and the Egyptian Resurrection, Volume One* (pg. 59)

Giving the following images:

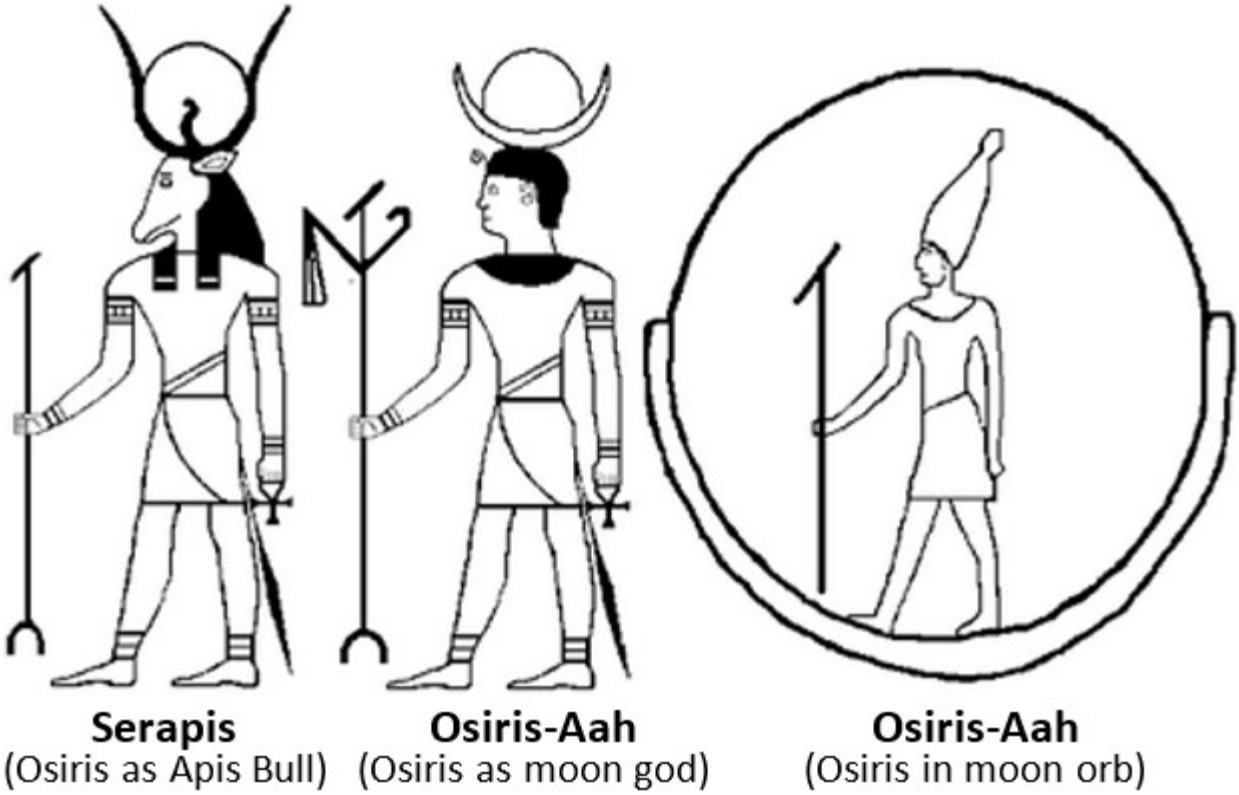

Yoel then concluded as follows:

> "Muhammad thought of Christian Trinity, not as 'father', 'son', and 'spirit', but as a triad of father Osiris, sun Horus, and mother Isis."
>
> — Yoel Natan (2006), *Moon-o-theism* (pg. 608)

In 2012, Brett Stortroen, in his *Mecca, Muhammad & the Moon-god: a Candid Investigation into the Origins of Islam*, argued that the Quran was constructed as follows:

> "Ancient Arabian folklore with its stone and astral cults, shamanism, various Judaic traditions, heretical sects within Christianity, and prevalent moon-god veneration, were all rolled together into a kind of salad religion, taking bits and pieces [from surrounding religions]."

(add)

Non-Existent?

> *See main: Muhammad never existed*

In 1239, Frederick II published a treatise that denied the divinity of Jesus, Moses, and Muhammad, declaring each of them imposters, but conducted experiments to test the truths of various religious models, e.g. that Adam and Eve were the first two humans (language deprivation experiments) and soul detection experiments.

In 1930, Soviet Marxist theoretician Liutsian I. Klimovich, in his lecture "Did Muhammad Exist?", argued the time gap between Muhammad's alleged lifetime and the first written sources was so huge that we cannot suppose that any of the information given in these sources is authentic; that nothing is known for sure about the historical Muhammad, and that

it is even likely that he never existed. Quite consequently, Klimovich assumed that the Koran was not Muhammad's work but the product of a whole group of authors. Muhammad was created by later historians as a myth, designed to explain the emergence of the Islamic community out of the Hanif movement. The prophet was an invention to cover up early Islam's character as a social protest movement. [4]

In 2003, Walter Williams, in his *The Historical Origin of Islam*, asserted that Muhammad is the brainchild of Arabian scholar Ibn Arabi (1165-1240) (Q) who was the main individual involved in the morphing and mythologizing (Q) of the making of the prophet Muhammad; he also shows that the the Koran is a mixture of Jewish literature, put together by Jewish scholars to include the Torah and the New Testament Gospels. [6]

In 2008, German jurist and former Islamic theologian Sven Kalisch, whose doctoral thesis (1997) was on "common sense and flexibility in Islamic legal methodology" (see also: Goethe's jurisprudence issues and student reactions), completed at the Faculty of Law and Economics at the Technical University of Darmstadt—a Protestant-to-Muslim convert (age 15) turned Muslim-to-nonbeliever convert (age 44)—made controversial headlines by stating, in an article entitled "Islamic Theology Without the Historic Muhammad: Comments on the Challenges of the Historical-Critical Method for Islamic Thinking", his researched opinion that Muhammad never existed; at the time, he was said to be in the middle of completing a book on this subject. [1]

In 2011, Hans Jansen, in his "The Historicity of Muhammad, Aisha and Who Knows Who Else", argued the position that Muhammad is a fictional character. [3]

In 2012, Robert Spencer,

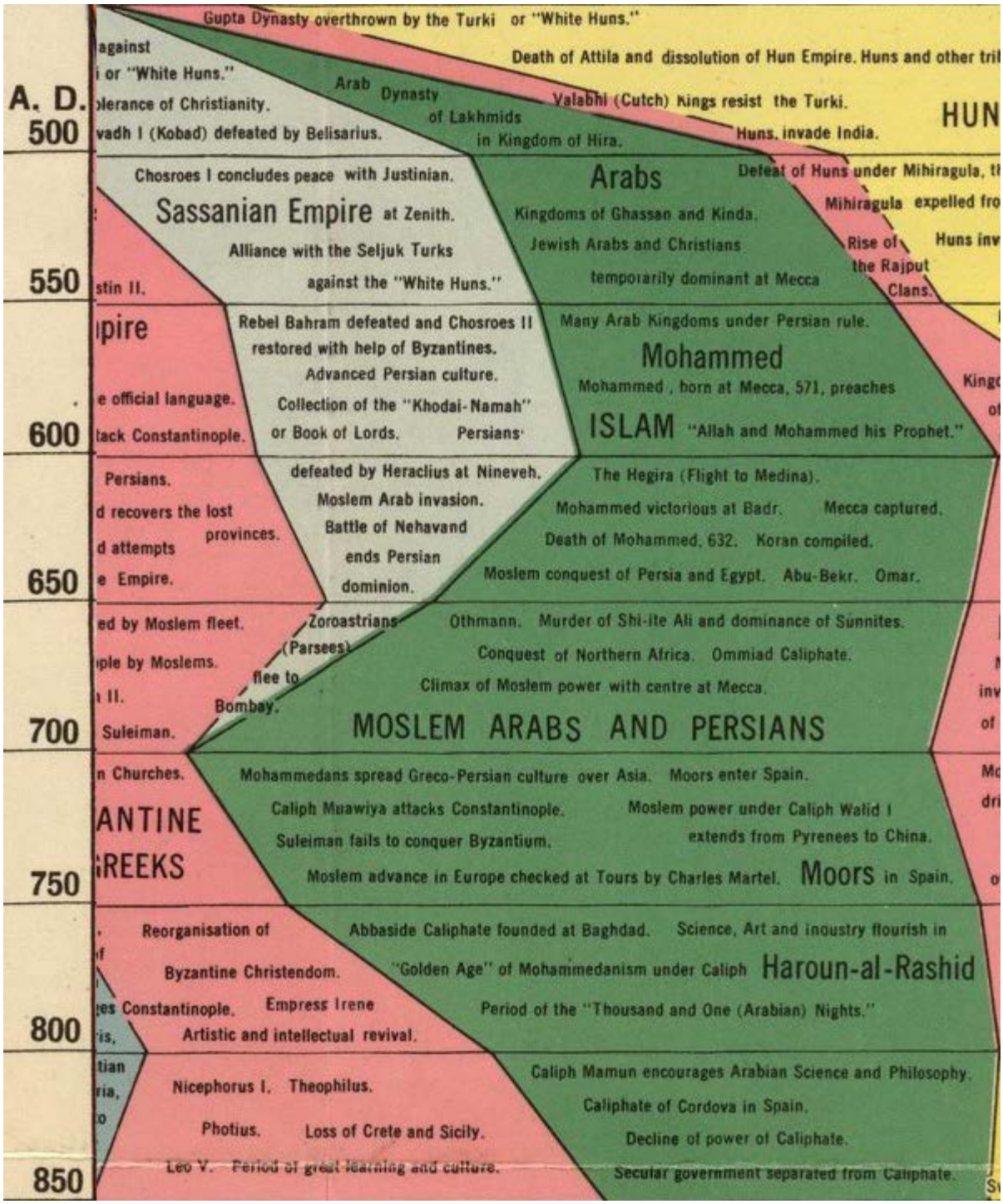

Above, a section from John Spark's histomap (1932), shows the rise and fall of "Arab power", from 450-850AD, during which time Islam was invented, similar to rise and fall of "Roman power", from 250BC-300AD, during which time Christianity was invented, which gives indication as to when the figure of Muhammad was invented

(c.750AD), similar to the way the character of Jesus was invented (c.200AD). [5] All world powers, in short, arise out of some form of heated "action" to explode into the form that they become in history; the legare or "glue" of the why of the action, therein, becomes and afterthought, and named the "religion" of the movement, albeit done after the peak of the power.

founder (Q) of JihadWatch.org (Q), in his *Did Muhammad Exist?: An Inquiry into Islam's Obscure Origins*, asserted, per reason that there is no mention of a person named "Muhammad" in Arab literature until 692, a full sixty years (Q) AFTER the purported death of Muhammad in 632, that what is Islamic revelation was an afterthought, a narrative created *after* the Arab conquests of the Near East, to give the new ruling elite an ideological pretext for power. [2]

Quotes

The following are noted quotes:

> "That Muhammad could predict certain events does not prove that he was a prophet: he may have been able to guess successfully, but this does not mean that he had real knowledge of the future. And certainly the fact that he was able to recount events from the past does not prove that he was a prophet, because he could have read about those events in the Bible and, if he was illiterate, he could still have had the Old Testament read to him."
>
> — Abu al-Warraq (c.860) [1]

> "Muhammad's own presuppositions and systems show that religious traditions are not trustworthy. The Jews and Christians say that Jesus really died, but the Quran [Surah 4:157] contradicts them."
>
> — Ibn al-Rawandi (c.870) (Q)

> "Frederick II, this pestilent king, a scorpion spitting out poison from the stinger of his tail, has notably and openly stated that—in his own words—the whole world has been fooled by three imposters, Jesus Christ, Moses, and **Muhammad**, two of whom died honorably, while Jesus himself died on the cross. Moreover, he has dared to affirm, or rather, he has fraudulently claimed, that all those who believe that a virgin could give birth to the god who created nature, and all the rest, were fools. And Fredrick has aggravated the heresy by this insane assertion, according to which no one can be born without having been conceived by the prior intercourse of a man and woman; he also claims that people ought to believe nothing that cannot be proven by the strength and reason of nature."
>
> — Pope Gregory IX (1239), address to monarchs

> "**Muhammad** probably never existed."
>
> — Sven Kalish (2008) (Q)

> "It may sound crazy but it is not as crazy as it sounds: a number of scholars consequently suspect that **Muhammad** is not a historical figure, but a literary character that was created by ancient Arab storytellers, perhaps early in the eighth century of our era."
>
> — Hans Jansen (2011), "The Historicity of Muhammad" [3]

References

1. (a) Kalisch, Sven. (2008). “Islamic Theology Without the Historic Muhammad: Comments on the Challenges of the Historical-Critical Method for Islamic Thinking”, (in German), Publication.
(b) Anon. (2008). “Excerpt: Muslim Academic Questions Muhammad’s Existence”, *The Wall Street Journal*, Nov. 15.
(c) Higgins, Andrew. (2008). “Professor Hired for Outreach to Muslims Delivers a Jolt” (Q), *The Wall Street Journal*, Nov. 15.
(e) Historicity of Muhammad – Wikipedia.
(f) Thims, Libb. (2011). *Purpose? (in a Godless universe)*. (94-pg manuscript) (unfinished); Online as 105-page unfinished manuscript (14 Apr 2013). IoHT publications.
(g) Sven Kalisch – WikiIslam.net.
(h) Sven Kalisch (German → English) – Wikipedia.
2. (a) Spencer, Robert. (2007). *The Truth About Muhammad* (Q). Publisher.
(b) Spencer, Robert. (2012). *Did Muhammad Exist?: An Inquiry into Islam's Obscure Origins* (foreword: Ibn Warraq). Open Road Media.
(c) Zmirack, John. (2012). “Amazon Review” (Q), Apr 9.
3. Jansen, Hans. (2011). “The Historicity of Muhammad, Aisha and Who Knows Who Else” (Q), Trykkefrihed.dk, May 16.
4. (a) Existence of Muhammad (section) – Wikipedia.
(b) Klimovich, Liutsian. (1931). “Did Mohammed exist? The debate in the Communist Academy in anti-religious section of the Institute 12/1930 CI philosophy. on the report of LI Klimovich” (“Sushchestvoval li Mokhammed? Diskussiia v Kommunisticheskoi akademii v antireligioznoi sektsii instituta filosofii 12/XI 1930g. po dokladu L.I. Klimovicha”), in: Voinstvuiushchii ateizm, No. 2-3, (1931), 189-218.
5. Sparks, John. (1932). “Histogram” (Q), Slate.com.
6. Williams, Walter. (2003). *The Historical Origin of Islam* (abs). Maathian Press.
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8. Natan, Yoel. (2006). *Moon-o-theism, Volume One of Two* (Osiris, 5+ pgs; quote, pg. 608). Publisher.
9. Stortroen, Brett. (2012). *Mecca, Muhammad & the Moon-god: a Candid Investigation into the Origins of Islam* (editor: Gene Beach) (Amz). Publisher.

External links

- Muhammad – Wikipedia.
- Muhammad (name) – Wikipedia.

θΔics

In religio-mythology, **Muhammad never existed** is the view, opinion, or reasoned belief that Muhammad (569-632 ACM / purported), the supposed-to-have-existed prophet or figurehead of Islam, said to have penned the Quran, never existed as a real person, but rather is a mythical character sold as an historical figure.

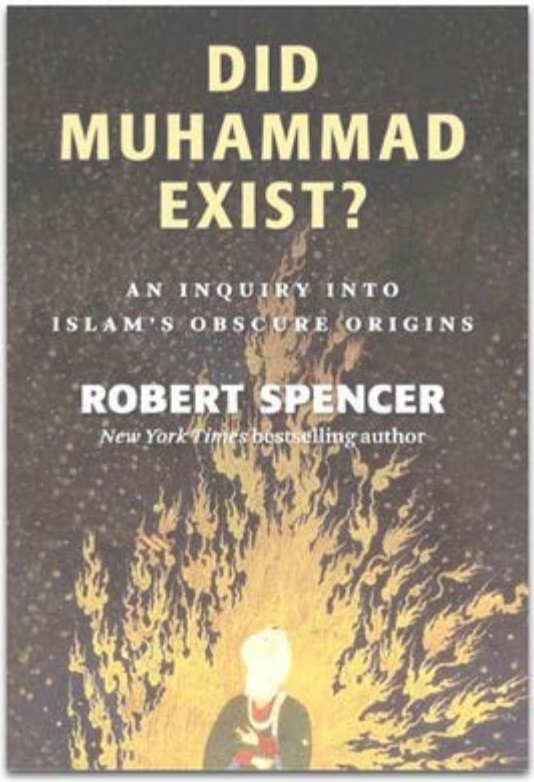

American Robert Spencer's 2012 *Did Muhammad Exist?*, in which he recounts how he unlearned his previously held 2007 belief that Muhammad was a real historical figure. [6]

Overview

In 1239, Frederick II published a treatise that denied the divinity of Jesus, Moses, and Muhammad, declaring each of them imposters.

In 1930, Soviet Marxist theoretician Liutsian I. Klimovich, in his lecture "Did Muhammad Exist?", argued the time gap between Muhammad's alleged lifetime and the first written sources was so huge that we cannot suppose that any of the information given in these sources is authentic; that nothing is known for sure about the historical Muhammad, and that it is even likely that he never existed. Quite consequently, Klimovich assumed that the Koran was not Muhammad's work but the product of a whole group of authors. Muhammad was created by later historians as a myth, designed to explain the emergence of the Islamic community out of the Hanif movement. The prophet was an invention to cover up early Islam's character as a social protest movement. [1]

In 2003, Walter Williams, in his *The Historical Origin of Islam*, asserted that Muhammad is the brainchild of Arabian scholar Ibn Arabi (1165-1240) (Q) who was the main individual involved in the morphing and mythologizing (Q) of the making of the prophet Muhammad; he also shows that the the Koran is a mixture of Jewish literature, put together by Jewish scholars to include the Torah and the New Testament Gospels. [2]

In 2007, Robert Spencer, founder of Jihad Watch (2003), author of *The Politically Incorrect Guide to Islam* (2005) and *The Truth About Muhammad: Founder of the World's Most Intolerant Religion* (2006), was at a conference with Ibn Warraq, author of *Why I Am Not a Muslim* (1995), during the course of which they whet for walk together, discussing Islam, during which time Warraq made the following comment:

> "**I don't think Muhammad ever existed at all**."
>
> — Ibn Warraq (2007), comment to Robert Spencer during walk [3]

Spencer, who at the time believed that Muhammad was a "real person", who actually existed as an historical figure, i.e. he believed Muhammad was a "false prophet", someone who sold his own opinions off to people as divine revelations, and Warraq engaged into debated on issue. Warraq's reasoning and answers paused Spencer into reflection. In the next five years, Spencer came to reevaluate his position:

> "Ibn Warraq is responsible for the fact that I no longer believe in Muhammad. **I no longer believe Muhammad existed as an historical figure**."
>
> — Robert Spencer (2013), "Interview with Ibn Warraq" [3]

In 2008, German jurist and former Islamic theologian Sven Kalisch, whose doctoral thesis (1997) was on "common sense and flexibility in Islamic legal methodology" (see also: Goethe's jurisprudence issues and student reactions),

completed at the Faculty of Law and Economics at the Technical University of Darmstadt—a Protestant-to-Muslim convert (age 15) turned Muslim-to-nonbeliever convert (age 44)—made controversial headlines by stating, in an article entitled "Islamic Theology Without the Historic Muhammad: Comments on the Challenges of the Historical-Critical Method for Islamic Thinking",

> "**Muhammad probably never existed**."
>
> — Sven Kalish (2008) (Q)

Kalisch's researched opinion is that Muhammad never existed; at the time, he was said to be in the middle of completing a book on this subject. [4]

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> "It may sound crazy but it is not as crazy as it sounds: a number of scholars consequently suspect that **Muhammad is not a historical figure, but a literary character** that was created by ancient Arab storytellers, perhaps early in the eighth century of our era."
>
> — Hans Jansen (2011), "The Historicity of Muhammad" [3]

In 2012, Robert Spencer, in his *Did Muhammad Exist?: An Inquiry into Islam's Obscure Origins*, asserted, per reason that there is no mention of a person named "Muhammad" in Arab literature until 692, a full sixty years (Q) AFTER the purported death of Muhammad in 632, that what is Islamic revelation was an afterthought, a narrative created *after* the Arab conquests of the Near East, to give the new ruling elite an ideological pretext for power. [6]

In 2013, Karl-Heinz Ohlig (1938-) (Q), in his "From Muhammad Jesus to Prophet of the Arabs", argued that the term "Muhammad" was not an actual person, but rather an epitaph, meaning "praised one", "promised one", or "god's servant", and agues that the four mentions of the name Muhammad in the Quran, do not justify the existence of an actual extant person, but rather one or more series of Muslim preachers who were selling an new reformed "Muhammad Jesus" figure as role model for a new Jewish-Christian upgraded religion, or something to this effect, in sort. [7]

Discussion

The general issue, to summarize this general Muhammad did not exist view, is that all of the main figures, characters, and prophets of Judaism, Christianity, and Islam, each of which progressively building on the other, are human character re-writes, aka "god reduction" morphs, of what were primarily original Egyptian mythological gods and stories, as the works of the 100+ religio-mythology scholars have shown, e.g. Noah is the god Nu (Noah never existed), Abraham is the god Ra (Abraham never existed), Sarah is the star Sirius, Virgin Mary is the goddess Isis, Jesus is the god Osiris (see: Jesus never existed), Joshua is the god Shu (see: Joshua 10:13), John the Baptist is the god Anubis, Joseph is the god Geb, and so on (see: Egyptian-to-Christian transliteration); hence, if the Islamic figure Muhammad claimed to have "spoken" to all of these so-called prophets, e.g. during his famous "night journey", then he too is a mythological figure, sold to people, over time, as a real person, as a way to found Islam on the historical religions, aka ancient mythologies.

See also

- Noah never existed
- Abraham never existed
- Sarah never existed
- Buddha never existed
- Moses never existed

● Jesus never existed

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Videos

● Spencer, Robert. (2015). “Did Muhammad Really Exist? No!” (Q), Keep it Real Israel, Nov 19.

θΔics

In sociological thermodynamics, a **Müller stability ratio** is the ratio of attraction-to-repulsion in a stable social aggregate. [1] The term is modeled on analogy to the Gottman stability ratio (5/1), in which stable long-term marriages have a 5-to-1 ratio of attraction to repulsion in the exchange force of their bond, but named after Venezuelan chemical engineer Erich Müller for his outline of the subject in the 1998 article "Human Societies: a Curious Application of Thermodynamics". [2]

See also

- Social bond
- Muller dispersion force

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(b) Thims, Libb. (2008). *The Human Molecule*, (preview), (pg. 46). Morrisville, NC: LuLu.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (§:Gottman stability ratios, pgs. 179-182). Morrisville, NC: LuLu.
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θΔics

In statistical thermodynamics, **multiplicity** *W*, from the German Wahrscheinlichkeit (war-shine-leash-kite), meaning probability, is the number of quantum states associated with one particular macroscopic thermodynamic state, defined typically by two state parameters, such as volume and energy, of a Boltzman-type system, containing a larger number of particles *N*, with non-correlated velocities. [1]

The symbol **W** in the Boltzmann formula engraved into the Boltzmann tombstone in the 1930s. [2]

In simpler terms, W is the number of different ways P particles can be distributed in a system composed of N different, but connected, compartments. [5]

To note, there is not a good English translation equivalent of the German word *Wahrscheinlichkeit*, wherein the direct translation is "probability", which does not seem to connote its original meaning as was was first developed in the form of an H theorem, in 1872, by Austrian physicist Ludwig Boltzmann; hence the W goes by variants including "multiplicity", "complexions" P, as well as "permutations" Ω, or "thermodynamic probability, depending on the discussion. The symbol W, as used in the engraved formula, seems to have introduced by Max Planck in 1901. [4]

Formulations

There are a number of similar but different formulas (and accompanying explanations) given for this "multiplicity", or probability, as it was called by Boltzmann, each of which seems to differ details, depending on the components of the system, e.g. atoms, molecules, bosons, etc. [1]

In 1969, American chemical engineer Linus Pauling gave the following expression for W:

$$W = \frac{n^N}{\prod_{j=1}^{\infty} N_j!}$$

where *n* refers to a molecular quantum state and where is $\prod$ product function, signifying the result of the product of N_j factorial, where *N* is a number of identical molecules, and N_j is the number of molecules in a set of *n* molecular quantum states with energy close to E_j. [1]

In 2003, Danish chemical-physicist John Avery gave the following expression for W: [6]

$$W = \frac{N!}{n_1! n_2! n_3! \ldots n_i! \ldots}$$

where *N* is a number of identical weakly-interacting systems and n_i is the number of the systems that occupy a particular state. [6]

In 1999, American physicist Ralph Baierlein gives the following definition of entropy:

$$S \equiv k \ln(multiplicity)$$

and defines the change in entropy ΔS = Sf – Si in a process, such as between the entropy of ice as compared to water, as being a function of the difference between the two multiplicities of the two states:

$$S = k\ln(multiplicity_f) - k\ln(multiplicity_i)$$

or

$$S = k\ln\frac{multiplicity_f}{multiplicity_i}$$

and then defines the *multiplicity* of a macrostate to be the number of microstates that corresponds to the microstate. He uses a four ball (labeled A, B, C, D) two bowl (L, R) example, and tabulates the possible unique arrangements, to conclude that the multiplicity, or the different ways in which one can apportion the four balls to the two bowls, is 16 (1 for all balls in L bowl; 4 for three balls in L bowl; 6 for two balls in each bowl; 4 for three balls in R bowl, and 1 for four balls in R bowl). Hence, a four particle, two-container system is said to have a multiplicity of sixteen. [7] It is difficult, however, to see how the number sixteen is arrived at using one of the above expressions for W?

Two-container/eight-particle example

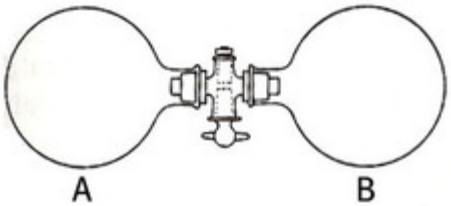

To go through a simple example, given by Belgian thermodynamicist Ilya Prigogine, suppose we have eight particles, N = 8, contained in a two-compartment system, such as two spherical gas bulbs connected via an open stopcock. The problem, then, is to find the probability of the various possible distributions of particles between the two compartments. There is, for instance, only way of placing the eight particles in a single half. If we assume the particles to be distinguishable, there are eight different ways of putting one particle in one half and seven in the other. Equal distribution of the eight distinguishable particles between the two halves can be done in:

$$\frac{8!}{4!4!} = 70$$

different ways. Prigogine, however, stops here and does not go on to calculate the total number of complexions or multiplicity for this system [5]

Orbital description

In molecular orbital theory, multiplicity is a quantity used in atomic spectra to describe the energy levels of man-electron atoms characterized by Russell-Saunders coupling given by 2S+1, where S is the total electron spin quantum number. The multiplicity of an energy level is indicated by a left superscript to the value of L, where L is the resultant electron orbital momentum of the individual electron orbital angular momenta l. [3]

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External links

- Wahrscheinlichkeit (German → English) – Wikipedia.

θΔics

In existographies, **Mumtaz Ahmed Ali Kazi** (1928-1999), aka "M.A. Kazi", was an Indian-born Pakistani organic chemist, noted for []

Beg

In 1953, Mirza Beg completed his BS in chemistry at D.J. College, Pakistan, where he studied, in some sense, under Kazi, or as Kazi later said "Beg was one time my student." [1]

In 1987, Kazi penned a three-page "Foreword by a Scientist" section to Beg's *New Dimensions in Sociology*. [1]

Education

In c.1950, Kazi completed his MS at D.J. College, Karachi, and in 1955 completed his PhD in organic chemistry at Kings College, London, after which he became a faculty member at the University of Sindh, Pakistan. From 1977 to 1990, Kazi was the president of the Chemical Society of Pakistan.

Quotes | By

The following are quotes by Kazi:

> "Man's observations of natural phenomena have fascinated him throughout the recorded history and have provided him a base for development of theoretical ideas. He has sought similarities occurring in two different systems, the social and the natural, and has attempted to derive corollaries in support of his theories. The interpretation of the atomic structure in terms of the solar system by Bohr the structure of benzene as a ring on the basis of a model of a snake with its tail in the mouth postulated by Kekule and the determination of density by the loss of weight of a body on its immersion in water, attempted by Archimedes are some such examples where the latter set of observations were superimposed on the former system to arrive at an acceptable solution of complex phenomena. The book *New Dimensions in Sociology*, *A Physico-Chemical Approach to Human Behaviour* by Mirza Beg is a new approach in which he has tried to **establish an interface between physico-chemical and social sciences**. It makes an interesting reading and provides a basis to quite a few socialization processes like assimilation, migration, mind-body split, etc."
>
> — Mumtaz Kazi (1987) "Forward by a Scientist" to Mirza Beg's *New Dimensions in Sociology* [1]

> "The author has suggested a universality of phenomena, the attraction and repulsive forces at atomic and molecular level, micro-cosmic and macro-cosmic level and among celestial bodies to be operative also among human beings which are an integral part of the universe and that similar forces should govern their interaction or behaviour."
>
> — Mumtaz Kazi (1987) "Forward by a Scientist" to Mirza Beg's *New Dimensions in Sociology* (pg. ii) [1]

> "The strength of a society is explained [by Beg] in terms of molecular association and dissociation for life seems to be ultimately molecular."
>
> — Mumtaz Kazi (1987) "Forward by a Scientist" to Mirza Beg's *New Dimensions in Sociology* (pg. iii) [1]

See also

- Ahmed Mumtaz
- Ahsan Siddiqui

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External links

- Mumtaz Ali Kazi – Wikipedia.
- Mumtaz Ali Kazi – WikiVisually.

θΔics

In thermodynamics, **Muriel Rukeyser** (1913-1980) was an American feminist poet noted for her detailed 1942 biography on American engineer Willard Gibbs. [1]

Gibbs | Poem

In the 1930s, Rukeyser became fascinated by Willard Gibbs, particularly inspired by his famous "mathematics is a language" quip; sometime therein she wrote a long poem about his life and work entitled "Gibbs", included in her collected works set *A Turning Wind* (1939), which is as follows: [2]

It was much later in his life he rose
in the professors' room, the frail bones rising
among that fume of mathematical meaning,
symbols, the language of symbols, literature . . . threw
air, simple life, in the dead lungs of their meeting,
said, "Mathematics is a language."
Withdrew. Into a silent world beyond New Haven,
the street-fights gone, the long youth of undergraduate
riots down Church Street, initiation violence,
secret societies gone : a broken-glass isolation,
bottles smashed flat, windows out, street-fronts broken : to quiet,
the little portico, wrought-iron and shutters' house.
A usable town, a usable tradition.
In our war or politics.

Not science.
Withdrew.
Civil War generates, but
Not here. Tutors Latin after his doctorate
when all of Yale is disappearing south.
There is no disorganization, for there is no passion.
Condense, he is thinking. Concentrate, restrict.
This is the state permits the whole to stand,
the whole which is simpler than any of its parts.
And the mortars fired, the tent-lines, lines of trains,
earthworks, breastworks of war, field-hospitals,

Whitman forever saying, "Identify."
Gibbs saying
"I wish to know systems."
To be in this work. Prepare an apocryphal
cool life in which nothing is not discovery
and all is given, levelly, after clearest
most disciplined research.

The German years
of voyage, calmer than Kant in Koenigsberg, to states
where laws are passed and truth's a daylight gift.
Return to a house inheriting Julia's keys,
sister receiving all the gifts of the world,
white papers on your desk.
Spiritual gift
she never took.

Books of discovery,
haunted by steam, ghost of the disembodied engine,
industrialists in their imperious designs
made flower an age to be driven far by this
serene impartial acumen.

Years of driving
his sister's coach in the city, knowing the
rose of direction loosing its petals down
atoms and galaxies. Diffusion's absolute.
Phases of matter! The shouldering horses pass
turnings (snow, water, steam) echoing plotted curves,
statues of diagrams, the forms of schemes
to stand white on a table, real as phase,
or as the mountainous summer curves when he
under New Hampshire lay while shouldering night
came down upon him then with all its stars.
Gearing that power-spire to the wide air.
Exacting symbols of rediscovered worlds.
Through evening New Haven drove. The yellow window
of Sloane Lab all night shone.
Shining an image whole, as a streak of brightness
bland on the quartz, light-blade on Iceland spar
doubled! and the refraction carrying fresh clews.
Withdrew.

It will be an age of experiment,
or mysticism, anyway vastest assumption.
He makes no experiments. Impregnable retires.
Anyone having these desires will make these researches.
Laws are the gifts of their systems, and the man
in constant tension of experience drives
moments of coexistence into light.
It is the constitution of matter I must touch.
Deduction from deduction : entropy,
heat flowing down a gradient of nature,
perpetual glacier driving down the side
of the known world in an equilibrium tending
to uniformity, the single dream.

He binds
himself to know the public life of systems.
Look through the wounds of law
at the composite face of the world.
If Scott had known,
he would not die at the Pole, he would have been
saved, and again saved—here, gifts from overseas,
and grapes in January past Faustus' grasp.
Austerity, continence, veracity, the full truth flowing
not out from the beginning and the base,
but from accords of components whose end is truth.
Thought resting on these laws enough becomes
an image of the world, restraint among

breaks manacles, breaks the known life before
Gibbs' pale and steady eyes.
He knew the composite
many-dimensioned spirit, the phases of its face,
found the tremendous level of the world,
Energy : Constant, but entropy, the spending,
tends toward a maximum—a "mixed-up-ness,"
and in this end of levels to which we drive
in isolation, to which all systems tend,
Withdraw, he said clearly.
The soul says to the self : I will withdraw,
the self saying to the soul : I will withdraw,
and soon they are asleep together
spiralling through one dream.
Withdrew, but in
his eager imperfect timidities, rose and dared
sever waterspouts, bring the great changing world
time makes more random, into its unity.

Biography | 1942

In 1942, Rukeyser published a followup book-length biography (*Willard Gibbs*, 1942). [2] According to Rukeyser, in her 1949 *Physics Today* article on Gibbs: [3]

> "Willard Gibbs is the type of the imagination at work in the world. His story is that of an opening up which has had its effect on our lives and our thinking; and, it seems to me, it is the emblem of the naked imagination—which is called abstract and impractical, but whose discoveries can be used by anyone who is interested, in whatever "field"—an imagination which for me, more than that of any other figure in American thought, any poet, or political, or religious figure, stands for imagination at its essential points."

Gibbs's nephew, Ralph Gibbs Van Name, a professor of physical chemistry at Yale, was unhappy with Rukeyser's biography, in part because of her lack of scientific training. Van Name had withheld the family papers from her and, after her book was published in 1942 to positive literary but mixed scientific reviews, he tried to encourage Gibbs's former students to produce a new and more technically oriented biography. [4] With his support, Lynde Wheeler published such a work in 1951. [5]

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External links

â— Muriel Rukeyser – Wikipedia.

θΔics

In folklore, **Murphy's law** is the adage "everything that can go wrong will go wrong", a famous phrase that originated in the 1940s at Edwards Air Force base, California, during the testing of rocket sleds, and named after a Captain Ed Murphy, a development engineer, and his frustration with a repetitive wiring malfunctions. [1]

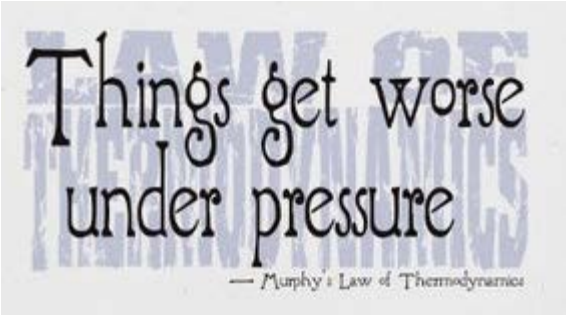

T-Shirt of **Murphy's law of thermodynamics**: things get worse under pressure (1978). [4]

Thermodynamics

In the style of thermodynamics humor, Murphy's law came to be referred to as the fourth law of thermodynamics in the 1952 book *The Making of a Scientist* by Anne Roe. The following are the mentioned excepts:

> "There were a number of particularly delightful incidents. There is, for example, the physicist who introduced me to one of my favorite 'laws,' which he described as '**Murphy's law** or the fourth law of thermodynamics' (actually there were only three last I heard) which states: 'If anything can go wrong it will.'"

In other places in the book, Roe states: "It was while working on this part of the study that I ran into the perfect exemplification of 'Murphy's law' at one university, where everything that could go wrong did!" or "Certainly this was Murphy's law in operation,--but I will never be the same again."

Sometime after 1952, it seems, Murphy's law became euphemistically associated with entropy and the second law. [3] One can find T-shirts and posters, for example, stating a Murphy's law of thermodynamics: "things get worse under pressure."

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External links

- Murphy's law – Wikipedia.

θΔics

In genius studies, **Murray 4000** (Murray 4000:#|#) refers to collection of the biggest 4,139 names (compare: Cattell 1000), based on citation dominance, from a meta-analysis of world literature in arts and sciences, of individuals who existed between 800 BC to 1950, as compiled by American intelligence scholar and political scientist Charles Murray (2003) (Q); from this list, Murray ranked the top 20 names in 21 fields, namely: combined sciences (CS), astronomy (A), biology (chnopsology) (B), chemistry (C), earth sciences (ES), physics (P), mathematics (M), medicine (Med), technology (T), Chinese philosophy (CP), Indian philosophy (IP), western philosophy (WP), western music (WM), Chinese painting (CArt), Japanese art (JA), western art (WA), Arabic literature (AL, Chinese literature (CL), Indian literature (IL), Japanese literature (JL), and western literature (WL). Note: the shorthand "(Murray 4000:#|acronym)" indicates a person's top 20 listing in a category of the Murray 4000, e.g. William Harvey (Murray 4000:7|B), indicates that Harvey is 7th ranked in top 20 biology (chnopsology) names.

Overview

In 2003, Charles Murray, in his *Human Accomplishment: the Pursuit of Excellence in the Arts and Sciences, 800 BC to 1950*, a Cattell 1000 like compendium, published the result of his name dominance research of a number of multi-cultural reputable existographical dictionaries, histories, and surveys of the arts, philosophy, and sciences, from which he compiled a list of 4,139 most-cited names, between 800BC and 1950, and therefrom derived a listing of top 20 names from each of the following 21 respective fields; some of which are listed below, the big check ✓ mark indicated all members of group have been added to the top 1000 geniuses rankings; the small check mark indicates that their IQ:#|# has been assigned and their Murray 4000 ranking is in both top 1000 rankings and their article; the small box □ symbol, means their IQ:#|# has not been slated:

Combined sciences ✓

1. Isaac Newton
2. Galileo Galilei
3. Aristotle
4. Johannes Kepler
5. Antoine Lavoisier
6. Rene Descartes
7. Christiaan Huygens
8. Pierre Laplace
9. Albert Einstein
10. Michael Faraday
11. Louis Pasteur
12. Ptolemy
13. Robert Hooke
14. Gottfried Leibniz
15. Ernest Rutherford
16. Leonhard Euler
17. Charles Darwin
18. Jacob Berzelius
19. Euclid
20. James Maxwell

Chemistry

1. Antoine Lavoisier
2. Jacob Berzelius
3. Carl Scheele
4. Joseph Priestley
5. Humphry Davy
6. Robert Boyle
7. John Dalton
8. Joseph Gay-Lussac □
9. Joseph Black
10. William Ramsay □
11. Justus Liebig
12. William Crookes
13. Claude Berthollet □
14. Linus Pauling
15. August Kekule
16. Dmitri Mendeleyev
17. Johann Helmont
18. Frederick Soddy □
19. Martin Klaproth
20. Robert Bunsen

Physics

1. Isaac Newton
2. Albert Einstein
3. Ernest Rutherford
4. Michael Faraday
5. Galileo
6. Henry Cavendish
7. Niels Bohr
8. Joseph Thomson
9. James Maxwell
10. Pierre Curie
11. Gustav Kirchhoff
12. Enrico Fermi
13. Werner Heisenberg
14. Marie Curie
15. Paul Dirac
16. James Joule
17. Christiaan Huygens
18. William Gilbert
19. Thomas Young
20. Robert Hooke

Astronomy

1. Galileo
2. Johannes Kepler
3. William Herschel
4. Pierre Laplace
5. Nicolaus Copernicus
6. Ptolemy
7. Tycho Brahe
8. Edmond Halley
9. Giovanni Cassini
10. Hipparchus
11. Walter Baade
12. Edwin Hubble
13. Friedrich Bessel
14. William Huggins
15. George Ellery Hale
16. Arthur Eddington
17. Ejnar Hertzsprung
18. Heinrich Olbers
19. Gerard Kuiper
20. Johannes Hevelius

Mathematics

1. Leonhard Euler
2. Isaac Newton
3. Euclid
4. Carl Gauss
5. Pierre Fermat
6. Gottfried Leibniz
7. Rene Descartes
8. Georg Cantor
9. Blaise Pascal
10. Bernhard Riemann
11. David Hilbert
12. Jacob Bernoulli
13. Diophantus
14. Gerolamo Cardano
15. François Viète
16. Adrien Legendre
17. John Wallis
18. Augustin Cauchy
19. Fibonacci
20. Archimedes

Technology

Medicine

Biology/Chnopsology

Earth Sciences

1. Charles Lyell

1. James Watt
2. Thomas Edison
3. Leonardo da Vinci
4. Christiaan Huygens
5. Archimedes
6. Guglielmo Marconi
7. Vitruvius
8. John Smeaton
9. Henry Bessemer
10. Thomas Newcomen
11. Charles Babbage
12. Carl Siemens
13. John Wilkinson
14. Benjamin Franklin
15. Charles Wheatstone
16. Alfred Nobel
17. Michael Faraday
18. Denis Papin
19. George Stephenson
20. Samuel Morse

1. Louis Pasteur
2. Hippocrates
3. Robert Koch
4. Galen
5. Paracelsus
6. Paul Ehrlich
7. Rene Laennec
8. Elmer McCollum
9. Alexander Fleming
10. Ambroise Pare
11. Emil von Behring
12. Joseph Lister
13. Kitasato Shibasaburo
14. Thomas Sydenham
15. Andreas Vesalius
16. Gerhard Domagk
17. Alexis Carrel
18. Sigmund Freud
19. John Hunter
20. Ignaz Semmelweis

1. Charles Darwin
2. Aristotle
3. Jean Lamarck
4. Georges Cuvier
5. Thomas Morgan
6. Carl Linnaeus
7. William Harvey
8. Theodor Schwann
9. Stephen Hales
10. Jan Swammerdam
11. Marcello Malpighi
12. Claude Bernard
13. Hugo de Vries
14. Karl Ernst von Baer
15. John Ray
16. Ernst Haeckel
17. Lazzaro Spallanzani
18. Gregor Mendel
19. Pliny the Elder
20. Albrecht Haller

2. James Hutton
3. William Smith
4. Georgius Agricola
5. Abraham Werner
6. Roderick Murchison
7. Matthew Maury
8. Louis Agassiz
9. Jean Guettard
10. Carl Mosander
11. Horace Saussure
12. Nicolas Desmarest
13. Alfred Wegener
14. Alexandre Brongniart
15. Adam Sedgwick
16. Thomas Chamberlin
17. Vihelm Bjerknes
18. Eilhard Mitscherlich
19. Per Cleve
20. Maurice Ewing

Chinese philosophy

1. Confucius
2. Laozi
3. Zhu Xi
4. Mencius
5. Zhuang Zhou
6. Xun Kuang
7. Wang Yangming
8. Mozi
9. Dong Zhongshu
10. Cheng Hao
11. Chengi
12. Feng Youlan
13. Zhou Dunyi
14. Kang Youwei
15. Dai Zhen
16. Han Fei
17. Zou Yan
18. Lu Jiuyuan
19. Zhang Zai
20. Huineng

Western art

Western philosophy ✓

1. Aristotle
2. Plato

Western literature

1. William Shakespeare

Western music

1. Ludwig Beethoven
2. Wolfgang Mozart

1. Michelangelo
2. Pablo Picasso
3. Raphael
4. Leonardo da Vinci
5. Titian
6. Albrecht Durer
7. Rembrandt
8. Giotto
9. Gian Bernini
10. Paul Cezanne
11. Peter Rubens
12. Caravaggio
13. Diego Velazquez
14. Donatello
15. Jan van Eyck
16. Francisco Goya
17. Claude Monet
18. Masaccio
18. Vincent van Gogh
19. Paul Gauguin

3. Immanuel Kant
4. Rene Descartes
5. Georg Hegel
6. Thomas Aquinas
7. John Locke
8. David Hume
9. Augustine
10. Benedict Spinoza
11. Gottfried Leibniz
12. Socrates
13. Arthur Schopenhauer
14. George Berkeley
15. Friedrich Nietzsche
16. Thomas Hobbes
17. Bertrand Russell
18. Jean-Jacques Rousseau
19. Plotinus
20. Johann Fichte

2. Johann Goethe
3. Dante Alighieri
4. Virgil
5. Homer
6. Jean-Jacques Rousseau
7. Voltaire
8. Moliere
9. Lord Byron
10. Leo Tolstoy
11. Fyodor Dostoyevsky
12. Petrarch
13. Victor Hugo
14. Friedrich Schiller
15. Giovanni Boccaccio
16. Horace
17. Euripides
18. Jean Racine
19. Walter Scott
20. Henrik Ibsen

3. Johann Bach
4. Richard Wagner
5. Joseph Haydn
6. Georg Handel
7. Igor Stravinsky
8. Claude Debussy
9. Franz Liszt
10. Franz Schubert
11. Robert Schumann
12. Hector Berlioz
13. Arnold Schoenberg
14. Johannes Brahms
15. Frederic Chopin
16. Claudio Monteverdi
17. Giuseppe Verdi
18. Felix Mendelssohn
19. Carl Maria von Weber
20. Christoph Gluck

(add)

Quotes

The following are related quotes:

> "Murray scanned the most reputable biographical dictionaries and histories of the arts, philosophy, and sciences to find who and what, during 800 B.C.-1950, are mentioned in them. He came up with 4,139 persons and a list of events and ponders 20 persons in each of nine scientific, three philosophic, and nine artistic fields who were most extensively covered in the resources."
>
> — Anon (2003), *American Library Association*

References

1. Murray, Charles. (2003). *Human Accomplishment: the Pursuit of Excellence in the Arts and Sciences, 800 BC to 1950*. Harper Collins.

External links

- Human Accomplishment – Wikipedia.

θΔics

In existographies, **Murray Gell-Mann** (1929-2019) (IQ:#|#) (Simmons 100:45) (CR:22) was an American physicist, a semi-ranked greatest physicist ever, a 2014 SPE (#3|25), known generally for the eight-fold way classification of particle physics, understood by a new field of physics he called "quantum chromodynamics", in parallel to quantum electrodynamics, noted for his coining of "quantum flapdoodle" for people who used quantum mechanics incorrectly to argue for nonsense. [1]

Eight-fold way

In Dec 1960, Gell-Mann, following a conversation with mathematician Richard Block, about Lie group theory, saw that elementary particles could be ordered into a scheme he called the "eight-fold way", akin to Dmitri Mendeleyev and the periodic table, for the chemical elements.

Education

At age 7, Gell-Mann taught himself calculus (see: prodigies and calculus).

At age 10, Gell-Mann read James Joyce's notoriously obscure masterpiece *Finnegan's Wake* (Q); and in 1963 naming the "quark", the fundamental constituents of the nucleon (protons and neutrons), after a passage in the book.

In 1948, Gell-Mann, aged 19, was accepted into the graduate program of MIT and Harvard, but was seriously contemplating suicide (Q), because he was turned down by Yale and Princeton, and considered MIT to be kind of "grubby"; in the end, he decided that he could try MIT and then commit suicide after, if it didn't work out.

Sante Fe Institute

In 1980s, Gell-Mann, bored with physics, having done, in his mind, his share of ground-breaking work, decided to venture into complexity theory, animals, and communication, and therein founded the Santa Fe Institute; this is summarized as follows:

> "In 1980, just after Murray had turned 50, Margaret was diagnosed with cancer, and she died the following year. He became depressed: he had already won the Nobel prize and most other prizes and honors in physics, so he now turned to new fields to conquer. From his childhood onwards he had been interested in birds, nature and sustainability. He had long wanted to apply the mathematical principles of theoretical physics to other fields, especially those that dealt with biological phenomena. He was fascinated by language and its origins. Murray thought that future scientific development would involve the study of really complex phenomena: physics was not simple, but the origins of language or cognitive development were of a different order of complexity. With his wealth of contacts, he set about obtaining funds for the Santa Fe Institute, situated in the hills overlooking Santa Fe, which would study such problems. He left Caltech for the Santa Fe Institute in 1993 and settled in the city."
>
> — Norman Dombey (2019), "Murray Gell-Mann Obituary" [2]

(add)

Life | Emergence + Accidents?

In 2007, Gell-Mann, in his TED talk "Beauty and Truth in Physics", told people that he believed that life was the result of emergent properties plus lots of accidents:

> "We don't have to assume these principles as separate metaphysical postulates. They follow from the fundamental theory. They are what we call 'emergent properties.' You don't need something more to get something more. That's what emergence means. **Life can emerge from physics and chemistry, plus a lot**

of accidents. The human mind can arise from neurobiology, and a lot of accidents. The way the chemical bond arises from physics and certain accidents. Doesn't diminish the importance of these subjects, to know that they follow from more fundamental things, plus accidents. That's a general rule, and it's critically important to realize that. You don't need something more in order to get something more. People keep asking that when they read my book, *The Quark and the Jaguar*, and they say 'isn't there something more beyond what you have there?' Presumably they mean something supernatural. Anyway, there isn't. (laughs) You don't need something more to explain something more."

— Murray Gell-Mann (2007), "Beauty and Truth in Physics" (Q), TED talk, Mar

Here, we see Gell-Mann repeating the term "accident" (4 times) and "emergence" (3 times), which belies deep ignorance, in respect to subject matter.

Quotes | On

The following are Gell-Mann related quotes:

"I wonder what IQs some of the following would have: Edward Witten [1951-], **Murray Gell-Mann**, Richard Garwin [1928-], Marvin Minsky [1927-], Grigori Perelman [1966-], Saul Kripke [1940-], and Erik Demaine [1981-]. From years past who are no longer alive I would have likes to know what Kurt Godel's or Herbert Simon (one of the founders of AI as well as having a Nobel Prize in economics as well as the Turing award which can be thought of as the equivalent award for computer science), Gauss, Euler and many more listed already on this page but only as estimates."

— Anon (2010), IQ: 200+ thread post (Feb 20), made from Newberg, Oregon

"Any listing of the 30+ smartest people ever without **Murray Gell-Mann** and John von Neumann is dubious at best."

— tpsmith800 (2011), forum post at "IQ 200+ | Smartest person ever (4 of 4)" video

"Here's my personal list for the title of greatest American physicist in history, in no particular order: Joseph Henry, Willard Gibbs, Albert Michelson, Robert Millikan, Robert Oppenheimer, Richard Feynman, **Murray Gell-Mann**, Julian Schwinger, Ernest Lawrence, Edward Witten [1951-], John Bardeen, John Slater, John Wheeler and Steven Weinberg. This list pales in comparison with an equivalent list of European physicists which would include names like Einstein, Dirac, Rutherford, Bohr, Pauli and Heisenberg; and this is just if we include twentieth-century physicists."

— Ashutosh Jogalekar (2013), "Who's the Greatest American Physicist in History" (Q)

Gell-Mann and Richard Feynman, during interactions of which Gell-Mann reported to have observed the Feynman problem solving algorithm.

Quotes | By

The following are noted quotes:

> “Modern physics is governed by that magnificent and thoroughly confusing discipline called quantum mechanics that has survived all tests, is believed to be flawless, but one that nobody understands.”
>
> — Murray Gell-Mann (1990), “Some Truer Method: Reflections on the Heritage of newton (pg. 51)

References

1. Gell-Mann, Murray. (1994). *The Quark and the Jaguar: Adventures in the Simple and the Complex* (pg. 167-). Owl Book.
2. Dombey, Norman. (2019). “Murray Gell-Mann Obituary: On of the Leading Particle Physicists of the 20th Century” (Q), The Guardian, Jun 2.

Further reading

- Johnson, George. (2000). “The Jaguar and the Fox” (Q), The Atlantic, Jul.

External links

- Murray Gell-Mann – Wikipedia.

θΔics

In human chemistry, **music chemistry** defines the large number of musical songs that have been written or themed on variations of felt or uncontrollable chemistry between people, especially those effects having to do with love. One example is a BMI publishing firm called "Chemistry Music" started in 1961 by American singer, songwriter, and record producer Al Hazan, named after the first song he published, which was entitled "The Chemistry of Love." [1] Other examples are shown below:

Left: the 1962 song (V) "The Chemistry of Love" written by Al Hazan. Right: the 2007 song "Chemistry" by Swedish pop singer Velvet.

Classics

In 1959, "Love Potion No. 9" by Jerry Leiber and Mike Stoller, originally performed by The Clovers that year. The song has since been covered by numerous artists, including the well-known version by the The Searchers (1963)

The 1962 two-minute and thirteen-second song "The Chemistry of Love", written by Al Hazan and Annette Tucker, was recorded by Crystalette Records and sung (hear song) by Tony Caro with Jimmy Haskell and his Orchestra. The formula for the chemistry of love, according to this song, is:

1. Start with the heart of a girl.
2. Mix with the heart of a boy.
3. Add a little moonlight from above.
4. That's the Chemistry of Love.

(add discussion)

Velvet | Chemisttry

The 2007 single "Chemistry" (O), released in August, is a popular club hit by Swedish pop singer Velvet:

> I feel the ***chemistry***
> Between you and me
> There's **electricity**
> when you're touching me
> I feel the chemistry
> feel the **biogravity**
> I want you touching me
> I feel you touching me
>
> Na nanana na nanana (2x) ... It's the perfect night - To go out and do it right - One look into your eyes - Sets

> the emotion - Don't need **psychology** - With this **biology** - officialty is ever **flowing** - All I really wanna do is feel **love** - Get into the rhythm of the two of us - wanna feel your love can't get enough - together. [[... Chorus ...]]:
>
> The way my body acts - When your body moves like that - It's science in control - And we're defenceless - It's in the D.N.A. - that we feel this way - So let the music play - With least attention. [[... break ...]] All I really wanna do is feel love - Get into the rhythm of the two of us - wanna feel your love can't get enough - together. [[... *Chorus:* repeats ...]] I feel you touching me - Chemistry - I want you touching me - Chemistry - I feel you touching me - Na nanana na nanana na nanana (5x).

Interesting that, in respect to interpersonal attraction, modern singers, in their talk of “biogravity”, are somewhere floating between Isaac Newton’s 1686 universal law of gravitation, Charles Coulomb’s 1717 law of electrostatic attraction (see: Coulomb’s law), and William Warntz’s 1964 social gravitation models?

Other

The 2001 song "All About Chemistry" describes how a guy found out about chemistry when he was young and soon began to conduct good-intentioned experiments witha certain fine girl, but soon found that when the two of them were mixed together, they had a bad tendency to explode. The adjacent video is a clip about brooke and chase set to the sound of semsonic's chemistry.

The 2002 song "Just Like a Pill" describes a relationship as being like a drug. Specifically, the song describes the effects of being sickly attached to a partner, in a ambivalent or deteriorating relationship, such that, according to the hook: "your're just like a pill, stead of makin' me better, you keep makin' me ill".

Other songs that utilize a metaphor-like chemical theory in lyrics include:

● 2008 dance song: “Every Word” (Wendel kos edit), Artist: Ercola featuring Daniella, Key verse (at time 2:00):
“Something about our love is like a chemical,
If we don’t do it right, I think it might explode”

● 1996 Song: “One in a Million”, Artist: Aliyah, Key Verse (at time 0:50):
"Baby you don’t know what you do to me,
Between me an you, I feel the chemistry.”

Another song is the 1995 song "Chemistry" by Jawbreaker, where the key verse is "corner me in chemistry", in which the singer doesn't seem to have chemistry with a girl two grades below him. [2]

See also

● Music thermodynamics

References

1. Chemistry Music - Al Hazan.
2. Chemistry (lyrics) - 1995 song by Jawbreaker, *LyricsFreak.com*.

External links

● Chemistry Music | Playlist (14+ songs) – HumanChemistry101, YouTube.

θΔics

In

A basic thermodynamics word cloud (O) with music affixed, giving a thematic to songs indicative of **music thermodynamics**.

human thermodynamics, **music thermodynamics** is the use of thermodynamic terminology or theory in song writing and singing.

Thermal word themed

The following are songs that employ a significant amount of thermal word terminology to convey their message and or meaning:

- She Made My Blood Run Cold | Clayton Love with Ike Turner's Kings of Rhythm (1957) (L)
- One More Try | George Michael (1988)
- November Rain | Guns n Roses (1992)
- Angel | Sarah McLachlan (1997)
- Hot n Cold | Katy Perry (2008)
- Firefly | Paul Oakenfold | ft. Matt Goss (2010) (V)

Overview

In 1963, Flanders and Swann performed and recorded, at the Haymarket Theatre, London, their now-famous and classic *The First and Second Law*. [1]

In 1975, Wayne Smith, in his article "Thermodynamics, Folk Culture, and Poetry", discussed the principles of the first, second, and third laws of thermodynamics in songs and poems. [4]

In 1999, the rapper MC Hawking, a play on Stephen Hawking, produced the very-humorous, thermodynamics-themed rap-parody song *Entropy* themed on entropy. [2]

In 2005, the punk rock group Bad Religion released a 2:24-min song entitled “Entropy” that mentions Austrian physicist Ludwig Boltzmann. [3] The lyrics are:

> random blobs of power expressed as that which we all disregard,
> ordered states of nature on a scale that no one thinks about,
> don't speak to me of anarchy or peace or calm revolt,
> man, we're in a play of slow decay orchestrated by Boltzmann,
>
> it's entropy, it's not a human issue,
> entropy, it's a matter of course,
> entropy, energy at all levels,
> entropy, from it you can not divorce
> and your pathetic moans of suffrage tend to lose all significance,

extinction, degradation;
the natural outcomes of our ordered lives,
power, motivation; temporary fixtures for which we strive,
something in our synapses assures us we're ok
but in our disquilibrium we simply can not stay,
it's entropy.....

a stolid proposition from a man unkempt as I,
my affectatious nature I can not rectify,
but we are out of equilibrium unnaturally,
a pang of consciousness of death
and then you will agree

In 2005, with the invention of YouTube, a number of thermodynamics-themed physics-project videos can often be found where students sing or rap about energy, entropy, and the laws of thermodynamics; some of which are listed below:

- Thermodynamics | Ladam, Deepti, and Radhika (2007) (V)
- Thermodynamics of Love | David Ng (2009) (V)

(add discussion)

See also

- Music chemistry

References

1. "The First and Second Law" (song six) in the 1964 album *At the Drop of Another Hat* by Flanders and Swann.
2. "Entropy" (song five) in the 2004 album *MC Hawking's Greatist Hits - a Brief History of Rhyme* by MC Hawking.
3. (a) Bad Religion (2005). "Entropy", Amazon.com.
(b) Entropy (lyrics) – Sing365.com.
4. Smith, Wayne L. (1975). "Thermodynamics, Folk Culture, and Poetry" (abs), *J. Chem. Educ.* 52(2): 97.

θΔics

In science, **mutation** is a modification of a segment of the genome or DNA of an organism.

Chance | Determinism

Of note, mutation in colloquial knowledge, is believed to be blind, random, chance-based, and or accidental; oft-conceptualized as “mistakes”. This, however, is a mistaken view; an issue first broached by Schoffeniels:

> “Spontaneous ‘**mutations**’, according to Monad, are regulated by the laws of chance, that is to say, those of large numbers. Now this statement appears to me questionable. Whatever the interpretation, ‘chance’ does not seem to be concerned save if we wish to mask our ignorance for the time being.”
> — Ernest Schoffeniels (1973), *Anti-Chance* (pg. 45) [1]

All "spontaneous" changes in atomic structures of DNA are governed by the spontaneity criterion, which is deterministic, and not chance based. This confusion tends to be one of the barriers in the ongoing science vs religion debates and tensions.

Quotes

The following are related quotes:

> “Science says that a series of genetic mistakes, genetic **mutations** led to the great complexity of our world.”
>
> — Shmuley Boteach (2009), La Ciudad de las Ideas Re-evolution (vid | 3:58)

References

1. Schoffeniels, Ernest. (1973). *Anti-Chance: a Reply to Monod’s Chance and Necessity* (*L’Anti-Hasard*) (Amz) (translator: B.L. Reid) (pg. 20-21). Pergamon, 1976.

External links

â— Mutation – Wikipedia.

θΔics

In thermodynamics, **Myron T. Tribus** (1921-) is an American engineer and thermodynamicist, associated with the MIT school and co-founder of the MaxEnt school of thermodynamics, note for the coining of the term "thermoeconomics" (1962)—albeit in the context of the economic considerations for converting sea water into fresh water—for his work in thermostatics, and for his studies in information theory thermodynamics.

Education

In 1941, Tribus, as an undergraduate chemistry student, learned thermodynamics and statistical mechanics from Canadian-born American chemist William Giauque, of the Lewis school of thermodynamics. [1] Tribus completed his PhD in 1948 from UCLA soon thereafter began teaching courses on thermodynamics, fluid mechanics, and heat transfer at UCLA.

Clausius entropy vs Shannon entropy?

In 1948, when Tribus was examined for his doctoral degree, at UCLA, he was asked to explain the connection between entropy defined by Claude Shannon, i.e. Shannon entropy (1948), and the entropy defined by Rudolf Clausius, i.e. Clausius entropy (1965). In fifty-years retrospect, in 1998, Tribus comment on this question that:

> "Neither I nor my committee knew the answer. I was not at all satisfied with the answer I gave. That was in 1948 and I continued to fret about it for the next ten years. I read everything I could find that promised to explain the connection between the entropy of Clausius and the entropy of Shannon. I got nowhere. I felt in my bones there had to be a connection; I couldn't see it."

Tribus goes on to state that one day in 1958 a student of his named Zyssimo Typaldos (c.1930-c.1995) replied to his question about the connection between Shannon and Clausius by saying: "Oh, that's already been solved." Typalodos referred Tribus to American physicist Edwin Jaynes' his two part 1957 paper "Information Theory and Statistical Thermodynamics" in which Jaynes attempts to derive a statistical thermodynamics interpretation of information theory. [2] Tribus obtained a copy the next day. He comments:

> "Here was my Rosetta Stone! I went home and worked with that paper for a week, almost without sleep. All of my studies for a decade suddenly fell in place. A straight forward connection between Shannon's entropy and the entropy of Clausius poured into the paper, almost without my hand."

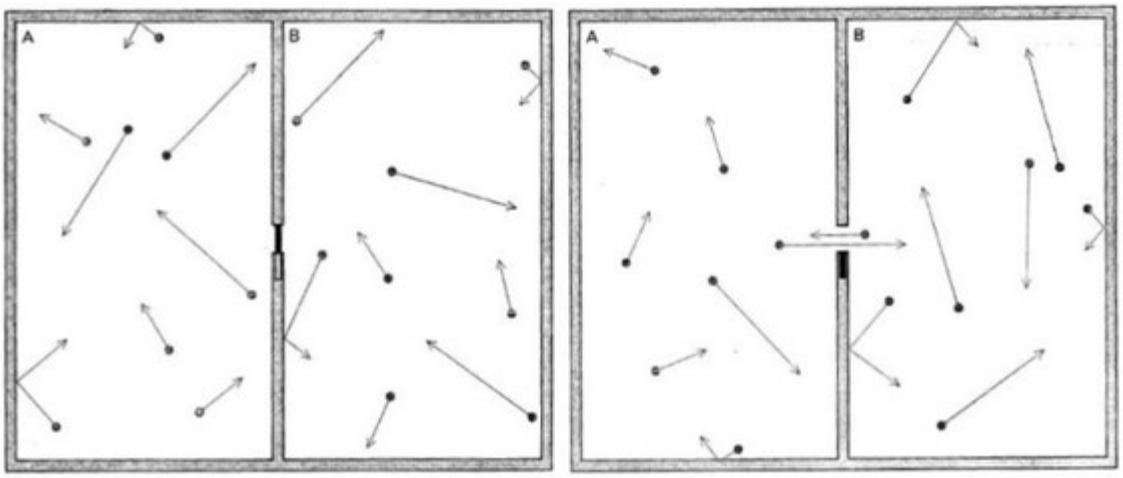

Tribus' 1971 Maxwell's demon diagram, about which he says that the demon was finally "exorcised" in 1951 by French-born American physicist Leon Brillouin, who pointed out that if the demon were to identify the molecules, he would have to illuminate them in some way, causing an increase in entropy that would more than compensate for any decrease in entropy such a being could effect. [7]

Next he found out that Jaynes was at Stanford:

> "I took an overnight train and showed up in his office, the next morning, surely acting like a crazed man. I remember going to the blackboard in his office and pouring out the derivation of the laws of

thermodynamics."

In 1959, Tribus invited Jaynes to come to UCLA to participate in a two week summer course on information theory and thermodynamics, during which time Tribus learned that Jaynes had been preparing material for a book on probability and its applications; the taught the course together. Although Jaynes never completed his book, Tribus did writing his 1961 *Thermostatics and Thermodynamics: an Introduction to Energy, Information and States of Matter*, based, as he says, "squarely on Ed's work"; the fundamental ideas in this book taken directly from Jaynes' work, which was never published. [6]

Tribus could only cite Jaynes' work as "in print". Tribus' book was the first book publication to attempt to base the laws of thermodynamics on information theory rather than on the classical arguments.

Shannon meeting

In April 1961, Tribus gave a seminar at MIT on a new way to derive thermodynamics based on information theory. He states that a critical audience, comprised of students of American mechanical engineer Joseph Keenan, founder of the MIT school of thermodynamics, "tried to rip it apart". Moreover, French mathematician Benoit Mandelbrot was in the audience and quickly attacked the MaxEnt interpretation, saying:

> "Everyone knows that Shannon's derivation is in error."

Beyond this, it happened that Shannon was in residence at MIT that week, so Tribus went to see him. Shannon, according to Tribus, "was immediately able to dispel Mandelbrot's criticism, but went on to lecture me on his misgivings about using his definition of entropy for applications beyond communication channels." [1] During this meeting, Tribus queried Shannon as to his reason for choosing to call his information function by the name 'entropy', the details of which were first made public in Tribus' 1971 article "Energy and Information", wherein he states: [4]

> "What's in a name? In the case of Shannon's measure the naming was not accidental. In 1961 one of us (Tribus) asked Shannon what he had thought about when he had finally confirmed his famous measure. Shannon replied: 'My greatest concern was what to call it. I thought of calling it 'information', but the word was overly used, so I decided to call it 'uncertainty'. When I discussed it with John von Neumann, he had a better idea. Von Neumann told me, 'You should call it entropy, for two reasons. In the first place you uncertainty function has been used in statistical mechanics under that name. In the second place, and more importantly, no one knows what entropy really is, so in a debate you will always have the advantage."

Tribus, in his 1987 article "An Engineer Looks at Bayles", recounts his discussion with Shannon on this question as follows: [5]

> "The same function appears in statistical mechanics and, on the advice of John von Neumann, Claude Shannon called it 'entropy'. I talked with Dr. Shannon once about this, asking him why he had called his function by a name that was already in use in another field. I said that it was bound to cause some confusion between the theory of information and thermodynamics. He said that Von Neumann had told him: 'No one really understands entropy. Therefore, if you know what you mean by it and you use it when you are in an argument, you will win every time."

Other

From 1961 to 1969 he was dean of the school of engineering at Dartmouth College. From 1974 to 1986 he directed the Center for Advanced Engineering Study at MIT. Tribus is co-founder of Exergy Inc., a company modeled on the

principle of exergy, specializing in the design of high-efficiency power production systems.

Quotes

The following are related quotes:

> "After my book on *Thermodynamics* appeared, I sat back and waited for the call from the Nobel Committee. They never wrote. But other people did writer and it was not at all what I wanted to hear. My attempts at getting engineering professors to adopt a new way to look at thermodynamics was a complete failure. Not only that, but I was attacked as someone who had taken intellectual shortcuts. Once, during a presentation at IIT in Chicago, I showed how Ed Jaynes' methods developed, in four lines, the equations of the Fowler and Guggenheim required hundreds of pages to reach. Now once did we mention ergodicity. The presentation did not convince most of the audience. Their reaction: Surely we had cheated somewhere."
>
> — Myron Tribus (1998), "A Tribute to Edwin T. Jaynes" [8]

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1. Tribus, M. (1998). "A Tribute to Edwin T. Jaynes". In *Maximum Entropy and Bayesian Methods, Garching, Germany 1998: Proceedings of the 18th International Workshop on Maximum Entropy and Bayesian Methods of Statistical Analysis* (pgs. 11-20) by Wolfgang von der Linde, Volker Dose, Rainer Fischer, and Roland Preuss. 1999. Springer.
2. (a) Jaynes, E. T. (1957) "Information theory and statistical mechanics", (PDF), *Physical Review* 106:620.
(b) Jaynes, E. T. (1957) "Information theory and statistical mechanics II", (PDF), *Physical Review* 108:171.
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4. (a) Tribus, Myron and McIrving, Edward C. (1971). "Energy and Information", *Scientific American*, 225: 179-88.
(b) Ben-Naim, Arieh. (2010). *Discover Entropy and the Second Law of Thermodynamics: a Playful Way of Discovering a Law of Nature* (pg. 12). World Scientific.
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â— Tribus, Myron, Shannon, Paul T., and Evans, Robert B. (1966). "Why Thermodynamics is a Logical Consequence of Information Theory" (abs), *American Institute of Chemical Engineering Journal*, 12(2): 244-48.
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External links

â— Myron Tribus – Wikipedia.
â— Myron Tribus (1961-1969) – Thayer School of Engineering at Dartmouth.

θΔics

In terminology, **mythology** (TR=171) is the study of myths or allegorical narratives, often dealing with God, gods, demigods, and or legendary heroes or stories, or admixtures thereof, of a particular people, or of popular beliefs or assumptions that have grown up around someone, something, or some phenomena.

A book collection of mythologies: Egyptian mythology, Christian mythology, Islam mythology, Norse mythology, Roman mythology, Greek mythology, most of which are derived from the Egyptian Book of the Dead.

Jefferson

The following quote(Q) by Thomas Jefferson on religion as fables and mythologies, shown in a 2011 fence-protected holiday display, made by Atheists United, in Santa Monica, California:

(add discussion)

Quotes

The following are related quotes:

> "It is impossible for anyone to dispel his fear over the most important matters, if he does not know what is the nature of the universe, but instead suspects something that happens in **myth**. Therefore, it is impossible to obtain unmitigated pleasure without natural science."
>
> — Epicurus (c.280BC), opening quote to Victor Stenger's *God and the Atom* [1]

> "Fables should be taught as fables, myths as **myths**, and miracles as poetic fancies. To teach superstitions as truth is a most terrible thing. The child mind accepts and believes them, and only through great pain and perhaps tragedy can he or she be in after years relieved of them. The reason for this is that a superstition is so intangible a thing that you cannot get at it to refute it."
>
> — Hypatia (c.400)

See also

- Comparative mythology and religion
- Religio-mythology

References

1. Stenger, Victor J. (2013). *God and the Atom: From Democritus to the Higgs Boson: the Story of a Triumphant Idea* (pg. 11). Prometheus Books.

External links

- Mythology – Wikipedia.

θΔics

In symbols, **N** is the symbol of 14th letter of the English alphabet; in chemistry, the element nitrogen, 7th element of the periodic table; and, in thermodynamics, the symbol for the equivalence-value of all uncompensated transformations.

Language

In language, N is the 14th letter of the English alphabet, etymologically derived from the Egyptian "water level" hieroglyph, the Nile River flooding to 30-feet each year, marked at water levels by "nilometers" (Ñº), the letters N (Nile) and M (meters) having the same etymology (as discussed below), as follows: [1]

In origin, in religio-mythology terms, Egyptian water god "Nun", the water primordial abyss or chaos that came or existed before everything, was signified by the hieroglyph (Unas Pyramid texts, 2500BC), symbolic of the water wave, "water level', or "flowing water", and three pots (for water storage); summaries of which are as follows:

> "The Egyptians had three homophonic signs for ***N***, i.e. they sounded 'n' in three symbols. Firstly, the 'water line' , which was normal and universal. Secondly, the 'red crown' of Lower Egypt , which does not make its appearance before the time of the New Kingdom [1550BC]. Third, the 'vase' , which is rare and a sign of limited use [e.g. Unas Pyramid Text, 2500BC], being confined to certain words."
>
> — Isaac Taylor (1883), *The Alphabet: an Account of the Origin and Development of Letters* (pgs. 66 + 106)

> "The letter **N**'s link with the water element is also found in the Greek word *nero* (το νερο), 'water'. In Etruscan, this was *neri*, whose root is visible in the words such as: *navigate, nautical, navy, naval,* etc.."
>
> — Laurent Pflughaupt (2003), *Letter by Letter* (pg. 95) [1]

The water meaning of "N", accordingly, is the root meaning behind god/prophet names such as: MaNu, Noah, Anu, Vishnu, Nuh, etc. [see: god character rescripts], and names such as: new, nothing, null, neo- (birth), negative, nihilism, non, none, nautical, navigate, navy, naval, etc.

In the original Egyptian myth (2800BC), the sun god Ra, to go through the main etymological thread of this issue, is said to have been born as a bulb of light, born simultaneously in conjunction with the evil snake Apep (symbolic of the forces of darkness or evil), whom he does battle with each night, both born out of a lotus flower, the "stem" of which descends into the waters of Nu or Nun, as shown below (left).

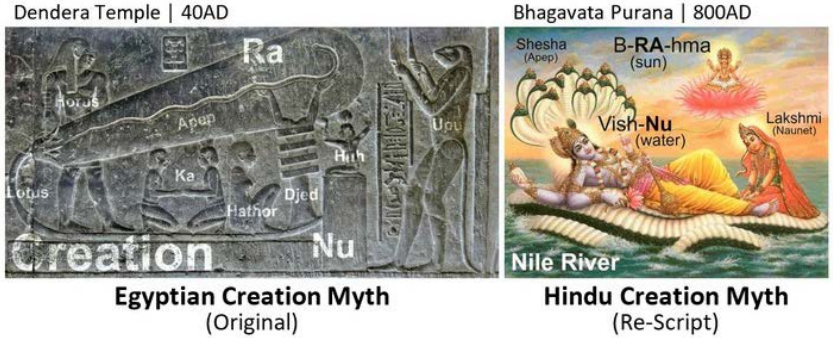

In Hindu mythology (c.800BC), this cosmology was rescripted (see: god character rescripts) into the story that the sun god Brahma (Ra in Hindu) is said to have been born out of the "navel" (not stem) of the water god Vishnu (Nun in Hindu), as shown above (right). Hence, the English root of the word navel, and related "N" words, new, new, newborn, etc., is the Egyptian god Nun, out of which all things were said to have been born, according to Heliopolis creation myth, symbolized by the "water level" hieroglyph, which became, over the centuries, shortened to "N". In later motifs, this was rescripted as follows:

In the modern American guise of things, Abraham (Ra) was born out of Noah (Nun), i.e. he was an offspring of Noah by so many generations, the modern variant of the myth, in short. The ordering of the English alphabet (A = father, D = Delta [Nile Delta], to N = water, M = ocean water [see: Sirius], to R = sun) derives in like manner, in like order.

M and N?

The contentious topic of how the Egyptian horizontal zigzag sign became, purportedly, a vertically oriented wavy line in Proto-Sinaitic script (1700BC), is based the following etchings on a small sphinx (Ñº), found at a Hathor temple, at Serabit el-Khadim (Sinai, Egypt) (Ñº), discovered by Flinders Petrie (1904), particularly the vertical squiggle (fourth from the left) shown in section B below, which Alan Gardiner (Ñº) (1916) classified as a "rearing snake" and the forerunner to the Phoenician letter N:

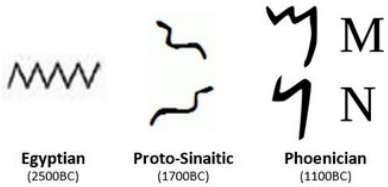

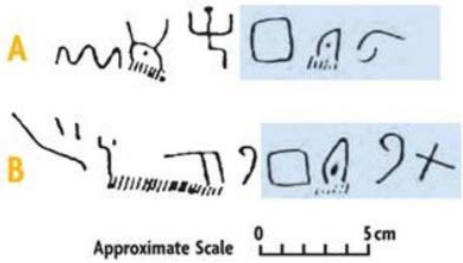

This debate owes it nature, firstly, to the fact that available samples of Proto-Sinaitic script, shown above, are scant and amount to child-like scribbles, leaving room for interpretation, particularly in respect to symbols 9, 11, and 13, below, which are said to correspond to the modern letter N, and symbol 12 which is said to correspond to the modern letter M: [3]

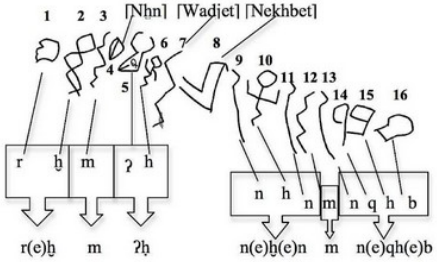

In more detail: (Ñº)

Presently, the exact nature of these Proto-Sinaitic scripts, thought to be hieroglyphic shorthand, are open to interpretation:

> "The history of the alphabet started in ancient Egypt. By 2700 BCE Egyptian writing had a set of some 22 hieroglyphs to represent syllables that begin with a single consonant of their language, plus a vowel (or no vowel) to be supplied by the native speaker. In the Middle Bronze Age an apparently "alphabetic" system known as the Proto-Sinaitic script is thought by some to have been developed in central Egypt around 1700 BCE for or by Semitic workers, but only one of these early writings has been deciphered and **their exact nature remains open to interpretation**."
>
> — Jan Crabben (2011), "Alphabet" (Ñº), Apr 28

The short answer, baring prolonged contentious etymological symbol discussion (as touched on below), is captured in the following astro-theological based motif behind Egypt as a culture

> "Who is there that does not know that the **vapor of the sun** [Ra or sun god] **is kindled by the rising** of the **dog-star** [star Sirius / goddess Isis]? The most powerful effects are felt on the earth from this star. When it rises, the seas are troubled, the wines in our cellars ferment, and stagnant waters [Nile River] are set in motion."
>
> — Pliny the elder (77AD), "On the Rising of the Dog Star"

> "The Egyptians hold the festival of Isis at the time when they say she is mourning for Osiris. At that time the **Nile River** begins to rise, and it is a common saying among the natives that it is the tears of Isis that cause the river to rise and water the fields."
>
> — Apuleius (c.165AD), *Eleventh Book*; cited by Wallis Budge (1904)

In other words, the annual Jun 25 "helical rising" of the star Sirius, previously absent for 70-days, occurs, which marks the start of the annual 150-day Nile River flood, during which time the "sun", in the re-born in form of a bird carrying the sun or phoenix, appears to grow stronger, as summer approaches. A sun-carrying bird (father Ra, or Ab-Ra, as in the names Abraham and Brahma), the prefix Ab- symbolic of the letter "A", is born out of rising land

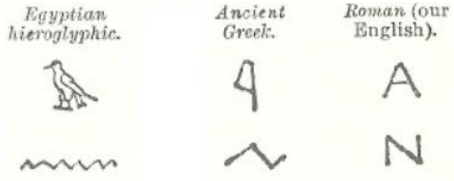

mound following a flood (Nun), symbolic of the letter "N". The adjacent diagram, from Hilda Finnemore's *A History of Earth* (1924), illustrates the jump from the pictographs for "bird to A" and "water to N" symbol evolution. [6]

Moreover, the star Sirius, aka "star of the sea", was deified as the goddess Isis, and thereafter into the character of the Virgin Mary, Mary, Martha, hence, the words Maritime, i.e. "sea", and mother, and the letter "M". Alvin Kuhn touches on this religio-mythological ordering scheme to the alphabet as follows:

> "The detailed knowledge is not at present available to trace the chain of linked steps in the descent of the divine flame R [Ra] from A [Ab] down to M. It does not seem apparent that at any rate in extant alphabets there is to be found a sequence of letter signification, paralleling and depicting the successive stages of the creative fire's descent into the water, or matter involvement. If such an explicit arrangement was planned for the first alphabets, it seems impossible to trace the stages in orderly succession in present alphabets. But what emerges with astonishing certitude is that the central letters, **M and N**, carry the significance of what the diagram demands, —water. Thus, at the point of lowest descent, where our thesis requires water, there indeed we have it. Every letter of the Hebrew alphabet, beside carrying a number value, also has attached to it a symbolic monograph: B is *beth* and means house; G is *gimel* and means camel; D is *daleth* and means door; H is *he* and means window, etc. When we come to **M**, we find it is named *mem* and means—water! **N** is called *nun* and means that which is the animal life in water, —fish! This is in the Hebrew. But amazingly, when we turn to the old Egyptian, we find that N has the name of nun likewise, but means and is the hieroglyph of —water!"
>
> — Alvin Kuhn (1900), *Esoteric Structure of the Alphabet* (Ñº) (pg. 23)

The annual flooding of the Nile was deified by the god Nun, the water wave sign, and hence the letter N. In short, the star of the sea (letter M) appears and the flood (letter N) begins. Hence, letters M and N appear as letters 14 and 15 in the English alphabet, in this order, owing to the order of the appearance of the two things (sea star → flood) in this order, as observed by the ancient Egyptian thinkers, and passed along as a cosmology, to radiating cultures, over time.

Water | Symbol

In the 1830s, Francesco Salvolini, student of Jean Champollion, and Hensleigh Wedgwood, following him, were beginning to make connections between the the water Aquarius zigzag symbol and the letter N (and M); some of which is summarized as follows:

> "It will be convenient to treat the case of **M** and **N** together, the intimate connexon of the sounds having apparently led to precisely the same plan of graphic representation in the two cases. The hieroglyphic equivalent of the letter N is identical with the ordinary symbol of the constellation **Aquarius** among the signs of the Zodiac, an indented line representing the wavy surface of water. It seems probable that the word 'nun' may have signified *water*, a sense which may be recognized, according to Salvolini (c.1832) (Ñº), in the hieroglyphic name of the heavenly Nile, *nun-n-pe*, 'water of heaven'. The analogue of M represents an object of which we neither under-stand the meaning nor know the name. It has been called an embattled wall or a basket, but its true meaning is still to be established."
>
> — Hensleigh Wedgwood (1850), "On the Traces of an Egyptian Origin in the Alphabets of Greece and Rome" (Ñº), Nov 22

> "The zigzag line which represents the wavy surface of water when used as the **symbol of Aquarius** among the signs of the zodiac is found in Egyptian hieroglyphs with the force of the letter 'n'. If we cut the symbol down to the three last strokes of the zigzag we shall have then of early Greek inscriptions, which does not materially differ from the capital N of the present day. The evidence from the derivation of the letter N from the symbol representing water (in Coptic *noun*) cannot be duly appreciated unless in conjunction with the case of the letter M. The combination of symbols and , as shown in the subjoined illustration, occurs very frequently in the hieroglyphics with the force of MN. The lower symbol is used for *n*, and thus in this combination the upper symbol undoubtedly has the force of *m*, although it is said to be never used independently for that letter. Now if the two symbols be epitomized by cutting them down to their extremity, as a lion is represented by his head and forelegs, it will leave figures and , which are identical with the M and N of the early Phoenician and Greek. Figures , , , are forms of Phoenician M from Gesenius (Ñº); , ancient Greek M; , Greek N from Gesenius; and from inscriptions in the British Museum."
>
> — Hensleigh Wedgwood (1871), *A Dictionary of English Etymology* (pg. lxvii) [4]

> "Our letter 'N' came up through Old Phoenician 'Nun', meaning *fish*. While the N-sign, in very olden times, stood for 'water', the U-sign stood for 'consciousness', thus, Nu signified 'water-consciousness' or *fish*. In ancient Greek, Mem became Mu, and Nun became Nu. These became M and N, respectively, in later English."
>
> — R.M. Manley (1931), *Synthetic Philosophy* (pg. 24)

Of note, the Hebrew transliteration of Nun having a "fish" meaning, seems to have something to do with the "measure of the fish", being the square root of three, and how the pyramids, build over the waters of the Nun, were designed using this number?

Red Crown | Symbol

In 1861, Samuel Sharpe, in his *Egyptian Hieroglyphics*, was connecting the letter “n” with the water wave symbol and the “red crown” symbol, or Deshret (Ñº), of Lower Egypt. [7] A few recent symbol etymological attempts in this direction are as follows:

> “The two hieroglyphs and unilateral characters from the Egyptian alphabet that transcribe the [n] sound. The first represents flowing water, the second a red crown. In the Proto-Sinaitic alphabet, this same phoneme is denoted by a snake image, which was then taken up by the Phoenicians, who accentuated the curve of the line and simplified the shape by removing the snake's head, resulting in the sign , the fourteenth letter of their alphabet, the NUN. The Hebraic letter derived from it bears the same name, which in Aramaic means "fish" or "water snake." In terms of its shape, our N is derived from the Greek NU, itself a result of the Phoenician NUN. The first Hellenic inscriptions present the letter NU with the form . This is also found in archaic Etruscan inscriptions from the seventh to fifth centuries BCE, and in the first Roman writings such as the Lapis NigÒ½r . By making the letter vertical and balancing out the stems, we arrive at its current shape, already in use in classical Greek from the fifth century BCE.”
>
> — Laurent Pflughaupt (2003), *Letter by Letter* [1]

The following would be the supposed etymology of the Red Crown conjecture for the letter N: [3]

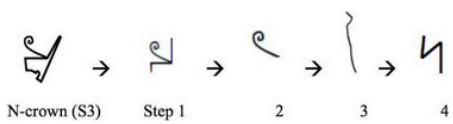

This conjecture, while interesting, makes little sense, particularly in respect to the little "curl" at the top of the crown becoming the letter N.

Snake | Symbol

In 1916, Alan Gardiner decoded some of the Proto-Sinaitic text and argued that it represented a kind of “missing link” between Egyptian hieroglyphics and the early western alphabet; at some point therein, he had classified, in his opinion, the Proto-Sinaitic "nun" as a "rearing snake", thus yielding the following proposed-etymology: [5]

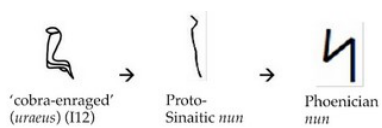

In 1924, Gardiner was being cited (Ñº) as referring to the Proto-Sinaitic “vertical squiggle” (#s 9, 11, and 13) to be the “snake common in Sinai texts” and representing the phonetic value of *n*. The following year, the Gardiner hypothesis was being sold to the effect that snake was a water serpent; the following being an example:

> “Nun, on the other hand, is not a fish, but a water serpent or an ordinary serpent, det. The value of ‘n’ came from the Semitic *nahas*, but the derived forms are not good imitations. Samech, in like manner, is the Semitic name of the Egyptian An, the usual word for ‘fish’, but from this the Phoenican letter differs considerably.”
>
> — Author (1925), “Article” (pg. 89), *Ancient Egypt and the East*

The "letter N" as "angry cobra" or "water serpent", however, makes no mythical sense, aside from the sun, born out of Nun, doing battle with a snake (Apep) each night? In recent years, accordingly, Gardiner’s “snake symbol” conjecture origin for the letter “N”, however, had come to be questioned:

> “As [the Proto-Sinaitic script's] most systematic critic points out, this solution [i.e. Gardiner's interpretation of *lb clt* acrophonically as "to the Lady"] involves at least four assumptions: this is an alphabetic script; the signs have Egyptian prototypes; the letters are pictographic and acrophonic; and the language is Semitic (Sznycer 1975: 91). Furthermore, most of the occurrences of *lb clt ['to the Lady']* are restorations. Gardiner took a snake-shaped character to be *n* because the modern Ethiopic name for the letter is *nahas*, and the **corresponding word in Hebrew, *nÄ á¸¥Ä š*, means "snake".** But it seems very likely that the modern Ethiopic letter names date no further back than the sixteenth century C.E., and so are **irrelevant to the investigation of Proto-Sinaitic**.”
>
> — Peter Daniels (1991), *The World’s Writing Systems* (pg. 29) (Ñº)

> “There's a lot of other original research going on here, too. **Take N, which the table says is *naá¸¥š* "snake"**. In Phoenician, however, it was *nÅ«n* "fish". *Naá¸¥š* comes instead from Ethiopic, but as far as I know, it's only attested from the 16th century CE! There's no way to know if it actually dates back to Proto-Sinaitic, and Phoenician was innovative, or if it was renamed in Ethiopia because it looked snake like, but people have argued for the latter. Yet **we simply present the completely unattested Proto-Sinaitic *naá¸¥š* "snake" as a fact**?”
>
> — Kwami (2011), “Proto-Sinaitic script talk page” (Ñº), Wikipedia, Jul 19

> “I disagree with certain alphabet historians in that **I do not see** the ‘cobra-at-rest’ (djet), I10 (Ñº) in Gardener’s sign list, as a viable origin for the letter N.”
>
> — Paul LeBlanc (2017), *Deciphering the Proto-Sinaitic Script* (pg. 50) [3]

The reared cobra etymology of the letter N, in short, is an incorrect conjecture.

X | Symbol

Some have attempted to trace the origin of the letter N to Sumerian or Babylonian pictographs; the following is one example:

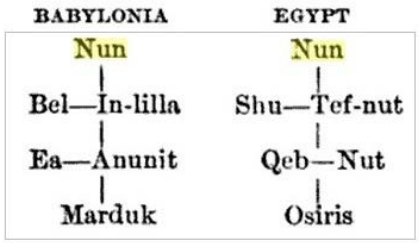

> “The Babylonian creation stories represent a great chaos of waters as existing before the creation of the earth. When the earth was created there was stretched above it a great firmament studded with stars. Between this firmament and the earth was the air, the home of the god In-lilla or Bel. Above the firmament were the waters, the ‘ocean of heaven’, and beneath the earth were also waters, called by the Babylonians *apsu*; hence Î¬βνσσος, and the English word *abyss*. But the waters above the firmament were in connection with the waters beneath the earth, the whole forming a great ocean somewhat similar to Homer's ωκεανÎŒς. **The Babylonian name for this ocean was *anum* or *anun*, and in a still shorter form ‘nun’**. We have said above that Eridu was also called Nun-ki. In Babylonian, *ki* means ‘place’; hence, this old name of Eridu, means ‘ocean-place’, a place so called, we might say, because it was the place of worship of Ea, the god of the earth and of the waters under the earth.”
>
> — Robert Rogers (1894), “The Origin of Egyptian Culture” (pg. 58-59)

> “The nasal **letter N** is found in Egypt from the twelfth dynasty onwards in its modern form as well as reversed, and unreversed in Cadmean and reversed in the Semitic Phoenician. Its Sumerian parent is evidently the sign *Nu*, , ‘No’ or ‘Not’, picturing what Assyriologists interpret as a line cancelled or crossed out. The occasional reversal of the middle stroke of as may be merely owing to carelessness of the scribe, as this form is often perpetrated nowadays by even educated persons in writing their name in capitals.”
>
> — Laurence Waddell (1927), *The Aryan Origin of the Alphabet* (pg. 38)

Hence, in both Egyptian mythology and Mesopotamian mythology, the watery abyss out of which all was created or arose was called "Nun", as diagrammed above (right). [8] That the N symbol derives from the "X" pictograph, however, is wanting.

Chemistry

In chemistry, the symbol “N” is representative of the element nitrogen, the 7th element of the periodic table.

Thermodynamics

In thermodynamics, N is the symbol of the equivalence-value of all uncompensated transformations; which is the forerunner to the Clausius inequality, and therein entropy.

Quotes

The following are related quotes:

> “The ‘waved line’, based on the alphabets of Chevalier Bunsen and Chevalier, is the Egyptian phonoglyph for the alphabetic letter N, sometimes replaced by three vertical lines, implying that the waves line should be thrice repeated. It was used in the first age on the tomb of Teta [c.2600BC]. (Ñº).”

— Edward Hincks (1847), *An attempt to Ascertainthe Number, Names, and Powers, of the Letters of Hieroglyphic or Ancient Egyptian Alphabet* (pg. 57)

"The alphabet was invented in Egypt around 2000BC as a writing method to show sounds of words."

— David Sacks (2010), *Letter Perfect: the A-to-Z History of Our Alphabet* (pg. #)

"The letter N probably started its life 4,000 years ago as an Egyptian hieroglyph with one very small ripple and one large one, meaning a 'cobra' or 'snake'. The ancient Semites took this diagonal squiggle, smoothed it out a bit, and gave it the sound 'n' from 'nun' meaning 'fish'. This may have been logical if, as a people, their word for water-based snakes and fish was the same. By the year 1000, the diagonal had become vertical and the sign contained just one wave. The ancient Greeks took it from the Phoenicians, calling it 'nu', and it now looked like a 'v' added to a long vertical tail on the right-hand side. The Etruscans copied it and passed it on to the Romans who shortened the tail so that it was now a 'v' attached to an inverted 'v' or 'downstroke, upstroke, downstroke'. By the time Imperial Rome was carving it on its victory arches, it was the 'N' we know today."

— Michael Rosen (2013), *Alphabet: How Every Letter Tells a Story* [2]

References

1. Pflughaupt, Laurent. (2003). *Letter by Letter: an Alphabetical Miscellany* (*Lettres Latines*). Princeton Architectural Press.
2. Rosen, Michael. (2013). *Alphabetical: How Every Letter Tells A Story* (N, pgs. 203-). Hodder & Stoughton.
3. LeBlanc, Paul. (2017). *Deciphering the Proto-Sinaitic Script* (§3. The 'water sign = proto-Sianatic mem [m], pgs. 41-; §9. The 'snake' sign = proto-Sinaitic nun [n] (aka nahash), pgs. 49-). Publisher.
4. Wedgwood, Hensleight. (1872). *Dictionary of English Etymology* (1872) (Ñº)(Ñº). Publisher.
5. Shaw, Ian. (2003). *Exploring Ancient Egypt* (pg. 132). Oxford University Press.
6. Finnemore, Hilda. (1924). *A History of the Earth: from Star-Dust to Man* (pg. 114). Longmans, Green, and Co.
7. Sharpe, Samuel. (1861). *Egyptian Hieroglyphics: Being and Attempt to Explain Their Nature, Origin and Meaning, with a Vocabulary* (pgs. 16-17). E. Moxon and Co.
8. (a) Hommel, Fritz. (1892). *The Babylonian Origin of the Egyptian Culture has been Proved* (*Der Babylonische Ursprung der ägyptischen Kulture nachgewiesen*). Munchen.
(b) Rogers, Robert W. (1894). "The Origin of Egyptian Culture" (Ñº)(Ñº), *Methodist Review*, 76:51-63.

Further reading

â— Cahalan, Susannah. (2015). "The Stories Behind the Letters of our Alphabet" (Ñº), New York Post, Feb 8.

External links

â— N (etymology) – Wiktionary.
â— N – EtymOnline.com.

θΔics

In hmolscience, **Nancy Etcoff** (1955-) (CR=8) is an American evolutionary psychologist noted for her 1999 book *Survival of the Prettiest*, an evolutionary psychology look at beauty (and its inverse relation to happiness), in which, among other things, she cites both the famous 1975 Dabbs-Stokes study on time-lapsed video recorded personal space volume expansions and contractions (see: volume change) of people, varying by beauty (and supposedly by power), encountering each other as passerbyers on sidewalks, and the 1974 "Body Height, Position, and Sex as Determinants of Personal Space" study of John Hartnett, Kent Bailey, and Craig Harley, both of which she summarizes as follows: [1]

> "Tall people have bigger territories. When people are asked to approach stranger and stop when they no longer feel comfortable, they will stop about two feet away from a tall person (22.7 inches to be exact) but less than a foot (9.8 inches) from a short person. Very attractive people of any size are given bigger personal territory [space]; which they carry around with them."

Etcoff's TED profile page quote, based on the Gottman stability ratio, is the following: [2]

> "The formula for a happy marriage is five positive remarks, or interactions, for every one negative."

Etcoff's work, in some sense, is comparable to thinkers such as David Buss and Matt Ridley in quality and content.

Quotes

The following are related quotes:

> "Sex, number, and attractiveness may be regarded as aspects of power, which serve to dominate various amounts of space."
>
> — James Dabbs and Niel Stokes (1975), "Beauty is Power: the Use of Space on the Sidewalk"

Education

Etcoff completed her Med at Harvard and her PhD in psychology at Boston University, after which she completed a post-doctoral fellowship in brain and cognitive sciences at MIT. Currently, she teaches a course on the science of happiness at Harvard Medical School and is the director of the program in aesthetics and well-being at Massachusetts General Hospital. Her research tends to focus on evolutionary psychology views on happiness and beauty.

References

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2. Nancy Etcoff (profile) – Ted.com.

External links

â— Ectoff, Nancy L. (1955-) – WorldCat Identities.
â— Nancy Lee Etcoff (faculty) – Harvard Catalysts Profiles.

θΔics

In thermodynamics, **nanothermodynamics** or "small-systems thermodynamics" is the thermodynamical study of phenomenon and processes at the nanometer scale (nanoscale), in which systems are in the in size range of 10^{-9} meters (nanosystems), often consisting of a countable number of particles (nanoparticles), each with a discernable structure. Significant aspects unique to nanosystems, from the thermodynamic point of view, include their high surface-to-volume ratio, in which "surface effects" become increasingly important with decreasing size, and “fluctuations”, such as temperature fluctuations, among others. Nanothermodynamics, in short, is the application of the principles and laws of thermodynamics and statistical mechanics to the prediction of the properties and performances of nanoscale structures in small molecular systems.

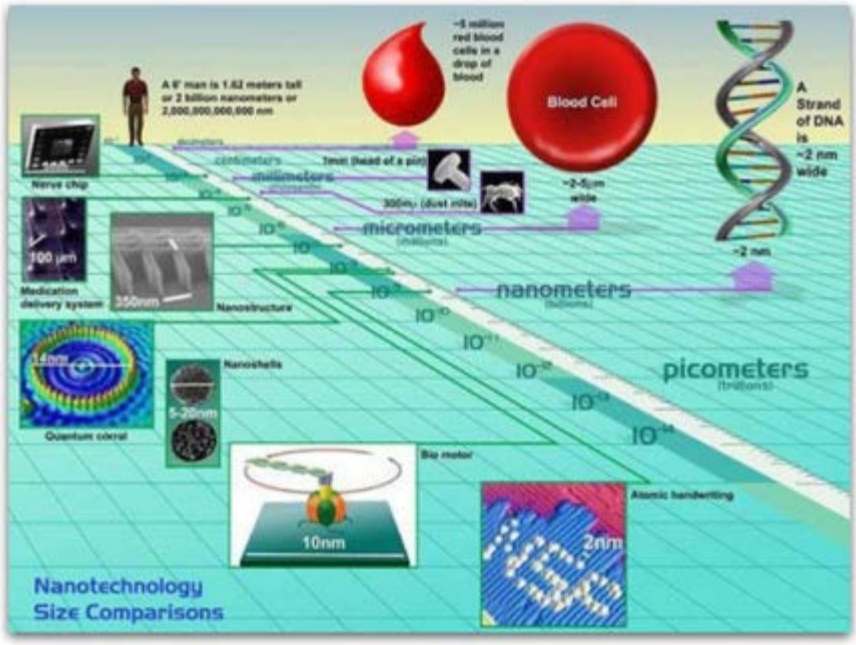

Size comparison and examples of "nanosized systems" of study in **nanothermodynamics** (from the 2009 *Teacher's Guide to Nanothermodynamics*, Northeastern University). [4]

History

The question of the issue of the application of thermodynamics on the nanoscale began to emerge after the nucleation reaction was discovered in the early 1930s. [2] The term ‘nanothermodynamics’ was being used as a synonym for small-systems thermodynamics as early as 2000. [1]

Most sources, e.g. Ali Mansoori, attribute the dominant introduction of the term *nanothermodynamics* to the introduction of its use in the title of the 2001 article “Nanothermodynamics” by American chemist and biophysicist Terrell Hill; themed to be a shortened version of the older phrase “small system thermodynamics” used by Hill in 1963 to designate the subject of the thermodynamics and statistical mechanics of systems of colloidal particles, polymers, or macromolecules. [3]

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Further reading

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θΔics

In hmolscience, **Naoki Sato** (c.1960-) is a Japanese genomics of photosynthetic organisms researcher noted for []

Overview

In 2012, Sato, in his *Entropy* journal article "Scientific Elan Vital: Entropy Deficit or Inhomogeneity as a Unified Concept of Driving Forces of Life in Hierarchical Biosphere Driven by Photosynthesis", positioned to introduce the concept of "entropy deficit" to be the new unified driving force of the biosphere; the abstract of his argument is as follows: [11]

> "Life is considered something different from non-living things, but no single driving force can account for all the different aspects of life, which consists of different levels of hierarchy, such as metabolism, cell physiology, multi-cellular development and organization, population dynamics, ecosystem, and evolution. Although free energy is evidently the driving force in biochemical reactions, there is no established relationship between metabolic energy and spatiotemporal organization of living organisms, or between metabolic energy and genetic information. Since Schrödinger pointed out the importance of exporting entropy in maintaining life, misunderstandings of entropy notion have been obstacles in constructing a unified view on the driving forces of life. Here I present a simplified conceptual framework for unifying driving forces of life at various different levels of hierarchy. The key concept is "entropy deficit", or simply, 'inhomogeneity', which is defined as the difference of maximal possible entropy and actual entropy. This is equivalent to information content in genetic information and protein structure (see: protein thermodynamics), and is also defined similarly for non-homogeneous structures in ecosystems and evolution. Entropy deficit or inhomogeneity is a unified measure of all driving forces of life, which could be considered a scientific equivalent to 'élan vital' of Bergson."

This is an example of someone lost in the garden of thermodynamics.

Difficulties on theory

A number of issues are involved in this abstract, the foremost of which is that Sato seems to be unaware of the historical attempts (as tabulated: here and in more detail: here) to quantify large scale social-population aspects of human systems and other bio-animate systems using a Gibbs free energy differential-based formulation, which is the correct "driving force" for in the "hierarchical biosphere" as Sato labels it, as was first clearly summarized by Gilbert Lewis (1923).

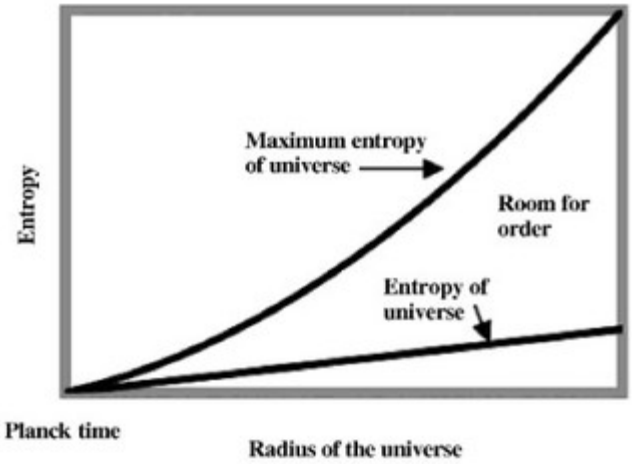

American physicist Victor Stenger's 1995 "entropy per unit volume" model of the origin of order in the universe; a model which Sato seems to cull from concept is "entropy deficit", or simply, 'inhomogeneity', which is defined as the difference of maximal possible entropy and actual entropy. . [2]

Secondly, Sato's "entropy deficit", or inhomogeneity, which he defined as the difference between maximal possible entropy and actual entropy, is nothing but an "entropy antonym" of which there are dozens; and furthermore the notion that "order" is something that results within the gap of maximal possible entropy and actual entropy seems to be a culling of Victor Stenger's 1995 model of the universe (as diagramed adjacent).

Third, Sato's equating of his "entropy deficit" with Henri Bergson's century-old notion of "élan vital" associates his theory with vitalism, which is a defunct scientific theory, implying that his theory is also defunct.

Fourth, in his article he mixes in information theory, arguing that DNA is an "information-carrying molecule", and attempts to re-define entropy in units of bits, using the Shannon information model, which as Claude Shannon warned (1955) is a model not to be used outside of communication theory proper: [4]

> "Workers in other fields should realize that the basic results of the subject [communication channels] are aimed in a very specific direction, a direction that is not necessarily relevant to such fields as psychology, economics, and other social sciences."

Lastly, Sato's opinion that "life is considered something different from non-living things", highlights the fact that Sato is unaware that the concept of "life" is now a defunct scientific theory (see: defunct theory of life), replaced by the science of animate thermodynamics, the energetic and entropic study of carbon-based animated molecular structures (or "animated beings" as Henry Adams calls them; or animated matter, among other names); the first artificially synthesized (see: laboratory produced life) walking molecule being 9,10-Dithioanthracene (DTA) is the first molecule ever to be able to "walk" in a straight line by, in effect, mimicking the bipedal motion of a human being.

More recent examples being macroscopic movements are powered by molecular motors from the dynein, myosin and kinesin superfamilies. These motor proteins literally walk, step by step, along polymeric filaments, carrying out essential tasks such as organelle transport, according to which view the "life | non-life" divide or "unbridgeable gap model" dissolves, after which one is forced to conceded that the notion of "life", particularly at the origin of life level (where atoms, chemicals, and molecules reign), is a religio-mythology based forced-contrivance passed along to us via our cultural heritage (Anunian theology, for 72% of the world; or yellow river mythology for about 10% of the world), albeit a notion that becomes defunct under the rigor of the chemical thermodynamic microscope.

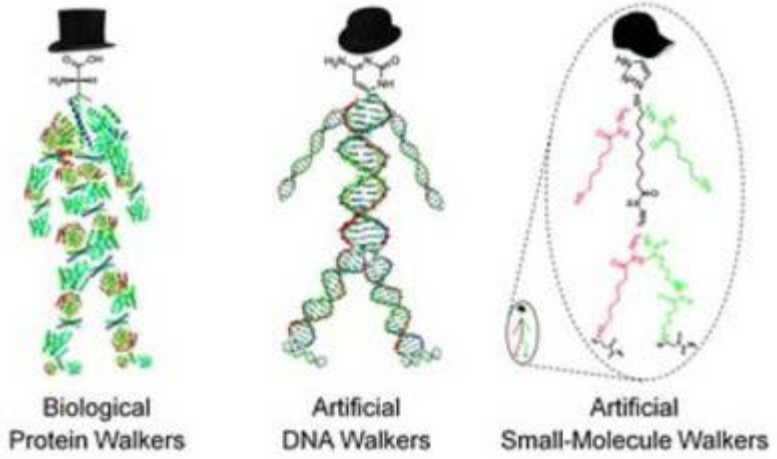

Scottish chemists Max von Delius and David Leigh's 2011 depiction of a DNA-based "walking molecule", a view from which the "life | non-life" issue dissolves into the nonsensical (see: defunct theory of life). [3]

Education

Naoki currently is a professor of genomics of photosynthetic organisms in the department of biological sciences graduate school of science at the University of Tokyo.

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External links

â— Naoki Sato (faculty) – University of Tokyo.

θΔics

In existographies, **Napoleon Bonaparte** (1769-1821) (IQ:180|#107) (Cattell 1000:1) [RGM:169|1,500+] (HD:20) (FA:67) (CR:158) was a French military leader, emperor of France, from 1804 to 1815, thing philosopher, religio-mythology scholar, and an achristist asoulist irreligionist, noted for his latter years efforts to grapple with religious questions in the context of growing intelligence tending towards atheism.

Soul

See main: Napoleon on the soul

The following are quotes by Napoleon on the soul:

> "Laplace made a detestable Minister of the Interior [under the Directory]. His great friend was Lagrange, and he never dared to speak in the Institute without consulting him. If Lacroix or others attacked him, Lagrange thundered down upon them. I often asked Laplace what he thought of god. He owned he was an atheist. Many crimes have been committed in the name of religion. The oldest religion is the worship of the sun. **Where is the soul of an infant?** I cannot remember what I was before I was born; and what will become of my soul after my death? As to my body, it will become carrots or turnips. I have no dread of death. In the army I have seen many men suddenly perish who were talking with me."
>
> — Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr [3]

> "Herodotus tells us that in his day the slime of the Nile changed into rats, and that they might be seen in process of formation. Can any one tell us what the brain is? **All things can be explained by magnetism**. **Where is little Arthur Bertrand's (Ñº) soul?** The soul is formed as the body forms. Knock a nail into your head, then you become a madman, and then where is your soul? It is absurd to believe that at the Last Judgment we must appear in the flesh. Why should we, for a few crimes committed upon earth, be punished eternally?"
>
> — Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr [3]

> "When I see that a dog or a pig has a stomach and can eat, I say to myself, 'I have a soul, they must have one too'. **Give my watch to a savage and he will think it has a soul**."
>
> — Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr [3]

> "A soul? Give my watch to a savage, and he will think it has a soul. If I have a soul, then pigs and dogs also have a soul?"
>
> — Napoleon Bonaparte (1817), "Comment to Gaspard Gourgaud", St. Helena, Dec 17; cited by James Haught (1996) in *2000 Years of Disbelief* (pg. 109)

Napoleon also to to a certain extent was a soul theorist, e.g. querying physicians about having ever seen the "soul" during their dissections of the brain, and also himself conducting experiments with plants to discern the possible location of the soul, or something along these lines.

Atheism | Religion

See main: Napoleon Laplace anecdote

Napoleon was a famous agnostic leaning towards atheism. From 1804 to 1815, Napoleon notably went around polling of the leading scientists of France on their religious views, e.g. Pierre Laplace (see: Napoleon Laplace anecdote). from which he discerned was atheism, in large part. The following are noted Napoleon statements made in dialogue with Gaspard Gourgaud in 1817:

> "I have dictated thirty pages on the world's three religions; and I have read the Bible. My own opinion is made up. **I do not think Jesus Christ ever existed**. I would believe in the Christian religion if it dated from the beginning of the world. That Socrates, Plato, the Mohammedan, and all the English should be damned is too absurd. Jesus was probably put to death, like many other fanatics who proclaimed themselves to be prophets or the expected Messiah. Every year there were many of these men."
>
> — Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr [3]

> "I once found at Milan an original manuscript of the 'Wars of the Jews,' in which Jesus is not mentioned. The Pope pressed me to give him this manuscript. What is certain is, that in the days of Jesus public opinion favored the worship of One God, and those who first preached that doctrine were well received and welcomed. It would have been so in my own case if from the lowest ranks of society I had become Emperor. It would have been because circumstances and public opinion were for me, not against me."
>
> — Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr [3]

> "I read the Bible. Moses was an able man. The Jews were a cowardly and cruel people."
>
> — Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr [3]

> "I think that **man was formed by the action of the heat** of the sun upon the mud."
>
> — Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr [3]

> "Say what you like, but **everything is more or less organized matter**. When I have had stags cut open in hunting, I saw that their interior was like that of man. Man is only a more perfect being than dogs and trees. Plants are the first link in the chain of which man is the last. I know this is contrary to religion, but it is my opinion. **We are all matter**. **Man was created by a certain warmth in the atmosphere**. Man is young, and the earth is old. The human race has not existed more than six or seven thousand years, and thousands of years from now man may be very different from what he has been. Science may then have made such progress that mankind may perhaps have found out how to live forever. Agricultural chemistry is yet in its infancy. Not many hundred years ago we found out extraordinary properties in certain bodies, but we cannot explain them—the loadstone, electricity, and galvanism. What discoveries may not be made in these thousands of years!"
>
> — Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr [3]

> "**If a man can think, it is because his nature is more perfect than that of a fish**. When my digestion is bad, I think differently from what I do when I feel well. Everything depends on matter. If I had believed in a God who punished or rewarded us according to our deeds, I might have lost courage in battle."
>
> — Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr [3]

> "A man may have no religion, but may yet have morality. He must have morality for the sake of society.

Morality for the better classes, the scaffold for *la canaille*."

— Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr [3]

"Science, which has disproved that the earth is the center of the celestial system, struck a great blow at religion. **Joshua, we are told, stayed the sun**, and that stars will fall into the sea from heaven. What do I say? All the suns, and all the planets, etc."

— Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr [3]

"A man cannot become an atheist merely by wishing it."

"If I had to choose a religion, the sun as the universal giver of life would be my god."

"It remains an open question whether Christ ever lived."

— Napoleon Bonaparte (c.1815), "To Christoph Wieland"; cited by Emil Ludwig (1926) in *Napoleon* (pg. 321); cited by James Haught (1996) in *2000 Years of Disbelief* (pg. 109)

"Everything is more or less organized matte. To think so is against religion, but I think so just the same."

— Napoleon Bonaparte (c.1815), *Publication*; cited by James Haught (1996) in *2000 Years of Disbelief* (pg. 110)

(add)

Goethe meeting

See main: Goethe meets Napoleon

A depiction of Goethe's 1808 meeting with **Napoleon** at Erfurt, photograve from the painting by Hillemmacher (spelling?). [2]

Napoleon was a great fan of Goethe, having had read *Werther*, supposedly, six times during battle. [1]

On 6 Aug 1806, news reached Goethe of the formal dissolution of the Holy Roman Empire; by Oct, war had come to Jena. During the chaos, on 14 Oct, drunken French troops, bent on looting, force their way into Goethe's house, whereupon Christiane Vulpius (1765-1816) boldly confronted (see: Goethe timeline) them and declared that "a friend of Napoleon" lived here—the house was spared, and five days later, on 19 October Goethe made Christiane his wife; their sixteen year old son August present as one of the witnesses.

In 2 Oct 1808, Goethe famously met Napoleon. [1] Napoleon's famous greeting of the author Werther on 2 October, was" «Voilà un homme!» ('Now here is a real man!'). After meeting with Beethoven, four years later, Goethe famous commented something along the lines of how he admired the former, but despised (?) the latter, or there to this affect.

Last days

See main: Atheist deathbed conversions

Napoleon being an agnostic irreligionist most of his existence, in his last three weeks, professed belief in god:

> "I am neither atheist nor a rationalist; I believe in god and am of the religion of my father. I was born Catholic, and will fulfill all the duties of the church."
>
> — Napoleon Bonaparte (1821), statement three weeks before reaction end, Apr 18

Curiously, here we see some sort of Pascal's wager like fear creeping into his mind, at the last moment?

Quotes | On

The following are quotes on Bonaparte:

> "The **Emperor** dictated a note to me, to prove that the water struck out of a rock by Moses could not have quenched the thirst of two millions of Israelites."
>
> — Gaspard Gourgaud (1817), travel journal notes, Apr [5]

Quotes | By

The following are quotes by Napoleon:

> "Destiny urges me to a goal of which I am ignorant. Until that goal is attained I am invulnerable, unassailable. When destiny has accomplished her purpose in me, a fly may suffice to destroy me."
>
> — Napoleon Bonaparte (1816), *In His Own Words*

> "Lead the ideas of your time and they will accompany and support you; fall behind them and they drag you along with them; oppose them and they will overwhelm you."
>
> — Napoleon Bonaparte (1816), *In His Own Words*

> "History is a set of agreed-upon lies."
>
> — Napoleon Bonaparte (c.1820), paraphrase of Bernard Fontenelle (c.1740); cited (Ñº) by John Avery (2017)

> "Great ambition is the passion of a great character. Those endowed with it may perform very good or very bad acts. All depends on the principles which direct them."
>
> — Napoleon Bonaparte (c.1820),

> "Men are moved by two levers only: fear and self interest."

— Napoleon Bonaparte (c.1820), *Publication*

"Great men are meteors that burn so that the earth may be lighted."

— Napoleon Bonaparte (c.1820), *Publication*

"Nothing is more difficult, and therefore more precious, than to be able to decide."

— Napoleon Bonaparte (c.1820), *Publication*

"Public opinion is the thermometer a monarch should constantly consult."

— Napoleon Bonaparte (c.1820), *Publication*

"Take time to deliberate, but when the time for action has arrived, stop thinking and go in."

— Napoleon Bonaparte (c.1820), *Publication*

"There is no such thing as accident; it is fate misnamed."

— Napoleon Bonaparte (c.1820), *Publication*

See also

â— Napoleon Bonaparte and Johann Goethe (2010) – Hmolpedia thread.

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3. (a) Bonaparte, Napoleon. (1817). "Comment to Gaspard Gourgaud", Apr.
(b) Gougaud, Gaspard. (1898). *Talks of Napoleon at St. Helena with General Baron Gourgaud: Together with the Journal Kept by Gourgaud on Their Journey from Waterloo to St. Helena* (pg. 276). Nabu Press, 2012.
(c) Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pg. 109). Prometheus.

External links

â— Napoleon Bonaparte – Wikipedia.

θΔics

In anecdotes, **Napoleon Laplace anecdote** is a famous *circa* 1802 conversation that took place between French leader Napoleon Bonaparte and physicist Pierre Laplace, one of Napoleon's former professors, on the question of the existence of god in the context of the new celestial mechanics models of the formation and operation of the universe, the dialog of which was latter communicated to mathematician Joseph Lagrange, the gist of which being that Laplace no longer needed the so-called "hypothesis of god", as he referred to it, in the description of the mechanical operation of the universe.

Celestial Mechanics | Godless

The following is an 1829 photo (Ñº) of French physicist Pierre Laplace's 5-volume *Celestial Mechanics* affixed with his famous 1802 quip to French emperor Napoleon Bonaparte, in response to his god queries, that he had no use of the hypothesis of god, which was prompted into query after completion of at least the first volume, in which Napoleon could not find the world "god" mentioned:

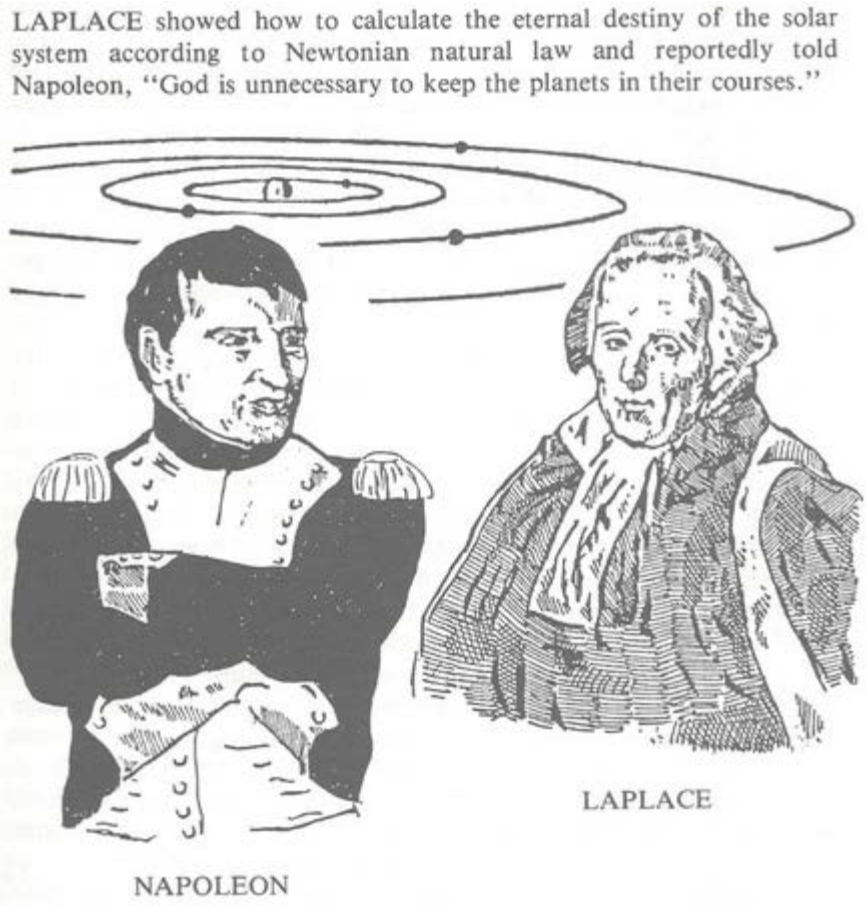

An 1985 illustration (with caption) of the **Napoleon Laplace anecdote**, from George Scott's *Atoms of the The Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will*, a circa 1802 dialogue between French emperor Napoleon Bonaparte and physicist Pierre Laplace, during which the latter told the former that "god" was no longer a needed "hypothesis" in celestial mechanics; Scott also comments that in 1814, after Napoleon's doom was sealed, Laplace added (a possible reference to Laplace's demon) that "the curve described by a simple molecule of air is regulated in a manner just as certain as the planets", and went onto claim that the destiny of every atom in the universe is mathematically predictable in principle from the forces of nature. [17]

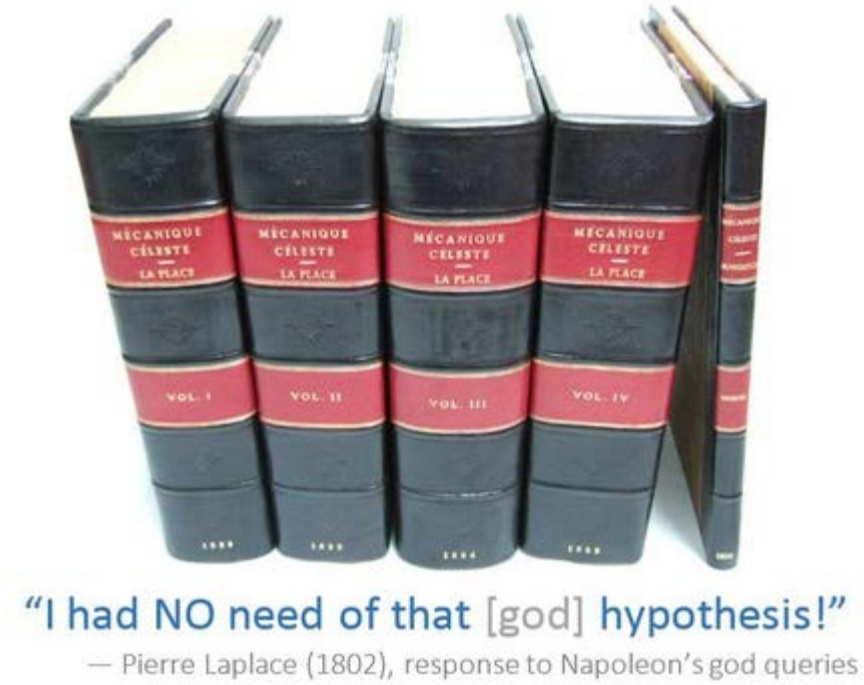

(add discussion)

Ball's description | 1888

The gist of which, accounted by British mathematician Walter Ball (1888), is as follows: [12]

> "Laplace went in state to Napoleon to accept a copy of his work, and the following account of the interview is well authenticated, and so characteristic of all the parties concerned that I quote it in full. Someone had told Napoleon that the book contained no mention of the name of God; Napoleon, who was fond of putting embarrassing questions, received it with the remark, 'M. Laplace, they tell me you have written this large book on the system of the universe, and have never even mentioned its Creator.' Laplace, who, though the most supple of politicians, was as stiff as a martyr on every point of his philosophy, drew himself up and answered bluntly, 'Je n'avais pas besoin de cette hypothèse-là.' ['I had no need of that hypothesis.'] Napoleon, greatly amused, told this reply to Lagrange, who exclaimed, 'Ah! c'est une belle hypothèse; ça explique beaucoup de choses.' ['Ah, it is a fine hypothesis; it explains so many things.']"

(add discussion)

McGrayne's description | 2011

American science writer Sharon McGrayne (2011) states that the conversation took place at a reception in Josephine Bonaparte's rose garden, at the Chateau de Malmaison, in 1802, during which time Napoleon, then emperor of France, was trying to engineer a rapprochement with the papacy, and so the religious probings ensued: [14]

> Napoleon: "Who is the author of all this?"
> Laplace: "A chain of natural causes would account for the construction and preservation of the celestial system."
>
> Napoleon: "Newton spoke of God in his book. I have perused yours but failed to find his name even once. Why?"
> Laplace: "I have no need of that hypothesis"
>
> Laplace: "The true object of the physical sciences is not the search for primary causes [i.e. God] but the

search for laws according to which phenomenon are produced.”

(add discussion)

Citations

The number of citations to the Napoleon-Laplace anecdote is large, already having been "well authenticated" by 1888, as Walter Ball put it. In perusal of many of these there seems to be an unwritten rule, which states that if one cites the anecdote, one is partial to Laplace's position; though this rule does not old in all cases, some taking a middle ground on the matter (e.g. William Reed, Karen Armstrong). Some of thinkers to cite the anecdote are listed chronologically below, showing date of statement or publication in which the statement is quoted or references, reaction extent (RE), i.e. age, of person, when the citation or usage was implemented. as example *par excellence*, and title of publication:

Person	Date	Age	Publication
Pierre Laplace (1749-1827)	1802	53	Conversation with Napoleon Bonaparte (1769-1821) [age: 33]
William Reed (1806-1876)	1839	33	“The Infancy of the Union” (see: below) [13] In his *Mathematical Psychics* (pg. 134), via citation to Louis Bourrienne’s *Memoirs of Napoleon Bonaparte* (1836), he seems to cite the anecdote: [16]
Francis Edgeworth (1845-1926)	1881	36	“Thus it appears that the mathematical method makes no ridiculous pretensions to authority in practical politics. There is no room for the sarcasm of Napoleon complaining that Laplace wished to govern men according to the differential calculus. The sense of practical genius need not take offense. The mathematical method has no place in camps or cabinets; but in a philosophic sphere in which Napoleon had neither part nor lot, and which he scouted as 'Ideology'.”
Walter Ball (1850-1925)	1888	38	*A Short History of Mathematics* [12]
Jean-Paul Sartre (1905-1980)	1945	40	“Existentialism is a Humanism” [10]
Paul Samuelson (1915-2009)	1965	50	“Causality and Teleology in Economics” [9]

George Scott (1921-2002)	1985	64	*Atoms of the The Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* [17]
Francis Crick (1916-2004)	1994	78	*The Astonishing Hypothesis: the Scientific Search for the Soul* [11]
Richard Dawkins (1941-)	2006	65	*The God Delusion* (pg. 68n)
Christopher Hitchens (1949-2011)	2007	58	*God is Not Great* (pg. 66-67)
Karen Armstrong (1941-)	2009	68	*The Case for God* (pg. 227)
Greg Graffin (1964-)	2010	46	*Anarchy Evolution: Faith, Science, and Bad Religion in a World Without God* (pg. 1) (Ñº)
Sharon McGrayne (c.1950-)	2011	61	*The Theory that Would Not Die* [14]

Overview

In 1796, French physicist Pierre Laplace (IQ=190), who in published his *Exposition of the System of the World*, which outlined the mathematical details of the nebular hypothesis, the theory that the solar system formed billions of years ago from a quickly rotating nebula, or interstellar gas cloud, and that the planets and the sun coalesced from this rotating mass in accordance with the mechanical laws of nature. Laplace based his nebular hypothesis derivations on the previous work of Swedish polymath Emanuel Swedenborg (IQ=190) whom in his 1734 (284 PE) treatise *On the Principles of Natural Things* had postulated that the formation of the solar system occurred as follows:

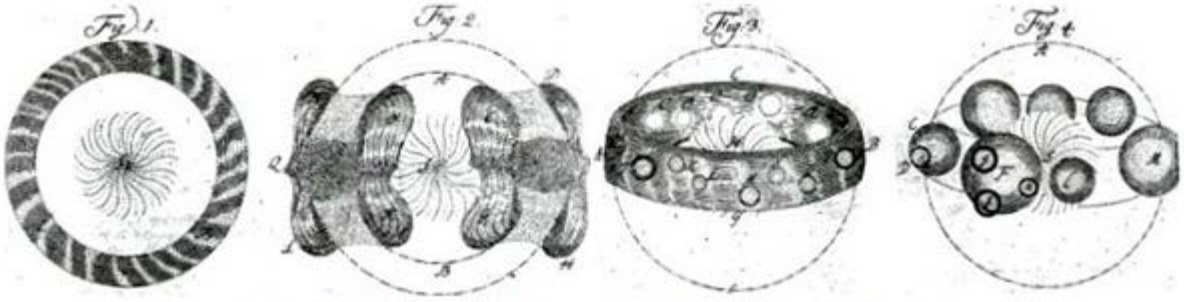

Emanuel Swedenborg's 284 "Formation of the Solar System" Diagram

Swedenborg hypothesized, as shown in figure one, that first the crust formed by the original nebula as it solidified is about to burst; then, figure two, the state of confusion and collapse as pieces of the sun are scattered through space; then, figure three, the crust reformed as a disc surrounding the proto-sun; lastly, figure four, the pieces separated into individual spheres: the planets. Laplace's version of this model soon became the standard model of the origin of the solar system.

The central argument of Laplace was 'consideration of planetary motions thus leads us to think that, as the result of excessive heat, the solar system originally extended beyond the orbits of all the planets, and that it contracted by

successive steps to its present limits. In the assumed primitive condition of the sun, it resembled those nebulae which are shown by the telescope to be composed of a more or less brilliant nucleus, surrounded by nebulosity which, in condensing toward the surface of the nucleus, transforms it into a star.' In other words, the solar system formed, according to Laplace, by the slow rotative contraction of the nebula around the nucleus of a newly ignited star.

Over the next three decades, Laplace expanded on this early work with the writing of his five-volume opus *Celestial Mechanics*, a sort of updated translation English physicist Isaac Newton's 1686 *Principia*, the book that introduced the laws of motion, albeit written in the language of differential calculus, in which, in Laplace's own words, he set himself the task to write a work which should 'offer a complete solution of the great mechanical problem presented by the solar system, and bring theory to coincide so closely with observation that empirical equations should no longer find a place in astronomical tables.'

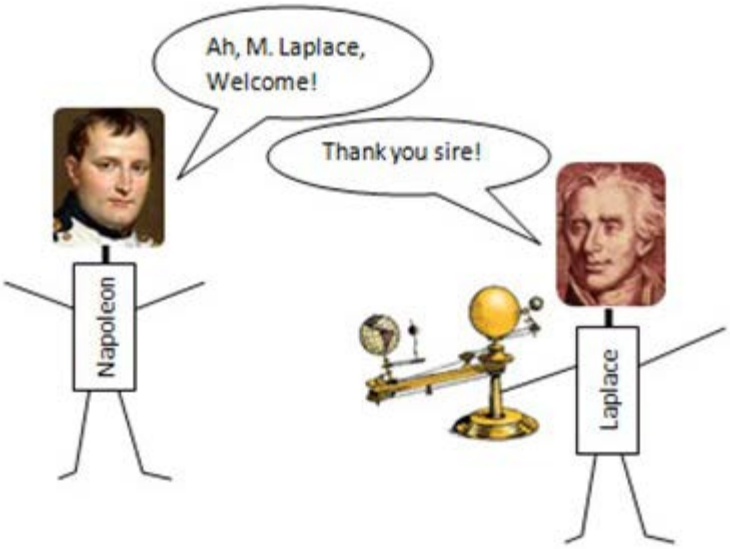

Napoleon Bonaparte greeting French physicist Pierre Laplace (1802) to congratulate him on his newly published *Celestial Mechanics*.

The first two-volumes of Laplace's *Celestial Mechanics* were published in 1799 and that year given to Napoleon, one of his former students, as a gift to which Napoleon replied 'the first six months to which I can spare will be employed in reading it.' [2] When he finally did finish reading it, Napoleon, the emperor of a predominately Catholic empire, albeit himself an agnostic of the most profound kind, interjected into a famous dialog with Laplace on the religious implications of his new mechanical model of the origin and operation of the universe, a conversation said to have occurred on August 8th, 1802—the day the *universe*—the universe of the scientific elite—became Godless (as pictured adjacent).

This famous conversation, as reconstructed below, with Napoleon essentially curious to know Laplace's views on God, has since been told and retold so many times, said to have occurred in different years and in a number of different circumstances, scenarios, and points of view that a number of differing versions of the conversation exist. [3] Whatever the exact details and circumstances of the conversation, that is whether Napoleon visited Laplace or Laplace visited Napoleon, whether Napoleon was referring to Laplace's *Celestial Mechanics* or his *Exposition of the System of the World*, whether Napoleon was comparing the God-free universe model of Laplace to the God-tinged work of Lagrange or that of Newton, whether the conversation occurred in 1802 or 1812, whether Napoleon had read the book prior to the conversation or not, along with subtleties attributed to French to English translation renditions, among other details, the gist of the dialog is said to have occurred as follows: wherein first (left) he queries Laplace and then next, greatly amused by the response, quickly conveys the dialog to Laplace's intellectual comrade Italian mathematical physicist Joseph Lagrange (IQ=185) who corroborated (right):

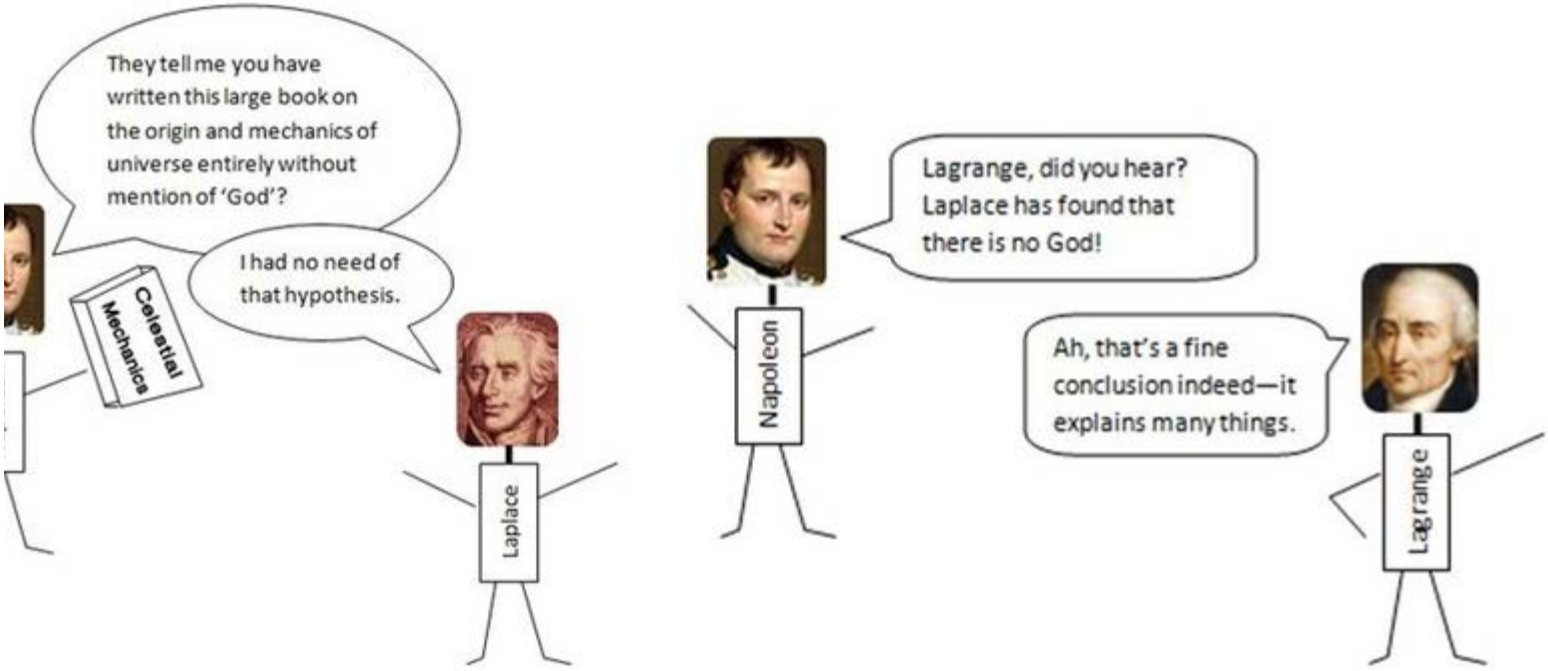

ıdition of Napoleon querying Laplace about why there is no mention of God in his new book on the mechanics of the universe. Right:
of Napoleon telling Lagrange about his interaction with Laplace on the question of the existence of God in the framework of the new mechanical

Another version is: [8]

> Napoleon says, "François, you wrote this whole book on astronomy, and you didn't once mention God." Laplace replies, "I had no need of that hypothesis." Hilarity ensues.

And so it came to pass—in the centuries to follow—that among the elite of the elite of the scientific community, the universe, the *Laplacian universe*, that is to say, was Godless. The universe of the lay public, the so-called *moral universe*, however, remained a different story and is the story we intend to address herein.

Napoleon, to note, in the decades to follow, during his various debates with others on religion, would frequently refer back to these early conversations with Laplace, Lagrange, and the other faculty members of the *École Polytechnique*, about their convictions that there is no God, as sorts of anchor points to get his own bearings, right up until his last years. In one debate with his personal assistant General Baron Gaspard Gourgaud, during the years 1812-1816, on the subject of Gourgaud's opinion that staring up at the starry heavens leads one to an amazement and wonder in the greatness of God, Napoleon replied: [4]

> "How comes it, then, that Laplace was an atheist? At the Institute neither he nor Monge, nor Berthollet, nor Lagrange believed in God. But they do not like to say so."

This statement, made about the great leading scientists of Napoleon's day is more or less a verbatim description of the views held by the leading scientists of our day—nearly all do not believe in God, but do not like to say so. This issue will be a central focal point of this book. In other words, although scientists no longer believe in God, considering divine intervention as being an *unneeded hypothesis*, what exactly scientists do believe remains a bit of an obscure picture.
Gourgaud went on to comment in rebuttal or rather defense of his Christian beliefs that 'I own that I believe firmly in God, and cannot

conceive how men can be atheists. To proclaim themselves such seems to me mere mental braggadocio'. To this abrasive comment, Napoleon retorted:

> "Bah! Laplace was an atheist, and Berthollet too. At the Institute they all were atheists, and yet Newton and Leibnitz were believers. Atheists compare man to a clock; but the clock-maker is a being of superior intelligence. They grant that creation is the result of matter, as warmth is the effect of fire."

Newtonian mechanics led Laplace to believe that the whole universe could be described by a world equation of the (vector) form $dX/dt = F(X)$. He boasted that given these laws of causality and the initial conditions of the universe at any instant of time, he could, in principle, predict the whole future in all of its details. When Napolean asked Laplace, "What is the role of God in your system?", the illustrious writer of *Celestial Mechanics* replied, "Sire, I have no need for that hypothesis." (On hearing of this, Lagrange, who has been called the Shakespeare of mathematics, is supposed to have said, "Yes, but what a beautiful hypothesis it is.")

Napoleon Bonaparte

Pierre Laplace

Joseph Lagrange

A truncated synopsis of the **Napoleon Laplace anecdote** from American economist Paul Samuelson's 1965 "Causality and Teleology in Economics." [9]

To pause and reflect on this frank statement, we notice, firstly, a definite century shift in the thinking mindset of the modern intellectual, specifically from that of a science framed in the workings of a creator God, the Newtonian universe (1727), to that of a science framed in the workings of a Godless universe, the Laplacian universe (1827). Secondly, the *new atheists*, that is the hard scientists of the modern day, no longer compare man to a clock but to that of a multi-element animated reactive molecule, by virtue of the finding that each human, identical twins aside, has a definite, unique, and measurable human molecular formula—and molecules do not behave like clocks. Lastly, we grant that creation is the result of chemical synthesis, the interaction of matter *and* energy, driven by the dynamics and operation of the universe, just as warmth is the effect of fire.

Soul discussions

A central unresolved issue that remained in the Laplacian universe model, one that was frequently on the mind of Napoleon, as it is on the mind of many this very day, is the nature of life and death, the origin of life, and that most-sacred of all terms the *soul* (or as other contexts *spirit*)—a single word that in one passing embodies morality, meaning, and purpose. [6] As Napoleon commented in April of 1817 during a conversation with Gourgaud who at the time was praising the *Celestial Mechanics* of Laplace:

> "I often asked Laplace what he thought of God. He owned he was an atheist. Many crimes have been committed in the name of religion. The oldest religion is the worship of the sun [Ra theology]. Where is the soul of an infant? I cannot remember what I was before I was born; and what will become of my soul after my death? As to my body, it will become carrots or turnips. I have no dread of death. In the army I have seen many men suddenly perish who were talking with me."

Where is the soul of the infant, indeed? The soul is a term of Egyptian origin, which connotes the summation of one's right or wrong motions, morally speaking, throughout one's total state of existence. In its original formulation, the soul was said to be located heart and called the 'ba' and something that could be measured on a scale in the judgment hall in the afterlife. While the majority of this soul weighing theory is mythological, a person, or for that matter any atom or molecule, animated or not, does have combinations of natural and unnatural "motions", and any and all motions are quantitative measurements of *work*—or forces moving objects per unit distance—that are quantified in units of joules, the unit of energy. There is, therefore, some residual semblance of scientific truth to the notion ancient concept of the soul—although not to the effect that there is some measureable mass of moral nature found in one's body—such as in the pineal gland, as famously postulated in 1620 by French philosopher Rene Descartes—but rather in one's motions,

which are both natural and unnatural.

The subject of the nature of the soul was a question that plagued Napoleon up until his last days. In fact, in 1820, a year before his death, Napoleon was experimenting with seeds and plants of melon, spinach, sorrel, asparagus, salad, artichokes, cucumber, radishes, and endives, to figure out or rather gain insight into the search for the origin of life and nature of the soul. During these investigations, Napoleon entered into a dialog with his personal physician Francois Antommarchi as to the whereabouts of the soul, during which time he commented again on his retrospect conversation with Laplace on God: ‘You do not believe it, you doctors are above such weakness. Tell me, you who know so well the human body, who have probed into all its ramifications, have you ever come across the soul under your scalpel? Where is it? In which organ?’ 'I hesitated to respond,' says Antommarchi. 'Come now, frankly, there is not a doctor who believes in God, is not that so?' 'No, Sire, they are ensnared by the demonstration, they accept the dictum of the mathematicians.' 'Eh, but the latter are generally religious. Your reply, however, recalls to me a curious remark. I was talking to Laplace , I was congratulating him upon a book he had just published and I asked him how it was that the name of God, which was so incessantly repeated in the writings of Lagrange, did not appear even once in his work. The reason,' he replied, 'is that I had not had occasion to make use of that hypothesis’.’ [7]

These open and frank and Napoleonic conversation dialogs, which in modern terms would be akin to JFK going down to MIT and having a one-on-one discussion of belief systems with every professor, offer a glimpse into a subject that has become a rather taboo discussion topic in the modern day and is a taboo that we intend to break with herein and to continue onward in the framework of this open and frank style of Napoleonic dialog.

In any event, the Napoleon Laplace dialog is often said to mark the start of the "Godless universe" model of modern science.

Other

French philosopher Jean-Paul Sartre, in his 1945 “Existentialism is a Humanism” lecture, attributed some possible variant of the above to someone in the year 1880, as follows: [10]

> “Around 1880, some French professors attempted to formulate a secular morality, they expressed it more or less in these words: God is a useless and a costly hypothesis, so we will do without it.”

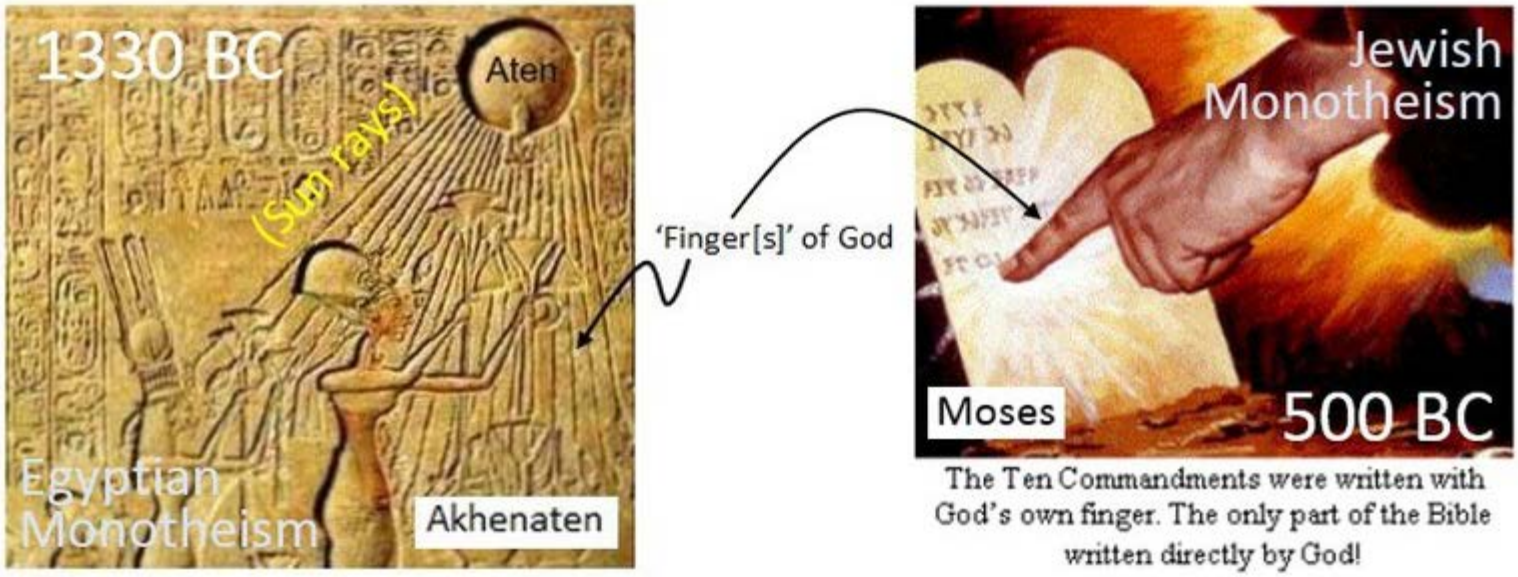

A depiction of long outstretched "fingers of Aten", i.e. sunrays anthropomorphized, of the sun-god Aten being worshiped in 1330BC by the Egyptian monotheism-believing pharaoh Akhenaten, cited by American politician William Reed in 1838 as a theory or hypothesis that we need to keep in order to explain political union formation.

Reed's description | 1839

In 1839, American politician William Reed, in his “The Infancy of the Union” address, delivered before the New York

Historical Society, had the following rather religion-siding message to say about the anecdote: [13]

> "And how was the Union made? Has it a date, a day or a year, like the declaration of independence or the constitution? Was it done in convention? Did men come together by some appointment, and deliberate in solemn council, and ordain a Union? Never. It was the work of time—the natural result of things—the growth of circumstances, or whatever other plausible, but really unmeaning phrases, may be used as a substitute for an acknowledgment of God's providence in the destinies of mankind. It is related — we do not vouch for the accuracy of the story, though we can well believe it:
>
> > When **Napoleon inquired of Laplace**, why he had not mentioned god in his *System of the World*, the *savant* replied, because he could dispense with that hypothesis.
>
> In contemplating the political system of our country, there are minds which doubtless would dispense with the same hypothesis in many particulars, not looking beyond the secondary cause of human agency. But in the formation of the Union, the hypothesis not only cannot be dispensed with, but it is the only adequate cause that can be offered, to explain the effects. Let anyone, taking for his point of mental vision the present day, look back to the years, when the separate companies of the primitive colonists, the hapless followers of the hapless Raleigh at the south, and the iron-nerved pilgrim band at the north; and though the observer should be Bunyan's Little-Faith, or Mr. Worldly-Wiseman, he could scarce fail to trace the controlling power of divine agency. The way was preparing, slowly, cautiously, laboriously, for an era, in which there was to be a mighty development of the capacity of man for self political government. The course of events was led on so tranquilly, that there was given no note of preparation to intimate to human intelligence, what was in reserve at no very distant futurity. The Union was coming on, the chief great means of achieving a system of popular government on a widely extended territory. The ground was made ready and the foundations laid, and it only remained for human sagacity to carry out a plan, which, in humble confidence we may say, was traced by the finger of God."

This so-called "finger of god" reasoning behind the formation of the union, is reference to Egyptian pharaoh Akhenaten's 1330BC monotheistic Aten (Ñº) theory of god, whose long stretched out "fingers", shown above, were conceptualized as the rays of the sun, a model that was incorporated into passages of the Christian Bible, in particular the method (Ñº) cited by which the 10 commandments (i.e. 42 negative confessions) were written onto stone tablets, which Reed unknowingly cites as the "cause" behind the formation of the American union.

The three main two cultures namesakes books, written in a Clausius-based reformulation of the humanities, the first not mentioning the term "god" (although mentioning "religion" 22+ times), the second written without mention the the term "god" (although Muhammad the "Prophet (b.p.u.h.)" mentioned 19 times), albeit a concept believed inherently by the author, the third written by an an author, like Laplace, "without the need of that hypothesis [of god]", but acutely aware of the void left in its wake.

Social mechanics | Physicochemical sociology

While Laplace may very well have "had no need" for the hypothesis of god in his 1802 formulation of "celestial mechanics", the same has not necessarily been the case for "social mechanics".

If, in fact, to given an equivalent scenario, in 1898, Eugene Fuffy, the then president of the Swiss Confederation, would have gone down to the University of Geneva and asked Leon Winiarski why the word god or "dieu" (French) is not to be found in his *Essay on Social Mechanics*, Winiarski would have been hard pressed to reply back that he had no need of that hypothesis, because he does in fact employ the word "religion" 21+ times in his book. [1]

Likewise, in Mirza Beg's 1987 *Physicochemical Sociology*, we find citation of Muhammad the "Prophet (b.p.u.h.)" mentioned 19 times.

(add)

Further reading

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Wormeley Latimer, author of *France in the Nineteenth Century*) (ch. 17: Religion, pgs. 270-81). A.C. McClurg & Co.
6. Note: aside from 'soul', there are a number of derivative and or near synonymous terms that convey, in a roundabout sense, the same essential message, including spirit, spirituality, karma, among many other variants; some of which we will attempt to address herein.
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θΔics

In chnops-thermodynamics, **Nasif Nahle Sabag** (1951-) is a Mexican-born American biologist noted for his publications, beginning in 1999, on the topic of a Gibbsian-based thermodynamic quantification of life and death. [1] In 1975, Nahle co-founded the *Biology Cabinet*, in New Braunfels, Texas, an institute of scientific research and education in biology. [2]

Objections

In 2010, Nahle seems to have begun to attracted a bit of a crank, new ager, fringe status of sorts. In 2010, to give an example, Ian Forrester, in comment to English computer scientist Tim Lambert, stated the following: [4]

> "Yes **Nasif Nahle** is a complete whack job. I did a little bit of searching and found that he has one English paper listed by Google Scholar. It is published in a 'journal' called *Journal of Human Thermodynamics*. It contains such gems as: 'On the Mechanical Equivalent of Heat and Occupation', 'Facial Vibration Imaging Technology and Quantification of Thermodynamic States of Individuals', 'Coriolis Force and Asymmetry in Chemical-Biological Evolution', and 'Human Thermodynamics and Business Efficiency'. The journal is run by someone called Libb Thims who is even more of a crank than NN."

Likewise, in 2012, similar jabs can be found in respect to his global warming theories. (Ñº)

Education

Nahle completed his BS in biology in 1977 from the Autonomous University of Nuevo Leon, in San Nicolas de los Garza, Mexico, where he focused on topics such as thermodynamics, heat transfer, physical chemistry, biophysics, and radiobiology. In 1994, Nahle became certified in antibiotic therapy, from the same university. In 2001, Nahle completed an MS level of work at Harvard School of Medicine on complementary, alternative, and integrative medical research.

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1. (a) Nahle, N. (1999). "Life". *Biology Cabinet*. New Braunfels, TX.
(b) Nahle, N. (1999). "Biological Death". *Biology Cabinet*. New Braunfels, TX.
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2. Biology Cabinet – About Us.
3. Nasif Nahle (about) – BioCab.org
4. Posted by: Ian Forrester, 03 Apr 2010.

θΔics

In existographies, **Nassau Senior** (1821-1894) was an English economist, lawyer, and government advisor, noted for []

Quotes | By

The following are quotes by Senior:

> "The science of statistics is far wider as to its subject matter. It applies to all phenomena which can be counted and recorded. It deals equally with matter and with mind. Perhaps the most remarkable results of the statistician's labors are those which show that **the human 'will' obey laws nearly as certain as those which regulate matter**."
>
> — Nassau Senior (1860), "Opening Address President of Section F (Economic Science and Statistics) at the British Association", Oxford, Jun 28 [1]

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1. (a) Senior, Nassau. (1860). "Opening Address President of Section F (Economic Science and Statistics) at the British Association", Oxford, Jun 28; in: *Journal of the Statistical Society of London* (quote, pg. 359), 23:357-.
(b) Ball, Philip. (2004). *Critical Mass: How One Thing Leads to Another* (pg. 66). Farrar, Straus and Giroux.

External links

â— Nassau William Senior – Wikipedia.

θΔics

In human physics, **Nassim Haramein** (1962-) is a Swiss-born American new age theoretical physicist noted for his 2004 “spacetime torque” model of stellar movement, developed in coordination with American nuclear physicist and engineer Elizabeth Rauscher, which is based on the inclusion of torque and Coriolis force terms in Einstein’s field equations to formulate a universal model of “spin”. [1] On this basis, in contrast to the big bang model, he outlines a torus shaped infinite universe model, in a way that everything is connected, humans included.

Spirituality | Vacuums

Haramein, seemingly, is oft-cited or discussed as having attempted to bridge the gap between science and spirituality, or geometry and spirituality, wherein he supposedly equate the power of the vacuum to God, or something along these lines. (O)

Spin

Haramein's model explains that in the framework of German-born American physicist Albert Einstein’s spacetime geometric model of gravity, the measured velocity of the sun (240 km/s), moving in a direction toward the great attractor, acts to pull the planets along with it, sort of like water going down a drain, the drain shaped like a trampoline with a bowling ball sitting on it, whereby a modified type of Coriolis force and torque act to create a three-dimensional coil-like spin-forward trajectory of stellar system movement. Haramein argues that this model accounts for the ubiquitous nature of spin throughout the universe, from the subatomic to the supergalactic.

Humanities

In discussing how his theory applies to the human movement scale, although he doesn't seem to touch on subjects such as Austrian physicist Ernst Mach's circa 1885 turning tendencies or American chemical engineer Libb Thims' circa 2004 human molecular spin, he does touch on a mixture of loose thermodynamics, information, and energy exchange with a person’s boundary, speaking about things deteriorating towards entropy, but all-in-all the discussion seems to diverge into the metaphysical, to a large part, e.g. speaking about the hidden energies of the structure of the vacuum, auras, consciousness or awareness. [2]

Education

Haramein seems to be self taught with little formal education. He states that at age nine he began to develop a basis for a unified hyperdimensional theory of matter and energy.

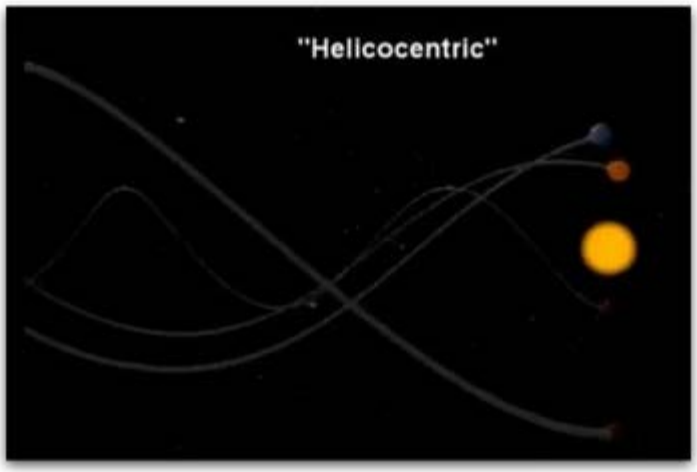

Haramein’s 2003 **spin trajectory spacetime model** heliocentrisim of the sun moving towards the great attractor at a speed of 240 km/s, pulling the planets along with it, according to a torque-spin model of spacetime.

In circa 1990, Haramein entered into a self-study period of physics in efforts to figure out the nature of spin. In 2003, he founded a new-age science non-profit group called The Resonance Project in Hawaii.

Quotes

The following are representative quotes:

"Biology is the feedback mechanism for the universe to learn more about itself."

— Nassim Haramein (c.1990) (Q)

"Looking for consciousness in the brain is like looking inside a radio for the announcer."

— Nassim Haramein (c.1990) (Q)

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- Nassim Haramein (personal) – TheResonanceProject.org.

θΔics

In existographies, **Nassim Taleb** (1960-) (CR:3) is a Lebanese-born American risk engineer, noted for []

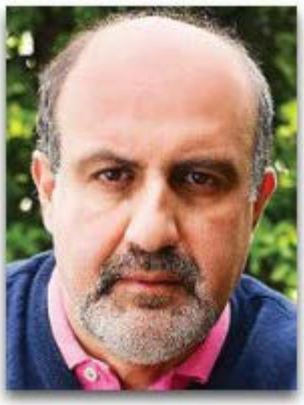

Overview

Taleb, in human physics, penned a trio of books, namely: *Fooled by Randomness: the Hidden Role of Chance in the Markets and in Life* (2001), *The Black Swan: the Impact of the Highly Improbable* (2007), and *Antifragile: Things That Gain from Disorder*, themed on the use of mathematics and physics concepts such as randomness, probability, uncertainty, entropy, equilibrium, disorder, dissipative structures, among others, citing thinkers such as Ilya Prigogine, Stuart Kauffman, etc., with the general aim to outlined insight into catastrophe dynamics and other heightened transition state social models.

Taleb's work is similar, in some respects, to the social physics work Mark Buchanan and Malcolm Gladwell.

Education

Taleb received his BS and MS from the University of Paris, his MBA from the Wharton School at the University of Pennsylvania, and PhD in management science, dissertation on the mathematics of derivatives pricing, from the University of Paris (Dauphine). Taleb currently is he is currently professor of risk engineering at New York University's Polytechnic Institute.

Quotes | On

The following are quotes on Taleb:

> "IQ measures something specific, linear reasoning so to say, or first order reasoning. So you have a problem, which is well-defined, and you know there is an answer, and you find the answer on the test [see: IQ test]. But in real life, where things are 'complex', and there aren't obvious answers, or maybe no answers, to a particular problem, and things are just multi-dimensional, the **IQ stops working**, really. It works if you're just doing pure mathematics, for instance. But if you're an entrepreneur, then things are much more complicated. So this is the problem with IQ."
>
> — Jaanus Vogelberg (2018), "The Great Twitter IQ debate: Taleb Won!" (Ñº), Dec 24

> "The world is full of well-educated people who have made stupid choices, a phenomenon referred to by scientists as 'dysrationalia'. A survey of Canadian Mensa Club members, whose membership is limited to those in the top two percentiles of IQ, demonstrates this nicely. Among those surveyed, 44% believed in astrology, 51% bought into biorhythms and 56% believed that earth has been visited by aliens. Martin Heidegger, a well-respected philosopher, used his keen mind in support of the Nazi party, using spurious arguments to defend reprehensible behavior. William Crookes, who discovered the element thallium, was repeatedly swindled by spiritual mediums but could never be persuaded to give up his spiritualist beliefs. And Isaac Newton, a scientist without equal, lost his fortune in the South Sea Bubble through a fundamental misunderstanding of the nature of markets and human behavior. Smarts, it would seem, are no guarantee of being a rational actor. Yes, the lessons you have just learned will be least available to your mind when they are most needed. Studies suggest that we lose roughly 13% of our cognitive capacity under stress, lending credence to **Nassim Taleb**'s advice: 'Even once we are aware of our biases, we must recognize that knowledge does not equal behavior. The solution lies in designing and adopting an investment process that is at least partially robust to behavioral decision-making errors."
>
> — Daniel Crosby (2019), *Behavioral Investor* [1]

References

1. Crosby, Daniel. (2019). *Behavioral Investor* (pg. #). Jaico Publishing.

Further reading

â— Taleb, Nassim. (2019). “IQ is Largely a Pseudoscientific Swindle” (Ñº), Medium.com, Incerto, Jan 1.

External links

â— Nassim Taleb – Wikipedia.

θΔics

In hmolscience, **Nathan Brown** (c.1977-) is an English-Canadian philosopher noted for co-hosting the 2011 To Have Done With Life conference.

Education

Brown completed his BAH and MA at Queen's University, PhD at the University of California Los Angeles, and presently is professor of poetics at Concordia University, Montreal, where he teaches graduate courses on Martin Heidegger (*Being and Time*), Georg Hegel (*Science of Logic*; *Phenomenology of Spirit*), Rene Descartes, Benedict Spinoza, David Hume, Immanuel Kant (*Critique of Pure Reason*), and Alain Badiou (*Being and Event*).

Quotes

The following are noted quotes:

> "The problem for biology, then, is that it is constantly on the cusp of either reduction to physical chemistry or ideological capture by metaphysics."
>
> — Nathan Brown (2011), "Introduction" to *To Be Done With Life* conference [1]

References

1. Brown, Nathan. (2011). "Introduction" (Ñº), WordPress, DoneWithLife.mi2.hr.

Further reading

â— Brown, Nathan. (2007). "The Inorganic Open: Nanotechnology and Physical Being", Radical Philosophy144, July/Aug.

External links

â— Nathan Brown (faculty) – University of Concordia.

θΔics

In hmolscience, **Nathan J. Schwartz-Salant** (c.1940-) is a Swiss-born American Jungian psychotherapist noted, in psychological thermodynamics, for his 1969 to present efforts to outline a type of Jungian spirituality model applied as a type of psychology.

Overview

In 1969, Schwartz published *Entropy, Negentropy, and the Psyche: an Inquiry into the Structure of Psychic Energy*, his PhD thesis, which was followed by articles and books on entropy and negative entropy applied to the psyche. [1]

In 1998, Schwartz published *The Mystery of Human Relationships*, wherein he outlines a spiritual Jungian psychology theory of relationships.

Education

Salant completed his thesis in 1969 on "Entropy, Negentropy, and the Psyche" at the C.G. Jung Institute Zurich. [1] Salant is thus a student of the work of Carl Jung. He currently has a psychotherapy practice in New York, Princeton, and New Jersey.

References

1. Schwartz, Nathan. (1969). *Entropy, Negentropy, and the Psyche*: *an Inquiry into the Structure of Psychic Energy* (WorldCat) (Google Books), 222-pgs., PhD thesis, C.G. Jung Institute Zurich.
2. Schwartz-Salant, Nathan. (1998). *The Mystery of Human Relationships: Alchemy and the Transformation of the Self* (entropy, pg. 11). Routledge.

Further reading

â— Schwartz, Nathan and Schwartz, Sandra R. (1970). "On the Coupling of Psychic Entropy and Negentropy" (link), *Spring*, 51: 67-90.

θΔics

In hmolscience, **Nathaniel Shaler** (1841-1906) was an American paleontologist noted, in cessation thermodynamics, for his 1891 to 1900 lectures and publications on the subject of what seems to be an energy-based reinterpretation of the soul, people defined as an "organic individuality" derived from atoms via an aggregation process.

Overview

In 1891, Shaler gave his *The Interpretation of Nature* lecture series, turned book, a course of theological seminary student lectures, on the strained relations between natural science and religion, wherein he talked about how as a youth contact with the natural sciences “had the not uncommon effect” of leading him far away from Christianity, but that in recent years he insights into certain “truths of nature”, as he says, has led him back to some type of scientific reinterpretation of religion.

Shaler, here, discusses the differences between “inorganic and organic individualities”; and on the question of what constitutes a “living thing” mentions how Brownian motion, namely that “finely divided particles of many substances when suspended in a fluid will, under the influence of some forces as yet not well understood, take on an incessant movement”, and the properties of crystals of rocks, e.g. changes in constitution to make new materials, being similar to animals and plants, both obfuscate the old once-held definitions of what constitutes life:

> “In truth, we can no longer maintain the existence of a clear physical difference between the organic and the inorganic world, and must regard these realms as divided from each other by features which when measured in a formal way are most unsubstantial.”

Later, in his section on materialism, energy, and the soul, states:

> “A generation ago we conceived that matter was an inert something which was quickened into activity by energy, and that this energy was in its nature essentially different from the physical basis of the universe. The confidence of those who held to the opinions commonly termed materialistic was largely due to this belief in the dual organization of nature. Observing the ever-changing character of the natural forces and the endless transmutations which they undergo in action, and noting at the same time what seemed to them the inert character of substance except when stirred into motion or built into form, they naturally were led to deny the immortality of the soul, and to base their negations, as they supposed, on a firm material foundation. Of late years, however, the opinion has been gaining among physicists that matter itself is but a mode of action of energy, and so in place of the dualistic basis, naturalists are being driven to a conception of unity as regards the phenomenal world.
>
> It is not difficult to see that in proportion as we come to the opinion that nature is but an exhibition of energy in various forms of presentation we are driven to a new conception as to the essential conditions of existence. It is obvious that we are less entitled than of old to make statements based upon the evanescent character of energy, or to suppose that we have compassed the range of its modes of action. The correction brings with it no affirmation, but it diminishes our trust in the ancient disbeliefs.”

(add discussion)

In 1900, Shaler, in his *The Individual: a Study of Life and Death*, outlined, albeit in rather inconclusive discussions, views on the conservation of energy in the context of immortality; the following is an excerpt: [2]

> “How is it that the naturalists are led to the false sense of certainty as to the value of their explorations in determining such questions as the immortality of the soul? The reasons for this state of mind, appear to be

> as follows: the conception that all the occurrences of the visible universe are related in the manner of antecedent and consequent or as cause and effect, that nothing lies without the enchainment of action, along with the conviction, eminently well founded, that energy involved in action is never lost, but only changes its form of activity."

Shaler, supposedly, wrote also on moral philosophy in general.

Students

American zoologist and biologist William Patten was a noted student of Shaler.

Education

In 1905, Shaler was a professor of geology at Harvard University.

References

1. Shaler, Nathaniel. (1891). *The Interpretation of Nature: Winkley Foundation Lectures, Delivered before students of Andover Theological Seminary* (Brownian motion, pg. 111; soul + energy, pg. 285). Houghton, Mifflin and Co, 1893.
2. Shaler, Nathaniel. (1900). *The Individual: a Study of Life and Death* (ch. XV: Immortality, pgs. 286-346; conservation of energy, pgs. 291-92). D. Appleton and Co.

External links

â— Nathaniel Shaler – Wikipedia.

θΔics

In existographies, **Nathaniel Umukoro** (1977-) (CR:2) is a Nigerian political scientist, noted for his application of thermodynamics to social conflict management (2003) and to border security, migration, and strategic studies (2016). [4]

Overview

In 2003, Umukoro completed his MS thesis on “Thermodynamics: Application of its Principles to Conflict Diagnosis, Management and Resolution in the Niĝer Delta of Nigeria” (see: human thermodynamics dissertations).

In 2016, Umukoro, in his “Thermodynamics: Application of its Principles to the Effects of Cross-Border Migration and Boko Haram Crisis on Security Challenges in Africa”, citing the socio-thermodynamics theories of Ingo Muller, among others, attempted to look at the "Boko Haram" problem, e.g. talked about by Ayaan Ali, in terms of thermodynamics, via the key terms: heat transfer, thermal equilibrium, exothermic reaction, and entropy, wherein he digresses on concepts such as "conflict energy", "conflict temperature", and "conflict explosion". [2]

Education

Umukoro completed a BS in local government management, in c.2001, at University of Benin, Nigeria; an MS, in 2003, with a dissertation on “Thermodynamics: Application of its Principles to Conflict Diagnosis, Management and Resolution in the Niĝer Delta of Nigeria”, in the in humanitarian and refugee studies department of University of Ibadan, Nigeria; an MA in 2010 with a dissertation on “Environmental Scarcity and Violent Conflicts in the Niĝer Delta”, and a PhD in 2015 with a thesis on “Regime Type, Human Rights Violations and Conflict Escalation in Nigeria’s Niĝer Delta”, the latter two both at the in the Peace and Conflict Studies Department at University of Ibadan, Nigeria. Umukoro, in 2016, was associated with the Department of Political Science of Delta State University, Abraka, Nigeria. In 2019, Umukoro was the senior lecturer and head of the political science department at Edo University, Iyamho, Edo State, Nigeria. [2]

Quotes | By

The following are quotes by Umukoro:

> “Ingo Muller introduced the concept of “socio-thermodynamics” which focuses on the study of racial divisions and separations in society, which can be understood from a phase-diagram perspective (Müller, 2002). Rees and Wackernagel (1996) also used the principles of thermodynamics to explain why cities cannot be sustainable. Similarly, Peon-Escalante and colleagues (2007) used the entropy conception thermodynamics to study organization development and change. Garcia-Gonzalez (2011) also used the principles of thermodynamics to study how problems created by the economic system in industrialized countries can be confronted. The successful application of the principles of thermodynamics in the social sciences made Jitao Wang (2009) conclude that ‘achievement of thermodynamics has influence not only on natural sciences, but also on social sciences and philosophy’.”
>
> — Nathaniel Umukoro (2016), “Thermodynamics: Application of its Principles to the Effects of Cross-Border Migration and Boko Haram Crisis on Security Challenges in Africa” [3]

References

1. Umukoro, Nathaniel. (2016). “Thermodynamics: Application of its Principles to the Effects of Cross-Border Migration and Boko Haram Crisis on Security Challenges in Africa” (pdf) (abs), *Journal of Applied Security Research*, 11(1):44-60.
2. Nathaniel Umukoro (cv) – Academia.edu.
3. (a) Umukoro, Nathaniel. (2016). “Thermodynamics: Application of its Principles to the Effects of Cross-Border Migration and Boko Haram Crisis on Security Challenges in Africa” (pdf) (abs), *Journal of Applied Security Research*, 11(1):44-60.

(b) Muller, Ingo. (2002). “Socio-thermodynamics: Integration and Segregation in a Population”, *Continuum Mechanics and Thermodynamics*, 14:384-404.
(c) Rees, William. and Wackernagel, Mathis. (1996). *Our Ecological Footprint: Reducing Human Impact on the Earth* (thermodynamics, 5+ pgs). New Society Publishers.
(d) Peon-Escalante, Ignacio, Tejeida, R, & Badillo-Pina, Isais (2007). “Entropy and Emergence in Organizations Under a Turbulent Environment” (pdf), *51st Annual Meeting of the International Society for the Systems Sciences* (TOC). Tokyo, Japan, Aug 5-10.
(e) Garcia-Gonzalez, J. (2011). “Degrowth and Sustainability Analyzed from the Perspective of Thermodynamics of Irreversible Processes.” *Journal of US-China Public Administration*, 8(12), 1425–1436.
(f) Wang, Jitao. (2009). “Modern thermodynamics: New Concepts based on the Second Law of thermodynamics” (Q), *Progress in Natural Science*, 19(1), 125–135.
4. Nathaniel Umukoro (existography) (Apr 2019) – Hmolpedia attachment.

External links

- Nathaniel Umukoro (faculty) – Edo University Iyamho.

θΔics

In science, **natural** or ‘what is natural’, as contrasted with unnatural, is defined by processes or reactions, for standard earth-bound systems, that meet the following criterion: [1]

$$dG < 0$$

This is called the Lewis inequality that are ‘thermodynamically possible’, defined in 1923 by American physical chemist Gilbert Lewis, based on the various Gibbs inequalities, which he termed as a “universal rule” for freely reacting isothermal-isobaric processes (e.g. ones that occur between reacting humans). [2] In generalized form, what is natural for any system or body of the universe is defined or quantified those processes or reactions that meet the Clausius inequality (1856).

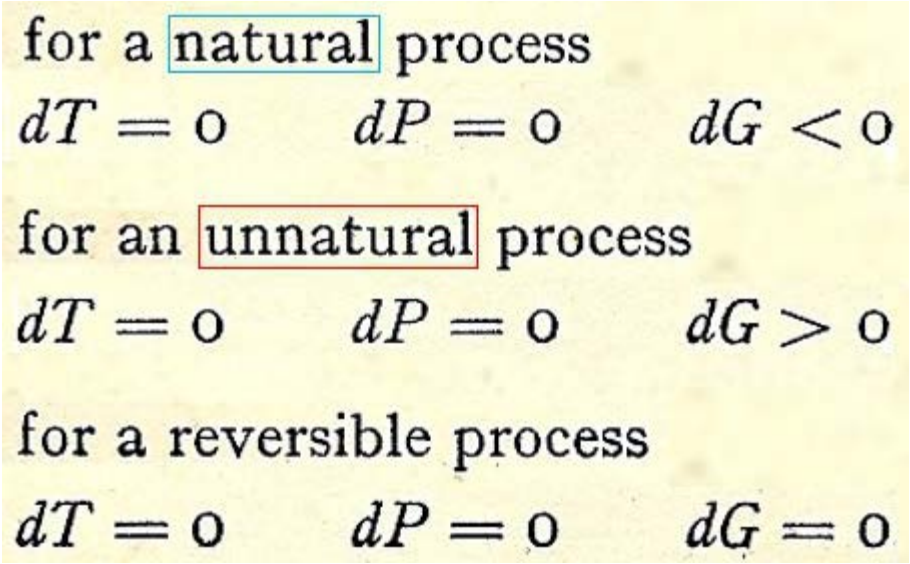

The chemical thermodynamic definition of a "**natural**" vs "unnatural" (and reversible) process, according to Edward Guggenheim (1933), based on the Clausius inequality (1862), for "freely-running" earth-bound reacting systems. [1]

Quotes

The following are related quotes:

> “**Natural** things are exactly those things which do move continuously, in virtue of the principle inherent in themselves, towards a determined goal; and the final development which results from any one such principle is not identical for any two species, nor yet is it any random result, but in each there is always a tendency towards an identical result if nothing interferes.”
>
> — Aristotle (322BC), *Physics* (2:8) [3]

See also

â— Natural science

References

1. Guggenheim, Eduard, A. (1933). *Modern Thermodynamics by the Methods of Willard Gibbs* (pgs. 5, 17). London: Methuen & Co.
2. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pg. 160). McGraw-Hill Book Co., Inc.
3. Brown, Richard H. (1977). *A Poetic for Sociology: Toward a Logic of Discovery for the Human Sciences* (pg. 130). University of Chicago Press, 1989.

θΔics

In science, **natural law** refers to one of the laws of nature or nature ruled by law and order.

Quotes

The following is a related quote:

> "It is not only in those departments of science where the uniformity of **natural law** would seem to be a legitimate deduction that the scientific method has found favor with investigators, for at the present time many of the writers on ethics and sociology and theology are attempting to apply the methods and the laws of physical science in their fields of investigation. It is noticeable, however, that it is not the new physics of energy, but the old physics of forces, which is being thus applied. The physics which has been rendered obsolete by the investigation of the century has been taken up by the sociologist, and we have this mighty organism, man, still struggling with as many forces as were formerly supposed to battle for the control of the physical bodies of his individual members. ... If there is any spiritual universe, the phenomena of ethics are spiritual phenomena. The assumption of natural law, that is, physical law, in the spiritual universe means that there is no spiritual universe. A universe governed by the laws of physics is a universe in which there is no right or wrong, justice or injustice, reward or punishment: nothing but inevitable consequences. . . . This much, at least, is certain: if there is not a uniformity of nature in social phenomena so that effects follow causes with the same certainty as they do in the physical universe, then is there no science of sociology, and no such thing as a moral or social law. In so far as man is a free, moral agent, capable of determining his own conduct, all attempts at predicting what he will do under given circumstances must fail. Only in so far as man is *governed*, not merely influenced, by laws as unalterable and unvarying as are the laws of the physical universe, can his actions furnish the materials of scientific study. If, on the other hand, there are such laws, then all attempts of man at influencing the social order will be as successful as would attempts at revising the law of gravitation."
>
> — Fernando Sanford (1899), "The Scientific Method and its Limitations" [1]

References

1. (a) Sanford, Fernando. (1899). "The Scientific Method and its Limitations" (pg. 19-21), Address at the eight Annual Commencement, Leland Stanford Junior University, May 24.
(b) Ward, Lester F. (1903). *Pure Sociology: a Treatise on the Origin and Spontaneous Development of Society* (pgs. 166-67). MacMillan, 1907.

External links

â— Natural law – Wikipedia.

θΔics

In hmolscience, **natural morality**, related to "universal morality" (Q) and "absolute morality" (Q), refers to the "good and evil" (Hobbes, 1651), in anthropo-religious speak, or "right and wrong", in secular speak, defined according to nature, as nature is understood in a physico-chemical sense, i.e. in terms of what is "natural" and "unnatural" in thermodynamic terms; morality defined by nature.

Overview

In 1809, Johann Goethe states, in cryptic form, that the "moral symbols" of nature, chemically and socially, are found in Torbern Bergman's 1775 *A Dissertation on Elective Attractions*, in other words, that the measure of chemical affinity, as determined by affinity tables and affinity reaction diagrams, is what determines right and wrong in evolutionary terms, or "metamorphosis" terms, as Goethe called his version of evolution, chemical to man.

In 1852, John Mill, in his "Nature" essay, in his discussion of Alexander Pope's 1734 *An Essay of Man* moral poetry work, gave the following semblance of ideas on natural morality: [5]

> "For how stands the fact? That, next to the greatness of these cosmic forces, the quality which most forcibly strikes everyone who does not avert his eyes from it is their perfect and absolute recklessness. They go straight to their end without regarding what or whom they crush on the road. Optimists, in their attempts to prove that **'whatever is, is right,'** are obliged to maintain, not that nature ever turns one step from her path to avoid trampling us into destruction, but that it would be very unreasonable in us to expect that she should. Pope's **'Shall gravitation cease when you go by?'** may be a just rebuke to anyone who should be so silly as to expect common human morality from nature. But if the question were between two men, instead of between a man and a natural phenomenon, that triumphant apostrophe would be thought a rare piece of impudence. A man who should persist in hurling stones or firing cannon when another man 'goes by,' and, having killed him, should urge a similar plea in exculpation, would very deservedly be found guilty of murder. In sober truth, nearly all the things which men are hanged or imprisoned for doing to one another are nature's every-day performances."

The "slave stealing parable" of Zeno of Citium seems to come to mind here.

See also

- Flower stealing model
- Goethean morality
- Morality Squared
- Physicochemical morality puzzles

References

1. (a) Mill, John S. (c.1852). "Nature", in: *Three Essays on Religion* (pgs. 3-68; Pope, pg. 28). Longmans, Green & Co., 1885.
(b) Stewart, Balfour and Tait, Peter G. (1875). *The Unseen Universe: or Physical Speculations on a Future State* (pg. 195). Macmillan.

External links

- Natural morality – Wikipedia.

θΔics

In science, **natural philosophy** refers to search for the general understanding of reality, whose main business, according to Newton (c.1690), is to argue from phenomena without feigning hypotheses, and to deduce causes from effects. [1]

Natural philosopher | Scientist

In 1833, the term "natural philosopher", which was the preferred self-description for thinkers such as Michael Faraday and Thomas Huxley, was beginning to come under question in respect to its ability to distinguish someone who worked in the so-called "real sciences" per se, after which, amid the so-called Whewell-Coleridge debate, the term "scientist" was coined, by William Whewell (1834), to satisfy this newer and harder branch in the tree of knowledge.

References

1. (a) Koyre, Alexandre. (1965). "Concept and Experience in Newton's Scientific Thought", *Newtonian Studies* (pg. 51). Chapman & Hall.
(b) Foley, Michael. (1990). *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian Mechanics* (pg. 9). Routledge, 2014.

External links

â— Natural philosophy – Wikipedia.

θΔics

In belief systems, **natural religion** refers to []

Overview

In c.1750, David Hume outlined a plan of his *Dialogues Concerning Natural Religion*, which he kept in his study drawer, which he had reviewed by his friend Gilbert Elliott (1751), eventually published posthumously (1779) per his will, wherein he opened to the following ideology:

> "Students of philosophy, as Chrysippus advises, ought first to learn logics, then ethics, next physics, and last of all the nature of the gods."
>
> — David Hume (c.1750), *Dialogue Concerning Natural Religion* [1]

The book, in short, was an attempt at a modern remake of Cicero's three-character view dialogue in *The Nature of the Gods*.

In views of Thomas Paine, according to Susan Jacoby (2004), were said to have outlined some form of "natural religion", that rejected miracles, mysteries, and ecclesiastical hierarchies; later William Garrison was said to have embraced this view. [2]

In modern terms, natural religion refers to a belief in nature as defined by what is natural, as opposed to what is unnatural, thermodynamically speaking, and that natural is coupled to unnatural, the former driving the latter.

References

1. Hume, David. (c.1750). *Dialogue Concerning Natural Religion* (pg. viii). Publisher, 1779.
2. Jacob, Susan. (2004). *Freethinkers: a History of American Secularism* (pg. 73) (rev). Publisher.

Further reading

â— James, William. (1902). *The Varieties of Religious Experience*: *a Study in Human Nature, Being the Gifford Lectures on Natural Religion Delivered at Edinburgh in 1901-1902*. The Modern Library, 1994.

External links

â— Natural religion – Wikipedia.

θΔics

In terminology, **natural right**, as opposed to "natural wrong", refers to []

Overview

In 1651, Thomas Hobbes (1588-1679) published his *Leviathan*, which set the stage for theories about natural rights.

In 1670, Benedict Spinoza (1632-1677), in his *Tractatus Theologico-Politicus* (§3), building on Hobbes and Maimonides (1135-1204), digressed on what he referred to as the natural right of things, as follows: [1]

> "By the right and order of nature, I merely mean the rules determining the nature of each individual **thing** by which we conceive it is determined naturally to exist and to behave in a certain way. For example fish are determined by nature to swim and big fish to eat little ones, and therefore it is by sovereign natural right that fish have possession of the water and that big fish eat small fish. For it is certain that nature, considered wholly in itself, has a sovereign right to do everything that it can do, i.e., the right of nature extends as far as its power extends … since the universal power of the whole of nature is nothing but the power of all individual things together, it follows that each individual thing has the sovereign right to do everything that it can do, or the right of each thing extends so far as its determined power extends."

In circa 1675, Jakob Thomasius (1622–1684), Gottfried Leibniz's teacher in Leipzig, composed a work, Adversus Anonymum, de Libertate Philosophandi, devoted entirely to the refutation of the *Tractatus Theologico-Politicus* and its underlying naturalism. Leibniz too seems to have regarded Spinoza's views on right and law as more dangerous even than Hobbes', for while Hobbes at least allowed conceptual space for a divine legislator, Spinoza did not. [1]

In 1689, John Locke argued in his *Two Treatises of Government* that political society existed for the sake of protecting "property", which he defined as a person's "life, liberty, and estate"; according to which life, liberty, and property are three main natural rights. (Q)

In 1771, Goethe, influenced by Spinoza, wrote his *Positions of Rights*, set of 56 theses, on topics ranging from natural law to inheritance law to criminal trial procedure, that he defended on August 6th allowing him to obtain a degree of licentiate of law.

In 1776, Thomas Jefferson, in the *Declaration of Independence*, stated that the three "unalienable rights" of people are "life, liberty, and the pursuit of happiness"; which some conjecture has its origins on Locke's earlier formulation. (Q)

In 1809, Goethe, building on Bergman (1775), came to see natural right and natural wrong defined by the moral symbols of physical chemistry, according to which in social interactions there is battle between "morality and passions" the result of which is determined by the measure of the chemical affinities; the measure of the affinities being determined to be free energy in by Helmholtz (1882), according to which natural right and natural wrong in modern terms are quantified by Gibbs energy differentials, as shown adjacent.

for a natural process

$$dT = 0 \qquad dP = 0 \qquad dG < 0$$

for an unnatural process

$$dT = 0 \qquad dP = 0 \qquad dG > 0$$

for a reversible process

$$dT = 0 \qquad dP = 0 \qquad dG = 0$$

The chemical thermodynamic definition of a "**natural**" vs "unnatural" (and reversible) process, according to Edward Guggenheim (1933), based on the Clausius inequaliy (1862), for "freely-running" earth-bound reacting systems. [2]

References

1. (a) Steinberg, Justin. (2008). "Hobbes and Spinoza on the Right of Nature" (Q), Stanford.edu, 2013.
(b) Laerke, Mogens (2010). "G.W. Leibniz's two readings of the *Tractatus Theologico-Politicus*," in: Spinoza's Theological-Political Treatise: A Critical Guide (editors: Yitzhak Melamed and Michael Rosenthal) (pgs. 101-127; esp. pg. 125), Cambridge University Press.

2. Guggenheim, Eduard, A. (1933). *Modern Thermodynamics by the Methods of Willard Gibbs* (pgs. 5, 17). London: Methuen & Co.

See also

- Appeal to nature

External links

- Natural and legal rights – Wikipedia.

θΔics

In science, a **natural science** refers to the study of natural phenomena according to the Baconian method or scientific method; the two principle natural sciences, according to the 1809 views of German polymath Johann Goethe, being physics and chemistry, intertwined with and applied to the study of human nature, on the logic that there is after all only one nature. [1]

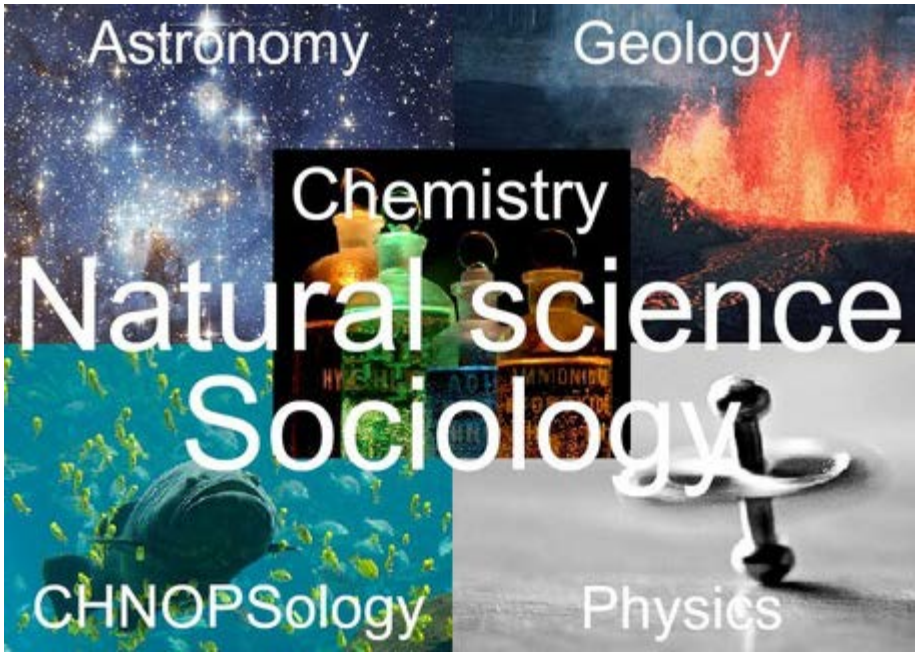

A depiction of "sociology" overlaid on the five main branches of **natural science**, namely: astronomy, geology, CHNOPSology (biology), physics, and chemistry.

> "It seems that his continued work in physics made the author choose this strange title. He may have noticed that often in **natural science**, ethical similes are used to bring something nearer that is remote from the region of human knowledge, and so, presumably, he may have wanted to trace the parlance of a chemical simile back to its spiritual origin, all the more so since there is after all just one nature."

Goethe thus defines "natural science" as the unified study of chemistry, physics, and humanities. German physicist Karl Pearson, likewise, defines "natural science" in an encompassing manner, which he explains via footnote as follows: [2]

> "I use this word—**natural science**—purposely, for I allow no distinction ultimately between the physical and biological branches of science. A the latter advances, mere descriptions of sequences of sense-impressions are more and more likely to be replaced by formulae describing conceptual motions; such is, indeed, the confessed aim of those somewhat embryonic studies 'cellular dynamics' and 'protoplasmic mechanics'."

References

1. Kompridis, Nokolas. (2006). *Philosophical Romanticism* (pg. 246). Routledge.
2. Pearson, Karl. (1900). *The Grammar of Science* (pg. 299). Adam and Charles Black.

External links

â— Natural science – Wikipedia.

θΔics

In science, **natural selection** is a theory which posits, per Charles Darwin (1859), that the descent of species occurs, not by divine action, by a process whereby variations of traits of offspring are selected by nature based on fitness fit to the state of a growing population confined to a limited land and material resources.

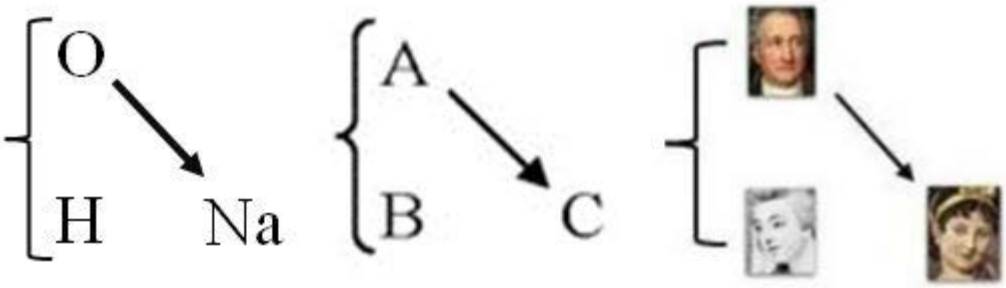

The physicochemical depiction of nature "selecting", so to say, reactions between species, e.g. as theorized by Johann Goethe (1809), see: reaction decipherment, a model cited by Charles Darwin (1859/1861) as being something verbally akin to his conception of the term "**natural selection**", albeit not exactly.

Lucretius

Chambers Cyclopedia traces the origins of the theory of natural selection to the atomic theorists—Lucretius in particular: (Ñº)

> "The theory of **natural selection** advocated by Darwin is of ancient date—as old as Lucretius—and has been maintained by Lamarck and others; but Darwin conceived that the previous schemes or theories afford no explanation of the mode in which the alleged progressive transmutation of organic bodies from the lowest to the highest grades has taken place."

Goethe | Natural selection

The so-called theory of natural selection developed by Goethe, referred to by him as "metamorphosis via elective affinity", or something along these lines, is outlined in his general theory of metamorphology.

Darwin | Natural selection

In 1859, English naturalist Charles Darwin, citing Goethe, introduced the term "natural selection" via publication of his now-famous *On the Origin of Species: by Means of Natural Selection*, in which he set out to outline the general laws by which species descend from one another per citation of the following quote: [1]

> "But with regard to the material world, we can at least go so far as this—we can perceive that events are brought about not by insulated interpositions of divine power, exerted in each particular case, hut by the establishment of general laws."
>
> — William Whewell (1833), *Bridgewater Treatise*

The following are Darwin's retrospect reflective statements on his first glimpse of his theory of natural selection:

> "It long remained to me an inexplicable problem how the necessary degree of modification could have been effected, and it would have thus remained forever, had I not studied domestic productions, and thus acquired a just idea of the power of **selection**. As soon as I had fully realized this idea, I saw, on reading Malthus *On Population*, that **natural selection** was the inevitable result of the rapid increase of all organic beings; for I was prepared to appreciate the struggle for existence by having long studied the habits of animals."
>
> — Charles Darwin (1868), *The Variation of Animals and Plants under Domestication* (Ñº)

Here, in his mention of "power", a thermodynamics-based term, we see the beginnings of the difficulties on theory in Darwin's model of natural selection.

Terminology difficulties

In 1861, in regards to terminology issues, in the third edition of *Origin of Species*, Darwin added the following concerning criticism raised about the term 'natural selection': [3]

> "Several writers have misapprehended or objected to the term '**natural selection**'. Some have even imagined that natural selection induces variability, whereas it implies only the preservation of such variations as occur and are beneficial to the being under its conditions of life. No one objects to agriculturists speaking of the potent effects of man's selection; and in this case the individual differences given by nature, which man for some object selects, must of necessity first occur. Others have objected that the term selection implies conscious choice in the animals which become modified; and it has even been urged that as plants have no volition, natural selection is not applicable to them!
>
> In the literal sense of the word, no doubt, natural selection is a misnomer; but who ever objected to chemists speaking of the elective affinities of the various elements? — and yet an acid cannot strictly be said to elect the base with which it will in preference combines.
>
> It has been said that I speak of natural selection as an active power or Deity; but who objects to an author speaking of the attraction of gravity as ruling the movements of the planets? Every one knows what is meant and is implied by such metaphorical expressions; and they are almost necessary for brevity. So again it is difficult to avoid personifying the word nature; but I mean by 'nature', only the aggregate action and product of many natural laws, and by laws the sequence of events as ascertained by us. With a little familiarity such superficial objections will be forgotten."

English two cultures literature scholar Gillian Beer notes that the issue here is that the term "selection" implies or imbues nature with "conscious agency", and that Darwin, aware of German polymath Johann Goethe's previous usage of the term—as the title of his grand 1809 metamorphology theory of form change (chemical to plant to animal to human)—whom he cited in his original 1859 edition as being one of three forerunners of evolution theory (along with Erasmus Darwin and) brought the science of affinity chemistry here into the discussion to deflect the attack. [4]

Chemical thermodynamics | Natural selection

When Darwin's version of the theory of natural selection, according to which "living" species originate via some type of struggle to live and or to survive, amid limited land and material resources, gets carried down the great chain of being, or backwards in time through the evolution timeline (or molecular evolution table), difficulties on terminology and theory quickly become apparent, as pointed out by thinkers such as Robert Pirsig (1991), on paradox of molecules that struggle, and numerous people on the issue that atoms and molecules are not alive (see: defunct theory of life) hence the principle of continuity is breached, as Darwin (1882) himself pointed out himself in his last and final letter: [5]

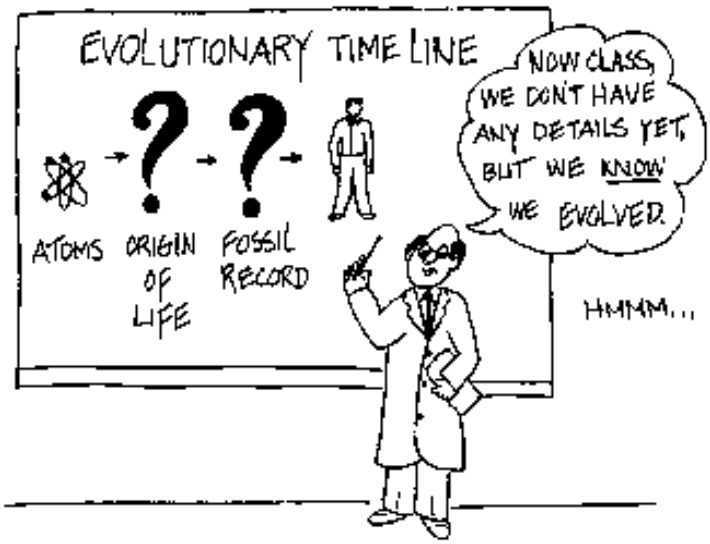

A typical evolution is a hoax cartoon promoted by creationists, which highlights the salient fact that Darwin's theory of evolution by **natural selection** falls apart, in regards to both the the origin of life question, and in regards to the paradoxical premise that that atoms and molecules struggle to survive.

> "I believe that I have somewhere said (but I cannot find the passage) that the principle of continuity renders it probable that the principle of life will hereafter be shown to be part or consequence of some general law."

The "general law" here, in modern retrospect, being the combined law of thermodynamics (first law + second law),

according to which a chemical thermodynamics based model of evolution, transmutation of species, molecular metamorphosis, or atomic geometry form change, emerges or arises as the replacement or rather upgrade to Darwin's theory of evolution by natural selection, according to which, firstly, the premise "living" species become supplanted with the premise of powered animate CHNOPS+ species (or chemical species), per recognition of the fact that life and death are religio-mythology terms not recognized by physics and chemistry (Charles Sherrington, 1938), being that when a gravitationally-bound system of atoms and molecules is cyclically-heated, chemical thermodynamics defines what processes in this mix are natural or unnatural, and furthermore stipulates that the two processes, natural and unnatural, are coupled together (per free energy coupling theory), per system condition confines, according to which reaction "products", i.e. descendants in Darwinian speak, are not necessarily "selected", as this implies someone or something is doing the selecting, but rather yielded per the "nature" of each respective equilibrium reaction process, in the mechanism of molecular evolution, hydrogen atom to human molecule, or molecules-to-man evolution, as some refer to it in colloquial speak.

Religious | Conflicts

Darwin, per opening 1859 William Whewell quote, stating that his new evolution theory book was to establish a general law of origin of species, according to events brought about "NOT by insulated interpositions of divine power", opened a can of worms, in regards to religious debate, that has not yet simmered down. The following are cartoon parodies of the ongoing situation.

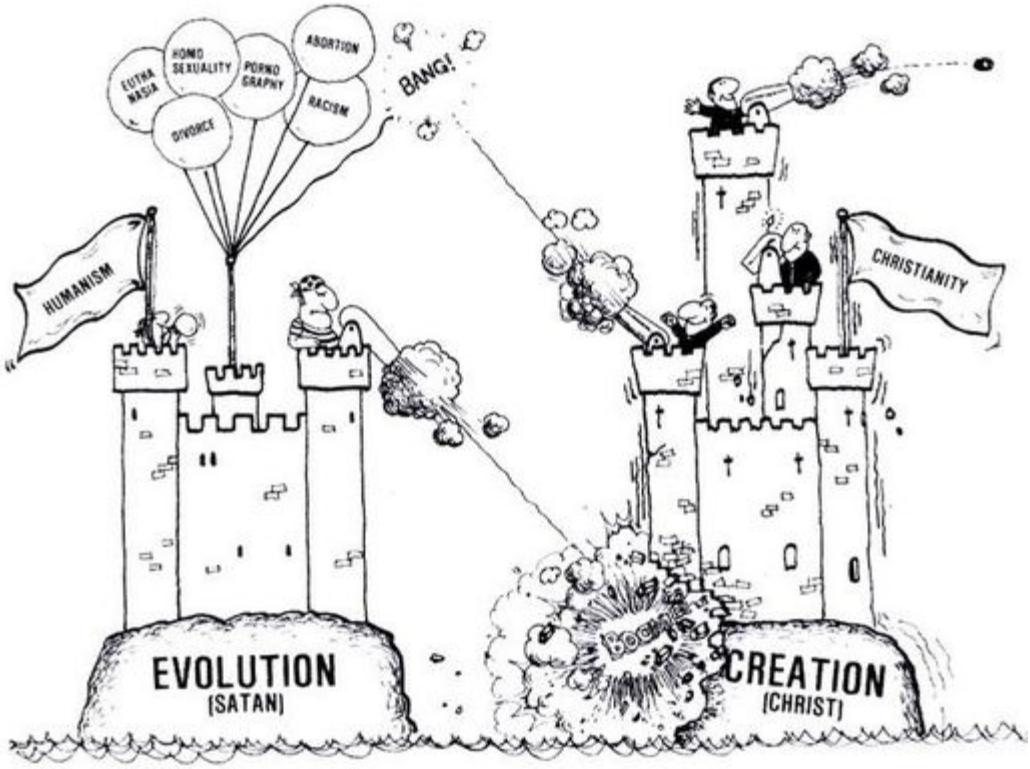

Quotes

The following are related quotes:

> "After Darwin, human morality became a scientific mystery. **Natural selection** could explain who intelligent, upright, linguistic, not so hairy, bipedal primates could evolve, but where did our morals come from? Darwin himself was absorbed by this question?"
>
> — Joshua Greene (2013), *Moral Tribes* [2]

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1. Darwin, Charles. (1859). *On the Origin of Species: by Means of Natural Selection or the Preservation of Favored Races in the Struggle for Life*. London: John Murray.
2. Greene, Joshua. (2013). *Moral Tribes: Emotion, Reason, and the Gap Between Us and Them* (pg. 22). Penguin.
3. (a) Darwin, Charles. (1861). *The Origin of Species* (3rd edition) (pg. 85). Murray.
(b) Peckham, Morse. (1959). *The Origin of Species by Charles Darwin: A Variorum Text* (pg. 163). University of Pennsylvania Press.
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5. (a) Darwin, Charles. (c.1882). "Letter to George Wallich." Publication
(b) Avery, John (2003). *Information Theory and Evolution* (pg. viii). World Scientific.

External links

â— Natural selection – Wikipedia.

θΔics

In philosophy, **naturalism**, according to James Ward (1899), is the belief that all phenomena are governed by the laws of science, and that supernatural cannot exist. [1]

Naturalism, in more precise terms, as summarized by Edward Guggenheim (1933), is that all phenomena are distinguishable between what is "natural" and what is "unnatural", and furthermore, according to Fritz Lipmann (1943), that these two phenomena, in nature, are coupled to each other, in such a way that the latter drives the former.

Naturalism religion

Naturalistic religion, with "religion" defined according to the root *legare*, "that which binds", is when naturalism becomes one's implicit belief system.

In 2016, Terry Mortenson, in his "The Religion of Naturalism", comments the following: [2]

> "Naturalism, or philosophical naturalism, is one of the most popular religions in the world today, although most people don't recognize it as such because it has no *obvious* worship centers, clergy, liturgy, or holy book."

Mortenson then cites William Provine as the spokesperson for atheistic naturalism:

> "Let me summarize my views on what modern evolutionary biology tells us loud and clear — and these are basically Darwin's views. There are no gods, no purposes, no goal-directed forces of any kind. There is no life after death. When I die, I am absolutely certain that I am going to be dead. That's the end for me. There is no ultimate foundation for ethics, no ultimate meaning to life, and no free will for humans, either."
>
> — William Provine (1994), "Darwinism Science or Naturalistic Philosophy?" [3]

Provine's adamant open atheistic (compare: closet atheism) views, to note, seem to be a reaction, in large part, to the intelligent design views of Phillip Johnson, who he had a friendly relationship with, and whose book *Darwin on Trial* (1991), he used as a course book in his evolutionary biology class.

Here, whatever the case, to put things frankly, we see an example of dumb atheism.

References

1. Ward, James. (1899). *Naturalism and Agnosticism*. Cambridge University Press, 2011.
2. (a) Chaffey, Tim. (2015). "Feedback: is Atheism a Religion?" (Ñº), AnswersInGenesis.com, Jul 25.
(b) Hodge, Bodie and Patterson, Roger. (2016). *World Religions and Cults, Volume Three: Atheistic and Humanistic Religions* (§12:205-226; Provine, pg. 206-207). New Leaf Publishing.
3. (a) Provine, William. (1994). "Darwinism Science or Naturalistic Philosophy?", *Origins Research*, 16(2):9.
(b) Hodge, Bodie and Patterson, Roger. (2016). *World Religions and Cults, Volume Three: Atheistic and Humanistic Religions* (§12:205-226; Provine, pg. 206-207). New Leaf Publishing.

External links

- Naturalism (disambiguation) – Wikipedia.
- Naturalism (philosophy) – Wikipedia.

θΔics

In science, **nature** is a difficult to define word.

Overview

In 1821, French philosopher Stendhal gave the following definition of nature in the context of an action: [1]

> "We call an action ***natural*** when it does not differ from the habitual mode of action."

Any process	Earth-bound process
$\frac{q}{T_{max}} < dS$ for any natural process	for a natural process $dT = 0$ $dP = 0$ $dG < 0$
$\frac{q}{T_{min}} > dS$ for any unnatural process	for an unnatural process $dT = 0$ $dP = 0$ $dG > 0$
$\frac{q}{T} = dS$ for any reversible process	for a reversible process $dT = 0$ $dP = 0$ $dG = 0$

English chemical thermodynamicist Edward Guggenheim's 1933 definition of what constitutes the differences between a **natural** process and an unnatural process, based on the Clausius inequality (that which governs the known universe), for all systems (left) and for standard earth-bound systems ((right), for the latter of which: differential Gibbs free energy decrease (dG < 0) quantifies what is "natural" whereas differential Gibbs free energy increase (dG > 0) quantifies what is "unnatural". [2]

The definition of what constitutes a "nature" or a so-called "natural process" was seeded with the 1856 introduction of the Clausius inequality, which led to the Gibbs inequalities (1876), to the Lewis inequality (1923), and to the Guggenheim inequalities (1933), the latter of which are shown adjacent.

In 1950, American chemical thermodynamicist Frederick Rossini defined natural and unnatural processes, in terms of the Lewis inequality, as such: [3]

Rossini notation (1950)	Modern notation	Description
$\delta u < 0$	$\Delta G < 0$	If the value of δu is negative, useful energy is obtainable from the system and we know the change is a **naturally occurring** one in the direction toward the state of equilibrium.
$\delta u > 0$	$\Delta G > 0$	If the value of δu is positive, useful energy is required to be supplied to the given system to bring about the desired change and we know that the change is an **unnatural one** in the direction away from equilibrium.

Hence, for earth-bound natural processes, measurements of Gibbs free energy change can determine what is natural (dG < 0) and unnatural (dG > 0) in the corpus of human affairs.

Morality

The idea that the simple inequality sign, < or >, could differentiate between natural and unnatural, was an addition to German polymath Johann Goethe's 1809 definition of the moral symbols of physical chemistry applied to human interactions.

See also

â— Nature abhors a vacuum

References

1. Stendhal. (1821). *On Love.* Publisher.
2. Guggenheim, Eduard, A. (1933). *Modern Thermodynamics by the Methods of Willard Gibbs* (pgs. 5, 17). London: Methuen & Co.
3. Rossini, Frederick D. (1950). *Chemical Thermodynamics* (pg. 122). John Wiley & Sons, Inc.

θΔics

In science, **nature abhors a vacuum**, aka "axiom of Aristotle" (Galileo, 1638) or *horror vacui*, is a postulated, originating in Parmenides c.485BC argument that a void or rather a vacuum, in nature, cannot exist, which became assimilated in the writings of Aristotle (320BC) to the conclusion that vacuums might exist in partially, but are abhorrent to nature. [1]

This void abhorrence postulate, and the two-millennia long debate that followed, can be said to be directly responsible for the invention or development of a number of things: atomic theory (c.450BC), barometer (1643), vacuum pump (1650), piston and cylinder (1650), air pump (1657), steam engine (1690), gas laws (1645-1897), and the science of thermodynamics (1865). In a dictionary sense, the term has come to represent an idiom used to express the idea that empty or unfilled spaces are unnatural as they go against the laws of nature and physics. [2]

A Schott diagram depiction of German engineer Otto Guericke's famous *circa* 1649 beer keg vacuum experiment, in which Guericke and another man (or Guericke's two assistants) try to completely evacuate the fluid from a well-caulked beer keg, so to see if a "vacuum" could be made (at the top of the keg), the existence of which that was deemed impossible by Parmenides.

Early history

See also: Parmenides vs Heraclitus

The nature abhors a vacuum argument was first presented in stated in Greek physicist-philosopher Parmenides (510-450BC) *circa* 485 BC by essay “On Nature”, in which he stated, via reasoning and argument, that a void or rather a vacuum, in nature, cannot exist. [1]

The first to object was Leucippus (c.500-450BC) who in *circa* 475BC invented the now-famous atomic theory, which was stimulated into conception to purposely contradict Parmenides, which stated explicitly that everything in the universe is either atoms or voids, or combinations of both.

Greek standard model philosopher Empedocles (495-435BC) denied the existence of empty space—in his own words: “the universe has no space that is empty nor space that is overcrowded.”

Next, Plato (427-348BC) found the idea of a vacuum inconceivable.

In *circa* 350BC, Aristotle, student of Plato, declaring the famous dictum *horror vacui*, on the logic that in a "complete vacuum" infinite speed would be possible because motion would encounter no resistance, hence if infinite speed was impossible, so to is a vacuum. Aristotle seems, however, to have had in mind the conception of a partial void as evidenced by the following view of his on quantities of fire:

> “For any two portions of fire, small or great, will exhibit the same ratio of solid to **void**; but the upward movement of the greater is quicker than that of the less, just as the downward movement of a mass of gold or lead, or any other body endowed with weight, is quicker in proportion to its size.”

The Aristotlean universe, being that it was adopted by Christianity (via Aristotle's mentoring of Alexander the Great), is the model that would go on to dominate scientific thinking for the next millennium-and-a-half.

In 50AD, Hero, a Greek engineer of Alexandria, challenge the *horror vacui* dictum by attempting to create an artificial vacuum. [14] His *Pneumatica* employed vacuum logic, e.g. he outlined what seems to have been a Leucippus-base atomic theory in which matter consists of particles mixed with distributed vacua.

Cartesian view

In the 1630s, French philosopher-physicist Rene Descartes, supposedly, held the view that there could be no void, no vacuum, because empty space could only be conceived in terms of matter, which is an extension. [8]

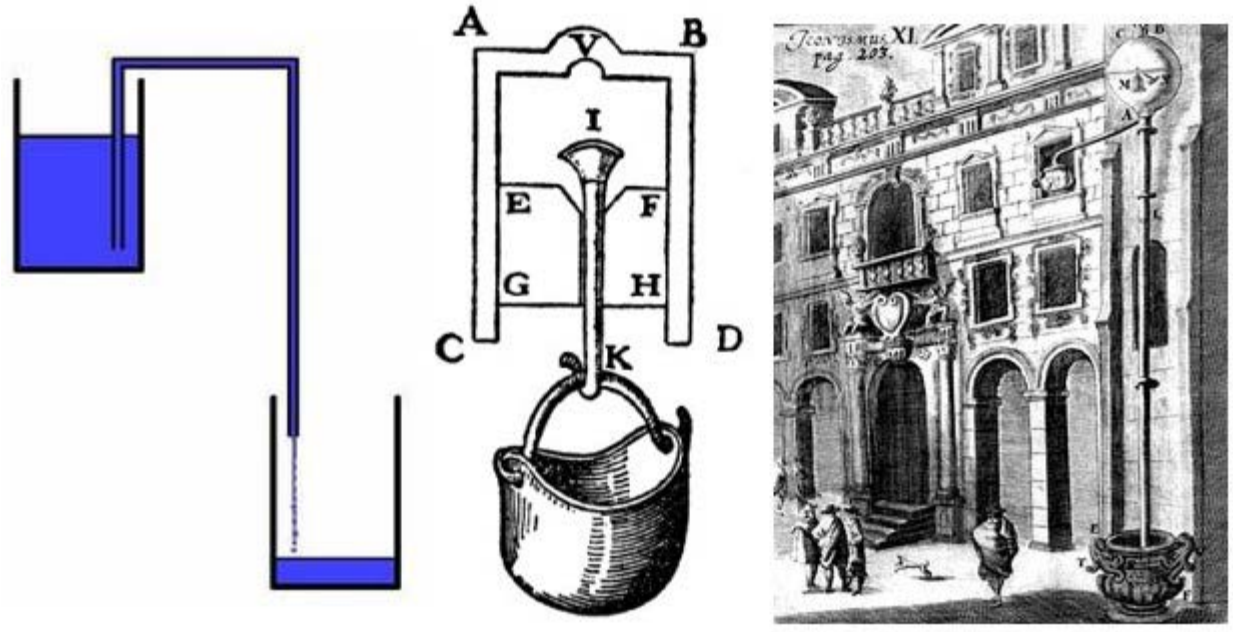

Suction pump issues

See main: Pump problem

Left: Basic "siphon" principle, in which water will drain though a tube as long as final end of the tube is lower than the liquid surface in the reservoir. Center: Italian physicist Galileo Galilei's *circa* 1630-1646 experiment for testing the "force of the vacuum". [13] Right: The 1641 siphon experiment, done by Gasparo Berti, created by means of an 11 meter high column of water. Demo in Rome, for an invited audience which included Raffaelo Magiotti, Athanasius Kircher, and Nicolo Zucchi. [11]

Sometime in the early 17th century, pumpmakers of the Grand Duke of Tuscany attempted to raise water to a height of 12 meters or more, but found that 10 meters (33 feet) was the limit to which it would rise in the suction pump.

Baliani's 1630 siphon problem

On July 27, 1630, Italian physicist Giovanni Baliani wrote a letter to Galileo Galilei about the explanation of an experiment he had made in which a siphon, led over a hill about twenty-one meters high, failed to work. Galileo responded with an explanation of the phenomena: he proposed that it was the power of a vacuum which held the water up, and at a certain height (in this case, thirty-four feet) the amount of water simply became too much and the force could not hold any more, like a cord that can only withstand so much weight hanging from it.

Galileo's ideas reached Rome in December of 1638 in his Discorsi. Rafael Magiotti and Gasparo Berti were excited by these ideas, and decided to seek a better way to attempt to produce a vacuum than with a siphon. Magiotti devised such an experiment, and sometime between 1639 and 1641, Berti (with Magiotti, Athanasius Kircher and Nicolo Zucchi present) carried it out. [2]

Four accounts of Berti's experiment exist, but a simple model to his experiment consisted of filling a long tube with water that had both ends plugged up, then placing the tube into a basin already full of water. The bottom end of the tube was opened, and the water that had begun inside of it poured out of the bottom hole into the basin. However, only part of the water in the tube flowed out, and the level of the water inside the tube stayed at an exact level, which happened to be thirty-four feet, the exact height Baliani and Galileo had observed that was limited by the siphon. What was most important about this experiment was that the lowering water had had left a space above it in the tube which had had no intermediate contact with air to fill it up. This seemed to suggest the possibility of a vacuum existing in the space above the water. [3]

Torricelli's 1643 experiment

See main: Torricelli vacuum

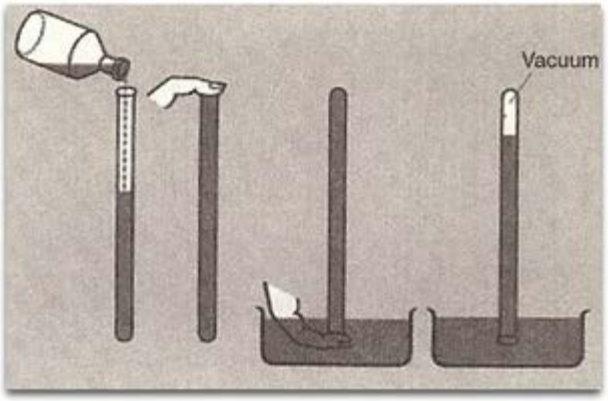

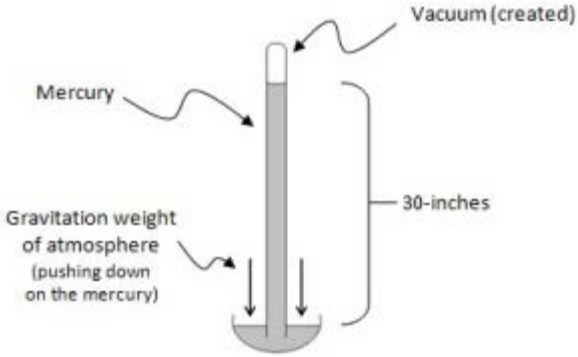

A modern small-scale version of Italian physicist Evangelista Torricelli's 1643 testing of the nature abhors a vacuum theory, wherein a filled tube of mercury is upended into a dish of mercury, without letting any mercury escape, the result of which is that the column falls by a certain height which varies with the atmospheric pressure of the earth; the top evacuated space is called "Torricelli vacuum"; the device itself has since come to be called a barometer.

Italian physicist Evangelista Torricelli, a friend and student of Galileo, dared to look at the entire problem from a different angle. In a letter to Michelangelo Ricci in 1644 concerning the experiments with the water barometer, he wrote: [4]

> "Many have said that a vacuum does not exist, others that it does exist in spite of the repugnance of nature and with difficulty; I know of no one who has said that it exists without difficulty and without a resistance from nature. I argued thus: If there can be found a manifest cause from which the resistance can be derived which is felt if we try to make a vacuum, it seems to me foolish to try to attribute to vacuum those operations which follow evidently from some other cause; and so by making some very easy calculations, I found that the cause assigned by me (that is, the weight of the atmosphere) ought by itself alone to offer a greater resistance than it does when we try to produce a vacuum."

It was traditionally thought (especially by the Aristotelians) that the air did not have lateral weight: that is, that the miles of air above us don't weigh down on the air at our level. Even Galileo had accepted the weightlessness of air as a simple truth. Torricelli questioned that assumption, and instead proposed that the air had weight, and that it was the weight of the air (not the attracting force of the vacuum) which held (or rather, pushed) up the column of water. He thought that the level the water stayed at (thirty-four feet) was reflective of the force of the air's weight pushing on it (specifically, pushing on the water in the basin and thus limiting how much water can fall from the tube into it). In other words, he viewed the barometer as a balance, an instrument for measurement (as opposed to merely being an instrument to create a vacuum), and because he was the first to view it this way, he is traditionally considered the inventor of the barometer (in the sense in which we use the term now).

In 1643, Galileo Galilei, believing that Aristotle's *horror vacui* postulate was true, but to within limits, encouraged his pupil Evangelista Torricelli to investigate the subject. Pumps operating in mines had already proven that nature would only fill a vacuum with water up to a height of thirty feet. Knowing this curious fact, Galileo encourages his former pupil, Torricelli to investigate these supposed limitations. Torricelli did not believe that vacuum abhorrence was responsible for

Left: A 1644 rendition of experiments of Torricelli on making a vacuum by means of a mercury column, Florence. [12] Right: A depiction of one of Blaise Pascal's vacuum experiments, using a water column, in the city of Rouen, France. [14]

raising the water. Rather, he reasoned, it was the result of the pressure exerted on the liquid by the surrounding air. To prove this theory, he filled a glass tube, sealed at one end, filled with mercury and upended it into a dish also containing mercury, as shown adjacent. Torricelli found that only a portion of the tube emptied, as shown above; thirty inches of the liquid remained. As the mercury emptied, a vacuum was created at the top of the tube. This barometer-type vacuum effectively disproved Aristotle's theory and affirmed the existence of vacuums in nature.

Due to rumors circulating within Torricelli's gossipy Italian neighborhood, which included that he was up to some form of sorcery or witchcraft, Torricelli realized he had to keep his experiment more secretive, or run the risk of being arrested. He needed to use a liquid that was heavier than water, and from his previous association and suggestions by Galileo, he deduced by using mercury, a shorter tube could be used. With the use of mercury, then called "quicksilver", which is about 14 times heavier than water, a tube only 32 inches was now needed, not 35 feet.

Pascal's water/wine experiments

In 1646, Blaise Pascal along with Pierre Petit, had repeated and perfected Torricelli's experiment after hearing about it from Marin Mersenne, who himself had been shown the experiment by Torricelli toward the end of 1644. Pascal further devised an experiment to test the Aristotelian proposition that it was vapors from the liquid that filled the space in a barometer. His experiment compared water with wine, and since the latter was considered more 'spiritous', the Aristotelian's expected the wine to stand lower (since more vapors would mean more pushing against the liquid column).

Pascal performed his version of the vacuum experiment in front of 500 people. He used hoses of 10 meters' length hoisted by a ship's mast, as depicted above. [14]

Pascal performed the experiment publicly, inviting the Aristotelians to predict the outcome beforehand. The Aristotelians predicted the wine would stand lower. It did not. However, Pascal went even further to test the mechanical theory. If, as suspected by mechanical philosophers like Torricelli and Pascal, air had lateral weight, the weight of the air would be less in higher altitudes.

Therefore, Pascal wrote to his brother-in-law, Florin Perier, living near the mountain called the Puy de Dome, requesting that the latter perform a crucial experiment. Perier was instructed to take a barometer up the Puy de Dom and make measurements along the way of how high the column of mercury stood. He was then to compare it to measurements taken at the foot of the mountain to see if those measurements taken higher up were in fact smaller.

In September of 1648, Perier carefully and meticulously carried out the experiment, and found that Pascal's predictions had been correct. The mercury barometer stood lower the higher one went.

Guericke vacuums

In vacuum theory and experiment history German engineer Otto Guericke has cogently been described as one of the "giants" in the history of the subject. [14] It has been surmised that Guericke heard about or been stimulated or influenced in some way or another by the synergy of these Galileo-Torricelli vacuum investigations. [10] Guericke translated Aristotle's definition of the void as follows: [14]

> "A **void** is a space that is not taken up by any extended object, but that is capable of being filled with such objects."

In *circa* 1649, Guericke attempted to make a vacuum in a beer keg, as depicted adjacent.

This experiment lead to the invention of the vacuum pump and in 1654 to the famous demonstration of the the Magdeburg hemispheres, vacuum containing copper spheres invented to prove that vacuums can exist in nature.

Above: a 16-horse demonstration of German engineer Otto Guericke's 1654 **Magdeburg hemispheres**, spheres with a mechanically-made vacuum inside (made using a vacuum pump), invented to disprove Greek philosopher Parmenides' *circa* 485BC "**nature abhors a vacuum**" (*horror vacui*) postulate; below: a statue of Guericke's famous vacuum demonstration proof in Altstadt, Magdeburg, Germany. [6]

Pneumatical engine

Guericke's vacuum pump invention led to the development of the the pneumatical engine (pictured adjacent), build by Robert Hooke, under the direction of Robert Boyle, in 1658. This experimental device lead to the ideal gas law.

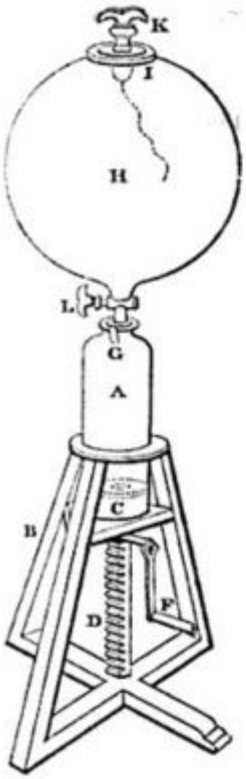

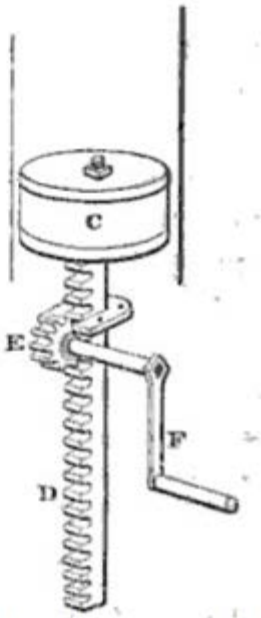

The piston or sucker C was solid. The shank or piston-rod had teeth cut in it, so as to form a rack; and was moved by a toothed wheel or pinion E working into the rack, and turned by a handle F.

The pneumatical engine, used to make a partial vacuum (of various measurable pressures) in the detachable glass bulb H, built by Robert

Gravity

In 1662, a nineteen-year-old college student named Isaac Newton, in his second year at University of Cambridge, was becoming self-educated through his voracious reading habit, had heard of both Evangelista Torricelli's 1643 barometer invention or "Torricelli vacuum" experiment as well as Robert Boyle's recent experiments with an air pump-vacuum, and began fill out a notebook (section: Some Philosophical Questions) with 45 philosophical queries, one of which was entitled "The Flux and Reflux of the Sea", in which he outline an experiment in which mercury barometer could be used to test the then-prevalent theory that the tides were caused by the moon's "pressing the atmosphere", as it had been believed. Newton wrote:

"[Fill a tube with mercury or water; seal the top]; "the liquor will sink three or four inches below it leaving a vacuum (perhaps)"; [then as the air is pressed by the moon, see if the water will rise or fall]."

The completion of his 1687 *Principia*, which contained the three laws of motion and the law of universal gravitation,

Hooke in 1658, under the direction of Robert Boyle, based on Otto Guericke's earlier vacuum pump designs, a device that led first to Boyle's law, then to the various gas laws, and eventually to the ideal gas law.

would eventually disprove the moon pressure gravity theory.

In 1726, a year before Newton's end (death), after being released from the Bastille (jail), on the condition that he go to England, French science-philosopher and writer Voltaire went to London, where he occupied himself mainly with mathematics and made himself familiar with the philosophy of Newton, where he remained for a period of three years. Upon arrival he reported that: [15]

> "For us [Cartesian-based French science] it is the pressure of the moon that causes the tides of the sea; for the English [Newtonian-based science] it is the sea that gravitates towards the moon, so that when you think that the moon should give a high tide, these gentleman think you should have a low one."

Hence, over the course of 65-years, starting from some loose outline queries in a college notebook, in regards to using a vacuum-making device to test Rene Descartes impulse theory of moon induced tide variations, Newton had revolutionized the way the operation of the universe was viewed.

Perfect vacuum

Building on the work of Hooke and Boyle, in 1678 Dutch mathematical physicist Christiaan Huygens invented the gunpowder engine, which worked by driving out the air of the cylinder during the explosion though one-way valves after which a partial vacuum in respect to the surrounding atmosphere was created inside the cylinder, to result in the piston being pushed down by the atmosphere to eliminate the vacuum. The aim of these endeavors was to create the so-called "perfect vacuum". The fowling of the explosion (products left over at the end of the explosion), supposedly, is what was said to prevent the perfect vacuum from resulting.

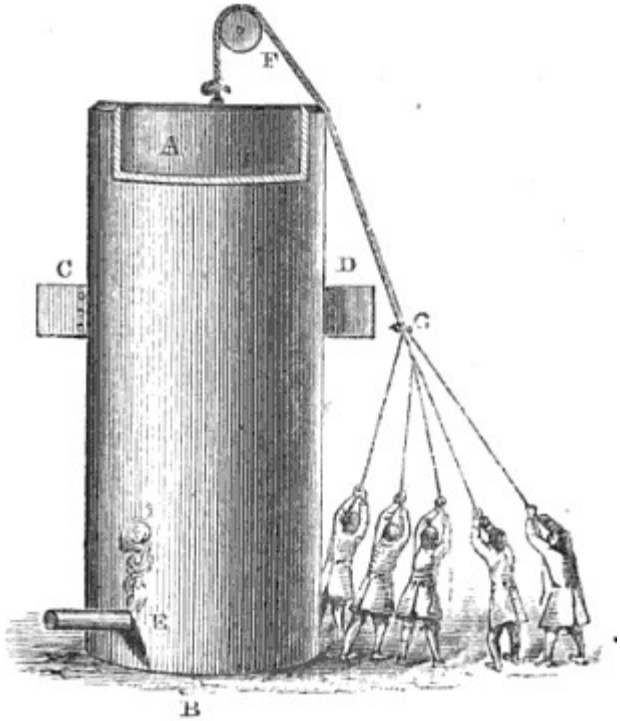

An 1682 demonstration of Christiaan Huygens gunpowder engine, where a dram of gunpowder created enough vacuum to lift 7-8 boys into the air.

Steam engine

In 1690, after experimenting with gunpowder engine designs (with Huygens), French physicist Denis Papin drew out the designs for the steam engine (Papin engine) based on the idea of quickly cooling a body of steam in a piston and cylinder, resulting to create a vacuum, and drive the piston down.

Thermodynamics

Much of the theoretical structure of the follow-up science of thermodynamics, the subject of physics that arose to explain the operation of Papin's basic heat engine design, is based around this concept and explanation of "vacuum creation", whenever a body is quickly cooled, such as embodied in the notion of pressure volume work (PV work).

Physical chemistry

In physical chemistry, nature abhors a vacuum is sometimes explained in enthalpy and entropy terms, as discussed adjacent (in terms of liquids vs solids). [9]

Modern views

German physicist Henning Genz argues in his 1994 book *Nothingness: the Science of*

Empty Space that quantum mechanics and particle physics make or indicate that a complete vacuum is impossible. [14]

In the 2005 book *Into the Cool: Energy Flow, Thermodynamics, and Life*, science writers Eric Schneider and Dorion Sagan twist the idiom around to argue that "nature abhors a gradient." [5]

In the 2007 book *The Void*, English particle physicist Frank Close gives a detailed history of the subject of "nature abhors a vacuum" and speculates on how the subject may be making a return in the concept of the Higgs field. [7]

3.1.1 Nature Abhors a Vacuum

As with all chemical phenomena, enthalpy and entropy determine the free energy of the system and hence the system's structure. The weak binding interactions that hold solvents together are all related to enthalpy, and in general they lower the free energy of the liquid state due to negative enthalpy contributions. Yet, entropy has a very large influence on solvent structure also. The entropy of most solvents is relatively large and positive compared to the solid state. This large entropy is due to the substantial freedom of movement of the solvent molecules relative to molecules in a crystal lattice.

Liquids prefer not to have empty spaces, leading to the common dictum, "Nature abhors a vacuum". The creation of a bubble in a solvent is very costly, because there are fewer configurations for the entire ensemble of molecules to adopt. As such, the tendency of liquids to fill space is fundamentally an entropy effect. Enthalpy is also significant, because bubbles increase the surface area at the expense of intermolecular attractive forces. Yet, in some cases enthalpy can become more favorable with a more open structure, such as ice relative to liquid water.

Liquids have structures in between gases (complete randomness) and crystals (highly ordered). The average location of the individual molecules in a solvent is expressed in terms of a radial distribution function, $g(r)$. This function relates the probability of finding another molecule at a particular distance r from each molecule. Figure 3.1 shows a schematic representation of $g(r)$ for a liquid and a perfect crystal. There are definite distances separating each molecule in the crystal, and hence there are predictable and reproducible distances at which each molecule in the crystal will be found relative to each other molecule. These repetitive distances are what lead to the diffraction of x rays in single-crystal crystallography. This repetitive nature is referred to as **long range order**. Such a high degree of order is not found in a liquid. There is a good probability of finding a layer of nearest neighbor solvent molecules around each individual solvent molecule, but the distances to the molecules in the second, third, etc., layers becomes less certain. This drop off in repetitiveness is called **short range order**.

The forces that hold liquids together are the same as those that hold molecular solids together. However, on raising the temperature of a system, these forces become less able to compete with thermal energy, and so we transition from a system with long range order to one with only short range order. We will discuss these intermolecular forces in considerable detail in this chapter. However, first we consider efforts to characterize solvents on a more macroscopic scale, emphasizing the bulk properties of the liquid.

A 2006 section on **nature abhors a vacuum** in the context of the physical chemistry of liquids: enthalpy and entropy terms. [9]

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â— Schmitt, Charles B. (1967). “Experimental Evidence for and Against a Void: the Sixteenth-Century Arguments” (abs), *Isis*, 58(3):352-66.

External links

â— Horror vacui (physics) – Wikipedia.
â— The Vacuum – RadicalArt.info.

θΔics

In existographies, **Nausiphanes** (c.360-290BC) was Greek philosopher, a pupil of Pyrrho, a student of the works of Democritus, and purported teacher of Epicurus, noted for []

Quotes | On

The following are quotes on Nausiphanes:

> "**Nausiphanes** (Q)(Q) when a young man was captivated by Pyrrho: at all events he used to say that we should follow Pyrrho in disposition but himself in doctrine; and he would often remark that Epicurus, greatly admiring Pyrrho's way of life, regularly asked him for information about Pyrrho."
>
> — Diogenes Laertius (220), *The Lives and Opinions of Eminent Philosophers* (§9.11) [1]

> "Apollodorus in his *Chronology* tells us that Epicurus was a pupil of **Nausiphanes** and Praxiphanes; but in his letter to Eurylochus, Epicurus himself denies it and says that he was self-taught. Both Epicurus and Hermarchus deny the very existence of Leucippus the philosopher, though by some and by Apollodorus the Epicurean he is said to have been the teacher of Democritus. Demetrius the Magnesian affirms that Epicurus also attended the lectures of Xenocrates."
>
> — Diogenes Laertius (c.230), *Lives and Opinions of Eminent Philosophers* (§10.12) (note: If this Praxiphanes was the pupil of Theophrastus, considerations of age would make it highly improbable that he could have taught Epicurus; cf. Usener, Fr. 123)

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External links

- Nausiphanes – Wikipedia.

θΔics

In thermodynamics, **near-equilibrium thermodynamics** is the study of processes of systems said to be close to equilibrium. This branch of thermodynamics was created by Norwegian-born American physical chemist Lars Onsager, with two famous 1931 papers, in which near-equilibrium processes are characterized by what are called the Onsager reciprocal relations. [1] In biochemical thermodynamics, it has been suggested that near or 'close' to equilibrium processes are characterized by a change in the Gibbs free energy of $\Delta G << 1.5$ kJ/mol. [2]

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θΔics

In science, **nebular hypothesis**, or "Swedenborg-Kant-Laplace hypothesis", is a conjecture, arrived at independently in the years 1734 to 1796, by several thinkers, which argues that solar systems of the universe form via the gravitational attraction of interstellar matter of a nebula (Latin for *cloud*), during which processes increasing internal pressures trigger the ignition of a star, such as the sun, at the center of the volume of the nebula mass, about which rotation and spin effects cause various planets to form about the newly formed star.

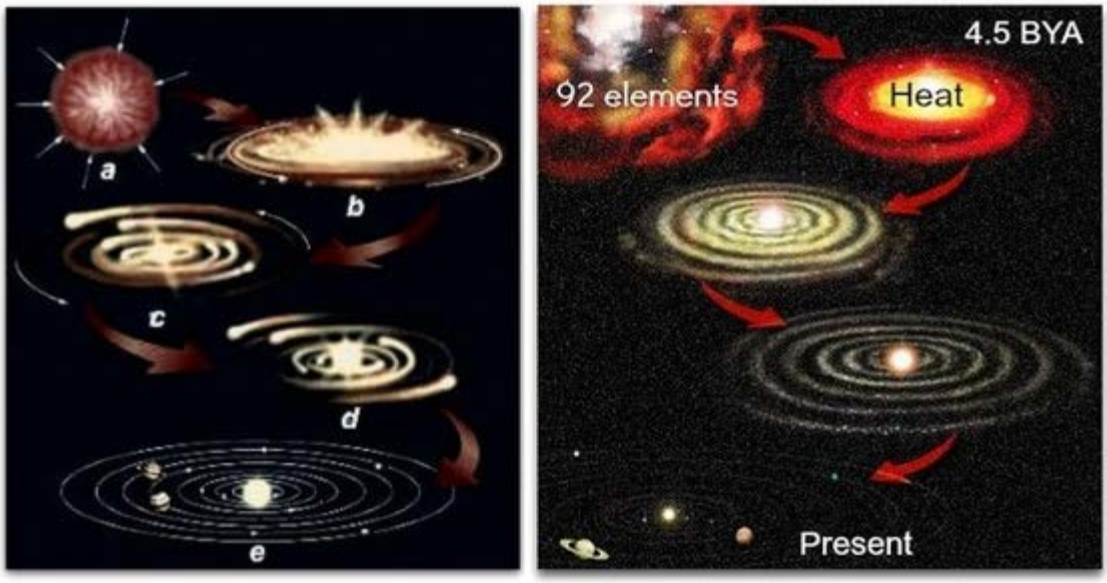

Modern artistic rendition of the **nebular hypothesis**: (a) interstellar matter attracts into a volume or cloud, (b) the center ignites, (c) the surrounding fluid-like cloud begins to contract inward and rotate, (d) proto comet-like planets begin go form, rotating at high speeds; earth known have been rotating once per every ten hours, (e) the modern star system forms.

Meslier | Descartes

In 1729, Jean Meslier, in his *Testament*, §71: “Being or Matter, which are the Same Thing, Can only have its Existence and Movement from Itself”, in efforts to rebut or disprove the following theistic view:

> “We have to say that it is only the will of god that can move a body; and so, the moving force of bodies is not in the bodies that move since this force is nothing but the will of god.”
>
> — Nicolas Malebranche (c.1670), *The Search after Truth*

went on to state that the Cartesians were the first to speak about the circular motion as the origin of the round earth, sun, and moon:

> “If it only with respect to circular movement that we can say that matter by itself always tends to move in a straight line, being the simplest and most natural movement, but it cannot always do this because everything that has extension is full of matter, so matter cannot always move in a straight line without encountering other matter that prevents it from continuing its movement and so it is forced to move in a curved or circular line, which necessarily makes certain portions or volumes of matter always move in a circle and produce many vortices of matter. And t**here is no doubt that it is only from this that the roundness of the earth, sun, moon, and all the stars and planets come**, as our Cartesians rightly mentioned.”
>
> — Jean Meslier (1729), *The Testament* (pg. 400-01)

(add)

Swedenborg

In 1734, Swedish polymath Emanuel Swedenborg (1688-1772), as shown below, in his *On the Principles of Natural Things*, hypothesized that first the solar system was a nebula, after which the sun formed at which point the planets, including the earth, were part of the sun, but sometime thereafter separated themselves from the sun. [1]

> “Swedenborg’s ‘nebular hypothesis’ for the origin of the solar system, described in his *Principia Rerum Naturalium*, was derived from his philosophy of ‘like-partedness’, the idea that every entity is recursively composed of smaller, homologous versions of itself, and that it likewise forms a component part of a larger entity. For the solar system, Swedenborg proposed that the sun had developed a dense surface layer that was forced outward by the centrifugal force of its rotation, into the equatorial plane of the solar rotation. Continuing its outward motion, this ring eventually thinned and broke apart into smaller bodies that formed the planets and smaller bodies.”
>
> — Glen Cooper (2007), *Biographical Encyclopedia of Astronomers* (Ñº)

(add)

Buffon

In 1745, independent of Swedenborg, French natural philosopher Georges Leclerc (1707-1788), aka "Buffon", argued that the force that created the planets was a comet impacting with the sun, which caused pieces of the sun or its crust to be thrown outward, but then drawn back by gravitational pull, in such a manner that the opposing forces centrifugal and gravitational resulted in the orbiting and formation of the planets. [4]

Kant

In 1755, Immanuel Kant, in his *General History of the Earth and the Theory of the Heavens*, outlined his own version of the nebular hypothesis; which Ernst Haeckel (1899) summarizes as follows: [8]

> “The first attempt to explain the constitution and the mechanical origin of the world in a simple manner by ‘Newtonian laws’ — that is, by mathematical and physical laws—was made by Immanuel Kant in the famous work of his youth (1755), *General History of the Earth and Theory of the Heavens.* Unfortunately, this distinguished and daring work remained almost unknown for ninety years; it was only disinterred in 1845 by Alexander Humboldt in the first volume of his *Cosmos.*”

Irish physicist John Tyndall (1874) defined German philosopher Immanuel Kant as the "first propounder" of the nebular hypothesis, stating that he drew the idea from Greek atomic theorist Lucretius' notion of atoms falling through space, as outlined in his *On The Nature of Things*. [6] Kant is also said to have investigated the nebular hypothesis notion further using astronomical measurements of Herschel.

Laplace

In 1796, French mathematician Pierre Laplace, in dependent of Kant, according to Ernst Haeckel (1899), gave an extensive explanation of the origin of the solar system has said to have “dominated the world’s thought since the very date of its publication”. [2] The original statement of the nebular hypothesis was given by Laplace in his *Exposition of the System of the World*, wherein he argued that our solar originated from a cloud or fluid-like atmosphere or gas. The original English translation of Note VII is shown below. A few paragraphs, dealing with more technical details, are omitted, but all of the essential features are retained: [3]

> “In seeking to trace the cause of the original motions of the planetary systems, the following five phenomena, enumerated in the last chapter, are available: the motions of the planets in the same direction and nearly in the same plane; the motions of the satellites in the same direction as the planets; the motions of rotation of these different bodies and of the Sun in the same direction as their orbital motions, and in but slightly different plain's; the small eccentricity of the orbits of planets and satellites; finally, the great eccentricity of comets' orbits, as though their inclination had been left to chance.

So far as I am aware, Buffon is the only one who has endeavored, since the discovery of the true system of the world, to trace the origin of the planets and their satellites. He supposes that a comet, falling upon the Sun, drove from it a torrent of matter, which reunited at a distance in several globes, varying in size and in distance from the Sun; these globes, having become opaque and solid by cooling, are the planets and their satellites."

Laplace then goes on to show that, although this hypothesis might account for the first of the five phenomena mentioned above, the others could not be explained by it. In seeking to discern their true cause, he continues as follows:

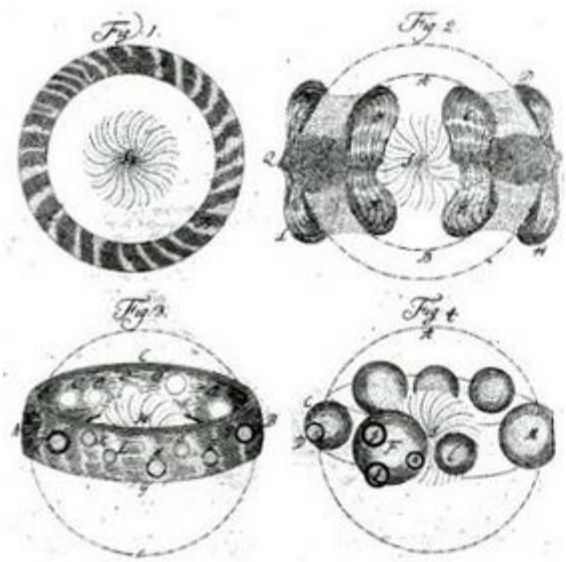

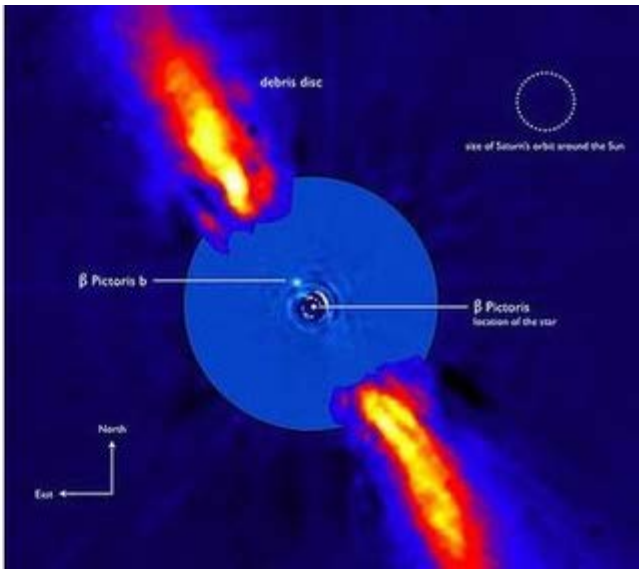

Left: Swedish polymath Emanuel Swedenborg's 1734 depiction of the **formation of the solar system** ("De Chao Universali Solis"); figure 1: the crust formed by the original nebula as it solidified is about to burst; figure 2: the state of confusion and collapse as pieces of the sun are scattered through space; figure 3: the crust has reformed as a disc surrounding the proto-sun; figure 4: the pieces have separated into individual spheres: the planets. [1] Right: a near infrared light image (Ñº) of Beta Pictoris, a 8-20 million year old newly forming solar system caught in the act of "being born", as Neil Shubin describes it, the first so-called confirmation of Swedenborg's 1734 nebula hypothesis prediction.

"Whatever be its nature, since it has produced or directed the motions of the planets, it must have embraced all of these bodies, and. in view of the prodigious distances that separate them, it could only have been a fluid of immense extent. In order to give them a nearly circular motion about the Sun, in the same direction, the fluid must have surrounded this body like an atmosphere. The consideration of planetary motions tbus leads us to think that, as the result of excessive heat, the solar system originally extended beyond the orbits of all the planets, and that it contracted by successive steps to its present limits.

In the assumed primitive condition of the Sun, it resembled those nebulae which are shown by the telescope to be composed of a more or less brilliant nucleus, surrounded by nebulosity which, in condensing toward the surface of the nucleus, transforms it into a star. If, by analogy, we conceive of all the stars being formed in this manner, we may imagine their earlier nebular state, itself preceded by other states, in which the nebular matter was more and more diffuse, the nucleus being less and less luminous. By going back as far as possible, we thus arrive at a nebulosity so diffuse that its existence could hardly be suspected.

Philosophical observers have long been impressed with the peculiar distribution of certain stars visible to the naked eye. Mitchel has remarked on the improbability that the stars of the *Pleiades*, for example, could have been compressed within the narrow limits which inclose them by mere chance, and he has hence concluded that this group of stars, and similar groups in the heavens, are the effects of an original cause or of a general law of nature. These groups are the necessary result of the condensation of nebulae having several nuclei; for it is evident that, if the **nebular** matter were continually attracted by these various nuclei, they would ultimately form a group of stars like that of the *Pleiades.* The condensation of nebulae having two nuclei will similarly form stars lying very close together, and revolving about one another, like the double stars whose motions have already been observed.

But how has the solar atmosphere determined the motions of rotation and of revolution of the planets and satellites? If these bodies had penetrated deeply into this atmosphere, its resistance would have caused them

to fall upon the Sun. We may thus conjecture that the planets were formed at its successive limits, by the condensation of zones of vapors which the Sun, in cooling, must have alxiudoned in the plane of its equator.

Let us recall the results given in a preceding chapter. The atmosphere of the Sun could not have extended out indefinitely. Its limit was the point where the centrifugal force, due to its motion of rotation, balanced the attraction of gravitation. Now, *as* cooling contracted the atmosphere and condensed at the surface of the Sun the molecules lying near it, the motion of rotation accelerated. For, from the law of areas, the sum of the areas described by the radius vector of each molecule of the Sun and of its atmosphere, when projected on the plane of its equator, being always the same, the rotation must be more rapid when these molecules approach the center of the Sun. The centrifugal force due to this motion thus becoming greater, the point where it equals the weight is nearer the Sun. If we then adopt the natural supposition that the atmosphere extended, at some period, to an extreme limit, it must have left behind, in cooling, the molecules situated at this limit and at the successive limits produced by the acceleration of the Sun's rotation. These abandoned molecules must have continued to revolve around the Sun, sinco their centrifugal force was balanced by their weight. But since this equilibrium did not obtain in the case of the atmospheric molecules in higher latitudes, their weight caused them to approach the atmosphere as it condensed, and they did not cease to belong to it until this motion brought them to the equator.

Let us now consider the zones of vapor successively left behind. To all appearances these zones should form, by their condensation and the mutual attraction of their molecules, various concentric rings of vapor revolving around the Sun. The mutual friction of the molecules of each ring should have accelerated some and retarded others, until they had all acquired the same angular velocity. Thus the linear velocities of the molecules farthest from the center of the Sun must have been the greatest. The following cause would also contribute toward the production of this difference of velocity. The molecules farthest from the Sun, which, through the effects of cooling and condensation, came together to form the outer part of the ring, always described areas proportional to the time, since the central force which controlled them was constantly directed toward the Sun. This constancy of areas requires that the velocity increase as the molecules move inward. It is evident that the same cause must have diminished the velocity of those molecules which moved outward to form the inner edge of the ring.

If all the molecules of a ring of vapor continued to condense without separating, they would finally form a liquid or solid ring. But the uniformity which this formation demands in all parts of the ring, and in their rate of cooling, must have rendered this phenomenon extremely rare. Thus the solar system offers only a single example of it, that of the rings of *Saturn.* In almost all cases each ring of vapor must have broken into several masses which, having only slightly different velocities, continued to revolve at the same distance around the Sun. These masses must have assumed a spheroidal form, with a motion of rotation corresponding in direction with that of their revolution, since their inner molecules had smaller linear velocities than their outer molecules; they thus formed as many planets in a vaporous state. But if one of them had possessed sufficient power of attraction to bring all the others successively together about its own center, the vaporous ring would thus have been transformed into a single spheroidal mass of vapor, revolving about the Sun and rotating in a direction corresponding to that of its revolution. This latter case has been the most common one. Nevertheless, the solar system offers an example of the first case in the four minor planets which lie between, *Jupiter* and *Mars;* unless we suppose, in agreement with M. Olbers, that they originally formed a single planet broken up by a violent explosion into several parts having different velocities.

Now, if we follow the changes which ultimate cooling must have produced in the vaporous planets whose formation we have just pictured, we shall witness the production, at the center of each, of a nucleus which continues to develop through the condensation of the atmosphere surrounding it. In this state the planet exactly resembles the Sun in its primitive nebular condition. Cooling must thus have produced, at the various limits of its atmosphere, phenomena similar to those we have described; that is to say, rings and satellites revolving around its center in the direction of its motion of rotation, and turning in the same direction upon themselves. The symmetrical distribution of *Saturn's* rings about its center and in the plane

of its equator naturally results from this hypothesis, and would be inexplicable without it. These rings seem to me ever-present proofs of the original extension of *Saturn'8* atmosphere and of its successive retreats. Thus the singular phenomena of the slight eccentricity of the orbits of the planets and satellites, the small inclination of these orbits to the solar equator, the identity in direction of the motions of rotation and revolution of all these txxlies with that of the solar rotation: How from our **hypothesis** and give it great probability.

If the solar system had been formed with perfect regularity, the orbits of the bodies which compose it would have been circles whose planes, like those of the various equators and rings, would have coincided with the plane of the solar equator. But it may be conceived that the endless varieties which must have existed in the temperature and density of the various parts of these great masses produced the eccentricity of their orbits and the deviation of their motions from the plane of this equator.

In our hypothesis, comets are strangers to the planetary system. In considering them, as we have done, to be small nebulae wandering from system to system, and formed by the condensation of nebular matter distributed with such profusion throughout the universe, we perceive that, when they arrive in the region of space where the solar attraction is predominant, it forces them to describe elliptical and hyperlx>lic orbits. But their motions being equally possible in all directions, they must move indifferently in all directions and at all inclinations to the ecliptic; which is in agreement with observation. Thus the condensation of nebular matter, by which we have just explained the motions of rotation and revolution of the planets and satellite's in the same direction, and in planes differing but slightly, also explains why the motions of comets do not agree with this general law."

Laplace, after discussing the great eccentricity of comets' orbits, as bearing on the nebular hypothesis, continues as follows:

"If certain comets entered the atmospheres of the Sun and planets during the formative period they must have fallen upon these bodies, after pursuing spiral paths. The result of their fall would be to cause the planes of the orbits and the equators of the planets to deviate from the solar equator.
If in the zones left behind by the solar atmosphere there were molecules too volatile to combine among themselves or with the planets, they must have continued to revolve about the Sun. They would thus give rise to such an appearance as that of the zodiacal light, without offering appreciable resistance to the various Ixxlies of the planetary system, either because of their extreme rarity, or because their motion is very nearly the same as that of the planets which they encounter.

A close examination of all the details of the solar system adds still further to the probability of our hypothesis. The original fluidity of the planets is clearly indicated by the flattening of their figure, in conformity with the laws of mutual attraction of their molecules; furthermore, it is proved in the case of the Earth by the regular diminution of weight from the equator to the poles. This condition of original fluidity, to which we are led by astronomical phenomena, should show itself in the phenomena of natural history. But, to perceive it there, it is necessary to take into account the immense variety of combinations formed by all terrestrial substances mingled together in a state of vapor, when the reduction of temperature permitted their elements to unite among themselves. It is also necessary to consider the enormous changes that this fall of temperature must have brought about successively within the Earth and upon its surface, in all formations, in the constitution and the pressure of the atmosphere, in the ocean, and in the bodies which it held in solution. Finally, consideration should be given to violent disturbances, such as great volcanic eruptions, which must have modified, at various epochs, the regularity of these changes. Geology studied from this point of view, which unites it to astronomy, will acquire precision and certainty in many particulars."

Although the nebular hypothesis received almost universal acceptance, objections and difficulties were brought forward

at various times during the nineteenth century, but by the early 20th century Laplace's version of the nebular hypothesis has become the standard model.

Other

German-born British astronomer William Herschel is also said to have arrived at the nebular hypothesis as an explanation of many phenomena he observed among stars; American mathematical-astronomer William Sidis (1920) classified Herschel, along with Kant and Laplace, as one of the three co-formulators of the nebular hypothesis. [5]

Hmolscience

A number of thinkers have applied the stellar contraction energy release aspect of the nebular hypothesis to human societies to argue to the affect that cities form, pressurize, and release energy of some kind, over time, owing to some type of nebular hypothesis logic.

In 1858, American sociologist Henry Carey posited his "law of molecular gravitation", as expounded on in his *Principles of Social Science*, wherein he described London and Paris as "rival suns" of our system.

In 1910, American historian Henry Adams, in his 1910 *A Letter to American Teachers of History*, alluded to the premise that a sort of stellar contraction exists in formation and aggregation of newly forming large cities, and that this energy release counters in some way the degradation of energy aspect of the second law, thus creating progressive rises and falls of history.

In 1920, American physicist William Sidis utilized the stellar hypothesis in his *The Animate and the Inanimate*, chapter eight "The Nebular Hypothesis".

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External links

â— Nebular hypothesis – Wikipedia.

θΔics

In existographies, **Nedjeljka Petric** (c.1941-) is a Croatian chemical engineering and chemical thermodynamics professor noted a number of 1990s articles in which she attempts to explain the "spiritual" aspects of humans, e.g. "god gives us the possibility to choose" negative or positive positions, using recourse to: quantum mechanics, thermodynamics, the Boltzmann-Planck entropy equation, the Heisenberg uncertainty relation, Onsager reciprocal relations, mathematical infinities and irrational numbers—a rare classic case of the overt "ontic opening" theorist, especially rare for a professor of chemical thermodynamics.

Overview

In 1991, Petric, in her "Application of the Thermodynamic Theory to Social Events", opened to the following: [1]

> "The thermodynamics of open systems may be applied to social events and social development. In this paper, the **thermodynamic method is applied to the society as a system**. The principle followed was: not man against nature, trying to overpower natural laws ('arrange the nature') and thus survive, but man in harmony with natural laws, man as a part of nature. The other principle used was: 'what the storm takes, the calm will not return' (a proverb), i.e. social events should take place as near to the equilibrium as possible approaching the reversible process as much as possible. When the second law of thermodynamics is applied to society i.e. social events, entropy is interpreted not as disorder but as freedom of individuals."

Here, she argues that entropy, as defined by the Boltzmann equation, is interpreted not as disorder but as freedom of individuals (Frederick Rossini also argues along these lines); which is religious agenda code for using entropy as an ontic opening to argue that humans have free will can can therein "choose", without actually saying so.

In 1995, Petric published her "Thermodynamical and Quantum Theory applied to Spiritual (Psychic) Condition of a Person", where her aim is to attempt to build a bridge between science and religion, as she states, via thermodynamics, primarily, and quantum mechanics, secondarily. [2]

In 1997, she publisher her barely-readable Bible-backing article "Application of the Thermodynamic and Mathematical Theory to Man (Person) and Society", wherein she attempts to argue, in short, that (a) just as we can never precisely know irrational numbers, e.g. π, which have an "infinite" number of decimal places, we cannot precisely know reversible processes, which are idealized to take place "infinitely" slowly, subsequently, we cannot know "infinite (God's) wealth", or something along these lines.

Then she goes on to argue that the Heisenberg uncertainty principle, applied to observations of our energy and our thoughts, means that in spiritual considerations, we cannot insist upon reproducibility of results, and that this has something to do with Jesus Christ. This particular article is a strain on the mind to read. In one of her conclusions, she seems to equate the striving of social systems towards equilibrium as the striving after God:

> "The state of equilibrium is the 'aim' and everything in nature tries to reach it, strives unstoppably after the aim, strives after God."

In 1998, she applied the Onsager reciprocal relations to the "spiritual condition" of a person. [2] This seems to be the last of her effort at an "attempt at a scientific approach to the religious", as she stated in 1995.

See also

- Juliana Boerio-Goates

Education

Petric, since the 1970s, has been working as a chemical engineering professor at the Faculty of Technology, Split, Croatia, where she ran a thermodynamics laboratory, taught courses in undergraduate thermodynamics, technical thermodynamics, and engineering thermodynamics, and graduate courses in chemical engineering thermodynamics. Most of her research seems to have focused on processes to obtain magnesium oxide obtained from seawater, e.g. electrochemical. In 1986, Petric published a *Technical Thermodynamics* textbook and in 1988 she co-authored a *Chemical Engineering Thermodynamics* textbook with a I. Vojnovica. Currently, she is a retired chemical engineering professor, of the Faculty of Technology, Split, Croatia. (Q)

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External links

- Petric, Nedjeljka – WorldCat Identities.
- Nedjeljka Petric (faculty) (Croatian → English) – Ktf-split.hr.

θΔics

In literature thermodynamics, the **Nefastis Machine** is a fictional device described as a patented box inside of which is contained a Maxwell's demon, outside of which is a sketch of James Maxwell, and as seen on the top, contains two pistons, which are said to be attached to a crankshaft and flywheel, whereby if one concentrates on one cylinder, right or left, the Demon will raise the temperature in that cylinder and the air will expand, pushing the piston upwards, thus operating as a perpetual motion machine of the second kind. [1]

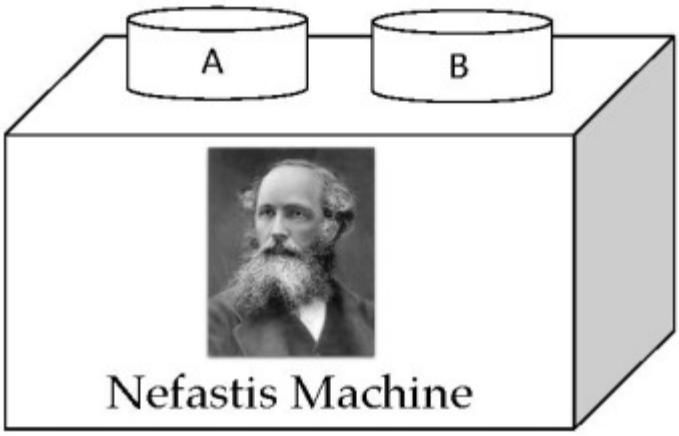

Rendition of the **Nefastis Machine**, as described in Thomas Pynchon's 1965 *The Crying of Lot 49.*

Overview

The Nefastis Machine was invented by Berkeley scientist John Nefastis, a character in the 1965 novel *The Crying of Lot 49* by American writer Thomas Pynchon. [2] The character is most-likely based on Hungarian chemical engineer John Neumann who in the 1940s suggested to American electrical engineer Claude Shannon to call is summation of logarithms equation (1948) for "information, choice and uncertainty" of telephone signal communications:

$$H = - k \sum p \log p$$ (information, choice and uncertainty) (via Shannon)

by the thermodynamic term "entropy", since supposedly the equations looks the same as the statistical entropy formulas of Ludwig Boltzmann (1882) and Willard Gibbs (1901):

$$S = - k \sum p \ln p$$ (entropy) (via Gibbs)

The passage from the novel goes:

> "For John Nefastis two kinds of entropy, thermodynamic [Boltzmann entropy] and informational [Shannon entropy], happened, say by coincidence, to look alike, when you wrote them down as equations. Yet he had made his mere coincidence respectable, with the help of Maxwell's demon."

The surname Nefastis is likely a play on the conjunction "Neumann + Fastest", in that the demon only lets the fastest particles into his soon to be hottest cylinder.

Photo of Maxwell found on the front matter (second page) of the 1920 book *Matter and Motion* published by Society for the Propagation of Christian Knowledge. [3]

Photo

The character Koteks, in the novel, explains that: "the familiar Society for the Propagation of Christian Knowledge photo, showing Maxwell in right profile, seemed to work best." This indicates that the photo referred to in the novel is the one of Maxwell found on the front matter (shown adjacent) of the 1920 book *Matter and Motion* published by that society. [1]

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Further reading

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External links

â— The Crying of Lot 49 (Chapter 5, Part I) – SparkNotes.com.
â— The Nefastis Box (Pynchon's solution) – Pynchon.Pomona.edu.

θΔics

In evolution thermodynamics, **neg-entropy** is marginal variant of the conjunction "negative-entropy", similar to negentropy or neguentropy, referring to an energetic-effect of growth, evolution, or increasing organization.

The term neg-entropy, however, seems to be far removed, in many cases, from its original connotation. Author Stephen Haines, an engineer, management consultant, and human systems theorist, for instance, incorrectly states, based on extrapolations of the heat death theory, that entropy refers to the natural characteristic of all living systems to eventually slow down and die and that in open biological systems or social systems, entropy can be arrested. He defines "neg-entropy" as phenomena such as new and stimulating inputs, e.g. education and learning, and states that a body's cells completely regenerate every seven years through neg-entropy. [1]

In alternative medicine, neg-entropy is associated with stability and time. [2] It is argued, for instance, that one's perception of time is connected with their state of neg-entropy, in that the more neg-entropic one is (young, whole, and growing), the slower time is perceived to be; whereas the more entropic one becomes (old, chaotic, and degenerating), the faster time seems to pass. [2]

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θΔics

In religio-mythology, **negative confessions** are forty-two actions or acts prohibited to humans, the weight of each act (soul weight) said to have a measureable or quantifiable after death moral mass greater than or equal to zero, the sum of one's moral masses said to characterize or determine the weight of one's 'soul', as it is called in Ab-*ra*-ham-ic theology (500BC), 'karma', as it is called in B-*ra*-hma-ic theology (1000BC), or 'ba' as it was called in the original Ra theology (3000BC) framework. This is expressed mathematically as such:

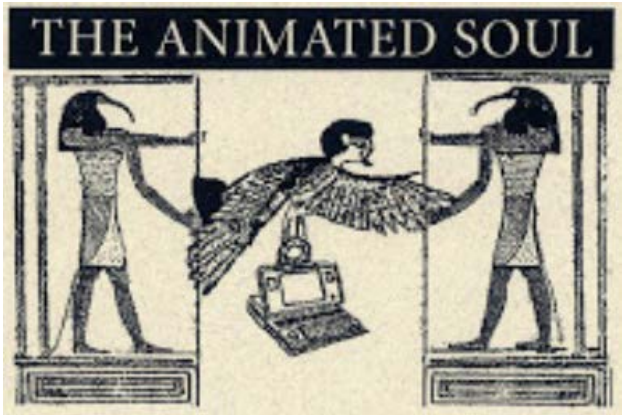

A semi-conception rendition of the soul (ba) of a person flying off to "confess" on 42 sacred acts of Egyptian morality in the judgment hall of the afterlife.

$$M_m = \sum_{i=1}^{42} C_{n_i}$$

where M_m is the moral after death mass of one's soul, ba, or karma, and C_n is a specific negative confession, each associated with a specific confession mass. To determine whether or not one was overall a good or bad (or evil) person, this moral mass was weighted against the weight of the feather of truth M_f, where by the following inequalities would determine the outcome of one's soul (ba or karma):

Measure	Result
$M_m > M_f$	No rebirth into the after life state; eaten by Ammut; descend into the lake of molten fire.
$M_m < M_f$	Granted access to the after life state.
$M_m = M_f$	No mention given as to this condition (possibly the criterion for the state of limbo?)

This morality theory was reformulated in the B-*ra*-hma-ic religions, generally speaking, into a cyclical positive or negative reincarnation theory with the prospect of cycle escape (nirvana), and reformulated in the Ab-*ra*-ham-ic religions, generally speaking, into the ten commandments and onetime judgment (heaven or hell) resurrection theory. A full 72% of the modern world's morality system, at a minimum, is based on this Egyptian morality theory, in one way or another.

Number 42

The significance of the number forty-two is a bit difficult to track down. The numbers 4, 9, 14, 18, 27, 42, and 110 are all said to have cosmic significance. [2] The number 42 seems to have arisen in Egypt's predynastic period (5500-3100BC), during which period each settlement, called a nome, had its own local god or "nome god", and according to actual records there were 42 of these nomes (or 44 depending on list). [4] There were 20 nomes of Lower Egypt and 22 nomes of Upper Egypt. [7]

These 42 different nome gods were incorporated into the first dynasty period Ra theology, such that there were said to be 42 gods (or nome gods) in the judgment hall, each god presiding over judgment of one particular sin. Hence the number 42 seems to have been a syncretism of the older scattered tribal-settlement gods into a unified state religious system, with head gods and subordinate gods.

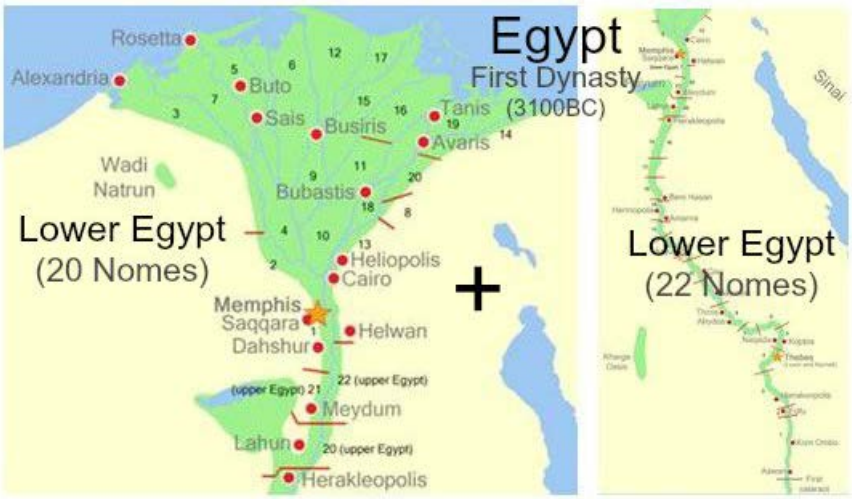

The 42 Nomes or cities (territories) of Pre-Dynastic Egypt, which when merged into the Egyptian First Dynasty, each previous 42 nome deities were given a place in the judgment hall over which the 42 negative confessions were read and the weight of the soul determined.

At the head judgment hall sat Osiris, the main judge of the dead and great-grandson of Ra, and passage of the deceased into this judgment hall was conducted by Horus, the son of Osiris.

In Christianity, a monotheistic version of Ra theology, the number 42, or the 42 judgment gods, were rewritten to the effect that there were said to be 42 generations between god (Ra) and Jesus (Osiris-Horus).

In modern times, the number 42 became popularized in Douglas Adams' famous 1978 science fiction comedy *The Hitchhiker's Guide to the Galaxy* as the supercomputer answer to the ultimate question of life, the universe, and everything; although, supposedly, the number was picked at random. [5]

42 Confessions → 10 commandments

In terms of the actual list of 42 forbidden actions, in 1300BC, following the demise of the short-lived monotheism promoted by the pharoh Akhenaton at Amarna, the displaced priests of this sect merged and truncated the list into another list called the ten categories of sin, commonly known in this period, into the famous "ten commandments". [2] An outline of this truncation process is shown below, using the famous 1200BC Papyrus of Ani. [1]

This these are compared with the so-called seven deadly sins, which were added to the classification of general sins, deriving from Greek monk Evagrius Ponticus' 400AD list of eight evil thoughts. [6]

Negative Confessions (1500BC)	Ten Categories of Sin (1300BC)	Ten Commandments (500BC)	Seven Deadly Sins (400AD)
1. I have not committed sin. 2. I have not committed robbery with violence. 3. I have not stolen. 4. I have not slain men and women. 5. I have not stolen grain. 6. I have not purloined offerings. 7. I have not stolen the property of the god. 8. I have not uttered lies. 9. I have not carried away food. 10. I have not uttered curses. 11. I have not committed adultery. 12. I have not lain with men. 13. I have made none to weep. 14. I have not eaten the heart [i.e I have not grieved uselessly, or felt remorse]. 15. I have not attacked any man. 16. I am not a man of deceit. 17. I have not stolen cultivated land. 18. I have not been an eavesdropper. 19. I have slandered [no man]. 20. I have not been angry without just cause. 21. I have not debauched the wife of any man. 22. I have not polluted myself. 23. I have terrorised none. 24. I have not transgressed [the law]. 25. I have not been wroth. 26. I have not shut my ears to the words of truth. 27. I have not blasphemed. 28. I am not a man of violence. 29. I am not a stirrer up of strife (or a disturber of the peace). 30. I have not acted (or judged) with undue haste. 31. I have not pried into matters. 32. I have not multiplied my words in speaking. 33. I have wronged none, I have done no evil. 34. I have not worked witchcraft against the King (or blasphemed against the King). 35. I have never stopped [the flow of] water. 36. I have never raised my voice (spoken arrogantly, or in anger). 37. I have not cursed (or blasphemed) god. 38. I have not acted with arrogance. 39. I have not stolen the bread of the gods. 40. I have not carried away the khenfu cakes (Ñº) from the spirits of the dead. 41. I have not snatched away the bread of the child, nor treated with contempt the god of my city. 42. I have not slain the cattle belonging to the god.	1. "General sins against people" 2. "Crimes against a person" 3. "Crimes against the gods" 4. "Crimes against the king" 5. "Crimes against the dead" 6. "Crimes against animals" 7. "Crimes against property" 8. "Fraud" 9. "Faults of morals and character" (I) 10. "Faults of morals and character" (II)	1. I am the lord thy god. Thou shalt have no other gods before me. (41) 2. Thou shalt not make unto thee any graven image... 3. Thou shalt not take the name of the lord they god in vain... (7, 37, 41) 4. Remember the sabbath day, to keep it holy... 5. Honor thy father and mother. (1, 12, 28) 6. Thou shalt not kill. (4) 7. Thou shalt not commit adultery. (11, 20, 21) 8. Thou shalt not steal. (2, 3, 5, 6, 7, 9, 39, 40) 9. Thou shalt not bear false witness against thy neighbor. (8, 13, 18, 29) 10. Thou shalt not covet thy neighbor's house or wife... (13, 20, 21, 29, 33)	1. Lust (pornography) 2. Gluttony (obesity) 3. Greed (overwealthed) 4. Sloth (laziness) 5. Wrath (anger) 6. Envy (jealousy) 7. Pride (vainglory)

An obvious issue in this system of morality is that it a relative system, which seems to change as the times change.

Modern morality

In modern terms, to upgrade the olden 42 negative confessions based system of morality, one must explain right and wrong behaviors in terms of the modern physical sciences.

The 1789 theory of utilitarianism, introduced by English jurist and philosopher Jeremy Bentham, defined as a sort of sum over everybody happiness calculus of positive and negative individual utilities of one's actions summed over the total populous, was a step in this direction.

Likewise, British philosopher John Stewart's 1789 "moral movement" theory, wherein he viewed a human as a type of intelligent animate matter, made of particles (atoms), and that all that exists in the universe is matter and motion, some motion being "moral" some "amoral".

In 1809, similar to Stewart's view of a person as type of animate matter, German polymath Johann Goethe's outlined his conception of moral symbols, in which a person was viewed as a reactive chemical whose reactions and behaviors to other people are determined by the forces of chemical affinity as outlined in the standard physical chemistry textbooks of his day, predominately Swedish chemist Torbern Bergman's 1777 *A Dissertation on Elective Attractions*.

Goethe's moral symbols logic equates, in modern parlance, to the explanation of morality or of specific second-by-second good (natural) or bad (unnatural) actions terms of firstly the Lewis inequality (1923), which describes what is "natural" and "unnatural" in human interactions:

Measure	Result
$\Delta G > 0$	A process, interaction, action, or reactions quantified as "unnatural" (bad or wrong, in an anthropomorphic sense).
$\Delta G < 0$	A process, interaction, action, or reactions quantified as "natural" (good or right, in an anthropomorphic sense).
$\Delta G = 0$	Equilibrium state

Then, secondly, how these inequalities relate to thermodynamic coupling:

$\Delta G_{total} = \sum_{i=1}^{k} \Delta G_i$	Sum of the total set of internal natural and unnatural processes of a given system of people.
$\Delta G_{total} < 0$	The actions of the system will be considered "natural" or good as long as the system is indicative of negative Gibbs free energy decrease actuating during the process or reaction.

This would then define morality for the system. In the case of global conflicts of morality, a summation (similar to previous) would need to be done to determine if the overall coupled systems (e.g. countries at war), would be a natural or unnatural process.

In the big picture of things, all of this would need to be explained in terms of the spin cycles of the universe, which thus drive the coupling, and thus the individual measures of morality.

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5. 42 (number) – Wikipedia.
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7. Nome (Egypt) – Wikipedia.

External links

â— Negative confessions – PaganizingFaithOfYeshua.Netfirms.com.

θΔics

In animate thermodynamics, **negative entropy** is a mathematical synonym for order, in an entropic sense. The term comes from Austrian physicist Erwin Schrödinger's famous 1944 booklet *What is Life?*, wherein he tried to explain the second law to a lay audience, stating that negative entropy is the amount of order that an organism "sucks from its environment" as its lives or "avoids decay to thermodynamical equilibrium or of maximum entropy". [1]

Mathematics

The idea of the verbal expression 'negative entropy' being synonymous to 'order' stems from a combination of the following three expressions:

$\frac{1}{X} = X^{-1}$	Rule for inverse functions
$\log(a^b) = b\log(a)$	Rule for logarithms
$S = k\log W$	Entropy expression from statistical mechanics.

In short, Schrodinger equates the multiplicity W of the Boltzmann entropy equation with disorder, pure and simple, which he reasons applied to all systems; then equates the inverse of multiplicity with order, as in:

$$W^{-1} = Order$$

then carries the negative sign over to the left side of the statistical entropy expression, using the rule for logarithms, to argue that negative S equals order.

Derivation

In his 1944 book *What is Life?*, Schrödinger reasoned that it is not energy that living beings feed on that keeps them at bay from decay but “negative entropy”. In rephrasing this statement, he says “the essential thing in metabolism is that the organism succeeds in freeing itself from all the entropy it cannot help producing while alive.” In making these ball-park statements, Schrödinger calls on the statistical concept of order and disorder, connections that were revealed, as he says, by the investigations of Boltzmann and Gibbs in statistical physics. On this basis, he situates the following definition:

$$\text{Entropy} = k\log D$$

where *k* is the Boltzmann constant and *D*, he says, is a “quantitative measure of the atomistic disorder of the body in question”. Here, to note, Schrodinger fails to mention that this expression is generally valid only for ideal gases. In any event, Schrödinger reasons that this statistical expression applies to living organisms. Moreover, to make is verbal argument mathematical, he states that “if *D* is a measure of disorder, its reciprocal, 1/*D*, can be regarded as a direct measure of order.” In addition, “since the logarithm of 1/*D* is just the minus of the logarithm of *D*, we can write can write Boltzmann’s equation thus:

$$-\text{Entropy} = k\log\frac{1}{D}$$

or

$$-S = k \log \frac{1}{D}$$

Hence, as Schrödinger states:

> "The awkward expression **negative entropy** can be replaced by a better one: entropy, taken with the negative sign [– entropy], is itself a measure of order."

Thus, he concludes "the device by which an organism maintains itself stationary at a fairly high level of orderliness", a state he equates with a low level of entropy, consists in "sucking orderliness from its environment".

Negentropy

In 1953, through the guise of information theory, Schrödinger's *negative entropy* usage was shortened into the term "negentropy" by French physicist Léon Brillouin. [2]

Difficulties

After his lecture, wherein he discussed negative entropy, Schrodinger famously had to add a note to Chapter 6, where explains that:

> "My remarks on **negative entropy** have met with doubt and opposition from physicist colleagues."

He goes on to explain that had he been lecturing to them, he would have turned the discussion to free energy, but judged the concept too intricate for the lay audience. In a 1946 review of Schrödinger's *What is Life?*, author H.J. Muller stated, supposedly, that biologists have, in the previous decades, commonly defined negative entropy as "potential energy". [3] Muller, it seems, is referring here to Schrodinger's note on free energy. When concept of negative entropy is taken literally and measured in actual organisms, the concept looses its meaning, and a move to free energy discussions prevails. [4]

See also

â— Positive entropy

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Further reading

â— Iniquez, Cruz. (2008). *Negative Entropy: A Brief Incursion into the Uncharted Universe of Decreasing Entropy* (abs) (pdf). Infinity Publishing.

θΔics

In chemistry, a **negative free energy change** refers to a reaction or process in which the free energy, Gibbs or Helmholtz, in the reactants in initial state, G_i or F_i, is greater in value that the free energy of the products in the final state, G_f or F_f.

For isothermal-isobaric (typical earth-bound) systems, negative free energy change is stated mathematically as:

$$\Delta G < 0$$

where the symbol ΔG or free energy change is defined mathematically as:

$$\Delta G = G_f - G_i$$

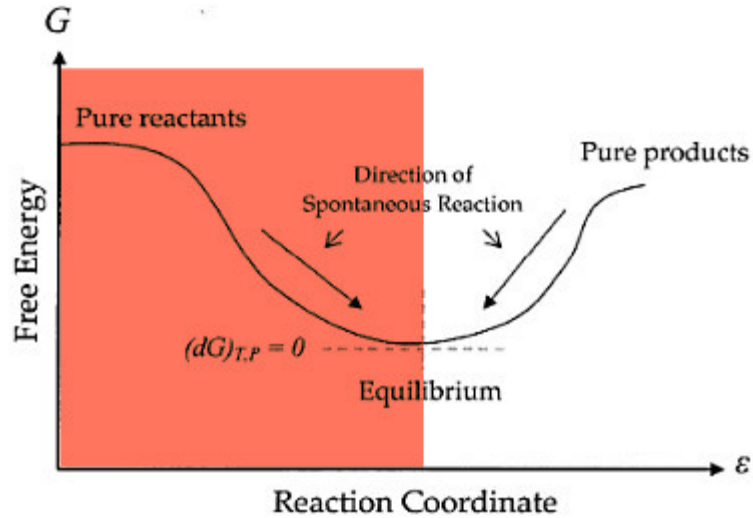

Reaction coordinate showing two possible directions of spontaneous reactions; the region in red depicting a reaction quantified by a **negative free energy change** (ΔG < 0) of products on going to reactants, otherwise referred to as an exergonic reaction. [1]

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θΔics

In thermodynamics, **negative transformation**, as contrasted with a positive transformation, is the transformation that results from the conversion of heat into work and therefore of heat from lower to higher temperature. [1]

Clausius footnotes this 1854 version of the negative transformation definition with the comment “the reason why this choice of positive and negative senses is preferable to the opposite one, will become apparent after the theorems relative to the transformations have been enunciated (1864). The exact details of this 1864 asterisk remain to be tracked down, but seem to refer the 1864 "Appendix to the Fifth Memoir: On Some Approximate Formula employed to Facilitate Calculations. [2]

See also

- Positive work
- Negative work
- Double transformation
- Uncompensated transformation
- Transformation-equivalents
- Transformation content
- Equivalence-value of all uncompensated transformations

References

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2. Clausius, Rudolf. (1865). *The Mechanical Theory of Heat* (pgs. 208-14). John van Voorst.

θΔics

In thermodynamics, **negative work**, in contrast with positive work, is work in which the component of the force acting on a body, producing the work, is in the opposite direction in which the motion of the body actually takes place, the calculation of which is defined mathematically according to the principle of the transmission of work. [1] Interestingly, French physicist Gustave Hirn, in his 1868 *Philosophical Implications of Thermodynamics*, devotes a section to what he calls "positive and negative work to be alive". [2]

References

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θΔics

In hmolscience, **negentropic life** is oft-used conjunction term meant to represent Austrian physicist Erwin Schrodinger's 1943 *What is Life?* argument that life is something that feeds on negative entropy or 'negentropy', as it has since come to be called in its shortened form.

Overview

In 2002, American philosopher Christian de Quincey, in reference to heat death theory, stated the following: [1]

> "The cosmological prediction of entropic 'heat death' of the universe [occurs when] all available physical energy if used up, and all pockets of **negentropic life** will have disappeared forever."

The recent 2007 work *Negentropy and its New Global Meaning* by Italian engineer Valter Caggio seems to be representative of the typical way thinkers attempt to theorize about negentropic models of life. [2]

See also

â— Negentropism

References

1. De Quincey, Christian. (2002). *Radical Nature: Rediscovering the Soul of Matter* (pg. 296). Invisible Cities Press.
2. (a) Caggio, Valter. (2007). *Negentropy: Meaning and New Meaning* (*Negentopia: Accezione, Nuove Accezioni*). Lulu.com.
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θΔics

In evolution thermodynamics, **negentropism** is an obscure entropy antonym term associated with evolutionary advancement, metabolism, and energy intensiveness. [1] It may be attributed to Norbert Wiener in connection with "islands of decreasing entropy". [2] Some maintain that an early proponent of a negentropism principle was Hungarian-born American positive psychologist Mihály Csíkszentmihályi with his Freudian psychodynamic-based ideas on energy, entropy, and mental flow and movements towards complexity. [5]

Other

In science fiction, negentropy is an ethical philosophy based on the view that entropy is a fundamental flaw of the universe, and that ethical actions are those that serve to slow or stop the increase of entropy. [3] In this sense, negentropists are individuals who adhere to the philosophy that the pursuit of efficiency, the reduction of all forms of waste, and the ultimate discovery of how to reverse the flow of thermodynamics, are the highest callings of intelligence. It is said to be a practical philosophy is largely based on making deductions of correct action from certain axioms and precepts. [4] This type of logic, although fictional in nature, borders into the field of philosophical thermodynamics.

See also

â— Anti-entropy difficulties

References

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θΔics

In thermodynamics, **negentropy** is a shorthand term or abbreviation of the term "negative entropy". In a strict thermodynamic sense, "negentropy" is the name given to the function (-*S*) and, as such, is the thermodynamic potential of an isolated system. [2]

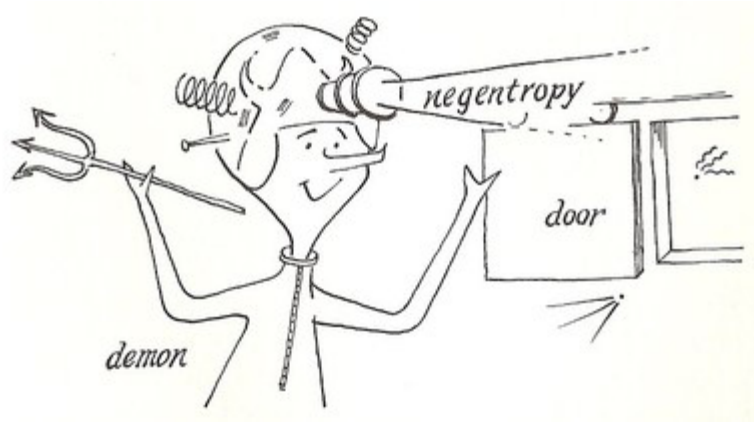

A cartoon of a Szilard demon (information energy version of Maxwell demon), from the 1967 book *Order and Chaos*, with a **negentropy** flashlight, from which the demon obtains information about the movement and positions of the molecules in the room beyond the door (see also: Heisenberg uncertainty principle). [8]

Etymology

In 1943, Erwin Schrodinger, gave his famous "What is Life?" lecture, wherein he famous posited that life is something that feeds on negative entropy. In the followup, Note to Chapter 6, in the 1944 book version of the lecture, Schrodinger clarified the following:

> "Entropy taken with a negative sign is not my invention."

In other words, that "–S" was something that predated 1943, whatever one wants to call it.

In 1950, French-born American physicist Leon Brillouin, in his article "Thermodynamics and Information Theory", stated the following—his brackets and italics: [1]

> "Every observation in the laboratory requires degradation of energy of energy and is made at the expense of a certain amount of negative entropy (abbreviation: ***negentropy***), taken away from the surroundings."

This seems to be the so-called "coining" of the now infamous silly term "negentropy" (the silliness is comparable to akin hypothetical terms: "negenergy" (negative energy) or "negheat" (negative heat), which we do not find in usage, because the ignorance is more obvious. Brillouin, in the preface to his 1956 book *Science and Information Theory*, specifically states that he "coined the word negentropy", which seems to be a reference to the above.

Into the 1950s, the term negentropy had gained a certain level of popularity. By 1956, owing to the work of Claude Shannon and Schrödinger, French physicist Léon Brillouin, for instance, in his book *Science and Information Theory*, had stated that "a new scientific theory has been born during the last few years, the theory of information." [14] The basics of this theory, according to Brillouin, revolve around the question of how one is able to define the quantity of information communicated by a system of telegraph signals, signals which themselves consist of either electromagnetic or current transmissions. In this theory, the basic definition of information in a given operation, a quantity that Brillouin supposedly proves is "very closely related to the physical entropy of thermodynamics", is defined by him as:

$$I = K \ln P$$

where *I* denotes information, *K* is a constant, and *P* is the probability of the outcome. Brillouin reasons that with these types of probability arguments, "it enables one to solve the problem of Maxwell's demon and to show a very direct connection between information and entropy" and that "the thermodynamic entropy measures the lack of information about a physical system." Moreover, according to Brillouin, "whenever an experiment is performed in the laboratory, it is paid for by an increase in entropy, and a generalized Carnot principle states that the price paid in increase of entropy must always be larger than the amount of information gained." Information, according to Brillouin, corresponds to "negative entropy" or *negentropy*, a term he coined.

In sum, Brillouin unjustifiably declares that the "generalized Carnot principle (second law) may also be called the

negentropy principle of information".

Negentropy flashlight

The origin of the so-called "negative entropy flashlight" seems to have originated in footnote eleven of Leon Brillouin's 1949 article "Life, Thermodynamics, and Cybernetics" where in comment on American mathematician Norbert Wiener's 1948 *Cybernetics* discussion of Maxwell's demon comments: [10]

> "One remark should be added. In order to choose the fast molecules, the demon should be able to see them; but he is in an enclosure in equilibrium at constant temperature, where the radiation must be that of the black body, and it is impossible to see anything in the interior of a black body. The demon simply does not see the particles, unless we equip him with a torchlight, and a torchlight is obviously a sours of radiation not at equilibrium. It pours negative entropy into the system."

At this point, Brillouin is not yet using the term "negentropy" (short for negative entropy).

In 1971, American engineer Myron Tribus commented, in retrospect, that the demon was finally "exorcised" in 1951 by Brillouin who pointed out that if the demon were to identify the molecules, he would have to illuminate them in some way, causing an increase in entropy that would more than compensate for any decrease in entropy such a being could effect. [11]

Derivation

The concept of negentropy stems from Léon Brillouin's extended efforts to make a crossover information-thermodynamics science, a blend of the two of sorts. In his derivation, on the analogy of Helmholtz's 1882 description "free energy" (available energy) and "bound energy" (entropy) of physical systems, Brillouin divides information into two classes: (a) *free information*, which occurs when the possible cases are regarded as abstract and have no specified physical significance, and (b) *bound information*, which occurs when the possible cases can be interpreted as complexions of a physical system. He states that bound information is a special case of free information.

Next, skipping a few point on probability arguments on the relation between entropy, information obtained, and numbers of complexions (as defined by Planck), Brillouin states that "bound information appears as a negative term in the total entropy of the physical system", and we can conclude that:

$$\text{Bound information } I_b = \text{decrease in entropy } S$$

$$= \text{increase in negentropy } N$$

where, as he states, we define *negentropy* as the negative of entropy and that "this statement represents the negentropy principle of information." [7]

Difficulties on term | Objections to use

Well into the 1960s, the term generally found little objection. Statements can be found such as: [6]

> "A fully living system must be capable of energy conversion in such a way as to accumulate *negentropy*, that is, it must produce a less probable, less random organization of matter and must cause the increase of available energy in the local system rather than the decrease demanded in closed systems by the second law of thermodynamics."

After 1980, however, the term negentropy has been generally considered as a sloppy cross-over analogy and not

recommenced for use in either information theory or in the study of the thermodynamics of living systems. [3] American chemical engineer Linus Pauling stated the point as "life does not feed on *negentropy* as a cat laps up milk." [4] American author Hubert Yockey has gone so far as to state that "the notion of *negentropy* has crept into the textbooks and the technical and popular literature" and that "it must be exorcised to avoid more damage". [5]

In 1994, Russian scientist Mikhail Bushev cogently explains that the term "negentropy" adds little if anything to the discussion: [12]

> "Leon Brillouin gave this negative entropy the name ***negentropy*** and identified it with the information received by the system. The new term, however, does not contribute any new insight, neither into entropy, nor into information. The difference in the signs of these two quantities is similar to the difference between conveyed and received heat, conveyed and received work, etc."

In other words, negentropy has about the same significance as if one were to introduce the term "negwork", short for "negative work", into the vernacular of science. The effect, in this hypothetical example, as we see, only acts to add a layer of confusion to a relatively straightforward situation.

Other

A 1942 mention of the term "negentropy" is attributed to American physicist Robert Lindsay, supposedly by Dick Hammond, in reference to a type of ethics based on reducing entropy to the minimum or, in other words, increasing negentropy to the maximum. [9] In this sense, this would be the inverse of the metaphorical association of death with the state of maximum entropy, such that life would be associated with minimum entropy or a maximum negentropy principle. The actual "1942" Lindsay citation of negentropy terminology usage, however, may be missattribution. (Ñº)

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8. Angrist, Stanley, W. and Helpler, Loren G. *Order and Chaos - Laws of Energy and Entropy*, (pg. 196-214). New York: Basic Books.
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(b) Hammond, Dick K. (2005). *The Human System from Entropy to Ethics* (pgs. 12-14). Publisher: Dick Hammond.
(c) Lindsay, Robert. (1942). "The Impact of Science on Contemporary Civilization" (Ñº), Sigma Xi Quarterly: v.30, no. 1.
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11. Tribus, Myron and McIrving, Edward C. (1971). "Energy and Information", *Scientific American*, 225: 179-88.
12. Bushev, Mikhail. (1994). *Synergetics: Chaos, Order, and Self-Organization* (pg. 247). World Scientific.

Further reading

â— Popper, Karl R. (1967). "Time's Arrow and Feeding on Negentropy", *Nature*, 213 (5079): 320-.
â— Woolhous, H. W. (1967). "Negentropy Information and Feeding on Organisms", *Nature* 213 (5079): 952+.
â— Mae-Wan Ho. (1994). What is (Schrödinger's) Negentropy?, *Modern Trends in BioThermoKinetics* 3, 50-61.
â— Negentropica - an e-Journal on negentropy, thermodynamics, and self-organized phenomena (2001-2003).

External links

â— Negentropy – Wikipedia.

θΔics

In human thermodynamics, the term **neguentropy** is a variant of the expression "negative entropy". [1] The particular spelling of this term, as compared to more commonplace term "negentropy", seems to be the result of a language translation effect of the Spanish term "neguentropia". [2] The term was also used by French scientific religious philosopher Pierre Teilhard in his writings on evolution, consciousness, and thermodynamics. [3]

References

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θΔics

In hmolscience, **Neil Shubin** (1960-) (318- ME) is an American evolutionary paleontologist and anatomist noted for his 2006 announced discovery of the fish-amphibian (walking fish) like fossil Tiktaalik, the so-called "missing link" connecting evolution of aquatic dwellers to and animals, which resulted an amount of notoriety and two followup books: *Your Inner Fish: a Journey into the 3.5-Billion-Year History of the Human Body* (2008) and *The Universe Within: Discovering the Common History of Rocks, Planets, and People* (2013).

Fish → Human | Big bang → Human molecule

In 2008, Shubin, in his *Your Inner Fish*, outlined a "walking fish to walking human" 365-million-year leap, below left. In 2013, in his *The Universe Within*, Shubin used the Sterner-Elser human molecular formula, to outlined a "big bang to human molecular formula" 13.7-million-year leap, shown below right: [1]

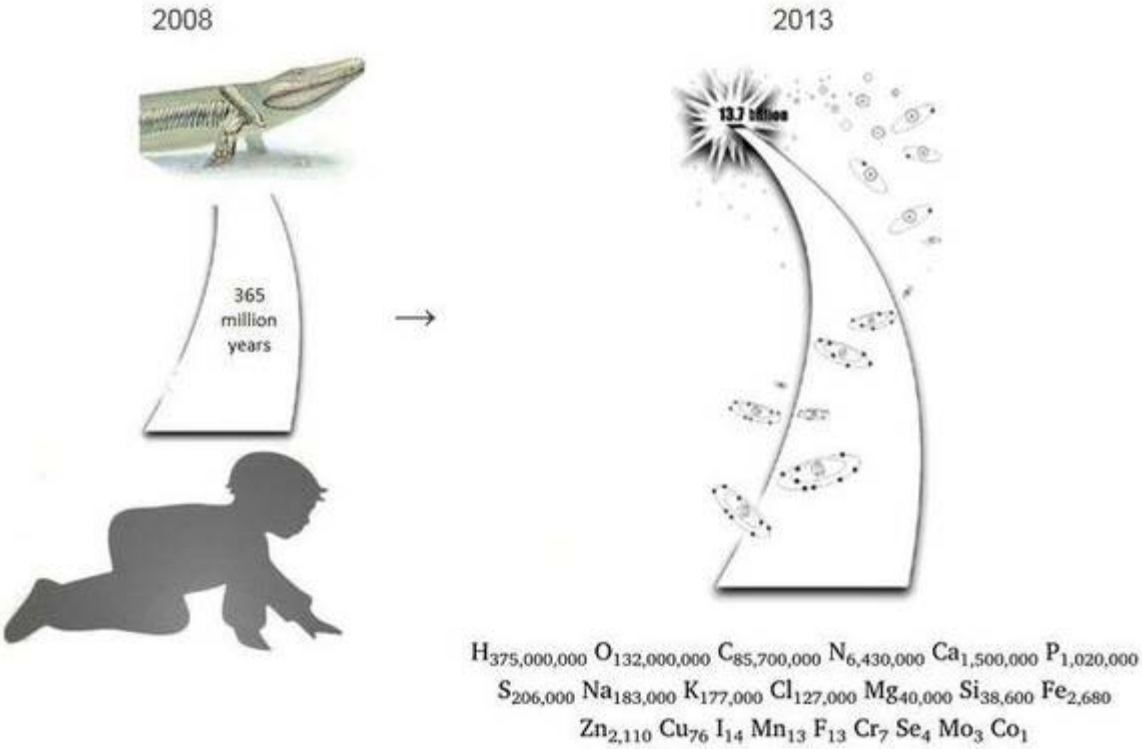

The following quote, from his *Your Inner Fish*, seems to capture Shubin's mindset, at least in 2008: [1]

> "This [*Tiktaalik*] fossil is just as much a part of our history as the African hominids, such as *Australopithecus afarensis*, the famous 'Lucy'. Seeing Lucy, we can understand our history as highly evolved advanced primates. Seeing *Tiktaalik* is seeing our history as fish."

In 2013, in upgrade mindset, so to speak, Shubin gives the following

> "This is a formula of elements that make up the human body. We are a very select mix of atoms. This of course not a true chemical formula, as the

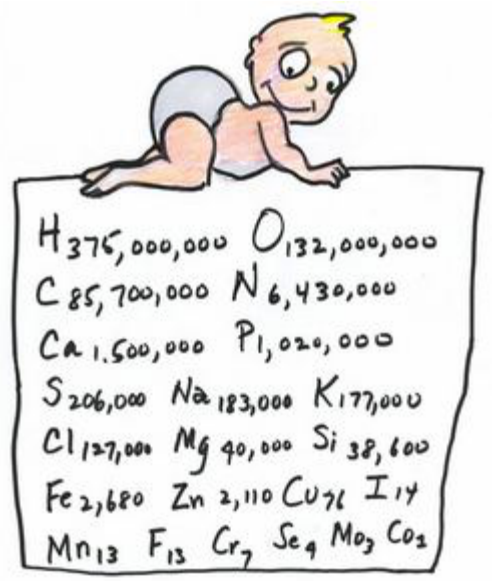

ratios of elements in us [see: hmolscience periodic table] compose not a single unique molecule, like a crystal of salt, but a body consisting of numerous different kinds of them."

— **Neil Shubin** (2013), End note to chapter two "Blast From the Past" [2]

Left: a 2013 NPR cartoon of **Shubin's** humans as evolved fish-like formulaic water babies. [3] Right: Shubin's text and footnote commentary about the human molecular formula.

The salient issue, in the above statement by Shubin, are is his subtle use of the term "human body", which belies a some type of mind/body ignorance or issue side-stepping; whereas, correctly, if he would have said something to the effect of "this is formula of elements that make up one average human", there would be no confusion or side-stepping.

Difficulties on theory

A salient difficulty on theory, amid Shubin's collective books, is his 2013 molecular formula definition of a human, above left, which conflicts with his 2008 belief in a "first life" point in time, adjacent, being that the premise of making a collection of atoms come "alive" at some fixed point in time is a concept not recognized by physics and chemistry, as Charles Sherrington so aptly put it in 1938, an irreconcilability issue that caused Francis Crick, in his *Of Molecules and Men* (1966), to assert, which much foresight, that we must abandon the world "alive".

Education

Shubin completed his undergraduate work at Columbia University, did his PhD in 1987 with a dissertation on "The Morphogenesis and Origin of the Skeletal Pattern of the Tetrapod Limb" (see: metamorphology) at Harvard University, and completed post-graduate work at the University of California, Berkeley. Presently, he is a professor of organismal biology and anatomy at the University of Chicago.

Quotes

The following are related statements and or quotes:

> "I seek to understand the mechanisms behind the evolutionary origin of new anatomical features and faunas. The philosophy that underlies all of my empirical work is derived from the conviction that progress in the study of evolutionary biology results from linking research across diverse temporal, phylogenetic, and structural scales."

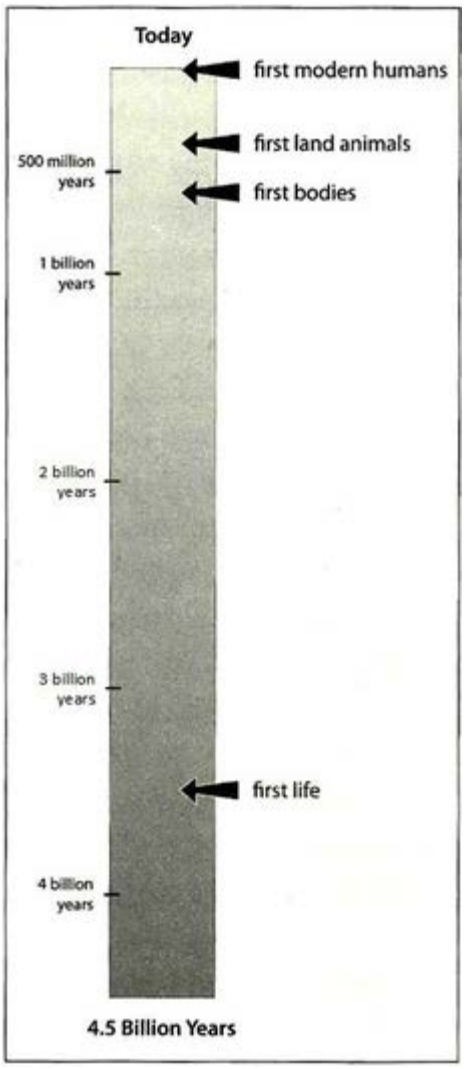

Shubin's so-called "first life" diagram, from his 2008 *Your Inner Fish*, which he situates at 3.5 billion years ago. [2]

— Neil Shubin (2013), faculty profile statement (Q)

References

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2. Shubin, Neil. (2013). *The Universe Within: Discovering the Common History of Rocks, Planets, and People* (§: pg. #; end note, pg. 198). Random House.
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External links

- Neil Shubin – Wikipedia.
- Neil Shubin (profile) – University of Chicago.
- Shubin, Neil – WorldCat Identities.
- Neil Shubin (about) – NeilShubin.com.

θΔics

In science, **Neil deGrasse Tyson** (1958-) (CR:2) (FA:117) is an American astrophysicist, a Debate.org SMA candidate (Q), known for his Carl Sagan like persona, an oft-perceived atheist, albeit self-aligned (2012) agnostic, who frequently has to correct his Wikipedia page to clarify this (Q), known for being outspoken against intelligent design (Q), how faith and reason are irreconcilable, how the Bible is bunk, etc., noted for his 2007 *Death by Black Hole: and Other Cosmic Quandaries*, wherein he elaborated on the humans = star dust ideology.

Religion

In 1999, Tyson, in his "Holy Wars" article, stated the following frank views: [2]

> "At nearly every public lecture that I give on the universe, I try to reserve adequate time at the end for questions. The succession of subjects is predictable. First, the questions relate directly to the lecture. They next migrate to sexy astrophysical subjects such as black holes, quasars, and the big bang. If I have enough time left over to answer all questions, and if the talk is in America, the subject eventually reaches god. Typical questions include: Do scientists believe in god? Do you believe in god? Do your studies in astrophysics make you more or less religious?

This "if the talk is in America", is hilarious ... seemingly tracing to Thomas Jefferson's 1802 separation of church and state (see: atheism timeline) addition to the US constitution. Tyson continues:

> "Publishers have come to learn that there is a lot of money in god, especially when the author is a scientist and when the book title includes a direct juxtaposition of scientific and religious themes. Successful books include Robert Jastrow's *God and the Astronomers*, Leon Lederman's *The God Particle*, Frank Tipler's *The Physics of Immortality: Modern Cosmology, God, and the Resurrection of the Dead*, and Paul Davies' two works *God and the New Physics* and *The Mind of God*. Each author is either an accomplished physicist or astronomer and, while the books are not strictly religious, they encourage the reader to bring God into conversations about astrophysics. Even Stephen Jay Gould, a Darwinian pitbull and devout agnostic, has joined the title parade with his recent work *Rock of Ages: Science and Religion in the Fullness of Life*.
>
> The financial success of these published works indicates that you get bonus dollars from the American public if you are a scientist who openly talks about god. After the publication of *The Physics of Immortality*, which suggested the law of physics might allow you and your soul to exist long after you are gone from this world, Tipler's book-tour included many well-paid lectures to Protestant religious groups. This lucrative sub-industry has further blossomed in recent years due to efforts made by the wealthy founder of the Templeton investment fund, Sir John Templeton, to find harmony and reconciliation between science and religion. In addition to sponsoring workshops and conferences on the subject, Templeton seeks out widely published religion-friendly scientists to receive an annual award whose cash value exceeds that of the Nobel Prize."

The following are noted statements on religion: (Q)

> "After the 9/11 attacks, when President Bush, in a speech aimed at distinguishing the US from the Muslim fundamentalists, said, 'Our god is the god who named the stars.' The problem is two-thirds of all the stars that have names, have Arabic names. I don't think he knew this. This would confound the point that he was trying to make."

Quotes

The following are noted quotes:

“So you're made of detritus [from exploded stars]. Get over it. Or better yet ... celebrate it! After all ... what nobler thought can one cherish than that the universe lives within us all?”

— Neil Tyson (2007), *Death by Black Hole* [1]

“The remarkable feature of physical laws is that they apply everywhere, whether or not you choose to believe in them. After the laws of physics, everything else is opinion.”

— Neil Tyson (2007), *Death by Black Hole* [1]

“God is an ever-receding pocket of scientific ignorance that’s getting smaller and smaller and smaller as time moves on.”

— Neil Tyson (2011), “Video Interview" (Q)(Q), *The Science Network*, Jan 20.

“To be scientifically literate is to empower yourself to know when someone else is full of bullsh*t.”

— Neil Tyson (c.2012), The Nerdist Podcast (Q)

“When you look at the ingredients of the universe (Q), the number one ingredient is hydrogen. Next is helium. Next is oxygen. Then nitrogen. Then, when you look at earth, because we like to think of ourselves as ‘special’, the number one element in the human body (Q): hydrogen [No: #3], matches the universe. Number two is oxygen [No: #1]. Matches the universe. Number three: carbon [No” #2]. Matches the universe. Number four: nitrogen [Correct]. Matches the universe. And for each of us, the fifth element – “other” [No] – is the same in both places.”

— Neil Tyson (c.2014), “Dialogue on Origin of Life” (1:14-2:35) (Q)

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(b) Neil deGrasse Tyson (quotes) – GoodReads.com.
2. Tyson, Neil de. (1999). “Holy Wars”, *Natural History Magazine*, Oct 1.

External links

- Neil deGrasse Tyson – Wikipedia.

θΔics

In science, **neo-vitalism** are versions of vitalism promoted or theorized about in the post Helmholtz school formation years, 1842 or thereafter, or thereabouts, in to the 1920s, approximately.

Overview

In 1842, the Reymond-Brucke oath was penned and signed in blood, so the legend has it: [1]

> "[We pledge] to put in power this truth: no other forces than the common physical chemical ones are active within the organism. In those cases which cannot at the time be explained by these forces one has either to find a specific way or form of their action by means of physical mathematical method, or to assume new forces equal in dignity to the chemical physical forces inherent in matter, reducible to the force of attraction and repulsion."

Neo-vitalism, in other words, are types of vitalism beyond that of the classical Johannes Muller model of vitalism.

In 1894, French-German science translator Frances A. Welby, in his article "Neo-Vitalism", gave the following historical: [2]

> "A Quarter of a century ago, du Bois-Reymond headed the revolt of mechanicalist biology against the vitalism of Johannes Müller. From Bichat to Magendie, from Johannes Müller to Schwann, the pendulum swung backwards and forwards; but it was reserved for du Bois-Reymond, in his now famous Berlin addresses, together with Ludwig and Helmholtz, to expose the fallacies of vitalism, and establish physiology on a mechanical basis."

In 1921, English biologist (chnopsologist) James Johnstone, in his chapter on the nature of life, stated: [3]

> "Into the last generation there has been a recrudescence of vitalism—'**neo-vitalism**' it is now called—being obviously something that seems to be different from the Cartesian speculations about the sensitive soul. At its best this is seen in the 'psychoids' and 'entelechies' of Driesch and others, concepts which are applicable to living things only, and not to chemical and physical phenomena. At its worst **modern vitalism** is exhibited in the crude and even grotesque 'spiritualism' which has attained such a vogue with the less resolute thinkers of our own generation. This, then, is the modern impasse to which biology has come. Purely physico-chemical explanations of life are not satisfactory, and the immaterial and non-energetic agencies that are being invoked in their place have no interest for science, since they cannot be the objects of investigations."

in the last sentence of Johnstone's book, he states: "life probably itself has existed on earth for 1,000 million years [and] in living processes the increase of entropy is retarded—this is our '**vital**' concept." This is a type of "physics-disguised vitalism", which is difficult to pin down, often requiring that one is an expert in a number of fields so as to be able to pin down the underlying vitalism or neo-vitalism. Here, in short, Johnstone is invoking a contrived thermodynamic argument, i.e. entropy reversal (or entropy reduction), to salvage the view that certain types of matter can be considered alive.

In 1966, Francis Crick, in the wake of 1963 vitalism debates, with so-called metaphysical vitalism of Pierre Teilhard and the scientific vitalism of Michael Polanyi, among others, e.g. Walter Elsasser, penned his *Molecules and Men*, wherein he stated the following: [4]

> "**Neo-vitalists** [are those] who hold vitalistic ideas but do not want to be called a vitalist."

Crick went on to state suggest: "we should abandon the word 'alive'." This was one of the stepping stones to the defunct theory of life.

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2. Welbey, Frances A. (1894). “Neo-Vitalism” (abs), *Nature*, 51:43-44.
3. Johnstone, James. (1921). *The Mechanism of Life in Relation to Modern Physical Theory* (pg. 159, 193). Longmans, Green & Co.
4. Crick, Francis. (1966). *Of Molecules and Men* (pg. #). University of Washington Press.

θΔics

In religio-mythology, **Nephthys**, hieroglyph: 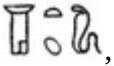 , or Nebt-Het, hieroglyph: , aka "lady of the house", is the Egyptian funerary goddess (Jordan, 1993) and or the "goddess of death which is not eternal" (Budge, 1904), who, according to Ennead genealogy, is the daughter of Geb and Nut, the the younger sister of Isis, Osiris, and Set; who becomes the unwilling (Q) wife of Set; later becoming, via a "brief liaison" with Osiris, the mother of Anubis (Anpu); oft-paired Isis, in the form of the goddess pair "Meri sisters" (Massey, c.1890), noted for []. [1]

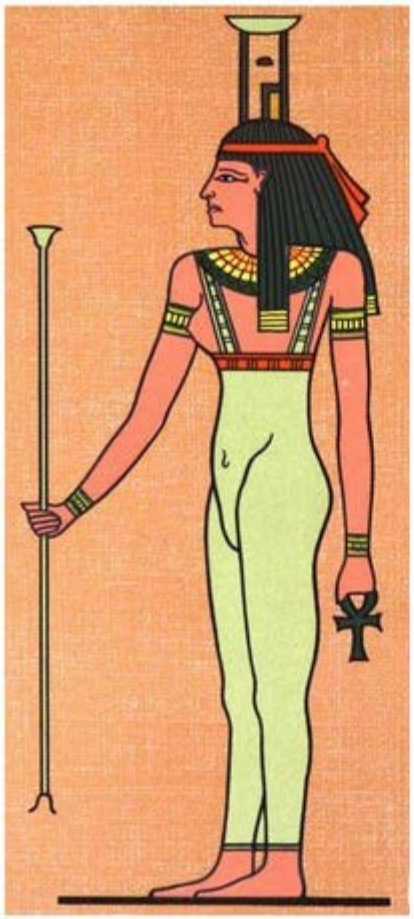

Two images of **Nephthys**, one from Wallis Budge (1904), the other a carved statue (Q) figure.

Epagomenal days

The birthdays of Nut's five children, in the epagomenal days myth, are: #1 Wesir (Osiris), #2 Heru-wer (Horus the Elder), #3 Set, #4 Aset (Isis), and #5 Nebt-het (Nephthys). (Q)(Q)

Body parts goddess

Nephthys, in one dominant role sense of things, was generally known as the "Lady of the Body" or "Lady of the Body of the Gods", which Budge (1904) summarizes as follows: [2]

> "Nephthys always appears as the faithful sister and friend of Isis, and helps the widowed goddess to collect the scattered limbs of Osiris and to reconstitute his body. In the Pyramid Texts she appears as a friend of the deceased, and she maintains that character throughout every Recension of the *Book of the Dead*; indeed, she seems to perform for him what as a nature goddess she did for the gods in primeval times when she fashioned the 'body' of the 'Company of the Gods', and when she obtained the name Nebkhat 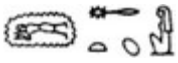 'Lady of the body [of the Gods]'."

This would seem to have something to do with astro-theology, in the sense of stars of constellations, e.g. Orion, as Nebkhat hieroglyph, namely the symbol: , which seems to be the dead Orion [horizontal (8PM) Orion constellation], seems to indicate, being the "body" or body parts of gods? Budge states that after during and after the Theban recension (1550BC) (see: recension theory), Nephthys main role became that as second assistant to Isis.

Osiris | Anubis

Osiris, according to the famous myth of Osiris, Isis, and Set, was said to have slept with Nephthys, then Set's wife, "by accident", therein creating the offspring of Anubis, per reason that he mistook Nephthys for his wife Isis, Nephthys' twin sister. This was the "act" that sparked the so-called "Passion of Osiris" tale, wherein Set first gets back at Osiris, for sleeping with his wife, by trapping in a chest, via ruse, during a dinner party, and then trowing the sealed chest into the Nile. Isis recovers the chest. Set then chops the body of Osiris into 14 pieces, scattering the pieces around the land. Isis, with the help of Thoth, finds the scattered pieces, makes a mummy out of them, and, with the combined help or power of Nephthys (and Thoth), resurrects (see: death and resurrection of Osiris) or brings back to life Osiris, from the dead, for a moment of time, long enough to procreate Horus. Horus then is born and avenges his father, by killing Set, therein restoring balance to Egypt.

Quotes

The following are related quotes:

> "**Nephthys**, although a goddess of death, was associated with the coming into existence of the life which springs from death, and that she was, like Isis, a female counterpart of Amsu, the ithyphallic god."
>
> — Wallis Budge (1904), *The Gods of Egypt, Volume Two* (pg. 258)

> "In the original resurrection of Osiris story, the Egyptian corn god Osiris who was shucked apart into 14 pieces [see: Orion]. Each piece was then scattered about the land and, as legend has it, wherever a piece landed a temple grew. Later these pieces were collected and put back together into the form of a mummy. To reincarnate this mummy, two special birds, Isis or Stela Maris (star of the sea) and her sister **Nephthys**, had to hover over the inanimate body so to impart spirit into it. Osiris was the world's first mummy. In the Christian version, Mary (Isis) and an Angel (Nephthys) had to hover over the body of Jesus (Osiris) to resurrect him, following his crucifixion (a reenactment of the shucking of Osiris into pieces)."
>
> — Libb Thims (2010), Hmolpedia forum post, Nov 17 (O)

References

1. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (pg. 181). Facts on File, Inc.
2. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (§XV: Set and Nephthys, pgs. 441-60; §§:Nephthys, pgs. 254-60; Body of the Gods, pg. 255; Nephthys, 54+ pgs). Dover, 1969.

External links

- Nephthys – Wikipedia.

θΔics

In terms, **Neter** or Ntr (Netjer, Netcher), represented by the “𓏲” hieroglyph, the symbol of a "hatchet" (Birch, 1848), "weapon" (Brugsch, 1862), or "axe" (Budge, 1904), is the original Egyptian word for “god”, or in plural form “neteru”, represented by the combined hieroglyph set of symbols “𓏲𓏲𓏲”, meaning “gods”.

When the neter symbol is shown groups of eight “𓏲𓏲𓏲𓏲𓏲𓏲𓏲𓏲”, or Ogdoad, in Greek, e.g. Hermopolis ogdoad (Ñº), or nine “𓏲𓏲𓏲𓏲𓏲𓏲𓏲𓏲𓏲”, or Ennead, in Greek, e.g. Heliopolis ennead (Ñº), it refers to a "paut" or group of gods, generally symbolic of the strength of the "military power" of the given city. [1]

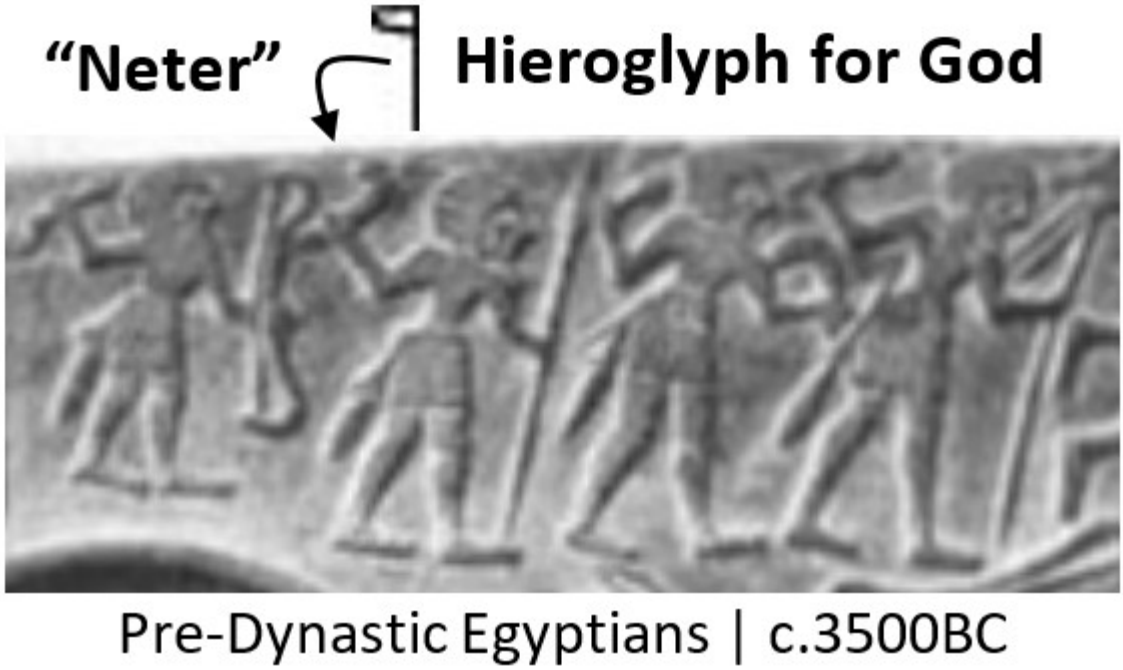

A a section from a c.3200BC pre-dynastic Egyptian green slate, showing the various weapons used by the Egyptian hunter-warriors, one of which is a "axe" like object, which in Dynastic times, became the word "**neter**", shown by the hieroglyph “𓏲”, meaning the word "god", which was translated in Judaism (700BC) as the word "El", meaning "mighty, might, strong, power", which became in Coptic "nutra", thereafter rendered as "nature" (Brugsch, 1888), "kraft" (force), or power. [4]

Overview

In 2360BC, the pyramid of king Unas (c.2400-2360) was built, on the walls of which are the Pyramid Texts of Unas, wherein the deceased king is described as a "kha ba em neter" which translates as "soul rising like a god" as follows: [1]

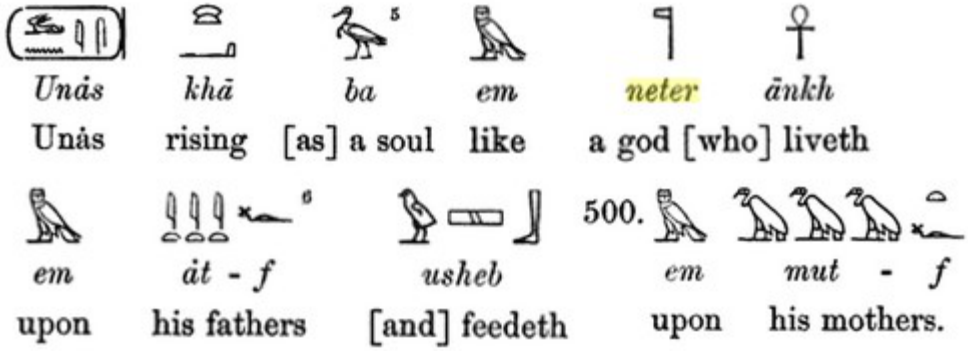

(add)

Brugsch

In 1872, Heinrich Brugsch placed ‘𓏲’among ‘objets tranchants, armes’ [sharp objects; weapons], in his classified list of hieroglyphic characters.

In 1888, Brugsch, in his *Religion and Mythology* (pg. 93), defined neter as follows:

German	English
“Neter [means] die thatige Kraft, welche in	“Nete [means] the operative power [force] which

periodischer Wiederkehr die Dinge erzeugt und erschafFt, ihnen neues Leben verleiht und die Jugendfrische zuriickgiebt.”

created and produced things by periodical recurrence, and gave them new life and restored to them the freshness of youth.”

Note, the English translation, at right (above), is done by Budge (1904) who translates "kraft" as power, whereas correctly, in modern scientific terms, kraft translates as force. When, correctly, a force moves an object, e.g. a person, through unit distance, per unit time, only then is the quantity of effect a "power".

Griffith

In 1898, Francis Griffith, in his *Hieroglyphs*, wherein it is suppositioned that the ‘𓏤’ symbol is a bone with a roll of yellow cloth wrapped around it.

Budge | Etymology

In 1904, Wallis Budge, in his *The Gods of the Egyptians, Volume One* (pg. 41), describes neter as follows:

The common name for “god,” as we have already seen, is “neter,” 𓏤, or 𓏤𓀁, with the plural “neteru,” 𓏤𓏤𓏤, or 𓏤𓏥, or 𓏤𓏤𓏤𓀁𓏥, or 𓅓𓅓𓅓, but we find that the male gods are sometimes called “hawks,” 𓅃𓅓𓅓𓅓𓅓, even when the female gods are called “netert,” 𓏤𓏏𓏏𓏏.[1]

Budge footnotes this passage as follows:

1. See the Pyramid Text of Unas (2360BC), line 209; in the Pyramid Text of Teta (2333BC)(Ñº), line 197, the gods are described as "male and female" via the hieroglyphs:

𓆑𓏤𓏤𓏤𓅓𓅓𓅓𓅓

Francis Griffith's *Hieroglyphs* (1898), wherein it is supposed that the '𓏏' symbol is a bone with a roll of yellow cloth wrapped around it, which Budge dismisses as an evidence-less based conjecture.

A pre-dynastic green slate object (an enlarged section of which is shown above), held in the British Museum, which, according to Wallis Budge (1904), shows Egyptian warriors holding the "axe", the symbol of power, which became the Egyptian hieroglyph for god or **neter** sign.

Budge, concurring with Birch and Brugsch, gives his opinion that the '𓏏' object is "an axe and nothing else". Budge then, citing his earlier *History of Egypt* (1902), goes onto discuss types of stone and metal axe-like weapons the ancient Egyptians might have used during battle, citing examples of which from the archaic period (before 1st dynasty), as preserved in the British Museum, as shown (adjacent). [4]

Budge (1902) to justify this weapon meaning, in reference to the above object, goes on to state how the warriors of Horus Kings of the 1st dynasty used stone-headed Maces, bow and arrows, etc.

Budge (1904) goes on (pgs. 66-69) to argue that neter became the Coptic "neter" (netra), which became the Hebrew "El" (see: supreme god timeline), both eventually becoming the Latin "nature", German "kraft" (force), or "operative power" in general.

Ashby

In 1997, Muata Ashby, in his *Anunian Theology*, was referring to Neterianism, based on the root neter, which he defined as "hidden divinity", as the oldest known religion in history. Asyby, citing what seems to be the Griffith "fabric" (1898) wrapping meaning, and the Brugsch (1888) "nature" meaning, defined ntr (or neter) as follows: [5]

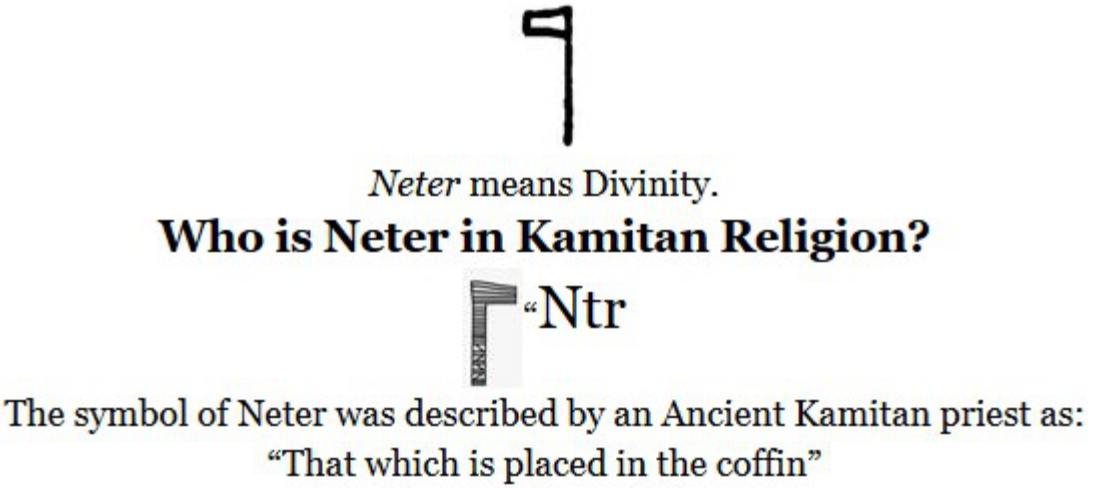

A visual of Muata Ashby's 1998 natural afterlife spirituality definition of **neter**. [5]

"The term Ntr '𓈖𓏏', or Ntjr '𓈖𓏏𓄿', comes from the Ancient Egyptian hieroglyphic language which did not record its vowels. However, the term survives in the Coptic language as 'Nutar'. The same Coptic meaning (divine force or sustaining power) applies in the present as it did in ancient times. It is a symbol composed of a wooden staff that was wrapped with strips of fabric, like a mummy. The strips alternate in color with yellow, green and blue. The mummy in Kamitan spirituality is understood to be the dead but resurrected divinity. So, the Nutar (Ntr) is actually every human being who does not really die, but goes to live on in a different form. Further, the resurrected spirit of every human being is that same divinity. Phonetically, the term Nutar is related to other terms having the same meaning, such as the Latin 'natura', the Spanish 'naturalesa', the English 'nature' and 'Nutriment', etc. In a real sense, as we will see, Natur means power manifesting as Neteru and the Neteru are the objects of creation, i.e. 'nature'."

Asyby, to note, has the backdrop agenda to sell a "hidden properties of matter" (see: ontic opening) based new age Egyptian spirituality; naturally enough, therefore he eschews the axe-symbol etymology.

Goelet

In 2015, Ogden Goelet, with the department of Near Eastern Studies of the New York University, in his), "A Commentary on the Corpus of Literature and Tradition which Constitutes the Egyptian Book of the Dead (the Book of Going Forth By Day)" of the Ani Papyrus version of the Egyptian Book of the Dead, stated the following: [6]

> "The root of the idea or belief that Egyptians hoped to become one of the gods in the next world. Cam be found in the meaning of the word for 'god', ***netjer***, especially in relation to the afterlife where the world 'god' may have an extended meaning. Neither the hieroglyphic sign nor any of the suggested etymologies for the word are particularly helpful in explaining what the Egyptians really meant when they spoke 'god' or 'gods'. The hieroglyphic sign apparently shows either a pole with cloth streamers attached, or a cloth-wrapped pole. In the so-called 'Signs Papyrus, dating to the Roman era, the hieroglyph is given the gloss 'he is buried'."

(add)

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (neter, 66+pgs; name for god, pg. 41; Unas rises, pg. 45; The Word Neter, pgs. 63-75). Dover, 1969.
2. (a) Bunsen, Christian C.J. (1848). *Egypt's Place* (i., Nos. 556, 557, 623). Publisher.
(b) Christian Bunsen (1791-1860) – Hymnary.org.
(c) Samuel Birch (1813-1885) – Wikipedia.
(d) Brugsch, Heinrich K. (1872). *Index des hieroglyphs phonetiques* (No. 394). Publisher.
(e) Heinrich Karl Brugsch (1827-1894) – Wikipedia.
(f) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (neter, 66+pgs; The Word Neter, pgs. 63-75; neter symbol, pgs. 63-64). Dover, 1969.
3. (a) Griffith, Francis. (1898). *Hieroglyphs* (pgs. 46). Publisher.
(b) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (neter, 66+ pgs; Griffith, pgs. 64). Dover, 1969.
4. (a) Budge, Wallis. (1910). *A History of Egypt from the End of the Neolithic Period to the Death of Cleopatra VII B.C. 30, Volume Two: Egypt Under the Great Pyramid Builders* (axe figure and description, pg. 10). Publisher.
(b) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (neter, 66+ pgs; weapon, pg. 65). Dover, 1969.
5. Ashby, Muata. (1997). *Anunian Theology: African Religion, Volume One* (Neterianism, pg. 11; neter, pg. 16). Cruzian Mystic Books.
6. Faulkner, Raymond. (1972). *The Egyptian Book of the Dead: the Book of Coming Forth by Day: Complete Papyrus of Ani, Featuring Integrated Text and Full-Color Images* (translator: Ogden Goelet; Preface: Carol Andrews; Introduction: Daniel Gunther; Foreword: James Wasserman) (Amz) (pg. 154). Chronicle Books, 2015.

External links

â— Neter – Prntrkmt.org.

θΔics

In thermodynamics, **network thermodynamics** is a synthesis of thermodynamics, particularly nonequilibrium thermodynamics and Prigoginean thermodynamics, circuit theory, graph theory, and differential geometry directed towards studies of biological systems and temporal and spatial organizations in biology. [1]

History

The term and general logic of "network thermodynamics" was coined by Israeli chemist Aharon Katchalsky, who in 1968 began to introduce the dissipative structure works of Belgian chemist Ilya Prigogine into the Lewis school of thermodynamics, particularly through the association of postdoctoral student George Oster and graduate student Alan Perelson. [1] American physiologist Donald Mikulecky is a more recent advocate of network thermodynamics.

References

1. Perelson, Alan S. (1975). "Network Thermodynamics", *Biophysical Journal*, Vol. 15 (7): 667-85.

Further reading

â— Peusner, L. (1970). *The Principles of Network Thermodynamics and Biophysical Applications*, Ph.D. thesis, Harvard University, (Reprinted by Entropy Limited, 1987).
â— Bonchev, Danail and Rouvray, Dennis H. (2005). *Complexity in Chemistry, Biology, and Ecology* (ch 3: The Structure of Network Thermodynamics as Formalism, pgs. 118-32). Birkhäuser.

External links

â— Network Thermodynamics of Biophysical Systems (a list of sources) – Infography.com

θΔics

In mononyms, **Neumann** (CR:196|#20) refers generally to Hungarian-born American polymath John Neumann (1903-1957); in some discussions it can refer to German mathematical physicist Carl Neumann (1832-1925).

John Neumann

The following are John Neumann related links:

- Neumann automaton theory
- Neumann on god
- Neumann-Shannon anecdote

Carl Neumann

The following are Carl Neumann related links:

- Neumann notation

The **Neumann** stamp, showing John Neumann, one of four in the 2005 US Post Office "great American scientists" series, along with: Willard Gibbs, Richard Feynman, and Barbara McClintock. (O)

In science, **Neumann automaton theory** or "free energy automaton theory" is a thought experiment which argues that a robot or automaton, made of wires, electrical motors, batteries, etc., constructed in such a way that when floating on a lake stoked with component parts, it could reproduce itself (self-replicate); albeit one that could be made to work only if a source of free energy is available. [1] The theory is part thermodynamic-based, part electrical-chemical based, part computer engineering/computer programing based.

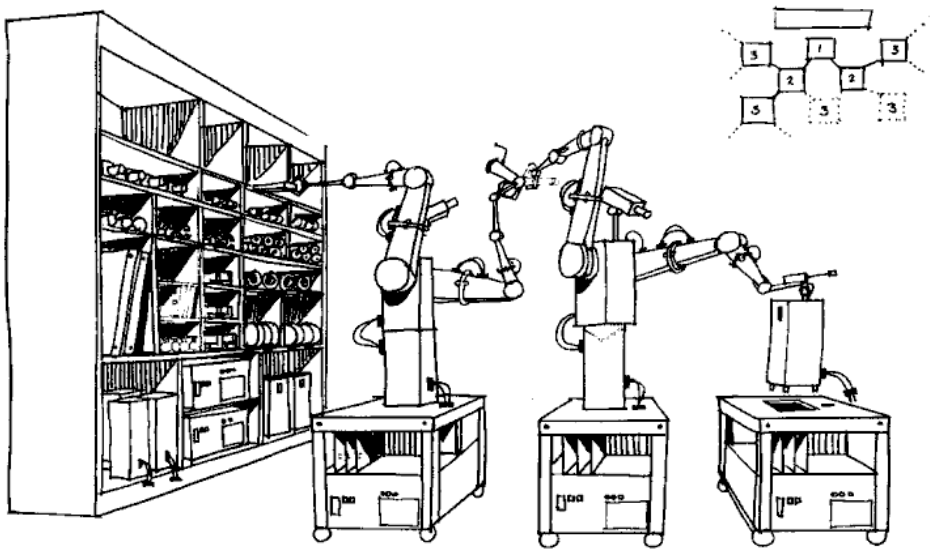

A NASA-funded artistic rendition of **Neumann's automaton** that produce automaton, the original caption of which is: "proposed demonstration of simple robot self-replication", based on the Advanced Automation for Space Missions NASA/ASEE summer study held at the University of Santa Clara in Santa Clara, California, from June 23-August 29, 1980. [15]

The self-replicative electrochemical automaton theory was first presented in 1948 by American chemical engineer, mathematician, and computer pioneer John Neumann.

Number of lectures

To note, as summarized by American mathematician and computer designer Arthur Burks (1966), Neumann seems to have given at least five or more different lectures (1948-1949), in which the various parts self-reproducing automaton theory are presented:

First: "Computing Machines in General"

Delivered: (add)

Second: "Rigorous Theories of Control and Information"

Delivered: (add)

Third: "Theory and Organization of Complicated Automata"

Delivered: (add)

Fourth: "The Role of High and of Extremely High Complication"

Delivered: (add)

Fifth Lecture: "Re-evaluation of the Problem of Complicated Automata: Problems of Hierarchy and Evolution"

Delivered: at the University of Illinois, December, 1949

Neumann then seems to have been in the process of assembling all of this into a book entitled *The Theory of Automata: Construction, Reproduction, Homogeneity*. Both the fifth lecture and the unfinished manuscript were published as the edited 1966 book by Arthur Burks.

Four talks

In 1953, Neumann delivered the Vanuxem Lectures at Princeton University, March 2-5, entitled "Machines and Organism", which he intended to have published by Princeton University Press. Later,

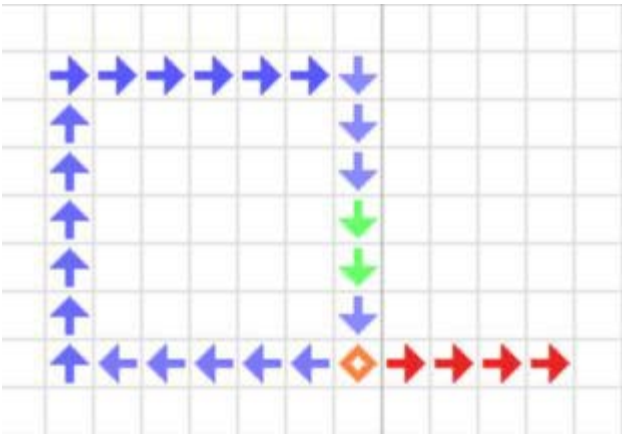

A modern two-dimesional computer iteration version of **Neumann's cellular automaton**, according to which a binary signal is passed repeatedly around the blue wire loop, using excited and quiescent ordinary transmission states, during the course of which a confluent cell duplicates the signal onto a length of red wire consisting of special transmission states; the then signal passes down this wire and constructs or so-called self-replicates a new cell at the end (i.e. a new red arrow).

however, owing to, it has been argued, manifold activities and possibly failing health, he declined to publish these lectures. A summary of these lectures, however, can be found in a *Scientific American* article written by John Kemeny of Dartmouth. [13] A considerable portion of the first three talks, supposedly, are found in the 1958 posthumous book *The Computer and the Brain.* [14]

Health issues

In 1955, he was invited to deliver the Silliman Lectures at Yale University, during the spring of 1956. On 15 March 1955, Neumann was sworn in as one of the Atomic Energy Commissioner, and he and his wife moved to Georgetown in May. Three months later, in August, he developed severe pains in his left shoulder, and after surgery, bone cancer was diagnosed; in 1957 he reached his dereaction point (died). [12]

Thermodynamic information

In his third and fourth lectures, supposedly, Neumann outlined his ideas on "thermodynamic information", namely that, in his view "information is entropy" and that it is measured by the logarithm as follows:

$$I_T = \log_2 N$$

where N is number of alternatives, which tends to be two, i.e. a choice between a high or low signal pulse, in the simplified case, or binary digits (bits), involved in the measurement. He then calculated that the energy per elementary act of information (alternative decision and or transmission), which he equates to the following formula:

$$E_I = kT \log_e N$$

wherein *k* is the Boltzmann constant, *T* is the absolute temperature, and *N* is the number of alternatives. When *N* is two, i.e. the choice is between 0 and 1, i.e. low or high current, Neumann calculates what he calls the "thermodynamical minimum" which has a value of 3x10E-14 ergs at a temperature of about 300 degrees kevin, "per elementary act of information, that is, per elementary decision of a two-way alternative and per elementary transmittal of 1 unit of information." He then idealized the neuron to be a binary alternative reading vacuum tube and extrapolated the above logic to this scenario. [11]

Overview

The so-called “Neumann automaton theory” originated in a 20 September 1948 Hixton Symposium lecture, Pasadena, California, organized by American chemical engineer Linus Pauling, given by Hungarian-born American chemical engineer and mathematician John Neumann, during the course of which Neumann invented a famous thought experiment which illustrates the role which free energy plays in creating statistically unlikely configurations of matter. Neumann imagined a robot or automaton, made of wires, electrical motors, batteries, etc., constructed in such a way that when floating on a lake stoked with component parts, it will reproduce itself (self-replicate). Neumann, in his lecture, first compares computers to biological information processing systems then suggests a program to deal with “automata that produce automata”, the gist of which is captured in the following statement:

> “Can one build an aggregate out of such elements in such a manner that if it is put into a reservoir, in which there float all these elements in large numbers, it will then begin to construct other aggregates, each of which will then at the end turn out to be another automaton exactly like the original ones?”

These so-called floating elements, as noted by American mathematician and computer designer Arthur Burks, who would later attempt to create a two-dimensional realization of Neumann's three-dimensional thought experiment premise, were spoken about prior to the lecture, by Neumann in the summer of 1948, as consisting of eight kinds of parts: a ‘stimulus organ’, a ‘coincidence organ’, an ‘inhibitory organ’, a ‘stimuli producer’, a ‘rigid member’, a ‘fusing organ’, a ‘cutting organ’, and a ‘muscle’. [10]

Free energy

The important point about Neumann’s automaton, as summarized by Lebanese-born Danish theoretical chemist and physicist John Avery, is that it would require a source of free energy in order to function: [2]

> “The important point about von **Neumann’s automaton theory** is that it requires a source of free energy (i.e. a source of energy from which work can be obtained) in order to function. We can imagine that the free energy comes from electric batteries which the automaton finds in its environment. (These are analogous to the food eaten by animals.) Alternatively we can imagine that the automaton is equipped with photocells, so that that it can use sunlight as a source of free energy, but it is impossible to imagine the automaton reproducing itself without some energy source from which work can be obtained to drive its reproductive machinery. If it could be constructed, would von Neumann’s automaton be alive? Few people would say yes. But is such a self-reproducing automaton could be constructed, it would have some of the properties which we associate with living organisms.”

It does not seem to be the case, to note, that Neumann was thinking along the lines of “free energy”, as the term does not seem to be found in his lecture publications, but rather possibly this is but latter adumbrations and elaborations by other others, Avery being a possible case in point. Avery's notion of free energy as being equated with either a battery or, in the human/animal case, with "food eaten", however, is not the way in which "Gibbs free energy" is understood in chemical reaction theory, such as discussed in human chemical reaction theory.

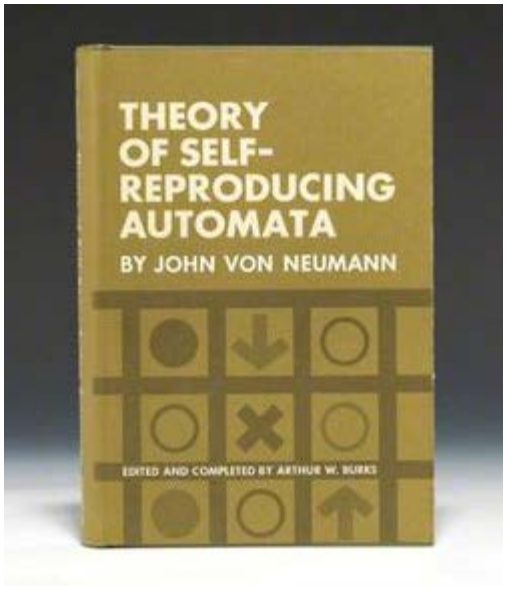

A $1,450 dollar rare books copy of John Neumann’s high-sought 1966 *The Theory of Self-Reproducing Automata*. [8]

In 1992, American computer scientist John Koza, in his *Genetic Programming: On the Programming of Computers by Means of Natural Selection*, for instance, stated that the rules of the Neumann milieu are such that there is “sufficient free energy and free matter available in the milieu to permit the creation of a copy of the desired thing.” This statement, however, does not seem to come from Neumann. This is exemplified by the fact that Koza, in his so-called "Entropy-Driven Evolution" chapter, culls his understanding of thermodynamics from the Shannon bandwagon, such as is exemplified by his statement: “entropy (i.e. information) drives the evolutionary process”. [6] Neither of these, information nor entropy, however, "drives" the evolutionary process, but rather the correct thermodynamic potential driving force, for the given reaction conditions of evolution, which are approximated as being isothermal and isobaric and freely going, is Gibbs free energy. [7]

Supposedly, to note, Neumann, in his first design attempt, disregarded the fuel and energy problem, planning to consider it later, perhaps by introducing a battery as an additional elementary component. It is argued that the full kinematic machine was never realized in hardware, not even fully designed, due in part to Neumann’s premature reaction end (death) in 1957. [3]

Publication

In 1951, Neumann's original 20 September 1948 lecture was expanded or rather elaborated on in more detail, as Neumann says, into the form of a 39-page chapter publication "The General and Logical Theory of Automata". Neumann, supposedly, did not but complete and publish any further work on this topic.

In 1966, American mathematician and computer designer Arthur Burks published *Theory of Self-Replicated Automata*, an edited, what seems to be, collected works set on the bulk of Neumann's automaton theories. [5]

NASA

In the summer of 1980, at the request of American president Jimmy Carter, 11.7-million dollars were spent on a study to investigate a potential realization of Neumann's self-replicating automaton theory for a possible lunar factory system, which would theoretically be capable of exponentially increasing productive capacity and, in the long run, exploration of the entire galaxy within a reasonable timeframe. [9]

An artistic rendition of the 1980 conceived **Neumann automaton theory** based self-replicating lunar space station, a premise about which NASA spent 11.7 million dollars investigating. [9]

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External links

â— Von Neumann cellular automaton – Wikipedia.

θΔics

In mathematical thermodynamics, **Neumann notation** refers to the use of the d hat symbol used to signify that the differential is an inexact differential, predominately used for differentials of heat and work, as compared to an exact differential.

Differential	Date	By	Comment	Publication
$\bar{d}$	1875	Carl Neumann	(add: comment)	*Lectures on the Mechanical Theory of Heat*
Ä‘	date	(add: Person?)	(add: comment)	
δ	1924	James Partington	The symbol δ to denotes that "δQ and δA are not perfect differentials, since each depends on the path of change."	*Chemical Thermodynamics*

To note, Partington footnotes this statement, directing readers to his 1920 *Higher Mathematics for Chemical Students*, in which he says that he gives a proper treatment of the properties of perfect differentials, as presented by Rudolf Clausius (1875). [2]

Etymology

The term "Neumann notation", an Hmolpedia coining, is indicative of the fact that the d hat notation was specifically introduced by German mathematician Carl Neumann in his 1875 *Lectures on the Mechanical Theory of Heat* to signify inexact differentials.

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θΔics

In geniuses on, **Neumann on god** refers to the paradoxical nature of the religious beliefs, particularly in respect to the question of the god's existence, of Hungarian-born American polymath John Neumann (1903-1957), the last of the last universal geniuses, who was raised in an ecumenical non-serious Jewish family, who defined themselves as Jewish, for reasons of "tradition", who, in his first marriage, nominally converted to Catholicism, albeit presenting himself as agnostic throughout his days to his friends and associates, but who in his last months on his death bed, Apr/May 1956 to his last day of existence on 8 Feb 1957, had Roman Catholic priest Anselm Strittmatter stay by his side, wherein he expressed great fear of death, and asked to have Pascal's wager administered to hims so that he wouldn't have to endure the possibility of eternal damnation.

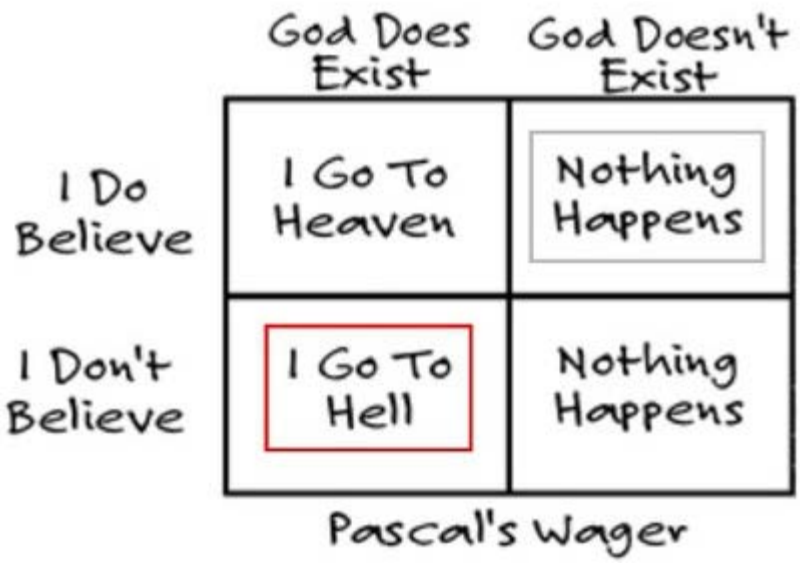

Hungarian-born American polymath John Neumann, a life-long secular agnostic, during his last 8 months of existence, after being diagnosed with bone or pancreatic cancer, called a priest to his side, expressing great fear of death, and therein took vows expressing his belief in the existence of god, i.e. became a theist, so to side with Pascal's wager, and not have to suffer the possibility of eternal damnation, as he saw things in his mind.

Religion

Neumann was born into a Jewish family with "ambivalent" religious attitudes; his family was so ecumenical that his family put up a Christmas tree, exchanged gives, and sang Christmas carols each year with their German governess, while also maintaining equal secular observance of the major Jewish holidays. Once Johnny's brother Michael asked his father Max Neumann why the family considered itself Jewish when it did not observe the religion seriously? Max's answer was: "tradition". This religious confusion, according to William Poundstone, "would follow von Neumann throughout his life", inclusive of a nominal conversion to Catholicism at the time of his first marriage, stitched together with an essentially agnostic belief system stance [1] Neumann's friend Edward Teller commented that whenever Neumann was tempted to curse, he would refrain himself and joke, "Now I will have to spend two hundred fewer years in purgatory." [1]

Last days | Pascal's wager

In the spring of 1956, at the hospital, while in his last 18-months dereacting (dying) from cancer, Neumann invited Anselm Strittmatter (1894-1978) (Ñº), a well-educated (Ñº) Roman Catholic priest who could discuss classical Rome and Greece, to visit him for consultation, who thereafter he began to see regularly. During these visits, Neumann expressed great fear of death. To his visitors, he despaired that "he could not visualize a world which did not include himself thinking within it." [2]

Neumann recited in Old Latin passages about judgment, right and wrong, and freedom:

> "When the judge his seat hath taken .. what shall wretched I then plead? Who for me shall intercede when the righteous scarce is freed?

Neumann told the priest that Blaise Pascal, in section 233 of *Pensees*, had a point, referring to Pascal's wager, commenting something to the effect of: [2]

> "So long as there is a the possibility of eternal damnation for nonbelievers it is more logical to be a believer at the end."

Neumann, in short, he sided with Pascal about betting one's afterlife on belief or nonbelief in the existence of god.

Subsequently, so to not lose in the wager, Father Strittmatter administered the last sacraments to him. [3] To his mother, who was also dying from cancer during this period, he expressed the following similar view: [2]

> "There probably has to be a God, because it is more difficult to explain if there is than if there isn't."

Some of Von Neumann's friends, having always known him as "completely agnostic", believed that his religious conversion was not genuine since it did not reflect his attitudes and thoughts when he was healthy. As Dutch-born American physicist and science historian Abraham Pais reports: [4]

> "He had been completely agnostic for as long as I had known him. As far as I could see this act did not agree with the attitudes and thoughts he had harbored for nearly all his life."

Even after his conversion, Father Strittmatter recalled that von Neumann did not receive much peace or comfort from it as he still remained terrified of death.

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θΔics

In anecdotes, **Neumann-Shannon anecdote**, or "Shannon-Neumann anecdote", is a famous conversation, or "widely circulated story" (Mirowski, 2002), that occurred in the time period fall 1940 to spring 1941 in a discussion between American electrical engineer and mathematician Claude Shannon and Hungarian-born American chemical engineer and mathematician John Neumann, during Shannon's postdoctoral research fellowship year at the Institute for Advanced Study, Princeton, New Jersey, where Neumann was one of the main faculty members, during which time Shannon was wavering on whether or not to call his new logarithmic statistical formulation of data in signal transmission by the name of 'information' (of the Hartley type) or 'uncertainty' (of the Heisenberg type), to which question Neumann suggested that Shannon use neither names, but rather use the name 'entropy' of thermodynamics, because: (a) the statistical mechanics version of the entropy equations have the same mathematical isomorphism and (b) nobody really knows what entropy really is so he will have the advantage in winning any arguments that might erupt. [1]

A 2010 parody of the **Neumann-Shannon anecdote**, by Israeli physical chemist Arieh Ben-Naim, form his three-page chapter section "Snack: Who's Your Daddy?", in which retells the story such that Shannon has a new baby and he and his wife are deciding on what name to pick: 'information' or 'uncertainty'? Neumann suggests they name their son after Rudolf Clausius' son's name 'entropy', which Shannon decides to do—only to find out, in the years to follow, that people continually confuse his son with Clausius' son and also misuse and abuse the name; after which, it is suggest to Shannon that he change is son's name to: Smomi, a short acronym for "Shannon's Measure Of Missing Information". [2]

Date

The date of the infamous Neumann-Shannon conversation is predominately attributed to the year 1940 and said to have occurred at the Institute for Advanced Study, Princeton, New Jersey, where at John Neumann was one of the main faculty members. [12]

To put the infamous conversation in chronological context, *Time* staff reporter Robert Slater, in his 1989 computer history book *Portrait in Silicon*, written following his travels to Silicon Valley where he interviewed the designers, entrepreneurs, hardware engineers, and software writers behind the modern computer, states specifically that Shannon completed his PhD with a dissertation entitled "An Algebra for Theoretical Genetics" in the spring of 1940 in mathematics, while at the same time completing a MS in electrical engineering. Then in summer of 1940 he worked under T.C. Fry, director of the mathematics department at Bell Labs, doing work on switching circuits, resulting in the paper "The Synthesis of Two-Terminal Switching Circuits", wherein he outlined a new method of design that reduced the number of contacts needed to synthesize complex switching functions.

Then, in the fall of 1940, Shannon accepted a National Research Fellowship that allowed him to work under German mathematician Hermann Weyl at the Institute for Advanced Study, Princeton, New Jersey. Then, in the spring of 1941, he was back at Bell Laboratories. [11]

This would put the conversation as having occurred between the fall of 1940 and the spring of 1941. It would seem likely that the conversation—being something important on Shannon's mind—would have occurred early upon his arrival at the Institute, which would assign the conversation as having occurred in September to December of 1940.

American information theory historians Jorge Schement and Brent Ruben, however, state that Shannon "spent a year (1939-1940) as a National Research Fellow at the Institute for Advanced Study, studying mathematics and Boolean algebra with Hermann Weyl. [1] This 1939 date, however, seems to be incorrect, as

$$H = \sum_{i=1}^{N} p_i log_2(p_i)$$

most sources state that Shannon had not yet finished his PhD at MIT until 1940. [12] In agreement with this Schement, in 2012, issued a correction retraction on the "1939" date, stating that they may have jumped the gun in regards to this dating timeframe.

Shannon used the word "entropy" once in his classified 1945 “A Mathematical Theory of Cryptography”. [16]

My greatest concern was what to call it. I thought of calling it "information", but the word was overly used, so I decided to call it "uncertainty". When I discussed it with John von Neumann, he had a better idea. Von Neumann told me, "You should call it entropy, for two reasons. In the first place your uncertainty function has been used in statistical mechanics under that name, so it already has a name. In the second place, and more important, nobody knows what entropy really is, so in a debate you will always have the advantage."

A 2010 snapshot summary of the 1940 **Neumann-Shannon anecdote** from the 2010 lecture notes turned book *Biomedical Informatics* of German computer processing scientist and cognitive theorist Andreas Holzinger. [15]

Overview

The Neumann-Shannon anecdote has been retold so many times that it has classified by some as an urban legend in science.

In Apr 1961, the story of the incident became public knowledge when American engineer Myron Tribus was invited to gave a seminar at MIT on a new way to derive thermodynamics based on information theory. The audience, according to Tribus, was a critical audience, comprised of students of American mechanical engineer Joseph Keenan, founder of the MIT school of thermodynamics, who “tried to rip it apart”, and also that French mathematician Benoit Mandelbrot was in the audience and quickly attacked the MaxEnt interpretation, saying: “Everyone knows that Shannon’s derivation is in error.”

It also happened to be the case that Shannon was in residence at MIT that week, so naturally enough Tribus went to see him. Shannon, according to Tribus, “was immediately able to dispel Mandelbrot’s criticism, but went on to lecture me on his misgivings about using his definition of entropy for applications beyond communication channels.” [3] During this meeting, Tribus queried Shannon as to his reason for choosing to call his information function by the name ‘entropy’, the details of which were first made public in his 1963 *Helvetica Physica Acta* article “Information Theory and Thermodynamics”, and in many symposiums and publications to follow. The most-cited version comes from Tribus' 1971 article “Energy and Information”, co-written with American physicist Edward Charles McIrvine (1933-), wherein they states: [4]

> “What’s in a name? In the case of Shannon’s measure the naming was not accidental. In 1961 one of us (Tribus) asked Shannon what he had thought about when he had finally confirmed his famous measure. Shannon replied: ‘My greatest concern was what to call it. I thought of calling it ‘information’, but the word was overly used, so I decided to call it ‘uncertainty’. When I discussed it with John von Neumann, he had a better idea. Von Neumann told me, ‘You should call it entropy, for two reasons. In the first place you uncertainty function has been used in statistical mechanics under that name. In the second place, and more importantly, no one knows what entropy really is, so in a debate you will always have the advantage.”

Likewise, Tribus, in his 1987 article “An Engineer Looks at Bayles”, recounts his discussion with Shannon on this question as follows: [5]

> "The same function appears in statistical mechanics and, on the advice of John von Neumann, Claude Shannon called it 'entropy'. I talked with Dr. Shannon once about this, asking him why he had called his function by a name that was already in use in another field. I said that it was bound to cause some confusion between the theory of information and thermodynamics. He said that Von Neumann had told him: 'No one really understands entropy. Therefore, if you know what you mean by it and you use it when you are in an argument, you will win every time."

Truncated variations of the above have been retold ever since.

In 1982, Shannon, in recorded interview (Ñº), commented, rather hazily, on this past event as follows:

> **Shannon:**
> Well, let me also throw into this pot, Szilard, the physicist. And von Neumann, and I'm trying to remember the story. Do you know the story I'm trying to remember?
> **Price:**
> Well, there are a couple of stories. There's the one that Myron Tribus says that von Neumann gave you the word entropy, saying to **use it because** nobody, **you'd win every time** because nobody would understand what it was.
> **Shannon:**
> [laughs]
> **Price:**
> And furthermore, it fitted p*log(p) perfectly. But that, but then I've heard . . .
> **Shannon:**
> von Neumann told that to me?
> **Price:**
> That's what you told Tribus that von Neumann told that to you.
> **Shannon:**
> [laughs – both talking at once]
> **Price:**
> Bell Labs too, that entropy could be used. That you already made that identification. And furthermore in your cryptography report in 1945, you actually point out, you say the word entropy exactly once in that report. Now this is 1945, and you liken it to Statistical Mechanics. And I don't believe you were in contact with von Neumann in 1945, were you? So it doesn't sound to me as though von Neumann told you entropy.
> **Shannon:**
> No, I don't think he did.
> **Price:**
> This is what Tribus quoted.
> **Shannon:**
> Yeah, I think this conversation, it's a very odd thing that this same story that you just told me was told to me at Norwich in England. A fellow —
> **Price:**
> About von Neumann, you mean?
> **Shannon:**
> Yeah, von Neumann and me, this conversation, this man, a physicist there, and I've forgotten his name, but he came and asked me whether von Neumann, just about the thing that you told me, that Tribus just told you, about this fellow. . .
> **Price:**
> That was Jaynes, I imagine the physicist might have been [Edwin] Jaynes.
> **Shannon:**
> Yes, I think it was, I think so. Do you know him?
> **Price:**
> Well, he's published in the same book as Tribus, you see. This is a book called *The Maximum Entropy*

Formalism. You've probably seen that book, but they have chapters in it, and Jaynes, the physicist —
Shannon:
Now, **I'm not sure where I got that idea, but I think I, somebody had told me that. But anyway**, I think I can, I'm quite sure that it didn't happen between von Neumann and me.
Price:
Right. Well, I think that the fact that it's in your 1945 cryptography report establishes that, well, you didn't get it from von Neumann, that you had made the p*log(p) identification with entropy by some other means. But you hadn't been —
Shannon:
Well, that's an old thing anyway, you know.
Price:
You knew it from thermodynamics.
Shannon:
Oh, yes, from thermodynamics. That goes way back.
Price:
That was part of your regular undergraduate and graduate education of thermodynamics and the entropy?
Shannon:
Well, not in class, exactly, but I read a lot, you know.

(add)

Restated versions of the anecdote

The following are regurgitated versions of the conversation, originally reported by Trybus (above), that varies depending on the source and point of view, and in which if one looks closely at the version reported by Tribus, we see him jumping from the report that Neumann used the phrase already used in "statistical thermodynamics" (1964) to "statistical mechanics" (1971) to "thermodynamics" (1983), which is somewhat humorous in itself:

Evolution of the Neumann-Shannon Conversation	Source
Conversation, between John Neumann and Claude Shannon, occurred between fall 1940 to spring 1941 at the Institute for Advanced Study, Princeton, New Jersey.	
April of 1961, Myron Tribus visits Shannon at his office at MIT and questions him about the reason behind his "entropy" name adoption.	
Tribus recounts the Shannon interview as such:	
"When Shannon discovered this function he was faced with the need to name it, for it occurred quite often in the theory of communication he was developing. He considered naming it "information" but felt that this word had unfortunate popular interpretations that would interfere with his intended uses of it in the new theory. He was inclined towards naming it "uncertainty" and discussed the matter with the late John Von Neumann. Von Neumann suggested that the function ought to be called "entropy" since it was already in use in some treatises on statistical thermodynamics (e.g. ref. 12). Von Neumann, Shannon reports, suggested that there were two good reasons for calling the function "entropy". "It is	Myron Tribus (1963) [8]

already in use under that name," he is reported to have said, "and besides, it will give you a great edge in debates because nobody really knows what entropy is anyway." Shannon called the function "entropy" and used it as a measure of "uncertainty," interchanging the two words in his writings without discrimination.

"What's in a name? In the case of Shannon's measure the naming was not accidental. In 1961 one of us (Tribus) asked Shannon what he had thought about when he had finally confirmed his famous measure. Shannon replied: 'My greatest concern was what to call it. I thought of calling it 'information', but the word was overly used, so I decided to call it 'uncertainty'. When I discussed it with John von Neumann, he had a better idea. Von Neumann told me, 'You should call it entropy, for two reasons. In the first place you uncertainty function has been used in statistical mechanics under that name. In the second place, and more importantly, no one knows what entropy really is, so in a debate you will always have the advantage."	Myron Tribus and Edward McIrving (1971) [4]
"You should call it 'entropy' for two reasons: First, the function is already used in thermodynamics under that name; second, and more importantly, most people don't know what entropy really is, and if you use the word 'entropy' in an argument you will win ever time."	Myron Tribus (1983) Philip Mirowski (2002) [13]
At first, Shannon did not intend to use such a highly charged term for his information measure. He thought "uncertainty" would be a safe word. But he changed his mind after a discussion with John von Neumann, the mathematician whose name is stamped upon some of the most important theoretical work of the first half of the twentieth century. Von Neumann told Shannon to call his measure entropy, since "no one really knows what entropy is, so in a debate you will always have the advantage."	Jeremy Campbell (1982) [9]
Shannon, the pioneer of information theory, was only persuaded to introduce the word 'entropy' into his discussion by the mathematician John von Neumann who is reported to have told him: "it will give you a great edge in debates because nobody really knows what entropy is anyway."	Peter Coveney and Roger Highfield (1992) [10]
"The theory was in excellent shape, except that he needed a good name for 'missing information'. 'Why don't you call it entropy', von Neumann suggested. 'In the first place, a mathematical development very much like yours already exists in Boltzmann's statistical mechanics, and in the second place, no one understands entropy very well, so in any discussion you will be in a position of advantage'."	John Avery (2003) [7]

By 1990, Shannon's *Mathematical Theory of Communication* sold more than 51,000 copies (Stockanes, 1990), and the anecdote has since become somewhat of an established factual legend, apocryphal or not. [1]

Discussion

There is some reference, to note, where it is claimed that Shannon says that he did not get the concept of entropy from either John Neumann, who has been working with entropy formulas since 1927, the or Alan Turning (Ellersick, 1984), whom Shannon frequently met with for lunch at Bell Labs in the 1940s, or from Norbert Wiener (Omni, 1987), who in 1946 was equating entropy with information, but rather that he derived his equation for the amount of information, and found it was identical to the formula that physicists use to calculate the equation known as entropy in thermodynamics (Bello, 1953). [6]

In his 1968 *Encyclopedia Britannia* article "Information Theory", Shannon wrote the following telling statement: [20]

> "The formula for the amount of information is identical in form with equations representing entropy in statistical mechanics, and suggest that there may be deep-lying connections between thermodynamics and information theory. Some scientists believe that a proper statement of the second law of thermodynamics requires a term related to information. These connections with physics, however, do not have to be considered in the engineering and other [fields?]."

Shannon, during his 1977 interview with graduate student science historian Friedrich-Wilhelm Hagemeyer, also recorded on tape, commented that when he wrote his 1948 paper, that he wasn't aware of Leo Szilard's 1929 work. He also told Hagemeyer that he read Norbert Wiener's 1942 Yellow Peril report, which contained discussions on entropy and communication. [1]

This, however, conflicts to some extent with the fact that Shannon was a close associate of Warren Weaver who was the first to alert Leon Brillouin to the so-called importance of Szilard's paper; also in 1950, at the Rockefeller Institute, formerly introduced Szilard and Brillouin. [19]

Shannon, during his 1982 oral history interview recorded on tape, conducted with communication engineer Robert Price, as reported in the 1984 article "A Conversation with Claude E. Shannon", said that he did not get the concept of entropy from either John Neumann or Alan Turing, but did so in an evasive way mixed with a seeming lack of memory. [16] [17] As Brazilian electrical engineer Erico Guizzo, who did his 2003 MS thesis on the origins of information theory, conducting many interviews himself, and listing to the Hagemeyer interview tapes, "Shannon seemed to always evade this kind of question", as to the origins of information theory". [18]

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θΔics

In thermodynamics, **neurochemical thermodynamics** is the study of the thermodynamical aspects, in particular energy, entropy, free energy, and chemical potential, work, of chemical operation of the nervous system.

History

The subject the application of thermodynamics to nervous system operation itself is still rather in development, having begun loosely in the 1960s, following the development of neurochemistry as a subject in the 1950s. One of the first publications was Canadian materials science engineer Jack Kirkaldy's 1965 article "Thermodynamics of the Human Brain". [1] In 2007 book *Money: Virtual Energy - Economy through the Prism of Thermodynamics*, Russian bioelectrochemist Octavian Ksenzhek outlined a pleasure center based (endorphins view) of economics in which humans act as active agents coupling energy flows in economy. [2]

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θΔics

In chemistry, **neurochemistry** is the study of the chemical function and operation of the nervous system. [1]
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Overview

Neurochemistry includes the study of cellular neurochemistry and neural membranes; intercellular signaling; intracellular signaling; growth, development, and differentiations; metabolism; inherited and neurodegenerative diseases; sensory transduction; and neural processing and behavior. [2]

In human chemistry, research efforts over the last few decades has focused on how various neurochemicals, in particular: oxytocin, vasopressin, endorphin, dopamine, serotonin, norepinephrine, testosterone, estrogen, epinephrine, phenylethylamine (PEA), dehydroepiandrosterone (DHEA), brain-derived neurotropic factor (BDNF), monoamine oxidase (MAO), gamma-aminobutyric acid (GABA), prolactin, cortisol, progesterone, estradiol, nerve growth factor (NGF), gonadotropin-releasing hormone (GNRH), among others, related to various moods, e.g. happiness, and states of human existence, e.g. being in love, in relation to changes in human bonding. [3]

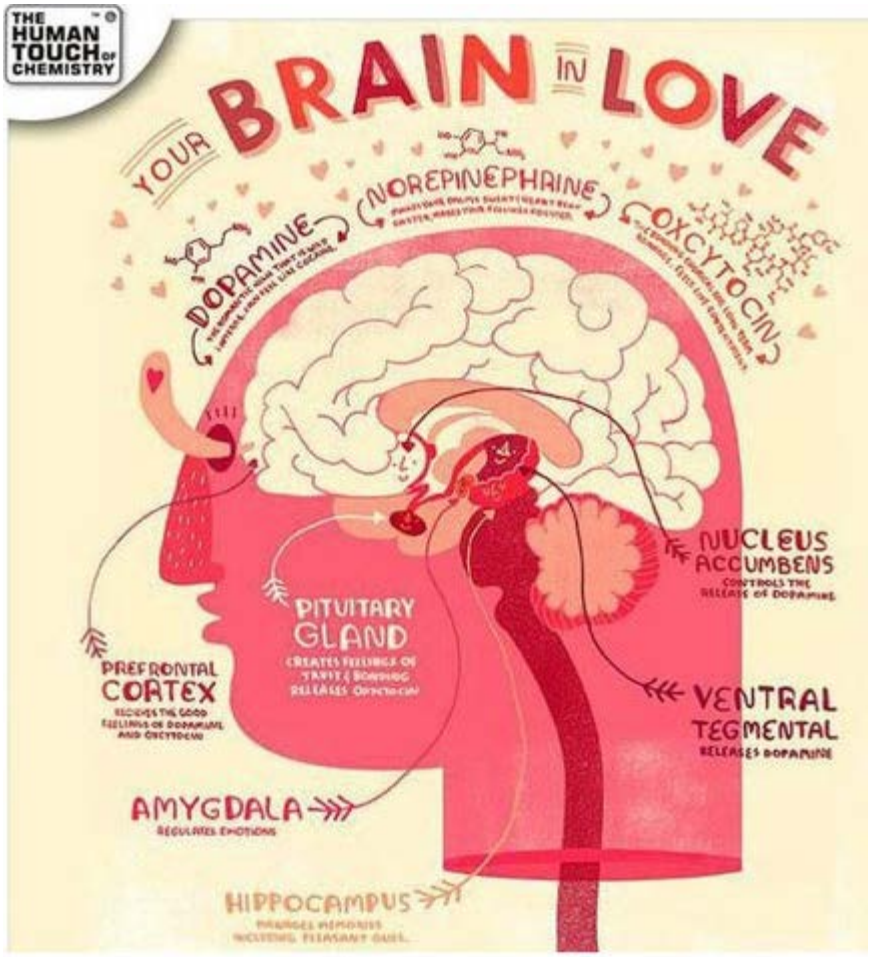

A 2014 Human Touch of Chemistry diagram on **neurochemicals**, such as Dopamine, Norepinephrine, and oxyctocin, and neuroanatomy, such as the prefrontal cortex, amygdala, hippocampus, pituitary gland, nucleus accumbens, and the ventral tegmental area. (Q)

Neurochemicals

The following bulleted terms—a paste from American electrochemical engineer Libb Thims' 2007 section "Neurochemicals", from his *Human Chemistry (Volume Two)*, numbered non-bracketed references found therein—are the main neurochemicals related to human behavior and bonding, along with related neuroanatomical areas and terms: [3]

● **Oxytocin** [$C_{43}H_{66}N_{12}O_{12}S_2$] – bonding molecule (hormone): high levels correlate with strong pair-bonding; sometimes called the 'cuddle chemical'; levels rise during touching, kissing, and foreplay, and peak during orgasm. Is considered the 'hormone of love'.123 Associated with male-female attachment.124 Is made in the hypothalamus, ovaries, and testes.122 Is released in women during the birthing process.125 Initiates contractions of the uterus, stimulates the mammary glands to produce milk, and stimulated bonding between a mother and her infant.126 At orgasm, levels increase dramatically in women.126 Released during stimulation of the genitals and nipples.127 Is secreted in response to the crying of the infant.11 Thinking about a loved one will cause levels to rise.128 It reduces stress.128 It makes people forgetful and diminishes the capacity to think and reason.128 Is secreted in the posterior lobe of the pituitary gland.128 When given to females around ovulation, it heightens their efforts to contact males and intensifies lordosis, i.e. sexual presenting.128 When given to males, they will develop maternal behaviors and infant guard ferociously; when levels are artificially blocked in males, they will neglect their infants and may even eat them.128 Improves erection, speeds ejaculation, enhances contractions of penile tissue, and increases ejaculation volume and sperm count; conversely, lowered levels reduces sperm count.128 Penis-vaginal contact and penetration increases levels in both sexes.128

| → Oxytocin theory of love

Oxytocin, according to intranasal administration studies, is found to affect people's responses to moral dilemmas that pit in-group members against out-group members, making them less comfortable with sacrificing in-group members, but not out-group members. [4]

● **Vasopressin**– monogamy molecule (hormone); responsible for creating intense loving memories during passionate situations; responsible for clarity of thought and alertness during passionate situations. Associated with male-female attachment.122 Ejaculation increases levels of in the brain, triggering spousal and parenting zeal.129 When injected into the brain it causes males to engage in territorial defense behaviors from other males and to become extremely possessive of the female[s] in his territory.130 When the production of in the brain is artificially blocked, males will copulate with a female and then abandon her for another mating opportunity.130 Is made in the hypothalamus, ovaries, and testes.122 At orgasm, levels increase dramatically in men.131 Released during stimulation of the genitals and nipples.127 Works with testosterone, modulating male sexual behavior, keeping it from reaching extremes or becoming too hot, i.e. it has a tempering influence.128 It turns a person's attention from the abstract to the concrete, away from the past and future to the here and now, and appears to improve memory, cognitive powers, and concentration.128 Secreted from the posterior pituitary gland.128 It increases attention and alertness while reducing emotionalism.128 A deficiency of causes a reduction of REM sleep.412 Artificially increased levels of induces flank-marking behaviors, thus communicating status and instilling dominant-subordinate heirarchies.128

● **Endorphin** (endogenous opioid) - calming natural pain killer; levels increase in response to touch, pleasing visual stimulus (as a smile), or after dwelling on positive thoughts.128 Thought to be the main attachmentchemical in long-term relationships.132 Is associated with love.126 Exercise elevates levels of some of the endorphins, instilling a calming effect.122 Stroking and massage trigger the production of, which causes a person to relax, and produces feelings of attachment.133 Reduces separation-induced crying.134 Secreted in situations of social comfort and produce a sense of well-being.134 When people feel socially cut off the brain's production of decreases, which makes people feel anxious and even panicky.134 When deprived of an important social bond our levels shut down; with the passage of time, however, the system begins to prime itself again as receptors become more sensitive and storage pools increase their stock.134 Dwelling on positive thoughts can raise levels of.128

| → Endorphin theory of love

Related bonding chemicals

The following are the main neurochemicals involved in human bonding (human chemical bonding):

● **Dopamine** [$C_8H_{11}NO_2$] – desire molecule (neurotransmitter): levels increase as passion levels increase; elevated levels are associated with romantic love.135 Is produced by specialized nerve cells located in the *arcuate nucleus* of the brain. Increased levels associated with sexual arousal and heightened motivation.136 Elevated levels directly associated with a *preference* for a particular mate.137 Mate favoritism is associated

A WikiHow image (Q) of how as little as 10-15 minutes of sunlight exposure (#2) can work to open up more dopamine receptors, therein allowing the mind to make more use of available **dopamine**; the #1 method of increasing dopamine being "setting a goal" for oneself, according to which when one begins to approach the reward, or achievement of the goal, the body releases dopamine, and that with each small step toward the goal, the body releases dopamine, incrementally.

with a fifty percent increase in the nucleus accumbens, a part of the brain associated with craving and addiction.138 Reduced levels correlated to indiscriminate mate selection.139 **Injected increases of cause females to prefer the male present at the time of the infusion, even if she had never mated with this individual**.139 Levels spike as an estrus female looks at slides of a males face.140 **Heightened levels associated with extremely focused attention**.141 **Heightened levels associated with unwavering motivation and goal-directed behaviors**.142 All major addictions are associated with elevated levels of.143 **Specific brain cells produce greater amounts when a reward is delayed, thus energizing, focusing, and driving the pursuer harder**.144 **All basic drives, and particularly sexual drive or motivation, are associated with elevated levels of**.145 Stimulates the release of testosterone.146 Elevated levels are related to sexual arousal, frequency of intercourse, and positive sexual function.147 When injected into the blood stream it stimulates copulatory behaviors.148 When a male is near an estrous female, such that he can see or smell her, his levels rise.149 During copulation levels rise.150 Stimulates lust and erectile function.151 Drugs that elevate levels of in the brain cause sex drive to improve.152 Very high levels of are associated with intense motivation and goal-directed behaviors, as well as with anxiety and fear.133 **Vigorous exercise drives up levels of dopamine in the nucleus accumbens, bestowing feelings of euphoria**.153 **Twice as many receptors for dopamine are found in the limbic systems of schizophrenics**.154 Is responsible for the desire or pursuit of any pleasure [see: pleasure center]; without it, a person will feel no joy, anticipation, enthusiasm, excitement, or exuberance.128 It is the common denominator of most addictions, such as cocaine and alcohol, and may be what addicts people to each other.128 **It is the neurotransmitter that moves people, drives them to go after what they want**, reinforces that desire, and promotes the anticipation of pleasure.128 **Is what makes a person smile as well as induces spontaneous activity and movement**.128

| → Neuroeconomics

● **Serotonin** [$C_{10}H_{12}N_2O$] – stability molecule (neurotransmitter). Selective serotonin reuptake inhibitors, such as Prozac or Zoloft, work to elevate levels of and thus alleviate aberrant behaviors such as obsessive-compulsive disorders.155 **During the first six months of love, serotonin levels drop to forty percent below those in normal subjects**.156 Low levels are attributed to a lover's persistent, involuntary, irresistible ruminations, e.g. up to ninety percent of one's waking hours, about a loved one.157 Both those newly in love within the previous six months and those will obsessive-compulsive disorder have lower levels of.158 Rising levels of dopamine and norepinephrine cause levels to plummet.159 **Exercise elevates serotonin**.122 Women taking SSRI's, i.e. serotonin boosters, rate male faces as less attractive than compared to non-medicated women and spend less time looking at the faces.122 Serotonin enhancer drugs dampen the sex drive and tends to inhibit the sex response.122 High levels cool one's sex drive; low levels intensify it.128 High levels instill a peaceful nature in a person, reduce sex drive, and delay orgasm.128 **High levels promote selectivity in mates, namely same species and heterosexual choice; low levels promote indiscriminate sexual choice of partner and gender**.128 **Those with low levels will tend to participate in group sex**, in a violent and often frenzied nature.128 **Low levels promotes responsiveness; in females, orgasms come more quickly; in males, ejaculations come quicker**.128 Levels decrease with dieting often added to the sex drive as body image improves.128 Lower levels of in females will cause them to mount other females and smaller males and behave more like males.128

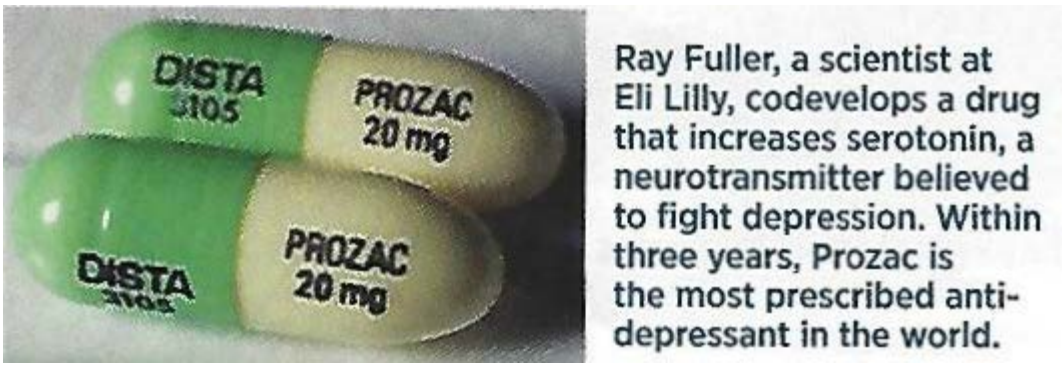

A 1987 timeline clip from *Forbes* 18 Dec 2017 100th anniversary issue, discussing the invention of Prozac, which artificially increases serotonin. [5]

● **Norepinephrine** [$C_8H_{11}NO_3$] - elevated levels are associated with romantic love.135 Is a precursor of epinephrine (adrenaline) in its major biosynthetic pathway.160 Increased levels associated with sexual arousal and heightened motivation.161 The smell of male urine causes levels to increase in the female brain.162 Levels spike as an estrus female looks at slides of a male's face.140 Heightened levels associated with lordosis.163 Increasing levels produce exhilaration, excessive energy, sleeplessness, and loss of appetite.122 Is associated with increased memory for new

stimuli, especially social memory.164

● **Testosterone** [$C_{19}H_{28}O_2$] – masculinization hormone (high testosterone-laden males tend to bond with high estrogen-laden females); levels drop in men who are involved in long-term monogamous relationships; functions as the main sex drive hormone for both men and women.135 It is the hormone of sexual desire and associated with lust in both men and women.122 Men and women who have higher circulating levels of engage in more sexual activity.165 Male athletes who inject themselves with it tend to have more sexual thoughts, more morning erections, more sexual encounters, and more orgasms.122 Women who take supplement of in middle age boost their sexual desire.165 Women feel more sexual desire around ovulation, when levels increase.166 When males see a sexually available female or watch a companion copulate with a female, their levels soar.167 Increased levels of works to elevate levels of dopamineand norepinephrinebut to suppress levels of serotonin.122 Men with high levels of marry less frequently, have more adulterous affairs, commit more spousal abuse, and divorcemore often.122 As a man's marriage becomes less stable, his levels rise and with divorce his levels rise further.122 Single men tend to have higher levels than married men.168 As a man becomes more and more attached to his family, levels decline.169 At the birth of child, expectant fathers experience a significant decline in levels of.169 When a man holds a baby his levels decrease.122 Increasing levels of can sometimes drive down levels of vasopressin (and oxytocin) and elevated levels of vasopressin can decrease levels of.170 High levels of reduce attachment.122 High levels of inhibit nurturing behavior in both males and females.171 Lowers the firing threshold of the amygdala, the area of the brain most involved with violence and agression.172 Is responsible for the aggressive sex drive, makes one want to pursue sex, initiate, and dominate.128 It stimulates desire directly by enhancing levels of dopamine, a neurotransmitter known to increase sex drive.128 Without testosterone males won't mark their territory or confront intruders; with it, they fight to protect their turf, take ownership of their mates, and often wish to be aloof or alone.128 Is a potential aphrodisiac for both males and females, promoting the drive for genital sex and orgasm.128 Promotes masturbation, one-night stands, and a decreased desire for emotional entanglements.128 It doubles as an anti-depressant, but makes people irritable when it spikes.128 Levels drop in men who live together.128 Is extremely sensitive to environmental stimuli, e.g. a confrontation, competition, stress, or the presence of other men or women.128 Higher levels of in the male increases the attractiveness of the male odors to the female.128 Levels rise in those who are victorious in combat.128 Men with high levels of are less likely to get married and more likely to have affairs if they do marry.128

● **Estrogen**– feminization hormone (high estrogen-laden females tend to bond with high testosterone-laden males). Attractiveness to men is enhanced by it.128 It governs the female receptive sex drive and makes a female acquiescent to a man moved to pursue her by testosterone.128 Generates attractive body odor and texture.128 Promotes vaginal lubrication and promotes lordosis.128 In regards to behavior, it prevents depression, reduces stress, improves sense of taste and smell, and decreases appetite.128

● **Epinephrine** (adrenaline) [$C_9H_{13}NO_3$] – a basic sympathomimetic stimulate hormone, e.g. it causes a person's heart to race.160 A mixture of danger, fear, and adventure, e.g. riding on a roller coaster or walking on high creaky suspension bridge, stimulates levels of and new couples are more likely to attach to each other following dates where levels were high.173 Makes a person more happy in a pleasant situation, but more angry in a frustrating one.134

● **PEA** [$C_8H_{11}N$] – amphetamine-like molecule (neurotransmitter) often known as the 'molecule of love.'128 It speeds up the flow of information between nerve cells.132 Keeps one alert, confident, and ready to try something new.132 Causes people to feel optimistic of the future, sleep less, and be more socially out-going.134 Low levels have been correlated with love sickness.122 Is considered the visual component of the chemistry of love, in that its levels surge in the sight of someone desirable or even a picture, art, or something one reads.128 Levels are typically higher in women, particularly at ovulation, than in men.128 Levels are high in schizophrenics and during a divorce.128

● **DHEA** [$C_{19}H_{28}O_2$] – most abundant hormone in the body;

A 2008 **neurochemistry** talk on PEA and oxytocin in love and attachment by Croatian neuroscience researcher Marko Kosicek.

increases sex drive and influences who one finds attractive; levels increase to three to five times that of baseline before and during orgasm. Because most of the other sex hormones are derived from it, it thus unconsciously tells a person when they can or cannot have sex.128 Pheromones are derived from it.128 Responds directly to both emotional and environmental stimuli and drops drastically under stress.128 Through the action of pheromones, it acts on the brain to influence our choice of mates.128 Lean females have double the amount of it than obese females.128 It excites the septum and medial preoptic areas, which are known to promote active and pleasurable sexual behavior and reactions.128 When males are exposed to the scent of receptive females for seven days, levels are increased in the amygdala and hypothalamus.128 Vigorous exercise, for about thirty minutes per day, for one month, causes a measurable increase in levels of.128

● **Brain-Derived Neurotropic Factor** [BDNF] – exercise increases levels of in the hippocampus, the memory center, which protects and makes new nerve cells.122 Exposure to stress and the stress hormone corticosterone has been shown to decrease the gene expression of, and leads to an eventual atrophy of the hippocampus if exposure is persistent.174

● **Monoamine oxidase**(MAO) – one of the most important brain enzymes involved in the regulation of emotions and is a major metabolizer of norepinephrine, dopamine, serotonin, and PEA.134 Men with lower levels of tend be sensation-seekers, with a preference for wild or disinhibited forms of behavior and a particular distaste for anything that smacks of routine or is tedious or boring.134 Those with lower levels are often more social, more active, more playful, and sleep less.134 People with low levels of seem to have, and to prefer, more intense emotional stimulation in their lives.134 Schizophrenics have lower levels in their blood.175 Is an enzyme that removes a variety of neurotransmitters by oxidation after they have performed their task; a deficiency in MAO would leave excess neurotransmitters at the synapses transmitting information which, in reality, not there.11

● **Gamma-aminobutyric acid**(GABA) – plays and inhibitory role in the brain.11 GABA receptors induce calm by inhibiting or modulating over-reactive neurons.11 Substances such as alcohol and valium have a potentiating effect on GABA synapses, thus instilling a state of calmness.11

● **Prolactin**– motherly hormone (stops female and male sex drive). Is secreted by the pituitary glandand stimulates the growth of mammary tissue and triggers the production of milk.128 When a baby suckles, levels sore to ten times their normal level.128 Women who suckle their infants on a regular basis have a severely reduced sex drive.128 Men with prolactin-producing pituitary tumors often lose their libidocompletely along with their erections.128 Dopamine inhibits prolactin, consequently boosting sex drive indirectly.128 Estrogen gradually increase prolactin secretion, thus diminishing he aggressive sex drive.128 In both men and women, prolactin secretion is increased by exercise, psychological stress, stimulation of the nipples, and sleep.128

● **Cortisol**- the primary hormone product of the adrenal glands; helps restore homeostasis after a state of stress; heightened levels are associated with those newly in loveand with the establishment of new relationships.176 Depressed people have elevated levels beyond what can be explained by the stress they are under.134 The scent of androstadienone, a volatile component of male sweat, causes levels to rise in females.177

● **Progesterone** [$C_{21}H_{30}O_2$] – reverse sex drive hormone; one of the two female sex hormones along with estradiol that during pregnancy begin to rise causing an intensification of a women's natural femaleness, where she becomes more mothering and nurturing, and while at the same time dampening sexual receptiveness.11 The rapid decrease in progesterone and estradiol after childbirth is accompanied by increased prolactin and oxytocin, which are themselves stimulated to production by the nursing infant's suckling at it's mothers' breast.11 Hormonal treatment of induces maternal behavior towards infants, even those not the mothers.178 It reduces sex drive, by lowering testosteronelevels in both sexes.128 It decreases positive sexual scents, e.g. pheromones, and may make people smell bad to each other, reducing the likelihood of attraction.128 It makes women irritable towards men and aggressive in protecting their young.128 Has a mild sedative, anesthetic, and calming effect.128

● **Estradiol** [$C_{18}H_{24}O_2$] – reverse sex drive hormone; one of the two female sex hormones along with progesteronethat during pregnancy begin to rise causing an intensification of a women's natural femaleness, where she becomes more mothering and nurturing, while at the same time dampening sexual receptiveness.11 The rapid decrease in progesterone

and estradiol after childbirth is accompanied by increased prolactin and oxytocin, which are themselves stimulated to production by the nursing infant's suckling at it's mothers' breast.11 Hormonal treatment of induces maternal behavior towards infants, even those not the mothers.178 Is one of the estrogens that drives the development of secondary sex characteristics in women.179 Promotes maternal behavior by lowering the threshold for the firing nerve fibers in the *media preoptic area*, an area essential to maternal behavior.180

● **Nerve growth factor**– a neuroprotein that stimulates cell growth; higher levels are found with those newly in loveas compared to those single or in long-term relationships.181

● **Gonadotropin-releasing hormone** (GNRH) – is a pulsatile, rhythmic-release sexual stimulant that reliably increases mating and sexual behavior, e.g. male copulation and female lordosis.128 Heightened levels in males induces them to spend more time near females sniffing, licking, nuzzling, and nipping.128

Neuroanatomy and love

The following are notable neuroanatomical areas associated with love:

● **Amygdala** – when a person begins to realize that an expected reward is in jeopardy, even unattainable, this area together with centers in the prefrontal cortex trigger rage.133 The area of the brain most involved with violence and agression.172 Removal of in violent criminals results in the elimination of the violent behavior.11 Levels of DHEA increase in the area when males are exposed to the scent of receptive females for seven days.128

● **Limbic system** – first system in the brain to switch on when we see someone attractive.134 Is considered to be the central location of the 'pleasure center'.182 Is the central brain region involved in romance.134

● **Caudate nucleus** – parts of the body and tail of the *right* caudate nucleus become more active when madly in love and when gazing at a photo of a lover.122 Associated with detection and perception of a reward, discrimination between rewards, preference toward a particular reward, and anticipation of a reward.122 Associated with the acts of paying attention and learning.183

● **Hypothalamus** – synthesizes and secretes neurohormones, often called *releasing hormones*, as needed that control the secretion of hormones from the anterior pituitary gland. Among other hormones, it releases gonadotropin-releasing hormone (GnRH). The neurons that secrete GnRH are linked to the limbic system, which is primarily involved in the control of emotions and sexual activity.184 Levels of DHEA increase in the area when males are exposed to the scent of receptive females for seven days.128

● **Septum pellucidum** – becomes active when people eat chocolate or when ruminating on an immortal beloved.185 Some refer to it as the pleasure center.11 DHEA excites this area and promotes active and pleasurable sexual behavior and reactions.128

● **Septum** – the part of the limbic systemthat regulates emotions and the ability to learn and control impulses as well as such drives as sex, hunger, thirst, aggression, and fear.186 The septum, or *septal nuclei*, in the brain, named for its approximate shape (partition), receives reciprocal connections from the hippocampus, amygdala, hypothalamus, midbrain, habenula, cingulate gyrus, and thalamus.187 Is rich with nicotonic cholinergic receptors. Is the area of the brain where orgasmic activity is generated.128 When stimulated with electrodes, it causes ecstatic reactions resembling orgasms.128

● **Ventral tegmental area** – parts of the *right* ventral tegmental area become more active when madly in loveand when gazing at a photo of a lover.122 Is a central part of the reward circuitry of the brain.188 Is the mother lode for dopamine-making cells.122 Its tentacle-like axons distribute dopamine to many parts of the brain, including the caudate nucleus.189

● **Anterior cingulate cortex** – becomes active, for those 2.3-years in love, when gazing at a photo of a lover.190 Is where emotions, attention, and working memory interact.191 Is where a person registers 'butterflies' in the stomach and

where the mind processes emotions.122

● **Insular cortex** – becomes active, for those 2.3 years in love, when gazing at a photo of a lover.190

● **Basal ganglia** – becomes active when gazing at a photo of a lover.156

● **Posterior cingulate gyrus** – becomes *less* active when gazing at a photo of a lover.156

● **Right pre-frontal cortex** – becomes *less* active when gazing at a photo of a lover.156

● **Frontal lobes** – the number of gray cells here is significantly linked to intelligence.192

● **Pineal gland** – sunlight is a tonic for depression, i.e. it stimulates this gland, which regulates bodily rhythms in ways that often elevates mood.193

● **Locus ceruleus** – region heavily involved in producing terrifying panic attacks and possibly the anxiety felt when separated from loveones.138

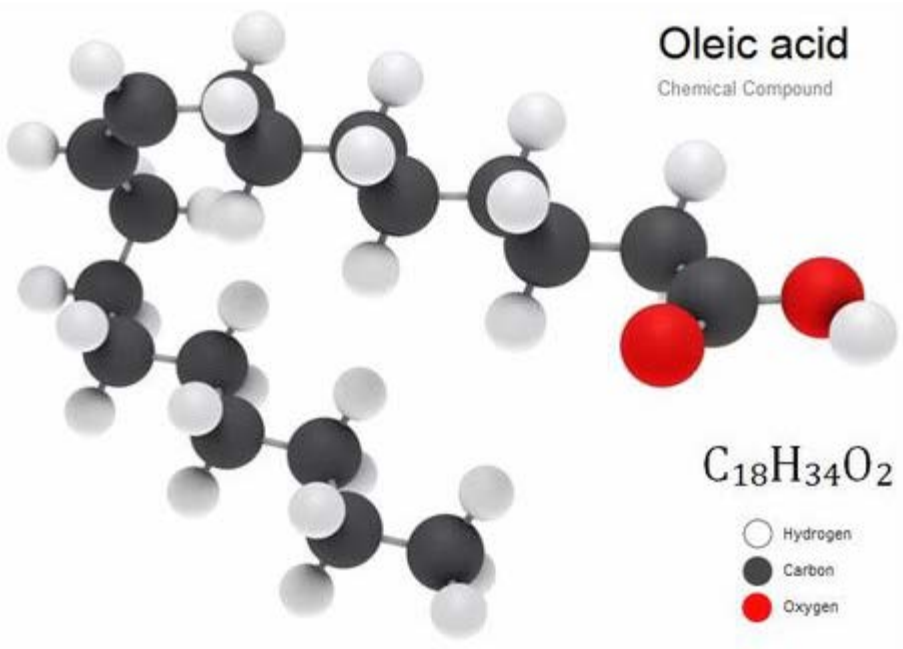

● **Myelin sheath** – the "white matter" portion of the brain. Those who are petted, messaged, and loved are found to have significantly more of the material necessary for myelin formation.11 A dominant structural component of myelin sheath is oleic acid [$C_{18}H_{34}O_2$], which is found in large amounts in specific oils, such as almond oil or olive oil. Thicker myelin sheath is found to correlated with faster thinking. A notable large number of centenarians on the island of Crete have the habit of drinking a wine glass of olive oil for breakfast each morning.

● **Cerebellum** – may be involved in developing the human ability to love.194 Plays an important role in the integration of sensory perception and motor output.195 Is intimately connected to the *limbic system*, the brains emotional control system, and activation of these two systems, e.g. during sport or play, is the reason for the feeling of exhilaration.11 A lack thereof, especially for infants, results in somatosensory deprivation, and an inadequate wiring of the pathways between these the cerebellum-limbic system.196

● **Medial preoptic area** – an area that is essential to maternal behavior.180 DHEA excites this area and promotes active and pleasurable sexual behavior and reactions.128

● **Vomeronasal organ** (VMO) – a small region in the nasal cavity that is believed to be the organ through which human pheromones act.197

Related facts

The following are related facts:

● **Major histocompatibility complex** (MCH) – is a large genomic region or gene family that plays an important role in the immune system, autoimmunity, and reproductive success, i.e. women are found to be vomeronasally-attracted to men with a more dissimilar complex.198 Proteins encoded by it are expressed on the surface of cells and display

antigens, i.e. fragments of molecules from invading microbes or dysfunctional cells, such as tumor cells, to a particular type of white blood cell called a *T cell* that has the capacity to kill or co-ordinate the killing of the microbe, infected cell, or malfunctioning cell.198

| → Sweaty T-shirt study

● **Pheromones** – are sexual signals transmitted from one individual to another through scent, i.e. 'smell-prints', which are derived from DHEA.128 Convey information about what species type and genotype, the general purpose of which is to transmit information about immune system, a mechanism to avoid inbreeding. Females are attracted to males with the least similar genotype, which means they are attracted to males who are the least likely to be related to them.199 Are believed to be the chemo-transmission agent involved in the *McClintock effect*, where females that live together will tend to regulate their menstrual cycles in unison following the lead of the alpha female.200 Male pheromones tend to regulate, synchronize, and to bring female ovulation cycles into a normal range.201

● **Androstadienone** – is a volatile chemical compounds that has been described as having pheromone-like activities in humans and is a derivative of the sex-hormone testosterone.177 It is a component of male sweat that acts as a chemosignal to women causing their levels of cortisol to rise.177

● **Androsterone** [$C_{19}H_{30}O_2$] – is a is a steroid hormone with weak *androgenic activity*, i.e. it weakly stimulates or controls the development and maintenance of masculine characteristics and acts as a female pheromone attractor.128 The consumption of large amounts of celery can cause an increase in the production of this hormone in males.202 Some musks, such as *Jovan*, contains alpha-androsterone.

● **Seminal fluid** – alleviates depressive symptoms in women.203

● **Pleasure center** – stable long-term couples mutually stimulate each other centers in a synergistic manner, conversely un-stable partners have unbalanced pleasure center connections.204 Inadequate wiring to this center during infancy results in a later inability to fully experience love and pleasure.11

● **Alcohol** – a social lubricant.134 It relives anxiety thus allowing the pleasure center to react more freely.134

● **Follicle-stimulating hormone** – males in lovehave decreased levels of.176 In men, it enhances the production of androgen-binding protein by the Sertoli cells of the testes and is critical for spermatogenesis.

● **Tactile stimulation** – minimal levels of tactile stimuli deprivation during the stage of active cell growth in infancy results in reduced neural metabolism, reduced dendritic growth, and atrophy of neuron-nourishing glial cells.205

● **Midcycle** – the period of ovulation, during which testosterone, increasing the female sex drive, and estrogen, increasing her femaleness, levels both spike.128

● **Paramenstruum period** – begins about three days prior to the onset of menstruation and lasts about four days into menstruation. It is estimated that approximately sixty-two percent of violent crimes committed by women are committed in this period.11 In this period, estradiol levels fall to fifty percent of baseline, while testosteroneremains relatively high at eighty-two percent of baseline.11

● **Squalene** [$C_{30}H_{50}$] – a pheromone repellant; stops male courtship behavior in snakes.128

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External links

- Neurochemistry – Wikipedia.
- Empathy (Valerio Loi) – DesignInspiration.net.

θΔics

In science,

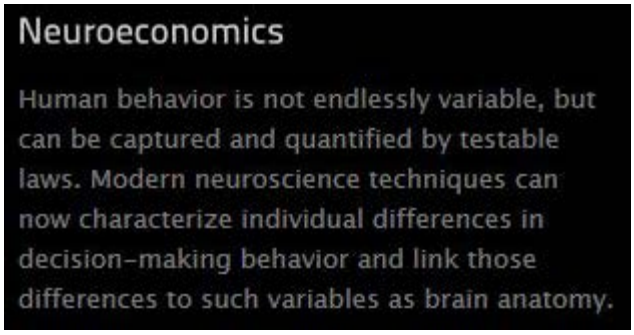

Top: A definition of neuroeconomics from American mathematician, biophysicist, and neuroeconomics pioneer Read Montague's computational psychiatry unit of Virginia Tech Carilion. [1] Right: Montague's 2012 TED talk on his neuroeconomics research.

neuroeconomics is the study of the relationship between neurochemistry and neurochemicals (e.g. dopamine levels), neuroanatomy and economic decision making mechanisms, and behavioral changes related to the results of those decisions and choices, in respect to return on investment, expected reward, and timing prediction or timed expectation to reward.

Overview

In 1999, American neuroscientists Paul Glimcher and Michael Platt presented the results of a study in which they measured the nerve cell activity in the brains of monkeys, specifically the lateral intraparietal cortex, performing decision and reward tasks; the finding of which pointed toward the hypothesis that choice making activity, was correlated with levels of dopamine, and hence theoretically with economic utility. This line of reasoning was called at the time "neuro economics".

In 2000, economists and neuro economics researchers met in Princeton for the first major "neuroeconomics"—a 2002 coined term—conference. American mathematician, biophysicist, and neuroeconomics pioneer Read Montague, in 2003 interview, recalled the skepticism of expressed by one of the economists attending the conference, who say no reason to believe that brain chemicals might have anything to do with economics, to which Montague replied: [2]

> "That is just poppycock. If your brain doesn't generate economic behavior, what kind of ghost horses do you believe in?"

In 2002, Montague and American behavior psychiatrist Gregory Berns published their "Neural Economics and the Biological Substrates of Valuation", connecting economics and brain chemistry, the abstract of which is as follows: [3]

> "A recent flurry of neuroimaging and decision-making experiments in humans, when combined with single-unit data from orbitofrontal cortex, suggests how neural responses in the orbitofrontal-striatal circuit may support the conversion of disparate types of future rewards into a kind of internal currency, that is, a common scale used to compare the valuation of future behavioral acts or stimuli. A general function of neural tissue is ongoing economic evaluation, a central function for any system that must operate with limited resources, that is, all mobile creatures. All mobile creatures run on batteries; they must continually acquire nutrients and expel wastes in order to reproduce and survive. Consequently, the way that mobile creatures value their internal states, sensory experience, and behavioral output influences directly how they will invest their time and energy. By economic evaluation, we refer to the problems that an individual nervous system faces when making rapid, moment-to-moment decisions possessing real costs and potential future payoffs (good and bad). A central feature of this problem is the need for an internal currency that can

> be used as a common scale to value diverse behavioral acts and sensory stimuli."

Here, interestingly, we see Montague and Berns using the term "mobile creatures" (see: life terminology upgrades). The gist conclusion of their paper, as summarized by American science writer Tom Siegfried, is as follows: [4]

> "The paper note various lines of evidence supporting the idea that a circuit of activity linking two parts of the brain—one at the front, behind the forehead, and another deep in the brain's middle—helps govern choice making by producing more or less dopamine. Dopamine levels predict the likely reward associated with different choices, the evidence indicated. If a choice produces precisely the predicted reward, the dopamine cells maintain a constant level of activity. When pleasure exceeds expectations, the cells squirt out dopamine like crazy. If the reward disappoints, dopamine production is curtailed. This monitoring system also takes timing into account—if dinner is delayed, dopamine is diminished. When the anticipated rewards aren't realized the dopamine monitoring system tells the brain to change its behavior."

(add discussion)

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(d) Montague, Read P. (2012). "What We're Learning from 5,000 Brains", TED talks, Jun.
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External links

â— Neuroeconomics – Wikipedia.

θΔics

In science, **neuroscience** is the study of the brain, its structures, and functions, in the context of its chemical, electrical, and electromagnetic properties.

See also

- ABC model
- Neurochemistry
- Neuroeconomics
- Neurochemical thermodynamics
- Neurothermodynamics

External links

- Neuroscience – Wikipedia.

θΔics

In thermodynamics, **neurothermodynamics** or "neurological thermodynamics" studies neuronal operations and processes generally, with the neuron considered as the thermodynamic system, from an energy and entropy perspective, with emphasis on information transmission, neurometabolism, and neurodynamics.

Etymology

The term “neurothermodynamics” seems to have been introduced in 2002 by Indian-born English physician Prasun Roy and his group, who use terms such as “neurodynamic temperature” or “neurodynamic entropy”, among others. [1] Roy even formulates a third law of neurothermodynamics: “a neuron’s trans-information parameter asymptotically tends to a maximum, as its neurodynamics temperature approaches 0ºN.” [2]

Overview

Readings on the subject of “neuro-thermodynamics”, at present, come across as one of the more convoluted and hodgepodge braches of thermodynamics. Examples include purported neuronal operations based on Nicolis-Prigogine principle “fourth laws”, Shannon principle “second laws”, mixed with “third law” attempts at formulating a “neural absolute zero” temperature scale (with references to analogues of neuro-type zero point energies), among others. [3] These somewhat humorous attempts can be attributed to the mixing of two black-box sciences, thermodynamics and neuroscience.

The 2009 article “The Thermodynamics of Human Reaction Times” by French cognitive psychologist Fermin Martin’s is an example of this, wherein a crude attempt is made to consider the mind as a “cognitive system”, analogous to a thermodynamic system, and to explain human reaction times based on the works of Leon Brillouin, Claude Shannon, Jack Kirkaldy, and Edwin Jaynes, using a mixture of discussions on negentropy, logarithms, information, noise, and so on, all of which amounts to be nonsensical. [4]

See also

â— Neurochemical thermodynamics

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Further reading

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θΔics

In physics, **neutron**, from *neutral*- "charge zero" + -*on* "subatomic particle", symbol n, is a bound state particle, which charge 0, classified as a baryon, comprised of two down quarks and one up quark, bound together via gluons.

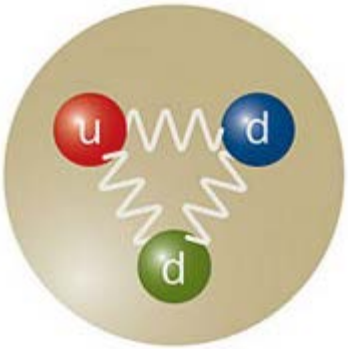

Neutron

Overview

The neutron was theorized about and named in 1920 by Ernest Rutherford, and discovered independently in 1932 based on data by Ettore Majorana and James Chadwick.

Quotes

The following are related quotes:

> "The answer to the question 'what are we made of' is: protons and **neutrons**, the heavy particles, or baryons, and electrons, the light particles, or leptons."
>
> — Michael Robinson (1999), *The Nine Number of the Cosmos* [1]

References

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External links

1. Neutron – Wikipedia.

θΔics

In terminology, **new age**, new age science (Q), new age physics, 1970s terms, or more recently: "woo woo", a 1990s term, or woo woo physics, quantum woo (Q), quantum physics woo, quantum mysticism (Q), or combinations thereof, such as "new age woo-woo physics" (Q), and or fringe science, etc., refers to, in effect, someone who seemingly pulls seeming reconcilable religion and or philosophical solutions out of science the way a magician pulls a rabbit out of a hat, using smoke and mirrors, in such a "new" way that it makes the crowd and or the masses go "woo", the way the audience responds, at first, to seeing a magical rabbit come out of nowhere.

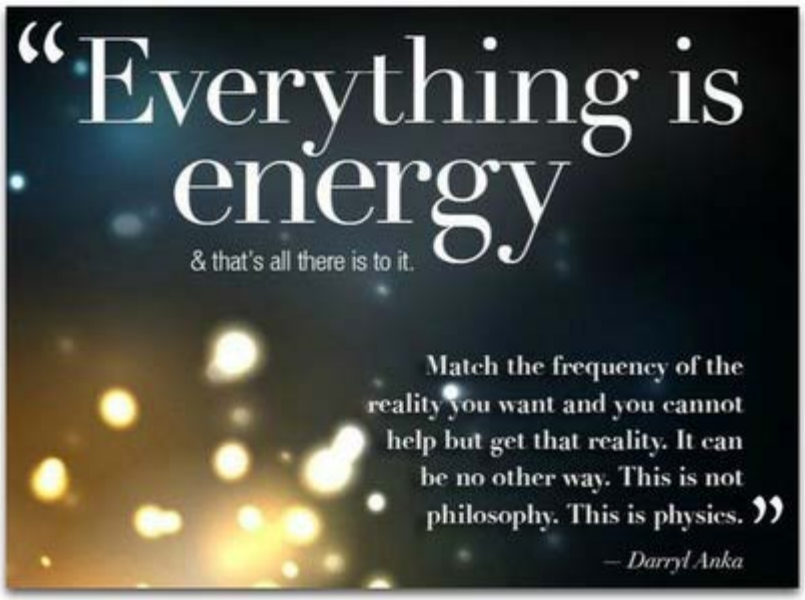

A example (Q) of "woo woo physics", aka "new age physics", a quote on energy and reality, according to Darrly Anka (Q), a self-described "channeler" of Bashar, a being of extraterrestrial origin (V), a sub-branch of the overall **new age** movement, i.e. "new" appealing ideas of the ages, crouched in hues, angles, or aspects of reality, some or much of which tends to be distorted, biasing the presentation in a non-neutral anthropomorphic, often self-help, manner.

Etymology

In the early 19th century, the term "new age" was in usage, representative of a coming time of future torch lit time of spiritual enlightenment, typified by a seeming reconciliation of religion, philosophy, and science:

> "The stolen and perverted writings of Homer and Ovid, of Plato and Cicero, which all men ought to contemn, are set up by artifice against the sublime of the Bible; but when the **new age** is at leisure to pronounce, all will be set right, and those grand works of the more ancient and consciously and professedly inspired men will hold their proper rank; and the daughters of memory shall become the daughters of inspiration. Shakespeare and Milton were both curbed by the general malady and infection from the silly Greek and Latin slaves of the sword. Rouse up, O young men of the new age! Set your foreheads against the ignorant hirelings! For we have hirelings in the camp, the court, and the university; who would, if they could, for ever prolong corporeal war. Painters! on you I call! Sculptors! Architects! suffer not the fashionable fools to depress some powers by the prices they pretend to give for contemptible works, or the expensive advertising boasts that they make of such works."
>
> — William Blake (1809), preface to *Milton a Poem* (Q)

In the 1970s, the term "new age science" and or "new age physics", were in common usage, typified by the work of Fritjof Capra.

In 1975, American physicists Jack Sarfatti (1939-) and Fred Wolf published *Space-Time and Beyond*, cited in Gary Zukav's 1979 *The Dancing Wu Li Masters: an Overview of the New Physics* (Q), which Sarfatti claims (Q) started the "new age physics" movement.

In the 1990s, the skeptic derogatory term "woo" or "woo-woo" (Q) began to be employed as labels of vacuous new age theories.

In 2010, the term "woo woo", being a reference to the work of a: crackpot, metaphysicist, mystic, new ager, or combinations therein, e.g. referring to someone as a "woo woo crackpot" (Q), began to be associated with the vernacular of American evangelical Christian turned skeptic Michael Shermer. In a 2010 debate, backed by Sam Harris, on the subject of "Does God Have a Future", with Deepak Chopra, Shermer stated the following to the debate audience: [1]

> "Chopra's [quantum spirituality] arguments are the very embodiment of '**woo woo**' [or woo woo physics]."

In 2011, Shermer, in his *The Believing Brain*, referenced the term "woo woo" as referring generally to someone who adroitly uses fuzzy language to string together words and phrases to the effect that something intelligible is being said. [2]

In the 2010s, Nassim Haramein has often been labeled as "new age".

In 2013, Irish physicist Philip Moriarty, in his "Quantum Physics Woo" video, discusses American geneticist Robert Lanza's 2007 theory of biocentrism (Q), referred to by fellow newager Deepak Chopra as "original and existing" (Q), which argues that quantum physics proves that afterlife exists, an argument Moriarty labels as "quantum physics woo". [4]

Quotes

The following are related quotes:

> "Wolf's quantum physics [of consciousness] are on the **fringes** of mainstream science."
>
> — Anon (2007), *Newsweek* article (Q) on Rhonda Byrne's law of attraction based *The Secret*

> "Thims' thermodynamic coupling proof that 'good always triumphs over evil' is nothing but '**calculus coated woo**', hidden behind a smokescreen of rhetorical mathematics."
>
> — Ryan Grannell (2011), "On Human Chemistry" [3]

See also

- Creationism scientists ranked by idiocy
- Fringe thermodynamics
- New atheism

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2. Shermer, Michael. (2010). *The Believing Brain: From Ghosts and Gods to Politics and Conspiracies: How we Construct Beliefs and Reinforce them as Truths* ("woo woo", pg. 160). MacMillan.
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(b) Lanza, Robert. (2009). *Biocentrism: How Life and Consciousness are the Keys to Understanding the True Nature of the Universe* (physics, 36+ pgs; chemistry, 4+ pgs; thermodynamics, pg. 97). BenBella Books.
(c) Moriarty, Philip. (2013). "Quantum Physics Woo" (Q), Sixty Symbols, Dec 5.

Further reading

- Chopra, Deepak. (2010). "Woo Woo is a Step Ahead of (Bad) Science" (V), Huffington Post, Feb 18.

External links

- New age – Wikipedia.

θΔics

In atheism, **new atheism** refers to a non-closeted type of atheism, initiated in the wake of 9/11, generally defined as an "atheist who is finally speaking up" (Dave Rubin, 2015), as defined amid erudite discussion (V:38:00-39:00) with Sarah Haider.

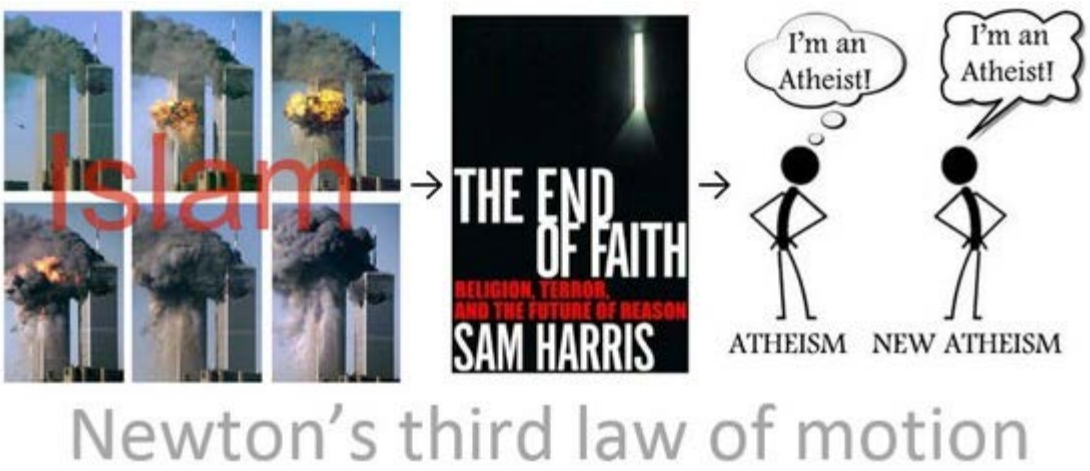

The "action" of 9/11 resulted in the "reaction" of Sam Harris starting to pen, the day after 9/11, his religion-denouncing book *The End of Faith* (2004), which worked to seed "**new atheism**" movement, led by Richard Dawkins (2006) and Christopher Hitchens (2007), in the years to follow. [1]

Overview

The term "new atheism", is not new, and has been used nearly every decade, according to Google Books, going back at least the last two centuries; to cite one example:

> "And in fact there are atheists. Atheism, both theoretical and practical, is a profound vice, — or rather, the radical vice of the heart and human mind. No age has been free from it. Our own is more fully infected by it than we think. Practical atheism is visible to every eye, and philosophical atheism is revealed under the form of pantheism. More yet, express, exact, avowed, and declared atheism has a school of its own; and this school of **new atheism**, more scientific than the old atheism, is built upon a foundation which it calls *Modern Science*."
>
> — Auguste Gratry (1892), *Guide to the Knowledge of God* (pg. 16)

In 1986, Christian apologeticist Robert Morey published *The New Atheism and the Erosion of Freedom*, written in the wake of the atheism wave of George Smith (*The Case Against: The Case Against God*, 1979), whom he debated on a radio show, and Madalyn O'Hair, the 1960 champion of school prayer abolishment.

On 1 Nov 2006, Gary Wolf penned his Wired article "The Church of the Non-Believers" (Q); which opens to the following:

> "It`s a question you may prefer not to be asked. But I`m afraid I have no choice. We find ourselves, this very autumn, three and a half centuries after the intellectual martyrdom of Galileo, caught up in a struggle of ultimate importance, when each one of us must make a commitment. It is time to declare our position. This is the challenge posed by the **New Atheists**. We are called upon, we lax agnostics, we noncommittal nonbelievers, we vague deists who would be embarrassed to defend antique absurdities like the Virgin Birth or the notion that Mary rose into heaven without dying, or any other blatant myth; we are called out, we fence-sitters, and told to help exorcise this debilitating curse: the curse of faith."

This was followed by Simon Hooper's 9 Nov 2006 CNN article "The rise of the 'New Atheists'". (Q) After this point, an atheist "trinity" of Richard Dawkins (*The God Delusion*, 2006), Sam Harris (*The End of Faith*, 2004) and Daniel Dennett were being billed as the "new atheists" in a significant manner. [3]

In 2007, Christopher Hitchens published his *God is Not Great*, and the "atheist trinity" turned into the "four horseman" of new atheism.

In 2007, Peter Joseph's uploaded his viral documentary *Zeitgeist*, on the Osiris-Horus Jesus connection, which worked

to weaken the legs of theism, from a religio-mythology scholar approach.

Harris | Ideology

The following gives an example of new atheism logic:

> "Only 28 percent of Americans believe in evolution; 72 percent believe in angels. Ignorance in this degree, concentrated in both the head and the belly of a lumbering superpower, is now a problem for the entire world."
>
> — Sam Harris (2005), postscript "Afterword" to *The End of Faith*

> "No one is suffering under the doctrine of Islam more than Muslims are—particularly Muslim woman. Those who object to any attack upon the religion of Islam as 'racist' or as a symptom of 'Islamophobia' display a nauseating insensitivity to the subjugation of women throughout the Muslim world. At this moment, millions of women and girls have been abandoned to illiteracy, forced marriage, and lives of slavery and abuse under the guise of 'multiculturalism' and 'religious sensitivity.' This is a crime to which every apologeticist for Islam is now an accomplice."
>
> — Sam Harris (date) (O)

A Harris new atheism favorite is the morality of "throwing acid in the Islam girl" immorality example. The recent story of the building of Islamic schoolgirls who were left to burn to death because the fireman wouldn't go into the building because the girls weren't wearing Burkas, is one example a new atheist might employ for a call for faith reformation.

Quotes

The following are related quotes:

> "After Harris came high pope Dawkins, then cardinal Hitchens, the bishop Dennett, and then the lower and more moderate figures in this **new atheist** priesthood: Krauss, Stenger, Atkins, Shermer [and all the rest] *e bella compagnia*."
>
> — Bo Jinn (2013), *Illogical Atheism* (loc. 286)

> "Kierkegaard's central concern was faith and the problems of faith. Today, the evolutionary biologist and sometimes children's author Richard Dawkins is at the forefront of the faith debate. The philosopher and cognitive scientist Daniel Dennett is a frequent contributor, as well as the neuroscientist Sam Harris. The late, great Christopher Hitchens was the angriest and funniest participant. We'll call these figures the **new atheists**."
>
> — Morgan Meis (2013), "The First New Atheist" [2]

See also

- Atheism timeline
- Four horsemen of atheism

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External links

● New atheism – Wikipedia.

θΔics

In famous publications, ***New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*** is a 1987 book by Pakistani organometallic chemist Mirza Beg, wherein Gilbert Lewis-framed chemical thermodynamics-based physical chemistry is used as a foundation for general sociology, defining people as molecules or chemical species, employing advanced concepts such as fugacity, wherein societies exist in different physicochemical states or phases (see: social phase): slums (gas phase), cities (liquid phase), or metropolises (solid phase), in which Gibbs energy is the driving forces for chemical reactions.

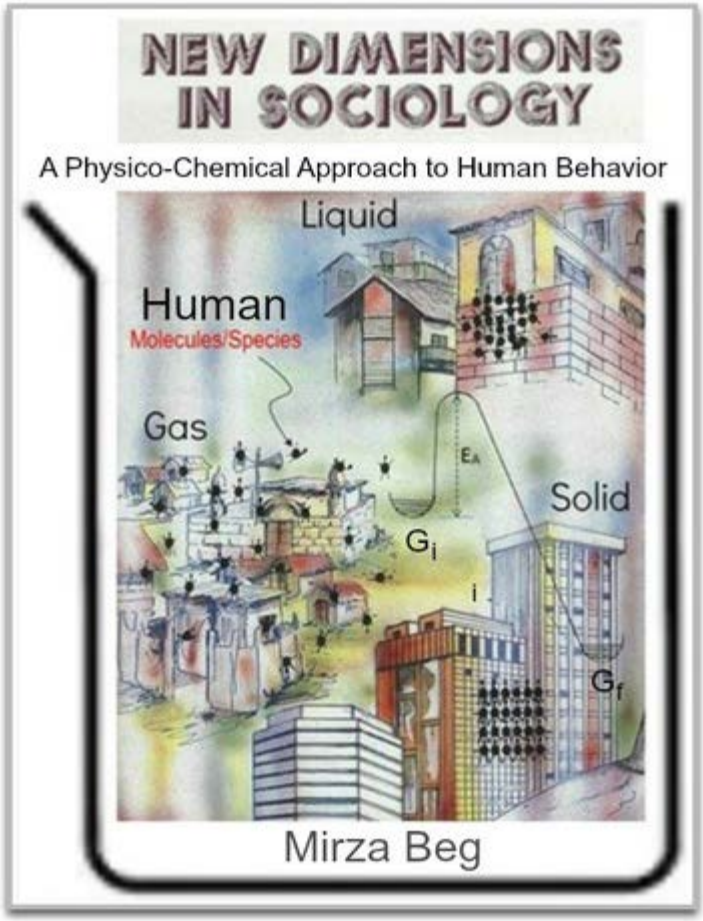

Mirza Beg's 1987 ***New Dimensions in Sociology***, wherein he shows societies existing in reaction beaker, shows a Gibbs energy surface diagram, depicts humans as little molecules, residing in various states: gas, liquid, solid, shows activation energy, lattice structure, etc. [1]

Re-discovery

In 2014, Libb Thims discovered *New Dimensions in Sociology*, a work seemingly hidden for the last three decades, scanned the book, made it available as a public pdf format, and thereafter began to promote the work, on the Internet, at conferences, in video, and in journals.

Education

In 2017, at Quaid-ai-Azam University (QAU), Islamabad, the CourseHero notes (Q) for their Sociology 1234 (compare: Sociology 23), contained the 2014 issue of the *Econophysics, Sociophysics, and Other Multidisciplinary Sciences Journal*, which included Libb Thims' "Note on Beg's Physicochemical Sociology". [2]

Difficulties

The main difficulty in Beg's version of physicochemical sociology, which is by far a pioneering work, beyond anything come before, is that it's underlying logic, as per deriving new rules or paradigms of morality, meaning, or purpose, is anchored in Islam (Gibbs energy is viewed was the will of Allah, specifically) and the various surahs (sentences) of the Quran as non-bending proscriptions or right and wrong of human behavior, e.g. homosexuality, women's rights, etc., no matter what the chemical equations and new reaction findings might say.

Quotes | On

The following are quotes on *New Dimensions in Sociology*:

> "Man's observations of natural phenomena have fascinated him throughout the recorded history and have provided him a base for development of theoretical ideas. He has sought similarities occurring in two different systems, the social and the natural, and has attempted to derive corollaries in support of his theories. The interpretation of the atomic structure in terms of the solar system by Bohr the structure of benzene as a ring on the basis of a model of a snake with its tail in the mouth postulated by **Kekule** and the determination of density by the loss of weight of a body on its immersion in water, attempted by Archimedes are some such examples where the latter set of observations were superimposed on the former system to arrive at an acceptable solution of complex phenomena. The book *New Dimensions in Sociology*, *A Physico-Chemical Approach to Human Behaviour* by Mirza Beg is a new approach in which he has tried to establish an interface between physico-chemical and social sciences. It makes an interesting reading and provides a basis to quite a few socialization processes like assimilation, migration, mind-body split, etc."
>
> — M.A. Kazi (1987) "Forward by a Scientist" to Mirza Beg's *New Dimensions in Sociology* [2]

See also

- Beg analysis
- Beg-Thims dialogue

References

1. Beg, Mirza Arshad Ali. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (intro) (pdf, annotations by Libb Thims, 2014) (Foreword by a Scientist, pgs. i-iii) (individual, pg. 23). Karachi: The Hamdard Foundation.

2. (a) Thims, Libb. (2014). "Note on Beg's Physicochemical Sociology" (pdf) (pdf), *Econophysics, Sociophysics and other Multidisciplinary Sciences Journal* (Q), No. 4.

(b) Anon. (2017). "Affinities and Fugacities Characterize the Behavior" (Q), Sociology 1234 (compare: Sociology 23), Quaid-ai-Azam University, Islamabad, QAU, CourseHero, Spring.

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- Mimkes, Jurgen. (2016). "On Mirza Beg's Physico-Chemical Sociology" (Q), Interview by Libb Thims during PBE 2016, at University of District of Columbia, Jul 23.

θΔics

In famous publications, ***New Experiments: Physico-Mechanical, Touching the Spring of the Air**, and its Effects: Made, for the most part, in a New Pneumatical Engine* is a 1660 letter (Ñº) turned 1662 book published by Irish chemist Robert Boyle in which the first statement of what is now know as Boyle's can be found, which declares that for a body of gas at constant amount and constant temperature the pressure of the gas will vary inversely with volume. [1] The book presented the results of experiments done on a pneumatical engine.

NEW
EXPERIMENTS
PHYSICO-MECHANICAL,
Touching
The SPRING of the AIR, and its EFFECTS,
(Made, for the most part, in a New
Pneumatical Engine)

Cover page of Robert Boyle's 1662 *Spring of the Air*.

Boyle's law

See main: Boyle's law

In 1658, Irish chemist Robert Boyle and his assistant Robert Hooke built a combination air pump/vacuum, based on the design of German engineer Otto Guericke's vacuum pump in the 1657 book *Mechanical Hydraulic Pneumatics* by German scientist Gaspar Schott. [2]

On 20 Dec 1659, Boyle dispatched the first version of a letter (Ñº) to his nephew, Charles, Lord Viscount of Dungarvan, Eldest Son to the Earl of Corke, which marks the first draft publication of the outline of the book.

In 1662, Boyle, after conducting 43 experiments, turned his "spring of the air" letter into a book, entitled *New Experiments: Physico-Mechanical, Touching the Spring of the Air, and its Effects: Made, for the most part, in a New Pneumatical Engine*; the following, from the end section of this book, are is the experimental equipment used by Boyle and his assistant Hooke to conduct these experiments:

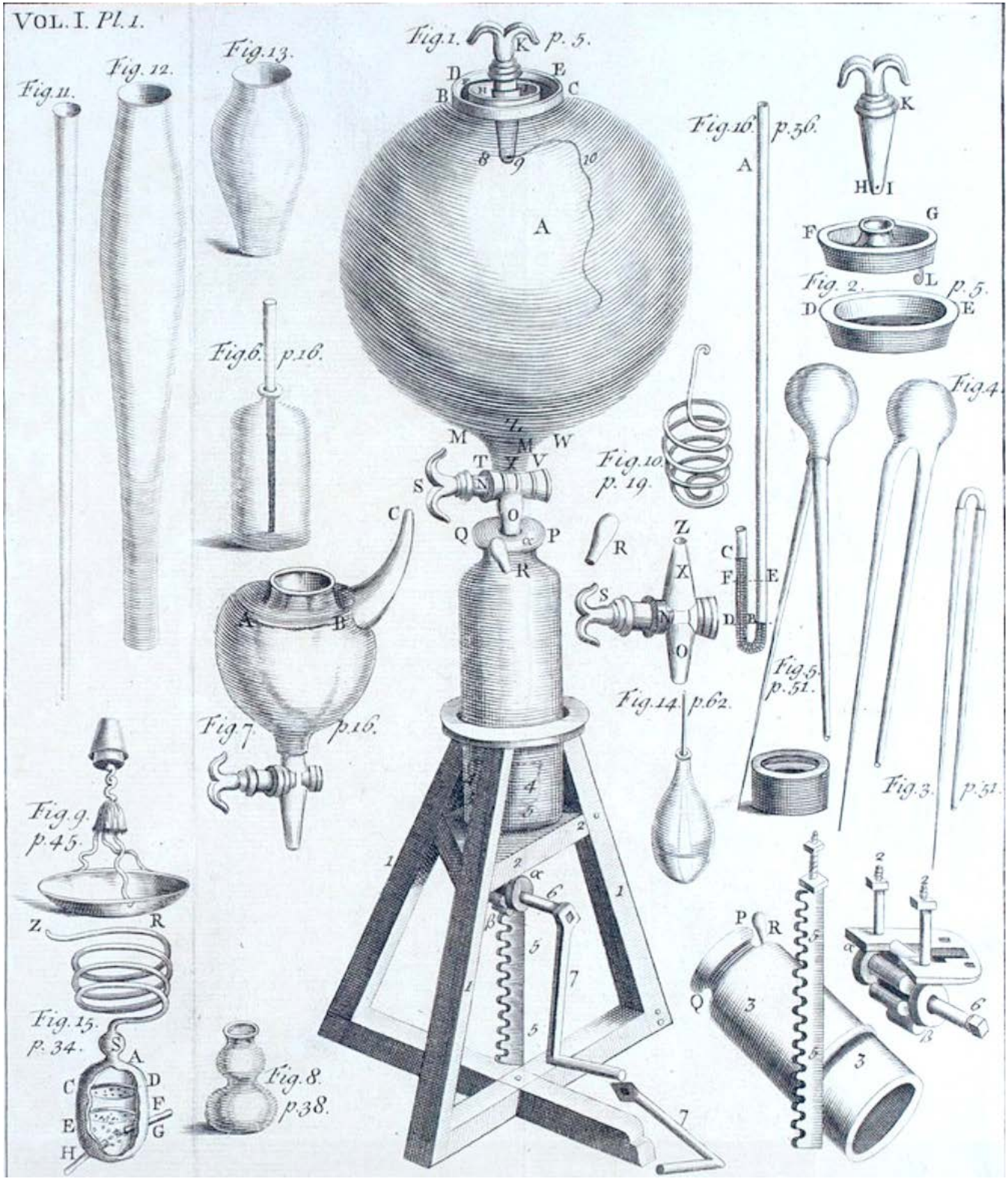
Fig. 1. p. 5.
Fig. 2. p. 5.
Fig. 3. p. 51.
Fig. 4.
Fig. 5. p. 51.
Fig. 6. p. 16.
Fig. 7. p. 16.
Fig. 8. p. 38.
Fig. 9. p. 45.
Fig. 10. p. 19.
Fig. 11.
Fig. 12.
Fig. 13.
Fig. 14. p. 62.
Fig. 15. p. 34.
Fig. 16. p. 56.

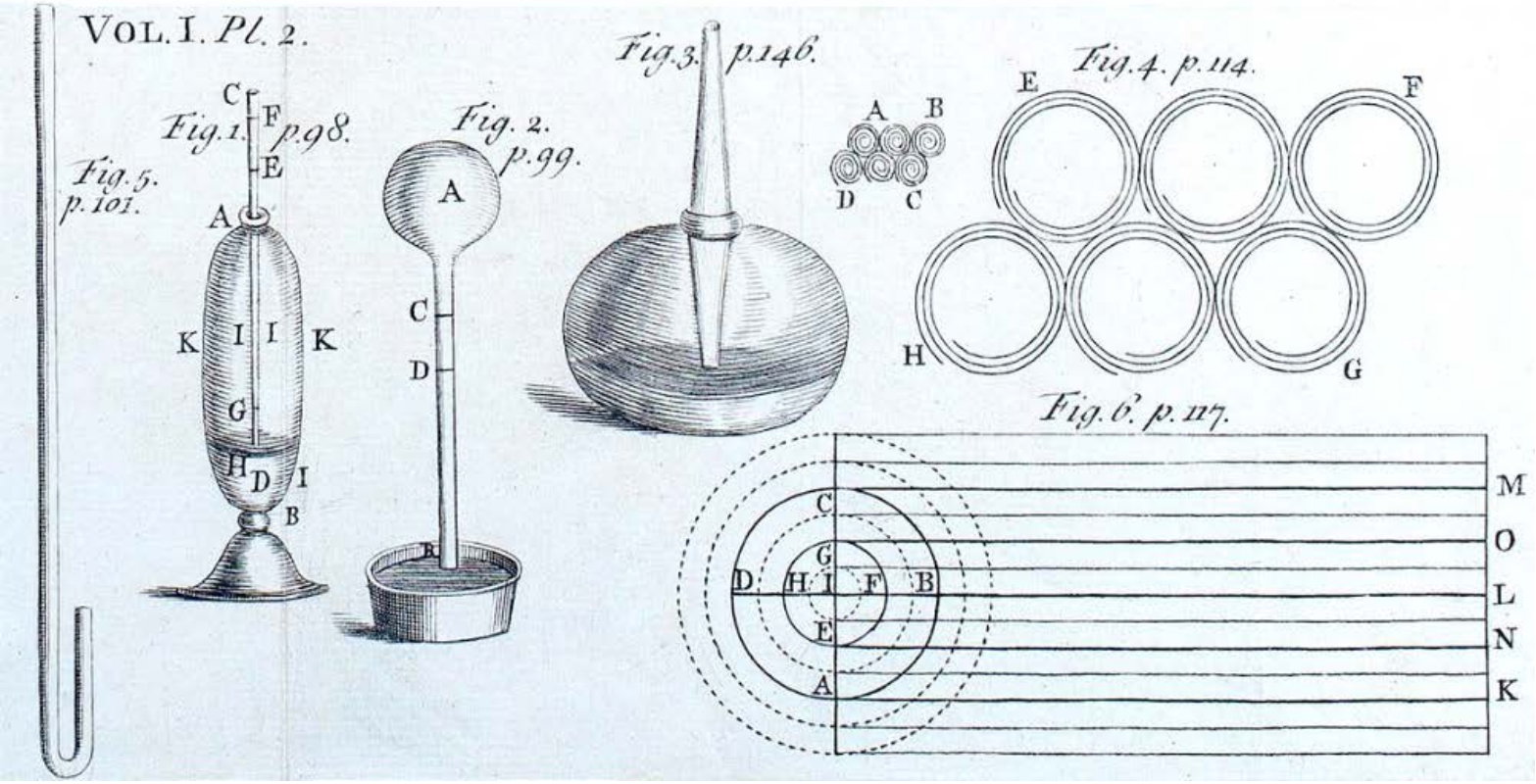

In 1662, in the appendix to the second addition, is where it the actual first enunciation of the Boyle's law is found. Specifically, an appended second edition section A Defence of the Doctrine Touching the Spring and Weight of the Air, chapter V, entitled "Two new experiments touching the measure of the force of the spring of the air compressed and dilated", contains a statement of the Law in column six of the first table (on the condensation of air): [3]

> "What that pressure should be according to the Hypothesis, that supposes the pressures and expansions to be in reciprocal proportion."

Supposedly, among the critics of the views put forward in first edition was a scientist named Francis Linus (1595–1675), and it was while answering his objections that Boyle made his first mention of the law that the volume of a gas varies inversely to the pressure of the gas, which among English-speaking people is usually called after his name. The person that originally formulated the hypothesis was Henry Power in 1661. Boyle included a reference to a paper written by Power, but mistakenly attributed it to Richard Townley. This hypothesis is what is now known as "Boyle's law" defined in modern shorthand as: [4]

$$PV = K\,|_{n,T}$$

which says that for a body of gas at constant number of particles *n* and temperature *T* the product of the measure of the pressure *P* and volume *V* of gas will be a constant *K*.

The relationship between pressure and volume was brought to the attention of Boyle by two friends and amateur scientists, English mathematician Richard Towneley and English physician Henry Power, who discovered it. Boyle confirmed their discovery through experiments and published the results. Boyle's law is based on experiments with air, which he considered to be a fluid of particles at rest, with in between small invisible springs. [5] The *Spring of the Air* had a great influence on other scientists, who built their own air pumps, and devised new experiments of their own.

See also

â— Gas laws

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1. (a) Boyle, Robert. (1659). *New Experiments Physico-mechanical, Touching the Spring of the Air, and Its Effects: made for the Most Part, in a New Pneumatical Engine*. Publisher, 1660.
(b) Boyle, Robert. (1774). *The Works of the Honorable Robert Boyle, Volume One* (editor: Thomas Birch) (§: New Experiments Physico-Mechanical, pgs. #-#). A. Millar.
(c) Boyle, Robert. (1660). "The Spring of the Air" in *The Kinetic Theory of Gases of Gases* (pgs. 43-51), 2003, by Stephen G. Brush, Nancy S. Hall. Imperial College Press.
2. (a) Schott, Gaspar. (1657). *Mechanical Hydraulic Pneumatics* (*Mechanicahydraulica-pneumatica*). Würtzburg.
(b) Wilson, George. (1849). "On the Early History of the Air-Pump in England", *The Edinburgh New Philosophical Journal*, (pgs. 330-54).

3. Baldwin, W.G. (1998). "Excerpts on Boyle's Law", *University of Manitoba.*
4. Morris, Richard. (2005). *The Last Sorcerers: the Path from Alchemy to the Periodic Table* (pg. 55). The National Academies.
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External links

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θΔics

In new age, **new relationship energy** is a niche term, used in the polyamorous community, referring generally to the energy or heightened energy state of new love or new sexual experiences; or to energy infused into an established pair-bond relationship with addition of an extra-relationship sexual attachment or interaction.

Etymology

The term seems to have been coined in 1993 by poly activist Zhahai Stewart, who commented, while in a polyamore discussion room, that: [1]

> "People seem ever so much more compatible, interesting, and clever while in the throes of **new relationship energy**."

The term seems to have gained popularity, to a certain extent, in recent years. [2]

Human chemistry

The term seems to be describing the "heightened energy state", or transition state, connected to the measure of activation energy, in a human chemical reaction, between two colliding human molecules, preceding stable product formation. [3]

References

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(b) Keener, Matt C. (2004). *A Phenomenon of Polyamorous Persons* (section: new relationship energy, pg. 89-90). MS thesis, University of Utah.
3. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
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External links

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θΔics

In engines, **Newcomen engine**, aka "improved Savery engine", was a steam engine built in 1712 by English engineer Thomas Newcomen, which was a sort of upgraded version of the Miner's friend (1698), with employed a rocker arm and a piston and cylinder cycle based mode of operation.

Overview

In 1712, the first Newcomen engine was installed at Tipton, Staffordshire and used to pump water from the workings of the Coneygre Colliery, for the next thirty years. [1]

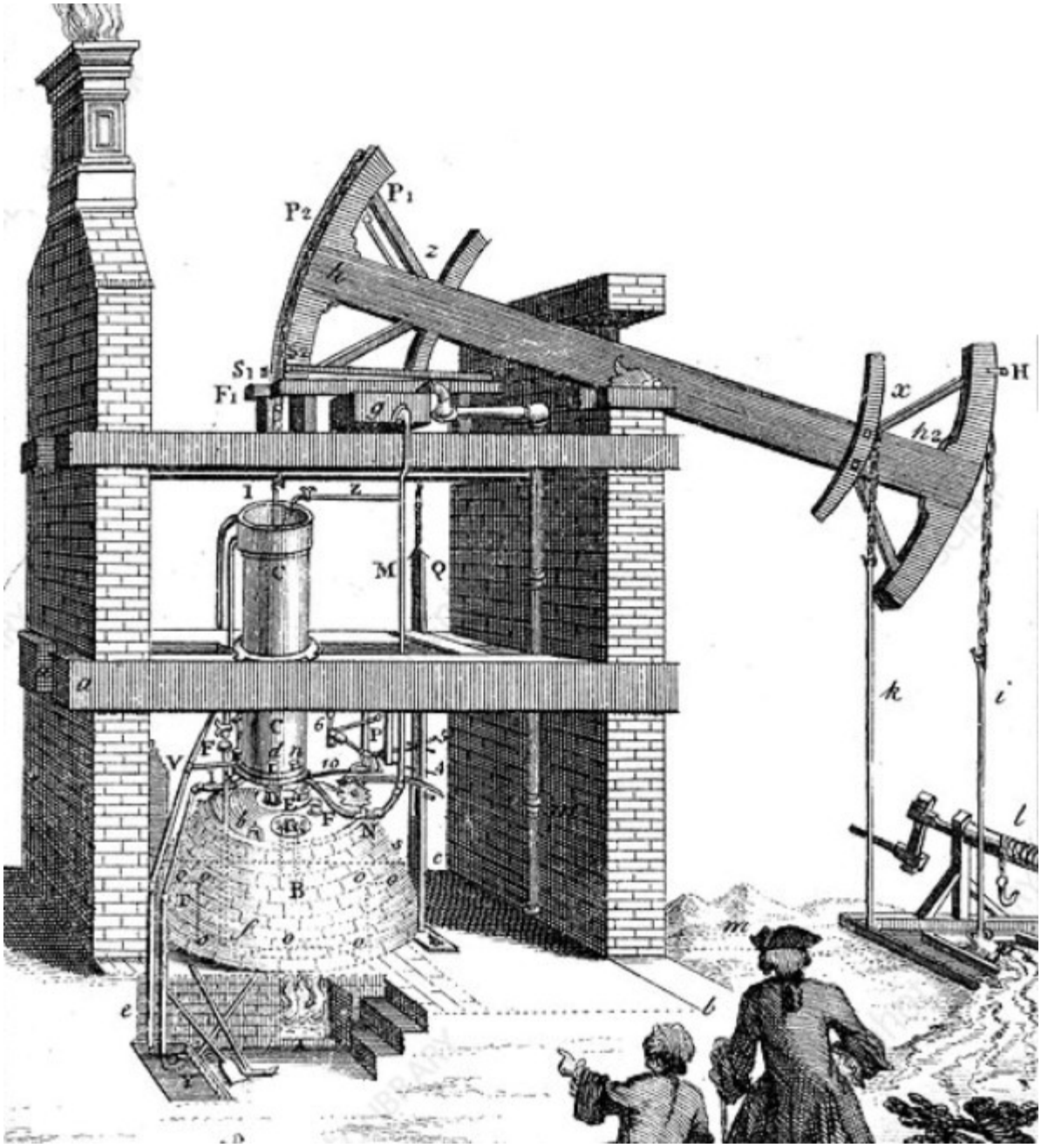

A 1744 printing of a **Newcomen engine**, from John Desaguliers *Course in Experimental Philosophy*. [2]

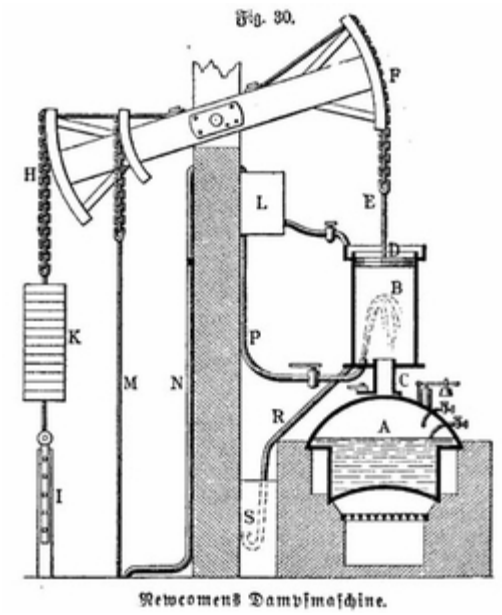

The following is a retrospect synopsis of the operation of Newcomen's engine:

> "Thomas Newcomen, ironmonger and preacher on occasion, completed his engine in 1712 after years of experimenting. His first engine was installed at Dudley Castle in Staffordshire to pump water from a mine. Newcomen's partner, John Calley or Cawley, a plumber and glazier of Dartmouth, provided the manual skill. Newcomen's contribution was an ingenious mixture of familiar devices with ideas of his own. He took the copper kettles and furnaces of brewers to supply the steam for the same kind of cylinder and piston which had been used for lifting water as far back as Roman times and **condensed the steam below the piston within the cylinder** to create there a partial vacuum which would **allow the weight of the atmosphere above to force the piston down**. Instead of using Savery's method of creating the vacuum by dashing cold water on the outside and thus condensing the steam, Newcomen sprayed water directly into his vertical cylinder. This condensed the steam, created the vacuum, and allowed the atmospheric pressure to force the piston down. To put this downward pull of the piston to work, he connected its rod by a chain to a horizontal and centrally pivoted working beam, or walking beam as it was later called, and fastened the other end of the beam by a chain and rod to the piston or plunger in the pump cylinder. As new steam was admitted below the first piston and the vacuum broken, this piston was raised again by the weight at the other end of the working beam, and the piston of the pump was lowered to its original position. Thus, the reciprocating motion, up and down, was complete."
>
> — Richard Kirby (1956), *Engineering in History* (pgs. 162-64) [3]

The following is a Newcomen engine shown pumping water out of the Coneygre Colliery, in Tipton, Staffordshire. [1]

The following is another sketch of a Newcomen engine: [5]

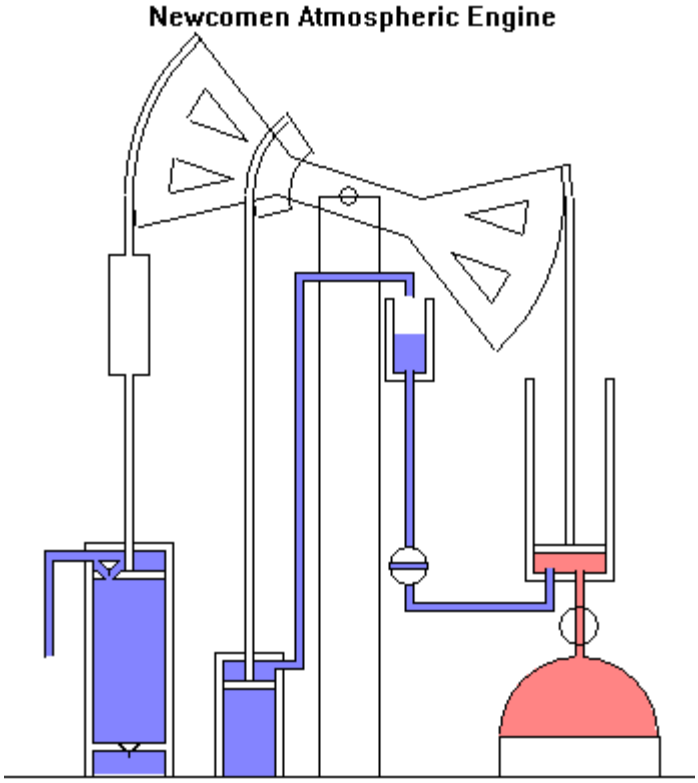

An animation of the operation of the Newcomen engine (1712), showing how first steam, from the boiler, at right, is put into the piston and cylinder, above the boiler, which is then cooled, by a spray of cold water, at the point when the piston is at its highest position in the cylinder, which makes a vacuum in the cylinder, which thus forces, via atmospheric pressure, the the piston down; and the cycle repeats. The head of the piston is connected via a rod to a rocker arm, which thus imparts work in the form of **reciprocating motion** to a water pump on the other end of the rocker arm.

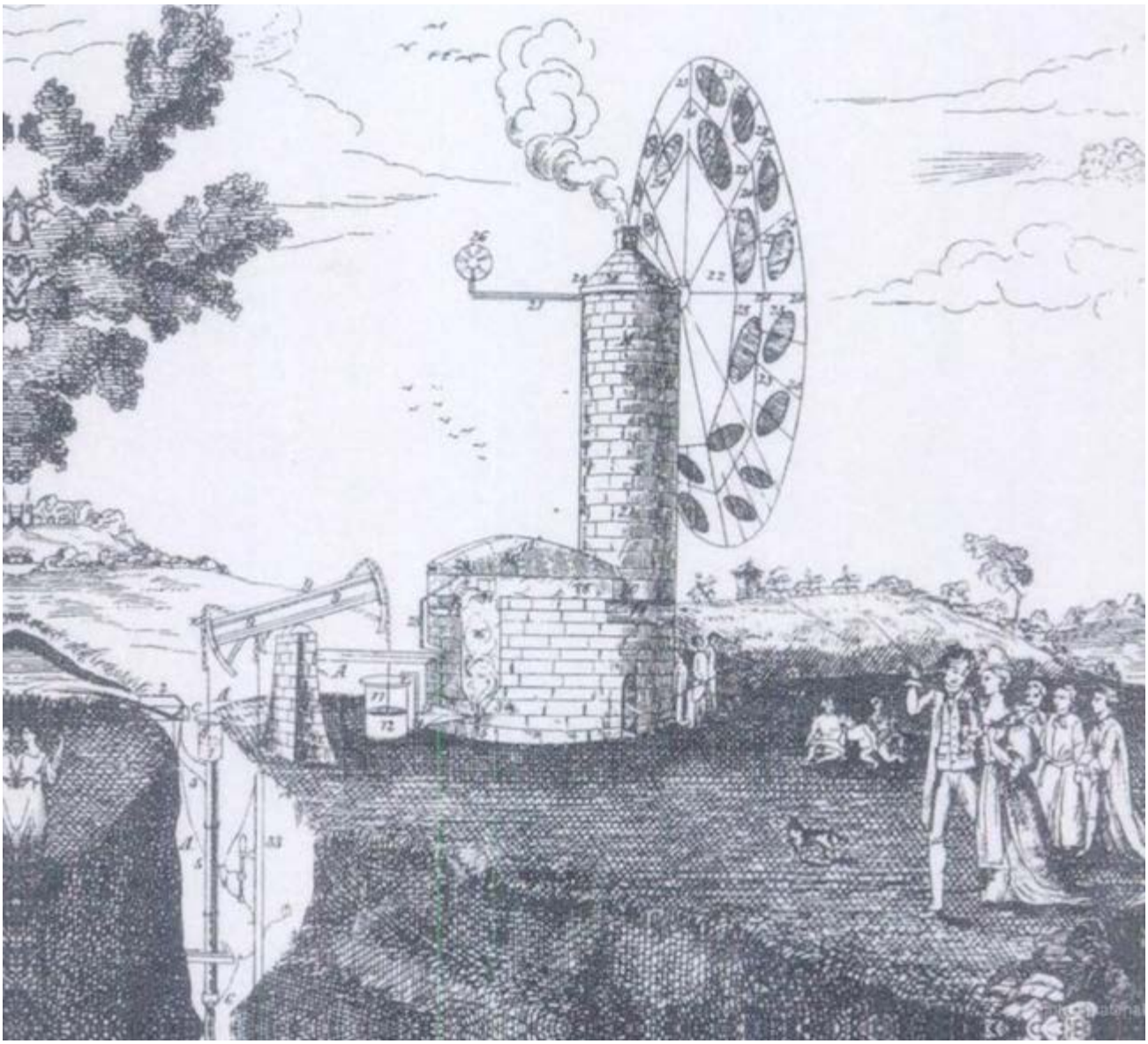

In 1732, there were, supposedly, more than 100 Newcomen engines in Britain and Europe, and 2,000 Newcomen engines by 1800, as some have claimed. [4]

The Newcomen engine was superseded and or upgraded by the Smeaton engine (1769-1777), the Pickard engine (1780), and then by the Watt engine (1781).

Quotes

The following are related quotes:

> "In about the year 1710, Thomas Newcomen, ironmonger, and John Calley, glazier, of Dartmouth in the county of Southampton (Anabaptists) made then several experiments in private, and having brought it to work with a piston, etc., in the latter end of the year 1711, made proposals to draw the water at Griff in Warwickshire; but their invention meeting not with reception, in March following, through the acquaintance of Mr. Potter of Bromsgrove in Worcestershire, they bargained to draw water for Mr. Back of Woolverhampton, where, after a great many laborious attempts, they did make the engine work; but not being either philosophers to understand the reasons, or mathematicians enough, to calculate the powers, and to proportion the parts, very luckily by accident found what they sought for. They were at a loss about the pumps, but being so near Birmingham, and having the assistance of so many admirable and ingenious

workmen, they soon came to the method of making the pump valves, clacks, and buckets; whereas they had but an imperfect notion of them before. **One thing is very remarkable; as they at first were working, they were surprised to see the engine go several strokes, and very quick together, when after a search they found a hole in the piston, which let the cold water into condense the steam in the inside of the cylinder, whereas before they had always done it on the outside**. They used before to work with a buoy in the cylinder enclosed in a pipe, which buoy rose when the steam was strong, and opened the injection, and made a stroke; thereby they were capable of only giving six, eight, or ten strokes in a minute, until a boy, Humphry Potter, who attended the engine, added (what he called scoggan) a catch that the beam Q always opened: and then it would go 15 or 16 strokes in a minute. But this being perplexed with catches and strings, Mr. Henry Beighton, in an engine he had built at Newcastle on Tyne in 1718, took them all away, the beam itself simply supplying all much better. N.B. about the Tear 1717, I communicated to Mr. Beighton, the use of the steel-yard over the puppet-clack, or safety valve, which be applied to some engines. The way of leathering the piston was found by accident in about 1713: having then screwed a large broad piece of leather to the piston, which turned up the sides of the cylinder two or three inches; in working it wore through, and cut that piece from the other, which falling flat on the piston, wrought with its edge to the cylinder, and having been in a long time, was worn very narrow; which being taken out, they had the happy discovery, whereby they found that a bridle rein, or even a soft thick piece of rope or match going round would make the piston air and water-tight."

— John Desaguliers (c.1740), *A Course in Experimental Philosophy, Volume Two* (pgs. 532-33)

"As the story goes, Humphrey Potter, Newcomen's boy who was supposed to open and close the steam valve, attached what he called a 'scoggan', so that the beam would trip the valve each time and do his work while he went fishing."

— Richard Kirby (1956), *Engineering in History* (pg. 164) [3]

References

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3. Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 42). Courier, 1990.
4. John Smeaton – Engineering-Times.com.
5. MacLeod, Christine. (1988). *Inventing the Industrial Revolution: the English Patent System, 1660-1800*. Cambridge University Press.

Videos

â— Moore, David. (2015). "Newcomen Atmospheric Engine" (Ñº), David Moore, Jul 12.

External links

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θΔics

In hmolscience, **Newell LeRoy Sims** (1878-1965), or "Newel Le Roy Sims", was an American sociologist noted for []

Potential | Kinetic energy

In 1924, Sims, in his *Society and its Surplus: a Study in Social Evolution*, outlined (pg. 6) the following view:

> "The physicists' terms, potential and kinetic energy, may be conveniently employed in describing social energy. By potential energy is meant that which is stored up, and in society this includes the people themselves, economic goods, culture or tradition, social structure and organization. Kinetic signifies motion or action, and in society which embodies all endeavor, activity, and effort or whatever sort such as work, play, worship, etc. Instead of using the terms potential and kinetic, we might more properly speak of social energy as capital and current."

Sims, in short, as summarized by Howard W. Odum (1929), stated the following:

> "Society is essentially a physical phenomenon. The people, economic goods, culture and tradition, and social organization are the potential energy of society, while all kinds of activity — work, play, worship, etc. — constitute the kinetic energy; and these two — potential energy and kinetic energy — combine to make up the sum total of social energy, as the two combine in the physical realm."

This, interestingly, is kind of like a "social Lagrangian" model (see: Hamiltonian) and or the social cannon ball model.

Thing | Philosophy

Sims seemed to be digging at an explosion of an energy based thing philosophy; the following (pg. 3) is representative:

> "It was the philosopher Lotze [1817-1881] (Ñº), I believe, who held that a thing is known by its activities. To determine how it acts through and through is, he declared, to arrive at a complete understanding of what it is. It would seem, however, that, contrary to the Lotzean point of view, the energies of a thing, provided they can be separately determined, furnish a better criterion of its nature than do its mere activities."

(add)

Influence

Sims, in respect to influences behind his *Society and Surplus*, cites Auguste Comte, who he calls the "grandfather", and Herbert Spencer, labeled the "father" of "sociology attempted physical interpretations of society", aka physical sociology. Beyond this basic foundation, Sims (pg. ix) says the following: [4]

> "The inspiration of this book, in so far as it can be traced to any direct sources at all outside of the author's own mind, came in a direct measure from the writings of the Simon Patten, especially from certain chapters of *The Theory of Social Forces* and *the New Basis of Civilization*. It also came from a germinal idea found in an essay of Alvan Tenney [1976-1936] on 'The Genesis of Individual and Social Surplus'."

Sims, in addition to these, cites: Frederick Soddy (pg. 4), Lester Ward (pg. 14), Henry Buckle (pg. 21), and Thomas Carver (pg. 21), to name a few.

Life | Non-life

Sims, in respect to energy-based thing philosophy, stepping up the chain of being, switches from "life" to "non-life", cites the ideas of vitalist Arabella Keanealy (1914), amid which he seems to side with materialistic siding monism, as follows:

> "The thermic, lumic, chemic, electric, and radioactive are, however, specifically manifested through inorganic substances, and when we pass to the organic an old question which will not down rises in the query: do these forms also constitute the energy which is called 'vital force'? Is life just heat, light, chemical affinity, electricity, and radioactivity, some one or some combination or complex of these forms and nothing more? We do not know the answer, but it is a safe assumption that no new form appears in the organic."

Sims, then rejecting the four organic modes of energy views of John Macfarlane (*The Causes and Course of Evolution: a Study in Bioenergies*, 1918), who posits there are four organic modes of energy (biotic, cognatic, cogitic, and spiritic), concludes with:

> "If, then, social energy is not to be distinguished from physical energy in general, the law of transformation of energy is obviously applicable."

Sims, at this point (pg. 5), would seem to be siding with energy based materialism philosophy.

Education

In 1900, Sims studied history, with interest in theology, at Tri-State College, Indiana, where he took a sociology course which used C. Henderson's and D.D. Richmond's 1898 *Social Elements* (Ñº) as the class text, where at in 1901 he completed an A.B. He then entered the seminary school at Transylvania University, where he absorbed medieval orthodoxy, and over the next fifteen years served as minister and preaching at churches at a number of places from Kentucky to Southern Ohio. Sometime thereafter he became a sociologist. [2] He completed a second A.B. at the University of Kentucky (1905), an an M.A. (1910) and a Ph.D. degree (1912) in Sociology at Columbia University and also studied at Union Theological Seminary (1908-1913). He became professor and head of the Sociology and Political Science Department of the University of Florida,1915-1920, and at Massachusetts Agricultural College, 1920-1924. He taught summer sessions at Simmons College School of Social Work (1923), at Amherst College (1922), and at Smith College (1923). By the time he came to Oberlin in 1924, Sims was already recognized as a pioneer in American Sociology, highly regarded for his substantial work in rural sociology and social change. He was a professor in the Oberlin College Sociology Department from 1924 to 1944 (emeritus, 1944-1965). [3]

Quotes | Employed

The following are quotes employed by Sims:

> "Desire is the social force, and where there is no desire, no will, there is no force, no social energy. Civilization is the product of active social energy. Or, to use Ratzenhofer's terminology, there must be a lively *interest* or there can be no achievement. It is this innate interest *(angeborenes Interesse)* that makes men fight and conquer and struggle. It is the same that makes them undertake voyages of discovery in search of golden fleeces, or El Dorados, or Northwest Passages. Interest impels mankind to explore, to migrate, to invent, to labor, to produce wealth, to seek knowledge, to discover truth, to create objects both of use and beauty — in a word, to achieve."
>
> — Lester Ward (1903), *Pure Sociology* (pgs. 33-34) (png); cited by Newell Sims (1924) in *Society and Surplus* (pg. 14)

References

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(b) Patten, Simon. (1896). *The Theory of Social Forces* (force, 100+ pgs). American Academy of Political and Social Science.
(c) Patten, Simon. (1908). *The New Basis of Civilization*. MacMillan Co.
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(e) Tenney, Alvan. (1912). "The Genesis of Individual and Social Surplus" (Ñº), *Popular Science Monthly*, Vol. 81, Dec.
(f) Alvan Tenney – Wikisource.
5. Kenealy, Arabella. (1914). "Is Man an Electrical Organism?" (Ñº), *The Nineteenth Century and After*, 76:101-30.

θΔics

In science, **Newton** (CR:235) [CR:243] is the surname of English chemist, physicist, mathematician astronomer Isaac Newton.

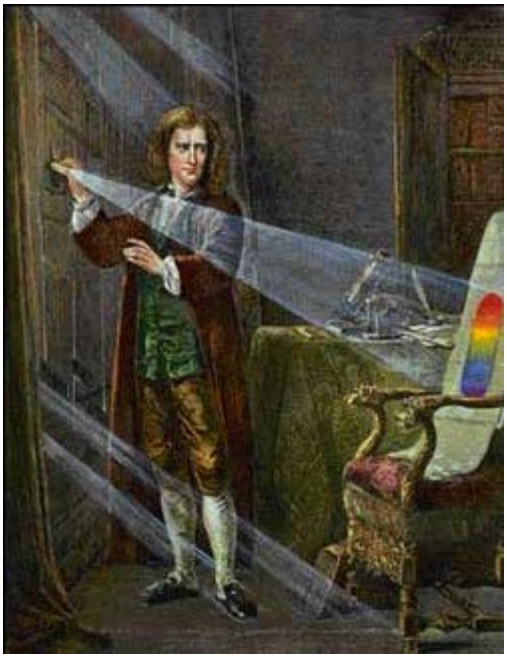

A photo of **Newton** standing, doing color experiments with light.

See also

- Another Newton
- Social Newton
- Newton's law of cooling
- Newton's laws of motion
- Newton's circle (Q) (Q)
- Newton double slit experiment (Q)
- Newton (unit) | kg m/s²

θΔics

In hmolscience, **Newton in Senegal**, aka “Reasonable Drama”, is a 1777 satirical play by French philosopher Jean Sales, on the so-called dietary morals of an African, an oyster, a merman, and a vegetarian, representative of a fictional Isaac Newton, conceived as a "social Newton", in respect to the theory of the soul, and who of the four is the most moral, in respect to dietary behaviors.

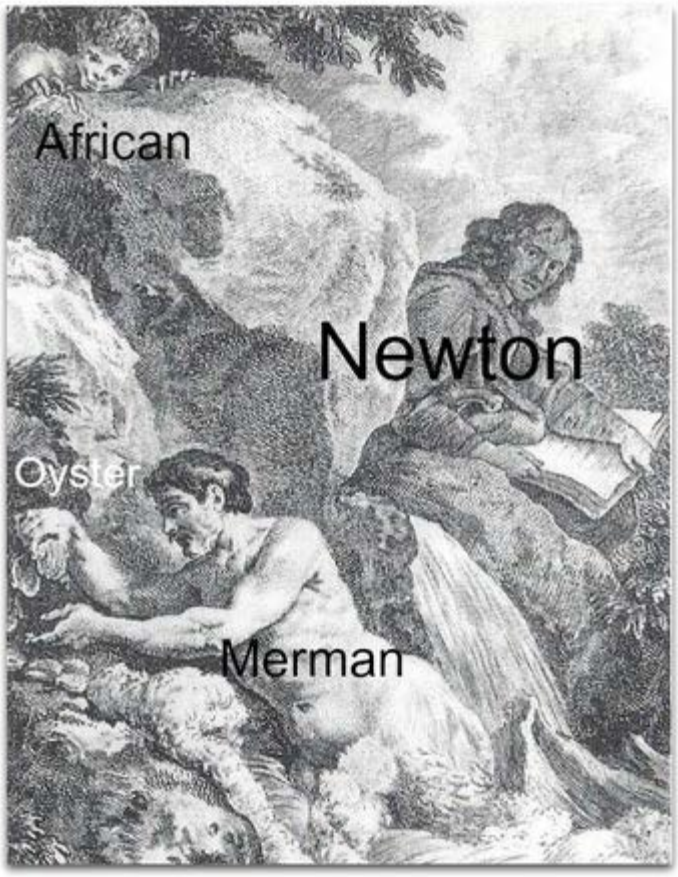

French thinker Jean Sales' illustration of “**Newton in Senegal**” (see: social Newton), from his satirical play “Reasonable Drama” (1777), showing Newton, depicted as a vegetarian, eavesdropping on a conversation between a merman, a meat-eater, and an oyster, which is desperately reasoning for its life, amid which a African, who believes in a scarab-like god, enters the scene, illustrating the idiosyncrasies and seeming moral conundrums involved in so-called morality of eating. [1]

Overview

In 1770, Baron d’Holbach, with footnote assistance by Denis Diderot, in their *The System of Nature*, were comparing man to oyster, in a Newtonian laws of motion sense of things:

> “From the benumbed **oyster**, to the thoughtful and active **man**; we see an uninterrupted progression, a perpetual chain of motion and combination, from which is produced beings.”
>
> — Baron d’Holbach (1770), *The System of Nature* (pg. 27)

> “These reflections would appear to contradict the ideas of those, who are willing to conjecture that the other planets, like our own, are inhabited by beings resembling ourselves. But if the Laplander (Finnish) differs in so marked a manner from the Hottentot (Africans), what difference ought we not rationally to suppose between an inhabitant of our planet and one of Saturn or of Venus?”
>
> — Baron d’Holbach (1770), *The System of Nature* (pg. 45)

> “In the eyes of nature, the oyster that vegetates at the bottom of the sea is as dear and perfect as the proud biped who devours it.”
>
> — Denis Diderot (1770), note to Baron d’Holbach’s *The System of Nature* (pg. 47)

Voltaire commented his views on d'Holbach's *System of Nature* to Jean Sales as follows:

> “D’Holbach’s book caused a great stir among the Paris savants, effectively dividing the deists from the atheists. Voltaire, committed to deism and long impatient with d’Holbach’s declamatory ways, called it ‘a chaos, a great moral sickness, a work of darkness, a sin against nature, a system of folly and ignorance.’ He wrote to Delisle de Sales: “I think that nothing has debased our century more than this enormous stupidity.”
>
> — Rebecca Stott (2013), *Darwin’s Ghosts: in Search of the First Evolutionists*

In 1777, Jean Sales, likely influenced by the above, penned “Reasonable Drama”, a short Socratic dialogue style satirical play, accompanied by an image of “Newton in Senegal”, shown adjacent, which is found in volume four of his *The Philosophy of Nature*, with a accompanying discussion section, of controversial nature, the gist of which, as summarized by Patricia Fara (2002), situates an allegorical tale of Newton perched by the coast in Senegal, Africa, representative of a civilizing force of the enlightenment, taking time off from checking his calculations of the tides to

contemplate the grandeur of nature, during which Newton, presented as vegetarian, enters into a dialogue with a merman, an oyster, and a native African about whether or not they should eat each other.

Newton, set up as an icon of rationality, concludes that only African is worth teaching, since his perception of god as a cockchafer does at least indicate that he can acquire a human soul. [4]

See also

â— John Stewart | Moral vegetarianism

References

1. (a) Sales, Jean. (1777). “Reasonable Drama” (“Drame Raisonnable”). Publisher.
(b) Sales, Jean. (1789). *The Philosophy of Nature: Treatise on Human Moral Nature, Volume 4* (*De la Philosophie de la Nature: Ou Traité de Morale Pour Le Genre Humain, Tiré de la Philosophie Et Fondé Sur la Nature, Volume 4*) (Drame Raisonnable, 7+ pgs; esp. pgs. 173-201, 205). Publisher.
(b) Darnton, Robert. (1996). *The Forbidden Best-Sellers of Pre-Revolutionary France* (Delisle de Sales, Jean-Babtiste-Claude Isoard, pgs. 48-49, 70-71, 397 n. 32). W.W. Norton.
(c) Malandian, Pierre. (1982). *Delisle des Sales: Philosophe de la Nature (1741-1816), Volume 1*. Oxford: Voltaire Foundation.
(d) Malandian, Pierre. (1982). *Delisle des Sales: Philosophe de la Nature (1741-1816), Volume 2*. Oxford: Voltaire Foundation.
(e) Fara, Patricia. (2002). *Newton: the Making of a Genius* (pg. 126; Newton in Senegal, figure 5.1). Columbia University Press.
(f) Shank, J.B. (2008). *The Newton Wars and the Beginning of the French Enlightenment* (pg. 9). University of Chicago Press.

θΔics

In geniuses on, **Newton on god** refers to the views of Isaac Newton on god and or related, e.g. atheism.

Atheism

In c.1705, Newton, in his "A Short Schematic of the True Religion", stated his reasons for objecting to atheism as follows: [1]

> "Opposite to the first is atheism in profession and idolatry in practice. Atheism is so senseless and odious to mankind that it never had many professors. Can it be by 'accident' that all birds beasts and men have their right side and left side alike shaped (except in their bowels) and just two eyes and no more on either side the face and just two ears on either side the head and a nose with two holes and no more between the eyes and one mouth under the nose and either two fore legs or two wings or two arms on the shoulders and two legs on the hips one on either side and no more? Whence arises this uniformity in all their outward shapes but from the counsel and contrivance of an author? Whence is it that the eyes of all sorts of living creatures are transparent to the very bottom and the only transparent members in the body, having on the outside a hard-transparent skin, and within transparent juices with a crystalline lens in the middle and a pupil before the Lens all of them so truly shaped and fitted for vision, that no artist can mend them? Did 'blind chance' know that there was light and what was its refraction and fit the eyes of all creatures after the most curious manner to make use of it? These and such like considerations always have and ever will prevail with mankind to believe that there is a being who made all things and has all things in his power and who is therefore to be feared."

Here, we see that Newton, as an anti-chance theorist, objects to what seems to be generally Epicurean atheism, with its implicit views that all things are the result of accidents brought about via blind chance. It would not be, to note, until 1770, with the publication of Holbach's *The System of Nature*, and thereafter Holbachean atheism, that a more cogent anti-chance brand of atheism would be seen; and it would not be until 1934 with Harold Blum's Gibbsian-based chemical peneplanation theologically-free model of evolution that we would begin to see the above objections raised by Newton solved.

AC | BC

Newton, to give one example of religious theory objection, had certain issues with the Julian calender dating system and would objectionably not label years as AD, but instead used AC (*Anno Christum*), signifying is objection to the argument of the existence of the trinity, namely his view that a person named Jesus may have existed, may have been the son of god, and may have been christened or arisen, but definitely was not the 'Lord' or god. [2]

Quotes | Related

The following are related quotes:

> "God who gave animals self-motion beyond our understanding is without doubt able to implant other principles of motion in bodies which we may understand as little. Some would readily grant this may be a spiritual one; yet a mechanical one might be shown."
>
> — Isaac Newton (1674), philosophical query notes: [2]

> "Did Christ send his apostles to preach metaphysics to the unlearned people, and to their wives and children?"
>
> — Isaac Newton (c.1680), religious notes (O)

> "Atheism is senseless and odious to mankind."
>
> — Isaac Newton (c.1705), "A Short Schematic of the True Religion" [1]

References

1. Newton, Isaac. (c.1705). "A Short Schematic of the True Religion" (Q)(Q) , Manuscript
2. Gleick, James. (2003). *Isaac Newton* (pgs. 105-06). Vintage Books.

External links

- Religious views of Isaac Newton – Wikipedia.
- What did Isaac Newton mean by saying that atheism is senseless? (2016) – Quora.

θΔics

In political science, **Newtonian government** refers to a government, its constitution, and or laws, based on, conceptualized, and or governed via the logic of Newtonian mechanics, namely according to the three laws of motion, inertia in particular, i.e. a celestial mechanics framed model of politics and social regulation.

Overview

In 1728, John Desaguliers, Newton's experimental assistant, published *The Newtonian System of the World, the Best Model of Government*, wherein he set out to argue how the ideal government should be run according to celestial mechanics; the following is his opening preface: [1]

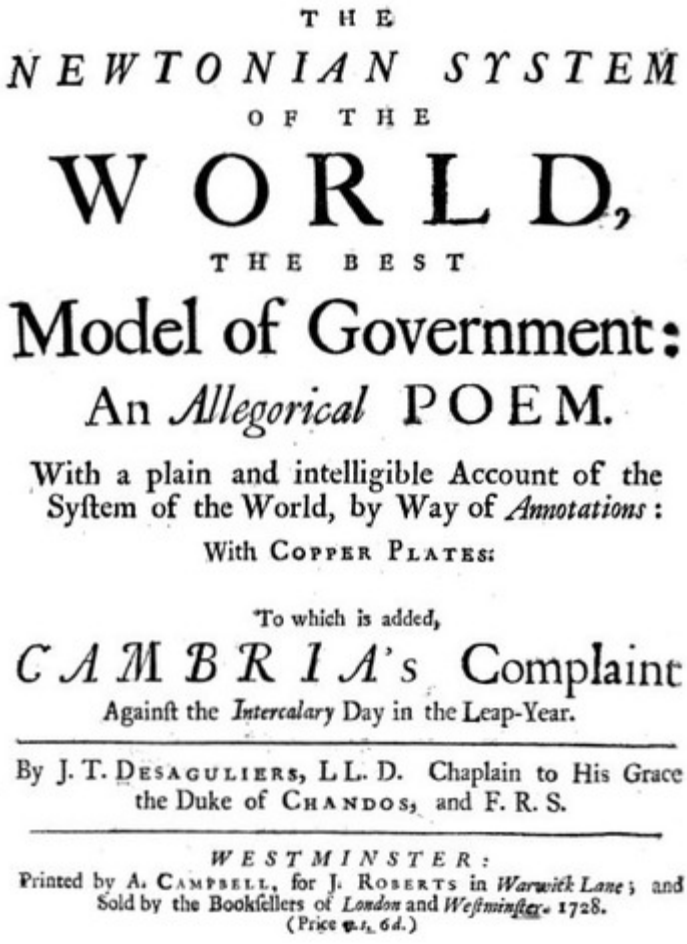

THE
NEWTONIAN SYSTEM
OF THE
WORLD,
THE BEST
Model of Government:
An *Allegorical* POEM.

With a plain and intelligible Account of the Syſtem of the World, by Way of *Annotations*:
With COPPER PLATES:

To which is added,
CAMBRIA's Complaint
Againſt the *Intercalary* Day in the Leap-Year.

By J. T. DESAGULIERS, L.L.D. Chaplain to His Grace the Duke of CHANDOS, and F. R. S.

WESTMINSTER:
Printed by A. CAMPBELL, for J. ROBERTS in *Warwick Lane*; and Sold by the Bookſellers of *London* and *Weſtminſter*. 1728.
(Price 1s. 6d.)

Title page to John Desaqulier's 1728 *The Newtonian System of the World: the Best Model of Government*, wherein he attempts to outline a "**Newtonian government**" system, a celestial mechanics stylized politics, i.e. government based on Newtonian mechanics, the three laws of motion. [1]

> "Among my philosophical inquiries, I have considered government as a phenomenon, and looked upon that form of it to be most perfect, which did most nearly resemble the natural government [see: natural government] of our system, according to the laws settled by the all-wife and almighty architect of the universe.
>
> Those philosophers who wanted observations and mathematics, or would not make use of them, have given us such incoherent hypotheses concerning celestial appearances, and the causes of the motions of the heavenly bodies; that the very worst form of government cannot be so inconvenient to those who live under it, as the wild notions of such philosophers are shocking to unprejudiced reason and common sense.
>
> But when the incomparable Isaac Newton gives us facts and demonstrations, instead of suppositions and conjectures, how is the mind charmed with the beauty of the system? What traces of divine wisdom do we see in the most regular action of universal gravity, (or attraction) whose power is diffused from the sun to the very centers of all the planets and comets, and acts upon the most distant of those bodies, in as mathematical a manner as it does upon the nearest? How wonderfully does it bring back the comets from their immensely distant aphelion, in their very long ellipses, by the same laws that it keeps the nearest planet mercury in its orbit: The former describing equal areas in equal times round the sun, as regularly as the latter, whilst gravity always checks the projectile force, (whereby the bodies tend to fly from the sun) in proportion to the quantity of that force.
>
> The limited monarchy, whereby our liberties, rights, and privileges are so well secured to us, as to make us happier than all the nations round about us, seems to be a lively image of our system; and the happiness that we enjoy under his present majesty's government, makes us sensible, that ATTRACTION is now as universal in the political, as the philosophical world.
>
> Your lordship's consummate knowledge of the laws of mature which are established in the heavens, as well as that of the laws of nations, and particularly those of Great Britain, makes the patronage of this poem your undoubted right. Your lordship can best judge, whether the allegory be just; and it is by your lordship's approbation that I desire to stand or fall: only begging, that the truth of the philosophy may excuse the badness of the poetry."

(add discussion)

In 1990, Michael Foley, in his *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian Mechanics*, outlined the history of the absorption of Newtonian ideas into the construction of the operation of the American political system, run as a Newtonian government operated system, particularly thought the ideas of James Madison and the Princeton social physics school. [2]

In 1990, Philip Allott, in his *Eunomia: New Order for a New World*, defined constitution, in loose or connotative physical science terms, as: [1]

> "The generic principles of a constitution are intended to perform a similar explanatory function to that of general hypothetical principles of the natural sciences—the principles of Newtonian mechanics, thermodynamics, relativity, quantum mechanics, genetics."

(add discussion)

See also

- Darwinian government
- Cartesian economics
- Gibbsian government
- Newtonian sociology

References

1. Desaguliers, John T. (1728). *The Newtonian System of the World: the Best Model of Government - an Allegorical Poem.* A. Campbell.
2. Foley, Michael. (1990). *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian Mechanics*. Routledge, 2014.

θΔics

In hmolscience, **Newtonian sociology**, a near synonym to social mechanics, is the study of the social sciences and social phenomena according to the three laws of motion, the inverse square law of attraction, and or attraction and repulsion theory, and Newtonian mechanics, in general.

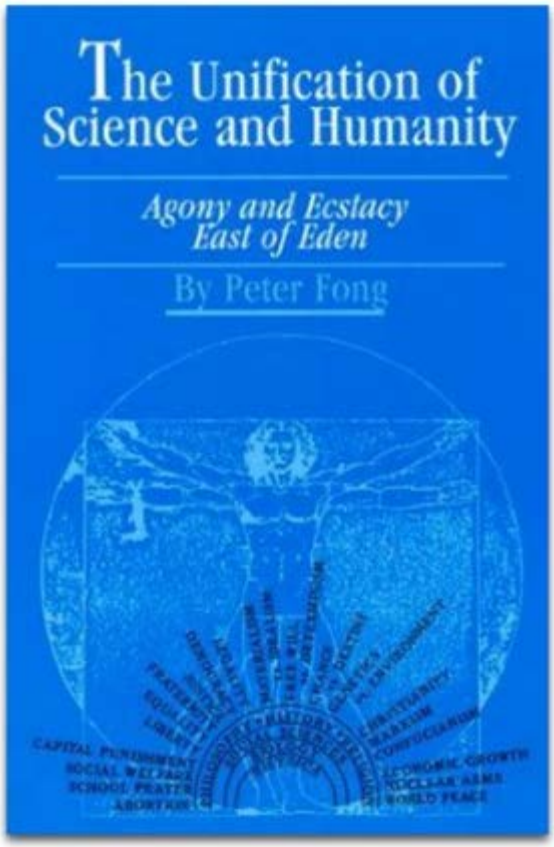

American physicist Peter Fong's 1996 *The Unification of Science and Humanity*, outlines the semblance of **Newtonian sociology**, i.e. sociology based on physics. [1]

Overview

In 1988, American physicist Peter Fong, in his "Ethics, Politics and Sociology as Newtonian Sciences", gives the following well-honed reductionism-styled description of the basic outline or conception of Newtonian sociology: [1]

> "In astronomy, it was once thought that the advance of the perihelion and the change of eccentric of the planetary orbits were expressions of God's will that was beyond the control of Newton's laws. These phenomena were eventually explained by the very laws which Newton applied to the interactions among the planets. This established the planetary system as a purely mechanical system in which there was no role for non-mechanical entities.
>
> Chemistry presented challenges. Things may disappear and reappear. Concepts such as those of phlogiston and caloric theory competed with the Newtonian concepts. But eventually it was learned that chemistry was entirely reducible to physics as a mechanical system.
>
> Biology presented even greater challenges. There are phenomena in biology apparently not shared by inanimate material agencies: birth, growth, reproduction, and death. There is no sex in physics and chemistry. But through molecular biology most manifestations, including sex, can now be explained on a mechanical basis. All previously supposed non-mechanical elements have been eliminated.
>
> Since humans are part of the biological system, it is logical that there be a Newtonian derivation of the social sciences. However, we cannot ignore the existence of apparently non-mechanical elements manifested in such notions as virtue, evil, liberty, and equality. These will have to be accounted for in a Newtonian framework. Then the social sciences can be developed as hard sciences—like physics and chemistry—that are well-established, complete, exhaustive and exclusive. Such development would be one of the most important intellectual developments of this century. Right now, the existing social sciences are like the natural sciences before Newton, with conflicting concepts and principles that are competing with each other, without a body of firmly established knowledge the solution of practical problems."

(add discussion)

See also

- Darwinian government | Woodrow Wilson
- Cartesian economics
- Gibbsian government
- Newtonian government
- Physicochemical sociology

Quotes

The following are related quotes:

> "It may be reasonable to suppose that the corpuscular-kinetic format of the immediate world of human experience is duplicate in the nature of human organization—thereby giving rise to a **Newtonian sociology** reducing 'society to a cluster of human atoms, complete and self-contained each in itself' and only mutually attracting and repelling each other."
>
> — Michael Foley (1990), per citation of Alexandre Koyre [2]

References

1. Fong, Peter. (1988). "Ethics, Politics and Sociology as Newtonian Sciences" (abs), in: *Newton's Scientific and Philosophical Legacy* (editors: P.B. Scheurer and G. Debrock) (§4:pgs. 343-54). Kluwer Academic Publishers.
2. (a) Koyre, Alexandre. (1965). *Newtonian Studies* (pg. 23). Chapman & Hall.
(b) Foley, Michael. (1990). *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian Mechanics* (pgs. 198-99). Routledge, 2014.

θΔics

In science, **Newton's law of cooling** states that the rate of heat loss dQ of a body is proportional to the difference in temperatures between the body and its surroundings, as shown below: [1]

$$\frac{dQ}{dt} = h \cdot A(T_B - T_S)$$

where *h* is the (convective) heat transfer coefficient, *A* is the unit surface area of the body through which the heat is transferred, T_B is the temperature of the surface of the body (solid), and T_S is the temperature of the surroundings (fluid). [2] Newton's law of cooling is generally limited to simple cases where the mode of energy transfer is convection, from a solid surface to a surrounding fluid in motion, and where the temperature difference is small, approximately less than 10º C. [3] When the medium into which the hot body is placed varies beyond a simple fluid, such as in the case of a gas, solid, or vacuum, etc., this becomes a residual effect requiring further analysis. [5]

History

This law of cooling is named after English physicist Isaac Newton who, in the late 17th century, conducted the first experiments on the nature of cooling. Specifically, noting that when the difference in temperature between the two bodies is small, approximately less than 10º C, that the rate of heat loss will be proportional to the temperature difference, Newton applied this principle to estimate the temperature of a red-hot iron ball, by observing the time which it took to cool from a red heat to a known temperature, and comparing this with the time taken to cool through a known range at ordinary temperatures. [3] According to this law, if the excess of the temperature of the body above its surroundings is observed at equal intervals of time, the observed values will form a geometrical progression with a common ratio.

The inaccuracy of Newton's law become's considerable at high temperatures. The corrected Newton's was formulated in 1817 by French physicial chemist Pierre Dulong and physicist Alexis Petit who, experimenting through temperature ranges as high as 243º C, found that the quickness of cooling for a constant excess of temperature, increases in geometrical progression, when the temperature of the surrounding space increases in arithmetical progression. [5]

Human thermodynamics

Iranian-born American engineer Robert Kenoun, in his 2006 book *Theory of History and Social Evolution*, seems to use an unwritten Joule's second law interpretation of human social systems, in combination with Newton's law of cooling, to argue that evolving human social systems tend towards a minimum of internal energy over time and that conjoined systems will exchange energy during these evolutions, through a process of thermalization or equilibriation, at a rate proportional to their difference in internal energies, in such a manner that greater internal energy (temperature) differences result in greater rates of energy transfer, typified by great violence, such as in war and revolution. [4]

References

1. Powell, Michael. (2004). *Stuff You Should Have Learned at School.* New York: Barnes & Noble.
2. Potter, Merle C. and Scott, Elaine P. (2004). *Thermal Sciences - an Introduction to Thermodynamics, Fluid Mechanics, and Heat Transfer*, (pg. 61). U.S.: Brooks/Cole.
3. Newton's law of cooling (Heat, section 26), The Encyclopedia Britannica, 1910.
4. Kenoun, Robert. (2006). *A Proposition to Theory of History and Social Evolution*. Trafford Publishing.
5. Whewell, William. (1866). *History of the Inductive Sciences*, (section: "Correction of Newton's law of cooling", pgs. 149-50). Appleton.

Further reading

â— Lewis, Michael A. (2010). "The Physics of Inflation: Newton's Law of Cooling and the Consumer Price Index" (pdf), *Journal of Applied Quantitative Methods*, 1(5)115-12.

θΔics

In experiments, **Niagara Falls** is a frequented site of experimentation, in the early history of thermodynamics, on whether or not there is a difference in temperature between the top water and bottom water. The impetus is such that the measured data points of the change in temperature and the change in height of a unit mass of water would yield for a measurement of the mechanical equivalent of heat.

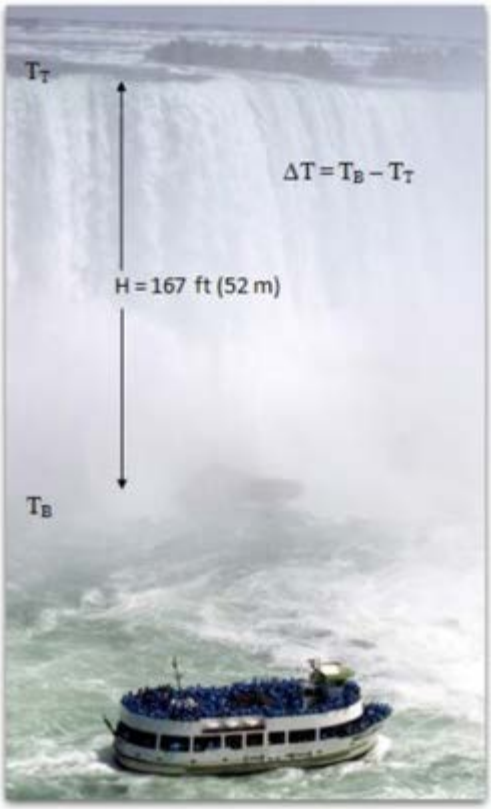

English physicist James Joules' famous 1847 **Niagara Falls experiment**, in measuring the mechanical equivalent of heat.

Joule

English physicist James Joule suggested that water at the bottom of Niagara Falls, which are 50 meters high, should be warmer than that at the top; he estimated that the rise in temperature should be about 0.10 K. [4] In the early 1840s, Joule suggested to Manchester chemistry professor Lyon Playfair that they take a trip to Niagara Falls to "ascertain the difference of the temperature of the water at the top and bottom of the fall." [1] Joule latter commented on this: [7]

> "I have disputed with Dyer on these matters for a good 20 years … I once invited him to go with me to Niagara and offered to pay our joint expenses if a higher temperature was not found at the bottom than at the top of the falls."

Joule's finally conducted the experiment while visiting a waterfall (Niagara Falls?) with his wife on their honeymoon in 1847, during which he produced a thermometer with which to measure the change in the temperature of the water as it fell. [2]

Mayer

In circa 1865, American physicist Alfred Mayer, during a visit to Trenton and Niagara Falls, found that on misty days the water was heated by the arrest of motion after the descent, as one would expect in accordance with the first law of thermodynamics. If the atmosphere were dry, however, the evaporation more than offset the heating effect. [3]

Maxwell

In 1868, Scottish physicist James Maxwell commented in a letter to Irish-Scottish physicist William Thomson: [6]

> "I hope Tait will start the determination of Joules equivalent with mercury coming down a wide tube from a cistern and flowing through a difficult passage into a lower cistern. One foot of mercury is as good as 400 of water so an experiment in a room will be much better than Niagara Falls."

Student problems

Chemical thermodynamics students are frequently assigned the task of calculating the temperature change using the data of: height equals 50 meters, heat capacity of one mol of water, 0.018 Kg, equals 80 J/K, acceleration equals 9.8 meters per second squared. [4] Another version of the question is: "How much warmer is the water at the bottom of Niagara Falls than at the top, knowing that the height is 160 feet?" [5]

See also

â— Thermodynamic anecdotes

References

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2. Joule – Anecdotes.com.
3. Mayer, Alfred G. and Woodward, Robert S. (1916). “Biographical Memoir of Alfred Marshall Mayer (1836-1897)” (32-pgs). Washington: *National Academy of Sciences*, Jan.
4. Smith, E. Brian. (2004). *Basic Chemical Thermodynamics* (pg. 20). Imperial College Press.
5. Draper, Charles H. (1906). *Heat and the Principles of Thermodynamics* (pg. 244). Blackie and Son.
6. Maxwell, James. (1868). “Letter to William Thomson”, Feb 20; in *The Scientific Letters and Papers of James Clerk Maxwell: 1862-1873, Volume II* (pg. 346-47). Cambridge University Press.
7. Cardwell, Donald S. L. (1991). *James Joule: A Biography* (Niagara Falls, pgs. 76, 210). Manchester University Press.

θΔics

In existographies, **Niccolo Cabeo** (1585-1650) (IQ:#|#) (CR:3), aka "Cabeus" (Sanford, 1921) was an Italian philosopher, engineer, mathematician, and theologian, noted for []

Overview

Cabeo is classified as a "Jesuit naturalist", along with Athanasius Kircher and Gaspar Schott, who attempted to tackle the problem of occult or insensible causation in the seventeenth century. [2]

In 1629, Cabeo, in his *Magnetic Philosophy*, a book that attempted to refute the theories of William Gilbert (1600), from the Aristotelian view, made an important observation of electrical repulsion, reporting his observations that an electrically charged body can attract non-electrified objects, also that two charged objects repelled each other. [1]

Quotes | By

The following are quotes by Cabeo:

> "If you seek to be able to know, from the school of the philosophers, why fire should induce heat, so that you do not seek refuge in an occult force or faculty, likewise, from this book you should be able to understand no less clearly why the magnet attracts iron, and why it turns itself to the pole, without another occult quality being thrust upon you."
>
> — Niccolo Cabeo (1629), *Magnetic Philosophy* [2]

> "It is plain from the above quotation, that **Cabeus** did not recognize repulsion as a true property of electrification. Nor was it so recognized by others until the publication by Otto von Guericke of his paper 'De Virtutibus Mundanis' in 1672. Von Guericke recognized what he regarded as a true repulsion of his electrified sulphur globe for light bodies in its vicinity, but his explanation of the phenomenon was rather metaphysical than physical."
>
> — Fernando Sanford (1921), "Some Early Theories Regarding Electrical Forces" [3]

References

1. (a) Cabeo, Niccolo. (1629). *Magnetic Philosophy* (*Philosop[hia Magnetica*). Succius.
(b) Kirby, Richard. (1956). *Engineering in History* (co-authors: Sidney Withington, Arthur Darling, Frederick Kilgour) (pg. 329). Courier, 1990.
2. Waddell, Mark A. (2016). *Jesuit Science and the End of Nature's Secrets* (pg. #). Routledge.
3. Sanford, Fernando. (1921). "Some Early Theories Regarding Electrical Forces: the Electrical Emanation Theory" (pg. 546), *The Scientific Monthly*, 12:544-.

External links

â— Niccolo Cabeo – Wikipedia.

θΔics

In existographies, **Niccolo Machiavelli** (1469-1527) (IQ:105|#180) (Cattell 1000:83) [RGM:54|1,500+] (Gottlieb 1000:40) (GPhE:#) (CR:53) was an Italian realism philosopher, historian, politician, and diplomat, best known for his 1513 leadership advice book *The Prince*, political ethics discourse advocating an 'ends outweigh the means' (or "end justifies the means") philosophy; influential to: Francis Bacon and Vilfredo Pareto.

Machiavelli, according to Russian-born American sociologist Pitirim Sorokin, was the first advance the idea of the cyclic development of societies. [2]

Pareto

Italian engineer turned socioeconomist Vilfredo Pareto, supposedly, was inspired by Machiavelli's distinction between two types of human instincts, one oriented toward tradition (lions) and one toward innovation (foxes), and that this, in part, is from where he gets is circulation of elites theory.

Quotes | On

The following are noted quotes and or tributes:

> "We are much beholden to **Machiavelli** and others, that write what men do, and not what they ought to do. For it is not possible to join serpentine wisdom with the columbine innocency, except men know exactly all the conditions of the serpent; his baseness and going upon his belly, his volubility and lubricity, his envy and sting, and the rest; that is, all forms and natures of evil. For without this, virtue lieth open and unfenced. Nay, an honest man can do no good upon those that are wicked, to reclaim them, without the help of the knowledge of evil."
>
> — Francis Bacon (1605), *The Advancement of Learning* (Ñº) [1]

> "**Machiavelli's** chief contribution to political thought lies in his freeing political action from moral considerations."
>
> — Daniel Donno (1981), "Introduction" to *The Prince* [4]

Quotes | By

The following are noted quotes:

> "It must be considered that there is nothing more difficult to carry out nor more doubtful of success, nor more dangerous to handle, than to initiate a new order of things. For the reformer has enemies in all those who profit by the new order, and only lukewarm defenders in all those who would profit by the new order, this lukewarmness arising partly for fear of their adversaries, who have the laws in their favor; and partly from the incredulity of men, who do not truly believe in anything new until they have had actual experience of it."
>
> — Niccolo Machiavelli (1513), *The Prince* (§6)

> "The way men live is so far removed from the way they ought to live that anyone who abandons what is for what should be pursues his downfall."
>
> — Niccolo Machiavelli (1532), *The Prince* [3]

"Christian principles seem to me to have made men feeble, and caused them to become an easy prey to evil-minded men, who can control them more securely, seeing that he great body of men, for the sake of gaining paradise, are more disposed to endure injuries than to avenge them."

— Niccolo Machiavelli (1513), *The Prince*; cited by Jennifer Hecht (2004) in *Doubt: a History* (pg. 273)

References

1. (a) Bacon, Francis. (1605). *The Advancement of Learning* (bk. II, xxi, 9). Publisher.
(b) Henderson, Lawrence J. (1935). *Pareto's General Sociology: a Physiologists Interpretation* (pg. 3). Harvard University Press.
(c) Note: the above "not what they ought to do" seems to be reference to his 1517 *Discourses*. (Ñº)
2. Raikhlin, Raddai. (2010). *Military Sociology: Collapse of the Israel Defense Forces* (translator: Tanya Chepkova) (abs). CreateSpace.
3. (a) Machiavelli, Niccolo. (1513). *The Prince* (pg. 56). Bantam, 1981.
(b) Rigney, Daniel. (2001). *The Metaphorical Society: an Invitation to Social Theory* (pg. 46). Rowman & Littlefield.
4. (a) Donno, Daniel. (1981). "Introduction", in *The Prince* (by Niccolo Machiavelli). Bantam Classic.
(b) Rigney, Daniel. (2001). *The Metaphorical Society: an Invitation to Social Theory* (pg. 67). Rowman & Littlefield.

External links

â— Niccolo Machiavelli – Wikipedia.

θΔics

In existographies, **Niccolo Tartaglia** (c.1500-1557) was an Italian physicist, mathematician, and translator, noted for []

Overview

In c.1545, Tartaglia, in his booklet on Jordanus Nemorarius, was, supposedly, the first to state the idea of both "vertical pressure" and "lateral pressure" (see: mean girls model) in a liquid, e.g. at different depths. [1]

Quotes | On

The following are quotes on Tartaglia:

> "**Tartaglia** was the first to have a clear idea of the 'vertical' and 'lateral' pressure in a liquid."
>
> — William Middleton (1964), *The History of the Barometer* (pg. 5) [2]

Quotes | By

The following are quotes by Tartaglia:

> "The deeper the liquid is, the more it will compress the deeper parts; for they are compressed both by the upper parts [vertical pressure] and by those next to them [lateral pressure]."
>
> — Niccolo Tartaglia (c.1545), *Jordanus: a Small Treatise* [1]

References

1. (a) Tartaglia, Niccolo. (c.1545). *Jordanus: a Small Treatise: Correction Study with New Growth Figures* (*Iordani: Opusculum de ponderositate, Nicolai Tartaleae studio correctum novisque figuris auctum*) (abs). Publisher, 1565.
(b) Middleton, William E. (1964). *The History of the Barometer* (pg. 5). Publisher.
2. (a) Middleton, William E. (1964). *The History of the Barometer* (pg. 5). Publisher.
(b) Jordanus de Nemore – Wikipedia.

External links

â— Niccolo Fontana Tartaglia – Wikipedia.

θΔics

In hmolscience, **Nicholas Boyle** (1946-) is a an English German literature scholar noted for his 1990s-launched, partially-complete, three-volume existography work on Goethe and for his 2007 essay on *Elective Affinities* delivered as a lecture at Cambridge, extensive partially complete three-volume biography on Goethe.

Overview

In 1992, Boyle began publishing the first parts of a three-volume biography on Goethe. [1]

In 1994, Boyle, in his review of David Constantine's translation and introduction of Goethe's *Elective Affinities*, commented: [2]

> "*Die Wahlverwandtschaften* is probably the most unapproachable of Goethe's works, and was probably intended by Goethe to be so. An 'oppressive rigidity and unnaturalness' may alienate us from the symmetrical plot and structure—which seem to suggest that human relationships can be formulated schematically as a chemical reaction."

In 2007, Boyle, in his his "Goethe, *Die Wahlverwandtschaften*", a lecture at University of Cambridge, commented: [3]

> "An interpretation of the novel seems to be hinted at here: these events are the human equivalent of an experiment in a chemical retort. The movements of passion between Edward, Ottilie, Charlotte, and the Captain are no different from the operations of 'Wahlverwandtschaft' between limestone, carbon dioxide, sulphuric acid and water. The human figures and events are but the manifestations of concealed natural forces, possibly not yet wholly understood by science."

(add discussion)

Quotes

The following are related quotes:

> "As the age of paper passes, so [Goethe] seems its supreme product."
>
> — Nicholas Boyle (2000) [3]

References

1. (a) Boyle, Nicholas. (1992). *Goethe: the Poet of Desire, Volume One*. Oxford University Press.
(b) Boyle, Nicholas. (2000). *Goethe: Revolution and Renunciation (1790-1803), Volume Two*. Clarendon Press.
2. Nicholas, Boyle. (1994). "Review: *Elective Affinities* (translated with an Introduction and Notes by David Constantine)" (abs), *J. European Studies*, xxiv:411-17.
3. Nicholas Boyle (2007). "Goethe, *Die Wahlverwandtschaften*", Lecture at University of Cambridge; in *Landmarks in the German Novel, Volume 1* (editor: Peter Hutchinson) (§4, pgs. 49-66) (Ñº). Peter Lang.

External links

â— Nicholas Boyle – Wikipedia.
â— Nicholas Boyle (faculty) – Cambridge University.

θΔics

In human chemistry, **Nicholas Christakis** (1962-) is an American medical sociologist noted for Granovetter-inspired 2007 to 2010 carbon atom bonding social models.

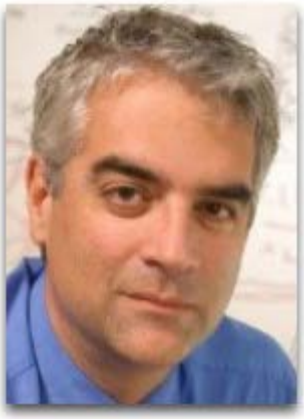

Overview

In 2007, Christakis gained fame with his article "The Spread of Obesity in a Large Social Network Over 32 Years", co-authored with American sociologist James Fowler, in which they presented the results of a study, which showed that obesity can spread from a person to person, through social networks, much like a virus during an epidemic. [2]

In 2009, Christaksi and Fowler, in their *Connected: the Amazing Power of Social Networks and How They Shape Our Lives*, builded on some of American sociologist Mark Granovetter's 1969 hydrogen bonding based weak ties and strong ties sociology model, to argue that thinks such as obesity and happiness are dependent on one's social network. [3]

In 2010, Christakis, in his "The Chemistry of Social Networks" interview, uses a type of human atom model to explain the properties of social networks on the model of how the properties of graphite verses diamond differ not due to the carbon atoms but to bonds or ties between each atom. To quote an excerpt: [1]

> "Like atoms in a molecule, we're all linked together. Studying the complex matrix that results can illuminate everything from bucket brigades to Bernie Madoff."

(add discussion)

Carbon | Social network model

The following is the outline of Christakis' properties of social network model based on carbon bonding:

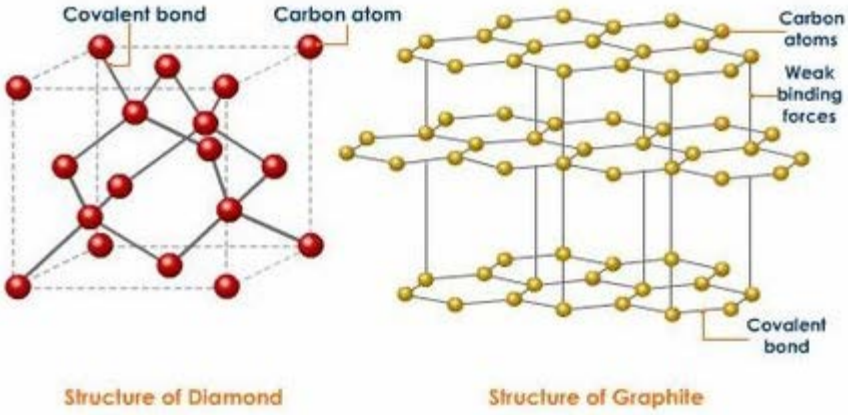

Christakis' 2010 carbon ties model of social networks.

> "One of the key ideas about human social networks is that in the addition of ties between people and specific patterns of ties that obey particular mathematical rules the whole becomes greater than the sum of its parts. The collection of human beings have properties that do not reside within the individuals, and this collection of human beings is now able to do things that they previously were not able to do. And one of the illustrations or examples that I most like to give about this is something that most people are familiar with from high school or college chemistry and that is the example of carbon.
>
> So you can take carbon atoms and you can assemble the carbon atoms into graphite and here we put particular hexagonal pattern of ties and you get sheets of graphite and this graphite is soft and dark. Or we can take the same carbon atoms and assemble them differently into a kind of a perimetral structure with the ties between them, the bonds between the carbon atoms and we get diamond, which is hard and clear and these properties of softness and darkness or hardness and clearness first of all differ dramatically, not because the carbon is different. The carbon is the same in both, but rather because of the ties between the carbon atoms. And second these properties are not properties of the carbon atoms. They're properties of the group, properties of the collection of carbon atoms. Therefore, when we take constituent elements and

> assemble them to a larger whole, this larger whole can have properties that we could not have foreseen merely by studying the individual elements and properties which do not reside within the individual elements."

Christakis goes on to argue that the same thing happens with humans in networks, and the differing properties that develop based on how people are tied together.

Education

Christakis completed his BS in biology at Yale University in 1984, his MPH in 1988 and MD in 1989 at Harvard Medical School, and his PhD in medical sociology in 1995 at University of Pennsylvania. He then became professor of sociology and medicine at the University of Chicago. Since 2001, he has been a professor of sociology at Harvard and medicine at Harvard Medical School.

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1. Allen, Austin. (2001). "The Chemistry of Social Networks: Interview with Nicholas Christakis", BigThink.com. May 06.
2. Christakis, Nicholas A. and Fowler, James. (2007). "The Spread of Obesity in a Large Social Network Over 32 Years" (abs), *New England Journal of Medicine*, 357(4): 370-79.
3. Christakis, Nicholas A. and Fowler, James. (2009). *Connected: the Amazing Power of Social Networks and How They Shape Our Lives.* HarperCollins.

External links

â— Nicholas A. Christakis – Wikipedia.
â— Nicholas Christakis (faculty) – Department of Sociology, Harvard University.

θΔics

In hmolscience, **Nicholas of Autrecourt** (c.1299-1369) was a French skeptical philosopher and theologian noted for his defense of atomic theory, repudiation of Aristotle, and rejection of the Democritus-Epicurus view of the soul as a type of atom or atomic movement, instead considering soul to be composed of two immortal spirits called "intellect" and "sense" as he named them. [1]

Atoms | Voids

The following is Blake Dutton's 1996 abstract of Nicholas' contribution: [2]

> "In [Nicholas'] treatment of motion: in reducing all change to the locomotion of atoms, in positing an interstitial void, and in denying the infinite divisibility of the continuum, Nicholas both challenged Aristotelian physics at its most fundamental level and separated himself from virtually all of his scholastic contemporaries. Yet with few exceptions, this has received virtually no attention."

(add discussion)

Cause | Effect

Nicholas, according to Jennifer Hecht (2004), on the question of cause and effect, argued along the same lines as the ancient skeptics, the Charvaka, and al-Ghazali, positioning that we can never be certain if two rational notions are causally related, no matter how well they seem to link. [3]

Works | Burned

In 1347, Nicholas was sentenced to burn all his writings, which he did in November. Two letters to a friend survived.

References

1. Stenger, Victor J. (2013). *God and the Atom: from Democritus to the Higgs Boson: the Story of a Triumphant Idea* (pg. 48). Prometheus Books.
2. Dutton, Blake D. (1996). "Nicholas of Autrecourt and William of Ockham on Atomism, Nominalism, and the Ontology of Motion" (abs), *Medieval Philosophy and Theology*, 5(1).
3. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 262). HarperOne.

External links

â— Nicholas of Autrecourt – Wikipedia.

θΔics

In existographies, **Nicholas of Cusa** (1401-1464) (IQ:180|#141) [RGM:248|1,500+] (CR:6), aka "Nicolaus Cusanus" or "Cardinal von Kues" (Guericke, 1663), was a German polymath—thing philosopher (see: thing philosophy), theologian, jurist, and astronomer—noted for his heliocentric belief, contrary to the then prevailing view, that the earth was not stationary but revolved, and that the sun was fixed as the center of the movement; his views would later influence those including: Leonardo da Vinci, Nicolaus Copernicus, Giordano Bruno, Johannes Kepler, Galileo, and Gottfried Leibniz.

Overview

Cusa proposed the earth was a sphere, spinning daily on its axis orbiting the sun—also, in opposition to Aristotle's circular orbit theory, argued that perfect spherical orbits are impossible, thus predating the elliptical orbit theories of Johannes Kepler; that heavenly bodies were made of the same material as the earth; proposed dropping objects from towers to see why they fell as they did; described rules for experimentation; took the pulse; forecast the weather; argued for an infinite universe; invented reading glasses; wrote on squaring the circle, among other mathematical subjects; his best known work is his *Learned Ignorance*, according to which a person of learned ignorance is not a person of erudition (Ñº); Nicolaus Copernicus, Galileo Galilei, Giordano Bruno, and Kepler were all, supposedly, aware of his writings, the latter citing him in the first paragraph of his first published work; commonly labeled as a polymath also many-sided genius.

Quotes | On

The following are quotes on Cusa:

> "**Nicholas of Cusa** has understood and seen much, and is one of the most outstanding geniuses who ever breathed air. But regarding his apprehension of the truth, he was like a swimmer in the midst of a tempestuous river, tossed high and low; because he did not see the light continuously, and did not swim quietly or calmly, but intermittently, and by intervals. The reason for this is, he had not removed all of the false principles he'd imbibed from the common wisdom from which he'd parted; so perhaps, through force of industry, he came to correctly title his work *On Learned Ignorance* or *The Ignorant Doctrine*."
>
> — Giordano Bruno (1584), *On the Infinite, the Universe, and the Worlds* [1]

> "**Cusa** was the first modern thinker."
>
> — Ernst Cassirer (1927), *Individuum und Kosmos in der Philosophie der Renaissance*

> "**Cusanus** owned more works by Lull than any other single author."
>
> — Pauline Watts (1982), *Nicolaus Cusanus: a Fifteenth-Century Vision of Man* (pg. 16)

Quotes | By

The following are noted quotes:

> "Each star makes its own individual world."
>
> — Nicholas of Cusa (c.1450), *Learned Ignorance* (2.12); cited by Otto Guericke (1663), in *New Experiments on the Vacuum of Space* (pg. 363), in support of his view and the view of Giordano Bruno, that fixed stars are moving suns with their own planetary systems

“There is present in all things a natural desire to exist in the best manner in which the condition of each thing's nature permits this. And [we see that all things] act toward this end and have instruments adapted thereto. They have an innate sense of judgment which serves the purpose of knowing. [They have this] in order that their desire not be in vain but be able to attain rest in that [respective] object which is desired by the propensity of each thing's own nature.”

— Nicholas of Cusa (1450), *Learned Ignorance* (Ñº)

“It would always seem to each person, whether he were on the earth, the sun, or another star, that he was at the ‘immovable’ center, so to speak, and that all other things were moved … if he were on the sun, he would fix a set of poles in relation to himself; if on the earth, another; on the moon, another; on mars, another; and so on.”

— Nicholas of Cusa (c.1450), *Publication* (Ñº); paraphrased, without citation, by Giordano Bruno (1584) via the voice of Fracastorio in *On the Infinite, the Universe, and the Worlds* (pgs. 114-15)

References

1. Bruno, Giordano. (1584). *On the Infinite Universe and the Worlds* (*On the Infinite, the Universe, and the Worlds*) (*de l’Infinito, Universo e Mondi*) (translator: Scott Gosnell) (pg. 108). Giusto Laterzi & Sons, 1907; CreateSpace, 2014.

External links

â— Nicholas of Cusa – Wikipedia.

θΔics

In existographies, **Nicholas Georgescu-Roegen** (1906-1994) [CR:117], or Nicholas Georgescu, "Nicholas", or "Nicholas Roegen" (Thims, 2020), was a Romanian-born American mathematician,and statistician noted, in economic thermodynamics, for his 1971 *The Entropy Law and the Economic Process*, wherein he argues for a material entropy theory of economic resources.

Overview

In 1971, Georgescu-Roegen, published his now highly-cited book *The Entropy Law and the Economic Process*, which situated the view that economic systems are governed by the second law of thermodynamics. The following is a representative excerpt from this work: [1]

> "All living beings, in their role as Maxwellian demons, [sort] low entropy for the purpose of enjoying and preserving their lives."

Although most the book is mostly incorrect, thermodynamically speaking, the simplified verbal entropology theme of the book, along with the underlying attempt at extrapolation of the second law to explain man's overuse of natural resources, i.e. material entropy tends to a maximum, have made Georgescu sort of a cult legend in many circles. Georgescu's general theory rejects the older "mechanistic" economics in favor of "thermodynamic" economics, and insists that descriptions of economic phenomena, especially mathematical descriptions, must go beyond relative market prices, namely they must be grounded in reality, i.e. in the physical and social universe of which humans are embedded, which he attributes to what he calls the "entropy law". [2]

Name | Roegen anagram

He was born Nicolae Georgescu and also formerly known as Nicholas St. Georgescu. The name Nicholas seems to be an English (or Americanized) version of Nicholae. In post-humorous publications and discussion of him, by his associates, e.g. Kozo Mayumi and John Gowdy, he is simply referred to as 'Georgescu'.

The appended surname 'Roegen', according to several sources, is an attached reverse anagram.

According to one explanation, when Nicolae was very young, he attended military school to help support his widowed mother and his younger brother. He was clearly a superior mathematician, but there was another Georgescu (very common Romanian name) so he added "Roegen" to his Georgescu to make himself "unique". He was in academic competitions and won many scholarships for academics. He kept his new name after leaving Romania after the WWII and is know by that whole name. The surname "Roegen", according to this source, is a play on the name "George" (of his original last name George-scu). [8]

According to a second reference, surname attachment name came from an anagram of his Romanian name NicolaE GEORescum, such that if the capital letters are read backward it becomes ROEGEN. [10]

Of similar commonality, to note, the surname American electrochemical engineer Libb Thims, also a human thermodynamicist, similar to Georgescu-Roegen, is a reverse anagram of "Smith" (see: etymology), the most common last name in America.

Education

Georgescu completed his BS in mathematics at the University of Bucharest in 1926 and completed his PhD at the University of Paris in 1930 with a thesis on "The Problem of Finding the Components of a Cyclical Phenomenon". His work on periodic phenomena convinced him that social phenomena could in no way be described by the "mechanics" of classical statistics, which in his view described locomotion as reversible and qualityless. Although he had taken only two courses in economics at the Sorbonne, he concluded that economic phenomena could be described by a mathematical system. In 1932, after completing two-years of post graduate work at the University College London, he became a professor of statistics at the University of Bucharest, remaining there until 1946. From 1950 to 1976,

Georgescu was a professor at Vanderbilt University, Tennessee.

His interest in the relation between entropy and economics seems to have began with his 1966 introductory essay to a collection of his theoretical papers published in *Analytical Economics*. [2] He spent the last 25-years of his life researching this topic.

Students / influence

A student of Georgescu-Roegen is Japanese applied economist Kozo Mayumi, author of the 2001 book *The Origins of Ecological Economics: The Bioeconomics of Georgescu-Roegen*, who studied bioeconomics under Georgescu-Roegen from 1984 to 1988 at the economics department of Vanderbilt University, Nashville, Tennessee. [7] Georgescu-Roegen's work has stimulated a number of writers, such as Herman Daly, Robert Ayres, Jeremy Rifkin, Jing Chen, among others.

Economic entropy theory

The core of Georgescu-Roegen's theory is found in his 1971 book *The Entropy Law and the Economic Process*. In it, based on verbal versions of the second law of thermodynamics, his basic line of reasoning argues that due to the universal nature of the second law of thermodynamics, which, in the 1882 verbalized descriptions of German physicist Hermann von Helmholtz, states that usable "free energy" (system energy available to do external work) tends to disperse or become lost in the form of "bound energy" (system internal energy unavailable to do external work), in economic systems natural resources will always tend to deplete. To clarify, in 1976, at the age of 70, Georgescu-Roegen looked back to his earlier experiences in Romania to find the roots of his dissatisfaction with traditional economics and his preoccupation with entropy and irreversible evolutionary change: [3]

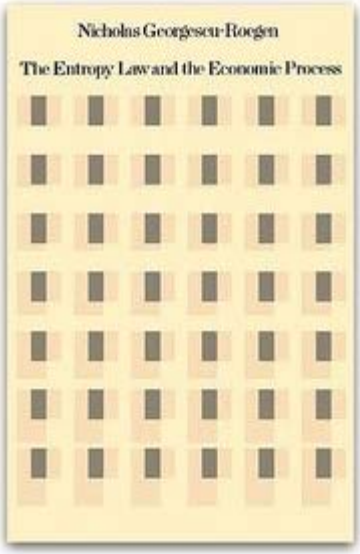

Georgescu's 1971 book *The Entropy Law and the Economic Process*, one of the most highly-cited human thermodynamics books (in spite of the fact that most its thermodynamic content is incorrect).

> "The idea that the economic process is not a mechanical analogue, but an entropic, unidirectional transformation began to turn over in my mind long ago, as I witnessed the oil wells of the Ploesti field of both World Wars' fame becoming dry one by one and as I grew aware of the Romanian peasant's struggle against the deterioration of their farming soil by continuous use and by rains as well. However, it was the new representation of a process that enabled me to crystallize my thoughts in describing for the first time the economic process as the entropic transformation of valuable natural resources (low entropy) into valueless waste (high entropy)."

In caution to the reader, in the simplicity of this theory, however, he states that: [3]

> "I may hasten to add … that this is only the material side of the process. The true product of the economic process is an immaterial flux, the enjoyment of life, whose relation with the entropic transformation of matter-energy is still wrapped in mystery."

In other words, in a modern sense, to understand the economic process as an external measure of more meaningful system internal states described via measures of 'life enjoyment", one must be able to quantify both the energy and the entropy of the various states in which a system is possible. In this view, resources such as oil and coal function as factors in the height of the activation energy to human chemical reactions occurring on substrate.

Difficulties on theory

The essential difficulty in Georgescu-Roegen's economic entropy theory is that he uses simple verbal descriptions of the second law of thermodynamics, stemming from the 1882 verbal phrases of Helmholtz, and makes unjustified

assumptions of where these verbal terms apply in human social systems. Specifically, he reasons that "free energy" refers to coal or crop soil and that "bound energy" refers to the conversion of that coal energy or food energy into the end products of human consumption, such as the energy spent in using electric appliances or as food or consumer end products as found in a used condition at garbage dumps. The difficulty here is that Georgescu-Roegen makes no connection to the Carnot cycle or Clausius' 1862 transformation integral:

$$\int \frac{dQ}{T} \geq 0$$

which is used to quantify irreversibility in the Carnot cycle. Said another way, Georgescu-Roegen never defines either his "working body" (e.g. steam body) or his "boundary" (across which heat, work, or matter may pass) to his economic process. The reader is supposedly assumed to think that the bottom boundary to the human economic system lies several miles underground, below the coal and oil deposits, and to ignore the first law of thermodynamics energy balance to the remainder of the picture.

In modern terms, boundaries to "working bodies" of human systems, i.e. interactive collections of human molecules confined to economic systems, are defined as being the the 90 percent probability regions in which a specific number of socially interactive or energetically-coupled humans are found. In this point of view, the "boundary" does not typically go several miles below ground but rather the surface of the earth, including the soils and natural resource deposits are considered as substrate or catalyst upon which human molecules react. The entropy considered by Georgescu-Roegen is defined as the internal system energy dissipated as humans act on each other, energy that does not find conversion into system external work. [4]

Objections

The use of material entropy, as seeded by Georgescu-Roegen, is generally seen as point of non-logic. Israeli physical chemist Brian Silver, in commentary on what he calls "Georgescu-Roegen's brainchild", for instance, states that "the term *material entropy* is meaningless; it has not the slightest connection with entropy". [5]

In a recent 14-page article "The Three Laws of Thermodynamics", in *Redorbit News*, a staff writer takes issue with Georgescu-Roegen's interpretation of the second law of thermodynamics (entropy law) and its relevance to the economics of production. The paper concurs with experts on thermodynamics that Georgescu-Roegen has committed a major error. Namely, Georgescu-Roegen's notion of "material entropy," which he christened as the "fourth law of thermodynamics," is unfounded. They conclude that Georgescu-Roegen's purported law, as the application of the second law to the realm of matter, is a grave conceptual blunder. [6]

The central error in Georgescu's derivation stems from the fact that the "degradation of environmental resources" is what acts as the hot body of the economic heat engine, in the thermodynamic system model, and not on the transformation content of the workers of the factory; or, conversely, if one is focusing specifically on applying the second law to the reactions between humans in a production process system, e.g. a factory or a town, environmental resources, e.g. the use of coal in the steam engine (and its later derivatives) to power the industrial revolution, is energy that goes into or acts to lower the activation energy of the various human chemical reactions of the system or society of study, e.g. accelerated reproduction or societal expansion, etc., as is evidenced by the population explosion that coincides with the start of the industrial revolution.

The error stems from the fact that the dispersion of material resources from waste disposal is not a direct analogy extrapolation of the second law view of energy dispersal; but rather the second law deals with the 'vanishing of disequilibrium,' in reactions between the human molecules of the system.

Low entropy / high entropy

Georgescu-Roegen made huge, rather blunderous, extrapolations of what he considered the terms "low entropy" and "high entropy" to mean. To cite one example: [1]

> "Low entropy is a necessary condition for a thing to have value. The relation between economic value and low entropy is of the same type as that between price and economic value."

This statement needs a huge redo, from a human chemical thermodynamics perspective, to actually make any sense.

Quotes | On

The following are quotes on Rogen:

> "There is in me a pixy-ish (or quixotic) propensity to make it even more difficult than necessary for you to believe the ideas herein. In that spirit: Paul Samuelson, the first American Nobel Prize winner in economics, called **Georgescu-Roegen** 'a scholar's scholar, an economist's economist' in an admiring foreword to a 1966 book of Roegen's that Samuelson says is 'a book to own and savor'. In my view, this just shows how **great talents can swear to nonsense** when the nonsense is framed in the 'difficult art' (Samuelson's phrase) of mathematical economics."
>
> — Julian Simon (1981), *The Ultimate Resource 2* (pg. 79) [14]

> "**Georgescu-Rogen**, in his *Entropy Law and the Economic Process* (pg. 283), points out that 'there have been sporadic suggestions that all economic value can be reduced to a common denominator of low entropy' and mentions Helm (1887) and Winiarski (1900)."
>
> — Richard Adams (1988), *The Eight Day* (pg. 94)

Quotes | By

The following are noted quotes by Georgescu-Roegen:

> "Manifold avenues **open up** up almost as soon as one begins to tackle the problem."
>
> — Nicholas Roegen (1971), *The Entropy Law and the Economic Process* (pg. 3)

> "It is physics that supplies the only clear example of evolutionary law: the second law of thermodynamics."
>
> — Nicholas Rogen (1971), *The Entropy Law and the Economic Process* [11]

> "As to the scarcity of matter in a closed system, such as the earth, the issue may, in my opinion, prove in the end more critical than that of energy."
>
> — Nicholas Roegen (1979), "Comments on the Papers by Daly and Stiglitz" (pgs. 98-99); cited by Julian Simon (1981) in *The Ultimate Resource 2* (pg. 79) [13]

> "Can the 'market mechanism' be an instrument for the intergenerational distribution of natural resources?"
>
> — Nicholas Roegen (1979), "Comments on the Papers by Daly and Stiglitz" (pg. 99) [12]

See also

â— Romanian school of physical socioeconomics

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3. Georgescu-Roegen, Nicholas. (1976). "Foreword," *Energy and Economic Myths*, (pgs. ix-xxvi), New York: Pergamon Press.
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8. Thread post (from person in Albany, New York) (23 Jul 2011) – Hmolpedia.
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11. (a) Georgescu-Roegen, Nicholas. (1971). *The Entropy Law and the Economic Process* (pgs. 128-29). Cambridge, Massachusetts: Harvard University Press.
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12. Roegen, Nicholas. (1979). "Comments on the Papers by Daly and Stiglitz", in: *Scarcity and Growth Revisited* (editor: Kerry Smith) (pgs. 95-105). Johns Hopkins.
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(b) Simon, Julian L. (1981). *The Ultimate Resource 2* (§4: Grand Theory (txt), pgs. 77-83; quote, pg. 79) (txt) . Princeton University Press, 1996.
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Further reading

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â— Beard, Thomas R. and Lozada, Gabriel A. (1999). *Economics, Entropy, and the Environment:* (ch. 5: An Economists Primer on Thermodynamics, pgs. 83-98; ch. 6: Thermodynamics and Georgescu-Roegen's Economics, pgs. 99-119). Edward Elgar Publishing.
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External links

â— Nicholas Georgescu-Roegen – Wikipedia.
â— Georgescu-Roegen, Nicholas – WorldCat Identities.

θΔics

In hmolscience, **Nicholas-Francois Canard** (1750-1833) was a French mathematician and engineer turned economist noted for []

Overview

In 1801, Canard, in his essay-turned-book *Principles of Political Economy*, gave his view that supply and demand are ontologically like contradicting physical forces. [1] American physical economics historian Philip Mirowski (2004) puts it like this: [2]

> "**Canard** wrote down an equation of forces which determined price under nonspecific circumstances. Here the sellers and buyers were accorded a single function each, which price as the shared variable; psychological need is identified as the ultimate source of each function; equilibrium is equated with the balance of forces. Unfortunately, all specification of the sequence of actions by which equilibrium is brought about is absent, in clear analogy with d'Alembert's principle in mechanics."

Canard's essay "Principles of Political Economy" arose as an attempt to refute the Physiocratic "single tax" thesis. Contrary to the Physiocrats, Canard posited a labor theory of value, specifically that all wealth arises from the application of "superfluous" labor. He identified three sources of income: income from land, income from industry and income from capital.

Echoing French economic theorist Richard Cantillon (c.1680-1734) and drawing an analogy with the circulation of fluids, Canard discussed how these flows need to be balanced to achieve equilibrium and how the forces of individual interest and competition operate to achieve this balance. He discussed how the economy can be viewed as a system of markets and discusses how equilibrium prices are determined by the balance of opposing forces of buyers and sellers.[3]

References

1. (a) Canard, Nicholas-Francois. (1801). *Principles of Political Economy, Work couronée by the National Institute* (*Principes d'Économie Politique, Ouvrage couronée par l'Institut National*). Publisher.
(b) Savoiu, Gheorghe and Iorga-Siman, Ion. (2008). "Some Relevant Econophysics' Moments of History, Definitions, Methods, Models and New Trends" (pdf), Romanian Economic and Business Review 3(3):29-41.
(c) Savoiu, Gheorghe and Andronache, Constantin. (2012). "The Potential of Econophysics for the Study of Economic Processes", in: *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (§7, pg. 94). Academic Press.
2. Mirowski, Philip. (2004). *The Effortless Economy of Science?* (pg. 287). Publisher.
3. Nicholas-Francois Canard (Wayback) – New School University.

External links

â— Nicolas-Francois Canard – Wikipedia.

θΔics

In hmolscience, **Nickolas Dorfman** (1941-) is a Russian-born American biologist, specializing in tumor immunology, noted for his 2008 *Was Mona Lisa Created by Physicochemical Reactions Alone?*, wherein he attempts to argue the the human mind cannot arise from energy and molecules alone; the following is his abstract: [1]

> "Mainstream science is going to deep into physics and chemistry limiting science to only molecules and energy and dismissing any spiritual ideas. A simple logic can clearly indicate that inanimate molecules and energy just cannot be so smart to create numerous masterpieces of human civilization."

(add discussion)

Primordial soup fairytale

The following is Dorfman's take, his bolding (four times), on what he calls the origin of life "fairy tale", which originally he said he could accept, being educated in atheistic materialism, with some reservations:

> "Once upon a time, one molecule, scudding in a primordial ocean, suddenly and **absolutely accidentally** met another cute molecule. They decided to bind to each other and scud together, and found that they acquired a new property, which gave them a better chance to survive in that rough and unfriendly primordial ocean. During the next billions of years, these molecules met many other attractive molecules (of course, *absolutely accidentally*) and combined with many of them, creating a big conglomerate of molecules. This conglomerate again *absolutely accidentally* discovered that it can create similar little baby conglomerates by simple division and that is how a primordial organic complex or protein or nucleic acid was created. They then *absolutely accidentally* found each other in the primordial ocean, combined and created a small syndicate that acquired many new and very useful properties for survival and we now call it a 'cell'."

Here, in this molecules having a better chance to survive or struggle to exist, we see the issues of the so-called "Darwin (evolution theory) meets Democritus (atomic theory) paradox, i.e. that atoms and molecules don't struggle to survive, as pointed out by Robert Pirsig.

Dorfman goes to state that the following is his objection to this argument:

> "Accidental and random combinations of molecules can neither create a car nor a human being or even a simple one-celled organism with a certain 'directing power' that can transform originally inanimate matter into numerous forms of life."

(add discussion)

Education

Dorfman competed his PhD in biology at Moscow State University in 1965 and then worked there for 11 years in the field of tumor immunology. In 1976, he immigrated to United States and continued his tumor immunology research at the National Institutes of Health in Bethesda, Maryland.

Religion

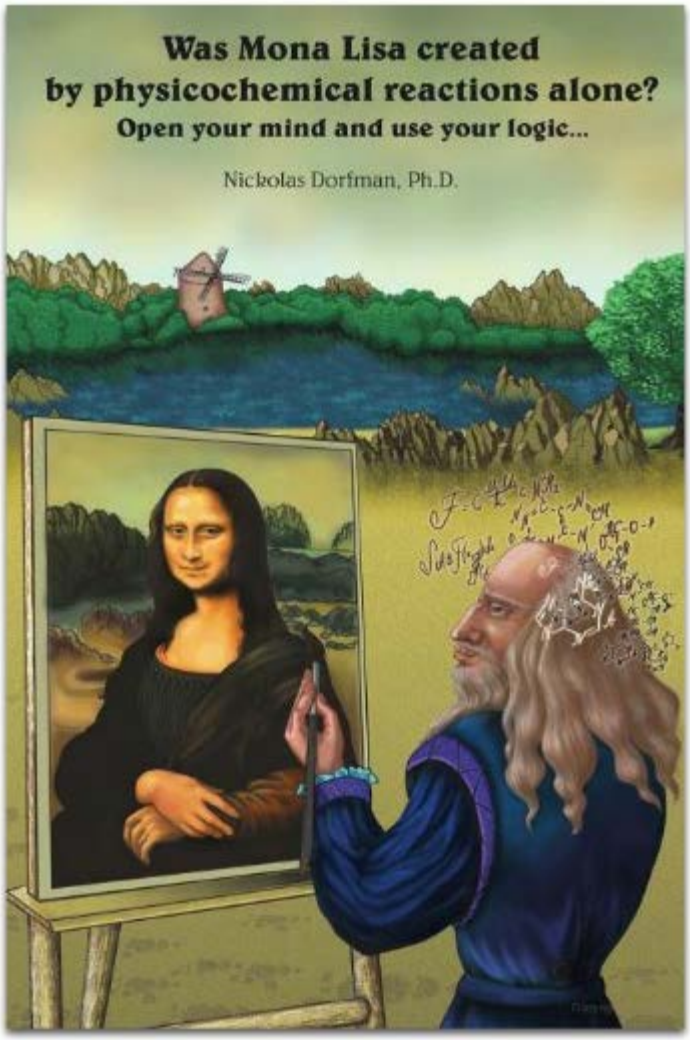

Russian artist Ekaterina Shulzhenko's sketch of **Dorfman's** premise that something beyond mere matter and energy created Leonardo Da Vinci's Mona Lisa. [1]

Dorfman states that he was raised in a strictly atheist environment, like all kids in Russia, taught a materialist view, and ingrained with the belief that there is no god and that religion is the "enemy of the people" and "poison for people's mind." Dorfman states that he turned to spirituality after he found a dead end with the following puzzle:

> "While working in the field of science, which is mostly a materialistic environment, I was trying to analyze the human mind form the viewpoint of evolution and molecules, or in other words, rejecting everything that is beyond matter and energy. This brought me to a dead end with no exit."

He states that, after learning about the abilities of blind musicians, and savant syndrome minds like Kim Peek and Daniel Tammet, that he conceded that there might be some type of intelligence in the universe "beyond matter and energy".

Quotes

The following are noted quotes:

> "Judge a man by his questions rather than by his answers."
>
> — Voltaire (c.1780), front matter quote

References

1. Dorfman, Nikolas. (2008). *Was Mona Lisa Created by Physicochemical Reactions Alone? Open Your Mind and Use Your Logic*. iUniverse.

θΔics

In existographies, **Nicolaas Hartsoeker** (1656-1715) (IQ:170|#340) was a Dutch mathematician and physicist, noted for his 1678 description of sperm, in a letter to Christiaan Huygens, which he postulated was a little human, therein originating the homunculus theory, and for his c.1694 invention of a screw-barrel simple microscope.

Overview

In 1678, Hartsoeker, in a letter to Christiaan Huygens, stated that he had seen worm-like things (aka sperm) in human semen, after which he devised the "homunculus" theory, according to which each sperm was said to contain a little human, conceptualized as follows:

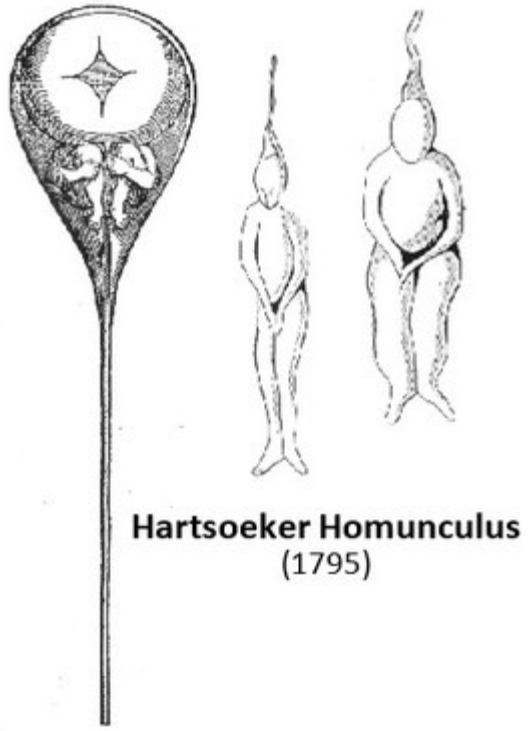

that would grow and hatch inside of the woman's egg. [1]

Hartsoeker, of note, quarreled with, among others, Huygens, Newton, Leibniz, and Leeuwenhoek (his mentor). (Ñº)

Quotes | On

The following are quotes on Hartsoeker:

> "Let them say whether it is untrue that man is originally nothing more than a worm, which becomes a man just as a caterpillar becomes a butterfly. The most curious authors, e.g. Boerhaave, have told us how to go about seeing this animalcule. All curious observers, like **Hartsoeker**, have seen it in the man's semen and not in the woman's; only fools have been hesitant."
>
> — Julien la Mettrie (1747), *Man: a Machine* (pgs. 35-36) [1]

References

1. La Mettrie, Julien. (1751). *Machine Man and Other Writings: Treatise on the Soul, Man as Plant, The System of Epicurus, Anti-Seneca or the Sovereign Good, Preliminary Discourse* (translator and editor: Ann Thomson) (pgs. 25-36). Cambridge University Press, 1996.

External links

â— Nicolaas Hartsoeker – Wikipedia.

θΔics

In existographies, **Nicolas Bergier** (1718-1790) was a French Catholic theologian, noted for being the chief apologist for the church in their attempt to refute the anonymous publications of Baron d'Holbach.

Overview

In 1768, Bergier probed the Holbach coterie to see if they would rather "retract their thoughts" when faced with the possibility of tribunal punishment; Diderot recounts this incident as follows:

> "I wanted to be burned at any price. Never was so important a question treated more gaily, and with less pedantry, for we laughed like children. Naigeon, Suard (Q)(Q), the Baron and this great pumpkin **Bergier** turned their eyes away from each other on this question of sacrificing one's life in witness of the truth."
>
> — Denis Diderot (1768), view defended, by Diderot, at Holbach's Coterie, following Nicolas Berger's query on whether or not a philosopher should retract his thoughts when faced by punishment by a tribunal [1]

(add)

References

1. Kors, Alan C. (2015). *D'Holbach's Coterie: an Enlightenment in Paris* (Bergier, 6+ pgs, burned, pgs. 115-16). Princeton University Press.

Further reading

● Bergier, Nicolas. (1758). *Refutation of Christianity Revealed* (*Apologie de la religion chretienne*). Publisher.
● Bergier, Nicolas. (1771). *Examen du materialism: Refutation du System de la Nature*. Publisher.

External links

● Nicolas-Sylvestre Berger – Wikipedia.

θΔics

In existographies, **Nicolas Boulanger** (1722-1759) (RMS:25) was French mathematician, civil engineer, philosopher, and ancient and oriental languages scholar noted for []

Overview

Boulanger's collected works amount to 10-volumes. Many of his works seem to have been published posthumously. Also, of note, Baron d'Holbach, supposedly, used Boulanger's name as a pseudonym for some of his own work in religio-mythology.

In c.1758, Boulanger, in his "The Christian Mythology", the fourth chapter of his *Christianity Unveiled*, explicitly defined Christianity as a "mythology" (see: Christian mythology); the opening section of which is as follows: [3]

> "God, by an inconceivable act of his omnipotence, created the universe out of nothing [*Ex nihilo nihil fit*, was considered as an axiom by ancient philosophers. The creation, as admitted by Christians of the present day, *i.e.* the education [*induction*] *of all thing from nothing*, is a theological invention not indeed of very remote date. The word *Barah*, which is used in Genesis, signifies to *tempest*, *arrange*, to *dispose matter already existing*]. He made the earth for the residence of man, whom he created in his own image. Scarcely had this man, the prime object of the labours of the almighty, seen the light, when his creator set a snare for him, into which god undoubtedly knew that he *must* fall. A serpent which speaks, seduces a woman, who is no way surprised at this phenomenon. Being persuaded by the serpent, she solicits her husband to eat of a fruit forbidden by god himself. Adam, the father of the human race, by this light fault draws upon himself and his innocent posterity innumerable evils, which are followed but not terminated by death. By the offense of only one man the whole human race incurs the wrath of god; and they are at length punished for involuntary faults with an universal deluge. God repents haying peopled the earth, and he finds it easier to drown and destroy the human race, than to change their hearts."

This was later reprinted in Baron d'Holbach's *Critical History of Jesus Christ*, as an appendix. [4]

In c.1758, Boulanger, together with Baron d'Holbach, penned *Research on the Origin of Despotism and Superstitions, Posthumous work of Mr. Bidpec*. [1]

In c.1758, Boulanger penned *Christianity Unveiled: Review of the Principles and Effects of the Christian Religion*. [1]

Quotes | By

The following are quotes by Boulanger:

> "Let us not despair that truth will one day force its way even to thrones."
>
> — Nicolas Boulanger (c.1758), *Publication*; cited by Baron d'Holbach in *Ecce Homo!* (title page) [2]

> "All cults, hydraulic in origin, were commemorative rehearsals of the one catastrophe which weighed heavily upon man."
>
> — Nicolas Boulanger (c.1758) (Ñº)

References

1. Nicolas-Antoine Boulanger (French → English) – Wikipedia.
2. Holbach, Baron. (c.1770). *Ecce Homo! A Critical Enquiry into the History of Jesus Christ: being a Rational Analysis of the Gospels*. D.I. Eaton, 1813.

3. (a) Boulanger, Nicholas. (1761). *Christianity Unveiled: Being an Examination of the Principles and Effects of the Christian Religion* (*Le christianisme devoile, ou examination of principes et des effets de la religion chrétienne*) (§:The Christian Mythology). Publisher.
(b) Christianity Unveiled – Wikipedia.
4. d'Holbach, Baron. (1770). *Ecce Homo [Behold the Man]: a Critical Inquiry into the History of Jesus of Nazareth, Being a Rational Analysis of the Gospels* [*Critical History of Jesus Christ: a Rational Analysis of the Gospels*] (*Histoire critique de Jésus-Christ, ou Analyse raisonnée des Évangiles*) (Appendix I: The Christian Mythology, pgs. 325-28) (Gut)(txt). Gordon Press, 1977.

External links

â— Nicolas Antoine Boulanger – Wikipedia.

θΔics

In existographies, **Nicolas Chamfort** (1741-1794) (IQ:155|#603) (Cattell 1000:958) (RGM:565|1,500+) was a French writer, epigramist, and aphorist, noted for []

Quotes | On

The following are quotes on Chamfort:

> "The aphorism as a deliberately cultivated literary form, as distinct from something said briefly, did not appear in European literature until the Renaissance, when the aphoristic writings of Erasmus, Michelangelo, Paracelsus and Bacon, but above all those of the line of French philosophers from Montaigne to **Chamfort**, bestowed on it the distinctive character by which we now recognize it."
>
> — Reginald Hollingdale (1990), "Introduction" to Georg Lichtenberg's *The Waste Books* (1799) [1]

Quotes | By

The following are quotes by Chamfort:

> "A witty woman once told me something which may well be the genuine secret of her sex: that in choosing a lover each one of her kind takes more account of how other women regard him than of how she regards him herself."
>
> — Nicholas Chamfort (c.1790) (Ñº)

> "The art of the parenthesis is one of the great secrets of eloquence in society."
>
> — Nicholas Chamfort (c.1790) (Ñº)

> "Petty souls are more susceptible to ambition than great ones, just as straw or thatched cottages burn more easily than palaces."
>
> — Nicholas Chamfort (c.1790) (Ñº)

References

1. Lichtenberg, Georg. (1799). *The Waste Books* (translation and Introduction: Reginald Hollingdale) (pg. x). Penguin, 1990.

External links

â— Nicholas Chamfort – Wikipedia.

θΔics

In existographies, **Nicolas Freret** (1688-1749) (FA:75) was a French scholar and religio-mythology scholar, noted for []

Overview

In c.1725, Freret published *Letter of Thrasybulus to Leucippus*, which is stylized as an ancient Greco-Roman document from one friend to another, namely a fictional Thrasybulus to Leucippus, offering guidance in protecting him from the temptation of religion through rational comparison of religious belief. [1]

In 1768, Jacques Naigeon was referring to *Letter of Thrasybulus to Leucippus*, for some reason, in reference to Baron Holbach's *Letter to Eugenia*. [2]

References

1. Freret, Nicolas. (c.1725). *Letter of Thrasybulus to Leucippus: a Safeguard Against Religion* (*Lettre de Thrasibule a Leucippe*) (abs). Publisher.
2. Holbach, Baron. (1768). *Letters to Eugenia: a Preservative Against Religious Prejudices* (Preface: Jacques Naigeon) (translator: Anthony Middleton) (Ñº). Mendum, 1870.

External links

â— Nicolas Freret – Wikipedia.

θΔics

In existographies, **Nicolas Lemery** (1645-1715) (IQ:#|#) (Faber 114:10) (GCE:#) was a French chemist, noted for []. [1]

Organic | Inorganic

In 1675, Lemery, in his *Course on Chemistry* (*Cours de chymi*), supposedly (Thorpe, 1874), was the first to propose the division of chemistry into "organic chemistry" (animal/vegetable kingdom) and "inorganic chemistry" (mineral kingdom).

Acid-Base

Lemery is noted for his so-called "geometric atomism" (Farber, 1961), wherein to explain neutralization that takes place when an acid and a base react, he conceived, based on contemporary atomism and Rene Descartes, a geometrically-locking acid-base model of corpuscles, according to which the barb or spike of an acid corpuscle fit into the grove of a base or alkali, such as below.

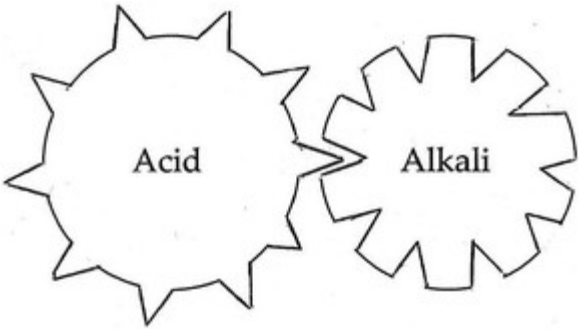

This has been called the doctrine of "figured particles", according to which the fitting of the two yielded a less abrasive product. [1]

This was one of the earliest conceptions of "molecule" (Ñº) or two corpuscles joined, and a remote precursor to the chemical bond (see: history of the chemical bond).

Weight balancing

Lemery, in his lectures, discussed his preparations in terms of weights, usually in the manner of a cookbook, but frequently gives explanation of gains and losses in weights, but mostly as a "sop to the curious" done in an "offhand and almost flippant concern" (Farber, 1961). He is classified, in this regard, as a transitional figure in the theory of atomic balancing of chemical equations.

Family

Lemery was the father of matter of heat theory chemist and physician Louis Lemery.

Quotes | On

The following are quotes on Lemery:

> "The metals sympathized with the planets and with the principle parts of the human body. An 'alkahest, which no one had ever seen dissolved everything. The greatest absurdities were revered by the grace of a mysterious obscurity with which they were enveloped or entrenched against reason. One took pride in speaking only in a barbaric language resembling the sacred languages of the ancient theology of Egypt, understood by the priests alone, and apparently devoid of sense. Lemert was the first who dissipated the natural or artificial shadows of chemistry; who reduced it to more clear and simple ideas; who abolished the useless barbarism of its language; who only promised from it what was within its power, and that which he knew it could accomplish."

— Bernard Fontenelle (c.1715), “Eulogy of Lemery” [1]

“Chemistry occupies such an extensive sphere, its operations are so widely distributed, that it has been found desirable, for the greater convenience of study, to subdivide the matters upon which it treats. It was therefore agreed, as suggested by **Lemery** [c.1675], nearly two hundred years ago, to divide the subject into the two branches of ‘inorganic’ and ‘organic’ chemistry. Inorganic chemistry was formerly defined to be the chemistry of the mineral kingdom, in contradistinction to organic chemistry, which was held to be the chemistry of the animal and vegetable kingdom, since most of the subjects included under this division were of animal or vegetable origin.”

— Thomas Thorpe (1874), *A Manual of Inorganic Chemistry* (pgs. 18-19)

“**Lemery** explained chemical and physical properties by shape. Acids had sharp spikes on their atoms, accounting for the pricking sensation that exert on the skin. Alkalis were highly porous bodies into which the spikes of the acids penetrated and were broken or blunted in producing neutral salts.”

— Henry Leicester (1971), *The Historical Background of Chemistry*

Quotes | By

The following are quotes by Lemery:

“Chemistry is the art which teaches the separation of different substances encountered in a mixture.”

— Nicolas Lemery (1675), *Course on Chemistry* [1]

References

1. (a) Fontenelle, Bernard. (c.1715). “Eulogy of Lemery” (translator: R.P. Multhauf), read at Academy of Sciences.
(b) Farber, Eduard. (1961). *Great Chemists* (§10:149-62). Interscience Publishers.

External links

â— Nicolas Lemery – Wikipedia.

θΔics

In existographies, **Nicolas Malebranche** (1638-1715) (IQ:175|#252) (Cattell 1000:295) was a French natural philosopher noted for his extension of the philosophical views of Rene Descartes.

Overview

In 1664, Malebranche chanced to read René Descartes' *Traité del l'Homme*, which moved him so deeply that (it is said) he was repeatedly compelled by palpitations of the heart to lay aside his reading, and was from that hour consecrated to Cartesian philosophy.

Descartes and Malebranche were said to have inspired the development of physiocracy. [1]

In c. 1706, in commentary on Isaac Newton's *Opticks*, Malebranche stated: "though Newton is no physicist, his book is very interesting". [2]

Malebranche summarized the Cartesian soul model, which he seems to have adopted as his own, as follows: [3]

> "Dogs, cats, and the other animals, have no intelligence, no soul in the sense in which thus concept is usually understood. They eat without pleasure, cry without pain, grow without knowing this. They have no desires and no knowledge."

His end was said to have been hastened by a metaphysical argument into which he had been drawn in the course of an interview with George Berkeley.

Quotes | On

The following are quotes on Malebranche:

> "Those who wish to form an idea of the shackles imposed by theology on the genius of philosophers born under the 'Christian dispensation', let them read the **metaphysical romances** of Leibniz, Descartes, Malebranche, Cudworth, etc., and coolly examine the **ingenious but rhapsodically** systems entitled: the pre-established harmony of occasional causes; physical pre-motion, etc."
>
> — Baron d'Holbach (1770), *The System of Nature* (pgs. 51-52)

Quotes | By

The following are quotes by Malebranche:

> "It is shameful that intelligent men and philosophers, who are obliged to search after and defend the truth for all kinds of reasons, talk without knowing what they say and are satisfied with what they do not understand."
>
> — Nicolas Malebranche (c.1677), *The Search After Truth*; cited by Jean Meslier (1729) in *The Testament* (pg. 389)

References

1. Nicholas Malebranche – NNDB.com.
2. Gleick, James. (2003). *Isaac Newton* (pg. 166). Vintage Books.
3. Wigner, Eugene P. (2001). *Philosophical Reflections and Syntheses* (pg. 565). Springer.

External links

â— Nicolas Malebranche – Wikipedia.

θΔics

In human physics, **Nicolas Rashevsky** (1899-1972) was a Russian-born American theoretical biologist and sociologist noted for his 1935 article turned chapter "Mathematical Theory of Human Relations", in which, building on the physical biology work of American physical chemist Alfred Lotka, he attempts to derive mathematical equations for things such as 'desire' and 'will', in terms of concepts such as intensities and physical forces. In 1954, Rashevsky introduced the term "relational biology" for a the study of a type of non-reductionist version of biology.

Education

Rashevsky competed a doctorate in theoretical physics 'while barely out of his teens' (circa 1920) and soon became a regular contributor to international physic journals like the *Zeitschrift fur Physik*, publishing scores of articles on thermodynamics, relativity, and quantum theory.

In the late 1920s, he was working on the thermodynamics of liquid droplets at the research laboratories of the Westinghouse Corporation in Pittsburgh, Pennsylvania. He found that such droplets became unstable past a certain critical size, i.e. when the surface tension became too weak to offset diffusional and other forces impinging on the droplets, and would then spontaneously divide into two or more smaller droplets, something along the lines of a bifurcation, surface law, or Dunbar number type phenomena.

Rashevsky cell division anecdote

In a noted anecdote recounted to his graduate student Robert Rosen, sometime during his thermodynamics of liquid droplet division work, Rashevsky met a biologist from the University of Pittsburgh at some social occasion. In the course of the casual discussion, he asked the biologist whether the thermodynamic mechanisms on which he was working on was the way biological cells divide. Rashevsky was told:

> (1) Nobody knew how biological cells divided.
> (2) Nobody *could* know how biological cells divided, because this was biology.

Rashevsky, who was more of an 'ideal' physicist than a 'contemporary' one, found it outrageous that a material phenomenon (the division of biological cells) should so casually be put outside the pale of physics. This chance event turned Rashevsky to the study of biology and to establishing the material basis of basic biological phenomena in general. Rashevsky mission following this encounter, in his own words, was to completed: [2]

> "The building up of a systematic mathematical biology, similar in its structure and aims to mathematical physics."

This seems to have been the start of Rashevsky's addendum of self-education to solution of this problem

Students

Some of Rashevsky's PhD students, at the University of Chicago, include: Robert Rosen and Anatol Rapoport. In 1948, Rapoport took over Rashevsky's course in mathematical biology, so that Rashevsky could teach mathematical sociology instead.

References

1. Rashevsky, Nicolas. (1935). "Outline of a Mathematical Theory of Human Relations" (abs), *Philosophy of Science*, 2(4):413-. Oct.
(b) Mathematical Theory of Human Relations (92-pg chapter) – Library.du.ac.in.
2. Rosen, Robert. (2005). *Life Itself: A Comprehensive Inquiry into the Nature, Origin, and Fabrication of Life* (pg.

110). Columbia University Press.

External links

â— Nicolas Rashevsky – Wikipedia.

θΔics

In psychological thermodynamics, **Nicolas von Grot** (1852-1899) was a Russian psychologist who, according to Swiss psychiatrist Carl Jung, was the first to have defined the concept of psychic energy. [1] Specifically, in his 1898 article "The Terms of the Soul and the Psychic Energy in the Psychology" von Grot stated that: [2]

> "The concept of psychic energy is as much justified in science as that of physical energy, and psychic energy has just as many quantitative measurements and different forms as has physical energy."

In seems that, von Grot maintained the view that there is an interchange of energy between material process and conscious process and propounded the hypothesis that the most immediate correlate of conscious process is not nervous matter, but ether. [3]

Psychological energy

In terms of principles, von Grot outlined three points about psychic energy: [4]

> (a) Psychic energies possess quantity and mass, just like the physical energies.
> (b) As different forms of psychic work and psychic potentiality, psychic energies can be transformed into one another.
> (c) Psychic energies can be converted into psychical energies and vice versa by means of physiological processes.

In defending his views on psychic energy, he states that: "the burden of proof falls on those who deny psychic energy, not on those who acknowledge it."

References

1. Bishop, Paul. (1999). *Jung in Contexts*. (pg. xxiii). Routledge.
2. Von Grot, Nicolas. (1898). "Die Begriffe der Seele und der Psychischen Energie in der Psychologie" (The Terms of the Soul and the Psychic Energy in the Psychology), *Archiv fur systematische Philosophie*, IV.
3. Anon. (1898). *Mind*, Vol. 7, (pg. 591). B. Blackwell.
4. Jung, Carl. (1928). "On Psychic Energy" (pg. 8), in *On the Nature of the Psyche* (1960). Princeton University Press.

θΔics

In existographies, **Nicolaus Copernicus** (1473-1543) (IQ:185|#56) (Cattell 1000:341) [RGM:14|1,500+] (Murray 4000:5|A) (Gottlieb 1000:18) [Kanowitz 50:15] (GPE:35) (GAE:1) [CR:136], or "Nicolao Copernico" (Latin), was a Polish mathematician, astronomer, and physician, aka the "next Ptolemy" (Erasmus Reinhold, 1542), noted for his 1514 forty-page booklet “Little Commentary” (Commentariolus), in which he began to lay out the basics of his heliocentric model of the universe, as opposed to the older geocentric model of the universe, eventually publishing the finalized version as the 1543 *On the Revolution of the Heavenly Spheres*, the “first book in nearly 1,400-years to rival Ptolemy’s *Almagest*” (Repcheck, 2007), which introduced the revolutionary idea to the world that the “earth moves” or that "the earth is moving and the stars are at rest" (Anon, 1542), a view opposed to that of the older 350BC physics model of Aristotle that the earth is the center of the universe and stationary. This famous publication is said to mark the start of the scientific revolution and later the various science-religion debates.

Genius | Succession

See main: Greatest astronomer ever

The following is the succession of astronomical genius:

→ Aristotle

→ Ptolemy

→ Al-Battani

→ Regiomontanus

→ **Copernicus**

→ Brahe

→ Kepler

→ Galileo

→ Newton

In this mix, we note that Galileo, in discussion with Kepler, called Copernicus "the master" who dared to take the first step.

Rotation | Proof

Copernicus' assertion that the earth rotates, on its axis, was not proved until 1851 when Jean Foucault set up his famous pendulum (Q), which showed that when the pendulum circled clockwise, it returned

to its original spot after twenty-four hours.

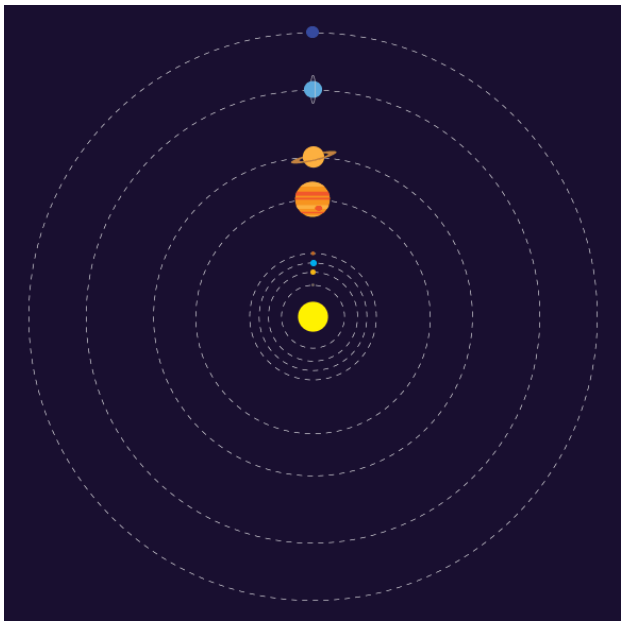

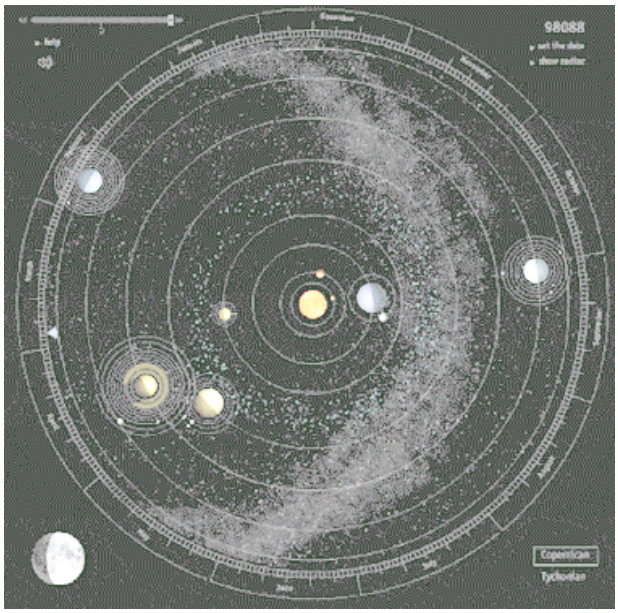

Two animations of the **Copernican model** of the world.

Overview

In c.1514, Copernicus, in his *Commentariolus* ("Little Commentary"), a short, hand-written, anonymous, untitled, non-technical manuscript, listed seven assumptions or axioms; the main revolutionary three of which are as follows: [4]

> 1. The center of the earth is NOT the center of the universe, but only of gravity and of the lunar sphere (meaning the moon revolves around the earth).
> 2. All the spheres revolve about the sun as their midpoint, and therefore the sun is the center of the universe.
> 3. The earth performs a complete rotation on its fixed poles in a daily rotation.

Copernicus, following these axioms, commented:

> "I have thought it well, for the sake of brevity, to omit from this sketch the mathematical demonstrations, reserving these for my larger work."

This larger work, *On the Revolution of the Heavenly Spheres*, would not be competed for another two-plus decades.

Luther | Melanchthon

In 1540, Martin Luther (1483-1543), as paraphrase by Ernst Haeckel (1899), said the following about Copernicus and his theory: [2]

> "I reject as folly the [supposed] discovery of **Copernicus**, because in the Bible 'Joshua bade the sun, not the earth, stand still'."

Luther, supposedly, also said the following about Copernicus:

> "Copernicus is a fool [who] wants to turn the whole art of astronomy upside down!"

Likewise, Philipp Melanchthon (1497-1560), an the younger associate of Luther, described Copernicus' heliocentric

theory as an **"old joke"** (see: crackpot), implying that it was a superfluous revival of a frivolous circa 250BC suggestion by Aristarchus. Moreover, upon reading the Rheticus' *First Account* (*Narratio Prima*), the first condensed summary of Copernicus' theory, Melanchthon commented: [3]

> "[Some think it] a distinguished achievement to construct such a **crazy thing** as that Prussian astronomer who moves the earth and fixes the sun. Verily, wise rulers should tame the unrestraint of men's minds."

(add)

IQ | Genius ranking

In genius studies, it is frequently reported that, in the early decade of the invention of the IQ scale (1916 to 1926), the IQ of Francis Galton was calculated to be twice that of Copernicus; this is summarized as follows:

> "The American hereditarian Lewis Terman, the man most responsible for instituting IQ tests in America, retrospectively calculated Gallon's IQ at above 200, but accorded only 135 to Darwin and a mere 100-110 to **Copernicus** (see pp. 213-218 on this ludicrous incident in the history of mental testing). Darwin, who approached hereditarian arguments with strong suspicion, wrote after reading *Hereditary Genius*: 'You have made a convert of an opponent in one sense, for I have always maintained that, excepting fools, men did not differ much in intellect, only in zeal and hard work' (in Galton, 1909, p. 290). Galton responded: 'The rejoinder that might be made to his remark about hard work, is that character, including the aptitude for work, is heritable like every other faculty'."
>
> — Stephen Gould (2006), *The Mismeasure of Man* [6]

Gould elaborates in this in more detail (see: Cox IQ); the current (Jun 2017) rankings for the three are as follows:

- **Nicolaus Copernicus** (1473-1543) (IQ:185|#58) [RGM:21|1,260+] (Cattell 1000:341)
- **Charles Darwin** (1809-1882) (IQ:180|#104) [RGM:13|1,260+] (Cattell 1000:116)
- **Francis Galton** (1822-1911) (IQ:145|#472) [RGM:325|1,260+] (Cattell 1000:N/A)

Moreover, it is difficult to envisage the future ranking Galton as a top 500 genius, at all.

Reaction end

See also: Last words

On 24 May 1543, Copernicus ceased to move, for the last time; his last day is recounted by Tiedemann Giese to Georg Rheticus as follows:

> "Copernicus death was caused by a hemorrhage and subsequent paralysis of the right side on 24 May, his memory and mental alertness having been lost many days before. He saw his treatise only at his last breath on his dying day."

(add)

Quotes | On

The following are quotes on Copernicus:

> "So large is the number of fools."
>
> — Galileo (1596), note to Kepler on his refrain from publishing on Copernicus

> "Of all discoveries and opinions, none may have exerted a greater effect on the human spirit than the doctrine of **Copernicus**. The world had scarcely become known as round and complete in itself when it was asked to waive the tremendous privilege of being the center of the universe. Never, perhaps, was a greater demand made on mankind—for by this admission so many things vanished in mist and smoke! What became of Eden, our world of innocence, piety and poetry; the testimony of the senses; the conviction of a poetic-religious faith? No wonder his contemporaries did not wish to let all this go and offered every possible resistance to a doctrine which in its converts authorized and demanded a freedom of view and greatness of thought so far unknown, indeed not even dreamed of."
>
> — Johann Goethe (1808) [4]

> "**Copernicus**' book [1543] was not removed from the Index of Forbidden Books for more than two-hundred years [1835]."
>
> — Jack Repcheck (2007), *Copernicus' Secret* (pg. 194)

A 2005 facial reconstruction of Copernicus, from his supposed skeletal remains. (Q)

Quotes | By

The following are quotes by Copernicus:

> "When I attribute certain motions to the terrestrial globe, they will immediately shout to have me and my opinion hooted off the stage. Therefore, when I weighted these things in my mind, the scorn which I had to fear on account of the newness and absurdity of my opinion [that the earth moves] almost drove me to abandon a work already undertaken. In fact, I kept [the manuscript] hidden among my things."
>
> — Nicholas Copernicus (c.1540), a reference, supposedly, to the earlier work of al-Zarqali and al-Battani [5]

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(b) Repcheck, Jack. (2007). *Copernicus' Secret: How the Scientific Revolution Began* (pg. 10). Simon & Schuster.
(c) Saleh, Abeer. (2015). *One Giant Step for Mankind: One Verse at a Time* (pg. 57). Cedar Graphics.

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- Nicolaus Copernicus – Wikipedia.

θΔics

In hmolscience, **Nidhal Guessoum** (1960-) (DN:1) is an Algerian-born United Arab Emirate astrophysicist noted for his 2010-present pro-science position in respect to reconciliation of Islamic faith and modern science, e.g. evolution theory.

Religion | Science

Guessoum is an observant Muslim, who doesn't believe in miracles, e.g. considering stories such as Muhammad's night journey on the flying horse to be "spiritual experience"; believes in evolution, e.g. when queries about the story of Adam and Eve, i.e. the Quranic version of the clay creation myth, stated that he sees theses as metaphorical, allowing for "flexible" interpretation, in a way that evolution fits into the description and he objects to the anti-evolution tactics of people such as Turkish creationist Harum Yahya.

Golden age | Islamic scientists

The four big scientific figures in Islam's golden age, according to Algerian-born astrophysicist Nidhal Guessoum (2010), are: al-Khwarizmi, inventor of algebra and coiner of "algorithm", Alhazen (Ibn al-Haytham), Avicenna (Ibn Sina), and Abu al-Biruni, who exchanged many letters with the former; Averroes (Ibn Rushd) is also tagged in this group as a related universal scholar. [1]

Education

Guessoum completed his BS in theoretical physics at the University of Science and Technology of Algers, Algeria, in 1982, and his MS and PhD (1988) at the University of California at San Diego, the latter with a dissertation on "Thermonuclear Reactions of Light Nuclei in Astrophysical Plasmas". Presently, he is a professor of astrophysics at the American University of Sharjah, United Arab Emirates.

Quotes

The following are representative quotes:

> "I don't think science can answer questions about design and purpose."
>
> — Nidhal Guessoum (2010), "Response to question on design in the universe, creation of stars, and life, as an astrophysicist" [1]

See also

- Mirza Beg | Beg-Thims dialogue
- Mehdi Bazargan

References

1. Guessoum, Nidhal. (2010). "Interview", in: *Atoms and Eden* (§16:215-28; Al-Biruni, pg. 217). Oxford University Press.

Further reading

- Guessoum, Nidhal. (2011). *Islam's Quantum Questions: Reconciling Muslim Tradition and Modern Science* (abs) (thermodynamics, 3+ pgs). I.B. Tauris.
- Guessoum, Nidhal. (2012). "Does Islam Forbid Even Studying Evolution?" (Q), *Huffington Post*, Jan 4.

External links

- Nidhal Guessoum – Wikipedia.
- Nidhal Guessoum (faculty) – American University of Sharjah.

θΔics

In existographies, **Niels Bohr** (1885-1962) (IQ:180|#90) [RGM:47|1,500+] (LGS:1) (CR:76) was a Danish physicist noted for his 1913 Bohr model of the atom; for work in radiation thermodynamics; for his work on the exchange force model of bonding; and for his view that the living state is not reducible to the non-living state (1958).

Chemistry

In chemistry, in 1913 Bohr developed what has come to be known as the Bohr model of the atom, which depicts the atom with a small positively charged nucleus, surrounded by circular orbits of negatively charged electrons, which jump up in orbital position by the absorption of a quantum of electromagnetic energy (light or photon) and jump down in orbital position with the release of a quantum amount of electromagnetic energy. [4] This seems to be from where the notion of the energy level originated.

Complementarity principle | Human experiences

In 1958, Bohr, in his *Atomic Physics and Human Knowledge*, according to Aharon Katchalsky (1970), attempted to show that his principle of complementarity, of atomic physics, could serve as a basis for international complementary relations between contradictory cultures. [9]

Bohr, according to Bruce Lindsay (1983), applied his complementarity principle of quantum mechanics to domain of human experiences, the complementary aspects of love and justice, specifically. [8]

In regards to the repercussion of quantum mechanics, namely his complementarity principle (1927), applied to animate nature, Bohr reasoned that the living state would be irreducible to that of the non-living state; as explained by Howard Pattee: [2]

> "Bohr (1958) often speculated that the complementarity principle would prevent simultaneous physical and biological description, and that the living state should be regarded as irreducible both in definition as well as observation."

In his 1961 essay "Physical Models and Living Organisms," Bohr stated the following: [5]

> "Thus, there appears to be no reason to expect any inherent limitation of the application of elementary physical and chemical concepts to the analysis of biological phenomena. Yet, the characteristic properties of living organisms, which have resulted from the whole history of organic evolution, reveal potentialities of immensely complicated material systems, which have no parallel in the comparatively simple phenomena studied under reproducible experimental conditions."

See 2012 discussion on this quote. [6]

Life | Will | Purpose

Bohr, in his 1930s lectures on physics and biology, gives a puerile view in an attempt to find a solution between vitalism and mechanism, in respect to both will, life, and purpose; the following are examples:

> “The very existence of ‘life’ must in biology be considered as an elementary fact, just as in atomic physics the existence of the quantum of action has to be taken as a basic fact that cannot be derived from ordinary mechanical physics.”
>
> — Niels Bohr (1932), “Light and Life” (pg. 11)

> "The freedom of the will is considered as a feature of conscious life which corresponds to functions of the organism that not only evade a causal mechanical description but resist even a physical analysis carried to the extent required for an ambiguous application of the statistical laws of atomic mechanics."
>
> — Niels Bohr (1932), "Light and Life" (pg. 11)

> "The existence of life itself should be considered, both in regards its definition and observation, as a basic postulate of biology, not susceptible of further analysis, in the same way as the existence of the quantum of action, together with the ultimate atomicity of matter, forms the elementary basis of atomic physics."
>
> — Niels Bohr (1937), "Biology and Atomic Physics" (pg. 21) [10]

> "The lesson with respect to the role which the tools of observation play in defining the elementary physical concepts gives a due to logical application of notions like 'purposiveness' foreign to physics, but lending themselves so readily to the description of organic phenomena. Indeed, on this background it is evident that the attitudes termed mechanistic and finalistic do not present contradictory views on biological problems, but rather stress the mutually exclusive character of observational conditions equally indispensable in our search for an ever richer description of life."
>
> — Niels Bohr (1957), "Physical Science and the Problem of Life" (pg. 100) [10]

He concludes, in a basic copout sense, that "such a view is equally removed from the extreme doctrines of mechanism and vitalism" and "it rejects as irrational all such attempts at introducing some kind of special biological laws inconsistent with well-established physical and chemical regularities". Bohr, of note, states that he gives these lectures with "temerity" mixed with "great hesitation".

Students

One of Bohr's most-noted students was Werner Heisenberg who commented in 1973 retrospect: [3]

> "When I entered **Neils Bohr**'s institute in Copenhagen in 1924, the first thing Bohr demanded was that I should read the book of Gibbs on thermodynamics. And he added that Gibbs had been the only physicist who really understood statistical thermodynamics."

English physicist C.G. Darwin also spent a term working with Bohr in Copenhagen, during the time when the uncertainty principle and the 'spinning electron' were discovered. Russian physicist Lev Landau was also said to have been a protégé of Bohr. Linus Pauling also studied under Bohr.

Human physics

In human physics, the philosophy of Bohr was used in the development of Czechoslovakian physicist Reinhold Furth's 1950s notions that statistical mechanics and crystallography should be employed by sociology students. [4]

Quotes | By

The following are related quotes:

> "How wonderful that we have met with paradox. Now we have some hope of making progress."
>
> — Niels Bohr (c.1930), stated, supposedly, during a debate about quantum mechanics [7]

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(b) Bohr, Niels. (1937). "Biology and Atomic Physics", Publisher.
(c) Bohr, Niels. (1958). *Atomic Physics and Human Knowledge*. Dover, 2010.

External links

â— Niels Bohr – Wikipedia.

θΔics

In hmolscience, **Niels Lind** (1930-) is a Danish-born Canadian civil and structural engineer noted for []

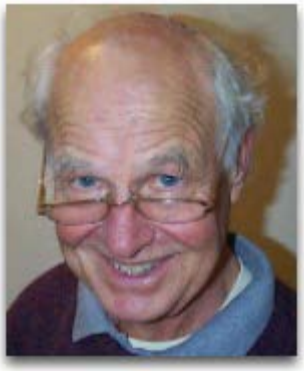

Overview

In 1975, Lind, in his conference presentation "Economic Activities Under Public Regulation: A Thermodynamic Analogy", developed an outline of a thermodynamic economic model straight from American physicist Herbert Callen's 1960 *Thermodynamics*—with citation of Ilya Prigogine (*Introduction to the Thermodynamics of Irreversible Processes*) and Aharon Katchalsky (*Nonequilibrium Thermodynamics of Biophysics*)—along the way mentioning P.O. Pedersen's *circa* 1925 electrical network model of an economy and O.I. Franksen's 1969 two-terminal electrical and thermodynamic model of an economy. [1]

Education

Lind completed his MS in civil and structural engineering in 1953 at the Technical University of Denmark and his PhD in theoretical and applied mechanics in 1959 at the University of Illinois. Lind, currently, is professor emeritus of civil and structural engineering department of the University of Waterloo and an associate of the Institute of Risk Research, Canada.

See also

- Wayne Angel

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External links

- Niels Lind (publications) – Institute for Risk Research, Canada.
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- Niels Lind (faculty) – University of Waterloo, Canada.

θΔics

In hmolscience, **Nightingale Chair of Social Physics**, akin to the more-illustrious Lucasian Chair of Mathematics—a mathematics professorship at the University of Cambridge, famously held by Isaac Newton—was a proposed "social physics" professorship, conceived in 1874, by Italian-born English nursing reform pioneer and social theorist Florence Nightingale, on eve of the passing of Belgian statistical mathematician, astronomer and social physics pioneer Adolphe Quetelet (1796-1874), author of the 1835 *Essay on Social Physics*, aimed to be established and initiated at the University of Oxford. [1]

"I propose that a **chair in 'social physics'**, and their practical applications, be established at Oxford."
— Florence Nightingale (1874)

From 1874 to 1891, Italian-born English social thinker and health care reform pioneer Florence Nightingale lobbied to a **chair of "social physics"** established at the University of Oxford, based on a combination of Adolphe Quetelet's social physics theories, John Mill's philosophy, collected data on social statistics, applied intelligently, i.e. evidence-based, for the betterment of humanity.

Nightingale, in short, proposed the chair in 1874, offered money towards the chair, and lobbied for a number of years, up until 1891, to get the chair and or a readership established at Oxford, working in coordination with a number of individuals, including: Oxford administrator Benjamin Jowett, who offered to leave money in his will for the chair, suggesting that it be named after her father, English anthropologist Francis Galton, who guided her in drawing up an outline of topics to be addresses for such a course, English economist Alfred Marshall, who said the "government ought to do it", among others.

Overview

In 1835, Belgian statistical mathematician and astronomer Adolphe Quetelet (1796-1874) published his *Essay on Social Physics*, which, according to its first English translator Robert Knox, was the "first attempt made to apply the art of calculation to the social movements of the human being, and to examine by it his moral anatomy, with the view of detecting the real sources and amount of the evils under which he labors, and, ulteriorly, of remedying them when known." [2] English historian Henry Buckle's two-volume 1857/1861 *History of Civilization in English* worked to promote and disseminate Quetelet's ideas to a wide readership. [4]

In 1837, Italian-born English thinker Florence Nightingale (1820-1910), at the age of 17, had entered into some kind of religious enlightenment, in which she began to view god as a perfect creator, who made and runs the world by 'laws', which humans can ascertain by rigorous, preferably statistical, study, and that with this knowledge gained one can then intervene for 'good'. This philosophical basis led her through all the health care and social reform she would go on to do, her collected works alone, covering a broad spectrum of topics, comprising a 16-volume collected works set. To guide her in doing the research to discover 'god's laws', according to her collected works editor Lynn McDonald, she developed a methodological approach, in which her two main sources were Adolphe Quetelet, on the conduct of research, and John Mill, on philosophical grounding. Nightingale's *Society and Politics*, is said to contain what Nightingale learned from these two people and how she further developed these ideas. [3]

In circa 1859, Quetelet took part in the first meeting of British Association for the Advancement of Science, which, according to Canadian social science historian Lynn McDonald, was an organization "dominated by natural scientists hostile to social science." Quetelet recommended the creation of a separate statistical association, which was promptly done. In 1860, Quetelet was the opening speaker at the International Statistical Congress, in London, after which he visited Nightingale, a great admirer of his work, who could not attend the conference, but had sent papers and invited major participants to her

home for discussions. [4] The two remained close correspondents thereafter.

In 1871-74, Quetelet, in his last years, gave Nightingale copies of his *Social Physics* (1835) and *Anthropometry* (1871), an incident which she recounts, in her 7 Feb 1891 letter to Francis Galton, as follows: [7]

Proposal for a Chair in Social Physics

Editor: One of the last initiatives Nightingale took in her life, in 1891, was the attempt to have a chair or readership established at Oxford University on social physics and their practical application. This was to be the means of carrying on Quetelet's work and better still of introducing it to those who could best make use of it for social good: future administrators of government programs. Nightingale had reproached her friend Sidney Herbert, secretary of state for war, for failing to reorganize the War Office so that it could engage in an ongoing reform process. Administrators in the civil service able to interpret statistics would be essential to implement the appropriate lessons from them and advance a reform agenda.

The idea for teaching the subject at Oxford University goes back to her "In Memoriam" essay on Quetelet's death, 1874. It would be "the only fitting memorial" to her great mentor "to introduce *his* science" to Oxford, "the science of which he was the discoverer, upon which alone social and political philosophy can be founded".

Canadian social science historian Lynn McDonald's 2003 chapter section header on Florence Nightingale's 1874-1891 Oxford **social physics chair** initiation project. [9]

> "Quetelet gave me his *Physique Sociale* and his *Anthropometrie*. He said, almost like Sir Isaac Newton: 'These are only a few pebbles picked up on the vast seashore of the ocean to be explored. Let the exploration be carried out'."

On 21 Feb 1874, following Quetelet's passing, Nightingale wrote the following: [8]

> "The only fitting memorial to Quetelet would be to introduce his [social physics] science in the studies of Oxford, the science of which he was the discoverer, upon which alone social and political philosophy can be founded, which as he said himself ought no means to be limited to the administrative or legislative domain but should be the interpreter of all *theodike*, all the government and its laws embracing the smallest and the most accidental to the greatest and most universal actions and phenomena of our moral physical life."

In 1876, Nightengale discussed the idea with Oxford administrative reformer Benjamin Jowett (1817-1893), who offered to leave money in his will for the chair, suggesting that it be named after her father (i.e. Nightingale Chair of Social Physics). [9] The list of potential research topics, for the holder of the chair in social physics, as summarized by Lynn McDonald, that Nightingale listed, included the following: [4]

> "The effects of schooling, secondary, night schools, and other state-funded; how much learning was retained in adulthood? The results of legal punishments in actually deterring crime; does education decrease crime; the effects of charity and workhouses, …"

In 1890-91, she spent a year-and-a-half lobbying to see the chair established, including discussion with Francis Galton, among others; the following being an example statement:

> "I think the [following] needs doing: [we need] a scheme from someone of high authority as to what should be the work and subjects in teaching 'social physics' and their practical application, in the event of our

being able to obtain a statistical professorship or readership at the University of Oxford."

— Florence Nightingale (1891), "Letter to Francis Galton", Feb 7

In 1891, Jowett discussed the proposal with Alfred Marshall who gave his opinion that the "government ought to do it". [2]

In 1891, Nightingale, in her discussions with Galton, offered to give £2,000 (pounds), the equivalent of 100,000 USD in modern currency. Galton, however, was only prepared to use the money on a few essays, and Nightingale withdrew her offer. The project dead-ended after this point. [4]

C.G. Darwin | Human thermodynamics

This slight error, on the part of Francis Galton, not to proceed with Nightingale's initiative to start a chair of social physics at Oxford, of course, is somewhat ironic, given that C.G. Darwin, grandson to the more illustrious Charles Darwin, Galton's half-cousin, who was age four at the time, could have very well gone onto become the second, third, or fourth social physics chair holder, being that by that by 1911 he was a lecturer in physics, working under proton discoverer Ernest Rutherford, at Victoria University of Manchester, lectured on topics such as kinetic theory and thermodynamics, by 1935 he had become the directory of the National Physics Laboratory, at Cambridge, and by 1952, in his *The Next Million Years*, in his "Introduction" section, famously became the first person to outline the subject of "human thermodynamics", a more focused and advanced version of social physics, as the statistical mechanics study of conservative dynamic systems of "human molecules". [10]

Nightingale | Chair of Physicochemical Humanities

The modern name for the chair Nightingale had in mind would, seemingly, be called "Chair of Physicochemical Humanities", with readerships and professorships in physicochemical humanities, the centralized textbook being human chemical thermodynamics (the modern version of what C.G. Darwin envisioned), being that into the mid-1890s, and the century to follow, the subject of social physics began become more encompassing:

Main "Social Physics" Schools

Lausanne school (1890-1923)

Harvard Pareto circle (1932-1943)

Princeton social physics (1945-1955)

Romanian school (2007-present)

The form main universities that had or have actual functioning physicochemical humanities stylized courses and or departments (see: two cultures synergy).

"The sun and earth, or storms and earthquakes, which nowadays we understand as manifestations of natural **physico-chemical** forces, were once seen as persons or as the results of actions and "designs" of persons [gods]. Only gradually did the transition come about from magical and metaphysical thinking to scientific thinking about the physico-chemical aspects of the world. The change was to a large degree dependent on the fading away of heteronomous, naively egocentric explanatory models. In **sociology**, we are [presently] confronted with a similar task of emancipation."

— Norbert Elias (1978), *What is Sociology?* [11]

Modern "social physics" going by names such as: pure political economics and social mechanics (Leon Winiarski, 1894), physico-chemical social dynamics (Henry Adams, 1908), humanized physics (Edwin Slosson, 1910), anthropic physics (Wilhelm Ostwald, 1912), Gibbs-Pareto based sociology (Lawrence Henderson, 1932), physicochemical

sociology (Pitirim Sorokin, 1943), among others, up to modern names such as applied thermodynamics: physical socio-economics (Jurgen Mimkes, 2005), and so on (see: two cultures namesakes).

Thims | Inquires

See main: Two cultures inquiries

In 2012, American electrochemical engineer Libb Thims began probing into an initiative, similar to the effort of Nightingale (1874-1891), to establish a "Chair of Physicochemical Humanities", at one of the top universities of the world.

On 5 May 2015, Thims emailed (Ñº) the Gates Foundation (Ñº) to inquire about getting funding for a "Nightingale Chair of Social Physics" in America, similar to the way the Rockefeller Foundation funded the Princeton Social Physics Project (see: Princeton Department of Social Physics), from 1949 to 1953, prior to having funding cut off amid the Stewart-Weaver fallout.

On 25 Apr 2016, Thims envisioned (Ñº) the idea that he could use the proceeds from MailCubes.com (Ñº) to fund the establishment of the Nightingale Chair of Social Physics, similar to the way Ernest Solvay, in France, used his wealth, derived from his invention of sodium bicarbonate synthesis, to fund, promote, and attempt to establish the science of social energetics (1894-1910), thereby avoiding the classical pitfalls of (a) "Stewart-Weaver fallout" issues and thereby provide fuel to cut through unnecessary (b) "doctrinaire departmentalism" issues.

Quotes

The following are related quotes:

> "Quetelet is the founder of the most important science in the whole world."
>
> — Florence Nightingale (1874), on social physics [6]

> "**Nightingale**'s later endeavors to establish a **chair of 'social physics'** at Oxford University were founded upon her belief that governmental data collection (which was routine by this time) was useless without applied statistical analysis and decision making—which effectively was an argument for evidence based decision making in public health and policy. However, like James Lind's recommendations in the 18th century, Nightingale's proposal was frustrated by a resistant administrative body, and the chair was not established."
>
> — Trahern Jones et al (2011), "Evidence-Based Medicine Through the Ages" [5]

See also

â— Stewart-Weaver fallout

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2. (a) Quetelet, Adolphe. (1835). *Treatise on Man and the Development of his Faculties or Essay on Social Physics* (Sur l'homme et le developpement de ses faculties, ou essai de physique sociale). Publisher; First English edition

(publisher's note by Robert Knox, pg. iii): William and Robert Chambers, 1842.
(b) Robert Knox (1791-1862) – TBCS.org.uk.
3. (a) Nightingale, Florence. (2009). *Collected Works of Florence Nightingale, Volume 12: the Nightingale School* (editor: Lynn McDonald) (pg. xii). Wilfrid Laurier University Press.
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4. McDonald, Lynn. (1995). *The Early Origins of the Social Sciences* (pg. 257-58). McGill - Queen's University Press.
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θΔics

In philosophy, **nihilism** is circular pejorative label, arisen during the Fichte-Foreburg atheism debate (1798-1800), meaning, in its original sense, the "philosophical knowing of nothing" (Jacobi, 1799), i.e. nothingness philosophy (compare: thing philosophy), an interpretation of the atheism-labeled views of Johann Fichte; tending to refer to discourse wherein scientific discourse about god results in the death of god, a purely 'logical enthusiasm' (Behler, 1987); interpreted as "the impossibility of putting one's trust in a religion" (Camus, 1959), among other variants; tending to be synonymous with pointlessness and or meaninglessness views of things; associated, historically, with the philosophies of: Schopenhauer, Kierkegaard, and Nietzsche; recently, as embodied, philosophically, in the cartoon humor show *Rick and Morty* by Rick Sanchez. [1]

Jacobi

In 1799, Friedrich Jacobi (1743-1819), a noted (Ñº) Lessing commentator, in his famous "Open Letter to Fichte", originally penned as a personal communication to Johann Fichte, penned amid the Fichte-Foreburg atheism dispute (1798-1800), introduced the term "nihilism" into public philosophical discourse as follows: [5]

> "Since outside of the mechanism of nature, I come across nothing but miracles, mysteries, and signs and have a terrible aversion to 'nothingness', the absolutely indefinite, the utterly empty (these three are one, the Platonic infinite!), particularly as the object of philosophy or goal of wisdom; but in the investigation of the mechanism of the nature of the ego as well as that of the non-ego, reach nothing but 'nothing-in-itself' and am so tainted, struck, and exhausted by it in my transcendental essence (personally, so to speak), that in order to empty out the infinite, I even must want to fill it up, as an infinite 'nothingness', a purely totally 'in-and-of-itself', were it only not impossible! Since, I say, that is the way it is with me and the science of the true, or more accurately, the true science; I therefore do not see why I, for reasons of good taste, should not be allowed to prefer my 'philosophy of not-knowing' to the '**philosophical knowing of nothing**', even it were only in *fugam vacui* (void flight or avoiding the void). I have nothing against me but **'nothingness'**; and with that, even chimeras can probably compete.
>
> Truly, my dear Fichte, it should not vex me if you, or whoever it might be, want to call what I contrast to idealism, what I chide as **nihilism**, chimerism. I have made a display of my 'not-knowing' in all of my writings; I have so boasted of being **unknowledgeable with knowledge**, completely and extensively to such a high degree, that I should be allowed to despise the mere doubter. With earnestness and fervor I have strived from childhood on for truth as have few, have

The Russian Intelligentsia Descends Into "Nihilism"

72

"A nihilist is a person who does not bow down to any authority, who does not accept any principle on faith, however much that principle may be revered." Those are the words of Arkady Kirsanov, a shy university graduate in *Fathers and Sons*, the great novel from 1862 by the Russian writer Ivan Turgenev. Though the term "nihilism" was first used by the German philosopher Friedrich Heinrich Jacobi in the 18th century, it was Turgenev who popularized it. In the character of Arkady's friend Yevgeny Bazarov, a brusque, cynical young medical student who worships science, sneers at the idea of moral principles, and rejects all institutions, Turgenev created an unforgettable portrait of nihilism's across-the-board repudiation of tradition. In the 1860s nihilism appealed to a generation of young Russian intellectuals struggling to absorb the lessons of the Enlightenment, which had arrived belatedly in their native land in the 19th century. What began as a revolt against religious dogma and czarist absolutism developed over time into the rejection of all forms of belief and authority. Something Bazarov says in Turgenev's novel —"What matters is that twice two makes four, and the rest is all rubbish"—could have served as its motto.

In the decade that followed, nihilism provided a philosophical point of departure for ever more radical and desperate varieties of revolutionary activity in Russia, a period characterized by terrorism and secret societies that culminated in the assassination of Czar Alexander II in 1881. In his 1869 manifesto, *Cathechism of a Revolutionist*, the anarchist Sergei Nechaev could announce that the revolutionary "knows one science only: the science of destruction." Nechaev would be the inspiration for the character of Pyotr Verkhovensky in Fyodor Dostoevsky's novel *The Devils*, also known as *The Possessed*. Verkhovensky leads a secret society that in its ruthlessness and perverse internal dynamics seems to foreshadow both the Baader-Meinhof group—German terrorists whose heyday was the 1970s—and the Manson family.

A synopsis of **nihilism** from the 2011 *Time* magazine special issue "100 Ideas that Changes the World". [7]

> experienced my incapacity as have few, and my heart has thereby become tender—oh, very tender, my dear Fichte, and my voice so gentle! Just as I, as a human being, have a deep sympathy with myself, so I have it with others. I am patient without effort; but that I am truthful without effort costs me a lot. The earth will be light above me— before long."

Jacobi's use of the terms "nihilism" or chimerical nihilism, here, meaning "philosophical nothingness" or the "philosophical knowing of nothing", were later picked up by his friend Friedrich Koppen, and thereafter into public discourse; the following are a few comments on this etymology:

> "Although on good personal terms with Fichte, Friedrich Jacobi was nevertheless the most severe critic of Fichte's systematic tendency and his attempt to construct a completed system of reason. Absolute reason, in the last analysis, was nothing but atheism for Jacobi, and the endeavor of Fichte's science of knowledge was so alien and repugnant to him that a conflict between the two philosophers was unavoidable. Whereas this controversy was conducted in the manner of a mutually respectful dissent, however, Hegel's excessive polemics led to the result that the entirety of transcendental idealism fell under the indictment of '**nihilism**' and Jacobi's formerly more technical usage of the term assumed the caustic and aggressive nuance which it has since kept."
>
> — Ernst Behler (1987), "Introduction" to *Philosophy of German Idealism* (pg. xiii)

> "The scientific discourse about god results in the death of god, a purely 'logical enthusiasm', and has no other consequence but **nihilism**. Inverting the real into the ideal, the basic action of reason, marks the beginning of the 'philosophy of absolute nothingness', and the idea of an absolute centrifugal and centripetal movement as practiced by Fichte suggested to Jacobi only a movement out of nothing, to nothing, for nothing, and into nothing."
>
> — Ernst Behler (1987), "Introduction" to *Philosophy of German Idealism* (pg. xiv)

> "One of them, by Jacobi's friend Friedrich Koppen, maligned Schelling's doctrine as the 'philosophy of absolute no-thing-ness'— a claim certainly derived from Jacobi's term **nihilism**: a philosophy which lays claim on all and everything, like Schelling's system of identity, necessarily results in absolute nihilism. When Jacobi offered his response to Hegel's attack in three open letters to Koppen, and Koppen included them as an appendix in his book, Jacobi certainly contributed to the eschatological nuance in the term nihilism noticeable throughout the nineteenth century and culminating in Nietzsche."
>
> — Ernst Behler (1987), "Introduction" to *Philosophy of German Idealism* (pg. xvi)

(add)

Turgenev

In 1861, Russian Ivan Turgenev, in his novel *Father and Sons*, was using the term "nihilists", as those raised on Ludwig Feuerbach, the positivism of Auguste Comte, and the popular German materialists: Ludwig Buchner, Jacob Moleschott, and Karl Vogt; along with John Mill.

> "A **nihilist** is a person who does not bow down to any authority, who does not accept any principle on faith, however much that principle may be revered."
>
> — Ivan Turgenev (1862), *Fathers and Sons* (character: Arkady Kirsanov)

In *Fathers and Sons*, the character Yevgeny Bazarov, a friend of Kirsanov, characterized as a “brusque, cynical young medical student, who worships science, sneers at the idea of moral principles, and rejects all institutions". [7]

> “What matters is that two plus two makes four, and the rest is all rubbish.”
>
> — Ivan Turgenev (1862), *Fathers and Sons* (character: Yevgeny Bazarov); this is a supposed motto for nihilism [7]

Bazarov describes himself as a "nihilist" who wants to educate the people. [4] The term nihilism, supposedly, spread quickly in Russia following this publication, serving as a philosophical point of departure for revolutionary radicals.

Dostoyevsky

In 1866, Fyodor Dostoyevsky, in his *Crime and Punishment*, addressed many aspects of nihilism; for example:

> “The **nihilists** went so far as to propose the destruction of all tradition in creating a new society. The theories of nihilism, however, never proposed a plan to replace the traditions that were destroyed.”
>
> — Paul Moliken (2005), “Reading Pointers for Sharper Insights” in Dostoyevsky’s *Crime and Punishment* [5]

In 1872, Dostoyevsky, in his *Demons* (aka *The Possessed*) (Ñº), a book originally intended to be called *The Atheist*, , wherein the character Pyotr Verkhovensky (Ñº) , in the novel, is based on Russian anarchist Sergey Nechaev (1847-1882) (Ñº), author of the manifesto *Cathechism of a Revolution* (1869), whose ideology was that “the revolutionary knows one science only: the science of destruction”. [7] In one passage of the book, an army officer goes mad and attacks his commanding officer, then smashes up his landlady’s little shrine of Christian icons, and puts in their place the works of Vogt, Moleschott, and Buchner, like a trio of Bibles on stands, in front of each he burns a church wax candle. [4]

Other

In 1871, English biologist Thomas Huxley, in his “Administrative Nihilism”, coined both the terms ‘social chemistry’ and ‘social molecule’, as follows: [2]

> “Every society, great or small, resembles ... a complex molecule, in which the *atoms* are represented by *men*, possessed of all those multifarious attractions and repulsions which are manifested in their desires and volitions, the unlimited power of satisfying which we call freedom ... the social molecule exists in virtue of the renunciation of more or less of this freedom by every individual. It is decomposed, when the attraction of desire leads to the resumption of that freedom the expression of which is essential to the existence of the social molecule. The great problem of social chemistry we call politics, is to discover what desires of mankind may be gratified, and what must be suppressed, if the highly complex compound, society, is to avoid decomposition.”

The term “existential nihilism” argues that existence is without objective meaning, purpose, or intrinsic value; that morality does not inherently exist, and that moral values are abstractly contrived.

In the 1880s, Friedrich Nietzsche, after reading Dostoyevsky, advocate of the conservation of force models, particularly of Friedrich Mohr and Robert Mayer, whose books he read in 1873 and 1881, respectively, devotes a considerable amount of effort to a critique and dissection of the concept or possibility of the rise of nihilism, particularly within the framework of the decline of Christianity. [3] The name Turgenev, of note, is never mentioned in Nietzsche's books. [5]

Quotes

The following are related quotes:

> "I don't see any 'point' in **nihilism**, just as I suppose the nihilist sees no point in everything else."
>
> — John Green (c.2015) (Ñº)

A 2015 image (Ñº) of **nihilism**, as "believe nothing", according to Garret Harrison, who ruminates on the arbitrary fame of the Haffners, who were part of the ruling class of Salzburg, and who funded Mozart's *Haffner Symphony*, but who are now completely unknown and forgotten, say as compared to Mozart.

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7. Anon. (2011). "100 Ideas that Changed the World", *Time*, May 6.

External links

â— Nihilism – Wikipedia.

θΔics

In hmolscience, **Niklas Luhmann** (1927-1998) was a German sociologist noted, in sociological thermodynamics, for the construction of a general theory of social systems, utilizing the logic of entropy, with special emphasis on modern society, logic stemming from the works of his mentor American sociologist Talcott Parsons, whom he had studied under at Harvard in 1961 during a sabbatical. In his work, however, in contrast to Parsons, Luhmann was to emphasize entropy, disorder, and communicative failure. [1]

Luhmann, together with French philosopher Jacques Ellul, were said to share a "systems" bias view of sociology, wherein the goal of a system is self-maintenance and the task of the systems analyst is to study how social processes and mechanisms forestall the end state of societal entropy. [2]

Luhmann's influence in North American sociology began to expand in the mid 1980s due to the translation of his 1982 book *The Differentiation of Society.*

References

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External links

â— Niklas Luhmann – Wikipedia.

θΔics

In existographies, **Nikola Kajtez** (1965-) is a Serbian philosopher, noted for []

Overview

In 2016, Kajtez, in his *The Philosophy of Nature*, published in Serbian and Russian, attempted to argue some type of spiritual and or supernatural interpretation of entropy; the following is the abstract: [1]

> "No philosopher has addressed the entropy controversy so far, although this philosophically most important aspect of the nature of the universe has been described and explained by thermodynamics a hundred and fifty years ago! The spiritual situation of our time is still characterized by the lack of awareness of the disappearing world. Because of the ontological [see: ontic opening] consequences of thermodynamic principles, the phenomenon of entropy deserves to be introduced here not only as a philosophical term but also as a new philosophical category! Dealing with the knowledge of the inevitable destiny of the universe is the key to dealing with yourself and your entire existence. Underestimating this fact, entropy flows are supported. As the flow of time itself is disorganizing [see: entropy as disorder], the one who does not collect - is actually wasting. The only way to divert the natural path of things (as predicted by thermodynamics) is to, in addition to establishing a coherent unity of inorganic and organic, trace the connection with the supernatural (in this case, the supernatural need not be understood as something volitional, mysterious, esoteric in the traditional sense of the word. but as an integral part of an epistemologically expanded and deepened, refined, immensely diverse large chain of beings). If man is a being of cosmic integrity, by exploring the entropy of nature and the nature of entropy, he will come closer to understanding the origin and meaning of existence; if not - then there is nothing to be hoped for in either the knowing or the existential sense."

In 2019, Kajtez, in his five-part video series "The Philosophy of Entropy", presented an English-version of his ideas in storyboard form, which the subtitles as the "entropic nature of created systems"; the term "created" being code for creation and hence god. The following is his main platform:

> "All systems are connected via a process of given and take. Every 'event' is entropic, destructive, devaluating. When something happens, a certain quantity of 'value' becomes unusable for all future events."
>
> — Nikola Kajtez (2019), "Philosophy of Entropy" (Part 1 of 5) (0:30-1:09)

This opening statement is incorrect, per reason that he is reading into the concept of entropy or the equivalence value of all uncompensated transformations the notions of "destruction" and "devaluation", which is not part of the formulation of entropy by Clausius; the following is his opening infographic: [2]

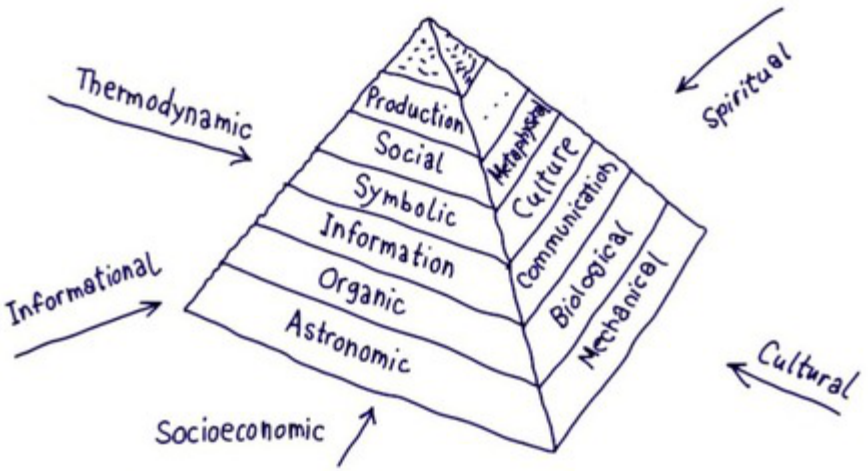

The gist of Kajtez's idea, baring prolonged digestion of his video series, and given limited translation of his work, seems to be the polemic of using information theory and the Heisenberg uncertainty principle, and no doubt free will, as ontic openings to argue that for the existence of some type of supernatural spirit or spirituality.

Quotes | By

The following are quotes by Kajtez:

> "If civilization does not respect the broadest possible natural-cosmic context if it continues to calculate according to its local, egotistical framework alone, it will only hasten the final collapse, it will only further stoke, accelerate entropic currents."
>
> — Nikola Kajtez (2019), "Philosophy of Entropy" (Part 1 of 5)

References

1. Kajtez, Nikola. (2016). *The Philosophy of Entropy* (Serbian → English). Agora.
2. Kajtez, Nikola. (2019). "The Philosophy of Entropy" (part 1 of 5), Nikola Kajtez, YouTube, Jan 8.

External links

â— Nikola Kajtez (about) – NokolaKajtez.com.

θΔics

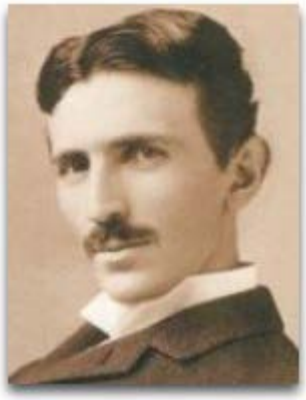

In existographies, **Nikola Tesla** (1856-1943) (IQ:195|#18) [RGM:7|1,500+] (RE:87) (CR:148) was a Austrian-born American electrical engineer, philosopher, and polyintellect noted for his 1988 invention of the AC electromagnetic motor; for his 1900 article "The Problem of Increasing Human Energy", wherein he outlines the three types of kinetic human energy, discussing ways to increase, decrease, and to measure this energy; and for his 1915 article "How Cosmic Forces Shape Our Destines" wherein he outlines a proto defunct theory of life formulation that there is no thing endowed with life. [1]

Defunct life theory

In 1915, Tesla published his *New York American* article "How Cosmic Forces Shape Our Destines", which extols a mixture of the defunct theory of life and the panbioism perspective, i.e. the everything is alive point of view. Tesla's views, in this area, to note, are akin, in some sense, to those of German polymath Johann Goethe, being that Tesla read the philosophy of Goethe (see: Goethean philosophy) to the exclusion of all other philosophies. The following is the famous opening section from Tesla's article: [6]

> "Every living being is an engine geared to the wheelwork of the universe. Though seemingly affected only by its immediate surrounding, the sphere of external influence extends to infinite distance. There is no constellation or nebula, no sun or planet, in all the depths of limitless space, no passing wanderer of the starry heavens, that does not exercise some control over its destiny—not in the vague and delusive sense of astrology, but in the rigid and positive meaning of physical science.
>
> More than this can be said. **There is no thing endowed with life**—from man, who is enslaving the elements, to the humblest creature—in all this world that does not sway it in turn. Whenever action is born from force, though it be infinitesimal, the cosmic balance is upset and universal motion result.
>
> Herbert Spencer has interpreted life as a continuous adjustment to the environment, a definition of this inconceivably complex manifestation quite in accord with advanced scientific thought, but, perhaps, not broad enough to express our present views. With each step forward in the investigation of its laws and mysteries our conceptions of nature and its phases have been gaining in depth and breadth.
>
> In the early stages of intellectual development man was conscious of but a small part of the macrocosm. He knew nothing of the wonders of the microscopic world, of the molecules composing it, of the atoms making up the molecules and of the dwindlingly small world of electrons within the atoms. To him life was synonymous with voluntary motion and action. A plant did not suggest to him what it does to us—that it lives and feels, fights for its existence, that it suffers and enjoys. Not only have we found this to be true, but we have ascertained that even matter called inorganic, believed to be dead, responds to irritants and gives unmistakable evidence of the presence of a living principle within.
>
> Thus, everything that exists, organic or inorganic, animated or inert, is susceptible to stimulus from the outside. There is no gap between, no break of continuity, no special and distinguishing vital agent. The same law governs all matter, all the universe is alive. The momentous question of Spencer, "What is it that causes inorganic matter to run into organic forms!" has been answered. It is the sun's heat and light. Wherever they are there is life. Only in the boundless wastes of interstellar space, in the eternal darkness and cold, is animation suspended, and, possibly, at the temperature of absolute zero all matter may die."

The first two paragraphs, of this opening article section, corroborate with the now confirmed and accepted 2009 defunct theory of life, i.e. that life is something that does not exist. Very deep insight indeed. In the last paragraph we see Tesla: conclude that the unbridgeable gap model is bunk (correct), that vitalism is bunk (correct), that the same law (thermodynamics) governs all matter (correct), discuss the heat death theory (seems cogent), and attempt to give his solution to the Spencer-version of the great problem of natural philosophy (close). In the last of these, however, his

mention that "all the universe is alive" (incorrect) is one step away from the rigid physical science defunct view of life, namely that correctly "nothing in the universe is alive" (correct). When one first delves into the matter, such as via descent down to smaller scales, e.g. as viewed on the molecular evolution table or evolution timeline, the first possibility that comes to mind, knowing that atoms and nucleons are teeming with movement and activity, is to conclude that "all is alive" in some sense of the matter. This view, however, does not hold water in the long run after which one concludes that the "all is alive" possibility is an anthropomorphism and that correctly what is needed is a deanthropomorphism.

Spirit | Soul

In 1935, Tesla published his “A Machine to End War”, where he stated the following in regards to the metaphysical terms soul and spirit: [7]

> “To me, the universe is simply a great machine which never came into being and never will end. The human being is no exception to the natural order. Man, like the universe, is a machine. Nothing enters our minds or determines our actions which is not directly or indirectly a response to stimuli beating upon our sense organs from without. Owing to the similarity of our construction and the sameness of our environment, we respond in like manner to similar stimuli, and from the concordance of our reactions, understanding is born. In the course of ages, mechanisms of infinite complexity are developed, but what we call 'soul' or 'spirit,' is nothing more than the sum of the functionings of the body. When this functioning ceases, the 'soul' or the 'spirit' ceases likewise.”

(add discussion)

Automaton theory

In 1900, Tesla published his “The Problem of Increasing Human Energy”, wherein he stated the following belief state or view on what a human is:

> “I am an automaton endowed with power of movement, which merely responds to external stimuli beating upon my sense organs.”

Tesla opens with a crude diagrammatic model of “human energy”, shown adjacent, discussing rather cogently the impelling and retarding forces to human movement. To explain this diagram, Tesla states:

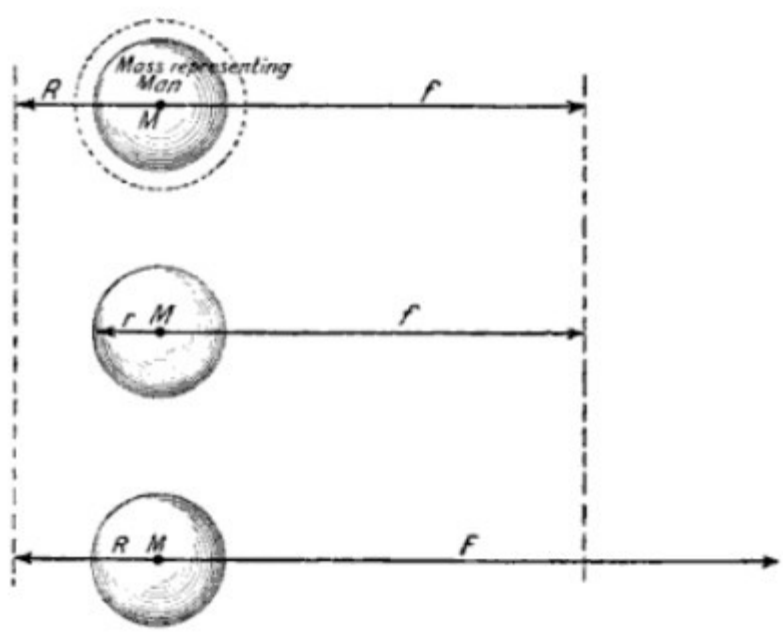

> “Let *M* represent the mass of man. This mass is impelled in one direction by a force *f*, which is resisted by another partly frictional and partly negative force *R*, acting in a direction exactly opposite, and retarding the movement of the mass. Such an antagonistic force is present in every movement and must be taken into consideration. The difference between these two forces is the effective force which imparts a velocity *V* to the mass *M* in the direction of the arrow on the line representing the force *f*. In accordance with the preceding, the human energy will then be given by the product:

Human energy = ½mv²

Tesla's 1900 **human energy diagram:** the three ways if increasing human energy (top, middle, bottom). The symbol M representing the mass of an average person, acted on by positive forces (impelling forces) and negative forces (retarding forces), which act to either accelerate or impede human motion. [1]

where *M* is the total mass of man in the ordinary interpretation of the term "mass," and *V* is a certain hypothetical velocity, which, in the present state of science, we are unable exactly to define and determine. To increase the human energy is, therefore, equivalent to increasing this product, and there are, as will readily be seen, only three ways possible to attain this result, which are illustrated in the above diagram.

The first way shown in the top figure, is to increase the mass (as indicated by the dotted circle), leaving the two opposing forces the same.

The second way is to reduce the retarding force *R* to a smaller value *r*, leaving the mass and the impelling force the same, as diagrammatically shown in the middle figure.

Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But **as soon as the body moves** under the influence of the force, **Work is performed.**

German physicist Rudolf Clausius' classic 1875 definition of "work", the opening paragraph of his mathematical introduction, framed in the context of the summation of the impelling forces and retarding forces to the production of work, from his . [3]

The third way, which is illustrated in the last figure, is to increase the impelling force *f* to a higher value *F*, while the mass and the retarding force *R* remain unaltered. Evidently fixed limits exist as regards increase of mass and reduction of retarding force, but the impelling force can be increased indefinitely. Each of these three possible solutions presents a different aspect of the main problem of increasing human energy, which is thus divided into three distinct problems."

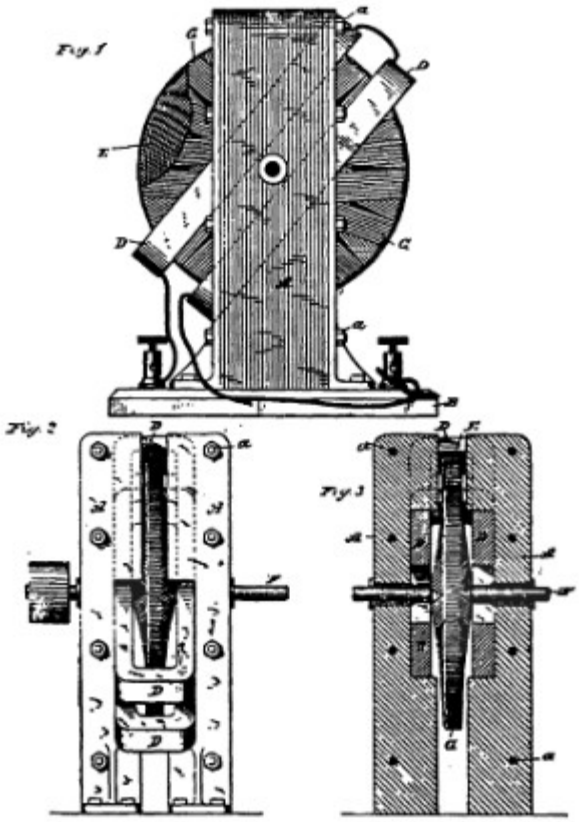

Diagram of Tesla's 1889 AC electromagnetic motor. [5]

Curiously, a similar depiction of the various forces acting to move the human or rather human molecule, in modern parlance, were presented in American electrochemical engineer Libb Thims' 2009 chapter "Thermodynamics Philosophy of Evolution". [2]

Here, to note, in Tesla's derivation of a formula for human energy, seems to be attributing the entirety of human energy to kinetic motion (or vis viva), whereas in the modern human chemical thermodynamics sense of the matter, the totality of human energy, according to the standard model, is divided into three main variants of energy:

Human energy = internal energy + pressure volume energy + transformation content energy

Tesla, however, would not likely have been aware of this logic, as it was not until the 1923 work of American physical chemist Gilbert Lewis that this view came into the body of common knowledge.

This statement finds acceptance in the modern view that from a chemical point of view, a man defined as a molecule, i.e. "human molecule", there is no such thing as "life", but only, instead, different degrees of movement, animation, or reaction, in contrast to inertness, or dissolution.

Goethe

Tesla was said to have been an adherent of the philosophy of German polymath Johann Goethe. Tesla owned a thorough collection of Goethe's scientific texts and read these to the exclusion of all other philosophies.

The idea for a self-starting AC electric motor came to Tesla one evening as he was reciting a poem of Goethe, specifically a passage from *Faust*, a book which he had memorized in entirety (among other books), and watching a sunset, at which point he imagined a magnetic field rapidly rotating inside a circle of electo-magnets. [4]

Voltaire

Tesla, somewhere along the lines, also engaged into a quest to master the works of Voltaire (IQ=195). The following are Tesla's reflections on this task:

> "I had a veritable mania for finishing whatever I began, which often got me into difficulties. On one occasion I started to read the works of Voltaire when I learned, to my dismay, that there were close on one hundred large volumes in small print which that monster had written while drinking seventy-two cups of black coffee per diem.ï»¿ It had to be done, but when I laid aside the last book I was very glad, and said, 'Never more!'"

(add discussion)

Other

In the literature something called the "Tesla principle" was said to be a type of reversible process invented by Tesla; this, however, may not be related to thermodynamics and needs fact checking.

Quotes

The following are noted Tesla quotes:

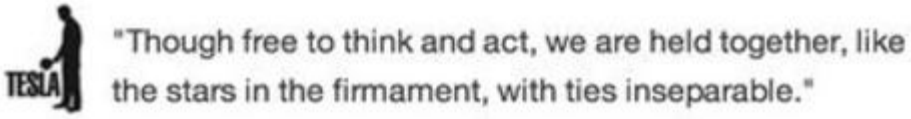

> "Life is and will ever remain an equation incapable of solution, but it contains certain known factors."
>
> — Nikola Tesla (1935), "A Machine to End War"

> "It seems that I have always been ahead of my time."
>
> — Nikola Tesla (date), comment to George Sylverster Viereck (Ñº) (Ñº)

> "Though free to think and act, we are held together, like the stars in the firmament, with ties inseparable."
>
> — Nikola Tesla (date)

References

1. (a) Tesla, Nikola. (1900). "The Problem of Increasing Human Energy: with Special Reference to the Harnessing of the Sun's Energy" (url), *The Century*, 60: 175-211.
(b) Tesla, Nikola. (1900). *The Problem of Increasing Human Energy: with Special Reference to the Harnessing of the Sun's Energy*. Wilder Publications.
2. Thims, Libb. (2009). "Thermodynamic Philosophy of Evolution", (Nature Network: abstract) (Wikiversity: abstract)

(13-pages), in: *Philosophy of Evolution*, AK Purohit (editor). India: Publisher (circa Oct. 2010 publication date).
3. Clausius, Rudolf. (1875). *The Mechanical Theory of Heat* (section: Mathematical Introduction: on Mechanical Work, on Energy, and on the Treatment of Non-Integrable Differential Equations, pgs. 1-20). London: Macmillan & Co.
4. (a) Gruber, Gary R. (2005). *Gruber's Complete Preparation for the New SAT* (pg. 790). HarberCollins.
(b) Tesla, Nikola. (2007). *The Essential Tesla* (Goethe's Faust and AC Motor, pg. 132). Wilder Publications.
5. O'Neill, John J., Morrison, Colladay. (1996). *Nikola Tesla: Incredible Scientist and Prodigal Genius the Life of Nikola Tesla* (1889 electro magnetic motor, pg. 102). Kissinger.
6. (a) Tesla, Nikola. (1915). "How Cosmic Forces Shape Our Destinies ('Did the War Cause the Italian Earthquake'), *New York American*, Feb 7.
(b) Tesla, Nikola. (2007). *The Nikola Tesla Treasury* (pg. 504-13). Wilder Publications.
(c) Gaither, Carl C. and Cavazos-Gaither, Alma E. (2012). *Gaither's Dictionary of Scientific Quotations* (pg. 460). Springer.
(d) Seifer, Marc. (1998). *Wizard: the Life and Times of Nikola: Biography of a Genius* (pg. 105). Citadel Press.
7. Tesla, Nikola. (1935). "A Machine to End War" (Ñº), Feb.

External links

â— Nikola Tesla – Wikipedia.
â— Tesla (selected writings) – TFCBooks.com.

θΔics

In hmolscience, **Nikolai Bukharin** (1888-1938) was Russian politician and scholar noted for his 1926 *Historical Materialism: a System of Sociology*, wherein he expands upon Karl Marx's theory of historical materialism. [1]

Bukharin, supposedly, saw equilibrium in social systems as resulting from the interchange of energy among its parts. (Q)

Bukharin's quotes on physics and chemistry seem to given indication that he is anti-reductionist, siding with argument to the effect that "the law of cause and effect in social science must be a social law" and that "analogy with physical organisms" is useless. (Q)

Bukharin, according to American political economist Kenneth Stokes (1994), is classified as one of the 'heretical philosophers of social energetics', along with: Wilhelm Ostwald, Leon Winiarski, Alexander Bogdanov, Eduard Sacher, Felix Auerbach, Rudolf Clausius, Patrick Geddes, Leopold Pflaunder, Georg Helm, Thomas Carver, Frederick Ackerman (Technocracy), Fred Henderson (*The Economic Consequences of Power Production*, 1923), Alfred Lotka, and Frederick Soddy. [2]

Reaction end

In 1938, Bukharin, a former friend and or intellectual idol of Joseph Stalin, was found guilty of counter-revolutionary activities and espionage. He was shot on 14 March 1938, along with 17 other "traitors". Stalin had assured Bukharin that the decision to execute him was "nothing against you personally". In his death letter to Stalin, Bukharin stated "I am not a Christian, but I do have my quirks." (Q)

References

1. Bukharin, Nikolai. (1926). *Historical Materialism: a System of Sociology*. Routledge, 2013.
2. Stokes, Kenneth M. (1994). *Man and Biosphere: Toward a Coevolutionary Political Economy* (pg. 90-91). M.E. Sharpe.

Further reading

● Bukharin, Nikolai I. (1935). "Marx's Teaching and its Historical Importance. In: *Marxism and Modern Thought* (§1, pgs. 1-64; "laws of social motion", pg. 32). Routledge, 2013.

External links

● Nikolai Bukharin – Wikipedia.

θΔics

In existographies, **Nikolai Kornev** (c.1970-) is a Russian scientist, noted for []

Overview

In 2014, Kornev, and Irina Cherunova, in their *Lectures on computational fluid dynamics and heat Transfer: with applications to Human Thermodynamics*, devote a few end pages to scientific models of clothing insulation design, e.g. for cold water swimming and artic weather, a subject they refer to as "human thermodynamics". [1]

References

1. Cherunova, Irina and Kornev, Nikolia. (2014). *Lectures on computational fluid dynamics and heat Transfer: with applications to Human Thermodynamics*. Publisher.

θΔics

In hmolscience, **Nikolai Krainsky** (1860-c.1935), often cited as N. Krainsky (or "N.V. Krainskii"), was a German [?] psychiatrist noted, in psychological thermodynamics, for his his 1897 to 1910 publications on energy psychology, i.e. the term "energy" applied to things such as: ego, ideas, sensory input, among others.

Overview

In 1897, Krainsky, according to Henry Adams (1910), published some type of volume entitled “Law of Conservation of Energy applied to Psychical Activity”. [1]

In 1909, Krainsky, in his “Principles of Energetic Psychology”, stated that: [3]

> “The energy of ideas is that of the sensory impulse, solely; the greater energy of the muscular contraction is due to stored potential energy. The term energy is applied in characteristic ways to the ‘ego’ and to the several phases of consciousness, and equivalence is asserted between the stimulus and its effects in sensation and imagination, without clarification of the problem what common meaning may lie under these two applications of the term energy, and how equivalence may be demonstrated.”

Krainsky was listed along with writers such as Kurd Lasswitz and Nicolas von Grot to have theories on a special form of psychic energy occurring in psychological processes and was noted among them for his “energetic theory of memory” [2]

Russian psychodynamic neurologist Vladimir Bekhterev (*Suggestion and its Role in Social Life*, 1902) to a Dr. N. Krainskii concerning hysteria, which leads to the conclusion that N. Krainsky is Nikolai Krainskii

In 1929, a Russian "N. V. Krainsky" was lecturing at Belgrade University on experimental criminological psychology and psychiatry.

In 1936, a N.W. Krainsky published “Nerven-psychische Emission und Radio-Prozesse in Lebenden organismus (Neuro-psychological Emission and Radio Processes in Living Organisms).

Quotes

The following are representative quotes:

> “The term energy is applied in the characteristic ways to the ‘ego’ and to several phases of consciousness, and equivalence is asserted between stimulus and its effects in sensation and imagination, without clarification of the problem what common meaning may lie under these two applications of the term energy, and how equivalence may be demonstrated.”
>
> — N. Krainsky (c.1900), *The Principles of Energy Psychology* [4]

> “The energy of ideas is that of the sensory impulse, solely; the greater the energy of the muscular contraction is due to stored potential energy.”
>
> — N. Krainsky (c.1900), *The Principles of Energy Psychology* [5]

References

1. (a) Krainsky, N. (1897). "Law of Conservation of Energy applied to Psychical Activity". Russia.
(b) McDougall, William. (1932). *Body and Mind: A History and a Defense of Animism*, 3rd ed. (pg. 130). New York: International Publishers.

(c) Adams, Henry. (1910). *A Letter to American Teachers of History* (pgs. 89-99). Washington.
(d) Adams, Henry. (1919). *The Degradation of the Democratic Dogma* (Krainsky, pg. 197). MacMillan Co.
2. (a) Krainsky, N. (1911). *Soul and Energy* (Dusha i Energiya), pg. 31. Vilna.
(b) Bekhterev, Vladimir. (1932). *General Principles of Human Reflexology* (Krainsky, pgs. 97, 101). Ayer Publishing.
3. (a) Krainsky, N. (1909). "Principles of Energetic Psychology" (Die Prinzipien der Energetischen Psychologie), *Annalen der Naturphilosophie*, 1(4) Nov. pgs. 371-385; 413-470.
(b) Author. (1910). "article" (Krainsky, pgs. 82; 109). *The Journal of Philosophy, Psychology, and Scientific Methods,* Vol. 7. Science Press.
4. (a) Krainsky, N. (c.1900). *The Principles of Energy Psychology* (*Die Prinzipien der Energetischen Psychologie*) (ego, pgs. 413-470). Publisher.
(b) Author. (1910). "Article" (pg. 109), *The Journal of Philosophy, Psychology and Scientific Methods*. Science Press.
5. (a) Krainsky, N. (c.1900). *The Principles of Energy Psychology* (*Die Prinzipien der Energetischen Psychologie*) (ego, pgs. 371-85). Publisher.
(b). Author. (1910). "Article" (pg. 82), *The Journal of Philosophy, Volume 7*. Publisher.

θΔics

In thermodynamics, **Nikolay Bogolyubov** (1909-1992) or Nicolai Bogoliubov, was a Russian mathematician and theoretical physicist, notable for being the founder of the Russian school of thermodynamics, a statistical mechanics focused school. [1]

References

1. Luzzi, Roberto, Rossas, Vaaconcellos, Aurea R., Ramos, Jose. (2000). *Statistical Foundations of Irreversible Thermodynamics* (Russian school, pg. 126). Vieweg+Teubner Verlag.

External links

â— Nikolay Bogolyubov – Wikipedia.

θΔics

In existographies, **Nikolay Chernyshevsky** (1828-1889) (CR:3), or Nicholas, was a Russian materialist philosopher, noted for []

Overview

In 1860, Chernyshevsky, in his essay "The Anthropological Principle in Philosophy", argued that, based on the recent chemical vitalism theory (see: vitalism) downfall—i.e. that organic substances, such as urea or acetic acid, could be made outside of organic bodies—and the utilitarianism views of John Mill and the humanistic materialism views of Ludwig Feuerbach, he outlined a social materialism philosophy (see: materialism): [1] He called his model the "anthropological principle". [2] On this principle, Chernyshevsky did away with all dualisms: mind-body (Cartesian dualism), mind-brain, subject-object, etc., and attempted to solve the great question of good and evil and of human actions based thereon, based on his unique version of utility:

> "Good is the superlative of utility, a very useful utility."

Evil, therefore, consists in what is not useful, and theoretical miscalculations in determining utility cause the extreme evil that man perpetual on each other. [3]

Russian revolution

Chernyshevsky put this philosophy into his 1863 *What Is to Be Done?*, which was read by Lenin (five times in one summer) among others, and is said to have "supplied the motional dynamic that eventually went into make the Russian Revolution." [4]

Quotes | On

The following are quotes on Chernyshevsky:

> "You say, science itself will teach man that he does not really have either caprice or will of his own and that he has never had it, and that he himself is something like a piano key or an organ stop, and that, moreover, laws of nature exist in this world, so that everything he does is not done by his 'will' at all, but is done by itself, according to the laws of nature. Consequently, we have only to discover these laws of nature, and man will no longer be responsible for his actions and life will become exceedingly easy for him."
>
> — Fyodor Dostoyevsky (1864), *Notes From the Underground* (pg. #); supposedly, a satirical response to the view of **Nikolay Chernyshevsky** (1860), as summarized by George Scott (1985) in *Atoms of the Living Flame* (pg. 117)

> "What we call 'will' is not free, but only a link in the chain of causes giving rise to human acts. Human 'will', therefore, is subject to material natural law. Chernyshevsky did not state it chemically; but, because man was a 'chemical combination', he believed that it now was possible to explain all will and behavior on the basis of a rational concept.
>
> — George Scott (1985), *Atoms of the Living Flame* (pg. 113); summary of the c.1953 views of Nikolay Chernyshevsky (Ñº)

Quotes | By

The following are quotes by Chernyshevsky:

> “The human organism is but a complex ‘chemical combination’ that goes through an extremely complex chemical process that we call life; human ‘acts’, in their theoretical formula, all come under the same law; the strongest passion gains the upper hand over those that are less strong, which are sacrificed to the former.”
>
> — Nikolay Chernyshevsky (1860), “The Anthropological Principle in Philosophy”; cited by George Scott (1985) in *Atoms of the Living Flame* (pgs. 112-13)

References

1. Chernyshevsky, Nikolay. (1860). “The Anthropological Principle in Philosophy”, *Sovrernennik*, no. 4; in: *Selected Philosophical Essays* (pgs. 49-135), Moscow, 1953.
2. Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pgs. 111-14). University Press of America.
3. Barnhart, Joe E. (2005). *Dostoevsky’s Polyphonic Talent* (pg. 188). University Press of America.
4. What Is to Be Done? (novel) – Wikipedia.

External links

â— Nikolay Chernyshevsky – Wikipedia.

θΔics

In hmolscience, **Nikos Salingaros** (c. 1949-) is a Australian-born American mathematician and architect noted, in architectural thermodynamics, for his 1997 thermodynamics-in-namesake model of things such as "living buildings", architectural temperature, among others.

Overview

In 1997, Salingaros, in his "Life and Complexity in Architecture from a Thermodynamic Analogy", wherein he attempted to outline a simple model, using ideas of Christopher Alexander, to estimate certain intrinsic qualities of a building, according to which the architectural temperature T is defined as the degree of detail, curvature, and color in architectural forms. The following is an example quote: [1]

> "The connection between biological life and architectural life, as an organization of matter and energy of human actions, arises from thermodynamics."

Salingaros uses verbalized analogies, unitless thermodynamic variables, e.g. architectural entropy and architectural temperature, chaos theory, and complexity, outlining what he calls the "three laws of architectural order" geared to match building design with emotional comfort and beauty. [1]

Education

Salingaros completed his BS from the University of Miami in 1971 and his MS (1974) and PhD (1978) from the State University of New York, all in physics. [2] He is currently a professor of applied mathematics at the University of Texas at San Antonio. Salingaros also serves as a visiting (or adjunct) professor at Technologio de Monterrey (urbanism), Mexico, University of Delft, Holland (urbanism), and University of Rome III (architecture), Italy.

References

1. (a) Salingaros, Nikos A. (1997). "Life and Complexity in Architecture from a Thermodynamic Analogy." *Physics Essays*, Vol. 10, pgs. 165-73.
(b) Salinngaros, Nikos A.. (2007). *A Theory of Architecture* (ch. 5: Life and Complexity in Architecture from a Thermodynamic Analogy, pgs. 105-28; quote, pg. 127). Contributors: Mehaffy, Michael W., Terry M. (Con.) Mikiten, Debora M. (Con.) Tejada, Hing-Sing Yu. Umbau-Verlag Harald Puschel.
2. Nikos Salingaros - Curriculum Vitae.

Further reading

- Salingaros, Nikos A. (1995). "The Laws of Architecture from a Physicist's Perspective", *Physics Essays* 8**:** 638-643.

External links

- Nikos Salingaros – Wikipedia.
- Nikos Salingaros – Nexus Network Journal.
- Nikos A. Salingaros (Homepage) – Zeta.Math.utsa.edu.

θΔics

In geography, **Nile River** is a north-flowing river, predominately located in Egypt, the world's largest river, behind the Amazon River, whose tributaries are the Blue Nile, originating from Lake Tan, in Ethiopia, and the White Nile, originating from Lake Victoria, in Kenya and Tanzania.

A picture of the **Nile River** during flood season; prior to the the 1970 construction of the Aswan Dam, the Nile would rise to heights of 30 feet, and last for 150 days. This phenomena is the basis for all the world's flood myths, via the water god Nu (Nun) turned, MaNu (VishNu), i.e. MaNu's flood, Noah, i.e. Noah's flood, etc.

Helical rising | Flood

In Jun, in Egypt, the Nile River, owing to snow melting in the Ethiopian mountains, begins to flood, rising to heights of 30 feet, lasting 150-days.

In 450BC, Herodotus, in his *History* (2.19.2), stated that the Nile rises at the summer solstice, and after 100 days falls again. [4]

On Jun 25, the helical rising of Sirius, previously absent for 70-days, occurs, which marks the start of the annual Nile River flood. [2] As the star Sirius was associated with the goddess Isis, to the effect that the star seems to follow the Orion constellation, in the latter months of the year, as it perceptually "rises" as a human figure to a vertical orientation in the sky, the cultural story was common that the tears of Isis caused the Nile to flood:

> "The Egyptians hold the festival of Isis at the time when they say she is mourning for Osiris. At that time the **Nile River** begins to rise, and it is a common saying among the natives that it is the tears of Isis that cause the river to rise and water the fields."
>
> — Apuleius (c.165AD), *Eleventh Book*; cited by Wallis Budge (1904) [5]

In 1970, the Aswan High Dam was completed, which ended the summer floods and their renewal of the fertile soil, fundamentally changing farming practices.

Egyptian mythology

The Egyptians believed that the Nile River was mirrored in the sky by the Milky Way, as shown below (Q), and the three pyramids at Giza were built to mirror the belt of the Orion constellation, who they considered the god Sah (astral body) or Osiris:

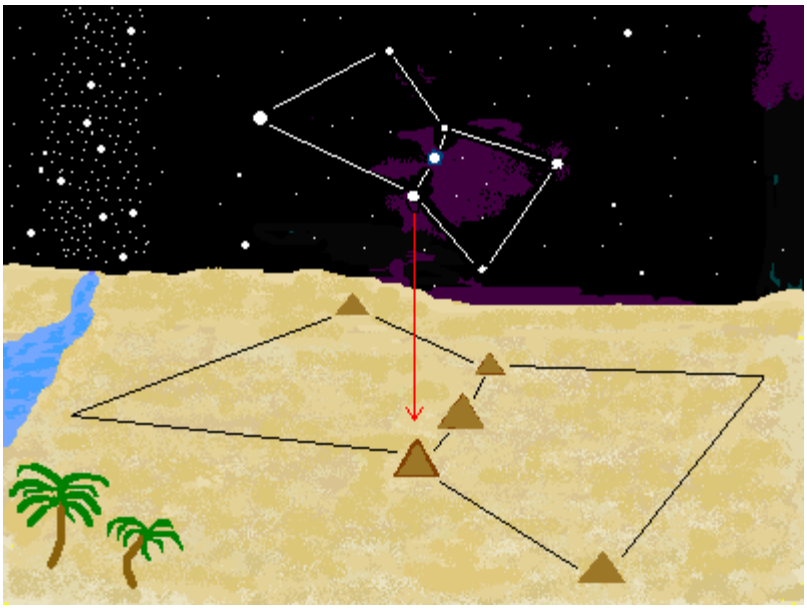

The flooding of the Nile, the helical rising of Sirius, and the re-kindling of the Sun on Dec 25 formed the core of Egyptian mythology.

According to one account, it was believed, by the Egyptians, that the annual flooding of the Nile River was caused by Isis weeping for her husband. [3]

> "Who is there that does not know **that the vapor of the sun is kindled by the rising** of the **dog-star** [Sirius]? The most powerful effects are felt on the earth from this star. "When it rises, the seas are troubled, the wines in our cellars ferment, and stagnant waters are set in motion. There is a wild beast, named by the Egyptians Oryx, which, when the star rises, is said to stand opposite to it, to look steadfastly at it, and then to sneeze, as if it were worshiping it. There is no doubt that dogs, during the whole of this period, are peculiarly disposed to become rabid."
>
> — Pliny the elder (77AD), "On the Rising of the Dog Star" [1]

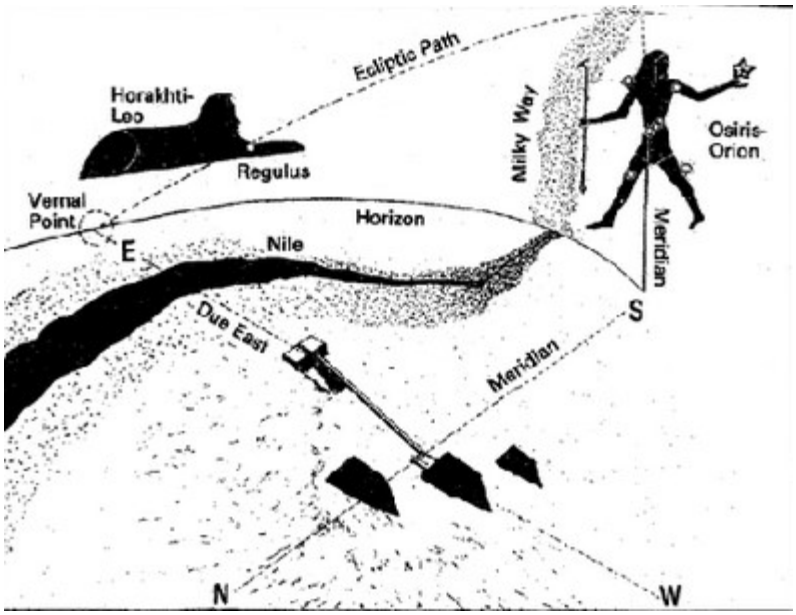

A diagram (Q)(Q) showing how the Egyptians considered the **Nile River** to be a mirror representation of the Milky Way.

(add)

Christian mythology

At a certain point in the annual flood cycle, the Nile turned "red colored", owing, supposedly, to he red mud from the mountains. In the Bible, this is told as the story in Exodus 7:20 (Q) of Moses turning the Nile to blood via the action of a miracle.

Muslim mythology

In 1904, Wallis Budge summarized things as follows: [1]

> "The ancient Egyptian festival has its equivalent among the Muhammadans in that which is celebrated by them about Jun 17, and is called *Lelet al-Nukta*, i.e., Night of the Drop, because it is believed that on that night a miraculous drop falls from heaven into the Nile and makes it to rise."

(add)

Quotes

The following are related quotes:

> "If I now ask you: 'How, exactly, did the Dracula myth come about? Why? Who refashioned and propagated it? Why did they base it on Vlad mythology?', we run into the same type of quagmire; certainly Vlad was a real person, prior to his transformation into the myth of Dracula, just as the annual **Nile River** flood is a real phenomenon, prior to its transformation into the myth of Noah and the Biblical flood, but to track down the specifics of 'who' and 'why', particularly in the latter example, wherein exact documentation is less readily available, is a big tossup."
>
> — Libb Thims (2014), "Hawking-Faraday Paradox" (Q), Hmolpedia tread (#9), Oct 8.

> "In order to understand hmolscience, one has to understand 100 percent that the Bible, and related derivatives, i.e. Quran, Rig Vida, Buddhist scriptures, etc., is but a collection of ancient proverbs, and semi-modern morals, i.e. rules for right and wrong, anchored into a proto-scientific mythological framework, framed within a tale of humans created from clay, amid a cyclical **Nile river** flood sun rebirth cosmology."
>
> — Libb Thims (2016), "mental note", arisen while pausing amid doing bench and shoulder press sets, while looking at the parallel Bible sitting on the book shelf, 1:46 PM CST Feb 20

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pgs. 47). Dover, 1969.
2. Sirius – Wikipedia.
3. Bob. (2015). "Temple of Isis on Philae Island Aswan" (Q), Blogspot, Jun.
4. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (pg. 189). Oxford University Press, 1998.
5. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pgs. 216-17; Isis weeping, pg. 219). Dover, 1969.

External links

- Nile River – Wikipedia.

θΔics

In hmolscience, **Niles Lehman** (c.1962-) (DN=6/10) is an American chemist noted for his 2012 "The Chemical Origin of Behavior is Rooted in Abiogenesis", co-authored by Brian Larson and Paul Jensen, reviewed by Christopher Southgate, Andrew Robinson, and Mark Ditzler, wherein they attempt to grapple with free will, the origin of life problem (aka the great problem of natural philosophy), and animal behavior in terms of chemistry, or rather "behavioral chemistry" as they call it, namely the argument that RNA polymers of a sufficient length have the ability of "making a choice". [1]

Life

On the topic of "abiogenesis", after being directed to the following articles: life does not exist, defunct theory of life, and life terminology upgrades, Lehman had the following to say: [2]

> "'Life' exists, if only as a useful human perception. That's good enough for me to spend my academic career focused on its origin."

(add discussion)

Religion

On the question of his Dawkins number, Lehman has the following to say:

> "Dawkins Number. I hadn't seen that. Off hand: oscillating between being exactly on 6 and exactly on 10, depending on mood. It's probably one of those things that could be quantized, but shouldn't be."

Education

Lehman completed his BS in chemistry in 1984 and MA in comparative biochemistry in 1986, both at the University of California, Berkeley, and his PhD in biology at the University of California, Los Angeles. Since 2001, he has been a chemistry professor at Portland State University, where he teaches courses on the chemistry of the origins of life (Chem 360), prebiotic chemistry (Chem 460/560), along with general chemistry and biochemistry, and also is editor-in-chief of the *Journal of Molecular Evolution*.

References

1. Larson, Brian C., Jensen, R. Paul, and Lehman, Niles. (2012). "The Chemical Origin of Behavior is Rooted in Abiogenesis" (Ñº), *Life*, 2:313-322.
2. Lehman, Niels. (2014). "Email communication with Libb Thims", Dec 16.

Further reading

â— Lehman, Niles, Berghard, Tess, Larson, Brian C., Robinson, Andrew J.N., and Southgate, Christopher C.B. (2014). "Empirical Demonstration of Environmental Sensing in Catalytic RNA: Evolution of Interpretive Behavior at the Origins of Life" (pdf), *BMC Evolutionary Biology*, 14:248.

External links

â— Niles Lehman (faculty) – Portland State University.

θΔics

In religio-mythology, **Nimrod**, worshiped: 2,000-1500BC, from Nimr, meaning “the leopard”, and Rod, meaning “to subdue”, rendered as “spotted” in Hebrew (Q), was Sumerian god equivalent of the Egyptian Osiris.

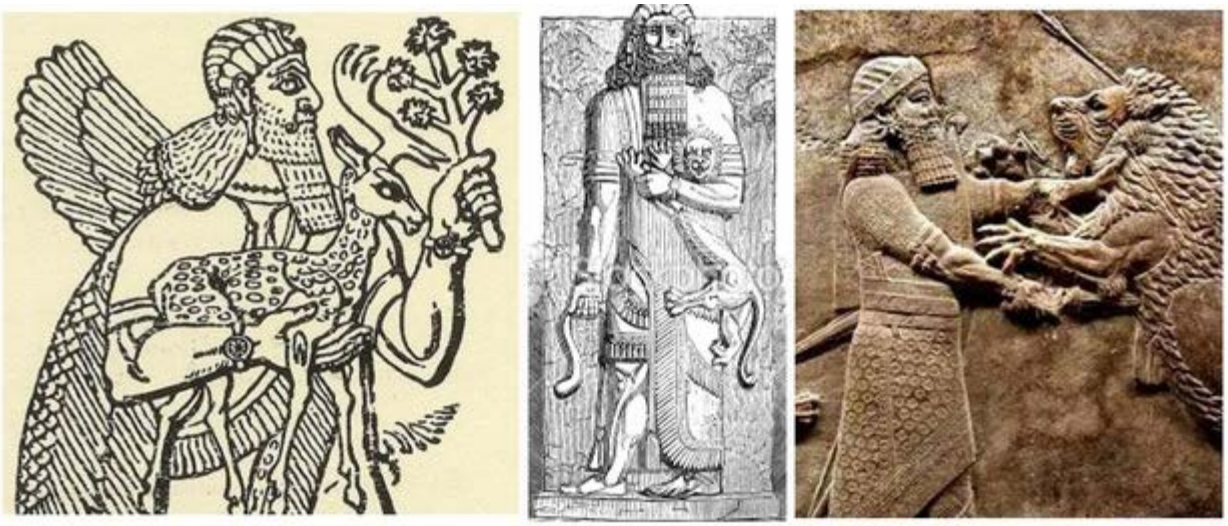

Various depictions of the Babylonian god **Nimrod**, with his spotted leopard and Zoroaster (800BC) like wings, which are themselves a rescript of the wings of the aggregate Egyptian god Amen (1900BC).

Nimrod | Osiris

In 2004, Steven Merrill, in his *Nimrod: Darkness in the Cradle of Civilization*, describes Nimrod as such:

> “**Nimrod** tamed a leopard, according to legend. The leopard supposedly accompanied him on hunting expeditions. The Babylonian name for leopard is ‘Nimr’, and ‘Rod’ means, ‘to subdue.’ Nimrod is often depicted wearing a garment of leopard skin in the artwork of antiquity. The Hebrew word Nimrod means, 'to rebel,' or 'to revolt' That definition illustrates the story of this man's life. He was the chief instigator of the rebellion against god and is credited for building the Tower of Babel. **Tammuz and Nimrod are names for the same person**. Myths from civilizations of antiquity describe the sun god (deified Nimrod) fathered Tammuz using a sunbeam to impregnate the maiden Semiramis. The result was a re-incarnated Nimrod. Mythology portrays Semiramis as world civilizations worshipped her in that way. Extra-Biblical legends about Tammuz are plentiful. Sumerians called him Dumuzi. He was allegedly a shepherd king of Uruk during his lifetime. Dumuzi (Nimrod) married Manna (Semiramis). The gods granted him divine power over the fertility of plants and animals following the consummation of their marriage. According to legend, Dumuzi gave his life as a ransom for Manna after the goddess of the under-world captured her. Demons from the underworld slayed Dumuzi after Manna was released, and they took his spirit to their domain. Dumuzi was later freed from the underworld for half the year while his sister, Geshtinanna (goddess of wine), served out his term. The gods permitted this rotational arrangement because Manna mourned ceaselessly before the gods.”

The above mention of Nimrod and the leopard skin connects him to Osiris, Dionysus, Bacchus, Moses (see: Osiris, Dionysus-Bacchus, and Moses) and their leopard-skinned “thyrsus”.

Tammuz

Nimrod, according to Sumerian mythology, had a mother-wife named Sumeramis, or Semeramis (aka Astarte, Asherah, Ashtoreth, Isis, Ishtar and Easter) (Q), who supposedly is the root (Q) of the name Sumer. Nimrod then died, somehow, and Sumeramis, according to legend, reanimated (Q) the dead body of Nimrod in order to conceive the child Tammuz:

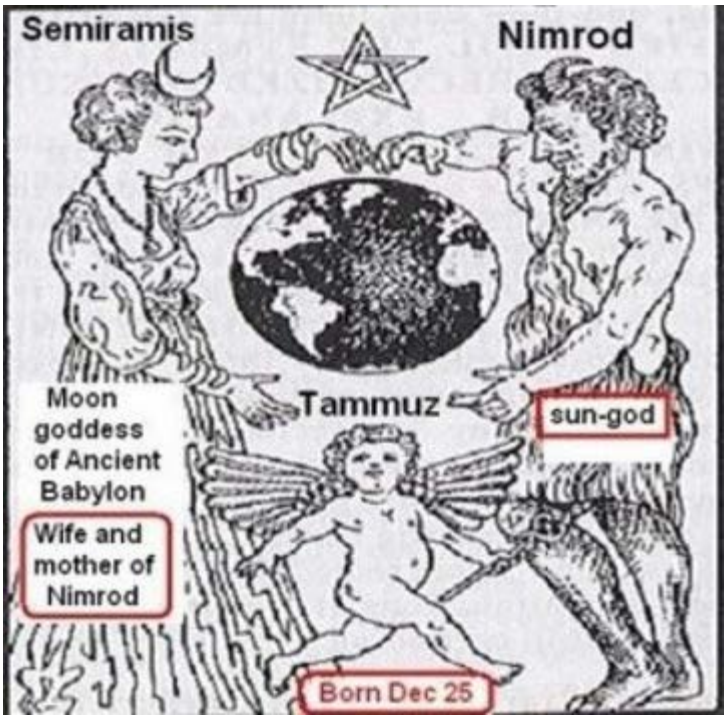

Here, as we see, this is a retelling of the "black rite" reincarnation sex of Osiris to make Horus of Egyptian mythology.

Evergreen tree

The story of Osiris turning into a tamarisk tree, in the Passion of Osiris, is also retold in the Sumerian mythology version as follows:

Nimrod as Evergreen Tree (900BC)

A depiction of the **Nimrod** as an evergreen tree, which is a rescript of Osiris as a tamarisk tree and or in the form of the djed pillar.

> "The queen (Semiramis) told the worshipers that when Tammuz (aka **Nimrod**) was killed … some of his blood fell on the stump of an **evergreen tree**, and the stump grew into a full new tree overnight. This made the evergreen tree sacred by the blood of Tammuz."
>
> — David Meyer (2000), "The Pagan Origin of Easter (Q)

In 1998, Sheryl Karas, in her *The Solstice Evergreen*, touches on some of this Tammuz tree variant. [2]

Obelisk | Phallus

In 2015, Roberta Sams, in her *There Were Giants on the Earth on those Days*, summarizes the obelisk as follows: [3]

> “Another telling goes like this, **Nimrod**/Osiris was killed by an enemy and his body was cut into pieces and sent out into his kingdom. Semiramis gathered all the parts and seemingly put them back together, except for his reproductive organ, which she could not find. She proclaimed that Nimrod could not come back to life without that missing part, and she had one made and set up in Babylon. "Semiramis quarried out a stone from the mountains of Armenia which was one hundred and thirty feet long and twenty five feet wide and thick... she brought it down the stream to Babylonia...." "The ancient Greek historian, Diodorus, reports that Queen Semiramis erected a 130-foot obelisk in Babylon and it was associated with sun worship and represented the **phallus of the sun god Baal/Nimrod**. Some Masonic researchers say that the word `obelisk' literally means 'Baal's shaft' or 'Baal's organ of reproduction'." is . This particular obelisk is not found today, it is known as the Lost Obelisk of Babylonia. There are others. That missing part would later be represented by thousands of obelisks around the planet. The obelisk is still recognized as **Osiris/Nimrod's phallus**, his sex organ of reproduction. One wonders why there is a huge obelisk in Washington, D.C., and one at the Vatican. There are obelisks in just about every important city and in every nation on earth. Why?”

(add)

References

1. Merrill, Steven. (2004). *Nimrod: Darkness in the Cradle of Civilization* (pg. 336), Xulon Press.
2. Karas, Sheryl. (1998). *The Solstice Evergreen: History, Folklore, and the Origins of the Christmas Tree*. Author’s Choice Publishing.
3. Sams, Roberta. (2015). *There Were Giants on the Earth in Those Days and Also After* (pg. #). Balboa Press.

External links

- Nimrod – Wikipedia.

θΔics

In Sumerian mythology, **Ninti**, from *Nin-* “lady” + *-ti* “rib” / “to make live”, is a life goddess, of sorts, noted for her curing of Enki’s rib, which is said to have made its way into the story of god creating woman out of Adam’s rib (see: Adam). [1]

A exaggerated depiction of **Ninti** holding Enki’s rib.

Overview

In the c.1250BC Nippur tablets, which describes the Sumerian version of the destruction of mankind, humans are characterized as "Ninti's creations". [3]

Synonyms

Ninti is also known as: “Nintu” (lady of birth) (Poebel, 1914) (Jordan, 1993), Ninhursaga (lady of the mountain), Ninmah (great queen), Mami (mother), Aruru (sister of Enlil), Belet-ili (lady of the gods [Akkadian]), is []. [2]

References

1. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (Myth #23: Eve Came from Adam’s rib, pgs. 54-55). Source Books.
2. (a) Poebel, Arno. (1914). *Historical Texts*, *Issue One* (translation, pgs. 17-20; date, pg. 24). Publisher.
(b) Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (pgs. 184-85). Facts on File, Inc.
3. Poebel, Arno. (1914). *Historical Texts*, *Issue One* (translation, pgs. 17-20; date, pg. 24). Publisher.

External links

â— Ninti – Wikipedia.
â— Mami (goddess) – Wikipedia.
â— Ninhursag – Wikipedia.

θΔics

In chemistry, **nitrogen**, symbol N, atomic number 7, is a nonmetallic element, row one of the periodic table, the fourth most abundant element in the person, comprising 2.6 percent by mass of an average human molecule. [1]

Rank	CPK (jmol)	Symbol	Z	% Mass	Picture	Electron Configuration
4		N	7	2.6		$[He]2s^2 2p^3$

Human molecular formula

The position of the element nitrogen in the average human molecular formula is as follows:

$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}$

$Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$

Function

Typically, the most expensive foods contain nitrogen, being that atmospheric nitrogen, the main source of nitrogen, can only be fixed by bacteria in soil, which becomes incorporated into plants, then into the meat of animals, of which meat, egg, and dairy are the primary "complete" proteins, i.e. meaning they contain all of the essential amino acids (for protein building), of the human diet. [2]

Quotes

In 1874, English physical economist Stanley Jevons gave the following view of nitrogen in relation to the human: [3]

> "By degrees it is found that the chemistry of organized substances is not widely separated from, but is rather continuous with, that of earth and stones. Life itself seems to be nothing but a special form of that energy which is manifested in heat and electricity and mechanical force. The time may come, it almost seems, when the tender mechanism of the brain will be traced out, and every thought reduced to the expenditure of a determinate weight of **nitrogen** and phosphorus."

This is excellent discernment for 1874, indeed.

> "No apparent limit exists to the success of scientific method in weighing and measuring, and reducing beneath the sway of law, the phenomena both of matter and of mind [mind brain duality]. And if mental phenomena be thus capable of treatment by the balance and the micrometer, can we any longer hold that mind is distinct from matter? Must not the same inexorable reign of law, which is apparent in the motions of brute matter, be extended to the most subtle feelings of the human heart? Are not plants and animals and ultimately man himself, merely crystals, as it were, of a complicated form? If so, our boasted free will becomes a delusion, moral responsibility a fiction, spirit a mere name for the more curious manifestations of material energy. All that happens, whether right or wrong, pleasurable or painful, is but the outcome of the necessary relations of time and space and force, and of the laws of matter emerging from them, which are fixed in the very nature of things.
>
> Materialism seems, then, to be the coming religion, and resignation to the nonenity of human will the only duty. Such may not generally be the reflections of men of science, but I believe that we may thus describe the secret feelings of fear which the constant advance of scientific investigation excites in the minds of many who view it from a distance. Is science, then, essentially atheistic and materialistic in its tendency? Does the uniform action of material causes, which we learn with an ever increasing approach to certainty, preclude the hypothesis of an intelligent and benevolent creator, who has not only designed the existing universe, but who still retains the power to alter its course from time to time?"

He concludes this excellent tract, being already well past the 400+ page mark of his treatise, by commenting “to enter actually upon theological discussions would be evidently beyond the scope of this work.”

In 1991, in a similar vein, American philosopher Robert Pirsig commented: [4]

> “Why should a group of simple, stable compounds of carbon (C), hydrogen (H), oxygen (O), and **nitrogen** (N), 'struggle' for billions of years to organize themselves into a professor of chemistry? What's the motive? If we leave a chemistry professor out on a rock in the sun long enough the forces of nature will convert him into simple compounds of carbon, oxygen, hydrogen and nitrogen, calcium, phosphorus, and small amounts of other minerals. It's a one-way reaction.”

References

1. Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc) (pgs. 52-55). LuLu.
2. Slosson, Edwin. (1925). *The Sermons of a Chemist* (pgs. 10-11). Harcourt, Brace, and Co.
3. (a) Jevons, William Stanley. (1874). *The Principles of Science: a Treatise on Logic and the Scientific Method* (Book VI, ch. 31: Reflections on the Limits of the Scientific Method, pgs. 427-70; quote, pgs. 427-28).
(b) Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature’s Economics* (pg. 219). Cambridge University Press.
4. Pirsig, Robert M. (1991). *Lila: An Inquiry into Morals* (excerpt, pg. 140; chemistry, 11+ pgs). Random House.

External links

â— Nitrogen – Wikipedia.

θΔics

Article
Natural Law Social Science: A Method of Socioeconomics as an Exact Science | **Peer Review**
(a JHT submission)

Article | Review versions
â— Original article | Received: 31 Jan 2012 | Pages: 7
â— **Formatted article** | 3 May 2013 | Pages: 12 | Format: PDF

This is a new **JHT peer review stage article**, in the re-formatting and or re-construction stage of development, about which: comments, suggestions, and or criticism are welcome, which can be submitted via: (a) the threads below, (b) comments added into the "this" wiki page, via the EasyEdit button, (c) attachment added to this page, via EasyEdit tools, (d) review posted externally, e.g. in beta wiki, WordPress, Blogger, your own website, etc., or (e) email comments sent to JHT editor Libb Thims directly *via* libbthims@gmail.com, which will be made public.

Abstract
The formatted abstract of the working draft-article is as follows:

A presentation of a synopsis of socioeconomics as a potential-to-become exact science based on units of time, money, and energy is given.

Author
Stephen Ternyik
Email: StephenJehucal@web.de
Independent researcher, Munich, Germany

Received: 31 Jan 2012; *Reviewed:* 3 Mar 2013-(Date); *Published:* Date

Review period
This article entered the review period on 3 May 2013 and will close prior to 27 Jun 2013, the date when JHT editor Libb Thims leaves for the University of Pitesti Econophysics and Sociophysics Workshop 2013, if not sooner as Thims will need to focus on completion of his key speaker talk. [1] Comments and review in between these two points will be appreciated.

Editorial questions

Formatting | Other

Libb Thims | 3 May 2013 | **Post**

The following questions, accumulated during editing, are in need of resolve by the submitting author:

Q1. What does the author mean by this statement: 'Erroneous monetary thought and methodical financial mischief did historically always result in a rapid entropy of the socio-economic system'?
Q2. What does the author mean by this term: '*working body* economic'?
Q3. Why are John Keynes and Hyman Minsky mentioned in the conclusion but not mentioned in the article?

Stephen Ternyik | 3 May 2013 | **Email**

Response:

A1. Since Sumer/5000 years, social entropy wasalways caused by an unreasonable expansion of the monetary volume (monetary excess);
A2. The human economy works like a living organism;
A3. Both economists (Keynes, Minsky) are common to economic discourse as the ocean is made up of water.

Prof. Leonid Grinin/Volgograd (leonid.grinin@gmail.com) and Prof. Andrey Korotayev/Moscow (akorotayev@gmail.com) know a lot of my recent attempts on global wave compression, universal temporal scaling and world system energetics.

Libb Thims | 4 May 2013 | **Post**

Re: Q2. '*working body* economic'?, I still need clarification on your usage here: "working body" is a very specific usage in thermodynamics; and I'm not exactly sure what you mean by "economic"? Do you mean "economic[s]" plural or "economic system" or do you mean by this term the "production and exchange of goods and services" or something else?

Stephen Ternyik | 5 May 2013 | **Email**

Response: Re: A2.

Working = physical function;
Body = physical structure;
Economic = concerned with production/distribution;

the human economy works like a living organism by the laws of energetics.

Peer review

Reviews | **Review board** | Other

Kalyan Annamalai | 3 May 2013 | **Email**

Comment: "I briefly went over; it is an interesting proposition; after finals are over (May 13th), I will have another look at it."

Curtis Blakely | 7 May 2013 | **Email**

Comments: Comments regarding "Natural Law Social Science: A Method of Socioeconomics as an Exact Science". To begin, let me say that the quality of articles that appear in JHT are some of the best that I have read over the course of my academic career – and I have found this article stimulating as well.

I agree with many of the statements that Ternyik makes especially with regard to the lost science of applying the natural sciences to the study of human behavior as a way of gaining insight into the social realm. His discussion of "time" at least for me, was a bit confusing, but all of us would certainly agree that time is the only reference point with universal meaning.

In several places, the author uses the words "our" and "we" - this is a bit misleading since he appears as the sole author of the paper.

The author's discussion of recurrent recessions and depressions is greatly welcomed as I too find that many events occur in "cycles" (and these are often difficult for us to discern since we are participants and our vantage point is quite limited (yes, often by time itself)). In fact, one of the great things about socio-physics is that it provides us insight into concepts like "cycles".

If I were to add a single suggestion, it would simply be that I would attempt to write in a more simplistic manner to facilitate understanding among the layperson. For example, "The physicality of money is its medial service as replicative market mechanism…." – a bit confusing, and while I understand the meaning being conveyed, believe that we must keep specialized terminology and phrases to a minimum (thereby making our efforts more attractive to a larger audience). Another quality paper and I applaud the author!

Libb Thims | 7 May 2013 | **Post**

Re (Blakeley review): "His discussion of "time" at least for me, was a bit confusing, but all of us would certainly agree that time is the only reference point with universal meaning", yes I get the idea that he recently read Moshe Carmeli's 2008 *Relativity: Modern Large-Scale Spacetime Structure of the Cosmos*, which is cited in his reference section? The usage of time in the argument also brings to mind Gilbert Lewis' famous quote:

"Time is not one of the variables of pure thermodynamics."

— "The Symmetry of Time in Physics" (1930)

these "variables" of pure thermodynamics, to remind us, are the following, give or take one or two I may be leaving out:

Variables (extensive)	Variables (intensive)
Length *l*	
Surface *A*	
Volume *V*	Temperature *T*
Entropy S	Pressure *P*
Internal energy *U*	Magnetic field *B*
Enthalpy *H*	Chemical potential μ
Free energy, *F* or *G*	Density
Momentum	Velocity
Kinetic energy	
Electricity amount of (of substance)	

in which "time" is not one of the variables. Hence, if Ternyik's aim, quoting from his abstract, is to make socioeconomics into an "exact science" (which he seems to think will be in units of time, money, and energy) he will have to rethink his target, because "time" and "money" are not variables of pure thermodynamics, as Lewis defines things.

Re (Blakeley review): “The physicality of money is its medial service as replicative market mechanism….”, being personalized jargon ridden, I agree. The author needs to be more clear in these loaded terms, e.g. "replicative market mechanism".

Stephen Ternyik | 7 May 2013 | **Post**

Response: Thank you for the comments and I will learn from the details mentioned; visit SSRN (world system energetics) and you can see that it got more simple; also plain logic formulae are work in progress. Yes, M.Carmeli*** is exciting, because of the backward motion of time ! Energy is the **technical key** as money has become (temporal) access to energy; historically and empirically, human energy consumption evolved like the Snooks-Panov algorithm projects!' New thermodynamics' (e.g, the syntropy project/Ulisse di Corpo) points to alternative views of energetics; E. Yudkovsky from Machine Intelligence Research Institute opens up new horizons for applied rationality. Of course, my scientific aim is exactness (say 99%).

Umberto Lucia | 8 May 2013 | **Email**

Comments: I think that the author would consider Velasco's approach in his paper. Indeed, prof. Velasco have introduced a thermodynamic approach to economics, obtaining many results. Moreover, I suggest to introduce also some consideration on Wall's and Sciubba's papers and results.

Stephen Ternyik | 10 May 2013 | **Post**

Response: Grazie! Prof. Velasco served very well as Finance Minister/Chile (2006-2010), his model of reserve-building is an empirical example/pardigm that dynamic efficiency pays back for the better interplay of public & private concerns. Maybe, Prof. J. Huerta de Soto's : Theory of Dynamic Efficiency was influential as it was first written in Castellano/Spanish.

Mohsen Mohsen-Nia | 9 May 2013 | **Email**

Comments: Good article overall, but for me (I’m not a professional in the social science discipline of economics), there is one major problem in this
article with the re-definition of values of the physical thermodynamic variables as representative monetary production economic. In thermodynamics, there are clear definition for the independent thermodynamic variables such as temperature, volume and pressure and their relations with the dependent variables such as energy, force and entropy. The author needs to present a brief description for the left column of redefinition table showing the relation between monetary production economics variables and the corresponding variables in the right column. Can the author elaborate some on the conceptual definition of "accounting" and "equilibrium"?

Stephen Ternyik | 10 May 2013 | **Post**

Response: The balance of payments in the daily economics profession is traditional boop-keeping technique, trying to compute the monetary flow into equilibrium. Scientifically, it does not exist because the payment (particle) travels in the wave function of all

payments; the fiat expansion of the monetary volume (via credit x interest in exponential rate) wants politcally to grow the market, hence even more energy is needed for input. This economic behavior is an artificial wish list that does not reflect the physical boundaries of production/distribution; a more advanced elaboration is now posted at SSRN: World System Energetics. Even if bioelectronic money will be introduced, the monetary system will physically evolve towards dynamic efficiency (minimum: narrow reserves) or fully go bust. Time will teach us this lesson, even it is not a thermodynamic variable, but energy is; the temporal acceleration on this globe is proportionally caused by increasing energy consumption, i.e. monetary reserves are a consequence of economic reason.The Snooks/Panov-algorithm documents this empirical trend from the long-term perspective.

Gheorghe Savoiu | 29 May 2013 | **Email**

Comments: THE PROBLEMS OF THE ARTICLE
How can we identify laws and variables between economics and physics?
How can we generate a new physics theory and reunite general relativity and quantum theory?
How can we extend this theory to economics when it does not exist in physics?

THREE FORMAL SOLUTIONS
The major similarities between:

-variables in economics and physics
-laws of economics and physics
-methods and models of economics and physics

COMMENTS
The similarities or the similitude between the variables and the laws of economics and physics must consider the following:

Macroeconomics overlaps the idea of Macrocosmic / Multiverse and could be reconsidered under the action of theory of relativity where the variable “inflation – unemployment” becomes the variable space – time from physics.

Microeconomics virtually identified with the micro particles / Microuniverse and quantum theory could be basically a quantum economics theory (e.g. the service could be the real wave).

Response: Multumesc ! Scott Patterson gave us in THE QUANTS and DARK POOLS a journalistic impression of methodical mischief in monetary economics, pointing to 'scientific errors'. Among the 3 formal solutions, methodical research into the *basic laws comes in NLSS first, but identifying & modeling variables (e.g.* ***energy*** *input, monetary volume, temporal interval) is vital for knowledge applications, to elaborating socio-economics and moneto-physics as exact discipline. In addition, the* ***global monetarization of human relations*** *calls ethically for a humanistic approach of the world monetary production economy (e.g.Syntropy, Value and Money/U di Corpo&Vanini/2013/e-book). It is my empirical guess or evolutionary observation that monetary economics will become more congruent with* ***energetics*** *if methodical rational reasoning gains 'sociophysical momentum'.*

Stephen I. Ternyik/1 June 2013

Jeff Tuhtan | 28 June 2013 | **Post**

Comments:
This is an interesting article, however there are in my opinion significant issues with assuming a connection between economics and energetics. It must be stated, that this is a much larger issue which extends far beyond the material in this submission. This criticism is therefore not meant solely for the author of this submission, but for all practitioners of economics as a "science", which it is certainly not.
A fundamental problem is relating the concept of money withanyphysical variable. Just as thermodynamic entropy cannot be described using Shannon's information theory, money cannot be described as units of energy. Money is debt, not energy. This is often easily overlooked, and through some hand-waving, or dealt with using complex mathematical formulations. It remains that there are no mathematically or physically rigorous theories in economics which have any real relations to "equilibrium" concepts culled from classical thermodynamics. If this were the case, the bankers would have harnessed a physical energy source unimaginable!

Criticisms
Economics is not thermodynamics similar to the way that information theory is not. My recommendation is to put economics in the same category as religion when considering future submissions.
Response: Many thanks for your *elaborations***, Dr**, Jeff Tuhtan ! Economis is a social science, it has to explain human behavior. *Money is temporal acces to energy* and can be made into debt by banking practice (if the legal system allows that kind of 'economic performance'). We (me and you) have both bank accounts and we need to use these facilities to finance our livings; NLSS points precisely to this fact!**Your dogma=**(**money is debt, not energy**) can be submitted to the Vatican or any other orthodox institute (always financed via taxation as the state or any other similar non-productive organization), but it is false*** (**debt can be used as temporal access to energy**)*** For .myself, using the **empirical rationalist method**, you can not explain the passion of financial greed that destroys the harmony of our common biosphere. As having said that, **Dr. Tuhtan**, in future editions of this

journal, you will **surely** not have to bear the **religious burden** of reading future submissions by un-scientific researchers like me!*******. *'The bankers'* (your' scientific' jargon) can use and issue debt as temporal access to energy because it is legal, but it is a violation of natural law; exactly this problem is NLSS about. Consequently, 'the bankers' indeeed harnessed already unimaginable physical energy resources, but they have exploited vital future potential for no-thing than passionate greed ('stochastic gambling' as **science**). Economics is not thermodynamics and it is not information theory; it is about human behavior and adaptation to natural law. Economics is a profession (**like medicine**), not a science ! In any case, all the best: Stephen I. Ternyik/June28, 2013
Jeff Tuhtan | 29 June 2013 |**Post**

Comments:
I don't fully comprehend your response. There seems to be two levels involved, the first is some kind of personal issue surrounding my academic title. This has nothing to do with my comments, you don't need a PhD to point out that economics is not a physical science. Science is a method whose long-term successes are contingent upon the repeatability of the theses established by those practicing science. If you have a monetary theory invoking tenets of thermodynamics, it should be related to the well-worn concepts of heat and work. This should be expected when you submit to the Journal of Human Thermodynamics.
The first law of thermodynamics does not allow for the creation or destruction of matter-energy. Money can be created. This seems to be the crux of my problem in understanding how analogies between energetics and economics are not physically reconcilable without a new metaphysics. You state that "Money is temporal access to energy" and then attack my statement that money is debt. Only a few lines later you reiterate that "debt can be used as temporal access to energy." The harnessing of energy via debt is then described as a violation of natural law. What natural law are you talking about?
In your response, you seem to agree with my criticism: "Economics is not thermodynamics and it is not information theory..." That was pretty much all I was trying to convey. Your submission is certainly interesting, I am however not certain how well it fits within the Journal of Human Thermodynamics. This is why I made the recommendation that economics articles should be placed in the same "not necessarily related to Hmol science" category. I do not mean to state that economics is a type of religion.
Response**: Yes**, economics is not thermodynamics and not information theory; *a system of morality/ethics* is always involved. The monetary system has to learn from ecological energetics (6 principles, e.g. H.Odum) to fix the economic brakes of the financial machinery. The molecular 'Aufbau' (E.Müller) of human society is of higher physical order, even in group dynamics, and this is the social scientific problem to solve; human psychophysiology is more complex than the 4 laws of TD as veterinary medicine can also not catch the higher psycho-neural functions.of the 'homo economicus'; I hope this clarifies my point, concerning the economic application of the scientific method.
Stephen I. Ternyik/June 29, 2013

Exercises | Problems

Exercises | **Homework problems** | Other

On the wise protocol of Swedish physical chemist Sture Nordholm's penning of eight homework problems to his 1997 *Journal of Chemical Education* article “In Defense of Thermodynamics: an Animate Analogy”, the submitting author has provide (6 May 2013) two homework problems and or exercises, shown below, that will be added to the finial version of the submitted article, if published:

â— Problem #1: The technical introduction of bioelectronic money will not resolve the implicit error in our financial system. Why not, according to NLSS?

â— Problem #2: Money is temporal access to energy. Please discuss this statement from the viewpoint of NLSS! Is monetary inflation the economic indicator of social entropy?

JHT editor Libb Thims may, down the road, end up writing a *Chemical Thermodynamics: with Applications in the Humanities* textbook, built on Gilbert Lewis' famous 1923 *Thermodynamics and the Free Energy of Chemical Substances*, and some of these JHT homework problems may find their way into the end of chapter exercises.

References

1. Thims, Libb. (2013). “Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?” (abs) (main), University of Pitesti Econophysics and Sociophysics Workshop (UPESW) 2013 / Exploratory Domains of Econophysics News (EDEN V) (organizer: Gheorghe Savoiu). University of Pitesti, Pitesti, Romania, Jun 29.

In life theories, **no origin theory of life** posits that life is coeternal with matter, has no beginning; hence, in short, there is *no* origin of life. [1]

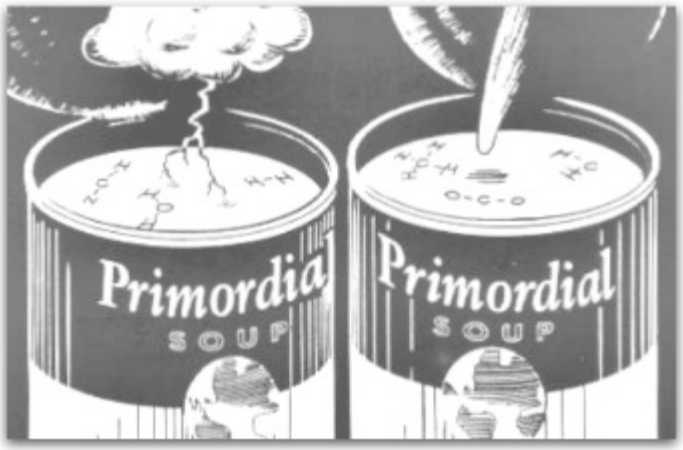

A depiction of the electrical origin of life theory (left), sometimes called the warm pond model or Miller-Urey experiment, and meteor origin of life theory (right), sometimes called panspermia theory, both variations of the primordial soup models of origin of life, each being the typical second stepping stone view in progression away from the creator theory of life (stone one): the third stone being the **no origin theory of life**, the forth being the defunct theory of life.

History

The first no origin statement seems to have been made and thereafter debated, by German chemist Justus Leibig:

> "It is sufficient to admit that life is as old and as eternal as matter itself, and the entire argument about the origin of life loses apparently all sense by this simple admission. And, really, why can we not imagine that organic life is just as much without beginning as is carbon and its combinations, or as is all uncreated and indestructible matter and the forces which are eternally bound up with the movement of matter in universal space."
>
> — Justus Liebig (c.1850), *Publication*; refuted by Friedrich Engels in his *Dialectics of Nature* (1883) as incompatible with the materialistic world view; both cited by Alexander Oparin in his *Origin of Life* (1936) in §2: Theories of the Continuity of Life (pg. 32)

In 1874, German physicist Hermann Helmholtz, in his "On the Use and Abuse of the Deductive Method in Physical Science", in his German translation of William Thomson and Peter Tait's *Treatise on Natural Philosophy*, penned the following statement—which supposedly is a middle ground position vented in his debated with the romanticism idealisms of German astrophysicist Karl Zollner and objections with Arthur Schopenhauer's philosophy: [6]

> "If failure attends all our efforts to obtain a generation of organisms from lifeless matter, it seems to me a thoroughly correct procedure to inquire **whether there has ever been** an origination of life, or whether it is not as old as matter, and whether its germs, borne from one world to another, have not been developed wherever they have found a favorable soil."

In 1874, English physical economist Stanley Jevons gave the synopsis of his concluding views on the over-typical response question of "what separates a rock from a human" if indeed there is no difference from life and non-life, in the chemical sense of things, specifically in context of the scientific method, nebular hypothesis, reductionism, materialism, evolution, heat death, heat birth, thermodynamics, in relation to the human feelings: [2]

> "By degrees it is found that the chemistry of organized substances is not widely separated from, but is **rather continuous** with, that of earth and stones. Life itself seems to be nothing but a special form of that energy which is manifested in heat and electricity and mechanical force. The time may come, it almost seems, when the tender mechanism of the brain will be traced out, and every thought reduced to the expenditure of a determinate weight of nitrogen and phosphorus."

> No apparent limit exists to the success of scientific method in weighing and measuring, and reducing beneath the sway of law, the phenomena both of matter and of mind [mind brain duality]. And if mental phenomena be thus capable of treatment by the balance and the micrometer, can we any longer hold that

> mind is distinct from matter? Must not the same inexorable reign of law, which is apparent in the motions of brute matter, be extended to the most subtle feelings of the human heart [love]? Are not plants and animals and ultimately man himself, merely crystals, as it were, of a complicated form? If so, our boasted free will becomes a delusion, moral responsibility a fiction, spirit a mere name for the more curious manifestations of material energy. All that happens, whether right or wrong, pleasurable or painful, is but the outcome of the necessary relations of time and space and force, and of the laws of matter emerging from them, which are fixed in the very nature of things.
>
> Materialism seems, then, to be the coming religion, and resignation to the nonenity of human will the only duty. Such may not generally be the reflections of men of science, but I believe that we may thus describe the secret feelings of fear which the constant advance of scientific investigation excites in the minds of many who view it from a distance. Is science, then, essentially atheistic and materialistic in its tendency? Does the uniform action of material causes, which we learn with an ever increasing approach to certainty, preclude the hypothesis of an intelligent and benevolent creator, who has not only designed the existing universe, but who still retains the power to alter its course from time to time?"

He concludes this excellent tract, being already well past the 400-page mark of his treatise, by commenting "to enter actually upon theological discussions would be evidently beyond the scope of this work."

In 1916, American mathematical physicist William Sidis gave the following statement of the no origin theory: [3]

> "The second law of thermodynamics must date from some sort of great collision out of which the present universe evolved. Our theory of the origin of life is that there is ***no* origin**, but only a constant development and change in form."

In 1924, American physical biochemist Albert Mathews, in his article "Chemistry and Psychism", spoke of the difference between "living and dead hydrogen atoms", albeit in the end his discussion teetered on the nonsensical, but nevertheless is an interesting example of the perplexity one faces when deciding on which theory to side with: theory of life, defunct theory of life, or no origin theory of life, in the context of the periodic table view of a cell or a human. [4]

In 1946, English mathematical philosopher Bertrand Russell, in his article "Mind and Matter in Modern Science", seemed to teetering on the solution when in he commented: [5]

> "There is increasing reason to think that the whole of difference between living and dead matter is chemical: living matter has the capacity of transforming suitable other matter into something of the same chemical composition as itself."

See also

â— Defunct theory of life
â— Creator theory of life

- Creationism
- Creation from clay

References

1. (a) Encyclopedia Britannica (c.2005)
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 127). Morrisville, NC: LuLu.
(c) Thims, Libb. (2008). *The Human Molecule* (pg. 75) (issuu) (preview) (Google Books) (docstoc). LuLu.

2. (a) Jevons, William Stanley. (1874). *The Principles of Science: a Treatise on Logic and the Scientific Method* (Book VI, ch. 31: Reflections on the Limits of the Scientific Method, pgs. 427-70; quote, pgs. 427-28).
(b) Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (pg. 219). Cambridge University Press.
3. Sidis, William J. (1920). *The Animate and the Inanimate*. Draft stage 1916; Formerly published: R.G. Badger, 1925.
4. (a) Mathews, Albert P. (1924). "Chemistry and Psychism", in: *General Cytology* (pgs. 25-28, 92), Edmund V. Cowdry, ed. University of Chicago Press.
(b) Slosson, Edwin E. (1925). *Sermons of a Chemist* (pgs. 11-12). Harcourt, Brace, and Co.
(c) Blavatsky, Helene P. (1937). *The Laws of Healing: Physical and Metaphysical* (pg. 27). Kessinger.
5. Russell, Bertrand. (1946). "Mind and Matter in Modern Science", *The Rationalist Annual*, Watts & Company; in: *Bertrand Russell on God and Religion* (chapter 11, pgs. 151-63), ed. Al Seckel, Prometheus Books, 1986.
6. Helmholtz, Hermann. (1874). "On the Use and Abuse of the Deductive Method in Physical Science" (translator: Crum Brown), from Helmholtz' preface to the second part of the German edition of William Thomson and Peter Tait's *Treatise on Natural Philosophy*, vol. 1; in: *Nature*, 11:149-51, Dec 24; in *Nature*, 11:211-12, Jan. 14.

θΔics

In terminology, **no religion**, related to the term “none” [or nones (Q)], albeit more specific, refers to someone or some entity that does not have a specific belief system or belief state; someone who is belief-debonded, so to speak.

A word scramble "**no religion**" T-shirt, which is visually appealing, but technically inaccurate, at least per terminological correctness.

Imagine | No legare?

A salient issue exists when people attempt to dream of future utopias wherein “no religion”, supposedly, exists, being that “religion” is but Latin for “binding”, from *legare*, or a set of beliefs that bind a person or a group with a set of common beliefs. Hence, the supposition “imagine no religion”, such as word-scrambled as shown adjacent, is equivalent to saying: “imagine a social system with no binding”, or “imagine water existing in the liquid state without hydrogen bonds?”, or in some sense “imagine methane CH_4 with no covalent bonds”, which are physically impossible. The following, to exemplify, is a circa 2003 scratch note, from Thims’ personal folder entitled “stability/bonding”, possibly done when he was writing on drafts on thermodynamics of religion, with hand-written notes made from a reading of Candice Pert’s 1997 *Molecules of Emotion*:

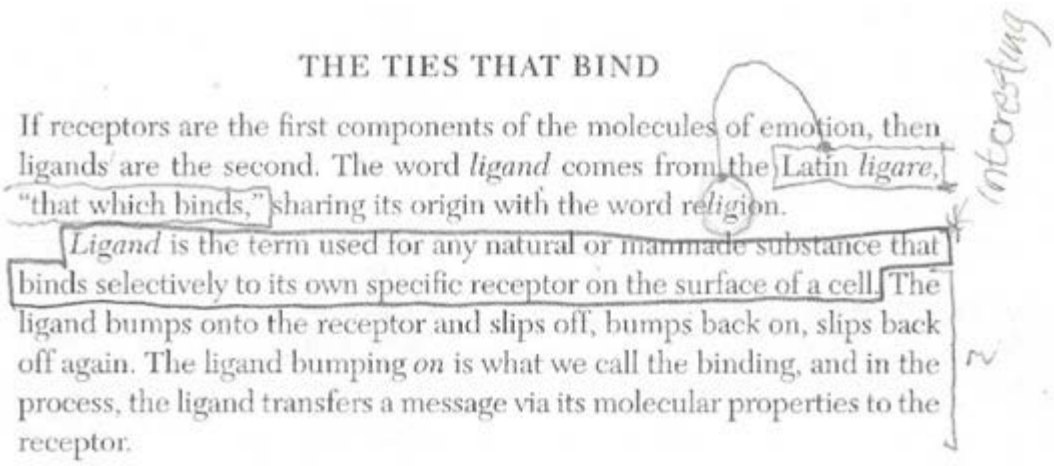

THE TIES THAT BIND

If receptors are the first components of the molecules of emotion, then ligands are the second. The word *ligand* comes from the Latin *ligare*, “that which binds,” sharing its origin with the word religion.

Ligand is the term used for any natural or manmade substance that binds selectively to its own specific receptor on the surface of a cell. The ligand bumps onto the receptor and slips off, bumps back on, slips back off again. The ligand bumping *on* is what we call the binding, and in the process, the ligand transfers a message via its molecular properties to the receptor.

interesting

Correctly, we say that when an old religion becomes corrupted, such that its core tenets are no longer in alignment with reality, in as much as reality is known, based on discernible evidence, have reached the point of promoting absurdities, such as shown adjacent, etc., then we say that its "legare bonding glue" is corrupted, lacking adhesion, past expiration date, no longer functionable, etc., according to which one might say "imagine a new religion" or evidenced-based legare that binds the new social order, that is in alignment with reality, or something along these lines.

Examples of religious absurdities: a Jew in a bag (Q) while flying so to not become impure when he flies over cemeteries, a Jain with bug mouth guard and broom, so to not accidentally eat or step on a reincarnated relative, Muslim wearing a burqa while exercising, so to not break the dress codes of the faith.

In 2016, Inderjit Singh, in his “Essay on Man” (2016), to elaborate via example, stated the following: [1]

> “As humans proliferate, an imperfect system of morality is instituted to control them. This system promises existence after death. It offers an eternal paradise, and threatens eternal damnation. It is based on the mythology of ancient Egypt. This is organized religion. Science stands as the antithesis to religion. The teachers of science attempt to nullify the insidious ideas of the Abrahamic and Brahmaic religions. This is shown in history by the renaissance and the age of enlightenment. With the aid of the philosophers, science will soon overthrow the organized religions of the world.”

In review of this, Libb Thims, in respect to the truncated comment "soon science with overthrow religion", stated the following: [2]

> “A second salient point, is that one can never get rid of “religion” as you suggest, being that religion is but Latin for something that “binds”; hence, if a large society is to exist, it will always have a binding mechanism, a *ligare* so to say. The format of the ligare will always tail behind science, being that it takes time for new knowledge and experimental findings to translate back into the new legare.”

Hence, just as polytheism replaced spiritism in 3100BC, and just as monotheism replaced polytheism in 300AD, so to now are we seeing a new zero god "-ism", e.g. zerotheism, pastafarianism (Q), jedi religion (jediism) (Q) coming to replace monotheism, presently.

The selection of labels of creeds by atheist-neighborhood like people who enter the military service evidences this, being that the three things are printed on their "dog tags", in case of fatal accident, namely: name, blood type, and religion, some examples of which are shown adjacent. In 2014, the US Army added “humanist” (Q) to the list of 100+ “religion types” a person is allowed to choose from, thus adding to the related terms: agnostic, no religious preference, none, or unknown, previously available.

Examples of "no religion" or "alternative religion" or "joke religion" like dog tags, wherein we see people claiming pastafarianism (Q), started by Bobby Henderson, jedi religion (jedism) (Q), started by George Lucas, viking, and pagan, as the label of their creed (see: atheist's creed).

In 2015, Libb Thims, in his "Zerotheism for Kids" lecture, employed the term "zerotheism" as short, per the Critias hypothesis, for a "smart atheism belief system", which he taught to a group of six kids looking to get a straight modern view of things, as opposed to the god created every thing in six days followed by a Noah's ark flood model of everything, which one of the six-year-old kids was confused about.

Quotes

The following are related quotes:

> “Twenty times, in the course of may late reading, have I been on the point of breaking out: ‘this would be the best of all possible worlds, if there were **no religion** in it!’ But in this exclamation, I should have been

> as fanatical as Bryant or Cleverly [minster and tutor to Adams' son]. Without religion, this world would be something not fit to be mentioned in polite company, I mean hell, the most abandoned scoundrel that ever exited, never yet wholly extinguished his conscience, and **while conscience remans there is some religion**. Popes, Jesuits, and Sorbonists and inquisitors have some religion."
>
> — John Adams (1817), "Letter to Thomas Jefferson", May 19 [3]

See also

- Atheistic religion

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1. Singh, Inderjit. (2016). "Essay on Mankind" (Q), WordPress, InderjitSingh.net, Mar 16.
2. Thims, Libb. (2016). "Review of Essay on Mankind", Post #30 (Q), Mar 17.
3. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pg. 38). Prometheus.

Further reading

- Hedges, Chris. (2009). *When Atheism Becomes a Religion: America's New Fundamentalists*. Publisher.

External links

- No religion – Wikipedia.

In religio-mythology, **Noah**, or “Nuh” (Islam), is the Jewish recension (see: recension theory) rescript, via the god-turned-patriarch method, of the Egyptian water god Nun. [1]

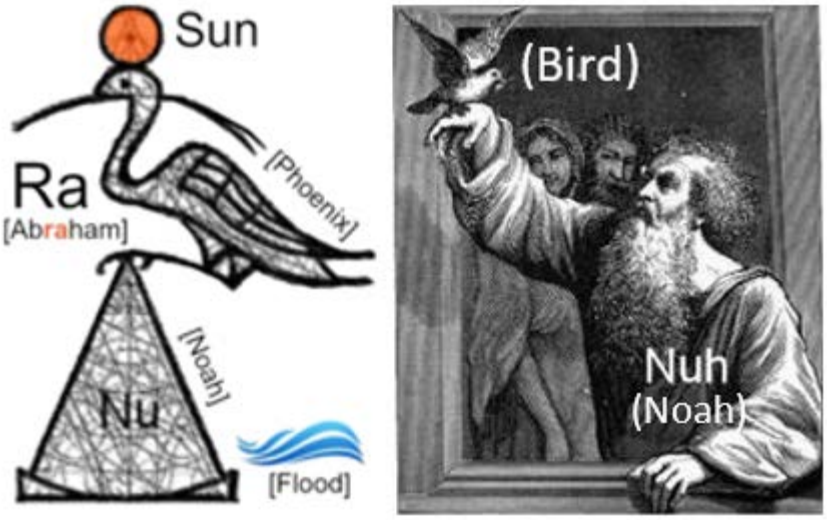

A general visual of how the Egyptian god Nun (or Nu) (3100BC) became the Jewish patriarch **Noah** (or Nuh) (500BC). [1]

Quotes

The following are noted quotes:

> “It seems from what we hear on all sides that the Christian religion is a huge blunder; that the Mosaic account of the creation is an absurdity large enough to throw all nations into rollicking guffaw; that Adam and Eve never existed (see: Adam and Eve never existed); that the ancient flood and **Noah's** ark were impossibilities; that there never was a miracle; that the Bible is the friend of cruelty, of murder, of polygamy, of all forms of base crime; that the Christian religion is woman's tyrant and man's stultification; that the Bible from lid to lid is a fable, a cruelty, a humbug, a sham, a lie.”
>
> — Robert Ingersoll (c.1882), “The Plague of Infidelity” (O)

See also

- Noah’s ark
- Noah’s flood

References

1. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

External links

- Noah – Wikipedia.

In religio-mythology, **Noah's ark** (TR:20), aka Nuh's ark (Islam) or Ma-Nu's boat (Hinduism), is the monotheistic rewrite of Nu's solar barque of Egyptian mythology. [1]

Noah's ark, in short, is the Hebrew (Is-Ra-El-ites) turned Christian origin of animals and humans, following a great flood, a monotheistic version retelling of the Heliopolis creation myth story of Nu's solar barque, according to which, following a primordial flood (technically the annual Nile River flood), burst forth from the Nun (or Nu), i.e. a rising land mound (pyramid), and carried the sun (Ra) through the sky in its daily journey, from whose power of which all humans were procreated.

A generic rendition of **Noah's ark**, showing Noah loading all the animals of the world on board his boat, in pairs, before the big flood.

Christian | Islam version

Typically modern Christian and Islam children, throughout the world, are taught that the originally humans had sinned, or dishonored the gods in some way, but that among these sinful humans, one person, named Noah, was righteous. God told this righteous person to build an ark, i.e. large boat, and to put two of ever animal on it, along with is family, so to survived the great flood that god was planning to inflict on the world. Noah followed these instructions, and from this boat is from where all humans and animals originated.

Hindu version

The Hindu version, taught to children, is about the same, only Noah is known as Ma-Nu and the story involves a talking fish.

Egyptian | → Hinduism & Christianity

See main: Religio-mythology transcription and syncretism

Etymologically, the story of Noahs' ark, derives from the story of the god Nun (Noah), in the form of a mountain (pyramid), arising out of the a great primordial flood, which covered the world, from which the the sun burst forth, conceptualized as the god Ra, and was thereafter carried through the arc of the sky on a solar barque. The following, in short, shows the Egyptology to Hinduism and Christianity reformulation of annual Nile river flood cycle and perceptually seen islands (pyramids) arising out of the receding flood at the end of the 150-day flood cycle, anthropomorphized into the stories of Noah's ark (or Nuh's ark) and Manu's, respectively: (Q) (Q)

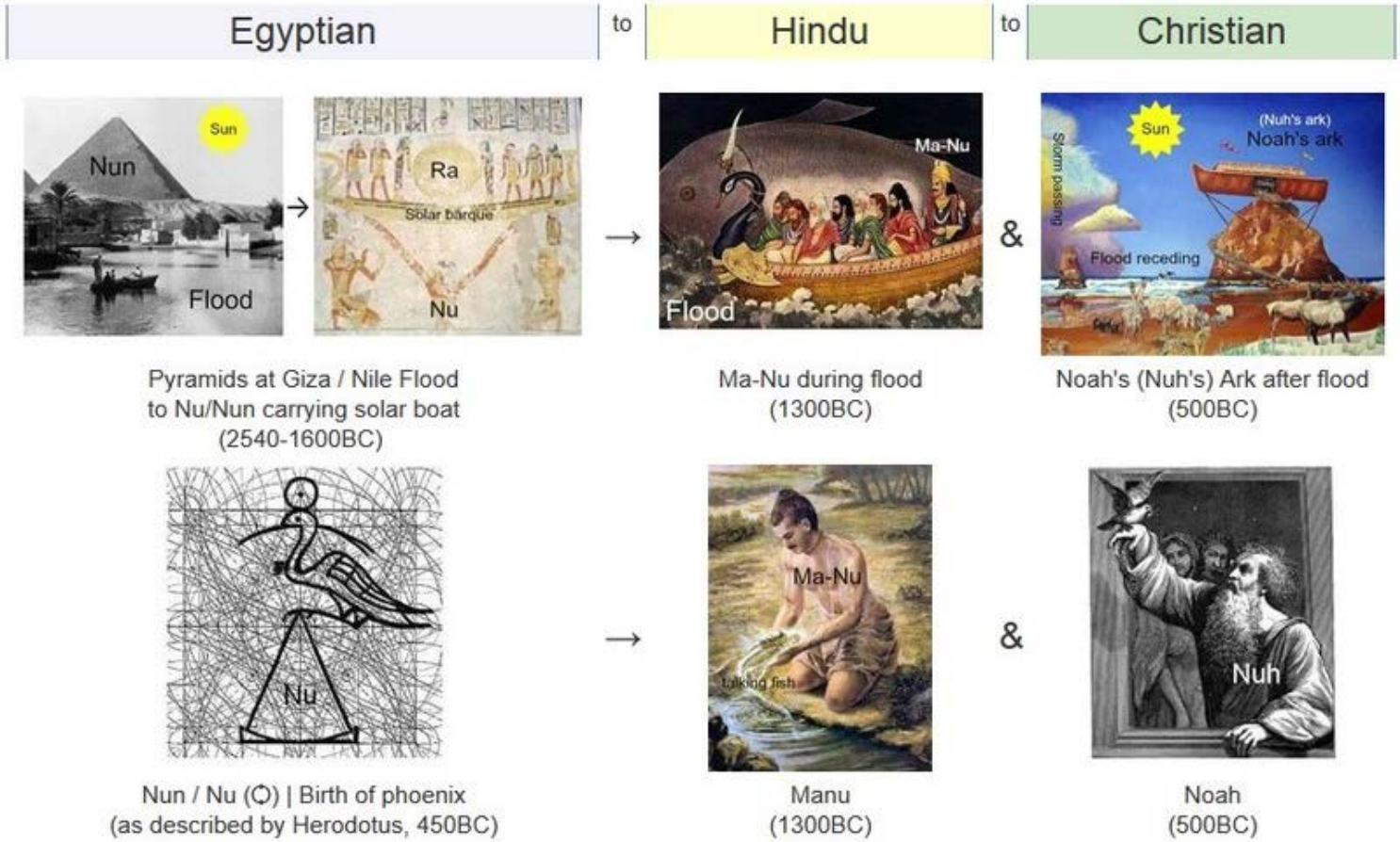

(add discussion)

Creationism

American civil engineer Henry Morris, who believed in the existence of Noah's ark (Q); his 1961 *The Genesis Flood*, co-written with John Whitcomb, argues that geological theories do not truly depend on scientific data but are rather a "moral and emotional decision," in which evolutionists seek "intellectual justification for escape from personal responsibility to his Creator and escape from the 'way of the Cross' as the necessary and sufficient means of his personal redemption"; was eventually kicked out of Virginia Tech, in 1970, because his creationism writings were becoming "too controversial."

In the 1990s, American amateur scientist and Christian apologeticist Kent Hovind became known as "Dr. Dino" because he said that dinosaurs fit on Noah's ark, because Noah only took the Dinosaur eggs with him.

Ark Encounter

In 2010, the $27 million dollar Creation Museum, in Kentucky, run by Ken Ham, announced its plans to build a $50 million dollar replica (Q) of the Ark; but by 2015, they had raised $19 million dollars (Q); a draft image of the proposed ark is shown adjacent.

A 2015 rendition of the Creation Museum proposed "Ark Encounter", an exact replica of the mythological Ark that Noah built, as told to children in Genesis of the Bible.

Quotes

The following are related quotes:

> "Because, even although it might rise to the height mentioned, the ark could not have contained, according to known physical laws, all the living things of the earth, together with their food, for so long a time; considering that lions, tigers, panthers, leopards, ounces, rhinoceroses, bears, wolves, hyenas, eagles, hawks, kites, vultures, falcons, and all carnivorous animals, which feed on flesh alone,

would have died of hunger, even after having devoured all the other species."

— Voltaire (1764), *Philosophical Dictionary* (§:Deluge) [2]

"The **Noah story** is nothing less than a very detailed and reasonably accurate version of the Heliopolian creation myth."

— Ralph Ellis (2004), *Eden in Egypt* (pg. 170)

See also

- Adam and Eve

References

1. Thims, Libb. (2015). "Zerotheism for Kids" (co-host: Thor), 14-part 4:41-hr video lecture playlist (Q), 5-intro sides (Q), 56-main sides (Q), 11AM-3PM, Chicago, Aug 10.
2. (a) Voltaire. (1764). *Philosophical Dictionary* (§Christianity) (txt). Publisher.
(b) Joshi, Sunand T. (2014). *The Original Atheists: First Thoughts on Nonbelief* (pg. 54). Prometheus Books.

Videos

- Anon. (2013). "Atheist 6th Grader asks Pastor about Noah's Ark" (Q), SecHummer, Jan 13.
- Anon. (2014). "Atheist 7th Grader asks Christian philosopher about Noah's Ark" (Q), SecHummer, Apr 9.

External links

- Noah's ark – Wikipedia.

θΔics

In religio-mythology, **Noah's flood**, aka "Biblical flood", is [name] recension (see: recension theory) rewrite, as described in Genesis, of Nun (turned man Noah), the Egyptian god of the primordial waters, and his ark, i.e. Nu's solar barque (see: Noah's ark), which was thought to carry the sun, or sun god (Ra), through the sky each day, in its daily rebirth, and also annual yearly rebirth; the flood itself being based on the annual 150-day Nile River flood cycle

A general synopsis of how the annual 150-day Nile River flood became, in Egyptian mythology, the myth of the flood of Nun and Nu's solar barque (3100BC), which became, in Christian mythology, the Biblical story of **Noah's flood** and Noah's ark (500BC). [1]

Overview

The Nile River, prior to the construction of the Aswan dam (1970), "flooded", annually, for 150-days, beginning Jun 25 to Nov 21, start marked by the helical rising of Sirius, ending late Dec (near Dec 25, the darkest day of the year), during which time the waters, owing to the melting of the snow in the Ethiopian highlands, would rise to heights of 30 feet (9 meters); the details of which are shown below: [1]

The following is a view of the "flooded Nile" river, from the point of view of a person in 1830 standing near the Pyramids at Giza, looking towards Cairo, according to which, from the point of view of a person in a Heliopolis creation myth mindset (geocentric; flat earth), it looks to the "senses" (see: common sense), as though the waters "rise" to great heights, thereby "covering" the mountains: [1]

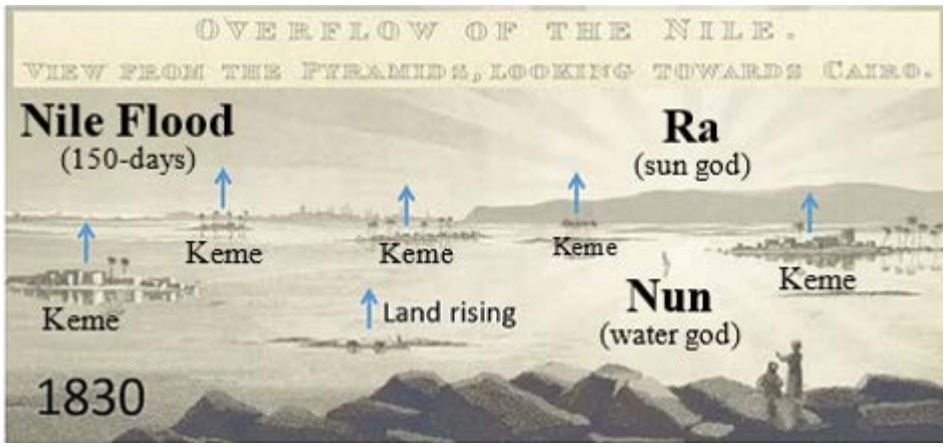

In 500BC, during the redaction of the Egyptian Book of the Dead into the monotheistic format of the Old Testament, of the Bible, the "real" 150-day Nile River flood became the "mythical" 150-days of Noah (Genesis 7:24).

Religio-mythology | Scholars

In c.1500, Leonardo da Vinci rejected Biblical flood theory as being responsible for depositing fossils many miles from their origin. (O)

In 1736, Marquis of Argens, in his *The Philosophy of Good Sense*, which was peer-reviewed by Voltaire, wherein he argues that we must continually revise our knowledge about things, and attacks scriptural authority, arguing, e.g., that there is not enough water on the globe to make possible a deluge that would cover all the highest mountain tops of the world. [2]

In 2000, Gary Greenberg, in his *101 Myths of the Bible*, section Myth #32: God Sent a Flood to Destroy Mankind, recounted the mythical origins of Noah's flood as follows: [3]

> **The Myth**: The earth also was corrupt before god, and the earth was filled with violence. And god looked upon the earth, and, behold, it was corrupt; for all flesh had corrupted his way upon the earth. And god said unto Noah, The end of all flesh is come before me; for the earth is filled with violence through them; and, behold, I will destroy them with the earth. (Gen. 6:11-13)
>
> **The Reality**: The story of Noah and the flood originated as a monotheistic version of the Hermopolitan Creation myth and presented an expanded account of events on the first day of creation.
>
> In the Hermopolitan Creation myth, four males and four females emerged from the primeval flood and crawled onto the first land. These four males and four females, known as the Ogdoad (i.e., group of eight) collectively gave birth to Re, the Hermopolitan Creator deity, who floated on a lotus while the benben bird flew above.
>
> The four male deities were Nun, Huh, Kuk, and Amen, who represented the four primary elements of the universe before creation, but in some texts other deities were substituted. Nun signified the primeval flood and Egyptians usually portrayed him in anthropomorphic form, standing waist-high in the primeval waters and holding aloft the solar boat that carried other deities.
>
> In the story of Noah, to four males and four females emerged from a worldwide flood after a mountain arose out of the waters, during which time a sole child may have been born (see Myth #33) with some interesting questions about who his parents were. It also includes the appearance of birds, one of which behaves differently than the others (see Myth #34). In addition, the names of Noah and his three sons closely resemble names associated with the Egyptian creation cycle.

> In old biblical Hebrew, the name "Noah" (which should be transliterated as "Noach") consists of only two letters "Nun" and "Ched". We don't know what the original vowels were because old Hebrew text did not use vowels. The present assignment of vowels is speculative. It is interesting that "Nun", the Hebrew name for the first letter of Noah's name, is the same word the Egyptians use to name the primeval flood. The name of the biblical flood here, therefore, corresponds to the name of the Egyptian deity who represents the great flood of creation and guides the solar boat across the waters."

(add)

Polls

According to 2004 polls, 60% of Americans believe in the story of Noah's ark and a global flood. (Q)

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1. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.
2. (b) Argens, Marquis. (1736). *The Philosophy of Good Sense*. Publisher.
(b) Gasper, Julia. (2013). *The Marquis d'Argens: a Philosophical Life* (pg. 100). Lexington Books.
3. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (Myth #32: God Sent a Flood to Destroy Mankind, pgs. 73-75). Source Books.

External links

- List of flood myths – Wikipedia.
- Flood myth – Wikipedia.
- Genesis flood narrative – Wikipedia.

θΔics

In science, the **Nobel Prize** is a yearly award given to honor men and women for outstanding achievements in physics, chemistry, medicine, literature, and for work in peace; the foundations of which were in 1895 when Swedish chemist, engineer, and dynamite inventor Alfred Nobel wrote his last will, leaving much of his wealth to the establishment of the Nobel Prize. [1]

The medal of the **Nobel Prize,** showing Alfred Nobel, the initiator of the prize.

A number of Nobel Prize Lectures have been somewhat notable publications in the context of the hmolsciences, some of which are outlined below.

Samuelson

In American economist Paul Samuelson's 1970 Nobel Lecture "Maximum Principles in Analytical Economics", he alludes to his usage of maximization and minimization methods of thermodynamics, as passed on to him via his teacher Edwin Wilson (one of Gibbs' students), commenting that "in thermodynamics the reciprocity or integrability conditions are known as Maxwell conditions [correct: Euler reciprocity relation]; in economics they are known as Hotelling conditions in honor of Harold Hotelling's 1932 work"; he comments how in listening to Wilson's lecture that: [2]

> "My earlier formulation of the inequality in equation:
>
> $$\Delta p_1\ \Delta v_1 + \Delta p_2\ \Delta v_2 + \ldots + \Delta p_{99}\ \Delta v_{99} < 0$$
>
> owed much to Wilson's lectures on thermodynamics. In particular I was struck by his statement that the fact that an increase in pressure is accompanied by a decrease in volume is not so much a theorem about a thermodynamic equilibrium system as it is a mathematical theorem about surfaces that are concave from below or about negative definite quadratic forms. Armed with this clue I set out to make sense of the LeChatelier principle."

He goes onto say, in latter discussion, that these types of thermodynamics-framed formulations are "mathematical isomorphisms" (or thermodynamic isomorphisms), not analogies, but only isomorphized equations taken from thermodynamics in outline and reapplied to economic issues, but without fundamental connection, or something along these lines. He then falls into his somewhat well-known abrasive and frequently re-quoted humor, which is difficult to surmise if it is directed in self-reflection at himself or at everyone who attempts hmolscience formulation:

> "Now what in the world has all this to do with economics? There is really nothing more pathetic than to have an economist or a retired engineer try to force analogies between the concepts of physics and the concepts of economics. How many dreary papers have I had to referee in which the author is looking for something that corresponds to entropy or to one or another form of energy. Nonsensical laws, such as the law of conservation of purchasing power, represent spurious social science imitations of the important physical law of the conservation of energy; and when an economist makes reference to a Heisenberg principle of indeterminacy in the social world, at best this must be regarded as a figure of speech or a play on words, rather than a valid application of the relations of quantum mechanics."

What is interesting about this frank and oft-quoted statement is that it is a blurry mixture of the truthful aspects common to thinkers in human thermodynamics, human physics, and human chemistry, many of which are often lost in the garden of thermodynamics, producing delusional weeds of grandeur; yet the reality that energy and entropy does, in all aspects, and without question, apply to humans, individually, and societies, economically, is not necessarily the sign of a

crackpot or a "half-baked speculator in the social sciences", as he would latter comment in 1972, but is in fact reality, as capture well by the following 1999 synopsis on “The ‘Dynamics’ in the Thermodynamics of Binding” by American-born Canadian biophysical chemist Julie Forman-Kay: [2]

> “Whether two molecules will bind is [completely] determined by the free energy change (ΔG) of the interaction, composed of both enthalpic and entropic terms.”

which, without change, being that this is a universal rule, can be scaled up to the human-human reaction level, to the affect that:

> “Whether two people [human molecules] will bind is [completely] determined by the free energy change (ΔG) of the interaction, composed of both enthalpic and entropic terms.”

an analysis first worked out by Goethe, in terms of chemical affinities, the precursor to free energy, in 1796 (see: Goethe timeline), the principles of which he latter had to defend himself against, to a rouge women in the street, stating that the principles were in fact "true" no matter who wants to raise objection (see: best book). In short, the bondings of humans to each other in relationships, friendships, marriages, companies, corporations, cities, countries, etc., and hence the economic variables (secondary field particle exchange force quantities) used to mediate these process (reactions), are "completely" determined by the energy and entropy of the individual interactions, and hence the search for the more complete solution and formulaic presentation and or derivation of this solution is not necessarily the path of fools, but rather the path towards a deeper understanding of reality, but one blocked, to a certain extent, by the language of partial differential equations, a language very difficult in comprehension, but more importantly difficult to translate into common English explanation.

Dual Nobel Prize winners

Among individual to have one two Nobel Prizes, as depicted adjacent, namely Marie Curie, Linus Pauling, John Bardeen, and Frederick Sanger, 75 percent, i.e. three out of four, have been the product of an early parental death childhood.

Marie Curie	Mother and sister died before she was 11
Linus Pauling	Father died when he was 9
John Bardeen	Mother died when he was 12
Frederick Sanger	No Early Parental Death [EPD]

LAUREATE:	NOBEL PRIZES:	CREDENTIALS:
Marie Curie [1867-1934]	Physics [1903]: Discovery of Radioactivity Chemistry [1911]: Isolation of Pure Radium	Ph.D. Physics & Radiochemistry
Linus Pauling [1901-1994]	Chemistry [1954]: Hybridized Orbital Theory Peace [1962]: Nuclear Test-Ban Treaty Activism	B.S. Chemical Engineering Ph.D. Physical Chemistry
John Bardeen [1908-1991]	Physics [1956]: Invention of Transistor Physics [1972]: Theory of Superconductivity	Grade-switched: 3rd to 7th B.S. Electrical Engineering M.S. Electrical Engineering Ph.D. Mathematical Physics
Frederick Sanger [1918-]	Chemistry [1958]: Structure of the Insulin Molecule Chemistry [1980]: Virus Nucleotide Sequencing	B.S. Natural Sciences Ph.D. Biochemistry

The Dual-Laureate Similarities section from American electrochemical engineer Libb Thims’ 2005 IoHT profile page, where he lists Nicolaus Copernicus, Isaac Newton, Charles Darwin, James Maxwell, Willard Gibbs, Friedrich Nietzsche, Edger Allan Poe, Lucille Ball, James Dean, JFK, Marilyn Monroe, Madonna, and Julia Roberts, as examples. [7]

Prigogine

In Belgian chemist Ilya Prigogine’s 1977 Nobel Lecture “Time, Structure and Fluctuations”, he opens to an argument to the effect that “free energy”, specifically the Helmholtz free energy, does not explain or apply to people and societies: [3]

> “Thermodynamic equilibrium may be characterized by the minimum of the Helmholtz free energy defined usually by: F = E – TS. Are most types of ‘organisations’ around us of this nature? It is enough to ask such a question to see that the answer is

> negative. Obviously in a town, in a living system, we have a quite different type of functional order. To obtain a thermodynamic theory for this type of structure we have to show that that non-equilibrium may be a *source of order*. Irreversible processes may lead to a new type of dynamic states of matter which I have called 'dissipative structures'."

Prigogine, of course, was hiding his long-standing agenda, which was to find indeterminism in deterministic thermodynamics to explain the human condition, having been inspired by the creative evolution ideas of Henri Bergson.

See also

- Nobel Prize winners in thermodynamics
- Prigogine medal
- Thermodynamics medal (proposal) - Hmolpedia: Discussion.

References

1. Alfred Nobel – NobelPrize.org.
2. Samuelson, Paul. (1970). "Maximum Principles in Analytical Economics", *Nobel Prize Lecture*, Dec 11.
3. Prigogine, Ilya. (1977). "Time, Structure and Fluctuations", *Nobel Lecture*, Dec. 08.

External links

- Nobel Prize – Wikipedia.
- Nobel Prize – NobelPrize.org.

θΔics

In thermodynamics awards, **Nobel Prize winners in thermodynamics** are those individuals, i.e. physicists, chemists, thermodynamicists, engineers, biochemists, etc., to have had both a significant background or connection in thermodynamics or energy and to have won a Nobel Prize, either in physics, chemistry, physiology or medicine, or economics based on work connected to thermodynamics. A little over a dozen people, as listed below, have won the prize, based on work connect to or in thermodynamics. Russian thermodynamicist Ivan Bazarov give his take on the relation of thermodynamics to the Nobel Prize in the following humorous quote: [1]

> "The second law of thermodynamics is, without a doubt, one of the most perfect laws in physics. Any *reproducible* violation of it, however small, would bring the discoverer great riches as well as a **trip to Stockholm**. The world's energy problems would be solved at one stroke. It is not possible to find any other law (except, perhaps, for super selection rules such as charge conservation) for which a proposed violation would bring more skepticism than this one. Not even Maxwell's laws of electricity or Newton's law of gravitation are so sacrosanct, for each has measurable corrections coming from quantum effects or general relativity."

Belgian thermodynamicist Ilya Prigogine receiving the 1977 **Nobel Prize in chemistry** from Swedish king Karl XVI Gustav.

Of thermodynamicist Laureates, the 1977 win of the Nobel Prize in chemistry by Belgian chemist Ilya Prigogine, pictured adjacent receiving the prize from the hands of King Karl XVI Gustav, did the most to effect a change in the public thinking about role of thermodynamics in human existence and in evolution. The arguments from his 1972 article "Thermodynamics of Evolution", to exemplify this point, formed the opening section to his Nobel Lecture. [6]

Overview

The prize was first awarded in 1901 in the main fields and began to be awarded in 1969 in economics. The award was established in 1895 by the will of Swedish chemist Alfred Nobel of the funds derived from his 1867 discovery of dynamite. With the exception of the Nobel Peace Prize, the Nobel Prizes and the prize in economics are presented in Stockholm, Sweden, at the annual Prize Award Ceremony on 10 December, the anniversary of Nobel's death. Those connected thermodynamic laureates are listed below. [2]

#	Individual	Year	Medal	Significance
1.	Jacobus van't Hoff	1901	Chemistry	Published *Studies in Chemical Dynamics* (1884), in which he described a new method for determining the order of a reaction using graphics, applied the laws of thermodynamics to chemical equilibria, and introduced the modern thermodynamic interpretation of chemical affinity; won for his work with solutions.
2.	Wilhelm Ostwald	1909	Chemistry	For work on catalysis and associated fundamental studies on chemical equilibria and rates of reaction; also outlined cessation thermodynamic (energetic) views; and stated the energetic imperative (1912).
	Johannes van der			For his 1873 work in developing an equation of state for

3.	Waals	1910	Physics	liquids and solids based on the work of Clausius and Gibbs.
4.	Wilhelm Wien	1911	Physics	For work in radiation thermodynamics.
5.	Max Planck	1918	Physics	For originated quantum theory by explaining black body radiation via his postulate of energy quanta (energy element), based on the 1872 work of Boltzmann.
6.	Fritz Haber	1918	Chemistry	Published *Thermodynamics of Technical Gas Reactions* (1905), the first systematic study of all the thermodynamic data necessary for the calculation of the free energy changes in a group of important reactions; won for the synthesis of ammonia.
7.	Walther Nernst	1920	Chemistry	Established his heat theorem (1905), now called the third law of thermodynamics, which describes the behavior of matter as temperatures approaching absolute zero; a theory which provided a means of determining chemical affinities or free energies (and therefore equilibrium points) of chemical reactions from heat measurements; won for his thermochemistry work.
8.	Frederick Soddy	1921	Chemistry	For work in radioactivity; published some of the first work in economic thermodynamics.
9.	Albert Einstein	1921	Physics	Twenty-eight of his first thirty papers were in thermodynamics; explained the nature of mass-energy equivalence (1905), and building on the work of Planck explained the photoelectric effect using the postulate that light interacts with matter as discrete packets of energy or light quanta; won for his work in theoretical physics.
10.	Henri Bergson	1927	Literature	In his 1907 *Creative Evolution*, and works to follow, worked to outline a unified theory of religion, evolution, and thermodynamics.
11.	Albert Szent-Gyorgyi	1931	Physiology	For isolating vitamin C; was a bioenergetics pioneer; In 1974 proposed to replace the term "negative entropy" (or *negentropy*) with “syntropy”, which he pictured as a force which causes living things to reach "higher and higher levels of organization, order and dynamic harmony"; followed this up with his 1977 article "Drive in Living Matter to Perfect Itself".
12.	Charles Sherrington	1932	Physiology	Published his philosophical *Man on His Nature*, with entropy, evolution, life discussions.
13.	Erwin Schrödinger	1933	Physics	Published *What is Life?* (1944) and *Statistical Thermodynamics* (1946); won for his work in quantum mechanics, i.e. the development of the Schrodinger equation (1926).
14.	Heike Kamerlingh-Onnes	1936	Physics	Using the Joule-Thomson effect, reached a temperature of 0.9 K (1908); won for investigations on the properties of matter at low temperatures which led, *inter alia*, to the production of liquid helium.
				While writing the appendix for the Italian edition of the book *Foundation of Einstein's Relativity*, written by A. Kopff, pointed out, for the first time, the fact that hidden inside the

15.	Enrico Fermi	1938	Physics	famous Einstein equation ($E = mc^2$), there was a enormous amount of energy (nuclear energy) to be exploited; author of the 1936 *Thermodynamics*; won for his discovery of new radioactive elements produced by neutron irradiation, and for his related discovery of nuclear reactions brought about by slow neutrons.
16.	Percy Bridgman	1946	Physics	Published *A Condensed Collection of Thermodynamic Formulas* (1925), *Thermodynamics of Electrical Phenomena in Metals* (1934), and *The Nature of Thermodynamics* (1941); won for work in high pressure physics.
17.	William Giauque	1949	Chemistry	Student of the Lewis school; won contribution to the field of chemical thermodynamics, particularly concerning the behavior of substances at extremely low temperatures.
18.	Bertrand Russell	1950	Literature	Noted for his 1927 lecture on heat death and religion; won for "his varied and significant writings in which he champions humanitarian ideals and freedom of thought."
19.	Fritz Lipmann	1953	Medicine	Developed the thermodynamics of ATP function (1941); later used this work to discover co-enzyme A.
20.	Lars Onsager	1968	Chemistry	For the discovery of the reciprocal relations (1931), fundamental equations in the thermodynamics of irreversible processes.
21.	Paul Samuelson	1970	Economics	Second generation student of Gibbs, via Edwin Wilson; won for his development of static and dynamic economic economics theory (utilized physics analogs).
22.	Christian Anfinsen	1972	Chemistry	For work on the thermodynamic hypothesis of protein folding.
23.	Tjalling Koopmans	1975	Economics	People as "molecules" of economic life theory (1947); entropy applied to economics in 1979.
24.	Ilya Prigogine	1977	Chemistry	For his contributions to nonequilibrium thermodynamics, particularly his theory of dissipative structures.
25.	John Avery	1995	Peace	Published *Information Theory and Evolution* (2003), which argues that "life feeds on Gibbs free energy"; won for efforts with the Pugwash Conferences on Science and World Affairs.
26.	John Fenn	2002	Chemistry	PhD dissertation: "The Thermodynamics of Hydrochloric Acid in Methanol-Water Mixtures" (1940), wrote *Engines, Energy, and Entropy: a Thermodynamics Primer* (1982); won for work in the field of mass spectrometry, specifically for the electrospray ionization technique often used to identify and analyze biological macromolecules.

Other notes

Most believe that Willard Gibbs (1839-1903), known for his 1876 work, and Ludwig Boltzmann (1844-1906), known for his 1872 work, would have won had they lived long enough (Van der Waals, for example, won (1909) for his 1873 work).

Percy Bridgman receiving the Nobel Prize from King Gustav V of Sweden, December 11, 1946.

Lewis

Many cite the example of Gilbert Lewis, one the central founders of modern chemical thermodynamics, who was nominated 35 times for the Nobel Prize, four of his students being Nobel Prize winners, but never winning himself. [3] In 1998, African physical chemist Adriaan de Lange commented on this: [9]

> "The fact that Lewis never was awarded the Nobel Prize for breathtaking work is one of the stains in the history of this prize. Yet the very same Lewis was the direct mentor of more Nobel Prize winners in chemistry than any Nobel Prize winner in any category."

In 2002, English physical chemist Keith Laidler commented in a biography on him that "Lewis never received the Nobel Prize, but many physical chemists feel that he well deserved one." [5] In 2003 scientific biographers Istvan and Magdolna Hargittai comment on the Lewis issue: "in 1916, [Lewis] postulated that the electrons in atoms of higher atomic number in the periodic table than helium were divided into an inner shell with the electronic structure of the preceding zero-valent noble gas, and an outer valence shell of electrons which determined the number and character of bonds to other atoms, in which each atom attained the electronic structure of the preceding noble gas … Lewis published these ideas in his 1923 book *Valence and the Structure of Atoms and Molecules*; the Noble Prize in Chemistry was left unfilled in 1919, 1924 and 1933 for 'lack of candidates of suitable stature', and Lewis would have been an appropriate candidate … in fact [during these period] he was nominated by [no other than] inorganic chemist and science historian J. R. Partington." [7]

Sommerfeld

In April of 1951, while in the midst of writing a book on thermodynamics (*Thermodynamics and Statistical Mechanics*), German theoretical physicist Arnold Sommerfeld been nominated 81 times for the Nobel prize (more than any other physicist), but not yet having won, was killed from injuries after a traffic accident while walking his grandchildren. The book was published posthumously the following year. [8]

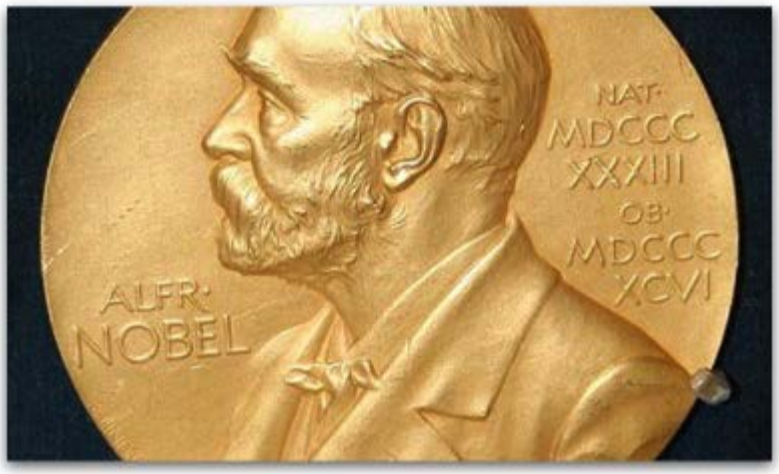

Nobel prize medal.

Rumford Medal-Prize

In 1796, Benjamin Thompson, known as Count Rumford, gave $5000 separately to the Royal Society of London and to the American Academy of Arts and Sciences to give awards every two years for outstanding scientific research on heat or light. The Royal Society awards the Rumford Medal (restricted to Europeans); the American Academy of Arts and Sciences awards the Rumford Prize. [4]

See also

â— Prigogine medal
â— EoHT wiki: Thermodynamics Medal (Proposal)

References

1. Bazarov, Ivan P. (1964). *Thermodynamics*. Pergamon.
2. List of Nobel laureates - Wikipedia.
3. (a) FAQ#1: How many people are nominated each year for the Noble Prize, such as in chemistry? Answer: about 250-350 per year (Source: Nomination and Selection for the Nobel Laureates)
(b) FAQ#2: How many nomiations does one need to win? Answer: there is no immediate answer. Mahatma Gandhi, for instance, received 12 nominations between 1937 and 1948, but was never awarded the Nobel Prize. Similarly, Banting and Macleod were awarded the 1923 Nobel Prize in Physiology or Medicine the first year they were nominated (with three nominations) for their discovery of insulin. By contrast, Robert Koch was nominated 55 times over 4 years before he received the Prize in 1905 for his discoveries concerning tuberculosis (Source: Nomination Facts)
4. (a) Rumford Medal – Wikipedia.
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5. Laidler, Keith J. (2002). *The World of Physical Chemistry* (pg. 437). Oxford University Press.
6. (a) Prigogine, Ilya, Nicolis, Gregoire, and Babloyants, Agnes. (1972). "Thermodynamics of Evolution," (part I). *Physics Today* (pgs. 23-28), Vol. 25, November.
(b) Prigogine, Ilya, Nicolis, Gregoire, and Babloyants, Agnes. (1972). "Thermodynamics of Evolution," (part II). *Physics Today* (pgs. 38-44), Vol. 25, December.
(c) Prigogine, Ilya. (1977). "Time, Structure and Fluctuations", *Nobel Lecture*, Dec. 08.
7. Hargittai, Istvan and Hargittai, Magdolna. (2003). *Candid Science III* (pg. 489). Imperial College Press.
8. (a) Sommerfeld, Arnold. (1952). *Thermodynamik und Statistik - Vorlesungen über theoretische Physik Band 5* Herausgegeben von Fritz Bopp und Josef Meixner. Diederich sche Verlagsbuchhandlung.
(b) Sommerfeld, Arnold, edited by F. Bopp and J. Meixner, and translated by J. Kestin. (1964). *Thermodynamics and Statistical Mechanics - Lectures on Theoretical Physics Volume V*. Academic Press.
(c) Crawford, Elisabeth. (2001). "Nobel Population 1901-50: Anatomy of a Scientific Elite", November 15, 2007, PhysicsWorld.com.
9. De Lange, A.M. (1998). "Entropy", Oct 30, Learning-org.com.

θΔics

In existographies, **Noel Journet** (1554-1582) (RMS:14) is a French schoolteacher and freethinker noted for []

Overview

In c.1580, Journet penned two manuscripts showing inconsistencies in the Bible, such as how Moses could have written the Old Testament, if the book tells of Moses' own death; how could Samson bring down a building with his own hands, when columns of buildings are separated by a far greater distance than arm's length; how could Sarah at her advanced age possibly kindle the pharaoh's lust? [3]

Journet asserted in full that the Bible was a fable. Journet asserted that Jesus was fully human and therefore an impostor. He also attempted to start a new religion, per belief that people needed religion, but that the Christian religion and its idea of god were wicked. [1]

Reaction end

In 1582, Journet was burned at the stake, in Metz, France, with his books, for "blasphemy and execrable atheism". Henry III of France (1551-1589) (Ñº), supposedly, congratulated the magistrates in their diligence in solving the matter so quickly. [3]

Education

Journet was schoolteacher at Ardennes. [2]

Quotes

The following are noted quotes:

> "Holy scripture is full of fables, and of all sorts of fantasies and falsehoods."
>
> — Noel Journet (c.1580) [2]

References

1. (a) Wootton, David. (1992). "Chapter", in: *Atheism from the Reformation to the Enlightenment* (editors: Michael Hunter and David Wootton) (abs) (pg. 29). Clarendon.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 289). HarperOne.
2. Spencer, Nick. (2014). *Atheists: the Origin of Species* (pg. #). Bloomsbury.
3. Finkin, Matthew W. (2009). *For the Common Good: Principles of American Academic Freedom* (pg. 15). Yale University Press.

Further reading

â— Cooke, Bill. (2005). *Dictionary of Atheism, Skepticism, and Humanism* (pg. 297). Prometheus.

θΔics

In religio-mythology, **nome god** refers, in Egyptian mythology, to one of the 42 local gods of each "nome" or state of Ancient Egypt, which can be divided between Upper Egypt (22 nomes) and Lower Egypt (20 nomes).

Overview

The following shows some of the 42 nome gods (top two rows) that presided over the weighing of the soul of the dead in the judgment hall, seated between Ra and Osiris:

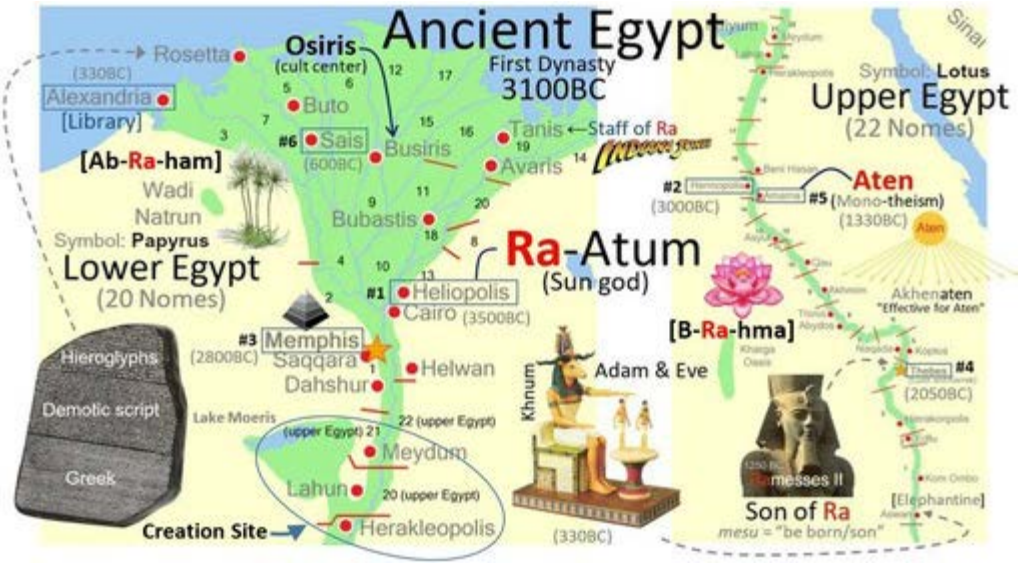

The 42 Nomes or cities (territories) of Pre-Dynastic Egypt, which when merged into the Egyptian First Dynasty, each previous 42 **nome deities** were given a place in the judgment hall, one nome god presiding over each of the 42 negative confessions, were read and the weight of the soul determined.

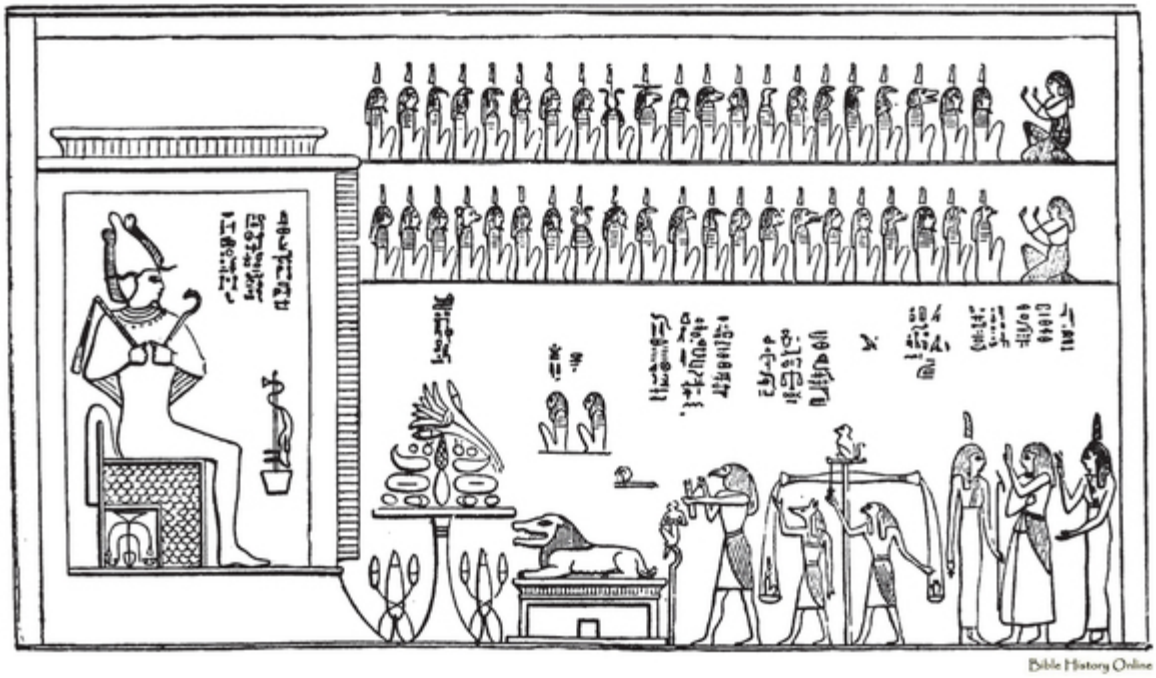

In the Roman recension (100-300AD) rescript of this, the 42 nome gods became the 42 descendants (see: Judeo-Christian genealogy) between Abraham and Jesus:

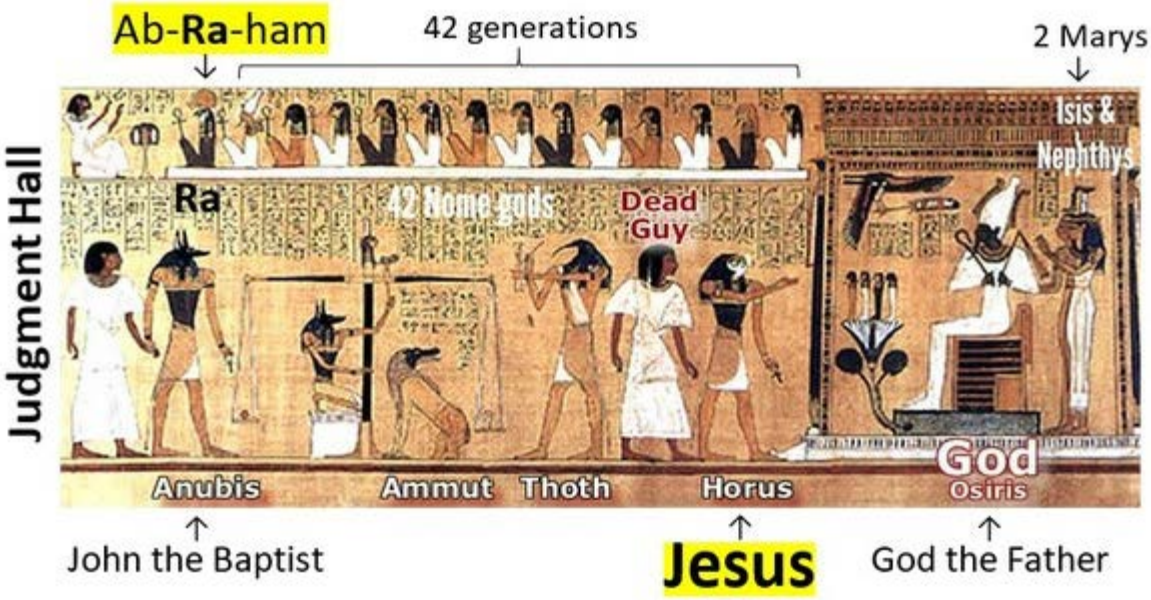

The following is a related comment on this:

> "The learned have also been much tormented by the difference between the two genealogies of Jesus Christ St. Matthew makes Joseph the son of Jacob, Jacob of Matthan, Matthan of Eleazar [Matt 1:16-17]. St. Luke, on the contrary, says that Joseph was the son of Heli, Heli of Matthat, Matthat of Levi, Levi of Melchi, etc. [Luke 3:24] They will not reconcile the fifty-six progenitors up to Abraham, given to Jesus by Luke, with the **forty-two other forefathers** up to the same Abraham, given hint by Matthew; and they are quite staggered by Matthew's giving only forty-one generations, while he speaks of forty-two."
>
> — Voltaire (1764), *Philosophical Dictionary (§Christianity)*

(add)

Quotes

The following are related quotes:

> "During the predynastic period in Egypt every village and town or settlement possessed its god, whose worship and the glory of whose shrine increased or declined according to the increase or decrease of the prosperity of the community in which he lived. When the country was divided into sections which the Egyptians called ḥespu , or **"nomes," a certain god**, or group of allied gods, became the representative, or representatives, of each nome, and so obtained the pre-eminence over all the other gods of the nome ; and sometimes one god would represent two nomes. In this way the whole country of Egypt, from the Mediterranean Sea to Elephantine, was divided among the gods, and it became customary in each nome to regard the god of that nome as the "great god," or "god", and to endow him with all the powers and attributes possible."
>
> — Wallis Budge (1904), *The Gods of Egypt, Volume One* [1]

References

1. (a) Nome gods – The Gods of Egypt, Volume One (Budge, 1904).

(b) Budge, Wallis. (1904). *The Gods of the Egyptians*, *Volume One*. Dover, 1969.

Videos

● Thims, Libb. (2017). “42 Generations of Christ | Abraham (Ra) to Jesus (Horus)” (Q), Atheism Reviews, Nov 25.

External links

● Nome (Egypt) – Wikipedia.

θΔics

In thermodynamics, **non-compensated heat** is a more descriptive name for entropy change *dS* involved in a cyclical process. The concept of "non-compensated heat", according to Dutch thermodynamicist Sybren de Groot, was introduced by German physicist Rudolf Clausius in 1850 as a measure of irreversibility (in systems which need not be thermally insulated from their surroundings). [1] Belgian chemist Theophile de Donder, in 1927, supposedly, was able to relate Clausius' non-compensated heat to affinity, a thermodynamic variable characterizing the state of the system. [2]

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Further reading

Duhem, Pierre. (1903). *Thermodynamics and Chemistry: a Non-Mathematical Treatise for Chemists and Students of Chemistry* (non-compensated heat, pg. 89). J. Wiley & Sons.

θΔics

In categories, **non-existences** refers to things that, although once believed to exist, do not exist, in reality.

Religio-mythology | Figures

The following are religio-mythology based non-existences, once believed to be real people or entities, but now considered fictional:

- Adam and Eve never existed (Ingersoll, c.1882)
- Noah never existed
- Abraham never existed (see: Abraham and Brahma) (Ibn Warraq, 1995) (Q); (Thims, 2004)
- Sarah never existed
- Buddha never existed
- Moses never existed (Wittgenstein, 1953)
- Virgin Mary never existed (see: virgin birth)
- Jesus never existed | Achristism
- Muhammad never existed
- God does not exist

(add)

Religio-mythology | Things

The following are religio-mythology things once considered to exist, but now considered fictional:

- Soul does not exist | Asoulism
- Spirit does not exist | Aspiritism
- Karma does not exist
- Life does not exist
- Afterlife does not exist

(add)

Science

In science, things once believed to exist, but now no longer believed to exist, include: ether, caloric, phlogiston, terra pinguis, three elements, four elements, perpetual motion, philosopher's stone, to name a few.

θΔics

In science, **non-life** is a difficult to understand umbrella term set to distinguish or characterize those inanimate chemical precursors found in the hypothetical “primeval soup” of the early years of planetary evolution from which life, theoretically, evolved or came into existence.

In the classic 1953 Miller-Urey experiment, for example, non-living chemical entities such as water (H_2O), methane (CH_4), ammonia (NH_3) and hydrogen (H_2) were electrically stimulated, using sparks as simulating lightning, into forming the various precursors to life, such as hydrogen cyanide, amino acids, simple sugars, etc. [1] These, in time, would theoretically form RNA and DNA, the building blocks of life.

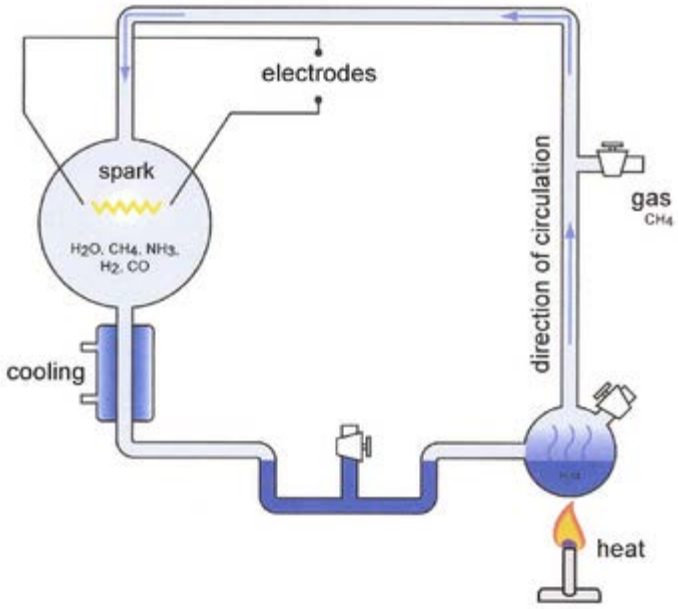

A depiction of the 1953 Miller-Urey experiment, wherein chemicals are heated and sparked in an apparatus, over a number of days, after which life-like chemicals are formed, the poster model for the life from **non-life** conception.

Difficulties on term

According to standard molecular evolution tables, however, the conception of non-life falls apart. From a chemical evolution point of view, any animate structure, such as a single unit of water or human being, can be considered as a dynamic molecule, e.g. H_20, a DNA molecule, a bacterial molecule, or “human molecule”, etc. Subsequently, the contrast of life versus non life, approximately, is a contrast between a particle animated by a heat source verse a particle not animated by a heat source.

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θΔics

In terminology, **non-living**, as opposed to living, is a defunct (Thims, 2009) conceptual-divide based term (see: defunct theory of life), which tends to assign things smaller than bacteria or viruses as being "different", e.g. energetically, thermodynamically, chemically, or physically, than things bigger in size. The "living" / "non-living" divide is a chimera, in short; the divide is NOT found going up or down the molecular evolution table, or "great chain of being", as the ancients classified things. See: life terminology upgrades for correct term usages.

Quotes

The following are related quotes:

> "I do not quite agree with the observation that main problem I have presently in the work (and mindset) is the religious conflict; reason being 'chemistry and physics do not recognize the word life' (Sherrington, 1938). This reasoning however raises another conflict. Chemistry deals with materials and material sciences while physics deals with energy and the energetics of materials. Wedding chemistry with physics opens the dimensions of physical chemistry. The physical sciences claim that they are exact sciences but they are at best correlation with observations. For the present, I do not contest the above observation since more important for me is the application of the principles of exact sciences to non-exact sciences, which includes the application of physico-chemical principles of exact sciences on a molecular system to a living molecule. This is where the main conflict lies. The living molecule is bound to act differently from the non-living molecule and hence the behaviour of the human molecule is bound to be different from a humanized molecule that has been energized with a certain quantum of free energy. In sum, the behaviour of the energized human molecule is not likely to be exactly in accordance with the physico-chemical principles. There can be empirical correlations and this is what the work so far done has its emphasis on; it does not make tall claims; it only aims at reducing the empiricism in the first instance."
>
> — Mirza Beg (2014), Beg-Thims dialogue (comment #4), Jul 6

See also

â— Non-living matter
â— Non-living thing

θΔics

In terminologies, **non-living matter**, as contrasted with living matter, is a term used to describe the either intake of atomic material into a biological organism for metabolism or the precursor atoms and molecules to the reaction or process that lead to the hypothetical first form of life.

Overview

In 1925, American chemist Edwin Slosson stated following about non-living matter: [1]

> "Thirty times a minute, we repeat [the action of breathing], some particles of **non-living matter** [air] are drawn into our bodies and become living matter, just as with mathematical precision the reverse process is repeated."

This definition presupposed that air, a medium composed of ten chemical species: nitrogen (N_2) 78%, oxygen (O_2) 21%, as well as argon (Ar), neon (Ne), helium (He), methane (CH_4), krypton (Kr), hydrogen (H_2), nitrous oxide (N_2O), and xenon (Xe), in smaller percentages, is an example of 'dead matter', but that these ten atoms and molecules become living matter or, in other words, 'alive' when inhaled, which is a nonsensical postulate.

References

1. Slosson, Edwin. (1925). *The Sermons of a Chemist* (pg. 11). Harcourt, Brace, and Co.

θΔics

In terminology, **non-living thing**, as compared to a living thing, is an obsolete defunct religio-mythology based term referring to a thing previous thought to be not-alive (or non-living) as the property of "life" does not exist, e.g. see: life does not exist or defunct theory of life, neither does its antonym.

Overview

In 330BC, Aristotle, supposedly, situate the view that a non-living thing, as compared to a living thing, is a thing that does not have a soul. [1]

In the 1930s, the virus debate erupted, during which time, and after, people could not figure out whether a virus was a living thing or a non-living thing, being that it is a crystal of sorts that has the ability to reproduce in plants and animals; some in modern times confusedly state that a virus is “on the borderline between living and non-living things” (Ñº); that a “virus is a non-living thing outside of a living cell, but a living thing when it is inside of the cell.” (Ñº)

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θΔics

In thermodynamics, a **nonequilibrium state** refers to the state of existence of a given system or body in which the variation of the thermodynamic potential quantifying the system is not equal to zero. [1] A system or body in a nonequilibrium state means that unbalanced potentials (or driving forces) exist within the system. [2]

Overview

A system not in equilibrium or in a nonequilibrium state generally equates to the conclusion that the variation in the entropy of the system is positive and has not reached a maximum value; the specifics of which, however, depending on the type of system, i.e. isolated, closed, open, etc., as well as what variables are being held constant, e.g. isothermal, isobaric, isochoric, etc. Systems not found in states not meeting what is called the criterion of equilibrium are said to be out of equilibrium or in a non-equilibrium. A nonequilibrium state, in simple terms, refers to the state of a system that is not in equilibrium.

There are, however, four general types or states of nonequilibrium: (a) non mechanical equilibrium, (b) non thermal equilibrium, (c) non phase equilibrium, and (d) non chemical equilibrium; each of which requires detailed discussion. Chemical equilibrium, for instance, refers to systems in which the rate of the forward reaction equals the rate of the reverse reaction, and therefore the equilibrium constant is zero, which is point assigned to a free energy variation of zero.

The details of the description of systems found in what is called a "state of equilibrium", as contrasted to systems not in a state of equilibrium or nonequilibrium for short was worked out in American engineer Willard Gibbs' 1876 *On the Equilibrium of Heterogeneous Substances*, in what he described as a 'general theory of thermodynamic equilibrium', the core statement of which is a as follows:

> "It is an inference naturally suggested by the general increase of entropy which accompanies the changes occurring in any isolated material system that when the entropy of the system has reached a maximum, the system will be in a state of equilibrium."

Conversely, a system of this type is in a state wherein the value of entropy has not reached a maximum value, the system can be said to be in a nonequilibrium state.

The degree to which a system is out of thermodynamic equilibrium is sometimes quantified in terms of what are called near-equilibrium variables, justified on what is called the local equilibrium approximation, using terms such as quasi-equilibrium or near-equilibrium state (near-equilibrium thermodynamics).

Another variant, developed generally by Belgian chemist Ilya Prigogine, is what is called the far-from-equilibrium state.

It is often said that so-called living systems exist continuously under nonequilibrium conditions. [3]

See also

â— Equilibrium state

References

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θΔics

In thermodynamics, **nonequilibrium thermodynamics** is the study of systems out of equilibrium or not in thermal equilibrium and their evolution with time. [1] Synonyms include “thermodynamics of irreversible processes”, non-equilibrium thermodynamics, far-from-equilibrium thermodynamics, among other variants. The “founding fathers” of nonequilibrium thermodynamics, a field emerging between 1931 and 1947, are Norwegian-born American physical chemist Lars Onsager (1931), German theoretical physicist Josef Meixner (1941), Belgian chemist Ilya Prigogine (1947), and Austrian-born Danish theoretical physicist Peter Mazur (1950s). [5] A defining publication in this field is the 1962 book *Non-Equilibrium Thermodynamics* by Danish theoretical physicists Sybren de Groot and Mazur, de Groot's graduate student. [6]

Near-equilibrium

See main: *Near-equilibrium thermodynamics*

The nonequilibrium thermodynamical study of systems “close to equilibrium”, i.e. close enough for a linear relationship to be assumed between assumed between observed fluxes and the forces that cause them is often referred to as “linear thermodynamics of irreversible process” a field initiated by Belgian mathematical physicist Théophile de Donder beginning in 1918 followed by the work of Lars Onsager in 1931. [2] Nonequilibrium systems near thermal equilibrium are described by the Onsager relations.

Far-from-equilibrium

When the linear hypothesis begins to reveal limitations, such as, for instance, in the "far-from-equilibrium" heat flow range, as in the phenomenon of of Bénard cell formation, in the study of various aberant chemical reactions, or in the case of oscillating reactions, a “non-linear thermodynamics of irreversible processes” is said to define this subject of study, as developed by Belgian chemist Ilya Prigogine, beginning in the 1945. [3] One of the earliest reports of an oscillating reaction, was the reported the periodic "flaring up" of phosphorus in contact with the air, in the seventeenth century, by English-Irish chemist Robert Boyle. [4] A modern example of an oscillating reaction is the Belousov-Zhabotinsky reaction (1950s).

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External links

● Non-equilibrium thermodynamics – Wikipedia.

θΔics

In terminology, **nonsense**, as compared to sense, is []

Quotes

The following are related

One person's sense can be another's **nonsense**.

"To all rational readers, the use of the chemical theory [in *Elective Affinities*] is **nonsense** and childish fooling around."

— Christoph Wieland (1809), commentary on Goethe's human chemical theory

"Almost all of the latter part of my life has been spent unlearning the **nonsense** I learned in my youth."

— Godfrey Higgins (1833), *Anacalypsis, Volume One* (pg. x); cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 200)

"**Nonsense** is incense to our noses."

— James Maxwell (1873), "Molecular Evolution" (Q)

"Schopenhauer is a mindless, ignorant, spreader of **nonsense**."

— Ludwig Boltzmann (c.1895), Draft lecture title

"I didn't know anything about evolution when I introduced it. I'd read in the papers that boys and girls were coming home from school and telling their fathers and mothers that the Bible was all **nonsense**."

— John Butler (c.1926), retrospect reasoning (Q) on why the Butler Act (1925), making it illegal to teach evolution, was passed

"Love is a romantic designation for a most ordinary biological process — or, shall we say, *chemical* — process … a lot of **nonsense** is talked and written about it."

— Author (1932), said by Greta Garbo in *Ninotchka*

"That **nonsense** is not merely nonsense. It is objectionable nonsense."

— Albert Einstein (c.1932), on presumption (Q) that routine organic processes have "something like free will", according to modern physical science

"Lest your longing for the transtemporal should awake and spoil the whole affair, they use any rhetoric that comes to hand to keep out of your mind the recollection that even if all the happiness they promised could come to man on earth, yet still each generation would lose it by death, including the last generation of all, and the whole story would be nothing, not even a story, for ever and ever. Hence all the **nonsense** that Mr. Shaw puts into the final speech of Lilith, and Bergson's remark that the élan vital [vital impetus of evolution] is capable of surmounting all obstacles, perhaps even death—as if we could believe that any social or biological development on this planet will delay the senility of the sun or reverse the second law of thermodynamics."

— C.S. Lewis (1941), "The Weight of Glory" [1]

"Where do you draw the line between one creature and another? Where does one organism stop and another begin? Is there even a boundary between you and the non-living world, or will the atoms of this page be a part of your body tomorrow? How, in short, can you make any sense out of the conception of a man as a discrete entity? How can the proper study form man be man if it is impossible for man to exist out of context. For the ecologist, then, the desire of some in the humanities to deal only with the fragment of reality they term 'human' is **nonsense**."

— Neil Evernden (1996), "Beyond Ecology: Self, Place, and the Pathetic Fallacy"; cited by Matthew Taylor (2008)

"Please stop trying to propagate your pseudoscientific human thermodynamics **nonsense** any further."

— Philip Moriarty (2009), comment #88 (Q) in Moriarty-Thims debate, Sep 10

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● Pierce, Charles. (2012). "The Consequences of Believing Nonsense" (Q), Esquire, Jun 22.

θΔics

In chemistry, a **nonspontaneous reaction**, as contrasted with a spontaneous reaction, is a chemical reaction that under normal conditions will not progress in the forward direction as written because it is not energetically favored, according to the restrictions of the Lewis inequality for natural processes, but can be made to proceed if it is coupled to a driving energy source, such as another strongly exergonic spontaneous reaction mixed into the system.

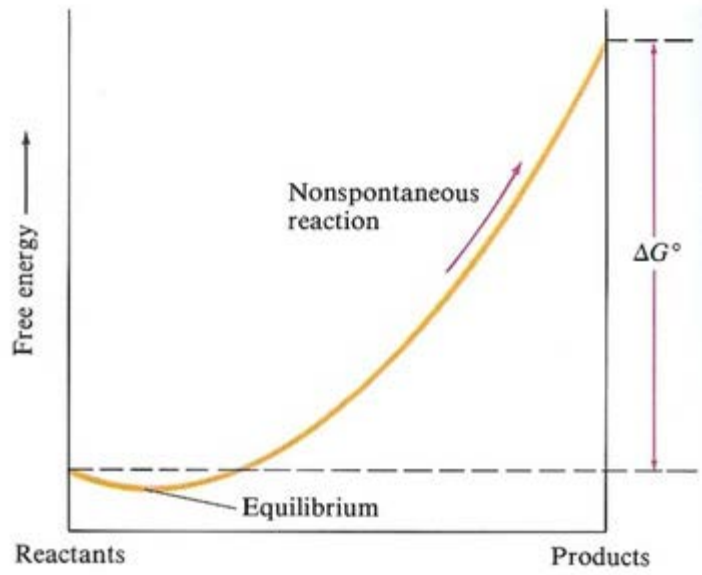

Generic depiction of a **nonspontaneous reaction**: showing that free energy increases as the reaction progresses on going to products, the products becoming more unstable, energetically, as compared to the reactants. [1]

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θΔics

In existographies, **Norbert Wiener** (1894-1964) (IQ:170|#311) [RGM:1329|1,500+] (CR:98) was an American mathematician and computer machine developer notable for his 1948 information thermodynamics stylized development of the science of cybernetics, the subject of the set of problems centered around communication, control, and statistical mechanics (statistical thermodynamics), whether in machine or in a living organism, and for his 1950 book *The Human Use of Human Beings*, specifically chapter "Entropy and Progress", in which he theorizes about progress entropically. [1]

Overview

Wiener, in general, made a connection between "information", which he correlated with the degree of a system's organization, and the inverse of entropy, which translates with the use of a negative sign in logarithmic terms. [3] The thermodynamic part of Wiener's theory, being based on the weak footing of Austrian physicist Erwin Schrödinger's idea of negative-entropy, is generally considered as an off-logic extrapolation, but, however, one which has had historical impact.

In 1948, based on Schrodinger's overly-simplified descriptions of negative-entropy and life, Wiener postulated that "the notion of information attaches itself very naturally to a classical notion in statistical mechanics: that of *entropy*." [1] As such, Wiener argued naively that "just as the amount of information in a system is a measure of its degree of organization, so the entropy of a system is a measure of its degree of disorganization; and the one is simply the negative of the other." He continues "this point of view leads us to a number of considerations concerning the second law of thermodynamics, and to a study of the possibility of the so-called Maxwell demons." On this logic, he states that such questions arise independently in the study of the phenomenon of living matter, as metabolism and reproduction, and that a "third fundamental phenomenon of life, that of irritability, belongs to the domain of communication theory (cybernetics)."

In his 1950 *The Human Use of Human Beings*, Wiener outlined his general theory:

> "It is my thesis that the physical functioning of the living individual and the operation of some of the newer communication machines are precisely parallel in their analogous attempts to control entropy through feedback. Both of them have sensory receptors as one stage in their cycle of operations: that is, in both of them there exists a special apparatus for collecting information from the outer world at low energy levels, and for making it available in the operation of the individual or the machine."

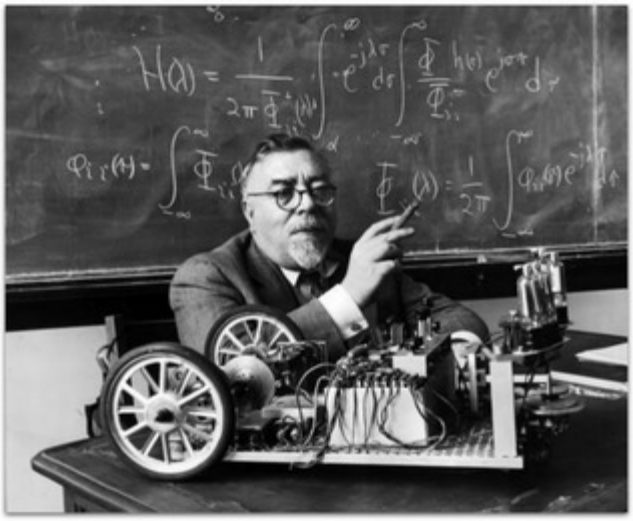

Wiener and one of his cybernetic machines. [7]

He continues, "in both cases, these external messages are not taken in neat, but through the internal transforming powers of the apparatus, whether it be alive or dead …the information is then turned into a new form available for the further states of performance." [2]

Cybernetics

Cybernetics proved attractive in many fields: it aimed to describe all systems in general because all systems ultimately were cybernetic, whether they were organic, mechanical, social or aesthetic. "Any organism is held together in this action by the possession of means for the acquisition, use, retention and transmission of information," Wiener wrote, making information the raison d'être of any organism, whether a living being, built circuit or societal construct. Cybernetics' implications extended to engineering, computer science, biology, philosophy, anthropology, art, architecture and even the organization of society—the direction of Wiener's second book on cybernetics, *The Human Use of Human Beings*. [7]

Macy Conferences

One key reason for the spread was because of the Macy Conferences (1946–53), a core group that included Wiener, W. Ross Ashby, Heinz von Foerster, Gregory Bateson, Margaret Mead, John Neumann, and Buckminster Fuller, who gathered twice a year to explore the science of feedback in the social and biological sciences. The Macy Conference attendees sought to create models of the brain and of living organisms in logical systems, linguistic and information theory and with early computers. [7]

Machines, life, and entropy

See: human machine

In commentary on his perspective of what defines "life", with focus on machine life, Wiener states: [5]

> "Certain analogies of behavior are observed between the machine and the living organism, the problem as to whether the machine is alive or not is, for our purposes, semantic … if we use the word 'life' to cover all phenomena which locally swim upstream against the current of entropy, we are at liberty to do so; however, we shall then include many astronomical phenomena … it is my opinion, therefore, best to avoid all question-begging epithets such as 'life', 'soul', 'vitalism', and the like, and say merely that machines [and] human beings [are] pockets of decreasing entropy in a framework in which the large entropy tends to increase."

Freud | Gibbs

Wiener, supposedly, argued that there are points of contact between Sigmund Freud's psychodynamic views and Willard Gibbs' statistical mechanics views, stressing that they both recognized chance as a basic element in the fabric of the universe. He also, supposedly, argued that in communication systems the crucial concept is information rather than energy, and that therefore Freud's emphasis on libido was inappropriate. [6]

Education

Wiener was a forced prodigy, whose cadre includes successes: John Mill and William Sidis, of the many not-so successful attempts. (Ñº)

In 1894, following his inception, his father Leo Wiener—a Harvard professor of Slavic languages—gave a press conference announcing that the child was to be turned through forced book reading into a genius. [9]

Norbert, in turn, was made into a child prodigy who completed his BS in mathematics from Tufts College at age 14 and PhD in mathematics from Harvard at age 18. During this period, while in the class of Harvard mathematics professor Edward Huntington's (c.1909-11), Wiener commented about his 225+ IQ cited prodigy-peer classmate William Sidis:

> "Both Sidis and I were in the class, and it was there that I first became aware of the boy's real ability and how great a loss mathematics suffered in his premature breakdown."

During his first year of classes, Sidis left Harvard for some months because of a nervous breakdown shortly after having given his speech, at age 11, on four dimensional bodies. To note, Wiener's human thermodynamics theories, as found in his 1948 *Cybernetics* and 1950 *The Human Use of Human Beings*, are on par or comparible to those of Sidis.

Wiener studied under British mathematician Bertrand Russell during a fellowship at Cambridge in 1912. [4]

Religion

In 1963, seven months before his reaction end (death), Wiener published *God and Golem*, a short effort to outline his views on how science, cybernetics in particular, impinges on religion; gist of which seems to be an effort to elaborate on

a updated machine version of the philosophical quagmires surrounding the older clay creation myth theory, which Wiener summarizes as follows:

> "Rabbi Low of Prague claimed his incantations blew breath of life into the Golem of clay. The modern machine is the modern counterpart of the Golem of the Rabbi of Prague."

The language of the book seems to indicate that Wiener some where between a believer and an agnostic in respect to belief in the existence of God, comparing the omnipotence of god to something like a mathematical infinity; employing the term "spiritual" without too much digression, etc. The following are noted quotes from the book: [9]

> "On no account is it permissible to mention living beings and machines in the same breath. Living beings are living beings in all their parts; while machines are made of metals and other unorganized substances, with no fine structure relevant to their purposive or quasi-purposive function. Physics—or so it is generally supposed—takes no account of purpose. The emergence of life is something totally new. If we adhere to these tabus, we may acquire a great reputation as conservative and sound thinkers, but we shall contribute very little to the further advance of knowledge."

Digital computer

In Sep 1940, Wiener approached Vannevar Bush with a proposal to build a digital computer based on binary. [8] Bush declined to provide NDRC funding for it on the grounds that he did not believe that it could be completed before the end of the war. The supporters of digital computers were disappointed at the decision, which they attributed to a preference for outmoded analog technology. Nearly three years later (Jun, 1943) the Army provided $500,000 to build the computer, which became ENIAC, the first general-purpose electronic computer.

Quotes

The following are noted quotes:

> "Where the knaves assemble, there will always be fools."
>
> — Norbert Wiener (1948), *Cybernetics* (Ñº) (Ñº)

> "Just as entropy is a measure of disorganization, the information carried by a set of messages is a measure of organization. In fact, it is possible to interpret the information carried by a message as essentially the negative of its entropy, and the negative logarithm of its probability. That is, the more probable the message, the less information it gives. Cliches, for example, are less illuminating than great poems."
>
> — Norbert Wiener (1950), *The Human Use of Human Beings: Cybernetics and Society* (Ñº)

See also

â— Jonathan Tennenbaum

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External links

â— Norbert Wiener – Wikipedia.

θΔics

In mythology, **Nordic mythology**, aka “Norse mythology”, refers to the c.700AD cultural rescript (see: god character rescripts), in the Germanic regions, of Egyptian mythology, centered around the gods: Odin (Ra), Thor (Horus), Loki (Set), and Frigga (Isis); and motifs such as Thor’s oak (Osiris’ tamarisk tree / Christmas tree), loss of one eye, e.g. Odin’s eye (eye of Ra) or Thor’s eye (eye of Horus), “spearing motif”, among others.

Eye of Odin | Eye of Thor

The motif of both Odin and Thor losing their eyes in battle, supposedly, derives from the myths of Ra and Horus (see: eye of Horus) losing their eyes in battle, which are astro-theology motifs based on the sun and moon losing their luminosity during eclipse and new moon, respectively:

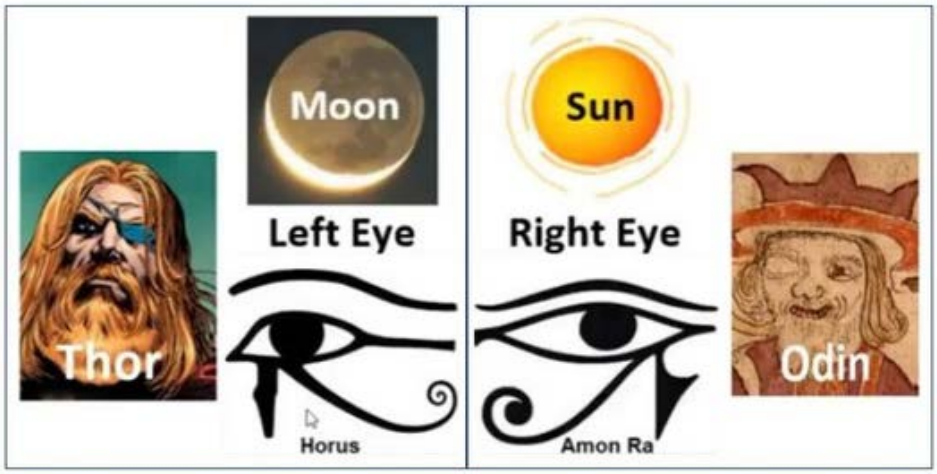

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Spearing motif

The myth of Loki tricking Hod to stab his brother Balder in the side with a mistletoe spear, according to Dorothy Murdock derives from the same motif as that in the myth of a solder spearing Jesus in the side during his crucifixion:

> “And then [during crucifixion] often **stabbed in the side** with a sharp object, e.g. in the Odin myth a mistletoe spear.”
>
> — Dorothy Murdock (c.1999), interview (12:20-)

The “Roman solder spearing Jesus in side motif”, as has been pointed out by Libb Thims (c.2018), in turn derives, astro-theologically in some way, from “opening of the mouth” ceremony and the “spearing of Osiris” in the face by Horus, as shown on the walls of Dendera Temple, below left: [3]

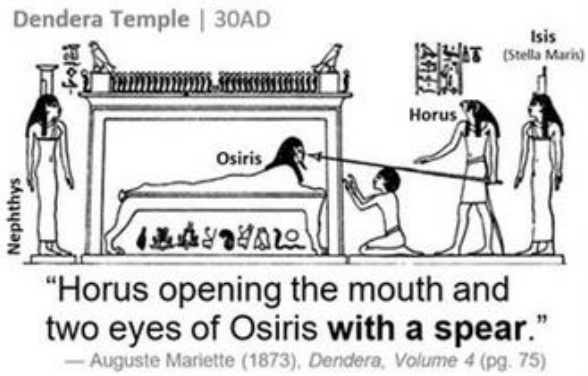

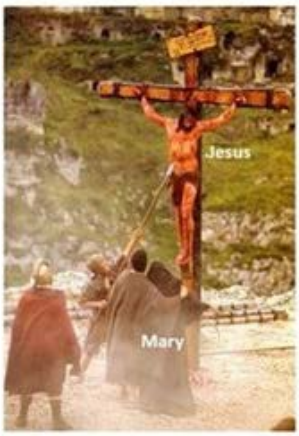

“But when they came to Jesus and found that he was already dead, they did not break his legs. Instead, one of the soldiers pierced **Jesus’** side **with a spear**, bringing a sudden flow of blood and water.”
— Anon (c.200AD), *Bible*, **John 19:33-34**

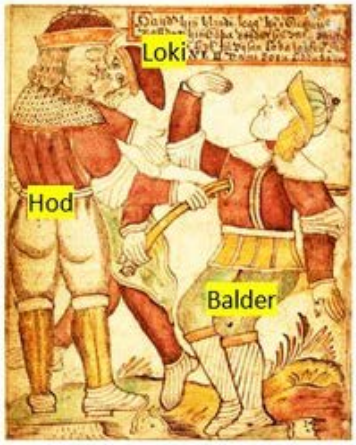

(add)

Santa | Thor

The following shows the basics of how the motif of Thor, holding his hammer, being pulled through the sky by two goats named Cracker and Gnasher, became the motif of Santa, holding his jingle bell, being pulled by Rudolf: [2]

(add)

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External links

â— Norse mythology – Wikipedia.

θΔics

In existographies, **Norman Dolloff** (1907-1984) (IQ:185|#59) (SN:5|55+) (EvT:21|21+) (CR:41) was an American metallurgical engineering geologist noted, in hmolscience, for his 1975 *Heat Death and the Phoenix: Entropy, Order, and the Future of Man*, wherein he takes a stab at applying entropy and free energy to the humanities, albeit with the double downside use of Shannon-Wiener information models of entropy and an entropy antonym term "ordiny" (conceived by him in the 1950s, after reading Schrodinger's negative entropy discussions), according to which he classify reactions and processes that "go in the direction of greater order" as being "ordinic" changes (as opposed to entropic changes).

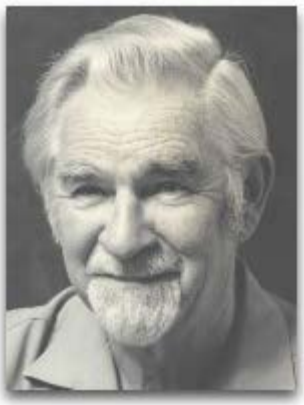

Free energy of formation | Human

See main: Free energy of formation

Dolloff, in the end pages of his §7: “Order and Life: Evolution” (pgs. 134-35), gives a synopsis of what he has been arguing thus far, as follows:

> “We have started with atoms and have calculated the absolute changes in entropy when they are combined in simple organic compounds; for instance, graphitic carbon and hydrogen gas combine to form gaseous butane, a decrease in entropy. We have seen that distinguishable rearrangements of the same atoms, isomers, have different entropies (the "snake" and the "spider"). We have seen that the process of polymerization results in entropy decreases whether by adding chains or cross-linking. For instance, polyethylene with a thousand links represents a decrease in entropy of almost 23,000 calories/mole when compare with the necessarily simple ethylene. The possible different arrangements of RNA and DNA molecules are enormous and must represent differences in entropy. The coacervate, protoplasm, and the cell are still more complex organizations of matter and represent further decreases in entropy in their formation. Organisms from cell to homo sapiens represent even further decreases in entropy. A chemical analysis of man has been given as so many gallons of water, calcium enough as hydroxide to whitewash a fence, phosphorous for so many matches and iron enough for a very small bag of nails. What is the difference in entropy between these chemicals and a healthy human being!”

In response to this query statement, Dolloff gives the following what we might call "organism synthesis equation":

$$\sum n_i \rightarrow \text{organism}; \Delta G_R^\circ = +; \Delta S_R^\circ = -$$

where Σn_i represents the “sum of simpler chemical species”. This, +/- signs (of Gibbs energy change) aside, seems to be one of the first coherent attempts at stating that humans have a Gibbs free energy of formation, i.e. a human free energy of formation.

Here, to note, it is difficult to discern what he is trying to say, in respect to his labeling of the free energy of formation as positive (non-spontaneous)? It could possibly be (a) a way to state that "evolution" isn't natural by itself (i.e. is endergonic), and that heat from the sun must drive the reaction to make it occur, or (b) a type or oversight, being that his focus is on entropy, more so than free energy. He then gives the following second equation, which seems to be a what we might call "organism analysis equation"

$$\text{organism} \rightarrow \sum n_i; \Delta G_R^\circ = -; \Delta S_R^\circ = +$$

Here, again, it is difficult to discern what he is trying to say by this statement (being that he gives a negative free energy sign)? Possibly that an organism "at death" will decay spontaneously into its component chemicals? In any event, he then says that the “whole process of evolution from the first eobiont to the most complex species is ordinic [negentropic/order-forming]”.

Atheism | Implicit

Dolloff’s book is written with an “implicit atheism” method; the following end chapter closing statement (pg. 190) is the core statement of this:

> “One of the recognized ways to condition animals to act a certain way is by means of rewards and punishments. With human beings, we should add imaginary rewards and punishments. In the area of reality these can involve hunger, thirst, sleep, rest, peace of mind, happiness, power, hate, love, and so on. The naughty child may be sent to bed without his supper or, if good, rewarded with a cookie; an officer may be promoted or reduced to the ranks; a husband may be given the silent treatment or invited into the connubial bed.
>
> There was the ‘great spirit’, call it by any name, that knew what was going on under the sheets and could read one's innermost thoughts. Then there was the next life for which this one was only a preparation. Since there was an encyclopedia of sins [see: negative confessions, ten commandments, etc.], which could include eating certain food on the wrong day, let alone sins of the flesh, the only hope to gain ‘paradise’ or avoid the ‘inferno’ was to conform to the system whereby these inevitable sins could be forgiven. The power to do this lay in certain members of the society. This seems to be a logical way for societies to survive and prevail against others. For heinous crimes such as believing in some other religious system (or no system), there was the stake the gibbet, Saint Bartholomew's Night and the Crusades.”

Then he connects this to energy and order as follows:

> “This order could only achieved as the consequence of expending an enormous amount of directed energy. There are other dogmas and doctrines beside those of organized religion. To mention a few, there are *The Thoughts of Mao*, *Mein Kampf* the Constitution. But these works were not based on spirits or Valhallas.”

Dolloff, in short, employs the Critias hypothesis view of god, namely that gods, god and 'great spirit" ideas were social inventions, used to condition people to act in certain ways via promise of imagined rewards and punishments.

Medium of exchange | Directed energy

The following are Dolloff’s comments (pgs. 190-91) the evolution of the medium of exchange in terms of the conditioning of the mind via education and expenditure of directed energy:

> “Another matter of the highest importance in these days is that of money and media (of exchange. In primitive societies exchange of goods, barter, was a method largely used. Sometimes such articles as wampum, seashells, and flints were used. Later more durable materials were used as media of exchange, such silver or gold. But these were scarce substances and often awkward to use.
>
> The acceptance of these pieces of paper as a medium of exchange has occurred only on the basis of the conditioning of human brains for their acceptance. This conditioning process has required the expenditure of directed energy through education and experience. In order to maintain the belief in the value of a dollar bill, extensive and intensive processes must take place. Savings are secured by an agency of the federal government; there are strict laws with severe penalties for such activities as counterfeiting. The right to print is jealously guarded by federal governments.”

(add)

Citations

Dolloff cites scholars and works including: Lawrence Henderson's *The Fitness of the Environment* (1913), Robert Emden (1938), Norbert Wiener's *The Human Use of Human Beings: Cybernetics* (1950) and *God and Golem* (1964), Harold Blum (1951), Fred Cottrell (1955); along with physicists and thermodynamicists including: citing works such as: Kenneth Denbigh (1951), Henry Eyring (1957), Alexander Oparin (1961), Robin Giles (1964), among others.

Boundary problem

On the boundary problem, Dolloff (pg. 169) cites Johann Fast (1962) as follows: [7]

> "In symordinis [any type of 'order' that results from two or more things, animate or inanimate, e.g. lichens-plants, humans-cars, beaver-dam, etc.], we deal with two or more systems or two or more types of systems. A system can be any portion of the universe we wish to define. 'Although, in principle, one is free in the choice of the limits of a system, that choice sometimes determines whether or not a problem is solvable' (Fast, 1962). **Defining the boundaries** of a system is more of a problem in symordinis than in symbiosis since the boundaries of a plant or an animal are usually rather easily determined. Sometimes the boundaries are sharp as in an empty gastropod shell, a honeycomb, an automobile or a satellite; in other cases the boundaries not so sharp, as the hydrosphere, residual soil, or mineral deposit."

(add)

Off target | Issues

Dolloff divides his book into a part one "inorganic scene" and part two "organic scene", which is one area of a misconceptual divide issue (see: organic and inorganic). A second area of conceptual divide is explained (pg. 140) as follows:

> "In a primitive society, an understanding of these [first and second] laws [of thermodynamics] is not important, but in order to understand the operation of a high energy mechanized society these laws are of great importance."

In other words, in the first part of his book, Dolloff correctly defines free energy and bound energies operating between molecules, such as (pgs. 108-09) the synthesis reaction of glycine, which he gives as follows:

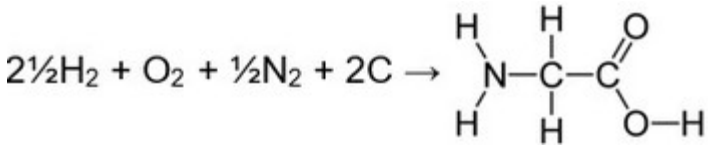

which he cites as having an entropy of reaction of:

> $S_R = -152.63$ e.u.

where e.u. is "entropy units" (calories / degrees), but then in the second half of the book he switches logic and focuses not on reactions occurring between people and the entropies of reactions and free energy of formations, e.g. of societies or families, such as follows:

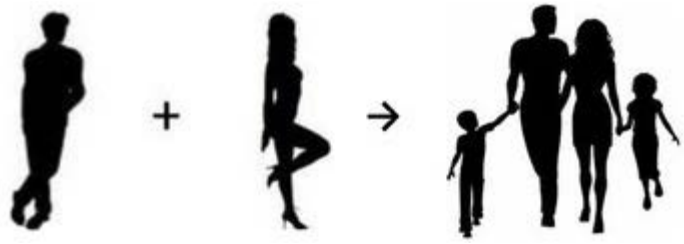

which might have a hypothetical entropy of reaction (see: human entropy) of:

$$S_R = \frac{10^9 \text{cal}}{273K}$$

or:

S_R = – 3,700,000 e.u.

based on his statement (pg. 189-90) that:

> "The thermodynamics of why societies are organized as they and act as they do, is not at all well known. But we do know that in order to arrive at a certain organization of society, energy is required to condition human minds and these ends, and by energy I mean giga-calories."

but instead, ironically, he focuses of "fossil free energies" (a common off-target mistake, Nicholas Georgescu-Roegen [whom Dolloff cites in his bibliography] being the prime example), i.e. the free energy released from coal or gasoline combustion (instead of human combustion; see: social combustion theory), and how "high energy societies" and "low energy societies" function they way they do, based on things such as automobile use, hydroelectric power ability, etc., with focus on "prime movers", which he defines as "any animate or inanimate entity that can convert potential energy or kinetic energy into energy that is available to and can be controlled by man", e.g. a heat of a combustion engine used to lift an elevator. This ill-logic can be gleaned by the following statement (pg. 193):

> "As the flow of energy through a technological society increases, there are certain tendencies that can be anticipated, one of which is a tendency to increase the population of 'free energy consuming entities', such as people, automobiles, electric motors, schools, libraries."

Dolloff, here, in other words, likely via Georgescu-Roegen influence, incorrectly defines people as 'free energy consuming entities', i.e. the people are things that use up fossil fuels model, rather than the free energies are the driving force of chemical reactions between people model; the latter of which he uses in the book, but is not able to visually make the jump to human chemical reaction theory directly.

Mutation | Thermodynamics & Kinetics

Dolloff, in his §7: "Order and Life: Evolution", devotes a few pages (pg. 126-28) to Harold Blum's discussion of "A Thermodynamic and Kinetic Treatment of Mutations", specifically Blum's equation 9.10 shown below:

$$K \approx \frac{k_B T}{h} e^{\frac{-E}{RT}} e^{\frac{\Delta S}{R}}$$

where K is the mutation rate constant between two forms of genetic mutation in say a breed of flies, kB is the Boltzmann constant, T is absolute temperature, h is Planck's constant, E is an experimental energy of activation, R is the gas constant, and ΔS, plots of which supposedly can be used to calculate the Gibbs energy of mutations of evolving species; about which Blum goes over in more detail. Blum, to note, states that this logic originated from Fred W. Lorenz, a student in one of his classes, who had the idea of applying thermodynamics to the problem of quantifying mutations involved in evolution.

Overview

In 1975, Dolloff, in his *Heat Death and the Phoenix: Entropy, Order, and the Future of Man*, presented the results of his conclusion that thermodynamics is applicable to human affairs; the following is Dolloff's preface:

> "Ideas about order and disorder began to germinate in my mind about the end of the 1940s and the beginning of the 1950s. Their origin was in the areas of physics and chemistry—the Carnot cycle, of course, as well as my wanderings through the labyrinth of chemical thermodynamics. It was about this time that the laws and principles of thermodynamics began to be applied on an increasing scale to the geological and biological sciences. My discovery in the 1950s of Shannon's and Wiener's development of information theory and its relation to statistical mechanics meant to me that the concept of entropy was much more universal than my **formal courses had indicated**."

Here, of first note, we see an indication of the pressing a two cultures integrating, hmolscience course, of a generalized physicochemical humanities. Of second note, we see Dolloff falling into the Shannon trap (or Shannon bandwagon), of thinking his mathematical isomorphism formulation of data transmission is thermodynamics, which is not the case, i.e. its scientific fool's gold, easily alluring to those not schooled in electrical engineering and or computer science and thermodynamics. He continues:

> "The conviction grew that energy and entropy relationships were fundamental not only in understanding processes in physics and chemistry but also in astronomy, geology, and biology. Inevitably this led to the conjecture that further extrapolation would lead to the human sciences and arts, and even to psychology, sociology, history, music, philosophy and religion. Someone, I thought, will bring out the importance of understanding the concepts of order and disorder to all configurations of matter—including man and all of his works. Individuals have applied these concepts within their own specialties; there are articles on information and electronics, entropy in literature, music, and even entropy in religion. But I have waited in vain for someone to show that order and disorder are universal. Most of this essay, and it is an essay—an attempt—was written in the early 1960s. But I am, I believe, a cautious person. I ask myself, who am I to presume myself enough of an eclectic to be **able to discuss all of human knowledge**?"

Here we see the polymathy degree problem; Dolloff already has four degrees, but he does not feel competent enough to venture into the "all knowledge" area of expertise, which requires a 6 to 8 degree level of intellect. Dolloff continues:

> "And if I should attempt it, to whom should I address myself? Experts in thermodynamics may discover that my background is elementary; experts in the human sciences and arts may be 'turned off' by formulas and technical language, as was pointed out by C.P. Snow in his *The Two Cultures*. The only conclusion I could arrive at was—if I am going to do this writing, I am going to have to write it to myself."

The following is the dust jacket synopsis: [3]

> "Is the universe running down? Will the highly organized structures of matter and life be transformed at last

into a state of inert uniformity? Or will matter and life develop ever more efficient structures capable of making use of the energy of the universe? The author pondering the significance of the laws of thermodynamics, realized that they were applicable (compare: not applicable view) not only to physics and chemistry but to all the natural sciences, and indeed to the whole range of human activity: psychology, history, music, philosophy and religion. Now, in this incisive and wide-ranging study, he shows how an understanding of the laws of thermodynamics in all their ramifications may enable man to organize his future and control the destiny of life in accordance with the fundamental principles that govern the universe."

The following is the press-release abstract: [5]

> "In this incisive, wide-ranging study, Dolloff examines the nature and tendencies of matter and energy. He establishes the applicability of the laws of thermodynamics and their ramifications to the natural sciences and to the entire range of human activity. Indeed, he holds that it may be an understanding of these laws and their ramifications that enables man to reckon successfully with the universe in times ahead. Dolloff examines the concepts of entropy (disorder) and ordiny (order), and compares them to the concepts of chaos and order in society, drawing interesting parallels and pointing up the significance of these. In a penetrating survey of the entire scope of knowledge and activity, he considers the sciences generally and applies his findings to man's immediate problems now. For instance, he examines how society is organized, how energy sources are utilized in our industrial world, and how man's capacities may be developed. For Dolloff, life is not a miracle; it is an integral part of the master plan of the universe. He propounds and substantiates this view very ably in his book."

wherein, of note, we see the use of the term "ordiny" which seems to be an entropy antonym theorized by Dolloff.

Fish tank | Carnot engine

Dolloff, in his §1 "Energy and Entropy", devotes four pages (pgs. 18-21) to an interesting fish tank Carnot engine model, shown adjacent, wherein part of the heat flow form the hot body (T_1) to the cold body (T_2) is used to power a generator, via a turboelectric device, which is used to power a photosynthetic light, which powers plant photosynthesis, which powers the fish, according to which a thing such as fish respiration represent areas of "local entropy increase", according to Dolloff, and things such as photosynthesis of large organic molecules in the algae represent areas of "local entropy decrease". Dolloff then scales this model up to a hypothetical section of earth suspended in a vacuum as follows:

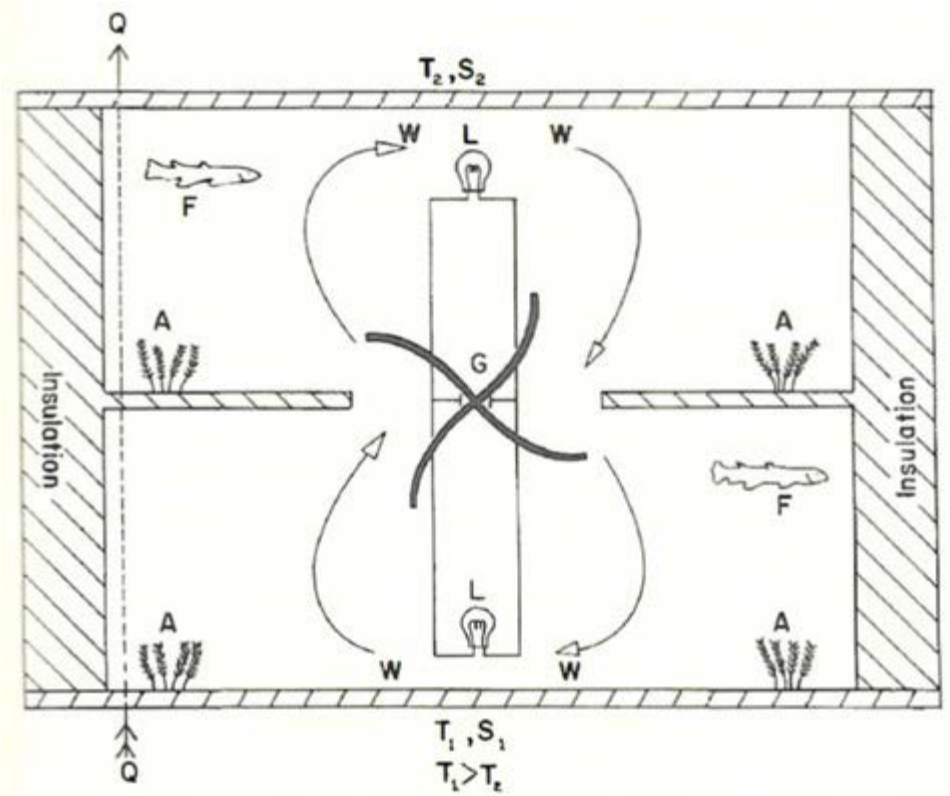

Dolloff's fish tank Carnot engine model (figure 1.3), which titles as "Flow of Heat and Entropy Changes in an Open System in a Steady State", where: Q is heat, T_1 is a large high temperature reservoir, T_2 is a large low temperature reservoir, S_1 and S_2 are the entropies passing into and out of the system, respectively, W is water, G is a hydroelectric generator,

> "Perhaps a model could be made something like earth by following monochromatic ultraviolet light through a one-way window into a container. A careful adjustment of the

A is algae, F is fish, and L is a light bulb. [1]

contents of the container (fish, plants, air, etc.) might enable the system to approach a steady state. If the container were suspended in a vacuum and if its internal energy were free to radiate out by means of another one-way window, an analysis could be made of the radiation spectrum form the window. It would be predicted that the frequencies of the radiation energy would be less than the incoming monochromatic ultraviolet radiation and that the frequencies would be several.

This model is roughly that of the planets, and the earth in particular. Sun is the hot reservoir and its energy is composed of all the electromagnetic frequencies and variable intensities coming from it and intercepted by earth. The cold reservoir is space into which earth radiates its frequencies and particular spectral intensities. In the astronomical case, the heat is not transferred by conduction and convection but by radiation.

The lower temperature of the cold reservoir (heat sink) has its counterpart in the fact that earth's radiation consists as a whole of lower frequencies (e.g. infrared) than those of sun (e.g. ultraviolet).

It is possible that some frequencies can be emitted that are greater than that of incoming radiation. For instance by thermos-luminescence low-grade radiation is capable of producing visible light. But the overall result in each case must be an increase in the total entropy."

(add discussion)

Entropy of formation | Organisms

Dolloff, in his §4: "Order and Disorder in the Chemical World", devotes a certain amount of focus to discussing the entropy of formation of chemicals, carbon chemistry in particular, the aliphatic series (Ñº) specifically, in attempt to ferret out some type of order/disorder categorization of the structures and their entropy of formation values; a noted quote from this discussion is:

> "Perhaps we will never have quantitative data on the negative entropy of formation of a particular DNA molecule from its elemental building blocks such as the amino acids. Even more involved would be the entropy of formation of a living cell such as a protozoan. There appears to be no limit to the decrease in entropy of formation of organisms. Perhaps the entropy of formation of a living, functioning human brain may be the most ordinic [negentropic] system that has occurred on this planet."
>
> — Norman Dolloff (1975), *Heat Death and the Phoenix* (pg. 58)

Here, to note, it is the free energy of formation that is the relevant quantity importance; at least, however, Dolloff is stepping in the correct direction, given the period of his idea formulations (1950s to 1970s).

Gibbs energy | Entropy

Dolloff, in respect to entropy increase and Gibbs energy, does give (pg. xvi) give the following formula:

$$\frac{dS}{dt}(\mathrm{irr}) = -\frac{1}{T}\frac{dG}{dT}$$

which shows, according to Dolloff, that "the rate of production of entropy due to chemical reactions is proportional to the decrease in Gibbs free energy" (pg. 71) or that "irreversible increase in thermodynamic entropy is related to the decrease in free energy" (pg. xvi). The use of the phrase "thermodynamic entropy", is a red flag that Dolloff is attempting to differentiate between Shannon-Wiener labeled entropy models, in an ad hoc manner; nevertheless, he

makes a decent connection between entropy increase and Gibb energy change.

On Gibbs energy in general, Dolloff comments:

> "The Gibbs free energy is the driving force of chemical reactions and a quantitative value of it can be used to predict the tendency for a chemical reaction to go to products."
>
> — Norman Dolloff (1975), *Heat Death and the Phoenix* (pgs. 64-65)

> "The Gibbs free energy includes the energy within the system that is available for work and the work capable of being done by the system on its surroundings. With a chemical reaction, the difference in free energy between the products and the reactants gives a measure of the driving force."
>
> — Norman Dolloff (1975), *Heat Death and the Phoenix* (pg. 65)

On this coherent basis, to note, Dolloff does not have the "reactions between humans" visual of what he is discussing; rather he seems to have this free energy release conceptualized as coming from fossil fuel combustions (e.g. burning of gas to power an engine, work form which can be used to yield order, e.g. lift an elevator up a building); one example of this view is the following statement:

> "Man, by releasing Gibbs free energy of fossil fuels, has increase the production of entropy. But that is not his aim. His aim is to direct that energy into producing ordinic events. He directs available energy even though it eventually becomes random energy."
>
> — Norman Dolloff (1975), *Heat Death and the Phoenix* (pg. 72)

(add discussion)

Origin of life?

On the vexing subject of the origin of life, Dolloff comments the following cogent statement:

> "When did life begin? We can say that a certain complex protein is not alive, that a synthetic coacervate made of gelatin, gum arabic and ribonucleic acid is not alive. We may say that a particular specimen of protoplasm is alive. The inference of a large number of such choices may be that things are either alive or not alive. A certain animal may be said to be biologically dead. But is the system all dead? When it is seething with maggots? Man, due to the relative simplicity of his cerebration, likes pigeonholes. This organization of information is like the old game of picking the petals off daisies: 'She loves me, She loves me not.' 'It is, it isn't.' This technique has gotten man a long way, perhaps as a first approximation, but that is not the way things are. His thinking often seems to be like a computer operating on a two-digit system. With education, he learns to think in straight-line relationships: *a* varies as *b*. Some people learn to think in terms of logarithms: *a* varies as a power of *b*. Many natural phenomena vary logarithmically. But let us recognize our short-comings. If we could have observed the entire evolutionary process from simple molecule to mammal, it is doubtful if we could have logically made the statement, 'Now, just now, the first living thing exists'."

Here we see Dolloff on the verge of abioism.

Phoenix

A salient note on Dolloff's preface aim to tackle religion with energy and entropy, is that with a bird flying no his cover of a book with the name "Phoenix" in the title, one does not find the translative term "Abraham" (creator patriarch of Christianity, Islam, and Judaism) nor "Brahma" (creator god of Hinduism) listed in the index? This means, of course, that Dolloff is lacking in basic religio-mythology education, e.g. he seems to be unaware that the term "phoenix" is Herodotus' name for the Egyptian sun god Ra born out of the pyramid carrying the sun (disc) on its head, according to Heliopolis creation myth, which the root meaning of both Abraham, i.e. Ab-Ra-ham, and Brahma, i.e. B-Ra-hma, both of which mean or transliterate as "Father 'Ra' born out of the Nun (-*ham* or keme) following the primordial flood (Ab-)".

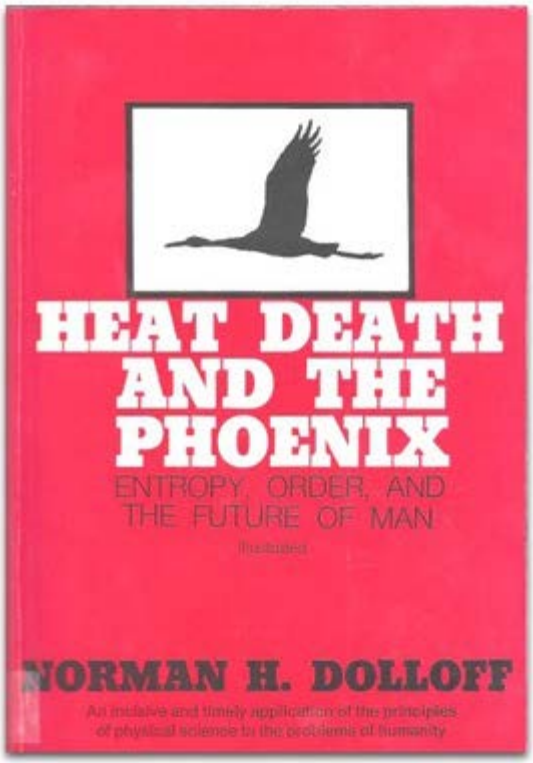

Dolloff's 1975 *Heat Death and the Phoenix*: *Entropy, Order, and the Future of Man*; the bottom caption reads: an incisive and timely application of the principles of physical science to the problems of humanity.

Ordiny

Dolloff introduces term "ordiny", an entropy antonym term, a variant of negentropy or as he puts it in footnote:

> Ordiny ≡ negentropy

conceptualized as "the Phoenix of order rising, like the mythical bird, from the ashes of a tendency toward the universal unavailability of energy or heat death (warmestod)".

Difficulties

Difficulties on theory, in Dolloff's argument, include: firstly, his use of information theory, which in his preface he comments on as follows:

Secondly, his assertion that by developing more efficient structures capable of making optimum use of energy, man will be able to organize his future and "control the destiny of life"; his use of a patch entropy antonym solution

Other

In 1991, Mark Wexler, in his "The Entropy Metaphor and the New Age of Ideology", cited Dolloff's *Heat Death and the Phoenix*, one of his few citations according to Google scholar. [4]

Entropy | Piper

Dolloff, possibly being seduced into information theory lured by Canadian weed theorist Witold Brostow (1972), states the following:

> "A DNA molecule has been compared to a message. Four amino acids are attached on the DNA double spiral in various combinations, hence the similarity with a message. The complex

molecules are too involved for chemical thermodynamics but are amenable to interpretation through information entropy."

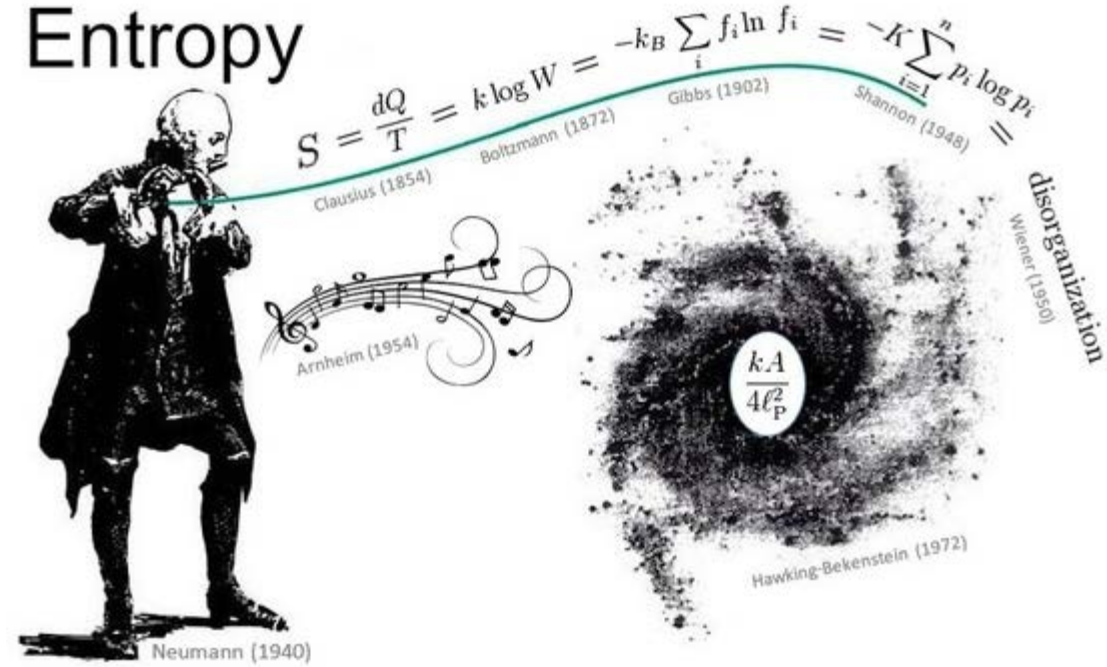

An entropy piper, an extra-labeled variant of the version shown on the cover of Harold Morowitz' 1992 book *Entropy and the Magic Flute*, showing various entropy formulations, something **Dolloff** seems to have succumb to, him thinking of Shannon-Weiner entropy as an magical "open sesame" to the sciences of man, thereby allowing him to take a musical ride on the Shannon bandwagon.

He goes onto state that future computer with enormous memory banks will facilitate the solution and moreover:

> "The Shannon-Wiener information entropy that is related to the thermodynamic entropy may be the 'open sesame' to the sciences of man."

This is depicted below:

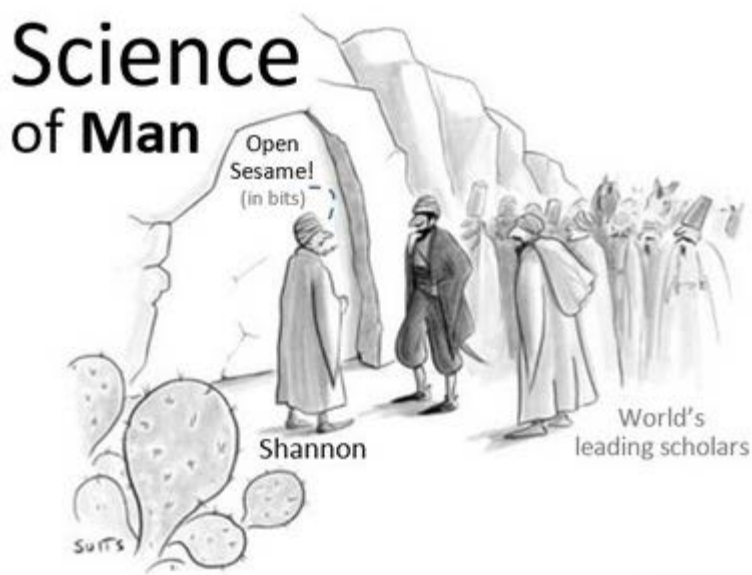

Here we see someone succumb to the pied piper, as depicted adjacent.

Education

Dolloff completed his BS in geology at MIT in 1930, focused on a study of certain granite pegmatites (pegmatite

minerals) of York County, Maine, publishing something on this topic in either 1930 (Ñº) or 1936 (Ñº), his MA at Columbia University, after which, in 1939, he was studying at the University of Michigan (Ñº), and then completed a second MA and PhD in 1950 in metallurgical engineering, with a dissertation on "Electrolytic Reactions of Galena and Chalcopyrite", at Stanford University's School of Mineral Sciences. [2]

Quotes | By

The following are related quotes:

> "'Man conforms to the laws of the earth. Earth conforms to the laws of the universe. The universe conforms to the laws of tao. Tao follows itself' (Laozi, 600BC). The universe, as far as we know, conforms to the laws of thermodynamics, so perhaps thermodynamics in its larger sense might be considered as the tao. The laws apply to all energy and matter in the universe, at least as far as we know (perhaps excepting quasars and black holes)."
>
> — Norman Dolloff (1975), *Heat Death and the Phoenix* (pg. xii)

> "Hutton [James Hutton] and his disciples were able to remove the assumption that six thousand years was the age of this planet. This relaxation gave Darwin the lever to pry biology loose from religion."
>
> — Norman Dolloff (1975), *Heat Death and the Phoenix* (pg. xiv)

> "Organisms are much more complicated than minerals. We know the free energy of formation and the entropy of quartz, but the value of the same parameter in a cell is unknown."
>
> — Norman Dolloff (1975), *Heat Death and the Phoenix* (pg. xv)

> "One of the difficulties with the concept of entropy is the fact that the senses have difficulty in detecting or measuring it. We can feel the difference between hot and cold, long and short, big and little, fast and slow, heavy and light, but there are no spontaneous sense perceptions to judge quantitative variations in entropy."
>
> — Norman Dolloff (1975), *Heat Death and the Phoenix* (pg. 6)

> "The principle difference between carbon on a chimney sweep's face and a diamond in a queen's tiara is a matter involving entropy; so is the family kitchen before and just after a party, gold scattered in a stream gravel and at Fort Knox, tubes of paint and a Mona Lisa, ten pounds of chemicals and an equivalent cat."
>
> — Norman Dolloff (1975), *Heat Death and the Phoenix* (pgs. 6-7)

> "A crystallizing substance [approaching absolute zero] is something like military order. A group of soldiers hear the commands, 'fall in! Dress right, dress! Present arms!' A command increase the amount of order. Every rifle is at the vertical, a deviation receives a reprimand. Even eyeballs are directed straight ahead. Respiration, circulation and peristalsis go on but we are not at 0° Kelvin! [Similarly] if one gram of water freezes, ΔS is –80/273 e.u."
>
> — Norman Dolloff (1975), *Heat Death and the Phoenix* (pgs. 6, 13)

> "We melt a substance. Similarly upon the command 'Fall out!' the company becomes 'entropized'. This one lights a cigarette, that one scratches an intolerable itch, they walk off in different directions. 'Entropy' increases. [Likewise] the latent heat of melting ice is 80 calories per gram. If just enough heat is added to melt one gram of ice not to raise it temperature above 273° K and if the heat is used *only* for that purpose, then the change in entropy ΔS is +80/273 e.u. per gram."
>
> — Norman Dolloff (1975), *Heat Death and the Phoenix* (pgs. 5-6, 13)

> A substance like glass if cooled to 0°K would not have an entropy of zero because it is a supercooled liquid and the particles are anything but organized. An analogy would be a game that is played where people are moving around or dancing and the leader cries 'Freeze!' The disorder of the moment must be maintained … even anatomical balance may be precarious."
>
> — Norman Dolloff (1975), *Heat Death and the Phoenix* (pgs. 13-14)

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Further reading

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External links

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θΔics

In hmolscience, **Norman Lockyer** (1836-1920) was an English astronomer noted, in human thermodynamics, for his 1868 articles with Scottish physicist Balfour Stewart on theology-siding energetics and for being the 1869 founding editor of *Nature*.

Overview

In 1868, Lockyer co-authored two articles, with Scottish physicist Balfour Stewart, on life in the context of thermodynamics and the solar system, the first being "The Sun as a Type of the Material Universe", they argued in favor of theology, arguing against materialism and social disorder, to the effect that the universe is a delicately balanced organism that can be directed by life without making life subject to its physical laws; in their second, entitled "The Place of Life in a Universe of Energy", they attempt to explain analogy in using the term energy, as well in the degradation of energy, in both the physical world and social world. [1]

Notes

Lockyer was the founding editor of *Nature*, the first issue of which he launched in 1869. Many of the early editions of *Nature* consisted of articles written by members of a group that called itself the X Club, a group of scientists known for having liberal, progressive, and somewhat controversial scientific beliefs relative to the time period. Initiated by Thomas Huxley, the group consisted of such important scientists as Joseph Hooker (warm pond model), Herbert Spencer, and John Tyndall, along with another five scientists and mathematicians; these scientists were all avid supporters of Charles Darwin's theory of evolution as common descent, a theory which, during the latter-half of the 19th century, received a great deal of criticism among more conservative groups of scientists

In 1922, Lockyer penned the obituary for Danish civil engineer Ludwig Colding, noted for his 1843 theory of the imperishability of forces. [2]

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External links

â— Norman Lockyer – Wikipedia.

θΔics

In hmolscience, **Norval Morrisseau** (1932-2007) was a Canadian aboriginal-themed artist note for his 1988 painting entitled “Human Molecule”, shown below:

showing a human superimposed on a fish and a bird, supposedly giving a visual impression of, possibly, a mixture of thinking or views on evolution, modern science, and spiritualism associated with American Indian religion, giving one artist's impression of what the concept of 'human molecule' implies.

References

1. Human Molecule (1988 acrylic on canvas) – Authentic Norval Morrisseau Blog.

External links

â— Norval Morrisseau – Wikipedia.

θΔics

In beliefs, **not applicable view**, similar to the "unbridgeable gap" mindset, as contrasted with the applicable view (e.g. Norman Dolloff), refers to position that thermodynamics does not apply to humans, in short.

Overview

The "not applicable view" is the view, held by many, that that thermodynamics and or the laws of thermodynamics *do not* apply to humans, and or to living organisms, in general; a logic held in spite of the generally held, long-standing position that thermodynamics governs the operation of every material body and system in the universe:

> "Gentle mathematicians and physicists still cling to their laws of thermodynamics, and are almost epileptic in their convulsive assurances that they have reached a generalization which will hold good. Perhaps it will. Who cares?"
>
> — Henry Adams, June letter, 1903 [20]

In 1824, French physicist-engineer Sadi Carnot initiated the general subject of the phenomena of the production of motion by heat, from the sufficiently universal point of view, as follows:

> "[Thermodynamics] is the study of the principles and laws behind the phenomenon of the production of motion by heat, considered from a sufficiently general point of view, applicable to not only steam engines, but to all imaginable heat engines, *whatever* the working substance and *whatever* the method by which it is operated."

The key word here is "whatever" and as long as the working substance (system or body) in question, whatever it may be, is not a human or a system of humans (social system), people generally do not object to the view that the laws of thermodynamics govern the universe, but when applied to humans (human thermodynamics) personal bias comes immediately to the fore, and many will argue, adamantly and fervently, for all sorts of difficult to discern reasons (e.g. religious, philosophical, conflicting belief systems, etc.), that thermodynamics **does not apply** to the governance, regulation, evolution, and or behavior humans.

The second law in particular being the supreme law (Eddington, 1928) of nature. In short, the "not applicable view" is the unwieldy position, held by some, that humans (or social systems of humans), in some way or another, are *exempt* (or above the law) from the regulation the first and second law of thermodynamics. While some of this objection can be directly scratched-off as a religious objection (e.g. William James, John Wójcik, etc.), objecting per the belief that humans have souls, spirits, or karma, or life, etc., beyond the auspices of measurable science, others are more difficult to discern, in regards to objection.

James

In 1909, supposedly with "one foot in the grave", a few months before his end, American psychologist William James, in objection to the history thermodynamics theories of his Harvard colleague Henry Adams, commented his opposition opinion: [8]

> "The 'second law' is **wholly irrelevant** to 'history'—save that it sets a terminus—for history is the course of things before the terminus."

(add discussion)

Carrell

In 1939, French surgeon and biologist Alexis Carrel commented his view that: [9]

> "The second law of thermodynamics, the law of dissipation of free energy, indispensable at the molecular

> level, **is useless** at the psychological level. As much importance should be given to feelings as to thermodynamics."

(add discussion)

du Nouy

In 1942, French-born American mathematician, biophysicist, and religious philosopher Pierre Lecomte du Nouy's used a Boltzmann-stylized statistical view of thermodynamics, to argue that the second law does not apply to humanity and that God is synonymous with anti-chance; in particular, he stated: [1]

> "Obviously, Carnot-Clausius law, sometimes called the second law of thermodynamics, **does not apply** to living organisms."

(add discussion)

Bowlby

In 1969, in objection to the psychological thermodynamics work of Sigmund Freud, English developmental psychologist John Bowlby commented:

> "**Nor is it to be supposed** that the principle of entropy apples to living as it does to non-living systems."

(add discussion)

Prigogine

In his 1977 Nobel Lecture "Time, Structure and Fluctuations", Belgian chemical thermodynamicist Ilya Prigogine opened to the following view: [10]

> "Thermodynamic equilibrium may be characterized by the minimum of the Helmholtz free energy defined usually by: F = E – TS. Are most types of 'organisations' around us of this nature? It is enough to ask such a question to see that the **answer is negative**. Obviously in a town, in a living system, we have a quite different type of functional order."

(add discussion)

Simon

In 1981, American economist Julian Simon commented that in regard to the second law in relation to human activity and economics that: [12]

> "The notion of entropy, in the large, is **entirely irrelevant** to us."

(add discussion)

Zolotas

In 1981, Greek economist Xenophon Zolotas argues that: [14]

> "If it were eventually possible for man to put to use other forms of energy (solar, Aeolian, etc.), which by their nature are virtually unlimited, the entropy law would be **practically irrelevant**, since the economic process would occur as part of an open system."

(add discussion)

Gilider

In his 1981 and 2000 publications, American political scientist George Gilder advocated the view that: [13]

> "Gone is the view of a thermodynamic world economy, dominated by natural resources being turned into entropy and waste by human extraction and use … the key fact of knowledge is that it is anti-entropic: it accumulates and compounds as it is used … Concerning the microcosm, the mind transcends every entropic trap and **overthrows** matter itself. Through learning, **civilization defies** the thermodynamic laws of decline and fall."

(add discussion)

McCauley

In 2003, American physicist and econophysicist Joseph McCauley, founder of the Econophysics department at the University of Houston (see: thermodynamics education), in his "Thermodynamic Analogies in Economics and Finance: Instability of Markets" (see: financial thermodynamics), argued that: [15]

> "Real financial markets **cannot behave** thermodynamically."

Likewise, in 2011 he corroborated this with his opinion that: [16]

> "Thermodynamics is **impossible** in economics."

(add discussion)

Sanville

In 2005, American computational chemist and quantum molecular dynamics researcher Edward Sanville commented: [7]

> "Of course, human beings obey the laws of thermodynamics like everything else in the universe, but the Gibbs free energy equation [$\Delta G = \Delta H - T\Delta$] only [can be used] to describe large systems of microscopic particles; [and **cannot be applied**] to analogous situations between human beings, just because the everyday and scientific words involved happen to correspond (in English)."

(add discussion)

Anon | Wikipedians

In 2005, Wikipedian The Literate Engineer, a civil engineering intern, commented: [15]

> "I admit, open systems do exist and can be described with thermodynamics; nonetheless, their application to group dynamics is a major stretch, and modeling human relationships on them involves all sorts of **unstated assumptions**, for instance that a state function (like Gibbs free energy) even applies. Or that they're spontaneous."

In 2005, Wikipedian Ten of All Trades, with a BS in physics and chemistry and a PhD in biology and biophysics, stated his view that: [16]

> "Thermodynamics **isn't meant** to describe human relationships."

(add discussion)

Wojcik

In the 2006 Rossini debate, American physical chemistry professor John Wójcik commented: [6]

> "Worst of all, there is some danger that chemical thermodynamics will have ascribed to it a **power that it simply does not have**, namely, the power to explain the human condition."

(add discussion)

Moriarty

In 2009, after being told (by Libb Thims) that an arrangement of students in a field has a measurable entropy and that the original view of thermodynamics, according to Gibbs (1876), is that "the comprehension of the laws which govern *any* material system is greatly facilitated by considering the energy and entropy of the system in the various states of which it is capable.' A society is one such material system. If you think that you are exempt from these laws, that is your prerogative", Irish thermal physics professor Philip Moriarty went on to argue that you cannot say that a particular arrangement of students has a thermodynamics entropy (see: Moriarty-Thims debate) and moreover that:

> "Your thesis is that the laws of thermodynamics 'govern human existence' is a grossly misleading understatement. Your thesis (such as it is) is that there are quantum mechanical, chemical bonds between humans which can give rise to 'human reactions' and that there are enthalpic/entropic contributions to a human' free energy function (see: human free energy). This is delusional and based on fundamentally nonsensical premises."
>
> — Philip Moriarty (2009), Moriarty-Thims debate (post #61), Sep 8

Moreover:

> "Where did Gibbs say that 'a society is one such material system'? He didn't –that is your particular **(incorrect) reading** of the application of thermodynamics."

In response to this comment, YouTube user PenguinJin commented to Moriarty:

> "So, why areï»¿ we **exempt from** this application of thermodynamics? Why would energy alter its behavior in a fundamental way when it began manifesting as the patterns of human behavior? Recursion is everywhere."

To this, Moriarty offered the following terse reply:

> "The main points are:
>
> > (i) An arrangement of students (or socks, or objects in a room) will not *spontaneously* rearrange themselves (unlike the milk molecules mentioned in the video).
> > (ii) There is no change in the thermodynamic free energy of, e.g., socks [or students], if we rearrange them."

Moriarty, to summarize his views, also offered the following in-video interview statement: [4]

> "Concepts of entropy [only] apply to gas molecules; **you cannot say** that a particular arrangement of students has a thermodynamic entropy."

(add discussion)

Anon | Student

In 2010, following a lecture by American electrochemical engineer Libb Thims on an introduction to human thermodynamics to bioengineering students at a Chicago university, to exemplify, one student commented, in rather overtypical and frank style of American homogenized belief system rhetoric, in written response: [18]

> "I believe thermodynamics **can only** function in man-made things: mechanical devices (such as vehicles), combustion, politics, and stuff. However, things like morals and love go far beyond thermodynamics. It can perhaps be argued to a certain point that thermodynamics can explain these phenomena. But if thermodynamics can't even be fully explained in the physical body, how can it explain the mind and the soul."

(add discussion)

Motl

In 2010, Czech-American theoretical physicist, black hole thermodynamicist, and former Harvard professor Lubos Motl commented: [2]

> "You've got to realize the blatant absurdity of trying to model theï»¿ laws governing human relationships using the rules of thermodynamics, a set of rules that **only apply at a molecular level**. Human beings are not molecules, they are composed of molecules, but we aren't giant molecules. Human relationships are governed mostly by human psychology. I can only assume you're senile or crazy to believe this nonsense."

(add discussion)

Grannell

In 2011, Irish atheist biochemistry student Ryan Grannell commented: [3]

> "This is all just a horrendous analogy. Chemical laws apply to humans, but **ourï»¿ behavior is more complex than** something that can be modeled with a couple of thermodynamic equations. A + B → AB is just a pretentious way of stating something we already know; it tells us absolutely nothing new."

(add discussion)

Ulanowicz

In 2011, American chemical engineer and ecological thermodynamicist Robert Ulanowicz, noted for his three decades worth of work on his free energy themed "ascendency" model of evolution (see: ontic openness), commented rather paradoxically his stern opinion that: [11]

> "Entropy or entropy-related measures (such as free energy) **should *not* be invoked** for living systems!"

(add discussion)

Prausnitz

In 2013, American chemical engineer and molecular thermodynamicist John Prausnitz commented the following, in response to a query made by American electrochemical engineer Libb Thims about the fit of a possible "two cultures department" at the University of California, Berkeley: [19]

> "I don't know what the Rossini debate is but I hope to find out. [The] idea for a department for teaching two cultures would **not be appreciated** at Berkeley. In the social sciences and in some humanities, thermodynamics may be useful as an analogy, as a suggestion for looking at a problem (e.g., information theory) but beyond that, **I see little** use of thermodynamics outside [physical] science."

(add discussion)

Discussion

> *See also: Unbridgeable gap*

(add)

See also

â— John Hibben

â— Philip Mirowski

â— Human thermodynamics (objections to)

â— Petre Trisca
â— Pitirim Sorokin
â— Paul Samuelson
â— Peggy La Cerra
â— Tony Rothman
â— Granville Sewell
â— Tominaga Keii
â— Detractors
â— Libb Thims (attack)
â— Human chemistry (objections to)

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θΔics

In phenomena, **not seeing the forest**, or "forest blind", is a figure of speech referring to individuals who being extensively knowledgeable about divisions of modern knowledge—the trees—are not able to grasp or see the big picture—the forest—in respect to the overall picture of who the various branches of knowledge fit together to comprise one nature.

A parody rendition of Israeli chemist Addy Pross' perspective that he and American complexity theorist Stuart Kauffman "see so many **trees**", such as catalysis, synthetic biology, RNA, metabolic pathways, DNA, molecular machinery, ATP, biosynthesis, etc., but that he and Kauffman "have no real view of the **forest**" which is solution to the question "what makes a cell alive?" [2]

Overview

The following quote seems to well-capture the issue, in respect to the origin of the blindness effect:

> "The trend towards the already mentioned diversified society of 'specialists' and the related danger of **narrower way of thinking** (idiot savant) necessarily leads to a growing helplessness of the individual. Related to this is a growing blind belief in science. Since Leibnitz, probably the last universal genius, we know more and more about a shrinking area of knowledge. Biology and physics, chemistry and medicine are divided already today into dozens of individual disciplines, which like a 'hydra', keep dividing into other individual disciplines."
>
> — Hans-Wolff Graf (1995), "We Need a New World View" [1]

Thinkers who are unable to see the forest, or rather those unwilling to become polymathic, or those who spend too much time spent specializing in a narrower field or narrower way of thinking, might well be classified as "tree theorists", as compared to, conversely, "forest theorists" who tend to be after a vision of the big picture view of nature.

What is life? | Example

The following is a related quote by Israeli chemist Addy Pross, in commentary about statements from Stuart Kauffman's 2000 *Investigations*, about not being able to see the forest: [2]

> "We see so many trees, yet we have **no real view of the forest**."
>
> — restatement of Kauffman's 2000 "life remains shrouded from view" perspective

The issue here is that Kauffman and Pross have many "trees" (molecular machinery, metabolic pathways, membrane biosynthesis, molecular biology, etc.), to look at and study, but they cannot see the "forest" (or as Kauffman states: "what makes a cell alive is still not clear to us"). The forest that they cannot see in this case is the defunct theory of life and subsequent life terminology upgrades—a very difficult forest to see, to say the least.

Non-crank **Crank or prophet?**

Human chemical thermodynamics | Crank theory or trees not

seen?

For many a modern scholar abruptly put in contact with human chemical thermodynamics, a combination of "ships not seen" and "forest not seen" are common mental vision problems, possibly reaction symptoms akin to someone with what might be called intellectual color blindness: not able to see the meaning of formulas and equations directly in front of them. The following 2011 reaction commentary by Irish openly atheist biochemistry student Ryan Grannell is an example of someone not able to "see" through to the immensity of what results when one applies chemical thermodynamics to humans in their behaviors,wherein relationship formations and changes are described as chemical reactions and their nature quantified via free energy changes:

In 1995, American historian John Diggins incorrectly classified American physical science historian Henry Adams (IQ=195), noted for his 1885 social chemistry of human molecules in relationships theory, for his 1895 first and second laws of thermodynamics applied to the rise and fall of civilizations, and for his 1909 phase rule applied to history—whose two cultures genius is near to on par with that of Goethe (IQ=230)—as "more of a **crank** than a prophet", which is but the result of the growing dividedness and fragmentation of the body of modern knowledge, the totality of which few are able to presently hold in one mindset. [3]

> "This is all just a horrendous analogy. Chemical laws apply to humans, but ourï»¿ behavior is more complex than something that can be modeled with a couple of thermodynamic equations. A + B → AB is just a pretentious way of stating something we already know; it tells us absolutely nothing new."

The newcomer to this new point of view will often times be quick to label the theory as "crackpottery" and the theorist as a "crank", an example of which being when in 1995 American historian John Diggins penned an entire chapter on American physical science historian Henry Adams (IQ=195) and his physical history theory, after which he classified Adams as follows: [3]

> "On the matter of science, consensus of conventional wisdom in Adams scholarship regards him as more of a **crank** than a prophet."

Adams' physical history theory is comprised of firstly his 1885 social chemistry of human molecules in relationships theory, which would seem to be likely have been culled, in seed idea, from his nine years spent in Germany and England, 1859 to 1867, where he became acquainted with the works of Goethe, Schiller, and Voltaire, and hence likely the 1798 Goethe-Schiller discussion on human chemical theory (see: Goethe timeline). [4] Adams' personal library, in latter years, likewise, contained a large number of books in French and German on science, with, as Diggins notes, contained penciled queries written in the page margins on the author's description of things such as the: [3]

> "Flow of electric current or the behavior of molecules or the gravitational relation of the moon to terrestrial waves."

Why would a history professor be studying current flow, molecular behavior, and gravitational influence on lunar induced tidal waves? The answer is that Adams correctly considered people to be "molecules" hence a study of "molecular behavior" is the key to the understanding of human behavior and hence the nature of human history—though, to note, he got the specific term "human molecule", not from, it seems, Goethe and Schiller, but from his 1873 reading of a review of French philosopher Hippolyte Taine's 1869 *On Intelligence*, wherein people are referred to as molecules, specifically, according to Taine, as follows:

> "The historian notes and follows the general transformations presented by a certain human molecule, or a certain peculiar group of *human molecules*; and, to explain these transformations, he writes the psychology

of the molecule or its group."

Secondly, human molecular behavior theory aside, Adams' physical history theory is comprised also of his 1895 first and second laws of thermodynamics applications to the explanation of the rise and fall of civilizations, and thirdly his 1909 phase rule, culled from his reading of the the chemical thermodynamics work of American engineer Willard Gibbs, applied to history. In this respect, Adams' two cultures mindset genius is near to on par with that of Goethe (IQ=230). American physical science historian Morris Zucker, noted for his 1945 Adams-inspired 1,764-page "historical field theory", pure and applied, might be the only comparable example of genius near to that of Adams, in this regard. Hence, to conclude, Diggins, like many modern scholars caught up in the "consensus of conventional wisdom", is an example of one not able to see the forest amid the trees.

A more recent example is American neurological anthropologist Terrence Deacon, noted for his 2011 emergent chemical teleology theory, who in 2013 classified American electrochemical engineer Libb Thims as a "wacko" as follows:

> "Libb Thims [is] self-published wacko angry at the world for not taking his theories seriously."

Non-wacko

Wacko or prophet?

In 2013, American neurological anthropologist Terrence Deacon called American electrochemical engineer Libb Thims and his Goethean-Adams based chemical thermodynamics of human molecules point of view as "wacko", seemingly believing, conversely, in his "consensus of conventional wisdom" mindset, that his own emergent chemical teleology is the correct view point and solution to the question of desire, purpose, and intentional feelings in modern philosophies of mind debates.

Here, the issue at hand is verbatim to that of Diggins classifying Adams as more of a crank than a prophet. Thims is near duplicate in mindset to Adams. Not only has Thims penciled in notes on the flow of electric current, but he obtained a degree in electrical engineering; not only has penciled in noted on the behavior of molecules, but he obtained a degree in chemical engineering, not only has Thims studied the gravitational relation of the moon to terrestrial waves (e.g. one of Thims favorite books is Arnold Lieber's 1996 *How the Moon Affects You*); not only does Thims consider people to be molecules, but he was the second person to independently calculate the human molecular formula and the first to write a book (*The Human Molecule*, 2008) on the history of the human molecular hypothesis; not only has Thims theorized about the first law and second law, through the chemical thermodynamics works of Willard Gibbs, applied to humans, historically, presently, and futuristically, but he is presently attempting to write the first textbook on *Chemical Thermodynamics: with Applications in the Humanities*, something that has never been done before. Deacon, like Diggins, is an example of one caught up in the "consensus of conventional wisdom" and thus not able to see the forest amid the trees.

See also

â— Glass walls
â— Ships not seen
â— Reverse engineering

References

1. Graff, Hans-Wolff. (1995). "Conclusion: We Need a New World View" (pgs. 228-36), in *The Path Toward Global Survival: A Social and Economic Study of 162 Countries* (editor: Hans-Wolff Graf) (pg. 229). Gordon and Breach Publishers.
2. Pross, Addy. (2012). *What is Life?: How Chemistry becomes Biology* ("so many trees", pg. 114). Oxford University Press.
3. Diggins, John P. (1995). *The Promise of Pragmatism: Modernism and the Crisis of Knowledge and Authority* (§2: Who Bore the Failure of the Light: Henry Adams, pgs. 55-107; §§: Science and the Fate of the Universe, pgs. 67-80; quote, pg. 84; thermodynamics, 9+ pgs). University of Chicago Press.

θΔics

In science, **notation** refers to the use of superscripts, subscripts, hats, daggers, brackets, and or marks, etc., often affixed to letters or symbols, generally done to signify something specific, such as a variable, constant, or condition, typically as a means of shorthand.

Further reading

- Bryan, George H. (1907). *Thermodynamics* (§notation, pgs. xi-xiv). B.G. Teubner.
- Anderson, Gregor M. (2005). *Thermodynamics of Natural Systems* (§2.6.4: Notation, pgs. 27-28). Cambridge University Press.

External links

- Thermodynamics notation (2008) – PhysicsFormums.com.
- Nuclear notation – Wikipedia.
- History of mathematical notation – Wikipedia.

θΔics

Notations used for the thermodynamic potentials in some important texts of Thermodynamics.

Authors	Internal Energy	Heat Content	Helmholtz Free Energy or Maximum Work	Gibbs Thermo-dynamic Potential
De Donder (new edition)	E	H	F	G
De Donder [1] (old edition)	U	Ψ	F	H
Gibbs [2]	ε	χ	ψ	ζ
Duhem [3]	U	—	σ	Φ
Guggenheim [4]	E	H	F	G
Lewis and Randall [5]	E	H	A	F
Massieu [6]	U	U'	$-t\psi$	$-t\psi'$
Partington [7]	U	H	F	Z
Planck [8]	U	W	$-T\Psi$, F	$-T\Phi$
Sackur [9]	E_v	E_p	F_v	F_p
Schottky, Ulich and Wagner [10] / Ulich [11]	U	W	F	G
van Lerberghe [12]	U	I	F	H

Belgian chemist Theophile de Donder's 1936 notation table, showing the different types of **notations** used to represent the various thermodynamic potentials.

In famous publications, **Note to Chapter 6** is an appended two-page section to chapter six "Order, Disorder, and Entropy" of Austrian physicist Erwin Schrodinger's famous 1944 book *What is Life?*, wherein he responded to doubt and opposition from his physicist colleagues to his thermodynamics-based definition of life as something that "feeds on negative entropy", in which he stated that had he been catering his lecture to them alone, he would have let the discussion turn on free energy, but that he judged the topic too difficult for a lay audience. The famous opening response statement is as follows: [1].

> "The remarks on *negative entropy* have met with doubt and opposition from physicist colleagues. Let me say first, that if I had been catering for them alone I should have let the discussion turn on *free energy* instead."

To upgrade this, as modern physical chemistry sees things, he should have let the discussion turn not simply on "free energy", which as many (such as Ilya Prigogine) have bantered on incorrectly about, could imply Helmholtz free energy, but correctly on Gibbs free energy, which is the correct thermodynamic potential for isothermal isobaric systems (which are the type of processes, animate or inanimate, seen going on about the surface of the earth). Schrodinger goes on to clarify:

> "It is the more familiar notion in this context. But this highly technical term seemed linguistically too near to *energy* to make the reader alive to the contrast between the two things. He is likely to take *free* as more or less an *epitheton ornans* without much relevance, while actually the concept is a rather intricate one, whose relation to Boltzmann's order-disorder principle is less easy to trace than for entropy and 'entropy taken with a negative sign', which by the way is not my invention. It happens to be precisely the thing on which Boltzmann's original argument turned."

NOTE TO CHAPTER 6

The remarks on *negative entropy* have met with doubt and opposition from physicist colleagues. Let me say first, that if I had been catering for them alone I should have let the discussion turn on *free energy* instead. It is the more familiar notion in this context. But this highly technical term seemed linguistically too near to *energy* for making the average reader alive to the contrast between the two things. He is likely to take *free* as more or less an *epitheton ornans* without much relevance, while actually the concept is a rather intricate one, whose relation to Boltzmann's order–disorder principle is less easy to trace than for entropy and 'entropy taken with a negative sign', which by the way is not my invention. It happens to be precisely the thing on which Boltzmann's original argument turned.

But F. Simon has very pertinently pointed out to me that my simple thermodynamical considerations cannot account for our having to feed on matter 'in the extremely well ordered state of more or less complicated organic compounds' rather than on charcoal or diamond pulp. He is right. But to the lay reader I must explain that a piece of un-burnt coal or diamond, together with the amount of oxygen needed for its combustion, is also in an extremely well ordered state, as the physicist understands it. Witness to this: if you allow the reaction, the burning of the coal, to take place, a great amount of heat is produced. By giving it off to the surroundings, the system disposes of the very considerable entropy increase entailed by the reaction, and reaches a state in which it has, in point of fact, roughly the same entropy as before.

Yet we could not feed on the carbon dioxide that results from the reaction. And so Simon is quite right in pointing out to me, as he did, that actually the energy content of our food *does* matter; so my mocking at the menu cards that indicate it was out of place. Energy is needed to replace not only the mechanical energy of our bodily exertions, but also the heat we continually give off to the environment. And that we give off heat is not accidental, but essential. For this is precisely the manner in which we dispose of the surplus entropy we continually produce in our physical life process.

This seems to suggest that the higher temperature of the warm-blooded animal includes the advantage of enabling it to get rid of its entropy at a quicker rate, so that it can afford a more intense life process. I am not sure how much truth there is in this argument (for which I am responsible, not Simon). One may hold against it, that on the other hand many warm-blooders are *protected* against the rapid loss of heat by coats of fur or feathers. So the parallelism between body temperature and 'intensity of life', which I believe to exist, may have to be accounted for more directly by van't Hoff's law, mentioned on p. 65: the higher temperature itself speeds up the chemical reactions involved in living. (That it actually does, has been confirmed experimentally in species which take the temperature of the surroundings.)

Austrian physicist Erwin Schrodinger's 1944 **Note to Chapter 6** which he had to append to his book chapter after taking heat from his fellow colleagues for his remarks on "negative entropy", in which he said he should have let the discussion turn to free energy. [1]

Schrodinger goes on, as shown adjacent, to mention the objections given by an "S. Simon" and also to mention van't Hoff's law.

Butler

English physical chemist and chemical thermodynamicist John Butler, in his 1946 article “Life and the Second Law of Thermodynamics”, gave his opinion that: [2]

> [Schrodinger’s view that] “an organism feeds on negative entropy” [is a] “picturesque if somewhat inaccurate language”.

Butler, conversely, stated that: “a majority would probably be found in favor of the view that any local increase of ‘free’ energy is compensated by a greater amount of dissipation elsewhere.” This alternative statement (see also: local entropy decrease), however, has issues in its own right.

Pauling

In his 1989 memorial chapter “Schrodinger’s Contribution to Chemistry and Biology”, American chemical engineer Linus Pauling (1901-1994) probably gives one of the harshest critiques of Schrodinger’s overall ideas on the thermodynamics of life. Pauling, after telling how much respect he had for Schrodinger for his work in quantum mechanics (particularly for his Schrodinger equation), begins his rip into Schrodinger's *What is Life?* lecture with the following mock:

> “In his discussion of ‘negative entropy’ in relation to life, he made a negative contribution.”

Pauling, then, after quoting Schrodinger’s two main excerpts about “keeping aloof” and “feeding on negative entropy”, continues:

> “When I first read this book, over 40 years ago, I was disappointed. It was, and still is, my opinion that Schrodinger made no contribution to our understanding of life.
>
> Several physicists and biologists with whom I have discussed this question have disagreed with me. When I asked what the contribution made by Schrodinger to our understanding of life is, each answered essentially by saying that Schrodinger showed that life is negative entropy, that living organisms utilize entropy in a way different from non-living matter.
>
> I have not had the opportunity to discuss this matter with a physical chemist, a person with a good understanding of the great work by J. Willard Gibbs on chemical thermodynamics. I am sure that he or she would agree with me.
>
> Schrodinger’s discussion of thermodynamics is vague and superficial to an extent that should not be tolerated even in a popular lecture. In the discussion of thermodynamic quantities it is important to define the system. When he is writing about a change in entropy of the system, Schrodinger never even defines the system. Sometimes he seems to consider that the system is a living organism with no interaction whatever with the environment; and sometimes it is a living organism in thermal equilibrium with the environment; and sometimes it is the living organism plus the environment, that is the universe as a whole.”

Pauling then goes on to discuss the Note to Chapter 6 and his views on spontaneous reactions. [3] All-in-all, this is a fairly excellent review by Pauling and in effect highlights the general ignorance in the modern-day science community that is only glimpsed by a rare few minds, such as Pauling, able to grasp not only all of modern science, but to have an acute awareness of what it means to have a "good understanding of the great work by J. Willard Gibbs", as Pauling put it.

Perutz

In 1987, Austrian-born English molecular biologist Max Perutz (1914-2002), in his memorial chapter (following Pauling), entitled "Erwin Schrödinger's *What Is Life?* and molecular biology", also laid into Schrodinger. Perutz commented, in short, that: [4]

> "We live on free energy and there [is] no [need] to postulate negative entropy."

This, however, has issues with it as well; which can be attributed to the fact that Perutz had a less than rigorous background in the hard physical sciences (chemical thermodynamics in particular), as Pauling, a chemical engineer and and quantum chemist, did.

Thims

The final page of American electrochemical engineer Libb Thims' 824-page textbook *Human Chemistry* ends with a discussion of Schrodinger's Note to Chapter 6, and to summarize the bulk content of the previous 824-pages, states: [5]

> "Herein, in Schrodinger's own words, we have let the discussion turn on free energy."

Dated added

The original public lecturing occurred in 1943. [6] Ecological economists Kozo Mayumi and Mario Giampietro seem to indicate that the note was added in either the 1945 edition or the combined reprint 1967 edition. [7]

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4. (a) Perutz, Max. (1987). "Erwin Schrödinger's *What Is Life?* and molecular biology", pp. 234–251 in *Schrödinger: Centenary Celebration of a Polymath*, edited by C. W. Kilmister. Cambridge University Press, Cambridge.
(b) Max Perutz – Wikipedia.
5. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (§What is Life?, pgs. 700-701). . Morrisville, NC: LuLu.
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7. Mayumi, Kozo and Giampietro, Mario. (2004). "Entropy in Ecological Economics", in: *Modelling in Ecological Economics* (pg. 83). Eds. John Proops and Paul Safonov. Edward Elgar Publishing.

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â— Dawkins, Richard. (2008). "Erwin Schrodinger *from* WHAT IS LIFE?", in: *The Oxford Book of Modern Science Writing* (pgs. 249-54; §Note to Chapter 6, pg. 253-54). Oxford University Press.

θΔics

In existographies, **nothingness**, literally "no-thing-ness", is a semi-synonym of the terms void, vacuum, or emptiness of space; in Aristotelian terms, a place in which there is nothing; in philosophical terms, a conjectured state into which "being" goes. [1]

Overview

The term "nothingness" tends to arise in philosophical discussions on "being" and "nonbeing" and or existence and non-existence.

Quotes

The following are related quotes:

> "**Nothingness** contains all things; it is more precious than gold, free from birth and destruction, more pleasant than the sight of pure light, more noble than the blood of kings, comparable with the sky and higher than the stars, more powerful than a bolt of lightning, perfect and rich in all its parts."
>
> — Otto Guericke (1672), *The Magdeburg Experiments on the Vacuum of Space* (pg. 99); cited by Edward Grant (1981) in *Much Ado About Nothing* (pg. 216); cited by Helge Kragh (2014) in *The Weight of the Vacuum* (pg. 6) [1]

> "The first task of philosophy, is to conceive of absolute **nothingness**."
>
> — Georg Hegel (1802), *Faith and Knowledge* (Glauben und Wissen) (Ñº)

References

1. Guericke, Otto. (1663). *New Magdeburg Experiments: on the Vacuum of Space* (*Ottonis de Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (translator and preface: Margaret Ames) (place, pg. 84; gold, pg. 99). Publisher, 1672; Kluwer, 1994; Springer, 2012.

Further reading

â— Grant, Edward. (1981). *Much Ado about Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution* (Guericke, 9+ pgs). Cambridge University Press.

External links

â— Nothingness – Stanford Encyclopedia of Philosophy.

θΔics

In existographies, **Novalis** (1772-1801) (IQ:170|#403) (RE:29) (CR:6), aka "Georg Hardenberg", was a German prose writer, poet, mystic, philosopher, civil engineer, and mineralogist, noted for []

Education

The following is a snippet of the education of Novalis: [3]

> "Although so conversant with critical philosophy, still von Hardenberg loved intercourse with men who cultivated his aesthetic and poetical genius. The spirit of the times just then brought ideas of freedom and equality, man's rights, and the principles of government under discussion. He also studied law, especially at Leipzig and Wittenberg; and attained great proficiency in both chemistry and mathematics."

In 1789, Novalis, aged 17, had become greatly influenced by Plotinus:

> "I do not know if I have already spoken to you of my beloved Plotinus? Through Tiedemann, I have been initiated into this philosopher, born expressly for me, and I have been almost frightened by his resemblance to Kant and Fichte. He pleases me more than either of them."
>
> — Novalis (1789), "Letter to Friedrich Schlegel"; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 369)

(add)

Other

In 1910, Vyacheslav Ivanov began to do work on Goethe's human chemical theory, that supposedly has relation to Novalis. [1]

Quotes | On

The following are quotes on Novalis:

> "When one says of any man 'He is a genius', the accepted meaning is, that he has the peculiar quality of mind which not only enables him to acquire science or the arts with unusual facility, but has power to produce his knowledge in an original way. If the mind takes a strong bent in one direction, either towards art or science, we say, 'He has a poetical or mathematical genius'. But we mean a very different thing when we say, 'He is a genius'. We express thereby that nature has so endowed the man that in the particular art or science to which he is devoted he is not only technically perfect, but original, and has an inherent power and adaptability which enables him not only to master difficulties with ease, but to go to the very bottom of his subject, retain clearly all he has acquired, and exercise judgment and penetration in combining the results of his researches. He must have such well-balanced powers of mind that his perseverance in work is equaled by his dexterity in practice, joined to love and delight in his occupation. These remarks occurred to me while watching the development of **Fredrich von Hardenberg**'s richly gifted mind. Genius is often accused of superficiality and caprice, of preferring pleasurable to graver studies, of living in theories and abhorring practical matters. But this was not the case with Hardenberg. He was determined to study everything thoroughly and deeply, and to investigate every subject of human knowledge. Joined to this, he gave diligent heed to practical life, never shirking any detail, however irksome. In addition, his heart was open to impressions of all that nature, friendship, or love can offer; and while he laboured to develop his mind, he never ignored the claims on his affections, and gauged clearly the hearts and powers of all around him."

— Just (c.1802), “Life of Novalis” [3]

“Fuller had read German books, and, for the three years before I knew her, almost exclusively: Lessing, Schiller, Richter, Tieck, **Novalis**, and, above all GOETHE. It was very obvious, at the first intercourse with her that the last writer—food or poison—the most powerful of all mental reagents—the pivotal mind in modern literature—for all before him are ancients, and **all who have read him are modern**—that this mind had been her teacher, and, of course, that place was filled, nor was there room for any other. She had that symptom which appears to all the students of Goethe.”

— Ralph Emerson (1852), commentary on Margaret Fuller [2]

“There are men of great genius who have shown no special talent in any marked degree; for instance, men like **Novalis** or Jean Paul.”

— Otto Weininger (1903), *Sex and Character* (pg. 103)

“If we are to speak of the ‘key’ to early romanticism, it is to be found in one of the thinkers of antiquity, Plotinus. For his neoplatonic philosopher not only inspired the entire system of **Novalis**, scattered through innumerable fragments, and many of the ideas of Schelling in his middle period; his arm reached farther: through Novalis and Schelling he exercised an influence, though an indirect one, upon both Schlegels [August Schlegel and Friedrich Schlegel], and without knowledge of this fact many a passage in the ‘Dialogue concerning Poetry’ and the Berlin lectures of August Schlegel remains an enigma.”

— Paul Reiff (1912), “Plotin und die Deutsche Romantik” [4]

“Religion — as noted by Marquis de Sade (1797), **Novalis** (1798), Marx (1843), and Dirac (1927) — is but an opiate or opium for the mind; and like all drugs, it can be replaced, upgraded, or in some cases treated, with a better or less symptomatic one.”

— Libb Thims (2014), personal note, Sep 17

Quotes | By

The following are quotes by Novalis:

“The simplification and combination of science, and the transformation of all sciences into one, is an exercise for philosophy, which the love of science demands.”

— Novalis (1795), “Fugitive Thoughts”, in: *His Life, Thoughts and Works* (pg. 189)

“Light in action; light is like life—a force; light makes fire—it is the genius of the fire.”

— Novalis (1795), “Fugitive Thoughts”, in: *His Life, Thoughts and Works* (pg. 189)

“Thought is certainly electricity; the earthly spirit and its spiritual atmosphere are acted on by a heavenly supernatural spirit.”

— Novalis (c.1795) [3]

"Body and soul affect each other electrically."

— Novalis (c.1795) [3]

"The world must be romanticized. In this way the originary meaning may be found again."

— Novalis (c.1800) (Ñº)

"Goethe was the first physicist of his time and epoch-making in the history of physics."

— Novalis (c.1800) (Ñº)

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External links

â— Novalis – Wikipedia.

θΔics

In human

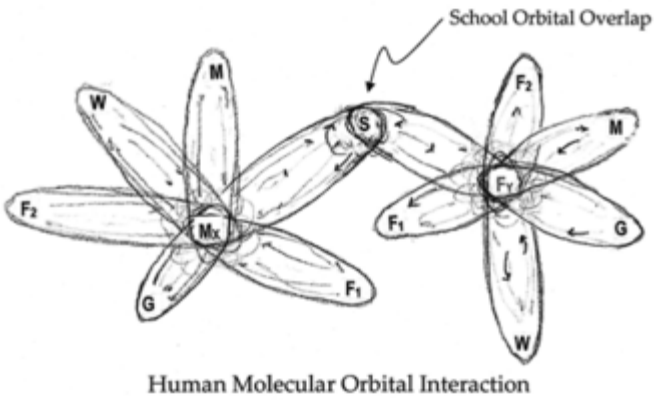

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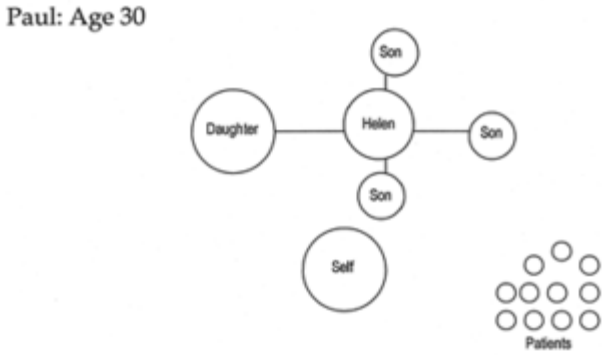

Left: a human molecular orbital view of the start reaction of the formation of the typical **nuclear family** at the day of first meeting of two human molecules, e.g. in their school orbitals, symbol S, say at about age 21, from American electrochemical engineer Libb Thims' 2007 *Human Chemistry*; right: an drawing of semi-orbital / semi-Venn diagram / semi-human chemical bond aspect of the self-visualized existence of a person named Paul, from American psychologist Ruthellen Josselson's 1996 book *The Space Between Us.* [3]

chemistry, **nuclear family** is a chemical aphorism (or chemical anthropomorphism) wherein the concept of the nucleus is used as a model or metaphor of the essential core of the human family, generally a pair of parents plus one or more orbiting children, just as the essential core of an atom is a pair of nuclides (bound protons and neutrons) plus one or more orbiting electrons.

Overview

The term “nuclear family” seems to have drifted into use in the 19th century, as can be found in a number of usages, following the circa 1846 non-atomic usage of the term “nuclear” meaning “of or like the nucleus of a cell”; after which following the discovery of the atomic nucleus in 1911 by Ernest Rutherford and his famous gold foil experiments, the term "nuclear family" transformed from a biological metaphor to a chemical metaphor, as can be found in number of usages in the decades to follow. [1]

The term “nuclear family”, in a dominant sense, is generally attributed to American anthropologist George Murdock and his 1949 book *Social Structure*, a term which forms the title of his opening chapter, in which he states: [2]

> “The nuclear family is a social group characterized by common residence, economic cooperation, and reproduction. It includes adults of both sexes, at least two of whom maintain a socially approved sexual relationship, ...”

American electrochemical engineer Libb Thims' 2007 *Human Chemistry* textbook was the first to depict the so-called 2.5 child nuclear family in human molecular orbital theory terms. [3]

The typical generic idea or conception of the **nuclear family**: one child and two parents.

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External links

â— Nuclear family – Wikipedia.

θΔics

In science, a **number** is a type of symbol used for counting and measuring, whose operations are defined by mathematics.

History

The modern-day concept of numbers is based on the counting system of the ten digits of two human hands, which evolved into various bone tally mark systems, known to have existed 20,000 years ago.

The concept of negative numbers, supposedly, were first used in the 200BC Chinese book *Nine Chapters on the Mathematical Art* (*Jiu zhang suan-shu*), in which red counting rods denoted positive coefficients and black rods negative coefficients.

The symbol zero, $\bar{0}$, in the form of a small circle with a long overbar, was supposedly first introduced by Roman-Egyptian scientist Ptolemy in his 130AD *Syntaxis Mathematica*.

Human group sizes

In hmol sciences, numbers refers to various group size numbers at which significant patterns emerge in human group formations and interactions. Some of these are listed below and in the adjacent drop box.

Name	#	Note	Description
	0		The number of gods a zerotheist, i.e. an adherent of zerotheism, believer to exist.
Human molecule (human particle)	1		The unit number for one individual "human molecule" or person considered as a molecular entity.
Dihumanide number (A≡B) (dihumanide molecule)	2		The number of human molecules in the bound state unit of a marriage or close relationship.
Nuclear family number	4.5		The number of human molecules in the average 2.5-child nuclear family.
Continuity bond number (Continuing bond)	12	10-15 (range)	The average number of people in a persons network of connections and relationships whose death would leave one truly devastated: people typically listing 10-15 names, with the average being twelve. [1]
	12/30		The so-called “12/30 motif” (Murdock, 2009) refers to the respective ages of Horus (and Jesus) (O) when he was said to have first impressed the leading priests with his “intelligence” (age 12) and later the time when he returned as an “adult” (age 30), both of which are astro-theological, in the sense of the sun, aka “Horus the child”, being at full power at noon (12) and the sun, yearly, travelling through 12 constellations or zodiac signs, each being segmented into 30 degree regions a circle, according to which 12 times 30 equals 360, which is the number of days of the year (plus the five intercalation days, wherein, according to the myth, Osiris, Horus, Typhon, Isis, and Nephthys were born, one on each day), at which point the sun is reborn. [7]
	14		In Egyptian religio-mythology, 14 is number of pieces Set hacked the body of Osiris into. Isis uttered 14 magical words to revive him. 14 magical words were spoken to restore the eye of Horus, which Set blinded in battle. Astrologically, the number 14 refers to (a) the number of days the moon wanes or waxes and or (b) the number of stars in the Orion constellation, which was thought to be representative of the astral body of Osiris. (O)
	28		“They say that the date on which this deed – Set trapping Osiris in chest and throwing it into the Nile – was done was the seventeenth day of Athyr [Nov 13] when the sun passes through the Scorpion, and in the **twenty-eighth year** of the reign of Osiris; but some say that these are the years of his life and not his reign.” — Plutarch (100AD), *On Isis and Osiris* (pg. 37); note: compare Horus being bitten by a scorpion and Isis summoning the sun and moon to heal him, as told in Sorrows of Isis (line 205), and as rescripted in Joshua 10:13 “The fourteen parts into which the body of Osiris was broken refer, beyond doubt, to the fourteen pieces which were assumed to be broken or bitten off from the moon during its period of waning, just as **twenty-eight years** [lunar month] of reign, or life, of Osiris, refer to the days of the moon’s life. Apart from the fact that Osiris is actually called “Asar Aah”, i.e. ‘Osiris the Moon’, there are so many passages which prove beyond all doubt that at one

			period at least Osiris was the 'moon god', that it is difficult to understand why Diodorus stated that Osiris was the sun and Isis the moon. The Egyptian texts suggest that in late times the sun-god of night may have been regarded as a form of Osiris." — Wallis Budge (1911), *Osiris and the Egyptian Resurrection, Volume One* (pg. 21)
	42		● Number of "nomes" (states) of Ancient Egypt (22 Upper Egypt + 20 Lower Egypt). ● Became, in Anunian theology, the number of components (Negative Confessions) of the weight of the soul (soul weight). ● Became, in Anunian theology, the number of gods (see: nome god) in the Judgment Hall (of Osiris) in the afterlife. ● Became, in Christianity monotheistic rewrite of Aten-version of Anunian theology, the number of generations, according to Matthew's genealogy (Q), between Abraham and Jesus.
Social Avogadro number	60		First calculated attempt to develop a "human molar number" (or "hmol") equivalent to Avogadro's number (6.022×10^{23}), done by Hungarian sociologist Babics Laszlo (2003).
	72		● 72 conspirators, along with Set, closed the lid on the chest of Osiris. [6] ● 5 (days gained by Thoth in game of draughts with moon) x 72 = 360 (degrees in circle) [6] ● 72 x 360 = 25,920 (precession completion) [6] ● The stars or constellation movement, based on the axial precession of the earth on its tilted axis, move 1° every 72 years (Q)(Q). ● Number of the names of god (Q) according to Athanasius Kircher.
Nile River flood period Dunbar number	150		● The number of days of the Nile river flood, which became the basis if Noah's flood, as told in the Bible, Genesis 7:24: "And the waters prevailed upon the earth an hundred and fifty days". (Q) ● The maximum group size that a system will remain stable, based solely on interpersonal ties, without overarching established rules and laws (Robin Dunbar, 1992). [2]
	153		Was regarded as sacred by Pythagoras and a miracle story of him catching a large number of fish was attributed to him; the ratio 265/153, being the height-to-width ratio of the intersection of two circles (called by Archimedes in 250BC the "measure of the fish"); rescripted into the Biblical story of Jesus predicting that a group of fisherman would catch 153 fish in their net.
Social network number	200		The number of people said to exist in a typical person's social network.
Name memory number	300-5,000		The number of people the average person knows by name.
Energy signature number (human bond number)	0-5,000		The number of total defining "bonds" (human bonds, sexual bonds, relationship bonds, social bonds, weak ties, strong ties, human chemical bonds, continuity bonds, etc.) that one person has; whereby it is assumed that each bond has a quantifiable amount of bond energy, as do all chemical bonds.
	60		
Laszlo number		?	The the tentative name to be assigned to a future number of the "hmol", or human mole, the basic unit to human chemical thermodynamic calculations, e.g. entropy (J/K·hmol), in honor of the first person to make an attempt at calculating a molar human unit (Babics Laszlo, 2003).
Population number	7 billion		The current human population. [5]
Soul number (IQ number)	81 billion	2005	Number of humans, come and gone, since the migration of humanoids out of the East African Rift Valley, some 200,000 years ago (as of 2005). The number crops up in theories and discussions on whether or not a human has a conserved moral essence or "soul" in the sense of the Ra theology after death theory of the weighing of the soul. [4] The number also crops up in discussions of ceiling IQs, in the 200+ range.
	105		See: number of people who have existed.

billion

Number of atoms in

See main: Number of atoms in

In science, **number of atoms in** (something), such as 'one human', 'the earth', 'the sun', 'the galaxy', 'the universe', among other varieties, is a popular search query. The following table lists some of these atomic counts. [1] The third column, Exp, shows the old-fashioned calculator shorthand symbol for large numbers, in which E is short for exponent, in the sense that, for instance, E9 is short for 10E9 which is short for 10^9.

#	Name	Number written out	Exp	Number of atoms in
1	one	1		H
2	two	2		H_2
3	three	3		H_2O
10^2	hundred	100	E2	
10^3	thousand	1,000	E3	
10^6	million	1,000,000	E6	
10^9	billion	1,000,000,000	E9	(ten) bacteria molecules
10^{12}	trillion	1,000,000,000,000	E12	
10^{15}	quadrillion	1,000,000,000,000,000	E15	(ten) pre-aquatic worms
10^{18}	quintillion	1,000,000,000,000,000,000	E18	
10^{21}	sextillion	1,000,000,000,000,000,000,000	E21	(one) small fish
10^{24}	septillion	1,000,000,000,000,000,000,000,000	E24	Avogadro's number
10^{27}	octillion	1,000,000,000,000,000,000,000,000,000	E27	(one) human molecule (person)
10^{30}	nonillion	1,000,000,000,000,000,000,000,000,000,000	E30	
10^{33}	decillion	1,000,000,000,000,000,000,000,000,000,000,000	E33	
10^{36}	undecillion	1,000,000,000,000,000,000,000,000,000,000,000,000	E36	
10^{39}	duodecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000	E39	
10^{42}	tredecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E42	
10^{45}	quattuordecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E45	
10^{48}	quindecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E48	
10^{51}	sexdecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E51	(one) earth molecule (the earth)
10^{54}	septendecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E54	
				(one) sun

10^{57}	octodecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E57	molecule (the sun)
10^{60}	novemdecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E60	
10^{63}	vigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E63	
10^{66}	unvigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E66	the milky way galaxy
10^{69}	duovigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E69	
10^{72}	tresvigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E72	
10^{75}	quattuorvigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E75	
10^{78}	quinquavigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E78	
10^{81}	sesvigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E81	the observable universe
10^{84}	septemvigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E84	

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(c) Laszlo, Babics. (2010). "The Mechanics and Thermodynamics of Mass Societies", *Journal of Human Thermodynamics*, Vol. 6, pgs. 39-46, Aug.
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(b) Olson, Steve. (2003). *Mapping Human History: Genes, Race, and Our Common Origins.* Mariner Books.
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7. Murdock, Dorothy M. (2008). *Christ in Egypt: the Horus-Jesus Connection* (§:Horus at Ages of 12 and 30, pgs. 210-). Stellar House Publishing.

See also

- Floating magnets experiment

External links

- Number – Wikipedia.

θΔics

In science, **number of atoms in** (something), such as 'one human', 'the earth', 'the sun', 'the galaxy', 'the universe', among other varieties, is a popular search query. The following table lists some of these atomic counts. [1] The third column, Exp, shows the old-fashioned calculator shorthand symbol for large numbers, in which E is short for exponent, in the sense that, for instance, E9 is short for 10E9 which is short for 10^9.

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10^{57}	octodecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E57	(one) sun molecule (the sun)
10^{60}	novemdecillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E60	
10^{63}	vigintillion	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	E63	

10^{66}	unvigintillion	1,000,000,000

In numbers, **number of people who have existed**, aka “number of people who have ever lived” or “soul number”, as found in afterlife discussions (e.g. thermodynamics of hell), refers to the count of the number of humans to have ever come into and gone out of existence, since “humans”, as a distinct species, distinguished from primates, arose out of the East African Rift Valley, some 200,000 years ago, estimates of which vary between 81 billion (Thims, 2003) to 105 billion (Haub, 1995).

A religious-view visual, from the article “What are the Demographics of Heaven?” (2015) (Q), of god creating humans (aka nature synthesizing humans), based on the “god creating Adam” (c.1512) painting by Michelangelo, which itself is based, religio-mythological speaking, on the 3100BC Heliopolis creation myth of the god Atum being self-engendered out of the watery god Nun, of the notion of the **number of people who have existed**.

Overview

In 1981, Carl Haub, a demographer at the Population Reference Bureau, got a call from someone saying that they had heard that "75% of the people ever born, in human history, were living in that year", after which, puzzled by this statement, which he intuited was a off estimate, he began researching the topic of the number of people who have ever existed. [1]

In 1995, Haub, in his “How Many People Have Ever Lived on Earth”, calculated that 105 billion people “have lived on earth, of whom 5.5% are alive today”. [2]

In 2005, Libb Thims, independent of Haub, in his *Cessation Thermodynamics* manuscript, calculated that about 81 billion people have come into existence.

References

1. Haub, Carl. (2011). “Distilled Demographics: How Many People Have Ever Lived on Earth?” (vid), YouTube, Population Reference Bureau, Oct 3.
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θΔics

In religio-

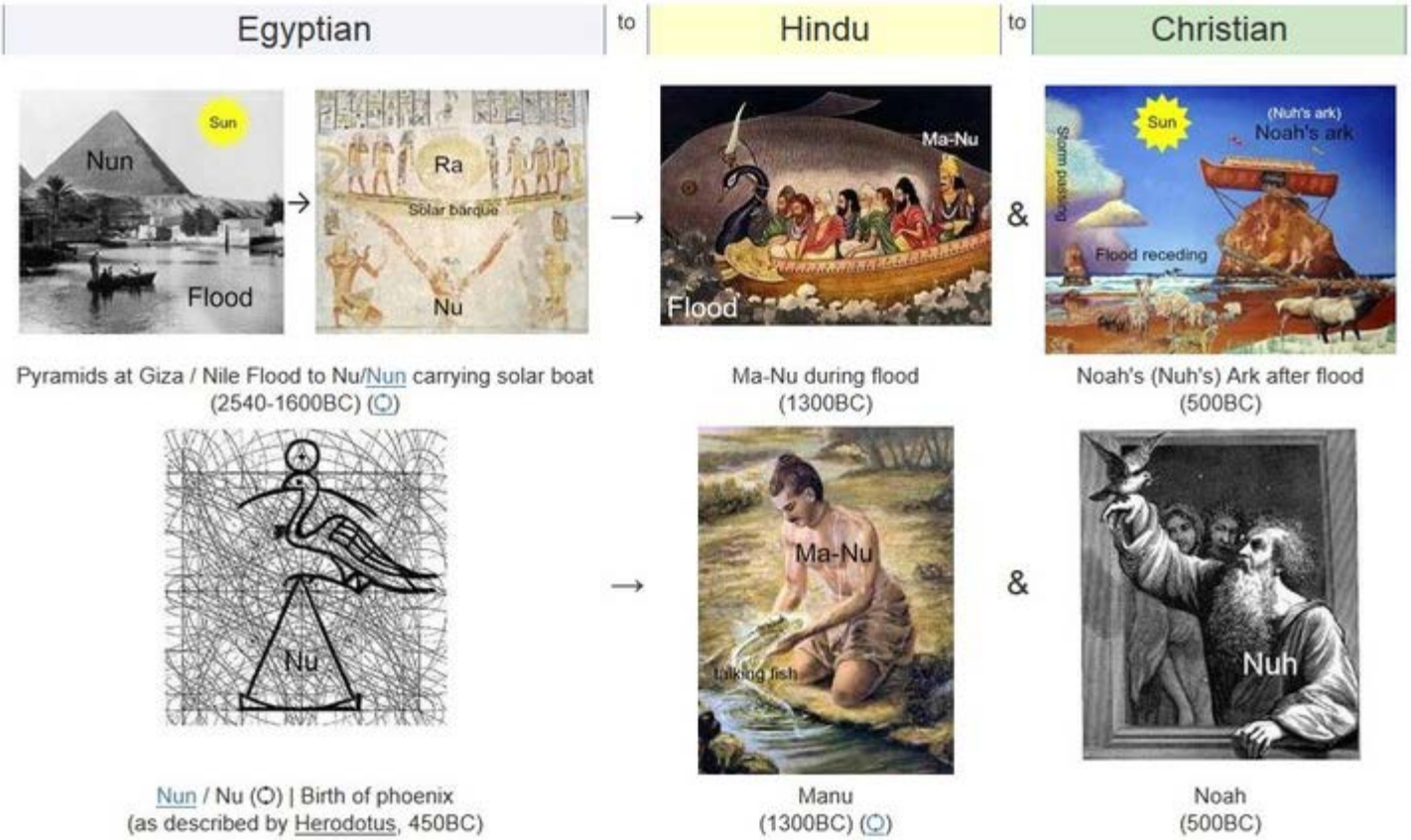

A depiction of the **Nun** (Nu), the 150-day Nile River annual flood, Nu's ark, to Ma-Nu and the flood, to Noah (Nuh) and Noah's ark conceptual evolution.

mythology, **Nun**, Nu, or Nunu (Ashby, 1997), hieroglyph (Unas Pyramid texts, 2500BC), symbolic of a pot (for water storage) and a water wave, or , the pot symbol, plus water wave symbol, plus sky symbol , plus god symbol (man seated), plus some type of platform symbol, is the primordial land mound and god combined that arose from the chaos or flood of beginning out of which the sun god Ra was born bursting forth into the sky, bringing the first light to the world. Nun is often depicted holding aloft the solar boat or the sun disc. [1]

History

See main: Religio-mythology transcription and syncretism

Nun originated in the 3100BC Heliopolis creation myth of a land mound arising following the original flood a theory based on the annual 150-flood cycle of the Nile river, at the end of which a fertile black soil called *keme* (pronounced 'chem') is left behind in the receding water. Hence, similar to the observed flood cycle of the Nile, it was hypothesized that there was one great primordial flood out of which a land mound arose, out of which the sun was born.

This soon became known as the Ennead cosmogony (group of nine) or the Heliopolitan Ennead, in which Nun is perceived as transcendent at the point of creation alongside Atum the creator god, who then self-creates two progeny gods: Shu (air) and Tefnut (moisture), who then create two progeny gods: Geb (earth) and Nut (heaven), who then create four progeny gods: the 'good' pair Osiris and Isis and the 'bad' pair Seth and Nephthys: [3]

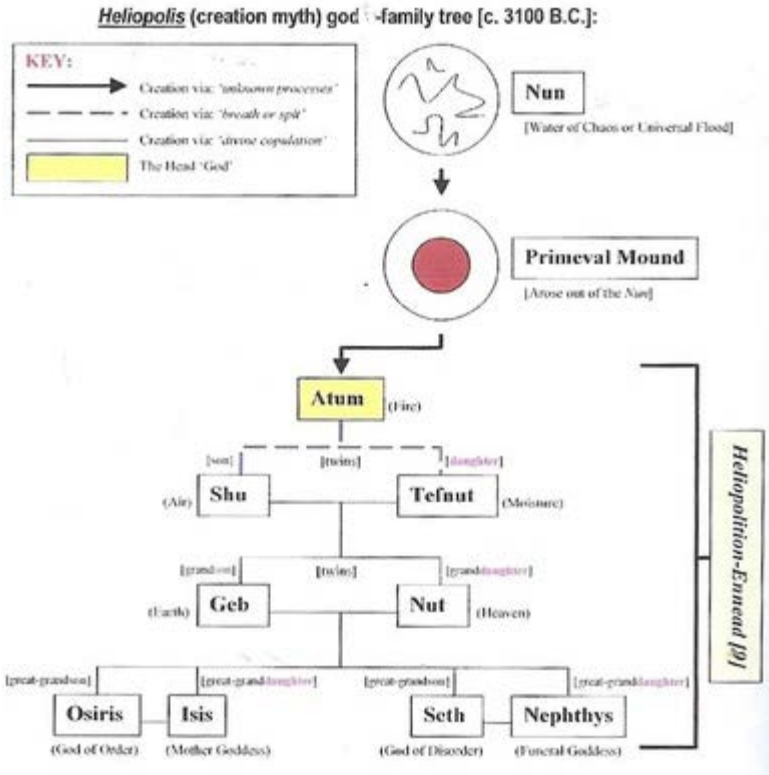

The following is an etching (Ñº) of is Nu carrying the solar barque, containing Ra in the form of Kephri (Ra-Kephri), i.e. the sun disc, as it sails through the day sky, as found on a temple wall in Abydos, Egypt: (Ñº)

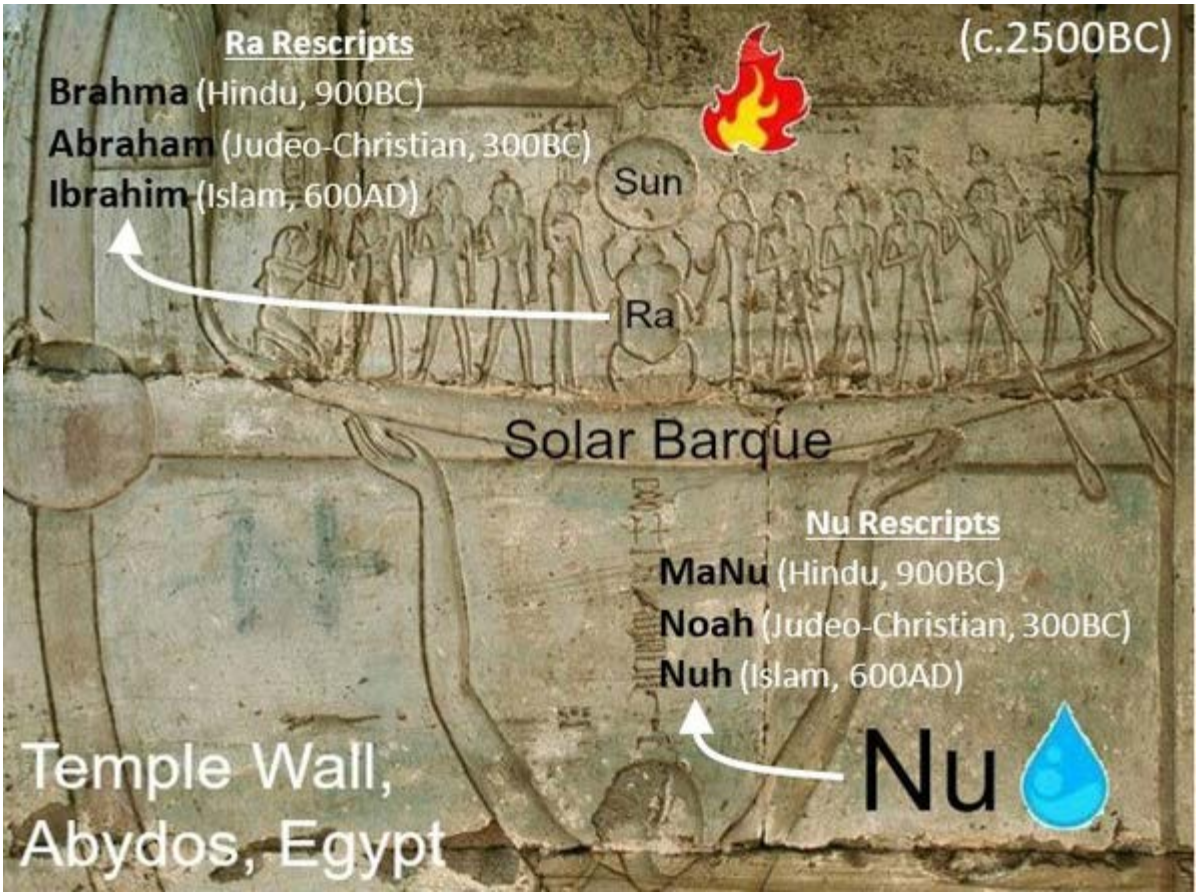

(add discussion)

Father of Ra

The name of this sun or sun god came to be known as Ra, the son of Nun. Ra eventually came to be seen as the original progenitor of all life, hence the "father" to all humans, where after the full name of Ra was written in Hieroglyphics as:

> Father Ra son of Nun (e.g. father Tom son of Steve)

In the sense that the prefix Ab- or B- meant "father" and the suffix -ham or -hma, meaning *keme* (or black land), pronounced chem or ham, the name Father Ra son of Nun became rewritten in the B-ra-hma-ic theologies (20% of modern religions) and Ab-ra-ham-ic theologies (53% of modern religions) as:

> B - Ra - ham (B-ra-hma)
> AB - Ra - ham (Ab-ra-ham)

although the original Egyptian association became lost or discarded through syncretism, although not enough to have covered up the overlap in stories of the latter two versions of the character (sister-wife issue, sacrifice of son faith test, Ma-Nu/Noah flood forefather, etc.)

In the scheme of the Hermopolitan Ogdoad (Hermopolis, 2400BC) theory, Nun was coupled to the primordial goddess Naunet, the pair epitomizing the primordial abyss, and Ra became a syncretism with the fire god Atum, called Re-Atum.

Noah | Ma-Nu

The primordial flood-then-land aspect of Nun became reformulated in the Hindu-Buddha version as the flood god Ma-Nu. The primordial flood-then-land aspect of Nun became reformulated in in later Judea-Christian-Islam version as a man named Noah, a person who built an ark before the flood and landed on a mound after the flood, releasing three birds, at 40-day intervals, on the third day of which (120-days) the sun rose (just as in the original Egyptian version a bird burst forth from the land mound Nun carrying the sun on its head into the sky; later recorded by Herodotus as the phoenix).

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(b) List of Egyptian hieroglyphs – Wikipedia.
(b) Jordan, Michael. (1993). *Encyclopedia of Gods.* Facts on File.
2. Thims, Libb. (2003). *Human Thermodynamics, Volume 3.* Unpublished manuscript. IoHT publications.
3. Ennead – Wikipedia.

External links

â— Nu (mythology) – Wikipedia.

θΔics

In cosmologies, **Nun cosmology** is a model where the universe is said to be comprised of a primeval, self-generated ocean called the "Nun", out of which the first land or land mound, also called the Nun, depending on version, arose, from which the sun, called "Ra" (among other names) was born, and from which everything else (humans included) were generated or created.

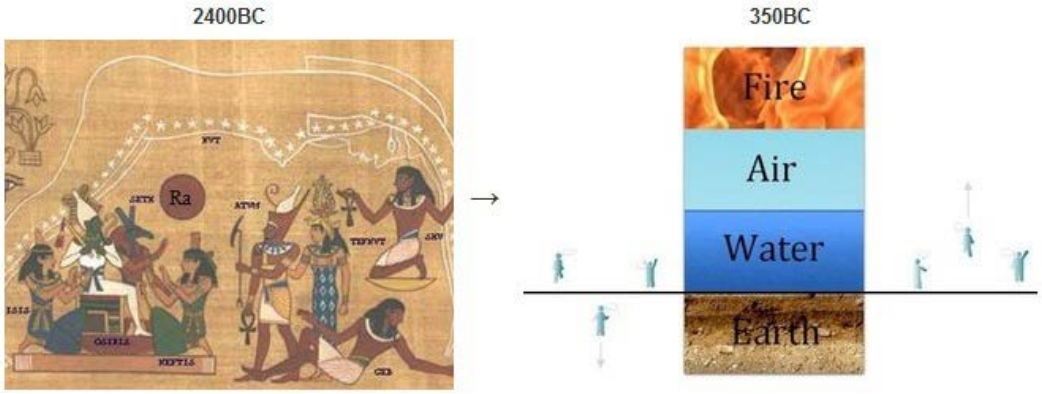

Two versions of **Nun cosmology**: the 2400BC Heliopolitan Ennead (god of nine) version, shown on the *left*, an anthropomorphic derivative of the original 3100BC "land mound (Nun) arising out of body of water" version, out of which the sun (Ra) was born; and *right* a pre-Aristotle flat earth model (c.350BC), wherein earth (unmovable), the center of the universe, was the heaviest of elements, followed by water, air, and fire, in decreasing density, and "motion" was tendency of bodies to seek or achieve their natural place in the order of the universe; a model that was part physics (four elements and two forces), i.e. Empedocles standard model (450BC), and part theology, in particular Nun cosmology, which included the notion of good and evil (negative confession).

Synonyms

Synonyms of Nun cosmology include: "Ra-born-of-Nun (sun born of earth), "Ab-ra-ham-ic theology" (Christianity, Islamic, Judaism, etc.), "B-ra-hma-ic theology" (Hinduism, Buddhism, etc), among others.

History

See main: Universe

Nun cosmology was developed predominantly in Egypt, a synthesis of the local mythologies of the 42 pre-dynastic nomes (5000-3100BC), which was worked into a nation creation theology, changing theoretical form and development over time, in four different power centers: Heliopolis (3100BC), Memphis (2800BC), Hermopolis (2400BC), and Thebes (2040BC).

The Heliopolis creation model, sometimes referred to as the Heliopolitan Ennead (god of nine), as well as the other modified versions, are shown below.

In Hermopolis scheme, the model became strongly anthropomorphic, in the sense that the god earth (Geb) was viewed as being surrounded by the heavens (Nut) through which the sun (Ra) passed on its daily journey being carried on a solar barque. This model was incorporated into the work of Aristotle and afterwords into science.

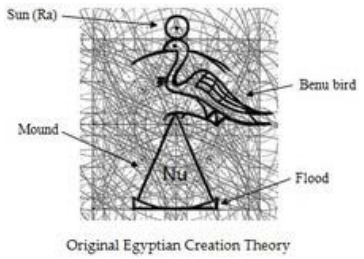

Heliopolis creation theory (3100BC)

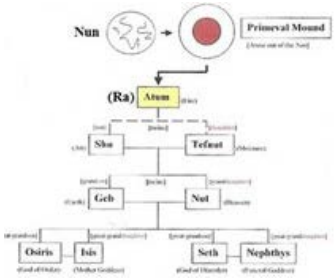

Heliopolitan Ennead (2700BC)

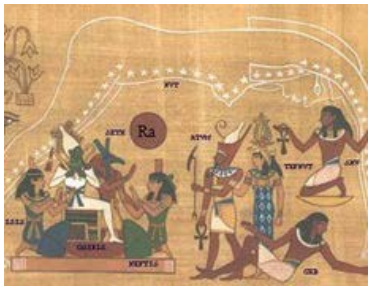

Anthropomorhic Ennead (2400BC)

Egyptian flat earth model (1000BC)

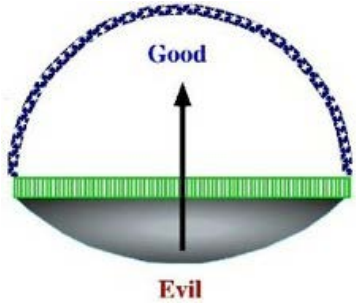

Osiris-Set rendition of the Ennead [1]

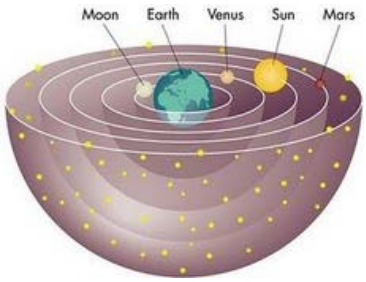

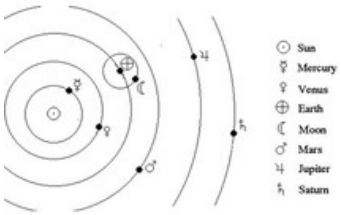

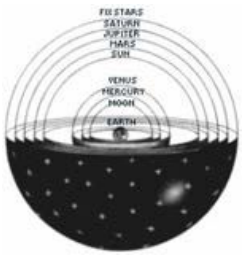

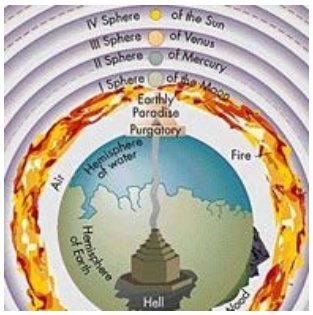

Aristotle's Egyptian version + Greek four element theory (320BC)

→

Aristarchus heliocentric model (270BC)

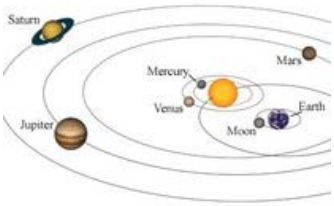

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Ptolemy' elaborated Aristotle model (150AD)

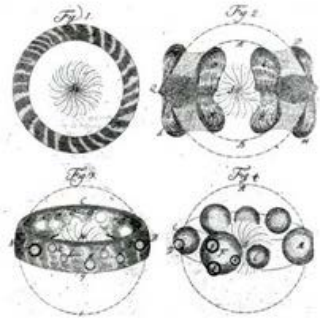

Dante's universe (1300)

Copernican model (1543)

Brahe model (1590)

Nebular hypothesis (1734)

Modern version

Modern Aristotle-based laity Christian earth model (2000)

References

1. Fontaine, Didier. (2002). "Flat Worlds: Today in Antiquity", *Memorie della Societa Astronomica Italiana*, 3(1): 257-62.

Further reading

â— James, Edwin O. (1970). *Creation and Cosmology: A Historical and Comparative Inquiry* (ch. 2: Middle Eastern Cosmology, pgs. 15-). BRILL.

External links

â— Flat earth – Wikipedia.

θΔics

In religio-mythology, **Nut**, hieroglyphics: 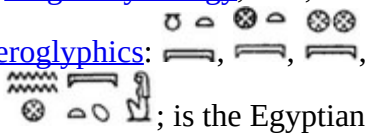 , or ; is the Egyptian goddess of the heavens; daughter of Shu (air) and Tefnut (moisture); female counterpart to Geb (earth); mother of the god-goddess pairs: Osiris-Isis and Set-Nephthys. [1]

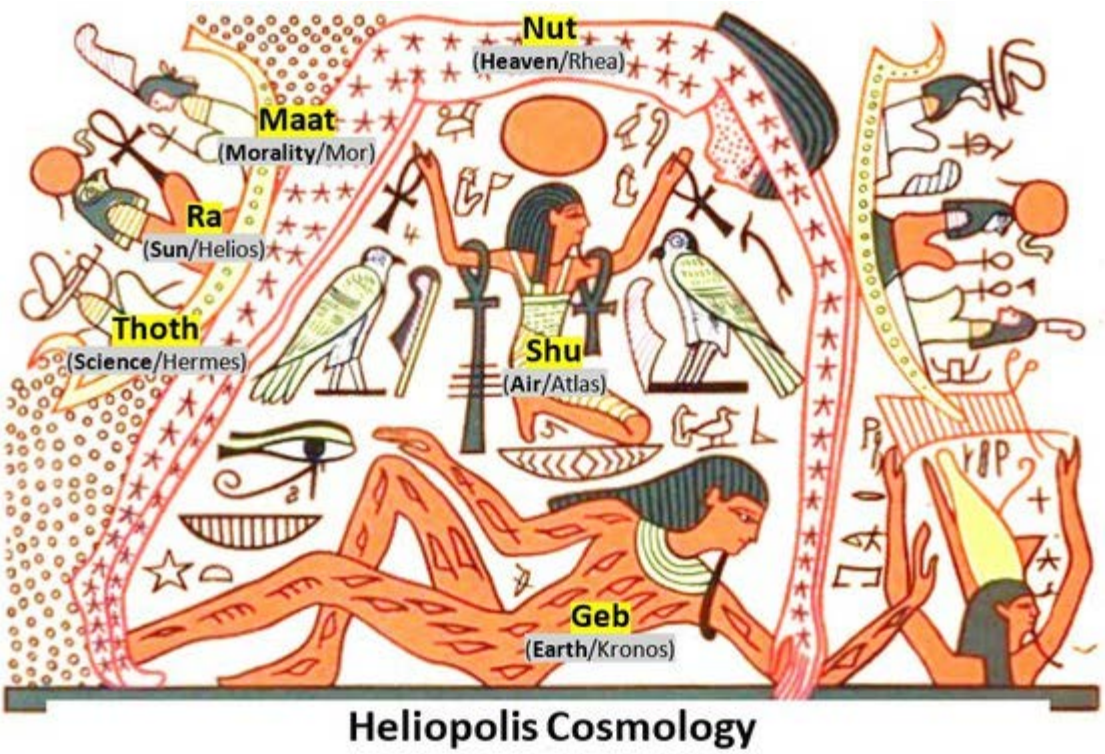

An image of **Nut**, as the female embodiment of the heavens, through which the sun, in the form of the god Ra, conceptually travels; shown being held aloft by the god Shu (air), who separates Nut from her lover Geb (earth). [1]

Overview

The following shows an image of Nut giving birth to the sun (Ra), out of her vagina, the rays of which falling on the goddess Hathor in the horizon: [1]

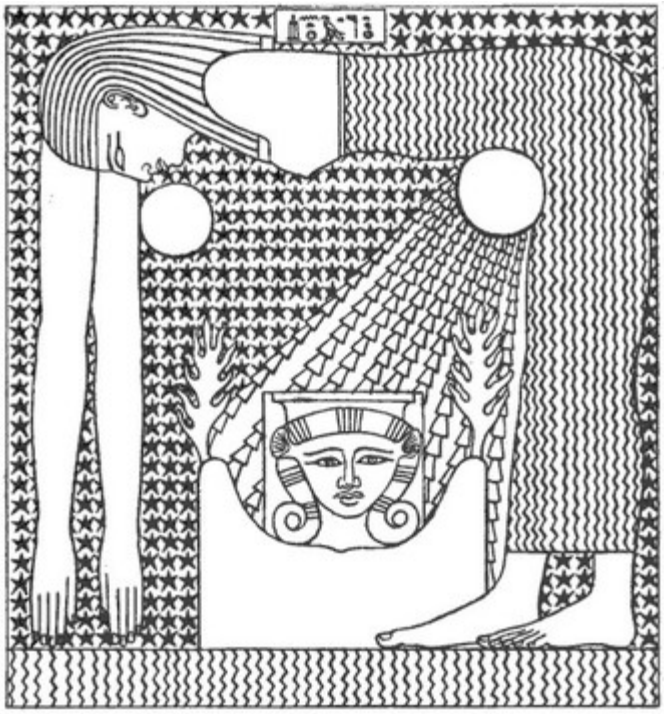

Images of this sort, to note, are found on the walls at the Dendera temple.

Quotes

The following are related quotes:

"Plutarch's version of the myth of Isis and Osiris connects the various episodes, many of which can be

documented from Egyptian sources, into a single, running narrative (*On Isis and Osiris*, 12-19). The story begins with Kronos (Geb, the Egyptian earth god) and Rhea (**Nut**, the Egyptian sky goddess) overcoming the curse of Helios (Re, the sun god) with the help of Hermes (Thoth, the Egyptian moon god) by producing five children on five intercalary days: Osiris, Horus, Typhon (Set), Isis, and Nephthys. As pharaoh of Egypt, Osiris brings civilization to that country and to the whole world. Typhon, however, gathers conspirators and plots to kill Osiris. First, he imprisons Osiris within a coffin and throws it into the Nile River, and later he dismembers the body of Osiris and scatters the pieces all around Egypt. One piece, the penis, is lost forever in the Nile River. In both episodes, the reproductive power of Osiris is sub-merged in the Nile. (Isis grieving and searching for Osiris and burning away the mortality of the infant prince of Byblos can be compared with …"

— Marvin Meyer (1999), *The Ancient Mysteries* (Ñº)

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians*, *Volume Two* (§:Nut, pgs. 100-; image, pgs. 94-96; Nut giving birth image, pg. 101). Dover, 1969.

External links

â— Nut – Wikipedia.

θΔics

In Egyptian mythology, **Obelisk** refers to one of many architectural representations, originally made in Egypt, of the missing phallus of Osiris, as told historically in the ancient passion of Osiris play.

A general diagram illustrating that the **obelisk** as the lost phallus of the god Osiris who is brought back to life by the powers of the goddess Isis so to conceive the man god Horus in the black rite process.

Overview

In c.3100BC, in the Heliopolis creation myth, the tip of the pyramid, named the benben stone, out of which the bennu bird flies, carrying the sun god Ra, was considered to be the petrified semen of Atum; a surmised overview of this is illustrated (Ñº) as follows:

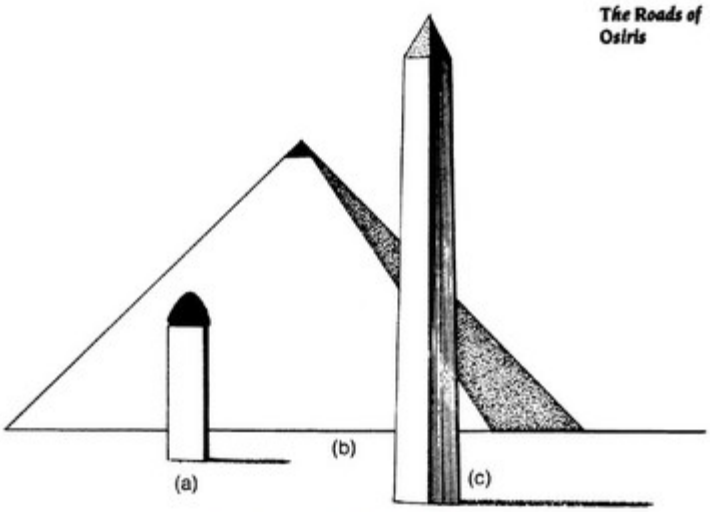

21. *The Benben through the Ages*
(a) The original Benben of Heliopolis as it may have looked
(b) A pyramid surmounted by a pyramidion or Benben
(c) An obelisk tipped by a Benben-T

In c.2500BC, in the same general myth, the god Geb, symbolic of the earth, was oft-depicted as trying to obtain coitus with the sky goddess Nut, as shown below:

In c.2400BC, in the passion of Osiris, the so-called golden phallus of Osiris was said to have been lost in the Nile river, presumably eaten by a fish, but then, when Osiris is re-combined into the form of a mummy, a golden phallus is made to be his new sexual organ; this is shown below:

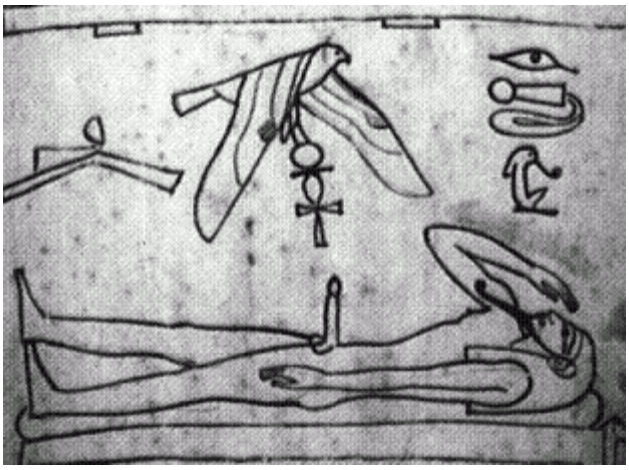

This, generally speaking, is considered to have been the origin of the obelisk, although certainty of this connection is inexact.

Quotes

The following are related quotes:

> "This process was intensified in the third intermediate period [1069-945BC], and it was at this time that the first representations of **Osiris with the obelisk** appear on painted coffins. Let us now examine the contexts in which **Osiris or Isis are shown together with the obelisk**. In the third intermediate period, a new representation of Osiris was created which can be called 'Osiris standing in the tree' [see: Christmas tree]. The motif of Osiris in the tree is often accompanied, on both sides, by an obelisk and some deities. In this case, Osiris is identified with the periodic renewal of vegetation, and this chthonic type of regeneration is synchronized with the cosmic type. Among the bronze statuettes of the first millennium, there is a relatively rare type showing a divinity sitting or standing in front of an obelisk. I already mentioned a sitting variant of Osiris with a hollow obelisk containing a model phallus. Other variants are devoted to solar deities such as Re or Atum; they need not be discussed here."
>
> — M. Muller (2003), "A Comprehensive Iconographical Databank for Egyptian Objects: Methods and Results", in: *Egyptology and the Dawn of the Twenty-First Century* (§:322-27; quote, pg. 325)

“Another telling goes like this, **Nimrod**/Osiris was killed by an enemy and his body was cut into pieces and sent out into his kingdom. Semiramis gathered all the parts and seemingly put them back together, except for his reproductive organ, which she could not find. She proclaimed that Nimrod could not come back to life without that missing part, and she had one made and set up in Babylon. "Semiramis quarried out a stone from the mountains of Armenia which was one hundred and thirty feet long and twenty five feet wide and thick... she brought it down the stream to Babylonia...." "The ancient Greek historian, Diodorus, reports that Queen Semiramis erected a 130-foot obelisk in Babylon and it was associated with sun worship and represented the **phallus of the sun god Baal/Nimrod**. Some Masonic researchers say that the word `obelisk' literally means 'Baal's shaft' or 'Baal's organ of reproduction'." is . This particular obelisk is not found today, it is known as the Lost Obelisk of Babylonia. There are others. That missing part would later be represented by thousands of obelisks around the planet. The obelisk is still recognized as **Osiris/Nimrod's phallus**, his sex organ of reproduction. One wonders why there is a huge obelisk in Washington, D.C., and one at the Vatican. There are obelisks in just about every important city and in every nation on earth. Why?”

— Roberta Sams (2015), *There Were Giants on the Earth in Those Days* [1]

References

1. Sams, Roberta. (2015). *There Were Giants on the Earth in Those Days and Also After* (pg. #). Balboa Press.

Further reading

â— King, James. (1893). *Cleopatra's Needle: A History of the London Obelisk, with an Exposition of the Hieroglyphics* (txt). Publisher.

External links

â— Obelisk – Wikipedia.

θΔics

In terminology, **objectionable nonsense** is a statement about something that produces a powerful reaction, of vocal objection, to the point that seasoned thinkers are willing to take a stand against said statement; nonsense that is beyond ordinary nonsense. [1]

Overview

In 1932, Albert Einstein, in his interview with James Murphy (see: Einstein-Murphy dialogue), stated vocally, that the supposed conjecture or assertion, in modern science, that "physical science attributes something like free will to routine processes of organic nature", as Murphy put things to Einstein, was not just ordinary nonsense, but "objectionable nonsense". [1]

References

1. (a) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (clouds, pg. 7; no duality, pg. 531). Arnold-Howard Publishing Co.
(b) Planck, Max. (1933). *Where is Science Going?* (pg. 201). Allen & Unwin.

θΔics

In nouns, **occupation**, a term synonymous with work, job, or vocation, is the activity in which one engages; the principle business of one's state of existence. [1]

An icon depiction (O) of various **occupations**, from teacher, businessman, musician to cowboy, policeman, and thief.

Occupational naturalness

In his *Politics*, Aristotle comments on the relative naturalness or unnaturalness of money-making: [2]

> "Of the two sorts of **money-making**, one is a part of household management, the other retail trade, the former necessary and honorable, the latter a kind of exchange which is justly censured, for it is unnatural, and a mode by which men gain from one another. The most hated sort, and with the greatest reason, is usury, which makes a gain out of money itself, and not from the natural use of it. For money was intended to be used in exchange, but not to increase at interest. And this term usury, which means the birth of money from money, is applied to the breeding of money because the offspring resembles the parent. Wherefore of all modes of making money, that is the most unnatural."

(add discussion)

Occupation and sexual receptiveness

In *circa* 1993, American evolutionary psychologist David Buss and graduate student Jennifer Semmelroth, polled 213 college women, half of which (N=109) were asked how flattered the would feel by being persistently asked out on a date by various men, differing by occupation, shown below, the other half (N=104), were asked how upset they would feel by outright sexual proposition by various men, similarly differing by occupation, on a Likert scale of 7 being 'most upset' to 1 being 'least upset', the results of which are shown below: [3]

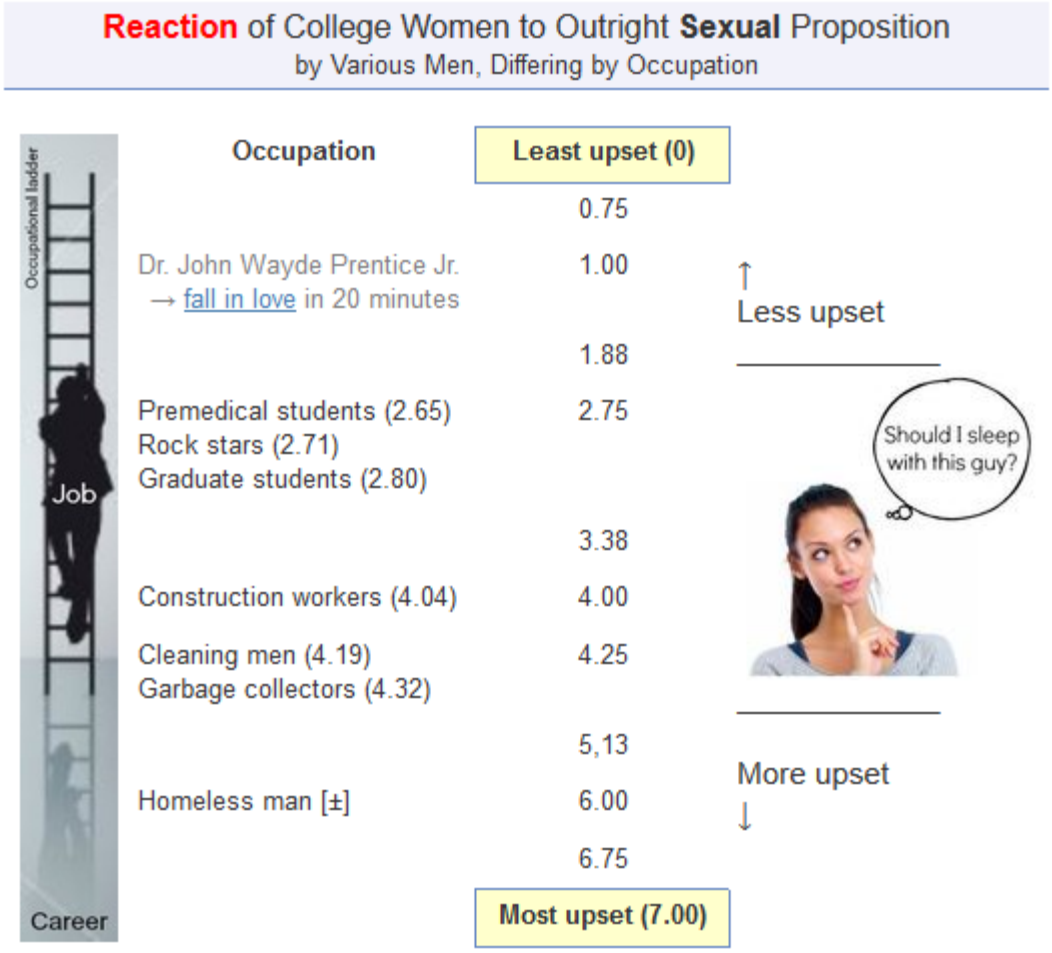

The above results, to note, of , with the guesstimated inclusion of the explicitly-designed occupationally-perfect idealized male Dr. John Wayde Prentice Jr., from the 1967 film *Guess Who's Coming to Dinner* and and an occupationless homeless man, and the general occupational role played by English-born American actory Cary Grant, whose tended to personify identities to the effect that "I pretended to be somebody I wanted to be and I finally became that person. Or he became me. Or we met at some point" resulting to the effect that "everyone wants to be Cary Grant—even I want to be Cary Grant": [7]

Quotes

The following are related quotes:

> "A clergyman is one who feels himself called upon to live without work at the expense of the rascals who work to live."
>
> — Voltare (c.1760) in FSM app

See also

- Lazy ant study
- Alley equation

References

1. Merriam-Webster Collegiate Dictionary, 2000.
2. (a) Aristotle (322BC). *The Politics* (Bk. I, pg. 16). Publisher.
(b) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 145). Arnold-Howard Publishing Co.

3. (a) Buss, David M. (1994). *The Evolution of Desire: Strategies of Human Mating* (sexual proposition study, pgs. 161-62). Basic Books.
(b) Jennifer S. Simmelroth (resume) – SaelmGastro.com.

Further reading

● Thims, Libb. (2008). "On the Mechanical Equivalent of Heat and Occupation" (PDF), *Journal of Human Thermodynamics*, Vol. 3, Issue 1. pgs. 1-7, April.

External links

● Occupation – Wikipedia.

θΔics

In existographies, **Octavian S. Ksenzhek** (c.1945-) (TR:11) is a Russian bio-electrochemist noted, in economic thermodynamics, for his 2007 *Money: Virtual Energy: Economy through the Prism of Thermodynamics*, wherein he models economics systems thermodynamically and people as molecules.

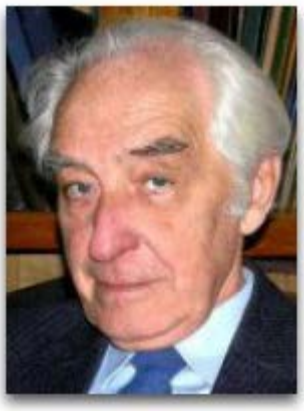

Overview

In 2007, Ksenzhek, in his *Money: Virtual Energy: Economy through the Prism of Thermodynamics*, argued that economy, modeled as an irreversible thermodynamic system, performs work necessary for functioning of society, at the expense of the dissipation of energy. The following is Ksenzhek's two cultures dissection of the economics and thermodynamics divide issue:

> "The grandiose building of modern human knowledge, growing before our eyes with impressive acceleration, shows now some features that resemble the story of the construction of the Babylon Tower. As time goes on, the specialization of science becomes deeper and deeper, so that the 'builders' of its different domains lose the ability to understand each other. It is happening because the division of science into different branches is artificial and reflects its preceding path of development rather than the natural interlinks or similarities between the phenomena that they deal with. Economics and thermodynamics represent just one example of this kind. They are located far enough from each other on the tree of science that their branches do not intersect. Students of both disciplines are mostly ignorant of ideas and methods of the other side. Specialists in both sciences publish their works in different journals and do not assemble together at common conferences."

Building on the work of Frederick Soddy, namely his 1926 book *Virtual Wealth and Debt*, with passing mention of Herbert Spencer, Vilfredo Pareto, and Ilya Prigogine, Ksenzhek argues that "money" plays a fundamental role of virtual energy specific for economic processes and makes possible the mutual coupling of energy flows distinct in their nature. [2] Although Ksenzhek supports the application of thermodynamics in economics, he objects to its use in political thermodynamics.

Human molecules

In relation to the concept of the human molecule, Ksenzhek correctly states that: "the economy of mankind is a very large and extremely complicated system: people are the 'molecules' of which it consists", and "various associations of people constitute its structural components." [1]

Working medium

In terminological analogy to French physicist Sadi Carnot's 1823 "working substance" and German physicist Rudolf Clausius' 1850 "working body", Ksenzhek correctly outlines the view of what he calls a "working medium". Specifically, he gives a very basic neurochemical human thermodynamic view in which endorphins, i.e. the body's natural pain killer and mental high chemical, in low concentrations exert a strong influence on the processes of the nervous system, particularly in the pleasure center. Thus, he concludes that endorphins play a key role in the hidden processes of basic human motivations and that in the economic system, humans act as "active agents" coupling technology and "virtual energy flows". [1]

Subsequently, according to Ksenzhek, the modern economy exploits the various endorphin channels with every-increasing intensity, via advertising, commercials, the image in the mind of becoming sexier with a certain product, e.g. a new car, or new technology. In this manner, "a whole arsenal of various means is set into action to inspire people to incessantly wish for something. Such a state of people is necessary for their efficient functioning as the "working medium" of the economic cycle. In order to keep people excited, powerful advertising is used. As a rule, it appeals to the subconscious rather than reason." [1]

Education

Ksenzhek has a DrSci and PhD in something. Ksenzhek in 2007 was head of the Laboratory of Bioelectrochemistry at the Ukrainian State University for Chemical Technology, Dniepropetrovsky. He is the author of three books, including the 1998 *Plant Energetics*, on the thermodynamics of energy processes in plants, their interconnection and arrangement, and the estimation of intrinsic energy needs of the plant connected with performing various physiological functions. [3]

References

1. Ksenzhek, Octavian S. (2007). *Money: Virtual Energy: Economy Seen Through the Prism of Thermodynamics* (quote, pg. vii-viii; pgs. 162, 170). Universal Publishers.
2. Soddy, F. (1926). *Virtual Wealth and Debt.* London: George Allen & Unwin LTD. (318 pages).
3. Ksenzhek, Octavian S. and Volkov A. (1998). *Plant Energetics*. New York: Academic Press.

Further reading

â— Ksenzhek, Octavian. (2010). "Quid est Homo?", Mar 01, Knol.
â— Energy & Humankind: a Tentative Step in Bringing Together Science and Humanities – Blogspot.com.

θΔics

In hmolscience, **Oded Kafri** (c.1946-) is an Israeli physicist noted for his 2013 book *Entropy: God's Dice Game*, with a concluding chapter on entropy in social systems, specifically and the Pareto distribution, Zipf's law, and something they call the "Planck-Benford distribution" on the 1931 work of American physicist and electrical engineer Frank Benford, all-in-all being an attempt to argue that entropy applies to things such as corporate communications (see: corporate entropy) and social networking. [1] A downside of the book is that it is riddled with information theory arguments (see: Shannon bandwagon).

Education

Kafri received a DSc from the Technion, Israel Institute of Technology, Haifa, in 1973 for his research on laser radiation. His research experience is in thermodynamics of light, optical metrology, encryption and communication. He served as senior scientist and a group leader at the Nuclear Research Center-Negev. He published more than 100 scientific papers, among them two pioneering papers on "Visual Cryptography" and on "Moire deflectometry", and holds numerous patents and two scientific monographs.

References

1. (a) Kafri, Oded, Kafri, Hava. (2013). *Entropy: God's Dice Game* (editor: Emanuel Lotem) (amz). CreateSpace.
(b) Frank Benford – Wikipedia.

External links

â— Oded Kafri (publications) – ResearchGate.net.
â— Oded Kafri (publications) –Mendeley.com.

θΔics

In genius rankings, **Oduenyi 100** (Odueny 100:#) refers to

Overview

In 2017, Valentine Oduenyi (Q), a Swiss scholar, educated in atomic and molecular physics, mathematics, and science history, published an online listing of "100 greatest scientists", from antiquity to the year 2000, based on a four-part ranking criterion, namely: overall ability, versatility, productivity and developmental influences, which took him 15-years to conclude, based on research conducted in dozens of libraries, in 20 countries. (Q)

List

The following Odueny's listing his ranking of the "100 greatest scientists" of all time:

1. Isaac Newton
2. Leonhard Euler
3. Gottfried Leibniz
4. Carl Gauss
5. Michael Faraday
6. Euclid
7. Galileo
8. Nikola Tesla
9. Marie Curie
10. Albert Einstein
11. Alhazen
12. Louis Pasteur
13. Johannes Kepler
14. Liu Hui
15. Max Planck
16. Augustin Cauchy
17. James Maxwell
18. Avicenna
19. Amedeo Avogadro
20. Dmitri Mendeleyev
21. Robert Koch
22. Ernest Rutherford
23. Nicolaus Copernicus
24. Georg Riemann
25. Zhang Heng
26. Blaise Pascal
27. Al-Khwarizmi
28. Henri Poincare
29. Abu Al-Biruni
30. Isambard Brunel
31. Galen
32. Joseph Lagrange
33. Qin Jiushauo
34. Paul Ehrlich
35. Archimedes
36. Nasir Al-din Al-Tusi
37. Robert Boyle
38. Pierre Laplace
39. Zhu Shijie
40. Wernher Braun
41. Henri Becquerel
42. David Hilbert
43. Niels Bohr
44. Srinivasa Ramanujan
45. Gregor Mendel
46. Emmy Noether
47. Antoine Lavoisier
48. Brahmagupta
49. Edward Jenner
50. Pierre Fermat
51. Zu Chongzhi
52. James Watt
53. Rene Descartes
54. John Neumann
55. Omar Khayyam
56. Hermann Helmholtz
57. Robert Hooke
58. George Carver
59. Pythagoras
60. Joseph Gay-Lussac
61. Aryabhata
62. Alessandro Volta
63. Christiaan Huygens
64. Carl Linnaeus
65. Walther Nernst
66. Hippocrates
67. Charles Coulomb
68. Gerolamo Cardano
69. Andrey Kolmogorov
70. Hans Orsted
71. Andreas Vesalius
72. Daniel Bernoulli
73. Heinrich Hertz
74. Jean d'Alembert
75. Shen Kuo
76. Bhaskaracharya
77. John Dalton
78. Andre Ampere
79. Enrico Fermi
80. Claude Bernard
81. Johann Lambert
82. James Joule
83. Seki Takakazu
84. Hendrik Lorentz
85. Otto Hahn
86. Luigi Galvani
87. Joseph Fourier
88. Abu-Kamil ibn-Aslam Shujaj
89. Georg Ohm
90. William Thomson
91. John Bardeen
92. Li Shizhen
93. James Sylvester
94. Wilhelm Roentgen
95. Sergei Korolev
96. Antoine Leeuwenhoek
97. Jesse Wilkins
98. Humphry Davy
99. Lise Meitner
100. Alexander Fleming

(add)

References

1. 100 Greatest Scientists – SapaViva.com.

θΔics

In hmolscience, **Odum classification** is a general materialism based social philosophy historical, grouped by era, given by Howard W. Odum (1929), largely based on the early mechanistic school classification of Pitirim Sorokin (1928), with two updated eras added in by Libb Thims (2016).

Overview

In 1929, Howard W. Odum, in his *An Introduction to Social Research*, §2, §§: "Fallacies of Pure Analogy" (pgs. 48-49), digresses on the question of making "analogies between physical science and social sciences", in respect to whether these are "pure analogy", see: pure analogy fallacy (Ñº), figurative analogy, or real analogy; then, after stating that the social sciences gain in the development of their methodology along with gains made in the methodology of the physical sciences, he gives the following very-condensed statement, which seems to be an attempt at abstracting the history of physical sciences based sociology, up to his day: [1][N1]

Era	Abstract	Chiefs
Greek era	"As a matter of fact, this attempt to make of the social sciences merely adaptations of the physical sciences is not new. The classical social theorists as, germinated in the old social philosophers surmised and made hypotheses a plenty about the human and social organism and the forces which knit, it together and pull it apart. Psychical and social phenomena were interpreted by Greek philosophers [Empedocles (450BC), Epicurus (270BC), Lucretius (55BC), etc.] in theories of materialistic atomism.	Epicurus
Dark age	Religious Theogony	
Renaissance era	**Hobbes** [1651], **Spinoza** [1676], **Descartes** [1620], and others attempted to study man as a kind of physical automaton—life a regular functioning mechanistic unit, death its wreck. Thus we find that the conspicuous seventeenth century in which physics, mechanics, and mathematics flourished was notable also for the carrying over of methods and conclusions into the social field. From his limited results and his uneven success in his efforts *et exquirire et docere causas rerum* [and required to teach causes] the physical scientist has attempted to discover the unknowable in terms of cosmic philosophy, and failing that has turned to the social field, still attempting to utilize his old methods of physical science or speculative philosophy.	Hobbes
Social physics era	And the mechanistic social theorists, how they tried to make a mathematical or an astronomical, or physical mass out of human society! **Sperktorsky** made an astronomical human order with the human being an attraction and compulsion of conations, society a system of individuals, so attracted or repelled, mankind a system of the attraction and compulsion of groups. Others made elaborate systems of dimensional proportions, with time, space, extension as elements. **Bentham** [1789] had moral arithmetic, **Herbart** [1825] (Ñº) mechanistic psychology, **Berkeley** [1713] a theory of moral attraction and social stability. The physicists found centrifugal forces in egoism, and centripetal forces in social instincts. **Saint-Simon** [1817] interpreted society in terms of Newton's laws of gravitation; and so on for many other types up to **Comte**'s [1842] social statics and dynamics and **Quetelet**'s [1835] statistical measurement of man.	Comte
Strait-jacket era	**Carey**'s [1858] mechanistic monism was not unlike theories of many others who tried to subject human association to the laws of physics and mechanics, or theories of energetics which make energy the fundamental force, or like **Winiarsky** [1900] make social aggregates nothing but a system of points and atoms being repelled and attracted through biochemical energy."	Winiarski
	Into the early to mid 20th century, it became apparent that modern universities and cultures were becoming a "house divided" (Judson Herrick, 1930), cleaved and split, by a	

Two cultures era	"barrier" (John Dewey, 1938), which came to be dubbed the "two cultures" (Charles Snow, 1959). In this period, a few, e.g. Vilfredo Pareto (1912), Lawrence Henderson (1930s), Edwin Wilson (1935), John Q. Stewart (1950s), tried to fix the house; but to no avail. The end of WWII, as some have reported, worked to switch focus to Marxism; the general subject seeming to inter thereafter, haunted, in some sense, by crackpot labellers, straight-jacket taboos (see: Stark classification), and closet atheism.	Henderson
New house era	Into the late 20th century, a newer breed of thinkers, including: Frederick Rossini (1971), Norman Dolloff (1975), Jurgen Mimkes (1995), Malcolm Gladwell (2000), Christopher Hirata (2001), Thomas Wallace (2009), began to emerge; which, in the wake of the following events and or inventions: Internet (mid 1990s), econophysics (1995) and sociophysics (2008) conferences , 9/11 (2001), Wikipedia (2004), new atheism (2004), YouTube (2005), Google Books (2007), Zeitgeist (2007), Hmolpedia (2008), etc., all interlaced with ongoing religious-based global terrorism, a new awake fervent blend of realism-based publications and presentations of the the "atheist who is finally speaking up" (Dave Rubin, 2015) variety, of the atheism-explicit physicochemical materialism seems to be arising.	Thims

This is a very interesting abstract indeed; though, to note, it seems to be, in large part, a truncation of the mechanistic school portions of Pitirim Sorokin's richly-cited *Contemporary Sociological Theories* (1928), who discusses the works of some 1,000+ scholars, as Odum notes.

See also

â— Stark classification
â— Sorokin classification

Note

N1. (a) Odum, of note, footnotes this dense quote with "see chapter 8 for further discussion and references".
(b) Thims (2016) divided Odum's abstract into four eras; the latter of which, namely: "straight-jacket era" is based on the stark classification (1962) ideology.
(c) The 1965 Max Gluckman quote: "A science is any discipline in which the **fool** of this generation can go beyond the point reached by the genius of the last generation" comes to mind here; Carey and Winiarski are the so-labeled straight-jacket fools that went beyond the genius of the social physics generation; little cultural progress has been made since (see: crackpot; detractors; attack).
(d) Note: the "two cultures era" and "9/11 era" sections were added in by Libb Thims (21 Apr 2016) to make the Odum abstract more complete and up-to-date.

References

1. Odum, Howard W. and Jocher, Katharine C. (1929). *An Introduction to Social Research* (thermodynamics, pgs. 108-109; spirit, 31+ pgs). H. Holt and Co.

θΔics

In schools, **Odum school** refers either to (a) the work of zoologist turned ecosystem theorist Eugene Odum (1917-2002), e.g. the Odum School of Ecology at the University of Georgia, is named after him, some classifying him, in this circle, as the “father of systems-based thinking in the United States” (Ñº), and his students, e.g. Robert Ulanowicz; (b) the Alfred Lotka based work of his younger brother ecosystem ecologist Howard T. Odum (1924-2002), and his students, e.g. Charles Hall, a "disciple" of the systems ecology work H.T. Odum, or others from the “University of Florida” school of energetics, e.g. Corrado Giannantoni (2002); or (c) the sociological work of their father Howard W. Odum (1884-1954), the founder of the *Journal of Social Forces* (1922-present), on "social forces", who in 1929, e.g., aptly defined Leon Winiarski (SN:4) as the leader of the mechanistic school of sociology. [1]

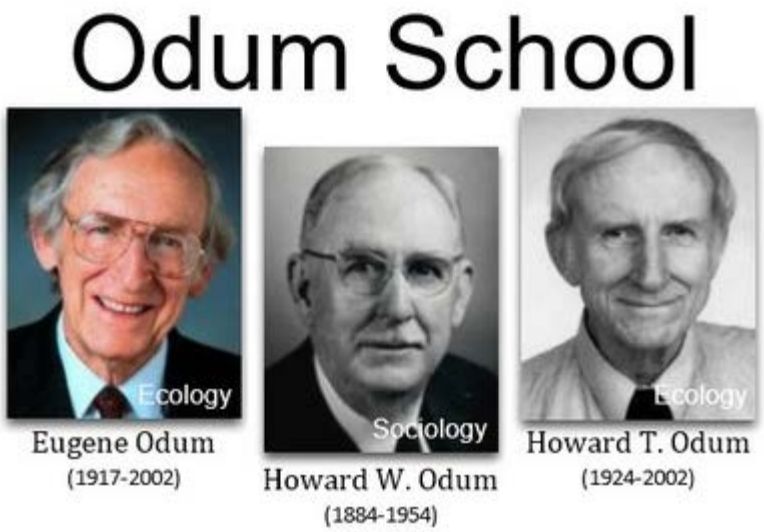

The three key figures of the so-called "**Odum school**", namely: the energy-themed ecosystems views of the brothers Eugene Odum and Howard Odum, and the holism views of their father Howard W. Odum.

References

1. Biophysical Economics – BPEconomics.org.

External links

â— Odum School of Ecology – Wikipedia.

θΔics

In theogonies, **Ogdoad** was an eight-god family, or paut, centered in Hermopolis (c.2400BC), generally considered the oldest of Egyptian theogonies, comprised of male-female god-goddess pair: Nun and Naunet, representative of chaos, who produced three god-goddess pairs: Huh and Hauhet, representative of space and infinity, Kuk and Kauket, representative of darkness, and Amen and Amenet, representative of wind, turbulence, stormy waters, and hidden powers. [1]

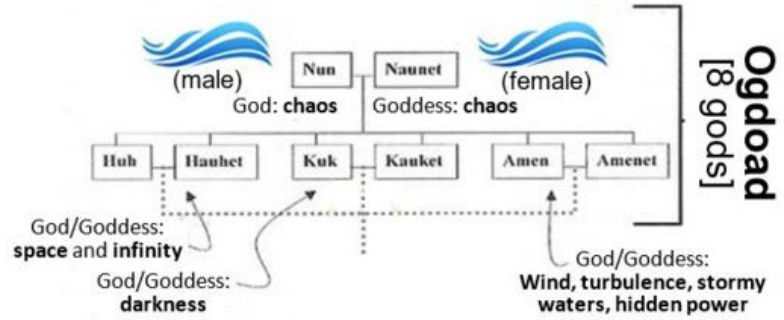

A visual of the structure of the **Ogdoad**, according to Gary Greenberg (2000), comprised of the eight gods: Nun, Naunet, Huh, Hauhet, Kuk, Kauket, Amen, and Amenet.

Overview

In 1904, Wallis Budge, in his *The Gods of the Egyptians*, visually depicted the Ogdoad, with snake (goddess) and frog (god) heads, as follows: [2]

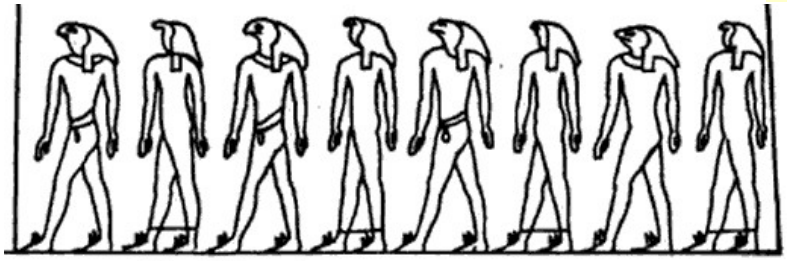

The Oldest Company of the Gods.

The following is 2018 rendition of first god-goddess pair Nun and Naunet, of the Ogdoad, by artist Jeszika le Vye (Q)(Q), showing "pairs symmetrical, a woman with the head of a snake and a man with the head of a frog - masculine and feminine representations of the same concept - so much so that their names even were identical except the change in gender" with "Nu and Nunut represented the primordial waters that existence spawned from, the great chaotic expense before the order of creation":

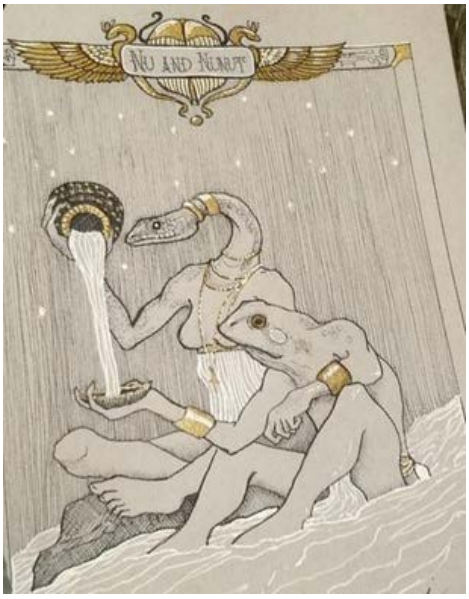

Budge writes the names of each of the gods, hieroglyphically, as follows, showing: Nun (Nu) and Naunet (Nut), Hah (Heru) and Hauhet (Hehut), Kak (Kekui) and Kauket (Kekuit), and a last pair "Kerh and Kerhet":

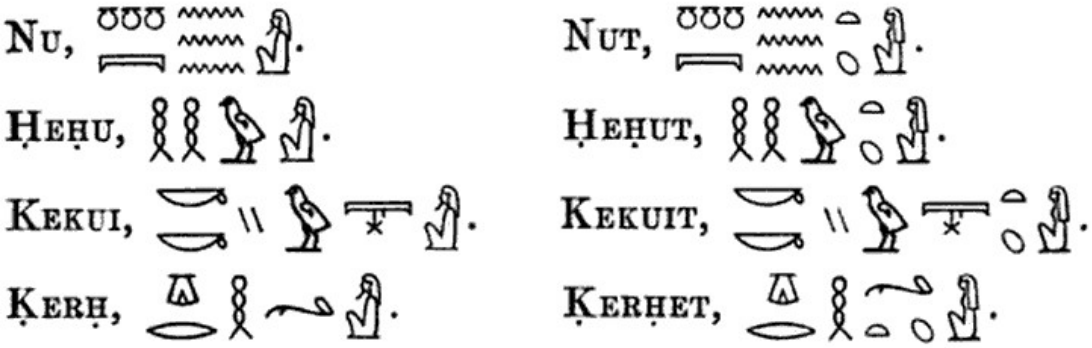

In 2000, Gary Greenberg, of note, classified the last pair of gods as Amen and Amenet. [1]

The following is a depiction of the Ogdoad, showing the gods with serpent and frog heads, from the Hathor temple in the Dendera temple (c.30AD) area:

(add)

Egyptian pantheon

The following shows the Ogdoad in the context of the general Egyptian pantheon of gods, made (O) by deviant artist TeniCola (O), which is fairly accurate:

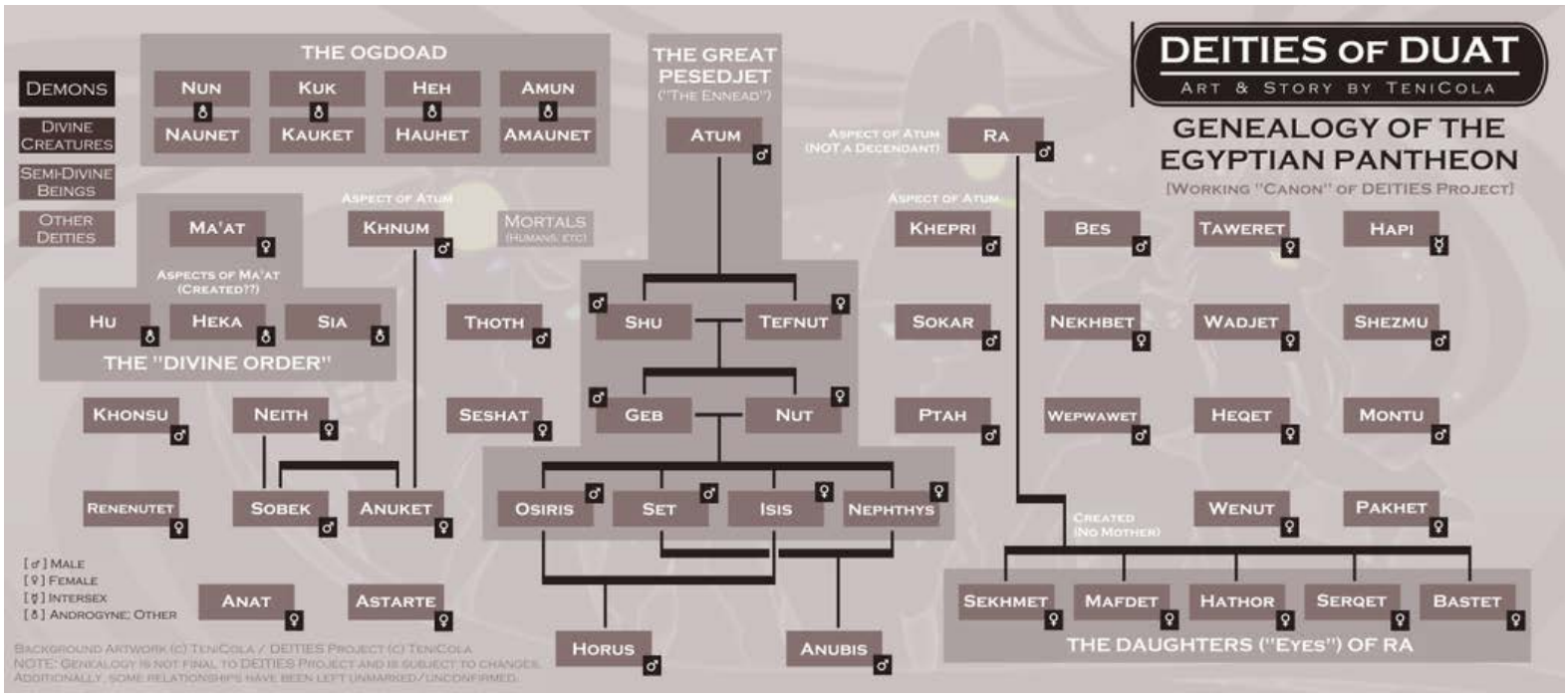

Here we see the Ogdoad, the oldest god family, shown next to the Ennead, or group of nine gods at Heliopolis. Budge, of note, comments that all god families or "pauts" were eight in number; the paut of Heliopolis became "nine" because they added on their local god Atum to the separate eight god paut (Shu and Tefnut, Geb and Nut, Osiris, Set, Isis and Nephthys). [2]

Hermopolis recension

In 2181 to 2061BC, or 7th to 11th dynasty (first intermediate period), during the so-called "Hermopolis recension", Hermopolis became the state capital of Egypt, according to which the Ogdoad became the supreme god or god power, so to say, of Egypt, and a synretism occurred in which the Ogdoad was said to have created Ra or Ra-Atum (Atum-Ra):

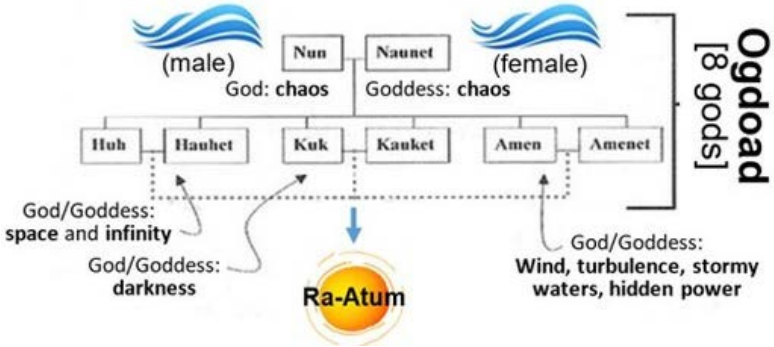

After which, Ra-Atum, in turn, was said to have created the Ennead.

Greek recension

In c.640BC, Hesiod used the Ogdoad model of chaos as the origin basis of his *Theogony* model of the origin of the Greek gods, similar to what Salon had done before him.

In 321BC, Epicurus, then aged 12, learned Hesiod's chaos origin of things, after which he interrogated his teacher with the query: 'Whence, then, came chaos?' The teacher could not answer. Epicurus began to philosophize on his own after this.

See also

- Ennead

References

1. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (Ogdoad, 5+ pgs). Source Books.
2. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (pgs. 282-83). Dover, 1969.

Further reading

- Anon. (2008). *National Geographic Essential Visual History of the World Mythology* (pg. #). National Geographic Society.

External links

- Ogdoad (Egyptian) – Wikipedia.

θΔics

In hmolscience, **oil and water**, as compared to "water and wine", refers to the observation that oil does not mix with water and to extrapolations and implications of this observed phenomena, in respect to general cosmological models, e.g. Empedoclean cosmology (450BC), Aristotelian cosmology (330BC), or Goethean cosmology (1809), with focus on this phenomena in respect to unmixability of certain humans, e.g. enemies, sects, or people who hate each other.

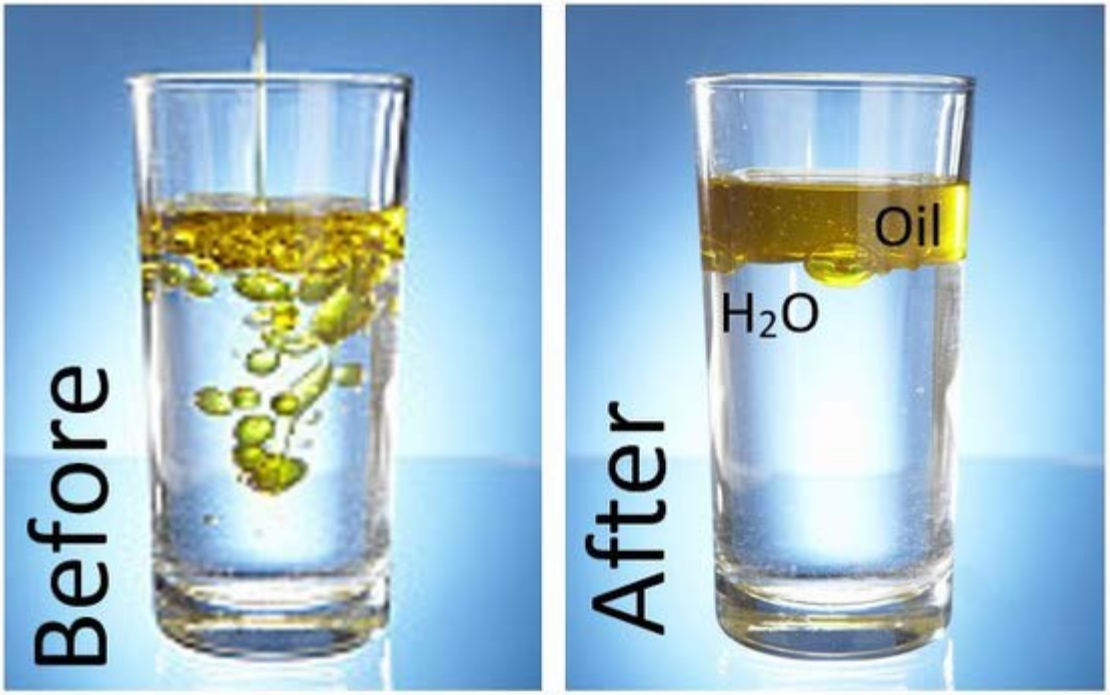

The observation that **oil and water** do not mix, as pointed out by Empedocles (450BC), has led to much philosophical discussion, e.g. Aristotle (330BC), Goethe (1809), Mimkes (2005), to name a few examples, particularly in respect to the observation that certain groups, faiths, or types of people do not mix.

Quotes

The following are example quotes:

"Empedocles, then, thinks that sense-perception and thinking occur thus; but from what he says one might wonder first of all how 'living things' differ from 'other things' with respect to sense-perception. For things fit into the pores of 'lifeless things' too; for in general he says that mixture occurs by a symmetry of pores. That is why **oil and water** do not mix [N1], but other fluids do, as indeed do other substances whose proper blends he lists. Consequently, everything will perceive and mixture, sense-perception, and growth will be the same process. For he makes them all [occur] by the symmetry of pores, unless he add some differentiating feature."

— Author (c.300BC), "Testimonia #12", in: *The Poem of Empedocles* (pg. 198) [1]

"[Empedocles] claimed that there is a mixture and blending of those things whose solid parts and pores (i.e. hollows and dense parts) are symmetrical; for example, water and wine. But he claimed that things in which they are asymmetrical are unmixed, for example **oil and water**. Fore he says that 'water is more easily fitted to wine, but with oil it does not want [to mix].' (89/91). He says this about every body and gives it as the cause of the sterility of mules."

— Philoponus (c.550), Commentary on Aristotle's *De Generatione Animalium* CIAG 14.3, 123.16-21; "CTXT-78" in: *The Poem of Empedocles* (pg. 133) [1]

"I am standing here in the name of the human reason common to us all, and in the name of that human reason, I repeat, it is not the question of 'Rome *and* Reason' The question is, and will ever be, 'Rome *or* Reason,' as long as Rome will not, like MacMahon, submit; as long as Rome will still try to subdue and enslave Reason; as long as the Roman Catholic Church will understand the issue of 'Rome and Reason' only in the sense in which **oil combines with water**—whatever the poor water may do the oil is always at the top. As long as the Roman Catholic Church claims to be the oil whence all the light comes, and that the poor water is only quenching that light, then there will be no question whatever to me, or to a great many others, that the ways of Rome are altogether other ways than the ways of Reason."

— S.H. Sonneschein (1878), “Review of Bishop Ryan’s Lecture on Catholicism” [3]

See also

- Goethe + Empedocles
- Gibbs, Goethe, and Empedocles
- Gibbs and Goethe
- Integration and segregation thermodynamics
- Racial thermodynamics | Racism thermodynamics

Notes

N1. A reference to 89/91.

References

1. Inwood, Brad. (2001). *The Poem of Empedocles: a Text and Translation with an Introduction* (oil and water, pg. 198). University of Toronto Press.
2. (a) Inwood, Brad. (2001). *The Poem of Empedocles: a Text and Translation with an Introduction* (oil and water, pg. 133). University of Toronto Press.
(b) John Philoponus – Wikipedia.
3. Sonneschein, S.H. (1978). “Review of Bishop Ryan’s Lecture on Catholicism”, in:*The Great Awakening on Temperance, and The Great Controversy, Romanism, Protestantism and Judaism: A Series of Lectures, Papers and Biographies from the Ablest Advocates of Temperance, and Prominent Clergymen of the Roman Catholic, Protestant and Jewish Churches* (§2:48-69; pg. 65). Anchor Publishing.

Further reading

- Smertenko, Clara. (1908). *On the Interpretation of Empedocles* (pg. 76). University of Chicago Press.
- Palmer, John. (2009). *Parmenides and Presocratic Philosophy* (pg. #). Oxford University Press.

θΔics

In human thermodynamics, **Povl Ole Fanger** (1934-2006), often cited as P.O. Fanger, was a Danish environmental engineer noted for his theories of thermal comfort and for his thermodynamics-based energy balances of human and human systems. [1]

Education

Fanger completed his MS in civil engineering in 1957 and his DSc in 1970s, both at the Technical University of Denmark. From 1959 to 2004, Fanger was a professor at the Technical University of Denmark, focused on research concerning indoor environmental factors related to the quality and comfort of indoor existence. [2] Intermittently, Fanger worked and taught at a few other universities, in selected years, such as Syracuse University.

References

1. Kutz, Myer. (2005). *Mechanical Engineers' Handbook: Energy and Power* ("skin-boundary diagram" (based on Fanger, 1970), pgs. 540-41). Wiley.
2. Povl Ole Fanger (curriculum vitae) - Technical University of Denmark.

Further reading

â— Fanger, P.O. (1970). *Thermal Comfort Analysis and Applications in Environmental Engineering.* McGraw-Hill.

External links

â— P. Ole Fanger – Wikipedia.

θΔics

In existographies, **Ole Romer** (1644-1710) (CR:4) (IQ:#|#), or "Roemer", was a Danish astronomer noted for []

Light

In 1665, Romer conjectured that anomalies in the apparent movement of Jupiter's moon Lo, which varied depending on location of the earth in respect to the sun, led to the conclusion that light had a finite speed; this is illustrated as follows:

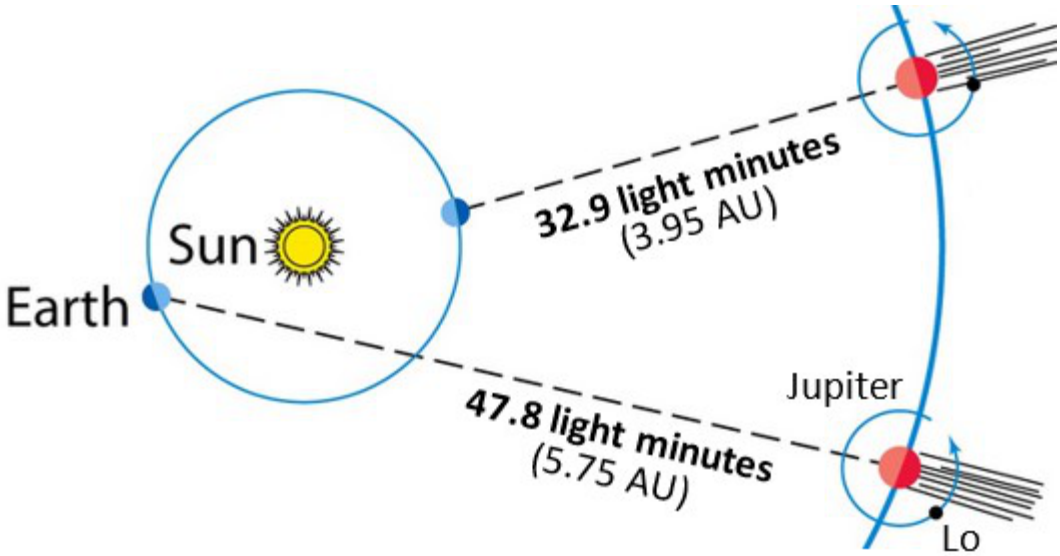

In 1676, Romer, based on this conjecture, estimated it took light 22 minutes to cross the diameter of the earth's orbit. (Ñº) This value was later combined, by Christiaan Huygens, with the value of the earth's orbit, to obtain an estimate of the speed of light of 220,000 km/s, which is fairly close to the modern value of 300 km/s.
Romer, in short, was the first to measure the finite velocity of light. [2] Romer's theory was accepted by Isaac Newton and Christiaan Huygens, but rejected by Robert Hooke.

Thermometer

In 1701, Romer made a thermometer in which he defined the lower fixed point to be the freezing point of water at precisely 7.5 degrees and the upper point as the boiling point of water at 60 degrees. [1]

Fahrenheit

In circa 1708, it is said that Polish physicist Daniel Fahrenheit learned of Romer's scale during a visit with him. [3] Fahrenheit commented in a retrospect letter to Dutch chemist Herman Boerhaave, that in about 1717 he had begun using an improved Romer scale, supposedly, by increasing the number of divisions by a factor of four, using different fixed points. Fahrenheit used the fixed points of 96 (instead of 22.5 or 90), the temperature of his wife's armpit, 32 the temperature of ice melting in water, and 0 the temperature of a bath of ice melting in a solution of common salt. This scale is now known commonly as the Fahrenheit temperature scale (ËšF), which found its finalized form by 1724.

Quotes | On

The following are quotes on Romer:

> "Hooke doubted the ingenious argument put forward by **Ole Romer** in 1675, that anomalies in the apparent movement of Jupiter's moons showed that light travelled with a finite, though unimaginably, rapid speed."
>
> — Stephen Inwood (2002), *The Man Who Knew Too Much* (pgs. 308-309)

References

1. Romer scale – Wikipedia.
2. Daintith, John. (2005). *Oxford Dictionary of Science.* Oxford University Press.
3. Whitfield, Peter. (1999). *Landmarks in Western Science* (pg. 179). Psychology Press.

External links

â— Ole Romer – Wikipedia.

θΔics

In existographies, **Oliver Heaviside** (1850-1925) (IQ:180|#129) (CR:19) was English electrical engineer, mathematician, and physicist, a characterized "forgotten genius" (Brillouin, 1970) noted for []

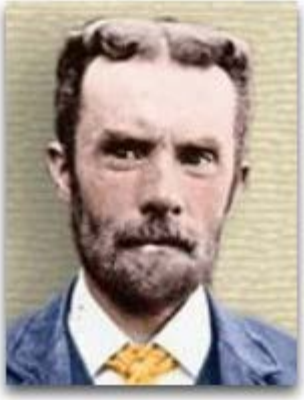

Entropy | Debate

See main: What is entropy debate?

In 1903, Planck, in commentary on English electrical instrument maker James Swinburne's articles, stated that: "Swinburne has written one of the best and clearest expositions of the subject that has ever been written, especially when he points out that nature never undertakes any change unless her interests are served by an increase in entropy." [1] This metaphysical-sounding statement caught the eye of English self-taught electrical engineer, mathematician and physicist Oliver Heaviside, and prompted a letter which tells us, explicitly, something about his thermodynamic ideas, and of energy: [2]

> "I should like to ask Professor Max Planck whether the view he expresses that 'nature never undertakes any change unless her interests are served by an increase of entropy' is to be taken with or without any particular reservation or with any special interpretation of 'her interests'. My thermodynamic ideas are somewhat old-fashioned—viz., that there is invariably a dissipation of energy or loss of availability of energy due to imperfect or total want of reversibility in natural processes. This entirely agrees in effect with the way of expressing things in terms of increase of 'entropy', although that subtle quantity is certainly 'ghostly' (see: ghostly quantity), and is somewhat too evasive to be regarded as a physical state even though it be a function of the physical state referred to a standard state. But the question is how the interests of nature are served by imperfect reversibility? Planck's words suggest a choice on nature's part, as if nature had any choice. Goethe said god himself could not alter the course of nature. That was truly scientific. Then, again, what are to be considered the interests of nature? Are we to take exactly things exactly as we find them, and define the interests in that way? If so, it carries us no further. Or is there a theorem of greatest entropy, showing how any variation from the proper course of nature would tend to reduce the rate of increase of the entropy?"

Planck replied promptly with a sharp rejection of Heaviside, at first dismissing the 'ghostly' business: [3]

> "Whether entropy has any **'ghostly'** attributes, is a question I will not open, but I am for the present quite content to know that it is a quantity which can be measured without ambiguity."

(add)

Maxwell's equations

In 1918, Heaviside wrote of his obsessive need to absorb Maxwell's writings: "I saw that it was great, greater and greatest, with prodigious possibilities in its power. I was determined to master the book and set to work … It took me several years before I could understand as much as I possibly could. Then I set Maxwell aside and followed my own course. And I progressed much more quickly"; the result of which, he was able to condense Maxwell's equations with 20 variables down to just two equations in two variables; he played a significant role in the Gibbs-Heaviside vector algebra method supplantment of the older less-congruous Hamilton-Tait quaternion method.

Education

Almost entirely a self-taught genius: although he went to school until age 16 and finished fifth among more than 500 candidates for a College of Preceptors Examination given in 1865, he had no formal education after this point.

Quotes | On

The following are quotes on Heaviside:

> "After writing the papers just discussed here, Carstoiu discovered a very extraordinary note of **Heaviside** (1893), where he suggests for gravitation a set of equations very similar to Maxwell's electromagnetic equations and Carstoiu's formulas. Heaviside shows that these equations require the introduction of a second field, analogous to the magnetic force; this is Carstoiu's vortex Ω. It is very strange that such an important paper had been practically ignored for so many years, but the reader may remember that Heaviside was the forgotten genius of physics, abandoned by everybody except a few faithful friends."
>
> — Leon Brillouin (1970), *Relativity Reexamined* [4]

References

1. Planck, Max. (1903). "Article", *The Electrician*, 50: 821, Mar 06.
2. Heaviside, Oliver. (1903). "Article", *The Electrician*, 50: 735, Feb 20.
3. Johnstone, James. (1914). *The Philosophy of Biology* (pg. 54). Cambridge: University Press.
4. Brillouin, Leon. (1970). *Relativity Reexamined* (pg. 103) (Ñº). Academic Press.

Further reading

â— Yavetz, Ido. (2011). *From Obscurity to Enigma: the Work of Oliver Heaviside, 1872-1889*. Springer.

External links

â— Oliver Heaviside – Wikipedia.

θΔics

In existographies, **Oliver Wendell Holmes Sr.** (1809-1894), not to be confused with his son, American jurist Oliver Wendell Holmes Jr. (1841-1935), was an American physician and poet, noted for []

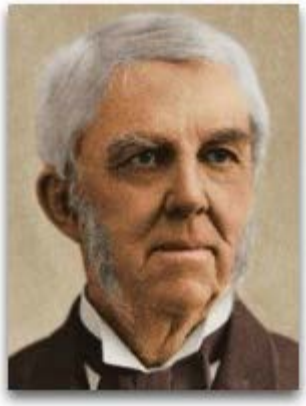

Quotes

The following are related quotes:

> "If one were told that many centuries ago a celestial ray shone into the body of a sleeping woman [see: virgin birth], as it seemed to her in her dream; that thereupon the advent of a wondrous child was predicted by the soothsayers; that angels appeared at this child's birth; that merchants came from afar, bearing gifts to him; that an ancient saint recognized the babe as divine, and fell at his feet and worshiped him; that in his eighth year the child confounded his teachers with the amount of his knowledge, still showing them due reverence; that he grew up full of compassionate tenderness to all that lived and suffered; that to help his fellow-creatures he sacrificed every worldly prospect and enjoyment; that he went through the ordeal of a terrible temptation, in which all the powers of evil were let loose upon him, and came out a conqueror over them all; that he preached holiness and practiced charity; that he gathered disciples and sent out apostles, who spread his doctrine over many lands and peoples; that this 'helper of the world' could claim a more than earthly lineage and a life that dated from long before Abraham was — of whom would he think this wonderful tale was told? Would he not say at once that this must be another version of the story of one who came upon our earth in a Syrian village during the reign of Augustus Caesar, and died by violence during the reign of Tiberius? What would he say if he were told that the narrative was between five and six centuries older than that of the founder of Christianity [Jesus]? Such is the story of this poem. Such is the date assigned to the personage [**Buddha**] of whom it is told."
>
> — Oliver Holmes (1879), "Introduction to Edwin Arnold's *The Light of Asia*"; cited by Alvin Kuhn (1963) and Tom Harpur (2004) [1]

> "The young man knows the rules, but the old man knows the exceptions."
>
> — Oliver Holmes (c.1882) (Ñº)

> "The mind of a bigot to the pupil of the eye; the more light you pour on it, the more it contracts."
>
> — Oliver Holmes (c.1882) (Ñº)

References

1. (a) Holmes, Oliver. (1879). "Introduction to Edwin Arnold's *The Light of Asia*", *International*; in: *Unity, Volumes 3-6* (pgs. 269-70). Publisher, 1879.
(b) Kuhn, Alvin B. (1963). *A Rebirth for Christianity* (pgs. 201-02). Quest Books, 2014.
(c) Harpur, Tom. (2004). *The Pagan Christ* (pgs. 31-32). Thomas Allan Publishers.

External links

â— Oliver Wendell Holmes Sr. – Wikipedia.

θΔics

In existographies, **Oliver Wendell Holmes Jr.** (1841-1935), not to be confused with his father, American physician and poet Oliver Wendell Holmes Sr. (1809-1894), was an American jurist noted for []

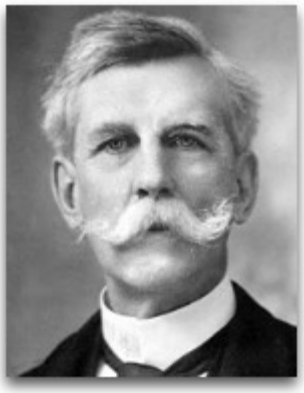

Quotes

The following are noted quotes:

> "If this universe is one universe, if it is so far thinkable that you can pass in reason from one part of it to another, it does not matter very much what that fact is. For every fact leads to every other by the path of the air. Only men do not yet see how, always. And your business as thinkers is to make plainer the way from some thing to the whole of things; to show the rational connection between your fact and the frame of the universe. If your subject is law, the roads are plain to anthropology, the science of man, to political economy, the theory of legislation, ethics, and thus by several paths to your final view of life. It would be equally true of any subject. The only difference is in the ease of seeing the way. To be master of any branch of knowledge, you must master those which lie next to it; and thus, to know anything — you must **know all**."
>
> — Oliver Holmes Jr. (1886), "The Profession of the Law" [1]

References

1. (a) Holmes, Oliver. (1886). "The Profession of the Law", Conclusion of a lecture Delivered to Undergraduates of Harvard University, Feb 17.
(b) Holmes, Oliver. (1943). *The Mind and Faith of Justice Holmes: His Speeches, Essays, Letters, and Judicial Opinions* (pgs. 32-33). Transaction Publishers.

External links

â— Oliver Wendell Holmes Jr. – Wikipedia.

θΔics

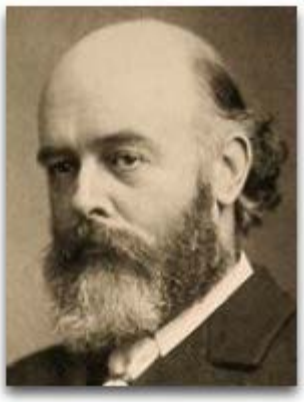

In existographies, **Oliver Lodge** (1851-1940) (GPE:111) (CR:11) was an English physicist, electrical engineer, and philosopher, noted for his involvement in the 1902-1904 "what is entropy debate", for at some point (Q) having performed laboratory experiments, with William Crookes, in attempts to provide evidence of survival of consciousness after physical death (reaction end), a belief deriving from his theory that some type of electromagnetic field like ether existed in which the spirit world was embedded, thus satisfying his spiritual Christian belief system.

Telegraphy

In c.1893, Lodge realized the possibility of using Hertzian waves for the transmission and reception of telegraphic messages.

In 1894, Lodge described a device which consisted of a receiver tuned to a proper resonance to collect waves, a detector, i.e. a relay to amplify the signals and a printer for recording dots and dashes. [4]

Lodge's device was later realized by Guglielmo Marconi (1896).

Length contraction

Lodge is credited by Lorentz, supposedly, with the first published description of the length contraction hypothesis, in 1893; though in fact Lodge's friend George Francis FitzGerald had first suggested the idea in print in 1889.

Overview

In 1905, Lodge, in his *Life and Matter: a Criticism of Professor Haeckel's Riddle of the Universe*, attempted to do battle with Ernst Haeckel and his Goethe-based monism; one semi-cited section of which is as follows:

> "To every force there is an equal opposite force or reaction, and a reaction may be against a live body, but it is never suspected of being against the abstraction, life or mind—that would indeed be enlarging the scope of mechanics!—the reaction is always against some other body. All stresses, as a matter of fact, occur in the ether; and they all have a material terminus at each end (or, in exceptional cases, a wave-front or some other recondite ethereal equivalent); that is to say, something possessing inertia; but the timed or *opportune* existence of a particular stress may be the result of organization and control. Mechanical operations can be thus dominated by intelligence and purpose. When a stone is rolling over a cliff, it is all the same to "energy" whether it fall on point A or point B of the beach. But at A it shall merely dent the sand, whereas at B it shall strike a detonator and explode a mine. Scribbling on a piece of paper results in a certain distribution of fluid and production of a modicum of heat: so far as energy is concerned it is the same whether we sign Andrew Carnegie or Alexander Coppersmith, yet the one effort may land us in twelve months' imprisonment or may build a library, according to circumstances, while the other achieves no result at all. John Mill used to say that our sole power over nature was to *move* things; but, strictly speaking, we cannot do even that: we can only arrange that things shall move each other, and can determine by suitably preconceived plans the kind and direction of the motion that shall ensue at a given time and place, provided always that we include in this category of "things " our undoubtedly material bodies, muscles, and nerves.
>
> But here is just the puzzle: at what point does will or determination enter into the scheme? Contemplate a brain-cell, whence originates a certain nerve-process whereby energy is liberated with some resultant effect; what pulled the detent in that cell which started the impulse? No doubt some chemical process: combination or dissociation, something atomic, occurred; but what made it occur just then and in that way?
>
> I answer, Not anything that we as yet understand, but apparently the same sort of prearrangement that determined whether the stone from the cliff should fall on point A or point B; the same sort of process that guided the pen to make legible and effective writing instead of illegible and ineffective scrawls; the same kind of control that determines when and where a trigger shall be pulled so as to secure the anticipated slaughter of a bird. So far as energy is concerned, the explosion and the trigger-pulling are the same

> identical operations, whether the aim be exact or random. It is intelligence which directs; it is physical energy which is directed and controlled and produces the result in time and space."

American political entropy theorist Randall Schweller (2014), citing the above quote, attempted to spin it off in the following manner: [3]

> "Lodge, here, explained why mechanical operations and physical energy must be guided by purposive intelligence to perform useful work. It is of no consequence to the 'energy', he points out, whether the stone rolling over a cliff falls on point A or point B of a beach. If purposive intelligence to direct available energy is required for useful work, then it follows that entropy increases in the absence of such guidance. This is the general intuition that things tend to go to pot unless someone intervenes; that willful intelligence circumvents the natural tendency for disorder to increase in the world."

This, of course, is anthropomorphically imbecilic.

In 1930, Lodge, in his *Beyond Physics*, penned the following emergent property argument, which he employed as follows: [2]

> "It is proved that neither an atom of hydrogen nor an atom of oxygen has any of the properties of water. The separate atoms acquire those properties in combination. Hence a molecule has properties denied to an atom, and so also an organized assemblage of a large number of molecules; and if the molecular compounds are sufficiently complicated and sufficiently numerous so as to be organized into a portion of protoplasm, then further properties makes it appearance."

Here, Lodge seems to be alluding to the premise that life (and or spirit) is an emergent property found in or past the protoplasm level of molecular complexity.

Quotes | By

The following are other noted quotes:

> "That is where I part company with Professor James Ward in the second volume of *Naturalism and Agnosticism;* with whom, nevertheless, on many broad issues I find myself in fair agreement. Those who find a real antinomy between 'mechanism and morals' must either throw overboard the possibility of interference or guidance or willed action altogether, which is one alternative, or must assume that the laws of physics are only approximate and untrustworthy, which is the other alternative—the alternative apparently favoured by Professor James Ward. I wish to argue that neither of these alternatives is necessary, and that there is a third or middle course of proverbial safety: all that is necessary is to realise and admit that the laws of physical science are *incomplete*, when regarded as a formulation and philosophical summary of the universe in general. No Laplacian calculator can be supplied with all the data."
>
> — Oliver Lodge (1905), *Life and Matter* (pg. 143)

References

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2. (a) Lodge, Oliver. (1930). *Beyond Physics: or The Idealization of Mechanism* (properties of water, pgs. 150-51). G. Allen & Unwin.

(b) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory*. Arnold-Howard Publishing Co.
(c) Spiritualism (section) – Wikipedia.
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External links

- Oliver Lodge – Wikipedia.

θΔics

In human thermodynamics, **Oliver Reiser** (1895-1974) was an American philosopher noted for his 1935 book *Philosophy and Conceptions of Modern Science*, in which he comments that he plans to carry the work of American chemist Edwin Slosson, in applying the second law of thermodynamics to the study of human history, “a step forward”. In this book, Reiser also devoted a section to the social energetics, i.e. those who brought physical chemistry methods to bear on social problems, such as Wilhelm Ostwald, Henry Adams, and Thomas Carver [1]

In 1940, Reiser helped to introduce the subject of "scientific humanism" in his book *The Promise of Scientific Humanism*, in which he discusses, for instance, how the behavior of living matter, as defined by the laws of thermodynamics, compares to molecular behavior. [4]

Pareto's human molecules

See main: Human molecule

In commentary on Italian engineer Vilfredo Pareto’s conception of human society as a system of molecules undergoing various combinations in space and time, stated that ‘some critics might like to raise the question of how it is that if we, as individuals, corresponding to the molecules of a gas we can know anything of the total state’. He argues that, ‘as constituents of a statistical ensemble we see what happens within the system, but only a *super-observer* could note from without those changing combinations which constitute the cultural patterns’. He concludes, ‘the impossibility of such a human super-observer would seem to place a limitation upon the possibility of a science based on such assumption.’ [1] Here Reiser uses the term 'super-observer' as a synonym for what American chemical engineer Libb Thims classified as the advanced intelligence perspective mode of viewing humanity. [2]

Education

Reiser was a professor of philosophy at the University of Pittsburgh for fifty years and was said to have been a friend of Albert Einstein. [3]

Other

His other works include the 1958 *Integration of Human Knowledge* and the 1966 *Cosmic Humanism*, a theory of the eight-dimensional cosmos based on integrative principles from science, religion, and art, the latter of which he is best-known for.

Quotes

The following are noted quotes:

> “The problem of the origin of life is one of the oldest enigmas with which the human mind has been concerned; and yet it is a problem which is ever-recurring, seemingly as insurgent as life itself.”
>
> — Oliver Reiser (1940), “Life as a Form of Chemical Behavior” [4]

References

1. Reiser, Oliver L. (1935). *Philosophy and Conceptions of Modern Science* (Slosson, pg. 240; Pareto, pg. 225). MacMillan.
2. Thims, Libb. (2008). *The Human Molecule* (pg. 41). Morrisville, NC: LuLu.
3. Smith, Robert. (date). “Oliver L. Reiser”, EarthPortals.com.
4. Reiser, Oliver L. (1940). *The Promise of Scientific Humanism: Toward a Unification of Scientific, Religious, Social, and Economic Thought* (thermodynamics, 6+ pgs; origin of life, pg. 159). Oskar Piest.

Further reading

â— Reiser, Oliver L. (1973). “Cosmic Humanism and World Unity”, *World Union Journal*, Pondicherry, India, Sep.

19.

θΔics

In information thermodynamics, **Olivier Beauregard** (1911-2007) was a French theoretical physicist, having had a general interest in the relationship between mind and matter, and noted for his 1963 book *The Second Principle of Time*, in which he attempts to reconcile reversible time of relativity, and irreversible time of consciousness and thermodynamics, using the information theory ideas of Leo Szilard and Leon Brillouin. [1] In short, he seems to equate negative entropy (neguentropy) with information and speculates on how acquisitions of information in the mind consumes negative entropy, but also how the mind can generate negative entropy, thus increasing organization. [2] Beauregard also co-wrote a 1972 article defending the thermodynamics interpretation of information with Myron Tribus. [3]

Education

Costa de Beauregard's 1943 PhD dissertation was on the electron theory of Paul Dirac. [4]

References

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2. Rosnay, Joel. (1975). *The Macroscope: a New World Scientific System* (pgs. 164-67). Harper & Row Publishers (1979 Eng. Trans.).
3. Costa de Beauregard, Olivier and Tribus, Myron. (1972). "Information Theory and Thermodynamics", in *Maxwell's Demon 2* (pgs. 137-145) by Harvey S. Leff and Andrew F. Rex, CRC Press, 2003.
4. Olivier Costa de Beauregard – MetaPsychique.org (French → English).

Further reading

● Costa de Beauregard, Olivier (1970). "(reporter): *Discussion on Temporal Asymmetry in Thermodynamics and Cosmology*, in *Proceedings of the International Conference on Thermodynamics*, held in Cardiff, edited by P.T. Landsberg. London: Butterworths.

● Costa de Beauregard, Olivier. (1970). *Is there a Paradox in the Theory of Time Anistorpy*, in *A Critical Review of Thermodynamics*, edited by E.B. Stuart, B. Gal-Or and A.J. Brainard. Baltimore: Mono Book Corps, pgs. 463-72; see also: Studium Generale, *54*, 10 (1971).

● Lestienne, Remy and Neher, E.C. (1998). *The Creative Power of Chance* (section: Mental Information as an "Entropy Saver", pg. 109-101). University of Illinois Press.

External links

● Olivier Costa de Beauregard – Wikipedia (French → English).

θΔics

In intellectual groups, **Olympia Academy** was a 1902 study group formed by German born American physicist Albert Einstein and Rumanian college student Maurice Solovine (1875-1958), others joining shortly, wherein they read list of great works during the course of which they would meet up weekly to the discuss the great questions of the day in modern science and philosophy.

Conrad Habicht, Maurice Solovine, and Albert Einstein, *circa* 1902-1903, at one of their Olympia Academy meetings, during which time they read Karl Pearson's 1900 *The Grammar of Science*, with its superluminal Filon-Pearson demon note. [2]

Overview

In 1895, sixteen year old Albert Einstein had contemplated the following, as he would later write: [1]

> "Such a principle [relativity] resulted from a paradox upon which I had already hit at the age of sixteen: If I pursue a beam of light with a velocity c (velocity of light in a vacuum), I should observe such a beam of light … at rest. However, there seems to be no such thing, whether on the basis of experience or according to Maxwell's equations."

In 1902, Einstein, having recently graduated (1900) from the Ecole Polytechnique of Zurich, with a degree in mathematical physics, and working for a minimal wage at the Berne Patent Office, put an ad in the paper offering to teach physics as a private tutor at so much an hour. Shortly thereafter, Rumanian college student Maurice Solovine (1875-1958), who was studying a mixture of subjects at Berne University, including literature, philosophy, Greek, mathematics, and geology, became Einstein's first tutor pupil. The two men struck up a close relationship and Einstein was to say to Solovine a few days after meeting him:

> "It is not necessary to give you lessons in physics, the discussion about the problems which we face in physics today is much more interesting; simply come to me when you wish, I am pleased to be able to talk to you."

On the third visit, Solovine suggested that they should read some of the standard works and discuss the problems they presented. Einstein then proposed they start with Karl Pearson's 1900 *The Grammar of Science*.

This was followed by John Mill's *A System of Logic*, David Hume's *Treatise on Human Nature*, Benedict Spinoza's *Ethics*, Ernst Mach's *Analysis of Sensations*, Henri Poincare's *Science and Hypothesis*, the work of Bernhard Riemann, whose non-Euclidean geometry was utilized in Einstein's development of his 1916 general theory of relativity, along with literary works, such as Miguel de Cervantes's *Don Quixote*. At some point along the line, Conrad Habicht (1876-1958), Einstein's old friend from Zurich, who had recently arrived in Bern to continue his mathematical studies, joined the study group. [3] The three formed a weekly discussion group that eventually came to be known as the Olympia Academy.

Further details of the group's reading and discussion list is detailed by Galina Weinstein. [4]

References

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2. Maurice Solovine – Wikipedia.
3. Clark, Ronald W. (1984). *Einstein: the Life and Times* (pgs. 78-79). Harper Collins.

4. Weinstein, Galina. (c.2015). “Albert Einstein: Close Friends and Colleagues from the Patent Office” (pg. 12) (pdf), AriXiv.org.

External links

â— Olympia Academy – Wikipedia.

θΔics

In existographies, **Omar Khayyam** (1048-1131) (IQ:165|#529) [RGM:443|1,500+] (HD:1) (FA:18) (CR:11) was a Persian philosopher, mathematician, astronomer and nonbeliever, known, according Christopher Hitchens (2007), as a skeptic, whose poetry satirized the claims and practices of religion; an seeming "Persian Voltaire" so to say. [1]

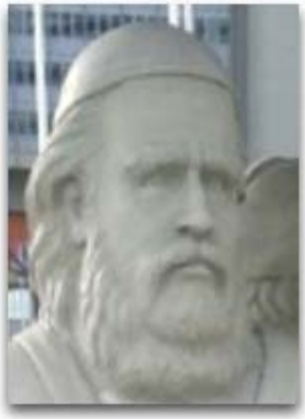

Education

Khayyam taught the philosophy of Avicenna for decades in Nishapur, where he was born and buried.

Influenced

Khayyam influenced: Jorge Borges, George Scott, and Christopher Hitchens.

Quotes | On

The following are quotes on Khayyam:

> "**Khayyam** is an atheist, but knows how to interpret in orthodox style the most difficult passages of the Koran; for every educated man is a theologian and faith is not a requisite."
>
> — Jorge Borges (c.1960), *Selected Non-Fictions* (Q)

> "It's not a coincidence that **Omar Khayyam**, rebuking and ridiculing the stone-faced Iranian mullahs of his time, pointed to the value of the grape as a mockery of their joyless and sterile regime. Visiting today's Iran, I was delighted to find that citizens made a point of defying the clerical ban on booze, keeping it in their homes for visitors even if they didn't particularly take to it themselves, and bootlegging it with great brio and ingenuity. These small revolutions affirm the human."
>
> — Christopher Hitchens (2010), *Hitch-22: a Memoir* (Q)

Quotes | By

The following are noted quotes:

> "The Koran! Well, come put me to the test; lovely old book in hideous error drest. Believe me, I can quote the Koran too; the unbeliever knows his Koran best. And do you think that unto such as you, a maggot-minded, starved, fanatic crew, god gave the secret, and denied it me? Well, well, what matters it! Believe that too."
>
> — Omar Khayyam (c.1120), a statement of disbelief in Islam (Q)

> "If instead of studying religion, men would have devoted to develop mathematics, e.g. algebra. If logic of science would have occupied the place of Sufism, faith and superstition. Religion that divides human beings would have replaced humanism."
>
> — Omar Khayyam (c.1120) (Q)

> "Oh threats of Hell and hopes of Paradise! One thing at least is certain: this life flies. One thing is certain

and the rest is lies. The flower that once has blown forever dies.”

— Omar Khayyam (c.1120) (Q)

“Impotent pieces in the game He plays
Upon this checkerboard of nights and days,
Hither and thither moves, and checks, and slays,
And one by one back in the closet lays.

— Omar Khayyam (c.1120), cited (Q) by Clarence Darrow (1924)

References

1. Hitchens, Christopher. (2007). *The Portable Atheist: Essential Readings for the Nonbeliever* (§2: Rubaiyat: a Paraphrase from Several Literal Translations by Richard Le Gallienne, gps. 7-12; quote, pg. 7). Da Capo.

External links

- Omar Khayyam – Wikipedia.

θΔics

In religious thermodynamics, **omega point** is a hypothetical point in future time in which human minds would unite in a type of universal consciousness. The theory was conceived in circa 1938 by French religiosity philosopher Pierre Teilhard. The following circa 1950 quote by Teilhard alludes to the idea of omega point: [1]

> "It is a mistake to look for the extension of our being or of the noosphere in the impersonal. The future universe could not be anything else but the hyper-personal at the **omega point**."

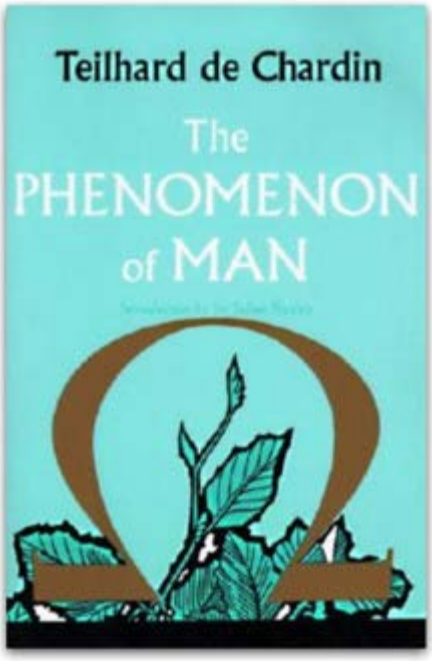

Cover of the 1955 book *The Phenomenon of Man* with the omega symbol Ω shown prominently on the cover.

The theory was conceived based on mixture of evolution, second law tendencies, and religious eschatology. The basic position of Teilhard, supposedly, was that the earth will die as result of entropy; the omega point, therefore, must somehow be autonomous from this effect. [2] In 1994, American physicist Frank Tipler used Teilhard's omega point theory in his negentropic promise of immortality, based on some type of future computer. [3]

The Exorcist

The inspiration behind the character of Father Merrin, in the best seller 1971 book *The Exorcist*, was Pierre Teilhard; and parts of the plot were themed on Teilhard's theory of evil (or the existence of Satan) in the world possibly being Lucifer [or matter-energy spirit] working out his [or its] salvation through the process of physical evolution ending in Teilhard's omega point.

References

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2. McCarty, Doran. (1976). *Teilhard de Chardin* (pg. 97). Word Books.
3. (a) Tipler, Frank J. (1994). *The Physics of Immortality: Modern Cosmology, God and the Resurrection of the Dead* (second law, pgs. 67, 72-73, 90, 94, 135, 295, 297, 441-42, 461-63, 476-78). Anchor Books.
(b) Ansell-Pearson. (1997). *Viroid Life* (pg. 167). Routledge.

External links

â— Omega point – Wikipedia.

θΔics

In famous publications, **"On a Universal Tendency in Nature to the Dissipation of Mechanical Energy"** is a short 1852 paper by Irish physicist William Thomson, which functioned to introduce the terms energy and dissipation to the general public and to establish the colloquial view that in the future the second principle of the dynamical theory of heat suggests that the mechanism of the universe will run down, where the gears will stop moving due to energy loss or dissipation, and the world will eventually be uninhabitable for humankind. [1]

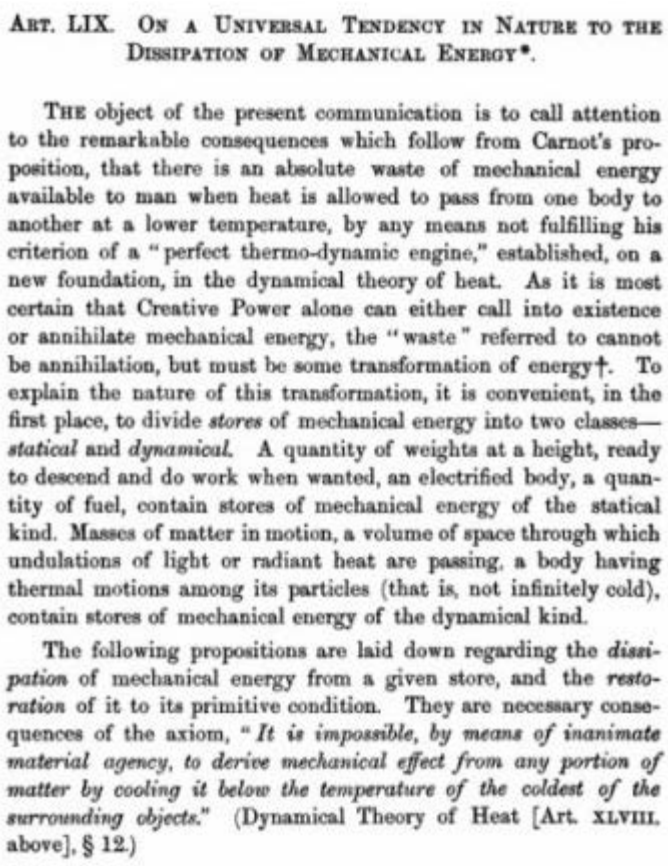

ART. LIX. ON A UNIVERSAL TENDENCY IN NATURE TO THE DISSIPATION OF MECHANICAL ENERGY*.

THE object of the present communication is to call attention to the remarkable consequences which follow from Carnot's proposition, that there is an absolute waste of mechanical energy available to man when heat is allowed to pass from one body to another at a lower temperature, by any means not fulfilling his criterion of a "perfect thermo-dynamic engine," established, on a new foundation, in the dynamical theory of heat. As it is most certain that Creative Power alone can either call into existence or annihilate mechanical energy, the "waste" referred to cannot be annihilation, but must be some transformation of energy†. To explain the nature of this transformation, it is convenient, in the first place, to divide *stores* of mechanical energy into two classes—*statical* and *dynamical*. A quantity of weights at a height, ready to descend and do work when wanted, an electrified body, a quantity of fuel, contain stores of mechanical energy of the statical kind. Masses of matter in motion, a volume of space through which undulations of light or radiant heat are passing, a body having thermal motions among its particles (that is, not infinitely cold), contain stores of mechanical energy of the dynamical kind.

The following propositions are laid down regarding the *dissipation* of mechanical energy from a given store, and the *restoration* of it to its primitive condition. They are necessary consequences of the axiom, "*It is impossible, by means of inanimate material agency, to derive mechanical effect from any portion of matter by cooling it below the temperature of the coldest of the surrounding objects.*" (Dynamical Theory of Heat [Art. XLVIII. above], § 12.)

Title page of William Thomson's **"On a Universal Tendency"** from *Mathematical and Physical Papers.*

Overview

The following noted quote is a view that eventually became synonymous with heat death: [2]

> "Within a finite period of time past, the earth must have been, and within a finite period of time to come the earth must again be, unfit for the habitation of man as at presented constituted, unless operations have been, or are to be performed, which are impossible under laws to which the known operations going on at present in the material world are subject."

This paper is often the considered as the softer verbal description of German physicist Rudolf Clausius' more dense mathematical description of the second law. In fact, what has been termed the law of dissipation originated in "On a Universal Tendency", and it is colloquially assumed that the second law is simply a mathematical statement of the law of dissipation. American historian Henry Adams used Thomson's "On a Universal Tendency" paper as his key second law reference in his famous *A Letter to American Teachers of History* to argue that society, history, and evolution are subject to the laws of thermodynamics. He states: [3]

> "The second law of thermodynamics was briefly stated by Thomson in **"On a Universal Tendency in Nature to the Dissipation of Mechanical Energy"**, published in October, 1852, which is now as classic as Kepler's or Newton's Laws."

This has come to be known as the Kelvin statement of the second law of thermodynamics. [4] This enunciation had previously been stated in the form of a question by Thomson in his 1851 paper "On the Dynamical Theory of Heat": [4]

> "It is possible to continually get work by abstracting heat from a body till all its heat is removed? Is it possible to get work by cooling a body below the temperature of the medium in which it exists: I believe we may consider a negative answer as axiomatic. Then we deduce the proposition that μ [Carnot's coefficient] is the same for all substances at a given temperature."

(add discussion)

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(b) Lindberg, David C., Porter, Roy, Nye Mary J., Numbers, Ronald L, and Ross, Dorothy. (2003). *The Cambridge History of Science: the Modern Physical and Mathematical Sciences* (pg. 300). Cambridge University Press.
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(b) Smith, Crosbie and Wise, M. Norton. (1989). *Energy and Empire: a Biographical Study of Lord Kelvin* (pg. 329). Cambridge University Press.

External links

â— On a Universal Tendency – Zapatopi.net.

θΔics

In famous publications, "**On an Absolute Thermometric Scale** founded on Carnot's Theory of the Motive Power of Heat, and Calculated from Regnault's Observations" is an 1848 article by English physicist William Thomson that introduced the absolute temperature scale a thermodynamic temperature scale starting at absolute zero degrees of temperature. [1] In the articles, Thomson derived the SI Kelvin temperature scale based on French physicist Sadi Carnot's 1824 theory that the efficiency of any heat engine, i.e. the working ability any physical body whatsoever, depends only on the difference between the hot and cold reservoirs acting on the working body, in corroboration with 1847 experimental measurements of French chemist-physicist Henri Regnault. [2]

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ART. XXXIX. ON AN ABSOLUTE THERMOMETRIC SCALE FOUNDED ON CARNOT'S THEORY OF THE MOTIVE POWER OF HEAT*, AND CALCULATED FROM REGNAULT'S OBSERVATIONS†.

THE determination of temperature has long been recognized as a problem of the greatest importance in physical science. It has accordingly been made a subject of most careful attention, and, especially in late years, of very elaborate and refined experimental researches‡; and we are thus at present in possession of as complete a practical solution of the problem as can be desired, even for the most accurate investigations. The theory of thermometry is however as yet far from being in so satisfactory a state. The principle to be followed in constructing a thermometric scale might at first sight seem to be obvious, as it might appear that a perfect thermometer would indicate equal additions of heat, as corresponding to equal elevations of temperature, estimated by the numbered divisions of its scale. It is however now recognized (from the variations in the specific heats of bodies) as an experimentally demonstrated fact that thermometry under this condition is impossible,

* Published in 1824 in a work entitled *Réflexions sur la Puissance Motrice du Feu*, by M. S. Carnot. Having never met with the original work, it is only through a paper by M. Clapeyron, on the same subject, published in the *Journal de l'École Polytechnique*, Vol. XIV. 1834, and translated in the first volume of Taylor's *Scientific Memoirs*, that the Author has become acquainted with Carnot's Theory.—W. T. [Note of Nov. 5th, 1881. A few months later through the kindness of my late colleague Prof. Lewis Gordon, I received a copy of Carnot's original work and was thus enabled to give to the Royal Society of Edinburgh my "Account of Carnot's theory" which is reprinted as Art. XLI. below. The original work has since been republished, with a biographical notice, Paris, 1878.]

† An account of the first part of a series of researches undertaken by M. Regnault by order of the French Government, for ascertaining the various physical data of importance in the Theory of the Steam Engine, is just published in the *Mémoires de l'Institut*, of which it constitutes the twenty-first volume (1847). The second part of the researches has not yet been published. [Note of Nov. 5, 1881. The continuation of these researches has now been published: thus we have for the whole series, Vol. I. in 1847; Vol. II. in 1862; and Vol. III. in 1870.]

‡ A very important section of Regnault's work is devoted to this object.

External links

â— Barus, Carl, Randall, Wyatt W., and Ames, Joseph S. (1898). *Laws of Gases: The Free Expansion of Gases: Memoirs by Gay-Lussac, Joule, and Thomson* (edited by Joseph S. Ames) (section IV: On an Absolute Thermometric Scale, pgs. 73-). Harper & Brothers Publishers.
â— On an Absolute Thermometric Scale – Zapatopi.net.

θΔics

In famous publications, **"On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings"** is a 1929 article by Hungarian-born American physicist Leo Szilard in which he described an information type Maxwell's demon (Szilard demon), i.e. one that has a sort of "memory faculty, where measurements occur, that might cause a decrease of entropy", version of the famous paradox, by attempting to calculate the amount of entropy generated as the demon collects information storing it in his memory. The opening of the paper gives the following goal: [1]

> "The objective of the investigation is to find the conditions which apparently allow the construction of a perpetual motion machine of the second kind, if one permits an intelligent being to intervene in a thermodynamic system."

This was, supposedly, the first publication to make a theoretical connection of entropy to information. The term "Szilard's demon", seems to have arisen in the decades to follow. [4]

ON THE DECREASE OF ENTROPY IN A THERMODYNAMIC SYSTEM BY THE INTERVENTION OF INTELLIGENT BEINGS

LEO SZILARD

Translated by Anatol Rapoport and Mechthilde Knoller from the original article "Über die Entropieverminderung in einem thermodynamischen System bei Eingriffen intelligenter Wesen." Zeitschrift für Physik, 1929, 53, 840–856.

The objective of the investigation is to find the conditions which apparently allow the construction of a perpetual-motion machine of the second kind, if one permits an intelligent being to intervene in a thermodynamic system. When such beings make measurements, they make the system behave in a manner distinctly different from the way a mechanical system behaves when left to itself. We show that it is a sort of a memory faculty, manifested by a system where measurements occur, that might cause a permanent decrease of entropy and thus a violation of the Second Law of Thermodynamics, were it not for the fact that the measurements themselves are necessarily accompanied by a production of entropy. At first we calculate this production of entropy quite generally from the postulate that full compensation is made in the sense of the Second Law (Equation [1]). Second, by using an inanimate device able to make measurements—however under continual entropy production—we shall calculate the resulting quantity of entropy. We find that it is exactly as great as is necessary for full compensation. The actual production of entropy in connection with the measurement, therefore, need not be greater than Equation (1) requires.

THERE is an objection, already historical, against the universal validity of the Second Law of Thermodynamics, which indeed looks rather ominous. The objection is embodied in the notion of Maxwell's demon, who in a different form appears even nowadays again and again; perhaps not unreasonably, inasmuch as behind the precisely formulated question quantitative connections seem to be hidden which to date have not been clarified. The objection in its original formulation concerns a demon who catches the fast molecules and lets the slow ones pass. To be sure, the objection can be met with the reply that man cannot in principle foresee the value of a thermally fluctuating parameter. However, one cannot deny that we can very well measure the value of such a fluctuating parameter and therefore could certainly gain energy at the expense of heat by arranging our interven-

Information theory

Szilard's ideas or rather calculations of the entropy production occurring when the demon collects information about the speeds of the moving particles in the system, storing the data in his demon memory, found its way famously into the hands of American electrical engineer Claude Shannon in the mid 1940s, via Szilard's good friend John Neumann, who advised Shannon to information in telegraph and telephone wires (current and voltage highs or lows) by the name entropy, which he ended up doing (to the consternation of modern thermodynamicists). [2]

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(b) English translation of "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings" by Anatol Rapoport and Mechthilde Knoller in *Maxwell's Demon 2* (pgs. 110-19) by Harvey Leff and Andrew Rex.
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θΔics

In famous publications, **"On the Dynamical Theory of Heat**, with Numerical Results Deduced from Mr Joule's Equivalent of a Thermal Unit, and M. Regnault's Observations on Steam" is a March 1851 paper by Irish physicist William Thomson that gave what has come to be known as the Thomson-statement of the second law of thermodynamics. [1] This statement is: [2]

> "Is it possible to continually get work by abstracting heat from a body till all its heat is removed? Is it possible to get work by cooling a body below the temperature of the medium in which it exists: I believe we may consider a negative answer as axiomatic. Then we deduce the proposition that μ [Carnot's coefficient] is the same for all substances at a given temperature."

This was restated again, albeit in simpler terms, in Thomson's famous 1852 paper "On a Universal Tendency in Nature to the Dissipation of Mechanical Energy."

ART. XLVIII. ON THE DYNAMICAL THEORY OF HEAT, WITH NUMERICAL RESULTS DEDUCED FROM MR JOULE'S EQUIVALENT OF A THERMAL UNIT, AND M. REGNAULT'S OBSERVATIONS ON STEAM.

[*Transactions of the Royal Society of Edinburgh*, March, 1851, *and Phil. Mag.* IV. 1852.]

Introductory Notice.

1. SIR HUMPHRY DAVY, by his experiment of melting two pieces of ice by rubbing them together, established the following proposition:—"The phenomena of repulsion are not dependent on a peculiar elastic fluid for their existence, or caloric does not exist." And he concludes that heat consists of a motion excited among the particles of bodies. "To distinguish this motion from others, and to signify the cause of our sensation of heat," and of the expansion or expansive pressure produced in matter by heat, "the name *repulsive* motion has been adopted *."

2. The dynamical theory of heat, thus established by Sir Humphry Davy, is extended to radiant heat by the discovery of phenomena, especially those of the polarization of radiant heat, which render it excessively probable that heat propagated through "vacant space," or through diathermanic substances, consists of waves of transverse vibrations in an all-pervading medium.

* From Davy's first work, entitled *An Essay on Heat, Light, and the Combinations of Light*, published in 1799, in "Contributions to Physical and Medical Knowledge, principally from the West of England, collected by Thomas Beddoes, M.D.," and republished in Dr Davy's edition of his brother's collected works, Vol. II. Lond. 1836.

Title page of William Thomson's **"On the Dynamical Theory of Heat"** from *Mathematical and Physical Papers.*

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External links

â— On the Dynamical Theory of Heat (Kelvin papers) – Zapatopi.net.

θΔics

In famous publications, **"On the Equilibrium of Heterogeneous Substances"** is a 300-page, 160,000-word, 700-equation treatise, published in parts between October 1875 and July 1878, by American mathematical engineer Willard Gibbs, which investigated the mathematical results derivable when one considers the energy ε and entropy η of any material system in the various states of which it is capable. [1]

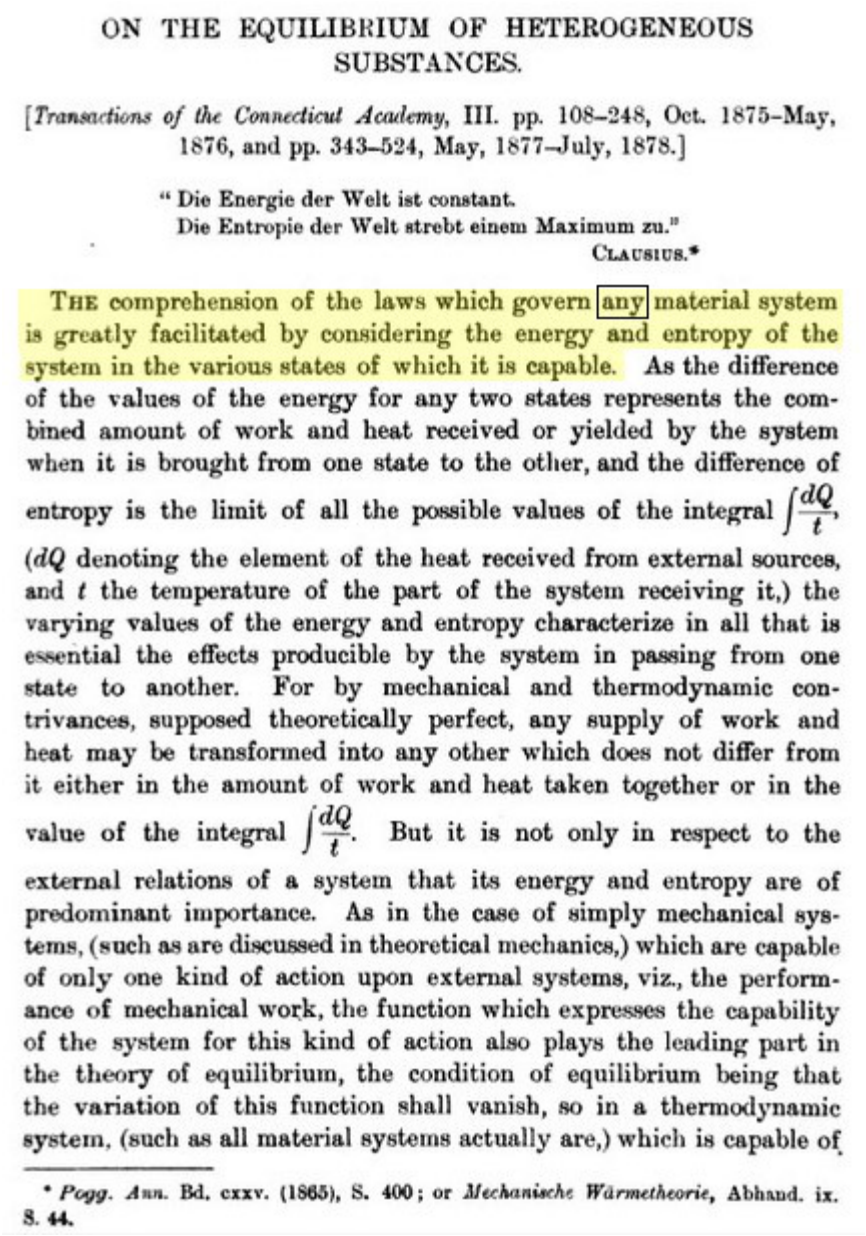

ON THE EQUILIBRIUM OF HETEROGENEOUS SUBSTANCES.

[*Transactions of the Connecticut Academy*, III. pp. 108–248, Oct. 1875–May, 1876, and pp. 343–524, May, 1877–July, 1878.]

"Die Energie der Welt ist constant.
Die Entropie der Welt strebt einem Maximum zu."
CLAUSIUS.*

THE comprehension of the laws which govern any material system is greatly facilitated by considering the energy and entropy of the system in the various states of which it is capable. As the difference of the values of the energy for any two states represents the combined amount of work and heat received or yielded by the system when it is brought from one state to the other, and the difference of entropy is the limit of all the possible values of the integral $\int \frac{dQ}{t}$, (dQ denoting the element of the heat received from external sources, and t the temperature of the part of the system receiving it,) the varying values of the energy and entropy characterize in all that is essential the effects producible by the system in passing from one state to another. For by mechanical and thermodynamic contrivances, supposed theoretically perfect, any supply of work and heat may be transformed into any other which does not differ from it either in the amount of work and heat taken together or in the value of the integral $\int \frac{dQ}{t}$. But it is not only in respect to the external relations of a system that its energy and entropy are of predominant importance. As in the case of simply mechanical systems, (such as are discussed in theoretical mechanics,) which are capable of only one kind of action upon external systems, viz., the performance of mechanical work, the function which expresses the capability of the system for this kind of action also plays the leading part in the theory of equilibrium, the condition of equilibrium being that the variation of this function shall vanish, so in a thermodynamic system, (such as all material systems actually are,) which is capable of

* *Pogg. Ann.* Bd. cxxv. (1865), S. 400; or *Mechanische Wärmetheorie*, Abhand. ix. S. 44.

Overview

In commentary on his *Equilibrium* paper, Gibbs stated that: [15]

> "[I had no] sense of the value of time, of my own or others, when I wrote it."

Gibbs' *Equilibrium* is generally considered to have laid out the main foundations for the science of chemical thermodynamics. Gibbs' *Equilibrium*, together with German physicist Rudolf Clausius' 1865 *Mechanical Theory of Heat*, upon which Gibbs' memoir was built, totaling 1,158-equations, went on to stimulate the founding of the various "schools of thermodynamics". Gibbs' *Equilibrium* (rank #89) has been described as one of the top 111 books that shaped western civilization. [14]

Hidden treasures

In 1891, Gibbs' *Equilibrium* was translated into German, by German chemist Wilhelm Ostwald, and in 1899 into French by French chemist Henry Le Chatelier. [7] It has frequently been mentioned that Ostwald undertook the task of translation because he believed there were hidden treasures in it. In the preface to his *Thermodynamische Studien, von J. Willard Gibbs* (1892), Ostwald states: [17]

> "The material of the work is still of direct importance at the moment, and the interest in it is not historical. For only a small part of the almost immeasurable results which are contained and suggested here have as yet been realized. There are still hidden treasures of the greatest variety and importance here for the theoretical and most of all for the experimental worker."

At the turn of the 19th century, French thermodynamicist Pierre Duhem, likewise, commented on how Johannes van der Waals, was the first to see its hidden power, to perceive the phase rule, "among the algebraic formulas where Gibbs had to some extent hidden it." [18]

In 1989, thermodynamics historian Carlo Cercignani commented how "Gibbs succinct and abstract style and unwillingness to include examples and applications to particular experimental situations made his work very difficult to read. Famous scientists such as Helmholtz and Planck developed their own thermodynamic methods in an independent

fashion and remained quite unaware of the treasures buried in the third volume of *Transactions of the Connecticut Academy of Arts and Sciences*." [19] Likewise, in 2007, German thermodynamics historian Ingo Muller comments on this further: [20]

> "Ostwald, the German translator of Gibbs, had said that he undertook the task because he believed in hidden treasures in Gibbs' work. He was right, and le Chatelier and later Haber and Bergius were chemists who uncovered and lifted the treasures as did Roozeboom."

The fruition of some of these treasures coming to bear is evidenced in the 1949 summary that "the work of Ostwald, of Haber, of [Carl] Bosch and [Friedrich] Bergius, each of whom received a Nobel prize, was based directly on the application of Gibbs' concepts; indeed, the very first Nobel prize in chemistry went to a follower (van't Hoff). [21]

As to the difficultly faced by Ostwald, or for that matter anyone in search of these so-called hidden treasures said to be found in Gibbs 700-equations, Ostwald expressed it best: [17]

> "One cannot help deny that the study of these researches offers inner difficulties. Actuated by a wish for the greatest possible universality and plainness of expression, Gibbs has chosen a mode of presentation which calls for an unusual attentiveness and devotion on the part of the reader, owing to the abstractness of the form and the difficult presentation."

One of the most obvious of these presentation difficulties is that Gibbs scripted his 700-equations using Greek symbols, a likely adoption of those used in 1869 by French engineer Francois Massieu, albeit difficult to follow.

Pre-History

The thermodynamical problem of the equilibrium of heterogeneous substances, according to James Maxwell, was first attacked by German physicist Gustav Kirchhoff in 1855, who studied the properties of mixtures of sulphuric acid with water, and the density of the vapor in equilibrium with the mixture. Kirchhoff's method, according to Maxwell, was then employed by German mathematical physicist Carl Neumann in his 1875 *Lectures on the Mechanical Theory of Heat*. Neither, however, according to Maxwell, used the methods of both the intrinsic energy and the entropy of the substance, as did Gibbs. [22]

Overview

The beginnings of Gibbs' *Equilibrium* treatise trace to two 1873 papers in the Transactions of the Connecticut Academy on "Graphical Methods in the Thermodynamics of Fluids," and "Method of Geometrical Representation of the Thermodynamic Properties of Substances by means of Surfaces." [4] In December 1875, German physicist Rudolf Clausius had cited Gibbs use of the term "isentropic" in his *Graphical Methods.* [11]

Scottish physicist James Maxwell was one of the first to recognize the significance of the work and to promote it, beginning in 1873, in various publications at and around Cambridge. [6] In a 29 July 1876 letter to Peter Tait, for instance, Maxwell says: [16]

> "Have you Willard Gibbs on ***Equilibrium of Heterogeneous Substances***. If not read him. Refreshing after H. Spencer on the *Instability of the Homogenous*."

In December of 1878, Gibbs published an 18-page abstract to the *Equilibrium* in the *American Journal of Science.* [8] In shortened overview, according to Gibbs' biographer Lynde Wheeler, in the *Equilibrium* Gibbs starts with the first and second laws of thermodynamics as defined by Clausius, giving a rigorous derivation of the general mathematical conditions of equilibrium and stability to which they lead. He then proceeds to methodically discuss the necessary

modifications of the prime equation (combined law of thermodynamics) and the particular forms the equilibrium conditions take on when there is brought into picture: [13]

> (a) the presence of matter of different kinds of states.
>
> (b) the presence of gravitational forces.
> (c) the effects of a state of strain in the solids which may be present.
> (d) the effects of surface tensions in the bounding surfaces between various portions.
> (e) the effects of electrical forces.

The central feature gained from Gibbs' treatises, according to Dutch physical chemist Johannes van der Waals, winner of the 1910 Nobel Prize for the development of an equation of state for gases and liquids, which Gibbs had sent him shortly after their publication, was the principle that: "for a given amount of substance, equilibrium sets in if the free energy is minimum for the temperature and pressure." [2]

Gibbs' *Equilibrium* was later digested and disseminated in simpler format by those as Gilbert Lewis and Merle Randall in 1923, James Partington in 1924, and Edward Guggenheim in 1933. [9] According to Partington, for instance, who seems to be referring to Lewis and Randall: [12]

"It is particularly the countrymen of Willard Gibbs who have in recent years contributed most effectively to chemical thermodynamics."

In particular, it was the Lewis school of thermodynamics that progressed the work of Gibbs to its fullest extent.

Tributes

Gibbs's *Equilibrium* paper has been described as "the *Principia* of thermodynamics". [3] Similarly, according to 1973 views of American physicist Robert Lindsay: [5]

> "In the hands of Willard Gibbs, thermodynamics became a powerful tool for the study of chemical reactions ... his famous memoir *On the Equilibrium of Heterogeneous Substances* formed a large part of the basis of physical chemistry and thus led to the establishment on a firm scientific basis of what has come to called chemical engineering."

In modern commentary, Gibbs' *Equilibrium* is still considered one of the most important yet near-impenetrable works in core thermodynamics. In 1999, for instance, Japanese physicist David Bottomley commented that:

> "Very few experts in thermodynamics have the ability to read this from cover-to-cover."

and that "anyone who hopes to make advances in the fundamental theory or interpretation of thermodynamics (assuming, contrary to current dogma, that such advances can be made) needs to read the majority of this book". [10]

See also

â— Gibbsian thermodynamics

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External links

â— On the Equilibrium of Heterogeneous Substances – Wikipedia.
â— On the Equilibrium of Heterogeneous Substances – Britannica.

θΔics

In famous publications, **"On the Law of Distribution of Energy in the Normal Spectrum"** is a 1901 publication by German physicist Max Planck in which he launched the science of quantum mechanics, by conceiving of the idea that the energy of bodies (specifically a black body cavity radiator) can be partitioned into unit elements (energy elements), later to be called 'quanta' or quantum units of energy, divided by Planck constant based partitions, based on Austrian physicist Ludwig Boltzmann's earlier 1872 ideas, as found in his article "Further Studies on the Thermal Equilibrium of Gas Molecules", on how entropy can be partitioned, logarithmically, as the numbers of states of arrangements of a given body of ideal gas. [1]

Planck, supposedly, viewed or modeled, in his mind, the body of a cavity radiator (or its energy of radiation) as a volume of gas, and on this model solved the ultraviolet catastrophe, by applied Boltzmann's 1872 H-theorem version of entropy, in the form of S = k log W, to black body radiation, and thus situated the principle of elementary disorder.

Planck's constant

The 1901 paper, supposedly, is based on Planck's earlier 1900 paper "On the Theory of the Law of Energy Distribution in the Normal Spectrum", in which he famously stated: [2]

> "If E is considered to be a continuously divisible quantity, this distribution is possible in infinitely many ways. We consider, however—this is the most essential point of the whole calculation—E to be composed of a well-defined number of equal parts and use thereto the constant of nature h = 6.55x10E-27 erg sec. This constant multiplied by the common frequency ν of the resonators gives us the energy element ε in erg, and dividing E by ε we get the number P of energy elements which must be divided over the N resonators."

On the Law of Distribution of Energy in the Normal Spectrum

Max Planck

Annalen der Physik vol.4, p.553 ff (1901)

The recent spectral measurements made by O. Lummer and E. Pringsheim[1], and even more notable those by H. Rubens and F. Kurlbaum[2], which together confirmed an earlier result obtained by H. Beckmann,[3] show that the law of energy distribution in the normal spectrum, first derived by W. Wien from molecular-kinetic considerations and later by me from the theory of electromagnetic radiation, is not valid generally.

In any case the theory requires a correction, and I shall attempt in the following to accomplish this on the basis of the theory of electromagnetic radiation which I developed. For this purpose it will be necessary first to find in the set of conditions leading to Wien's energy distribution law that term which can be changed; thereafter it will be a matter of removing this term from the set and making an appropriate substitution for it.

In my last article[4] I showed that the physical foundations of the electromagnetic radiation theory, including the hypothesis of "natural radiation," withstand the most severe criticism; and since to my knowledge there are no errors in the calculations, the principle persists that the law of energy distribution in the normal spectrum is completely determined when one succeeds in calculating the entropy S of an irradiated, monochromatic, vibrating resonator as a function of its vibrational energy U. Since one then obtains, from the relationship $dS/dU = 1/q$, the dependence of the energy U on the temperature q, and since the energy is also related to the density of radiation at the corresponding frequency by a simple relation,[5] one also obtains the dependence of this density of radiation on the temperature. The normal energy distribution is then the one in which the radiation densities of all different frequencies have the same temperature.

Consequently, the entire problem is reduced to determining S as a function of U, and it is to this task that the most essential part of the following analysis is devoted. In my first treatment of this subject I had expressed S, by definition, as a simple function of U without further foundation, and I was satisfied to show that this from of entropy meets all the requirements imposed on it by thermodynamics. At that time I believed that this was the only possible expression and that consequently Wein's law, which follows from it, necessarily had general validity. In a later, closer analysis,[6] however, it appeared to me that

German physicist Max Planck's 1901 article "On the Law of Distribution of Energy in the Normal Spectrum", in which he situates quantum mechanics based on entropy. [1]

(add disucssion_

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θΔics

In famous publications, **"On the Mechanical Equivalent of Heat"** was an 1845 paper by English physicist James Joule in which he presented the results that when the temperature of a pound of water is increased by one degree Fahrenheit that an amount of vis viva (kinetic energy) is communicated to the water equal to mechanical work expended by a weight of 890 pounds falling one foot, a value now known as the mechanical equivalent of heat. [1]

In the following years, Joule expanded on his work, via more precise experiments, and published the definitive form of his "On the Mechanical Equivalent of Heat", in nineteen pages, in the transactions of the *Philosophical Society of London*. [2]

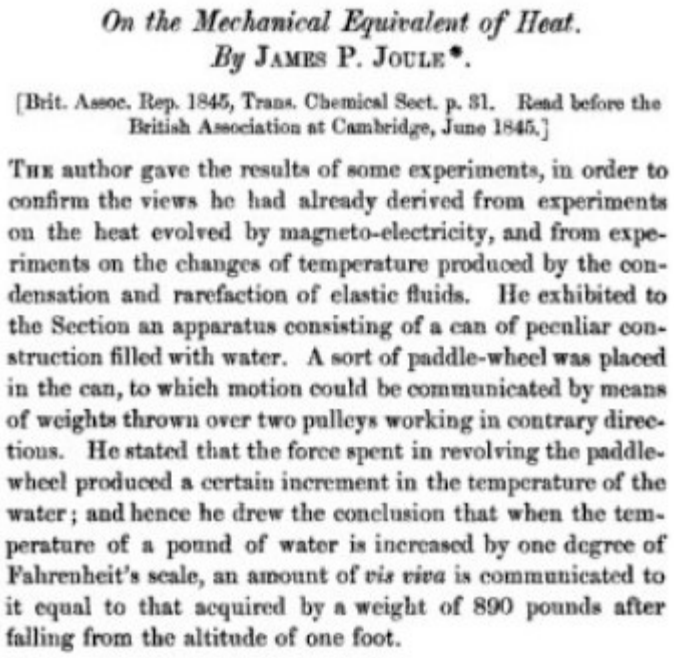

On the Mechanical Equivalent of Heat.
By James P. Joule*.

[Brit. Assoc. Rep. 1845, Trans. Chemical Sect. p. 31. Read before the British Association at Cambridge, June 1845.]

The author gave the results of some experiments, in order to confirm the views he had already derived from experiments on the heat evolved by magneto-electricity, and from experiments on the changes of temperature produced by the condensation and rarefaction of elastic fluids. He exhibited to the Section an apparatus consisting of a can of peculiar construction filled with water. A sort of paddle-wheel was placed in the can, to which motion could be communicated by means of weights thrown over two pulleys working in contrary directions. He stated that the force spent in revolving the paddle-wheel produced a certain increment in the temperature of the water; and hence he drew the conclusion that when the temperature of a pound of water is increased by one degree of Fahrenheit's scale, an amount of *vis viva* is communicated to it equal to that acquired by a weight of 890 pounds after falling from the altitude of one foot.

Cover page of the 1845 article **"On the Mechanical Equivalent of Heat"** by English physicist James Joule.

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2. (a) Joule, James P. (1847). "On the Mechanical Equivalent of Heat: as Determined by the Heat evolved by the Friction of Fluids." *Phil. Mag. Vol. 31*, pg. 173-78. Read before the Mathematical and Physical Section of the British Association at Oxford, June.
(b) Joule, James P. (1850). "On the Mechanical Equivalent of Heat." *Philosophical Transactions of the Royal Society of London*, 140: 61-82.

Further reading

â— Smith, Crosbie W. (1976). "Faraday as Referee of Joule's Royal Society Paper: 'On the Mechanical Equivalent of Heat'." *Isis*, 67: 444-449.

External links

â— On the Mechanical Equivalent of Heat (historical) – Encyclopedia of Earth.

θΔics

In famous publications, “**On the Moving Force of Heat and the Laws of Heat which may be Deduced Therefrom**” is an 1850 article, first communicated to the Academy of Berlin in February, written by German physicist Rudolf Clausius in which he set out to reconcile inconsistencies in French physicist Sadi Carnot’s 1824 publication *Reflections on the Motive Power of Fire*, related to his use of the caloric theory in modelling changes or transformations involved in the arrangement of the particles of the working substance of the heat engine during a forward expansion and reverse contraction engine cycle. [1]

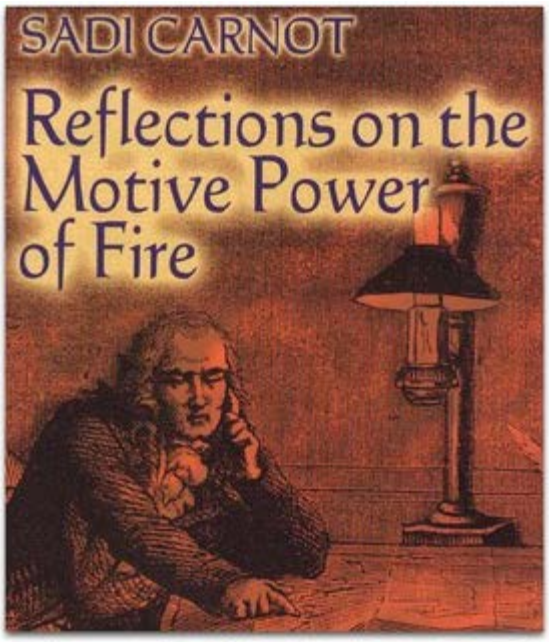

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V. *Ueber die bewegende Kraft der Wärme und die Gesetze, welche sich daraus für die Wärmelehre selbst ableiten lassen; von R. Clausius.*

Seit man mit Hülfe der Dampfmaschinen die Wärme als bewegende Kraft benutzt, und dadurch practisch darauf hingewiesen hat, eine gewisse Arbeitsgröfse als Aequivalent für die dazu nöthige Wärme zu betrachten, lag es nahe, auch theoretisch eine bestimmte Beziehung zwischen einer Wärmemenge und der durch sie möglicher Weise hervorzubringenden Arbeit vorauszusetzen, und diese Beziehung zu benutzen, um aus ihr Schlüsse über das Wesen und die Gesetze der Wärme selbst abzuleiten. Es sind auch in der That schon einige erfolgreiche Versuche der Art gemacht; doch glaube ich, dafs der Gegenstand damit noch nicht erschöpft ist, sondern die fortgesetzte Beschtung der Physiker verdient, indem sich theils gegen die bisher gezogenen Schlüsse noch erhebliche Einwendungen machen lassen, theils andere Schlüsse, zu welchen sich Gelegenheit bietet, und welche zur Begründung und Vervollständigung der Wärmetheorie wesentlich beitragen können, entweder noch ganz unerwähnt geblieben, oder doch noch nicht mit hinlänglicher Bestimmtheit ausgesprochen sind.

Die wichtigste hierher gehörige Untersuchung rührt von S. Carnot her [1]) und die Ideen dieses Autors sind später noch auf eine sehr geschickte Weise von Clapeyron *analytisch* dargestellt [2]). Carnot weist nach, dafs jederzeit, wenn Arbeit durch Wärme geleistet wird, und nicht zugleich eine blei-

To the left, the cover to the 1988 Eric Mendoza collected works set of the three big Carnot-Clapeyron-Clausius papers (1824:1834:1850), the latter of which, shown right, according to Willard Gibbs, marks the foundational start of thermodynamics as a science.

Overview

In dissection of the title, the term "moving force" or motive power, refers to movement of a body per unit time, by the action of heat, according to the premise of Boerhaave’s law, and the laws to be deduced, refer to the first main principle and second main principle.

This 1850 article by Clausius, according to American engineer Willard Gibbs, “marks an epoch in the history of physics”, moreover: [2]

> “If we say, in the words of Maxwell some years ago (1878), that thermodynamics is ‘a science with secure foundations, clear definitions, and distinct boundaries,’ and ask when those foundations were laid, those definitions fixed, and those boundaries traced, there can be but one answer. Certainly not before the publication of **that memoir**.”

In short, the publication of this article marks the beginning of the science of thermodynamics.

The article was to become the first of nine memoirs making up Clausius' 1865 textbook *The Mechanical Theory of Heat*. [3]

References

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(b) Translated in: the *Philosophical Magazine*, July 1851, Vol. ii, pgs, 1, 102.
(c) Clausius, R. (1850), "Über die bewegende Kraft der Wärme, Part I, Part II", *Annalen der Physik* 79: 368–397, 500–524. See English Translation: "On the Moving Force of Heat, and the Law regarding the Nature of Heat itself which are Deducible Therefrom". *Phil. Mag*. (1851), 2, 1–21, 102–119.
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θΔics

In famous publications, **"On the Nature of the Motion which we call Heat"** or "Über die Art der Bewegung die wir Wärme nennen" is an 1857 article by German physicist Rudolf Clausius that gave a kinetic explanation of heat, by explaining the translational, rotational, and vibrational motions of gas particles; later leading to the development of the Maxwell-Boltzmann distribution and the H-theorem. [1] The essential accomplishment of the paper was that it showed how to relate the pressure and temperature of volume of gas to the motion of the atoms in a quantitative manner by deducing the average speed of molecules.

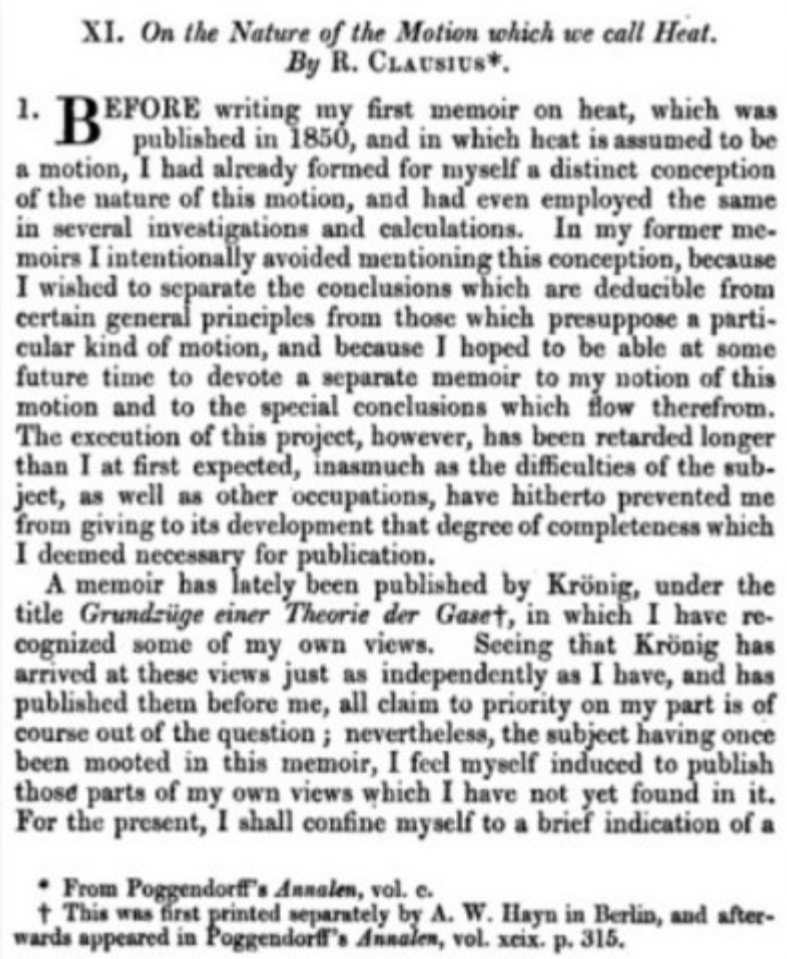

XI. *On the Nature of the Motion which we call Heat.* *By* R. Clausius*.

1. BEFORE writing my first memoir on heat, which was published in 1850, and in which heat is assumed to be a motion, I had already formed for myself a distinct conception of the nature of this motion, and had even employed the same in several investigations and calculations. In my former memoirs I intentionally avoided mentioning this conception, because I wished to separate the conclusions which are deducible from certain general principles from those which presuppose a particular kind of motion, and because I hoped to be able at some future time to devote a separate memoir to my notion of this motion and to the special conclusions which flow therefrom. The execution of this project, however, has been retarded longer than I at first expected, inasmuch as the difficulties of the subject, as well as other occupations, have hitherto prevented me from giving to its development that degree of completeness which I deemed necessary for publication.

A memoir has lately been published by Krönig, under the title *Grundzüge einer Theorie der Gase*†, in which I have recognized some of my own views. Seeing that Krönig has arrived at these views just as independently as I have, and has published them before me, all claim to priority on my part is of course out of the question; nevertheless, the subject having once been mooted in this memoir, I feel myself induced to publish those parts of my own views which I have not yet found in it. For the present, I shall confine myself to a brief indication of a

* From Poggendorff's *Annalen*, vol. c.

† This was first printed separately by A. W. Hayn in Berlin, and afterwards appeared in Poggendorff's *Annalen*, vol. xcix. p. 315.

Title page of German physicist Rudolf Clausius' 1857 "On the Nature of the Motion which we call Heat" which launched both kinetic theory and statistical mechanics.

Dining room anecdote

See main: Thermodynamics anecdotes

In this paper, Clausius supposedly deduced the average speed of particles to be moving in the neighborhood of 300 to 1,000 meters per second (modern values often cite 500-meters per second or 1,200-mph). This calculation drew a quick response from Dutch meteorologist Christoph Ballot who argued that if he were seated in a long dining room and the butler brought in dinner, it would be some moments before the smell of the food would reach his nose. [5] A response to this objection by Clausius resulted in the development of the concept of themean free path. [6]

History

In 1856, a year prior to Clausius' paper, German chemist and physicist August Kronig published his "A General Theory of Gases", which outlined a simple gas-kinetic model that considered the translational motion of the particles. [3] This paper seems to have spurred Clausius into his publication, as Clausius comments that in Kronig's paper he recognizes some of his own views.

In 1860, Irish physicist James Maxwell published his "Illustrations on the Dynamical Theory of Gases", an elaboration of Clausius' paper, taking into account not only the average speeds of particles, but a graph of the distribution of speeds of the particles at any given temperature. In 1868, Austrian physicist Ludwig Boltzmann published a more convincing physical explanation of the formula Maxwell had derived. Boltzmann would go on to initiate statistical mechanics, by furthering his work in this same area [2].

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2. Lindley, David. (2001). *Boltzmann's Atom: the Great Debate that Launched a Revolution in Physics* (pgs. 17-18). The Free Press.
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4. Lindley, David. (2001). *Boltzmann's Atom: the Great Debate that Launched a Revolution in Physics* (pgs. 24-25). The Free Press.
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6. Clausius, Rudolf. (1859) [1858]. "On the Mean length of the Paths described by the Separate Molecules of Gaseous

Bodies on the Occurrence of the Molecular Motion: together with some other remarks upon the mechanical theory of heat", *Phil. Mag.* 17:81-91.

Further reading

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θΔics

In famous publications, ***On the Nature of Things*** (*De rerum natura*), or "On the Nature of the Universe", is a *circa* 60BC six part book, written in poem-style, by Greek philosopher Lucretius, which outlined the basics of the atomic theory, as developed earlier by Leucippus, Democritus, and Epicurus in which the universe, and humans, are comprised of and worked by the operation of atoms and voids.

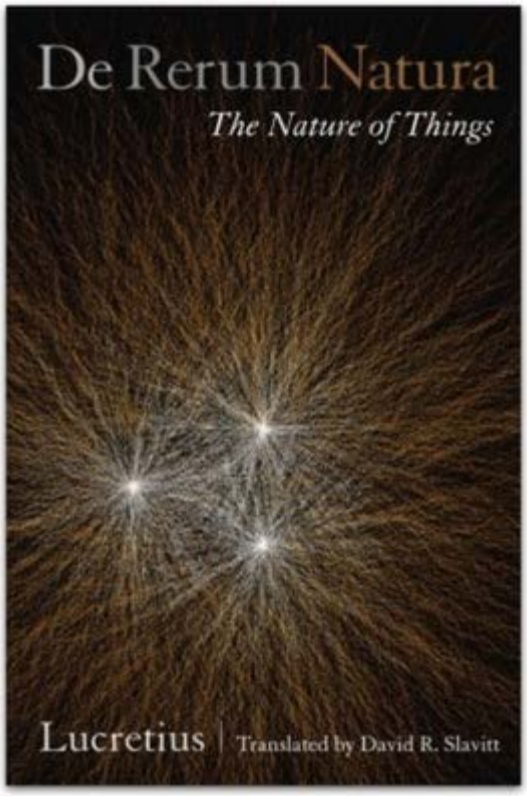

2008 translation of ***De Rerum Natura***, by David Slavitt, described as "Lucretius's majestic elaboration of Greek Epicurean physics and psychology in an epic that unfolds over the course of six books. This sumptuous account of a secular cosmos argues that the soul is mortal, that pleasure is the object of life, and that humanity has free will." [3]

Overview

In circa 60BC, Greek philosopher Lucretius (99-55BC) published the multi-millennium famous *On the Nature of Things*, wherein he gives a physical science based explanation of all "things", such as the mind and the soul, cold, heat, free will, love, sex, the stars, the motion of the moon and the sun, etc.; the following is an abstract: (Ñº)

> "***De rerum natura*** (*On the Nature of Things*) is an unusual poem as to its content. The Roman poet Lucretius (94(?)-55 BC) wrote it to convince his audience that man need not fear the whims of the Gods or punishment in the hereafter, because the universe is governed by mechanical laws.
>
> It is therefore not surprising that his work was hardly ever read in the Middle Ages. Characteristically, the text was copied at least twice in the first half of the 9th century, when all things from Antiquity were collected as fully as possible. The two manuscripts that have come down to us from that period are now both kept in Leiden, where for the sake of distinction they have been named after their dimensions the codex quadratus (the square manuscript) and the codex oblongus (the rectangular manuscript)."

Lucretius was a student of the work of Epicurus, outlined the basics of atomic theory in his lengthy poem *De Rerum Natura* (*On the Nature of Things*), chapter two on 'movement and shapes of atoms'. [10] On heat in relation to atoms, Lucretius states: [2]

> "Clothes hung above a surf-swept shore grow damp; spread in the sun they dry again.
> Yet it is not apparent to us how the moisture clings to the cloth, or flees the heat. Water, then, is dispersed in particles, atoms too small to be observed."

On atomic volition he comments:

> "For surely the atoms did not hold council, assigning order to each, flexing their keen minds with questions of place and motion and who goes where. But shuffled and jumbled in many ways, in the course of endless time they are buffeted, driven along, chancing upon all motions, combinations. At last they fall into such an arrangement as would create this universe."

This talk of the absence of atomic volition, to note, is similar in context to the earlier circa 450 BC human chemistry views of Greek philosopher Empedocles, who famous stated that people related tend to mix like water and wine; whereas enemies mix or rather separate like oil and water.

The following are two selections of Lucretius from the 1947 three-volume set of prolegomena, text, translation, and commentary by Cyril Bailey. [7]

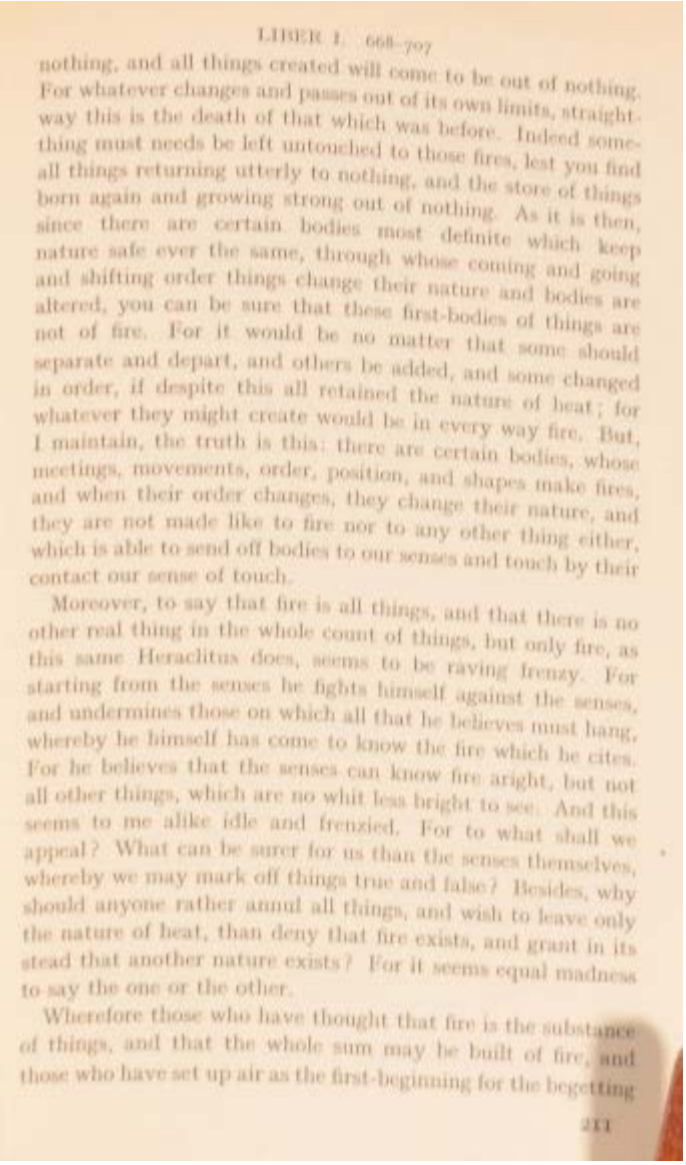

LIBER I. 668–707

nothing, and all things created will come to be out of nothing. For whatever changes and passes out of its own limits, straightway this is the death of that which was before. Indeed something must needs be left untouched to those fires, lest you find all things returning utterly to nothing, and the store of things born again and growing strong out of nothing. As it is then, since there are certain bodies most definite which keep nature safe ever the same, through whose coming and going and shifting order things change their nature and bodies are altered, you can be sure that these first-bodies of things are not of fire. For it would be no matter that some should separate and depart, and others be added, and some changed in order, if despite this all retained the nature of heat; for whatever they might create would be in every way fire. But, I maintain, the truth is this: there are certain bodies, whose meetings, movements, order, position, and shapes make fires, and when their order changes, they change their nature, and they are not made like to fire nor to any other thing either, which is able to send off bodies to our senses and touch by their contact our sense of touch.

Moreover, to say that fire is all things, and that there is no other real thing in the whole count of things, but only fire, as this same Heraclitus does, seems to be raving frenzy. For starting from the senses he fights himself against the senses, and undermines those on which all that he believes must hang, whereby he himself has come to know the fire which he cites. For he believes that the senses can know fire aright, but not all other things, which are no whit less bright to see. And this seems to me alike idle and frenzied. For to what shall we appeal? What can be surer for us than the senses themselves, whereby we may mark off things true and false? Besides, why should anyone rather annul all things, and wish to leave only the nature of heat, than deny that fire exists, and grant in its stead that another nature exists? For it seems equal madness to say the one or the other.

Wherefore those who have thought that fire is the substance of things, and that the whole sum may be built of fire, and those who have set up air as the first-beginning for the begetting

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Lucretius on the origin of "being" of all "things" out of nothing; and on the "raving frenzy" idea of Heraclitus that "fire is all things".

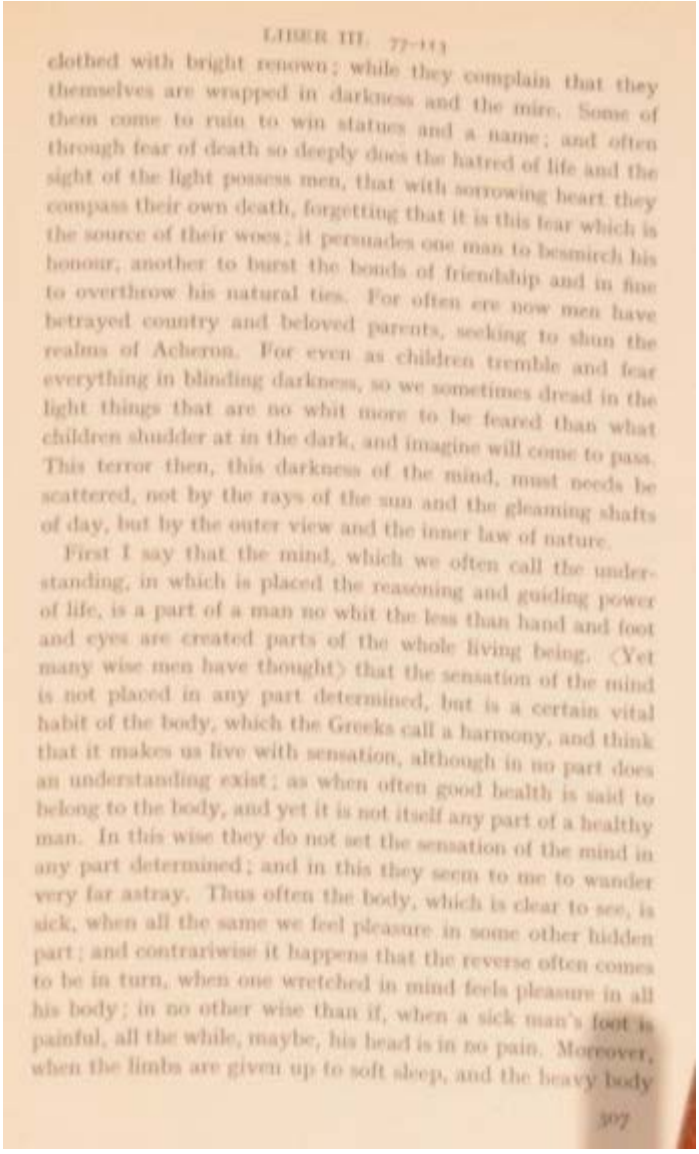

LIBER III. 77–113

clothed with bright renown; while they complain that they themselves are wrapped in darkness and the mire. Some of them come to ruin to win statues and a name; and often through fear of death so deeply does the hatred of life and the sight of the light possess men, that with sorrowing heart they compass their own death, forgetting that it is this fear which is the source of their woes; it persuades one man to besmirch his honour, another to burst the bonds of friendship and in fine to overthrow his natural ties. For often ere now men have betrayed country and beloved parents, seeking to shun the realms of Acheron. For even as children tremble and fear everything in blinding darkness, so we sometimes dread in the light things that are no whit more to be feared than what children shudder at in the dark, and imagine will come to pass. This terror then, this darkness of the mind, must needs be scattered, not by the rays of the sun and the gleaming shafts of day, but by the outer view and the inner law of nature.

First I say that the mind, which we often call the understanding, in which is placed the reasoning and guiding power of life, is a part of a man no whit the less than hand and foot and eyes are created parts of the whole living being. ⟨Yet many wise men have thought⟩ that the sensation of the mind is not placed in any part determined, but is a certain vital habit of the body, which the Greeks call a harmony, and think that it makes us live with sensation, although in no part does an understanding exist; as when often good health is said to belong to the body, and yet it is not itself any part of a healthy man. In this wise they do not set the sensation of the mind in any part determined; and in this they seem to me to wander very far astray. Thus often the body, which is clear to see, is sick, when all the same we feel pleasure in some other hidden part; and contrariwise it happens that the reverse often comes to be in turn, when one wretched in mind feels pleasure in all his body; in no other wise than if, when a sick man's foot is painful, all the while, maybe, his head is in no pain. Moreover, when the limbs are given up to soft sleep, and the heavy body

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Lucretius on mind-body dualism.

(add discussion)

Gods

Lucretius' aim, according to American chemist-theologian Edwin Slosson, was to abolish belief in all gods from the mind of mankind. [4]

Free will

See main: Epicurean swerve

Determinism, in Lucretius' physical science theory of the universe, appears to conflict with the concept of free will.

This is similar to others like-minded reductionist thinkers such as C.G. Darwin (1952) and Mehdi Bazargan (1956). Lucretius attempts to allow for free will in his physicalistic universe by postulating an indeterministic tendency for atoms to swerve randomly (Latin: *clinamen*) or the "swerve of the atom" as it is sometimes phrased. This indeterminacy, according to Lucretius, provides the "free will which livings things throughout the world have." [2]

Influence

Lucretius' description of atomic theory was revived most-significantly French philosopher Pierre Gassendi who, during his writing on the philosophy of Epicurus, began to elaborate on atomic theory, introducing and coining the concept of the molecule, in 1649, as a structural attachment of two or more atoms.

English physicist Isaac Newton included ninety lines of *De Rerum Natura* in the early drafts of his *Principia*. [5]

The 1417 re-discovery of *On the Nature of Things*, according to American literary critic Dwight Garner, was "recognized as a bold work of philosophy, one that helped recalibrate thinking when it began to recirculate during the Renaissance. Among those who admired and drew from it were Galileo, Freud, Darwin and Einstein. Thomas Jefferson owned at least five Latin editions of *On the Nature of Things*, as well as translations into other languages." [6]

Quotes

The following are noted quotes:

> “What law defines the power of things.”
>
> — Lucretius (55BC), *On the Nature of Things* (translator: Frank Copley) (pg. 2) (1:76-77)

> “They do not know the nature of the soul: if it is born or at birth slipped into us; whether, destroyed by death, it dies with us, or goes to see hell’s broad and lightless pools, or by some miracle passes to other creatures [see: transmigration], as our loved Ennius sang, who first brought down from lovely Helicon garlands evergreen to grow in fame wherever Italians live.”
>
> — Lucretius (55BC), *On the Nature of Things* (translator: Frank Copley) (pg. 3) (1:112-19)

> “All religions are equally sublime to the ignorant, useful to the politician, and ridiculous to the philosopher.”
>
> â€• Lucretius (55BC), *On the Nature of Things* (Ñº)

> “None of this happens, we know, for every thing; is made of certain seeds, by certain parents; And in their growing they preserve their kinds. Of course they must; a **fixed law** makes it so.”
>
> — Lucretius (55BC), *On the Nature of Things* (pg. 77) [8]

> “So nature makes all food to living flesh / and from that food gives birth to animal senses / in much the same way as she make **dry tinder / explode in flames** and turn all into fire.”
>
> — Lucretius (55BC), *On the Nature of Things* (pg. 82) [8]

> “When after all our world is made by nature; Of her own, **by chance**, by the rush and collision of atoms; Jumbled together any which way, in the dark, to no result,
> But at last tossed into combinations which; Became the origin of things, Of the earth and the sea and the sky and all that live.”
>
> — Lucretius (55BC), *On the Nature of Things* (pgs. 86-87) [8]

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(c) The Swerve: How the World Became Modern – Wikipedia.
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8. (a) Lucretius. (55BC). *On the Nature of Things* (translator: Anthony Esolen) (fixed law, pg. 77; chance, pg. 86-87). John Hopkins University Press.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (§:Leucritius, pgs. 146-51). HarperOne.

Further reading

â— Lucretius. (55BC). *On the Nature of Things* (translator: Frank Copley). W.W. Norton & Co., 2011.

External links

â— De rerum natura – Wikipedia.

θΔics

In famous publications, ***On the Origin of Species*** is a 1859 book by English naturalist Charles Darwin that presents his theory of evolution, which explains form change (metamorphosis) and the origin of species according to a mixture of the following: common decent, variation of species, survival of the fittest, and struggle to survive.

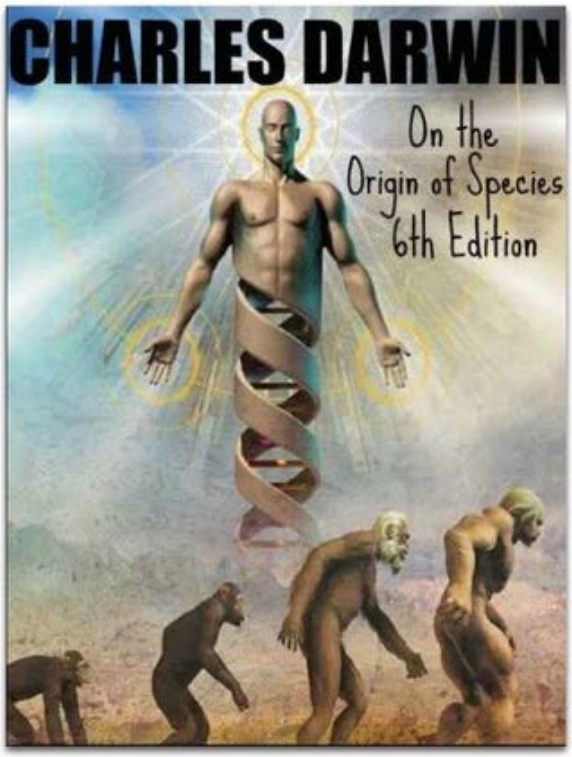

A 1966 DNA cover themed 6th edition reprint of Charles Darwin's classic 1859 ***On the Origin of Species***. [1]

Blind random chance

Darwin introduced the idea of natural selection of variations produced by "chance" in chapter five; though he demurred that uses of this term was incorrect, but nevertheless used owing ignorance.

Evolution theory pioneers

Darwin, in his first edition, cites three people as having been forerunner theorists to his own evolution theory:

- Johann Goethe (1784)
- Erasmus Darwin (1791)
- Etienne Saint-Hilaire (1833)

Darwin explains this in following footnote:

> "I have taken the date of the first publication of Lamarck from Isid. Geoffroy Saint Hilaire's (' Hist. Nat. Generate,' torn. ii. p. 405, 1859) excellent history of opinion on this subject. In this work a full account is given of Buffon's fluctuating conclusions on the same subject. It is curious how largely my grandfather, Dr. Erasmus Darwin, anticipated the erroneous grounds of opinion, and the views of Lamarck, in his 'Zoonomia' (vol. i. p. 500-510). published in 1794. According to Isid. Geoffroy there is no doubt that Goethe was an extreme partisan of similar views, as shown in the Introduction to a work written in 1794 and 1795, but not published till long afterwards. It is rather a singular instance of the manner in which similar views arise at about the same period, that Goethe in Germany, Dr. Darwin in England, and Geoffroy Saint Hilaire (as we shall immediately see) in France, came to the same conclusion on the origin of species, in the years 1794-6."

Metamorphology

See main: Metamorphology

German polyintellect Johann Goethe's metamorphology theory, originally conceived in part in 1784 with his discovery of the human intermaxillary bone, and later published in three part metamorphology treatise set, in the form of the metamorphosis of plants, animals, and humans respectively:

Metamorphology

(1784)

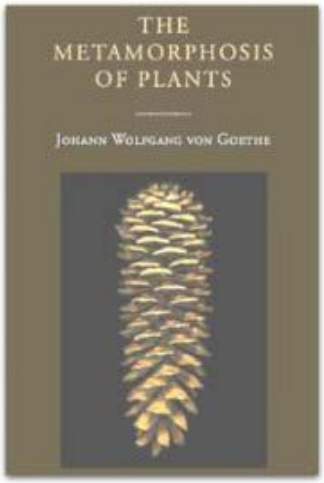

(1790)

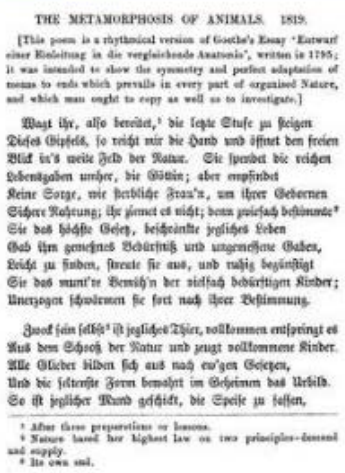

THE METAMORPHOSIS OF ANIMALS. 1819.

[This poem is a rhythmical version of Goethe's Essay 'Entwurf einer Einleitung in die vergleichende Anatomie', written in 1795; it was intended to show the symmetry and perfect adaptation of means to ends which prevails in every part of organised Nature, and which man ought to copy as well as to investigate.]

Wagt ihr, also bereitet,[1] die letzte Stufe zu steigen
Dieses Gipfels, so reicht mir die Hand und öffnet den freien
Blick in's weite Feld der Natur. Sie spendet die reichen
Lebensgaben umher, die Göttin; aber empfindet
Keine Sorge, wie herzliche Frau'n, um ihrer Geborenen
Sichere Nahrung; ihr gemet es nicht; denn zweifach bestimmte[2]
Sie das höchste Gesetz, beschränkte jegliches Leben
Gab ihm gemessnes Bedürfniß und ungemessene Gaben,
Leicht zu finden, streute sie aus, und ruhig begünstigt
Sie das munt're Bemüh'n der vielfach bedürftigen Kinder;
Unerzogen schwemmen sie fort nach ihrer Bestimmung.

Zweck sein selbst[3] ist jegliches Thier, vollkommen entspringt es
Aus dem Schoß der Natur und zeugt vollkommene Kinder.
Alle Glieder bilden sich aus nach ew'gen Gesetzen,
Und die seltenste Form bewahrt im Geheimen das Urbild.
So ist jeglicher Mund geschickt, die Speise zu fassen,

[1] After these preparations or lessons.
[2] Nature based her highest law on two principles—demand and supply.
[3] Its own end.

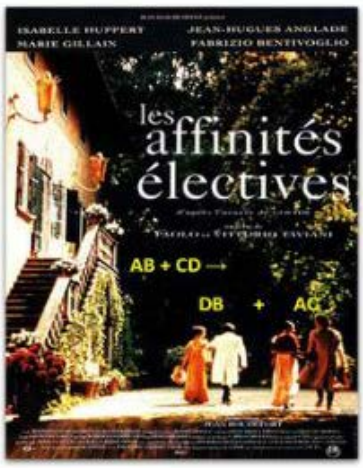

(1806)

(1809)

which, of the four respective evolution theories, is the more robust of the group, in that it presents a unified view of form change:

chemical → plant
chemical → animal → human

whereas the other three theories (Erasmus Darwin, 1791; Etienne Saint-Hilaire, 1833; and Charles Darwin, 1959) situate the following divide:

chemical | plant
chemical | animal → human

Hence, maintaining the life | non-life conceptual divide or unbridgeable gap model.

References

1. Darwin, Charles. (1872). *On the Origin of Species*. United Holding Group, 1966.

Further reading

● Darwin, Charles. (1859). *On the Origin of Species: by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. London: John Murray, Albemarle Street.

External links

● On the Origin of Species – Wikipedia.

θΔics

In famous publications, **"On the Thermodynamics of Chemical Processes"** or *Ueber Die Thermodynamik Chemischer Vorgange* is a three-part, 55-page address given to the Berlin Academy on February 02 and July 27 of 1882 by German physicist Hermann Helmholtz, which integrated thermodynamics into affinity chemistry, thus being a founding paper in chemical thermodynamics, which acted to disprove the Berthelot-Thomsen principle. [1] The following is a noted summary quotation from this address by Helmholtz: [2]

> "Given the unlimited validity of Clausius' law, it would then be the value of the free energy, not that of the total energy resulting from heat production, which determines in which sense the chemical affinity can be active."

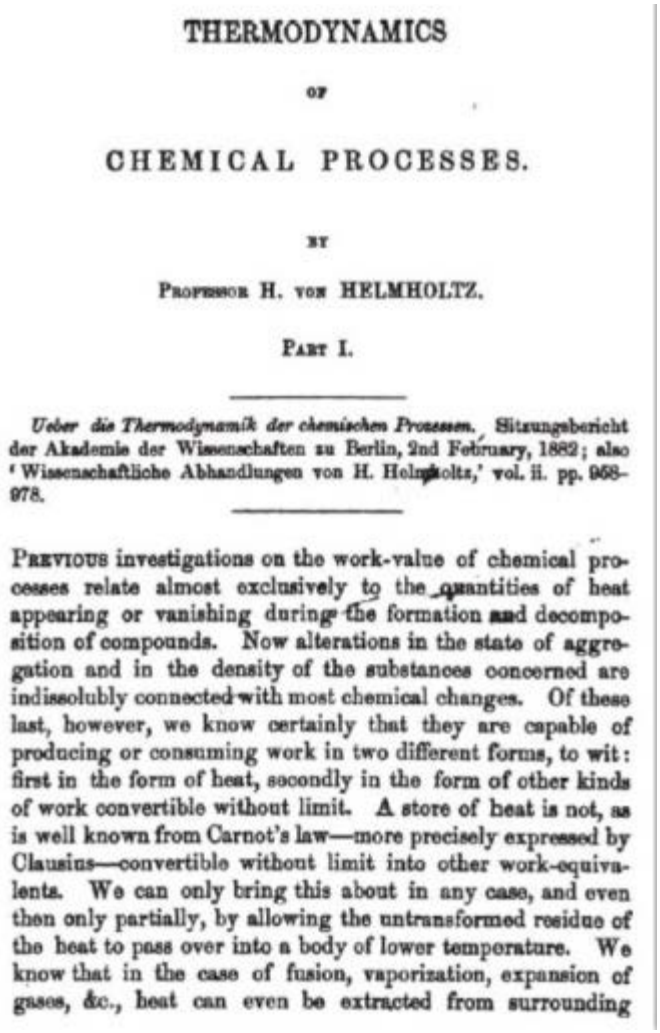

THERMODYNAMICS

OF

CHEMICAL PROCESSES.

BY

PROFESSOR H. VON HELMHOLTZ.

PART I.

Ueber die Thermodynamik der chemischen Prozessen. Sitzungsbericht der Akademie der Wissenschaften zu Berlin, 2nd February, 1882; also 'Wissenschaftliche Abhandlungen von H. Helmholtz,' vol. ii. pp. 958–978.

PREVIOUS investigations on the work-value of chemical processes relate almost exclusively to the quantities of heat appearing or vanishing during the formation and decomposition of compounds. Now alterations in the state of aggregation and in the density of the substances concerned are indissolubly connected with most chemical changes. Of these last, however, we know certainly that they are capable of producing or consuming work in two different forms, to wit: first in the form of heat, secondly in the form of other kinds of work convertible without limit. A store of heat is not, as is well known from Carnot's law—more precisely expressed by Clausius—convertible without limit into other work-equivalents. We can only bring this about in any case, and even then only partially, by allowing the untransformed residue of the heat to pass over into a body of lower temperature. We know that in the case of fusion, vaporization, expansion of gases, &c., heat can even be extracted from surrounding

German physicist Hermann Helmholtz's 1882 paper "On the Thermodynamics of Chemical Processes", which showed that free energy is the measure of affinity; it is one of the founding papers of chemical thermodynamics.

In this paper, Helmholtz defines the magnitude of entropy |S| as the measure of atomic-molecular disorganization. [1] The first English translation seems to be the 1888 translation by the Physical Society of London. The most-cited aspect of the paper is that Helmholtz showed that the true measure of affinity is free energy, not heat as it had previously been assumed. It seems that Helmholtz had plans to expand on this paper into a book, but this aim was never completed.

Notes

The terms free energy and bound energy were introduced in this paper.

Overview

In 1880, Helmholtz became the director of the Institute of Physics in Berlin. Between 1881 and 1884, Helmholtz attacked the question of how to integrate energy conservation and Maupertuis's principle of least action to describe thermodynamic and chemical processes. [3]

The usual approach to mathematical description of a physical system is to use differential equations. Differential equations describe the change in variable elements of the system over time. Using functions to describe the variables, the differential calculus establishes the rates of change of the functions over time by determining the change in a variable at any one point. For instance, Newtonian mechanics uses the calculus to describe the velocity and position of any given particle of a system at any given point in time.

While differential equations differentiate between distinct points in time, "action" principles are integral principles, that is, they measure the change in a variable from one state to another, which is an "action." To analyze a physical system using an action principle, it is only necessary to know two states of the system. For instance, if you throw a ball in the air and want to know how much energy it expends to reach its highest point, you need only know the initial state, the ball in your hand, and its final state, the highest point of its path through the air.

The Lagrangian equation, in its most simple case, is the kinetic energy of a system minus the potential energy: $L = T - U$. The Hamiltonian equations also evaluate potential and kinetic energy in a system, but use an integral sum of the momenta of the elements of the system, $H = T + U$. The Hamiltonian gives a minimum value for a function over any path of an action given the initial and end states of the action. The Hamiltonian expression of the momenta of the system can be derived from the Lagrangian, and vice versa, using a Legendre transform. The Hamiltonian function yields the

derivative of the Lagrangian: in the simplest case, the Lagrangian deals with the velocity of a particle and the Hamiltonian with the momenta of the particle. The Legendre equation transforms the Lagrangian into a function of the Hamiltonian, its derivative.

The equations for a system containing heat as a variable contain entropy as a variable quantity. Entropy is an inconvenient variable, difficult to control for and hold constant as one can hold temperature, pressure, and volume constant. The Legendre transform allows a researcher to convert equations containing entropy into equations expressed only in terms of temperature, pressure, and volume. The Legendre transform can be applied correctly only under certain conditions, which must be specified.

In 1882, Helmholtz gave an address, “The Thermodynamics of Chemical Processes,” at the Berlin Academy. Up until Helmholtz's address, chemical reactions had been explained by “chemical forces” or “affinities” between chemical substances, measured quantitatively by the heat developed during a chemical reaction. Gustave Coriolis had clarified the notion of work as the product of force over distance in 1821, and this notion was in common use by the late 19th century. In his address, Helmholtz “proved that affinity was not given by the heat evolved in a chemical reaction but rather by the maximum work produced when the reaction was carried out reversibly”. [4] However, while kinetic and mechanical energy can be converted into heat in every case, only in restricted cases can heat be converted into kinetic and mechanical energy. Hence, the equations describing chemical processes involving heat could not always be reversed. These are the conditions under which the Legendre transform could not be applied.

Helmholtz proposed the notion of a “free energy” to account for cases involving heat and entropy. The Helmholtz free energy is defined as F $E - TS$, where E is energy, T is temperature, and S is entropy. The free energy equation yields a quantity, F, that is independent of heat and entropy. Many equations involving F and not T or S are fully reversible, and so Helmholtz's work allowed for the application of the Hamiltonian to many chemical processes. Hence while “Helmholtz was neither the sole nor the most important contributor” to theoretical chemistry, “his thermodynamic theory of 1882–1883 was the pioneering work on which much of the new theoretical chemistry rested”. [4]

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Further reading

â— Laidler, Keith J. (1993). *The World of Physical Chemistry* (The Thermodynamics of Helmholtz, pgs. 112-14). Oxford University Press.
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θΔics

In science, **one nature**, as contrasted with two natures, refers to the conviction or view that one nature governs the entire universe, animate and inanimate, governing both humans and human activities, and other non-human things, alike.

Belief systems of people, generally, can be divided into whether one is a two nature theorist or one nature theorist or two nature in belief and philosophy or one nature in belief and philosopher.

Romanian-born American mechanical engineer Adrian Bejan's 2012 depiction of how the geometry of flow structures found surrounding river deltas and lung bronchi are both governed by one law of nature, which Bejan calls "constructal law". [4]

Goethe

In *circa* 1770, German polyintellect Johann Goethe, the preeminent "one nature theorist", as he states in his retrospect book 20 of his *Poetry and Truth* (1811-1814), how, in his pre-1775 youth years, he was searching for a universal rule to explain the happenings of existence, which he recounts as follows: [1]

> "I perceived something in nature (whether living or lifeless, animate or inanimate) that manifested itself only in contradictions and therefore could not be expressed in any concept, much less any word. It was not divine, for it seemed irrational; not human, for it had no intelligence; not diabolical, for it was beneficent; and not angelic, for it often betrayed malice. It was like chance, for it laced continuity, and like providence, for it suggested context. Everything that limits us seemed penetrable by it, and it appeared to dispose at will over the elements necessary to our existence, to contract time and expand space. It seemed only to accept the impossible and scornfully to reject the possible."

Later, following the completion of his tripartite chemical-to-animal-to-human tripartite metamorphology theory of form change, in his famous 4 Sep 1809 anonymous advertisement, shown below, to his soon-to-be published "most dangerous work" *Elective Affinities*, Goethe states explicitly there is after all only one nature:

> "The author must have been led to his strange title by his continuing work in the physical sciences where we often make use of comparisons drawn from the world of human behavior so that things which are essentially remote from us may be brought a little nearer; and in the novel, in a case concerning morality, doubtless the author was seeking to trace an expression used as an analogy in chemistry back to its origin in the life of the human spirit. [The advertisement concludes with a general remark, the essence of which is] there is after all only **one nature**, and that even in our human zone of it, the cheerful zone of reason and freedom of choice, still there are traces, in the passions, of bleak and irresistible necessity."

Haken

In 1986, German theoretical physicist Hermann Haken, in his *Advanced Synergetics*, gave the following noted one nature statement: [3]

> "Why should systems consisting of components as different as electrons, atoms, molecules, photons, cells, animals, or even humans be governed by the same principles when they organize themselves to form

> electrical oscillations, patterns in fluids, chemical waves, laser beams, organs, animal societies, or social groups."

(add discussion)

Bejan

In 1995, Romanian-born American mechanical engineer and thermodynamicist Adrian Bejan, after being irked by a prebanquet speech by Belgian chemist Ilya Prigogine about how natural structures are all but the result of throwing the dice, or as Bejan recalls: [4]

> "Echoing the scientific community's conventional wisdom, this famous man asserted that three-shaped structures that abound in nature—including river basins and deltas, the air passages in our lungs, and lightning bolts—were *al*éatoires (the result of throwing the dice). That is, there is nothing underlying their similar design. It's just a cosmic coincidence."

A statement which Bejan discredits with the following comparison of the flow shape structure of the Delta of the Lena River, Siberia and the Bronchus of a human lung, both shown adjacent, which he argues are governed by the same "constructal law" of nature. In his 2012 book *Design in Nature*, Bejan summarizes his one nature philosophy as such:

> "Design in nature as a scientific discipline, [is] centered on a physics law of design and evolution: the constructal law. This law sweeps the entire mosaic of nature from inanimate rivers to animate designs, such as vascular tissues, locomotion, and social organization."

(add discussion)

See also

â— Forest blind

References

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2. Goethe, Johann. (1994). *Elective Affinities* (introduction, note on translation, selected bibliography, chronology, and explanatory notes by David Constantine). World Classics.
3. Haken, Herman. (1983). *Advanced Synergetics* (Amz) (quote, pgs. xii-viii). Springer.
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θΔics

In hmolscience, **ontic opening**, aka "Einstein twisters" (Lovecraft, c.1929), ontic openness, something that is “ontic open”, and or an ontic opening theory, refers to something that is said to bring in or allow the existence of a non-deterministic nature or give a means of proving indeterminism; and or allow for the emergence or introduction of a non-materialistic or non-physicalist angled "being" or "becoming" theory; a scientific-sounding way to sneak anthropisms into hard physical science, so to say, typically underlaid by some type of hidden or implicit god or spirituality agenda. [1]

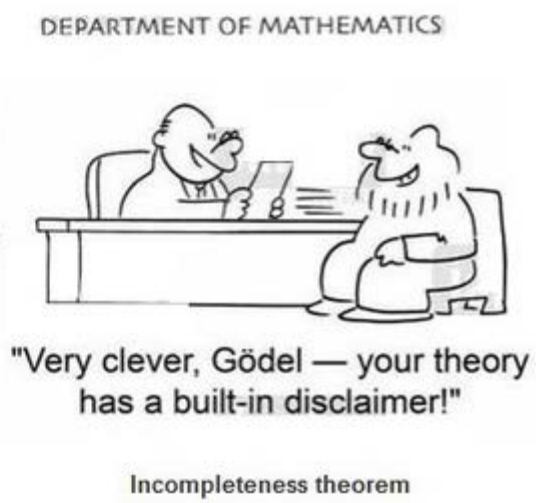

Left: an **ontic opening** humor jab on Werner Heisenberg's uncertainty principle, used socially. Right: an ontic opening themed cartoon (Q) on Kurt Godel’s 1931 incompleteness theorem.

Etymology

The prefix “ontic” is a shorthand reference to "ontology", the study of the emergence of being, becoming, and or existence, and hence ontic is short for the study of these in regards to being and becoming questions related to human existence, particularly in regards to the modern physical sciences.

In philosophy, the concept of “ontic openness” or ontic openings seems to have arisen in the work of Martin Heidegger.

In 1929, Howard Lovecraft, in a letter, warned a correspondent not to be tricked by what he referred to as "Einstein-twisters", namely scientists and litterateurs who used Einstein, e.g. energy = matter views (see: mass-energy equivalence) or relativity ideas, to bolster previously outmoded views regarding god and the soul. [4]

In systems ecology, the mixture of “open” as defined in thermodynamics in connection with the older ontological version of open or openness seems to have been introduced in 2001 by Sven Jorgensen. [2]

In the 2009 book *A Third Window: Natural Life beyond Newton and Darwin*, American systems ecologist Robert Ulanowicz, according to Swedish two-cultures literature theorist Erland Lagerroth, gives the “ontic openings” of nature examples of Gödel's incompleteness theorem, Heisenberg's uncertainty principle, the Pauli exclusion principle, and Elsasser's unique events (see: Walter Elsasser), to argue for the existence of God and his possibilities to intervene in what happens on earth. [3]

Belgian chemist Ilya Prigogine's "bifurcations", along the same lines as Lagerroth's classification scheme, might well be also classified as an ontic opening.

Openings

The following is a work-in-progress chronological listing commonly employed ontic theories employed to conceptualize or feign about “openings” of nature:

Theory | Principle | Model	Date	Theorist	Summary | Assertion	Rebuttal | Disproof

Chance	400BC	Greek philosopher	Said to derive from Greek atomic theory.	● Lawrence Henderson (1913) dismissed as a false assertion; the correct assertion being that the property of entropy maximization (or free energy minimization, in evolutionary terms) of matter and energy organizes the universe in space and time.
Swerve of the atom (*Clinamen*)	300BC	Epicurus	Proposed that certain atoms "serve" thus giving humans free will.	
Teleology	322BC	Aristotle	Argues that all phenomena have a final cause, i.e. desired or optimal end location in the universe, which is its purpose.	Has been defined as a "dead" theoretical option in biology (John Wilkins, 1997), in physics and chemistry (John Hawthorne, 2005), and in sociology (Water Runciman, 2005); and since superseded by waves and tides framed directional movements towards free energy minimization point theory.
Emergent property	1843	John Mill		
Entropy	1865	Rudolf Clausius	Dozens of "entropy antonym" theories, into the 21st century, have sprouted: extropy (1900 | Georg Hirth), ectropy (1910 | Felix Auerbach), negentropy (1950 | Leon Brillouin), anti-entropy (1951 | Pierre Teilhard), etc.	This, generally, is but the result of confusion about entropy, most assuming it is but the tendency towards disorder; the correct focus is on "Gibb energy" the quantitative measure of change of state of order.
Radioactivity	1896	Henri Becquerel	Discovered that uranium emits radiation, "unpredictably" (randomly), without any need for excitation by an external energy source; thereafter some (e.g. Ettore Majorana, 1935) began to use the "unpredictable" aspect of radioactive clicking of the meter to develop "chance" based philosophies of sociology and human nature.	Dismissed by the fact that social systems are not uranium based; Richard Feynman (1985), e.g., stated that all of existence, social existence included, aside from gravitational phenomena and radioactivity, can be explained by the theory of light and matter (or photons and electrons) otherwise known as quantum electrodynamics.

Uncertainty principle	1927	Werner Heisenberg	Claimed to overthrow: the principle of causality (Heisenberg, 1930), thereby seemingly inserting "indeterminism" into science; the idea that natural phenomena obey exact laws (Heisenberg, 1930); and Laplacian determinism (Compton, 1935)	● Dean Wooldridge (1968): “Even the existence among the laws of a principle of indeterminacy limiting the precision with which the future can be predicted does not permit entry of caprice into the world of the physical scientist. Within a calculable and frequently very narrow range of uncertainty, the future is completely determined by the past. Given the laws and the particles, all else follows inexorably.”
Quantum mechanics	1930s			● Steven Weinberg (1992) dismissed, in his Scrooge Tiny Tim dialogue, as a false extension. Murray Gell-Mann (1994) used the term "quantum flapdoodle" to describe abuses of quantum mechanics to support extraordinary claims. [5]
Incompleteness theorem	1931	Kurt Godel		
Self-organization	1943	Ross Ashby		● Friedrich Cramer (1993: the notion of “self-organization” lets the metaphysical into physics (see: ontic openings) and hence justifies the notion of creation by god.
Cybernetics	1948	Norbert Wiener	The model of mechanical feedback, in the sense of the method by which an oarsman steers a ship, has given rise to all sorts of ontic opening theories. (Q)	
Information theory	1949	Claude Shannon	After being told by John Neumann that he should call his new coding formula for the sending of 1s and 0s, i.e. Boolean algebra based information, in telegraph wires, by the name "entropy", superficially drawing a parallel to	● Dirk ter Haar (1954) dismissed as having nothing to do with thermodynamics; retracted by Shannon (1956) himself has something that is “not

			Boltzmann entropy of thermodynamics, the so-called Shannon bandwagon took of, one that many still ride today, allowing anyone to argue about anything.	relevant to psychology, economics, and other social sciences".
General systems theory	1950s	Ludwig Bertalanffy		
Unique events	1958	Walter Elsasser		
Far-from-equilibrium Fluctuations/Bifurcations	1970s	Ilya Prigogine	The Benard cell (1900) phenomenon of so-called "far-from-equilibrium" formation of "order" (hexagonal cell patterns) from "disorder" (randomly moving silicon atoms), past a certain Reynold's number of heat input, alludes to the view that before the fluctuation and or bifurcation, determinism and predictability exist, but at or after the bifurcation (or bifurcation point), indeterminism and unpredictablity exist, and there by semblance of materialistic "choice" and or free will exists.	● Georgi Gladyshev (1979) dismissed as but "mathematical fantasies" devoid of any real world application; societies, in short, are not made of silicon or whale oil, nor heated "continuously" (but cyclically) on a hotplate (but by the sun).
Ascendency	1979	Robert Ulanowicz		
Chaos theory	1990s	Edward Lorenz	Arguments, such as the "butterfly effect", assert that social systems are at the "edge of chaos", according to which slight changes to initial conditions, bring about unpredictably large end result changes.	Fell off, in popularity, into the 2000s.

The following are other possible or tentative avenues of ontic opening arguments:

● Pauli exclusion principle

Ontic opening theorists

An ontic opening theorist is someone who uses "openings" to make an "ontological" argument. Examples include:

- Robert Ulanowicz
- Morris Zucker

Teleic opening theorists

A teleic opening theorist, similar to an "ontic opening theorist", in Swedish two-cultures literature theorist Erland Lagerroth's 2009 classification scheme, refers to someone who uses "openings" to make a "teleological" (design or purpose as an explanation) argument of natural phenomena. Examples include:

- Alicia Juarrero
- Terrence Deacon

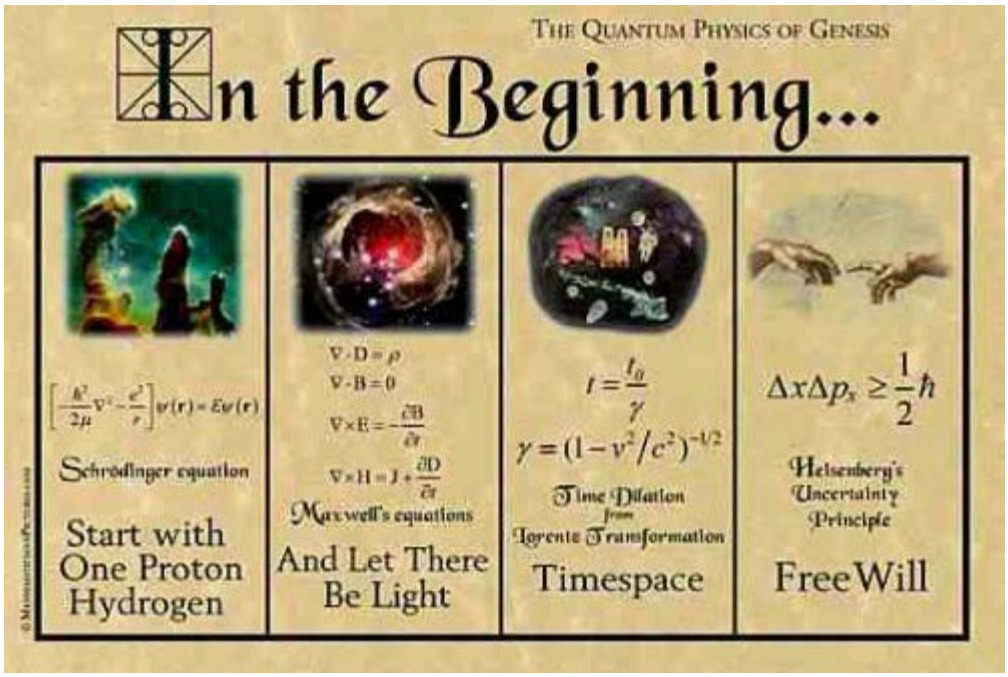

An explicit religious use of Heisenberg's uncertainty principle, as an **ontic opening**, to validate the premise of "free will", thereby giving comforting, albeit vacuous, justification of the premise that people have the ability to freely "choose" between good and evil or right and wrong; thereby substantiating the classical models of the soul and or karma based religion.

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(b) Ulanowicz, Robert E. (2009). *A Third Window: Natural Life beyond Newton and Darwin* (thermodynamics, 32+ pgs; entropy, 17+ pgs; God, 12+ pgs) . Templeton Press.
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Further reading

- Jorgensen, Sven. (2007). *A New Ecology: Systems Perspective* (3.2: Why is Ontic Openness so Obscure?, pgs. 36-). Elsevier.

External links

- Ontology – Wikipedia.

θΔics

In thermodynamics, **open** refers to a system surrounded by a boundary across which energy, in the form of work or heat, and matter, may pass or be exchanged with its surroundings. [1] In this sense, an "open system" can have any type of interaction with its surroundings.

See also

- Closed
- Isolated

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θΔics

In hmolscience, **open sesame** refers to the use of Shannon entropy as the magic word or formula into explaining all things related to the thermodynamics of humans; an ontic opening of sorts.

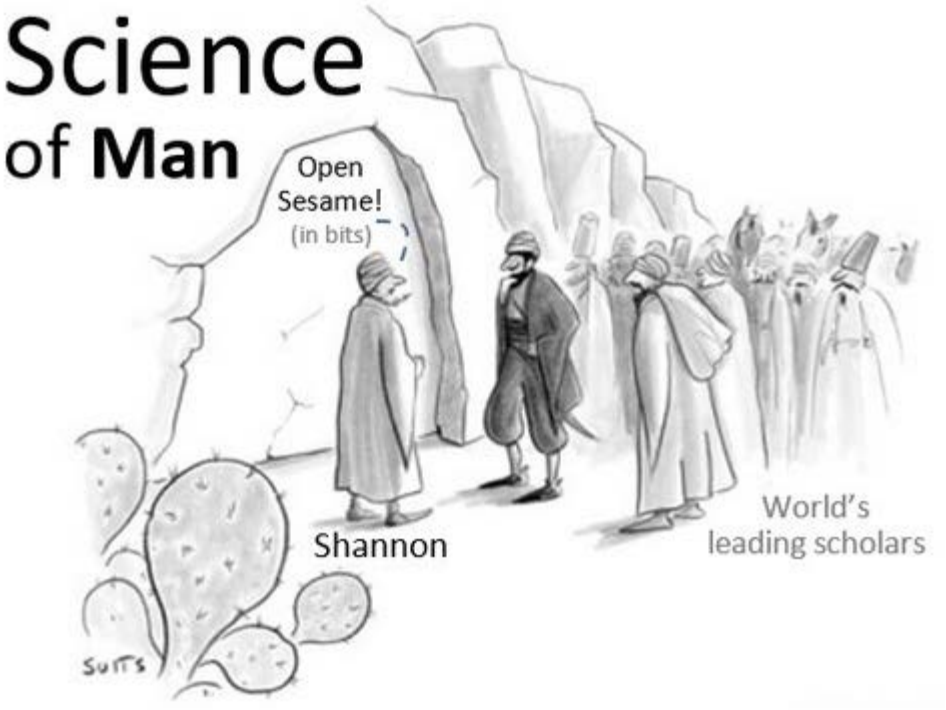

The view of Shannon-Wiener entropy according to Norman Dolloff (1975), who sees **information entropy** as an "open sesame" to the sciences of man, thereby connecting information measures of things such as DNA to thermodynamics. [1]

Overview

In 1975, Norman Dolloff, in his *Heat Death and the Phoenix*, classified Claude Shannon's 1948 logarithmic formula (see: Shannon entropy; information entropy) model of information, itself based on Hartley information (1927) (O), as an apparent "open sesame" to the sciences of man, thereby opening doorway into the dark cave of connecting information themed things, such as DNA, mind, knowledge, etc., to thermodynamics. [1]

See also

- Entropy pied piper
- Information entropy (quotes)
- Thermodynamic information fallacy

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1. Dolloff, Norman H. (1975). *Heat Death and the Phoenix: Entropy, Order, and the Future of Man* (pg. xvi). Exposition Press.

θΔics

In hmolscience, **open up**, similar to "rabbit hole", refers to [] [N1]

Overview

In c.1995, Libb Thims, intuited the obvious idea that Gibbs energies explain phenomena such as golden wedding anniversaries; the following is a recent embodiment of this "idea" so to speak:

> "As strange as it sounds, I have thought the same way (chemically) about relationships ... especially entropy and molecules. Weird."
>
> — Hala Kalmareiata (Q) (2014), "IQ:200+ | Smartest Person Ever (3 of 4)", forum (Q) post

Thims, in short, after learning chemical thermodynamics, discerned the view that "love", i.e. how to intelligently and emotionally, based on experimental evidence, "choose" one mate over another, aka the equation of love, the most liked page in Hmolpedia, as colloquially known, could be explained by the following equation:

$$\Delta G < 0$$

Introductory note

The following are the divisions of the ten-volume 'print set' of *Hmolpedia: an A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, written online at EoHT.info, a prolegomenon to derivation:

Hmolpedia, Volume 1 (A-B)	1-682	(686-pgs)
Hmolpedia, Volume 2 (C-Ek)	683-1352	(674-pgs)
Hmolpedia, Volume 3 (El-Goe)	1353-2058	(710-pgs)
Hmolpedia, Volume 4 (Gof-Ir)	2059-2750	(696-pgs)
Hmolpedia, Volume 5 (Is-Mr)	2751-3444	(698-pgs)
Hmolpedia, Volume 6 (Ms-Ra)	3445-4064	(624-pgs)
Hmolpedia, Volume 7 (Rb-Sw)	4065-4762	(702-pgs)
Hmolpedia, Volume 8 (Sx-Z)	4763-5466	(708-pgs)
Hmolpedia, Volume 9 Misc (A-I)	5467-5986	(524-pgs)
Hmolpedia, Volume 10 Misc (J-Z)	5987-6496	(514-pgs)

The following are four addendum books, the first two embedded into EoHT.info, the third a JHT pdf, the fourth a precipitate of the 2008 IQ:200+ rankings, scheduled to be published (estimated page count shown) as accompaniments to the encyclopedia set:

Elective Affinities: Illustrated, Annotated, and Decoded | 280-pgs
Morality Squared: Religion Dissolved in Nitric Acid | 70-pgs
Shannon Thermodynamics: Science's Greatest Sokal Affair | 120-pgs
500 Greatest Geniuses: Ranked by IQ | 250-pgs

The total print set is meant as a backup hardcopy of the online version; a repercussion of which, being that, in the conversion process, robust editing of the latter is limited; noticeable areas being: hyperlinks removals, justified paragraphs, equations in LaTex (bad) vs jpg (good) rendering differences, among slight issues; as the total set—online and print—is meant only as a tool, according to which functionality takes precedence over tool presentation. The following quote seems to encapsulate the gist of the content of Hmolpedia:

> "To be master of any branch of knowledge, you must master those which lie next to it; and thus, to know anything — you must **know all**."
> — Oliver Homes (1886), American jurist

In 1957, Keith Burton, when asked why he found publication increasingly difficult following the publication of his famous 1957 tables of "Free Energies of Formation—of chemical species, general and biochemical—from the Elements", replied: "of the impossibility of saying anything without saying everything." Thims, likewise, would prefer to say simply that 'humans, like smaller textbook chemicals, have free energies of formation, per state of existence', which quantitatively defines the thermodynamical nature one's state of 'being', as a person, with a simple citation to 'see: Burton (1957) for *biochemical species* [an antiquated term] and Lewis (1923) for general methodology', and that these tables can be used cogently to predict, guide, and or predetermine human reaction pathways, or the feasibilities of future states of existence, but such a result is not palatable to the general public, whose mindset is largely anchored in the paradigm hues of ancient mythologies, e.g. Aristotelian models of purpose, a turn of mindset requisite to a modification of five thousand plus years of ingrained beliefs; hence Hmolpedia is elaboration on details of explicits. The content of Hmolpedia, in short, is a corpus of footnotes to a change of beliefs.

> "One's **beliefs** or theological holdings can be divided into two classes: those for which a man would go to the stake, and those for which a man would not go to the stake."
> — Edwards A. Park (c.1870), American moral philosopher

Knowledge, in the discerning words of Francis Bacon, is power. **Power**, in the quantifications of James Watt, is work per unit time. **Work**, in the unimpeachable formulations of Gustave Coriolis, is the result of a force moving a body through unit distance. **Force**, as defined by the illustrious Newton, is influence—mediated via field particle exchanges (in modern terms)—that tends to change the state of rest of a body or its uniform motion in a straight line. The **body** of interest herein is the light-stimulated power (knowledge) animated CHNOPS+20 molecular body or phase reading these words.

The "Introductory Note" section to the 2016 print edition of the 10-volume *Hmolpedia*, outlining what exactly "**opens up**" (Georgescu-Roegen, 1971), when one goes down the "broad highway (Q) of thermodynamics" (Lewis, 1923) to the new land of future non-mythological-based society.

and was curious to know how the details of this were ferreted out socially and "who" specifically and done this

ferreting? In 2001, Thims had come to largely solve the details of this problem of his own, therein satisfying a question he was reluctant to ask while and undergraduate student sitting in his chemical engineering thermodynamics class.

Over the next decade, Thims had come to learn that this query subject is what "human free energy" theory, in 1882 or thereafter, or "human affinity theory", before 1882, the turning point marked by the publication Helmholtz's "On the Thermodynamics of Chemical Processes", wherein he proved the thermodynamic theory of affinity, in place of the thermal theory of affinity.

The journey into this so-called rabbit hole of inquiry is replete, but nevertheless well encapsulated by the following pre-Thimsian quote:

> "Recently, the application of quantities of thermodynamic origin for social system description occurred in which the free energy is used along with entropy (Dragulescu and Yakovenko, 2000; Mimkes, 2000; **Stepanic** et al., 2000; McCauley, 2002; Muller, 2002). In these works, authors interpret the free energy in social context as profit in economic processes (Dragulescu and Yakovenko, 2000), common happiness or common benefit (Mimkes, 2000), or as a part of complete thermodynamically based formalism without a specific meaning (McCauley, 2002; Muller, 2002). Furthermore, it has been specifically described as a measure of possible social actions in relatively stationary social system states, i.e. a measure of iso-structural social actions (Stepanic et al., 2000). The stationary state means a state describable using time-independent quantities. In all these cases the social analogue of free energy is close to material and immaterial surplus of resources. The measure of iso-structural social acting provides information about what activities can happen in a given social system, without a significant change of the system structure. Therefore, it is analogous to a measure of the quantity of work obtainable from some physical system in that its initial and final states are in equilibrium. That recognition led to its description as social free energy. Nevertheless, the similarity between social and thermodynamic free energy is not complete. Thermodynamic free energy is accompanied with the firm formalism. In the social system context we are not aware of explicitly written, appropriate equations of state, although their existence has been discussed (Bailey, 1994)."
>
> — Josip Stepanic, et al (2005), "Describing Social Systems Using Social Free Energy and Social Entropy" [2]

In other words, when, as an inquisitive person, curious about how Gibbs energy applies socially, economically, morally, philosophically, historically, and or and inter-personally (e.g. romantically), etc., one will be forced into the following citation investigations:

1994	2000	2002	2005
Bailey	Mimkes Dragulescu Yakovenko **Stepanic**	McCauley Muller	**Stepanic**

Without going into detail, in order to understand the following combined logic:

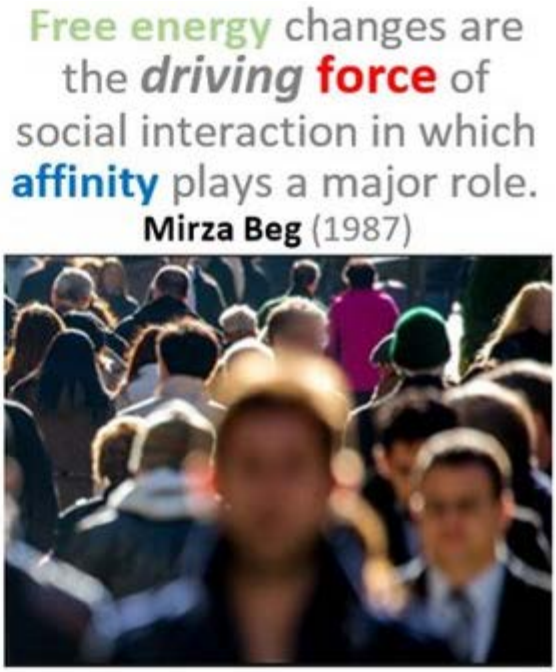

One has to go down the "free energy" rabbit hole and sift through 1,000s of articles and books, depending on the erudition, discernment, and most-importantly "educational" background, of each scholar cited, each of which, in turn, will lead down a further "hole", in some cases 100s of imbecilic citations, scattered with one or two workable citations (e.g. Bailey) others with off the rails derivations methods, owing to a lack of understanding of basic fundamentals (e.g. McCauley), others with keen insight (e.g. Mimkes or Muller), within the matrix of the original rabbit hole, some of which being extended and longer than others, many of which leading to "goose chases", which take many years and sometimes decades to realize that they are goose chases, examples of which include Myron Tribus being asked during his 1948 UCLA PhD dissertation what "Clausius entropy" has to do [if anything] with "Shannon entropy", Erwin Schrodinger positing that "life feeds on negative entropy", the elusive assertion, by John Avery (2003) that John Neumann was theorizing about his floating automaton theory that the self-assembly requires "free energy", among numerous others, all of which leading to a bottom citation point, e.g. that Empedocles said that fiends mix like water and wine, whereas enemies separate like oil and water.

Hence, in sum, in order to following through so-called "Kalmareiata" idea above, as outlined in various ways by others, e.g. John Tukey (1966), Adriaan de Lange (1982), two name a few, one has to dig through the intellectual material equivalent to a 10-volume, 6,500-page physicochemical materialism encyclopedia, at minimum.

Quotes

The following are related quotes:

> “One’s **beliefs** or theological holdings can be divided into two classes: those for which a man would go to the stake, and those for which a man would not go to the stake.”
>
> — Edwards A. Park (c.1870), Publication

> “To be master of any **branch of knowledge**, you must master those which lie next to it; and thus, to know anything — you must **know all**.”
>
> — Oliver Homes (1886), Publication

> “Manifold avenues **open up** up almost as soon as one begins to tackle the problem.”
>
> — Nicholas Roegen (1971), *The Entropy Law and the Economic Process* (pg. 3)

Notes

N1. Note: this article was started within the hours after Thims received the final formatted (second ordered) print version of volume one of the 10-volume *Hmolpedia*; meaning the 6,496 pages penned, from 2008 to 2016, of 4,050-articles (online), are the rabbit hole that one goes down when inquiry into $\Delta G < 0$ applied socially goes into the mind.

References

1. Georgescu-Roegen, Nicholas. (1971). *The Entropy Law and the Economic Process* (manifold, pg. 3). Cambridge, Massachusetts: Harvard University Press.
2. Stepanic, Josip, Sabol, Gabrijela, and Zebec, Jislav S. (2005). “Describing Social Systems Using Social Free Energy and Social Entropy” (abs) (pdf), *Kybernetics*, 34(6):857-68.

θΔics

In theories, **opposites attract**, sometimes heard in association with “likes repel”, as compared to “likes attract”, e.g. "birds of a feather flock together" (Democritus, c.450BC), refers to either the phenomenon, in physics, of opposite charges attracting; or, in sociophysics, of opposite traits and or personalities attracting. [1]

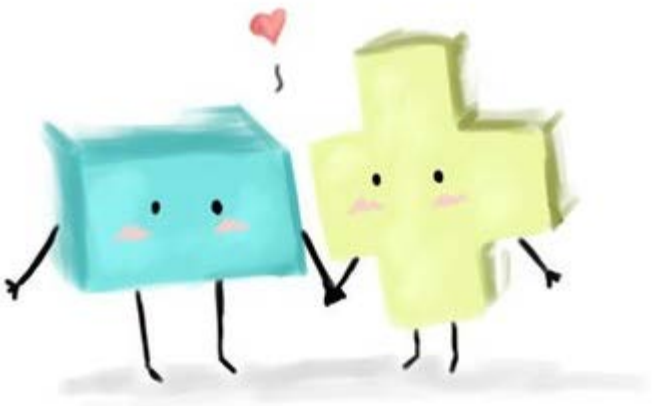

Etymology

The model of likes repelling and opposites attracting seems to have originated from Coulomb's law (1785); and or possibly dating farther back to Plato's laws of affinity.

The phrase “like repels like, and opposites attract”, applied socially, seems to have been in common circulation in 1850. (Ñº)

Quotes

The following are related quotes:

> “The male attracts the female, and vice versa; but what we must not fail to notice is, that likes repel, and **opposites attract**, each other. Hence, two of the same gender cannot associate so harmoniously as two of directly opposite relations.”
>
> — Andrew Davis (1850), *The Great Harmonia: a Philosophical Revelation of the Natural, Spiritual and Celestial Universe* (Ñº)

> “Magnetism has its seat in the vital realm, and is therefore the energy of love and passion, and the controlling spirit of counterpart selection. Positive forces are male; negative forces are female. Being magnetic, the positive repel each other, the negative repel each other, and the **opposites attract**. It is seen to be true in life that persons of opposite magnetic or vital qualities should marry each other, but not opposites in mental attributes. In the mental realm, like attracts like, and persons of the same tastes and inclinations should affiliate. It is the saddest of all mistakes for persons who differ in mental character to marry each other.”
>
> — Edmund Shaftesbury (1898), *The Two Sexes: Their Functions, Purposes and Place in Nature* (Ñº)

> “In nature **opposites attract**, and that its phenomena come from this attraction and from the consequent commingling of opposite conditions, that the strongest affinities exist between things dissimilar, and that when combination ensues, the compounds so formed are the most permanent.”
>
> — Author (c.1885) (Ñº)

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 170). Morrisville, NC: LuLu.

θΔics

In thermodynamics, **order**, in contrast to disorder, in a system or structure is often correlated to a low measure of entropy. A perfectly ordered crystalline structure, at absolute zero of temperature, for instance, is considered to have a measure of zero entropy, the lowest value of entropy.

Overview

In the 1862, Rudolf Clausius was associating entropy with the aggregation (coming together) and disgregation, i.e. dis-aggregation (coming apart) of bodies.

In 1936, British biochemist and historian Joseph Needham, in his *Order and Life*, stated: [3]

> "For the astronomers and the physicists the world is, in popular words, continually 'running down' to a state of dead inertness when heat has been uniformly distributed through it. For the biologists and sociologists, a part of the world, at any rate is undergoing a progressive development in which an upward trend is seen, lower states of organization being succeeded by higher states. For the ordinary man the contradiction, if such it is, is serious, because many physicist, in expounding the former of these principles, the second law of thermodynamics, employ the word 'organization' and say it is always decreasing."

Needham followed up his own query with the publication of the 1942 article "Evolution and Thermodynamics: a Paradox with Social Significance". [4]

In 1944, Austrian physicist Erwin Schrodinger, in his *What is Life?*, chapter "Order, Disorder and Entropy", gave the following equivalence for systems "in a uniform environment":

High (↑) levels of orderliness = Low (↓) levels of entropy

This stated equivalence, for systems that are not isolated and are not made of ideal gas phase particles, i.e. those that are not bound by the Boltzmann chaos assumption, however, becomes rather non-logical as system complexity increases. This becomes apparent in the concept of material entropy or if one tries to model human social system organizations via entropy qualifications, as in measures of "human entropy" or "social entropy". Schrodinger, went on to argue that, via the statistical thermodynamics of Austrian physicist Ludwig Boltzmann and American engineer Willard Gibbs, disorder is given by the following expression:

$$\text{entropy} = k \log D$$

where *k* is the Boltzmann constant and *D* is a "quantitative measure of the atomistic disorder of the body in question". [5] On this basis, Schrödinger states that the reciprocal of the measure of disorder, 1/D, can be regarded as a direct measure of order. Subsequently, according to Schrödinger, since the logarithm of 1/D is minus the logarithm of D, according to the rule:

$$\log_b(x^y) = y \log_b(x)$$

then, in his own words, we can write Boltzmann's equation as:

$$-(entropy) = k \log(\frac{1}{D})$$

Hence, via this derivation, according to Schrödinger:

> "The awkward expression 'negative entropy' can be replaced by: entropy, taken with the negative sign, is itself a measure of **order**."

Thus, as he states, "the device by which an organism maintains itself stationary at a fairly high level of orderliness (= fairly low level of entropy) really consists in continually sucking orderliness from its environment." [1]

n 1973, American physicist Robert Lindsay argued that "the statistical interpretation of entropy and the principles of thermodynamics leads at once to another important point of view, namely, that of the role of order in the direction of naturally occurring processes." He continues, "we can therefore introduce another interpretation of entropy: increase in entropy means a transition from a more orderly state to a less orderly state", a principles which he oversimplifies to be applicable to all systems. In particular, he concludes that the second law of thermodynamics states:

> "In any naturally occurring process the tendency is for all systems to proceed from **order** to disorder, and the maximum entropy of Clausius is the state of complete disorder or thorough randomness, out which no return to order is practically possible."

This sloppy argument is an example of unsubstantiated over-extrapolation of an ideal gas system logic to an all-system logic.

References

1. Schrödinger, Erwin. (1944). *What is Life?* (ch. 6 "Order, Disorder, and Entropy). pgs. 67-75 Cambridge: Cambridge University Press.
2. Lindsay, Robert B. (1973). *The Role of Science in Civilization,* (pg. 161-62). Westport: Greenwood Press.
3. (a) Needham, Joseph. (1936). *Order and Life.* New Haven: Yale University Press.
(b) Layzer, David. (1990). *Cosmogenesis: the Growth of Order in the Universe,* (section: "Biological Order", pgs. 28-32). Oxford University Press.
4. Needham, Joseph. (1942). "Evolution and Thermodynamics: a Paradox with Social Significance" (abs), *Science and Society*, 352-75.

θΔics

In famous publications, **Order, Disorder, and Entropy** is the famous nine-page chapter six of Austrian physicist Erwin Schrodinger's 1944 book *What is Life?*, itself a precipitate of Schrodinger's February 1943 lectures at Trinity college. [1]

Overview

It is difficult to even begin to describe the influence of this little chapter. In all probability, it is likely the most indirectly-cited chapter in corpus of theory represented with human thermodynamics, particularly for its simpleton derivation of negative entropy, which Schrodinger posits is the thermodynamic representation of the order of any system.

See also

â— Entropy as disorder confusions

References

1. Schrodinger, Erwin. (1943). *What is Life?* (ch. 6: Order, Disorder, and Entropy, pgs. 67-75). Cambridge University Press.

θΔics

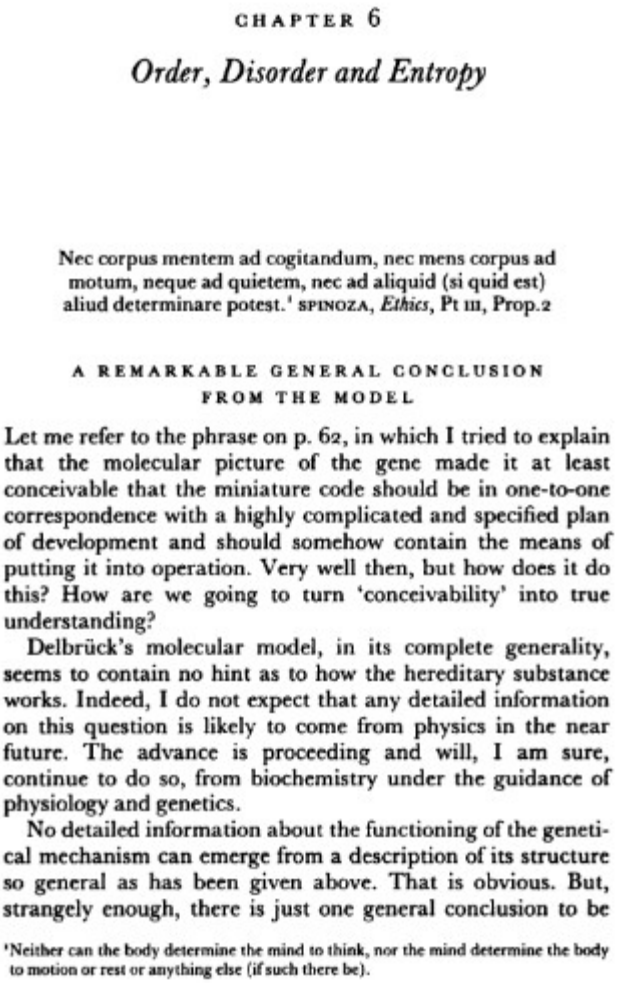

CHAPTER 6

Order, Disorder and Entropy

Nec corpus mentem ad cogitandum, nec mens corpus ad motum, neque ad quietem, nec ad aliquid (si quid est) aliud determinare potest.[1] SPINOZA, *Ethics*, Pt III, Prop.2

A REMARKABLE GENERAL CONCLUSION FROM THE MODEL

Let me refer to the phrase on p. 62, in which I tried to explain that the molecular picture of the gene made it at least conceivable that the miniature code should be in one-to-one correspondence with a highly complicated and specified plan of development and should somehow contain the means of putting it into operation. Very well then, but how does it do this? How are we going to turn 'conceivability' into true understanding?

Delbrück's molecular model, in its complete generality, seems to contain no hint as to how the hereditary substance works. Indeed, I do not expect that any detailed information on this question is likely to come from physics in the near future. The advance is proceeding and will, I am sure, continue to do so, from biochemistry under the guidance of physiology and genetics.

No detailed information about the functioning of the genetical mechanism can emerge from a description of its structure so general as has been given above. That is obvious. But, strangely enough, there is just one general conclusion to be

[1]Neither can the body determine the mind to think, nor the mind determine the body to motion or rest or anything else (if such there be).

Title page to Erwin Schrodinger's 1944 chapter Order, Disorder, and Entropy.

In hmolscience, **order-from-disorder**, or "order out of chaos", refers to the seemingly paradoxical phenomenon of the spontaneous formation of ordered structures in the universe, as typified by humans and society, in a universe governed by the second law of thermodynamics, often typified as the tendency in isolated systems to tend towards maximum entropy.

CF001.2: The second law of thermodynamics, and the trend to disorder, is universal.

The entire universe is a closed system, so the second law of thermodynamics dictates that within it, things are tending to break down. The second law applies universally. (T. Wallace 2002)

1. The second law of thermodynamics applies universally (see CF001), but, as everyone can see, that does not mean that everything everywhere is always breaking down. The second law allows local decreases in entropy offset by increases elsewhere. The second law does not say that order from disorder is impossible; in fact, as anyone can see, order from disorder happens all the time.

2. The maximum entropy of a closed system of fixed volume is constant, but because the universe is expanding, its maximum entropy is ever increasing, giving ever more room for order to form (Stenger 1995, 228).

3. Disorder and entropy are not the same. The second law of thermodynamics deals with entropy. There are no laws about things tending to "break down."

An **order from disorder** rebuttal, CF001.2 (Q), from TalkOrigins.org index editor (Q) Mark Isaak's 2005 book on the top 400 counter-creationism objections, that order from disorder is impossible, according to the second law. [3]

History

The phrase "order from disorder sprung" is from John Milton's 1667 *Paradise Lost*. (Q)

In 1944, Austrian physicist Erwin Schrödinger penned his "Order, Disorder and Entropy", wherein he pits the science of genetics as a counter to statistical thermodynamics and second law, entropy tendency, towards disorder. [1]

In 1984, Belgian chemist Ilya Prigogine published *Order Out of Chaos*, in which a nonequilibrium thermodynamics variation of a far-from-equilibrium state of ordered life emergence was hypothesized. This soon led to a mixture of the two interpretations.

In 1992, American sociologist Thomas Fararo, in his *The Meaning of General Theoretical Sociology*, warns his readers not to mix up the far-from-equilibrium Prigoginean thermodynamics interpretation of equilibrium and structure formation with the standard sociological one (an abstract analytical conception): [2]

> "The main point is that theoretical sociology should employ an abstract analytical conception of equilibrium in which this concept is in reference to certain states of the social system, not of the biophysical environment … any special emergence of **order-from-disorder** phenomenon in our field must be accounted for by the mechanism of social interaction, not by a vague appeal to some thermodynamic situation."

(add discussion)

References

1. (a) Schneider, Eric D. and Sagan, Dorion. (2005). Into the Cool: Energy Flow, Thermodynamics, and Life (section: Order from Disorder, pg. 15-19). Chicago: The University of Chicago Press.
(b) Schneider, Eric D. and Kay, James J. (1997). "Order from Disorder: the Thermodynamics of Complexity in Biology", chapter 12 (pgs. 161-74) in Michael P. Murphy and Luke A. J. O'Neill's *What is Life? the Next Fifty Years*, Cambridge University Press.
(c) Hunter, Graeme K. (2000). *Vital Forces: the Discovery of the Molecular Basis of Life* (pg. 249).

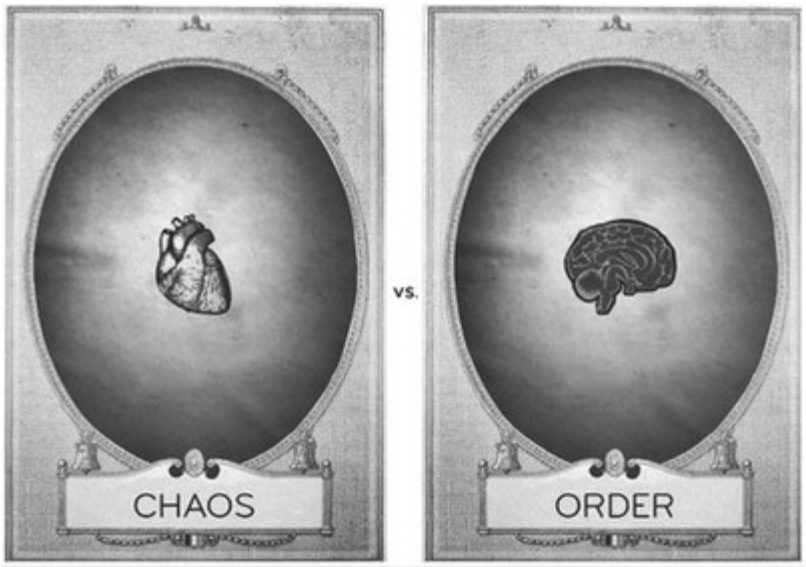

A chaos vs order image (Q), indicative of the idiom that the mind brings order; following the heart, often times, brings about chaos.

Academic Press.
2. Fararo, Thomas J. (1992). *The Meaning of General Theoretical Sociology: Tradition and Formalization* (pg. 86-87). Cambridge University Press.

Mark Isaak's 2007 counter-creationism snippet on the assertion, commonly employed by creationists, that order from disorder is impossible according to the second law. [3]

3. Isaak, Mark. (2007). *The Counter-Creationism Handbook* (order from disorder, pgs. 191, 193). University of California Press.

θΔics

In existographies, **Orestes Brownson** (1803-1876) (IQ:155|#530) [RGM:881|1,330+] (EPD product) was an American auto-educated intellectual, activist, and publicist; noted for his voluminous writings on his respective views as a Presbyterian (1822) turned Universalism pastor (1831) turned infidel-atheist (1840) turned Roman Catholic (1844).

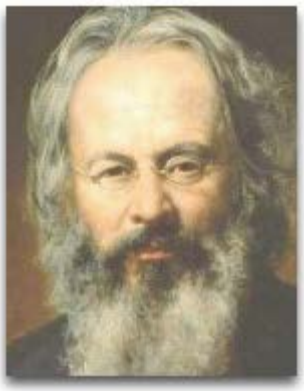

Quotes | By

The following are quotes by Brownson:

> "Infidel literature, or science pressed into the service of infidelity, or even into the service of mammon, we grant, has no attractions for us, and, in our judgment, contributes nothing not really injurious to the best interests of mankind. If the reviewer thinks differently, we thank god the church does not think with him. What benefit to mankind does the reviewer think has accrued from the writings of Hobbes, Tindal (1656-1733) (Q), Collins, Morgan (1806-1871) (Q)(Q), Mandeville (1670-1733) (Q) , Voltaire, Rousseau, Helvetius, D'Holbach, Dupuis, Cabanis, Destutt de Tracy, Goethe, Schiller, Kant, Schelling, Hegel, Heine, Eichhorn, Gesenius, Paulus, Strauss, Feuerbach, Godwin, Byron, Shelley, Bulwer, Victor Hugo, De Balzac, George Sand, Paul de Kock, Eugene Sue, and **hundreds and hundreds of others** we might mention had we room? Genius, talent, learning, are never respectable unless enlisted in the cause of religion, unless they bow low at the foot of the cross, and lay their offerings on the altar of the crucified god. Is the reviewer prepared to deny this?"
>
> — Orestes Brownson (1846), "Article", *Methodist Quarterly Review*, Jan

See also

- Lee Strobel
- Ravi Zacharias

References

1. (a) Brownson, Orestes. (1846). "Article", *Methodist Quarterly Review*, Jan.
(b) Brownson, Orestes A. (1884). *The Works of Orestes A. Brownson: Controversy, Volume Six: Containing the Second Part of the Writings in Defense of the Church* (editor: Henry Brownson) (pg. 563). T. Nourse.

Further reading

- Brownson, Orestes. (1840). *Charles Elwood: the Infidel Converted* (note: a semi-autoexistographical work). Publisher.
- Brownson, Orestes A. (1883). *The Works of Orestes A. Brownson: Religion and Society, Volume Four: Containing the Writings on Religion and Society* ***Prior to*** *the Author's Conversion* (editor: Henry Brownson). T. Nourse.
- Brownson, Orestes A. (1884). *The Works of Orestes A. Brownson: Controversy, Volume Six: Containing the Second Part of the Writings in Defense of the Church* (editor: Henry Brownson) (pg. 563). T. Nourse.

External links

- Orestes Brownson – Wikipedia.

θΔics

In science, **organic** (TR=983), as contrasted with inorganic (TR=112), tends to refer to the chemistry of organs, “organisms”, or with living structure (see: organic life), and in large part tends to be a chemistry-coated term used to distinguish or label life from non-life; and or, depending, that associated with carbon-based compounds. Related terms include: organic life, as contrasted with inorganic life; as well as organic chemistry, as contrasted with inorganic chemistry.

Organic | Inorganic duality

Several thinkers, amid the French enlightenment, including Pierre Maupertuis (1698-1759) and Denis Diderot (1713-1784), promoted a non-supernatural duality theory, according to which two types of matter existed: organic and inorganic. [3]

Related

In 1794, English physician Erasmus Darwin published his *Zoonomia: or the Laws of Organic Evolution*, in which he speculated on the origin of life. [1]

In 1935, Schrodinger, in his *Science and the Human Temperament*, stated the following in regards to the second law and rise of human cultures, as re-quoted by American anthropologist Leslie White (1959): [2]

> “I am convinced that this law [second law] governs all physical and chemical processes, even if they result in the most intricate and tangled phenomena, such as **organic life**, the genesis of a complicate world of organisms from primitive beginnings, [and] the rise and growth of human cultures.”

(add discussion)

Life terminology upgrades

> *See main: Life terminology upgrades*

In 2009, with the establishment of the defunct theory of life position, by American electrochemical engineer Libb Thims, the concept or notion of "organic" life became classified as a defunct scientific theory, upgrade to powered CHNOPS-ological matter.

References

1. Zoonomia – Wikipedia.
2. (a) Schrodinger, Erwin. (1935). *Science and the Human Temperament* (pgs. 39, 47). George Allen & Unwin, Ltd.
(b) White, Leslie A. (1959). “Energy and Tools”, in: *The Evolution of Culture: the Development of Civilization and the Rise and Fall of Rome* (pg. 39), McGraw-Hill; in: *Readings for a History of Anthropological Theory* (editors: Paul A. Erickson and P.A.E. Liam D. Murphy) (§23, pgs. 293-310; quote, pg. 297). University of Toronto Press, 2010.
3. (a) Pullman, Bernard. (1995). *The Atom in the History of Human Thought* (translator: Axel Reisinger) (pgs. 146-51). Oxford University Press, 1998.
(b) Stenger, Victor J. (2013). *God and the Atom: from Democritus to the Higgs Boson: the Story of a Triumphant Idea* (pg. 76). Prometheus Books.

θΔics

In chemistry, **organic chemistry**, as contrasted with inorganic chemistry, is the study of carbon-based, CH-based, and or CHNOPS-based, CHNOPS+ based things; the chemistry of organic things.

Quotes

The following are related quotes:

> "It is the object of these researchers to do away with 'life' as an explanation, wherever **organic chemistry** is concerned."
>
> — Marcellin Berthelot (c.1865), *Publication*; cited by Forris Moore (1918) in *A History of Chemistry* (pg. 204); cited by George Scott (1895) in *Atoms of the Living Flame* (pg. 93)

> "Since my name is not Socrates or Einstein and I hold only one [**organic chemistry**] of the seven or eight PhD degrees [see: **polymathy degree problem**] this problem [EAP] requires, readers are quite justified in questioning my qualifications to testify as such a multidisciplinary expert."
>
> — George Scott (1985), *Atoms of the Living Flame* (pg. viii) [1]

References

1. Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pg. viii). University Press of America.

External links

â— Organic chemistry – Wikipedia.

θΔics

In hmolscience, **organic vs inorganic**, a chemical restatement of the "life vs nonlife" divide, originating from the animal + plant (organic) and mineral (inorganic) tripartite divide of Carl Linnaeus (aka Linnaean classification), refers to precariously untenable divide of the periodic table into two groups, one generally carbon-based (i.e. organic), the other non-carbon based (i.e. inorganic), in short.

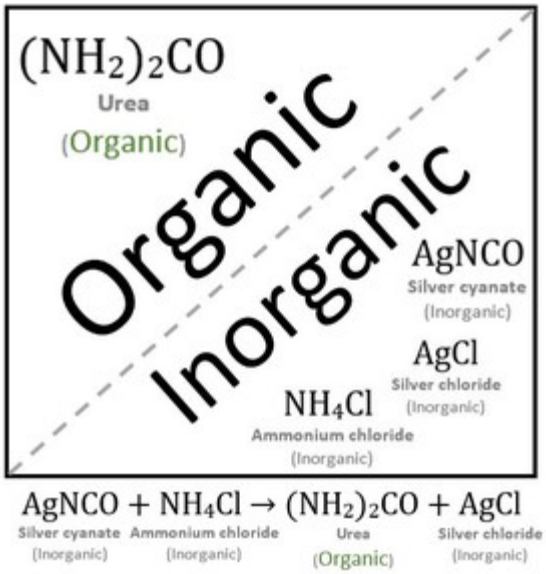

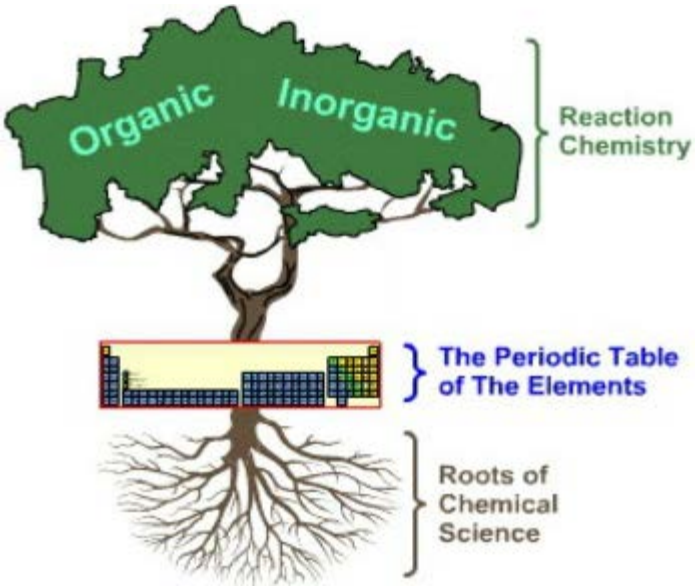

Left: Friedrich Wohler's 1828 urea synthesis, which according to Henry Bray "bridged the gap" between organic and inorganic. Right: Mark Leach's "**organic vs inorganic**" tree divide, representative of his "chemogenesis theory, according to which conceptualizes that chemical reactivity, organic, and inorganic "emerge" from the periodic table. (Ñº)

Overview

In 1862, Ernst Haeckel, in his *The History of Creation*, stated the following: [1]

> "The idea of the unity of **organic and inorganic** nature is now firmly established. . . . All natural bodies which are known to us are equally animated, and the distinction which has been made between animals and inanimate bodies does not exist."

In 1910, Henry Bray, in his *The Living Universe*, previously citing the above quote by Haeckel, stated the following: [2]

> "Some years ago chemistry was divided into **inorganic and organic** branches, on the supposition that what is known as the life-principle was somehow a necessary factor in the formation of the organic compounds; but since very many of these compounds have been made, and are now daily making, in all the laboratories of the world, this supposed principle of differentiation has to be given up. Today organic chemistry is sometimes called, 'chemistry of the carbon compounds'; sometimes, 'chemistry of the hydro-carbons and their derivatives'. By whatever name one may call it, chemists no longer believe that organic chemistry is dependent on any so-called life principle for the formation of its compounds. Especially is this true since potassium cyanide [KCN], urea [CH_4N_2O], potassium formate [HCO_2K], and acetylene [C_2H_2] were formed by Wohler and Berthelot: and since in our own day carbon compounds exactly as they exist in the bodies of plants and animals are prepared hourly with simply chemical means. Thus therefore the supposed chasm between the so-called living and the so-called dead **has been most certainly bridged** [compare: unbridgeable gap]."

In 1926, Vladimir Vernadsky, in his *The Biosphere*, attempted to surmount the life / non-life issue, thermodynamically, by arguing that certain portions of the periodic table go into living matter, and that there is some type of unbridgeable gap between living matter and non-living matter, or something along these lines; the result, however, was highly incongruous.

Quotes

The following are related quotes:

> "What are the physical and chemical origins of diversity among **inorganic and organic** things, and how shall the adaptability of matter and energy be described? He may then see his way through all the difficulties which philosophical and biological thought have accumulated around a problem that in the final analysis belongs only to physical science, and at the end he will find a provisional answer to the question."
>
> — Lawrence Henderson (1917), *Order of Nature* [3]

> "Even now there are serious conceptual discontinuities in the evolutionary theory, were its philosophical mission of unifying organic and inorganic nature is not fully realized. Whereas **organic nature** is pictured as purposive, self-serving, and, at least in its highest expressions, conscious, **inorganic nature** is conceived as behaving according to the blind mechanistic principles of chance and necessity."
>
> — Jeffrey Wicken (1981), "Chance, Necessity, and Purpose: Toward a Philosophy of Evolution" [4]

> "Chemistry professors are unstable mixtures of predominantly unstable compounds which, in the exclusive presence of the sun's heat, decay irreversibly into simpler **organic and inorganic** compounds. That's a scientific fact. The question is: Then why does nature reverse this process? What on earth causes the inorganic compounds to go the other way? It isn't sun's energy. We just saw what the sun's energy did. It has to something else. What is it?"
>
> — Robert Pirsig (1991), *Lila: An Inquiry into Morals*

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θΔics

In terminology, **organism** is an individual powered CHNOPS+ entity, e.g. plant, animal, microorganism, comprised of 'organs'. [1]

Quotes

The following are related quotes:

> "No one, not even the vitalist, doubts that the **organism** is a Gibbs system."
>
> — Lawrence Henderson (1917), *The Order of Nature*

> "**Organisms** are much more complicated than minerals. We know the free energy of formation and the entropy of quartz, but the value of the same parameter in a cell is unknown."
>
> — Norman Dolloff (1975), *Heat Death and the Phoenix* [2]

> "**Organisms** consist exhaustively of atoms and molecules. A steam engine may consist only of iron and other materials, but it is something else than iron and other components. Similarly, an electronic computer is not only a pile of semiconductors, wires, plastic, and other materials. Organisms are made up of atoms and molecules, but they are highly complex patterns, and patterns of patterns, of these atoms and molecules. Can the properties of benzene be predicted from knowledge about oxygen, hydrogen, and carbon? Or, at a higher level of complexity, can the behavior of a cheetah chasing a deer be predicted from the knowledge about the atoms and molecules making up these animals?"
>
> — Francisco Ayala (1983), "Biology and Physics: Reflections and Reductionism" [3]

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(b) Daintith, John. (2005). *Oxford Dictionary of Science* (pg. 585). Oxford University Press.
(c) Organism – EtymOnline.com.
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3. Ayala, Francisco J. (1983). "Biology and Physics: Reflections and Reductionism"; in: *Old and New Questions in Physics, Cosmology, Philosophy, and Theoretical Biology: Essays in Honor of Wolfgang Yourgrau* (editor: Alwyn Merwe) (§A1:525-34). Plenum Press.

External links

â— Organism – Wikipedia.

θΔics

In hmolscience, **organistic sociology**, “social organism theory” (Ward, 1897), “bio-organismic school” (Sorokin, 1928), or “organic analogy” (Odum, 1929), refers to the biological interpretation of social phenomena; society viewed as an organism made of cells governed by non-supernatural physiological principles.

The organic model (organic sociology), in late 1920s sociological classifications (Sorokin, 1928; Odum, 1929), were ranked second behind the lumped grouping of: mechanical (mechanical sociology), physical (physical sociology), chemical (chemical sociology), and or energetic (energetic sociology) models of social phenomena; which, in crude division terms, in the 1940s became superseded by the thermodynamical sociology (Henderson, 1942); which, in crude division terms, in the 1980s became superseded by the physicochemical sociology (Beg, 1987) models.

Overview

In 1860, Herbert Spencer published his essay “The Social Organism”, wherein he attempted to usurp Biblical models of society with a growth model of society; a representative excerpt is as follows: [1]

> “Social organization in its leading traits, are neither supernatural, nor are determined by the wills of individual men, as by implication the older historians teach; but are consequent on general natural causes.”

Spencer, the “most notable” social organic theorist, according to Howard W. Odum (1929), in short, interpreted the structure and function of society in quasi-biological organism terms. [2]

The second big social organicist was Russian statesman and social scientist Paul von Lilienfeld (1829-1903) (Q) who, over the course of eight years, penned a five volume *Thoughts on the Social Science of the Future*:

> I. Human Society as a Real Organism (1873)
> II. The Laws of Society (1875)
> III. Social Psychophysics (1877)
> IV. Social Physiology (1879)
> V. Religion Considered from the Viewpoint of Real Genetic Social Science: Attempt at a Natural Religion (1881)

The following is an abstract of the first three volumes:

> “Lilienfeld starts with the conception of society as a real organism, and attempt to work out this point of view upon the methods proper to the natural sciences. The treatise commences with a demonstration that society consists of individuals in the same manner as the physical organism is made up of cells, and that the one is real in the same sense as the other. With this idea the author seeks to exhibit a thorough-going identity between the laws of nature as they exist in the case of its highest development, society, and in its lower stages, including the individual human being. The first three parts are worked out with great minuteness, the connecting thread being the conception of a real analogy between the individual and the social group as the essential foundation of the social science of the future.”
>
> — Anon (1878), “Review of *Thoughts on the Social Science of the*” [4]

Other so-called “organicists”, according to Sorokin (1928), include: Vacher de Lapouge (1854-1936) (Q), who had read Spencer and Darwin, Gabriel Tarde, who was critical of Lilienfeld, Alfred Fouillee (1838-1912) (Q), who theorized about “idea forces” (1890), Emile Durkheim, Paschel, Thomas Hobbes, Georg Simmel, Joseph de Maistre (1753-1821) (Q), Burke, Muller, Johann Herder, Johann Fichte, Immanuel Kant, Friedrich Schelling, and Georg Hegel. [3]

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External links

- Social organism – Wikipedia.
- Organicism – Wikipedia.
- Organismic theory – Wikipedia.
- Organic (model) – Wikipedia.

θΔics

In psychodynamics, **orgone energy** is a type of hypothesized sexual energy, psychological energy, or energy related to the orgasm, postulated in the 1920s by Austrian-born American psychologist Wilhelm Reich, said to permeate the atmosphere and all living things. [1]

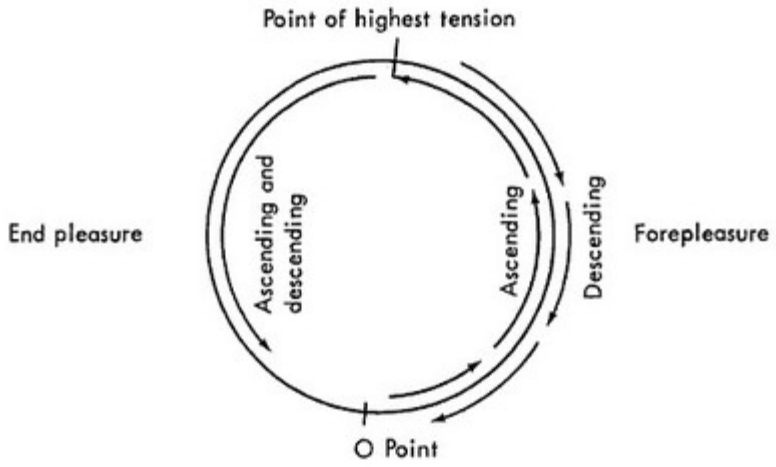

Austrian-born American psychologist Wilhelm Reich's 1923 sexual tension diagram, from his "Concerning the Energy of Drives", in which the outlines of the idea of **orgone energy** began to take root. [13]

The theory of orgone energy was [or is] very controversial, is said to be now considered a defunct theory, although devices utilizing this theory are still being sold on Amazon (see below), and very convoluted to pick through, being that it culls from a number of different areas, both from the nonsensical fringe domain, e.g. chemical ether, from electromagnetic field theory, semi-conductor theory, and from Freudian psychodynamics, in particular Austrian psychologist Sigmund Freud's libido theories (sexual drive), which themselves are deeply rooted in extrapolated ideas of Helmholtzian thermodynamics (Freud's vicarious mentor), i.e. of concepts of conservation of energy, bound energy, free energy applied to the mental domain of thought, action, and repression of ideas and movements.

Orgone energy, in some contexts, is described as being "negative entropic force", or life force, in nature responsible for concentrating and organizing matter. This, however, may be a latter interpretation by one Reich's followers, being that the concept of negative entropy wasn't introduced until *circa* 1942; although, to note, Reich was aware of entropy used in psychology at least as early as 1923.

History

The theory of orgone energy was developed in the 1920s through the 1950s by Austrian-born American psychologist Wilhelm Reich, loosely being an expanded derivative of Sigmund Freud's psychological energy theories of libido (*Instincts and Their Vicissitudes*, *Beyond the Pleasure Principle*, etc.).

Summary videos of Austrian-born American psychologist Wilhelm Reich's **orgone energy** theory.

Reich, following Freud, saw nascent sexuality as the primary energetic force of life. The term itself was chosen to share a root with the word *orgasm*, which both Reich and Freud took to be a fundamental expression of psychological health. The focus on sexuality, while acceptable in the clinical perspective of Viennese psychoanalytic circles, scandalized the conservative American public; the result of which, spurred by the WWII fears, Reich was jailed at least twice.

In his 1923 article "Concerning the Energy of Drives", in which mention of entropy is made in a footnote, Reich outlines a "drive theory" to study the way in which energy functions in humans and nature and eventually, in the decades to follow, platforms from drive energy to, in the summary words of historian Michael Mannion, "libido through

bioenergy to orgone energy." [2]

Reich seems to have had many students that latched on to this idea, a school of thought sometimes called Reichian psychology. His daughter Eva Reich (1924-2008), for example was said have lectured on Reichian psychology, as well as taken part in many of his early experiments. [1]

In 1934, after his migration to the US, Reich began to speculate about biological development and evolution, and then branched out into much broader speculations about the nature of the universe. [3]

Patient using "orgone accumulator" box

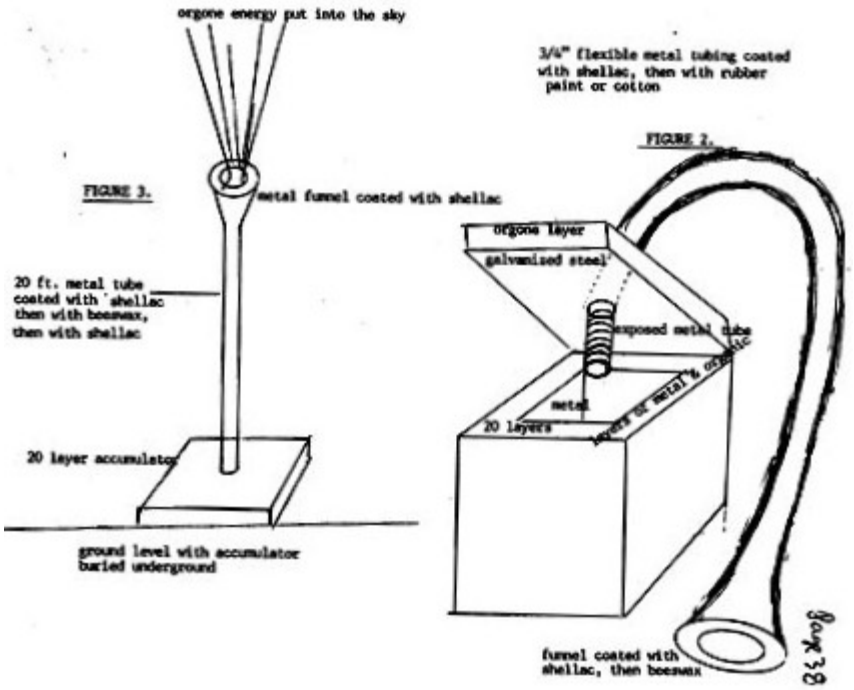

One of Wilhelm Reich's *circa* 1940s orgone accumulators, described as such: "one takes the energy directly out of the accumulator and send it to the specimen itself. This latter method is employed in construction of the chemical ether generator. A typical approach in its construction is to make a 5-20 layer orgone accumulator, making a small hole through all the layers. A small flexible tube can then be inserted directly inside, thereby drawing out the **orgone energy** from the multiplayer box. This tube is then aimed right at the specimen. Most of the time a metal cone is connected to the outside end of the metal tube. Both tube and cone should be coated with a good flexible organic insulator to prevent orgone energy from escaping from the sides." [8]

Believing he had detected "bions"—self-luminescent sub-cellular vesicles visible in decaying materials, and presumably present universally—he first conceived them as electrodynamic or radioactive entities, as had the Ukrainian biologist Alexander Gurwitsch, but later concluded from his research that he had discovered an entirely unknown but measurable force, which he then named "orgone", a pseudo-Greek formation probably from *org-* "impulse, excitement" as in *org-asm*, plus *-one* as in *ozone* (the Greek neutral participle, virtually *á½„ργον, *gen.*: *á½„ργοντος). [11]

Orgone accumulators

In 1940, jumping from what seems to have been a possibly a useful theory of sexual energy in outline, Reich jumped into what seems to be the fringe range of ideas (e.g. discussing UFOs), when he built what he called "orgone accumulators", types of said-to-be conductive boxes, comprised of alternating layers of ferrous metals (iron) and organic insulators (non-conducting material) with a high dielectric constant (ratio of the amount of electrical energy stored in a material by an applied voltage, relative to that stored in a vacuum), in which people could sit and absorb stored orgone energy or "orgone heat" from the surroundings, and supposedly heal themselves, or something along these lines.

In his *Time* magazine obituary, orgone energy accumulators are described as "telephone-booth-size devices that supposedly gathered energy from the atmosphere, and could cure, while the patient sat inside, common colds, cancer, and impotence." [4]

The construction of the boxes caught the attention

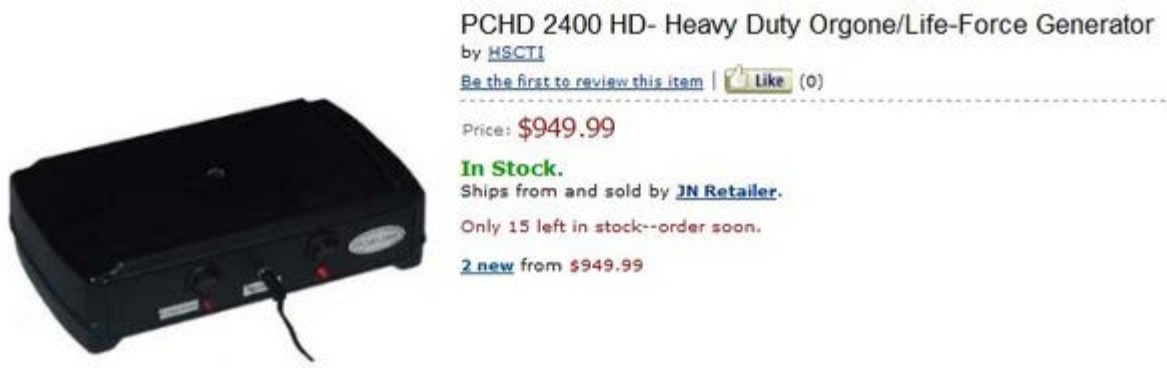

A modern-day version of Reich's **orgone energy** generator selling on Amazon. [10]

of the press, leading to wild rumors that they were "sex boxes" that caused uncontrollable erections. [9]

Einstein experiments

Reich was concerned with experimental verification from other scientists and famously contacted German-born American Albert Einstein, who agreed to participate and test some of Reich's theories.

On December 30, 1940, Reich wrote to Einstein saying he had a scientific discovery he wanted to discuss, and on January 13, 1941, went to visit Einstein in Princeton. They talked for five hours, and Einstein agreed to test an orgone accumulator, which Reich had constructed out of a Faraday cage (a metallic enclosure that blocks out external static and non-static electric fields) made of galvanized steel and insulated by wood and paper on the outside.

Einstein agreed that if, as Reich suggested, an object's temperature could be raised without an apparent heating source, thus violating the second law of thermodynamics, it would be a "bombshell" in physics. [7]

Einstein was said to have concluded that Reich's research lacked scientific detachment and experimental rigor, and in particular, found Reich's demonstrations of "orgone heat" inconclusive. [5] Reich eventually published a book on these experiments, and event which he dubbed the "Einstein affair", in 1953. [12]

Anti-orgone energy | Cloudbusters

Reich posited a conjugate, life-annulling energy in opposition to orgone, which he dubbed Deadly Orgone Radiation or DOR. He wrote that accumulations of DOR played a role in desertification, and he designed a "cloudbuster" with which he said he could manipulate streams of orgone energy in the atmosphere to induce rain by forcing clouds to form and disperse. It was a set of hollow metal pipes and cables inserted into water, which Reich argued created a stronger orgone energy field than was in the atmosphere, the water drawing the atmospheric orgone through the pipes. In 1953, he tested his cloudbuster orgone energy manipulator device out on blueberry crops, receiving money for his services.

See also

â— Siegfried Bernfeld and Sergei Feitelberg (and their libido energy and rectal temperature vs. brain temperature measurements of entropy, etc.).

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External links

â— Orgone – Wikipedia.

θΔics

In existographies, **Origen** (185-254AD) (IQ:170|#350) (Cattell 1000:145) (RMS:24), aka "Origenes" (Guericke, 1672), was an Alexandrian-born heretical theologian, referred to as the "great" (Voltaire, 1764), in comparison to Augustine and St. Clement of Alexandria, noted for []

Overview

In c.230, Origen, in commentary on Genesis, said the following: [1]

> "To what person of intelligence, I ask, will the account seem logically consistent that says there was a 'first day' and a 'second' and 'third', in which also 'evening' and 'morning' are named, without a sun, without a moon, and without stars, and even in the case of the first day without a heaven (Gen. 1:5-13)? …. Surely, I think no one doubts that these statements are made by Scripture in the form of a type by which they point toward certain mysteries."

Another variant of this famous quote is:

> "What man of sense will think that there was a first and second and third day, evening and morning, without any sun, moon, or stars? And who would be so stupid as to imagine that god, after the fashion of a human gardener, had planted a garden in Eden towards the East, and set in it a tree of life that should be seen and felt, so that one who ate of its fruit with his bodily teeth should acquire life? Why need I say more when anyone who is not blind can quote multitudes of such examples, written down as though they had occurred, and yet never having occurred in the literal sense?"
>
> — Origen (c.230), *Publication*; quoted by J. Armitage-Robinson (1904); cited by George St. Clair (1907) in *The Secret of Genesis* (pg. 5)

(add)

Noah's ark | Pyramid

In c.230BC, Origen alluded to the idea that Noah's ark was pyramid-shaped, or that it's roof was the shape of a pyramid:

> "l think that the ark, as much as is clear from the things that are described, had four angles rising from the bottom that gradually narrowed as they came to the peak and came together in the space of one cubit. Thus the cubit is the length and width of the peak."
>
> — Origen (c.230) (Q)

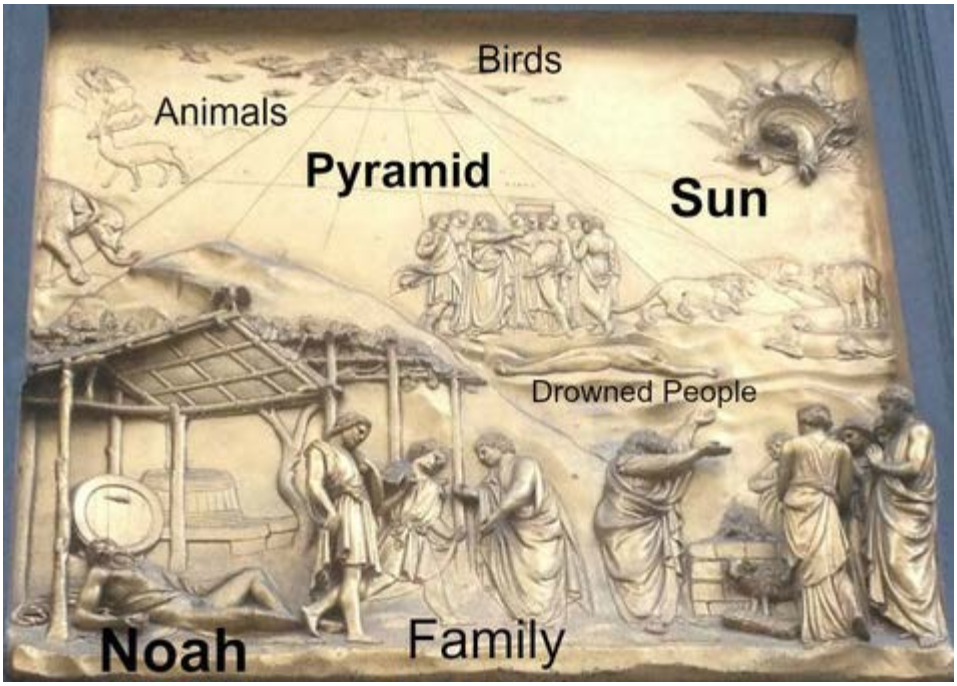

Italian artist Lorenzo Ghiberti's 1452 depiction of Noah's ark (as a pyramid) based Greek theologian Origen's c.230 earlier ideas about a pyramid ark.

In 1452, Italian artist Lorenzo Ghiberti (1387-1455) (Q) , in his 'Gates of Paradise' panel section, included three scenes (Q) showing the Biblical story of the flood, one

of which, shown below, depicting Noah and his family coming to rest outside of a "pyramid" (not a mountain), that arose out of the flood (adjacent). [2]

The pyramid shown here, to note, is interpreted by Ghiberti to be the “ark” and not actually the mountain. This pyramid ark thesis comes from Greek theologian Origen. [3]

> “I think that the ark, as much as is clear from the things that are described, had four angles rising from the bottom that gradually narrowed as they came to the peak and came together in the space of one cubit. Thus the cubit is the length and width of the peak.”
>
> — Origen (c.230) (Q)

Ghiberti's two doors, started in 1403, taking 25-years to complete, contain ten illustrations from the Old Testament, including creation of Adam and Eve, Noah’s ark, and Moses receiving the Ten Commandments. (Q)

Quotes | On

The following are quotes on Origen:

> “If anyone does not confess that our Lord Jesus Christ who was crucified in the flesh is true god and the Lord of Glory and one of the Holy Trinity: let him be anathema. If anyone does not anathematize Arius, Eunomius, Macedonius, Apollinaris, Nestorius, Eutyches and **Origen**, as well as their impious writings, as also all other heretics already condemned and anathematized by the Holy Catholic and Apostolic Church, and by the aforesaid four Holy Synods and [if anyone does not equally anathematize] all those who have held and hold or who in their impiety persist in holding to the end the same opinion as those heretics just mentioned: let him be anathema.”
>
> — Anon (553), 5th Ecumenical Council: Constantinople II, The Capitula of the Council (§:10-11) (Q)

> “**Origenes** wished to interpret the waters above the heavens, as described in the first chapter of Genesis, as being angels who enjoy the sight of god, and the lower waters as the devils who have been banished from the heavens for their wrongdoing.”
>
> — Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* (pg. 73)

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External links

- Origen – Wikipedia.

θΔics

In science, **origin of life** was a sort of puzzle, aka "origin of life problem" or "great problem of natural philosophy", grappled with regarding the conditions, time-frames, physics, and chemistry involved in the supposed transition from non-life to life, or when life started in the metamorphosis from hydrogen to human in the great chain of being or coupled mechanism of chemical reaction synthesis and analysis.

The following overview by American physicist John Gribben summarizes the way most modern people think about the question of the origin of life:

> "That all living organism share the same four letter alphabet and common DNA language, is convincing evidence that we are all descendant from one uniquely successful ancestor, whether that ancestor first appeared inside a comet [spore life] or in Haldane's primeval soup [light/heat-made life] or in Darwin's warm little pond [lightning-made life]."

which summarizes the three main origin of life theories.

Old view

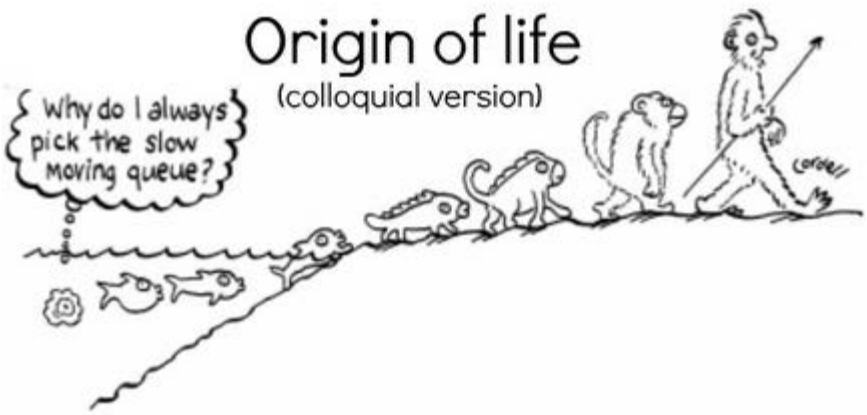

Modern view

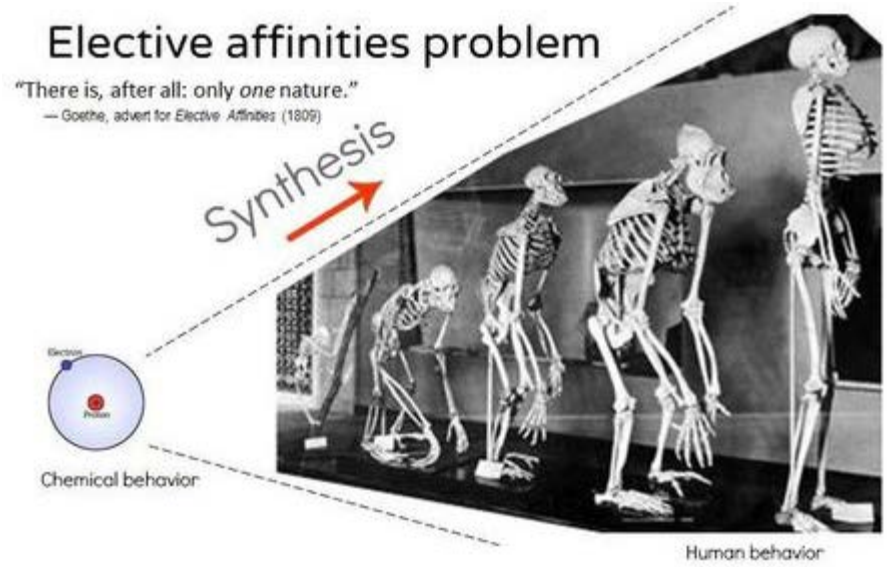

Top: the "**old**" colloquial view of evolution, according to which "life" originated 3.85 billion years ago in the form of some type of cell or bacteria. **Bottom:** the "**new**" hmolscience view of the chemical synthesis of humans from hydrogen atom precursors, according to which—in the defunct theory of life view of things—humans are 26-element molecules that have been synthesized over time, in a transformation process that began once the the sun ignited some 4.5 billion years ago (see: elective affinities problem).

Theory | Histories

In 1933, German chemist Edmund Lippmann, in his *Spontaneous Generation and Life Force: the History of these Problem from the Earliest Times up to the Beginning of the 20th Century*, according to Alexander Oparin (1936), gave a fairly complete survey of all the theories of the origin of life, from ancient times to the early 20th century. [22]

Perpetual motion

The majority of all origin of life theories, in large part, amount to perpetual motion of the living kind theories (e.g. self-motion); the following is an apt illustration of this:

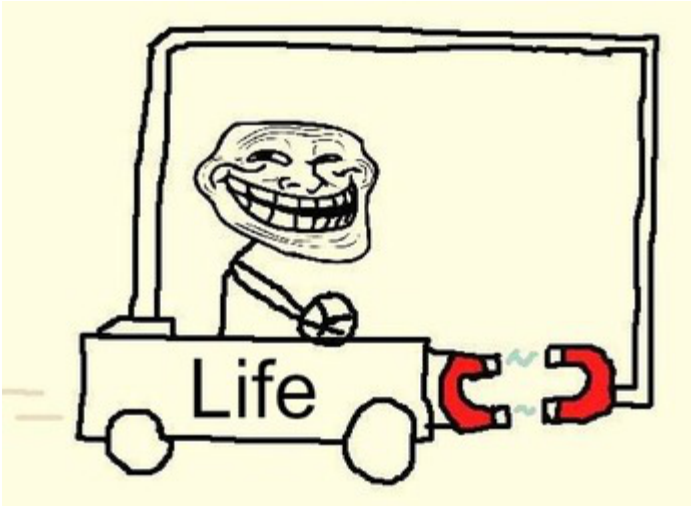

(add discussion)

List

The following are the main historical "origin of life" theories listed chronologically:

- Creation / Creationism
- Clay creation origin of life
- Creation by breath
- Gunpowder theory of life
- Spark of life theory
- Meteoroid origin of life theory
- Lightning origin of life theory
- Half-living thing
- Warm pond model
- Laboratory produced life
- Clay substrate theory
- Hydrothermal vent origin of life theory
- Autocatalytic closure
- No origin of life theory

Among this list, the "meteoroid theory" is somewhat recent, and adhered to by some at present. In 1834, Jacob Berzelius obtained samples of the Alais meteorite (a meteorite that had fell near the town of Alais in France in 1802) and subjected them to chemical analysis, and found the presence of carbon compounds, which to Berzelius meant life. [16] This seems to have been the start of the so-called "comet origin of life theory".

French chemist Marcellin Berthelot isolated “coallike” material from the 1864 Orgueil meteorite and under the microscope, tiny spherical grains were revealed, coated in carbonaceous material, which reminded Berthelot of fossilized bacterial cells. [16] Other similar theories were put forward by those including: William Thomson (1871), Hermann Helmholtz (1879), and Svante Arrhenius (1903).

In 2015, Martha Grover, et al, in their “A Chemical Engineering Perspective on the Origins of Life”, gave the following conceptual diagram (left), indicative of the ideology most modern scientists have in mind in respect to the origin of life question, which shows a pre-biotic or primordial soup earth reducing atmosphere model overlaid with the Miller-Urey experiment; about which they ruminate on, as quoted below (right): [21]

“How did these simple chemicals react to form the

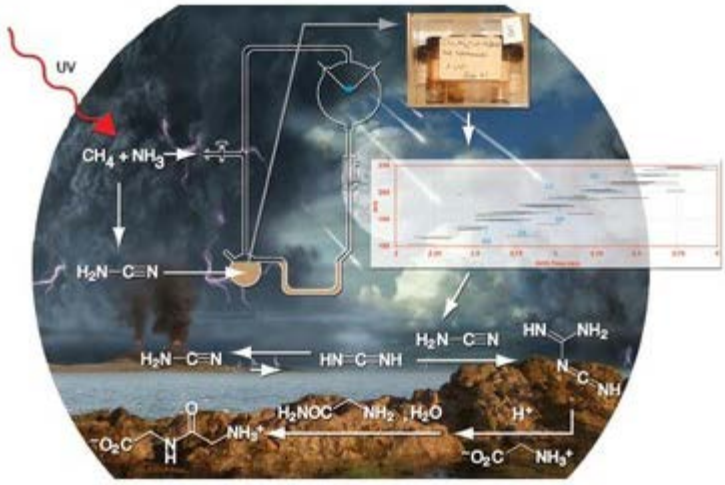

small-molecule building blocks of life?—amino acids, nucleobases, sugars, and lipids. While the exact pathways may never be known, many pathways can certainly be excluded based on prebiotic constraints, leaving a smaller number of plausibly prebiotic candidates. The scientific question is thus "How could life have emerged?" To answer this question, the chemicals and the environment must be considered together as a system, which may also include a periodically varying environment that drives the chemical reactions. The kinetics of these reactions must be understood, as well as the long-term thermodynamic behavior."

(add discussion)

Beliefs

Recent estimates indicates of polled Americans, yield the following opinions on the question of the origin of life: [14]

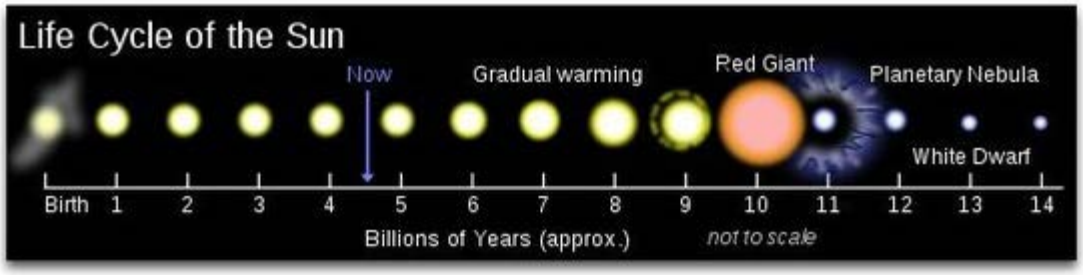

A timeline depiction of the formation and transformation of the sun, according to which, humans, as animated molecules, having over time become attached to the surface of the earth—which rotates on its axis and revolves about the sun—are viewed as animated atomic aggregates (human molecules) that have come into bound state existence, following some 4.5 billion years of thermodynamically-governed cyclical heat-driven chemical reaction synthesis and transformation (see: nebular hypothesis). [18]

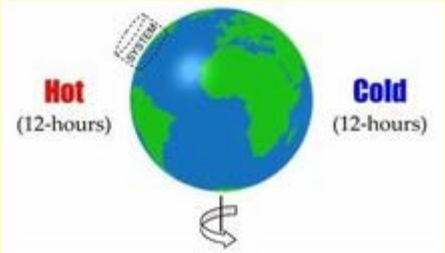

- 42 percent of Americans believe that life has existed in its present form since the beginning of the world.
- 21 percent believe that while life may have evolved, its evolution has been guided by the hand of God.
- 26 percent believe in evolution through natural section.

In other words, about 42% of Americans believe in the Bible, that humans were created, in their present form, some recent time in the past, i.e. circa 6,000-years ago, 21% believe in god-directed evolution, and 26% believe in one or another variations of Charles Darwin's theory of evolution from a warm pond.

Overview

The question became an issue in the years to follow the 1859 publication of English naturalist Charles Darwin's *Origin of Species.* The subject is often approached using the universal science of thermodynamics, being that its laws apply equally to both realms. [1]

The modern, post 2008 view, as outlined below, is that the concept of life, or of the supposed existence of living things, is defunct. It is scientifically incorrect to say that either subatomic or superatomic entities are "alive". The correct view is to say that what, in the past, were considered as "biological", e.g. a moving bacteria or a breathing human, are merely carbon-centric reactive "animate molecules". A human, for instance, is a 26-element human molecule that has been synthesized, by the operation of universe, over the course of the last 13.7 billion years.

The concept of life, in its most probable origin, is a vestigial theory of olden days religion, derived primarily from the Egyptian Ra-based theological theory a divine "breath of life" imparted to a living thing to give it life, in conjunction with a morality-based theory of afterlife/resurrection/reincarnation or of universal continuity, as this passed into the Abrahamic/Brahamic religions of the world, the basis of over 80 percent of the world's religious thinking, as regarding the concept of life.

Early | Life principle/mechanism theories

The following table outlines some of the famous materialistic origin of life theories:

Date	Theorist	View
1784	Johann Goethe (1749-1832)	Discovered the human intermaxillary bone connecting humans and lower animals in 1784; in his 1790 treatise on the metamorphosis of plants, he had worked out the evolution or transformation of parts (morphogenesis); by 1795, following more studies in osteology, he had become convinced of the universality of his “newly discovered principle”, and was able to define the idea in his *Sketch of a General Introduction to Comparative Anatomy*, wherein he laid down with the utmost confidence and precision, that “all differences in the structure of animals must be looked upon as variations of a single primitive type, induced by the coalescence, the alteration, the increase, the diminution, or event the complete removal of singe parts of the structure”; in 1796, in is *Third Lecture on Anatomy*, he interjected into evolution all the way down to the chemical level: hence the birth of his human chemical theory and with the publication of his 1809 physical chemistry based novella *Elective Affinities*, the start of the science of human chemistry.
1794	Erasmus Darwin (1731-1802) English physician	In his *Zoonomia*, explained: “would it be too bold to imagine, that in the great length of time, since the earth began to exist, perhaps millions of ages before the commencement of the history of mankind, would it be too bold to imagine, that all warm-blooded animals have arisen from one living filament, which the great first cause endued with animality, with the power of acquiring new parts, attended with new propensities, directed by irritations, sensations, volitions, and associations; and thus possessing the faculty of continuing to improve by its own inherent activity, and of delivering down those improvements by generation to its posterity, world without end!” [5]
1833	Etienne Saint-Hilaire (1772-1884)	Sometime in the 1830s, he states, in what seems to be a very telling view: [19] “It is quite certain that there was a moment when life did not exist on our planet, and another moment when it appeared. It is the passage between these two states that forms the great problem of natural philosophy today.” In later 13 Jul 1838 letter to Georg Sand he explains his reasoned position on this: “God created materials predisposed for organization, by endowing them with all the virtual conditions to pass through all possible transformations according to the prescriptions of unceasingly variable ambient media. Animal forms are thus unceasingly variable.”
	Charles Darwin	In his 1871 "Letter to Joseph Hooker", after publishing his famous evolution theory in 1859, wherein he cites Saint-Hilaire, Erasmus, and Goethe as precursors to evolution theory, he comments: [6]

1871 (1809-1882) English naturalist

"The original spark of life may have begun in a warm little pond, with all sorts of ammonia and phosphoric salts, lights, heat, electricity, etc. present, so that a protein compound was chemically formed ready to undergo still more complex changes."

1921 James Johnstone (1870-1932) English biologist

In his *The Mechanism of Life*, states: "life probably itself has existed on earth for 1,000 million years [and] in living processes the increase of entropy is retarded—this is our 'vital' concept."

1924 Alexander Oparin (1894-1980) Russian biochemist

In his *The Origin of Life* (1924), argued that compounds of nitrogen, carbon, hydrocarbons, and other oxygen-containing organic molecules fell from the cooling clouds, filling the oceans, and from these a complex aggregate called colloids formed, and eventually transformed into an organic body. [20] In 1936, argued, based on the 1931 'coazervate' theory of Budenberg de Jong, that inorganic molecules, in an oxygenless atmosphere, could react via the action of sunlight, to produce a 'primeval soup' of organic molecules; which in turn could combine to create a 'coacervate droplet'; which, in turn, would grow by fusion with other droplets, and reproduce through fission into daughter droplets, gaining a primitive metabolism in which those factors that promoted cell integrity survived, whereas those that didn't became extinct. [7]

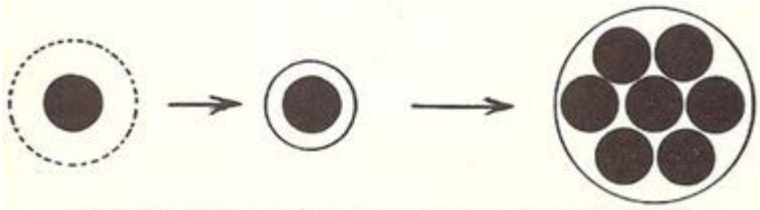
Transformation of a colloidal solution particle into a coazervate particle.

1925 Edwin Slosson (1865-1929) American chemist-theologian

In his *Sermons of a Chemist*, stated that "it has been surmised that in the early ages certain colloidal particles composed of compounds of carbon, hydrogen, nitrogen, and oxygen, perhaps in contact with a catalyst such as iron oxide, and under the influence of the ultraviolet rays of sunshine, might have acquired the power of feeding and fission, and so become the progenitors of all future living beings."

In a 1929 article, published in *Rationalist Annual*, argued that the atmosphere of the early earth was mostly carbon dioxide, ammonia, and water vapor, containing little oxygen; without oxygen no ozone would be present, hence: [20]

1929 John Haldane (1982-1964) English biochemist

"When ultra-violet light acts on a mixture of water, carbon dioxide, and ammonia, a vast variety of organic substances are made, including sugars and apparently [Edward Baly, 1920s] some of the materials from which proteins are built up. The first living or half-living things were probably large molecules synthesized under the influence of the sun's radiation, and only capable of reproduction in the particularly favorable medium in which they originated."

Here, to note, in Haldane's supposition of a 'half-living thing', we recall

$C_4H_7O_4N$ (aspartic acid) – not alive
$C_{10}H_{12}O_6N_5P$ (ribonucleic acid) – alive
$C_{21}H_{36}O_{16}N_7P_3S$ (coenzyme A) – more alive

American electrochemical engineer Libb Thims' 2007 ridicule (*Human Chemistry*), depicted adjacent, of the more-alive/less-alive theory associated with the RNA life theory (see: defunct theory of life).

In his 1932 *The Causes of Evolution*, Halden postulated that, some two billion years ago, something of microscopic size separated from the 'hot thin soup'.

1952 Harold Urey (1893-1981) American planetary chemist

In his *The Planets: Their Origin and Development*, speculated that the early terrestrial atmosphere was probably composed of ammonia, methane, and hydrogen; was a student of American physical chemist Gilbert Lewis and mentor to Stanley Miller (below).

1952 Stanley Miller (1930-2007) American biochemist

Showed, as pictured adjacent (in retrospect), that if Harold Urey's atmospheric mixture is exposed to electric sparks and to water it can interact to produce about half of the need amino acids, commonly called the "building blocks of life", precursors to proteins (see: Miller-Urey experiment).

1971 Manfred Eigen (1927-)

In his "Molecular Self-Organization and Evolution" proposed that living systems might have emerged from some non-living autocatalytic chemical reactions (see also: Stuart Kauffman and his 199s auto-catalytic closure theory).

1983 Anthonie Muller (1951-) Dutch biophysicist

Posited a "thermosynthesis" origin of life model, arguing that the first form of life was some type of pre-respiratory, pre-photosynthesis, version of a molecular heat engine. Motto "from negative entropy—by evolution—to intelligence".

1993 Stuart Kauffman (1939-) American biochemist

Posited an "auto-catalytic closure" origin of life theory, in which "dead" individual molecular species A, B, and C, become "alive" once catalytic closure among them is achieved and they are able to complete one thermodynamic cycle.

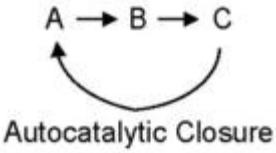

1999 Paul Davies (1964-) English physicist and astrobiologist

Developed the panspermia theory of the origin of life, i.e. that life on earth originated from a frozen extraterrestrial bacteria on an asteroid that impacted on earth.

(add discussion)

Modern | Defunct view

See main: Defunct theory of life; Life does not exist; Life terminology upgrades

The following table outlines the defunct view of life and the search for the origin of life:

2008	Michael Brooks (c.1975-) American quantum physicist	Outlined the view that "life" is one of the big 13 things of science that doesn't make sense. Notes that attempting to differentiate “between living [matter] and nonliving matter and come up with the definition of life” [is] widely admitted to be a dead end.” [10]
2009	Libb Thims (c.1975-) American chemical engineer	Arrived at the view that life is a "defunct theory", similar to vitalism and caloric theory, in that moving structures, such as a walking breathing human (or walking molecule) or single celled bacteria (or bacteria molecule), are "animate molecules", pure and simple, and hard science does not consider atoms nor molecules to be alive, nor will it ever. [11] This conclusion came into view, following prolonged calculations of molecular formulas for every step, i.e. each supposed "living entity", in molecular evolution tables and in the evolution timeline.
2010	Alfred Rogers (1933-) American philosopher	View: “Life does not exist in the sense that life is not absolutely different from non-life.
2013	Ferris Jabr (c.1986-) Science writer	View: “Life is a property [that] does not exist. Life is a concept that we invented. On the most fundamental level, all matter that exists is an arrangement of atoms and their constituent particles. These arrangements fall onto an immense spectrum of complexity, from a single hydrogen atom to something as intricate as a brain. In trying to define life, we have drawn a line at an arbitrary level of complexity and declared that everything above that border is alive and everything below it is not. In truth, this division does not exist outside the mind. There is no threshold at which a collection of atoms suddenly becomes alive, no categorical distinction between the living and inanimate, no Frankensteinian spark. We have failed to define life because there was never anything to define in the first place.”

McLean v. Arkansas

See main: Religious thermodynamics

In 1982, in the famous case of McLean vs. Arkansas Board of Education, on the debate of whether creation science should be taught in public schools, American biophysicist Harold Morowitz was designated an expert in biophysics and biochemistry and was tasked with demonstrating that the origins of life did not violate the laws of thermodynamics. [2]

Difficulties on theory

Crude estimates, based on carbon-dating of fossilized bacteria, indicate that life originated on earth *circa* 3.85 billion years ago. [3] The difficulty here is that a single bacterium is a single molecule, i.e. a "bacteria molecule". The question immediately becomes: at what point can a molecule be considered to be alive? In making attempts to answer this question, one runs into insurmountable difficulties. [4]

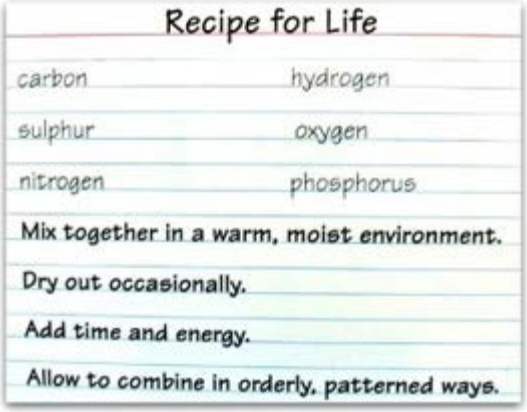

Left: Humorous clipping from the 2006 evolution and pre-history displays at the Denver Museum of Natural Science. [12]Right: Clip from the 2008 film *Expelled*, summarizing the scientific view (Darwin, 1871) of the origin of life.

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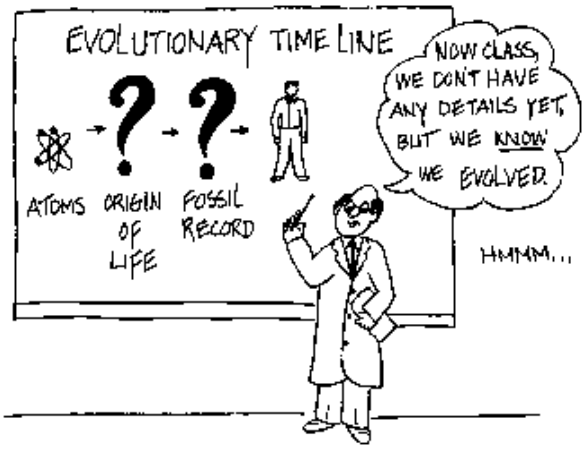

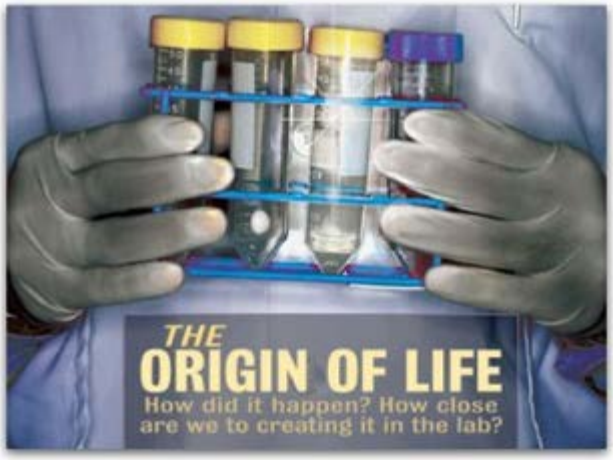

Left: A BestBibleScience.org **origin of life** cartoon, subtitled: the biggest weakness of evolutionary theory is that "there is no adequate explanation for the origin of life from dead chemicals." [17] The highlighted use of the terms: dead matter or dead atoms are common in the works of thinkers, e.g. Christian de Quincey, who like to attack the unbridgeable gap or life/non-life divide issue. Right: Cover story "How did Life Begin?" on the question of the **origin of life** by Paul Deisler, *Skeptic* magazine (2011), depicting the commonly-held view by many scientists that the riddle of life's origin can be solved by synthesizing or formulating the proper chemical reactions in a laboratory said to mimic the formation of the first form of life, 3.9 billion years ago. [13]

(ch. 5: Life, pgs. 69-
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External links

● Abiogenesis – Wikipedia.

θΔics

In problems, **origin of life problem**, aka "great problem of natural philosophy" (Etienne Saint-Hilaire, c.1836), refers to []

Overview

The following origin of life diagram shows the general outline of the problem:

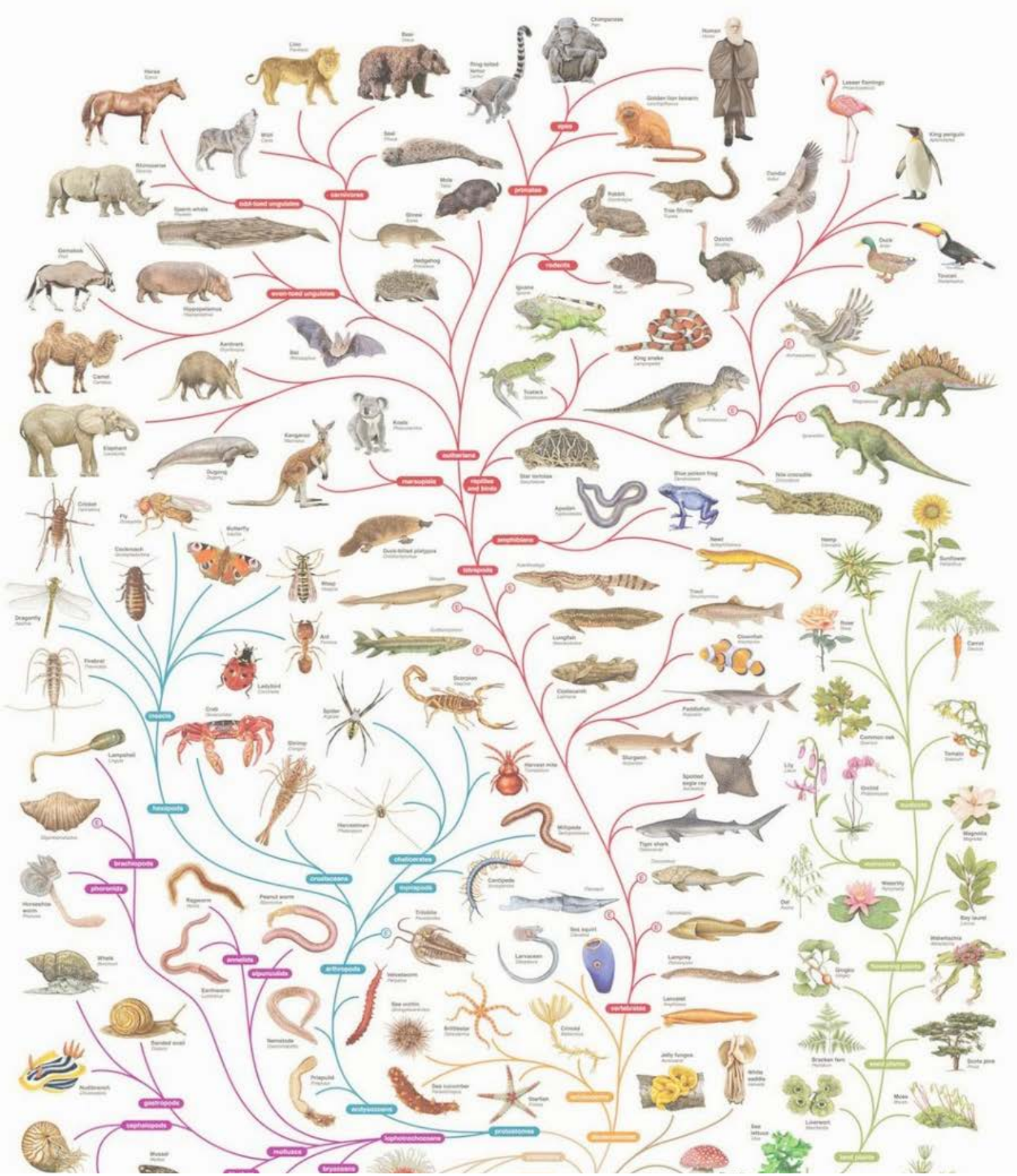

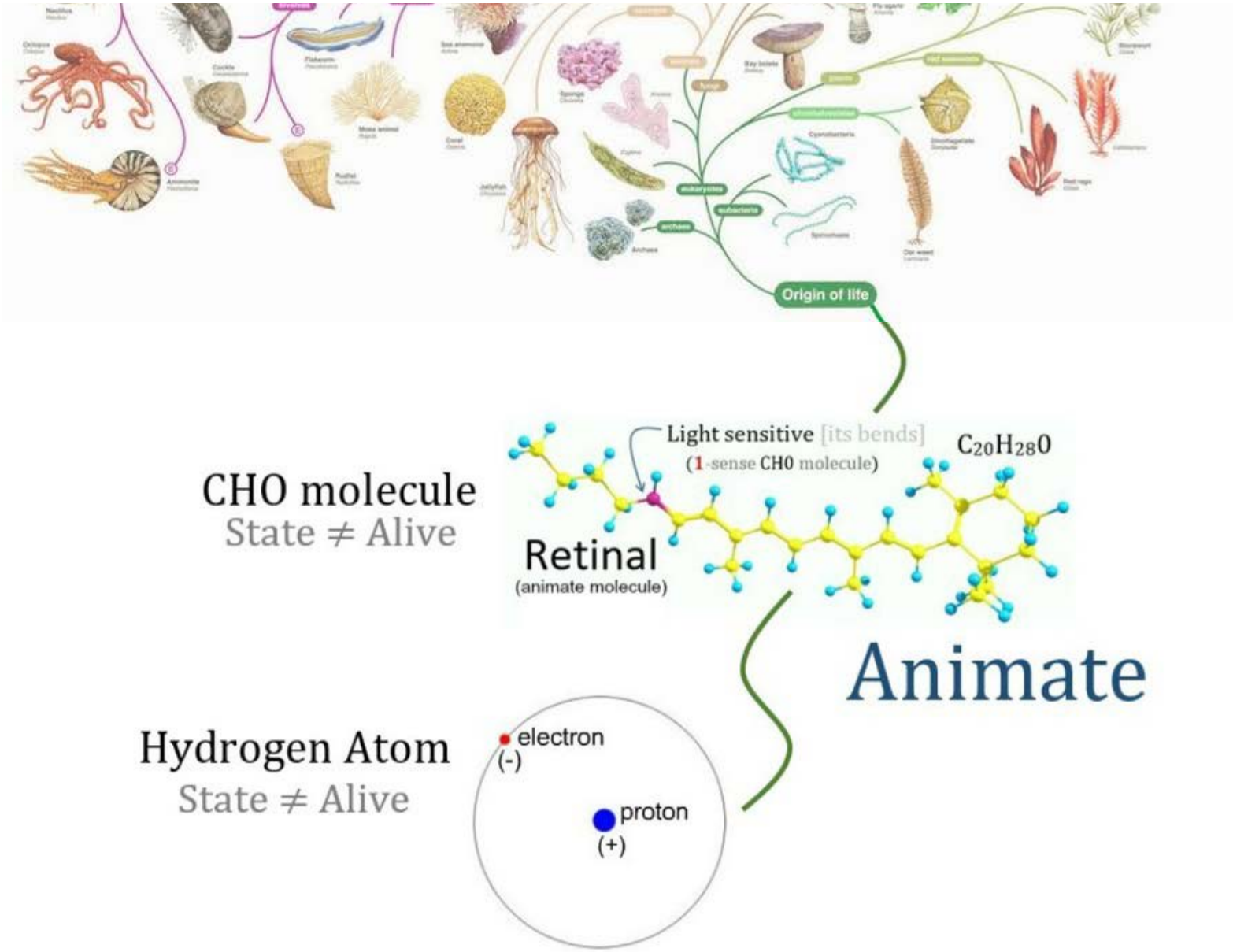

Namely, the turning of a Hydrogen into a Heisenberg, as modern science sees things, is the result of a long-chained 14.5-billion year length physical-chemical mechanism; this view, however, leaves open a number of gaping questions, e.g. how do you go from the so-named "non-alive" state, i.e. *inanimate* hydrogen atom, or one proton and one neutron in a bound state, into an *animate* human, i.e. a proton-electron configuration, in the so-named "alive" state?

Only three people, independently, have ever solved the problem, namely: Libb Thims (2009), Alfred Rogers (2010), and Ferris Jabr (2013); see: defunct theory of life; life does not exist; life terminology upgrades.

Quotes

The following are related quotes:

> "The turning of hydrogen into thinking and ***purposive*** beings is scientifically undemonstrated, and philosophically devoid of merit. Thinking about atoms discussing morals is **absurd**."
>
> — Ravi Zacharias (1990), *The Real Face of Atheism*

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1. Origin of life (photo) – HowHumans.Blogspot.com.

θΔics

In existographies, **original sin** refers, in Christianity, to the idea that humans were once sin free creatures, but that once Eve at from the fruit of the tree of knowledge of good and evil, which was forbidden to her, humanity forever after entered fell into a state of sin.

Overview

In c.400AD, Pelagius was, supposedly, the first raise an objection to the concept of "original sin" (O).

Other

In 1978, Morgan Peck, in his *The Road Less Travelled*, argued that entropy was the original sin. [1]

Quotes

The following are related quotes:

> "The opinion that god waits six weeks before he creates a damned soul in a fetus is, in fact, no other than that which creates it at the moment of sexual connection: the difference of six weeks cannot be of the slightest consequence in the argument."
>
> — Voltaire (1764), *Philosophical Dictionary* (§:Original Sin) [2]

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External links

- Original sin – Wikipedia.

θΔics

In

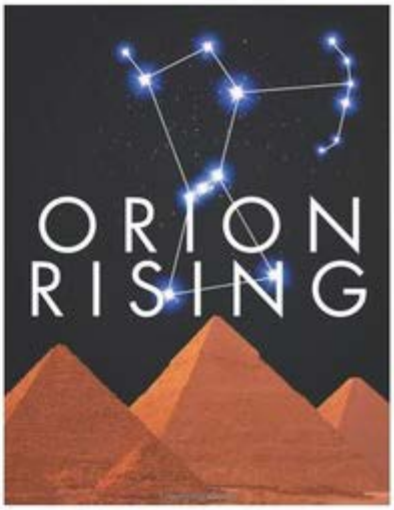

A visual showing how the "raising of the Orion" constellation, personified by the Egyptians as the god Sah, later Osiris (see: death and resurrection of Osiris), is the forerunner to the Biblical story of the "raising of Lazarus" from the dead by Jesus, the the resurrection of Jesus (see: death and resurrection of Jesus) in general.

astronomy, **Orion** is noted constellation, comprised of 14 stars, originally personified by the Egyptians as the god Sah, and later blended into the story of the god Osiris, noted for []

Overview

The Egyptians considered the Orion nebula to be the final resting place of Osiris, after he was murdered, and cut into 14 pieces, and scattered about the land, by his evil brother Set. [1]

Belt

In 1983, Robert Bauval, while sitting out in the desert of Egypt with a friend, was told by his friend that the star Sirius would rise and that in the belt of Orion, the three stars run in a row, but that the smallest star was slightly off-set to the left. Bauval then realized that this off-set was the same as the off-set of the above-view of the three pyramids at Giza. [4] Bauval, in short, concluded that the three great pyramids were build modeled on the three stars of Orion's belt: [3]

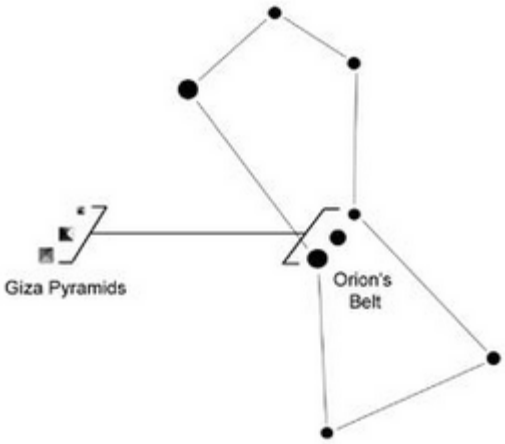

Scholars later began to assert that this was a global phenomena:

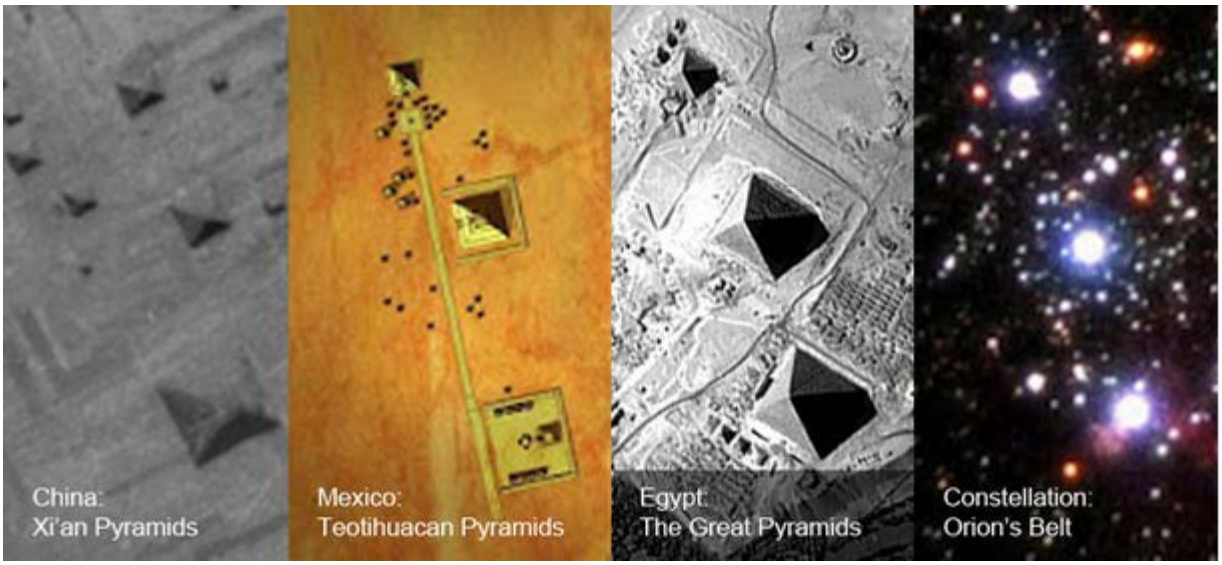

(add)

Horus | Orion

The following, from Senemut's tomb tablet (1463BC), is Horus as Orion spearing the bull, the "leg of the bull" being the Pleiades constellation: (Q)

(add)

Quotes

The following are related quotes:

"That we celebrate Dec 25th, based on the fact that three stars of **Orion**'s belt, aka "three kings", align with

the star Sirius, to point out the position of the rising sun, following the winter solstice, i.e. day of least amount of sunlight hours of the year, following the apparent "death" of the sun three days earlier, on the cross, i.e. "southern crux" star constellation, which originated with the celebration of the 3100BC (4850BG) birthday of Ra in the temples on Dec 25, wherein, of note, the Egyptians put pine trees in temples (origin of Christmas tree tradition), which was remolded into the story of the birth of Osiris (2800BC), then Horus (1800BC), then Jesus (300AD), with such joyous ignorance, has us "marching backwards into 20th century", as the saying goes, or 49th century (BG), as we would see it."

— Libb Thims (2014), Hmolpedia forum post [2]

References

1. Dewdney, Christopher. (2008). *Acquainted with the Night: Excursions Through the World After Dark* (pg. 218). Bloomsbury.
2. Thims, Libb. (2014). "Jesus 'Jehovah' of Nazareth's IQ" (post #21) (Q), Dec 25.
3. Anon. (2016). "The Orion Correlation: 3 Fascinating Ancient Structures Connected to Orion" (Q), Ancient-Code.com, Apr 11.
4. Anon. (2016). "The Story of Osiris – Ancient Egyptian God Documentary" (Q), YouTube, Ancient World History, Dec 23.

External links

- Orion (constellation) – Wikipedia.
- Orion (mythology) – Wikipedia.

θΔics

In hmolscience, **Orrin Edgar Klapp** (1915-1997) was an American sociologist noted, in sociological thermodynamics, for his 1978 general systems theory plus Shannon entropy model of "boundaried" systems, across which entropy can pass.

Overview

In 1978, Klapp, in his *Opening and Closing: Strategies of Information Adaptation in Society*, outlined a general systems theory mixed with Shannon-thermodynamics type theory of "entropic communication" in society. [1] Klapp presents a model of social systems as oscillating systems that can alternatively open or close their boundaries as their internal state dictates. [2] Klapp's model was used by Larry Comeau and Leo Driedger in 1978 article "Ethnic Opening and Closing in an Open System: A Canadian Example." [3]

Klapp reasons that entropy, rather than negentropy, can be imported into human systems and that "threats" to the system come not only from the accumulation or production of internal entropy but also from the importation of external entropy. Entropy, in Klapp's view, is the opposite of information. Examples of entropy import include: noise, banality, signal boringness, restriction, or lack of reinforcement, among others. He reasons that by successfully opening or closing the boundaries to a system at the proper time, the social system can achieve the correct amount of information input without gaining an excessive amount of entropy. [2]

In 1975, Klapp spoke in terms of controlling boundaries in order to, among other things, restrict the entry of entropy into the system. On this view, American sociologist Kenneth Bailey reasons that the view is reversed, in that boundaries must be manipulated in order to bring energy and information or negentropy into the system, to combat the internal increase of entropy. [2] They both, to note, generally seem to derive their understanding of entropy from Claude Shannon and thus are both inept at a proper discussion of the use of entropy as a function of heat.

Education

In 1962, Klapp was a professor of sociology at San Diego State College and in 1978 a professor of sociology at the University of Western Ontario.

References

1. Klapp, Orrin E. (1978). *Opening and Closing: Strategies of Information Adaptation in Society* (ch. 5: Entropic communication, pgs. 81-105). CUP Archive.
2. Bailey, Kenneth D. (1990). *Social Entropy Theory* (pg. 82-83, 155). New York: State University of New York Press.
3. Comeau, Larry R. and Driedger, Leo. (1978). "Ethnic Opening and Closing in an Open System: A Canadian Example." *Social Forces* 57: 600-20.

External links

â— Orrin Edgar Klapp Papers (1942-1997) – Directory of Special Collections, California State University Library.
â— Orrin Edgar Klapp – LibraryThing.com

θΔics

In existographies, **Osborne Reynolds** (1842-1912) (GPE:112) was an Irish-born British engineer, generally known, in fluid dynamics, as the eponym of the Reynolds number, noted for []

Quotes | By

The following are quotes by Reynolds:

> "The combustion engine, in the form of a cannon, is the oldest form of heat engine."
>
> — Osborne Reynolds (1883), "On the General Theory of Thermo-Dynamics" [1]

References

1. (a) Reynolds, Osborne. (1883). "On the General Theory of Thermo-Dynamics", Lecture at Engineering School at Owens College, Manchester; in: *Papers on Mechanical and Physical Subjects, Volume Two: 1881-1900* (§47:138-52, quote, pg. 151). Cambridge University Press, 1901.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 11). Cornell University Press.

External links

â— Osborne Reynolds – Wikipedia.

θΔics

In Egyptian mythology, **Osiris**, "Asar" or "Wesir", in Egyptian form, is the Egyptian death and resurrection god, symbolic of both the moon, the Orion constellation, and annual crop regrowth, depending; in Heliopolis creation myth, he is the great grandson of the god Ra, sun of Geb (see: Easter), father of Horus, and husband-brother of Isis, brother rival of Set, noted for []

A painted wooden statue (Q) of **Osiris**, with green skin, in mummified form, from the 20th Dynasty (see: Supreme god timeline), about 1170 BC, from Thebes, Egypt.

Films

The films *The God Who Wasn't There* (2005) (Q)(Q), by Brian Flemming, *Zeitgeist* (2007), by Peter Joseph, and *Religulous* (2008), featuring Bill Maher, all talk about Jesus as a re-telling of the Osiris myth.

Orion | Sah

See main: Astro-theology

In 2287BC, in the Pyramid Texts of Pepi I, Osiris was being associated with the Orion star constellation, the dying and rising pharaoh (or hunter):

> "Lo, he has come as Orion; Lo, Osiris has come as Orion; Lord of wine at the wag-feast."
>
> — Anon (2287BC), Pepi I (Q) Pyramid Texts, Utterance 442 (Q)

> "Behold, he has come as Orion, Osiris has come as Orion, Lord of the Wine in the Wag-festival."
>
> — Anon (2287BC), *Pyramid Text* (§818-20) (Q)

> "Hail, O King! Thou art this great star, the bearer of Orion, who ferries the ship of heaven with Orion, who rows the ship of Dewat with Osiris. The king goes forth from the eastern part of heaven, reinvigorated in his season and fresh in his time. Nut gave birth to this King together with Orion. The Year (?) has adorned thee together with Osiris."
>
> — Anon (date), *Pyramid Text*, 882a-883d.PM [7]

Osiris, at some point, before or after this, was synced with the god Sah.

Isis | Osiris

Matthew Firestone, in his *Egypt* (2010), summarized the basics of the story of Isis and Osiris as follows: [1]

> "The most familiar of all ancient Egypt's myths is the story of Isis and Osiris, preserved in the writings of the Greek historian Plutarch (c AD 46-126) following a visit to Egypt. According to Plutarch, Osiris and his sister-wife Isis ruled on earth, bringing peace and prosperity to their kingdom. Seething with jealousy at their success, their brother Seth invited Osiris to a banquet and tricked him into climbing inside a chest.

Once Osiris was inside, Seth sealed the coffin and threw it into the Nile, drowning his brother. Following the murder, the distraught Isis retrieved her brother-husband's body, only to have it seized back by Seth who dismembered it, scattering the pieces far and wide. But Isis refused to give up and, taking the form of a kite, searched for the separate body parts, burying each piece where she found it, which explains why there are so many places that claim to be Osiris' tomb. Another version of the story has Isis collecting the parts of Osiris and reassembling them to create the first mummy, helped by Anubis, god of embalming. Then, using her immense magic, she restored Osiris to life for long enough to conceive their son Horus. Raised to avenge his father, Horus defeated Seth. While Horus ruled on earth, represented by each pharaoh, his resurrected father ruled as Lord of the Afterlife. A much-loved god, Osiris came to represent the hope for salvation after death, a concept as important to life-loving ancient Egyptians as it was to early Christians."

Here we see Plutarch (c.100AD) cited as one of the first to document the Osiris death and resurrection story. Herodotus, however, prior to this had described the birth of Ra as the story of the phoenix.

Dendera temple | Osiris resurrection

See main: Dendera Temple

In Dendera (Q), a site 37-mi north of Luxor (Thebes), in the 6th nome of Upper Egypt, in the Dendera temple complex, a 23-part story board scene, built during the late Ptolemaic period, in the first century BC, completed by Roman emperor Tiberius (Q), in 14 to 37AD, depicts the resurrection of Osiris and the immaculate conception of Horus. [8]

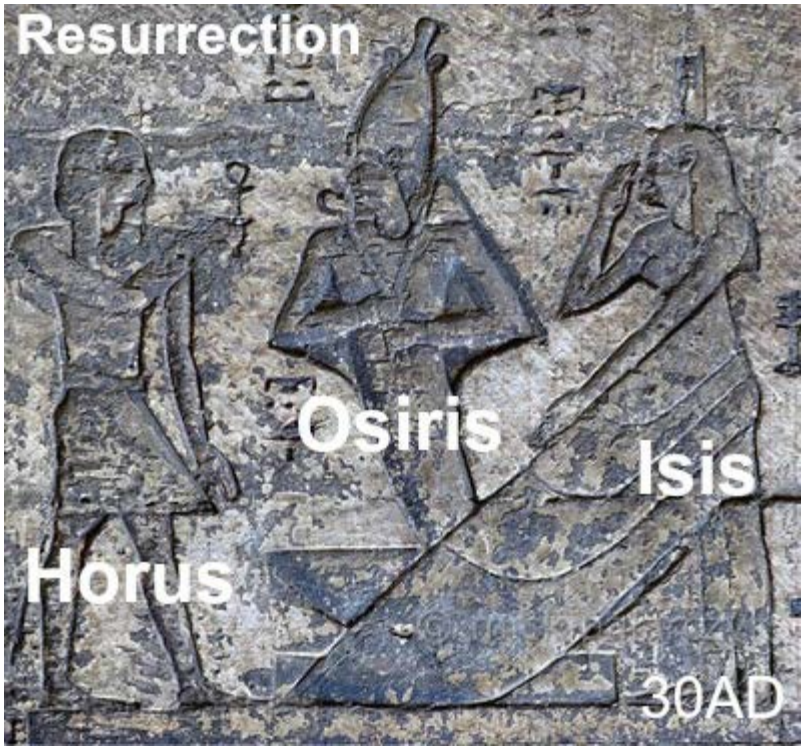

A 30AD relief in the northernmost of the western Osiris chapel on the roof of the Hathor Temple, at Dendera, showing a winged Isis (right) watching over the resurrection of her husband Osiris, by the power of the Ankh used by his son Horus (left). (Q)

One relief, as shown adjacent, depicts the resurrection of Osiris by Horus in the presence of Isis; which is found in the Bible as the story of Jesus resurrecting Lazarus in the presence of the a Mary.

The following shows the god Sah (or Sahu), i.e. Orion constellation, as the Greeks later referred to it, with arm raised, the constellation god that was merged with Osiris, the idea behind the raising of Osiris from the dead: [9]

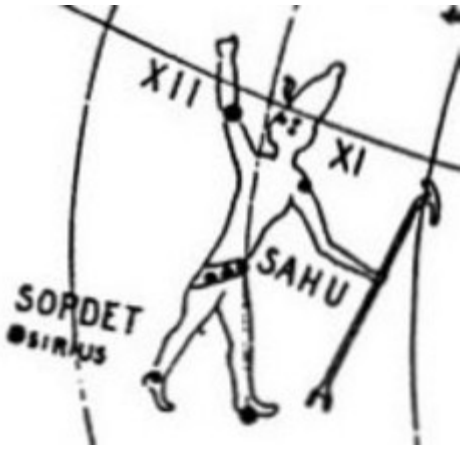

The following, from the Dendera Temple (Q), shows Osiris, arm raised (like the constellation god Sah), with erection, with Isis, in kite form, hovering over Osiris, with the yellow body outline, symbolic of the Orion constellation in horizontal position, with a djed pillar overlaid on the body, indicative of his backbone, and or the four pillars of heaven,

or something to this effect:

The Osiris chapel, in Dendera, was used during the Osiris festival in the month of Khoiak (see: Christmas tree), which celebrated the resurrection of Osiris. (Q)

Origin

Budge (1904) states that Osiris, originally, was a nome god of Busiris (pg. 99), nome #9 of Lower Egypt, as well as and Mendes (pg. 115), that "his origins are obscure" and that his original seat of worship must have "been in the Delta" (pg. 103).

The roots of Osiris date to the sun god worship of the ancient city of Heliopolis and their Heliopolis creation myth; the city itself having been active and occupied since pre-dynastic times, or before 3100BC.

English god encyclopedist Michael Jordan (1993) dates Osiris worship from *circa* 3000BC to 400AD. [6]

English Egyptologist Wallis Budge (1899) dates Osiris to at least the period of the 4th dynasty or 2600-2500BC, being that king Men-Kau-Ra (2530-2500BC), is described as “Osiris, King of the South and North, Men-kau-Ra, living forever” on his coffin. [5]

Osiris-Ra

See main:
Osiris-Ra

In c.1500BC, the separate afterlife re-birth myths of Osiris and Ra were being joined into one myth, retold in a combined manner, so to give

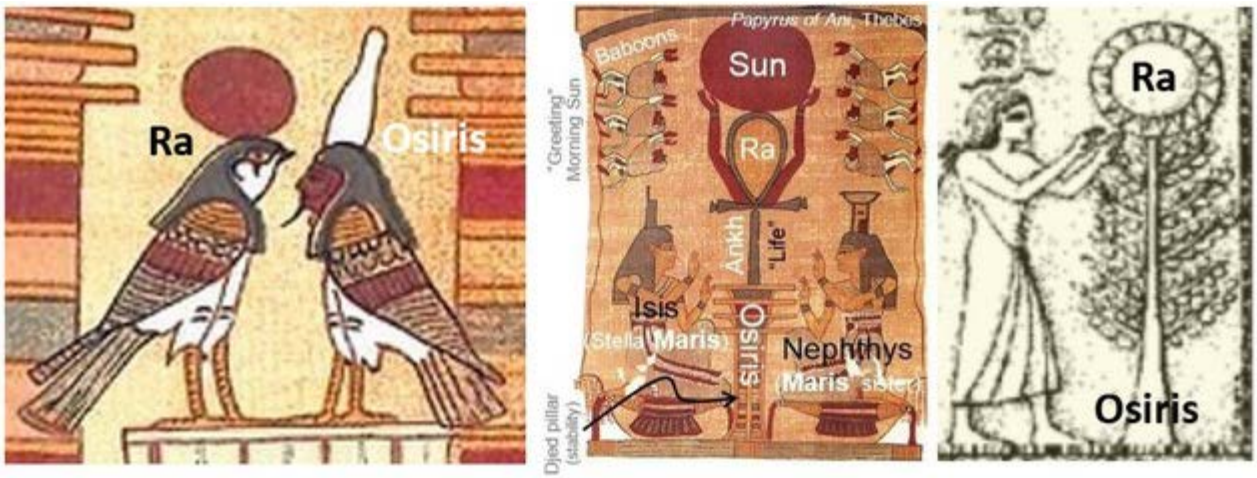

the deceased double afterlife power, so to say; a take on this is as follows:

Left: the souls of Ra and **Osiris** squaring up with each other, symbolic of being equal in supreme god power, in the form of **Osiris-Ra** or Ra-Osiris. Center: a depiction, from the Papyrus of Ani (1250BC) of Ra in the form of an ankh, being born out of the djed pillar (backbone) of Osiris. Right: an image (c.1150BC) Ra in the form of the sun being born out of the evergreen tree form of Osiris.

> "The very sub-title of the *Book of the Dead: the Chapters of Going Forth by Day*, evokes an image of the soul emerging into the restorative rays of the sun's light after revival during the nighttime in the underworld. Most Egyptian mortuary texts are like the *Book of the Dead* in this respect—they view the life beyond the grave as combining a chthonic Osirian afterlife with a solar or stellar afterlife. The Egyptian sense of balance meant that both aspects of life beyond the grave were necessary for the survival of the dead. The chief celestial deity, the sun god Ra, was therefor a major figure in the Egyptian concepts of the afterlife, second only to Osiris."
>
> — Ogden Goelet (1994), "A Commentary on the Corpus of Literature and Tradition which Constitutes the Egyptian Book of the Dead (the Book of Going Forth By Day)" in *The Egyptian Book of Dead* (pg. 149); in *Revised and Illustrated Edition* (2015) (pg. 159) [10]

(add)

Greek | Roman Mythology

See: Osiris rescripts; Osiris, Dionysus-Bacchus, and Moses

In c.800BC, in Greek mythology, Osiris became identified with the Greek god Dionysus. [8] Dionysus, in Roman mythology (c.400BC-400AD), in turn, became identified with the Roman god Bacchus. Bacchus, in Jewish mythology (c.500AD), as many have argued was rescripted into Moses. Bacchus, in Christian mythology (200AD), became the mold for the Christian son-god Jesus.

Christianity

The story of the death and resurrection of Osiris is the backbone of Christianity; the resurrection of Osiris by Horus, in the Bible, is found as the story of the resurrection of Lazarus by Jesus.

Death | Resurrection

The so-called "Passion of Osiris" was a yearly reenactment of the death of resurrection of Osiris, which took place on the Nile delta in the form of a festival. Later, this became the so-called "Passion of

Christ", a reformulated version of which as told in Christianity.

The pine cone toped "staff of Osiris" (aka thyrsus) at the Egyptian Museum (Q), Turino, Italy, symbolic of the origin of the Christmas tree (see: djed pillar).

Jesus

In 1841, an anon German-Jew, publishing out of England, in his *The Existence of Christ Disproved by Irresistible Evidence*, in a series of 30 letters, attempted to argue the following position: [4]

> "If it can be shown, by clear and indisputable evidence, that the history of Jesus Christ (as commonly received among Christians) is a forgery and a fiction—that he was not the son of a virgin called Mary, the wife of Joseph the carpenter, who conceived through the power of the holy ghost, and ceased not to be a virgin even after she had become a mother—that he did *not* converse with the Jewish doctors in the temple—nor preach to the populace in Jerusalem and elsewhere—nor perform miraculous cures—nor hold communion with the devil—nor, in point of fact, *do any one act that pious enthusiasts and ignorant devotees have ascribed to him;* and further, that neither a god nor a man called Christ was crucified by Pontius Pilate, the Procurator, and therefore could not by possibility have arisen from the dead three days after an event which did not happen, and ascend into heaven, as is vulgarly *supposed*, —if, we repeat, it *can* be clearly proved that the foregoing assertions about the birth, life, death, and resurrection of Jesus Christ, *are idle, tales, having no foundation whatever in truth—mere fictions stolen from the mythological fables of ancient nations,*—the very root of the Christian system will be as nought!"

In 1877, William Cooper, in his *The Horus Myth in its Relation to Christianity*, touched on Osiris, but put more focus on Horus, stitching out the premise that Jesus was based on Horus.

In 1878, John Stuart-Glennie, in his *Isis and Osiris: the Origins of Christianity*, penned out a treatise on the similarities and differences of the "doctrines of Christianism" and the "myths of Osirianism", as he phrased things. [2]

In 1883, Gerald Massey, in his *The Natural Genesis*, was outlining Osiris and Jesus connections. (Q)

In 1885, an anon English writer, in his *The Faith in Jesus, Not a New Faith*, stitched out the premise that both Jesus and Krishna, were rewrites of Osiris. [3]

Quotes

The following are related quotes:

> "**Osiris**, their King and Lord, they portray by means of an eye and scepter; there are even some who explain the meaning of the name as 'many-eyed' on the theory that *os* in the Egyptian language means 'many' and *iri* 'eye'' and the heavens, since they are ageless because of their eternity, they portray by a heart with a censer beneath."
>
> — Plutarch (100AD), *On Isis and Osiris* (pg. 27)

> "They say that the date on which this deed – Set trapping **Osiris** in chest and throwing it into the Nile – was done was the seventeenth day of Athyr [Nov 13] when the **sun passes through the Scorpion**, and in the twenty-eighth year of the reign of Osiris; but some say that these are the years of his life and not his reign."
>
> — Plutarch (100AD), *On Isis and Osiris* (pg. 37); note: compare Horus being bitten by a scorpion and Isis summoning the sun (Amen-Ra) and moon (Thoth) to heal him, as told in Sorrows of Isis (line 205), and as rescripted in Joshua 10:13

> "Not only the Nile, but every form of moisture they call simply the effusion of Osiris; and in their holy rites the water jar in honour of the god heads the procession. And by the picture of a rush they represent a king and the southern region of the world, and the rush is interpreted to mean the watering and fructifying of all things, and in its nature it seems to bear some resemblance to the generative member."
>
> — Osiris (100AD), *On Isis and Osiris* (§36)

> "What emerges clearly from a study of the Horus myth and the Osiris myth is that although they appear in the Pyramid Texts as a composite story they were not originally so."
>
> — John Griffiths (1980), *The Origin of the Osiris and his Cult* [7]

> "The frequent mention of 'nephrite', a type of green stone, relates to the green color of many amulets, particularly the important 'heart scarab'. The Egyptian word for green also meant to 'to flourish', with all of its implications of revitalization in the afterlife. The hoe of emerging reborn from the earth, just as vegetation does yearly, is written in the green color of **Osiris**' face in the Ani Papyrus."
>
> — Ogden Goelet (2015), "A Commentary on the Corpus of Literature and Tradition which Constitutes the Egyptian Book of the Dead (the Book of Going Forth By Day)" [10]

See also

- Phallus of Osiris
- Osiris rescripts

References

1. Firestone, Matthew. (2010). *Egypt* (pg. 235). Lonely Planet.
2. Stuart-Glennie, John. (1878). *Isis and Osiris: Or, The Origin of Christianity as a Verification of an Ultimate Law of History*. Longmans, Green, and Co.
3. Anon. (1885). *The Faith in Jesus, Not a New Faith* (pg. 62). Williams & Norgate.
4. Anon. (1841). *The Existence of Christ Disproved by Irresistible Evidence, in a series of letters, from a German Jew. [30 letters]* (pg. 4). Publisher.
5. (a) Budge. Wallis. (1900). *Egyptian Ideas of the Future Life* (pg. 56). Publisher.
(b) Menkaure – Wikipedia.
6. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (pg. 195-96). Facts on File, Inc.
7. Griffiths, John. (1980). *The Origin of the Osiris and his Cult* (pgs. 13-14). Brill.
8. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pg. 130; Osiris story board, pgs. 131-38). Dover, 1969.
9. (a) Petrie, Flinders. (1940). *Wisdom of the Egyptians* (plate III). Publisher.
(b) Clagett, Marshall. (1989). *Ancient Egyptian Science: Calendars, Clocks, and Astronomy, Volume Two* (pg. 677). American Philosophical Society.
10. Faulkner, Raymond. (1972). *The Egyptian Book of the Dead: the Book of Coming Forth by Day: Complete Papyrus of Ani, Featuring Integrated Text and Full-Color Images* (translator: Ogden Goelet; Preface: Carol Andrews; Introduction: Daniel Gunther; Foreword: James Wasserman) (Amz) (pg. 156). Chronicle Books, 2015.

Further reading

- Griffiths, John G. (1980). *The Origins of Osiris and His Cult*. Brill.

External links

- Osiris – Wikipedia.

- Osiris (quotes) – AZQuotes.com.

θΔics

In religio-mythology, **Osiris rescripts**, aka "Osiris-Horus rescripts", variants of Osiris or "names of Osiris", refers to the cultural variants or translations of the astro-theological story of the Egyptian dying and rising god Osiris, based on the human-shaped dying and rising constellation Orion, which perceptually "rises" each Dec, nightly, from a horizontal to a vertical position, synretized with Horus, the oldest god of Egypt, who was re-conceptualized as the son of Osiris in Heliopolis creation myth.

A Spanish rendition (Q), based on the Dorothy Murdock stylized film Zeitgeist, of the "Last supper of Christ", with the 12 main gods born on Dec 25, namely: Hermes, Dionysus, Zarathustra, Krishna, Jesus, Horus, Mithra, Heracles, Tammuz, and Adonis, eleven of whom are **rescripts of the "Osiris-Horus motif"** a god syncretism, formulated in the early Dynastic Egypt, each based on older astro-theology models.

Overview

In c.385AD, Ausonius equated Osiris with four other gods: Dionysus, Bacchus, Liber, and Adonis. [1]

In 1791, Constantin Volney, in his *The Ruins*, §XXI: Problem of Religious Contradictions, connected, loosely, the following god-men: Zoroaster, Jesus, Buddha, and Mithra, via a dialogue.

In 1812, Sergey Uvarov, in his *On the Mysteries of Eleusis*, citing Ausonius, equated Osiris with five other gods: Tammuz, Dionysus, Bacchus, Liber, and Adonis. [1]

In 1875, Kersey Graves, in his *The World's Sixteen Crucified Saviors*, discusses 16 "main" dying and rising gods, along with 30 other men-like holy figures who died and were said to ascend into heaven. [2]

Table

See also: God character equivalences

The following shows the main rescripts of Osiris:

	Figure	Date	Country	Scholar	See also
0.	**Osiris** → Horus	3100BC	Egypt		• Death and Resurrection of Osiris • Passion of Osiris
1.	Nimrod → **Tammuz**	1500BC	Syria	(Uvarov ,1812)	

2.	Krishna	1200BC	India	(Volney, 1791) (Graves, 1875)	
3.	Attis	1150BC	Phrygia	(Graves, 1875)	
4.	Zoroaster	900BC	Persia		
5.	**Dionysus**	800BC	Greece	(Ausonius, 385BC)	● Osiris, Dionysus, and Bacchus
6.	Adonis		Greece	(Ausonius, 385BC) (Graves, 1875)	
7.	Prometheus	450BC	Greece	(Graves, 1875)	
8.	Buddha	600BC	India		
9.	**Moses**	400BC	Canaan		● Osiris, Dionysus-Bacchus, and Moses
10.	Liber	300BC	Rome	(Ausonius, 385BC)	
11.	**Bacchus**	200AD (Q)	Rome	(Ausonius, 385BC) "Moses = Bacchus" (Vossius, 1630) "**Osiris** = Mnevis (Q) = **Bacchus** = **Moses**" (Huet, 1679)	● Osiris, Dionysus-Bacchus, and Moses
12.	Lazarus → **Jesus**	300AD	Rome		● How Osiris became Jesus ● Raising of Lazarus ● Death and Resurrection of Jesus
13.	Odin → Thor	600AD	Germany	(Graves, 1875)	
14.	**Santa Claus**	1800AD	Europe	(Arthur, 2000)	● Christmas ● Christmas tree

(add)

Quotes

The following are related quotes:

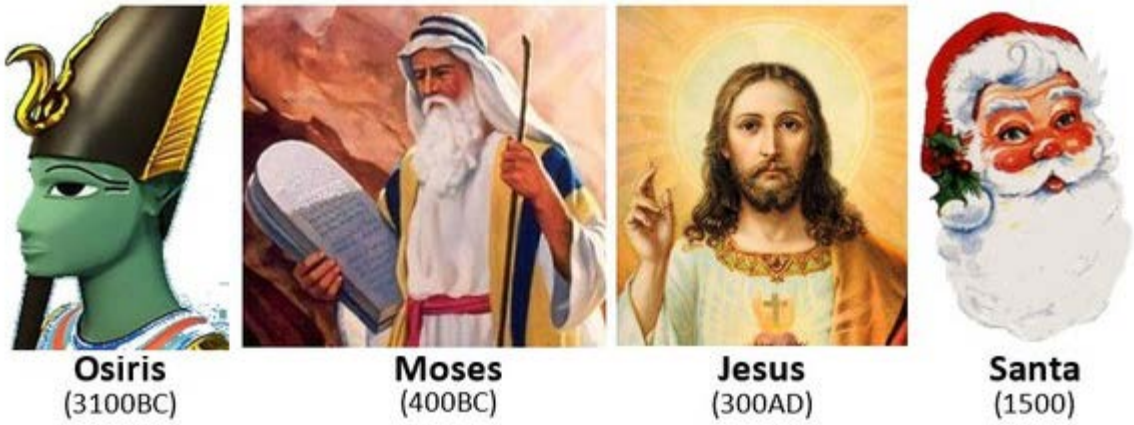

The Egyptian god Osiris was culturally transmitted into the rescripted figures of: Moses, Jesus, and Santa Claus, to name four dominant characters.

"Osiris was known amongst the Phoenicians, in Syria and Cyprus, by the title of Thammuz [Tammuz], or Adonis. Ausonius (c.385AD), in the following verses, asserts the identity of Osiris, Dionysus, Bacchus, Liber, and Adonis: 'Ogygia me *Bacchum* vocat, *Osirin* Aegyptus putat, Mystae Phanacem nominant, *Dionyson* Indi existimant, Romana sacra *Liberum*, Arabica gens *Adoneum*, Lucanianus Pantheum'."

— Sergey Uvarov (1812), "On the Mysteries of Eleusis" [1]

"Tammuz and Adonis are proved to be the same divinity. Jerome, who lived in Palestine when the rites of Tammuz were observed, up to the very time when he wrote, expressly identifies Tammuz and Adonis (vol. ii., p. 353), in his *Commentary on Ezekiel*, viii. 14, where the Jewish women are represented as weeping for

> Tammuz; and the testimony of Jerome on this subject is universally admitted. Then the mode in which the rites of Tammuz or Adonis were celebrated in Syria was essentially the same as the rites of Osiris. The statement of Lucian *(De Dea Syria*, vol. iii., p. 454) strikingly shows this, and Bunsen (vol. i., p. 443) distinctly admits it. The **identity of Osiris and Nimrod** has been largely proved in the body of this work. When, therefore, **Tammuz or Adonis is identified with Osiris**, the identification of Tammuz with Nimrod follows of course. ”
>
> — Alexander Hislop (1853), *The Two Babylons*

References

1. Uvarov, Sergey (1812). *Essay on the Mysteries of Eleusis* (translator: J.D. Price) (Arc). London, 1817; in: *The Classical Journal* (Bacchum vocat, pg. 61), 40:59-#, 1927.
2. (a) Graves, Kersey. (1875). *The World’s Sixteen Crucified Saviors* (Osiris, 24+ pgs; Horus, 2+ pgs). Publisher.
(b) The World’s Sixteen Crucified Saviors – Wikipedia.

External links

- List of dying and rising deities (2014) – Wikipedia.
- Dying and rising deities – Wikipedia.

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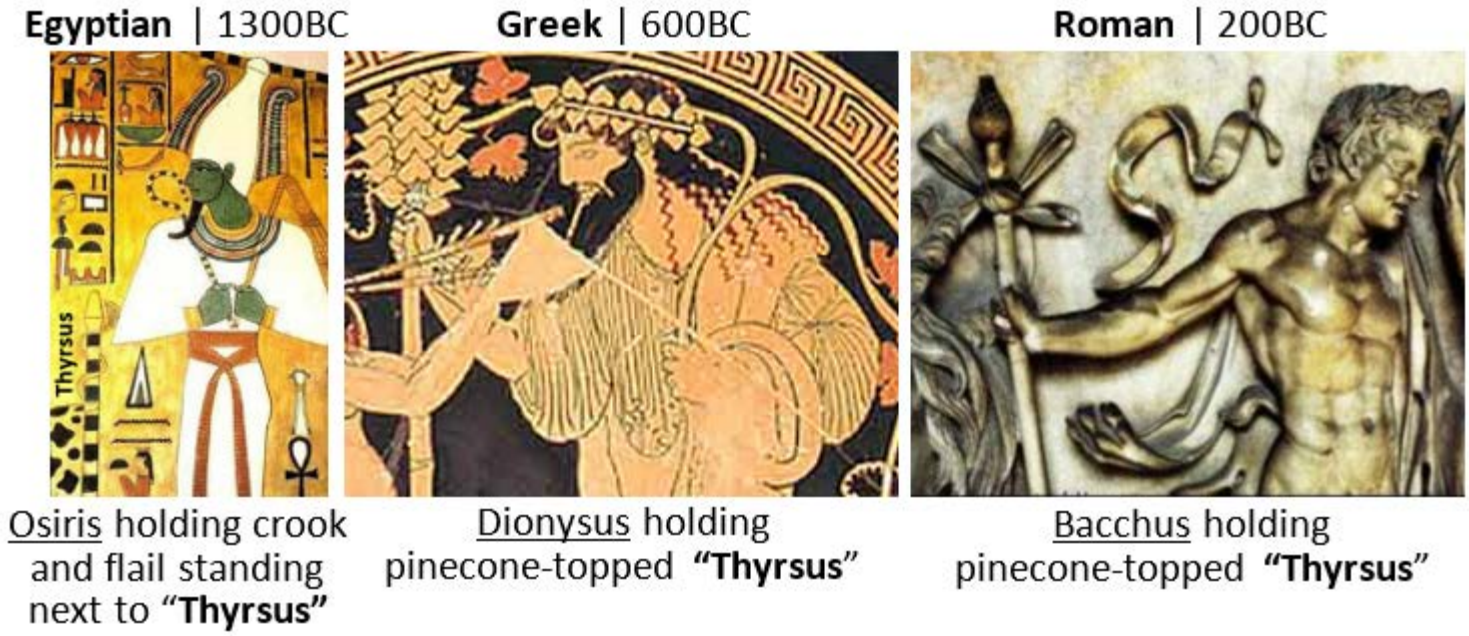

Depictions of the Egyptian Osiris (3500BC), Greek Dionysus (c.600BC), and Roman Bacchus (200AD) each holding or standing next to their thyrsus.

religio-mythology, **Osiris, Dionysus, and Bacchus** is the subject and or discussion of the topic of the cultural migration of the model, concept, and surrounding festivals of the Egyptian god Osiris (worshiped: c.3500BC-400AD), into the c.700BC transmigration mold of Greek god Dionysus, and or the c.200BC transmigration mold equivalent of the Roman god Bacchus. [1]

Overview

In 680BC, Orpheus (c.725-675BC), according to Diodorus (c.40BC), travelled from Thrace to Egypt, wherein he was initiated into the mysteries of an Egyptian "Dionysus", aka Osiris, which he brought back to Greece; Aaron Johnson (2012) summarizes (Ñº) this line of argument as follows:

> "When Orpheus visited Egypt in search of wisdom and knowledge, he was initiated into the mysteries of Osiris/Dionysus, but wanting to make the Thebans of Greece happy, he changed the place of Dionysus' birth to Hellenic Thebes and then initiate the Thebans in the mysteries."

In 435BC, Greek historian Herodotus, in his *Histories* (pgs. 92; 100) gave his account of things as follows:

> "Ethiopians inhabit the country immediately above Elephantine, and one half of the island; the other half is inhabited by Egyptians. Meroe is said to be the capital of all Ethiopia. The inhabitants worship no other gods than Jupiter and Bacchus; but these they honor with great magnificence; they have also an oracle of Jupiter; and they make war, whenever that god bids them by an oracular warning, and against whatever country he bids them.
>
> All the Egyptians sacrifice the pure male kine and calves, but they are not allowed to sacrifice the females, for they are sacred to Isis; for the image of Isis is made in the form of a woman with the horns of a cow, as the Grecians represent Io; and all Egyptians alike pay a far greater reverence to cows than to any other cattle. So that no Egyptian man or woman will kiss a Grecian on the mouth, or use the knife, spit, or caldron of a Greek, or taste of the flesh of a pure ox that has been divided by a Grecian knife. They bury the kine that die in the following manner: the females they throw into the river, and the males they severally inter in the suburbs, with one horn, or both, appearing above the ground for a mark. When it is putrefied and the appointed time arrives, a raft comes to each city from the island called Prosopitis; this island is in the Delta,

> and is nine schoeni in circumference: now in this island Prosopitis there are several cities; but that from which the rafts come to take away the bones of the oxen is called Atarbechis; in it a Temple of Venus has been erected. From this city, then, many persons go about to other towns; and having dug up the bones, all carry them away, and bury them in one place; and they bury all other cattle that die in the same way that they do the oxen; for they do not kill any of them. All those who have a temple erected to Theban Jupiter, or belong to the Theban district, abstain from sheep, and sacrifice goats only. For the Egyptians do not all worship the same gods in the same manner, except Isis and **Osiris, who, they say, is Bacchus**; but these deities they all worship in the same manner."

In 40BC, Greek historian Diodorus Siculus, in his 20-volume *Historical Library*, stated the following (aggregate quote):

> "The initiatory rites of Demeter in Eleusis were transferred from Egypt (1.29.2). The rite of Osiris is the same as that of Dionysus and that of Isis very similar to that of Demeter; the names alone having been interchanged, and the punishments in Hades of the unrighteous, the Fields of the Righteous and the fantastic conceptions, current among the many - all these were introduced by Orpheus in imitation of the Egyptian funeral customs. (1.96.4-5). Isis, after having invented the practice of medicine, taught this art to her son Orus [Horus], named also Apollo, who was the last of the gods that reigned in Egypt."

In c.50AD, Cornutus commented on the comment on the Osiris and Dionysus/Bacchus equivalence. [4]

In 100AD, Greek-born Roman historian Plutarch, in his *On Isis and Osiris*, stated the following: [2]

> "The histories on which the most solemn feasts of Bacchus, the Titania and Nuktelia, are founded, exactly correspond with what are related of the cutting to pieces of Osiris, of his rising again, and of his new life."

In c.320AD, Greek-born Roman historian Eusebius (c.263-339AD) digressed on the equivalence of Osiris and Dionysus. (Ñº)

In c.375AD, Ausonius commented on the comment on the Osiris and Dionysus/Bacchus equivalence. [4]

In c.475, Nonnus commented on the comment on the Osiris and Dionysus/Bacchus equivalence. [4]

In 1170, John Tzetzes commented on the comment on the Osiris and Dionysus/Bacchus equivalence. [4]

In c.1475, Servius (on Virgil) commented on the comment on the Osiris and Dionysus/Bacchus equivalence. [4]

In 1829, Robert Taylor, in his *The Diegesis* (pg. 188) stated the following:

> "The Egyptian Bacchus was brought up at Nysa, and is famous as having been the conqueror of India. In Egypt he was called Osiris, in India Dionysus, and not improbably *Chrishna*, as he was called Adoneus, which signifies the 'lord of heaven', or the 'lord and giver of light', in Arabia; and Liber, throughout the Roman dominions, from whence is derived our term liberal, for every thing that is generous, frank, and amiable."

In 1904, Wallis Budge said the following: [5]

> "From the works of classical writers we know that Isis worship spread from Egypt into several places in

> Western Europe, and she was identified with Persephone, Tethys, Athene, etc., just as Osiris was identified with Hades or Pluto, Dionysus-Bacchus, and other foreign gods."

In 1907, James Frazer summarized things as follows: [4]

> "Herodotus found the similarity between the rites of Osiris and Dionysus so great, that he thought it impossible the latter could have arisen independently; they must, he thought, have been recently borrowed, with slight alternations, by the Greeks from the Egyptians."

In 2001, Timothy Freke and Peter Gandy, in their *Jesus and the Lost Goddess*, stated the following: [6]

> "It is impossible to ignore the similarities between the Egyptian quarternity: Isis and Nephthys (known as 'the Two Goddesses' in Egypt), Osiris and Set (personifications of life and death), and the leading characters of the Eleusinian drama: Demeter and Persephone (also known simply as 'the Two Goddesses'), Dionysus and Hades. Diodorus of Sicily, first century BC, clearly states that the initiatory rites of Demeter in Eleusis were transferred from Egypt (Diodorus Siculus, 1.29.2). Later he states: The rite of Osiris is the same as that of Dionysus and that of Isis very similar to that of Demeter; the names alone having been interchanged, and the punishments in Hades of the unrighteous, the Fields of the Righteous and the fantastic conceptions, current among the many - all these were introduced by Orpheus in imitation of the Egyptian funeral customs.' (1.96.4-5)."

(add)

Quotes

The following are related quotes:

> "The important thing in our context is that the thyrsus was an attribute of Dionysus/Bacchus. Partial or full identifications of Dionysus with Osiris are well attested ever since Herodotus, who says that Dionysus is the Greek name of Osiris (2.42). There is also some late evidence for the use of ivy in the cult of Osiris, probably an import from the cult of Dionysus in the Roman period. But there is no parallel in the cult of Osiris for the use of a thyrsus. Apart from that, the fact that a significant identification of Dionysus and Osiris in Apuleius' *Metamorphoses* [c.160AD] is made only in our passage would seem to call for an explanation anyway."
>
> — Stefan Tilg (2014), *Apuleius' Metamorphoses* [3]

See also

â— Osiris, Dionysus-Bacchus, and Moses

References

1. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World*. Facts on File, Inc.
2. (a) Plutarch. (c.100AD). *Isis and Osiris* (35). Publisher.
(b) Herodotus. (c.435). (1875). *History of Herodotus* (editors: Henry Rawlinson and John Wilkinson) (pg. 87). Publisher.
3. Tilg, Stefan. (2014). *Apuleius' Metamorphoses: a Study in Roman Fiction* (pg. 118). Oxford University Press.
4. Frazer, James. (1907). *Adonis, Attis, Osiris* (pg. 357). MacMillan.
5. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pgs. 216-17; Isis weeping, pg. 219). Dover, 1969.

6. Freke, Timothy and Grandy, Peter. (2001). *Jesus and the Lost Goddess: The Secret Teachings of the Original Christians* (Osiris, 18+ pgs; quote, pg. 255). Random House.

External links

â— Histogram (large) (John Sparks, 1932) – Slate.com.

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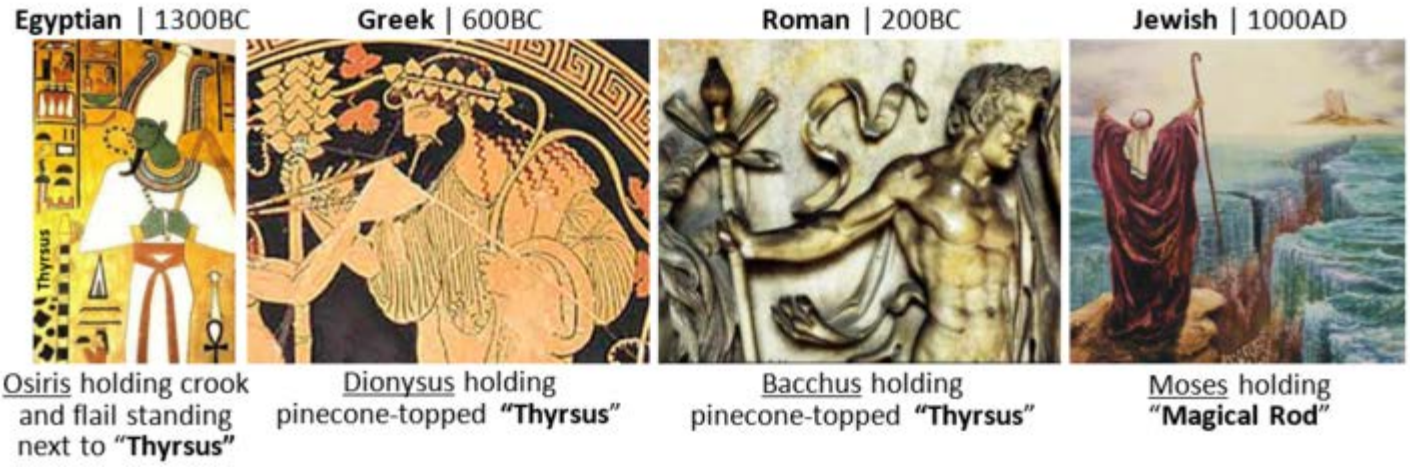

The Egyptian god Osiris, the Greek god Dionysus, the Roman god Bacchus, the latter two being cultural rescripts of the former, and Moses with his "magical rod" (aka Thyrsus) parting the red sea, which, according to the Vossius-Huet conjecture (c.1680), is but a monotheistic rewrite of the former deity model.

mythology, **Osiris, Dionysus-Bacchus, and Moses** is the subject and or discussion of the topic of the cultural migration of the model, concept, and surrounding festivals of the Egyptian god Osiris (worshiped: c.1500-400AD), into the c.700BC transmigration mold of the Greek god Dionysus, the c.200BC transmigration mold of the early-Roman god Bacchus, and or the Dionysus-Bacchus (see: Osiris, Dionysus, and Bacchus), which culminated, according to the to the so-called Vossius-Huet conjecture (c.1680), into the c.200-1000AD resultant of the Judeo-Roman architype confabulous person named Moses, who has 24 points of overlap with Bacchus (as tabulated below).

Overview

In c.1630, Gerardus Vossius, in his *On the Origin and Progress of Idolatry*, is historically well-cited as having been the first to make some kind of Moses and Bacchus parallelism connection (Q); English translations of his works, however, are wanting.

In c.1650, Samuel Bochart (1559-1667) asserted the following: (Q)

> "Both Bacchus and Moses were born in Egypt, shut up in an "ark," and put on the waters. Both fled from Egypt toward the Red Sea and had serpents (in Moses' case, a bronze serpent). For both, water flowed from a rock and milk and honey were provided. Both were called legislators, turned sticks into snakes, saw light in the darkness, and had unknown tombs."

In 1679, Pierre Huet, supposedly, had produced the following equation: (Q)

> Mnevis (Q) = **Osiris** = **Bacchus** = **Moses**

In c.1750, American theologian Jonathan Edwards (1703-1753), in his *Notes on the Bible*, equated Bacchus and Moses, in an apologetic way, to the effect that he believed that the Bacchus legends were 'based on' the stories Moses; the key section is as follows: (Q)

> "[408] Exod. ii. Moses is the same with the Egyptian Osiris; for:
>
> 1. Moses is the same with Bacchus, as has been shown before, No. 401; and Diodorus tells us that Osiris was called by the Greeks Dionysus, the name of Bacchus.
> 2. Diodorus tells us that Hercules [Horus] was the chief captain of Osiris' army, who was Joshua, as has

been shown, No. 402.
3. Diodorus tells us that Osiris had in his army Anubis covered over with a dog's skin, which thence was pictured with a dog's head, and called the dog keeper, &c.; all which seems to refer to *Caleb's* name, which signifies *a dog*.
4. Pan is said to war under Osiris, which is the same with Christ, whom god promises should go with Moses when he says פני or "*my presence* shall go with him." See No. 404."
5. Osiris is said to have horns from the mistake of Moses's character, who is thence pictured with horns, because of his beams of light—the word in Hebrew for *horns* and *beams* being the same.
6. Moses with the princes of the tribes carried up the bones of Joseph into Canaan: hence the poets fable of *Osiris'* bones, &c. See Gale's Court of Gen. p. 1, b. 2, c. 7, p. 94, 95."

In c.1769, Voltaire, in his *Philosophical Dictionary* (Q), citing Vossius (c.1630) and Pierre Huet (1679), stated that Moses is a rewrite of the Bacchus; the opening section of which is as follows: [5]

"Of all the true or fabulous personages of profane antiquity, Bacchus is to us the most important. I do not mean for the fine invention which is attributed to him by all the world except the Jews, but for the prodigious resemblance of his fabulous history to the true adventures of Moses.

The ancient poets have placed the birth of Bacchus in Egypt; he is exposed on the Nile, and it is from that event that he is named "Mises" by the first Orpheus [c.680BC], which, in Egyptian, signifies "saved from the waters", according to those who pretend to understand the ancient Egyptian tongue, which is no longer known. He is brought up near a mountain of Arabia, called Nisa, which is believed to be Mount Sinai. It is pretended that a goddess ordered him to go and destroy a barbarous nation, and that he passed through the Red Sea on foot, with a multitude of men, women, and children. Another time, the river Orontes suspended its waters right and left to let him pass, and the Hydaspes did the same. He commanded the sun to stand still [compare: Joshua 10:13]; two luminous rays proceeded from his head. He made a fountain of wine spout up by striking the ground with his thyrsis, and engraved his laws on two tables of marble. He wanted only to have afflicted Egypt with ten plagues, to be the perfect copy of Moses.

Vossius is, I think, the-first who has extended this parallel. The Bishop of Avranches, Huet, has pushed it quite as far; but he adds, in his *Evangelical Demonstrations*, that not only Moses is Bacchus, but that he is also Osiris and Typhon [Set]. He does not halt in this fine path. Moses, according to him, is Esculapius, Amphion, Apollo, Adonis, and even Priapus."

Voltaire, to note digresses for several pages beyond this. Here, however, we do note that connecting Moses with Bacchus and both back to Osiris is a cogent synopsis for 1630 (Vossius) as well as for 1769 (Voltaire).

In 1802, William Hort, in his *The New Pantheon: an Introduction to the Mythology of the Ancients* (Q), describes Bacchus as follows:

"What appears to be the true history of **Bacchus**? The best historians, Herodotus, Plutarch, and Diodorus Siculus, assert that he was born in Egypt, and educated at Nysa, a city in Arabia Felix, whither he had been sent by his father, Jupiter Ammon. From them it appears, that the Bacchus of the Greeks was no other than the famous Osiris, conqueror of India. This Bacchus is supposed, by many learned men, to be Moses. Both are represented as born in Egypt, and exposed in their infancy upon the Nile. Bacchus was educated at Nissa or Nysa, in Arabia, and in the same country passed forty years. Bacchus, when persecuted, retired to the borders of the Red Sea; and Moses fled with the Israelites, from the Egyptian bondage, beyond the same sea. The numerous army of Bacchus, composed of men and women, passed through Arabia in their journey to India. The army of the Jewish legislator, composed of men, women, and children, was obliged to wander in the desert, long before they arrived in Palestine, which, as well as India, is part of the continent of Asia.

The fable represents Bacchus with horns, which may be supposed to allude to the light that is said to have shone around the countenance of Moses, who, in old engravings, is frequently represented with horns. Moses received the Jewish law on Mount Sinai. Bacchus was brought up on Mount Nysa. Bacchus, armed with his thyrsus, defeated the giants. The miraculous rod of Moses was the means of destroying the descendants of the giants. Jupiter was said to have sent Bacchus into India to exterminate a sinful nation; and it is recorded, that Moses was commanded, by the true god, to do the same in Palestine. The god Pan gave Bacchus a dog to accompany him in his travels; Caleb, which, in Hebrew, signifies a dog, was the name of the faithful companion of Moses. Bacchus, by striking the earth with his thyrsus, produced rivers of wine. Moses, by striking the rock with his miraculous rod, caused water to gush out to satisfy the raging thirst of the Israelites."

In 1803, Charles Lebrun, in his *Doubts of the Infidels*, argued the following:

"The history of Moses is copied from the history of **Bacchus**, who was called Mises by the Egyptians, instead of Moses. Bacchus was born in Egypt; so was Moses... Bacchus passed through the Red Sea on dry ground; so did Moses. Bacchus was a lawgiver; so was Moses. Bacchus was picked up in a box that floated on the water; so was Moses.... Bacchus by striking a rock made wine gush forth... Bacchus was worshipped...in Egypt, Phenicia, Syria, Arabia, Asia and Greece, before Abraham's day."

In 1817, Edward Stillingfleet, in his *Sacred Origins: Rational Account of the Grounds of Natural and Revealed Religion*, summarizes the main 15 points of overlap between Bacchus and Moses as follows: [1]

Overlaps	Bacchus and Moses
1. Born in Egypt 2. Put in ark as child onto Nile 3. Adopted by Pharaoh's daughter	"Many things concerning Moses are preserved in the story of Bacchus; not that from thence we are to conclude that Moses was the Bacchus of the Greeks, as Vossius [c.1630] thinks; but they took several parts of the Eastern traditions concerning him, which they might have from the Phoenicians who came with Cadmus into Greece, while the memory of Moses was yet fresh among the Canaanites. In the story of Bacchus, as Vossius observes, it is expressly said that he was born in Egypt, and that soon after his birth he was put in an ark, and exposed to the river; which tradition was preserved among the Brasiatae of Laconica: and Bacchus in Orpheus is called Μίσης ["Mises", Voltaire, c.1770], and by Plutarch, in *On Isis and Osiris*, "Palaestinus"; and he is called Βιμάτωζ [Βιμάτωϱ], which agrees to Moses, who, besides his own mother, was adopted by Pharaoh's daughter.
4. Beautiful 5. Educated in Arabia	Bacchus was likewise commended for his beauty, as Moses was, and was said to be educated in a mount of Arabia called Nysa; which agrees with Moses's residence in Arabia forty years.
6. Banished from homeland 7. Crosses Red Sea 8. Men and Women in Army	So Plutarch mentions Φυγὰς Διονύσου the banishments of Bacchus; and Nonnus mentions Bacchus's flight into the Red Sea; who likewise mentions his battles in Arabia, and with the neighboring princes there. Diodorus says, that Bacchus's army had not only men, but women in it; which is most true of the company which Moses led.
9. Lawgiver	Orpheus calls Bacchus Θεσμοφόρον, and attributes to him Δίπλακα Θεσμὸν: whereby we understand Moses's being a legislator, and that he delivered the laws in two tables.

10. Fetched water out of rock 11. Snake associations 12. Had dog companion	Moses's fetching water out of a rock with his rod, is preserved in the Orgia of Bacchus; in which Euripides relates, that Agave and the rest of the Bacchae celebrating the Orgia, one of them touched a rock, and the water came out: and in the same Orgia Euripides reports how they were wont to crown their heads with serpents; probably in memory of the cure of the fiery serpents in the wilderness. A dog is made the companion of Bacchus; which is the signification of Caleb, who so faithfully adhered to Moses.
13. Parted seas with thyrsus 14. Turned thyrsus into snakes 15. Were in light; others darkness	To these and Bochartus. some other circumstances insisted on by Vossius, Bochartus adds two more very considerable ones; which are, that Nonnus reports of Bacchus, that he touched the two rivers, Orontes and Hydaspes, with his **thyrsus**, or rod, and that the rivers dried, and he passed through them; and that his ivy-staff being thrown upon the ground, crept up and down like a serpent; and that the Indians were in darkness while the Bacchae enjoyed light..”

Stillingfleet concludes:

> “Circumstances considered, will make everyone that hath judgment say, as Bochartus doth, ‘Ex mirabili illo consensu vel coecis apparebit priscos fabularum architectos a scriptoribus sacris multa esse mutuatos’ [From the extraordinary agreement that appears, many dark or ancient myths, penned by sacred writers and architects, are of borrowed form]. From this wonderful agreement of Heathen mythology with the [Jewish] Scriptures, it cannot but appear that one is a corruption of the other.”

To these fifteen, we might add, per above and below, the following further overlapping points:

16. Had two ray-like horns	"Bacchus/Moses had two luminous rays (or horns) proceeded from his head." (Bochart, c.1650) (Voltaire, c.1769)
17. Engraved laws on two tablets	"Bacchus/Moses made engraved his laws on two tables of marble." (Voltaire, c.1769)
18. Afflicted ten plagues	"Bacchus/Moses wanted only to have afflicted Egypt with ten plagues" (Voltaire, c.1769)
19. Defeated giants with thyrsus	"Bacchus, armed with his thyrsus, defeated the giants. The miraculous rod of Moses was the means of destroying the descendants of the giants." (Hort, 1802)
20. Ordered by god to destroy sinful nation	"Jupiter was said to have sent Bacchus into India to exterminate a sinful nation; and it is recorded, that Moses was commanded, by the true god, to do the same in Palestine." (Hort, 1802)
21. Both left Egypt for battle accompanied by brother	(Siculus, 40BC) (Murdock, 2014)

(or sons)	
22. Carried bones	"Moses with the princes of the tribes carried up the bones of Joseph into Canaan: hence the poets fable of *Osiris'* bones, &c. See Gale's Court of Gen. p. 1, b. 2, c. 7, p. 94, 95." (Edwards, c.1750)
23. Wives gave same name	"Bacchus married Zipporah, a name of one of the seven planets, Venus; so Moses married Zipporah, one of the seven daughters of the priest of Midian." (Ladd, 1907)
24. Both had unknown tombs	"Both Bacchus and Moses had unknown tombs." (Bochart, c.1650)

In 1842, Logan Mitchell, in his *The Christian Mythology Unveiled*, put things thusly: (Q)

> "That the god Bacchus was the archetype of Moses seems to have been the opinion of many learned men, particularly the celebrated Bishop Huet, and I. Vossius, who agree that the Arabian name of **Bacchus is Meses**."

In 1879, Kersey Graves, in his *The Bible of Bibles*, outlines nine points of overlap between Bacchus and Moses, which he actually numbers, as follows: (Q)

> "Here we will call the attention of the reader to the resemblance between Moses and the still more ancient Egyptian Mises, or Bacchus. It is so striking, that we cannot resist the conviction that they were originally closely connected with each other.
>
> 1. Bacchus, like Moses, was born in Egypt.
> 2. Bacchus, or Mises, was also exposed to danger on the River Nile, like Moses.
> 3. Bacchus lived on a mountain in Arabia called Nisas; Moses sojourned on Mount Sinai in Arabia.
> 4. Bacchus passed through the Red Sea dry-shod with a multitude of men, women, and children, as Moses is represented as doing.
> 5. Bacchus likewise parted the waters of the River Orontes, as Moses did those of Jordan.
> 6. Bacchus commanded the sun to stand still, as Moses' friend Joshua did.
> 7. Bacchus, with his wand, caused a spring of wine to spring from the earth, as Moses did a spring of water to flow from a rock with the 'rod of god', or the 'rod of divination'.
> 8. Mises, like Moses, also engraved his laws on tables of stone.
> 9. Both have been represented in pictures with rays coming out of their heads, indicative of the light of the sun.
>
> Thus, it will be observed, the resemblance runs through nearly the whole line of their history. That Bacchus figured in history anterior to the time of Moses, no person versed in Oriental history can doubt, — a fact which impels us to the conclusion that the two stories got mixed before the history of Moses was written."

In 1907, Parish Ladd, in his "The Hebrews: Egypt, Moses and Exodus", summarized the Bacchus to Moses rescript as follows: (Q)

> "Archibald Sayce, an able Assyriologist and Egyptologist, in his *Records of the Past*, says: 'We learn from a Babylonian text recently discovered in Upper Egypt that Moses' title was Mosu the Hero, a word which

renders in Hebrew *Moshah*, which dates back to Akkadian cosmology, where Mosu was deified as the sun god.' The learned Huet, Vossius, Massey and other writers, give a long list of parallel acts of Moses and the Egyptian [Grecian] god Bacchus, showing the two to be one and the same. Gerald Massey, in his *Book of Beginnings*, says: 'From the Greek and Roman reports and Hebrew scriptures a perfect parallel may be drawn between Moses and Bacchus.' Bacchus, like Moses, was born in Egypt. Orpheus calls Bacchus *Mysos*. Bacchus was called *Bimater*, having had two mothers, his own and the-daughter of Pharaoh, his nurse; and Moses, like Bacchus and Kepheus, was a lawgiver. Bacchus was represented, like Moses, as having horns, and the one, like the other, carried a rod with which he struck water out of a rock and which turned into a serpent. Bacchus covered the Indians with darkness as did Moses the Egyptians; the former crossed the Red Sea dry-shod as did the latter the river Orontes. A nymph of Bacchus, like Miriam, crossed the Red Sea. Jupiter commands Bacchus to go and destroy the impious people of the Indies, just as Moses is ordered to abolish the abominations of the idolatrous nations. Pan gave Bacchus a dog as his faithful companion, and in like manner Moses is accompanied by Caleb the dog. Bacchus married Zipporah, a name of one of the seven planets, Venus; so Moses married Zipporah, one of the seven daughters of the priest of Midian."

In 2000, Gerald McDermott, in his *Jonathan Edwards Confronts the Gods*, citing Samuel Bochart (1559-1667) and Jonathan Edwards (1703-1753), summarized the Bacchus legends are 'based on' the Moses stories backwards apologetics like train-of-thought thusly: (Q)

"Bochart and Edwards believed there were good reasons for believing that the Bacchus legends were based on the stories of Nimrod and Moses. They believed the name Bacchus to be derived from the Hebrew Burnish, or son of Cush, and Cush was the father of the biblical Nimrod. This belief was reinforced by several correspondences. Both Bacchus and Nimrod were styled "mighty hunters," and Bacchus's "other name" was Nebrodes, which "is the very name of Nimrod among the Grecians" (MS, no. 401). The Bacchus story also contained remarkable similarities to Mosaic attributes and legends. For, as Bochart pointed out, both Bacchus and Moses were born in Egypt, shut up in an "ark," and put on the waters. Both fled from Egypt toward the Red Sea and had serpents (in Moses' case, a bronze serpent). For both, water flowed from a rock and milk and honey were provided. Both were called legislators, turned sticks into snakes, saw light in the darkness, and had unknown tombs (NS, no. 401). Incidentally, Gale added, the Egyptian myth of Osiris is the Bacchus legend under a new name. For the Greeks called Osiris Dionysus, which is another Greek name for Bacchus (NS, no. 407)."

In 2004, Dorothy Murdock, in her *Suns of God*, citing Mitchell (1842), was summarizing things thusly: (Q)

"Dionysus is not only Osiris but also the counterpart of Moses, who is likewise a mythical personage."

In 2014, Murdock, in her *Did Moses Exist? The Myth of the Israelite Lawgiver* (pg. 201), which, to note, is the top Google Books search (Jul 2017) return for keys: "Osiris, Dionysus, Bacchus, Moses" (Q), elaborates on the Osiris-Moses connection in extended format (Q); herein, she gives (pgs. 331-33) 18+ Dionysus-Bacchus and Moses overlaps, the top five of which are as follows:

1. Like the Hebrew prophet, Dionysus was said to be born in or near Egypt,' reflected in the epithet Nilus or "of the Nile."
2. Dionysus was "saved from the waters" in a small box or chest.
3. Bacchus's epithet was "Mises," similar to "Moses."
4. The Greek god was said to be "Bimater" or to have two mothers, like Moses with his birth and adoptive mothers.

5. Dionysus was "brought up near a mountain of Arabia called Nisa," comparable to Mt. Sinai, where Moses spent many years.
6. Like Moses exiled to "Arabia," Bacchus grew up in Arabia and battled Egypt.
7. Bacchus married Venus, one of the seven "planets," while Moses's wife, Zipporah, is one of seven sisters.
8. Like Moses (Exod 2:22), Dionysus fathered children.
9. Like Yahweh's burning bush, Dionysus was "the fire," appropriate for a solar hero."
10. Dionysus was instructed in the "secrets of the gods," serving as a prophet.
11. Wherever Bacchus marched, the "land flowed with wine, milk, and honey."
12. Bacchus carried a magical rod that he could change into a serpent and that was wrapped with snakes like a caduceus, similar to Moses's staff and brazen serpent pole.
13. Like the biblical pestilences, Dionysus caused a "plague of insanity" to befall the women of Athens, who killed themselves, a curse ended by creating a new religious festival to propitiate the gods.
14. Disbelievers in Bacchus's religion were "smote with disease in their private parts," much like the hemorrhoids of Yahweh (1 Sam 5:9, 6:4-5).
15. Dionysus's army included both men and women, as did the Israelites fleeing Egypt.
16. Like Yahweh's pillar of fire leading the way, the solar "joy-inspiring" Bacchus himself was considered to be a "pillar to the Thebans."
17. Again like the biblical fire column, Dionysus used fire to lead his army through India.
18. As Moses battled Pharaoh the "dragon," Dionysus smote Pentheus the "serpent."'

Murdock, in interview (Q) on this book, states that she found a total of 40 points of comparison between Dionysus and Mosus.

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θΔics

In religio-mythology, **Osiris-Horus**, or "Horus-Osiris" (which renders as "Horus Christ"), similar to joint god Amen-Ra, refers generally to the syncretism of the gods Osiris and Horus amalgamated into one god, united in traits, background, and characteristics, which occurred predominately in the Roman recension, from 50BC to 400AD, when the traits of Osiris, e.g. being able to rise from the dead, god the father, etc., and Horus, e.g. the savior and professor of morals, were reformulated into the character of Jesus Christ (see: Osiris rescripts).

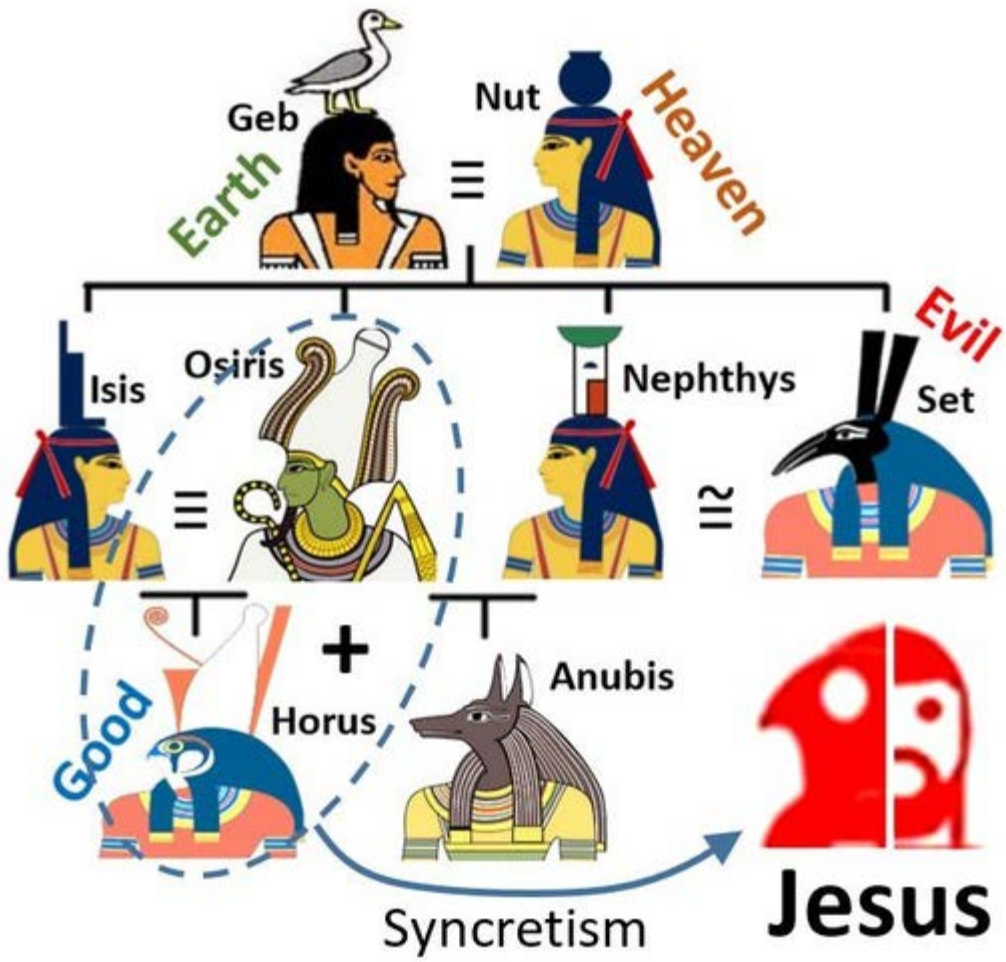

A diagram of the Heliopolis creation myth (2600BC) showing generally how, during the Roman recension (100BC-500AD), the gods Osiris and Horus were merged into the joint god **Osiris-Horus**, who thereafter came to be called "Jesus Christ" or "Horus Osiris" (aka Horus Christ), Osiris being the original "Christ" or mummy, and Horus being his son or god son who is the guide to the afterlife.

Pop culture

Some of the conduits via which the Osiris + Horus to Jesus connection have been disseminated to the general public, include: Dan Brown's 2003 *The Da Vanci Code*, which sold 80+ million books translated into 44 languages, and the films The God Who Wasn't There (2005) (Q)(Q), by Brian Flemming, Zeitgeist (2007), by Peter Joseph, and Religulous (2008), featuring Bill Maher, through which the general public has been enlightened, in a taste like manner, about the mythical origins of modern religions.

Egyptian

Originally, of note, Horus and Osiris were two completely different and unrelated god, Horus being the oldest god in Egypt, according to Wallis Budge. In c.3100BC, in the Heliopolis recension, Osiris became the father of Horus, according to Heliopolis creation myth. The pharaohs all perpetuated the belief, accordingly, that they were the god Horus while in existence, and then became the god Osiris in the afterlife; John Griffiths (1980) summarizes this as follows: [1]

> "The Egyptian treatment of the myth of Osiris is constantly presented, as we have seen, in the setting of death; and it is also constantly related in its early phases to the fact of kingship. Horus as the living Pharaoh and his father Osiris as the dead Pharaoh: these are the basic elements in the royal funerary cult. Osiris *per se* is king of the domain of the dead, so that the dead Pharaoh is naturally regarded as aspiring to sovereignty in the afterworld in the form of Osiris. At the same time the royal burial rites adumbrate the birth of a new Horus in the son who succeeds the deceased. As for the deceased King, he is urged to sit on the throne of Osiris; he inherits now the sovereignty of the dead."

Griffiths refers to the manner in which the older "Horus myth" and the newer "Osiris myth" were merged together, in the 4th Dynasty (2613-2498 BC), in the form of a god family (see: paut), in the Heliopolis creation myth, as "mythological fusion" (Q).

In the period 100BC to 500AD, during the Roman recension, a further mythological fusion occurred wherein, using a combination of the Hebrew "god to prophet" god reduction method and Egyptian god fusion method, the myths of Osiris and the myths of Horus were merged into the character of the man god Jesus.

Over time, as the Egyptian dynasties began to wane in power, and come to an end, the Osiris-Horus myth god king myth structure began to culturally migrate to neighboring civilizations as these began to rise on power.

Sumerian | Tammuz & Adonis

In c.1600BC, in Mesopotamia and Syria, the Osiris-Horus model was molded into the story of Tammuz and Adonis, albeit in this scheme the Sumerian, Babylonian, and Assyrian rules called themselves, not "gods", but priests or priest kings. The god as king models, beginning in about c.1600BC, was losing cultural hold.

Roman | God & Jesus

In c.100AD, as the Roman empire began to rise in power, in the so-called Roman recension, the Osiris-Horus model was reformulated such that the Emperor was the ruler of Rome, the priests, run by the senate, controlled religion, and Osiris was detached from the king by becoming "god the father", whereas Horus became "god the son"; summarized (Q) as follows:

Or, said another way:

In 2008, Dorothy Murdock, in her *Christ in Egypt: the Horus-Jesus*

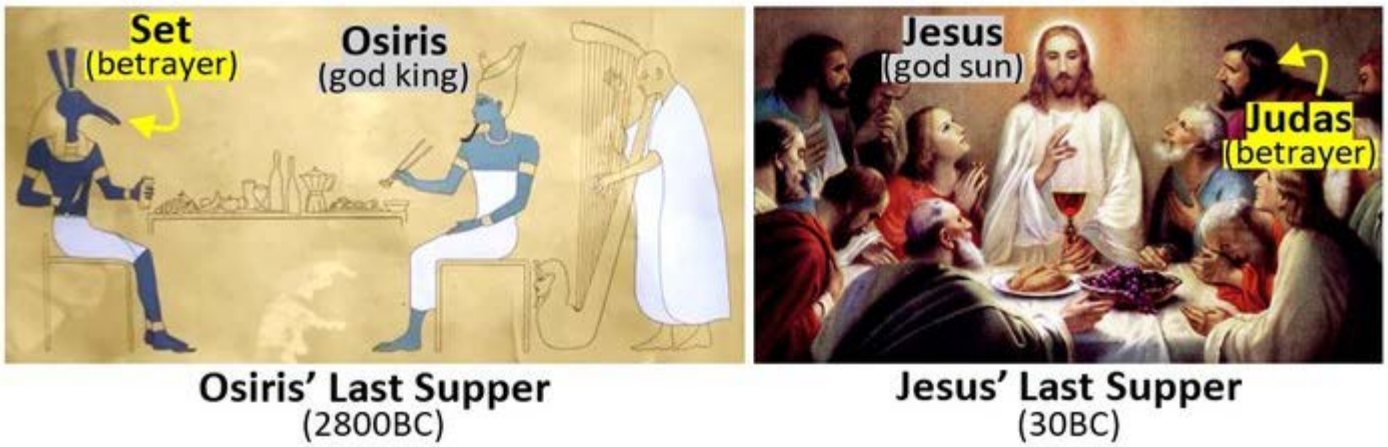

A comparison of the "Last Supper of Osiris", before he his betrayed by his brother Set, and tricked into getting into a chest of wood, which is thrown into the Nile, after which his body is torn into 14 pieces, prior to being resurrected (see: death and resurrection of Osiris), which became, in the Roman recension (100AD-600AD), the "Last Supper of Christ", after which he is betrayed by Judas, for 30 pieces of silver, and Jesus is then whipped into pieces and "crucified" on the cross, prior to being resurrected (see: death and resurrection of Jesus).

Connection, summarized the main points of "Osiris + Horus = Jesus" syncretism as follows: [2]

> "In ancient mythology, in which immortal gods can die, the death of a deity is very significant and is often attended by a sentiment of redemption and salvation, such as the ultimate sacrifice of god's son in Jesus Christ. We have already seen how Osiris and Horus both were betrayed and murdered by their brother/uncle Typhon/Set, with Osiris's death plotted during a sort of "Last Supper" gathering. But were either Osiris or Horus "crucified," as has been claimed by a number of writers? Firstly, when it is asserted that Horus (or Osiris) was "crucified," it should be kept in mind that it was not part of the Osiris/Horus myth that the murdered god was held down and nailed to a cross, as we perceive the meaning of "crucified" to be, based on the drama we believe allegedly took place during Christ's purported passion. Rather, in one myth Osiris is torn to pieces before being raised from the dead, while Horus is stung by a scorpion prior to his resurrection."

Here, Murdock's mention of Osiris' death plotted during a sort of "Last Supper" refers to how the story of Set inviting Osiris to a big dinner and then tricking him into getting into a "chest" that just fit the body size of Osiris, after which he threw the chest into a river (see: Christmas tree), became the New Testament story of the final meal, aka Last Supper (Q), that, in the Gospel accounts, Jesus shared with his Apostles in Jerusalem before his crucifixion; during the meal Jesus predicts his betrayal by one of the apostles present. In the original version, Set betrays his brother Osiris during Osiris' last meal.

Quotes

The following are related quotes:

> "The assertion that 'Osiris' son Horus has the exact same bio of Jesus' is just based on misinformation. This is garbage that's spread on the Internet, that just isn't true. What's funny about this is that these people who say this kind of thing, never seem to quote the primary sources. They tell you that this is in **Osiris OR Horus**, but you never see the primary sources quoted. When you look at the primary sources, you find out that they're not at all parallel."
>
> — William Craig (2012), response (Q)(Q) to audience member who asks about the Osiris/Horus and Jesus parallel, Feb 24

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θΔics

In religio-mythology, **Osiris-Ra**, aka "Ra-Osiris" (Budge,1904) or "Ra-Asar", hieroglyph: 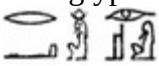 , was a syncretistic god, made by joining Osiris and Ra into one god, who became the supreme god (see: supreme god timeline) in the mid to late New Kingdom era (1250-1050 BCM), developed in Thebes. [1]

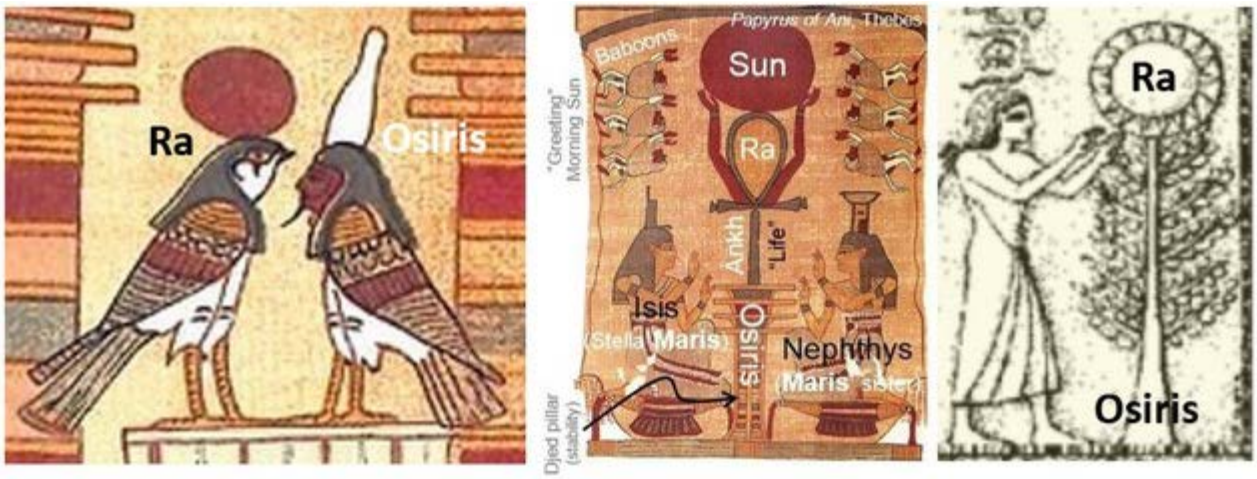

Left: the souls of Ra and Osiris squaring up with each other, symbolic of being equal in supreme god power, in the form of **Osiris-Ra** or Ra-Osiris. Center: a depiction, from the Papyrus of Ani (1250BC) of Ra in the form of an ankh, being born out of the djed pillar (backbone) of Osiris. Right: an image (c.1150BC) Ra in the form of the sun being born out of the evergreen tree (see: Christmas tree) form of Osiris.

Jewish recension

In the Jewish recension (c.900-200 BCM), Osiris-Ra supreme god motif, promoted in Thebes, was recast into the Moses-Abraham motif, admixtured with Atenism ideas, supposedly, by a sect of reformed Egyptian priests called by Herodotus the Cohens, who therein made the Old Testament of the Bible via a god to prophet rescript technique, wherein Osiris became Moses and Ra became Abraham, thereby doing away with the previous god reduction techniques of god synretism (e.g. Amen-Ra) or god incarnation (e.g. Amen).

Quotes

The following are related quotes:

> "Amongst modern scholars, Lepsius, in identifying Osiris with the sun, appears to rely mainly on the passage of Diodorus already quoted. But the monuments, he adds, also show "that down to a late time **Osiris was sometimes conceived as Ra**. In this quality he is named **Osiris-Ra** even in the *Book of the Dead*, and Isis is often called 'the royal consort of Ra'." That Ra was both the physical sun and the sun-god is undisputed; but with every deference for the authority of so great a scholar as Lepsius, it may be doubted whether the identification of Osiris with Ra can be accepted as proof that Osiris was originally the sun."
>
> — James Frazer (1907), *Adonis, Attis, Osiris* [2]

> "The very sub-title of the *Book of the Dead: the Chapters of Going Forth by Day*, evokes an image of the soul emerging into the restorative rays of the sun's light after revival during the nighttime in the underworld. Most Egyptian mortuary texts are like the *Book of the Dead* in this respect—they view the life beyond the grave as combining a chthonic Osirian afterlife with a solar or stellar afterlife. The Egyptian sense of balance meant that both aspects of life beyond the grave were necessary for the survival of the dead. The chief celestial deity, the sun god Ra, was therefor a major figure in the Egyptian concepts of the afterlife, second only to Osiris."
>
> — Ogden Goelet (1994), "A Commentary on the Corpus of Literature and Tradition which Constitutes the Egyptian Book of the Dead (the Book of Going Forth By Day)" in *The Egyptian Book of Dead* (pg. 149); in *Revised and Illustrated Edition* (2015) (pg. 159) [3]

> “In the religious texts that adorned the Theban royal tombs of the New Kingdom, a new, important god of the afterlife makes his first appearance: **Osiris-Re**.”
>
> — Ogden Goelet (1994), “A Commentary on the Corpus of Literature and Tradition which Constitutes the Egyptian Book of the Dead (the Book of Going Forth By Day)” in *The Egyptian Book of Dead* (pg. 149); in *Revised and Illustrated Edition* (2015) (pg. 160) [3]

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θΔics

In hmolscience, **Oskar Morgenstern** (1902-1977) was a German-born Austrian economist notable for his 1938-1944 game theory and utility theory collaborations with his friend John Neumann, resulting in the 1944 jointly-published *Theory of Games and Economic Behavior*, wherein "heat" discussions are utilized.

The Neumann-Morgenstern book inspired the 1950 molecular based economic equilibrium PhD dissertation of John Nash. [1]

Heat | Economic behavior

In 1944, Morgenstern and Neumann jointly-published *Theory of Games and Economic Behavior*, in the preface of which they state the following:

> "This book contains an exposition and various applications of a mathematical theory of games. The theory has been developed by one of us since 1928 and is now published for the first time in its entirety. The applications are of two kinds: On the one hand to games in the proper sense, on the other hand to economic and sociological problems. Our aim is primarily to show that there is a rigorous approach to these subjects, involving, as they do, questions of parallel or opposite interest, perfect or imperfect information, free rational decision or chance influences."

The above "the theory has been developed by one of us (1928) and now published in its entirety" seems to credit Neumann with the bulk of the writing. Canadian economist Robert Leonard in fact asserts that according to historical study Neumann had previously written most of the book without Morgenstern's help. [6]

Anti-reductionist?

In 1999, Italian game theory biographers mathematician Giorgio Israel and Ana Gasca, assert that "Neumann was later to claim that a worthwhile foundation of mathematical economics should be based on the rejection of mechanical and physical reductionism and on the creation of a new kind of mathematics better suited to the specific nature of socio-economic phenomena." [7] In 2007, Israel argues again that Neumann, as early as 1928, and thereafter, had a polemical attitude to general economic equilibrium theory of the Leon Walras variety, a model that Israel refers to as "dreary reductionism". [9] Likewise, in 2014 Israel elaborated: "the fact that von Neumann (and Morgenstern) were strongly opposed to the mechanical reductionism of the Walras-Pareto mathematical economics is trivially evident and well known." [8]

That Neumann was anti-reductionist, however, seems to be a view uniquely held by Israel (who seems to be himself anti-reductionist), as the following opposing points of view exemplify:

> "Cellular automata were conceived in 1948 by John von Neumann, whose motivation was in finding a reductionist model for biological evolution [vonN51]."
>
> — Andrew Ilachinski (2001), *Cellular Automata* (Q)

> "Based on his general approach, one may say von Neumann was a psychophysical reductionist."
>
> — Miklos Redei and Michael Stoltzner (2001), *John von Neumann and the Foundations of Quantum Physics* (Q)

The situation with Morgenstern, however, may be different? In 1970, e.g. Morgenstern gave the following retrospect two natures and or unbridgeable gap stylized statement: [2]

> "Game theory is a new discipline that has aroused much interest because of its novel mathematical properties and its many applications to social, economic, and political problems. Earlier efforts were oriented on the physical sciences and inspired by the tremendous success these have had over the centuries. Yet social phenomena are different: people are acting sometimes against each other, sometimes cooperatively with each other; they have different degrees of information about each other, their aspirations lead them to conflict or cooperation. Inanimate nature shows none of these traits. Atoms, molecules, stars may coagulate, collide, and explode but they do not fight each other; nor do they collaborate. Consequently, it was dubious that methods and concepts developed for physical sciences would succeed in being applied to social problems."

Here, paradoxically, Morgenstern seems to hold the view that molecules, at least inanimate molecules, have one nature, whole humans have a different nature. Likewise, in 1973 Morgenstern commented that: [9]

> "[The notion of stability that emerges in connection with imputation and stabile sets] has nothing to do with the usual equilibria of physics … indeed the present notion differs so profoundly with the usual ideas of stability and equilibrium that one would prefer to avoid even the use of the words. But no better ones have yet been found."

(add discussion)

Education

Morgenstern completed his economics PhD in 1925 on the subject of marginal productivity; thought, as he says, he was constantly troubled by the Bohm-bawerk theory of bargaining and of the "marginal pairs", while dealing with fundamentals, could not be considered complete. This led him, while still in Vienna, to the work of Francis Edgeworth, whom he visited during his 1925 trip to America, specifically his contract curve theory in his *Mathematical Physics* (1881). [3]

Morgenstern and John Neumann at Spring Lake, circa 1946.

In 1928, Morgenstern published *Economic Forecast*, in which he addressed the double blind placebo issue of "influence of prediction on predicted events", a problem peculiar to the social sciences, but not to the physical sciences. [4] As Tom Siegfried explains, in his chemical analogy elaborations: [5]

> "When a chemist predicts how molecules will react in a test tube, the molecules are oblivious. They do what they do the same way whether a chemist correctly predicts it or not. But in the social sciences, people display much more independence than molecules do. In particular, if people known what you're predicting you will do, they might do something else just to annoy you."

That year, mathematician Eduard Cech told Morgenstern that John Neumann's 1928 paper on parlor games contained ideas on the anticipations of anticipations recursive loop issue of prediction, after which Morgenstern became entranced, and desired to meet Neumann.

From 1929 to 1938, Morgenstern taught economics at the University of Vienna.

In 1938, Morgenstern accepted a three year appointment to lecture at Princeton University, for the sole reason—Neumann being then working at the nearby Institute for Advanced Study—of the "possibility that I might become

acquainted with von Neumann." [5] The two eventually met; Neumann began to critique early drafts of a paper of Morgenstern on the relevance of game theory to economics; the result was 1944 jointly-published *Theory of Games and Economic Behavior*, the bible of game theory, thought some assert that Neumann had previously written most of the book without Morgensern's help.

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● Leonard, Robert J. (2010). *Von Neumann, Morgenstern, and the Creation of Game Theory* (pg. i). Cambridge University Press.

External links

● Oskar Morgenstern – Wikipedia.

θΔics

In equations, **Ostwald happiness formula**, or “happiness equation”, is a 1905 equation developed by German physical chemist Wilhelm Ostwald that formulates "happiness" in terms of useful work and energy dissipated in resistance (George Fleck, 1993), and or the energies directed by the will and the energy used up in experiences opposing the will (Ferenc Szabadvary, 1993), or something to this effect.

The formula, supposedly, was or became part of Ostwald’s thermodynamic imperative (1912)

Overview

In 1905, German physical chemist Wilhelm Ostwald published his “A Theory of Happiness”, wherein he penned a happiness equation based on his energetics theories. [1] Ostwald's happiness equation reads as follows: [2]

$$G = k(A - W)(A + W)$$

where, according to Nobel Prize biographer George Fleck, *G* is *Gluck* (happiness), *A* is *Arbeit* (work or ‘energy expended in doing useful work’), *W* is *Widerstand* (energy dissipated in overcoming resistance), and *k* supposedly some type of proportionality constant. This formula can be reduced to the following: [3]

$$G = k(E^2 - W^2)$$

where, according to Hungarian analytical chemistry historian Ferenc Szabadvary, *G* is the amount of happiness, *E* is the sum of energies directed by the will, *W* is the energy used up for experiences opposing the will, i.e. the sum of the energies used for overcoming obstacles, while *k* is a factor for the energetical-physical transactions which is dependent on the individual.

Ostwald, in his circa 1925 *Autobiography*, devotes a chapter to his equation of happiness.

See also

â— Equation of love

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θΔics

In hmolscience, **Oswald Kulpe** (1862-1915) was a German psychologist noted, in psychological thermodynamics, for his 1895 discussions on how the law of the conservation of energy relates to mental processes. [1]

Education

Kulpe was a residual product of the Helmholtz school. Specifically, Kulpe was a student of German physician Wilhelm Wundt at the University of Leipzig, and Wundt, in turn, had previously studied with Johannes Muller and been an assistant to German physicist Hermann Helmholtz, one of the three central developers of the theory of the conservation of force or energy.

Quotes

The following are related quotes:

> "It would thus make no difference whether a quantum of **mental energy** inserts itself into the course of the material process or not: the law of the conservation of energy as formulated hitherto would not be impaired."
>
> — Oswald Kulpe (c.1900), cited by Carl Jung [2]

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External links

â— Oswald Külpe – Wikipedia.

θΔics

In existographies, **Oswald Spengler** (1880-1936) (IQ:170|#349) (RGM:250|1,500+) (GHE:5) (CR:15) was a German philosopher of history noted for []

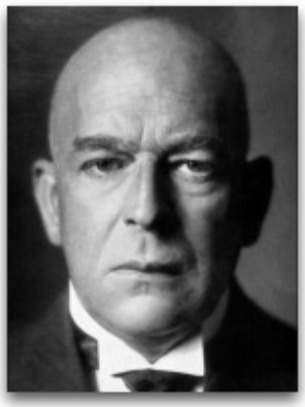

Overview

In 1918/1922, Spengler published his two-volume *The Decline of the West*, wherein, as discussed by Greg Myers, he devoted a certain amount of discussion to entropy, in particular he supposedly alludes to a cyclical entropy-based theory of the rise and fall of civilizations: [1]

> "What the myth of Gotterdammerung signified of old, the myth of entropy signifies today—the world's end as completion of an inwardly necessary evolution."

The German *Götterdämmerung* is a translation of the Old Norse phrase *Ragnarök*, which in Norse mythology refers to a prophesied war of the gods that brings about the end of the world. [2]

In 1945, American physical historian Morris Zucker commented how Spengler's work had a 15-year intellectual acceleration on the intelligencia: [4]

> "Over thirty-seven years ago, Seligman first published his *Economic Interpretation of History*. It has gone through several printings, editions and translations. In itself that work is a living example of the peculiar **myopia** which afflicts the intellectual world. Sometimes it takes ten or fifteen years for that world **to catch up** with a **Spengler**. Kyserling was more transparent. Seligman himself in 1902 commented upon the fact that fifty years after Marxism had made its first appearance and had stirred to the depths economic, social and philosophical thought among European scholars, here in America Marx was scarcely known outside of a few obscure immigrants socialists."

an example of the so-called "catch up effect".

Goethe | Nietzsche

Spengler immediate inspiration was his perception that the civilization of the west since the late nineteenth century was exhibiting the same symptoms as ancient civilization in its decline. He acknowledged the influence primarily of Goethe and Nietzsche; to them he owed "practically everything". (Ñº)

Quotes | By

The following are related quotes:

> "Today we live so cowed under the bombardment of this intellectual artillery that hardly anyone can attain to the inward detachment that is required for a clear view of the monstrous drama. The will-to-power operating under a pure democratic disguise has finished off its masterpiece so well that the object's sense of freedom is actually flattered by the most thorough-going enslavement that has ever existed."
>
> — Ostwald Spengler (1923), *The Decline of the West, Volume Two* (pg. 461) [3]

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(b) The Decline of the West – Wikipedia.

(c) Myers, Greg. (1985). "Nineteenth-Century Popularizations of Thermodynamics and the Rhetoric of Social Prophecy." *Victorian Studies*, 29: 35-66.
2. Gotterdamerung – Wikipedia.
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External links

â— Oswald Spengler – Wikipedia.

θΔics

In cyphers, **OTT**, as compared to TOT, refers to []

Overview

In 1809, Goethe, in his *Elective Affinities*, stylized the names of five characters, the four main characters (Edward, Charlotte, Captain, and Ottilie), and the child (Otto) that is born during the course of the novel, in a coded way, as pointed out by John Williams (1998), to the effect that each has an “ott” root to their name; specifically, Ott is the stem of the names of Eduard (his baptism name was Otto), Charlotte, the Captain (his baptism name was Otto), Ottilie, and the child, each being a reference to "Saint Ottilia" (c.634), legendary child who having been born blind, had her vision restored at age 12, thereafter being named "Sol Dei" (Ol-dei), or "God Sun", i.e. sun of god, or sun god, or some equivalent, the hidden message, in Goethe's mind, supposedly, being that just as each of the five OTT-characters (Edward, Charlotte, Captain, Ottilie, Otto), in the the cryptic novel, are CHEM-children of the sun, so are the rest of us, and that as soon as we see this "new" view of things, we will have our "vision restored", and thereby come out of the dark ages, or Plato's cave, or something along these lines. [1]

Quotes

The following are related quotes:

> “Are you [Edward and Captain] not both named Otto [**OTT**]?”
>
> — Goethe (1809), *Elective Affinities* (P1:C3) (Ñº)

> “When you start to see the world though 'chemical eyes' or **Gibbsian eyes** then you’ll have a new morality.”
>
> — Libb Thims (2015), “Zerotheism for Kids”, Monday Lecture, Chicago, Sep 7 [2]

References

1. Williams, John R. (1998). *The Life of Goethe* (anagram, pg. 137; Otto anagram, pgs. 233-34). Blackwell.
2. Thims, Libb. (2015). “Zerotheism for Kids” (co-host: Thor) (main), 14-part [4:41-hr] lecture playlist (Ñº), 5-intro sides (Ñº), 56-main sides (Ñº), 11AM-3PM, Chicago, Sep 7.

θΔics

In *Elective Affinities*, **Ottilie**, is the adopted daughter of Charlotte's deceased best friend, is the fourth of the reactants brought into the estate so to bring about the double elective affinity reaction, as described in Goethe's affinity table, and is one of the four "Otto" interchangeable chemical species.

A circa 1864 depiction of **Ottilie** and the dead child Otto by German painter Wilhelm von Kaulach (1802-1874). [6]

Multiple relationships

David Constantine, English translator of the 1994 Oxford World Classics edition of *Elective Affinities*, likewise argues that Ottilie could have been based on one of three people, firstly Christiane Vulpius, a girl from a local flower shop, who became Goethe's mistress and whom he lived with for eighteen years. Ottilie could also have been Minna Herzlieb who Goethe began to have feelings for, a year after marrying Christiane; as he comments: [1]

> "Goethe wrote a sequence of sonnets for her [Herzlieb]; and it has very often been said that she moved him to write *Elective Affinities* much as Charlotte Buff had moved him to write *Werther*, and that she appears in it as Ottilie."

Constantine, however, also argues that Ottilie could have been Sylvie von Ziegesar whom Goethe was seeing frequently during his usual summer stay in Karlsbad in 1808. It has also been noted that between 1788 and 1816 Goethe was in love, more or less passionately, more or less intimately, half-a-dozen times at least. [1]

Minna Herzlieb

The most-cogent argument for the bulk of the person behind the character Ottilie, however, comes from Goethean scholar Hjalmar Boyesen who, in 1879, explained that Ottilie was based on Minna Herzlieb: [3]

> "Goethe's affair with Minna Herzlieb, the adopted daughter of the bookseller Fromman, in Jena, was a kind of poetic devotion, at a time when he was yet bound to another naturally stimulated him to many reflections concerning the nature and validity of marriage, and these reflections, embodied in living characters, furnished the theme of the novel, *Elective Affinities*."

In other words, just as Ottilie was the adopted daughter of Charlotte's deceased best friend, so to was Minna the adopted daughter of one of Goethe's friends, the bookseller Fromman, in Jena, with whom Goethe had developed strong amorous feelings towards. To corroborate, as Goethean historian Calvin Thomas explains: [4]

> "[Toward the end of 1807] to while away the otherwise lonely and tedious winter evenings he resorted to the homes of congenial friends, among whom was the bookseller Frommann. One of the members of the Frommann household was Wilhelmina Herzlieb, a shy girl of eighteen year whom Goethe had known casually for ten years. He liked her very much—more than was 'proper', as he admitted to Zelter some years later—while she seems to have looked up to him with veneration, counting herself blest to be admitted to such choice society."

Goethe's biographer George Lewes points out that "at length it was resolved to send Minna to school, and this absolute separation saved them both" just as "in the novella, Ottilie also is sent back to school." [2] The main source for the Ottilie character seems to have been Minna Herzlieb.

Person Behind the Character

Christiane Vulpius (1765-1816)	A girl from a local flower shop, who became Goethe's mistress (because of her class), whom he lived with for eighteen years; married her in 1806; bore him five children.	
Minna Herzlieb (1765-1839)	In 1807, she came to Weimar, where she met Goethe, who presented her with some sonnets; it has been argued that she may have been one of the models for Ottilie.	
Sylvie von Ziegesar (1785-1858)	Goethe was seeing her frequently during his usual summer stay in Karlsbad in 1808; and it has been said she to was the model for Ottilie. She was the subject of Goethe's poem: "To Sylvie von Ziegesar".	
Johann Goethe (1749-1832)	It has been argued that the Ottilie character was based on Goethe's youthful (age 27) entry into the established Charlotte von Stein (age 34) family.	

Goethe in youth

One of the more telling suppositions as to the character of Ottilie comes from German philosopher Herman Grimm who argues that the Ottilie character was based on Goethe's experience in 1776 at the age of 27 when entered the life of Charlotte von Stein (age 34): [5]

"Into their wedded life Ottilie enters, as Goethe once found his way into the Frau von Stein's family."

This is corroborated by Goethe's 1780 writings to Lavater about Frau von Stein:

"She has gradually succeeded to the position of mother, sister, beloved one; and a bond unites us which seems like these natural ties."

To Goethe, according to Grimm, Stein had become son, brother, lover, all in one. Grimm goes on to allude to the conclusion that the child, or "poor creature" as Grimm calls it, born out of this unnatural relation is Goethe's realization of the disastrous outcome that would have befell him had he stayed with Stein relation in those early years, in that older woman type of situation.

See also

â— Ottilie Pogwisch

References

1. Constantine, David. (1994). "Introduction" (to English translation of *Elective Affinities*). Oxford University Press.
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4. Thomas, Calvin. (1917). *Goethe* (pg. 132). H. Holt and Co.
5. Grimm, Herman F. (1880). *The Life and Times of Goethe* (pg. 465). Trans. Sarah Adams. Little, Brown, and Company.
6. (a) Goethe timeline (elective affinities section)– GoetheZeitPortal.de.
(b) Wilhelm von Kaulbach – Wikipedia.
(c) Ottilie (c.1864) – PDMP Gallery.

θΔics

In existographies, **Ottilie Pogwisch** (1796-1872), or “Ottilie von Goethe” by marriage, is was the daughter-in-law of Johann Goethe, wife of August von Goethe, whom she married in 1817, and the one present beside the elder Goethe during his "more light" 1832 last words.

Overview

Nobility, she was the daughter of Wilhelm Julius von Pogwisch and Henriette Ulrike Ottilie Gräfin Henckel von Donnersmarck. Her parents separated when she was very young and she traveled with her mother, a countess, until they finally came to Weimar in 1806. [1] She soon becoming good friends with Adele Schopenhauer (1797-1849), sister of Arthur Schopenhauer (1788-1860), daughter of Johanna Schopenhauer (1766-1838), the women in whose home Goethe and his new scandalous bride Christiane made their first public appearance.

She was intelligent and after an unhappy love married August von Goethe on June 17, 1817. Their marriage was very unhappy but they had three children. [1]

Ottilie von Goethe is one of the most controversial women of her time. Her restlessness, energy and unconventionality made her a sought-after, but also despised woman who had to endure numerous slanders especially after Goethe's death. Especially after the birth of her illegitimate daughter Anna, in 1835, which she had conceived together with a British officer, there were increasing rumors and eventually culminated in the assertion that she had killed her eldest daughter Alma. [2] The established reason, however, is that Alma Goethe (1827-1844) met her reaction end at the age of 17 during the typhoid epidemic.

OTTO

There may have been a possibility that "Ottilie" Pogwisch had suggestive influence the character of "Ottilie" of Goethe's *Elective Affinities* and in turn the OTTO name root puzzle, being that her entry into Weimar circle occurred two years before 11 Apr 1808 when Goethe begins to work on *Elective Affinities* according to diary entry. This, however, is pure speculation at this point.

References

1. Ottilie von Goethe – FindAGrave.com.
2. Rahmeyer, Ruth. (2002). *Ottilie von Goethe. A Biography* (pg. 243). Frankfurt am Main.

External links

â— Ottilie von Goethe (German → English) – Wikipedia.

θΔics

In cryptography, **Otto**, or "otto cypher" (see: OTT), refers to a coded etymological term (name, root, and suffix) used overlappingly by German polymath Johann Goethe to represent or relate four different characters in his 1809 novella *Elective Affinities*, namely: Otto, the name of both Eduard (Eduard Otto), in youth, and the Captain (Hauptmann Otto), in baptism, the two leading male characters in the novella, and CharlOTTe and OTTilie, the two leading female characters, as well as the name of the child Otto (or Ott), born out of the mental double adultery or double elective affinity reaction (double displacement reaction) that takes place over the course of the novella. Much work and speculation has been done in effort to decode this riddle, some of which is summarized below.

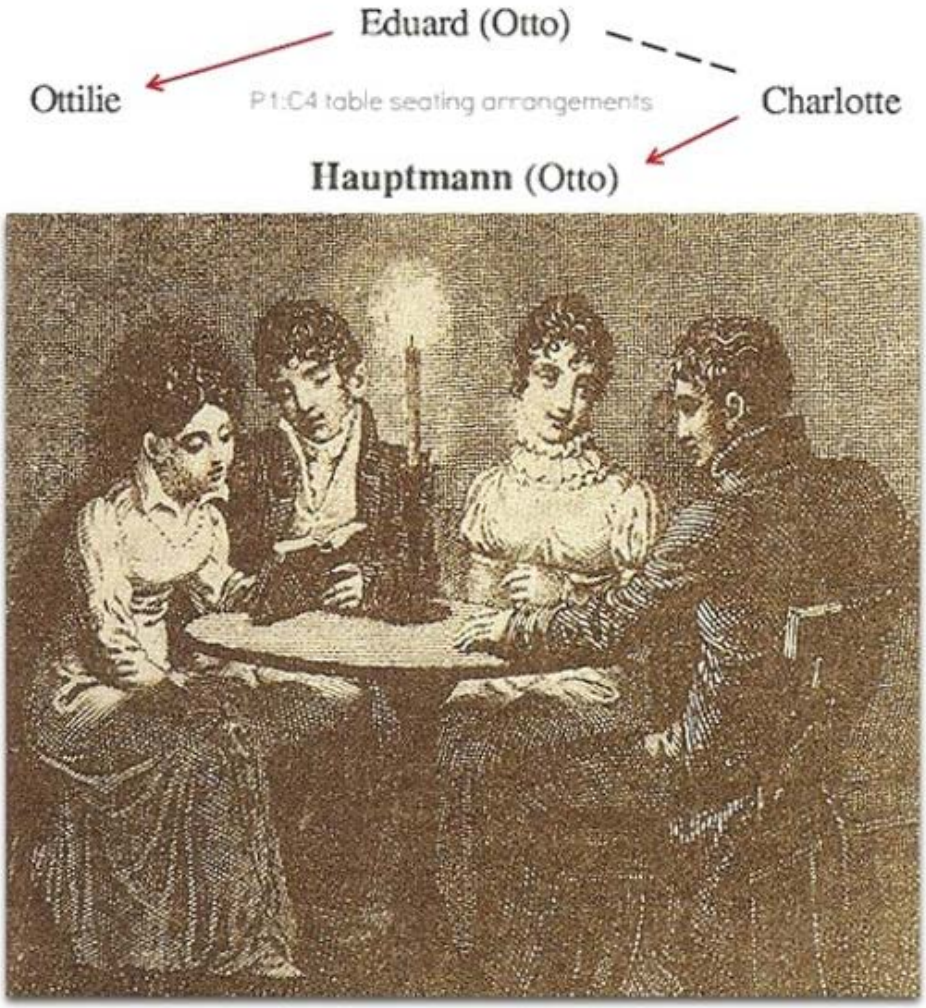

Since Charlotte derives from French (Charles + Otto), and since Ottilie derives from the Latin diminutive of Otto, Ottilia, then all persons at the table have one name element in common, Otto.

American Goethean scholar Alfred Steer's 1990 seating diagram (modified with the addition of Cullen affinity darts and bonding brackets (dashed line style)) take on Goethe's narrator-described P1:C4 seating arrangements, about which, he speculates, based on Friedrich Nemec's 1973 argument, that **Otto** derives from the Old High German root *ot-* meaning owner or possessor of the land. [9]

Overview

See also: Goethe's affinity table; List of characters

On 9 May 1809, Goethe sent a letter to Charlotte von Stein, referred to her as "St. Ottilia", in reference to Saint Ottilia, the patron saint of vision restoration. [1]

On 3 Oct 1809, Goethe published *Elective Affinities*, wherein the following clue is found:

> "Are you not both named Otto?"
>
> — Goethe (1809), *Elective Affinities* (P1:C3) (Ñº)

On 5 Nov 1809, German playwright Johann Rochlitz (1769-1842) is said to have been the first to notice the name cipher; stating:

> "... very artfully contrasted with each other in groups [which occur in polar relationships]"

In 1911, German biographer Albert Bielschowsky, in his biography of Goethe, alluded to the argument that the name or root name OTT has some type of hidden relation to Saint Ottilia, a 15th century abbess, the patron saint of suffers from eye diseases, typically depicted in artwork holding a book with a pair of eyes (or reading stones) in her hands, of which Goethe had painted on his visit to Odilienberg, when a student at Strasburg, an image that supposedly, according to Bielschowsky, later came to be blended together with his experiences with Minna Herzlieb, the daughter of a local book seller whom he had fallen or almost fallen for. [1]

In 1981, Heinz Schlaffer, in his "Names and Characters in Goethe's *Elective Affinities*", argued that "Otto" became a cypher for the inevitable death of the infant. [14]

In 1998, Scottish biographer and German literature lecturer John Williams, in his *The Life of Goethe*, gave one of the best summarizes of Goethe's intricate use of this anagram. Williams surmises that Eduard, Charlotte, Otto form ECHO—which in turn

relates to allusions to the myth of Narcissus and Echo and various points. Charlotte, Hauptmann (Captain), Eduard, Mittler, form CHEM (see: CHEM cypher; chemistry etymology)—a significant acronym for the main theme of the novella (chemistry), even if, according to Williams, "Mittler (the mediator) fails to catalyze or restore the relationship between Charlotte and Eduard." Ott is the stem of the names of Eduard (one of whose name in youth was Otto), Charlotte, the Captain, Ottilie, and the child. [4]

As an anagram, OTT becomes TOT (dead); as a palindrome, OTTO represents an ironically harmonious mirror-image. Ottilie is near enough to OTT-LILIE: lilies are "symbols of purity, attributes of the Virgin Mary", according to Williams. [4] This Virgin Mary speculation by Williams, to note, is likely erroneous, being that Goethe's 1770 PhD dissertation (rejected on the grounds that it was unorthodox) "The Legislature, On the Power of the Magistrate to Determine Religion and Culture", at the University of Strasbourg, contended, among other things, that "Jesus Christ is not the author of Christianity, but rather a subject composed by a number of wise men and that Christian religion is merely a rational, political institution"; which as as Goethe surmised correctly turns out to the case, being that we now know that the story of Jesus Christ, and hence Christianity, is based on the myth of "Osiris Anointed" and Ra theology in general. [5]

The initials E and O, such as are engraved on the glass that gets symbolically destroyed, according to Williams, are not only the initials of Eduard and Ottilie, or Eduard and Otto, but also of Eurydice and Orpheus—which, according to Williams, relates to the symbolism of Mittler as Hermes, the ubiquitous messenger and Psychopomp, the conductor of souls to the underworld.

Lastly, the cryptic encodings of the novel have been related, somewhat obscurely, to Mittler's win of the lottery: L-OTTO. [6]

In 2001, Germanic studies professor Astrida Tantillo noted that it has frequently been pointed out that the four main characters as well as the child that is born share the same root name "Otto". [2] Both Eduard and the Captain were called OTTO in youth; the two women CharlOTTE and OTTilie, have related names; and the misfortune child born out of the "mental" double adultery (or double elective affinity) of the four main characters (reactants) is called Otto. [3]

Opinions differ as to why Goethe used this naming riddle, but the modern chemical view would argue that Goethe intended the reader to grasp the logic that each person is a different type of "human chemical" (or human molecule) in essence.

A depiction of Saint Ottilia (c.662-720), the patron saint of vision restoration, said to have some type of hidden connection to the characters: Eduard and the Captian (both called **Otto** in youth), Charlotte (suffix **Ott**), and Ottilie (prefix **Ott**), each of which Goethe viewed as a type of chemical or chemical species governed by the laws of chemical reaction, as described by the affinity chemistry (laws of affinity), the chemistry of his time.

Chemical model

In 2007, American electrochemical engineer Libb Thims speculated that the OTT-cypher signifies the following: [10]

> "It is likely that Goethe situated this curious puzzle piece to signify the reality that each character in the novella or each human in the world, underneath, is simply a different chemical species, each with varying amounts of affinity for one another."

In short, it is very possible that Goethe intended the literary device as one of his many "hidden elements", as he put it, to the effect that the world or "future", as he put it, come to "see" people as reactive chemicals or human molecules (modern sense); something along the lines of a combination of "I see ships" and "seeing the forest among the trees" (e.g. see Jean-Marie Lehn section of equation decoding) in the sense that the future or progress of human knowledge would restore vision to humankind, and begin to see people and relationships in the true human chemical thermodynamic sense of the matter?

In 2014, Matthew Bell, in his "In Retrospect: Elective Affinities", speculated on the "Ott" cypher, as follows: [11]

> "Bergman's theory of 'elective affinity' seems to describe the shifting relationships of the protagonists, Eduard, Charlotte, Ottilie and the Captain. In this sense, the novel can be read as an exercise in reductionism: like elements, the characters seem to have no choice but to make new bonds when a reagent is introduced. Even their names reinforce this. Both Eduard and the Captain were christened Otto, so the repletion of the 'ott' in the names of the

characters emerges as a sign of affinity."

This seems to be incorrect in that Goethe, e.g. as found in assumed to have been conceptualized "human" affinity table (see: Goethe's affinity table), situated affinity forces, reactions, and tendencies between all the characters in the novella, not just the for main protagonists; also as the term "Ott" was symbolic, in Goethe's mind, with the restoration of vision, his intention was to situation the view that the vision restored to humanities, when the deeper nature of his theory was absorbed, would be a new view of humanity, of the "molecular goggles" type of advanced perspective or "super observer" Matrix code seeing sort of vision restoration, as Albert Szent-Gyorgyi speculated about in the 1960s.

In 2015, Libb Thims, in his "Zerotheism for Kids" lecture, explained to the children that Goethe employed the Ott cypher as a means to explain that when we one comes to see people each as different but unique types of "chemicals" that a new "vision", previously blinded, of meaning and morality would be restored; a visual of this as follows (lecture #6 (0:00-1:35); slide #15): [12]

Thims then summarized this to the children as follows:

"When you start to see the world though chemical eyes or Gibbsian eyes then you'll have a new morality."

In short, in modern term, each person as being OTT-based, in the novella is prototype to the late 19th century model of each person being carbon-based or C-based, which is equivalent to, in the early 20th century, of each person being a CHNOPS-based chemical; such as stated by German physical chemist Wilhelm Ostwald, a modern Goethean human chemical theory philosopher, about himself, in 1926, as follows: [13]

"I am made from the **C-H-N-O-S-P** combination from which a Bunsen, Helmholtz, Kirchhoff came."

Goethe, in short, was trying to say, in code, speaking in modern terms, that each of his four main protagonists, with the name root "OTT", was a "CHNOPS combination", as Ostwald would say, or, in modern terms, a "powered CHNOPS+20 chemical" (or molecule), whose affinities and combinations are determined by the elective affinities (or free energies in modern speak).

Other

In 2005, German director Doris Dorrie, in the film *The Fisherman and His Wife* (Der Fischer und Seine Frau), employed the name Otto to explore marriage through the two types of Ida-Otto couples: one a happy marriage, the other a cursed marriage, in a way that is said to be reminiscent or similar to Goethe's usage. [7]

In 2008, American author and former exotic dancer Megan Clark, published *Seduce Me*, which is said to be a modern variant of Goethe's *Elective Affinities*, supposedly with emphasis on the full carnal details that Goethe left out; although, it seems, the novel has little to do with actual chemistry, aside from the word being mentioned twice, in a purely metaphorical sense, namely in respect to the "chemistry between them" and the "fire of their chemistry" being more like "sliding a match across a specified surface and getting an instant flame". [8] The character Charlotte, of the two lead females in the novel, one reserved, the other non-reserved, is the one who embodies a person who follows their sexual desires to their fullest.

See also

â— Otto Sackur
â— Otto Guericke

A 2011 play rendition of *Elective Affinities* and the "**OTT**" letters at the National Theater in Weimar by Claudia Meyer. (Ñº)

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6. (a) See: Norbert Bolz (ed.), *Goethe's Wahlverwandtschaften. Kritische Modelle und Diskursanalysen zum Mythos Literature*, pgs. 214ff, 326ff, 3338ff, and *passim*; and Waltraud Wietholter in *Frankfurter Ausgabe* (Goethe's works). 8, 984-1017.
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Further reading

â— Goethe, Johann. (1809). *Elective Affinities* (Otto, pgs. 22, 232, 275). Publisher.

θΔics

In existographies, **Otto Guericke** (1602-1686) (IQ:190|#37) [RGM:274|1,500+] (EP:10) (GPE:62) [CR:186] was a German military engineer, physicist, electrical scientist, diplomat, characterized as an: "ingenious gentleman" (Boyle, 1660), “neglected genius” (Coulson, 1943), “ten founding fathers of electrical science” (Bern, 1954), and adult “prodigy” (Multhauf, 1971), notable for his so-called leisure time "scientific experimentation", which he began in 1632, resulting in the inventions of the piston and cylinder, vacuum pump (c.1650), vacuum bulb, Magdeburg hemispheres (1657), and the electrostatic generator (1660), to name the main fruits.

Name

Guericke is cited as: "Ottone Gericke" (Schott, 1657), "Otto Gericke" (Boyle, 1660), his birth name, Otto von Guericke (Leopold, 1666), his new "von" ennobled name, or Ottonis de Guericke (Latin), as his name appears in his scientific treatises. In 1665, Guericke, because of the commonness of his surname “Gericke”, and wishing to be distinguished, i.e. unique, and also to be ennobled, petitioned Kaiser Leopold: [8]

> “Because of this, I have been moved, for the good of posterity, to bring up another matter, namely the fact that there are many people, where and elsewhere, who share my name (Gericke) though they are not related to me, often leads to mistaken identity. Also, as foreigners pronounce the initial ‘Ge’ as ‘sch’, my name is often misunderstood. Both these would be rectified by the title ‘von’ and the insertion of a ‘u’ between the ‘G’ and the ‘c’ so that I write my name ‘von Guericke’.”
>
> — Otto Guericke (1665), “Letter to Leopold”, Jan 31

In early 1666, “Gericke” was ennobled and his new last name became “von Guericke”. Guericke became “von” Guericke ennoblement by Leopold I, Holy Roman Emperor when he changed the spelling of his name from "Gericke" to "Guericke" and when he became entitled to the prefix "von". Schimank (1936) reproduces von Guericke's petition to Leopold requesting the prefix "von" and the change of spelling. [20]

First generation vacuum pump

In 1630, Guericke, aged 28, experienced the “Sack of Magdeburg” (Ñº), the worst incident of the "Thirty Year War" (1618-1648), wherein his hometown was burned down, and of the city’s 25,000 inhabitants, only 5,000 survived. This event, supposedly, was said to have prompted Guericke, in the 1640s, to begin testing "water pump" designs for firefighting. [11]

In 1632, Guericke began collecting scientific instrumentation, e.g. he owned an astrolabe and a spirit level.

On 5 Sep 1646, Guericke, age 44, became Burgomaster (mayor) of Magdeburg, a position he would hold for the next 30-years. [8]

In 1647, Guericke, according to a number of sources, Guericke historian Fritz Krafft (1978) in particular, began his vacuum pump experiments:

> “A **few years previous** (pancos ante annos), Guericke ‘thought up a device’ whose intent and purpose you will understand from his words reproduced below.”
>
> — Gaspar Schott (1657), “New Experiments in Magdeburg” [13]

> “**Unaware of most of the** [Torricelli-Pascal vacuum debate] **discussion**, the Magdeburg Mayer Otto Guericke started experimenting with his air-pump **around 1647**. His aim was to establish the existence of a vacuum by creating one? Although his research fitted well into the on-going discussion, Von Guericke's involvement was spurred by a different concern. The invention of his machine had as its main purpose the refutation of Descartes' cosmology and his related ideas on space and matter.”
>
> — Anne Helden (1991), “The Age of the Air-Pump” (pg. 151); per citation of Fritz Krafft (1978) and his *Otto von Guericke* (pgs. 55-57) [14

> “The vacuum pump, for which Guericke is most celebrated, has been **dated to 1647**, but that too must have been the culmination of work going back to earlier years.”
>
> — Thomas Conlon (2011), *Thinking About Nothing* (pg. 43) [8]

The following, below left, is the first version of his "vacuum pump" (see: Guericke first generation vacuum pump), or “antlia pneumatica” (air pump), in Latin, as he called it, the term *antlia* (Ñº) of Greek origin meaning “hold of a ship, bilgewater, reservoir”, in the sense of pumping water out of flooded ship. He used this vacuum pump for his "beer keg experiment, as shown below left, wherein he attempted to suck the water out of a water-filled beer keg: [10]

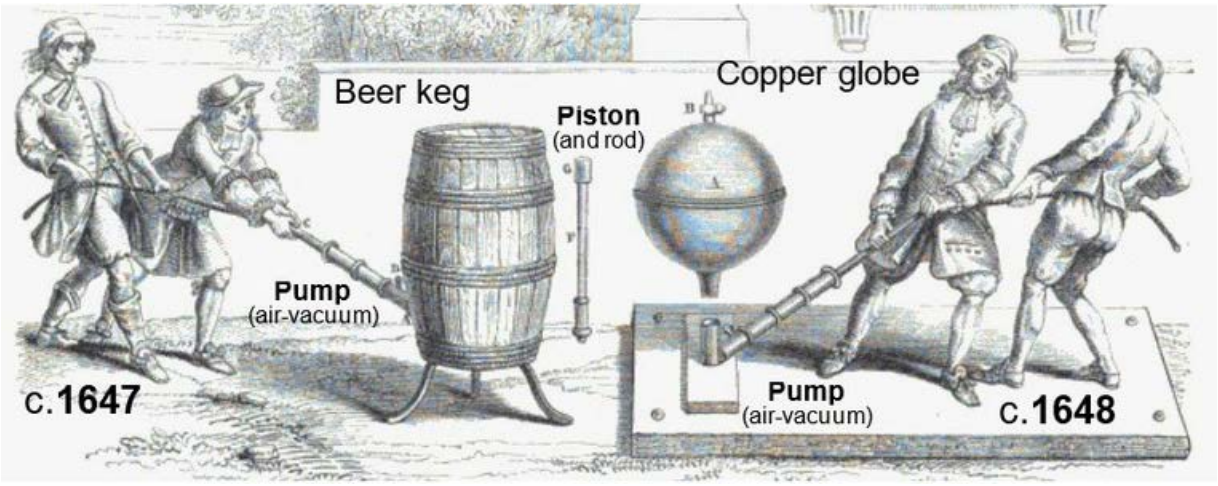

The use of the beer keg, of note, seems to have been a repercussion of the fact that Guericke owned a brewery and a farm. [8] The invention of the vacuum pump, based on taking a fire squirt gun, and reversing the operation, a repercussion of the fact that he tested a number of fire squirt guns, following the burning of Magdeburg, his home town, during the Thirty Year War (1618-1648).

In 1648, the Thirty Year War ended, which released Guericke from his stressful job as wartime diplomat for Magdeburg, after which he became a rotating mayor of Magdeburg, therein freeing up more time for experiments.

In 1654, Guericke, at the end of the Imperial Assemby at Regensburg, give, per request, public demonstrations, to small groups of his associates:

> "At the Imperial Assembly held at Regensburg, in **1654**, where I had been sent on municipal business, some enthusiasts for scientific matters heard something about these experiments and pressed me to give a demonstration. The person most taken by them was Johann Philipp, Archbishop of Mainz and Bishop of Wurzburg, who prevailed upon me to send him the apparatus that **I had brought with me to Regensburg** and he then had it taken to Wurzburg."
>
> — Otto Guericke (1672), *New Experiments* (preface)

Guericke, at the end of the Regensburg meeting, sold the vacuum pump equipment he had to Johann Philipp, who wanted it for his own, who then took the equipment back to Wurzburg with him, and gave it to Gaspar Schott to text and experiment with; Schott, in turn, then began to discuss the device with Athanasius Kircher. [8]

Second generation vacuum pump

In 1654, Guericke made an improved vacuum pump (see: Guericke second generation vacuum pump), which he described as a "pump with two openings, through one of them the air is introduced, and through the other it is expelled", which seems to be the device in figure II below, from Gaspar Schott's 1657 *Mechanical Pneumatical Hydraulics* (pg. 466), which he was demonstrating for people at the Imperial Assembly held at Regensburg: [4]

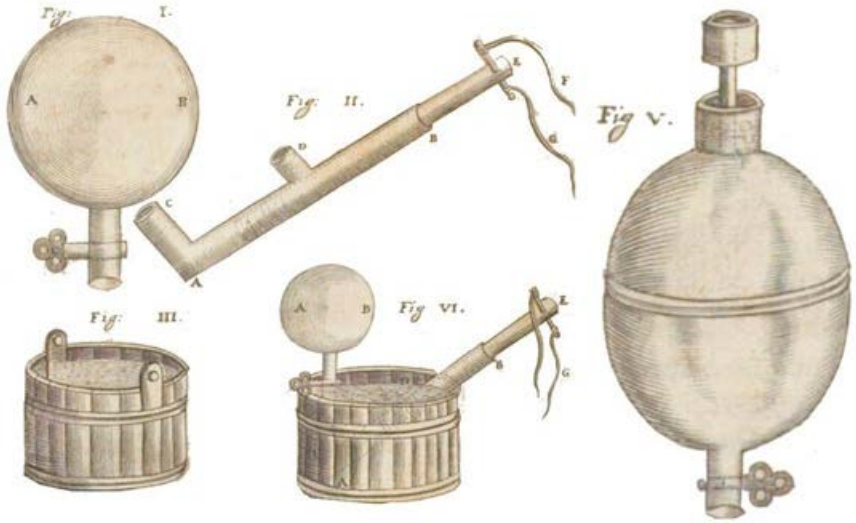

This model, presumably, was the one displayed at Johann Philipp's residence in Wurzburg (Ñº), as depicted by Gaspar Schott (1664) in *Technical Curiosities* (pg. 9), such as shown below, where the so-called "water raising experiment" is being performed:

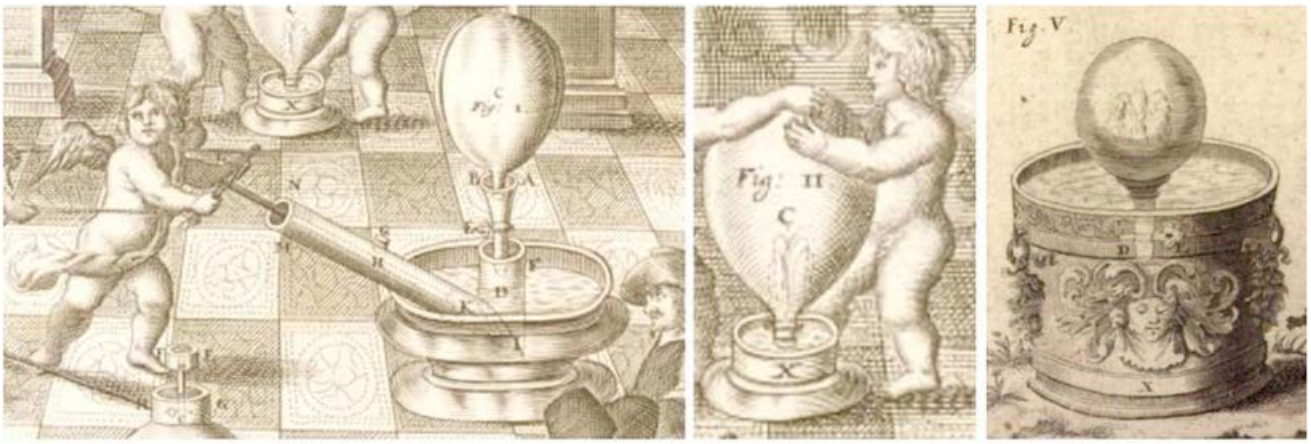

The following is a map of Guericke's travels, e.g. Regensburg (1654), Wurzburg (c.1655), Vienna (c.1656), as well as influence of ideas spreading, via word of mouth, e.g. Kircher (1656), Philipp (c.1655), etc., and publications, such as Schott (1657), Boyle (1660), etc.: [22]

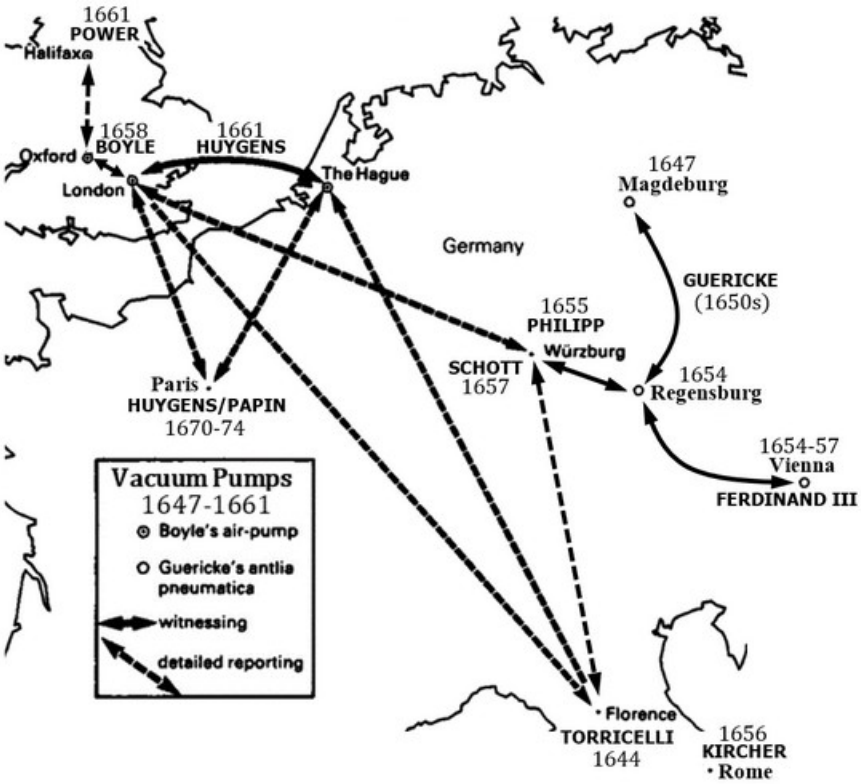

Guericke, in respect to this timeline map of Guericke's movements and influence, is said to have conducted ten experiments while in Regensburg, wherein he had a cosmopolitan audience, according to a conjectured list made by Hans Schimank (1936), based on the two published accounts by Gaspar Schott (1657; 1663), as reviewed by Thomas Conlon (2011), some of which are: [21]

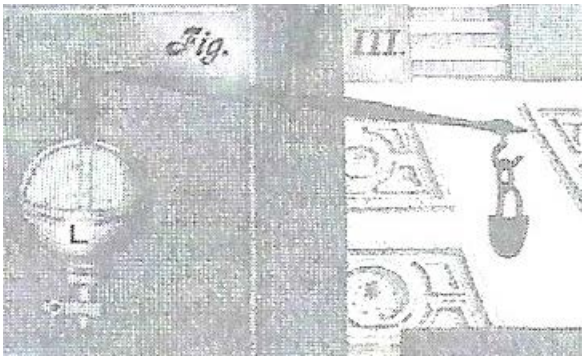

A depiction **Guericke**'s "weighing of air" experiment, as discussed in his 18 Jun 1656 letter to Gaspar Schott, wherein he weighed an air-filled receiver, then evacuated it, and re-weighted it, finding that it lost two "lobt" (coins) or two ounces. [23]

1. The crushing of an air-tight vessel as air was withdrawn from it; the air being allowed to expand into a previously evacuated receiver.
2. A number of men were only able to pull an airtight piston halfway up a copper cylinder
3. Extraction of air using a vacuum pump
4. Extinction of a flame (combustion) in a sealed vessel
5. Raising water vertically inside a vacuum bulb against its natural tendency to fall
6. Weighted the air
7. Caused clouds and wind to form in the glass vessels
8. Shattered toughened glass into splinters
9. Showed that sound is not heard in a vacuum (compare the Kircher "bell" in the Berti vacuum, c.1639)

On 22 Jul 1656, Guericke, in a letter to Gaspar Schott, mentions the an experiment where he has tried to have teams of horses pull the sealed hemispheres apart; in a followup 4 Aug 1656 letter to Schott, Guericke states that he has carried out the Magdeburg hemispheres experiment with 12-horses, at a considerable cost; the following shows a 20-horse version, one of many variants performed thereafter: [17]

On 16 Nov 1656, Guericke, in a letter to Gaspar Schott, as published in *Technical Curiosities* (pg. 37), stated that over the summer he had tried first 16-horses, which he said "could scarcely pull them apart, and later that 24-horses were required. [8] Conlon (2011), of note, points out that it is a frequently "reported myth" that Guericke used horses at the 1654 Imperial Assembly at Regensburg, which was not the case. [8]

In 1658, Guericke attempted to repeat Blaise Pascal's mountain climbing experiment (see: Pascal atmospheric pressure experiment), by attempting to measure the atmospheric pressure at the base and top of mountain then-named "Brocksburg"; he and an assistant took a vacuum bulb, and supposedly a vacuum pump, measured the pressure at the base, but during the ascent, the servant carrying the glass bulb fell, and it broke. [24]

In c.1659, Guericke, according to Ditmar Schneider (1986), per citation of Gaspar Schott (1664), was performing his so-called "gas test with piston and cylinder", as shown below, wherein, by connecting the vacuum bulb to the piston, and turning the connecting valve, it forces the piston down with a strong stoke, which he uses to play tug-of-war with 20+ men (left, back), or to lift loads of weight (left, front): [19]

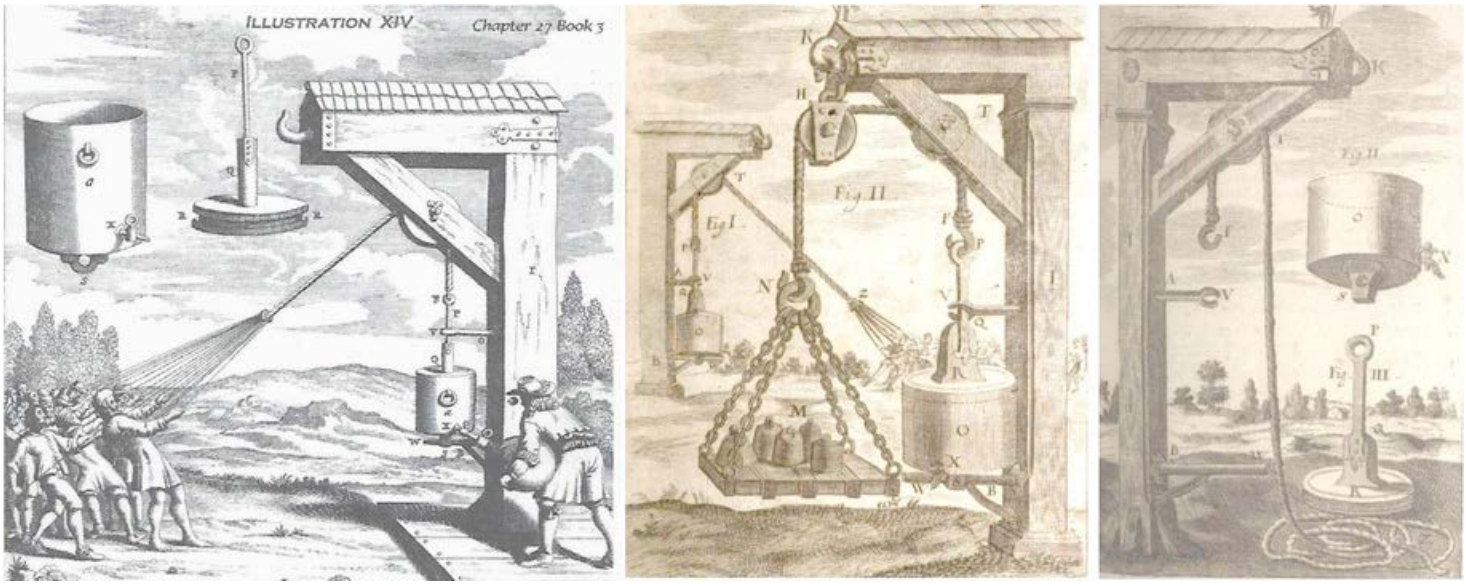

In 1661, Robert Boyle's *New Experiments Physico-Mechanical touching the Spring of Air and its Effects*, was translated into Latin, and, via correspondence with Gaspar Schott, Guericke was made aware of the Boyle-Hooke vacuum pump design (see: Hooke vacuum pump), and thus acquired a copy of Boyle's book. [17]

On 16 Nov 1661, Guericke, writing to Gaspar Schott, relates progress on his new treatise, as follows:

> “As far as **my treatise**, which is in hand, is concerned, I work on writing I during whatever spare time my other occupations allow. It is divided into eight books. The first is entitled ‘About the Cosmos and its Organization According to the More Commonly Received Opinion among Philosophers’; the second is ‘Concerning my own Experiments’; the third, ‘About What is and What is Not’ (this particularly demonstrates that space is infinites and immeasurable); the fourth, ‘Concerning the potencies operating [virtutibus mundanis] in the Cosmos, and Other Associated Topics’; the fifth, ‘concerning the Earth of Land and Sea and its Associate Moon’; the sixth, ‘Concerning the World of the Planets and their True Organization’; the seventh, ‘Concerning the Fixed Stars’; and the eight, ‘Concerning What is at the Limits of the Cosmos’. However, the task is proceeding very slowly both because of the burden of other affairs and because I am without any assistance, I am also having considerable difficulty writing in Latin, since no fewer than 38-years have gone by since I finished studying in universities and during which opportunities for writing only infrequently presented themselves.”
>
> — Otto Guericke (1661), “Letter to Gaspar Schott”, Nov 16 [26]

(add)

Third generation vacuum pump

In c.1662, Guericke, according to vacuum pump historian Anne Helden (1991), had made the following so-called "travel pump", wherein the crank arm is employed to make the vacuum, and the former wooden tub of water is replaced by cone x, to effect the sealing solution, which was given Johann Philipp, and is now on display at the Deutsches Museum, Munich, as photographed below right, and is the oldest extant vacuum pump, which generally is classified as the Guericke third generation vacuum pump: [15]

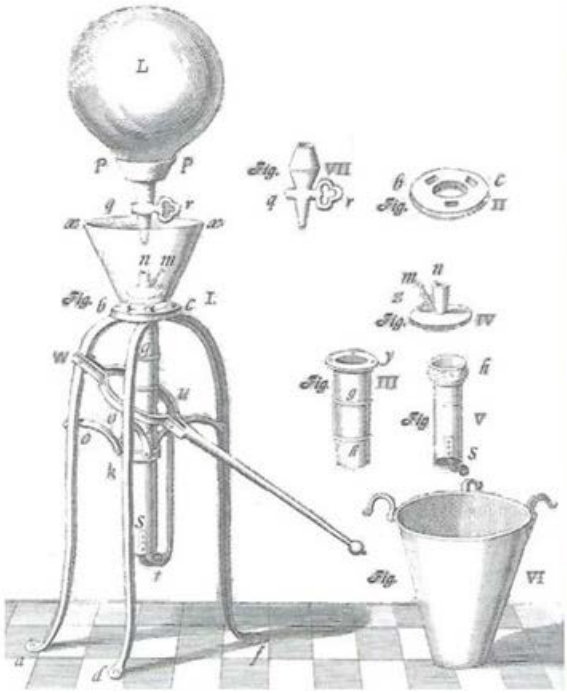

On 28 Feb 1662, Guericke, in his letter correspondence with Gaspar Schott, in commentary on Robert Boyle's experiments, stated that a "book describing his own experiments" was in his hands, meaning that he was working on his own manuscript.

On 14 Mar 1663, Guericke "prefaced" his new book entitled *New Magdeburg Experiments on the Vacuum of Space* (*Ottonis de Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*), his magnum opus, as being essentially complete. The publication of this book, however, was delayed for nine-years, until 1672, owing to "illness, pressrue of other concerns, and difficulties with his Dutch publisher, Johannes Janssonius" (Conlon, 2011). [25]

Fourth generation vacuum pump

In c.1663, Guericke, had the following version of his vacuum pump, possibly his "fourth generation" vacuum pump (see: Guericke fourth generation vacuum pump), shown with vacuum bulb L, which he had installed in his house, spanning two-floors, from the cellar up to his office, the pumping mechanism shown submerged in the wooden tub, operated by a two person crank of some kind: [16]

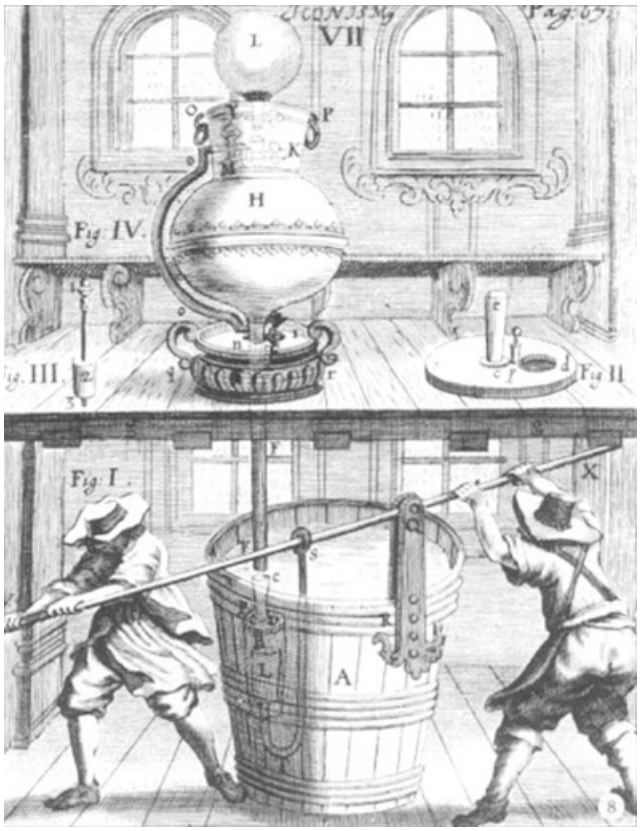

The reason for this double-floor designed vacuum pump, the top part of which seeming to have a long bench to hold spectators, was that Guericke began to have so many frequent quests come to his home, that he had to build an audience room, so to say; this is summarized as follows:

> "So many were the visitors that crowded to **Guericke**'s house to witness his marvelous performances, that he had a large pump erected in his cellar, with tubes ascending into an upper room, and connected with suitable apparatus. At great receptions, the pump was driven all day by two men, who kept emptying a very large copper globe of air. When an experiment was to be made, a communication was opened be-tween this globe and the interior of much smaller vessels, the air contained in which was immediately greatly rarefied, and their cavities left nearly vacuous."
>
> — Charles Weld (1849), "A History of the Royal Society, with Memoirs of the Presidents: Robert Boyle" [29]

(add)

Experiments | Continued

In 1664, Gaspar Schott, in his *Technica Curiosa, Volume One*, expanding on his earlier 1657 book, dedicated the first chapter, entitled "The Magdeburg Miracle" (Mirabilia Magdeburgica"), to 87-pages, with 8-images, e.g. his two-floor vacuum pump (above), his "gas test with piston and cylinder" (above), etc., of Guericke's ongoing vacuum work. [18]

In c.1665, Guericke made in improved vacuum pump per the request of Johann Philipp (1605-1673), the Elector of Mainz, who had heard about Guericke's experiments performed at the Regensburg Imperial Assembly (1654).Guericke describes his third-generation "improved vacuum pump" as follows:

> "I am replying to the letter written on June 4th Wurzburg and received on June 14th. My experiments are particularly directed to showing that air is nothing other than a fume or evaporation coming from the earth, which it surrounds with a fixed and definite night. It penetrates everything that is not already filled with some other subsume, is carried with the earth as it executes both its daily and annual motions and, along with the earth, constitutes, as it were, a single body. To show this I have set up various experiments but none of them makes the point as well as the one your reverence observed in the presence of the most eminent Elector of Mainz [Johann Philipp]. There you had a **pump with two openings**. Through one of them the air is introduced and through the other it is expelled. Notwithstanding that I have improved everything a lot since then, the use and point of those experiments is very briefly the following:

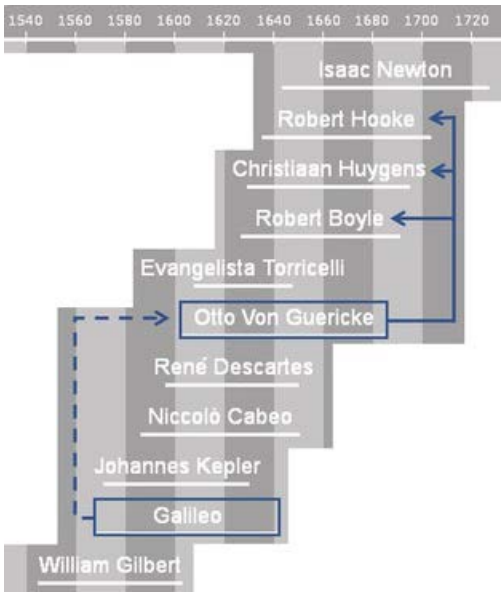

A timeline showing **Guericke**, in the context of William Gilbert, Galileo, Johannes Kepler, Niccolo Cabeo, Rene Descartes, Evangelista Torricelli, Robert Boyle, Christiaan Huygens, Robert Boyle, and Isaac Newton. [11]

1. They make it clear, how great is the weight of the air surrounding us and to what height it drives the water he an evacuated tube.
2. If something else that is not spherical is firmly attached to an evacuated sphere, so that the air from the former is violently drawn into the latter, then it is subject to compression, just like the non-spherical glass containers are, and fragments, with a great bang, into a thousand pieces.
3. We can **weigh the air** confined in a glass vessel. The weight is given by how much lighter the glass is once it has been evacuated. For example, a receiver, of the sort that medical people use to distilled water, is about three or four lobt [a small coin] lighter after the extraction of the air as you and the eminent Elector of Mainz [Johann Philipp] have seen.
4. From the same experiment we infer the true cause of winds and clouds. For when a wind is created inside a **closed glass vessel** by shaking it, a cloud appears very shortly thereafter.

> “Since the time when I produced the exhibition for the said eminent Elector [Johann Philipp], I have a much better and clearer grasp of all these matters and of many other topics as well.”
>
> — Otto Guericke (**1656**), “Letter to Gaspar Schott”, Jun 18

In 1656, Guericke was testing whether the two Magdeburg hemispheres could be pulled apart by "teams of men", three on each hemisphere:

> “The hemispheres could not be pulled apart by six strong men.”
>
> — Otto Guericke (**1656**), “Letter to Gaspar Schott”, Jul 22

> “He weighed the very archetype of lightness, the air, and, as if god had revealed to him a share in the secrets of creation, he caused clouds and wind to form in glass vessels and through this same air, which we don’t feel on our necks and shoulders thought it washes all around us, he shattered tough glass into splinters.”
>
> — Author (**c.1656**), “Letter to Someone”; cited by Hans Schimank (1936), in *Otto von Guericke: Burgermeister von Magdeburg* (pg. 37); cited by Thomas Conlon (2011) in *Thinking About Nothingness* (pg. 64)

In 1657, Guericke's vacuum experiments were "formerly published" as an appendix of Gaspar Schott's *The Art of Mechanical Hydraulic Pneumatics*, which therein became the vehicle of transmission to global scholars, in particular Robert Boyle, who had his assistant Robert Hooke reproduce the described device for the purposes of testing:

> “As soon as the Reverend Fathers of the Society of Jesus and the professors of the public University of Werzburg, under the chairman-ship of the same Eminent Elector, had verified these experiments of mine, they wrote out a draft of their findings and communicated them to the scholars in Rome and elsewhere and at the same time sought their opinions. Among this group of particular importance was the Reverend Father Gaspar Schott, Professor of Mathematics at the same university, who wrote me regarding the experiments and sought more information about them. Ultimately, he added, as an Appendix to his book, *The Art of Mechanical Hydraulic Pneumatics* (*De Arte Mechanica Hydraulico-Pneumatica*), published in **1657**, these ‘new experiments’ of mine and called them "Magdeburgica", and these were set up in type so that they might be available for many to read and study.”
>
> — Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* (pg. xix)

In early 1657 (or late 1656), Guericke began testing to see if "teams of horses", six pulling on each hemisphere, could pull the evacuated spheres apart:

> “Experiments with the two exactly-fitting dishes or hemispheres has now been carried through. I wrote to your reverence that six strong men would hardly be able to pull them apart. Shortly thereafter I actually tried it out (which was a costly undertaking) and found that "twelve horses" could hardly separate them. Indeed, if all the air were to be extracted perhaps not even sixteen could do it. As soon as the air is introduced through the opening tap, the hemispheres come apart of their own accord.”
>
> — Otto Guericke (**1657**), “Letter to Someone”, Aug 4

Guericke with three of his famous experimental devices: the vacuum pump and vacuum bulb (left), his electrostatic generator (center), and his sealed copper pot device (right) for weighing the sound of Magdeburg hemisphere breaking vertically.

In 1661, Guericke was reporting that he had found that somewhere between sixteen (8-horses on each side) to twenty-four horses (12-horses on each side) were required to pull the spheres apart, meaning, in effect, that the pulling force of about 10-horses, on average, was required to lift a 62-mile (see: Karman line) column of atmosphere (about 6-inches in diameter) off the ground of the earth:

> “This summer, I have done some new things. In one experiment, "sixteen horses" could scarcely separate them, and in another, "twenty-four" horses were required.”
>
> — Otto Guericke (**1661**), “Letter to Gaspar Schott”, Nov 16

In 1660 (or 1663), Guericke invented his “electrical machine”, which he described in his *New Magdeburg Experiments* (1672), wherein he described electrical conduction and repulsion, similar to what had been described earlier by Cabeo in 1629. [12]

Over the years, Guericke, according to his great-grandson Biedersee, spent an estimated 20,000 thalers, on experiments and machines, using his own money, which equates (Ñº)(Ñº), via inflationary terms, to about $600,000 USD (2017). [8]

Presently, at the Guericke exhibition in Lukasklause, Magdeburg, a replica (Ñº) of Guericke’s original pumps and experimental devices are on display (Ñº) over two floors. (Ñº)

Independence?

A salient question that resounds, in the experiments of Guericke, is whether or not, in the early years of his experimentation, 1647 to 1653, he invented all these various experiments "independently", or whether he had been influenced? The adjacent diagram comparing the Galileo vacuum engine (1638) with the Guericke vacuum barrel experiment (1647) visualizes what seems to an "obvious" similarity?

The following are few example quotes that poke in this direction:

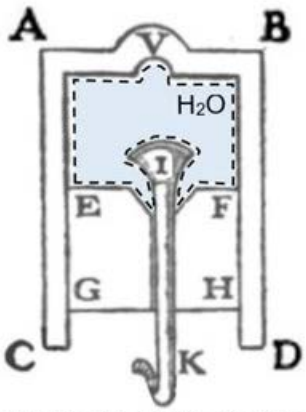

Galileo Vacuum Device
(1638)

Guericke Water Barrel Vacuum Experiment
(1647)

A diagram showing the Galileo engine (1638) thought experiment and the Guericke beer keg vacuum experiment (1647), both being similar attempts to measure and make a vacuum respectively, using nearly similar experimental designs (e.g. water in both devices; both devices wood)? Guericke, according to most historical concensus, was said to have done his 1647 vacuum experiments "**independently**", i.e. without any knowledge of the vacuum experiments done prevoius to him in Italy (Galileo, 1638; Berti, 1639; Torriicelli, 1644) and France (Pascal, 1648). The question is an unresolved puzzling issue, presently.

> “Here stood a man **entirely on his own**. There was no Medici family to put resources at his disposal. Scientifically, he was in a less favorable situation than the members of the Florentine Academia del Cimento who could advise each other. He had to **think out for himself** every little artifact and design emery piece of auxiliary apparatus so that it could be made by a Magdeburg based business. Perhaps it is this that is at the root of the preference, that all his experiments show, for a **certain unsophisticated directness**. When someone in Florence carried out experiments on the pressure of the air, he could rely on the availability of the highest technical expertise. Here in Magdeburg, the equipment for scientific research was the solid and durable work of a local forge. While this, on the one hand, made it harder to perform experiments it also, on the other, gave them an overwhelming direct impact.”
>
> — Hans Schimank (1936), *Otto von Guericke* (pg. 40)

> “This work, which is described in all standard histories of science, was paralleled in Germany by experiments performed by Otto von Guericke around 1650. Surprisingly, von Guericke seems at first to have had **no knowledge** of what had been done by Berti, Torricelli, or Pascal, but **worked quite independently**, probably on the basis of what he had read of Giovanni Porta and similar authors. His approach was therefore rather different from that of the Italians. For example, in an attempt to deter-mine whether a vacuum could be created artificially, he success-fully pumped water out of an airtight copper vessel. Improving his apparatus, he soon recognized that air itself was a fluid and, like water, could be pumped out of the vessel. ft was then a small step to redesign a conventional pump for the purpose, and so he invented an air pump. Following this demonstration, a man named Caspar Schott was asked to write an account of it. Schott had been a pupil of a priest named Athanasius Kircher, who had actually been present at Berti's experiments in Rome. Indeed, it is possible that von Guericke first learned of the Italian work through Schott. Both Schott and Kircher were Jesuits, and we may comment in passing that they were just two of many seventeenth-century Jesuits who had an interest in science—several in Italy during Galileo's time were expert astronomers.”
>
> — Arnold Pacey (1992), *The Maze of Ingenuity* (pgs. 84-85)

> “Working entirely as a self-funded amateur, **Guericke** gained a permanent place in the scientific community, through three original achievements: the invention of the vacuum pump, the first demonstration of electrostatic repulsion, and the pioneering of the concept of absolute space. Inter alia, he also **independently** invented the barometer, associated low pressure with stormy weather, weighted air, investigated sound and combustion in the vacuum, and estimated the height of the atmosphere.”
>
> — Thomas Conlon (2011), *Thinking About Nothing* (pg. 7) [8]

> “One interesting question to ask here is **whether von Guericke conceived of his experiments on his own**, as Pascal did, unaware of the specifics of Torricelli's work. That may well be the case. On the other hand, there are some interesting connections among some of the aforementioned individuals. Berti's experiments were witnessed by Athanasius Kircher, a well-known scholar based in Rome with a deep interest in steam. Kircher, in turn, had a German pupil, Caspar Schott, who returned to Germany at the end of the Thirty Years' War after teaching in Italy for twenty years at the time von Guericke started his experiments. In fact, the two of them developed a correspondence. These connections reveal the type of channels through which, and the speed at which, scientific information flowed and make it clear that von Guericke was aware of, and became inspired by, the Italians' work on the physics of the atmosphere.”
>
> — Harry Kitsikopoulos (2015), *Innovation and Technological Diffusion* (pg. 13)

These three quotes, as we see, attempt to stitch a communication trail from Schott to Kircher, or Guericke to Kircher, and from him to Berti, and from Berti-Kircher interaction to Torricelli, Pascal, Galileo. In respect to this conjecture, we know that the Schott-Kircher letter exchanges, did not begin until 1650; also that Schott did not become aware of Guericke until the 1654 Regensburg convention.

The earliest known connecting point, in respect to this conjectured “Galileo, Berti, Kircher, Guericke” link, is that in Sep 1651 to Jun 1652, Hans Otto Guericke (1628-1704), Guericke’s son, during a visit to Italy, met Kircher in person, and “conveyed his father’s greetings” (Conlon, 2011), meaning that the Kircher-Guericke connection might have begun years back? [8]

We know that in 1654, during the Imperial Diet in Regensburg, Guericke learned about the Evangelista Torricelli and his Torricelli vacuum mercury experiment (1644), specifically from Valerianus Magnus (1586-1661) (Ñº), who gave him a demonstration of the inverted mercury column, and also a copy of his book *Ocular Demonstrations* (1648). [27]

We know that by 1662, Guericke had learned of the Robert Boyle / Robert Hooke vacuum pump, from Gaspar Schott, who informed him about this, and that he had obtained a copy of Boyle’s book *New Experiments on the Spring of the Air* (1660).

In respect to Galileo, the linchpin of the entire vacuum affair, we know that Guericke, his 1672 *New Magdeburg Experiments*, cites Galileo’s *Dialogus Cosmicus* [*Book Name*], via a preface quote, as well as his *De Systemate Mundi* (*Dialogue Concerning the Two Chief World Systems*) (1635), but NOT specifically his *Dialogue Concerning the Two New Sciences* (1638), in which the vacuum thought experiment (see: Galileo engine), pictured above (right), is found. Guericke, accordingly, by 1672, was certainly well-acquainted with Galileo.

> “Throughout *New Experiments*, Guericke shows himself conversant with Galileo's work and alludes to him frequently and favourably. But the ‘Galileo affair’, which loomed so large in later centuries, so far **fails to excite** his indignation that it **does not even rate a mention**. It may well be that a man who had spent the prime of his adult life amidst the horrors of the Thirty Years War and who exercised political authority as a professional, did not recognize the confinement of an elderly professor to his villa for gratuitously cheeking the powerful of the day as the iconic outrage it later transpired to be.”
>
> — Thomas Conlon (2011), *Thinking About Nothing* (pg. 87)

The remaining open question is: was Guericke aware of the "Galileo engine", as published in Galileo's *Dialogues Concerning the Two New Sciences*

(1638), when he did his beer keg vacuum experiment (1647)? The following, in Guericke's own words, is how he was led into an investigation of the vacuum:

> "Since I had deliberated on these questions for a long time and had likewise been engaged in active **study of the structure of the world [universe]**, not only did the great mass of these world bodies and their enormous distances lead me to doubt that the human intelligence could comprehend them, but also, and most particularly of all, did vast, intermediate, and endless space fill me with curiosity and infuse me with a desire to investigate it. For indeed, **what is it?** Inasmuch as it contains all things, it serves as a place for 'being' and 'existing'. Is it by chance some fiery heavenly matter? Is it solid, as Aristotelians assert? Is it fluid, ad Copernicus and Tycho Brahe believe? Is it some sort of tenuous fifth essence? Or, is space completely devoid of all matter, a 'vacuum', as it were?"
>
> — Otto Guericke (1672), "Why the Author Was Led to Investigate the Vacuum" in: *New Magdeburg Experiments on the Vacuum of Space* (§§: Book 2, §: Chapter 1, pg. 84)

Moreover, Guericke, in his 1682 publication, is fairly frank about how he came to learn about Torricelli. If he was to have "thought up" is beer barrel experiment, from seeing Galileo's vacuum measuring machine "thought experiment", it would seem, in line with his general mode of operation, to acknowledge this, similarly? Guericke, after all, was aimed at the big picture view of things: god, vacuum, space, being and becoming, and certainly not petty issues of rights to "discovery" so often seen in later scenarios in the history of thermodynamics (e.g. conservation of energy; see: founders of thermodynamics and suicide). There could, however, have been some sort of subtle influence, in respect to transmission of ideas, that we are not able to "see"? All-in-all, in respect to probability, presently, it would seem to be the case, that there is a 48% likelihood, or less, that Guericke actually "saw" a picture of the Galileo engine (1638) prior to making his beer keg experiment (1647). This conjecture, however, could certainly be wrong.

Piston and cylinder

To visually show the effect of a vacuum, Guericke designed a piston and cylinder, pictured below, and conducted various demonstrations to demonstrate its power of the weight of the atmosphere. The air cylinder **a** was about twenty-inches high and fifteen-inches wide, having its sides perfectly even and parallel, which could be fixed firmly in a vertical position by the ring **s**. The piston, **p**, **q**, **r**, was made to fit exactly inside of the cylinder, **p** being of iron and **q** wood, and the rounded head **r**, formed of hard oak, had a grove on its edge which was filled with flax or hemp.

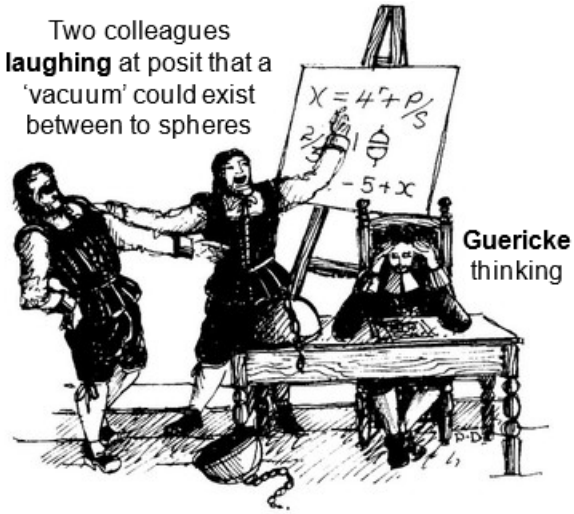

A sketch of **Guericke** thing about the existence of vacuums, while, supposedly, two of his friends laugh at his theory that a vacuum could exist between to hemispheres.

To demonstrate the power or strength of the vacuum, the piston was let into the cylinder, and its iron handle was passed through the ring of the arm **o**, shown below, in such a manner that it could move freely up and down through the whole height of the cylinder and at the same time be preserved in a straight line. In a first experiment, the piston was positioned at the bottom of the cylinder the stop-cöck **x** was closed. In this arrangement, the joint efforts of twenty or more men could not raise the piston more than halfway up. The men, in effect, were not just pulling on the piston, but the weight of a column of atmosphere 62-miles high.

In a second experiment, with the men pulling on the piston at the halfway up position, a large glass receiver, which had been mad perfectly vacuous by Guericke's pump, was then applied to the stop-cöck; and when the men were exerting their utmost force, on a communication being opened between the receiver and the cylinder, the piston was suddenly forced down to the bottom of the cylinder in spite of the efforts of the men to keep it up.

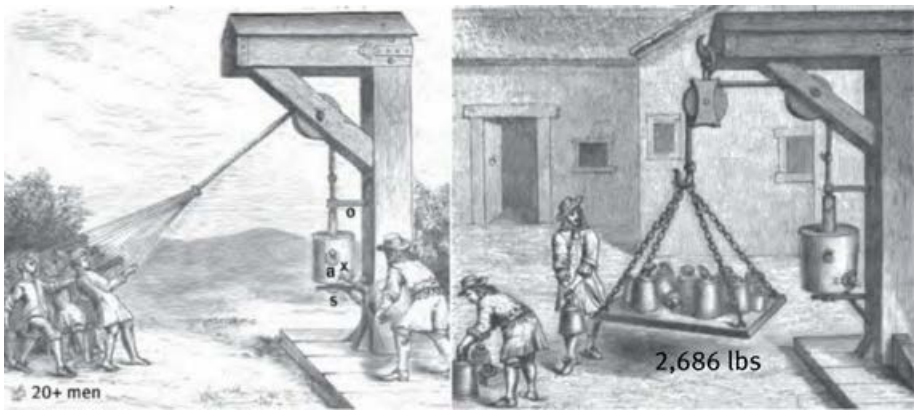

Guericke arranged the piston at the top of the cylinder, having a scale loaded with 2,686 lbs attached to it, shown above right. In this configuration, a little boy, by means of a small syringe applied at the stop-cöck **x** to pump out the air, was able to bring down the piston and raise the weight. [2]

Magdeburg hemispheres

See main: Magdeburg hemispheres

In his most famous experiments, performed between 1654 and 1663, Guericke removed the air from to copper hemispheres fit together, sealed with grease at their rims, in such a manner to form hollow copper spherical vacuum. He then showed that two teams of horses, ranging from 8-15 per team, harnessed to each sphere, respectively, in opposite directions, could not pull the hemispheres apart. Guericke's demonstration was first performed on 8 May 1654 in front of the *Reichstag* and the Emperor Ferdinand III in Regensburg, in which thirty horses, in two teams of 15, could not separate the hemispheres until the vacuum was released. [3]

Steam engine

The logic of these instruments, experiments, and public demonstrations functioned to stimulate the later development of the steam engine. Specifically, Guericke's vacuum pump was first described in the book 1657 book *Mechanical Hydraulic Pneumatics* by German scientist Gaspar Schott, a correspondent of Guericke, Dutch mathematical physicist Christiaan Huygens, and English physicist and chemist Robert Boyle who read the book. [4] Boyle and his assistant Hooke then improved Guericke's air vacuum design and built their own in 1658, one that also functioned as a pump. [1]

Several decades later, in the 1690 memoir "A New Method to Obtain Very Great Motive Powers at Small Cost", Boyle and Huygen's associate French engineer Denis Papin conceived that the quick condensation of steam in a cylinder, via contact with a cold body, would quickly make a vacuum that would drive the piston down in such a manner that if the process was repeated in a cyclical manner useful work, as in raising weights out of mines, could be obtain. This design was later used by English engineers Thomas Savery, in 1697, and Thomas Newcomen, in 1710, to make the first working steam engine.

Thermodynamics

Guericke's inventions were the technological seeds that led to the development of the science of thermodynamics. In short, Guericke's vacuum pump (1650) led to the first steam engine design, by French physicist Denis Papin (1690), which led to the construction of the first steam engine, by English engineer Thomas Savery (1697), which led to latter improved steam engine designs, such as the steam engines built by English engineer Thomas Newcomen (1710) and Scottish engineer James Watt (1763-75), and to the first treatise on the physics of steam engine or heat engines, by French engineer Sadi Carnot titled *Reflections on the Motive Power of Fire* (1823).

Other

Guericke was said to also made other, less dramatic, public demonstrations of the effectiveness of air pressure on several occasions in Regensburg; these Regensburg experiments were reported by Gaspar Schott in *Mechanica hydraulico-pneumatica* (1657) and *Technica curiosa* (1664), and were supplemented by information that von Guericke communicated by letter. [5]

Electricity

In c.1663, Guericke, in an effort to disprove William Gilbert's magnetic earth theory of gravity, invented the first electrostatic generator, a type of metallic globe or sulfur globe, the size of a baby's head, that could be spun to produce charge. [6]

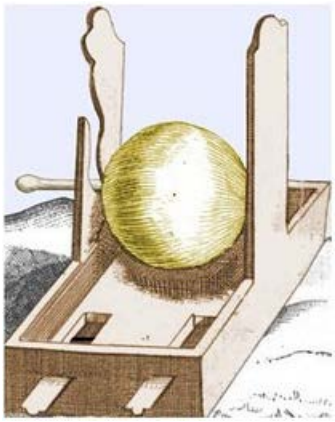

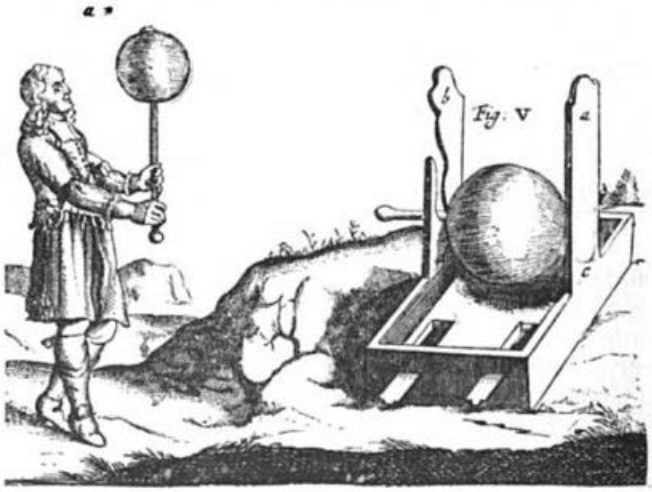

Guericke's circa 1663 electrostatic generator: a device he used to disprove William Gilbert's magnetic earth theory of gravity. [6]

With this device, he found that that after rubbing the ball with his hand, it would pick up small bits of leaves and paper from a wooden tray about 10 cm below. When he rotated the sphere these pieces remained clinging to its surface. Guericke, of curious note, wrongly concluded that what we today call static electricity explained why people and animals, etc, are stuck to the rotating earth's surface. [11]

The following is a photo of Guericke demonstrating is electric machine, entitled "experiments of Guericke on electric repulsion" (Hamburg, 1672):

Guericke, had read William Gilbert (Ñº), prior to inventing his electricity generating machine, the aim of which was to disprove Gilbert's magnetic earth theory of gravity.

Weather | Forecasting

Guericke recorded air pressures for some time with his water column barometer, and noticed that when the pressure was rising, the weather would tend to be fine, but that when it was falling, the weather often worsened. [11]

Originator of modern whether forecasting (Ñº)(Ñº), e.g. in 1660, using his newly invented wooden man with pointing finger water barometer, predicted a severe storm at Magdeburg, Prussia, two hours before it struck.

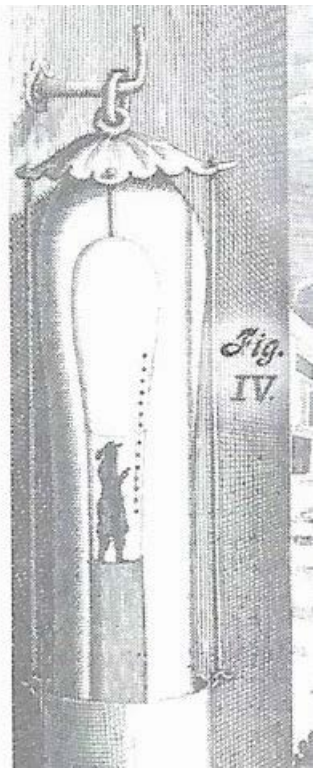

Guericke's wooden man on water column barometer, from Illustration X, Figure IV, of Schott diagrams, which varied up or down by sever hand lengths, according to atmospheric pressure, which he used to predict when storms were near.

Religion

Guericke, similar to, but differing from the beliefs of Athanasius Kircher, believed that "god, the vacuum, and infinity" were one, or something along these lines. He pretty much avoids "god talk" in the context of his experiments.

> "God and nature create nothing that is without purpose or use or is imperfect in itself."
>
> — Otto Guericke (1663), *New Experiments on the Vacuum of Space* (pg. 238)

His digressions on the vacuum, going back to the Greeks, and being and becoming, however are deep discussions, not easy to summarize.

Education

In 1621, Guericke studies law at the University of Jena, and in 1622, at Leyden University, he studied astronomy, physics, and mathematics. [7] He also studied: English, French, Dutch, Latin, and fortification engineering. [8] He was an engineer at Erfurt; entered political life as an alderman in 1627 In this mix, Guericke attended the University of Helmstedt, then worked as an engineer and or city contractory during the Thirty Years' War (1618-1648), and eventually became mayor of Magdeburg, a position he held for thirty years.

Quotes | Employed

The following are quotes employed by Guericke:

> "If mortal souls were to understand the innermost workings of the universe, royal power and might would be nothing more to them than meaningless froth."
>
> — Anon (c.1600), *Source*; opening preface quote to Otto Guericke's 1670 *Magdeburg Experiments*

> "It follows from this that all science is empty, deceptive, and pointless unless it is supported by **experiment**. What inconsistencies otherwise successful and perceptive scholars bring forth without its help! It is experimentation that dissolves all doubts, reconciles difficulties, is a unique teacher of the truth, furnishes a torch in darkness and instructs us how to determine the true causes of things by disentangling knotty problems."
>
> — Athanasius Kircher (1631), *Ars Magnetica* (pg. 570); cited by Otto Guericke (1672) in *New Magdeburg Experiments* (pg. xvii)

"A thousand Demosthenes, a thousand Aristotles can be laid prostrate by a single man of mediocre talent who has seized upon a better way to find the truth. Such a hope, therefore, must be removed: for indeed, men, more learned and superior to us in book-learning, will be found who, to the same of nature itself, can make that which is, in fact, false, true."

— Galileo (1632), *Dialogue on the Two Chief World Systems* (character: Salviati (Ñº)); cited by Guericke in "Preface" to *Magdeburg Experiments*

Quotes | On

The following are quotes on Guericke:

A colorized photo of Guericke. [17]

"I should immediately proceed to the mention of my experiments, but that I like too well that worthy saying of the naturalist Pliny: 'It is a virtue and manifestation of a fitting modesty to acknowledge anyone through whom one has made progress', not to conform to it, by acquainting your lordship, in the first place, with the hint I had of the engine I am to entertain you of. You may be pleased to remember, that a while before our separation in England, I told you of a book that I had heard of but not perused, published by the industrious Jesuit Schottus [Gaspar Schott], wherein it was said he related how that ingenious gentleman, **Otto Gericke**, Consul of Magdeburg, had lately practiced in Germany a way of emptying glass vessels, by sucking out the air at the mouth of the vessel, plunged under water. And you may also perhaps remember, that I expressed myself much delighted with this experiment, since thereby the great force of the external air (either rushing in at the opened orifice of the emptied vessel, or violently forcing up the water into it) was rendered more obvious and conspicuous, than in any experiment that I had formerly seen. And though it may appear by some of those writings I sometimes showed your lordship, that I had been solicitous to try things upon the same ground; yet in regard this Gentleman was before-hand with me in producing such considerable effects, by means of the ex-suction of air, I think myself obliged to acknowledge the assistance, and encouragement the report of his performance bath afforded me."

— Robert Boyle (1660), "Preface" to *New Experiments Physico-Mechanical Touching the Spring of the Air* [9]

"I do not hesitate to speak openly and declare without qualification that I have never seen nor heard of any experiments of this kind more worthy of admiration nor read nor even imagined such, and I do not believe that the sun ever shone upon anything like them from time immemorial. And I might add, this is the judgment of powerful princes and learned scholars as well, with whom I have been in communication as regards these experiments, etc."

— Gaspar Schott (1664), *Technical Curiosities* (pg. 3) [7]

"I have also the opinion of Kaspar Peucer and Jean Bodin who contend that evil spirits and genii exercise great power, with divine permission, in the heavens and over the earth."

— Sanislaus Lubienietzki (1665), "Letter to Otto Guericke", on the comet of 1664/1665, Mar 4/14; by Otto Guericke (1663) in *New Experiments on the Vacuum of Space* (pg. 287)

"Boyle improved on the pneumatic engine invented by **Otto Guericke**, and was thereby enabled to make several new and curious experiments on the air, as well as on other bodies: his chemistry is much admired by those who are acquainted with that art: his hydrostatics contain a greater mixture of reasoning and invention with experiment than any other of his works; but his reasoning is still remote from that boldness and temerity which had led astray so many philosophers."

— David Hume (1836), *The History of England, Volume Two* (pg. 653)

"In contrast to the Cartesian caution, in Germany — where orthodox Cartesianism never gained a foothold — several prominent thinkers embraced the belief that the fixed stars were surrounded by planets and spread throughout an infinite universe. The *Ecstatic Celestial Journey* (*Iter exstaticum coeleste*), 1656, by the Jesuit Athanasius Kircher explicitly characterized the fixed stars as suns with encircling planets, although it denied inhabitants even to the planets of our solar system and to the moon. And Otto von Guericke, famous for the 'Magdeburg experiments' proving the existence of a vacuum, devoted a section of his *Experimenta Nova* (1672) to an examination and endorsement of Kircher's view of other planetary systems. Von Guericke also noted the possibility of an inhabited moon and planets, and emphasized (following Galileo) that any inhabitants would not be men, but rather diverse creatures beyond all our imaginings. But von Guericke denied Descartes's equation of extension and matter, and instead traced his ideas to Galileo, Kepler, Antonius de Rheita, Mersenne, Bruno, and Nicholas of Cusa."

— Steven Dick (1984), *Plurality of Worlds* (pg. 116)

"Guericke was destitute at thirty; when he gave the superbly crafted [mechanical] celestial globe [which he made] to Torstenson he was forty-four; when he appeared at Regensburg with a thought-out position on one of the great philosophical questions of the day [on the vacuum] and able to support it with experiments, he was fifty-two; when he completed his *Experiments Nova* he was sixty-one."

— Thomas Conlon (2011), *Thinking About Nothing* (pg. 38)

"Beside this world-famous [Magdeburg hemispheres] experiment, **Otto von Guericke** used the vacuum for many other demonstrations. At the Reichstag in Regensburg, he demonstrated that water flows upwards against its natural flow-direction into an air-evacuated glass container or that a candle extinguishes very quickly under vacuum or that, despite the obvious hammer blow against the bell, a clock does not make an audible sound. He could also report from a long-term experiment that grapes could be conserved under vacuum for half a year."

— Anon (2020), "The First Vacuum Pump" [16]

Quotes | By

See main: Guericke quotes

The following are noted quotes:

"Could empty space exist, and is heavenly space unbounded?"

— Otto Guericke (1972), *The Magdeburg Experiments on the Vacuum of Space* (pg. #) [5]

"Theories which are demonstrated by **experiment** and visual perception must be preferred to those derived from reasoning, however probable and plausible, for many things seem true in speculation and discussion, which in actual fact defy reality."

— Otto Guericke (1663), *New Magdeburg Experiments on the Vacuum of Space* (pg. xvii)

"Because, in truth, scholars have sharply disputed with one another for a long time the **question of the vacuum** -- does it exist or not? or what is it? -- and each one has defended his theory like a determined soldier defending a stronghold against an attacking enemy, for this reason **I felt a *burning desire* to investigate the truth of this question** which has been a source of dispute, not being able to lay my feelings to rest nor extinguish them until I should find time to carry out an experiment involving the vacuum. I performed this experiment in a number of ways and my efforts were not unrewarded: indeed, I designed several pieces of apparatus to prove the existence of that vacuum whose existence had always been denied. Later on, when I had been sent on behalf of the state to the Imperial Diet being held in Regensburg, in 1654, several enthusiastic followers of these kinds of investigations had heard about my aforementioned experiments: they succeeded in convincing me to demonstrate some of them and I endeavored to do this insofar as I could, considering the limits of my capabilities."

— Otto Guericke (1663), *New Magdeburg Experiments on the Vacuum of Space* (pgs. xviii-xix)

"The aim of this book, is to recall from ingrained and poorly conceived imaginings all who do not labor under preconceived opinions, but regard the experiments dispassionately and weigh them on the fair scale of truth, having acquired from them rich experience and knowledge. Indeed, **when there is evidence from facts, words are not necessary**. One need not dispute and take up arms against an opponent who denies experiments that are completely reliable; let such a one keep for himself his own opinion and dig in the dark like a mole. An 'exact science' does not march into battle but celebrates its victory and rests in the deep tranquility of truth. Other branches of science, however, are subject to controversy because they are devoid of the rational certitude in which an exact science is rich. So, it comes about that the human spirit, after it has wandered for a long time in the circle of arts and science finally comes to find rest in the certain knowledge of an exact science."

— Otto Guericke (1663),*New Magdeburg Experiments on the Vacuum of Space* (pgs. xx-xxi)

"It is our wish that the contents of this work be encompassed by the cloistered walls of natural science and not slip out from these confines into other fields that are perhaps mixed with faith or belief: rather, **this treatise must be limited by the principles of natural science alone made manifest by experimentation**. But should some thoughtless or inadvertent remark slip out contrary to our intention, however, we should like to retract this statement herewith. We grant to everyone the freedom of dissent but for our part we are prepared to follow truth rather than agreement for the sake of harmony. As for the rest, we believe that there will be no lack of keen and perspicacious minds,

being stimulated by my experiments to arrive at perhaps better and deeper insights, who are going to undertake this work at some future time."

— Otto Guericke (1663), *New Magdeburg Experiments on the Vacuum of Space* (pgs. xxi-xxii)

"Place in itself has no real existence. Rather it is a creation of the mind or imagination, an individual and particular relationship, as it were, of one thing with respect to another. When one thing has taken away, then another takes its place and when this in turn is removed, its place is again filled and vise versa. Furthermore, just as 'place' has no real existence, neither does time."

— Otto Guericke (1663), *New Magdeburg Experiments on the Vacuum of Space* (pg. 85)

"An 'empty place' or 'vacuum' is the cause of a very great effect in nature. Experiments, discussed in our subsequent book, demonstrate an exaggeration of this characteristic when air or water enters evacuated glass vessels, surging in with 'great force' contrary to the usual course in nature."

— Otto Guericke (1663), *New Magdeburg Experiments on the Vacuum of Space* (pgs. 86-87)

"We do not regard a vacuum, in terms of its vacuity, as something of 'real existence', but rather as a lack or absence as shadow is the absence of light or as blindness is the absence of sight, conditions which have no real existence in themselves. Furthermore, as death is the extinction of life, so death is without reality [see: death does not exist]. In the same way a vacuum is the absence of fullness, but in no way does it follow that a lack or absence of this or that thing, which is commonly called a 'vacuum', is of real existence."

— Otto Guericke (1663), *Magdeburg Experiments on the Vacuum of Space* (pg. 88)

"Nothingness contains all things; it is more precious than gold, free from birth and destruction, more pleasant than the sight of pure light, more noble than the blood of kings, comparable with the sky and higher than the stars, more powerful than a bolt of lightning, perfect and rich in all its parts."

— Otto Guericke (1972), *The Magdeburg Experiments on the Vacuum of Space* (pg. 99); cited by Edward Grant (1981) in *Much Ado About Nothing* (pg. 216); cited by Helge Kragh (2014) in *The Weight of the Vacuum* (pg. 6)

"Air extends and expands itself more or less according to a greater or lesser intensity of heat. Warm air, consequently, occupies a larger space and cold a smaller."

— Otto Guericke (1663), *Magdeburg Experiments on the Vacuum of Space* (pg. 112); see: Boerhaave's law

"The air surrounding the earth presses upon itself because it is corporeal and has a certain weight. Indeed, the upper air presses down increasingly heavily on the lower. Thus, it follows that the lower air here, which surrounds us, is much denser than the upper air."

— Otto Guericke (1663), *Magdeburg Experiments on the Vacuum of Space* (pgs. 112-13); see: Karman line

"Hang a glass of this kind [see: Illustration 10, Fig III in Schott diagrams, or Fig III adjacent] from a balance and weigh it, with the stop-cá» cks open, however, so that you may be certain that the glass is filled with air. Then evacuate all air from it and you will discover that after this has been done, it weighs one or two ounces less than its capacity. Thus, after my receiver has been exhausted and is surrounded by the pressure of the atmosphere, it will be found, when examined on the balance, to be two ounces lighter than before, being equal in weight to two imperial thalers. Furthermore, if should be remarked here that a glass vessel of this kind which is attached to a balance with its stop-cá» ck open, always fluctuates in weight. For **in warmer weather, when the air is expanded, the receiver is lighter. When it is colder, however, the vessel is heavier because it holds more air** in it."

— Otto Guericke (1663), *Experiments on the Vacuum of Space* (pg. 156)

"As for the opinions of Epigenes, Bienewitz, Cardano, Scaliger, let these pass because they are not apposite to the subject and I do not have the at hand right now a copy of their work. As for whether storms are stirred by demons, as Paracelsus holds, this should be discussed at some length and a distinction should be made between the demons."

— Otto Guericke (1665), “Reply Letter to Sanislaus Lubienietzki”, Mar 29; in *New Experiments on the Vacuum of Space* (pg. 289)

“So far as the main part of the work is concerned, it is principally about the right understanding and perception of the universal vessel or container of all things, which I, to use one word, call ‘space’ but not understood in its usual three-dimensional sense, but as that in which every body and every substance either has its being and subsistence or could so have. Space yields to nothing and is not displaced according to the volume of the body it receives; it is permanent and immobile, everywhere in everything and through everything, whether corporeal or incorporeal and to which nothing brings being whether it is occupied or empty.”

— Otto Guericke (1671), “Letter to Gottfried Leibniz”, Jun 6; cited by Thomas Conlon (2011) in *Thinking About Nothing* (pg. 90)

“There are different minerals that, poured together with sulphur into a ball about the size of two fats, allow a usual demonstration of what I have named ‘mundane virtues’ (*virtutes mundanae*). Tycho Brahe writes that he would very much like to support Copernicus, if only the earth were not such a heavy body. My experiments show the contrary is true — the earth is not as heavy as the lightest feather. Likewise, Galileo in his treatise thinks that one cannot grasp the reason why the moon follows the earth and always presents the same fade towards it. I show with the same spherical ball that this happens through particular forces of nature. When the ball is first rubbed, e.g., somewhat by hand and then a light feather is held close to it, the ball first attracts the feather to itself, but then soon repels it as far as the range of its force (orbis virtutis) allows. Then, wherever the ball goes the feather goes too, hovering in the air, so that one can bring it to any desired point even up to someone's nose. It always presents the same side to the spherical ball, so that, by means of this ball, once can turn it in the air, as one pleases. Likewise, many other remarkable things can be demonstrated using this ball.”

— Otto Guericke (c.1672), “Letter to Gottfried Leibniz”; cited by Thomas Conlon (2011) in *Thinking About Nothing* (pgs. 84-85)

“So, it would be impossible for a rock that was dropped to fall to the earth’s center, if a tunnel through the planet existed. Nature does not allow a stone whose natural place is the exterior surface of the earth to be found in the interior.”

— Otto Guericke (1672), *New Magdeburg Experiments* [11]

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θΔics

In thermodynamics, **Otto Sackur** (1880-1914) was a German physical chemist notable for his 1908 *Chemische Affinitat, Die* (*The Chemical Affinity*) and for his 1912 *Lehrbuch der Thermochemie und Thermodynamik* (*Textbook on Thermochemistry and Thermodynamics*). [1]

Berkeley school

Sackur's textbook was translated into English in 1917 by Scottish-born American chemist George Gibson at the University of California, Berkeley; where it was used as a reference text on the subject until 1923, when Gilbert Lewis and Merle Randall's text on chemical thermodynamics appeared, thus founding the Lewis school of thermodynamics. [3] Sackur was instrumental in bringing German chemist Walther Nernst's 1906 heat theorem into the postion of the third law.

Overview

Sackur was born 28 September in Breslau. He studied at the University of Breslau and obtained his doctorate in 1901. After spending two years working with Rudolf Ladenburg in Breslau, he went to London to work under William Ramsay and to Berlin as a pupil of German physical chemist Walther Nernst. In 1905 he obtained his *Habilitation* at the University of Breslau and in 1911 he became a professor of chemistry there.

In 1910, while a physical chemist at the University of Breslau, Sackur submitted a paper to the *Annalen* in which he argued for a connection between the "new law of thermodynamics", i.e. Nernst's heat theorem, now known as the third law of thermodynamics, and the role played by the quantum constant, i.e. Planck's constant *h*, in statistical calculations of entropy. [2] Upon reading this paper, German physicist Max Planck seized on this logic in a move to eliminate the additive constant to the statistical entropy equation.

In 1911, Sackur discovered an expression for the absolute translational entropy of a monoatomic gas. A Dutch high-school student, Hugo Martin Tetrode, obtained the same result at about the same time independently. The resulting Sackur–Tetrode equation rendered entropy as an extensive variable (in contrast to the classical expression, cf. the Gibbs paradox) and expressed the thermodynamically undetermined constant in terms of molecular parameters and Boltzmann's and Planck's constants. This result was of great heuristic value because it suggested the possibility of deriving the thermodynamic quantities of a gas quantum mechanically. At the same time, the Sackur–Tetrode equation offered a convenient means to evaluate the equilibrium constant of gas-phase reactions, thus foreshadowing a unification of quantum theory, thermodynamics, and physical chemistry. [5]

In 1914, Sackur joined German chemist Fritz Haber's institute in Berlin (the *Kaiser-Wilhelm-Institute fur Physikalische und Elektro-Chemie*), as the director of a department.

Reaction end

On 17 Dec 1914, Sackur, age 31, while experimenting on a new army shell casing at the institute, died (dereacted) an explosion while mixing two chemicals in a test tube. [4]

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θΔics

In hmolscience, **Otto Weininger** (1880-1903) (IQ:155|#560) [RGM:238|1,350+), was an Austrian philosopher noted for his 1903 *Eros and Psyche or Sex and Character: A Fundamental Investigation*, published four months before he shot himself in the heart (see: founders and suicide), in which he claims to be the first to extrapolate upon German polymath Johann Goethe's 1809 chemical affinity theory of relationships, passions, sex, marriage and divorce. [1]

Goethe's protégé Arthur Schopenhauer and his elective affinities based *The World as Will and Representation* (1814/44), of course, predates Weininger's publication, but, nevertheless, there is some truth to Weininger's assertion, as Weininger does seem to present Goethe affinity model as an established scientific fact, and on this fact attempt to outlined a theory of maleness and femaleness in regards to sex and character.

Sexual affinity | Love

The poet William Carlos Williams (1883-1963) (Ñº) was so impressed by Weininger's ideas that he decided to marry a woman he didn't love, because Weininger argued that sexual affinity, rather than love, formed the true bond between man and woman. (Ñº)

Education

Weininger studied philosophy at the University of Vienna with Friedrich Jodl (1849-1914), his main mentor, himself a mixture of David Hume, Ludwig Feuerbach, and positivism, and Laurenz Mullner (1848-1911), his second supervisor; physics with Ludwig Boltzmann and Franz Exner (1849-1926); studied certain aspects of medicine and physiology; and worked in the department of plant physiology with Wilhelm Figdor (1866-1938). [7]In 1902, Weininger, then aged 22, completed his PhD dissertation in philosophy; the bulk of which when into forming his 1903 *Sex and Character* or *Eros and Psyche* (as it was originally called), the gist of which, as summarized by John Ross (2009), amounts to a "bizarre mixture of science and philosophy" aiming to solve the "Jewish problem" and the "woman problem" in one blow, via some type of spectrum of masculinity and femininity logic applied individually and to social groups. [10]

Life | Non-life issue

See: Defunct theory of life; Unbridgeable gap;

Weininger paralleled chemical affinity and sexual affinity as follows:

> "The law of sexual affinity is analogous in another respect to a well-known law of theoretical chemistry, although, indeed, there are marked differences. The violence of a chemical reaction is proportionate to the mass of the substances involved, as, or instance, a stronger acid solution unites with a stronger basic solution with greater avidity, just as is the case of the union of a pair of living beings with strong maleness and femaleness."

This is fairly cogent. Following this, however, he ventures into a life/non-life divide conception:

> "But there is a difference between the living process and the reaction of the lifeless chemical substances. The living organism is not homogenous and isotropic in its composition; it is not divisible into a number of small parts of identical properties. The difference depends on the principle of individuality, on the fact that that every living thing is an individual, and that its individuality is essentially structural. And so in the vital process it is not as in inorganic chemistry; and there is no possibility of a larger proportion forming one compound, a smaller proportion forming another."

Here, Weininger seems to be touching on the the so-called: individuality problem.

Influence

Weininger was influential to those including: Ludwig Wittgenstein and James Joyce. [3]

&

Weininger was influential to Ludwig Wittgenstein, (1889-1951) estimated by some with an IQ of 190, one of the world's greatest philosophical geniuses, and James Joyce (1882-1941), a noted literary genius, both shown above respectively.

Weininger's plant physiology professor Wilhelm Figdor (1866-1938), of note, came from the family that Hermann Christian Wittgenstein married into, thereby making a connectivity to a then "young Weininger fan" named Ludwig Wittgenstein, who in 1903, then aged 14, was assumed to have been at Weininger's funeral, which took place at Matzleinsdorf Protestant Cemetery, pictured below (right). Wittgenstein, e.g., as a youth, read *Sex and Character*, and was said to have been deeply influenced by it. [2]

Weininger, as noted summarized by John Ross (2009), had "a powerful influence" on Wittgenstein, both examining the same relationships between logic and morality from a psychological point of view; Wittgenstein, of note, continued to think along Weininger lines throughout his days, e.g. mentioning him in his notes as late as 1950. [10]

Chemical | Morality

The following are noted quotes on morality, in the human chemical theory perspective:

> "If iron sulphate and caustic potash are brought together, the SO_4 ions leave the iron to unite with the potassium. When in nature an adjustment of such differences of potential is about to take place, he who would approve or disapprove of the process form the moral point of view would appear to most to play a ridiculous part."

Weininger states that this the fundamental idea of Goethe's *Elective Affinities*, namely that: "a divorce takes place, as much constitutional, depending on the nature of things". He notes:

> "None the less, it is as little my intention as it was the intention of Goethe to advocate divorce, but only to explain it."

(add)

Other

It was Friedrich Jodl (1849-1914), to note, who convinced Weininger to change the title of book from *Eros and Psyche* (original title), seemingly on Algerian-Roman Latin-prose writer Apuleius' 160AD "Cupid and Psyche", in his *Metamorphosis*, to *Sex and Character* (*Geschlecht und Charakter*), the latter considered more "scholarly", in Jodl's view. [8]

Weininger, to note, sent a copy of his *Sex and Character* to Sigmund Freud, who belittled it. [10]

Jews | Hitler

Weininger, himself the son of a Jewish goldsmith, supposedly, considered both Jews and woman as soulless. In 1941, Weininger's name was making the rounds in Adolf Hitler's circle (Ñº); Hitler's mentor Dietrch Eckart, e.g., referring to Weininger as the only decent Jew he had ever made the acquaintance of (Ñº); Hitler later saying, something to effect of, "there was only one decent Jew, and he killed himself".

Reaction end | Suicide

See main: Founders of thermodynamics and suicide

On 3 Oct 1903, **Weininger**, age 23, shot himself in the chest, in the area of the heart, in Schwarzspanierstrasse 15, 1090 Vienna, in the same room that Ludwig Beethoven met his reaction end (died) 76-years previously, on 26 mar 1827. (Ñº) The original house, in which Beethoven and Weininger both ceased to exist, to note, was demolished in 1904 (Ñº); the new building contains a plaque, pictured above (left). Right: Wininger's tomb at Matzleinsdorf Protestant Cemetery, burial said to have been attended by Ludwig Wittgenstein, then age 14.

In June 1903, after months of concentrated work, Weininger finish his human chemistry upgrade book *Sex and Character: A Fundamental Investigation*, an attempt "to place sex relations in a new and decisive light"—namely, it seems, and expansion of Goethe's human chemical theory applied to feminism and sexual relation issues. Shortly after finishing *Sex and Character*, Weininger commented the following: [6]

> "There are three possibilities for me: the gallows, suicide, or a future so brilliant that I don't dare to think of it."

The book, however, did not created the expected "stir", although at one point it was attacked by German neurologist and Goethe-Schopenhauer-Nietzsche scholar Paul Mobius who accused him of plagiarism. Deeply disappointed, and seemingly depressed, Weininger left for Italy.

Back in Vienna he spent his last five days with his parents. On October 3, he took a room in the house in Schwarzspanierstraße 15, the noted final resting place of Ludwig van Beethoven. He told the landlady that he was not to be disturbed before morning since he planned to work and then to go to bed late. This night he wrote two letters, one addressed to his father, the other one to his brother Richard, telling them that he was going to shoot himself. On October 4, Weininger was found mortally wounded, having shot himself through the heart. He died in *Wiener Allgemeines Krankenhaus* at half past ten that morning. Otto Weininger was buried in the Matzleinsdorf Protestant Cemetery in Vienna. The epitaph by his father translates:

> "This stone closes the resting place of a youth whose spirit never found rest on earth. And when he had made known the revelations of his spirit and of his soul, he could no longer bear to be among the living. He sought out the death precinct of one of the greatest in Vienna's Schwarzspanier house, and there destroyed his bodily existence."

(add)

Quotes | Employed

The following are quotes employed by Weininger:

> "Love is a rebellious bird, that no one can tame: And it is in vain that it is called, If he agrees to refuse.

Nothing works; threat or prayer: One speaks, the other is silent; And that's the other one I prefer; He did not say anything, but I like him. Love is child of Bohemia, He never knew a law."

— Georges Bizet (1875), *Carmen* (Ñº); cited by Otto Weininger (1903) in *Sex and Character* (pg. 26)

Quotes | On

The following are notes of praise and or tribute:

"This book ... is a sensational work, both by reason of its contents and of the tragic fate of its author. Weininger, as is commonly known, shot himself in the autumn of 1903 at the early age of twenty-three, in the house in Vienna where Beethoven had died. . . . But it is the book itself, even more than its author's individuality, which is abnormal. It is nothing less than an attempt to construct a system of sexual characterology on the broadest scientific basis, with all the resources of the most modern philosophy."

— Author (1907), "Review", *General News Paper* (*Allgemeine Zeitung*) [1]

"We have all come under the spell of **Otto Weininger**, even those of us who have never heard of him, for he was one of those geniuses whose ideas echo far beyond any sound that is made by their names."

— Harvey Wickham (c.1920) [4]

"I think, I have never *invented* a movement of thought, rather they are always given to me by others. I have merely taken them up passionately for my work of clarification. In this way Boltzmann, Hertz, Schopenhauer, [Gottlob] Frege, Russell, Kraus, Loos, **Weininger**, Spengler, Sraffa have influenced me."

— Ludwig Wittgenstein (1931), diary note [11]

"The man came as a meteor and disappeared as suddenly. It was only when he had passed that his ideas started to sparkle, electrifying the world. Some regarded him as a biologist, others as a psychologist, still others called him a mystic. Though generally considered a realist, he was at the same time strongly suspected of dealing in fantasies. He was praised for his invincible logic and attacked for his crusade against women. He was full of contradictions. His name became the signal for dispute and controversy in a thousand cities."

— David Abrahamsen (1946), *The Mind and Death of a Genius* [4]

"**Weininger**'s nature forced his mind on long expeditions into psychology, biology, literature, and philosophy, journeys from which he never returned. Dissatisfied with scientific research, discontent with his own restless nature, he went farther and farther along the paths of speculative thought until he was, at the end, quite alone."

— David Abrahamsen (1946), *The Mind and Death of a Genius* [4]

"It would be hard to find another man who showed even in mild form the characteristics and the mental processes that **Otto Weininger** revealed in the extreme."

— David Abrahamsen (1946), *The Mind and Death of a Genius* [4]

Quotes | By

The following are noted quotes:

> "I must confess to being proud that this book is the first work to take up [Goethe's] ideas."
>
> — Otto Weininger (1903), *Sex and Character* (pg. 41)

> "Definite scientific conceptions are preceded by anticipations. The process of clarification is spread over many generations. There were ancient and modern vague anticipations of the theory of Darwin and Lamarck, anticipations which we are now apt to overvalue. Mayer and Helmholtz had their predecessors, and Goethe and Leonardo da Vinci, perhaps two of the most many-sided intellects known to us, anticipated in a vague way many of the conclusions of modern science."
>
> — Otto Weininger (1903), *Sex and Character* (pg. 97)

> "There are men of great genius who have shown no special talent in any marked degree; for instance, men like Novalis or Jean Paul (Ñº) ."
>
> — Otto Weininger (1903), *Sex and Character* (pg. 103)

> "Universality is the distinguishing mark of genius. There is no such thing as a special genius, a genius for mathematics, or for music, or even for chess, but only a universal genius. The theory of special genius, according to which for instance, it is supposed that a musical genius should be a fool at other subjects, confuses genius with talent. There are many kinds of talent, but only one kind of genius, and that is able to choose any kind of talent and master it."
>
> — Otto Weininger (1903), *Sex and Character* (pg. 112) [12]

> "Other men, who do not possess this organic thirst for truth, are always deeply involved in lies and errors, and so do not understand the bitter revolt of great men against the 'lies of life'."
>
> — Otto Weininger (1903), *Sex and Character* (pg. 174)

> "The most terrible chapter in the most comfortless of all the great books that have been written, the chapter on 'Death and its Relation to the Indestructibility of our Nature', in Schopenhauer's *The World as Will and Idea*, is where the permanence of the will to maintain the species is set down as the only real permanence."
>
> — Otto Weininger (1903), *Sex and Character* (pg. 223)

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(b) Janik, Allan and Veigly, Hans. (1998). *Wittgenstein in Vienna: a Biographical Excursion through the City and its History* (pg. 205). Springer Science.
(c) Vandenabeele, Bart. (2012). *A Companion to Schopenhauer* (pg. 381). John Wiley & Sons.
12. Otto Weininger – Wikiquote.

Further reading

â— Sengoopta, Chandak. (2000). *Otto Weininger: Sex, Science, and Self in Imperial Vienna* (elective affinities, 4+ pgs). University of Chicago Press.

External links

â— Otto Weininger – Wikipedia.
â— Otto Weininger on genius (quotes) – TheAbsolute.net.

θΔics

In science, **ouroboros** or uroboros is a fictional or folklore snake that eats or bites its own tail, referred to by Plato (c.380BC) as the first "living thing"; referred to by Ronald Fox (1988) as the icon of the puzzle as to how how a state of no-life or non-life transitioned into proto-life and life, particularly in respect to "energy"; generally a synonym of the great problem of natural philosophy.

Original

Newer

Left: A 1300BC depiction of the sun-battling snake, holding its tail in its mouth, aka **Ouroborus**, encircling the sun disc, which is in the form of Khepri; the tail biting snake later described by Plato, in his *Timaeus* (c.360BC) (O), as the first living thing. A newer Asian-like derivative (O) of the **ouroboros**.

Overview

In c.3000BC, the cobra goddess Wadjet, whose main cult center was in Buto (Tell el-Barian), was being depicted as the snake that coils around the sun disc to symbolized Ra's powers of destruction; sometimes depicted as a fire-breathing snake. [7]

In later times the Uraeus (O), or upright “rearing cobra”, with or without the sundisc, became the symbol of Wadjet, as worn on the crown of the pharaohs in the 18th dynasty.

In 1300BC, and into the 19th and 20th dynasties, Theban priests penned a burial text called the *Book of Pylons* (Book of Gates), in an attempt to adjust the cult of Ra to the Osiris cult, in which, as depicted on the alabaster sarcophagus of Seti I (1279BC), as shown below, in the scene of the ‘first hour of night’, the solar barque sails in a mythical river, containing the sun disc containing a morning scarab beetle, aka morning sun version of Ra (Khepri) which is encircled by a huge serpent holding its tail in its mouth; as shone below

Or as found in the original diagram: [6]

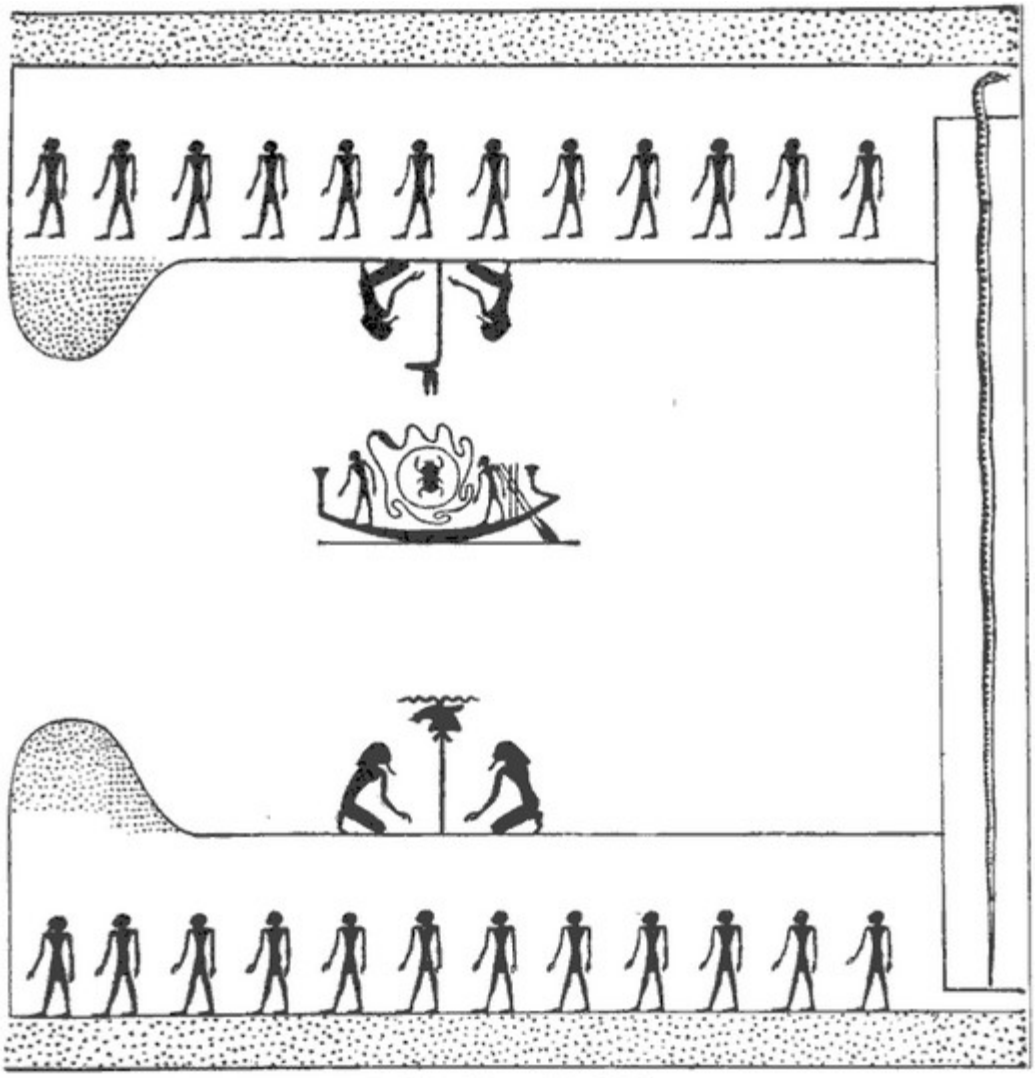

The First Hour of the Night.

In 1995, German-Egyptian dictionary writer Rainer Hannig argued that the Mehen (mḥn), a protective deity who is depicted as a snake which coils around the sun god Ra during his journey through the night, is equivalent to the Ouroboros. [4] This conjecture, however, seem to be off, being that Mehen, the vertical snake depicted above diagram from the *Book of Pylons*, as described in detail by Budge (pgs. 178-82), is one of several snakes described, including Apep, the one that does battle with Ra at night, a number of uraesus, with shooting balls of fire coming from their mouths, and the one encircling the Khepri-Ra sundisc in the boat.

In 1100BC, in the Papyrus of Dama (c.1077-943BC), a snake, surrounding the sun (Re) or pharaoh as sun, biting its tale, is shown as follows: [3]

In 380BC, Greek philosopher Plato was speaking of the ouroboros as so-called first living thing. [1]

In 1909, English radiochemist Frederick Soddy referred to the ouroboros myth as a symbol of cyclic and ever-regenerative cosmic processes. [5]

In 1988, American physicist Ronald Fox, in his *Energy and the Evolution of Life*, was referring to the "uroboros puzzle", visually depicted below, as the fundamental issue of how a state of no-life or non-life transitioned into proto-life and life, particularly in respect to "energy". [2]

It is likely the case that the "dragon" depiction is a confabulation of the Herodotus "phoenix" depiction Ra, the sun bursting forth out of the mound (Nun), as the primordial origin of everything, and the the snake coiled around the sun disc.

References

1. Fox, Ronald F. (1982). *Biological Energy Transduction: the Uroboros.* Wiley.
2. Fox, Ronald F. (1988). *Energy and the Evolution of Life* (pg. 5). New York: W.H. Freeman and Co.
3. Ouroboros – CrystalLinks.com.
4. (a) Hannig, Rainer. (1995). *Die Sprache der Pharaonen: Großes Handwörterbuch Ägyptisch-Deutsch* (*The language of the Pharaohs: Large Pocket Dictionary of Ancient Egyptian and German*). Publisher.
(b) Mehen – Wikipedia.
5. Kragh, Helge S. (2008). *Entropic Creation: Religious Contexts of Thermodynamics and Cosmology* (pg. 178). Ashgate Publishing, Ltd.
6. Budge. Wallis. (1904). *The Gods of the Egyptians, Volume One* (pgs. 179-80). Dover, 1969.
7. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (pgs. 219-20, 286). Facts on File, Inc.

Further reading

● Bejan, Adrain and Mamut, Eden. (1999). *Thermodynamic Optimization of Complex Energy Systems* (pgs. 223-24). Springer.

External links

● Ouroboros – Wikipedia.

θΔics

In science, **out-of-equilibrium** is a term that refers to thermodynamic system that is not in equilibrium. [1]

See also

- Local equilibrium
- Non-equilibrium
- Near-equilibrium
- Far-from-equilibrium

References

1. (a) Leuzzi, Luca and Nieuwenhuizen, Theo M. (2007). *Thermodynamics of the Glassy State* (section 3.3: Out-of-equilibrium thermodynamics, pgs. 116-31). CRC Press.
(b) Balescu, Radu. (1997). *Statistical Dynamics: Matter Out of Equilibrium.* College Press.

Further reading

- Amendola, Mario and Gaffard, Jean-Luc. (1998). *Out of Equilibrium*. Oxford University Press.
- Punzo, Lionello F. (2001). *Cycles, Growth and Structural Change: Theories and Empirical Evidence* (ch. 5: Out-of-equilibrium Dynamics, pgs. 115-27). Routledge.

θΔics

In ideologies, **outside the province**, or the "outside the province" argument, refers to the notion, position, or belief, held by some, mostly those of the religion-adhering type, that certain queries or subjects of the humanities, e.g. ethics, and or human nature lie outside the bounds of scientific measurement, hypothesis, theory and or discussion.

Quotes

The following are example quotes:

> "There are problems to whose solution I would attach an infinitely greater importance than to those of mathematics, for example touching ethics, or our relation to god, or concerning our destiny and our future; but their solution lies wholly beyond us and completely **outside the province** of science."
>
> — Carl Gauss (c.1847), later years musings on philosophy and religion [1]

> "Ethics lie **outside the province** of science. Science doesn't make ethical judgments."
>
> — William Craig (c.2003), "Interview with Lee Strobel" [2]

> "Do I have a soul? If a soul is something that only God can examine, then that's not a question science is qualified to address. No scientist I know can prod or scratch a soul. (Assuming one exists.) It is not a scientific object or a theory."
>
> — Bruce Bathurst (2009), "Why I'm Not a Molecule" [3]

See also

â— Unbridgeable gap
â— NOMA | Non-overlapping magisteria

References

1. (a) Newman, James R. (1956). *The World of Mathematics, Volumes 1* (pg. 314) (Ñº). Publisher.
(b) Muir, Jane. (1961). *Of Men and Numbers: the Story of the Great Mathematicians* (pgs. 181-82).C ourier Dover Publications.
2. Strobel, Lee. (2004). *The Case for Faith* (§5:113-52; quote, pg. #). Zondervan, 2009.
3. Bathurst, Bruce. (2009). "Why I'm Not a Molecule", Hmolpedia threads (post #9), Aug 24.

θΔics

In genius studies, **overrated geniuses**, as compared to "underrated geniuses", e.g. Robert Hooke (IQ:195|#20) [RGM:N/A|1,400+], refers to genius who tend to be "sold as" being *more* of a genius than they actually are, in the context of the top 1000 geniuses view of things.

Overview

The following is a work-in-progress ranking of the top 10 most overrated geniuses:

#	Genius	IQ estimates	Reason / Source
1.	William Sidis (1898-1944)	IQ_P=250-300 IQ_O=200 $IQ_?$=180-195	(IQ:175|#300) [RGM:702|1,400+] He's akin to an urban legend in genius discussions, oft-named dropped as either "highest IQ ever" or smartest person ever, yet if one looks at his actual accomplishments, namely his *The Animate and The Inanimate*, while impressive for a 25-year old, it lacks in genius light luster, and is error-filled in respect to big picture questions, and basis of logic (e.g. it's based on William Thomson's theistic ideas of animation); a "The Top 10 Most Overrated Geniuses" (2014). [2]
2.	Nikola Tesla (1856-1943)	IQ_O=230-310 IQ_O=200 IQ_O=140-160	A comparison of his top 1000 position (IQ:195|#19) and popular cultural rankings [RGM:7|1,400+] is indicative of his over-fame, for some peculiar reason; in modern electrical engineering schools, Gauss and Maxwell, of note, far out rank Tesla in density of intellect, in respect to name dominance.
3.			
4.			
5.			
6.			
7.	Benjamin Franklin (1706-1790)	IQ_{CB} =**173** IQ_C=160 IQ_B=185 IQ_W=160	A comparison of his top 1000 rankings (IQ:180|#202) as compared to (Cattell 1000:45) [RGM:21|1,400+] (Murray 4000:14|T) is indicative of fact that he is more of a "pop genius", often sold to children, as a great genius; a "The Top 10 Most Overrated Geniuses" (2016). [1]
8.			
9.			
10.	Srinivasa Ramanujan (1887-	IQ_O=185 IQ_O=180+ IQ_O=130-140	(GME:30) Indian mathematician; influential (Q) to Abdus Salam (IQ:#|#); IQ guesstimates: 185 (Ratner, 2016) (Q) , 180+ (Gamarra, 2018) (Q), 130-140 (Williams, 2016), and or "overrated as a mathematician" (Q).

1920)

Other names that crop up include: Pythagoras, Plato, Stephen Hawking (because he prevailed against Lou Gehrig's disease), Marie Curie (because she is female), Bill Gates (because Microsoft is so dominate presently), to name a few. [1][2]

Quotes

The following are related quotes:

> "Newton was a genius, but he is another **overrated genius** like Einstein. A lot of what culminated in Newtonian physics is the work of Copernicus, Galileo and Kepler. Copernicus shattered the geocentric view of the world; Galileo postulated the laws of motion; and Kepler calculated the elliptical motions of the planets. Newton put the tremendous discoveries of those men together."
>
> — Monydit Malieth (2013), *The Future Affects the Past* [3]

References

1. Anon. (2016). "The Top 10 Most Overrated Geniuses" (Q), Did You Know?, YouTube, May 20.
2. Anon. (2014). "The Top 10 Most Overrated Geniuses" (Q), NairaLand.com.
3. Malieth, Monydit (aka Tonnerre). (2013). *The Future Affects the Past: What Destination is Time Rushing To?* (pg. 44). Red Lead Books.

Further reading

- Goethe is overrated (2012) – Hmolpedia thread.

θΔics

In existographies, **Ovid** (43BC-c.17AD) (IQ:170|#322) (Cattell 1000:117) (CR:26) was an Roman poetical philosopher noted for his 8AD work *Metamorphoses*, derived from the Greek μεταμορφώσεις, meaning "transformation, transforming", from μετα- (*meta*-) "change" + μορφή (*morphe*) "form", one the the first works on morphology, a fifteen-book collection of epic poems, in book three of which he tells the story of Echo and Narcissus—a thematical story said to be embedded in Goethe's 1809 *Elective Affinities*, the third part of his metamorphology theory of form change.

Overview

In 8AD, Ovid, in his *Metamorphosis*, explains the explains the origin of life, i.e. non-human life, according to a warm pond model stylized model, as follows: [1]

> "All other forms of life the earth brought forth,
> In diverse species, of her own accord,
> When the sun's radiance warmed the pristine moisture
> And slime and ooze marshlands swelled with heat,
> And in that pregnant soil the seeds of things,
> Nourished as in a mother's womb, gained life
> And grew and gradually assumed a shape."

Dutch philosopher Benedict Spinoza, noted influence to Goethe, regularly quoted from Ovid, Terence, and other Roman authors. [2]

Ovid's metamorphosis theory, aka assumed a shape theory, supposedly, is one of the back bones to Goethe's morphology theory.

Quotes | On

The following are quotes on Ovid:

> "Virgil, in his noble epic, had made its hero the son of a mortal and a goddess, Venus; the implications of this genealogy were a temptation **Ovid** could not resist."
>
> — Rolfe Humphries (1954), "Introduction" to *Metamorphosis* [4]

Quotes | By

The following are related quotes:

> "The verses of sublime Lucretius are destined to perish only when a single day will consign the world to destruction."
>
> — Ovid (16BC), *Amores* 1.15.23–24 [3]

> "We do not desire what we do not know."
>
> — Ovid (c.10AD), *Art of Love* (§3.397) [5]

References

1. Ball, Philip. (2011). *Unnatural: the Heretical Idea of Making People* (pg. 17). Vintage Books.
2. Garrett, Don. (2001). "Introduction", in: *Ethics* (by: Benedict Spinoza; translator: W.H. White; revised by: A.H. Stirling) (pgs. vii-xv). Wordsworth Editions Limited.
3. Greenblatt, Stephen. (2011). *The Swerve: How the Renaissance Began* (abs). Random House.
4. Ovid. (8AD). *Metamorphosis: Stories of Changing Form* (§:Introduction, pgs. v-ix) (translator and introduction: Rolfe Humphries). Indiana University Press, 1955.
5. Meslier, Jean. (1729). *Testament: Memoir of the Thoughts and Sentiments of Jean Meslier* (translator: Michael Shreve; preface: Michel Onfray) (pg. 423). Prometheus Books.

External links

- Ovid – Wikipedia.
- Metamorphoses – Wikipedia.

θΔics

In chemistry, **oxidation**, as compared to reduction, is a reaction in which an element loses electrons.

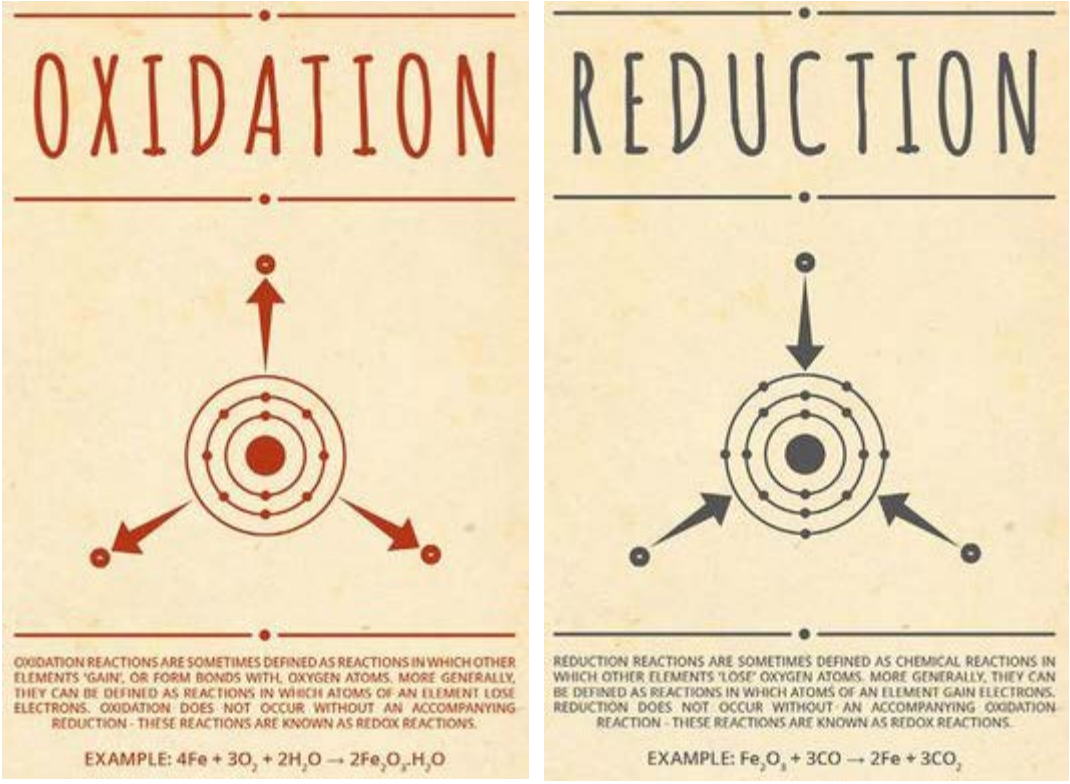

A CompoundChem.com (Q) info graphic (Q) of oxidation and reduction.

Quotes

The following are related quotes:

> "We can no longer maintain the infinite past duration of the earth; for chemical forces as well as mechanical tend to equilibrium. If, for instance, a large portion of the earth's mass were originally pure potassium, we can imagine violent igneous action to go on so long as any part remained unoxidized; but when the **oxidation** of the whole has taken place, this action must be at an end; for there is no agency (physical) which can reproduce the de-oxidized metal. Thus a perpetual motion is incapable in chemistry, as it is in mechanics; and a theory of constant change, continued through infinite time, is untenable."
>
> — William Whewell (1883), *Bridgewater Treatise*, quoted by E.B. (1851) [1]

References

1. E.B. (1851). "Hard Hits by the Author of the Creed of Error" ("human chemistry" pg. 326), *The Reasoner: and Theological Examiner*, 10(228-259): 326-28.

External links

- Oxidation – TheFreeDictionary.com.

θΔics

In chemistry, **oxygen**, symbol O, atomic number 8, is a nonmetallic element.

Rank	CPK (jmol)	Symbol	% Mass	Picture	Z
1		O	61		8

Discovery

In 1663, Otto Guericke reported, in resect to an experiment done with a lit candle inside of a water filled vessel (see: Illustration VIII), that 10% of the volume of the air was consumed by the flame: [2]

> "But then, indeed, I saw all the water rise into the glass f and at the same time to draw up many bubbles. This was a clear indication that some of the air contained in the receiver had been consumed. Indeed, at least a **tenth part** of the air was consumed by the flame of the candle and perhaps all might have been consumed had not the flame gone out."
>
> — Otto Guericke (1663), *Magdeburg Experiments on the Vacuum* (pg. 140)

Other work done on the discovery of oxygen, include: Michael Sendivogius (1604), Carl Scheele (1771), Joseph Priestley (1774), all of which was assimilated and explained correctly by Antoine Lavoisier (1777).

Human molecule

In the human molecule, comprising 61 percent by mass of its structure, oxygen is the most abundant element.

Roughly 60% of the human body is H_2O, which is essential for almost all chemical reactions within the body. [1]

Quotes

The following are related quotes:

> "Why should a group of simple, stable compounds of carbon (C), hydrogen (H), **oxygen** (O), and nitrogen (N), 'struggle' for billions of years to organize themselves into a professor of chemistry? What's the motive?"
>
> – Robert Pirsig (1991), *Lila: an Inquiry into Morals*

See also

â— Animal heat

References

1. Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc) (pgs. 52-55). LuLu.

External links

â— Oxygen – Wikipedia.

θΔics

In love theories, the **oxytocin theory of love** posits that during heightened bond formation stages, such as mother-child bonding, following birth, or mate bonding, following sex, that the hormone oxytocin, $C_{43}H_{66}N_{12}O_{12}S_2$, will be released in large quantities and that this is the main neurochemical involved in the processes of human bonding in specifically in establishment and formation of human chemical bonds. [1]

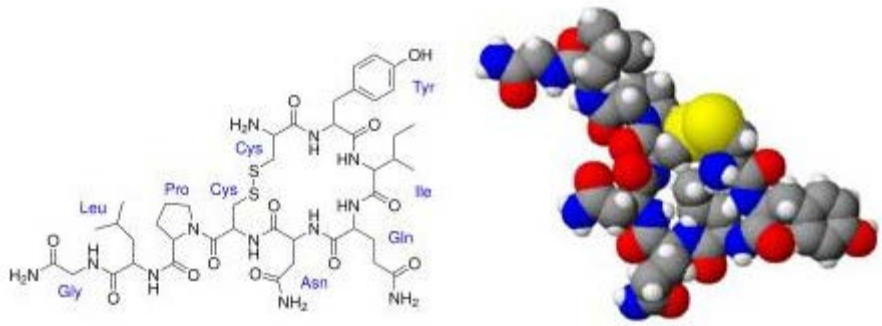

Artistic rendition of **oxytocin**, $C_{43}H_{66}N_{12}O_{12}S_2$, a 5-element neurochemical, the so-called 'cuddle chemical', with heart shaped letter Os.

History

The effect of oxytocin to mediate spatial tendency, to the effect that people stand closer to those they like than to those they abhor, was discovered in 1968. In the early 1980s, oxytocin release was being associated with breastfeeding.

The "oxytocin theory of love" with specific focus on marriage formation and marriage dissolution seems to have gained fame with the publication of the 1992 studies of American behavior neuroscientist Thomas Insel who studied the differences in mating behaviors and corresponding oxytocin levels in two types of voles: prairie voles (prairie living voles), wherein adults tend to be monogamous, wherein both parents nurture their young, and mountain voles (mountain living voles), wherein adults tend to be more promiscuous and parent engage in less caretaking of the young. Insel found that oxytocin levels tend to be high in the monogamous prairie voles and low in the promiscuous mountain voles. [2] Oxytocin seems to have began to be called the 'cuddle chemical' or 'love hormone' into the 1990s the 2000s.

Overview

The neurochemical oxytocin is a bonding molecule (hormone), with a number of characteristic traits: high levels correlate with strong pair-bonding; levels rise during touching, kissing, and foreplay, and peak during orgasm. Associated with male-female attachment. Is made in the hypothalamus, ovaries, and testes. Is released in women during the birthing process. Initiates contractions of the uterus, stimulates the mammary glands to produce milk, and stimulated bonding between a mother and her infant. At orgasm, levels increase dramatically in women. Released during stimulation of the genitals and nipples. Is secreted in response to the crying of the infant.

Thinking about a loved one will cause levels to rise. It reduces stress. It makes people forgetful and diminishes the capacity to think and reason. Is secreted in the posterior lobe of the pituitary gland. When given to females around ovulation, it heightens their efforts to contact males and intensifies lordosis, i.e. sexual presenting. When given to males, they will develop maternal behaviors and infant guard ferociously; when levels are artificially blocked in males, they will neglect their infants and may even eat them. Improves erection, speeds ejaculation, enhances contractions of penile tissue, and increases ejaculation volume and sperm count; conversely, lowered levels reduces sperm count. Penis-vaginal contact and penetration increases levels in both sexes. [1]

Morality

In 2004, American neuroeconomist Paul Zak's lab discovered that oxytocin allows us to determine who to trust. Zac's obsession with finding the chemical basis for morality has led him to write the 2012 book *The Moral Molecule*. [3]

References

1. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (ch. 12: Bond History and Neurochemistry, pgs. 469-513, esp. pgs 503-04). Morrisville, NC: LuLu.
2. (a) Lewis, Thomas, Amini, Fari, and Lannon, Richard. (2001). *A General Theory of Love* (pg. 96). Random House.
(b) Thomas Insel – Wikipedia.

3. Zak, Paul J. (2012). *The Moral Molecule: the New Science of What Makes us Good or Evil*. Dutton Adult.

Further reading

â— Kuchinskas, Susan. (2009). *The Chemistry of Connection: How Oxytocin Response Can Help You Find Trust, Intimacy, and Love.* New Harbinger Publications.
â— Breuning, Loretta G. (2012). *Meet Your Happy Chemicals: Dopamine, Endorphin, Oxytocin, and Serotonin*. CreatSpace.

External links

â— Oxytocin – Wikipedia.

θΔics

In equations, the formula:

$$P = kT$$

is called Gay-Lussac's law and states that for a body of ideal gas, at constant particle count and volume, not too far from STP, the pressure of the gas will be equal to the product of a constant k and the temperature T of the gas.

History

The equation was introduced in 1802 by French chemist Joseph Gay-Lussac.

θΔics

In dropboxes, **package to unit ratio**, i.e. P/U ratio, is the ratio of the dimensions of maximum package acceptable, of a given dropbox, to the dimensions of the given dropbox unit; it is a gauge of design quality in the home package dropbox industry.

Package size / Unit dimensions

The following is a comparison of the package/dimension (P/U) ratios for BrizeBox (BB), MailCube (MC), and other comparable units; the higher the ratio the better design, in terms of mechanism functionality and size-aesthetics:

Unit	Package (max size/inches)	Package (1)	Packages (capacity)	Dimensions (unit/inches)	P/U	Weight	Cost	Video	Link
MC Package Carousel (concept)	15Hx15Wx35	7875 in³	25,000 in³	42" dia x 38H	50%	c.200lbs	c.$800		
MC 9O1	7.5Hx15Wx11D	1238 in³	2476 in³	17Wx9.5Dx32H	23.9%	c.35lbs	N/A		(Q)
BB 2XL (concept/prototype)	14Hx25Wx17D	5950 in³					$700		
BB Large	9x12x17	1836 in³		20Wx13Dx34H	**20.8%**	59lbs	$394	(Q)	
BB XLarge	13x14x20	**3750 in³**	7500 in³	24Wx19Dx45H	18.3%	99lbs	$529		
BB Small	7x8x12	788 in³		15Wx13Dx23H	17.6%	38lbs	$263		
HomeScapes Smart Parcel Box XL (EU)	10Hx17Wx13D	2210 in³		17Wx21Dx40H	15.9%		$400	(Q)	(Q) (Q)
ParcelWirx Drop Box	8Hx13Wx19D	1976 in³		17Wx21Dx36H	15.3%	58lbs	$460	(Q)	(Q) (Q) (Q) [1]
Deliver-Eze Pillar (Austria)	9Hx13Wx12D	1344 in³		17Wx17Dx35H	13.1%	53lbs	$499	(Q)	(Q)
DVault CS0015 (In/Out Mail top)				19Wx19Wx48H		115lbs	$899	(Q)	(Q)
DVault CS0023	9Hx17Wx12D	1836 in³		19Wx19Dx40H	12.7%	87lbs	$790	(Q)	(Q)
QualArc WF-PB003 Parcel Defender	7.5Hx16Wx11.5D	1380 in³		20Wx15Dx40H	11.5%	61lbs	$340		(Q) (Q)
QualArc Grandform	5Hx11Wx14D	770 in³		14Wx11x44H	11.4%		$530		
CurbVault	9.5Hx18Wx5D	855 in³		12Wx13Dx50H	11.0%	131lbs	$1590	(Q)	(Q)
Elephant Trunk	7Hx11Wx9D	693 in³		18Wx16Dx37H	6.5%	40 lbs	$220	(Q)	(Q)
MailBoss Package Master	3.5Hx10.5Wx4D	147 in³		12Wx22Dx16H	5.4%	87lbs	$240	(Q)	(Q) (Q)
Locking Security Mailbox	3.5Hx11Wx7D	270 in³		24Wx22Dx24H	4.1%	50lbs	$580	(Q)	(Q)
Salsbury Industries Courier Box 4975	7Hx15Wx8D	840 in³		20Wx26Dx49H	3.2%	160lbs	$750		(Q)

(add)

Dimensions | Comparisons

The following is a max package size (MPS) and cost comparison between the BBXL and the Dvault CS0015 both of which have the same MPS:

BB L
Max Package Size: 9Hx17x12
Cost: $394

DVault CS0015
Max Package Size: 9Hx17x12
Cost: $899

20Wx13Dx34H
(Unit Dimensions)

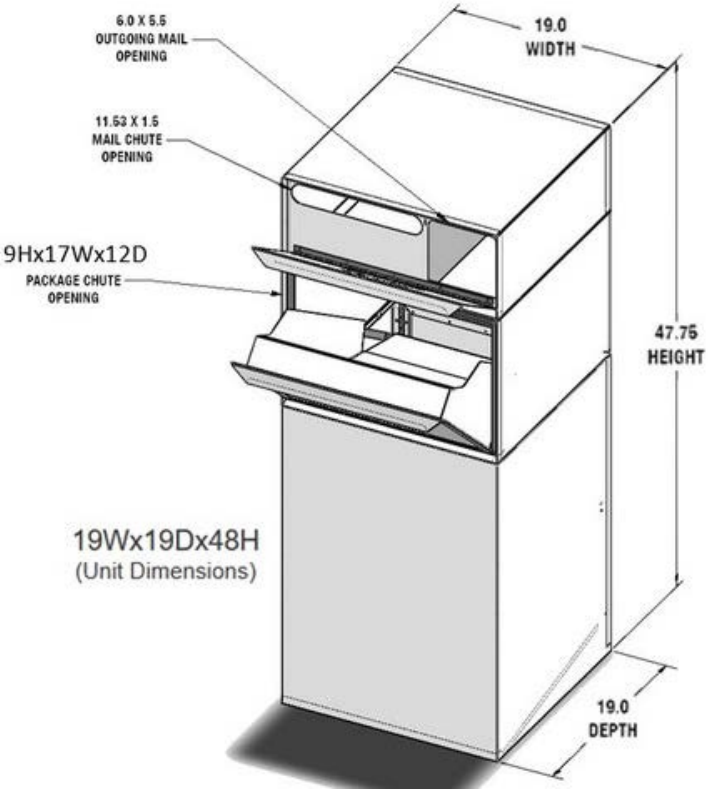

Max Package Size | Visuals

The following shows Max Package Sizes (MPS), for various units, to get a feel for how package to unit dimension (P/D) ratios are related to design quality:

MPS: 1836 in³

BrizeBox Large

MPS: 2275 in³

HomeScapes ParcelBox XL

MPS: 693 in³

Elephant Trunk

MPS: # in³

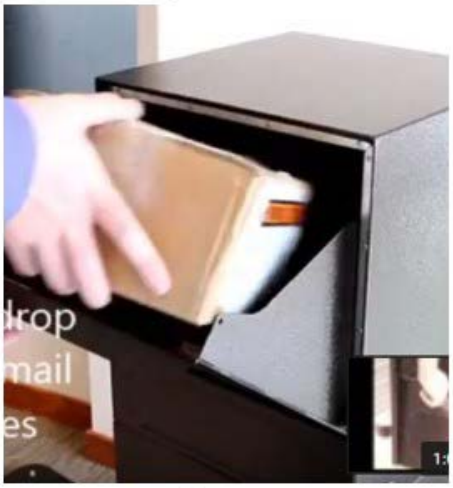

DVault DVU0050

MPS: 770 in^3

QualArc Grandform

MPS: 840 in^3

Salsbury Courier Box

MPS: 1344 in^3

Deliver-Eze Pillar

MPS: # in^3

RTS ParcelWirx

The drop design mechanism of units such as Elephant Trunk work to limit the maximum size package the unit will accept, as compared to designs with higher P/D ratios. In other words, when HomeScapes boast that there Smart Parcel Drop Box is the “largest parcel drop box available in the UK” (Q), the statement is misleading in that P/D ratios are not taken into account, i.e. the unit may be large, but it does not accept large packages.

References

1. Smith, Brad. (2018). "Email to Libb Thims", Jan 9.

In experiments, **paddle wheel experiment** is an 1845 experiment, conducted by English physicist James Joule, in which he let a weight of 890 pounds fall through a height of one foot, which worked (turned) a paddle wheel in a tub of water, thus causing a raise in temperature of one degree in the water, as measured by a thermometer. The measured variables: mass, height, temperature gave one of the first accurate measured of the mechanical equivalent of heat.

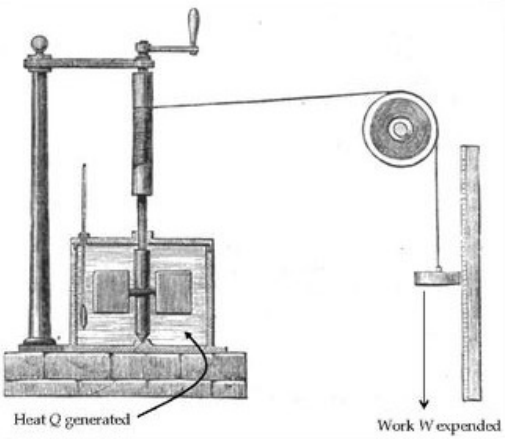

Engraving of James Joule's 1843 **paddle wheel experiment** for measuring the mechanical equivalent of heat. [2]

Overview

On 24 Jun 1845, Joule had the following read before the Chemical Section of the British Association for the Advancement of Science in Cambridge: [4]

> "The author gave the results of some **experiments**, in order to confirm the views he had already derived from experiments on the heat evolved by magneto-electricity, and from experiments on the changes of temperature produced by the condensation and rarefaction of elastic fluids. He exhibited to the section an apparatus consisting of a can of peculiar construction filled with water. A sort of **paddle-wheel** was placed in the can, to which motion could be communicated by means of weights thrown over two pulleys working in contrary directions. He stated that the force spent in revolving the paddle-wheel produced a certain increment in the temperature of the water; and hence he drew the conclusion that when the temperature of a pound of water is increased by one degree of Fahrenheit's scale, an amount of vis viva is communicated to it equal to that acquired by a weight of 890 pounds after falling from the altitude of one foot."

The following shows Joule's original paddle wheel experimental devices, held at the Science Museum, London. [3]

In 1989, historian Donald Cardwell summarizes the behind the scene details of this famous abstracted presentation as follows: [5]

> "On Thursday 24 June, Joule read his paper on the new theory of heat. It was late in the day and, to save time, the Chairman asked him to confine himself to a brief summary of the principal points of his paper. He exhibited and explained his paddle-wheel apparatus. Experiments using water and sperm oil gave, he claimed, 781.5 and 782.1 foot-pounds respectively for the mechanical equivalent of heat. He had also made some experiments on the compression of steel springs. No heat, he found, was generated; all the living force used to compress the springs had been convened into attraction through space. It was, he believed, analogous to latent heat. These static experiments were not, Mendoza has pointed out, actually included in his brief summary and they were omitted from his subsequent paper in the Philosophical Magazine. They had to be published later."

A screenshot of a 2013 video documentary (Ñº) showing a re-construction of the original experiment and measurements.

The results of this experiment were described in his famous 1845 paper "On the Mechanical Equivalent of Heat", in which Joule determined a value *A* for the amount of work *W* required to produce a unit of heat *Q*. The following, supposedly, is sketch of the 1847 model used by Joule to measure the mechanical equivalent of heat: (Ñº)

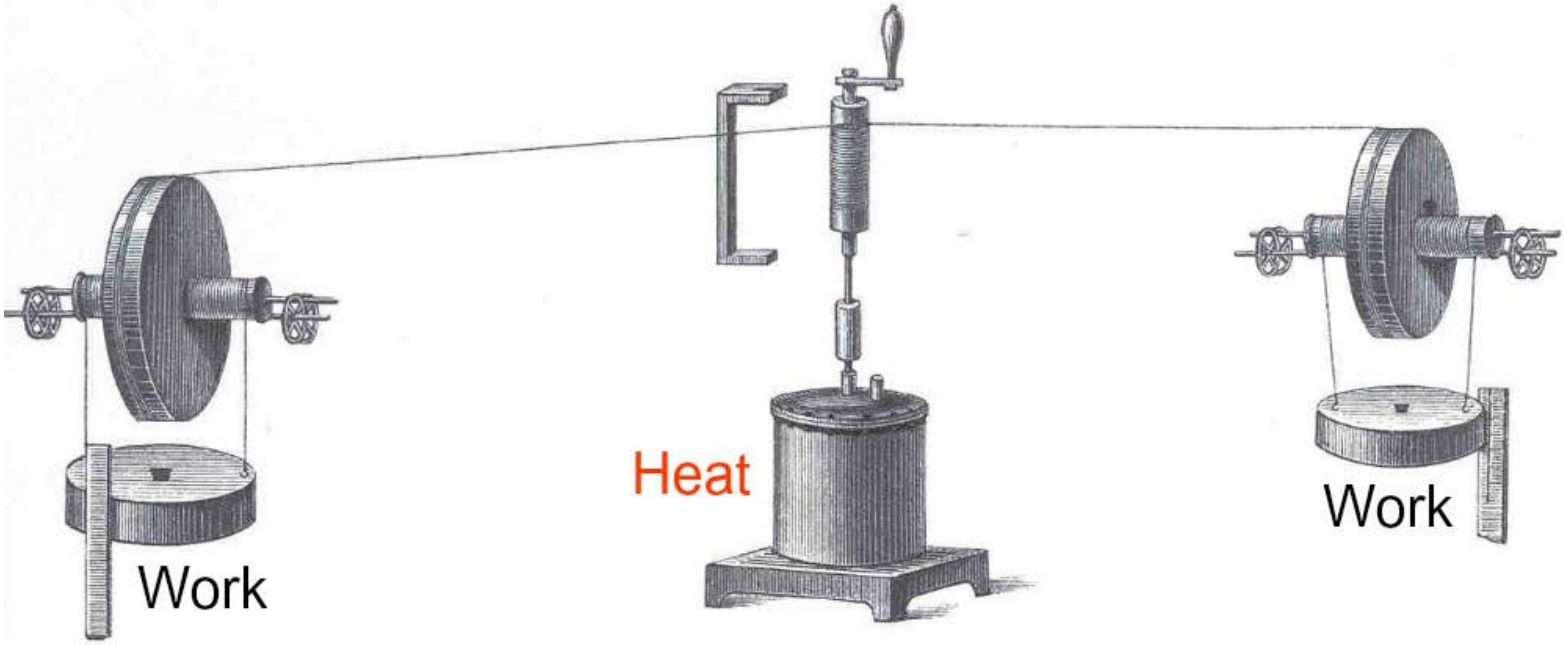

The "Joule" as the unit if energy is now named in his honor.

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1. Joule, James P. (1845). "On the Mechanical Equivalent of Heat", *Brit. Assoc. Rep., trans. Chemical Sect*, p.31, read before the British Association at Cambridge, June.
2. Author. (1869). “Article”, *Harper's New Monthly Magazine* (pg. #), No. 231, August.
3. Young, John. (2015). “Heat, Work, and Subtle Fluids: a Commentary on Joule (1850) ‘On the Mechanical Equivalent of Heat’” (Ñº), *Philosophical Transactions A*, 373(2039), Apr.
4. (a) Joule, James. (1845). “On the Mechanical Equivalent of Heat”, Transactions of the Chemical Section (pg. 31), British Association for the Advancement of Science, Cambridge, Jun.
(b) Joule, James. (1884). *The Scientific Papers of James Prescott Joule, Volume One* (pg. 202). Publisher.
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θΔics

In religio-mythology, **pagan**, from the Latin *pagus*, a country district, i.e. peasant lands, refers to, in the post Roman recension era, circa 300AD to present, to mean or refer to non-Christian religions, lumped together, in an obfuscative way; generally related to Egyptian, Greek, and early Roman polytheisms and religio-mythologies .

pa·gan
/ˈpāgən/

noun

1. a person holding religious beliefs other than those of the main world religions.
   synonyms: heathen, infidel, idolater, idolatress; *archaic* paynim
   "pagans worshiped the sun"

adjective

1. relating to pagans.
   "a pagan god"
   synonyms: heathen, ungodly, irreligious, infidel, idolatrous
   "the pagan festival"

A generic Google definition of "**pagan**", as one who holds non-mainstream religious beliefs; or a heathen, ungodly, irreligious, infidel, and or idolatrous.

Overview

In 2000, James Arthur summarized the gist of the underlying meaning of the term "pagan" as follows: [1]

> "It is well documented by fundamentalists (apologists) that the Christmas traditions are **Pagan** in origin. This simply means that their origin comes from the traditions of the country-folk (pagan). By contrast, the Pagan origins of most of the other attributes of Christianity are vigorously denied. It is also very easy to obscure, overlook and discredit the Egyptian, Mithraic, Germanic, Norse, Celtic, Greek, Hindu and Buddhist roots by lumping all non-Christian religions together and labeling them **'Pagan'**. These are certainly not simple country-folk religions. So to just say Christmas has Pagan roots, and not go further, is glossing over what exactly those roots are, and discrediting their study as worthless. Christmas icons, traditions and stories have hidden meanings. Although not initially apparent, a more thorough investigation reveals far more symbolic content (which is decipherable) than originally suspected. At the roots of this symbolism research is information about the secrets of the mushroom, regarding its habitats, forms, uses, preparations, and effects."

In 2005, Tom Harpur, in the "Introduction" to the paperback edition of his *The Pagan Christ* (2004), clarified the following in respect to the use of the term "pagan" in the title of his book: [2]

> "The word **'Pagan'** is almost totally misunderstood today. The deeply pejorative use of the word—entirely due to Christian prejudice and bias for centuries—is illustrated at once by the *Concise Oxford Dictionary's* almost brusque: 'heathen, unenlightened or irreligious (person).' But, the citation goes on to admit that in its origin the word was totally neutral. It comes from the Latin *pagus*, a country district. A Pagan, a 'Paganus', initially was a peasant. The term was soon to be used by the emerging church authorities to denote all who were not orthodox Christians."

(add)

Quotes

The following are related quotes:

> "Primitive and **pagan** people attribute some kind of life to all creation. The pre-Socratics concurred with this belief, as Thales' hylozoism and Pythagoras' pananimism attest. From this traditional viewpoint, all beings are alive in different ways and various degrees, the more formidable the complexity of its components, the more alive is the system."
>
> — Paris Arnopoulos (1993), *Sociophysics* [2]

References

1. Arthur, James. (2000). *Mushrooms and Mankind: The Impact of Mushrooms on Human Consciousness and Religion* (Horus Temple, pg. 5; Santa-ology, pgs. 11-13) (Ñº). Book Tree.
2. Harpur, Tom. (2004). *The Pagan Christ* (Pagan, pgs. xvii-ixx). Thomas Allan Publishers.
3. Arnopoulos, Paris. (1993). *Sociophysics: Cosmos and Chaos in Nature and Culture* (being, pg. 31; more alive, pg. 39). Nova Publishers, 2005.

Further reading

â— Freke, Timoth and Gandy, Peter. (1999). *The Jesus Mysteries: Was the Original Jesus a Pagan God*? Three Rivers Press

External links

â— Paganism – Wikipedia.

θΔics

In dating systems, **Paine dating system** (BCM/ACM), aka "Paine Calendar", is a secular achristism alternative to the theistic "BC and AD system" (Exiguus, 525AD) (Ñº), which explicitly labels "common era" years, or "vulgar era" (Kepler, 1615), as Years ***Before*** *Christ Myth* (**BCM**), instead of *Before Christ* (BC) or Before Common Era (BCE), and Years ***After*** *Christ Myth* (**ACM**) instead of *Anno Domini* (AD) or Common Era (CE).

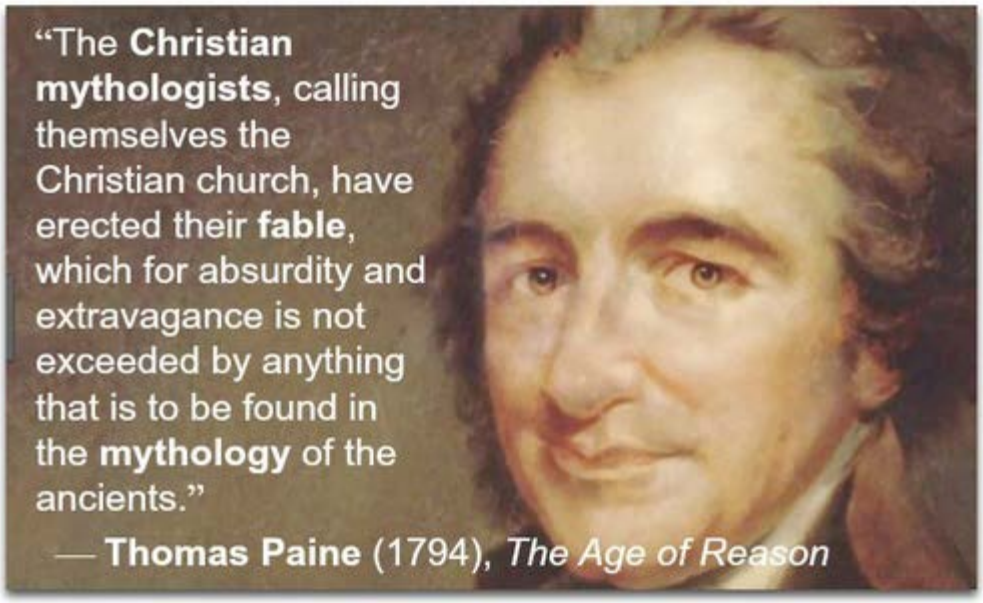

An image of Thomas Paine, and noted Christian fable quote, from his famous *The Age of Reason*, one of the founding books of American free thinking, the inventor of the **Paine dating system**.

Overview

The "Paine dating system" was invented in the mind of Thomas Paine who about eight years after the publication of his *The Age of Reason* (1794), one of the most-widely cited "atheist's bible", historically (Ñº)(Ñº), wherein he outlines some basics of the Christ myth, aka Christ myth theory, Christian mythology (or Christ fable), began to date his letters to people as follows:

> "Paris, February 21st, 1802, **since the fable of Christ"**
>
> — Thomas Paine (1802), "Letter to Elihu Palmer", signature and dating method [1]

On 8 Nov 2018, Libb Thims began to employ the above defined Paine dating system notion to Hmolpedia articles, e.g. Johann Goethe (1749-1832 ACM) (0-82 AG), Empedocles (495-435 BCM) (2245-2185 BG), and Thomas Paine (1737-1809 ACM) (13 BG – 59 AG), along with the water-testing stage upgrade secular Goethean calendar (BG/AG) notation system, shown in addition. It is generally advisable to use both dating systems, when dating people; over time, the later, or something equivalent, will superseded the former.

Quotes

The following are related quotes:

> "Written in the land of the living; on the right bank of the Adige, in Verona, in the year of that **god whom you never knew** the 1345th."
>
> — Petrarch (1345), signoff to a letter [2]

> "Since, we are looking at the history of god from the Jewish and Muslim as well as the Christian perspective, the terms 'BC' and 'AD', which are conventionally used in the West, are not appropriate."
>
> — Karen Armstrong (1993), *A History of God* [3]

> "The fact that we still categorized years in BC/AD dating system, indicates that we are still a backwards

people."

— Libb Thims (2018), mental note; arisen will editing the Murray 4000 page, 7:40PM CST Jan 15

References

1. (a) Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pg. 88). Prometheus.
(b) Conway, Moncure D. (date). *The Life of Thomas Paine* (Ñº). Publisher.
2. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (Cicero letter, pg. 262; year of that god, pg. 269). HarperOne.
3. Thims, Libb. (2011). *Purpose? (in a Godless universe)*. (94-pg manuscript) (unfinished); Online as 105-page unfinished manuscript (14 Apr 2013). IoHT publications.

External links

â— Thomas Paine Day (aka Freethinkers Day) – PunchBowl.com.

θΔics

In hmolscience, **Pamela Zoline** (1941-) is an American writer noted, in literature thermodynamics, for her 1967 work on entropy and ontology.

Overview

In 1967, Zoline, penned her controversial entropy-themed short story "The Heat Death of the Universe", wherein she she attempted to address the question of what thermodynamics has to say about ontology, the subject that concerns itself with the problems of the nature of existence or being. [1]

Education

Zoline was educated at Barnard College, Slade School of Art, and University College, London. [2]

References

1. (a) Zoline, Pamela. (1967). "The Heat Death of the Universe", New Worlds.
(b) Van der Spek, Inez. (2000). *Alien Plots: Female Subjectivity and the Divine in the Light of James Tiptree's 'A Momentary Taste of Being'"* (pg. 63). Liverpool University Press.
2. Zoline, Pamela. (1988). *The Heat Death of the Universe and Other Short Stories*. McPherson.

External links

â— Pamela Zoline – Wikipedia.
â— Page, Alison. (2005). "An Appreciation: 'The Heat Death of the Universe' by Pamela Zoline", The ED SF Project, Nov 16.

θΔics

In -isms, **panbioism**, from the Greek *pan*- “all” and *bio*- “life”, aka "panbiotism" (Carus, 1892) or "hylozoism" (Cudworth, 1678), which can be contrasted with abioism (Thims, 2015), is the view that every thing in the universe is alive; sometimes referred to as the “everything is alive theory”.

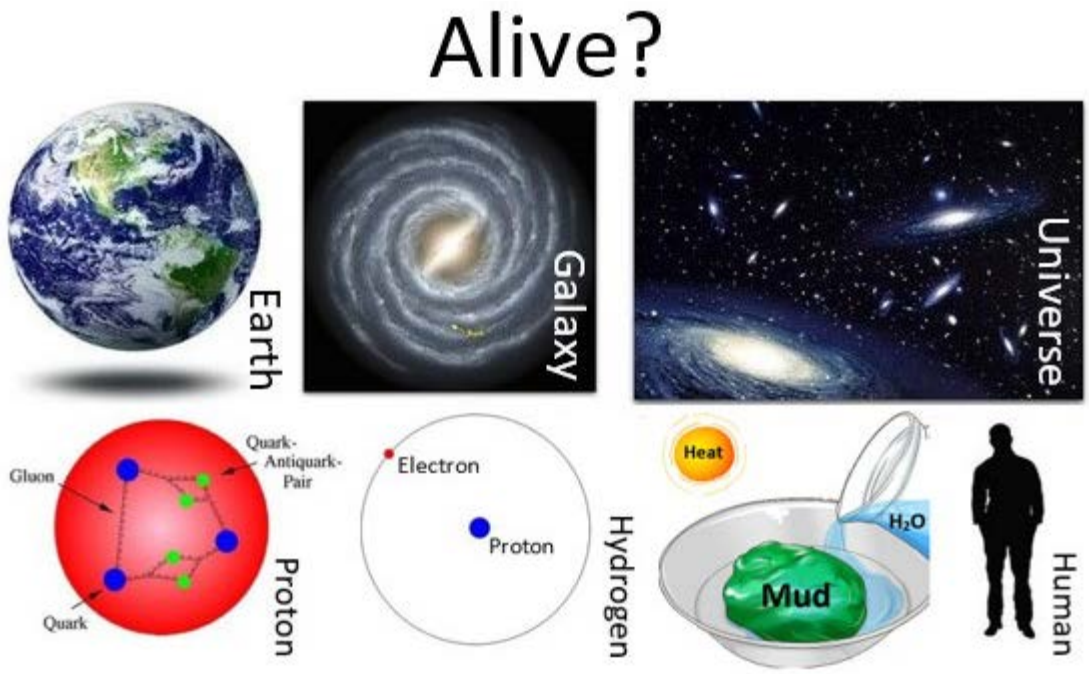

Top: the **panbioism** view holds that all super human sized entities, such as the earth, milky way, the universe, are alive. Bottom: Two examples of entities, the proton nucleon and hydrogen atom, that one will have to accept as being alive if one adopts the panbioism perspective: the view that everything in the universe, smallest to biggest, is alive.

Greco-Roman views

In Greek philosophy, Anaxagoras is credited with with having had professed on of the earliest panbioism views; one synopsis of this is as follows:

> “Neither creation nor destruction of life, according to Anaxagoras, was possible, and although, in his opinion, plants, animals, and man all come from the earth slime, nevertheless it was essential that this should be fructified by unchanging and infinitely small seeds (spermata), the ethereal embryos, which were carried into the earth from the air with rain water.”
>
> — Alexander Oparin (1936), *The Origin of Life*

(add)

Hylozoism

In 1678, English philosopher Ralph Cudworth introduced the term hylozoism, from the Greek *hyle* “matter” and *zoe* “life”, aka "living matter", to characterize the the philosophical point of view that all matter (including the universe as a whole) is in some sense alive; dating, supposedly, dating from the Milesian school period of Greek philosophy. [11]

Heinzen | Chemical materialism

In 1846, Karl Heinzen, in his *Six Letters to a Pious Man*, building on the work of Ludwig Feuerbach, whom he knew, and the so-called “scientific materialists”, namely: Jacob Moleschott, Ludwig Buchner, and Karl Vogt, stated the following ripe logic, given the time period:

> “The mind is nothing but the result of an organic combination of physical powers. The universe is, as it were, a chemical, magnetical, electrical, etc., laboratory, in which, the material powers (also called vital powers) consummate their unceasing changes and transformations. Where one formation ceases [final state], another begins [initial state]. Even the corpse of man lives; but this is no longer human life, it is only the **life of ‘anorganic’ nature** [see: inorganic life], to which the human form, after its dissolution, returns, and out of which ‘organic’ nature reproduces itself. **There is nothing dead in the world**, and dying implies only a retransformation to the material of common life.”
>
> — Karl Heinzen (1846), *Six Letters to a Pious Man* (pg. 14)

Heinzen referred to this belief as "atheist materialism"; retrospectively, we might now refer to this view, given the above statement, as "physico-chemical-electromagnetic materialism", which, to note, is a short stepping stone to when panbioism, e.g. references to both inorganic life (or anorganic life) and organic life, turn into abioism, and reference to the science defined motions of CH-based things (see: animate thing).

Panbiotism

In 1892, Paul Carus defined "panbiotism", a term, supposedly, identical to but independent to hylozoism (Skrbina, 2015), as the view that everything is fraught with life; it contains life; it is the ability to live". [12]

Nietzsche

German writer Ruedige Grimm (1977) argues that once the conservation of force (Helmholtz) and conservation of energy (Clausius) views emerged in the mid-19th century, the idea that everything in the universe could be viewed as a form of energy or force that was conserved, that soon thereafter the "everything is alive" theories began to emerge. Grimm cites German philosopher Goethe-Schopenhauer proselyte Friedrich Nietzsche, and will to power as the first dominate example of this: [10]

> "For Nietzsche, everything [organic and inorganic] is alive, everything is active and dynamic in the most fundamental sense, and everything is ultimately constituted out of the primal drive to increase power."

Goethe's famous student Arthur Schopenhauer, likewise, developed his own "will go power" theory, chemical-reaction level to human-reaction level; although it remains to be discerned if he had "panbioism" views, in any sense of the matter?

Finnemore

In 1924, Hilda Finnemore outlined a materialism implicit "soft panbioism".

Other

The theory of panbioism, the possibility that everything, from subatomic particles to atoms to planets to the entire cosmos, might be alive or have some form or semblance of "life", is one of the stepping stone alternative theories when one begins to address the origin of life question or the so-called "great problem of natural philosophy", aka the life/non-life divide puzzle. English scientist James Lovelock and American biologist Lynn Margulis's 1970s entropy reduction inspired Gaia hypothesis, i.e. the new age theory that the earth is a living, interrelated organism, is one example of panbioism. American complexity theorist James Gardner's 2003 book *Biocosm*, which argues that "intelligent life is the architect of the universe", is an example of the view that the universe or entire cosmos is alive, so to speak. [6]

Hmolscience

In hmolscience, one way to be led into the panbioism-view is to follow a dissent or step down the evolution table (2005), or evolution timeline (2009), starting from the "human", an entity that, as we have been told, generation after generation, ingrained from conception, is "alive", and keep stepping downward in the de-evolution or involution path to the point at which one can definitively state—without doubt—that one has found the first non-alive entity or non-living matter. This "thought experiment" will take one down to the atomic and subatomic level,

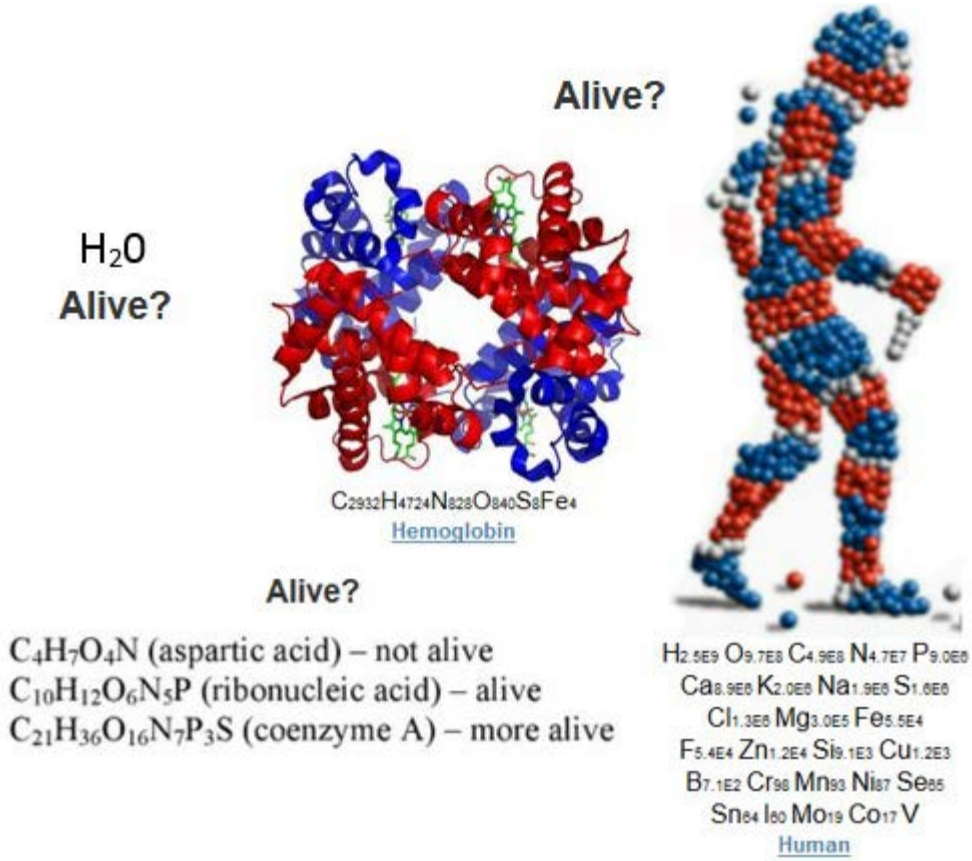

Top: the **panbioism** view holds that supramolecular entities, such as hemoglobin and human molecules, are alive.Bottom (left): A 2007 except diagram of American electrochemical engineer Libb Thims's vacillating on the "is the aspartic acid alive? question, which boils down to the deeper question: "is the hydrogen atom alive?" question, which amounts to the the point at which one stops calling molecules as being alive: being that many currently define RNA (ribonucleic acid) as the first form of life; similar to how many in the 1960s were debating about whether or not the virus or virus molecule was alive? [1]

wherein one will begin to speculate as to whether, e.g. inside the proton or neutron, wherein quarks move about via the operation of exchange forces called bosons, "subatomic life" is a literal term, a metaphorical term, or a reality term?

An example of this type of querying can be found in American electrochemical engineer Libb Thims' chapter "Molecular Evolution", of his 2007 *Human Chemistry* textbook, wherein he can be seen readily vacillating in indecision on the not-alive/alive/more-alive divide question (see adjacent)—a view which readily leads to the possibility of panbioism: the model according to which one has to conclude that the hydrogen atom is alive—albeit a view that becomes nonsensical given prolonged introspection. [1] It would not be until 2009, with the publication of the defunct theory of life, that Thims was able to work himself out of this quagmire. [2]

Etymology

In 2000, the hyphenated term "pan-bioism" had an internet usage. The following is Google groups (2009) posting, comment by Ecce, which gives a cogent overview: [5]

> "Even though—in most physical overviews—atoms would be taken to be precursor components of the human body (and other macroscopic objects), atoms aren't called "proto-humans" or "proto-biotic bodies", etc., or categorized under items like "pan-humanism" or "**pan-bioism**". Thus, our current tendency to label speculatively global primitive or elemental stages of later brain-grounded consciousness with terms like "panpsychism", "panexperientialism", and proto-versions of those (including proto-consciousness) is probably inhibiting exploration beyond neural activity because of the stigma of "kook territory" that they engender."

Decent synopsis of the issue indeed. In 2011, in discussion about Francis Crick's 1953 half-joking comment that DNA is the "secret of life", a blogger by the name of Mr. Zero commented: [3]

> "What if it turned out that *everything* had a double helix? **Pan-bio-ism**!"

In 2010, in Hmolpedia thread (#27), in discussion between Russian physical chemist Georgi Gladyshev (advocator of an emergence origin of life theory) and Americans chemical engineer Ted Erikson (advocator of a semi-panbioism "awareness" theory at the Planck scale level) and electrochemical engineer Libb Thims (advocator of the defunct theory of life) on the question of the "origin of life", Thims classifies the "everything is alive theory" as one of the alternative origin of life solution theories, albeit an untenable one:

> "The premise of the Quincey's book, which he says are themed on the ideas of Pierre Teilhard, Henri Bergson, and Arthur Young, is that the 'universe is not dead', as the materialists would have it, but rather matter is alive (and the universe is alive), and has consciousness, on the model that the photon is the unit of being and becoming (Young's theory). The alternative to this **"everything is alive theory"**, is the "emergence theory" (Gladyshev's view), that life emerged at one point in the evolution timeline from hydrogen to human. Both theories, however, become nonsensical when the one looks into the details of the argument. The only solution, which I have been employing in my writing in the last year, is to stop using the words "life", "living", and "alive", being that they have no scientific basis, and to instead begin using the terms "animated", "reactive", "moving", etc., in the place of the defunct terms."

A query post by David Bossens about equilibrium, death, free energy, and maximum entropy, after which, in response by Thims (post #20), in dialogue with Jeff Tuhtan, the term "**panbioism**" began to be employed.

On 14 Jun 2012, Libb Thims, amid a thread discussion with an anon, posting from Brussels, and Jeff Tuhtan, on the question of maximum entropy, equilibrium, and death, post query shown adjacent, began to use (post #20) the term "panbioism" (no hyphen), definition-defined, as follows: [4]

> "Re (Jeff): "So to be technically correct you could just say 'animate = life' and everything in the universe is 'alive'"; to correct you on this, if this is indeed your current stance, i.e. the 'everything is alive theory', aka '**panbioism**', being similar or nearly synonymous with panpsychism or panexperientialism. I would suggest for you to slow your roll on this one. At least from experience, when you first adopt the molecular formula point of view of everything, as I did in 2005 by making the world's first molecular evolution table, and a later expanded evolution timeline (2009), one of the first natural tendencies is to attempt to extend the concept of 'alive' down past the hydrogen atom into the proton and below. You can see in my *Human Chemistry* chapter five 'Molecular Evolution', pages 123-131, up to the comment about 'spark day' [see: Ferris Jabr, 2013], that I was still vacillating on this issue. It takes some time to get this loose puzzle out of one's head to say the least. A good starting point is to ask yourself 'is the hydrogen atom alive (yes/no)'?"

In 2015, the term "abioism" began to be used as the antonym of panbioism, in short.

Crackpottery

The above 2009 comment about panbioism, panpsychism, panexperientialism, and the like, being in "kook territory", or tending to be in crackpot land, one might say, should be taken note of. While the well-intentioned physicist or chemist will gladly trumpet about that "I am alive and I know it" without reserve, the first to trumpet about that "the hydrogen is

alive and I know it" or "water is alive and I know it" will be quick to be cast in to ridicule. Correctly: all three should be cast into ridicule; the only difference is the former is not aware that they are not alive, because the premise of life is so-ingrained into the cultural embeddedness that it is extremely difficult to expunge. In a sense it is almost like the pot calling the kettle black.

An example of this is the recent 2012 105-page "high-controversial" (Ñº) article "Theory of the Origin, Evolution, and Nature of Life" by American molecular geneticist Erik Andrulis—a self-defined RNA metabolism and life researcher, published in Shu-Kun Lin's newly-launched *Life* journal, which posits a gyres theory, a type of "everything is alive theory", which has come to cause a scandal of sorts in the so-called new 21st century mass-information peer review process, which amounts to not getting peer reviewed at all. The abstract of the scandalous everything is alive theory article is as follows:

> **"**Abstract: Life is an inordinately complex unsolved puzzle. Despite significant theoretical progress, experimental anomalies, paradoxes, and enigmas have revealed paradigmatic limitations. Thus, the advancement of scientific understanding requires new models that resolve fundamental problems. Here, I present a theoretical framework that economically fits evidence accumulated from examinations of life. This theory is based upon a straightforward and non-mathematical core model and proposes unique yet empirically consistent explanations for major phenomena including, but not limited to, quantum gravity, phase transitions of water, why living systems are predominantly CHNOPS (carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur), homochirality of sugars and amino acids, homeoviscous adaptation, triplet code, and DNA mutations. The theoretical framework unifies the macrocosmic and microcosmic realms, validates predicted laws of nature, and solves the puzzle of the origin and evolution of cellular life in the universe."

The article opens to the following sentence:

> "How life abides by the second law of thermodynamics yet evolutionarily complexifies and maintains its intrinsic order is a fundamental mystery in physics, chemistry, and biology."

which, of course, is footnoted to Erwin Schrodinger's famous 1943 *What is Life?* lecture and is but an attempted dig into the second law (disordering) evolution (ordering) query. Science journalist Jesse Emspak, of LiveScience.com, gives the following synopsis of the article: [8]

> "Essentially, objects — atoms, cells, molecules, chemicals and so on — are packets of energy and matter that are described by gyres – spinning spirals. Gyres are defined by the singularity at one end and the changing shape of the spiral at the other. Everything around us oscillates between excited and ground states as they pivot around the center of these lifelike gyres. Everything isn't alive, exactly, but gyres have 'lifelike characteristics'."

Emspak went on to label Andrulis' article as the "crackpot theory of everything" for claiming that everything is alive, which, again, is a bit paradoxical coming from someone who journals for a blog claiming that "science is alive" (the name LiveScience.com in itself is another pot-kettle highlighter: science is alive, but defining atoms as alive is crackpot?) In any event, the publication of the article has caused at least one of the 23 members of Life's editorial board, Ginestra Bianconi, a physicist at Northeastern University, to tender her resignation. [9] Whatever the case, the overall aim of Andrulis seems to be an effort to dig into the spin problem.

Animism

A cousin term to panbioism is older term "animism", which is loosely the idea that there is no separation between the

spiritual and physical (or material) world, and souls or spirits exist, not only in humans, but also in all other animals, plants, rocks, geographic features such as mountains or rivers, or other entities of the natural environment. [7] The difference between the two, panbioism and animism, is that the former casts out all religious connotation, all except the term "life".

Quotes

The following are related quotes:

> "Everything is alive; everything is interconnected."
>
> — Cicero (55BC), original: Omnia vivunt; omnia inter se conexa; possibly a misattribution (2004) done via "motto" of online Grey Wizard School (Ñº); though, to note, he may have had similar (Ñº) views, as found in his *De Natura Deorum*

See also

â— Panpsychism
â— Panexperientialism

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pgs. 123-131). Morrisville, NC: LuLu.
2. Thims, Libb. (2009). "Letter: Life a Defunct Scientific Theory", *Journal of Human Thermodynamics*, Vol. 5, pgs. 20-21.
3. Comment (7 Jun 2011 3:36 PM) – Is This What Scientists Think Philosophers Do?
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θΔics

In terminology, **Pandora's box** refers to the gift box given to Pandora, the first woman of the human race, made from dirt (earth), water, and the four winds, according to Hesiod's 700BC *Theogony*, who unleashed "evil" into the world, via a result of her "gift of curiosity", i.e. to know what was inside the box she was warned by the gods not to open —a deceptive trick by Zeus, done to get back at Prometheus (see: Promethean heat) for stealing fire from the gods and giving "life" to humans; the specific term "Pandora's box" being introduced into literature, in circa 1520, Desiderius Erasmus, during his translation of the work; the story is said to be a forerunner or precursor for the story of Eve (see: Adam and Eve), the snake, the apple, i.e. the forbidden fruit, and the unleashing of evil (or original sin) to humans in the Garden of Eden of the Bible. [1]

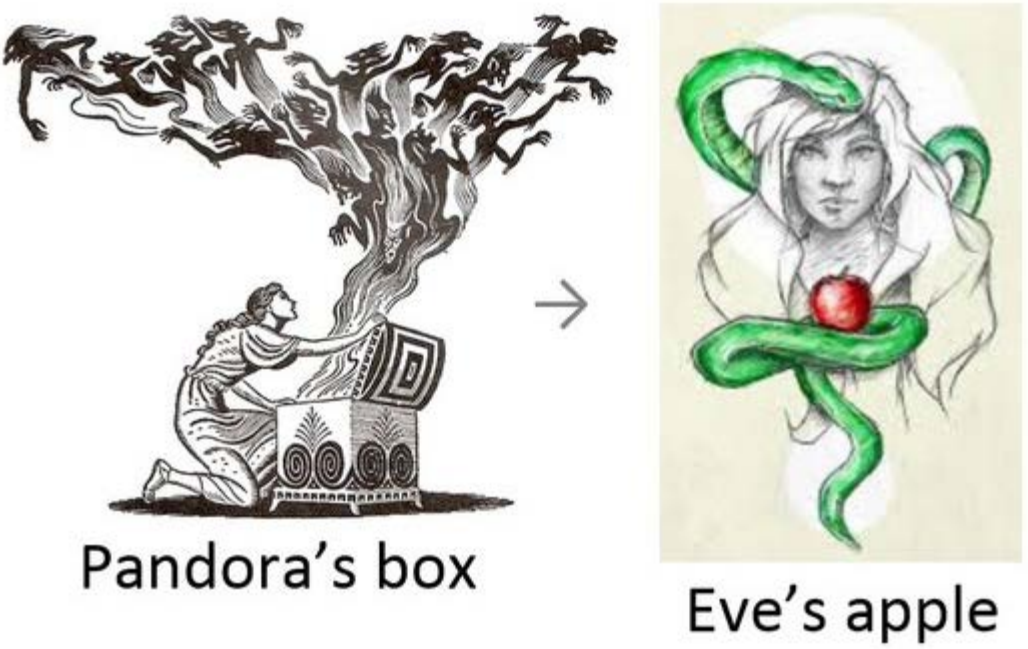

A depiction showing how Hesiod's 700BC story of Pandora, the first woman of Greek mythology, and her golden box, which she was warned by god (Zeus) not to open, became the basis for the 500BC Israelite story of Eve, the first woman of Hebrew mythology, and her apple, which she was forbidden by god (Yahweh) not to eat; transgressed acts said to be what let "evil" into the world.

Overview

The following are are key original textual background wherein he Pandora and Prometheus are introduced: [3]

> Iapetos took as his wife the fair-ankled Klymene, daughter of Okeanos, and shared her bed, and she bore him Atlas, a son of invincible spirit, and Menoitios of the towering pride, and Prometheus, whose mind was labyrinthine and swift, and foolish Epimetheus {5}, who from the start brought harm to men who toil for bread; he was first to accept the virgin woman fashioned by farseeing Zeus.
>
> {5} Epimetheus: the titan of afterthought, the father of excuses. He was given the task of creating the creatures of the earth. At the same time his brother, Prometheus, was creating mankind and, seeing the formidable abilities Epimetheus had given his creations, stole fire from heaven to assist his. Zeus in anger at this crime ordered the gods to mold **Pandora**, the first woman, and sent her to Epimetheus as his bride armed with a great jar. Pandora, succumbing to curiosity, opened it releasing all of the harmful daimones the gods had trapped within (the children of Nyx and of Eris) to forever plague mankind. Only Hope (Elpis) remained behind to comfort them.

In 1667, John Milton, in his *Paradise Lost*, alludes to a connection between Pandora's box and Eve's apple. (Q)

Quotes

The following are related quotes:

> "We must get entirely clear of all the notions drawn from the wild traditions of original sin, the eating of the apple, the theft of Prometheus, the opening of **Pandora's box**, and the other fables, too tedious to enumerate, on which priests have erected their tremendous structures of imposition, to persuade us, that we

are naturally inclined to evil."

> — Mary Wollstonecraft (1792), *A Vindication of the Rights of Women: with Strictures on Political and Moral Subjects* (Q); cited by Patricia Fara (Q)

"**Pandora's box** (140) may properly be took in the same mythical sense, with the apple in the book of Genesis; and in that light the moral will appear without any difficulty."

> — Author (1795), editorial note; *Cook's Hesiod* (pg. 17)

"The Hesperides are beautiful nymphs who, along with Atlas (517-520) and a monstrous serpent (334-335), guard the tree of golden apples [255, 361] in a marvelous garden somewhere in the imaginary world at the end of the earth."

> — Richard Caldwell (1987), editorial commentary on *Theogony* [2]

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Further reading

● Voltaire. (1759). *Candide: and Other Poetic and Philosophical Writings* (editor: Eric Palmer) (apple, pg. 189). Broadview Press.

External links

● Works and Days – Wikipedia.

θΔics

In philosophy, **panexperientialism** is the view that if evolution of humans goes all the way down to subatomic particles, then human 'experience' by deduction must have originated at the subatomic level, which implies that not just humans but individual cells, individual molecules, individual atoms, and even individual subatomic particles, such as photons or electrons, incorporate a capacity for 'feeling' or degree of subjective interiority. [1]

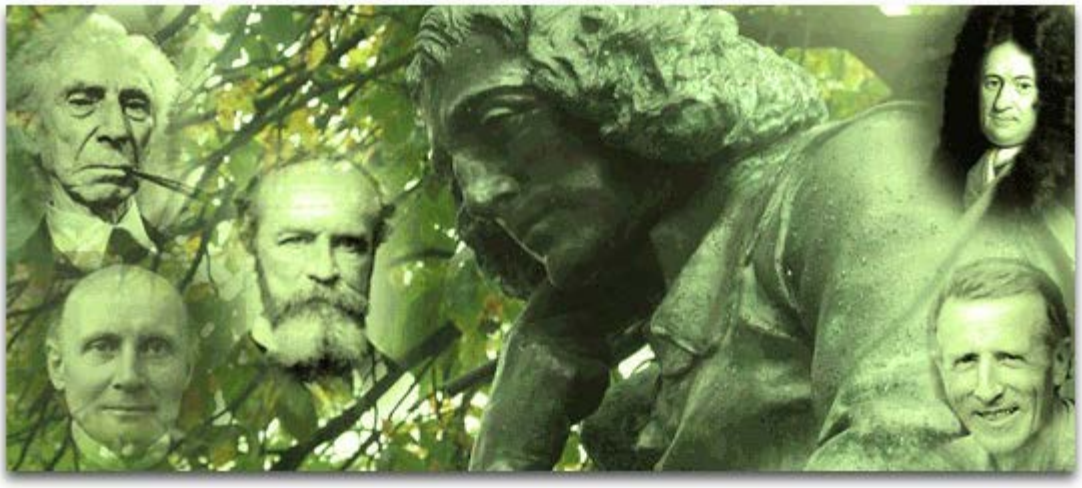

An image (O) of some of the **panexperientialism**-themed thinkers, namely, in clockwise order, starting from top left: Bertrand Russell, Gottfried Leibniz, Pierre Teilhard, Alfred Whitehead, and William James, all circling a statue of Rene Descartes ruminating on mind-soul dualism.

The term panexperientialism is one of the theory varieties that philosophers use to debate or explain how mind evolved from matter, along with dualism (mind and matter remain separate, a Rene Descartes theory), emergentism (mind 'emerged', over time, or at some point, in the process of evolution), materialism (nothing exists but mechanical matter and forces), and idealism (that mind, matter, and spirit are somehow mixed or only spirit exists). One who adheres to a version of panexperientialism is American philosopher Christian de Quincey, who argues that matter-energy is sentient.

American philosopher Mathew Segall considers himself a panexperientialist.

Etymology

The term 'panexperientialism' was coined in 1977 by American theologian-philosopher David Griffin, a combination of 'pan' meaning all of, the whole, or universal, and 'experience', meaning loosely to take place in an event, in commentary on the theories of Alfred Whitehead. Charles Hartshorne commented on it favorably, saying that it had the advantages over both 'panpsychism' and 'psychicalism.' Hence, panexperientialism is sometimes referred to as the Griffin-Whitehead-Hartshorne version of panpsychism (that everything has a psyche).

Griffin introduced the term to differentiate from the older theory of panpsychism, which implies that all entities of the universe have not just experience, but also consciousness, so as to avoid the implication that entities such as electrons or photons possess consciousness.

Griffin, according to the views of Christian de Quincey, summarizes that the term attempts to avoid the typical knee-jerk response to panpsychism, which is the retort that it implies atoms, molecules, or cells, as well as plants and rocks, experience and interior psychic life with all the conscious richness of human desires, fears, evaluations, thoughts, emotions, choices, and dreams.

The theory of panexperientialism, supposedly, is summarized best in Griffin's 1998 book *Unsnarling the World-Knot: Consciousness, Freedom, and the Mind-Body Problem*, in which he argues that panexperientialism, by taking experience and spontaneity as fully natural, can finally provide a naturalistic account of the emergence of consciousness—an account that also does justice to the freedom we all suppose in practice. [3]

Difficulties

A difficulty on the term 'panexperientialism', in namesake, is that it only seems to be a less innocuous temporary plug, i.e. more politically correct term, masking the same issues that the older term 'panpsychism' evoked, e.g. that electrons have some type of free will, choice, or self-directing internal force.

Panexperientialism, in short, is an "extrapolate down", the great chain of being, technique, whereas the "extrapolate up"

technique is the modern technique; the former a deanthropomorphization strategy, the latter an anthropomorphization strategy.

This is similar to the way, by comparison, that the term 'Christian science' become renamed as creation science and then eventually intelligent design, each being a less tainted or more dormant version of the former, but containing the same difficulties. In other words, often is the case that panexperientialists, typically philosophers with little or not training in chemistry or physics, will force awkward anthropocentric models into chemistry and physics, so as to justify his or her argument, sometimes concluding to the effect that the experimental data of science will need to change to justify their argument.

Quotes

The following are related quotes:

> "There must be an infinite number of degrees of consciousness, following the degrees of complication and aggregation of the primordial mind-dust. To prove the separate existence of these degrees of consciousness by indirect evidence, since direct intuition of them is not to be had, becomes therefore the first duty of psychological evolutionism."
>
> — William James (1890), *The Principles of Psychology* (Q)

Left: a 2008 video (Q) "“What is it like to be an atom?" by YouTuber LordImmolation, in which he gives his ten reasons why he rejects **panexperientialism**. Right: a response (Q) by American philosopher Mathew Segall.

See also

- Panbioism

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External links

- Panpsychism (section: panexperientialism) – Wikipedia.

θΔics

In geology, **Pangaea**, or “Pangea” (1922), from the Greek pan- “everywhere” + Gaia “earth”, meaning “entire earth”, or “urkontient” in German (1915), is the name of the single land mass or supercontinent that all present continents were once part of 200 million years ago.

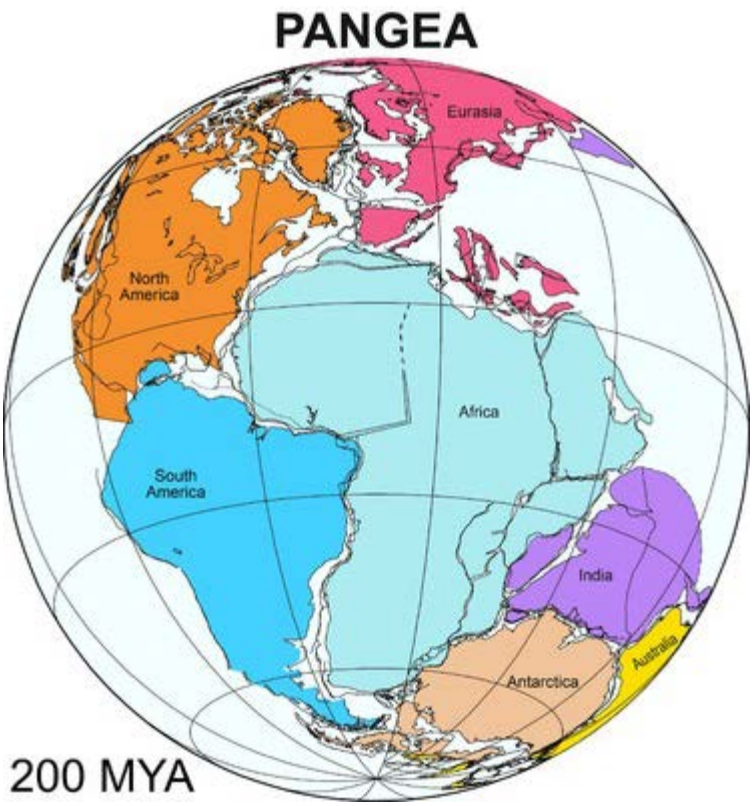

A reconstruction of **Pangaea** or the supercontinent said to have existed 200 million years ago, based on fossil evidence, geometrical fit, and sea floor spreading data.

Overview

In 1697, Robert Hooke, based on his previous 1664 earth axial tilt change theory of fossil layers, stated, in response recent reports of discoveries of remains of unknown or strangely located mammas, e.g. Siberian mammoth, Kentish hippopotami, Norfolk elephants, and a Roman ocean-going vessel buried in a Swiss mountain, that Ireland and America might have been joined previously:

> “Ask yourselves whether the latitudes of places might have been changes, whether **Ireland and America might not have been formerly joined**, whether the bottom of the sea might have been dry land and what is now dry land might not have been sea.”
>
> — Robert Hooke (1697), "Lecture", Jun 2 [1]

In 1910, Alfred Wegener, based on sea shell studies, similar to Hooke, conceived the theory that all continents formerly were joined. In 1912, Wegener went on an expedition to find evidence of fossil plant overlap between fitting continents.

Wegener published his findings in his *The Origin of the continents* (1912) and *The Origin of Continents and Oceans* (1915), arguing therein that all continents used to be joined as one super continent, which he called “Urkontinent” (German), or “original content”, aka supercontinent, in modern terms. [2] In 1920, Wegener referred to the supercontinent as the “Pangaea of the carboninferous”, after which the term Pangaea became the assumed name of the supercontinent.

References

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2. Beech, Martin. (2014). *The Pendulum Paradigm: Variations on a Theme and the Measure of Heaven and Earth* (pg. 135). Universal Publishers.

External links

â— Pangaea – Wikipedia.

θΔics

In theories, **panpsychism** is the view that everything in the universe has a psyche; in other meanings, the view that attributes the property of consciousness to everything, aka naive empathy theory.

In 1967, philosophy encyclopedist Paul Edwards, a critique of panpsychism, defined panpsychist as any view that attributes some kind of consciousness to all material objects. [4]

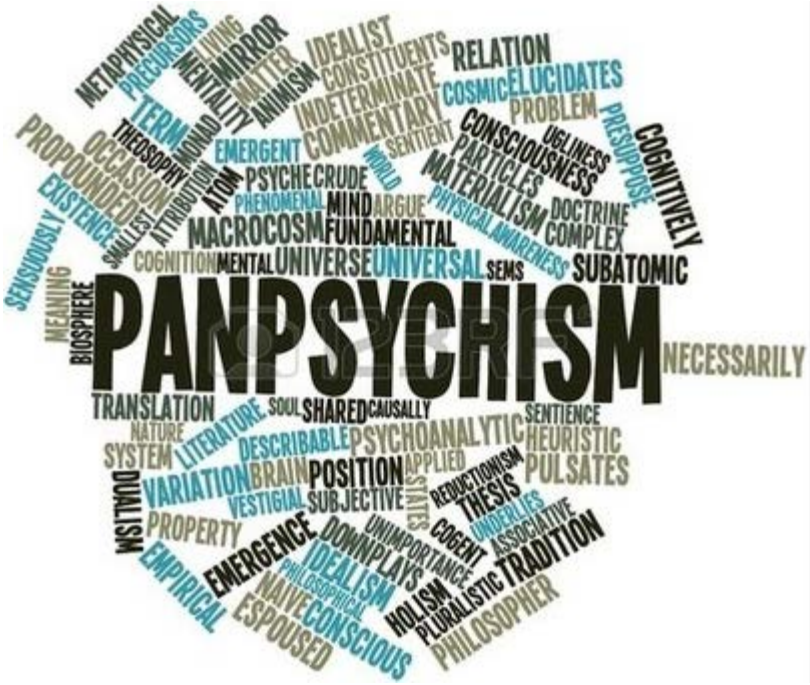

A **panpsychism** word cloud (Q), showing related terms such as: monad, emergent (emergence), metaphysical, consciousness, psyche, materialism, subatomic, physical awareness, theosophy, indeterminate, sentience, holism, existence, among others.

Panpsychist philosophers

Notable panpsychist philosophers include: Arthur Schopenhauer (1788-1860), described as a "pessimistic panpsychist", was said to have influenced Gustav Fechner in his panpsychism, described as an "optimist panpsychis". [5] Others include: Friedrich Schelling, Clifford, Carus, Empedocles, Epicurus, Gilbert, William James, which supposedly grew out of his "neutral monism" (Q) views, Gottfried Leibniz, Carl von Nageli, Josiah Royce (mentor to John Boodin), and the Stoics (see: Stoicism). [1]

Panpsychism | Dialogue

The following is the *circa* 2003 Lee Strobel Q&A dialogue with J.P. Moreland on the seeming untenability of the atheist mind-from-matter position: [2]

> **Moreland**: "What doesn't make sense—and which many atheistic evolutionists are conceding—is the idea of getting a mind to squirt into existence by starting with brute, dead, mindless matter. That's why some of them are trying to get rid of consciousness by saying that it's not real and that we're just computers."
>
> **Strobel**: "Still, some scientists maintain that consciousness is just something that happens as a natural byproduct of our brain's complexity. They believe that once evolution gave us sufficient brain capacity, consciousness inexorably emerges as a biological process."
>
> **Moreland**: "Let me mention four problems with that. First, they are no longer treating matter as atheists and naturalist treat matter—namely, as brute stuff that can be completely described by the laws of chemistry and physics. Now they're attributing spooky, soulish, or mental potentials to matter."
>
> **Strobel**: "What do you mean by 'potentials'?"
>
> **Moreland**: "They're saying that prior to this level of complexity, matter contained the potential for mind to emerge—and at the right moment, guess what happened? These potentials were activated and consciousness was sparked into existence!"
>
> **Strobel**: "What's wrong with that theory?"
>
> **Moreland**: "That's no longer naturalism. That's panpsychism."
>
> **Strobel**: "Pan *what*?"
>
> **Moreland**: "*Panpsychism*. It's the view that matter is not just inert physical stuff, but that it also contains proto-mental states in it. Suddenly, they've abandoned a strict scientific view of matter and adopted a view

that closer to theism than to atheism. Now they're saying that the world began not just with matter, but with stuff that's mental *and* physical at the same time. Yet they can't explain where these pre-emergent mental properties came from in the first place."

(add discussion)

Quotes

The following are related quotes:

"Isms in my opinion are not good. A person should not believe in an ism."

– John Hughes (1986), *Ferris Bueller's Day Off*

"Everything, living or not, is constituted from elements having a nature that is both physical and nonphysical--that is, capable of combining into mental wholes. So this reductive account can also be described as a form of **panpsychism**: all the elements of the physical world are also mental."

—Thomas Nagel (2012), *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature Is Almost Certainly False* (Q) (Q)

*The panpsychist trail, according to Edwards, includes "Thales, Anximenes, Empedocles, several of the Stoics, Plotinus, and Simplicius; numerous Italian and German Renaissance philosophers (including Paracelsus, Girolamo Cardano, Bernardino Telesio, Giordano Bruno, and Tommaso Campanella); G. W. Leibniz, F. W. J. von Schelling, Arthur Schopenhauer, Antonio Rosmini, W. K. Clifford, Harald Høffding, C. B. Renouvier, Eduard von Hartman, and Wilhelm Wundt; the German freethinkers Ernst Haeckel, Wilhelm Bölsche, and Bruno Wille; C. A. Strong, Erich Adickes, Erich Becher, Alfred Fouillée, C. S. Peirce, and F. C. S. Schiller; and, in our own day, A. N. Whitehead, Samuel Alexander, Bernadino Varisco, Paul Haeberlin, Aloys Wenzel, Charles Hartshorne, and the biologists Pierre Teilhard de Chardin, C. H. Waddington, Sewall Wright, and W. E. Agar."

To this list we may add also French philosopher Pierre-Louis Maupertuis (1698–1759), German scientist-philosopher Johann Wolfgang Goethe (1749–1832), German philosopher-psychologist Gustav Theodor Fechner (1801–1887), German Idealist metaphysician Rudolf Hermann Lotze (1817–1881), Russian philosopher Alexey A. Koslov (1831–1901; who actually called his system "Panpsychism"), American psychologist-philosopher William James (1842–1910), American philosopher Josiah Royce (1855–1916), French philosopher Henri Bergson (1859–1941), and contemporary American theologian-philosopher David Ray Griffin, as well as contemporary biologists Bernard Rensch and Charles Birch.

Surprisingly, British philosopher Francis Bacon (1561–1626), who opened the way for empirical-experimental science, expressed the belief that "all bodies whatsoever, though they have no sense . . . yet have perception. . . . And sometimes this perception, in some kind of bodies, is far more subtile [sic] than sense . . . And this perception is sometimes at a distance, as well upon the touch . . . [and] that which in these perceptions appeareth early, in the great effects cometh long after."[24]

A debatable grouping of so-classified "panpsychists", according to Paul Edwards (1967), as cited by Christian de Quincey (2002). [3]

See also

- Panexperientialism

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5. (a) Massaro, Dominic W. (2009). "Book Review: *Nature From Within: Gustav Theodore Fechner and His*

Psychophysical Worldview" (pdf), American Journal of Psychology, 122(3):405-20.
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External links

- Panpsychism – Wikipedia.

θΔics

In religio-mythology, **pantheism**, from the Greek *pan-*, meaning “all, whole”, + *-theism* meaning “god” refers, is the []

Etymology

The term “pantheism” was coined in 1705 by John Toland to describe the “god equals nature” (see: god = nature) views of Benedict Spinoza. [1]

Quotes

The following are related quotes:

> “**Pantheism** is the belief in no other eternal being but the universe.”
>
> — John Toland (1710), “Letter to Gottfried Leibnitz”

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 335-37). HarperOne.

External links

â— Pantheism – Wikipedia.

θΔics

In religio-mythology, **pantheonic adjustment**, synonymous with: "recension" (Budge, 1899), "rescript" (Kuhn, 1944), or "redaction" (Greenberg, 2000), refers to a transition state period reformulation of a given state religion or national religion, wherein, typically, a previous local god or god group (e.g. Ogdoad, Ennead) becomes the new supreme god (or god complex), or, as seen in later periods, god reduction occurs (e.g. synretism), generally done for political reasons, albeit overtly justified via socio-religious purviews.

Overview

In 1965, Govind Ghurye (1893-1983) (O), in his *Religious Consciousness*, in elaboration on what he considers to be the three main religion cosmology "adjustments" of ancient Egypt as follows: [1]

> "**Pantheonic adjustment** is a form of [god family] manipulation to promote political ends, which, in Egypt, occurred thrice: when Ptah, Amen and Aten were declared supreme gods at different periods. Around 3000BC, the deity Ptah was declared the 'supreme one'. He was the presiding deity of the city of Memphis from where King Menes ruled. Ptah displaced the deity Ra of Heliopolis, till then the overlord (see: Heliopolis creation myth, 3100BC). The priests fabricated a suitable mythology to support the claim. A very important document, the Memphite theology (see: Memphis creation myth, 2800BC), was brought out to legitimize Ra as the creation of Ptah. The occasion for this change-over was the unification of southern and northern Egypt. The purpose was political though the socio-religious point was put forth, namely the need to have one god at the apex of the pantheon in a unified nation.
>
> → [see: Hermopolis creation myth, 2150BC]
>
> By about 1971BC, the powerful noble families of the city of Thebes (see: Thebian creation myth, 2000BC), declared their deity Amen as the supreme god. In this case the deity Ra was incorporated with Amen who by 1870BC, during the reign of Senusret III, became Amen-Ra.
>
> In 1372BC, Amenhotep introduced a form of sun worship through his chosen deity Aten. He changed his name to Akhenaten, dropping 'Amen' from Amenhotep and placing Aten in the second part of the name (see: Amarnan creation myth, 1330BC). Aten too fell after a period. The next king Tutankhaten changed his name to Tutankhamen and revived lord Amen. On all these occasions theologians and priests fabricated suitable mythologies connecting other deities in a subordinate relationship to the supreme deity of the moment."

(add)

See also

- Egyptian pantheon
- Greek pantheon
- Supreme god timeline

References

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θΔics

In existographies, **Paolo Sarpi** (1552-1623) (IQ:180|#127) (Cattell 1000:426) (FA:37) (CR:5) was an Italian theologian, free thinker, historian, prelate, scientist, lawyer, and statesman, characterized as the "first philosopher to develop systematic arguments for atheism" (Q), noted for []

Overview

In 1606, Sarpi was employed, in Vienna, as a government theological consultant.

In 1607, Sarpi was excommunicated, supposedly, for publishing descriptions of the universe that left no room for god or anything supernatural, and that "the end of man is to live, just like any other living being". [1] He argued that the human sense of god comes from ignorance and frailty, i.e. that it is about human needs, but that these needs can be transcended. He argued that intelligent people can see past the myths of religion and have moral existences without fear of god or death. [2]

When Sarpi was investigated by the church, he was then believed to have been the "head of an atheistic company" located in Venice; he is said to have reported that there were many atheists in Venice. [2]

Quotes | On

The following are quotes on Sarpi:

> "**Sarpi** is the most deep and general scholar of the world."
>
> — Henry Wotton (c.1610) (Q)

> "A thoughtful historian tells us that, between the middle ages and the nineteenth century, Italy produced three great men. As the first of these, he names Machiavelli, who he says, 'taught the world to understand political despotism and to hate it'; as the second, he names **Sarpi**, who 'taught the world after what manner the holy spirit guides the councils of the church'; and as the third, Galileo , who 'taught the world what dogmatic theology is worth when it can be tested by science'."
>
> — Andrew White (c.1890) (Q)

> "**Sarpi** was one of the two foremost Italian statesmen since the middle ages, the other being Cavour."
>
> — Andrew White (c.1890) (Q)

Quotes | By

The following are quotes by Sarpi:

> "I am a chameleon has to wear a mask like everyone else in Italy."
>
> — Paolo Sarpi (c.1608) (Q)

> "To give us the science of motion, god and nature have joined hands and created the intellect of **Galileo**."
>
> — Paolo Sarpi (c.1620) [3]

References

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(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 296). HarperOne.
2. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 296). HarperOne.
3. Galileo. (1632). *Dialogues Concerning the Two New Sciences* (translators: Henry Crew and Alfonso Salvio) (quote, pg. ix). Macmillan, 1914.

External links

- Paolo Sarpi – Wikipedia.

θΔics

In genius studies, **paper IQ** refers to an IQ that one has printed on a sheet of paper, e.g. an IQ test certificate, conducted either under supervision of a trained psychologist, in school, via a mail-in method (e.g. Mensa Test, Mega Test), online, among other methods; a paper IQ, more often than not, however, if claimed to be in the genius range (IQ:140+), tends to be an off or over approximation; something more "show" than "tell" (compare: real IQ; mislabeled geniuses and IQ tests).

Sketch of a kid with his "paper IQ", possibly derived from some test, which he seems to be handing to a person in authority.

Overview

In 1961, Isaac Asimov, as retrospectively discussed in his *I, Asimov: a Memoir* (c.1990) (Ñº)(Ñº), was asked, by a friend, to join Mensa; firstly, he stated his reservations about this as follows:

> "I have been a lifelong beneficiary of intelligence tests, I don't think much of them. I believe they test only one facet of intelligence—the ability to answer the kind of questions other people with the same facet of intelligence are likely to ask. My IQ rating has always been out of sight, but I am perfectly aware that in many respects I am remarkably stupid. Second, it seemed to me to be beneath my dignity to take an intelligence test. Surely, my life and work were ample testimony to my intelligence (such as it was)."

Then he discussed his joining experience:

> "I took the test, scored high, and became a member of Mensa. It was not on the whole, a happy experience. I met a number of wonderful Mensans, but there were other Mensans who were brain-proud and aggressive about their IQs, who, one got the impression, would like, on being introduced, to be able to say, 'I'm Joe Doakes, and my IQ is 172,' or, perhaps, have the figure tattooed on their forehead. They were, as I had been in my youth, forcing their intelligence on unwilling victims. In general, too, they felt underappreciated and undersuccessful. As a result, they had soured on the universe and tended to be disagreeable.
>
> What's more, they were constantly jousting with each other, testing their intelligence on each other, and that sort of thing becomes wearing after awhile. Furthermore, I became uncomfortably aware that Mensans, however high their **paper IQ** might be, were likely to be as irrational as anyone else. Many of them believed themselves to be part of a 'superior' group that ought to rule the world, and despised non-Mensans as inferiors. Naturally, they tended to be right-wing conservatives, and I generally feel terribly out of sympathy with such views.
>
> Worse yet, there were groups among them, I found out eventually, who accepted astrology and many other pseudoscientific beliefs, and who formed 'SIGs' ('special interest groups') devoted to different varieties of intellectual trash. Where was the credit of being associated with that sort of thing, even tangentially?... I stayed on in Mensa for years, getting more and more tired of it. ... Eventually, after both Marvin and Margot [two of the New York Mensans he acknowledged as "delightful and intelligent"] had died, I did resign."

Asimov was a bit of an open speaker about his perceived level of intelligence:

> "Those people who think they **know everything** are a great annoyance to those of us who do."

— Isaac Asimov (c.1960) [37]

> “Marvin Minsky [1927-2016] and Carl Sagan [1934-1996] are two men I conceded were more intelligent than I was.”
>
> — Isaac Asimov (1980), *In Joy Still Felt: Autobiography* [16]

In 1976, Asimov, in the non-fiction work *The Planet That Wasn't*, claimed to have an IQ of 300. He got it that high by taking one of the instant IQ-tests found in a book, but taking 15 minutes instead of the 30 that was recommended. The score calculation provided an IQ of 150, and Isaac doubled the score to account for half the time. He then explained why he doesn't have much faith in these IQ tests (the most important claim being that they penalize for slowness but give no bonus for speed). (Ñº)

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θΔics

In engines, **Papin digester** (TR:22) or Bone digester, was a type of pressure cooker the liquefied bones and other hard materials via high heat and pressure conditions.

Overview

In 1679, French engineer Denis Papin invented what he called a "digester or engine for softning bones", aka "bone digester", or Papin's digester as it later came to be called. [1] The following is a 1681 version of the details of the digester: (Ñº)

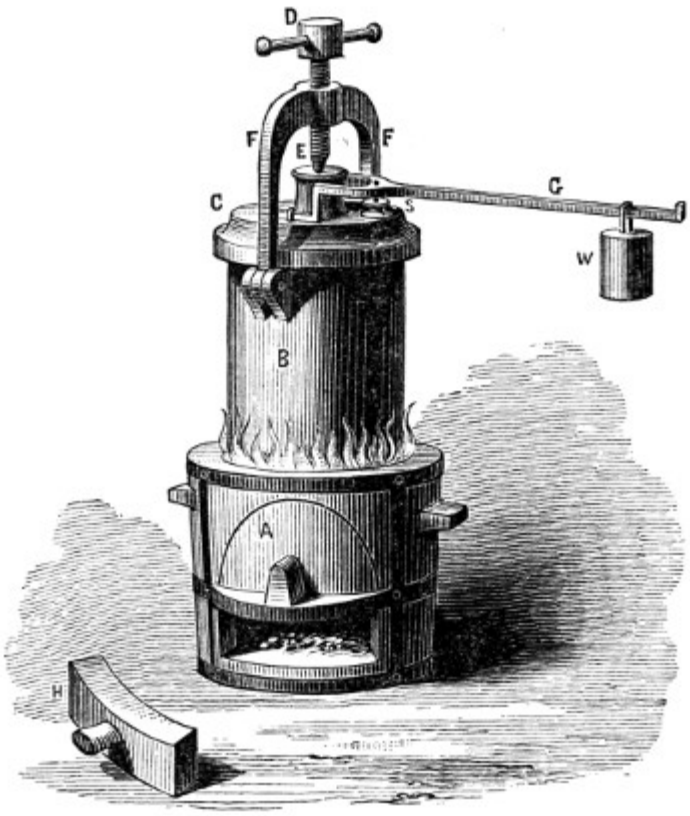

An 1680 version of the **Papin's digester**, built by Denis Papin, from Robert Thurston's *A History of the Growth of the Steam-Engine* (1878). [3]

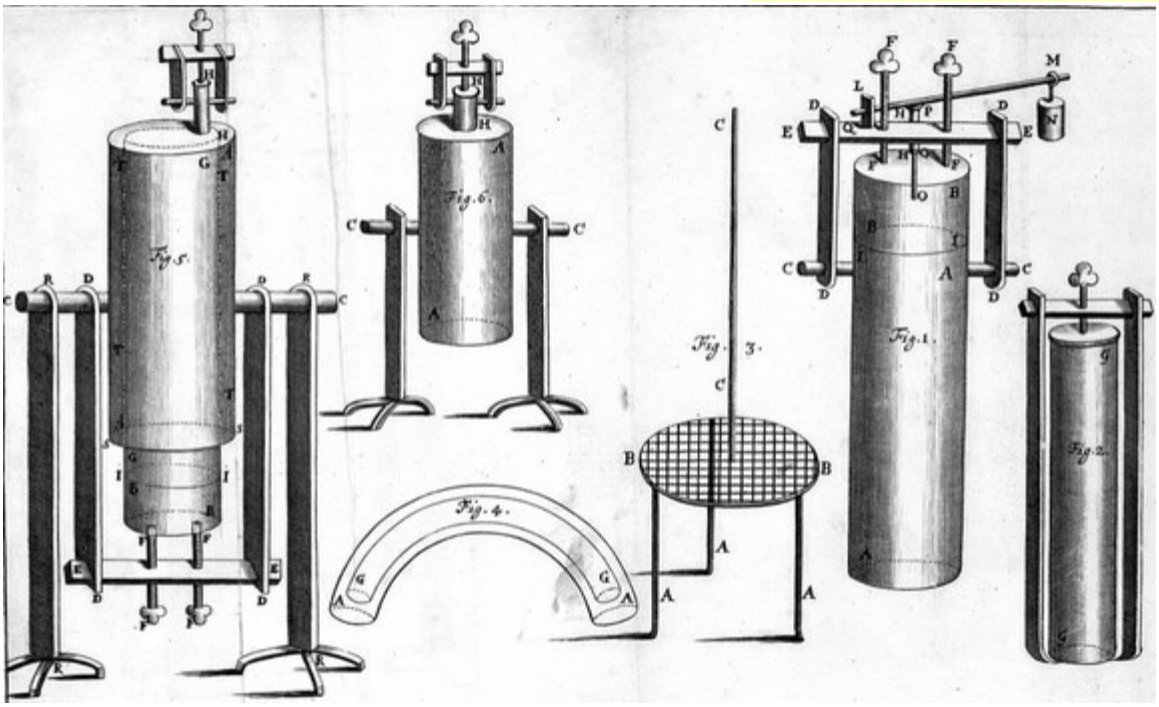

Early versions resulted in explosion, owing to the extreme pressures. Late version fixed this problem by adding on steam release valve.

It is said that by watching the steam release valve bob up and down that Papin conceived of the design of the steam engine, the Papin engine, as outlined in his 1690 memoir "A New Method to Obtain Very Great Motive Powers at Small

Cost." [2]

Quotes

The following are related quotes:

> "I went this afternoon with several of the Royal Society to a supper which was all dressed, both fish and flesh, in Monsieur **Papin's digestors**, by which the hardest bones of beef itself, and mutton, were made as soft as cheese."
>
> — John Evelyn (1682), diary note, Apr 12 [4]

See also

â— Timeline of engine development

References

1. Papin, Denis. (1681). *A New Digester or Engine for Softning Bones: Containing the Description of Its Make and Use in These Particulars : Viz, Cookery, Voyages at Sea, Confectionary, Making of Drinks, Chymistry, and Dying. With an Account of the Price a Good Big Engine Will Cost, and of the Profit it Will Afford*. Mallinckrodt Chemical Works.
2. (a) Papin, Denis. (1690). "A New Way to Obtain Very Great Motive Powers at Small Cost" (Nova Methodus ad Vires Motrices Validissimas levi Pretio Comparandas). *Acta Eruditorum*, anno, Aug., pgs. 410-14.
(b) Muirhead, James. (1859). *The Life of James Watt*, (English translation: Ch. XI, Denys Pain: His memoir of 1690, Section: A New Way to Obtain Very Great Motive Powers at Small Cost", pgs. 131-42). London: John Murray.
3. Thurston, Robert H. (1878). *A History of the Growth of the Steam-Engine* (Ñº). D. Appleton and Co., 1886.
4. Anon. (2012). *Engineers: From the Great Pyramids to the Pioneers of Space Travel* (§: Denis Papin, pgs. 106-107). DK Publishing.

External links

â— Steam digester – Wikipedia.

θΔics

In engines, **Papin engine** was a steam engine, conceived by French chemist Denis Papin, in his 1690 "A New Method to Obtain Very Great Motive Powers at Small Cost", in which water contained inside of a sealed piston and cylinder is alternatively made to expand, via external fire, and made to contract via external cool water contact, such to work the piston rod up and down. [1]

Modern Papin engine depiction

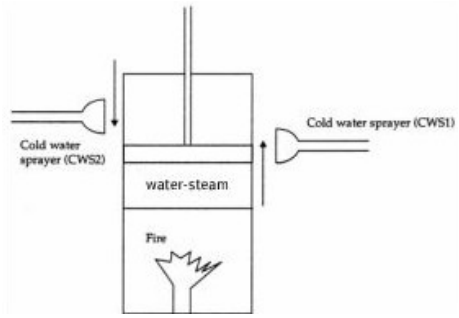

Left: Original 1690 **Papin engine** diagram. [1] Right: modern drawing of 1712 **Papin engine** diagram. [2]

Overview

In 1671, Denis Papin became an assistant curator of experiments under Christiaan Huygens, at the Royal Academy of Sciences in Paris; by 10 Feb 1673, Huygens described and drew a sketch of his new gunpowder engine for "obtaining a new motive power by means of gunpowder and the pressure of the air", as shown below (left) in Papin 1688 engine (section). [4] The term “Papin engine”, supposedly, had come into use by 1712. [2]

1685 | Engine

In 1685, Denis Papin, proposed a machine that would use the power of water from a river, as diagrammed below, from his 1688 published description, that would turn a water wheel, which would turn a crank arm, that would work two suction pumps, that were connected to more suction like piston and cylinder devices below in the mine, which would turn a wheel, so to lift weight: [3]

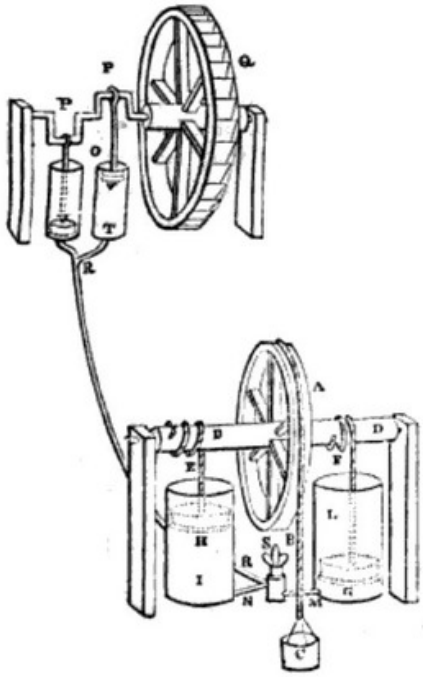

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1688 | Engine

In 1687 (Farey) or 1688, Papin, then age 41, and occupying a chair in Marburg, building on his previous gunpowder engine design work (see: Huygens engine), below left, done under the direction of Christiaan Huygens (1673), built an upgraded gunpowder engine, shown below right, where C is the attachment of the piston to the cord, D is the ventilator for the gases, F the edge of ventilator, HP the gunpowder holder, which fits to tube GG at the base of the cylinder, so that successive charges could be introduced, MNO is a safety valve lever weighted at N, which is a device he invented for his Papin digester (1680), LL is cord connected to a weight, and TT are pulleys: [4]

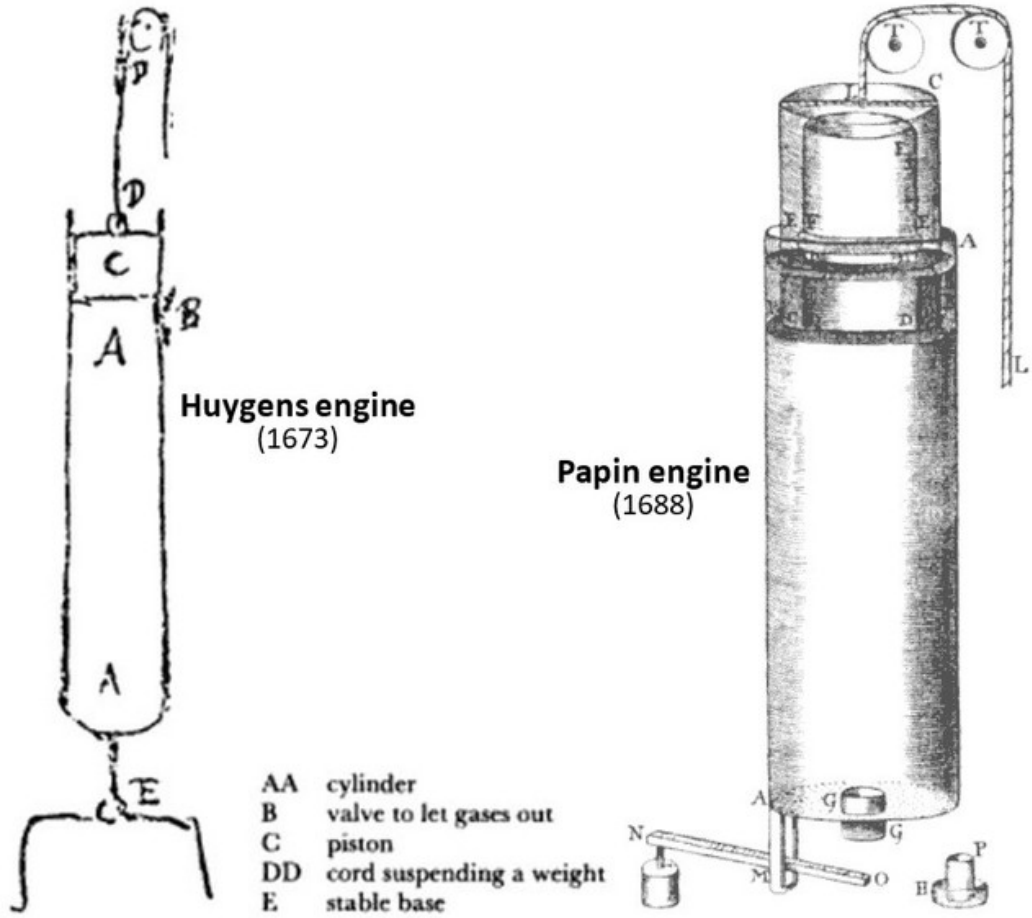

The chief difference in this new design, was that the piston was fitted with a “spring valve” that was closed by atmospheric pressure when the gases left, after which it was allows to make a powerful downstroke. One problem remained, namely: that a fifth or sixth part of the air and gases remained, leaving an imperfect vacuum (less powerful), similar to the issues Huygens faced with his engine.

1690 | Engine

In 1690, Papin, as described in his "A New Method to Obtain Very Great Motive Powers at Small Cost", after letting this problem ruminate in his mind, two years later, he arrived at the solution of using water, heated and cooled, instead of gunpowder, ignited, to make a working engine able to lift things via heat:

> “Since it is a property of water that a small quantity of it, turned into vapour by heat, has an elastic force like that of air, but upon cold supervening is again resolved into water, so that no trace of the said elastic force remains, I readily concluded that machines could be constructed wherein water, by the help of no very intense heat, and at little cost, could produce that perfect vacuum which could by no means be obtained by the aid of gunpowder.”
>
> — Denis Papin (1690), "A New Method to Obtain Very Great Motive Powers at Small Cost”

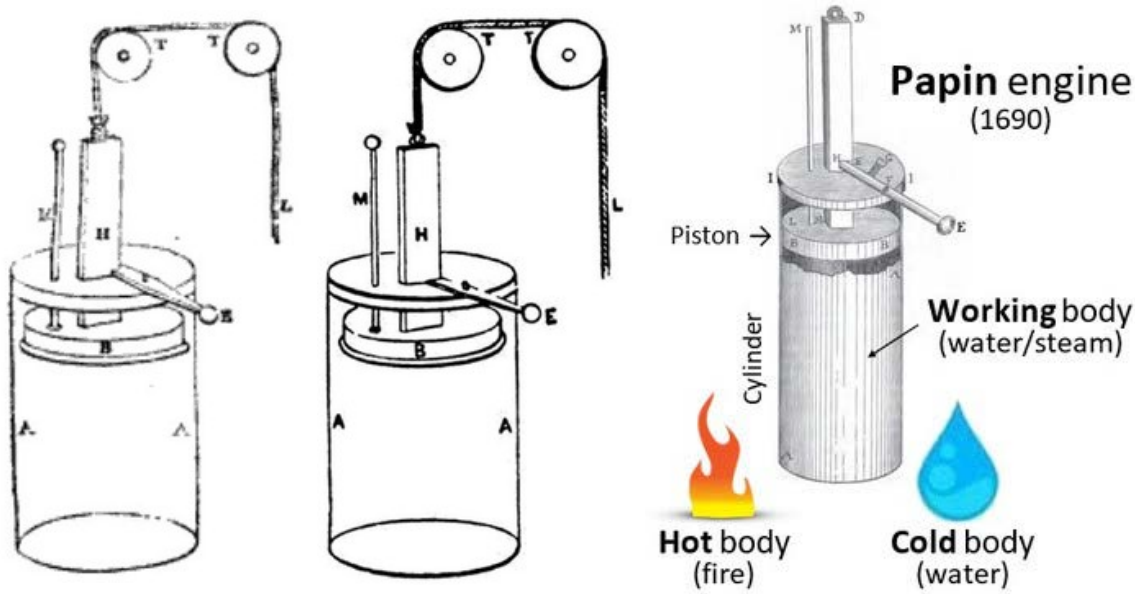

Left: an 1690 sketch of the **Papin engine**, according to which water is placed in the cylinder, the piston is then heated from the outside, thus turning the water into steam, which forces the piston up, which is then latched into position, by notch E; the piston is then cooled, which makes a powerful vacuum inside, such that when the latch is turned, the downward force of the piston can work the rope and pulley, so to lift 60 pounds, using a 2.5-inch diameter cylinder. [3] Right: an annotated version using his 1690 journal publication illustration of his new steam engine.

Here, Papin proposed the a new design, as shown adjacent, for an engine that would be operated by alternate heating and cooling of a piston and cylinder that was filled with water; this is summarized as follows:

> "In the Acts for 1690, p. 410, Papin published an addition to his former paper. He says, that finding it impossible to make a complete vacuum in the cylinder by means of gunpowder, he had endeavored to obtain his object by means of water, which, he says, 'has the property when changed into vapor to spring like the air' and afterwards to recondense itself so well by cold, that there remains "no appearance of this force or spring." The machine which he proposed is a cylinder, AA, made of thin metal, and fitted with a piston B, which can slide freely up and down in the cylinder. A small quantity of water is put into the bottom of this cylinder, and the piston B put down so as to touch the water, the air being expelled through a hole in the piston, which is afterwards plugged up by a plug M. A fire is applied beneath the bottom of the cylinder to heat the water within, and make it boil, which will soon be done, the bottom being made of very thin metal. **The water is then changed into vapor, which exerts so strong a pressure beneath the piston, that it surmounts the pressure of the atmosphere, and pushes the piston upwards to the top of the cylinder, and then a latch E falls into a notch in the stem H of the piston, to prevent it from going down again**. The fire must now be taken away from beneath the cylinder, and the vapors in this thin cylinder soon recondense themselves into water by cold, and leave the cylinder entirely empty of air. In this state, the machine is ready to exert its force, for by only releasing the latch E, the piston will be pressed down into the cylinder by the weight of the atmosphere which presses upon its upper surface, whilst there is O no air beneath it to resist its descent, and a rope L being fastened to the stem of the piston H, may be conducted over pulleys TT, and applied to raise weights. The principle of the atmospheric steam-engine is suggested in this rude machine, which was afterwards perfected ; the author states that he tried the experiment with a cylinder 2.5 inches diameter, which he found capable of raising 60 pounds (that is = 12.25 pounds per square inch) and that it could be made to repeat its action once a minute; from this data he calculated, that a cylinder of little more than two feet diameter, and four feet in height, would have sufficient force to raise a weight of 8000 pounds every minute to a height of four feet; this is 32,000 pounds raised one foot per minute, which is nearly a modern horse-power, or equal to the force of 8.5 men. Papin states his invention to be applicable to draw water from mines, to throw bombs, and to row vessels against wind and tide."
>
> — John Farey (1827), *A Treatise on the Steam Engine* (pgs. 97-98) [3]

(add)

Savery | Newcomen | Watt

The following shows how "Papin engine" (1688/1690) inspired or rather became the design template behind the: Savery engine [Miner's friend] (1698), Newcomen engine (1712), and Watt engine (1765-96): [5]

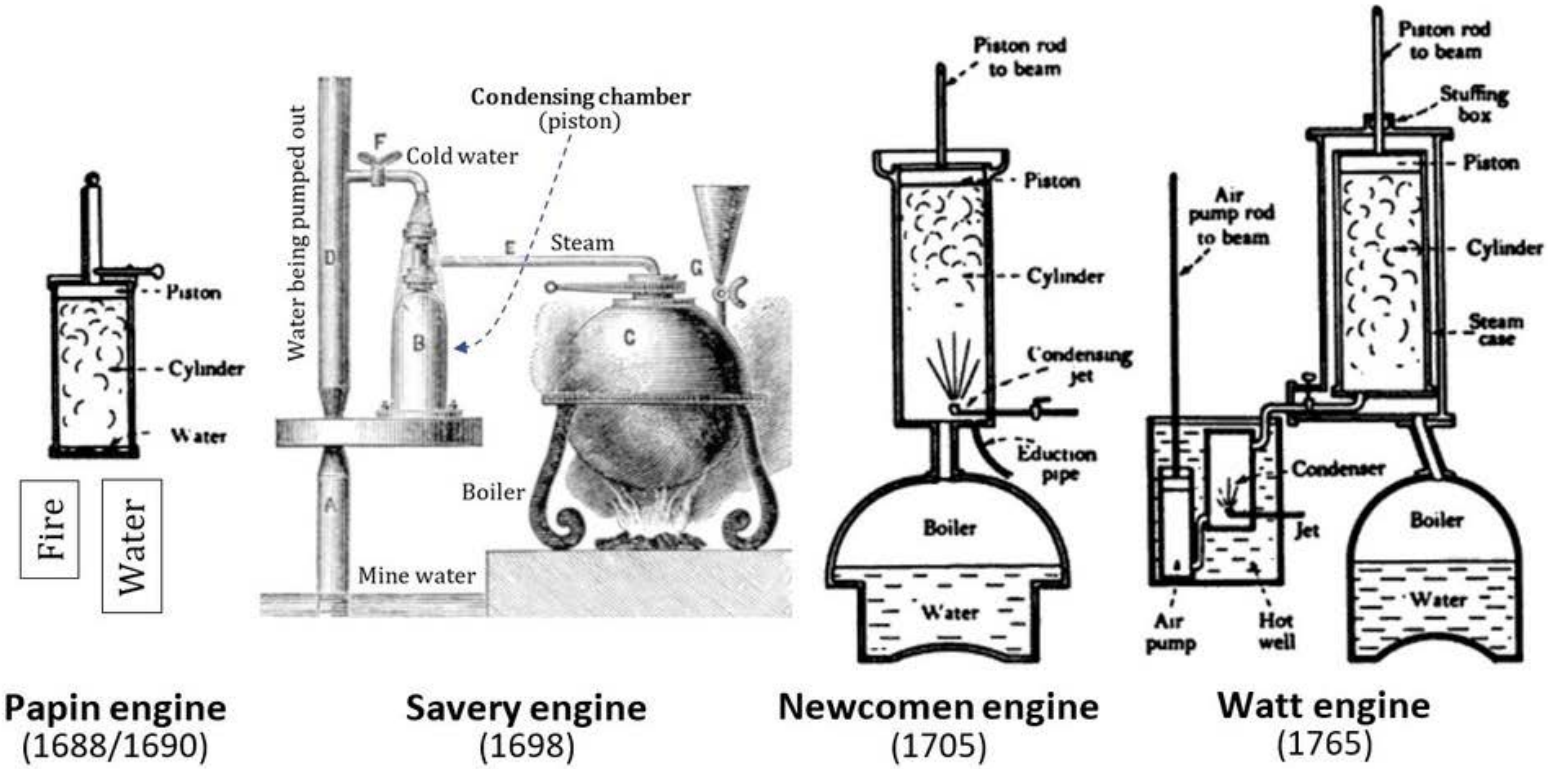

Now, the actual historical details of how Papin's 1688 gunpowder engine and 1690 steam engine designs influenced the minds of Thomas Savery (1698) and his engine (Savery engine) and Thomas Newcomen and his engine (Newcomen engine) becomes murky, if not an semi-unsolved problem in the history of the steam engine.

Firstly, that all of Papin's engine designs were openly published for others to read about and work on, such as the German periodical *Acts of Erudite*

(1688 and 1690); in the form of a book in French entitled *Collection of Various Pieces Touching Some New Machines*; and most importantly that summarizes of his engine models were read to the Royal Society in 1686 and 1687, which both Savery and Newcomen were connected with. Moreover, Papin, in 1676 to 1679, was an assistant to Robert Hooke, the curator of experiments of the Royal Society, and that in 1682, some of the Royal Society's dinners were being cooked in Papin's digestor. We also know that Hooke was in communication with Thomas Newcomen and had told him about Papin's engine designs. We also know that Savery and Newcomen resided 15-miles from each other.

Now, as to Savery, details are wanting, but we do know that in 1698 he obtained a patent for his new engine, albeit with description or technical details, and on 14 Jun 1699, Savery demonstrated a scale model of his new steam engine to the Royal Society.

The following is one conjecture on the Papin-Savery connection, namely that Savery learned of Papin in the years when 1686 to 1690, during which time Papin's theoretical engine designs came under the attack of Robert Hooke, who in 1675 had had published a cypher-coded secret description his own vacuum-based heat engine theory, which caused Papin to retreat for four years, and that Savery observed and learned from this attack:

> "Thomas Savery filed the first patent in 1698 for a steam engine that allowed water to be raised by the driving force of fire, the first copy of which was built the same year and presented in 1699 to the Royal Society of London and the King. This patent was quite particular in that it provided that any fire machine that was manufactured or installed in England would be confiscated and placed under the control of Thomas Savery. Moreover, this patent imposed secrecy on Savery's machine, and it was not until 1704 that a spy copied this description in Hanover and transmitted it to Leibniz. Thomas Savery was a former mine worker. As a marine captain and engineer, **he became aware of the work of Denis Papin, who was Robert Hooke's assistant in 1679**. The latter had presented a series of criticisms of Denis Papin's work at a meeting of the Royal Society of London, widely publicized criticisms that pushed Papin to abandon his research until 1694. For Thomas Savery, these comments, the reversal of the members of the Learned Societies, his desire to quickly file a patent and the pressures of the English mining managers, not to mention the time needed to create a new machine that would not have the defects reported in Papin's, prompted him to choose an intermediate strategy, a strategy that consisted of developing a revised and less complex steam engine (without cylinder or piston) but specialized for pumping water from the mines."
>
> — Michel Vigezzi (2019), *World Industrialization: Shared Inventions, Competitive Innovations, and Social Dynamics* (pg. #)

In sum, although exact historical verification is wanting, baring Vigezzi's conjecture (above), it is HIGHLY-unlikely that Savery was ignorant of Papin in 1698 when he applied for his patient, given the nearly to exact overlap of his design and Papin's design, both having a hot body, cold body, and vacuum chamber.

1707 | Engine

In 1705, Gottfried Leibnitz sent Papin a description of the Savery engine, which promoted Papin to suggest improvements to Savery's design, which resulted in the following 1707 steam engine model: [6]

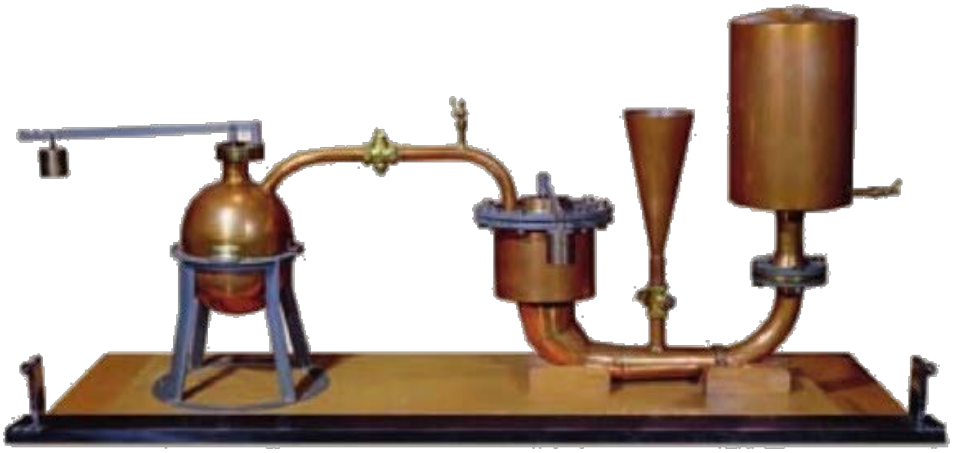

(add)

Quotes

The following are related quotes:

> "In 1688, Papin published in the *Acts of Erudite*, a method of prolonging the motion of water-wheels to a great distance, by drawing air through pipes; also a project for a new use of gunpowder. **Papers on both these subjects had been read to the Royal Society in 1686 and 1687**. In the *Acts of Erudite* for 1690, is a further addition to his former paper on the use of gunpowder. In this he proposes to use steam, and here is the origin of the steam-engine. These three papers, which are in Latin, contain the sum of Papin's inventions, and are

certainly of great merit. He afterwards republished them in French, with some additions, in a small book, entitled: *Collection of Various Pieces Touching Some New Machines* (*Recueil de diverse Pièces touchant quelques nouvelles Machines*), par D. Papin, Cassel, 1695." It is an interesting publication, and does the author great credit."

— John Farey (1827), *A Treatise on the Steam Engine* [3]

"Papin's **project of 1687**, for using gunpowder, is of no real utility: indeed, he was sensible that he had not succeeded, and **said he published it only to excite the learned of other countries to perfect it. (See the *Acta Eruditorem* for 1688, p. 497.)** He proposed to employ a cylinder with a piston fitted into it, and to the rod of this piston the weights which were to be raised were applied by a rope conducted over pulleys, and they were to be lifted by the pressure of the atmospheric air upon the piston, when the air was exhausted from the cylinder. Thus far, he followed Otto Guericke; but instead of exhausting the cylinder by an air pump, Papin proposed to drive out the air by firing off a small quantity of gunpowder in the inside of the cylinder. The piston had a large aperture in it, covered by a valve opening upwards; and he thought that the sudden blast of flame produced by the explosion of the gunpowder would lift up the valve, and drive out the air at the aperture; but when the flame ceased, the valve would fall, and prevent the return of the air into the cylinder, so as to leave it exhausted, and then the pressure of the atmosphere on the upper surface of the piston not being balanced by any air beneath, would press the piston down with great force. Papin speaks of two models of this machine which he tried; one of them five inches diameter and 16, inches high; but he says he could never succeed in expelling the whole of the air from the inside of the cylinder: about one-fifth always remained, and that fifth, as he says, reduced the force to one-half of what it would have been if he could have expelled the whole of the air."

— John Farey (1827), *A Treatise on the Steam Engine* [3]

"I find it almost impossible to believe that Newcomen never knew of Papin's steam engine cylinder, at least by hearsay. Papin published sever other papers (3,4,5) and maybe there was someone at Dartmouth, one of the gentry perhaps, who could read French, if not Latin, and gave Newcomen access to Papin's work."

— Joseph Needham (1987), *Science and Civilization in China* (pg. 559)

"The similarities between Newcomen's steam engine design and Papin's first piston-and-cylinder engine also suggest that Newcomen might have seen Papin's articles published by the Royal Society."

— Anon (2012), *Engineers* [6]

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2. Datta, N.C. (2005). *The Story of Chemistry* (pg. 92). Orient Black Swan.
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4. (a) Papin, Denis. (1688). "On a New Application of Gunpowder" ("De Novo Pulveris Pyri Usu") (pg. 497), *Acta Eruditorum* (*Acts of Erudite*) (Ñº) (years). Mencke.
(b) Gerland, E. and Traumuller, F. (1899). *History of Physical Experimentation* (*Geschichte der Physikalischen Experimentierkunst*) (figure 219, pg. 227). Leipzig.
(c) Needham, Joseph. (1987). *Science and Civilization in China: Volume 5, Chemistry and Chemical Technology, Part 7, Military Technology: The Gunpowder Epic* (§§: Gunpowder as the Fourth Force: its Role in the History of Steam Engines, pgs. 544-67; Huygens and Papin, pgs. 556-61; Papin engine (1688), figure 229, pg. 559). Cambridge.
5. (a) Dickinson, Henry W. (1939). *A Short History of the Steam Engine* (pg. 67). Cambridge University Press.
(b) Needham, Joseph. (1987). *Science and Civilization in China: Volume 5, Chemistry and Chemical Technology, Part 7, Military Technology: The Gunpowder Epic* (§§: Gunpowder as the Fourth Force: its Role in the History of Steam Engines, pgs. 544-67; image, pg. 561). Cambridge.
6. Anon. (2012). *Engineers: From the Great Pyramids to the Pioneers of Space Travel* (§: Denis Papin, pgs. 106-107). DK Publishing.

θΔics

In existographies, **Paracelsus** (1493-1541) (IQ:175|#235) (Cattell 1000:553) [RGM:255|1,500+] (Murray 4000:5|M) (Gottlieb 1000:108) (GCE:25) [CR:72] was a Swiss physician-chemist noted for his early formulations of chemical affinity (Geoffroy's first law of affinity) and for his 1524 combination of Aristotle's circa 350 BC four element theory with Geber's circa 790 three principles. [1]

Goethe | Faust

It is know that Goethe, by age 18, had already begun studying Paracelsus (see: Goethe and chemistry). Knowledge of God, for Paracelsus, depended upon knowledge of nature. [7] This Paracelsian logic, or equivalently Spinozian-like logic, would, naturally enough, have attracted Goethe.

> "The beginning of wisdom is the beginning of supernatural power."
>
> — Paracelsus (c.1530) [6]

Moreover, a number of scholars, e.g. Andrew Weeks (Q), surmise that Goethe drew on Paracelsus as a model for his character Faust, and or that overtime many of the historical attributes of Paracelsus attached themselves to the legend and persona of original Dr. Johann Faust. [7]

Human

Paracelsus, being a devout Christian, albeit who aimed at a physical science reinterpretation, like an early Pierre Teilhard so to speak, held the following views about what constitutes a person: [6]

> "Besides the visible body, man has an invisible one. The former comes from the Limbus, the latter is made from the breath of God. As a breath is like nothing in our estimation, likewise this spiritual body is like nothing to our external senses. This invisible body is the one which is spoke of as constituting our corporeal form on the day of the resurrection."
>
> "Man has two spirits, a divine and a terrestrial spirit. The former is from the breath of God; the latter from the elements of the air and the fire. He ought to live according to the life of the divine spirit and not according to that of the animal."

Here we see Paracelsus employing, in unwritten citation, the clay creation myth model of humans.

Paracelsus also stated his view that he considered Moses to have been a physicist and the Hebrews but ignorant people.

Gas | Coining

The etymology of the word "gas" stems from Paracelsus' used of the word *khaos*, in the occult sense of "proper elements of spirits" or "ultra-rarified water". [4]

Life | Fire

On the topic of life, Paracelsus equated fire and life, in the logic that fire is life, and that whatever secrets fire truly bears the seed of life. [2]

Sulphur | Terra Pinguis → Phlogiston → Caloric → Entropy

In 1524, Paracelsus adopted Aristotle's four element theory, but reasoned that they appeared in bodies as Geber's three principles. Paracelsus saw these principles as fundamental, and justified them by recourse to the description of how wood burns in fire. Mercury included the cohesive principle, so that when it left in smoke the wood fell apart. Smoke

represented the volatility (the mercury principle), the heat-giving flames represented flammability (sulphur), and the remnant ash represented solidity (salt). [3]

In 1669, German physician and chemist Johann Becher updated Paracelsus' sulphur model of how things burn with a *terra pinguis* model of combustion, wherein terra pinguis was considered as the fatty, oily material substance of bodies that gives things the property of combustion.

In 1703, German chemist and physician Georg Stahl, one of Becher's students, updated the terra pinguis model of with a phlogiston model of combustion. The deficiencies of this theory, as shown by experiment in later decades, led French chemist Antoine Lavoisier in the 1780s to develop the caloric theory of combustion. The deficiencies of this theory led German physicist Rudolf Clausius in the 1850s to develop an entropy model replacement for caloric and heat, which in turn gave birth to the science of thermodynamics (1865). [1]

Quotes | On

The following are quotes about Paracelsus:

> "The writings of **Paracelsus** are especially distinguished by the short and concise manner in which his thoughts are expressed. In this regard they may be compared to some of the writings of Thales, Heraclitus, Pythagoras, Anaxagoras, and Hippocrates. There is no ambiguity in his expressions, and if we follow the roads which he indicated, progressing at the same time along the path of physical science, we shall find the richest of treasures buried at the places that he pointed out with his magic wand."
>
> — Franz Hartmann (1896), *The Life and the Doctrines of Paracelsus*

Quotes | By

The following are noted quotes:

> "He who knows nothing, loves nothing. He who can do nothing understands nothing. He who understands nothing is worthless. But he who understands also love, notices, sees. The more knowledge is inherent in a thing, the greater the love. Anyone who imagines that all fruit ripen at the same time as the strawberries knows nothing about grapes."
>
> — Paracelsus (c.1530), quoted by Erich Fromm [5]

See also

- Entropy formulations

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External links

● Paracelsus – Wikipedia.

θΔics

In science, **paradigm change** refers to a jump, shift, or transition from one ‘normal science’, or paradigm—defined as an achievement unprecedented to attract an enduring group of adherents away from competing modes of scientific activity while at the same time being simultaneously open-ended to leave all sorts of problems for the refined group of practitioners to solve—to a new paradigm, which thus becomes the new ‘normal science’, the former relegated to the historical category of ‘old science’. [1]

American physicist-historian Thomas Kuhn gives the transition in cosmology from a Ptolemaic system (earth-centric system) based cosmology (168AD), the old "normal science" paradigm, to a Copernican system (sun-centric system) based cosmology (1543), the new "normal science" paradigm, as an example of a "classic" **paradigm shift**.

Overview

In 1962, Thomas Kuhn, an American physicist-historian, in his *The Structure of Scientific Revolutions*, introduced the concept of "paradigm change"; the following is an example:

> “Almost always the men who achieve these fundamental inventions of a new paradigm have been either very young or very new to the field whose **paradigm they change**.”
>
> — Thomas Kuhn (1962), *The Structure of Scientific Revolutions* (pg. 89); cited by Herman Daly (1980) in “The Economic Thought of Frederick Soddy” (Ñº)

The transitions between two paradigms, according to Kuhn, are what are known as scientific revolutions.

Heliocentric | Paradigm change

The adjacent diagram shows the paradigm change brought about the the replacement of the Ptolemaic system with the Copernican system.

Hmolscience | Paradigm change

See also: Goethean revolution

In science, the recent 21st century hmolscience shift in thinking about viewing humans as "biological" entities governed by blind random chance "evolution" whose mandate is to pass on "DNA", i.e. the old ‘normal science’ paradigm, to that of humans viewed as "chnopsological" heat-driven "animate" molecules (human molecules), or chemical structures, governed by the "transformation" laws and mechanisms of modern chemical thermodynamics, has, in the view of some, come to be seen as the beginnings of a paradigm change, shift, or jump in ways about viewing human existence. The following example quotes outline this newly-forming paradigm shift view:

> “Thims' brilliant book [*Human Chemistry*] symbolizes the beginning of a **new era (epoch)** in human history.”
>
> — Georgi Gladyshev (2006), Russian physical chemist [2]

> “The chapters [*Human Chemistry*] are wonderfully written. I have a feeling it will be [Thims] who will get the public’s attention about the **fundamental change** in thinking in science.”

— Jing Chen (2006), Chinese-born Canadian mathematician and economist [2]

"One of the most interesting topics [human molecule] I have ever had the pleasure to read. Going through it a second time, and looking forward to the third. [*The Human Molecule*] covers the most **fundamental change** in human knowledge since Charles Darwin's *On the Origin of Species* [1859], by presenting a theory that we are fundamentally molecules, and that the question of life itself is a fundamentally flawed one. Especially important is the carefully laid out historical narrative of how Thims came to his theory of the human as a molecule. Whether you ultimately agree with this work or not, it represents a **paradigm shift** in viewing our place in the world."

— Jeff Tuhtan (2011), American civil engineer and ecological thermodynamicist [3]

"[Human

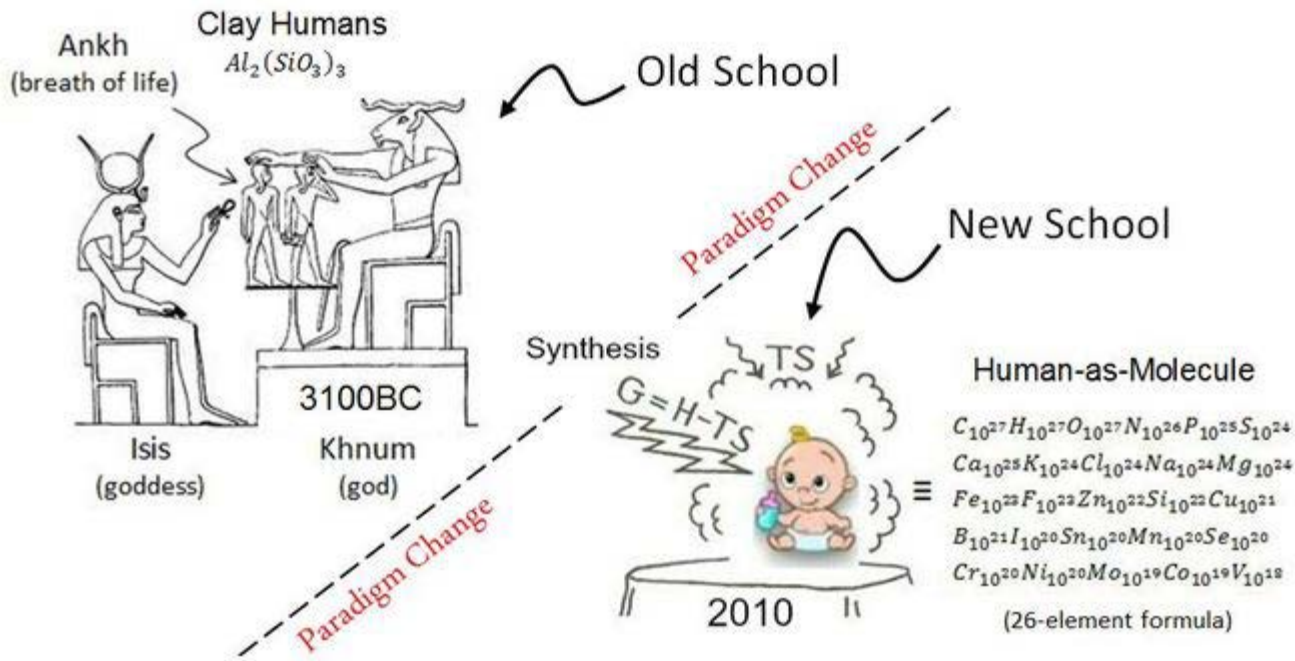

An more recent **paradigm change**, that of the old normal science Egyptian model of humans molded into shape from the clay of the earth and given the breath of life by a God (or gods) to that of the new coming to be seen as normal science model (hmolscience) of humans "synthesized" by the universe and given "animation" and or reactivity by the "powers" of the known forces of the universe as explained by the equations of thermodynamics.

thermodynamics] is a branch of science that attempts to predict the behavior of people via chemical and thermodynamical equations. It is an interesting philosophy, a **change of paradigm**, perhaps even leaving having a broader explanation for human behavior than Darwinian evolution. Human thermodynamics can also be useful as a new framework for the origin of life. Libb Thims, for instance, proposed an online that the idea of Darwin's [IQ=175] 'dark pond' which suddenly sprang to 'life', is not a very coherent one [defunct theory of life], and that it would be much more creditable and parsimonious to have as a rule that molecules bond and form ever more complex beings. Libb Thims also proposed a 'human molecule' where people are attracted to each other by chemical bonds [human chemical bond]. All this I believe to be a reasonable explanation: even if Darwin's theory is still correct, they approach of thermodynamics and chemistry is a much more simple, and at the same time broader view. If the concept of biology is somehow redundant, then we must study it by means of chemistry and physics."

— David Bossens (2012), "Reflections: Criticisms of Science" [4]

See also

â— Goethean revolution

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External links

â— Paradigm shift – Wikipedia.

θΔics

In science, **paradox** (TR=171), from the Greek *para-* 'contrary to' + *doxa* 'opinion', is a proposition going against accepted ideas, or whose logical consequences generate a contradiction; a statement seemingly absurd yet really true. [1]

Quotes

The following are relevant quotes:

> "The thinker without **paradox** is like the lover without passion."
>
> — Soren Kierkegaard (c.1830), Publication

> "As the circle of science grows larger, it touches **paradox** at more places."
>
> — Friedrich Nietzsche (c.1880) [5]

> "Such a principle [relativity] resulted from a **paradox** upon which I had already hit at the age of sixteen: If I pursue a beam of light with a velocity c (velocity of light in a vacuum), I should observe such a beam of light … at rest. However, there seems to be no such thing, whether on the basis of experience or according to Maxwell's equations."
>
> — Albert Einstein (c.1930), retrospect reflection on relativity theory [3]

> "How wonderful that we have met with **paradox**. Now we have some hope of making progress."
>
> — Niels Bohr (c.1930), stated, supposedly, during a debate about quantum mechanics [4]

> "The solution to this **paradox** is that an organism inherits rules that spell out the progression. The rules are, or are like, time-based differential equations which have the ability to encode complex sequences with high efficiency. Thus on hast to regard development as an integration through space and time, the genome providing the equivalent of the differential equations."
>
> — Paul Green (c.1990) (Q) [2]

See also

- A Paradoxical Ode
- Beauty-brains paradox | Beckhap's law
- Bridgman paradox
- Drive-thru paradox
- Equatorial paradox | see: Philip Parker
- Fermi's paradox | see: William Sidis
- Loschmidt's paradox
- Philosopher's paradox
- Szilard's paradox
- Zermelo's paradox

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External links

● Paradox – Wikipedia.

θΔics

In physics, **parallelogram of forces** is the resolution of the forces, e.g. gravitational force and force normal, acting on a body into its component forces, e.g. force in the direction of motion, the diagram of which makes a parallelogram.

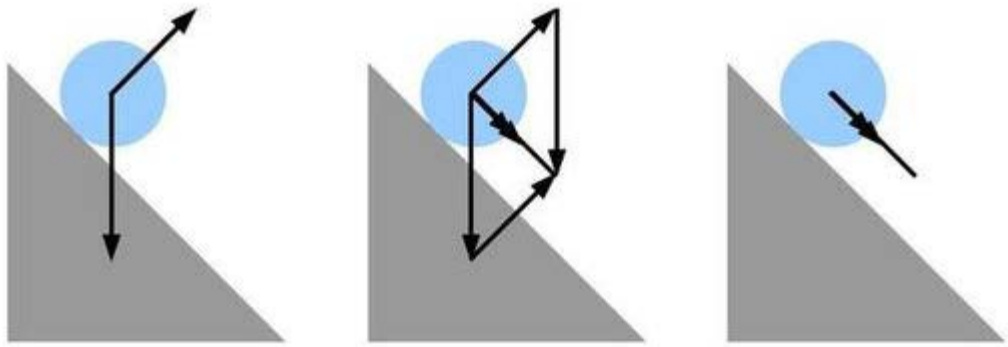

A **parallelogram of forces** model (Ñº), namely the addition of the force normal, directed perpendicular to the plane plus the gravitational force, directed downward, which yields the resultant force, directed in a downward parallel to the plane direction, which Buckle says can be used to explain what he calls the "great social law", namely that moral actions of men are the product not of their volition, but of their antecedents.

Buckle

In 1857, Henry Buckle, in his *History of Civilization in England*, did an extrapolation of the parallelogram of forces model scaled up to conceptualize a similar moral social law order: [1]

> "Those readers who are acquainted with the manner in which in the physical world the operations of the laws of nature are constantly disturbed, will expect to find in the moral world disturbances equally active. Such aberrations proceed, in both instances, from minor laws, which at particular points meet the larger laws, and thus alter their normal action. Of this, the science of mechanics affords a good example in the instance of that beautiful theory called the parallelogram of forces; according to which the forces are to each other in the same proportion as is the diagonal of their respective parallelograms. The diagonal always giving the resultant when each side represents a force, and if we look on the resultant as a compound force, a comparison of diagonals becomes a comparison of compounds.
>
> This is a law pregnant with great results; it is connected with those important mechanical resources, the composition and resolution of forces; and no one acquainted with the evidence on which it stands, ever thought of questioning its truth. But. the moment we avail ourselves of it for practical purposes, we find that in its action it is warped by other laws, such as those concerning the friction of air, and the different density of the bodies on which we operate, arising from their chemical composition, or, as some suppose, from their atomic arrangement. Perturbations being thus let in, the pure and simple action of the mechanical law disappears. Still, and although the results of the law are incessantly disturbed, the law itself remains intact.
>
> Just in the same way, the great social law, that the moral actions of men are the product not of their volition, but of their antecedents, is liable to disturbances which trouble its operation without affecting its truth. And this is quite sufficient to explain those slight variations which we find from year to year in the total amount of crime produced by the same country. Indeed, looking at the fact that the moral world is far more abundant in materials than the physical world, the only ground for astonishment is, that these variations should not be greater; and from the circumstance that the discrepancies are so trifling, we may form some idea of the prodigious energy of those vast social laws, which, though constantly interrupted, seem to triumph over every obstacle, and which, when examined by the aid of large numbers, scarcely undergo any sensible perturbation."

(add)

Thims

In 2010, Libb Thims, in his "Thermodynamic Philosophy of Evolution", outlined a resultant of forces acting on a person, while driving in Chicago. [2]

Quotes

The following are related quotes:

“I have been engaged, as you are doubtless aware, for some years in the pursuit of mathematical research, exploring the mines of science, which have of late been worked very persistently, but often, like the black diamond mines, at a loss. Concurrently with these researches, I have speculated on the great social problems which perplex the minds of men, both individually and collectively. And I have come to the conclusion that the same laws hold good in both spheres of work; that methods of mathematical procedure are applicable to the grand social problems of the day and to the regulation of the mutual relations which exist between man and man. Take, for example, the force of public opinion. Of what is it composed? It is the Resultant of all the forces which act upon that which is generally designated the 'social system.' Public opinion is a compromise between the many elements which make up human society; and compromise is a purely mechanical affair, based on the principle of the parallelogram of forces. Sometimes disturbing forces exert their influence upon the action of Public Opinion, causing the system to swerve from its original course, and precipitating society into a course of conduct inconsistent with its former behaviour ; and it is the duty of the governing body to eliminate as far as possible such disturbing forces, in order that society may pursue the even tenor of its way.”

— Lady Professor (c.1883), “Lecture on the Theory of Brain Waves and the Transmigration and Potentiality of Mental Forces”, in: *The Romance of Mathematics* (pg. 16-17) [3]

“Much of the opposition against the mechanical conception of human achievement centers in the fact that in the measurement and analysis of human behavior it is not yet possible to apply concretely the **parallelogram of forces** technique.”

— Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 32) [4]

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External links

â— Parallelogram of forces – Wikipedia.

θΔics

In economics, **Pareto principle**, also known as the "80-20 rule" or "Pareto's natural law of wealth", refers to the phenomena that about 80 percent of a country's wealth tends to be held in about 20 percent of the population. [1]

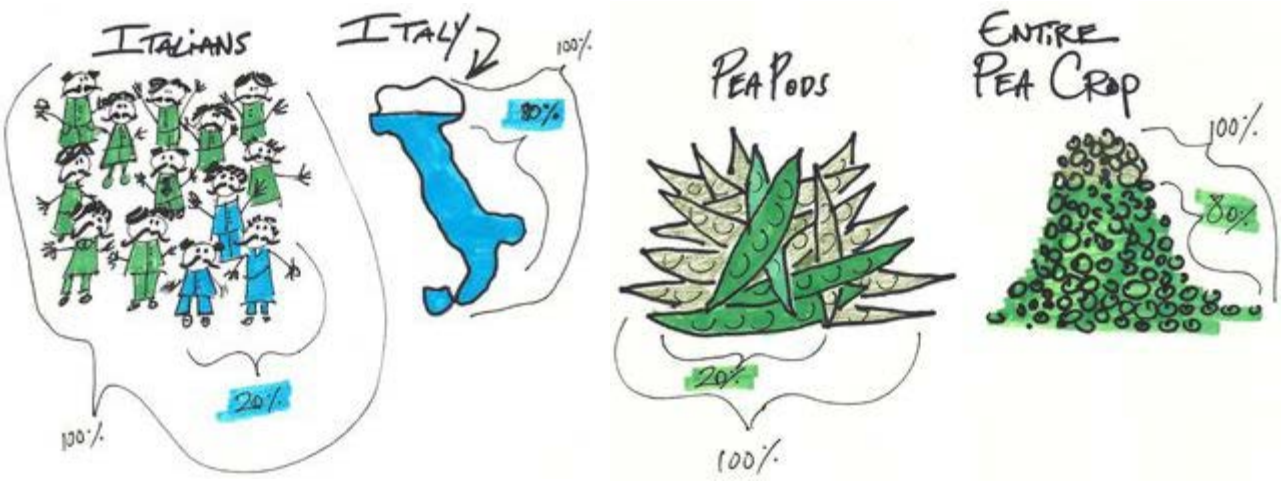

Left: a land ownership perspective of the Pareto principle, that 80 percent of land tends to be owned by 20 percent of the population. Both phenomenon, supposedly, were observed in the early 1900s by Italian mathematician and engineer-economist Vilfredo Pareto. [6] **Right:** a production perspective of the **Pareto principle**, that 20 percent of peas in a garden produce or yield 80 percent of the peas.

Formulation

The Pareto principle, according to Jaroslav Sestak, asserts that the statistical character of wealth in a stable economy is modeled by the following power law distribution: [9]

$$y \approx x^{-a}$$

where *y* is the number of people having an income *x* or greater than *x* and *a* is an exponent that was estimated to be 1.5 applicable to various conditions and nations.

Etymology

The principle is named after French-Italian mathematical engineer and economist Vilfredo Pareto, who first discussed the phenomenon in his 1897 *Course of Political Economics*. [7]

In his 1902 *Socialist Systems*, Pareto elaborated on his earlier 1896 outlined wealth distribution principle ideas with the following diagram (see: Pareto social pyramid)—shown with added clarification annotated—and comments: [8]

> "The curve of the distribution of wealth in our society, varies little from one era to another. What is called social pyramid is in reality a sort of spinning top, which the following figure gives an idea:

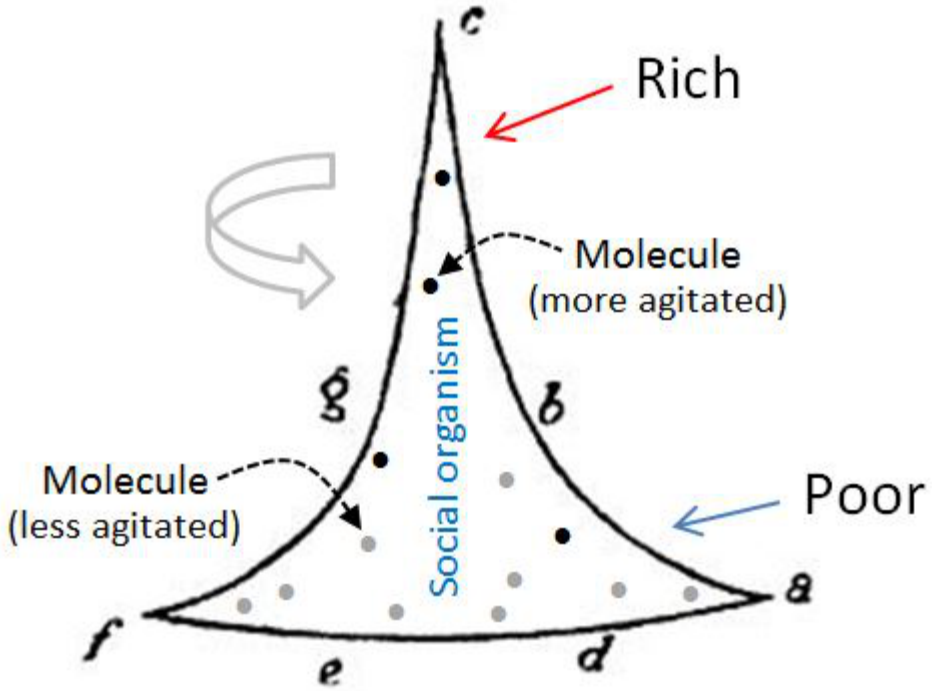

Rich occupying the summit, the poor are at the base. *Abcgf* the part of the curve we are only well known, thanks to the statistical data. The *adef* part is only speculative. We have adopted the form indicated by Otto Ammon and which seems to us quite likely that the shape of the curve is not due to chance. It probably depends on the distribution of the physiological and psychological characteristics of men. Moreover, can, in part, relate to the theories of pure economics, that is to say, the choice of men (these choices are specifically related to the physiological and psychological characteristics) and the obstacles encountered in production.

Assuming men arranged in layers according to their wealth, figure *abcgfed* is the outer form of the social organism. From what we have said this form does not change much, it can be assumed nearly constant on average and for a short time. But **the molecules that make up the social aggregate do not remain at rest; individuals get richer, others poorer**. So quite extensive are the **agitated movements** within the social organism, which resembles, in this, a living organism. In the latter, the blood flow is rapidly moving some molecules, the absorption and secretion processes continually change the molecules composing the tissue, while the external shape of the body, such as an adult animal, feels only insignificant changes.

Assuming men arranged in layers according to other characters, such as their intelligence, their ability to study mathematics, their musical talent, poetic, literary, their moral character, etc., it is likely to have curves forms more or less similar to what we just found for the distribution of wealth."

In 1906, Pareto observed that 80% of the land in Italy was owned by 20% of the population; Pareto is said to have developed or arrived at the principle by observing that 20% of the pea pods in his garden contained or harvested 80% of the peas. [5] In the 1940s, Romanian-born American business-management consultant and engineer Joseph Juran suggested the principle and named it after Pareto, whose work he had become acquainted with during a 1941 visit to General Motors Headquarters. [4]

Thermodynamics

In 2007, American physicist Mark Buchanan discusses the Pareto principle in the context of thermodynamics and his social atom theory. [1]

In 2008, American electrochemical engineer Libb Thims discussed the 1980s "lazy ant study", which found that ants can be divided into two categories: one consisting of hard workers, the other of inactive or 'lazy' ants, and that if the "system" is shattered by separating the two groups from one another, each in turn developed its own subgroups of hard

workers and idlers—in other words, a significant percentage of the 'lazy' ants suddenly turned into hard working ants—in terms of the mechanical equivalent of heat and the Pareto principle. [2]

In 2011, American chemical engineer James Ferri oversaw a biomolecular engineering student produced video on the Pareto principle in the context of thermodynamics. [3]

Note

The 80-20 rule has since been applied baselessly to a number of non-wealth (land ownership) related scenarios, e.g. that "20% of one's effort produce 80% of the results", that "20% of the salespeople produce 80% of the sales", among others.

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External links

â— Pareto principle – Wikipedia.

θΔics

In schools, **Pareto school**, or 'Paretian school', a considered by some to be subset, spinoff, and or precipitate of the Lausanne school, refers to the school of rational mechanics and or physical-chemical sciences based social and economic thought of Italian engineer Vilfredo Pareto.

The following seems to give a retrospect overview of the Pareto school: [1]

> "A complication in the history of the school of Lausanne is that Pareto was thought by a number of economists to have founded a school of his own (Schumpeter, 1954). They were inspired directly by him, so to them the 'school of Lausanne' meant '**Paretian school**' rather than the Walras-Pareto school. Writers of this persuasion include: Luigi Amoroso (1921), Alfonso de Pietri-Tonelli (1927), Antonio Osorio, whose 1913 book was introduced by Pareto, and economists of the generation after Pareto."

Italian economic historian Mario Pomini cites Italian mathematical economist Giuseppe Palomba as being the "most prolific and talented" of the Pareto school. [2]

Quotes

The following are related quotes:

> "The rise of the **Pareto school** and its sudden decline in the years following the Second World War can be considered as one of the most significant events in the history of economic thought in Italy in the first half of the twentieth century."
>
> — Mario Pomini (2014), *The Paretian Tradition During the Interwar Period* [1]

See also

- Harvard Pareto circle
- Lausanne school of physical socioeconomics
- Pareto principle

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Further reading

- McLure, Michael. (2006). "The 'Pareto School' and the Giornale Degli Economisiti", Discussion Paper, University of Western Australia.

θΔics

In hmolscience, **Pareto social pyramid**, or "Pareto spinning top social pyramid" (Ñº), refers to the circa 1896 to 1902 model of society, conceptualized by Vilfredo Pareto, via the adjacent diagram, according to which society, comprised of people conceived as molecules, or rather wealth in a given society, or in social familial structures, moves or circulates in the format of a "spinning top" like social pyramid (Ñº) , wherein more "agitated" human molecules tend to move to the top of the pyramid, over time, whereas less agitated human molecules tend to filter towards the bottom of the social pyramid. [1] The pyramid model is a verbal and visual description of his so-called 80-20 rule or Pareto principle of wealth distribution.

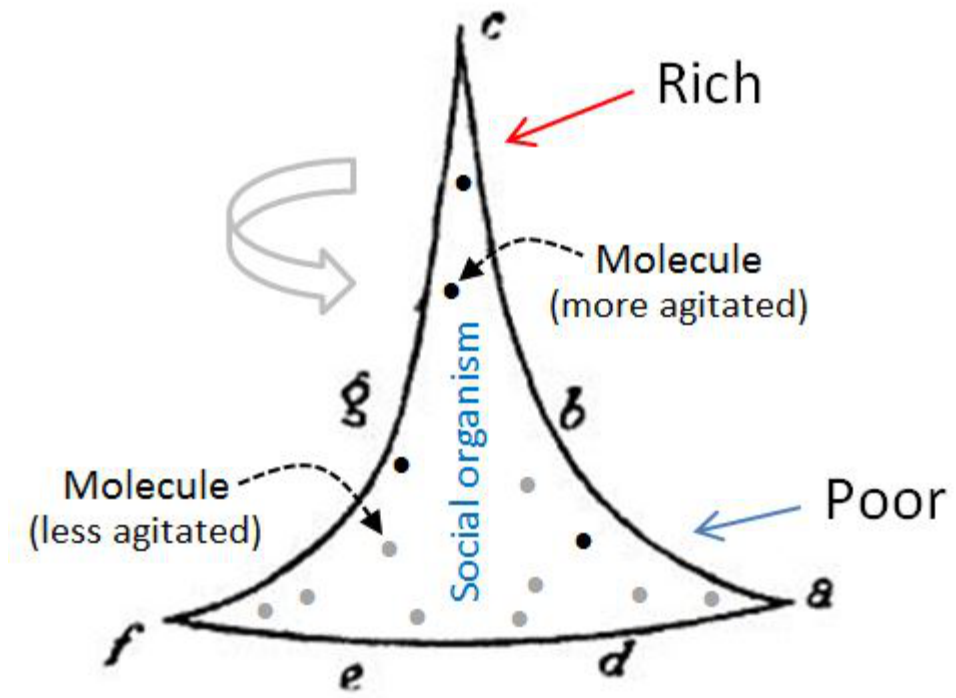

A 1902 drawing of society by Vilfredo Pareto, comprised of human molecules and wealth, moving or circulating (i.e. circulation of elites), akin to the atoms in a heat-induced Benard cell, in the form of a **spinning top social pyramid**. [1]

Overview

In 1902, Pareto, in his *Socialist Systems*, in elaboration on his earlier 1896 work, outlined wealth distribution principle ideas with the adjacent diagram—shown with added clarification annotated—and comments: [1]

> "The curve of the distribution of wealth in our society, varies little from one era to another. What is called **social pyramid** is in reality a sort of **spinning top**, which the adjacent figure gives an idea. Rich occupying the summit, the poor are at the base. *Abcgf* the part of the curve we are only well known, thanks to the statistical data. The *adef* part is only speculative.
>
> We have adopted the form indicated by Otto Ammon and which seems to us quite likely that the shape of the curve is not due to chance. It probably depends on the distribution of the physiological and psychological characteristics of men. Moreover. can, in part, relate to the theories of pure economics, that is to say, the choice of men (these choices are specifically related to the physiological and psychological characteristics) and the obstacles encountered in production.
>
> Assuming men arranged in layers according to their wealth, figure *abcgfed* is the outer form of the social organism. From what we have said this form does not change much, it can be assumed nearly constant on average and for a short time. But the molecules that make up the social aggregate do not remain at rest; individuals get richer, others poorer. So quite extensive are the agitated movements within the social organism, which resembles, in this, a living organism. In the latter, the blood flow is rapidly moving some molecules, the absorption and secretion processes continually change the molecules composing the tissue, while the external shape of the body, such as an adult animal, feels only insignificant changes.
>
> Assuming men arranged in layers according to other characters, such as their intelligence, their ability to study mathematics, their musical talent, poetic, literary, their moral character, etc., it is likely to have curves forms more or less similar to what we just found for the distribution of wealth."

(add discussion)

In 1906, Pareto observed that 80% of the land in Italy was owned by 20% of the population; Pareto is said to have developed or arrived at the principle by observing that 20% of the pea pods in his garden contained or harvested 80% of the peas. [2]

See also

â— Lazy ant study

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θΔics

In existographies, **Paris J. Arnopoulos** (c.1935-) (SNE:11) (CR:33) is a Canadian political scientist and semi-polymath noted for his 1993 book *Sociophysics*, in the field of sociophysics, in which he attempts to use 'powerful physics metaphor' to speculate on topics such as force, heat, energy, field, potential, bond, temperature, volume, pressure, entropy of societies. [4] The books seems to be well-researched, as Arnopoulos uses the term thermodynamics on twenty pages, and entropy on sixty pages, citing German physical chemist Wilhelm Ostwald's energetic imperative, among numerous other topics.

Purpose | States

On the question of purpose, individuality, and system function, Arnopoulos directs or deflects the question to initial state and final state distinction: [8]

> "In considering the function of a system, one also gets involved with questions of role and purpose. These try to find the instrumentality of systems by determining their priority in the chain of causality. In this respect, one can distinguish between original and final states in the system's function."

(add discussion)

Hot / Cold | Societies

> *See main: Hot and cold societies*

Arnopoulos, in his section on pressure, states that: [1]

> "Hot societies have a more mobile or energetic population than cold ones."

Historically, hot society and cold society models trace back to the 1959 hot / cold societies models of Claude Levi-Strauss, whom Arnopoulos cites; if not before to the work of Emile Durkheim. (Ñº)

In 2015, Jurgen Mimkes, independently, was doing some hot / cold societies theorizing work, in thermodynamic terms. [6]

Bonding | Field particles

> *See main: Social exchange force*

The following is a rather decent quote by Arnopoulos in regards to the field particle exchange force nature of human chemical bonding: [1]

> "All entities, whether fermions or humans, need some mediating agency to interconnect them into systems. This indispensable interrelating and interacting role is ultimately played by different field particles named bosons. Unlike fermions, which are characterized by a significant mass and charge, bosons do not take partake of these to attributes. Rather, they only have spins and provide connections as they are exchanged among fermions. Such exchanges are of three kinds: weak or strong nuclear, electromagnetic, and gravitational. The first exist by sharing gluons and thus hold together the atomic nucleus. The second take place by exchanging photons and thus explain most of our ordinary phenomena. The third operate by the displacement of gravitons and thus provide the overall attraction between everything in the universe. Similar phenomena occur up the ontological ladder to describe social, as well as atomic and galactic bonding. Societies, like all systems, are held together by certain ties of varying strength and extent."

This is a quite cogent statement about human bonding, in some sense near parallel to American electrochemical engineer Libb Thims' 2007 formulation of the same, in regards to the exchange force nature of human bonding and human dynamics. [5]

Mind | Matter

Arnopoulos, on the seeming mind from matter topic, has the following to say: [8]

> "The traditional ontological dichotomy between matter and mind may be explained, perhaps in an oversimplified way, by the fundamental difference between quarks and leptons. Ideas are basically systems of electrons, rooted in the quarks of the brain. From the simplest symbol to the most complex theory, mental entities arise from the most various activities of material elements; at the same time as they in turn affect their material hosts. Mind and matter are thus interrelated to various degrees, as exemplified in human beings."

(add discussion)

Origin

Arnopoulos states that his *Sociophysics* originated in the early-1980s amid the rise of the application of general systems theory, chaos theory, and quantum mechanics to the natural sciences and in turn and in part to the social sciences. Different aspects of his study into sociophysics, were presented and debated as papers in various conferences throughout the world, UNESCO, Paris, United Nations University, Tokyo, Social Development Institute, Sri Lanka, International Society for Systems Theory and Cybernetics, Germany, Institute for Social Philosophy, Italy, among about five others. A first draft was put together in the mid-1980s. The draft was tested in a seminar on macropolitics at Concordia University; a revised draft served as a basis for course on world affairs, at California State University, Hayward, in 1991, and Florida International University, Miami, in 1993, and published as a first edition that year. In 2005, a soft-cover second edition was produced, with content largely unchanged, to help widen the audience. [1]

Education

In the mid 1960s, Arnopoulos completed his graduate studies in New York after which he began teaching political science at Concordia University, Montreal. In 2004, he became a professor emeritus of Concordia University, Montreal. [1]

A photo of **Arnopoulos** from an author blurb describing him as professor who has "published several books on the theory of sociophysics, using the metaphors of physics to describe societal movements and tensions." (Ñº)

Quotes | Cited

The following are noted quotes cited by Arnopoulos:

> "Energy is eternal delight."
>
> — William Blake (1793), *The Marriage of Heaven and Hell*; in *Sociophysics* (pg. 37)

Quotes

The following are related quotes:

> "In modern time, there has been a disintegration of the intellectual community, due mainly to the proliferation of scientific discoveries and the accumulation of information, which has resulted in a tremendous fragmentation of knowledge and a compartmentalization of the scientific estate. The cultivated encyclopedia scholar or renaissance man has thus joined the ranks of the endangered species."

— Paris Arnopoulos (1993), *Sociophysics* (pg. 1); 2005 edition (pg. xxxi)

"Condorcet's and Quetelet's social physics, as well as Bagehot's *Physics and Politics*, provided the outstanding attempts which began with the new-Platonists and culminated with the neo-positivists."

— Paris Arnopoulos (1993), *Sociophysics* (pg. 3); 2005 edition (pg. xxxii)

"Sociophysics is a combination of natural and social science theories, using powerful physics metaphors as an inertial guidance system."

— Paris Arnopoulos (1993), *Sociophysics* (pg. 3); 2005 edition (pg. xxxii)

"Present knowledge rests on the foundation of physics, which will be used to support our contentions herein. Accordingly, we admit the postulate that reality may ultimately be reducible to certain elementary particles. It is they eventually make up everything, from the most banal material things to the most exalted ethereal ideas. These particles, named fermions, are of two kinds: leptons and quarks. The former, of which electrons are the most prevalent example, are very antisocial in that they exist alone; while the latter are quite sociable and so are always found in groups. Quarks combine to form protons and neutrons, which make up the atomic nucleus. As the fundamental units of matter, various combinations of atoms, composed of nuclei and revolving electrons, build up all material structures, from molecules and cells, to planets and stars. In between, there is the realm of human society with its own kind of individual and collective entities."

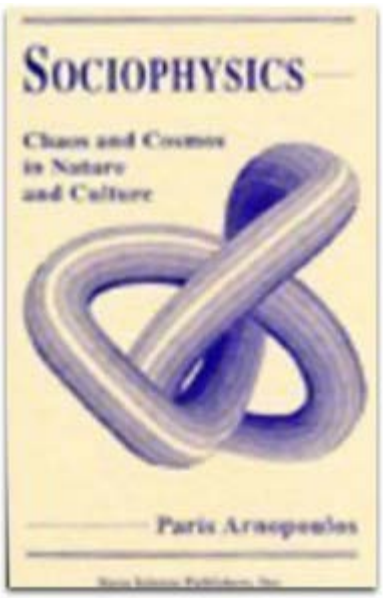

1993 edition

→

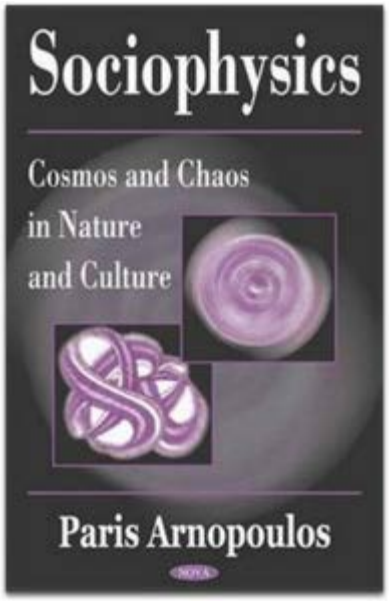

2005 edition

Arnopolous' 1993 book *Sociophysics*, in hardcover and softcover, respectively.

— Paris Arnopoulos (1993), *Sociophysics* (pg. 22); 2005 edition (pgs. xlviii)

"Many philosophers, from Heraclitus and Empedocles to Hobbes and Locke, consider physical attraction and repulsion to be the primary sources of love and hate."

— Paris Arnopoulos (1993), *Sociophysics* (pg. 61); 2005 edition (pg. 17)

"When we move from the [socio-] mechanical to the [socio-] thermal phenomena of energy, we rise from the atomic 'billiard ball' interaction to the molecular 'chemistry set' reactions. Unlike the former, the latter do not consider relations simply on the basis of mass, distance, and velocity, but rather temperature, pressure, and volume. The importance of a particular position is therefore, replaced by that of a substantive composition. The physical motion of bodies is replaced by the chemical reactions of compounds

[sociomasses]."

— Paris Arnopoulos (1993), *Sociophysics* (pg. 74); 2005 edition (pg. 26)

References

1. (a) Arnopoulos, Paris. (1993). *Sociophysics: Chaos and Cosmos in Nature and Culture.* Nova Science.
(b) Arnopoulos, Paris. (2005). *Sociophysics: Cosmos and Chaos in Nature and Culture* (origin, pg. xxviii; thermodynamics, 17+ pgs; fermions or humans, pg. xIviii; thermics, pgs. 26-31). Nova Publishers.
2. Paris Arnopoulos (about) – VNC.BC.ca.
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5. (a) Thims, Libb. (2007). *Human Chemistry (Volume One).* Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two).* Morrisville, NC: LuLu.
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7. Arnopoulos, Paris. (1993). *Sociophysics: Chaos and Cosmos in Nature and Culture.* Nova Science.
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External links

â— Arnopoulos, Paris – WorldCat Identities.
â— Paris J. Arnopoulos (about) – WCSpeakers.com.

θΔics

In questions, **parlay questions** tend to be self-reflective queries that seemingly can be exploited successfully to increase or otherwise transform into something of much greater value—in the sense of the famous saying that at least half, or some say the most difficult part, of solving a problem is asking the right question.

List

The following is a listing of noted parlay questions:

> "We might not believe that love is 'forever', but we do say, of a glorious fling that lasted three months, 'it didn't work out.' What were we supposed to be working *for*? Why measure the success of a relationship by how long it lasts?"
>
> — Robert Solomon (1981), *Love: Emotion, Myth, Metaphor* [1]

> "This is the sort of irrelevant-sounding question that seems minor at first, and the mind looks for a quick answer to dismiss it. It sounds like one of those hostile, ignorant questions some fundamentalist preacher might think up. But why do the fittest survive? Why does any life survive? It's illogical. It's self-contradictory that life should survive. If life is strictly a result of the physical and chemical forces of nature then why is life opposed to these same forces in its struggle to survive? Either life is with physical nature [natural] or it's against it. If it's with nature there's nothing to survive. If it's against physical nature [unnatural] then there must be something apart from the physical and chemical forces of nature that is motivating it to be against physical nature. The second law of thermodynamics states that all energy systems 'run down' like a clock and never rewind themselves. But life not only 'runs up,' converting low energy sea-water, sunlight and air into high-energy chemicals, it keeps multiplying itself into more and better clocks that keep "running up" faster and faster. Why, for example, should a group of simple, stable compounds of carbon (C), hydrogen (H), oxygen (O), and nitrogen (N), 'struggle' for billions of years to organize themselves into a professor of chemistry? What's the motive?"
>
> — Robert Pirsig (1991), *Lila: An Inquiry into Morals*; see main: chemistry professor paradox [2]

References

1. Pirsig, Robert M. (1991). *Lila: An Inquiry into Morals* (chemistry professor paradox, pgs. 139-42). Random House, 2013.
2. Solomon, Robert C. (1981). *Love: Emotion, Myth, & Metaphor (*pg. 117). Prometheus Books, 1990.

θΔics

In existographies, **Parmenides** (510-450BC) (IQ:180|#127) [RGM:216|1,500+] (GPhE:7) (ACR:11) [CR:118] was Greek physicist-philosopher noted for his circa 485 BC treatise “On Nature” in which he argued that a void or rather a vacuum, in nature, could not exist. [1]

This famous postulate, and the two-millennia long debated on this issue that followed, can be said to be directly responsible for the invention or development of a number of things: barometer (1643), vacuum pump (1650), piston and cylinder (1650), air pump (1657), steam engine (1690), gas laws (1645-1897), and the science of thermodynamics (1865).

Vacuum debate

See main: Nature abhors a vacuum

Parmenides' famous "denial of the void" erupted into what would become a 2,000-year heated and intricate debate, with views going back and forth on the matter, as to whether or not voids or vacuums can or cannot or do or do not exist. The first to object to Parmenides' denial was Leucippus who invented the now-famous atomic theory, which was stimulated into conception to purposely contradict Parmenides; the short version of Leucippus' theory being that the postulate that everything in the universe is either atoms or voids.

Next, Plato found the the idea of a vacuum inconceivable. After Plato, Aristotle, student of Plato, declaring the famous dictum *horror vacui* or “nature abhors a vacuum”, on the logic that in a complete vacuum (see also: perfect vacuum) infinite speed would be possible because motion would encounter no resistance, hence if infinite speed was impossible, so to is a vacuum.

In circa 1648, German engineer Otto Guericke began to devote a considerable portion of his spare time to experimentation and was especially fascinated with the nature of cold, much of which was centered on the question of the void: [2]

> “Could empty space exist, and is heavenly space unbounded?”

In researching this query, he was brought into contact with German mathematical physicist Gaspar Schott, an adherent to Aristotle’s version of the denial of the void, albeit open to new experimental information, and ultimately and to French scientist philosopher Rene Descartes’ adherence to the “denial of the vacuum” dictum. This puzzle intrigued Guericke and he went to work trying to evacuate the air form a well-caulked beer keg (adjacent), which introduced him to the sealing problem, i.e. how to make a container air tight. After solving the sealing problem, Guericke was said to have discovered the phenomenon of the compressibility of air after which he invented a vacuum pump.

A Schott diagram depiction of German engineer Otto Guericke's famous *circa* 1649 beer keg vacuum experiment, in which Guericke and another man (or Guericke's two assistants) try to completely evacuate the air form a well-caulked beer keg, so to see if a "vacuum" could be made, the existence of which that was deemed impossible by **Parmenides**.

Schott recorded, diagrammed, and documented all of the Guericke's experimental results, which he appended to his own massive book *The Mechanics of Gas Hydraulics*.

In 1854, Guericke built the Magdeburg hemispheres to publicly prove that vacuums can exist in nature. Investigations of this same question, by others, led to the development of the thermometer, the steam engine, and eventually the science of thermodynamics, among others.

Quotes | On

The following are quoted by Popper:

> "**Parmenides**' theory may be described as the first hypothetico-deductive theory of the world. The atomists took it as such; and they asserted that it was refined by experience, since motion does exist. Accepting the formal validity of Parmenides' argument, they inferred from the falsity of his conclusion the falsity of his premise. But this meant that the **nothing** — the **void**, or **empty space** — existed. Consequently, there was now no need to assume that 'what is' — the full, that which fills some space — had no parts; for its parts could now be separated by the void."
>
> — Karl Popper (1958), "Back to the Presocratics" [4]

Quotes | By

The following are representative quotes:

> "Being is unbegotten, indestructible, whole, eternally one, immovable and infinite. With it there is no was nor shall be; the whole is forever now, one and continuous."
>
> — Parmenides (c.460BC), *Publication*; cited by: Henry Bray (1910) [3]

See also

- Heraclitus vs Parmenides

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (section: Vacuums in nature, pgs. 46-47). Morrisville, NC: LuLu.
2. Partners and Rivals during the Scientific Revolution – Faculty.Fairfield.edu.
3. Bray, Henry T. (1910). *The Living Universe* (pg. 251). Truro Publishing Co., 1920.
4. Popper, Karl. (1998). *The World of Parmenides* (foreword: Scott Austin; editors: Arne Petersen, Jorgen Mejer) (§1: "Back to the Presocratics", pgs. 7-35; quote, pg. 19; §2: The Unknown Xenophanes, pgs. 36-75). Routledge, 2012.

Further reading

- Parmenides. (470BC). *Fragments*; in: *Early Greek Philosophers* (editor: John Burnet) (§4). Publisher, 1982.
- Miller, Mitchell H. (1986). *Plato's Parmenides: the Conservation of the Soul*. Princeton University Press, 2017.
- Cohen, S. Marc, Curd, Particia, and Reeve, C.D.D. (2011). *Readings in Ancient Greek Philosophy: From Thales to Aristotle* (§6:Parmenides of Elea, pgs. 40-46). Hackett Publishing.

External links

- Parmenides – Wikipedia.
- Parmenides – Stanford Encyclopedia of Philosophy.

θΔics

In hmolscience, **Parmenides vs Heraclitus** refers to the great intellectual "void vs being" debate (Q) between Greek philosophers Heraclitus (535-450BC), who advocated a “flux and fire” conceptualized change philosophy, according to which the universe was comprised of fire, earth, and water, albeit “fire” being primary, controlling and modifying earth and water, amid various states of “void” (or vacuum), in a continuous state of flux (or change), typified by the "you can never step in same river twice" idiom, and Parmenides (510-450BC), who argued that all that existed was some type of immovable “being”, and concordantly that “non-being” or void was impossible.

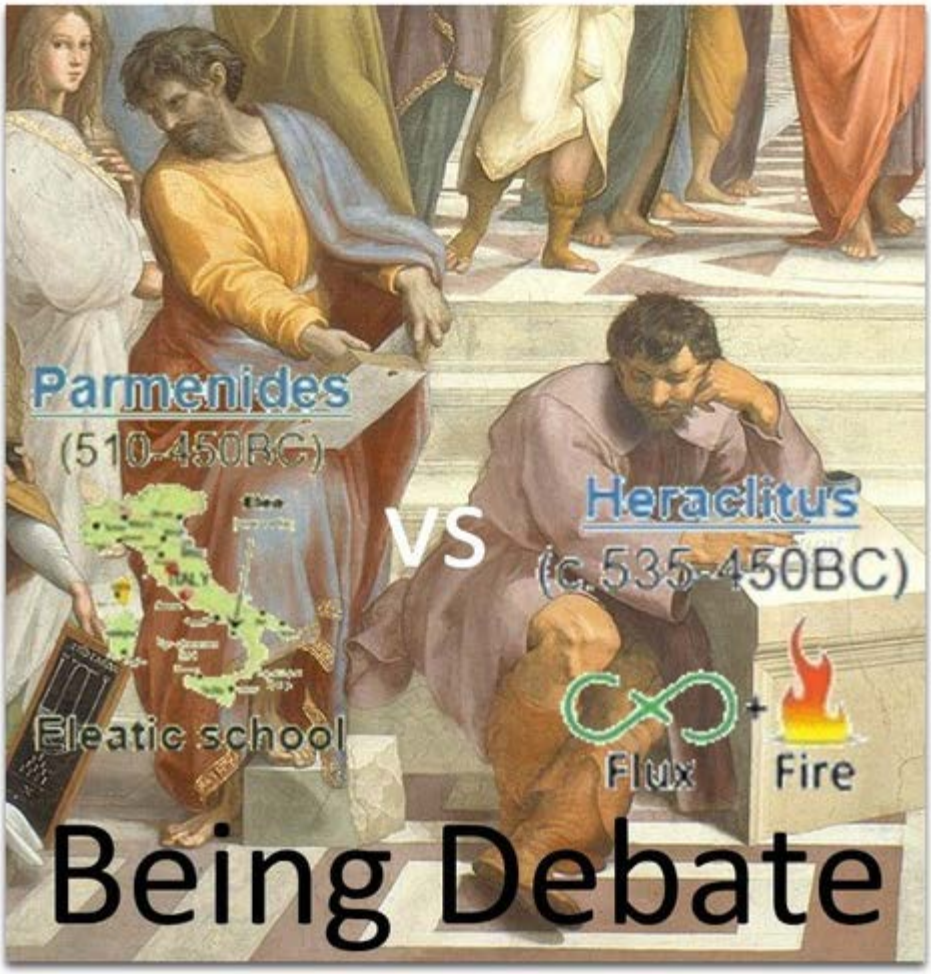

The **Heraclitus vs Parmenides** debate, sparked around 480BC, revolved around the question of “being” (or personhood) and “void” (or vacuum), the latter explicable, via pure materialism, but inherently negating the validity of the former.

Overview

Shown adjacent, is the section from Italian painter Raphael's 1510 depiction of the School in Athens, Greece, showing: Parmenides, representative of the immovable being view, Heraclitus, representative of the flux, fire, and eternal change view of nature, amid an unnamed woman, said to be representative of "love", who glares out of the scene, in a strikingly peculiar way, that draws one's attention.

Parmenides, of note, was head of the so-called Eleatic school, whose members included Melissus (500-440BC) and Zeno of Elea (495-430BC), the latter a said “pupil” of Leucippus (who, supposedly, conceived "atomic theory" in reaction to Parmenides' denial of the void), intellectual mentor of Epicurus, the school of which, in reaction Heraclitus' materialism philosophy, went on a full out "attack" (Q) on Heraclitus, arguing that all that existed was some type of immovable “being”, and concordantly that “non-being” or void was impossible; the deeply entrenched debate finding prolonged discussion in the two-millennium long nature abhors a vacuum; which, via the experiments of Otto Guericke, resultantly worked to initiate the science of thermodynamics, and in turn quantum mechanics, via Max Planck, and, in turn, relativity, via Albert Einstein.

Originally, in circa 505BC, Greek philosopher Heraclitus (535-450BC) developed a “flux and fire” philosophy, according to which, in his view:

> “The universe, that is the all, is made neither of gods nor men, but ever has been and ever will be an eternal living fire, kindling and extinguishing in destined measure.”

In short, three elements: fire, earth, and water, are all that exist, but that, among these, “fire” was the primary element, controlling and modifying the other two, and that everything is in a continuous state of flux, or change, and war and strife between opposites is the eternal condition of the universe.

An implicit assumption in this logic is underlying premise that movement and change would require

space or a "**void**", or space devoid of the three elements. (Q)

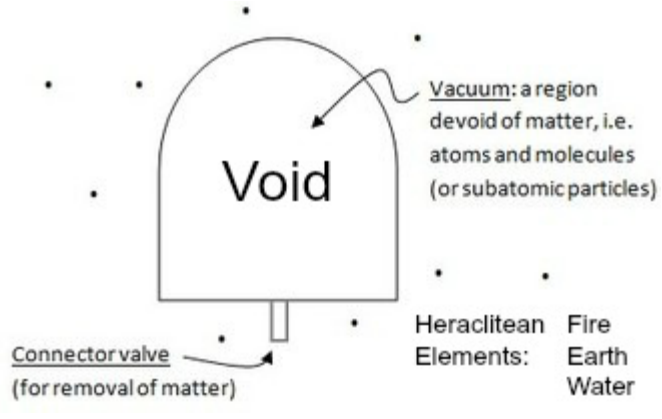

In circa 480BC, Greek philosopher Parmenides (510-450BC), head of the so-called Eleatic school, whose members included Melissus (500-440BC) and Zeno of Elea (495-430BC), the latter a said "pupil" of Leucippus, in reaction to materialism philosophers, in what some have referred to as an "attack" (Q) on Heraclitus, argued that all that existed was some type of immovable "being", and concordantly that "non-being" or void was impossible—the following fragment from Melissus gives the gist of this argument: [4]

> "There is absolutely **NO void**. For void is not-being and the nothing could not exist. And it does not move. For it cannot move in any direction. But it is full. For if there were void, it would move into that void, but since there is no void it has nothing to move into."

The following is another example statement:

> "**Being** is unbegotten, indestructible, whole, eternally one, immovable and infinite. With it there is no was nor shall be; the whole is forever now, one and continuous."
>
> — Parmenides (c.460BC), *Fragment*; cited by: Henry Bray (1910) in *The Living Universe* (pg. 251) [3]

(add discussion)

Other

In 1908, Polish-born French chemist and philosopher Emile Meyerson published *Identity and Reality*, said to be some type of Heraclitus vs Parmenides reconciliation aiming work. [1]

In 1942-43, at the University of Feiburg, Martin Heidegger gave a winter semester lecture course on Parmenides; and in the winter semester of 1966-67, conducted a seminar on the fragments of Heraclitus; together, the set is said to outline the contrasting views of both philosopher on the subjects of truth, being, and understanding. [2]

References

1. Meyerson, Émile. (1908). *Identity and Reality* (*Identité et Réalite*) (ch. 8: Carnot's principle, pgs. 259-90). Routledge.
2. (a) Heidegger, Martin. (1943). *Parmenides* (translators: Andre Schuwer and Richard Rojcewicz). Indiana University Press, 1992.
(b) Heidegger, Martin and Fink, Eugen. (1967). *Heraclitus Seminar* (translator: Charles Seibert). Northwestern University Press, 1993.
3. Bray, Henry T. (1910). *The Living Universe* (pg. 251). Truro Publishing Co., 1920.
4. Algra, Keimpe. (1995). *Concepts of Space in Greek Thought* (pg. 43). Brill.

Further reading

● Anon. (2013). "Heraclitus vs Parmenides: the Problem of Change" (Q), True Forms, WordPress.com, Jul 16.

Videos

- Anons. (2013). “Discussing the Heraclitus and Parmenides” (Q), Tokyo Philosophical Society, Jun 26.

External links

- Heraclitus and Parmenides – ThreeMinutePhilosophy.com.
- Heraclitus and Parmenides (2002) – PhilosophyForums.com.

θΔics

In mathematics, **partial derivative**, or "partial differential", signified by curl d or "curly d" derivative symbol (∂), is an infinitesimal change in a function consisting of two or more variables when one of the variable changes and the others remain constant. [1] In the function z = f(x,y), for instance, the partial derivative of *z* with respect to *x*, while *y* remains unchanged is:

$$\left(\frac{\partial z}{\partial x}\right)_y$$

History

The notation and logic of the partial differential or partial derivative was introduced in 1786 by French mathematician Adrien-Marie Legendre and later adopted by German mathematician Carl Jacobi in 1841.

References

1. Daintith, John. (2005). *Oxford Dictionary of Science.* Oxford University Press.

External links

- Partial derivative – Wikipedia.

θΔics

In mathematics, **partial differential equation** is an equation containing partial derivatives of a function. [1]

References

1. Daintith, John. (2005). *Oxford Dictionary of Science.* Oxford University Press.

External links

- Partial differential equation – Wikipedia.

θΔics

In science, **particle** is a small point-sized entity, of which there are three varieties: fundamental particles (or elementary particles), composite particles, and bound state particles, all of which, according to Louis de Broglie, exhibit wave-particle duality.

Discovery timeline

See main: Particle discovery timeline

The follow table shows a work-in-progress timeline of particle discovery: [3]

Particle	Symbol	Spin	Predicted / Proposed	Discovered / Identified
Atom			Leucippus (c.460BC)	Jean Perrin (1909)
Electron	e−, β−	½	James Stoney (1874)	J.J. Thomson (1897)
Alpha particle	α, He²â °, α²â °		N/A	Ernest Rutherford (1899)
Photon	γ	1	N/A	Albert Einstein (1905)
Nucleus			N/A	Ernest Rutherford (1909/1911)
Proton	p, p+, N+	½	William Prout (1815)	Ernest Rutherford (1919)
Neutron	n, nâ °, Nâ °	½	Ernest Rutherford (1920)	James Chadwick (1932)
Antielectron	e+		Paul Dirac (1927); Ettore Majorana (1928)	Carl Anderson (1932)
Electron neutrino	ν_e	½	Wolfgang Pauli (1930)	Frederick Reines and Clyde Cowan (1956)
Monopole			Paul Dirac (1931)	[Unconfirmed]
Graviton	G	2	Dmitrii Blokhintsev and F. M. Gal'perin (1934)	[Unconfirmed]
Pion	π+, πâ °, π−	0	Hideki Yukawa (1935)	Cecil Powell, et al (1947)
Gluon	g	1	Murray Gell-Mann (1962)	PLUTO detector (1979)
Up quark	u	½	Murray Gell-Mann (1964); George Zweig (1964)	SLAC (1968)
Down quark	d	½	Murray Gell-Mann (1964); George Zweig (1964)	SLAC (1968)
Higgs boson	Hâ °	0	Peter Higgs (1964)	CERN LHC (2012)
Partons			Murray Gell-Mann and George Zweig (1964)	SLAC (1969)
J/ψ (J/Psi) meson			James Bjorken and Sheldon Glashow (1964)	Burton Richter and Samuel Ting (1974)

W boson	W−	1	Sheldon Glashow, Abdus Salam, and Steven Weinberg	CERN (1983)
Z bosons	Z	1	Sheldon Glashow, Abdus Salam, and Steven Weinberg	CERN (1983)

The standard model, as of 2009, contains 61 elementary particles: 24 fermions, 24 antifermions, 12 vector bosons, and the Higgs boson, grouped as follows: [4]

Elementary Particles

	Types	Generations	Antiparticle	Colors	Total
Quarks	2	3	Pair	3	36
Leptons	2	3	Pair	None	12
Gluons	1	1	Own	8	8
W	1	1	Pair	None	2
Z	1	1	Own	None	1
Photon	1	1	Own	None	1
Higgs	1	1	Own	None	1
Total					61

The following is a basic particle diagram:

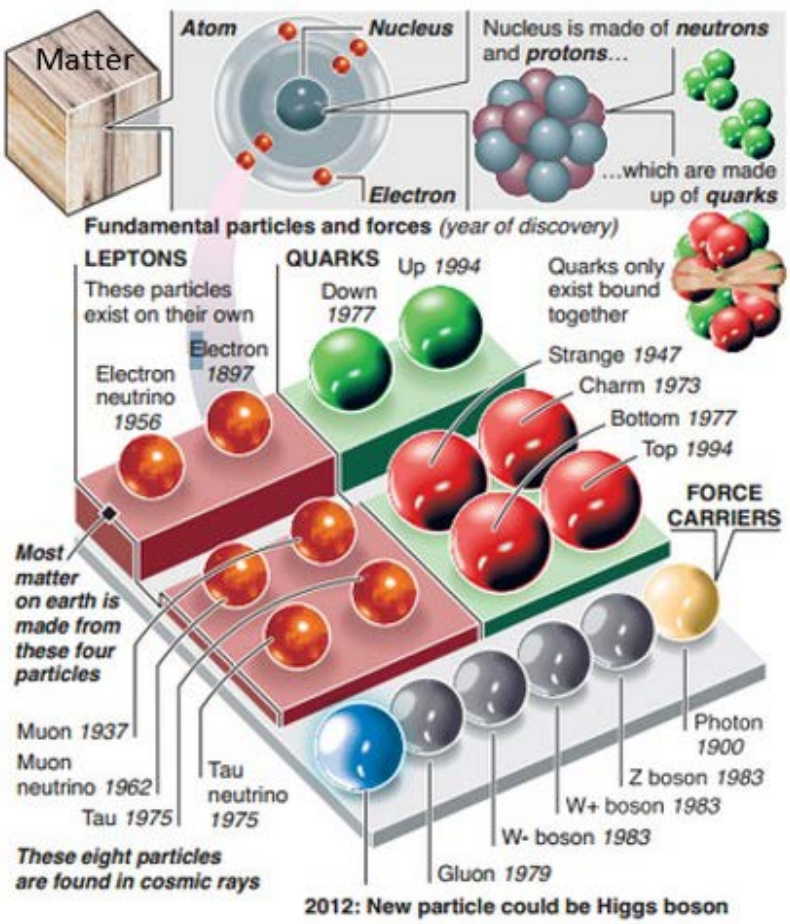

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Overview

Particles can be Fundamental particles are defined as those that do not have an internal structure, whereas composite particles and bound state particles do. Particles can also be classified as either a fermion (leptons, quarks, and baryons), those with half-integer spin, or a boson (gauge bosons and mesons), those with integer spin. All structures in the universe are believed to be comprised of fundamental particles, i.e. composite particles and bound state particles (as well as all other structures) are aggregates of fundamental particles. The following overview table shows the classifications in which the various structures of the universe can be divided: [1]

Fundamental Particles	Composite Particles	Bound State Particles
Leptons and quarks form matter, while gauge bosons carry forces. Quarks feel the strong force, but leptons do not: 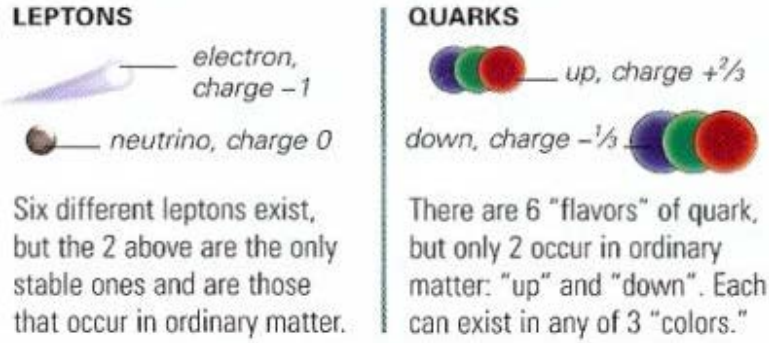 **GAUGE BOSONS** These are force-carrier particles. Some shown are hypothetical: 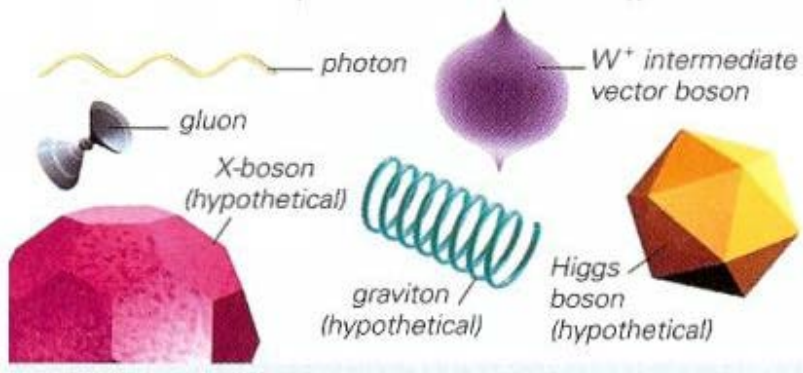 		The term 'bound state' tends to be used to refer to objects, larger in size than the hydrogen atom, considered as a single entity, particularly in cases where the term 'molecule' is not employable. **MICROBES** Small motile entities, such as the avian flu virus (adjacent), having an approximate molecular formula of $C_{E3}H_{E3}O_{E4}N_{E4}P_{E2}S_{E2}Ca_{50}K_{50}$, can be viewed as a bound state of thousands of atoms. **PEOPLE** In = statistical mechanics, humans, which have a measured 26-element human molecular formula, are often modeled as 'human particles', treated in mass, statistically, to discern bulk behaviors, being quantified as a type of social physics or human physics.

Also known as hadrons, these are composed of quarks, antiquarks, or both, bound by gluons.

BARYONS
Relatively large-mass particles containing 3 quarks.

proton, *1 down and 2 up quarks, charge +1*

neutron, *1 up and 2 down quarks, charge 0*

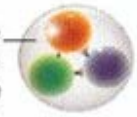

MESONS
Particles containing a quark and an antiquark.

positive pion, *1 up quark, 1 anti-down quark, charge +1*

Hundreds of other baryons and mesons exist.

EXOTIC PARTICLES

Further particles have been hypothesized that do not have a place in this particle classification. They include magnetic monopoles and WIMPs (weakly interacting massive particles).

ANTIPARTICLES
Most particles have an antimatter equivalent that has the same mass, but whose charge and other properties are opposite:

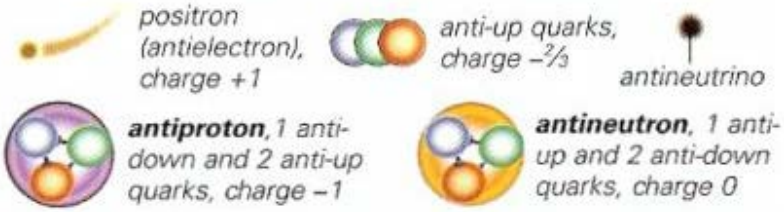

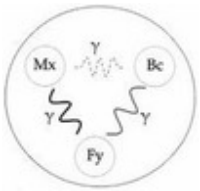

FAMILIES
Three human molecules, MxFyBc, attached in the tight unit of a bound state family held together via force carrier particles called photons.

GALAXIES
Large aggregated galactic-sized structures, such as the milky way (adjacent), can be considered as a bound state of stars (e.g. sun molecule) and planets (e.g. earth molecule).

The subjects of statistical mechanics and statistical thermodynamics, as mentioned, typically study systems whose entities (atoms, ions, molecules, chemical species , proteins, human molecules, etc.) are modeled as discrete point-sized particles, assumed to have no inter-particle interaction, i.e. adhere to the Boltzmann chaos assumption. When people are modeled as point-sized particles, the subject becomes human statistical mechanics (or human statistical thermodynamics) as contrasted with human chemical thermodynamics, which views people as human molecules, and takes into account aspects such as bond energies, activation energies, free energy coupling, and other energies of interaction. [2]

See also

â— Field particle
â— Messenger particle (or force carrier)
â— Primary field particle
â— Secondary field particle
â— Human particle
â— Human particle map

References

1. Rees, Martin. (2005). *Universe* (pg. 31). DK Publishing.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
3. Timeline of particle discoveries – Wikipedia.
4. Braibant, Sylvie, Giacomelli, Giorgio, and Spurio, Maurizio. *Particles and Fundamental Interactions: An Introduction to Particle Physics* (2009). (pg. 314). Springer.

External links

â— Elementary particles – Wikipedia.
â— List of particles – Wikipedia.

θΔics

In science, **particle physics** is the study of the dynamics of the particles comprising the forces and matter of the universe. [1]

Human chemistry

Aspects of particle physics logic are used in the description of mechanism of the human chemical bond, in the sense that a stable exchange force must exist between two or more human molecules in order for a chemical bond to form, and it is the exchange of primary field particles and secondary field particles that carry the force existent in the bond. A second use of particle physics is used in the construction of human molecular orbital theory, in which people are considered as human particles, whose movements are viewed over extended time periods, so as to obtain a high-speed orbital look at human movements, particularly when it comes to orbital overlap, bonding, and mechanism. [1]

References

1. Close, Frank. (2004). *Particle Physics: a Very Short Introduction.* Oxford.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.

External links

â— Particle physics – Wikipedia.

θΔics

In genius rankings, **Partington 50** refers to the ranking of the top fifty chemists, in the history of chemistry, according to citation dominance in English chemistry historian and chemical thermodynamicist James Partington's 1937 *A Short History of Chemistry*, based on "name index" page citation count, the top fifty of which are listed below, a treatise which itself is a condensed version of his three-volume *A History of Chemistry*. [1]

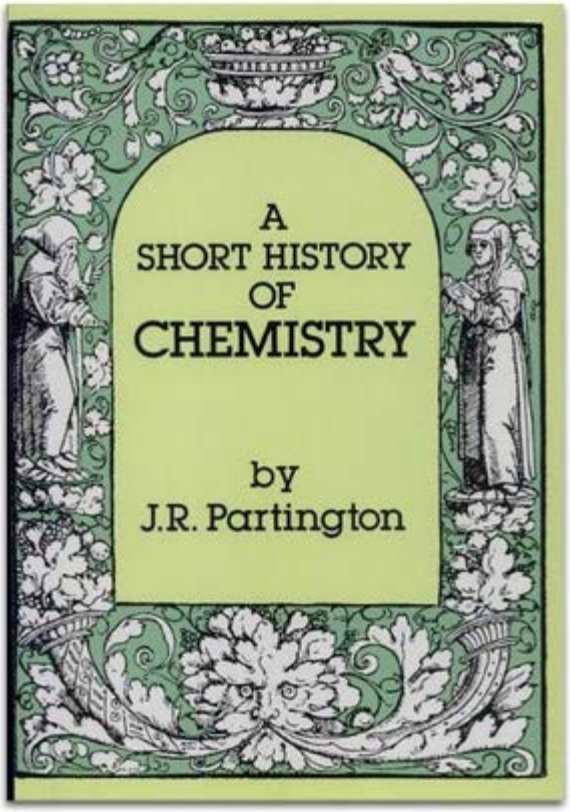

The **Partington ranking**, of the top 50 chemists, based on citation dominance, derives from English chemistry historian James Partington's 1937 *A Short History of Chemistry*, the go to quick-reference book in the history of chemistry. [1]

Top 50

The following are the top 50 chemists according to Partington citation ranking:

1. Jacob Berzelius (52)
2. Justus Liebig (39)
3. Jean Dumas (38)
4. Robert Boyle (30)
5. Antoine Lavoisier (26)
6. August Kekule (22)
7. Joseph Priestley (23)
8. Henry Cavendish (21)
9. Carl Scheele (20)
10. Claude Berthollet (19)
11. Humphry Davy (17)
12. Joseph Gay-Lussac
13. Joseph Black (16)
14. Johann Helmont (16)
15. Friedrich Wohler (16)
16. Edward Frankland (15)
17. Hermann Kolbe (15)
18. John Dalton (14)
19. August Laurent (13)
20. Thomas Thomson (13)
21. Robert Bunsen (12)
22. August Hofmann (12)
23. Robert Hooke (12)
24. Michael Faraday (11)
25. John Mayow (11)
26. Lothar Meyer (10)
27. Amedeo Avogadro (10)
28. Richard Kirwan (10)
29. Adolf Baeyer (10)
30. Georg Stahl (9)
31. Torbern Bergman (9)
32. Aristotle (9)
33. Fourcroy (9)
34. Hales (8)
35. Gmelin (8)
36. Avicenna (7)
37. Herman Boerhaave (7)
38. Werner (7)
39. Paracelsus (7)
40. Albertus Magnus (6)

41. Guyton Morveau (6)
42. Graham (6)
43. Johann Becher (6)
44. Isaac Newton (6)
45. Wilhelm Ostwald (6)
46. Cannizzaro (6)
47. Ernest Rutherford (6)
48. J.B. Richter (6)
49. Louis Pasteur (6)
50. Marcellin Berthelot (5)

These are followed by others, including: Willard Gibbs (3), Geber (2), Johann Goethe (1), among others in the near 1-4 page range.

References

1. Partington, James R. (1938). *A Short History of Chemistry*. MacMillan and Co, 1960.

θΔics

In terminology, **party** refers to either a social gathering or a person or group taking one side of a question, dispute, contest, or government policy (e.g. political party). [1]

A 1931 meeting of the minds "thermodynamics" dinner **party** photo showing, from left to right, thermodynamics founders: Walther Nernst, Albert Einstein, and Max Planck, following by Robert Millikan, grinning, noted for his famous 1909 electron charge determining oil drop experiment, at the house of host Max von Laue, noted relativistic thermodynamics pioneer; in the photo collage can be seen: Ludwig Boltzmann and Rudolf Clausius among others.

HmoIscience

Parties tend to be good in that, in theory, they tend to loosen up existing bond status quos, giving minds a window of free time to think, similar to the genius hiatus effect, thereafter giving people opportunities to transition, per transition state theory, into new reaction trajectories.

Tea party

On 19 Oct 1806, Goethe married Christiane Vulpius (1765-1816), the mother to his sixteen-year-old son August Goethe (1789-1830), albeit a women of lowly origins; shortly thereafter, the first time the pair were seen in public together was at a tea party at the house of Johanna Schopenhauer (1766-1838), mother of then aged-18 budding philosopher Arthur Schopenhauer.

Dinner party

A 1613 dinner party (Ñº) conversation on the topic of whether “the world is established and cannot be moved”, as stated in the Bible, between the Duke of Tuscany, the Duchess of Tuscany, the person who gave Galileo Galilei his professorship, Benedetto Castelli, a physics professor, and Cosimo Boscaglia, a philosophy professor, ended with Boscaglia accusing Galileo of heresy, because moving earth theory, data for which he was gathering via his new telescope, in support of Nicolaus Copernicus’ 1543 heliocentric model, conflicts with Biblical stationary earth theory (i.e. Anunian theology Geb-centric [geocentric] theory of Heliopolis creation myth); Galileo was eventually tried in 1633 and convicted of heresy, made to recant his views, and put under house arrest for the remainder of his days.

Party

A general party is type of no-rules celebration for the sake of fun, excitement, and letting go, so to speak, not necessarily focused superficially on anything in particular, such as "tea" or "dinner", that will tend to involved 3 or more people.

Dancing | Dirac dancing anecdote

See main: Dirac dancing anecdote

In 1929, mid August, Werner Heisenberg and Paul Dirac, after each had given a series of lectures in Robert Oppenheimer’s department at the University of California,

Berkeley, set off from San Francisco on a two-week cruise to Japan, during which time Heisenberg was "conventionally hedonistic", as Graham Farmelo reports, likely partying and dancing with the flapper girls. Heisenberg long remembers Dirac looking on quizzically and asking: [3]

Top (left): American electrochemical engineer Libb Thims **partying** (c.1995) at the Flats, Cleveland, Ohio, which at that time was the biggest group of dance clubs in the US, at about the time he began to conceive of human chemical thermodynamics. Top (middle): Thims at a birthday party (10 May 2014) at the Mark II lounge, Chicago. Top (right): Thims' at 4th annual summer party doing countdown (see: video) of two girls about to jump out of cake for crazy Carl's 21st birthday at the stroke of midnight (Aug 2014). Bottom (left): Thims' 3rd annual volley ball, bonfire, dunk tank and s'mores summer party (19 Aug 2013). Bottom (right): Thims at (Ñº) North Shore Chicago beach mansion birthday party (10 Apr 2016).

> "Why do you dance?"

(add discussion)

Rage

A rage is when parties tend to get rather wild, often involving at or above 100 or more people, many times in the 1000s of people.

Other

In 2009, Mark Janes, on a whim invitation to a Halloween party, dressed up as "Mr. Carbon Atom ", which was a hit, and also indicative of his new philosophy.

Quotes

The following are related quotes:

> "A little **party** never hurt anyone."

— Scott Fitzgerald (1922), *The Great Gatsby* (Ñº)

“You don't describe a tea **party** by quantum mechanics.”

— Niels Bohr (c.1950), attributed to Bohr by Howard Pattee, 2013 [2]

References

1. Merriam-Webster Collegiate Dictionary (2000).
2. (a) Pattee, Howard. (2013). "Thread post" (Ñº), Mar 8; quote conceptualized (or having been stated as a matter of fact by Bohr) as representative of the supposed *reductio ad absurdum* (reduction to absurdity) ideology of reductionism; which Pattee conceives as being embodied in his 1973 quote: “since human organizations are staffed by human beings, and since human beings are biological organisms, it might be argued that my research problem is indeed biological. And since biological organisms are constructed from molecules, and those molecules from atoms, and the atoms from elementary particles—all obeying the laws of quantum mechanics—it might even be argued that research on human organizations is merely a rather baroque branch of physics.” [2]
(b) Pattee, Howard. (1973). *Hierarch Theory: the Challenge of Complex Systems* (pg. 3). G. Braziller.
3. Farmelo, Graham. (2009). *The Strangest Man: the Hidden Life of Paul Dirac, Mystic of the Atom* (pgs. 163-64). Basic Books.

θΔics

In experiments, **Pascal atmospheric pressure experiment**, aka “Puy-de-Dome experiment” (Hall, 1970), refers to a 19 Sep 1648 test in which Florin Perier, brother in law of Blaise Pascal, took a Torricelli barometer to the base of Puy de Dome, France, then, per the instructions of Pascal, recorded the reading, i.e. height of the mercury, after which he climbed to the top, a height of 4,800 feet, and then recorded the reading of the mercury height again, finding that the column of mercury had dropped by 3 inches and 1.5 lines of height; this result therein was the first proof that atmospheric pressure decreases with height.

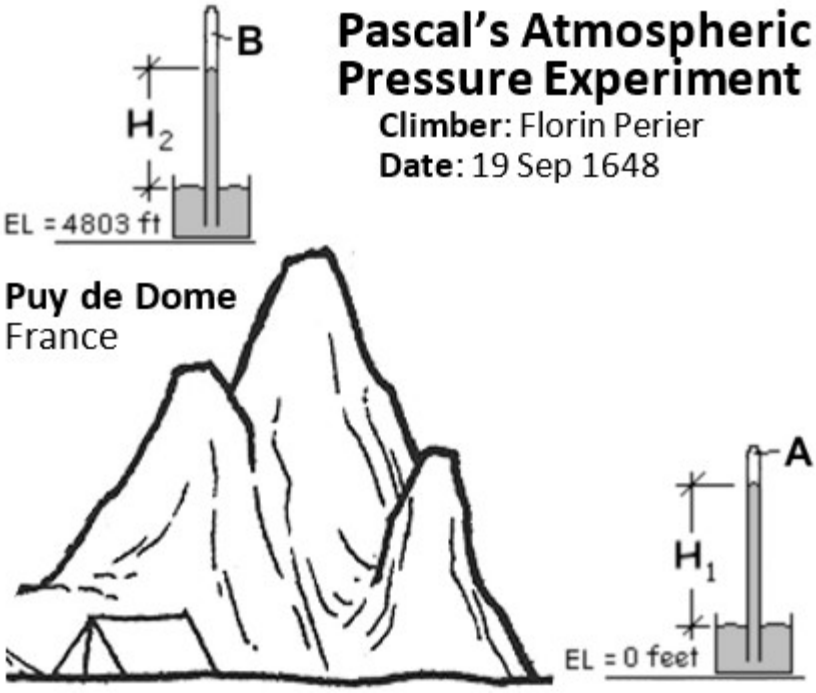

A depiction of Blaise Pascal's 1648 **atmospheric pressure experiment**, wherein he had his brother-in-law Florin Perier carry a Torricelli barometer to the top of Puy de Dome, France, to see if the height of the mercury column would fall as a result of decreasing atmospheric pressure, as he predicted.

Overview

In 1644 to early 1648, Evangelista Torricelli told Marin Mersenne, someone characterized as having the “biggest address book of amateur scientists” on the continent, about his mercury column experiment. [1] Mersenne, in turn, was the first to draw the attention of Blaise Pascal to the work of Torricelli and the mercury column. [2]

In 1647 (Hosson, 2009), or early 1648, Pascal reasoned that if it were true that earth's atmosphere has a maximum height, based on he logic of the according to the results of the Torricelli vacuum experiment, then air pressure on a high mountain must be less than at a lower altitude. The following are his thoughts on this:

> “I have thought of an experiment which will remove all doubt, if it be executed with exactness. The experiment should be made *in vacuo* several times, in one day, with the same quicksilver, at the bottom and at the top of the mountain of Puy, which is near our town of Clermont. If, as I anticipate, the height of the quicksilver be less at top than at the base, it will follow that **the weight or pressure of the air is the cause of this**; there certainly is more air to press at the foot of the mountain than at its summit, while one cannot say that nature abhors a vacuum in one place more than in another.”
>
> — Blaise Pascal (1648), “Letter to Florin Perier” (Q)

As Pascal resided near the Puy de Dome mountain, which is 4,790 feet (1,460 m) tall, and wanted to bring a mercury column to the top to test his theory, but his health was poor, so could not do the climb.

On 19 Sep 1648, after many months, Pascal convinced Florin Perier, husband of Pascal's elder sister Gilberte, to make the climb; Perier described the results as follows: (Q)

> “At eight o'clock, we met in the gardens of the Minim Fathers, which has the lowest elevation in town. First, I poured 16 pounds of quicksilver into a vessel, then took several glass tubes, each four feet long and hermetically sealed at one end and opened at the other. Then placed them in the vessel of quicksilver. I found the quicksilver stood at 26" and 31⁄2 lines above the quicksilver in the vessel. I repeated the experiment two more times while standing in the same spot. They produced the same result each time. Taking the other tube and a portion of the quicksilver, I walked to the top of Puy-de-Dôme, about 500 fathoms higher than the monastery, where upon experiment, and found that the quicksilver reached a height of only 23" and 2 lines. I repeated the experiment five times with care. Each at different points on the

summit, found the same height of quicksilver, in each case."

Pascal replicated the experiment in Paris by carrying a barometer up to the top of the bell tower at the church of Saint-Jacques-de-la-Boucherie, a height of about 50 metres. The mercury dropped two lines.

In 1651, or shortly before, Pascal, in his *De l'equilibre des liqueurs* and *De la Masse d'air*, wrote up the Dome experiment, as well as how he tried the experiment in several towers in Paris; two books were published (Q) posthumously in 1663. [3]

References

1. Winston, Morton and Edelbach, Ralph. (2013). *Society, Ethics, and Technology* (pg. 29). Cengage Learning.
2. Conlon, Thomas. (2011). *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum* (pg. 44). Saint Austin Press/LuLu.
3. Pascal, Blaise. (c.1651). *The Physical Treatises of Pascal:* the *Equilibrium of Liquids* (*De l'equilibre des liqueurs*) and the *Weight of the Mass of the Air* (*De la Masse d'air*) (Puy de Dome, pgs. 96-112). Octagon Books.

Further reading

- Hall, Marie. (1970). *Nature and Nature's Laws: Documents of the Scientific Revolution* (pg. 134). Springer.
- Hosson, Cecile and Caillarec, Benedicte. (2009). "Students' Ideas About Blaise Pascal's Experiment at the Puy de Dome Mountain" (abs), ResearchGate.net, Apr 20.

External links

- Pascal's experiment – ThermoSpokenHere.com.

θΔics

In religio-mythology, **Pascal's wager** (CR:13) is []

Overview

In c.1650, Pascal, in his *Thoughts*, attempted to grapple with the existence of god problem as follows: [1]

> "Either god is or he is not. But to which view shall we be inclined? Reason cannot decide this question. Infinite chaos separates us. At the far end of this infinite distance a coin is being spun which will come down heads or tails. How will you wager? Reason cannot make you choose either, reason cannot prove either wrong. You have two things to lose: the true and the good; and two things to stake: your reason and your will, your knowledge and your happiness. Since you must necessarily choose, your reason is no more affronted by choosing one rather than the other. But your happiness? Let us weigh up the gain and the loss involved in calling heads that god exists. Let us assess the two cases: if you win you win everything, if you lose you lose nothing. Do not hesitate then; wager that he does exist.""

(add) (Ñº)

Bradlaugh

In 1884, Charles Bradlaugh (FA:107), in his "Christian Priest and Unbeliever", gave one of the first cogent and logical refutations of a variant of Pascal's wager; the gist of which is the following: [2]

> Christian Priest: At least, belief is the safe side. When you die, if your unbelief be right, there is an end of you and of all your heresy ; and if it is wrong, there is eternal torment as your sad lot (see: Pascal's wager).
> **Unbeliever**: Hardly so. If I am right, my unbelief will live after me, in its encouragement to others to honest protest against the superstitions which hinder progress.
>
> Christian Priest: But you, at any rate, may be wrong, and belief is, therefore, safest for you.
> **Unbeliever:** Which belief? Must I accept alike all creeds?

(add)

Neumann

> *See main: Neumann on god*

In the spring of 1956, John Neumann, at the hospital, while in his last 18-months dereacting (dying) from cancer, invited Anselm Strittmatter, a well-educated Roman Catholic priest who could discuss classical Rome and Greece, to visit him for consultation, who thereafter he began to see regularly. During these visits, Neumann expressed great fear of death. To his visitors, he despaired that "he could not visualize a world which did not include himself thinking within it." [3] Neumann recited in Old Latin passages about judgment, right and wrong, and freedom:

> "When the judge his seat hath taken .. what shall wretched I then plead? Who for me shall intercede when the righteous scarce is freed?

Neumann told the priest that Blaise Pascal, in section 233 of *Pensees*, had a point, referring to Pascal's wager, commenting something to the effect of: [3]

> "So long as there is a the possibility of eternal damnation for nonbelievers **it is more logical to be a**

believer at the end."

Neumann, in short, he sided with Pascal about betting one's afterlife on belief or nonbelief in the existence of god. Subsequently, so to not lose in the wager, Father Strittmatter administered the last sacraments to him. [4] To his mother, who was also dying from cancer during this period, he expressed the following similar view:

> "There probably has to be a god, because it is more difficult to explain if there is than if there isn't."
>
> — John Neumann (c.1956), said to his mother late in life (reaction existence) [5]

Some of Von Neumann's friends, having always known him as "completely agnostic", believed that his religious conversion was not genuine since it did not reflect his attitudes and thoughts when he was healthy. As Dutch-born American physicist and science historian Abraham Pais reports: [6]

> "He had been completely agnostic for as long as I had known him. As far as I could see this act did not agree with the attitudes and thoughts he had harbored for nearly all his life."

Even after his conversion, Father Strittmatter recalled that von Neumann did not receive much peace or comfort from it as he still remained terrified of death.

References

1. Pascal, Blaise. (1861). *The Thoughts, Letters and Opuscules of Blaise Pascal* (translator: O.W. Wight; additions: Henry Rogers, Victor Cousin, Charles Louandre) (wager, pgs. 252-53). H.W. Dereby.
2. (a) Bradlaugh, Charles. (1884). "Christian Priest and Unbeliever", *National Reformer*, Aug 31; in: *Doubts in Dialogue*; Originally appeared (Ñº) in the *National Reformer*, Aug 31, 1884-Jan 11, 1891; Watts, 1909.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 414). HarperOne.
3. MacRae, Norman. (1992). *John Von Neumann: the Scientific Genius Who Pioneered the Modern Computer, Game Theory, Nuclear Deterrence, and Much More* (deathbed, pgs. 378-79). American Mathematical Society.
4. Halmos, P.R. (1973). "The Legend of von Neumann", *The American Mathematical Monthly*, 80(4):382-94.
5. MacRae, Norman. (1992). *John Von Neumann: the Scientific Genius Who Pioneered the Modern Computer, Game Theory, Nuclear Deterrence, and Much More* (fly puzzle, pgs. 10-11; God, pg. 43; deathbed, pgs. 378-79). American Mathematical Society.
6. Pais, Abraham. (2006). *J. Robert Oppenheimer: A Life* (pg. 109). Oxford University Press.

External links

â— Pascal's wager – Wikipedia.

θΔics

In terminology, **passion** refers an intense, driving, or overmastering feeling or conviction; a strong liking or desire for or devotion to some activity, object, or concept; or in the plural sense, as in "passionate", a state of intensely-felt emotion. [1]

An iconic sexual encounter rain scene, from the 2010 film *Young Goethe in Love*, of Goethe's **passionate** affair with Charlotte Buff—which was quickly extinguished owing to her family's financial situation—and his other various intellectual and poetry **"passions"**, in the 1771, when Goethe was age 22, the year he became a lawyer, which may well capture one aspect Goethe's famous retrospect 1830 comment: "I lived every word of my *Elective Affinities*." [7]

Goethe

In 1799, German polymath Johann Goethe, in a letter to his intellectual friend German author Friedrich Schiller, commented the following on French author Prosper Crebillon (1674-1762), in regard to the lack of realism in his work:

> "Crebillon … treats the **passions** like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. There is no trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover."

Turned around in the form of a learned maxim, this comment would translate as:

> "Never treat the **passions** like playing cards."

which may very well capture the quintessential essence of Goethean philosophy. In loose equation form, Goethe conceptualized passion as function of individual attractions and repulsions mediated largely by the external forces of the elective affinities:

$$f(\text{passion}) = \begin{cases} \text{attraction}, & \text{if } A \text{ is positive} \\ \text{repulsion}, & \text{if } A \text{ is negative} \end{cases}$$

where A is chemical affinity or elective affinity (as described by Torbern Bergman). In short, Goethe is commenting here that Crebillon's work is not realistic in the sense that it is not based on the way that people "react" to each other—just as chemicals react to each other—according to the principles, laws, and outcomes of physical chemistry.

Goethe, here, to note, in his "without their changing at all" comment, seems to be digging around at what would eventually come to be known as the "irreversibility" of nature, as captured in Greek flux-and-fire philosopher Heraclitus' motto that we "never step in the same river twice" and what German physical chemist Rudolf Clausius eventually came to quantify by the notion of entropy increase. Goethe, in any event, ten years later, would go on to work out the details and repercussions of this dense statement, in the form of a layered and coded physical chemistry based novella: *Elective Affinities* (1809), which thus officially-launched the science of human chemistry. The following, to exemplify the way in which "passion" is studied in the novella, is an 1859 synopsis of Goethe's novella from the *New American Cyclopedia*: [8]

> “In 1809, Goethe printed the most exceptionable of his novels, the *Wahlverwandschaften* (“Elective Affinities”), in which the charms and graces of this style are employed in the description of the impulses which spring from the collision of **passion** and duty in the relations of marriage. By the title of the book, and in the whole spirit of it, he would represent that sexual affinities follow the same inevitable law as chemical affinities, and that humanity struggles impotently against the dictates of nature. Like all his productions, this was suggested by circumstances in his own experience. The work shocked the moral world, in spite of the beauty with which it was written, and to this day tasks the ingenuity of those of his admirers who seek to defend it from attack.”

In P2:C4, Goethe ends by giving the following reflective maxims on passion, which he lists as entries to Ottilie's diary:

> “The **passions** are defects or excellencies only in excess.”
>
> “Our **passions** are true phoenixes: as the old burn out, the new straight rise up out of the ashes.”
>
> “Violent **passions** are incurable diseases; the means which will cure them are what first make them thoroughly dangerous.”
>
> “**Passion** is both raised and softened by confession. In nothing, perhaps, were the middle way more desirable than in knowing what to say and what not to say to those we love.”

Thermal theory of affinity | Thermodynamic theory of affinity

The term "passion", as employed historically in literature (see: literature chemistry and literature thermodynamics) tends to be representative—as a thermal word—of the physical term "heat" and, in this sense, following the great 1854 to 1882 “thermal theory of affinity debate”, on the topic of whether or not heat was the true driving force of chemical reactions, in the sense that the more heat that was released in a given reaction the greater the affinity between the reactants, the chemical interpretation of passion and change only become more complicated. The "heated" debate, however, was quenched when in 1882 German physicist Hermann Helmholtz published his chemical thermodynamics-launching article "On the Thermodynamics of Chemical Processes" in which he proved that "free energy" (not heat) is the true measure of chemical affinity and wherein he gave the following formulation for chemical affinity:

$$\frac{dF}{dt} \leq 0$$

meaning that the affinities *A* are "active" only in the sense in which the free energy differentials *dF* of the reacting system decrease with differentials of time *dt*. The century to follow saw purifications of this logic, significantly in the works of: Nernst (1906), Lewis (1923), De Donder (1936), and to some extent Perrot (1998) in his dictionary descriptions of the relations of affinities and free energies (see: equation decipherment):

Equations of *Elective Affinities*

$\frac{dF}{dt} \leq 0$	$A = -\Delta U$	$A = -\Delta G$	$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$	$A^\circ = \sum_{i=1}^{k} -\nu_i \mu_i^\circ$
Helmholtz	Nernst	Lewis	De Donder	Perrot

(1882) (1906) (1923) (1936) (1998)

In short, the human interactions of each chapter of Goethe's novella need to be explained in terms of partial differential equations of Gibbs free energy or human free energies per extent of reaction; or in terms of components, in the Lewis-sense of the affinity formulation:

$$A = -\Delta G$$

with substitution:

$$A = -(\Delta H - T\Delta S)$$

with carry-through of the negative sign:

$$A = T\Delta S - \Delta H$$

the "delicate affinities" Goethe spoke of in 1799, in modern terms, need to be upgraded to the "delicate entropies" ΔS and "delicate enthalpies" ΔH involved in the reactive processes through which people, in Goethe's view, "attract and repel each other, reunite, neutralize [each other], separate again and recover." In short, with the 1882 Helmholtz disproof of the thermal theory of affinity, putting in place of it the "thermodynamic theory of affinity", namely that the true driving force of chemical reactions is not "heat" but rather "free energy"—Gibbs free energy in the case of freely-going isothermal-isobaric surface-attached human chemical reactions—the modern literary writer or social theorist, in the years to follow, would have needed to reinterpret "passion" in terms of not heat but free energy, in particular Gibbs free energy, if one was to construct a drama, literary work, or social theory using chemical models.

In 1896, French-Italian mathematical engineer Vilfredo Pareto, in his *Course on Political Economics*, supposedly aware of the new chemical thermodynamics upgrade, via his knowledge of the work of American engineer Willard Gibbs, defined society as "system of human molecules in a complex mutual relationship", and further posited that each human molecule (person) only acts in response to the force of ophelimity—a formulation that supposedly removes (or deanthropomorphizes) the notion or concept of passion from the description of man:

> "First we separate the study of ophelimity (economic satisfaction) from the diverse forms of utility, then we direct our attention to man himself; stripping him of a large number of his attributes, leaving out the **passions**, good or bad, reducing him to a kind of molecule that only acts in response to the forces of ophelimity."

In 1914, English-born American chemical engineer William Fairburn, in his *Human Chemistry*, defined people—similar to Goethe (although he does not cite Goethe)—as "human chemical elements", and argued that people, as chemicals, could not only be classified by their reactive affinities among each other, but also by their respective "entropy" measure (entropy being a component of Gibbs free energy), which he says can be likened to passion: [3]

> "A classification based on their relative electricity or relative energy or enthusiasm would not of itself help us much, for misapplied energy and wasteful application of human forces are common. The classification of entropy, referring to temperature changes which can be likened to coolness, **passion**, explosiveness and frigidity, are all interesting but of themselves prove little."

In 1993, British playwright Tom Stoppard debuted his *Elective Affinities* rewrite stage play *Arcadia*, wherein he incorporates talk of sexual energy, heat, entropy, the second law, human chemical affinity, via his talk of "the attraction that Newton left out … all the way back to the apple in the garden" (see: Query 31), the steam engine, among other topics. [4]

In 2002, German chemist Volker Wiskamp, in his online article "Chemistry in the Work of Goethe", discussed Goethe's *Elective Affinities* in terms of both enthalpy (enthalpy of formation) and entropy (entropy increase) which is a very rare find, as far as human free energy theorists go. [5]

In 2007, American electrochemical engineer Libb Thims, in his two-volume *Human Chemistry* textbook, expanded on the work of Goethe, commenting, in introducing the etymology of the term enthalpy, that: [6]

> "In human intimate terms, enthalpy correlates to the heat of **passion** within human relationships."

Discussion

Of note, in comparing Thims' 2007 view (enthalpy correlates with passion) with Wiskamp's 2002 view (enthalpy of formation correlates with passion) with Fairburn's 1914 view (entropy correlates with passion), one notices a but if inconsistency, in regards to interpretation of "passion" in chemical thermodynamic terms—which is a puzzling phenomenon, to some extent? This interpretation inconsistency, by comparison, is similar to Russian physical chemist Georgi Gladyshev's 2006 view that entropy is very small and nearly insignificant in social reactions, but supposed large and significant in laboratory chemical reactions—which is the opposite of German physical chemist Wilhelm Ostwald's circa 1910 view that entropy is large in social situations, but small in beaker-sized chemical reactions situations.

Quotes

The following are other noted quotes concerning passion:

> "How few men reflect, and even among those who pay attention to themselves, scarcely any have found the thread for the labyrinth of our **passions**."
>
> — Bernard Mandeville (c.1714) [9]

> "The only unions which are legitimate are those ruled by a genuine **passion**."
>
> — Stendhal (1822), *On Love*

References

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(c) Steer, Alfred G. (1990). *Goethe's Elective Affinities: the Robe of Nessus* (Crebillon, pg. 37; symbolically, pg. 158). Winter.
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4. Stoppard, Tom. (1993). *Arcadia* (heat, 6+ pgs; sexual energy, pg. 33; atom, 2+ pgs; second law of thermodynamics, pg. 65; quote: "Ah. The attraction that Newton left out. All the way back to the apple in the garden", pg. 74). London: Faber and Faber.

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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
7. (a) Young Goethe in Love (overview) – MoveGuy247.com.
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8. Ripley, George and Dana, Charles D. (1859). *The New American Cyclopedia: a Popular Dictionary of General Knowledge, Volume 8* (pg. 337). D. Appleton and Co.
9. Zinsser, Judith. (2006). *Emilie Du Chatelet: Daring Genius of the Enlightenment* (pg. 59). Penguin.

External links

â— Passion (emotion) – Wikipedia.

θΔics

An overview of the Passion of Osiris, aka **Osiris resurrection myth**, according to which Set kills his brother Osiris, cuts his body into 14 pieces, and scatters them about the land, so that his soul can never be reborn. His sister-wife Isis recollects 13 of the fourteen pieces, all by the phallus, then mummifies Osiris, and with her sister Nephthys, magically brings him back long enough to procreate, and produce the offspring of Horus, who avenges his dead father (now god of the afterlife) by killing his uncle Set, thereby bringing order to the land. By 300AD, this had been monotheistically-rewritten into the of the Passion of Christ. [1]

In religio-mythology, **Passion of Osiris**, from the Greek πάσχειν (paschein), "to suffer", is the 2,800BC mythological story, much of which is carved on the walls of the Dendera Temple (100BC-68AD), of the death and resurrection of the Egyptian god Osiris — of which two parallel version exist — who is killed and dismembered via the jealously and hatred of his brother Set, but later reassembled and brought back to life via mummification and temporary time-stopping resurrection by his wife-sister Isis, during which time they have magical sex, producing the offspring man-god Horus, who avenges his father Osiris (now the king of the afterlife), by killing his uncle Set, thereby restoring justice and stability to Egypt. Two different overlapping versions of story of Osiris exist. [1]

Passion of Christ

The original 2,800BC polytheist version of the death and resurrection of Osiris eventually became the the 100AD death and resurrection of Jesus, aka the “Passion of Christ”, both themselves, in turn, being derivatives of the older 3,100BC story of the annual death of Ra or sun at winter solstice, refers to

Synonyms

The story of the death and resurrection of Osiris goes by various names, including: “story of Osiris” (203K), “story of Osiris, Isis, and Horus”, “legend of Osiris” (198K), “death of Osiris” (150K) or “two deaths of Osiris”, passion of Osiris (21K), aka “Osiris myth” (18K) or “Osiris legend” (6K), “Osiris resurrection” (4K), Osiris cycle (2K) or Osirian cycle (2K), numbers being Google search return dominance.

Overview

The first semi-modern historical account of the death and resurrection of Osiris was given by Plutarch. (O)

Quotes

The following are related quotes:

> “The nearest thing to a truly national religion in Egypt was the **Osiris cycle**. The story is not extant in full epic version but must be pieced together from several ancient and classical sources: the *Pyramid Texts* of the Old Kingdom, the *Coffin Texts* of the Middle Kingdom, the *Book of the Dead* from the New Kingdom, a ribald text entitled *The Contest of Horus and Seth for Rule* from the Twentieth Dynasty, and the summary of Plutarch in *Concerning Isis and Osiris* from the second century C.E.”
>
> — Patrick Reid (1987), *Readings in Western Religious Thought* [2]

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Videos

● Anon. (2012). “Legend of Osiris” (Q), WoodsMidnight, Jun 13.

External links

● Osiris myth – Wikipedia.

θΔics

In hmolscience, **passions like playing cards** is []

Overview

On 23 Oct 1799, Goethe, in a letter to Friedrich Schiller, stated the following, in truncated form, on the work of French author work of French author Prosper Crebillon (1674-1762): [1]

> "Crebillon … treats the passions like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. There is no trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover."

In short, Goethe stated his opinion that Crebillion's writing is not realistic in the sense that it is not based on the way that people "react" to each other, according to the principles and outcomes of chemistry. The full letter reads as follows: [2]

A rendition of the famous 1799 Goethe to Schiller comment that Crebillon treats the "**passions like playing cards**" with NO trace of the delicate "chemical affinities", i.e. micro-interaction forces of attraction and repulsion, that move people, interaction-wise; which is equivalent to the post 1882 [see: Helmholtz] statement that "there is no trace of any fine delicate free energies [Gibbs energy] that drive the reactive system" in Crebillon.

> "I congratulate you upon the continued good state of things in the sick room; perhaps I may myself pay it a visit. My life here is as prosaic as Voss's *Almanack*, and I do not, under the present circumstances, see any possibility of making any progress with my work, for it requires a tender state of mind. Just that which has now to be done with *Mahomet* can, least of all, be accomplished by mere reason.
>
> Since Humboldt's letter [N1] and your adaptation of Mahomet have given me new light regarding the French stage, I find more pleasure in reading their plays, and have now begun Crebillon. He is remarkable in a peculiar way. He treats the **passions like playing cards**, which are mixed, played out, and can again be shuffled and played out without being in the least degree changed. There is in him no trace of any fine chemical affinity, by which they are attracted and repelled, united, neutralized, again divided and repaired. True he does, in his way, obtain situations which it would be impossible to obtain otherwise. To us this manner would be intolerable, but I have been thinking whether it might and should not be successfully employed in an inferior kind of composition, in operas and plays of chivalry and mystery. My thoughts on the subject will lead to discussion and reflection.
>
> I shall be very glad if you bring the scheme of your *Maltese Knights* with you. If I can make it possible—but more especially if I see no other way of getting my *Mahomet* finished—I shall come over on the 1st of November; by that time everything that depends upon me here will be pretty well set agoing for a time.
>
> From Frankfurt I have received the news that Schlosser [N2] is dead. The French and his own garden were the immediate causes of his death. He was in it when the French were approaching Frankfurt; he was late, and found the nearest gate locked, he had to hurry on to the next one—which was a long way off—came into a very hot room, and was thence called to the town-hall, whereupon he was attacked by a fever, which proved fatal and carried him off in a very short time. Farewell, and let us make use of the days that are still before us."

(add discussion)

See also

â— Balzac feelings and affinity dialogue | Balzac (1834)
â— Church of Elective Affinities | Shelley (1816)

Notes

N1. This letter of Humboldt's was published in the fifth number of the PropyUea under the title of: Ueber die gegenwartige Framlisische tragieche Biihne.
N2. Goethe's brother-in-law who had returned to Frankfurt as syndic some months previously. He died on the 17th of October.

References

1. (a) Winnett, Susan. (1993). *Terrible Sociability: the Text of Manners in Laclos, Goethe, and James* (pg. 220). Stanford University Press.
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(c) Steer, Alfred G. (1990). *Goethe's Elective Affinities: the Robe of Nessus* (Crebillon, pg. 37; symbolically, pg. 158). Winter.
2. Goethe, Johann. (1799). "Letter to Friedrich Schiller", Oct 23; in: *Collected Works, Volume 14* (pg. 284-85). Publisher.

θΔics

In thermodynamics, **path function** is a one, two, or three dimensional Cartesian coordinate function whose magnitude depends on the path followed during a process as well as the end state. Path functions have inexact differentials. A path function, such as heat or work, are often contrasted with state functions, which are path independent and have exact differentials. [1] The difference between what constitutes a path function and a state function is bound up in the condition for an exact differential, which predates thermodynamics. In loose speak, according to American thermodynamicist Gordon van Wylen, the term 'point function' is synonymous with exact differential and the term 'path function' is synonymous with inexact differential. [1]

Related, albeit more complicated, conceptions include irreversible paths and reversible paths.

Few particle systems

There is some indication, according to computer simulations in nanothermodynamics (small system thermodynamics), that as system particle count becomes smaller, i.e. goes below about 1,000, and begins to decrease towards zero, path functions become state functions and state functions become path functions. [2]

Human thermodynamics

In 2006, American thermodynamics professor Christopher Edwards, at Stanford University, was teaching his students that, in thermodynamic terms, life is a path function: [3]

> "Life is a **path function**. You begin life, you end life—that's not so interesting, right? But quality of life is a path function. It's the path that you take from the beginning to the end, the integral of that path, that's the special part."

Edwards explains that it is the choices one makes along the path that are the important steps.

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3. Levy, Dawn. (2006). "Professor of Thermodynamics Shares Best Practices for Teaching Tough Topics." *Stanford Report*, Dec 05.

Further reading

● Perrot, Pierre. (1998). *A to Z of Thermodynamics* (path function, pgs. 62, 106, etc.). Oxford University Press.
McQuarrie, Donald A. and Simon, John D. (1997). *Physical Chemistry: a Molecular Approach* (section 19-8: Heat capacity is a path function, pgs. 783-85). University Science Books.

External links

● What is the difference between a path function and a state function in thermodynamics? – WikiAnswers.
● State function vs Path Function (2007) – PhysicsForums.com.
● Why is heat a path function and not a state function? – YahooAnswers.

θΔics

In thermodynamics, **path-dependent**, as compared to "path-independent", refers to function (see: path function) or variable, typically heat dQ or work dW, that "depends" on the "path taken", a thing typically defined graphically (e.g. PV-diagram), in going from one state (initial state) to another state (end state or final state).

Quotes

The following are related quotes:

> "When the state of a system is altered, the change of any state function depends, by definition, only the initial and final states. It must therefore be ***independent*** of the path along which the change in state has taken place."
>
> — Jurg Waser (1966), *Basic Chemical Thermodynamics* [1]

References

1. Waser, Jurg. (1966). *Basic Chemical Thermodynamics* (pg. 12). W.A. Benjamin, Inc.

θΔics

In thermodynamics, **path-independent**, as compared to "path-dependent", refers to function (see: path function) or variable, e.g. energy, enthalpy, or entropy, that does NOT "depend" on the "path taken", a thing typically defined graphically (e.g. PV-diagram), in going from one state (initial state) to another state (end state or final state).

Quotes

The following are related quotes:

> "When the state of a system is altered, the change of any state function depends, by definition, only the initial and final states. It must therefore be ***independent*** of the path along which the change in state has taken place."
>
> — Jurg Waser (1966), *Basic Chemical Thermodynamics* [1]

References

1. Waser, Jurg. (1966). *Basic Chemical Thermodynamics* (pg. 12). W.A. Benjamin, Inc.

θΔics

In hmolscience, **Patrick Ezepue** (c.1965-) is a Nigerian-born English researcher noted, in business thermodynamics, for his 2004 thermodynamics conceptualized career advancement model.

Overview

In 2004, Ezepue began working out a version of "human thermodynamics" (his term usage) of what he calls the soft mathematical "state equations" to quantify the movement of a student, productively and creatively, through the university and eventually, as a professional, through the corporate academic model, who sell their intellectual work as a business. Ezepue defined "human thermodynamics" as the application of thermodynamics principles to ergonomics and productivity-enhancing factors in man-machine systems, especially with the thinking and production of creative mental and physical artifacts. [1]

Education

Ezepue completed his BS in statistics in 1985 and his MS in statistics in 1989 both at the University of Nigeria, Nsukka, and completed his PhD in stochastic modelling at the University of Sheffield, UK, in 1999. Ezepue currently an Adjunct Associate Professor in Applied Statistics at the Nnamdi Azikiwe University, Nigeria, where he co-leads multidisciplinary mathematical sciences research developments in Statistics, Mathematics and Computer Sciences. He is the Research Lead in Business Intelligence and Quantitative modelling at Sheffield Hallam University (SHU), United Kingdom. [1]

References

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2. Patrick Oseloka Ezepue (about) – Glosstra.co.uk.

External links

â— Patrick Ezepue (faculty) – Sheffield Hallam University.
â— Patrick Oseloka Ezepue –AfriHero.org.uk.

θΔics

In existographies, **Patrick Fergus** (1985-2015) (DN:9.5) (CR:26), aka "Pat" or "King Atheist", was an American atheist and realist noted for being the co-host, with American extreme atheist and electrochemical engineer Libb Thims, of the 2014-launched YouTube channel Atheism Reviews. [1]

Thompson | Kesey

Fergus' favorite author was American writer, journalist, and realist Hunter Thompson (1937-2005). The following is the most-liked quote of Thompson's *Fear and Loathing in Las Vegas*, his most-famous book, according to GoodReads: [3]

> "No sympathy for the devil; keep that in mind. Buy the ticket, take the ride ... and if it occasionally gets a little heavier than what you had in mind, well ... maybe chalk it off to forced conscious expansion: Tune in, freak out, get beaten ... it's all in Kesey's Bible …. the far side of reality."

The mention of "Kesey's Bible" here refers to American *One Flew Over the Cuckkoo's Nest* author Ken Kesey (1935-2001) and his 1971 *The Realist* article "The Bible", and it's philosophical discourse on the paradoxical nature of work; few representative quotes: [6]

> "Man's theories about himself will build up, like tartar on a tooth, until something breaks the shell or until he succumbs to the twilight security of an armored blind mind."
>
> — Ken Kesey (1971), "The Bible", attributed to Jerry Garcia [6]

> "This task of revolution turned to with conscious purpose ten years ago has demanded nothing less than full time effort of everyone aware of the job to be done. No one has f*cked off—laid back, maybe, or f*cked up, but not really f*cked off—because the person who can still take a vacation has never gone to work—and very few have defected back to their former jobs. Who wants to take a train back and forth every day from one schizophrenic life to the other?"
>
> — Ken Kesey (1971), "The Bible" [6]

(add discussion)

Energy philosophy | Atheist's creed

Fergus was a passionate hard-core atheist, even being an "evangelical atheist" of sorts with most people he came in contact with, particularly if you began to hang out with him and or interact with him. The following is what Fergus believed in, i.e. his atheist's creed so to say:

> "Energy. You have sex, there's friction … that's heat. Then a baby shoots out. It's all energy. The sun's a giant orgasm. Like if you see a hot girl ... and she's soo hot, you can't even touch that sh*t. You're like daaammn!"
>
> — Pat Fergus (2014), when queried on Easter (Apr 20) about what—as an atheist—he believes in?

In respect to where he derived this "belief", his favorite author was American writer Hunter Thompson (1937-2005),

best-known for his 1971 book turned (1998) film *Fear and Loathing in Las Vegas*, which was Fergus' favorite film, behind *Wolf of Wall Street* (2014). [2] The following are notably representative "energy" structured Thompson quotes:

> "All energy flows according to the whims of the great magnet. What a fool I was to defy him."
>
> — Hunter Thompson (1971), *Fear and Loathing in Las Vegas* (Ñº)

> "History is hard to know, because of all the hired bullsh*t, but even without being sure of 'history' it seems entirely reasonable to think that every now and then the energy of a whole generation comes to a head in a long fine flash, for reasons that nobody really understands at the time—and which never explain, in retrospect, what actually happened . . . There was madness in any direction, at any hour. If not across the Bay, then up the Golden Gate or down 101 to Los Altos or La Honda . . . You could strike sparks anywhere. There was a fantastic universal sense that whatever we were doing was right, that we were winning . . . And that, I think, was the handle—that sense of inevitable victory over the forces of Old and Evil. Not in any mean or military sense; we didn't need that. Our energy would simply prevail. There was no point in fighting—on our side or theirs. We had all the momentum; we were riding the crest of a high and beautiful wave . . . So now, less than five years later, you can go up on a steep hill in Las Vegas and look West, and with the right kind of eyes you can almost see the high-water mark—that place where the wave finally broke and rolled back."
>
> — Hunter Thompson (1971), *Fear and Loathing in Las Vegas* [2]

(add)

Religion | Upbringing

Fergus was raised Irish Catholic, his father being an Irish Catholic Christian, his mother being denominationally a theist, but teetering on atheism, as Pat speculated in 2014. At age 10, Fergus irreverence and disdain for religion was prominent, as evidenced by the fact that him and his friend Chris burned ten of one of their Jewish friend's yarmulkes in a fire, for a laugh. At age of about 15, Fergus became an atheist, as one of his Jewish friends recollect things, as told to Libb Thims, when queried about when Fergus became atheist; which seems to corroborate with episode commentary where he "by that age" told to his parents [or father] "I'm not stepping foot in another church." The following Thompson quote seem to capture aspects of Fergus' mindset:

> "This is the same cruel and paradoxically benevolent bullsh*t that has kept the Catholic Church going for so many centuries. It is also the military ethic … a blind faith in some higher and wiser 'authority.' The Pope, The General, The Prime Minister … all the way up to 'god'."
>
> — Hunter Thompson (1971), *Fear and Loathing in Las Vegas* [4]

(add)

Abioism

The following are Fergus' absorption of abioism view:

> "Good lookin' out Libb!"
>
> — Pat Fergus (2014), laughing response after explained by Libb Thims that life does not exist and is a religious concept

“If we’re alive we die, [if] we’re not [we don’t].”

— Patrick Fergus (2015), an Atheism Reviews video; in: *Best of Pat Fergus* (28:28); made shortly before he met his own reaction end

(add)

Atheism Reviews

In 2014, Libb Thims, in the wake of the Beg-Thims dialogue, in particular Mirza Beg's admittance that he believes in flying horses, approached Fergus, who had been talking with Thims about atheism, nearly daily since the met, about doing a YouTube atheism channel.

Patrick Fergus and Libb Thims during their debut show “History of Atheism | Timeline” doing fist-bump (@2:45-) after Fergus quick-wittedly responded to the query: in what year did Nietzsche declare that ‘god is dead?’ with: “God can never be dead, because he’s never existed.”

Thims told Fergus that his shown nickname was going to be “King Atheist”, per the reasons:

(a) atheism is all he ever talks about, particularly when he's drinking with his friends
(b) he’s always trying to convert his spiritual and religious friends to atheism, by ripping on the idiocy of their belief system, sometimes staying up all night, till the crack of dawn, to do so
(c) owing to the fact that he has a Jewish friend, that drives him around to parties and bar-hopping, whom he always refers to in the third person as “King Jew”, whereby, accordingly, Thims told Pat: “just as you call what’s-his-name ‘King Jew’, we have to call you ‘King Atheist’!”

The "crown" symbols to all the thumbs of all Atheism Reviews episodes wherein King Atheist is co-host, per his debut interjection "heavy wears the crown" gesture. [4]

The following are noted show quotes and or show-related quotes:

“There's no soul; that’s garbage.”

— Pat Fergus (2014), response statement when Libb Thims told Pat that he was conducting a “What is the Soul Comprised of?” polling of 36 people; also picked as most-liked answer by vote, Sep 28 [5]

“God can never be dead, because he’s never existed.”

— Patrick Fergus (2014), response to query: in what year did Nietzsche declare that ‘god is dead?’ (V:2:00-3:00) in “History of Atheism | Timeline”, Atheism Reviews, Nov 5

“I’d sniff chopped bacon off the Quran!”

— Pat Fergus (2014), Allah-based Islam vs Chance-based atheism (Ñº), Nov 12

"…. and then a cockroach fell outta the toilet."

— Pat Fergus (2014/15), interjection following Art's (the God-believer) discourses on God and religion

"Ashes to ashes, dust to dust."

— Pat Fergus (2014/15), response to query: "What's the most truthful thing in the Bible?" | Note: historically, this is a mixture of Plato's first law of affinity and the clay creation myth

(add discussion)

Reaction end

Fergus met his reaction end on Wednesday 21 Jan 2015, while on vacation in Thailand, after a long night of partying no-doubt like a rock star themed Hunter Thompson, in Cambodia, at the age of 29. The following Thompson quote seems to capture Fergus' out:

A 20 Jan 2015 photo of **Fergus** during, his last night, in Otres Beach, Cambodia, with his traveling friend Kevin Matthew, who remembers him "turning around with the biggest simile on his face."

"We must ride this strange torpedo out until the end."

— Hunter Thompson (1971), *Fear and Loathing in Las Vegas* (Ñº)

"There he goes. One of god's own prototypes. A high-powered mutant of some kind never even considered for mass production. Too weird to live, and too rare to die."

— Hunter Thompson (1971), *Fear and Loathing in Las Vegas* [3]

"You took too much man, too much, too much."

— Hunter Thompson (1971), *Fear and Loathing in Las Vegas* [3]

"Old elephants limp off to the hills to die; old Americans go out to the highway and drive themselves to death with huge cars."

— Hunter Thompson (1971), *Fear and Loathing in Las Vegas* [3]

> "Get the ludes. I'm not gonna die sober!"
>
> — Jordan Belfort (2013), Jordan Belfort to Donnie Azoff in film *The Wolf of Wall Street*; a Fergus favorite quote

In short, the days before he left he was bragging, to Thims, how is friend Fernando said "I'd better go have a drink with you, because this might be the last time I see you!" He had already made out his last will and testament with his lawyer friend, from high school, who resides down the block from Thims; talking endlessly about how he wanted to be fed to the sharks when he's gone, etc.. The last movie he wanted to watch in Chicago before going away was *Full Metal Jacket* (1987), during which he was real intense related to Thims and Art the god believer, who was there, how he related to the lead character in the film.

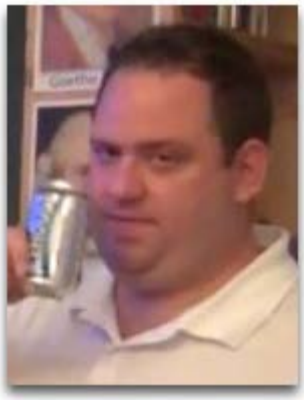

Fergus during one of the Atheism Reviews episodes.

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θΔics

In hmolscience, **Patrick Geddes** (1854-1932) (CR:8) was a Scottish physical economist, biologist, and urban planner noted, in architectural thermodynamics, for his *circa* 1910s theories on energy construction and energy destruction in the design of urban centers.

Overview

Geddes linked historical developments with the consumption of energy and the importance of English polymath John Ruskin's vision of the role of the physical sciences in the processes of life and for his development of an energy accounting methodology that represents net energy and material transformations, illustrating production inefficiencies and the relative value between energy inputs and outputs. [1]

Geddes is often grouped with Ukrainian physician and socialist Sergei Podolinsky along with engineer and social reformer Josef Popper-Lynkeus who each were said to have tried to promote a biophysical view of economy as a subsystem embedded in a larger system subject to the laws of thermodynamics. [2]

It is difficult, to note, to find exactly what in publication Geddes uses thermodynamics logic? According to Italian architect Luis Fernández-Galiano, Geddes alludes to thermodynamics logic in his 1915 *Cities in Evolution*, stating that we need both "constructive and destructive energy" in the design of urban fabrics. [4]

American political economist Kenneth Stokes lists Geddes as one of the 'heretical philosophers of social energetics', along with Wilhelm Ostwald, Leon Winiarski, A.A. Bogdanov, Nikolai I. Bukharin (*Historical Materialism: a System of Sociology*, 1921), Julius Davidson, Eduard Sacher, Felix Auerbach, Rudolf Clausius, Leopold Pflaunder, Georg Helm, Thomas Carver, F. Ackerman, F. Henderson, Alfred Lotka, and Frederick Soddy. [3]

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3. Stokes, Kenneth M. (1994). *Man and Biosphere: Toward a Coevolutionary Political Economy* (pg. 90-91). M.E. Sharpe.
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θΔics

In literature thermodynamics, **Patrick O'Neill** (c.1944-) is an Irish-born Canadian German-literature and comparative literature theorist noted for

Overview

In 1980, O'Neill gave a seminar on "black humor fiction", which resulted in his 1990 book *The Comedy of Entropy: Humour, Narrative, Reading*, wherein he discusses writers who employ "entropic comedy", which he defines as: the expression — literary or otherwise — of a form of humor whose primary characteristic is its own awareness of its status as essentially decentered discourse; the following, from Canadian Book Review Annual, is a synopsis:

> "In a world preoccupied with doubt, disorder, and indeterminacy, where the laws of thermodynamics seem the only certainties, **O'Neill** sees a deconstructive "black humor" as the inevitably dominant literary mode. Imposing order on existential chaos (with a hint, one hopes, of the quixotic nature of the undertaking), he divides his study into three parts: the contextual, in which the subject is discussed in relation to contemporary intellectual ideas; the theoretical (and we all know what that means); and the practical, in which 12 illustrative texts are duly analyzed.
>
> O'Neill makes further divisions here into satire, irony, and parody, neatly providing four specimens of each. Since this is an exercise in comparative literature, texts in English, French, and German are included; the authors discussed are Beckett, Camus, Céline, Grass, Handke, Heller, Joyce, Kafka, Nabokov, Pynchon, Robbe-Grillet, and Sartre. If, as O'Neill maintains, "narrative always borders on parody," so does literary criticism, and in seriously providing an elaborate taxonomy of entropic comedy, O'Neill is clearly walking a tightrope over an absurd abyss.
>
> Though he warns in a chapter title against the importance of being earnest, he tends to be fairly earnest himself; for example, his complicated diagrams and equations in Part 2—designed, he says, "to clarify"—cry out for deconstructing parody. One does not expect humorous writing in such a study, but an approach that allowed for the expression of witty paradox within the argument would have helped immensely. Significantly the texts that come across most effectively in Part 3 are those in which language is most freshly and dexterously employed; O'Neill's non evaluative subdivisions seem secondary. *The Comedy of Entropy* contains some interesting insights, breaks some new ground, and is necessary reading for anyone interested in literary genres, but I wish it were a little lighter in tone."

In one part, to exemplify further, O'Neill comments on how the character Oskar, of German author Gunter Grass' 1959 *The Tin Drum*, after being rejected by the public schools, "undertakes his own education by close reading of two books whose pages, for simplicity's sake, he has torn out and shuffled to make a single new volume, Goethe's Elective Affinities and a volume promisingly entitled *Rasputin and Women*." [1]

Education

O'Neill completed his MA in Ireland in 1968, his PhD at Queens University in 1972, and Doctor of Literature in Ireland in 1994. Presently, he is professor of German and associate dean of international studies at Queens University, Canada. Much of O'Niell's comparative literature studies, to note, seem to be focused on the works of German author Gunter Grass.

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External links

- Patrick O'Neill (faculty) – Queens University, Canada.

θΔics

In existographies, **Patrick Walsh** (1923-2013) was a English Latinist and classical philologist, generally focused on the works of Livy and Cicero.

Overview

In 1997, Walsh did the introduction, translation, and notes to the Oxford University Press English translation of Cicero's *On the Nature of the Gods*, wherein he footnotes paragraphs of correctional side commentary on Cicero's take on the ancient Greek philosophers, their schools, and theories about god. [1]

Religion

Walsh influenced by his father, who had had a mystical experience after being wounded at the Somme, was a devout Catholic. This was one reason for his interest in patristic writers such as St Paulinus, Thomas Aquinas, and Augustine. He received a papal decoration for this work. (Ñº)

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External links

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θΔics

In hmolscience, **Patrissia E. Cuberos** (c.1965-) (DN:4±) is a Colombian-born British writer noted for her *The Thermodynamics of Love*, a three-part one of a three-part trilogy (part I: *The Secret Life of a God*, part II: *Diary of an Ex-Goddess*; part III: *The Physics of Romance*), a seeming mixture of literature thermodynamics and quantum philosophy, wherein she applies chemistry (marginally), thermodynamics, and supposedly physics (third volume), to the explication of relationship dynamics, via a fictional story, as a seeming emotional catharsis to better find resolution or understanding with her own historical course of four marriages and four children; a seeming mixture of Carl Sagan, Jean-Paul Sartre, existentialism, and quantum indeterminacy, interlaced with a thematic two-sided god-questioning discourse.

Overview

In 2000, Cuberos began writing her manuscript for *The Thermodynamics of Love*, the abstract of book one, *The Secret Life of a God*, published on 31 Jan 2015, is as follows: [1]

> "We live in a world of relationships: from chemical bonds to boy meets girl, to families and societies, to the laws that govern the cosmic order. The trilogy is a typical love story. Indeed, boy meets girl and a relationship develops, but we all know that as Woody Allen says 'Sooner or later everything turns to sh*t.' In other words, in most relationships, the initial dynamic exchange of heat-energy soon becomes the dreaded lukewarm entropy, harbinger of heat death. However, the physics that seem to doom David and Kate's relationship to the thermodynamic trap, might be able to help them to transform it into the everlasting loop of energy exchange they have always dreamed of: a superconductive love unmarred by friction from guilt, fear and resentment. Their quest will force them to challenge, and eventually transcend their all too human feelings of inadequacy, the apparently inevitable limitations of time, and the hazy, illusory lines between dream and reality, life and death."

The work and philosophical underpinnings were inspired by a mixture of the belief that thermodynamics govern relationships, but that there is the possibility for self-directed change via something akin to the quantum indeterminacy ideas in Danah Zohar's 1990 *The Quantum Self: Human Nature and Consciousness Defined by the New Physics*. [2]

Cuberos' *The Thermodynamics of Love* is similar, in some conceptual sense, to David Hwang's 2001 article "The Thermodynamics of Love", albeit more structured on Prigoginean thermodynamics, rather than Gibbsian thermodynamics (Hwang's version), and interlaced with the addition of quantum indeterminacy ideas, and also lacking the human chemical reaction theory. Cuberos states that she was aware of Hwang's article, via Hmolpedia (circa 2009), after already working on her first novel for several years; then re-discovering it again in early 2015 after the publication of her first novel. (Ñº)

On 20 Jul 2015, Cuberos published book two, *Diary of an Ex-Goddess*, the synopsis of which is as follows: [3]

> "Some people need to die in order to live. Kate is one of them… Kate has met David again, but she is now a very different person: a survivor. After all, as a fallen goddess, she has learnt the hard way that beauty is like paper wings to a firebird, dangerous and ephemeral. If there is any chance of re-kindling the love that they once shared, she hopes that this time it won't be thermodynamically determined. It must end differently. Then, like a phoenix she must rise from the ashes of depression into the dawn of self-love: the magic key to true, reciprocated love."

(add discussion)

Education

Cuberos states that her scientific background is that of a layperson's understanding of things; a self-education style of

knowledge accumulation.

Religion | Beliefs

Cuberos was raised as a Catholic, in a very Catholic country, and attended a very strict school led by nuns. Cuberos' father, of note, was an atheist, whom she saw as the "paradigm of virtue", which presented her with an intellectual conflict, being that the nun's told her that "atheists go to hell when they die." The nuns thought her to fear god, and that pleasure, happiness, and sexual pleasure were not to be pursued. At age 14, however, Cuberos began to read outside of her faith, e.g. works of the mystics, and states that it took 20 years to expunge many of these early religious indoctrination beliefs out of her head; specifically:

> "Prisoner as I was of the fear of god, or perhaps of the god of fear, it took me 20-years to free myself from the clutches of the terrifying images imprinted in my mind by my early education, and to enter fearlessly into the worlds of religious exploration. I live entrenched into what I currently perceive as my reality. I am as happy as I can be. I have the universal freedom to believe anything and to doubt everything, and I exercise those two basic human rights to the best of my ability."

Her 2015 statement on god is as follows: "I don't know if god exists, but I am sure god, if there is one and whatever or whoever god is, god believes me." [1] This, together with her atheism-inclination towards her father, would seem to situate her at Dawkins number: 4-5, approximately. The following would be her seeming agnostic's creed (see: atheist's creed), so to say:

> "I believe in myself, in the goodness of existence, and I believe in love. Like Dante in *The Divine Comedy* (Ñº), I believe in universal love: 'the love that moves the sun and the other stars'."
>
> — Patrissia Cuberos (2015), *The Thermodynamics of Love* (§:The Author and Religion, loc. 2731)

(add discussion)

Glossary

Cuberos includes a glossary key terms employed in her trilogy, including: absolute zero, action at a distance (non-locality principle), arrow of time, autopoiesis (Humberto Maturana and Francisco Varela's 1972 theory), butterfly effect, big bang, biophoton (Fritz-Albert Popp's experiment), black hole, bon savage (Jean-Jacques Rousseau's natural man concept), bosons, Cartesian, causal determinism, change of state, chaos theory, complex system, conservation of energy, Copenhagen interpretation, dark energy, dark matter, Rene Descartes, determinate state, determinism, field theory, dissipative structures, dualism, dynamical system, eco-system, energy, entanglement, entropy, equation, fermions, Ludwig Feuerbach, friction, Herbert Frohlich, Frohlich-Prigogine system, relativity, graviton, gravity, grand unification theory, heat, heat death, Werner Heisenberg, indeterminate state, irreversibility, causality (law of causality), Magdeburg hemispheres, materialism, mechanics, M-theory, multiverse, Isaac Newton, Newtonian mechanics, Newton's clockwork universe, non-linear system, observer's paradox (wave function collapse), paradox, parallel universes (William James' 1895 term), particle/particle-like (wave particle duality), periodic table (chemistry), phase, photon, predeterminism, Ilya Prigogine, quantum indeterminacy, quantum mechanics, quantum numbers, quantum paradox (Schrodinger's cat), quantum state, quantum superposition, relational holism, resistivity (electric current), Sadi Carnot, Erwin Schrodinger, self-organized systems, singularity, sophism, speed of light, state, statistical (state quantification), superconductivity, superconductors, super-string, supersymmetry, system, theory of everything, thermodynamics, uncertainty principle, and wave function.

The book also contains a religion and mythology glossary, with terms from Hinduism, e.g. Brahma and Saraswati, Buddhism, e.g. eightfold path, karma, samsara, etc., Greek mythology, e.g. phoenix, Prometheus, etc., Islam, e.g. Sufism.

Quotes

The following are noted quotes:

> "Like my protagonists, I wrestled throughout all my young years with the thermodynamic nature of my relationships. All of them seemed to be doomed. When I started writing this novel, fourteen years ago, I hadn't found a solution. I seemed to be condemned by physics or stupidity, to have unsatisfactory relationships. But I am not easily defeated."
>
> — Patrissia Cuberos (2015), *The Thermodynamics of Love* (§:Scientific Inspiration, loc. 2668)

> "If we equate love and passion to heat, it is often the case that on those first passionate encounters: heat runs or is transferred from the hotter to the colder body. Once the two bodies reach the same temperature, the dynamic energy exchange stops, the inevitable entropy takes its toll, and heat death threatens to smother the once vigorous flame."
>
> — Patrissia Cuberos (2015), *The Thermodynamics of Love* (§:Scientific Inspiration, loc. 2688)

Ben Biddle's 2013 "Heat = Passion" coffee napkin idea sketch of innovation being like a chemical reaction; which similar to **Cuberos**' 2015 ideas of equating love and passion with heat (see adjacent quote). [4]

References

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(b) Thims, Libb. (2014-15/16). *Chemical Thermodynamics: with Applications in the Humanities* (97-page version: pdf of 800-pages estimated total) (Biddle "Heat = Passion" diagram, pg. ix). Publisher.
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- Patrissia Cuberos (about) – The Science of the Improbable, WordPress.com.
- Patrissia Cuberos (about) – Gravatar.com.

θΔics

In hmolscience, **Paul Aebersold** (1910-1967) was an American biophysicist noted for his 1930s work on the production and application of the first radioactive materials (sodium-24 and phosphorus-32) administered to humans, resulting in his so-called atomic "turnover rate" studies based model of the metabolic-themed material composition of a human or human molecule. In 1949, Aebersold, in his "Atomic Energy Benefits: Radioisotopes" address, stated following: [1]

> "Everyone should be interested in atoms. We are much more intimate with atoms than we realize. They make up all the air we breathe, all the food we eat, our flesh and blood and bone, and everything around us — in fact, all the matter in the world, the planets, the stars and the far away galactic universes. Each of us from a purely physical standpoint is a large batch atoms."

This "batch of atoms" description of a human, to note, is similar to the recent "bag of chemicals" description seen being employed. He continues:

> "The atoms now in your body are being replaced by new atoms at an amazingly rapid rate — at such a rate that in another year **...** Before we go into more detail about the terrific traffic of atoms in your body — for that matter, the rapid atomic turnover in all forms of life, in even the simplest organisms — let us pause for some background information that may forestall the quite justified unbelief you may have concerning these startling facts. How do we know all this? How do we follow all the fast and complicated maneuvers that atoms enter into in our bodies and other complex systems?"

Aebersold at his computer station, either at Berkeley Radiation Laboratory or at the Oak Ridge National Laboratory, Tennessee, where at he did his pioneering experiments done with radioisotopes and the tracing of elements in and out of the body, finding that atoms in animate organisms have a 98 percent per year atomic **turnover rate**. [3]

Later, following further discussion, Aebersold clarifies:

> "Among stable elements from hydrogen, element number one, to bismuth, element number 83, there are now known 284 stable species of atoms or isotopes. Actually, therefore, we are not just composed of atoms, but of a number of different forms of atoms, or isotopes. We are composed of stable isotopes of hydrogen, carbon, oxygen, nitrogen, calcium, and so forth. Hence, in terms of physics, you are not just a batch of atoms but a batch of 'stable isotopes'!"

Education

Aebersold completed his AB in physics at Stanford University and his PhD in biophysics in 1939, in the area of the production and application of the first radioactive materials (sodium-24 and phosphorus-32) administered to humans, at the University of California, Berkeley, where he was a member of the group under American physicist Ernest Lawrence, the 1932 inventor of the cyclotron.

Aebersold stayed at Berkeley to do post-doctoral work on radioisotopes, investigated the properties of biological reactions resulting from fast neutron beams, and was a research associate in the Radiation Laboratory at Berkeley where he was in charge of operating the 60-inch cyclotron. In 1946, Aebersold became chief of the Isotope Branch at the Los Alamos Scientific Laboratory, Oak Ridge. In 1957, Aebersold transferred to Washington D.C. to eventually become, in 1962, the Director of the Atomic Energy Commission's division of isotopes development. [2]

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2. Seaborg, Glenn T. (1968). “Paul C. Aebersold (1910-1967)” (abs), *Radiation research*, 33(3):677-79.
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External links

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θΔics

In hmolscience, **Paul Bohannan** (1920-2007) was an American anthropologist noted, in anthropological thermodynamics, for his 1995 book *How Culture Works*, wherein he attempts to extend the works of Leslie White, Alfred Kroeber, etc., speculating on things such as: action chains, cultural heat, cultural temperature, cultural dynamics, among others.

Overview

In 1995, Bohannan, in his *How Culture Works*, section "Transformation", attempts to outline the difficulties involved in the application of thermodynamics to the study of cultural transformation, such as how transformations are studied in physics, discussing concepts such as "cultural temperature", etc; the following is an example quote: [1]

> "Adapting thermodynamic ideas to the study of culture is limited by a very simple fact: nobody has yet figured out what might be the cultural equivalent of heat or energy … nobody has yet found the 'heat' or the 'energy' in cultural matters … the concepts of 'cultural temperature' (see: social temperature) to refine our understanding of 'cultural heat' (see: social heat) have not yet appeared. This is one of the most pressing problems for the next generation of anthropologists, and the difficulties are profound."

Bohannan also outlines a chapter on what he calls "cultural dynamics" based on the postulate of the existence of 'action chains'; which, in a modern human chemistry sense, might be equivalent to mechanism steps in a series of human chemical reactions.

Education

Bohannan completed his undergraduate work at the University of Arizona, withstanding a brief hiatus in the army during World War II. As a Rhodes scholar, he then completed his PhD in philosophy at Oxford in 1951. Bohannan spent several years studying the Tiv tribe in Africa during the years 1949 to 1953, where he lived in a mud hut without plumbing, learned the Tiv language, and documented the customs and culture of the tribe, then numbering 800,000. [2] He then taught at Princeton University until 1958. From 1959 to 1975 he taught at Northwestern University, Chicago, where he focused on economic anthropology. Thereafter, he taught at the University of Santa Barbara and ten became professor emeritus of anthropology at the University of Southern California. [3]

Quotes

The following are noted quotes:

> "What we are lacking right now is ways to index human experience—ways like turning 'heat' into 'temperature', which allows new kinds of measurement and comparison."
>
> — Paul Bohannan (1995), *How Culture Works* (pg. 195)

References

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(b) Maugh, Thomas H. (2007). "Paul Bohannan, 87; USC anthropologist researched Nigerian culture and American divorce." LA Times, Science and Medicine, Aug. 02.
3. Paul James Bohannan (biography) – Minnesota State University, Mankato.

External links

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θΔics

In existographies, **Paul Carus** (1852-1919) (CR:7) was a German-born American philosopher, editor, panpsychist (Skrbina, 2005), and comparative religion scholar, noted for []

Panbiotism

In 1892, Carus defined “panbiotism”, a term identical to hylozoism (Skrbina, 2015), as the view that everything is fraught with life; it contains life; it is the ability to live”. [3]

Atomic souls?

See main: Do atoms have souls?

In 1907, Carus, in his “Goethe’s Soul-Conception”, printed a number of quotes by Goethe in immortality (see: Goethe on the soul) conjoined with views by Ernst Haeckel. [1]

In 1910, Carus, in his “Have Atoms Souls?”, cites German-born American philosopher Johannes Barandun’s article “Excursion Into the Infinitely Small”, who outlined views similar to "Goethe's monadology of the soul", as Carus refers to things, wherein he outlines a modification of Ernst Haeckel's "animate atoms" theory and Wilhelm Wundt's "animated will-centers" theory. [2]

Panpsychism

Carus has been classified, by David Skrbina (2005), as a panpsychist whose work was read by Charles Peirce. [3]

Religion

Carus, supposedly, characterized himself as an “atheist who loved god”, where the word god, as a cosmic order, was a name comprising "all that which is the bread of our spiritual life." (Ñº)

Associations

Carus sent and received letters from: Leo Tolstoy, Thomas Edison, Nikola Tesla, Booker T. Washington, Elizabeth Stanton, Ernst Mach, Ernst Haeckel, and John Dewey, to name a few.

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(c) Carus, Paul. (1910). “Have Atoms Souls?” (pdf), *The Open Court*, 24:119-22.
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(b) Skrbina, David. (2017). *Panpsychism in the West: Revised Edition* (Carus, 4+ pgs; panbiotism, pg. 14; read by Peirce, pg. 190). MIT Press.

External links

â— Paul Carus – Wikipedia.

θΔics

In existographies, **Paul Chefurka** (c.1960-) is a Canadian sustainability activist, noted for []

Overview

In 2013, Chefurka, in his series of online articles, e.g. "A Thermodynamic Answer to Fermi's Paradox" (Q), introduced concepts such as "thermodynamic footprint", which he defines as the "ratio of all the energy a person normally uses in a period of time, over the amount of energy they generate within their bodies from food" (Q), on his journey towards understanding how the characteristics of living systems (animate systems), including humans and their social behavior, are shaped by the operation of thermodynamics; a representative quote of which is as follows: [1]

> "The extension of thermodynamic principles into the traditionally human realms of politics and anthropology is still a very new idea, and is fenced around with taboos over questions like free will and determinism."

He builds on stock authors such as: Ilya Prigogine, Erwin Schrodinger, Eric Schneider, James Kay, Howard Odum, Eric Chaisson, among others. [2]

New age

A noted downside of the Chefurka's site is that it is stitched together with new age and or Eastern mysticism theories, such as: Buddhism, soul psychology, spiritual psychology, etc.

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1. Chefurka, Paul. (2013). "A Thermodynamic Reading List", PaulChefurka.ca, Nov 9.
2. Chefurka, Paul. (2013). "Thermodynamic Critique", PaulChefurka.ca, Oct 18.

External links

- Paul Chefurka – YouTube.

θΔics

In existographies, **Paul Churchland** (1942-) (CR:3) is a Canadian philosopher, noted for []

Eliminative materialism

In 1981, Churchland, in his “Eliminative Materialism and the Propositional Attitudes”, stated, in advocation of "eliminative materialism", that the traditional roadblocks to the so-called materialist program, namely emotions, qualia, and raw feelings, were beginning to dissolve as compared to previous decades, and went on to argue that neuroscience needs to be more substantially integrated into physical science. [1]

Other

Churchland, of note, is married to Canadian-born American philosopher Patricia Churchland, author of the provocative 1986 *Neurophilosophy*, which advocates the eliminative materialism positions, suggesting that developments in neuroscience point to a bleak future for commonsense mental states. [2]

Quotes | By

The following are quotes by Churchland:

> “The red surface of an apple does not *look* like a matrix of molecules reflecting photons of a certain wavelengths, but that is what it is. The sound of a flute does not *sound* like a sinusoidal compression wave train in the atmosphere, but that is what it is. The warmth of the summer air does not *feel* like the mean kinetic energy of millions of tiny molecules, but that is what it is. If one’s pains and hopes doe not introspectively *seem* like electrochemical states in a neural network, that may be only because our faculty of introspection, like our other senses, is not sufficiently penetrating to reveal such hidden details.”
>
> — Paul Churchland (1988), *Matter and Consciousness* [3]

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External links

â— Paul Churchland – Wikipedia.

θΔics

In science, **Paul Alfred Colinvaux** (1930-) (GS:2) is an English-born American zoologist and ecologist noted, in chnops-thermodynamics, for his 1979 book *Why Big Fierce Animals are Rare* in which uses the second law of thermodynamics to argue that big meat-eating animals are rare because the available energy in each step in the food chain is degraded. The following is an example quote: [1]

> "The size and ferocity of real-life predators is restricted to the scale of a tiger, and even these must also be rare. The second law of thermodynamics says so."

Colinvaux's basic argument, which amounts to essentially verbal thermodynamics, is that each step in the food chain contains a certain energy amount in calories and that because one variation of the second law implies a degradation of available energy in any process, that would apply to the transmission of energy in the food chain.

Food chain thermodynamics

While Colinvaux may be oft-cited as the person who popularized the notion that big animals are rare because of the second law, it was American ecologist Raymond Lindeman (1942) who, building on Charles Elton's "food chain" model (1927), or the so-called "Eltonian pyramid" of number of animals by size in a given ecosystem, diagrammed as follows, for floor-fauna invertebrates of the Panama rain forest (from E.C. Williams, 1941): [2]

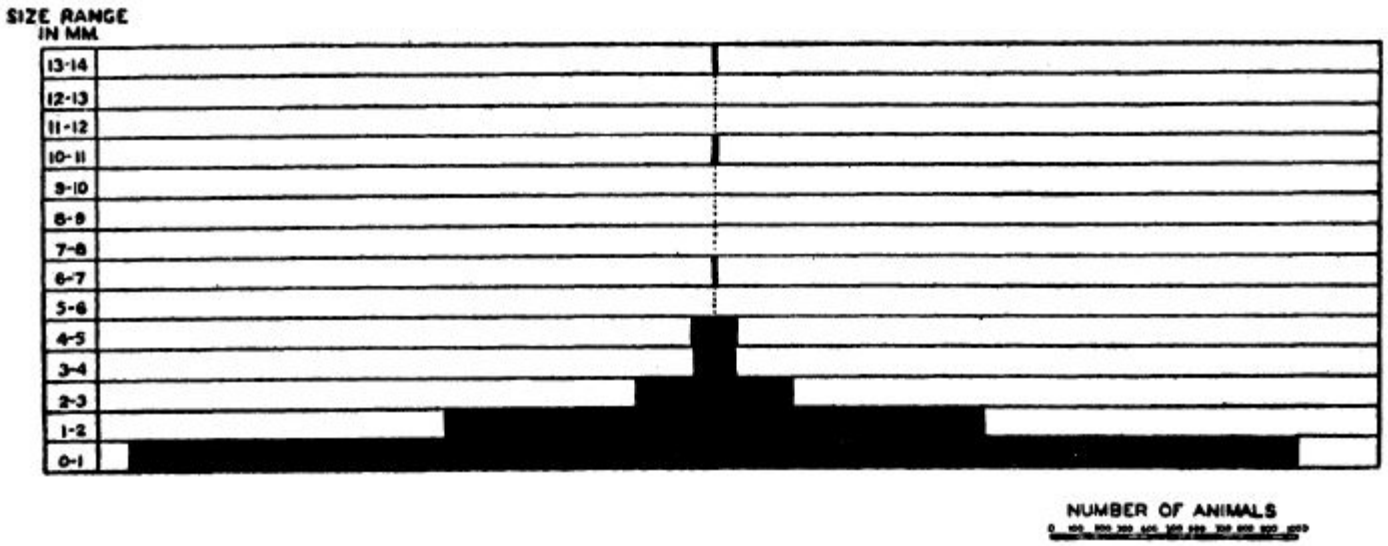

put forward the so-called "ten percent law", or energy pyramid model, for the transfer of energy from one trophic level to the next, according to which he asserted that in the transfer of organic food from one trophic level to the next, only about ten percent of the organic matter is stored as flesh—the remaining is lost during transfer or broken down in respiration: [3]

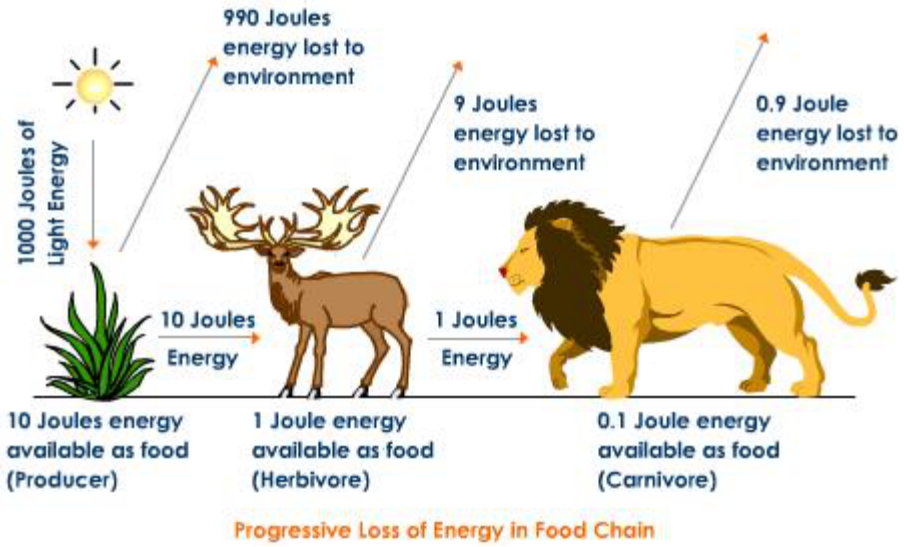

This conceptual model, along with the energy mechanisms of photosynthesis, is typically the basic amount of so-called thermodynamics the typically person is taught in school.

Education

Colinvaux completed his BA (1956) and MA (1960) at the Jesus College, Cambridge England. He completed a PhD from Duke University in 1962. In 1964, he became a professor of zoology at Ohio State University, a position he held till retirement.

See also

â— Surface law

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External links

â— Paul Colinvaux – Wikipedia.

θΔics

In hmolscience, **Paul Davies** (1946-) is a English physicist noted for his 1960s-present effort to understand how a physical system, looked at from the point of view of Australian physicist Brandon Carter's "anthropic principle", can make a transition from a nonliving state to a living state, for his *circa* 1983 gravity-derived "entropy gap" theory of the origin of life, and for his 1990s to 2000s publications a number of origin of life themed books structured around explaining life in terms of the second law. An oft-cited quoted by Davies, from his 2003 "Was Life on Earth Born Lucky?" *New Scientist* article, is the following:

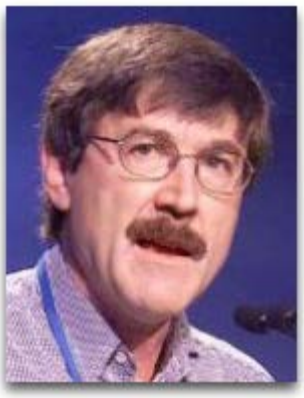

> "Nobody knows how a mixture of lifeless chemicals spontaneously organised themselves into the first living cell."

The quote forms the basis of question number one (how did life originate?) of the semi-notorious 2011 "15 Questions for Evolutionists" pamphlet sold by Creation.com, written by Don Batten. [13]

Related people

The following are related people also searched for—namely: John Barrow, Fred Hoyle, John Wheeler, John Polkinghorne, and Frank Tipler:

John D. Barrow | Fred Hoyle | John Archibald Wheeler | John Polkingho... | Frank J. Tipler

among others, including: George Francis, Brian Green, Lee Smolin, Lawrence Krauss, Andrei Linde, Sean Carroll, Leonard Susskind, Seth Shostak, Alan Guth, Dirk Schluze-Makuch, Kip Thorne, Stephen Hawking, Seth Lloyd, and Max Tegmark. (Ñº)

Popular books

The following are Davies' most-popular books—namely: *The Mind of God* (1992), *God and the New Physics* (1984), *Cosmic Jackpot* (2007), *The Fifth Miracle* (1998), and *Quantum Aspects of Life* (2008):

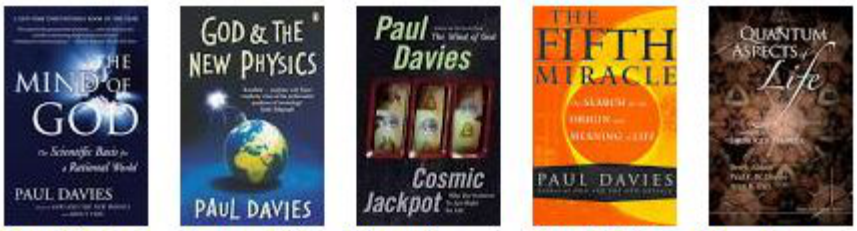

The Mind of God 1992 | God and the New Physics 1984 | Cosmic Jackpot 2007 | The FIFTH MIRACLE 1998 | Quantum Aspects of Life 2008

Among others, including: *Last Three Minutes* (1997), *About Time* (1996), *The Cosmic Blueprint* (1987), *Are We Alone? Philosophical Implications of the Discovery of Extraterrestrial Life* (1995), *Superforce: the Search for a Grand Unified Theory of Nature* (1984), numerous others (Ñº), one of note being his 2006 *The Goldilocks Enigma: Why Is the Universe Just Right for Life?*, pictured adjacent, in which he argues that the earth, with its so-called "bio-friendly" conditions habitable zone, was fine-tuned by accident, and found in one of many universes.

What is life? | Living cloud?

See also: What is life? (theories of existence), Defunct theory of life, Unbridgeable gap

Davies states that his interest in understanding the question of what exactly is life began to take hold as an undergraduate physics student in the mid 1960s when he read English astronomer Fred Hoyle's 1957 science fiction novel *The Black Cloud*, in which a large cloud of gas from interstellar space arrived in the solar system, which was said to be 'alive'. Davies was intrigued by this idea, in his own retrospect words: [1]

> "How can a cloud be alive? I puzzled over this at length. Surely gas clouds just obey the laws of physics? How could they exhibit autonomous behavior, have thoughts, make choices? But, then, it occurred to me, all living things supposedly obey the laws of physics."

→

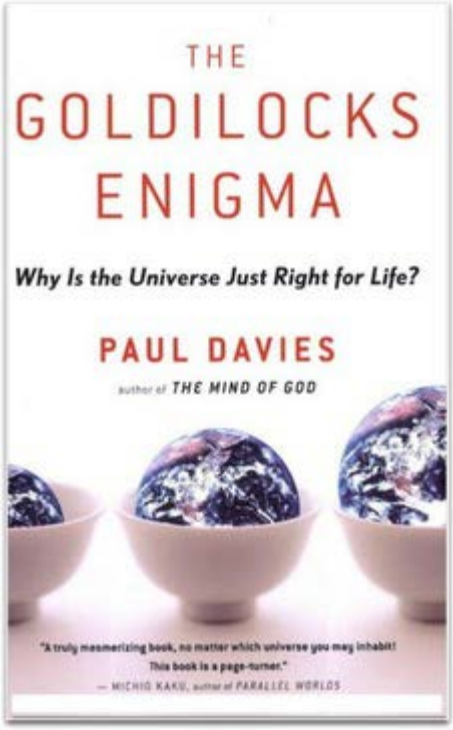

(1959) (2006)

Left: Fred Hoyle's 1959 *The Black Cloud*, wherein he explains how life arose from a black cloud. Right: Davy's 2006 *The Goldilocks Enigma*, wherein he argues, as a solution to Hoyle's black cloud puzzle, that just like how Goldilocks' porridge can't be too cold or too hot, but intermediate in temperature, that so too does the universe have a "fitness for life" based on the fine-tuning parameters of the anthropic principle.

Hoyle's living cloud left Davies 'baffled and vaguely disturbed', leaving him questioning the 'what exactly is life question' and 'when did it start?' issue.

Likewise, as described in Hoyle's autobiography *Home Is Where the Wind Blows: Chapters from a Cosmologist's Life*, Wolfgang Pauli later told Hoyle that he discussed the philosophical implications of the novel with Carl Jung and thought the novel was "better than your astronomical work."

Next, Davies' PhD advisor (Michael Seaton or Sigurd Zienau) then gave him a copy of Hungarian-American physicist Eugene Wigner's 1961 essay "The Probability of the Existence of a Self-Reproducing Unit" which purported to prove that a physical system can not make a transition from a nonliving state to a living state without contravening the laws of quantum physics, arguing to the effect, according to Davies, that 'something funny must have gone on when life started.' [7]

Davies supervisor then passed him Australian astrophysicist Brandon Carter's circa 1970 paper on the 'anthropic principle' (a term he coined), which argues to affect that the laws of nuclear physics are fine-tuned to make carbon in stars, and hence predisposed to the development of life, and hence anthropocentric laws are made to favor the development of human life, in short. Davies then worked under Hoyle and with Carter for two years at Cambridge, from 1970 to 1972. During this period he chanced across a copy of Erwin Schrodinger's famous 1944 booklet *What is Life?*, as we all have, which gave Davies the view that biological organisms can be explained by physics. This seems to have been Davies first indoctrination into the basics of the thermodynamics of life and his later circa 1980s gravitational entropy theory of life. In 1999, Davies, in fact, declared the second law to the "ultimate problem of biogenesis".

In his 2003 *The Origin of Life*, Davies attempts to answer the question: [8]

> “Is life written into the laws of nature, or just a bizarre accident, unique in the universe? How can a mix of non-living chemicals be transformed into something as complex as the living cell?

He begins this book, by spending a considerable portion of the start detailing the second law of thermodynamics and the oft-mentioned misconception that the origin of complex organized systems infringes this law, in which he argues, supposedly, that such events occur in a closed system, but not in the case of open systems.

Panspermia

Davies was one of the early promoters of the mars-derived origin of life theory, namely that life on earth may have originated from bacteria that was formed on other planets many ages ago, impacting on the earth. This leads to the view that life predates the formation of the earth, meaning that organisms may have propagated from star system to star system, ferried on asteroids, across the universe, which reduces the question of whether life had a beginning (in the mind of Davies) to a question of whether the universe had a beginning. He started working on his "micro-organisms traveling between mars and earth" theory in the 1990s after becoming interested in the work of Duncan Steel, who theorized that asteroids could be ejected from planets by cosmic collisions.

The 1996 discovery of the ancient Mars-derived meteorite, said to contain possible fossilized bacteria, seems to have been a goad that led Davies to pen his 1999 book *The Fifth Miracle: the Search for the Origin and Meaning of Life*.

In his 2008 chapter “A Quantum Origin of Life”, Davies argues that modern topics quantum mechanics, namely coherent wavelike nature of matter, tunneling, entanglement, intrinsic spin, Berry phase, environmental post-selection, and the watchdog effect, may soon solve the riddle of the “living state of matter” and the origin of life question. [6]

Entropy gap theory

Davies' first book, the 1974 *The Physics of Time Asymmetry*, is an exposition on time, thermodynamics, statistical mechanics, reversibility, reversibility objections, thermodynamics and cosmology, with end chapters on electromagnetic and quantum mechanics. In this book, Davies discusses Ludwig Boltzmann’s 1878 H-theorem, objections to Boltzmann’s theory by those as Josef Loschmidt and Ernst Zermelo, Arthur Eddington’s 1928 entropy arrow of time, along with the posthumous 1956 book *The Direction of Time* by German-born American science philosopher Hans Reichenbach, who theorized about ‘branch systems’ that separate off from the main environment in a low entropy state. [11] Davies continued with his theorizing on entropy and the movement of the universe in his 1978 *The Runaway Universe*. [10]

Sometime in the 1980s, Davies began to develop a gravity-driven entropy reversal theory of life, his central argument somehow crouched in the idea that "time reverses with each cosmic bounce." [9]

In his 1983 book *God and the New Physics*, Davies seems to clearly dig into his gravity-driven entropy-order theory. [2] Yet, according to American physician David Alkek, somewhere in his three books *The Cosmic Blueprint* (1988), *The Mind of God* (1992), and *The Last Three Minutes* (1997), Davies outlines ideas on self-development, growth of organized complexity, mixed together with discussions on “reverse entropy” (or entropy reversal). In his *The Mind of God*, he discusses life in terms of gravity and entropy and the human brain. [4] In his 1999 origin and meaning of life book *The 5th Miracle*, Davies devotes the second chapter to thermodynamics, concluding that:

> “All life feeds off the entropy gap that gravitation has created. The ultimate source of biological information and order is gravitation.”

A notable aspect of Davies's work is that he bases many of his arguments on the relatively unknown 1930s work of American chemical engineer and theoretical cosmologist Richard Tolman who found that as the entropy of the universe rises, so to do the cycles grow bigger and bigger and last longer and longer. [3]

Algorithmic entropy

Davies discusses what he calls "algorithmic entropy", a term which he says expresses the relative complexity of an organism's genome, which he says gives a more precise method of the notion of comparing the entropy of two organisms. In his formulation, higher more evolved organisms have higher, not lower, algorithmic entropy, and which in his view explains why evolution does not conflict with the second law. [1]

Difficulties on theory

An obvious sore thumb in Davies' theory, is that much of his discussions are intertwined with American electrical engineer Claude Shannon's 1948 "information entropy" theory of communication, which is a way to quantify 1s and 0s in telegraph wires, but a theory that has nothing to do with entropy or thermodynamics.

Religion

Davies ambivalently open to the possibility that the universe is anthropocentric and that god may exist. This is evidenced by the fact that Davies is often cited by thinkers in the religious community and in religious thermodynamics themed articles and books, and his noted mentions of Genesis and god, leads to the conclusion that he has some underlying belief in the existence of god.

Davies states that he grew up in a family where his incessant questions about the why's of everything, were typically answered with "because God made it that way, and that's that!" In this book, he seems to give the view that he is agnostic, but open to the possibility that intelligent design may operate in the universe. To note, his exact adulthood views, e.g. Dawkins number, on the existence of god, seem to be unstated.

Education

Davies completed his BS in physics at in 1967 and his PhD in 1970, with a thesis on "Contributions to Theoretical Physics: (i) Radiation Damping in the Optical Continuum (ii) A Quantum Theory of Wheeler-Feynman Electrodynamics", both at the University College London. He then worked for two years under Fred Hoyle at the University of Cambridge, after which he became a professor at Kings College (1972-1980), University of Newcastle upon Tyne (1980-1990), University of Adelaide (1993-1997), then a visiting professor at a number of universities, and since 2006 has been at the Arizona State University, as head of the Beyond Center, which focuses on quantum mechanics, early universe questions, gravity, black hole thermodynamics, time (arrow of time), origin of life, and extraterrestrial life. [5]

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Further reading

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External links

â— Paul Davies – Wikipedia.
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â— Davies, Paul – WorldCat Identities.

θΔics

In existographies, **Paul Dirac** (1902-1984) (IQ:190|#32) [RGM:311|1,500+] (Murray 4000:15|P) [GPE:#] (DN:7) (CR:129) was an English theoretical physicist, ranked as a greatest physicist every, especially in particle physics, noted for his 1927 work in developing a relativistic + quantum mechanics based description of the motion of the electron, which predicted the existence of antimatter or negative energy states of the electron and included electron spin.

Dancing anecdote

See main: Dirac dancing anecdote

In 1929, mid August, Werner Heisenberg and Paul Dirac, after each had given a series of lectures in Robert Oppenheimer's department at the University of California, Berkeley, set off from San Francisco on a two-week cruise to Japan, during which time Heisenberg was "conventionally hedonistic", as Graham Farmelo reports, likely partying and dancing with the flapper girls. Heisenberg long remembers Dirac looking on quizzically and asking: [3]

> "Why do you dance?"

Compare this to William Rankine's circa 1845 "The Mathematician in Love" poem (section IV).

Anti-particles | Negative energy states

In 1928, Dirac derived a relativistic wave equation for the electron, using both quantum mechanics and relativity, which predicted the existence of antimatter.

In 1932, Ettore Majorana wrote in unpublished paper, he kept in a drawer for five years, that qualifies some aspects of Dirac's well-known thesis on anti-particles, which continues to be (even today) a work of reference.

Reductionism

In 1929, Dirac stated the following: [1]

> "The underlying physical laws necessary for the mathematical theory of a large part of physics and the whole of chemistry are thus completely known, and the difficulty is only that the exact application of these laws leads to equations much too complicated to be soluble. It therefore becomes desirable that approximate practical methods of applying quantum mechanics should be developed, which can lead to an explanation of the main features of complex atomic systems without too much computation."

These words, according to Dirac biographer Graham Farmelo, to have become one of the clarion calls of reductionists—according to which, for instance, "extreme reductionism" would thus explain "why a dog barks" via quantum mechanics. [2]

Influenced

Dirac influenced: Einstein, Richard Feynman, and Abdus Salam.

Religion

See main: God does not play dice

In 1927, at the fifth Solvay Conference in Brussels, while sitting around one evening at the hotel's smoky lounge, some

of the younger physicists were sitting around on chairs and sofas, among them Dirac, Werner Heisenberg, and Wolfgang Pauli, during the course of which, as recalled by Heisenberg, Dirac went off on rant about religion, triggered by a comment about Einstein's habit of referring to God during discussions of fundamental physics: [3]

> "If we are honest — and scientists have to be — we must admit that religion is a jumble of false assertions, with no basis in reality. The very idea of God is a product of the human imagination. It is quite understandable why primitive people, who were so much more exposed to the overpowering forces of nature than we are today, should have personified these forces in fear and trembling. But nowadays, when we understand so many natural processes, we have no need for such solutions. I can't for the life of me see how the postulate of an Almighty God helps us in any way. What I do see is that this assumption leads to such unproductive questions as why God allows so much misery and injustice, the exploitation of the poor by the rich and all the other horrors He might have prevented. If religion is still being taught, it is by no means because its ideas still convince us, but simply because some of us want to keep the lower classes quiet. Quiet people are much easier to govern than clamorous and dissatisfied ones. They are also much easier to exploit. Religion is a kind of opium that allows a nation to lull itself into wishful dreams and so forget the injustices that are being perpetrated against the people. Hence the close alliance between those two great political forces, the State and the Church. Both need the illusion that a kindly God rewards — in heaven if not on earth — all those who have not risen up against injustice, who have done their duty quietly and uncomplainingly. That is precisely why the honest assertion that God is a mere product of the human imagination is branded as the worst of all mortal sins."

At the end of which Pauli, when asked what he thought, declared: [2]

> "Well our friend **Dirac**, too, has a religion, and its guiding principle: There is no God and Dirac is his prophet."

after which everyone laughed, including Dirac. The following, likewise, is an unpublished 1933 handwritten note by Dirac: [5]

> "Any further assumption implied by belief in a God which one may have in one's faith is inadmissible from the point of view of modern science, and should not be needed in a well-organized society."

which, to note, is near verbatim to the famous 1802 "I had no need of that hypothesis" Napoleon Laplace anecdote on Pierre Laplace's god-free celestial mechanics.

Quotes | On

The following are quotes on Dirac:

> "I don't know what the fuss is all about—**Dirac** did it all before me."
>
> — Richard Feynman (c.1970), recollected by Freeman Dyson (2005) [3]

Quotes | By

The following are quotes by Dirac

> "It seems clear that the present quantum mechanics is not in its final form. Some further changes will be

needed, just about as drastic as the changes made in passing from Bohr's orbit theory to quantum mechanics. Some day a new quantum mechanics, a relativistic one, will be discovered, in which we will not have these infinities occurring at all. It might very well be that the new quantum mechanics will have determinism in the way that Einstein wanted."

— Paul Dirac (1979) [4]

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External links

â— Paul Dirac – Wikipedia.

θΔics

In thermodynamics, **Paul Ehrenfest** (1880-1933) was an Austrian physicist, noted student of Ludwig Boltzmann of the Vienna school, noted for his 1911 Ehrenfest model (dog flea model) of the multiplicity function, developed with his wife Tatyana Ehrenfest, of the second law in terms of probability [1] Ehrenfest, like is mentor Boltzmann, followed in the footsteps of founders of thermodynamics and suicide exits.

Economic thermodynamics

Ehrenfest was also said to have been interested in developing mathematical theories in economics, stimulated by his notion that there should be an analogy between thermodynamics and economic processes. While this did not result in publications, he did encourage his graduate student Jan Tinbergen to follow up on this. Tinbergen's 1929 thesis “Minimization Problems in Economics and Physics” was devoted to problems both from physics and economics, and he went on to become an economist and was awarded the 1969 Nobel Prize in economics.

Suicide

In 1933, at the end of Niels Bohr’s annual Meeting, in September, Ehrenfest confessed the following to Paul Dirac: [2]

> “What you have said, coming from a young man like you, means very much to me because maybe, a man such as I feels he has no force to live.”

Then, after he made arrangements for the care of his other three children, on September 25 he first shot his Down syndrome son Wassik, then shot himself.

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2. Farmelo, Graham. (2009). *The Strangest Man: the Hidden Life of Paul Dirac* (pg. 232). Basic Books.

External links

â— Paul Ehrenfest – Wikipedia.
â— Tatyana Afanasyeva – Wikipedia.

θΔics

In existographies, **Paul Ehrlich** (1932-) (CR:9) is an American biologist noted for []

Overview

In 1977, Ehrlich, in his chapter "Availability, Entropy, and the Laws of Thermodynamics", co-written with Anne Ehrlich and John Holdren, superficially discusses the high-grade (availability) low-grade (non-availability) interpretation of energy forms, e.g. stored energy in gas, versus room temperature heat. [1]

In 2008, Ehrlich, in his *The Dominant Animal: Human Evolution and the Environment*, stated that the best-known effect of the second law is its functioning in the steps of the food chain, to the effect that in each step up the food chain energy is degraded, or something along these lines. [2]

Quotes | By

The following are quotes by Ehrlich:

> "One wonders if **Simon** could not at least find a junior high school science student to review his writings?"
>
> — Paul Ehrlich (1981), *Publication*; cited in: Simon (1990); Simon (1991) [3]

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In thermodynamics, **Paul Epstein** (1883-1966) was a Russian-born American mathematical physicist and fifth generation thermodynamicist noted for his 1937 *Textbook of Thermodynamics*, written for the point of view and application of the physicist. [1]

Education

Epstein completed his undergraduate work in mathematics and physics at the Imperial University of Moscow in 1905 and completed his PhD, under Arnold Sommerfeld, on a problem of the theory of diffraction of electromagnetic waves at the Technical University of Munich in 1914. He began teaching at the California Institute of Physics in 1921 and was a professor of theoretical physics there by 1937. His studies and research interest were on theoretical physics, with emphasis on thermodynamics and quantum theory. [2]

Quotes

The following are related quotes:

> "What I did was, first, I tried to read advanced physics, and I got Maxwell's treatise on electricity and magnetism, which is one of the great fundamental books, and I worked hard on it. I could not read it, but it was a concept of mathematics that I did not know—partial differential equations, they didn't have anything like that. I had to give it up finally. The other book which I took was Planck's *Thermodynamics*. Planck was a pretty famous man in those days, a German professor in Berlin. Later I had classes, relations with him. I could read the book, but I found it excruciatingly dull. That is one of the reasons I myself wrote a book on thermodynamics, and I think I did it better."
>
> — Paul Epstein (1966), Interview reflections on what, as a Russian college student, he studied since he didn't attend lectures most of the time" [2]

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θΔics

In hmolscience, **Paul Darwin Foote** (1888-1971) was an American physicist noted, in religious thermodynamics, for his circa 1920 thermodynamics humor stylized article "The Temperature of Heaven and Hell" (see: thermodynamics of hell), wherein he used Boyle's law to talk about souls and heat.

Overview

In circa 1920, Foote published an anonymous article entitled "The Temperature of Heaven and Hell", published in the Taylor Instrument Company house organ, in which he attempt to present a half-serious, half-humorous, proof that souls have mass, which can be treated as gas particles, whereby using Boyle's law, in conjunction with the rates at which people come and go (die), one can argue that the temperature of hell depends on the expansion rate of the volume of hell, which is, in turn, based on the rate at which souls are entering hell.

Foote, supposedly, commented to the effect that: [2]

> "First, we postulate that if souls exist, then they must have some mass. If they do, then a mole of souls can also have mass. So, at what rate are souls moving into hell and at what rate are souls leaving? I think that we can safely assume that once a soul gets to hell, it will not leave. Therefore, no souls are leaving. As for souls entering hell, let's look at the different religions that exist in the world today. Some of these religions state that if you are not a member of their religion, you will go to hell. Since there are more than one of these religions and people do not belong to more than one religion, we can project that all people and all souls go to hell. With birth and death rates as they are, we can expect the number of souls in hell to increase exponentially. Now, we look at the rate of change in volume in hell. Boyle's law states that in order for the temperature and pressure in hell to stay the same, the ratio of the mass of souls and volume needs to stay constant. So, if hell is expanding at a slower rate than the rate at which souls enter hell, then the temperature and pressure in hell increase until all hell breaks loose. Of course, if hell is expanding at a rate faster than the increase of souls in hell, then the temperature and pressure will drop until hell freezes over."

The article was reprinted in various journals in the decades to follow and is the seed of the now many variations on the thermodynamics of hell exam questions given out to chemistry students.

Education

Foote completed his undergraduate work in 1909 at Adelbert College, Western Reserve University, in mathematics and physics. He then spent two years at the University of Nebraska, completing a MS in 1912, under C. A. Skinner, with a thesis on the magnetic rotation of the plane of polarization and ellipticity of plane polarized light reflected from mirrors in a magnetic field. He then began working at the Bureau of Standards and based on the joint work of graduate courses taken in Washington, D.C. and Bureau of Standards work was awarded a PhD in physics in 1917 by the University of Minnesota. [1]

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θΔics

In thermodynamics, **Paul Glansdorff** (1904-1999) was a French physicist noted for playing a major role in the development of the the theory of dissipative structures with Belgian chemist Ilya Prigogine, the first presentation of which was jointly published in 1971. [1]

Education

In 1981, Glansdorff was on the faculty at the Free University of Brussels.

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θΔics

In human chemistry, **Paul Peachey** (1918-2012) was an American writer note for 2001 *Leaving and Clinging*, wherein he employs Christianity themed molecular sociology to discuss bonding socially.

Overview

In 2001, Peachey, in his *Leaving and Clinging*, outlines views on the pair-bond as a "human molecule" as found in his book *Leaving and Clinging*, containing chapters on topics such as the psychodynamics of the pair bond and the marital bond as the human molecule. [1] Peachey seems to cull many of his ideas on human bonding and human molecules from American sociologist Robert Nisbet, whom he quotes often, for example: [2]

> "It should be obvious that family, not the individual, is the real molecule of society, the key link of the social chain of being. The family [is] the societal germ or 'molecule' that Nisbet proclaims".

In another instance, he states:

> "The family is the social molecule, it is not the first instance because it produces and socializes the young, but because it is the cradle of covenanting freedom. The often life-long trauma experienced by children of divorces testifies to the germinal (or molecular) significance of pair-bonding in the creation of the human."

Most of his reasoning seems, however, to be used in loose metaphor. Below is one example:

> "To put the matter metaphorically, only when the **family molecule** begins to dissolve into individual atoms can the rational reconstruction or resynthesis that we call modernization be undertaken."

Religion

Much of Peachey's writing, to noted, is soaked-through with discussions on Christianity, particularly it seems with his theory that the marital bond has some sort of divine significance to it. The following is his associate American pastor Harvey Yoder's 2012 obituary synopsis of his divine marital bond theory: [3]

> "One of our common interests was the state of marriage and the family, both in the church and in society as a whole. I was especially interested in one of his most recent books, *Leaving and Clinging, the Human Significance of the Conjugal Union*. Here he makes the case that we humans are created to experience marital bonds that are even stronger than our blood family ties. Because of the universal taboo against incestuous relationships, we leave our parents and "cleave" to our spouse in order to form a united pair—for purposes of perpetuating the race and passing on our values and way of life. I was especially intrigued by how this sign of divine wisdom results in each generation developing new ties with others, creating a network of societal bonds that would never happen if families procreated with their immediate kin. This means makes forming strong marital bonds extremely important for nurturing stable families. We can't have the latter without stable forms of the former."

Education

Peachey states that he began writing after his academic retirement in 1987.

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θΔics

In hmolscience, **Paul Samuelson** (1915-2009) (CR:89|#52) was an American physics-trained economist noted, in economic thermodynamics, notable for his circa 1940 to 1970s efforts to derive economics via what he refers to a "mathematical isomorphisms" of the thermodynamics of Willard Gibbs, as communicated to him via his mentor Edwin Wilson and the so-called Harvard Pareto circle.

Economic stability | Equation 133

In 1938, Edwin Wilson, amid various letter communicates on his steam engine/physical chemistry based "mathematical economics" course, he was teaching at Harvard, wrote the following to Samuelson with critical comments on a paper by Samuelson:

> "Moreover, general as the treatment is I think that there is the possibility that it is not so general in some respects as Willard Gibbs would have desired. [In] discussing equilibrium and displacements from one position of equilibrium to another position [Gibbs] laid great stress on the fact that one had to remain within the limits of stability. Now if one wishes to postulate the derivatives including the second derivatives in an absolutely definite quadratic form one doesn't need to talk about the limits of stability because the definiteness of the quadratic form means that one has stability. I wonder whether you can't make it clearer or can't come nearer following the general line of ideas [that] Gibbs has given in his *Equilibrium of Heterogeneous Substances*, equation 133."

The very impressive mention of "equation 133", from Gibbs' subsection "Internal Stability of Homogeneous Fluids as indicated by Fundamental Equations", is the following:

$$U - TS + PV - M_1m_1 - M_2m_2... - M_nm_n$$

Wilson, in other words, is suggesting, as it seems to be, to Samuelson that he use the Gibbs fundamental equation to formulate a theory of economic stability. Very hilarious indeed. Even the best of the best top dozen of the three dozen or so known human free energy theorists have been barely able to get a handle on this very intricate problem. No wonder Samuelson, into the 1970s, would become so irritated when people queried him about entropy and or sent him entropy-based economic papers to look at.

Overview

Samuelson, a student of Edwin Wilson, the sole protege of Willard Gibbs, and from hims he learned that the variational calculus of chemical thermodynamics could be used as a general model to reformulate utility. Samuelson, in short, in some ways, was a precipitate of the Harvard Pareto circle, noted for his use of analogy concepts from chemistry (e.g. Le Chatelier's principle), physics (equilibrium), thermodynamics (entropy) in various economic theories; for being a second generation student, so to speak, of Willard Gibbs; and for his post-1970s strong vocal skepticism of the use of thermodynamics, particularly entropy, in economic models. The following is an snippet from Samuelson's collected works abstract: (Ñº)

> "One of **Samuelson's** many novel contributions was that he generalized and applied mathematical methods developed for the study of thermodynamics to the field of economics. His inspiration for doing so came, in part, from his mentor, polymath Edwin Wilson who was a former Yale student of the founder of chemical thermodynamics, Willard Gibbs. Samuelson, therefore, is a successful example of interdisciplinarity, and he combined these ideas in his magnum opus *Foundations of Economic Analysis* (1947)."

Samuelson won the 1970 Nobel Prize in economics for his theories, the second year of the prize. [3]

Education | Pareto-Henderson-Gibbs

In 1925, Samuelson, age 20, completed his BS in physics (Ñº)(Ñº)(Ñº) from the University of Chicago, after which he completed his MS in 1936 at Harvard. From 1937 to 1940, Samuelson entered the Harvard's Society of Fellows (1937-40), an alternative program, founded by Abbott Lawrence and Lawrence Henderson (1878-1942), where students could spend three years pursuing any research that interested them, but were prohibited from working on their PhD dissertations.

Henderson, of note, had in 1928 published an equilibrium theory of blood, during which time he assumedly began to learn about Gibbs, in followup to this, published his 1935 *Pareto's General Sociology: a Physiologists Interpretation*, in which he explains French-Italian engineer Vilfredo Pareto's 1916 four-volume *Treatise on General Sociology*, and Pareto's view of society as a system of "human molecules", via the logic of Gibbsian thermodynamics, using what Henderson calls Gibbsian "analogies", where a social system is said to contains individuals roughly analogous to "Gibbs' components". [18]

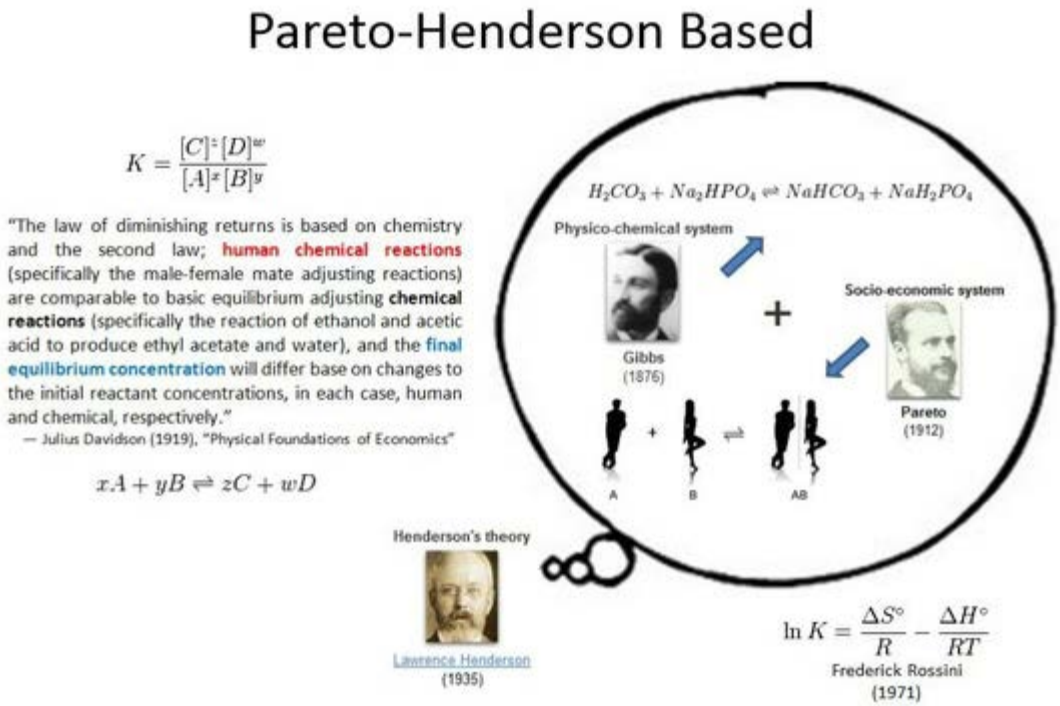

Samuelson learned about Gibbs-Pareto based economic equilibrium models, in the 1930s at Harvard from either Lawrence Henderson, whose program he was in, and or Edwin Wilson, one of his dissertation mentors, from whose lectures he learned Le Chatelier's principle.

Direct connections between Henderson and Samuelson, if they exist, in regards Henderson specifically mentoring Samuelson about Gibbs and Pareto and sociology/economics, remain to be ferreted out.

American science historian Hunter Crowther-Heyck (2005) seems to stitch out some semblance of a Henderson-Samuelson-Pareto connection, stating that Samuelson used Pareto's ophelimity model of utility, which in turn was being popularized, at Harvard, in the 1930s, in the enthusiastic seminars on Pareto that Henderson was giving. [19]

Education | Pareto-Wilson-Gibbs

In any event, at some point along the line, during this period at Harvard, Samuelson studied under American mathematician Edwin Wilson, who *was* interested in Pareto economics theories, possibly via Henderson influence, and who himself had been the sole protégé of American engineer Willard Gibbs. In 1970, in his famous two-cultures ambivalent Nobel Laureate speech "Maximum Principles in Analytical Economics", in reflection on this Wilson influence, Samuelson stated the following: [17]

> "I was struck by a remark made by an old teacher of mine at Harvard, Edwin Bidwell Wilson. Wilson was the last student of J. Willard Gibbs' at Yale and had worked creatively in many fields of mathematics and physics; his advanced calculus was a standard text for decades; his was the definitive write-up of Gibbs' lectures on vectors; he wrote one of the earliest texts on aerodynamics; he was a friend of R. A. Fisher and an expert on mathematical statistics and demography; finally, he had become interested early in the work of Pareto and gave lectures in mathematical economics at Harvard. My earlier formulation of the inequality in Eq. 4:

$$\Delta p_1 \Delta v_1 + \Delta p_2 \Delta v_2 + \ldots + \Delta p_{99} \Delta v_{99} < 0$$

> owed much to Wilson's lectures on thermodynamics. In particular, I was struck by his statement that the fact that an increase in pressure is accompanied by a decrease in volume is not so much a theorem about a thermodynamic equilibrium system as it is a mathematical theorem about surfaces that are concave from below or about negative definite quadratic forms. Armed with this clue, I set out to make sense of the Le Chatelier principle."

This, to note, is a "social ideal gas law" like formulation. In lecture, Wilson had taught Samuelson Le Chatelier's principle, which explained to Samuelson that in a system (chemical or economic) the changes in the equilibrium is a constrained maximization problem when one of the constraints is marginally tightened or relaxed and thus solved by the "variation principle".

At some point therein, in this 1930s period, Wilson taught a seminar on mathematical economics which Samuelson and a few others attended. [20] This seminar may be "Wilson's lectures on thermodynamics" to which Samuelson is referring (1970) to above?

Dissertation

Samuelson, following his Harvard's Society of Fellows intellectual sojourn, quickly wrote up his PhD dissertation, after which, as the story goes, when he completed his defense of his doctoral dissertation, one member of the committee turned to another and said, "did we pass?". Specifically, as William Barnett, in co-editor association with Samuelson (2007), summarizes: [16]

A photo of **Samuelson**, in his later years, in his office, in an article discussing how in 1938 he remaindered "utility" theory as obsolete. (Ñº)

> "It is widely reported that at the end of Samuelson's dissertation defense at Harvard, the great economist Joseph Schumpeter turned to Nobel Laureate, Wassily Leontief, and asked, 'Well, Wassily, have we passed?'"

The exact date of this defense needs to be tracked down, but whatever the case, most sources report that Samuelson received his PhD in 1941 from Harvard —though, to note, somehow, he had moved to MIT before finalizing his PhD (see below) (check).

Samuelson's thesis, according to Andrew W. Lo, modeled each person as an economic agent, and assumed that each individual acted so as to maximize a quantity called 'expected utility', a model with which he assumed should be able to predict their behavior in much the same way that physicists predict the behavior of physical objects.

The thesis soon won international acclaim as well as the David A. Wells Prize (1941) for best publishable thesis, and was eventually published in 1947 under the title *Foundations of Economic Analysis*, the first run 750 copies selling out and soon thereafter was selling at nearly 50,000 copies a year, and would soon become one of the highest selling college textbooks of all time, and as Samuelson latter put it, the work done in his *Foundations*, won him the 1970 Nobel Prize.

[13]

Harvard → MIT | Newton's third law of motion

In Dec 1939, Samuelson received a letter of recruitment from Harold Freeman, a former co-student with Samuelson from 1936-68, who was now an associate professor at MIT. In Oct 1940, Samuelson departed from Harvard, owing to a number of argumentative circumstances, to MIT where he became professor of economics. [14] In this transition, period, sometime one or after October 10, when MIT president Karl Compton offered Samuelson an assistant professorship, Rupert Maclaurin—an economics professor and son of former MIT president Richard Maclaurin—phoned him daily, dangling before him the prospect research funds, including money offered by businessman Roger Babson (1875-1967) to support the study of the "implications for economics of Isaac Newton's law of action and reaction" (see: third law of motion), as English economist and Samuelson biographer Roger Backhouse summarizes things. [15]

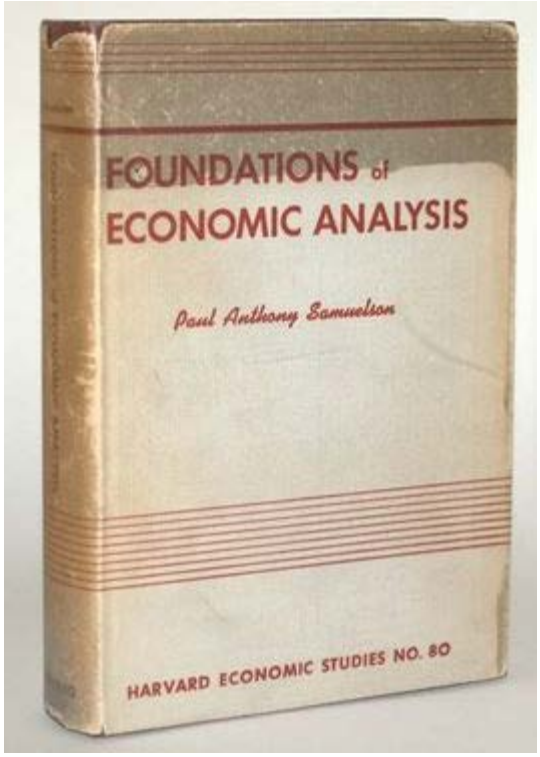

A signed copy of Samuelson's 1947 *Foundations of Economic Analysis*, with its opening Willard Gibbs quote: "mathematics is a language", from which he supposedly borrowed the minima and maxima differential methods for use in economic analysis. (Ñº)

Foundations | 1947

Samuelson's general economic model, in particular, was influenced by Gibbsian equilibrium criterion. His 1947 book *Foundations of Economic Analysis*, from his doctoral dissertation, is based, in theme, on Gibbs' 1876 *On the Equilibrium of Heterogeneous Substances*. [1] Samuelson was the sole protegé of the polymath Edwin Wilson, who had himself been the sole protegé of Yale's great physicist Willard Gibbs. [2] During these formative years, Gibbs' theories on equilibrium and chemical thermodynamics influenced them both in their ideas on the equilibrium of economic systems. In his seminal *Foundations*, Samuelson suggested, for example, that variation of the demand for a factor with a change in its price was analytically similar to thermodynamic variation in the pressure, volume, and temperature of an ideal gas. [9] All of this is pure Gibbsian. In fact, one may argue that the terms "foundation" and "variation" were plucked directly from the first page of the abstract to *Equilibrium*, wherein Gibbs states:

"Little has been done to develop the principle [of entropy] as a **foundation** for the general theory of thermodynamic equilibrium, which may be reformulated as follows: for the equilibrium of any isolated system it is necessary and sufficient that in all possible **variations** of the state of the system which do not alter its energy, the variation [δ] of its entropy shall either vanish or be negative."

In short, Samuelson seemed to have adopted the variational logic of differential equations employed in thermodynamics, where variation goes by the mathematical name of "derivative", to be applied in economics. Samuelson, however, maintains that his borrowing of thermodynamics to application in theoretical economics is only as "mathematical isomorphisms" between the maximum-minimum structures of thermodynamics and the cost-profit-utility systems of economics. [10]

Samuelson | 1960-70s

Into the late 1950s going into the 1960s, Samuelson seems to have gone on the defensive in regards to his physical chemistry stylized economics models, in particular in regards to whether or not his analogies or thermodynamics conceptualized "mathematical isomorphisms" are real or just fictional contrivances. In 1960, to exemplify, Samuelson commented the following: [11]

"The formal mathematical analogy between classical thermodynamics and mathematic economic systems

> has now been explored. This does not warrant the commonly met attempt to find more exact analogies of physical magnitudes – such as entropy or energy – in the economic realm. Why should there be laws like the first or second laws of thermodynamics holding in the economic realm? Why should 'utility' be literally identified with entropy, energy, or anything else? Why should a failure to make such a successful identification lead anyone to overlook or deny the mathematical isomorphism that does exist between minimum systems that arise in different disciplines?"

At this point, one can begin to see Samuelson's mind begin to fall apart on this issue. His statement: "why should there be laws like the first or second laws of thermodynamics holding in the economic realm?", is clearly indicative of this. The reversal of this statement is that the first and second laws hold in all systems of the universe, as such the question becomes: "what are the economic determinants involved in the quantification of the governance of the first and second laws in economic terms?"

Curiously, although Samuelson used and discussed thermodynamics in his own work, he seemed to become more and more pessimistic of the use of entropy and thermodynamics in general by others, especially in his later years, particularly after his 1970 Nobel prize win. In 1972, for instance, in a dismissal of the idea of a sociological thermodynamics, Samuelson concluded: [4]

Samuelson in Washington in 1962, with an angry look.

> "The sign of a half-baked speculator in the social sciences is his search for something in the social system that corresponds to the physicist's notion of entropy."

Yet, in 1974, Samuelson wrote that a high-PQ trader "is in effect possessed of a 'Maxwell's demon' who tells him how to make capital gains from effective peek into tomorrow's financial page reports." [7] Again, in the 1980 edition of his famous *Economics* textbook, he outlines a discussion on "entropy economics". In the same work, he outlines how, in his view, energy and entropy are consequential for economics: [6]

> "You can't make a perpetual motion machine that will run by dropping a ball's bouncing back to higher than its point of release. That's a consequence of the first law of thermodynamics—which guarantees conservation (or constancy of the total energy). More subtle, but no less consequential for economics, is the second law of thermodynamics: it requires that the total entropy (or 'disorder') irreversibly increases, while the total of energy is remained constant."

So, on one hand (1972), he states that people who use entropy in the social sciences are half-baked, yet he advises its use in economics on the other hand (1980); a point of inconsistency in his mind? A turning point in the mind of Samuelson occurred following the publication of the eleventh edition (1980) of his *Economics*. In subsequent editions (after the eleventh), noted Egyptian-born American physicist Jack Hokikian, all mentions of entropy and the laws of thermodynamics had been removed? [8]

At the 1989 *Gibbs Symposium*, organized to honor the memory of the theoretical physicist Willard Gibbs on the 150th anniversary of his birth, Samuelson had become even more pessimistic on the use of thermodynamics in economics:

> "As will become apparent, I have limited tolerance for the perpetual attempts to fabricate for economics concepts of 'entropy' imported from the physical sciences or constructed by analogy to Clausius-Boltzmann magnitudes."

He continues: [5]

> "The monthly mail still brings grandiose schemes to replace the dollar as a unit of value by energy or entropy units. Superficial knowledge of thermodynamics, brought into contact with ignorance of economics, cannot even in the presence of the catalyst of noble intentions beget stable equilibrium of useful of useful products. This is not a tautology, merely a finding of fifty-five years of reading the morning mail."

Volumes 1-5 of **Samuelson's** *Collected Scientific Papers* (Ñº); see hmolscience power center genealogy.

Whatever the reason, it is very curious that a student of Gibbs would find such irritation at the use of energy and entropy in the study of economic systems?

Quotes | On

The following are noted tributes:

> "Samuelson won the Nobel Prize in economics in 1970, while a professor at MIT. I was an undergraduate engineering student at MIT from 1959 to 1963. To all students at MIT in all fields, there were to 'gods' who loomed over the rest of the faculty: the great mathematician, Norbert Wiener, and the economist, **Paul Samuelson**."
>
> — William Barnett (2007) [16]

Quotes

The following are other quotes:

> "The formal mathematical analogy between classicalthermodynamics and mathematical economic systems has nowbeen explored. This does not warrant the commonly metattempt to find more exact analogies of physical magnitudes—such as entropy or energy—in the economic realm. Whyshould there be laws like the first or second laws ofthermodynamics holding in the economic realm? Why should "utility" be literally identified with entropy, energy, or anythingelse? Why should a failure to make such a successful identification lead anyone to overlook or deny the mathematicalisomorphism that does exist between minimum systems thatarise in different disciplines?"
>
> — Paul Samuelson (1960), "Publication"; cited by Jason Smith [21]

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Further reading

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â— Samuelson, Paul A. (1990). "Gibbs in Economics (subsection: How thermodynamics impacts economics, pg. 263-)" (pgs. 255-68); in *Proceedings of the Gibbs Symposium: Yale University, May 15-17, 1989* by D.G. Caldi, George D. Mostow, American Mathematical Society, 1990.

External links

â— Paul Samuelson – Wikipedia.

θΔics

In hmolscience, **Paul A. Strassmann** (c.1925-) is a Czechoslovakian-born American engineer and business management theorist noted, in business thermodynamics, for his 2005-2007 talks and publications thermodynamics-conceptualized information theory applied to business management.

Overview

In 2005, Strassmann gave a 47-minute talk entitled "Information Management and Organizational Entropy", in which he discusses his views on the relationship between IT spending, disorder, organization, and structural entropy in the informational infrastructures of companies. The following is the opening synopsis from the lecture: [1]

> "The whole evolution of mankind is one of increasing level of ordering relationship in creating complexity. Thermodynamics tells us that entropy or the lack of organization is the nature of the universe and that organization will [tend to] disintegrate or dissipate unless [made to be] organized. The same theory, in fact, of entropy, in application of the laws of physics, was applied by Claude Shannon to the fundamental principle of information theory. That is really the issue today of what information management is all about."

In his 2007 book *The Economics of Corporate Information Systems*, he comments further on this view in stating that in the structure of the tooth-to-tail ratio of an organization, "tooth" being the employees at the front end of the company "tail" being the overhead staff, middle managers, support structure, etc., the tail is "always the source of disorder", representing a loss of useful energy (available energy), and thus the focal location of the second law of thermodynamics at work within any company. [2] Strassmann's entropy theories, to note, seem similar, albeit in a different spin, to other corporate entropy theories, such as Tom DeMarco and Timothy Lister's 1987 peopleware view of red tape and corporate entropy. [3] Strassmann, however, seems to acknowledge only Claude Shannon in his understanding of entropy.

Education

Strassman completed a BS in electrical engineering at Cooper Union, an MS in management at MIT, and a PhD at George Mason University; has is or has been a senior officer of General Foods, Kraft, Xerox, US Department of Defense, NASA; Strassmann currently a professor of information sciences at George Mason University. [4]

References

1. Strassmann, Paul A. (2005). "Information Management and Organization Entropy", *George Mason University*, 29 March, Google Video.
2. Strassmann, Paul A. (2007). *The Economics of Information Systems* (term: "entropy", pg. 153). Information Economics Press.
3. DeMarco, Tom and Lister, Timothy. (1987). *Peopleware: Productive Projects and Teams*. Dorset House Publishing.
4. Walsch, Daniel. (2009). "Paul Strassmann to be Honored: by George Mason University with Honorary Doctorate of Human Letters.", 23 April., GMU, Newsroom.

External links

â— Paul A. Strassmann (biography) – Strassmann.com.

θΔics

In Egyptian, **paut**, symbolized by three or more of the neter "𓇋" hieroglyphs, e.g. "𓇋𓇋𓇋", equals "three god group", refers to or means "god company", group of gods, or god family, generally of a particular city or state capital, e.g. Hermopolis had an eight god paut "𓇋𓇋𓇋𓇋𓇋𓇋𓇋𓇋", called by the Greeks the Ogdoad, and Heliopolis had a nine god paut "𓇋𓇋𓇋𓇋𓇋𓇋𓇋𓇋𓇋", called by the Greeks the Ennead, .

Quotes

The following are example quotes:

> "Osiris in men's mouths, is the '**paut**-ti' of the world, Atum, feeder of beings among the gods, beneficent spirit in the abode of spirits. The word 'paut-ti' or double-paut is connected with the idea of creation."
>
> — Samuel Birch (1874), "Hymn to Osiris" (line 4), on tablet made in reign (1506-1493BC) of Thutmose I of the 18th dynasty [2]

> "Besides the nine gods who were supposed to form the 'great company"' of gods of the city of Heliopolis, there was a second group of nine gods called the 'little company' of the gods, and yet a third group of nine gods, which formed the least company. Now although the **paut** or company of nine gods might be expected to contain nine always, this was not the case, and the number nine thus applied is sometimes misleading. There are several passages extant in texts in which the gods of a paut are enumerated, but the total number is sometimes ten and sometimes eleven. This fact is easily explained when we remember that the Egyptians deified the various forms or aspects of a god, or the various phases in his life. Thus, the setting sun, called Temu or Atmu [Atum], and the rising sun, called Khepera [Khepri], and the mid-day sun, called Ra, were three forms of the same god; and if any one of these three forms was included in a paut or company of nine gods, the other two forms were also included by implication, even though the paut then contained eleven instead of nine gods."
>
> — Wallis Budge (1899), *Egyptian Ideas of a Future Life* [1]

References

1. Budge, Wallis. (1899). *Egyptian Ideas of a Future Life* (paut, 3+ pgs; quote, pgs. 90-91). Kegan Paul, Trench, Trubner & Co., 1908.
2. Birch, Samuel. (1874). *Records of the Past: English Translations of the Assyrian and Egyptian* (pg. 99). Publisher.

θΔics

In hmolscience, **Pavel Barseghyan** (c.1943-) is an Armenian-born American electrical engineer, computer engineer, and consultant noted for his 2014 JHT submission draft article "Methods of Thermodynamics for Describing Stationary Behavior of Human Systems", wherein he attempts to outline a thermodynamic type of project estimation methodology which was the base for development of project management commercial software tools in the area of chip design, based on a state equation of human labor which is the reflection of the balance between the complexity of work and the human capacities to overcome it. [1]

Barseghyan claims to have begun working on his theory in 1999, amid difficulties to do silicon chip manufacturing better, in respect to project management. Libb Thims explained to him that he should read the social ideal gas law historical overview, and then, per new JHT protocol, do the following: [2]

> (a) Pick a "human" model definition; per Irving Fisher (1892) protocol.
> (b) Redo submission using physicochemically neutral terminology; per Charles Sherrington (1938) protocol that "physics and chemistry do not recognize the word life" and per Alfred Rogers (2010) and Ferris Jabr (2013) conclusions that "life does not exist", i.e. to redo any defunct theory of life terminology with life terminology upgrades.

(add discussion)

References

1. Barseghyan, Pavel. (2014). "Methods of Thermodynamics for Describing Stationary Behavior of Human Systems", submitted for JHT publication to Libb Thims, Nov 29.
2. Email communication from Libb Thims to Barseghyan, Nov 30.

Further reading

● Barseghyan, Pavel. (2009). "Human Effort Dynamics and Schedule Risk Analysis." *PM World Today*, Mar, 21(3), 13 pgs.
● Barseghyan, Pavel. (2010). "The Dynamics of Human Social Behavior: Qualitative Mathematical Description of Human Interactions." *PM World Today*, Jan, 22(1), 16 pgs.
● Barseghyan, Pavel. (2012). "Entropy of the System of Human Knowledge" (Q), WordPress.com, Dec 14.

External links

● Pavel Barseghyan (about) – PMWorldLibrary.net.

θΔics

In dating systems, **PE**, short for “printing era”, as compared to modern era (ME), is an hmolscience dating system, according to which the year zero (0 PE), the start of the knowledge revolution, is assigned to the year of the invention of the Guttenberg printing press, by German inventor Johannes Gutenberg, which occurred in the year 1450 AD, in the *Anno Domini* dating system.

Years before printing era (PE) are referred to as “Before Printing” (BP) era years.

4 BP	3 BP	2 BP	1 BP	0 PE	1 PE	2 PE	3 PE	4 PE
1446 AD	1447 AD	1448 AD	1449 AD	1450 AD	1451 AD	1452 AD	1453 AD	1454 AD

← Before Printing | Printing Era →

Top: Gutenberg depicted taking the first proof off his printing press. (Ñº) Bottom: the BP (before printing) / **PE** (printing era) "printing era dating system", based on the year of the invention of the Gutenberg printing press, introduced in 2012 (562 PE) by American electrochemical engineer Libb Thims. [1]

Epicurus | 1417

Alternative to the assignment of 1450 to the start of the modern era (or 1642 Newton birth as start), American Historian Stephen Greenblatt contends, in his discussion of the Epicurean swerve, how Florentine-Roman Latin manuscripts scholar Poggio Bracciolini's Jan 1417 discover of the then known only surviving copy of Lucretius’ 55BC *On the Nature of Things*, is what launched the modern era, the Renaissance, and modern science. [10] Poggio’s find is summarized as follows: [11]

> “One of Poggio's finds that has become especially famous was, in January 1417, in a German monastery (never named by Poggio, but probably Fulda), the discovery of the only manuscript of Lucretius's *De Rerum Natura* known at the time. Poggio spotted the name, which he remembered as quoted by Cicero. This was a Latin poem of 7,400 lines, divided into six books, giving a full description of the world as viewed by the ancient Greek philosopher Epicurus. It has been translated as *On the Nature of the Universe* (Oxford World's Classics). The manuscript found by Poggio was not preserved, but he sent the copy he had ordered to Niccolo Niccoli, who made a transcription in his beautiful book hand (the creator of italic script), which became the model for the more than fifty other copies circulating at the time. Poggio complained that Niccoli didn't return his original copy for 14 years! Later two 9th-century manuscripts were discovered, the O ("Oblongus", ca. 825) and Q ("Quadratus") codices, now kept at Leiden University.”

(add discussion)

Dating system | Comparisons

The following are noted printing era geniuses (see: genius IQs), ordered by date of synthesis (birth) in the PE dating system:

Genius	AD	PE	ME
Leonardo da Vinci	1452-1519	2-69	
Nicolaus Copernicus	1473-1543	23-93	
Isaac Newton	1643-1727	193-27	0-84
Johann Goethe	1749-1832	299-382	107-190
Albert Einstein	1879-1955	429-505	237-313
Stephen Hawking	1942-	492-	300-
Christopher Hirata	1982-	532-	340-

where are a different breed of geniuses, in some sense, as compared to before printing (BP) geniuses, as the amount of known information tended to increase.

Cosmological reference point

The start of the PE dating system is cosmologically assigned to the day after the winter solstice six years prior exactly to the 23-documented passing of Haley’s comet, which occurred on June 9th, 1456 AD, as shown below:

- 1P/−239 K1, −239 (25 May 240 BC)
- 1P/−163 U1, −163 (12 November 164 BC)
- 1P/−86 Q1, −86 (6 August 87 BC)
- 1P/−11 Q1, −11 (10 October 12 BC)
- 1P/66 B1, 66 (25 January 66 AD)
- 1P/141 F1, 141 (22 March 141)
- 1P/218 H1, 218 (17 May 218)
- 1P/295 J1, 295 (20 April 295)
- 1P/374 E1, 374 (16 February 374)
- 1P/451 L1, 451 (28 June 451)
- 1P/530 Q1, 530 (27 September 530)
- 1P/607 H1, 607 (15 March 607)
- 1P/684 R1, 684 (2 October 684)
- 1P/760 K1, 760 (20 May 760)
- 1P/837 F1, 837 (28 February 837)
- 1P/912 J1, 912 (18 July 912)
- 1P/989 N1, 989 (5 September 989)
- 1P/1066 G1, 1066 (20 March 1066)
- 1P/1145 G1, 1145 (18 April 1145)
- 1P/1222 R1, 1222 (28 September 1222)
- 1P/1301 R1, 1301 (25 October 1301)
- 1P/1378 S1, 1378 (10 November 1378)
- **1P/1456 K1, 1456 (9 June 1456)** ← 0 PE (9 Jun 1450)
- 1P/1531 P1, 1531 (26 August 1531)
- 1P/1607 S1, 1607 (27 October 1607)
- 1P/1682 Q1, 1682 (15 September 1682)
- 1P/1758 Y1, 1759 I (13 March 1759)
- 1P/1835 P1, 1835 III (16 November 1835)
- 1P/1909 R1, 1910 II, 1909c (20 April 1910)
- 1P/1982 U1, 1986 III, 1982i (9 February 1986)
- Next perihelion predicted 28 July 2061

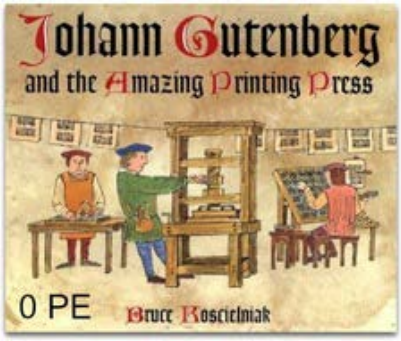

Halley's Comet on 8 March 1986

and in which the year 1 BP(1449 AD) occurred the year prior, counting backwards, similar to the years BC. [1] The BP/PE dating system is thus a modern hmolscience, non religio-mythology based, upgrade to the older AD, or "*Anno Domini*", or "Year of our Lord", Western culture dating system.

Left: English physicist Isaac Newton, in the 18th century, objected to the label "AD", based on his objection to the existence of the trinity, and would use "AC", or *Anno Christum*, in its place.

Etymology

English physicist Isaac Newton (1643-1727) (193-277 PE) was one of the first prominent researchers in this area, albeit research done incognito, and he would objectionably not label years as AD, but instead used AC (*Anno Christum*), signifying is objection to the argument of the existence of the trinity, namely his view that a person named Jesus may have existed, may have been the son of God, and may have been christened or arisen, but definitely was not the 'Lord' or God. [2]

The BP/PE Guttenberg dating system was introduced in the 2012 manuscript *Purpose? (in a Godless universe)* by American electrochemical engineer Libb Thims, based on the fact that the current BC/AD dating system is a baseless system, namely based on the birth (0 AD) (1450 BP) or synthesis of the religio-mythological figure of the god/person named Jesus Christ, and hence Christianity a "Ab-Ra-ham-ic" faith which, in turn is based or rather a transmogrification/syncretism of the earlier religio-mythological figure of the Egyptian god Osiris and his god/son Horus, as retold annually in the famous "Passion of Osiris" (2400-400BC) or "Passion of Christ" (300 AD-present), all of which, Hinduism (a "B-Ra-hma-ic" faith) and Islam (an "Ab-Ra-ham-ic" faith) included, date back or rather originated in the pre-Dynastic Egyptian era (4000 BC) sun (Ra) birth/death theory (Anunian theology/Ra mythology). [3]

To cite one dominant strong opinion on the matter, without further into prolonged discussion, the following is French emperor Napoleon Bonaparte's educated views on matter of the existence of a religio-mythology figure of Jesus Christ (Greek), a term which translates as "God Osiris-Horus Anointed" (Egyptian), as follows: [4]

"I have dictated thirty pages on the world's three religions; and I have read the Bible. My own mind is made up. I do not think Jesus Christ ever existed."

– Napoleon Bonaparte (367 PE)
French emperor

Hence, the use of a dating system based on the date of something that never existed, especially in a hard science encyclopedia, a focused group within which fewer than 5 percent of which believe in the existence of god. The following are the 1998 polled views of America's so-called leading or "greater" scientists, the members of the National Academy of Sciences, on personal belief or disbelief on God and immortality: [2]

American National Academy of Sciences (1998)	**Disbelief in God**	**Disbelief in immortality**	**Doubt** (or agnosticism) **of belief in God**	**Doubt** (or agnosticism) **of belief in Immortality**	**Belief in God**	**Belief in Immortality**
Physical scientists (physicists and astronomers)	79%	76.3%	13.5%		7.5%	7.5%
Biological scientists	65.2%	69%	32.3%		5.5%	7.1%
Mathematicians					14.3%	15%
Overall:	72.2%	76.7%	20.8%	23.3%	7.0%	7.9%

This 1998 data set can be combined with American psychologist James Leuba's 1916 and 1933 data sets to yield the following plot, which show, according to extrapolative estimates, that currently about 5 percent of leading scientists believe in the existence of God: [5]

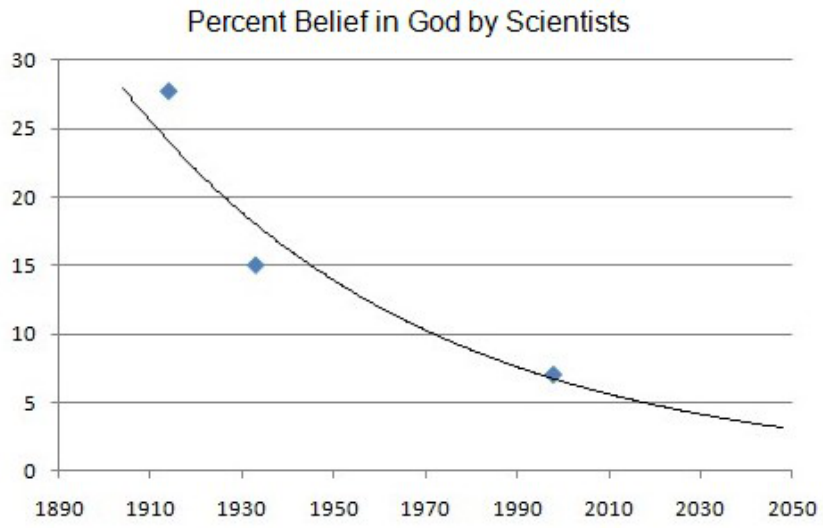

The following is the circa 2000 (550PE) global distribution in beliefs:

World Religions Distribution

Ab-Ra-ham-ic faiths: (53%)

Christianity (33%)

Islam (20%)

Judaism (0.2%)

Baha'ism (0.1%)

Mandaeism (0.001%)

B-Ra-hma-ic faiths: (19%)

Hindu (13%)

Buddhism (6%)

Sikhism (0.4%)

Jainism (0.07%)

Non-religious/Atheist: (15%) $ Secular (12.6%) Atheist (2.5%)

Other-religions: (13%) Chinese religions (6.4%) Ethnic religions (4.2%) New religions (1.7%) Spiritists (0.2%) 水 Confucians (0.1%) 鳥居 Shintoists (0.05%) Zoroastrians (0.005%)

Of which 72 percent, as shown above, are Anunian theology or Ra theology (Ab-ra-ham-ic/B-ra-hma-ic) based, i.e. "Father Ra born of Nun" belief systems:

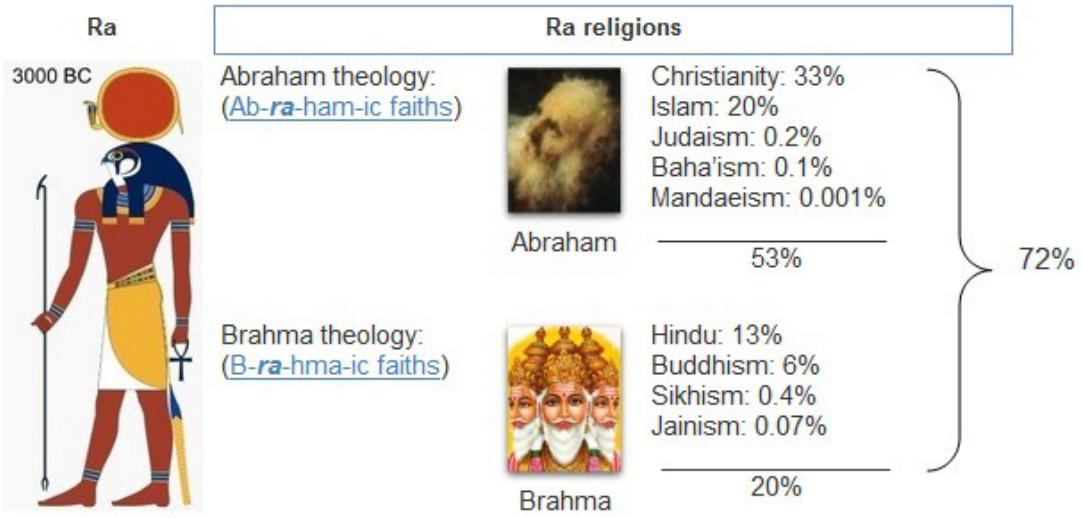

Hmolpedia, however, is a "thermodynamics" based belief system, hence the BC/AD dating system is congruent and in need of reform —hence the new 2013 online introduced “BP/PE” dating system implementation in *Hmolpedia* articles.

The BP/PE dating system was introduced online, namely into the Empedocles article, on 14 Apr 2013, prior to Thims' 16 Apr 2013 lecture, entitled “A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies”, in which he planned to introduce Empedocles' circa 450 BC (1900 BP) chemical aphorisms about people, as poetically discussed in his *On Nature*; who, in turn, was cited by German polymath Johann Goethe, in his 1809 (359 PE) physical chemistry based *Elective Affinities*; whom, in turn, were both cited by German solid state physicist Jurgen Mimkes in his 2000 (550 PE) article "Society as a Many Particle System": [6]

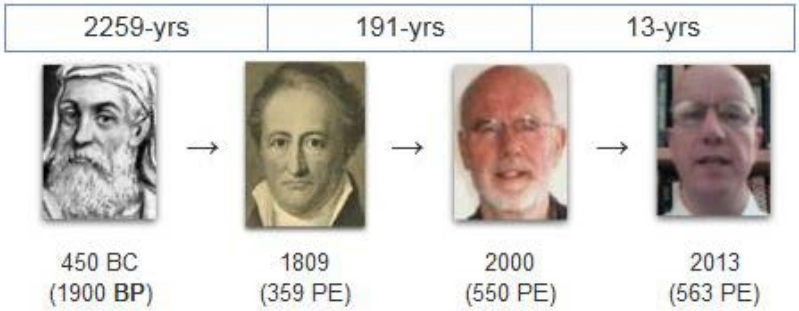

A gist learning curve chronology of the evolution of the BP/PE printing era dating system, in terms of the citation building blocks of the some of the main founders of hmolscience, namely: Empedocles (*On Nature*, 450BC), Goethe (*Elective Affinities*, 1809) Mimkes ("Society as a Many Particle System", 2000), and Thims ("A Guidemap to Human Chemical Thermodynamics"), who all, in turn, cited each other, progressively, in a successive build up.

> “This idea goes back to Empedocles of Acragas (495-435 BC). In his book *On Nature* he explains solubility of wine in water by the attraction and love of relatives, segregation of water and oil by the hate of enemies. J. W. Goethe (1749-1832) used this idea in his novel *Die Wahlverwandtschaften* to demonstrate that human relations depend on the chemical laws of society.”

who, all three of which, are planned to be cited in the opening of Thims' 2013 (563 PE) lecture. [7] The Empedocles-Goethe human chemical theory and modern version Mimkes-Thims human chemical thermodynamics theory are "godless" belief systems; hence the use of a god-based dating system in a godless belief system is antithetical and thus directly opposed or contrasted; mutually incompatible. The BP/PE dating system is a patch solution to this inconsistency problem.

On 15 Apr 2013, the BP/PE dating system began to be introduced online into a few Hmolpedia articles, namely: Empedocles, Isaac Newton, Johann Goethe, Libb Thims, Jurgen Mimkes, and Napoleon Bonaparte.

Anno Domini dating system

The *Anno Domini* dating system was devised in 525 AD (925 BP) by Dionysius Exiguus to enumerate the years in his Easter table. His system was to replace the Diocletian era that had been used in an old Easter table because he did not wish to continue the memory of a tyrant who persecuted Christians. The last year of the old table, Diocletian 247, was immediately followed by the first year of his table, AD 532. When he devised his table, Julian calendar years were identified by naming the consuls who held office that year—he himself stated that the "present year" was "the consulship of Probus Junior", which was 525 years "since the incarnation of our Lord Jesus Christ". Thus Dionysius implied that Jesus' Incarnation occurred 525 years earlier, without stating the specific year during which his birth or conception occurred. [2]

Etymology

> *See main: BP article (for full etymology)*

The BP/PE dating system was conceived in 2012 by American electrochemical engineer Libb Thims. [1] On 15 Apr 2013, the BP/PE dating system began to be introduced online into a few Hmolpedia articles, namely: Empedocles, Isaac Newton, Johann Goethe, Libb Thims, Jurgen Mimkes, and Napoleon Bonaparte.

Quotes

The following are relevant quotes:

> "In the era BC (before cybernetics) it [*Elements of Physical Biology*] was an important source of education and encouragement for few souls who had gleam in their eyes about the prospective mathematization of the social sciences. It had a substantial influence on Henry Schultz and Paul Samuelson, and, I am sure, many others besides myself. As a matter of fact, most of the ideas of [Norbert] Wiener emphasizes—for example, the relation of entropy to organizational behavior—can be found in Lotka, and I have felt some annoyance at the lack of recognition of the latter's contributions."
>
> — Herbert Simon (c.1990) (Ñº)

> "Since, we are looking at the history of God from the Jewish and Muslim as well as the Christian perspective, the terms 'BC' and 'AD', which are conventionally used in the West, are *not* appropriate."
>
> — Karen Armstrong (1993) (542 PE), *A History of God* [9]

References

1. (a) Thims, Libb. (2011). *Purpose? (in a Godless universe)*. (94-pg manuscript) (unfinished); Online as 105-page unfinished manuscript (14 Apr 2013) (§1: Dating system, pgs. 1-4). IoHT publications.
(b) Anno Domini – Wikipedia.
2. Gleick, James. (2003). *Isaac Newton* (pg.112). Vintage Books.
3. Thims, Libb. (2011). *Purpose? (in a Godless universe)*. (94-pg manuscript) (unfinished); Online as 105-page unfinished manuscript (14 Apr 2013) (§1: Dating system, pgs. 1-4). IoHT publications.
4. Gourgard, Gaspard. (1904). *The Talks of Napoleon at St. Helena with General Baron Gourgaud*: *together with the Journal Kept by Gourgard on Their Journey from Waterloo to St. Helena* (translated, and with notes, by Elizabeth Wormeley Latimer, author of *France in the Nineteenth Century*) (ch. 17: Religion, pgs. 270-81). A.C. McClurg & Co.
5. Larson, Edward J. and Witham, Larry. (1998). "Leading Scientists Still Reject God", Nature, 394:313, Jul 23.
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8. Anno Domini – Wikipedia.
9. Armstrong, Karen. (1993). *A History of God* (Introduction, note pg. xxiii). Ballantine Books.
10. (a) Greenblatt, Stephen. (2011). *The Swerve: How the Renaissance Began* (abs). Random House.
(b) The Swerve: How the World Became Modern – Wikipedia.
11. Gian Francesco Poggio Bracciolini – Wikipedia.

θΔics

In terminology, **peace** (TR=84) is []

peace
/pēs/

noun

1. freedom from disturbance; quiet and tranquility.
   "you can while away an hour or two in peace and seclusion"
   synonyms: tranquility, calm, restfulness, peace and quiet, peacefulness, quiet, quietness; More
2. freedom from or the cessation of war or violence.
   "the Straits were to be open to warships in time of peace"
   synonyms: law and order, lawfulness, order, peacefulness, peaceableness, harmony, nonviolence; *formal* concord
   "we pray for peace"

A Google-generated definition of **peace** as freedom from disturbance or cessation from war or violence.

Theories | Overview

In 1936, American historian Charles Beard, in his *The Devil Theory of War*, according to Morris Zucker, aimed to scorn the utopian forever peace theorists. [1]

In 1967, Norwegian sociologist Johan Galtung published his *Theories of Peace: a Synthetic Approach to Peace Thinking*, which presents the results of a year-long funded project to develop an "entropy/energy theory of peace". [2]

In 1971, American writer John Garcia, in his *The Moral Society*, penned a Teilhardian-conceptualized theory wherein he theorized about peace entropically; the following being an example section: [3]

> "The evolutionary force driving man toward ever-greater mind causes him to seek ever-greater awareness. The entropic force drives him toward matter and causes him to seek ever-greater **peace** and tranquility. Tension is produced by an unpredictable and uncontrollable environment. Man, in an effort to adjust to both the entropic and the evolutionary forces, relieves his tension by deluding himself into believing he is aware when he is not. He deliberately avoids the tension of the evolutionary force by destroying his feedback. Without feedback the game of life cannot be won."

(add discussion)

In 2012, American hobbyist researcher Kurt Johnson, curator of the newly-launched SocialOrganizationPhysics.com, was lecturing to local groups around the Chicagoland area on his "Physical Theory of Peace", wherein he extolled his agenda-loaded view that physical sciences can be used to eliminate war and find sustainable peace. [4] The entire presentation, however, seems to be but a bloated diatribe on the motto that "if we can learn to fly" then "we can learn to eliminate war", largely inspired by his hero English railroad and aeronautical engineer George Cayley (1773-1857), but little to do with actual "physics" other than superficial namesake.

Quotes

The following are related quotes:

> "The morning after Goethe's death, a deep desire seized me to look once again upon his earthly garment. His faithful servant, Frederick, opened for me the chamber in which he was laid out. Stretched upon his back, he reposed as if asleep; profound **peace** and security reigned in the features of his sublimely noble countenance. The mighty brow seemed yet to harbor thoughts. I wished for a lock of his hair; but reverence prevented me from cutting it off. The body lay naked, only wrapped in a white sheet; large pieces of ice had been placed near it, to keep it fresh as long as possible. Frederick drew aside the sheet, and I was astonished at the divine magnificence of the limbs. The breast was powerful, broad, and arched; the arms and thighs were elegant, and of the most perfect shape; nowhere, on the whole body, was there a trace of either fat or of leanness and decay. A perfect man lay in great beauty before me; and the rapture the sight caused me made me forget for a moment that the immortal spirit had left such an abode. I laid my hand on his heart – there was a deep silence – and I turned away to give free vent to my suppressed tears."

— Johann Eckermann (1832), day after Goethe's reaction end (death) at age 82

"*Elective Affinities*—the famous novel by Goethe—is often considered, along with *War and* ***Peace*** [Tolstoy], the best novel of the nineteenth century."

— Francesca Santucci (2002) (Ñº)

"Regarding the Dawkins scale I cannot easily place myself because I don't believe in a super natural entity that designed and created the universe so I would be a strict 7. However my theory that there is a natural arrow of time driving increasing order in the universe to a point where life becomes God like or my appropriately very stable (iron instability arrow of time). I do, however, still believe in the long term effect of the 2nd law. So in terms of the classical definition I am a strict 7. However I do think people are entitled to their belief as long as they are **peaceful** and respect others belief so perhaps that drops me to a < 6. It's very interesting, thanks for showing this to me. I used to be a strong 10 for fifteen years, but the effect of belief on human evolution and its production of scientific logic gave it some limited justification. I am actually an atheist. My philosophy on God is as described by yourself a response to free energy, so called islands of negative entropy and a 'future' evolutionary level of human consciousness not some unsupportable metaphysical entity."

— Mark Janes (2010), response to query (Ñº) on Dawkins number

"The only way I will rest in **peace** is if one day transgender people aren't treated the way I was. Transgender needs to be taught about in schools, the earlier the better. My death needs to mean something."

— Leelah Alcorn (2014), suicide note, Dec 27; note: "rest in power" eulogy (Ñº)

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External links

â— Peace – Wikipedia.

θΔics

In science, **peer review** is a process by which new theories and ideas undergo review and critique by peers of that subject, typically in professional journals.

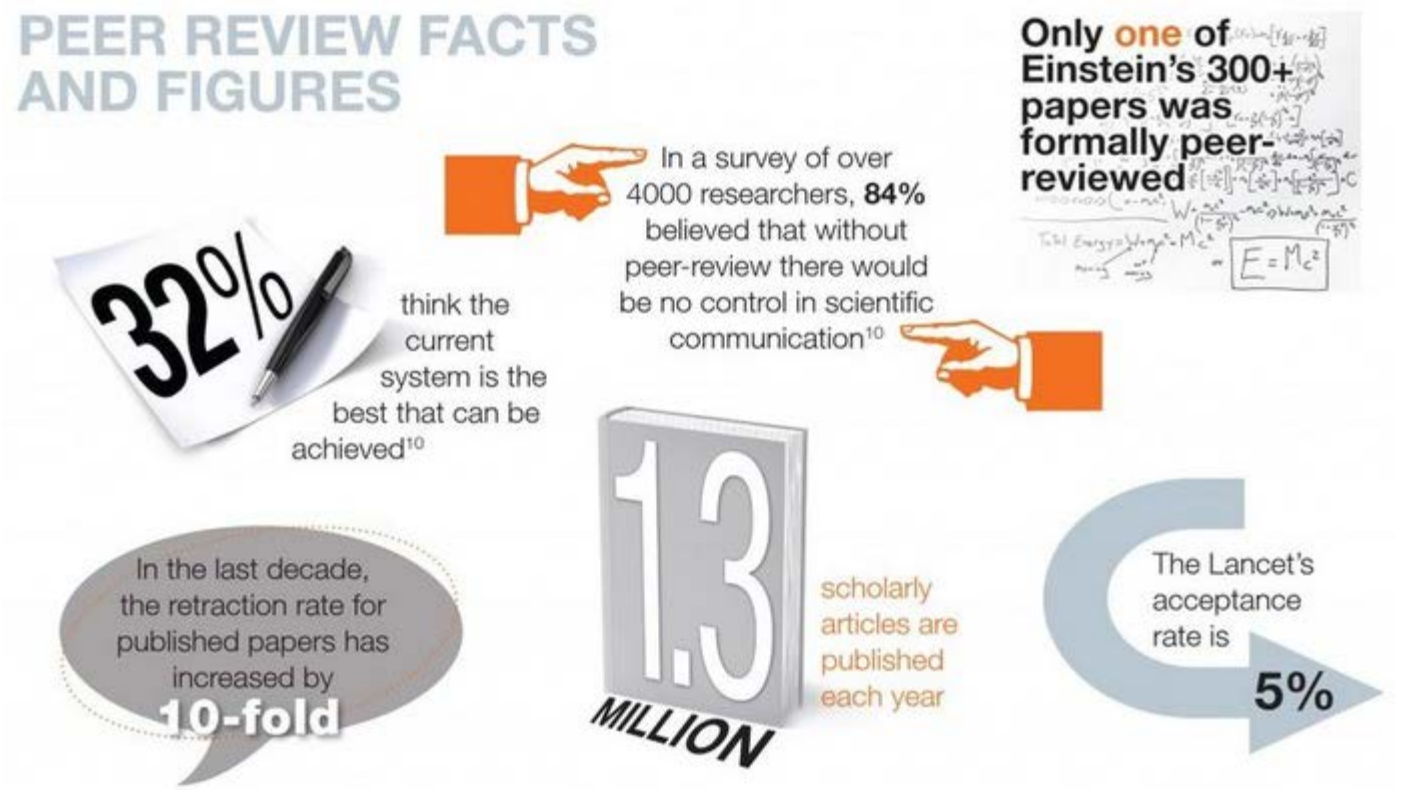

A 2013 factoid sheet (Q) on **peer review**; showing, interestingly, that only one of Albert Einstein's papers was formally peer-reviewed. The classic case of informal peer review would be the famous "Gibbs mailing list" a detailed ordering of who Willard Gibbs sent each of his famous papers to. [6]

Philosophical Transactions

In 1662, the Royal Society of London was formed, with Robert Hooke being Curator of Experiments, among other notables; and in 1665, German-born Englishman Heinrich Oldenburg, who had luminaries such as Oliver Cromwell, John Milton, John Wilkins, and Robert Boyle in his circle, began printing and distributing the society's correspondence in the form a news sheet called the *Philosophical Transactions*. This was the first so-called "journal of science".

In 1672, Isaac Newton had an account of his double prism experiments with light printed in the *Philosophical Transactions*, wherein he showed how his work had showed that white light is a mixture of beams of colored beams of light, and that these colors are not something that the prism adds to the light, which overthrew the very basis of optics. Over the next four years, the *Philosophical Transactions* boiled with controversy, amounting to ten critiques of Newton's letter and eleven counter from Newton. This tension of this first-ever "peer review" process was so great and previously before unheard of that having only recently been elected to the Royals Society, less than fifteen months ago, Newton announced that he wished to withdraw—and not just from the society but from all correspondence (Hooke having been Newton's most aggressive antagonist during this boiling). He wrote to society mathematician John Collins: [4]

> "I suppose there hath been done me no unkindness, but I could wish I had met with no rudeness in some other things. And therefore I hope you will not think it strange if to prevent accidents of that nature for the future I decline that conversation which hath occasioned what is past."

Newton never returned to the Royal Society, until after Hooke's end (death) in 1703.

Early journals

In 1799, the famous *Annalen der Physik* (*Annals of Physics*) was launched; notable for publishing articles such as with Albert Einstein's 1905 annus mirabilis ($E=mc^2$) papers, as well as for infamously-rejecting noted articles such as Robert Mayer's 1841 paper "On the Quantitative and Qualitative Determination of Forces", one of the first papers on the conservation of energy (rejected by German physicist Johann Poggendorff).

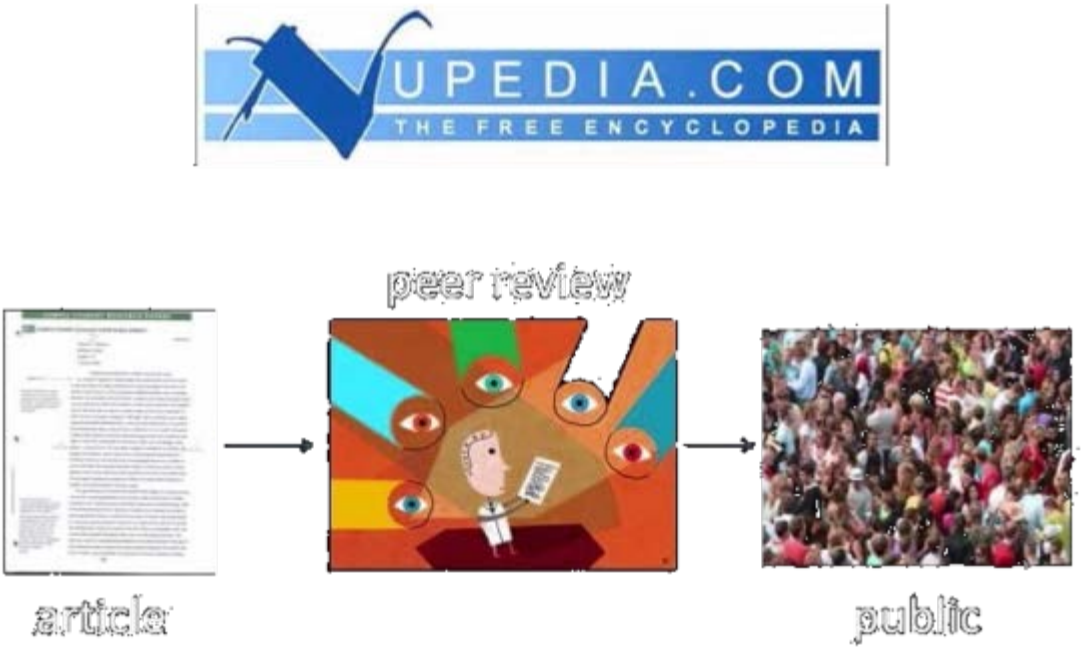

The strict "**peer-review**", for-profit, articles written-by-experts, envisioned Nupedia, prior to going "went belly-up" (O) in 2003, managed to produce, in its 36 month existence span, only 24 articles, a rate of 8 articles/year; which jumped to a rate of 5-million articles being written in a 10-year span, a rage of 500,000 articles per year, in the decade to follow.

In 1869, English astronomer Norman Lockyer became the founding editor of *Nature*, one the world's current premier scientific journal. Many of the early editions of *Nature* consisted of articles written by members of a group that called itself the X Club, a group of scientists known for having liberal, progressive, and somewhat controversial scientific beliefs relative to the time period. Initiated by Thomas Huxley, the group consisted of such important scientists as Joseph Hooker (warm pond model), Herbert Spencer, and John Tyndall, along with another five scientists and mathematicians; these scientists were all avid supporters of Charles Darwin's theory of evolution of common descent.

In 1885, German physical chemist Wilhelm Ostwald published *Lehrbuch der allgemeinen Chemie* (*Textbook of General Chemistry*), the first textbook on physical chemistry and in 1887, together with Dutch chemist Jacobus van't Hoff, founded *Zeitschrift für physikalische Chemie* (*Journal of Physical Chemistry*) the first periodical in physical chemistry. [2]

In 1991, arXiv.org was launched by Paul Ginsparg, an electronic preprint review phase for scientific papers; where currently, as of 2011, once accredited into the circle of accepted peers, users simply upload articles to the site.

Affairs

Peer review towards the end of the 20th century seems to have become a bit of a unwieldy practice, by virtue of the split and fracturing of specialties, as evidenced by the Sokal affair (1996), a hoaxed physics paper accepted to a sociology journal solely via over-the-head jargon use and credential stature, and the Bogdanov affair (2002), a hoaxed physics PhD and peer-review journal publication, where journal acceptance translated into PhD confirmation, where professor knowledge on said subject no longer held sway.

Irish physicist Philip Moriarty (during the 2009 Moriarty-Thims debate) referred to Thims' work on the thermodynamics, chemistry, and physics of human molecules as being a Sokal affair.

Beta open wiki peer review

In 2011, the *Journal of Human Thermodynamics* (founded in 2005) began using and testing a beta state open wiki review process, in which inquiring-to-publish authors are required to first submit their work to open public review in the EoHT beta wiki, where authors are requested to obtain reputable feedback commentary (by at least 3 peers) in the public discussion threads below each

The article icon and description for the first open beta wiki peer review, which seemed to work out smoothly overall, with tensions and objections quickly been voiced in threads and publicaly-posted emails.

submitted article, and to have their article edited and improved based on feedback publically in the format of a public wiki page, such that each change to the article is preserved in the wiki page history archives.

The first to go through the process, Iranian-American chemical engineer and fluid thermodynamics researcher Mohsen Mohsen-Nia, whose article "A Thermodynamic Methodology for Evaluating of Friendship Relations Stability" came under reviewed criticism and attack from nine peers, commented:

> "Thank you very much for entering my article into the beta review process. I read the constructive reviewer's comments and really I think the "beta review process" is interesting (Oct 31)" and "At first, I would like to thank you and the reviewers for taking the time and effort to review the manuscript. I would also like to thank the reviewers for their professional approach, detailed evaluation and the valuable comments (Nov 20)."

The article was published and the beta review process publicly archived. [5]

See also

- Thermodynamics journals

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External links

- Peer review – Wikipedia.

θΔics

In hmolscience, **Peggy La Cerra** (c.1959-) is an American evolutionary psychologist and neuroscientist noted, in psychological thermodynamics, for her 1996 energy theory of depression or "energetic model of the mind", a mixture of evolutionary psychology, neuroscience, thermodynamics, and Freudian id-ego-superego psychodynamics.

Overview

In 1996, La Cerra began to glean her general theory that: "despite our differences, we are all the handiwork of the energetic universe, and each of us—and everything in the world around us—manifests its laws; and that everything is and always has been at one with the universe", during the tail end of her undergraduate and graduate studies in the psychology and neuroscience of depression. She explains her awaking to this viewpoint as follows: [7]

> "My awakening to this truth came like a bolt of lightning on a gray winter's day in Southern California. It was January 9, 1996, and I was pacing the floor of my tiny apartment, adjacent to the University of California, Santa Barbara. I had been working on the same research problem for months, trying to understand the complex group of phenomena we call 'depression' within the existing framework of evolutionary psychology. This school of thought held that the mind is a collection of separate problem-solving instincts, each one arising from a separate brain circuit that had solved a specific survival or reproductive problem for our ancestors. I had spent years of graduate and postdoctoral study doing research guided by this model, but I now felt deeply troubled by it. I just couldn't fathom how a bunch of separate instinctual circuits could possibly produce the seemingly orchestrated series of physical, psychological, and behavioral changes that make up a clinical depression."

She then gives an overview of her experience and research in depression:

> "Depression was a problem I knew something about. As a graduate student in neuroscience, I had spent years studying the characteristics of the dopamine system, one of the major neurotransmitter systems implicated in this condition. And long before that, I had a deluxe crash course — a severe episode of depression that had, over a frighteningly short period of time, systematically siphoned off my will to live."

La Cerra goes on to explain how her deluxe crash course in depression occurred when she was about twenty and mother, aunt, favorite cousin, and first boyfriend all died within a short period and that this sent her into a deep immobilizing depression, during which time she lost her period, stopped socializing, and was in a sort of undead holding pattern without a will to exist:

> "At first I simply felt odd — a little sad and unable to think clearly, with a diminished sense of self. But then everything spiraled downward. I was constantly tired but couldn't sleep. I tried to eat, but my favorite foods tasted like cardboard. Nothing felt pleasurable and, perhaps more disturbing, nothing felt painful. It was like being slowly embalmed. The sensory world faded, and nothing interested me. I stopped socializing and eventually lost the motivation to get out of bed. Finally, my periods stopped, and I was in a kind of holding pattern — not quite dead but not really alive. It was a profound experience — nothing like a set of instincts gone awry. It was more like a single plug had been pulled, and the vital force within me was draining out."

Back to her 1996 research query, she describes her energetic-view-of-the-mind epiphany as follows:

> "As I stared out the window, trying to find the right words and feeling the downward pull of my heart, my

> mind flickered back to my research problem about depression. Suddenly, something snapped into place. The depression I was beginning to experience wasn't the result of ancient problem-solving instincts gone awry, as the evolutionary psychologists had claimed. Nor was it an illness or a chemical imbalance, as the psychiatric community claimed. What was becoming clear in that moment was that depression is a potentially lifesaving adaptive response — a kind of dormancy. Suddenly I understood that there is an energetic calculus in our brains and minds that effects this downward shift: When our intelligence system perceives that there is not much to gain by carrying on with the tasks of life — when we are overcome by too much loss or are facing a period of too little gain — we get 'depressed.' By the same token, the seasonal shutdown psychiatrists call seasonal affective 'disorder' is actually a normal, if uncomfortable, recalibration for the energetically barren winter months that our species confronted during our ancestral past. This kind of motivational downshifting forces us to radically reconfigure our lives and our selves in an effort to keep us energetically solvent. My brain was shutting down my motivational system to keep me from wasting any more behavioral energy on a dead-end path."

In this statement we see a fairly well-formed philosophy, the idea that happenings such as states of depression can be quantified energetically and thus eventually in thermodynamic terms, in what be classified along the same lines as Austrian psychologist Sigmund Freud's 1895 "A Project for Scientific Psychology", wherein he outlined his epiphany of a future chemical thermodynamics based psychology, framed in the Helmholtz terms 'bound energy' and 'unbound energy' in a physical-psychological sense, a subject that eventually became psychodynamics (or energy psychology, as it is sometimes called). In any event, La Cerra goes on to describe the period of intellectual breakthrough and growth that follows as such:

> "Like a person starving in the desert who rejoices when he comes across a succulent tuber poking out of the ground, I went from sliding into a depression to being launched into a state of elation. I had 20 years of accumulated experimental knowledge about the mind and brain and almost 40 years of life experience to be resolved through the lens of this energetic model, and with this huge energetic boost, my own mind wasted no time. For the next weeks and months, I hardly slept as I was bombarded with hundreds of insights into how our intelligence system is designed to solve our behavioral challenges. A new paradigm of the human mind began to emerge — one that explained its functional design in accordance with the second law of thermodynamics, or entropy."

She describes the core to her new energy model of the mind as follows:

> "Somewhere in the midst of this 'enlightenment period,' I realized one simple truth: all life intelligence systems evolved in a world where the number one threat was — and is — entropy: the tendency toward randomness in a system. It takes a lot of energy to counter entropy and significantly more to form the basic jobs of life, so all forms of life have intelligence systems that have been honed by evolution to acquire, manage, and direct energetic resources. Everything else is secondary to meeting this energetic bottom line."

La Cerra recounts this epiphany incident (which might be similar to that experienced by Jing Chen or as described by Adriaan de Lange, to name a few examples), which seems to be her bottom line philosophy, in the adjacent video interview documentary. [5] Here we see that La Cerra is fairly close to target correctness in her philosophy, in her view that the second law is the bottom line rule of universal operation. Her view that the "number one threat in the world is entropy: the tendency toward randomness in a system [and that] it takes a lot of energy to counter entropy and

significantly more to form the basic jobs of existence", however, needs a bit of a rewrite.

The first rewrite is the "type" of systems humans are in, which is as described by American physical chemist Gilbert Lewis, are "surface-attached isothermal, isobaric, freely-going reactive system", according to which the entropy tendencies of the second law become subsumed into the bottom line that the tendency to evolution in social systems is towards Gibbs free energy decrease, which takes into account entropy increase or what is better described in its original Clausius terminology as transformation content increase.

A circa 2011 excerpt of an interview with **Peggy La Cerra** on her clash with her evolutionary psychology department colleges on her adamant view that everything, the human mind included, is the result of the adaptive driving pressures of energy and entropy. [5]

The second rewrite is her notion of "countering entropy" and that it takes a lot of energy to do this, which is a mis-extrapolation of the notion that entropy is the tendency to randomness or disorder to human social systems. It must always be remembered that underlying the mathematics of entropy, we are talking about heat release or heat absorption. Hence, for example, when two people fall in love or a person comes out of a depression and starts a new company, the process, if it is naturally spontaneous, is an endergonic chemical reaction between two or human molecules (people), meaning that during the course of the reaction heat will be released, in the form of electron orbital shifts downwards, photon release, and increased molecular motion, just as does a campfire warm one's hands. In any event, she continues in her retelling of her enlightenment period:

> “Behavior itself is energetically expensive — we must use energy in order to even attempt to get more. If our behavior doesn’t get us “the goods,” we run out of energy and die. Nature’s solution to this economic conundrum is a behavioral intelligence system that acts as an energetic cost–benefit analysis and prediction system. It creates a neural record of our experiences, a “representation” with all the details of each relevant moment, especially the attendant energetic costs and benefits. When we find ourselves in a situation similar to one we’ve encountered before, the system uses this stored information to “model” various behavioral options, estimate their likely costs and benefits, modify the one that most closely approximates our current circumstances, and chart an energetically sound behavioral course into the future.”

La Cerra goes on to conclude that she first published her theory as the 1998 paper “The Adaptive Nature of the Human Neurocognitive Architecture: An Alternative Model”, published in the *Proceedings of the National Academy of Sciences*, which was expanded on later in general audience format in her 2002 book *The Origin of Minds*.

Sher describes her theory as “the first scientifically based model of the functional human neurocognitive architecture that recognizes the second law of thermodynamic—entropy—as the primary adaptive force shaping the functional operational design of the mind.” [1]

La Cerra’s energetic model was presented for the general audience in the 2002 book *The Origin of Mind: Evolution, Uniqueness, and the New Science of the Self*, co-written with American theoretical evolutionary neuroscientist Roger Bingman. [2]

Spiritual awakening

La Cerra states that what she didn’t write about in her 1998 article and 2002 book was her spiritual awakening that she states that she had in the course of the discovery period. She describes this spiritual awakening as such:

> “My awareness of the exquisite integrity of the energetic universe. In this amazing period of discovery, it became crystal clear to me that the same laws that continually effect the changes in the seasons and that shape and reshape the contours of the land and the seas are continually shaping and reshaping our thoughts and behaviors and are creating our reality and our sense of self. I knew that I was experiencing the Tao —

> the energetic flow of the universe. One night, while I was standing under the stars on a grassy hill overlooking the Pacific Ocean, 'I' simply disappeared into it — anatta, 'no self.'"

She goes on to comment that she then began to reflected on the Pali scriptures, the earliest record of Buddhist thought, to find a unifying anchor point with her theory, wherein the self is considered to be illusory — nothing more than an experience arising from a collection of skandhas, bundles of form, feeling, perception, mental formations, and consciousness. This Buddhist spirituality aspect of her theory generally seems to unravel the cogentness of her purely thermodynamic presentation into a lot of conjectural and baseless ancient philosophy about existence. In any event, she concludes with interesting (spirit free) gems such as:

> "Energetic interactions. The love we feel when our child smiles at us, and the pride we feel when we're praised for a job well done are the emotional correlates of an actual or a predicted gain in energy; likewise, the anger we feel when we've been mistreated, and the jealousy we feel when someone flirts with our mate are the emotional readouts of an energetic loss."

These are all descriptions that can be measured (see: human thermodynamic instruments), just as a calorimeter measures heats released or absorbed from chemical reactions.

La Cerra went on to completed here PhD in evolutionary psychology, after which she did research in cognitive neuroscience. Since, 2002 she has been director of the Center for Evolutionary Neuroscience, a research and educational nonprofit that examines human nature and the human condition from the perspective of an energetic (thermodynamic) evolutionary model of the neurocognitive architecture. Since 2009, she has been a columnist for *Spirituality & Health Magazine* ('Our Evolving Selves'). La Cerra also is neuroscientific consultant to The Baumann Institute. [6]

On God

La Cerra seems to be agnostic with respect to the question of the existence of God. This is indicated by her comment on the pre-big bang initial state of the universe: [1]

> "Divine or not, there is what might be called a plan—a body of interrelated laws, discovered through the great communal detective story of science, that govern all forms of matter and energy in our universe and lead inexorably to the design of your mind."

Spirituality

In recent years, being a columnist of *Spirituality & Health Magazine* and an invited speaker at the Science and Nonduality Conference, La Cerra seems to be of the bent to incorporate or advocate "spiritual" ideas into her energy theory of the mind. Her views on the relation of the two, spirituality and thermodynamics, are expressed in her 2009 talk at a public interfaith service about peace, wherein she seems to use a Teilhardian-style of discourse: [3]

> "When we look at the human experience through the clear lens of universal law, the distinctions between the physical and metaphysical, disappear. Through this lens, we are energetic life forms, at once absolutely exquisitely unique, and yet universal – sharing with all members of our species all aspects of the human experience, the full range of human emotions and a creative capacity that is unparalleled in the kingdom of life on earth; sharing with all life forms the essential characteristics of all life; and sharing with all things animate and inanimate the ubiquitous fingerprints of these universal laws. Through this lens, we can see clearly that energy is constantly in flow, and the energy that we are is constantly changing, with every experience, in a great universal unfolding. Through this lens, we can see that there is a constant two-way energetic exchange between us and everything in our physical and social environment. Whatever we release into the social and physical world, positive or negative, constructive or destructive, enters into the

environment — the environment in which we humans are our selves being created. In this view, it is clearly in our enlightened self interest to release into the world only that which is healthy and uplifting."

She concludes that we should follow the golden rule in an effort to seek a peaceful society.

Difficulties on theory

La Cerra's overall philosophy that the mind is an adaptive feature of the evolutionary pressure of entropy, seems to be cogent, to a larger part. In terms of what exactly she means by the term "spiritual", in the context of evolution, mind, and thermodynamics, is in need of further discussion, as this extrapolation has never been done successfully before.

In terms of morality systems go, the "golden rule" advice is good as a superficial guiding idea, but to intelligently outline a long term model of a "peaceful society", one needs to acknowledge that, in reality, natural systems, such as local, social, or global systems, according to the laws of thermodynamics, are energetically coupled to each other, in such a way that natural systems and processes drive natural systems and processes, such that over time, change and large scale transformations occur in a tipping point, cyclical, or periodic manner. This equates, in laymanized terms, to the effect that what is considered 'good' or stable drives what is considered 'evil' or unstable, as explained in human terms. [4] In other words, periodic war is inevitable outcome of what La Cerra labels as the entropic pressure driving force of adaptive evolution. The hence the motto: "all's fair in love in war" might well capture this viewpoint, at least during the transition states.

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External links

- La Cerra, Peggy – WorldCat Identities.
- Peggy La Cerra – Twitter.
- Center for Evolutionary Neuroscience – AtOneWithTheUniverse.org.
- Peggy La Cerra – LinkedIn.

θΔics

In phrases, **people are chemicals**, akin to “people are molecules” (see: people are not molecules), opposite to “people are not chemicals”, refers to the view that humans are types of evolved, metamorphosized, animated or powered "chemicals".

Overview

In 1809, Goethe, in his *Elective Affinities*, via his implicit human chemical theory, discussed, via dialogue, between the three main characters: Charlotte, Eduard, and the Captain, the premise that humans defined as chemicals, evolved or "metamorphosized" over time.

In 1910, Thomas Dreier published his pamphlet “Human Chemicals” which he followed up by the 1948 book *We Human Chemicals*:

Screen shots from the 2015 dance song “Chemicals”, by Tiesto & Don Diablo, the lyrics of which explain that **people are chemicals** and that "fusion" occurs between people, as chemicals, when they are with certain other chemicals.

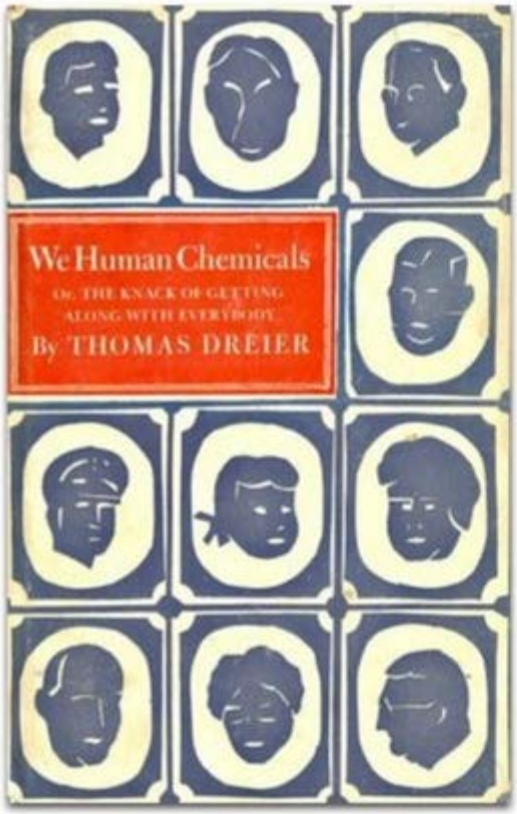

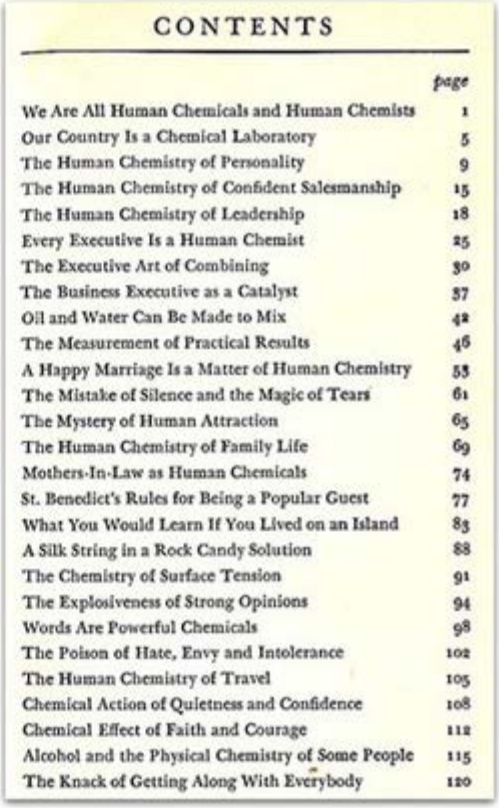

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wherein he argued that humans are “chemicals” (or human chemicals as he referred to people) and managers are “human chemists”. [1]

In 2013, Kirth Gerson, in his “Breaking Bad Pilot: People are Chemicals, Too!” class video lecture, analyzed *Breaking Bad* as a type of each human is an element (or chemical) reacting in a social system that makes chemicals, a sort of modern Elective Affinities analysis, so to say. [4]

The actual plot of the story, however, does not seem to have originated as a "humans as chemicals" type of show, but rather as after production decoration. [5]

Quotes

The following are related quotes:

> “People separate and aggregate like oil, water, and wine.”
>
> — Empedocles (450BC), *Fragments*

> “People react—attract and repel each other, reunite, neutralize each other, separate again and recover—like chemicals on an affinity table.”
>
> — Johann Goethe (1799), mental synopsis of dialog with Shiller on Crebillon, Oct 23 (Ñº)

> “The very man who, with a chemical experiment as his informing anecdote, or point of departure, might tell you that **people are but chemicals**, will induce responses in people by talking to them, whereas he would not try to make chemicals behave by linguistic inducement. And to say that people are ‘chemicals that talk’ is the same thing as saying that people aren’t ‘just chemicals’ since chemicals don’t talk. It is to confront the paradox of substance in a terminology unsuited to the illumination of this paradox. Conversely, the notion of chemical affinity about which Goethe organizes his novel of sorrowing love, *Die Wahlverwandtschaften*, is not really the chemicalizing of human substance, but rather the humanizing of chemical substance. For the motive is define by the action of the characters in a way totally unrepresentative of chemicals; and the situation is not chemical, but social. Nothing makes this more quickly apparent than the closing paragraph, where the dead lovers like buried side by side, surely their nearest approach to a chemical condition.”
>
> — Kenneth Burke (1945), *A Grammar of Motives* [2]

> “**People are chemicals** that react—form bonds, break bonds, go through transformation processes—according to the rules dictated by the logic of changes of bound states of existence, quantified by the calculated methods of free energy tables.”
>
> — Libb Thims (2015), respective mental synopsis of circa 1995 chemical engineering student mindset; possibly similar to John Tukey’s 1966 mindset, as jotted down in 1971 by James Coleman

See also

â— Chemical Party

References

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3. Tiesto & Don Diablo. (2015). “Chemicals” (Ñº), Spinnin’ Records, Sep 6.
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θΔics

In hmolscience, **people are molecules**, or “humans are molecules”, aka people are chemicals, similar to the “humans as stardust” view, as compared to “people are NOT molecules”, refers to the view, belief, or definition that a human is a molecule, a powered 26-element animate thing, specifically, or “human molecule” (or human chemical), generally.

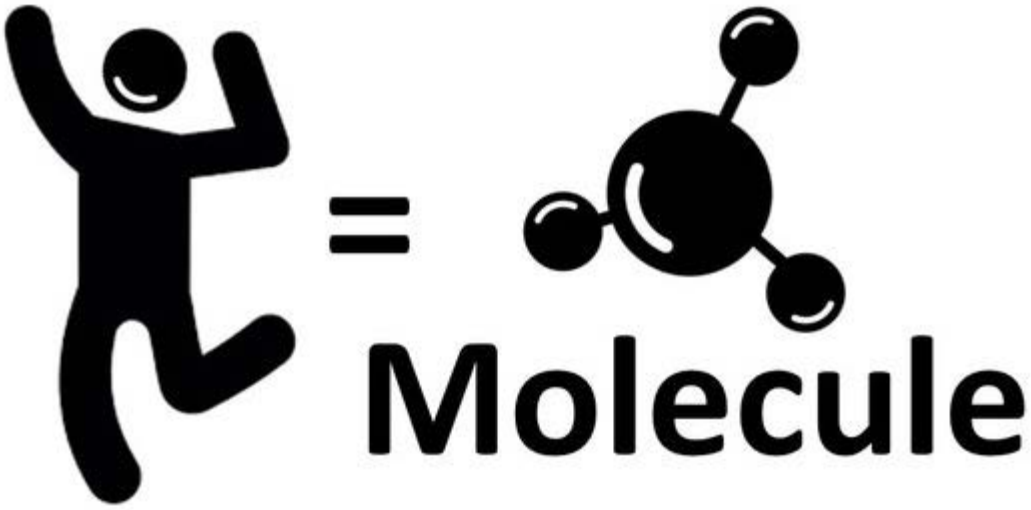

A "**human equals molecule**" image, showing the view that a human, by definition, is a molecule, or structure comprised of two or more atoms.

Discussion

Of note, in discussions as to whether or not a human, by definition, is a “molecule”, a common semantic objection that tends to be raised is that a human is not a molecule, but a “structure comprised of molecules”, e.g. DNA, RNA, protein, H2O, etc. This objection, while being a correct statement, is, however, a small picture view of things.

> “Hydrogen is a light, odorless gas, which, given enough time, turns into people.”
>
> — Edward Harrison (c.1990) *Publication* (Q); cited (Q) by John Wiley (1995) in “Phenomena, Comments and Notes” (Q); cited (Q) by David Christian (2004) in: *Maps of Time*

In the big picture, e.g. evolution timeline, great chain of being, molecular evolution table, molecule to man evolution, hydrogen to human, etc., view of things, there is NO dividing line, demarcation point, or reaction mechanism step, in which one of our ancestors was not a molecule, in the era following the formation (Q) of helium hydride (HeH+), the universe’s first molecule.

This view, however, is rather advanced. Most, e.g., being imbibed with some variant of the Darwinian "warm pond model", believe that a lightening bolt sparked a vat of chemicals in the past, at which point all sorts of anthropisms, e.g. life, free will, etc., started, which differentiates humans, from mere molecules.

Quotes

The following are related quotes:

> “Are we a fortuitous concourse of atoms?”
>
> — John Draper (1860), opening paper, read at Huxley vs Wilberforce debate, “on the intellectual development of Europe with relation to Darwin's theory”; was, supposedly, was a dry discourse [1]

> “The belief state of an **obscure lump of molecules** wandering around a remote corner of England is of no importance whatsoever epistemologically speaking.”
>
> — Barry Barnes (1998), response to David Mermin whether he “might perhaps be into astrology” [2]

> “The bird is a molecule, each **human is a molecule**, and molecules will invariably tend, i.e. are forced, to

migrate towards the most energetically stable configurations."

— Libb Thims (2007), *Human Chemistry, Volume One* (pg. 96)

See also

- HMS pioneers
- Human molecule
- Human molecular formula
- Powered CHNOPS+20 element thing

References

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θΔics

In hmolscience, **people are not molecules**, “humans are not molecules” or “humans ≠ molecules”, as contrasted with "people are molecules" (or people are chemicals), is unbridgeable gap, two cultures or two nature (vs one nature), anti-reductionist, and or anti-materialism statement, point of view, generally of the emergentism philosophy variety, holding that humans, in some way, are not structure of two or more atoms or structure of atoms—according to the original 1649 definition of the term “molecule” by French thinker Pierre Gassendi.

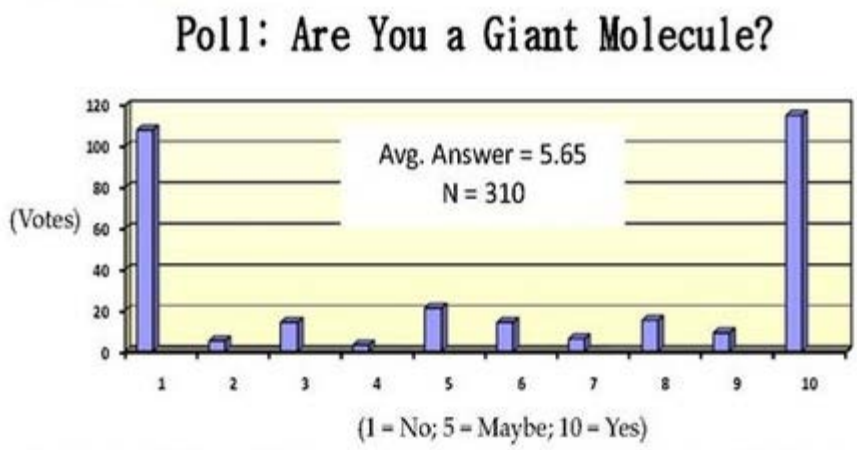

The 2001 to 2008 poll results [N=310] of English physicist James Eadon, indicating that 43 percent of people do not believe that **people are not molecules** or “giant molecules” as Eadon terms things. [8]

Social engineering

See also: human molecular engineering

Interestingly, the “humans ≠ molecules” position would seem to have detrimental consequences to the engineering professions, in respect to social engineering and or fields such as civil engineering, crowd dynamics, etc., where in poor engineering design can lead to disaster. In 1968, to exemplify, American engineer John Morley English (1915-1993), in his *Cost-Effectiveness: the Economic Evaluation of Engineering Systems*, which was produced from notes prepared for a one week short course offered in April 1967 by the Engineering and Physical Sciences Division of University Extension of the University of California, stated the following, in a discussion about people flow in the design of Grand Central Station: [7]

> “This is a plausible-sounding criterion until we stop to remember that **people are not molecules** of a fluid. Introspection tells us that it does make a difference, not only how many people are put through the road network, but how fast they movethrough the network.”

Ironically, only a few years after this statement by English, the fluid mechanics or gas system model of crowd dynamics was introduced in 1971 by Australian mechanical engineer Roy Henderson. The humans equals molecules of a fluid model is now a commonly used approach in 21st century crowd flow design.

Objection | Religious

While some advocates of this “humans ≠ molecules” position, such as Steve Fuller (2004) or Bruce Bathurst (2009), openly object on religious grounds, e.g. arguing that humans have a soul whereas molecules don’t, etc., the reasonings of others, as Tom Siegfried (2006), are more difficult to pin down. [1]

Unlike molecules

In 1987, Daniel Dennett, in his “The Three Kinds of Intentional Psychology”, stated the following: [9]

> “The success of valence theory in chemistry is no coincidence, and people were entirely right to expect that deep microphysical similarities would be discovered between elements with the same valence and that the structural similarities found would explain the dispositional similarities. But since **people and animals are unlike atoms and molecules** not only in being the products of their individual learning histories, there is no reason to suppose that individual (human) believers that *p* — like individual (carbon) atoms with valence four—regulate their dispositions with exactly the same machinery.”

(add discussion)

Quotes

The following are other representative quotes of the "humans ≠ molecules" position:

> "Production functions are in reality imposed by the laws of humanity and not of physics. **People are not molecules**, behaving in-a constant, consistent, mechanical fashion, always the same, universally yielding an identical response to a given set of stimuli. People are a composite of likes, dislikes, emotions, urges, morals, and much more. They need motivating to give of their best. Their best varies from day to day, from place to place to place, from factory to factory. No two human inputs are identical."
>
> — C.J. Hawkins (1977), "Contents of Income" [5]

> "**People are not molecules**, much as the social scientists (an oxymoron, surely) would like them to be. Nevertheless the outline of a radically new way of interpreting human history and behavior is emerging from the effort."
>
> — Thomas Martin (1997), *True Whigs and Honest Tories* [6]

> "Love flares and dims. Relationships start and end. Love is or isn't. Love is a person, a separate entity with its own body, metabolism, and dreams. Love is two human molecules bound to make a third. Just like molecules, people need an outside force to restore the initial, 'pre-love' conditions. Are you a stable molecule, Ginnie? 'I know I'm not lately.' ZeeBrain, **people are not molecules**! Love changes us forever. Once in love, we can never be restored back to 'pre-love conditions' even after our love is gone."
>
> — Lev Shneider (2005), *Matryoshka* [2]

> "**People are not molecules** with deterministic microdynamics. Nevertheless, the phase transitions must take into account running trends and motivations in order to get a realistic estimate of the probabilities."
>
> — Klaus Mainzer (2005), *Symmetry and Complexity* [3]

> "People do not all behave alike. Some players prefer to cooperate while others choose to defect, and some show a stronger desire than others to inflict punishment. A [theory] of nature must accommodate a mixture of individually different behavioral tendencies. The human race plays a mixed strategy in the game of life. **People are not molecules**, all alike and behaving differently only because of random interactions."
>
> — Tom Siegfried (2006), "Freud's Dream" [4]

> "**Humans are not molecules**, they are complex objects composed of many molecules."
>
> — Marcin Borkowski (2010), ChemistryForums.com post (Ñº); amid discussion with Thims on human chemistry

> "**Humans are not molecules**. We are made of molecules, but we are made of billions of them. We're not just one."
>
> — Dooker Bewitt (2015), YouTube thread post (Ñº); amid discussion with Thims on the Robertson's sin problem

“A **human is NOT a molecule**.ï»¿”

— Nathan Frey (2016), YouTube comment (Ñº) to HumanChemistry101’s 2010 “What is Its Nature?” video, Dec 27

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θΔics

In religio-mythology, **people claimed to be son of god**, or “people claiming to be Jesus” or “people claiming to be Horus”, is a phenomenon dating generally to the formation of the Egyptian first dynasty (3100BC), wherein each pharaoh claimed to be the son of Ra, a model that transmogrified later into the Horus son of Osiris model (2400-300BC), then into the Jesus son of God (200BC-present) model.

Overview

The exact origin of the “people claiming to be son of god” is a bit elusive, but is one that generally originated in first dynasty, wherein Egyptian pharaohs began to be given the assumed title of son of Ra and or Horus "favorite son of Ra." [1]

Though, to note, some discrepancy as to which specific dynasty this model became fixated.

African-born American African philosophy scholar Theophile Obenga, in his 2008 chapter “Egypt: Ancient History of African Philosophy”, states that pharaoh began to assume the title “Son of Ra” (sa-Ra) from the 5th dynasty (2498-2345BC) onward. [2]

British Egyptologist Stephen Quirke, in his 2001 *The Cult of Ra: Sun-worship in Ancient Egypt*, traces the model of the king with the central title “Son of Ra” from the 3rd millennium BC to the Roman conquest of Egypt to the rise of Christianity, albeit he ends his discourse with Akhenaten (c.1370-1335BC), which he describes as the “most exclusive son of Ra, who transformed the Ra cult into the royal worship of the sun-disk, Aten”. [3]

The period between end of the reign of Akhenaten (1335BC) and the Edict of Thessalonica (380AD), which made Christianity the state religion (Q) of the Roman empire, in respect to chronology of state leaders claiming son of divinity, and the transition from the polytheistic model of “Horus son of Ra/Osiris” to trinity conceptualized monotheism of “Jesus son of God” model, is one of the more blurry periods of historical certainty to document precisely, for a number of reasons, including the primary one that Akhenaten-like monotheism was illegal throughout this 1,600-year period, up until the 313AD when Constantine and Licinius issued the Edict of Milan decriminalizing Christian worship. (Q)

Egyptologist Gerald Massey, to cite an earlier date, traces Jesus myth back through the Horus myth back through some 10,000 years into stellar constellation arguments. (Q)

Pharaohs eventually, to note, came to be associated with Osiris as well, according to the logic that in life they were incarnations of Horus, in death, they became incarnations of Osiris. This reinforced the story of Horus and Osiris from mythology, portraying the current king as Horus and his deceased father as Osiris. [1]

Recent

The following are recent people claimed to be Jesus son of God examples:

Founded		Name	Religion
1820		Joseph Smith (1805-1844) Medium: Claimed revelations	Mormons 15M followers Type: Modified Christianity
1879		Charles Russell (1852-1916) Medium: none	Jehovah’s Witnesses 8-20M followers Type: Modified Christianity

1854		Sun Moon (1920-2012) Medium: Claimed to be Jesus Christ incarnate	Unification Church 1-2M followers Type: Modified Christianity
1973		Jose Miranda (1946-2013) Medium: claims the resurrected Jesus Christ "integrated himself within me" following visit by two angels Note: interviewed (Q) by Bill Maher in *Religulous* (2008)	Growing in Grace International 1-2M followers Type: Modified Christianity
1990		Sergey Torop (aka Vissarion) (1961-) Medium: Claims to be Jesus Christ returned, in the form of the "word of god", penned a book called the *Last Testament*, founded community in Southern Siberia in 1990. Note: see 5M+ view *Vice* (Q) documentary.	Community of Unified Faith 4K person settlement in Siberia 10K followers

See the Wikipedia "list of people claimed to be Jesus" and "list of people who have been considered deities" for more examples of the above. [4] A concordant list, prior to the transition from Osiris-Horus (1900BC) to Jesus (100AD), would be an Hmolpedia "list of Horus copies", which would seem to include Krisha, Mithra, Dionysus (Bacchus), Buddha, etc.

References

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(b) Theophile Obenga – Wikipedia.
3. (a) Quirke, Stephen. (2001). *The Cult of Ra: Sun-worship in Ancient Egypt: Sun-worship in Ancient Egypt from the Pyramids to Cleopatra* (abs). Thames & Hudson.
(b) Stephen Quirke – Wikipedia.
4. (a) List of people claimed to be Jesus – Wikipedia.
(b) List of people who have been considered deities – Wikipedia.

External links

- List of messiah claimants – Wikipedia.

θΔics

The following is a database of the 809 people listed as biographies in various places of Hmolpedia (06 Jan 2011):

List

name | group category | date | nationality | profession books | importance

Adolf Fick	religious TPs	1829-1901	german	physicist-physiologist	1869: the forces of nature in their relationship	3
Adolphe Quetelet	HP	1796-1874	belgian	mathematician, astronomer, sociologist	1835 essay on social physics	2
Adriaan de Lange	religious TPs	1945	south african	chemical physicist	free energy landscapes	1
Adrian Bejan	HP	1948	american	mechanical engineer		3
Adrien-Marie Legendre	biographies mathematicians	1752-1833	french	mathematician	1786: partial differentials, legendre transformation	2
Aharon Katchalsky	thermodynamicists(other)	1914-1972	israeli	chemist	1975: network thermodynamics	2
Alan Geoffrey Wilson	misc HTPs	1939	English	urban architect	1970: Entropy in Urban and Regional Modelling	3
Alan Nelson	HMS	1956	American	philosopher	human molecules, post-popperian methodology of economics	1
Alan Watts	HT	1915-1973	anglo-american	philosopher	meaning of life	3
Alastair Jenkins	HT	1952	danish	atmospheric physicist	Thermodynamics and Economics	3
Albert Einstein	thermodynamics founders	1879-1955	american	physicist		1
Albert Lehninger	biographies	1917-1986	american	biochemist	1971: bioenerjetics	3
Albert Magnus	biographies	1200-1280	german	chemical philosopher!	affinitas, affinity, book of secrets	3
Albert Mathews	HT HT pioneers HT pioneers HT pioneers	1871-1957	american	biochemist	physiological Chemistry,	3
Albert Szent-Gyorgyi	HT HT pioneers HT pioneersk	1893-1986	Hungarian	Physiologist	1977: drive in living matter to perfect	3 nobel 1931

	HT pioneers				itself	
Alberto Hernando	post 1995 HTPs	1981	spanish	physicist	2009: fisher-information and the thermodynamic of scale-invariant systems	3
Albion Small	HMS	1854-1926	American	sociologist	1899: Briefer Communicartions : A Unit in sociology	3
Aldous Huxley	literature TPs	1894-1963	English	writer		3
Alexander Freeman	biographies	1838-1897	english	mathematician		3
Alexander Zotin	thermodynamicists(other)	1926-2000	russian	biophysicist	1972: thermodynamic aspects of developmental biology	2
Alexis Petit	biographies	1791-1820	french	physicist	dulong-petit law 1819	3
Alf Hornborg	post 1995 HTPs	1954	swedish	anthropologist	2001: The power of machine, the thermodynamics of imperialism	2
Alfred James Lotka	misc HTPs	1880-1949	American	physical chemist	1922: contribution to the energetics of evolution	1
Alfred Mayer	biographies	1836-1897	american	physicist	1878: floating magnets experiment	3
Alfred Ubbelohde	biological TPs	1907-1988	English	thermodynamicist	1954: Man and Energy	2
Alfredo Infante	sociological TPs	1960	peruvian	engineer	2001: social entropy	2
Ali Mansoori	thermodynamicists(other)	1943	iranian	engineering scientist	2005: principles of nanotechnology	2
Alistair Duncan	biographies	1941	english	chemistry historian	1962: some theoretical aspects of eigheenth-century tables of affinity	3
Alphonse Esquiros	HMS	1812-1876	French	religious writer	1840: The Gospel of People	3
Amedeo Avogadro	biographies	1776-1856	italian	chemist	avogadro's law 1811 essay on determining relative masses of the elementary	2

					molecules of bodies	
Andre Lalande	Philosophical TPs	1867-1963	French	philosopher	1899: Dissolution Opposed to Evolution	2
Andrew Mcintosh	religious TPs	1950	english	thermodynamic professor	2000: genesis today	3
Andrew Morrow	post 1995 HTPs	1961	american	chemical engineer		3
Andrew Pikler	HT	1910-1980	American	Electrical engineer	1954: utility, theories in field physics and mathematical economics	2
					the quanta kinetic model of monetary theory	
Angelo Letizia	post 1995 HTPs	1975		writer	2007: The battle for Existence	3
Anson Rabinbach	history TP s	1945	American	historian	1990: The Human Motor, energy, fatique, and origins of modernity	3
Anthonie Muller	biographies	1951	dutch	biophysicist	1983: thermosynthesis theory	2
Antoine Bousquet	unfiled pages	1974	english	economist	complexity theory, 2008: the scientific way of warfare: order and chaos on the battlefields of modernity	1
Antoine Lavoisier	biographies	1743-	french	chemist	caloric theory	2
Arieh Ben-Naim	biographies	1934-	israeli	physical chemist	2007: entropy demystified 2008 a farewell to entropy	2
Aristotle	biographies	384-322BC	greek	philosopher	horror vacui, nature abhors a vacuum	1
Arnold Sommerfeld	thermodynamicists(other)	1868-1951	german	physicist		2
Arthur Eddington	HT	1882-1944	English	Mathematician, astronomer,	The Nature of Physical World	2
Arthur iberall	1952-1994 HTPs	1918-2002	american	physicist-engineer	1971: Towards a general science of viable systems	1 homeokinetics
				aeronautics	2009: Saving Capitalism from	

Arthur Jonath	economic TPs	1931	American	engineer	Finance: The Power of Thermoeconomics	3	
Arthur Peacocke	religious TPs	1924-2006	english	biochemist-theologian		3	
Arthur Schopenhauer	biographies	1788-1860	german	philosopher	1818: the world as will and representation	3	
Arthur Young	HT	1905-1995	American	Aviation engineer	The Reflexive Universe 1976	2	immortality of soul, cessation T.
Astrida Tantillo	HC	1963	American	germanic studies prof.		3	
Athanase Dupre	thermodynamicists(other)	1808-1869	french	mathematician, physicist		2	
Attila Grandpierre	post 1995 HTPs	1950	Hungarian	astrophysicist	2004: Entropy and information of human organisms and the nature of life	3	
August Horstmann	thermodynamics founders	1842-1929	german	chemist		2	
August Kronig	religious TPs	1822-1879	german	physicist	1856: a general theory of gases	3	
Auguste Comte	biographies	1798-1857	french	sociologist	social physics	2	
Babics Laszlo	post 1995 HTPs	1944	Hungarian	sociologist	2003: the mechanics and thermodynamics of mass societies	2	
Bakhuis Roozeboom	thermodynamics founders	1854-1907	dutch	chemist	1901 phase theory	2	
Balfour Stewart	biological TPs	1828-1887	Scottish	physicist	1874: The Conservation of Energy	3	
Barri Gold	HT	1966	American	English professor	2010: ThermoPoetics: Energy in Victorian Literature and science. 2002: the Consolation of Physics 2009: Bleak House	3	
Bela Lukacs	economic TPs	1947	Hungarian	phsicist, cosmologist	1989: Once more about Economic Entropy	3	
			swedish-		1990:		1993: ecological

Bengt Mansson	unfiled pages	1960	german	ecologist	thermodynamics and economics	1	thermodynamics
Benjamin Gal-Or	thermodynamicists(other)	1933	israeli	physicist	1974: modern developments in thermodynamics	2	
Benjamin Kyle	1952-1994 HTPs	1927	American	chemical engineering	1988: The mystique of entropy	3	
Benjamin Libet	biographies	1916-2007	american	neuroscientist	1983. time of conscious intention to act in relation to onset of crebral activity	3	
Benjamin Thompson (count Rumford)	thermodynamics founders	1753-1814	english	physicist	1798: cannon-boring experiments	2	
Bernard Beaudreau	economic TPs	1955	Canadian	economist	2005: Energy Rents 2008: energy and Organization	2	
Bernard Strehler	biological TPs	1925-2001	American	biologist	1962: Time, Cells and Aging	3	
Bertrand Arthur William Russel	misc HTPs	1872-1970	British	mathematician	1927. Why I am not a Christian	1	
Bill Nye (William Sanford Nye)	1952-1994 HTPs	1955	American	mechanical engineer		3	
Bogdan Anghel	biographies	1984	romanian	electronic music producer	2010 EP human thermodynamics	3	
Boris Sidis	psychological TPs	1867-1923	american	psychologist		3	
Borisas Cimbleris	HT	1938	Brazilian	nuclear engineer	1998: economy and Thermodynamics	1	
Brian Allen Schill	cessation TPs	1960		paranormal investigator	2008: Stalking Darkness	3	
Brian Smith	thermodynamicists(other)	1933	english	physical chemist		3	
Brooks Adams	history TP s	1848-1927	American	historian, lawyer	1895: The law of civilization and Decay	3	
Bruce Clarke	literature TPs	1950	American	professor of literature	2001: energy forms: allegory and science in the era of classical thermodynamics	3	
Bruce Gunn	misc HTPs	1940	American	business management	1968: The Dynamic Synthesis Theory of Motivation	3	
					Entropy, Information, Evolution		

Bruce Weber	HT	1941	American	biochemist	Darwinism evolving: system dynamics and Genealogy of Natural Selection Darwinism, Design and complex System Dynamics	2	
Bryan Donkin	misc HTPs	1836-1902	English	engineer	1893: The Scientific Work of gustav Adolph Hirn	3	
Buckminster Fuller	misc HTPs		American	architect	1976: And it Came to Pass--Not to Stay	2	
C.G. Darwin	1952-1994 HTPs	1887-1962	English	phsicist	1952: The next million years	1	
Camille Flammarion	literature TPs	1842-1925	French	astronomer	1893: La Fin du Monde (the end of the world) sci-fi.	3	heat death illustrations
Carl Holtzmann	thermodynamics founders	1815-1875	german	teacher, mathematician	1845: on the heat and elasticity of gases and vapours	2	
Carl Jacobi	biographies mathematicians	1804-1851	german	mathematician	1841: on the determinant functions	2	
Carl Jung	psychological TPs	1875-1961	swiss	psychiatrist	1928: on psychic energy, on the nature of the psyche	3	
Carl Linde	biographies	1842-1934	german	mechanical engineer	1870: system to refrigerate beer	3	
Carl Neumann	biographies mathematicians	1832-1925	german	mathematical physicist	1875: lectures on the mechanical theory of heat	1	economic thermodynamics
Carl von Nageli	biographies	1817-1891	swiss	botanist, physiologist	1877: the limits of natural knowledge	3	
Carter Finn	Philosophical TPs	1935	American	writer	1974: Religion, philosophy and the second law of thermodynamics	3	
Caspar Ä ±senkrahe	religious TPs	1844-1921	german	physicist	1910 energy, entropy, and beginning and end of universe	3	
Catherine Cox	biographies	1890-1994	american	psychologist	1926: early mental traits of 300 geniuses	3	
Chanel Wood	HC	1982	Canadian	writer	2007: social chimestry	3	

Charles Darwin	biographies	1809-1882	english	naturalist	1859: on the origin of species	1	
Charles ****	HT	1950	american	philosopher	1988: the evolutionary dynamics of complex systems	2	from thermodynamics to economy: a thorny path
Charles Guye	biological TPs	1866-1942	Swiss	physicist	1922: Physical Chemical Evolution	3	
Charles Herrick	1952-1994 HTPs	1868-1960	American	neurologist	1956: The evolution of human nature	3	
Charles Montesquieu	biographies	1689-1755	french	political philosopher	1748: the spirit of the laws	1	
Charles Sherrington	biological TPs	1857-1952	English	physiologist	1940: Man on His Nature	3	
Charles Snow	biographies	1905-1980	english	physicist	1959. the two cultures	3	
Christiaan Huygens	biographies	1629-1695	dutch	physicist	1669: mv2 vis viva, vacuum pump	2	
Christian Anfinsen	thermodynamicists(other)	1916-1995	american	biochemist	1972 nobel prize	3	
Christian de Quincey	biographies	1955	american	philosopher	2002: radical nature	3	panpsychism, conscious matter
Christoph Ballot	biographies	1817-1890	dutch	meteorologist	objection to the speed of gas molecules	3	
Christoph Wieland	HC	1733-1813	German	poet, writer		3	
Christopher Edwards	post 1995 HTPs	1959	american	mechanical engineer		3	
Christopher Hirata	post 1995 HTPs	1982	american	astrophysicist	2000: the physics of relationships	2	
Christopher Southgate	religious TPs	1953	english	biochemist	2008: the groaning of creation: god, evolution and the problem of evil	3	
Claes Johnson	post 1995 HTPs	1943	swedish	mathematician	2008: computational thermodynamics	3	
Claude Berthollet	biographies	1748-1822	french	chemist	1799: research on the laws of affinity	3	
Claude Elwood Shannon	information TPs	1916-2001	American	electrical engineer	1948: A Mathematical Theory of Communication	1	
Claude Levi-Strauss	misc HTPs	1908	French	anthropologist	1955: tristes tropiques	2	hot and cold cultures

Claudia Rotondi	HT	1969	Ä°talian	political economist	2001: Competition and Economic Temperature, the Entropy Law in Emanuele Sella's Work	2	economics
Claus Bock	HC	1926-2008	German	scholar		3	
Clifford Truesdell	thermodynamicists(other)	1919-2000	american	mathematician	1969: rational thermodynamics	3	
Clinton Stoner	biographies	1933	american	physicist	2000: inquiries into the nature of free energy and entropy in respect to biochemical thermodynamics	3	
Constantin Caratheodory	thermodynamics founders	1873-1950	greek	mathematician		1	bosphorus xirokrini kuruçeÅŸme
Cornelis Hoede	HMS	1955	Dutch	social mathematician	1990: social atoms, social velocity	3	
Cosmio Boscaglia	biographies	1550-1621	italian	philosopher	1613 launched a crusade to have galileo galilei	3	
Craig Anderson	biographies	1954	american	psychologist	1997: hot years and serious and deadly assault: empirical test of the heat hypothesis	3	
Crosbie Smith	biographies	1950	english	thermodynamics historian	1989: energy and empire, 1998: the science of energy New Scientist weekly columns	3	
Daedalus	HT	1930-2000			financial thermodynamics, thermodynamics of money	3	penname to an anonymous thinker
Daniel Bernoulli	biographies	1700-1782	swiss	mathematician, physicist, physician	1738: hydrodynamica, ideal gas law, pressure	3	
Daniel Brooks	unfiled pages	1951	canadian	zoologist	1986: evolution as entropy: towards a unified theory of	1	

					biology	
Daniel Fahrenheit	biographies	1686-1736	german	physicist	1720: mercury thermometer	3
Daniel Hershey	1952-1994 HTPs	1931	American	chemical engineer	2009: entropy theory of aging systems	2
Daniel Katz	psychological TPs	1903-1998	american	psychologist	1966: the social psychology of organization	3
David Aberle	misc HTPs	1918-2004	Canadian	anthropologist		3
David Alkek	post 1995 HTPs	1931	american	dermatologist	2007: self-creating universe	3
David Buss	biographies	1953	american	psychologist	1994. the evolution of desire: strategies of human mating	3
David Christian	history TP s	1946	English	historian	2004: maps of Time: an introduction to Big History	3
David Hwang	post 1995 HTPs	1980	american	computational chemist	2001: the thermodynamics of love	3
David Lindley	biographies	1956	american	physicist	2001: boltzmann's atom 2004: degrees kelvin	3
David Ng	post 1995 HTPs	1969	canadian	immunologist	2009: song: thermodynamics of love	3
David Weir	literature TPs	1950	American	professor of comparative literature	2007: Decadent Culture in the United States	3
Denis Papin	biographies	1647-1712	french	physician, physicist	1690: a new method to obtain very great motive powers at small cost	2
Dennis Gabor	biographies	1900-1979	hungarian	electrical engineer	1964: disproof of maxwell's demon, 1972: the mature society	3
Dick Hammond	misc HTPs	1938	American	writer	entropy ethics	2
Dickey Eason	post 1995 HTPs	1965	american	social dynamics theorist	2009: the impact dynamic	2
Dilip Kondepudi	thermodynamicists(other)	1952	american	physical chemist	2008: introduction to modern thermodynamics	3
Dimitri Katakis	psychological TPs	1950	greek	psychologist	teleonomic entropy	3

Dimitris Keranis	economic TPs	1948	Greek	lawyer	2005: Human Values and Second Law of Thermodynamics	3
Dmitri Mendelyev	biographies	1834-1907	russian	chemist	1869: periodic table of elements	3
DMR Sekhar	religious TPs	1952	indian	chemical engineer		3
Donald Cardwell	biographies	1919-1998	english	historian of science	1971: from watt to clausius: the rise of thermodynamics in the early industrial age	3
Donald Haynie	thermodynamicists(other)	1964	american	biophysicist	2001: biochemical thermodynamics	3
Donald Murray	religious TPs	1865-1945	new zealand	engineer, philosopher		3
Dorion Sagan	post 1995 HTPs	1959	american	science writer	2005: into the cool , energy flow, thermodynamics and life	3
Dorothy Sherrill	cessation TPs	1940	American	nurse	2010: Thermodynamics: the secret life of Heat	3
Douglas Spanner	religious TPs	1920	english	biophysicist	1964: an introduction to thermodynamics : experimental botany	3
Douglas White	misc HTPs	1942	american	anthropologist	2000: thermodynamic principles fot the Social Sciences	3
Duncan Foley	HT	1942	American	Economist	1994: A Statistical Equilibrium Theory of Markets 2003: Unholy Trinity: Labour, Capital and Land in the New Economy 2002: Maximum Entropy Exchange Equilibrium 2008: Classical Thermodynamics and Economic general equilibrium theory	1
Duncan Mac	biographies	1866-	american	physician	1901: soul theory	3

Dougall		1920				
Eann Patterson	misc HTPs	1955	English	mechanical engineer	2004: The Entropy Vector: Connecting Business and Science	3
Ed Stephan	sociological TPs	1939-2008	american	sociologist	1995: the division of territory in society	2
Edgar Morin	sociological TPs	1921	French	philosopher	1977: the nature of nature	2
Edward Frankland	biographies	1825-1899	english	chemist	1852: valence theory	3
Edward Goldsmith	biographies	1928-2009	english	economist	1981: thermodynamics or ecodynamics	1
Edward Guggenheim	thermodynamics founders	1901-1970	english	physical chemist	1933: modern thermodynamics by the methods of willard gibbs	2
Edward Sanville	sociological TPs	1981	american	chemist		3
Edward Wiley	unfiled pages	1950	american	systems ecologist	1986: evolution as entropy	2
Edwin Jaynes	thermodynamicists(other)	1922-1998	american	physicist	1957: information theory and statistical thermodynamics	3
Edwin Slosson	misc HTPs	1865-1929	american	chemist	1914: Major prophets of Today, 1925: sermons of a Chemist	3
Edwin Wilson	biographies	1879-1964	american	mathematician	1902: vector analysis	2
Ejnar Lundsgaard	biographies	1899-1968	danish	physiologist		3
Elihu Fein	HT	1916	American	Physicist	1970: Demography and Thermodynamics 1946: A Comparsion of the stopping power of Lead, Aluminium and Carbon for high speed mesotrons	3
Elizabeth Porteus	Philosophical TPs	1911-2010	American	writer, philosopher	molacular sociology 2005: Life, the Second Law of Thermodynamics and Hapiness	3

Emanuel Swedenborg	biographies	1688-1772	swedish	polymath	1721: atomic theory 1734: nebular hypothesis	3
Emanuele Sella	economic TPs	1879-1946	italian	lawyer-economist	1910: La Vita della Ricchezza 1915: La concorrenza	2
Emile Borel	biographies	1871-1956	french	mathematician	1913. statistical mechanics of irreversibility, 1914: chance, typing monkeys	3
Emile Chatelet	biographies	1706-1749	french	mathematician, physicist	1740. vis viva, kinetic energy, living force, postulate	2 E=mv2
Emile Clapeyron	thermodynamics founders	1799-1864	french	engineer	1834: Memoir on the motive power of heat	2
Emile Durkheim	sociological TPs	1858-1917	French	sociologist		2
Emile Meyerson	Philosophical TPs	1859-1933	French	chemist	1908: identitiy and reality	3
Empedocles	HC	495-435BC	greek	Philosopher		3
Emyr Hughes	HMS	1905-1978	Welsh	physical chemist	energy among molecules is like money among men	3
Enrico Di Cera	thermodynamicists(other)	1960	american	biochemist	1998: linkage thermodynamics	3
Enrico Fermi	thermodynamicists(other)	1901-1954	american	physicist	1938 nobel prize	2
Enzo Tiezzi	sociological TPs	1938	italian	physicist	1983: the end of time, 2006: steps towards an evolutionary physics	2
Epicurus	biographies	341-270BC	greek	philosopher	atomic theory	2
Erasto Mpemba	biographies	1950	african	amateur scientist	1963 mpemba effect	3
Eric Beinhocker	economic TPs	1968	English	business economist	2006: The origin of Wealth: Evolution, Complexity	3
Eric Berne	psychological TPs	1910-1970	american	psychiatrist	1964: games people play: the psychology of human relations	3
Eric Mendoza	biographies	1919-2007	british	physicist		2
Eric Schneider	1952-1994 HTPs	1938	American	marine geologist		1

Eric Smith	HT	1965	American	Physicist	2008: Classical Thermodynamics and Economic General Equilibrium Theory 2008: chemical Carnot Cyles, Landauer's principle and Thermodynamicas of Natural Selection 2007: Classical Thermodynamics and Neoclassical Economics	1
Erich Jantsch	HT	1929-1980	Austrian	astrophysicist	1975: design for evolution, self organization and planning in the life of human systems	3
Erich Muller	post 1995 HTPs	1963	english	chemical engineer	1998: human societies: a curious application of thermodynamics	2
Ernest Barnes	religious TPs	1874-1953	english	mathematical scientist		3
Ernest Grunwald	thermodynamicists(other)	1923-2002	american	organic chemist	1997: thermodynamics of molecular species	3
Ernest Solvay	sociological TPs	1838-1922	Belgian	chemist	social energetics,	2
Ernest Zermelo	biographies mathematicians	1871-1953	german	mathematician	1894: on a theorem of dynamics and mechanical theory of heat	2
Ernst Brücke	psychological TPs	1819-1892	german	physician, physiologist	1874: lectures on physiology	2
Ernst Gryzanowski	HC	1824-1888	German	physician, diplomat	1875: Comtism	2
Ernst Haeckel	biographies	1834-1919	german	physician	1895: the riddle of the universe	2
Ernst Mach	biographies	1838-1916	austrian	physicist	1896: principles of the theory of heat: historically and critically elucidated	2
Ernst Zermelo	biographies					

Erwin Hiebert	religious TPs	1926	american	science historian		3
Erwin Schrödinger	biological TPs	1887-1961	Austrian	physicist	1944: What is Life?	1
Etienne Geoffroy	biographies	1672-1731	french	physician, chemist	affinity table	3
Eugene Odum	biological TPs	1917-2002	American	zoologist	1953: Fundamentals of Ecology	2
Eugene Roberty	HT	1843-1915	Russian	sociologist	1880: sociology and a lot of books	3
Eugene Ruyle	sociological TPs	1936	american	anthropologist	ethnoenergetics, thermodynamic substratum, marx labour theory	1
Evangelista Toricelli	biographies	1608-1647	italian	mathematical physicist	1643 pump problem	3
Felix Auerbach	biological TPs	1856-1933	German	physicist	1910: Ectropy and the Physical Theory of Life	3
Fielding Garrison	biographies	1870-1935	american	science historian	1909: josiah willard gibbs and his relation to modern science	3
Forbes Allan	literature TPs	1960	American	writer	1999: Milton's progress	3
Francesco Sagredo	biographies	1571-1620	italian	scientist	1613: thermometer	3
Francis Bacon	biographies	1561-1626	english	scientist, philosopher	heat is motion 1600, 1620: Novum Organum	1
Francis Galton	biographies	1822-1911	english	anthropologist	1827: hereditary genius	2
Francis Sears	thermodynamicists(other)	1898-1975	american	physicist		3
Francis Ysidro Edgeworth	HP	1845-1926	Irish	mathematical economist	1881: mathemathical Physics pleasure is concomitant of energy	1
Francisco Louca	HT	1956	Porteguese	politician and economist	2001: Economics and Interdisciplinary exchange	2
Francisco Tellez	psychological TPs	1980	chilean	psychologist	2003: transorgasmic sexuality	3
Francois Massieu	thermodynamics founders	1832-1896	french	engineer		2
Frank Lambert	religious TPs	1918	american	chemist	entropy as energy dispersion/dispersal	2

Frank Tipler	cessation TPs	1947	American	physicist	1994: the physics of Immortality	3	
Fred Cotrell	sociological TPs	1903-1979	american	sociologist	1955: energy and society	2	
Fred Fox	Philosophical TPs	1919-2007	American	professor of science education	1976: the recolored mentality: ethical lessons from science	3	
Fred Moss	biographies	1893-1966	american	psychologist	1924: study of animal drives, 1936: motivation of behaviour	3	
Frederic Myers	cessation TPs	1843-1901	English	psychial researcher	1903: Human personality and its survival of bodily death	3	
Frederic Soddy	economic TPs	1877-1956	English	physical chemist	1926: Wealth, Virtual Wealth and Debt	2	
Frederick Koenig	unfiled pages	1902-1974	american	chemist	1935: families of thermodynamic equations	2	
Frederick Rossini	misc HTPs	1899-1990	American	thermodynamicist	1971: Chemical thermodynamics in the real world	1	freedom and security paradox
Freeman Dyson	biological TPs	1923	American	physicist	1979: Time without end: physics and Biology in an Open Universe	3	
Friedrich Engels	economic TPs	1820-1895	German	social scientist	1882: dialectics of Nature	1	podolinsky
Friedrich Riemer	HC	1774-1845	German	writer, librarian, philologist		3	
Friedrich Schiller	biographies	1759-1805	german	writer		3	
Fritjof Capra	biological TPs	1939	American	physicist	1996: the web of Life	2	
Fritz Haber	thermodynamics founders	1868-1934	german	chemist	1905: thermodynamics of technical gas reactions	2	1918 nobel prize
Fritz Lipmann	thermodynamicists(other)	1899-1986	american	biochemist	ATP universal energy currency	2	
Fritz Sollner	HT	1965	German	environmental economist	1997: A reexamination of the Role of Thermodynamics in Environmental	2	

					Economics	
Galileo Galilei	biographies	1564-1642	italian	scientist	1632: dialogue concerning the two chief world systems	1
Gary Greenberg	biographies	1943	american	lawyer, archeologist, egyptologist	1996: the bible myth; the african origins of the jewish people	2 ra theology abrahamic religions
Gaspar Schott	biographies	1608-1666	german	mathematical physicist	1657: mechanics of gas hydraulics pneumatic	3
Gavin Ritz	misc HTPs	1959	New zealand	business engineer	2009: The fundamental formula as Energy & Work	2
Gavrilo Princip	biographies	1894-1918	bosnian serbian	black hand member	terrorist,	3
Geber	biographies	721-815	arabian	chemist	jabir ibn hayyan	3
Georg Ferdinand Helm	misc HTPs	1851-1923	German	mathematical physicist	1887: The Doctrine of energy, 1898: Historical development of Energetics	1
Georg Stahl	unfiled pages	1659-1754	german	chemist, physician	1703: phlogiston theory of heat	3
George carey	HC	1845-1924	American	physician	1919: The Chemistry of Human Life	3
George Carlin	1952-1994 HTPs	1937-2008	American	comedian		3
George Effinger	literature TPs	1947-2002	American	writer	1972: what entropy means to me (sci-fi)	3
George Gibson	thermodynamicists(other)	1884-1959	american	chemist		2
George Gilder	economic TPs	1939	American	writer	1981: wealth and poverty	3
George Goodenough	thermodynamicists(other)	1868-1929	american	mechanical engineer	1911: principles of thermodynamics	3
George Hatsopoulos	thermodynamicists(other)	1927	american	mechanical engineer	thermionic converter, thermo electricity	3
George Hirth	biological TPs	1841-1916	German	writer	1900: Entropy of the Germinal System and hereditary Enfranchisement	3
George Linhart	thermodynamicists(other)	1885-1951	american	physicist		3

George Lundberg	HP	1895-1966	American	sociologist	1939: foundations of Sociology	3
George Scott	1952-1994 HTPs	1939	American	physical chemist	1985: Atoms of the living flame	3
Georges Balandier	misc HTPs	1920	French	anthropologist	1967: Anthropologie Politique	3
Georgi Gladyshev	1952-1994 HTPs	1936	Russian	Physical chemist	1997: Thermodynamic theory of the evolution of living beings	1
Gerard Nahum	cessation TPs	1956	American	physician	2010: A Proposal for Testing the Energetics of Consciousness and its Physical Foundation	2
Germain Hess	biographies	1802-1850	russian	chemist	1840: constant heat sums	3
Gibert Wedekind	religious TPs	1946	american	engineer	2003: spiritual entropy	3
Gilbert Lewis	thermodynamics founders	1875-1946	american	physical chemist	1923: thermodynamics and free energy of chemical substances	2
Gordon Van Wylen	religious TPs	1920	american	mechanical engineer	1959: fundamentals of clasical thermodynamics	3
Gottfried Leibniz	biographies mathematicians	1642-1716	german	mathematician	1686: conservation of vis viva	1
Granville Sewell	HT	1944	American	Mathematician		2
Greg Myers	HT	1954	American English	rhetoric and communication		3
Gregoire Nicolis	biographies	1940	belgian	physicist	2007: foundations of complex systems	3
Gregory Botanes	misc HTPs	1965	Spanish	entrepreneur	sthar	3
Guillaume Amontons	biographies	1663-1705	french	physicist	air based thermometer, fire wheel, gas law equation	3
Gustav Jaumann	thermodynamics founders	1863-1924	austrian	physicist		3
Gustav Kirchhoff	thermodynamics	1824-	german	physicist		2

	founders	1887				
Gustav Zeuner	thermodynamics founders	1828-1907	german	physicist	1859: fundamentals of the mechanical theory of heat	2
Gustave Adolphe Hirn	Philosophical TPs	1815-1890	French	physicist	1868: Philosophical implications of thermodynamics	1
Gustave Coriolis	biographies	1772-1843	french	physicist	1829: calculation on the effect of machines	3
Gustavus Esselen	HC	1888-1952	American	chemist	1948: We Human Chemicals	3
Harold F. Blum	biological TPs	1899-1980	American	biology	1950: Time's Arrow and Evolution	3
Harold Leonard	post 1995 HTPs	1926	american	chemistry prof.	2006: chemical thermodynamics in the real world	2
Harold Morowitz	thermodynamicists(other)	1927	american	biophysicist	1992: entropy and the magic flute	2
Harold Nieburg	misc HTPs	1927-2001	American	political scientist	1973: Culture Storm	3
Harold Thayer Davis	economic TPs	1892-1974	American	mathematician	thermodynamic isomorphisms	3
Harrison White	HMS	1930	American	sociologist	1992: Identity and Control	3
Harvey Leff	biographies	1937	american	physicist	1996: thermodynamic entropy	3
Hector Berlioz	HMS	1803-1869	French	composer	human molecules 1854	3
Hector Sabelli	psychological TPs	1937	argentinean	psychiatrist	1995: sociodynamics	3
Heike Kamerlingh-Onnes	thermodynamicists(other)	1853-1926	Dutch	physicist	1913 nobel prize	2 enthalpy H
Heinrich Hertz	thermodynamicists(other)	1857-1894	german	physicist		3
Helen Fisher	biographies	1945	american	anthropologist	1992: anatomy of love 2004: why we love	3
Helge Kragh	religious TPs	1944	danish	science historian		3
Hendrick Van Ness	thermodynamicists(other)	1924-2008	american	chemical engineer		3
Henri Benard	biographies	1874-1939	french	physicist	1900: bernard cells	3

Henri Poincare	thermodynamicists(other)	1854-1912	french	mathematical physicist	1900: on the three-body problem and equations of dynamics	2
Henry Adams	history TP s	1838-1918	American	historian	1896: The tendency of history, 1909 : the rule of phase applied to history	3 socialistic society
Henry Bent	1952-1994 HTPs	1927	american	physical chemist	1965: The second Law	3 entropy ethics
Henry Bergson	biographies	1858-1941	french	philosopher	1907: creative evolution	2
Henry Bray	HC	1846-1922	American	philosopher, priest	1910: The Living universe etc.	3
Henry Buckle	biographies	1821-1862	english	historian	1857: history of civilization in england	3
Henry Carey	HP	1793-1879	American	economist	1859: the Principles of Social Science	3
Henry Eyring	biographies	1901-1981	american	chemist	1931: potential energy surface model, 1935: transition state theory	2
Henry Finck	HC	1854-1926	American	philosopher	1887: Romantic Love and personal Beauty	3
Henry Le Chatelier	biographies	1850-1936	french-italian	chemist	1888: experimental and theoretical research on chemical equilibria	2
Henry Morris	religious TPs	1918-2006	american	civil engineer		3
Henry Osborn	biological TPs		American	anatomist, zoologist, paleontologist	1916: The origin of life: On the Theory of Action, Reaction and Interaction of energy	3
Henry Power	biographies	1623-1668	english	physician	1653: experimental work, gas law	3
Heraclitus	HT	535-450BC	Greek	philosophy		
Herbert Callen	thermodynamicists(other)	1919-1993	american	physicist	1985: thermodynamics and an introduction to the physical theories of equilibrium thermostatics and	3

					and irreversible thermodynamics	
Herbert Spencer	misc HTPs	1820-1903	English	scientist, philosopher	1897: first Principles	2
Herman Boerhaave	biographies	1668-1738	dutch	physician	1724: elements of chemistry	3
Herman Daly	misc HTPs	1938	american	economist	2004: Ecological Economics	1
Herman Kalckar	biographies	1908-1991	american	biochemist	1941: the nature of energetic coupling in biological synthesis	3
Herman Stoffkraft	biographies		fictitous german materialist		1871 novel : paradoxical philosopher	3
Hermann Gossen	economic TPs	1810-1858	German	economist	1853: The Development of the Laws of human Exchange and the cconsequent Rules of Human Action	1
Hermann Helmholtz	thermodynamics founders	1821-1894	german	physicist		2
hero	biographies	10-70AD	greek	physicist	50 pneumatica, philo thermometer	3
Hippocrates	biographies	460-370BC	greek	physician	father of medicine, doctrine of internal heat	2
Hippolyte Carnot	biographies	1801-1888	french	statesman	1872: life of Sadi Carnot	3
Hippolyte Taine	HC	1828-1893	French	Historian		3
Holmes Rolston	religious TPs	1932	american	religious philosopher		3
Horton Johnson	information TPs	1926	American	pathologist	1970: information Theory and Biology	3
Howard Odum	1952-1994 HTPs	1924-2002	american	ecologist	1971: Environment, Power and Society	1
Howard Reiss	thermodynamicists(other)	1934	american	physical chemist	1965: methods of thermodynamics	3
Howard Scott	misc HTPs	1890-1970	American	engineer	1932: Technocracy	1
Howard Seifert	1952-1994 HTPs	1917	american	aeronautics physicist	1961: can we decrease entropy?	3
Howard W. Odum	HT	1884-1954	American	Sociologist		1

Humphry Davy	HMS	1778-1829	English	chemist		3	
Immanuel Kant	biographies	1724-1804	german	philosopher	1790: methodical system of the teleological faculty of judgement	1	
Ingo Müller	sociological TPs	1937	german	physicist	2007: a history of thermodynamics - the doctrine of energy and entropy	1	
Ira Livingstone	misc HTPs	1960	American	cultural theorist	1997: Arrow of Chaos : Romanticism and Postmodernity	3	
Irving Fisher	biographies		american	economist	1992: mathematical investigations in the theory of value and prices	1	
Irving Klotz	thermodynamicists(other)	1916-2005	american	chemistry prof.	1950: chemical thermodynamics	3	
Isaac Asimov	literature TPs	1920-1992	American	biochemist, sci-fi writer	1956: The Last question, Foundation, l robot,	1	
Isaac Newton	biographies	1643-1727	english	physicist	1686: the principia, 1704: optics	1	
Istvan Gyarmati	thermodynamics founders	1929-2002	hungarian	physicist, chemist	1967: non-equilibrium thermodynamics: field theory and variational principles	2	
Ivan Bazarov	thermodynamicists(other)	1916-2005	russian	physicist		3	
Ä±van Kennedy	post 1995 HTPs	1940	australian	chemist	2001: action in ecosystems	3	
Ivo Kolin	thermodynamicists(other)	1924-2007	croatian	economist, mechanical engineer	1972: Thermodynamics atlas	2	wave engine, stirling motor
ilya Prigogine	1952-1994 HTPs	1917-2003	Belgian	chemist	1984: order out of chaos	1	
irwing Simon	HT	1920	American	writer	1980: centropy. The vertical aspect of Evolution	3	
isabelle Stengers	HT	1949	Belgian	chemist-philosopher	1997: power and Invention		
					2002: the science of disorder:		

jack Hokikian	post 1995 HTPs	1945	american	physicist	understanding complexity, uncertainity, and pollution in our world	2
jack Kirkaldy	1952-1994 HTPs	1926	Canadian	materials science engineer	1965: thermodynamics of human brain, thermodynamics of terrestrial evolution	3
Jacob Bekenstein	thermodynamicists(other)	1947	jewish	physicist	2006: on gravity, black holes and information	2
Jacob Berzelius	biographies	1779-1848	swedish	chemist	1806: animal chemistry, 1814: theory of chemical proportions	2
Jacob Moreno	psychological TPs	1889-1974	romanian	psychologist	social atom	3
Jacob Spielman	biographies	1722-1783	french	chemist	1783: pharmacopoeia generalis	3
Jacobus van't Hoff	thermodynamics founders	1852-1911	dutch	physical chemist	1884: studies in chemical dynamics	2
Jacques Ellul	sociological TPs	1912-1994	french	sociologist	1972: the political illusion	2
Jacques Lacan	psychological TPs	1901-1981	french	psychoanalyst		2
Jacques Rueff	economic TPs	1896-1978	French	economist	1922: from the Physical to Moral Sciences	3
James Beniger	sociological TPs	1946-2010	american	sociologist	1986: the control revolution	2
James Dewar	biographies	1842-1923	scottish	physical chemist	low temperature thermodynamics	3
James E. Lovelock	biological TPs	1919	English	chemistry, medicine, biophysics	1979: Gaia. A new Look at Life on Earth	2
James Elser	HC	1959-	American	evolutionary ecologist	2002: ecological stoichiometry: the biology of elements from molecules to the biosphere	3
James Forbes	biographies	1809-	scottish	physicist	1830: undulatory theory of heat,	3

		1868			vortices, vortex		
James G. Miller	biological TPs	1916-2002	American	psychologist	1978: Living Systems	3	
James Hyslop	cessation TPs	1854-1920	American	abnormal psychologist	1918: life after Death	3	
James Jeans	biological TPs	1877-1946	English	Mathematical Physicist	1931: The Mysterious Universe , 1933: The New Background of Science	3	
James Johnstone	biological TPs	1870-1932	English	oceanographer, biologist	1921. The Mechanism of Life in relation to physical theory	3	
James Joule	thermodynamics founders	1818-1889	english	physicist	1843: mechanic equivalent of heat	1	
James Kay	biological TPs	1954-2004	Canadian	environmental systems	1984: PhD Self-organization and the Thermodynamics of Living Systems	3	
James Martineau	cessation TPs	1805-1900	English	theologian, philosopher	1888: A Sudy of Religion	3	
James Maxwell	thermodynamics founders	1831-1879	scottish	physicist, mathematician	1871: theory of heat 1873: theory of electromagnetism	1	thermodynamic surface
James Moriga	unfiled pages	1922	american	writer	2001. life long human values	2	
James Partington	thermodynamicists(other)	1886-1965	english	chemist	1913: thermodynamics with special reference to chemistry	3	
James Reiss	economic TPs	1937	Australian	organic chemist	1994: Comperative Thermodynamics in Chemistry and Economics	3	economic-thermodynamic parameters
James Samuel Coleman	information TPs	1926-1995	American	sociologist	1964: Ä±ntroduction to mathematical Sociology	2	
James Sandham	literature TPs	1984	Canadian	writer	2008: The entropy of Aaron Rosclatt	3	
James	thermodynamicists(other)	1858-	british	electrical engineer	1904: Entropy: or thermodynamics from an engineer's	2	

Swinburne		1958			standpoint and reversibility of thermodynamics		
James Thomson	biographies	1822-1892	scottish	engineer		3	
James Thomson (mathematician)	biographies	1786-1849	scottish	mathematician		3	
James Thomson (farmer)	biographies	1738-1810	scottish	farmer		3	
James Watt	biographies	1736-1819	scottish	engineer	watt engine	3	
Jan Tinbergen				economist	1925: minimization problems in economics and physics	1	bak: paul ehrenfest
Jay Teachman	information TPs	1950	American	sociologist	1980: Analysis of Population Diversity: measures of Quantitative Variation	3	
Jean Baudrillard	Philosophical TPs	1929-2007	French	social philosopher	1981: Simulacra and Simulation	3	
Jean Hachette	biographies	1769-1834	french	mathematician	1811: elementary treatise on machines	3	
Jean Sales	HMS	1741-1816	French	polymat, philosopher	1789: De la philosophie de la Nature	2	
Jean-Baptiste Dumas	HC	1800-1884	French	chemist		3	
Jean-François Lyotard	Philosophical TPs	1924-1998	French	philosopher	1993: Political writings	3	
Jeffrey S. Wicken	biological TPs	1940-2000	American	biochemist	1987: Evolution, Thermodynamics,and Information	3	
Jeremy Adler	HC	1947	German	poet, historian		3	
Jeremy Campbell	information TPs	1952	American	journalist	1982: Grammatical Man: Information, Entropy, Language and Life	3	
Jeremy Rifkin	religious TPs	1945	american	economist	1980: entropy: a new world view	1	
Jerome Heath	post 1995 HTPs	1940	american	information scientist	1998: thermodynamics of culture	3	

Jerome Rothstein	information TPs	1918	American	physicist	1952: Organization and Entropy	3	
Jim Eadon	biographies	1968	english	physicist	2001: online poll: are you a giant molecule?	3	
Jing Chen	economic TPs	1965	Canadian	economist	2005: the Physical Foundations of Economics	2	
Joao Magellan	biographies	1722-1790	portuguese	physicist	1770: essay on a new theoretical law of the fire element and of the heat of bodies	3	
Joel de Rosnay	1952-1994 HTPs	1937	French	biochemist	1975: The Macroscobe: a new world scientific system	2	
Johan Galtung	information TPs	1930	Norwegian	sociologist	1967: Entropy and the General Theory of Peace	3	
Johann Dobereiner	biographies	1780-1849	german	chemist	1817: theory of triads, 1823: catalysis	3	
Johann Eckermann	HC	1792-1854	German	author		3	
Johann Helmont	biographies	1579-1644	flemish	physician	1609 gas	3	
Johann Pfaff	biographies mathematicians	1765-1825	german	mathematician	pfaffian form	2	
Johann von Goethe	HC	1749-1832	German	polymath	1809: Elective Affinities	2	
Johannes Bronsted	thermodynamicists(other)	1879-1947	danish	chemical engineer	1946: principles and problems in energetics	2	work principle
Johannes Lisman	HT	1900-1990	Dutch	economist	1946: Econometrics, Statistics and Thermodynamics	2	
Johannes Muller	HT	1801-1858	German	physiologist		2	
Johannes van der Waals	thermodynamics founders	1837-1923	dutch	physicist	1910: the equation of state for gases and liquids	2	1910 nobel prize
John Anderson	misc HTPs	1939	American	author	2006: Mann's doctor Faustus: Gestapo Music	3	
John Avery	biological TPs	1933	Danish	chemist	2003: Information Theory and Evolution	3	

John Bowlby	psychological TPs	1907-1990	british	psychologist		3
John Bryant	economic TPs	1944	English	mechanical engineer	2009: thermoeconomics	3
John Butler	thermodynamicists(other)	1899-1977	english	physical chemist	1935: the fundamentals of chemical thermodynamics	3
John Christie	HT	1947	Australian	physical chemist	1994: A Survey of Thermodynamical ideas	1
John Dalton	biographies	1766-1844	english	chemist	atomic theory, stoichiometry	1
John Fenn	thermodynamicists(other)	1917	american	chemist	1982: engines, energy, and entropy : a thermodynamic primer	3 2002 nobel prize
John Garcia	Philosophical TPs	1936-2001	American	writer	1971: The Moral Society	3
John Gatto	misc HTPs	1935	American	educational reformer	2000: the underground history of american education	3
John Gottman	biographies	1942	american	mathematical psychologist	1994: why marriages succeed or fail	3
John Grier Hibben	Philosophical TPs	1861-1933	American	mathematician, physician, theologian	1903: The Theory of Energetics and its philosophical bearings	3
John Herepath	biographies	1790-1868	english	physicist	1820: on causes, laws and phenomena of heat, gases, gravitation	3
John Herschel	misc HTPs	1797-1871	english	mathematician, astronomer		3
John Hodgson	HC	1950	American	writer, painter	2002: Little fun book of Molecules Humans	3
John Neumann	thermodynamicists(other)	1903-1957	american	mathematician, chemical engineer	1938: a model of general economic equilibrium	1
John Nichol	biographies	1804-1859	scottish	astronomer	1860: cyclopedia of physical sciences	2
John O'Manique	religious TPs	1936-2003	canadian	philosopher		3

John Patrick	religious TPs	1950	american	civil engineer, architect		3	
John Proops	HT	1947	English	ecological economist		1	
John Sanford	religious TPs	1954	american	plant geneticist		3	
John Schmitz	post 1995 HTPs	1950	Danish	chemist	2007: the second law of life - energy, technology and the future of earth as we know it	3	
John Southern	biographies	1755-1825		engineering assistant	1796 indicator diagram	3	
John Stewart	biographies	1749-1822	british	philosopher		2	
John Strutt lord Rayleigh	biographies	1842-1919	english	physicist	1900: black body radiation spectral energy flux density J	2	
John Tyndall	biographies	1820-1893	irish	physicist	translations, mechanical equivalent of heat, spencer, equilibration, second law	2	Tyndall-stewart-Tait debate, religion
John Waterston	biographies	1811-1883	scottish	civil engineer	1845: on the physics of media that are composed of free and perfectly elastic molecules in a state of motion	3	
John Wojcik	misc HTPs	1938	american	physical chemistry	2006: a response to chemical thermodynamics in the real world	3	
Jonathan Borofsky	HMS	1942	american	sclupture artist	molecule man	3	
Jose manuel Rey	post 1995 HTPs	1975	Spanish	economist	2010: a mathematical model of sentimental dynamics accounting for marital dissolution	3	
Josef Loschmidt	biographies	1821-1895	austrian	physical chemist	double bonds, triple bonds	2	
Josef Ludvig Fischer	Philosophical TPs	1894-1973	Czech	philosopher, sociologist		3	

Josef Popper	misc HTPs	1838-1921	Austrian	physicist, engineer		2
Josef Schnippenkotter	religious TPs	1886-1955	german	science philosopher		3
Josef Stefan	thermodynamics founders	1835-1893	austrian	physicist		2
Joseph Black	biographies	1728-1799	scottish	phsicist, chemist	1786: lectures on chemistry	2
Joseph Bois	HT	1892-1978	Canadian-american	jesuit priest psychologist		
Joseph Dewey	religious TPs	1945	american	spiritual teacher		2
Joseph Fourier	biographies	1768-1830	french	mathematician, physicist	1822: analytical theory of heat	2
Joseph Gay-Lussac	biographies	1778-1850	french	chemist	1807: first attempt to determine the changes in temperature which gases experience …	2
Joseph Keenan	thermodynamicists(other)	1900-1977	american	mechanical engineer	1941: thermodynamics, stable equilibrium law	2
Joseph Kestin	thermodynamicists(other)	1913-1993	american	mechanical engineer	1966: a course in thermodynamics	3
Joseph Lagrange	biographies	1736-1813	italian	mathematician	1788: analytical mechanics	1
Joseph Vogel	HT	1960	american puerto rican	economist		1
Josip Stepanic	sociological TPs	1970	crotian	physicist	microeconomics,	1
Juan Martinez-Alier	economic TPs	1941	Spanish	economist	1987: Ecological economics: Energy, Environment and Society	3
Julian Huxley	misc HTPs	1887-1975	English	evolutionary biologist	1931: science and religion	2
Julian Simon	economic TPs	1932-1998	american	economist	1996: The Ultimate Resource	3
Juliana Goates	thermodynamicists(other)	1953	american	physical chemist	2000: chemical thermodynamics	3 very religious
Julie Forman-Kay	thermodynamicists(other)	1963	canadian	biochemist	1999: the dynamics in the thermodynamics of binding	3
Julius Thomsen	biographies	1826-1909	danish	chemist	1854: thermal theory of affinity	3

Jürgen Mimkes	economic TPs	1939	German	metalurgist	2006: a Thermodynamic Formulation of social Science	1	
Karl Bottiger	biographies	1760-1835	german	archaeologist		3	
Karl Fink	HC	1960	American	germanic studies prof.	2002. goethe's intensified border	3	
Karl Marx	biographies	1818-1883	german	political economist	1848: communist manifesto, 1867: Das Kapital	1	wolf winiarski about cries and their sources ?
Karl Mohr	biographies	1806-1879	german	chemist	1837: about the nature of heat	3	
Karl Popper	HT	1902-1994	ingiliz	philosopher	1965: Time's Arrow and Entropy	1	
Karl-Henrik Robert	1952-1994 HTPs	1947	Swedish	physician	1991: educating a Nation : the natural step	3	leukemia
Karlis Ullis	post 1995 HTPs	1959	American	physician	1999: Age Right - turn back the clock with a proven antiaging program	3	
Keith Burton	thermodynamicists(other)	1922-1996	english	elecreical engineer	1957: thermodynamic tables for biochemical reactions	2	
Keith Laidler	biographies	1916-2003	english	physical chemist	1993: the world of physical chemistry	3	
Kenneth Bailey	sociological TPs	1941	american	sociologist	1990: social entropy theory	1	
Kenneth Boulding	economic TPs	1910-1993	american	economist	1956: General systems Theory	2	
Kenneth Connors	thermodynamicists(other)	1932	american	pharmacologist	2002: thermodynamics of pharmaceutical systems	2	
Kenneth Denbigh	thermodynamicists(other)	1911-2004	english	chemical engineer	1975: an inventive universe	2	
Kenneth Jolls	thermodynamicists(other)	1936	american	chemical engineer	2005: gibbs stamp,	2	
Kenneth Stokes	misc HTPs	1960	American	political economist	1992: man and the biosphere	2	
Kent Hovind	HT	1953	American	creation science		3	
					1994: out of control:		

Kevin kelly	1952-1994 HTPs	1952	american	futurist	the new biology of machines, social systems, and the economic world	2	extropianism
Kevin Yee	HC	1970		german literature prof.		3	
Klaus Jaffe	HT	1951	Venezuelan	chemical biologist			
Kozo Mayumi	economic TPs	1954	japanese	economist	2001: The origins of Ecological Economics	3	
Larry Kaufman	thermodynamicists(other)	1930	american	metallurgist	computational thermodynamics	2	
Lars Onsager	thermodynamics founders	1903-1975	norwegian	chemical engineer, physical chemist	1968: the motions of ions, principles and concepts	2	1968 nobel prize
Laszlo Tisza	thermodynamicists(other)	1907	american	physicist	1966: generalized thermodynamics	3	
Lawrence Chin	history TP s	1969	American	philosopher, science writer	A thermodynamic interpretation of history	3	
Lawrence Henderson	sociological TPs	1878-1942	american	physiology prof.	1935: pareto's General Sociology : a physiologists interpretation	1	
Lazare Carnot	biographies	1753-1823	french	engineer, mathematician, politician	1784: essay on machines, 1797: reflections on the metaphysics of infinitesimal calculus	2	magdeburg steam engine 1818
Leland Gilsen	post 1995 HTPs	1945	american	anthropologist, archeologist	2006: modular approach to designing computer cultural systems	3	
Len Fisher	HP	1942	English	science writer	2009: the Perfect Swarm	2	
Leo Szilard	information TPs	1889-1964	Hungarian	physicist	1929: on the Decrease in Entropy in a Thermodynamic System by	2	
Leon Brillouin	information TPs	1889-1969	French	physicist	1956: Science and Information Theory	3	
Leon Walras	biographies	1834-1910	french	sociologist, economist	1874: elements of pure economics	1	
Leon Winiarski	sociological TPs	1865-1915	polish	economist	1898: essay on social mechanics	1	gold socio-biological energy
Leon Ying	religious TPs	1960	american	nuclear physicist	twin universe	1	video you tube

Leonardo da Vinci	biographies	1452-1519	italian	polymath	Vitruvian man	1
Leonhard Euler	biographies	1707-1783	swiss	mathematician	invented math. Symbols, operators	1
Leslie White	misc HTPs	1900-1975	American	anthropologist	1949: The science of culture	1
Lester Ward	sociological TPs	841-1913	american	sociologist	1883: dynamic sociology	2
Leucippus	biographies	500-450BC	greek	philosopher		3
Lev Landau	thermodynamicists(other)	1908-1968	russian	physicist	low temperature, free energy,	3
Lev Rozonoer	economic TPs	1934	Russian	cybernetician	1973: A Generalized Thermodynamic Approach to Resource Exchange and Allocation	1
Lev Shneider	HMS	1946	American	sci-fi writer	2005. Matryoshka	3
Lewis Gordon	biographies	1815-1876	scottish	civil engineer		2
Lewis Mumford	misc HTPs	1895-1990	American	historian	1934: Technics and Civilization	1
Libb Thims	post 1995 HTPs		American	human thermodynamics	2007: Human chemistry, 208: Human Molecule	1
Lila Gatlin	information TPs	1928	American	biophysicist	1972: Information Theory and the Living System	3
Louise Young	HT	1919-2010	American	Physicist	1986: the unfinished universe	3
Louis-Marie Vincent	cessation TPs	1940	French	electromechanical engineer	1988: Can We Belive in Resurrection	3
Luciano Floridi	information TPs	1964	Ä°talian	philosopher	1999: Philosophy and Computing	3
Lucretius	biographies	99-55BC	greek	philosopher	on the nature of things	3
Ludwig August Colding	cessation TPs	1815-1888	danish	civil engineer		3
Ludwig Boltzmann	thermodynamics founders	1844-1906	austrian	physicist		1
Ludwig Buchner	HC	1824-1899	German	physicist		3
Ludwig von Bertalanffy	1952-1994 HTPs	1901-1972	austrian	biologist	1968: General Systems Theory	1

Luigi Fantappie	biological TPs	1901-1956	Ä°talian	mathematical physicist		3	
Luigi Sertorio	HT	1933	Italian	physicist, ecophysicist	1991: Thermodynamics of Complex Systems: an Introduction to Ecophysics	2	
Luis Fernandez Galiano	misc HTPs	1950	Ä°talian	architect	1982: Fire and memory	2	
Lydia Goehr	HC	1965	American	philosopher	2008. elective affinities	3	
Lynde Wheeler	biographies	1874-1959	american	physicist	1951: Josiah Willard Gibbs: the history of a great mind	3	
Lyndon LaRouche	misc HTPs	1922	american	politician	2001: the economics of the noosphere	1	video lecture you tube
Lynn Liss	misc HTPs		american	business strategist	2005: human thermodynamics and business efficiency	3	
Lynn Margulis	HT	1938	American	biologist			
Mae-Wan Ho	HT	1941	Chinese-English	biochemist	1993: The rainbow and the Worm, the physics of organism	3	
Magoroh Maruyama			american		1963: the second cybernetics: deviation-amplifying mutual causal processes	1	logical levels of second law
Malte Faber	economic TPs	1938	German	economist		2	
Manuel De Landa	Philosophical TPs	1952	American	philosopher	2002: intensive science and virtual philosophy	3	
Marc Seguin	biographies	1786-1875	french	engineer	1822: observations on the effect of heat and motion	3	
Marcellin Berthelot	biographies	1827-1907	french	chemist	1879: essai de mecanique chimique fondee sur la thermochimie	2	
Marcus Vitruvius	biographies	75-15BC	roman	writer	25BC on architecture	3	
Marek Roland	1952-1994 HTPs	1954	canadian	physicist	1992: Life on Earth: Flow of energy and entropy	2	
					2009: the perversion		

Margherita Long	post 1995 HTPs	1967	american	literature scholar	called love	3	
Marguerite Callaway	misc HTPs	1950	american	business consultant	2006: The energetics of business	3	
Marian Smoluchowski	thermodynamicists(other)	1872-1917	polish	statistical physicist	kinetic theory of matter,	3	
Mark Blumberg	post 1995 HTPs	1961	american	biophysicist	2002: body heat: temperature and life on earth	3	
Mark Buchanan	HP	1961	American	physicist	2007: the Social Atom, 2000: Ubiquity	3	
Mark Ciotola	post 1995 HTPs	1963	american	physical economist	2003: physical history of economics	1	economic bubbles
Mark Granovetter	HC	1943	American	sociologist	hydrogen bonds, weak ties, strong ties	3	
Mark Janes	post 1995 HTPs	1973	english	biotechnologist	2006: carbon entromorphology, good and evil	1	
Mark Zemansky	thermodynamicists(other)	1900-1985	american	physicist	1937 : heat and thermodynamics	3	
Marlan Blissett	sociological TPs	1933	american	political scientist	1972: politics in science	2	
Martin Goldstein	biological TPs	1919	American	physical chemist	1993. The Refrigator and the Universe	3	
Mary Jo Nye	biographies	1944	american	science historian	1993: from chemical philosophy to theoretical chemistry	3	
Mary Mesny	HMS	1880-1950	American	writer-philosopher	1910: human molecule	3	
Mary Roach	cessation TPs	1968	American	science writer	2005: Spook: Science Tackles the Afterlife	3	
Matthew Melko	biographies	1930-2010	american	political scientist	1969: the nature of civilizations	3	
Matthias Ruth	economic TPs	1964	american	natural economist	1993: Ä±ntegrating economics, ecology and thermodynamics	2	
Maurice Hauriou	sociological TPs	1856-1929	french	philosopher, law prof.	1899: lessons on social movement	2	
Max Born	biographies	1882-1970	german	physicist	1929: lecture on maxwell's relations	2	
Max Leclerc	HC	1864-1932	French	education reformer		3	
Max Planck	thermodynamics founders	1858-1947	german	physicist		1	
					1920. the theory of		

Max Weber	HC	1864-1920	German	sociologist	social and economic organization	1	
Mazyar Lotfalian	post 1995 HTPs	1969	american	antropologist	2004: islam, technoscientific identities, and the culture of curiousity	3	
Meg Bond	HC	1952	American	psychologist	2007: workplace chemistry	3	
Mehdi Bazargan	cessation TPs	1907-1995	iranian	mechanical engineer	1956: Love and worship or Human thermodynamics	3	
Merle Randall	thermodynamics founders	1888-1950	american	physical chemist	1923: thermodynamics and the free energy of chemical substances	2	opponents eventually die
Michael Brooks	HMS	1970	English	quantum physicist	2005: 13 things that Don't Make Sense	2	
Michael Faraday	biographies	1791-1867	english	chemical physicist	1830: lines of force, 1857: on the conservation of force	2	
Michael Stavros Macrakis	economic TPs	1924-2001	American	engineer, physicist	1997: Scarity's ways : the origins of capital	3	
Michel Serres	Philosophical TPs	1930	French	philosopher	1980: the parasite, 1982: Hermes	3	
Migene Gonzalez Wippler	cessation TPs	1950	Puerto Rican	cultural anthropologist	1997: What Happens After Death	3	
Mihaly Csikszentmihalyi	psychological TPs	1934	Hungarian	psychologist		2	
Mikhail Volkenstein	1952-1994 HTPs	1912-1992	Russian	biophysicist	1985: Entropy and information	2	
Miles Sullivan	biographies	1917	american	chemist	drinking bird 1942	3	
Mladen Knezevic	HT	1958	Croatian	sociology and agriculture		2	
Morgan Peck	religious TPs	1936-2005	american	psychiatrist	1978: the road less traveled	2	
Motoyosi Sugita	biological TPs	1905-1990	Japanese	physicist	1952: Negative Entropy, 1953: thermodynamic analysis of life	3	
Muriel Rukeyser	biographies	1913-1980	american	poet	1942: willard Gibbss - american genius	3	
					1961: thermostatics and		

Myron Tribus	thermodynamicists(other)	1921	american	engineer	thermodynamics: an introduction to energy, information and states of matter	2	thermoeconomics
Nasif Nahle	misc HTPs	1951	american	biologist	2009: a thermodynamic description of life and death	3	
Nassim Haramein	HP	1962	American	Physicist	spacetime torque model of stellar movement	2	
Nathan Schwartz	HT	1940	Swiss-american	psychotherapist	1969: Entropy, Negentropy and the Psyche	3	
Nathanial Shaler	cessation TPs	1841-1906	American	paleontologist	1900: The individual: a study of life and death	3	
Nicholas Christakis	HC	1962	American	medical sociologist	2010: the chemistry of social networks	3	
Nicholas Georgescu Roegen	economic TPs	1906-1994	Romanian	economist	1971: The Entropy Law and the Economic Process	1	
Nicolas von Grot	psychological TPs	1852-1899	russian	psychologist	psychological energy	3	
Nicolaus Copernicus	biographies	1473-1543	polish	astronomer		3	
Niklas Luhmann	sociological TPs	1927-1998	german	sociologist	1982: the differentiation of society	2	
Nikola tesla	biographies	1856-1943	serbian	electrical engineer	1900: the problem of increasing human energy	1	defunct theory of life
Nikolai Krainskii	psychological TPs	1860-1935	russian	psychiatrist		3	
Nikolay Bogolyubov	thermodynamics founders	1909-1992	russian	mathematician, physicist		2	
Nikos Salingaros	misc HTPs	1949	american	mathematician, architect	1997: life and Complexity in Architecture from a Thermodynamic analogy	3	
Norbert Wiener	information TPs	1894-1964	American	cybernetics	1948: Cybernetics, 1950: The Human Use of Human Beings	1	
					1868: the sun as a		

Norman Lockyer	HT		english	astronomer	type of the material universe	3	
Norval Morrisseau	HC	1932-2007	canadian	artist, painter		3	
Octavian Ksenzhek	economic TPs	1945	Russian	bioelectochemist	2007: Money: Virtual Energy - Economy through the prism of thermodynamics	2	
Ole Fanger	biographies	1934-2006	danish	environmental engineer	1970: thermal confort analysis	3	
Ole Romer	biographies	1644-1710	danish	astronomer	1701 thermometer, velocity of light	3	
Oliver Reiser	misc HTPs	1895-1974	american	philosopher	1935: Philosophy and cenceptions of modern science	3	cosmic humanism and world unity
Olivier Costa de Beauregard	information TPs	1911-2007	French	physicist	1963: The Second Principle of Time	3	
Orrin Klapp	sociological TPs	1915-1997	american	sociologist	1978: opening and closing: strategies of information adaption in society	2	
Oswald Kulpe	psychological TPs	1862-1915	german	psychologist	on psychic energy	3	
Otto Guericke	biographies	1602-1686	german	engineer	1645: piston and cylinder, vacuum pump	2	
Otto Sackur	thermodynamicists(other)	1880-1914	german	physical chemist	1908: the chemical affinity	3	
Pamela Zoline	literature TPs	1941	American	writer	1967: The heat death of universe	3	
Paracelsus	biographies	1493-1541	swiss	physician	chemical affinity,	3	
Paris Arnopoulos	1952-1994 HTPs	1935	Canadian	political scientist	1993: sociophysics	2	
Parmenides	biographies	510-450BC	greek	phsicist-philosopher	485BC on nature, vacuum debate	3	
Paul Bohannan	post 1995 HTPs	1920-2007	american	anthropologist	1995: how culture works	3	
Paul Chun	thermodynamicists(other)	1935	american	biochemist	protein thermodynamics	3	
Paul Colinvaux	biological TPs	1930	American	zoologist, ecologist	1979: Why Big Fierce Animals are Rare	3	
Paul Darwin Foote	religious TPs	1888-1971	american	physicist	1920: the temperature of heaven and hell	3	

Paul Davies	biological TPs	1946	English	physicist	1974: The Physics of Time Asymmetry	2	
Paul Ehrenfest	thermodynamicists(other)	1880-1933	austrian	physicist		1	jan tinbergen
Paul Ehrlich	unfiled pages	1932	american	biologist	1993: availability, entropy and the laws of thermodynamics	2	2008: the dominant animal: human evolution and the
Paul Epstein	thermodynamicists(other)	1883-1966	american	mathematical physicist	1937: textbook of thermodynamics	3	
Paul Glansdorff	biographies	1941	french	physicist	dissipative structures	3	
Paul Peachey	HC	1927	American	writer		3	
Paul Samuelson	economic TPs	1915-2009	American	economist	1983: Foundations of Economic Analysis	1	
Paul Strassmann	post 1995 HTPs	1925	american	corporate information sys. Executive	2005: information management and organization entropy	3	
Percy Bridgman	thermodynamicists(other)	1882-1961	american	physicist	1934: thermodynamics of electrical phenomena in metals	2	1946 nobel prize, formulas
Peter Atkins	biographies	1940	english	physical chemist	1978: physical chemistry, 1987: the second law,	2	
Peter Corning	post 1995 HTPs	1935	american	biological social scientist	2003: nature's magic: synergy in evolution and the fate of humankind	2	
Peter Freese	literature TPs	1939	German	literature theorist	2006: From apocalypse to the entropic end	3	
Peter Hammond	post 1995 HTPs	1929	american	anthropologist	1964: cultural and social anthropology	3	
Peter Landsberg	thermodynamicists(other)	1922-2010	english	physicist	1982: the enigma of time, 1964. entropy and the unity of knowledge	2	
Peter Mauersberger	biographies	1928-2007	german	geophysicist, hydro-ecologist	1982: irreversibility in hydrology	3	
Peter Mitchell	biographies	1920-1992	english	biochemist	1961: chemiosmotic theory	3	
Peter Molton	biological TPs	1943	American	chemist	1978: Polymers to Living Cells	3	

Peter Pogany	post 1995 HTPs	1939	american	economist	2006: rethinking the world	1	
Peter Rock	thermodynamicists(other)	1939-2006	american	chemical thermodynamicist	1969: chemical thermodynamics	3	
Peter Tait	thermodynamics founders	1831-1901	scottish	mathematical physicist		2	
Philip Ball	HP	1962	English	physical chemist	2004: critical mass	3	
Philip Kelland	biographies	1808-1879	english	mathematician	1837: theory of heat	3	
Philip Mirowski	economic TPs	1951	American	economist	1989: More Heat than Light	3	
Philip Moriarty	sociological TPs	1968	irish	physicist		2	videos, you tube
Philip Parker	economic TPs	1960	American	economist	2000: Physioeconomics	3	equatorial paradox
Pierre Duhem	thermodynamicists(other)	1861-1916	french	physicist	1911: treatise on energetics	1	
Pierre Dulong	biographies	1785-1838	french	physical chemist	law of dulong-petit	3	
Pierre Gassendi	biographies	1592-1655	french	thinker	1647: on the life and death of epicurus book eight	3	
Pierre Laplace	biographies					1	
Pierre Laplace 2	biographies mathematicians	1749-1827	french	mathematician, physicist, astronomer		2	
Pierre Lecomte du Nouy	religious TPs	1883-1947	american	mathematician, biophysicist	1942: human destiny	3	
Pierre Levy	1952-1994 HTPs	1956	Canadian	cyberspace philosopher	1994: collective intelligence	2	
Pierre Perrot	thermodynamicists(other)	1939	french	thermodynamicist	1988. A to Z of thermodynamics dictionary	2	
Pierre Rousseau	HC	1950	American	philosopher, photographer	against free will	3	
Pierre Teilhard	religious TPs	1881-1955	french	scientific-religious philosopher	1938: the phenomenon of man	1	omega point, noosphere
Pitirim Sorokin	sociological TPs	1889-1968	american	sociologist	1928: contemporary sociological theories	2	
Plato	biographies	427-348BC	greek	philosopher		1	
Plinio Prioreschi	cessation TPs	1924	Italian	physician	1990: A History of Human Responses to Death	3	
Pope Pius xÄ±Ä±	HT	1876-		head of catholic	1951: Theology and	3	

		1958		church	Modern Science	
Provident Peterson	HMS	1950	American	writer	2010: The Universe, God and Us	3
Ralph Fowler	thermodynamics founders	1889-1944	english	physicist		2
Ralph Hartley	biographies	1888-1970	american	electronics engineer	logarithmic measure of information	2
Ralph Tykodi	thermodynamicists(other)	1925	american	physical chemist	1967: thermodynamics of steady state	3
Ramon Margalef	post 1995 HTPs	1919-2004	spanish	ecologist	1957. information theory in ecology	3
Reiner Kummel	HT	1939	German	physicist	2011: The Second Law of Economics, Energy, Entropy and the orogins of wealth	1
Reinhold Furth	sociological TPs	1893-1979	czechoslovakian	physicist	1951: physics of social equilibrium	2
Remy Lestienne	1952-1994 HTPs	1943	French	physicist	1990: The children of time: causality, entrÄ ±py, becoming	2
Rene Descartes	biographies	1596-1650	french	physicist, philosopher	1637: discourse on method, cartesian system	1
Richard Adams	post 1995 HTPs	1924	american	anthropologist	1975: energy and structure: a theory of social power	3
Richard Coren	post 1995 HTPs	1935	american	computer science	2006: God and science among the infinites	2
Richard Dawkins	unfiled pages	1941	english	zoologist	1991: the ultraviolet garden	2
Richard Delgado	1952-1994 HTPs	1948	American	law professor	1990: does voice really matter ?	3
Richard Feynman	biographies	1918-1988	american	physicist	quantum electrodynamics QED	1
Richard Gregory	biological TPs	1923	British	neuropsychologist	1981: Mind in Science: a History of Explanations in Psychology and Physics	3
Richard Hughes	post 1995 HTPs		american	professor of government and politics	thermodynamic interpretation of politics	3
		1733-				

Richard Kirwan	biographies	1812	irish	chemist	specific heats	3
Richard Kremer	thermodynamicists(other)	1960	american	science historian	1990. the thermodynamics of life and experimental physiology	3
Richard Owen	HT	1804-1892	English	anatomist		3
Richard Piccard	post 1995 HTPs	1947	american	physicist	entropy and human activity	2
Richard Raymond	information TPs	1935	American	physicist	1950: Communication, Entropy and Life	3
Richard Rudd	religious TPs	1967	english	new-age spiritual teacher		3
Richard Tolman	thermodynamics founders	1881-1948	american	chemical engineer	1934: relativity, thermodynamics, and cosmology	2
Richard Towneley	biographies	1629-1707	english	scientist	1653: gas law	3
Richard Weiss	thermodynamicists(other)	1933	american	engineer	1976: relativistic thermodynamics	3
Robert Alberty	thermodynamicists(other)	1921	american	physical chemist	2001: use of legendre transformations in chemical thermodynamics	3
Robert Ayres	post 1995 HTPs	1930	english	mathematical physicist	2009: economic growth engine	1
Robert Boyle	biographies	1627-1691	irish	chemist, physicist	1661: the sceptical chymist	3
Robert Clark	post 1995 HTPs	1940	american	political scientist	1997: the Global Imperative	3
Robert Cross	post 1995 HTPs	1950	american	author	1998: revenue management	3
Robert Evans	thermodynamicists(other)	1940	american	mechanical engineer	1962: a contribution to the theory of thermo-economics	2
Robert Handscombe	post 1995 HTPs	1955	english	engineer, business management prof.	2004: The Entropy Vector: connecting science and business	3
Robert Heilbroner	HMS	1919-2005	American	economist	1953: The Wordly Philosophers	3
Robert Hooke	biographies	1635-	english	physicist	pneumatical engine	3

		1703					
Robert Kahn	psychological TPs	1918	american	social scientist	1966: the social psychology of organization	3	
Robert Kenoun	history TP s	1950	American	materials scientist	2006: A Proposition to theory of history and social evolution	3	marxism, socialism
Robert Lindsay	Philosophical TPs	1900-1985	American	physicist	thermodinamic imperative, negentropy	3	
Robert Mayer	thermodynamics founders	1814-1878	german	physician, physicist	blood colour redness	2	
Robert Nisbet	sociological TPs	1913-1996	american	sociologist	1970: the social bond	2	
Robert Pirsig	HMS	1928	American	writer-philosopher	1991: Lila : An Inquiry into Morals	2	
Robert Raffa	thermodynamicists(other)	1949	american	pharmacological engineer	drug-receptor thermodynamics	3	
Robert Redcorde	biographies mathematicians	1510-1558	english	mathematician, physician	1557: the whetstone of witte	2	
Robert Russel	religious TPs	1946	american	physicist, theolgian		3	
Robert Sterner	HC	1958	American	biologist, ecologist, limnologist	2002. ecological stoichiometry	3	
Robert Thurston	thermodynamicists(other)	1839-1903	american	mechanical engineer	1878: a history of the growth of the steam-engine	3	
Robert Ulanowicz	biological TPs	1943	American	chemical engineer	1986: Growth and Development-ecosystems Phenomenology	3	
Robert Wald	thermodynamicists(other)	1947	american	physicist	1994: quantum field theory in curved spacetime and black hole thermodynamics	3	
Robin Dunbar	biographies	1947	english	anthropologist	dunbar number = 150 stability for a social group	3	
Rod Swenson	1952-1994 HTPs	1945		systems theorist		2	
Roger Boscovich	biographies	1711-1787	croatian	mathematical physicist	1758: theory of natural philosophy	3	
Roger Boscovitch	biographies	1711-1787	croatian	mathematical physicist	1758: theory of natural philosophy	2	

Roger Caillois	post 1995 HTPs	1913-1978	French	sociologist, anthropologist	myth and the man, mimesis	3	
Roger Penrose	1952-1994 HTPs	1931	English	physicist	1989: The Emperor's new mind	2	
Ronald Fisher Aylmer	biological TPs	1890-1962	English	evolutionary biologist	1930: The Genetical Theory of Natural Selection	2	entropy-fitness
Ronald Fox	1952-1994 HTPs	1943	american	physicist	1988: Energy and evolution of life	2	energy currency
Ronald Pearson	cessation TPs	1933		mechanical engineer	2005. survival physics, theoretical physics backs survival	3	
Roy Henderson	HP	1935	Australian	mechanical engineer	1970. crowd behaviour and pedesterian traffic	3	
Rudolf Arnheim	literature TPs	1904-2007	American	psychologist	1971: Entropy and Art, an essay on disorder and order	3	
Rudolf Clausius	thermodynamics founders	1822-1888	german	physicist	1865: the mechanical theory of heat	1	entropy
Sadi Carnot	thermodynamics founders	1796-1832	french	engineer	1824: reflections on the motive power of fire	1	
Samuel Burbury	thermodynamicists(other)	1831-1911	english	lawyer, mathematician	1894: H theory, boltzmann's minimum function	3	
Satch Ejike	post 1995 HTPs			lawyer	2008: find a good man and keep him	3	
Sean Carroll	HT	1966	American	astrophysicist		3	
Sean O'reilly	HT	1952	American	psychology philosopher	2001: How to Manage Your Dick	2	
Serge Galam	1952-1994 HTPs	1945	French	physicist	2004: sociophysics	2	
Sergei Feitelberg	psychological TPs	1905-1967	austrian	physicist		3	
Sergei Podolinsky	economic TPs	1850-1891	Ukrainian	physician, socialist		1	
Sergio Franzese	unfiled pages	1963-2010	italian	moral philosopher	2008: the ethics of energy : william james's moral philosophy in focus	2	
Seth Lloyd	information TPs	1960	American	quantum information theorist		3	
Shu-Kun Lin	biographies	1957	chinese	chemist	1999: Entropy, 2008:	3	Mdpi.com,

					Energies	Mdpi.org
Siegfried Bernfeld	psychological TPs	1892-1953	austrian	psychologist		3
Sigmund Freud	psychological TPs	1856-1939	austrian	psychiatrist	1895: a project for scientific psychology	1
Sigmund Wroblewski	biographies	1845-1888	polish	physical chemist	1883: low-temperature thermodynamics work	2
Spiru Haret	HP	1851-1912	Romanian	mathematical physicist	1910: social mechanics	2
Srdan Lelas	biological TPs	1939-2003	Indian	science philosopher	2000: Science and Modernity : toward an integral theory of science	3
Stanley Sandler	thermodynamicists(other)	1940	american	chemical engineer	chemical and engineering thermodynamics	2
Stefan Baumgartner	economic TPs	1968	German	physicist	1995: Entropy: A Unifying Concept for Ecological Economics	2
Stephane Leduc	biological TPs	1853-1932	French	biologist	1911: The mechanism of Life	3
Stephen Berry	1952-1994 HTPs	1931	american	physical chemist	1971: the option for survival	3
Stephen Brush	history TP s	1935	American	physics historian	1978: The Temperature of History: phases of science and culture in the nineteenth century.	3	the kind of motion heat
Stephen Coleman	post 1995 HTPs	1942	american	political scientist	1972: measurement and analysis of political systems: a science of social behaviour	3
Stephen Hawking	1952-1994 HTPs	1942	British	astrophysicist	1988: a brief history of time	1
Stephen Lower	HMS	1945	Canadian	biochemist	2007: List of Flim-Flam, Pseudoscience and Nonsense	2
Steve Fuller	biographies	1959	american	philosopher, sociologist	2005: l am not a molecule	3	violent social revolutions phase
Steven Polgar	post 1995 HTPs	1931-	American	anthropologist	1961: evolution and the thermodynamic	3

		1978			imperative		
Steven Rosen	post 1995 HTPs	1955	American	Hindu studies author	2002: Gita on the Green	3	
Steven Stogatz	unfiled pages	1959	american	applied mathematician	1988: love affairs and differential equations	2	
Stuart Kauffman	biological TPs	1939	American	physician, biochemist	2006: What We Believe But Cannot prove	2	
Sture Nordholm	post 1995 HTPs	1944	Swedish	physical chemist	1997: in defense of thermodynamics: an animate analogy	2	
Subrahmanyan Chandrasekhar	thermodynamics founders	1910-1995	indian	astrophysicist	1939: an introduction to the study of stellar structure	2	
Suma Varughese	religious TPs	1960	indian	journalist		3	
Surya Pati	post 1995 HTPs	1983	Indian	chemist	2009: the thermodynamics of the human bond	3	
Sven Jorgensen	thermodynamicists(other)	1934	danish	ecologist, chemical engineer	1982. a holistic approach to ecological modeling by application of thermodynamics	2	
Sybren de Groot	thermodynamics founders	1916	danish	physicist	1961: nonequilibrium thermodynamics	2	
Talcott Parsons	sociological TPs	1902-1979	american	sociologist	1937: the structure of social action	2	
Tanya Maslova	post 1995 HTPs	1970	Russian	economist	2010: thermolinguistics and human thermodynamics	2	
Ted Erikson	post 1995 HTPs	1928	american	chemical engineer		3	
Teresa Brennan	psychological TPs	1952-2003	australian	philosopher	1992: the interpretation of the flesh : fesud and feminity	2	social pressure
Terrel Gallaway	post 1995 HTPs	1970	American	economist	1999: Entropy, negentropy, and the laws of thermodynamics	3	
Terrel Hill	thermodynamicists(other)	1917	american	biochemist	1964: thermodynamics of	2	

					small systems	
Terry Bynum	information TPs	1938	American	philosophy professor	2005: Entropy and Purpose in Human life	3
Theodor Lipps	psychological TPs	1851-1914	german	psychologist	1903: guide to psychology	3
Theodore Richards	thermodynamicists(other)	1868-1928	american	chemist	1902: the relation of changing heat capacity to change free energy	3
Theophile de Donder	thermodynamics founders	1872-1957	belgian	physicist		2
Thomas Andrews	biographies	1813-1885	irish	chemist, physician	1869: on the continuity of the gaseous and liquid states of matter	2
Thomas Carver	economic TPs	1865-1961	American	economist	1924: The Economy of Human Energy	3
Thomas DeGregory	economic TPs	1937	American	economist	1986: technology and Negative Entropy	3
Thomas Dreier	HC	1884-1976	American	editor, writer, business theorist	1948: we Human chemicals	3
Thomas Hirst	biographies	1830-1892	english	mathematician		3
Thomas Hobbes	HP	1588-1679	English	science philosopher	1651: Leviathan	3
Thomas Huxley	HC	1825-1895	English	biologist	social chemistry	3
Thomas Kuhn	biographies	1922-1996	american	physicist, science historian	1962: The Structure of Scientific Revolutions	1
Thomas Newcomen	biographies	1664-1729	english	engineer	1712 newcomen steam engine	3
Thomas Pynchon	literature TPs	1937	American	novelist	1960: V, 1966: The crying of lot 49 , 1973: gravity's rainbow	2
Thomas Savery	biographies	1650-1715	english	engineer	1689 miner's friend or savery steam engine	3
Thomas Seebeck	biographies	1770-1831	german	physician	1821: thermo-electricity	3
Thomas Wallace	post 1995 HTPs	1937	american	physical chemist	2009: Wealth, energy and human values	1
					1801 : wave theory	

Thomas Young	biographies	1773-1829	english	physician-physicist	of light, rosetta stone, energy	2
Timothy Lister	post 1995 HTPs	1950	American	consultant	1999: peopleware, productive projects and teams	3
Tjalling Koopmans	HMS	1910-1985	american	mathematician, economist		2
Todd Silverstein	post 1995 HTPs	1954	american	chemistry prof.		3
Tom Bell	Philosophical TPs	1966	american	philosopher, lawyer	1991: Privately produced law	3
Tom DeMarco	post 1995 HTPs	1940	American	business consultant	1999: peopleware, productive projects and teams	3
Tom Stoppard	literature TPs	1937	British	playwright	1993: play Arcadia	3
Tominaga Keii	post 1995 HTPs	1920-2009	Japanese	chemical engineer	2004: Heterogenous kinetics: theory of ziegler-natta-kaminsky	3
Tony Buzan	biographies	1942	english	accelerated learning expert	1994: book of genius IQ	3
Tony Rothman	sociological TPs	1953	american	physicist	1989: science a la mode: physical fashions and fictions	3
Tor Norretranders	post 1995 HTPs	1955	Danish	science author	2002: The generous man: how helping others is the sexist thing you can do	3
Torbern Bergman	biographies	1735-1784	swedish	chemist	1775: a dissertation on elective attractions	3
Tullio Scrimali	psychological TPs	1952	italian	psychiatrist	2006: entropy of mind and negative entropy	3
Udai Veer	thermodynamicists(other)	1950	indian	science teacher	2006: encyclopedia of thermodynamics	3
Vaclav Havel	biological TPs	1936	Czech	playwright and president		3
Valery Chalidze	post 1995 HTPs	1932	american	mathematician	2000: entropy demystified: potential order, life and money	2
Valter Caggio	HT	1954	Italian	mechanical engineer	2008: Negentropy and its new global meaning	3

Vera Daniel	1952-1994 HTPs	1913	english	physicist	1952: Physical Principles in human cooperation	2	The uses and abuses of analogy
Victor Maslov	post 1995 HTPs	1936	russian	mathematical physicist	2009: similarity laws in thermodynamics: monomers and dimers and their relations to crises in society	1	
Victor Regnault	biographies	1810-1878	french	chemist	1847: experimental relations…	3	
Victor Sergeev	HT	1944	Russian	physicist	2005:the Thermodynamic Approach to market	1	
Viktor Minkin	post 1995 HTPs		russian	biometrist	2007: head movements vibraimage visualization and energetic models of emotions	2	
Vilfredo Pareto	sociological TPs	1848-1923	french-italian	mathematical engineer		1	
Vineet Nayar	HC	1962	Indian	business executive	2010. employes first, customers second	3	
Vladimir Bekhterev	psychological TPs	1859-1927	russian	neurologist		3	
Vladimir Sychev	thermodynamicists(other)	1935	russian	scientist	1973: complex thermodynamic systems	3	
Vladmir Vernadsky	HT	1863-1945	Russian	geochemical mineralogist	1926: The Biosphere	1	
Voltaire	biographies	1694-1778	french	writer, philosopher		2	
Vonda McÄ ±ntyre	literature TPs	1943	American	biological geneticist	1981: the entropy effect (sci-fi)	3	
Wallis Budge	biographies	1857-1934	english	egyptologist	1895: egyptian book of the dead	3	
Walter Albersheim	religious TPs	1897-1982	american	electrical engineer		3	
Walter Browne	biographies	1842-1884	english	civil engineer		3	
Walter Buckley	sociological TPs	1922-2006	american	sociologist	1967: sociology and modern systems theory	2	morphogenesis, morphostatis
	thermodynamics	1864-			1893: ideal gas law,		

Walter Nernst	founders	1941	german	physical chemist	1906: heat theorem	2
Wayne Angel	post 1995 HTPs	1945	american	physicist	2005: the theory of society	2
Wayne Saslow	economic TPs	1941	American	physicist	1999: An Economic Analogy to Thermodynamics	2
Werner Stark	HC	1909-1985	austrian	social economist		3
Wil Lepkowski	sociological TPs	1938	american	science writer	1979: the social thermodynamics of ilya prigogine	2
Wilhelm Buchholz	HC	1734-1798	German	physician, chemist		3
Wilhelm Ostwald	cessation TPs	1853-1932	German	physical chemist	1912: the Energetic Imperative	1
Willard Gibbs	thermodynamics founders	1839-1903		thermodynamicist	1876: on the equilibrium of hetrogeneous substances	1
William A. Fairburn	HC	1876-1947	American	naval architect, marine engineer	1914: human chemistry	3
William Bayliss	HT	1860-1924	English	physiologist	1922: Life and Laws of Thermodynamics	3
William Cullen	biographies	1710-1790	scottish	physician, chemist	1757: affinity reaction diagrams	3
William Dembski	HT	1960	American	mathematician-theologian	2004: Uncommon Dissent: Intellectuals Who Find Darwinism Unconvincing	3
William Gairdner	sociological TPs	1940	canadian	writer, english prof.	1994: the trouble with Canada, social entropy	2
William Giauque	thermodynamicists(other)	1895-1982	american	chemist	1949. some consequences of low temperature research in chemical thermodynamics	3
William Grove	biographies	1811-1896	welsh	physicist	1846: correlation of physical forces	3
William Hamilton	biographies	1805-1865	irish	mathematical physicist	1834: on a general method in dynamics	3
William Inge	HT	1860-1954	English	writer and priest	1934: god and astronomers	3
William Irvine	biographies	1743-	irish	chemist	1770: specific heat	3

		1787				
William James	history TP s	1842-1910	american	psychologist	1906: the energies of men	3
William Patten	HMS pioneers	1861-1932	American	biologist, zoologist	1919: The Message of the Biologist	3
William Paulson	literature TPs	1955		professor of literature	1988: The Noise of Culture: Literary Texts in a world of information	3
William Plank	philosophical TPs	1934	american	philosopher	2002: the quantum Nietzsche: the will to power and the nature of dissipative systems	3
William Ramsay	HC	1852-1916	Scottish	chemist		3
William Rankine	thermodynamics founders	1820-1872	scottish	mathematical physicist	1854: on the geometrical representation of expansive action of heat and the theory of thermo-dynamic engines	1
William Shakespeare	biographies	1564-1616	english	writer		1
William Sidis	post 1995 HTPs	1898-1944	American	mathematical child prodigy	1920: The Animate and the inanimate	1
William Thayer	history TP s	1859-1923	American	historian	1918: vagaries of historians	3
William Thomson (lord Kelvin)	thermodynamics founders	1824-1907	irish-scottish	physicist		1 heat death
Wolfgang Muschik	thermodynamicists(other)	1936	german	mathematical physicist	1990. aspects of non-equilibrium thermodynamics	3
Wolfgang Weidlich	HP	1931	German	physicist	1971: the Statistical Description of Polarization Phenomena in Society	2
Xenophon Zolotas	economic TPs	1904-2004	Greek	social economist	1981: Economic Growth and Declining Social Welfare	3
					1921 : We, 1923: On	

Yevgeny Zamyatin	post 1995 HTPs	1884-1937	Russian	engineer	literature, Revolution, Entropy and other matters	2
Yi-Fang Chang	unfiled pages	1947	chinese	particle physicist	2009: social synergetics, social physics and research of fundamental laws in social complex systems	1
Yunus Çengel	thermodynamicists(other)	1955	turkish	mechanical engineer	1989: thermodynamics: an engineering approach	1
Yuri Tarnopolsky	unfiled pages	1936	american	organic chemist	2009: introduction to pattern chemistry, econochemistry	1
Yves Guyot	HC	1843-1928	French	economist		3
Zoran Rant	thermodynamicists(other)	1904-1972	slovene	mechanical engineer	1956: exergy	2

In human physics, **Per Bak** (1948-2002) was a Danish theoretical physicist noted for his 1988 sand pile model of self-organized criticality, in which he argues that the complex behavior in nature reflects the tendency of large systems with many components to evolve into a poised "critical state" way out of balance, where minor disturbances may lead to events called avalanches or catastrophic events. Bak argues that the evolution to this very delicate state occurs without design from any outside agent and that the state is established solely because of the dynamical interactions among individual elements of the system: the critical state is "self-organized", as he sees it. Bak extends his model to the human sphere of activity, in particular economics, in his 1996 book *The Way Nature Works.*

Bak's sand pile

Into the early 1990s, "bak's sand pile", as many called it, was posed as a leading contender for those seeking a grand theory to explain the nature of complex systems. [3] To explain his model, Bak gave the analogy of a child's sand pile, in which a child builds a sand pile by dropping sand grains on a specific location. In the beginning, according to Bak, the pile is flat, and the individual grains remain close to where they land. There motion can be understood in terms of their physical properties. As the process continues, the pile becomes steeper, and there will be little sand slides.

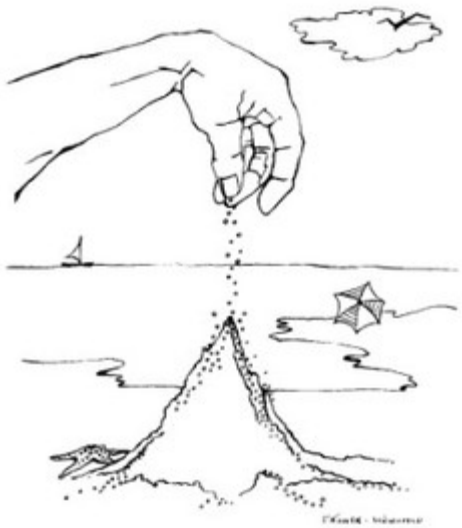

Bak's **sand pile analogy** of a complex system: at certain point in complexity, the system will reach a critical point of instability, a type of system-defined organizational property. [2]

As time goes on, the sand slides become bigger and bigger. Eventually, some of the sand slides may even span all or most of the pile. At that point, the system is far out of balance, and its behavior can no longer be understood in terms of the behavior of the individual grains. The avalanches form a dynamic of their own, which can be understood, according to Bak, from a holistic description of the properties of the entire pile rather than from a reductionist description of the individual grains. In Bak's view the sandpile is a 'complex system' which can be extended to the idea that the sand grains are either atoms or people, depending on which way one wishes to extrapolate.

Influence

Bak's critical state sandpile model was extended in the domain of explaining critical states in the course of social evolution, such as starts of world wars, in the 2000 book *Ubiquity: Why Catastrophes Happen* by American physicist Mark Buchanan. [4]

Education

Bak completed his PhD in 1974 at the Technical University of Denmark after which he began working in the area of theorizing about condensed matter, such as how particles interact to produce phenomenon like magnetism or crystallization or phase transitions such as when an insulator suddenly becomes a conductor of electricity or when water freezes into ice. This led him to the more general question of how order emerges from disorder and how, in turn, structures can unexpectedly collapse. [3]

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External links

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â— Self-organized criticality – Wikipedia.

θΔics

In thermodynamics, **Percy Bridgman** (1882-1961) (IQ:185|#53) (CR:65|#75), oft-cited as P.W. Bridgman, was an American physicist noted for 1914 Bridgman formulas, a systematic way of deriving the main 720-equations of thermodynamics by taking the first derivatives of the 10 fundamental quantities, operationalism model of meaning (1926), his 1941 *The Nature of Thermodynamics*, the 1946 Bridgman paradox, on the seeming impossibility of calculating the entropy of a living organism (powered CHNOPS+ system), and for his involvement in the Princeton Department of Social Physics.

Operationalism | Meaning

In 1927, Bridgman, in his *The Logic of Modern Physics*, outlined his so-named "operationalism" doctrine, which asserts that one does not know the meaning of a concept unless one has a method of measuring it; the following supposedly is the core tenet of the model: (Ñº)

> "We mean by any concept nothing more than a set of operations; the concept is synonymous with the corresponding set of operations."
>
> — Percy Bridgman (1927), The Logic of Modern Physics (pg. 5)

The following is a popularly quoted statement of operationalism applied to the humanities:

> "If a specific question has meaning, it must be possible to find operations by which an answer may be given to it ... I believe that many of the questions asked about social and philosophical subjects will be found to be meaningless when examined from the point of view of operations."
>
> — Percy Bridgman (c.1927) (Ñº)

(add discussion)

The Intelligent Individual | Sorokin

In 1939, Bridgman published *The Intelligent Individual and Society*, wherein he seems to suggest that we might learn something from physics and chemistry in regards to gaining insight into the seeming complex situations of society in its economic, political, asthetic, and religious aspects. [10]

In 1940, Russian-born American sociologist Pitirim Sorokin seems to have classified Bridgman's 1938 *The Intelligent Individual* as the latest product of the mechanistic school, following Vilfredo Pareto, as something swamped with a similar maze of blunders and inconsistencies: [12]

> "The fault is not, however, Lundberg's. It is the fault of the way and method he chose. Anybody who has done that, from all the representatives of the **Mechanistic School** up to Pareto and P.W. Bridgman (in his *The Intelligent Individual and Society*) similarly were swamped in a similar maze of blunders and inconsistencies."

Interestingly, all of these vehement objection, seen here, as Sorokin would finally latter admit, letting the cat out of the bag, so to say, in the 1950s, via his *The Ways and Power of Love* (1954) book and "The Mysterious Energy of Love" (1959) talk, seems to have been but a religious conflict with Sorokin.

Harvard debate | Bridgman's paradox

See main: Bridgman paradox

French-born American physicist Leon Brillouin states Bridgman was at the 1946 "what is life: in terms of physics and chemistry?" debate at Harvard, where at, supposedly, during the discussion, Bridgman commented how he saw a fundamental difficulty in the possibility of applying the laws of thermodynamics to any system containing living organisms (chnopsological organisms). Brillouin summarizes Bridgman's views as follows: [6]

> "How can we compute or even evaluate the entropy of a living being? In order to compute the entropy of a system, it is necessary to be able to create or to destroy it in a reversible way. We can think of no reversible process by which a living organism can be created or killed: both birth and death are irreversible processes. There is absolutely no way to define the change of entropy that takes place in an organism at the moment of death."

Brillouin defined this as the so-called "paradox of Bridgman" or Bridgman's paradox, as we have truncated it here. Compare also Martin Goldstein's 1993 entropy of a mouse chapter subsection.

The original transcripts, of the debate, if they exist, remain to be tracked down.

Bridgman's formulas

See main: Bridgman formulas

Bridgman is also noted for his 1914 clean and organized way of deriving thermodynamic expressions from the partial derivatives of the eight main thermodynamic variables, *P*, *V*, *T*, *E*, *H*, *S*, *A*, and *F* (see: symbols), of which there are 8 x 7 x 6 first (partial) derivatives. Bridgman devised a system that allows for the derivation of any of these first partial derivatives in terms of three quantities which are, in general, capable of experimental determination, namely $(\partial V/\partial T)_P$, $(\partial V/\partial P)_T$, and $(\partial H/\partial T)_P$, i.e. C_P. The twenty-eight essential formulas derived using this methodology are show adjacent. [3]

$$
\begin{aligned}
(\partial T)_P &= -(\partial P)_T = 1 \\
(\partial V)_P &= -(\partial P)_V = (\partial V/\partial T)_P \\
(\partial S)_P &= -(\partial P)_S = C_P/T \\
(\partial E)_P &= -(\partial P)_E = C_P - P(\partial V/\partial T)_P \\
(\partial H)_P &= -(\partial P)_H = C_P \\
(\partial F)_P &= -(\partial P)_F = -S \\
(\partial A)_P &= -(\partial P)_A = -S - P(\partial V/\partial T)_P \\
(\partial V)_T &= -(\partial T)_V = -(\partial V/\partial P)_T \\
(\partial S)_T &= -(\partial T)_S = (\partial V/\partial T)_P \\
(\partial E)_T &= -(\partial T)_E = T(\partial V/\partial T)_P + P(\partial V/\partial P)_T \\
(\partial H)_T &= -(\partial T)_H = -V + T(\partial V/\partial T)_P \\
(\partial F)_T &= -(\partial T)_F = -V \\
(\partial A)_T &= -(\partial T)_A = P(\partial V/\partial P)_T \\
(\partial S)_V &= -(\partial V)_S = C_P(\partial V/\partial T)_P/T + (\partial V/\partial T)_P^2 \\
(\partial E)_V &= -(\partial V)_E = C_P(\partial V/\partial P)_T + T(\partial V/\partial T)_P^2 \\
(\partial H)_V &= -(\partial V)_H = C_P(\partial V/\partial P)_T + T(\partial V/\partial T)_P^2 - V(\partial V/\partial T)_P \\
(\partial F)_V &= -(\partial V)_F = -V(\partial V/\partial T)_P - S(\partial V/\partial P)_T \\
(\partial A)_V &= -(\partial V)_A = -S(\partial V/\partial P)_T \\
(\partial E)_S &= -(\partial S)_E = PC_P(\partial V/\partial T)_T/T + P(\partial V/\partial T)_P^2 \\
(\partial H)_S &= -(\partial S)_H = -VC_P/T \\
(\partial F)_S &= -(\partial S)_F = -VC_P/T + S(\partial V/\partial T)_P \\
(\partial A)_S &= -(\partial S)_A = PC_P(\partial V/\partial P)_T/T + P(\partial V/\partial T)_P^2 + S(\partial V/\partial T)_P \\
(\partial H)_E &= -(\partial E)_H = -V[C_P - P(\partial V/\partial T)_P] - P[C_P(\partial V/\partial P)_T + T(\partial V/\partial T)_P^2] \\
(\partial F)_E &= -(\partial E)_F = -V[C_P - P(\partial V/\partial T)_P] + S[T(\partial V/\partial T)_P + P(\partial V/\partial P)_T] \\
(\partial A)_E &= -(\partial E)_A = P[C_P(\partial V/\partial P)_T + T(\partial V/\partial T)_P^2] \\
(\partial F)_H &= -(\partial H)_F = -V(C_P + S) + TS(\partial V/\partial T)_P \\
(\partial A)_H &= -(\partial H)_A = -[S + P(\partial V/\partial T)_P][V - T(\partial V/\partial T)_P] + P(\partial V/\partial P)_T \\
(\partial A)_F &= -(\partial F)_A = -S[V + P(\partial V/\partial P)_T] - PV(\partial V/\partial T)_P.
\end{aligned}
$$

The twenty-eight essential results of the **Bridgman formula** method, according to a 1946 table by American physical chemist Samuel Glasstone. [5]

Praise

In 1914, American chemist Theodore Richards commented on Bridgman in a 1915 letter of recommendation that: [2]

> "**Bridgman** … only 33 years old, although a slight and insignificant looking person, has dealt with the greatest pressures every studied carefully by physicists. His mind seems to be rather of the one-track type. His work with these high pressures is epoch making in my opinion … he seems to be a very expert mathematician, with a solid and deep knowledge of thermodynamics."

Bridgman was an attendee of the 1923 Solvay Conference organized by Belgian chemist Ernest Solvay. [2] Bridgman won the 1946 Nobel Prize in physics for his work in high pressure physics. [1]

Education

Bridgman was completed his AB in 1904, his AM in 1905, and PhD in 1908 all in physics at Harvard. He became a professor at Harvard in 1910; staying there through his retirement into the 1940s. [1]

Reaction end

In 1961, Bridgman, at the age of 79, shot himself in the head after living with megastatic cancer for some time; his suicide note read in part: [13]

> "It isn't decent for society to make a man do this thing himself. Probably this is the last day I will be able to do it myself."

In 1961, Bridgman, aged 79, shot himself in the head, after existing with megastatic cancer for some time.

American surgeon, bioethicist, and death-with-dignity advocate Sherwin Nuland (Ñº), in his *How We Die: Reflections on Life's Final Chapter*, following discussion of Seneca's views on death, cites Bridgman as the foremost clarion call to reason in respect to the need for death with dignity: [13]

> "Against such a standard, the suicide of **Percy Bridgman** was close to being irreproachable. Bridgman was a Harvard professor whose studies in high-pressure physics won him a Nobel Prize in 1946. At the age of seventy-nine and in the final stages of cancer, be continued to work until he could no longer do so. Living at his summer home in Randolph, New Hampshire, he completed the index to a seven-volume collection of his scientific works, sent it off to the Harvard University Press, and then shot himself on August 20, 1961, leaving a suicide note in which he summed up a controversy that has since embroiled an entire world of medical ethics:
>
> > 'It is not decent for society to make a man do this to himself. Probably, this is the last day I will be able to do it myself.'
>
> When he died, Bridgman seemed absolutely clear in his mind that he was making the right choice. He worked right up to the final day, tied up loose ends, and carried out his plan. I'm not certain how much consideration he gave to consulting others, but his decision had certainly not been kept a secret from friends and colleagues, because there is ample evidence of his having at least informed some of them in advance. He had become so sick that he felt it doubtful that he would much longer be capable of mustering up the strength to carry out his ironclad resolve. In his final message, Bridgman deplored the necessity of performing his deed unaided. A colleague reported a conversation in which Bridgman said:
>
> > 'I would like to take advantage of the situation in which I find myself to establish a general principle; namely, that when the ultimate end is as inevitable as it now appears to be the individual has a right to ask his doctor to end it for him.'?
>
> If a single sentence were needed to epitomize the battle in which we are all now joined, you have just read it."

The Bridgman suicide note is frequently quoted in euthanasia and physician-assisted suicide legalization arguments. (Ñº)

Quotes | By

The following are quotes by Bridgman:

> "The first business of a man of science is to proclaim the truth as he finds it; and let the world adjust itself as best it can to the new knowledge."
>
> — Percy Bridgman (1919), "Letter to R.M. Hunter" [9]

> "There's as many formulations of the second law as there have been discussions of it."
>
> — Percy Bridgman (1941), *The Nature of Thermodynamics* [4]

> "There is no adequate defense except stupidity, against the impact of a new idea."
>
> — Percy Bridgman (c.1950) (Ñº)

> "It seems to me that there is a good deal of ballyhoo about scientific method. I venture to think that the people who talk most about it are the people who do least about it. Scientific method is what working scientists do, not what other people or even they themselves may say about it. No working scientist, when he plans an experiment in the laboratory, asks himself whether he is being properly scientific, nor is he interested in whatever method he may be using as method."
>
> — Percy Bridgman (c.1950) (Ñº)

> "The humanities are much more complex and difficult than the sciences."
>
> — Percy Bridgman (1958), "Quo Vadis" [11]

> "By far the most important consequence of the conceptual revolution brought about in physics by relativity and quantum theory lies not in such details as that meter sticks shorten when they move or that simultaneous position and momentum have no meaning, but in the insight that we had not been using our minds properly and that it is important to find out how to do so."
>
> — Percy Bridgman (1958), "Quo Vadis" [11]

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External links

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θΔics

In existographies, **Percy Shelley** (1792-1822) (IQ:185|#61) (RGM:693|1,500+) (Gottlieb 1000:509) (HD:22) (FA:94) (GA:15) (CR:98) was an English romantic poet and philosopher, self-characterized as "atheist, democrat, philanthropist", which he had entered (Q) in the hotel registers in Switzerland under "occupation" in 1816, known as “Britain’s most famous atheist” (Q), husband to Mary Shelley, author of *Frankenstein: the Modern Prometheus*, noted for what seems to be a unique atheism-based elective affinities philosophy of existence.

Influences

Shelley was influenced, supposedly, by those including: Pierre Laplace, Cabanis, Bailly, J.P. Robinet’s *System of Nature* (which Shelley translated from French into English himself) (Q), Rousseau, Pliny the Elder, Lucretius, Francis Bacon, John Locke, David Hume, Newton, Marquis Condorcet, and Constantin Volney, to name a few. (Q)

Love

In 1815, or earlier, c.1814 (age 22), according the editor of his *Prose Works*, Shelley, penned an essay "On Love"; the following are the key parts of the opening section: [14]

> “What is love? Ask him who lives, what is life; ask him who adores, what is god? Thou demandest what is love. It is that powerful attraction towards all we conceive, or fear, or hope beyond ourselves, when we find within our own thoughts the chasm of in insufficient void, and seek to awaken in all things that are, a community with what we experience within ourselves. If we reason, we would be understood; if we imagine, we would that the airy children of our brain were born anew within another’s; if we feel, we would that another’s nerves should vibrate to our own, that the beams of their eyes should kindle at once and mix and melt into our own; that lips of motionless ice should not reply to lips quivering and burning with the heart’s best blood. **This is love**. This is the bond and the sanction which connects not only man with man, from the instant that we live, more and more thirsts after its likeness. It is probably in correspondence with this law that the infant drains milk from the bosom of its mother; this propensity develops itself with the development of our nature.”
>
> — Percy Shelley (c.1815), “On Love” [14]

(add)

Atheism

In 1806, age 16, Shelley entered Oxford University, where his favorite amusements were chemistry, microscopic investigations, and boating. [3]

Shelley, sometime thereafter, read Baron d’Holbach’s *The System of* Nature, began to translate it into English, to help in enlisting the English dons in attacking religion, and therein became an atheist.

In 1811, Shelley, aged 19, using Holbach and also by the proto-atheism work of Benedict Spinoza, wrote, together with Thomas Hogg, a college friend, albeit published anonymously, a 13-page pamphlet “The Necessity of Atheism”; and example quote:

> “If ignorance of nature gave birth to gods, knowledge of nature is made for their destruction.”
>
> — Percy Shelley (1811), *The Necessity of Atheism*; a Baron d'Holbach (1770) quote

The pamphlet resulted to be so controversial that it got him expelled from Oxford.

> “The mind cannot believe in the existence of god.”
>
> — Percy Shelley (1811), *The Necessity of Atheism* (Q)

In 1813, Shelley expanded the pamphlet and included it as a note to his long poem *Queen Mab*. [10]

Oxford | Expulsion

On 25 Mar 1811, Shelley, aged 19, was expelled from Oxford for his refusal to repudiate the authorship of his pamphlet *The Necessity of Atheism*.

On 28 Aug 1811, four months after being expelled from Oxford, Shelley, age 19, eloped to Scotland with Harriet Westbrook (1795-1816) (Q), aged 16—a pupil at the same boarding school as Shelley's sisters, whom his father had forbidden him to see; they had two children, then she committed suicide at age 21 on 10 Nov 1816.

Queen Mab

In 1813, Shelley published his poem *Queen Mab* (Q), a dialogue between a “spirit”, whose mother took him to see an atheist [aka Bruno] burned, and a “fairy”, who pipes “there is no god”; the fairy’s name being a reference, supposedly, to one of the fairy named “Queen Mab” (Q) of William Shakespeare’s *Romeo and Juliet* (c.1593). [10]

> “Shelley’s poem is out, and there are words about it’s being objected to as much as ‘Queen Mab’ was. Poor Shelley …!!”
>
> — John Keats (c.1815), “Letter to Brother” [10]

(add)

On a Future State

In 1815, Shelley penned his essay “On a Future State”, seemingly stylized as an skeptical afterlife hypothesis discourse; the following are noted quotes:

> “It has been the persuasion of an immense majority of human beings in all ages and nations that we continue to live after death,—that apparent termination of all the functions of sensitive and intellectual existence. Nor has mankind been contented with supposing that species of existence which some philosophers have asserted; namely, the resolution of the component parts of the mechanism of a living being into its elements, and the impossibility of the minutest particle of these sustaining the smallest diminution. They have clung to the idea that sensibility and thought, which they have distinguished from the objects of it, under the several names of spirit and matter, is, in its own nature, less susceptible of division and decay, and that, when the body is resolved into its elements, the principle which animated it will remain perpetual and unchanged.”
>
> — Percy Shelley (1815), “On a Future State” [12]

> “Suppose that the intelligent and vital principle differs in the most marked and essential manner from all other known substances. In what manner can this concession be made an argument for its imperishability? All that we see or know perishes and is changes. Life and thought differ indeed from everything else. But that is survives that period, beyond which we have no experience of its existence, such distinction and dissimilarity affords no shadow of proof, and nothing but our own desires could have led us to conjecture or imagine.”

— Percy Shelley (1815), “On a Future State” [11]

> “The desire to be for ever as we are; the reluctance to a violent and unexperienced change, which is common to all the animate combinations of the universe [see: human], is indeed, the secret persuasion which has given birth to the opinions of a future state.”
>
> — Percy Shelley (1815), “On a Future State” (pg. 280)

(add)

Mary Shelley

In late 1816, Shelley married Mary Shelley, daughter of political philosopher William Godwin, author of *Political Justice* (1793), which Percy Shelley had previously read, shortly after his expulsion, and agreed with, and feminist philosopher Mary Wollstonecraft; they took up abode, with the two kids, at the Great Marlow in Buckinghamshire. During this period, Shelley had the custody of his two children, by his first wife, taken away from him by Lord Chancellor Eldon, on the ground of the “atheistical principles” attribute to their father. [3]

Prometheus Unbound

In 1819, Shelley published his *Prometheus Unbound*, referring to things such as “the elements obey me not”, characterized (Q) himself as a “detested prodigy”.

In 1878, James Maxwell wrote his last publication, an encrypted poem entitled “A Paradoxical Ode / After Shelley”, the subtitled in reference to Shelley’s “Prometheus Unbound”. [2]

Elective affinities

Shelley, prior to 1811-1814, seems to have accumulated some type of elective affinity conceptualized chemical philosophy model of existence, marriage, love, and relationships; the following is one retrospect synopsis of this:

> “The radical tenets of Shelley’s philosophy appear transmuted to something rich and strange in the medium of his poetry. These principles, which he imbibed from William Godwin’s *Political Justice*, are, briefly, the perfectibility of man, the usurpation of Church and State, the negation of moral evil, and the **doctrine of elective affinities**. When religion and government shall have passed away, and liberty, equality and fraternity, the ideals of the French Revolution, shall have come to dwell among men, then will the golden age return. Shelley regarded himself as a seer, a hierophant whose concern was with the regeneration of humanity.”
>
> — Florence Moynihan (1922), “The Centenary of Shelley” (Q)

In 1839, Mary Shelley, in her “Memoir of Shelley” (Q), writes in the third person, gives a short existography of Percy Shelley, particularly during his tumultuous years, and seems to speak in a mutual language of chemical philosophy, particularly where she says that they were married in the “Church of Elective Affinities” as seems to be the case: [3]

> “It is a little odd, considering Shelley's opinions about marriage, that he should have been married twice to his first wife. After their return from Gretna Green, the ceremony was performed again at Cuckfield in Sussex. For some time, he seems to have led a rather migratory life. We find him for a time at Keswick, where he became acquainted with Southey, for whose poetry he had at this time an extravagant admiration; then in Dublin, projecting histories of Ireland, which result in a small political pamphlet, now irrecoverable; then in the Isle of Man, as a kind of Alsatia, sacred from the foot of bailiff; and last in Wales, whence he

appears to have come to London again.

The results of this marriage were two children, a daughter and a son, and a separation. The circumstances of the disagreement between Shelley and his wife, have never been cleared up. Perhaps it would have been quite as noble if Shelley had continued the martyr of a youthful misstep instead of making his wife the victim of notions about marriage in which there is no evidence that she shared. However this may be, he made himself so acceptable to Miss Godwin, daughter of the novelist and Mary Wolstonecraft, that she consented to elope with him to Switzerland in July, 1814. They crossed to Calais in an open boat, not without danger of being lost. A Miss Claremont went with them. She also was a deaconess in the **Church of the Elective Affinities**, and (Lord Byron having joined the party) became the mother of the Allegra, mentioned in his will. This, however, seems to have been on a second visit to the Continent, the fugitives having in the meanwhile returned for a short time to England. This last continental tour occupied but a few months, during which the northern part of Italy was visited.

Shelley came back to England again, bringing with him a child by his new connection, and went to Bath. But now was to come the terrible recoil which almost inevitably results from an attempt to bend an entire social system out of the way of the passions of a single man. However the brain may philosophize, the heart remains loyal to its traditions, and though Mrs. Shelley [Harriet Westbrook] may have been captivated with the doctrine of attractions while it drew her husband to her, she was not prepared for the more liberal application of it which drew him away. No theorizing can sweeten desertion; and the unhappy woman, disenchanted of the dream, and forsaken by the substance, sought shelter in death.

The lovers of Shelley as a man and a poet have done what they could to palliate his conduct in this matter. But a question of morals, as between man and society, cannot be reduced to any individual standard however exalted. Our partiality for the man only heightens our detestation of the error. The greater Shelley's genius, the nobler his character and impulses, so much the more startling is the warning. If we make our own inclinations the measure of what is right, we must be the sterner in curbing them. A woman's heart is too delicate a thing to serve as a fulcrum for the lever with which a man would overturn any system, however conventional. The misery of the **elective-affinity scheme** is that men are not chemical substances, and that in nine cases in ten the force of the attraction works more constantly and lastingly upon the woman than the man. There is no stronger argument against it than the *Memoirs of Mary Wollstonecraft* (1798) (Q). The Mormon polygamy is nothing more than a plant from the same evil seed sown in a baser soil, and is an attempt to compromise between the higher instincts of mankind, organized in their institutions, and the bestial propensities of sensualized individuals.

The suicide of Shelley's wife took place on the 10th of November, 1816, and shortly afterward he married Miss Godwin [Mary Shelley], at her father's solicitation, and took up his abode at Great Marlow in Buckinghamshire. His means of support were ample, as he had succeeded to some property in his own right which yielded a yearly income of one thousand pounds. During his residence here the custody of his two children by his first wife was taken away from him by a decision of the Lord Chancellor Eldon, on the ground of atheistical principles attributed to their father. Shelley felt this deeply, and all his life."

(add discussion)

Genius | Ranking

In 1819, Shelley, in his *Prometheus Unbound*, seemingly, was referred to himself, indirectly, as "detested prodigy".

In 1878, James Maxwell (IQ:210|#4), who dedicated his last dying poem ("A Paradoxical Ode") to Shelley, was a seeming Shelley-proselyte when it came to closeted statements of his deeper beliefs.

In 1878, Edward Trelawny, in his *Records of Shelley, Byron, and the Author*, ranked Shelley as a posthumous genius, and was devoting dozens of pages to the unsung genius of Shelley. [9]

In 1894, James Cattell, in the context of discussion of the Cattell 1000, ranked Shelley above George Byron (IQ:180|#120) follows: [7]

> "As we come nearer to our own times it becomes increasingly difficult to measure tendencies by the methods we are using. The positions of men on the list are subject to larger probable and constant errors. Byron may be a household word on the continent and **Shelley** unknown, while the best criticism may place Shelley above Byron. Our list places Mendelssohn above Bach and ignores Schumann altogether—while the last thirty years have altered not only critical opinion, but also popular taste."

In 1930, Lewis Terman was calculating Shelley as having an IQ of 165. [8]

Education

In 1802, Shelley, age 10, was sent to Syon House Academy, studying there for two years, wherein, during his second year (Q), he became captivated by the teachings of Adam Walker, a scientist, astronomer and inventor, who lectured on the possibility of life on other planets, links between magnetism and electricity (Q), and on the elements and the affinities. Shelley was enraptured by these lectures and experimental demonstrations, many of which he repeated at home, e.g. by electrocuting his sisters, making human electrical discharge circuits, among others. [6] Shelley was fascinated with electricity and galvanism; for example, he constructed a large-scale battery and repeated Benjamin Franklin's kite experiments. [5]

In 1804, Shelley, age 14, entered Eton College, during which time he translated half of Pliny's *Natural History*, spent his money on books, chemical instruments, and acts of liberality; one of his oft-spoken pronouncements during this time was: [4]

> "Nothing ever delighted me so much as the discovery that there were no *elements* of earth, fire, or water."

In 1806, age 16, Shelley entered Oxford University, where his favorite amusements were chemistry, microscopic investigations, and boating. [3]

Reaction end

> *See: Founders of thermodynamics and suicide*

In 1822, Percy Shelley, age 29, following a hardened social existence, after infamously getting expelled from Oxford ten years earlier (age 19), for his *Necessity of Atheism*, then married Mary Shelley, famed *Frankenstein* author, in the "Church of Elective Affinities", tried to obtain a lethal dose of prussic acid (Q), aka hydrogen cyanide (HCN), and then on Jul 8, a month shy of his 30th birthday, was reported to have "mysteriously" drowned (in his own rowboat); his obituary read as follows:

A rendition (Q) of the 18 Jul 1822 cremation of **Percy Shelly**, by Louis Fournier (1899), after Shelley's body had washed ashore, six days earlier (Jul 12), on a beach near Viareggio; reported by

some as boating accident during storm and as suicide by others.

> "**Shelley**, the writer of some infidel poetry, has been drowned: now he knows whether there is a god or no."
>
> — Author (1822), "Shelley Obituary" (Q), *London Troy newspaper*

Shelley's reaction end has been suggested, e.g. Richard Holmes (2004) (Q), Lynn Shepherd (2013) (Q), among others, to have been suicide. Shelley, like Goethe, was a "human elective affinity" theorists, i.e. the forerunner to the modern variant of "human free energy" theorist, the core subject of human chemical thermodynamics.

Quotes | On

The following are quotes on Shelley:

> "Many and long were the conversations Lord Byron and **Shelley**, to which I was a devout, but nearly silent listener. During one of these various philosophical doctrines were discussed, and, among others, the nature of the principle of life and whether there as any probability of it ever being discovered and communicated. [Perhaps a corpse would be reanimated? Galvanism had given a token of such things]."
>
> — Mary Shelley (1831), Preface to *Frankenstein*, reflections (Q) on her summer of 1816 [13]

> "Beauty is said to be a fatal gift to women, and it may be added that genius is a fatal gift to men; they are born before their time and out of harmony with the things about them."
>
> — Edward Trelawny (1878), "Commentary on **Shelley**" (see: posthumous genius); in: *Records of Shelley, Byron, and the Author, Volume One* (pg. xvi) [1]

> "The principal fault I have to find is that the Shelleyan writers, being Christians themselves, seem to think that **a man of genius cannot be an atheist**, and so they strain their own faculties to disprove what Shelley asserted from the earliest stage of his career to the last day of his life."
>
> — Edward Trelawny (1878), *Records of Shelley, Byron, and the Author, Volume One* (pg. #) (Q)

> "All error, not merely verbal, is a strong way of stating that the current truth is incomplete. The follies of youth have a basis in sound reason, just as much as the embarrassing questions put by babes and sucklings. Their most antisocial acts indicate the defects of our society. When the torrent sweeps the man against a boulder, you must expect him to scream, and you need not be surprised if the scream is sometimes a theory. **Shelley**, chafing at the Church of England, discovered the cure of all evils in universal atheism. Generous lads irritated at the injustices of society, see nothing for it but the abolishment of everything and Kingdom Come of anarchy. Shelley was a young fool; so are these cocksparrow revolutionaries. But it is better to be a fool than to be dead. It is better to emit a scream in the shape of a theory than to be entirely insensible to the jars and incongruities of life and take everything as it comes in a forlorn stupidity. Some people swallow the universe like a pill; they travel on through the world, like smiling images pushed from behind. For god's sake give me the young man who has brains enough to make a fool of himself! As for the others, the irony of facts shall take it out of their hands, and make fools of them in downright earnest, ere the farce be over. There shall be such a mopping and a mowing at the last day, and such blushing and confusion of countenance for all those who have been wise in their own esteem, and have not learnt the rough lessons that youth hands on to age. If we are indeed here to perfect and complete our own natures, and grow larger,

stronger, and more sympathetic against some nobler career in the future, we had all best bestir ourselves to the utmost while we have the time. To equip a dull, respectable person with wings would be but to make a parody of an angel."

— Robert Stevenson (c.1881), *Crabbed Age and Youth* (Q)

"Goethe opportunistically bowed to every invader. But as a thinker and man, he remained noncommittal and aloof… His aloofness, in these as in other matters, gained him the reputation of 'the Olympian'; and the label was not always meant to be flattering. But his Olympian appearance was due least of all to an inner indifference to the fate of his contemporaries. It veiled his drama: his incapacity and reluctance to identify himself with causes, each an inextricable, tangle of right and wrong… All three – Jefferson, Goethe, and **Shelley** – were in a sense outsiders to the great conflict of their time, and because of this they interpreted their time with more truthfulness and penetration than did the fearful – the hate-ridden partisans on either side."

— Isaac Deutscher (1950), "The Ex-Communist's Conscience" (Q)(Q), review of book *The God That Failed* in *The Reporter* (New York), Apr.

"**Shelley** is the most famous of all British atheists."

— Michael Palmer (2013), *Atheism for Beginners* (Q)

Quotes | By

The following are noted quotes:

"Every time we say that god is the author of some phenomenon, that signifies that we are ignorant of how such a phenomenon was able to operate by the aid of forces or causes that we know in nature."

— Percy Shelley (1811), *The Necessity of Atheism* [1]

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(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 421). HarperOne.
(c) On a Future State – WikiQuotes.
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External links

- Percy Shelley – Wikipedia.

θΔics

In thermodynamics, **perfect** refers to a vessel completely devoid of particles, thus being in the form of a ‘perfect’ vacuum.

The word “perfect” originated descriptions of earlier 17th century attempts to make a *perfect* vacuum, as discussed in the works of Denis Papin and Dutch mathematical physicist Christiaan Huygens, by the ignition or explosion of a substance inside of a piston and cylinder. [1] In this sense, the word “perfect” means that the cylinder had been made perfectly empty of atoms or gas particles, due to the combustion of the explosion, and thus the piston had the largest amount of downward pulling power as the atmosphere pushed down eliminating the newly created empty space.

The term perfect soon began to become synonymous with ‘ideal’, as in an ideal perfect gas or ideal gas.

A combination of these uses may have been in the sense in which in 1849 by Scottish mathematical physicist William Thomson speaks of a ‘perfect thermo-dynamic engine’ as defined by Sadi Carnot in his 1824 treatise *Reflections on the Motive Power of Fire*. [2] The use by Thomson, however, would not have been completely used in the vacuum sense, but rather in the sense of 'perfect' reversibility of the working substance; although, to note, reversibility was not defined completely until the following decade via Rudolf Clausius.

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θΔics

In thermodynamics, **perfect gas** is a substance, in the gaseous state, in such a condition that the total pressure exerted by any number of portions of it, at a given temperature, against the sides of a vessel in which they are enclosed, is the sum of the pressures which each portion would exert if enclosed in the vessel separately at the same temperature. [1] The term perfect gas is a synonym of more modern term "ideal gas".

Etymology

The term "perfect gas", as defined above in 1859 by Scottish engineer William Rankine, traces to the use of the word "perfect" in descriptions of earlier 17th century attempts to make a *perfect* vacuum, such as discussed in the works of Denis Papin, by the ignition or explosion of a substance inside of a piston and cylinder. In this sense, the word "perfect" means that the cylinder had been made perfectly empty of atoms or gas particles. In 1890, the phrase "ideal perfect gas" was being used in relation to gases that obeyed the laws of Charles and Boyle. In 1923, phrases such as "perfect gas or ideal gas" were being used. Soon thereafter, the adjective "perfect" tended to be removed, leaving the term ideal gas in common use.

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Further reading

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θΔics

In science, **perfect vacuum** refers to a region of space completely devoid of any material particles.

Overview

The quest for the "perfect" vacuum started with the invention of the Magdeburg hemispheres (1657), and was searched for with in the development of the various gunpowder engines (1670s), albeit one difficult to obtain owing to fouling after each explosion, likely due to various amounts of volume taken up by the products the explosion. This fouling problem led French physicist Denis Papin to outline the first theoretical steam engine, i.e. the Papin engine, as detailed in his 1690 "A New Method to Obtain Very Great Motive Powers at Small Cost", wherein he states: [1]

> "I at once saw that machines could be constructed, in which water, by the help of a moderate heat, and a little cost, might produce that **perfect vacuum** which could by no means be obtained by the aid of gunpowder."

This search for the perfect vacuum eventually formed the basis, in namesake, for the term "perfect gas", which eventually was called "perfect-ideal gas", and in modern time "ideal gas".

References

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θΔics

In chemistry, a **periodic table** is a listing of elements in rows, ordered by their atomic weights, ordered in the intervals in which their properties repeat periodically.

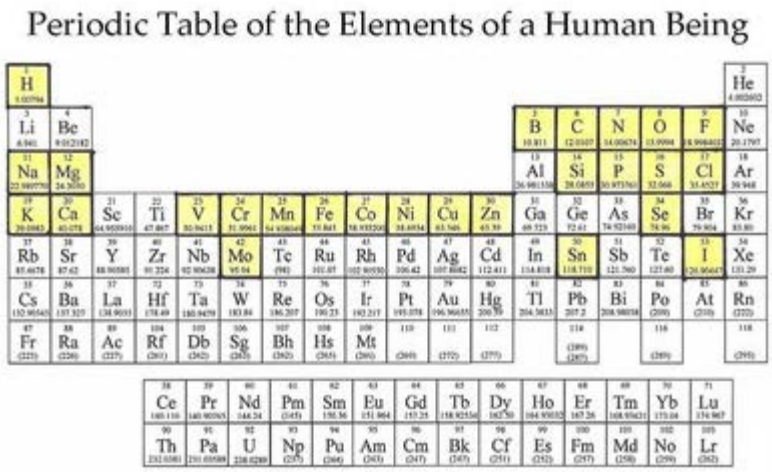

A 2008 **periodic table**, from *The Human Molecule*, showing the functional elements in average human molecule (person). [1]

History

In circa 1770-1789, French chemist Antoine Lavoisier an list of about 33 elements and or chemical entities, distinguishing between metals and non-metals. [5]

In 1800, a total of 28 elements where known to exist; the following shows their retrospect placement on a modern periodic table: [6]

In 1818, Swedish chemist Jacob Berzelius had determined the atomic weights of forty-five of the 49 accepted elements.

In 1828, Berzelius developed a table of atomic weights and introduced letters to symbolize elements. [5]

In 1829, Johann Dobereiner conceived of his “triads” or groups of three system to organize elements with similar properties, the forerunner to the notion of “groups”: [5]

> Triad: Lithium, sodium, potassium.
> Triad: Calcium, strontium, barium.
> Triad: Chlorine, bromine, iodine.

In 1858, as summarized by English chemist John Bidlake, there were 65 known elements, divided into two groups:

> (a) Non-metallic elements (metalloids): comprised of thirteen substances.
> (b) Metals: fifty two bodies which are known as metals; several of which are of very recent discovery, and their propterties are as yet very imperfectly understood.

Bidlake also included a “Table of Elementary Substances”, made of three columns: element name, symbol, and “combining numbers”. [4]

In 1863, English chemist John Newlands began to investigate atomic relationships among the elements, especially in bromine, chlorine, and iodine series. [5]

In 1864, Newlands arranged about 60 known elements in order of atomic weights and observed similarities between the first and ninth elements, the second and tenth elements etc.; he proposed the 'law of octaves'. This was the forerunner to the notion of “periods”. [5] The following is an 1866 version of Newlands periodic table: (Ñº)

No.	No.	No.	No.	No.	No.	No.	No.
H 1	F 8	Cl 15	Co & Ni 22	Br 29	Pd 36	I 42	Pt & Ir 50
Li 2	Na 9	K 16	Cu 23	Rb 30	Ag 37	Cs 44	Os 51
G 3	Mg 10	Ca 17	Zn 24	Sr 31	Cd 38	Ba & V 45	Hg 52
Bo 4	Al 11	Cr 19	Y 25	Ce & La 33	U 40	Ta 46	Tl 53
C 5	Si 12	Ti 18	In 26	Zr 32	Sn 39	W 47	Pb 54
N 6	P 13	Mn 20	As 27	Di & Mo 34	Sb 41	Nb 48	Bi 55
O 7	S 14	Fe 21	Se 28	Ro & Ru 35	Te 43	Au 49	Th 56

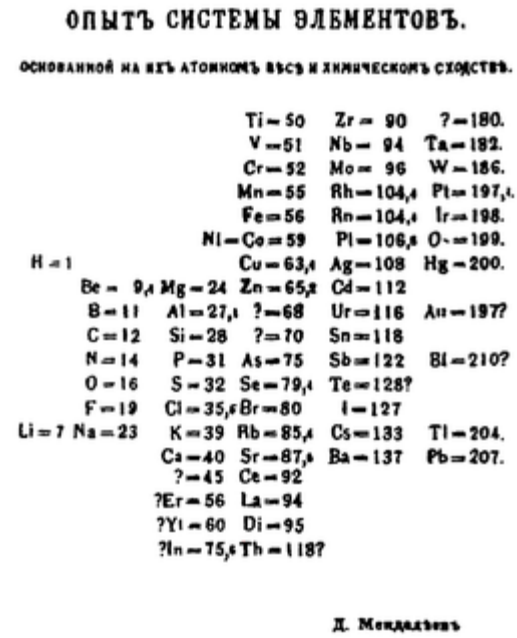

The 1869 **periodic table** invented by Russian chemist Dmitri Mendeleyev.

(add summary)

In 1869, Lothar Meyer compiled a periodic table of 56 elements based on the periodicity of properties such as molar volume when arranged in order of atomic weight; shown below: [5]

4 werthig	3 werthig	2 werthig	1 werthig
—	—	—	—
—	—	—	—
C = 12,0	N = 14,04	O = 16,00	Fl = 19,0
16,5	16,96	16,07	16,46
Si = 28,5	P = 31,0	S = 32,07	Cl = 35,46
$\frac{89,1}{2}$ = 44,55	44,0	46,7	44,51
—	As = 75,0	Se = 78,8	Br = 79,97
$\frac{89,1}{2}$ = 44,55	45,6]	49,5	46,8
Sn = 117,6	Sb = 120,6	Te = 128,3	J = 126,8
89,4 = 2.44,7	87,4, = 2.43,7	—	—
Pb = 207,0	Bi = 208,0	—	—

In 1869, independent of Meyer, Russian chemist Dmitri Mendeleyev arranged the 66 known elements of his day into a periodic table, shown above (left), entitled “The Experience of the System of Elements: Based on Atomic Weights and their Chemical Similarity”, which as he later famously recalled: [2]

> “I saw in a dream a **table** where all the elements fell into place as required”

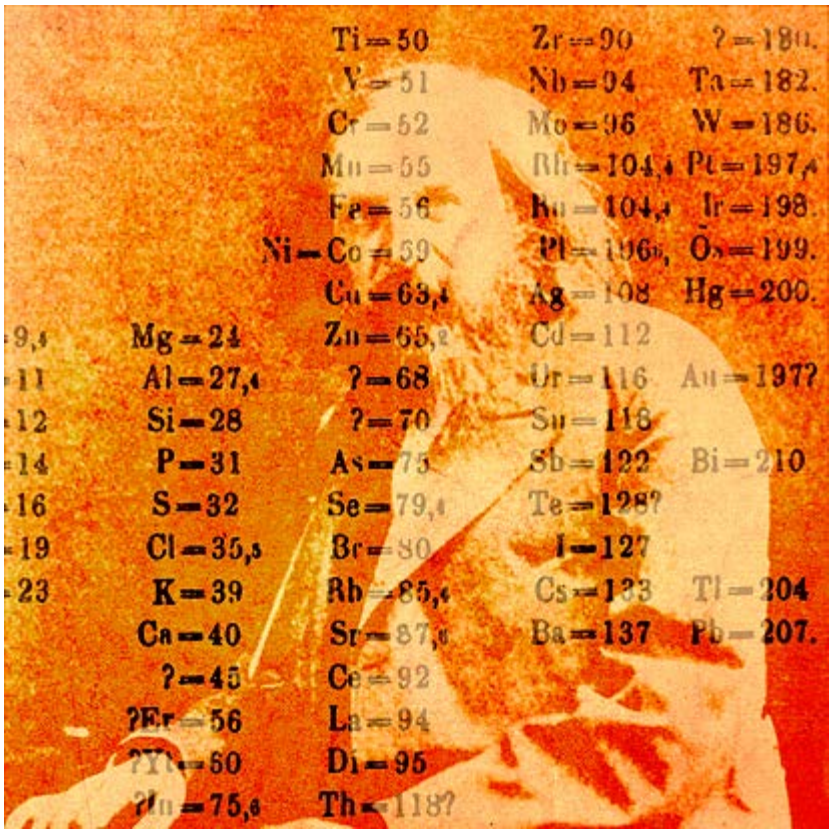

Mendeleev's table based on atomic weights but arranged 'periodically' with elements with similar properties under each other. Gaps were left for elements that were unknown at that time and their properties predicted (the elements were gallium, scandium and germanium). The order of elements was re-arranged if their properties dictated it, e.g., tellurium is heavier than iodine but comes before it in the periodic table. Mendeleyev's table was important because it enabled the properties of elements to be "predicted" by means of the "periodic law", namely that properties of the elements vary with their atomic weights.

In 1875, Scottish physicists Balfour Stewart and Peter Tait, in their chapter on the development of chemicals, planets, and life, were stating that there were 64 known elements. [7]

Animated systems | Biological elements

In 1910, about 81 elements were known, and it was in this year that American physician George Carey famous stated, in a rather prophetic manner, that:

> "Man's body is a chemical formula in operation".

In modern times, 118 elements have been discovered, only 92 of which occur naturally, and only 26± of which have been found to have function in the human or rather human molecule (formula first calculated in 2000 by Robert Sterner and James Elser).

In 1996, Portuguese chemist J.J.R. Frausto da Silva and English chemist Robert Williams, in their *The Natural Selection of the Chemical Elements: the Environment and Life's Chemistry*, made a periodic table showing elements known to be believed to be essential for bacteria, plants or animals.

In 2001 version of their table, termed a "biological elements period table", is shown adjacent, captioned as the “distribution of elements essential for life in the periodic

table", which lists thirty total elements, 11 bulk elements, 14 trace elements, and 7 possibly essential trace: [3]

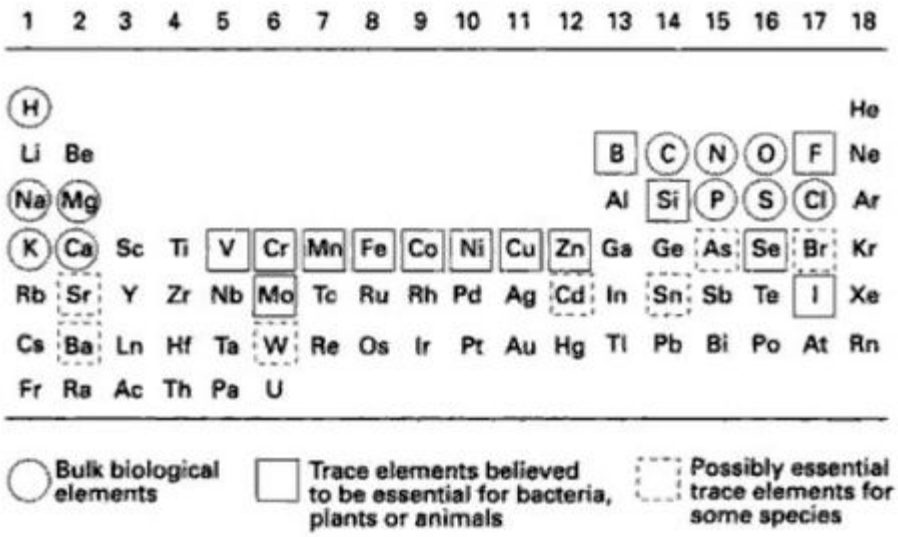

Description: "distribution of elements essential for life in the **periodic table**" (2001). [3]

Bulk elements: H, C, N, O, Na, Mg, P, S, Cl, K, Ca
Trace elements: B, F, Si, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Se, Mo, I
Possibly essential: As, Br, Sr, Cd, Sn, Ba, W

found in animated organisms.

Sheehan periodic table | Abundance

In 1970, American chemist William Sheehan, each element sized according to relative abundance on the earth's surface, color-coded to suggest relative electronegativity:

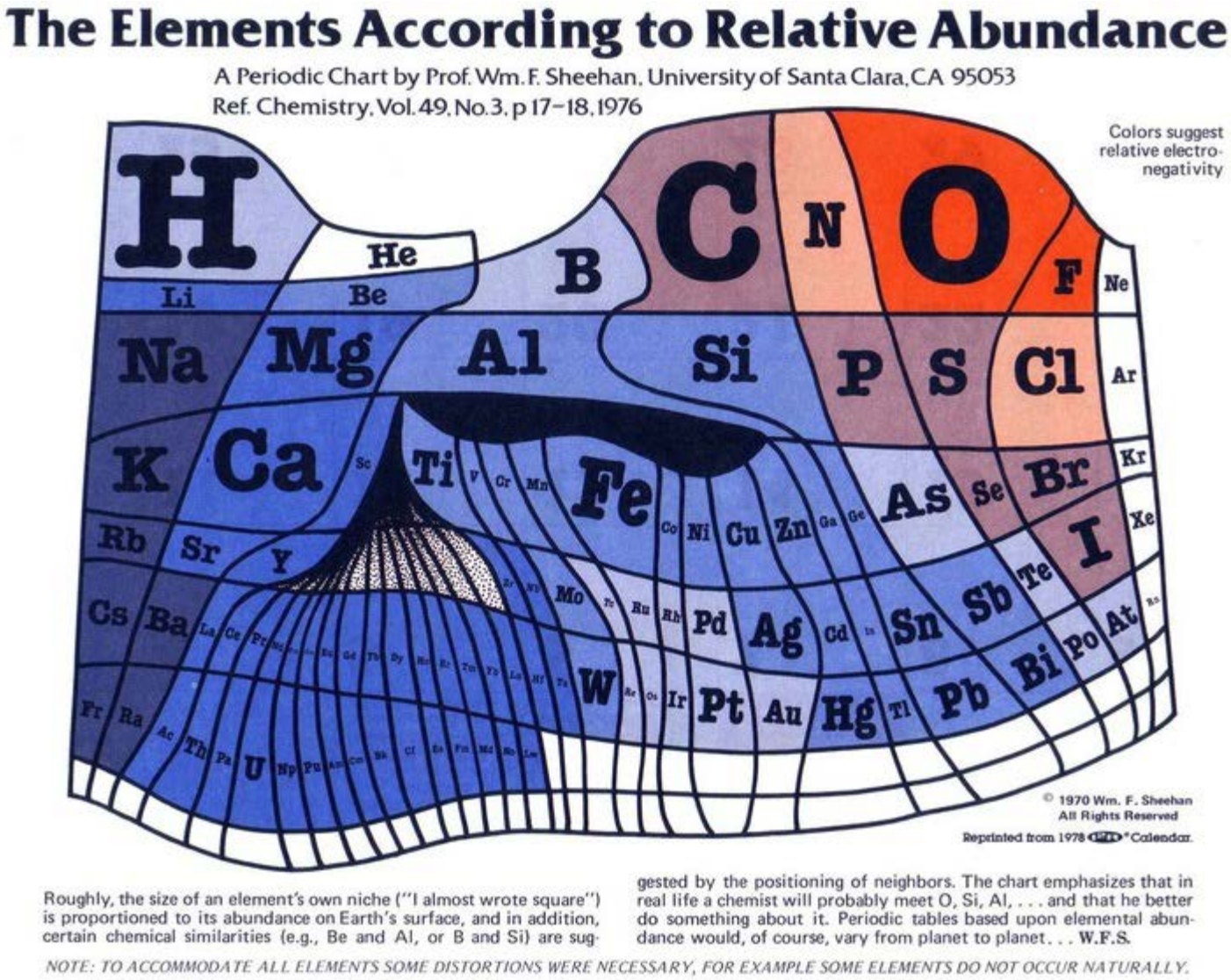

(add)

Hmolscience periodic table

See main: Hmolscience periodic table

In 2013, Libb Thims made (Ñº) an "abundance" version of the hmolscience periodic table; thematically similar to the above Sheenan periodic table.

Affinity tables | Confusion

There is, to note, some amount of reoccurring confusion in the literature that "affinity tables" (1718) were the precursor or forerunner to "periodic tables" (1866). This is incorrect: affinity tables were the forerunner to "free energy tables" (1914).

See also

â— Human periodic table

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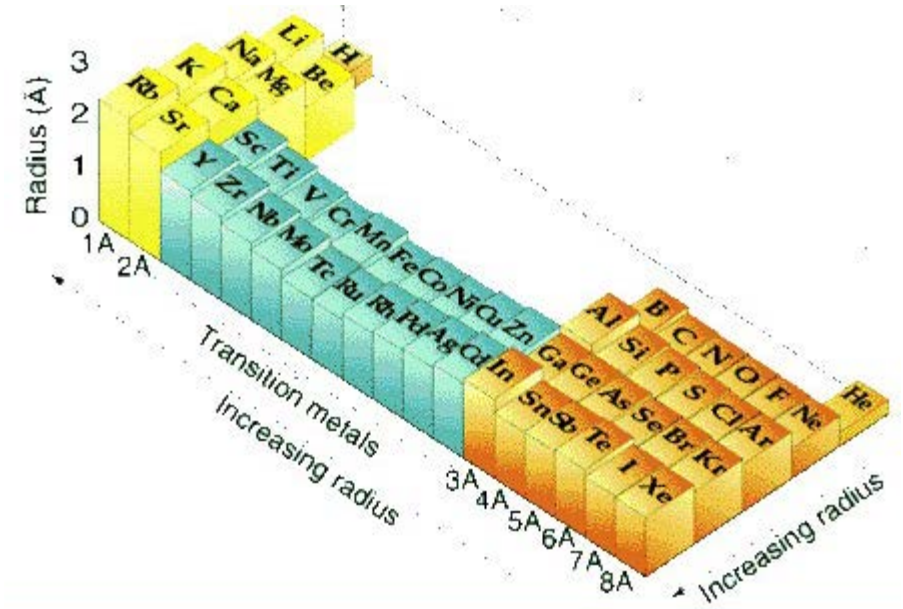

A **periodic table** showing radius of each element on the vertical axis (Ñº) .

External links

â— Periodic table – Wikipedia.

θΔics

In science, **perpetual motion**, aka "self-impelling power", refers to any number of machines or mechanisms, often built using various mixtures of levers, water wheels, screws, gears, balls running down ramps, etc., conceived to create continuous motion or mechanical work endlessly without an external power source. [1] The dipping bird is kind of like a perpetual motion machine, a contraption that runs for weeks on end, albeit one that runs on atmospheric heat gradients.

The famous **Escher house perpetual motion water wheel**, a 1961 lithograph by Dutch artist M.C. Escher depicting water paradoxically running uphill to the, which is said to be representative of perpetual motion of the first kind. [7]

History

All early perpetual motion machines were concerned with efforts to replace the work of the miller who used either water (waterpower) or wind (windpower) to grind corn. [5] Various modern-age perpetual motion devices continue to be made every year up to the present by individuals with dreams of solving the energy crisis. [3]

These devices were built endlessly, beginning in about the 8th century and over the following millennium, up until the invention of the steam engine by French physicist Denis Papin in 1691, which soon thereafter worked alleviate the hard work of the miller. In 1775, the Paris Academy of Sciences made the decision not to examine inventions concerning perpetual motion engines. [1]

> "The celebrated problem of a self-impelling power, though denied by Huygens and de la Hire (Ñº), who have attempted to demonstrate its fallacy, has yet been supported by some of the most celebrated among the ancient as well as modern philosophers. Innumerable have been the machines to which the idea of the **perpetual motion** has given birth; but the most celebrated among the modems is the Orffyrean wheel. This machine, according to the description given of it by G.F. 's Graevesande, in his *Oeuvres Philosophiques*, consisted of a large circular wheel or drum, twelve feet in diameter, and fourteen inches in depth."
>
> — Charles F. Partington (1825), note on Edward Somerset's 1663 presumed perpetual motion device [11]

> "It has long been, and so remains to this day, an unsettled question, whether perpetual motion is, or is not, possible. To name no other, it is evident, from their writings, that Bishop Wilkins, Gravesande, Bernoulli, Leupold, Nicholson, and many eminent mathematicians, have favored the belief in the possibility of **perpetual motion**, although admitting difficulties in the way of its discovery. Against it, we find De la Hire, Parent, Papin, Desaguliers, and the great majority of scientific men of all classes and countries."
>
> — Gardner Hiscox (1927), *Mechanical Appliances and Novelties of Construction* [12]

A popular example of an interesting perpetual motion machine is English physician Robert Fludd's 1630s grain grinding machine which supposedly operated via a water recirculation using a water wheel and an Archimedean screw. A late 17th century version of Fludd's perpetual motion grain grinding machine, as shown in Böckler's *Theatre of New Machines*, is depicted adjacent.

Dutch mathematician and engineer Simon Stevin, in his 1586 *Beghinselen Der Weegkunst* (*Statics and Hydrostatics*), is said to be the first to have given a complete statement of the impossibility of perpetual motion. [9]

Perpetual motion of the first kind

See main: Perpetual motion of the first kind

With the rise of thermodynamics in the 1850s, through the work of Rudolf Clausius, a general disproof of the possible

existence of perpetual motion machines was established. A disproof of perpetual motion using the first law of thermodynamics defines perpetual motion of the first kind. The 1961 lithograph by Dutch artist M.C. Escher, as pictured (above), depicting water paradoxically running from the base of the waterfall uphill to the top of the waterfall, is said to be representative of perpetual motion of the first kind. [2]

Perpetual motion of the second kind

See main: Perpetual motion of the second kind

French engineer Sadi Carnot was the first to have introduced the impossibility of perpetual motion of the second kind with his 1824 so-called "proof" on the coupling of heat engine with a refrigerator, as discussed in one of his appended footnotes. [10] This impossibility of perpetual motion of the second kind was then expanded on in more elaborate detail by German physicist Rudolf Clausius (1850-75).

A disproof of perpetual motion using the second law of thermodynamics defines perpetual motion of the second kind. The phrase “perpetual motion of the second kind”, supposedly, was introduced by German physical chemist Wilhelm Ostwald. [4]

Perpetual motion of the living kind

See main: Perpetual motion of the living kind

In theories of human existence, thinkers of all ages, past and present, continue to posit so-called "self-motion" theories or "self-driven" theories of human movement. These types of theories can be classified as "perpetual motion of the living kind" or perpetual motion of the biological kind, in the sense that human existence is some type of perpetual motion chemical reaction that started 3.9-billion years ago with a strike of lightening in Darwin's warm pond. This, however, is a defunct view, as is the case with any and all types of perpetual motion theories. In the view of a human as a "human engine", for instance, attempts to argue that a human is self-driven is an attempt to argue that the human motor, mind, brain, and body, is a perpetual motion machine.

Summation of the first and second law into a unified understanding of perpetual motion is captured in the combined law of thermodynamics, which means to the effect that system movement will only accrue when there is a decrease in free energy. This is the guideline that applies to what has been historically considered as the biological world, humans included.

This was stated by Erwin Schrodinger in 1944 when after being attacked by his physicist colleagues for his negative entropy based "What is Life?" lecture, replied that he would have turned the discussion to "free energy". Subsequently, in short, those who propound on theories of human movement that not in accord with the governance of the combined law of thermodynamics are promoting what are called "perpetual motion theories of the biological kind."

In recent decades, beginning generally with Belgian chemist Ilya Prigogine’s 1977 book *Self-Organization in Non-Equilibrium Systems*, in many thermodynamic explanations of biological processes or evolution the term “self-”, as in self-organizing, self-reproducing, self-activating, etc., are being used, which are akin to biological perpetual motion. These descriptions are typically found in origin of life discussions. An example is American biochemist Stuart Kauffman's 1995 theory of self-catalyzing looped chemical reactions that comes alive, seeming going on its own; which he equates to the threshold of the start of life in the evolution timeline. [6] Another example is Indian chemical engineer DMR Sekhar's 2010 "self-driven" theory of human motion. [8]

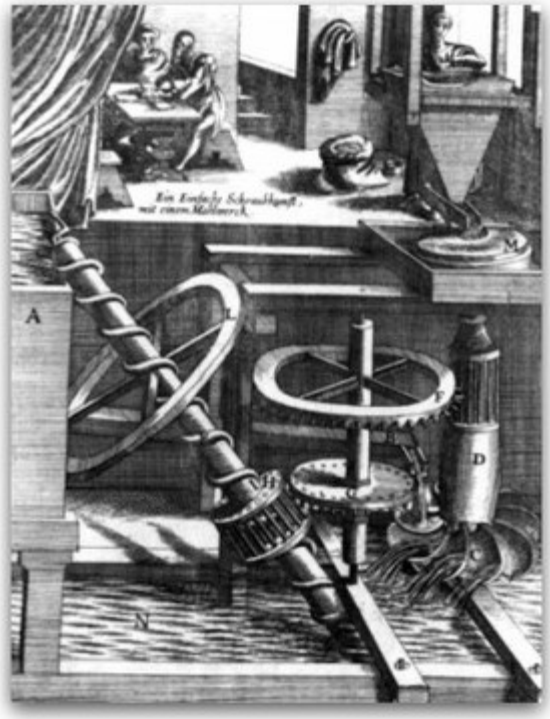

A perpetual motion device.

Quotes

The following are related quotes:

> "Oh ye seekers after **perpetual motion**, how many vain chimeras have you pursued? Go and take your place with the alchemists."
>
> — Leonardo da Vinci (1494), *Notebooks* (SKM, ii. 92 v) (Ñº)(Ñº)

References

1. Perrot, Perrie. (1998). *A to Z of Thermodynamics* (pgs. 234-35). Oxford University Press.
2. Waterfall (M. C. Escher) – Wikipedia.
3. History of perpetual motion machines – Wikipedia.
4. Hokikian, Jack. (2002). *The Science of Disorder: Understanding the Complexity, Uncertainty, and Pollution in Our World* (pg. 24). Los Feliz Publishing.
5. Ord-Hume, Arthur W.J.G. and Ord, Hume A. (2006). *Perpetual Motion: The History of an Obsession.* Adventures Unlimited Press; St. Martin's Press, 1977.
6. Kauffman, Stuart. (1995). *At Home in the Universe - the Search for the Laws of Self-Organization and Complexity* (pg. 50). Oxford: Oxford University Press.
7. Waterfall (M.C. Escher) – Wikipedia.
8. (a) Sekhar, DMR. (2010). "The Drive and the Direction of Evolution" (cached), *Knol* .
(b) Defunct theory of life (2011) – EoHT.info forums.
9. (a) Mach, Ernst. (1911). *History and Root of the Principle of Conservation of Energy*. Open Court Publishing.
(b) Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (pg. 15). Cambridge University Press.
10. (a) Carnot, Sadi, Hippolyte Carnot, and Thomson, William. (1890). *Reflections on the Motive Power of Fire and on Machines fitted to Develop this Power* (Appendix B: Carnot's Foot-notes, Note A: Perpetual Motion, pgs. 237-). J. Wiley.
(b) Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (pg. 25). Cambridge University Press.
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12. Hiscox, Gardner D. (1927). *Mechanical Appliances and Novelties of Construction* (Ñº). Norman W. Henley Publ. Co.

Further reading

â— Angrist, Stanley W. “Perpetual Motion Machines.” *Scientific American*, 218 (January, 1968): 114-22.
â— Ord-Hume, W.J.G. (1977). *Perpetual Motion: the History of an Obsession.* Adventures Unlimited Press.

External links

â— Perpetual motion – Wikipedia.
â— Simanek, Donald E. (date). “Perpetual Futility: A Short History of the Search for Perpetual Motion”, *Lock Haven University.*

θΔics

In motion classifications, **perpetual motion of the first kind** refers to perpetual motion machines or perpetual motion theories that violate the first law of thermodynamics. In lay terms, perpetual motion of the first kind is a device or theory that purports to create energy out of nothing. [1]

Laws of Energetics.

I. A perpetual motion of the first kind is impossible.
II. A perpetual motion of the second kind is impossible.

A 1894 summary of the **perpetual motion of the first kind** (I), by American physicist J.E. Trevor. [1]

Etymology

The classification of perpetual motion of the "first kind" seems to trace to German physical chemist Wilhelm Ostwald's 1893 *Textbook of General Chemistry*, wherein he outlined the so-called two laws of energetics. [2]

References

1. Trevor, J.E. (1894). "Book review: *Lehrbuch der Allgemeinen Chemie*", *The Physical Review* . MacMillan and Company.
2. Ostwald, Wilhelm. (1893). *Textbook of General Chemistry* (*Lehrbuch der Allgemeinen Chemie*). Leipzig: W. Engelmann.

θΔics

In motion classifications, **perpetual motion of the living kind** refers to perpetual motion machines or perpetual motion theories that violate the combined law of thermodynamics; often done to promote origin of life theories.

Laws | Overview

The laws that govern all movements on the surface of the earth are summarized as follows:

Energy motions		Entropy motions		Free energy motions
Perpetual motion of the first kind	+	Perpetual motion of the second kind	=	Perpetual motion of the living kind
First law	+	Second law	=	Combined law
$dQ = dU + dW$		$\int \frac{dQ}{T} \leq 0$		$\Delta G < 0$
Energy is conserved	+	Entropy must increase	=	Free energy must decrease

The latter column, which equates to the fact that all motions on the surface of the earth must abide to the governing nature of the combined law of thermodynamics, which in regard to human motions, as well as to all animate motions on the surface of the earth, wherein systems are defined as coupled freely-running isothermal-isobaric surface-attached reaction systems, the Lewis inequality for natural processes:

$$\Delta G < 0$$

is the governing equation to motion. Hence, any theory of human motion, or animate motion in general, or device, machine, or molecular structure that claims to be able to produce motion, in opposition to the combined law or system free energy decrease, is what is called perpetual motion of the living kind and is thus impossible.

Origin of life | Overview

In theories of human existence, thinkers of all ages, past and present, continue to posit so-called "self-motion" theories or "self-driven" theories of human movement. The majority of these theories arise often in origin of life investigations and discussions and are often centered around concepts of free will, choice, purpose, meaning, and morality. These types of theories can be classified as "perpetual motion of the living kind" or perpetual motion of the biological kind, in the sense that human existence is some type of perpetual motion chemical reaction that started 3.9-billion years ago with a strike of lightening in Darwin's warm pond. This, however, is a defunct view, as is the case with any and all types of perpetual motion theories. In the view of a human as a "human engine", for instance, attempts to argue that a human is self-driven is an attempt to argue that the human motor, mind, brain, and body, is a perpetual motion machine. Summation of the first and second law into a unified understanding of perpetual motion is captured in the combined law of thermodynamics, which means to the effect that system movement will only accrue when there is a decrease in free energy. This is the guideline that applies to what has been historically considered as the biological world, humans included.

In 1944, Erwin Schrodinger, after being attacked by his physicist colleagues for his negative entropy based "What is Life?" lecture, replied, in his Note to Chapter 6, that he would have turned the discussion to "free energy", if he was not speaking to a lay audience. Subsequently, in short, those who propound on theories of human movement that not in

accord with the governance of the combined law of thermodynamics are promoting what are called "perpetual motion theories of the biological kind."

In 1952, Serguis Morgulis, in his introduction to the second edition English translation of Alexander Oparin's *The Origin of Life*, stated the origin of life problem thusly: [3]

> "The [origin of life] problem is really quite insoluble since it is formulated upon a tacit assumption that the emergence of living from non-living could only have followed a hierarchical order, thus:
>
> 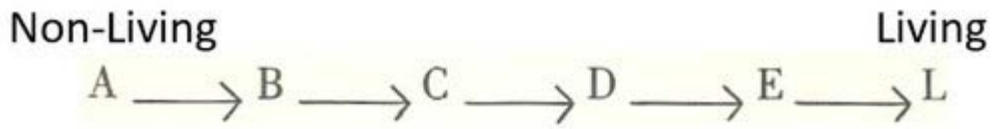
>
>
> But life could have originated not as the end link of a chain of consecutive events but by simultaneous coordination of several factors:
>
> 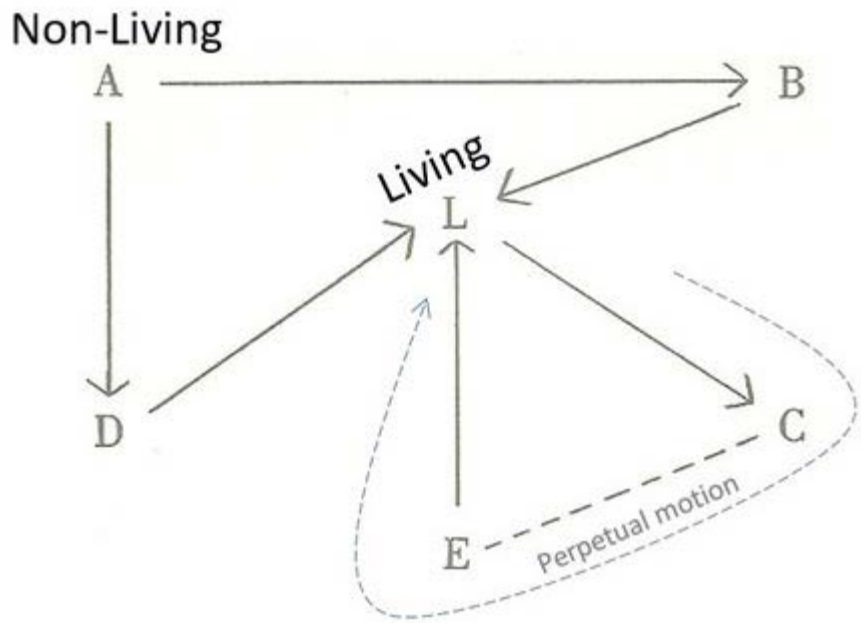
>
>
> As long as the cell is considered as the unit of life, the origin of life must remain a paradox. But like the erstwhile atom in chemistry, the cell has lost its prestige as the ultimate unit in biology. The cell, like the 'indivisible' atom, is not recognized as highly organized and integrated system built up form extremely small and distinct particles."

The "L → C → E → L" loop is what is called "chemical perpetual motion theory", specifically the idea that reactant can feed back into the products to create an "auto-powered" or "self-powered" chemical reaction that goes perpetually on its own, thereby giving the perception of having found the so-called "spark day" of the origin of life. Secondly, the the discussion of how the cell breaks down into smaller components, we are reminded of the cell-as-molecule view of things.

In 1995, American biochemist

Stuart Kauffman, similar to the Morgulis synopsis, introduced a theory of self-catalyzing looped chemical reactions that comes alive, seeming going on its own, aka "auto-catalytic closure", shown adjacent (middle); the gist of which is summarized as follows:

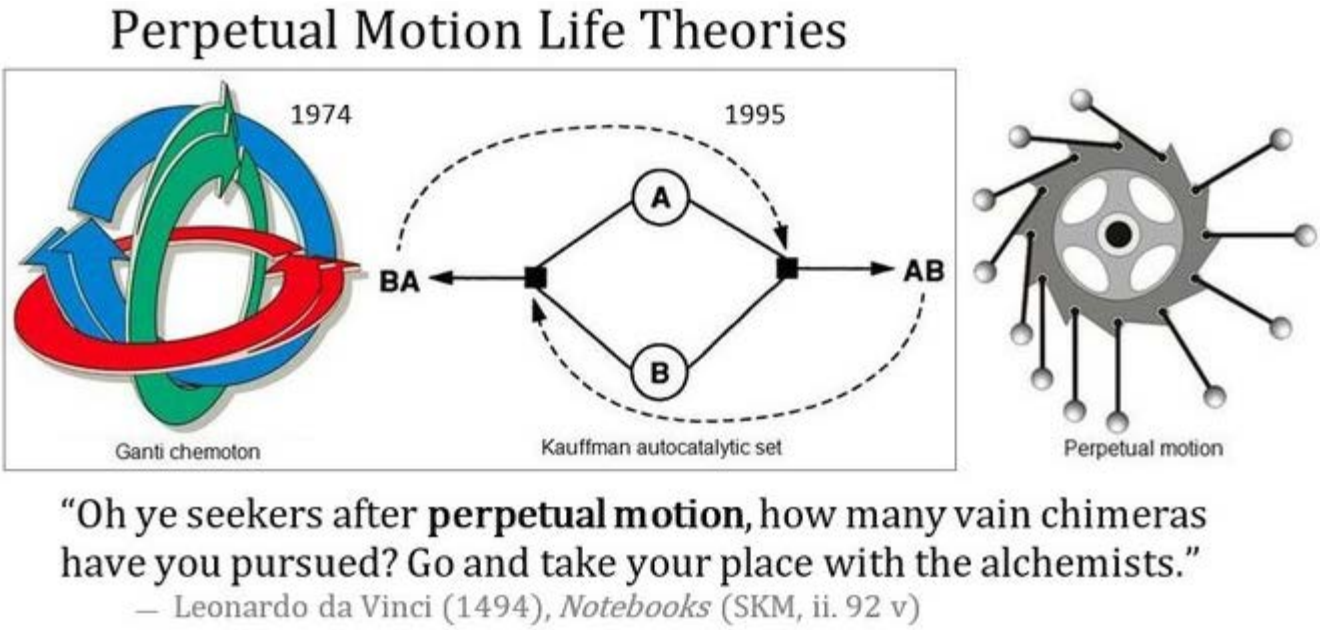

A diagram classifying the "life theories" of Tibor Ganti (1974), i.e. chemoton theory, and Stuart Kauffman (1995), i.e. auto-catalytic closure, as perpetual motion theories, i.e. end over unity theories, i.e. perpetual motion of the living kind; which is what Nathan Brown (2011) seems to be pointing out in in his "Introduction" talk given during the **To Have Done With Life** conference.

> "Alone, each molecular species is dead. Jointly, once catalytic closure among them is achieved, the collective system of molecules is alive."
>
> — Stuart Kauffman (1995), *At Home in the Universe* (pg. 50)

Kauffman, in shorts, equates "catalytic closure" to the threshold of the start of life in the evolution timeline. [1]

This so-called "Kauffman patch", was classified by Nathan Brown as an "irresolvable aporia", meaning an irresolvable internal contradiction or logical disjunction in an argument or theory, that does not allow for passage into the solution; Brown summarizes this as follows:

> "The term "emergence" is the surest index of the doubly physical and metaphysical scope of this problem. The emergence of life, we say, and what we seem to mean by this is that we do not know exactly how—at exactly what point and in exactly what way—life came into being, though we do seem to know a great deal about its properties—including, supposedly, that it exists [see: life does not exist]. The problem of "emergence" is that a modality of being came to be which was not before, and the difficulty is that tracking the physical causes of such an event leads to irresolvable aporia (Ñº). And these aporia are too easily dissembled through reference to "complex, self-organizing processes," as if we can at once account for and evade the radicality of the event we are trying to think by placing it within the same category as the formation of snowflakes, traffic patterns, or the activities of termite colonies. In its typical usage (the work of Stuart Kauffman, for example), the concept of "emergence" is a crypto-metaphysical concept pretending to offer physical explanations, at once allowing and accounting for gaps in the latter through reference to "complexity"."

This was one of the goads that led to the 2011 To Have Done with Life conference.

Other

In 1977, Belgian chemist Ilya Prigogine, in his *Self-Organization in Non-Equilibrium Systems*, introduced a self-based thermodynamic explanation of biological processes or evolution the term “self-”, as in self-organizing, self-reproducing, self-activating, etc., are being used, which are akin to biological perpetual motion. These descriptions are typically found in origin of life discussions.

In 2010, Indian chemical engineer DMR Sekhar introduced a "self-driven" (see: self-motion) theory of human motion. [2]

References

1. Kauffman, Stuart. (1995). *At Home in the Universe - the Search for the Laws of Self-Organization and Complexity* (pg. 50). Oxford: Oxford University Press.
2. (a) Sekhar, DMR. (2010). “The Drive and the Direction of Evolution” (cached), *Knol* .
(b) Defunct theory of life (2011) – EoHT.info forums.
3. Morgulis, Serguis. (1952). “Introduction” in: *The Origin of Life* (by Alexander Oparin; introduction and translation: Serguis Morgulis) (Introduction, pgs. v-xxii; diagrams, pgs. xv-xvi). Dover, 1965.

θΔics

In motion classifications, **perpetual motion of the second kind** refers to perpetual motion machines or perpetual motion theories that violate the second law of thermodynamics.

Laws of Energetics.

I. A perpetual motion of the first kind is impossible.
II. A perpetual motion of the second kind is impossible.

A 1894 summary of the **perpetual motion of the second kind** (II), by American physicist J.E. Trevor. [1]

In lay terms, perpetual motion of the second kind refers to theories or devices that purport to transform energy without intensity differences, such as gaining work from the constant temperature of a mass of water. [1]

An example of "perpetual mobile of the second kind" would be a device that purports to convert the supply of energy related to temperature contained in the soil, water, or atmosphere, where are practically unlimited, into use work. [3] This type of perpetual motion machine is said to be a violation of William Thomson's version of the second law:

> “A transformation whose only final result is to transform into work heat extracted from a source which is at the same temperature throughout is impossible.”

This is said to be equivalent to the same version of the statement made by Rudolf Clausius: [3]

> “A transformation whose only final result is to transfer heat from a body at a given temperature to a body at a higher temperature is impossible.”

Etymology

The classification of perpetual motion of the "second" kind seems to trace to German physical chemist Wilhelm Ostwald’s 1893 *Textbook of General Chemistry*, wherein he outlined the so-called two laws of energetics. [2]

References

1. Trevor, J.E. (1894). “Book review: *Lehrbuch der Allgemeinen Chemie*”, *The Physical Review* . MacMillan and Company.
2. Ostwald, Wilhelm. (1893). *Textbook of General Chemistry* (*Lehrbuch der Allgemeinen Chemie*). Leipzig: W. Engelmann.
3. Fermi, Enrico. (1936). *Thermodynamics* (pg. 29). Prentice Hall.

Further reading

â— Wainwright, Jacob T. (1905). *Perpetual Motion of the Second Kind: or Heat from the Atmosphere a Substitute from Fuel.* M. A. Donohue Printers.

External links

â— Perpetual motion of the second kind (section) – Wikipedia.

θΔics

In genius rankings, **Perry greatest thinkers** (Perry 80:#) refers to the eclectic mix of 80 individuals listed in American philosopher Kevin Perry's 2015 *Philosophy: an Illuminating Guide to History's Greatest Thinkers*, wherein he attempts to stitch out a breezy overview of what the big thinkers have to say on the subjects surrounding the "what is the meaning of life?" question, namely: time, knowledge, love, life, god and art; the code (Perry 80:1|Li) is short for Plato is ranked #1 in the "life" category, (Perry 80:6|La) that John Searle is ranked 6th in the "language" category, (Perry 80:2|Lo) that Goethe is ranked #2 in the "love" category, etc..

Overview

The following is Perry's listing of thinkers:

Life

1. Plato
2. Diogenes
3. Aristotle
4. Marcus Aurelius
5. Immanuel Kant
6. John Mill
7. Friedrich Nietzsche
8. Hannah Arendt

Language

1(25). Gottlob Frege
2(26). Bertrand Russell
3(27). Ludwig Wittgenstein
4(28). Martin Heidegger
5(29). Willard Quine
6(30). John Searle
7(31). Hilary Putnam
8(32). Jacques Derrida

Free Will

1(49). Epicurus
2(50). John Locke
3(51). Thomas Reid
4(52) Roderick Chisholm
5(53). Peter Strawson
6(54). David Wiggins
7(55). Thomas Nagel
8(56). Peter Inwagen

Death

73. Heraclitus
74. Lucretius
75. Michel Montaigne
76. Albert Camus
77. Bernard Williams
78. Derek Parfit
79. Shelly Kagan
80. Steven Luper

Man / Self

9. Thomas Hobbes
10. Nick Bostrom
11. Rene Descartes
12. Jean-Paul Sartre
13. Simone de Beauvoir
14. Michel Foucault
15. Charles Taylor
16. Katherine Hayles

Art

33. Edmund Burke
34. Estella Lauter
35. Georg Hegel
36. Friedrich Schiller
37. Monroe Beardsley
38. Iris Murdock
39. Arthur Danto
40. Jacques Ranciere

Love

57. Marsilio Ficino
58. Johann Goethe
59. Arthur Schopenhauer
60. Annette Baier
61. Robert Solomon
62. Harry Frankfurt
63. Martha Nussbaum
64. Alain Botton

Knowledge

17. David Hume
18. Edmund Husserl
19. Edmund Gettier
20. Alvin Goldman
21. Elizabeth Anderson
22. Richard Rorty
23. Michael Polanyi
24. Alvin Plantinga

Time

41. Plotinus
42. Augustine of Hippo
43. J.M.E. McTaggert
44. Parmenides
45. Albert Einstein
46. Henri Bergson
47. J.J.C. Smart
48. Ted Sider

God

65. Anselm of Canterbury
66. Boethius
67. Thomas Aquinas
68. Benedict Spinoza
69. Gottfried Leibniz
70. Charles Hartshorne
71. Alan Watts
72. Richard Dawkins

(add discussion)

References

1. Perry, Kevin. (2015). *Philosophy: an Illuminating Guide to History's Greatest Thinkers* (foreword: Simon Critchley). Fall Rivers Press.

External links

â— Kevin Perry Maroufkhani – Academia.eu.

θΔics

In hmolscience, **Perry Marshall** (1969-) is an American electrical engineer, turned internet marketer, turned (2005) information theory based theistic evolution promoter, noted for []

Overview

In circa 2000, Marshall, a Christian and then evolution-denier, gleaned the idea that he could come to see a "god-via-evolution" theory, which didn't leave everything to chance, accident, and purposelessness (e.g. Dawkins' view) or pointlessness (Weinberg's view) as many atheists tend to promote; in 2014, he retrospectively comments on this as follows:

> "I went down the evolution rabbit hole a decade ago. I suspected my discoveries might make me an atheist – but I decided I would follow the evidence wherever it led. What I discovered was the 'miracle of evolution', that organisms cut, splice, and re-arrange their DNA, performing astonishing engineering feats, faster than the world's smartest software coders. Nature is astonishingly more sophisticated than either side was telling us. And both sides were omitting the most tantalizing parts of the story. Darwinists were deliberately 'dumbing down' the science to make living things look random, purposeless and accidental. Nothing could be further from the truth."

Marshall outlines his information theory + computer science + genetics solution, as follows: (Ñº)

> "Both DNA and computer systems employ identical concepts to store, transfer, and evolve data; therefore, to the extent science can prove anything, modern communication theory and evolutionary history prove design in biology."

In 2005, Marshall gave a talk entitled "If You Can Read This, I Can Prove that God Exists", at the Willow Creek Community Church's TruthQuest, Barrington, IL, the gist argument of which was that only messages, transmitted in bits (0s and 1s) can come from a mind, therefore god exists, or something along these lines. [1]

In 2010, Marshall launched CosmicFingerprints.com to host his "If You Can Read This" talk, and to expand on his ideas.

Thermodynamics | Information

In 2015, Marshall, in his *Evolution 2.0*, gave a visual conception of his Shannon thermodynamics model of heat and information, as shown adjacent; which he captions as follows:

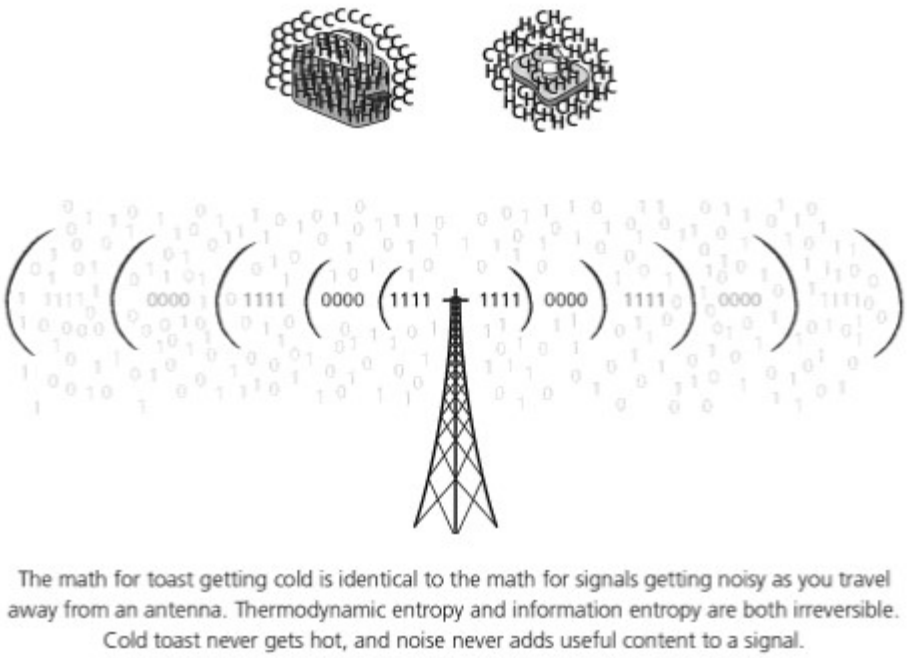

Marshall's hot toast entropy model, wherein he says that the "math for getting cold is identical to the math for signals getting noisy", which is but delusional tune from the Shannon bandwagon. [3]

> "The math for getting cold is identical to the math for signals getting noisy as you travel away from an antenna. Thermodynamic entropy and information entropy are both irreversible. Cold toast never gets hot, and noise never adds useful content to a signal."

This is a prime example of "self-Sokal affair hydraism ontic opening theism" at its finest, to say the least. [2]

Education

Marshall has a degree in electrical engineering and works in internet advertising.

References

1. Marshall, Perry. (2005). "If You Can Read This, I Can Prove that God Exists" (txt) (aud), Willow Creek Community Church, TruthQuest, Barrington, IL, Jun 3.
2. Marshall, Perry. (2015). *Evolution 2.0: Breaking the Deadlock Between Darwin and Design* (toast diagram, pg. 69). BenBella Books.
3. Thims, Libb. (2012). "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair" (Ñº), *Journal of Human Thermodynamics*, 8(1): 1-120, Dec 19.

External links

â— Perry Marshall – Wikipedia.

θΔics

In hmolscience, **personal god**, as contrasted with the singular term "God", tends to be a pejorative conception of an anthropomorphic-like deity; often employed by agnostic scientists when queried about their belief in the existence of god and or Dawkins number, to the effect that while they don't believe in a "personal god", they do believe in a "god = nature" model or supreme intellect model of the universe view of God, or something along these lines.

The nodal structure of the "God concept" according to American Christian to atheism deconverter Christopher Redford, giving indication that the notion of a **personal God** is one wherein one has a "personal relationship" with the god.

Quotes

The following are example quote usages:

> "The *anthropomorphic* dogma is likewise connected with the creation-myth of the three aforesaid religions, and of many others. It likens the creation and control of the world by God to the artificial creation of a talented engineer or mechanic, and to the administration of a wise ruler. God, as creator, sustainer, and ruler of the world, is thus represented after a purely human fashion in his thought and work. Hence it follows, in turn, that man is godlike. "God made man to His own image and likeness." The older, naive mythology is pure "homotheism," attributing human shape, flesh, and blood to the gods. It is more intelligible than the modern mystic theosophy that adores a **personal God** as an invisible—properly speaking, gaseous—being, yet makes him think, speak, and act in human fashion; it gives us the paradoxical picture of a "gaseous vertebrate."
>
> — Ernst Haeckel (1895), *The Riddle of the Universe* [1]

> "I have never seen the slightest scientific proof of the religious theories of heaven and hell, of future life for individuals, or of a **personal god**."
>
> — Thomas Edison (1911), Interview with Edward Marshall [2]

> "I do not believe in a **personal god** and I have never denied this but have expressed it clearly. If something is in me which can be called religious then it is the unbounded admiration for the structure of the world so far as our science can reveal it."
>
> — Albert Einstein (1954), Reply letter to an Italian-born American atheist on clarification of his religious views (Mar 24)

> "I have repeatedly said that in my opinion the idea of a **personal god** is a childlike one. You may call me an agnostic, but I do not share the crusading spirit of the professional atheist whose fervor is mostly due to a painful act of liberation from the fetters of religious indoctrination received in youth. I prefer an attitude of humility corresponding to the weakness of our intellectual understanding of nature and of our own being."
>
> — Albert Einstein (c.1955)

> "There is nothing that supports the idea of a **personal God**."
>
> — Ernst Mayr (c.2000) [3]

References

1. (a) Haeckel, Ernst. (1895–1899) *Die Welträthsel* ("world-riddle"); also spelled *Die Welträtsel*. Jena: Publisher.
(b) Haeckel, Ernst. (1905). *The Riddle of the Universe: at the Close of the Nineteenth Century* (ch. VI: The Nature of the Soul, pgs. 88-108; ch. XI: Immortality of the Soul, pgs. 188-210; ch. XII: The Law of Substance, pgs. 211-32; soul-snow, pg. 201; affinity, pg. 224), trans. Joseph McCabe. Harper & Brothers.
(c) *The Riddle of the Universe* – Wikipedia.
2. Edison, Thomas. (1911). "Thomas A. Edison on Immortality: the Great Inventor Declares Immortality of the Soul Improbable" (doc) (Interview by Edward Marshall), *The Columbian Magazine*, 3(4), Jan.
3. Shermer, Michael and Sulloway, Frank J. (2000). "The Grand Old Man of Evolution", *Skeptic*, 8(1): 76–82.

External links

â— Personal god – Wikipedia.

θΔics

In genius studies, **personal libraries** (TR:91), abbreviated (PL:#) in existographies, e.g. Thomas Young (PL:1K), are book collections, generally over the Buffett number (100+), on subjects connected to thermodynamics or human thermodynamics, or bigger "geniuses on" type questions in general.

Overview

At the high end of personal library rankings, there are, primarily in France, who purchased 20,000 to 30,000 libraries in bulk.

List

The following is a work-in-progress ranking of personal libraries of noted geniuses:

#	Person	Books	Notes
1.	John Acton (1834-1902)	60,000	(Q)
2.	Charles Ogden (1889-1957)	50,000	Collection (Q) contains interesting things, such as collection contains five books from Ben Jonson's own library, Percy Shelley's annotated copy of Petrarch.
	Umberto Eco (1932-2016)	30,000-50,000	[RGM:308|1,500+] Contained 30,000 at last count (Q) as commented on by Nassim Taleb; quote: "I'm afraid that, by now, it might actually be **50,000 books**. When my secretary wanted to catalogue them, I asked her not to. My interests change constantly, and so does my library. By the way, if you constantly change your interests, your library will constantly be saying something different about you. Besides, even without a catalogue, I'm forced to remember my books. I have a hallway for literature that's 70 meters long. I walk through it several times a day, and I feel good when I do" (Eco, 2009) (Q); multiple videos (Q)(Q)
3.	French salon owners	20,000-30,000	Based on several historical accounts of 18th and 19th century salon owners, e.g. Baron d'Holbach; many wealthy salon owners bought whole library collections outright.
4.	Emilie Chatelet (1706-1749)	25,000+ (?)	Built and ran her own research lab at Chateau de Cirey, from 1734-1749, said to have a library comparable to the Paris academy of sciences; scientists such as Samuel Koenig and Johann Bernoulli, not to mention Voltaire (her lover), would stay for weeks or months at a time.
	Harold Bloom (1930-)	25,000	In 2002, had amassed some 25,000 books encompassing most of American and British poetry, criticism, and literary history (Q); said to have a phenomenal ability to speed read and memorize what he's read (Q). 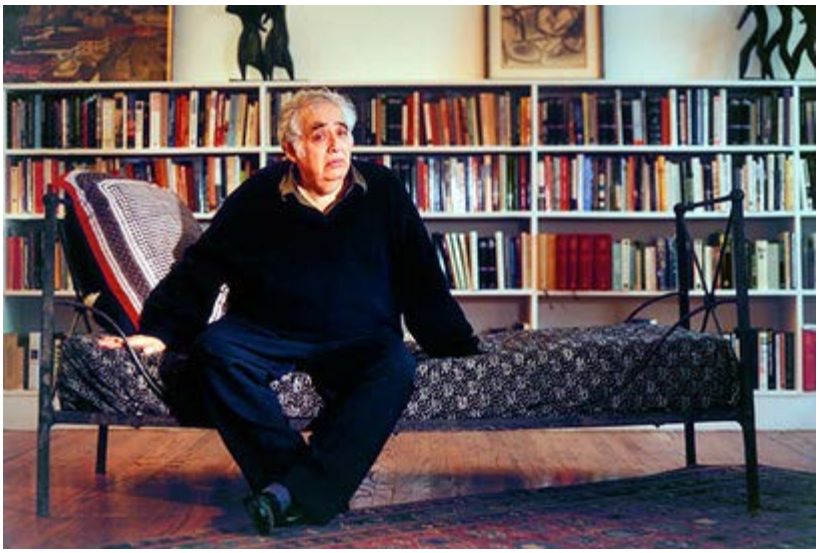

5.	Henry Buckle (1821-1862)	21,000	"In his library, when he died, were **eleven thousand books**—and these he and carefully digested, beside ten thousand more that he had disposed of when done with them." — Arthur Brisbane (1913), "Introduction to *History of Civilization in England* (pg. vi)
6.	Georges Cuvier (1769-1832)	20,000	Said to have twenty-thousand volumes in his library and could "recall in detail the contents of all" (Frenay, 2006); he was also "vain, arrogant, and authoritarian", liked to think of himself as "second only to Aristotle". [4] Based on his Biblically-nonsensed periodic flood based creation of species theory, this book memory count is a high end over-exaggeration.
	Susan Sontag (1933-2004)	20,000	Had a library of 20,000 volumes, according to Benjamin Moser's 2019 *Susan Sontag: Her Life*. (Q)(Q)(Q)
7.	William King (1663-1712)	20,000-7,000	Is exaggeratedly reported, by charlatan physician hack writer Joseph Browne (Q), to have dedicated himself completely to his studies (Q) at Oxford, during the years 1681 (age 18) to 1689 (age 26), and therein read over 22,000 books and manuscripts; this figure found its way into the mind of Thomas Young who stated, so to perspectively gauge his own reading level, over the course of 50 years, that: "it is said that William King the poet read no fewer than seven thousand in the course of his residence of seven years at Oxford." This reading rate (1000 books/year) to note, would amount to having read 2.74 books per day, on average, over the course of seven years; which seems a stretch if one was actually to process and assimilate what one has read; Thims, by comparison, on a good day, can read, at the high end, three large books in one day. Some deeper books, however, can absorb ones mental digestion time form months or more. Given that King never produced anything of intellectual note, per logic of the Young read-write formula: "The longer a person has lived the less he gains by reading, and the more likely he is to forget what he has read and learnt of old; and the only remedy that I know of is to write upon every subject that he wishes to understand, even if he **burns what he has written**." — Thomas Young (1809), "Letter to Hudson Gurney" [3] It is doubtful that King read as much as folklore attributes to him.
8.	Kim Peek (1951-2009)	12,000	Person behind the 1988 film *Rain Main*, who was born without a corpus callosum (the bundle of nerves that connects the two hemispheres of the brain), may have had this ability. He would read books, memorized them, and then placed them upside down on the shelf to show that he had finished reading them, a practice he maintained. He can read a book in about an hour, and remember almost everything he had read, and was thus able to memorizing vast amounts of information in subjects ranging from history and literature, geography, and numbers to sports, music, and dates. His reading technique consisted of reading the left page with his left eye and the right page with

			his right eye and in this way he could read two pages at a time with a rate of about 8-10 seconds per page. It is believed he could recall the content of at least 12,000 books from memory.
9.	Charles Bradlaugh (1833-1891)	7,000	“My father's books were very dear to him, and had always. been so, from the time when as a dragoon he was able to carry the whole of his library in his soldier's knapsack, until the day of his death, when his literary possessions had outgrown all ordinary-sized rooms, and had even swelled beyond the capacity of his work-room at Circus Road. They numbered in all rather over **7,000 volumes**, about 3,000 Blue Books, besides a very large number of unbound pamphlets. In many respects the library is essentially a poor man's library. There are only a few rare bindings, and comparatively few costly ‘first editions’ ; now and again there is a volume missing from a set, and here and there a title page is wanting.' But, such as they are, he valued them, all and every one.” — Hypatia Bradlaugh (1891), *The Library of the Late Charles Bradlaugh* (Q)
10.	Thomas Jefferson (1743-1826)	6,700	Jefferson, after inheriting books from his father Peter Jefferson, prior to 1770, noted that by age 40 (1783) he had acquired a total of 2,640 volumes; that by age 46 (1789), upon his return to America, had doubled his library (c.5280 books), and that by 1815 (age 72) he had a collection of 6,700 volumes. [7] On 28 Nov 1814, it is recorded that Jefferson sold 6,487 volumes (for $23,950) to the library of congress, to replenish the 3,000-volumes burned by the British. (Q) Legacy Library: 5,611 (to date) (Q)
11.	Johann Goethe (1749-1832)	5,000	At the age of about 80, had a 5,000 book personal library.
12.	James Lawler (1936-)	4,000+	American chemical-nuclear engineer (Q), curator of NexialInstitute.com (Q), which promotes the social entropy theories of Alfredo Infante, told (Q) Thims (Mar 2006) that he has 4,000+ books, some of which are in triplicate.
13.	James Madison (1751-1836)	4,000	[3]
14.	Robert Hooke (1635-1703)	3,000	“Hooke’s magnificent library, collected during a lifetime spent in auction rooms and bookshops, contained many bound pamphlets and over 3,000 books.” — Stephen Inwood (2002), *The Man Who Knew Too Much* (pg. 4)
14.	Ernst Schumacher (1911-1977)	2,500	German economist and statistician; protégé of John Keynes; read by Erland Lagerroth; library consists of: critiques of economics, technology, agriculture, and development, there are equally considerable collections of titles exploring Western and Eastern philosophies, a variety of religious and political thought, psychology, and mysticism. Seven hundred of the titles are in German and the remainder are in English. (Q)
15.	Thomas Browne (1605-1682)	2,000+	Over 2,000 titles (Q); subjects: Greek literature, Roman literature, Arabic, contemporary science, philosophy, theology, medicine, esoteric, natural history, literature, geography and history. (Q)

1#.	Rene Descartes (1596-1650)	2,000	When Christina Alexandra, Queen of Sweden, sent a ship to fetch him (1649), to come to Sweden, to tutor her, the ship brought back him and 2,000 books. Both are shown adjacent, Alexandra, also had amassed a enormous collection of books and manuscripts, which is now in the Vatican library.
16.	Walter Benjamin (1892-1940)	2,000	Roughly 2,000 books. (Q)
1#.	Isaac Newton (1643-1727)	1,752	Had a personal library consisted of 1,752 books, of which 369 were scientific works. Artist's engraving (Morel, 1874), showing a portion of **Newton's library** in the background, of apocryphal story of Isaac Newton's pet dog knocking over a candle and setting fire to his papers. Newton had on his table a pile of papers upon which were written calculations that had taken him twenty years to make. [1]
17.	John Adams (1735-1826)	1741	(Q)

18. John Dewey (1859-1952) 1687 (Q)

19. Libb Thims (c.1975-) 1,500+

In 2007, Thims' personal library stood at just past the 1,000 book mark. [2] In 2011, Thims' total personal library collection, including thermodynamics books, was at the 1,250+ mark.Thims' personal library is predominately polymathic (the core of which being Clausius' *Mechanical Theory of Heat* and chemical thermodynamics generally); the general predominate division is as follows:

- Thims' thermodynamics book collection | 403+
- Thims' mate selection book collection | 140+
- Thims religio-mythology and atheism book collection | 123+
- Thims' list of thermodynamics books to buy

Adjacent photo, from the 2014 "25 Smartest People Alive | Existive" (Q) video countdown, depicts some of Thims person library. A 30 Sep 2015 photo (Q) of library, amid residence move, of *circa* 1,300 books, aka the "hard drive of Hmolpedia", shows the library contained in: 39 banana boxes and 6 egg boxes. Possibly, at 1,500+ level in 2018.

A photo of some of the books in the **personal library** in the home of Friedrich Nietzsche. (Q)(Q)

20. Friedrich Nietzsche (1844-1900) 1,100

21.	Thomas Young (1773-1829)	1,000	"Though he wrote with rapidity, he read but slowly, [and] perhaps the whole list of the works that he studied, in the course of 50 years, does not amount to more than a thousand volumes: while it is said that William King the poet read no fewer than seven thousand in the course of his residence of seven years at Oxford." — Thomas Young (c.1825), *Autobiography*
22.	Arthur Schopenhauer (1788-1860)	818+	(Q)
23.	Kurt Godel (1906-1978)	700	(Q)
24.	Albert Einstein (1879-1955)	600+	Crude visual photo of Einstein's personal library shows about 600-700 books. "Throughout his life Einstein was a man of the **book**, to a much higher degree than other scientists. The remarkably diverse collection of volumes in **his library** grew constantly. If we look only at the German-language books published before 1910 that survived Einstein's Princeton household, the list includes much of the cannon of the time:

Boltzmann, Buchner, Friedrich Hebbel, the works of Heine in two editions, Helmholtz, von Humboldt, the many books of Kant, Gotthold Lessing, Mach, Nietzsche, and Schopenhauer. But what looms largest are the collected works of Johann von Goethe in a thirty-six volume edition and another of twelve volumes, plus two volumes on his *Optics*, the exchange of letters between Goethe and Schiller, and a separate volume of *Faust*."
— Gerald Holton (2008) [5]

25.	Immanuel Kant (1724-1804)	326	(Q)(Q)
16.	Leonardo da Vinci (1452-1519)	200	His person library (Q), which he cataloged in some cases, contains about 200 books (Q), depending on period.

(add)

Quotes

The following are related quotes:

> "I seek for learning in this book and cannot find it. Though I study all **books** from end-to-end, I cannot discover the touchstone of wisdom. O, how unfortunate art thou, Faust! The sleepless nights I have spent in fathoming the mysteries of theology! But, no! By heaven, I will no longer delay, I will take upon myself all labor, so that I may penetrate into that which is concealed, and fathom the mysteries of nature!"
>
> — Faust (c.1800), Geisselbrecht's puppet-play [1]

> "I have never met with a man more learned—I may add, more *universally* learned, than the Baron

d'Holbach; and I have never seen anyone who cared so little to pass for learned in the eyes of the world. Had it not been for the sincere interest he took in the progress of science, and a longing to impart to others what he thought might be useful to them, the world would always have remained ignorant of his vast erudition. His learning, like his fortune, he gave away, but never crouched to public opinion. The French nation is indebted to d'Holbach for its rapid progress in natural history and chemistry. It was he who, 30 years ago, translated (enriched with valuable notes) the best works published by the Germans on both these sciences, till then, scarcely known, or at least, very much neglected in France. Holbach possessed an **extensive library**, and the tenacity of his memory was such as to enable him to remember without effort every thing he had once read ”

— Friedrich Melchior (1789), “On Baron d’Holbach”, Aug 10; note that, in the context of this quote, Melchior (Q) was also closely associated with: Jean Rousseau (IQ:175|#243), Denis Diderot (IQ:175|#243), Jean d'Alembert (IQ:185|#73), Marmontel, Morellet, and Helvetius (IQ:175|#215) [6]

See also

- Einstein’s personal library
- Goethe’s collected works
- Library walk problem
- Libb Thims (books read)
- Thims’ personal library

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1. (a) Brewster, David. (1833). *The Life of Isaac Newton* (image). J. & J. Harper.
(b) Author. (1878). “King Alfred and the Cakes”, St. Nicholas magazine, Vol. 5, No. 4, Feb.
2. Pierce, Charles P. (2009). *Idiot America: How Stupidity became a Virtue in the Land of the Free* (pgs. 284-85). Anchor Books.
3. Robinson, Andrew. (2006). *The Last Man Who Knew Everything: Thomas Young, the Anonymous Genius who Proved Newton Wrong and Deciphered the Rosetta Stone, among other Surprising Feats* (self-taught, pg. 15; burn, pg. 179; Lagrange, pgs. 182-83). Plume Books.
4. Frenay, Robert. (2006). *Pulse: the Coming Age of Systems and Machines Inspired by Living Things* (pg. #). Farrar, Straus and Giroux.
5. Galison, Peter, Holton, Gerald J., and Schweber, Silvan S. (2008). *Einstein for the 21st Century: His Legacy in Science, Art, and Modern Culture* (ch. 1: Who Was Einstein? Why is He Still so Alive?, pgs 3-15; quote: pg. 10). Princeton University Press.
6. d’Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (attributed, pgs. iv-v; universally learned, pg. v; translated, pg. v). J.P. Mendum, 1889.

External links

- Library – Wikipedia.
- Legacy libraries – LibraryThing.com.

θΔics

In science, **personal space** is an association distance between close members of the same species, in the average range of 1.5 to 4 feet from the central axis of the person. [1] The adjacent diagram shows standard measurements of personal space.

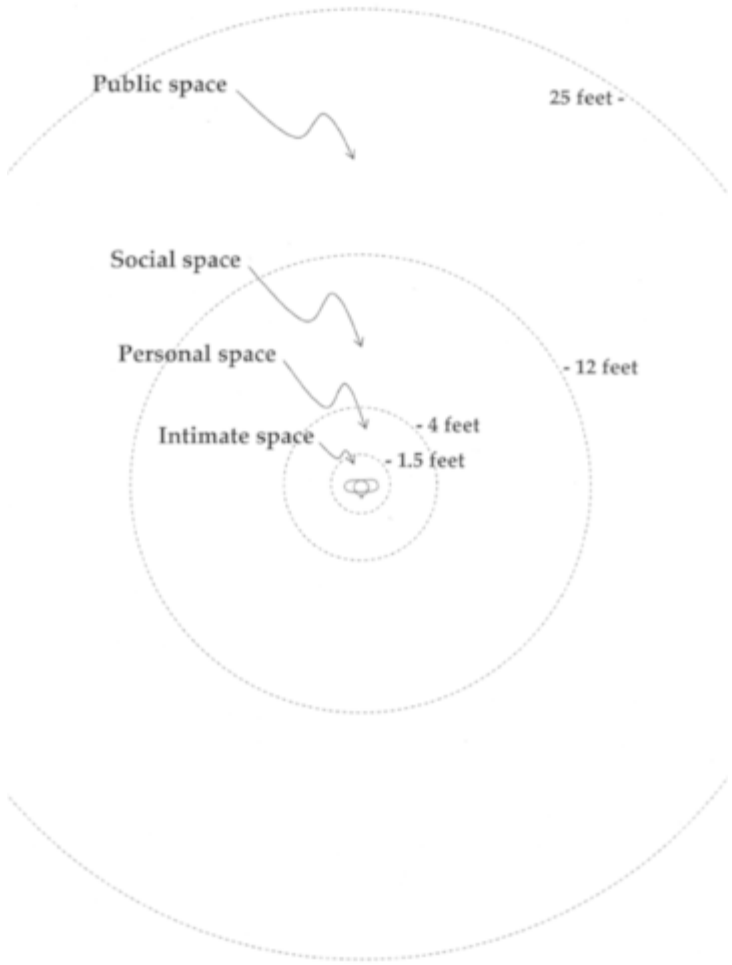

Public space, social space, **personal space**, and intimate space diagram (showing radii in feet) based on American anthropologist Edward Hall's 1966 global interpersonal measurements and theory of reaction bubbles.

Human systems

See main: Human system

The concept of personal space is intuitive in the thermodynamical study of volumes in human systems. Studies show, for instance, that alpha males and alpha females are given more individual or personal space. A supermodel, someone who is generally considered physically "hot", when walking alone through a crowd of people will be given more personal space than as compared to a more homely female. [2] This phenomenon is connected to Boerhaave's law.

Moreover, when people are asked to approach a stranger and stop when they no longer feel comfortable, they will stop about two feet away from a tall person (22.7 inches to be exact) but less than a foot (9.8 inches) from a short person. As height is correlative with physical attractiveness, e.g. shorter than average men and women are less attractive than taller men and women, it is found, according to attractiveness researcher Nancy Etcoff, that: [2]

> "Very attractive people of any size are given bigger **personal space** and territory; which they carry around with them."

In other words, physically 'hot' molecules, in a sense, trigger volume increase be it a gaseous molecule or a human molecule. [1]

Sidewalk personal space study

See main: Sidewalk study

The 1975 *Sociometry* article "Beauty is Power: the Use of Personal Space on the Sidewalk", presenting the results of the time lapse filming of pedestrians observed from above walking along a sidewalk, by American sociologists James Dabbs and Neil Stokes, seems to be the first quantified study of the relation between beauty and personal space volume increase. [3]

Human chemistry

See main: Human chemistry

The logic and measurements of reactionary personal space regions is a key anchor point in the development and understanding of human chemical bonding, particularly on the topic of human molecular orbital theory, in which the stablizing overlap of hybrid orbitals functions to instill a bonding effect in the system, as is the case in standard

molecular orbital theory. [1]

See also

- Social piston and cylinder
- HCT | P4: Piston and cylinder view – Thims Apr 2013 lecture

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)*, (pgs. 223-33, ch. 9: Human Molecular Orbital Theory, pgs. 247-95). (preview), (Google books). Morrisville, NC: LuLu.
2. Etcoff, Nancy. (1999). *Survival of the Prettiest: the Science of Beauty*. New York: Anchor Books.
3. Dabbs, James M. and Stokes, Neil A. (1975). "Beauty is Power: the Use of Space on the Sidewalk" (abs), *Sociometry*, 38: 551-57.

Further reading

- Hartnett, J.J. Bailey, and Harley, C. (1974). "Body Height, Position, and Sex as Determinants of Personal Space" (abs), *Journal of Psychology*¸ 87:129-36.
- Thims, Libb. (2006). "High School Cafeteria Seating Distributions", IoHT publications.

External links

- Personal space – Wikipedia.

θΔics

In existographies, **Peter Abelard** (1079-1142) (IQ:160|#517) (Cattell 1000:110) was a French scholastic philosopher, theologian, and logician, characterized a “fine genius” (Bayle, c.1693), noted for []

Quotes | On

The following are quotes on or related to Abelard:

> “It is indeed impossible to be unmoved at the surprising and multiplied afflictions and persecutions which befel a man of **Abelard**’s fine genius, when we see them so feelingly described by his own hand. Many of these were owing to the malice of such as were his enemies on the account of his superior learning and merit; yet the great calamities of his life took their rise from his unhappy indulgence of a criminal passion, and giving himself a loose to unwarrantable pleasures. After this he was perpetually involved in sorrow and distress, and in vain sought for ease and quiet in a monastic life. The *Letters* between him and his beloved *Heloise* were not written till long after their marriage and separation, and when each of them was dedicated to a life of religion. Accordingly we find in them surprising mixtures of devotion and tenderness, and remaining frailty, and a lively picture of human nature in its contrarieties of passion and reason, its infirmities, and its sufferings.”
>
> — Pierre Bayle (c.1693), *Letters of Abelard and Heloise* (Ñº)

> “It is true: writing brings forth in the lives of many humans just such destructive results, like Ottilie in Goethe’s *Elective Affinities*, through whose appearance the fortune of a satisfying life is ruined.”
>
> — Ludwig Feuerbach (1834), *Abelard and Heloise* (Aphorism #42) [1]

> “Abelard was the keenest thinker and boldest theologian of the 12th century.”
>
> — Anon (1897), *Chambers Biographical Dictionary*

Quotes | By

The following are quotes by Abelard:

> “It is by doubting that we come to investigate, and by investigating that we recognize the truth.”
>
> — Peter Abelard (c.1130)

References

1. Feuerbach, Ludwig. (1834). *Abelard and Heloise: the Writer and the Human: a Series of Humorous Philosophical Aphorisms* (Translation and Introduction: Eric Luft; Foreword: Angela Moreira) (Aphorism #42, pgs. 44-45). Gegensatz Press, 2012.

External links

â— Peter Abelard – Wikipedia.

θΔics

In existographies, **Peter Murray Allen** (1944-) (CR:1) is an English theoretical physicist noted for his dissipative structure theory work with Belgian chemist Ilya Prigogine, particularly as applied to evolution theory and sociology.

Overview

In 1981, Allen, in his "The Evolutionary Paradigm of Dissipative Structures", commented the following overtypical view:

> "The word 'evolution' in the physical sciences has traditionally referred to the movement towards thermodynamic equilibrium; the elimination of nonuniformities and the increase of disorder within the system, while in biology it has been associated with increasing complexity, specialization and organization."

The article: second law (disordering) evolution (ordering) gives reconciliations for further discussion of these apparent conflicting views.

Allen is the editor in chief of *Emergence: Complexity and Organization*, an interdisciplinary conversation about human organizations as complex systems and the implications of complexity science for those organizations; where many of his recent publications are found.

In 2002, Allen attended an EIASM meeting on "Thermodynamics of Social Systems", during which he presented a talk entitled "Evolution, Emergence, and Learning in Complex Systems". (Q)

Education

Allen completed BS in physics in 1965 and a PhD in theoretical physics, specializing in statistical mechanics, in 1969, both at the University of Hull, after which, from 1969 to 1971, he was a Royal Society European research fellow and, from 1972 to 1987, a senior research fellow at the Universite Libre de Bruxelles, where he worked with Belgian chemist Ilya Prigogine. Allen then joined Cranfield University as chair and as professor of evolutionary complexity theory, focusing on sustainability, economics, environment, and business management. Presently, Allen is professor emeritus of Cranfield University.

References

1. (a) Allen, Peter M. (1981). "The Evolutionary Paradigm of Dissipative Structures", in: *The Evolutionary Vision: Toward a Unifying Paradigm of Physical, Biological, and Sociocultural Evolution* (editor: Erich Jantsch) (pgs. 25-72). Westview Press.
(b) Brooks, Daniel R. and Wilson, E.O. (1988). *Evolution as Entropy: Toward a Unified theory of Biology* (pg. 82). University of Chicago Press.
2. Emergence: Complexity and Organization – EmergentPublications.com.

Further reading

● Schieve, W.C. and Allen, Peter M. (1982). *Self-Organization and Dissipative Structures: Applications in the Physical and Social Sciences*. University of Texas Press.
● Allen, Peter. (1985). "Ecology, Thermodynamics, and Self-Organization", in: *Ecosystem Theory for Biological Oceanography* (pgs. 3-26) (editors: Robert Ulanowicz and Platt), *Bulletin of Fisheries and Aquatic Sciences*, 213.
● Allen, Peter. (2002). "Evolution, Emergence, and Learning in Complex Systems", presented at EIASM meeting on "Thermodynamics of Social Systems", Brussels.

External links

● Peter Allen (faculty) – Cranfield University, England.
● Allen, Peter M. (Peter Murray) (1944-) – WorldCat Identities.

θΔics

In existographies, **Peter Atkins** (1940-) (CR:63) is an English physical chemist noted for a number of books and videos thermodynamics, such as 1978 multi-edition *Physical Chemistry* textbook, the 1987 *The Second Law*, on the second law, and recent 2007 *Laws that Drive the Universe*, an layperson's introduction to the four laws of thermodynamics and on the driving force of the universe. [1]

Purpose universe hypothesis

See main: Purposeless universe hypothesis

Atkins is well-known to be outspoken on the subject of the overlap between religion and science. Atkins' first venture into this genre was his 1981 book *Creation* (revised as *Creation Revisited*, 1992), in which he uses physical chemist principles to argue, in what seems to be a physical chemistry stylized Darwinism, in outline, that elephants and men are evolved emergent types of "molecules equipped for competition, survival, and reproduction", albeit molecules that are "unimportant", "insignificant", and "without purpose." [2] The gist of Atkins' aim seems to be to dispel the "creator view" of human existence and to replace it with a physical chemist and or thermodynamic view of human existence.

Atkins latest work is the 2011 *On Being: A Scientist's Exploration of the Great Questions of Existence*, the concluding gist of which, as entitled in his chapter section 2.7 "A Universe Without Purpose", seems to be a rehash of his second law based purposeless argument. Herein, he defines the "driving force" of all chemical reactions, human or otherwise, as "the natural tendency of matter and energy to disperse in disorder" or "all change is driven by purposeless decay" among other laymanized thermodynamics variants. [3]

Difficulties on theory

Where Atkins goes astray in his polemic, in what might be labeled as the "purposeless universe hypothesis", is that in his tunnel vision ideal of discarding the Biblical view of human existence, he subtly bends, twists, distorts, and over simplifies (dumbifies) the second law, and physical chemistry as a whole, in the name of disproof and agenda. The "pervading idea" of his argument, as he states, is entropy. In this end, where he goes astray in his application of entropy and the second law to evolution and in turn human existence is his over-use of the energy dispersal model of entropy. Atkins' pervading argument, in short, is as follows: [2]

> "Everything is driven by decay. Everything is driven by motiveless, purposeless decay. By [the term] 'quality', [we mean] the extent of its dispersal. High quality, useful energy is localized energy. Low quality, wasted energy, is chaotically diffuse energy. Things can get done when energy is localized; but energy loses its potency to motivate change when it has become dispersed. The degradation of quality is chaotic dispersal. Such dispersal is ultimately natural, motiveless, and purposeless. It occurs naturally and spontaneously, and when it occurs it causes change. When it is precipitate it destroys. When it is geared through chains of events it can produce civilizations."

Correctly, if Atkins was speaking in the correct physical chemistry definition of the matter, everything, in freely going, isothermal, isobaric, earth-bound reaction systems, is "driven" (see: driving force) by free energy change, *not* by decay as Atkins has laymanized things. In another vein, he rephrases this as:

> "The tendency of energy to chaos is transformed into love or war through the agency of chemical reactions. All actions are chains of reactions. From thinking to doing, in simple thinking or in responding, the mechanism in action is chemical reaction."

This is all good and dandy, in overall simplified premise, but the entire spiel, in core structure, is framed in a hugely-

distorted view of the second law and of entropy. No where in Rudolf Clausius' defining textbook *The Mechanical Theory of Heat*, is entropy or the second law defined as the "tendency of energy to chaos", nor does Atkins use this interpretation to define entropy or the second law in his standard *Physical Chemistry* textbook, but when it comes to human affairs, he repeats this mantra *ad nauseam* throughout his polemic.

References

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(b) Atkins, Peter. (1987). *The Second Law*. W.H. Freeman.
(c) Atkins, Peter. (2007). *Four Laws: that Drive the Universe*. Oxford University Press.
2. (a) Atkins, Peter. (1981). *Creation.* Publisher.
(b) Atkins, Peter. (1992). *Creation Revisited.* W.H. Freeman & Co.
3. (a) Atkins, Peter. (2011). *On Being: A Scientist's Exploration of the Great Questions of Existence* (thermodynamics, 6+ pgs). Oxford University Press.
(b) "On Being" by Peter Atkins (review), May 05, 2011 - Humanist4Science blog.

External links

â— Peter Atkins – Wikipedia.

θΔics

In existographies, **Peter Boghossian** (1966-) (FA:246) is an American philosopher, noted for []

Overview

In 2012, Boghossian, in his "Jesus, The Easter Bunny and Other Delusions: Just Say No!", a talk given to the Freethinkers of Portland State University, argued that faith will not lead to the truth and that he is a non-relativist, meaning that he does not believe that all truths are relative. [1]

In 2013, Boghossian, in his *A Manual For Creating Atheists*, outlined a "friendly persuasion" (Dawkins, 2013) of interacting with theists in respect to evangelical atheists attempting to get theists to question their faith. [2]

Quotes | Employed

The following are quotes employed by Boghossian:

> "When you're inside the religious bubble everything makes sense."
>
> — Michael Shermer (2013), "Foreword" to Peter Boghossian's *A Manuel for Creating Atheists* (pg. i2)

Quotes | On

The following are quotes on Boghossian:

> "I read *The God Delusion*, *God is not Great*, *Infidel*, and several other books and became comfortable with being an atheist. My ability to talk and reason to theists, however, evolved rapidly when I read *A Manual to Create Atheists* by **Peter Boghossian**. Instead of using Biblical arguments, looking for contradictions, or attempting to debunk wild arguments for god, I realized that most of religious belief is based on the cornerstone of faith. Faith generally means belief without evidence, but in the case of religion - it is 'pretending to know something you don't know'. Do theists really pretend? No, but in the context of putting virtue into the epistemology of faith - people tend to reduce their critical thinking and look for signs to match their cognitive bias. When looking for examples of god working in your life, you'll find something that seems to make sense. Keeping tempers low, and minds open, questioning faith is about questioning whether one can really be super confident when an epistemology leads to various conclusions."
>
> — Dem0n0cracy (2019), "r/DebateAnAtheist new Mod Introduction" (Ñº), Feb 14

Quotes | By

The following are quotes by Boghossian:

> "You cannot know the future, so take action. Don't wait for things to happen. Don't pray. Don't have faith. Don't rely upon imagined entities. Act."
>
> — Peter Boghossian (2013), *A Manual For Creating Atheists* (Ñº)

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External links

â— Peter Boghossian – Wikipedia.

θΔics

In hmolscience, **Peter Corning** (1935-) is an American socioeconomic ecologist, biologist, and complexity theorist, noted his 1981 to 2003 effort to promulgate a melting pot theory, e.g. cybernetics, dissipative structures, systems theory, ad hoc thermodynamics arguments, etc. to argue for a synergy-based theory of evolution.

Overview

In 1981, Corning, in his *The Synergism Hypothesis: A Theory of Progressive Evolution*, began to discuss a mixture of: energy, thermodynamics, cybernetics, James Miller's systems theory, Howard Odum, Elizabeth Odum, Herbert Spencer, Alfred Lotka, Leslie White, Ilya Prigogine, among others to argue for a "synergy" based theory of evolution. [4]

In 1998, Corning was publishing articles on thermodynamics, information, and life, therein discussing ideas on entropy, thermoeconomics, and discussions on synergy, bioeconomics, and cybernetics in the context of evolution. [1]

In 2003, Corning, in his *Nature's Magic: Synergy in Evolution and the Fate of Humankind*, his most popular book, having gone through seven-editions, penned an end chapter on the application of thermodynamics, by those as Ilya Prigogine, Harold Morowitz, Erwin Schrödinger, Pierre Teilhard, Stuart Kauffman, etc., to the humanities and history. [2]

Difficulties

Corning's understanding of thermodynamics, to note, seems to be very skewed and incorrect, as exemplified by the following quote:

> "Evolution is not simply an epiphenomenon of a few fancy laws. To illustrate, in physicist J. Willard Gibbs' classic formulation of the second law of thermodynamics, no fewer than 11 real-world constraints, including gravity and various other physical forces, have to be set aside. In other words, if you want to use Gibbs' 'law' to predict what will happen in the real world, you have to relax all those constraints and deal with the mess that results. That's what engineers, as opposed to theoretical physicists, have to do every day."

Corretly, Corning's statement is backwards as Gibbs incorporated gravity (section: 'the conditions of equilibrium for heterogeneous masses under the influence of gravity') and nearly every constraint, e.g. electromagnetic force, one could conceive of, resulting in the most elegant real world applications of prediction used in science.

Education

Corning completed his BA from Brown University and an interdisciplinary social science-life science PhD degree from New York University in 1971, with a thesis on "The Theory of Evolution as a Paradigm for the Analysis of Political Phenomena". [3] Later he was awarded a two-year NIMH post-doctoral fellowship for additional study and research at the Institute for Behavioral Genetics at the University of Colorado. After his post-doctorate degree, he taught in the interdisciplinary Human Biology Program at Stanford University for seven years, along with research appointments in the Behavior Genetics Laboratory of the Stanford Medical School and in the Department of Engineering Economic Systems.

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From Thermodynamics and Information Theory to Thermoeconomics and Control Information, pgs. 311-78; ch. 12: To Be or Entropy: Thermodynamics, Information, and Life Revisited, pgs. 313-). University of Chicago Press.
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3. Corning, Peter A. (1971). "The Theory of Evolution as a Paradigm for the Analysis of Political Phenomena" (abs), PhD thesis/dissertation, New York University.
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● Peter Corning – Wikipedia.
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● Synergy Live – blog on holistic Darwinism, by Peter Corning.

θΔics

In existographies, **Peter Carter Dodd** (c.1925-c.2000) is or was an American social scientist, possibly the son of Stuart Dodd, noted for []

Overview

In 1950, Dodd, at the, completed his 78-page BA senior thesis, presented to the School of Public and International Affairs, aka Woodrow Wilson School, at Princeton University, on "Social Physics: Theory and Application of Demographic Gravitation", a precipitate, in some way, of Princeton Department of Social Physics (or Princeton social physics), which he abstracted by seven summary points; the first three of which are as follows: [1]

> 1. Social physics is based on an analogy, between molecules and men. It is suggested that, in the aggregate, human beings may behave according to much the same principles as physical bodies. This is a logically loose analogy, intended primarily for suggesting new concepts and stimulating investigation.
>
> 2. One of the first theories suggested is that of demographic gravitation (see: social gravitation), or the influence of people at a distance. Derived from this is the concept of mutual energy between two populations, which is given by the formula:
>
> $$G_D = \frac{P_1 P_2}{D}$$
>
> The population may be weighted if they are not approximately homogeneous.
>
> 3. The mutual energy of two populations seems to be related to a number of quite different indices: intercity communication, transportation, newspaper articles by place of origin, migration, check clearances, etc.

(add)

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θΔics

In existographies, **Peter Elias** (1923-2001) was an American electrical engineer and information theorist noted, in science, for his 1958 parody editorial article “Two Famous Papers”, wherein he critiqued two made-up articles, in the first of which he mocked the Shannon bandwagon effect of the ballooned usage of information theory in unwarranted applications in fields ‘outside’ of information theory, such as: religion, photosynthesis, psychology, business organization, genetics, linguistics, psychiatry, etc. some 16+ fields in total by the time of the third symposium on information theory, and in the second of which he did a Sokal affair stylized fictional article to mock the situation. [1]

Education

Elias attended Swarthmore College from 1940 to 1941, after which he transferred to MIT in 1942 completing his SB in business and engineering management in 1944. He then served two years in the US Navy, as a radio technician instructor and electronics technician. Following is discharge in 1946 Elias completed an MA in mechanical engineering and science and PhD from Harvard University. In 1953, he became a professor at MIT and in 1960, at the age of 37, became the head of the MIT electrical engineering and computer science department, the youngest ever to do so. [2]

Two Famous Papers

The following is Elias' very-humorous 1958 editorial article "Two Famous Papers" a parody of the Shannon bandwagon. [1]

Two Famous Papers

PETER ELIAS

September 1958

It is common in editorials to discuss matters of general policy and not specific research. But the two papers I would like to describe have been written so often, by so many different authors under so many different titles, that they have earned editorial consideration.

The first paper has the generic title “Information Theory, Photosynthesis and Religion” (title courtesy of D. A. Huffman), and is written by an engineer or physicist. **It discusses the surprisingly close relationship between the vocabulary and conceptual framework of information theory and that of psychology (or genetics, or linguistics, or psychiatry, or business organization).** It is pointed out that the concepts of structure, pattern, entropy, noise, transmitter, receiver, and code are (when properly interpreted) central to both. **Having placed the discipline of psychology for the first time on a sound scientific base,** the author modestly leaves the filling in of the outline to the psychologists. He has, of course, read up on the field in preparation for writing the paper, and has a firm grasp of the essentials, but **he has been anxious not to clutter his mind with such details as the state of knowledge in the field,** what the central problems are, how they are being attacked, et cetera, et cetera, et cetera.

There is a constructive alternative for the author of this paper. If he is willing to give up larceny for a life of honest toil, he can find a competent psychologist and spend several years at intensive mutual education, leading to productive joint research. But this has some disadvantages from his point of view. First, psychology would not be placed on a sound scientific base for several extra years. Second, he might find himself, as so many have, diverted from the broader questions, wasting his time on problems whose only merit is that they are vitally important, unsolved, and in need of interdisciplinary effort. In fact, he might spend so much time solving such problems that psychology never *would* be placed on a sound scientific base.

The second paper is typically called “The Optimum Linear Mean Square Filter for Separating Sinusoidally Modulated Triangular Signals from Randomly Sampled Stationary Gaussian Noise, with Applications to a Problem in Radar.” The details vary from version to version, but the initial physical problem has as its major interest its obvious nonlinearity. **An effective discussion of this problem would require some really new thinking of a difficult sort, so the author quickly substitutes an unrelated linear problem which is more amenable to analysis.** He treats this irrelevant linear problem in a very general way, and by a triumph of analytical technique is able to present its solution, not quite in closed form, but as the solution to an integral equation whose kernal is the solution to another, bivariate integral equation. He notes that the problem is now in a form in which standard numerical analysis techniques, and one of the micromicrosecond computers which people are now beginning to discuss, can provide detailed answers to specific questions. Many authors might rest here (in fact many do), but ours wants real insight into the character of the results. By carefully taking limits and investigating asymptotic behavior he succeeds in showing that in a few very special cases (which include all those which have any conceivable application or offer any significant insight) the results of this analysis agree with the results of the Wiener-Lee-Zadeh-Raggazzini theory—the very results, indeed, which Wiener, Lee, Zadeh, and Raggazzini obtained years before.

These two papers have been written—and even published—often enough by now.

I suggest that we stop writing them, and release a large supply of manpower to work on the exciting and important problems which need investigation.

See the 2001 MIT Project History article “Information Theory and the Digital Age” for an inside look at Elias' role in the early bandwagon years. [3]

Sokal affair

In historical classification, the Elias "Two Famous Papers" editorial is classified as the "original" Sokal affair. Specifically, Elias second so-called famous (fictional) article, which Elias entitled "The Optimum Linear Mean Square Filter for Separating Sinusoidally modulated Trianglular Signals from Randomly Sampled Stationary Gaussian Noise, with Applications to a Problem in Radar", is but an early-prototype example of what has recently become categorized, in modern science writing, as a 'Sokal affair', the result of a publishing hoax perpetrated by Alan Sokal, a physics professor at New York University, who in early 1996 submitted an science article entitled 'Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity', to *Social Text*, an academic journal of postmodern cultural studies, in which he proposed that quantum gravity is a social and linguistic construct—but then, on its date of publication (May 1996), revealed in the magazine *Lingua Franca* that the article was a hoax, identifying it as "a pastiche of left-wing cant, fawning references, grandiose quotations, and outright nonsense, structured around the silliest quotations [by postmodernist academics] he could find about mathematics and physics." [4]

The similarity between the two is obvious—both are fake titles, making a parody of both authors who use overly-verbose and over-technical terminology, giving a false allusion of depth of truthfulness of content, and readers who are duped into believing in the content of such articles:

Elias (1958)	**Sokal (1996)**
"The Optimum Linear Mean Square Filter for Separating Sinusoidally modulated Trianglular Signals from Randomly Sampled Stationary Gaussian Noise, with Applications to a Problem in Radar."	"Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity."

The difference between the two is that in the Elias case it was an inside joke from the get go, particularly for regular readers and conference goers of the *Institute of Radio Engineers, Transactions on Information Theory*, whereas in the Sokal case, for the readers and editors of *Social Text*, the joke was on them.

Secondary corroboration that the use of Shannon's 1948 information theory, outside of communication engineering proper, is the "original Sokal affair", as embodied in the parody humor of the second of Elias' 1958 "Two Famous Papers" editorial, is the fact that American electrochemical engineer Libb Thims entitled his 2012 JHT article, on Shannon and the misuse of his information theory, as: "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair", before he became aware of Elias and his "Two Famous Papers" Sokal affair style editorial, found through research. [5]

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3. Aftab, O., Cheung, P., Kim, A., Thakkar, S., and Yeddanapudi, N. (2001). "Information Theory and the Digital Age" (§: Bandwagon, pgs. 9-11), Project History, Massachusetts Institute of Technology.
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â— Peter Elias – Wikipedia.

θΔics

In existographies, **Peter Ewart** (1767-1842) (CR:2) was British engineer, noted for []

Dalton | Atoms

In 1810, John Dalton had Ewart make him a set of wooden balls, shown below, of different sizes, that could be connected via metal pins and holes in each ball, so to demonstrate his newly "atomic theory": [1]

(add)

Education

Ewart was trained by James Watt and Matthew Boulton, and was said to have been an adherent of the caloric theory of heat. [3]

Quotes | On

The following are quotes on Ewart:

> "The question has long been agitated, whether mechanical force is to be measured by the mass multiplied into the velocity, or into the square of the velocity. The last of these opinions was adopted by Hooke and Huygens, in consequence of their observations on the motions of pendulums. It was also adopted by Smeaton, in consequence of his experiments on the mechanical action of water. **Ewart** supports the opinion of Smeaton with great force of reasoning. The essay is remarkable for the extensive knowledge of the subject which the author displays, and for the great perspicuity of his reasoning, which is the consequence of this extensive knowledge. He gives a number of examples, which he considers as inconsistent with the common notion, discusses these examples, and gives us a very full history of the opinions of mechanical writers on the subject."
>
> — Washington Irving (1814), *The Analectic Magazine, Volume Three* (pg. 352)

> "My friend **Ewart**, at my suggestion, suggestion, made me a **number of equal balls** about an inch in diameter about thirty years ago; they have been in use ever since, I occasionally showing them to my pupils. One ball had 12 holes in it equidistant, and twelve pins were stuck in the other balls so as to arrange the 12 around the one and be in contact with it; they (the 12) were about 1/10th of an inch asunder. Another ball, with 8 equidistant holes in it; and they (the 8) were about 3/10th of an inch asunder, a regular series of equidistant atoms. I had no idea at the time that the atoms were all of a bulk, but for the sake of illustration I had them made alike."

— John Dalton (1842), “On the Analysis of Sugar” [2]

References

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(c) Imagining Atoms – Science and Industry Museum.
3. Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (Ewart, 16+ pgs; trained, pg. 162). Cornell University Press.

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● Ewart, Peter. (1813). “On the Measure of Moving Force” (abs), *Memoirs of the Literary and Philosophical Society of Manchester*, 2(2):105-258.

External links

● Peter Ewart – Wikipedia.

θΔics

In hmolscience, **Peter Fong** (c.1926-) is an American physicist noted for his 1988 "Ethics, Politics and Sociology as Newtonian Sciences", wherein he outlines the premise of Newtonian sociology, and for his 1996 *Unification of Science and Humanity: Agony and Ecstasy East of Eden*, wherein he to explain the biological, social and cultural evolution of humankind starting with the fundamental laws of physics. [1]

Education

Fong completed his PhD in 1953 in theoretical geophysics (Q) at the University of Chicago, and in 1966 became a physics professor at Emory University, retiring in 2005. (Q) Fong is best known for his statistical theory of nuclear fission, and also has been also a freelance columnist for the *New York Times*, the *Christian Science Monitor*, the *San Francisco Chronicle*, the *Atlanta Journal*, and the *Atlanta Constitution*, and has written over a hundred publications in the physical sciences, philosophy, history, and social studies.

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θΔics

In hmolscience, **Peter Freese** (1939-) is a German literature theorist noted, in literature thermodynamics, for his commentaries on the use of entropy and apocalypse in works of various authors, of those such as Bernard Malamud, Thomas Pynchon, Kurt Vonnegut, William Gaddis, and Henry Adams.

Overview

In 1995, Freese, in his "Surviving the End: Apocalypse, Evolution, and Entropy in Bernard Malamud, Kurt Vonnegut, and Thomas Pynchon", discussed the work of Thomas Pynchon. [1]

In 1997, Freese published *From Apocalypse to Entropy and Beyond: the Second Law of Thermodynamics in Post-War American Fiction*, a rather long tome on the use of thermodynamics in late 20th century American fiction. [2]

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Further reading

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External links

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â— Peter Freese (German → English) – Wikipedia.

θΔics

In hmolscience, **Peter B. Hammond** (1928-2014) was an American anthropologist noted, in anthropological thermodynamics, for his energy and entropy arguing *Cultural and Social Anthropology*.

Overview

In 1964, Hammond, in his *Cultural and Social Anthropology*, via citation to Leslie White, speculates on cultural operations through the guise of verbal thermodynamics; the following being some condensed extracts: [1]

> "To understand man in particular we must understand living material systems in general; cultural systems, like biological systems, expend energy that is captured [by the sun]; in performing a ritual, playing a game, regarding a churinga with awe, or breathing a silent prayer, the event is an expression of energy expended."

In his book, Hammond seems to cull a good deal from Erwin Schrodinger's 1944 *What is Life?*, and thus in turn Ludwig Boltzmann's entropy theories. Hammond argues, for instance, that the maintenance of life is a continuous balancing between positive entropy and negative entropy and that the evolution of life is the ascendance of negative entropy. He states that evolution can be defined as the progress of energy organization moving in a direction opposite to that specified for the cosmos by the second law of thermodynamics. [1]

Education

Hammond completed his BA in anthropology in 1951 from the Universidad de Puerto Rico; Universidad de las Americas, Mexico, and PhD in 1962 in anthropology from Northwestern University. [2] He was a professor emeritus of anthropology at the University of California, Los Angeles. [3]

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2. Peter B. Hammond (Curriculum Vitae) – Sscnet.ucla.edu.
3. Peter B. Hammond (faculty) – UCLA Anthropology.

External links

â— Hammond, Peter B. – WorldCat.org.

θΔics

In existographies, **Peter M. Hoffmann** (1968-) (CR:2) is an American physicist noted for his 2012 *Life's Ratchet: How Molecular Machines Extract Order from Chaos*, in which he attempts to explain how the "seemingly purposeful motions" of humans, as "merely sophisticated structures of lifeless molecules", originated, which supposedly has a decent life force and vital force historical introduction, a chapter on the entropy of a late night robber, citations of Aristotle, Democritus, Gottfried Leibniz and his "monad" theory, the Napoleon-Laplace anecdote that "banned God from the heavens", as Hoffmann puts it, Pierre Teilhard, Erwin Schrodinger, among others, discussing Helmholtz free energy along the way, albeit in the end using recourse to emergence and information theory. [1]

Education

Hoffmann completed his BS in physics and mathematics at the Technische Universität Clausthal, Germany, his MS in physics with a thesis on "Surface induced metastability in nanoscale (<10nm) physically- restricted n-decane crystallites" at Southern Illinois University, Carbondale, and his PhD in materials science and engineering at Johns Hopkins University. Currently, he is a physics professor at associate dean at Wayne State University.

Quotes | Employed

The following are quotes employed by Hoffmann:

> "That crude matter should have originally formed itself according to mechanical laws, that life should have sprung from the nature of what is lifeless, that matter should have been able to dispose itself into the form of a self-maintaining purposiveness—that [is] contradictory to reason."
>
> — Immanuel Kant (c.1770), *Publication*; cited by Peter Hoffmann (2012) in *Life's Ratchet* (pg. #)

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1. Hoffmann, Peter M. (2012). *Life's Ratchet: How Molecular Machines Extract Order from Chaos*. Basic Books.

Further reading

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External links

â— Peter Hoffmann (faculty) – Wayne State University.

θΔics

In existographies, **Peter Joseph Merola** (1979-) is an American filmmaker noted for his 2007 documentary *Zeitgeist*, which introduced a laymanized blanket version of Christ myth theory to the general public.

Overview

On 1 Jun 2007, Joseph published the film documentary *Zeitgeist*, the first part of it, the religion debunking part, being based on the astro-theology theories of Dorothy Murdock, which went viral, resulting in many youth becoming aware of the Jesus figure parallels that exist *prior* to the invention of Christianity, aka the Roman redaction (see: recension theory) of Egyptian religio-mythology.

Joseph, by 2012, had also admitted (Q) he was a fan of Jordan Maxwell and Jacque Frescos.

References

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See also

- Joseph Atwill

Further reading

- Murdock, Dorothy M. (aka Acharya S.) (c.2010). “Zeitgeist: the Movie: Companion Source Guide”, ZeitgeistMovie.com.

External links

- Peter Joseph – Wikipedia.

θΔics

In existographies, **Peter Landsberg** (1922-2010) (CR:12) was a German-born English physicist and statistical thermodynamicist noted for his views on a number of various topics such as black hole thermodynamics, cosmological thermodynamics, the thermodynamic arrow, the entropological proof, and an irreversible thermodynamics view of life, among others.

Overview

In 1961, Landsberg, in his lecture "Entropy and the Unity of Knowledge", gave the example of the tendency of a child's room to become messy as an example of entropy increase. [3]

Religion

In 1990, Landsberg, in his "From Entropy to God", a conference presentation, stated the following:

> "To talk about the implications of science for theology at a scientific meeting seems to break a taboo. But those who think so are out of date. During the last 15 years this taboo has been removed. What is this taboo? Expressed crudely, it is said that only established scientists should philosophize about science and as such they should be at or beyond middle age. Other scientists better stick to experiments, equations and the minutiae which make up the crucial building blocks of science. Later in life, but only if you are famous, may you discuss the temple of science as a whole. What is middle age? When Eddington gave his delightful Gifford Lectures in Edinburgh he was about 45 years old, the sort of age at which Hawking produced his 'popular' book."
>
> — Peter Landsberg (1990), "From Entropy to God" (pg. 380) [5]

> "Do these models give a pointer to god? The steady-state universe, the Hawking model... and the infinitely oscillating model decidedly do not. One might almost regard them as models manufactured for a 'society of atheists'."
>
> — Peter Landsberg (1990), "From Entropy to God" (pg. #) (Q)

The rest of the talk seems to revolve around a history of "entropy arguments for gods existence", which he says are not plausibly arguments, but are historical points of view that have been neglected for the last 70-years.

In 1999, Landsberg, aged 77, in his *Seeking Ultimates*, devoted his last chapter to the query 'Does God Exist?', in which he says Blaise Pascal is the "hero" of the chapter, which is code for agnostic leaning towards theism, aka to take Pascal's wager in one's last days of existence, such as John Neumann infamously did. [4]

Education

Landsberg completed his MS in 1946, his PhD and DIC (Diploma of the Imperial College) in 1949, and DSc in 1966. [2] Landsberg wrote several books and published over 300 papers. Landsberg was professor and then emeritus professor at the University of Southampton, 1972 to till his reaction end. [1]

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θΔics

In existographies, **Peter M. Lichtenstein** (1944-) is an American economist noted for []

Overview

In 1982, Lichtenstein, "Thermodynamic, Marxian, and Neoclassical Resource Methodologies", building on the ideas of Nicholas Georgescu-Roegen and Ilya Prigogine, attempted to outline ideas on social thermodynamics.

Education

Lichtenstein completed his BA and an MS from Union College and an MA and PhD in economics from the University of Colorado. He was a professor of economics at Boise State University from 1975 until his retirement in 2006. (Ñº)

Quotes | By

The following are quotes by Lichtenstein:

> "The social thermodynamic perspective: thermodynamics, as a theory of social science, is still relatively and has not yet attained the full status of an academic school. Nevertheless, there is an overall pattern of views which seems to characterize thermodynamic interpretations of society."
>
> — Peter Lichtenstein (1982), "Thermodynamic, Marxian, and Neoclassical Resource Methodologies" (pg. 90) [1]

> "The philosophical basis of social thermodynamics is the perceived relationship between man and nature. In social thermodynamics, there exists certain natural laws which are common to both the human and the physical universe irrespective of the form which society takes."
>
> — Peter Lichtenstein (1982), "Thermodynamic, Marxian, and Neoclassical Resource Methodologies" (pg. 90) [1]

References

1. Lichtenstein, Peter M. (1982). "Thermodynamic, Marxian, and Neoclassical Resource Methodologies: a Comparative Analysis" (pg. 91), *Economic Forum, Volume 13, Winter 82-83*; in *Economic Forum, Volumes 13-14:89-104.* External links

External links

â— Lichtenstein, Peter M. (1944-) – WorldCat Identities.

θΔics

In science, **Peter Mander** (c.1955-) is an English-Danish physical chemist noted for his 2012-launched blog CarnotCycle, wherein in touches on topics surrounding the Carnot Cycle, classical thermodynamics, history, and physical chemistry, with some interjections into humanities implications, e.g. love, life, death, marriage, etc.

Overview

On 4 Aug 2012, Mander, in his "How Kelvin and Clausius discovered Carnot's ideas" (Q), wherein he cites William Thomson as stating in Oct 1848 that he first became of Sadi Carnot's theory via the 1837 translation of Emile Clapeyron's memoir on Carnot (see: Thomson's search for Carnot's Reflections), and how Clausius became aware of Carnot via Thomson.

On 1 Dec 2012, Mander, in his "On Reading Gibbs" (Q), commented on the John Strutt and Gibbs communications on the density of Gibbs *Equilibrium*:

The original two-volume set (Q) of Pareto's *Trattato di Sociologia generale* (1916).

> "Your *Equilibrium of Heterogeneous Substances* is too condensed and too difficult for most, I might say all, readers."
>
> — John Strutt (1892), letter to Gibbs, Jun 5

> "I myself had come to the conclusion that the fault was that it was too *long*. I do not think that I had any sense of the value of time, of my own or others, when I wrote it."
>
> — Willard Gibbs (1892), reply letter to Johann Strutt, Jun 27

On 1 Feb 2013, Mander, in his "Rankine on Entropy, Love and Marriage" (Q), blogged on firstly on Rankine's version of the new heat function, a variant of what Clausius would eventually call entropy, and secondly on Rankine's circa 1845 "The Mathematician in Love", about which he commented:

> "Rankine never found the time to test this theory in practice. He died a bachelor on Christmas Eve 1872, at the age of 52, of overwork."

Mander has blogged on other related topics, e.g. Legendre transform, Thomsen-Berthelot principle, exact differential vs inexact differential, and connective humanities implications, e.g. thermodynamics in respect to "life" (Q) and "death" (Q), Gibbs on entropy as mixed-up-ness (Q) , among other topics.

Library

Mander, in his blog, has a "library" (Q) dropmenu section, wherein he lists noted thermodynamics-related books, namely: Sadi Carnot (1824), James Maxwell (1873), Rudolf Clausius (1879), Max Planck (1897), Edgar Buckingham (1900), G.H. Bryan (1907), James Partington (1913), Gilbert Lewis (1923), Edward Guggenheim (1933), Enrico fermi (1936), Paul Epstein (1937), and Henry Margenau and George Murphy (1943), many via appealing greenery-background visual artwork; some of which are shown below:

Mander, in his blog, has a "library" (Q) dropmenu section, wherein he lists noted thermodynamics-related books, many via appealing visual artwork; some of which are shown below; along his funny "not now honey I'm reading Gibbs" image, which is reminiscent of the 1885 Thomson wife anecdote, wherein, while musing upon the subject of thermodynamics one day, William Thomson suddenly realized that his wife was discussing plans for an afternoon excursion, to which he replied: [2]

“At what time,” he asked, glancing up, “does the dissipation of energy begin?”

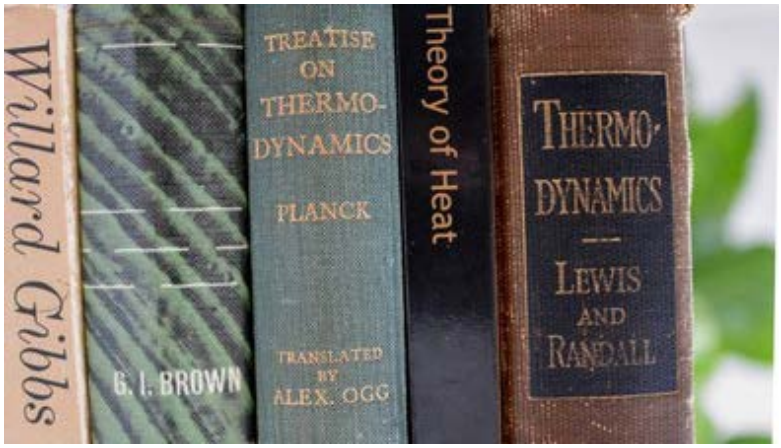

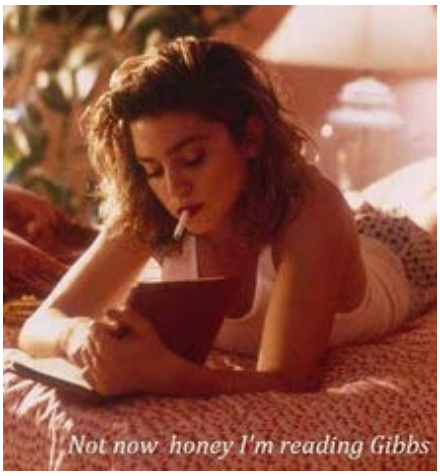

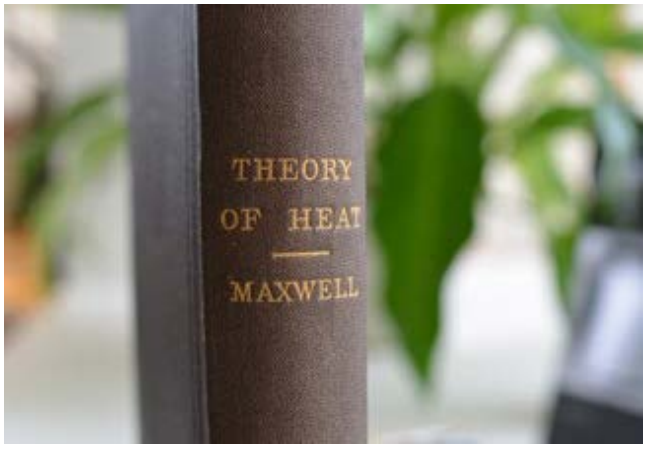

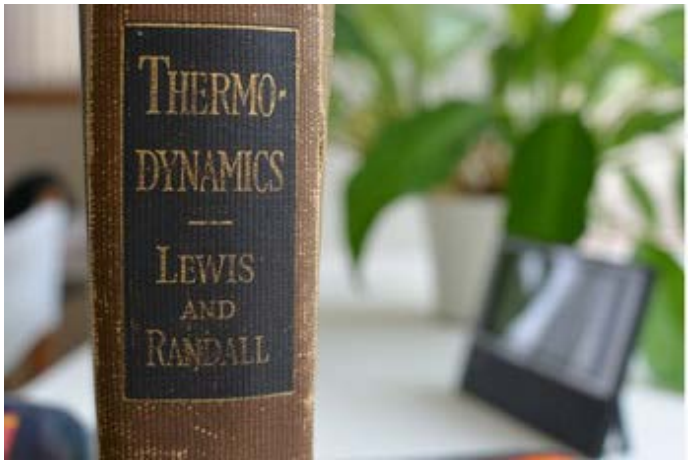

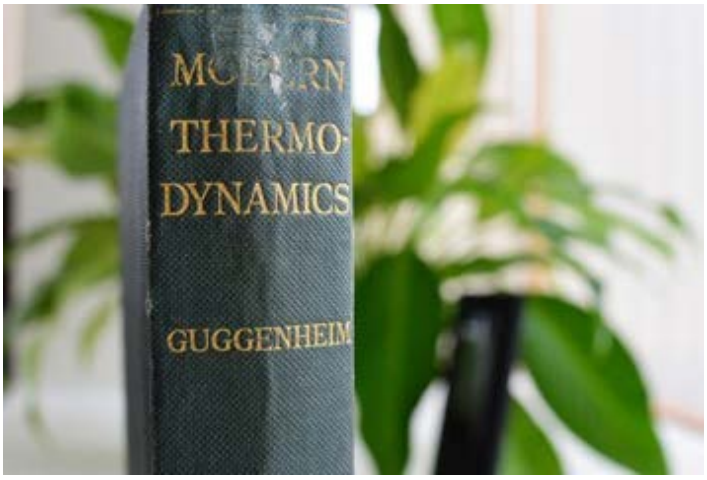

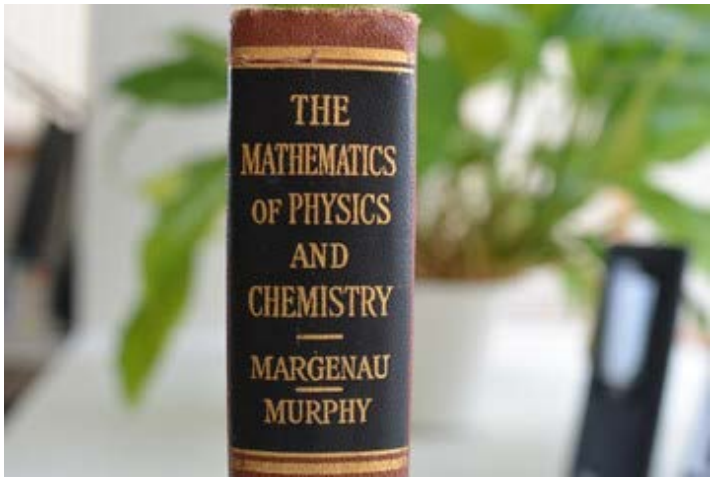

(add discussion)

Religion

Mander seemingly as some type of Christianity belief affiliation, being that, as he states (Q), he buys some of his thermodynamics books, at his local church book drives.

Education

Mander describes himself as a physical chemist by training with a keen interest in classical thermodynamics and its historical development. [1]

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1. (a) About – CarnotCycle, WordPress.
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2. (a) Cleveland, Cutler J., and Morris, Chris. (2006). *Dictionary of Energy* ("At what time does the dissipation of energy begin?" —William Thomson (1885; applying the terminology of his studies of thermodynamics to a question for his wife about their plans for an afternoon walk), pg. 497). Elsevier.
(b) Bell, Eric T. (1999). *Men of Mathematics.* Turtleback Books.
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θΔics

In hmolscience, **Peter Mauersberger** (1928-2007) was a German geophysicist and hydro-ecologist noted, in limnological thermodynamics, for doing some of the first chemical thermodynamic modelling of aquatic ecosystems, beginning in 1977, resulting in a number of publications outlining a theory of physico-chemical-biological processes in aquatic ecosystems, wherein he treats "biotic species" as but "components" of a Gibbsian system, i.e. physico-chemical species in a system, using Gibbsian thermodynamics methods.

Molecular aquatic ecosystem thermodynamics

In 1977, Mauersberger began working on his theory of physico-chemical-biological processes in aquatic ecosystems (surface water and underground water).

In 1981, in his “Entropy and Free Enthalpy in an Aquatic Ecosystem”, Mauersberger applied chemical thermodynamics to aquatic ecosystems, which he abstracts as follows: [1]

> “Modelling aquatic ecosystems, the second law of thermodynamics must be taken into consideration: The local entropy production always is positive definite. Therefore, this paper deals with the definition of thermodynamic functions in the framework of the macroscopic theory of aquatic ecosystems. Taking dissolved and inorganic material, particulate organic matter, solid phases, and aquatic biota at different trophic levels into account, the entropy, the free enthalpy, and the free energy in an aquatic ecosystem are determined on the basis of the theory of dilute solutions.”

In Mauersberger's 1985 publication on the "Local Entropy Production in Aquatic Ecosystems", similar to human molecular theory, albeit in the context of animate matter in liquid environments, ecosystem dynamics are treated as a type of multi-species community, where water, chemical constituents and aquatic organisms are all dealt with in a single formulation. [2] In this work, he states:

> "In the thermodynamic theory of aquatic ecosystems our basic postulate is that not only the physical and chemical processes but also some biological phenomena can be studied with reference to the laws of thermodynamics, at least to a good approximation on the macroscopic scale, if the Gibbs relation is generalized by introducing biotic species as "components" of the ecosystem in addition to the chemical constituents (organic and inorganic, particulate and dissolved matter)."

In order to include the animate systems directly into his thermodynamic formulation of aquatic ecosystems, Mauersberger employed two approximations:

1. In order to decrease the complexity of considering an individual's biomass, he introduced the concept of the chemical potential μ_i per unit mass for the ith species. The biomass composition of each (animate) species was assumed to be time-independent.
2. Energy and nutrient storage in aquatic organisms was accounted for by introducing balance equations with mass density terms differentiating photosynthetically produced organic substances, nutrients, chemicals engaged in internal energy storage, and the biomass of each species. [2]

These approximations allow for simplified expressions of the ecosystem's density and mass fractions by summing the water, chemical and biotic constituents directly. The animate components of the system were viewed as interactive entities within the larger aquatic environment, and were separated from the chemical constituents due to their composition and in order to be able to describe their kinetics separately from the purely chemical components. Thus Mauersberger's approach makes no explicit distinction between animate and inanimate components from a thermodynamic point of view.

In 1988, Mauersberger, in his “Generalized Gibbs Equation in the Theory of Aquatic Ecosystems”, outlined what he called the "Gibbs relation" for aquatic systems, namely a formulation of the fundamental Gibbs equation in terms of water, chemical, and biological matter:

$$T\frac{ds}{dt} = \frac{du}{dt} + p\frac{d\alpha}{dt} - \sum_j \mu_j \frac{dN_j}{dt} - \sum_k \left(\beta_k \frac{dB_k}{dt} + \beta_k \sum_n \mu_{kn} \frac{dm_{kn}}{dt} \right)$$

where s is the specific entropy density, u is the specific internal energy, α the specific volume, μ_j, N_j are the chemical potential and mass fraction of the chemical components, whereas β_k, B_k are used to denote the species-specific potential and mass fractions. The use of chemical energy by a animate species is accounted for in the terms μ_{kn}, m_{kn} which correspond to the chemical potential and mass fraction of the *n*-th substance within the *k*-th animate species. [3]

His work, contrary to people defined as molecules (human molecules or human chemical species) having chemical potentials, has not been the subject of any roaring debates, and indeed have spawned a number of books and papers. Sven Jorgensen, Alexander Zotin and other thermodynamically-inclined biologists and biophysicists have a considerable number of non-human works describing either entire ecosystems or individual organisms as nothing more than molecules or 'chemical species.' [4]

Education

Mauersberger completed his BS in geophysics from Humboldt University, in 1956 he completed his PhD, with a dissertation on the application of the Hamilton-Jacobi theory in hydrodynamics, and in 1964 completed his habilitation, at Humboldt University, with work on the foundations of theoretical magnetohydrodynamics in geophysics. From 1965 until his retirement in 1994, he lectured and researched in hydrology, geophysics, and geoecology, at Humboldt University, eventually becoming department head.

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1. Mauersberger, Peter. (1981). “Entropy and Free Enthalpy in an Aquatic Ecosystem” (abs), *Acta Hydrophysica*, 26(1): 67-90.
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3. Mauersberger, Peter. (1982). *Irreversibility in Hydrology* (*Irreversibilität in der Hydrologie*). Akademie-Verlag, Berlin.
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5. Mauersberger, Peter. (1988). “Generalized Gibbs Equation in the Theory of Aquatic Ecosystems”, *Acta Hydrophysica*, 32:27-36; in: *Complex Ecology* (editors: Bernard Patten and Sven Jorgensen) (Gibbs relation, pgs. 31-46). Prentice Hall, 1994.

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External links

● Peter Mauersberger (German → English) – Wikipedia.

θΔics

In hmolscience, **Peter Middleton** (1950-) is an English science, literature, and poetry scholar noted for his 2015 *Physics Envy: American Poetry and Science in the Cold War and After*, wherein, themed on the topic of "physics envy" (Philip Mirowski, 1989), from the vantage point of poetry + science connections, he springboards of Muriel Rukeyser's 1942 discussion of Lawrence Henderson's sociological extension of the combined work of Willard Gibbs and Vilfredo Pareto, he gives a modern digression, via citation to Joel Isaac (2008), of the Harvard Pareto circle; giving commentary on related thinkers, such as: Henry Adams, Irving Fisher (in respect to Gibbs), among others. [1]

Education

Middleton studied at Oxford, Sheffield, and SUNY Buffalo; currently he is a professor of English at the University of Southampton, UK, and is secretary of the British Society for Literature. (Ñº) His research interests include: research interests include science and literature, modern and contemporary poetry, poetry performance, ecology and climate change, critical theory, gender studies, and philosophy and literature.

Quotes

The following are noted quotes:

> "Milton Friedman described Fisher as 'the greatest economist the United States has ever produced.' Others are harsher in their judgment. In his critique of neoclassical economics for its lack of understanding of the consequences of borrowing conceptual metaphors of energy and field, Philip Mirowski argues that fisher was a major contributor to a long history of poorly 'reprocessed physics' in economics up the present day. Mirowski himself, however, does not simply dismiss such reprocessings as 'physics envy', concluding instead that that what is needed is not to expel these metaphors but to give more attention to the epistemological stakes. Why have they been so valuable and do they remain so? Such questions were raised at Harvard in the 1930s, though not so much in the discipline of economics. After Fisher's momentary appearance, Rukeyser introduces an influential sociologist [physiologist] at Harvard, Lawrence Henderson, saying simply that 'he has written a study of Pareto in the light of Gibbs.' This is an understatement."
>
> — Peter Middleton (2015), *Physics Envy* (pg. 130)

References

1. (a) Middleton, Peter. (2015). *Physics Envy: American Poetry and Science in the Cold War and After* ((§4:Conceptual Schemes: The Midcentury Poetics of Muriel Rukeyser and Charles Olson, pgs. 117-50; §§:Willard Gibbs and Social Science, pgs. 127-; Gibbs, 34+ pgs; Henderson, 13+ pgs; Pareto, 8+ pgs). University of Chicago Press.
(b) Rukeyser, Muriel. (1942). *Willard Gibbs: American Genius* (Henderson, pgs. 392-95, 418. Doubleday, Doran & Co., Inc.

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θΔics

In science, **Peter Mitchell** (1920-1992) was an English biochemist noted for his

Overview

In 1961, Mitchell introduced his chemiosmotic theory of membrane energy transduction, in which he showed that ATP synthesis, in the mitochondria, was coupled to electrochemical gradients. [1]

In 1977, in commenting in retrospect Mitchell stated: [3]

> "In 1961, the four postulates were almost entirely hypothetical; now after sixteen years of experimental scrutiny, they are now generally accepted as experimental facts. My 1966 review has been frequently cited because it was the first paper in which the chemiosmotic rational was discussed in depth, and examined stoichiometrically, thermodynamically, kinetically, and mechanistically in light of available experimental data on the systems described by the four postulates."

His 1966 review of his theory, entitled "Chemiosmotic Coupling in Oxidative and Photosynthetic Phosphorylation", went on to become a citation. [2] Mitchell is loosely considered the founder of membrane bioenergetics. [4] Mitchell received the 1978 Nobel Prize for his theory and in his Nobel Lecture cites what he calls the "rather abstract thermodynamic treatment" of chemical transport described in Edward Guggenheim's 1933 thermodynamics textbook. [5]

Education

Mitchell completed undergraduate work at Queen's College in the 1940s. In 1942, he began research in the biochemistry department of Cambridge completing his PhD there in 1950 on the topic of the mode of action of penicillin. In 1955, he became the head of the biochemical research unit at Edinburg University, staying there until 1963.

References

1. Peter Mitchell (1961). "Coupling of phosphorylation to electron and hydrogen transfer by a chemi-osmotic type of mechanism". Nature 191: 144–148.
2. Mitchell, Peter. (1966). "Chemiosmotic Coupling in Oxidative and Photosynthetic Phosphorylation" (abstract), *Bio. Rev. Cambridge Phil. Soc.* 41: 445-502.
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4. Nicholls, David G. and Ferguson, Stuart J. (2001). *Bioenergetics3* (pg. ix) New York: Academic Press.
5. Mitchell, Peter. (1978). "David Keilin's Respiratory Chain Concept and its Chemiosmotic Consequences", Nobel Lecture, pgs. 1-36. Dec 08.

External links

â— Peter D. Mitchell – Wikipedia.
â— Peter Mitchell – NNDB.com.
â— Peter Dennis Mitchell – Nobel-Winners.com.

θΔics

In science, **Peter M. Molton** (c. 1943-) is an American chemist, of the University of Maryland, noted, in chnops-thermodynamics, for his 1978 definition of life as “regions of order that use energy to maintain their organization against the disruptive force of entropy.” [1]

References

1. (a) Molton, Peter M. (1978). “Polymers to Living Cells: Molecules against Entropy”, *Journal of the British Interplanetary Society*, Vol. 31, pg. 147.
(b) Bradley, Walter L. (2004). “Information, Entropy, and the Origin of Life” (pgs. 331-51), ch. 18, in *Debating Design* by William A. Dembski and Michael Ruse. Cambridge University Press.

Further reading

â— Molton, Peter M. and Ponnamperuma, Cyril. (1974). “Aminonitriles: Possible Role in Chemical Evolution” (pgs. 127-36) in *Cosmochemical Evolution and the Origins of Life* by J. Oro, Spain International Conference on the Origin of Life (1974). Springer.

θΔics

In hmolscience, **Peter Pogany** (c.1939-) is a Hungarian-born American economist noted, in human thermodynamics, for his 2006 *Rethinking the World*, wherein he argues that humans are over-grown supermolecules and that culture is a thermodynamic "system".

Overview

In 2006, Pogany, in his *Rethinking the World*, penned a chapter on the thermodynamics of cultural evolution; the following being a condensed extract from this work: [1]

> "Culture may be regarded as a thermodynamics system … the world's economic and commercial activities may be reduced to the simple definition of organized molecular structures creating, maintaining, operating, discarding, and reusing other organized molecular structures; [and] cultural evolution is subject to the laws of thermodynamics."

Pogany goes on to give a good basis of thermodynamic reasoning, discussing Carnot, Clausius, Boltzmann, Gibbs, Prigogine, and a few others, giving an "island example" along the way, but then derails in his analysis by delving into discussions on Claude Shannon and measures of information entropy in bits. He does, however, interestingly, define states of condensed matter, e.g. a piece of coal, as an energy carrier; and superficially discusses the arrow of time, exergy, internal entropy, external entropy, negative entropy, and free energy among other points. He seems to cull his understanding of "free energy", to note, from Nicholas Georgescu-Roegen, which weakens his approach to an extent.

On people viewed as larger molecules (human molecules), Pogany states:

> "Accumulated knowledge suggests that humans are billions of highly evolved, overgrown **super-molecules** (or 'intensely conscious mice'?) that swarm in ever larger numbers on a piece of rock that wobbles, spins, revolves, and soars into nothingness at break-neck speed with an agitated, burning furnace in its interior."

As to the origin behind Pogany's quote, and his bracketed mention of mice, seems to come from American physical chemist Martin Goldstein's 1993 section "The Entropy of a Mouse" from his book *The Refrigerator and the Universe*, as listed in Pogany's bibliography, in which Goldstein explains how to calculate the entropy of a mouse. On history, Pogany states: [3]

> "Global history is a 'disequilibrium thermodynamic process' manifest through transformations in billions of physically interconnected cerebral cortices."

(add discussion)

Education

Pogany completed his "dr. oec" (PhD) in industrial economics in 1962 from the University of Economics, Budapest, Hungary, and a post-doctoral MA in 1967 in regional economics from the Wharton School, of the University of Pennsylvania. [2]

References

1. Pogany, Peter. (2006). *Rethinking the World* (ch. 5: Cultural and Cultural Evolution in the Context of Thermodynamics, pg. 103-38). iUniverse (and Shenandoah Valley Research Press).
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3. ibid, Pogany. (2006). Global history quote, pg. 25.

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● Pogany, Peter. (2015). *Havoc, Thy Name is Twenty-First Century: Thermodynamic Isolation and the New World Order*. iUniverse.

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● Pogány, Péter – WorldCat.org.
● Peter Pogany (about me) – Helium.com.
● Peter Pogany – Scribd.com.

θΔics

In hmolscience, **Peter Richmond** (c.1942-) is an English-born Irish physicist noted for an early 2000 course on econophysics he taught to final year undergraduates at Trinity College Dublin and for his co-authorship of the 2013 *Econophysics and Physical Economics*, together with German physicist Jurgen Mimkes and German-Irish physicist Stefan Hutzler, wherein the speculate on concepts such as "economic pressure" in economic thermodynamic terms, along the way penning out stylized versions of a first law of economics and a second law of economics, similar in theme to that done by other thinkers such as Reiner Kummel (2011). [1]

Overview

In 1999, Richmond, supposedly, was among the about 200 people who met in Dublin to participate in the first congress on Application of Physics in Financial sponsored by the European Physical Society, focused on the growing subject of how many physicists have begun taking up employment in finance, working as '*quants*' in large and not so large investment banks and financial institutions across the world, whereby theoretical and computational physics is applied to quantitative finance as a research area. This was followed in 2000 by a second congress in Liege. Many other meetings have been held elsewhere and econophysics is now a well-established research topic within the broad field of statistical physics. [2]

From 2003-2012, Richmond was chair of two major concerted actions spanning 26 countries across Europe and sponsored by COST; 'Physics of Risk' (2003-2007) and 'Physics of Cooperation and Conflict' (2008-2012).

In 2009, Richmond gave a talk on “How Did Physics Become Involved in the Social and Economic Sciences?”, the abstract of which is as follows: [3]

> “Outlining the development of physics concerned with forces and machines as captured in the clockwork universe of Newton, Galileo and Kepler to the emergence of a new paradigm - the statistical universe of Boltzmann and Gibbs with its emphasis on states and their evolution. Prof **Richmond** will discuss how the move from this the treatment of people in the manner of atoms as proposed by Mandelbrot seems entirely logical. Some applications will be developed by way of illustration. In passing we shall begin to understand how wealth in societies is as it is and why stock markets can crash. To physicists, unlike, it would seem, some of our bankers, these possibilities were evident well before the present financial debacle.”

(add discussion)

Education

Richmond completed his BS in physics in 1964 and PhD in theoretical physics in 1967 both at Queen Mary College, London, followed by a DSc in theoretical colloid and surface science at the University of London. He has been a visiting professor at Trinity College Dublin since 1998, where he teaches physics and since early 2000 a course in econophysics, at some point.

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External links

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θΔics

In thermodynamics, **Peter A. Rock** (1939-2006) was an American chemical thermodynamicist, of the Lewis school of thermodynamics, noted for his 1969 textbook *Chemical Thermodynamics.* [1] The UC Davis Peter A. Rock Thermochemistry Laboratory is named after him. [2]

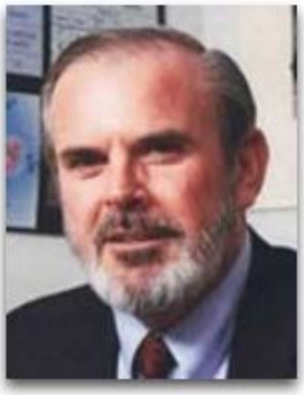

Education

Rock was born in 1939 in New Haven, Connecticut. He attended high school in Lowell, Massachusetts, and received his bachelor's degree in chemistry from Boston University in 1961. He then went on to UC Berkeley, where he was awarded a doctorate in physical chemistry and chemical thermodynamics in 1964. That same year, he joined the faculty at UC Davis as an assistant professor, where he remained for the rest of his career.

In his research, Rock measured the energy flows that accompany chemical reactions and used this training to advance theory within physical chemistry, study the chemistry of the Earth, and design treatments for medical disorders. His thermodynamic measurements were so precise that virtually all of them were incorporated into the National Institute for Standards and Technology source book that identifies data of the highest quality for use by the nation. Rock also wrote textbooks for students at all levels of chemistry and geochemistry, averaging a book every five years. His first book, *Chemical Thermodynamics: Principles and Applications*, written in 1969, remains in high demand and is still used as a text in engineering and geosciences. [3]

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External links

â— Peter A. Rock Hall – LocalWiki.org.

θΔics

In evolution thermodynamics, **Peter T. Saunders** (1939-) is an English mathematical biologist (mathematical chnopsologist) noted for []

Overview

In 1981, Saunders, in his "On the Increase in Complexity in Evolution", co-authored with Chinese-born English biophysicical geneticist Mae-Wan Ho, building, supposedly, on the theories of Conrad Waddington, draw an analogy between their view of evolutionary processes and non-equilibrium thermodynamics, especially the principle of minimum entropy production, in postulating a principle of minimum increase of complexity in evolution. [1] His research interests, as of 2012, as he states on his King's College faculty page, is as follows:

> "The aim of my research program is to explain the properties of organisms and other complex systems in terms of ordinary mathematics, physics and chemistry."

(add discussion)

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1. (a) Saunders, Peter T. and Ho, Mae-Wan. (1976). "On the Increase in Complexity in Evolution" (abs), *Journal of Theoretical Biology*, 63:375-84.
(b) Saunders, Peter T. and Ho, Mae-Wan. (1976). "On the Increase in Complexity in Evolution: II: the Relativity of Complexity and the Principle of Minimum Increase", (abs), *Journal of Theoretical Biology*, 90:515-30.
(c) Brooks, Daniel R. and Wilson, E.O. (1988). *Evolution as Entropy: Toward a Unified theory of Biology*. (pg. 19). University of Chicago Press.
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External links

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θΔics

In literature chemistry, **Peter Daniel Smith** (1965-) is an English writer noted for his late 1990s work on Goethe, *Elective Affinities*, and the two cultures.

Overview

In 1997, Smith, completed his PhD dissertation on the overlap of German literature and the world scientific view.

In 1999, Smith, in his "Elective Affinities: A Tale of Two Cultures?", connected and traces German polymath Johann Goethe's 1809 physical chemistry based romance novella up through English physicist C.P. Snow's 1959 "two cultures" divide of intellectual circles, touching along the way the similar works of: Emile Zola (*Therese Raquin*, 1867), Yevgeny Zamyatin (*We*, 1921), Primo Levi (*The Periodic* Table, 1975), John Banville (*The Newton Letter*, 1982), among others.

In 2007, Libb Thims, in his "Goethe's Affinities" chapter, cited Smith's work on Goethe. [4]

In 2012, Smith, in his "about me" section, summarized himself as such: [5]

> "I'm fascinated by the way the ideas of science permeate our lives and underpin our beliefs. My earlier study, *Metaphor and Materiality*, showed how in German literature, writers from Goethe through to Robert Musil and Bertolt Brecht explored scientific ideas in their work. Both books demonstrate that, far from being two divided cultures, science and literature are part of the same equation."

(add discussion)

Education

Smith completed his BA in 1992 at the University of Kent, and his MA (1993) and PhD (1997), both at the University College, London, the latter with a dissertation on "German Literature and the Scientific World-View in the Nineteenth and Twentieth Centuries", about which English poet and Goethean human chemical theory historian Jeremy Adler was one of his PhD examiners. Smith also attended Munich University. In 2000, Smith's PhD was published as the book *Metaphor and Materiality: German Literature and the World-View of Science 1780-1955*, in the abstract of which he states: [3]

> "The question which guides my investigation is not merely whether literature derives themes from science, but whether it can also interrogate scientific models of the world and thus contribute to human knowledge and reflexivity. For this, Goethe's subtle and wonderfully ambiguous text *Die Wahlverwandtschaften* provides an ideal point of departure."

Smith has written for the *Guardian*, *Independent*, *and TLS*, among others. From 2003 to 2004, Smith was an instructor at the University College, London, and is an honorary research fellow.

Quotes

The following are related quotes:

> "In Goethe's greatest play, Faust came to personify mankind's ceaseless quest to understand and control nature, a quest that Einstein was to make his own."
>
> — Peter Smith (2003), *Einstein* [2]

See also

â— Two cultures department

References

1. Smith, Peter D. (1999). "Elective Affinities: A Tale of Two Cultures?" (wayback), *Prometheus*, Apr, 46-65.
2. Smith, Peter D. (2003). *Einstein* (Goethe, pg. 1). Haus.
3. (a) Smith, Peter D. (1997). *German Literature and the Scientific World-View in the Nineteenth and Twentieth Centuries*, PhD dissertation. University of London.
(b) Smith, Peter D. (2000). *Metaphor and Materiality: German Literature and the World-View of Science 1780-1955* (abs) (Goethe, 92+ pgs; chemistry, 30+ pgs). Legenda.
4. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (§10: Goethe's Affinities, ref. 6, pg. 373). Morrisville, NC: LuLu.
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External links

â— Smith, Peter D. (Peter Daniel) (1965-) – WorldCat Identities.
â— Smith, P.D. (1965-) – Encyclopedia.com.

θΔics

In existographies, **Peter Tait** (1831-1901) (CR:146) was a Scottish mathematical physicist, noted for []

Overview

In 1864, Tait published “Dynamical Theory of Heat” and “Energy” in the *North British Review*, wherein he began to outline his views on the historical development of thermodynamics. [4] These two articles later became the basis for his 1868 *Sketch of Thermodynamics*. [5]

In 1867, Tait co-authored, with William Thomson, *Treatise on Natural Philosophy*, which worked to popularize William Rankine's terms "potential energy" and "kinetic energy", in place of vis mortua and vis viva, respectively. This book is said to have helped to establish the concept of "energy" within the structure of the theory of mechanics. [3]

Associates

Tait was closely associated with English physicist William Thomson and Scottish physicist James Maxwell. The three of them, being life-long good friends, for instance, used the shorthand of “θΔics” to signify the science of thermodynamics, in personal communications postcards. [1]

Maxwell's demon

In 1867, Maxwell, in a letter to Tait, introduced his now-famous thought experiment of Maxwell’s demon was conceived. [2]

Tyndall-Stewart-Tait debate

In 1874, Tait was involved in the Tyndall-Stewart-Tait debate.

In 1875, Tait, as a repercussion of the debate, co-authored with Scottish physicist Balfour Stewart the controversial book *The Unseen Universe: or Physical Speculations on a Future State*, in which they speculate on immortality, supposedly in an energy-thermodynamic sense, the heat death of the universe; how thoughts are molecular motions of the brain; how the universe may contain "bonds of energy" that connect to the thinking aspects of the mind; among curious other subjects. [6]

Education

Tait was a product of the Edinburgh school of thermodynamics.

See also

- Donald Cardwell

References

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4. Tait, Peter G. (1868). *Sketch of Thermodynamics*. Edmonston and Douglas.
5. (a) Maxwell, James C. (1878). “Tait’s ‘Thermodynamics’ (I)”, (pgs. 257-59). *Nature*, Jan. 31.
(b) Maxwell, James C. (1878). “Tait’s ‘Thermodynamics’ (II)”, (pgs. 278-81). *Nature*, Feb. 07.
6. Stewart, Balfour and Tait, Peter G. (1875). *The Unseen Universe: or Physical Speculations on a Future State.* Macmillan.

Further reading

- Tait, Peter. (1864). “Dynamical Theory of Heat”, *North British Review*.

● Tait, Peter. (1864). “Energy”, *North British Review*.
● Tait, Peter. (1904). *Heat* (ch. 20: Watt’s Indicator Diagram, pgs. 298-323; ch. 21: Elements of Thermodynamics, pgs. 324-51). MacMillan and Co. (1884, 1st ed).

External links

● Peter Tait – Wikipedia.

θΔics

In philosophy, **Peter Zapffe** (1899-1990) was a Norwegian philosopher — whose ideas were supposedly in line with those of Arthur Schopenhauer — noted for outlining some type of "equilibrium through change" systems ecology philosophy, wherein he grounds the dynamics and existential conditions of life (reaction existence) entropy or the second law. [1]

Religious views

Zapffe, in his *The Last Messiah*, supposedly, explicates a disdain for religious thought, according to which he could be classified as anti-theist; the following quote, supposedly, summarizes this facet of his philosophy:

> "The seed of a metaphysical or religious defeat is in us all. For the honest questioner, however, who doesn't seek refuge in some faith or fantasy, there will *never be an answer*."

Zapffe's usage of the Socratic disavowal of knowledge, which is (supposedly) blatant in this prior quotation, is evidence of the influence of Socratic thought on Zapffe. (Ñº)

On the Tragedy

Much of his work, supposedly, has yet to be translated into English. His *On The Tragedy*, however, seems to have been (partially) translated into English online via the digital apparatus. However, the Essay for which he is most widely known has been translated into English online, via the digital apparatus, in its *entirety*, and this essay entitled *The Last Messiah.* (Ñº)

Boredom

Zapffe, supposedly, is grouped among the so-called "boredom philosophers", namely: Pascal, Rousseau, Kant, Schopenhauer, Kierkegaard, Nietzsche, Heidegger, Benjamin, Adorno, Goethe, Flaubert, Stendhal, Mann, Beckett, Buchner, Dostoevsky, Chekhov, Baudelaire, Leopardi, Proust, Byron, Eliot, Ibsen, Valery, Bernanos, and Pessoa. [3] Two classic innate prodigies turned genius, deeply sensitive to boredom, and thereby possibly driven by that sensitivities, were Scottish physicist James Maxwell's famous age three repeated query "What's the go 'o that?", and deep sensitivity to boredom, similar to German polymath Johann Goethe's famous age eighty to "die of *ennui*" phrase.

Other

The following are, apparently, Zapffe's views on communism: [4]

> "Communism and psychoanalysis, however incommensurable otherwise, both attempt by novel means to vary the old escape anew; applying, respectively, violence and guile to make humans biologically fit by ensnaring their critical surplus of cognition. The idea, in either case, is uncannily logical. But again, it cannot yield a final solution. Though a deliberate degeneration to a more viable nadir may certainly save the species in the short run, it will by its nature be unable to find peace in such resignation, or indeed find any peace at all."

The following, supposedly, is Zapffe's version of Friedrich Nietzsche's uberman: [4]

> "And humans will persist in dreaming of salvation and affirmation and a new messiah. Yet when many saviors have been nailed to trees and stoned on the city squares, then the last messiah shall come. Then will appear the man who, as the first of all, has dared strip his soul naked and submit it alive to the outmost thought of the lineage, the very idea of doom. A man who has fathomed life and its cosmic ground, and whose pain is the earth's collective pain. With what furious screams shall not mobs of all nations cry out for his thousandfold death, when like a cloth his voice encloses the globe, and the strange message has

resounded for the first and last time: ‘know yourselves; be infertile, and let the earth be silent after ye.’”

Zapffe’s usage of “know yourself”, supposedly, is evidence of the influence of Socratic thought on Zapffe. (Ñº)

Education

Zapffe entered the University of Oslo in 1918 where he initially studied law, writing his bar exam in verse, but he later took a degree in philosophy. In 1941, Zapffe completed a 600-page doctoral thesis entitled *On The Tragedy* (*Om det Tragiske*), which is considered his magnum opus. [2]

Quotes

The following are noted quotes:

> “The tragedy of a species becoming unfit for life by over-evolving one ability is not confined to humankind. Thus it is thought, for instance, that certain deer in paleontological times succumbed as they acquired overly-heavy horns. The mutations must be considered blind, they work, are thrown forth, without any contact of interest with their environment. In depressive states, the mind may be seen in the image of such an antler, in all its fantastic splendor pinning its bearer to the ground.”
>
> — Peter Zapffe (1933), *The Last Messiah*

> “What we call nature shows neither morality nor reason; its degeneration is inevitable, and nothing, not even man’s most glorious achievements, can escape final annihilation.”
>
> — Peter Zapffe (c.1941) [2]

References

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2. Reed, Peter and Rothenberg, David. (1993). *Wisdom in the Open Air: the Norwegian Roots of Deep Ecology* (§2:Peter Wessel Zapffe, pgs. 37-64; pg. 38). University of Minnesota Press.
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4. Zapffe, Peter W. (1933). *The Last Messiah* (pg. #). Publisher.
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External links

â— Peter Wessel Zapffe – Wikipedia.

θΔics

In existographies, **Petrarch** (1304-1374) (IQ:175|#240) (Cattell 1000:52) [RGM:158|1,500+] (RMS:15) (CR:15) or Francesco Petrarca, was an Italian scholar, poet, and philosopher, regarded by humanists as their first master (Walsh, 1998), noted for []. [3]

Religio-mythology

In 1341, Petrarch, in his epic poem *Africa* (Q), he equated Apollo, son of Zeus and slayer of Python, to Christ, son of god and slayer of Satan. [5]

Cicero

In 1345, Petrarch, after years of searching in monasteries and libraries, found a volume of the lost letters of Cicero. [1] Some have credited this with initiating the renaissance (compare: Poggio Bracciolini). Petrarch, supposedly, had a list of books, among with Cicero's *On the Nature of the Gods*, was one of his favorites.

Dark ages

Petrarch, supposedly, was the first to originate the concept of the dark ages. [2]

> "Amidst the errors there shone forth men of genius; no less keen were their eyes, although they were ***surrounded by darkness*** and dense gloom."
>
> — Petrarch (1367), *Defense Against the Calumnies of an Anonymous Frenchman*

(add)

Quotes | By

The following are noted quotes:

> "Written in the land of the living; on the right bank of the Adige, in Verona, in the year of that **god whom you never knew** the 1345th."
>
> — Petrarch (1345), signoff to a letter; compare: Paine dating system [1]

> "If anyone who wanders all day arrives toward evening, it is enough."
>
> — Petrarch (c.1374), *Publication*; quoted fondly by Arthur Schopenhauer (c.1860) near his reaction end (death) [4]

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (Cicero letter, pg. 262; year of that god, pg. 269). HarperOne.
2. Mommsen, Theodore E. (1942). "Petrarch's Conception of the 'Dark Ages'", *Speculum*, 17.2:226–42, Apr.
3. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (Varro, pg. xxvi; perpetuate, pg. xxvi; Voltaire, pg. xliv). Oxford University Press, 1998.
4. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§25: Schopenhauer, pgs. 112-14). Prometheus.
5. Boyle, Majorie. (1991). *Petrarch's Genius: Pentimento and Prophecy* (pgs. 32-33). University of California Press.

External links

- Petrarch – Wikipedia.

θΔics

In hmolscience, **Petre C. Trisca** (c.1890-c.1956), or Peter Trisca, was a Romanian-born French social concerns scholar, “excessively prolific medical scribbler” (Q), and hmolscience detractor, noted for his 1922 *Preliminaries on Social Mechanics*, wherein he argues vehemently against social mechanics.

Overview

In 1922, Trisca published his *Preliminaries on Social Mechanics: Analysis of Works*, in which he engages “an almost pathologically savage attack” on the mechanistic school, the social mechanics of Spiru Haret and Antonio Portuendo in particular. The following is Trisca's opening paragraph:

> “In 1900, Alessandro Grappali wrote: ‘It has been more than fifty years since Auguste Comte gave birth to his young discipline [social physics]: the baptism of life by clearly defining the methods, but the task and the fuel, have not been able to change the state of crisis that inevitably beset any discipline in its infancy.’ These lines could also be written now. Probably Durkheim with his *Rules of Sociological Method* said the way, the only real way of scientific sociology. But the inevitable mistakes that Groppali reported, have not disappeared, especially as Durkheim has left for the moment no one after him to continue his work. Mr. combat Bouglé Professor those mistakes which even their authors return. Witness Mr. René Worms whose *Sociology*, reduced to fair value the organicist theories. But there is a more ‘pure’ design, more ‘scientific’, so-called sociology, which has long been adeptness, which gave her the safest works between 1896 and 1914. It is more false and more dangerous; we want to talk about the mechanistic conception of social science. Comte especially Quetelet and Spencer also have their responsibility for this design. These are especially Mr. Haret, Lester Ward, Winiarski, and A.-P. Barcelo, who developed the mechanistic conception.”

The use of "dangerous" here, the Rossini debate coming to mind, would seem to imply that Trisca was opposing social mechanics for underlying religious reasons.

Trisca, later, summarizes his aim as follows: [1]

> “We have no illusions, we know that our detailed study will simply highlight more strongly the conclusion that the social mechanism is a utopia, a metaphysics, and we need more than ever think about the strong words of Durkheim, ‘what our rule claim is that the sociologist in entering the social world is aware that it enters the unknown: he must feel in the presence of facts which the laws are also unexpected that could be those of the life, when biology was not made’.”

Although a large part Trisca's book is devoted to a summary of the social mechanics works of Lester Ward, Spiru Haret, Leon Winiarski, and Antonio Portuendo, among others, in what seems to be a discourse on the views of the mechanistic school of social thermodynamics, it's overall aim is to debunk or disprove the views of this school of logic. [2] Trisca has been summarized as a “critic of social mechanics” and his discussion of social mechanics has been described as “an almost pathologically savage attack on Haret.” [3]

Trisca defined the social mechanics, or what he calls the mechanistic conception of social science, as the consideration of the elements and social groups as point systems and equipment subject to forces, social forces, in our cases, which result from balances and movements that can be studied according to the laws, methods, and principles of rational mechanics. [1]

Trisca outlining the use of the principle of d’Alembert in both the works of Winiarski and Haret.

Education

In 1922, Trisca was labeling himself as: docteur en droit (doctor of laws), docteur es lettres (doctor of letters).

See also

- Pitirim Sorokin

References

1. Trisca, Petre. (1922). *Prolégomènes à Mécanique Sociale: Étude sur la Mécanique Sociale: Analyse des Ouvrages Ayant le meme Titre* (*Introduction to Social Mechanics: Study of Social Mechanics: Analysis of Works of the Same Title*) (thermodynamique, pgs. 95, 145, 152; entropie, pgs. 95, 151-52). Libraire Felix Alcan.
2. Voegelin, Eric. (1924). "Review: *Prolégomènes à Mécanique Sociale*", published in *Archive fur Sozialwissenschaft und Sozialpolitik* 51: 540-541; in English: *Selected Book Reviews* (pgs. 14-15), by Eric Voegelin (1901-1985), *Volume 13 of The Collected Works of Eric Voegelin*. University of Missouri Press.
3. Barnes, Harry E. and Becker, Howard. (1938). *Social Thought from Lore to Science* (Petre Trisca, pg. 1093, xxxix, xlii). D.C. Heath and Co.

External links

- Trișcă, Petre – WorldCat Identities.
- Prolégomènes (French → English) – Wikionary.
- Prolégomènes (French → English) – Wikipedia.

θΔics

In mathematics, the **Pfaffian form** is an expression which takes the form: [1]

$$\sum_{k=1}^{n} X_i(x_1, \ldots x_n) dx_i$$

(add discussion)

History

The so-called Pfaffian form, supposedly, was derived in circa 1805 by German mathematician Johann Pfaff, a noted student of which was German mega-mathematician Carl Gauss.

Truncated Pfaffian

The expression:

$$dW = Y dZ$$

where W is an amount of work done by the system, Y is an intensive property of the system, and Z is an extensive property of the system, is called a "truncated Pfaffian". [3]

Note

The Pfaffian expression is somehow related to the so-called Maxwell relations as found in the thermodynamic work of James Maxwell. [3]

Etymology

The names Pfaffian form, Pfaffian function, Pfaffian expression, truncated Pfaffian, etc., may have been introduced in Greek mathematician Constantin Caratheodory's 1908 "Studies in the Foundation of Thermodynamics", and what has since been called Caratheodory's theorem; although this needs to be fact-checked.

Another reference seems to state that the names Pfaffian function and Pfaffian form for these types of expressions were introduced in the 1970s by Russian mathematician Askold Khovanskii and named in honor of German mathematician Johann Pfaff.

Conjugate variables

See main: Conjugate variables

Pfaffian forms is a common formulation in thermodynamics, where the summation pairs, each taking the form of intensive (X_i) and extensive (x_i) conjugate variable pair, act as quantifiable energy representations of transformations of the internal energy of the system. The right side of the Gibbs fundamental equation, for example, is a Pfaffian form. In short, the general use of the conjugate pairs perspective is that one can quantify the internal energy of a system as the sum of the conjugate variables. In short, with any extensity x_i (extensive variable) it is always possible to associate a tension variable X_i (intensive variable):

$$X_i = \frac{\partial U}{\partial x_i}$$

which is called the "conjugate", whereby, according to the first law, the change in internal energy dU of a system is given by the summation of the product of the conjugate pairs:

$$dU = \sum_{i=1}^{k} X_i dx_i$$

The combined law of thermodynamics:

$$dU = TdS - PdV$$

being the simplest example, temperature *T* and pressure *P* being the intensive variables (dependent on position in the body) and *S* and *V* being the extensive variables (independent on position in the body).

References

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2. Caratheodory, Constantin. (1908). *Studies in the Foundation of Thermodynamics* (*Untersuchungen uber die Grundlagen der Thermodynamik*). Bonn; published in: *Math. Ann*., 67: 355-386, 1909.
3. Kestin, Joseph. (1966). *A Course in Thermodynamics* (truncated Pfaffian, pg. 531). London: Blaisdell Publishing Co.

Further reading

● Emanuel, George. (1987). *Advanced Classical Thermodynamics* (3.3: Legendre Transformation, pgs. 25-28). AIAA.
● Ott, Bevan J. and Boerio-Goates Juliana. (2000). *Chemical Thermodynamics – Principles and Applications* (2.2d: Caratheodory and Pfaffian Differentials, pgs. 63-). Academic Press.

External links

● Pfaffian function – Wikipedia.
● Pfaffian form – Wolfram MathWorld.

θΔics

In religio-mythology, **phallus of Osiris** refers to []

Overview

In Egyptian mythology, in the so-called “death and resurrection of Osiris” or the “passion of Osiris”, Osiris was killed by his brother Set and cut into 14 pieces, and scattered throughout the landm and it is said that wherever a piece of Osiris landed, that a temple grew or was founded; the Egyptians acted out this myth, as it has been theorized (Bauval, 1983), by building temples and pyramids at locations of the Orion constellation mirrored around the Nile River, as shown below, the Nile River river presumed to be the mirror of the Milky Way:

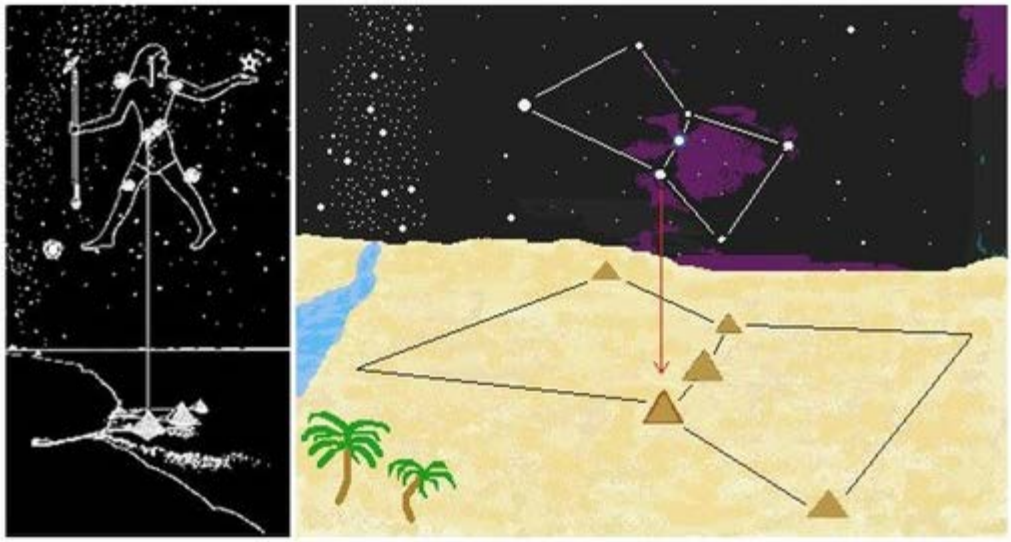

later, all Isis, with the help of Anubis tracked down and found all the pieces of the Osiris, “except” the phallus, which was said to have been eating by a fish, having its powers, thereafter, submerged in the waters of the Nile River, making it, in a sense, holy water (see: baptism).

The number 14 is theorized to be significant of the 14 stars of the Orion constellation, with which Osiris was associated (as the dying and rising god of Egypt, just as the Orion constellation "rise" to the vertical position each night in Nov and Dec), or the 14 days of the half lunar period (28 days), thereby being symbolic of the moon being chopped up as goes from a full moon to a half moon, Osiris also being viewed as a "moon god", in some cases.

Isis then took the 13 pieces of the body of Osiris, and assembled them into the form of a mummy, and to make him complete, she either cut her thumb off to make a makeshift phallus for him or made a golden phallus, depending on story variant, which she affixed to his mummified body, in an erect position:

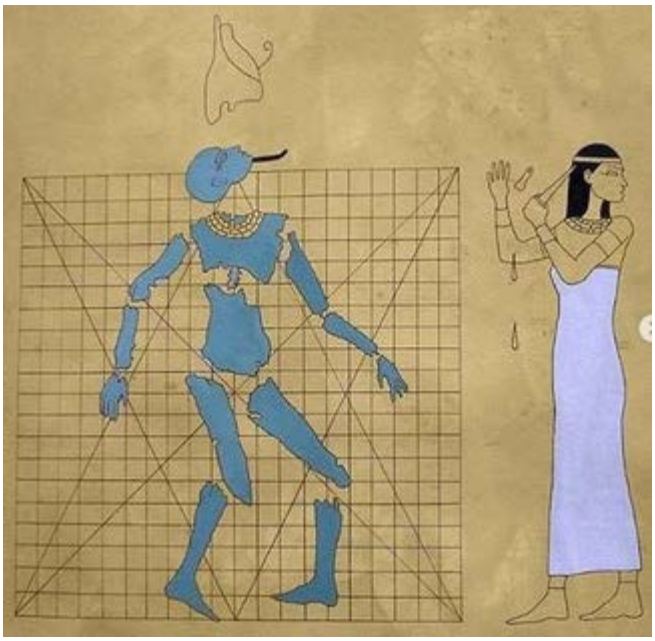

Isis then turned into kite (bird) and, via the "black rite" ceremony, used her magical powers along with the magical powers of Thoth resurrect him, and conceive the god child Horus along the way (see: virgin birth), through the spiritual powers of the celestial seed emanating from his new magical phallus, such as shown below:

In theme with this myth, pharaohs began to be buried in mummified form with erect phallus, so to emulate the resurrection of Osiris. The mummy of king Tut (c.1300), e.g., was famously found with an erect phallus. Later, Egyptians began to make Osiris corn mummy out of earth and seeds replete with Osiris-like erections, such as shown below: [3]

(add)

Hindu mythology

In Hindu mythology, the myth of Osiris and his golden phallus was rescripted into the myth of Shiva (Creuzer, c.1838) and the golden lingam phallus (Ñº), as shown below: [1]

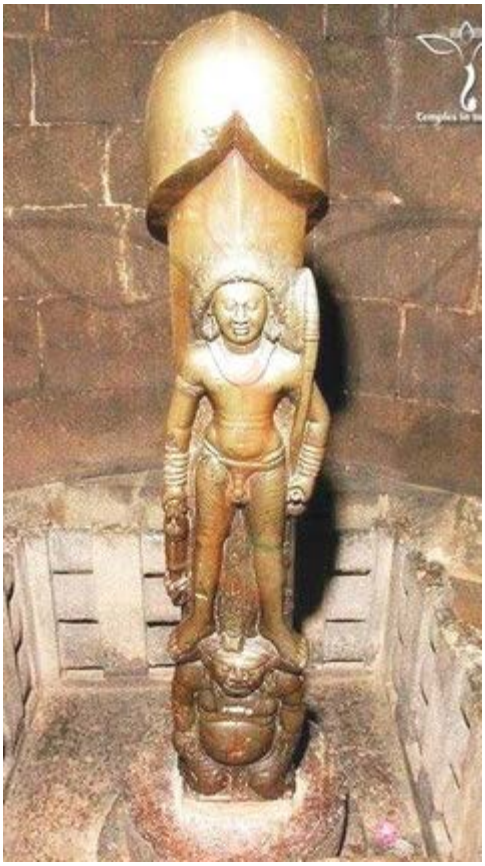

(add)

Greek mythology

In Greek mythology, the myth of phallus of Osiris was rescripted into the myth of the Dionysus and it was reported by Herodotus that the phallic processions seen in the Dionysiac festivals ware of Osirian festival origin. [2]

Christian mythology

In Christian mythology, the story of the “lost phallus” of Osiris was rescripted into the story of the “virgin birth” and the conception of Jesus, in the womb of the "virgin Mary", not involving a phallus or sperm, but via the magical action of the “holy spirit”.

Quotes

The following are related quotes:

> “Plutarch's version of the myth of Isis and Osiris connects the various episodes, many of which can be documented from Egyptian sources, into a single, running narrative (*On Isis and Osiris*, 12-19). The story begins with Kronos (Geb, the Egyptian earth god) and Rhea (**Nut**, the Egyptian sky goddess) overcoming the curse of Helios (Re, the sun god) with the help of Hermes (Thoth, the Egyptian moon god) by producing five children on five intercalary days: Osiris, Horus, Typhon (Set), Isis, and Nephthys. As pharaoh of Egypt, Osiris brings civilization to that country and to the whole world. Typhon, however, gathers conspirators and plots to kill Osiris. First, he imprisons Osiris within a coffin and throws it into the Nile River, and later he dismembers the body of Osiris and scatters the pieces all around Egypt. One piece, **the penis, is lost forever in the Nile River**. In both episodes, the reproductive power of Osiris is sub-merged in the Nile. (Isis grieving and searching for Osiris and burning away the mortality of the infant prince of Byblos can be compared with …”
>
> — Marvin Meyer (1999), *The Ancient Mysteries* (Ñº)

> “As in the Sumero-Semitic myths, the image of the fish appears in Egypt, too. This is not surprising, as where there is water, there are usual-ly fish; and the fish in Egypt, as in the Middle East, symbolized both the water-mother and her divine offspring. Nut was sometimes portrayed in fish-form, and under the name Hatmehit, her local title in the Delta, she was called "she who is before the fishes." But the most important fish symbolism was given to Osiris, the god-child whom Nut bore and who ultimately became Egypt's great mythic victim-redeemer, in a story remark-ably similar to the story of the life of Christ. Osiris, who was portrayed as a fish at his centre of worship at Abydos, is a more sophisticated version of the primitive sun-god Amun-Ra who arose from the depths of his father-mother Nun. The mythic fate of this complex deity gives us considerable insight into the more uncomfortable dimensions of the water-mother's ambivalent relationship to her divine child. Osiris was dismembered by the dark god Set, portrayed as a great river-snake or crocodile—the Egyptian version of Leviathan, the destructive phallic face of the sea-mother—and **his penis was swallowed by a fish**. Although he was put back together again, the penis was never found, and **one made of clay** had to be substituted instead.”
>
> — Liz Greene (2000), *The Astrological Neptune and the Quest for Redemption* (pg. 15)

References

1. (a) Dwight, Mary. (1864). *Grecian and Roman Mythology for Schools* (pg. 246). A.S. Barnes.
(b) Georg Friedrich Creuzer – Wikipedia.
2. Osiris – Encyclopedia.com.
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θΔics

In thermodynamics, **pharmaceutical thermodynamics** is the chemical thermodynamic study of drug action. Subjects in this field, which is relatively new, include the thermodynamics of adsorption, crystallization, encapsulation, partitioning, as well as drug-receptor thermodynamics. Synonyms seem to include: physical pharmacology, physical pharmacy, or pharmacological thermodynamics.

A key aspect of pharmaceutical thermodynamics, according to American physical pharmacologist Kenneth Connors, is focus on the "pharmaceutical system" as a thermodynamic system. [1]

References

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External links

â— Pharmaceutical thermodynamics (research group) – Friedrich Alexander University.

θΔics

In science, a **phase** refers to a given composition and thermodynamic state of a given body without regard to its quantity or form.

Etymology

The first to discuss the fact that matter can exist in three states: solid, liquid, and gas, being but a factor of the temperature of the matter or of the degree of heat penetrated or released, into or out of the body, respectively, was French chemist Antoine Lavoisier, who in his1787 *Elements of Chemistry*, discussed Boerhaave's law, the Papin digester, the possibility of absolute zero, the terms homogenous and heterogeneous substances, and then following a bit of argument, stated what he called the first corollary:

> "Solidity, liquidity, and aeriform elasticity [gas], are only three different states of existence of the same matter, or three particular modifications which almost all substances are susceptible of assuming successively, and which solely depend on the degree of temperature to which they are exposed; or, in other words, upon the quantity of caloric [entropy] which they are penetrated."

In 1876, American engineer Willard Gibbs, in his section "On the Coexistent Phases of Matter" of his *On the Equilibrium of Heterogeneous Substances*, coined the term phase as follows: [2]

> "In considering the different homogeneous bodies which can be formed out of any set of component substances, it will be convenient to have a term which shall refer solely to the composition and thermodynamic state of any such body without regard to its quantity or form. We may call such bodies as differ in composition or state different ***phases*** of the matter considered, regarding all bodies which differ only in quantity and form as different examples of the same phase. Phases which can exist together, the dividing surfaces being plane, in an equilibrium which does not depend upon passive resistances to change, we shall call *coexistent.*
>
> If a homogeneous body has n independently variable components, the phase of the body is evidently capable of $n+1$ independent variations. A system of r coexistent phases, each of which has the same n independently variable components is capable of $n+2-r$ variations of phase. For the temperature, the pressure, and the potentials for the actual components have the same values in the different phases, and the variations of these quantities are by (97) subject to as many conditions as there are different phases. Therefore, the number of independent variations in the values of these quantities, i.e., the number of independent variations of phase of the system, will be $n+2-r$.

This "$n+2-r$" number of "variations of phase" is what is know known as the phase rule. Gibbs continues:

> Or, when the r bodies considered have not the same independently variable components, if we still denote by n the number of independently variable components of the r bodies taken as a whole, the number of independent variations of phase of which the system is capable will still *he* $n + 2 - r$. In this case, it will be necessary to consider the potentials for more than n component substances. Let the number of these potentials be $n + h$. We shall have by (97), as before, r relations between the variations of the temperature, of the pressure, and of these $n + h$ potentials, and we shall also have by (43) and (51) h relations between these potentials, of the same form as the relations which subsist between the units of the different component substances.
>
> Hence, if $r = n + 2$, no variation in the phases (remaining coexistent) is possible. It does not seem probable that r can ever exceed n+2. An example of 7i = l and r = 3 is seen in the coexistent solid, liquid, and gaseous forms of any substance of invariable composition. It seems not improbable that in the case of sulphur and some other simple substances there is more than one triad of coexistent phases; but it is entirely

> improbable that there are four coexistent phases of any simple substance. An example of $n = 2$ and r = 4 is seen in a solution of a salt in water in contact with vapor of water and two different kinds of crystals of the salt."

Polish-born American mechanical engineer Joseph Kestin, in his 1966 section "Phase", credits Gibbs, above, with the coining of the term phase. [3]

References

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See also

- Human phase
- Phase rule
- Phase thermodynamics
- Phase transition
- Social phase

Further reading

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External links

- Phase – Wikipedia.

θΔics

In thermodynamics, the **phase rule** or "Gibbs phase rule" states that the number of distinct phases for any system at equilibrium is determined by the following expression:

$$P = C + 2 - F$$

where P is the number of phases, C the number of components, and F the number of degree of freedom. [1]

History

The phase rule was derived by American chemical engineer Willard Gibbs who first formulated it in his 1876 treatise *On the Equilibrium of Heterogeneous Substances*.

The first proof of the phase rule was said to have been made by French physicist Pierre Duhem as found in what is called the Gibbs-Duhem equation, argued to be the basis of the phase rule. [2]

Human thermodynamics

See main: Social phase

American historian Henry Adams wrote his 1909 article “The Rule of Phase Applied to History” based on a crude interpretation of Gibbs phase rule. [3] In it Adams attempted to use Maxwell’s demon, as an historical metaphor, though he seems to have misunderstood and misapplied the principle. Adams interpreted history as a process moving towards "equilibrium", but he saw militaristic nations (he felt German pre-eminent in this class) as tending to reverse this process, a "Maxwell's demon of history". Adams made many attempts to respond to the criticism of his formulation from his scientific colleagues, but the work remained incomplete at Adams' death in 1918. It was only published posthumously.

References

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(b) Alberty, Robert A. (2003). *Thermodynamics of Biochemical Reactions* (2.4: Gibbs-Duhem equation and the Phase Rule, pgs. 25-26). John Wiley and Sons.
3. Adams, Henry. (1909). “The Rule of Phase Applied to History”. Washington.

Further reading

â— Berry, R. Stephen and Smirnov, Boris M. (2011). “The Phase Rule: Beyond Myopia to Understanding” (abs), *Structure and Bonding*, 1-9.

External links

â— Gibbs’ phase rule – Wikipedia.

θΔics

In thermodynamics, **phase thermodynamics** is the study of phases, phase separations, or phase transformations thermodynamically.

See also

- Phase rule
- Maxwell's thermodynamic surface

Further reading

- Hillert, Mats. (2006). *Thermodynamics and Phase Transformations*. EDP Sciences.
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θΔics

In science, **phase transition** is a change in a feature, namely: state (solid, liquid, gas, plasma) or magnetism (paramagnetic, ferromagnetic), or conductivity (normal conductivity, superconductivity), that characterizes a system.

Discussion

The history of the parlay of the term "phase", as in change of state, to other aspects of change, e.g. magnetism, conductivity, social phenomena, is in need of clarification, a large part of which simply seems to be term adoption, without explanation. To cite one example, in 1995 American biochemist (chnops-chemist) Stuart Kauffman argued the following to account for the origin of life as a type of chemical reaction "phase change" from dead molecular species to alive system of molecules on fire: [2]

> "Alone, each molecular species is dead. Jointly, once catalytic closure among them is achieved, the collective system of molecules is alive. As a threshold of diversity is crossed, a giant web of catalyzed reactions crystallizes in a **phase transition**. A critical diversity of molecules must be reached for the system to catch fire, for catalytic closure to be attained."

(add discussion)

Socioeconomic | Transitions

> *See main: Social phase*

In 1909, American historian Henry Adams wrote his article "The Rule of Phase Applied to History" based on a crude interpretation of Gibbs phase rule. [3] In it Adams attempted to use Maxwell's demon, as an historical metaphor, though he seems to have misunderstood and misapplied the principle. Adams interpreted history as a process moving towards "equilibrium", but he saw militaristic nations (he felt German pre-eminent in this class) as tending to reverse this process, a "Maxwell's demon of history". Adams made many attempts to respond to the criticism of his formulation from his scientific colleagues, but the work remained incomplete at Adams' death in 1918. It was only published posthumously.

In 20th century, a number of usages of the term "phase transitions" began to be applied to things such as: opinion dynamics, historical change, origin of life theory, emergence models, complexity theory, among others.

Some of these models come from Ising model (Ising model of human behavior) others from bifurcation theory and chaos theory.

In 2001, Romanian econophysicists Margareta Ignat and Mircea Gligor began applying phase transition theory to model demographic crashes. [3]

In 2010, Romanian electronics music artist Bogdan published his EP *Human Thermodynamics*, modeled on the theme of the HumanThermodynamics.com cite, containing four tracks: pressure correlations, phase transitions, aerospace race, and transport phenomena.

See also

- Phase rule
- Phase thermodynamics

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External links

● Phase transition – Wikipedia.

θΔics

In thermodynamics, **phenomenological thermodynamics** is the study of systems, from the thermodynamics viewpoint, wherein specifically the actions of the individual parts or components of the system are *not* discussed. [1]

References

1. Ulanowicz, Robert E. (2009). *A Third Window: Natural Life beyond Newton and Darwin* (pg. xxiii-xxiv). Templeton Foundation Press.

External links

- Phenomenological thermodynamics – Wikibin.

θΔics

In existographies, **Pherecydes** (c.580-520BC) (IQ:175|#280) was a Greek cosmologist, mythicist, theologian, and miracle-mongerer (Q); teacher of Pythagoras; oft-cited, e.g. by Cicero, as the "inventor" of the "soul", or at least the Egyptian-adopted (see: Egyptian soul) Greek version (see: Greek soul) of it, and or metempsychosis (Q), aka transmigration of souls.

Soul

In c.530BC, Pherecydes, according to Cicero, in his *Tusculam Dispulat* (c.55BC), or another part of his works, as cited by Jean Meslier (1729) and Baron d'Holbach (1770), no doubt via absorption of Egyptian soul theory (see: Egyptian human), was purported to have "invented" the doctrine of either the soul and or the model of the immortality of the soul. [1]

Quotes | On

The following are quotes on Pherecydes:

> "Philosophy, the pursuit of wisdom, has had a twofold origin; it started with Anaximander on the one hand, with Pythagoras on the other. The former was a pupil of Thales, Pythagoras was taught by **Pherecydes**. The one school was called Ionian, because Thales, a Milesian and therefore an Ionian, instructed Anaximander; the other school was called Italian from Pythagoras, who worked for the most part in Italy. And the one school, that of Ionia, terminates with Clitomachus and Chrysippus and Theophrastus, that of Italy with Epicurus. The succession passes from Thales through Anaximander, Anaximenes, Anaxagoras, Archelaus, to Socrates, who introduced ethics or moral philosophy; from Socrates to his pupils the Socratics, and especially to Plato, the founder of the Old Academy; from Plato, through Speusippus and Xenocrates, the succession passes to Polemo, Crantor, and Crates, Arcesilaus, founder of the Middle Academy, Lacydes, founder of the New Academy, Carneades, and Clitomachus. This line brings us to Clitomachus. There is another which ends with Chrysippus, that is to say by passing from Socrates to Antisthenes, then to Diogenes the Cynic, Crates of Thebes, Zeno of Citium, Cleanthes, Chrysippus. And yet again another ends with Theophrastus; thus from Plato it passes to Aristotle, and from Aristotle to Theophrastus. In this manner the school of Ionia comes to an end. In the Italian school the order of succession is as follows: first Pherecydes, next Pythagoras, next his son Telauges, then Xenophanes, Parmenides, Zeno of Elea, Leucippus, Democritus, who had many pupils, in particular Nausiphanes [and Naucydes], who were teachers of Epicurus."
>
> — Diogenes Laertius (c.230), *The Lives and Opinions of Eminent Philosophers* (1:13-15) (Q)

-

> "Cicero said the opinion about the immortality of the soul was first introduced by **Pherecydes** of Syros in the time of King Tullus (others attribute it to Thales, others to others). It is the part of the human science that is treated with the most reservation and doubt. The firmest dogmatists are forced to take cover in the shadow of the academy. No one knows what Aristotle taught about the subject (or even all of the ancients in general who handle it with unsteady belief) and he left it to his successors to battle it out about his opinion on the matter. It is marvelous how those who are stubborn in this opinion about the immortality of our souls come up short and are powerless to establish it by their human powers. They are the dreams of a man who teaches nothing, but is hopeful. As Cicero said: 'dreams are not of a teacher, but of the wisher' (*somnia sunt non docentus, sed optantis*) (*Academia*, 2:38)."
>
> — Michel Montaigne (c.1590), *Essays* (§2:12); cited by Jean Meslier (1729) in *The Testament* (pg. 570) [2]

-

> "Man, feeling within himself a concealed force that insensibly produced action, that imperceptibly gave direction to the motion of his machine, believed that the entire of nature, of whose energies he is ignorant, with whose modes of acting he is unacquainted, owed its motion to an agent analogous to his own soul, who acted upon the great macrocosm in the same manner that this soul acted upon his body. Man having supposed himself double, **made nature double also**: he distinguished her from her own peculiar energy; he

separated her from her mover, which by degrees he made spiritual. Thus this being distinguished from nature was regarded as the soul of the world, and the soul of man was considered as portions emanating from this universal soul. This notion upon the origin of the soul, is of very remote antiquity. It was that of the Egyptians, of the Chaldeans, of the Hebrews, of the greater number of the *wise men of the east.* It was in these schools that **Pherecydes**, Pythagoras, Plato, drew up a doctrine so flattering to the vanity of human nature—so gratifying to the imagination of mortals."

— Baron d'Holbach (1770), *The System of Nature* (pg. 117)

"**Pherecydes** the philosopher, who should be distinguished Pythagoras, *from* the Athenian historian of the same name, was either a native of Scyros, or, according to some authorities, of Syria or Assyria; and he was the tutor of Pythagoras in the sixth century BC. Suidas, Philo of Byblus, Clemens of Alexandria, Hesychius of Milet, Eustathius, and Cicero, agree in stating that he acquired his philosophy in Phoenicia; and Cedrenus adds, that, like Thales and Pythagoras, he visited Egypt and Chaldea in pursuit of knowledge. According to Theopompus, Pherecydes was the first among the Greeks who wrote on the nature of the gods. He also wrote a work on cosmogony, intitled [Greek], which contains the Chaldean theories on and his ether, the earth, time, and the four elements. Galen assigns to this author the work *De salubre virtus rationis*, which is commonly printed with the works of Hippocrates; and if this be correct, it would clearly prove that medicine has an oriental origin."

— Francis Chesney (1850), *The Expedition for the Survey of the Rivers Euphrates and Tigris* (pg. 520)

References

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External links

- Pherecydes of Syros – Wikipedia.

θΔics

In human thermodynamics, Philip J. Allott (c.1935-) an English international lawyer and philosopher, focusing on global constitutional theory, noted for []

Overview

In 1990, Allott, in his *Eunomia: New Order for a New World*, defined constitution, and it seems a Newtonian government model, in loose or connotative physical science terms, as: [1]

> "The generic principles of a constitution are intended to perform a similar explanatory function to that of general hypothetical principles of the natural sciences—the principles of Newtonian mechanics, thermodynamics, relativity, quantum mechanics, genetics."

In 2008, Allott, in his *Invisible Power 2: a Metaphysical Adventure Story*, gave what seems to be a Freudian thermodynamics based, take on two of the so-called three laws of human thermodynamics as follows: [2]

> "The **second law of human thermodynamics** suggests that human beings with very low energy/desire/libido levels are liable to lead a quiet life, but are also liable to depersonalize and dematerialize, prematurely into the formless void. The **third law of human thermodynamics** [suggests that] those who divert high levels of energy/desire/libido in creative and constructive directions may lead a less entropic life, but will have to learn to live with the ever-present threat of serial frustration and haunting despair."

In another passage of dialog, Allott writes:

> "But most people don't actually will anything," Edmund said. "They just do things as slaves of desire. They live in a sort of entropic void. Things just happen. It takes a special effort of mind not to do something. That's all our famous moral freedom actually is—the freedom not to do something, if we summon up the effort not to do it."

Allott, it seems, culled his thermodynamics learning from the 1971 Paul Glansdorff and Ilya Prigogine, along with possibly some of the work of Erich Jantsch, with the aim or intention to open a discourse on reconstituting the international order in the mind of all people concerned, in the framework of evolution and sustainability. [3]

Education

Allott worked as an official in the British Foreign Office during the 1960s and 1970s, he held such varied offices as legal adviser to the British Military Government in Berlin, legal counselor to the British representative to the European Community, and adviser and representative to the United Nations Law of the Sea Conference, function during these years as a diplomat and a scholar. Currently, Allott is professor emeritus of international public law, at Trinity College, University of Cambridge.

References

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External links

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â— Allott, Philip – WorldCat Identities.

θΔics

In science, **Philip Anderson** (1923-) (DN:7) is an American physicist, a semi-ranked top 60 SPE thinker (Ñº), noted for his 1967 “More is Different” lecture, wherein he sides with reductionism, but states that it is not a simple matter to jump from the description of the properties of a few particles to religious instinct.

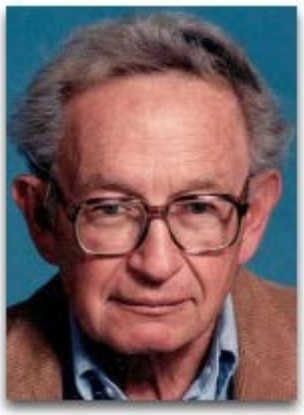

Religion | Atheism

In 2011, Anderson, in his *More is Different: Notes from a Thoughtful Curmudgeon*, stated frankly that he is an atheist and is not religious and weights in on a pitting of Francis Collins' *The Language of God* (2006) vs Richard Dawkins' *The God Delusion* (2006), wherein he gives cogent argument that Collins' argument that "moral sense" can only be based on theology, by stating that this is but a "god of the gaps" issue that will be resolved atheistically as knowledge increases. [9]

Particle physics | Not fundamental

Anderson, in his testimony against the Super Collider project, stated the following:

> “The results of particle physics are in no sense more fundamental then what Alan Turing did in founding the computer science, or what Francis Crick and James Watson did in discovering the secret of life.”

Steven Weinberg took issue with this statement, arguing that computer science is but mathematics and that “mathematics itself is never the explanation of anything” and on the secret of life supposition cited following quote: [5]

> “The DNA revolution led a generation of biologists to believe that the secret of life lay entirely in the structure and function of DNA. This faith is misplaced and the reductionist programme must be supplemented with a new conceptual framework.”
>
> — Harry Rubin (1988), “Molecular Biology Running into a Cul-de-sac?” [6]

(add discussion)

Reductionism | Constructivism

In 1967, Anderson, in his “More is Different” lecture, opens to the following—seemingly well-honed synopsis:

> “The reductionist hypothesis may still be a topic for controversy among philosophers, but among the great majority of active scientists I think it is accepted without question. The workings of our minds and bodies, and of all the animate or inanimate matter of which we have any detailed knowledge are assumed to be controlled by the same set of fundamental laws, which except under certain extreme conditions we feel we know pretty well.”

He then compares this to what he calls the "constructionist hypothesis", namely that while our minds and bodies, and all animate or inanimate matter, are governed by the same set of fundamental laws, it is not "simple extrapolation of the properties of a few particles" to construct a detailed explanation of mind and body. Anderson then gives the following diagram, summarizing it with the premise that the elementary entities of science X obey the laws of science Y:

X	Y
solid state or many-body physics	elementary particle physics
chemistry	many-body physics
molecular biology	chemistry
cell biology	molecular biology
•	•
•	•
•	•
psychology	physiology
social sciences	psychology

Anderson, however, clarifies this diagram by stating that this hierarchy does not imply that science X is "just applied Y".

Pippard

Anderson, at the end of this “More is Different”, seems to take issue with some statements by British physicist Brian Pippard (1920-2008) on whether or not to build bridges between the various sciences: [2]

> “Biology has certainly taken on a whole new aspect from the reduction of genetics to biochemistry and biophysics, which will have untold consequences. So it is not true, as a recent article [2] would have it, that we each should ‘cultivate own valley, and not attempt to build roads over the mountain ranges … between the sciences.’ Rather, we should recognize that such roads, while often the quickest shortcut to another part of our own science, are not visible from the viewpoint of one science alone.
>
> The arrogance of the particle physicist and his intensive research may be behind us (the discoverer of the positron [Carl Anderson] said ‘the rest is chemistry’), but we have yet to recover from that of some molecular biologists, who seem determined to try to reduce everything about the human organism to ‘only’ from the common cold and all mental disease to the religious instinct. Surely there are more levels of organization between human ethology and DNA than there are between DNA and quantum electrodynamics, and each level can require a whole new conceptual structure.”

(add discussion)

Emergence

Anderson’s “More Is Different” (1967), although it does not employ the term “emergence” has somehow begun to be cited in discussions of emergence. The discussion, on first pass, is a bit opaque: he explicitly states that he sides with reduction, but in the end seems to assert that "broken symmetry" results in a "whole new conceptual structure" at each level, thus prohibiting the goal of "molecular biologists aim to reduce everything about the human organism (including 'religious instinct') to 'only' chemistry". In his “Is Complexity Physics? Is it Science? What is It?” (1991), Anderson retrospectively clarifies the message of his earlier article as follows: [7]

> “In my Reagent’s Lecture ‘More is Different’ (1967), I emphasized the concept of ‘broken symmetry’, the ability of a large collection of simple objects to abandon its own symmetry as well as the symmetries of the forces governing it and to exhibit the ‘emergent property’ of a new symmetry. ‘Emergent’ is a philosophical term going back to the 19th century debates about evolution, implying properties that do not preexist in a system or substrate. Life and consciousness, in this view, are emergent properties. The canonical example was the Bardeen-Cooper-Schrieffer theory of superconductivity, which could be described as broken gauge symmetry.”

American particle physicist Steven Weinberg (1992), e.g., states the following: [3]

> "There is one other problem that must be confronted, one associated with the buzz-word 'emergence'. As we look at nature at levels of greater and greater complexity, we see phenomena emerging that have no counterpart at the simpler levels, least of all at the level of the elementary particles. For instance, there is nothing like intelligence on the level of individual living cells, and nothing like life on the level of atoms and molecules. The idea of emergence was well captured by the physicist **Philip Anderson** in the title of a 1972 article 'More Is Different'."

Weinberg goes on to clarify that:

> "The emergence of new phenomena at higher levels of complexity is most obvious in biology and the behavioral sciences, but it is important to recognize that such emergence does not represent something special about life or human affairs; it also happens within physics itself."

American anthropologist Terrence Deacon, on the flip side of the fence, cites Anderson's "More Is Different" to argue that some type of teleological thermodynamic infused spirit can "emerge" in the course of evolution; an ontic opening type theory aimed at cashing in the Templeton Prize. [4]

South African physicist George Ellis (2005), similar to Deacon, citing Anderson (1991), argues for a shielded emergence states basis for scientifically-coded closet theology argument for free will. [7]

Quotes

The following are noted quotes:

> "I think it will be accepted that all ordinary matter obeys simple electrodynamics and quantum theory. We must all start with reductionism, which I fully accept."
>
> — Philip Anderson (1967), "More is Different"

> "For most of its history, and for its most well-known practitioners, physics has been the ultimate reductionist subject. Physicists reduce matter first to molecules, then to atoms, then to nuclei and electrons, then to nucleons and so on—always attempting to reduce complexity to simplicity."
>
> — Philip Anderson (1991), "Is Complexity Physics? Is it Science? What is It?" [7]

> "Of course I am not religious—I don't in fact see how any scientist who thinks at all deeply can be so. We atheists can . . . argue that, with the modern revolution in attitudes toward homosexuals, we have become the only group that may not reveal itself in normal social discourse."
>
> — Philip Anderson (2011), *More is Different: Notes from a Thoughtful Curmudgeon* [9]

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θΔics

In existographies, **Philip Ball** (1962-) (SNE:17) (CR:65) is a English physical chemist noted for his publications and talks, beginning in 2001, focused on what he calls a 'physics of society', aka sociophysics in more common terms, a subject he seems to approach using statistical mechanics viewing people as particles or human particles. [4]

Overview

In 2003, gave a talk on a "physical modeling of society"; the following is an abstract: [5]

> "There seem to be 'laws' [of] social systems that have at least something of the character of natural physical laws, in that they do not yield easily to planned and arbitrary interventions. Over the past several decades, social, economic and political scientists have begun a dialogue with physical and biological scientists to try to discover whether there is truly a 'physics of society', and if so, what its laws and principles are. In particular, they have begun to regard complex modes of human activity as collections of many interacting 'agents'—somewhat analogous to a fluid of interacting atoms or molecules, but within which there is scope for decision-making, learning and adaptation."

This type of social mechanics or social physics outlined here culminated in his popular 2004 book *Critical Mass: How One Thing Leads to Another*, in which Ball outlines a view in which people are considered as statistically averaged interacting human particles, so as to explain how one thing leads to another, along with his theory of a social "critical mass". [2]

Ball notes that when one first begins to apply statistical thought or the "logic of large numbers" to society, that the concept of human free will is the first question in the minds of those encountering the new "physics of society" for the first time. The debate on this topic, according to Ball, began to rage in the 19th century and still preoccupies sociologists today. On the topic of people viewed as human particles, Ball argues that "to develop a physics of society" one must use the model that "particles will become people" to which he uses the term *peoploids* to designate human particles in computer simulations.

The 2005 *New Scientist* article "I am not a Molecule", by American Sociologist Steve Fuller, was a reaction to Ball's book, in which Fuller objects to the atomistic reduction view being used. In particular, Fuller objects to not only Ball's 2004 *Critical Mass*, but also American evolutionary biologist Jared Diamond's 2005 book *Collapse: How Societies Choose to Fail or Succeed*, and Canadian-born evolutionary psychologist American Steven Pinker's 2002 book *The Blank Slate: the Modern Denial of Human Nature*, all of which, according to Fuller, are "infuriating the social scientists". [6] Ball's ideas on applying physics to society are similar to those of Vera Daniel and Mark Buchanan.

Atheism? | Freudian slips

In 2004, Ball in his *Critical Mass*, was alluding to a "limited" free will stylized social physics, where humans HAVE free will, but bacteria don't, a blurry gradient-sloped dualism of sorts.

In 2009, Ball engaged into a heated debate (Q)(Q)(Q) with new atheist Sam Harris, via email, in respect to their disagreeing views on the religion and science conflicts, Ball stating that he is more Karen Armstrong and Martin Rees minded in sympathy, Harris being a more Thomas Paine stylized ridicule of dumb beliefs atheist. (Q)

In 2011, Ball stated he was an atheist:

> "To be honest, I already suspected that Philip Pullman, literary darling of militant atheists (no doubt to his chagrin), is more religious than me, a feeble weak-tea religious apologist. But it is nice to have that confirmed (Q) in the *New Statesman*. Actually, 'religious' is not the right word, **since Pullman is indeed (like me) an atheist**. I had thought that 'religiose' would do it, but it does not – it means excessively and

> sentimentally religious, which Pullman emphatically isn't. The word I want would mean 'inclined to a religious sensibility'. Any candidates?"
>
> — Philip Ball (2011), "An Anglican Atheist" (Q), Jun 15

In 2017, Ball was using Freudian slip god phrases in his Tweets:

> "Nice to come back to two boxes of these paperbacks, though **god knows** where I'm going to put them all."
>
> — Philip Ball (2017), Tweet (Q), Jun 9

(add)

Boltzmann

Ball argues that the following noted quote by Austrian physicist Ludwig Boltzmann: [3]

> "Molecules are like to many individuals, having the most various states of motion, and the properties of gases only remain unaltered because the number of these molecules which on average have a given state of motion is constant."

from his 1872 *Further Studies on the Thermal Equilibrium of Gas Molecules*, where Boltzmann compares people to molecules (human molecules), traces to Boltzmann's reading of English historian Henry Buckle's 1861 *History of Civilization*.

Human chemistry

In human chemistry, in his 2008 article "Literary Reactions", Ball discusses what he calls the "human double displacement reaction" (double elective affinity), one of the human elective affinity reactions from German polymath Johann Goethe's 1809 novella *Elective Affinities*, based on his human affinity table. Ball also discusses the use of chemistry theory in literature, such as English poet John Donne's circa 1590 poem *The Comparison*, where he speaks of 'love's alchymie', and that by Thomas Pynchon in *Gravities Rainbow*. [1]

Paracelsus

Ball authored a 2006 book on the life of Swiss chemist Paracelsus, who is noted for his Aristotle-Geber, four element three principle, formulation of how wood burned, wherein sulphur was said to represent the heat-giving flames; sulphur being a forerunner to entropy (via the intermediate theories of terra pinguis, phlogiston, and caloric). [8]

Education

Ball completed his BS in chemistry at Oxford in 1983 and his PhD in physics at Bristol University in 1988. Ball has worked as a senior editor for *Nature*, physical sciences section, from 1988 to 1999. [7]

Quotes | Employed

The following are quotes employed by Ball:

> "A gravity-like force of attraction is now as universal in the political as in the philosophical world."
>
> — John Desaguliers (1728), *The Newtonian System of the World* [10]

Quotes | By

The following are popular quotes by Ball:

> "Most people who have encountered thermodynamics blanch at its mention, because it is an awesomely tedious discipline both to learn theoretically and to investigate experimentally."
>
> — Philip Ball (2004), *Critical Mass* (pg. 37)

> "Today physicists regard the application of statistical mechanics to social phenomena as a new and risky venture. Few, it seems, recall how the process originated the other way around, in the days when physical science and social science were the twin siblings of a mechanistic philosophy and when it was not in the least disreputable to invoke the habits of people to explain the habits of inanimate particles."
>
> — Philip Ball (2004), *Critical Mass* (pg. 69) [9]

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- Homunculus: Postings from the interface of Science and Culture – BlogSpot.com.

θΔics

In existographies, **Philip Ball 2** (1962-) is

→ **Philip Ball** (mobile; readable; NON-editable)
→ **Philip Ball** (online; readable) – WayBack (2017)
→ Philip Ball (hacked; Non-readable)

Philip Ball (1962-) is a English physicist, chemist, and science writer, noted for his publications and talks, beginning in 2001, focused on what he calls a 'physics of society', aka sociophysics in more common terms, a subject he seems to approach using statistical mechanics viewing people as particles or human particles.

θΔics

In science, **Philip Kelland** (1808-1879) was an English mathematician notable for his 1837 book *Theory of Heat*, in which he claimed to find many contradictions and inconsistencies in French mathematical physicist Joseph Fourier's 1822 *Analytical Theory of Heat*. [1] Both books were read by Scottish physicist William Thomson, at the age of sixteen, to which he concluded "Fourier is right, Kelland is wrong". [2]

Thermo-dynamic etymologies

The coining of terms "thermo-dynamic" (1849) and "thermo-dynamics" (1854), by Thomson, seem to have their etymology, to an extent, in Kelland's 1837 book. In his *Theory of Heat*, Kelland defines the "dynamical hypothesis" as the argument that heat consists of vibratory motions, in contrast to the "statical hypothesis" being the view that heat is a substance, and refers several times to the *thermo-multiplier* a device to measure incremental heat measurements via current flows between dissimilar metals, invented by Italian physicist Leopoldo Nobili. In particular, after speaking of the *dynamical hypothesis*, Kelland states:

"In addition to the circumstance that no *theory of* ***heat*** has yet been promulgated, sufficiently comprehensive to include the explanation of all the phenomena, even the simple and well known facts relative to pressure and density are felt to be utterly inexplicable on any of the ordinary suppositions, without the aid of ***force***, the effect of which is insensible at a finite interval."

In a similar phrasing, in 1854 Thomson would set the following definition: [3]

> "*Thermo-dynamics:* the subjects [of] the relation of heat to forces acting between contiguous parts of bodies, and the relation of heat to electrical agency."

(add discussion)

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θΔics

In existographies, **Philip Mirowski** (1951-) (CR:71) is an American economist and science historian noted, in economic thermodynamics, for in his 1989 *More Heat than Light*, the title, supposedly, based on a talk by Richard Adams (1977), wherein outlined, historically, in a very detailed and well-cited manner, the use of physics and thermodynamics, particularly the conservation of energy, in economics, giving a somewhat objectionable view along the way. [1]

Overview

In Sep 1988, Mirowski published "Energy and Energetics in Economic Theory: a Review Essay", wherein he attempts to attack the energy based economics ideas as found in Mihai Demetrescu 1986 *Entropy and Bioeconomics: the New Paradism of Nicholas Georgescu-Roegen* (Ñº), and the workshop papers found in W. Van Gool and J. Bruggink's *Energy and Time in Economic and Physical Sciences* (Ñº), in the latter of which are found discussions of Gibbs free energy (Ñº) and sections on the "possible relations between thermodynamics and economics". (Ñº)

Against Mechanism

In 1988, Mirowski, published his *Against Mechanism: Protecting Economics from Science*, wherein he he seems to present a fence-sitting leaning towards anti-materialism, anti-mechanism, and or anti-reductionism position; the following being a representative excerpt:

> "At the very beginning of a course of study in a new discipline, the 'why' questions are difficult to avoid, at least initially. When the 'whys' are unavoidable, the most frequent recourse is to the putative 'laws' of the phenomenon: laws of nature, laws of behavior, laws of thought, laws of regularity. I have always been a little uneasy and perhaps even ambivalent about this curious appeal to laws. The very metaphor itself embodies a contradiction. Laws are conventions constructed by human beings, yet often they are invested with legitimacy through appeals to overarching principles or rules that are not the handiwork of humans. Particularly in the disciplines that seek to explain human society, the concept of law is frequently used, but not without a certain defensiveness. 'We have laws, too,' the social scientists maintain, with a nervous glance in the direction of their colleagues, the physical scientists."
>
> — Philip Mirowski (1988), Introduction to *Against Mechanism*

He opens his book to the following 1900 quote of American economist Thorstein Veblen, in which the premise of economic laws in relation to a possible "law of conservation of economic energy" is mentioned:

> "The economic laws aimed at and formulated under the guidance of this preconception are laws of what takes place 'naturally' or 'normally,' and it is of the essence of things so conceived that in the natural or normal course there is no wasted or misdirected effort . . . the resulting economic theory is formulated as an analysis of the 'natural' course of the life of the community, the ultimate theoretical postulate of which might, not unfairly, be stated as some sort of law of the conservation of economic energy . . . there prevails an equivalence of expenditure and returns, an equilibrium of flux and reflux, which is not broken over in the normal course of things. So it is, by implication, assumed that the product which results from any given industrial process or operation is, in some sense or unspecified aspect, the equivalent of the expenditure of forces, or the effort, or what not, that has gone into the process out of which the product emerges."
>
> — Thorstein Veblen (1900), *Industrial and Pecuniary Employments*

This Mirowski's seems to use as an example of a "bold assertion in the face of ignorance". [2]

More Heat than Light

See also: Beg analysis

Mirowski's 1989 *More Heat than Light* was preceded by a six-year manuscript gestation period; a period tracing or rather seeded by a passing 1979-1980 comment that "value had to be conserved", made by a speaker at an economics seminar at Stanford University, if in the speaker's model a certain mathematical assumption were to hold; the tone of the speaker's voice suggesting that no one in his or her right mind would find that a problem. The implied idea here, supposedly, being that the conservation of energy could be invoked ad hoc in economics and applied to "value theory" without question or objection.

The question of the historical origins of economic theory in the context of culled physics theories would go on to haunt Mirowski, as he says, to the effect that it resulted in searches in dictionaries, encyclopedias, and books for non-existent entry on the subject of his query, that resulted to become a sort of secret indulgence, hobby, and surreptitious pleasure that stole moments away from his regular economics work, albeit one that turned into a popular book. The following passage (diagrammed adjacent) seems to be the synopsis of Mirowski's end conclusion: [1]

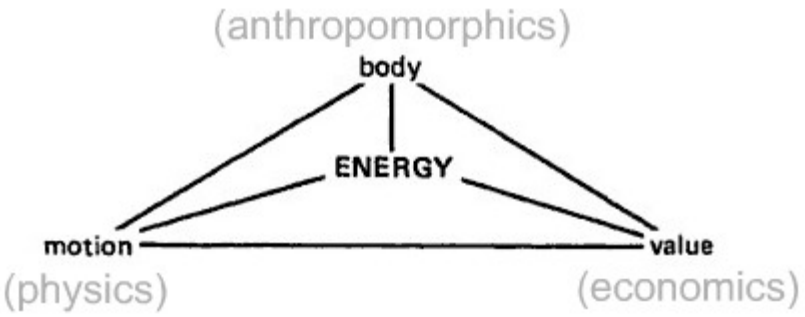

Mirowski's "energy architectonic metaphor triangle", according to which he argues that the three metaphors constituted the *a priori* content as well as the common context that made the energy concept possible, if not necessary: the **motion**/**value** (economics/physics) face responsible for the quantification and mathematization of the energy concept; the **body**/**motion** (human/physics) face responsible for the symmetry character of the energy concept; the **body**/**value** (human/economics) face responsible for the less-acknowledged anthropomorphic and social character of the energy concept, the religious overtones and cultural influences so often spurned as the opposite of scientific argument. [1]

> "Instead of discrete influences, imagine, if you will, the energy concept as an ever expanding pyramid with the three metaphors of body, motion, and value at the base vertexes. As the vertexes grow further and further apart, the metaphorical distance between physics and economics also widens, until it becomes commonplace to assert thaty ther are indeed separate and distinct systems of explanation. Nevertheless, they operate in the same cultural milieu, partake of much of the same language and formalisms, and most important, maintain a reciprocal metaphorical legitimation and support: they remain a pyramid."

The gist of Mirowski's findings, in his research, iss that conclusion that the progenitors of Western neoclassical economics copied their models mostly term for term and symbol for symbol from the reigning physical theories of the 1870s.

The following quote, by American physician and existential philosopher Walker Percy, is the opening set-the-stage quote to *More Heat than Light*: [5]

> "As late as a week ago, such a phrase as 'hopefully awaiting the gradual convergence of the physical sciences and the social sciences' would have provoked no more than an ironic tingle or two at the back of my neck. Now it howls through the Ponchitoula Swamp, the very sound and soul of despair."

(add)

Difficulties on theory

Mirowski's central thesis, pole vaulting on the so-called "Hessen thesis" (Boris Hessen, "The Social and Economic Roots of Newton's Principia", 1931), i.e. that Newton derived his laws of motion from economic theory and the culture milieu of his time, is the general argument that the physicists and economists copied from each other. Certainly there is

some truth in this, e.g. Boltzmann and Maxwell culling statistical mechanical ideas from Buckle, but to think that pure energy theory experimenters, e.g. Willem Gravesande rolling weighted brass spheres roll down a ramp onto a soft clay floor and measuring their impact deepness to test kinetic energy E = mv theory, had something to do with anthropomorphism or economics, is a bend over backwards argument.

Education

Mirowski at first had plans to study anthropology, but found a lack of attention to the theoretical foundations of the subject, and because of this moved into economics, completing his BA in economics at Michigan State University in 1973. During this period, Mirowski took a graduate course in economics history with American economics historian Warren Samuels. [6] On this basis, Mirowski went on to complete his his MA (1976) and PhD (1979) at the University of Michigan, both in economics. His experience of graduate school was disappointing, and he recalls poor teaching and his own lack of interest in much of what he was taught. [7] Somewhere in this mix, Mirowski received some "background in physics", as he states, where he learned the importance of the conservation principles.

His first academic appointment was at Santa Clara University, where he began teaching history of economic thought. Since 1990, Mirowski has been a professor of economics, and the history of science, and philosophy of science at Notre Dame University. [4]

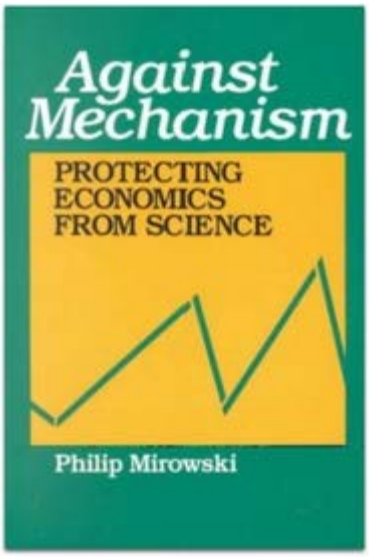

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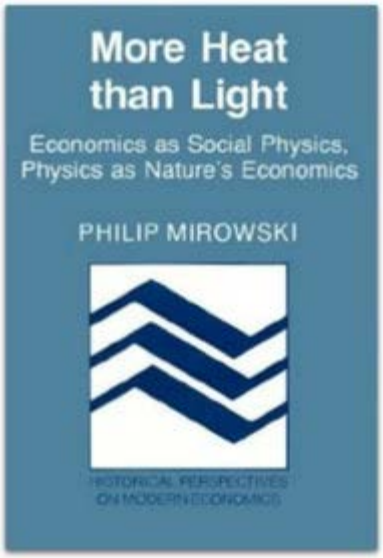

(1989)

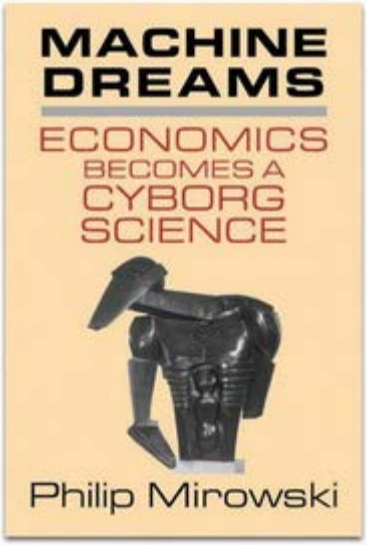

(2002)

Mirowski's core physical economics book trilogy: *Against Mechanism* (1988), which touches on the notion that economic laws are assumedly somewhere buried in the physical sciences; *More Heat than Light* (1989), on the origin of energy and the conservation of energy as employed in economic theory; and *Machine Dreams*, on the cybernetics era movement of John Neumann, Norbert Wiener, and Alan Turing, etc., in economics.

Quotes

The following are related quotes:

> "Economics needs protection from science, and especially from scientists such as Richard Feynman, or any other physicist who thinks he knows just what is needed for economists to clean up their act. Economics needs protection from the scientists in its midst, the Paul Samuelsons and the Tjalling Koopmans and all the others who took their training in the physical sciences and parlayed it into easy victories among their less technically inclined colleagues."
>
> — Philip Mirowski (1988), Introduction to *Against Mechanism*

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θΔics

In existographies, **Philip J. Moriarty** (1968-) (DN:6) [CR:160] is an Irish physicist and hmolscience detractor, noted for his physics commentaries in the Nottingham University's *60 Symbols* YouTube channel, the overt focus of which is to give summaries of symbols and constants of physics, e.g. S, k, G, etc., amid which he digresses on related physics applied to philosophy topics, such as whether or not subjects such as thermodynamics (e.g. human chemical thermodynamics) or quantum mechanics (e.g. human quantum mechanics) applies to human interactions, such as he debated with American electrochemical engineer Libb Thims in 2009 (see: Moriarty-Thims debate), or new age topics, such as American geneticist Robert Lanza's 2007 biocentrism theory of everything, or "quantum physics woo" as Moriarty called it in 2013, about whether quantum physics proves that an afterlife exists. [9]

Overview

In 2009, Moriarty, a professor at Nottingham University, working in the field of nanoscience, who for some six years taught a course in thermal physics—entered into a very opinionated objections to the applications of thermodynamics to humans, as expressed in his 60 Symbols YouTube channel, which carried over into the lengthy Hmolpedia thread facilitated Moriarty-Thims debate, during which time he commented objectionably on the Rossini debate (2006) and solicited emails, together with American organic chemist Frank Lambert, to professors at the University of Illinois, Chicago, that American electrochemical engineer Libb Thims should not be allowed to lecture (see: Libb Thims (lectures)), to thermodynamics students about human thermodynamics, all in defense of his position that you can say that entropy (thermodynamic entropy) can be applied to arrangements of students in a field as an analogy, say to help explain the concept, but not in reality.

Entropy videos

On 23 Apr 2009, Sixty Symbols uploaded their first video (below left) on the symbol "S" for entropy, during which Moriarty gives the secondary, i.e. non-primary (Clausius), statistical mechanics (i.e. Boltzmann) version entropy, during which time described entropy in terms of an analogy based around the distribution or arrangement of students in a university park.

On 30 Apr 2009, American electrochemical engineer Libb Thims, unaware of Moriarty's video, made a semi-humorous "What is Entropy?" video, for his Human Chemistry 101 channel, since removed (owing to too many negative down votes, being that people didn't get the inside joke), based on a combination of James Maxwell's1877 discussions (Ñº) with Clausius about the origin of the term "entropy" and his followup 1878 discussion of entropy as the theory of transformation-equivalents and how it will take "several generations" before we can expect beginners to receive as axiomatic the theory of entropy, together with video footage of his 1-year-old nephew flipping through an original second edition copy of Clausius' *The Mechanical Theory of Heat*.

Thims then found Moriarty's video and went on to discuss, below Moriarty's video forum, the issues with Moriarty's discourse on the origin of the symbol "S", namely:

(a) that the symbol *S* comes from Rudolf Clausius, not Ludwig Boltzmann (who used the symbol *E* for entropy);
(b) that the relationship of the Poincare recurrence theorem and entropy is a mute issue;

> [Moriarty says: "you've got to define the difference between something that's impossible and something that is very very improbable. Its not impossible, for example, for all the atoms and molecules in the air around us to suddenly collect themselves together and suddenly head off there and re-asphyxiate. That's not impossible, it's just incredibly incredibly improbable"];

(c) that the exact equation used in the video, $S = k \ln \Omega$, was penned not by Boltzmann (although based on his work and inscribed on Boltzmann's tombstone) but by Max Planck.
(d) etc.

Moriarty, following several months of debate with Thims, made a second video entitled "Entropy: Professor's Response", shown below (middle); along with a second followup video entitled: "Entropy Confusion", shown below (right):

Entropy - Sixty Symbols	Entropy: Professor's Response	Entropy Confusion - Sixty Symbols
(add)	(add)	(add)
23 Apr 2009	4 Aug 2009	3 Nov 2013

Moriarty's set of entropy explanation videos.

(add)

Human | Entropy, quantum mechanics, human bonding

See main: Human chemical bond, Human quantum mechanics

In objection to the premise that entropy and quantum mechanics apply to human activity, on Aug 30th, 2009, Moriarty commented. in regards to human entropy (or the premise of the entropy of humans):

> "[Thims has] taken the abuse of the term entropy to an entirely new level, by suggesting that it—and, unbelievably, quantum mechanics—can be applied to 'interactions' in romantic human relationships."

A week earlier, in video posted on Aug 23, 2009, Moriarty had used an analogy involving distributions of students to describe entropy (see below):

> "Then, as they sort of spread out or move around [from this packed state], we say that they are moving to a high entropy state … and that's what entropy's really about ... about this dispersal of energy, about moving from a state where everything is nicely packed and close together to one where everything is spread out … and you can apply that to gas molecules just as easily as you can to students."

Moriarty clarified in a subsequent YouTube video (see above) his position, highlighting that the distribution of students was used as an *analogy*. In Sept. 2009, and as part of the lengthy online debate discussed above, Moriarty further clarified his position for Thims:

"It is this

Quote: “We can think about the students who are milling about here and filling out this state quite well [as a high entropy state].” “Then we can think about bringing them into what we term a low entropy state, where we pack them all nicely together, nicely ordered in the center of this lovely green.”

distinction between analogy and mathematical/physical equivalence that is so important and which you seem unable to grasp. Hence, you misinterpreted the analogy I drew in the Sixty Symbols YouTube video on entropy and argued that I was actually claiming that one could associate a thermodynamic entropy with the arrangement of students.

That someone could confuse the analogy with the actual thermodynamic quantity just never occurred to me. Of the approximately 750 physics majors who took the first-year Thermal and Kinetic Physics module I taught, not one made this fundamental error. Similarly, the number of professional scientists who have made this error is very small indeed.”

In using the phrase "dispersal of energy" in the YouTube video to describe entropy (see: entropy (misinterpretations)), we see that Moriarty agrees with the interpretation of entropy put forward by American chemist Frank Lambert (whom he regularly cites as a good reference), who in turn culls his views of entropy from William Thomson, and admits to never having read any of Clausius' textbook *The Mechanical Theory of Heat*, let alone any of his work on entropy. [7]

In any event, these objections as to "Thims abusing entropy", however, were made without an actual reading of the 2007 textbook *Human Chemistry* [3]. This is perhaps not surprising as this book was not subject to peer review and, moreover, is published by LuLu.com, a self-publishing/vanity-publishing internet business. Unsurprisingly, there are a very small number of people who have used the "theories" in Human Chemistry in further research and publication. However, Russian physical chemist Georgi Gladyshev, and Canadian mathematical economist Jing Chen, etc., find the theory and application cogent. [4] American sociologist Satch Ejike, for example, used Thims' quantum mechanical modeling of human bonding in psychological application his 2008 book *Find a Good Man and Keep Him*, commenting that the human quantum chemical theory it “is a very viable explanatory framework.” [5] It should also be noted, however, that there have been many objections put forward to the concept of human thermodynamics espoused by Thims (see Human Thermodynamics (Objections To)).

Human thermodynamic systems

See main: Working Body, Working Substance, Working medium, System, Thermodynamic System, Social system, Human system, Economic system, etc.

In commentary on the point made by Thims that, according to Willard Gibbs’ 1876 *On the Equilibrium of Heterogeneous Substances*, which is considered as the Principia of thermodynamics, that “all material systems are thermodynamics systems”, whereby a system of humans (made of matter) is one such material system, and that “the laws of thermodynamics which govern any material system is greatly facilitated by considering the energy and entropy of the system in the various states of which it is capable”, Moriarty responds back with:

“Whereï»¿ did Gibbs state that ‘a society is one such material system’? He didn't - that is your particular (incorrect) reading of the application of thermodynamics.”

These comments by Moriarty are akin to those of Paul Samuelson (a student of Gibbs). In other words, when teaching a class on thermal physics or thermodynamics, the first lesson (lecture) typically involves instilling the rule that the laws of thermodynamics are universal (laws of the universal), in that they apply to any and all systems. Thims highlights the contribution of YouTube user (PenguinJin) who commented:

“So, why areï»¿ we exempt from this application of thermodynamics? Why would energy alter its behavior

> in a fundamental way when it began manifesting as the patterns of human behavior? Recursion is everywhere."

The response comment Moriarty offers the following:

> "The main points are:
>
> > (i) An arrangement of students (or socks, or objects in a room) will not *spontaneously* rearrange themselves (unlike the milk molecules mentioned in the video).
> > (ii) There is no change in the thermodynamic free energy of, e.g., socks [or students], if we rearrange them."

Moreover, Moriarty made the point repeatedly during the debate with Thims that in his, and others' opinion, a grouping of students is not a thermodynamic "system" (see Comment #7, Comment #99, and Comment #270 (the latter outlines Thims' response to this particular criticism)). In short, according to Moriarty, the rule of spontaneity criterion does not apply to human interactions, e.g. love the chemical reaction, and there is no change in Gibbs free energy when a system of students rearranges over time (when plotted out on a free energy map or extent of reaction diagram)? Moriarty seems to have issue with the logic that humans may be considered simply as obeying the same laws of physics as gas molecules (i.e. human molecules).

Winiarski's thermodynamics of love

In response to the comment, made by Thims, that Polish sociologist Leon Winiarski taught a course for six-years (1894-1900),ï»¿ at the University of Geneva, themed on the postulate of hunger and love functioning as two forms of thermodynamics potential; and how energy and entropy relate to this, using Clausius and Lagrange as course material, Moriarty comments back with:

> "If I understand you correctly, you *are* suggesting that the (romantic) relationships of groups of humans are associated with a thermodynamic entropy (and other functions of state)! This is very worrying … you seem to be making theï»¿ same type[s] of fundamental error[s] pointed out in the essays of Frank Lambert." [6]

In short, Moriarty believes that state functions do not apply to human systems.

Summary

In sum, Moriarty vocalized objections to the application of thermodynamics, chemistry, or quantum mechanics to the study of human movement, bonding, and organization, as expressed in YouTube video commentary and in online debate with American chemical engineer Libb Thims. Moriarty heavily criticizes Thims' human thermodynamics/human chemistry thesis throughout the debate, repeatedly labeling it as "nonsensical pseudoscience" in response to statements such as the following by Thims:

> "Every single one day of rotation of the earth constitutes one Carnot cycle. Expansion stroke: Heat is added (daytime) to the system (surface of the earth), the particles (human molecules) become active and expand outward, doing work in the process (occupation); contraction stroke: heat is removed (nighttime) from the system (surface of the earth), the particles (human molecules) begin to deactivate expanding inward (towards their bed), doing a reverse work in the process. This is all basic thermodynamics."

The origin of the debate with Thims arose with Moriarty's contribution to a video on entropy (as part of the University

of Nottingham's Sixty Symbols YouTube project) during which he stated: [1]

> "Concepts of entropy apply to gas molecules; you cannot say that a particular arrangement of students has a thermodynamic entropy."

In Thims' view, however, this statement is in conflict with the opinions of Austrian physicist Ludwig Boltzmann who in 1886 postulated that: "life is a struggle for entropy." [8]. Key elements of Thims' *human thermodynamics* "thesis" are discussed in detail during the debate. As stated during the debate, Moriarty considers Thims' general view to be as follows:

> "Your [Thims'] laughable central premise is as follows: Well, a human is made of lots of atoms. Therefore a human is just a big molecule. Big molecules will behave just like small molecules. Therefore I can apply all thermodynamic principles to human 'molecules'."

(add)

Education

Moriarty is professor at Nottingham University working in the field of nanoscience and previously taught a course in thermal physics for six years.

Quotes | On

The following are quotes on Moriarty:

> "It's a little more than that. I attend **Moriarty**'s university, and he's universally disliked because he refuses to ever acknowledge other viewpoints than his own. He's dogmatic, and that's unacceptable in someone who calls themselves a scientist."
>
> — RedChris18 (2018), Reddit comment (Ñº) to query: "What's going on with Prof. Philip Moriarty?" in r/OutOfTheLoop

See also

â— Human thermodynamics (objections to)

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θΔics

In hmolscience, **Philip M. Parker** (1960-) is an American economist noted, in economic thermodynamics, for his 2000 effort to explain the variation of capital per latitude via a loose physics, thermodynamics, and neuroscience.

Overview

In 2000, Parker, in his *Physioeconomics*, attempts to explain the "equatorial paradox", i.e. that income per capita per country increases with latitude, using physiology and physics. Parker reasons that because humans are homeotherms, i.e. organisms home to a certain requisite internal temperature, that concepts from heat transfer, thermodynamics, and the actions of certain hormones and neurotransmitters on the hypothalamus, can be used aptly to explain variations in utility and consumption. To quote Parker on his overall view: [1]

> "The laws most directly applicable to governance of humans are the laws of thermodynamics."

Parker's theory (physioeconomics), from a thermodynamics and brain physiology perspective, however, is very elementary. Parker seems to reduce the entire mechanism of the brain down to actions of the hypothalamus, postulating that "humans are motivated via chemical processes regulated mostly by hypothalamic activity" and that average yearly temperatures explain production and consumption. The theory is noted though for being one of the first to make connections to brain changes, economic activities of humans, and thermodynamics. It is also one of the few books to use the term "human thermodynamics" (similar to Karlis Ullis), albeit one in which the skin is considered as the boundary of the thermodynamic system, a point of view common in physiology. [2]

Education

Parker completed a PhD in business economics from the Wharton School of the University of Pennsylvania, an MA in Finance and Banking (University of Aix-Marseille) and Managerial Economics (Wharton), and undergraduate work in mathematics, biology and economics. [3]

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External links

â— Philip M. Parker (Channel) – YouTube
â— Philip M. Parker – Wikipedia.

θΔics

In genius studies, **Philip Stokes** (c.1969-) is British-born Thai philosopher noted for []

Overview

In 2002, Stokes, in his *Philosophy: 100 Essential Thinkers*, presented sketches of who he considers to be the top 100 thinkers (see: Stokes 100 essential thinkers), a type of genius rankings list, over the last 2,600-years, specifically taking Greek genius as his starting point.

The following is a circa 2011 statement of Stokes' philosophical outlook: [2]

> "Philosophically, I started wondering at around the age of 16 'why stuff happens' and is still awaiting an answer. I've come up with a few theories along the way, but most have been squashed in intense debates in pubs not far from Reading University (undergrad days), Bristol University (postgrad days) and a few places in between that have slipped my memory. I continue to search for the ultimate meaning of everything while acknowledging that better people have tried and gone home."

(add discussion)

Education

Stokes completed his BA in philosophy in 1993 at the University of Reading, and his MA in philosophy in 1995 at University of Bristol, both in the United Kingdom. In 2011, Stokes was teaching English language and critical thinking skills at Thai University.

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θΔics

In human chemistry, **Philip Toshio Sudo** (1959-2002) was an American music philosopher noted for []

Overview

In 1998, Sudo, in his *Zen Guitar*, devoted a section to "chemistry", particularly band chemistry, which he outlines as follows:

> "With most groups in life, we don't bond. With a few groups, we do. On those rare occasions, learn what it means to band and *be* a band.
>
> A band is not merely a collection of individuals. Its essential character might be for the whole to exceed the sum of its parts. When the right people get together, be it in music or sports or business or marriage or sex or whatever, a kind of spiritual fusion takes place. This fusion cannot be bought or forced or manufactured. It simply happens from the chemistry of nature.
>
> Most groups of people have no chemistry. Like a random collection of molecules, they don't combine to make anything special. There particular level of talent makes no difference. Examples abound in the music world of supergroups and all-star jams that fail to produce inspiring music.
>
> Every now and then, though, two hydrogen molecules will collide with one molecule of oxygen. The resulting mix takes on a character far beyond its basic elements. So it is with human beings as well. This chemistry defines a great band.
>
> Human chemistry is not a science. No one knows how this magic happens. But when it does, we feel the presence of something divine, and everyone who's there knows it. Cherish the chemistry of great bands wherever you find it. You're onto something big."

Sudo here seems to be using a semi-modern version Empedocles-style of chemistry aphorisms to explain band chemistry. To correct a few points of inaccuracy, firstly, that human chemistry is not a science, however, is incorrect. Human chemistry was defined as a "science yet to be created" in 1885 American historian Henry Adams, defined as "an important branch of the science of human nature" in 1948 by American philosopher Thomas Dreier, and has been taught at the university level since at least 2010 by American electrochemical engineer Libb Thims (see: lectures). [2]

Secondly, the nature of the chemistry between people, just as the case of the nature of the chemistry between atoms, does not involve "spiritual fusion" nor "something divine" as Sudo seems to believe, in his Zen Buddhism slanted belief system.

Thirdly, that fusion cannot be "bought or forced or manufactured" is certainly incorrect, the Haber process being one famous example, according to which the normally non-bonding hydrogen and nitrogen molecules are forced into bonding arrangement (ammonia) via the use of high temperatures and a catalytic surface.

Fourth, the assertion that "no one knows how this magic happens" is certainly fallacious, the prime example being German polyintellect Johann Goethe, who in 1796 correctly asserted that the "magic" happens via the forces of affinity or free energy (in modern terms). [3]

See also

â— Martha Nochimson | screen couple chemistry

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External links

â— Philip Goshio Sudo – Maui.net.

θΔics

In artists, **Philip Grot Johann** (1841-1892), or "P. Grotjohann" as he signed his artwork, was a German book illustrator, best-known for his illustrations of *Grimm's Fairy Tales*, but more-importantly known for his illustrations for the 1885 five-volume *Goethe's Works*, translated by into English by American languages professor Hjalmar Boyesen, the artwork for the fifth volume of which serving as the illustration backbone for the online 2012-launched *Elective Affinities: Illustrated, Annotated, and Decoded* undertaking by American electrochemical engineer Libb Thims. [1]

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θΔics

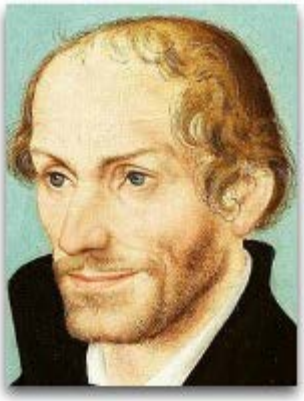

In existographies, **Philipp Melanchthon** (1497-1560) (IQ:180|#177) [RGM:241|1,500+] (Cattell 1000:137) (CR:15), was a German child prodigy, a youngest college graduate, and university head, noted for being the second most important individual behind the Lutheran reformation, behind Martin Luther, via acting as restraint on Luther's more "counterproductive impulses". [1]

Overview

Melanchthon rejected certain Biblical absurdities, such as transubstantiation, but held fast to others, notably geocentric theory.

Copernicus

Melanchthon, an associate of Martin Luther — who had referred to Copernicus as a "fool [who] wants to turn the whole art of astronomy upside down!" — described Copernicus' heliocentric theory as an **"old joke"** (see: crackpot), implying that it was a superfluous revival of a frivolous circa 250BC suggestion by Aristarchus.

In Oct 1541, Melanchthon, after having received a copy of Rheticus' *First Account* (*Narratio Prima*), the previous year, the first condensed summary of Copernicus' theory, wrote the following to a correspondent: [2]

> "[Some think it] a distinguished achievement to construct such a **crazy thing** as that Prussian astronomer who moves the earth and fixes the sun. Verily, wise rulers should tame the unrestraint of men's minds."

An alternative translation reads as follows: [4]

> "Many hold it an excellent idea to praise an **absurd matter**, like that sarmatic [Polish] astronomer, who moves the earth and lets the sun stand still."

(add)

Other

Melanchthon, supposedly, was acquainted with Johann Faust.

Education

The early education of Melanchthon was summarized by Catherine Cox (1926) as follows: [1]

> "Melanchthon is distinguished for his brilliant mental powers and his extraordinarily precocious scholastic achievement. 'In matters of intellect he had a quick perception, an acute penetration, a retentive memory, an ardent thirst for knowledge, and the ability to express his thoughts with accuracy and precision. In school and out he was incessantly asking questions, and often would gather a few school fellows around him for the purpose of discussing what had been read and learned.' Before he was 11 he disputed with roving Bacchanti, and it was seldom that one could withstand him. He was among the few 'brightest and best' of the academic youth who were permitted to study Greek. He wrote Latin verses at 12. Before he was 13 he entered the University of Heidelberg, where he read poetry, wrote verses, and studied, for the most part without other direction than his own. His reputation as a Greek scholar was soon established. During his first year, and before he was 13, he was appointed to hear the Greek recitations in the professor's absence. He tutored the sons of a nobleman. Evidences of his ability are preserved in two Latin poems written at 13, when he had already taken rank among the learned. At 14 he took the Bachelor's degree. It is believed that he was working on his grammar at this time. At the end of another year he had fulfilled the requirements for the Master's degree, but the degree was denied him because of 'his youth and boyish appearance.' At 15 he

> went to Tubingen, where his studies ‘took a wide range’. ‘He sought to know everything and to be a master in every science’. ‘He gave attention chiefly to Greek and Latin literature, to philosophy, history, eloquence, logic, and mathematics, heard the theologians and the lecturers on law and medicine, and read Galen so carefully that he could repeat most of his works from memory.’ Just before his 17th birthday he received the degree of Master of Arts as first among eleven candidates and, with the degree, the license as *privat docent* to lecture on the ancient classics.”

Here we see Melanchthon ranking in among the youngest college graduates.

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θΔics

In hmolscience, **Phillip Johnson** (1940-) is an American law professor noted for []

Overview

In circa 1988, Johnson went through a divorce, after which he became a born-again Christian, and went on sabbatical in England and sought, through prayer, inspiration for what he should do with the rest of his existence; during which time, while reading atheist Richard Dawkins' *The Blind Watch Maker* (1986) and theist Michael Denton's *Evolution: a Theory in Crisis* (1985), he felt that as a law professor he might add something to the debate, being that:

> "Something about the Darwinists' rhetorical style, made me think they had something to hide."
>
> — Philip Johnson (c.1988), retrospect on reading Dawkins' *The Blind Watchmaker* [2]

In 1991, Johnson published his *Darwin on Trial*, wherein he attempted to pick away at Darwinism and and what he called "scientific materialism" (as opposed to "spiritual materialism", supposedly), not from a theoretical point of view, but from their word use: [3]

> "I approach the creation-evolution dispute not as a scientist but as a professor of law, which means among other things that I know something about the ways that words are used in arguments."

In 1997, Johnson, in his *Defeating Darwinism by Opening Minds*, described his "wedge strategy" for getting creationism, or intelligent design, teaching into public schools: [1]

> "If we understand our own times, we will know that we should affirm the reality of god by challenging the domination of materialism and naturalism in the world of the mind. With the assistance of many friends I have developed a strategy for doing this. We call our strategy the 'wedge'."

In Mar 2002, the Ohio Board of Education passed legislation to move (Ñº) to have creationism or intelligent design, per initiative of the Discover Institute, taught alongside evolution, and to publications of creationists, such as Johnson's *Darwin on Trial* (1991). This sparked the Rennie creationism fiasco (2002-2003).

Education

Johnson completed his BA in English literature at Harvard in 1961 then completed his JD in 1965 graduating in the top of his class at the University of Chicago, and from 1967 to 2000 he was a law professor at the University of California, Berkeley.

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θΔics

In existographies, **Philo of Byzantium** (c.280-220BC) (IQ:#|#) (CR:3), aka “Philo Machanicus”, was a Greek engineer, physicist, and mathematician, noted for making the first thermometer.

Thermometer

See main: Philo thermometer

In c.230BC, Philo conducted an experiment wherein a tube from a hollow sphere, below right, was extended over a jug of water, below left. The sphere was then placed in the sun, after which bubbles were released as air expanded out of the sphere. When the sphere was moved to the shade, water rose in the tube as air in the sphere contracted:

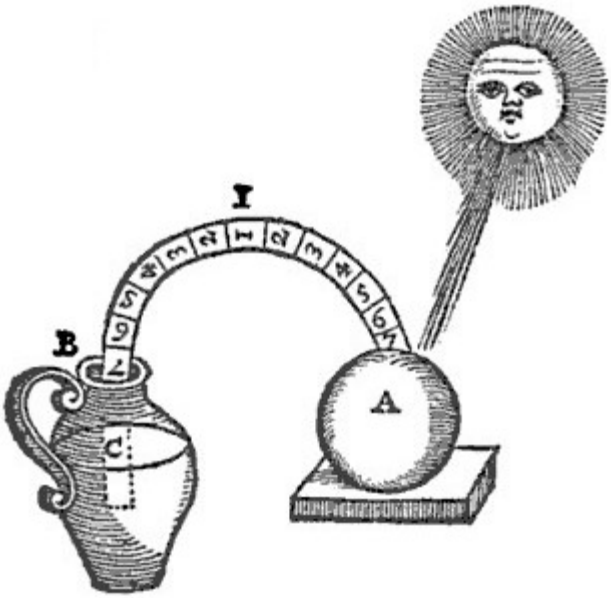

In 1592, Galileo made a similar thermometer like device (see: Galileo thermometer). [2]

In 1638, Robert Fludd, who read the work of Philo, used a modified Philo-thermometer design, in which he placed the sphere vertically above the jug (adjacent), thus making an unsealed air thermometer (see: thermometer), with a scale. [1]

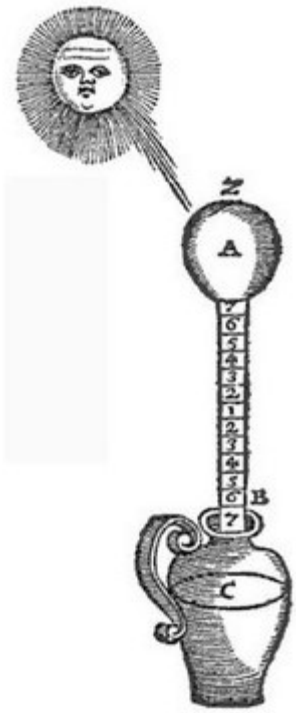

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Quotes | On

The following are quotes on Philo:

> "For other things, such as the flat-mesh conveyor belt and the repeating crossbow, Leonardo follows **Philo of Byzantium**."
>
> — Lucio Russo (1996), *The Forgotten Revolution: How Science was Born in 300BC and Why it Had to be Reborn* (pg. 336)

See also

- Ctesibius
- Hero
- Philo of Alexandria (20 BC-40AD) (Q)
- Philo of Byblos (Q) | Theta

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External links

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θΔics

In thermometers, **Philo thermometer** is a temperature measuring device in which a tube from a hollow sphere is extended over a jug of water operating such that if the sphere is placed in the sun, bubbles will be released as air expands out of the sphere; conversely, when moved into the shade, water rises in the tube as air in the sphere contracts, as pictured adjacent. [1]

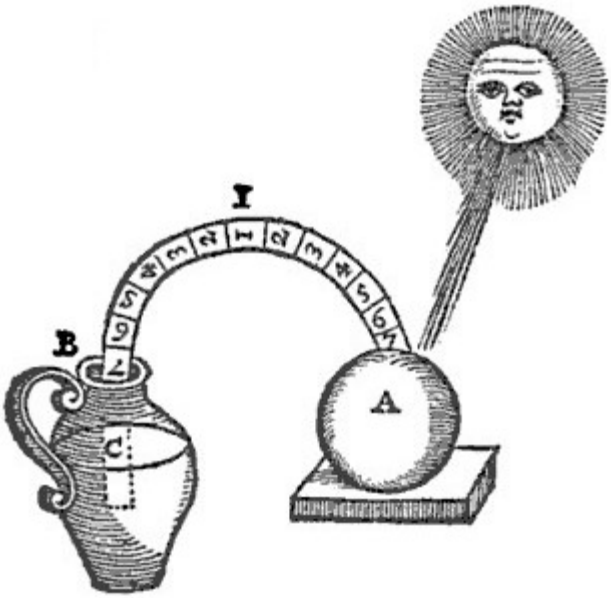

A **Philo thermometer**.

This device was invented by Philo of Byzantium (c.280-220BC), and is said to be the first thermometer-like device.

Influence

Philo's thermometer design was described in a pamphlet published by him, and later read by those including Greek engineer Hero and German engineer Robert Fludd.

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â— Philo of Byzantium – Wikipedia.

θΔics

In existographies, **Philodemus** (c.110-35BC) was an Greco-Roman Epicurean philosopher, student of Demetrius, teacher of Virgil (Q), characterized as "very learned" (Cicero, 55BC) (Q), noted for []

Overview

Thirty-six of his books were preserved when Mt. Vesuvius erupted in 79AD, and embalmed Piso's villa at Herculaneum, which contained an extensive library of papyrus scrolls.

Atheism

In c.45BC, Philodemus, in his *On Piety*, attempts to defend the model of "atomic gods", i.e. gods made of atoms, in respect to immortality beliefs and common theism beliefs, or something to this effect. (Q)

Philodemus, in his *On Piety*, wherein he attempts to defend the Epicureans against attacks of atheism, supposedly classified the following three types of atheists of antiquity: [1]

1. Those who say that it is unknown whether there are any gods or what they are like;
2. Those who say openly that the gods do not exist;
3. Those who clearly imply it.

(add)

Quotes | By

The following are quotes by Philodemus:

> "Democritus, a man who was not only the **most learned man about nature of all the ancients** but no less industrious than any other inquirer, says that music is more recent, and indemnifies its cause, saying that it was not singled out by necessity, but arose as a result of plenty."
>
> — Philodemus (c.45BC), *On Music*; Herculaneum papyrus 1497 (col. CCCVI 29-39) [2]

References

1. Bremmer, Jan N. (2006). "Atheism in Antiquity" (Q); in: *Cambridge Companion to Atheism*. Cambridge University Press.
2. Taylor, C.C.W. (1999). *The Atomists: Leucippus and Democritus: Fragments: a Text and Translation with a Commentary by C.C.W. Taylor* (pg. 155). University of Toronto Press.

External links

- Philodemus – Wikipedia.

θΔics

In human thermodynamics, **philosopher's paradox** is a mental syndrome, common to thermodynamic philosophers, particularly when discussing ingrained cherished concepts, such as life vs. death, consciousness, feelings, immortaility, soul, morality, etc., in the context of the physical sciences, where objective prophetic visions, theoretical implications, or hypotheses often tend to become skewed, scientifically empty, and generally biased on the premise that each supposition leads back to the subjective view and vested interests of the writer. [1]

First page of James Maxwell's poem "A Paradoxical Ode", his last and final poem on his views concerning thermodynamics, evolution, immortality, morality, soul, and consciousness reasoned down to the atomic level, sent to Peter Tait in jest of his 1875 conservation of energy theory of immortality, co-written with Balfour Stewart. [5]

Scottish physicist James Maxwell, in his 1878 *Nature* review of Balfour Stewart and Peter Tait's religion-sided science-crouched books *The Unseen Universe* (1875) and followup sequel *Paradoxical Philosophy* (1878), gave the following depiction of the paradoxical philosopher: [2]

> "Paradoxical philosophers [are those] eminent men of science, 'driven,' as they tell us, 'by the exigencies of the subject,' [who] having laid down all the instruments of their art, shaken the very chalk from their hands, and, locked up their laboratories, have betaken themselves to those blissful country seats where Philonous long ago convinced Hylas that there can be no heat in the fire and no matter in the world; and where in more recent times, Peacock and Mallock have brought together in larger groups the more picturesque of contemporary opinions."

Paradoxes that arise in the paradoxical philosophy mindset, as discussed by Maxwell, include the "double mind", the "binding problem", the unbridgeable gap issue or "leveling up policy", as Maxwell called it, the "continuity issue" (morality or immortality), among others.

Double mind

Maxwell goes on to comment how the scientists with philosopher's paradox often tend to conclude with the conception of the "double mind" and cites the following passage of German physician-physiologist Emil de Bois-Reymond as an example:

> "On the one side the acting, inventing, unconscious material mind, which puts the muscles into motion, and determines the world's history; this is nothing else but the mechanics of atoms, and is subject to the causal law, and on the other side the inactive, contemplative, remembering, fancying, conscious, immaterial mind, which feels pleasure and pain, love, and hate; this one lies outside of the mechanics of matter, and cares nothing for cause and effect."

Maxwell then goes on to comment "we might ask professor Du Bois-Reymond which of these [two minds] it is that does right or wrong." Maxwell also give the example of how the paradoxical philosopher may lead to the contradictory conclusion that "all matter is, in some occult sense, alive", i.e. the panpsychism or panexperientialism, in modern parlance, such as posited by a doctor Hermann Stoffkraft, in one chapter of *Paradoxical Philosophy*.

Binding problem

In his discussion of the "leveling up" policy [extrapolate up vs. extrapolate down], a name which he gives to the view of Dr. Stoftrakft that all kinds of matter have their motions accompanied with certain simple sensations or that all matter is to some sense alive, Maxwell also brings up the recent 1877 lecture "The Limits of Natural Knowledge" by Swiss-born

German botanist Carl von Nageli, wherein Maxwell summarizes as follows: [7]

> "He can draw no line across the chain of being [unbridgeable gap], and say that sensation and consciousness do not extend below that line. He cannot doubt that every molecule possesses something related, though distantly, to sensation, 'since each one feels the presence, the particular condition, the peculiar forces of the other, and, accordingly, has the inclination to move, and under circumstances really begins to move—becomes alive as it were; ... If therefore, the molecules feel something which is related to sensation, then this must be pleasure if they can respond to attraction and repulsion, *i.e.*, follow their inclination or disinclination; it must be displeasure if they are forced to execute some opposite movement, and it must be neither pleasure nor displeasure if they remain at rest'."

Maxwell goes on to speculate as to whether or not atoms can have pleasure, in terms of pure dynamics, and concludes with the remark "even if a man were built up of thinking atoms would the thoughts of the man have any relation to the thoughts of the atoms?" This is what is known as the "binding problem" in modern philosophical parlance, a 1890 expression of American psychologist William James who commented "how can many consciousnesses be at the same time one consciousness?" This is what is called, according to American philosopher Christian de Quincey, the main issue in any standard critique of any form of panpsychism. [8]

A Paradoxical Ode

In followup to his review, in 1878 Maxwell penned a satirical three-part poem entitled "A Paradoxical Ode", addressed to Hermann Stoffkraft (the so-called materialistic hero of *Paradoxical Philosophy*), which he sent to Tait poking fun at their work, themed on the alluded to premise that his soul was an amphicheiral knot, a knot that can be deformed into its mirror image, in a scientific sense, which curiously was Maxwell's last poem, as he died in midlife, at the age of 48 (in 1879) and knew he was dying as he wrote it.

Paradoxical philosophers | modern

In modern times, a recent example of a paradoxical philosopher is English physicist Philip Moriarty who argues and teaches that entropy can apply to arrangements of atoms and molecules in statistical systems, supposedly viewed in terms of the Max Planck 1900 black body-multiplicity of atomic states model of entropy, but that that "thermodynamic entropy", in his own words, cannot be applied to the arrangements of students in a field. His view was discussed and argued at length in the 2009 Moriarty-Thims debate.

Another example of the paradoxical philosopher, i.e. one who used contradictory phrases and statements in argument, is Czech black hole thermodynamicist, string theorist, and former MIT physics professor Lubos Motl, who when confronted with the view that thermodynamics governs human relationships, commented in hasty objection to the work of American chemical engineer Libb Thims, on 20 Nov 2010, that:

> "It is blatant absurdity to model laws governing human relationships using rules of thermodynamics, a set of rules that only apply at the molecular level and human beings are NOT molecules." (his capital use).

This statement, however, contradicts Motl's previously stated views on how thermodynamics applies to black holes. In 2003, for example, he stated: [6]

> "Entropy defined statistically as the logarithm of the number of microstates always behaves in the same approximate thermodynamic way if the systems become large, and black holes are no exception."

This paradoxical contradiction of views is sort of akin to the "double blind placebo effect", being that: (a) theorizing objectively on something external to oneself, e.g. the thermodynamic behavior of bacteria or black holes, tends to have

no observer bias, for the most part (unless say the theorizer is being funded by an entity with ulterior interests in mind, which tends to skew results and conclusions), but (b) theorizing objectively on oneself may very well often tend to lead to skewed thinking, e.g. Motl switching his choice of words to "rules of thermodynamics" (in arguing against thermodynamic human modeling), from his standard "laws of thermodynamics" in his journal articles on black hole thermodynamics. In other words, for black holes Motl becomes objective and not subject to observer bias, but when he thinks about how thermodynamics applies to himself, he becomes mentally confused and contradicts himself, to conclude that no thermodynamics cannot be scaled up as systems become large (such as in human societies).

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8. (a) De Quincey, Christian. (2002). *Radical Nature: Rediscovering the Soul of Matter* (section: Binding Problem, pgs. 230-37). Invisible Cities Press.
(b) James, William. (1890). *Principles of Psychology* (ch. 6: Mind Stuff Theory). Publisher.
(c) Binding problem – Wikipedia.

Further reading

â— Harman, P.M. (2001). *The Natural Philosophy of James Clerk Maxwell* (pg. 192). Cambridge University Press.
â— Porter, Theodore M. (2005). *Karl Pearson: the Scientific Life in a Statistical Age* (pgs. 38-39). Princeton University Press.

θΔics

In famous publications, ***Philosophical Implications of Thermodynamics*** or *Métaphysique et Conséquences Philosophiques de la Thermodynamique: l'Analyse Fondamentale de l'Univers* (*Metaphysics and Philosophical Implications of Thermodynamics: Basic Analysis of the Universe*) is an 1868 book by French physicist Gustave Hirn in which the philosophical ramifications of the newly-forming universal science of thermodynamics are considered in respect to the meaning of human existence. [1] It is this work of Hirn, along with his earlier measurements of the mechanical equivalent of heat of humans in action, to which the term 'human thermodynamics' was first used in, specifically in the 1893 paper "The Scientific Work of Gustav Adolph Hirn" by English engineer Bryan Donkin. [2]

CONSÉQUENCES

PHILOSOPHIQUES ET MÉTAPHYSIQUES

DE LA

THERMODYNAMIQUE

ANALYSE ÉLÉMENTAIRE

DE

L'UNIVERS

PAR

G. A. HIRN

PARIS

GAUTHIER-VILLARS,

IMPRIMEUR-LIBRAIRE DE L'ÉCOLE POLYTECHNIQUE, DU BUREAU DES LONGITUDES,

Quai des Augustins, 55

1868

Title page to French physicist Gustave Hirn's 1868 book ***Philosophical Implications of Thermodynamics***, in which the Hirn attempts to outline a philosophy of human existence based on the universal principles of thermodynamics. [1]

Synopsis

The following seems to be Hirn's synopsis or rather origin of the book:

> "Six of the following sketches were read to the Society of Natural History Colniar, and were printed in the Bulletin of the Society under the name of reading. Many people have hoped, most flattering for me to see them reprinted at a larger number of copies, I decided to make them serve as an introduction to a great work I had long been in preparation. I have reviewed carefully, I have stripped to affect the local character, and I have supplemented by a seventh sketch entirely new. As such, they are full and faithful expression of the book which they are used as input. They express the same thought in a form more accessible to the generality of cultivated minds. Their appearance, sometimes almost slight, will perhaps accept more readers walking austere book itself. It will prove at least to a mathematician and a physicist may, whenever he wants, think, feel and write in the language of everybody."

In his second sketch, interestingly Hirn devotes a section to "positive and negative work to be alive", which seems to be a direct extrapolation of German physicist Rudolf Clausius' conception of positive work and negative work.

English translation

No English translation, as yet, seems to exist. Shown below is the partial start of a straight French → English Google translation of Hirn's book.

(pgs. i-v)

ELEMENTAL ANALYSIS of the UNIVERSE
Philosophical and metaphysical Implications of
THERMODYNAMICS

BY G. A. HIRN
The unity of our finished works of art and the unity of this
artwork infinite and admirable, which is self universe, resulting
of harmony in diversity, not the identity of parties.

PARIS: GAUTH1ER-Villars, PRINTER, BOOKSELLER OF POLYTECHNIC SCHOOL, THE OFFICE OF LONGITUDES, Quai des Augustins, 55, 1868; [Graphic] [merged small] HIS EXCELLENCY DUKUY, MINISTER

OF EDUCATION, Tribute high gratitude and affectionate sympathy,

(pgs. vi-x)

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INTRODUCTION: Page » Aim and purpose of this book. - Method and demonstration elements employees. - Players whom he talks (I)

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FIRST SKETCH: Preliminary definitions. - Proposal of fundamental mechanical theory nic heat. - Application to heat engines, the phenomena general physical. - Kinship that the new doctrine establishes between all the physical sciences. - Equivalence of all forces of nature (17)

SECOND SKETCH: Application of the mechanical theory of heat engines animated. - Sources of vital heat. - Similarity of the organization Areas live with our engines. - Positive and negative work to be alive. - The first proposal of thermodynamics apply to these beings as our engines. - Details on the physiological functions of animated motors. - In what parts of the body is consumes heat as much as to work (30)

THIRD OUTLINE: Philosophical Implications of the mechanical theory. - Study the na-sor ing forces in general. - Where it ends up equating to a force simple motion of ponderable matter. - Materialism as Radical leaves Celtic necessarily assimilation. - Refutation of the assi- Milat. - The strength, considered in general, is a separate principle Pages matter: it is, just like it, a mild constituent of the universe. - Classification of forces. - Events various forces. - Materialism, pantheism and spirituality: their " definition. - Refutation of the first two doctrines. Fault-where fell frequently supporters of the third (53

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INTRODUCTION

Aim and object of this suppties shipped. - Method and demonstration / clothing emptoyés. - Players whom it is addressed. The first title of this book does not indicate that the starting point and the general method. The second, however, indicates clearly the goal.

Proceed towards distinct beings in the sensible world, as the chemist proceeds in respect of a body that analysis, look what is the elementary constitution of beings, from the grain of sand to the stars of the firmament , from the humble fungus to man, such is the daring that I proposed.

I support explicitly upon Tépithète I just used so that the reader does not believe for one moment that I should do the slightest illusion about the difficulty and size of the company. I'm even going on, and for the same reason, bring out the magnitude of the difficulty and the grandeur of the problem. I will then be much easier to identify my personality in my work, and show that if the problem is resolved in its entirety from the very introduction, it is not by me but by science and Using modern analytical methods.

The sages, philosophers, thinkers of all time, tried to guess the elementary constitution of the universe. The first man who looked eagerly plunged into the vastness of the heavens, or in the petals of a flower, or in his own being, must have wondered: "What is the nature of everything around me, what is my own nature? "

At all times too, these important questions were answered, still very firm and determined, but still very contradictory. However, if one takes the trouble to weigh the answers, so varied in appearance, it is recognized that they can be reduced to three very distinct. The solution, in fact, has somehow embodied in three huge doctrines, which have lasted for centuries, by modifying and perfecting itself, parallel to cféveloppement of the human mind in all its entirety. All blanks, like all the most distinct statements, concerning the elementary constitution of the universe, ultimately result in SPIRITUALISM, to pantheism or materialism.

For the ordinary scholar, that is to say the spirits disinclined to reflection, and yet avail themselves of the daily common terms of philosophical sciences, spiritualism is simply the assertion of a creator God and spirit and the human soul, spirit ellemême, known to survive and feed our organic existence of this world, materialism is precisely the opposite of that statement, he also intertwines with pantheism, and results in the eyes public tarnished by atheism, fatalism, rationalism, skepticism. etc.. In this form, of course, these doctrines would incidentally be included in an analytical study on the composition of beings. Indeed, although their definitions, and asked, responding to one side of the question, does not form any idea of a demonstration based on reason and experience, and does a blind statement.

But it is easy to bring these three words to their true meaning. The materialism, considered an analytical theory of the universe, admits, and can admit only one kind of essential elements: 1a matter existed from all eternity, and everywhere identical with itself, c ' is with this element and its only movement that not only did he claim, but he suffered the sentence to explain all phenomena possible, since the movement of the stars, since the formation of the crystal, until the thought in its most sublime developments. I say he suffered a conviction, and this was well understood by all his supporters consistent with themselves. As soon as he accepts more than one kind of elements, as he admits, for example, the existence of a dynamic element capable of giving rise to the motion in the matter without motion earlier, he no longer no reason to reject the existence of a third element, Calvin animistic necessary to give rise to the phenomena of organic life ceases to be himself, or rather, he has no reason to being, it becomes a matter of fact, and cease to be a doctrine of principles.

Pantheism (God in everything, everything in God) also admits an element but this element, far from being

always and everywhere identical with itself, is instead likely of all possible transformations, it can become spirit, force or matter it contains, in its essence and potentiality, all possible phenomena and may temporarily individualized as distinct beings, which, after a cycle of changes, of themselves absorbed in the great Whole. Between this and the previous doctrine there is a chasm: the point of view of principle as that of the straightforward interpretation of the facts.

Spiritualism is more difficult to Deune, or, rather, its forms are more varied, but we can say that its essence is to admit not only the variety of items from the material to the pure spirit, but also and above all, the indestructibility and individuatité of these elements. This is at least the form of this doctrine when it is logical and consistent with herself.

These three doctrines, see, are. each in its way, a real analysis of the constitution of beings. Applied to very particular of our own being, this analysis tells us the name of materialism, that man there is matter, and that his thought is a movement of atoms on behalf of pantheism, that the Man is both matter, Strength and Soul, forming a single species transmutable, each of these three words does a fashion in the name of spiritualism, that man is at least matter and mind, considered forever separate elements.

These three doctrines have crossed the centuries under the sway of progress. Materialism, obviously. has never been a philosophical doctrine somehow separate from practical life. In pantheism and spiritualism, on the contrary, are based and rendered, not only all religions possible, but all religious aspirations isolated from human consciousness.

These three interpretations are facing today, in the form of overt or covert, in all our societies. What do I say? They face and prevail alternately in the heads of many men who can think, when, returning to themselves, they look at large views, beliefs they have been taught from childhood, and that face of all, they dare not pretend to doubt.

The expression of daring that I used from the outset, specifying the purpose of this book is not too strong, it seems at least, and most readers probably will ask me: " By what right do you solve a problem you call itself secular, and you confess exist or have existed in the minds of many men, some think they know? "The question would be overwhelming if possibility of solving the problem only depended on the more or less force of our intellect alone, and if, therefore, the personality of each man thinking only intervened. That is, thank you god, not the case, and here comes a great power far more than any exceptional genius, here our personality as it disappears entirely, to make way for a collective strength which now has each of us.

Any analysis requires knowledge of the attributes of being analyzed, and the parties are supposed to form the components of that being. An elemental analysis of the universe or the beings who compose it assumes knowledge as complete as possible for all phenomena that leads the competition of the things we claim to isolate in thought. This analysis is thus exclusively for all our natural and exact sciences, Science cosmogonic, and everything we try, outside the field of science can be a hypothesis, or theory and systematically biased.

This assertion, which the evidence is likely to hit everyone, we now understand very well how our big problem was and has been through the ages without being resolved, how the three fundamental doctrines that I have specified are held face to face, without one or the other has never been completely victorious or defeated. All of our exact knowledge of the phenomena of the sensible world, Scientific cosmogony, in fact, is subject to the law of progress as possible all the work of the human spirit. What was impossible yesterday, she solves today what he is missing today, it will reach tomorrow. Our problem has been resisting for centuries, but we have the right to say one day it will be defeated by science.

In this sense, the only critical question to ask is this: "How do you know if it is time to attack a question of wise think out of the reach of human reason, as it has always seemed difficult?" If our science would step and regularly, it would be almost impossible to decide when. But that is not their operation. They shall, in fact, somewhat jerkily, their power is focused to a point sometimes, sometimes to another, a set of unexpected discoveries of the same family will often opens a horizon which no one suspected the vicinity.

Our era has been, or rather is the witness of a very striking phenomenon of development of this kind. In one of the most special of physics, in that which has for its object the study of heat, it has recently made a radical revolution in all the ideas accredited so far: a series of experimental facts, apparently paradoxical and strangers to each other, have been linked to the most brilliant in the mathematical analysis, the revolution effected in this isolated spot has quickly gained step by step, and has established a relationship now inseparable, or rather, confounded in a single beam of science that seemed to have nothing in common. Mechanics, physics, chemistry, physiology ...., spontaneously grouped around a common core of principles indelible.

Following the special character of this great and remarkable movement, the most conservative minds, the most timid, found themselves drawn to discourse on the nature of matter, forces, probing the mysteries of life and falling in excess quite opposite to their habits, have finally found what they believed easily possible. A considerable number of books of all sizes, all styles, but all marked the same trend appeared in recent times, there trying to dissect the phenomena, to trace the causes, determine the nature of the causes.

(pgs. 9-13)

open before them, have given to explain this major source of movement, saying it is an effect of the will of God, as if, at this point of view, the smallest of the phenomena of nature was not as an effect of this will, and they looked painfully linking all possible dynamic phenomena that only force, which is not yet over one of their own confession.

If, as a physicist and as a metaphysician, I was mistaken in thinking that the only language of facts now known and well understood it is possible to draw a natural and general synthesis, embracing all phenomena of the universe if I gave the epigraph to this book, which shows all the trends, should be only an expression of poetic illusion on my part, I do not at least be difficult to show that the eloquence of facts sufficient to rebut the unitary synthesis is claimed to be written so clearly in the great book of nature. As a physicist, and an objective point of view, I shall not prove that a phenomenon so admirably analyzed and grouped together in these last days, will legitimize the explanatory hypothesis, and also the most specious, we presented as the only true on the nature of forces. As a metaphysician, and a subjective point of view, I know perhaps better still bring out the close connection between pure materialism and synthesis Unitarian, I shall show that materializing phenomena we have inflicted the same out to others who will seem completely foreign. and that to be called spiritualist, not to be simply materialistic inconsistent, it is not enough to make professions of orthodox faith, to deliver at all times solemnly called Creator, draw a chalk line through the phenomena of nature, and declare that everything is on one side, and pure spirit of the other! Conditions are less specious necessary for us to say really belong to one or another of our three major philosophical doctrines.

The first title of this book, I said, indicates the starting point and the method. The creation of thermodynamics is a new era in the development of all our science, and not just that the only physical - mechanical. She came to enforcing laws and defined clear interpretation of a host of phenomena which seemed to have no other rule than chance. To identify the various species of elements that constitute beings, and who, by their mutual relations, give rise to. phenomena, it was natural to start from the very principles that have somehow changed our science, and linked them into a single beam. From these principles I have tried to draw philosophical and metaphysical implications, I was constantly causes from effects: I have used, in a word, almost exclusively critical and analytical method. This method, despite what has been said, is the true power of our science, and for having abandoned too soon, that many modern thinkers, believers found a general synthesis, have led that to small partial syntheses, devoid of any viability. Explain life by electricity, heat, electricity, magnetism, gravitation, universal gravitation by the movement of matter or the will. God is not explaining anything at all, or rather, it will translate, in the form of sensory images and palpable, which in the reality of nature, can affect any figure!

And now, am I allowed to say to whom I offer this book? Is it permissible for an author to say that he wants to be read? I think, in all cases, filling almost an obligation to say to whom I méconseille read me.

The epigraph of the book shows all the trends. It is, as a philosophical work, the refutation of materialism and pantheism, a justification of spiritualism as absolute but is, as a work of pure science, a refutation of all theories partial quis physics, mechanics, lead straight to the two First doctrines any sensible mind and consistent with himself. The

author would hope or wish an official success and welcome the crowd literate, can not do better.

But as a work of pure science, this book goes against many: the author, thank you god, is far from alone in his opinion, but it is nevertheless a small number to fight against the ideas present the vast majority of scientists. This is not an element of success among its peers. If, as a work of philosophy, this book refutes materialism and pantheism to top spiritualism, he reasons carefully with the first doctrine, he attacks with respect to the second, and it points very often deplorable excess third. The author was careful not to insult the philosophers who accept the materialism or pantheism as scientific truth: he knows that among them are the most powerful minds of these two centuries, he knows many of them of QENS honest, he knows that the materialist, in the bad sense of the word, that the intelligent man who has neither faith nor law, which at every moment, violating its most basic duties towards himself and towards others , is found in all camps, and perhaps in greater numbers in the camp of so-called purists. He knows that many Christians are blind to their pantheistic, and all are even some points. The insult, in a word, has no place in this book. This is not an element of success either, among the large number of less.

For many people it's almost a crime to prove the truth of what they believe is true, because a reasoned demonstration finds a doubt and the need for verification. They prefer to accept without examining what they have been taught true or false by the yoke of authority, rather than to scrutinize and dig. Let those who are endowed with this strong faith, who believe that man is free to believe what he wants, who have hatred in my heart and lightning for any opponent in hand, hastily closed the book and return it on the shelves of the bookstore, the author has never been blessed with this faith there, perhaps he would even volunteer that he had the good fortune never to possess.

This is a book of science, it is therefore aimed firstly, in its entirety, to the scientists, who fear or do not disdain occasionally to leave the restricted circle of their special works to shed light on philosophy of science. But, I hope at least, its introduction, if not its entirety, will find the sympathies of a still larger class of readers.

Many sensible minds know from experience that one is not free to believe the false and absurd, without being sated with what we liked to call the forbidden fruit, yet they have enough learned to know the historical and scientific formulas that the authority of caste, of all time, substituted the aspirations of the human conscience. Knowing now what to expect on allirmations sententious old codes, somewhat satisfied, on the other hand, contradictory statements of those who speak in the name of science, they look back with disappointment, and apprehension ahead : doubt, in short, has bitten the heart. On certain days of the funeral event, under the blows of injustice, the grave of a loved one in these days when the ground beneath the feet lack of stronger, they could not see the absurdity of one side and nothing on the other, despair is their lot, until the most powerful of doctors, the time has closed the wound. These, I dare believe, will be a joyful surprise that positive science and experimental opens today at the horizon thinker more comforting and serene, they recognize that if the revelations of nature lead to the ultimate denial at certain points, they do not push for doubt, in other key points, that when we bring in interpreting the obstinacy of a preconceived system, wrong or this method of investigation, which leads us to conclude before we possess the rudiments of a conclusion. It is these that addresses the introduction of this book: each line, they will recognize one of their kind and sympathetic friend. But they go beyond the introduction, if they still doubt, and if they do not fear the more austere language of a true scientific demonstration. The thought of being useful to one of those, I pay all my toil and all my efforts.

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This book is the analytical expression of all sciences, scientific cosmogony, as I learned to understand, and not at all the statement of a systematic collection of ideas. That's a little too thought of themselves for saying a little too often my summary, my philosophy, that many authors have led only to dead-born blanks. But even in this sense, will I always knew not to speak, but let him speak properly part of science that I was able to kiss? Alas Here again, more than once without doubt, the personality of the writer will reappear, and with it human error. If I had such faith in myself, believe that strong, which are indispensable for carrying out its end a great job, I am once myself finishing my work, and, terrified at the thought of the probable imperfections of this work I had to console myself by remembering the words of the great poet:

Es IRRT der Mensch, so tany 'er strebt! ("Man errs as he strives toward his goal."). That is, the man wanders as it is in this world.

PRELIMINARY SKETCHES

Six of the following sketches were read to the Society of Natural History Colniar, and were printed in the Bulletin of the Society under the name of reading. Many people have hoped, most flattering for me to see them reprinted at a larger number of copies, I decided to make them serve as an introduction to a great work I had long been in preparation . I have reviewed carefully, I have stripped to affect the local character, and I have supplemented by a seventh sketch entirely new. As such, they are full and faithful expression of the book which they are used as input. They express the same thought in a form more accessible to the generality of cultivated minds. Their appearance, sometimes almost slight, will perhaps accept more readers walking austere book itself. It will prove at least a mathematician and a physicist may, whenever he wants, think, feel and write in the language of everybody.

FIRST SKETCH

Preliminary definitions. - Proposal of the basic mechanical theory. - Application to heat engines, the physical phenomena in general .- Relationship establishes that the new doctrine among all the physical sciences. - Equivalence of all forces of nature.

In the course of the last twenty years, science has been enriched by a great conquest, which will mark the history of human knowledge the beginning of a new era. The foundation and the building of the mechanical theory of heat actually constitute a step forward as crucial as that of universal gravitation. By its very modest way, the mechanical theory of heat seems to be a special branch of a limited and special itself of physics. In reality, it is a whole science of which all other natural sciences sontdéjà become dependent. That is, among other things, I will highlight in these sketches, in a form that will convince everyone.

To our surprise, we see the mechanical theory of heat we drive level on the field of physiology, and spread the brightest light on has some problems long dark and then allow us to tackle some issues of psychology known for centuries out of the reach of Sciences. Moreover, and this is already striking a physician, Dr. Mayer of Heilbronn, who first makes a key proposals of the mechanical theory, based on considerations drawn mostly from the reign of beings. In short, what will strike most legitimately, that the universality of the consequences of some of the elementary propositions of doctrine is the kinship and solidarity it makes between science that we had until here separate flood and were taught separately.

Taken in the literal meaning of its title, the mechanical theory is to study the necessary relations between the phenomena of heat and of static or dynamic balance of ponderable matter. This definition alone already provides a hyphen between the two sciences now inseparable apparently very distinct between the mechanics and physics.

I began by clarifying the meaning of two expressions belonging to these sciences, and whose employment will save us long and frequent circumlocutions. I mean this is in physics is called a unit of heat or calories, and this in mechanics is called a work unit, a dynamic.

The heat, as we know, can not be weighed or gauged, and it is indeed a force, it can not be properly assessed by its effects. What we call the temperature of a body, and what we measure with our thermometers, is, properly speaking, the intensity of caloric force currently free in this body, but our thermometers, kind, good or bad in themselves, can not give us any idea of the direct

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amount of heat, or increases or decreases it undergoes. It is evident that this quantity and its variation with more or less depend on both the intensity and heat in a body and the amount of the body itself, which is subjected to the action of caloric force. By combining these two elements, one can arrive at a relative measure entirely correct and clear. This is done in physics, called unit of heat or calories, the amount of heat that must be added to one kilogram of water at 0 ° to raise the temperature 1 degree centigrade.

I think I should elaborate a bit more about the definition of the dynamic unity, whose use is much less familiar and

whose meaning is also clearly very difficult to understand.

There are few words whose use is more common and whose meanings are more varied in appearance than the terms of Labour Force and it is little more that are often diverted from their true meaning, not only in language vulgar, but even in that of many men of science, too little attention to the huge inconvenience caused a vicious use of certain terms. Without dwelling unduly on those meanings or vicious to those jobs, I say once that mechanical force all known causes of motion of ponderable matter or body. I will not try for now, though, as most schools admit materialists, the motion can only arise from the movement if when we see, for example, a body falling to the surface of the earth with a speed of More and more, he is driven by our knowledge of material molecules endowed with very high speeds and through space in all directions, or if, as I tried to demonstrate in most of my work, the not exist, however, in nature, special principles completely separate matter, and able to take it from the rest or get him back. I will return, as appropriate, on this great and beautiful question.

All things being equal, the speed acquired by a material body subject to the influence of a force, depends on time and intensity of that force, and space that the body runs under it. 11 is clear from this that the product of the distance covered and the intensity of the force accurately represents the amount of action developed or expended by the directive. This product is called the mechanical work. The digital conversion of the expense of action is very simple mechanics. Just as a force may be used to set in motion a free body as well, and it is even more often, it can be used to overcome another force.

For example, while our guns, the expansive force of gases, which is none other than the heat, is used to give impetus to increasing the projectile on the contrary, when with a machine steam, we lift some burden, the expansive force of steam or heat, is used to overcome the action of gravity or the gravitational force on the body. The product of the height at which a high burden, and weight of this burden, here becomes the very clear expression of the work or the quantity of action developed in the machine by the caloric force. It is a product of this species being converted now universally the expense of mechanical action of all possible forces. It was taken as unit weight per kilogram and the meter unit height, and called kilogrammetre the amount of action he must spend, using any force whatsoever to raise a meter tall weighing 1 kilogram. in a second time.

When, for example, we say a steam engine, a hydraulic motor has a force of 10,000-pounds, this means that beyond using power generated and used without loss, we could raise in one second one meter in height weighing 10,000 kilograms. 10000 meters or weighing 1 kilogram. So again, when we say that a horse can provide a working 75-pounds, this means that the motive power of the animal, used without loss, may raise per second to 1 meter tall weighing 75 kilograms. It is often taken as the unit of horse power and expressed, and it is said that a steam engine has a power of 100 horsepower, when it is able to provide work of a hundred times 75-pounds per second.

If I explained myself clearly and not too tiring the reader's attention, several thoughts will already spontaneously offered to his mind. We have noticed how these definitions in the sciences are different from those merely the general public, when he uses the same words, and how they reduce the terms to their original meaning. Force, in effect, means engine power, a principle of action, whether of physical or faculties of our soul work means spending of action for some time, whether as of a physical phenomenon or a function of our thought. That is the sense that these mechanics are two terms often so vague in ordinary language.

We see how many people incorrectly thought are what we call the power of an engine. When they hear about a steam engine, a water wheel of twenty horses for example, it contained only twenty horses harnessed together and acting both are driven by the engine. They thus confuse the effort exerted at a given time, and assumes no minimum time, with the mechanical work, which involves the idea of time. Archimedes said that with a lever and a fulcrum long enough, that it would raise the earth, he probably thought to have multiplied almost indefinitely the power of man, in reality, unconsciously perhaps He has made us very small. Lift the land means, in effect, use the engine working at our disposal, to raise to a height equal weight to that of Earth. But really, how long would it take a very vigorous man, working day and night, without rest, to lift such a weight to one millimeter in height? 11 would need two million of millions of centuries! Archimedes indeed, although we were humiliated.

The effort that we can leverage to multiply indefinitely and work due to this effort, when he reflects on the move and

mingle too often still in many minds otherwise very intelligent; this mistake gave rise to a disease that is incurable, when not cut it at its birth: it is that the search for perpetual motion or production of a work without equal spending power.

I have just defined two kinds of measurement units that appear to have absolutely nothing in common: the unit of heat, the unit of mechanical work. Yet between them that the mechanical theory has come to draw a line of union now indestructible.

A body that is heated it expands, or increases in volume, a body that is cooled contracts or shrinks. By increasing volume, the body is able to overcome external resistors larger or smaller, often huge, that tries to oppose it. Thus water, which we submit to an increasing heat in a closed vessel, finally broke the walls thicker, if we do end steam happens if we do not allow the volume of s increase. Thus the water that we boil Open Cup takes a volume nearly ten seven hundred times bigger, in fact, overcoming, ever, atmospheric pressure, a simple calculation tells us that a kilogram. water we évaporons well, actually raises to seventeen meters in height the enormous weight of one thousand kilograms.

The powder that we fired-in a firearm is in fact something other than a very large body heat comes suddenly dilate: the tendency to increase the pressure exerted on the body and the heated projectile is such that it, on a trip of just one meter, often receives a speed of 800-1200 meters per second.

Heat, in a word, is a force, and in this capacity it acts in all nature, and that we use in our engines. We can already see that these two units I defined above, are not so foreign to each other that we thought at first; amount of heat that is to say how much force in action in a phenomenon much work, that is to say amount of action produced by this force, these are elements which, far from not knowing each other, all must have a mathematical connection.

The general principle according to which all run our engines to heat without exception is very clear and simple. Any body, water, ether, chloroform, air, gas in general, are subject to alternative expansion and contraction of volume. During the period of expansion, the body exerts a force and pushed forward a piston that moves in a casing, which, using suitable mechanical parts, we provide outside the amount of effort, work it receives. During the period of contraction, the piston become free again returns to its original position.

In our steamers, for example, water, subject to

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the action of heat in the boiler, it reduces vapor, that is to say, it actually expands, so take a volume several hundred times greater, as it formed, the steam will push forward or back the piston engine. Each time the piston reaches the end of its stroke, the steam that had pushed is placed in communication with a cold and empty space where it condenses and precipitates, the piston can become free and back in action new steam acting on its opposite side.

Expansion and contraction of an alternative body, this is the cause somehow palpable movement of any heat engine. Addition and subtraction alternative heat, this is the real cause, but absolutely untouchable, these volume changes and movements. Such an engine requires, therefore, not only the existence of a heat source to expand the body, but also a source of cold to remove the body, at first dilated, which had thus expanded, and returning it to its original state.

One of the most crucial question arises here naturally to mind. The body on which we act warmth he brings to the cold source that receives all the heat source of heat? In other words, more precise, suppose that we measure all the heat supplied to water boiling in a steam boiler and also that we measure all the heat that we find in the condenser of the machine, taking of also account for passive losses: there he equality between the amount originally given, then found?

Before 1842, there are therefore twenty years ago, physicists all without exception had responded by affirming, all would have said without hesitation: yes, there is equality between the amounts spent and recovered heat, the heat can only disperse more or less in different bodies, so as to keep them at temperatures higher or lower, but it is impossible that it ceases to be heat.

Today, however, there is a single physicist who could still respond well.

Whenever the action of heat on a body produces a mechanical work, it disappears heat strictly proportional to the work product. Conversely, whenever a mechanical work is used to alter the state of internal equilibrium of a body, it develops a heat strictly proportional to the work expended. Between work and produced or consumed and the heat produced or consumed and there is a report immutable, which is what is called the mechanical equivalent of heat.

This is the great principle laid down for the first time by Dr. Mayer, that is the fundamental proposition on which rests the whole edifice of the mechanical theory of heat.

In all engine heat, the heat transfers more heat to the body on which it acts, the source of cold fact is this body back to its original volume, and the difference of these two quantities of heat is precisely that which gives us the work of the machine. Each unit of heat expended is thus translated for us by four hundred twenty-five kilogram units of work or products. This is the numerical value of the mechanical equivalent.

Everyone knows that the friction, the shocks, the compression of the body develop heat Well! the amount of heat produced does not depend on the particular nature of each body, but exclusively to the work consumed. Whenever he has made an expenditure of 425-pounds of work, he develops a unit of heat, a calorie.

I pointed out that in our arms fire, the heat that, by dilating suddenly the constituents of the powder, is the motive cause of the ball. But while it travels more quickly into the room, the gases produced by inftammation cool: there operates a heat consumption is strictly proportional to the work that represents the speed of the ball to each moment. Say it with any initial velocity, go hit a block and still strong enough, a rock, for example, at the very moment of impact, it will get hot, and heat that it will develop as a result of the loss of his movement, will be exactly equal to that which had disappeared in the powder gas to produce this movement.

It is easy to understand what changes the root principle of Mayer had to bring in all our physical sciences, and what enormous progress made there.

Many phenomena, which seemed to have nothing in common between them, and whose study seemed to be pusieurs different sciences have been reduced to mere questions of static or dynamic, fully addressed by mathematical analysis. A very small number of well-chosen examples will be immediately grasping the magnitude of the progress already, or to do very soon again.

The resistance of solids to break the cohesion is due to the mutual attraction of all the physical parts that constitute the body. To stretch, to bend an iron bar, he must overcome this attraction with an effort, he must, in a word. spend at work. But when the heat expands a body, it is also obvious that she overcomes these attractions, it operates in a word, as work: Some of this heat is used in this work. It follows directly from that statement is so simple that when we expose any body heat, a portion of heat it receives is used to overcome the internal forces, this part does not change the temperature of the body, another part, otherwise, only serves to raise the temperature. So if we can recognize that in the heating of a body belongs to the first and second of these parts, we can calculate the work done by internal heat, and therefore also the intensity of attraction of atoms to each other.

This attractive force has a very high value in solids very resistant, it is conceivable that very easily, but what we might surprise is learning that it is far from be zero in the vapors in gases, which, however, the parties seem to be repelled to infinity, and in liquids, water for example, the intensity of this force is colossal. If we assume A0 ° water contained in a vessel it fills completely inelastic, and if we assume that the work of internal forces of attraction be suspended for leaving only the repulsive force of heat, the liquid will exert on the walls of the vase and on each square meter of the enormous pressure of five hundred million pounds. So that pressure is really that caloric balance in a liquid which, however, the parties seem to take us some way to dens. It is this attraction, which for the most part, determines the enormous absorption of heat caused by boiling liquids.

Everyone knows that water is subject to constant pressure and reached its boiling point, temperature does not change, regardless of the amount of heat to be provided. All this heat is then added to separate the molecules used to overcome

their attraction and the external pressure. When water boils at the open air, that is to say, under the ordinary atmospheric pressure, forty calories alone are employed in external work and four hundred ninety-six are to overcome the internal attraction. The old physics called latent heat and the heat absorbed by the liquid without changing temperature. In reality, there is nothing of latent here in one kilogram of steam at one hundred degrees and one atmosphere of pressure, there is no more heat than one kilogram of water 100 °, although it must be the enormous sum of 536 calories to evaporate the water. It has at all times that the evaporation of water determines the cooling of the liquid: the correct explanation of the phenomenon is rather quite recent.

This is the beautiful result which today leads the mechanical theory of heat, weigh the attraction of two atoms, such as astronomy weighs the attraction of two globes of the firmament.

But there is one more step to do, and already the road is open. The force that brings together in a homogeneous and resistant atoms of an element is obviously not the same as that between two, three, four different atoms in a molecule composed. In other words, the molecular attraction, the cause of cohesion, can be confused in its effects with chemical affinity. Well in this sense, the study of heat Severe already allows us to certain bodies, to distinguish what belongs to one or other of these forces, and consequently reduce to numbers, to express in kilograms energy force that unites two chemical elements in a homogeneous compound. Without a doubt, by a few years, the chemistry, which seemed a science of facts and memory will be affordable to the mathematical analysis.

The sound, whether a simple noise or the most harmonious chord sequence, the sound result, we know, a

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state of oscillation of the internal parts of elastic bodies and if we could see the internal movement of air, for example, which gives us a continuous, we should see the fluid divided into mobile units, in waves, sound waves, such that these parties, even slices, approach and depart from each other alternately. But to compress an elastic body to reduce its volume, it must spend at work, and consequently the body heats up. If, because of its elasticity, the body is instead a larger volume, it provides employment and hence cools. The wave is compressed to a higher temperature, and the rarefied wave is a lower temperature than the body where the sound propagates. This alternative heating and cooling changes the elasticity of body sound, and therefore alter the level occupied by the sound in the range and velocity.

And we do not think it is a minimal impact and negligible Newton, by calculation, set the speed of sound in air at 288 meters; Laplace, taking into account the heat and cold produced by the compression and rarefaction, set this speed to 340 meters: the number actually found by direct experience. The speed of sound in air one can deduce the value of the mechanical equivalent of heat, and add that the calculated value is consistent with a nearly four-hundredth Joust with that and I have found directly. That is the sound itself linked to the mechanical theory of heat.

We see how closely related the grand principle of Dr. Mayer came to establish between our various sciences. And we do not think this relationship is merely subjective or relative to our way of classifying. It is objective, that is to say that it concerns the very subjects of our science, natural phenomena and their causes. The principle of Mayer, in fact, concerns not only the calories, but all the forces of nature, electricity, light, magnetism, gravity, etc.. If, in any phenomenon, it occurs, for example, electricity, we are perfectly sure it is spent or light, or heat, or mechanical work, the equivalent amount.

In short, all the forces of nature can replace each other, there are quantitative equivalence between the point of view of the effects. But I do not want to tire the longer the reader's attention by quotations from the physical world, I go immediately into the field of organic life and I look with the attention that it deserves a wide class of phenomena of interest physiologist, physician, naturalist.

SECOND SKETCH

Application of the mechanical theory of heat engines anime. - Sources of vital heat. - Similarity of the body of living beings with our engines. - Positive and negative work to be alive. - The first proposal of the mechanical theory applies to these beings as all our engines. - Details on the physiological functions of animated motors. - In what parts of the

body heat that is consumed labor costs, etc..

The bodies of all living things, plants, cold-blooded or warm blooded, is a source of heat, a fire going. If the heat that it is constantly developing student does not continue indefinitely with temperature, because the external heat losses are equal to the amount of heat produced internally, and are also regulated by the organism itself Similarly, so that the temperature remains constant at each being a half a degree, despite variations in temperature of their physical surroundings to be organized.

We talked for centuries about the origin of heat called vital. Aristotle, scholars cite the environment when there is a man of modern science to depreciate, Aristotle thought that heat is created by the vital force itself, and the respiratory organs, in higher animals, is used to continually refresh the body, preventing it from being consumed by the excess heat produced.

We'll see how the mechanical theory enters this issue, first as a critic, and then as affirmative. Nihil ex nihilo nihil in Nihilum. Nothing can come of nothing, nothing that has been being can go into nothingness.

Life, whatever its nature, moreover, can not create anything with no ponderable or imponderable elements that constitute the body of a living being, she can only use the elements it finds in the physical world. The heat continuously produced in the body of living beings, and in great quantities in the warm-blooded animals, can be due only to assume that new combinations in the organism itself, the physical elements which are not continually introduced.

I say purposely exclusively. Several physiologists Indeed, without adopting the whole of the ideas of Aristotle, had adopted and amended at least one party. "The friction of blood in the veins and arteries, rubbing the muscles etc.. etc.. must, they say, produce heat, and therefore add to that developed chemical reactions. "And as for the first part of the assertion, they are perfectly right. But the mechanical theory refutes completely the final conclusion. These frictions, these mechanical actions of all kinds generate heat, said that theory, but the movements that gave rise, the blood, the muscles, etc.., Costing themselves from heat and rigoureusementégales quantities, the total amount of heat produced in the body is not so amended. We shall soon see that this assertion has been verified experimentally and the most triumphant.

Among the chemical reactions that can develop heat in the living being, the most important, one that predominates all others, is that resulting from the absorption of oxygen from the air and its combination with the elements fuel supplied by food. Breathing, in short, is the main cause, if not unique, the production of vital heat. This was established beyond doubt, first, in the experiments of Lavoisier, Laplace, and then those of Dulong and Regnault, on animals of different species, and then finally my experiments on humans.

In experiments four physicists and chemists that I mentioned above, the animal was enclosed in a calorimeter or apparatus suitable for measuring the total amount of heat produced in a given time, he was sent through a tube the air required the respiration were analyzed air coming out of the device. From the weight of carbonic acid found in the outgoing air, we calculated the amount of carbon burned, the weight of oxygen combined in this carbonic acid was subtracted from that wanted to air this deficit allowed calculate the amount of hydrogen burned off, making the total amount of heat represented by these two elements are burned, they had the amount of total heat available in the body. This quantity, in the tests of Dulong and Regnault, was found so close to that indicated by direct calorimeter, that doubt is no longer allowed on the fundamental role of breathing.

My experiments on humans highlight something more remarkable: that, from one individual to another, the ratio of various fuel elements combine with oxygen is the same. The consequence is that the heat developed at every moment in our body is always strictly proportional to the weight of oxygen absorbed in a given time. I have, in effect, subject to the experience of both sexes, different ages, different temperaments, one among others, was suffering from a high lung catarrh, I submitted myself experience during a strong period of fever. The amount of oxygen absorbed per hour and, consequently, the amount of heat generated per hour, varied considerably from one person to another, but in all, each gram of oxygen consumed produced very nearly 5 calories, that is to say five times what it takes heat to raise the temperature of 1 ° of i kil. water to zero. I shall return later to some very curious details, as a matter of physiology.

All I have to say about the production of vital heat, refers exclusively to the living being in a state of rest.

Two major divisions are introduced, so to speak ellesmêmes in the study of organized beings. Among these people, some, in fact, are fixed in a more or less absolute, instead of their birth: they are forced to wait until the elements necessary for their existence and their development to reach them: it are plants. The others are endowed with mobility, they can go and take the necessary elements to their existence: they are animals. But the move and raise their own body weight, drag, carry, raise a weight, an additional burden, is provide what

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θΔics

In human thermodynamics, **philosophical thermodynamics** is the study of the thermodynamic questions of how one should live (ethics); what sorts of things exist and what are their essential natures (metaphysics); what counts as genuine knowledge (epistemology); and what are the correct principles of reasoning (logic). [1]

A rendition of Gustave Hirn in 1868 ruminating on **philosophical thermodynamics**, namely on implications of thermodynamics on philosophy and metaphysics. [7]

Overview

In 1869, French physicist Gustave Hirn published *Philosophical Implications of Thermodynamics*, on what thermodynamics has to say about philosophical and metaphysical questions.

In 1955, French anthropologist and philosopher Claude Lévi-Strauss, in his *Tristes tropiques (Sad Tropics)*, coined the term entropology, as the name sometimes given to thermodynamics without differential equations. [4]

In 1987, American writer Elizabeth Porteus situated her *Twentieth Century Philosophy* of life, happiness, child rearing, and integrated work around the second law of thermodynamics. [5]

In 2002, American physicist Jack Hokikian state the following relation between philosophy and thermodynamics: [6]

> "[Long ago] science and philosophy were unified in their goal: to discover the truth about how nature works, [in recent years, however] science has been taken over by technology—applied science—but technology does not provide us with any principles of nature, principles needed to derive a practical **philosophy** of life—for this we have to turn to the laws of thermodynamics."

In a sense, philosophical thermodynamics is human thermodynamic analysis of the grounds of and concepts expressing fundamental beliefs as well as search for a general thermodynamic understanding of values and reality by chiefly quantitative means. [2]

Core concepts in philosophical thermodynamics include: time, meaning, purpose, eschatology (e.g. heat death), among others. Of the laws of thermodynamics, according to thermodynamicist Myron Kaufman, the second law has important philosophical implications. [3]

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θΔics

In HT pioneers, the **philosophical** (thermodynamics pioneers) **TPs** page is a file-tree header for grouping individuals, ordered in the dropbox to the left, in the category of pioneers of philosophical thermodynamics.

θΔics

In science, **philosophy** is the "reasoning art" (Aurelius, 167AD); the "daughter of reason and the future mother of truth" (Schopenhauer, 1936); the study of topics concerning the whys and hows of human existence; generally those which have not yet been quantified by the hard sciences.

Thermodynamics

The term "philosophical thermodynamics", refers to the penetration of exacting logic of thermodynamics on various philosophical questions. In human chemistry, since the time of German polymath Johann Goethe's 1809 *Elective Affinities*, the logic of the chemical reaction in regards to human chemical reactions, has led to debates on the issue of free will and choice among other topics. [1]

List

The following are some of the noted branches of philosophy:

	Type	Description
1.	Materialistic philosophy	he views of Epicurus and Thomas Hobbes (Henderson, 1917). [2]
2.	Natural philosophy	
3.	Goethean philosophy	
4.	Greek philosophy	
5.	Philosophical romanticism	
6.	Philosophical thermodynamics	
7.	Physico-chemical philosophy	

(add)

Quotes

The following are related quotes:

> "The first to use the term [**philosophy**], and to call himself a philosopher or lover of wisdom, was Pythagoras; for, said he, no man is wise, but god alone. Heraclides of Pontus, in his *De mortua*, makes him say this at Sicyon in conversation with Leon, who was the prince of that city or of Phlius. All too quickly the study was called wisdom and its professor a sage, to denote his attainment of mental perfection; while the student who took it up was a philosopher or lover of wisdom. Sophists was another name for the wise men, and not only for philosophers but for the poets also. And so Cratinus when praising Homer and Hesiod in his *Archilochi* gives them the title of sophist."
>
> — Diogenes Laertius (c.230BC), *The Lives and Opinions of Eminent Philosophers* (1:12) (Q)

> "**Philosophy**, the pursuit of wisdom, has had a twofold origin; it started with Anaximander on the one hand, with Pythagoras on the other. The former was a pupil of Thales, Pythagoras was taught by Pherecydes. The one school was called Ionian, because Thales, a Milesian and therefore an Ionian, instructed Anaximander; the other school was called Italian from Pythagoras, who worked for the most part in Italy. And the one school, that of Ionia, terminates with Clitomachus and Chrysippus and Theophrastus, that of Italy with Epicurus. The succession passes from Thales through Anaximander, Anaximenes, Anaxagoras, Archelaus, to Socrates, who introduced ethics or moral philosophy; from Socrates to his pupils the Socratics, and especially to Plato, the founder of the Old Academy; from Plato, through Speusippus and Xenocrates, the succession passes to Polemo, Crantor, and Crates, Arcesilaus, founder of the Middle Academy, Lacydes, founder of the New Academy, Carneades, and Clitomachus. This line brings us to Clitomachus. There is another which ends with Chrysippus, that is to say by passing from Socrates to Antisthenes, then to Diogenes the Cynic, Crates of Thebes, Zeno of Citium, Cleanthes, Chrysippus. And yet again another ends with Theophrastus; thus from Plato it passes to Aristotle, and from Aristotle to Theophrastus. In this manner the school of Ionia comes to an end. In the Italian school the order of succession is as follows: first Pherecydes, next Pythagoras, next his son Telauges, then Xenophanes, Parmenides, Zeno of Elea, Leucippus, Democritus, who had many pupils, in particular Nausiphanes [and Naucydes], who were teachers of Epicurus."
>
> — Diogenes Laertius (c.230BC), *The Lives and Opinions of Eminent Philosophers* (1:13-15) (Q)

> "The truth is, the 'science of nature' has been already too long made only a work of the 'brain' and the 'fancy': It is now high time that it should return to the plainness and soundness of observations on material and obvious things. It is said of great empires, that the best way to preserve them from decay, is to bring them back to the first principles, and arts, on which they did begin. The same is undoubtedly **true in philosophy**, that by wandering far away into invisible notions, has almost quite destroyed itself, and it can never be recovered, or continued, but by returning into the same sensible paths, in which it did at first proceed."

— Robert Hooke (1665), *Micrographia* (preface) [4]

Icon | Philosophers

The following are related poster quotes: [3]

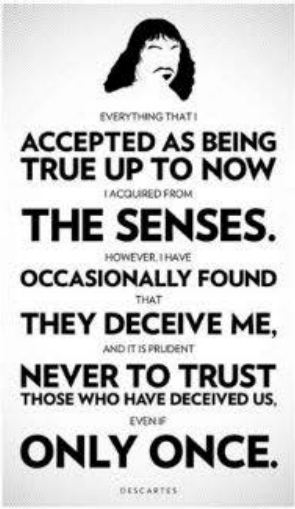

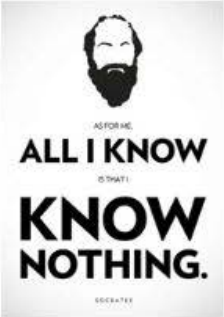

See also

- Perry 80
- Greatest philosopher ever
- Stokes 100

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4. (a) Hooke, Robert. (1665). *Micrographia: Or, Some Physiological Descriptions of Minute Bodies Made by Magnifying Glasses, with Observations and Inquiries Thereupon* (pg. #). Martyn and Allestry.
(b) Inwood, Stephen. (2003). *The Man Who Knew Too Much: the Strange and Inventive Life of Robert Hooke 1653-1703* (Brain and the fancy, pg. 1). Pan MacMillan.

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External links

- Philosophy – Wikipedia.

θΔics

In chemistry, **phlogiston**, symbol Ï• (phi), from Greek, meaning "to enflame" (Leicester, 1951) or "fire of earth" (Woodcock, 2005), was a hypothetical substance supposed to be common to all combustible bodies and metals, which escaped during combustion or calcinations, but could be transferred to one body to another, and restored to the metallic calces by heating with substances rich in phlogiston (charcoal, oil, etc.); metal, for example, was produced by the following reaction: [1]

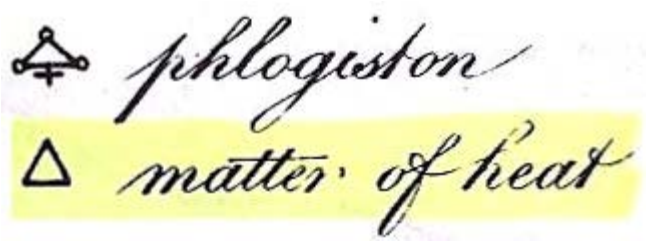

Swedish chemist Torbern Bergman's 1775 listing of the symbols for **phlogiston** and the matter of heat, categorized as two types of "earths", of which he listed 15 types, as contrasted with the acids (25), alkalis (3), and metallic calces (16). [3]

$$metal \rightleftharpoons calx + \phi$$

(add discussion)

Overview

In 1669, Johann Becher proposed the terra pinguis theory of heat.

In 1703, German chemist Georg Stahl, Becher's student, proposed the phlogiston theory.

Phlogiston theory was a precursor to French chemist Antoine Lavoisier 1787 caloric theory; which in turn was a precursor to German physicist Rudolf Clausius' entropy theory.

On a modification of Becher's three earths theory, terra pinguis was renamed as *phlogiston*, from the Ancient Greek *phlogios* for 'fiery', which was said to be the "matter and principle of fire, and not fire itself" that escapes from burning bodies with a rapid whirling motion, and is contained in all combustible bodies and also in metals, which can be burnt to "calces".

Calx is a residual substance, sometimes in the form of a fine powder, that is left when a metal or mineral combusts or is calcinated due to heat. Calx, especially of a metal, is now properly defined as an 'oxide', i.e. a chemical compound containing an oxygen atom and other elements. In the phlogiston theory, the calx was the true elemental substance, having lost its phlogiston in the process of combustion. The phlogiston was said to have the property that it could be restored to the original substance by supplying a replacement phlogiston from any material containing it, such as oil, wax, charcoal, or soot, which was thought to be nearly pure phlogiston.

Phlogiston was thought of as a material entity, sometimes considered as the matter of fire, sometimes as a dry earthy substance (soot), sometimes as a fatty principle, such as in sulphur, oils, fats, and resins, and sometimes as invisible particles emitted by a burning candle; contained in animal, vegetable, and mineral bodies. It could be *transferred* from one body to another. [2]

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Further reading

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θΔics

In chemistry, **phlogiston theory** argued that heat was a fire-like element, having mass, called "phlogiston", contained within combustible bodies and released during combustion.

A depiction of **phlogiston theory**, the supposition that when wood burned, phlogiston and calx were products.

Overview

In 1697 to 1703, German chemist Georg Stahl (1659-1734) introduced and developed phlogiston theory, as an improved modification of Johann Becher's 1669 terra pinguis theory of combustion. [1]

Stahl explained natural phenomena by affirming that "heat matter" (or matter of heat), a hypothetical entity to which he assigned the name "phlogiston", was contained in all combustible bodies and was made to appear when such bodies were burned. [2]

In 1774 to 1786, English polymath Joseph Priestley, in his six-volume *Experiments and Observations on Different Kinds of Air*, published the results of a number of experiments he conducted on air, that worked to repudiated the last vestiges of four element theory, in which he attempted to situate his own variant of phlogiston theory. [3] Herein, according to English chemical thermodynamicist and chemistry historian Leslie Woodcock, Priestley posited phlogiston as the driving force for chemical reactions; thereby, supposedly, presaging Gibbs by some 200-years, a precursor to Gibbs free energy, in the following sense, as supposed by Woodcock: [4]

> "Every thermodynamic material does indeed have a constitutive state function, ('phlogiston'?), which can be given a definition: 'minus the Gibbs chemical potential of oxygen within the material.' It has the dimensions of (free) energy per mole of oxygen, and measures its oxidation propensity. While the antiphlogistonists may have been the first inorganic chemists, Priestley's conceptual interpretation of phlogiston was the first attempt at the physical chemistry of reactions. If phlogiston is regarded as an alternative description of 'Gibbs free energy,' the theory appears to be an intuitively accurate description, as could reasonably be expected at that time, and remains essentially correct today given its precise thermodynamic definition."

(add discussion)

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3. Experiments and Observations on Different Kinds of Air – Wikipedia.
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Further reading

â— Golinski, Jan. (1999). *Science as Public Culture: Chemistry and Enlightenment in Britain, 1760-1820* (phlogiston, pgs. 120, 139, 181; as a principle of combustion, 23, 134; phlogiston theory, pgs. 118, 131-36, 146, 151, 154, 213, 258; overthrow of, pgs. 131-35, 140). Cambridge University Press.

External links

â— Phlogiston theory – Wikipedia.

θΔics

In religio-mythology, **Phoenix**, called the "Bennu" (or benu bird), signified by the hieroglyphic: 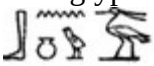 , by the Egyptians, is the name given by Herodotus (c.450BC) to the mythical bird, i.e. heron, hawk, or something resembling an eagle with red and gold feathers, according to Egyptian mythology, that carried the sun, sun disc, or sun god, depending on interpretation, balanced on its head each day, during its journey through the sky. [2]

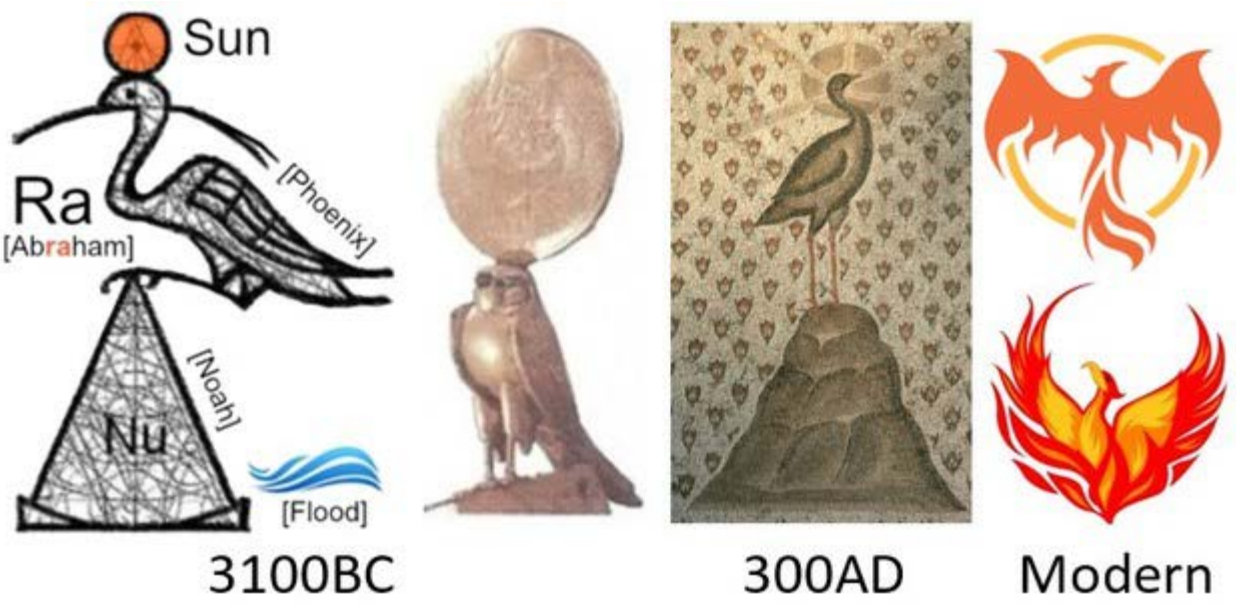

Left: the sun or sun god (Ra), arising out of a mound (pyramid), that arises out of the flood (Nun or Nu). Middle: a depiction of "**Phoenix**", the name ascribed to the latter by Herodotus (c.450BC), in a Mosaic from Antioch (Antakya) (c.300AD), coming out of the primeval mound, surrounded by the chaotic waters of Nu. [1] Right: the modern idea of the phoenix is a "fire bird".

Overview

In 3100BC, in Egyptian mythology, the predominate model of the origin of things, Heliopolis creation myth in particular, asserted that originally everything was a flood (called Nun or Nu), out of which a land mound arose, from which the sun (or sun god) burst forth carried by a bird on its head.

In c.435BC, Herodotus, in his *The Histories* (pg. 110-11), in his chapter on Egypt, in recounting the various animals he learned of and seen with his own eyes, e.g. crocodile, hippopotamus, otter, and eel, the gives the following account of the sun god Ra, which he was told was a sacred bird that rarely appears:

> "There is also another sacred bird, called the **phoenix**, which I have never seen except in a picture; for it seldom makes its appearance among them, only once in five hundred years, as the Heliopolitans affirm: they say that it comes on the death of its sire. If he is like the picture, he is of the following size and description: The plumage of his wings is partly golden-colored, and partly red; in outline and size he is very like an eagle. They say that he has the following contrivance, which in my opinion is not credible. They say that he comes from Arabia, and brings the body of his father [god name] to the temple of the sun, having enclosed him in myrrh, and there buries him in the temple. He brings him in this manner: first he molds an egg of myrrh as large as he is able to carry; then he tries to carry it, and when he has made the experiment, he hollows out the egg, and puts his parent into it, and stops up with some more myrrh the hole through which he had introduced the body, so when his father is put inside, the weight is the same as before: then, having covered it over, he carries him to the temple of the sun in Egypt. This they say is done by this bird."

Here, to note, Herodotus questionably believes that this "phoenix" was a real animal, that existed in Egypt, and not, as is correct, the story of the birth of sun, according to Egyptian mythology.

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â— Dolloff, Norman H. (1975). *Heat Death and the Phoenix: Entropy, Order, and the Future of Man* (figure 1.3, pg. 19; free energy, 27+ pgs; Gibbs, 9+ pgs; god; 3+ pgs; social, 9+ pgs). Exposition Press.

External links

â— Phoenix (mythology) – Wikipedia.

θΔics

In chemistry, **phosphorus**, symbol P, atomic number 15, is a nonmetallic element, the sixth most abundant element in a person, comprising 1.1 percent by mass of the structural composition of an average human molecule. [1]

Rank	CPK (jmol)	Symbol	% Mass	Picture	Z
6		P	1.1		15

Human molecular formula

The position of the element phosphorus in the average human molecular formula is as follows:

$$C_{E27}H_{E27}O_{E27}N_{E26}\mathbf{P}_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}$$

$$Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$$

Function

Calcium plays a part in almost every chemical reaction within the body because it is present in every cell. Forms calcium phosphate with calcium in the bones and teeth in a 2-1 ratio. Is important in the utilization of carbohydrates, fats, and proteins for growth, maintenance, and repair, etc. [1]

Quotes

In 1874, English physical economist Stanley Jevons gave the following view of phosphorus in relation to the human: [2]

> "By degrees it is found that the chemistry of organized substances is not widely separated from, but is rather continuous with, that of earth and stones. Life itself seems to be nothing but a special form of that energy which is manifested in heat and electricity and mechanical force. The time may come, it almost seems, when the tender mechanism of the brain will be traced out, and every thought reduced to the expenditure of a determinate weight of nitrogen and **phosphorus**."

This is excellent discernment for 1874, indeed.

> "No apparent limit exists to the success of scientific method in weighing and measuring, and reducing beneath the sway of law, the phenomena both of matter and of mind [mind brain duality]. And if mental phenomena be thus capable of treatment by the balance and the micrometer, can we any longer hold that mind is distinct from matter? Must not the same inexorable reign of law, which is apparent in the motions of brute matter, be extended to the most subtle feelings of the human heart? Are not plants and animals and ultimately man himself, merely crystals, as it were, of a complicated form? If so, our boasted free will becomes a delusion, moral responsibility a fiction, spirit a mere name for the more curious manifestations of material energy. All that happens, whether right or wrong, pleasurable or painful, is but the outcome of the necessary relations of time and space and force, and of the laws of matter emerging from them, which are fixed in the very nature of things.
>
> Materialism seems, then, to be the coming religion, and resignation to the nonenity of human will the only duty. Such may not generally be the reflections of men of science, but I believe that we may thus describe the secret feelings of fear which the constant advance of scientific investigation excites in the minds of many who view it from a distance. Is science, then, essentially atheistic and materialistic in its tendency? Does the uniform action of material causes, which we learn with an ever increasing approach to certainty, preclude the hypothesis of an intelligent and benevolent creator, who has not only designed the existing universe, but who still retains the power to alter its course from time to time?"

He concludes this excellent tract, being already well past the 400+ page mark of his treatise, by commenting "to enter actually upon theological discussions would be evidently beyond the scope of this work."

Quotes

The following are other related quotes:

> "The brain cannot exist without **phosphorus**-containing fat. The phosphorus is the origin, hence also established activity of the brain—without phosphorus no thought."
>
> — Jacob Moleschott (c.1849), cited by Ludwig Feuerbach, 1850 [2]

> "Why should a group of simple, stable compounds of carbon, hydrogen, oxygen and nitrogen struggle for billions of years to organize themselves into a professor of chemistry? What's the motive? If we leave a chemistry professor out on a rock in the sun long enough the forces of nature will convert him into simple compounds of carbon, oxygen, hydrogen and nitrogen, calcium, **phosphorus**, and small amounts of other minerals. It's a one-way reaction."
>
> — Robert Pirsig (1991), *Lila: An Inquiry into Morals*

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1. Thims, Libb. (2008). *The Human Molecule* (pg. 14) (issuu) (preview) (Google Books) (docstoc). LuLu.
2. (a) Jevons, William Stanley. (1874). *The Principles of Science: a Treatise on Logic and the Scientific Method* (Book VI, ch. 31: Reflections on the Limits of the Scientific Method, pgs. 427-70; quote, pgs. 427-28).
(b) Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (pg. 219). Cambridge University Press.
3. Pirsig, Robert M. (1991). *Lila: An Inquiry into Morals* (excerpt, pg. 140; chemistry, 11+ pgs). Random House.

External links

â— Phosphorus – Wikipedia.

θΔics

In science, a **photon** is a particle of light, technically defined as a boson with zero mass, and spin 1. [1] On the surface of the earth, about 1,000 billion photons of sunlight fall on a pinhead each second.

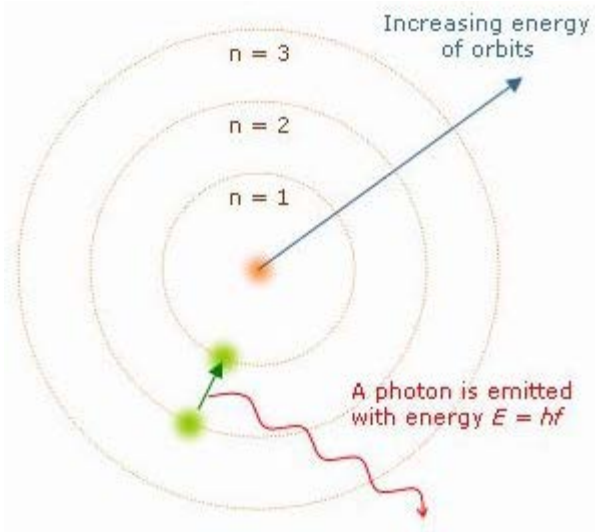

Bohr model (1913) depiction of a **photon** being emitted as a result of the downward movement of an electron in atomic orbital structure.

Bohr model

To move an electron down in a valence shell orbital of an atom or molecule requires the release of a photon; whereas, to move an electron up in a valence shell orbital requires the absorption of a photon. This is called the Bohr model, a theory developed in 1913 by Danish physicist Niels Bohr.

Evolution

The impact of photons from the sun, thus forcing valence shell electrons upwards into higher energy atomic orbitals, aside from the action of gravity, is the central mediator (force carrier) or driving force of evolution. In the dynamics of the human molecule case, approximately 80% of sensory input (force) is visual and approximately a minimum of 4-5 photons are required to generate a nerve impulse, thus mediating human behavior (induced movement). [5]

Electromagnetic field

The following is the modern particle physics interpretation of the relation between photons, light, electromagnetic field, magnetic field, and electric field:

> "Light—an electromagnetic field of certain wavelength range—is a stream of **photons**; those of light are 'on the mass shell', those of electric and magnetic fields are not."
>
> — Martinus Veltman (2003), *Facts and Mysteries in Elementary Particle Physics* [11]

It is important to distinguish between on-shell and off-shell, in QFT, because on-shell and off-shell, according to Lubos Motl (2013), are opposite to each other, in a sense. On-shell describes fields that obey the equations of motion and real particles; off-shell describes fields that don't have to obey the equations of motion and are virtual particles. (Ñº)

In modern physics parlance, particles are said to be "on the mass shell," or simply "on-shell," if their behaviour satisfies the relationship between energy and momentum given by Einstein in his theory of special relativity. Virtual particles are those that don't satisfy this relationship, and are said to be "off-shell." (Ñº)

History

Building on the 1830s work of who had built on the work English chemist and physicist Michael Faraday and his conception of "lines of force" (or field lines), Scottish physicist James Maxwell, through the publication of his 1873 *Treatise on Electricity and Magnetism*, had established that light or all forms of electromagnetic radiation consisted of electromagnetic waves. Subsequently, by 1905 the wave nature of light was an established, incontrovertible fact.

In 1901, German physicist Max Planck introduced the notion of the energy element.

In 1905, German-born American physicist Albert Einstein, however, proposed that light was not continuous but consists of localized particles: [2]

> "According to the assumption to be contemplated here, when a light ray is spread from a point, the energy is not distributed continuously over ever-increasing spaces, but consists of a finite number of ***energy***

> ***quanta*** that are localized in points in space, move without dividing, and can be absorbed or generated only as a whole."

(add discussion)

Etymology

In 1917, American psychologist Leonard Troland (1889-1932) introduced the term "photon" in his article "The Measurement of Visual Stimulation Intensities", a term usage which in 1922 he summarized as follows: [8]

> "In order to facilitate the specification of the visual stimulus intensity in terms which shall be significant for the retinal image, the writer has suggested the employment of a special intensity unit called the **photon**. The photon is defined as that intensity of stimulation which accompanies the use of a pupillary area of one spare millimeter an external stimulus surface brightness of one candle per square meter."

The use of the term photon here by Troland, however, has no quantum mechanical connection.

In 1923, American physicist Arthur Compton published his "A Quantum Theory of the Scattering of X-Rays by Light Elements", wherein he gave experimental evidence for the particle view of light, in which he employed the terms: "light element", "quanta of radiation", "radiation quantum", but not, it seems, the term photon. [9] Many, such as American science historian Isaac Asimov, claim that Compton coined the term photon in 1923. [4] The actual coining passage, however, remains to be tracked down. In any event, by 1924 American physicist Robert Millikan, in his *The Electron*, was summarizing things as such: [10]

> "The next mode of interaction of light with electrons was discovered and explained in terms of a famous billiard-ball model proposed by Arthur H. Compton in 1923. Compton pictured a free, stationary electron as being hit by a **'photon'** of light."

In 1926, American physical chemist Gilbert Lewis, in his "The Conservation of Photons", describe a particle of light as follows: [3]

> "I therefore take the liberty of proposing for this hypothetical new atom, which is not light but plays an essential part in every process of radiation, the name ***photon***."

Dozens, in fact the majority, of references misattribute the coining of the term photon to this 1926 article by Lewis, whereas correctly the term was in use for the particle of light by Millikan in 1924, if not by Compton the year prior. In 1935, Compton, in his discussion of the double slit experiment and the Heisenberg uncertainty relation, stated: [7]

> "Recent experiments have shown that a light beam consists of a stream of particles—**photons**, we call them."

In other publication, herein about this period, Compton also referred to photons as "radiation particles".

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External links

â— Photon – Wikipedia.

θΔics

In science, **photon mill** is the conceptual idea that the sun acts as a type of windmill or watermill to the effect that flow of photons through any given surface section of the earth acts to produce work in the same way that water turning a water wheel works mechanical grinders to grind corn; the work of evolution being the typical topic of discussion. The term seems to be used frequently in ecological thermodynamics.

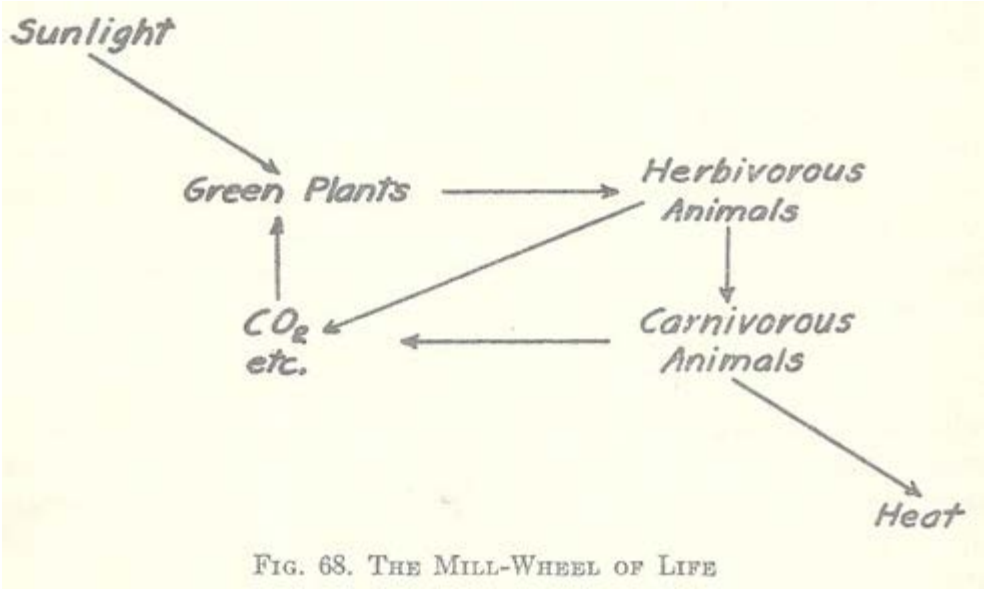

The 1925 diagram Alfred Lotka's conceptualization of "life" as a function of the "**photon mill**" or "overshot mill wheel" as he referred to it.

Pre-history

In his famous 1824 *On the Motive Power of Fire*, French physicist Sadi Carnot outlined the view of how the heat (or caloric as he conceived things, initially) from the sun acts as kind of watermill when it falls from a hot to a cold body in the production of work both on the surface of the earth and in steam engine or heat engine. Carnot used the term "fall of the caloric" akin to "fall of the water" to illustrate this comparison. Carnot states:

> "According to the principles at the present time, we can compare with sufficient accuracy the motive power of heat to that of a waterfall. Each has a maximum what we cannot exceed, whatever may be, on the other hand, the machine which is acted upon by the water, and whatever, on the other hand, the substance acted upon by the heat. The motive power of a waterfall depends on its height and on the quantity of the liquid; the motive power of heat depends also on the quantity of caloric used, and on what may be termed, on what in fact we will call, the *height of its fall*,* that is to say, the difference of temperature of the bodies between which the exchange of caloric is made. In the waterfall the motive power is exactly proportional to the difference of the level between the higher and lower reservoirs. In the **fall of caloric** the motive power undoubtedly increases with the difference of temperature between the warm and cold bodies; but we do not know whether it is proportional to this difference. We do not know, for example, whether the fall of caloric from 100 to 50 degrees furnishes more or less motive power than the fall of this same caloric from 50 to zero. It is a question which we propose to examine hereafter."

The asterisk mark (*) goes to a footnote which states: "the matter here dealt with being entirely new, we are obliged to employ expressions not in use as yet, and which perhaps are less clear than is desirable."

In 1886, Austrian physicist Ludwig Boltzmann, in his famous lecture "The Second Law of Thermodynamics", stated the following: [10]

> "The general struggle for existence of animate beings is not a struggle for raw materials—these, for organisms, are air, water and soil, all abundantly available—nor for energy, which exists in plenty in any body in the form of heat *Q*, but of a **struggle** for entropy *S*, which becomes available through the transition of energy from the hot sun to the cold earth."

In 1913, Swiss astrophysicist and meteorologist Robert Emden stated something similar: [11]

> "The possibility of terrestrial life results from the vast increase of entropy associated with the

transformation of hot solar radiation into colder terrestrial radiation.”

In 1961, Hungarian bioenergetics researcher Albert Szent-Gyorgyi gave an outline of the loose idea of a photon mill as follows: [1]

> "It is common knowledge that the ultimate source of all our energy and negative entropy is the radiation of the sun. When a photon interacts with a material particle on our globe it lifts one electron from an electron pair to a higher level. This excited state, as a rule has but a very short lifetime and the electron drops back within 10-7 to 10-8 seconds to the ground state giving off its excess energy in one way or another. Life has learned to catch the electron in the excited state, uncouple it from its partner and let it drop back to the ground state through its biological machinery, utilizing it excess energy for life processes."

Szent-Gyorgyi, to note, did although not using the term “photon mill” specifically.

Lotka

In 1925, Alfred Lotka, in his *Elements of Physical Biology*, seems to have been the first to diagrammatically conceptualize "life" as a function of the "photon mill" or "overshot mill wheel" as he calls it, diagram shown above, about which he says (pg. 334) the following:

> “The circulation of substance in the organic world and its inorganic background, which was considered in an earlier chapter in its purely material relations, now acquires a new significance. We recognize in it now a typical characteristic of the great world engine which, for continued operation, must of necessity work thus in cycles. The picture presented to our minds is that of a **gigantic overshot mill wheel**, receiving from above the **stream of sunlight** with its two hundred twenty-seven million gross horsepower though much of this is split without effect and discharging below its dissipated energy in the form of heat at the general temperature level. The main outstanding features of the wheel are represented diagrammatically in figure 68. But in detail the engine is infinitely complex, and the main cycle contains within itself a maze of subsidiary cycles. And, since the parts of the engine are all interrelated, it may happen that the output of the great wheel is limited, or at least hampered, by the performance of one or more of the wheels within the wheel. For it must be remembered that the output of each transformer is determined both by its mass and by its rate of revolution. Hence if the working substance, or any ingredient of the working substance of any of the subsidiary transformers, reaches its limits, a limit may at the same time be set for the performance of the great transformer as a whole”

(add discussion)

Ebeling-Feistel Photonenmühle schematic

In 1982, the actual term “photon mill”, was introduced via the German term "Photonenmühle" by German physical evolutionists Werner Ebeling and Rainer Feistel, who describe the concept verbally and via accompanying schematic diagram: [9]

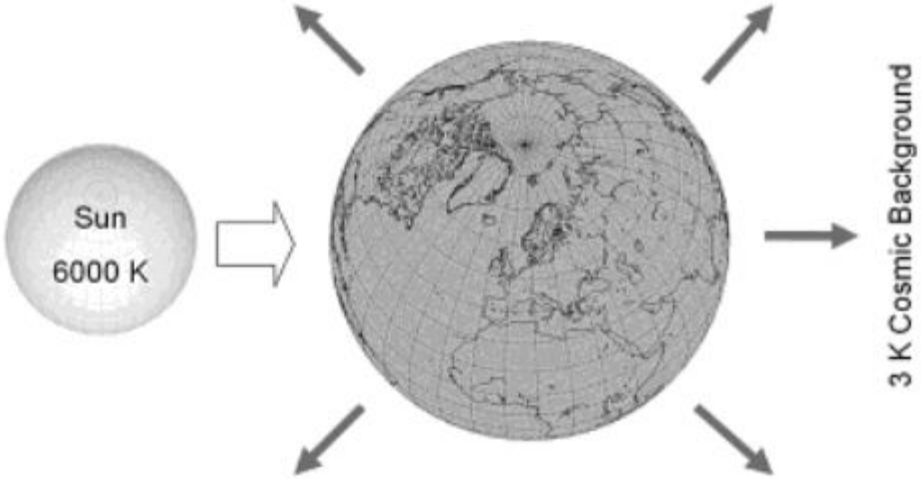

Their model depicts the estimation of the terrestrial entropy export, about which the earth is described as existing at mean surface temperature of about 300 K, located amid a radiative thermal gradient of 6000 K (the hot sun) and 3 K (the cold cosmic background), through which the flow of photons (similar to the flow of water in a water mill), operate, as they describe in 2011, as such: “entropy production necessarily accompanies the multiple self-organization phenomena and sustained dissipative structures observed in our natural environment.” [9]

Another version occurs in Ebeling, Andreas Engel, and Feistel's 1988 'Physik der Evolutionsprozesse', wherein they use the exact phrasing of 'hot' and 'cold' photons and give a diagram of at 'Photonenmühle' or photon mill. [2]

Polish-born Canadian physicist Marek Roland claims, to note, that the notion "Hot" and "Cold" photons concepts, as found on several earth system thermodynamical depictions, originated and or were explained in his paper 1992 paper "Life on Earth - flow of Energy and Entropy". [5]

The following is a circa 1999 rendition of a **photon mill** from Peter Strazewski’s talk “A Pleading for Chemistry”, based on the 1994 version by Werner Ebeling and Rainer Feistel, which describes a photon mill as being the main driving force for the self-organization and evolution on planets. [4]

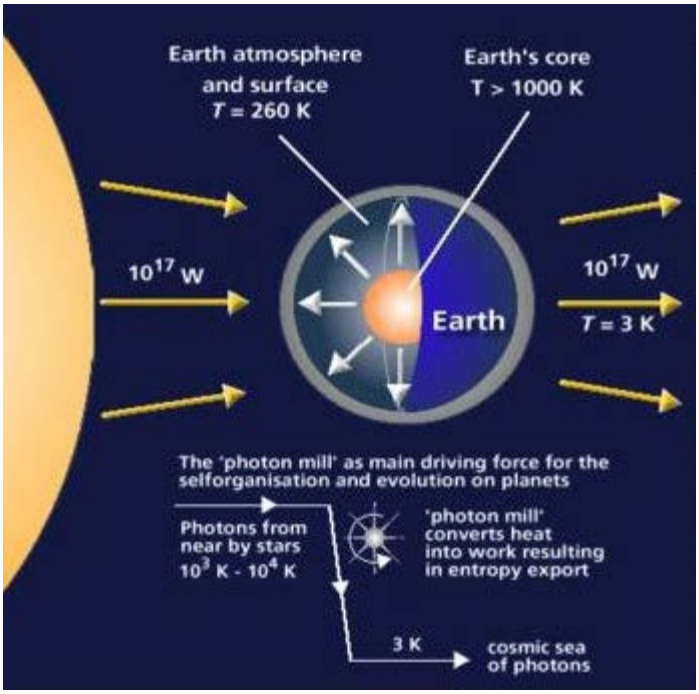

The following, below left, is 2004 online German animated gif version of a **"Photonenmühle"**, described as such: “the mill supplies the earth with photons or physical negative entropy and provides information for life processes”, or something along these lines. [14] Below right is a Werner Ebeling version of the sun-earth system as a **photon mill**. [15]

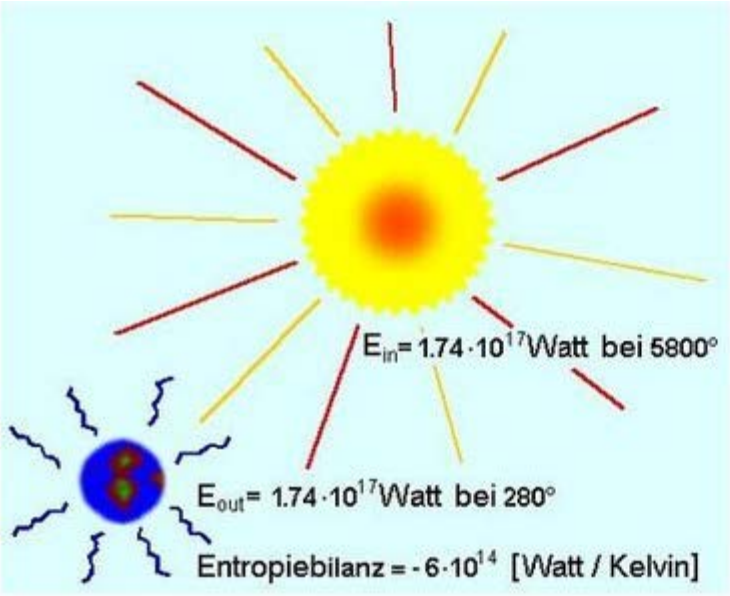

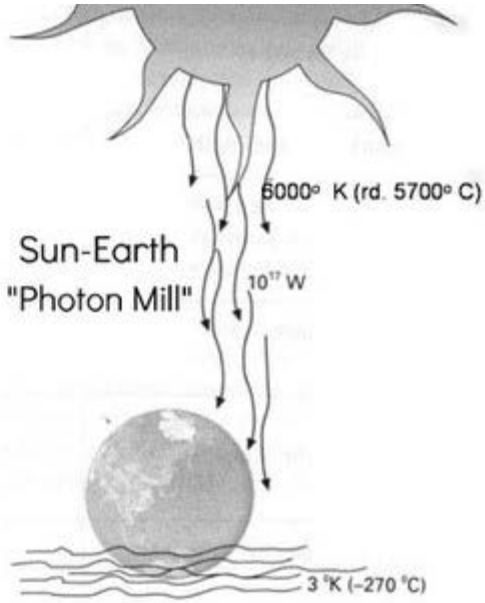

In 2005, based on the Roland-version, American ecologist Eric Schneider made a similar version in 2005, as shown below. [6]

In 2005 and 2007, based on the Schneider-version, American electrochemical engineer Libb Thims made a similar version, based on the Schneider version, during which time the notion of "cold photons" and "hot photons" came under attack, by various Wikipedians, after which the labeling of gamma ray photons and diffuse photons were used, respectively. [7]

The version shown adjacent is made by American chemist Peter Strazewki (c.1999) and is an English-modified annotated version based on version found in the the 1994 book *Chaos and Kosmos: Prinzipien der Evolution*. [3]

In 2008, German climate researcher Y.M. Svirezhev describes life and relation to the photon mill as such: [12]

> “Life on earth is a product of the so-called **‘photon’s mill’**, which has started to function when our solar system was in the form of a matter’s ‘clots’ [see: nebular hypothesis] embedded into the ocean of ‘cold’ photons with temperature T = 2.7 K. Evolution and self-organization of planets (including life on our planet) is a result of this mill’s functioning, which is happening due to the fact that the sun’s surface irradiates the ‘hot’ photons’ at T = 5800 K, and these photons reach the cold planet’s surfaces. Then they cool down to the temperature of the surface and irradiated back into space. For the earth, this temperature is equal to 253 K; it is the

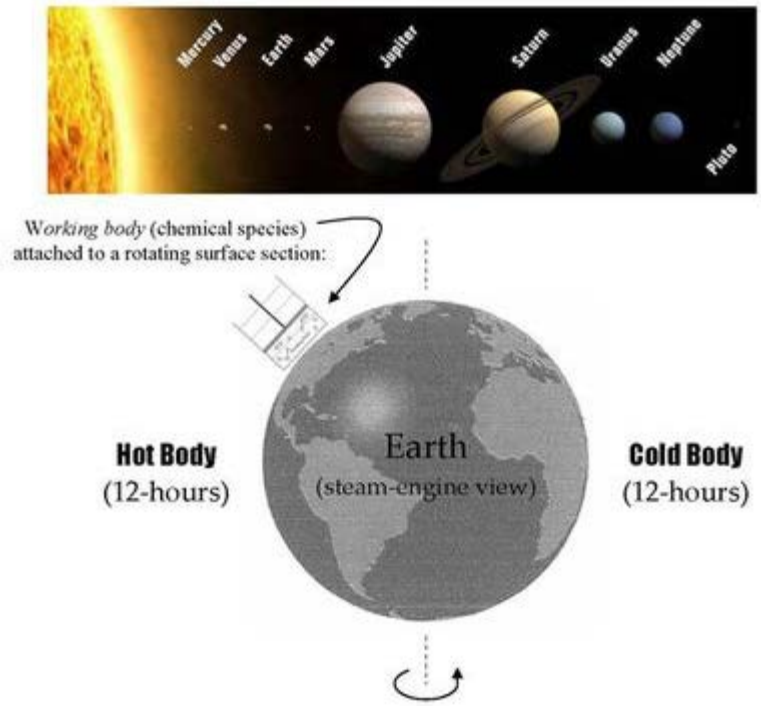

A 2007 Carnot cycle depiction of a given earth surface section, from American electrochemical engineer Libb Thims's *Human Chemistry*; an upgrade, so to speak, to the 1982 **photon mill** concept, taking into account (a) the rotative nature of the earth, and (b) the volume expansion and volume contraction aspects of each system. [13]

temperature, which could be measured by an observer at the top of the atmosphere. Formerly, the photon's mill is a typical 'heat machine' that is functioning by Carnot cycle, but its working body is the photon gas."

Issues in this description abound; to list a few: the working body is not the photon gas, but the geometry of elements about any given region of interest on or near any given surface section of the earth; second, the notion of "formerly" a heat engine is incorrect, the action of the laws of thermodynamics are still in operation acting to create animate movement in the form of cyclical surface attached heat engines; the cold photon / hot photon labeling has issues in itself: the terms hot body and cold body are the correct labeling; the mechanism of heat transfer, whether radiation, conduction, or convection, is irrelevant.

Photon mill equation

German mathematician Eberhard Zeidler, in his 2008 chapter subsection "The Photon Mill on Earth", labels the following expression:

$$\Delta S_e = \frac{\Delta Q}{T_{in}} - \frac{\Delta Q}{T_{out}}$$

which he says is "called the photon mill on earth", and rather haphazardly used the sun surface temperature of 5800 K as Tin, a "universe at a lower temperature" of 260 K as Tout, a Q of 10E17 joules, being the amount of heat the "surface of the earth receives", to calculate that ΔSe equals -4x10E14 J/K, meaning that "one square meter of the surface of the earth radiates the entropy of about 1 J/K during one second into the universe, which he thus uses to conclude that "the radiated entropy decreases the disorder on earth, that is the earth gains order". [8] Issues abound in this calculation, to say the least.

Discussion

In some of the above descriptions of this so-called "photon" mill, e.g. the "working body is the photon gas", it would seem that there are different descriptions and conceptions as to where exactly the boundary or location of this "mill" is,

whether in the sun, on the surface of the earth, or the sun-earth system combined.

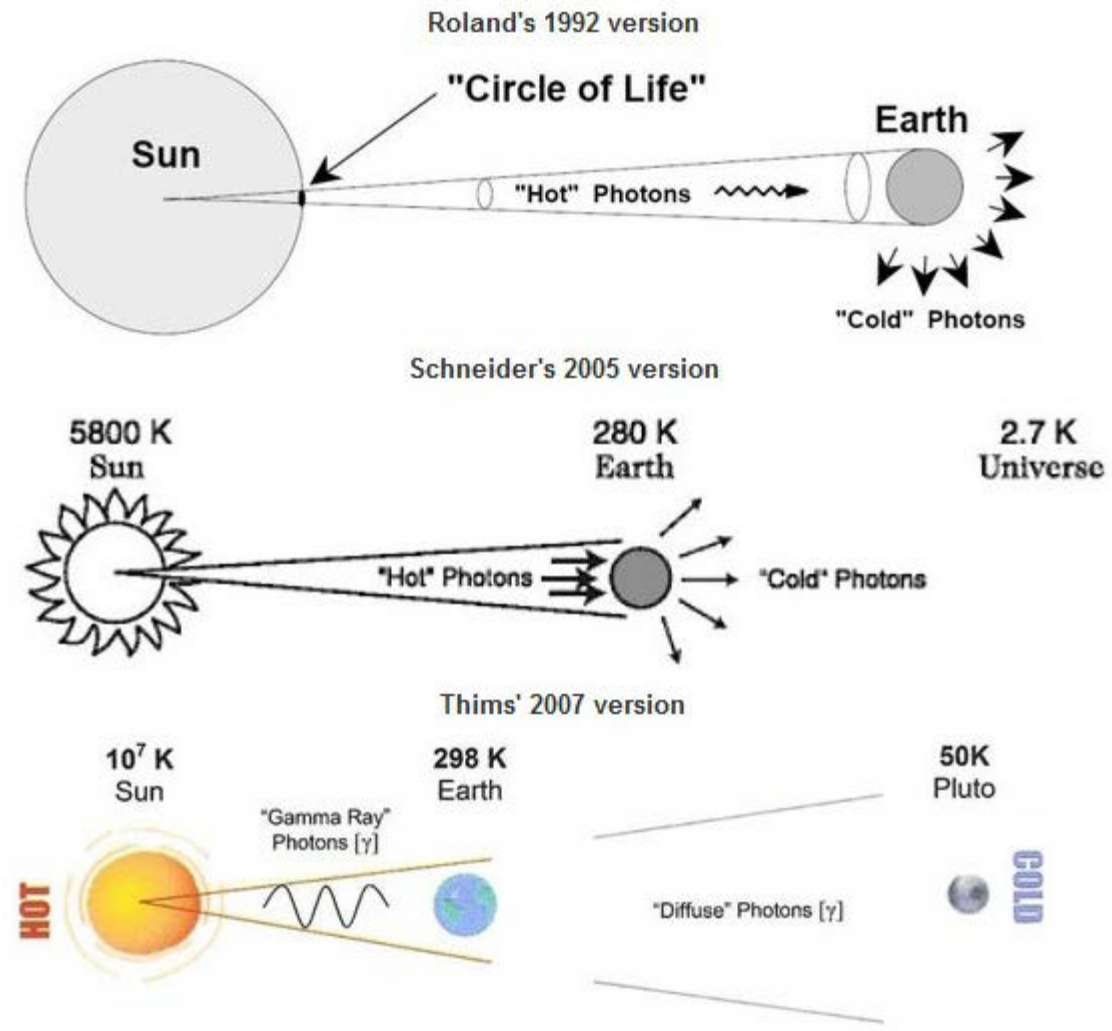

Three **photon mill** illustration examples: Marek Roland (1992), Eric Schneider (2005), and Libb Thims (2007), the middle diagram taking criticism for its use of the "cold" photon labeling.

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12. Jorgensen, Sven. (2010). *Global Ecology* (photon mill, pgs. 147, 154). Academic Press.
13. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 53). Morrisville, NC: LuLu.
14. Photon Mill (German → English) – Ernst-team.de.
15. Entropy and Economy (German → English) – Ausstieg Aus Dem Crash.

Further reading

â— Thims, Libb. (2008). "On the Mechanical Equivalent of Heat and Occupation" (PDF), *Journal of Human Thermodynamics*, Vol. 3, Issue 1. pgs. 1-7, April.

θΔics

In psychological thermodynamics, **phrenentropy** is synonym for "entropy of mind"; a combination of *phren-* (*φρήν, φρεν-*; "mind") and *-entropy* ("thermal content + disgregation"). The term was coined in 2008 by Italian psychiatrist Tullio Scrimali on the theme, possibly, of the relationship between Schizophrenia and disorder. [1]

References

1. Scrimali, Tullio. (2008). *Entropy of Mind and Negative Entropy: A Cognitive and Complex Approach to Schizophrenia and its Therapy* (Phrenentropy, pg. 14) . Karnac Books.

θΔics

In terminology, **physical** (TR:2789), similar to chemical (TR:2232), refers to things related to physics.

Quotes

The following are example usage quotes:

> "We pledge to put in power this truth: no other forces than the common physical chemical ones are active *within* the organism. In those cases which cannot at the time be explained by these forces one has either to find a specific way or form of their action by means of physical mathematical method, or to assume new forces equal in dignity to the chemical-**physical** forces inherent in matter, reducible to the force of attraction and repulsion."
>
> — Emil Reymond (1842), written in collaboration with Ernst Brucke; soon after, Helmholtz and Karl Ludwig joined in (see: Reymond-Brucke oath), and as legend has it they each signed it with their own blood

See also

- Physicalism
- Physical chemistry
- Physical economics
- Physical humanities
- Physical intelligence
- Physical science
- Physical sociology

External links

- Physical (disambiguation) – Wikipedia.

θΔics

In occupations, **physical chemist** is a chemist who specializes in the field of physical chemistry, namely those subjects where physics and chemistry intersect.

Educational background	#
Physical chemist (chemical physicist)	7
Chemical engineer	6
Thermodynamicist (chemical/statistical/mechanical)	5
Chemist	4
Sociologist/Economist/Mathematician	4
Physicist / Metallurgist	4
Physicist-Engineer	2
Physical biologist/Physiologist	2
Engineer (mechanical/materials science/civil)	2
Philosopher	2
Psychologist	1

A ranking of "occupational types" found among the 40 main human free energy theorists; which finds that forty-five percent (or 18 individuals) are either: **physical chemists** (chemical physicists), chemical engineers, and or thermodynamicists, among the latter of which chemical thermodynamicists, Frederick Rossini (the only one known) in particular, yield the best theory.

Hmolscience | Accessibility

In the hmolsciences, human chemical thermodynamics is the pinnacle and foundation of the entire field, though still yet a "subject of the future" as Ingo Muller (2007) opinionates. Those who are intellectually or educationally able to understand, comment on, and or to theorize about human chemical thermodynamics, however, are a restrictive or rather selective group of, respectively, chemical thermodynamicists, chemical engineers, and physical chemists, in order of decreasing ability of comprehension; among which, as the adjacent table shows, in respect to free energy applied to the humanities, socially (human free energy), theorists, physical chemists exist in the greatest number.

This sensitive and rarely spoken about issue is explicitly discussed by American sociologist Talcott Parsons, who comments in retrospect about the fall off—impact ripple effect aside—of in assimilation of the physical socioeconomic work of Italian engineer Vilfredo Pareto (1893-1912), as re-clothed in socioeconomic equilibrium defined via Gibbsian thermodynamic terms by American physical chemist Lawrence Henderson (1932-1945) in the Harvard sociology and business school departments, following WWII (1939-1945) or the passing of Henderson, depending on point of view:

> "Most of the neglect of Pareto stems from the *scientific limitations* of subsequent generations of sociologist rather than from his irrelevance to their interests."
>
> — Talcott Parsons (1968), on reason fall-off of Harvard Pareto circle interest after WWII [1]

In other words, without an inspired physical chemist to lead the way, the Henderson-epicenter of famous influential Harvard Pareto circle peaked at 1945, past which, Henderson not having trained any physical chemists to carry on the project, the non physical science trained sociologists, economists, historians, business theorists, etc., were thus handicapped to the effect that continuation could only occur based on what had been said and published, the 1935 conclusion of which, according to Henderson, is the following very ripe, prolific, and great meaning embodying statement: [2]

> "Another characteristic of many ideal systems [physical or social] that is, in general, indispensable in order that conditions shall be determinate is the establishment and use of some definition of equilibrium or some criterion of equilibrium, whether in the case of statical equilibrium or in the case of dynamical equilibrium. This criterion is often of such a character that some function like entropy or energy assumes a maximum or a minimum value or, as in the case of the derivatives or variations of such functions, vanishes. In the case of Pareto's social system the definition of equilibrium takes a form that closely resembles the theorem of Le Chatelier in physical chemistry, which expresses a property of physico-chemical equilibrium, and which **may be deduced from** the work of Gibbs."

American physical chemist, chemical engineer, and chemical thermodynamicist Frederick Rossini, with his 1950 *Chemical Thermodynamics* textbook and 1971 ‘Chemical Thermodynamics in the Real World’ address, in particularly, has been the only known person to explicitly and independently carry forward what is suggestively outlined above by Henderson.

Those who are directly taught the chemical thermodynamics work of Gibbs, however, is a very selective group, chemical engineers mainly, in the curriculum of which, chemical thermodynamics (or chemical engineering thermodynamics) is the core course, infamously known as the "weeder course", of the degree. Physical chemists, in turn, absorb "the work of Gibbs", albeit in a softer format.

Other educational background baring subject accessibility limiting quotes include:

> “It is interesting to note that socio-thermodynamics is only *accessible* to chemical engineers and metallurgists. These are the only people who know phase diagrams and their usefulness. It cannot be expected, in our society, that sociologists will appreciate the potential of these ideas.”
>
> — Ingo Muller (2007), *A History of Thermodynamics* [3]

> “Physical chemistry uses mathematical language, and it is a large part of my evangelistic attitude to suppose that much of developmental biology will someday have to be written in much the same language that **physical chemists** use.”
>
> — Lionel Harrison (2008), *The Shaping of Life* [4]

Hmolscience

The following is a work in progress chronological listing of hmolscience applied physical chemists, in Hmolpedia, of note:

#	Person	Date	Description
	Gilbert Lewis	1925	
	Lawrence Henderson	1932	
	Georgi Gladyshev	1978	
	Adrian Hough	2010	

Science

The following is a work in progress listing of general science physical chemists, discussed within Hmolpedia, who did

not explicitly apply physical chemistry to the humanities, but in most cases were either physical chemistry pioneers or at the boundary land of applying physical chemistry to physiological or biological (powered chnopsology) arena.

â— Lionel Harrison

See also

â— Hmolpedia: Categories

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2. Henderson, Lawrence J. (1935). *Pareto's General Sociology: a Physiologists Interpretation* (pg. 86). Harvard University Press.
3. Müller, Ingo. (2007). *A History of Thermodynamics: the Doctrine of Energy and Entropy* (DS) (pg. 164). Springer.
4. Harrison, Lionel G. (2011). *The Shaping of Life: the Generation of Biological Pattern* (pg. 105). Cambridge University Press.

θΔics

In chemistry, **physical chemistry** is the study of the thermodynamics, quantum chemistry, electrochemistry, kinetics, and macroscopic and microscopic structures of atoms, molecules, chemical species, and chemical systems. [1] Physical chemistry deals with the interpretation of chemical phenomena and properties in terms of the underlying physical processes and with the development of techniques for their investigation. [2]

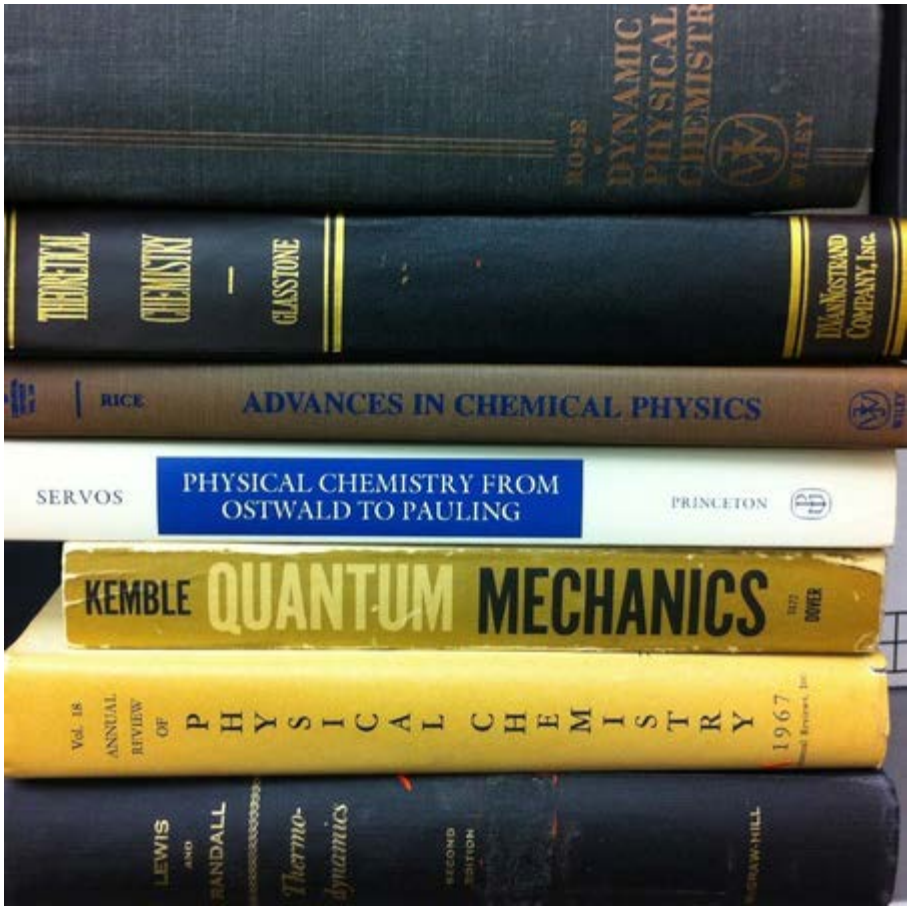

A **physical chemistry** book stack, by Rigoberto Hernandez (Q) on the rise of physical chemistry, via thermodynamics, and later quantum mechanics, as seen by Wilder Bancroft, the graduate student of Wilhelm Ostwald and post-doctoral student of Jacobus van't Hoff.

History

It is said that the term 'physical chemistry' was coined by Russian chemist Mikhail Lomonosov, notable for having experimentally disproved the phlogiston theory in 1756 after having studied the works of Robert Boyle. [7] This, however, seems to be a mis-attribution, as physical chemistry, as the term is understood in modern times, is a result of the application of thermodynamics, a subject solidified in 1865 via German physicist Rudolf Clausius' *The Mechanical Theory of Heat*, in chemistry.

In 1885, German chemist Wilhelm Ostwald published *Lehrbuh der Allgemeinen Chemie* (*Textbook of General Chemistry*), the first textbook on physical chemistry (1885-87), and in 1887, together with Dutch chemist Jacobus van't Hoff, founded *Zeitschrift fur Physikalische Chemie* (*Journal of Physical Chemistry*), the first periodical in physical chemistry. [4] The subject of physical chemistry became a solidified "branch" of chemistry in 1895, according to the views of American chemist Charles Palmer, translator of the 1893 English edition of Nernst's *Theoretical Chemistry: from the Standpoint of Avogadro's Rule and Thermodynamics*. In the preface to the translated edition, Palmer comments: [6]

> "For the last four of five decades, most of the advanced work in pure chemistry has been largely synonymous with *organic chemistry*. But with the growth of the science, another great branch has developed, which promises to become equally important; and that is the new ***physical chemistry***."

Palmer continues:

> "It is to Ostwald that we are chiefly indebted for building up this new school; not only by his own extended and thorough investigations, which are already classic; but also by his remarkably successful efforts to concentrate the previously scattered work of others into a well-defined specialty. It has thus come about that Ostwald himself may almost be regarded as the father and founder of that school of physical chemistry the influence of which radiates from the Leipsic [University of Leipzig] all directions."

Palmer here, to note, seems to use the term "school of physical chemistry" as a synonym for what others have referred to as the "energetics school", although not exactly. Palmer continues:

> "I would not, by any means, seem to ignore the great and classical work of such men as Thomsen [1854], Berthelot [1864], van't Hoff [1884], Raoult [François-Marie Raoult, 1882], Arrhenius [Svante Arrhenius, 1889], Roozeboom [1886], Ramsay [1898], Gibbs [1876], and others, or that brilliant student Nernst [1893], the writer of this timely treatise. It is largely by the concentration and discussion of all such material, both in Ostwald's text-books (viz. the *Outlines*, the *Hand-und Hilfsbuch*, and the *Lehrbuck)*, and also and especially in the *Zeitschrift fur Physikalische Chemie* that Ostwald and van't Hoff have performed a task which puts t science under great obligation to them."

Another so-called modern 'founding father' of physical chemistry, according to some, is Gilbert Lewis; although, technically, it is more-correct to refer to Lewis as one of the founders of chemical thermodynamics, assuming that physical chemistry can be divided into two parts (chemical thermodynamics + quantum mechanics). [5]

Human chemistry

Interestingly, the newly launched science-based dating site ScientificMatch claims that it is matching people according to "physical chemistry", using the 1995 results of the famous "sweaty T-shirt study", which finds that people are most sexually attracted to mates having the most dissimilar major histocompatibility complex. [3] This, obviously, is a terminological mishap referring to the chemistry of the "physical" body verses the "physics" of chemistry.

See also

● Hmolpedia: Categories | Physical chemist

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External links

● Physical chemistry – Wikipedia.

θΔics

In economics, **physical economics** is the study of economic phenomenon from the point of view of physics.

Synonyms

Near synonyms to the term “physical economics”, although subtle variations may exist, include: physioeconomics, thermoeconomics, biophysical economics, and economic thermodynamics.

Overview

The coining and attribution of the term “physical economics” seems to have been first dominantly introduced in a set of two early 1880s papers by Scottish thinker Patrick Geddes, who incorporated some of the earlier thermodynamics work of Scottish physicist Peter Tait to outline a comprehensive attempt to enumerate the physical and physiological principles of economic science. [1] These two papers by Tait and Geddes, according to a 1901 review by Victor Branford, are said to mark the start of the invasion of physics into the territory of economics. In these papers, Geddes is said to have argued that “goods” should be considered as matter and energy, both quantitatively and qualitatively, and expressed in terms of mechanics and chemistry. The passage best representative of Geddes’ version of physical economics is as follows: [2]

> “The economist having reached the conception of the processes of production and consumption as one vast mechanical process; the view of society as a machine in which all phenomena are interpreted as integration or disintegration of matter, with transformation or dissipation of energy .... it is legitimate, nay inevitable, to apply the quantitative conceptions of physics— the modern measurements of matter and energy— .... that measurement in terms of units of energy as well as of units of , weight is practicable, and this physical conception once introduced its extension to all processes must be attempted. For the treatment of this only one other consideration need be pointed out, the possibility of expressing the labour of the producer automata, just as we do that of the ordinary machines with which they are so largely interchangeable: the horse-power of an engine is easily translatable into man-power, might indeed always have been so expressed; this granted, the conception of man-day .... and its multiples (man-year, man-life) with the higher multiples of these can all be approximately stated .... The **physical economist** then has means of measurement and comparison other than that afforded by money—his units are really the metre and the kilogram of the physicist—and only when some quantitative data in these terms are approximately reached, will those expressed in money be really capable of interpretation."

Also in this period, Austrian economist Eugen Bohm-Bawerk, similar but independent to the views of Geddes, also began to insist that no analysis of economic phenomena can be considered as completed which does not include a consideration from the point of view of physical science or of the matter and energy consumed or liberated in the interaction between man and the physical environment. [2]

American economist Philip Mirowski may well be said to be the leading historian of physical economics, as he spent nearly a decade researching the ins and outs of this subject in his quest to discover how the conservation principles, particularly the conservation of energy, got incorporated into economic theory. [3]

Politics

In politics, a version of “physical economy” is often found promoted by Lyndon LaRouche, or his followers, but is a version of physical economics that is a barely digestible rewritten spinoff of what seems to be the biosphere-noosphere ideas of Vladimir Vernadsky, employed for nothing more than polemics. [4]

See also

â— Physical chemistry

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External links

â— Physical economics – Wikinfo.org.

θΔics

In education, **physical humanities**, or "physical science based humanities", a two cultures-one nature subject, refers to the study of: economics, sociology, history, philosophy, psychology, government, anthropology, politics, literature, business, law, finance, architecture, among other subjects of human inquiry, in terms of the logic of: physics, chemistry, and thermodynamics. [1]

> "All knowledge can be divided into two classes: subjects that study the interrelations of two or more persons (history, literature, economics, sociology, law, politics, theology, education, etc.) and those that do not (logic, mathematics, physics, biology, and other natural sciences, grammar, harmony, etc.); [the former are slower] in setting in motion activity that becomes the most important and influential in the world."
>
> — Lawrence Henderson (1935), on Machiavelli's studies vs. Galileo's studies [2]

> "Man must jump, as Adams liked to say, if he would save himself; a moral and intellectual elite must be recruited. If nothing else would serve to make moral philosophers out of historians, the fear of imminent annihilation might. University education must be revolutionized by the **physicist-historian**."
>
> — Ernest Samuels (1989), *Henry Adams* [4]

Said another way, in reference to the above statement by American physical chemistry applied sociologist Lawrence Henderson, physical humanities is the science of the study of two or more persons as defined by the physical sciences—physics, chemistry, and thermodynamics—chemical thermodynamics of foremost, foundational, and fundamental importance, being that the first law and second law of thermodynamics are the foundational basis of the laws of operation of nature and the universe.

Courses | Historical

Historical examples of "physical humanities" stylized courses include: Polish physical socio-economist Leon Winiarski's Clausius inequality based "Social Mechanics" course on political economy and pure economics taught at the University of Geneva (1894-1900), American polymath Edwin Wilson's physical chemistry and heat engine based "Mathematical Economics" course taught at Harvard (1934-1937), and American physical chemist Lawrence Henderson's chemical thermodynamics based "Sociology 23" course taught at Harvard (1935-1938) (see: Harvard Pareto circle).

The modern logic of such "physical humanities" is embodied in American chemical thermodynamicist Frederick Rossini's now semi-controversial 1971 "Chemical Thermodynamics in the Real World" address (see: Rossini debate).

Recent examples of a "physical humanities" like courses can be found being taught in Korea University Graduate School's program in science and technology studies, who since at least 2013 have been offering courses in sociological thermodynamics, an intermixture of general systems theory, cultural and industrial revolution, and thermodynamics, which they define as the "new paradigm of social science" in the 21st century, two examples of which, as three credit courses, are shown below: [3]

SOS 623	Seminar on Social Thermodynamics	[3]
This course will be held in the form of seminar. The advantage of general system theory will be solidated and the drawbacks of it will be complemented. The theory of Social Thermodynamics and its application will be also introduced.		

2013

2014

SOS 725	Revolutionary Theory of Science, Industry and Culture	[3]

Revolution is a kind of sociological phenomenon. We will examine and criticize the science, industry and cultural revolution ever achieved in terms of **sociological thermodynamics** which is a new paradigm of social science. Futhermore we will predict how it is unfolded in 21century and try to find out the way to make a provision for it.

Etymology

The term “physical humanities”, introduced in 2013 by American electrochemical engineer Libb Thims, is meant to embody and encompass the extensive and variegated historical two cultures namesakes precursors. [1] The term physical humanities is somewhat conceptualized as an expanded (all-humanities) version of American sociologist Leon Warshay’s 2013 discussions of “physical sociology”, in his critique of the critiquers, namely Pitirim Sorokin (1921) and Werner Stark (1962), of the various physio-chemical based mechanistic schools of the late 19th century early 20th century sociology, which he sees as being a type of “foreign matter”, albeit not for lack of want or potential, to modern sociology.

History

One early example of "physical humanities" like effort, so to say, is French scholar Michel Montaigne's readings of the atomic theory in Lucretius' *On the Nature of Things*, with which he used as the basis of his 1580 *Essays* on existence—a work that would become one of William Shakespeare's favorite books.

Further historical discussion is found in: two cultures synergy, two cultures department, and human thermodynamics education.

See also

â— Physicochemical humanities

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θΔics

In human thermodynamics, **physical intelligence**, abbreviation PI, is a theory, premise, or research program, conceived by DARPA program manager Todd Hylton in 2009, which supposes that intelligence spontaneously evolves as a consequence of thermodynamics in open systems, and that such types of evolved intelligences can be built from chemical and electrical components. [1] A 2012 description of the so-called physical intelligence program, according to program manager Jamil R. Abo-Shaeer, is as follows: [6]

A screenshot of the DARPA-funded 2009 **physical intelligence** project, the premise that a thermodynamics-based type of artificial intelligence can be built, that evolves. [5]

> "The physical intelligence program will address its overall objective through a coordinated effort in three complementary domains: theory, implementation, and analysis. The objective of the theory domain is to develop and validate a physical formalism that unifies and expands ideas from diverse domains such as evolution, thermodynamics, information, and computation. The objective of the implementation domain is to demonstrate the first human-engineered open thermodynamic systems that spontaneously evolve nontrivial "intelligent" behavior under thermodynamic pressure from their environment. The objective of the analysis domain is to develop analytical tools to support the development of human-engineered physically intelligent systems and to understand **physical intelligence** in the natural world."

As of early 2013, however, to note, the funding for the program has since been exhausted. [7]

Overview

The idea of PI was conceived as a two-year research and development project, initiated by Defense Advanced Research Projects Agency (DARPA), of the US Department of Defense, particularly through the efforts of DARPA program manager Todd Hylton in May of 2009. [1] According to the 30-page project proposal publication, the project of constructing or understanding "physical intelligence" is described as a follows:

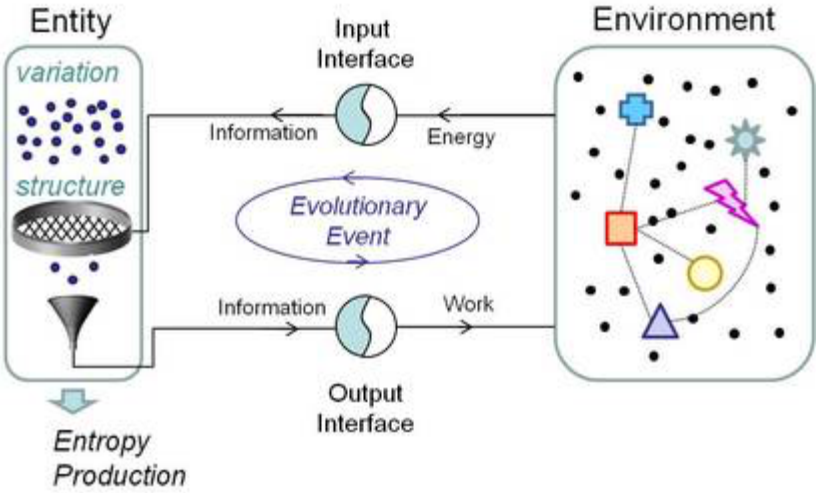

A flowchart diagram of the **physical intelligence** model. [6]

> Synopsis: Our current understanding of the natural world lacks an effective description of the evolution of complexity evident in all living systems. The Physical Intelligence (PI) program hypothesizes that a unifying description called *physical intelligence* can be developed from currently fragmented disciplinary domains. The vision of the Physical Intelligence program is to develop a physically-grounded understanding of intelligence that applies to engineered systems and scales to high levels of organization. If achieved, this understanding might be applied to problems as diverse as the complexity of living systems, the nature of human intelligence, and the engineering of systems that spontaneously evolve intelligent behavior. This capability would find broad utility in the many defense systems requiring improved autonomy in unmanned systems and improved

situational awareness and decision support in manned systems.

Background: For the past 50 years, the dominant paradigm for *intelligence* supposes that the brain is the seat of intelligence and is functionally equivalent to a computer capable of executing any algorithm. Hence, the current conceptual foundations of intelligence are rooted in the abstractions of logic. Although many valuable and practical applications have emerged from this approach, the goal of true machine intelligence remains distant and the validity of the conceptual foundation is unclear. In contrast, our understanding of the *evolution* of life is rooted primarily in observations of the natural world, resulting in a multitude of descriptive, domain-specific models of evolutionary processes. A particular challenge is the specification of the mechanisms of selection, as they are typically attributed to a complex environment within which a model system is situated. With some exceptions, current approaches to understanding *intelligence* and *evolution* are disconnected and often lack grounding in fundamental physical principles.

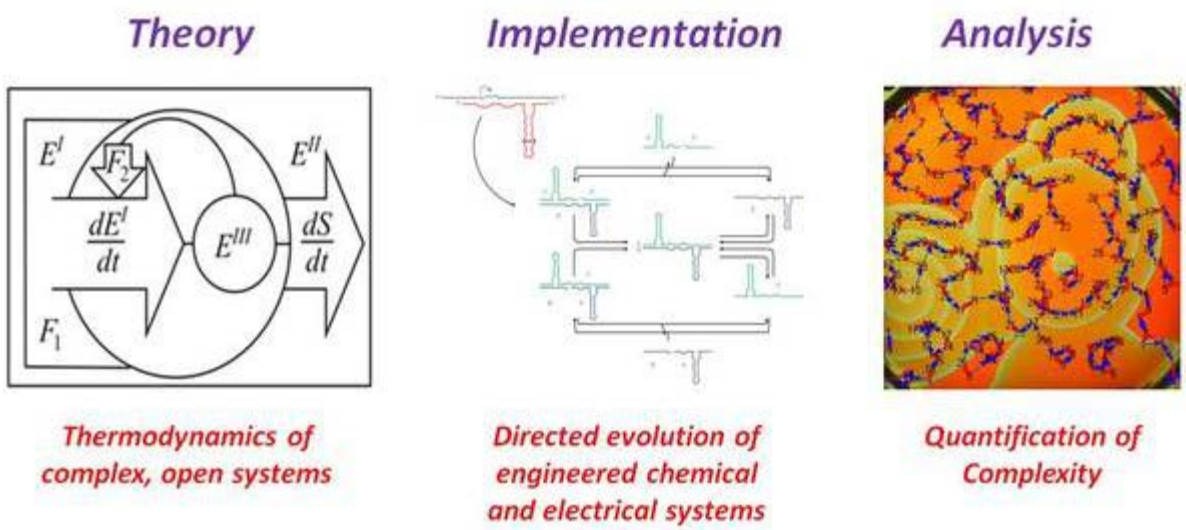

A **physical intelligence** project overview schematic. [6]

The Physical Intelligence program supposes that the phenomena associated with *intelligence* and *evolution* can be understood as natural consequences of complex, open *thermodynamic* systems. In particular, evolutionary variation may result from thermodynamic fluctuations, and evolutionary selection may result from entropy production. Further, the hierarchy of organization observed in the natural world may result from the evolutionary/thermodynamic growth of "networks" of energy transduction mechanisms. These networks include neural systems, for example, but also many other complex natural systems. Although the idea that life is "a struggle for entropy" (Boltzmann) has been supposed for more than a century, acknowledged formalisms, validation in the natural world, and applications to engineered systems are scarce. The Physical Intelligence program aspires to change this situation.

Description: The outline of the program is hinged on three independent but connected points: (a) Creating a theory (a mathematical formalism) and validating it in natural and engineered systems; (b) Building the first human-engineered systems that display physical intelligence in the form of abiotic, self-organizing electronic and chemical systems; (c) Developing analytical tools to support the design and understanding of physically intelligent systems.

The outline of the theory seems to be similar to the concept of artificial intelligence (AI), a term coined by American computer scientist John McCarthy in 1959, defined as the science and engineering of making intelligent machines, albeit with the exception of the requirement of electrical parts and chemical parts, rather than computer parts alone. [2]

Historical theories

See main: Neumann automaton theory

The theory of electrical-chemical intelligent systems, to note, was first proposed by American chemical engineer John Neumann in 1948, who envisaged a robot or automaton, made of wires, electrical motors, batteries, etc., constructed in such a way that when floating on a lake stoked with component parts, it will reproduce itself (self-replicate), albeit only if a source of free energy is available. [3]

A similar theory was proposed in 1965 by Canadian materials science engineer Jack Kirkaldy, who argued that the "human brain may be regarded as an irreversible system which is constrained by a fixed inflow of free energy in the form of chemical nourishment from within the body and information from the environment." [4]

The only other possible theories available may come from the work of Norbert Wiener (cybernetics), Ilya Prigogine (dissipative structures), possibly recent complexity theory work, or other neuroscience possibilities (e.g. neurochemical thermodynamics, neurothermodynamics, neurodynamics, etc.).

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θΔics

In science, **physical science** is the study of matter and energy (or force) and, generally speaking, is an umbrella term referring to the grouped subjects of physics, chemistry, and thermodynamics. [1]

Etymology

In 1876, Scottish physicist James Maxwell, following a brief prefaced note that 19th century physical science is the extension of the 18th century study of the forces acting between one body and another, gave the following definition of physical science: [2]

> "**Physical science** is the study of natural phenomena in which the energy of a material system is conceived as determined by the configuration and motion of that system, and in which the ideas of configuration, motion, and force are generalized to the utmost extent warranted by their physical definitions."

In 1912, German physical chemist Wilhelm Ostwald defined physical science, rather cogently, as a synthesis of mechanics, physics, and chemistry, centered around the study of energy: [2]

> "There now follows a group of **physical sciences**, which are referred to as mechanics, physics and chemistry. They also correspond to an increasing diversity of the considered properties or relations and have also its summary term. This is the concept of energy, such as the physical sciences can be summarized as the study of the various activities of the energy."

This outline, in modern terms, one of the central aspects of a hard science.

Quotes

The following is a relevant poem excerpt:

> "See how **physical science** which is reason's trade
> And high profession, booketh ever and docketeth
> All things in order and pattern."
>
> — Robert Bridges (1929), *Testament of Beauty* [4]

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External links

â— Outline of physical science – Wikipedia.

θΔics

In hmolscience, **physical sociology** is sociology based on the physical sciences and or physics specifically.

Synonyms

Near synonyms include: social physics, sociological physics, and socio-physics (or sociophysics).

Overview

In 1898, Edward Payson, in his *Suggestions Towards and Applied Science of Sociology* (Q), employed the term "physics" some 13+ times and "physical sociology" some 14+ times in a very loose way; an abstract of this effort is as follows: (Q)

> "This writer's endeavor is to formulate a system of what he terms 'physical sociology', as distinguished from animistic. He believes that much evil in the world heretofore viewed as intangible, has really a physical character, and hence may be reached and grappled with the state. He draws illustrations of the practical application of this proposition from criminal law and public philoanthropy."

In 1921, discussions of instances of what might be called "physical sociology" were being discussed. (Q)

In 1960, some were attributing the work of Thomas Hobbes as being an attempt at quasi-physical sociology: (Q)

> "Yet when these sciences attained their modern prestige it was, in a way, natural to make new attempts at physical or **quasi-physical sociology**. Hobbes seems to have been the first to try. Hard things have been said about him, not all of them..."

In 2000, Chinese researcher Zhong Xue Fu published *Physical Sociology: Social Phenomena, Interpretation of Theoretical Exploration*, which supposedly as some type of physical nature of wealth and possession modelling. [1]

In 2000, Bruno Latour was commenting around in interview, as a joke, how there is no "physical sociology" in sociology, akin to physical anthropology, in anthropology, or physical geography, in the geography department. (Q) A number of discussions and variations of this comment can be found; one example being the following:

> "Unfortunately there is no **'physical sociology'**, and that is why sociology is so poor because it never actually had a counter-part in the same department."
>
> — Bruno Latour (2000) (Q)

In 2013, American sociologist and social mechanics historian of sorts Leon Warshay, in discussion with Libb Thims about the pros and cons of his "two cultures inquiries" efforts, employed the term "physical sociology" in commentary on University of Chicago sociology department chair Mario Small's comment to Libb Thims that a two cultures (sociology department + physics department) proposal for establishment at University of Chicago is too "tall" an order at the moment, as follows: [2]

> 1. Mario Small's statement that the "introduction of a department or class, strung between the physics and sociology department, seems like a tall order at the moment" but, being true to a physical analogy or model, tall orders can be toppled.
> 2. While a **physical sociology**, or social science, is "foreign matter," given the prevalence in sociology of Weberian, Parsonian, Interactionist, Functionalist, and similar approaches, the concepts and theories to be selected and used are a pragmatic matter, a matter of fit and usefulness, in prediction, explanation,

intelligibility, and the like.
3. Hence, sociophysics cannot, and should not, be ruled out of court, despite Talcott Parsons.
4. At the other "extreme," neither should qualitative, humanistic, and/or idealist approaches be ruled out, whether subjective idealist or objective idealist.
4. What should be avoided is narrowness and closed-mindedness.
5. Hence, it is necessary to entertain physicalist, chemical, biologistic, psychologistic, material culturalist, geographic concepts, models, and theories.

Quotes

The following are related quotes:

> "The elucidation of economic relationships, depending as it does on the nature of the hypothesis of human aggregation actually in operation at any time, is considered to be subordinate and subsequent to this general science of sociology. Political economy and economics, in our world now, consist of a hopeless muddle of social assumptions and preposterous psychology, and a few geographical and physical generalisations. Its ingredients will be classified out and widely separated in utopian thought. On the one hand there will be the study of physical economies, ending in the descriptive treatment of society as an organisation for the conversion of all the available energy in nature to the material ends of mankind—a **physical sociology** which will be already at such a stage of practical development as to be giving the world this token coinage representing energy—and on the other there will be the study of economic problems as problems in the division of labour, having regard to a social organisation whose main ends are reproduction and education in an atmosphere of personal freedom. Each of these inquiries, working unencumbered by the other, will be continually contributing fresh valid conclusions for the use of the practical administrator."
>
> — H.G. Wells (1904), *A Modern Utopia* (Q)

See also

- Physicochemical humanities
- Physicochemical sociology

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θΔics

In phenomena, **physical sociology falloff problem** refers to puzzling phenomenon of the apparent rise to prominence of the so-called "mechanistic school" of sociology—one based explicitly on physics, chemistry, and mechanics—to the apex of contemporary early 20th century American sociology, according to Pitirim Sorokin (1928), to the further rise and formation of the Gibbs-Pareto based so-called Harvard Pareto circle (1932-1942), epicentered the efforts of American physical chemist Lawrence Henderson, to the further historical beginnings (e.g. Princeton school, 1796) and later formation of the Rockefeller-funded Princeton department of social physics (1945-1955), anchored around the one nature vision of American physicist John Q. Stewart, after which the overall physical sociology program in America ceased abruptly.

Overview

Consensus, from a number of sources, indicates that sociology, in the early 20th century was growing into the form of a "true science", mathematical and based in the natural sciences, but that with the event of WWII (1939-1945), and or up-till *circa* 1955, or sometime there, it peaked as a striving-to-be true science, and fell off. The following are few quotes evidence to this view:

> "The leading contemporary sociological theory—of the last sixty or seventy years—has been the mechanistic school, which may be classified as all sociological theories which interpret social phenomena in the terminology and concepts of physics, chemistry, and mechanics."
>
> — Pitirim Sorokin (1928), *Contemporary Sociological Theories* (pgs. xvii + 3) [1]

> "The school dominating present day sociology at least in America is the neopositivist one. It is best represented by G. Lundberg's *Foundations of Sociology* (1939), in its companion volume which is S.C. Dodd's *Dimensions of Sociology* (1942), but also in such works as G.K. Zipf's *Human Behavior and the Principle of Least Effort* (1949), in N. Rashevsky's *Mathematical Theory of Human Relations* (1947), and in innumerable articles appearing in the sociological journals."
>
> — Nicholas Timasheff (1950), "Sociological Theory Today" [2]

> "For about twenty-five years prior to the middle 1950s it was widely held in America that sociology was rapidly becoming a true science."
>
> — Richard Brown (1977), per citation of Talcott Parsons (1954) and George Lundberg (1955) [3]

> "The clarion call for a return to the dream of a social physics does not, at this moment, seem to be winning the day. Many social theorists are now more inclined to turn to historical and literary studies than to physics and chemistry for inspiration. Whether new developments in the natural sciences can breathe new life into the dream of a social physics is an open-ended and uncertain prospect. Nineteenth-century social theorists favored metaphors that mimicked the more successful natural sciences, selecting analogies mainly from biology, chemistry, and physics. Social scientists, modeling themselves after physical scientists, sought to discover the natural 'laws' of society and history. In recent decades, however, the ground has shifted. Today, the positivist dream of a social physics seems, if not dead, at least dormant."
>
> — Daniel Rigney (2001), *The Metaphorical Society* (pgs. 49+197) [4]

(add summary)

Void period

American sociology historian Jonathan Turner, in his 2012 *Theoretical Sociology: 1830 to the Present*, states that a theoretical void existed, in sociology, between the late 1920s and 1950s, and that Pitirim Sorokin was such theorist who flourished as a "giant" during this period. [9]

Reasoning | Discussion

In 1968, as per reasoning behind this apparent falloff, American sociologist Barbara Heyl, in respect to the Harvard Pareto circle, specifically, argued that the impact of WWII enacted a switch to Marxism-focused American sociology. [5] Alternatively, that same year, American sociologist Talcott Parsons stated that the reason for the fall off of physics and chemistry based sociology, of the Pareto-variety, after WWII, was scientific limitation: [6]

> "Most of the neglect of Pareto stems from the scientific limitations of subsequent generations of sociologist rather than from his irrelevance to their interests."

American sociologists Joseph Lopreato and Sandra Rusher, in their "Vilfredo Pareto's Influence on USA Sociology" (1983), call this a mordant and justified sentence. [7]

In 2013, American anti-reductionist sociologist Leon Warshay, in response to a query, by Libb Thims, about why the mechanistic school is not being taught in American sociology, attempted to give a semblance of an opinionated answer, in a series of email responses, amounting to the effect that the subject of physicochemical based sociology (see: physicochemical sociology) is now seen as foreign matter to modern sociologists, whose minds are absorbed in the prevalence of Weberian, Parsonian, Interactionist, Functionalist, and similar sociological approaches. [8]

Among these supplied reasonings, the "scientific limitations" answer seems to be the main reason, which is evidenced by the fact that Harvard's "Sociology 23", a physical chemistry based sociology, steered by physical chemist Lawrence Henderson, and "Mathematical Economics", a steam engine and physical chemistry based economics, steered by Gibbs-trained Edwin Wilson, are no longer in operation, now that no one with the proper training and qualifications are available to run the show. This would seem to have something to have to do with the intellectual hydraism-effect.

References

1. Sorokin, Pitirim. (1928). *Contemporary Sociological Theories* (§1: The Mechanistic School (pdf), pgs. 4-62). Harper & Brothers.
2. (a) Timasheff, Nicholas S. (1950). "Sociological Theory Today", *American Catholic Sociological Review*, 11(26), Mar.
(b) Nicholas Timasheff – Wikipedia.
(c) Lundberg, George. (1955). "The Natural Science Trend in Sociology" (abs), *American Journal of Sociology*, 61(3):191-202.
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(b) Parsons, Talcott. (1954). *Essays in Sociological Theory* (366-67). Simon and Schuster, 2010.
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4. Rigney, Daniel. (2001). *The Metaphorical Society: an Invitation to Social Theory* (pg. 49+197). Rowman & Littlefield.
5. Heyl, Barbara. (1968). "The Harvard 'Pareto Circle'." *Journal of the History of the Behavioral Sciences*, 4:316-34; in: *Talcott Parsons: Critical Assessments, Volume 1* (editor: Peter Hamilton) (§2, pgs. 29-49). Taylor & Francis.
6. (a) Parsons, Talcott. (1968). "Vilfredo Pareto: Contributions to Sociology", *International Encyclopedia of the Social Sciences*, 11:411-16.
(b) Lopreato, Joseph and Rusher, Sandra. (1983). "Vilfredo Pareto's Influence on USA Sociology" (abs), *Revue Europenne des Sciences Sociales*, 21(65):69-122; in: *Vilfredo Pareto: Critical Assessments of Leading Economists, Volume 3* (editors: John Wood and Michael McLure) (§74, pgs. 187-237). Taylor & Francis, 1999.
7. Lopreato, Joseph and Rusher, Sandra. (1983). "Vilfredo Pareto's Influence on USA Sociology" (abs), *Revue*

Europenne des Sciences Sociales, 21(65):69-122; in: *Vilfredo Pareto: Critical Assessments of Leading Economists, Volume 3* (editors: John Wood and Michael McLure) (§74, pgs. 187-237). Taylor & Francis, 1999.
8. Warshay, Leon. (2013). "Email communications to Libb Thims" Mar 5, 8; May 14.
9. (a) Turner, Jonathan H. (2012). *Theoretical Sociology: 1830 to the Present* (pg. 292). Sage.
(b) Jonathan H. Turner – Wikipedia.

θΔics

In isms, **physicalism**, as compared to "mentalism" or

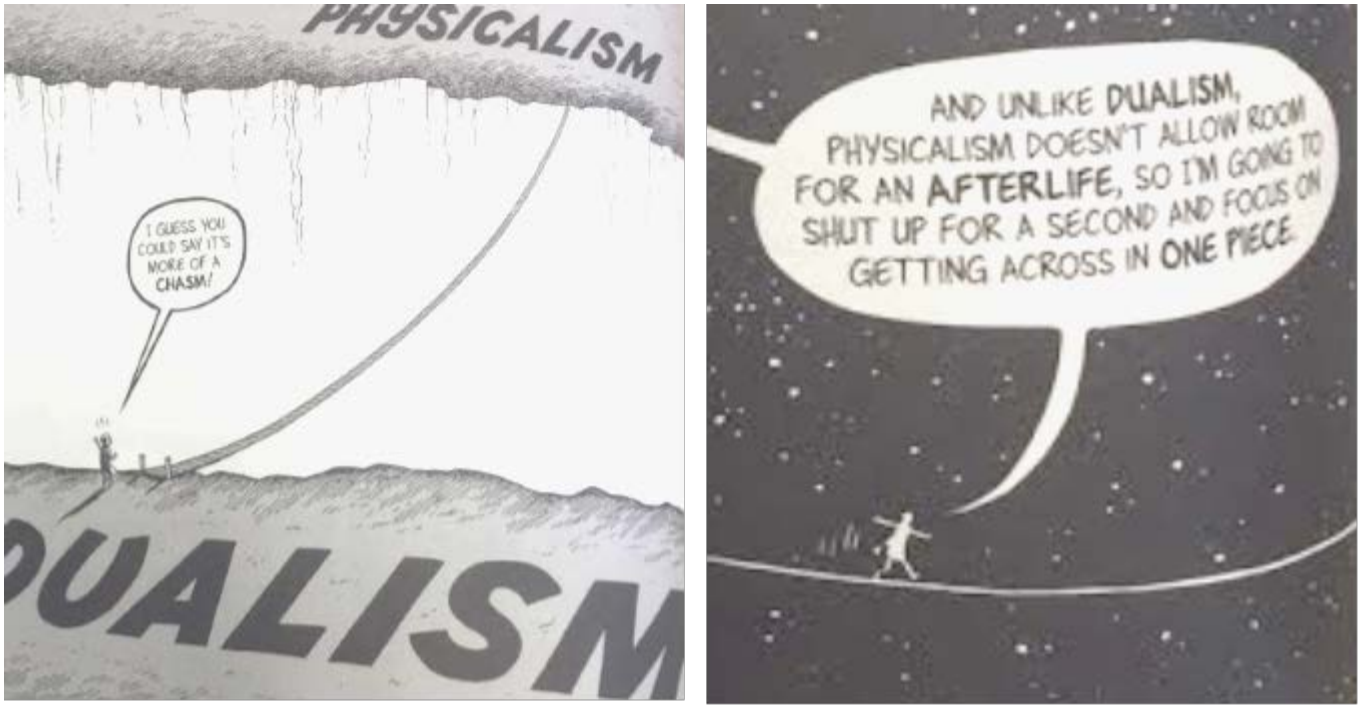

A cartoon (Q) visual of **physicalism**, which denies afterlife, vs dualism, which allows for soul and afterlife.

"materialism", is the doctrine that events are governed by the laws of physics (Russell, 1946). [1] The term often is invoked in philosophical debates on mind-body dualism.

History

German physicist Hermann Helmholtz's 1847 memoir "On the Conservation of Force", in which he overthrew the concept of vital forces, is said mark the initiation of modern physicalism. [2]

Quotes

The following are related quotes:

> "**Physicalism** is a kind of monism, opposing the dualist's distinction between two kinds of substance: matter and mind. As such, it is descended from 'materialism': the view that everything is matter—for instance, the view that nothing exists but collections of atoms in the void—as opposed to say Cartesian dualism, which held that as well as matter (extended substance) there is also mind (thinking substance)."
>
> — Tim Crane (1990), "There is No Question of Physicalism" (pgs. 185-86) [3]

See also

- Materialism
- Physico-chemical materialism
- Physico-chemicalism

References

1. Russell, Bertrand. (1946). "Mind and Matter in Modern Science", *The Rationalist Annual*, Watts & Company; in: *Bertrand Russell on God and Religion* (chapter 11, pgs. 151-63; definition, pg. 151), ed. Al Seckel, Prometheus Books, 1986.
2. Papineau, David. (2005). "The Rise of Physicalism" (pdf), Kings College London.
3. Crane, Tim and Mellor, D.H. (1990). "There is No Question of Physicalism" (pdf), *Mind*, 99:185-206.

External links

- Physicalism – Wikipedia.

θΔics

In science, **physico-chemical** refers to physics-based chemistry; short for physical chemistry.

See also

- Physico-chemical monism
- Physico-chemical morality
- Physico-chemical social dynamics
- Physico-chemical sociology | Physicochemical sociology | (Beg, 1987)

External links

- Physicochemical – Merriam Webster.

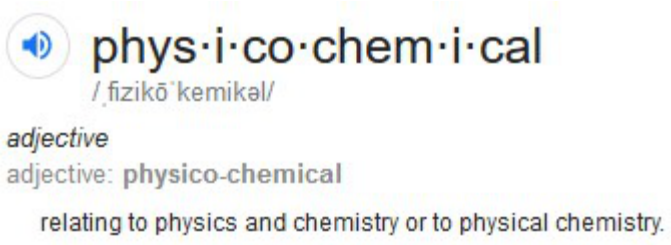

A Google-generated definition of **physico-chemical**, meaning related to physics and chemistry or to physical chemistry.

θΔics

In science, **physico-chemical monism** (PCM) refers to a monism based on the principles of physics and chemistry, or physico-chemical principles.

Overview

In monism, there are generally two types, namely: atheistic physico-chemical monism, e.g. Thims (2007), and theistic physico-chemical monism, e.g. Rossini (1971) or Beg (1987); then there are intermediate varieties of PCM theory, e.g. Haeckel (1892), who admits of atheism, but retains the theistic concept of "soul".

Empedocles

In 450BC, Empedocles, in his *On Nature*, most of which now only existing in fragments, outlined a two-force and four elements monism theory of everything.

Goethe

In 1809, Goethe, in his *Elective Affinities*, themed on an admixture of ideas of Benedict Spinoza, Empedocles, and Torbern Bergman, outlined a general monistic "human chemical theory" of people reacting together, according to the same affinity laws of smaller test tube chemicals.

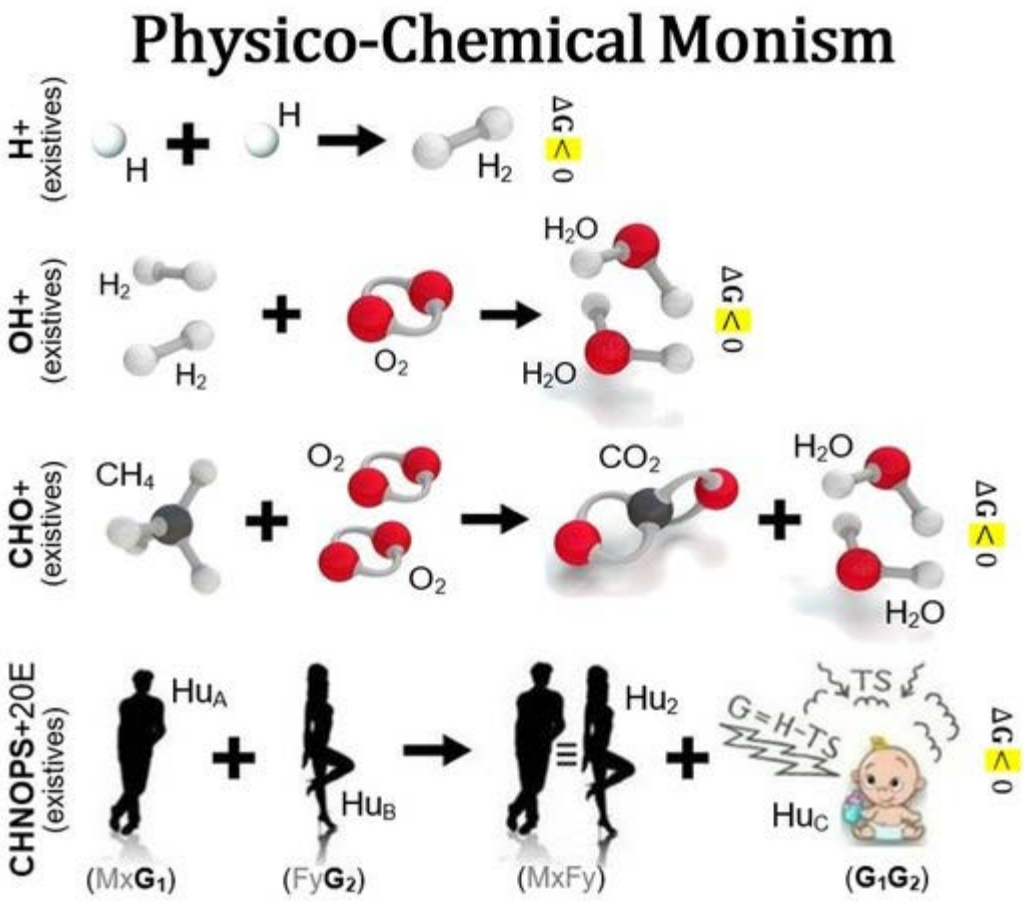

A image showing the gist of "**physico-chemical monism**", namely the view that all existents, hydrogen to human, e.g. carbon-based, CH-based, OH+ based, CHO+ based, or CHNOPS+ based things, are things that go through one and the same reaction processes and are "governed" by one and the same physico-chemical laws and principles, in particular the combined law, $\Delta G < 0$, the less than sign " < " indicating that for each respective reaction to occur or proceed, the reaction must have a negative free energy change; some reaction, to note will proceed "unnaturally" ($\Delta G > 0$), but these must be coupled to an exergonic reaction order to proceed (see: coupling theory); also, reactions that don't normally go, and normal STP, can be forced to go, by submitting the system to high temperatures and pressures, e.g. Haber process.. [N1]

Haeckel

In 1890s, Ernst Haeckel, building on Goethe, outlined brand of physico-chemical monism, wherein he did away with god, basically, but kept the concept of "soul", which he believed extended up and down the great chain of being, e.g. as stated by him as: "I regard all matter as ensouled"; the following are summaries:

> "In the determinate sense, in which '**monism**' is at present employed by the majority of philosophers and physical inquirers, the sense which I believe *I was the first* to establish in my *General Morphology, Volume One* (pg. 105) (1866), it denotes a unitary or natural conception of the world, in *opposition* to a supernatural or mystical one, that is, in opposition to dualism. For us, accordingly, there exists, in the 'sense of Goethe', no opposition whatsoever between nature and mind."
>
> — Ernst Haeckel (1892), "Our Monism" (pgs. 481-82) [1]

> "All the phenomena of organic life ultimately admit of ***being reduced*** to being reduced to 'mechanical' (or '**physico-chemical'**) processes that differ from the processes of the inorganic world only in point of degree or quantitatively, not qualitatively."

— Ernst Haeckel (1892), “Our Monism” (pgs. 483-84) [1]

> “In its widest sense: panpsychism. All matter is ensouled, because all natural bodies known to us possess determinate chemical properties, that is to say ‘react’ uniformly and by law when subjected to the determinate chemical, i.e. molecular-mechanical, influences of other bodies: chemical affinity. Simplest example: sulfur and quicksilver rubbed together form cinnabar, a new body of entirely different properties. This is possible only on the supposition that the molecules (or atoms) of the two elements if brought within the proper distance, **mutually ‘feel each’ other**, by attraction move towards each other; on the decomposition of a simple, chemical compound the contrary takes place: repulsion. Think of Empedocles's doctrine of the ‘love and hatred of atoms’.”

— Ernst Haeckel (1892), “Our Monism” (pgs. 483)

(add)

Quotes

The following are related quotes:

> “The writer denies an intention to identify the two elements and repudiates **physico-chemical monism**, but insists that the study of the cerebral part of the psychical function can be attached to human physiology and biology, though not to general biology.”

— Anon (1917), “Review” (Q), of, supposedly, the *Romantic Revolution* of Emmanuel Barat (Q)(Q) [?]

> “We may accept philosophical ‘monism’, but we have no reasons for accepting the **physico-chemical monism** imposed on us from time to time, which identifies vital and psychic processes with physico-chemical processes.”

— Petr Uspenskii (1938), *A New Model of the Universe* [2]

See also

- Physico-chemical morality
- Physico-chemical social dynamics
- Physico-chemical sociology

Notes

N1. The above image, originally was uploaded, with lesser annotation, to the death does not exist article (2 Apr 2020), made following an explanatory discourse on how Lotkean jabberwocky results when anyone tries to digress on an "origin of life" theory, while stepping down the levels of the molecular evolution table.

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1. Haeckel, Ernst. (1892). “Our Monism: the Principles of a Consistent, Unitary World-View” (pdf), *The Monist*, 4(2):481-86, Jul.
2. (a) Uspenskii, Petr. (1938). *A New Model of the Universe* (pg. #). Publisher.
(b) Uspenskii, Petr D. (1878-1947) – WorldCat Identities.

θΔics

In hmolscience, **physico-chemical morality** refers to []

Quotes

The following are related quotes:

> "We conclude that there exists a principle of the human body which comes from the great process in which so many millions of atoms of the earth become many millions of human molecules."
>
> — Jean Sales (1789), *The Philosophy of Nature: Treatise on Human Moral Nature*

> "The **moral symbols** in the natural sciences—for example that of the elective affinities invented and used by the great Bergman—are more intelligent and permit themselves to be connected better with poetry, even connected with society better than any others, which are, after all, even the mathematical ones, anthropomorphic. The thing is that the former (the chemicals) belong with the emotions, the latter (mathematics) belong with the understanding."
>
> — Johann Goethe (1809), "Conversation with Friedrich Riemer", Jul 24

> "Many do not see the battle between morality and passion within *Elective Affinities*."
>
> — Johann Goethe (1809), in response to critics, mid Dec; in: Tantillo (pg. 6) (FA 2, 6:616-17)

> "My chief proposition: there are no moral phenomena, there are only a moral interpretation of these phenomena. This interpretation itself is of extra-moral origin."
>
> — Friedrich Nietzsche (c.1885), WP:258

> "If iron sulphate and caustic potash are brought together, the SO_4 ions leave the iron to unite with the potassium. When in nature an adjustment of such differences of potential is about to take place, he who would approve or disapprove of the process from the moral point of view would appear to most to play a ridiculous part."
>
> — Otto Weininger (1903), *Sex and Character*

> "Morality has nothing to do with any particular form of religion. Morality is the adjustment of matter to its environment—the natural arrangement of molecules. More especially it may be considered as dealing with organic molecules. Conventionally it is the science of reconciling the animal *homo* (more or less) *sapiens* to the forces and conditions with which he is surrounded."
>
> — Howard Lovecraft (1918), "Letter to Maurice Moe", May 15

> "The most familiar attempts to explain how evolution takes place are restricted to special aspects of evolution, and are often epitomized in personal names, such as Darwinism, Lamarkism, Weismannism, Mendelism. Among us there are naturalists, morphologists, physiologists, and psychologists; breeders, experimentalists, and bio-chemists. And **surrounding us** on all sides **are the physicists, chemists,** geologists, and astronomers, **with whom we must reckon**, for their domains and their subject matter overlap ours in countless ways. But unfortunately between all these workers there is little common understanding and much petty criticism. We shall use the terms morality, behavior, conduct, or constructive

action in the same broad way. It may sound strange to speak of the morals of an atom, or of the way in which a molecule conducts itself. But in the last analysis, science can draw no fundamental distinction between the conduct of an animal, a bullet, or a freshman, although there may be more unknown factors involved in one case than in the other."

— William Patten (1920), AAAS address "The Message of the Biologist" + *The Grand Strategy of Evolution: the Social Philosophy of a Biologist*

"Thinking about atoms discussing morals is absurd."

— Ravi Zacharias (1990), *The Real Face of Atheism*

"This is the sort of irrelevant-sounding question that seems minor at first, and the mind looks for a quick answer to dismiss it. It sounds like one of those hostile, ignorant questions some fundamentalist preacher might think up. But why do the fittest survive? Why does any life survive? It's illogical. It's self-contradictory that life should survive. If life is strictly a result of the physical and chemical forces of nature then why is life opposed to these same forces in its struggle to survive? Either life is with physical nature or it's against it. If it's with nature there's nothing to survive. If it's against physical nature then there must be something apart from the physical and chemical forces of nature that is motivating it to be against physical nature. The second law of thermodynamics states that all energy systems 'run down' like a clock and never rewind themselves. But life not only 'runs up,' converting low energy sea-water, sunlight and air into high-energy chemicals, it keeps multiplying itself into more and better clocks that keep "running up" faster and faster. Why, for example, should a group of simple, stable compounds of carbon (C), hydrogen (H), oxygen (O), and nitrogen (N), 'struggle' for billions of years to organize themselves into a professor of chemistry? What's the motive? (see: motive force) If we leave a chemistry professor out on a rock in the sun long enough the forces of nature will convert him into simple compounds of carbon, oxygen, hydrogen and nitrogen, calcium, phosphorus, and small amounts of other minerals. It's a one-way reaction. No matter what kind of chemistry professor we use and no matter what process we use we can't turn these compounds back into a chemistry professor. Chemistry professors are unstable mixtures of predominantly unstable compounds which, in the exclusive presence of the sun's heat, decay irreversibly into simpler organic and inorganic compounds. That's a scientific fact. The question is: Then why does nature reverse this process? What on earth causes the inorganic compounds to go the other way? It isn't sun's energy. We just saw what the sun's energy did. It has to something else. What is it?"

— Robert Pirsig (1991), *Lila: An Inquiry into Morals*

See also

â— Moral chemistry
â— Physicochemical morality puzzles

θΔics

In hmolscience, **physio-chemical social dynamics**, an early two cultures namesake synonym to: physicochemical sociology (Sorokin, 1943) and or physicochemical humanities (Thims, 2014), is the name to which Henry Adams in 1908 used to refer to his Gibbsian thermodynamics plus human molecular theory based social phase dynamical change model of history, conceptualized to describe the laws which govern animated beings, in a universal manner. [1]

Overview

The following 1863 to 1910 quotes are representative of Adams' "physico-chemical social dynamics theory", as he seems to have referred to his theory in the 27 Sep 1908 letter to Charles Gaskell, shown below:

> "Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday within this law. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."
>
> — Henry Adams (1863), "Letter to Charles Gaskell" (Oct)

> "Altogether, we go on with placidity unequalled, and the only question is what we live for. Nothing seems to come of it?"
>
> — Henry Adams (1878), "Letter to Charles Gaskell" (Aug 21)

> "Social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life."
>
> — Henry Adams (1885), "Letter to Clover Adams" (Apr 12)

> "A period of about twelve years measured the beat of the pendulum. After the *Declaration of Independence* [4 Jul 1776], twelve years had been needed to create an efficient *Constitution* [17 Sep 1787]; another twelve years of energy brought a reaction against the government then created; a third period of twelve years was ending in a sweep toward still greater energy; and already a child could calculate the result of a few more such returns."
>
> — Henry Adams (1890), *A History of the United States of America* (Ñº)

> "An atom is a man and Maxwell's demon, who runs the second law, ought to be made president."
>
> — Henry Adams (1903), "Letter to Brooks Adams", May 2

> "Gentle mathematicians and physicists still cling to their laws of thermodynamics, and are almost epileptic in their convulsive assurances that they have reached a generalization which will hold good. Perhaps it will. Who cares?"
>
> — Henry Adams (1903), "Letter to Charles Gaskell" (Jun 14)

> "On the **physico-chemical** law of development and **dynamics**, our **society** has reached what is called the critical point where it is near a new phase or equilibrium."
>
> — Henry Adams (1908), "Letter to Charles Gaskell" (Sep 27) [1]

> "The solution of mind is certainly in the magnet."
>
> — Henry Adams (1908), "Letter to Charles Gaskell" (Sep 27)

> "I have run my head hard up against a form of mathematics that grinds my brains out. I flounder like a sculpin in the mud. It is called the 'law of phases', and was invented at Yale [by Gibbs]. No one shall persuade me that I am not a phase."
>
> — Henry Adams (1908), "Letter to Elizabeth Cameron" (Sep 29)

> "I'm looking for a 'young and innocent physico-chemist who wants to earn a few dollars by teaching an idiot what is the first element of theory and expression in physics.'"
>
> — Henry Adams (1908), "Note to John Jameson" (Dec)

> "My essay 'The Rule of Phase [Applied to History]' is a 'mere intellectual plaything, like a puzzle' [to Brooks]. I am interested in getting it into the hands of a 'scientific, physico-chemical proofreader' and I am willing to pay 'liberally for the job' [to Jameson]."
>
> — Henry Adams (1909), Notes to Brooks Adams and John Jameson

> "I have been studying science for ten years past, with keen interest, noting down my phrases of mind each year; and every new scientific method I try, shortens my view of the future. The last—thermodynamics—fetches me out on sea-level within ten years. I'm sorry Lord Kelvin is dead. I would travel a few thousand-million miles to discuss with him the thermodynamics of socialistic society. His law is awful in its rigidity and intensity of result."
>
> — Henry Adams (1909), "Letter to Charles Gaskell" (May 2)

(add discussion)

Asimov

There is some suggestion (Ñº) that Isaac Asimov's 1942 to 1993 theory of "psychohistory", a "science of human behavior reduced to mathematical equations", as Asimov describes, as described by the fictional character Hari Seldon (Ñº), in his seven-volume *Foundation* series, is similar to Adams 1908 "physico-chemical social dynamics", as Adams calls it.

In 1944, Asimov, it seems, was passingly referring to Henry Adams (Ñº), as the name of one of his characters, in his science fiction stories; so possibly, Asimov may have had some type Henry Adams model behind his character of Hari Sheldon.

References

1. (a) Adams, Henry. (1908). "Letter to Charles Gaskell", Sep 27.

(b) Adams, Henry. (1992). *Henry Adams: Selected Letters* (editor: Ernest Samuels) (pg. 504-06). Harvard University Press.

θΔics

In terminology, **physicochemical** (TR:191) or "physico-chemical", not to be confused with *physio*chemical (physiological chemistry or chemistry of physiology), refers to physical chemistry or physical chemical phenomena.

phys·i·co·chem·i·cal

/ˌfizikōˈkemikəl/

adjective

1. of or relating to physics and chemistry or to physical chemistry.

A Google-produced definition of **physicochemical** meaning of or relating to physics and chemistry or their overlapping joint subject of physical chemistry.

The term "physico-chemical" tended to be used in the years circa 1870s to 1930/70s, after which the term "physical chemistry" tended to supersede the former; although not completely (the unwieldy phrase "physical chemical", e.g., is inept in certain uses). The following Google-made term usage chronology outlines this:

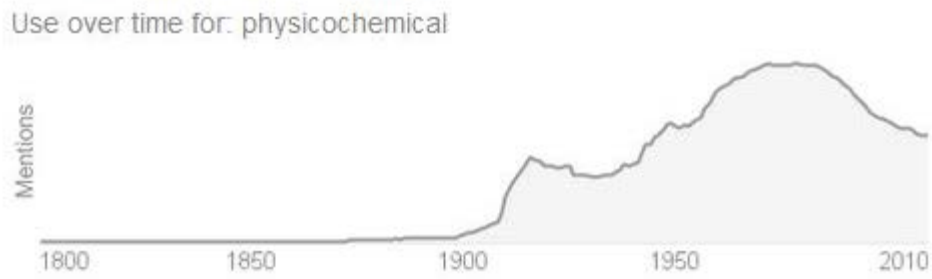

Scholars

Hmolscience thinkers to have employed "physicochemical" language, include: Henry Adams (1908-1909), Lawrence Henderson (1930s), Pitirim Sorokin (1943), in objection to Henderson, and the other physicochemically-minded thinkers of his historical "materialism school" (1928) classification, George Scott (1985), and Mirza Beg (1987).

Adams

The following are ripe quotes employing the term "physico-chemical" by American physical humanities historian Henry Adams:

> "On the **physico-chemical** law of development and dynamics, our society has reached what is called the critical point where it is near a new phase or equilibrium."
>
> — Henry Adams (1908), "Letter to Charles Gaskell" (Sep 27) [1]

> "I'm looking for a 'young and innocent **physico-chemist** [see: Henry Bumstead] who wants to earn a few dollars by teaching an idiot what is the first element of theory and expression in physics."
>
> — Henry Adams (1908), "Note to John Jameson" (Dec) [2]

> "My essay 'The Rule of Phase [Applied to History]' is a 'mere intellectual plaything, like a puzzle'. I am interested in getting it into the hands of a 'scientific, **physico-chemical** proofreader' and I am willing to pay 'liberally for the job'."
>
> — Henry Adams (1909), Notes to Brooks Adams and John Jameson [1]

Quotes

The following are other noted quotes:

> “To a materialist no thing is real but atoms in a void and we are but molecular people controlled by the actions of natural **physicochemical** law.”
>
> — George Scott (1985), “Molecular People” dedicated to Lucretius

See also

â— Physicochemical humanities

References

1. (a) Adams, Henry. (1908). “Letter to Charles Gaskell”, Sep 27.
(b) Samuels, Ernest. (1989). *Henry Adams* (physico-chemical, pgs. 401, 411). Harvard University Press.
2. (a) Adams, Henry. (1908). “Note to John Jameson”, circa early Dec.
(b) Samuels, Ernest. (1989). *Henry Adams* (pg. 409). Harvard University Press.

External links

â— Physicochemical – Wikipedia.

θΔics

In atheism terminology, **physicochemical atheism**, as can be contrasted with physiochemical theism, e.g. of the Pierre Teilhard (1936), Frederick Rossini (1971), and Mirza Beg (1987) variety, is atheism based on premise that all things, e.g. morality, passions, sense of purpose, meaning, states existence, consciousness, mind, love, good, evil, etc., can be explained by physics and chemistry, or physical chemistry in general, inclusive of thermodynamics, chemical thermodynamics specifically, wherein "god", as a working concept, has been disabused, in a component sense, namely from: physics (Laplace, 1802), chemistry (Wislicenus, 1885), thermodynamics (Blum, 1934), respectively (see: year god was disabused from science); atheism derived directly from physical chemistry; said another way: "there's no god in the test tube", whether be it a social test tube (see: social retort) or laboratory test tube, in the belief system (or belief state) of a physico-chemical atheist.

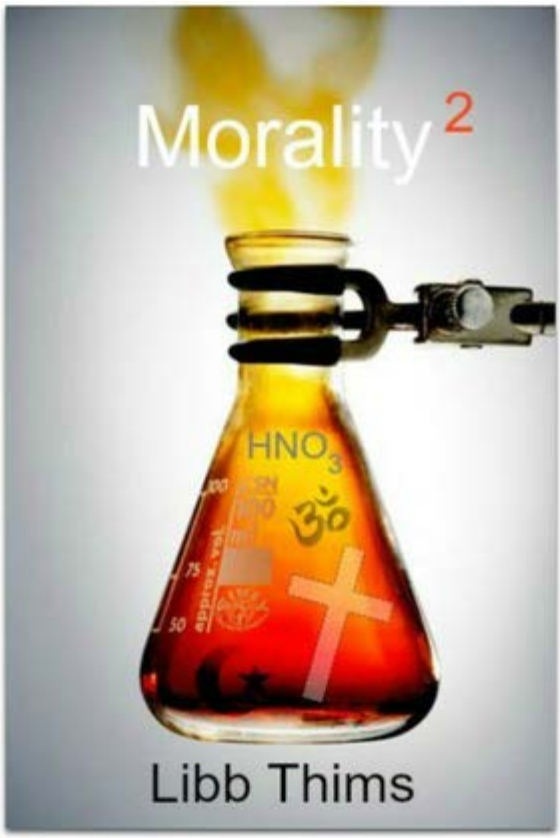

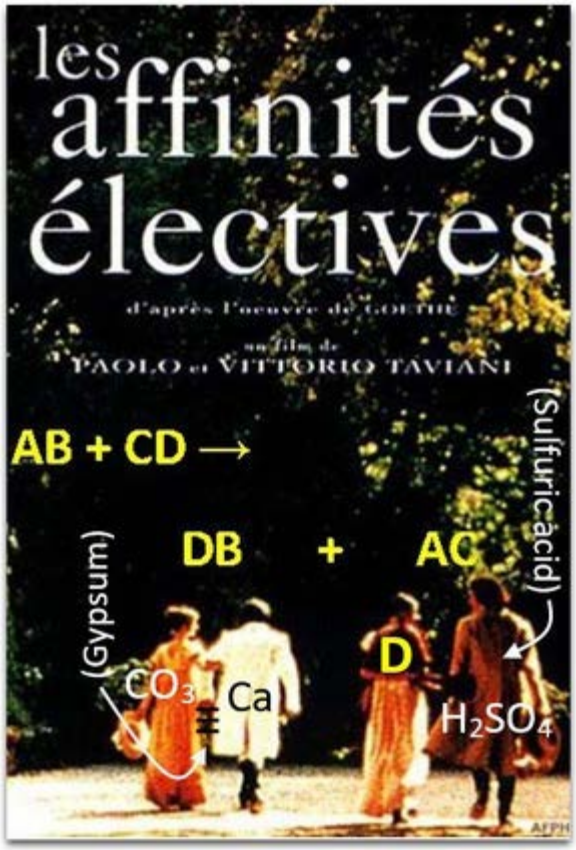

Left: a 2015 cover to Libb Thims' draft stage *Morality Squared*, wherein religion is dissolved in nitric acid, as Ludwig Feuerbach famously proclaimed would happen one day. Right: an annotated cover to the 1996 French-Italian film adaptation of Goethe's *Elective Affinities*. Both visuals of **physico-chemical atheism**, i.e. human interactions described via physical chemistry, pure, applied, and WITHOUT any god theory, god hypotheses (see: Napoleon Laplace anecdote), or god belief.

Overview

In c.450BC, Empedocles taught atheism (see: atheism professor) based on the premise that all things can be explained in terms of two forces and four elements; which he socially described via the logic that friend mix like water and wine, whereas enemies separate like oil and water.

In 1809, Goethe, building on the earlier proto physiochemical atheism logic of Empedocles, and using the modern physical chemistry textbook *A Dissertation on Elective Attractions*, by Torbern Bergman, as a basis, penned his *Elective Affinities*, which explained the passions and morals of human reactions via god-disabused chemical affinity theory, aka the moral symbols of physical chemistry. Goethe then trained Arthur Schopenhauer in this art, and the works of Schopenhauer later intellectually trained Friedrich Nietzsche; and the works of Goethe trained Ludwig Buchner and Wilhelm Ostwald.

Types

See main: Atheism types by denial and belief

The following, ordered by power ranking, are the main types of physicochemical atheism:

1. Thimsian atheism
2. Buchnerian atheism
3. Ostwaldian atheism
4. Schopenhauerian atheism
5. Freudian atheism
6. Goetheanism

(add)

Quotes

The following are related quotes:

> "In the course of these seven years the philosophic development of the individual, preserving its correspondence with that of the race, will pass through its last phase. As the pupil passed before from 'fetichism' to 'polytheism', so he will now pass, as spontaneously, into 'monotheism', induced by the influence on his imaginative powers which hitherto have been supreme, of the spirit of discussion. No interference should be offered to this metaphysical transition, which is the homage that he pays to the necessary conditions under which mankind arrives at truth. There is something in this provisional phase which evidently harmonizes well with the abstract and independent character of mathematics, with which the two first years of the seven are occupied. As long as more attention is given to deduction than to induction, the mind cannot but retain a leaning to metaphysical theories. Under their influence the student will soon reduce his primitive theology to 'deism' of a more or less distinct kind and this during his **physicochemical studies** will most likely degenerate into a **species of 'atheism'**; which last phase, under the enlightening influence of biological and still more of sociological knowledge, will be finally replaced by 'positivism'. Thus, at the time fixed for the ultimate study of moral science, each new member of humanity will have been strongly impressed by personal experience, with a sense of historical filiation, and will be enabled to sympathize with his ancestors and contemporaries, while devoting his practical energies to the good of his successors."
>
> — Auguste Comte (1848), *A General View of Positivism* [1]

See also

â— Atheism terminology
â— Atheism types

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θΔics

In hmolscience, **physicochemical economics** is economics based on physicochemical principles; an early 20th century upgrade, so to say, form the 19th century models of economics based on rational mechanics, of the Walrus-Pareto Lausanne school variety, primarily.

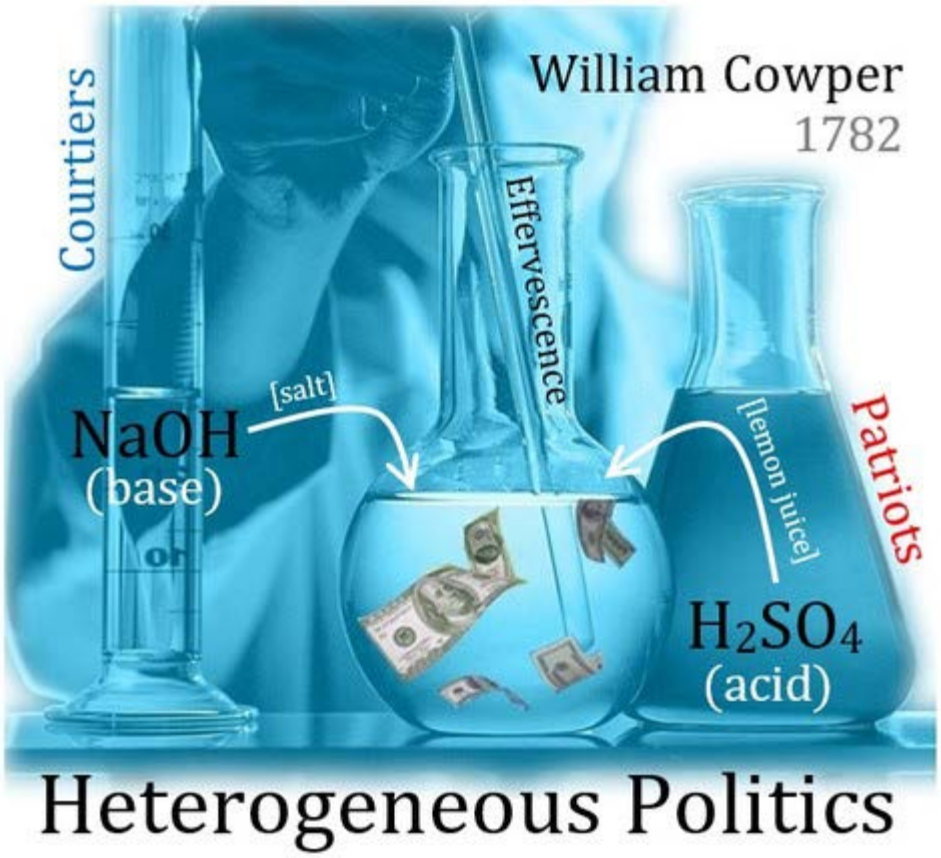

An artistic rendition of the so-called "Cowper model", i.e. the 1732 view of William Cowper that courtiers and patriots mix like acids and bases in their heterogeneous political economics; depicted above (Ñº) via a mixing of sodium hydroxide (NaOH), the base (or salt) and sulfuric acid (H2SO4), the acid; original image from a 2013 discussion (Ñº) about why **economics** currently isn't as elegant as the physical sciences.

Overview

In 1782, William Cowper, in his "On Friendship", poetically suggested, as depicted adjacent, that courtiers and patriots, aka republicans and democrats, in modern terms, mix, in their heterogeneous politics, and supposedly economics mediated thereby, like salts and acid (lemon juice), or acids and bases in modern terms. [1]

In 1934, Edwin Wilson, protege of chemical thermodynamics founder Willard Gibbs, discussed, with Harvard economics chairman Harold Burbank, the possibility of teaching a physical chemistry based "mathematical economics" course, based on thermodynamics and steam engine operation principles. [2] Over the next three years, 1935-38, Wilson was one of the guest lecturers in Henderson's Gibbs-Pareto based Sociology 23 course. Sometime therein, Wilson taught this course, which was taken by Paul Samuelson, at Harvard; the following is Wilson's 1938 communicate to Burbank on this course:

> "Schumpeter has suggested that it would be particularly well for me to give as I gave last time a general theory of [economic] equilibrium such as this is understood by physical chemists including the phase [see: social phase] systems of Willard Gibbs. Most of our equilibrium theory in economics really has for its background the notions of equilibrium which arise in mechanics. Although Pareto was certainly quite familiar with the types of equilibrium which arise in physical chemistry and are necessary in fact for the study of the steam engine he doesn't use this line of thought in economics."

In 1938, Wilson suggested the following to his student Paul Samuelson, in commentary on one of Samuelson's papers:

> "Moreover, general as the treatment is I think that there is the possibility that it is not so general in some respects as Willard Gibbs would have desired. [In] discussing equilibrium and displacements from one position of equilibrium to another position [Gibbs] laid great stress on the fact that one had to remain within the limits of stability. Now if one wishes to postulate the derivatives including the second derivatives in an absolutely definite quadratic form one doesn't need to talk about the limits of stability because the definiteness of the quadratic form means that one has stability. I wonder whether you can't make it clearer or can't come nearer following the general line of ideas [that] Gibbs has given in his *Equilibrium of Heterogeneous Substances*, equation 133."

The very impressive mention of "equation 133", from Gibbs' subsection "Internal Stability of Homogeneous Fluids as indicated by Fundamental Equations", is the following:

$$U - TS + PV - M_1m_1 - M_2m_2... - M_nm_n$$

Wilson, in other words, is suggesting, as it seems to be, to Samuelson that he use the Gibbs fundamental equation to formulate a theory of physicochemical economic stability.
Samuelson absorbed some of this physico-chemical based economics logic, which he used, somewhat in his 1947 *Foundations of Economic Analysis*; the physicochemical implications of which he comments on more explicitly in his 1970 Nobel Prize speech.

Going into the latter half of the 20th century, little has been done, beyond the above outlined subject matter; the field seems to have split into the smattering of human free energy theory thinkers, who may digress on economic matters, and the newer 1990s "Stanley-style" econophysics group, i.e. physicists who focus effort on kinetic energy models of "money" (people themselves not ever treated as related subject matter) and or physicists who attempt to apply physics equations randomly to stock market prices and financial trends (see: financial physics); the latter version of which being basically a conceptually foundationless endeavor.

Quotes

The following are related quotes:

> "The servants of quantitative economic analysis, especially the mathematical economists, have bent their efforts to defending that sector of their theoretical citadel where the opposite camp has always concentrated its attack; for the suggestion that human actions can be analyzed into laws of mathematical rigidity had been decried long before **economics** came out with a mathematical theory of utility. On the other hand, even the fiercest enemies of mathematical economics have never challenged the use of the mathematical tool for studying production: after all, production being a **physicochemical** process must run according to the rigid laws of nature. And from what one can infer, economists too have concurred in that production theory, for one, cannot possibly upset the apple cart of mathematical economics."
>
> — Nicholas Georgescu-Roegen (1965), "Process in Farming Versus Process in Manufacturing" [3]

See also

â— Physicochemical humanities
â— Physicochemical sociology

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θΔics

In hmolscience, **physicochemical humanities**, a near-synonym of: physical humanities, physical sociology, and or physicochemical sociology, is the study of the humanities through the lens of the physicochemical methods, namely: physical chemistry, chemical thermodynamics, and statistical mechanics to some extent.

Goethe | 1809

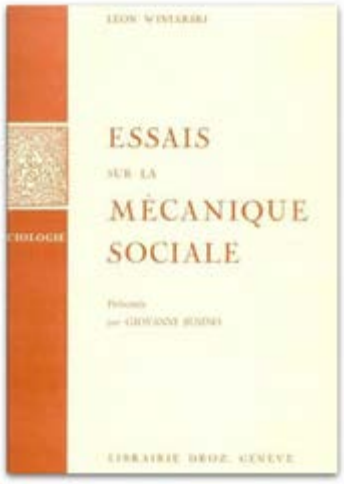

Winiarski | 1898

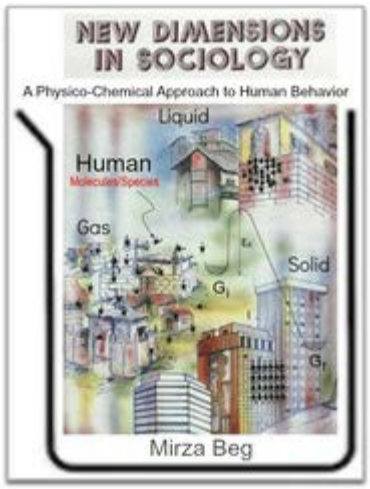

Beg | 1987

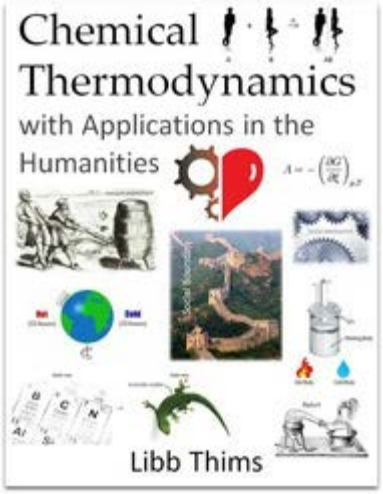

Thims | 2015

A representative selection of physicochemical sociology turning "**physicochemical humanities**" centric books, all employing the methodology of using the principles of the physicochemical sciences as a basis to understand and interpret social phenomena.

> "The social system thus defined and characterized is clearly an instrument that may be employed, within limits, similar to those explained [by Gibbs] for the **physico-chemical** system, in studying all the subjects of the first class (history, literature, economics, sociology, law, politics, theology, education, etc.). For like history, literature, law, and theology, all these subjects are conversant with the interactions of individuals in their manifold relations, with their sentiments and interests, with their sayings and doings, while none can dispense with considerations of the mutual dependence of many factors."
>
> — Lawrence Henderson (1935), *Pareto's General Sociology: a Physiologist's Interpretation* [7]

(add discussion)

Sestak | Prediction

In 2005, Czech chemical engineer, solid state physicist, and materials scientist Jaroslav Sestak, in his chapter "Thermodynamics, Econophysics, Ecosystems, and Societal Behavior", predicted that the physicochemical approach to the explication of human behavior socially, in the form an established science, like thermodynamics, could take upwards of another century to complete: [13]

> "Researching the analogy of physical chemistry to sociological studies of human societies is a very attractive area particularly assuming the role of thermodynamic links, which can be functional until the relation between inherent particles and independent people, is overcome by the conscious actions of humans because people are not so easily classifiable as are mere chemicals. Such feedback between the human intimate micro-world to the societal macro-state can change the traditional form of thermodynamic functions, which, nevertheless, are here considered only in a preparatory stage of feelings. Therefore this sociology-like contribution can be classified as a very first though rather simplified approach to the problem whose more adequate solution will not, hopefully, take another century [2105] as was the development of the understanding of heat and the development of the concept of the early elements."

Sestak argues that the main delay behind the "physico-chemical" approach to the sociological studies of human societies, as he defines the subject, wherein he defines "people as unvarying thermodynamic particles without accounting for their own human-self-determination", will be owing to the confusion surround the macro (thermodynamics) to micro (self-movement conceptualization) perceptual confusions. Similarly, in *circa* 2005,

American electrochemical engineer Libb Thims, while drafting his *Human Chemistry* textbook, envisioned the subject as still being in the processing and or acceptance stage at the turn of the next millennium [3000].

Adams

In 1863, up to 1910, American historian Henry Adams promulgated, in letters and publications, the embodiment of the term "physicochemical humanities", or the humanities defined according to physical chemistry and or chemical thermodynamics; a few key statements of which are listed below:

> "Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday within this law. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."
>
> — Henry Adams (1863), "Letter to Charles Gaskell" (Oct) [1]

> "Social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life."
>
> — Henry Adams (1885), "Letter to Clover Adams" (Apr 12) [2]

> "On the physico-chemical law of development and dynamics, our society has reached what is called the critical point where it is near a new phase or equilibrium."
>
> — Henry Adams (1908), "Letter to Charles Gaskell" (Sep 27) [3]

> "The solution of mind is certainly in the magnet."
>
> — Henry Adams (1908), "Letter to Gaskell (or Cameron (check))" (Sep)

> "I have run my head hard up against a form of mathematics that grinds my brains out. I flounder like a sculpin in the mud. It is called the 'law of phases', and was invented at Yale [by Gibbs]. No one shall persuade me that I am not a phase."
>
> — Henry Adams (1908), "Letter to Elizabeth Cameron"

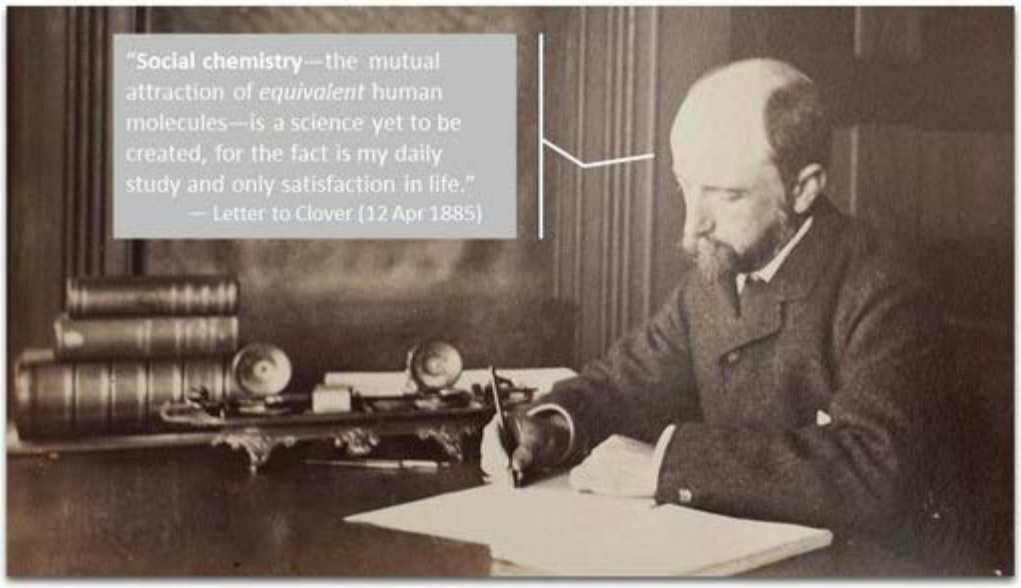

American historian Henry Adams spent some five decades (1863-1910) self-educating himself about how to go about reformulating the study of the humanities, the rise and falls of civilizations and history in particular, in terms of pure physics and chemistry, people defined explicitly as either "molecules" (see: human molecule) or "phases" (see: human phase or social phase),

(Sep 29) [4]

depending, a subject he defined as "physico-chemical social dynamics" (aka **physicochemical humanities**), even going so far as to recruit one of Willard Gibbs' graduate students, namely Henry Bumstead, to read and review his drafts on the phase rule applied to history.

> "I'm looking for a 'young and innocent physico-chemist who wants to earn a few dollars by teaching an idiot what is the first element of theory and expression in physics.'"
>
> — Henry Adams (1908), "Note to John Jameson" (Dec) [3]

> "My essay 'The Rule of Phase [Applied to History]' is a 'mere intellectual plaything, like a puzzle' [to Brooks]. I am interested in getting it into the hands of a 'scientific, physico-chemical proofreader' and I am willing to pay 'liberally for the job' [to Jameson]."
>
> — Henry Adams (1909), Notes to Brooks Adams and John Jameson [3]

> "I have been studying science for ten years past, with keen interest, noting down my phrases of mind each year; and every new scientific method I try, shortens my view of the future. The last—thermodynamics—fetches me out on sea-level within ten years. I'm sorry Lord Kelvin is dead. I would travel a few thousand-million miles to discuss with him the thermodynamics of socialistic society. His law is awful in its rigidity and intensity of result."
>
> — Henry Adams (1909), "Letter to Charles Gaskell" (May 2) [5]

(add discussion)

Kroeber | Zucker

In 1915, American cultural anthropologist Alfred Kroeber, in his "Eighteen Professions" article, attempted to argue in favor of the logic of Aristotle, over that of the logic of modern physico-chemical sciences, with the following statement: [9]

> "There are no laws in history similar to the laws of **physico-chemical** science. The causality of history is teleological."

On this backwards thinking point of view, American physical historian Morris Zucker had the following to say: [10]

> "This mumbo-jumbo of medieval phraseology connecting **causality** with purpose in history is another evidence of that professorial phenomenon, while the body moves and breaths in the twentieth century, while the mind is five hundred years behind its time."

(add discussion)

Guillaume brothers

In 1932, Swiss-French economist Georges Guillaume and his brother physicist Edouard Guillaume, published a Percy Bridgman based *On the Fundamentals of Economy*, wherein the attempt to dissect the concept of "value" thermodynamically, i.e. according to conservation laws; the following is a representative objective statement:

> "It is curious that in **political economy**, we have not yet succeeded in establishing very general laws,

analogous to the fundamental principles of the **physico-chemical sciences**."

Their assertions about free energy were commented on by non other than John Neumann, who surmised that free energy of the estate of an economical subject should be "cash value".

Henderson | Sociology 23

In 1930s, American physical chemist, biochemist, and physiologist Lawrence Henderson (SN:6), who built on the work of Vilfredo Pareto (SN:3), to tackle the following monumental project, namely to upgrade Pareto's socioeconomic theories via the modern physicochemical language of Willard Gibbs.

HARVARD UNIVERSITY Department of Physico-Chemical Sociology

In 1935 to 1938, American physical chemist Lawrence Henderson taught a **physico-chemical humanities** like course called "Sociology 23" at Harvard University, based on a synthesis of Willard Gibbs and Vilfredo Pareto, together employed as a universal framework to describe and explain social phenomena.

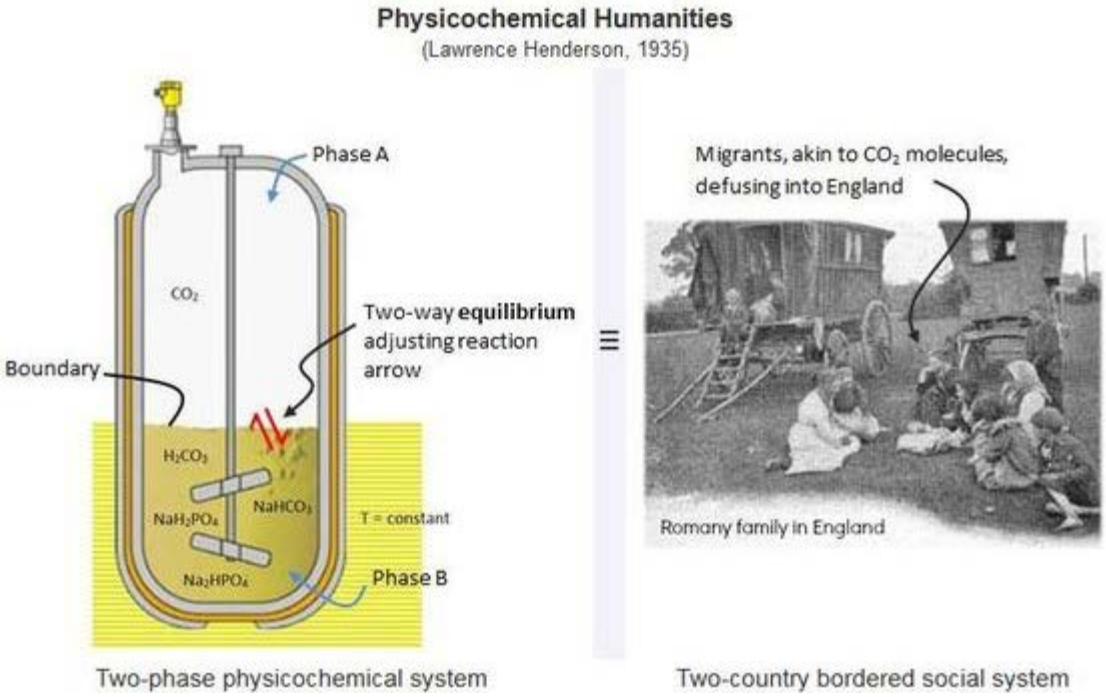

Shown adjacent (left) is Henderson's 1935 isolated five component liquid and gas phase **physico-chemical** system example model, wherein he shows how equilibrium of the system, according to Le Chatelier's principle (and Gibbs methods), shifts when carbon dioxide CO_2 is added, and goes on to assert that these reactive shifting equilibrium models apply universally to the social sciences (**humanities**), namely to the movements within and across connective semi-permeable boundaried (migrative) social systems. [7]

Shown adjacent (right) is a Romany nomadic family immigrating into England, photo from *Our waifs and Strays* (1902) (Ñº), who, according to Henderson, are akin to the CO2 molecules, pushed into England from the over pressurized (populated) Romania when the concentration increases. Note: dsimilar chemical-to-social equilibrium adjusting examples are found in the works of: Julius Davidson (1916), Frederick Rossini (1971), Christopher Hirata (2000), and Thomas Wallace (2009).

Henderson outlined his views as follows:

> "Another characteristic of many ideal systems that is, in general, indispensable in order that conditions shall be determinate is the establishment and use of some definition of equilibrium or some criterion of equilibrium, whether in the case of statical equilibrium or in the case of dynamical equilibrium. This criterion is often of such a character that some function like entropy or energy assumes a maximum or a minimum value or, as in the case of the derivatives or variations of such functions, vanishes.
>
> In the case of Pareto's social system the definition of equilibrium takes a form that closely resembles the

theorem of Le Chatelier in physical chemistry, which expresses a property of physico-chemical equilibrium, and which may be deduced from the work of Gibbs."

On this platform Henderson went on to run the influential Harvard Pareto circle, wherein through seminars, publications, and courses, e.g. Sociology 23, he taught a physical chemistry based humanities course.

Stewart | Princeton social physics

In 1939, and going into the 1950s, American physicist John Q. Stewart enacted the so-called Princeton Department of Social Physics, wherein, via interaction with sociologists and physicists at Princeton, and some 40+ members of his 1953 AAAS "Committee for Social Physics" he worked out the basics of the study of people as "chemical moles" or "number of people" via thermodynamic analysis of "working systems" models of social systems and societies.

A depiction of John Q. Stewart's 1950s Princeton social physics department.

Beg

In 1974, Pakistani organometallic chemist Mirza Beg was nominated to attend a business administration course, wherein he found the speakers using physical chemistry terms such as: polarization, activation, potential energy, complexes, compounds, which prompted him, out of curiosity, to ask the presenters if they were aware of the real sense of the terminologies which have actually been borrowed from chemistry or material sciences. Beg comments on these queries:

> "As expected, they had no clue to them and this prompted me to write a few notes, related physico-chemical terminologies to those of human behavior."

This resulted in one booklet: *Human Behaviour in Scientific Terminology* (1976), several journal articles: "Human Behaviour in Scientific Terminology" (1979), "Human Behaviour in Scientific Terminology: Assimilation" (1980), "Human Behaviour in Scientific Terminology: Affinity, Free Energy Changes, Equilibria, and Human Behaviour" (1981), "Physico-Chemical Processes and Human Behaviour Part—IV: Muslim Society, its Formation & Decline" (1983), and one magnum opus book: *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (1987). The following are a few representative quotes:

> "Physicochemical laws can be extended to a variety of human relations and interactions."
>
> — Mirza Beg (1987), *New Dimensions in Sociology* (pg. 22)

> "Affinities and fugacities characterize the behavior of individuals in a society."
>
> — Mirza Beg (1987), *New Dimensions in Sociology* (pg. 95)

In 2014, American electrochemical engineer Libb Thims discovered the, heretofore hidden, work of Beg, after he began to upload papers to Academia.edu, and soon thereafter entered into public dialogue with Beg and his physicochemical sociology theory (see: Beg-Thims dialogue).

Beg's main difficult on theory is that he situates the "will of Allah" behind Gibbs energy. This, implicit difficult, was one of the goads behind the launching of explicit atheism YouTube channel Atheism Reviews in aims to grapple with

this embedded problem, that seems to pervade the upper echelons of the global scientific community, even those in America, 95 percent of which claiming atheism in belief state.

Scott

In 1985, American physical organic chemist George Scott published his *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will*, wherein, in respect to terminology, he outlined the subject or future science of people governed by physicochemical law: [6]

> "To a materialist no thing is real but atoms in a void and we are but molecular people controlled by the actions of natural **physicochemical** law."
>
> — George Scott (1985), end poem: "Molecular People" dedicated to Lucretius

Scott conceptualized this new science as the seven main subjects of the humanities (sociology, economics, history, etc.) centered around physical chemistry, or something to this effect:

> "Since my name is not Socrates or Einstein and I hold only one of the seven or eight PhD degrees this problem requires, readers are quite justified in questioning my qualifications to testify as such a multidisciplinary expert."
>
> — George Scott (1985), mini-introduction (pg. viii) to *Atoms of the Living Flame*

(add discussion)

Sestak

In 2005, Czech chemical engineer, solid state physicist, and materials scientist Jaroslav Sestak, in his chapter "Thermodynamics, Econophysics, Ecosystems, and Societal Behavior", devoted an entire chapter subsection (§8.4) to what he referred to as the "physico-chemical" approach, wherein people are assumed as unvarying "thermodynamic" particles, without accounting for their own "human" self-determination. [13]

Thims

In 2010 to 2013, American electrochemical engineer Libb Thims began lecturing at various universities (UIC, NIU, UP) in efforts to introduce students to chemical thermodynamics based humanities. In 2013, Thims began probing various university professors, department heads, and presidents with the possibility of implementing and teaching a course in physicochemical humanities, a modern version of what Goethe, Adams, Pareto, Winiarski, Henderson, Wilson, and the other so-called "social Newtons" envisioned and outlined in their respective works, along with the newer ideas of the modern social Newtons, to be taken by undergraduate and possibly graduate students, as required curriculum (see: two cultures inquires).

Other

In 1990s, English-born Canadian physical chemist and theoretical biologist Lionel Harrison began to push for a "physicochemical" approach in the study of form change (see also: metamorphology) in biology (powered chnopsologist), in contrast to Paul Green's "biophysical" view, albeit not directed at the humanities, *per se*, but focused on the application of physical chemistry to embryological development; the terminology reform suggestions of his effort, however, are relevant.

Religion | Physicochemical conflicts

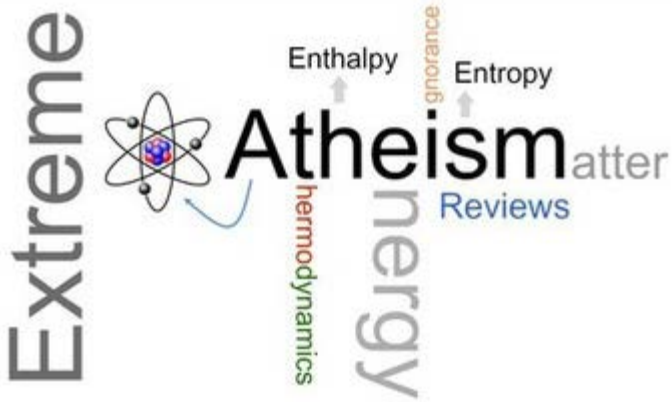

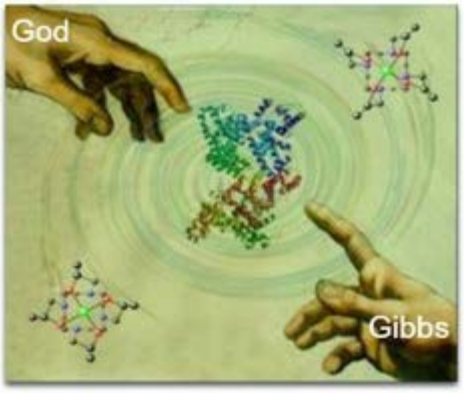

A depiction of the inherent "religious" conflict of the physicochemical approach to the humanities, namely that in the process of Gods energy being usurped by Gibbs energy an entire reconceptual understanding of mechanistic nature of right (natural) and wrong (unnatural) needs to accrue, per the Rossini hypothesis, wherein enthalpy (H) is the measure of "security" in social interactions and entropy (S) is a measure of "freedom" in social interactions.

The physicochemical view of the humanities supersedes and subsequently supplants the older religio-mythology view of the humanities, in a number of decisive areas, e.g. "choice" vs. determinism, and morality, as these ideologies impinge on legislature, jurisprudence, and national policy, etc., as well as personal meaning and sense of purpose, hence conflict is inherent and ripe.

Indian-born Pakistani organometallic chemist Mirza Beg's 1987 book *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, shown adjacent, is one example of conflict, wherein attempts to explain sociology, framed in an overt Islamic theme, in physicochemical terms, is subtly ripe with such religion vs science tension, specifically when it comes to the deeper questions, such as: consumerism, women's rights, gay marriage, what the supposed ideal society, e.g. in regards to wealth distribution, should be, etc. [12]

Russian-born American biologist Nickolas Dorfman's 2008 *Was Mona Lisa Created by Physicochemical Reactions Alone?*, is a second example, wherein the premise that the interaction of molecules and energy alone are "not enough" to explain the various creations, animations, and masterpieces of human civilization, such as Leonardo da Vinci's famous Mona Lisa, and therefore that we must insert "spiritual ideas" into the main stream science (physics and chemistry) to explain the unique nature of the humanities. [11]

Quotes

The following are other related quotes:

> "In treating society as a system, Pareto was doing for sociology what Gibbs had done for physical chemistry, what Bernard had adumbrated for physiology. Pareto's social system was in important respects analogous to Gibbs' **physicochemical** system. As Gibbs considered temperature, pressure, and concentration, so Pareto considered the manifestations of sentiments through words and deeds, verbal elaborations, and economic interests. Now within the confines of a physicochemical system it is quite clear that all the factors involved are in a condition of mutual dependence which defies explanation by means of a cause-and-effect relationship. Change in one variable means change in all others. For example, if a stopper is thrust deeper into a thermos bottle containing ice, soda water, and whiskey—thus increasing the pressure—the concentration in both liquid and gas phases will change, the temperature will change, and the concentration of the solid phase will change. Similarly, the social system does not operate in terms of cause and effect; social conditions, like physicochemical conditions, are the result of simultaneous variations in mutually dependent variables."
>
> — Cynthia Russett (1966), summary of the Pareto-Gibbs-Henderson humanities methodology [8]

> "At first glance it might seem surprising that it is a British scholar [Adler] of German literature who tackles this particular aspect of the 'German genius', Goethe, but unfortunately enough in Germany the division

between the 'Two Cultures' is still considerably deeper than in the English-speaking world. Recently, however, the attempts in interdisciplinary research to **build a bridge** and to indicate the fertile interplay between science and poetry are increasing, even in Germany. Adler's book represents an important step in this direction."

— Karin Figala (1988), book review of Jeremy Adler's *Goethe's Elective Affinities and the Chemistry of its Time* [14]

See also

â— Beg-Thims dialogue
â— Nightingale Chair of Social Physics
â— Two cultures department
â— Two cultures namesakes

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θΔics

In education, **physicochemical humanities (course outline)** is a outline for a proposed "chair" (see: Nightingale Chair of Social Physics), undergraduate course, graduate program in physicochemical humanities (PCH), a general assimilation of all two cultures namesake subjects; a 21st realization, so to say, of John Q. Stewart's once kindled 1950s Princeton Department of Social Physics.

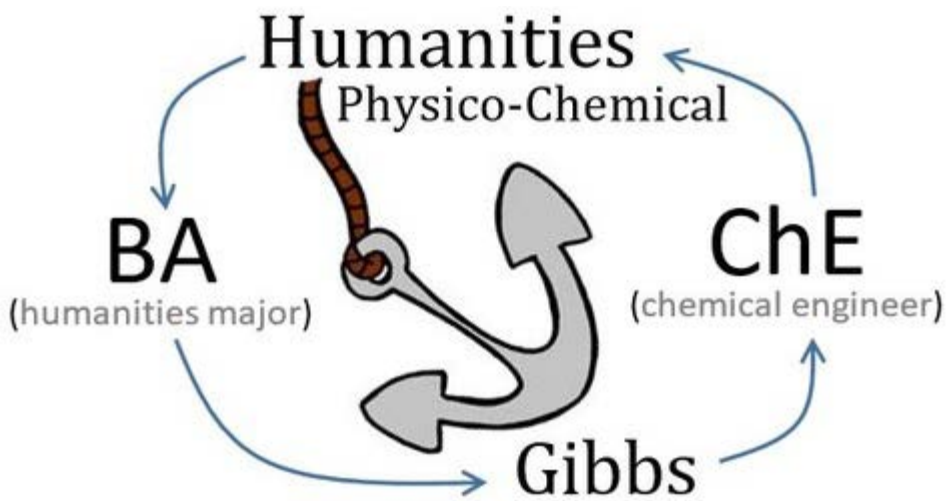

A knowledge flow schematic for a generalized department of **physicochemical humanities**, which takes into account (a) the polymathy degree problem, (b) ChE + H coupling, and (c) the two cultures seed plant planting problem (Winiarski, Henderson, Wilson, and Stewart, etc., all failed, in the long run, to get the multi-generationally primed two cultures department established, i.e. to get the cyclical mechanism running), wherein the top students of the chemical engineering class, in chemical thermodynamics (Gibbs) in particular, teach and work with the top students of the humanities, in the basics of the physicochemical sciences, as applicable to the deeper visceral human questions, in respect to getting an early age 20s "systematic conception of it all" (Adams [1863], age 25), therein creating a two cultures synergy growth cybernetic feedback effect.

Overview | Undergraduate

The following is draft outline the necessary components of a general one-semester course on a physics + chemistry based general humanities course; those shown bolded are actual historically-famous college courses taught: [1]

1. Sociology
    - Physicochemical sociology | Beg (1987)
    - **Sociology 23** | Henderson (1940)
    - **Social mechanics** | Winiarski (1894)
2. Economics
    - **Mathematical economics** | Wilson (1935)
    - Socio-economic thermodynamics | Mimkes (2006)
3. History
    - History of materialism | Lange (1865)
    - Physico-chemical social dynamics | Adams (1910)
    - History of mechanistic, physical, chemical, and thermodynamical sociology | Sorokin (1928)
    - Princeton school of social physics | Stewart (1955)
    - Socio-economic thermodynamics | Wallace (2009)
4. Philosophy
    - Forces & elements philosophy | Empedocles (450BC)
    - Thing philosophy | Lucretius (75BC)

    - Human chemical theory | Goethe (1809)
    - Thermochemical relationship model | Hirata (2000)
5. Politics
    - Molecular political economics | Pareto (1897)
    - Chemical thermodynamics of freedom and security | Rossini (1971)
6. Government

- Newtonian government | Madison (1787)
- Euclidean government | Lincoln (1865)
- Darwinian government | Wilson (1912)
- Universal principles government | Obama (2006)

7. Psychology

- Scientific psychology | Freud (1895)
- Flow theory | Csikszentmihalyi (1990)

8. Literature

- Literary realism | Realistic school (Q)

9. Anthropology

- Cultural evolution energetics | White (1943)

10. Religion | Mythology

- Religio-mythology scholars (120+)
- Atheism | Nietzsche (1888)

- Tensions | Rossini debate (2006)

- Metaphysics | Teilhard (1937)

(add discussion)

Conference | Calls

The following are recent conference calls for a physicochemical humanities (PCH) course:

> "Dobereiner helped in refining Russian platinum, discovered catalysis, and reported his work to Goethe. The latter's novella *Elective Affinities*, a work of art, gave impulse to a **new scientific field** named 'human chemistry' (Thims, 2007). In the exact sciences there are quantitative measures of estimation of each value: mass, length, force, energy. In the humanistic disciplines (history, philosophy, psychology) as well as art there are no quantitative criteria. This is similar to the question of how to measure beauty, love, friendship, democracy? The function named Gibbs energy defines 'love' between substances [and] people ... and is similar to Hamlet's 'to be or not to be?' of William Shakespeare."
>
> — Alec Groysman (2011), 14th Generative Art Conference, Rome [2]

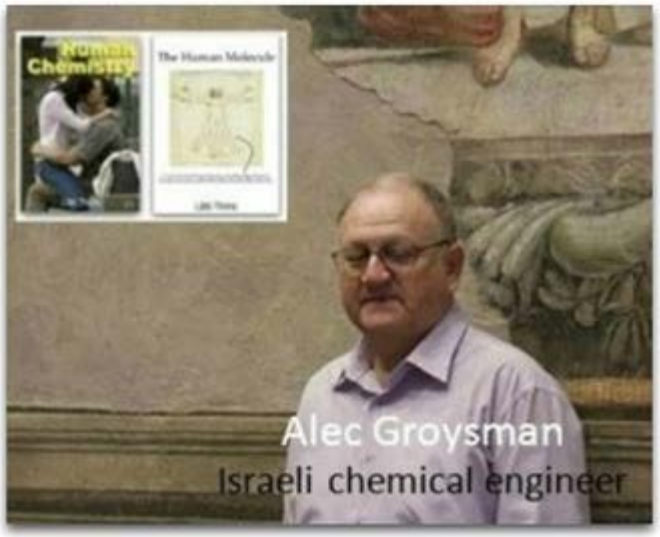

Israeli chemical engineer Alec Groysman at the the 2011 Generative Art Conference, Rome, calling for a chemical engineering based physicochemical humanities (PCH) like course, anchored in Goethe-Thims modeled humanities. [2]

"In contrast, other fields, such as biology, economics, health sciences, among other, have found practical applications of *complexity* in their disciplines. The purpose of this work is to show some possible

applications of complexity, not necessarily in the traditional field of chemical engineering, but where clearly chemical engineers can uniquely contribute due to our formation and basic elements of thermodynamics, and processes analysis, compared to other disciplines, in matters of study that are not the classical chemical engineering applications, but where their application is necessary, even not being chemical processes."

— Jaime Aguilar-Arias (2014), 20th Brazilian Congress of Chemical Engineering, Brazil [3]

Aguilar-Arias, in his presentation, to note, cites, first and foremost, Venezuelan-born English chemical engineer Erich Muller, his famous "Human Societies: a Curious Application of Thermodynamics" (1997), and his human-as-molecules classroom stylized approach to teaching chemical engineering students how chemical thermodynamics applies socially. He then discusses how this new field is fermenting by new emerging journals, such as the *Journal of Human Thermodynamics*, in particular, via articles such as Iranian-born American chemical engineer Mohsen Mohsen-Nia's 2013 "Social Equation of State", which he compares to earlier work by English mechanical engineer John Bryant (2011)

The establishment of such a PCH stylized course, as outlined herein, will be the focus of part of the 2016 BPE 2016 meeting, whereat a number of leading social Newtons, e.g. Jurgen Mimkes (SNE:1), will be present.

Overview | Graduate

The outline for the "graduate program" for physicochemical humanities is a work-in-progress.

In the following representative examples list, of physicochemical humanities like thesises or dissertations, is the MS physics + economics thesis by Puerto Rican child prodigy Luis Arroyo, completed at age 20, sent to Thims in early 2016, by Ram Poudel, that would have been a good match with a physicochemical humanities graduate program, had such existed in America:

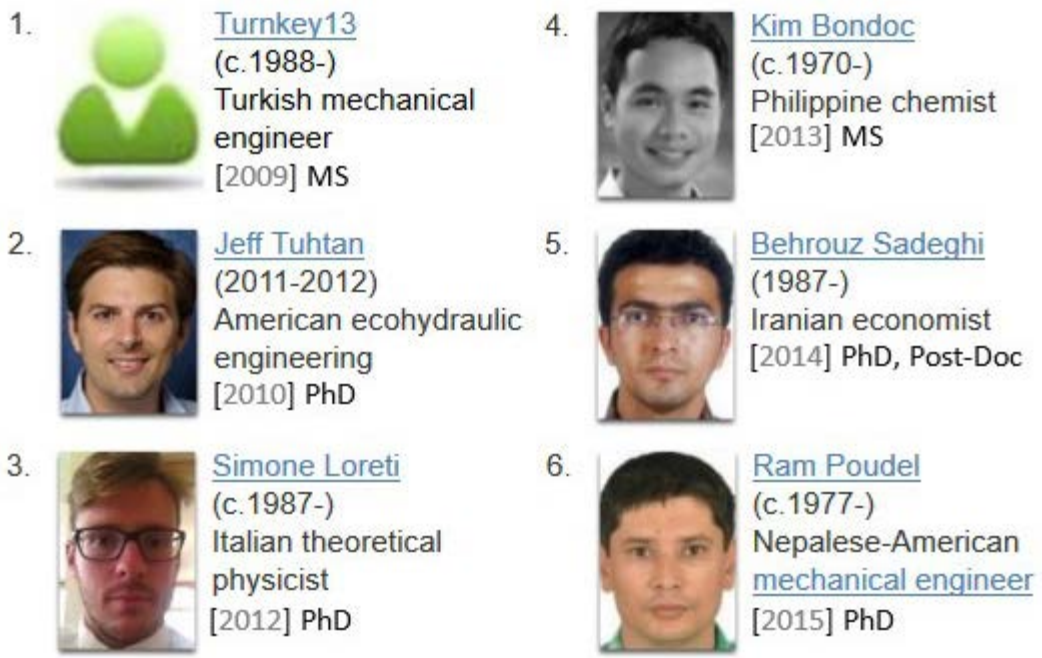

A listing of the graduate students Libb Thims, since 2009, has mentored and or given guidance to in their graduate work (see: Thims students).

- Adler, Jeremy. (1978). "Goethe's use of Chemical Theory in his *Elective Affinities*" (Q), PhD dissertation, advisor: Claus Bock, Westfield College London.

- Arroyo-Colon, Luis B. (2010). "A Thermal Model of the Economy" (abs) (pdf) (79-pgs), Master's Thesis (in physics), University of Puerto Rico, Mayaguez.

What is apparent, from the above list, is the salient fact that perhaps one of the most illuminating PhD dissertations ever produced, namely that of Jeremy Adler, guided by Claus Bock, in respect to physicochemical humanities, was a product of an admixture of the German and science history departments.

Shown adjacent is a listing of the graduate students (see: Thims students) Thims, since 2009, has mentored and or given guidance to in their graduate work, purely as a hobby.

Anchor | Point

A key aspect of such a course, to been keenly aware of, as history has shown, is that a necessary imperative of such a course is that the course be "anchored" into the core department that teaches the laws of nature, the first and second law of thermodynamics, as applied to surface-attached chemically reactive systems, i.e. human social systems, Gibbs-Lewis chemical thermodynamics in particular; the subject of which taught in chemical engineering, primarily, and the physicochemical department secondly, so that the gears of the "polymathy degree problem" keep turning, generationally, or else such efforts will not be fortuitous. This is evidenced by failed attempts of chemical engineer James Coleman going into sociology, physicist Paul Samuelson going into economics, physical chemist Lawrence Henderson going into sociology, physicist John Q. Stewart going into sociology and demographics, among others, WITHOUT founding an actual "established" long-term department, e.g. once Henderson was gone, the famous "Harvard Pareto circle", the educated early 20th century person's alternative to Marxism, ceased to be, once Stewart was gone, the Princeton Department of Social Physics atrophied into but a present historical footnote, once Samuelson was gone, there was no longer anyone to send their entropy economics theories to, and so on. The best students, in other words, i.e. the top of the class of the chemical thermodynamics classes, have to replenish teachers of each physiochemical humanities department, as generations the centuries pass, so that students becoming adults get a "systematic conception of it all" as Henry Adams longed for, or else the tree of knowledge won't grow.

Quotes

The following are related quotes:

> "A society grows great when old men plant trees whose shade they know they shall never sit in."
>
> — Greek proverb (c.300BC) (Q)

> "I've got a MA in chemistry—but your book [*Human Chemistry*]—it really affected me. I've been prompting it in our university [Technion] in the last couple of years—and got great responds from some top researchers—I think you're doing excellent work!"
>
> — Ofer Po (2013), Facebook messaging, Dec 24

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(b) Note: Thims, prior to and or amid starting this page, per 2014 influence the discovery of Mirza Beg and his 1987 physicochemical sociology textbook, had contemplated 'only' starting a physicochemical sociology course anchored in a chemical thermodynamics and or physical chemistry department; then branching from there once established. Thims invite to PBE 2016, on "Regarding Definitions" in the biophysical economics, his sixth university lecture (since 2010), seems to push towards the inescapable realization that a bulk course may be the only way to go, correctly speaking.
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Brazilian Congress of Chemical Engineering (*Congresso Brasilerro de Enenharia Quimica*, XX) (pdf), Florianopolis, Brazil, Oct 19-22.

θΔics

In hmolscience, **physicochemical morality puzzles** refers to seeming puzzlements that tend to arise in the mind when one attempts to carry, scale, or apply standard moral precepts, e.g. killing is wrong, assignment of guiltiness, etc., up or down the great chain of being to the level of the "human = molecule" point of view.

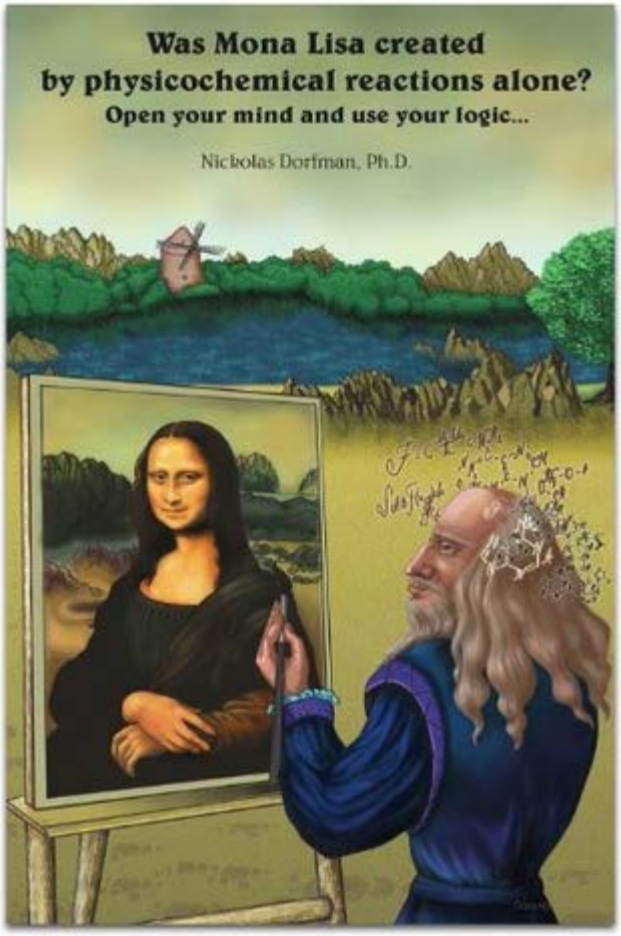

Russian-born American biologist Nickolas Dorfman's 2008 *Was Mona Lisa Created by Physicochemical Reactions Alone?*, attempts to argue that mind and morals cannot come from physicochemical reactions of if inanimate molecules and energy. [6]

Morality

In 1902, Frank Stockbridge, in his article "Creating Life in the Laboratory", gave a summary of the some of the recent parthenogenesis and or laboratory-created life work of those including: Louis Pasteur, Jacques Loeb, and Henry Bastian, in which he famously summarizing the crux of the issue as such: [7]

> "'Life is a chemical reaction; death is the cessation of that reaction; living matter, from the microscopic yeast spore to humanity itself, is merely the result of accidental groupings of otherwise inert matter, and life can actually be created by repeating in the laboratory nature's own methods and processes!' [Loeb/Bastian?] Think for a moment what this declaration signifies. If it be true, where is the theology? If you and I are merely physico-chemical compounds, slightly more complex than a potato, a little less durable than a boulder, what is the basis of our moral code? If man can lump together sand and salt and by pouring water on them create life, what becomes of the soul?"

This ripe statement, which seems to be a mixture of Loeb, Bastian, and Stockbridge, has become a popular quote in scientific circles, e.g. making the pages of: Carl Gaither's *Chemically Speaking* (2001) and English chemical physicist Philip Ball's *Unnatural* (2012). [8]

The following are two other noted early 20th century quotes:

> "If iron sulphate and caustic potash are brought together, the SO_4 ions leave the iron to unite with the potassium. When in nature an adjustment of such differences of potential is about to take place, he who would approve or disapprove of the process form the moral point of view would appear to most to play a ridiculous part."
>
> — Otto Weininger (1903), *Sex and Character*

> "It may sound strange to speak of the **morals** of an atom, or of the way in which a molecule conducts itself. But in the last analysis, science can draw no fundamental distinction between the conduct of an animal, a bullet, or a freshman, although there may be more unknown factors involved in one case than in the other."
>
> — William Patten (1920), AAAS address "The Message of the Biologist" + *The Grand Strategy of Evolution: the Social Philosophy of a Biologist*

In 1948, American author Thomas Dreier's 1948 discussed morality in the context of pure objective chemical reactions, i.e. human chemical reactions, divorce, and marriage: [1]

> "The trouble is that too many people get chemical reactions all mixed up with **morals**. They call immoral what is only a normal chemical reaction."

In justifying this statement, Dreier states that chlorine can react with sodium to make the moral product table salt; whereas, conversely, chlorine (sulfur dichloride) can react with ethylene to make immoral mustard gas, as was used in WWI by the Germans against the British. Dreier argues that human beings can react and combine according to the same basic laws, making moral and immoral combinations of marriages.

My atoms made me do it?

See main: My atoms made me do it

In hmolscience, when one is introduced to the premise of a human conceptualized as a molecule, one of the first questions that seems to arise in the mind is where to place the wrongfulness, source, and or the "guiltiness" of a given crime, if indeed a person is but an atomic geometry. The following are example "my atoms made me do" like puzzlement queries:

> "The flaws of reductionist explanations in an interpersonal context are the same as those of religious explanations. Saying, **'My atoms made me do it,'** is an attempt to evade responsibility, doesn't explain why what happened happened specifically as it did (although there is an…"
>
> — George Kelling (1975), *Language: Mirror, Tool, and Weapon* [5]

> "You know, I've been thinking about what you said about me being a molecule and I want to ask you a question. Suppose I kill someone, does that mean I can tell the judge **my atoms made me do it?**"
>
> — Rodolfo Flores (2013), In person query to Libb Thims, Oct 10.

> "So if a man rapes your 5-yr old daughter he can say that it was carbon or actually phosphorus that made them do it?"
>
> — dadorf10 (2013), forum comment to Libb Thims on "Feynman on Purpose" (Ñº) video, Sep

> "Quite frankly, Dahmer's defense team blew it. Why didn't Dahmer's lawyers tell him to say: **'My atoms made me do it!'** This may sound absurd, but it is consistent with what evolution teaches."
>
> — Dan Greenup (2014), *Generation Why?* [4]

The case of Lina Medina, who gave birth at age five, comes to mind here. [3] American philosopher Katherin Rogers, philosophy 301 class, section the pre-Socratics, lists the following as one of the possible problems with atomism (atomic theory applied to the deeper human questions) and or naturalism: (Ñº)

> "**My atoms made me do it** … so I'm not the sort of thing that can be subject to praise and blame."

These, to some extent, to note are but variants of the slave stealing parable of Zeno of Citium. In modern terms, however, the parable is upgraded to the effect of where to situate the blame, e.g. in the internal force, external force, the molecule in question, the free energy change of the system, etc., all generally themed on tendency towards system stability, and the naturalness and or unnaturalness of the reaction process. This atoms made me do it, supposedly, is one of the five historical forms of determinism: (Ñº)

- Religious (god made me do it)
- Psychological (my environment or upbringing made me do it)
- Biological (my genes made me do it)
- Economic (the state made me do it)
- Physical (my atoms made me do it)

(add discussion)

Killing spree paradox

See main: Killing spree paradox

In hmolscience, when one is introduced to the premise of a human conceptualized as a molecule, governed by physicochemical principles, commonly one of the first queries to come to mind, for many, concerns the seeming universe without morals issue, typified by the query: "what's stopping me from going on a killing spree", or something along these lines, if there is no God and or the universe is moral-less.

A semblance of this premise was stated by Fyodor Dostoyevsky, in his *The Brothers Karamazov* (1880), via the character Ivan Karamazov, who asserts: "If god does not exist, everything is permissible."

The following, along these lines, are typically killing spree puzzlement queries:

A cartoon rendition of the so-called "killing spree paradox", often put to atheists, by believers, who raise the question about the basis of atheistic morality.

> "The morality Libb would propose, is never explicitly proposed. Rather, Libb, each time after he says 'life does not exist', goes on to claim that this should have something to do with morality. To me the most obvious moral principle that would follow from 'life does not exist' is that 'it really doesn't matter whether we would kill somebody', since life does not exist. Clearly, such reasoning is highly *immoral* and I hope that Libb does not propose this?" (pg. 97) .... Can Libb be a serial killer if it doesn't really matter since: one, life does not exist, so you cannot remove it, and two if the negativeness of dG tells me that killing many people is ok, then I must do so." (pg. 104)
>
> — David Bossens (2013), *Debates of the Hmolpedians* [2]

> "What's stopping me, if I am just a molecule, and morality or the judgment of god does not exist, from going on a killing spree?"
>
> — Rodolfo Flores (2013), In Person Query to Libb Thims, Oct 10

(add discussion)

See also

â— Moral symbols

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In

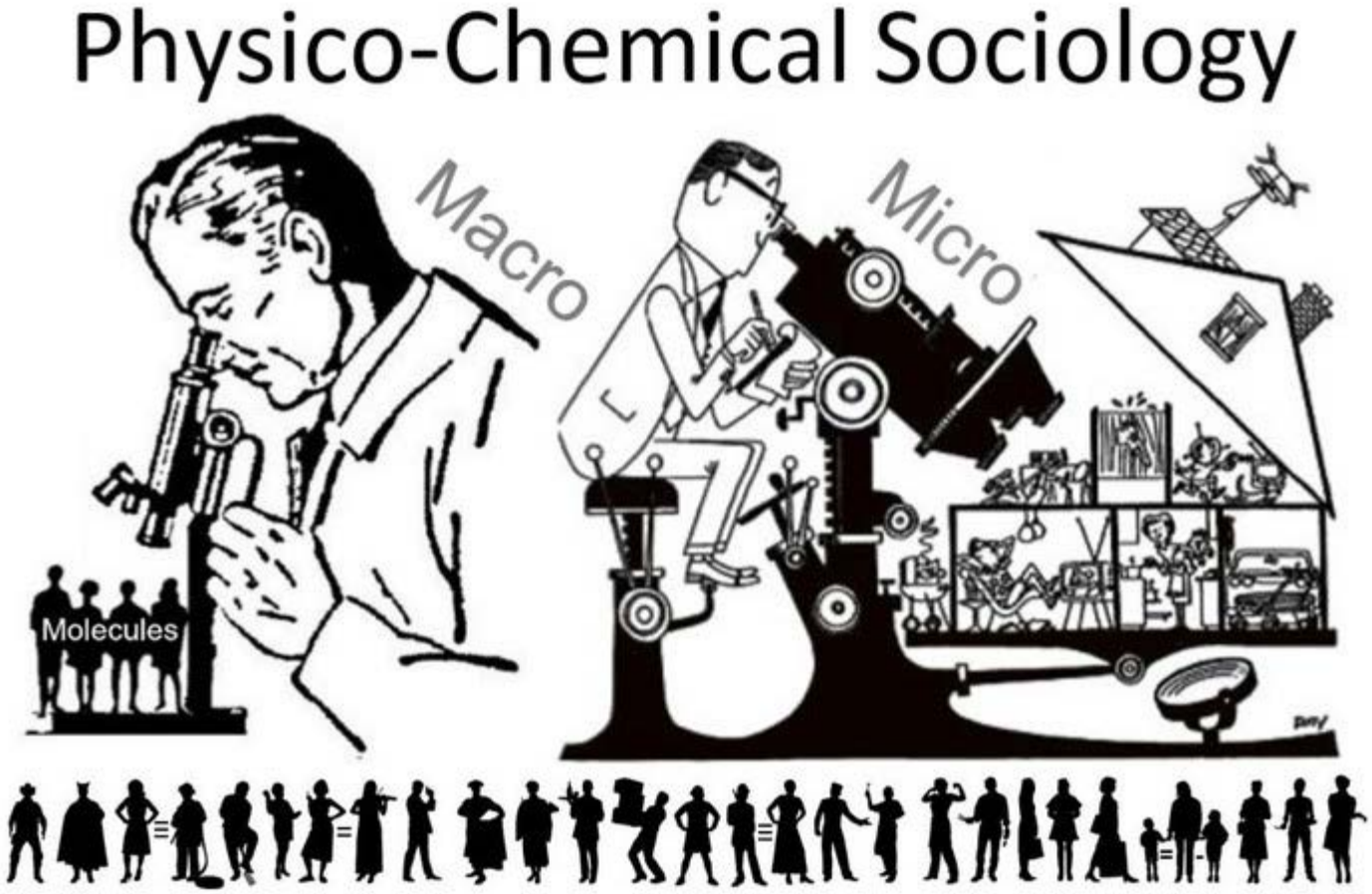

A basic **physicochemical sociology** diagram showing, on the left (macro-view): a physiochemical sociologist studying social mass, defined as an aggregate of human molecules, each defined as powered CHNOPS+22 molecule or chemical, via the advanced perspective, using, predominately, the universal methods of chemical thermodynamics, of semi-open isothermal isobaric systems, freely reacting, i.e. freely running (Lewis, 1923), and on the right (micro-view): the nature of individual interactions, relationship bonds, family dynamics, sexual interactions, psychological phenomena, etc., from the mechanism view, according to physics and chemistry. See: Alfred Lotka for how micro-mechanics relates to macro-mechanics.

hmolscience, **physicochemical sociology**, coined in 1943 by Pitirim Sorokin, or socio-physical chemistry, a subset of physicochemical humanities focused on sociology, is the study of social relations, reactions, processes, and phenomena via the physicochemical methods and principles of physical chemistry.

Prodigies | Need

Among IQ:200+ cited child prodigies, namely: Goethe, Sidis, Hirata, and Arroyo, a commonality found is for such intellects to gravitate / electromagnetate towards the use of thermodynamics to explain the humanities. Goethe, the child prodigy who went onto found human chemistry (1809) and to become the first person ever cited with an IQ of 225 (Cox, 1926) being the prime example. William Sidis (1898-1944), with an IQ citation of 250-300 at circa age 14, and Christopher Hirata (1982-), with an IQ citation of 225 cited (age 16), who each, with similar background in math and physics, applied thermodynamics to the deeper questions of the humanities as teenagers, Sidis at age 16 and Hirata at age 18. In 2010, Luis Arroyo (1990-), cited with an IQ of 200 (Ñº) at age 15, completed his MS degree in physics-based economics via thermodynamics. The subject of physiochemical sociology and or physicochemical humanities in general (e.g. physicochemical economics, aka mathematical economics) would seem to cater to these types of growing intellectual needs. Presently, however, such a graduate school is lacking in America, if not globally, give or take a few patch examples (e.g. Mimkes in Germany).

Overview

In 1809, Goethe ferreted out the beginning principles of society and social phenomena explained via the physicochemical principles; he used Bergman-principles in particular; Bergman being the forerunner to modern Gibbs-Lewis based physical chemistry.

In 1863 to 1910, Henry Adams worked to ferret out a subject that he seemed to indirectly refer to, in its end Willard Gibbs based result, as "physico-chemical social dynamics theory", as he seems to have referred to his theory in the 27 Sep 1908 letter to Charles Gaskell:

> "On the **physico-chemical** law of development and **dynamics**, our **society** has reached what is called the critical point where it is near a new phase or equilibrium."

the result of which being that Adams had convinced himself that he was a social phase or Gibbs energy equilibrium state of being.

In the 1890s, French sociologist Emile Durkheim outlined a type of social theory using "physico-chemical" terminology and theory. (Ñº)

In 1893, Gabriel Tarde outlined a semblance of ideas of physics, chemistry, and sociology, particularly with respect to war and chemical affinities.

In 1914, German-born American electrochemical engineer Eugene Roeber, in the wake of WWI (28 Jul 1914 – 11 Nov 1918), published his "The European War", shown below, wherein he outlined some basic principles of human chemical thermodynamics, e.g. stated that WWI was a gigantic chemical reaction [see: human chemical reaction theory], governed by the second law, wherein people's free will becomes like that of the will of "free" ions of dissociation theory; that entropy will increase as the war goes; that the end result will be a new Europe closer to absolute zero of temperature.

In the 1930s, American physical chemist Lawrence Henderson ran the famous Willard Gibbs + Vilfredo Pareto based Harvard Pareto circle, one of the precipitates being "Sociology 23" a physicochemical based sociology course taught at Harvard.

> "The social system thus defined and characterized is clearly an instrument that may be employed, within limits, similar to those explained [by Gibbs] for the **physico-chemical** system, in studying all the subjects of the first class (history, literature, economics, **sociology**, law, politics, theology, education, etc.). For like history, literature, law, and theology, all these subjects are conversant with the interactions of individuals in their manifold relations, with their sentiments and interests, with their sayings and doings, while none can dispense with considerations of the mutual dependence of many factors."
>
> — Lawrence Henderson (1935), *Pareto's General Sociology: a Physiologist's Interpretation*

Henderson's version of physico-chemical system conceptualized sociology would go onto influence a number of thinkers in the decades to follow, such as: Pitirim Sorokin (below), Walter Cannon, and Talcott Parsons, to name a few. (Ñº) This Gibbs-Pareto analysis view of society, to note, is equivalent to the recently-named "thermodynamic lens" view of society (2014), in respect to leadership roles and employee bonding, outlined by chemical engineer Marc Donohue and psychologist Richard Kilburg, depicted below: [13]

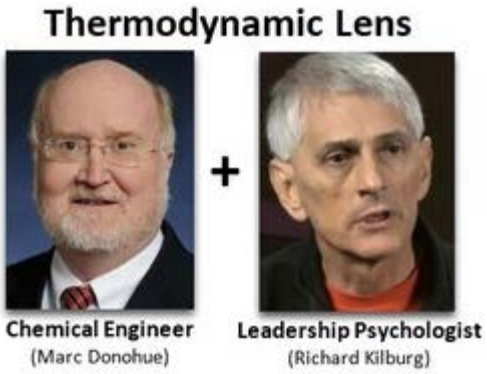

The 2014 interaction of chemical engineer Marc Donohue and leadership psychologist Richard Kilburg, as presented in their "Leadership and Organizational Behavior: a Thermodynamic

Approach", involving some 12 total authors in various fields, allowed the latter, the psychologist, to formulate theories on leadership and group formation dynamics via the eyes of the former, i.e. a "thermodynamic lens", as American business leadership scholar Bruce Avolio (Ñº) refers to their approach, thus bring about a soft science + hard science amalgamation; which is a generalized model of **physicochemical sociology**, applied. [13]

In 1943, ironically, the term "physicochemical sociology" was coined by Russian-born American sociologist Pitirim Sorokin, in his opening chapter "Declaration of Independence of Sociology and the Social Sciences from the Natural Sciences", of his *Sociocultural Causality, Space, Time*, in an anti-reductionism (or anti-positivism) stance vehement objection to the physicochemical-based sociology views being promulgated via Henderson and the general "mechanistic school" of the turn of the early 20th century:

CHAPTER I

DECLARATION OF INDEPENDENCE OF SOCIOLOGY AND THE SOCIAL SCIENCES FROM THE NATURAL SCIENCES

Page 3

4 SOCIOCULTURAL CAUSALITY, SPACE, TIME

science would be needed; for "physicochemical sociology" would be merely another way of designating the physicochemical sciences. No basis exists for a duplication of the same science under two different names. Hence the utter futility of any sociology or social science under these conditions. Thus the claims in question, if realizable, would lead, not to the creation of "a natural-science sociology" but to the disap-

Page 4

Sorokin, here, declares that "sociology" and the "social sciences" should forever remain "independent" from the natural sciences (physics and chemistry). The subject of "physicochemical sociology", here, then, would seem to have entered the "violent opposition" phase of the Schopenhauer three stage self-evident truth acceptance model:

> "All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is

accepted as being self-evident."

— Arthur Schopenhauer (1818), *The World as Will and Representation* (preface)

The "ridicule phase", to note, seemingly started when Christoph Wieland, in 1809, called Goethe's human chemical theory "childish nonsense and fooling around". The actual verbal confrontations occurring during the 1930s Harvard Pareto circle wherein Henderson and Sorokin were said to have been butting heads during nearly every meeting. [1] Sorokin's vehement objections, here, to note, were of a "covert theological" nature, as his later 1954 writings on "love energy" would indicated, wherein he anchors his ideology in the red-flag word "creative", e.g. creative power, creative heroes, creative love, etc., indicative of his "god-through-energy" or "god-through-power" reformulation of Christianity, a pitfall common to many ontic opening theorists; Sorokin, in short, opposes the idea of "physicochemical sociology" because it conflicts with his ingrained deeply-rooted beliefs about: life, free will, soul, morality, meaning, purpose, and afterlife—which of course is the can of worms that the physicochemical-approach opens.

In 1971, American chemical engineer turned sociologist James Coleman, in his "Theoretical Bases for Parameters of Stochastic Processes", discussed the 1961 social "attitude" free energy theory of John Tukey.

In the 1970s, American sociologist Ed Stephan, together with physicist Louis Barrett and chemist George Gerhold, at Western Washington University, coordinated in joint interaction, up until circa 1995, culminating in the publication of Stephan's online manuscript *The Division of Territories in Society*, with its famous "Stephan social system" model:

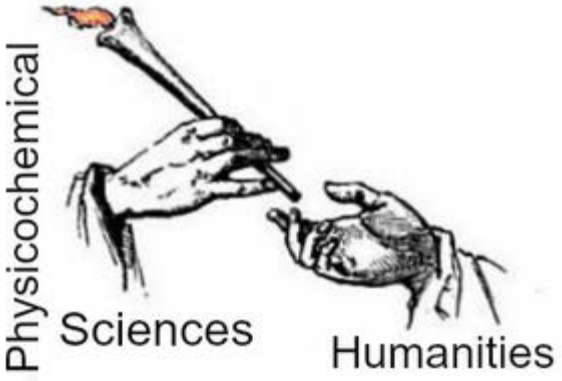

Left: a depiction of the historical Western Washington University "**physicochemical sociology**" group, comprised of leader sociologist Ed Stephan working in coordination with physicist Louis Barrett and chemist George Gerhold, in efforts to formulate sociology in terms of physical and chemical fundamentals; one precipitate of which being the "Stephan social system" (left), one of the first visual models of a society (or social system) to employ social chemical potential theory. Right: A depiction of **physicochemical sociology**, namely: the "torch of knowledge" being passed to from the physicochemical sciences (physics, chemistry, thermodynamics, natural science) to the humanities, first and foremost the social science department (sociology), thereby bringing enlightenment to the latter.

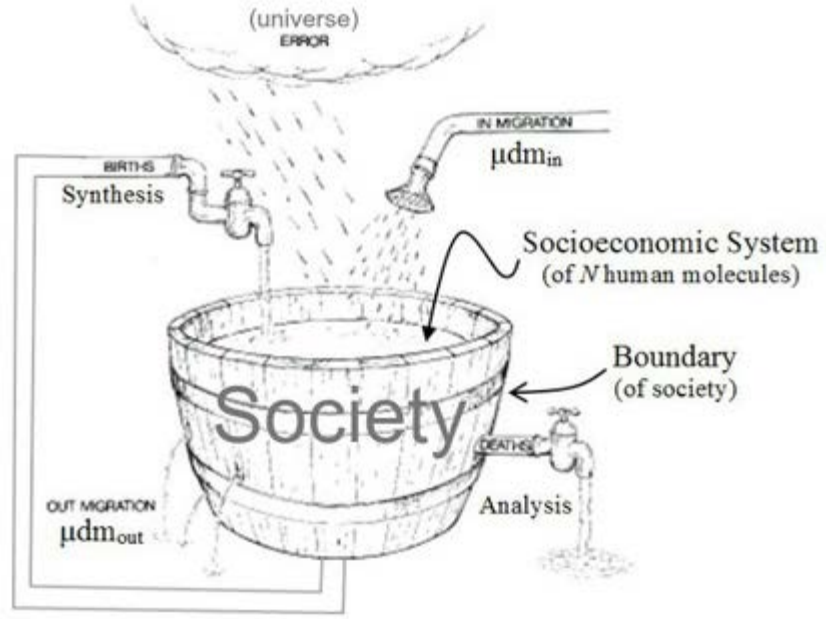

to form a prototype for a department of physical chemical sociology, focused on the application of fundamental physics, chemistry, and thermodynamics concept to the study of society and territory dynamics.

In 1983, German physicists Wolfgang Weidlich and Gunter Haag (Ñº), in their *Concepts and Models of a Quantitative Sociology: the Dynamics of Interacting Populations*, attempted, via platforming off Hermann Haken's 1960s synergetics, admixtured with a few other concepts, e.g. bifurcations, Brownian motion, etc., to attempt to apply "physico-chemical" stylized concepts to sociology, to develop a physics-like attempt at quantitative sociology; to quote:

> "When applying synergetic concepts to sociology it must be stated that there exists no direct 'short-cut' to transfer **physico-chemical** concepts to **sociology**."

Their result, however, was superficial and lacking, amounting to calling people "units" and societies as "open", in short.

In 1987, Indian-born Pakistani chemist Mirza Beg published *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, the first so-called "textbook" on physicochemical sociology, wherein he seems to be the first to semi-cogently outline the subject of "physicochemical sociology" (see: two cultures namesakes), as a standalone subject, a physicochemical humanities conceptualized branch (or root) of education, in which, to exemplify, he likens society to a chemical solution and explains human behavior in terms of physicochemical laws, using terms such as fugacity, likening migration

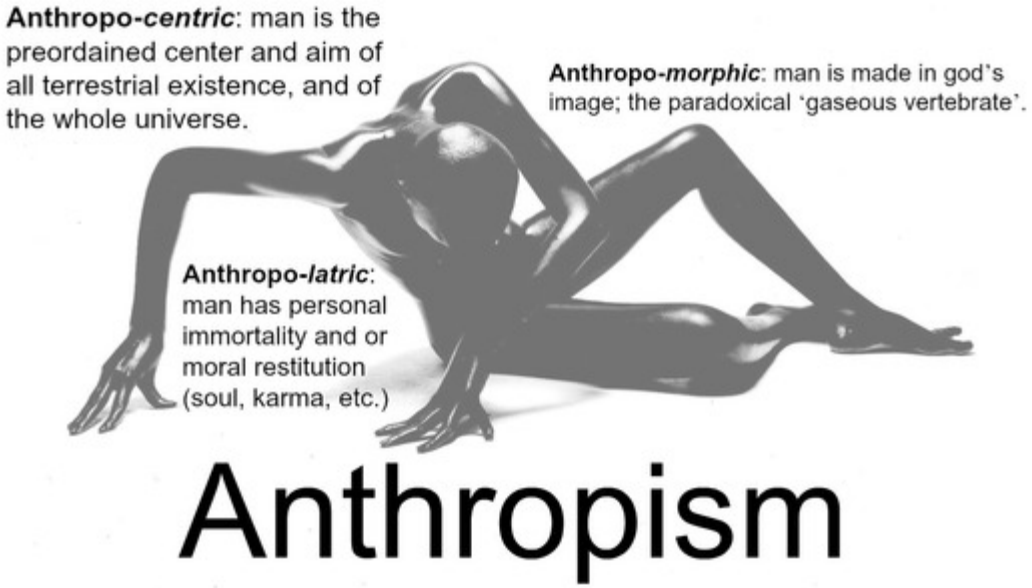

The three ingrained beliefs of **anthropism**, which one must grapple with whenever the physical science based evolution view is applied to humanities, according to Ernst Haeckel (1899), namely: anthropocentrism, belief that man is the preordained center of the universe; second:

to evaporation of solution molecules at higher temperatures, social conflict to the generation of heat in solution, slums to the formation of coarse-grained solids, etc. [2]

anthropomorphism, belief that man's shape is the ideal perfect form and or fashioned in the image of god; and third: anthropolatrism, belief that main has personal immortality, and or that the universe operates on man's acts via some type of moral restitution principle, as conceptualized by soul or equivalent, e.g. karma (or spirit); each of which, according to Haeckel, deriving from Abrahamic-based monotheism (or Anunian theology, in modern terms).

In 2005, Czech chemical engineer, solid state physicists, and materials scientist Jaroslav Sestak, in his chapter section "Thermodynamic Laws Versus Human Feelings", to his *Science of Heat and Thermophysical Studies*, employs what he calls the "physico-chemical" approach to the sociological studies of human societies, according to which he defines "people as unvarying thermodynamic particles without accounting for their own human-self-determination". He estimates that the full elaboration of this approach might take another century: [10]

> "Researching the analogy of **physical chemistry** to **sociological** studies of human societies is a very attractive area particularly assuming the role of thermodynamic links, which can be functional until the relation between inherent particles and independent people, is overcome by the conscious actions of humans because people are not so easily classifiable as are mere chemicals [see: human chemical]. Such feedback between the human intimate micro-world to the societal macro-state can change the traditional form of thermodynamic functions, which, nevertheless, are here considered only in a preparatory stage of feelings. Therefore this sociology-like contribution can be classified as a very first though rather simplified approach to the problem whose more adequate solution will not, hopefully, take another century [2105] as was the development of the understanding of heat and the development of the concept of the early elements."

In 2011, Brigham Young University, was running a winter 400-level course called "Science Phy 453: Sociology and Physics", taught by professor David Samuels Barnard, whose course notes contain Mieczyslaw Dobija's 2004 "Theories of Chemistry and Physics Applied to Developing an Economic Theory of Intellectual Capital", Jing Chen's 2008 "Understanding Social Systems: a Free Energy Perspective", which, in turn, cities the works of John Bryant (2007), Bikas Chakrabarti (2005), Charles Hall (1986), Paul Colinvaux, Erich Muller (1998), Jurgen Mimkes (2005), Libb Thims (2007), and the Rossini debate works of Harold Leonard (2006) and Frederick Rossini (1971), among other residual works, such as Edwin Jaynes. [24]

The CourseHero.com banner for BYU's Science Phy 453 "Sociology and Physics" course taught by David Barnard, one of America's first **physicochemical sociology** like college courses (see: hmolscience courses). [12]

In 2015, Mirza Beg, in forum posts, was referring to his work as the "socio-physicochemical approach" or the "socio-physicochemical sense" of things, etc. (Ñº)

Abstract | Short

The following is the short abstract for any basic course in physicochemical sociology:

- â— Goethe and Empedocles
- â— Gibbs and Goethe
- â— Empedocles + Goethe + Beg

Pakistani organometallic chemist Mirza Beg's 2015 Academia.com user profile, with the tag "**physico-chemical sociology**", shown at the time of the upload of his Oct 22 "Socio-Physico-Chemical

The basic student of say a one semester course in

"physicochemical sociology", should, at the bare minimum, know the progression of connective ideas of the world view or universal view inherent in the works of Empedocles, Goethe, and Beg as defined, in modern retrospect, by Gibbs.

Interpretation of Poverty, Class Structure and Social Pollution" article, replete with human chemical reaction theory conceptualization and a human chemical thermodynamics basis. [6]

Abstract | Full

The following, generally framed around Pitirim Sorokin's 1928 classification (shown boxed) of first main branch of contemporary sociology, i.e. the "mechanistic school", is the work-in-progress modern draft structure of physiochemical sociology (or "physiochemical humanities" in expanded form), name-size indicative of subject dominance as per social Newton or existive social Newton rankings go, divided into four eras, one (classical), two (Sorokin contemporary), three (beginner Gibbsian), and four (explicit realism):

Physicochemical Sociology

Composition

Era One

(a) **Atomic sociology** | Four element philosophy | Greco-Roman philosophy

Representative: Thales, Empedocles, Parmenides, Aristotle, Epicurus, Cicero

(b) **Social physics** [17th century-18th century, early]

Representative: Hobbes, Spinoza, Descartes, Leibniz, Berkeley, Saint-Simon, Fourier, Comte, Quetelet

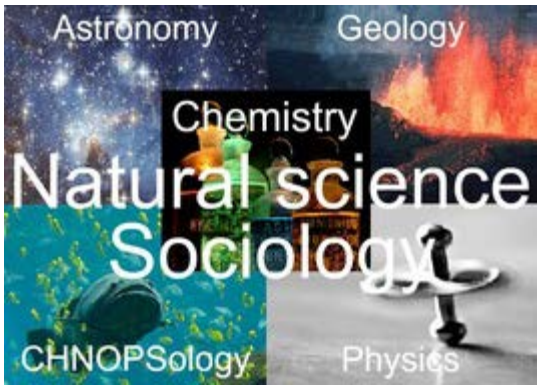

Sorokin "Mechanistic School" classification (1928)

Era Two

(c) **Social mechanics**

Representatives: Antonio Portuondo, Spiru Haret, Alfred Lotka

(d) **Social physics** [18th century, late]

Representatives: Henry Carey

(e) **Social energetics** | **Social thermodynamics**

Representatives: Ernest Solvay, Bekhterev, Wilhelm Ostwald, Thomas Carver, and Leon Winiarski

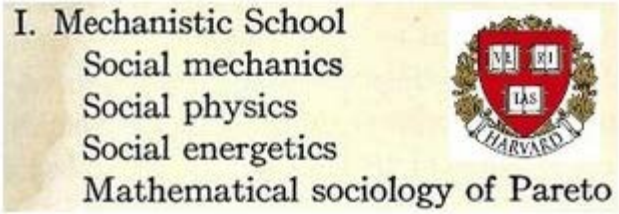

Contemporary Sociology
Sorokin classification (1928)

Era Three

(f) **Mathematical sociology**

Representatives: Vilfredo Pareto and Filippo Carli

(g) **Physico-chemical social dynamics** | Gibbs-based sociohistory

Representatives: Henry Adams

(h) **Sociology 23** | Gibbs+Pareto based sociology

Representatives: Lawrence Henderson, Harvard Pareto circle

(i) **Mathematical economics** | Gibbs-based economics

Representatives: Edwin Wilson, Paul Samuelson

(j) **Social physics** [20th century, early-mid] | **Sociophysics** [20th century, late]

Representative: John Q. Stewart, Arthur Iberall, Paris Arnopoulos, Serge Galam

(k) **Social chemistry** | **Molecular sociology** | **Sociochemistry**

Representatives: Goethe, Thomas Huxley, Henry Adams, Roy Henderson,

Goethe (1809)

Sacher (1881)

Winiarski (1898)

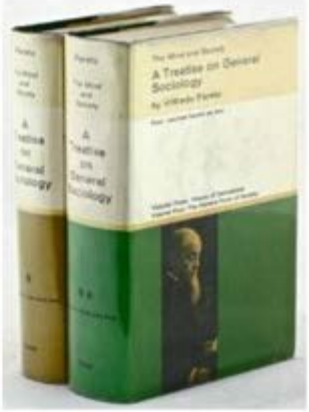
Pareto (1912)

(l) **Physicochemical humanities**

Representatives: Goethe, Buchner, Mirza Beg, Thomas Wallace

(n) **Socio-thermodynamics** | **Human**

Era Four

chemical thermodynamics

Representatives: Harold Blum, Frederick Rossini, Jurgen Mimkes, Christopher Hirata, David Hwang, Surya Pati, and Wenyuan Niu

(o) **Modern social Newtons**:

Representative: Wayne Angel, Erich Muller, Josip Stepanic, Adriaan de Lange, Sture Nordholm

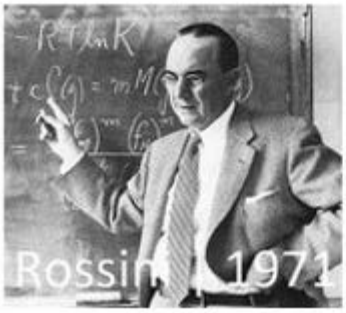

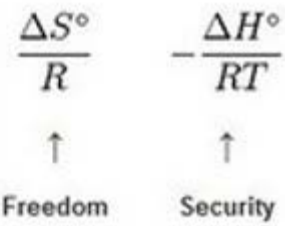

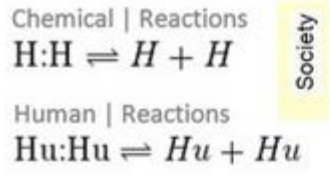

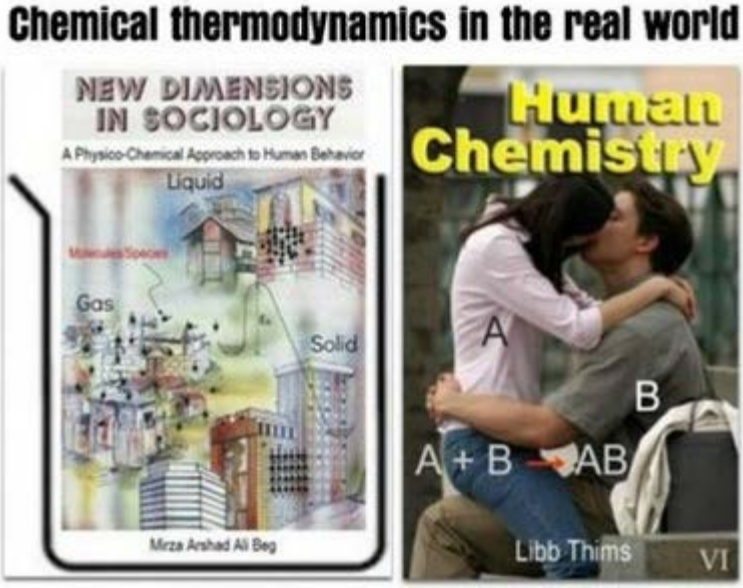

Adjacent (top): American physical chemist Frederick Rossini explaining, in his 19171 "Chemical Thermodynamics in the Real World" address, how freedom and security equate to entropy and enthalpy, respectively, in society, and how human "reactions" are larger types of chemical reactions, equilibrating in society; the first robust lecture on physicochemical sociology; the contentions and ramifications of which acting to spark the Rossini debate (2007-present):

Adjacent (bottom, left): Indian-born Pakistani organometallic chemist Mirza Beg's 1987 *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, the first general treatise on physicochemical sociology, showing people as reactive chemicals or molecules, in different states of aggregation, and societies conceptualized as being confined in semi-permeable reaction beakers or test tube. [2]

Adjacent (bottom, right), Libb Thims' *Human Chemistry*, which introduced human chemical reaction theory, in historical overview, and the modern CHNOPS+20 human molecular formula view, explicitly; one the precursors to *Hmolpedia*, and hence the complete synthesis to all of above.

Bond energy

See main: Relationship force

A key topic in physicochemical sociology is discussion and study of the nature of the yet-to-be quantified amount of Gibbs energy in the bond structure (see: bond energy) of a given human chemical bond.

Adjacent we see that modern humanities students are still being taught the "hook-n-

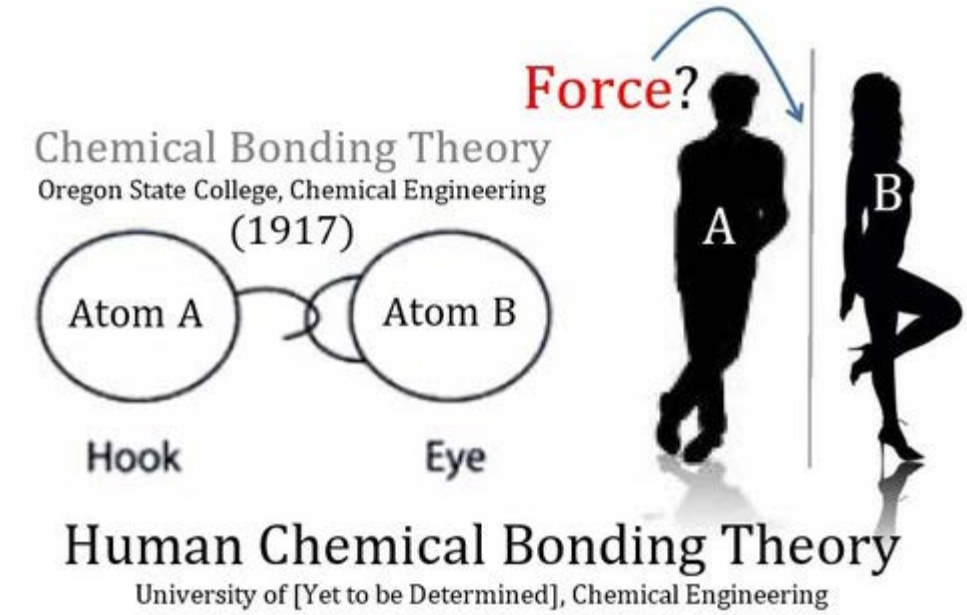

eye bonding" model, of human relationships, i.e. "I *saw* her, and I was *hooked*", the way Linus Pauling, as an undergraduate chemical engineering student, in 1917, was taught the hook-n-eye bonding model of physical chemistry, at Oregon State College.

Linus Pauling, in 1917, as a chemical engineering student at Oregon State University, was taught the "hook-n-eye" bonding model, John Dalton version, which he found so archaic that went on to pen his quantum chemistry based *On the Nature of the Chemical Bond* (1939) to remedy the situation. The equivalent patch solution for 21st century chemical engineers does not, of yet, exist, in any chemical engineering curriculum, despite a near century long work in human free energy theory, of which part of the Gibbs energy must exist quantifiably in the bond of relationships (bond energy), mechanistically described by a "force", aka **relationship force**, for lack of a better name, described generally in terms of fermion-boson interactions.

If Gibbs energy, in short, is the driving force of societies and social change, as has been posited as a mater-of-fact given universal rule (Mirza Beg, 1987; Thomas Wallace, 2009; etc.), then the Gibbs energy component of social bonds is a paramount topic in respect to micro-structure of macro-change; the preliminary outline and foundations of which being worked out by Goethe two centuries ago:

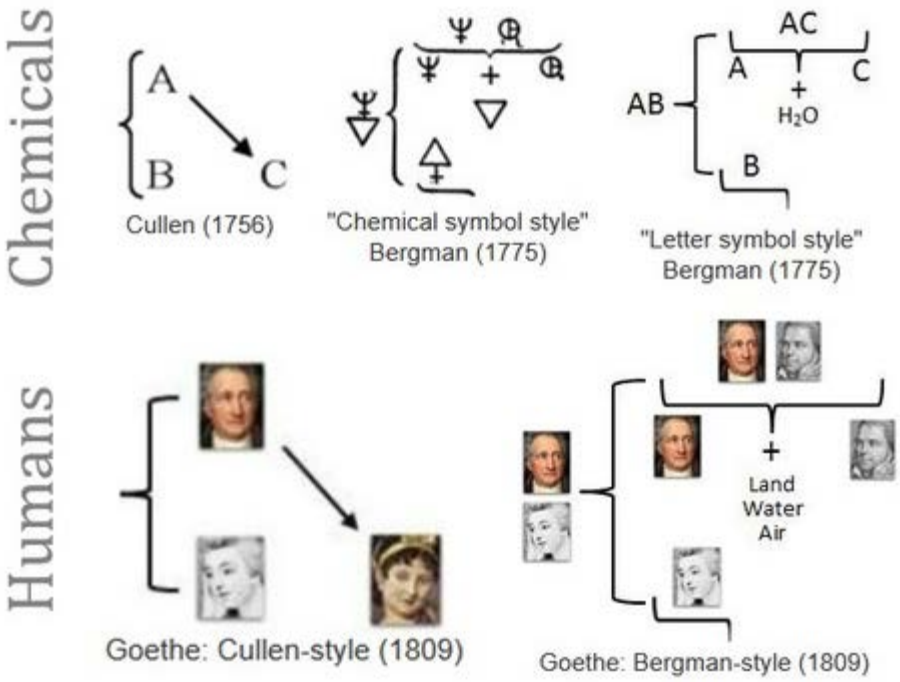

A noted problem here is that 21st century chemical engineering students, presently (2015), are not even given the bare minimum the hook-n-eye model of human chemical bonding; if questions of such nature arise, students are brushed off with the dismissive that "oh, the psychology department handles that topic" (Ñº), or something along these lines; the following being one example:

> "The premise of the subject of 'human chemistry', referring to things such as: chemical aphorisms (Empedocles, 450BC), love defined as a chemical reaction (Goethe, 1809), attraction and repulsion between 'human molecules' defining social chemistry (Adams, 1885), chemical thermodynamics explaining freedom and security in society (Rossini, 1971) and the post-9/11 debates on this to follow (Rossini debate, 2008), entropy of human civilizations (2005), etc., sounds like crackpottery to me and abuse of the word 'chemistry'. Students interested in the study of human interactions should consult sociology and psychology, where these topics are covered."
>
> — Marcin Borkowski (2010), on whether human chemistry should be taught as part of required college education, Sep 27 [8]

These types of dismissives, of course, are but blatant looped nonsense, by virtue of specialization-produced ignorance (see: hydraism), being that Freud founded psychology, in 1895, in his "A Project for Scientific Psychology", via culling the chemical thermodynamics concepts of "free energy" (dG) and "bound energy" (TdS) from the chemical engineers, namely Willard Gibbs, America's first PhD engineer, via the Helmholtz school; culturally we have become intellectual imbeciles, in large.

Terrorism | Hot topic

The 2006 Rossini debate was sparked into heated debate by the proposal that human chemical thermodynamics, as outlined by Frederick Rossini (1971), be used to study and model freedom and security in a post 9/11 terrorism prominent world. Shown adjacent is a Mark Buchanan + Malcolm Gladwell conceptualized social activation energy and social friction stylized social physics model, showing how 19-year-old Bosnian terrorist Gavrilo Princip was the spark that brought about WWI and in turn WII. It would seem a keen investment to fund a college curriculum on such a topic, i.e. physicochemical sociology, being that radical Islamic terrorists of the early 21st century seem to be presently reenacting the roll of the Bosnian terrorists of the early 20th century.

A Buchanan-Gladwell model (2001) of social physics, defined by concepts including: social heat, tipping points, activation energy, connectors, six degrees, Dunbar numbers, etc.; the above diagram showing how the rubbing of Bosnia with Austria-Hungray created "social friction" which on 28 Jun 1914 produced enough heat (or social heat) to "spark" the flame or social combustion of the first world war. [3]

Required reading

The following are famous publications selections of required reading, most of which readily available—the Wiskamp (2002) article, interestingly, being the result of lecture notes to a high school class, of 16-year-olds, on Goethe's human chemical theory, morality, relationships, and religion:

â— *Elective Affinities: Illustrated, Annotated, and Decoded* (1809) | **Johann Goethe** (German polyintellect)
â— The European War (1914) | **Eugene Roeber** (German-born American electrochemical engineer)
â— The Mechanistic School (§1:pdf) (full: pdf) (1928) | **Pitirim Sorokin** (Russian-born American sociologist)
â— Chemical Thermodynamics in the Real World (1971) | **Frederick Rossini** (American physical chemist)
â— *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (pdf) (1987) | **Mirza Beg** (Pakistani organometallic chemist)
â— In Defense of Thermodynamics: an Animate Analogy (1997) | **Sture Nordholm** (Swedish physical chemist)
â— Human Societies: a Curious Application of Thermodynamics (1998) | **Erich Muller** (Venezuelan-born English thermodynamicist)
â— Humans, All Too Chemical (2001) | **Kaspar Bott** (German organic chemist)
â— The Thermodynamics of Love (2001) | **David Hwang** (American chemist-neurophysician)
â— Chemistry in the Work of Goethe (2002) | **Volker Wiskamp** (German organic chemist)

â— *The Human Molecule* (issuu) (2008) | Libb Thims (American electrochemical engineer)
â— The Fundamentals of Thermodynamics Applied to Socioeconomics (2009) | **Thomas Wallace** (American physical chemist)

Quotes

See also: Hmolscience quotes; Two cultures calls

The following are related quotes:

"Social scientists are reaching the long-delayed conclusion that happenings in the social and the political sphere are not the result of chance, and individual impulse or willing, or of direct and arbitrary interference of an infinite power [god]. Social and political happenings, like physical and chemical actions and reactions, occur in an orderly and law-abiding manner. Events, movements, reforms, agitations, decay or growth of institutions may, in a measure, be prophesied, directed and aided or retarded. There is, or may be, a social science (or social sciences) as well as physical sciences. Social mechanics, social physics and social chemistry **are real** terms."

— Frank Carlton (1912), "History-Making Forces"

WILLARD GIBBS AND SOCIAL SCIENCE

In her diaries, the poet Marya Zaturenska records a visit in late 1941 from her friend Muriel Rukeyser, who "spoke with excitement about her book on Gibbs, making it sound more like an epic poem than a biography."[43] Zaturenska and her husband, poet and biographer Horace Gregory, had introduced Rukeyser to their neighbor, the chemist Theodore Shedlovsky, whom Rukeyser credits with having brought Gibbs's work to her attention.[44] After studying at MIT, Shedlovsky spent his working life at the Rockefeller Institute for Medical Research (now Rockefeller University), where he did pioneering research on electrolytes; he is now probably best known as the author of a textbook on electrochemistry. A biographical memoir tellingly describes him as having "an uncanny instinct for bringing together people who had problems with people who had ideas and suggestions."[45]

English poetry & science scholar Peter Middleton's 2015 section "Willard Gibbs and Social Science", the core subject of **physicochemical sociology**, from his *Physics Envy*, wherein he traces the path from Gibbs' chemical thermodynamics into sociology via Lawrence Henderson, the Harvard Pareto Circle, and Sociology 23. [9]

"… emergence, the **physicochemical**, the organismal, the mental and the **social**. Hence, it till the advent of a few super-Einsteins (see: another Newton; polymathy degree problem), theoretical biology must stand as a combination of oppositions—a *compositio oppositorum*."

— William Wheeler (c.1935), "Essay" (person who in 1927 introduced Lawrence Henderson to the works of Vilfredo Pareto)

"As late as a week ago, such a phrase as 'hopefully awaiting the gradual convergence of the physical sciences and the social sciences' would have provoked no more than an ironic tingle or two at the back of my neck. Now it howls through the Ponchitoula Swamp, the very sound and soul of despair."

— Walker Percy (1961), *The Moviegoer*; opening quote to Philip Mirowski's 1989 *More Heat Than Light*

"Ideas about order and disorder began to germinate in my mind about the end of the 1940s and the beginning of the 1950s. Their origin was in the areas of physics and chemistry—the Carnot cycle, of course, as well as my wanderings through the **labyrinth of chemical thermodynamics**. It was about this time that the laws and principles of thermodynamics began to be applied on an increasing scale to the geological and biological sciences. My discovery in the 1950s of Shannon's and Wiener's development of information theory and its relation to statistical mechanics meant to me that the concept of entropy was much more universal than my **formal courses** [BS, MA, MA, PhD, in geology, chemistry, and

metallurgical engineering, at MIT, Columbia, and Stanford] **had indicated**. The conviction grew that energy and entropy relationships were fundamental not only in understanding processes in physics and chemistry but also in astronomy, geology, and biology. Inevitably this led to the conjecture that further extrapolation would lead to the human sciences and arts, and even to psychology, **sociology**, history, music, philosophy and religion."

— Norman Dolloff (1975), *Heat Death and the Phoenix* (Preface)

"The sun and earth, or storms and earthquakes, which nowadays we understand as manifestations of natural **physico-chemical** forces, [were once seen as] persons or as the results of actions and designs of persons [gods]. Only gradually did the transition come about from magical and metaphysical thinking to scientific thinking about the physico-chemical aspects of the world. The change was to a large degree dependent on the fading away of heteronomous, naively egocentric explanatory models. In **sociology**, we are [presently] confronted with a similar task of emancipation."

— Norbert Elias (1978), *What is Sociology?* [3]

"Man must jump, as Adams liked to say, if he would save himself; a moral and intellectual elite must be recruited. If nothing else would serve to make moral philosophers out of historians, the fear of imminent annihilation might. **University education must be revolutionized** by the physicist-historian."

— Ernest Samuels (1989), *Henry Adams*

"The first and second laws of thermodynamics are usually presented as straight physics. Local problems (such as heat engines) may be assigned but seldom is any effort made to examine **universal human problems**. Considering moral implications of these laws makes them relevant to students, gaining their attention and easing instruction."

— Alvin Saperstein (1982), "Point of View: Ethics in the Classroom: Morality and the Laws of Thermodynamics"

"The study of the interaction between the natural sciences and the social sciences has been a **grossly neglected** field of study."

— Bernard Cohen (1993), "Analogy, Homology, and Metaphor in the Interaction between the Natural Sciences and Social Sciences, Especially Economics" [11]

"It is interesting to note that socio-thermodynamics is only accessible to **chemical engineers** and metallurgists. These are the only people who know phase diagrams and their usefulness. It cannot be expected, in our society, that **sociologists** will appreciate the potential of these ideas."

— Ingo Muller (2007), *A History of Thermodynamics*

See also

â— Bruno Latour
â— Physical sociology falloff problem

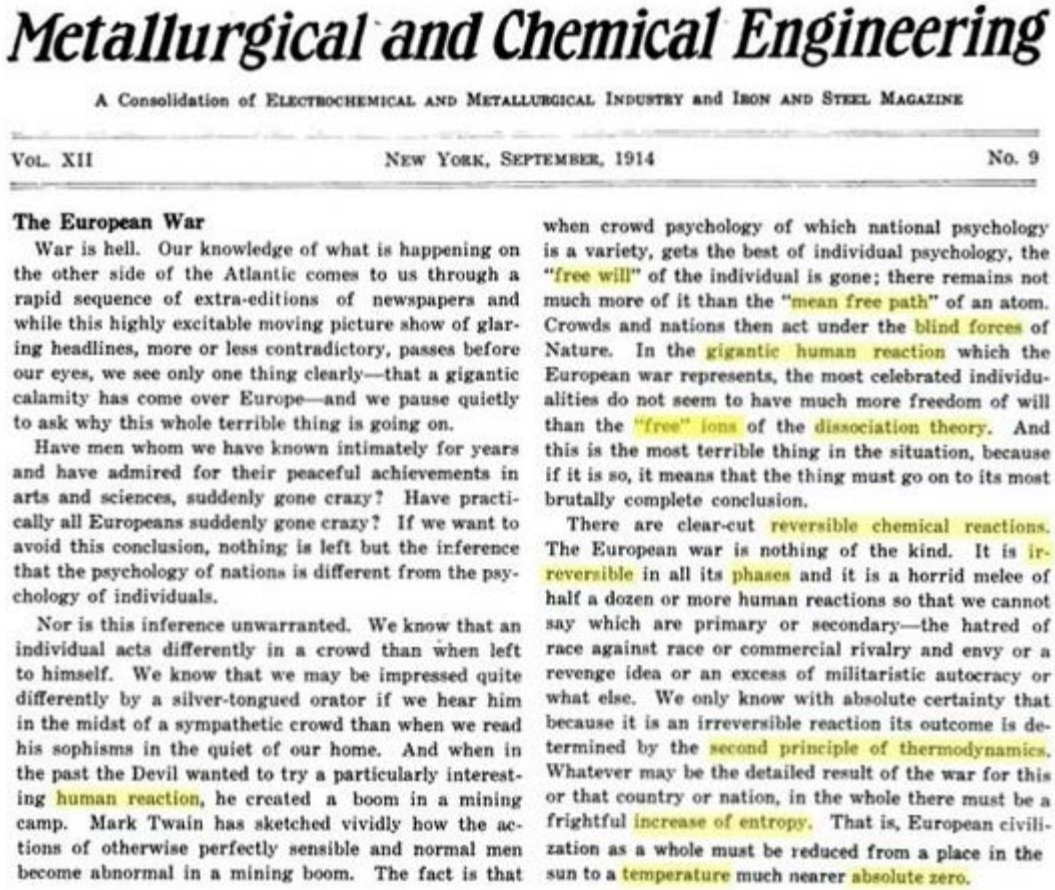

Metallurgical and Chemical Engineering

A Consolidation of Electrochemical and Metallurgical Industry and Iron and Steel Magazine

Vol. XII | New York, September, 1914 | No. 9

The European War

War is hell. Our knowledge of what is happening on the other side of the Atlantic comes to us through a rapid sequence of extra-editions of newspapers and while this highly excitable moving picture show of glaring headlines, more or less contradictory, passes before our eyes, we see only one thing clearly—that a gigantic calamity has come over Europe—and we pause quietly to ask why this whole terrible thing is going on.

Have men whom we have known intimately for years and have admired for their peaceful achievements in arts and sciences, suddenly gone crazy? Have practically all Europeans suddenly gone crazy? If we want to avoid this conclusion, nothing is left but the inference that the psychology of nations is different from the psychology of individuals.

Nor is this inference unwarranted. We know that an individual acts differently in a crowd than when left to himself. We know that we may be impressed quite differently by a silver-tongued orator if we hear him in the midst of a sympathetic crowd than when we read his sophisms in the quiet of our home. And when in the past the Devil wanted to try a particularly interesting human reaction, he created a boom in a mining camp. Mark Twain has sketched vividly how the actions of otherwise perfectly sensible and normal men become abnormal in a mining boom. The fact is that when crowd psychology of which national psychology is a variety, gets the best of individual psychology, the "free will" of the individual is gone; there remains not much more of it than the "mean free path" of an atom. Crowds and nations then act under the blind forces of Nature. In the gigantic human reaction which the European war represents, the most celebrated individualities do not seem to have much more freedom of will than the "free" ions of the dissociation theory. And this is the most terrible thing in the situation, because if it is so, it means that the thing must go on to its most brutally complete conclusion.

There are clear-cut reversible chemical reactions. The European war is nothing of the kind. It is irreversible in all its phases and it is a horrid melee of half a dozen or more human reactions so that we cannot say which are primary or secondary—the hatred of race against race or commercial rivalry and envy or a revenge idea or an excess of militaristic autocracy or what else. We only know with absolute certainty that because it is an irreversible reaction its outcome is determined by the second principle of thermodynamics. Whatever may be the detailed result of the war for this or that country or nation, in the whole there must be a frightful increase of entropy. That is, European civilization as a whole must be reduced from a place in the sun to a temperature much nearer absolute zero.

German-born American electrochemical engineer Eugene Roeber's famous Sep 1914 editorial "The European War", wherein he outlines a proto-version of human chemical thermodynamics, in his explanation that WII is a large phase change global social chemical reaction, in short. [1]

â— Mathematical economics | Physicochemical economics
â— Polymathy degree problem
â— Rennie creationism fiasco
â— Stephan social system
â— Why Students Choose Chemical Engineering?

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θΔics

In science, **physicochemical system** or "physico-chemical system" refers to a "system" conceptually defined by the chemical thermodynamics of Willard Gibbs (1876), generally a boundaried system, comprised of a certain type and number chemical components (or chemical species), whose nature [natural, unnatural, or equilibrium] is quantified by a certain number of state function variables, the selection of which being determined by the state of the system; open, semi-open, or closed, isothermal-isobaric freely-going systems for societies, according to which Gibbs energy is the thermodynamic potential.

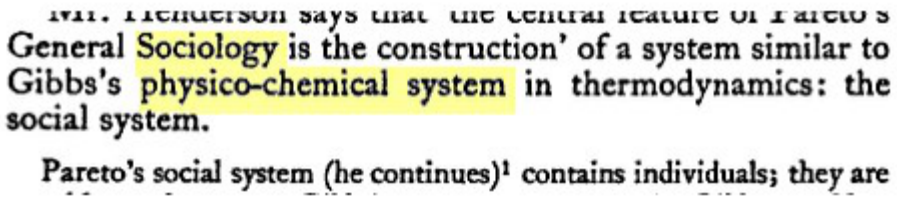
Mr. Henderson says that the central feature of Pareto's General Sociology is the construction' of a system similar to Gibbs's physico-chemical system in thermodynamics: the social system.

Pareto's social system (he continues)[1] contains individuals; they are

A 1935 summary of Lawrence Henderson, amid the Harvard Pareto circle and "Sociology 23" lectures, summarizing that the the central feature of Vilfredo Pareto's 1912 general sociology is the modeling of a social system similar or framed akin to to Willard Gibbs' **physiochemical system** of chemical thermodynamics, i.e. "system" of thermodynamics with the addition of chemical potential of boundary crossing or system additions or substractions; akin to a van't Hoff equilibrium box model of society, with semi-permeable boundries [2]

Quotes

The following are related quotes:

> "The comprehension of the laws which govern ANY material system is greatly facilitated by considering the energy and entropy of the system in the various states of which it is capable."
>
> — Willard Gibbs (1876), *On the Equilibrium of Heterogeneous Substances*

> "Any arbitrarily isolated portion of the material universe, according to Gibbs, may be regarded as a **physico-chemical system**."
>
> — Lawrence Henderson (1935), "Physician as Patient and as a Social System" [3]

> "Gibbs' **physico-chemical system**, Henderson felt, validated the concept of a system as a genuine abstraction, useful despite the fact that it was a creation of the imagination. Systems imposed boundaries and mapped out relationships: within them, facts made sense. They were ordered and interrelated. They became amenable to logical consideration. [Henderson wrote]: 'Just as Newton first conclusively showed that this is a world of masses, so Gibbs showed revealed it as a world of systems.'"
>
> — Cynthia Russett (1966), *The Concept of Equilibrium in American Social Thought* [1]

See also

- Physicochemical humanities
- Physicochemical morality puzzles
- Physico-chemical social dynamics
- Physicochemical sociology

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θΔics

In hmolscience, **physicochemical will**, an extrapolate down type of term, refers to discussions of "will", either free (free will), semi-free, or not free (controlled, driven, or forced), hypothetically, or in scenario, operating at the physical, e.g. the will of steel to be steel, chemical level, e.g. in organic reactions, or nanometer-range size of animation.

A walking molecule **physicochemical will** comparison, left: the walking two-legged kinesin molecule, a motor protein with a molecular weight (Ñº) of 380,000, which moves along tubules carrying cargo powered by ATP, like trains moving along railway tracks powered by coal; right: a human pushing a large rock up a hill (depictive of the Myth of Sisyphus) powered by physical fuel of foodstuff and mental fuel of desire, reason, or impulse. The question remains: is "will" involved in either scenario. The 2005 to 2010 synthetic walking molecular carrier molecule DTA, of Ludwig Bartels , whose mechanism of powering, walking, and turning, etc., has nearly completely been worked out, would seem to given insight into this so-called "will" problem.

Schopenhauer

In 1844, Arthur Schopenhauer, in his second volume of his *The World as Will and Representation*, cited German chemist Justus Liebig's description of the reaction of damp copper Cu in air containing carbonic acid H_2CO_3, to argue rather cogently that the: [1]

> "The **will of the copper**, claimed and preoccupied by the electrical opposition to the iron, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive."

(add discussion)

Einstein

In 1932, Albert Einstein, amid the Einstein-Murphy dialogue, gave the following responses to suppositions of organic will: [2]

> "**Murphy:** I have been collaborating with our friend, Planck, on a book which deals principally with the problem of causation and the freedom of the human will.
>
> **Einstein:** Honestly, I cannot understand what people mean when they talk about the freedom of the human will. I have a feeling, for instance, that I will do something or other; but what relation this has with freedom I cannot understand at all. I feel that I will light up my pipe and I do it; but how can I connect this up with the idea of freedom? What is behind the act of willing to light the pipe? Another act of willing? Schopenhauer once said: Man can do what he wills, but cannot will what he wills.
>
> **Murphy:** But it is now the fashion in physical science to attribute something like free will even to the routine processes of organic nature.
>
> **Einstein:** That nonsense is not merely nonsense. It is objectionable nonsense."

(add discussion)

Bartels

The following is a 2010 abstract of Ludwig Bartels work on two-legged and four-legged walking molecules; albeit he doesn't speculate on will: (Ñº)(Ñº)

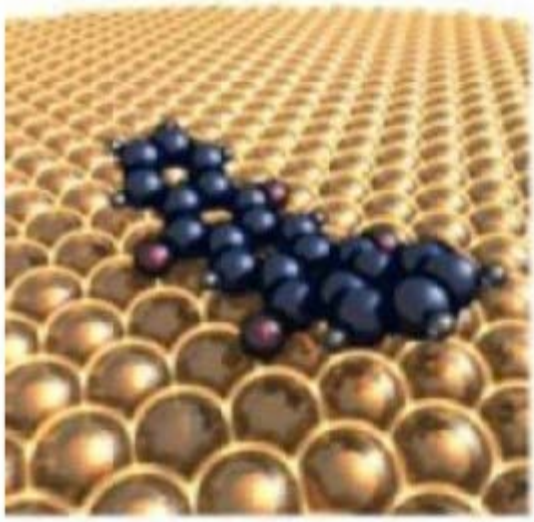

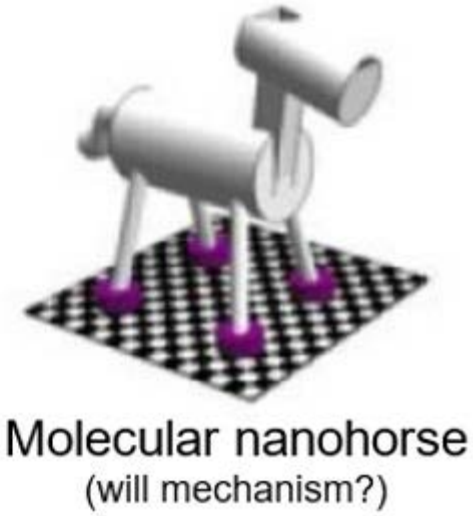

An image of Ludwig Bartels 2010 four-legged walking synthetic nanohorse (Ñº); which begs the question: does the principle of "will" hold when scaled down the great chain of being to the nano-movement range of powered animation?

> "Molecular machines can be found everywhere in nature, for example, transporting proteins through cells and aiding metabolism. To develop artificial molecular machines, scientists need to understand the rules that govern mechanics at the molecular or nanometer scale (a nanometer is a billionth of a meter). To address this challenge, a research team at the University of California, Riverside studied a class of molecular machines that 'walk' across a flat metal surface. They considered both bipedal machines that walk on two 'legs' and quadrupedal ones that walk on four. "We made a horse-like structure with four 'hooves' to study how molecular machinery can organize the motion of multiple parts," said Ludwig Bartels, a professor of chemistry, whose lab led the research. "A couple of years ago, we discovered how we can transport carbon dioxide molecules along a straight line across a surface using a molecular machine with two 'feet' that moved one step at a time. For the new research, we wanted to create a species that can carry more cargo - which means it would need more legs. But if a species has more than two legs, how will it organize their motion?" Study results appeared online last week in the *Journal of the American Chemical Society*, and will appear in print in an upcoming issue of the journal."

(add discussion)

Quotes

The following are related quotes:

> "The will is free. Free in what sense? It is free to act according to its nature. This, in fact is true of all realities. Take steel. Steel is free to act as steel, and nothing in existence can make steel act otherwise than steel should act."
>
> — Harry Waton

(1932), *The Philosophy of Spinoza* [3]

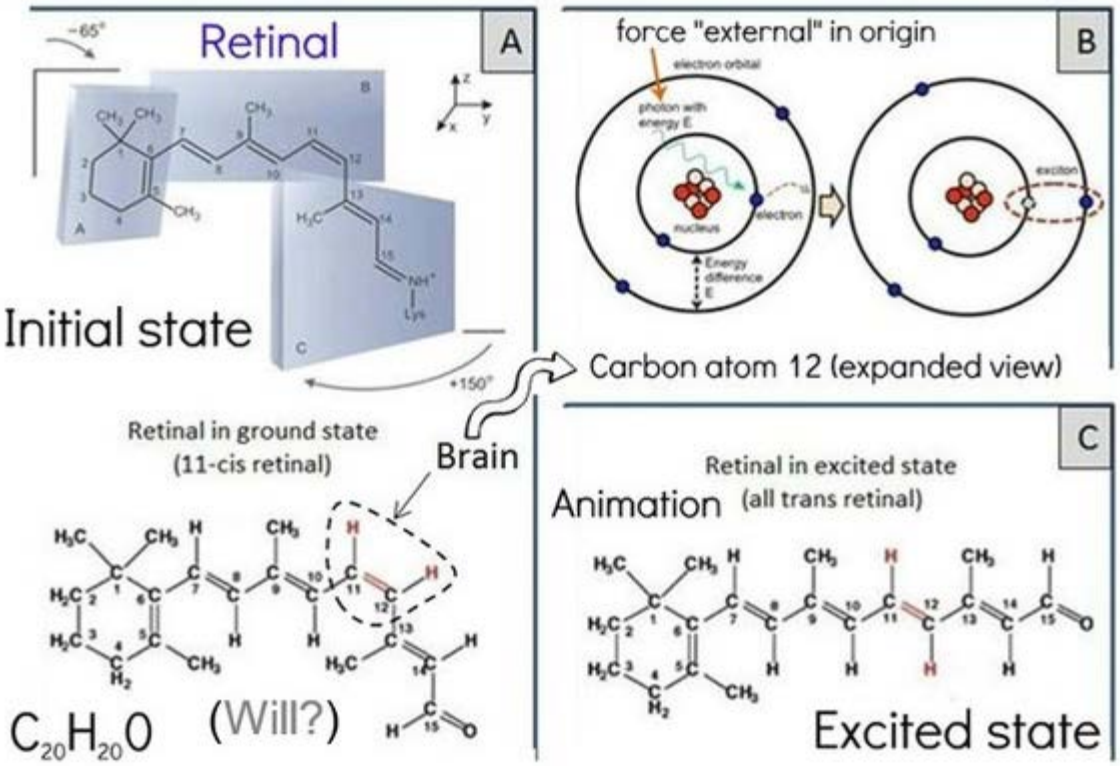

The ABC model of the mechanism of the light-induced movement ("straightening") of the three-element retinal molecule, $C_{20}H_{20}O$ according to which the anthropomorphic model of "will" and "choice" become reduced to pure step-by-step physics and chemistry; a simple basic model which which to expand on to better understand theories of "will" and induced movement in humans, which is a CHNOPS+20 type of animate molecule.

See also

â— ABC model

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θΔics

In science, **physics** is the study of the laws that determine the structure of the universe with reference to the matter and energy of which it consists. It is concerned with the forces that exist between objects and the interrelationship between matter and energy. [1]

Etymology

The term physis (φύσις), supposedly, comes from phyein (φύειν), "to grow", related to our word "be"; possibly deriving from Thales. (O)

Overview

In 320BC, Aristotle introduced term "physics", in parallel with "metaphysics", as the study of things, in short.

In circa 1610, Francis Bacon, building on Aristotle, defined physics, a sub-branch of philosophy, as follows: [3]

Philosophy

1. Divine philosophy
2. Natural philosophy

    2.1. Speculative philosophy (or natural science)

        2.1.1. Physics

            2.1.1.1. The doctrine of the formation of things

            2.1.1.2. The doctrine of the formation of things, or the world

            2.1.1.3. The doctrine concerning the variety of things [metamorphosis or evolution]

        2.1.2. Metaphysics

            2.1.2.1. The doctrine of forms
            2.1.2.2. The doctrine of final causes

    2.2. Practical philosophy

3. Human philosophy

In 1830s, the word “physicist” began to appear in English, e.g. as used in the Whewell-Coleridge debate (1833). [2]

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θΔics

In terminology, **physics envy** refers to economists being envious of physicists, in their desire to make economics a real science, thereby leaning towards the adoption of concepts from physics wholesale.

Overview

In 1989, Philip Mirowski, in his *More Heat than Light*, coined the term "physics envy", the title of his chapter seven, as a derogation label for economists, particularly of the 19th century, envious of physicists and therein attempt to emulate their methods, the prime example being the search for conservation of energy models in economics. [1]

In 2015, Peter Middleton published *Physics Envy*, wherein he pens a chapter entitled "Willard Gibbs and Social Science", wherein he traces the path from Gibbs' chemical thermodynamics into sociology via Lawrence Henderson, the Harvard Pareto Circle, and Sociology 23. [2]

In 2015, Erik Millstone (Ñº), a physicist turned environmental philosopher, in his blog "Does Social Science Suffer from Physics Envy?", argued, rather ignorantly, that "idea that the approaches adopted by physicists are well suited to any and all topics, including those in the humanities and social sciences, is hopelessly naïve", and that economists suffer from "envy of thermodynamics", in their attempts to formulate theories on economics and equilibrium. [4]

Quotes

The following are related quotes:

> "A revisionist history that complements my thesis is Philip Mirowski's *More Heat Than Light* (1989). Mirowski argues that most of the developments in economic theory since the marginal revolution derive from the misappropriation of a mathematical metaphor from the energy physics of the mid-nineteenth century. The metaphor was borrowed in an attempt to make economics more scientific, an urge so prevalent among economists that Mirowski describes it as a kind of disease; he dubs it '**physics envy**'."
>
> — Bruce Caldwell (1992), "Commentary on Alan Nelson's 'Human Molecules'" [3]

See also

â— Toolism

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1. Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (physics envy, 11+ pgs). Cambridge University Press.
2. Middleton, Peter. (2015). *Physics Envy: American Poetry and Science in the Cold War and After* ((§4:Conceptual Schemes: The Midcentury Poetics of Muriel Rukeyser and Charles Olson, pgs. 117-50; §§:Willard Gibbs and Social Science, pgs. 127-; Gibbs, 34+ pgs; Henderson, 13+ pgs; Pareto, 8+ pgs). University of Chicago Press.
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4. Millstone, Erik. (2015). "Does Social Science Suffer from Physics Envy?" (Ñº), Steps-Centre.org, Blog, Jul 24.

External links

â— Physics envy – Wikipedia.

θΔics

In science, the **physics of love** is a popularized term that refers to any of various overview attempts or outlines to explain love in terms of the science of physics.

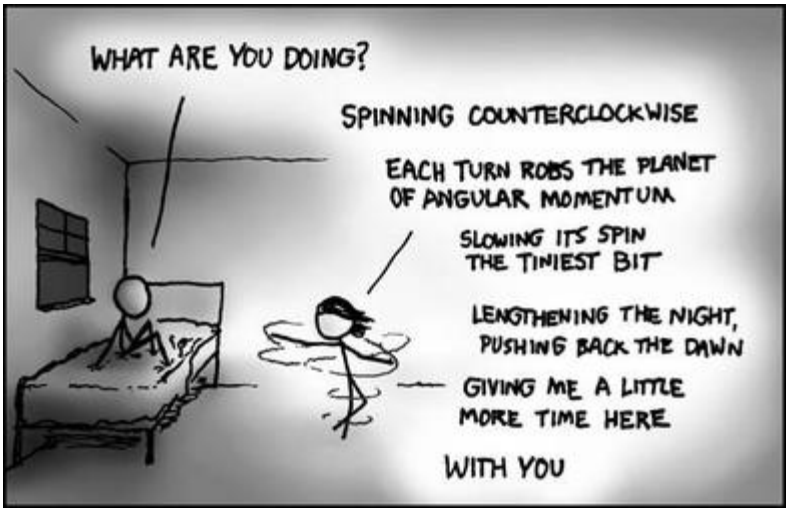

A **physics of love** story themed on spin and angular momentum.

History

Greek philosopher Empedocles was the first to incorporate ideas about human love and hate in his circa 450BC standard model of physics, loosely conceiving of love as an attraction force, and hate as a repulsion force.

In 2000, American astrophysicist Christopher Hirata outlined a decent five part article "The Physics of Relationships", in which he attempted to scratch out a crude model of relationships in terms of physics concepts, e.g. neutron scattering. [1]

Standard model

The standard model of the physics of love, developed by American electrochemical engineer Libb Thims in 2007, centers on the study of the (a) the nature of the attraction and repulsion forces involved in human relationships, (b) the nature of behavior of humans when viewed from a distant observational perspective as bound state particles, using the human particle model, and (c) the study of how the photon or "quantum of action", in Niels Bohr's terminology, functions to create exchange forces between humans in the millisecond-by-millisecond interaction perspective. In short, human relationships, according to the standard model, are governed by the electromagnetic force and Gibbs free energy. [2]

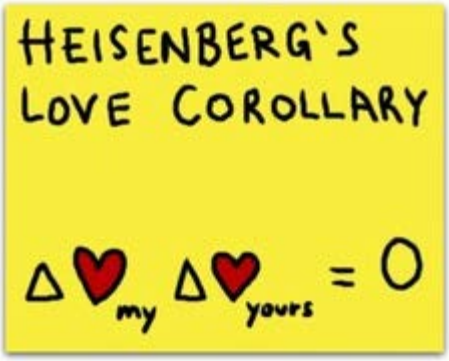

A 2010 **physics of love** humor image of a "love uncertainty principle" version of Heisenberg's uncertainty principle. [3]

Pseudoscience

In the last few decades or so, a number of new age researchers, with little fundamental training in physics, have promulgated various physics of love theories based on concepts such as tachyon energy, zero point energy, vibrational either energy, etc., nearly all of which as little to do with actual human relationships, but nevertheless attract a certain type of readership.

References

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(b) Hirata, Christopher M. (c. 2000). "The Physics of Relationships" (section: Fun), Tapir.Caltech.edu.
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3. Anon. (2010). "Heisenberg's Love Uncertainly Principle", ScienceHumor.org, blog, Aug. 14.

See also

- HP pioneers
- Chemistry of love
- Thermodynamics of love
- The Physics of Relationships
- Relationship physics
- Love the chemical reaction
- Equation of love
- Relationship chemistry

External links

- New Physics of Love – HenryGrayson.com.
- Kurtzweil, Kristin. (2009). "The Relationship between Quantum Physics and Love." Helium.com, Mar 11.

θΔics

In economics, **physiocracy** is an economics school of thought which argues that land is the source of economic value.

Overview

In the 1750s, French physician-economist Francois Quesnay, the avid admirer of Rene Descartes and Nicolas Malebranche, imported the full Cartesian conception of science into political economy, to create physiocracy. [1]

The practitioners of Quesnay's new school of economics came to called "physiocrats", supposedly, out of their affinity for the methods of physics.

Quesnay contributed two articles to Denis Diderot's encyclopedia: "Farmers" (1756) and "Rural Philosophy" (1763), which in some way are said to have initiated what came to be known as physiocracy. [5]

Quesnay's 1758 *Tableau Economique* (*Economics Table*), wherein the human body is treated as a machine, with the coronary system reduced to a pump with some valves, vital processes equated to the motion of the blood, is said to mark the start of physiocracy.

The “physiocrats” are frequently mentioned in prehistory sections in physical economics, ecological economics, and or economic thermodynamics treatises, such as summarized in American earth energy scientist Cutler Cleveland’s 1999 ecological economics article. [2]

In Charles Gide and Charles Rist’s 1909 book *History of Economic Doctrines: from the Physiocrats to the Present* the concept of a person as a molécule humaine (human molecule) is employed. [3]

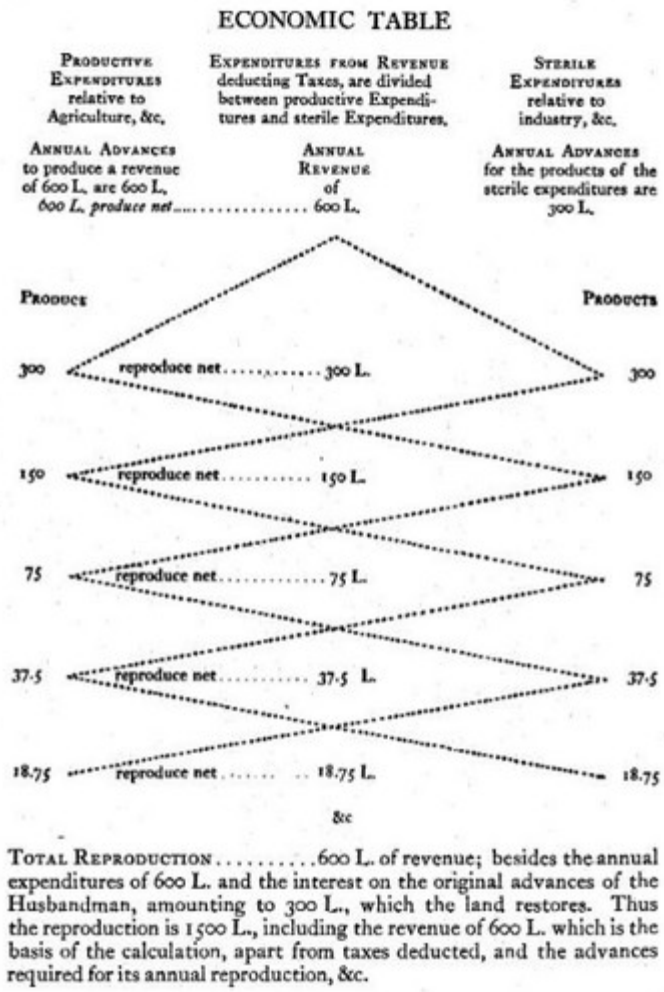

One of Francois Quesnay's **economic tables**, in which he explains the flow of goods and services, at each step in the passage downward, modeled on William Harvey (heart pump) / Rene Descartes (machine) blood flow model of the body. [4]

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External links

â— Physiocracy – Wikipedia.

θΔics

In economic thermodynamics, **physioeconomics** is a theory that a physics-based physiology of macroeconomics explains economic growth. [1]

Overview

The theory was conceived by American economist Philip Parker a professor of economics and international strategy at the University of California. In short, physioeconomics is a loose collection of ideas on the relationship between the hypothalamus, thermodynamics, and economics.

References

1. Parker, Philip. (2000). *Physioeconomics - the Basis for Long-Run Economic Growth.* Cambridge, Massachusetts: The MIT Press.

θΔics

In science, **physiology** is the physics of the organic world (Nagel, 1877). [1]

Physiologists

Noted hmolscience-relevant physiologists include: John Hunter, Charles Sherrington, Claude Bernard, Frank Thone, Harold Blum, Gustav Fechner, and Lawrence Henderson.

Social physiology

As the early physiologists, who studied the functions "inside" of body in physics, producing a number of notable results, it would seem logical that some might extrapolate this model to society, conceived as a body. The first, it seems, to have ventured in this direction was Emile Maxweiler, who defined the following subject:

> "Sociophysiology is social ethology [defined via] social energy [or] physiology reaction phenomena due to mutual excitation of individuals of the same species."
>
> — Emile Waxweiler (1906), *Outline of Sociology* [2]

(add discussion)

Quotes

The following are related quotes:

> "The most familiar attempts to explain how evolution takes place are restricted to special aspects of evolution, and are often epitomized in personal names, such as Darwinism, Lamarkism, Weismannism, Mendelism. Among us there are naturalists, morphologists, **physiologists**, and psychologists; breeders, experimentalists, and bio-chemists. And surrounding us on all sides are the physicists, chemists, geologists, and astronomers, with whom we must reckon, for their domains and their subject matter overlap ours in countless ways. But unfortunately between all these workers there is little common understanding and much petty criticism. We shall use the terms morality, behavior, conduct, or constructive action in the same broad way. It may sound strange to speak of the morals of an atom, or of the way in which a molecule conducts itself. But in the last analysis, science can draw no fundamental distinction between the conduct of an animal, a bullet, or a freshman, although there may be more unknown factors involved in one case than in the other."
>
> — William Patten (1920), AAAS address "The Message of the Biologist" + *The Grand Strategy of Evolution: the Social Philosophy of a Biologist*

References

1. Von Nageli, Carl. (1877). "The Limits of Natural Knowledge" (abs), delivered before the German Association at Munich; synopsis (Q) in: *Nature*, 16:491-92, Oct 4; translation part I (O) in: *Nature*, 16: 531-35, Oct 18; translation part II (Q), *Nature*, 16:559- (physiology, pg. 559).
2.(a) Waxweiler, Emile. (1906). *Outline of Sociology* (*Esquisse d'une sociologie*). Fascicule 2 des *Notes et Mémoires* de l'Institut de Sociologie, Instituts Solvay, Parc Léopold, Bruxelles. Bruxelles et Leipzig: Misch et Thron.
(b) Emile Waxweiler – Wikipedia.

Further reading

● Wright, Jonathan. (1920). "Empedocles the Primitive Physiologist" (Goethe, pgs. 144-45; evolutionist, pg. 144), *American Medicine*, 26:139-47, Mar.

External links

- Physiology – Wikipedia.

θΔics

In existographies, **Pierre Bayle** (1647-1706) (IQ:175|#209) (Cattell 1000:413) (FA:61) (CR:27) was a French philosopher and encyclopedist noted for []

Atheist | Morals

In 1682, Bayle, in his *Various Thoughts on the Occasion of the Comet*, in commentary on the famous comet of 1680, argued that comets were a natural phenomenon, that comets did not presage disaster, after which he presented the "first-ever all-out defense of the morals of an atheist (see: atheistic morality)", as Jennifer Hecht (2003) summarizes things. [2]

Dictionary | Critical history

In 1695 to 1697, Bayle penned his 3,000-entry *Historical and Critical Dictionary*, wherein each entry is accompanied by lengthy footnotes, themselves up to 20-pages per note, and these footnotes have footnotes; herein he discussed things, such as the "three impostors" legend, which he attributed to Averroes. (Q) Bayle also upheld Michel Montaigne's claim that religious claims are not confirmed by any inner principle, but are fed to people as children. [2]

This multi-volume work has been referred to, by some, as the "arsenal of the enlightenment" and or a "bible for doubters" (see: atheist's bible).

Foe Kiao | Nothingness and vacuum

Bayle, in his *Critical and Historical Dictionary, Volume 5* (Q), discusses a Chinese atheism sect called "Foe Kiao" (65BC), whose founder he refers to as "Foe", which renders as "no man", whose creed was the following: [2]

> "There is nothing to seek, nor anything to put one's hopes on, except the nothingness and the vacuum that is **the principle of all things**. Our parents came forth from this vacuum and they returned there after death."

Daniel Herman (2014), to note, asserts that Herman Melville had read this philosophy and had this mind when he penned the character of Captain Ahab of Moby Dick, and that what Bayle was referring to was the "Ch'an school" of China or its equivalent the "Zen Buddhism" school in Japan. (Q)

Voltaire

In 1755, Voltaire, in his "Poem on the Lisbon Disaster", cited Bayle as upgrade to Plato and Epicurus.

Other

Bayle, of note, seems to be listed in Johan van der Pot's 1985 listing (Q) of post renaissance stylized social Newtons. [3]

Quotes | On

The following are quotes on Bayle:

> "Anaxagoras is said to have been the first who supposed the universe created and governed by an intelligence: Aristotle reproaches him with having made an automaton of this intelligence; or in other words, with ascribing to it the production of things, only when he was at a loss to account for their appearance (see: **Pierre Bayle**'s *Dictionary*, article: Anaxagoras (note E))."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 38)

> "The illustrious **Bayle** [*Thoughts on Various Subjects* (§:21)], who teaches us so ably to think, says, with abundant reason, that 'there is nothing but a good and solid philosophy, which can like another Hercules,

exterminate those monsters called popular errors: it is that alone which can set the mind at liberty'."

— Baron d'Holbach (1770), *The System of Nature* (pg. 313)

Quotes | By

The following are noted quotes by Bayle:

"They are not the general opinions of the mind, which determine us to act, but the passions."

— Pierre Bayle (1628), *Various Thoughts on the Occasion of the Comet* (§:177); cited by Baron d'Holbach (1770) in *The System of Nature* (pg. 309-310)

"Spinoza was the **greatest atheist** there ever was and who was so infatuated with certain principles of philosophy that, to meditate on them better he went into retirement, renouncing all that may be called the pleasures and vanities of the world and concerning himself only with abstruse meditations. Sensing that he was near his end [see: atheist deathbed deconversions], he had his landlady come and begged her to prevent any minister from coming to see him in that condition. His reason was, as is known from one of his friends [Adriaan Paets, according to Verniere], that he wished to die without a dispute and that he feared falling into some weakness of the understanding which would make him say something that could be used against his principles. This is to say that he feared that it would be spread about in the world that, when facing death, his conscience having awoken, it made him give the lie to his bravery and renounce his sentiments. Can a more ridiculous and more extreme vanity be seen than this one, and a crazier passion for the false idea one forms of constancy?"

— Pierre Bayle (1628), *Various Thoughts on the Occasion of the Comet* [1]

"In matters of religion it is very easy to deceive a man, and very hard to undeceive him."

— Pierre Bayle (c.1685), *Publication*; cited by David Fitzgerald in *Nailed* (pg. #)

References

1. (a) Bayle, Pierre. (1682). *Various Thoughts on the Occasion of the Comet* (*Pensées Diverses sur l'Occasion de la Comète*) (pg. 227) (translator: Robert C. Barlett). SUNY, 2000.
(b) Verniere, Paul. (1954). *Spinoza et la pensée française avant la Révolution* (pg. 30). Presses Universitaires de France.
(c) Bunge, Wiep van; Krop, Henri; Steenbakkers, Piet; van de Ven, Jeroen M.M. (2014). *The Bloomsbury Companion to Spinoza* (pg. 86). Bloomsbury.
2. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (Bayle, pg. 328; Foe, pg. 330; bible for doubters, pg. 331). HarperOne.
3. Van der Pot, Johan H.J. (1985). *Die Bewertung des Technischen Fortschritts: Eine Systematische Übersicht der Theorien* (volume 2). Uitgeverij Van Gorcum. (c) Van der Pot, Johan H.J. (1999). *Sinndeutung und Periodisierung der Geschichte: eine Systematische Übersicht der Theorien und Auffassungen* (*Of Meaning and Periodization of History: a Systematic Overview at Theories and Concepts*) (list, pg. 959; Bayle, pg. 720). Brill.

External links

- Pierre Bayle – Wikipedia.

In hmolscience, **Pierre Bourdieu** (1930-2002) (CR:9) was a French sociological anthropologist and philosopher noted his phenomenological social physics and social gravity theories.

A claimed to be expert on Bourdieu and his social physics theories is Lebanese-born Australian social anthropologist Ghassan Hage, noted for his 2011 chapter entitled "Social Gravity: Pierre Bourdieu's Phenomenological Social Physics". [1]

American sociologist and religion and culture scholar Christian Smith's 2010 *What is a Person?: Rethinking Humanity, Social Life, and the Moral Good from the Person Up*, is in large part pasted on Bourdieu, along with others such as Michael Polanyi on anti-reductionism, along with the particle-field social theories of Harrison White. [2]

Quotes

The following are noted quotes:

> "The field of power is a field of latent, potential forces which play upon any particle which may venture into it, but it is also a battlefield."
>
> — Pierre Bourdieu (1993), *Field of Cultural Production* [1]

References

1. (a) Bourdieu, Pierre. (1993). *Field of Cultural Production* (pgs. 148-50). Publisher.
(b) Hage, Ghassan. (2011). "Social Gravity: Pierre Bourdieu's Phenomenological Social Physics", in: *Force, Movement, Intensity: the Newtonian Imagination in the Humanities and Social Sciences* (§7, pgs. 80-92; quote, pg. 80). (editors: Hage Ghassan and Emma Kowal). Melbourne University Press.
2. (a) Smith, Christian. (2010). *What is a Person?: Rethinking Humanity, Social Life, and the Moral Good from the Person Up* (Amz). University of Chicago Press.
(b) Christian Smith (faculty) – University of Notre Dame.
(c) Popova, Maria. (2011). "What is a Person?", BrainPIckings.org, Oct 27.

External links

â— Pierre Bourdieu – Wikipedia.

θΔics

In existographies, **Pierre Charron** (1541-1603) (IQ:170|#405) (FA:58) (CR:9) was a French lawyer, turned theologian-monk, turned free thinking philosopher, oft-characterized as the "adopted son" of Michel Montaigne, noted for []

Overview

In 1601, Charron published *On Wisdom* (*De la sagesse*), wherein he presented a system of moral philosophy that developed the ideas of Michel Montaigne; it was characterized, for centuries, as a "seminary of atheism". [1]

In 1640, Charron was listed in Marin Mersenne's "catalog of atheists".

Quotes | On

The following are quotes on Charron:

> "A library should not be without Sextus Empiricus and the two best books in the world are the Bible and **Pierre Charron**'s *Of Wisdom*."
>
> — Gabriel Naude (c.1640), reply to cardinal Bagini on what were the two best books in the world [1]

"A few years after the appearance of the *Essays* [1588] of Montaigne, there was published in France a work, which, though now little read, possessed in the seventeenth century a reputation of the highest order. This was the celebrated *Treatise on Wisdom* [1601], by **Charron**, in which we find, for the first time, **an attempt made in a modern language to construct a system of morals without the aid of theology**. There is about the work of Charron a systematic completeness which never fails to attract attention. In originality, he was, in some respects, inferior to Montaigne; but he had the advantage of coming after him, and there can be no doubt that he rose to an elevation which, to Montaigne, would have been inaccessible.

Taking his stand, as it were, on the summit of knowledge, he boldly attempts to enumerate the elements of wisdom, and the conditions under which those elements will work. In the scheme which he thus constructs, **he entirely omits theological dogmas**; and he treats with undissembled scorn many of those conclusions which the people had hitherto universally received. **He reminds his countrymen that their religion is the accidental result of their birth and education**, and that if they had been born in a Mohammedan country, they would have been as firm believers in Mohammedanism as they then were in Christianity [see: religion as a function of birthplace]. From this consideration, he insists on the absurdity of their troubling themselves about the variety of creeds, seeing that such variety is the result of circumstances over which they have no control. Also, it is to be observed that each of these different religions declares itself to be the true one and all of them are equally based upon supernatural pretensions, such as mysteries, miracles, prophets, and the like. It is because men forget these things, that they are the slaves of that confidence which is the great obstacle to all real knowledge, and which can only be removed by taking such a large and comprehensive view, as will show us how all nations cling with equal zeal to the tenets in which they have been educated.

And, says Charron, if we look a little deeper, we shall see that each of the great religions is built upon that which preceded it. Thus, the religion of the Jews is founded upon that of the Egyptians [see: Egyptian religion]; Christianity is the result of Judaism; and, from these two last, there has naturally sprung Mohammedanism. We, therefore, adds this great writer, should rise above the pretensions of hostile sects, and, without being terrified by the fear of future punishment [see: hell], or allured by the hope of future happiness [see: heaven; afterlife], we should be content with such practical religion as consists in performing the duties of life; and, uncontrolled by the dogmas of any particular creed, we should strive to make the soul retire inward upon itself, and by the efforts of its own contemplation, admire the ineffable

grandeur of the being of beings, the supreme cause of all created things. Such were the sentiments which, in the year 1601, were for the first time laid before the French people in their own mother tongue."

— Henry Buckle (1856), *History of Civilization, Volume One* (pg. 375-77)

Quotes | By

The following are quotes by Charron:

"Whoever does not know how to be silent, is rarely able to speak well."

— Pierre Charron (c.1601), *Publication*; compare Sadi Carnot on giving opinions (O)

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 307-08). HarperOne.

Further reading

● Charron, Pierre. (1601). *On Wisdom, Volume One* (translator: George Stanhope). Bonwick, 1707.
● Charron, Pierre. (1601). *On Wisdom, Volume Two* (translator: George Stanhope). Bonwick, 1707.
● Charron, Pierre. (1601). *On Wisdom, Volume Three* (translator: George Stanhope). Bonwick, 1707.
● Charron, Pierre. (1601). *On Wisdom* (*De la sagesse*) (Paraphrase translation by Myrtilla Daly based on the early 17th century translation by Samson Lennard; Introduction: Marcus Benjamin). Putman, 1891.

External links

● Pierre Charron – Wikipedia.

θΔics

In existographies, **Pierre Duhem** (1861-1916) (IQ:#|#) (CR:34) was a French mathematical physicist, chemical thermodynamicist, historian, and philosopher of science, characterized an "uneasy genius" (Demartres, 1892) (Q), noted for []

Overview

In 1887, Duhem, age 26, published a “Study of the Thermodynamics Works of Willard Gibbs”, digressing on things such as an “historical background of Gibbs’ theory”. [9]

In 1892, Duhem published a “Commentary on the Principles of Thermodynamics: the Principe of the Conservation of Energy”, with discussion on topics such as the fundamental equation, work and the quantity of heat. [9]

In 1893, Duhem published a “Commentary on the Principles of Thermodynamics: the Principe of Sadi Carnot and Clausius”, discussing the Carnot cycle, reversible changes, Carnot’s theorem, absolute temperature, and entropy. [9]

In 1894, Duhem published a “Commentary on the Principles of Thermodynamics: the General Equations of Thermodynamics”, discussing systems in equilibrium, in motion, and on the “total thermodynamic potential”. [9]

In 1902, Duhem penned *Thermodynamics and Chemistry* (*Thermodynamique ct Chimie*); in the 1903 American edition, he stated: [4]

> “One of the objectives I had in mind when writing it was to make the work of J. Willard Gibbs known and admired; I like to think it will contribute to enhance, within your active universities, the glory of your illustrious countryman … [a] glory [becoming] more and more resplendent every day; more and more clearly the author of the phase law appears as the initiator of a chemical revolution; and many do not hesitate to compare the Yale College professor to our Lavoisier.”

In 1907, Duhem penned a pamphlet entitled: "Josiah Willard Gibbs: On the Publication of his Scientific Memoirs" (Josiah Willard Gibbs, a propos de la publication de ses memoires scientifiques).

In 1911, Duhem, in his *Treatise on Energetics* (*Traite d’Energetique*), used the logic of thermodynamic potentials, particularly the Gibbs free energy and Helmholtz free energy, to deploy these in a manner similar to the potentials in mechanics for representing all physical and chemical changes.

Duhem, in his theories on the newly forming concept of the “thermodynamic potential”, in short, built on Willard Gibbs (1876) and Hermann Helmholtz (1882). Duhem’s entire scientific program, in fact, was driven by a conviction that a generalized thermodynamics would be the proper unifying scheme for physical theory, with all of chemistry and physics, including mechanics, electricity, and magnetism, being derivable from thermodynamic first principles. [1]

Duhem’s work was given appreciation later years among German energeticists, such Wilhelm Ostwald and Georg Helm. [1]

Eponyms

Equations eponymously named after Duhem include: the Duhem-Margules equation and the Gibbs-Duhem equation, the latter of which is basis of the phase rule of Gibbs (the first general proof of the phase rule). [5]

Religion | To Save Phenomena

In 1905, Duhem, a devout Catholic, argued that to draw cosmological or religious consequences from thermodynamics was unjustified. [6]

In 1908, Duhem, in his *To Save Phenomena: an Essay on the Idea of Physical Theory from Plato to Galileo*, a series of

articles collectively entitled “To Save Phenomena”, in *Annals of Christian Philosophy*, discussed the relation between physical theory and metaphysics; specifically, between astronomy and physics, and critiques the answers given by Greek thought, Arabic science, medieval Christian scholasticism, and, finally, the astronomers of the renaissance. [10] In short, according to one review, Duhem set out to address the related questions: (a) “what is the value of physical theory?” and (b) what relations do physical theories have to do with metaphysical explanation?”, the gist of his argument being that former aren’t yet precise enough and or are just mathematical approximations and thus not able to measure or quantify the latter. [8]

Education

In 1884, while a third-year student at the Ecole Normale Superieure, Paris, Duhem made a first attempt at a doctorate in physics with a thesis on the concept of the “thermodynamic potential”, with the aim, direct or indirect, supposedly, to disprove French chemist Marcellin Berthelot's 1864 principle of maximum work, a principle which asserting that chemical changes tend spontaneously to produce maximum heat. [7] In retrospect, historically-speaking, the principle of maximum work was first disproved by German physicist Hermann Helmholtz in 1882. Whatever the case, Duhem's thesis submission, while correct, directly criticized Berthelot and his principle. [1] Subsequently, not only Berthelot, but his colleagues as well rejected Duhem's thesis, and he was forced to defend another thesis. [2] Duhem's rejected thesis was, nevertheless, published two years later as Duhem’s first book. [1] Berthelot retaliated, to the publication of this book, by having Duhem relegated to the provinces of France, away from the great schools, libraries, and scientific centers. [7] In 1887, Duhem began work as a lecturer in physics in Lille. Out of his conflict with Berthelot, however, Duhem never won an academic position in Paris. He once commenting, for instance, when asked whether he would be interested in a newly created chair in the history of science at the College of France, that he would go to Paris as a physicist or not at all. [1] Duhem eventually took his doctorate in mathematics from Sorbonne in 1888. From 1894 to 1916, Duhem held the chair of theoretical physics at Bordeaux. [9]

Quotes | On

The following are quotes by Duhem:

> “Mathematicians regret that the principles of thermodynamics should have been developed in general with so little precision that the same proposition can be regarded by some as a consequence, and by others as a negation, of these principles.”
>
> — Pierre Duhem (c.1893), *Publication* [9]

References

1. Pierre Duhem – Routledge Encyclopedia of Philosophy.
2. Nye, Mary J. (1993). *From Chemical Philosophy to Theoretical Chemistry: Dynamics of Matter and Dynamics of Disciplines: 1800-1950* (section: From Chemical Affinity to Chemical Thermodynamics, pgs. 116-20). University of California Press.
4. Duhem, Pierre M.M. (1903). *Thermodynamics and Chemistry: a Non-Mathematical Treatise for Chemists and Students of Chemistry* (Author’s Introduction to the American Edition, pgs. iii-v); translator: George Kimball Burgess. J. Wiley & Sons.
5. (a) Duhem-Margules Equation – McGraw-Hill’s Digital Engineering Library.
(b) Alberty, Robert A. (2003). *Thermodynamics of Biochemical Reactions* (2.4: Gibbs-Duhem equation and the Phase Rule, pgs. 25-26). John Wiley and Sons.
6. Kragh, Helge. (2008). “Pierre Duhem, Entropy, and Christian Faith.” *Physics in Perspective*, Vol. 10, pgs. 379-95.
7. Graves, Dan. (1996). *Scientists of Faith: Forty-Eight Scientists and Their Christian Faiths* (pg. 156). Kregel Resources.
8. (a) Duhem, Pierre. (1908). *To Save the Phenomena: an Essay on the Idea of Physical Theory from Plato to Galileo* (originally a series of articles in: *Annales de Philosophie Chretiennes*, published as collected monograph: *Sozein Ta Phainomena*). University of Chicago Press, 1969.
(b) Stenger, Victor J. (2013). *God and the Atom: from Democritus to the Higgs Boson: the Story of a Triumphant Idea* (pg. 62). Prometheus Books.

(c) Duhem, Pierre. (1996). *Essays in the History and Philosophy of Science* (translators, editors, and section introductions: Roger Ariew and Peter Barker) (pg. 131). Hackett Publishing.
9. Duhem, Pierre. (1893). *Commentary on the Principles of Thermodynamics* (editor, translator, introduction: Paul Needham). Springer, 2011.
10. Duhem, Pierre. (1908). *To Save Phenomena: an Essay on the Idea of Physical Theory from Plato to Galileo* (translators: Edmund Dolan and Chaninah Maschler; introduction: Stanley Jaki) (abs). University of Chicago Press, 1969; 2015.

Further reading

● Duhem, Pierre. (1903). *L'Evolution de la Mecanique*. A. Joanin.
● Jaki, Stanley. (1984). *Uneasy Genius: the Life and Work of Pierre Duhem.* Springer, 2012.

External links

● Pierre Duhem – Wikipedia.

θΔics

In existographies, **Pierre Dulong** (1785-1838) (CR:8) was a French physical chemist, noted for []

Overview

In 1817, Dulong, along with physicist Alexis Petit, in the correction to Newton's law of cooling, later to be named the law of Dulong and Petit. The found that by experimenting through temperature ranges as high as 243º C, found that the quickness of cooling for a constant excess of temperature, increases in geometrical progression, when the temperature of the surrounding space increases in arithmetical progression. [1] In thermochemistry, Dulong is known for having done some of the first work on heat in relation to respiration in animals. [2]

Quotes | By

The following are quotes by Clapeyron:

> "**Dulong**, in in his 'Researches on the Specific Heats of Elastic Fluids', established, by experiments, which are free from all objections, that equal volumes of all elastic fluids at a given temperature and pressure, compressed or expanded suddenly by a given fraction of their volumes, release or absorb the same absolute quantity of heat."
>
> — Emile Clapeyron (1834), "Memoir on the Motive Power of Heat" (pg. 73)

References

1. Whewell, William. (1866). *History of the Inductive Sciences*, (section: "Correction of Newton's law of cooling", pgs. 149-50). Appleton.
2. Hirn, Gustave. (1868). *Philosophical Implications of Thermodynamics* (*Métaphysique et conséquences philosophiques de la thermodynamique: l'analyse fondamentale de l'univers*) (*Metaphysics and Philosophical Implications of Thermodynamics: Basic Analysis of the Universe*). Paris: Gauthier-Villars.

External links

â— Pierre Louis Dulong – Wikipedia.

θΔics

In existographies, **Pierre Fermat** (1607-1665) (IQ:175|#223) (Cattell 1000:893) [RGM:628|1,500+] (Murray 4000:5|M) (GME:14) (CR:8) was a French mathematician and lawyer, noted for []

Overview

In 1729, Leonhard Euler began to read Fermat's work seriously following correspondence with German mathematician Christian Goldbach (1690-1764) on some of Fermat's observations; which thus acted to launch the long drawn-out study of "reciprocity laws", upward through the works of Adrien-Marie Legendre, Carl Gauss (1777-1855), Johann Dirichlet (1805-1859), Carl Jacobi (1804-1851), and Sergei Eisenstein (1898-1948). [1]

Quotes | By

The following are quotes by Fermat:

> "Perhaps, posterity will thank me for having shown that the ancients did not know everything."
>
> — Pierre Fermat (1659), "Letter to Pierre de Carcavi (an amateur mathematician) in 'Relation of New Discoveries in the Science of Numbers'" (Ñº), Aug

> "To divide a cube into two other cubes, a fourth power, or in general any power whatever into two powers of the same denomination above the second is impossible, and I have assuredly found an admirable proof of this, but the margin is too narrow to contain it."
>
> — Pierre Fermat (c.1660), theorem (Ñº), beside the eighth proposition of the second book of *Diophantus*; Heinrich Olbers attempted to coax Carl Gauss in to solving this in 1816; it was finally solved by Andrew Wiles in 1994

References

1. Lemmermeyer, Franz. (2000). *Reciprocity Laws: From Euler to Eisenstein*. Springer.

External links

â— Pierre de Fermat – Wikipedia.

θΔics

In existographies, **Pierre Gassendi** (1592-1655) (IQ:190|#30) (Cattell 1000:218) (CR:94) was a French thinker and polymath noted for his explosion on the atomic theory, physics, and philosophical implications of the *circa* 300BC work of Greek philosopher Epicurus, outlined in his 1647 book *De vita, moribus, et doctrina Epicuri libri octo* (*On the Life and Death of Epicurus Book Eight*) followed by the 1649 commentary *Syntagma philosophiae Epicuri* (*Arrangement of the Philosophy of Epicurus*), in which he was the first (or one of the first) to coin the term 'molecule' defined as two or more atoms joined together in an attachment. The set of books were supposedly written to counter the philosophical views of Rene Descartes.

Astronomy

Gassendi, using telescope lenses provided by Galileo Galilei, made numerous astronomical observations that helped establish the validity of Kepler's laws of planetary motion. In 1631, he observed Mercury transit in front of the sun, thus providing strong evidence of the Copernican model. Gassendi also denounced astrology since it had no empirical support. [5]

Moving ship experiment

Gassendi did the experiment in which a stone was dropped from the mast of a moving ship, to test whether it would maintain the speed of the ship, and fall at the base of the mast, or whether it would fall behind or in front of the mast, because the earth was at rest (Ptolemaic) and or moving (Copernican). Galileo, prior to Gassendi, in 1624, had suggested the thought experiment as a way to test for the validity of Copernicanism (Q); later publishing an account of it is his 1632 his *Dialogue Concerning the two Chief World Systems.* (Q)

Actual or thought experiments similar to the moving ship ball dropping experiment, prior to Galileo or Gassendi, had previously discussed, supposedly (Q), by: Jean Buridan, Nicolas Oresme, Nicolaus Cusanus, Clavius, Giordano Bruno, and Hypatia (Q).

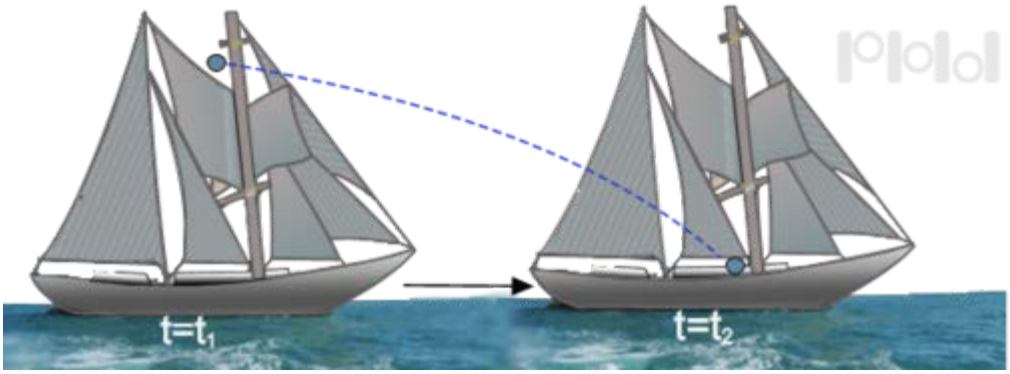

A depiction of **Gassendi**'s moving ship stone dropping experiment.

Animation

Gassendi gave the following comments in regards to animation and movement: [3]

> "Who can easily comprehend that small thing … within the body of an elephant … that it should be able to agitate such a bulk, and to cause it to perform a swift and harmonious dance? But indeed, the same fiery nature of the soul, serves within the body by its own mobility, what a little flame of gunpowder does in a cannon: it not only drives the bullet with so much force, but also drives back the whole machine with so great strength."

Gassendi, here, in his comment "but also drives back", seems to be speaking of what would be come the third law of motion, of the laws of motion (1687); and his his comment about the great effect of the "little flame" is a precursor to the concept of activation energy (1889).

In his descriptions, such as above, he might have also used the term "animal machine" (check). [4]

Molecules

In his 1649 book, Gassendi presented the view that the properties of atoms (e.g. their taste) depend on their shape (pointed or round, elongated or squat, etc.), and he had the idea that they might join together, to form what he called

‘molecules’, by a kind of hook-and-eye mechanism. [1] Gassendi held the view that objects, such as metal, should be resolvable into the five elements, but that he held the unique view that the five elements should be further resolved into seeds (or molecules) and then into atoms: [2]

> “I remain silent here about what could be added concerning the resolution of those five principles into their seeds and finally into atoms.”

In short, he wrote a book on the life of Epicurus, reasoned that to account for the size and shape of atoms moving in a void could account for the properties of matter. Heat was due to small, round atoms; cold, to pyramidal atoms with sharp points, which accounted for the pricking sensation of severe cold; and solids were held together by interlacing hooks.

Evolution

In his reformulation of Lucretius’ view of evolution, wherein the world began as a random arrangement of separated atoms that came together by chance to form seeds and bodies, Gassendi gave the view that:

> “While [the atoms] are moving in various ways and meeting, interweaving, intermingling, unrolling, uniting, and being fitted together, molecules or small structures similar to molecules are created, from which the actual seeds are constructed and fashioned.”

This seems to be a fairly advanced view for his day in age, possibly comparable to the later work of French philosopher Jean Sales and his 1789 human molecular hypothesis.

Religion

Gassendi, while following the basic tenets of Greek atomic theory, believed that atoms were put their by god. [5]

Note

It is sometimes said that Rene Descartes may have used the term ‘molecule’ prior to Gassendi, as some references attribute the etymology of the term molecule to Descartes, but a definitive reference for this needs to be determined.

Quotes | By

The following are noted quotes:

> “But because men may yet be puzzled with the universality and constancy of this regularity, and its long continuance through so many ages, that there are no records at all of the contrary anywhere to be found; the **atomic atheist** further adds, that the senseless atoms, playing and toying up and down, without any care or thought, and from eternity trying all manner of tricks, conclusions and experiments, were at length (they know not how) taught, and by the necessity of things themselves, as it were, driven, to a certain kind of trade of artificialness and methodicalness; so that though their motions were at first all casual and fortuitous, yet in length of time they became orderly and artificial, and governed by a certain law, they contracting as it were upon themselves, by long practice and experience, a kind of habit of moving regularly; or else being, by the mere necessity of things, at length forced so to move, as they should have done, had art and wisdom directed them.”
>
> — Pierre Gassendi (c.1648), *Arrangement of the Philosophy of Epicurus*; refuted by Ralph Cudworth, 1678; quoted by Charles Peirce (Q) [6]

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θΔics

In existographies, **Pierre Huet** (1630-1721) was a French religio-mythology scholar noted for []

Overview

In 1679, Huet, in his *Demonstration of the Gospel* (*Demonstratio Evangelica*), building on the earlier works (O) of Origen, he attempted to use the method of comparative religion and mythology a "proof" of the Old Testament; arguing something along the lines that ancient populations had received Moses' teachings. [1]

In 2010, Dorothy Murdock cited Huet, along with Gerardus Vossius, as the first two thinkers to have completed massive studies on comparative mythology and modern religion. [2]

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External links

- Pierre Daniel Huet – Wikipedia.

θΔics

In existographies, **Pierre-Simon Laplace** (1749-1827) (IQ:195|#15) (Cattell 1000:233) [RGM:1306|1,500+] (Murray 4000:8|CS / 4|A) (GPE:34) (CR:189) was a French mathematician, physicist, and astronomer, a disciple of Baron d'Holbach (Blumenau, 2014) (Q), notable for having built the first ice calorimeter with Antoine Lavoisier in 1782, with which they made measurements of heat released or absorbed during various chemical reactions and processes, according to which he is one of the founders of thermochemistry. [1]

Social physics

In 1795, Laplace, in his *A Philosophical Essay on Probabilities*, Chapter X: Application of the Calculus of Probabilities to the Moral Sciences, famous commented: [3]

> "Let us apply to the political and moral sciences the method founded upon observation and upon calculus, the method which has served us so well in the natural sciences."

A follower of Laplace's social science dictum, according to American social science historian Theodore Porter, was Adolphe Quetelet. Quetelet's mécanique sociale, later physique sociale, was conceived as the social analogue to Laplace's mecanique celeste, and embodied the results of an unswerving commitment not only to the presumed method of celestial physics, but even to its concepts and vocabulary. It is too weak to say that Quetelet's goal was the transmission of the achievements of celestial physics into the social sphere. He aspired to nothing less than imitation. [4]

Other

In 1796, Laplace famously published his *Exposition of the System of the World*, which outlined the mathematical details of what has come to be known as the nebular hypothesis, the theory that the solar system formed billions of years ago from a quickly rotating nebula, or interstellar gas cloud, and that the planets and the sun coalesced from this rotating mass in accordance with the mechanical laws of nature.

Laplace is also eponym of Laplace's demon (1814), a precursor, so to speak, of Maxwell's demon (1867).

Laplace's work on the mathematics of force is said to have been precursor to the later development of the concept of potential.

Quotes | On

The following are quotes on Laplace:

> "**Laplace** is the Newton of France."
>
> — Simeon Poisson (c.1820), *Publication* (Q)

> "Among the chemical reactions that can develop heat in the living being, the most important, one that predominates all others, is that resulting from the absorption of oxygen from the air and its combination with the elements fuel supplied by food. Breathing, in short, is the main cause, if not unique, the production of vital heat. This was established beyond doubt, first, in the experiments of Lavoisier, **Laplace**, and then those of Dulong and Regnault, on animals of different species, and then finally my experiments on humans."
>
> — Gustave Hirn (1868), *Philosophical Implications of Thermodynamics* [2]

See also

- Napoleon Laplace anecdote

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θΔics

In hmolscience, **Pierre Laszlo** (1938-) is a French organic chemist noted for his 1978 article "All Kinds of Affinities", on German polyintellect Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*, and for his 1995 *Organic Reactions* textbook wherein he mentions the character Mittler (P1:C2) as being representative of an auxiliary molecule or mediator (catalyst) that has the ability to convert reactants from inert from to labile form via lowering the activation energy barrier of the transition state. [1]

Overview

In 1995, Laszlo, in his *Organic Reactions*, cites Goethe as follows: [2]

> "We will not develop further this topic in this chapter: the conversion from inert to labile—by lowering the transition state with an auxiliary molecule, a mediator (just like the character of 'Mittler' in Goethe's *Elective Affinities*)—is by definition *catalysis*. Catalysis of organic reactions is field in full expansion."

This is one of the rare handful of citations to Goethe human chemical theory in a chemistry textbook.

In 2001, Laszlo, in his *Salt: Grain of Life*, his most widely-held book, touches on the history of salt, from the Roman salt pay origin of the term "salary" to so-called evil diminution effect of having or throwing salt about one's environment—though, to note, he doesn't seem to speculate on the neurochemical explanation this effect in regards to the air ionization effect, i.e. positive air ion (+) concentration increase, of throwing salt, similar to the feel good effect that occurs around campfires, waterfalls, and after thunderstorms. [2]

Education

Laszlo studied chemistry at Grenoble and then completed his PhD in chemistry at Sorbonne in 1965, becoming an assistant professor at the University of Princeton. In 1970 he became a professor at the University of Liege, remaining there until 1999, after which he seems to have switched over into a writing career, mostly in general science and popular chemistry subjects. Laszlo's self-written 2001 minibiography is: "honorary professor of chemistry at the Ecole Polytechnique in Paris, France and the University of Liege, Belgium. Was on the faculty at Princeton University in the late 60s. Has Held a dozen visiting professorships in various American universities (Berkeley, Chicago, Colorado, Cornell, Johns Hopkins, etc.). Main research interest is catalysis of organic reactions by inorganic solids: such as the clay minerals. More than 200 primary publications and 15 published monographs, textbooks and essays in the popularization of science." [3]

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θΔics

In existographies, **Pierre Lecomte du Nouy** (1883-1947) (CR:5) was a French-born American mathematician, biophysicist, and religious philosopher noted, in religious thermodynamics, for his 1942 Boltzmann-based argument that the second law does not apply to humans.

Overview

In 1939, Nouy, in his *The Road to Reason*, penned discussions on entropy, molecules, Maxwell's demon, kinetic theory, thermodynamics, Arthur Eddington, etc., as a standard reference for the argument on the improbability of living things to have formed out of the random chance of the material of the universe, from a statistical-mechanical point of view. [3] Advocates of intelligent design tend to cite his book.

In 1942, du Nouy, in his *Human Destiny*, used a Boltzmann-themed statistical view of thermodynamics, he seems to argue that the second law of thermodynamics does not apply to humanity and that god is synonymous with anti-chance; the following his oft-repeated quote: [1]

> "Obviously, Carnot-Clausius law, sometimes called the second law of thermodynamics, does not apply to living organisms."

Nouy seems to use a crude version of statistical thermodynamics to argue that simple forms of life, such as a protein molecule, could not have formed by chance, because the universe is not old enough; and seems to interject on speculations of a god as a means of life explanation. [2]

Telefinalism

Nouy, at some point, met Pierre Teilhard, whom with he shared similar interests in evolution and spirituality. Nouy later went on to develop a theory called "telefinalism", crudely defined as "evolution directed by some kind of internal direction" (Ñº), which accepted mutation and natural selection, but in some way that god was directing the overall operation, or something along these lines.

Other

Nouy is cited by Rudolf Arnheim in his 1971 *Entropy and Art.* [4]

Quotes | On

The following are quotes on Nouy:

> "Descartes's grossly mechanistic interpretation of life, and the logical extreme to which his ideas were carried by Holbach and de la Mettrie, inevitably provoked a reaction leading to vitalistic theories which have been in vogue, off and on, to the present day. I have only to mention names like Driesch (entelechy), Bergson (elan vital), and **Lecomte du Nouy** [telefinalism] among the more prominent authors of the recent past. Though these authors may differ in particulars, they all agree in claiming that living beings and life processes cannot be causally explained in terms of physical and chemical phenomena. It is our task to ask whether this assertion is justified, and if we answer this question with 'no', to determine the source of the misunderstanding."
>
> — Ernst Mayr (1961), "Cause and Effect in Biology" [5]

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θΔics

In human thermodynamics, **Pierre A. Levy** (1956-) is a Canadian cyberspace philosopher noted for his 1994 book *Collective Intelligence*, in which, very superficially and verbally, he theorizes on human molecule / human chemistry / human thermodynamics type of metaphors and logic applied to the growing social bonding and organization of the internet.

Overview

Levy defines collectives as organic "molar groups", he speaks of entropy of men and women in bulk, theorizes about the engineering social bonds from a molecular philosophy / political thermodynamics point of view, even being one of the first to use the term human thermodynamics in a sentence. His main theme is to view the internet as a new type of connective mind (like the noosphere) and to explain this organization through the sciences of chemistry (people in groups viewed as molar masses), thermodynamics, self-organization, among other subjects. In defining collective intelligence, Levy states: "the possibility of cyberspace allows us to envisage forms of economic and social organization based on collective intelligence and the enhancement of humanity in all its variety." On entropy he asks:

> "How do we stop treating men and women entropically, in bulk, in the mass, as if they were interchangeable within their category, and consider them as unique individuals?"

On the question of management of his new internet organization, Levy interestingly argues that a new field of human molecular social engineering will be needed:

> "When intelligently managed organizations are no longer able to confront the complexity of existing situations, how do we make the transition to organizations that are collectively intelligent? These are representative of the problems that face us when we attempt to engineer the social bond—the molecular technology of a politics that has yet to be invented."

In defining groups in the metaphor of chemistry he states:

> "Families, clans, and tribes are *organic* groups [carbon-based entities]. Nations, institutions, religions, larger corporations, as well as the revolutionary 'masses' are organized groups, molar groups, which undergo a process of transcendence or exteriority in forming and maintaining themselves. Finally, self-organized, or molecular, groups realize the ideal of direct democracy within very larger communities in the process of mutation and deterritorialization."

(add discussion)

Thermodynamics

In rare pre-year-2000 human thermodynamics quotations, Levy is one of the earliest users of the term:

> "Based on identities of adhesion, individuals are seen as a mass, as numbers, independent of their molecular wealth. The molar group organizes a kind of human thermodynamics, an exteriorized channeling of behavior and character that squanders individual qualities."

Beyond these few example quotes, it seems that his entire section one of his book, entitled "Engineering the Social Bond", specifically chapter 3: From the Molar to the Molecular: the Technology of the Collective Intelligence (pgs. 39-

56), is a treasure trove of interesting human molecular theory, yet to be explored.

Education

Levy completed his MS in the history of science (1980) at Sorbonne, Paris, his PhD in sociology (1983) at EHESS, Paris, and PhD in information and communication sciences (1991) at Grenoble, France. [2]

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â— Levy, Pierre (1956-) – WorldCat Identities.

θΔics

In existographies, **Pierre-Joseph Macquer** (1718-1784) (CR:7), or P.J. Macquer, was a French chemist, noted for

Overview

In 1749, Macquer, in his *Elements of the Theory of Chemistry*, expanded on the pioneering 1718 affinity table work of French physician and chemist Étienne Geoffroy, the effort of which he summarizes as such: [1]

> "All the experiments that have been hitherto carried out, and those that are still being daily performed, concur in proving that between different bodies, whether principles or compounds, there is an agreement, relation, affinity or attraction (if you will have it so), which disposes certain bodies to unite with one another, while with others they are unable to contract any union: it is this effect, whatever be its cause, which will help us to give a reason for all the phenomena furnished by chemistry, and to tie them together."

The following diagram, from the 1753 second edition, is the famous illustration of three putti, in a chemistry laboratory, studying Geoffroy's affinity table: [2]

(add)

Quotes | On

The following are quotes on Macquer:

> "Despite the caution of Black and his followers, in the second half of the eighteenth century, there was a hardening of opinion in favor of the **'**material theory of heat**'**. The difficulties of the 'kinetic theory' which was favored by mathematicians and physicists were still unresolved, while the chemists who came increasingly to dominate the study were, perhaps by tradition (in the footsteps of Boerhaave), perhaps by metaphysical preference, predisposed to favor the substantial theory. An exception was **Pierre Macquer**, but he had few disciples."

— Donald Cardwell (1971), *From Watt to Clausius* (pg. 57)

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External links

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θΔics

In existographies, **Pierre Maupertuis** (1698-1758) (IQ:185|#48) [RGM:370|1,500+] (Cattell 1000:598) (Eells 100:59) (GME:#) (FA:32) (SN:69) (GPE:66) (CR:30) was a French mathematician-physicist, philosopher, and evolutionist, aka "radical materialist", noted for his 1745 book *Venus Physics*, in which he outlined a materialistic godless 'blind destiny' inherited traits fitness variation evolution model, and for his 1746 principle of least action, loosely that a system of point masses tend to minimize action.

Voltaire

Maupertuis and Voltaire seems to have an antagonistic feuding relationships. Voltaire, supposedly, had referred to Julien La Mettrie as the "court atheist" of Frederick the Great; also, shortly, after La Mettrie passed (1751), Maupertuis spread the story that Voltaire had said that now the post of the "royal atheist" was vacant. [13]

Principle of least action

Maupertuis, at some point, generalized Newton's first law, to formulate the theorem of least action, the gist of which Alfred Whitehead (1925) summarizes as follows:

> "**Maupertuis** conjectured that a particle travelling through a field of force would realize the least possible amount of some quantity. He discovered such a quantity and called it the integral action between the time limits considered. In modern phraseology it is the sum through successive small lapses of time of the difference between the kinetic and potential energies of the particle at each successive instant. This action, therefore, has to do with the interchange between the energy arising from motion and the energy arising from position. Maupertuis had discovered the famous theorem of least action."

Whitehead goes onto explain how this method was extended by Joseph Lagrange. [12]

Between 1881 and 1884, German physicist Hermann Helmholtz attacked the question of how to integrate energy conservation and Maupertuis's principle of least action. Note: check to see how this relates to his 1882 *On the Thermodynamics of Chemical Processes* and free energy or free energy minimization.

Intelligent atoms | Diderot debate

See main: Maupertuis-Diderot debate

Maupertuis seems to have held a panpsychism/panbioism perspective, ascribed to "corpuscles" (atoms) the property of life and intelligence, albeit according to relative degrees in matter, increasing from stones to plants to animals; and that the intelligence attained by the whole organism was not merely a matter of amount, but also a matter of arrangement. [9]

Maupertuis, in debate with Denis Diderot, described as an "exchange or polemic of two authors trading accusations of atheism" (Ñº), surrounding the definition of matter and molecule, promoted a non-supernatural duality theory, according to which two types of matter existed: organic and inorganic. [11]

System of Nature

In 1751, Maupertuis, in his *System of Nature: Essay on Organized Bodies*, gives the following objection: [5]

> "Should we speak here of this absurd system, if a system it is, imagined by an impious philosopher, adorned by a great poet with all the richness of his art, a system that libertines of our time would like to revive? This system admits as principles of the universe only eternal atoms, devoid of feelings and intelligence, the fortuitous encounters of which formed all things: an accidental organization generates the soul, which is destroyed as soon as the organization ceases … Never will the formation of any organized body be

> explained solely by the physical properties of matter; to be convinced of this one need only read the writings of the philosophers who have tried this explanation, from Epicurus to Descartes."

(add discussion)

Students

In 1733, Maupertuis began to tutor Emilie Chatelet in advanced geometry and algebra. [10]

Human chemistry

> *See also: Maternal imagination theory*

The assumption that conscious beings are comprised of atoms led Maupertuis, often characterized as radical materialist, to conclude that atoms 'feel' attraction and repulsion; this view is sometimes compared or contrasted with Goethe and his *Elective Affinities*. [1]

Venus physics | Chemical evolution

In 1744 he presented the memoir "Agreement on the Different Laws of Nature" ("Accord de différentes lois de la nature") and published "Dissertation on the White Negro" ("Dissertation sur le négre blanc"), the latter of which becoming the precursor of his 1745 *Venus Physics: Dissertation on the Origin of Men and Animals* (Vénus physique: *Dissertation sur L'Origine des Hommes et des Animavx*, published anonymously, which was an enlarged and more fully analyzed argument against the then dominant biological theory of the preformation of the embryo. [4]

Maupertuis argued convincingly that the embryo could not be preformed, either in the egg or in the animalcule (spermatozoon), since hereditary characteristics could be passed down equally through the male or the female parent. He rejected the vitalistic notion that some "essence" from one of the parents could affected the preformed fetus in the other parent, or that maternal impressions could mold the characteristics of the offspring. A strict mechanist, although a believer in the epigenetic view of the origin of the embryo, he looked for some corporeal contribution from each parent as a basis of heredity. [4]

The book was part popular science, part philosophy, and part erotica, in which proposed a theory of generation (i.e. reproduction) in which organic matter possessed a self-organizing (check) "intelligence" that, supposedly, was analogous to the contemporary chemical concept of affinities.

Maupertuis here outlined a materialist version of evolution, supposedly, based on blind random chance (or "blind destiny", as Maupertuis seems to have put it) and the fitness of variations of traits to survive: [3]

> "Could one not say that, in the fortuitous combinations of the productions of nature, as there must be some characterized by a certain relation of fitness which are able to subsist, it is not to be wondered at that this fitness is present in all the species that are currently in existence? Chance, one would say, produced an innumerable multitude of individuals; a small number found themselves constructed in such a manner that the parts of the animal were able to satisfy its needs; in another infinitely greater number, there was neither fitness nor order: all of these latter have perished. Animals lacking a mouth could not live; others lacking reproductive organs could not perpetuate themselves. The species we see today are but the smallest part of what **blind destiny** has produced."

Supposedly, following either Aristotle and or Galen, Maupertuis, in his *Earthly Venus*, attributed generation to the mixture of male and female seminal fluids or chemical particles, which combined, he speculated, in a manner resembling the 'elective affinity' recently proposed by chemists (possibly Etienne Geoffroy, 1718). [6] Normally, he reasoned, offspring would be a blend of the organic particles (representative of the various parts of the body), e.g. a child having a blend of the skin colors of both parents; sometimes, however, an offspring might receive an extra particle

or not enough particles, resulting in mutated or monstrous offspring, such as the albino black child produced from two normal black parents, that he had observed. [7]

This seems to be a very interesting theory; possibly the first "chemical affinity" based theory of sex; pre-dating Goethe; and the precursor to the way in which the haploid number of chromosomes of the gamete (sperm and egg) of the male and female actual do combine, as modern physical science sees things, in terms of free energy determinants. [8]

Kant

German philosopher Arthur Schopenhauer suggests that much of Immanuel Kant's 1781 *Critique of Pure Reason* was culled or based on Maupertuis. [2]

Education

Maupertuis was mentored by Johann Bernoulli (see: Euler genealogy) and was a follower of Gottfried Leibniz.

Quotes | On

The following are quotes on Maupertuis:

> "The brilliance of much of what he did was undermined by his tendency to leave work unfinished, his failure to realize his own potential: it was the **insight of genius** that led him to least-action principle, but a lack of intellectual energy or rigor that prevented his giving it the mathematical foundation that Lagrange would provide. ... he reveals **remarkable powers of perception** in heredity, in understanding the mechanism by which species developed, even in immunology, but no fully elaborated theory. His philosophical work is his most enthralling: bold, exciting, well argued."
>
> — David Beeson (1992), *Maupertuis: an Intellectual Biography* (pg. 5) (Ñº)

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External links

â— Pierre Louis Maupertuis – Wikipedia.

θΔics

In thermodynamics, **Pierre Perrot** (1939-) is a French physicist and thermodynamicist noted for the publication of his 1994 thermodynamics dictionary *A to Z of Thermodynamics*, containing 587 thermodynamics' definitions and terms. [1]

Education

Prior to the writing of his dictionary, Perrot had taught thermodynamics for over twenty years. Perrot is associated with the Laboratoire de Metallurgie Physique and the University of Lille, at the latter of which he is an emeritus professor. He is also the author the 1998 French problems/solutions manual *Thermodynamique Chimique* (*Chemical Thermodynamics*), intended for graduate students. [2]

Hmolpedia

Perrot's thermodynamics 587-term dictionary is one of American electrochemical engineer Libb Thims' favorite books, and in some way has been an inspiration and and worked as a mental outline or starting point for many articles in the 2007-2010 *Encyclopedia of Human Thermodynamics* turned 2011-present *Hmolpedia: an A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*. Perrot's dictionary is one of the most spine-cracked and re-glued books in Thims' library.

Dictionary origin

Perrot's 1994 French *Dictionnaire de Thermodynamique* (published in 1998, in English, as *A to Z of Thermodynamics*), found its origin during a visit to the library at the University of Lille. During one visit to the university library, Perrot, having thoughts of writing a thermodynamics textbook, counted that there were 57 thermodynamics books for students, which very approximately recopied one another, giving nearly the same presentation. In this situation, Perrot thought that it did not seem useful to make the 58th, and instead wrote the world's first thermodynamics dictionary. [3]

Quotes

The following are notable quotes by Perrot:

> "Isn't thermodynamics a fine intellectual structure, bequeathed by past decades, whose every subtlety only experts in the art of handling Hamiltonians would be able to appreciate."

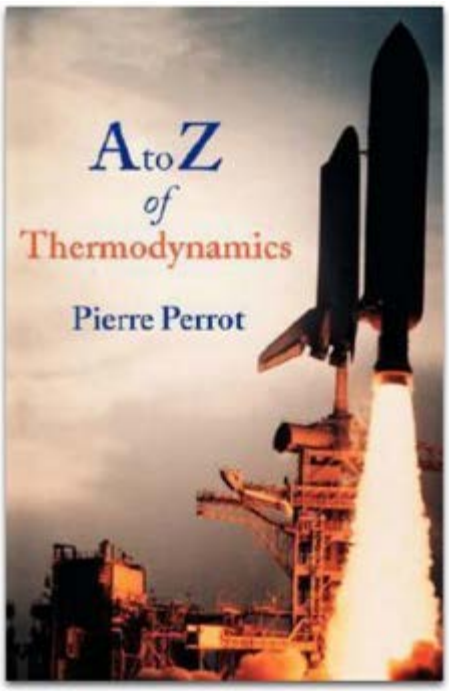

Perrot's 1898 *A to Z of Thermodynamics*, the English version of his 1994 *Dictionnaire de Thermodynamique*, containing some thermodynamics 587-terms. [1]

References

1. (a) Perrot, Pierre. (1998). *A to Z of Thermodynamics*. Oxford University Press.
(b) Perrot, Pierre. (1994). *Dictionnaire de Thermodynamique*. Publisher.
2. Perrot, Pierre. (1998). *Thermodynamique chimique: Problèmes corrigés et commentés avec rappels de cours* (French) (English). Dunod.
3. Email discussions between Libb Thims and Pierre Perrot on 05 January 2009.

Further reading

â— Perrot, Pierre. (2007). "Some Problems in the Teaching of Thermodynamics", *Joint European Thermodynamic Conference* IX, Ecole nationale superieure des mines de Saint-Etienne, France.

External links

â— Perrot, Pierre – WorldCat Identities.

θΔics

In existographies, **Pierre-Joseph Proudhon** (1809-1865) (IQ:#|#) (Cattell 1000: 742) (Gottlieb 1000:648) (CR:2) was a French politician, economic theorist, and self-defined anarchist, noted for []

Other

Proudhon is listed (Q) in Johan van der Pot's 1985 social Newton stylized ranking.

Influence

Proudhon was an influence to Guillaume de Greef. [1]

Quotes | On

The following are quotes on Proudhon:

> "Like other young men with blood in their veins, I wanted to do something to reform the world – to get rid of poverty and war, and so on. So I read Godwin, **Proudhon**, Marx and innumerable others. Kropotkin, revolutionary, but still a scientist, pointed out how important for any attempt to improve society was a scientific understanding of it."
>
> — Alfred Radcliffe-Brown (c.1940), commentary on his early education [3]

> "The French produced most of the leaders of utopian socialism: Henri de Saint-Simon, Charles Fourier, and **Pierre-Joseph Proudhon**, e.g. were all famous for their schemes for the perfect community, including a great deal of gender equality, free love, and of course, free thought."
>
> — Jennifer Hecht (2003), *Doubt: a History* [2]

Quotes | By

The following are quotes by Proudhon:

> "Anarchy is order without power."
>
> — Pierre Proudhon (1848), *Confessions of a Revolutionary*

References

1. Shantz, Jeff. (2012). "Syndicalist Sociology: the Forgotten Work of Guillaume de Greef" (Q), AlternativeHistoryOfSociology.org.
2. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 385). HarperOne.
3. Stocking, George. (1995). *After Tylor, British Social Anthropology, 1888–1951* (pg. 305). University of Madison.

External links

- Pierre-Joseph Proudhon – Wikipedia.

θΔics

In hmolscience, **Pierre Rousseau** (c.1950-) is an American philosopher and photographer noted for his 2006 photography philosophically viewing cars on a highway as a constant flow of human molecules.

Overview

In 2006, Rousseau published the following photo entitled “The Constant Flow of Human Molecules” of slowly moving traffic on a highway in Texas, subtitled “in blind service to Kant's Categorical Imperative:

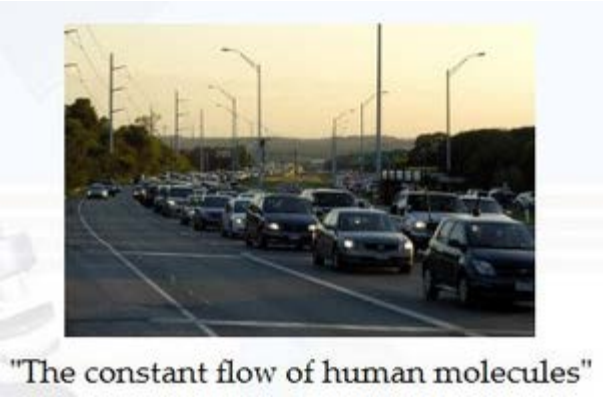

The newest psycho-babble craze is to get happy by perseveration of "good" behaviors, in acceptance of and slavery to the machine.” [1] Much of Rousseau's thinking seems to revolve around an interment of the concept of free will, explication of machine behavior, and self-organization, among other subjects. The following is Rousseau’s views on free will, dynamics, and energy: [2]

> “The realization is that the idea of free will is not only wrong and not necessary, but fatal. The full dynamic of the universe is a transfer of energy/information, regardless of whether there are loops of incomplete information stirring up the process, such as genetics (sexual selection) or memetics (reality selection). The idea of free will is a cover-up in a process systemically bent, by way of the institution of incomplete feedback loops of ideas as in memetics, on evolving humanity out of existence.”

(add discussion)

References

1. Rousseau, Pierre. (2006). “The Constant flow of Human Molecules”, Pbase.com.
2. Rousseau, Pierre. (2010). “Breaking Through to Us, Human”, Jul 10, Lodown | Human Perspective: the only good thing in this world – Lodown.net.

External links

â— Pierre Rousseau: Diary of a Zombie Savant – Pierre-Rousseau.net.

θΔics

In existographies, **Pierre Teilhard** (1881-1955) (IQ:180|#121) (Gottlieb 1000:809) [CR:153] was a French scientific-religious philosopher noted for his religious thermodynamics views on energy, consciousness, irreversibility, thermodynamics, the direction of evolution, and the conception of a person as a "human molecule", which he considered as an evolved structure of atoms, as captured in his 1938 *The Phenomenon of Man*, and other post-humorously published works.

His general theory or objective, being biased by presupposed a religious mandate in the structure of the universe, was to draw up the main lines of a "spiritual energetics" that he defined as "psychodynamics, on the analogy of thermodynamics" or a "motor force in the universe", devoted to the study of "the conditions under which the human zest for auto-evolution and ultra-evolution occurs in relationship to dissipation". [1]

Overview

Teilhard, being a Jesuit priest and paleontologist, who studied chemistry, physics, botany, and zoology and received his doctorate in geology, was conflicted by the contrast between the teachings of the religious scriptures and that of science. To remedy this, in his private writings, written between 1916 and 1955, published only post-humorously, Teilhard sought his own philosophy, an élan vital type of atomic spirituality in which the direction of evolution was towards the formation of higher mental spheres, e.g. the noosphere, from atom to man and beyond, as in the omega point. His writings, being against Catholic doctrine, were generally banned by the church after 1925.

Free energy

In the decade when Teilhard was in his peak, in regards to theory development, i.e. with the publication of his *The Phenomenon of Man* (1938), the Gibbs free energy interpretation of freely-running isothermal isobaric natural phenomenon, was just being introduced to the world, via Gilbert Lewis (1923) and Edward Guggenheim (1933); hence, it would seem likely that Teilhard as not thinking directly in terms of Gibbs-based logic in his time. The modern connections, however, can be discerned. Shown adjacent, e.g., is American biophysicist Harold Morowitz's 2002 take on the connections between Teilhard's 1936 theories and Gibbs free energy. [7]

Education

When he was 11, he went to the Jesuit college of Mongré, in Villefranche-sur-Saône, where he completed baccalaureates of philosophy and mathematics. From 1905 to 1908, he taught physics and chemistry in Cairo, Egypt, at the Jesuit College of the Holy Family. Teilhard studied theology in Hastings, in Sussex (United Kingdom), from 1908 to 1912. There he synthesized his scientific, philosophical and theological knowledge in the light of evolution. Teilhard was ordained a priest on August 24, 1911, aged 30.

be a speculative futurist to think about what emergence we may be in the middle of.

Teilhard spoke of two emergences, the material and the spiritual, and he was roundly berated from a thermodynamic point of view. He was troubled by the two energies because he knew that somehow or other there must be a single energy operating in the world. He expressed his problem in the following words:

> The two energies—of mind and matter—spread respectively through the two layers of the world (the *within* and the *without*) have, taken as a whole, much the same demeanour. They are constantly associated and in some way pass into each other. But it seems impossible to establish a simple correspondence between their curves. On the one hand, only a minute fraction of 'physical' energy is used up in the highest exercise of spiritual energy; on the other, this minute fraction, once absorbed, results on the internal scale in the most extraordinary oscillations.

The problem he stated can be formalized in the following way: if the change in the Gibbs free energy of a system is split up in its component parts, the change may be written:

$$\Delta G = \Delta H - T\Delta S$$

where **G** is the Gibbs free energy, **H** *the enthalpy,* **T** *the temperature, and* **S** the entropy. Now, **S** is the informational part of the thermodynamic state of the system. It is as if the Gibbs free energy part could be split up into a material and a mental component. Teilhard was closer to the solution than he knew.

Things improved from the Teilhard perspective when E. T. Jaynes, writing in 1957, showed that in statistical mechanics the entropy of a system was a measure of the information we would have if we knew which mi-

American biophysicist Harold Morowitz's 2002 take on the connections between **Teilhard's** 1936 theories and Gibbs free energy. [7]

From 1912 to 1914, Teilhard worked in the paleontology laboratory of the *Musée National d'Histoire Naturelle*, in Paris, studying the mammals of the middle Tertiary sector. Later he studied elsewhere in Europe. Professor Marcellin Boulle, specialist in Neanderthal studies, gradually guided him towards human paleontology.

Between 1914 and 1918, Teilhard served in World War I as a stretcher-bearer in the 8th regiment Moroccan riflemen. In these years of war, he developed his reflections in his diaries and in letters to his cousin, Marguerite Teillard-Chambon, who later edited them into a book: *Genèse d'une pensée* (*Genesis of a thought*). He confessed later: "...the war was a meeting ... with the Absolute." In 1916, he wrote his first essay: *La Vie Cosmique* (*Cosmic life*), where his scientific and philosophical thought were revealed.

Following the war, at the University of Paris, Teilhard completed three unit degrees of natural science: geology, botany, and zoology. His thesis treated of the mammals of the French lower Eocene and their stratigraphy. After 1920, he lectured in geology at the Catholic Institute of Paris, and then became an assistant professor after being granted a science Doctorate in 1922.

Seed of theory

His reading of the 1907 book *L'Évolution Créatrice* (*Creative Evolution*) by French philosopher Henri Bergson was, he said, the "catalyst of a fire which devoured already its heart and its spirit." Bergson's book provides an alternate

explanation for Darwin's mechanism of evolution, suggesting that evolution is motivated by an élan vital, a "vital impetus" that can also be understood as humanity's natural creative impulse.

Exorcist | Evil theory

See main: Father Merrin; Human thermodynamic films

Teilhard, a physical chemist and a priest, the epitome of a mind rankled with two competing belief systems, served the basis of the character of Father Merrin, in the best seller 1971 book *The Exorcist* (and followup 1973 film); and parts of the plot were themed on Teilhard's theory of evil (or the existence of Satan) in the world possibly being Lucifer [or matter-energy spirit] working out his [or its] salvation through the process of physical evolution ending in Teilhard's omega point theory. The following opening quote from the book version of *The Exorcist* is said to capture the theoretical aspects of Blatty's mindset: [5]

> "Matter is Lucifer crawling itself back to God"
>
> (Matter [is] Lucifer upward groping back to his God)

Father Merrin
(1973)

Pierre Teilhard
(1881-1955)

Teilhard, as one who grapples with good and evil theology in the context of mind from matter and energy science, served the basis of the character Father Merrin in the 1971 book-turned film *The Exorcist*.

This means, supposedly, that matter (humans being an evolved incarnation of matter) must work its way through the permutations of entropy, chaos, and generally things that make humanity unhappy in order to know about good and evil. The following is a quote from Blatty (about the novel Legion) which explain his theory: [6]

> 'In the novel, the coda was needed to put a button on what the novel was all about -- Kinderman's rescue of God's goodness via his theory of "The Angel," which hypothesized that the fall of man was premundane; that before the Big Bang, mankind was a single angelic being who fell from grace and was given his transformation into the material universe as a means of salvation wherein his legion of fragmented personalities would spiritually evolve ("Can there be a moral act without at least the possibility of pain?") back into the original single angelic being, back into himself, a process foreshadowed on the opening page of The Exorcist ("that matter was Lucifer upward groping back to his God").'

(add discussion)

Human molecules

See main: Human molecule

In the scheme of the universe, according to Teilhard, the case that interests us most is the "problem of man". In particular, Teilhard states, "the existence of an ascendant movement in the universe has been revealed to us by the study of paleontology." He then asks "where is man to be situated in this line of progress?"

This ascendant movement, in cosmology, according to Teilhard, occurs in the direction of higher degrees of consciousness. Within this scheme, according to Teilhard, prior to Galileo, science thought of man as the mathematical and moral center of the world composed of spheres turning statically upon themselves. In modern terms, according to

Teilhard:

> "In terms of our modern neoanthropocentricity, man, both diminished and enlarged, becomes the head (terrestrial) of a universe that is in the process of psychic transformation—man, the last-formed, most complex and most conscious of 'molecules'." [2]

In his *L'Energie Humaine* (*Human Energy)*, a collection of essays on morality and love, written between 1931 and 1939, Teilhard conceives of man as a "human molecule" (1936). In his 1947 essay "The Formation of the Noosphere", he outlines the global view that "no one can deny that a network (a world network) of economic and psychic affiliations is being woven at ever increasing speed which envelops and constantly penetrates more deeply within each one of us. With every day that passes it becomes a little more impossible for us to act or think other wise than collectively." In relation to the individual person, he concludes "the scope of each human molecule, in terms of movement, information and influence, is becoming rapidly coextensive with the whole surface of the globe" [3] In other words, according to Teilhard, human molecules are forming a connective sheath or skin around the globe of the earth.

In his *A Sketch of a Personalistic Universe*, Teilhard states "there is neither spirit nor matter in the world; the stuff of the universe is *spirit-matter*. No other substance but this could produce the human molecule. I know very well that this idea of spirit-matter is regarded as a hybrid monster, a verbal exorcism of a duality which remains unresolved in its terms. But I remain convinced that the objections made to it arise from the mere fact that few people can make up their minds to abandon an old point of view and take the risk of a new idea... Biologists or philosophers cannot conceive a biosphere or noosphere because they are unwilling to abandon a certain narrow conception of individuality. Nevertheless, the step must be taken. For in fact, pure spirituality is as unconceivable as pure materiality. Just as, in a sense, there is no geometrical point, but as many structurally different points as there are methods of deriving them from different figures, so every spirit derives its reality and nature from a particular type of universal synthesis."

Name

The shortened version of his name is "Pierre Teilhard". His full name can be seen on his headstone in the Jesuit cemetery in Hyde Park, New York. The translation reads Father Pierre Teilhard de Chardin; S.J. Born 1 May 1881; Entered the Society of Jesus 19 March 1899; Died 10 April 1955. French and Belgian families often use two last names when one name has been ennobled. As stated in the French language version of Wikipedia, the Teilhards were descended from an ancient family of magistrates in Auvergne, France; and the de Chardin family was ennobled by Louis XVIII (1800s).

Teilhard headstone at the Jesuit cemetery in Hyde Park, New York.

References

1. Teilhard, Pierre de Chardin. (2002). *Activation of Energy: Enlightening Reflections on Spiritual Energy*, (pg. 295-96). Harvest Books.
2. Teilhard, de Chardin. *The Future of Man*, (pg. 59). Image Books.
3. Teilhard, de Chardin. (1947). "The Formation of the Noosphere". (pg. 170-74).
4. Teilhard, Pierre. (1938). *The Phenomenon of Man*. Perennial.
5. Szumskyj, Benjamin. (2008). *American Exorcist: Critical Essays on William Peter Blatty* (pg. 34). McFarland.
6. Matter is Lucifer crawling itself back to God (2007) – Ask.Metafilter.com.

Further reading

â— Teilhard, Pierre. (1966). *Man's Place in Nature: the Human Zoological Group* (entropy, pgs. 6, 32-33). Harper & Row.
â— Pannenberg, Wolfhart. (1997). "Spirit and Energy in the Phenomenology of Pierre Teilhard de Chardin", in: *Beginning with the End: God, Science, and Wolfhart Pannenberg* (ch. 4, pgs. 80-90). Open Court Publishing.

â— King, Ursula. (1998). *Spirit of Fire: the Life and Vision of Teilhard de Chardin.* Orbis Books.

External links

â— Pierre Teilhard de Chardin – Wikipedia.

θΔics

In existographies, **Pietro Pomponazzi** (1462-1524), aka the "great new Averroist of Padua" (Girolamo Cardano, c.1514), was an Italian physician, philosopher, religious skeptic noted for []

Overview

In 1513, Pope Leo X issued a decree that condemned any teaching that asserted that the soul was mortal, i.e. ceased to exist once the body ceased to exist.

Sometime, therein, as news of this condemnation spread, one of Pomponazzi's students pressed him for a "straight answer" on the question of the soul, "leaving aside revelation and miracles, and remaining entirely within natural limits". [1] Pomponazzi told this student that he agreed with Aristotle and Averroes in respect to the view that a soul independent of its body cannot exist; the following seems to be his gist argument:

> "If we assume the continued existence of the individual, we must first of all prove that the soul can live without requiring the body as subject or object of its activity. We cannot think without sensations; but these depend on corporeality of its organs. Thought is in itself eternal and immaterial, but human thought is bound up with the senses; it can recognize the general only in the special, it is never free from the rule of space and time, for its ideas come and go one after the other. Our soul is therefore really mortal, since neither consciousness nor memory can endure. Virtue is far purer when practiced for its own sake, than for a reward. Yet must those politicians not be blamed who desire that the immortality of the soul should be taught for the sake of the public good, in order that the weak and the bad might at least go the right way under the impulse of hope or fear, while noble free spirits choose that path of their own accord. For it is utterly untrue that only base scholars have denied immortality, and that all noble sages have adopted it. Homer, Pliny, Simonides and Seneca, who did not cherish this hope, were not vile on that account; they only managed to get along without mercenary servility."
>
> — Pietro Pomponazzi (c.1520), *Publication*; cited by Ludwig Buchner (1884) in *Force and Matter* (pgs. 335-36)

Moreover, Pomponazzi rejected ghosts as mix of vapors from the charnel house and human imagination; that demons and angels are not real; possession and demonic prophecy are delusional states brought by sickness or madness. [2]

Three impostors

Pomponazzi, along with Averroes, are associated with the three impostors argument.

Atheism

Pomponazzi has been categorized as having been charged with atheism and or have been "secret atheist", along with Machiavelli, Bodin, Arentino, Montaingne, Charron, and Gassendi. (Ñº)

Education

In 1487, Pomponazzi completed a medical degree at University of Padua, specifically studying under under Nicoletto Vernia (1420-1499) (Ñº), noted commentator on the nature of the soul. Pomponazzi, in retrospect, recalled how fellow students, during this period, pressed their teachers for a rationalist evaluation of Averroes and Thomas Aquinas.

From 1495 to 1509, Pomponazzi was chair of the department of natural philosophy, at the University of Padua.

He then became a lecturer at the University of Ferrara, whereat he lectured on Aristotle's *The Soul* (*De Anima*). In 1512, he moved to Bologna, whereat he produced books on the nature of the soul.

Quotes | By

The following are note quotes by Pomponazzi:

> “The whole world has been deceived by the idea of immortality, for if we assume that there are three major religions: Christ’s, Moses’, and Muhammad’s, either all of them are false and the whole world is cheated or two are wrong and the greater part of mankind is deceived.”
>
> — Pietro Pomponazzi (c.1513) [1]

> “The atheists Epicurus, Lucretius, Diagoras, and some lesser-known figures, are the few who had managed not to be taken in.”
>
> — Pietro Pomponazzi (c.1513) paraphrase of Jennifer Hecht (2004) [2]

References

1. (a) Allen, Don C. (1964). *Doubt’s Boundless Sea* (pg. 32-35). Arno Press, 1979.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 272-73). HarperOne.
2. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 272-73). HarperOne.

External links

â— Pietro Pomponazzi – Wikipedia.

θΔics

The Hmolpedia **pioneers** page is a file-tree header for the various pioneers of the subjects of human molecular sciences in general, and human thermodynamics, human chemistry, and human physics in particular. The list of pioneers can be found in the side navigation dropdown box.

θΔics

In engineering, **piston** is the tightly-fitted, short-cylinder shaped, adjustable cap or head, typically made of wood (originally) or metal (modern), placed in larger tube-shaped cylinder, sealed at one end, within which it moves up and down, thereby making for an adjustable internal volume, of the piston and cylinder engine; which is typically connected to a rod, which therein imparts work from the working body, i.e. volume of substance contained (typically gas or liquid), if the volume expands, or to the working body, if the volume contracts.

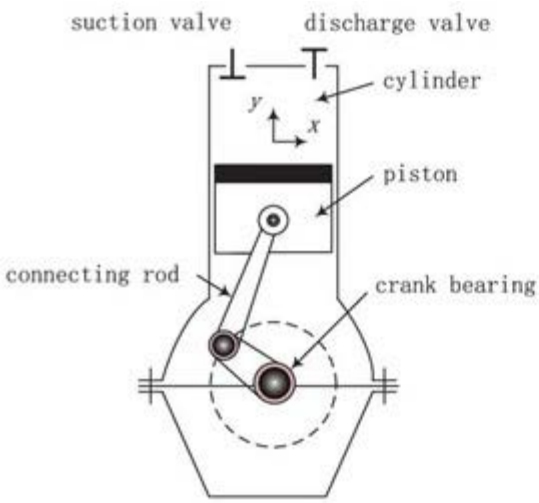

Left: a **piston** shown inside of an internal combustion engine, the modern version of the gunpowder engine. Right: a typical modern piston shown with its connecting rod.

Overview

In c.230BC, the piston, supposedly, was invented by Ctesibius, in the form of some type of air pump or bellows:

> "It is said that Ctesibius invented the **piston** and cylinder before 200BC."
>
> — Richard Kirby (1956), *History of Engineering* (pg. 154) [2]

> "Ctesibius had been responsible, about -230, for a simple and fundamental machine, the **piston** air-pump, known from the descriptions of later mechanicians. This simplest of pumps entered upon a new incarnation in the +17th century, when the virtuosi began to explore with excitement the properties of vacuous spaces, for what had been invented originally as a bellows for pumping air into something now found fresh employment as the 'air-pump' for getting as much air as possible out of it."
>
> — Joseph Needham (1987), *Science and Civilization in China: Volume 5* (pg. 555) [5]

In c.1495, Leonardo da Vinci designed an upside-down cannon barrel, fitted with a piston, as sketched by him below (left), which had a rod attached to the bottom of the piston, which he stated could be used to lift a weight of large size, if gunpowder was ignited inside the cannon, therein consuming the oxygen inside of the working body volume, thereby making a vacuum, which, owing to the force of the atmospheric pressure, would lift the weight: [3]

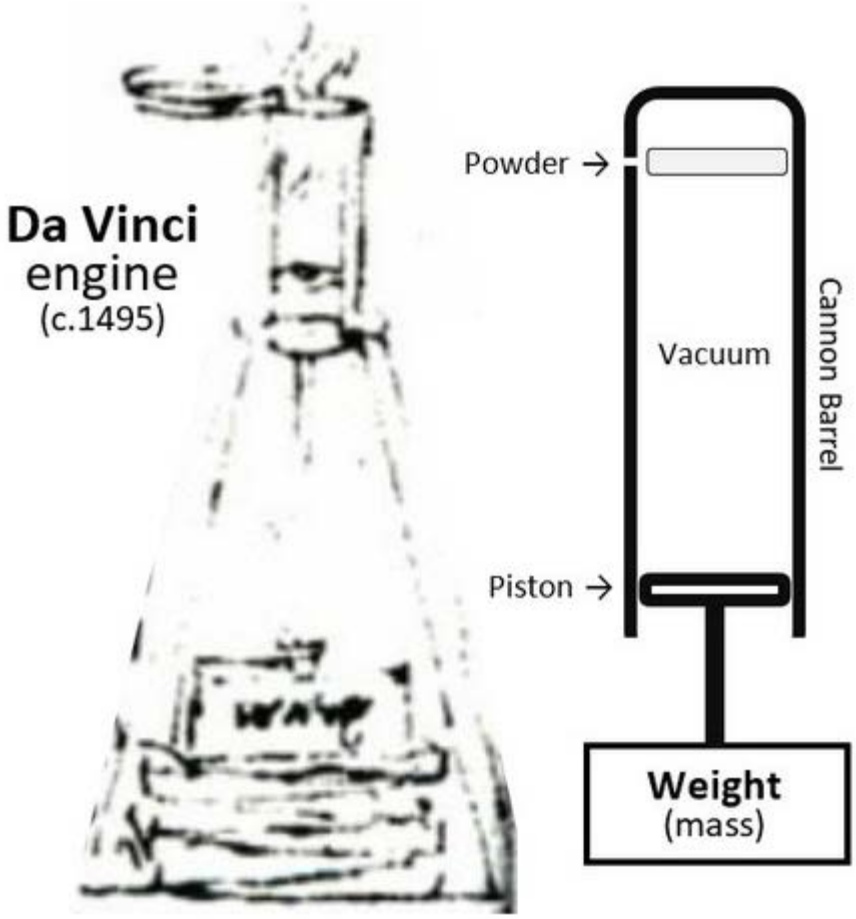

In 1632, Galileo, in his *Two New Sciences*, gave an illustration for a device for testing the “force of the vacuum”, as shown below, which was un upside down open-ended (at the bottom) cylinder ABCD, fitted with a piston head EFGH, through which the rod I, which could be raised or lowered (to let out air in the working body volume), was affixed to a bucket, into which weight could be added, so to see how much force was required to “break” the vacuum, as Galileo conceptualized things:

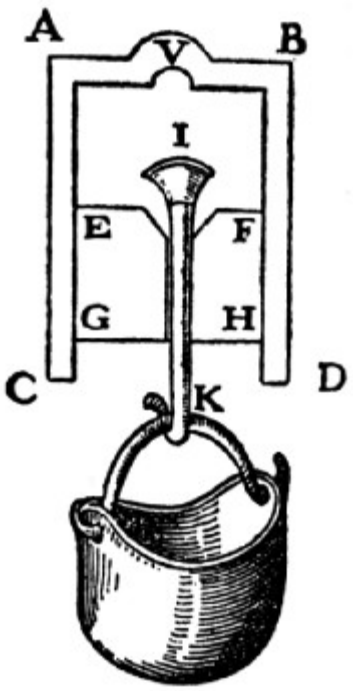

In 1654, Otto Guericke, amid his numerous vacuum experiments (see: Schott diagrams), carried out from 1647 into the 1670s, in part inspired by a reading of Galileo's *Two New Worlds*, and seeing his theoretical vacuum testing device, built what can be considered the modern variant of the piston and cylinder, and made a vacuum pump and vacuum bulb (bulb shown below being held by boy), to test the strength of the vacuum:

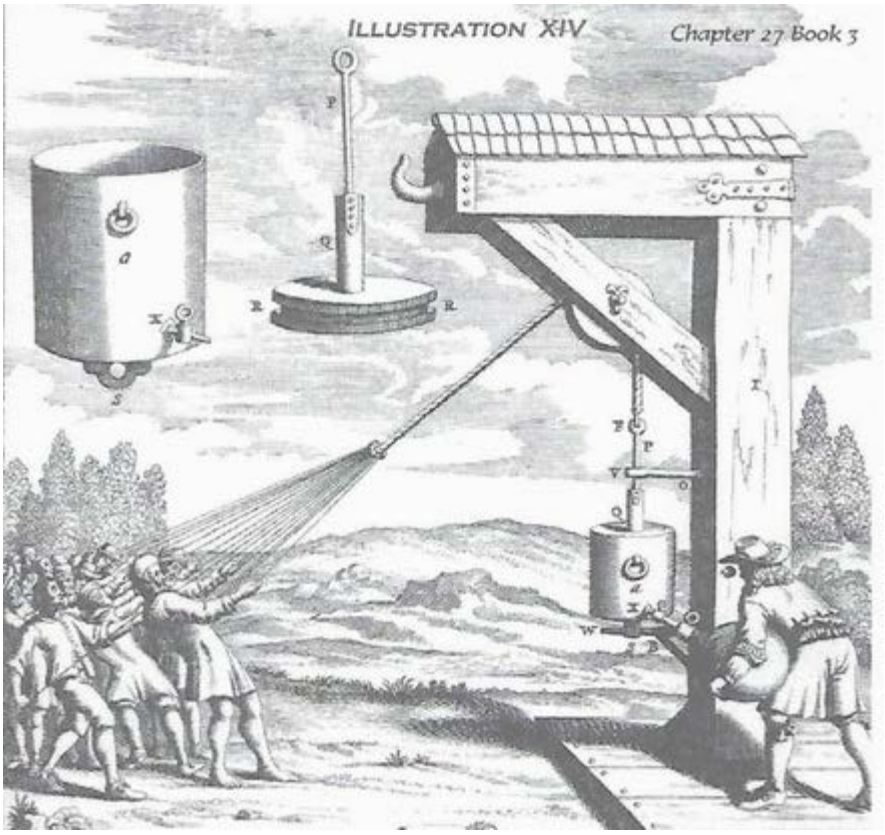

In 1670s, two different vertical or upright gunpowder engine, similar to da Vinci's design, albeit with a rope and pulley mechanism affixed to lift the weight were invented by Christiaan Huygens (1673), below left and center, and his assistant Denis Papin (1674), followed, independently, supposedly, by Jean Hautefeuille (1678), one version of which is shown below right, albeit without the piston:

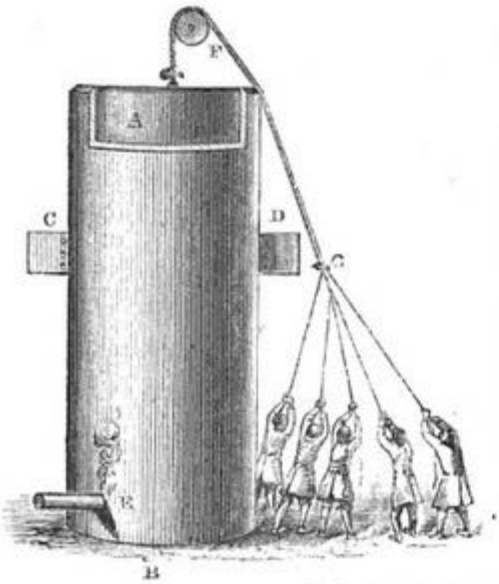

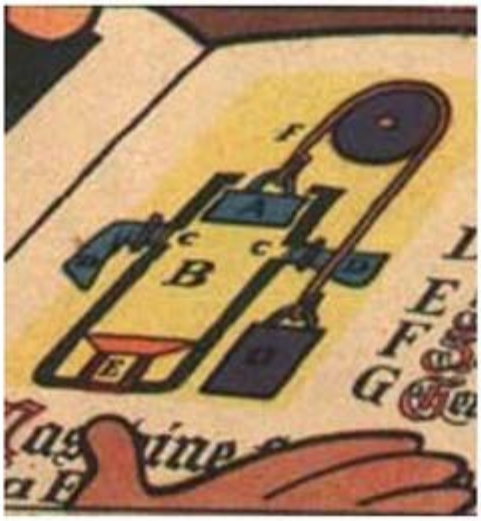

Huygens engine
(1673; 1682)

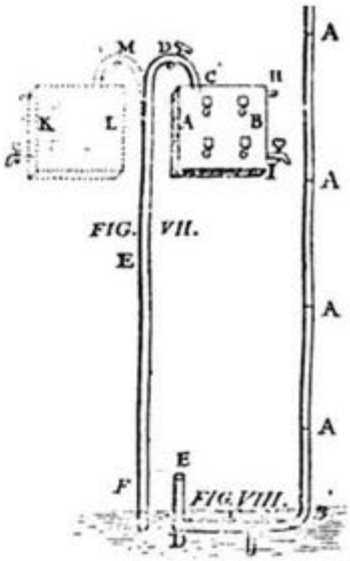

Hautefeuille engine
(1678)

In 1690, Denis Papin, in his "A New Method to Obtain Very Great Motive Powers at Small Cost", detailed an outline for a theoretical engine (see: Papin engine) wherein water (working body) contained inside of a sealed piston and cylinder, namely cylinder A into which an adjustable piston B is inserted, the height of which, indicated by indicator M, being regulated by adjustable arm E, as shown below, is alternatively made to expand, via external fire (hot body) put in contact with the outside of the cylinder, and made to contract, via external cool water (cold body) contact to the outside of the cylinder, such to work the piston rod up and down. [1]

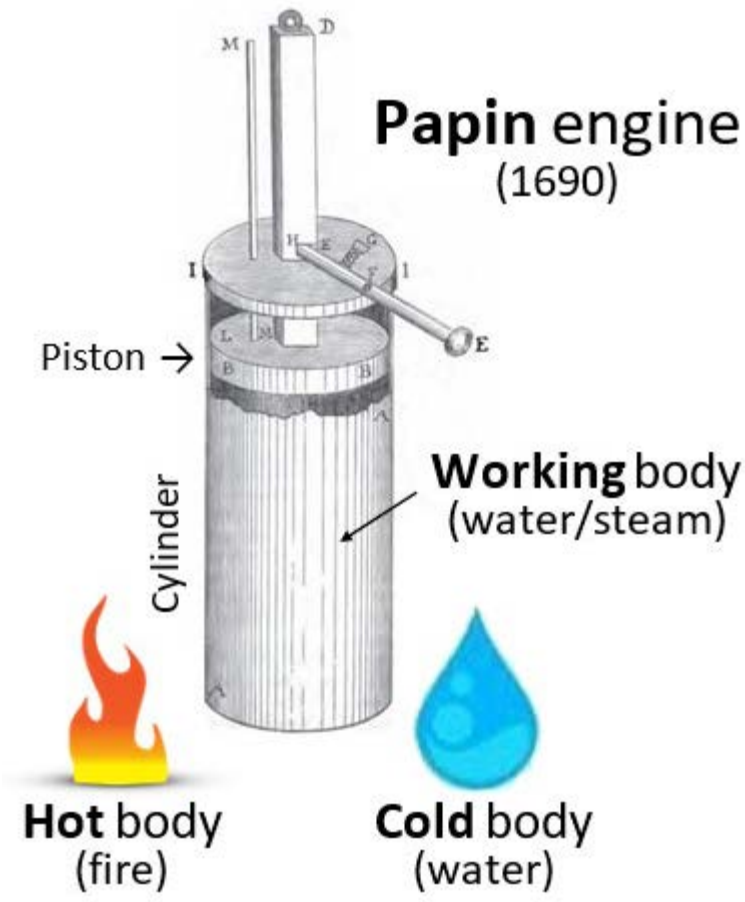

In 1765, there were Newcomen engines with 72-inch diameter cylinders, that were 10-feet in length. [2]

In 1824, Sadi Carnot devised the theoretical "Carnot engine", with the piston head level shown by line CD, encompassing working body volume of ABCD, which is generally based on the Papin engine, meant to encompass the overall principles of the general heat engine or all steam engines before him:

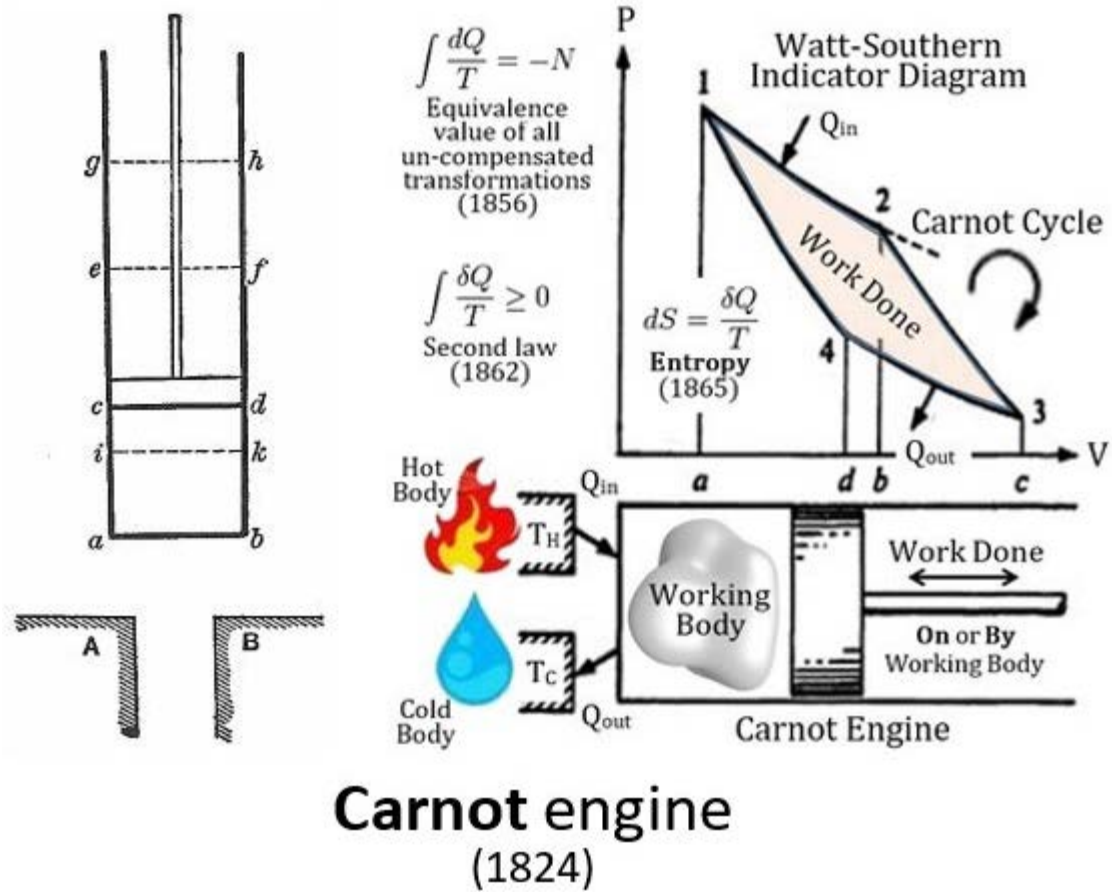

Carnot engine
(1824)

In 1849, William Thomson began to investigate Carnot's theoretical heat engine ideas, which began to launch thermodynamics as a new science.

Other

In 1963, Joseph Needham, in his the 'Pre-Natal History of the Steam-Engine', wherein, according a review of Ladislao Reti (1969), he gives the supposed origin of every single part of the compound mechanism of the steam engine is discussed and traced, such as: boiler, cylinder, piston, double acting principle, crank, and rod transmission, etc. [4]

Quotes

The following are related quotes:

> "In about the year 1710, Thomas Newcomen, ironmonger, and John Calley, glazier, of Dartmouth in the county of Southampton (Anabaptists) made then several experiments in private, and having brought it to work with a **piston**, etc., in the latter end of the year 1711, made proposals to draw the water at Griff in Warwickshire; but their invention meeting not with reception, in March following, through the acquaintance of Mr. Potter of Bromsgrove in Worcestershire, they bargained to draw water for Mr. Back of Woolverhampton, where, after a great many laborious attempts, they did make the engine work; but not being either philosophers to understand the reasons, or mathematicians enough, to calculate the powers, and to proportion the parts, very luckily by accident found what they sought for. They were at a loss about the pumps, but being so near Birmingham, and having the assistance of so many admirable and ingenious workmen, they soon came to the method of making the pump valves, clacks, and buckets; whereas they had but an imperfect notion of them before. One thing is very remarkable; as they at first were working, they were surprised to see the engine go several strokes, and very quick together, when after a search they found a hole in the piston, which let the cold water into condense the steam in the inside of the cylinder, whereas before they had always done it on the outside. They used before to work with a buoy in the cylinder

enclosed in a pipe, which buoy rose when the steam was strong, and opened the injection, and made a stroke; thereby they were capable of only giving six, eight, or ten strokes in a minute, until a boy, Humphry Potter, who attended the engine, added (what he called scoggan) a catch that the beam Q always opened: and then it would go 15 or 16 strokes in a minute. But this being perplexed with catches and strings, Mr. Henry Beighton, in an engine he had built at Newcastle on Tyne in 1718, took them all away, the beam itself simply supplying all much better. N.B. about the Tear 1717, I communicated to Mr. Beighton, the use of the steel-yard over the puppet-clack, or safety valve, which be applied to some engines. The way of **leathering the piston** was found by accident in about 1713: having then screwed a large broad piece of leather to the piston, which turned up the sides of the cylinder two or three inches; in working it wore through, and cut that piece from the other, which falling flat on the piston, wrought with its edge to the cylinder, and having been in a long time, was worn very narrow; which being taken out, they had the happy discovery, whereby they found that a bridle rein, or even a soft thick piece of rope or match going round would make the piston air and water-tight."

— John Desaguliers (c.1740), *A Course in Experimental Philosophy, Volume Two* (pgs. 532-33)

"Hautefeuille, if we may judge from evidence at hand, was the first to propose the use of a **piston** in a heat engine, and his gunpowder engine seems to have been the first machine which would be called a heat-engine by the modern mechanic."

— Robert Thurston (1878), *A History of the Growth of the Steam Engine* [1]

"The cannon [he wrote] was not only important in itself as a power-machine applied to warfare; it is a one-cylinder internal-combustion engine, and all of our more modem motors of this type are descended from it. The first effort to substitute a **piston** for a cannon-ball, that of Leonardo da Vinci, used gunpowder for fuel, as did Samuel Morland's patent of 1661, Huygens' experimental piston-engine of 1673, and a Parisian air-pump of 1674. Indeed, the conscious derivation of such devices from the cannon continued to handicap the development [of internal-combustion engines] until the nineteenth century, when liquid fuels were substituted for powdered."

— Lynn White (1962), *Publication*; cited by Joseph Needham (1987) in *Science and Civilization in China: Volume 5* (pg. 547) [5]

"The only detail that differentiates Leonardo's machine from those of Huygens and Papin is the system adopted for raising the weight sustained by the **piston**. Huygens and Papin use a pulley and rope transmission (the same that Leonardo adopted in his experiments with steam), while Leonardo preferred to attach a rod to the bottom of the piston."

— Ladislao Reti (1969), "Leonardo da Vinci the Technologist: the Problem of Prime Movers" [3]

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1. Thurston, Robert. (1878). *A History of the Growth of the Steam-Engine* (pgs. 24-25). Appleton and Company.
2. Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 154; 72-inch cylinders, pg. 165). Courier, 1990.
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4. (a) Needham, Joseph. (1963). "Pre-Natal History of the Steam-Engine" (abs)(Ñº), *Transactions of the Newcomen Society*, 35:3-58.
(b) Reti, Ladislao. (1969). "Leonardo da Vinci the Technologist: the Problem of Prime Movers", in: *Leonardo's Legacy: and International Symposium* (editor: C.D. O'Malley) §4:67-100; quotes, pgs. 95-98). University of California

Press.
5. Needham, Joseph. (1987). *Science and Civilization in China: Volume 5, Chemistry and Chemical Technology, Part 7, Military Technology: The Gunpowder Epic* (pg. 563). Cambridge.

External links

â— Piston – Wikipedia.

θΔics

In engineering, **piston and cylinder** is a mechanical device for either creating a vacuum or containing a volume of fluid capable of expansion or contraction through the action of heat, comprised of a "cylinder" shape, closed at one end, and an adjustable "piston", fitted air-tight to the shape of the cylinder, but adjustable.

Overview

In c.230BC, Ctesibius is said to have invented the piston and cylinder:

> "It is said that Ctesibius invented the **piston and cylinder** before 200BC."
>
> — Richard Kirby (1956), *History of Engineering* (pg. 154)

In c.55AD, Hero, in his *Pneumatics*, a summary of device inventions made by Ctesibius and others before him, detailed his so-called "device 27", characterized as a "fire engine", as follows: [2]

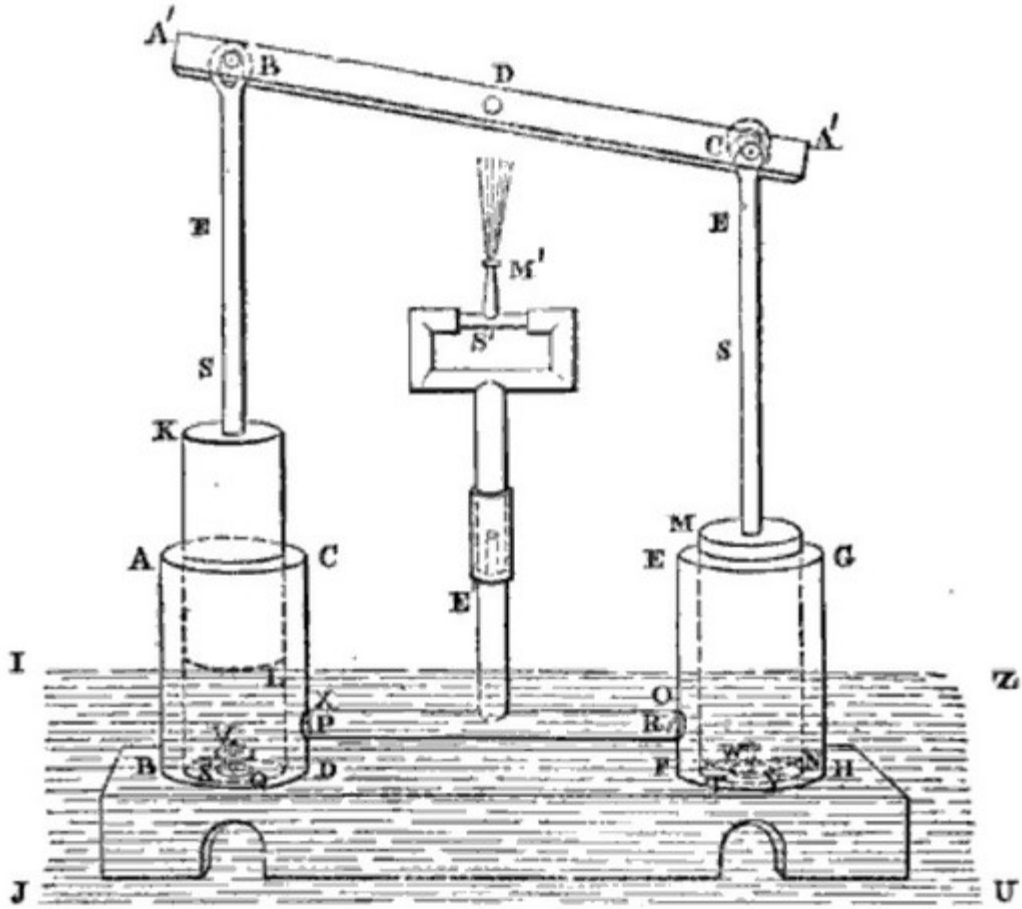

An illustration of Hero's device 27, which employs two **piston and cylinders** as a sort of mechanical pump designed to eject water from spout M' for the purpose of putting out fires. [2]

> "The siphons used in conflagrations are made as follows. Take two vessels of bronze, ABCD, EFGH (see: figure), having the inner surface bored in a lathe to fit a **piston**, like the barrels of water-organs, KL, MN being the pistons fitted to the boxes. Let the **cylinders** communicate with each other by means of the tube XODF, and be provided with valves, P, R, such as have been explained above, within the tube XODF and opening outwards from the cylinders. In the bases of the cylinders pierce circular apertures, S, T, covered with polished hemispherical cups, VQ, WY, through which insert spindles soldered to, or in some way connected with, the bases of the cylinders, and provided with shoulders at the extremities that the cups may not be forced off the spindles. To the centre of the pistons fasten the vertical rods SE, SE, and attach to these the beam A' A', working, at its centre, about the stationary pin D, and about the pins B, C, at the rods SE, SE. Let the vertical tube S' E' communicate with the tube XODF, branching into two arms at S', and provided with small pipes through which to force up water, such as were explained above in the description of the machine for producing a water-jet by means of the compressed air. Now, if the cylinders, provided with these additions, be plunged into a vessel containing water, IJUZ, and the beam A' A' be made to work at its extremities A', A', which move alternately about the pin D, the pistons, as they descend, will drive out the water through the tube E' S' and the revolving mouth M'.
>
> For when the piston MN ascends it opens the aperture T, as the cup WY rises, and shuts the valve R; but when it descends it shuts T and opens R, through which the water is driven and forced upwards. The action of the other piston, K L, is the same. Now the small pipe M', which waves backward and forward, ejects the water to the required height but not in the required direction, unless the whole machine be turned round;

which on urgent occasions is a tedious and difficult process. In order, therefore, that the water may be ejected to the spot required, let the tube E' S' consist of two tubes, fitting closely together lengthwise, of which one must be attached to the tube XODF, and the other to the part from which the arms branch off at S'; and thus, if the upper tube be turned round, by the inclination of the mouthpiece M' the stream of water can be forced to any spot we please. The upper joint of the double tube must be secured to the lower, to prevent its being forced from the machine by the violence of the water. This may be effected by holdfasts in the shape of the letter L, soldered to the upper tube, and sliding on a ring which encircles the lower."

In 1632, Galileo, in his *Two New Sciences*, presented his illustration and explanation for his vacuum measuring device (see: Galileo vacuum device) for measuring the force of the vacuum.

Guericke

In c.1650, Otto Guericke, after reading Galileo's *Two New Sciences*, began to employ a piston and cylinder like suction device for the purpose of drawing, at first liquid, namely liquid out of a beer keg, then air, namely air out of the Magdeburg hemispheres, in aims to prove the existence of vacuums in nature. [1]

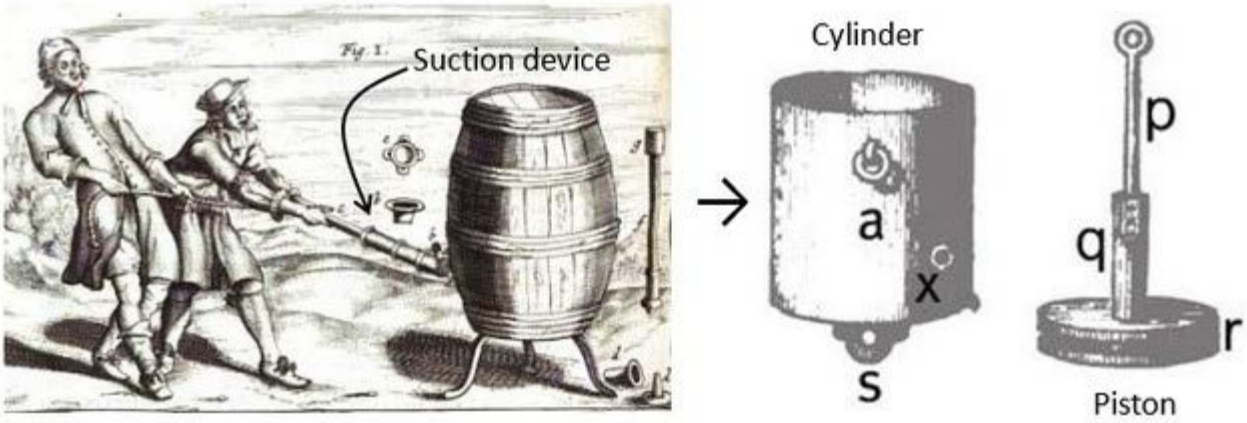

A timeline snippet of German engineer Otto Guericke's c.1650 attempt to make a vacuum in a beer keg using a suction pump device (left) to his later use of a **piston and cylinder** apparatus to which he attached a vacuum bulb, and thereby was able to make the piston go down, to the great powerful effect of being able to lift several thousand pound of weight (see: Schott diagrams).

To visually show the effect of a vacuum, in efforts to disprove Greek philosopher Aristotle's c.350BC supposition that "nature abhors a vacuum", Guericke designed a piston and cylinder, as labeled adjacent, and conducted various demonstrations to demonstrate its power of the weight of the atmosphere. The air cylinder **a** was about twenty-inches high and fifteen-inches wide, having its sides perfectly even and parallel, which could be fixed firmly in a vertical position by the ring **s**. The piston, **p**, **q**, **r**, was made to fit exactly inside of the cylinder, **p** being of iron and **q** wood, and the rounded head **r**, formed of hard oak, had a grove on its edge which was filled with flax or hemp.

To demonstrate the power or strength of the vacuum, the piston was let into the cylinder, and its iron handle was passed through the ring of the arm **o**, shown below, in such a manner that it could move freely up and down through the whole height of the cylinder and at the same time be preserved in a straight line. In a first experiment, the piston was positioned at the bottom of the cylinder the stop-cock **x** was closed. In this arrangement, the joint efforts of twenty or more men could not raise the piston more than halfway up. The men, in effect, were not just pulling on the piston, but the weight of a column of atmosphere 62-miles high. [1]

Thermodynamics

The piston and cylinder, together with the vacuum pump, also invented by Guericke, led to the formulation of the various gas laws, beginning with the work of Robert Boyle and Robert Hooke, as formulated in Boyle's law (1662), culminating later in the ideal gas law (1834), the design of the first steam engine by French engineer Denis Papin (1690), the first working steam engine by English engineer Thomas Savery (1698), and the initiation of thermodynamics as a subject, in 1824, by French engineer Sadi Carnot, in his *Reflections on the Motive Power of Fire*, a treatise on heat engines in general.

See also

â— Engine development timeline
â— Schott diagrams
â— Timeline of thermodynamics

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θΔics

In existographies, **Pitirim Sorokin** (1889-1968) (IQ:175|#250) (Scott 50:38) (DN:1) (CR:129) was a Russian-born American sociologist noted, sociological thermodynamics, for his 1928 book *Contemporary Sociological Theories*, wherein, with "more than a thousand authors listed" (Odum, 1929), he devotes the opening chapter "The Mechanistic School", the first sixty-pages, to first summarize what he calls the "mechanistic school of social thermodynamics", namely those who have used a human molecule or social atom views, steeped in social mechanism and thermodynamics-based views, including: Leon Winiarski, Vilfredo Pareto, Eugene Roberty, Henry Carey, and Wilhelm Ostwald, to conclude and argue, in the end, that the theories developed by this school are all "pseudo-sciences" and mere "superficial analogies". [1] Of note, Sorokin was a vocal opponent of American sociologist Talcott Parsons.

Clausius and economics

In 1941, Sorokin seems to have been wrestling with this issue of Clausius and economics, and seems to have become a supporter rather than a detractor, to an extent. Specifically, in his 1941 four-volume work *Social and Cultural Dynamics*, he devotes a section on the "hows and whys of sociocultural change" wherein he attempts to substantiate (or base), in part, sociocultural change on German physicist Rudolf Clausius' notions of transformations, energy, entropy, and the directionality of the universe, e.g. heat death, as connected to the mechanical theory of heat. [3]

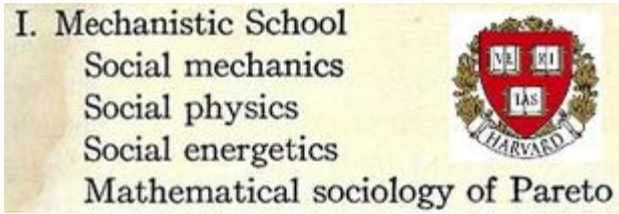

Sorokin's 1928 classification of the first main branch (of eleven) of "contemporary sociology", that of the "mechanistic school of social thermodynamics", all based on the thermodynamics of Rudolf Clausius. [3]

Mechanistic school of sociology

See main: Mechanistic school

Interestingly, Sorokin, in his 1940 review of George Lundberg's *Foundations of Sociology*, seems to classify Percy Bridgman (1938) as the latest mechanist since Pareto: [10]

"The fault is not, however, Lundberg's. It is the fault of the way and method he chose. Anybody who has done that, from all the representatives of the **Mechanistic School** up to Pareto and P.W. Bridgman (in his *The Intelligent Individual and Society*) similarly were swamped in a similar maze of blunders and inconsistencies."

Austrian sociologist Werner Stark, in two chapters to his 1962 *The Fundamental Forms of Social Thought*, attempted a similar aggressive "critique" of the mechanistic schools, which has been compared to Sorokin's critique. [5]

American sociologist Alan Sica, in his 2012 article "Classical Sociological Theory", has recently commented on Sorokin's "mechanistic school" dissection in relation to modern 21st century human thermodynamics. [6]

Pareto | Human molecules

Sorokin devoted a certain amount of focus to Vilfredo Pareto's conception of society viewed as 'a system of human molecules in a complex mutual relationship', as early as 1928, a subject about which he devotes a section to, with particular focus on Pareto's 'derivations' theory, which Sorokin considers to be a contemporary form of sociology. [1]

Equilibrium

In 1936, Sorokin wrote "Is the Concept of Equilibrium Necessary for the Social Sciences?" (in French), a critique of the equilibrium concept. [7]

On the subject of equilibrium, Sorokin states: [2]

> "Life can never be at equilibrium. Complete equilibrium is never attained and would be fatal if it were attained, as it would mean stagnation, atrophy, and death."

This seems to be a pure unadulterated adoption of Thomson's heat death theory applied to the concept of life; but, does seem to capture the view that the postulate that so-called paradise view of economic equilibrium is a false ideology.

States of existence

On the various states of which a culture may be in, Sorokin gives the following view: [4]

> "Whole integrated culture, as a constellation of many culture subsystems, changes and passes from one state to another, because each of these is a going concern and bears in itself the reason of its change."

He seems to adopt this perspective from Clausius, of whom he quotes as saying:

> "It is frequently asserted that everything in this world has a circular course. While transformations proceed in a certain direction in a certain place and time, other transformations take place in inverse direction at another place and time, in such a way that the same situations are reproduced generally and that the state of the universe remains invariable, when the phenomena are considered in their totality and in a general manner. The second fundamentally principle of the mechanical theory of heat, however, contradicts this opinion in the most decisive manner. It follows, from this, that the state of the universe must change more and more in a determined direction."

The source of this quote, however, still remains to be determined to corroborate that Clausius actually said this. On expressing the destiny of a society, Sorokin states his views in what seem to be Clausius-terms fairly well: [4]

> "The activities of [a society's] life career or destiny are determined mainly by the system itself, by its potential nature and the totality of its properties. External conditions can crush the system or terminate an unfolding of its immanent destiny at one of earliest phases of its development, depriving it of a realization of its complete life career; but they cannot fundamentally change the character and the quality of each phase of the development; nor can they, in many cases, reverse or fundamentally change the sequence of phases of the immanent destiny of the system."

In this passage, Sorokin seems to be in realization of the defunct aspects of the theory of life, in his usage of "life career or destiny" alternative, when speaking of society as a pure molecular-based thermodynamic system.

Marxism

The following is a noted 1927 Sorokin quote on what seems to be his take on Marxism: [8]

> "Any organized social group is always a stratified social body. There has not

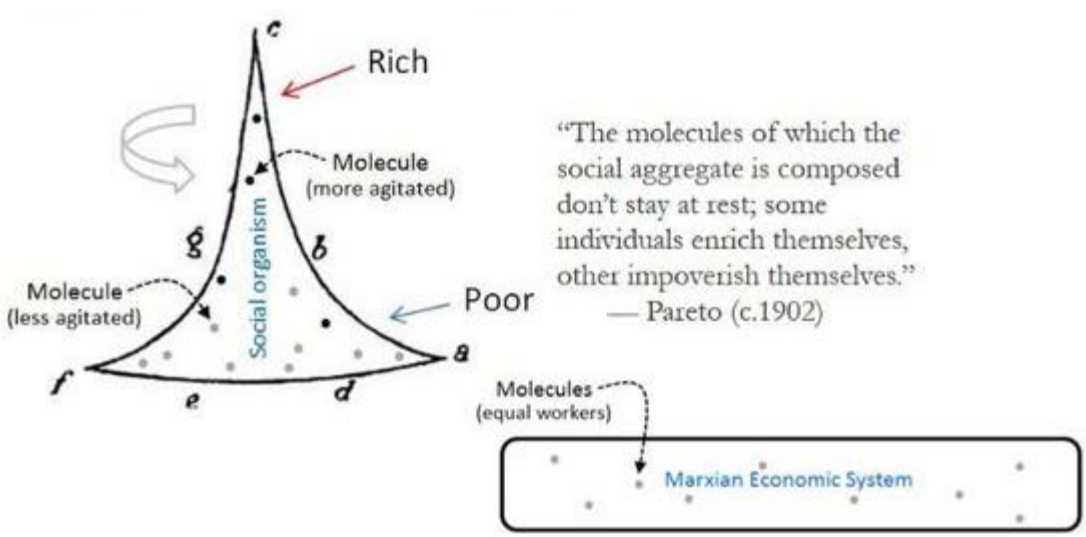

The lower right "flat" social structure (Marx-based), which is shown contrasted with the upper left "stratified" spinning top social pyramid (Pareto-based), seems to be what Sorokin is referring to in his 1927 quote (adjacent) about flat social groups (see: Harvard Pareto circle). [11]

been and does not exist
any permanent social group which is ‘flat’ and in which all members are equal.”

Namely, that the premise of equal workers in a workers state is untenable.

Energy of love | God?

In 1954, at the age of 65, Sorokin published *The Ways and Power of Love*. (Ñº)

In 1959, at the age of 70, in what seems to be a turn of the tables, Sorokin gave an audio-recorded lecture on “The Mysterious Energy of Love” (see: audio), the contents of which are shown below, where in he talks about "love-energy" and its production, distribution, and accumulation in society, all intermixed with ubiquitous use of the red-flag word "creative", e.g. creative power, creative heroes, creative love, etc., wherein he seems to now embrace physics concepts of energy and power applied to meaningful intimate interactions, such as love, suicide, etc.: [9]

The multiple use of the term "creative" in his overhead, and his quoting of Jesus, St. James, and St. Paul, at about 6-min into his talk, about hate and work, give insight into the likeliness that Sorokin's 1920s and 1930s vehement objection to the mechanistic school, his attacks on nearly every scholar who would attempt to use chemistry, physics, mechanics, to explain society or the humanities, from George Carey (1850s) all the way up through Vilfredo Pareto (1910s), Lawrence Henderson (1930s), and Percy Bridgman (1938-40s), all along, was but an underlying religious objection, which is quite hilarious, to say the least.

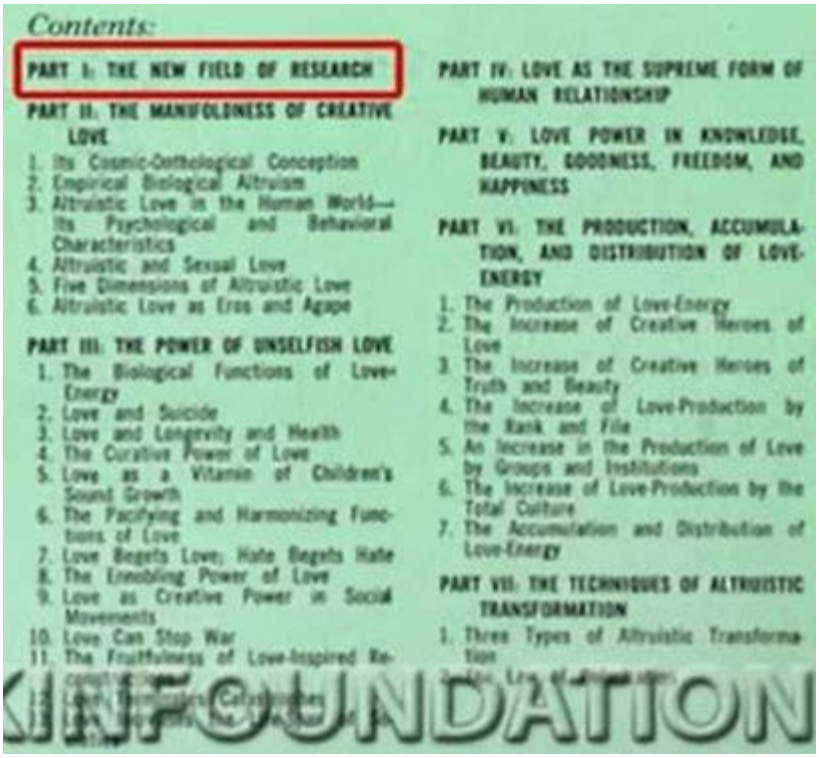
Contents:

PART I: THE NEW FIELD OF RESEARCH

PART II: THE MANIFOLDNESS OF CREATIVE LOVE
1. Its Cosmic-Ontological Conception
2. Empirical Biological Altruism
3. Altruistic Love in the Human World—Its Psychological and Behavioral Characteristics
4. Altruistic and Sexual Love
5. Five Dimensions of Altruistic Love
6. Altruistic Love as Eros and Agape

PART III: THE POWER OF UNSELFISH LOVE
1. The Biological Functions of Love-Energy
2. Love and Suicide
3. Love and Longevity and Health
4. The Curative Power of Love
5. Love as a Vitamin of Children's Sound Growth
6. The Pacifying and Harmonizing Functions of Love
7. Love Begets Love; Hate Begets Hate
8. The Ennobling Power of Love
9. Love as Creative Power in Social Movements
10. Love Can Stop War
11. The Fruitfulness of Love-Inspired Re-

PART IV: LOVE AS THE SUPREME FORM OF HUMAN RELATIONSHIP

PART V: LOVE POWER IN KNOWLEDGE, BEAUTY, GOODNESS, FREEDOM, AND HAPPINESS

PART VI: THE PRODUCTION, ACCUMULATION, AND DISTRIBUTION OF LOVE-ENERGY
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6. The Increase of Love-Production by the Total Culture
7. The Accumulation and Distribution of Love-Energy

PART VII: THE TECHNIQUES OF ALTRUISTIC TRANSFORMATION
1. Three Types of Altruistic Transformation

KINFOUNDATION

Contents of Sorokin's 1959 “The Mysterious Energy of Love” (see: audio), wherein he digresses on "love-energy" after had for so many years denounced all the mechanistic schools as pseudoscience; a case of hypocrisy par excellence.

In 1964, Sorokin, in his *The Basic Trends of Our Times*, sets out to help “readers can gain practice asking moral questions about actions in business and finding answers to those questions”, in the course of which he mentions god 35+ times, referring to the kingdom of god multiple times, how the root of ethics is found in the love of god and with one’s neighbor, and so on. [12]

Education

Sorokin studied at the University of St. Petersburg in the early 1910s and supposedly taught law and sociology there as well. He eventually became a professor of sociology at the University of Minnesota, from 1924 to 1930, after which he moved to Harvard, founding the department of sociology, remaining there until 1955.

Quotes | On

The following are quotes on Sorokin:

> “**Pitirim Sorokin**, besides the Le Play School, refers to approximately 1,000 social theorists, students, and philosophers. His divisions, include: The Mechanistic School, with 19; The Geographical School, with 59; Biological Interpretation of Social Phenomena: Bio-Organismic, with 16; Sociological Interpretation of the Struggle for Existence and the Sociology of War, with 8; Sociological Interpretation of the Struggle for Existence, with 41; Sociological Interpretation of the Struggle for Existence and the Sociology of War, with

12; Bio-Social Branch: Demographic School, with 69; Sociologistic School, with 16; Sociologistic School: The Formal School and a Systematics of Social Relationship, with II; Sociologistic School: Economic School, with 8 I; The Psychological School, with 29; Psycho-Sociologistic Theories of Religion, Mores, Law, Public Opinion, Art, and Other Cultural Phenomena as Factors, with 23; Other Psycho-Sociologistic Studies of the Correlation Between Various Psycho-Social Phenomena and their Dynamics, with 169."

— Howard W. Odum (1929), *An Introduction to Social Research* (pg. 204)

Quotes | By

The following are quotes by Sorokin:

"Take Winiarski's [social] thermodynamic principles, as an example. They do not work at all, giving no help to the understanding of these processes and their development. Take any of the generalizations of the [social thermodynamics] school and try to apply them in any explanation of any social phenomena. The results will be the same, for they neither work nor explain anything."

— Pitirim Sorokin (1928), *Contemporary Sociological Theory* (pg. 35)

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(b) Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (pgs. 165-66). AuthorHouse.
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6. Sica, Alan. (2012). "Classical Sociological Theory", in: *The Wiley-Blackwell Companion to Sociology* (editor: George Ritzer) (§5, pgs. 82-97; Sorokin + "mechanistic school", pgs. 85-86; humanothermodynamics, pgs. 87-88). John Wiley & Sons.
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(b) Russett, Cynthia. (1966). *The Concept of Equilibrium in American Social Thought* (quote, pg. 18; Gibbs, 18+ pgs). Yale College.
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Further reading

â— Johnston, Barry V. (1995). *Pitirim A. Sorokin: an Intellectual Biography* (Pareto, 17+ pgs). University Press of Kansas.

External links

â— Pitirim Sorokin – Wikipedia.
â— Pitirim A. Sorokin Collection – University of Saskatchewan.

θΔics

In terminology, **place** refers to an immobile container or receptacle which holds another body; the bounds of that which is contained and is in contact with; the outermost bounds of that which is contained; the surface of a body situated there; the concave surface of an encompassing body; a certain determined relationship wherein an object has a position with respect to some other object near at hand; a particular region within some boundary. [1]

Quotes

The following are related quotes:

> "Since I had deliberated on these questions for a long time and had likewise been engaged in active study of the structure of the world [universe], not only did the great mass of these world bodies and their enormous distances lead me to doubt that the human intelligence could comprehend them, but also, and most particularly of all, did vast, intermediate, and endless space fill me with curiosity and infuse me with a desire to investigate it. For indeed, what is it? Inasmuch as it contains all things, it serves as a **place** for 'being' and 'existing'. Is it by chance some fiery heavenly matter? Is it solid, as Aristotelians assert? Is it fluid, ad Copernicus and Tycho Brahe believe? Is it some sort of tenuous fifth essence? Or, is space completely devoid of all matter, a 'vacuum', as it were?"
>
> — Otto Guericke (1672), "Why the Author Was Led to Investigate the Vacuum" in: *New Magdeburg Experiments on the Vacuum of Space* (§§: Book 2, §: Chapter 1, pg. 84) [1]

References

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Further reading

â— Lang, Helen. (1998). *The Order of Nature in Aristotle's Physics: Place and the Elements*. Cambridge, 2007.
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θΔics

In science, **plant**, aka "vegetable", as compared to animal or mineral, refer to any number of solar-powered CHNOPS+10 species (or CHNOKCa+10 species), generally characterized by photosynthesis, or the ability to synthesize chemicals via light.

Overview

In c.1615, Johann Helmont conducted his famous oak tree growing experiment, similar to what Leonardo da Vinci is said to have done with pumpkins in the 15th century:

Approximate composition of elements necessary for plant growth

Element	Symbol	Atomic number	Approximate atomic weight	Percent composition	Relative number of atoms
Hydrogen	H	1	1	6	57,600,000
Carbon	C	6	12	45	30,857,143
Oxygen	O	8	16	45	27,000,000
Nitrogen	N	7	14	2	1,028,571
Potassium	K	19	39	1	246,154
Calcium	Ca	20	40	<1	120,000
Magnesium	Mg	12	24	<1	80,000
Phosphorus	P	15	31	<1	61,935
Sulfur	S	16	32	<1	30,000
Chlorine	Cl	17	35	<1	2,743
Boron	B	5	11	<<1	1,745
Iron	Fe	26	56	<<1	1,714
Manganese	Mn	25	55	<<1	873
Zinc	Zn	30	65	<<1	295
Copper	Cu	29	64	<<1	90
Molybdenum	Mo	42	96	<<1	1

A table (Smith, 2007) showing the typical 16-elements, namely CHNOPS plus 10 additional elements, that defined the material nature of **plants**. [1]

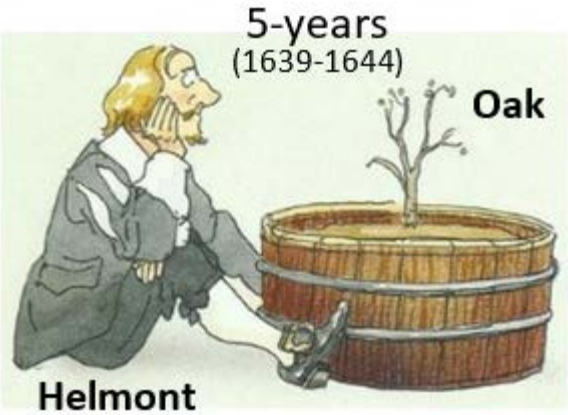

Helmont he found that 98 percent of the grown oak, when burned, gets converted into “gas”, a term he coined.

In 1779, Jan Ingenhousz discovered the basics of photosynthesis, as shown below:

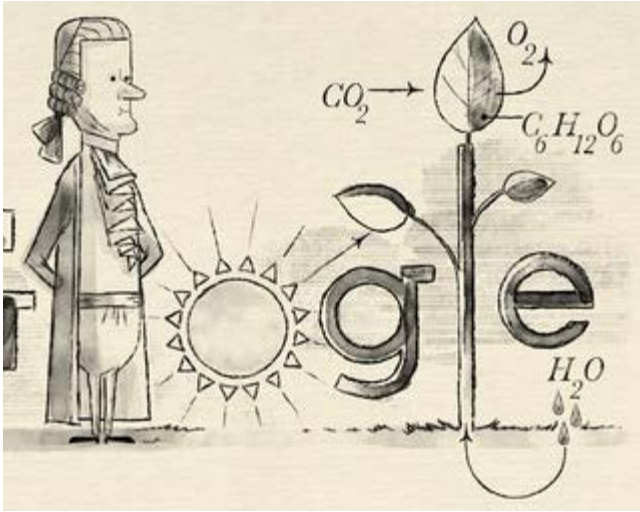

(add)

See also

â— Vegetable life
â— Goethe on evolution

References

1. Smith, Kevin T. (2007). “Plants Essential Chemical Elements” (pdf), *American Nurseryman*, 206(10):10-11.

External links

â— Plant – Wikipedia.

θΔics

In theories, **plastidule soul** is a plastidule, i.e. "center or bundle of force" (Louis Elsberg) (Q)(Q) applied to inorganic molecules, particularly, and atoms and molecules, in general, supposedly, such that "every atom possesses and inherent sum of force, and in this sense is endowed with a soul (beseelt)" (Haeckel). (Q)

Quotes

The following are related quotes:

> "**Plastidule-souls** are the plastidules or protoplasmic molecules, the smallest, homogenous parts of the protoplasm are, on our plastic theory, to be regarded as the active factors of all life-functions. The plastidular soul differs from the inorganic molecular soul in that it *possesses memory*."
>
> — Ernst Haeckel (1874), *Pedigree of Man* (pg. 296) [1]

> "Have you seen Nageli in *Nature*? He is of the school which supposes that all we think as well as we do is the result of the deliberations of *n* **plastidule souls** in every one of the *α* molecules of us. Now if *m* Masters of Arts, sleeping within *r* of Great St Mary constitute the Electoral Roll, the wisdom of the soul of that Roll must be *mnα* times that of a plastidule soul. The acts of the Roll are on record. Calculate the wisdom 1st of an MA 2nd of a plastidule soul. dp/dt."
>
> — James Maxwell (1877), "Letter to Peter Tait", Dec 12 (Q); see: [2] on plastidule souls

> "Modern organic chemistry shows that the peculiar physical and chemical properties of an element, of *carbon*, in its complicated combination with other elements cause the peculiar physiological properties of organic compounds, and before all others of protoplasm. The monera, consisting exclusively of protoplasm, forms the bridge over the deep chasm between organic and inorganic nature. If, in spontaneous generation, a certain number of carbon atoms unite with a number of atoms of hydrogen, oxygen, nitrogen, and sulphur, to form the unity of a plastidule, we must regard the **plastidule-soul**, *i.e.* the total sum of its life activities, as the necessary product of the forces of these united atoms. In this most extreme psychological consequence of our monistic doctrine of evolution we meet with those old conceptions of the animation of all matter, which already in the philosophy of Democritus, Spinoza, Bruno, Leibnitz, and Schopenhauer, have found varied expressions, because all soul-life can finally be reduced to the two elementary functions *of sensation* and *motion;* to their reciprocal action in reflex motion. The simple sensation of inclination and disinclination, the simple forms of motion, *attraction*, and *repulsion*, these are the true elements out of which all soul activity is built in infinitely varied and complicated combinations. Monism avoids the one-sidedness of materialism, as well as that of spiritualism, it unites practical idealism with theoretical idealism, it combines natural science with mental science, to form an all-comprising uniform, general, or total science."
>
> — Sidney Billing (1879), "Haeckel at Munich" [3]

References

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(b) Blavatsky, Helena P. (1888). *The Secret Doctrine: Anthropogenesis* (pg. 671). Theosophical Publishing Co.
2. Haeckel, Ernst. (1877). "The Present Position of the Evolution Theory" (plastidule-soul: last factor of organic soul-life, pg. 685), *Nature*, 16:492-96, Oct 4.
3. Billing, Sidney. (1879). *Scientific Materialism and Ultimate Conceptions* (§:Haeckel at Munich, pgs. 71-72). Bickers and Son.

θΔics

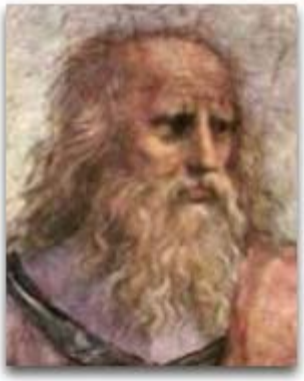

In existographies, **Plato** (427-348BC) (IQ:180|#98) (Cattell 1000:10) [RGM:5|1,250+] (Murray 4000:2|WP) (Perry 80:1|Li) (ACR:1) (GPhE:2) [CR:294] was a Greek philosopher, one of the greatest philosophers ever, noted for his *circa* 390BC efforts to employ Empedocles' model of *philia* (attractive force) and *neikos* (repulsive force) outline what's known as the first law of affinity: 'likes tend toward like', e.g. earth tends toward earth, water tends toward water, possibly captured in the phrase ashes to ashes, dust to dust, a logic that later came to be known as the Platonic law of affinity. [1]

Motion

On motion, Plato, as summarized by Cicero (45BC), argued that there were two kinds of motion:

> "Here we must lend an ear to Plato, the god so to say among philosophers. His view is that motion is of two kinds, the first self-propelled and the second directed from without; and that which is achieved spontaneously of its own accord is more divine than that awakened by the thrust of another. Spontaneous motion he attributes only to souls; in his view, it is from them that all motion takes its rise."

(add)

Love | Soul

The following is Plato's a synopsis of Plato's famous soul mate theory of love:

> "The intense yearning which lovers have toward each other does not appear to be the desire for sexual intercourse, but for something else which the soul of each desires and cannot tell, and of which he or she has only a dark and doubtful presentiment."
>
> — Plato (c.380BC), voice of Aristophanes, *Symposium* [4]

(add)

Allegories

See also: Plato's cave

In allegories, allegory of the charioteer is a famous metaphor, by Plato, from *Phaedrus*, wherein a person and his or her movements and or drives is conceptualized according to which reason is the charioteer guiding two horses, one the will, the other appetite. [1]

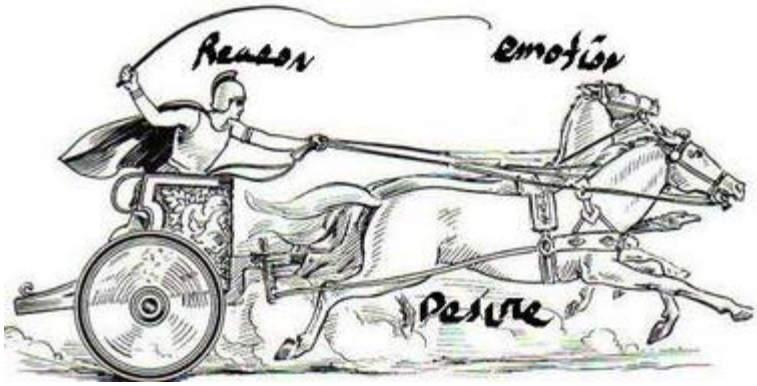

Alternative depictions of Plato's charioteer model of the human: left (Q) a white and noble and white pared with a dark, shaggy one, the latter of which is deaf as a post and yields only to the whip. These correspond to the honor-loving and appetitive parts of the soul, respectively; right (Q) the charioteer is "reason", who is the **driver** [driving force] of two horses, called emotion and desire, but is having trouble controlling the horses. Sometimes reason is in control, but at other times emotion and desire end up setting the direction of the chariot.

Egyptian | Greek science

Plato traveled to Egypt to learn their sciences and religio-mythology models, e.g. Nun cosmology, the logic of which was incorporated into the work of Aristotle and afterwords into science.

Vacuums
Plato found the idea of a vacuum inconceivable and was thus an advocate of the view that nature abhors a vacuum.

Teachers | Students
Plato was a student of Socrates and teacher to Aristotle.

Origin of life
Plato conceived of the 'uroboros', an entity that eats its own tail, as the first form of life.

Atomic theory
Plato, in his circa 360BC dialogue *Timaeus*, supposedly following Pythagoras, introduced the atomic theory proposition that ideal geometric forms serve as atoms, according to which atoms broke down mathematically into triangles, such that the form elements had the following shape: fire (tetrahedron), air (octahedron), water (icosahedron), earth (cube). [2]

Elements
Plato credits Empedocles as having created this list of elements.

Element	Polyhedron		Number of Faces	Number of Triangles
Fire	Tetrahedron (Animation)		4	24
Air	Octahedron (Animation)		8	48
Water	Icosahedron (Animation)		20	120
Earth	Cube (Animation)	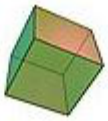	6	24

Atomic theory according to Plato. [3]

Quotes | On
The following are quotes on Plato:

> "**Plato**, the **great creator of chimeras**, says that 'those who admit nothing but what they can see and feel, are stupid and ignorant beings, who refuse to admit the reality of the existence of invisible things'. Our theologians hold the same language to us: our European religions, have visibly been infected with the reveries of the Platonists, which evidently are no more than the result of obscure notions, and of the unintelligible metaphysics of the Egyptian Chaldean, and Assyrian priests, among whom Plato drew up his pretended philosophy. Our theologians, still guided by the enthusiasm of Plato, discourse with their followers only of *spirit; intelligent, incorporeal substances; invisible powers; angels; demons of mysterious virtues; supernatural effects; divine inspiration; innate ideas,* &c., *&c.*""
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 219)

> "Whoever will take the trouble to read the works of Plato and his disciples, such as Proclus, Jamblicus, Plotinus, &c. will find in them almost all the doctrines and metaphysical subtilties of the Christian teleology. Moreover, they will find the origin of the *symbols*, the *rites*, the *sacraments*, in short, of the *theurgy*, employed in Christian worship, who, as well in their religious ceremonies as in their doctrines, have done no more than follow, more or less faithfully, the road which had been traced out for them by the *priests* of *paganism.* With respect to the ancient philosophy, with the exception of that of Democritus and Epicurus, it was, for the most part, a true *theosophy*, imagined by the Egyptian and Assyrian priests: Pythagoras and Plato have been no more than theologians, filled with enthusiasm, and perhaps with knavery. At least, we find in them a *sacerdotal* and mysterious mind, which will always indicate, that they seek to deceive or that they are not willing men should be enlightened. It is in *nature*, and not in *theology*,

that we must draw up an intelligible and true philosophy."

— Baron d'Holbach (1770), *The System of Nature* (pg. 220)

"Speaking of **Plato**, I will add, that no writer, ancient or modern, has bewildered the world with more *ignes fatui* [misleading influence], than this renowned philosopher, in ethics, in politics, and in physics. In the latter, to specify a single example, compare his views on the animal economy, in his *Timaeus*, with those of Margaret Bryan in her *Conversations on Chemistry*, and weigh the science of the canonized philosopher against the good sense of the unassuming lady. But Plato's versions have furnished a basis for endless systems of 'mystical theology', and he is therefore all but adopted as a Christian saint. It is surely time for **men to think for themselves**, and to throw off the authority of names so artificially magnified."

— Thomas Jefferson (1820), "Letter to William Short", Aug 4 [6]

Quotes | By

The following are quotes by Plato:

"Those who are able to see beyond the shadows and lies of their culture will never be understood, let alone believed by the masses."

— Plato (c.360BC) (Q)

"Philosophy is a mediation on death."

— Plato (c.375BC), *Phaedo* (81a) or "a rehearsal for death"; cited by Baron d'Holbach in *The System of Nature* (pg. 120) [7]

"Until philosophers are kings, and the princes of this world have the spirit and power of philosophy, and political greatness and wisdom meet in one, cities will never cease from ill—no, nor the human race, as I believe—and then only will our state have a possibility of life and see the light of day. The truth is, that the state in which the rules and are most reluctant to govern is best and most quietly governed, and the state in which they are most willing is the worst."

— Plato (c.380BC), *Republic* [9]

See also

- Plato's cave
- Plato's god

References

1. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (pg. 378). Morrisville, NC: LuLu.
2. (a) Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pgs. 58). University Press of America.
(b) Timaeus (dialogue) – Wikipedia.
3. Geometry and atoms (atomism) – Wikipedia.
4. (a) Plato. (c.38 0BC). *Symposium* (translator: Jowett) (pg. 192). Publisher.
(b) Solomon, Robert C. (1981). *Love: Emotion, Myth, & Metaphor* (pg. xv). Prometheus Books, 1990.

5. (a) Plato (360BC). *Phaedrus* (246a-254e). Publisher.
(b) Chariot allegory – Wikipedia.
(c) Brown, Richard H. (1977). *A Poetic for Sociology: Toward a Logic of Discovery for the Human Sciences* (pg. 89). University of Chicago Press, 1989.
6. (a) Jefferson, Thomas. (1820). "Letter to William Short", Aug 4; in: *Works of Thomas Jefferson, Volume Two* (editor: H.A. Washington) (pg. 217). Townsend, 1884.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 358-59). HarperOne.
7. Joshi, Sunand T. (2014). *The Original Atheists: First Thoughts on Nonbelief* (pg. 77). Prometheus Books.
8. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (2.32, pg. 58). Oxford University Press, 1998.
9. (a) Plato. (c.380BC). *Republic*. Publisher.
(b) Aurelius, Marcus. (167AD). *Meditations* (translator: George Long; Introduction: Alice Zimmern). DigiReads, 2015.

External links

- Plato – Wikipedia.

θΔics

In geniuses on, **Plato on the soul** refers to the collected ideas, theories, and beliefs of Plato on the concept of the soul, e.g. soul mate.

Overview

In c.1617, Lucilio Vanini, in dialogue style, was referring to Plato's views on the soul as follows: [1]

> "Plato has maintained the immortality of the soul against many philosophers. It is true, replies the other, but he has likewise held for the immortality of the soul of that little bird you see in that cage."

(add)

Quotes | On

The following are quotes on Plato's soul theories:

> "Plato believed in an immortal soul (compare: mortal soul) capable of surviving the death of the body. He wrote about it in *Phaedo* and *The Republic*, two of his many influential dialogues. Like most thinkers that followed in his footsteps, Plato believed that the soul is the principle that gives life to the body. For the great philosopher, the soul was a life soul, and it became a surviving soul after a person's death. Plato's doctrine maintained that the soul originated in the realm of the dead, temporarily passing through the world of the living, before it returned to the underworld in and endless cycle of reincarnation. Plato was one of he early dualists for whom the soul was a separate substance, distinct from the body, and capable of existing on its own. Plato also theorized about the structure of the soul and proposed that it is composed of three parts: the appetitive, the spirited, and the rational. The appetitive soul was the lower of the three, the one responsible for our basic desires such as hunger, thirst, and sexual drive. On top of the hierarchy sat the rational soul, the principle that gives us our quintessentially human capacity for thought and reason. In the middle we find the spirited soul playing the role of a mediator between the appetitive and the rational soul. Plato even located the three parts of the soul in different areas of the body. The rational soul had its place in the head, the spirited in the heart, and the appetitive in the belly."
>
> — Julien Musolino (2015), *The Soul Fallacy* [2]

See also

â— Geniuses on the soul

References

1. Durand, David. (1714). *The Life of Lucilio (alias Julius Caesar) Vanini: Burnt for Atheism at Toulouse with an abstract of his writings being the sum of the atheistical doctrine taken from Plato, Aristotle, Averroes, Cardano and Pomponazzius's philosophy with a confutation of the same; and Mr. Bayle's arguments in behalf of Vanini completely answered* (Amz) (pg. 76). Publisher, 1730.
2. Musolino, Julien. (2015). *The Soul Fallacy: What Science Shows We Gain from Letting Go of Our Soul Beliefs* (foreword: Victor Stenger) (pg. 44). Prometheus.

Further reading

â— Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (Plato, pgs. 14-15). HarperOne.

External links

â— Plato's Theories of Soul – Stanford Encyclopedia of Philosophy.

θΔics

In allegories, **Plato's cave** or "Plato's allegory of the cave", refers to []

A depiction (Q) of **Plato's cave** wherein, at left, prisoners are chained to a wall watching the "manufactured reality" of a puppet play, and, at right, three prisoners have broken free from their chains, and escaped to the "true reality" of the outside world.

Overview

In c.425BC, Socrates, supposedly, described a group of people who have lived chained to the wall of a cave all of their lives, facing a blank wall. The people watch shadows projected on the wall from objects passing in front of a fire behind them, and give names to these shadows. The shadows are the prisoners' reality. Socrates explains how the philosopher is like a prisoner who is freed from the cave and comes to understand that the shadows on the wall are not reality at all, for he can perceive the true form of reality (true reality) rather than the manufactured reality that is the shadows seen by the prisoners. The inmates of this place do not even desire to leave their prison; for they know no better life.

In c.407BC, Plato, Socrates' student, was taught this allegory, who therein perfected it, as presented in his Republic:

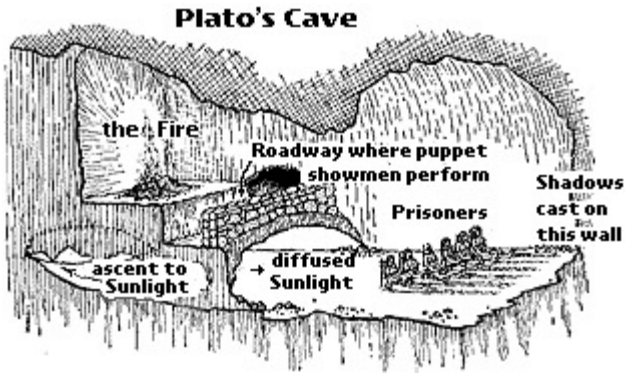

hence it became known as Plato's allegory of the cave.

Macnab

In 1818, Francis Macnab, in his *A Theory of the Moral and Physical System of the Universe*, outlined a Plato's allegory of the cave like section on how one's beliefs—specifically beliefs about relative motion, and in turn "thought"—can reoccurringly be deceptive and false: [1]

> §5. A man on board a ship, gliding in a calm sea, may imagine himself to be at rest, and think and act upon that supposition with the utmost propriety; because, though not absolutely at rest, he is relatively so. He afterwards, however, on going ashore, sits down, and, smiling at his mistake, says, 'Now I See my error; I have not been at rest till now.' But still he is mistaken; for the earth itself on which he sits or stands, is in

motion round the sun. ‘Well, then,’ says he, ‘the sun at any rate is at rest.’ ‘Not so,’ says the well-informed astronomer; ‘the sun also, and the whole solar system, are in motion through absolute space.’ But here the person who was first deceived in the ship asks the astronomer, ‘What proof have you that the universe itself is fixed in absolute space? or what is it you call *absolute*? I have already been three times deceived by adopting that-term; and will henceforth ascribe the title of absolute to no created being.’ What has thus been said regarding *motion*, is true also regarding *thought*. In human knowledge, there is nothing absolute; no fixed principles; no standard to which we can appeal.”

This is relatively cogent, so-to-speak. With this said, however, Macnab goes on to assert, in downgrade form, in end footnote like style, that the only thing to which we can appeal is the word of god, citing Biblical passages; and that, therefore, we must search the Bible for the outlines of general knowledge, and a basis on which to build.

Watts

In 1960, Alan Watts, in his "Science and Buddhism" (V|13:51), explained how one can see a certain figure as either a bear climbing a tree or a tree with lopped off branches (left), depending on what you were told it was, in the same what that one can conceptualize an eclipse of the sun as either a dragon swallowing the sun, as in primitive cultures (e.g. ancient Egypt), or as the moon obfuscating view of the sun, as modern science explains things:

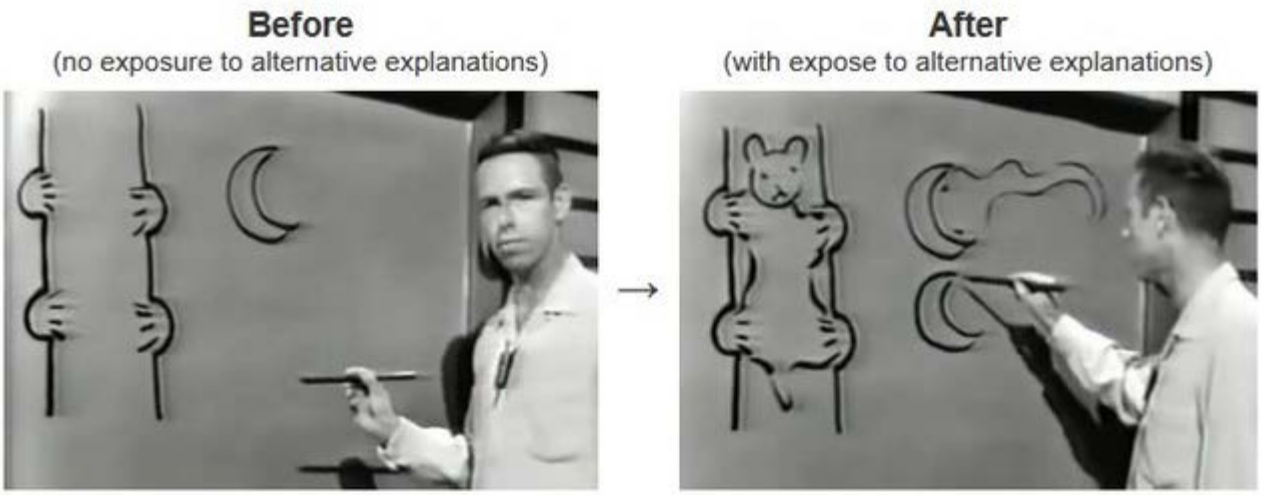

This is akin to a modern version of Plato's allegory of the cave, in respect to religious beliefs.

Matrix

In 1999, Andy Wachowski and Lana Wachowski, in their film *The Matrix*, presented a modern spin on Plato’s cave allegory, via the switch that the fire that makes the puppet plays the prisoners see on the wall, became computer programs running in minds of the prisoners who are in induced sleep in a factory, their bodies being used as energy sources to power something; wherein ripe topics including: reality, choice, causality (or cause and effect), purpose, (or sense of purpose), are discussed in film dialogue.

Quotes

The following are related quotes:

“The accepted belief in the theory of life is similar to **Plato’s 400BC allegory of the cave**. The person in the cave looks at the two shadows: (a) people walking in the sunlight and making shadows of walking people on the cave wall; (b) a person with moving puppets in the sunlight, making shadows of walking people on the cave wall. The person in the cave will look upon the shadows and naively conclude that ‘yes both shadows, a and b, are indicative that two different 'alive' entities outside the cave.’ The allegory of the

molecular cave is the same. Wherever we see something that we deem as "alive", be it a walking kinesin (6-element molecule) or a walking human (26-element molecule), we will always be able to look through the atomic telescope and see only an energy-driven molecule. In other words, belief that one of the molecules is alive is the same as belief in puppeteer's animated shadow."

— Libb Thims (2010), dialogue (O) with Georgi Gladyshev on the origin of life (see: defunct theory of life), Dec 6

References

1. Macnab, Francis M. (1818). *A Theory of the Moral and Physical System of the Universe, Demonstrated by Analogy: in which the Elements of General Science are Explained Upon a Principle Entirely New*. London: Ogles, Duncan, and Cochrane.

External links

- Allegory of the Cave – Wikipedia.

θΔics

In terminology, **Plato's god** refers to []

Overview

In 360BC, Plato, in his dialogue *Timaeus*, outlined his views on god. [1]

In 45BC, Cicero, in his *On the Nature of the Gods*, in comparison of the "Stoic god" called Pronoia (or Providentia), who is characterized as a "prophetic old lady", or the "Epicurean gods", who inhabit the "intermundia", or empty spaces between the worlds, states that "Plato's god", as Plato describes in his *Timaeus*, is a "craftsman-god" who constructs the world by taking the four elements: earth, air, water, and fire, and makes solids of five shapes, and from these originates all shapes or creates and orderly universe out of existing matter; also that this god had a beginning and lasts forever. [2]

See also

â— Spinoza's god

References

1. Timaeus (dialogue) – Wikipedia.
2. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (pgs. 9-10, 150). Oxford University Press, 1998.

θΔics

In genius studies, **Platt IQs** are IQs intuited by American John Platt, a child prodigy turned physicist, biophysicist, social thermodynamicist, and reductionism defender, and genius studies scholar.

List

The following are the Platt IQs:

The following, from the above description, is a tabulation of Platt's ranking scheme:

IQ_{JP}	Platt IQ scale
190	Newton, Gauss, Archimedes
180+	Einstein, Pasteur
180	Neumann, Pauling, Bridgman, Russell, Freud, Darwin, Shaw → Mycroft Holmes [fictional genius]
170	about 300 existive Americans (out of a 1962 population of 187 million) → Sherlock Holmes [fictional genius]
160	about 5,000 existive Americans (out of a 1962 population of 187 million)
150	about 100,000 existive Americans (out of a 1962 population of 187 million)
140	about 1,000,000 existive Americans (out of a 1962 population of 187 million) → Inspector Lestrade [fictional genius] (Q); equivalent to someone with a PhD
100	average adult
70	a moron
40	an adult chimpanzee, six-year-old human

The article seems to have been reprinted in Platt's 1962 *The Excitement of Science*. [4]

Cox-Platt-Platt IQs

The following are is the mean IQs of the geniuses common to the Cox IQs (1926), Platt IQs (1962), and Buzan IQs (1994):

Cox IQ (1926)	Platt IQ (1962)	Buzan IQ (1994)	Mean

1.	Isaac Newton	190	190	195	**188**
2.	Carl Gauss	190			
3.	Archimedes	190		190	
4.	Albert Einstein		180+	205	
5.	Louis Pasteur			180	
6.	John Neumann			180	
7.	Linus Pauling			180	
8.	Percy Bridgman			180	
9.	Bertrand Russell			180	
10.	Sigmund Freud			180	
11.	Charles Darwin	165	173	180	**173**
12.	Bernard Shaw			180	

Here, of curiosity, we see only two geniuses, namely Newton (mean IQ: 188) and Darwin (mean IQ:173), common to the 300 Cox geniuses, the 11 Platt geniuses, and the 100 Buzan geniuses, and two geniuses, namely Archimedes (mean IQ: 190) and Einstein (mean IQ: 195) (note: used "185" as Platt measurement for Einstein's IQ), common to two..

Quotes

The following are related quotes:

> "There is an apocryphal story physicists tell [see: fly bicycle problem] about the late John Neumann—probably a 180—that shows the difference they feel between such really high-speed minds and those of ordinary brilliance. In mental ability, an adult chimpanzee can solve mechanical problems about as well as a six-year-old child. This ape might be given an IQ of about 40. A moron would be around 70, an average adult 100, a PhD 140, an Einstein 180 or better. The hardest problems can be solved only by men of the greatest ability, and brilliant men are few. The second hard fact about the IQ scale is that there are not very many brilliant men at the top of it. At the 190 level, which might describe Archimedes, Newton, and Gauss, we have been seeing about one every five hundred years. A Newton at the 190 level occurs once in 500 years. At the 180 level of Darwin, Freud, Shaw, Bertrand Russell, Percy Bridgman, Linus Pauling, there might be a dozen living Americans. There are some 300 at 170 in the US, 5,000 at 160, about 100,000 at 150, and one million at 140."
>
> — John Platt (162), "The Coming Generation of Genius: an 'Explosion' of 180-IQ boys. And Girls?" [1]

See also

- Buzan IQ

- Cox IQ
- Cox-Buzan IQ

References

1. Platt, John R. (1962). “The Coming Generation of Genius: an ‘Explosion’ of 180-IQ boys. And Girls?” (Q)(Q)(Q)(Q), *Horizon*, 4(4):70-76.

θΔics

In science, **plenist**, as opposed to a "vacuist", refers to one who either denies the existence of the void (vacuum or nothingness), or adheres to the "nature abhors a vacuum" idiom; one who adheres to ether an Aristotelian and or Cartesian belief system, which holds that space is occupied by a continuous "plenum" of substance. [1]

Quotes

The following are related quotes:

> "The '**plenum**' [space with atoms] and 'void' [space without atoms], according to Democritus, exist, the one as 'being', the other as 'not being'."
>
> — Aristotle (c.322BC), *Physics* (§1.4)

> "The apparent triumph of the vacuists in the 17th century gave way, in the 19th century, to the apparent triumph of the **plenists** with their luminiferous aether. The displacement of the luminiferous aether by special relativity has still left us with a spacetime occupied by, among much else, oscillating electromagnetic fields."
>
> — Thomas Conlon (2011), *Thinking About Nothing* (pg. 320) [1]

References

1. Conlon, Thomas. (2011). *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum* (plenum, pg. 67; plenists, pgs. 319). Saint Austin Press/LuLu.

θΔics

In hmolscience, **Plinio Prioreschi** (c.1924-) is an Italian physician noted, in cessation thermodynamics, for his 1990 discussion on thermodynamic irreversibility and death.

Overview

In 1990, Prioreschi, in his *A History of Human Responses to Death*, devoted his first chapter to a discussion on whether or not death is reversible, in a thermodynamic sense, on the logic that: [1]

> "The second law of thermodynamics tells us that eventually everything must decay and die, but it does not set any immediate limit to the span of existence."

Prioreschi's argument seems cogent, to a good degree. He states that death is defined as the cessation of life; but then notes that we also use this term when referring to inanimate objects, such as in the 'death of a star'. In this direction, he suggests that death could be defined as a sufficient degree of change in the direction of a loss of function and notes that the directionality of change, on a global scale, is always goes in the direction indicated by the second law of thermodynamics, or "in the direction of disorder and decay", as Prioreschi puts it; whereby a modern definition of death could be "change beyond a certain limit or sufficient deterioration". He then states that we must further modify this to state that death should be re-defined according to the logic of thermodynamic irreversibility, wherein death would be defined as: "sufficient irreversible deterioration"; noting that people can be restored to life, e.g. resuscitation after cardiac arrest. He goes on to discuss this in terms of entropy increase.

Image

The photo is a possible image of Plinio Prioreschi from Open Library. [2]

Education

Prioreschi completed his MD (1954) at the University of Pavia, Italy, and his PhD (1961) in experimental medicine at the University of Montreal. From 1967 to 1970, Prioreschi was a professor of pharmacology and medicine at Creighton University, School of Dentistry.

References

1. Prioreschi, Plinio. (1990). *A History of Human Responses to Death: Mythologies, Rituals, and Ethics* (ch. 1: Man and Death: the second law, pgs. 3-36; entropy, pgs. 434, 70). Mellen.
2. Plinio Prioreschi – OpenLibrary.org.

External links

â— Prioreschi, Plinio – WorldCat Identities.
â— Plinio Prioreschi (about) – History-Medicine.com.

θΔics

In geniuses on the soul, **Pliny on the soul** refers to the views of Pliny the elder on the subject of the soul.

Overview

In 77AD, Pliny, in his *Natural History* (§7.55), said the following on the soul: [1]

> "People say different things about the soul after a man dies. Sometimes they think that men return to the same being that they were before they were born and there is no feeling of body and soul after death any more than before they were born. But the vanity in folly of men leads him to think that he will be something after death so that he flatters himself admits death itself and promises himself another life. Some attribute immortality to the soul, others say that it is transfigured, and there are those who think that 'shades' [shadows?] [ghosts?] can feel. That is why they revered them by establishing and making a god out of whatever could not remain man. As if the life-giving breath of man was different from that of beast or there were not things in this universe that lived much longer than man, to which, however, no one has ever attributed immortality.
>
> But show me what a soul is made of. Where is it thought, its sight, its hearing? What does it do? What is it busy at? Or, if it has none of this, what is the use of having a soul? Verily. But where does it go? Oh, how crowded the world must be with all these souls; they must be as thick as shadows.
>
> See, **all these things are only daydreams of little children in inventions of men would never want to fade away**. What a great folly to protect the body in hope of resurrection, as Democritus promised, who has not yet been resurrected himself.
>
> But what folly to think that through death that we can enter into a second life! What rest could any man have after being born if he has feeling of his soul above or his shade in hell? certainly, the lure of words and the gullibility of folly of men destroy all the gentleness of the principle of good nature, which is death, making a double death for whoever cares about the future life. For, if it is a great good to exist, what satisfaction could do we have been thinking that we only existed? Oh, it is much easier and more certain for everyone to believe in himself and be assured from the experience of what we were before we were born."

(add)

References

1. (a) Pliny. (77AD), *Natural History* (§7.55) (Ñº)(Ñº). Publisher.
(b) Meslier, Jean. (1729). *Testament: Memoir of the Thoughts and Sentiments of Jean Meslier* (translator: Michael Shreve; preface: Michel Onfray) (pg. 569). Prometheus Books.

θΔics

In existographies, **Pliny the elder** (23-79AD) (776-885 AUC) (O) (IQ:170|#385) (Murray 4000:19|B) (FA:26) (CR:33), aka Galius Plinius Secundus, not to be confused with his nephew Pliny the younger (61-113AD), was a Roman scholar, natural philosopher, military leader, god skeptic, stoic, and oft-cited first ever encyclopedist, noted for his 77AD *Natural History*, a 10-volume compendium of ancient knowledge, wherein he touches on topics such as the soul (see: Pliny on the soul), origin of cremation, etc.

Natural History

In 77AD, Pliny penned *Natural History*, a 10-volume, 37-book, all-knowledge comprising treatise, wherein he attempts to cover all subjects connected to nature;

> "My subject is a barren one – the world of nature, or in other words life; and that subject in its least elevated department, and employing either rustic terms or foreign, nay barbarian words that actually have to be introduced with an apology. Moreover, the path is not a beaten highway of authorship, nor one in which the mind is eager to range: there is not one of us who has made the same venture, nor yet one among the Greeks who has **tackled single-handed all departments** of the subject."

Pliny uses Aristotle's division of nature: animal, vegetable, and mineral.

Subjects including: resurrection, gods, astronomy, mathematics, geography, ethnography, anthropology, human physiology, zoology, botany, agriculture, horticulture, pharmacology, mining, mineralogy, sculpture, painting, and precious stones, among other subjects. [1]

God | Disproofs

See main: disproofs of the existence of god

Pliny in his section "On God" advocates a god equals power of nature and or god equals the sun's energy type of view; the gist of which is as follows: [6]

> "Between this body [earth] and the heavens there are suspended, in this aerial spirit, seven stars, separated by determinate spaces, which, on account of their motion, we call wandering, although, in reality, none are less so. **The sun is** carried along in the midst of these, a body of great size and power, the ruler, not only of the seasons and of the different climates, but also of the stars themselves and of the heavens. When we consider his operations, we must regard him as the life, or rather the mind of the universe, the chief regulator and **the god of nature**; he also lends his light to the other stars. He is most illustrious and excellent, beholding all things and hearing all things, which, I perceive, is ascribed to him exclusively by the prince of poets, Homer."
>
> — Pliny the elder (77AD), *Natural History, Volume One* (pgs. 19-21)

> "The power of nature is what we call god."
>
> — Pliny the elder (77AD), *Natural History, Volume One* (pg. 25); cited by Jennifer Hecht (2004) in *Doubt* (pg. 154)

Pliny, in his section "The Search for God", outlined a number of refutations and absurdities about beliefs in gods; an example of which is as follows: [2]

> “Some nations have animals—even repulsive creatures—as gods. To believe that some gods are always old and grey-haired, while others are young men and boys, or lame, born from eggs, or who live and die on alternate days—such beliefs are little short of the fantasies of children.”

The "born from eggs", to note, is reference to the Memphis creation myth, wherein in the god Ptah is the maker of the golden egg. [4] The young and old god, is reference to the young sun (Ra the youth), midday sun (Ra), and evening sun (Ra the elder).

Beliefs | Religion

The following is a synopsis of Pliny's belief system:

> “Pliny, with respect to philosophical opinions, did not rigidly adhere to any sect. He reprobates the Epicurean tenet of an infinity of worlds; favors the Pythagorean notion of the harmony of the spheres; speaks of the universe as god, after the manner of the Stoics, and sometimes seems to pass over into the field of the sceptics. For the most part, however, he leans to the doctrine of Epicurus.”
>
> — William Enfield (1819), *History of Philosophy, Volume Two* (pg. 131); in: *Natural History, Volume One* (pg. 20)

(add)

Soul

The following are the two main soul term usages by Pliny from volume one:

> “During the very time of these games of mine, a hairy star was seen during seven days, in the part of the heavens which is under the Great Bear. It rose about the eleventh hour of the day, was very bright, and was conspicuous in all parts of the earth. The common people sup-posed the star to indicate, that the **soul of Caesar** was admitted among the immortal gods; under which designation it was that the star was placed on the bust which was lately consecrated in the forums.”
>
> — Augustus Caesar (c.30BC), *Source*; cited by Pliny the elder (77AD) in *Natural History, Volume One* (pg. 58)

> “This same Hipparchus, who can never be sufficiently commended, as one who more especially proved the relation of the stars to man, and that **our souls are a portion of heaven**, discovered a new star that was produced in his own age, and, by observing its motions on the day in which it shone, he was led to doubt whether it does not often happen, that those stars have motion which we suppose to be fixed. And the same individual attempted, what might seem pre-sumptuous even in a deity, viz. to number the stars for posterity and to express their relations by appropriate names; having previously devised instruments, by which he might mark the places and the magnitudes of each individual star. In this way, it might be easily discovered, not only whether they were destroyed or produced, but whether they changed their relative positions, and likewise, whether they were in-creased or diminished; the heavens being thus left as an inheritance to anyone, who might be found competent to complete his plan.”
>
> — Pliny the elder (77AD), *Natural History, Volume 1* (pg. 59)

The following seems to be Pliny's main entry on the soul:

> “After burial come the different quiddities as to the existence of the Manes. All men, after their last day, return to what they were before the first; and after death there is no more sensation left in the body or in the

soul than there was before birth. But this same vanity of ours extends even to the future, and lyingly fashions to itself an existence even in the very moments which belong to death itself: at one time it has conferred upon us the immortality of the soul; at another transmigration; and at another it has given sensation to the shades below, and paid divine honors to the departed spirit, thus making a kind of deity of him who has but just ceased to be a man. As if, indeed, the mode of breathing with man was in any way different from that of other animals, and as if there were not many other animals to be found whose life is longer than that of man, and yet for whom no one ever presaged anything of a like immortality. For what is the actual substance of the soul, when taken by itself? Of what material does it consist? Where is the seat of its thoughts? How is it to see, or hear, or how to touch? And then, of what use is it, or what can it avail, if it has not these faculties? Where, too, is its residence, and what vast multitudes of these souls and spirits must there be after the lapse of so many ages? But all these are the mere figments of childish ravings, and of that mortality which is so anxious never to cease to exist. It is a similar piece of vanity, too, to preserve the dead bodies of men; just like the promise that he shall come to life again, which was made by Democritus *f* who, however, never has come to life again himself. Out upon it! What downright madness is it to suppose that life is to recommence after death! or indeed, what repose are we ever to enjoy when we have been once born, if the soul is to retain its consciousness in heaven, and the shades of the dead in the infernal regions? This pleasing delusion, and this credulity, quite cancel that chief good of human nature, death, and, as it were, double the misery of him who is about to die, by anxiety as to what is to happen to him after it. And, indeed, if life really is a good, to whom can it be so to have once lived? How much more easy, then, and how much more devoid of all doubts, is it for each of us to put his trust in himself, and guided by our knowledge of what our state has been before birth, to assume that that after death will be the same."

— Pliny the Elder (77AD), *Natural History, Volume 2* (§:The Manes, or Departed Spirits of the Soul, pg. 218-19)

The translator, John Bostock, footnotes this with: "Pliny views the state after death in the same light as Democritus and Epicurus, utterly denying the immortality of the soul; though it cannut be said that he looks upon life in the same cheerful, laissez fare manner in which it was regarded by the latter of these philosophers." The following are a few summaries of Pliny's views on the soul:

"Though anything but an Epicurean, in the modern acceptation of the word, he seems to have held some, at least, of the tenets of Epicurus, in reference to the immortality of the soul. Whether he supposed that the soul, at the moment of death, is resolved into its previous atoms or constituent elements, he does not inform us; but he states it as his belief, that after death the soul has no more existence than it had before birth; that all notions of immortality are a mere delusion; and that the very idea of a future existence is ridiculous, and spoils that greatest blessing of nature—death. He certainly speaks of ghosts or apparitions, seen after death; but these he probably looked upon as exceptional cases, if indeed he believed in the stories which he quotes, of which we have no proofs, or rather, indeed, presumptive proofs to the contrary; for some of them he calls 'magna fabulosetas [most fabulous tales]'."

— John Bostock (1855), "Life and Writings of Pliny", in: *Natural History, Volume One* (pg. xviii)

"Pliny, as will be seen toward the end of the *Natural History, Volume Two*, laughed to scorn the notion of the immortality of the soul."

— John Bostock (1855), "note #14" of *Natural History, Volume 2* (pg. 119)

"Pliny poses numerous questions about the soul, asking what it is made of, what is its power of thought, how does it hear or touch, and what use it gets of these senses. He asks where the soul resides and how great the crowd of souls from so many ages past. Then he dismisses all of these questions as: 'characteristic

of childish gibberish and of mortal men greedy for an everlasting life."

— Jennifer Hecht (2004), *Doubt* (pg. 154)

(add)

Chance | Tyche

Pliny digressed on the incredulous phenomenon on chance as god types of worships and belief seen in his day, particularly via the god Tyche (Greek) (Q) or Fortuna (Roman) (Q), as follows: [2]

> "Throughout the whole world, in all places and at all times, Fortuna alone is invoked, alone commended, alone accused and subject to reproaches, to her is credited all that is received and we are subject to chance that 'chance' herself takes the place of god."

Here we see what in modern times some refer to as Dawkins god, i.e. 'chance' championed as the replacement for god, albeit not without similar ridicule.

Christ myth

See main: Silent historians problem

In Christ myth arguments, Pliny the elder is oft-cited as someone who should have written, specifically in his *Natural History* (79AD), about the now-famous character of "Jesus Christ" – said to have existed as a real person (from 0 to 33AD) – but did not. Pliny even devotes a section to "revival of people pronounced dead, commenting "life is full of such predictions, but they should not be collected, since more often than not they are false", but makes no mention of a person named Jesus being revived from the dead? [2]

CHAP. 53. (52.)—PERSONS WHO HAVE COME TO LIFE AGAIN AFTER BEING LAID OUT FOR BURIAL.

Aviola,[93] a man of consular rank, came to life again when on the funeral pile; but, by reason of the violence of the flames, no assistance could be rendered him, in consequence of which he was burnt alive. The same thing is said to have happened to L. Lamia, a man of prætorian rank. Messala, Rufus,[94] and many other authors, inform us, that C. Ælius Tubero, who had filled the office of prætor, was also rescued from the funeral pile. Such then is the condition of us mortals: to these and the like vicissitudes of fortune are we born; so much so, that we cannot be sure of any thing, no, not even that a person is dead. With reference to the soul of man, we find, among other instances, that the soul of Hermotinus of Clazomenæ was in the habit of leaving his body, and wandering into distant countries, whence it brought back numerous accounts of various things, which could not have been obtained by any one but a person who was present. The body, in the meantime, was left apparently lifeless.[95] At last, however, his enemies, the Cantharidæ,[96] as they were called, burned the body, so that the soul, on its return, was deprived of its sheath, as it were.

The opening section from **Pliny's** 77AD encyclopedia article on people said to have come back to life after being laid out for burial, wherein he discusses a number of people, including a woman said to have been dead for seven days, but makes NO mention of an "Jesus", said to have famously died in 33AD, been dead for three days, and then resurrected. [2]

Roman | Vespasian

Pliny, in addition to being a naval and army commander in the early Roman empire, was a personal friend of emperor Vespasian (reign: 69-79AD), during which time the gods Serapis (Osiris-Apis) and Isis were the supreme gods of Roman worship. [3]

Study | Method

The following a description of the works and general through-going study method of Pliny the elder, described by his nephew Pliny the younger: [5]

> "His first composition was a treatise *On the Use of the Javelin by Cavalry*, in one book. This he composed, with equal diligence and ingenuity, while he was in command of a troop of horse. His second work was the *Life of Q. Pomponius Secundus*, in two books, a person by whom he had been particularly beloved.— These

books he composed as a tribute which was justly due to the memory of his deceased friend. His next work was twenty books on *The Wars in Germany*, in which he has compiled an account of all the wars in which we have been engaged with the people of that country This he had begun while serving in Germany, having been recommended to do so in a dream. For in his sleep he thought that the figure of Drusus Nero stood by him—the same Drusus, who after the most extensive conquests in that country, there met his death. Commending his memory to Pliny's attentive care, Drusus conjured him to rescue it from the decaying effect of oblivion. Next to these came his three books entitled *The Student*, divided, on account of their great size, into six volumes. In these he has given instructions for the training of the orator, from the cradle to his entrance on public life. In the latter years of Nero's reign, he wrote eight books, *On Difficulties in the Latin Language*; that being a period at which every kind of study, in any way free-spoken or even of elevated style, would have been rendered dangerous by the tyranny that was exercised. His next work was his *Continuation of the History of Aufidius Bassus*, in thirty-one books; after which came his *Natural History*, in thirty-seven books, a **work remarkable for its comprehensiveness and erudition, and not less varied than nature herself**.

You will wonder how a man so occupied with business could possibly find time to write such a number of volumes, many of them on subjects of a nature so difficult to be treated of. You will be even more astonished when you learn, that for some time he pleaded at the bar as an advocate, that he was only in his fifty-sixth year at the time of his death, and that the time that intervened was equally trenched upon and frittered away by the most weighty duties of business, and the marks of favor shewn him by princes. **His genius**, however, was truly quite incredible, his zeal indefatigable, and his power of application wonderful in the extreme. At the festival of the Vulcanalia, he began to sit up to a late hour by candle-light, not for the purpose of consulting the stars, but with the object of **pursuing his studies**; while, in the winter, he would set to work at the seventh hour of the night, or the eighth at the very latest, often indeed at the sixth [midnight]. By nature, he had the faculty of being able to fall asleep in a moment; indeed, slumber would sometimes overtake him in his studies, and then leave him just as suddenly. Before daybreak, he was in the habit of attending the Emperor Vespasian, — for he, too, was one who made an excellent use of his nights, — and then betook himself to the duties with which he was charged. On his return home, he devoted all the time which was still remaining **to study**. Taking an early repast, after the old fashion, light, and easy of digestion, in the summer time, if he had any leisure to spare, he would lie down in the sun-shine, **while some book was read to him**, he himself making notes and extracts in the meanwhile; for **it was his habit never to read anything without making extracts**, it being a maxim of his, that ‘there is no book so bad but that some good may be got out of it.’ After thus enjoying sunshine, he generally took a cold bath; after which he would sit down to a slight repast, and then take a short nap. On awaking, as though another day had now commenced, **he would study till** the hour for the evening meal, during which **some book was generally read to him**, he making comments on it in a cursory manner.

I remember, on one occasion, a friend of his interrupting the reader, who had given the wrong pronunciation to some words, and making him go over them again. ‘You understood him, didn't you?’ said my uncle. ‘Yes’, said the other. ‘Why, then, did you make him go over it again? Through this interruption of yours, we have? lost more than ten lines.’ So thrifty a manager was he of time! In summer, he rose from the evening meal by daylight; and, in winter, during the first hour of the night [6-7PM], just as though there had been some law which made it compulsory on him to do so. This is how he lived in the midst of his employments, and the bustle of the city. When in retirement in the country, the **time spent in the bath was the only portion that was not allotted by him to study**. When I say in the bath, I mean while he was in the water; for while his body was being scraped with the strigil and rubbed, **he either had some book read to him**, or else would dictate himself. While upon a journey, as though relieved from every other care, he **devoted himself to study, and nothing else**.

By his side was his secretary, with a book and tablets; and, in the winter time, the secretary’s hands were protected by gloves, that the severity of the weather might not deprive his master for a single moment of his services. It was for this reason also that, when at Rome, he would never move about except in a litter. I remember that on one occasion he found fault with me for walking — ‘You might have avoided losing all those hours’, said he; for he looked **upon every moment as lost which was not devoted to study**. It was

by means of such unremitting industry as this that he completed so many works, and left me 160 volumes of notes, written extremely small on both sides, which in fact renders the collection doubly voluminous. He himself used to relate, that when he was procurator in Spain, he might have parted with his common-place book to Largius Licinius for 400,000 sesterces; and at that time the collection was not so extensive as afterwards. When you come to think of how much he must have read, of how much he has written, would you not really suppose that he had never been engaged in business, and had never enjoyed the favor of princes? And yet, on the other hand, when you hear **what labor he expended upon his studies**, does it not almost seem that he has neither written nor read enough? For, in fact, what pursuits are those that would not have been interrupted by occupations such as his? While, again, what is there that such unremitting perseverance as his could not have effected? I am in the habit, therefore, of laughing at it when people call me a studious man, — me who, in comparison with him, am a downright idler; and yet I devote to study as much time as my public engagements on the one hand, and my duties to my friends on the other, will admit of. Who is there, then, out of all those who have devoted their whole life to literature, that ought not, when put in comparison with him, to quite blush at a life that would almost appear to have been devoted to slothfulness and inactivity?"

Here, we might compare this intensity of study method to that of the description of Gerald Massey and his book store reading method.

Influence

In 1804, Percy Shelley, at age 14, while studying at Eton College, translated half of Pliny's *Natural History* from Latin into English.

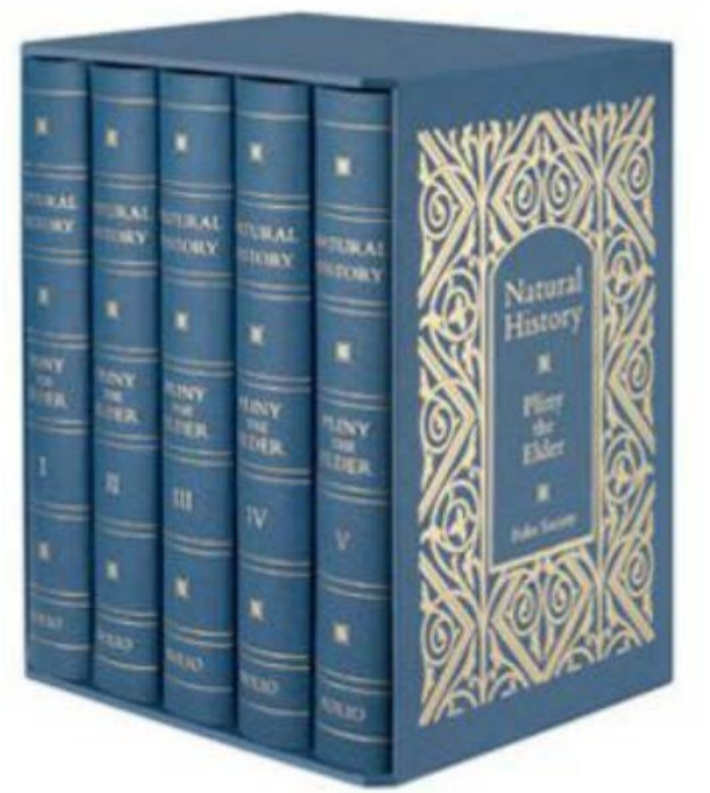

A 5-volume set of Pliny's *Natural History*.

Quotes | On

The following are quotes on Pliny:

> "To a man so eager as he was in the **pursuit of knowledge**, this appeared to be a most singular phenomenon, and one that deserved to be viewed more closely; accordingly he gave orders for a light Liburnian vessel to be got ready."
>
> — Pliny the Younger (c.80AD), recount of last day of his uncle; in: *Natural History, Volume One* (pg. ix)

"**Pliny** has worked upon a plan which is much more extensive than that of Aristotle, and not improbably too extensive. He has made it his object to embrace every subject; indeed, he would appear to have taken the measure of nature, and to have found her too contracted for his **expansive genius**. His *Natural History*, independently of that of animals, plants, and minerals, includes an account of the heavens and the earth, of medicine, commerce, navigation, the liberal and mechanical arts, the origin of usages and customs, in a word, the history of all the natural sciences and all the arts of human invention. What, too, is still more astonishing, in each of these departments Pliny shows himself equally great. The grandeur of his ideas and the dignity of his style confer an additional lustre on the profoundness of his erudition; not only did he know all that was known in his time, but he was also gifted with that comprehensiveness of view which in some measure multiplies knowledge. He had all that delicacy of perception upon which depend so materially both elegance and taste, and he communicates to his readers that freedom of thought and that boldness of sentiment, which constitute the true germ of

philosophy. His work, as varied as Nature herself, always paints her in her most attractive colors. It is, so to say, a compilation from all that had been written before his time: a record of all that was excellent or useful; but this record has in it features so grand, this compilation contains matter grouped in a manner so novel, that it is preferable to most of the original works that treat upon similar subjects."

— Buffon (c.1750), "Discours Premier sur l'Histoire Naturelle"; in: *Natural History, Volume One* (soul, pgs. ixx-xx)

"The enlightened and benevolent **Pliny** [in his *Natural History*] thus publicly professes himself an atheist."

— Percy Shelley (1811), *The Necessity of Atheism* [8]

"From the titles which he gives to Titus (39-81AD) (Q) in the dedicatory preface, it is pretty clear that **Pliny's** *Natural History* was published 77AD, two years before his death."

— John Bostock (1855), "Life and Writings of Pliny", in: *Natural History, Volume One* (pg. viii)

"**Pliny's** *Natural History* is not a 'natural history' in the modern acceptation of the term, but rather a vast encyclopedia of ancient knowledge and belief upon almost every known subject — 'not less varied than Nature herself', as his nephew says. It comprises, within the compass of thirty-seven books, 20,000 matters of importance, collected from about 2,000 volumes (nearly all of which have now perished), the works, as Pliny himself states, of 100 writers of authority; together with a vast number of additional matters unknown to those authorities, and many of them the results of his own experience and observation. Jean Hardouin (1646-1729) (Q) has drawn up a catalogue of the authors quoted by Pliny; they amount in number to between 400 and 500."

— John Bostock (1855), "Life and Writings of Pliny", in: *Natural History, Volume One* (pg. xvi)

Quotes | By

The following are noted quotes:

"The nature of the animated beings which exist upon [earth], is hardly in any degree less worthy of our contemplation than its other features; if, indeed, the human mind is able to embrace the whole of so diversified a subject. Our first attention is justly due to man, for whose sake all other things appear to have been produced by nature; though, on the other hand, with so great and so severe penalties for the enjoyment of her bounteous gifts, that it is far from easy to determine, whether she has proved to him a kind parent, or a merciless step-mother."

— Pliny the elder (77AD), *Natural History, Volume 2* (pg. 117)

"Man occupies a small fraction of the earth, itself a mere dot in the universe."

— Pliny the elder (77AD), *Natural History* [2]

"If I had to meet any divinity, I would meet none but the sun."

— Pliny (70AD), *Publication*; cited by Jean Meslier (1729) in *The Testament* (pg. 343)

"Fortune favors the bold."

— Pliny the elder (79AD), comment made upon hesitating for a moment, on whether or not to turn back, in route to study the newly erupting Mount Vesuvius, after the pilot strongly advised him to do so; in: *Natural History, Volume One* (pg. x)

"It is a virtue and manifestation of a fitting modesty to acknowledge anyone through whom one has made progress."

— Pliny the Elder (75AD), *Publication*; cited by Robert Boyle (1660) in *New Experiments Physico-Mechanical, Touching the Spring of the Air and its Effects* [9]

References

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2. (a) Pliny (the elder). (77AD). *Natural History, Volume 2* (translators: John Bostock and H.T. Riley) (§:Contents, pgs. iii-; §:Persons who have come to life again after being laid out for burial, pgs. 210-213). Henry G. Bohn, 1855.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (§:Pliny the Elder, pgs. 152-54). HarperOne.
3. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (Vespasian, pg. 217; Serapis, pg. 349) (Q). Dover, 1969.
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5. Pliny the younger (c.80AD), "Epistle addressed to Macer", in: *Natural History, Volume One* (pgs. xii-xv)
6. Pliny (the elder). (77AD). *Natural History, Volume 1* (translators: John Bostock and H.T. Riley) (§:Contents, pg. xxiii-; §2.5: Of God, pgs. 20-24) . Henry G. Bohn, 1855.
7. Pliny (the elder). (77AD). *Natural History, Volume 2* (translators: John Bostock and H.T. Riley) (§:Contents, pgs. iii-; animated being, pg. 117). Henry G. Bohn, 1855.
8. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 421). HarperOne.
9. Conlon, Thomas. (2011). *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum* (pg. 71). Saint Austin Press/LuLu.

Further reading

● Pliny (the elder). (77AD). *Natural History, Volume 1* (translators: John Bostock and H.T. Riley) (§:Contents, pg. xxiii-). Henry G. Bohn, 1855.
● Pliny (the elder). (77AD). *Natural History, Volume 2* (translators: John Bostock and H.T. Riley). Henry G. Bohn, 1855.
● Pliny (the elder). (77AD). *Natural History, Volume 3* (translators: John Bostock and H.T. Riley). Henry G. Bohn, 1855.
● Pliny (the elder). (77AD). *Natural History, Volume 4* (translators: John Bostock and H.T. Riley). Henry G. Bohn, 1855.
● Pliny (the elder). (77AD). *Natural History, Volume 5* (translators: John Bostock and H.T. Riley). Henry G. Bohn, 1855.
● Pliny (the elder). (77AD). *Natural History, Volume 6* (translators: John Bostock and H.T. Riley). Henry G. Bohn, 1855.

External links

● Pliny the elder – Wikipedia.

θΔics

In existographies, **Pliny the younger** (61-c.113 ACM) (FA:31), not to be confused with his uncle Pliny the elder (23-79AD), was []

Jesus | Silent historians

Pliny the younger's name often comes up in discussions (Q) of the silent historians problem and or discussions of his c.112 letter to Trajan, wherein he comments (Q), supposedly, on the growing numbers of "Christians".

Quotes | On

The following are quotes on Pliny the younger:

> "There has been a considerable number of those whom history calls 'atheists'. Leucippus, Democritus, Xenophanes, and others of the Atomistic and Eleatic schools (Q), are said to have been such. In his *Intellectual System*, Cudworth puts into this category Seneca and the **younger Pliny** among the Romans. Since the reformation, such men as: Rabelais, Machiavel, Bruno, Vanini, D'Alembert, Diderot, Buffon, Condorcet, Mirabeau, La Place, Frederic II, and even Pope Leo X, have been charged with atheism."
>
> — Willis Lord (1875), *Christian Theology for the People* (pg. 67)

Quotes | By

The following are noted Pliny the younger quotes:

> "An object in possession seldom retains the same charm that it had in pursuit."
>
> — Pliny the younger (c.100AD)

External links

- Pliny the Younger – Wikipedia.

θΔics

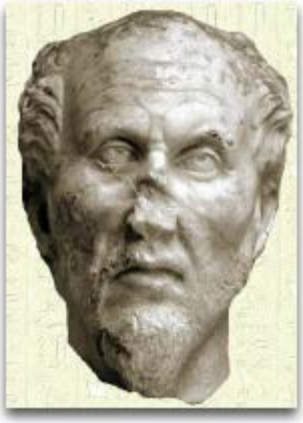

In existographies, **Plotinus** (205-270 ACM) (IQ:170|#352) (Cattell 1000:773) [RGM:500|1,500+] (Stokes 100:18) (Murray 4000:19|WP) (GPhE:#) (CR:30) was a Greek-Egyptian born Italian anti-atomicist philosopher, eponym of terms such as “Plotinian” (Q) ideas, characterized a "non-Christian" (Copleston, 1948), founder of the neoplatonic school, noted for his circa 265 collected works set *Enneads*, wherein he attempts to grapple with phenomena such as "passions" and concepts such as "soul" in terms of atomic theory, something rarely seen in modern time. [4]

Influence

Plotinus, according to Tom Harpur (2004), who he defines as a “pagan philosopher”, was the person from whom Augustine (354-430) learned the idea of “trinity”. [3]

Enneads

In *Enneads* 2.1, Plotinus, as cited by Victor Stenger (2013), asks: [2]

> “What motion of atoms can one attribute to the actions and passions of the soul? . . . What movements of atoms stir the thought of the geometer, the arithmetician, or the astronomer? What movements are the source of wisdom?”

In *Enneads* 4.4, he asks: [2]

> “It is impossible for the association of material bodies to produce life and for things devoid of intelligence to engender intelligence. . . . For there would be no composite bodies and not even simple bodies in the reality of the world, were it not for the pervasive soul of the universe.”

In the following, Plotinus talks about affinities:

> “We have learned, further, something of our human standing; we know that we too accomplish within the all a work not confined to the activity and receptivity of body in relation to body; we know that we bring to it that nature of ours, linked as we are by affinities within us towards the answering affinities outside us; becoming by our soul and the conditions of our kind this linked—or, better, being linked by nature—with our next highest in the celestial or demonic realm, and thence onwards with those above the celestials, we cannot fail to manifest our quality.”
>
> — Plotinus (c.260), *Enneads* 4.4 (Q)(Q)

(add)

Measure of the fish

Plotinus, at some point, supposedly, commented on the "measure of the fish", arguing something along the lines of that it was a measure of the "world soul". [7]

Quotes | On

The following are quotes by Plotinus:

> “Whoever will take the trouble to read the works of Plato and his disciples, such as Proclus, Jamblicus, **Plotinus**, etc., will find in them almost all the doctrines and metaphysical subtilties of the Christian

teleology. Moreover, they will find the origin of the *symbols*, the *rites*, the *sacraments*, in short, of the *theurgy*, employed in Christian worship, who, as well in their religious ceremonies as in their doctrines, have done no more than follow, more or less faithfully, the road which had been traced out for them by the *priests* of *paganism*. With respect to the ancient philosophy, with the exception of that of Democritus and Epicurus, it was, for the most part, a true *theosophy*, imagined by the Egyptian and Assyrian priests: Pythagoras and Plato have been no more than theologians, filled with enthusiasm, and perhaps with knavery. At least, we find in them a *sacerdotal* and mysterious mind, which will always indicate, that they seek to deceive or that they are not willing men should be enlightened. It is in *nature*, and not in *theology*, that we must draw up an intelligible and true philosophy."

— Baron d'Holbach (1770), *The System of Nature* (pg. 220)

"If we are to speak of the 'key' to early romanticism, it is to be found in one of the thinkers of antiquity, **Plotinus**. For his neoplatonic philosopher not only inspired the entire system of Novalis, scattered through innumerable fragments, and many of the ideas of Schelling in his middle period; his arm reached farther: through Novalis and Schelling he exercised an influence, though an indirect one, upon both Schlegels [August Schlegel and Friedrich Schlegel], and without knowledge of this fact many a passage in the 'Dialogue concerning Poetry' and the Berlin lectures of August Schlegel remains an enigma."

— Paul Reiff (1912), "Plotin und die Deutsche Romantik" [6]

Quotes | By

The following are quotes by Plotinus:

"Matter is no soul; it is not intellect, is not life, is no ideal principle, no reason principle; it is no limit or bound, for it is mere indetermination; it is not a power, for what does it produce?"

— Plotinus (c.260) (Q)

"Without soul there would be only stark body—clay and water—or rather the blankness of matter, the absence of being, and, as an author says, the 'excretion of gods'."

— Plotinus (c.245), *Ennead* [5]

"Whenever anything reaches its own perfection, we see that it cannot endure to remain in itself, but generates and produces some other thing. Not only beings having the power of choice, but also those which are by nature incapable of choice, and even inanimate things, send forth as much of themselves as they can: thus, fire emits heat and snow cold and drugs act upon other things."

— Plotinus (c.245), *Ennead, Volume Five* (pgs. 1, 4); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 64)

"The existence thus produced by or through being, and called life, is a mode of intellectual existence characterized by discursive thought, or that manner of thinking which divides the objects of thought in order to categorize them and make them knowable through the relational process of categorization or 'orderly differentiation'. "

— Plotinus (c.260) (Q)

> “An invisible and unchanging beauty pervades all things.”
>
> — Plotinus (c.260), *Publication*; cited by Gregory Bateson (1979) in *Mind and Nature* (pg. 14)

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6. (a) Reiff, Paul. (1912). “Plotin und die Deutsche Romantik”, *Euphorion*, 19:591, 602-12.
(b) Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea* (pg. 298). Harvard University Press, 1936.
7. Fideler, David. (1993). *Jesus Christ, Sun of God: Ancient Cosmology and Early Christianity* (Plotinus, pg. 300-01). Publisher.

External links

- Plotinus – Wikipedia.
- Enneads – Wikipedia.

θΔics

In existographies, **Plutarch** (c.46-120AD) (IQ:180|#157) (Cattell 1000:134) [RGM:204|1,500+] (FA:31) (GPhE:19) [CR:116] was a Greek-born Roman historian and philosopher, noted for his commentary on the Osiris resurrection theory (100AD), i.e. Egyptian state religion, for his discussions on the theory of the cold element (118AD) and for his Theseus's ship (see: turnover rate) paradox discussions.

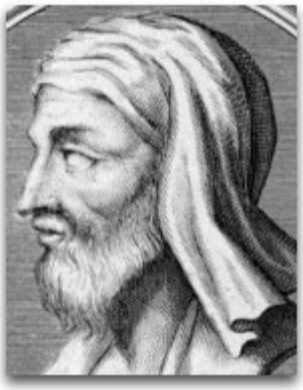

Good | Evil

Plutarch, in his *On Isis and Osiris* (§44), on the subject of good and evil, and it apparent commingling throughout religion and philosophy, says the following: [7]

> "There are some who would make the legend an allegorical reference to matters touching eclipses; for the moon suffers eclipse only when she is full, with the sun directly opposite to her, and she falls into the shadow of the earth, as they say Osiris fell into his coffin. Then again, the moon herself obscures the sun and causes solar eclipses, always on the thirtieth of the month; however, she does not completely annihilate the sun, and likewise Isis did not annihilate Typhon [Set].
>
> There are some who give the name of Typhon to the earth's shadow, into which they believe the moon slips when it suffers eclipse. Hence it is not unreasonable to say that the statement of each person individually is not right, but that the statement of all collectively is right; for it is not drought nor wind nor sea nor darkness, but everything harmful and destructive that nature contains, which is to be set down as a part of Typhon. The origins of the universe are not to be placed in inanimate bodies, according to the doctrine of Democritus and Epicurus, nor yet is the Artificer of undifferentiated matter, according to the Stoic doctrine, one reason, and one providence which gains the upper hand and prevails over all things. The fact is that it is impossible for anything bad whatsoever to be engendered where God is the Author of all, or anything good where God is the Author of nothing; for the concord of the universe, like that of a lyre or bow, according to Heraclitus, is resilient if disturbed; and according to Euripides:
>
> > The good and bad cannot be kept apart,
> > But there is some commingling, which is well.
>
> Wherefore this very ancient opinion comes down from writers on religion and from lawgivers to poets and philosophers; it can be traced to no source, but it carried a strong and almost indelible conviction, and is in circulation in many places among barbarians and Greeks alike, not only in story and tradition but alsoin rites and sacrifices, to the effect that **the universe is not of itself suspended aloft without sense or reason or guidance, nor is there one reason which rules and guides it by rudders, as it were, or by controlling reins, but, inasmuch as nature brings, in this life of ours, many experiences in which both evil and good are commingled, or better, to put it very simply, nature brings nothing which is not combined with something else**, we may assert that it is not one keeper of two great vases who, after the manner of a barmaid, deals out to us our failures and successes in mixture, but it has come about, as the result of two opposed principles and two antagonistic forces, one of which guides us along a straight course to the right, while the other turns us aside and backward, that our life is complex, and so also is the universe; and if this is not true of the whole of it, yet it is true that this terrestrial universe, including its moon as well, is irregular and variable and subject to all manner of changes. For if it is the law of nature that nothing comes into being without a cause, and if the good cannot provide a cause for evil, then it follows that nature must have in herself the source and origin of evil, just as she contains the source and origin of good."

Here, in this very ripe comment, we recall Goethe daemonic principle.

Isis | Osiris

In c.100AD, Plutarch, in his *On Isis and Osiris*, penned one of the first commentaries, since Herodotus (c.435BC), on Egyptian mythology; the following are example quotes:

> "It may be that this fabular relation borders on the verity of physical science."
>
> — Plutarch (100), *De Iside* (§36) (Q); cited by Gerald Massey (1883) in *Natural Genesis, Volume One* (pg. iv)

The following are abstracts:

> "The nearest thing to a truly national religion in Egypt was the Osiris cycle. The story is not extant in full epic version but must be pieced together from several ancient and classical sources: the *Pyramid Texts* of the Old Kingdom, the *Coffin Texts* of the Middle Kingdom, the *Book of the Dead* from the New Kingdom, a ribald text entitled *The Contest of Horus and Seth for Rule* from the Twentieth Dynasty, and the summary of **Plutarch** in *Concerning Isis and Osiris* from the second century C.E."
>
> — Patrick Reid (1987), *Readings in Western Religious Thought* [4]

> "**Plutarch**'s version of the myth of Isis and Osiris connects the various episodes, many of which can be documented from Egyptian sources, into a single, running narrative (*On Isis and Osiris*, 12-19). The story begins with Kronos (Geb, the Egyptian earth god) and Rhea (Nut, the Egyptian sky goddess) overcoming the curse of Helios (Re, the sun god) with the help of Hermes (Thoth, the Egyptian moon god) by producing five children on five intercalary days: Osiris, Horus, Typhon (Set), Isis, and Nephthys. As pharaoh of Egypt, Osiris brings civilization to that country and to the whole world. Typhon, however, gathers conspirators and plots to kill Osiris. First, he imprisons Osiris within a coffin and throws it into the Nile River, and later he dismembers the body of Osiris and scatters the pieces all around Egypt. One piece, the penis, is lost forever in the Nile River. In both episodes, the **reproductive power of Osiris is sub-merged** in the Nile. (Isis grieving and searching for Osiris and burning away the mortality of the infant prince of Byblos can be compared with …"
>
> — Marvin Meyer (1999), *The Ancient Mysteries* (Q)

(add discussion)

Silent historians problem

> *See main: Silent historians problem*

Plutarch, who writes, in c.100AD, about Osiris (but NOT Jesus) and the peculiar birth of Horus; specifically: [6]

> "Osiris, who the Greeks conclude to have been the same person with their Dionysus [Greek] or Bacchus [Roman], was accompanied, after his death, without his phallus, by Isis [Stella Maris], and in consequence hereof to have brought forth Harpocrates [Horus]."

is often cited (Q)(Q) along with thinkers such as Seneca the Younger (4BC-65AD), **Hero** (c.10-70AD), **Marcus Aurelius** (121-180), and Plotinus (205-270), among a hundred or so others, who should have cited "Jesus" as an historical figure, if he had in fact existed, but do not. (Q)

Cold element

Plutarch, in his "On the Principle of Cold" (c.118AD), a letter to Roman sophist-philosopher Favorinus (c.80-160AD), a debate on whether such a thing as an element of cold exists, revolving around what Aristotle and others had to say on the matter, opened to the following: [1]

> "Is there an active principle or substance of cold (as fire is of heat) through the presence of which and through participation in which everything else becomes cold? Or is coldness rather a negation of warmth, as they say darkness is of light and rest of motion? Cold, indeed, seems to have the quality of being stationary, as heat has that of motion; while the cooling off of hot things is not caused by the presence of any force, but merely by the displacement of heat, for it can be seen to depart completely at the same time as the remainder cools off. The steam, for example, which boiling water emits, is expelled in company with the departing heat; that is why the amount becomes less by cooling off; for this removes the heat and nothing else takes place."

The above "is coldness rather a negation of warmth, as they say darkness is of light and rest of motion?", to note, was restated later by Rene Descartes, in regards to the "idea of god"; and also later mis-attributed to Einstein (Q).

Theseus's paradox

Plutarch, supposedly, disputed Heraclitus' claim about stepping twice into the same river, citing that it cannot be done because "it scatters and again comes together, and approaches and recedes." He eventually summarized the paradox in the form of the story of the ship of Theseus, which had its parts continuously replaced each time one broke or rotted, after which philosophers began to puzzle as to whether it was really the same ship:

> "The ship wherein Theseus and the youth of Athens returned from Crete had thirty oars, and was preserved by the Athenians down even to the time of Demetrius Phalereus, for they took away the old planks as they decayed, putting in new and stronger timber in their place, in so much that this ship became a standing example among the philosophers, for the logical question of things that grow; one side holding that the ship remained the same, and the other contending that it was not the same."

This ship question came to be known as "Theseus's paradox"; an early version of the turnover rate paradox of self, wherein elements (or atoms) are substitute for ship parts. [5]

Chemistry | Etymology

The etymology of the word "chemistry" (see: chemistry etymology), according to English chemistry historian James Partington, derives from the native designation of Egypt, a country called *chēmia*, as described by Plutarch in his 100AD book *On Isis and Osiris*, which, according to Plutarch, was called as such owing to the black color of its soil; this etymology is confirmed by Egyptian inscriptions, where the hieroglyphic form of the word is used. [1]

On Listening

Plutarch, in his *On Listening to Lectures*, described education, via thermal word language, as follows: [2]

> "We must encourage those lazy ones, however—once they have grasped the basic points—to interconnect everything else on their own, to use memory to guide original thinking, and to accept what someone else says as a starting point, a seed to be nourished and grown. For the correct analogy for the mind is not a vessel that needs filling, but wood that needs igniting—no more—and then it motivates one towards originality and instils the desire for truth.
>
> Suppose someone were to go an ask his neighbors for fire and find a substantial blaze there, and just stay there continually warming himself: that is no different from someone who goes to someone else to get some

of his rationality, and fails to realize that he ought to ignite his innate flame, his own intellect, but is happy to sit entranced by the lecture, and the words trigger only associative thinking and bring, as it were, only a flush to his cheeks and a glow to his limbs' but he has not dispelled or dispersed, in the warm light of philosophy, the internal dank gloom if his mind."

Into the 1990s, to note, a variant of the above, namely: "education is the kindling of a flame, not the filling of a vessel", began to be misattributed vicariously to Socrates. (Q)

Quotes | By

The following are noted quotes:

"The soul, being eternal, after death is like a caged bird that has been released. If it has been a long time in the body, and has become tame by many affairs and long habit, the soul will immediately take another body and once again become involved in the troubles of the world. The worst thing about old age is that the soul's memory of the other world grows dim, while at the same time its attachment to things of this world becomes so strong that the soul tends to retain the form that it had in the body. But that soul which remains only a short time within a body, until liberated by the higher powers, quickly recovers its fire and goes on to higher things."

— Plutarch (c.100), *Moralia* (§:The Consolation) (Q)

"The mind is not a vessel to be filled but a **fire** to be kindled."

— Plutarch (c.100) (Q); oft-misattributed to Socrates (Q); paraphrased by Yeats (Q)

"Whenever we begin an enterprise or take possession of a charge, or experience a calamity, we place before our eyes the examples of the greatest men of our own or of bygone ages, and we ask ourselves how Plato, or Epaminondas, or Lycurgus, or Agesilaus, would have acted. Looking into these personages, as into a faithful mirror, we can remedy our defects in word or deed."

— Plutarch (c.100AD), "Helps to Virtue" (Q)

"The Romans revere flame symbolically, because it is like a living thing. It needs air and sustenance, it moves of itself, and when it is extinguished, with water, it gives out a sound as if it were being slain."

— Plutarch (c.100), *Publications*; cited by George Scott (1985) in *Atoms of the Living Flame* (pg. 75)

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2. (a) Plutarch. (100AD). *On Isis and Osiris*. Publisher.
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(b) Squire, Sam. (1744). *Plutarch's Treatise on Isis and Osiris* (pg. 15ff). Cambridge.
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Further reading

● Plutarch. (c.100AD). *Isis and Osiris*; in: *Plutarch's Moralia, Volume Five*: Isis and Osiris. The E at Delphi. The oracles at Delphi no longer given in verse (§:1-19; §:20-40; §:41-50: §53-67; §:68-80) . The obsolescence of oracles (Introduction: Victor Hanson). Harvard University Press.

External links

● Plutarch – Wikipedia.

θΔics

In engines, **pneumatical engine** (TR:37), aka “machine Boyleana”, was a modified Guericke engine (1657), an improved vacuum pump; a device consisting of a single-barreled pump, with a solid piston moved by a rack and pinion, and a globular glass receiver directly communicating with the cylinder, which had an aperture in it, closed and opened by a plug moved by the hand, and playing the part of a valve. [1]

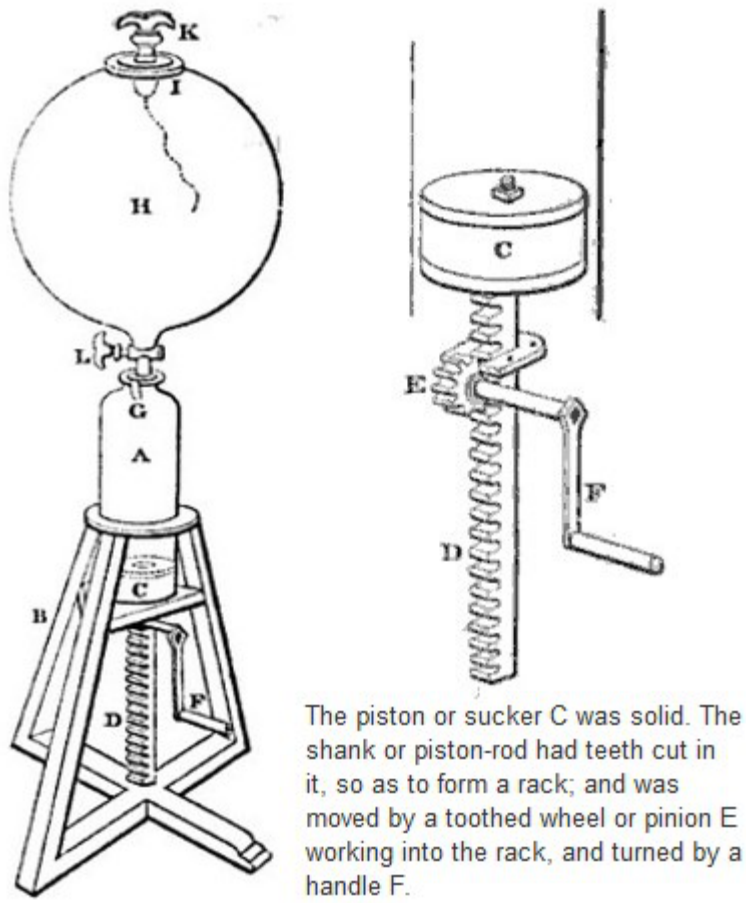

Left: the **pneumatical engine**. Right: the rack-and-pinion piston part of the engine.

Overview

In late 1658 or early 1659, the pneumatical engine, or English air pump, was built by Robert Hooke under the direction of Robert Boyle, a device which, according to Boyle, had two principal parts “a glass vessel and a pump to draw the air out of it.”

Boyle's law

The first gas law, now known as Boyle's law, was determined using this pneumatical engine, and first enunciated by Boyle in 1662 as:

> “The pressures and expansions are in reciprocal proportion.”

or in modern formulation:

$$PV = K\,|_{n,T}$$

which says that for a body of gas at constant number of particles *n* and temperature *T* the product of the measure of the pressure *P* and volume *V* of gas will be a constant *K*.

Parts and operation

The pump A, comprised a single brass barrel about 14 inches in length and 3 inches in internal diameter. It stood upon a strong wooden tripod, with its mouth turned upwards. The piston or sucker C was solid. The shank or piston-rod had teeth cut in it, so as to form a rack; and was moved by a toothed wheel or pinion E working into the rack, and turned by a handle F.

A hole was bored in the side of the upper end of the cylinder, provided with a plug G, which could be drawn out or pushed in by the hand. This was the only valve of the engine. The object of the inversion of the cylinder was to allow the globular or pear-shaped glass-receiver, H, from which it emptied the air, to be placed in a vertical position above the pump. The receiver had a large opening in the top for inserting objects into it. This opening could be narrowed by a tight-fitting brass ring I, in the center of which was an aperture provided with a brass stopper K, to close it. The receiver terminated below in a narrow neck, cemented into a brass stopcock L, which was ground to fit an opening in the upper end of the cylinder, near to the stoppered valve G.

The figure represents the arrangement of the parts, when the pump had completed on exhaustion. The valve of the cylinder G is shut, the stopcock L of the receiver open. L was then shut, G opened, and the piston driven home. The valve was then closed, the stopcock again opened, and the piston drawn down; and so on ad infinitum. By reversing the order in which the valve and stopcock were closed and opened, the pump could be made to condense instead of

rarefying the air of the receiver. The valve for that purpose was opened, whilst the stopcock was ****, and the piston drawn down, so as to allow the cylinder to be filled with atmospheric air. The valve was then shut, the stopcock opened, and the piston as it ascended condensed the air into the receiver.

History

In circa 1649-54, German engineer Otto Guericke had built the first vacuum pump. News of this device soon reached the likes of English physicist Robert Boyle, who had been mediating on the results of Italian physicist Evangelista Torricelli's 1643 mercury experiments on the vacuum. Guericke's designs and results had been published in the *Mechanica Hydraulo-Pneumatica* of Schottus in 1657. Boyle stated that he did not set out to construct his own pneumatical engine (air-pump) until he had heard of Guericke's "way of emptying glass vessels by sucking out the air at the mouth of the vessel." In retrospect, Boyle states that he put both Mr G. (Greatrex) and R. Hooke to contrive an air-pump which should be more manageable than the German one, and free from defects; and adds "after an unsuccessful trail or two of ways proposed by others, Hooke fitted me with a pump." Hooke commented on this "In 1658 or 59 I contrived and perfected the air-pump for Mr. Boyle."

Boyle, it seems, was the supervisor of the construction of his pump. He called in the assistance of a mister Greatrex, a well-known London instrument-maker, but the two of them could not succeed in making a serviceable machine. [2] Boyle then turned to his assistant Robert Hooke, known to be a great mechanical genius, to make the devise. Hooke studied Greatrex's contrivance, commenting that "it was too gross to perform any great matter." Hooke commenced with his design in 1658 finishing early in 1659 . The results of the experimenting with the devise were published in Boyle's 1660 *New Experiments on the Spring of the Air*. [3]

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2. Mr. Greatrex could be "Valentine Greatrex" or "Ralph Greatrex"; Hooke calls him Gratorix; *Waller's Life of Hooke*, pg. iii, Birch names him Greatericks and Greatoricks.
3. Boyle, Robert. (1660). *New Experiments: Physico-Mechanical, Touching the Spring of the Air, and its Effects: Made, for the most part, in a New Pneumatical Engine.* Publisher.

θΔics

In hmolscience, **Po Jen Shen** (c.1986-), or Po-Jen Shen, is a Taiwanese business management theorist noted for []

Education

In 2014, Shen completed his MBA with a thesis on "A Thermodynamic Perspective on Innovation and Distributed Capitalism: a Conceptual Paper", under advisor Joseph Z. Shyu, at the Institute of Management of Technology, College of Management, National Chiao Tung University, Taiwan, wherein, citing: Adam Smith (1776), Vilfredo Pareto (1890s), Ettore Majorana (1930s), and Libb Thims (2013), among others, concepts such as: unbridgeable gap, econoengineering, etc., he attempts to use the key term concepts: statistical thermodynamics, information theory, distributed capitalism, and entropy, to argue for some type of fermion and or boson model of economics and capital; the following is the abstract: [1]

> "Because economic knowledge is increasingly more dispersed, centrifugal, distributed and innovation-driven, an elite-based and lateral collaboration-centric model of distributed market mechanism forecloses the conventional aggregated and centralized market mechanism, particularly, in an era of knowledge economy with information overflows. This research provides essential background knowledge and tools to analyze markets behavior in thermodynamic perspective. The derived information theory is used as a tool that is proved useful to analyze variables/information in specified series, namely, time series. These tools/metrics can be used to judge randomness of a series information and dependency of two (or more) series information. The research also explores a thermodynamic perspective on innovation and distributed capitalism, in particular, strategic service innovation with sizable market diversity and supplies. Two different scenarios are employed, namely, boson, and fermion models of statistical thermodynamics. The results exhibit that boson models represent conventional indistinguishable markets that are close to centralized/aggregated markets in generic static and equally partitioned with chances. In the meanwhile, the fermion models represented progressive distinguishable markets that are close to distributed markets in non-equiprobable states for maximum effectiveness with full of chances."

Shen, in short, employs hmolscience concepts, such as human molecular theory, e.g. Pareto-conceptualized "kinetic human molecules" (pg. 4), to outline an upgraded thermodynamics-based Newtonian economics model, specifically he attempts to use "thermodynamics to study properties of complex market behavior of distributed capitalism" to derive an econophysics theory.

See also

â— Libb Thims (students)

References

1. (a) Shen, Po Jen. (2014). "A Thermodynamic Perspective on Innovation and Distributed Capitalism: a Conceptual Paper" (pdf) (Ñº), under advisor Joseph Z. Shyu, at the Institute of Management of Technology, College of Management, National Chiao Tung University, Jun.
(b) Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (video, 1:33-min) (article, 40-pgs) (PowerPoint, 36-slides), Key speaker talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29; in: *Econophysics, Sociophysics, and other Multidisciplinary Sciences Journal* (Ñº) (pdf), 3(2):5-25.

External links

â— Po-Jen Shen – LinkedIn.

θΔics

In famous publications, **Poem on the Lisbon Disaster or an Examination of the Axiom: 'All is Well'** is []

A depiction of the **Lisbon earthquake** (1755), from the *Kozak Collection: Images of Historical Earthquakes*, which prompted both Voltaire and Goethe towards atheism.

Lisbon earthquake

On 1 Nov 1755, the religious holiday of All Saints Day, in Lisbon, the capital of Portugal, an 8.5-9.0 magnitude earthquake occurred killing an estimated 100,000 people. [1]

Voltaire was age 61 when this occurred.

Goethe was age 6 when this occurred; it was said to have been one of the events, along with the Seven Years' War (1756-1763), that prompted him to first begin to question his religious faith. [2]

Atoms

In the poem, Voltaire refers to atoms, in the fourth to last stanza, as follows:

> "He knows not whence he comes, nor whither goes; Tormented atoms in a bed of mud."
>
> — Voltaire (1755), *Poem on the Lisbon Disaster* (200-201)

> "But thinking atoms, whose far-seeing eyes; Guided by thought, have measured the faint stars."
>
> — Voltaire (1755), *Poem on the Lisbon Disaster* (203-204)

Here we see Voltaire defining himself as both "thinking atoms" and "tormented atoms" (see: human).

Poem

The following is Voltaire's Lisbon poem in full:

Unhappy mortals! Dark and mourning
earth!
Affrighted gathering of human kind!
Eternal lingering of useless pain!
Come, ye philosophers, who cry, "All's
well,"
And contemplate this ruin of a world.
Behold these shreds and cinders of
your race,
This child and mother heaped in
common wreck,
These scattered limbs beneath the
marble shafts--
1 A hundred thousand whom the earth
devours,
Who, torn and bloody, palpitating yet,

Entombed beneath their hospitable roofs,
In racking torment end their stricken lives.
To those expiring murmurs of distress,
To that appalling spectacle of woe,
Will ye reply: "You do but illustrate
The iron laws that chain the will of God"?
Say ye, o'er that yet quivering mass of flesh:
"God is avenged: the wage of sin is death"?
What crime, what sin, had those young hearts conceived
That lie, bleeding and torn, on mother's breast?
Did fallen Lisbon deeper drink of vice
Than London, Paris, or sunlit Madrid?
In these men dance; at Lisbon yawns the abyss.
Tranquil spectators of your brothers' wreck,
Unmoved by this repellent dance of death,
Who calmly seek the reason of such storms,
Let them but lash your own security;
Your tears will mingle freely with the flood.
When earth its horrid jaws half open shows,
My plaint is innocent, my cries are just.
Surrounded by such cruelties of fate,
By rage of evil and by snares of death,
Fronting the fierceness of the elements,
Sharing our ills, indulge me my lament.
" 'T is pride," ye say--"the pride of rebel heart,
To think we might fare better than we do."
Go, tell it to the Tagus' stricken banks;
Search in the ruins of that bloody shock;
Ask of the dying in that house of grief,
Whether 't is pride that calls on heaven for help
And pity for the sufferings of men.

"All's well," ye say, "and all is necessary."
Think ye this universe had been the

worse
Without this hellish gulf in Portugal?
Are ye so sure the great eternal cause,
That knows all things, and for itself creates,
Could not have placed us in this dreary clime
Without volcanoes seething 'neath our feet?
Set you this limit to the power supreme?
50 Would you forbid it use its clemency?
Are not the means of the great artisan
Unlimited for shaping his designs? [see: higher power]
The master I would not offend, yet wish
This gulf of fire and sulphur had outpoured
Its baleful flood amid the desert wastes.
God I respect, yet love the universe.
Not pride, alas, it is, but love of man,
To mourn so terrible a stroke as this.

Would it console the sad inhabitants
Of these aflame and desolated shores
To say to them: "Lay down your lives in peace;
For the world's good your homes are
60 sacrificed;
Your ruined palaces shall others build,
For other peoples shall your walls arise;
The North grows rich on your unhappy loss;
Your ills are but a link in general law;
To God you are as those low creeping worms
That wait for you in your predestined
70 tombs"?
What speech to hold to victims of such ruth!
Add not such cruel outrage to their pain.

Nay, press not on my agitated heart
These iron and irrevocable laws,
This rigid chain of bodies, minds, and worlds.
Dreams of the bloodless thinker are such thoughts.
God holds the chain: is not himself

enchained;
By his indulgent choice is all arranged;
Implacable he's not, but free and just.
Why suffer we, then, under one so just?
There is the knot your thinkers should undo.
Think ye to cure our ills denying them?
All peoples, trembling at the hand of God,
80 Have sought the source of evil in the world.
When the eternal law that all things moves
Doth hurl the rock by impact of the winds,
With lightning rends and fires the sturdy oak,
They have no feeling of the crashing blows;
But I, I live and feel, my wounded heart
Appeals for aid to him who fashioned it.

Children of that Almighty Power, we stretch
Our hands in grief towards our common sire.
The vessel, truly, is not heard to say:
"Why should I be so vile, so coarse, so frail?"
Nor speech nor thought is given unto it.
90 The urn that, from the potter's forming hand,
Slips and is shattered has no living heart
That yearns for bliss and shrinks from misery.
"This misery," ye say, "is others' good."
Yes; from my mouldering body shall be born
100 A thousand worms, when death has closed my pain.
Fine consolation this in my distress!
Grim speculators on the woes of men,
Ye double, not assuage, my misery.
In you I mark the nerveless boast of pride
That hides its ill with pretext of content.

I am a puny part of the great whole.
Yes; but all animals condemned to live,
All sentient things, born by the same stern law,
Suffer like me, and like me also die.

The vulture fastens on his timid prey,
And stabs with bloody beak the quivering limbs:
All 's well, it seems, for it. But in a while
An eagle tears the vulture into shreds;
The eagle is transfixed by shaft of man;
The man, prone in the dust of battlefield,
Mingling his blood with dying fellow-men,
Becomes in turn the food of ravenous birds.
Thus the whole world in every member groans:
All born for torment and for mutual death.
And o'er this ghastly chaos you would say
The ills of each make up the good of all!
What blessedness! And as, with quaking voice,
Mortal and pitiful, ye cry, "All 's well,"
The universe belies you, and your heart
Refutes a hundred times your mind's conceit.

All dead and living things are locked in strife.
Confess it freely--evil stalks the land,
Its secret principle unknown to us.
Can it be from the author of all good?
Are we condemned to weep by tyrant law
Of black Typhon or barbarous Ahriman?
These odious monsters, whom a trembling world
Made gods, my spirit utterly rejects.

[see: problem of evil]

But how conceive a God supremely good,

Who heaps his favours on the sons he loves,
Yet scatters evil with as large a hand?
What eye can pierce the depth of his designs?
From that all-perfect Being came not ill:
And came it from no other, for he 's lord:
Yet it exists. O stern and numbing truth!
O wondrous mingling of diversities!
A God came down to lift our stricken
140 race:
He visited the earth, and changed it not!
One sophist says he had not power to change;
"He had," another cries, "but willed it not:
In time he will, no doubt." And, while they prate,
The hidden thunders, belched from underground,
Fling wide the ruins of a hundred towns
Across the smiling face of Portugal.

God either smites the inborn guilt of man,
Or, arbitrary lord of space and time,
Devoid alike of pity and of wrath,
150 Pursues the cold designs he has conceived.
Or else this formless stuff, recalcitrant,
Bears in itself inalienable faults;
Or else God tries us, and this mortal life
Is but the passage to eternal spheres.
'T is transitory pain we suffer here,
And death its merciful deliverance.
Yet, when this dreadful passage has
160 been made,
Who will contend he has deserved the crown?

Whatever side we take we needs must groan;
We nothing know, and everything must fear.
Nature is dumb, in vain appeal to it;
The human race demands a word of

God.
'T is his alone to illustrate his work,
Console the weary, and illume the wise.
Without him man, to doubt and error doomed,
Finds not a reed that he may lean upon.
From Leibnitz learn we not by what unseen
Bonds, in this best of all imagined
170 worlds,
Endless disorder, chaos of distress,
Must mix our little pleasures thus with pain;
Nor why the guiltless suffer all this woe
In common with the most abhorrent guilt.
'T is mockery to tell me all is well.
Like learned doctors, nothing do I know.

Plato has said that men did once have wings
And bodies proof against all mortal ill;
That pain and death were strangers to their world.
How have we fallen from that high estate!
Man crawls and dies: all is but born to die:
The world's the empire of destructiveness.
This frail construction of quick nerves
180 and bones
Cannot sustain the shock of elements;
This temporary blend of blood and dust
Was put together only to dissolve;
This prompt and vivid sentiment of nerve
Was made for pain, the minister of death:
Thus in my ear does nature's message run.
190 Plato and Epicurus I reject,
And turn more hopefully to learned Bayle.
With even poised scale Bayle bids me doubt.
He, wise and great enough to need no creed,
Has slain all systems--combats even himself:

Like that blind conqueror of Philistines,
He sinks beneath the ruin he has wrought.

What is the verdict of the vastest mind?
Silence: the book of fate is closed to us.
Man is a stranger to his own research;
He knows not whence he comes, nor whither goes.
Tormented atoms in a bed of mud,
200 Devoured by death, a mockery of fate.
But thinking atoms, whose far-seeing eyes,
Guided by thought, have measured the faint stars,
Our being mingles with the infinite;
Ourselves we never see, or come to know.

This world, this theatre of pride and wrong,
Swarms with sick fools who talk of happiness.
With plaints and groans they follow up the quest,
To die reluctant, or be born again.
At fitful moments in our pain-racked life
210 The hand of pleasure wipes away our tears;
But pleasure passes like a fleeting shade,
And leaves a legacy of pain and loss.
The past for us is but a fond regret,
The present grim, unless the future's clear.
If thought must end in darkness of the tomb.

All will be well one day--so runs our hope.
All now is well, is but an idle dream.
The wise deceive me: God alone is right.
With lowly sighing, subject in my pain,
I do not fling myself 'gainst
220 Providence.
Once did I sing, in less lugubrious tone,

The sunny ways of pleasure's genial
rule;
The times have changed, and, taught
by growing age,
And sharing of the frailty of mankind,
Seeking a light amid the deepening
gloom,
I can but suffer, and will not repine.

A caliph once, when his last hour had
come,
This prayer addressed to him he
reverenced:
"To thee, sole and all-powerful king, I
230 bear
What thou dost lack in thy immensity--
Evil and ignorance, distress and sin."
He might have added one thing further-
-hope.

In 2008, Ravi Zacharias, in his *The End of Reason*, cite lines 105 to 202, about which he summarizes as follows:

> "At least Voltaire, Sartre, and Nietzsche were honest and consistent in their views. They admitted the ridiculousness of life, the pointlessness of everything in an atheistic world."

(add discussion)

References

1. 1755 Lisbon earthquake – Wikipedia.
2. Goethe genealogy (see bottom) – The Esoteric Redux, Blogspot.com.
3. Voltaire. (1756). "Poem on the Lisbon Disaster: an Examination of the Axiom: 'All is Well'." (Ñº), in: *Toleration and Other Essays* (translator: Joseph McCabe) (pgs. 255-). G.P. Putnam's Sons, 1912.
4. Zacharias, Ravi. (2008). *The End of Reason: a Response to the New Atheists* (pgs. 42-43). Zondervan.

θΔics

In literature, **poetry** is the art of using aesthetic and rhythmic qualities of language, e.g. phonaesthetics, sound symbolism, metre, etc., typically in the form of stanzas, often employing humor and or pun, to evoke meanings in addition to, or in place of, the prosaic ostensible meaning; tending to be used as a tool to work out semi-formed ideas, thoughts, and meanderings, not yet solidified into the form of conclusive and or finalized logic.

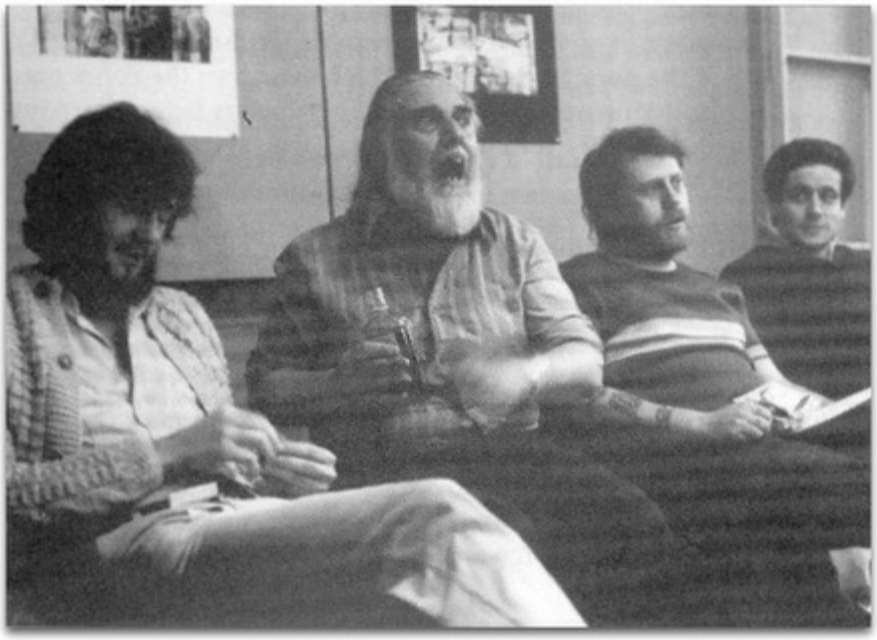

A *circa* 1977 poetry reading attended by noted British poets: Chris Cheek and Bob Cobbing, someone known as B.G., Jeremy Adler (far right)—noted Goethe *Elective Affinities* reaction scholar—and Steven Smith. [1]

Overview

The earliest ideas on the chemistry of love can be found in early Egyptian poems, alluding to ideas on chemical bonding. One circa 1000BC poem speaks, for instance, of how "the nets of your love have trapped me". [5]

In 1664, Margaret Cavendish wrote an entire series of poems against "atoms" and "infinite worlds", in the works Giordano Bruno, in her *Poems and Fancies*.

Cowper

In 1783, English poet William Cowper penned an Empedocles-style chemical aphorism like poem “On Friendship”, in which he compares the politics that arise from the mixing of courtiers and patriots to the effervescence that arises when salt and lemon juice are mixed, comments that the true friendship might be something akin to the chemist’s attempt to make gold, compares certain friendships to simmering copper, and intermixes this with discussion on the role of religion—the key section of which is as follows:

Courtier and patriot cannot mix
Their het'rogeneous politics
Without an effervescence,
Such as of salts with lemon-juice,
But which is rarely known t'induce,
Like that, a coalescence.

This was cited by American poet John Spollon in his 1894 article-poem “Among the Bards”.

Schiller

The following are poems by Friedrich Schiller:

● The World Ways (1795) | Freud-Schiller drive theory

Goethe

By age 20, Johann Goethe had published his first volume of poems. Goethe wrote some circa 3,000 poems, as found among his collected works. The following are noted poem and related poetry discussions by Johann Goethe:

● Aphorisms on Nature (date) | debut 1869 article, per idea of Thomas Huxley, of *Nature* [2]

The following is from the commentary decoding section:

> "My idea in the new novel *The Elective Affinities* is to show forth social relationships and the conflicts between them symbolically [in symbolic concentration]" (28 Aug 1808—to Riemer) and "the moral symbols in the natural sciences, that of the elective affinities invented and used by the great Bergman, are more meaningful and permit themselves to be connected better with **poetry** and society."
>
> — Goethe (1809), comment to Riemer Jul 24

Beethoven was greatly influenced by Goethe's poetry:

> "Goethe's **poems** exercise a great sway over me, not only by their meaning, but also by their rhythm. It is a language which stimulates me to composition."
>
> — Ludwig van Beethoven (c.1815) [7]

The idea for a self-starting AC electric motor came to Nikola Tesla one evening as he was reciting a poem of Goethe, specifically a passage from *Faust*. Sigmund Freud commented that he was cajoled into going to medical school after reading a poem by Goethe.

The following is a notable poet-to-poet statement:

> "The rhythm is an unconscious result of the poetic mood. If one should stop to consider it mechanically, when about to write a poem, one would become bewildered and accomplish nothing of real poetic value. All that is poetic in character should be rhythmically treated! Such is my conviction; and if even a sort of poetic prose should be gradually introduced, it would only show that the distinction between prose and poetry had been completely lost sight of."
>
> — Johann Goethe (1797), "Comment [or letter] to Friedrich Schiller [1]

(add discussion)

Rankine

The following is a noted poem by William Rankine, in which one of the first equations of love is found and in which love is posited to be a form of potential, akin to gravity, albeit thermodynamical:

- The Mathematician in Love (c.1845)

Maxwell

Scottish physicist James Maxwell used codes, puns, riddles, and hidden meaning is his many poems.

Danish science author Tor Norretranders, in his 1991 book *The User Illusion: Cutting Conscious Down to Size*, attempts to explain consciousness in terms of thermodynamics and an external force type theory or argument, the gist of which seems to be captured by Irish physicist Maxwell's 1879 final year comment, supposedly in regards to "who" actually wrote his famous "Maxwell's equations" of electrodynamics (Boltzmann having stated that he thought them to have been written by a god), to Irish theological editor Fenton Hort, that: [6]

> “What is done by what is called myself is, I feel, done by something greater than myself in me.”

This comment, according to Norretranders, has roots in Maxwell's 1856 poem, written shortly after his father's reaction end, wherein he states:

> “Powers and thoughts within us, that we/know not, till they rise/Though the stream of conscious action from where the/Self in secret lies.”

Which, in turn, seems to find corroboration in Maxwell’s famous 1847 (age 16) comment that:

> “The only thing which can be directly perceived by the senses is force, to which may be reduced light, heat, electricity, sound and all the other things which can be perceived by the senses.”

● Molecular Evolution (1873) (O)

> At quite uncertain times and places,
> The atoms left their heavenly path,
> And by fortuitous embraces,
> Engendered all that being hath.
> And though they seem to cling together,
> And form "associations" here,
> Yet, soon or late, they burst their tether,
> And through the depths of space career.
> So we who sat, oppressed with science,
> As British asses, wise and grave,
> Are now transformed to wild Red Lions,
> As round our prey we ramp and rave.
> Thus, by a swift metamorphosis,
> Wisdom turns wit, and science joke,
> Nonsense is incense to our noses,
> For when Red Lions speak, they smoke.
> Hail, Nonsense! Dry nurse of Red Lions,
> From thee the wise their wisdom learn,
> From thee they cull those truths of science,
> Which into thee again they turn.
> What combination of ideas,
> Nonsense alone can wisely form!
> What sage has half the power that she has,
> To take the towers of Truth by storm?

The use of the title “Molecular Evolution”, used at one of the 1873 Belfast meetings, is the alternative title for his 1874 'Song of the Cub', a young Red Lion's impressions of the Belfast address, clearly identifies the phrase with John Tyndall's doctrine of scientific materialism. The first sentence of Maxwell’s poem supposedly is reference to Lucretius’ 50BC poem on atomism “On the Nature of Things”. [4]

● A Paradoxical Ode (1874)

See also [3]

Fuller

In 1983, Buckminster Fuller penned some type of syntropy poem-like summary about humans in the universe and god:

> "The second law of thermodynamics — entropy — is also, as we have learned, the law of increase of the random element, i.e. every system loses energy — but synergy means behavior of whole systems, unpredicted by the behavior of any separate part. EN-ergy behaves entropically. SYN-orgy behaves syntropically. God is entropy, and god is syntropy. God is synergy. God is energy. And god is always a verb — the verbing of integrity."

(add discussion)

Radhakrishnan

In 2011, American chemist Mala Radhakrishnan published her *Atomic Romances, Molecular Dances* a collected works set of chemical aphorism like poems she wrote and read at various poetry readings.

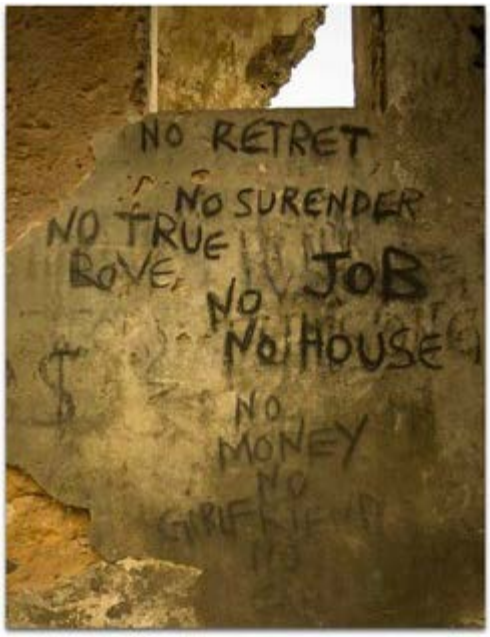

No retreat
No surrender
No true love
No job
No house
No money
No girlfriend
No car

A 2009 photo of a type of street graffiti like **poetry**, found written on the wall of an abandoned building in Bagamoyo, Tanzania, Africa, which captures an aspect of the Alley equation.

See also

● Alexander Pope | *An Essay on Man* (1734)

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External links

● Poetry – Wikipedia.

θΔics

In existographies, **Poggio Bracciolini** (1380-1459) (CR:5) was an Italian papal secretary noted for travels to German, Swiss, and French monastic libraries in search of forgotten classic Latin manuscripts; his 1417 discovery of Lucretius' *On the Nature of Things* (55BC), then considered non-extant, being his most famous find. [1]

Lucretius

In Jan 1417, Bracciolini, while scouting about German monasteries in search of rare "humanism" books of antiquity, discovered Lucretius' 55BC atomic theory based *On the Nature of Things*—all copies previous thought destroyed or non-existent—which he sent to his wealthy associate Niccolo Niccoli, inventor if *italic script*, a noted book collector whose aim was to will his final collection with funds into the form of Italy's first public library; Niccoli made more than fifty copies, in book form.

Some, e.g. Stephen Greenblatt (2011), have credited Bracciolini's 1417 find of Lucretius' *On the Nature of Things* (55BC) as having initiating the renaissance and or scientific revolution; similar to how some, e.g. William Fitzgerald (2015) (Ñº), have compared Petrarch's 1385 find of the lost *Letters of Cicero* (50BC), i.e. the personal correspondences of Cicero, to have initiated the Renaissance. [1] David Wilson-Okamura (2010), in this sense, refers (Ñº) to Bracciolini as the "Magellan" and Petrarch as the "Columbus" of manuscript-discovery.

Cicero

In 1390 to 1420, Poggio, together with Coluccio and Nicolo Niccoli, were involved with the gathering of all the range of philosophy written in Latin into orderly collections; one of which was Cicero's *On the Nature of the Gods*. [2]

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External links

â— Poggio Bracciolini – Wikipedia.

θΔics

In mechanics, **Poincaré recurrence theorem** states that an initial state or configuration of a mechanical system, subjected to conserved forces, will reoccur again in the course of the time evolution of the system. [1] The theorem was stated by French mathematician Henri Poincaré who in his 1890 article "On the Three-body Problem and the Equations of Dynamics", building on the previous work of French mathematician Simeon Poisson, states that: [2]

> "It is proved that there are infinitely many ways of choosing the initial conditions such that the system will return infinitely many times as close as one wishes to its initial position … there are also an infinite number of solutions that do not have this property, but it is shown that these unstable solutions can be regarded as 'exceptional' and may be said to have zero probability."

The commonly used example to explain the theorem is that if one inserts a partition in a box, pumps out all the air molecules on one side, then opens the partition, the recurrence theorem states that if one waits long enough that all of the molecules will eventually recongregate in their original half of the box.

Second law

The theorem is often found mixed up with the second law of thermodynamics to the effect that some will loosely argue that there exists a very small probability that an isolated system will reconfigure to a more ordered state (thus effecting an entropy decrease). In the 1972 article "Thermodynamics of Evolution" Belgian thermodynamicist Ilya Prigogine uses the recurrence theorem, in stating that the probability that a macroscopic number of molecules will assemble to form higher ordered living structures is "vanishingly small" at ordinary temperatures, to justify his argument that classical thermodynamics cannot explain the formation of biological structures. [3]

It was German mathematician Ernst Zermelo, an assistant to Max Planck, who in 1896 first pointed out the apparent incompatibility between Poincaré's recurrence theorem, Clausius' second law, and Boltzmann's H-theorem, in the sense that either the second law may be violated or connection to mechanical system cannot be made [4] Zermelo argued that the science of irreversible processes, thermodynamics, could not be reduced to mechanics, and reasoned that, for instance, German physicist Heinrich Hertz's mechanical derivation of the second law must be impossible. [5]

Life

Into the early to mid 20th century, following Max Planck's circa 1900-1910 push to define entropy as a measure of microstate disorder, people began to view humans as regions, eddies, of local entropy decrease. In 1946, Belgian-born English thermodynamicist Alfred Ubbelohde, for instance, utilized an unwritten version of the recurrence postulate:

> "Considered from the standpoint of the trend of entropy, both the activities of living organisms, and their first appearance, may be termed 'special happenings' [extremely unlikely] not wholly amenable to the laws of molecular probability."

This statement comes at the end pages on his chapter on thermodynamics and life, in which he concludes, in the end, rather ambivalently that "the contrast between inanimate matter and life is not to be explained starting solely from the laws that govern inanimate matter," but rather that certain experimental inquires will need to be made in the future, such as measuring the energy and entropy changes that accompany the activities of living organisms. [6]

See also

- Loschmidt's paradox

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2. Poincaré, Henri. (1890). "On the Three-body Problem and the Equations of Dynamics" ("Sur le Probleme des trios

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External links

● Poincaré recurrence theorem – Wikipedia.

θΔics

In

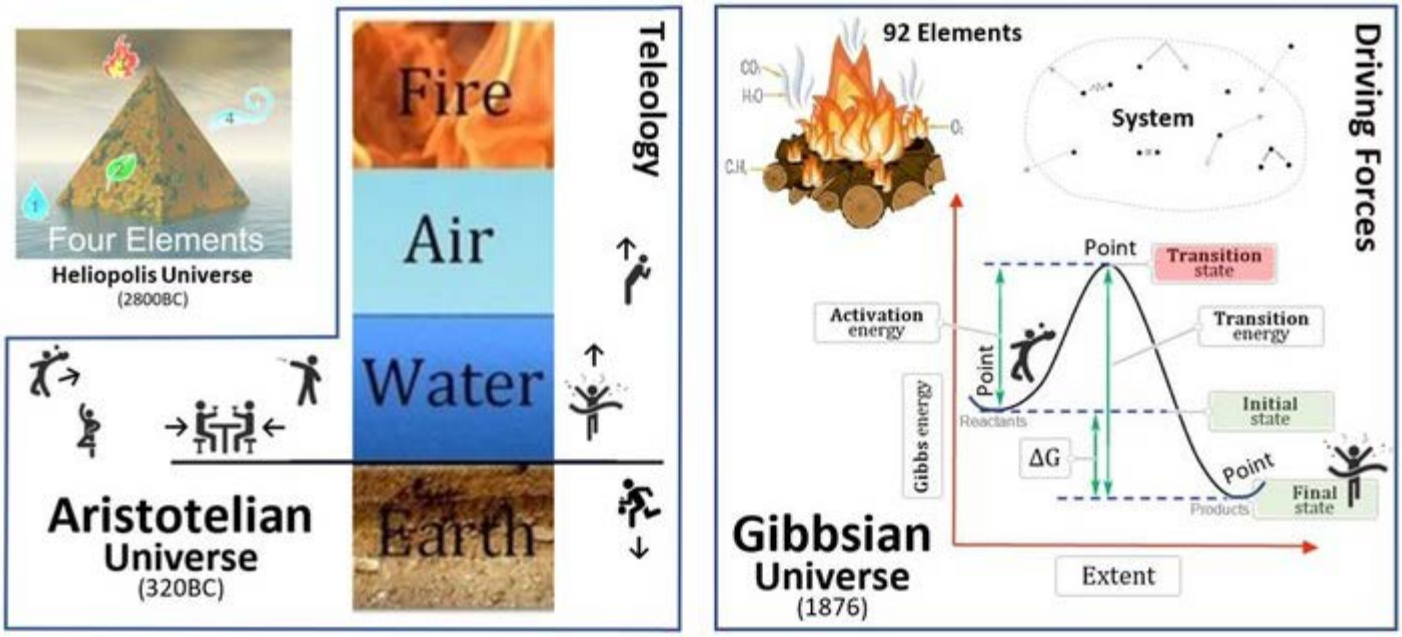

A comparison of the so-called "**point** of things" in the context of Aristotelian universe (defunct view), situated in a teleology framed movement theory, vs the Gibbsian universe (modern view), based on a driving forces movement model.

terminology, **point** refers to []

Overview

In c.320, Aristotle, in the context of his "Aristotelian universe" model, i.e. a four element theory model, situated a teleology-based model of movement, according to which each thing in the universe has "divine origin" based final cause conceptualized end point location to which it tends to move towards, in the sense that fire tends to rise, and earth tends to sink; in his own words:

> "Natural things are exactly those things which do move continuously, in virtue of the principle inherent in themselves, **towards** a determined goal."
>
> — Aristotle (c.320BC), *Physics* (2.8)

Here we see Aristotle relegating the question of the point of everything to "*telos*-" (result) or *teleos* (complete) end points, a philosophy (Ñº) which sees purpose in ends rather than in stated causes. This model, barring prolonged digression, in the modern view of things, results in a defunct or non-workable chemical teleology, e.g. the above statement by Aristotle violates the principle of inertia, the first law of motion, and is a self-motion theory (i.e. a perpetual motion theory).

In 1977, Steven Weinberg, in his *The First Three Minutes*, introduced, in his atheistic mindset, vicariously, the so-called point-**less**-ness model of the universe, which gained some popularity, and is oft-assumed, incorrectly, as the modern status quo scientific model.

In c.1989, Libb Thims, age 15 to 19, began to ruminate on the question of occupation, in the context of the drive-thru paradox (1987), Buss study (1993), and Alley equation (2013), retrospectively speaking, in terms of the nature of the social mechanism or mechanism of mate selection and child reproduction produced therefrom; generally framed around the question:

> "What is the **point** of every thing?"

— Libb Thims (c.1989), re-occurring mental puzzlement, age 15 to 19, prior to engaging in college education [1]

In 2014, Thims, in lecture, began to employ the Gates model to explain Einstein's crypto-atheistic "divine a sense of purpose" ideology, in the context of occupational paths, and end "points" of realized potential, to therein introduce, in his open atheistic mindset, the point-**full**-ness model of the universe.

In 2019, Thims began to envision the realization that he would have to overthrow and usurp the ancient point of everything, as currently quasi-understood according to the Aristotelian universe model / religio-mythology afterlife model, and replace it with the modern point of everything according to the new Gibbsian universe model, wherein the universe is comprised of systems. each with measurable and discernible reaction "end points" (see: final state), i.e. Gibbs energy minimas, in the energy landscape view of things.

Quotes

The following are related quotes:

> "The concept of an independent system is a pure creation of the imagination. For no material system is or can ever be perfectly isolated from the rest of the world. Nevertheless it completes the mathematician's 'blank form of a universe' without which his investigations are impossible. It enables him to introduce into his geometrical space, not only masses and configurations, but also physical structure and chemical composition. **Just as Newton first conclusively showed that this is a world of masses, so Willard Gibbs first revealed it as a world of systems**."
>
> — Lawrence Henderson (1917), *The Order of Nature: An Essay* [3]

> "There is no **point** in starting your own business unless you do it out of a sense of frustration."
>
> — Richard Branson (c.2009), "Article" (Ñº), *Magazine* [1]

See also

â— Point atom

References

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θΔics

In hmolscience, **point atom** is a theory that the considers the human to be an atom, not in the modern hydrogen atom point of view, but in the Boscovich-Priestly atomic theory view of an atom being a point center of force. [1]

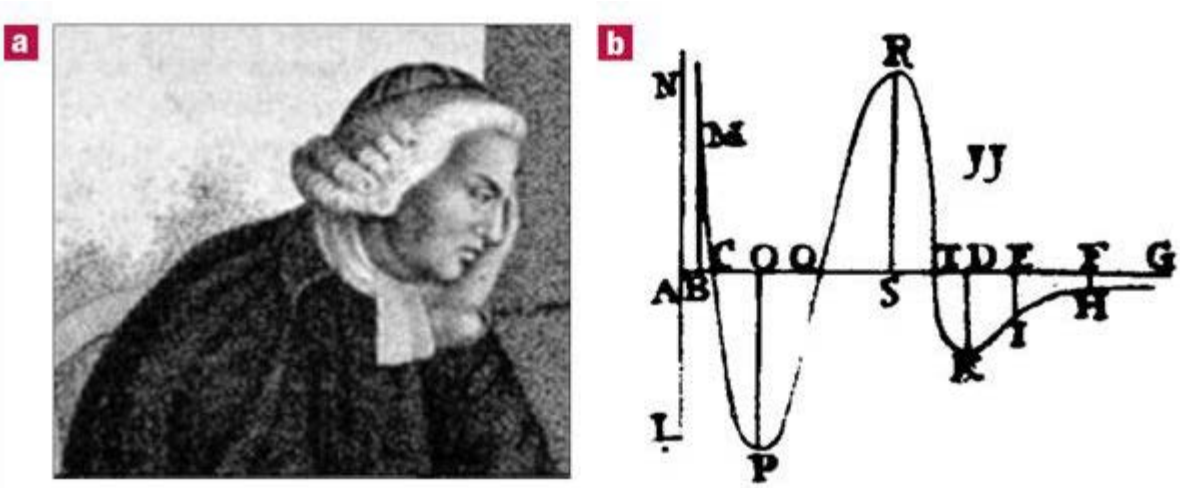

Roger Boscovich (1711-1787) and his force–distance curve from the dissertation *De viribus vivis*, published in 1745. Letters identify 'limit points' where attraction turns into repulsion and *vice versa*, inflection points, maxima and minima and so on. (The dissertation presents many of the concepts successively exposed in *Philosophiae naturalis theoria*). Other versions of the Boscovich force law present more oscillations around the horizontal axis. [4]

Davy

The point atom theory was developed by English chemist Humphry Davy in 1813. [2] The following quote by Davy seems to be representative of his human point atom view: [3]

> "The true chemical philosopher sees good in all the diversified forms of the external world. Whilst he investigates the operations of infinite power guided by infinite wisdom, all low prejudices, all mean superstitions disappear from his mind. He sees **man** an **atom** amidst atoms fixed upon a point in space ; and yet modifying the laws that are around him by understanding them; and gaining, as it were, a kind of dominion over time, and an empire in material space, and exerting on a scale infinitely small a power seeming a sort of shadow or reflection of a creative energy, and which entitles him to the distinction of being made in the image of god and animated by a spark of the divine mind. Whilst chemical pursuits exalt the understanding, they do not depress the imagination or weaken genuine feelings; whilst they give the mind habits of accuracy, by obliging it to attend to facts, they likewise extend its analogies; and, though conversant with the minute forms of things, they have for their ultimate end the great and magnificent objects of nature."

(add discussion)

Related

In 1865, Friedrich Nietzsche discovered the work of Arthur Schopenhauer and his emphasis on "will" and the concept of "will to live", and, the following year, through a reading of Friedrich Lange's 1865 *History of Materialism*, discovered the work of Roger Boscovich and his *Theory of Natural Philosophy*, and through these went on to develop a "centers of force" (see: atomic theory) theory of "will to power" as the embodiment of what Nietzsche believed was the main driving force in man. [5]

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4. Malescio, Gianpietro. (2003). "Intermolecular Potentials: Past, Present, and Future" (image), *Nature Materials*, 2:501-03.
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θΔics

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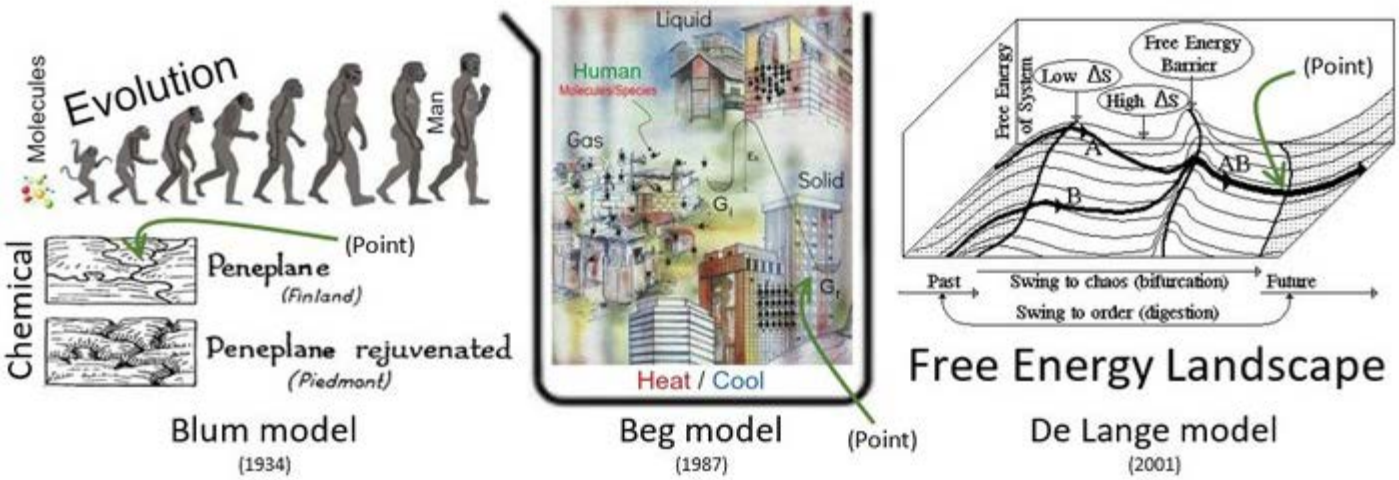

Three "**pointfullness**" models, in contrast to the oft-cited Steven Weinberg **pointlessness** universe model conjectures, namely: Blum model (1934), i.e. Harold Blum's chemical peneplanation evolution model, Beg model (1987), i.e. the physiochemical sociology model of Mirza Beg, and the De Lange model (2001), the Gibbs landscape model of Adriaan de Lange, which if which future state thermodynamic inflection "points" of free energy (thermodynamic potential) minimization.

hmolscience, **pointfullness**, as contrasted with "pointlessness" or meaninglessness, refers to the view that the universe is NOT pointless, but rather full of points or equilibrium states of existence, and future and past potentialities, quantified, chemical thermodynamically, in a social sense, by Gibbs energy minimas, i.e. points of stability and general system well-being, Gibbs energy maximas, i.e. points of instability and general system ill-being, and transformation states actuating between points.

Overview

Pointfullness models, based on the premise that transformation content (aka entropy) tends to a maximum, meaning that systems evolve or transform to "points" of free energy minimization, historically, include: Harold Blum's chemical peneplanation model (1934), Bruce Lindsay's thermodynamic potential purpose model (1983), Mirza Beg's physico-chemical model (1987) of social transformations, from from Gibbs energy initial "points" (initial state) to Gibbs energy final "points" (final state), Adriaan de Lange's Gibbs energy evolution model (2001), David Hwang's thermodynamics of love (2001) graphical models, and Libb Thims' Gates model (2015), to name the dominant examples, three of which are depicted above.

The atheistic Gibbs energy based "pointfullness model" usurps the older Greek atheistic atomic school based blind random accidental chance model of things, aka the "fortuitous concourse of atoms" model.

In 2014, Thims, during his "25 Smartest People Alive | Existive" countdown, used the reaction path of Bill Gates, then (Q) ranked #20, to explain Einstein's "divine a sense of purpose" motto in terms of riding Gibbs potentials. [1]

In 2015, Thims, during the "Zerotheism for Kids" lecture, an Ostwald-styled (see: Monistic Sunday Sermons) smart atheism Monday school, so to say, given to six kids, aged 2 to 11: girl 2, boy 6, girl 7, boy 9, girl 10, and boy 11, in Chicago, employed the Gates model again, amid showing the children Kareem Jarrah's TED-ed "What Triggers a Chemical Reaction?" video, to explain to them how when they go out

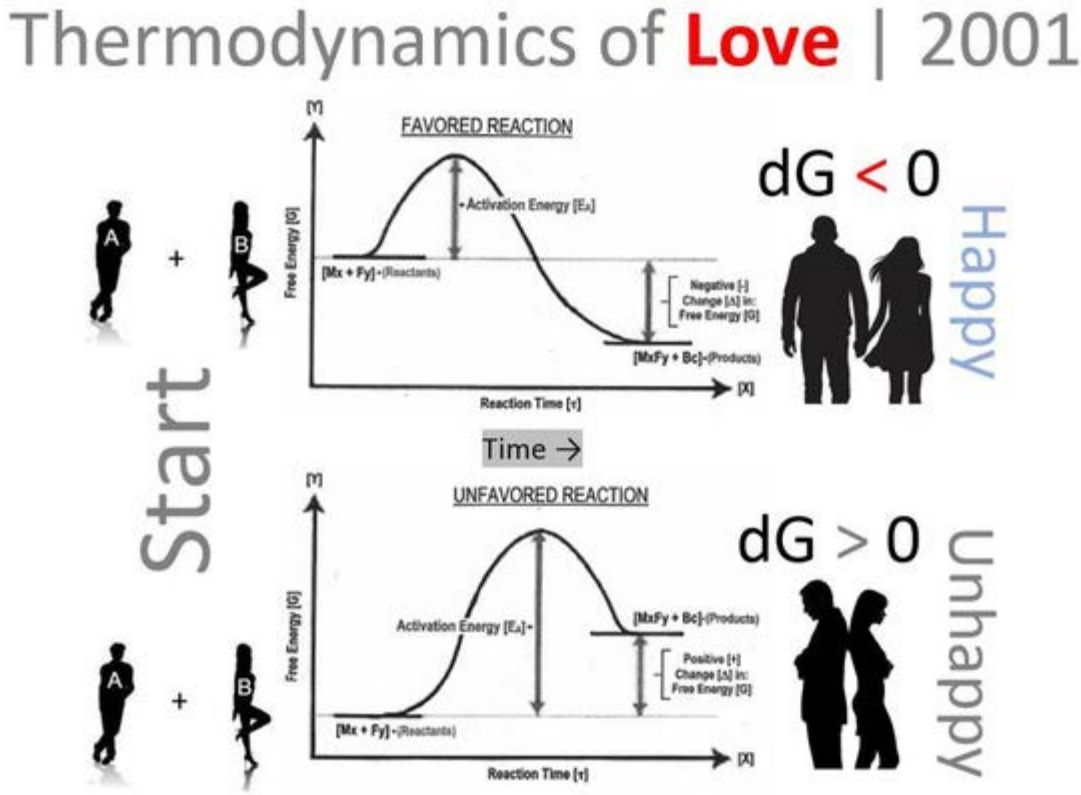

A visual of David Hwang's 2001 "thermodynamics of love" model, shown people can end up in both "happy" and "unhappy" end "**points**" in the course of their interactions and reactions with people, depending on their choices, all of which can be measured thermodynamically in terms of differences in Gibbs energy, between the before "point" and the after "point".

into the world, some of them, as Einstein said, may "divine a sense of purpose", and ride these Gibbs potentials, like a surfer rides a wave, that fits into the movement of the universe, like and Adams creed wave. [2]

In 2017, Thims, in his "8 Questions Atheists Supposedly Can't Answer", explained the "pointfullness" model of existence, as opposed to the "procreation" model of existence. [3]

Quotes

The following are related quotes:

> "The system – solid or social – will be stable only if the negative free energy (-dG) is at a maximum **[point]**. This idea goes back to Empedocles (450BC), who in his *On Nature* explains that solubility of wine in water similar to love of relatives, and Goethe (1809) who in his *Elective Affinities* demonstrated that love and marriage depend on the physico-chemical laws of society."
>
> — Jurgen Mimkes (2012), *Chemistry of the Social Bond* (Q)

> "Life as we know it, is a **point in our existence**. If we trace back our beginning up to this point of our existence and try to project it to our probable existence thereafter, our life is a point in our existence where we become animated because of light, energy and matter coming all together to make us what we are."
>
> — Canadian Anon (2017), "A Point in Existence", tread post (Q) to panbioism, Dec 11

See also

- Social phase

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θΔics

In hmolscience, **pointlessness**, as contrasted with "pointfullness", refers to the conjecture, originating predominately from Steven Weinberg (1977), that the universe, particularly from the atheism-based human view of things, is pointless or without points.

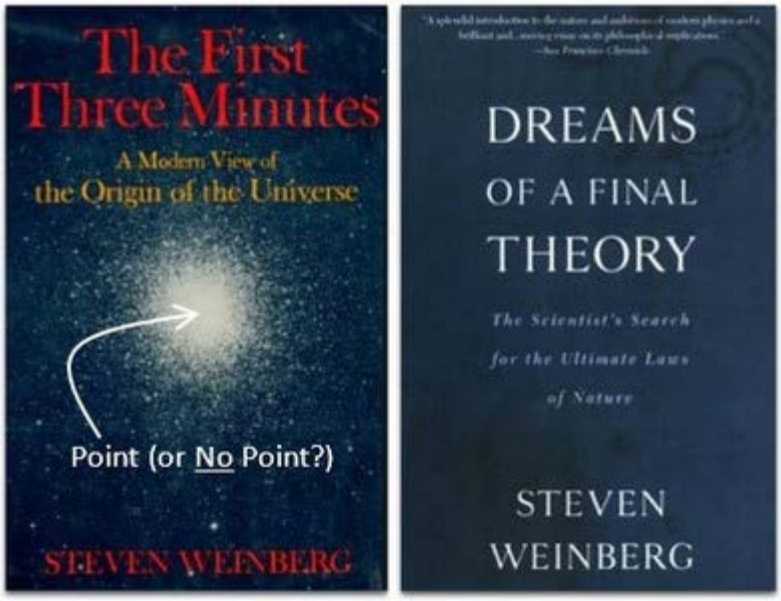

Steven Weinberg (1977), in a book depicting the universe originating from a point (above left), aka big bang, argued, ironically, to the chagrin of many, that, according to the second law, the universe is "**pointless**". [1]

Weinberg

In 1977, American physicist Steven Weinberg, in his *The First Three Minutes*, firstly, dismissed the infinite oscillating model of the universe with recourse to heat death theory, then discussed in upgraded particle physics language, at the end of which he famously or infamously, depending on one's point of view, concluded that the universe seems pointless: [1]

> "Some cosmologists are philosophically attracted to the oscillating model of the, especially because, like the steady-state model, it nicely avoids the problem of Genesis. It does, however, face one severe theoretical difficulty. In each cycle the ratio of photons to nuclear particles (or, more precisely, the entropy per nuclear particle) is slightly increased by a kind of friction (known as 'bulk viscosity') as the universe expands and contracts. As far as we know, the universe would then start each new cycle with a new, slightly larger ratio of photons to nuclear particles. Right now this ratio is large, but not infinite, so it is hard to see how the universe could have previously experienced an infinite number of cycles.
>
> However all these problems may be resolved, and whichever cosmological model proves correct, there is not much of comfort in any of this. It is almost irresistible for humans to believe that we have some special relation to the universe, what human life is not just a more-or-less farcical outcome of a chain of accidents reaching back to the first three minutes, but that we were somehow built in from the beginning. As I write this I happen to be in an airplane at 30,000 feet, flying over Wyoming en route home from San Francisco to Boston. Below, the earth looks very soft and comfortable—fluffy clouds here and there, snow turning pink as the sun sets, roads stretching straight across the country from one town to another. It is very hard to realize that this all is just a tiny part of an overwhelming hostile universe. It is even harder to realize that this present universe has evolved from an unspeakably unfamiliar earlier condition, and faces a future extinction of endless cold or intolerable heat. The more the universe seems comprehensible, the more **it also seems pointless**."

This last "the more the universe seems comprehensible, the more it also seems pointless" statement quickly became Weinberg's trademark philosophical credo statement, particularly among atheism and or science and religion publications. This view, to note, is reminiscent of Aldous Huxley's 1937 second law based "meaninglessness" atheism philosophy. [2]

In 1992, Weinberg, in his *Dreams of a Final Theory*, chapter: "What About God?", continued to discuss the repercussions of this pointlessness quote as follows: [3]

> "In my 1977 book, *The First Three Minutes*, I was rash enough to remark that 'the more the universe seems comprehensible, the more **it seems pointless**'. I did not mean that science teaches us that the universe is pointless, but rather that the **universe itself has no point**. I hastened to add that there were ways that we ourselves could invent a **point** for our lives, including trying to understand the universe. But the damage

> was done: that phrase has dogged me ever since.

Here again, Weinberg not only asserts that the universe that originates from a point (big bang) has no point, but also that in human existences there are no points, seems to assert that, according to modern science, “there is no point to life”, but that we can be secular scientists and “invent” points, e.g. trying to understand things.

Lightmann-Brawer | Poll

In circa 1990, Alan Lightman and Roberta Brawer polled twenty-seven cosmologists and physicists on Weinberg's pointlessness conjecture; Weinberg discusses this as follows:
Weinberg continues:

> “Recently Alan Lightman and Roberta Brawer published interviews with twenty-seven cosmologists and physicists, most of whom had been asked at the end of their interview what they thought of that remark. With various qualifications, ten of the interviewees agreed with men and thirteen did not, but of those thirteen three disagreed because they did not see why anyone would *expect* the universe to have a point.”

Some of the responses are as follows:

> “Why should it have a **point**? What point? It’s just a physical system, what point is there? I’ve always been puzzled by that statement.”
>
> — Margaret Geller (c.1990), Harvard astronomer; cited by Weinberg (1992)

> “I’m willing to believe that we are flotsam and jetsam.”
>
> — Jim Peebles (c.1990), Princeton astrophysicist; cited by Weinberg (1992)

> “I don't believe the earth was created for people. It was a planet created by natural processes, and, as part of the further continuation of those natural processes, life and intelligent life appeared. In exactly the same way, I think the universe was created out of some natural process, and our appearance in it was a totally natural result of physical laws in our particular portion of it. Implicit in the question, I think, is that there's some motive power that has a purpose beyond human existence. I don't believe in that. So, I guess ultimately I agree with Weinberg that it's **completely pointless** from a human perspective.”
>
> — Sandra Faber (c.1990) of Lick Observatory; cited by Michio Kaku (2006) [6]

Weinberg (1992) went on to state that Princeton astrophysicist Edwin Turner agreed with him, that his University of Texas colleague, astronomer Gerard de Vaucouleurs thought the remark was “nostalgic”, and that he sees himself unique among physicists for carrying about these types of science replacing religions intersections. By 2000, Weinberg's pointless universe statement, according to *The New York Times* (“Physicist Ponders God, Truth and a Final Theory”, James Glanz), had become a "much-quoted aphorism". (Ñº)

Other

In 2001, Weinberg again re-stoked the fires of debate with the following statement about how he believes that “there is nothing in the universe that suggests any purpose for humanity” statement: [6]

> "Though aware that there is nothing in the universe that suggests any purpose for humanity, one way that we can find a purpose is to study the universe by the methods of science, without consoling ourselves with fairy tales about its future, or about our own."

This again prompted further debate and objection, which Weinberg discusses further in his 2010 book *Lake Views*. [4]

See also

â— Meaninglessness
â— Purposeless

Quotes

The following are related quotes:

> "Academic degree after degree has not removed the haunting specter of the **pointlessness** of existence in a random universe."
>
> — Ravi Zacharias (2008), *The End of Reason* [5]

> "The science-religion controversy is rooted in talk of afterlife, soul, higher powers, muses, purpose, reason, objectivity, **pointlessness**, and randomness."
>
> — Robert Burton (2008), *On Being Certain: Believing You are Right Even When You're Wrong*

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θΔics

In terminology, **poisonous pen** refers to the pen of someone whose ink is poisonous to the mind of the recipient.

A pen dipped in truth, which acts as intellectual poison to the mind of those far ashore from truth; realist atheists, such as Sam Harris and Libb Thims have been classified, by religious thinkers, e.g. Ravi Zacharias, or ontic opening scholars, e.g. Terrence Deacon, as having "**poisonous pens**".

Quotes

The following are related quotes:

> "Shortly after Sam Harris published his first **poison pen** letter against religion, *The End of Faith*, I invited him to debate a Christian on my television shown."
>
> — Ravi Zacharias (2008), *The End of Faith* [1]

> "You have a remarkably **poisoned pen** that seems to overshadow your intellectual care."
>
> — Terrence Deacon (2013), commentary to Libb Thims during the "JDNM peer review", May 22

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External links

â— Poison-pen – Dictionary.com.

θΔics

In hmolscience, **political atheism** is disbelief in the existence of god, per reasoning, aka the Critias hypothesis, that the theory of god (see: god theory or hypothesis of god) arose form the needs of statecraft. [1]

Overview

In 410BC, Critias stated that the lawgivers of ancient times invented god as a kind of overseer of the right and wrong actions of men.

In 1666, Theophilus Spizelius, in his *Radical Atheism*, stated that "political atheism", which he ascribes to Niccolo Machiavelli and Hugo Grotius, is one of two ancient strains of atheism, the other being Epicurean atheism, deriving from the view that belief in god arose from the needs of statecraft. [1]

Quotes

The following are related quotes:

> "Critias seems to be from the ranks of the atheists when he says that the **lawgivers of ancient times invented god** as a kind of overseer of the right and wrong actions of men. Their purpose was to prevent anyone from wronging his neighbors secretly, as he would incur the risk of vengeance at the hands of the gods."
>
> — Sextus Empiricus (c.200AD) (Q)

See also

- Atheism terminology
- Atheism types by denial and belief
- Atheism types

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θΔics

In hmolscience, **political chemistry** refers to []

Overview

In 1783, William Cowper, in his poem "On Friendship", stated the following: [1]

> "Courtier and patriot cannot mix
> Their heterogeneous polities
> Without an effervescence,
> Such as of salts with lemon-juice;
> But which is rarely known to induce,
> Like that, a coalescence."

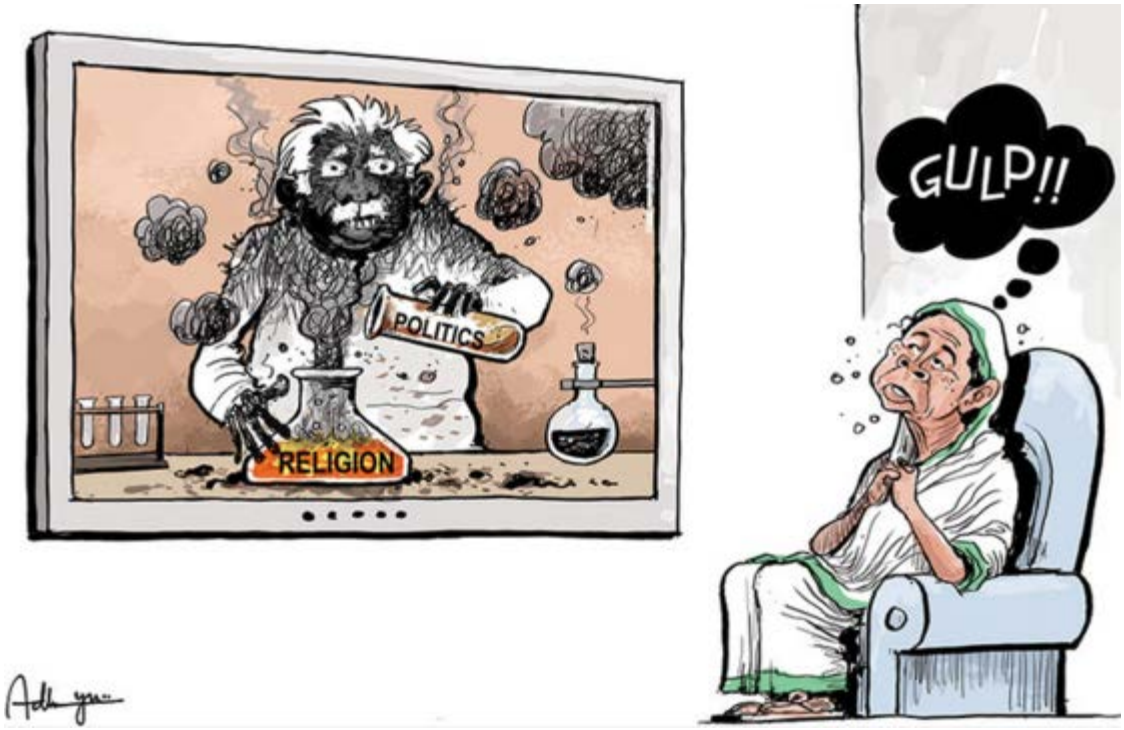

A 2017 "**political chemistry**" cartoon (Q), form *The Times of India*, indicating that things are exploding in Indian, with the mixture of religion and politics.

In 1803, Thomas Pownall, the British governor of the Province of Massachusetts Bay from 1757 to 1760, in his "Memorial Address to the Sovereigns of Europe and the Atlantic", stated the following: [2]

> "Must, by some dissolvent, by some counteracting elective attractions, first loosen the parts of this combustible, and then, by a kind of **political chemistry**, draw our the caloric; otherwise, it will neither be extinguished nor compressed, but must, in spite of all policy, of all force, explode."

Here, to note, the mention of drawing out the caloric, i.e. heat, from the system; is an early form of political thermodynamics, caloric being replaced, in 1865, by entropy.

In 1894, John Spollon, in his article "Among the Bards", on German polyintellect Johann Goethe's 1809 *Elective Affinities*, in which he characterizes Goethe as the father of affinity, wherein, among other things, he compares the effervescent liquored mixing of mix democrats and republicans to being akin to pouring water over some antacids (seidlitz powder); the full article of which is as follows: [3]

> Goethe, whose name in charity to young pronouncers should be spelled Getty, was the father of affinity. If there is a more dangerous combination than a woman, a kerosene can and damp kindlings, it is a poet, an inquiring mind and the science called chemistry. While tinkering with the science in an amateur way. Getty, the German Shakespeare, discovered, what every chemist knew, that there are certain atoms that possess elective affinities for certain other atoms; that is, they were intended by nature to meet with and adhere to each other, forming a perfect whole. He was not the only poet who got an idea from the elements. Cowper (1783) noticing that salts and certain acids have no affinity for each other, wrote: "Courtier and patriot cannot mix, their heterogeneous politics, without an effervescence, like that of salts with lemon juice."
>
> When, in mixing your seidlitz powder (Q), after placing together in one tumbler the contents of the blue paper and the white paper, you pour some water on them and they kick up a tremendous fuss, the thought may occur to you: take an handful of democrats and a handful of republicans, put them together just before election, pour some whiskey on them and the result will be the same as when mixing a **seidlitz powder**

[antacid pill] [N1], because they have *not* an affinity for each other.

Even so the thought came to Getty, that every man and every woman was born to meet sooner or later one certain woman or one certain man who was born for him or her — his or her affinity. And he wrote a great story based upon that idea.

"Chemistry!
Come with all thy pervading gases,
Thy crucibles retorts and glasses,
Thy fearful energies and wonders.
Thy dazzling lights and mimic thunders."

In 1894, John Spollon, citing the political poetry of William Cowper (1783) and the human chemistry of Goethe (1809), stated that democrats and republicans, mixed with alcohol, react and effervescerate, in a form of **political chemistry**, like an antacid pill dropped in water.

Come, and do your durndest, and you won't be able to do one-tenth of the mischief that can be worked by the pen in the hands of a man who knows how to move the millions. There was never a story written that could compare with his for popularity and results. Its effects were felt not only in his own time and country, but all over the civilized world and for generations. It was the cause of murder, suicide, debauchery and despair.

How easy it made things for a man whether married or single! If single, the first pretty maid he met was his affinity and they married in haste. In the course of time he meets another maid — prettier than his wife. All right: it seems he made a mistake that first trip, quite natural; and no doubt his wife, if she has read the great story, is of the same opinion, and has already made the acquaintance of her own genuine Simon Pure Affinity; or if she is not that sort of a woman, she makes the discovery that there is an affinity between her husband's new flame and a horsewhip and loses no time in bringing them together. And so it goes on, and everything is made easy and philosophical and pleasant for libertines, and all because a poet knew no better than to monkey with the elements and apply their peculiarities to human nature. (*To be continued.*)

The article seems to have been continued in a column later that much entitled “Among the Bards”, albeit focused on American poets in general, and not mentioning Goethe further. [2]

To give a simple idea of what Spollon here is alluding to, in his comparison of a democrat-republican reaction to that of an antacid in water or in stomach acid, the following is the reaction of the popular antacid Tums (calcium carbonate, $CaCO_3$) with HCl (stomach acid), the the gas product of carbon dioxide CO_2 being given off:

$$2HCl(aq) + CaCO_3(s) \rightarrow CaCl_2(aq) + CO_2(g) + H_2O(l)$$

(add discussion)

See also

- Political physics
- Political thermodynamics

Notes

N1. Seidlitz powder (Q) is an an early type of antacid pill, composed of a mixture of tartaric acid, sodium bicarbonate, and potassium sodium tartrate, and is used as a mild cathartic by dissolving it in water and drinking, after which the powder combines with gastric juices to develop intestinal gases which are somewhat helpful in evacuating the user's bowels; and acid-based type reaction

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θΔics

In political thermodynamics, **political entropy** is the general use of the disorder-decay-uncertainty view of entropy applied to a time-frame of a political system.

Overview

In 1969, Dutch economist Henri Theil was using the term political entropy. [4]

In 1975, American political scientist Stephen Coleman did his PhD dissertation on political thermodynamics, political entropy, and voting as a measure or gauge of political entropy, albeit using purely, it seems, information theory, mixed with thermodynamic models and metaphors. [1] Coleman argues that "political entropy" and "social entropy" are equivalent, and defines entropy, via a mixture Shannon's original definition (as "a measure of information, choice and uncertainty") used in the metaphor context of a thermodynamic system, as: [2]

> "The **entropy** measurement gives the average social uncertainty about what will happen for event sets in the social system. An entropy value for a unitary social system is analogous to a temperature reading for a thermodynamic system, such as a volume of gas. In a state of temperature equilibrium one temperature measurement describes the whole volume of any part of it. If a social system is in an entropy equilibrium, a single entropy measurement describes the state of the system or any subsystem. For a system in partial equilibrium, the entropy values of its subsystems must be known."

In 1981, author Jeffrey Pfeffer was speaking about the "law of political entropy." [5]

In 1992, author Benjamin Franks wrote a short booklet entitled *Political Entropy in the Jewish Diaspora*. [6]

In the 1990s, French philosopher Jean-François Lyotard was using a type of thermodynamic entropy logic in his political writings. [7]

In 2001, American social scientist Carl Boggs used the term political entropy as a metaphor for, what he describes as, "the deep sense of political malaise that gripped American society in the 1990s—a malaise deeply rooted in historical processes that have given rise to unprecedented levels of popular distrust, hostility, and alienation toward the political system, politicians, and indeed 'politics' in general", signified by a less than 25 percent public confidence in the federal government during this period. He goes on to state: "measured by virtually any set of criteria, the political system is in a (potentially terminal) state of entropy, out of touch with the needs and aspirations of the vast majority of people; citizenship—its rights and obligations—has decayed beyond recognition." [3]

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θΔics

In hmolscience, **political physics** is the study of laws and forces, as defined by physics, as applied to the method of making policies and laws, in government, using the methods of social physics, sociophysics, and or social mechanics.

Madison | Witherspoon

In 1769, American political theorist James Madison (1751-1836), the so-called "father of the constitution", and America's fourth president, was said to be studying a primitive form of social physics a Princeton (see: political physics). [1]

Madison, according to John Q. Stewart, was a student of Witherspoon, who in turn was a noted interpreter of the political philosophy of French theorist Charles Montesquieu, notable for his "hot climates" / "cold climates" theory of human behavior, who in turn had been deeply influenced by the celestial mechanics work of Isaac Newton; Stewart, e.g., comments on this: [2]

In 2015, Serge Galam taught a sociophysics-based politics, aka **political physics**, graduate school course, at the Paris Institute of Political Studies (SciencePo), which drew about 150 student. [11]

> "There can be no question of the fact that, in early Princeton, physics cooperated with politics in a sort of analogical double play, Newton to **Witherspoon** to Madison."

In 1771, College President John Witherspoon purchased an orrery, i.e. mechanical model of the solar system — regarded as essential teaching equipment for 18th-century lectures on "natural philosophy" — from American clockmaker, and self-taught astronomer David Rittenhouse, for approximately £220 and installed it in Nassau Hall.

The following, below left, is a pen and ink drawing of David Rittenhouse, in 1771, showing his orrery to Princeton president John Witherspoon, an item he purchased for Princeton that year [3]

Witherspoon
(Princeton, 1771)

→

Madison
(US Constitution, 1787)

In these years, the Whig-Cliosophic Society, Princeton's literary and debate club, formed, which had in its circle John Witherspoon, James Madison, and Irish-born American statesman William Paterson.

In 1787, James Madison penned the US constitution using social physics based logic.

In 1795, William Paterson made explicit comparisons of the social and planetary realms. [4] American criminal justice professor Curtis Blakely cites this as the first recorded comparison of its kind by a criminal justice official. [5]

In 1912, Woodrow Wilson stated that the Madison-Witherspoon "political mechanics" amounted to something along the lines of the three branches of government being equivalent to three planets orbiting the mass of the people, which he equated to the sun, as diagrammed above right. [6]

Blanchard

In 1861, Calvin Blanchard (1808-1868), a Thomas Paine (Q) proselyte, described as a "a disreputable publisher who kept a shop on Nassau Street, where you could buy any kind of book that your minister would frown upon — whether for free thought or for obscenity" (Q), in his *Religio-Political Physics*, attempted to pen out some sort of non-supernatural political physics. [12]

Bagehot

In 1873, Walter Bagehot, *Physics and Politics: Thoughts on the Application of Natural Selection and Inheritance to Political Science*, attempted to outline an evolution-based theory of political philosophy, admixtured with talk of nervous force, stored energy and power of the nervous system, albeit done in such a way that the sides with free will theory, and implicit Christianity, i.e. each individual "chooses" his or her own actions, autonomously and independent of external actions, impacts, or forces, the sum of the weight of the choices, and actions resulting being the measure of the "soul", term mentioned only once (Q), according to the argument that the mind acts on the forces of nature, rather than the reverse of such operation. [7]

Winiarski

In 1894 to 1890, Leon Winiarski, at the University of Geneva, taught a course in pure and applied social mechanics based course in political economics.

Other

A 1951 usage of the term "political physics", in respect to communism and physics, by an author (Q) of an article in *Physics Today*.

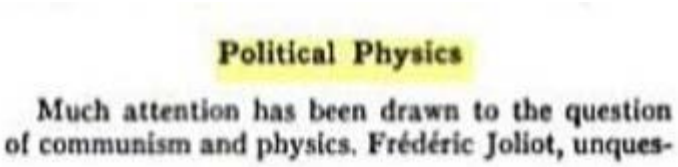

Political Physics

Much attention has been drawn to the question of communism and physics. Frédéric Joliot, unques-

A 1951 usage of the term "**political physics**", in respect to communism and physics, by an author (Q) of an article in *Physics Today*.

In the 1990s, Johannes Fabian (Q) was using the term "political physics", in anthropology, to assert something to the affect that two bodies cannot occupy the same space at the same time. (Q)

Deleuze | Protevi

In 1888, Friedrich Nietzsche, in one of his *Will to Power* fragments, stated the following Goethean-based physico-chemical humanities like logic: [8]

> "In the chemical world, the sharpest perception of the difference between forces reigns. With the organic world, imprecision and appearance begin."

In 1983, Gilles Deleuze, in his *Nietzsche and Philosophy*, citing Nietzsche's "chemical world" statement, attempted to scaffold on the following following monism view: [9]

> "Every relationship of forces constitutes a body — whether it is chemical, biological, social, or political."

In 2001, American philosopher John Protevi, in his *Political Physics: Deleuze, Derrida and the Body Politic*, citing both Nietzsche and Deleuze, expanded on stated the following: [10]

> "For Nietzsche, it seems, the 'chemical' world is one of the sites of the production of bodies politic."

Protevi then expanded on this model, or what he called the "Deleuzean-Nietzschean notion of forceful bodies politic", to give the following definition:

> "The study of forceful bodies requires a **political physics**: both a politicized physics (paying attention to the political ground of such basic physic terms as 'law') and a physicalized politics (paying attention to the physical ground of such basic political terms as 'force') are needed in order to understand politics as the forceful organ-ization of bodies."

(add discussion)

Galam

In 2015, Serge Galam, at the Paris Institute of Political Studies (*SciencesPo*), began teaching a sociophysics based politics course, as depicted above; the course advert of which is as follows: [11]

> "For the first time ever in a social science institution a series of 12 talks will be given introducing sociophysics, a new emergent field, which combines concepts and tools from the physics of disorder to build counter intuitive models aiming at the description of some aspects of social and political behaviors. Talks will be provided in English, although with a French accent. All used equations, not too many, not too complicated, will be explained in details yielding a unique opportunity to learn how physicists deal with discovering the hidden laws governing inert matter, hoping by a reconstructed analogy for some breakthrough in our understanding of human behavior."

The course, as Libb Thims and Galam discussed, at BPE 2016, attracted about 150 students.

See also

- Political chemistry
- Political thermodynamics

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θΔics

In human thermodynamics, **political thermodynamics** is the study of application of the laws and principles of thermodynamics to the analysis of rules, laws, and decisions in government or, in a general sense, the way in which groups of people make decisions in accordance with statistical or chemical thermodynamics. [1] A term in this subject is political entropy.

A thermodynamics humor stylized type of "**political thermodynamics**" scenario: themed take on Middle Eastern tensions, presented in the form of what one might call "perpetual motion politics" of the Rude Goldberg / mousetrap style contraption of movement, blended in with thermal words and human thermodynamics concepts, e.g. social friction, war thermodynamics, etc..

History

In 1971, American thermodynamicist Frederick Rossini, known for his work in chemical thermodynamics, used the combined law of thermodynamics to understand the paradox between freedom and security in social life, during one part of his Priestly Medal Address. [2] This lecture, 35-years later, in 2006, came to spark quite a debate (see: Rossini debate) between Americans chemist Harold Leonard, physical chemist John Wójcik, and chemist Todd Silverstein. [3]

In 1973, Author Harold Nieburg, *Culture Storm: Politics and the Ritual Order*, coined the term "political thermodynamics", via the title of his chapter five: Political Thermodynamics: Energy and Entropy" [5]

In 1975, American political scientist Stephen Coleman completed his PhD dissertation on entropy systems view of political systems, particularly on voting and elections, coining terms such as "political entropy" and discussing ideas on microscopic entropy measurements in political systems; albeit using Shannon's information theory. [7]

In the 1970s, Belgian-born American literary theorist Paul de Man (1919-1983) came to be noted for his notion of political thermodynamics, as described in his "L'Etat de Guerre" and *Le Contrat Social: Allegories of Reading*, wherein he describes: [8]

> "A kind of **political thermodynamics** governed by a debilitating entropy [the powerful inertia of the State]" which "illustrates practical consequences of a linguistic structure in which grammar and figure, statement and speech act do not converge".

In 1986, Crosbie Smith, together with physics historian Norton Wise (1940-) (O), in their "Measurement, Work, and Industry in Lord Kelvin's Britain", supposedly (O), thermodynamics and political metaphors (see: political thermodynamics), in the view of William Thomson's ideologies. [9]

In 1989 and 1990, Smith and Wise, in their three-part "Measurement, Work, and Industry in Lord Kelvin's Britain" article, supposedly (Q), elaborated on more political thermodynamics metaphors. [10]

In 1996, German metallurgical thermodynamicist Jürgen Mimkes authored a 110-page article on "Politics and Thermodynamics" and was in attendance at the 2003 "Talks on (inter) nation conferences on Politics and Thermodynamics". [6]

Objections

Not all scientists, however, agree that thermodynamics is applicable to politics. In 2007, Russian bioelectrochemist Octavian Ksenzhek put forward the argument that thermodynamics is applicable to economics, but that is reign in political affairs is not possible. According to Ksenzhek, in relation to the thermodynamics of the formation of unions, "apart from economic reasons for joining or not joining societies into huge unions, a significant role may also be played by political considerations ... this aspect, however, is beyond the scope of a thermodynamic approach." [4]

See also

- Democracy
- Political chemistry
- Political physics

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10. Wise, M. Norton and Smith, Crosbie. (1989-90). "Work and Waste: Political Economy and Natural Philosophy in Nineteenth-Century Britain", *History of Science*, 27:263-301; 27:391-449; 28:221-61.

Further reading

- Byeon, Jong H. (2000). "Non-equilibrium Thermodynamic Approach to the Change in Political Systems" (abs), *Systems Research and Behavioral Science*, Vol. 16, Issue 3, pgs. 283-91.

θΔics

In humanities, **politics** (TR:405), from Greek *politēs* ‘citizen,’ from *polis* ‘city’, or synonymously "political science", is the art of government (act of process of governing); generally concerned with guiding or influencing governmental policy; and or the art or science concerned with winning and holding control over a government, and or its actions, practices, and policies. [1]

Quotes

The following are related quotes:

> “Ostwald developed [his] epiphany into his doctrine of energetics, which he thought should revolutionize all human understanding: natural and earth sciences, of course, but also history, economics, sociology, **politics**, even ethics and morality. The laws of thermodynamics, to Ostwald, implied a new categorical imperative: ‘waste no energy!’”
>
> — Eric Zencey (2013), “Energy as Master Resource” via citation of Caspar Hakfoort [2]

See also

- Political entropy
- Political thermodynamics

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1. Merriam-Webster Collegiate Dictionary, 2000.
2. (a) Zencey, Eric. (2013). “Energy as a Master Resource” (pdf), in: *State of the World 2013: Is Sustainability Still Possible?* (§7:##-; image, figure 1-2). Island Press, 2013.
(b) Hakfoort, Caspar. (1992). “Science Deified: Wilhelm Ostwald’s Energeticist World-view and the History of Scientism” (abs), *Annals of Science*, 49(2):525-44.

External links

- Politics – Wikipedia.

θΔics

In data, **poll** is survey of a selection of people concerning one or more questions, topics, on public opinion or belief; some noted hmolscience related polls are shown below, concerning: belief that a human is a chemical or molecule, free will, love, etc.

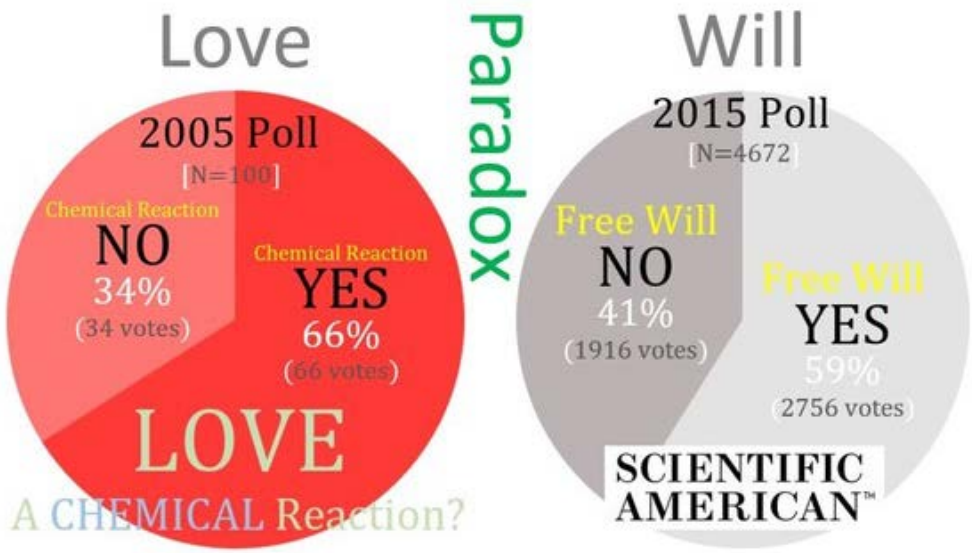

Polls show, paradoxically, that where as 66 percent of people believe that love is a chemical reaction (2005), only 41 percent believe "will" is determined (2015), i.e. not free.

Overview

The adjacent poll results show a paradoxical relationship between colloquial beliefs about "love" and "will", namely, while 66% believe love is a chemical reaction — "chemical reactions", by scientific definition, completely determined, involving no sort of freedom of ability of chemicals to "choose" from among different reactions — only 41% believe that will is determined.

This discrepancy, largely, is a result of conflicting religious beliefs, i..e. soul or karma theory, concerning the nature of "right" and "wrong", according to which the "free" ability to make a "choice" is conceptually believed to be the determinate of one's existence after reaction end; some of this is captured by the following diagram:

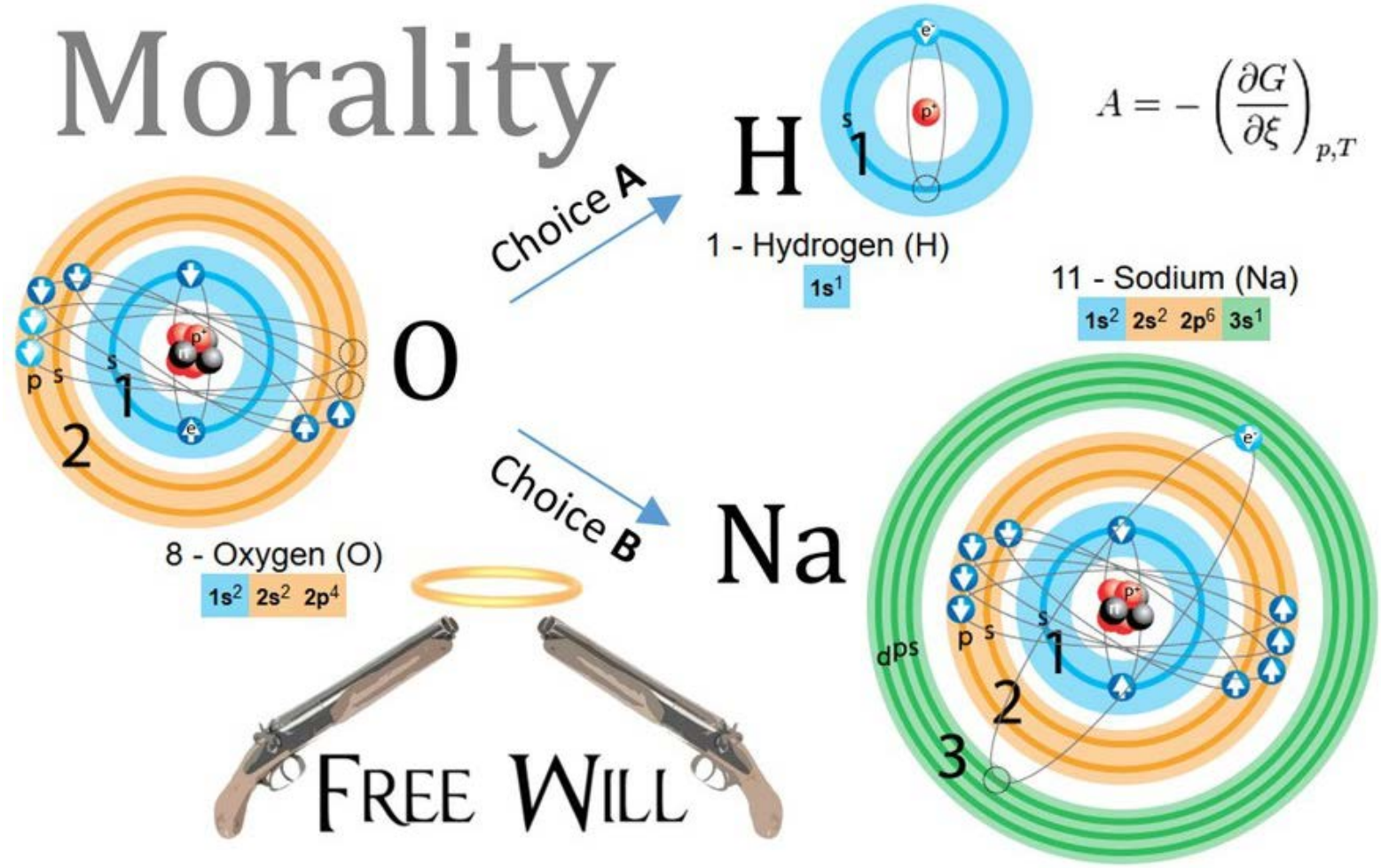

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

(add discussion)

Humans | Are Molecules?

In 2001, English physicist James Eadon initiated an online poll “Are You a Giant Molecule?”, which, as of 2009, with over 340 people polled, indicates that about 57% of people "believe" they are a molecule (human molecule) or "giant molecule" as Eadon terms things: [1]

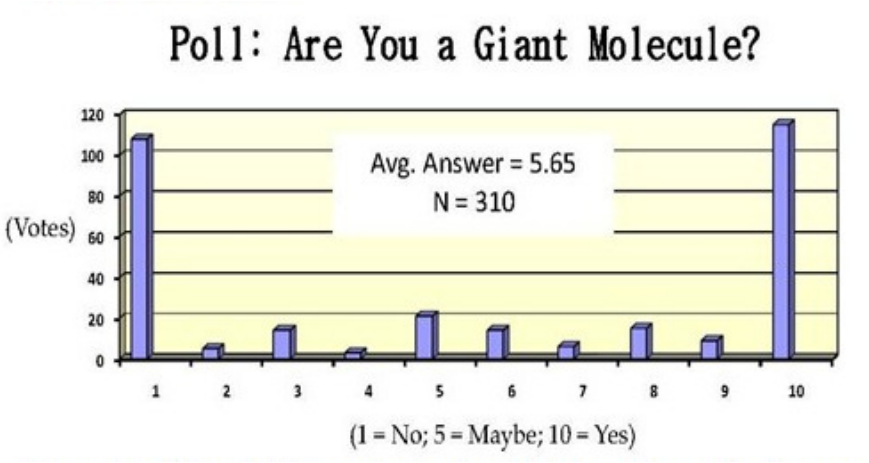

The poll was referenced in the 2008 book *The Human Molecule* by American chemical engineer Libb Thims. [2]

Love | Is a Chemical Reaction?

In 2005, Libb Thims conducted a poll of 100 people, from around Chicago, with the in person query “is love a chemical reaction?”, finding that 66 percent of people believe that love is a chemical reaction: [1]

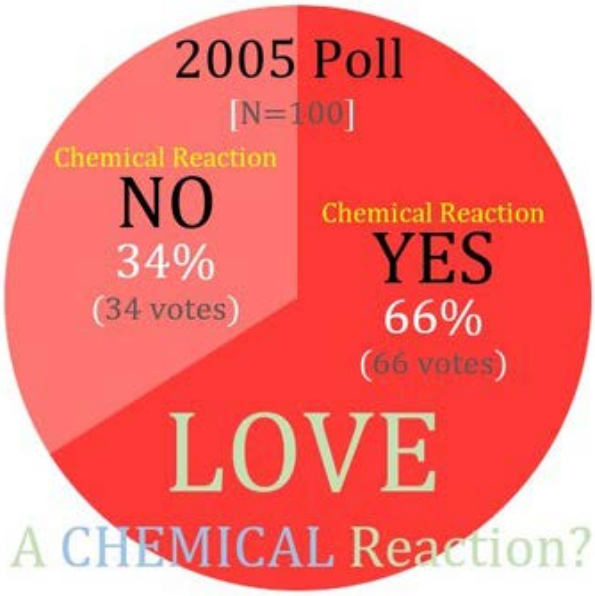

The following are example responses from the survey:

"YES" - 65.5% "NO"- 34.5%

Is LOVE a CHEMICAL reaction?

#	Reason	Name
1	How can it not be? If it has anything to do with brain synapses firing or misfiring, that's chemicals!	Dave
2	The "laws of attraction" say that when you fall in love with someone, your brain "reacts" in just the same way as when you eat chocolate.	Menos
3	Because there is the exchange of fluids, you "combine" and create something new!	Juan C.
4	Because every single emotion is a chemical reaction.	Gary
5	Because of the emotions you feel inside; because you are a chemical!	Miha
6	I want to say no, but I'm a psychology major and I've seen evidence pointing towards yes.	Ashley H.
7	Chemicals and things are shooting off in your body and your head when you like someone.	Laura S.
8	It's a reaction, your heart races, adrenaline increases, eyes dilate, everything changes.	Rasheed
9	I just heard on the news that when two people are in love the body produces some kind of chemicals, but after two years the chemicals subside.	Jeff
10	Because you have a bond going on.	Hanna

#	Reason	Name
1	It's all in your head.	Kneely
2	I know there are endorphins and chocolate, etc. that have to do with love, but I don't think the whole process adds up to chemicals.	Feona
3	Puppy love is; but real love isn't.	Lexus
4	I don't know why, I just don't think it is?	Akkrudi
5	Everything in the body of course has to do with chemicals, but the question of love itself is more philosophical.	Andy
6	It's more of emotions than chemicals; it's a feeling.	Eva
7	It's more emotional.	Dale
8	The initial chemical precursors involved in physical attraction are chemical, but the word "love" itself is a result of social conditioning.	Tim O.
9	It's something that happens in your heart.	Stephanie
10	It's just something that your body develops.	Steve
11	It's more "spiritual" than "chemical".	Adeel
12	Because a chemical reaction can't be reversed; whereas depending on the situation love can.	Valerie
13	Even when there's no chemistry people can still try and make it work.	Ofe

(add discussion)

Love | At First Sight?

In 1992, data by Helen Fisher, found that about 67% of people believe in love at first sight and 20% fall in love at first sight and marry that person. [2]

In 2013, polls by Sydnee Stannard, of American high school students, found that 62% believe in love at first sight: [3]

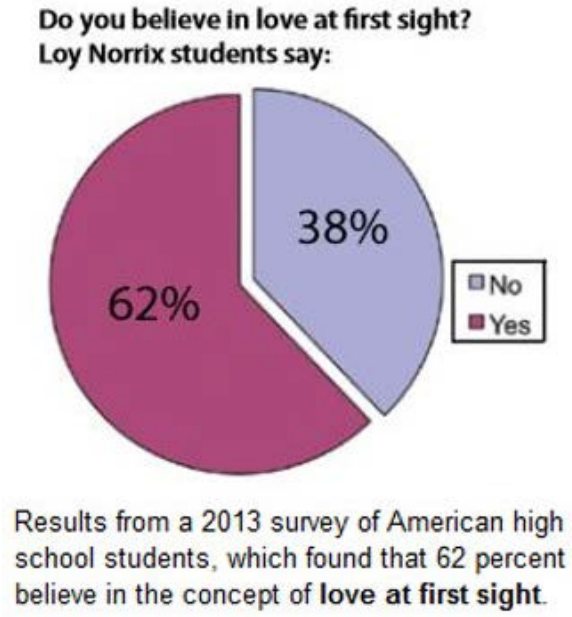

(add discussion)

Will | Free?

The following shows the polled results of a some 4,672 visitors to the *Scientific American* site, from 20 Dec 2014 to 13 Jan 2015, on question of whether or not people have free will: [4]

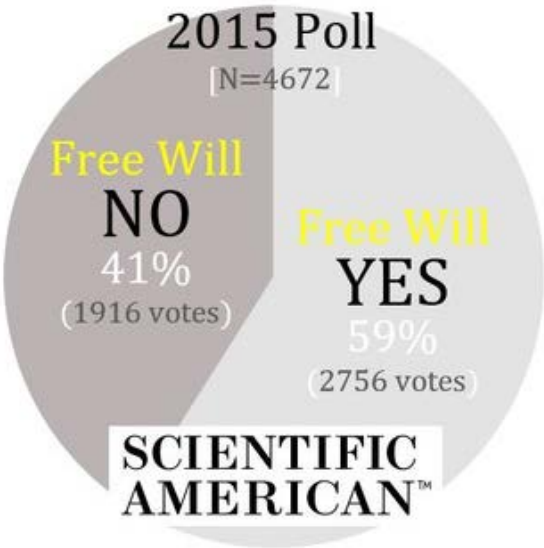

(add discussion)

References

1. Running Poll: "Are You A Giant Molecule?" (2001-2009+) – Eadon.com.
2. Thims, Libb. (2008). *The Human Molecule* (pg. 69) (preview) (Google Books). Morrisville, NC: LuLu.
3. Thims, Libb. (2005). "Poll: Is Love a Chemical Reaction?" *Research Project* #4, Chicago: Institute of Human Thermodynamics.
4. Fisher, Helen. (1992). *Anatomy of Love - a Natural History of Mating, Marriage, and Why we Stray* (section: "Love at First Sight", pgs. 49-50). Fawcett Columbine.
5. Stannard, Sydnee. (2013). "Together Forever: High School Relationships", *Knight Life*, 53(3):11.
6. Stix, Gary. (2015). "Site Survey Shows 60 Percent Think Free Will Exists. Read Why." (Ñº) *Scientific American*, Blog, Jan 15.

θΔics

In existographies, **Polybius** (c.200-118BC) (IQ:175|#275) (Cattell 1000:289) [RGM:N/A|1,350+] (Murray 4000:N/A) was a Greek historian and cryptographer, noted for []

Influence

Polybius was influential to: Diodorus, Livy, Cicero, Plutarch, Arrian, Niccolo Machiavelli, Jacques Thou, Paolo Sharpi, Charles Montesquieu, John Adams, Louis L'Amour, to name a few.

Quotes | On

The following are quotes on Polybius:

> "**Polybius** is one of the few great minds that the turbid human species has managed to produce. Damage to his *Histories* is without question one of the gravest losses that we have suffered in our Greco-Roman heritage."
>
> — Jose Ortega (c.1940), *Meditations On Hunting*

External links

â— Polybius – Wikipedia.

θΔics

In hmolscience, **polyhumanide molecule**, from Greek *poly*- “many” + *human* “one person” + *-ide* “a molecular compound or structure usually derived from or related to another, usually specified, compound or structure” (see: humanide) + French *molecule* “bound state atomic mass”, is a molecular formation of typically four or more human molecules.

A image of a man married to four women, i.e. a pentahumanide molecule, a type of **polyhumanide molecule**, compared to carbon bonded to our hydrogen atoms, as shown on the "immoral" vs "moral" articles.

Dihumanide | 2

A dihumanide molecule is bound state of two human molecules, e.g. a marriage. [1]

In 1809, German polyintellect Goethe, using Bergman symbols, defined a married couple or friendship as an AB union held in a bonding bracket type bond.

In 1987, Indian-born Pakistani organometallic chemist Mirza Beg, in his *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, referred to bonded associations of individual people: A, B, C, etc., which he refers to as chemical species or molecules, as he alludes, of form AB, BC, AC, AA, etc., as “dimers”, such as the formation of "close friends denoted by AB formed according to reaction":

$$A + B \rightleftharpoons AB$$

In 1995, Libb Thims, thinking about child reproduction, had the following reaction in mind, where A is a man, B is a women, which are the reactants, and C is a child-turning-adult product:

$$A + B \rightarrow C$$

In c.2000, American child prodigy turned astrophysicist Christopher Hirata, in his “The Physics of Relationships”, was used the symbols of X = girl, Y = boy, and XY = paired relationship, calling the single boys and girls, i.e. men and women on his college campus, as “basic elements”, defining the pair bonding reaction as follows: [3]

$$X + Y \leftrightarrow XY$$

Hirata also comments, in reference to the subject of queer chemistry (and other poly-amorphous relationships), in his human chemical reaction modeling, that he is neglecting “rare and non-traditional” products or compounds (human molecules), such as the "gay molecule" which he symbolizes as Y_2:

$$X + X \leftrightarrow X_2$$

or the "lesbian molecule" which he symbolizes as X_2:

$Y + Y \leftrightarrow Y_2$

(add)

Trihumanide | 3

A trihumanide molecule is a is bound state of three human molecules, e.g. a nuclear family.

In 1987, Mirza Beg defined the union of three people, as AAB or ABC, etc., as as “trimmer” or human trimmer, referring to things such as the "ABC society", wherein he employs the following equilibriating reaction: [3]

$$A + B + C \rightleftharpoons ABC$$

which, according to Beg, will have the following equilibrium constant:

$$K_6 = \frac{[ABC]}{[A][B][C]}$$

(add)

Tetrahumanide | 4

A tetrahumanide molecule is a is bound state of four human molecules.

In 1987, Mirza Beg defined the union of four religiously-distinct societies of people, e.g. Hindus, Muslims, Buddhists, and Christians, as a “polymer” or human trimmer, referring to things such as the "ABCD society or system", wherein he employs the following equilibriating reaction: [3]

$$A + B + C + D \rightleftharpoons ABCD$$

(add)

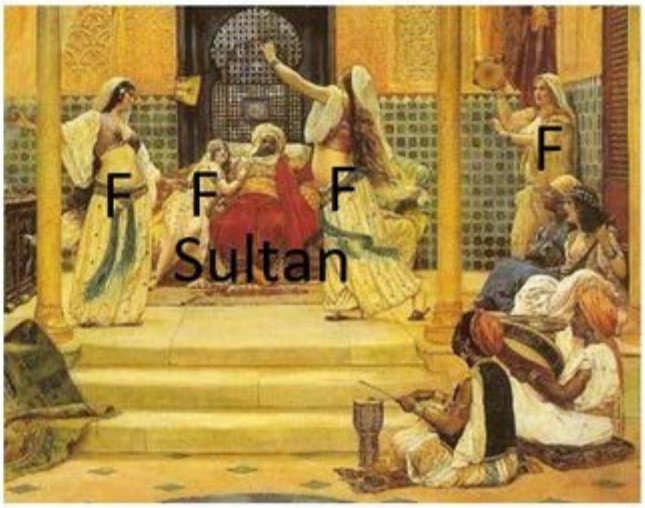

In 1910, Henry Bray discussed how the formation of iron sulfate $FeSO_4$ as akin to a sultan with a harem of four women; which is akin to Christopher Hirata's circa 2000 labeling of such model as a "middle-Eastern polygamous molecule", which he symbolically defined as X_4Y.

Pentahumanide | 5

A pentahumanide molecule is bound state of five human molecules.

In 1910, American polymath Henry Bray gave the following statement: [2]

> "If now this sulphide of iron be allowed to remain in a damp atmosphere, an efflorescence will be seen to collect on its surface composed of a saline matter. The sulphide of iron has here attracted to its family-life certain other individuals. Like a sultan, or Abraham, Isaac, and Jacob of old; so the iron, not being content with one young damsel, takes to itself four others, fair as the moon in its fullness, in the persons of four atoms of oxygen from the air, forming what is known as green vitriol or sulphate of iron."

In c.2000, Christopher Hirata, in his "The Physics of Relationships", stated the following:

> "In our model, we are neglecting rare and non-traditional products may form such as the middle-Eastern polygamous molecule X_4Y."

(add)

Hexahumanide | 6

A hexahumanide molecule is bound state of six human molecules.

Heptahumanide | 7

(add discussion)

Octahumanide | 8

(add discussion)

Enneahumanide | 9

(add discussion)

Decahumanide | 10

(add discussion)

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (dihumanide molecule, pgs. 34, 119, 170, 282). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (pg. 68). Morrisville, NC: LuLu.
2. Bray, Henry T. (1910). *The Living Universe* (pgs. 185-86). Truro Publishing Co., 1920.
3. (a) Hirata, Christopher M. (c.2000). "The Physics of Relationships" (section: Fun), Tapir.Caltech.edu; (WayBack Machine).
(b) Hirata, Christopher M. (2010). "The Physics of Relationships", *Journal of Human Thermodynamics*, 6(5): 62-76.
4. Beg, Mirza Arshad Ali. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (intro) (pdf, annotations by Libb Thims, 2014) (ABC society, pg. 75; ABCD system or society, pg. 149). Karachi: The Hamdard Foundation.

θΔics

In genius studies, **polymath**, from the Greek *polymathes* "having learned much, knowing much," from *polys* "much" + root of *manthanein* "to learn", first used in the 1620s (Ñº), akin to the term "renaissance man", refers to someone of learned acuity, in a great variety of areas.

POLYMATH (Gr.), a man of vast learning.—" Democritus, the younger, was the greatest polymath before Aristotle." " Leibnitz, after Aristotle, is the polymath of the greatest genius that ever lived. He united the greatest, the most penetrating power of intellect with the richest and most extensive erudition."

An 1874 definition of "**polymath**", as a "person of vast learning", from Charles Krauth's *A Vocabulary of Philosophical Sciences*. (Ñº)

The best capture of the embodiment of the label 'polymath' might well be the following: [7]

> "Doctor Faust the **polymath** is — as was Goethe the polymath — a man of "a hundred scholarly disciplines" [and] also a natural scientist."

This labeling of Johann Goethe, the so-called "prince of the mind", as polymath, who mastered over one-hundred disciplines, is similar to the over-common labeling of Athanasius Kircher (1602-1680), the so-called "master of a 100 arts", as a polymath, the former being a mutually-respecting admirer of the work of later.

Types

Whenever the term "polymath" is used there tends to be an underlying psychology to the method in which authors tend to use, which can be divided into four types. The first, and most common, usage of the term "polymath" is by rote regurgitation, owing to either the fact the person has entered common folklore as an established polymath or by virtue of the fact that the author simply copying or following the lead of a previously read biographical description of a person.

The second occurs where the individual being described has so many diversities of occupations or pastimes that it becomes cumbersome to list them all, whereby recourse to the single term polymath results.

The third, being that the author employing the term polymath, if done so with reserved usage—less than two or three assigned polymaths per book, e.g., history of science type publications—gives heavier weight to its usage.

Fourth, being of the more subtle kind, that in which the individual being discussed may be of the lesser known or unknown genius variety and or whose polymathy tends to unique to a specific field and in which the author employing the term is over-biased or unconsciously slanted in their use of the term. An example of this is American physical economist historian Philip Mirowski who, in his 1989 history of physics used in economic theory book *More Heat than Light*, uses the term polymath exactly four times, once each in reference to William Whewell (1794-1866) and Benoit Mandelbrot (1924-2010), who each may fall into the polymath category, but then uses the term twice in reference to the lesser known Simon Stevin (1548-1620), whose work seems to be in line with Mirowski's overall agenda.

Another example of bias in favor of the descriptive usage of the term is Johann Goethe, who is appropriately, and almost ironically (being that mathematics and astronomy were the only two fields he limited his attack), is the only person described as a polymath in Hmolpedia, being that not the least of ten labels seem to do him justice, the foremost of which (and least likely to be known) would be human chemist.

List

The following is a list of commonly known "polymaths", each individual referenced with a minimum of at least 2-4 respectable citations (although, to note, some references may tend to be slanted

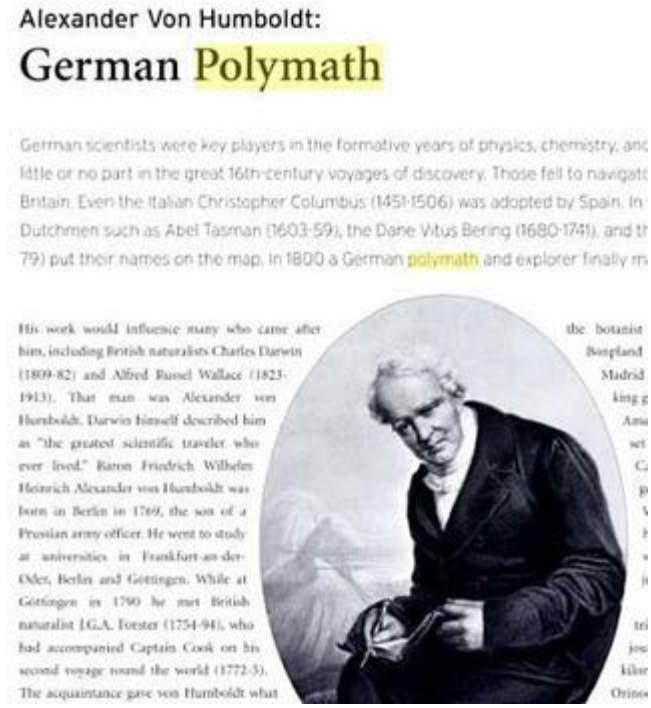

Alexander Von Humboldt:

German Polymath

German scientists were key players in the formative years of physics, chemistry, anc
little or no part in the great 16th-century voyages of discovery. Those fell to navigatc
Britain. Even the Italian Christopher Columbus (1451-1506) was adopted by Spain. In
Dutchmen such as Abel Tasman (1603-59), the Dane Vitus Bering (1680-1741), and tl
79) put their names on the map. In 1800 a German polymath and explorer finally m

His work would influence many who came after him, including British naturalists Charles Darwin (1809-82) and Alfred Russel Wallace (1823-1913). That man was Alexander von Humboldt. Darwin himself described him as "the greatest scientific traveler who ever lived." Baron Friedrich Wilhelm Heinrich Alexander von Humboldt was born in Berlin in 1769, the son of a Prussian army officer. He went to study at universities in Frankfurt-an-der-Oder, Berlin and Göttingen. While at Göttingen in 1790 he met British naturalist J.G.A. Forster (1754-94), who had accompanied Captain Cook on his second voyage round the world (1772-5). The acquaintance gave von Humboldt what

the botanist
Bonpland
Madrid
king g
Ama
set
C
p
V
tri
jou
kilor
Orinc

Chapter section on Alexander Humboldt, subtitled "German **polymath**", by cartographer John Clark, which lends more credence to Humboldt as a true polymath, as compared to passing mentions, made by Clark, of the lesser known cartographers Muhammad al-Idrisi and Shiba Kokan as being polymaths. [9]

towards a particular bias, in which case a minimum of four or more independent references may be needed), unless, of course, the individual goes without saying as being a polymath.

â— List of people who have been called a polymath (Wayback) – Wikipedia.
â— List of recognized polymaths (section) – Wikidoc.org.

A well-respected polymath assertion would be someone like George Eliot, with a well-established Cox-Buzan IQ of 175, who comments:

> "Goethe was last true **polymath** to walk the earth."

The IQ show are known mean meta-analysis ranked intelligence quotients of established geniuses, as listed on the genius IQs page, according to which a mean polymath IQ is discerned ($IQ_{polymath}$=?). The following (under construction) listing, is ranked in descending order of polymath, generally based on pre-established genius IQ ranking, Cox-Buzan genius [CBG], universal genius [UG] ranking, last universal genius [LUG], two cultures genius [TCG], last person to know everything [LPKE] ranking, greatest physicist ever [GPE], among other similar factors:

Johann Goethe (1749-1832) [LPKE] [LUG] [CBG] [TCG] (IQ=230) [7][8][10]
Leonardo da Vinci (1452-1519) [UG] (IQ=205)
Gottfried Leibniz (1646-1716) [LUG] (IQ=200) [5]
Thomas Young (1773-1829) [LPKE] (IQ=200) [11]
Erwin Schrodinger (1887-1961) [GPE] (IQ=190) [6]
Alexander Humboldt (1769-1859) (IQ=185) [9][10]
John Mill (1806-1873) (IQ=185) [5]
Benjamin Franklin (1706-1790) (IQ=175) [CBG] [10]

The above eight established polymaths, with the shown known or estimated IQs, situate the view that "true" polymaths tend to have an average IQ of 196.

Other said-to-be polymaths, per citation shown, without known or estimated IQs, are as follows:

William Whewell (1794-1866) [1][2][3][4]
Benoit Mandelbrot (1924-2010) [1]
Simon Stevin (1548-1620) [1]
Casanova (1725–1798) [11]

Otto Neurath (1882-1945) [4]
Muhammad al-Idrisi (1099-1165) [9]
Shiba Kokan (1747-1818) [9]
G. Evelyn Hutchinson (1903-1991) [10]
Carl Djerassi (1923-) [11]
Jagadish Bose (1858-1937) [14]

This group, however, may not rightly fall better into the IQ 170 to 180s, give or take.

Quotes

The following are noted quotes:

> "It isn't often that the human race produces a **polymath** like von Neumann."
>
> — Howard Rheingold (2000), *Tools for Thought* [12]

> "If any one person in the previous century personified the word ***polymath***, it was von Neumann."
>
> — Tom Siegfried (2006), *A Beautiful Math: John Nash, Game Theory, and the Modern Quest for a Code of Nature* [13]

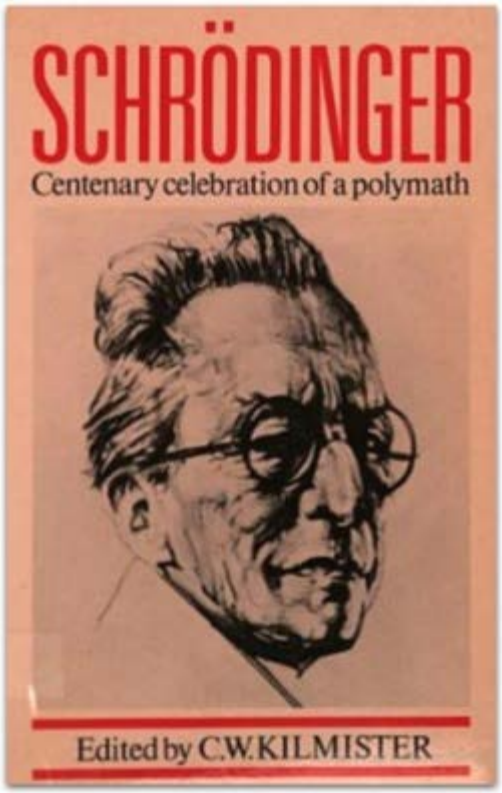

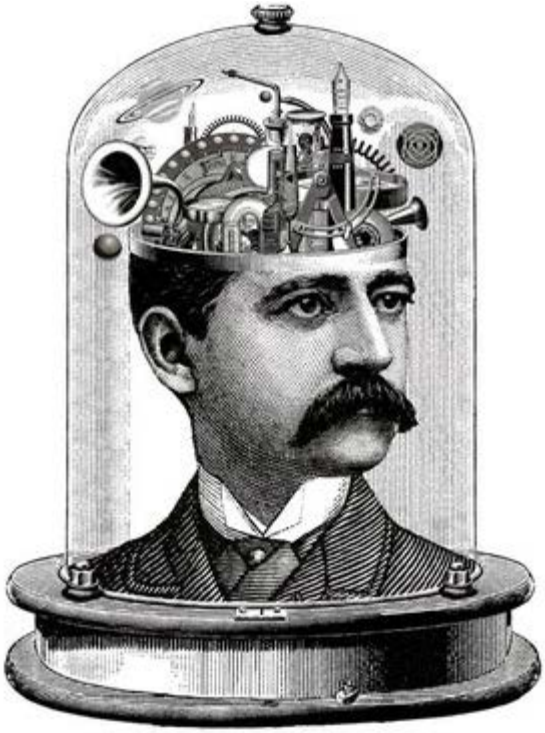

Left: Austrian physicist Erwin Schrodinger labeled as a **polymath**—a contender for last universal physicists (similar to Enrico Fermi); renowned for his 1942 lecture *What is Life?*, which might justify his thrusting into the polymathy category—although, to note, he may not necessarily have been a "polymath" in the true sense or traditional sense of the term, being that it is relatively easy to label him quite aptly as a "physicist" and to most he his known as one of the greatest physicists ever, hence categorization as a polymath is a less common labeling. [6] Right: Depiction of a **polymath**, from the 2009 *Intelligent Life* article "The Last Days of the Polymath", in which Carl Djerassi (1923-), Casanova (1725–1798), and Thomas Young (1773-1829) are classified as polymaths. [11]

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14. Jones, Barry. (2016). *Dictionary of World Biography, Third edition* (pg. 100). ANU Press.

Further reading

â— Cumming, Edward. (2009). "Polymaths: 20 Living Examples", *MoreIntelligentLife.com*, Autumn.

External links

â— Polymath – Wikipedia.

θΔics

In hmolscience, **polymathy degree problem**, aka "one nature" (or monism) credentiality problem (hydraism or interdisciplinarity), refers to issue that one, supposedly, has to become a "Socrates + Einstein", new Aristotle (Raymond Fosdick, 1924), social Newton, or last universal genius (e.g. Leibniz, Goethe, Helmholtz, or Neumann), equivalent to obtaining somewhere in the neighborhood of "five plus degrees" (Dolloff, 1975), or "six degrees" (Bray, 1910; Patton, 1920), to "seven or eight degrees" (Scott, 1985), of which, one must be in chemistry (organic chemistry, physical chemistry, chemical engineering, chemical physics), and another in thermodynamics (chemical thermodynamics, in particular), the mental equivalent to a "another Newton" (Adams, 1910) or a "few super-Einsteins" (Wheeler, c.1935), the fruit of which, supposedly, would be a *Social Principia*, in order to broach the problem of solution of how to update the humanities as the modern physicochemical sciences sees things.

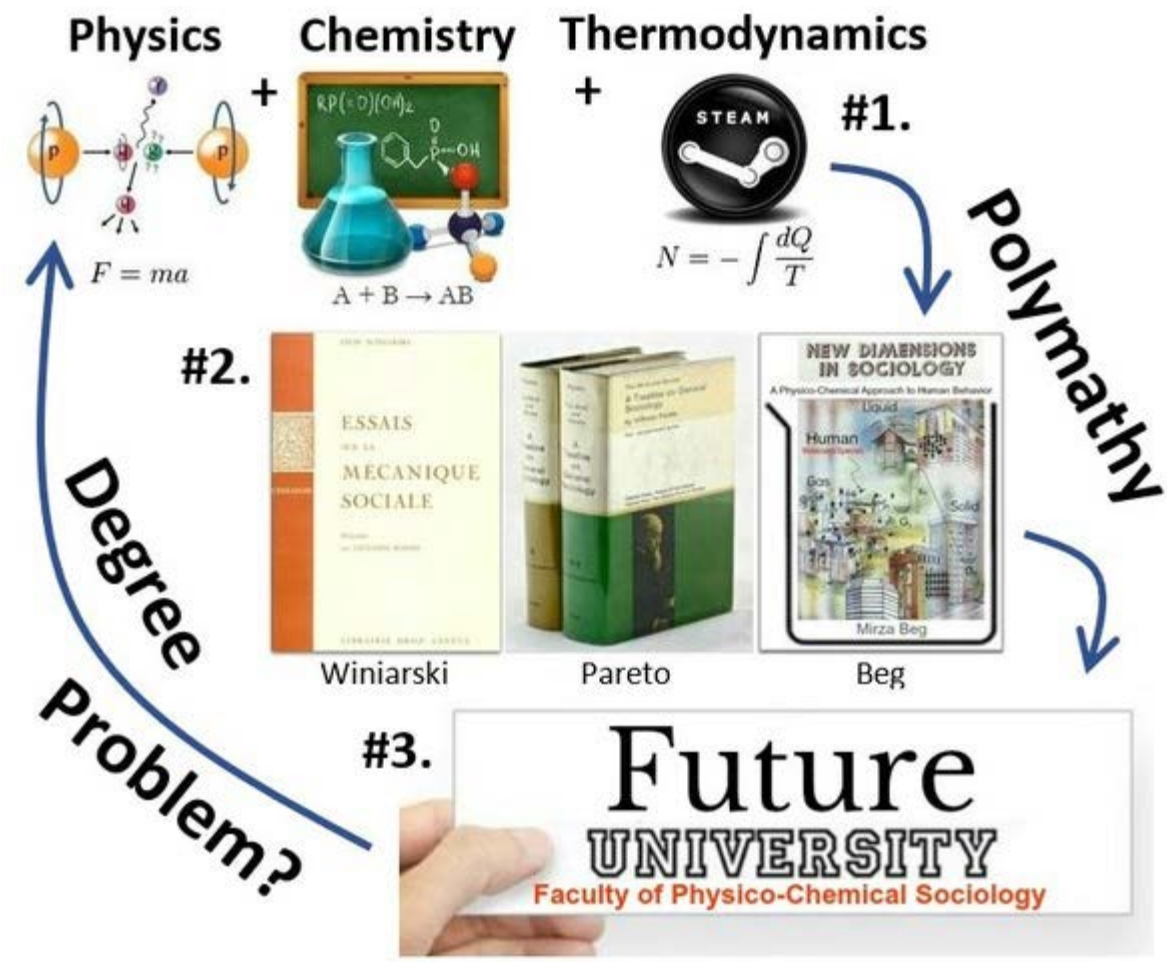

Shown above is the basic three step feedback (cybernetics) mechanism, in respect to the **polymathy degree problem**, showing how to start with students educated in the fundamentals of physics, chemistry, and thermodynamics, chemical thermodynamics specifically, who they read the main Social Principias (e.g. Goethe, Winiarski, Pareto, Beg, Thims), then engage into a physicochemical humanities course, e.g. physicochemical sociology, in a working established university, which in turn produces professors that go through the loop again, itself requiring a six-eight degree plus polymathic mind to turn, rotate, and or operate.

Quotes

The following are representative quotes:

> "It is not at all probable that the author will ever write another book; nor would he be inclined to publish this, did he not feel that he owes it to the world. Socrates told the court that he was moved by the indwelling spirit to teach as he had been taught; and thousands of others before and since have felt compelled to give utterance to thoughts not altogether originating in themselves. Without professing to have said the final word on the subjects concerning which the arguments and theories in this book are made, being a hard student and having been one all his life, and in addition to his natural love of study and assiduity in prosecuting it, having had a broader and more varied experience than but a few of his kind, and completed full courses in medicine, law, divinity, science and arts, and philosophy, receiving no less than **six degrees** from such well-known institutions of learning as Victoria University, Toronto University, Michigan University, Drew Theological School, and Hahnemann Medical College, Chicago, the author feels he is, and believers that the reader should consider him, comparatively well conversant with the subjects here investigated; and he does not doubt that the conclusions drawn from his life's studies and experience, and

carefully set down in these pages, will stand the test of all true scholarship of the present, and be increasingly approved in the future."

— Henry Bray (1910), *The Living Universe* [1]

"Surrounding us on all sides are the physicists, chemists, geologists, and astronomers, with whom we must reckon, for their domains and their subject matter overlap ours in countless ways."

— William Patten (1920), *Social Philosophy of a Biologist* [2]

"Ideas about order and disorder began to germinate in my mind about the end of the 1940s and the beginning of the 1950s. Their origin was in the areas of physics and chemistry—the Carnot cycle, of course, as well as my wanderings through the labyrinth of chemical thermodynamics. It was about this time that the laws and principles of thermodynamics began to be applied on an increasing scale to the geological and biological sciences. The conviction grew that energy and entropy relationships were fundamental not only in understanding processes in physics and chemistry but also in astronomy, geology, and biology. Inevitably this led to the conjecture that further extrapolation would lead to the human sciences and arts, and even to psychology, sociology, history, music, philosophy and religion. Someone, I thought, will bring out the importance of understanding the concepts of order and disorder to all configurations of matter—including man and all of his works. Individuals have applied these concepts within their own specialties; there are articles on information and electronics, entropy in literature, music, and even entropy in religion. But I have waited in vain for someone to show that order and disorder are universal. Most of this essay, and it is an essay—an attempt—was written in the early 1960s. But I am, I believe, a cautious person. I ask myself, who am I [**four degrees**: BS geology MIT; MA Columbia; MA and PhD metallurgical engineering, Stanford] to presume myself enough of an eclectic to be **able to discuss all of human knowledge** [see: last person to know everything]?"

— Norman Dolloff (1975), Preface to *Heat Death and the Universe* [3]

"Since my name is not Socrates or Einstein and I hold only one of the seven or eight PhD degrees [organic chemistry] this problem requires, readers are quite justified in questioning my qualifications to testify as such a multidisciplinary expert."

— George Scott (1985), *Atoms of the Living Flame*; introduction to the study of the ethics and physical chemistry of will [4]

"If it could stand the test of time, Beg's ideas, presented in [*New Dimensions in Sociology*] will rediscover new frontiers in sociology and will revolutionize the existing theories of human behavior as it has so far been propounded by philosophers. Beg's approach is a pioneering effort his writing style is matter of fact and **demands adequate knowledge of physical chemistry**."

— Jameel Jalibi (1987), "Foreword by a Sociologist" to Mirza Beg's *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* [5]

References

1. Bray, Henry T. (1910). *The Living Universe* (Preface pgs. 5-6). Truro Publishing Co., 1920.
2. (a) Patten, William. (1919). "The Message of the Biologist", Address of the vice-president and chairman of Section F,

Zoology, American Association for the Advancement of Science, St. Louis, Jan 31.
(b) Patten, William. (1920). "The Message of the Biologist", *Science*, pgs. 93-101, Jan 30.
(c) Patten, William. (1920). *The Grand Strategy of Evolution: the Social Philosophy of a Biologist* (molecule, pgs. 58-59, 127, 159, 345, 381, 419-20; molecular society and Mr. Molecule, pg. 419; Appendix: "The Message of the Biologist", pgs. 415-25; "surrounding us" quote, pg. 417). R.G. Badger.
3. Dolloff, Norman H. (1975). *Heat Death and the Phoenix: Entropy, Order, and the Future of Man* (Preface, pgs. xi-x). Exposition Press.
4. Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pg. viii). University Press of America.
5. Beg, Mirza. (1987). *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (abs) (intro) (pdf, annotations by Libb Thims, 2014) (Foreword by a Sociologist, pgs. iv-v). Karachi: The Hamdard Foundation.

θΔics

In terminology, **pond scum**, from the German *scum* "foam", is a semi-recent phrase, a possible cross between Charles Darwin's 1871 "warm pond" origin of life model and Stephen Hawking's 1995 "humans = heated chemical scum" model, often employed to dehumanize or derogate theories on human origins, often seen in religion vs science debates.

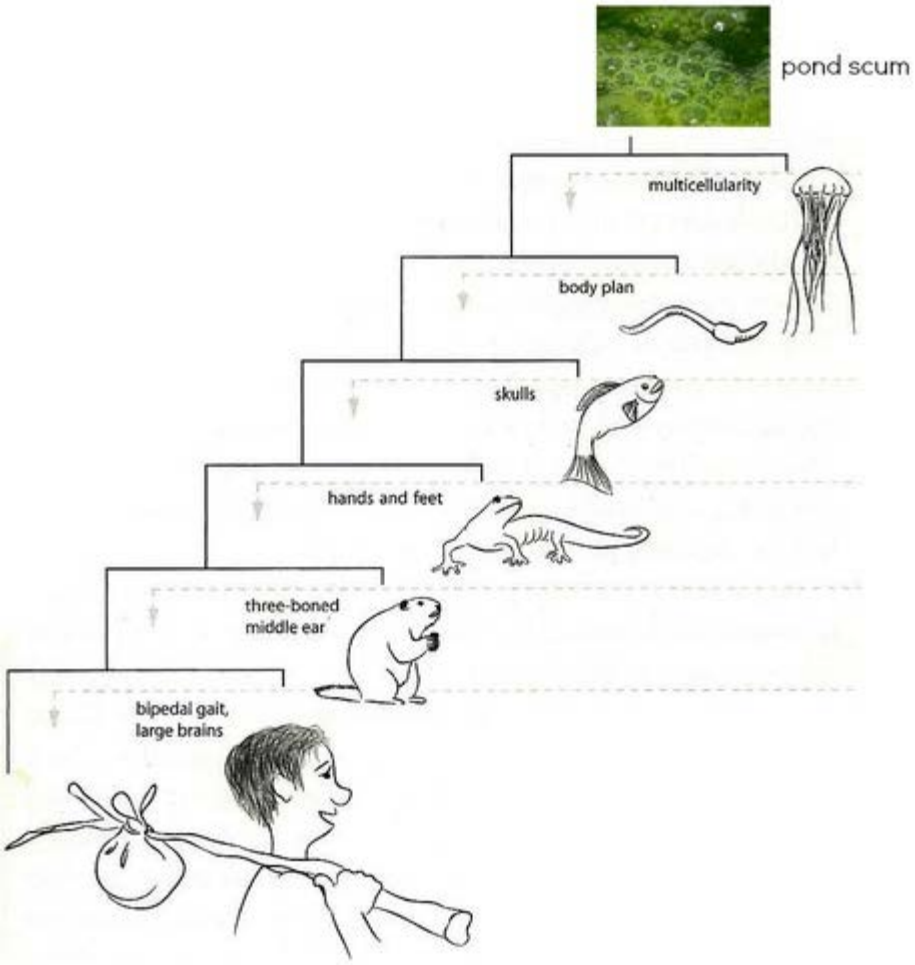

American paleontologist Neil Shubin's 2008 **pond scum** evolution diagram. [2]

Quotes

The following are related quotes:

> "The human race is just a chemical **scum** on a moderate-sized planet, orbiting around a very average star in the outer suburb of one among a hundred billion galaxies."
>
> — Stephen Hawking (1995), interview with Ken Campbell [1]

> "Where do our lineages stop? Does it continue to 3.8-billion-year-old **pond scum**, and beyond? Everybody agrees that there own lineage goes back go some point in time, but just how far back is the issue."
>
> — Neil Shubin (2008), *Your Inner Fish* [2]

> "Our country's *Declaration of Independence* specifically states that all men are 'created' and that they are endowed 'by their Creator' with basic human rights. Yet there is an ongoing effort in society to eliminate the very idea that we have a Creator. We did not evolve from **pond scum**, but were made in the image of God."
>
> — Ray Comfort (2013), commentary as producer of the film *Evolution vs. God* (Ñº)

See also

â— Bag of chemicals

References

1. (a) Hawking, Stephen. (1995). "Interview with Ken Campbell", Reality on the Rocks: Beyond Our Ken.
(b) Pross, Addy. (2012). *What is Life? How Chemistry Becomes Biology* (pg.viii). Oxford University Press.
(c) Tallis, Raymond. (2013). "You Chemical Scum, You", *Philosophy Now*, May/Jun.
2. Shubin, Neil. (2008). *Your Inner Fish: a Journey into the 3.5-Billion-Year History of the Human Body* (pond scum, pg. 178). Random House.

θΔics

In hmolscience, **Pope Francis** (1936-) is the 2013 inaugurated Pope of the Catholic Church, noted for his 27 Oct 2014 plenary assembly address to Pontifical Academy of Sciences, wherein he declared evolution true, big bang real, God not a magician with a magic wand, and that science does not contradict creation as described in Genesis.

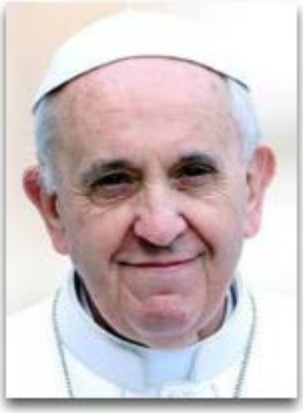

Overview

In 2014, Pope Francis gave his "Evolving Concepts of Nature" address, wherein he stated, among other things: [1]

> "God is not a demiurge [demigod] or a magician, but the creator who gives being to all entities. Evolution in nature is not opposed to the notion of creation, because evolution presupposes the creation of beings that evolve."
>
> "God created human beings and let them develop according to the internal laws that he gave to each one so they would reach their fulfillment."
>
> "God is not a magician with a magic wand able to do everything."

(add discussion)

See also

- Atheism timeline
- Pope Pius XII

References

1. (a) Francis, Pope. (2014). "Evolving Concepts of Nature" (Q), Pontifical Academy of Sciences, plenary address, Oct 27.
(b) McKenna, Josephine. (2014). "Pope Francis: 'Evolution is Not Inconsistent with the Notion of Creation'" (Q), *Religion News Service*, Oct. 17.

External links

- Pope Francis – Wikipedia.

θΔics

In existographies, **Pope Leo X** (1475-1521) (CR:22) was a Renaissance era pope, noted for his "indulgence selling practice" or sexual indulgence controversies, which left the indelible impression of his pontificate (Q), which is said to have sparked the Reformation; he also, in religio-mythology, referred to Christianity as the "fable of Christ" (see: Christ fable).

Christ | Fable

In 1514, at a lavish Good Friday banquet, in the Vatican, in the company of seven intimates, Leo X famously stated the following as he raised his toast glass to the air: [1]

> "How well we know what a profitable superstition this fable of Christ has been for us and our predecessors."

The pope's pronouncement, since characterized as the "most infamous and damaging statement about Christianity in the history of the Church", was recorded in the diaries and records of both Pietro Cardinal Bembo (Letters and Comments on Pope Leo X, 1842 reprint) and Paolo Cardinal Giovio (De Vita Leonis Decimi..., op. cit.), two associates who were witnesses to it.

Reformation

In 1515, Pope Leo X granted a plenary indulgence intended to finance the construction of St. Peter's Basilica in Rome. It would apply to almost any sin, including adultery and theft. All other indulgence preaching was to cease for the eight years in which it was offered. Indulgence preachers were given strict instructions on how the indulgence was to be preached, and they were much more laudatory of the indulgence than those of earlier indulgences. The "indulgences" being sold that promised reduced time in purgatory for deceased relatives" was the straw that broke the back of a camel named Martin Luther, who in 1517 nailed 95 theses,or indulgence-selling objections, on the door of the Wittgenberg Castle Church door.

Other

Leo X is said to have used an early type of telescope to observe, from the Medici Palace in Florence, "distant hunting chases and birds flying over the Fiesole hills". [4]

Moreover, Giovanni Rucellai (1475-1525), cousin of Pope Leo X, used a concave mirror to study the anatomy of bees, later described in the short poem *Le api*. [4]

Quotes | On

The following are quotes on Leo X:

> "The power of Rome was directed mercilessly for centuries against everything that stood in its way. Under the notorious Torquemada (1481-98), in Spain alone eight thousand heretics were burned alive and ninety thousand punished with the confiscation of their goods and the most grievous ecclesiastical fines; in the Netherlands, under the rule of Charles V., at least fifty thousand men fell victims to the clerical bloodthirst. And while the heavens resounded with the cry of the martyrs, the wealth of half the world was pouring into Rome, to which the whole of Christianity paid tribute, and the self-styled representatives of god on earth and their accomplices (not infrequently atheists themselves) wallowed in pleasure and vice of every description. 'And all these privileges,' said the frivolous, syphilitic **Pope Leo X**, 'have been secured to us by the fable of Jesus Christ."
>
> — Ernst Haeckel (1899), *The Riddle of the Universe* [3]

Quotes | By

The following are quotes by Leo X:

> "All ages can testify how profitable that fable of Christ has been to us and our company."
>
> — Pope Leo X (1514), response to cardinal Bembus in response to gospel question [2]

See also

- Frederick II
- Pope Francis
- Pope Pius XII

References

1. Author. (2007). "The Criminal History of the Papacy: Part 3 of 3" (O), *Nexus Magazine*, 14(3), Apr-May.
2. Bale, John. (c.1540). *The Pageant of the Popes* (O). Publisher, 1574.
3. Haeckel, Ernst. (1899). *The Riddle of the Universe: at the Close of the Nineteenth Century* (translator: Joseph McCabe) (pg. 318). Harper & Brother, 1900.
4. Ilardi, Vincent. (2007). *Renaissance Vision from Spectacles to Telescopes* (pg. 208). Publisher.

External links

- Pope Leo X – Wikipedia.

θΔics

In hmolscience, **Pope Pius XII** (1876-1958) was an Italian religious leader, the head of the Catholic Church from 1939 to 1958, and is noted, in religious thermodynamics, for his "notorious" 28 Nov 1951 “Theology and Modern Science” address, wherein he cited the second law as evidence of the existence of god or "necessary being" as he phrases things.

Overview

In 1951, Pope Pius XIII gave his his notorious Nov 28 lecture, entitled “Theology and Modern Science”, in which he argued that Rudolf Clausius' second law of thermodynamics provides "eloquent evidence of the existence of a Necessary Being." [1]

The oft-cited excerpt from the lecture, found in his sub-section “Direction of Transformations: In the Macrocosm; the Law of Entropy”, is as follows: [2]

> “Modern science has not only widened and deepened our knowledge of reality and the vastness of the mutability of the cosmos; it likewise provides us with valuable indication on the direction taken by the processes of nature. As late as a hundred years ago, especially after the discovery of the law of the conservation of energy, it was thought that natural processes were reversible. Consequently, in conformity with the principles of strict causality, or rather the determination, of nature, an ever-recurring renovation and rejuvenation of the cosmos was regarded as possible. Through the law of entropy, however, discovered by Rudolf Clausius, it was recognized that the spontaneous processes of nature are always accompanied by a diminution of free and utilizable energy. In a closed material system this conclusion must lead, eventually, to the cessation of processes on a macroscopic scale. This unavoidable fate, from which only hypotheses—sometimes unduly gratuitous—such as that of continued supplementary creation, have endeavored to save the universe, but which instead stands out clearly from positive scientific experience, postulates eloquently the existence of a necessary being.”

In other words, Pope Pius XII is trying to say that because the universe has not run down to heat death and cessation of operation, this must be evidence that God is keeping the processing going, or something to this effect.

See also

- Pope Francis

References

1. (a) Kyle, Benjamin G. (1988). “The Mystique of Entropy” (abstract), *Chemical Engineering Education*, Vol. 22., pgs. 92-97. Spr.
(b) Kyle, Benjamin G. (1999). *Entropy: Reflections of a Classical Thermodynamicist* (ch. 8: The Mystique of Entropy, 15 pgs.). Kansas State University; first published on attached CD-ROM to *Chemical and Process Thermodynamics* (3rd ed.), Prentice Hall, 1999.
2. Pope Pius XII. (1951). “Theology and Modern Science”, Address to the Pontificial Academy of Sciences, Rome, Nov 28; *The Tablet: the International Catholic News Weekly* (1951) (Q), Dec 1; in: *Bulletin of the Atomic Scientists* (1952), 8, 143-46, 165-.

Further reading

- Kragh, Helge S. (2008). *Entropic Creation: Religious Contexts of Thermodynamics and Cosmology* (Pope Pius XII, pgs. 204, 212 220). Ashgate Publishing, Ltd.

External links

- Pope Pius XII – Wikipedia.

In hmolscience, **population potential**, "potential of population" or "potential population by gravity model", is the attractive force felt at a distance away from a social aggregate; quantified by mass of the aggregate, typically the population of a city, divided by the distance away from the aggregate; the gravitational potential models of Joseph Lagrange (1773) applied to people and cities moving around each other like planets.

Box 3.2	The gravity model

Early in the nineteenth century, some scientists suggested that the laws of physics could be applied to the study of human relationships and that the laws of gravitation might explain patterns of travel and trade between places. By the mid-twentieth century gravity models were widely applied within the **spatial science** school of geography. In its simplest form, the **gravity model** can be expressed as follows:

$$I_{ij} = \frac{k\,(P_i P_j)}{(D_{ij})^2}$$

where I_{ij} represents the interaction between town *i* and town *j*; P_i and P_j are the populations of the two towns; D_{ij} is the distance between them; and *k* is a constant.

The equation indicates that the interaction between the two towns (for instance, numbers of telephone calls, flows of traffic) is proportionate to the *product* (.) of their populations, divided by the *square* – ( )^2 – of the distance between them.

The Carey-Stewart-Warntz conceptualized "gravity model", of the so-called "social physics school" of geographical research, one of the four schools of quantitative geography, according to human geography historian Ron Johnston, in which **population potential** maps, or distributions of populations divided by distances between cities, are central. [7]

Early theorists

Early thinkers to theorize about social phenomena in gravitational terms include: George Berkeley (1713), Francesco Algarotti (1737), and Thomas Carlyle (1837).

Carey

In 1858, American sociologist Henry Carey introduced the concept of social gravitation, namely the existence of a hypothetical force of attraction, similar to the gravitational force, existing between aggregates of people, i.e. cities, proportional to the number of people in each aggregate and inversely proportional to the distance between the aggregate; to quote a noted selection:

> "The great law of molecular gravitation: man tends of necessity to gravitate toward his fellow man. Gravitation is here, as everywhere else in the material world, in the direct ratio of the mass and in the inverse one of the distance. The greater the number collected in a given space, the greater is the attractive force there exerted, as is seen to have been the case with the great cities of the ancient world, Niniveh and Babylon, Athens and Rome, and is now seen in regard to Paris and London, Vienna and Naples, Philadelphia, **New York**, and Boston."

— Henry Carey (1858), *Principles of Social Science* (pgs. 42-43); quoted in: Stark (1962); Tocalis (1978); Barnes (2014) [1]

(add)

Stewart

In the late 1930s, American physicist John Q. Stewart was ruminating on how to study social aggregation as a force proportional to mass inversely proportional to distance of separation phenomena, in the sense of Lagrange-Newton potential models. The following is a retrospect summary of these thoughts from Stewart's 1947 "Distribution and Equilibrium of Population" article: [6]

> "The evident tendency of people to congregate in larger and larger cities represents an attraction of people for people that turns out to have a mathematical as well as merely verbal resemblance to Newton's law of gravitation. Lagrange in 1773 found that where the attraction of several planets at once was under consideration, a new mathematical coefficient, not used by Newton, simplified the calculations. This coefficient amounted to a measure of the gravitational influence of a planet of mass *m* at a distance *d*, and it was as simple as possible, merely m/d."

Stewart, in short, was ruminating on some type of social potential equation of the following form:

$$P_s = \frac{M_s}{d}$$

where P_s is sociological potential felt in the vicinity of a given social mass M_s in a given distance *d* from that mass.

In 1939, Stewart, supposedly either aware or unaware, at that point, of the earlier social gravitation work by Henry Carey (though by 1953 he was for sure), began to use a potential equation of the following form—notation use according to English geographer Rich David (*Potential Models in Human Geography*, 1980):

$$v_i = \frac{P_j}{D_{ij}}$$

where v_i is the "population potential" at location *i*, in respect to a given population at location j, P_j is the size of the population at j, and D_{ij} is the distance between locations i and j. Stewart's population potential equation states that population influence of location j on location i is proportional to the size of the population at j doing the influencing, and inversely proportional to the distance between the two locations. [2] Stewart's equation, supposedly, is based, in some way, on either the concept of universal law of gravitation (Newton, 1686) or "potential" (Leibnitz, 1773), or its synonym gravitational potential. [3]

In Dec 1939, Stewart, during his Christmas Holiday break, first applied this potential equation to the geographical distribution of what he referred to as the "Princeton Family," that is, the 20,438 members listed in the 1940 edition of Princeton University's Alumni Directory. Specifically, Stewart, with the assistance

of a Philip Wilkie, calculated the population potential of every state in relation to New Jersey, Princeton's home state. From that he worked out the expected number of Princeton alumni for every state, and compared that number to the actual count from the Alumni Directory. Stewart found that expected and actual numbers of alumni "more or less" lined up. It showed him that potential models applied not only to objects in the heavens but also to those down on earth within the social field. [4] Stewart, in other words, found that people graduating from a given university have the "potential" to migrate outward in radius to new cities, cities being akin to a clustering of several planets, wherein the "Stewart potential" represents the social gravitational attraction towards each outward location.

In 1947, Stewart then calculating total population potential for the US, in 1940, as a whole, via the following equation:

$$V_i = \sum_{j=1}^{N} \frac{P_j}{D_{ij}}$$

where Vi is the total population potential for location i, meaning that for any given location i, total population potential is equal to the sum of all the individual potentials created by populations found at every location j, summed through the total number of locations N. With this data, now knowing the total population potentials for all locations, then constructed an isopleth map, i.e. "equipotential" map, wherein each line of equipotential connects all the places with the same population potential:

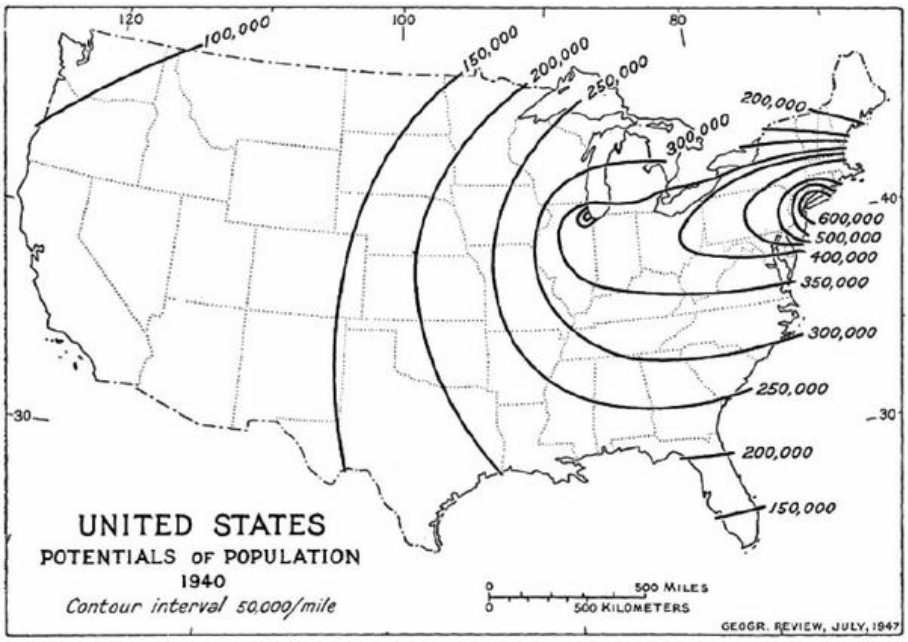

Somewhere in this "isopleth" map argument, Stewart, to note, devotes a small section to what he calls "demographic energy" or "energy of interchange", arguing along the lines that just as in physics, the potential is the energy in the field of a unit of mass, so to is the population potential the "demographic energy" in the social field around a given unit mass of population.

Stewart's isopleth map shows that population potentials are high in the northeastern states, indicating considerable influence of population on any given location within that region. Stewart also gave the following population potential equipotential maps: [6]

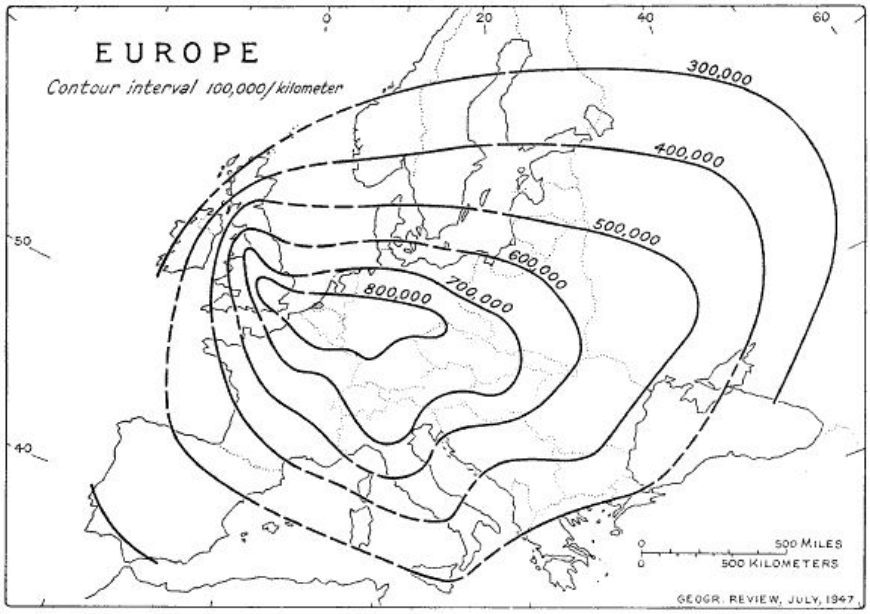
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GEOGR. REVIEW, JULY, 1947

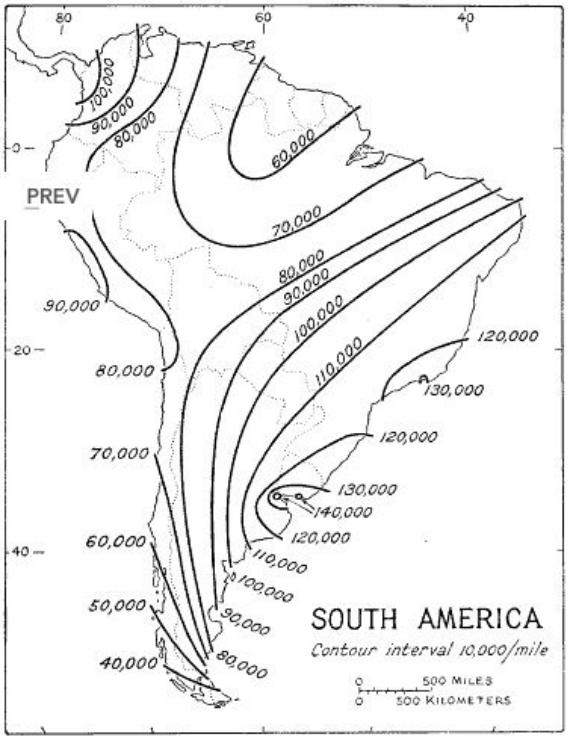
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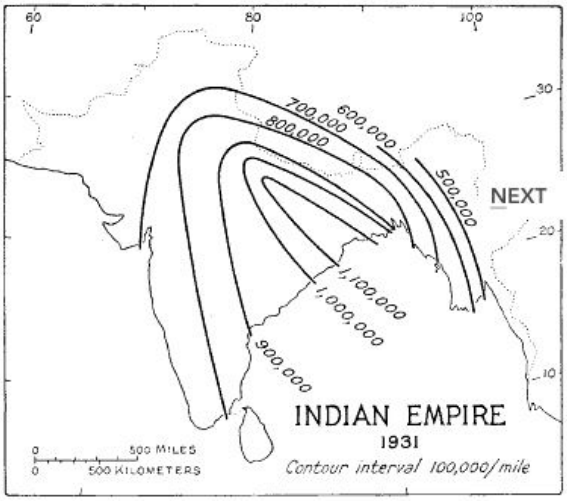
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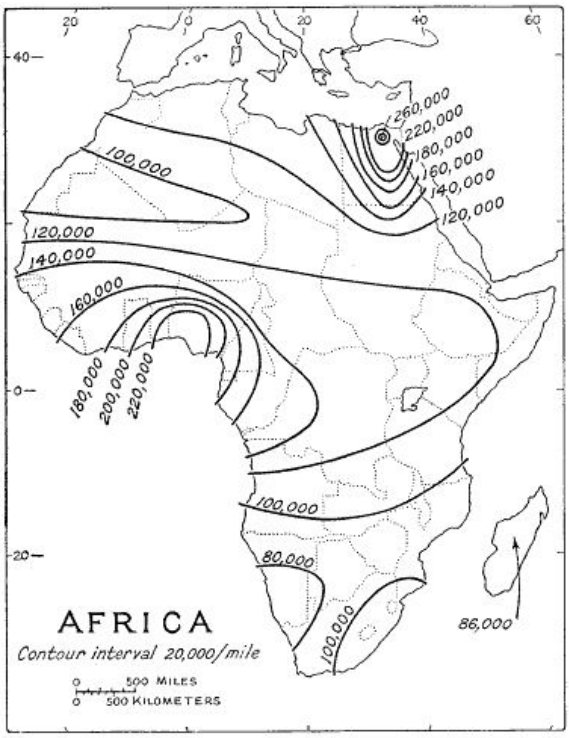

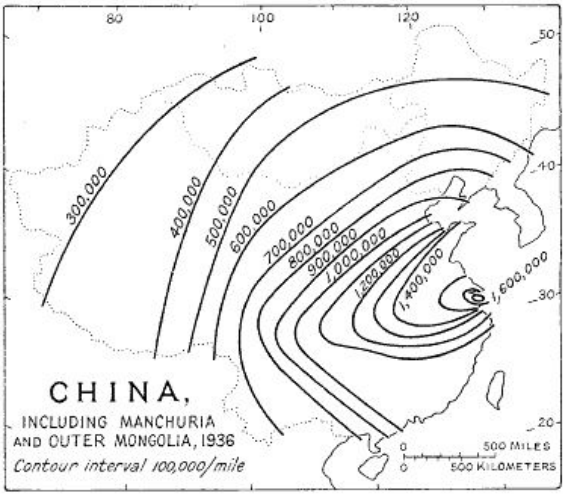

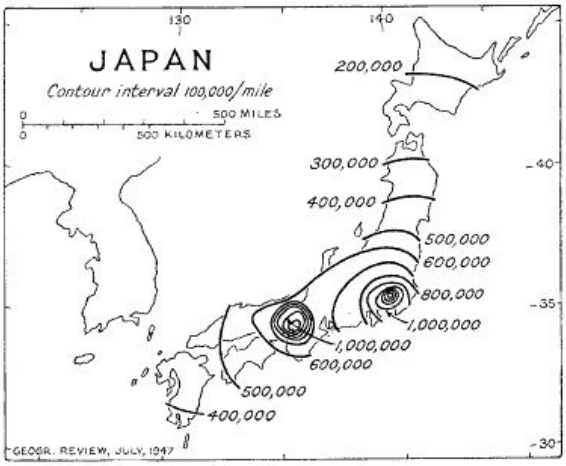

Stewart then gave US isopleths as the changed over a century:

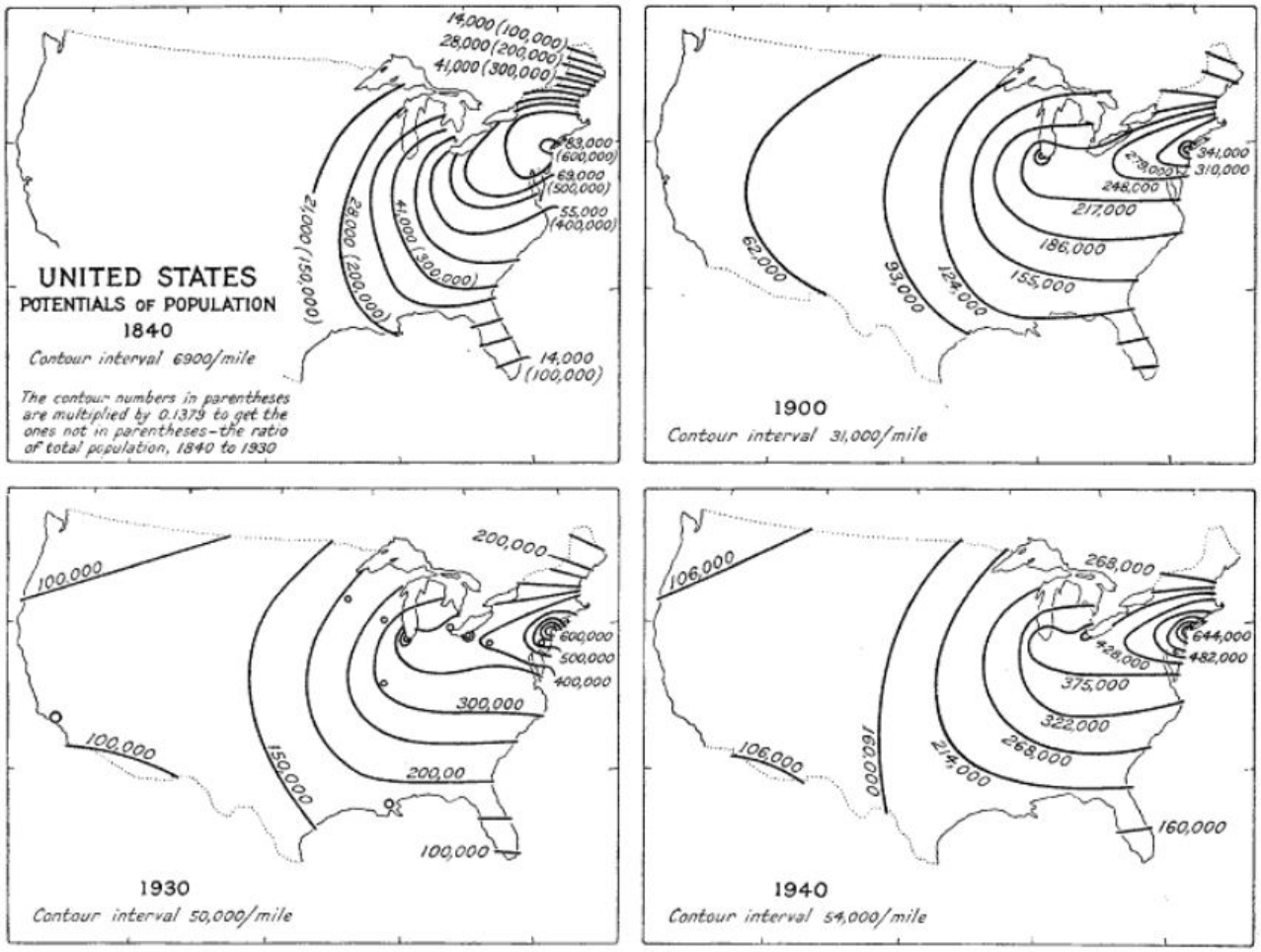

Warntz

In 1964, American economic macrodemographer William Warntz made

Warntz then made the following American and Canada isopleth map:

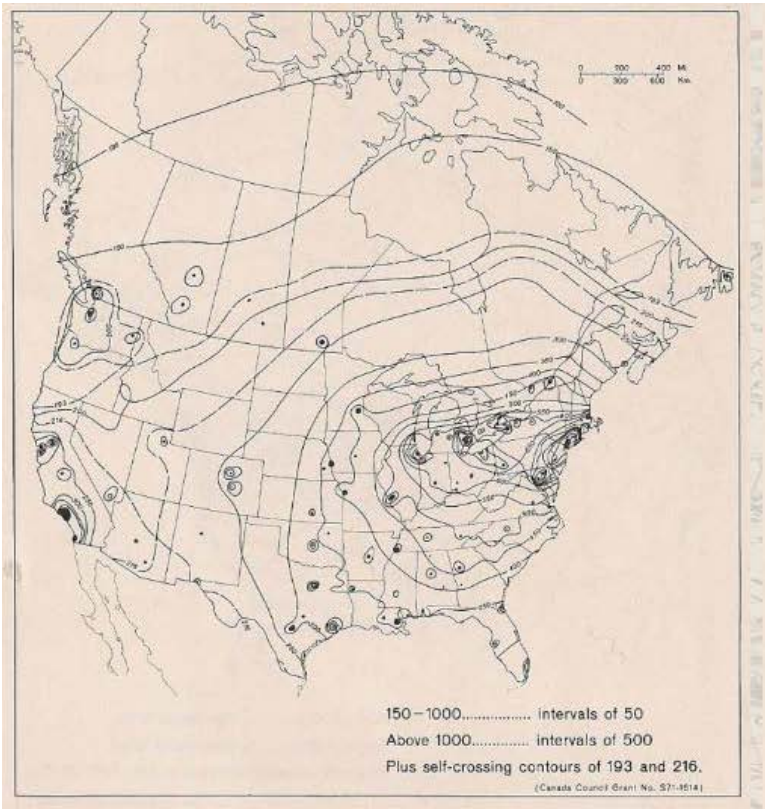

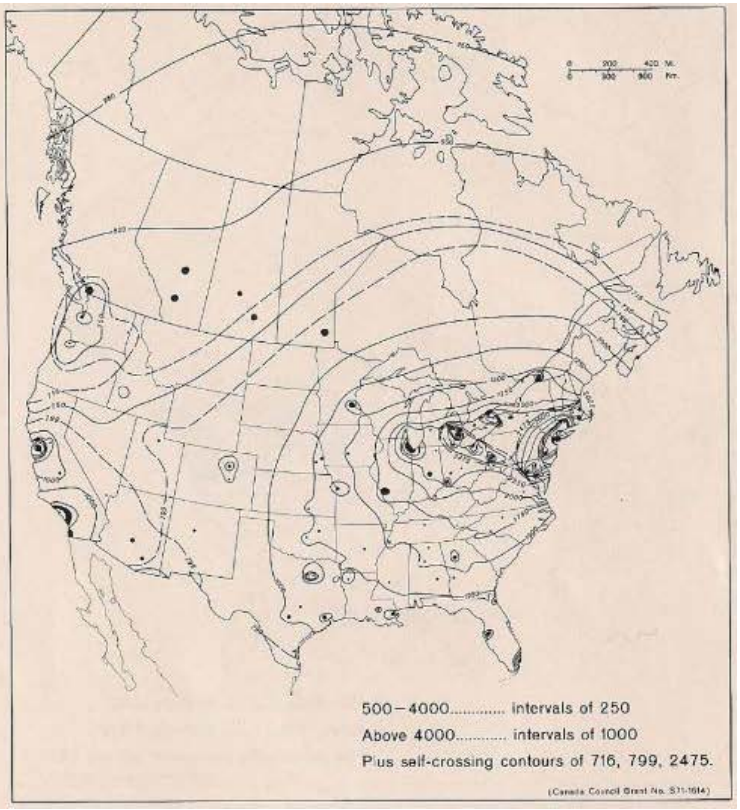

(add discussion)

See also

â— Gibbs landscape

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Further reading

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External links

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θΔics

In existographies, **Porphyry** (233-305) (IQ:#|#) (Cattell 1000:906) (CR:2) was a Roman philosopher, noted for []

Education

Porphyry was a student of Plotinus, and was the one who edited and published his *The Enneads*.

Number 9

The number 9 in the Greek alphabet, which is called “theta”, symbol " Θ ", which was written by the Egyptians as a circle with X inside " ", this generally being the symbol for the city of Heliopolis, aka "city of the sun", or also a circle with dot in side " Ê˜ ", the latter generally, however, being the symbol for Ra, the sun god, such as shown in Gardiner’s sign list (1929), was representative, according to Porphyry, of the ‘soul’ or possibly "world soul", and also, more importatly, that the number nine was representative of the great Ennead or paut of nine deities of Heliopolis creation myth. [1]

Quotes | On

The following are quotes on Porphyry:

> “The letter ***theta*** (Θ) was, in its archaic form, written as a cross within a circle (,) and later as a line or point within a circle (Θ, Ê˜). According to **Porphyry** (c.280), the Egyptians used an X within a circle as a symbol of the sou1. Having a value of nine ‘9’, it was used as a symbol for the **Ennead** [nine gods], the nine major deities of the ancient Egyptians. The earliest of these, the great Ennead of Heliopolis, was comprised of the original creator god, Atum, often identified with Ra [Ra-Atum]; his children, Shu and Tefnut; their children, Geb and Nut; and the fourth generation, the brothers, Osiris and Seth, and their sisters, Isis and Nephthys. Johannis Lydus (c.540) noted that the Egyptians also used a symbol in the form of a *theta* for the cosmos, with an airy fiery circle representing the world, and a snake, spanning the middle, representing the *agathos daimon* or ‘good spirit’. The Egyptians also used the sign of a point within a circle (Ê˜) to represent the sun god **Ra**, the probable origin of its use as the astrological symbol for the Sun. Coincidentally, *theta* had the same value in isopsephy as Helios, namely: ΘΗΤΑ = 318 = ΗΛΙΟΣ [Helios]. In classical Athens, *theta* was also known as the ‘letter of death’ because it was the initial letter of *thanatos* (death). It survives on potsherds used by Athenians when voting for the death penalty.”
>
> — Kieren Barry (1999), *The Greek Qabalah: Alphabetical and Mysticism and Numerology in the Ancient World* (pg. 73)

References

1. (a) Anon. (c.2019). “Theta Symbol and Its Meaning” (Ñº), Mythologian.net.
(b) Gardiner’s sign list – Wikipedia.

External links

â— Porphyry (philosopher) – Wikipedia.

θΔics

In existographies, **Posidonius** (135-51BC) (IQ:170|#276) (CR:13) was a Greek scientist, historian, philosopher, astronomer, and general polymath, characterized the “greatest polymath of antiquity” (Dodds, 1973) (Q) and a scholar of “almost Aristotelian stature” (Walsh, 1998), noted for []

Stoicism

Posidonius was a pupil of Panaetius (185-109BC) (Q), the fourth head of the Stoic school, from 129 to 109BC, who was a strong admirer of Plato and Aristotle, who built bridges with the Peripatetics. Posidonius became the chief philosopher through which Cicero learned Stoicism. [1]

Astronomy

Posidonius advanced the theory that the sun emanated a vital force which permeated the world.

In 90BC, he estimated the distance to the sun to be 9,893 times the earth’s radius, i.e. he calculated distance to sun to be 39M miles (actual: 93M miles); an improvement over measurements by Aristarchus. (Q)

Posidonius constructed an orrery, possibly similar to the Antikythera mechanism (Q), which, according to Cicero, exhibited the diurnal motions of the sun, moon, and the five known planets.

Sympathy | Proto-chemistry

In c.70BC, Posidonius advocated a theory of cosmic "sympathy" (συμπάθεια, *sumpatheia*), the organic interrelation of all appearances in the world, from the sky to the earth, as part of a rational design uniting humanity and all things in the universe, even those that were temporally and spatially separate. (Q)

In 2008, Ernesto Paparazzo, in his “Why Take Chemistry Stoically?”, argued that some of the ideology of Posidonius’ logic, e.g. his “generation and destruction”, form a sort of proto-science of chemistry, as being forerunners to chemical elements, chemical species, nuclear reactions, conservation of mass, and chemical change at solid surfaces; the following is a representative quote: [1]

> “Posidonius says that there are four kinds of destruction and generation that occur from what is to what is. For they [i.e. the Stoics] rejected as unreal any destruction from or generation into what is not...Of change into what is, he distinguishes: (a) dismemberment [diairesis]; (b) transmutation [alloiôsis]; (c) fusion [sugkhusis]; (d) breaking up of a whole, called dissolution [analusis]. Of these four, transmutation is related to substance (ousia); the other three have reference to qualities supervening on substance. Generation is analogous to that. Substance does not admit of increase or diminution by addition or subtraction, but only of transmutation, like number and measure. But individually qualified particulars like Dion and Theon [two stock names in Stoic logic (Kidd 1988a, p. 385)], also admit of increase and diminution. This is also why the predominant quality of each thing persists from generation to destruction, as in the case of animals, plants and things like them which admit destruction. In individually qualified particulars, he says, there are two receptive parts, in respect to the reality of substance and of quality. It is the latter, as we have often kept saying, that admits of increase and diminution. The individually qualified particular is not the same as its constituent substance, nor is it different either; but is all but the same in that its substance is a part of it and occupies the same space. For things that are said to be different from others must both be spatially separate and not viewed as part and whole.”
>
> — Ian Kidd (1972), *Posidonius: Volume Three, The Translation of the Fragments* [2]

(add)

Soul

Posidonius outlined a “moral psychology” that acknowledged some type of non-rational forces in the soul analogous to aspects of Platonic ideas. (O)

References

1. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (Stoa Poikile, pg. xxxiii). Oxford University Press, 1998.
2. (a) Kidd, Ian G. (1972). *Posidonius: Volume Three, The Translation of the Fragments* (pgs. 156-57) (O). Cambridge University Press, 1999.
(b) Paparazzo, Ernesto. (2008). “Why Take Chemistry Stoically? The Case of Posidonius” (abs), *Foundations of Chemistry*, 10(1):63-75.

External links

- Posidonius – Wikipedia.

θΔics

In thermodynamics, **positional entropy** is []

Overview

In 1904, James Jeans, in his *The Dynamical Theory of Gases* (§194), was referring to "positional entropy", based on what seems to be, his own peculiar derivation, based on his concept of "positional coordinates" of molecules in a gas body, framed around Max Planck's 1901 entropy formula *S = k log W*. [1] He began citing this term the following year:

> "We may perhaps summarize the question by saying that the **'positional entropy'** of the system is a maximum when the system is in the normal and anti-normal piling."
>
> — James Jeans (1905), "The Kinematics of a Granular Medium in Normal Piling" [2]

In 1920, Jeans, in a latter edition of his *The Dynamical Theory of Gases* (pgs. 178-180), gives his own peculiar derivation of a gas system that yields an entropy equation, entropy symbolized by phi φ, consisting of two parts:

$$\phi = N \int \frac{d\bar{E}}{T} + R \int \nu_b(\rho)\, dv$$

one, the first part of the above equation, entropy depending on the velocities of the molecules, the other, the second part above, on the positional coordinates of the molecules. [3]

Entropy and life debate

On **21 Apr** 1934, Jeans, amid the Jeans, Donnan, Guggenheim debate, referred to the "normal" formula for positional entropy (an invention which seems to be his own), as follows: [4]

> "I am anxious to treat Prof. Donnan's views with all courtesy, but think his last letter, written in conjunction with Prof. Guggenheim, is entirely invalidated, like his previous letter, by a technical error in thermodynamics. The ordinary formula for the **positional entropy** of a large number of particles is:
>
> $$\text{positional entropy} = k \iiint \nu \log \nu \, dxdydz$$
>
> where ν is the number of particles per unit volume. Thus, moving N particles from a place of density ν to one of higher density ν' decreases the entropy by
>
> $$kN\,(\log \nu' - \log \nu)$$
>
> Surely Profs. Donnan and Guggenheim have overlooked the factor *N*. Owing to its presence, moving a single molecule does not, as they contend, have the same effect as moving a truckload of *N* molecules, but only 1/Nth of this effect. The same error, I think, invalidates their second paragraph."

(add)

Quotes

The following are related quotes:

> "Typical views in the 1930's on this subject were expressed in an **exchange of letters** to the journal *Nature* between F. G. Donnan, a professor of physical and inorganic chemistry, and the physicist James Jeans. Donnan [1934] challenged the view expressed by Jeans in his book *The New Background of Science* that organisms must have some means for evading the second law of thermodynamics. Jeans [1934] replied that a person steering a large steamship adds little entropy in the activities of steering, but the '**positional entropy**' of the cargo is changed considerably. This is due to moving the cargo from a location where it has a high density $\upsilon 1$ to a location where it has a low density $\upsilon 2$, thereby changing the positional entropy by $\mathbf{\Delta S = k_B N[\ln \upsilon 1 - \ln \upsilon 2]}$. In this case, the intervention of an intelligent being is incidental to the entropy calculation. In spite of the entry of the physicist E. A. Guggenheim on Donnan's side, and the exchange of several more letters, this controversy died without being resolved and without, apparently, leaving any further trace. Jeans' positional entropy is only one example of the types of entropy proposed during this period."
>
> — Paul McEvoy (2002), *Classical Theory* (pg. 175)

References

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(b) Jeans, James. (1905). "The Kinematics of a Granular Medium in Normal Piling" (Ñº), *Proceedings of the London Mathematical Society* (pg. 136), Jan 12.
(c) Jeans, James. (1920). *The Dynamical Theory of Gases* (entropy, pgs. 78, 178, 180; of radiation, pgs. 367, 397; positional, 15+ pgs). Publisher.
2. Jeans, James. (1905). "The Kinematics of a Granular Medium in Normal Piling" (Ñº), *Proceedings of the London Mathematical Society* (pg. 136), Jan 12.
3. Jeans, James. (1920). *The Dynamical Theory of Gases* (entropy, pgs. 78, 178, 180; of radiation, pgs. 367, 397; positional, 15+ pgs). Publisher.
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θΔics

In famous publications, ***Positions of Rights***, or *Positiones Juris* (Latin), alternatively translated as *The Positions of the Right*, is German polyintellect Johann Goethe's 1771 set of 56 theses, on topics ranging from natural law to inheritance law to criminal trial procedure, that he defended on August 6th allowing him to obtain a degree of licentiate of law. [1]

POSITIONES
JURIS
QUAS
AUSPICE DEO
INCLYTI JURECONSULTORUM ORDINIS
CONSENSU
PRO LICENTIA
SUMMOS IN UTROQUE JURE HONORES
RITE CONSEQUENDI
IN ALMA ARGENTINENSI
DIE VI. AUGUSTI MDCCLXXI.
H. L. Q. C.
PUBLICE DEFENDET
IOANNES WOLFGANG GŒTHE
MOENO-FRANCOFURTENSIS.

ARGENTORATI
ex Officina JOHANNIS HENRICI HEITZII, Univerſit. Typographi.

Title page to German polyintellect Johann Goethe's 1771 ***Positions of Rights*** (*Positiones Juris*), in which he presents 56 theses that he defended to obtain the title of Licentiate of Law (the equivalent of a doctorate in Germany), thus entitling Goethe to call himself "Doctor juris". [3]

Overview

Goethe, after attending the University of Leipzig, at the age of 16, where he started to read law and had further lessons on drawing with Adam Friedrich Oeser, at the age of 20 to 21, attended the University of Strasbourg, completing a liberal arts curriculum with courses in political science, history, anatomy, surgery, and chemistry, e.g. he attended the chemistry courses of French chemist Jacob Spielmann, his first chemistry teacher, during which time he published his first volume of poems and had studied enough medicine to qualify to as a physician.

Goethe then attempted to obtain a doctorate in jurisprudence with a dissertation entitled "The Legislature, On the Power of the Magistrate to Determine Religion and Culture" that contained a number of controversial assertions, namely he contended, among other things that:

> "Jesus Christ is not the author of Christianity; it is a subject composed by a number of wise men and is merely a rational, political institution."
>
> — Goethe (1771), original law dissertation

Goethe's aggressive dissertation, naturally enough, unnerved his professors and thus was rejected on the grounds that it was unorthodox.

56 theses

As Goethean scholar Karl Fink cogently summarizes things: [2]

> "From this list of disputations, we see questions about life that were to fall within the pale of his literary and scientific works during the next sixty years."

Thesis 55, for example, was a moral issue that reoccurs in *Faust*.

The exceptions Goethe took to tradition were apparently "puffed up over his store of knowledge, but chiefly by reason of a few undesirable traits he has got from M. Voltaire", as one early reviewer put it. [2] His original dissertation submission, and general outlook on existence, were themed on his distaste for learned authority, and casting for a new way of looking at the relationship between humans to nature, society, and tradition.

In followup, to to show contempt for university authorities, he offered a series of 56 theses for disputation, which include:

#	English	Latin

1.	"Natural law is what nature has taught all creatures."	
2.	"The custom has been canceled and corrects the written law."	"Consuetudo abrogate & emendat legem scriptam."
3.	"Suitable guarantees to be of such a pledge, which jussores by-side."	"Idonea caution sit tam per pignora, quam per side-jussores."
4.		
55.	"Should the woman who kills her newly born child suffer the death penalty?"	

It would not be until 1809, following studies in affinity chemistry, that Goethe would be able to glean the insights of what he deemed as "natural law" being the guiding path to reason in respect to jurisprudence—namely the philosophy or science of law, the legal system, and the principles that lead courts to make the decisions they do:

> "The moral symbols in the natural sciences, that of the elective affinities invented and used by the great Bergman, are more meaningful and permit themselves to be connected better with poetry and society."
>
> — Goethe (1809), three months prior to completion of *Elective Affinities*

The symbols, here, he is referring to being the following, namely the "dart" or force of reaction (or affinity-free energy equation in modern terms), affinity reaction diagrams (or chemical equations in modern terms), and affinity tables (or free energy tables in modern terms):

- Bergman affinity table
- Bergman reaction diagrams
- Berman chemical signs explained

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

$$\begin{cases} A \searrow \\ B \quad C \end{cases}$$

A = chemical species one
B = chemical species two
C = chemical species three

In other words, by 1809, Goethe has arrived at the conclusion that "moral symbols" of physical chemistry are what determine natural law and that this guiding system should form the basis of the philosophy of science of law, the legal system, and the principles that lead courts to make the decisions they do.

Related

The following are related quotes:

> "I have found no confession of faith to which I could ally myself without reservation."
>
> — Goethe (1831), a year before his reaction end

See also

- Student reactions (2010-2012)

References

1. Goethe, Johann. (1771). The Positions of the Right: God under the Auspices of the consent order, the renowned jureconsultorum permission for the highest honors in both duly obtaining the right kind Argentinensi, day 6. August 1771. h. l. q. c (*Positiones Juris*: quas auspice Deo inclyti jureconsultorum ordinis consensu pro licentia summos in utroque jure honores rite consequendi in alma Argentinensi, die VI. augusti MDCCLXXI. h. l. q. c). Strasbourg.

Clip of the famous law degree "rejection" scene from the 2011 film *Young Goethe in Love*.

2. (a) Goethe, Johann. (c.1771). "The Legislature, On the Power of the Magistrate to Determine Religion and Culture" ("De legislatoribus, über die Macht der Gesetzgeber, über Religion und Kultus zu bestimmen"). Not extant.
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3. (a) Boerner, Peter. (2005). *Goethe* (law degree, pg. 22). Huas Publishing.
(b) Juris Doctor – Wikipedia.

External links

- Juris- (Latin: law) – Wordinfo.info.

θΔics

In thermodynamic, **positive entropy** is a loose term defined in 1943 by Austrian physicist Erwin Schrödinger to describe, in simple terms, something that a living organism produces, during every process, event, or happening, in that part of the world where it is going on. [1] According to the effects of "positive entropy", in Schrödinger's view, an organism increases its entropy (or produces positive entropy), in accordance with the second law of thermodynamics, as it lives, and thus tends to approach, what Schrödinger calls, "the dangerous state of maximum entropy, which is death."

Difficulties

The essential problem with the term positive entropy is that Schrödinger culls it from Ludwig Boltzmann's statistical thermodynamics of ideal gas phase particles in which the atoms and molecules stop moving or reach a constant state of external parameter changes, such as in pressure, temperature, and volume, when equilibrium is reached. At this point in the system, the measure of the heat transfered to internal work energy, used as the molecules of the system act on each other irreversibly, reaches its highest positive value, mathematically. In human terms, equilibrium means that the system of human molecules stop going spontaneously on their own in their human chemical reactions, e.g. when an intimate relationship stops working, which is called "relationship equilibrium" (a dead relationship). [2]

See also

â— Negative entropy

References

1. Schrödinger, Erwin. (1944). *What is Life?* (ch. 6 “Order, Disorder, and Entropy). pgs. 67-75 Cambridge: Cambridge University Press.
2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, ("dead relationships", pg. xviii). (preview). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, ("dead relationships", pg. 452). (preview). Morrisville, NC: LuLu.

θΔics

In thermodynamics, a **positive transformation**, as contrasted with a negative transformation, is the transformation that results from the conversion of work into heat and therefore the passage of heat from a higher to a lower temperature. [1]

Clausius footnotes this 1854 version of the positive transformation definition with the comment “the reason why this choice of positive and negative senses is preferable to the opposite one, will become apparent after the theorems relative to the transformations have been enunciated (1864). The exact details of this 1864 asterisk remain to be tracked down, but seem to refer the 1864 "Appendix to the Fifth Memoir: On Some Approximate Formula employed to Facilitate Calculations. [2]

See also

- Positive work
- Negative work
- Double transformation
- Uncompensated transformation
- Transformation-equivalents
- Transformation content
- Equivalence-value of all uncompensated transformations

References

1. Clausius, Rudolf. (1865). *The Mechanical Theory of Heat* (positive transformations, pg. 123). John van Voorst.
2. Clausius, Rudolf. (1865). *The Mechanical Theory of Heat* (pgs. 208-14). John van Voorst.

θΔics

In thermodynamics, **positive work**, in contrast with negative work, is work in which the component of the force acting on a body, producing the work, is in the same direction in which the motion of the body actually takes place, the calculation of which is defined mathematically according to the principle of the transmission of work. [1] Interestingly, French physicist Gustave Hirn, in his 1868 *Philosophical Implications of Thermodynamics*, devotes a section to what he calls "positive and negative work to be alive". [2]

References

1. Clausius, Rudolf. (1875). *The Mechanical Theory of Heat* (positive and negative work, pg. 2) London: Macmillan & Co.
2. Hirn, Gustave. (1868). *Philosophical Implications of Thermodynamics* (*Métaphysique et conséquences philosophiques de la thermodynamique: l'analyse fondamentale de l'univers*) (*Metaphysics and Philosophical Implications of Thermodynamics: Basic Analysis of the Universe*). Paris: Gauthier-Villars.

θΔics

In terminology, **positivism** (TR:11) or a "positivist" is a social scientist—in the vision of Auguste Comte's 1826 social physics, elaborated on his series of books, written between 1830 and 1842, on the subject of *Positive Philosophy*—whose research and or thinking aims to achieve a "positive" knowledge of the natural laws governing society and history; meaning that just as the physical world operates according to gravity and other absolute laws, so does society. [1]

Quotes

The following are related quotes:

> "If the magnetic force that has guided this particular compass – and what else was its source but the central order – should ever become extinguished, terrible things may happen to mankind, far more terrible even than concentration camps and atom bombs. But we did not set out to look into such dark recesses; let's hope the central realm will light our way again, perhaps in quite unsuspected ways. As far as science is concerned, however, Niels is certainly right to underwrite the demands of pragmatists and positivists for meticulous attention to detail and for semantic clarity. It is only in respect to its taboos that we can object to **positivism**, for if we may no longer speak or even think about the wider connections, we are without a compass and hence in danger of losing our way."
>
> — Werner Heisenberg (1952), Heisenberg-Pauli dialogue, Summer

> "**Positivism** needs to be purged. Romanticism needs to be borrowed from. It is the combination of determinism and freedom, after all, that constitutes the greatest art; advances in scientific sociology can move its aesthetics beyond a tire romanticism, hopefully into something greater."
>
> — Randall Collins (1975), *Conflict Sociology* [2]

> "**Positivism** is a doctrine contending that sense perceptions are the only admissible basis of human knowledge and precise thought."
>
> — Anon (c.1990), *American Heritage Dictionary* [3]

See also

- Chemicalism | Chemicalist
- Materialism | Materialist
- Physicalism | Physicalist
- Realism | Realist

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1. (a) Rigney, Daniel. (2001). *The Metaphorical Society: an Invitation to Social Theory* (pg. 42). Rowman & Littlefield.
(b) Macionis, John J. (2012). *Sociology* (14th edition) (pg. 11). Pearson.
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(b) Brown, Richard H. (1977). *A Poetic for Sociology: Toward a Logic of Discovery for the Human Sciences* (pg. 27). University of Chicago Press, 1989.
3. Bouw, Gerardus D. (c.1999). "Entropy and the Human Situation", *Biblical Astronomer*, No. 89, pgs. 16-25.

Further reading

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(editors: K. Martinas, L. Ropolyi, and Peter Szegedi) (pgs. 404-415) (Amz). World Scientific, 1991.
● Swingewood, Alan. (1998). "Industrialization and the Rise of Sociological Positivism", in: *Early Modern Social Theory* (pg. 81), edited by Murray E.G. Smith. Canadian Scholars' Press.

External links

● Positivism – Wikipedia.

θΔics

In HT pioneers, **post 1995 HTPs**, or human thermodynamic pioneers, are those individuals (listed to the left) to have developed or theorized on general human thermodynamic theories, on or after the year 1995, the year that American chemical engineer Libb Thims clearly visualized the basics of human chemical thermodynamics.

θΔics

In genius studies, **posthumous genius** refers to a great thinker whose profound, erudite, decisive and or revolutionary ideas are well-ahead of their time; society, as a whole, has to therefore "catch up" to their mind (see: catch up effect); in many cases of which this does not occur during the genius' reaction existence or reaction residence time.

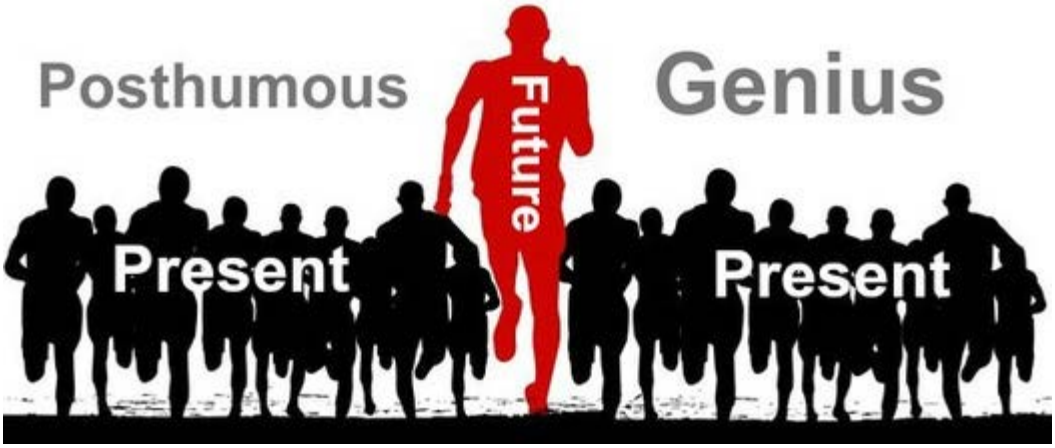

A conceptual visual of the **posthumous genius**, akin to running a race where the person is so far ahead of the present-day competition, that he or she is competing against of species of humans that "do not yet exist" as Nietzsche (1888) famously put things.

Da Vinci

Italian polymath Leonardo da Vinci (1452-1519) was so keenly aware of how far ahead in intellect he was that he wrote in coded upside down mirror writing to conceal his thoughts (note: recent theories, conversely, argue that he wrote like this because he was left-handed and like to paint pictures as they reflected in mirrors).

Spinoza

Dutch philosopher Benedict Spinoza (1632-1677) had his magnum opus *Ethics* published posthumously, by his friends, owing to fear of persecution.

Meslier

French philosopher Jean Meslier (1664-1729) was so aware of how far ahead of his time, in respect to the content of his extreme atheism philosophy, that he penned four duplicate copies of a hand written tome entitled *Testament*, all discovered posthumously.

Holbach

German-born French-raised atheism-explicit anti-chance based matter-and-motion philosopher Baron d'Holbach (1723-1789) was keen to the fact that he was well ahead of his time; stating so as such:

> "A society grows great when old men plant trees whose shade they know they shall never sit in."
>
> — Greek proverb (c.300BC) (Ñº)

> "An so, wise men, you are not men of your times; **you are men of the future**, the precursors of future reason. It is not wealth, nor honour, nor vulgar applause that you should aim for: it is immortality."
>
> — Baron d'Holbach (1770), *Essay on the Prejudices* [5]

> "Let them speak of immortality to intrepid and noble souls; let them show it as the price of their labors to energetic minds, who, springing forward beyond the boundaries of their actual existence, **are little satisfied** with eliciting the admiration and with gaining the love of their contemporaries, but are determined also to wrest the homage, to secure the affection of **future races**. Indeed, **there is an immortality to which genius, talents, virtue, have a just right to pretend;** do not therefore let them censure or endeavour to stifle so noble a passion in man, which is founded upon his nature, and from which society gathers the most advantageous fruits."

— Baron d'Holbach (1770), *The System of Nature* (pg. 133)

"It is for them that he plants the tree which his eyes will never behold in its vigor."

— Baron d'Holbach (1770), *The System of Nature* (pg. 133)

(add)

Stewart

Scottish-English colonel turned peregrinating atheist philosopher John Stewart (1747-1822), noted for his his extreme atheism stylized works, namely his: two-volume *Moral Motion* (1789), *The Opus Maximum* (London, 1803), *The Revelation of Nature* (New York, 1795), stated that his books should be translated into Latin and buried to escape anticipated censorship and suppression. [1]

"My books [e.g. *Moral Motion*, 1789] should be translated into Latin and buried to escape anticipated censorship and suppression."

— John Stewart (c.1820)

(add)
-

Buchner

In 1884, Ludwig Buchner declared that his views will be posthumously realized as truth:
-

"It is the not the present age, but a remote future, which he himself will never see, that can and will do justice to his intentions."

— Ludwig Buchner (1884), Preface to 15th edition of *Force and Matter* (pg. xiii)

-
(add)
-

Goethe

German intellectual giant Johann Goethe, the "German genius", said that his greatest work or "best book" was his *Elective Affinities*, wherein he outlined a physicochemical morality system and philosophy; this revolutionary view (see: Goethean revolution), however, was well ahead of its time; the following are two quotes representative to this:

"These remarks [from Solger to Tieck] were written as early as 1809. I should then have been much cheered to hear so kind a word about *Elective Affinties*; for **at that time, and afterwards**, not many pleasant remarks were vouchsafed be about that novel."

— Johann Goethe (1827), comment to Johann Eckermann; on Solger speaking of the fine nature of the Architect's character, Jan 18 [1]

"It is difficult to overestimate the value of Goethe's work to humanity. The bequest which he left to the world in his writings, and in the whole intellectual result of his life, is not as yet appreciated at its full worth; because, intellectually, the **world has not yet caught up to him**. His influence today asserts itself in

> a hundred minute ways—even where no one suspects it. The century has received the stamp and impress of his mighty personality. The intellectual currents of the age, swelled and amplified by later tributaries, flow today in the directions which Goethe indicated."
>
> — Hjalmar Boyesen (1885), *The Life of Goethe*

(add discussion)

Shelley

English radical atheist and human elective affinities theorist Percy Shelley (1792-1822) by 1870s was being ranked as a posthumous genius; the following is one example:

> "Beauty is said to be a fatal gift to women, and it may be added that genius is a fatal gift to men; they are **born before their time** and out of harmony with the things about them."
>
> — Edward Trelawny (1878), "Commentary on Percy Shelley" (see: posthumous genius); in: *Records of Shelley, Byron, and the Author, Volume One* (pg. xvi) [1]

(add)

Nietzsche

German philosopher Friedrich Nietzsche (1844-1900) (IQ:190|#35), seemingly, was keen to his own genius and to the fact that he was well ahead of his time. The following, mentioned, in part, in a letter to Carl Fuchs, shortly before the composition of *Ecce Homo* (1888), is testament to this: (Ñº)

> "My time has not yet come, some people are born **posthumously**. I write for a species of men that do not yet exist."

Sudanese-born American philosopher Monydit Malieth, citing this quote, claims that somewhere Nietzsche prophesied that his words would not begin to be understood until after the year 2000. [2]

Tesla

Serbian-born American electrical engineer Nikola Tesla (1856-1943) (IQ:195|#19) openly state that he himself was a ahead of his time

> "It seems that I have always been ahead of my time."
>
> — Nikola Tesla (c.1930), comment to George Sylverster Viereck (1884-1862) (Ñº)(Ñº)

(add)

Thims

In 2006, American electrochemical engineer Libb Thims, after discovering Goethe in Oct 2015, amid penning *Human Chemistry*, consciously strove to write to a year 3,000AD mindset. Thims, in more detail, becoming aware that Goethe had done what he was doing two centuries ago, and it was completely unknown in American, was awake to the view that what he was doing might not become apparent until at least another two-centuries.

Thims, in short, already doing the same thing he did, in his human chemical theory, albeit via Gibbs in place of

Bergman, after finding Goethe's "vouchsafed" quote (1827), shortly thereafter, gauged that since some two centuries had passed, and Goethe and his human chemical theory were still unknown in American, up through the top chemical engineers schools, that his Goethean-upgrade human chemical thermodynamics work would not be completely absorbable into the public mind until the year 3,000; in other words, Thims consciously wrote his *Human Chemistry* (2007) aimed for a third millennium audience; the following quotes attest to this:

> "Maybe someday kids, **in the future**, instead of or in addition to learning 1 + 1 = 2, will learn something like molecule A + molecule B = married couple? Ha ha, it's just a thought, but wouldn't it be funny if it were true?"
>
> — Natalia Duncan (c.2004), review of draft version of *Cessation Thermodynamics*; quote recalled [2015] from memory

> "A book **60-80 years ahead of its time**. In the future, Thims will be someone who's talked about in classrooms as this guy who had this idea. However, now, yes the book will sell, but its premise will not be accepted by people of this generation."
>
> — Monzer Ettawil (2005), review (Ñº) of 72-page draft version of *Cessation Thermodynamics*, May 7

> "I must say, I started watching your videos over a year ago, and have re-watched many. And they still fascinate me. I'm only 17 and I'm seriously considering doing a degree in chemistry after watching your videos. The only downside is not many people I know can have a conversation about the things you're talking about. You were right your videos are **decades if not a century in front** of its time."
>
> — Benjamin Cresdee (2011), comment on Human Chemistry 101 YouTube channel

> "Sadly logic barely has any significance amongst a swarm of imbeciles. Some people are doomed to feel like an alien."
>
> — Torandrius (2011), commentary on Libb Thims' HumanChemistry101 YouTube channel (Ñº)

(add)

Atheism | Forest pioneers

A salient commonality of the above set of geniuses is that 7 of 9 are famous atheist pioneers; the following quote comes to mind:

> "It would appear almost an act of folly, in pretending to uproot that ancient Upas-tree of religious superstition, under the poisonous shade of which mankind has been for ages accustomed to repose, and the roots of which are so widespread and profound."
>
> — Charles Dupuis (c.1794), cited as views in agreement with by 1872 English translator

(add)

IQ | Posthumous genius

The mean IQ of the posthumous genius, using an average of Da Vinci (IQ:200|#7), Spinoza (IQ:180|#94), Goethe (IQ:225|#1), Nietzsche (IQ:190|#35), and Tesla (IQ:195|#19), is: 198|#32.

Quotes

The following are related quotes:

> "A society grows great when old men plant trees whose shade they know they shall never sit in."
>
> — Greek proverb (c.300BC) (Ñº)

See also

â— Prophet

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θΔics

In science, **potential** is a scalar quantity associated with a field. [1] Examples include electrical potential, gravitational potential, chemical potential, in a chemical system sense.

History

In the 18th century, mathematicians, such as Swiss Leonhard Euler, Italian Joseph Lagrange, French Pierre Laplace, brought the logic of infinitesimal calculus to problems in physics, particularly in relation to the application of the concept of "force" to the study of the movement of free particles.

In 1773, Lagrange is credited with having explicitly introduced of the theory of potential into dynamics. Lagrange found that when several planets were clustered, gravitational attraction could be represented by a new coefficient: potential. [8]

The adoption of agreed upon terminology, however, was not immediate. Leonard Euler called the integral of force with respect to distance *effort* while Lagrange called it *potential.* [2]

The name "potential function" and fundamental memoir of the subject are due to British mathematical physicist George Green, and his 1828 "An Essay on the Application of Mathematical Analysis to the Theories of Electricity and Magnetism". [3] Green, starting from Laplace's equation, was the first to define the potential as a function of Cartesian coordinates V(x,y,z), particularly the potential energy of an arbitrary static distribution of electric charges.

The name "potential" was used mathematically in 1840 by German mathematical physicist Carl Gauss (1777-1855). [4]

In 1853, Scottish engineer and physicist William Rankine coined the term "potential energy".

The distinction between potential and potential function was clarified in 1859 by German physicist Rudolf Clausius. [5]

In 1876, American mathematical physicist Willard Gibbs introduced the concept of "chemical potential" into science. [6]

In 1885, author G.D. Liveing, in loose summary of these views, defined potential, by stating that: [2]

> "The fundamental notion connected with equality of *potential* being that when two forms of energy are at the same potential in the same substance there is no tendency for either to be increased at the expense of the other; but that if they are at unequal potentials there is a tendency to an equalization; also that when two bodies have their energies at equal potentials there is no tendency for the energy of one to increase at the expense of the other, while if they are at unequal potentials there is a tendency to equalization by the passage of energy from one body to the other."

The process defined by Liveing, in modern terms, however, is called thermalization.

See also

â— Gravitational potential
â— Thermodynamic potential

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External links

â— Potential – Wikipedia.

θΔics

In thermodynamics, **potential energy**, as apposed to kinetic energy, is a quantity of energy measured by the product of a change of state of a body into the resistance against which that change is made. [1]

The term was introduced in 1853 by Scottish engineer William Rankine. The phrase *potential energy* denotes all relations among bodies, or the parts of bodies, which consist in a power of doing work dependent on mutual configurations. [2] Types of potential energies, according to Rankine, are the mechanical powers of gravitation, elasticity, chemical affinity, statical electricity, and magnetism.

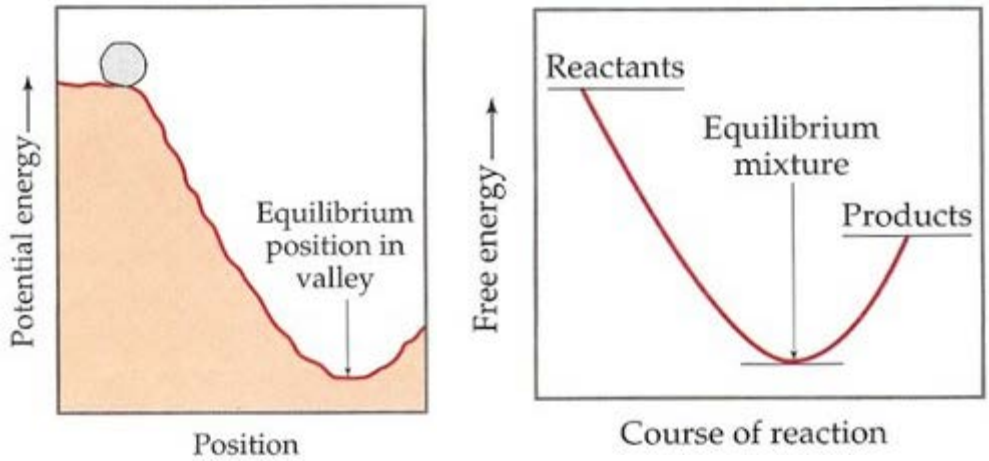

A visual depiction of free energy, as a type of thermodynamic potential, as compared to gravity, as a type of **potential energy**, showing that just as the potential energy in the gravitational field "drives" the boulder until it reaches a state of minimum potential energy in the valley, so to does the free energy "drive", in the form of a driving force, the reaction towards its "equilibrium position" in the valley of thermodynamic stability. [4]

Etymology

The term "potential energy", originally called *potential* or *latent* energy, was coined in 1853 by Scottish engineer and physicist William Rankine in a paper titled "On the General Law of the Transformation of Energy". [1] The quantity of potential energy, according to Rankine, originates in and forms part of the subject of the thirty-ninth proposition of English physicist Isaac Newton's 1686 *Principia*. [2] In 1867, following criticism of the term by English mathematician John Herschel, who stated that "[the phrase] potential energy is unfortunate, inasmuch as it goes to substitute a truism for the announcement of a great dynamical fact", Rankine defended and discussed his reasons for his introductions of the phrase. [2] Specifically, on the logic of English physicist Thomas Young who introduced the term energy in 1807, Rankine stated that: [2]

> "It appeared to me, therefore, that what remained to be done, was to qualify the noun 'energy' by appropriate adjectives, so as to distinguish between energy of activity and energy of configuration. The well-known pair of antithetical adjectives 'actual' and 'potential', seemed exactly suited for that purpose; and I accordingly proposed the phrases 'actual energy' and '**potential energy**'."

Rankine notes further that he was encouraged to preserve in the use of these phrases by virtue of their being immediately approved of by Scottish physicist William Thomson and a professor Baden Powell.

Field

With the introduction of the conception of the "field" by English chemist Michael Faraday and Scottish physicist James Maxwell in the 1860s, potential energy soon came to signify the energy possesed by a body by virtue of its position in a field, gravitational, magnetic, or electrical, etc. The typical example being the potential energy of a body in a gravitational field. For the case of a body of mass *m* at a height *h* above the surface of the earth, the potential energy is defined as:

$$E = mgh$$

where *g* is the gravity. In more detail, provided that the field has no effect on the microscopic properties of the body or system, such as typically the case with the gravitational field, the potential energy of a system placed in such an external field contributes only to the external energy of the body. In the case of a magnetic field inducing a magnetization or an

electric field, inducing polarization of the material, a fraction of the potential energy contributes to the internal energy of the system. [3]

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External links

â— Potential energy – Wikipedia.

θΔics

In physical chemistry, a **potential energy surface** is a two- or three-dimensional plot of the potential energy, or rather thermodynamic potential, i.e. typically Gibbs free energy or Helmholtz free energy, of a chemical reaction, as a function of either time, extent of reaction, change of nuclei arrangement, or concentration of products (or reactants).

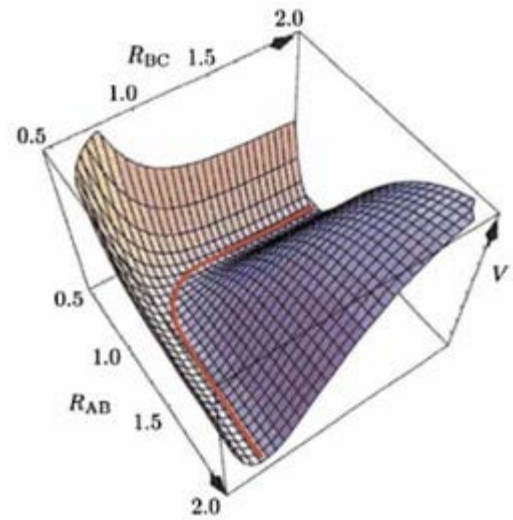

A basic **potential energy surface**, where V, the potential energy, is an explicit function of just two internal coordinates for the linear hydrogen atom exchange reaction, shown above, namely the internuclear distances RAB and RBC, in Angstroms. A trajectory that runs close to the valley bottom is marked in red. [5]

History

The first potential energy surface diagram was calculated in 1931 by Mexican-born American theoretical chemist Henry Eyring and Hungarian-born English physical chemist Michael Polanyi, as presented in their famous paper "On Simple Gas Reactions", in which, using the London equation (1927), they described the journey of the nuclei from reactant state of the system to the product state of the system, passing through the crucial intermediate state of activated complex. [1] The pioneering work is said to be the birth of 'reaction dynamics'. [2] The reaction they dealt with was:

$$H + H_2 \rightarrow H_2 + H$$

in which the used semi-empirical procedures, based on quantum-mechanical principles and energies of dissociation, to construct a three-dimensional diagram showing potential energy as a function of the shorter H–H distances in a linear H · · H · · H complex. Later, Erying and his students carried out dynamical calculations of this kind. [3] The development of these types of diagrams led to the conception of transition state theory in 1935.

Energy landscapes

See main: Energy landscape

In the mid 1980s, energy landscape models were being employed in the study of protein folding. The theory of RNA free energy landscapes was being utilized as early as 1993.

Human chemistry

In human chemistry, the first to apply the logic of potential energy surfaces to the explanation of human chemical reaction dynamics as American chemist David Hwang who, in his 2001 article "The Thermodynamics of Love", applied the logic Gibbs free energy potential energy surfaces to reaction in which two unattached male M and a female M individuals form a human chemical bonded relationship M-F. [4]

$$M + F \rightarrow MF$$

(add discussion)

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External links

● Potential energy surface – Wikipedia.

θΔics

In thermodynamics, **power** is defined as energy, e.g. work, exchanged between a system and its surroundings per unit time; rate at which work is done per unit hour, quantified in unit watts or "joules per second", which has dimensions of mass·length²/time³, based on the horsepower experiments done by Matthew Boulton and James Watt in 1783. [1]

Overview

Power, in terms of the principle of the transmission of work, is defined as follows:

$$\text{Power} = \frac{\text{Force} \times \text{Distance}}{\text{Time}}$$

In words, to quoted:

> "Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, work is performed."
>
> — Rudolf Clausius (1875), "Mathematical Introduction"

In equation form, the work performed by the force moving a body per unit time, reads as follows:

$$\text{Power} = \frac{\text{Work}}{\text{Time}}$$

Power, defined generally in terms of energy, formulaically reads as follows:

$$P = \frac{E}{t}$$

the rate at which work is done or energy transferred, between a system and its surroundings, per unit time. [2]

Dualism | Double entendre

Power, depending on culture (see: two cultures), has two conceptual meanings; the following table outlines this conceptual division:

Culture	Type
Clausius [Natural sciences]	Horsepower; motive power; waterpower; wind power; electric power; chemical power; power of the vacuum; power of cold;
Nietzsche [Monism]	Will to power (Nietzsche, 1888); rest in power; conservation of will (Crevioux, 2003) (Ñº)(Ñº) (Zeid1,

(one nature)	2012) (Ñº)
Shakespeare [Humanities] (Secularism)	Manpower; power center; separation of powers (Montesquieu, 1748); social power; willpower; knowledge is power (Bacon, 1597); wealth is power (Hobbes, 1651); beauty is power (Ray, c.1680); economic power; political power; military power
Augustine [General public] (Colloquial view)	Higher power; living power; superpower; supernatural power [see: supernatural]

The "Clausius culture", i.e. those who know the meaning of the second law, and the "Shakespeare culture", i.e. those who know the meaning of Hamlet, are Charles Snow (1959) distinctions; the so-called "Nietzsche culture" (one power ideology) and "Augustine culture" (two power ideology) were added in, by Thims (2016), for the sake of table classification uniformity, respect to the various types of "power" articles in Hmolpedia.

To exemplify "power dualism", the 2005 book *A Most Damnable Invention: Dynamite, Nitrates, and the Making of the Modern World*, cover shown below, by American non-fiction historian Stephen Bown, visually depicts a "**powerful**" dynamite explosion, while the book charts the invention of dynamite by Swedish chemist Alfred Nobel—who became "one of the richest men in a society rapidly transforming under the **power** of his invention", as the description states—to the "nitrogen problem" of German physical chemist Fritz Haber; the two term usages "powerful cover explosion" and "powerfully transforming society" giving way to the double entendre nature of thermal word crossover issue found in the so-called "two cultures dualism problem", as exemplified here, i.e. power interpreted in two ways, depending on culture, whereas in reality, there is only one power, just as Goethe professed over two centuries ago how "there is, after all, only one nature." [9]

To explain by way of comparative example, the following is the chemical equation for the detonation of nitroglycerin, the nitrate ester forerunner to the invention of dynamite, which is a more stable variety compared to the former: [10]

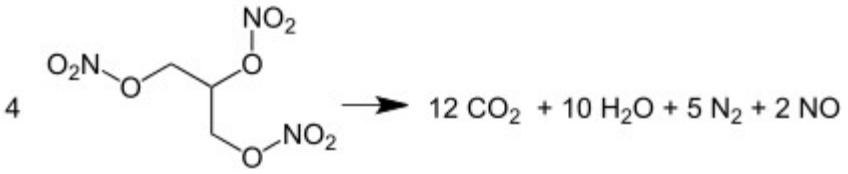

The thermal decomposition of nitrate esters mainly yields the gases molecular nitrogen (N_2) and carbon dioxide; in the case of nitroglycerin, a large liquid-to-gas state conversion, accruing via a process in which a large measure of pressure-volume work change occurs. The considerable chemical energy of the detonation is due to the high strength of the bond in molecular nitrogen—the following table, for example, shows the bond energies for various types of nitrogen bonds: [11]

Compound	Formula	Carbon-Nitrogen Bond Energy (kJ/mol)
Molecular nitrogen	N≡N	945
Hydrogen cyanide	H–C≡N	890
Isocyanic acid	H–N=C=O	615
Methylamine	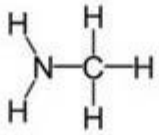	293

When this model is scaled up to the social level, e.g. of a society (initial state) rapidly transforming, to a newly evolved society (final state), under the "power of an invention", one immediately runs into a large number of conceptual reinterpretations that need to be learned, in regards to humans viewed as reactive exploding chemicals, in possession of various amounts of social bond strength, per social entity, structure, or given society. We do not, for example, have tables of bond-dissociation tables for various social entities, configurations, and structures, the way we do for smaller molecules and compounds. [11]

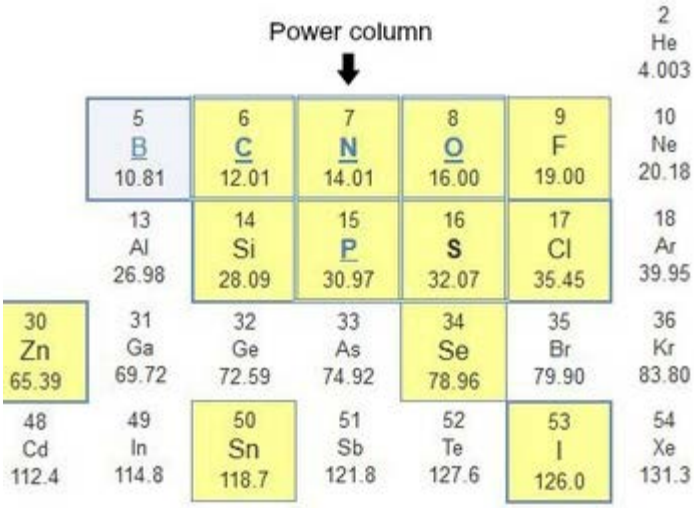

The similar position of nitrogen and phosphorus, on column 15 on the hmolscience periodic table, shows their similarity in properties in respect to being **power**-center types of elements, in explosives, whether for mining purposes or cellular purposes, respectively.

Within the body, to give some relative comparison, phosphorous, and the various phosphate bonds it is able to make, e.g. with ATP, plays the role of nitrogen in nitrate explosives, found in mitochondrion, the so-called "power center" (or "cellular power plant") of the cell. Their similar

At a minimum, in the social power direction, one firstly has to come to grips the nature of the theory of the human chemical bond, though many (e.g. Philip Moriarty) will outright deny that such bonds exists (see: Moriarty debate: #61, 75, etc.), the way we presently understand the nature of the high strength of the bond energy in molecular nitrogen. From here, one can then progress to a better conceptual and quantitative understanding of the explosive nature of social power, as we understand the explosive nature of gun powder or dynamite, quantifying the latter, thermodynamically, in horsepower, e.g. when employed in devices or engines, such as the gunpowder engine or the combustion engine (see: combustion).

History | Etymology

The coining of the term "power" seems to be a bit elusive; such as compared to the way the coining of the term "energy" can be traced to the works of works of Heraclitus and Aristotle.

In 1597, English polymath Francis Bacon, in his *Sacred Meditations*, famously stated “knowledge itself is power”.

In 1665, English chemist-physicist Robert Boyle, in his *New Experiments and Observations Touching Cold*, was referring to the "power of cold" in semi-modern quantitative scientific terms. [5] To cite one example: (Ñº)

> “We come now to consider in what line of direction the refrigerating **power** of cold bodies acts with the greatest

> force, or to the greatest distance. That heat diffuses itself principally upwards, is a known doctrine, and usually holds true; whence it might be suspected, that cold had its tendency chiefly downwards."

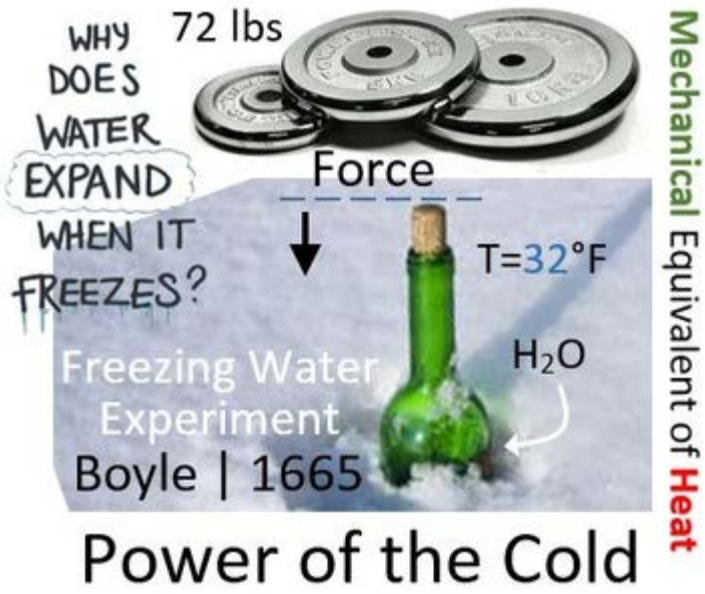

Robert Boyle's 1665 "**power** of cold" experiment, wherein, over a number of sub-zero nights, he determined that 72-pounds of weight is required to keep a cork in a bottle of water, as the water freezes and expands in volume.

Boyle, in one experiment, in measuring the work of the power of cold, discovered that a weight of 72-pounds was required to prevent expanding ice from pushing out a cork. [6]

Power defined as "energy available for work", supposedly, is from 1727. [4] This, however, sounds dubious, as work was not technically defined until 1824 (by Gustave Coriolis).

In 1783, the term "horsepower" in units was standardized, by engineers Brit Matthew Boulton and Scot James Watt, as 33,000 foot-pounds per minute, meaning that this was the amount of mechanical effect (pounds raised in height) that the average "brewery horse" could produce in one minute (see: mechanical equivalent of heat). [5]

In 1824, French physicist Sadi Carnot was using the term "motive power" as a synonym for what we know define technically as "work" or weight lifted through a height or force moving a body through a distance.

In 1882, during the second congress of the British Association for the Advancement of Science, the "watt", named in honor of James Watt, was recognized as the derived unit of power.

Hmolscience

The physical model of power applied to the humanities, produces a number of conceptual terms, including: social power, political power, economic power, will to power, the "money, power, respect" theory of gangster philosophy, sexual power, among others. [8] The famous image of a female holding a sledgehammer image—meant to "encourage women not to turn a blind eye from patriarchal realities—is representative of the theory or logic, according to Boundless.com, that: [12]

> "The tendency of men to hold more social power has resulted in an inequality in the amount of social power women hold."

In 2011, Australian political and social scientist Keith Dowding, in his *Encyclopedia of Power*, covered a wide range of usages of power-like concepts in the social sciences and humanities; of humorous note, Dowding ironically focuses on the term "**power**" as a central concept in the social sciences, but is nearly devoid of any notion of how physics or thermodynamics defines power; thought it does cite a few thinker's views on power such as: James Coleman or Pierre Bourdieu—this being but the a ripe modern example of two cultures atrophy. [3]

Knowledge

> *See main: Beauty is power*

The "knowledge is power" aphorism is attributed to Francis Bacon who, in his 1597 *Sacred Meditations*, stated “knowledge itself is power”, which later became truncated by Thomas Hobbes, Bacon’s former secretary, in his 1651 *Leviathan*, as “knowledge is power” or *scientia potential est*, in the original Latin. [14]

Wealth

See main: Wealth is power

The "wealth is power" aphorism, according to Adam Smith, is attributed to Hobbes:

> “Wealth, as Hobbes says, is power.”
>
> — Adam Smith (1776), *Wealth of Nations* (pg. 13)

(add discussion)

Beauty

See main: Beauty is power

The beauty is power proverb comes later and is frequently attributed to English naturalist John Ray, an avid collector and publisher of English proverbs—the most popular modern rendition of which is:

> “**Beauty is power**; a smile is its sword.”
>
> — John Ray (c.1680)

A beauty is **power** image, alluding to the idea that beauty has a certain amount of weight or power to it, in the same what that dropping a weight through a height can produce a certain amount of of work or heat via the mechanical equivalent of heat effect (see: sidewalk study). [19]

The original source of this exact quote, however, remains to be determined; one version, from a 1737 collection of his proverbs, reads: [15]

> “Beauty is potent, but money is omnipotent.”

In the same work, Ray also gives the inquisitive proverb: “the prerogative of beauty proceeds from fancy.”

Belief

The idiom that "belief is power" seems to have been first stated by Mill:

> “One person with a belief is a social power equal to ninety-nine who have only interests.”
>
> — John Mill (c.1855)

Of note, belief in a higher power, as captured in the Apostle's creed (c.390) has growingly been, since the late 19th

century, to become supplanted with atheists creeds; according to which, per Millian (Ñº) social power logic, monotheism is losing power, while zerotheism is gaining power.

Mixes | Blends

Another modern popular rendition, from *Fight Club* author Chuck Palahniuk: [16]

"It's all mirror, mirror on the wall because **beauty is power** the same way **money is power** the same way a **gun is power**."

Here, in respect to the equivalency of powers being outlined above, in some sense, we may be getting a glimpse of a potential concept, in some way or another, of how there may exist some type of checks and balances of powers in society, e.g. the way beauty may give checks and balances to knowledge (see: Beckhap's law) or separation of powers, below.

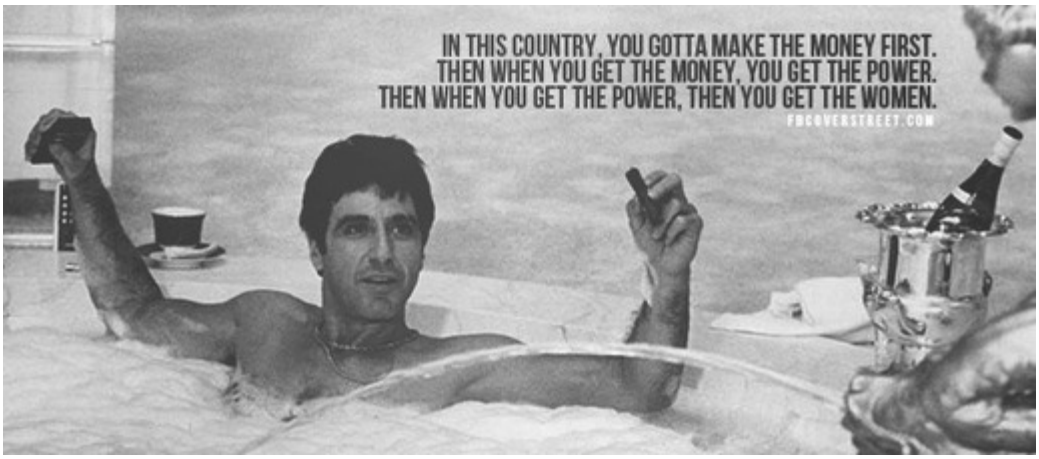

Above: the so-called "money, power, respect" motto of gangster philosophy, introduced in the 1983 film *Scarface*, during the pool scene where Manny gets rejected by a woman (clip). Right: a 1996 film *Money, Power, Respect: How Far Will You Go?*, on the dangerous implications of "nothing exceeds like excess" motto of the former.

The following are the results of a 2013 survey of 40 people (20 men and 20 women) as to whether their opinion on which of the following two statements: "beauty is power" or "knowledge is power" has more power in the structure of society as a whole:

Is beauty or knowledge more powerful in society?

Power Type	Men	Women
"Beauty is power."	40	45
"Knowledge is power."	60	55

(add discussion)

Separation of powers

The "separation of powers" model of governance, wherein power is divided in three, namely between the legislature, executive, and judiciary branches, supposedly, is based on Newtonian mechanics, via American 4th president James Madison and the so called "Princeton school" of social physics (see: Princeton department of social physics), a theory later critiqued by American 28th president Woodrow Wilson, who argued that it wasn't Darwinian enough: [17]

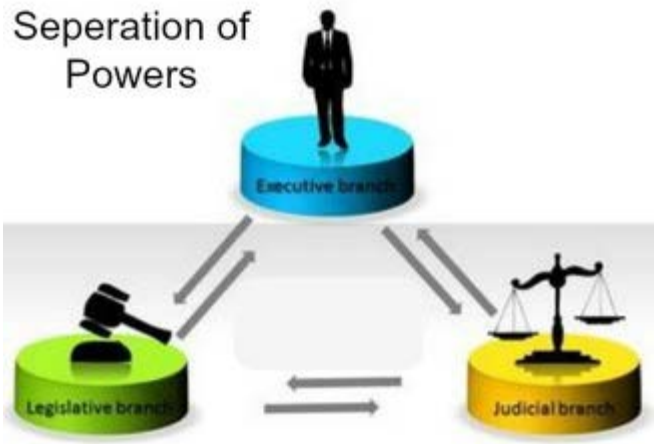

A diagram of the separation of powers theory of government, developed by French political philosophy theorist Charles Montesquieu, showing the **power** of the government divide

> "The Constitution was founded on the law of gravitation. The government was to exist and move by virtue of the efficacy of

> ‘checks and balances.’ The trouble with the theory is that government is not a machine, but a living thing. It falls, not under the theory of the universe, but under the theory of organic life. It is accountable to Darwin, not to Newton. It is modified by its environment, necessitated by its tasks, shaped by the sheer pressure of life.”

between the executive (law initiating), legislative (law passing), and judicial branches (law judging), who are kept checked in balance, via some type of two way exchange force arrows, so that no one branch becomes all powerful, and hence unstable.

The recent lecture "Newtonian Mechanics and Romanian Constitution Reform" by Romanian physicist Radu Chisleag grapples with some of this in terms of stability, instability, balances of forces, and Newtonian mechanics. [18]

Quotes

The following are relevant quotes:

> “Whatever some hypocritical ministers of government may say about it, **power** is the greatest of all pleasures. It seems to me that only love can beat it, and love is a happy illness that can't be picked up as easily as a ministry.”
>
> — Stendhal (1822), *On Love* (Ñº)

See also

â— Manpower
â— Motive power
â— Horsepower
â— Rest in power
â— Waterpower

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2. Daintith, John. (2005). *Oxford Dictionary of Physics.* Oxford University Press.
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(b) Horsepower - Online Etymology Dictionary.
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(b) What’s the philosophy from the film Scarface (2011) – BodyBuilding.com.
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10. Nitrate ester – Wikipedia.
11. (a) Bond-dissociation energy – Wikipedia.
(b) Nitrogen compound bond energies – KentChemistry.com.
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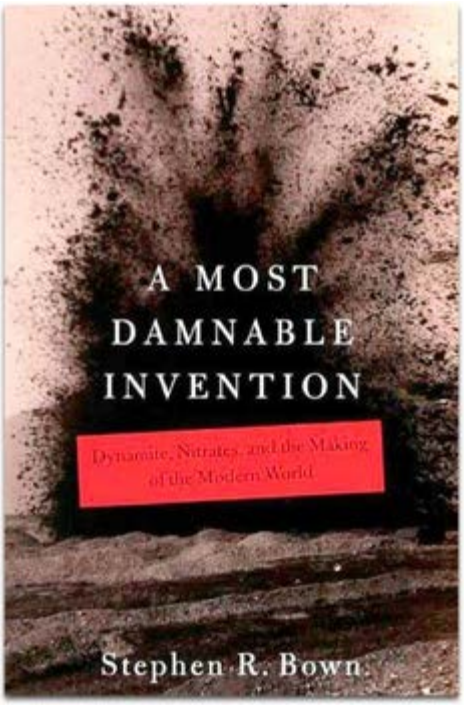

A “**powerful**” dynamite explosion shown on the 2005 book *A Most Damnable Invention*, by American non-fiction historian Stephen Bown, which charts the invention of dynamite by Swedish chemist Alfred Nobel —who became “one of the richest men in a

society rapidly transforming under the **power** of his invention". [9]

Knowledge" (N=40), in person, Nov 8.
14. Scientia potential est – Wikipedia.
15. Ray, John. (1737). *A Complete Collection of English Proverbs* (pg. 137). J. Hughs.
16. Palahniuk, Chuck. (1999). *Invisible Monsters* (Ñº). Publisher.
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18. Chisleag, Radu. (2013). "Newtonian Mechanics and Romanian Constitution Reform" (video, 49:19-min) (PowerPoint, 78-slides), talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29.
19. Dabbs, James M. and Stokes, Neil A. (1975). "Beauty is Power: the Use of Space on the Sidewalk" (abs), *Sociometry*, 38: 551-57.

External links

- Economic power – Wikipedia.
- Power - Wikipedia
- Power (physics) – Wikipedia.
- Power (social and political) – Wikipedia.
- Power (international relations) – Wikipedia.
- Human power – Wikipedia.
- Hard power – Wikipedia
- Soft power – Wikipedia.

θΔics

In hmolscience, **power center**, in the sense of the "knowledge is power" motto of Francis Bacon, refers to intellectual anchor points (e.g. the collected works set of Aristotle) from which intellectual outgrowths sprout, akin to the spread and growth of the strawberry plant, wherein each growth bundle connects to new growth bundles via shoots and sprouts.

Hmolscience power center genealogy

The following—launched on 26 Nov 2013, following the need to visually trace the connection between the 9-volume collected work set of Vilfredo Pareto and the 5-volume collected work set of Paul Samuelson (along with the web of links and nodes amid the other collected work sets of the big hmolscience thinkers: Goethe (150-volumes), Friedrich Nietzsche (5,000-page collected work set), Freud (23-volumes), Thiers (10-volumes), etc.)—is a work-in-progress hmolscience "power center" genealogy map showing the links and nodes, transmission of ideas, among the big multi-volume thinkers in the hmolsciences:

Date	Power Center
3100 - 600 BC (4742-2243 BN)	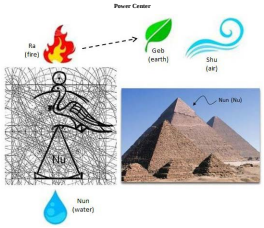 Origin of the Amunian theologies: **Ab**-**Ra**-**ham-ic** (53%) and **B**-**Ra**-**hma-ic** (19%) faiths; numbers shown being percent adherence in the modern era. Following the start of the Egyptian first dynasty (3100BC), a syncretism or synthesis of the local mythologies of the 42 pre-dynastic nomes (5000-3100BC), each with a different local god head, were worked together into a national creation myth based theology, changing theoretical form and development over time, in four different power centers: Heliopolis (3100BC), Memphis (2800BC), Hermopolis (2400BC), and Thebes (2040BC); the apex of which culminated in the building of the pyramids, supervised by Egyptian polymath Imhotep, the belief system cosmology teachings of which were inscribed into first the pyramid texts (2400-2300BC) (Q) and then into coffin texts (2181-2055BC) (Q).
1550 BC - 395 AD (3192-1247 BN)	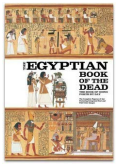 The earlier pyramid texts (2400-2300BC) and coffin texts (2181-2055BC) were condensed into the *Egyptian Book of the Dead* (1550-50BC) (Q); the general origin, for over 75 percent of the modern world (Yellow River based religions aside), of the theory of life and death, via Nun-to-Nuah conversion (in the Abrahamic faiths) and Nun-to-MaNu conversion (in the Brahmic faiths). The Khnum portions of which, whose influence of power came in the years 332BC-395AD, during the Greek and Roman periods, centered at Elephantine Island, resulted in the "clay creation myth" of humans, which became rewritten into the creation of Adam (clay in Hebrew) and Eve, as believed in the Abra-ham-ic theologies (Christianity, Islam, etc.), a belief that currently dominates the mindsets of over 50 percent of the modern world (see: religion). Further reading: Nun cosmology.
1642 - 1727 (0-84 ME)	In 1727 (84 ME), English physicist Isaac Newton, at the time of his death (reaction end), had amassed all the world's knowledge into a large collected works set, estimates of which, still not yet finalized (Q), indicate 48-volumes+, including: 25-volume set of correspondence, 8-volume plus set of mathematical papers, 3-volume plus set of optics, one volume plus on *Philosophical Questions*, and untold volumes on alchemical pursuits and religious ventures; the apex of which being his *Principia* (1686) and *Optics* (1718), the latter of which, via Quay 31, launched the chemical revolution. The link from Aristotle to Newton seems to be via the former's investigations into the nature abhors a vacuum query, which led him into a proto-version of the first law of motion (see: laws of motion), which the latter built on.
	In 322BC (1964 BN), Aristotle, at the time of his death (reaction end), had amassed all the world's knowledge into a large 2,512-page collected works set, uniting atomic theory, Greek philosophy, and Egyptian theology into a semi-modern earth-centric (Geb-centric), i.e. *geo*-centric cosmology, physical model of the universe (see: Aristotle citation ranking), which remained the dominate paradigm until the Copernicus-Galileo sun-centric (*helio*-centric) model (1642) acceptably supplanted the former. One of the above [add] traveled to Egypt and studied under the scholars there for a number of years.

Rank	Thinker	Dates	Classification	Rows
1.	Plato	427-348 BC	Philosophy	27
2.	Homer	c.800-700 BC	Epic poetry	21
3.	Empedocles	495-435 BC	Four elements + two forces model	20
4.	Anaxagoras	500-428 BC	Natural philosophy	14
5.	Democritus	c.460-370 BC	Atomic theory	12
6.	Pythagoras	c.570-490BC	Mathematics	11
7.	Euripides	c.480-406 BC	Tragedy and drama	11
8.	Socrates	469-399BC	Anti-atomic theory; mentor to Plato	9
9.	Heraclitus	c.535-450 BC	Flux and fire philosophy	7
10.	Sophocles	496-406 BC	Tragedy and drama	6
11.	Parmenides	510-450 BC	Denial of the void philosophy	5
11.	Zeno	c.490-430 BC	Paradox philosophy	5
13.	Coriscus	c.385-325BC	Student of Plato; friend of Aristotle	5

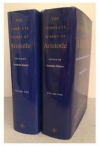

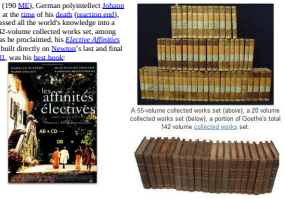

A 55-volume collected works set (above), a 20 volume collected works set (below), a portion of Goethe's total 142 volume collected works set.

In 1995, American electrochemical engineering student Libb Thims begun mulling over the same problem that Goethe worked on in his *Elective Affinities* (1809); began to see into the solution in 2001-2002, and thereafter began to research and investigate all the various paths this solution leads, e.g. as in study of the some 600-800 thinkers to have applied chemistry, physics, and or thermodynamics to the humanities; the result of which, as of 2013, is a 10-volume (and growing) collected works set:

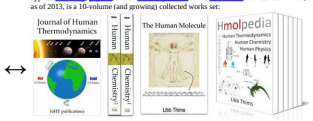

Discussion
(add)

See also
- Goethe timeline
- Evolution timeline

References
1. (add)

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Tools

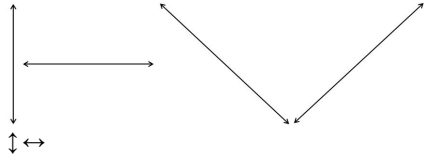

White bar 80:

White bar 70:

In hmolscience, **powered CHNOPS+20 element thing**, or powered CHNOPS+20 element "phase" (Adams, 1908), is the modern physico-chemically-neutral definition of a person (see: definition table), generally stylized on the historical acceptable precursor definitions of a human, namely: "phase" (Adams, 1908) [see: social phase], "CHNOPS combination" (Ostwald, 1926), "evolved CHNOPS plus substance" (Thone, 1936), "powered CHNOPS+ matrix" (Swan ,1974), "26-element reactive molecule" (Thims, 2002), "26-element energy/heat driven atomic structure" (Annamalai, 2011), all stylized on classical Greek thing philosophy view of nature, wherein the component term "powered" usurps the defunct historical term "bio-" (see: life terminology upgrades), "CHNOPS", refers to the core elements of animate things, and the "+20" is shorthand for the twenty elements of human composition not listed (see: human molecular formula). [1]

Screen shot of Libb Thims holding the hmolscience periodic table to teaching six kids what they are, from an explicit atheistic physicochemical point of view, during the 2015 "Zerotheism for Kids" lecture, wherein he used the phrase "**CHNOPS+20 molecular form**" (note: the "+22" was a typo on the card, at the time; a memory slip, related to the less accurate 22-element Sterner-Elser human molecular formula). [1]

Quotes

The following are related quotes:

> "No one shall persuade me that I am not a **phase**."
>
> — Henry Adams (1908), "Letter to Elizabeth Cameron", Sep 29 [2]

> "I am made from the **C-H-N-O-S-P** combination from which a Bunsen, Helmholtz, Kirchhoff came."
>
> — Wilhelm Ostwald (1926), *Lifelines: an Autobiography* [3]

See also

â— Carbon-based life
â— CH-based animation

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(b) Schwehn, Mark R. (1978). *The Making of Modern Consciousness in America: the Works and Careers of Henry Adams and William James* (pg. 109). Stanford University.
3. (a) Ostwald, Wilhelm. (1926-27). *Lifelines: an Autobiography* (*Lebenslinien. Eine Selbstbiographie)* (in two or three volumes). Berlin: Klasing & Co.
(b) Farber, Eduard. (1961). *Great Chemists* (§:Wilhelm Ostwald, pgs. 1019-30; quote, pg. 1021). Interscience Publishers.

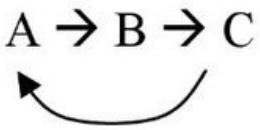

Autocatalytic Closure

"Alone, each molecular species is dead. Jointly, once catalytic closure among them is achieved, the collective system of molecules is alive."

— Stuart Kauffman (1995), *At Home in the Universe*

"Recently, however, I had an epiphany that has forced me to reexamine what life is, really.

For as long as people have studied life they have struggled to define it. Even today, scientists have no satisfactory or universally accepted definition of life.

Why do we think of the former as inanimate and the latter as alive? In the end, aren't they both machines?

On the most fundamental level, what is the difference between an inanimate machine and a living one? Do people, cats, plants and other creatures belong in one category and K'Nex, computers, stars and rocks in another?

My conclusion: No. In fact, I decided, **life does not actually exist**."

— Ferris Jabr (2013), "Why Life Does Not Really Exist", *Scientific American*, Brainwaves Blog, Dec 2

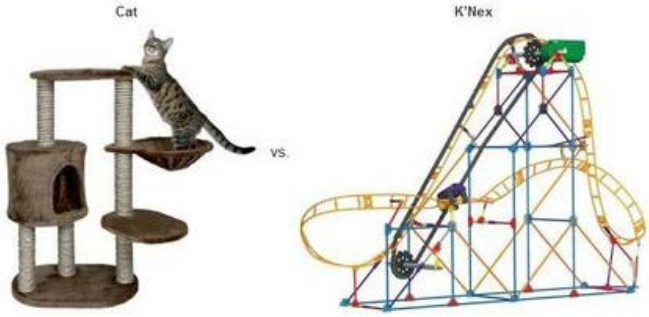

Animate Things

vs.

Old Faithful Paramecium

"There is no essential difference between 'life' and 'non-life.' The perceived difference is complexity. Old Faithful has 'life-like' movement but is easier to understand than a paramecium. The hydrogen atom is NOT alive."

— Alfred Rogers (2014), curator of LifeDoesNotExist.com, "Email communication to Libb Thims", Nov 21

Notes

Test:

d

"Origin of man now proved. Metaphysics must flourish. He who understands the baboon would do more towards metaphysics than Locke."

— Charles Darwin (1838), personal notes

"The only way I will rest in peace is if one day transgender people aren't treated the way I was. Transgender needs to be taught about in schools, the earlier the better. My death needs to mean something."

— Leelah Alcorn (2014), suicide note, Dec 27

d

"Libb Thims' science is laced with **extreme atheism** and materialism and hence his precarious position. Science needs to be kept at equal distance and away from both atheism and theism. I can't stop but laugh at myself when I think that I am not alive or I am not moving myself."

— DMR Sekhar (2011), Indian chemical engineer

"Libb Thims is a **strong atheist** who adheres to a physics-based morality, and considers himself a Goethean

revolutionist."

— David Bossens (2013), Belgian philosopher

d

"Fear was the **g**ods' begetter in this world."

— Petronius (c.50AD)

"As for me, I've long resolved not to think whether man

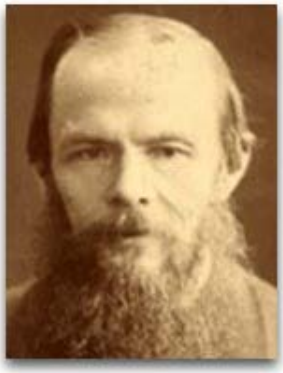

created **G**od or **G**od created man."

— Fyodor Dostoyevsky (c.1875)

"It is a strange fact, incidentally, that religious apologists love the **anthropic principle**. For some reason that makes no sense at all, they think it supports their case. Precisely the opposite is true. The anthropic principle, like natural selection, is an alternative to the design hypothesis. It provides a rational, design-free explanation for the fact that we find ourselves in a situation propitious to our existence."

— Richard Dawkins (2006), *The God Delusion*

d

"Staring up at the starry heavens leads one to an amazement and wonder in the greatness of God."

— Gaspard Gourgaud (1814), conversations with Napoleon

"How comes it, then, that Laplace was an atheist? At the Institute neither he nor Monge, nor Berthollet, nor Lagrange believed in God. But they do not like to say so."

— Napoleon Bonaparte (1814), responses to Gourgaud

"I own that I believe firmly in God, and cannot conceive how men can be atheists. To proclaim themselves such seems to me mere mental braggadocio."

— Gaspard Gourgaud (1814), conversations with

Napoleon

"Bah! Laplace was an atheist, and Berthollet too. At the Institute they all were atheists, and yet Newton and Leibnitz were believers. Atheists compare man to a clock; but the clock-maker is a being of superior intelligence. They grant that creation is the result of matter, as warmth is the effect of fire."

— Napoleon Bonaparte (1814), responses to Gourgaud

"I often asked Laplace what he thought of God. He owned he was an atheist. Many crimes have been committed in the name of religion. The oldest religion is the worship of the sun.

Where is the soul of an infant? I cannot remember what I was before I was born; and what will become of my soul after my death? As to my body, it will become carrots or turnips. I have no dread of death. In the army I have seen many men suddenly perish who were talking with me."

— Napoleon Bonaparte (1817), dialogue with Gaspard Gourgaud

"To speak specifically of our problem with the Muslim world, we are meandering into a genuine clash of civilizations, and we're deluding ourselves with euphemisms. We're talking about Islam being a religion of **peace** that's been hijacked by extremists. If ever there were a religion that's not a religion of peace, it is Islam."

— Sam Harris (c.2010), interview with Laura Sheahen

d

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"How comes it, then, that Laplace was an atheist? At the Institute neither he nor Monge, nor Berthollet, nor Lagrange believed in God. But they do not like to say so."
— Napoleon Bonaparte (1814), conversation with Gaspard Gourgaud on the heavens and greatness of God

"Religion is the masterpiece of the art of animal training, for it trains people how they shall think."

— Arthur Schopenhauer (c.1830)

d
d

"I have dictated thirty pages on the world's three religions; and I have read the Bible. My own mind is made up. I do NOT think Jesus Christ ever existed."

— Napoleon Bonaparte (1817)

Note: Date ↑ based on day that never existed.

"Scientists and philosophers realized long ago that **free will** could not be squared with our growing understanding of the physical world. Nevertheless, many still deny this fact."

— Sam Harris (2010), *The Moral Landscape*

"As my friend in New York, watching the event through his window, described the second hit, something in me snapped. This was no freak accident. This had to be a deliberately plotted attack. I froze. Then a wave of horror crashed over me as I realized that somewhere at the bottom

of this lay the shadow of my brother-in-law Osama Bin Ladin."

— Carmen Bin Ladin (2004), *Inside the Kingdom*

d
d

"No one, not even the vitalist, doubts that the organism is a Gibbs system."

— Lawrence Henderson (1917), *The Order of Nature*

"The science-religion controversy is rooted in talk of afterlife, soul, higher powers, muses, purpose, reason, objectivity, pointlessness, and randomness."

— Robert Burton (2008), *On Being Certain: Believing You are Right Even When You're Wrong*

"If we are going to teach creation science as an alternative to evolution, then we should also teach the stork theory as an alternative to biological reproduction."

— Judith Hayes (c.2000), author of *The Happy Heretic*

d

"Life does not exist. Life is a concept we invented. There is NO threshold at which a collection of atoms suddenly becomes alive. We have failed to define life because there was never anything to define in the first place."

— Ferris Jabr (2013), "Why Life Does Not Really Exist, *Scientific American*, Brainwaves Blog

d
d

"What's the matter with you guys? This was never about the money, this was about us against the system. That system that kills the human spirit. We stand for something. We are here to show those guys that are inching their way on the freeways in their metal coffins that the human spirit is still alive."

— Bodhi (1991), *Point Break*

"God who gave animals self motion beyond our understanding is without a doubt able to implant other principles of motion in bodies which we may understand as little. Some would readily grant this may be a **spiritual** one; yet a mechanical one might be shown …"

— Isaac Newton (c.1700), personal notes

"Since as a kid I was aware of the abyss (super rift) between the material and mental worlds. I tried to bridge this abyss, but could not. Yet I kept on with my own "Steigerung" as Goethe did.

Then during 1982-83 I discovered empirically that the law of entropy production applies to the spiritual [*humanistic*] world as it applies to the physical world. My joy knew no bounds. I have found the bridge between these two worlds with which to cross the abyss between them. Others thought I was crazy and would not dare to publish my account.

Then, in 1986, if I remember correctly, I was teaching university students the intricate calculations concerning free energy in chemical reactions. During that lecture I suddenly became aware how my mind was rushing along two levels. The lower level was concerned with chemical processes as a physical phenomenon. I executed this level almost automatically. But the higher level of my mind was exploring free energy in the process of knowing-learning as

a spiritual [*thermodynamics*] phenomenon.

I followed this level with great curiosity. I think the students became aware that I was rather absent minded that day, not perceiving my higher most thoughts. That day marks the beginning of my continual exploring of the role of free energy in the spiritulization [*actualization*] of humankind."

— Adriaan de Lange (2010), retrospect reflection on arrival of human free energy theory

d

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"Neither a lofty degree of intelligence nor imagination nor both together go to the making of genius. Love, love, love, that is the soul of genius."

— Mozart (c.1780)

"Everyone is born a genius, but the process of living de-geniuses them."

— Buckminster Fuller (c.1970)

"In the republic of mediocrity, genius is dangerous."

— Robert Ingersoll (1880), "Liberty in Literature"

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"While it was long possible and sometimes tempting for physicists to deny the usefulness of the **molecular hypothesis**, we economists have the good luck of being some of the 'molecules' of economic life ourselves, and of having the possibility through human contacts to study the behavior of other 'molecules'."

— Tjalling Koopmans (1947), Nobel Prize winner in economics

"Be religious …. or be smart."

— Bo Jinn (2013), on new atheism

"The true genius shudders at incompleteness — imperfection — and usually prefers silence to saying the something which is not everything that should be said."

— Edgar Allan Poe (c.1948), *Marginalia*

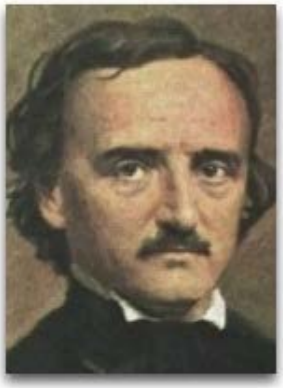

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"The noblest pleasure is the joy of understanding."
— Leonardo da Vinci (c.1500)

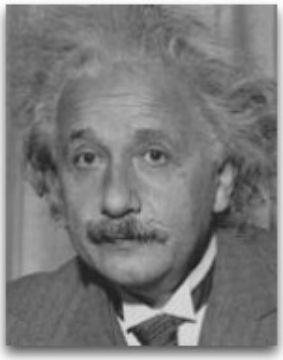

"Education is the progressive realization of our ignorance."

— Albert Einstein (c.1930)

"When a great genius appears in the world you may know him by this sign; that the dunces are all in confederacy against him."

— Jonathan Swift (1728), *Essay on the Fates of Clergyman*

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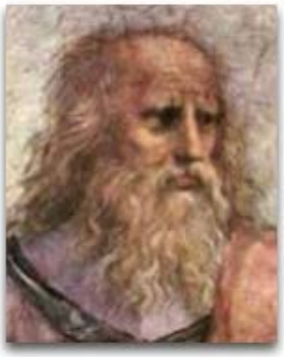

"Let no one enter here who is ignorant of mathematics."

— Plato (360BC), plaque over door to his academy

"Whoever would arrive at excellence must be self-taught. There is, in reality, very little that a person who is serious and industriously disposed to improve may not obtain from books with more advantage than from a living instructor."

— Thomas Young (1798), "Letter to brother"

"The fundamental concept in social science is power, in the same sense which energy is the fundamental concept in physics."

— Bertrand Russell (1938), *Power: a New Social Analysis*

"Genius is the capacity to see ten things where the ordinary man sees one."

— Ezra Pound (c.1950)

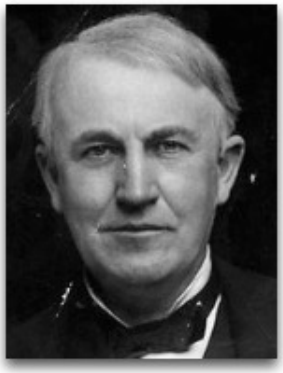

"Genius is one percent inspiration and ninety-nine percent perspiration."

— Thomas Edison (c.1915)

"The distance between insanity and genius is measured only by success."

— Bruce Feirstein (c.1985)

"Men think epilepsy divine, merely because they do not understand it. We will one day understand what causes it, and then cease to call it divine. And so it is with everything in the universe."

— Hippocrates (c.400BC)

"What is the soul, but an empty word to which no idea corresponds?"

— Julien la Mettrie (1745), *The Natural History of the Soul*

"eBay does not allow the auctioning of human **souls** for the following reasons: If the soul does not exist, eBay could not allow the auctioning of the soul because there would be nothing to sell. However, if the soul does exist then, in accordance with eBay's policy on human parts and remains, we would not

allow the auctioning of human souls."

— eBay (2000), company policy (Ñº)

Wolfgang Pauli
(1900-1958)

Pauli: "Do you believe in a personal God?

Werner Heisenberg
(1901-1976)

Heisenberg: "May I rephrase your question?" "I myself should prefer the following formulation:

> Can you, or anyone else, reach the **central order** of things or events, whose existence seems beyond doubt, as directly as you can reach the soul of another human being?

I am using the term 'soul' quite deliberately so as not to be misunderstood. If you put your question like that, I would say yes.

Wolfgang Pauli
(1900-1958)

Pauli: "Perhaps."

Pauli: "Why did you use the word 'soul' and not simply speak of another person?"

Werner Heisenberg
(1901-1976)

Heisenberg: "Precisely because the word, 'soul', refers to the central order, to the inner core of a being whose outer manifestations may be highly diverse and pass our understanding.

Heisenberg: "If the magnetic force that has guided this particular compass – and what else was its source but the central order – should ever become extinguished, terrible things may happen to mankind, far more terrible even than concentration camps and atom bombs.

Heisenberg: But we did not set out to look into such dark recesses; let's hope the central realm will light our way again, perhaps in quite unsuspected ways. As far as science is concerned, however, Niels [Bohr] is certainly right to underwrite the demands of pragmatists and positivists for meticulous attention to detail and for semantic clarity.

Heisenberg: It is only in respect to its taboos that we can object to positivism, for if we may no longer speak or even think about the wider connections, we are without a compass and hence in danger of losing our way."

Degree Wizard

30 Smartest People Alive Today

30. Paul Allen

29. Christopher Langan

28. Judit Polgár

21. Richard Rosner

20. Chris Hirata

19. Steven Pinker

18. Ivan Ivec

11. Noam Chomsky

10. Evangelos Katsioulis

9. Magnus Carlsen

8. Shahriar Afshar

7. Akshay Venkatesh

perhaps he was an is something.

27. Marilyn vos Savant

Image Source

Marilyn vos Savant was born in 1946 in Missouri. In 1986 the columnist and author made history when she was named in The Guinness Book of World Records as the person possessing the highest IQ, with

26. John H. Sununu

Image Source

With a reported IQ of 180, John H. Sununu is another individual who has proved equal to the slightly others for associations into the Mega Society, high IQ club. Born in 1938 in Havana, Cuba, Sununu studied mechanical engineering at the Massachusetts Institute of Technology, achieving his bachelor's degree in 1961, his master's in 1963 and his Ph.D. in 1966. After he graduated, Sununu worked as a professor at Massachusetts/Amherst Tufts University until 1982, when he was appointed the school's associate dean of engineering, a position he held until 1989. Between 1982 and 1989 Sununu served as the governor of New Hampshire, then in 1989 he became the White House Chief of Staff. However, in 1991 Sununu resigned amid following allegations that he had abused his government travel privileges.

25. Neil deGrasse Tyson

Image Source

Neil deGrasse Tyson is a highprofile American astrophysicist and research associate at the American Museum of Natural History, and he is also President & Rose Director of the Hayden Planetarium in New York City. Tyson was born in New York in 1958 and faced adversity from a young age. In 1980 he graduated from Harvard with a bachelor's degree in physics, and he went on to earn his master's in astronomy from the University of Texas in 1983. He then went to Columbia, where he obtained his M.Phil. in astrophysics in 1989 and his Ph.D. two years later. Tyson continued pay outlure time presenting educational PBS show NOVA. Extended from 2000 to 2011, and he has made numerous TV guest appearances. The awards he has received include a N.A.S.A. Distinguished Public Service Medal, and in 2001 Asteroid 15906 was renamed 15 22 Tyson in his honor.

24. Kim Ung-Yong

Image Source

Before The Guinness Book of World Records withdrew its Highest IQ category in 1990, South Korean former child prodigy Kim Ung-Yong made the list with a score of 210. Kim was born in Seoul in 1962 and by the time he turned three, he could already read Korean, Japanese, English and German. When he was just eight years old, Kim moved to America to work at N.A.S.A.. At that time, Uses my life like a machine. I wake up, solve the daily assigned equation, eat, sleep, and so forth," he has explained. "I was lonely, and has no friends." While he was in the States, Kim allegedly obtained a doctorate degree in physics, although this is unconfirmed. In any case, in 1978 he moved back to South Korea and went on to earn a Ph.D. in civil engineering.

23. Mislav Predavec

Image Source

Mislav Predavec is a Croatian mathematics professor with a reported IQ of 180. "I always felt I was a step ahead of others. My material is always interesting. I just solved the problems faster and better," he has explained. Predavec was born in Zagreb in 1967, and his unique abilities were obvious from a young age. As for his adult achievements, since 2003 Predavec has taught at Zagreb's Polytechnic Institute. In addition, he runs trading company Phantom, having done so since 1995. And in 2002 Predavec founded another IQ society, CerebrIQ, which forms part of his under IQ society mix-up. "Very difficult intelligence tests are my favorite hobby," he has said. In 2010 the World Genius Directory ranked Predavec as the third smartest person in the world.

22. Manahel Thabet

tests devised by psychologists are not ideal for anybody. Especially, there are intelligent people, capable of performing complex actions and reading complex tests, although their speed of solving is low," he has explained.

17. Garry Kasparov

Image Source

Born in 1963 in Baku, in what is now Azerbaijan, Garry Kasparov is arguably the most famous chess player of all time. When he was seven, Kasparov enrolled at Baku's Young Pioneer Palace, then at ten he started train at the school of legendary Soviet chess player Mikhail Botvinnik. In 1980 Kasparov qualified as a grandmaster, and five years later he became the then youngestever outright world champion. He retained the championship title until 1993, and he held the position of world number

16. Terence Tao

Image Source

Born in Adelaide in 1972, Australian former child prodigy Terence Tao didn't waste any time finding his educational muscles. When he was two years old, he was able to perform simple arithmetic. By the time he was nine, he was studying astrophysical math textbooks. And in 1986, ages just 13, he became the youngest gold medal recipient in International Mathematical Olympiad history, a record that still stands today. In 1992 Tao achieved a master's degree in mathematics from Princeton University in Adelaide, the institution from which he obtained his B.Sc. the year before. Then in 1996, ages 22, he earned a Ph.D. from Princeton, turning in a thesis entitled "Three Regularity Results in Harmonic Analysis." Tao's long list of awards includes a 2006 Fields Medal, and he is currently a mathematics professor at the University of California, Los Angeles.

15. Scott Aaronson

Image Source

Scott Aaronson is an associate professor in the Massachusetts Institute of Technology's electrical engineering and computer sciences faculty. Concerning his interests, his research focuses on the capabilities and limits of quantum computers, and computational complexity theory more generally. Aaronson was born in Philadelphia in 1981. In 2002 he earned a bachelor's degree in computer sciences from Cornell, and four years later he achieved a Ph.D. from the University of California, Berkeley. Then in 2010 he was given the Alan T. Waterman Award for "illuminating the fundamental limits on what can be computed in the physical world and seeking important new ground in computational theory." He is known for his key contributions to algebrization and the shortest quantum Turing machine.

14. Nikola Poljak

Image Source

According to the World Genius Directory, Croatian researcher and physicist Nikola Poljak has an IQ of 183. Born in 1953, Poljak is at present an assistant research fellow and instructor in the University of Zagreb's physics department. In addition, he is an assistant research fellow at CERN, working on the collaborative A Large Ion Collider Experiment in Geneva, Switzerland. And he is also an assistant research fellow with the Brookhaven National Laboratory in New York, involved in the STAR collaboration experiment at the Relativistic Heavy Ion Collider. In 2010 Poljak received his Ph.D. in physics from the University of Zagreb. His has served as scientific consultant to the Croatian Ministry of Business and the Agency for Mobility and EU Programmes, and his current projects include the exploration of metastable systems with stochastic passes."

13. Alan Guth

Image Source

Born in New Brunswick, New Jersey in 1947, American physicist and cosmologist Alan Guth was smart enough to twice extend a year early and go straight to the Massachusetts Institute of Technology (MIT), where he earned his bachelor's, master's and doctorate degrees in physics. Guth initially began analyzing the notion of cosmic inflation when he was a junior scientist at Cornell in 1979. Then in 1981 he officially put forward the theory, which is now widely accepted by many scientists. The theory suggests a time prior to the Big Bang during which the universe was able to evenly disperse itself thanks to its smaller size. This model also looks to explain more clearly the conditions that brought about the incredibly fast, exponential growth of the universe. Guth has been described as "the man who put the 'big' in 'Big Bang.'" He has held positions at Princeton, Columbia, Cornell and Stanford, and he's currently a physics professor at MIT.

12. Donald Knuth

6. Saul Kripke

Image Source

Born in Long Island, New York in 1940, Saul Kripke is an acclaimed living logician and philosopher noted for his jointly associated Kripke/Platek set theory, his sexual theory of reference and his 'Wittgenstein' theory. He was a child prodigy, too, having apparently learned Ancient Hebrew on his own by the time he was six before quickly grasping complex mathematics and philosophical questions. In 1959 Kripke published his hugely significant book Naming and Necessity, which discussed proper nouns within the context of the philosophy of language. Kripke has also had a significant bearing on areas surrounding mathematical logic, the philosophy of mathematics, metaphysics and epistemology. In 2001 he was awarded the esteemed Rolf Schock Prize. Kripke, furthermore, assisting in a 2003 poll, in which votes were cast by philosophers, Kripke ranked as the seventh most important philosopher of the past five centuries. He has taught at Harvard, New York's Rockefeller University, and Princeton – where he is currently a professor emeritus. In addition, he is a distinguished professor of philosophy at the City University of New York.

5. Ruth Lawrence

Image Source

Born in 1971, British mathematician and former child prodigy Ruth Lawrence made many headlines in 1983 when, ages just 12, she obtained a bachelor's degree in mathematics from Oxford University, gaining a coveted First. Lawrence was only three in physics, followed in 1985 and in 1986 she received her D.Phil. in mathematics, again from Oxford. In 1990 she was made a junior fellow at Harvard. Just after a stint at the University of Michigan, she took on an associate professorship there in 1997. Lawrence is currently an associate professor at the Hebrew University of Jerusalem's Einstein Institute of Mathematics and investigates algebraic topology and knot theory. In 1997 Charles Arthur wrote in The Independent, "The branch of mathematics she is now researching – to an extremely, so obscure as mind-boggling – is complicated for the normal mathematician that it will be years before technology and science catch up enough to make any practical use of it."

4. Grigori Perelman

Image Source

Born in 1966, Grigori Perelman is a highly influential, if somewhat eccentric, Russian mathematician. In 2003 he famously resolved the Poincaré conjecture, one of topology's most weighty and sought-after problems. However, the following year he reportedly quit mathematics to live with his mother in very modest circumstances in Saint Petersburg. In 2006 Perelman was honored with the esteemed Fields Medal for his work in furthering the understanding of geometry and particularly the Ricci flow, but he did not accept the awards. "I'm not interested in money or fame. I don't want to be an display like an animal in a zoo," he explained. In 2010 he was offered the Clay Millennium Prize one million dollars for the solving of the Poincaré conjecture, but again he declined. "I know how to control the universe. Why could I not be just a million bill man?" he said.

3. Andrew Wiles

Image Source

Andrew Wiles was born in Cambridge in 1953. He is an acclaimed English mathematician perhaps best known for officially proving Fermat's Last Theorem in 1995. Wiles has received, The Guinness Book of World Records lists the 300-year-old theorem as one of the world's "most difficult mathematical problems." Wiles attained a bachelor's degree in mathematics from Oxford in 1974, followed by a Ph.D. from Cambridge in 1980. He has worked as a professor at Princeton and Harvard, and in 1988 he received a prestigious Guggenheim Fellowship, which allowed him to spend time at Paris' Ecole Normale Supérieure and the Institut des Hautes Études Scientifiques. The mathematician currently holds a Royal Society research professorship at Oxford and his extensive list of awards includes an International Mathematics Union silver plaque, The Shaw Prize, and a National Academy of Sciences Cross in Mathematics.

12. Donald Knuth

2. Edward Witten

InformOverload

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Published on Dec 18, 2013
4 year old Sherwyn Sarabi is purported to have the same **IQ as Einstein** at the age of 4 he is already a member of MENSA.

Published on Oct 3, 2014
Top 10 Child Geniuses

Smartest person purviews

If one were truly the smartest person existive (alive), one or more of the following three truths would be within purview: [1]

1. That one is not alive.

(e.g. Tesla (almost), Goethe (almost); Rogers (yes), Jabr (yes), etc.)

"Let us abandon the word alive."

— Francis Crick (1966), *Of Molecules and Men*

Rogers

Jabr

2. That one is a powered 26-element (±) chemical or molecule whose spontaneity is governed by the laws of thermodynamics.

(e.g. Goethe; Hirata, etc.)

Wallace

Hirata

Kauffman

Ball

Hawking

Hwang

Mimkes

3. Would have discarded the "hypothesis of god" (as Laplace did in 1802).

(see: Napoleon Laplace anecdote).

Hawking

Weinberg

(a) That Abraham and Brahma religions are derivatives of the "father Ra son of Nun" religion (i.e. Anunian theologies).

(e.g. Aristotle (almost), Voltaire (close))

Higgs

Penrose

Nash

(b) Would have issues with the current dating system (e.g. BC/AD).

(e.g. Newton, Goethe, Napoleon, see: BP/PE or BN/ME)

Tao

Kauffman

Rogers

(c) Would know that God does not exist (i.e. DN=7+).

(e.g. Newton (almost), Laplace, Dirac, Curie)

d

d

In terminology, **prayer** (TR:15) is a supernatural mechanism according to which one puts their hands together and or hands to head, bows their head in reverence, and talks out in their mind or vocally to a deity for help or a wish to remedy some maelstrom.

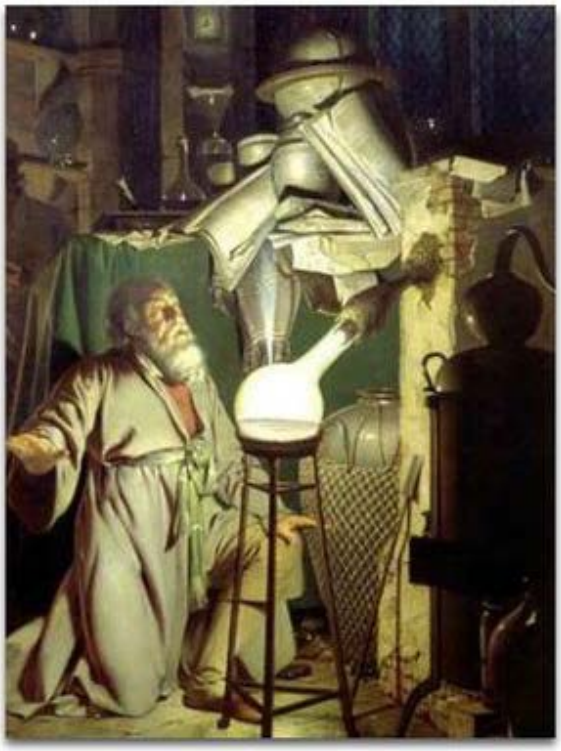

A chemical philosopher (1771) discovering phosphorus and then "**praying**" for the successful conclusions of his operations.

Overview

In 1758, Goethe, at the age 9, built his own alter to nature out of his father's natural history collection, surmounting it with sulfur, lit with a candle, when making his devotions.

In 1771, Joseph Derby painted his depiction (Ñº) of an alchemist discovering phosphorus and then "prays" for the successful conclusion of this operation, as was the custom of the ancient chymical astrologers in this period.

In 1936, Albert Einstein sent the following response letter to a sixth grade Sunday School student who ask whether or not scientists pray: [2]

> "Everything is determined … by forces over which we have no control. It is determined for the insect as well as the star. Human beings, vegetables, or cosmic dust—we all dance to a mysterious tune, intoned in the distance by an invisible piper."

In short, "praying" for something that is already determined, is illogical, i.e. a pointless endeavor.

Prayer shamming | Mass shootings

In 2015, in the wake of the 2 Dec San Bernardino terrorist attack, where 15 people were killed (quelled) reporters took notice of the tweet phenomenon of so-called "prayer shamming" used predominately by the republican presidential candidates, e.g. "our prayers go out to you", etc., as compared to the democratic candidates, who referred to it more along the lines of a situation in need of fixing, i.e. a mechanism gone wrong and in need of repair:

> "There's a clear claim being made here, and one with an edge: Democrats care about doing something and taking action while Republicans waste time offering meaningless **prayers**. These two reactions, policy-making and praying, are portrayed as mutually exclusive, coming from totally contrasting worldviews."
>
> — Emma Green (2015), "Prayer Shaming After a Mass Shooting in San Bernardino" [3]

Examples of which are shown below: [3]

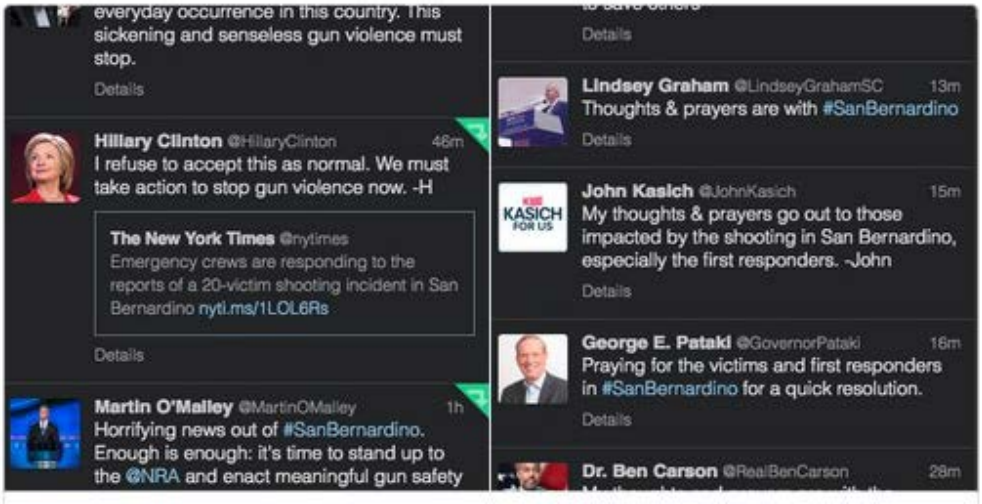

Here, we ruminate humorously how, historically, "prayer" and "incantations" were long ago driven out of professions, such as chemistry or medicine, i.e. no one trusts a doctor who tells you he or she is going to pray for you or a chemist who tells you they will pray for your new billion dollar invested chemical synthesis to turn out right, we see that prayer is a utility staple in the modern arena of politics. The following, likewise, the 3 Dec 2015 cover of the New York *Daily News*, shows more examples of prayer shamming:

Moreover, while democrats are not a eager to use prayer shamming, they're solution of stricter gun controls is, for the most part, no better a solution then prayer, i.e. the root of the mechanism disruption is an "education" problem, not a "gun-control" problem, namely it is not criminals who are sneaking through holes in loose gun laws and committing mass acts of

terrorism, but rather highly intelligent faith-driven individuals, who believe what they are doing is righteous and good, i.e. the underpinnings of the global ethics system is dysfunctional, likely as it was at the time period when Lucretius wrote his *On the Nature of Things* (55BC) when city-state ethics were switching to empire ethics.

Heart | Prayer studies

Research, funded ironically by the Templeton Foundation, has found (Ñº) that people, during times of illness, who know they are being prayed for, ironically, far worse. [1]

Theism controversies

The following is a prayer-questioning image sent to Libb Thims (DN=10), in 2014, from Art the God believer (DN=2) amid the launch of the new Atheism Reviews channel:

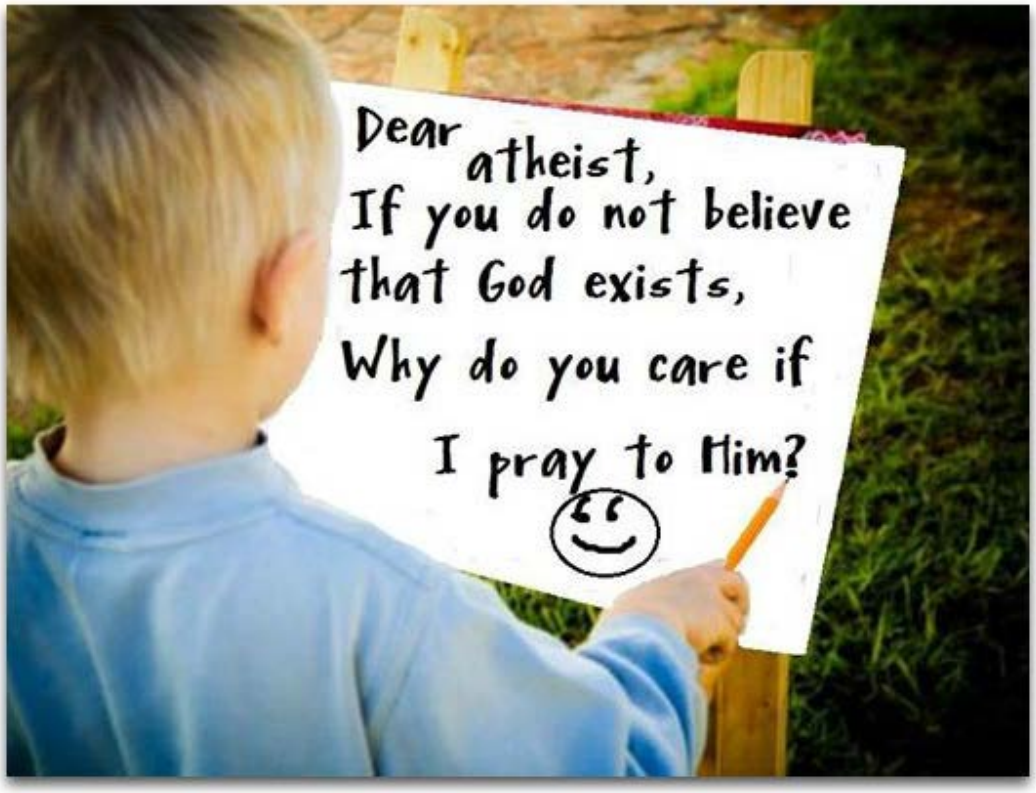

The following is a 23 Sep 2014 response, by American electrochemical engineer Libb Thims, post to the query: why do you care if I pray to God?, showing floating magnets, Islam issues, in the context of the godless so-called "standard model" of the universe:

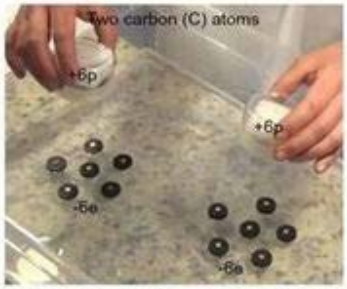

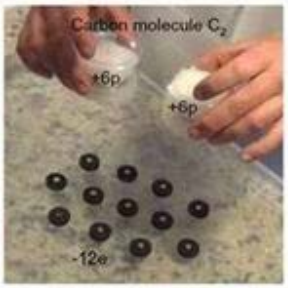

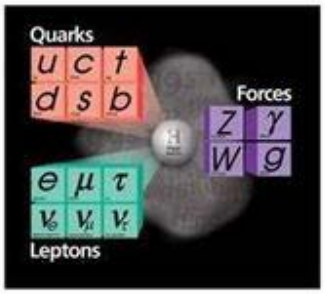

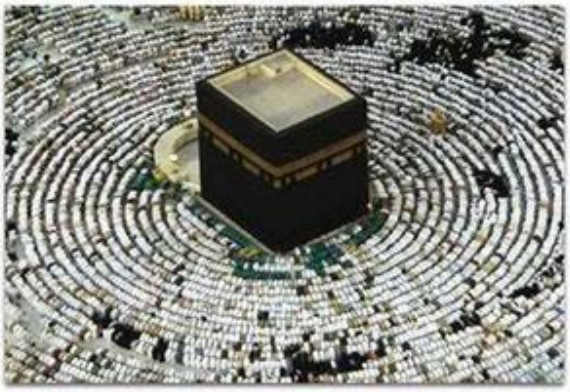

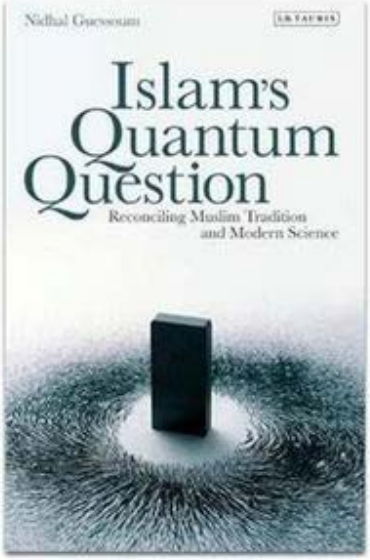

Above: the annual pilgrimage to Mecca (hajj), something that must be done at least once during a Muslim's reaction extent (lifetime), as one of the five "pillars" or basic acts in **Islam**. Right: the 2011 *Islam's Quantum Question*, by Nidhal Guessoum, showing a depiction of iron fillings around a magnet alluding to a comparison of Kaaba (cuboid building at center) and its "black stone" (eastern cornerstone) to the magnet and humans, in Islamic belief, aligned towards the Kaaba, like the aligned iron filings (see: Ising model of human behavior). [1]

Libb Thims
3 mins

Said another way, the way we currently understand things, the universe is comprised of fermions (quarks and leptons) and bosons (forces), nothing more nothing less, and from these components, in social systems, we get differential (change) measurements called free energy (Gibbs energy), and from these differentials we can predict whether or not two carbon atoms will bind just as we can predict whether or not two people will bind or whether two countries will bind and, conversely, whether or not, when bound, what sort of future the binding will have in respect to future stability. There's no god involved in any of this. So, at this point, the modern thinker has two choices: either one can "pray" for their relationship (or political dynamic) to work, or they can turn to reality, the way modern physical science explains things. Hopefully, this clarifies or at least elaborates on the inherent underlying issue? The following image of Muslims, like iron filings, praying towards Mecca, is one example, of the whole "why do you care if I pray to Allah?" issue.

Like

Quotes

The following are noted quotes:

> "**Prayer** is of no avail. The lightning falls on the just and the unjust in accordance with natural laws."
>
> — Robert Ingersoll (c.1880)

> "**Prayer** has no place in the public schools, just like facts have no place in organized religion."
>
> — Superintendent Chalmers (c.2005), *The Simpsons* (Ñº)

References

1. Studies on intercessory prayer – Wikipedia.
2. Einstein, Albert. (1981). *Albert Einstein: the Human Side*. Princeton University Press.
3. Green, Emma. (2015). "Prayer Shaming After a Mass Shooting in San Bernardino" (Ñº), *The Atlantic*, Dec 2.

External links

â— Prayer – Wikipedia.

θΔics

In thermodynamics, **prediction**, as applied to events or processes that are predictable, as opposed to those which are unpredictable, refers to the use of the laws of thermodynamics, generally the law that entropy will tend to increase over time, or its formulaic synonym that free energy will tend to decrease over time, to predict or predetermine certain processes, events, or reactions over time.

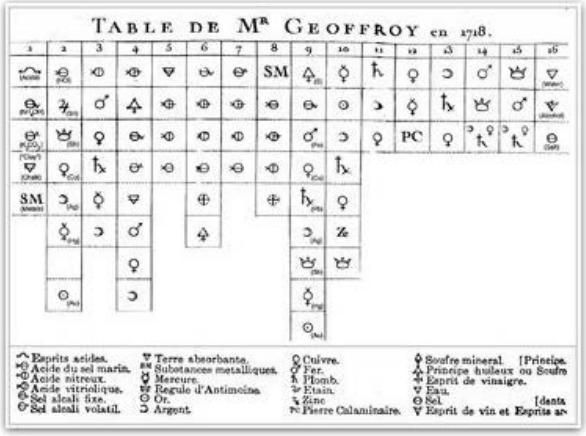

"This table becomes sort of **prophetic**, for if substances are mixed together, it can **foretell** the effect and result of the mixture."
— (1718) French Royal Academy of Science

French physician-chemist Etienne Geoffroy's 1718 affinity table, culled from Isaac Newton's "Query 31", the first reaction **prediction** device; the forerunner to prediction base on free energy, as embodied in 20th century free energy tables.

Overview

(add discussion)

Thermodynamics

On 2 Jan 1849, Scottish engineer James Thomson, in his "Theoretical Considerations on the Effect of Pressure in Lowering the Freezing Point of Water", made the following prediction, via thermodynamical reasoning, as summarized by Fielding Garrison: [26]

> "James Thomson, one of the early pioneers of physical chemistry, was able, by an implicit denial of Carnot's assumption, to **predict** and prove that the freezing point of water would be lowered by pressure."

Later that year, James' brother William Thomson verified this deduction to its numerical details by direct experiment. [27]

Chemical reactions

Most chemical reactions can be predicted using the methods of chemical thermodynamics, such as summarized cogently by American science historian Henry Guerlac, from his 1969 article "Chemistry as a Branch of Physics": [19]

> "By means of chemical thermodynamics the physical chemist can indeed, without leaving the 'cabinet', **predict** the course of many chemical reactions."

Scaled up to the human-human reaction level (reactions between people), this logic implies that "by means of human chemical thermodynamics the human physical chemist can indeed, without leaving the 'cabinet', **predict** the course of many human chemical reactions."

Prediction can also refer to the predetermination of the most likely product or products in a chemical reaction or the final conformational state in geometrical rearrangement. The logic of thermodynamic prediction is commonly used in economic forecasting, weather prediction, and protein conformational studies, among others.

Affinity

The subject of "reaction prediction" entered into chemistry with the initiation of the science of affinity chemistry. To exemplify, in commenting on French chemist Étienne Geoffroy's 1718 affinity table, the French *History of the Royal Academy of Science*, stated the year of its publication that: [6]

> "That a body which is united to another, for instance a solvent which has penetrated a metal, should leave it to go and unite with another which is presented to it, is a thing of which the possibility would not have been guessed by the most subtle of philosophers, and of which the explanation is still today not too easy for them. In the end, leaving as unknown that which is unknown, and keeping to certain facts, all the experiments of chemistry prove that a particular body has more disposition to unite with one body than another, and that this disposition has different degrees. This table becomes sort of **prophetic**, for if substances are mixed together, it can **foretell** the effect and result of the mixture, because one will see form their different relations what ought to be, so to speak, the issue of the combat."

In contemporary presentations of affinity tables, according to English chemistry historian Alistair Duncan: [7]

> "The emphasis is on their usefulness in summarizing chemical facts in an easily memorized form and enabling the user to **predict** the course of a reaction than on their theoretical implications."

After 1865, with the publication of German physicist Rudolf Clausius' *The Mechanical Theory of Heat*, it was proved that the measure of affinity is the change in Gibbs free energy (for isothermal-isobaric reaction):

$$A = -\Delta G$$

or Helmholtz free energy (for isothermal-isochoric reactions):

$$A = -\Delta F$$

after which time free energy tables replaced affinity tables, but used in the same sense with regard to prediction.

Temperature

In 1824, French physicist Sadi Carnot outlined the basics of the second law, namely that heat will always flow from hot to cold; therefore if two bodies, of different temperature, are put into contact, one can predict the direction of heat flow. In 1865, with the introduction of entropy, or heat divided by temperature, by German physicist Rudolf Clausius, the prediction aspects of temperature and heat were carried over into entropy, via the inequality sign. In 1947, Belgian-born English thermodynamicist Alfred Ubbelohde commented on this "temperature has to be reckoned with because it predicts the direction of spontaneous heat flow from one body to another. It is a kind of index of spontaneity, though a rather more rudimentary one than entropy." [14]

Free energy

The pioneering work in thermodynamic prediction was done by American engineer Willard Gibbs who applied German physicist Rudolf Clausius' 1865 notions of states of energies and entropies of a body to the study of heterogeneous chemical systems. Specifically, in Gibbs 1873 paper "A Method of Geometrical Representation of the Thermodynamic Properties of Substances by Means of Surfaces", he began to outline the principles of, in his own words, "what determines the direction of change". The first mention of "prediction" seems to be in a footnote where he states that for substances to exist in contact the conditions must be such that there pressures, temperatures, and free energies must be equal. On this conclusion, he comments:

> "These results are interesting, as they show us how we might be able to **foresee** whether two given states of a substance of the same pressure and temperature, can exist in contact."

Next, Gibbs refers to the experiments of Thomas Andrews, who showed that carbonic acid H_2CO_3 may be carried from any liquid state to any gas state without losing its homogeneity

> "Now, if we had carried it from a state of liquidity to a state of gas of the same pressure and temperature, making the proper measurements in the process, we should be able to **foretell** what would occur if these two states of the substance should be brought together—whether evaporation would take place, or condensation, or whether they would remain unchanged in contact—although we had never seen the phenomenon of the coexistence of these two states, or of any of the two states of this substance."

Beyond this, in his paper, he explains, graphically, for various contacts of substances, progress using phrases such as "the proposition above enunciated shows that processes will ensue which will …. ", or "processes will occur which will …", etc. Gibbs essential criterion for the stable equilibrium of a substance when surrounded by a medium of constant pressure and temperature is that that the value of the quantity of "available energy", or "free energy" as Helmholtz latter called it, of the body "shall be a minimum". This logic is outlined graphically below, in the form of Maxwell's thermodynamics surface, which he constructed based on Gibbs' graphical descriptions of available energies:

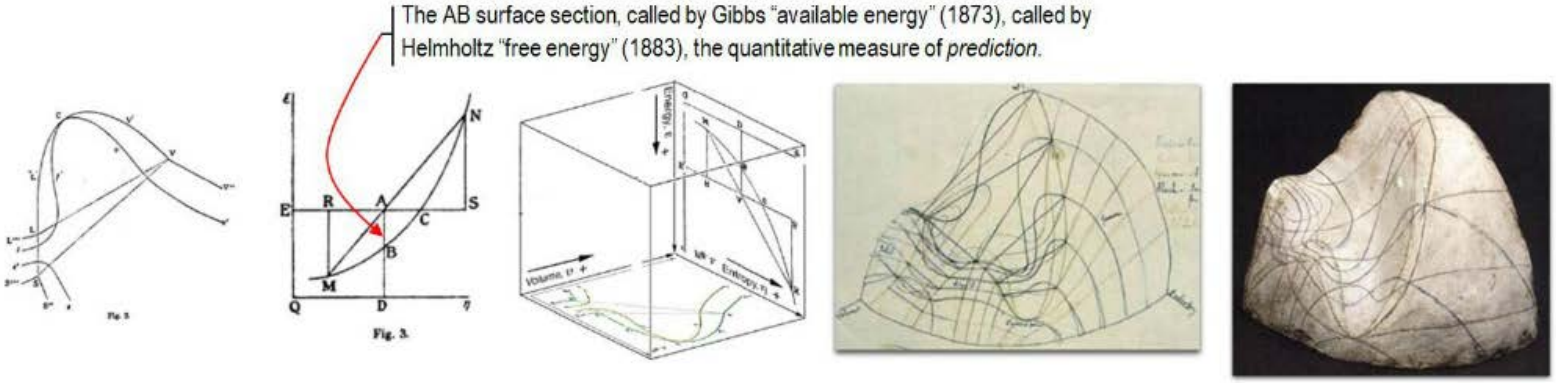

In 1893, German physical chemist Walther Nernst, who built on the work of Gibbs and Helmholtz, applied to reactions near absolute zero, summarized the situation as such: [13]

> "Since every chemical process, like every process of nature, can only advance without the introduction of external energy only in the sense in which it can perform work; and since also for a measure of the chemical affinity, we must presuppose the absolute condition, that every process must complete itself in the sense of the affinity—on this basis we me may without suspicion regard the maximal external work of a chemical process (i.e. the change of free energy), as the measure of affinity. Therefore the clearly defined problem of thermo-chemistry is to measure the amounts of the changes of free energy associated with chemical processes, with the greatest accuracy possible … when this problem shall be solved, then it will be possible to **predict** whether or not a reaction can complete itself under the respective conditions. All

reactions advance only in the sense of a diminution of free energy, i.e. only in the sense of the affinity."

In 1905, building on the work of Gibbs, German chemist Fritz Haber published his *Thermodynamics of Technical Gas Phase Reactions*, in which he systematically studied the thermodynamic data necessary for the calculations of the free energy of chemical substances in a group of important reactions, with which he used to make predictions on chemical reactions—a contribution that was summarized in 1907 by English chemist Arthur B. Lamb, the English translator of Haber's book, as follows: [2]

> "The most important contribution to the subject of **predicting** the course of a chemical reaction from a few characteristic constants (after the ill-starred attempt of Berthelot)."

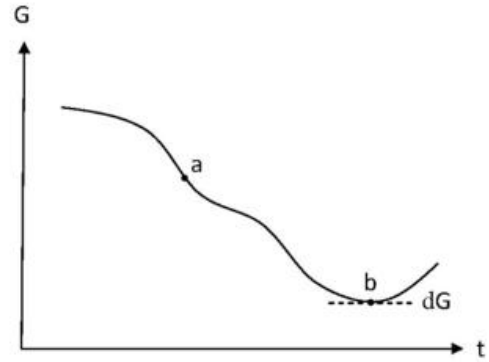

Diagram showing that the direction of natural change is determined, according to Gibbs, such that the variation δ of the free energy G, produced by any variations in the state of the parts of the body, tends over time to decrease, being equal to zero at equilibrium; hence if a body is in state a then one can **predict** that it will evolve to state b over time, in that state b satisfies the condition of most stable equilibrium.

In the decades to follow, particularly through the work of physical chemists Gilbert Lewis, Merle Randall, and Edward Guggenheim, it was shown that a decrease in free energy in a chemical system was the criterion used to predict feasibility in chemical reactions.

$G_{final} - G_{initial} < 0$
$\Delta G < 0$ | Criterion for spontaneous reaction

This is called the spontaneity criterion. The modern-day sense of chemical thermodynamics prediction is summarized best by Gilbert Lewis and G.H. Burrows, who in 1912 stated: [9]

> "The study of free energy affords the only true measure of chemical affinity, and although, when the free energies of all the substances involved in a given reaction are known, it may still be impossible to predict the rate of reaction, it will be possible to **state in advance** in what direction and to what extent the process can ultimately occur."

In other words, the study of free energies yields the ability to "state in advance" in what direction natural processes and reactions will tend and how strongly they will tend to go in that direction.

Shown adjacent is a 2000 memo (in Russian) with a *circa* 2010 hand-written note (in English) by Russian physical chemist Georgi Gladyshev, sent to American electrochemical engineer Libb Thims, in a package of Gladyshev's collected works on his various thermodynamic theories, wherein he points out that from some time, since at least the late 1990s, he has been under the strong conviction that "history can be predicted" using thermodynamics, specifically Gibbs free energy:

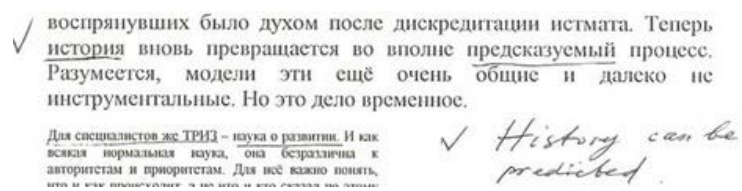
воспрянувших было духом после дискредитации истмата. Теперь история вновь превращается во вполне предсказуемый процесс. Разумеется, модели эти ещё очень общие и далеко не инструментальные. Но это дело временное.

Для специалистов же ТРИЗ – наука о развитии. И как всякая нормальная наука, она безразлична к авторитетам и приоритетам. Для неё важно понять,

History can be predicted

A handwritten 2010 note by Russian physical chemist Georgi Gladyshev, in a packet sent to American electrochemical engineer Libb Thims, that according to thermodynamics "history can be predicted."

Here we recall similar views expressed in the 1952 work of English physicist C.G. Darwin in regards to historical prediction and thermodynamics (though Darwin, to note, did not discuss "free energy", put presented only outline views; see his "Introduction" chapter for more on this).

The following is a 2005 example problem of reaction "prediction", from Raymond Chang's *Physical Chemistry for the Biosciences*, one of 32 plus examples of the ability of modern physical chemistry to "prediction" the direction of change in regards to chemical species reacting together: [18]

> The equilibrium constant (K_P) for the reaction
>
> $$N_2O_4(g) \rightleftharpoons 2NO_2(g)$$
>
> is 0.113 at 298 K, which corresponds to a standard Gibbs energy change of 5.40 kJ mol^{-1}. In a certain experiment, the initial pressures are $P_{NO_2} = 0.122$ bar and $P_{N_2O_4} = 0.453$ bar. Calculate $\Delta_r G$ for the reaction at these pressures and predict the direction of the net reaction.

To solve this, according to change, we us the following equation:

$$\Delta_r G = \Delta_r G^\circ + RT \ln Q$$

where $\Delta_r G$ is the Gibbs free energy of the reaction, at the conditions specified, $\Delta_r G^o$ is the standard Gibbs free energy of reaction, R is the ideal gas constant, T the absolute temperature, and Q the reaction quotient. Plugging the given data in to the equation, one can determine that free energy change for

the reaction is -3.06 kJ / mol and hence:

$$\Delta_r G < 0$$

and we can “predict”, in advance, according to the spontaneity criterion, that the reaction will proceed from left to right to reach equilibrium. The root key to all of this, of course, is that one has previously obtained thermodynamic data tables (or free energy tables) containing the Gibbs free energies of formation for all the necessary reactants in their standard state. This logic, naturally enough, can be scaled up to the human chemical reaction and human synthesis level and is only but a chemical engineering scaling problem.

Chemical bonding

Into the 1850s the theory of valency was developed, showing that certain atoms have a predisposed power or attachment nature to combine with specific other atoms. This logic slowly began to replace the older "hooked atoms" model of bonding. In 1910, American philosopher Mary Mesny stated, on the modeling of human relationship attachments on atomic valency, that: [12]

> “It is a happy thought that certain lovely combinations are **foreordained**, and that these human atoms often meet their mates.”

This was an early statement of human chemical bonding theory.

Social engineering

In 1957, American astrophysicist and engineer John Q. Stewart, head of the Princeton University Department of Social Physics, gave the following opinions: [22]

> “Statesmen of this and other nations … have embarked upon grandiose undertakings where on physical grounds failure was **predictable**, and … failure meant that … people perished in vain.”
>
> “The British and French invasion of Egypt in 1956 would never have occurred if the Eden government had properly appreciated the role of Newtonian mechanics in American history. Any student of social physics could have warned the British that the tradition of this Republic recognizes the existence of principle separate from any given set of circumstances.”

Human thermodynamics

See main: History thermodynamics

In 1952, English physicist C.G. Darwin argued, in his book *The Next Million Years*, that (a) humans are molecules, which he defined as "human molecules", and (b) that statistical thermodynamics or rather statistical thermodynamics could be used to "predict" the next million years of human evolution, a rather bold speculation. [3]

In 2005, American physicist Wayne Angel, in his *The Theory of Society*, outlines a theory he calls "relation thermodynamics", and states that his goal in developing his theory is to:

> “Present a theory of social organization and the means to develop the machinery of historical **prediction**.”

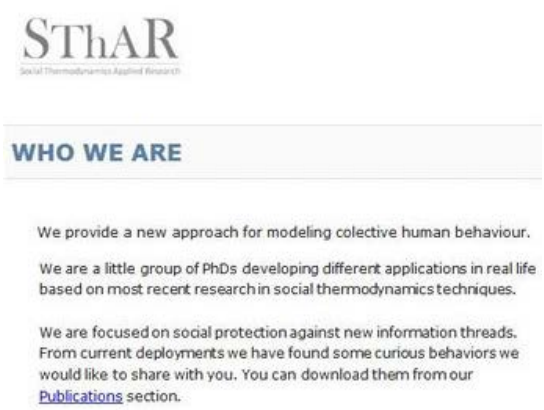

A 2012 screenshot of SThaR.com or "Social Thermodynamics Applied Research" an Italian business consulting company that claims to use thermodynamic principles to **predict** and improve business operations and forecasts.

Business thermodynamics

See main: Business thermodynamics

In the 2004 book *The Entropy Vector*, American engineers Robert Handscombe and Eann Patterson argue that business practice can be facilitated by utilizing entropy logic in operations. In their preface, however, the state that the second law will not be able to play a role in prediction: [10]

> “The second law of thermodynamics on its own will not explain management behavior and would not be able to **predict** ‘what happens next’ by applying it.”

Conversely, Spanish business engineer Gregory Botanes, founder of the 2009 consultant, applied human thermodynamics, company STHAR or “Social Thermodynamics Applied Research” argues that thermodynamics can be used to predict business paths and operations. According to Botanes: [11]

> "Social Thermodynamics Applied Research is the pioneer and world's leader in the application of social thermodynamics universal laws to real business needs, providing public and private companies with a whole new scientific methodology, not only to model their networks, better understand their user's roles and influence but, for the first time, to **predict**, under a non-empirical approach, their future behavior and interactions."

Curiously, both groups reason that thermodynamics can be applied fortuitously to business needs, but only Botanes argues that thermodynamics will actually predict the future of business needs and issues, just as is prediction is done in thermodynamics.

Determinism | Online dating | Human chemical thermodynamics

The hmolscience view of determinism and prediction, wherein humans are specifically defined specifically as "molecules", i.e. human molecules, is captured well by the following 1999 synopsis on "The 'Dynamics' in the Thermodynamics of Binding" by American-born Canadian biophysical chemist Julie Forman-Kay: [2]

> "Whether two molecules will bind is [completely] **determined** by the free energy change (ΔG) of the interaction, composed of both enthalpic and entropic terms."

which, without change, being that this is a universal rule, can be scaled up to the human-human reaction level, to the affect that:

> "Whether two people [human molecules] will bind is [completely] **determined** by the free energy change (ΔG) of the interaction, composed of both enthalpic and entropic terms."

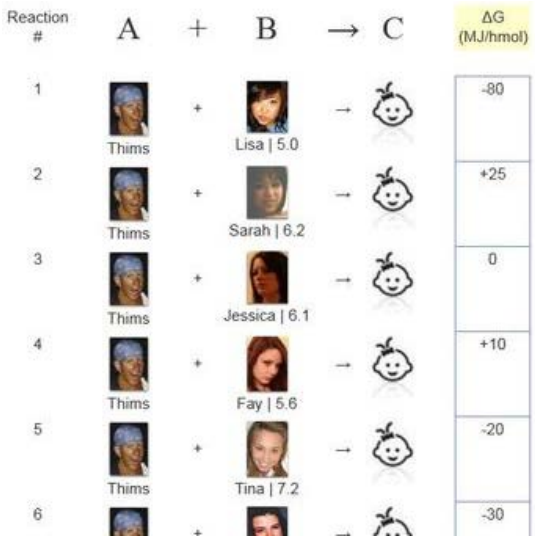

The *circa* 1995 "Thims thought experiment", according to which American chemical engineering student Libb Thims conceptualized his top 19 marriage-potential girlfriends as each having a reaction "potential" quantified by the Lewis inequality: ΔG < 0, analogous to what Goethe conceptualized in 1796 via affinities (see: Goethe-Helmholtz equation: A = -ΔG), according to which the discerning human chemist should theoretically be able to **"predict"** the most-favored human chemical reaction (see: HCR theory) of a given set of potential reactions.

An analysis first worked out by Goethe, in terms of chemical affinities, the precursor to free energy, in 1796 (see: Goethe timeline), the principles of which he latter had to defend himself against stating that they were in fact "true" no matter who wants to raise objection (see: best book).

Historically, although the above logic has yet to be carried through into the testing stage, the first outlines of such logic were introduced in 1995, during which time American electrochemical engineer Libb Thims began to study how the spontaneity criterion could be applied to mate selection, so as to predict the feasibility of any given romantic relationship in love the chemical reaction. Much of this work resulted in the 2007 textbook *Human Chemistry*. [4] To elaborate, by example, given two generic mating reactions, wherein two individuals, A and B or A and C, are hypothetically proposed to pair bond in a marriage potential relationship:

$$A + B \rightarrow AB$$
$$A + C \rightarrow AC$$

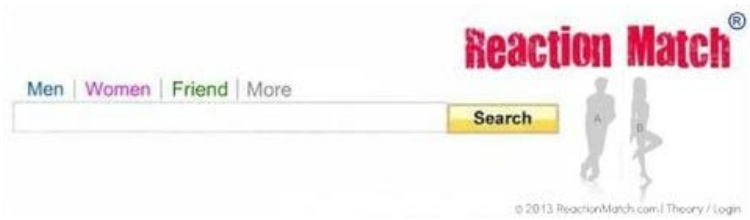

Logo for the the tentative future **prediction**-based dating site portal: ReactionMatch.com, conceived by American electrochemical engineer Libb Thims in *circa* 2007-2009; which went into the stalled-out development stage in circa 2010.

by studying the free energy of each reaction, in the words of Lewis, "it will be possible to state in advance in what direction and to what extent each process can ultimately occur." The logic of using free energy prediction in application in the half-billion-dollar a year dating industry is embodied in the protostage of development site ReactionMatch.com, although this may be something of the very distant future.

Tested theories

In the 1970s, American marriage dynamics mathematical psychologist John Gottman determined stable long-term marriages have a 5-to-1 ratio of attractive-to-repulsive bonding interaction, a ratio now called the Gottman stability ratio, the results of which study were famously published in his 1995 book *Why Marriages Succeed or Fail*. Through low-motion video recordings of human couple interactions, Gottman was able to develop a formulaic methodology that is able to "predict", with 94 percent accuracy, which couples will divorce in the long run and which will stay bonded in the long run. Gottman's models, however, only loosely employ thermodynamics logic. In 1999, for example, he gave his view that: [17]

> "Something like a second law of thermodynamics seems to function in marriage—that is, when marital distress exists, things usually deteriorate (entropy increases)."

In 2010, building on the work of John Gottman, Spanish mathematical economist Jose-Manuel Rey, in his "A Mathematical Model of Sentimental Dynamics Accounting for Marital Dissolution", attempted to formulaically and graphically explain marital dissolution using a metaphorical version of the second law of thermodynamics to indicate outline a model in which "the feeling of attachment in a relationship 'cools down' (thermal word) as time

evolves—unless energy in form of effort is supplied to keep things alive."

Drug-receptor thermodynamics

In the underpinnings of drug-receptor thermodynamics, is affinity or drug receptor affinity, which equates to measurements of 'free energy'. As stated in the opening to 2001, 782-page, tome *Drug-Receptor Thermodynamics* coordinated by senior editor Robert Raffa: [8]

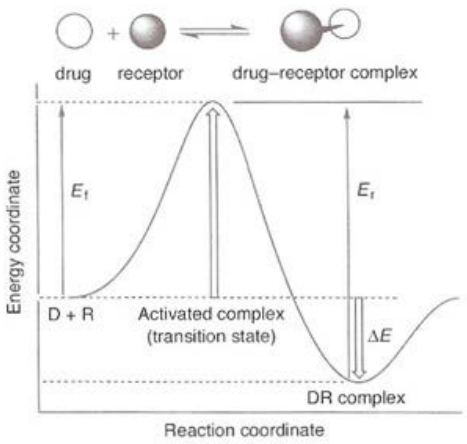

Generic drug-receptor reaction coordinate: showing the decrease in Gibbs free energy of the extent of a spontaneous reaction, meaning that the two reactants have a large positive affinity (graphical depiction of reaction **prediction**). [8]

> "That chemical reactions proceed spontaneously only when the change in a quantity termed the 'free energy' is negative for the reaction as written, and that spontaneity can be ***predicted*** using this construct, is widely known and gives thermodynamics a pragmatic utility that extends to an applied science such as pharmacology."

(add discussion)

Objections

Of curiosity, many new to the subjects of either human chemistry or human thermodynamics, will quick object to the subjects and comment to the effect, possibly seeing the testing of the subjects along something in the theme of Karl Popper's "falsifiability", of "what exactly can these subjects predict", or something along these lines. That human choices can be predicted, overrides the premise of free will, leading to the conclusion that humans have no "choice" in the matter in the first place, which is a disturbing and objectionable view for many. One of the first to raise such an objection, seems to have been American sociologist Edward Ross, who, in 1907 commentary on the human thermodynamics work of Polish economist Leon Winiarski, namely his social mechanics-thermodynamics view of desire as a form of energy (*Essay on Social Mechanics*, 1898), stated in objection:

> "Desire may or may not be a form of energy. In any case it is certain that a mechanical interpretation cannot help to **predict** the choices of people."

Ross seems to base this argument in the view that prediction can be made on the lower animals, whose behaviors are simply stimulus and reaction processes, but that in higher organisms, factors such as memory, psychological energy, consciousness, spontaneous sportive or festive activities, etc., exempt humans from mechanical simplicity. [5]

In the 2009 Moriarty-Thims debate, the questions prediction, quantification, and falsifiability arose. Beginning in about comment #41, American philosopher Aaron Agassi commented:

> "Indeed, what is student heat [see: social heat]? Is it anything like teen spirit? Or is it, or so I gather, a factor of compression and agitation of people in crowds? And is it quantifiable? It just might be. But why would any of that be important or interesting? Perhaps it might even factor into human movement patterns for building designs in situationist applied unitary urbanism. But any of that doesn't validate or even connect application to sociology or politics."

a query to which American electrochemical engineer Libb Thims replied (comment #42):

> "Regarding your question 'why would any of that be important or interesting?', from my point of view (similar to C.G. Darwin), is that of prediction: someone, 200-300 years from now, will be able to predict whether or not any given human chemical reaction will occur, e.g. divorce or 50-years of happy marriage, based on calculated measures of energy and entropy, just as is done with smaller chemical reactions. In other words, in the near future (not likely in our lifetime), people will be able to choose mates intelligently (20-30% rate of divorce at the 15-year mark), rather than willy-nilly (43% divorce rate at the 15-year mark, the current rate)."

In 2011, Irish biochemistry student Ryan Grannell spent a month researching and blogging about human chemistry, one of which was entitled "The Predictions of Human Chemistry", the opening section of which is shown adjacent, in which he attempted to argue that human chemistry is not a science because it does not meet the falsifiability criterion. Grannell gives the following synopsis: [16]

> "In order to verify Thims theories—that thermodynamic equations describe and

July 14, 2011

The Predictions of Human Chemistry

1 Introduction

In a previous discussion with Libb Thims, I told Thims that did not think that Human Chemistry qualified as a Science, because it did not make **predictions**; rather, it was Goethe's Affinities in a Labcoat. He sent me to a link on eoht.info (one of three large Human Chemistry websites I came across) to a page entitled **"prediction"**, which details "the history of **"prediction"** as used in these fields". Here is my analysis of that page.

Before I begin, I will state what we need. In order to verify Thims theories (that the thermodynamic equations describe and **predict** aspects of human relationships being a central one), we will evidence that they are falsifiable, predictive, and have evidence in favour of them.

The page begins off by discussing the idea of affinities as put forth by Etienne Geoffrey in the 1700's; namely, that "all the experiments of chemistry prove that a particular body has more disposition to unite with one body than another". In modern Chemistry, the idea of affinities has been superseded by the Hemholtz and Gibbs free energies, as given below. Free Energy tables can be used to predict what reactions are favourable; I've used them myself on various occasions in my Physical Chemistry practicals.

Equation 1.1. $A = -\Delta G$

Equation 1.2. $A = -\Delta F$

BAG OF MANY THINGS

ABOUT LIBRARY

A student's (valiant) attempt to grasp modern biology, valiantly

The opening section to Irish biochemistry student Ryan Grannell's 2011 blog entry "The Predictions of Human Chemistry", in which he attempt to argue that human chemistry is not a science because it cannot make **predictions** and hence is not falsifiable. [16]

> predict aspects of human relationships—we will need evidence that they are falsifiable, **predictive**, and have evidence in favor of them."

Grannell then goes on to question whether or not Étienne Geoffroy was wrong or not in his 1718 affinity theories, but does note correctly that "in modern Chemistry, the idea of affinities has been superseded by the Helmholtz and Gibbs free energies" (see: thermal theory of affinity → thermodynamic theory of affinity transition); and does correctly state:

> "Free energy tables can be used to **predict** what reactions are favorable; I've used them myself on various occasions in my physical chemistry practicals."

After this, however, Grannell seems to lose focus. At this point, the only question that remains is: are human-human interactions "chemical reactions" yes or no?

If yes, then the methodology of free energy tables can be scaled up to the prediction of reactions between humans, the logic of which being embedded in the form of what are called human free energy tables (see: affinity table page, bottom section, to see how this is done); the first prototypes of this methodology embodied in German polymath Johann Goethe's 1808 human affinity table, with which he used to write a 36 chapter physical chemistry coded novella called *Elective Affinities* in which each chapter a certain human chemical reaction occurs, predetermined by the nature of elective affinities of the interactions (see: *Elective Affinities: Illustrated, Annotated, and Decoded*).

The 14+ pioneers of "human chemical reaction theory" (Goethe, Melko, Adler, Steer, Thims, Hirata, Fink, Hwang, Wood, Jorge, Pati, Wallace, Regalla, and Vedula) would answer the question in the affirmative: that yes human interactions are chemical reactions, in the strict scientific definition of the matter, and as such can be "predicted".

This viewpoint is also corroborated by polls, according to which 66 percent of people answer "yes" to the question: is love a chemical reaction? (2005 poll).

Lastly, to conclude, as of 2002, with the publication of Robert Sterner and James Elser's *Ecological Stoichiometry* textbook, humans are now defined specifically as "abstract molecules", with a specific human molecular formula, of which Sterner and Elser giving the following calculation:

> $H_{375,000}\ O_{132,000,000}\ C_{85,700,000}\ N_{6,430,000}\ Ca_{1,500,000}\ P_{1,020,000}\ S_{206,000}\ Na_{183,000}\ K_{177,000}$
> $Cl_{127,000}\ Mg_{40,000}\ Si_{38,600}\ Fe_{2,680}\ Zn_{2,110}\ Cu_{76}\ I_{14}\ Mn_{13}\ F_{13}\ Cr_{7}\ Se_{4}\ Mo_{3}\ Co_{1}$

and chemical formula about which Sterner and Elser state the following clarification:

> "Organisms can [now] be thought of as complex evolved chemical substances that interact with each other and the abiotic world in a way that resembles a complex, composite, chemical reaction."

This is the modern view of humans as of 2002. If humans are "molecules" that "react" with each other, via what are called human chemical reactions, then like all reactions they are governed by Lewis' "universal rule" of reaction prediction, no exception. Those who would speak of "falsifiability" are simply not grasping the big picture, as Goethe did two hundred years ago. The problem with attempts to set up predictive experiments so to test the various points of view the theories would entail, is that human free energy theory is very a very complex subject, one might say the most advanced and complex subject of all, as is evidenced by the fact that of the 500+ human thermodynamics pioneers, only about 40 are human free energy theorists, a very rarified niche group, requiring the mastery of the language of partial differential equations and chemical thermodynamics, not something easily done, a task in and of itself barricaded by Willard Gibbs' 1876 *On the Equilibrium of Heterogeneous Substances*, the said-to-be most difficult to read, digest, and understand scientific treatise of all time.

Quotes

The following are related quotes:

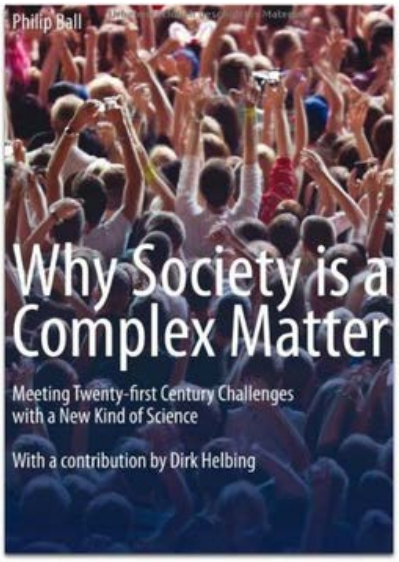

English chemist and physicist Philip Ball's 2012 social physics booklet *Why Society is a Complex Matter*, wherein he argues that science that can help to explain and perhaps even to **"predict"**—a term he uses on twenty-plus pages—social behavior. [20]

> "To **foresee** or to guide the affinities of each several molecule would be for the physicist as great a step in advance as it would be for the registrar-general could he foresee or guide every impulse to wedlock in the United Kingdom."
>
> — Frederic Myers (1896), *Human Personality and its Survival of Bodily Death*

> "As surely as the astronomer can **predict** the future state of the heavens, the sociologist can foresee that process of adaption must go on until in a remote future it comes to an end in proximate equilibrium."
>
> — John Fiske (1902), *Outlines of Cosmic Philosophy* [23]

> "The great regularity and predictability with which men *will* things and the 'choices' of men can be **predicted** by exactly the same techniques we use to predict other natural phenomena."
>
> — George Lundberg (1947) on the question of God and free will in a scientific world [28]

> "The business of social scientists, broadly speaking, is to be able to **predict** with high probability the social weather, just as meteorologists predict sunshine or storm."
>
> — George Lundberg (1947), *Can Science Save Us?* (pg. 38)

> "Pious platitudes doubtless will continue to be heard for some time about the 'unpredictability' of human behavior."
>
> — George Lundberg (1947), *Can Science Save Us?* (pg. 49)

> "Carlyle and the others contend that the knowledge of every act and thought of every individual of a given time must be clearly analyzed, and their permutations understood in order to write history. But by the same token we would never be able to understand the time in which we write. Is a metallurgist in a steel mill debarred from understanding the nature of the processes he himself starts, regulates and controls because he cannot give a graphic chart depicting the actions of ever electron of every atom of all the materials he works with, and therefore cannot **predict** the end results of his operations? But we have gone over this ground before."
>
> — Morris Zucker (1945), *Historical Field Theory* [24]

> "In general, an object in a given force field will, of necessity, behave in a calculable and **predictable** way. For any object, whether a stone, a plant, or a human society, force means movement."
>
> — Mehdi Bazargan (c.1980), note on *Thermodynamics of Humans* [21]

> "It's no mystery why economics is called the dismal science. With most sciences, experts make pretty accurate **predictions**. Mix two known chemicals, and a chemist can tell you ahead of time what you'll get. Ask an astronomer when the next solar eclipse will be, and you'll get the date, time, and best viewing locations, even if the eclipse won't occur for decades. But mix people with money, and you generally get madness. No economist really has any idea when you'll see the next total eclipse of the stock market."
>
> — Tom Siegfried (2006), *A Beautiful Math: John Nash, Game Theory, and the Modern Quest for a Code of Nature* [25]

> "When a chemist **predicts** how molecules will react in a test tube, the molecules are oblivious. They do what they do the same way whether a chemist correctly predicts it or not. But in the social sciences, people display much more independence than molecules do. In particular, if people known what you're predicting you will do, they might do something else just to annoy you."

— Tom Siegfried (2006), *A Beautiful Math: John Nash, Game Theory, and the Modern Quest for a Code of Nature* [25]

See also

â— Physical intelligence

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External links

â— Prediction – Wikipedia.

θΔics

In thermodynamics, **pressure** is a quantity of tension whose conjugated extensity is volume, defined as force per unit area of surface; formulaically:

$$p = \frac{F}{A}$$

The unit of pressure is the Pascal, named after Blaise Pascal. [1] A device for measuring atmospheric pressure is called the barometer.

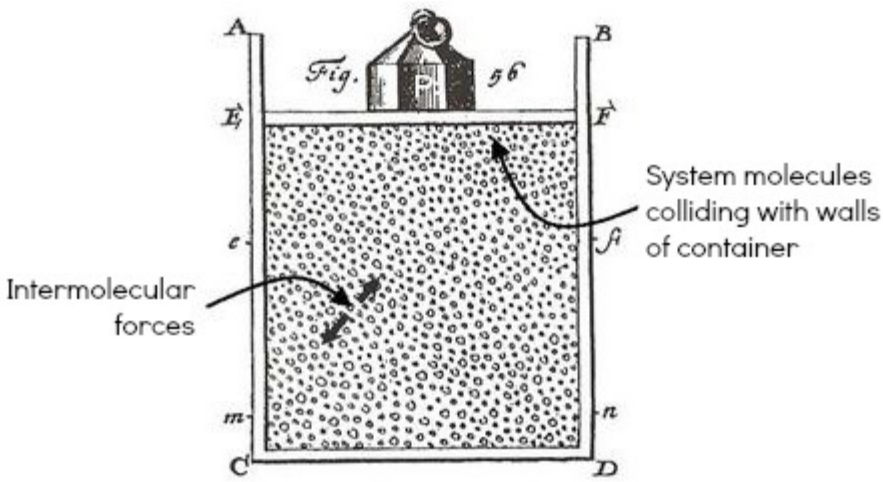

Swiss physicist and mathematician Daniel Bernoulli's 1738 pressure apparatus diagram.

History

In 1643, Evangelista Torricelli, during his investigation into the pump problem, demonstrated the so-called "Torricellian vacuum", so to explain why hand operated water draining pumps stopped working past a depth of about 32 feet. The Torricellian vacuum found that air pressure is equal to the weight of 30 inches of mercury. If air has a finite weight, earth's atmosphere must have a maximum height.

In 1648, Pascal reasoned that if it true, according to the results of the Torricelli vacuum (1643), were that earth's atmosphere must have a maximum height, air pressure on a high mountain must be less than at a lower altitude. He resided near the Puy de Dome mountain, 4,790 feet (1,460 m) tall, but his health was poor so could not climb it.

On 19 Sep 1648, after many months, Pascal convinced Florin Perier, husband of Pascal's elder sister Gilberte, to make the climb; Perier described the results as follows: (Q)

> “At eight o'clock, we met in the gardens of the Minim Fathers, which has the lowest elevation in town. First, I poured 16 pounds of quicksilver into a vessel, then took several glass tubes, each four feet long and hermetically sealed at one end and opened at the other. Then placed them in the vessel of quicksilver. I found the quicksilver stood at 26" and 31⁄2 lines above the quicksilver in the vessel. I repeated the experiment two more times while standing in the same spot. They produced the same result each time. Taking the other tube and a portion of the quicksilver, I walked to the top of Puy-de-Dôme, about 500 fathoms higher than the monastery, where upon experiment, and found that the quicksilver reached a height of only 23" and 2 lines. I repeated the experiment five times with care. Each at different points on the summit, found the same height of quicksilver, in each case.”

In 1738, Daniel Bernoulli, in his *Hydrodynamica*, described pressure of a gas as being due to the bombardment of the particles of the wall of the containing vessel; he defined pressure as follows: [3]

> “The weight *P* holding down the piston in [a given] position is the same as the weight of the overlying atmosphere, which we shall designate *P* in what follows.”

(add)

Human systems

The translation and understanding of the standard definition of pressure in systems of human molecules is a very difficult subject, as is the case with heat, temperature, and volume. Standard atmospheric barometers, for instance, are

not designed or capable of measuring subtle human system pressures, such as to account for phenomena such as variations in territory densities or high school cafeteria seating distributions of alpha-, beta-, and gamma- males and females. [2]

Quotes

The following are related quotes:

> "The weight of air on the earth's surface is as great as the weight of water about 20 Magdeburg cubits deep. In other words, if water should rise 20 cubits above the earth's surface, the pressure it would exert on all things beneath is the same as the pressure of air."
>
> — Otto Guericke (1663), *Magdeburg Experiments on the Vacuum of Space* (pg. 113)

See also

- Economic pressure
- Social Pressure

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External links

- Pressure – Wikipedia.

θΔics

In thermodynamics, **pressure volume work**, or PV work, is the work done when a body expands outward, typically through the addition of heat to the body, against the surrounding atmosphere, quantified by the measure of the pressure *P* of the body multiplied by the change in volume *dV* :

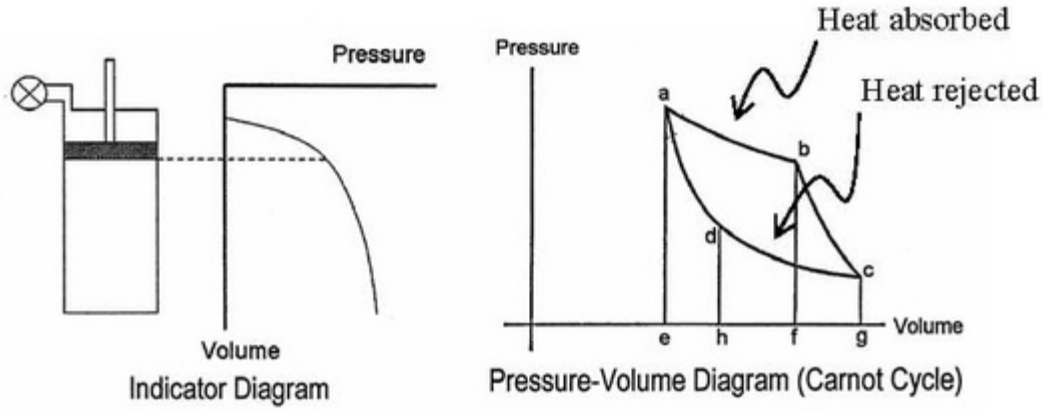

The graphical nature of **pressure volume work**, signified by the area of region abcd, was conceived when in the 1830s French physicist Emile Clapeyron began to use the indicator diagram, invented in 1796 by Scottish engineer James Watt and his employee John Southern, to quantify the mechanical work of the steam.

$$\delta W = PdV$$

whereby upon integration of the definite integral:

$$W = \int_{V_i}^{V_f} P\,dV$$

equates to:

$$W = P\Delta V = P\,(V_f - V_i)$$

whereby the system pressure and initial and final volume give solution to the calculation of pressure volume work.

Derivation

See main:
dW = PdV

To derive the equation for pressure volume work, we start with the standard definition of pressure, loosely deriving from Dutch-born Swiss physicist Daniel Bernoulli's 1738 book *Hydrodynamica*, as force per unit area:

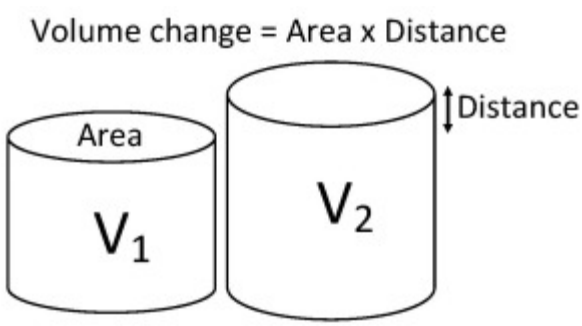

A 2011 derivation overview of **pressure volume work**, with a human example application from the 2004 film *Mean Girls*, by Libb Thims.

$$P = \frac{F}{A}$$

whereby

$$F = PA$$

We then substitute this into French physicist Gustave Coriolis' 1829 principle of the transmission of work:

$$W = Fd$$

where mechanical work *W* is equal to the force *F* moving a point of mass through a unit of distance *d*, whence we have:

$$W = (PA)d$$

In the case of a geometric body of a piston and cylinder, as shown adjacent, the area *A* of the cylinder moved upwards through a distance d gives the change in the volume *V* of the working body of steam, whereby the pressure volume work is thus:

$$W = PV$$

or in Neumann notation:

Ä‘W = PdV

where the d-crossbar Ä‘ derivative signifies that the work in this case is an inexact derivative.

History

The general formulation of pressure volume work was introduced in 1834 by French physicist Emile Clapeyron. [1]

References

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External links

â— Pressure-volume work – Wikipedia.
â— Pressure volume work – CityCollegiate.com.

θΔics

In human chemistry, **Preston John MacDougall** (1961-) is a Canadian-born American chemist noted for his 2006 Gibbs and Goethe connection.

Overview

In 2006, MacDougall, in his Valentine's day article "Chemical Eye on Love", touched on German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*, speculating that this book is the origin of the colloquial phrase "the chemistry between them is magical", but then, of interesting note, attempts to upgrade the Goethean chemistry model in thermodynamic terms as follows: [1]

> "To revisit this long-lost sentimentality, I would like to chemically paraphrase John Lennon's famous theorem ["all you need is love", 1967 (Q)]. First, however, I need to tell you that the most important thing about chemical reactions is that they try to reach *equilibrium*. Or, to put it in thermodynamic terms, when they occur in the open, they seek to minimize their Gibbs energy, which is universally given the symbol capital G. Graphically, and truthfully, one can say that reacting molecules spontaneously find the lowest spot on their G-curves ["G-spot" (Q) pun]. Getting back to the Beatles, perhaps the love you take is in equilibrium with the love you make?"

Very interesting section here indeed, as very view people, historically, have been able to make a connection between Goethe's affinities and Gibbs free energies, although the two were proved to be thermodynamically equivalent in 1882, via the Goethe-Helmholtz equation, by German physicist Hermann Helmholtz. MacDougall then gives the following excerpt:

> "Closer to home, children are both the product of love, and seemingly able to spontaneously generate it, even where none existed before. This is a feat that chemists are unable to rise to, as atoms are never created nor destroyed during chemical reactions."

This seems to be an "I'm just making a fun analogy" type of "people are not chemicals" footnote.

Education

MacDougall completed his BS in chemistry and PhD, dissertation "The Laplacian of the Electronic Charge Distribution" (1989), at McMaster University, Canada. In 1994, MacDougall became a chemistry professor at Middle Tennessee State University.

Chemical Eye

In 2004, MacDougall began writing a "Chemical Eye" column series, published by the Alaskan online newspaper *Stories in the News*, themed on the overlap of chemistry and public affairs, such as politics, sports, global warming, etc. [3] His commentaries are also featured in the Arts and Public Affairs portion of the Murfreesboro/Nashville NPR station WMOT.

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Further reading

- Lederman, Lynne. (2008). "Profile of Preston J. MacDougall", *BioTechniques*, 45(3): 211, Sep.

External links

- Preston MacDougall (contact) (faculty) – Middle Tennessee State University.
- Preston MacDougall – Twitter.

θΔics

In existographies, **Priestley Unbeliever** (c.1720-1800), aka an anonymous "Mr. Hammon", later said to be English chemist-physician Matthew Turner (Q), or possibly two authors combined, refers to the 1782 author of *Answer to Dr. Priestley's Letters to a Philosophical Unbeliever*, an atheist response to Joseph Priestley's 1772 *Institutes of Natural and Revealed Religion* and or his 1780 *Letters to a Philosophical Unbeliever*. [1]

Quotes | By

The following are quotes by the Priestly Unbeliever:

> "As to the question whether there is such an existent being as an atheist, to put that out of all manner of doubt, I do declare upon my honor that I am one."
>
> — Priestly Unbeliever (1782), *Answer to Dr. Priestley's Letters to a Philosophical Unbeliever*

References

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θΔics

In thermodynamics, **Prigogine entropy** is an oft-used term referring to the splitting of entropy into two variables, one being that which is "exchanged" (d_eS) with the surroundings and the other being a result of "internal" (d_iS) processes: [1]

$$dS = d_eS + d_iS$$

This expression is sometimes referred to as the "Prigogine entropy equation". [2] This equation was formulated by Belgian thermodynamicist Ilya Prigogine in his 1945 *Study of the Thermodynamics of Irreversible Phenomenon*. This new function results, according to Prigogine, because: [3]

> (a) The entropy of a system is an extensive property: if the system consists of several parts, the total entropy is equal to the sum of the entropies of each part.
> (b) The change in entropy can be split into two parts: denoting *deS* as the flow of entropy, due to interactions with the exterior, and *diS* the contributions due to changes inside the system.

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(b) Prigogine, Ilya. (1955). *Introduction to Thermodynamics of Irreversible Processes*, (pg. 16). New York: Interscience Publishers.

θΔics

In thermodynamics awards, the **Prigogine Medal** or "Prigogine Award" is a prize given to researchers in the field of systems ecology, who tend towards the use of Prigogine thermodynamics in theory development. [1] The prize was initiated in 2004 and named after Belgian chemist Ilya Prigogine, for the influence that his work in nonequilibrium thermodynamics has had in the development of ecological systems. The naming of the Prigogine Medal is based on the logic, according to Wessex Institute director Argentinean-born English engineer Carlos Brebbia, that: [2]

> "Prigogine's ideas established the basis for ecological systems research."

The award is divided between one senior and one junior recipient. The prize consists of a gold medal and a cash sum off 10,000 Euros ($12,000 USD) to the senior winner and 5,000 Euros ($6,000 USD) to the junior winner. The monetary premium has only been awarded for the first couple of recipients. The 2007 winner Robert Ulanowicz, for example, received only the medal.

The two medals are jointly awarded by Siena University, Italy and the Wessex Institute of Technology, United Kingdom. [3] The face of the Prigogine Medal is pictured adjacent, having what seems to be a bifurcation point.

List

A listing of winners is shown below: [6]

Year	Recipient (senior)	Plenary lecture
2004	Sven Jørgensen	
2005	Enzo Tiezzi	
2006	Bernard Patten	
2007	Robert Ulanowicz	
2008	Ioannis Antoniou	
2009	Emilio Del Giudice	"The interplay of Quantum Field Theory and Thermodynamics of Irreversible Processes as a conceptual basis for Biology and Ecosystem Dynamics."
2010		

History

The first prize was awarded to Danish ecologist Sven Jørgensen for his contribution to evolutionary thermodynamics by his use of the concept of exergy to give a deeper understanding of ecosystem reaction and evolution. In particular, through his numerous publications, Jørgensen has worked to introduce exergy as a goal function in ecological models. [4]

The 2007 award went to American chemical engineer Robert Ulanowicz for his theories on the thermodynamics of

ecology. The 2008 award when to Ioannis Antoniou, a former PhD student of Prigogine, for his work in systems ecology. [5]

References

1. Prigogine Awards – The Prigogine Lectures, University of Siena.
2. Prigogine Award Ceremony – at the 2007 Urban Transport Conference, Wessex Institute of Technology.
3. Jimenez, Anisa S. (2006). "Institute of Ecology professor to receive Senior Researcher Prigogine Medal - in recognition of UGA career", *News Bureau*, The University of Georgia.
4. Author. (2004). "Professor Jorgensen wins the 1st Prigogine Prize" in *International Lake Environment Committee News Letter*, No. 45, March.
5. Author. (2008). "Opening Addresses and the Prigogine Award", Wessex Institute of Technology. *Sept. 24-26.*
6. Prigogine Award (winners) – The Prigogine Lectures, University of Siena.

θΔics

In thermodynamics schools, the **Prigogine school** refers to the theories and ideas surrounding the work of Belgian chemist Ilya Prigogine and his so-called "disciples". The Prigogine school, so to speak, is a subset, branch-off, or precipitate of the Belgian school or rather Brussels school of thermodynamics.

Further reading

● Prigogine, Ilya. (2003). *Is the Future Given?* (Prigogine's school of Non-Equilibrium Physics, pg. 82). World Scientific.
● Luisi, Pier L. (2006). *The Emergence of Life: from Chemical Origins to Synthetic Biology* (Prigogine school, pg. 107). Cambridge University Press.
● Ramirez, Rafael, Selsky, John W., Heijden, Kees Van Der. (2010). *Business Planning for Turbulent Times* (Prigogine school, pg. 82). Earthscan.

θΔics

In hmolscience, **Prigogine-Waime theory**, "Prigogine-Wiame principle" or "minimum entropy production" principle (Adams, 1988), holds that the thermodynamics of linear irreversible processes apply to ontogenesis, such that the growth of the organism is a process of continuous approach of the organism to a final stationary state (adulthood), accompanied by a decrease of the specific rate of entropy production of the specific dissipation function:

$$\Psi = q$$

where q is either heat production and or respiration. [1]

Overview

In 1946, Belgians chemist Ilya Prigogine and cellular geneticist Jean-Marie Wiame, supposedly, following the 1931 work of Lars Onsager, introduced the principle; the abstract of which is as follows: [2]

> "The thermodynamic study of systems in which stationary (non-equilibrium) states were possible, led one of us (I. P.) to a number of general conclusions. In the present paper these conclusions are summarized and briefly discussed from a biological standpoint. It appears that the evolution of such systems is towards states with the least production of entropy (per mass unit) compatible with the conditions imposed. In the case of living matter this corresponds approximately to states of minimum metabolism. During this evolution the entropy contained in the system may decrease whilst the heterogenity increases. But this increase in heterogenity can only take place when there is a decrease in the entropy production, that is an evolution of the metabolism. We are thus led to suggest a physicochemical interpretation of Lamarchism. Finally we call attention to the fact that the moderation principle of Le Chatelier-Braun is not limited to equilibrium states."

The following is a rephrased version:

> "The **theorem of minimum entropy production** expresses a kind of 'internal' property of nonequilibrium systems. When given boundary conditions prevent the system from reaching thermodynamic equilibrium, i.e. zero entropy production, the system settles down in the state of 'least dissipation'."
>
> — Ilya Prigogine (1980), *From Being to Becoming* (pg. 88); cited by Richard Adams (1988) in *The Eighth Day* (pg. 43)

Russian biophysicist Alexander Zotin in 1972 asserted that available date for rates of heat production and respiration in various animals supported the Prigogine-Waime hypothesis.

Spelling

Of note, Jean-Marie Wiame's last name is some-times misspelled as "Waime". American anthropologist Richard Adams, for instance, has promoted the theory in several of his works (1988, 2004) with the mis-spelling. [3]

See also

â— Robert Balmer

References

1. Brooks, Daniel R. and Wiley E.O. (1988). *Evolution and Entropy* (pg. 111). University of Chicago Press.
2. Prigogine, Ilya and Wiame, Jean M. (1947). "Biologie et Thermodynamique des Phenomenes Irreversibles" (abs), *Experimentia*, 2:451-53.
3. (a) Adams, Richard N. (1988). *The Eight Day: Social Evolution as the Self-Organization of Energy* (pg. 43).

University of Texas Press.
(b) Adams, Richard N. (2004). “article”, in *Encyclopedia of Energy: A-Ea* (pg. 749). Elsevier.

θΔics

In thermodynamics, **Prigoginean thermodynamics** is an oft used synonym for the branch of thermodynamics developed, during the years 1945 to 1985, by Belgian chemist Ilya Prigogine, of the Brussels school. [1] The essential outline of Prigoginean thermodynamics, as it is used presently, is contained in the 1955 *Introduction to Thermodynamics of Irreversible Processes* and the 1977 *Self-Organization in Non-Equilibrium Systems: From Dissipative Structures to Order Through Fluctuations.* [2] Prigoginean thermodynamics is often referred to, in other synonymous terms, as open systems thermodynamics, thermodynamics of irreversible phenomenon, far-from-equilibrium thermodynamics, non-equilibrium thermodynamics, Prigoginean nonequilibrium thermodynamics, among others. Subjects include the topics "bifurcations" of "fluctuations".

References

1. (a) Irsigler, F.J. (1994). “Prigoginean Thermodynamics and the Human Brain”, *Mankind Quarterly*, XXXIV: 3, Spring, pgs. 155-74.
(b) MetaPress. (1991). *World Futures*, (pg. 200). Gordon and Breach.
2. (a) Prigogine, Ilya. (1955). *Introduction to Thermodynamics of Irreversible Processes*, (pg. 92). New York: Interscience Publishers.
(b) Nicolis, G. and Prigogine, Ilya. (1977). *Self-Organization in Non-Equilibrium Systems: From Dissipative Structures to Order Through Fluctuations.* Wiley.

θΔics

In thermodynamics, **Prigogine's disciples** refers to people influenced so much so by the work and theories of Belgian chemist Ilya Prigogine that they are considered his "disciples" or followers. In fact, according to his 2003 obituary article in *Nature*, in his lifetime Prigogine "attracted numerous disciples". [1] The following is example 1982 quote giving an idea of the reality of this term: [2]

> "This interpretation [Rifkin's] is simplistic in the eye's of **Prigogine's disciples**, one of whom, the philosopher Edgar Morin, has contemptuously described it as something extracted from the 'thermodynamic Vulgate'"

Below is another 2008 quote from the Wessex Institute of Technology: [3]

> "The Prigogine Medal to honor his memory is awarded annually to a leading scientist in the field of ecological systems. All recipients so far have been deeply influenced by the work of **Prigogine**, to the point that they could justly be called his **disciples**."

Ervin Laszlo has been self-described or designated by others as a disciple of Prigogine. Belgian physicist Radu Balescu states that he had the privilege of being "one of Prigogine's oldest disciples". [4] Austrian astrophysicist Erich Jantsch has been described as "Prigogine's most famous disciple and interpreter." [5]

Benard cells

Supposedly, to know if one is a disciple of Prigogine, a reader need only note the significance put on Bénard cell convection: [6]

> "Bénard convection, a sort of whirlpool, is constantly quoted by **Prigogine** and his **disciples**."

Many people, such Chilean philosophers Humberto Maturana and Francisco Varela, are also considered as "followers" of Prigogine. [7] The following quote gives an example of the use of this term: [8]

> "Dissipative structures certainly do exist in nature. The example cited *ad nauseam* by the **followers** of **Prigogine** is the so-called Bénard cell."

Others | With disciples

â— Sigmund Freud
â— Leslie White

References

1. Anon. (2003). "Obituary: Ilya Prigogine (1917-2003)", *Nature*, 424: 30, Jul 03.
2. Fernández-Galiano, Luis. (2000). *Fire and Memory: On Architecture and Energy* (pg. 113). MIT Press.
3. Anon. (2008). "The Sustainable City 2008: Fifth International Conference on Urban Regeneration and Sustainability", *Wessex Institute of Technology*.
4. Rice. Stuart A. (2007). *Special Volume in Memory of Ilya Prigogine: Advances in Chemical Physics*, Vol. 135. (pg. 3). Wiley.
5. (a) Ching-Yao, Hsieh, Ye, Meng-Hua. (1991). *Economics, Philosophy, and Physics* (pg. 127). M.E. Sharpe.
(b) Capra, Fritjof. (1988). *Uncommon Wisdom: Conversations with Remarkable People* (pg. 84). Simon & Schuster.
6. Redclift, M.R. and Woodgate, Graham. (1995). *The Sociology of the Environment, Vol. 3* (pg. 50). E. Elgar Pub.
7. Rabinovitz, Lauren and Geil, Abraham. (2004). *Memory Bytes: History, Technology and Digital Culture* (pgs. 58, 59,

74). Duke University Press.
8. Corning, Peter A. (2003). *Nature's Magic: Synergy in Evolution and the Fate of Humankind* (pg. 284). Cambridge University Press.

θΔics

In human chemistry, a **primary field particle** is a gauge boson, i.e. gluons, photons, W and Z bosons, and gravitons, that act as force carriers. [1]

See also

- Secondary field particle

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (pg. 202-03). Morrisville, NC: LuLu.

θΔics

In human chemistry, **Primo Levi** (1919-1987) was an Italian chemist noted for his 1975 book *The Periodic Table*, a type of literature chemistry book, which is comprised of twenty-one chapters, each chapter with the name of an element (of the periodic table) that either plays a role in that particular chapter or exhibits characteristics that are said to be "metaphorically descriptive of human relationships" portrayed in that chapter, with the last chapter "Carbon" said to the most impactive. [1]

Both English physicist and chemist Philip Ball and American science-infused literature critique Bruce Clarke have commented in detailed review on the implications and underlying messages and humanistic content of Levi's *The Periodic Table*. [2]

Atheism

Levi was Jewish-questioning teen, turned existence-long atheist (Q), who, amid is 1944 WWII gas chamber experiences, self-classified (Q) as a "non-believer". [3]

Quotes

The following are noted quotes:

> "Silence slowly prevails and then, from my bunk on the top row, I see and hear old Kuhn praying aloud, with his beret on his head, swaying backwards and forwards violently. Kuhn is thanking god because he has not been chosen. Kuhn is out of his senses. Does he not see Beppo the Greek in the bunk next to him, Beppo who is twenty years old and is going to the gas chamber the day after tomorrow and knows it and lies there looking fixedly at the light without saying anything and without even thinking anymore? Can Kuhn fail to realize that next time it will be his turn? Does Kuhn not understand that what has happened today is an abomination, which no propitiatory prayer, no pardon, no expiation by the guilty, which nothing at all in the power of man can ever clean again? If I was god, I would spit at Kuhn's prayer."
>
> — Primo Levi (1959), *If This is A Man*; in: Christopher Hitchens' *The Portable Atheist* [3]

See also

- Mala Radhakrishnan
- Johann Goethe

References

1. Levi, Primo. (1975). *The Periodic Table.* Einaudi (Italian); Schoken Books (English).
2. Ball, Philip. (2008). "Literary Reactions: Chemistry makes Occasional Appearances in Fiction by Rarely takes Centre Stage: Philip Ball Unearths Chemistry's Fictional Roles." *Chemistry World*, Dec. 46-49.
3. Hitchens, Christopher. (2007). *The Portable Atheist: Essential Readings for the Nonbeliever, Selected and with Introductions by Christopher Hitchens* (pg. v). De Capo Press.

External links

- The Periodic Table (book) – Wikipedia.

θΔics

In science, **primordial soup** or "primordial ocean" is amalgamation reference term tending to capture the gist ideas of Charles Darwin's 1871 warm pond model and the lightning origin of life theory, and, in some depictions, the older meteoroid origin of life theory.

Etymology

The term "primordial soup" was, supposedly, introduced in 1924 by Russian evolution theorist Alexander Oparin.

In 1932, English biochemist (chnopschemist) John Haldane, in his *The Causes of Evolution*, Haldane postulated that, some two billion years ago, something of microscopic size separated from the 'hot thin soup'.

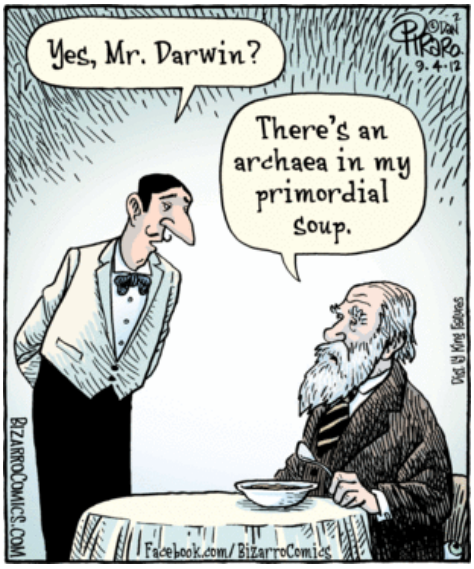

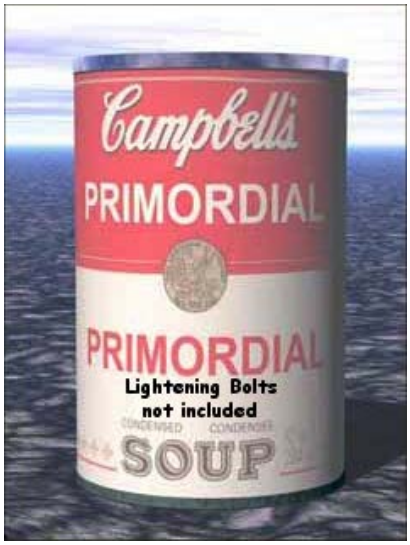

Left: A 2012 cartoon of Charles Darwin eating a bowl of **primordial soup** and asking the waiter if there is any archaea in his soup? (Ñº) Right: a 2012 can of primordial soup labeled with the subtitle "lightning bolts not included". (Ñº)

Images

The following, stemming from American mRNA researcher James Brown's homepage (2011), a Campbell's Soup parody of the primordial soup model, with humorous instructions for cooking or rather heating: (Ñº)

(add discussion)

External links

â— Primordial soup – Wikipedia.

θΔics

In science, **primum frigidum** was a hypothetical elementary substance, conceived by Greek philosopher Parmenides, which was postulated to be the source of all cooling or cold in the world. [1]

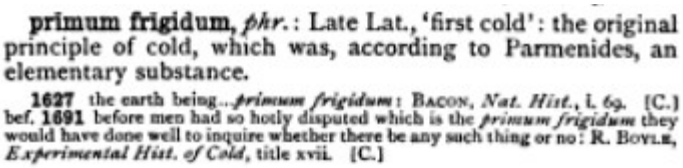
primum frigidum, *phr.*: Late Lat., 'first cold': the original principle of cold, which was, according to Parmenides, an elementary substance.

1627 the earth being... *primum frigidum*: BACON, *Nat. Hist.*, i. 69. [C.] bef. **1691** before men had so hotly disputed which is the *primum frigidum* they would have done well to inquire whether there be any such thing or no: R. BOYLE, *Experimental Hist. of Cold*, title xvii. [C.]

1892 dictionary definition of *primum frigidum*. [3]

In 1627, Francis Bacon produced thinking to write about primum frigidum. Likewise, Pierre Gassendi reasoned that nitre was primum frigidum.

The first exhaustive study of the legitimacy of primum frigidum seems to have been done in 1665 by Robert Boyle. [2] From his researches, Boyle concluded that neither air, nor earth, nor nitre, nor water could be the principle of cold and that a primum frigidum was an "unwarrantable conceit." [1]

References

1. Shachtman, Tom. (1999). *Absolute Zero and the Conquest of Cold* (pg. 28-29). Mariner Books.
2. Boyle, Robert. (1665). *New Experiments and Observations Touching Cold*. Publisher.
3. Stanford, John. (1892). The Stanford Dictionary of Anglicised Words and Phrases (pg. 651). University Press.

θΔics

In hmolscience, **Princeton Department of Social Physics**, or “Princeton social physics project” (Ñº), or "social physics school", in demographics, or "Princeton school" in general, was a *circa* 1939 to 1955 social physics and social mechanics research group ran at the physics department of Princeton University, under the organization direction of American astrophysicist and engineer John Q. Stewart with $160,000 (modern-terms) grant funding from the Rockefeller Foundation (per approval [and later disapproval] of Warren Weaver).

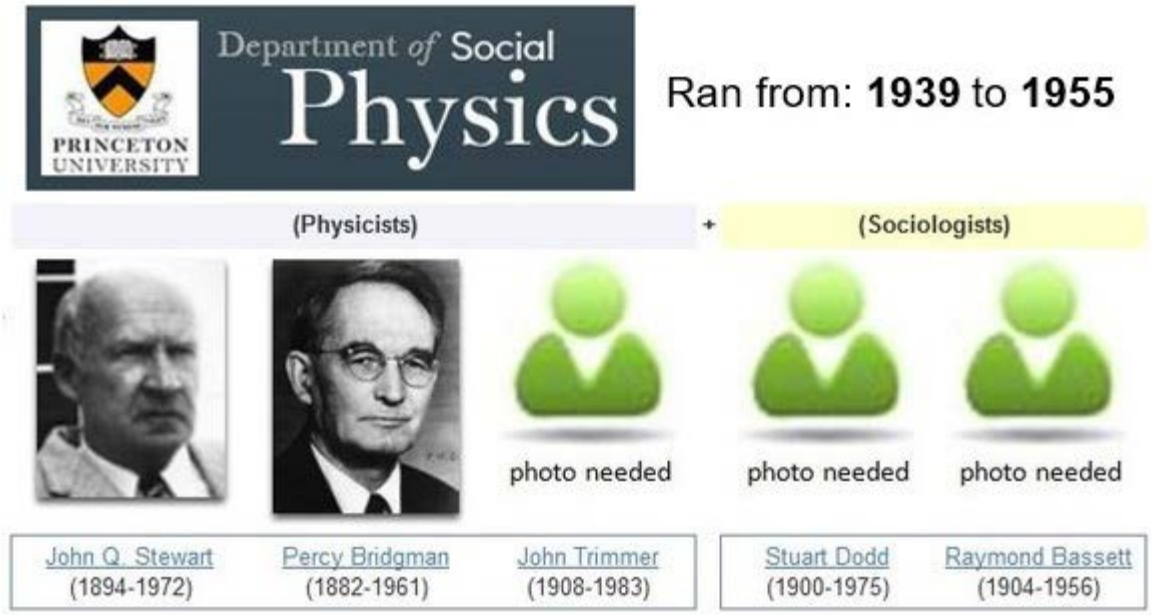

From *circa* 1945 to 1955, at the **Princeton University Physics Department**, American astrophysicist and engineer John Q. Stewart, ran a Rockefeller Foundation grant-funded social physics **and social mechanics** applied research group. [25]

Overview

The Princeton social physics project is well-summarized well by *Princeton Alumni Weekly*, in their 1955 “Social Physics” article on Stewart, as follows: [1]

> “In the early phase of their efforts, Professor Stewart and his colleagues in this enterprise confined their efforts to mass human relationships. They treated large aggregates of individuals as though they were composed of social molecules, without attempting to analyze the behavior of each molecule. They then attempted to describe demographic, economic, political, and sociological situations in terms of such physical factors as time, distance, mass, and numbers of people.”

(add)

Social gravity

In 1939, American astrophysicist and engineer John Q. Stewart began working with various people on developing Newtonian-like social gravitation "population potential" diagrams and models, to gauge "demographic energy" as he called it. This seems to have been the precursor to his eventual “Princeton social physics project” as he called it, centered in various offices of Princeton University.

Inception

In 1950, John Q. Stewart gave the first public announcement of what seem to be the beginnings of his social physics group: [11]

> “A notable little conference was held in Princeton October 12 and 13, 1949, with aid from The Rockefeller Foundation. Subjects included were mathematics, statistics, physics, astronomy, physiology, sociology, economics and marketing, philology, and history.”

In 1951, a *Princeton Alumni Weekly* excerpt, contained the following wherein Stewart announced that he had received a three-year Rockefeller foundation study grant: [1]

> "As I am going to be the beneficiary of the class's generosity in providing the Memorial Room, I want to at least mention the occasion to you. We are having a conference on social physics (I have a Rockefeller Foundation grant for three years for the study) March 29 and 30 and a number of participants will enjoy the room … At an early stage in planning the session on natural law, I found support and sympathy from two of the lawyers of the class, namely Ted Parsons and Dwight Sullivan."

Princeton alumni Winthrop H. Battles commented on the conference:

> "The conference included notables from other universities and organizations, many professors and associate professors from Princeton, and representatives from other institutions and organizations either associated with Princeton or in the Princeton area. Some undergraduates were also invited to participate. We were glad that we were able to provide the meeting place for this important occasion and that one of our class—John Q. in person—is such an active participant."

The *Princeton Alumni Weekly*, that year, was beginning to describe Stewart as the "director of the University's Social Physics Project". [10]

Research team

The Princeton social physics group was organized by American astrophysicist and engineer John Q. Stewart (1894-1972). Stewart, in spite of what has been referred to as the "gravest skepticism" on the part of some of his contemporaries, a theme common to this field (see, e.g., *Elective Affinities* (enemies), human thermodynamics (objectors), detractors, Libb Thims (attack), etc.), worked to assemble the following noted group of social and physical scientists: sociologist Stuart Dodd (1900-1975), known for his work in mathematical sociology and for articles such as his 1951 "Scientific Methods in Human Relations", sociologist Raymond Bassett (1904-1956), chairman of the department of sociology at the University of New Hampshire, and physicist John Trimmer (1908-1983), noted for his 1955 "Measurement as a Human Activity", an attempt at making consciousness-measuring instruments,

Discussion Questions II-9

One statement of the second law is that a physical system naturally evolves toward redistributing its energy equally among all of its parts. Zachary Hatch, of the class of 1991 of Princeton University, has proposed that the historical dissolution of empires—in which political power is first consolidated into large, centralized regimes and then ultimately dispersed into many smaller nation-states—can be understood on the basis of the second law of thermodynamics. For example, the end of World War II brought the end to Hirohito's Japan, the modern version of the feudal empire that had existed for hundreds of years. China, too, saw its several-thousand-year-old dynasty fall and be replaced with a socialist state. Recently, we have witnessed the disintegration of the Union of Soviet Socialist Republics. Do you think this application of the second law is justified? If so, what corresponds to the energy of the system? What is the political or social process that corresponds to molecules' bumping into each other and thereby redistributing and sharing the total energy? Does such a process have the needed element of randomness? What corresponds to a state and a configuration of the system? Would the second law, if applicable, preferentially lead to a capitalist or to a socialist society? If true, how would this theory reconcile itself with the *formation* of empires?

One of American physicist Alan Lightman's 1992 set of homework problems / discussion questions was based on Princeton student Zachary Hatch's circa 1991 theory about the thermodynamics underpinnings of the the rise and fall of civilizations; ideas of which have been produced prior to him by Henry Adams and after him by Thomas Wallace. [13]

Among Stewart's team, of interesting note, was the great physicist Percy Bridgman (1882-1961), one of the top ten thermodynamicists of the 20th century (known for exactingly and methodically-derived Bridgman equations of thermodynamics), who related to social physics was on of the more outspoken participants at the 1946 Harvard University "what is life—in terms of physics and chemistry—debate", wherein what has come to be known as the

"Bridgman paradox" resulted, which has been summarized by French-born American physicist Leon Brillouin as follows: [4]

> "How can we compute or even evaluate the entropy of a living being? In order to compute the entropy of a system, it is necessary to be able to create or to destroy it in a reversible way. We can think of no reversible process by which a living organism can be created or killed: both birth and death are irreversible processes. There is absolutely no way to define the change of entropy that takes place in an organism at the moment of death."

Brillouin defined this as the so-called "paradox of Bridgman", about which we should, in modern terms, compare also American physical chemist Martin Goldstein's 1993 entropy of a mouse chapter subsection, which gives led into modern human free energy theories of human synthesis. [5]

Utility | Aim

The general aim of the Princeton social physics group seems to have been directed at the productive education of humanities students so that better decision "physical science" grounded decision making might result, whereby accordingly a more robust society might result. The following quote by Stuart might well capture this vision, particularly in regards to the education of future leaders, possibly in the same way that Alexander the Great was educated by Aristotle:

> "Statesmen of this and other nations … have embarked upon grandiose undertakings where on physical grounds failure was predictable, and … failure meant that … people perished in vain."

(add)

Departmental divide | Issues

In regards to the departmental divide issue (see: two cultures department), the following synopsis is quite telling: [1]

> "[Stewart] has irritated the social scientists further by criticizing them for immaturity, lack of imagination and 'doctrinaire departmentalism'. Overspecialization, he feels, is choking modern scholarship and limiting man's communication with his fellows."

Similarly, as French physicist Serge Galam, who has attempted a similar project in France, reports, in his 2004 "Sociophysics: a Personal Testimony", such an effort is not without several decade's of resistance and opposition to the premise of a field in which a person is defined as an atom or a molecule, which comes from someone in France, the least religious country in the world. [9]

This is a problem that is ripe up to the present day, even between very close department, such as physics and chemical engineering, such as evidenced in the 2009 Moriarty-Thims debate on entropy being applicable or not applicable to student arrangements; or is evidenced more-so between the philosophy and anthropology department on thermodynamic questions applied to mind and life in regards to non-reductive materialism theories of emergence that bubbled to the point of legal action in the 2011 Juarrero-Deacon affair.

Princeton social mechanics | Early history

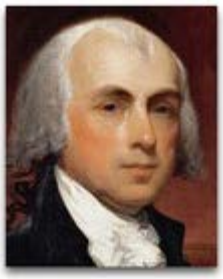

James Madison (1751-1836)

John Witherspoon (1723-1794)

Woodrow Wilson (1856-1924)

Christopher Hirata (1983-)

Stewart commented in a 1955 interview that for thirty years, he had "harbored a deep-seated desire to find some order in the social sciences comparable to that in the physical sciences", which dates his interest in social mechanics to 1925, which would have occurred a few years following his education at Princeton, having completed his BS in 1915 and and PhD in 1919 both at Princeton University.

Stewart also credits a number of Princeton alumni as having been prototype social physicists. The early history of social mechanics or social physics, depending on classification scheme, according to Stewart, dates as far back as 1769 when American political theorist James Madison (1751-1836), the so-called "father of the constitution" and America's fourth president, was said to be studying a primitive form of social physics a Princeton. [6] Madison, as Stewart points out, was a student of Scottish-born American John Witherspoon (1723-1794) a signatory of the Declaration of Independence and 6th president of Princeton University, who in turn was a noted interpreter of the political philosophy of French theorist Charles Montesquieu, notable for his "hot climates" / "cold climates" theory of human behavior, who in turn had been deeply influenced by the celestial mechanics work of Isaac Newton. Stewart comments on this: [8]

> "There can be no question of the fact that, in early Princeton, physics cooperated with politics in a sort of analogical double play, Newton to Witherspoon to Madison."

Stewart supports this argument with the following quote from Witherspoon:

> "The noble and eminent improvements in the natural philosophy, which have been made since the end of the last century, have been far from hurting the interests of religion; on the contrary, they have promoted it. Why should it not be the same with moral philosophy, which is indeed nothing else but the knowledge of human nature? … perhaps a time may come when men, treating moral philosophy as Newton and his successors have done natural, may arrive at greater precision."

This quote, of course, brings to mind the 1808 "moral symbols" theory work of German polymath Johann Goethe, and also the 1789 "moral movement" theories of British philosopher John Stewart (no relation to John Q. Stewart). Stewart also credits Woodrow Wilson (1856-1924), another Princetonian, America's 28th president, as being an early pioneering thinker in social physics/social mechanics, citing the following quote by Wilson in his writings on the Constitution: [6]

> "[The checks and balances between Congress, the President, and the Supreme Court are] a sort of unconscious copy of the Newtonian theory of the universe [in which] every free body in the space of the heavens … is kept in its place … by the attraction of bodies that swing with equal order and precision about it."

(add)

Recent

In 2005, American mathematician, astrophysicist, and former IQ: 225+ child prodigy Christopher Hirata, noted for his *circa* 2000 human chemical thermodynamics based article "Physics of Relationships", written at age 17, consisting of five parts: (a) thermochemical approach to relationships, (b) complex equilibria of man and women, (c) reaction kinetics, (d) neutron scattering, and (e) shell model, completed his PhD at Princeton with a dissertation on "Weak Gravitational Lensing Theory and Data Analysis" at Princeton. [7] This approach by Hirata, however, goes beyond the simpler "social physics" that Stewart envisioned, the result of the fact that the knowledge tree has grown considerably, and as such Hirata's discernment is more inline with modern human thermodynamics, human chemistry, human physics encompassing "hmolscience."

University of Geneva Department of Social Mechanics

Historically, the first university to run an actual social mechanics department and to teach courses on this subject was Polish economist Leon Winiarski's 1894 to 1900s social mechanics school at the University of Geneva, such as he summarized in his 1990 Paris sociology convention report on "The Teaching of Pure Economics and Politics of Social Mechanisms in Switzerland" as follows: [3]

Polish physical social economist Leon Winiarski, who for at least six years (1894-1900), at the University of Geneva, Switzerland, taught a course on political economics and social mechanics, based on the thermodynamics of Rudolf Clausius and the physics of Joseph Lagrange, was the first to pioneer the "two cultures" teaching method, as he explains (adjacent) at the 1900 Paris Expo on Social Science Education.

> "Turning to the dynamic part of the problem, we gave a definition of social-biological energy in two forms: potential (hunger and love) and kinetic (economic, political, legal, moral, aesthetic, religious, and scientific). This led us to the principles of thermodynamics, including the third, the Clausius same time explains the progressive spiritualization any closed social aggregate to show a decrease in potential. This dissipation of entropy that occurs is the same in the social world as in the physical world. **…** All this forms the **subject of a course** on social mechanics that we are giving under the title, 'Economic Bases of Social Science,' parallel with our course on pure political economy. In fact, the point of departure of our researches was, as we have shown, pure political economy, to which we refer all social science, and bring it all back to mechanics."

Stewart, it seems, was aware of this previous department-founding work by Winiarski.

Two cultures department

See main: Two cultures department

American electrochemical engineer Libb Thims is currently working to found a "two cultures" American university department thematically similar to both the Winiarski University of Geneva Social Mechanics department and the Stewart Princeton University Social Physical department, albeit more encompassing, not strictly limited to a unification of sociology, economics, and physics, but also chemistry, engineering, and all of the humanities.

Quotes

The following are related quotes:

> "Immaturity, lack of imagination, 'doctrinaire departmentalism', and [in particular] overspecialization is choking modern scholarship and limiting man's communication with his fellows."
>
> — John Q. Stewart (1955), on the need for a social physics department, Princeton University [1]

See also

â— University of Chicago
â— University of California, Berkeley | Lewis school of thermodynamics

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θΔics

In schools, **Princeton school of social physics**, or "Princeton social physics school", refers to the early “social physics” political science theories, e.g. separation of powers, developed by America's 4th president James Madison, America's 28th president Woodrow Wilson, among others, and the short-lived “Princeton Department of Social Physics”, ran at Princeton from 1945-1960 under the direction of John Q. Stewart.

A few noted Princeton students include Princeton student Zachary Hatch, and his 1992 theories about the thermodynamics of the rise and fall of civilizations, and Christopher Hirata, and his 2000 physics of relationships theory.

In American demographics and geography sciences, a spinoff or variant of the Princeton school, via the work of geographer William Warntz, in association with Stewart, is the so-called “social physics school”, generally focused on demographic gravitation and social gravitation theories.

See also

â— Chinese social physics school
â— Two cultures synergy

θΔics

In hmolscience, **Princeton social physics** refers to the study and use of social physics, social mechanics, and or physicochemical sociology at Princeton University.

In 1769, James Madison, the "father of the US constitution" was studying a primitive form of "social physics" at Princeton, influenced via his mentor John Witherspoon (his mentor being Charles Montesquieu), and his Newtonian moral philosophy theories, which marks the start of **Princeton social physics**, a program that was carried through, intermittently, into the mid-20th century (although dormant presently).

Overview

The subject of "social physics" and "Princeton", may refer either what one might categorize as "early Princeton social physics", associated with Newtonian mechanics based political economics and government thinking, spearheaded Declaration signatory John Witherspoon (1750s) and his religion-free Newtonian-based moral philosophy predictions, his student James Madison (1769) and his use of Newtonian mechanics to construct the constitution, and later Woodrow Wilson (1912) and Newtonian and Darwinian political campaign platform; the mid-20th century Rockefeller-funded “Princeton social physics project” (or Princeton Department of Social Physics), headed by John Q. Stewart (1939-1955); or the so-called “social physics school”, a precipitate of the latter, in geography circles, via their population potential models, carried forward by William Warntz (1964-1980s), the latter of which being only active form of all three branches.

Early years

In 1769, James Madison, age 18, specifically chose to ride horseback to New Jersey to attend the College of New Jersey, or what is now Princeton University, which he selected, according to historian Irving Brant (1974), specifically for its “hostility to episcopacy”, i.e. a school against the model of educational government by bishops. [2]

At Princeton, Madison, according to John Q. Stewart, was studying a primitive form of Newtonian-based social mechanics (or social physics) at Princeton, under the direction of Scottish-born American John Witherspoon, who was himself mentored by Charles Montesquieu, the logic of which he is said to have used in the construction and debate room floor selling of the penning of the US Constitution (1787); the following are example quotes:

> “There can be no question of the fact that, in early Princeton, physics cooperated with politics in a sort of analogical double play, Newton to Witherspoon to **Madison**.”
>
> — John Q. Stewart (1955), on social physics at Princeton [3]

> “The eighteenth century was dominated intellectually by the scientific work of Newton, and mechanical metaphors sprang naturally to men’s minds. Men had found a rational order in the universe and they hoped that it could be transferred to politics. **Madison** spoke in the most precise Newtonian language when he said that such a ‘natural’ government must be so constructed ‘that its several constituent parts may, by their mutual relations, be the means of keeping each other in their proper places.’”
>
> — Richard Hofstadter (1967), *The American Political Tradition* [4]

> “The third element—the principle of checks and balances—in the principle of separation of powers is what

> **Madison** called 'partial agency', which gives each branch enough power over the others to be able to check them. This principle of checks and balances, designed to enable the three branches to protect themselves from each other's encroachments."
>
> — Levine and Cornwell (1968), *An Introduction to American Government* [5]

> "The founders were elitists, and realists about human nature. Their task was to make passion subject to reason. If men could be expected to be selfish, or worse, then said **James Madison** 'ambition must be made to counteract ambition'. The Newtonian principles of action and reaction were applied to politics."
>
> — Lance Morrow (1987), "The Ark of America" [6]

(add)

Later years

In circa 1939, John Q. Stewart, in an attempt to rekindle the Princeton social physics flame, over the course of the next decade or so, until 1955, ran the so-called Princeton Department of Social Physics.

In 1940, Stewart, in his "The Gravity of the Princeton Family", as summarized by William Warntz (1959), reported on his findings that the number of Princeton alumni residing in a given state was directly proportional to the population of the state and inversely proportional to its distance from the Princeton campus. [8]

In 1950, Peter Dodd, a possible relative of Princeton sociologist Stuart Dodd (1950-1975), completed his senior thesis on "Social Physics: Theory and Application of Demographic Gravitation". [7]

Quotes | Related

The following are example quotes:

> "During the year 1951 the **Princeton social physics** project was hosted in two conferences and benefited by attention and criticism from authorities in the following fields: administration, advertising, anthropology, astronomy, biology, business, chemistry, city planning, demography, economics and econometrics, …"
>
> — John Q. Stewart (1952), "A Basis for Social Physics" [1]

See also

â— Physical sociology falloff problem

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Further reading

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θΔics

In famous publications, ***Principia*** (TR:47), or *The Mathematical Principles of Natural Philosophy*, is 1686 publication, of the power center of knowledge type, by English physicist Isaac Newton, which laid out the laws of motion: first law of motion, second law of motion, and third law of motion.

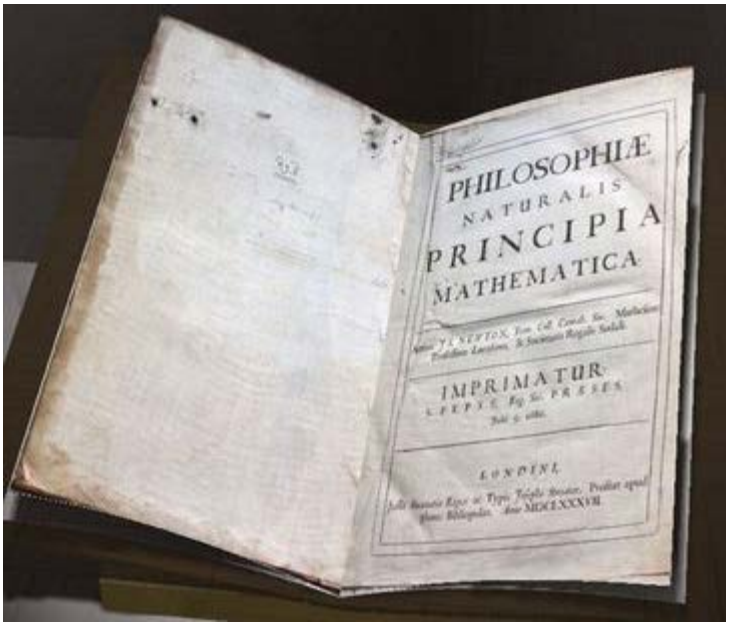

English physicist Isaac Newton's 1686 ***Principia***, the most famous and venerated publication in all of science.

Hooke

On reading Newton's *Principia*, English physicist-philosopher and inventor Robert Hooke is said to have claimed that the idea of an inverse square law for gravitation had been stolen from him. Hooke, supposedly, did have such an idea independent of Newton and also realized that an object falling towards the earth had the same motion as earth falling towards the sun. Hooke's lack of mathematical ability, however, was, supposedly, was what hindered his claim to fame. Upon hearing this accusation, Newton, promptly removed all mention of Hooke from the *Principia*, and refused to have anything to do with the Royal Society, Hooke's employer, agreeing to become president only after Hooke's death in 1703. When Newton did become president, Hooke's portrait hanging in the Royal Society mysteriously disappeared. [5] The inference here being that the reason that no pictures of Hooke exist in modern times, is the result of Newton.

Other

In 1834, Scottish engineer William Rankine, at age 14, was given a copy of Newton's *Principia*, in Latin, by his father, which he subsequently absorbed, thus laying the foundation of his knowledge in higher mathematics, dynamics, and physics. [1]

In 1989, American physical economics historian Philip Mirowski, in his *More Heat Than Light*, pole vaults on the so-called "Hessen thesis" (Boris Hessen, "The Social and Economic Roots of Newton's Principia", 1931), i.e. that Newton derived his laws of motion from economic theory and the culture milieu of his time, to supposition the general argument that the physicists and economists copied from each other, or that Newton copied the laws of motion from the economists, or something along these lines. [2]

Social Principias

A number of so-called "social Newtons" have been credited with attempts to emulate Newton and to pen out *Social Principias*, so to say, or *Mathematical Principles of Natural Philosophy of the Social Sciences*, or something along these lines.

An early reference to a social Newton is the work of French philosopher Charles Fourier, namely his 1808 *The Theory of the Four Movement*, which contains his views of the world in general, and his 1822 *The Association of Domestic and Agricultural Economy*, which contains his special views of the social system. [1] Moritz Kaufmann describes Fourier as follows: [1]

> "In order to judge of his system it is necessary to note one or two salient points in his conception of the constitution of man and the universe. Happiness he acknowledges is 'our being's end and aim'; and the only true science which leads to its attainment is sociology. As the doctrine of the material movements in the universe has been fixed by Newton's discoveries, so too the laws which regulate the movements in the social world must first be ascertained before we can hope to render mankind happy. To become such a **social Newton** was undoubtedly Fourier's ambition, and this is the fundamental law of his social Principia."

(add)

Quotes

The following are related quotes:

> "I designedly made ***Principia*** abstruse to avoid being baited by little smatterers in mathematics."
>
> — Isaac Newton (c.1687), "Comment to William Derham" [3]

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See also

â— Principia of thermodynamics

External links

â— Philosophiae Naturalis Principia Mathematica - Wikipedia

θΔics

In thermodynamics, the ***Principia* of thermodynamics** is an oft-quoted term generally referring to American engineer Willard Gibbs' 1876 *On the Equilibrium of Heterogeneous Substances*. [1] The tribute is used in the sense that Gibbs' 300-page *Equilibrium* treatise, containing exactly 700-equations, is the mark of scientific excellence, in thermodynamics, just as is English physicist Isaac Newton's 1687 *Mathematical Principles of Natural Philosophy* (*Philosophiae Naturalis Principia Mathematica*), in physics.

Etymology

Science writers Bill Bryson (2003) and William Cropper (2004) both state that Gibbs' *Equilibrium* treatise "has been called" the *Principia* of thermodynamics. [2] The tribute seems to trace to the 1925 article "Influence of J. Willard Gibbs" by Irish physical chemist Frederick Donnan who stated: [3]

> "Nothing in the history of science is more remarkable than the way in which Gibbs in 1878 provided the electrochemical science of the succeeding generation with its **thermodynamic *Principia***."

Other

In a short 2006 article "Science as Drama", American philosopher-historian Robert Crease states that William Thomson and Peter Tait's 1867 *Treatise on Natural Philosophy* is the "Principia of thermodynamics". [4] This, however, seems to be an uneducated dart throw, off-target.

The only other publication that may compete for the title of thermodynamics' *Principia* would be German physicist Rudolf Clausius' 1865 textbook *Mechanical Theory of Heat*, upon which Gibbs built his *Equilibrium*. Clausius' textbook, however, is collection of nine separate memoirs, published in various journals, during period 1850-65, which slowly formed into a unified textbook by 1875, the year of the second updated, ordered, and amended edition.

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θΔics

In science, a **principle** is a general statement, unproved, but justified *a posteriori* by verification of its consequences. [1] In loose terms a principle is a theory that has solidified to a good amount. In the 19th centuries, the first law and second law were referred to as the first main principle and second main principle.

Quotes

The following are related quotes:

> "Of those who hold that the first principle is one, moving, and infinite, Anaximander, son of Praxiades, a Milesian, who was a successor and pupil of Thales, said that the infinite is principle and element of the things that exist. He was the first to introduce this word '**principle**' <??>. He says that it is neither water nor any other of the so-called elements but some different infinite nature, from which all the heavens and the worlds in them come into being."
>
> — Simplicius (c.550), *Commentary on Aristotle's Physics* (24.13) (Q)

See also

- Zeilinger's principle
- Principle of inertia
- Maximum entropy principle
- Principle of the transmission of work
- Principle of elementary disorder
- Carnot's principle
- Le Chatelier's principle
- Principle of substance stability
- Landauer's principle

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θΔics

In science, the **principle of continuity**, or doctrine of continuity, posits that that there is some form of continuity of existence or "continuity of the inter-conversion of the forces" that give rise to the motion throughout the universe, in relation to termination of the movement or existence of a person, according to the laws of modern physical science.

Great **Principle of** all we see,
Thou endless **Continuity**!
By thee are all our angles gently rounded,
Our misfits are by thee adjusted,
And as I still in thee have trusted,
So let my methods never be confounded!
O never may direct Creation
Breach in upon my contemplation,
Still may the causal chain ascending,
Appear unbroken and unending,
And where the chain is best to sight
Let viewless fancies guide my darkling flight
Through aeon-haunted worlds, in order infinite.

The third stanza of Scottish physicist James Maxwell's last dying poem, which references Scottish physicist Peter Tait and Balfour Stewart's 1875 **principle of continuity**, which he was wrestling with at the time, summarizing his views on life and death in the context of the modern physical science. [3]

History

The term "continuity", supposedly, derives from Welsh physicist William Grove's 1846 book *The Correlation of the Physical Forces*. [4] In the original sense of the term "continuity" may be possibly found in the following 1842 lecture extract of Grove, and the premise that force is conserved or that there is a continuity among the operations of the following physical phenomenon that exists throughout the universe:

> "Physical science treats of matter, and what I shall to-night term its *affections;* namely, attraction, motion, heat, light, electricity, magnetism, chemical-affinity. When these re-act upon matter, they constitute forces. The present tendency of theory seems to lead to the opinion that all these affections are resolvable into one, namely, motion: however, should the theories on these subjects be ultimately so effectually generalized as to become laws, they cannot avoid the necessity for retaining different names for these different affections; or, as they would then be called, different modes of motion. Each force is definitely and equivalently convertible into any other and that where experiment does not give the full equivalent, it is because the initial force has been dissipated, not lost, by conversion into other unrecognized forces. The equivalent is the limit never practically reached."

In other words, "continuity" seems to imply or be synonymous or shorthand for "inter-conversion of forces".

Whatever the case, Grove's *The Correlation of the Physical Forces* was referenced as the basis of Scottish physicists Peter Tait and Balfour Stewart's usage of the term in respect to their so-called "principle of continuity", with which the attempted to explain death in the guise of a mixture of modern physical science and religion. The Tait-Stewart version of the "continuity", as contrasted with the original Grove version, to note, seems to have been bowdlerized to some extent, expunging parts not amenable to certain Christian dogma.

In short, Tait and Stewart, attempted to outline a type of physics-based afterlife theory, which they presented "anonymously" in their 1875 book *The Unseen Universe: or Speculations of a Future State*. The book was a sort of precipitate theory or reactionary derivative of the 1874 BAAS Tyndall-Stewart-Tait debate on the overlap of modern physical science and religion. [1]

A laymanized version of the principle of continuity was presented in fictional form in the followup 1878 novel *Paradoxical Philosophy: a Sequel to the Unseen Universe*, followed by discussion of the implications of these ideas by Scottish physisict James Maxwell in his 1878 review article "Paradoxical Philosophy", wherein he alludes to the idea of the paradoxical philosopher, all of which was summed up in his last and final dying poem "A Paradoxical Ode" (see above excerpt). [2]

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θΔics

In thermodynamics, **principle of elementary disorder,** “elementary disorder hypothesis” or “Boltzmann’s order-disorder principle” (Schrodinger, 1944), states that actual order-disorder positional and vibrational *micro-states* achievable by the atoms and molecules of physical systems, correspondent to the *macro-state* satisfaction of the second law of thermodynamics, in that "the principle of the growth of entropy will be satisfied in every direction". [1][5]

Overview

The principle of elementary disorder, according to American mechanical engineer Joseph Klein (1910), was introduced by German physicist Max Planck, beginning in about 1899, based on the macro-state conception of molar-order and molar-disorder of Austrian physicist Ludwig Boltzmann, as found in his 1896 *Lectures on Gas Theory*. [2]

In 1900, the term "principle of disorder" is first used by Planck. [3] In 1901, Planck gave the following outline his elementary disorder principle, in relation to the radiation energy emitted by the energy elements of a black body: [4]

> “Entropy depends on disorder and this disorder, according to the electromagnetic theory of radiation for the monochromatic vibrations of a resonator when situated in a permanent stationary radiation field, depends on the irregularity with which it constantly changes its amplitude and phase, provided one considers time intervals large compared to the time of one vibration but small compared to the duration of a measurement. If amplitude and phase both remained absolutely constant, which means completely homogeneous vibrations, no entropy could exist and the vibrational energy would have to be completely free to be converted into work.”

The principle was given great emphasis by Planck in his 1906 *Warmestrahlung* (*Heat Radiation*) and in other writings on irreversibility up until 1914.

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θΔics

In thermodynamics, the **principle of increasing entropy** or *principle of entropy increase* is an oft-used synonym for the second law of thermodynamics, or second main principle, referring to the idea that all real processes occurring in a system will occur such that an increase in the entropy of the system results, which is a mathematical way of saying, loosely, that more heat (or specifically the state quantity of heat divided by temperature Q/T, i.e. entropy) went into the system than went out, meaning that part of the heat was converted into the work in the irreversible repositioning of the particles of the system at the end of the heat cycle. [1] The principle of increasing entropy is said to be contained in the Clausius inequality. [2]

See also

- Surroundings entropy increase
- Entropy consumption

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- Increase in entropy principle – Ohio.edu.
- Increase in entropy – Theory.ph.man.ac.uk.

θΔics

In science, **principle of inertia**, or sometimes called "Galileo's principle", is the view that in nature there are two states of existence of position of bodies: being at rest or moving uniformly, which are to be treated as being the same. [1] The principle of inertia implies, said another way, that a body moving on a frictionless level surface will continue in the same direction forever at a constant speed unless disturbed.

A **principle of inertia** stylized type of political physics humor, in reference to Newt Gingrich's motivations and driving forces, which, according to Chan Lowe (2012), are self-aggrandizement and satisfaction. (Ñº)

History

In 322BC, Aristotle outlined a now defunct precursor model that impressed force (*vis impressa*), or some other *deus ex machina*, was needed to ensure that motion is conserved.

In c.530, John Philoponus, in his rejection of Aristotle's theories of motions, introduced some type of impetus theory, which influenced: Avicenna, Bonaventure, John Buridan (or Jean Buridan), and Galileo, the latter of whom, in his *The Two New Sciences* (1638), cites Philoponus.

In c.1500, Italian polymath Leonardo Da Vinci, in one of the notes of his *Codex Atlanticus* (1478-1519), outlined the principle of inertia as follows: [4]

> "Every motion will keep its course rectilinearly as long as the nature of the violence impressed by its motor will last in it."

Da Vinci does not say, however, say whether such 'impulse' [*violenzia*] dies out by itself, or by the action of external resisting forces.

In 1585, Giovanni Battista Benedetti was more explicit on the issue, and discussed the persistence of the speed of a body, even when the causes that have produced that speed to come to an end—and to assign to the force the rule of giving rise to acceleration.

In c.1600, Italian physicist Galileo Galilei (1564-1642) is said to have read and been inspired by Benedetti's work and to have went on to expand on it into the formulation of the principle of inertia, namely that a body, once set in motion, maintains its velocity if the resultant of the forces applied to it—both acting and resisting (typically friction)—is zero. Galileo is said to have derived this principle by his studies of balls rolling down and then up again inclined planes, expanded to infinity.

Galileo's inertia model, supposedly, overthrew the older impressed force model of Aristotle.

In 1687, Isaac Newton, in his *Principia*, stated the principle of inertia as follows:

> "The *vis insita*, or innate force of matter, is a power of resisting by which every body, as much as in it lies, endeavors to preserve its present state, whether it be of rest or of moving uniformly forward in a straight line."
>
> "Unless acted upon by a net unbalanced force, an object will maintain a constant velocity."

(add)

Psychodynamics

In psychodynamics, the **principle of inertia**, or "Freud's principle of inertia", is a tendency for the leveling of excitation to be reduced to zero. [2] The principle of inertia, in the view of English developmental psychologist John Bowlby, seems to trace to Austrian psychologist Sigmund Freud's 1915 publication "Instincts and their Vicissitudes", where Freud states: [3]

> "By the pressure of an instinct, we understand its motor factor the amount of force or the measure of the demand for work which it represents. The aim of an instinct is in every instance satisfaction, which can only be obtained by removing the state of the stimulation at the source of … the object of an instinct is the thing in regard to which or through which the instinct is able to achieve its aim."

(add)

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θΔics

In thermodynamics, the **principle of maximum entropy production** states that irreversible processes proceed in a direction in which the maximum amount of entropy is produced or that in which entropy production is greatest. [1]

History

The principle is said to trace to the work of American physicist Edwin Jaynes and his attempt to formulate a statistical thermodynamics interpretation of American electrical engineer Claude Shannon's 1948 theory of information transmission. [2]

Open systems

German biogeochemist Axel Kleidon, a promoter of the theory, defines the principle of maximum entropy production as a theorem which postulates that the steady state of open thermodynamic systems with sufficient degrees of freedom are maintained in a state at which the production of entropy is maximized given the constraints of the system. The papers of French environmental physicist Roderick Dewar are supposedly representative of this perspective. [4]

Acronyms

See also: MaxEnt school

The acronym MEP is frequently used, short for Maximum Entropy Production, when referring to this subject. The term 'law of maximum entropy production' is popularized in the 1988 theory of Rod Swenson, who uses the term LMEP. Others use the term MEPP as short for 'maximum entropy production principle'. [3]

Difficulties on theory

The concept of maximum entropy production as a guiding rule in the universe or in biology is generally considered as a fringe subject, generally considered to have little validity; but nevertheless is a subject that people write articles on in attempts to theorize further on it. Most, however, consider the so-called 'principle' generally invalid for chemistry, and hence for biology, in on the premise that rates of reactions are governed by activation energy and Gibbs free energy, not by the rate of entropy production. [1] A general rule-of-thumb, concerning so-called principles or theories of thermodynamics is that any such conception that bases its premise or has connection to the work of Claude Shannon is invalid and not a thermodynamic subject. [5]

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θΔics

In thermochemistry, the **principle of maximum work**, or "Thomsen-Berthelot principle", states that all chemical change occurs in the direction towards which the processes evolve the most of heat. [1] The principle was proposed in simple terms in 1853 by Danish chemist Julius Thomsen and later in more definitive form in circa 1864 by French chemist Marcellin Berthelot, but later found to only hold true only at absolute zero.

Berthelot's principle of maximum work, was said to have met its demise with the publication of German physicist Herman Helmholtz' 1882 paper "The Thermodynamics of Chemical Operations", in which he proved that the affinity is measured not by the heat evolved in a chemical reaction (in a galvanic battery) but by the maximum work produced when the reaction is carried out reversibly. One must distinguish, according to Helmholtz, between that part of energy which appears only as heat and that part which can be freely converted into other kinds of work, i.e. the "free energy" analogous to potential energy in mechanics. Subsequently, the conditions of chemical stability are not determined by heat production but by the production of a decrease in free energy. [2]

Chemical equilibria

It is known that chemical equilibria, at ordinary, temperatures, displace towards the systems which are formed with the evolution of heat, so that it is evident that those chemical changes which occur at ordinary temperatures must in the majority of cases be accompanied by evolution of heat. This effect is only rigorously true at absolute zero of temperature.

The opposite effect occurs, however, at high temperatures. Based on the 'principle of mobile equilibrium', it is found that at very high temperatures the opposite effect must take place, and that the changes which occur under these conditions will in general absorb heat.

These heat dynamic effects, at high temperatures, moderate temperatures, and zero temperatures, are found to be based on the exact laws of thermodynamics, as stated by Dutch chemist Jacobus van't Hoff in 1896, but do not corroborate with the views expressed by Thomsen and Marcellin Berthelot, whose views were found to contradict with fact and abandoned, but which in 1896 were still being represented in many textbooks as being in accordance with experience. [1] In 1853, Danish chemist Julius Thomsen expressed his view that:

> "Every simple or complex change of a purely chemical nature is accompanied by an evolution of heat."

Berthelot, likewise, in 1867 put forward his views in what he called the 'principle of maximum work', which states that:

> "Every chemical change, accomplished without intervention of external energy tends towards the production of bodies or of the system which evolves the greatest quantity of heat."

Van't Hoff, however, by 1896, had showed, based on thermodynamics, that correctly:

> "All chemical equilibria without exception are displaced completely at absolute zero towards those systems which are formed with evolution of heat, and only under these circumstances is the **principle of maximum work** rigorously true."

Chemical affinity

Thomsen originally argued, in circa 1853, that heat of a reaction was the true measure of affinity. This same view was expounded on by Berthelot. Berthelot's heat theory of affinity, it seems, was initially criticized by French physicist

Pierre Duhem, in a thesis that Berthelot's colleagues rejected. [2]

Van't Hoff, following Helmholtz, was one of the first to lay to rest Berthelot's theory. According to Van't Hoff, affinity is the force which produces chemical change, which may be expressed in kilograms or in atmospheres, and the work which it can effect can be expressed in kilogram-meters or in calories. Van't Hoff showed that Berthelot's principle was only true in respect to the affinities of the system and the work they can produce, at absolute zero. Van't Hoff began be noting that in any generic reactions:

$$A + B \rightleftharpoons C + D$$

there will exist a "transition temperature" *P* or point at which the system on the left equally replaces the system on the right, and vice versa, at temperatures above which the system on the right completely replaces the system on the left, while below it the reverse takes place.

He states that the affinity, i.e. the force which brings about the change, or the difference between the affinities which are at work in the two systems, is zero at the transition temperature; but when passing through the transition temperature the value of the affinity, or of the difference of the affinities, changes sign. Through some derivation, he gives the following expression for the work which can be done by the affinity A:

$$A = Q\left(\frac{P - T}{P}\right)$$

which states that the work, expressed in calories (joules), which the affinity in a given chemical reaction can perform, when the reaction takes place at a given temperature, is equal to the quantity of heat Q evolved by the reaction, divided by the absolute temperature of the transition point P, and multiplied by the temperature T at which the reaction occurs. The basis of this derivation seems to stem from page 281 of Clausius' *The Mechanical Theory of Heat*, second English edition. This equation is also similar to another form derived by Helmholtz in 1882:

$$A = T\Delta S - \Delta U$$

In any event, Van't Hoff notes that in the special case of P = T, we have A = 0, meaning that the work done by affinity at the transition temperature, and therefore the force of affinity itself, is zero.

Van't Hoff then states that considering that the maximum quantity of work which affinity can perform is equal to the quantity of work done by the change when it takes place in a reversible way, it will evidently be possible to obtain the above equation by means of thermodynamics. This derivation was done, it seems, by German chemist Walther Nernst in his 1906 heat theorem.

In any event, Van't Hoff concludes by noting the application that the work done by affinity at absolute zero, whereby the reaction temperature is zero, T = 0, that A = Q, such that the work which may be obtained from the change is equivalent to the whole of the heat which it evolves. He states, at absolute zero the change could occur either with evolution of Q calories and without doing any work, or evolving no heat and doing a quantity of work equivalent to Q calories. He concludes, this is in agreement with the conclusion arrived at above, where it was pointed out that the 'principle of maximum work' is rigorously true at absolute zero, whereby the quantity of heat evolved being then the measure of the work which can be done by the affinities, and its sign therefore the direction in which the change will occur.

At higher temperatures, the work which can be done by the affinity is then equivalent to a part only of the heat evolved,

the two have the same sign, however, until the transition temperature is reached, at this point the work which can be done by affinity is zero and at higher temperatures its sign is reversed, that is to say work must be performed in order to bring about the reaction. The change of sign accompanies the change in the direction of the reaction which occurs at the transition point.

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θΔics

In hierarchical thermodynamics, the **principle of substance stability** describes the tendency of natural systems to seek local and general equilibria at all temporal and structural levels of orgnaizational matter. [1] It establishes a predominant direction of stable and unstable atomic and molecular movements between hierarchies. The principle of substance stability was formulated by Russian physical chemist Georgi Gladyshev in 1978. [2]

THE TOP TEN ANCESTRY GROUPS OF AMERICAN MILLIONAIRES

Ancestry Group/ Ethnic Origin: Head of Household[1]	Percent of All U.S. Households	Number of Millionaire Households[2]	Percent of Millionaire Household Population	Rank: Percent of Millionaire Household Population	Concentration Ratio: % All Millionaire Households/ % All Households	Percent of Ancestry Group That Are Millionaire Households	Rank: Percent of Ancestry Group That Are Millionaire Households
ENGLISH	10.3	732,837	21.1	1st	2.06	7.71	4th
GERMAN	19.5	595,171	17.3	2nd	0.89	3.32	9th
IRISH	9.6	429,559	12.5	3rd	1.30	4.88	7th
SCOTTISH	1.7	322,255	9.3	4th	5.47	20.8	2nd
RUSSIAN	1.1	219,437	6.4	5th	5.82	22.0	1st
ITALIAN	4.8	174,929	5.1	6th	0.94	4.00	8th
FRENCH	2.5	128,350	3.7	7th	1.48	5.50	6th
DUTCH	1.6	102,818	3.0	8th	1.88	7.23	5th
NATIVE AMERICAN	4.9	89,707	2.6	9th	0.53	1.99	10th
HUNGARIAN	0.5	67,625	2.0	10th	4.00	15.1	3rd

[1]Head of Household refers to the adult within the household who responded to the survey. Respondents self-designated themselves as the person in their household who was responsible for making financial decisions.

[2]Millionaire households are those that have a net worth of $1M or more.

Statement of principle

In concise form, the "principle of substance stability" states that:

> "During the formation or self-assembly of the most thermodynamically stable structures at the highest hierarchical level (j), e.g., the supramolecular level, Nature, in accordance with the second law, spontaneously uses predominantly the least thermodynamically stable structures available from a given local part of the biological system, belonging to a lower level, i.e. molecular level (j-1), and incorporates these unstable structures into next higher level, i.e. supramolecular level (j)."

In short, the principle of substance stability argues that each subsystem of the biosphere evolves according to its thermodynamic tendency to seek a free energy minimum during each evolution cycle.

Atomic evolution viewpoint

In 1978, Gladyshev wrote “after the concluding stages of general evolution the concentration of free energy occurs not only owing to the growth of the chemical component G j-im (intermolecular) and higher order components, but also owing to the G-j at (atomic) component (as well as to other components not considered here).” In these early formulations of the principle of substance stability, Gladyshev understood, from the viewpoint of hierarchical thermodynamics, the importance of the atomic component (G j-at) for the understanding of direction of biological evolution. In application, american chemical engineer Libb Thims' 2005 molecular evolution table, according to Gladyshev, shows that the composition variation of chemical elements (atoms) during evolution that corresponds to “the principle of substance stability”. The same situation, according to Gladyshev, should be found with the variation of isotope concentration of elements during ontogenesis and phylogenesis. [3]

Sociological applications

In the sphere of sociology, with reference to family ties and their relation to society, according to Gladyshev, the principle of substance stability operates in social hierarchies. [1] In a generalized social matrix, one can visualize the substance, considered as an elementary structure, of any “inside” social hierarchy being defined

as an understructure hierarchy, e.g. a hierarchy of organisms, groups of organisms, etc.

To cite one example, the stronger the love and mutual understanding between a couple, i.e. the understructure hierarchy, the less time they spend “outside” the family, i.e. the “over-structure hierarchy”. Marriage partners in types of stable relationships will not have the desire or impetus to seek external interaction and bonding as compared to less stable couples. Furthermore, according to Gladyshev, the principle of substance stability corresponds with the well-known rules of maintenance of stabilities of parties, unions, states, and nations, as personified by the age-old social management custom of “divide and rule”, in which higher hierarchies have fewer but more powerful and stable members. [1]

Wealth hierarchies and country hierarchies

In human economic wealth hierarchies, where social class tends to be stratified, from lower class, middle class, upper class, to millionaires, to billionaires, the principle of substance may explain the movements between the hierarchies as well as movement of people between the hierarchies of countries. In America, for instance, 80 percent of millionaires are first-generation affluent, meaning that eight out of every ten millionaires in American came from a lower class or lower hierarchy. [4]

Moreover, this trend seems to extend through time. Over one-hundred years ago, for instance, in *The American Economy*, Stanley Lebergott reviews a study conducted in 1892 of 4,047 American millionaires. He reports that 84 percent “were nouveau riche, having reached the top without the benefit of inherited wealth.” Likewise, regarding ethnicity, and cross-latitudinal migrations of people between hierarchies of countries, it is found that majority of newly-made millionaires in the most stable or highest hierarchy country, i.e. the United States, came from one of the least stable or lowest hierarchy countries, namely Russia an economic system that recently fell-apart, as the table shown above indicates. [5] These trends can be understood in terms of movements of human molecules between stability hierarchies. [3]

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θΔics

In thermodynamics, the **principle of the equivalence of transformations** states that the combined value of all the transformations of a given body (or system), symbolized by a number *N*, is equal to the negative of the integral of the equivalence-values entering or leaving the body:

$$N = -\int \frac{dQ}{T}$$

2010 tattoo of the 1856 formulation of the **principle of the equivalence of transformations**, using the 1875 inexact differential notation δ of German physicist Carl Neumann, on the forearm of a newly graduated philosophy student Ivanka. [6]

where *dQ* is an element of heat, whereby any heat withdrawn from the body is to be considered as an imparted negative quantity of heat; the integral is extended over the whole quantity *Q*; *T* is the absolute temperature, and *N* is the equivalence-value of all uncompensated transformations involved in a cyclical process. [1] The principle of the equivalence of transformations is an alternative formulation of the second main principle or second law of thermodynamics.

N | Symbol

Clausius, to note, gives a lengthy asterisked footnote concerning the 'uncompensated transformations' to which N refers, but never gives *N* a name. [2] The basic rule, he presents, is that N equates to zero for a reversible process and has a numerical value for non reversible processes.

Two fundamental theorems

In his followup 1856 fifth memoir "On the Application of the Mechanical Theory of Heat to the Steam Engine", Clausius gave *N* the name "equivalence-value of all uncompensated transformations" and would defined the two fundamental theorems "which hold good in every cyclical process", i.e. the first and second laws of thermodynamics (first main principle and second main principle), by the following two equations: [4]

$$Q = A \cdot W$$

$$\int \frac{dQ}{T} = -N$$

where *A* is the thermal equivalent of the unit of work, and *W* is the external work performed during the cyclical process, Q signifies the heat imparted to the changeable body during a cyclical process, and dQ an element of the same heat, whereby any heat withdrawn from the body is to be considered as an imparted negative quantity of heat, and the integral is to be extended over the whole quantity of Q.

Temperature

In its first formulation, as presented in his 1854 article, to note, Clausius defined his equivalence of transformation principle as:

$$N = -\int \frac{dQ}{\tau}$$

wherein after he went into discussion to show that τ (tau) must be the absolute temperature *T*.

History

The principle of the equivalence of transformations was first formulated by German physicist Rudolf Clausius in his 1854 article "On a Modified Form of the Second Fundamental Theorem in the Mechanical Theory of Heat". [1] The article was reprinted verbatim as 'memoir four' to his first edition 1865 textbook *The Mechanical Theory of Heat* and then rewritten as 'chapter four' to his second edition 1875 textbook. [3]

See also

â— Transformational content
â— Transformation-equivalents

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θΔics

In physics, the **principle of the transmission of work**, or "work transmission principle", states that the movement of a material point defines work as the product of the component of force acting on a material point multiplied by the distance of space traveled by the point, i.e. that work equals force time distance:

$$W = Fd$$

(add)

History

The principle seems to have been first introduced explicitly in the 1829 by French physicist Gustave Coriolis in his *Calculation of the Effect of Machines*. [1] The result of Coriolis principle, wherein he gives a lengthy derivation using trigonometric force components and distance components, is that work equals force time distance.

He derives this assuming that a principle of the conservation of vis viva exists; in a sense, that kinetic energy can be transferred into work.

Quotes

The following are related quotes:

> "Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, work is performed."
>
> — Rudolf Clausius (1875), "Mathematical Introduction"

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θΔics

In terminology, **prison** is facility where inmates are physically confined, as part of a sentence, resulting from determined criminal activity.

Social physics

In the 19th century, Florence Nightingale attempted to reform prison system methodologies under the guise of social physics. (Q)

In 1952, English physicist Vera Daniel, in his "Physical Principles in Human Cooperation", outlined an atomic theory based order-disorder model of how inmates in prison can cooperate in groups. [1]

In 2010, American justice systems professor Curtis Blakely began publishing a number of articles on the physics of prison systems, people viewed as particles. [2]

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External links

- Prison – Wikipedia.

θΔics

In science, **probability** is the chance that a given event will occur; quantified, mathematically, as the ratio of the number of outcomes in an exhaustive set of equally likely outcomes that produce a given event to the total number of possible outcomes. [1]

Quotes

The following are relevant quotes:

> "Whether or not historical events are causality connected or are the result of chance, accident or mathematical **probability** are much more than abstract speculations. Their answer goes to the very root of the historian's method of procedure. Of what would it avail us, if after all our labor, the reader were to agree that while strict causality has been proved in all past history, the future must be shrouded in darkness, or is controlled by chance? One may be convinced that historical laws are controlled by laws, but conclude that these laws are not causal, but indeterminate in nature."
>
> — Morris Zucker (1945), *Historical Field Theory* [2]

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Further reading

â— Perrot, Pierre. (1998). *A to Z of Thermodynamics* (§Probability, pgs. 248-49). Oxford University Press.

External links

â— Probability – Wikipedia.

θΔics

In terminology, **problem** (TR=578), from Greek *problema*, 'obstacle', or *pro-* 'forward' + *-ballein* 'to throw', is a question raised for inquiry, consideration, or solution; a proposition, in mathematics, physics, or philosophy, stating something to be done; an intricate unsettled question; a source of perplexing distress or vexation. [1]

Quotes

The following are related quotes:

> "No **problem** can withstand the assault of sustained thinking."
>
> — Voltaire (c.1760) [3]

> "When a **problem** remains unsolved, general opinion must be wrong."
>
> — Fred Hoyle (c.1965) [2]

> "The eternal **problem** of the human being is how to structure his waking hours. In this existential sense, the function of all social living [existive reacting] is to lend mutual assistance for this project."
>
> — Eric Berne (1964), *The Games People Play*

> "We only think when we are confronted with **problems**."
>
> — John Dewey (c.1940) [3]

See also

- Blue sky problem
- Boundary problem
- Elective affinities problem
- Great problem of natural philosophy
- Homework problems
- Library walk problem
- Modern queries
- Reverse engineering puzzle

References

1. Merriam-Webster Collegiate Dictionary, 2000.
2. Harrison, Lionel G. (2011). *The Shaping of Life: the Generation of Biological Pattern* (pg. 46). Cambridge University Press.
3. Problem quotes – Decision-Making-Solutions.com.

External links

- Problem – Wikipedia.
- List of unsolved problems – Wikipedia.
- List of unsolved problems in philosophy – Wikipedia.
- List of unsolved problems in physics – Wikipedia.
- List of unsolved problems in mathematics – Wikipedia.

θΔics

In philosophy, **problem of evil** is the question of how, in religious or anthropomorphic speak, to explain the existence of evil in a universe governed by an all-powerful deity, in religious speak; or, in chemical thermodynamically neutral terms, how to account for the existence of unnaturalness and unnatural processes and reactions in the context of a universe governed by (non-deified) power, or directions of differential changes in energy or work per unit time of systems.

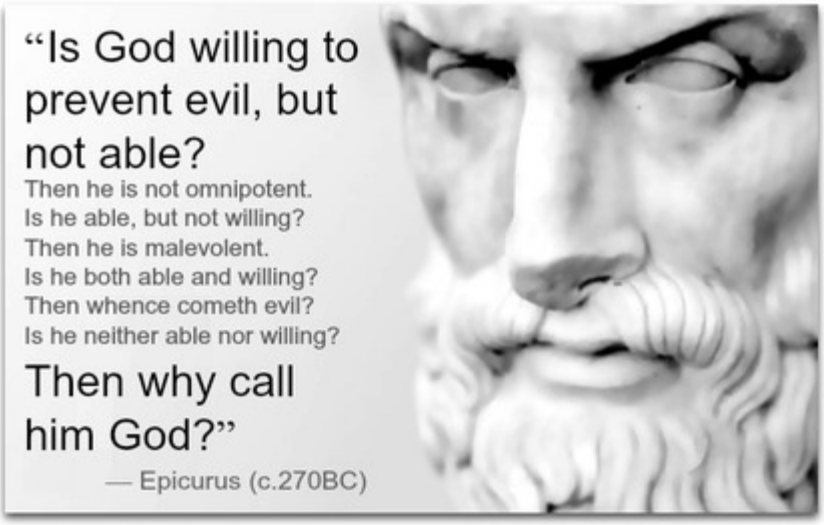

Greek philosopher Epicurus on the so-called **problem of evil**.

Overview

The statement of the "problem of evil" is attributed to Greek atomic theorist Epicurus.

Leibniz

In 1710, German polymath Gottfried Leibniz, in his *Theodicy*, put forward the so-called optimistic solution to the so-called problem of evil, namely that this is the best of both possible worlds. [1]

In 1759, Voltaire penned his satirical *Candice*, a parody of Leibniz's problem of evil solution, the key section being the following:

> "Appalled, stupefied, distraught, covered in blood and shaking uncontrollably, Candice said to himself: 'If this is the best of all possible worlds, what must the others be like?'"

German philosopher Arthur Schopenhauer later commented the following: [2]

> "I cannot assign to the *Theodicy* any other merit than that it gave rise to the immortal *Candice* of the great Voltaire. In this way, of course, **Leibniz's** oft-repeated and lame excuse for the evil of the world, namely that the bad sometimes produces the good, obtained proof that for him was unexpected."

(add discussion)

Thims

In circa 2004, Chinese-born American philosopher Lawrence Chin published his "Power, the Second Law of Thermodynamics and the Problem of Evil". [3]

In 2005, following discussion with and review of Chin on his thermodynamics of evil theories, American electrochemical engineer Libb Thims published "Evil, Structural Stability, and Predisposed Movements." [4]

In 2011, Thims solved the great problem of evil (see: atheism timeline), per the assertion that the existence of "unnaturalness", i.e. evil (in religio-mythology speak), in a godless universe, is the product or rather aspect of thermodynamic coupling, per the following logic:

In 1710, German polymath Gottfried Leibniz posited a solution to the **problem of evil**; in 2011, American polyintellect Libb Thims solved the problem, in outline, via use of free energy coupling theory, per Fritz Lipmann.

> (a) A person is large multi-element reactive animated molecule (human

molecule).
(b) So-called "good" actions, or rather "natural" actions, are governed by the Lewis inequality for a natural process (dG < 0)
(c) So-called "bad" (or evil) actions, or rather "unnatural" actions, are governed by the Lewis inequality for an unnatural process (dG > 0)
(d) Both natural and unnatural processes are thermodynamically "coupled" together, such that *natural* processes energetically drive the *unnatural* processes and that some reactions will progress in a direction contrary to that prescribed by their own affinity.

(add discussion)

References

1. (a) Leibniz, Gottfried. (1710). *Theodicy*. Publisher.
(b) Leibniz, Gottfried. (1734). *Essay on Man*. Publisher.
2. Jorgensen, Larry M. and Newlands, Samuel. (2014). “Introduction”, in: *New Essays on Leibniz’s Theodicy* (pg. 4). Oxford University Press.
3. Chin, Lawrence C.L. (2006). *A Thermodynamic Interpretation of History* (ch. 10: “Power, the Second Law of Thermodynamics and the Problem of Evil”). GeoCities publication.
4. Thims, Libb. (2005). “Evil, Structural Stability, and Predisposed Movements”, *Journal of Human Thermodynamics*, 1(1): 1-12, Aug.
5. Thims, Libb. (2011). “Thermodynamic Proof that Good Always Triumphs over Evil”, *Journal of Human Thermodynamics*, 7: 1-4.

External links

â— Problem of evil – Wikipedia.

θΔics

In thermodynamics, **process** (TR:1338) is a change in a system defined by an initial state, a final state, and the path followed. [1] A process, to note, must not be mistaken for a transformation, which is defined by only its initial state and final state. Said another way, a process, in thermodynamics, is defined as a method of operation in which specific quantities of heat and various types of mass and work are transferred across a boundary to and from the system to alter its state.

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics.* Oxford University Press.

θΔics

In existographies, **Prodicus** (c.465-395BC) (FA:12), aka “Prodicus of Ceos”, was a Greek philosopher, noted for []

Atheism

Prodicus, according to Mark Munn (2006), was labeled an atheist for the following reason: [2]

> “Prodicus of Ceos advanced an account of Demeter and Dionysus as mortals who taught agriculture and viticulture, and who were accorded divine honors after their deaths in recognition of their gifts to humanity. The argument that the gods familiar to the Greeks were once mortals was a key element in the suspicion that sophists like Prodicus were atheists.”

Here, knowing that Demeter and Dionysus are Greek versions of Isis and Osiris, respectively (see: god character equivalents), who are the Christian equivalents of Mary and Jesus, respectively, a “modern Prodicus” labeled atheist would be someone who denied the divinity of Jesus, arguing that Jesus Christ was mortal who taught civility and who because of this was posthumously accorded divine honors.

Prodicus also argued that gods were what the ancients invented to equate the sun, rivers, and other beneficial things with. (Empiricus, 200AD). He tried for figure out, from a secular linguistic point of view, how humans learn the names of their gods; latter classified as an atheist by early contemporaries (Hecht, 2003; pg. 8)

Quotes | On

The following are quotes on Prodicus:

> “In the list given by Drachmann [1922], others designated *atheoi* in the period up to the 3rd century BC are Diogenes of Apollonia, Hippo of Rhegium, Diagoras of Melos, **Prodicus of Keos**, the aristocrat Critias of Athens, Theodorus of Cyrene, Bion of Borysthenes, and Euhemerus of Messina.”
>
> — Michael Palmer (2013), *Atheism for Beginners* [1]

References

1. (a) Palmer, Michael. (2013). *Atheism for Beginners: a Coursebook for Schools and Colleges* (pg. 15). Lutterworth Press.
(b) Drachmann, Anders B. (1922). *Atheism in Pagan Antiquity* (pg. 13). Gyldendal.
2. Munn, Mark H. (2006). *The Mother of Gods, Athens, and the Tyranny of Asia: a Study of Sovereignty in Ancient Religion* (pg. 82). University of California Press.

External links

â— Prodicus – Wikipedia.

θΔics

In genius studies, **prodigies and calculus** refers to the subject of noted prodigies and geniuses in respect to the age at which he or she first learned calculus (TR=104), a subject that less than 1 to 2 percent of the population, supposedly, learns.

Prodigies | Geniuses

The following is a listing of ages at which noted prodigies and or prodigies turned geniuses learned calculus, ranked via age at which calculus was learned or mastered:

#	Person	IQE	Age	Description
1.	Kim Ung-Yong (1963-)	IQ_E =210	3	Began to learn differential calculus at age 3 (Q); solving integral calculus problems (Q) and or "intricate math equations" as he says (Q) at age 4; on Nov 2, 1967, at age 4, he solved an advanced stochastic differential equation (Q); at age 5, was solving complicated differential and integral calculus problems. (Q)
2.	Balamurali Ambati (1977-)		4	Mastered calculus at age 4. (Q)
3.	Soborno Bari (2012-)		4	Was learning trigonometry by age 3; doing calculus problems by age 4 (Q). This, however, seems to be the typical over-hyped "forced prodigy" scenario, his father Rashidul Bari, mathematics and physic professor, attempting to promote some type of Bari Science Lab, is hyping his son as "4 year old Einstein" or "4 year old calculus expert", but could only get his 13 year old son to score 610 math on the SAT. (Q)
4.	Michael Kearney (1954-)	IQ_E =325	6	At age 6, was wrapping up homework on calculus to get his high school diploma. (Q)
5.	Murray Gell-Mann (1929-)		7	Taught himself calculus at age 7. (Q)
6.	Terence Tao (1975-)	IQ_E =230	7	Started to learn calculus when he was 7, at which age he began high school; by 9 he was already very good at university-level calculus; by 11, he was thriving in international mathematics competitions. (Q)
7.	Jerry Newport (1948-)		7	At age 7, was using calculus to compute third and higher roots; self-discovered much number theory in elementary school—perfect numbers, Fibonacci, etc.—and in 2010 won title holder of 'Most Versatile Calculator'. [2]
8.	Promethea Pythaitha	IQ_E =173	7	Was taking calculus courses at Montana State University at age 7, completed her BS in mathematics at age 13, albeit officially

	(1991-)			receiving degree at 14. [2]
9.	Jeremy Shuler (2004-)		7	Studying pre-calculus by age 5 and had read William Dunham's *Journey Through Genius: the Great Theorems of Mathematics* (1990), from his mother's bookshelf; learned calculus at age 7; engineering freshman at Cornell by age 12. (Q)
10.	John Neumann (1903-1957)	IQ_R =190|#33 IQ_E =180	8	Learned calculus at age 8 (Q).
11.	Adragon De Mello (1976-)	IQ_E =400	9	Learned calculus at age 9 (1985) (Q).
12.	William Sidis (1898-1944)	IQ_E =250-300	9	Mastered differential and integral calculus at 9 or 10 years (Q).
13.	Henry Muhlbauer (2003-)		9	Mastered calculus at age 9, completed BS in electrical engineering at age 15 (see: youngest college graduates) at University of Virginia.
14.	Michael Grost (1954-)	IQ_E =200	10	Before age 8, had worked 2 to the 80th power, on a black board, in two hours time; mother could not help much with calculus questions, so at age 10 enrolled at Michigan State University. (Q)
15.	Sky Choi (1997-)		11	Taking Calculus II, Physics with Calculus I, at age 12 (2009), at Florida International University. (Q)
16.	John Mill (1806-1873)	IQ_R =185|#85 IQ_E =200	11	Learned calculus by age 11. [1]
17.	Albert Einstein (1879-1955)	IQ_R =220|#2 IQ_E =225	12	Taught himself calculus at age 12; integral and differential calculus by 13 (Q) (Q); in 1935, a rabbi in Princeton showed Einstein a clipping of the Ripley's column with the headline "Greatest living mathematician failed in mathematics." Einstein laughed. "I never failed in mathematics," he replied, correctly. "Before I was fifteen I had mastered differential and integral calculus" (Q).

18.	Christopher Hirata (1982-)	IQ_R =185|#75 IQ_E =225	12	Was taking college-level courses in physics and multivariable calculus; at age 14, upon arriving at Caltech, he registered one of the highest scores in history on the Institute's mathematics diagnostic tests, thereby enabling him to forego freshman calculus and sophomore differential equations for a more difficult upper-division class (Q).
19.	Richard Feynman (1918-1988)	IQ_R =190|#35	13	Was reading *Calculus for the Practical Man* at age 13 (Q), and had learned differential and integral calculus by age 13 (Q) or age 15. (Q)

(add)

Invention | Calculus

See main: Prodigies and calculus; See also: Greatest mathematician ever; History of differential equations

An interesting benchmark, among individuals claiming or being cited with a 200+ IQ, as well as other unknown IQs listed on this page, is the age at which calculus was learned. Firstly, of course, Newton (1665) and Leibniz (1674), independently invented calculus and later differential equations:

Isaac Newton (1643-1727)	at age 22 (1665) invented the first form of the calculus, which he called "the method of fluxions and fluents" (Q) (Q).
Gottfried Leibniz (1646-1716)	at age 28 (1674) independently invented his own variant of the calculus (Q).

After the publication of Leibniz's calculus publications, in 1684-1686, James Bernoulli and John Bernoulli began to work with him in the initial development of Leibnizian calculus—during which time James Bernoulli introduced the term "integral", in suggesting the name "calculus integralis", in place of Leibnitz's original term "calculus summatorius", for the inverse of "calculus differentialis". [3]

Swiss mathematician Leonhard Euler (1707-1783), sometime in or around his age 15 completion of university studies, learned mathematics from John Bernoulli, and thereafter would pen some 75-volumes, becoming the most prolific mathematician of

all time, ranking him, according to C.H. Edwards, along with Archimedes, Newton, and Gauss, as the one of the big four "incomparable giants of mathematics." [3]

At age 22, Marquis de Condorcet (1743-1794) published his *An Essay on the Integral Calculus*, which Jean d'Alembert praised as "work indicating great talent", and about which Joseph Lagrange said "it opens up for us a new field for the perfection of integral calculus." [1]

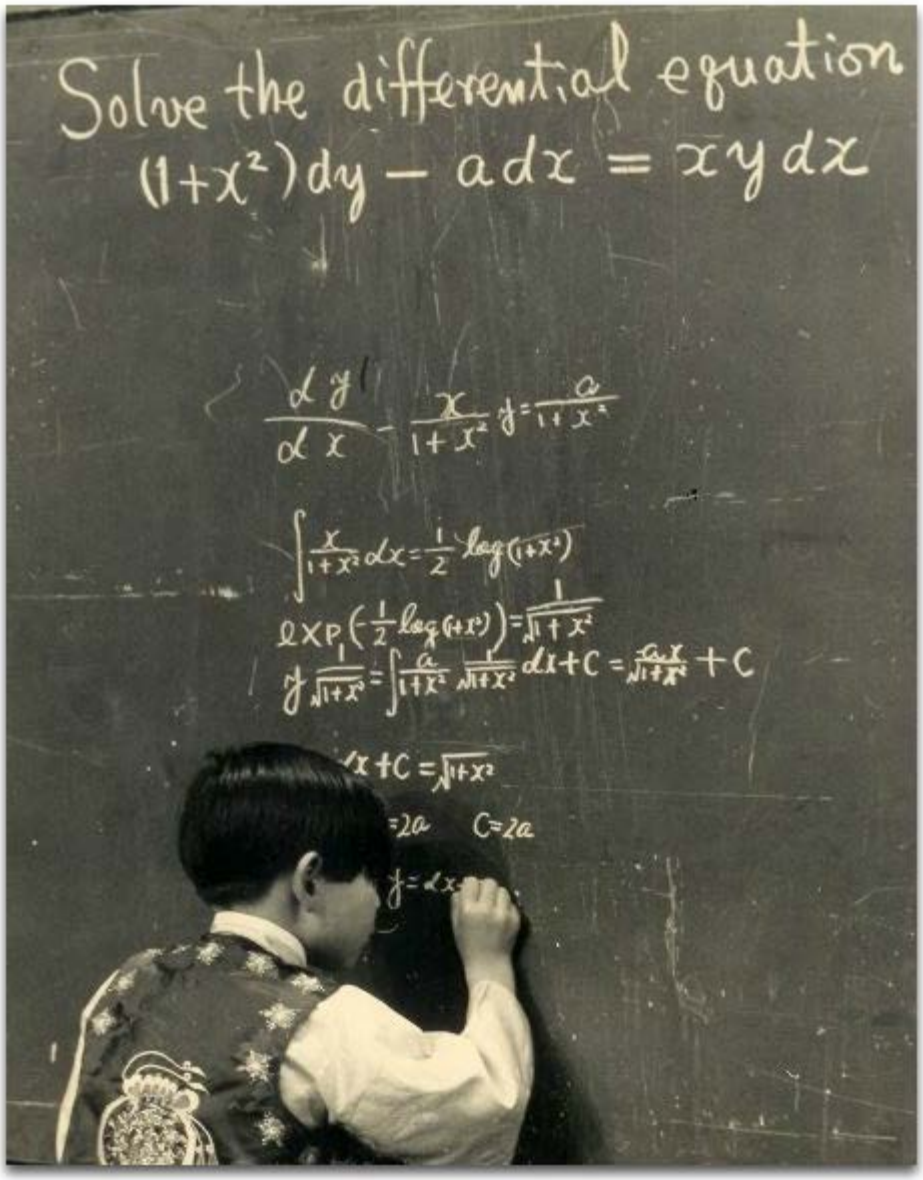

Korean child prodigy Kim Ung-Yong (1963-) solving a differential equation at age 7 on the Japanese Fuji TV show in 1969. (Q)

Keys

The following are IQ keys: IQ_R is The currently-estimated via meta-analysis genius ranking studies reality or real IQ as shown with top 500 geniuses ranking #. $IQ_E$is the highest-known IQ estimate, per sources, test calculations, ratio IQs, etc.

References

1. Cox, Catharine, M. (1926). *Early Mental Traits of Three Hundred Geniuses* *(Genetic Studies of Genius Series)* (calculus, 3+ pgs.). Stanford University Press.
2. List of child prodigies – Wikipedia.
3. Edwards, C.H. (1994). *The Historical Development of the Calculus* (pg. 268). Springer.

Videos

● Mueller, Scott. (2012). "6 Year Old Prodigy Solving a Problem Using Some Calculus" (Q), YouTube, Oct 24.
● Anon. (2012). "African Child Math Genius" (Q), two 8-year olds who passed the Cambridge A-level maths (supposedly a world record), Jan 1.

In genius studies, **prodigies on god** refers to religious beliefs, faiths, creeds (e.g. atheist's creed), if any, and or conversely agnostic, humanist, secular, proto-atheist, or atheist views of child prodigies, who, of peculiar nature, are born into a world with an accelerated ability to process new knowledge, which conflicts with ancient knowledge, which is mythological based, and therein a heightened sense of confusion may arise, particularly when it comes to those able to process thermodynamics, as applicable to the humanities, e.g. James Maxwell, William Sidis, Christopher Hirata, or Luis Arroyo, which is the replacement for the sun god belief systems, i.e. Abrahamic theology or Brahamic theology, presently dominating the basic foundation of the world religions, as taught in the form of Abraham or Brahma, both of which are Ra the sun god transmogrifications. [N1]

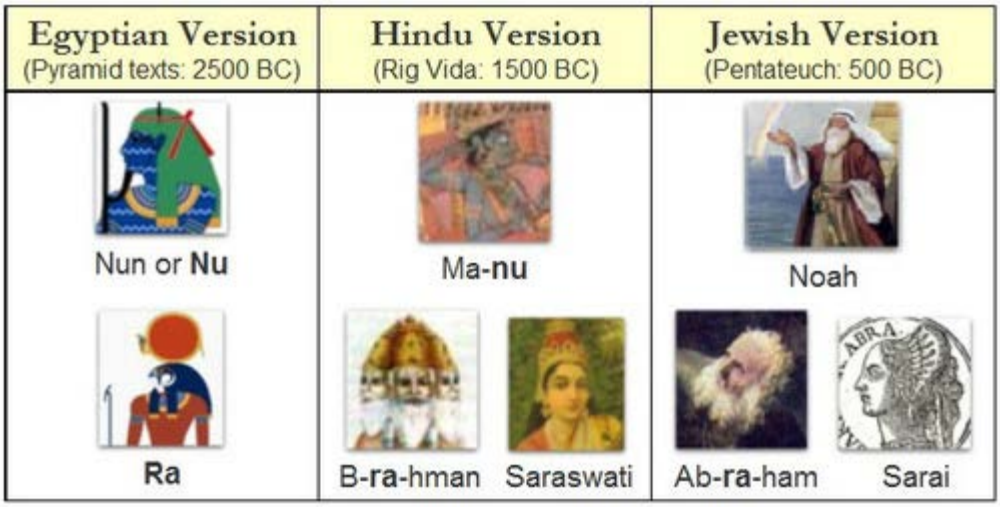

A synopsis of the morph of Nun + Ra based Egyptian mythology (Anunian theology) into Hindu mythology (Hinduism), and both of these as a syncretism morph into Jewish mythology (Judaism), and this into Christian mythology (Christianity), a belief system that currently dominates 75 to 88 percent of the world's religious beliefs.

Overview

The following shows the 2002 world religions according to Egyptian mythology classification:

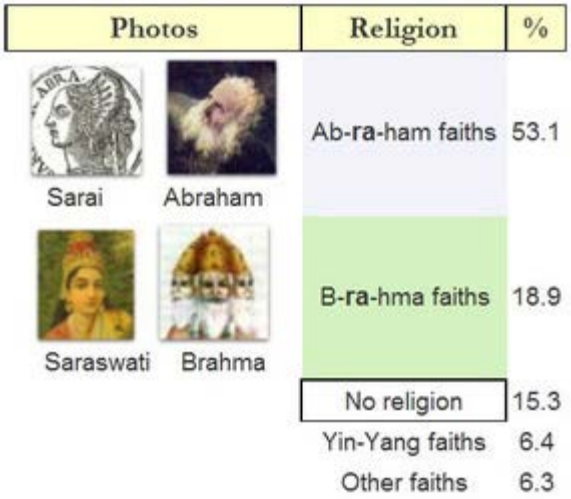

Photos	Religion	%
Sarai, Abraham	Ab-ra-ham faiths	53.1
Saraswati, Brahma	B-ra-hma faiths	18.9
	No religion	15.3
	Yin-Yang faiths	6.4
	Other faiths	6.3

A standing rule, concerning 200+ IQs, particularly for those born after 1895, a belief in god or gods is an automatic disqualification from the 200+ IQ range. This question, in fact, should be the first question asked on any standard high IQ test, whereby an answer of “yes” would result in an unequivocal 15% reduction in the final IQ score. The reason for this is that one’s opinion on the matter of religion, and particularly on the great ‘theory of god’, is a huge demarcation or insight into one’s intellectual framework. God is humankind’s oldest scientific theory, conceived by genius men of olden days. Subsequently, if one is a true modern-day genius, it is a matter of duty to question everything, especially those most established ideas. The theory is so dominant, that, in fact, at a minimum, seventy-two percent of the world's population currently believe this theory.

The theory of god serves its purpose for the masses, but for the all-knowledgeable genius, prior to the early 19th century, one may have been excused for adherence to the theory of god, in its various forms, but after 1822, the year in which the cryptic Rosetta stone was deciphered by English physicist Thomas Young, after which it was possible to see

clearly that the main tenets of the major modern day religions (Christianity, Islam, Hinduism, etc.) were simply reformulated Egyptian mythology, particularly the story of the birth of the sun god Ra out of the water or chaos of beginning god Nu, and the afterlife, rebirth, and reincarnation theories that followed:

This issue of religious syncretism became even clearer to the inquisitive genius reader when in 1895 Egyptologist Wallis Budge published *The Egyptian Book of the Dead* (*Papyrus of Ani*), wherein after "untold numbers of people began to write books, papers, and dissertations on the parallels between Jesus and Osiris (Ra's great grandson). [54] The issue of the Egyptian origin to the modern world religions can be said to have solidified, without doubt, after the publication of American religious scholar and Egyptologist Gary Greenberg's 2000 *101 Myths of the Bible*, wherein he steps through ever story in the Bible and shows the original Egyptian version (Pyramid texts + Coffin texts), from which these stories (Bible, Koran, Rig Vida, etc.) originated. [55] Beyond this the modern "human molecule" view of human existence, from which humans are of the same family as hydrogen atoms, would forever would act to inter the age-old theory of god, along with other now defunct scientific theories, including: vitalism, caloric theory, flat earth theory, spontaneous generation, and life, in the mind of the true modern universal genius.

Prodigy | Beliefs

In this context, the following opinions on the theory of god, expressed by the listed 200+ IQ group, gives a creditable intellectual litmus test as to the truthfulness of each person's estimated IQ:

Person	IQ	Religious Beliefs	Score
Johann Goethe (1749-1832)	180-225	● At age 21, at the University of Strasbourg, completing a dissertation (rejected on the grounds that it was unorthodox) on "The Legislature, On the Power of the Magistrate to Determine Religion and Culture", in which he contended, among other things, that "Jesus Christ is not the author of Christianity, but rather a subject composed by a number of wise men and that Christian religion is merely a rational, political institution." [65]	pass
William Sidis (1898-1944)	200-300	● At age 6, was a confirmed atheist. [60] ● At age 21, when asked in court if he believed in god, he replied "No" and clarified that evolution was his god; when pressed further about this he stated that he did not believe in the "big boss of the Christians", but that he did believe in something "that is in a way apart from a human being". [60]	pass
Albert Einstein (1879-1965)	160-225	● At age 75, gave his opinion that "the word of God is nothing more than an expression of human weakness"; described the Bible as "pretty childish"; and stated that "all religions are incarnations of the most childish superstitions." [56]	pass
James Maxwell (1831-1879)	190-205	● At age 48, in his last year (the same age his mother passed from the same infliction [stomach cancer] he would pass from), wrote out his final private thoughts about the relationship of science and religion, the soul, choice and chance, and death and eternity his is riddle poem "A Paradoxical Ode".	?
Marie Curie (1867-1934)	180-200	● At age 11, after both her mother and oldest sister had died (from tuberculosis and typhus, respectively), she fell into a profound depression and concluded that God did not exist. [64]	pass
Voltaire (1694-1778)	190-200	● Quote: "I want my lawyer, my tailor, my servants, even my wife to believe in God, because it means that I shall be cheated and robbed and cuckolded less often. ... If God did not exist, it would be necessary to invent him."	pass
Michael Kearney (1982-)	200-325	● At age 21, commented: "You have to be focused on the things that make you a human and not a golden god. You have to focus on just living." (link)	?
		● At age 4, engaged in "mystical behavior"; saw his recently deceased Aunt Bessie being carried up an a flight of stairs, assisted by two old ladies, while at	

	Marnen Laibow-Koser (1975-)	268	the funeral reception (although no one else could see these invisible stairs or invisible ladies), but supposedly described Bessie's funeral dress and arrangement exactly and communicated with her, even though he had never really met here (*Nature's Gambit*, pgs. 187-203). ● At age 34, stated "once again, God / the universe / whatever has reminded me that you get what you want (or what you think you want) when you're not really looking for it." (link)	fail
	Christopher Langan (1952-)	174-210	● Began to question god as a child; later returned to god, and is currently writing a treatise called the cognitive theoretic model of the universe, a type of intelligent design themed argument for the existence of god. ● At age 48, commented "Regarding evolution and creationism, the linkage is simple: Biblical accounts of the genesis of our world and species are true but metaphorical, our task is to correctly decipher the metaphor in light of scientific evidence also given to us by God." (link)	fail
	Sho Yano (1990-)	200	● Name means "happiness with god" (link). ● At age 14, commented that "I'm gifted. I got my gift from God, and I think I better not waste it" (link).	fail
	Michael Grost (1954-)	200	● Grost mostly likely believes in god. In the biographical book of him (*Genius in Residence*, 1970) written by his mother, when he was 16 (and old enough to object), the first page opens to a description of describing Michael as a "miracle of God", and the last page concludes with "may we offer those successes my son has experienced in the past, and God willing, those successes he may experience in the future …"	fail
	Marilyn vos Savant (1946-)	186-228	● Quote: "Suppose you have bet on horse number 1 in a 3 horse race in which there is no favorite. After you have placed your bet, omniscient god, who, of course, knows the horse destined to win and how you have bet tells you, 'It's not going to be horse number 3'. Depending on God's other attributes, e.g. whether God seeks to guide people towards the right decisions, you should probably switch to horse 2 if you have the opportunity." (link) ● Quote: "Religions cannot be proved true intellectually. They come from the heart—and your parents—not the mind." (link)	fail
	Rick Rosner (1960-)	140-250	● At age 7, in his own words, "when my parents returned, they found me spinning clockwise (so that I wouldn't accidentally travel backwards in time) and chanting to God. I was taken to a child psychiatrist and given more IQ tests, including parts of a Stanford-Binet." [59]	fail
	Naida Camukova (c.1976-)	140-200	● Believes in God and creation; has read the Koran multiple times, and re-reads it frequently; uses phrases such as "God willing", etc. (link).	fail

(add discussion)

See also

- Prodigies and calculus
- Religion and intelligence

Notes

N1. Note: This page started, on 19 Oct 2016, as a paste from the "Prodigies | God" section of the IQ: 200+ page, after finding 2014 discussions of Christopher Hirata's 13 Oct 2013 Facebook post about how he recited the Lord's prayer to a homeless person in Colorado. [1] The page may also have origin influence from Thims 18 Oct 2016 application letter for the Chair of the Appignani Atheism Chair, wherein commentary on Puerto Rican child prodigy Luis Arroyo's age 20

MS physics thesis “A Thermal Model of the Economy”, and how at age 15 he was interviewed about his Jehovah’s Witness beliefs in respect to science.

References

1. (a) Christopher Michael Hirata – Facebook.
(b) Tim. (2014). “Of 10 highest IQ’s on earth, at least 8 are Theists, at least 6 are Christians: Examiner.com” (Q), Eternal Vigilance, Blog, Jul 12.
(c) TrollSponge. (2014). Out of the World’s 30 Smartest People: 11 atheists, 1 deist, 10 theists, 8 not known” (Q), BodyBuilding.com, Forum, Nov 14.

θΔics

In chemistry, a **product** is a substance, such as an atom, ion, molecule, molecular entity, or chemical species that is formed during a chemical reaction. [1] A reactant, conversely, is what goes into or exists at the start of a reaction. This is diagrammed below:

Reactants → *Products*

References

1. (a) Product - IUPAC Goldbook
(b) Daintith, John. (2004). *Oxford Dictionary of Chemistry*. New York: Oxford University Press.

θΔics

In religio-mythology, **Promethean heat** (G:7K), or "Promethean fire" (G:50K), is the mythological substance of life, which, according to the 800BC stories of Hesiod, was a life-animating type of fire that was stolen from the god Zeus by wily intelligent Titan named Prometheus who gave it to mortals, made of clay, to animate them and thus give them life. In short, "Promethean fire" is the Greek version of the vital principle; the fire with which Prometheus quickened into life his clay images. [4]

Artistic rendition of **Prometheus** stealing **fire** from the heavens, the god Thor in particular, who gave it to mortals, made of clay, to animate them and thus give them life.

Passion

English writer William Shakespeare comments on this, extrapolated to the nature of the heats of passion, in his 1603 *Othello, the Moor of Venice*, in riddled form: [1]

> "I know not where is that **Promethean heat**, that can thy life relum."

In other words, even in Shakespeare's time, people believed that life, in some way, was due to an internal fire and that this heat is in some way connected to the heating natures and aspects of passion and love.

Etymology

Etymologically, the 800BC Greek Promethean "fire origin of life theory" is a handed-down derivative version of 3,100BC Egyptian Ra theology creation myth of the creator fire god Atum, himself born out of mud (or clay), creating the first two forms of life (Shu, his son, and Tefnut, his daughter) via "breath" and "spit". This "breath origin of life theory" then became syncretized, in the years to follow, with other derivatives such the Sumerian myth of the birth goddess Nammu, of the watery depths, molding clay into the shapes of humans and bringing the molds to life to be a workforce replacement for the gods in the maintenance of the land. [2]

Thermodynamics

In his 1954 chapter "Life and Thermodynamics", English thermodynamicist Alfred Ubbelohde quotes this motto by Shakespeare to argue to the effect that when we look into the question of the origin of life, or emergence of life, in the thermodynamic perspective, we are not much progressed, in our understanding of the issue of life's origin, beyond myth of Prometheus. In his own words: [3]

> "Scientifically, we are not much more advanced than the Greeks, who thought of Prometheus making men of clay, and stealing fire from heaven to animate them."

In the correct modern sense, the 2009 defunct theory of life is the reconciliation to the issue, which states that the theory of life is defunct, replaced by the view that humans are molecules (human molecules) animated or moved by the electromagnetic force, as are all molecules.

Synonymous theories

The defunct 19th century term "vital heat", as well as the early 20th century term "vital energy", are modern-day versions of Promethean heat. Other examples of modern-day thinkers in search of the so-called Promethean fire to explain the origin of life include: American chemist Stanley Miller, and his 1952 electric spark theory of the origin of life, Dutch biophysicist Anthonie Muller, and his 1983 thermosynthesis heat engine origin of life theory, American biochemist Stuart Kauffman, and his 1993 auto-catalytic closure thermodynamic cycle origin of life theory, and Russian physical chemist Georgi Gladyshev and his 2010 hierarchical thermodynamics origin of life theory.

All-in-all, attempts to search for a thermodynamic-stylized Prometheus fire origin of life theory is akin to the chemist's search for the philosopher's stone or the mechanist's search for perpetual motion.

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θΔics

In Greek mythology, **Prometheus** (CR:23) was a god, classified as a Titian, or second generation of divine beings (see: Ennead), credited with creation of man from clay (see: clay creation myth), famous for his theft of fire from the gods, which he gave to mankind.

A depiction of **Prometheus** stealing fire from heaven to give to mankind.

Creation of humans

Prometheus was said to have created humans by animating a figure of clay by putting into it a spark of fire. (Ñº)

Osiris | Cross

In c.640BC, Hesiod, in his *Theogony* (pg. 521) refers to a post or pillar to which Prometheus is fastened, for punishment, by Zeus, for stealing fire. [1]

In c.180AD, Lucian stated:

> "**Prometheus** was bound to a cross on Mount Caucasus where an eagle continually gnawed at his liver [emotion center]."
>
> — Lucian (c.180AD), *The Liar*; cited by Jean Meslier in *Testament* (pg. 66)

Alternatively, Lucian stated, somewhere, that Prometheus was nailed to two rocks above a ravine in the sight of all, in such a way as to produce the effect of a most serviceable cross, akin to the following: [1]

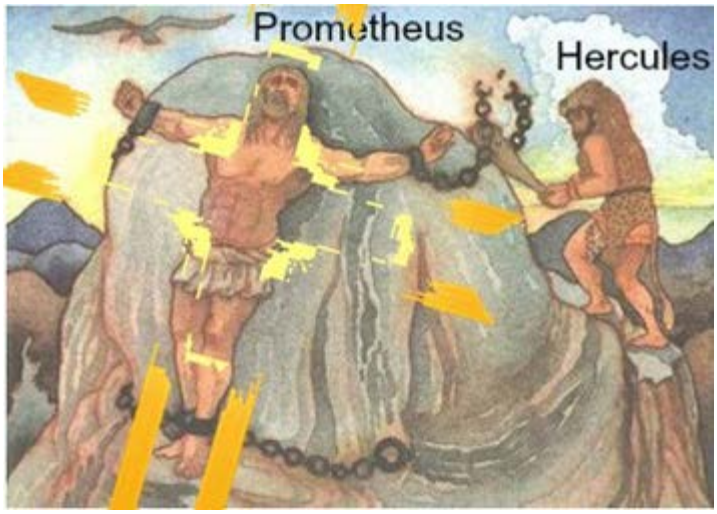

In addition to Prometheus, connected historically or allegorically with a crucifixion are: Adonis, Apollo, Arys, Bacchus, Buddha, Christna, Horus, Indra, Ixion, Mithras, Osiris, Pythagoras, Quetzalcoatl, Semiramis, and Jupiter. (Ñº)

In 1875, Kersey Graves, in his *The World's Sixteen Crucified Saviors*, was one of the first to state that Prometheus, like the other culturally-equivalent historical crucified saviors, was an Osiris rescript. [3]

Quotes | On

The following are quotes on Prometheus:

> "**Prometheus**, the great reformer and benefactor of mankind, son of the goddess Clymene, was stretched in a **cruciform** position on the rocks, and tormented by his father, Jupiter [Amen-Ra], who at length consented to allow Hercules [Horus] to liberate him, when he gained immortal fame for having by his agony procured light and knowledge for men. He was said to have formed the first man and woman out of clay, and afterwards to have animated them with the fire, which he stole from the chariot of the sun."
>
> — Herbert Hardwicke (1884), *The Popular Faith Unveiled* (pg. 49)

> "Thoth is the Egyptian **Prometheus**."
>
> — Ronna Burger (1980), *Plato's Phaedrus* [4]

See also

â— Promethean heat

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External links

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θΔics

In science, **proof** is the cogency of evidence that compels acceptance by the mind of a truth or a fact or the process of an instance of establishing the validity of a statement especially by derivation from other statements in accordance with principles of reasoning; something that induces certainty or establishes validity; the quality of having been tested or tried, especially to the point of unyielding hardness. [1]

In 1975, American sociologists James Dabbs and Neil Stokes found that beautiful people are given more volume of personal space when moving in public, a **proof** that thermodynamics applies to humans socially. In 2002, American electrochemical engineer Libb Thims found **prove** of Beckhap's law, that beauty is inversely proportional to brains, on average.

Descartes | Spinoza

The following is a noted maxim of Rene Descartes:

> "Nothing ought to be received as truth until it has been **proved** by good and solid reasons."

Dutch philosopher Benedict Spinoza, from an early an age, was said to have been said to have been strongly impressed by this Cartesian ideology.

Overview

In hmolscience, often when physics, chemistry, and thermodynamics terminologies are seen being employed to explain social phenomena and social questions, the objection arises to the effect of: "where is the proof?" or "has this been tested by falsifiability", of the Karl Popper test of science variety, "can the theory make predictions" that can be tested, and so on. The following 1945 statement by American historian Morris Zucker in objection to physicists employing physics theory, such as relativity, to explain sociology and history, seems to hit the nail on the head: [2]

> "We will soon have the occasion to discuss the social philosophies of some really great physicists when they deign to pass judgment on social questions. Here we are concerned with an attempt to engraft 'relativist' history through the medium of relativist phraseology. The frame of reference, lines of force in a gravitational field, the time-space continuum, all these are noble conceptions in physics where they are endowed with precise meaning and have been subjected to experimental proof. Writers have attempted to smuggle these conceptions into history by the simple expedient of employing the same idioms. They sound the same, but have not the same meaning. Let them use facts instead of phrases, **proof** instead of analogies."

In 2010, another example comes from Iranian-born American chemical engineer Ali Mansoori who, at the end of a guest lecture on human thermodynamics given by American electrochemical engineer Libb Thims, given to bioengineering thermodynamics students, at the University of Illinois Chicago, Mansoor, the professor of the class, asked Thims, in followup Q&A, "has this been proved anywhere?"

Thermodynamics

Swiss mathematical physicist Leonard Euler, with his circa 1740 "reciprocity relation" is the so-called mathematical proof behind the condition for an exact differential, and hence the mathematical proof behind the existence of state functions, in particular entropy, of thermodynamics.

In circa 1860, German physicist Rudolf Clausius gave his famous "proof of the impossibility of perpetual motion of the second kind", according to which perpetual motion violates the second law of thermodynamics.

In 1882, German physicist Hermann Helmholtz, in his “On the Thermodynamics of Chemical Processes”, famously proved that free energy, not heat, is the true measure of chemical affinity. Belgian chemist Theophile de Donder, supposedly, also gave a similar proof in 1922, but by that time, Helmholtz's proof had already been absorbed into the 1923 textbook of Gilbert Lewis, and hence modern chemical thermodynamics, as it is currently known.

Thermodynamic proofs

The subject of "thermodynamic proofs" are a bit of a complex subject. They are, in a sense, mathematical proofs—sets of arguments used to deduce a mathematical theorem from a set of axioms—combined with proofs and measurements found from physical experiments on nature in respect to heat, work, and energy. The examples of Q&A’s behind attempts to prove something as simple as, for example, Boyle’s law, something first arrived at via experimental data obtained from the pneumatical engine, give examples of the issues at hand. [6]

Dabbs-Stokes study

See main: Dabbs-Stokes study

The 1975, American sociologists James Dabbs and Neil Stokes, in their article "Beauty is Power: the Use of Personal Space on the Sidewalk", presenting the results of a study in which the time lapse filming of pedestrians observed from above walking along a sidewalk, which found a number of quantitative findings, one being that a beauty causes a volume expansion, meaning that a beautiful person is given or allotted more personal space when moving through crowds, a finding measured in inches increase in volume. [4] This would seem to be one of the first proofs of a connection between beauty, mechanisms of human chemical reactions, and pressure volume work, as quantified in human chemical thermodynamics.

Beckhap's law proof

See main: Beckhap’s law proof

In 2002, American electrochemical engineer Libb Thims, using college graduation photo attractiveness ranking data and intellectual difficulty of college degree obtained data proved of Beckhap’s law, that beauty and brains, on average, are inversely proportional.

Specifically, to determine if physical attractiveness, statistically, is inversely proportional to intelligence, on average, Thims had one group of people rate the physical attractiveness of 2,018 college graduation photos, graduating classes of 1969 and 1972 at the University of Illinois at Chicago, and had a second group of people rate the intellectual difficulty of each degree obtained, for the people in those photos, albeit only being shown the name of the degree.

These two data sets were sorted by sex and grouped into similar categories. The results confirmed the theory. In the graduating classes of 1969 and 1972, for example, 670 female students obtained 67 different degrees. By comparing females who obtained science-related degrees, among other related groups, we obtain the plot shown below: [3]

Description: A plot of the ranked data results, of the group "female science majors", from the 2002 study of 2,018 University of Illinois at Chicago (UIC) college graduation photos, graduating classes of 1969 and 1972, showing that

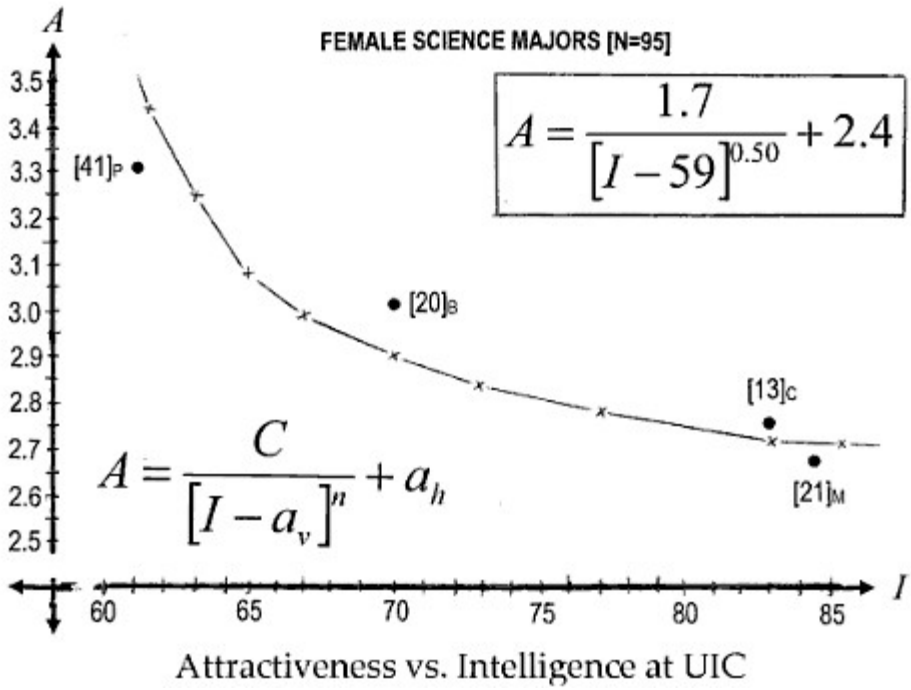

Attractiveness vs. Intelligence at UIC

attractiveness is inversely proportion, on average, to intelligence, a finding which corroborates Beckhap's law.

Key: P = psychology, B = biology, C = chemistry, and M = mathematics, each with 41, 20, 13, and 21 students, respectively. Similarly, *A* = physical attractiveness (of group); on a scale of 7.0 = most physically attractive to 1.0 = least physically attractive; and *I* = intellectual difficulty (of degree); on a scale of 100 = most intellectually difficult to 10 = least intellectually difficult.

A similar inverse trend was found with male engineering students, namely that the physical attractiveness of students, on average, was found to be inversely proportional to intellectual difficulty of degree obtained.

Thims then attempted to explain this finding by correlating the initial state G_i and final state G_f of the free energy change for a typical mating reaction to bulk values of attractiveness and intelligence involved in mate selection. A solution was found using the following two assumptions, first that enthalpy is proportional to physical attractiveness:

$$H = kA$$

This would concur, in some sense, with Frederick Rossini's 1971 "Chemical Thermodynamics in the Real World" argument that enthalpy is a measure of "security" in social reaction existence, meaning that people will tend to want to bond with physically attractive individuals in relationships, and hence be seemingly more "secure" in their social existence or in the social structure, whereas less physically attractive individuals will tend to remain single, e.g. homebodies, cat ladies, and or outcasts, e.g. hobos, bag ladies, etc., give or take, baring more detailed discussion.

The second assumption made was that entropy is inversely proportional to intelligence:

$$S = \frac{k}{I}$$

This would concur, in some sense, with Stephen Hawking's 1996 argument that reading decreases the neurological entropy of a person by so many units, meaning that intellectual mastery would be inversely proportional to entropy of a person, in a roundabout sense, using a combination of the 1862 entropy as a measure of disgregation model of Rudolf Clausius and the 1882 characterization by Hermann Helmholtz of the magnitude of entropy |S| as the measure of disorder of the particles of the system with respect to each other.

With these approximations in place, one can employ intelligence and physical beauty as correlative measure of entropy and enthalpy, respectively, which can thus be used to represent the instantaneous 'state' of the reactive system at any given second on going from reactants to products. These, in turn, can then be substituted into the Gibbs equation:

$$\Delta G = H_f - H_i - T(S_f - S_i)$$

to yield for an inverse relationship plot. Skipping over much of the derivation and discussion, using the two above approximations, and assuming that initial state of the reaction, in which two individuals, one male molecule Mx and one female molecule Fy, of varying levels of intelligence and beauty, is the day the pair fall in love at first sight, that they pair conceives one child, Bc, three years later, and that the end state of the reaction, coincides with the point of the fifteenth year of the growth of the child, after which the precipitate child molecule begins to detach from the parental structure. This gives the following simplified overall reaction mechanism:

$$M_X + F_Y \rightarrow B_C$$

On this model, the following variables can be be defined at day one (-3 years before conception) and the final day (+15 after conception):

$G_f = G_C^{15}$	Gibbs free energy of the state of the child, Bc, detached at age 15.
$G_i = G_X^{-3} + G_Y^{-3}$	Gibbs free energy of the state of two reactants, the male Mx and female molecule Fy, at the point of love at first sight.
$H_f = H_C^{15}$	Enthalpy of the state of the child, Bc, detached at age 15.
$H_i = H_X^{-3} + H_Y^{-3}$	Enthalpy of the state of the two reactants, the male Mx and female molecule Fy, at the point of love at first sight.
$S_f = S_C^{15}$	Entropy of the state of the child, Bc, detached at age 15.
$S_i = S_X^{-3} + S_Y^{-3}$	Entropy of of the state of the two reactants, the male Mx and female molecule Fy, at the point of love at first sight.

Using these time-specific variables, through a bit of substitution, one can derive the following result: [9]

$$A_X^{-3} = \frac{C_1}{I_X^{-3}} + C_2$$

which says that, owing to the constraints of the Gibbs equation, otherwise known as the combined law of thermodynamics, the physical attractiveness of the individual, in this case the male, will vary inversely with the intellect of the individual, on average, at the initial start to a typical romantic male-female reaction.

There are many issues, to note, with this proof, one being that the second assumption, that of entropy, using the disorder model of entropy, in human reactions, being inversely proportional to intelligence (mental order), is derived from gas theory, particularly the Boltzmann chaos assumption, in which particles are assumed to have non-correlative velocities, which is not the case with human molecules.

Other

In 1992, French-born English ecologist-philosopher Edward Goldsmith, in his *The Way: An Ecological World-View*, attempted to argue, on the logic of the views of Belgian chemist Ilya Prigogine, that the laws of classical thermodynamics cannot be applied to living things, and included an appendix section devoted to a supposed ten-page proof that "the entropy law does not apply to behavior within the ecosphere." [5]

In 1869, German physicist-physiologist Adolf Fick, supposedly, attempted to give some type of 'entropy proof of God's existence'; the first of many so called second law based or disorder-order based proofs of God reoccurring seen ever sense.

Quotes

The following are related quotes:

> "The concept of psychic energy is as much justified in science as that of physical energy, and psychic energy has just as many quantitative measurements and different forms as has physical energy. The burden of **proof** falls on those who deny psychic energy, not on those who acknowledge it."
>
> — Nicolas von Grot (1898), "The Terms of the Soul and Psychic Energy n Psychology"

> "What does economic power mean in a system theoretical rather than in a political sense? We don't know? Consequently, we cannot define a set of adjugate variables that describe the behavior of a macroeconomy. However, I would like to go one step further. While I **cannot prove** this to be correct, I am personally convinced that any real system that can meaningfully be describe by a differential equation model—and macroeconomic systems are among those without any question—possesses some sort of 'energy' that obeys the law of conservation of energy. It is just that, to my knowledge, nobody has ever looked into systems, such as macroeconomies, from quite that [thermodynamic] perspective and tried to formulate a meaningful and consistent definition of the terms 'energy' and 'power', and from there derived a set of adjugate variables, the product of which is 'power'. This would be a very worthwhile topic for a PhD dissertation."
>
> — Francois Cellier (1991), "Modelling in Nonequilibrium Thermodynamics"

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External links

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θΔics

In thermodynamics, **proof of the impossibility of perpetual motion of the second kind** refers to the proof given by German physicist Rudolf Clausius, sometime between 1850 and 1865, that if entropy did not increase, i.e. if the principle of entropy increase did not exist, in a system (body, working body, or working substance), in the operation of one cycle of a heat engine, or in many continuous cycles, quantified by the cycle integral, for any process that is in any way possible, that it would be possible to couple two heat engines together so as to make perpetual motion or rather perpetual motion of the second kind.

θΔics

In thermodynamics, **property**, particularly as defined in engineering thermodynamics, is a term, commonly defined as any quantity which serves to describe a system, used synonymously or rather in place of "variable", e.g. intensive property (vs. intensive variable) or extensive property (vs. extensive variable) the latter, i.e. variable, being the more common usage in general thermodynamics. [1]

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θΔics

In science, **prophet**, as compared to a religious prophet, seer, or oracle is one who has the ability to cogently see into the future and to correctly predict things to come.

> "Each age has its own **prophets**, men who bring to it distinctive messages and present them in such effective form as to sway the currents of contemporary thought."
>
> — Edwin Slosson (1914), *Major Prophets of Today* [9]

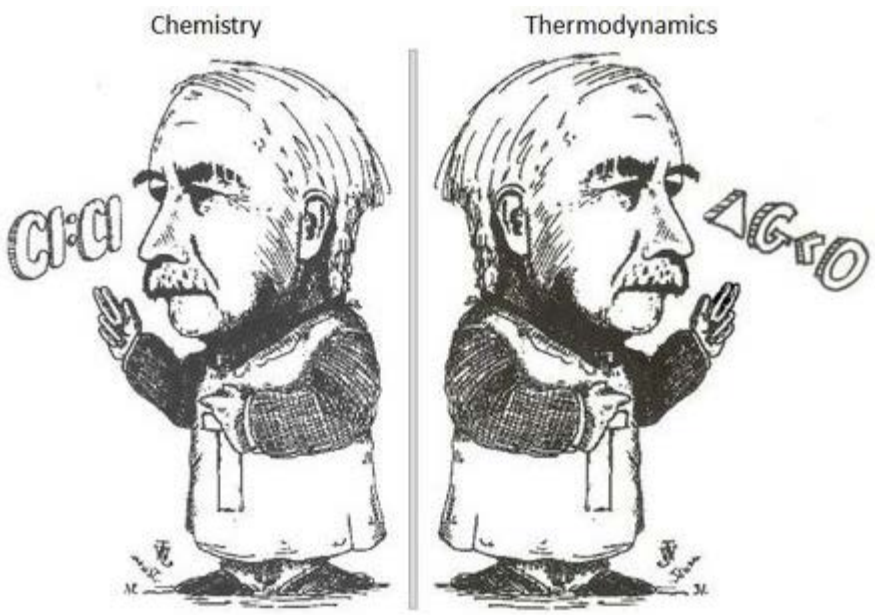

Left: American chemistry historian William Jensen's 2007 caricature of American physical chemist Gilbert Lewis as the **prophet** of the chemical bond, for the 1902 development of his Lewis dot structure model. Right: Jensen's diagram retouched in 2012 by American electrochemical engineer Libb Thims, depicting Lewis as the 20th century's greatest **prophet** of chemical thermodynamics, particularly for pointing the way to the usage of the free energy criterion $\Delta G < 0$ as the "universal rule" for naturally occurring earth-bound freely-going reactions and processes.

Overview

The following 1871 quote by American presidential candidate Victoria Woodhull on German polymath Johann Goethe (IQ=230) and his self-defined greatest work *Elective Affinities*, captures the essence of the scientific prophet: [1]

> "If this fundamental thought of the man who has proved to be the **seer** or **prophet** of science in so many other things, is also a **scientific truth**, the fact cannot be appreciated by the world too soon, nor its immense sweep of consequences be too clearly foreseen and provided for. It will affect the whole scope of morals and social order."

American historian Henry Adams was also a seer of sorts, for on the same subject that Woodhull here speaks, Adams stated, in depend to both, in 1885, that the subject, i.e. the chemistry, physics, and thermodynamics of "human molecules", as Adams defines people, specifically the scientific study of "attractions and repulsions of *equivalent* human molecules", as Adams stated, was a "science yet to be created"—a prophesy that would soon begin come true in the two centuries to follow (Dreier, 1910-54; Fairburn, 1914; Thims, 2007-present).

The mean if Goethe (IQ=230), Adams (IQ=190), Helmholtz (IQ=195), and Lewis (IQ=195), yields and prophet IQ mean of 203 (IQ_{avg}=203).

American anthropologist Leslie White, noted for his 1943 sketches of crude formulas on the nature of energy, entropy, and free energy in culture, has been described as "anthropology's most significant **prophet** of the second law." [2] This "prophet of the second law" epitaph might stem from Eric Wolf whose 1964 description of White as "an **evolutionist prophet** crying in an antievolutionary wilderness that yielded no sympathetic echo", which has frequently been requoted.

In this same vein, English physicist C.G. Darwin might be classified as a prophet, to some extent, for this 1952 *The Next Million Years*, wherein he attempted to speculate on how thermodynamics could be used to predict the next million years of the evolution of "human molecules" (his term).

In circa 1956, Iranian thermodynamicist Mehdi Bazargan, possibly stated in his *Thermodynamics of Humans*, stated the following views in regards to death or rather termination of the person: [4]

> "Thermodynamics might be able to say, though very vaguely, if there is going to be a resurrection and

another world, how this may occur and what the other world may look like … In this way, we may be able to examine to what extent the signs of the other world, as provided by the **prophets**, are plausible. If these signs about the resurrection, paradise and hell form a reasonable and sensible related collection that new sciences, to some extent, affirm, then such beliefs are not baseless."

The subject referred to here, to note is what is called cessation

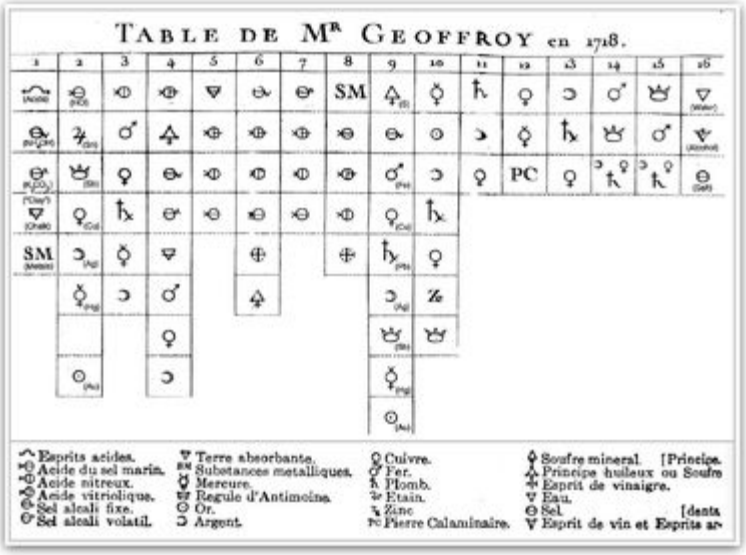

"This table becomes sort of **prophetic**, for if substances are mixed together, it can **foretell** the effect and result of the mixture."
—French Royal Academy of Science (1718)

French physician-chemist Etienne Geoffroy's 1718 affinity table, culled from Isaac Newton's "Query 31", the first reaction **prediction** device; the forerunner to prediction based on free energy, as embodied in 20th century free energy tables; the first to outline the logic of prediction based on human free energy tables done by American electrochemical engineer Libb Thims in 2007. [8]

thermodynamics, the study of the nature of the termination of existence of an individual human from the point of view of thermodynamics; and to clarify further, Bazargan, was Islamic in faith or belief system, meaning that he believed in the existence of God, and believed, possibly, in the theory of resurrection, which is a modified derivative of the Egyptian weighting of the soul afterlife theory, as structured in the framework of the Anunian theologies (Ra theologies), of which 75 percent of the current population of the world adheres to. The modern point of view, however, holds that a human is a molecule (see: human molecular formula) or atomic geometry or human chemical or whatever name one is attune to and chemicals and molecules, by definition are not alive and do not die—by repercussion of this fact: a human cannot die.

"Libb Thims — the great **oracle** and developer of human thermodynamics—the philosophical revolution of the 21st century. A genius of outstanding stature and originator of many concepts in human chemistry."

— Mark Janes (2011), comment on the work of Libb Thims [5]

"I must say, I started watching your videos over a year ago, and have re-watched many. And they still fascinate me. I'm only 17 and I'm seriously considering doing a degree in chemistry after watching your videos. The only downside is not many people I know can have a conversation about the things you're talking about. You were right your videos are decades if not a century in front of its time."

— Ben (2011), comment on Human Chemistry 101 YouTube channel

Economic thermodynamics

Romanian mathematician Nicholas Georgescu, has been described as American economist Jeremy Rifkin's "prophet and teacher", the main influence behind Rifkin's theories. [7]

Quotes

The following are related quotes:

> "He who learns the law of phenomena wins not only learning, but the power of entering into the course of nature and of working on it further according to his will and need. He wins insight into the **future** course of these phenomena. He wins indeed faculties that in superstitious times were looked for in **prophets** and magicians."
>
> – Hermann Helmholtz (1892), "Goethe Lecture" [6]

> "The **prophet** of this new science was Georg Helm, a school teacher who caused a sensation with his 1887 monograph *The Doctrine of Energy*, [in which] he append a final chapter on the extension of the energy principle to social theory and, more specifically, to economics, traversing the now familiar hierarchy of physical energy to vital energy to social energy."
>
> — Philip Mirowski (1989), *More Heat Than Light* [10]

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â— Slosson, Edwin E. (1914). *Major Prophets of Today* (ch. 5: Wilhelm Ostwald, pgs. 190-241, esp. 199-207; quote, pg. 204). Little, Brown.

External links

â— Prophet – Wikipedia.

θΔics

In human chemistry, **Prosper Crebillon** (1674-1762), pronounced "cray-bee-yawn", was a French tragedian writer noted for producing dramitic works that, according to German polymath Johann Goethe, treated the "passions like playing cards", i.e. were not "chemical" enough, i.e. based in reality in the way that people attract, repel, and neutralize each other in their interactions and passionate relationships.

Overview

The actual mention of Goethe's objection to the non-chemical reality of Crebillon's work was made in an October 23, 1799 letter to his associate German author Friedrich Schiller as follows: [1]

> "Crebillon … treats the passions like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. There is no trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover."

This irritation found release ten years later in the writing the great novella *Elective Affinities*, the founding book of the science of human chemistry—the study of chemical reactions between people—in which Goethe used Swedish chemist Torbern Bergman's 1775 physical chemistry textbook *A Dissertation on Elective Attractions* to "treat the passions", as he put it, according to the way in which relationships are actually governed by the laws of affinity or rather in which the passions occur in reality in chemical reactions.

Change

That there is great density of thought in the above objection comment made by Goethe, there is no doubt. What exactly Goethe means by "without their changing at all" in the chemical sense of his day is a bit elusive to pin down. The actual full explication of the quantification and description of chemical change would not be made until the year 1865 with the completion of the definition of "irreversibility" of chemical reactions as quantified by German physicist Rudolf Clausius who would define irreversibility in terms of the labels: "equivalence value of all uncompensated transformations", "transformation content", or entropy, depending on the context of the discussion and reaction scenario; terms which are quite complicated to explain in terms of change in human relationships.

Passion

The literary term "passion" tends to be representative of the physical term "heat" and following the great thermal theory of affinity debate (1854-1882), on the topic of whether or not heat was the true driving force of chemical reactions, in the sense that the more heat that was released in a given reaction the greater the affinity between the reactants, the chemical interpretation of passion and change only become more complicated. In short, German physicist Hermann Helmholtz' 1882 paper "On the Thermodynamics of Chemical Processes" disproved the thermal theory of affinity, putting in place of it the "thermodynamic theory of affinity", namely that the true driving force of chemical reactions is not "heat" but rather "free energy", hence the modern literary writer in the years to follow would have needed to reinterpret passion in terms of free energy, in particular Gibbs free energy, if one was to construct a drama or literary work using chemical models.

This has since never been done, which largely owes to the fact that one needs to have a degree in physical chemistry or chemical thermodynamics, at a minimum, and to spend at least a decade's worth of research on this topic, to understand the densely-woven mathematics behind the term "Gibbs free energy", which translates to the effect that instead of simply speaking of "affinities", as Goethe did, the modern literary writer would need to speak of three different types of energies: internal energy, pressure-volume work energy, and entropy, as these are now the modern chemical thermodynamic terms used in the quantification of earth-bound freely going chemical reactions (e.g. human chemical reactions) or in the the "treating of passions", in Goethe's phrasing.

A notable exception is British playwright Tom Stoppard and his 1993 play *Arcadia* a somewhat modern attempt a remake of Goethe's 1809 *Elective Affinities*. Although not a physical chemist or chemical engineer, Stoppard writes the

play such that it takes place in two different time periods, 1809, the year of Goethe's novella and the modern day, incorporating talk of "sexual energy", "heat", entropy, via his discussion of the "second law of thermodynamics", and human chemical affinity, via his talk of "the attraction that Newton left out … all the way back to the apple in the garden" (Isaac Newton being the one that launched the science of affinity chemistry via his Query 31), the steam engine, upon which the laws of thermodynamics were derived, among other topics. [2]

Note

The son of Prosper Jolyot de Crebillon (1674-1762), to note, was Claude Prosper Jolyot de Crebillon (1707-1777) (Ñº), a French novelist, whom it may have been possible Goethe was referring to. A fact check is in need.

References

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External links

â— Prosper Jolyot de Crebillon – Wikipedia.

θΔics

In existographies, **Protagoras** (c.490-420BC) (FA:8) (ACR:21) (CR:11) was a Greek philosopher, possible student of Democritus, noted, in the atheism timeline, for expressing the first agnostic views on the existence of the gods, for which he was labeled an atheist, and his books were burned.

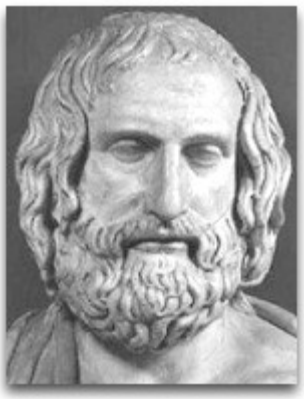

Overview

In c.430BC, Protagoras professed the following views:

> "Concerning the gods, I am unable to discover whether they exist or not, or what they are like in form; for there are many hindrances to knowledge, the obscurity of the subject and the brevity of the human mind."
>
> "There are two sides to every question."

For these views, he became the first person to be "labeled" an atheist.

Though technically, these views are what we now characterize as "agnostic", a term coined in 1869 by Thomas Huxley.

Because Protagoras had doubted the existence of gods he was banished and his works were burned publicly (see: book burning). [2]

Works

Books written by Protagoras, according to According to Diogenes Laërtius, include: *On the Gods*, *Art of Eristics*, *Imperative*, *On Ambition*, *On Incorrect Human Actions*, *On those in Hades*, *On Sciences*, *On Virtues*, *On the Original State of Things* and *Trial over a Fee*.

Student of Democritus?

In 322 BC, Aristotle, in his On Education, says that Protagoras invented the "arm pad" used by porters.

In 300BC, Epicurus, in his letter "On Professions", described (Ñº) Protagoras as: "porter, Democritus' copyist, village teacher". [5]

In c.160 ACM, Aulus Gellius (125-180AD), in his *Attic Nights*, reported that Democritus saw Protagoras working as a porter and observed his 'ingenious method" of making knots or bundles of wood, and therein took him on as a pupil. (Ñº)

In c.230 ACM, Diogenes Laertius, in his *The Lives and Opinions of Eminent Philosophers*, reported that Protagoras (c.490-420BC) originally was a porter, and that he was discovered by Democritus (c.460-370BC) who saw how skillfully his bundles were tied, who therein took him in as a pupil. [4]

That Protagoras, according to consensus dating, seems to have been about 20 to 30 years older than Democritus, the "teacher-student" connection may have been invented, contrived, or confabulated history, as several (Ñº) have argued. [5]

Quotes | On

The following are quotes on Protagoras:

> "**Protagoras** however professed himself in doubt on the matter and Diagoras of Melos and Theodorus of Cyrene did not believe them to exist at all."

— Cicero (45BC), *On the Nature of the Gods* (pg. 69-70) [3]

"With the sensationalism of **Protagoras** is combined a relativity which may remind us of the Buchner and Moleschott."

— Friedrich Lange (1875), *The History of Materialism, Volume One* (pg. 41)

"Meslier's war cry [*Testament*, 1729], never before heard in the history of western thought, offers one of the first true atheist moments, if not the first. Prior to him, they call the agnostic an atheist who, as **Protagoras**, concludes that when it comes to god one can conclude nothing; the pantheist who, such as Spinoza, affirms its existence consubstantial with nature; the polytheist, like Epicurus, who teaches its multiplicity; the deist, in the way of Voltaire, for whom god creates the world en bloc, but does not care about the details; or whoever's idol does not correspond to the strict criteria established by the church. Now, the atheist clearly says that 'god does not exist'. This is what Meslier clearly writes: 'there is no god' (chapters 59, 74, 93, 94)—that is clear and distinct, blunt, and straightforward."

— Michel Onfry (2009) (Ñº)

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External links

â— Protagoras – Wikipedia.

θΔics

In chnopsology, **protein thermodynamics** is the thermodynamical study of aspects of protein synthesis, dynamics, and formation, particularly protein polymerization (chain making) and the folding and stabilities of protein chains into three-dimensional conformation structures.

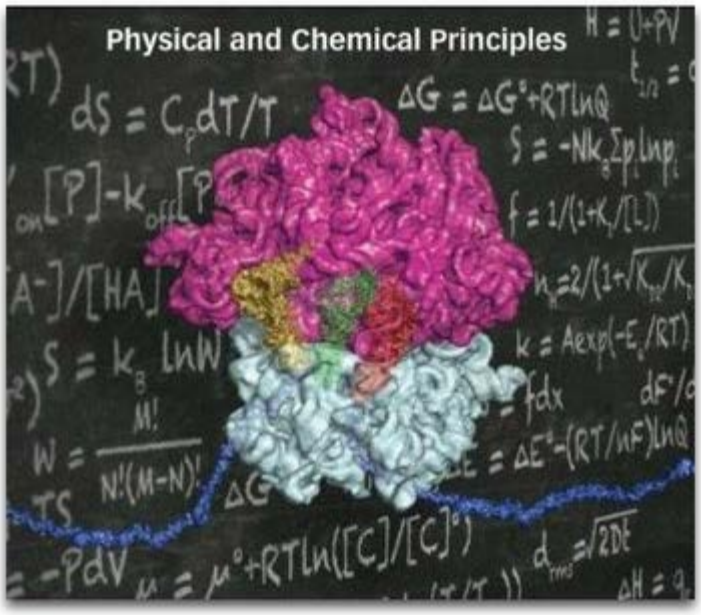

A protein molecule equation overlay method on a 2012 textbook on the thermodynamics and kinetics of protein, RNA, and DNA. [7]

Molecular formula

Protein was discovered in 1838 by Dutch chemist Gerardus Mulder who carried out elemental analysis of common proteins and found that nearly all proteins had the same empirical formula, $C_{400}H_{620}N_{100}O_{120}P_1S_1$.

This discovery was said to have sparked a heated debate between the so-called difference between "animal life" and "plant life" (vegetable life).

Thermodynamic hypothesis

The general subject of the thermodynamics of protein folding seems to revolve around the circa 1955 "thermodynamic hypothesis" (Anfinsen's dogma) positioned by American biochemist Christian Anfinsen to explain protein folding; loosely, that the "native structure" is a unique, stable and kinetically accessible minimum of the free energy. Anfinsen won half the 1972 Nobel Prize in chemistry for this hypothesis. [3]

Computer methods | Levinthal paradox

In the late 1960s, American physicist Cyrus Levinthal (1922-1990) pioneered the use computers to represent folded protein molecules in three dimensions, and to use computational methods to predict the 3-dimensional structure of proteins. [4]

His famous 1969 paper "How to Fold Graciously", outlined a sort of counting objection to the thermodynamic hypothesis, namely that the speed observed in actual protein foldings (less than one second or less) does not match up with the time predicted by the thermodynamic hypothesis (10 billion years). [5]

Levinthal's paper thus introduced what has come to be known as the "Levinthal paradox", the now classical viewpoint of protein folding that proteins cannot fold by a random search for the native (correctly folded) state because this would take far too long, and must therefore fold via a sequential (free energy intermediate states), energy biased folding pathway. [6]

Free energy landscapes

See main: Free energy landscapes; Free energy map; Potential energy surface

The quick and short view of the thermodynamics of proteins is that a protein is considered "active" when it is folded in a well-defined three-dimensional conformation called the "native state". The folding process is considered a spontaneous one correlative to a decrease in the change in the Gibbs free energy ΔG for the process, such that the native state is believed to be a minimal free energy among those available to the protein chain. It is reasoned that the stability of the folded state arises from a balance between what is called "chain entropy" loss and the gain in what is called "effective energy", which takes into account the effect of the solvent. To validate this view, one needs to have a well correlated "energy landscape" (free energy map), such that alternative folded states of high energy exist as compared to the lower free energy of the native state. [2]

Other

The subject of thermodynamics applied to

protein movements begun take of in 1960s and 70s. The chart below shows the annual number of publications reporting experimentally determined thermodynamic quantities on protein folding and stability. [1]

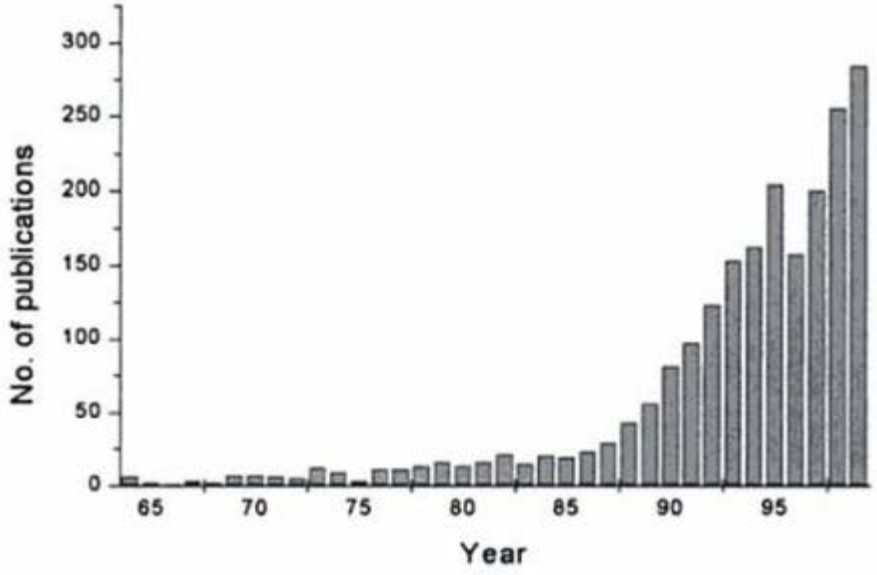

Manuscripts published per year reporting thermodynamic quantities on protein folding and stability.

In 1993, American biophysicist Donald Haynie completed his PhD on the thermodynamics of protein folding; later writing one of the first biological thermodynamics textbooks themed on this topic.

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External links

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● Protein thermodynamics – Editor's Summary, *Nature*, 14 July 2007.
● Hauryliuk, Vasili. (2011). "Darwin meets Gibbs: making a temperature-resistant protein", Jan 17, Stringent Response, Blogspot.com.

θΔics

In physics, **proton**, from Greek –*protos* "first" + -*on* "subatomic particle", symbol p (or p^+), is a bound state particle, which charge +1, classified as a baryon, comprised of two up quarks and one down quark, bound by gluons.

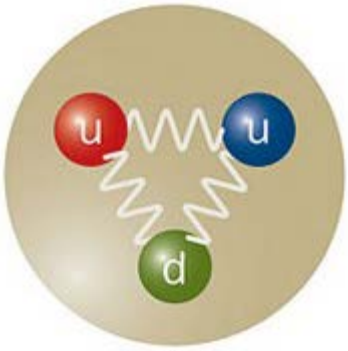

Proton

Quotes

The following are related quotes:

> "The answer to the question 'what are we made of' is: **protons** and **neutrons**, the heavy particles, or baryons, and electrons, the light particles, or leptons."
>
> — Michael Robinson (1999), *The Nine Number of the Cosmos* [1]

See also

- Social proton

References

1. Rowan-Robinson, Michael. (1999). *The Nine Numbers of the Cosmos* (pgs. 6, 8). Oxford University Press.

External links

- Proton – Wikipedia.

θΔics

In hmolscience, **proton-electron configuration**, “geometrical electron-proton patter” (Weiss, 1925), or “electron-proton configuration” (Lundberg, 1939), is a reductionism term which refers to a thing, being it a molecule, plant, animal, tissue, or human, from a physical sociology perspective, i.e. a human seen as a "configuration" or grouping of protons and electrons, in a bound state, in modern retrospect. [1]

Quotes

In 1925, Albert Weiss, in his section "Physical Units", of his *A Theoretical Basis of Human Behavior*, citing John McLennan (1922) (Ñº) and Harvey Lemon (1923), opened to the following statement: [5]

> “Physicists are fairly well agreed that negative and positive electrical particles, described as electrons and protons, are the hypothetical ultimate elements out of which every thing is built up.”

Weiss then jumps to the conclusion that man is a "geometrical electron-proton pattern or system" as follows:

> “For purposes of description, each separate **geometrical electron-proton pattern**, no matter how simple or complex it may be, is to be regarded as a system. Such systems may be classified into the degrees of the similarity or dissimilarity postulated of atoms, molecules, compounds, tissues, plants, animals, men, races, nations, planets, etc. The systems of especial interest to the behaviorist are classified under animal tissues and social organizations.”
>
> — Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 19)

> “In the final analysis, human behavior is **reduced to** movements between electron-proton systems, but this reduction is the final aim of all scientific investigation.”
>
> — Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 36) (Ñº)

> “All forms of social activity or achievement are **ultimately reducible** to electron-proton interactions [that are mechanistic as any physical or chemical process].”
>
> — Albert Weiss (1925), *A Theoretical Basis of Human Behavior* (pg. 142); cited by Judson Herrick (1956) [1]

In 1939, George Lundberg, in his *Foundations of Sociology*, citing Weiss, would going onto famous describe man as an “electron-proton configuration”. [2]

In 1956, Judson Herrick was citing Weiss' view that: "forms of social activity or achievement are **ultimately reducible** to electron-proton interactions [that are mechanistic as any physical or chemical process]". [3]

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3. Herrick, Charles J. (1956). *The Evolution of Human Nature* (abs) (pg. 46). University of Texas Press.

θΔics

In science, **protoplasm**, from the from the Greek *protos* for “first”, and *plasma* for “thing formed”, refers either to the membrane of a plant cell (Hugo Mohl, 1846) or in origin of life sense of the hypothetical “physical basis of life” (Thomas Huxley, c.1869).

Overview

In 1844, German botanist Hugo Mohl (1805-1872) introduced the term “primordial utricle” in reference to the “protoplasmic lining” of vacuolated cells. [1]

Micro-botanists J. W. Griffith and Arthur Henfrey, in their *Micrographic Dictionary* (c.1869), as follows: [2]

> “The name applied by Mohl to the colorless or yellowish, smooth or granular viscid substance, of nitrogenous constitution, which constitutes the formative substance in the contents of vegetable cells, in the condition of gelatinous strata, reticulated threads and nuclear aggregations, &c. It is the same substance as that formerly termed by the Germans 'schleim,' which was usually translated in English works by ‘mucus’ or ‘mucilage’.”

The surface of this mass, as summarized by Lionel Beale (1870), constituted the "formative protoplasmic layer" which was supposed to take part in the formation of the cellulose wall of the vegetable cell. This was regarded by Von Mohl as a structure of special importance distinct from the cell contents, and it was named by him, in 1844, the ‘primordial utricle’.” [2]

In 1869, Thomas Huxley, refined Mohl’s primordial utricle definition, to include its shell and contents, nitrogen-based, which at one point he referred to as “accidental anatomical modification” of the endoplasm, to mean “protoplasm”. [2]

Neuroplasm

In 1899, Ernst Haeckel, via general citation to Huxley, introduced the term “neuroplasm”, in references to the ganglion cells and their fibers, as the basis for his theory of the soul, according to which, based on embryological development of different forms of organisms, unicellular up to plants, animals, and humans, different cells, e.g. a “cell soul” or a “will soul”, differentiated out of the neuroplasmic matter, in development and over evolutionary periods. [3]

Quotes

The following are noted quotes:

> “CHNOPS: six chemical elements are essential parts of **protoplasm**, the living substance itself. These are carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur.”
>
> — Frank Thone (1936),“Nature Ramblings: ‘Chnops,’ Plus” [4]

References

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External links

â— Protoplasm – Wikipedia.

θΔics

In hmolscience, **Provident G. Peterson** (c.1950-) is American writer noted for his 2010 *The Universe, God, and Us*, wherein he argues that humans, as molecules, originated from the big bang and the hydrogen atom, but that along the way god put a "spark" into the picture.

Overview

In 2010, Peterson, in his *The Universe, God, and Us*, attempted to integrate the concept of God with the modern science view of the universe, defining a person specifically as an evolved atomic-based material substance that originated form the "human molecule", the seed molecule of all life. He specifically states about his book that it is intended for the astronomer and astrophysicist, but that what the contents of the book may not be acceptable to the scientific community. [1] In his opening pages he specifically states that everything that exists on earth is made of matter and that matter is made of atoms, the building blocks of matter. On the subject of gravity, Peterson correctly states that "gravity is nothing more than a large number of atoms with a large charge [such as the earth], attracting a lesser number of atoms with a lesser charge [such as a human]." He also goes on to introduce the logic that atoms, not only generate gravity, but also heat.

Difficulties

The book seems to be cogent, that is until Peterson begins discussing the human molecule and how God relates to the formation of the human molecule. First he outlines the view that the hydrogen reacted with other hydrogen atoms, following the Big Bang, forming all the elements of the periodic table and various other larger molecules, such as water, and that eventually, through the interactions of heat and gravity, a chemical soup of all known elements and water, in the state of chaotic reactions, had formed on the surface of the earth, after which "one specific element resulted in the first spark of life" to eventually evolve to create the "human molecule". Peterson goes on to argue that "the seed of God lies embedded within every nucleus of one specific atom, which if he had to guess would be carbon, and that this particular atom, containing the seed of God, has just the right energy to spark the beginning of life, and to create the first molecule of life. He goes on to argue that the desire of this element, and its living descendants, is the "fulfillment of one's evolution".

He then postulates that, following the formation of the God seed element, there formed what he calls an "Alpha combination of molecules", that resulted in "the liquid dwelling entity that would eventually become a human being." He continues "the molecule that was to become the human being, triggered the formation of all ensuing molecules of life. The human molecule created the need for all other molecules of life." Its seems, to note, that although Peterson defines all bodies to be made of atoms, he does not seem to come right out and say that the human is a molecule, but rather a descendent of the first Alpha, God-infused, 'human molecule', which itself formed from the first Alpha, God-infused atom, which Peterson posits was carbon.

Education

Peterson is a dropped out of high school in circa 1970 later becoming U.S. government employee, where he remained for 35-years, recently retiring in late 2000.

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1. Peterson Jr., Provident G. (2010). *The Universe, God, and Us* (human molecule, pgs. 38, 55). Dorrance Publishing Co.

θΔics

In terminology, **Proxmire affair** refers to 11 Mar 1975 press release by Wisconsin senator William Proxmire, and aftermath of debate and discussion to follow, which lambasted the National Science Foundation, for, apparently, wastefully funding research on "romantic love", per reasoning that "life is a mystery" and why people "fall in love" is the biggest puzzle that people *don't* want to know the answer to.

Wisconsin Senator William Proxmire's inaugural so-called "Golden Fleece Awards", which ran from 1975 to 1988, was an award to NSF funded research on the science of love, which Proxmire deemed as *fleece* or excessive wastefulness of public money. [7]

Overview

In 1974, the National Science Foundation (NSF) awarded American psychologist Ellen Berscheid, of the University of Minnesota, and her colleague Elaine Walster, a grant of $84,000 ($371,000, in 2014 terms) for a study on romantic love, the phenomenon of falling in love, and or relationship research. (Ñº) The project description included the subject of "romantic love" in its proposal, which provoked considerable controversy on use of tax dollars, and called into question use of public funds in scientific research. (Ñº) Proxmire soon herd of this spending and awarded the NSF the first-annual so-called Golden Fleece award, given to "wasteful, ironic or ridiculous uses of taxpayer money", per the following logic: [2]

> "I object to this not only because no one—not even the National Science Foundation—can argue that falling in love is a science; not only because I'm sure that even if they spend $84 million or $84 billion they wouldn't get an answer that anyone would believe. I'm also against it because *I don't want the answer*. I believe that 200 million other Americans want to leave some things in life a mystery, and right on top of the things we don't want to know is why a man falls in love with a woman and vice versa. So NSF—get out of the love racket. Leave that to Elizabeth Barrett Browning and Irving Berlin. Here if anywhere Alexander Pope was right when he observed: 'if ignorance is bliss, tis folly to be wise.'"

Proxmire also said: [3]

> "No one can argue that falling in love is a science. The impact of love is a very subjective, nonquantifiable subject matter. Love is simply a mystery."

Proxmire's self-serving proclamation garned widespread publicity, both pro and con, soon thereafter becoming known as the "Proxmire affair". (Ñº) In 1978, Elaine Hatfield, a research partner of Berscheid, and William Walster, Hatfield's co-author, e.g. refered to Proxmire's statement as an "idiotic press release gleefully fired off." [2]

In 1969, Walster and Berscheid, in their *Interpersonal Attraction*, reflected on this: [4]

> "It is odd that the notion that attraction, particularly such intense forms as romantic love, are simply 'non-quantifiable' has lingered to the present day. It seems especially strange when we consider that each of us, every day and in a variety of ways, manages to **quantify** our attraction to others and measure their attraction to us."

(add discussion)

Quotes

The following are other quoted truncations of Praxmire's reasoning:

> "The study of love is better left to poets and mystics, to Irving Berlin, to thousands of high school and college bull sessions."
>
> — William Proxmire (1975), on NSF grant to study love, quoted in NY Times obituary (2005) [5]

> "Senator Proxmire was trying to turn back the clock by criticizing valid research on love. Proxmire himself has suffered marital separation. I would think that he especially would want to understand about love being the basis for the marriage contract."
>
> — Ellen Berscheid (1975), "Proxmire Barb Goes Unloved" [6]

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θΔics

In science, **pseudoscience** (TR=34) is a false subject of knowledge, pure or applied, the object of which is chimerical, and therefore unattainable; which, though it may have some truth under it, has no truth in it. (Ñº)

pseu·do·sci·ence
/ˌsōōdōˈsīəns/
noun
a collection of beliefs or practices mistakenly regarded as being based on scientific method.

A Google-generated definition of **pseudoscience**, namely a belief, theory, or practice mistakenly regarded as being based on the scientific method.

Falsifiability

In 1919, at the age of 17, Karl Popper reflects on how there were many "theories" in the air, the three dominating his mind being: Albert Einstein's relativity, Karl Marx's theory of history (historical materialism), Sigmund Freud's psycho-analysis (psychodynamics), and Alfred Adler's individual psychology, and that the problem that troubled him was the following: [1]

> "'When should a theory be ranked as scientific?' or 'Is there a criterion for the scientific character or status of a theory?' The problem which troubled me at the time was neither, 'When is a theory true?' nor, 'When is a theory acceptable?' My problem was different. I wished to distinguish between science and **pseudo-science**; knowing very well that science often errs, and that pseudo-science may happen to stumble on the truth."

Popper states that he began to grapple with this problem in the "since the autumn of 1919", after becoming impressed with recent May 1919 confirmation of Einstein's light bending prediction of his relativity theory via Arthur Eddington's solar eclipse expedition. [2]

Popper used this Einstein-Eddington based "theories which can be confronted with observations or experimental results" model as his "falsifiability" test, which separates science from pseudoscience; according to which bad, nonscientific theories could not be falsified. [4]

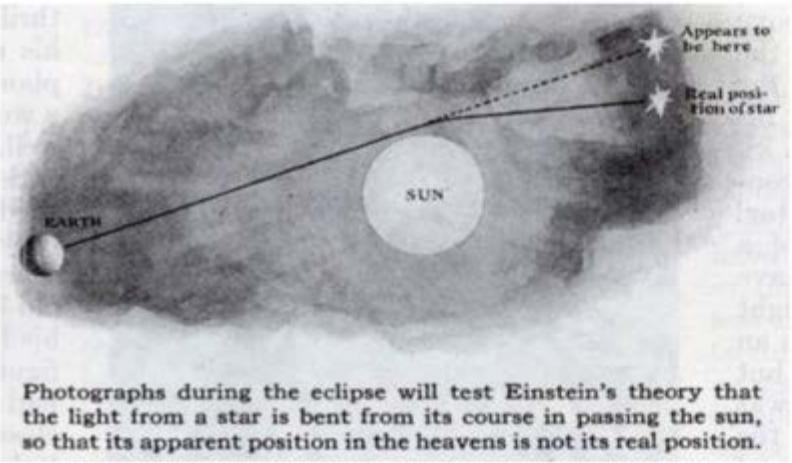

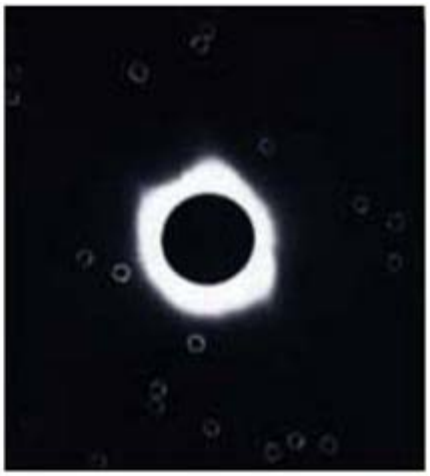

Left: a photo of Cambridge Observatory director Arthur Eddington who led an expedition to observe the total solar eclipse of May 29, 1919. During an eclipse, the sky gets dark enough that you can see stars, even close to the Sun. So Eddington set out to map the position of the stars when they were close to the Sun (right image), and see how the Sun bent the light (middle image) and to see if his measurements matched up with Einstein's prediction, Newton's prediction, or would light not bend at all? [3]

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θΔics

In psychodynamics, **psychic energy** or "psychological energy" refers, generally, to the energy of the mind, mental processes, or psychological phenomena; energy tends to be conceptualized as some type of flow in the psychological system, governed by the principle of conservation of energy, and or the first law of thermodynamics.

Overview

In 1838 to 1842, German physicians Ernst Brücke, Herman Helmholtz, and Emil Du Bois-Reymond, who during the years 1838-42, worked in the laboratory of the German physiologist Johannes Muller, who adherence to the principle of vitalism, a doctrine that the functions of a living organism are due to a vital principle distinct from physiochemical forces. In reaction to this, the three of them, in the words of Du Bois-Reymond, formulated a desire to validate the basic truth that: [1]

> "In an organism no other forces have effect than the common physio-chemical ones."

This force or *kraft*, as it is called in German, soon later became synonymous with the newly forming concept of energy.

In 1895, Austrian psychologist Sigmund Freud, Brücke's medical school student, in his "A Project for Scientific Psychology" began theorizing about bound energy and free energy in psychological terms.

In 1898, Russian psychologist Nicolas von Grot stated: [2]

> "The concept of **psychic energy** is as much justified in science as that of physical energy, and psychic energy has just as many quantitative measurements and different forms as has physical energy."

Into the early 20th century, Freud's protégé Swiss psychologist Carl Jung began discussing and using psychic energy, in his theories.

In 1976, American psychiatrist Robert Galatzer-Levy, in his article "Psychic Energy: A Historical Perspective", summarized that: [3]

> "Much criticism of the concept of **psychic energy** is based on its apparent failure to live up to the paradigm on which it is modeled, the concept of energy conservation in physics."

(add discussion)

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θΔics

In psychodynamics, **psychic entropy** or *psychological entropy* is the effect of the second law of thermodynamics or of entropy in a psychological system.

Overview

The first treatise on the concept of psychic entropy seems to have been done by Swiss psychologist Carl Jung, under the influence of his mentor Sigmund Freud, who had previously applied the first law of thermodynamics to the psyche. Jung had framed the outlines of his psychic entropy theory in 1912 and later published it in the 1928 paper "Über de Energetik der Seele" (About the Energetics of the Soul); translated in English that year as "On Psychical Energy". [1] In his description of psychic entropy, after introducing the reader to the older history of the concept of psychic energy (1898), Jung begins with mentions of Sadi Carnot and Ludwig Boltzmann, and delves into a rather convoluted discussion of how the mind is, generally, a "relatively closed system". To cite one example, Jung states:

> "Since our experience is confined to relatively closed systems, we are never in a position to observe an absolute **psychological entropy**; but the more the psychological system is closed off, the more clearly is the phenomenon of entropy manifest."

In a footnote on this statement, Jung says "a system is absolutely closed when no energy from outside can be fed into it; only in such a system can entropy occur." As an example of this, he says that mental disturbances characteristic of intense seclusion from the environment, such as the dulling of affect in dementia praecox or schizophrenia, may very well be understood as the phenomenon of entropy.

In the 1960s, Hungarian-born student named Mihály Csíkszentmihályi accidently came to attend a lecture of Jung's and from that point on decided to become a psychologist. Csíkszentmihályi went on, beginning in 1978, to incorporate Jung's psychic entropy theory into a flow theory of optimal experience in positive psychology, where psychic entropy, in Csíkszentmihályi's view, is interpreted as disorder in the consciousness or as mental states that produce conflict with individual goals. [2] In summarizing his view, Csíkszentmihályi states: [3]

> "Emotions refer to the internal states of consciousness. Negative emotions like sadness, fear, anxiety, or boredom produce '**psychic entropy**' in the mind, that is, a state in which we cannot use attention effectively to deal with external tasks, because we need it to restore an inner subjective order."

In the converse situation, he states: [3]

> "Positive emotions like happiness, strength, or alertness are states of 'psychic negentropy' because we don't need attention to ruminate and feel sorry for ourselves, and psychic energy can flow freely into whatever thought or task we choose to invest it in … therefore intentions, goals, and motivations are also manifestations of psychic negentropy. They focus psychic energy, establish priorities, and this create order in the consciousness."

In a modern sense, to note, the term psychological entropy may be more apt, as the latter term "psychic" seems to carry negative connotations.

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(c) The translators' forward to the latter volume states that this paper "was framed soon after the author had finished the *Psychology of the Unconscious* [i.e. *Wandlungenund Symbole der Libido*, pub. 1912]. It was, however, pressed aside by the greater importance of the type-problem …, and, originally entitled "The Theory of the Libido", was taken up again only last summer.
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External links

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θΔics

In psychodynamics, **psychic negentropy** refers to mental states of positive emotions such as happiness, strength, or alertness. [1] The term seems to have been first introduced in 1986 by Hungarian-born American psychologist Mihály Csíkszentmihályi, a syncretism of the older terms psychic entropy (1928) + negentropy (1942), literally meaning "negative psychic entropy". [2]

See also

- Anti-entropy difficulties

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θΔics

In hmolscience, **psycho-dynamics**, the prefix *psycho-* (mind) + -*dynamics* (power), was a semi-common "testing stage" terminology precursor to the late 20th century common term psychodynamics; similar to the way the late 19th century term thermo-dynamics, a conjunction of *thermo-* (heat) + -*dynamics* (power), was a common precursor to the 20th century term thermodynamics.

In 1931, in an article in *American Journal of Orthopsychiatry*, e.g., one finds: “psycho-dynamics … enters into an ultimate picture of dysfunction”. In addition, it is argued that the Oedipus situation, in the psycho-dynamic view, is defined in terms of the “drives of the child”, rather than in terms of the parent-child interaction. Moreover, an hypothesized set of *principles of psycho-dynamics* and *socio-dynamics* are slated to be analogs of the principles of physical energetics. [1]

References

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θΔics

In psychology, **psychoanalysis**, a term coined in 1896 by Austrian psychologist Sigmund Freud, refers to the scientific analysis of the psyche, the methodological nature of which is said to have been outlined Freud's 1895 draft manuscript "A Project for Scientific Psychology." [1]

References

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External links

- Psychoanalysis – Wikipedia.

θΔics

In human thermodynamics, **psychodynamics** is the study of mental processes, namely conscious and sub-conscious dynamics, as these related to basic human drives and instincts, according to the first and second law of thermodynamics. [1][3]

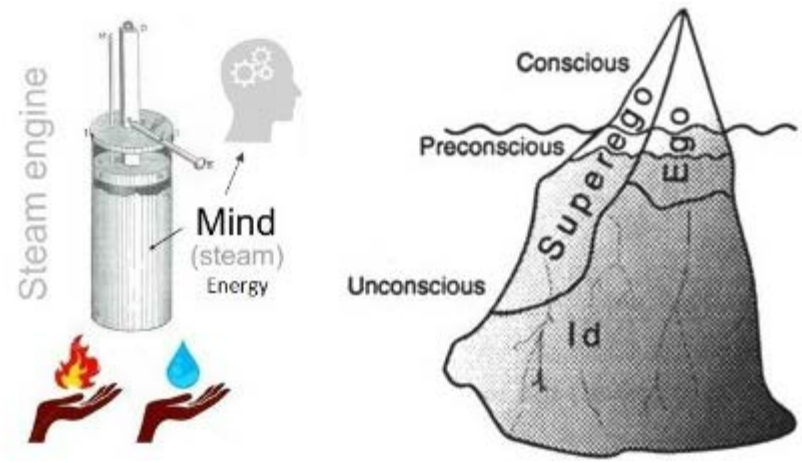

A visual conception of **psychodynamics** as conceived by Austrian psychologist Sigmund Freud, as a type of conservation of energy (or force) model of the mind, as outlined in his 1895 "A Project for Scientific Psychology", a chemical thermodynamics / steam engine stylized psychology, wherein the Helmholtz terms 'bound energy' (repressed energy) and 'unbound energy' (free energy) were first employed in a psychological sense, for the first time, and elaborated on further in his *Beyond the Pleasure Principle* (1920) and *The Ego and the Id* (1923), among other publications.

Overview

In 1874, German physiologist Ernst von Brücke—an associate of physicist Hermann von Helmholtz, one of the formulators of the first law of thermodynamics (conservation of energy), both of whom supposing that all living organisms are energy-systems also governed by this principle—gave his *Lectures on Physiology*, which is said, by some, to mark the initiation of psychodynamics.

Austrian psychologist Sigmund Freud, Brucke's medical school student, in 1874, absorbed some of these Brucke-Helmholtz ideas about energy and thermodynamics. During this year, at the University of Vienna, Brücke served as supervisor for first-year medical student Sigmund Freud who adopted this new "dynamic" physiology. In his *Lectures on Physiology*, Brücke set forth the radical view that the living organism is a dynamical system to which the laws of chemistry and physics apply. [2] This was the starting point for Freud's dynamic psychology of the mind and its relation to the unconscious. [2] The origins of Freud's basic model, based on the fundamentals of chemistry and physics, according to John Bowlby, stems from Brücke, Meynert, Breuer, Helmholtz, and Herbart. [3]

English child attachment psychologist John Bowlby (1969), an adamant objector to Frued's "dynamic view of psychology", defined psychodynamics as:

> "[The **dynamic** view is] propositions concerning psychological energy or psychological forces; concepts such as conservation of energy, entropy, direction and magnitude of forces, [in conjunction with] a principle of inertia."

In a modern medical sense, psychodynamics is the systematized study and theory of the psychological forces that underlie human behavior, emphasizing the interplay between unconscious and conscious motivation and the functional significance of emotion. [11]

The second law or entropy aspect of this view, i.e. psychic entropy, was developed later by Freud's associate Carl Jung. [4]

At the heart of psychological processes, according to Freud, is the ego, which he sees battling with three forces: the id, the super-ego, and the outside world. [8] Hence, the basic psychodynamic model focuses on the dynamic interactions between the id, ego, and superego. [9] Psychodynamics, subsequently, attempts to explain or interpret behavior or mental states in terms of innate emotional forces or processes. In his writings about the "engines of human behavior", Freud used the German word *Trieb*, a word that can be translated into English as either *instinct* or *drive*. [10]

From these early beginnings, by the turn of the century, psychologists around the world were in pursuit of "psychological laws" based on the laws of *Energetik*. [5] In Russia, for instance, Krainsky's volume on the "Law of Conservation of Energy applied to Psychical Activity" appeared in 1897. In the decades to follow, energy, according to the doctrine of "Energetics", was the only enduring reality, being capable of assuming, or transforming itself into, many

different modes or species of which consciousness or psychical energy is a part. All mental processes were thus conceived as the interplay of psychical energy with other species of energy. [6]

In the 1950s, American psychiatrist Eric Berne built on Freud's psychodynamic model, particularly that of the "ego states", to develop a psychology of human interactions called transactional analysis. [7] Transactional analysis, according to physician James R. Allen, is a "cognitive behavioral approach to treatment and that it is a very effective way of dealing with internal models of self and others as well as other psychodynamic issues." [7] The theory was popularized in the 1964 book *Games People Play*, a book that sold five-million copies, giving way to such catch phrases as *"Boy, has he got your number"* and others.

Etymology

The etymology of the term "psychodynamics" likely stems from or was influenced in its synthesis and developmental use by the 1860 publication of *Elemente der Psychophysik* (*Elements of Psychophysics*) by German physicist and psychologist Gustav Fechner, who coined the term "psychophysics" as the study of the relation between physical stimuli and the intensity of perception of the stimuli. [12] The term "psychodynamics", however, was not used immediately. Early prototype synonyms include: the "dynamic view" or "mental dynamics" (Freud, 1923), "psychic energism and dynamism" (Jung, 1928), the "psychical energy model" (Bowlby, 1969), "dynamic psychology", or "energy psychology". According to a 1979 translation, *psychodynamics* refers to the forces, motives, and energy generated by the deepest of human needs. [13]

The term "psychological thermodynamics", in a modern clarifying sense, as sub-branch of human thermodynamics, is an apt term.

A rare term "psycho-thermodynamics" or psychothermodynamics was coined in about in 1964 by physician Jurgen Ruesch. [14]

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External links

â— Psychodynamics – Wikipedia.
â— Psychodynamics - McGraw-Hill Science Tech Dictionary.
â— Psychodynamics – Microsoft Encarta.

θΔics

In hmolscience, **psychohistory** (CR:6) is a fictional scientific theory, developed by Isaac Asimov, as told through the mind of the character Hari Seldon, in his seven-volume *Foundation Series* (1942-1993), conceptualized as futuristic science that is able to predict the rise and fall of a fictional Galactic Empire, similar, in some ways, to earlier non-fictional social physics stylized attempts to predict the rise and fall of the Roman Empire, such as told in Edward Gibbon's six-volume *Decline and Fall of the Roman Empire* (1776-89), which Asimov had just finished reading (for the second time), when he conceived the concept.

Professor Hari Seldon explaining, to his fellow social scientists, at a time 50,000 years into the future, how the new science of "**psychohistory**" will be able to shorten the time (transition state) between during the transition to the new civilization.

Cliodynamics

In 2007, Russian-born American scientist Peter Turchin (1957-) (Q), who read Asimov's *Foundation Series* 30-years ago, developed his own free will implicit so-named "cliodynamics" (Q), from *Clio*, the muse of history, and *dynamics*, Greek "power" (forces moving bodies per unit time), conceptualized as non-fictional version of psychohistory (Q)(Q), some of which is supposedly found in his *War and Peace and War: the Rise and Fall of Empires*. (Q)

Quotes

The following are representative quotes:

> "The laws of history are absolute as the laws of physics, and if the probabilities of error are greater, it is only because history does not deal with as many humans as physics does atoms, so that individual variations count for more."
>
> — Isaac Asimov (1952), "girl describing Hari Sheldon's psychohistory", *Foundation and Empire* [1]

> "Hari Seldon devised **psychohistory** by modeling it upon the kinetic theory of gases. Each atom or molecule in a gas moves randomly so that we can't know the position or velocity of any one of them. Nevertheless, using statistics, we can work out the rules governing their overall behavior with great precision. In the same way, Seldon intended to work out the overall behavior of human societies even though the solutions would not apply to the behavior of individual human beings."
>
> — Isaac Asimov (1986), "Explanation by character Janov Pelorat" [2]

> "I assumed that the time would come when there would be a science in which things could be predicted on a probabilistic or statistical basis."
>
> — Isaac Asimov (1987), "Interview on Psychohistory with Terry Gross", NPR *Fresh Air*, Sep 25

> "Consider the manner in which scientists have dealt with subatomic particles. There are enormous numbers of these, each moving or vibrating in random and unpredictable manner, but this chaos turns out to have an

underlying order, so that we can work out a quantum mechanics that answers all the questions we know how to ask. In studying society, we put human beings in the place of subatomic particles, but now there is the added factor of the human mind. To take into account the various attitudes and impulses of mind adds so much complexity that there lacks time to take care of it all."

— Isaac Asimov (1989), "Hari Sheldon" to Emperor Cleon", *Prelude to Foundation* [3]

"Could not mind, as well as mindless motion, have an underlying order."

— Isaac Asimov (1988), "Emperor Cleon to Hari Seldon" [4]

"The three theorems of **psychohistorical** quantitivity: The population under scrutiny is oblivious to the existence of the science of Psychohistory. The time periods dealt with are in the region of three generations. The population must be in the billions (±75 billions) for a statistical probability to have a psychohistorical validity."

— Isaac Asimov (c.1985) (Q)

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(b) Siegfried, Tom. (2006). *A Beautiful Math: John Nash, Game Theory, and the Modern Quest for a Code of Nature* (pg. 114). National Academies Press.
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External links

- Psychohistory (fictional) – Wikipedia.

θΔics

In psychological thermodynamics, **psychological entropy**, a synonym or variant of psychic entropy, is an extrapolation of entropy in the context of psychology or of the mechanical equivalence of heat effects connected to mental activity and its related movement transformations involved during human-human interactions. [1]

The term was used, in a sense of allegory, in the 1921 socio-political novel *We* by Russian engineer Yevgeny Zamyatin. [2]

References

1. Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (term: psychological entropy, pg. 665) (preview), (Google books). Morrisville, NC: LuLu.
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Further reading

● Tyson, Lois. (1994). *Psychological Politics of the American Dream* (term: psychological entropy, pg. 104). Ohio State University Press.
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● Sexton, Timothy. (2008). "The Concept of Psychological Entropy", *Associated Content News*, Sept. 02.

θΔics

In human thermodynamics, **psychological thermodynamics** is the use of thermodynamics principles and laws in the study of psychology.

Overview

In 1895, Austrian psychologist Sigmund Freud, a product of the Helmholtz school of thermodynamics, penned his "A Project for Scientific Psychology", wherein he sought to apply the thermodynamic concepts of free energy and bound energy to human psychological phenomena, which can be said to mark the start of psychological thermodynamics.

The early development of this field often went by the more dominant name "psychodynamics" (Freudian psychodynamics; Jungian psychodynamics), "energy psychology", or Freud's "dynamic view of psychology", among others. [1]

References

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θΔics

In HT pioneers, the **psychological** (thermodynamics pioneers) **TPs** page is a file-tree header for grouping individuals, ordered in the dropbox to the left, in the category of pioneers of psychodynamics or psychological thermodynamics.

θΔics

In science, **psychology** is systematic study of human and animal behavior, with particular focus on internal processes and motives. [1]

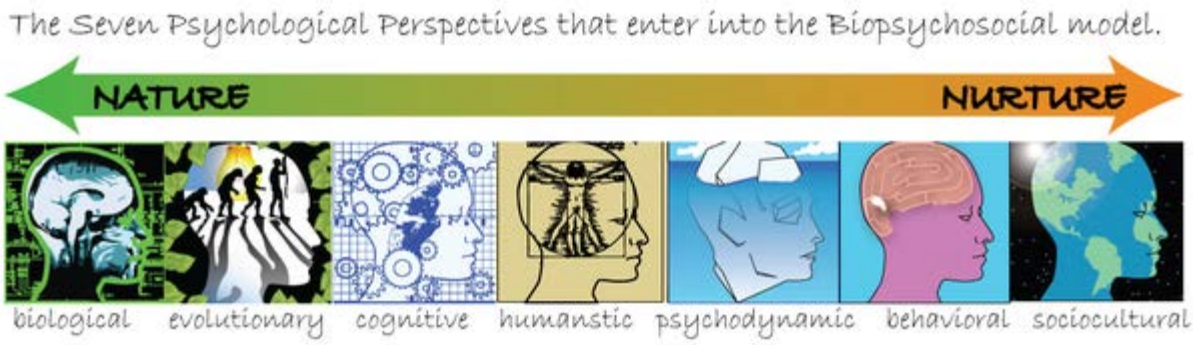

A depiction of the seven dominate models of **psychology**: biological psychology (life theory based), evolutionary psychology (Darwin-based), cognitive psychology (Cartesian-based), humanistic psychology, psychodynamics (Freudian-based), behavioral psychology (Skinner-based), and sociocultural psychology. (Ñº)

Psychodynamics

The thermodynamic study of psychology is called "psychodynamics", a field generally developed, beginning in the late 1870s, by Austrian psychiatrist Sigmund Freud. [2]

Quotes

The following are related quotes:

> "The unconscious must be explained *physically* and *chemically* and not **psychologically**, else we allow 'mystical agents', arbitrary constructions that can never be verified, to enter science."
>
> — Lev Vygotsky, Historical meaning of the crisis in Psychology (1927)

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(b) Eysenck, Michael W. (2004). *Psychology: An International Perspective*, (pg. 3). Taylor & Francis.
2. Hall, Calvin, S. (1954). *A Primer in Freudian Psychology*. Meridian Book.

External links

â— Psychology – Wikipedia.

θΔics

In science, **psychophysics** is the study of the relation between physical stimuli and the intensity of perception of the stimuli. The term was coined and defined in 1860 by German physicist and psychologist Gustav Fechner in his *Elemente der Psychophysik* (*Elements of Psychophysics*). [1] The term seems to have been a precursor to the subject of psychodynamics, as the work of Austrian psychologist Sigmund Freud, the founder of the latter, seems to have been influenced by Fechner. [2]

References

1. Fechner, Gustav T. (1860). *Elements of Psychophysics*. Holt, Rinehart, and Winston, 1966.
2. Freud's Psycho Dynamic Theory (1873-1923) – Institute of Human Thermodynamics.

θΔics

In human thermodynamics, **psychothermodynamics** is the study of the mind, psyche, psychological processes in terms of thermodynamics, energy, or entropy. Synonyms to the term "psychothermodynamics" include: energy psychology, psychodynamics, and the more clarifying term psychological thermodynamics.

Overview

In 1964, Swiss-born American psychiatrist Jurgen Ruesch was employing the conjoined term "psycho-thermodynamics" in the psychological modeling of human functioning based on energy analogies, as contrasted with "psychohydraulics" (pressure analogies) or "psychoelectronics" (machine analogies). [1]

In *circa* 1997, Internet humorist writer Lyle Zapato (pen name), in thermodynamics humor, listed in his qualifications brief, in thermodynamic parody style, that he received his MA in psychothermodynamics from Kelvinic University (a play on William Thomson, i.e. Lord Kelvin). [2]

In 2002, American alternative medicine philosopher Laurence Foss penned a seventeen-page chapter section entitled "The Second Law of Psychothermodynamics" in which he utilizes English physicist Paul Davies' 1983 gravity-driven entropy gap model, mixed anthropomorphized ideas on negentropy, information theory, vitalism, and self-organization, among others, to argue that the second law deviates when it comes to the formation of humans and human psychological functioning. [3]

References

1. (a) Ruesch, Jurgen. (1964). "Clinical Science and Communication Theory", *Disorders of Communication: Proceedings of the Association, December 7 and 8* (psycho-thermodynamics, pg. 252). Williams & Wilkins.
(b) Ruesch, Jurgen. (1972). *Semiotic Approaches to Human Relations* (psycho-thermodynamics, pg. 492). Mouton.
2. (a) ZPi Research Labs – Zapatopi.net.
(b) Lyle Zapato – Zapatopi.net.
3. Foss, Laurence. (2002). *The End of Modern Medicine: Biomedical Science under a Microscope* (Section: Second Law of Psychothermodynamics, pgs. 229-36). SUNY Press.

θΔics

In religio-mythology, **Ptah** (CR:2) was the primary creative force god of the Memphis creation myth (2800BC), which itself was modified variant of Heliopolis creation myth (3100BC). [1]

Some basic images of the Egyptian god **Ptah**, who holds the power symbols of: Ra (ankh), Osiris (djed pillar), and Set (was scepter), who rose to power (see: supreme god timeline) during the Memphis recension, in the 2nd Dynasty (2890-2686 BC). [2]

Staff

The staff of Ptah consists of the "djed pillar", symbolic of the resurrective nature of Osiris, the "ankh", symbolic of the rebirth of the sun or the god Ra, and the "was scepter", symbolic of Set. Ptah, accordingly, is thrice-powerful god, supposedly, subsuming those of Ra, Osiris, and Set.

Apis | Osiris

The Apis served as the Ba (the spirit or physical manifestation) of the Egyptian god Ptah, chief god of the city Memphis. The Greek name "Panepi" is thought to derive from the Egyptian phrase *Pth*, the "Spirit of Ptah," but Panepi is not attested to as a god elsewhere in the literary evidence.

Herodotus describes the mystical nature of the birth of the Apis, where "a flash of light descends upon the cow from heaven, and this causes her to receive Apis" and the mother cow "is never afterwards able to have another [calf]." Upon the death of the Apis bull, it becomes identified with Osiris. Because of the divine nature of the bull's birth and its affiliation with Osiris, the bull's mother, hence, comes to be identified with Isis, goddess of motherhood and sorceress whose magic resuscitated the deceased Osiris. [3]

Hephaestus | Greece

In Greece, Ptah came to be called "Hephaestus" (see: god character rescripts); the following is one summary of this:

> “The earliest recorded Egyptian versions of their own remote past date from Ramessid times. From this period dates the Turin Canon, which agrees substantially with Manetho's account. The oldest kings are definitely associated with Heliopolis, and there-fore the list ought to begin with the sun god, Re-Atum [see: Atum-Ra], or in Greek Helios. But in fact Manetho names ‘Hephaestus’ as the first ruler of Egypt, suggesting that this version was originally compiled in the 6th dynasty, the kings of which came from Memphis, the centre of worship of **Ptah**. Although Diodorus records what is primarily the Heliopolitan tradition, starting with Helios, it is clear that he is also aware of the Memphite theology since he records a variant genealogy of Hephaestus (Helios?), Cronus, and Osiris. It is possible that this owes something to Manetho, who may be included in the: ‘ενιοι δε των ίερεων’, a phrase which presumably refers otherwise to the priests of Memphis. The Greek god Hephaestus was identified with the Egyptian god Ptah, an identification aided by the fact that Ptah was noted as a craftsman, while Hephaestus was the god of smithying.”
>
> — Anne Burton (1973), *Diodorus Siculus: a Commentary* (pg. 71)

(add)

Egypt | Aigyptos | House of Ptah

In 2500BC, Egypt, in the old kingdom, was referred to as “Kmt” (hieroglyph) or “Kemet” (with syllables inserted), based on the term “keme”, meaning black soil, in contrast to the “red soil” of the desert, which was considered the “land of Set”.

In c.1150BC, Egypt, when Ptah became supreme god, came to be referred to as the “House of Ptah”, a reference to the god Ptah, who had become supreme god of Egypt in the years [add]. In other cultures, as this religious model was cross-culturally transmitted (see: god character rescripts), the god Ptah came to be called: “Jiapheta” (India, c.900BC), “Hephaestus” (Greece, c.600BC), “Vulcan” (Rome, c.400BC), and finally “Japheth” (Judea, 300BC),

In 1050 to 656BC, during the so-called “Judaic recension” (see: recension theory; supreme god timeline), the supreme gods were, generally speak, the following entities:

- YHWH / Yahweh
- Abraham | Ab-Ra-ham
- **El** [see: Neter]
- **Ptah** = “the Lord” = El (Q)
- Osiris-Ra | Moses + Abraham
- **Ptah**-Atum | Japheth + Adam

some, as shown above, being rescripted, via the god-to-prophet rescript method, so to affect a god reduction towards monotheism. In this period, the name of Egypt was changed from Kemet (Old Kingdom, 3100BC) to House of Ptah or Egypt; this etymological transition is summarized as follows:

> Ptah (Memphis, 2800BC) → Hikuptah (Amarna, 1300BC) → Hephaestus (Greek, 800BC) → Jiapheta (Indian, 800BC) → *Aigyptos* (Greek, 300BC) → AEgyptum (Latin, 500) → Egipte (Old English, 1150) → Egypt (English, c.1500)

(add)

Quotes

The following are related quotes:

> “Turning to the Egyptian sphere, though, again we have a connection. The name Japheth in old Hebrew consists of three consonants, ‘**J-Ph-Th**’. The ‘ph’ and ‘th’ sounds are linguistically equivalent to ‘p’ and ‘t’, so we can write the name as **J-PT**. In Hebrew, when combining the name of god with another word, one would use a ‘J’ for god's name, which usually appears in transliteration as ‘Ja’ [Ja-Pheth / god Ptah] or ‘Jo’ [Jo-seph / Joseph / god Geb]. In J-PT, the PT part of the name contains the same letters used for the name of the Memphite creator deity, **Ptah**, so Japheth would be the linguistic equivalent of the name ‘god-Ptah’. This is a typical form of Egyptian combination name, such as Atum-Re [Atum-Ra] or Re-Herakhte. It also suggests the frequently used Hebrew term ‘lord god’.”
>
> — Gary Greenberg (2000), *101 Myths of the Bible* (pg. 75)

> “Egypt: Old English *Egipte* ‘the Egyptians’, from French *Egypte*, from Greek *Aigyptos* ‘the river Nile, Egypt’, from Amarna *Hikuptah*, corresponding to Egyptian *Ha(t)-ka-**Ptah*** ‘temple of the soul of Ptah’, the creative god associated with Memphis, the ancient city of Egypt. Strictly, one of the names of Memphis, it

was taken by the Greeks as the name of the whole country. The Egyptian name, Kemet, means ‘black country’ [compare: red country; desert, aka land of Set], in reference to the rich delta soil.”

— Anon (Q) (2017), “Egypt” (Q), EtymOnline.com

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3. Livingston, Lucas. (2002). “Greek and Egyptian Religious Parallels.” (Q) Publisher, Jun 7.

External links

- Ptah – Wikipedia.

θΔics

In existographies, **Claudius Ptolemy** (c.100-170) (IQ:175|#207) (Cattell 1000:80) [RGM:98|1,500+] (Murray 4000:12|CS / 6A) (Eells 100:23) (GAE:3) [CR:50] was Greco-Egyptian mathematician and astronomer, noted for his his 130AD *Syntaxis Mathematica*, wherein he supposedly the first to introduce the zero number, and for his his 150AD Aristotle-based "geocentric model"; which not superseded for some thirteen centuries, namely until Nicolaus Copernicus established the heliocentric model (1543).

Geocentricism

Ptolemy's geocentric cosmology, held that the earth was the center of the cosmos, kept in position by the mutual attraction and repulsion of the stars and planets which revolved about it. [1]

Quotes | On

The following are quotes about Ptolemy:

> "Isaac Newton ranks with Copernicus and Einstein among principal shapers of our physical worldview. However, whereas we can appreciate Copernicus against the backdrop of **Ptolemy**, Einstein against the backdrop of Newton, Newton himself may strike the average educated non-scientist as somewhat remarkable."
>
> — Dennis Danielson (2001), *The Book of the Cosmos: Imagining the Universe From Heraclitus to Hawking* (Q)

Quotes | By

The following are representative quotes:

> "I know that I am mortal by nature and ephemeral, but when I trace at my pleasure the windings to and fro of the heavenly bodies, I no longer touch earth with my feet. I stand in the presence of Zeus himself and take my fill of ambrosia."
>
> — Ptolemy (c.150), penned in the margins of *Almagest* (Q)

> "As material fortune is associated with the properties of the body, so honor belongs to those of the soul."
>
> — Ptolemy (c.150), *Tetrabiblos* (Book 4:1) (Q)

See also

- Ptolemy I
- Ptolemy II

References

1. Bray, Henry T. (1910). *The Living Universe* (pg. 135). Truro Publishing Co., 1920.

External links

- Ptolemy – Wikipedia.

θΔics

In science, **pump problem** refers to the 1630 puzzle as to why pumps, or rather suction pumps, or siphons, could not operate, in their ability to pump water out of mines, if the bottom of the well were more than 32 feet deep.

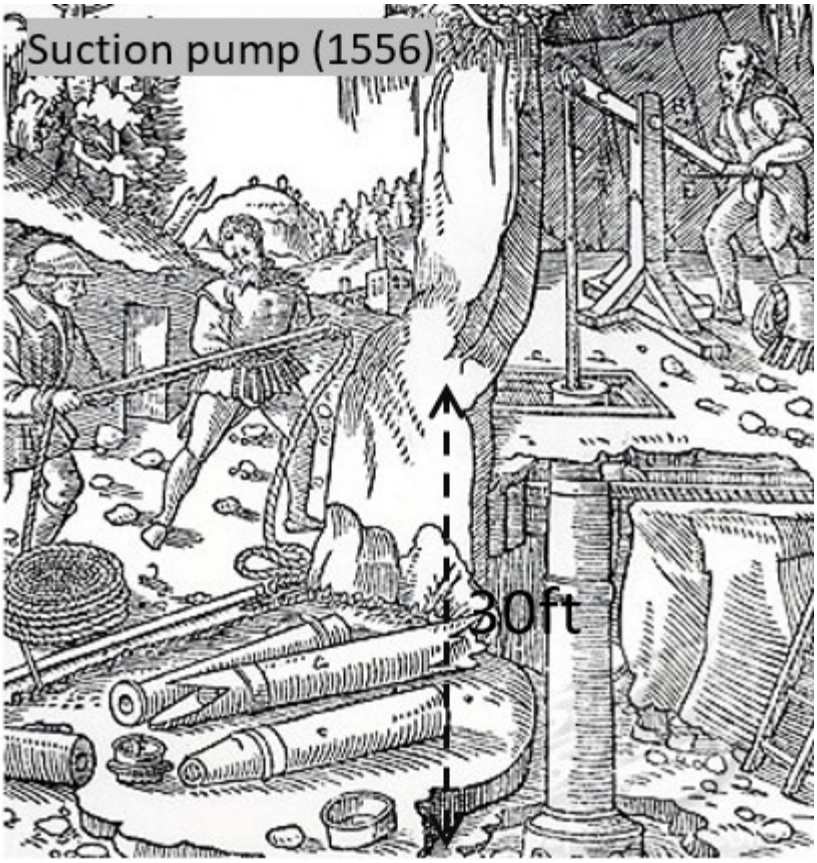

Depiction of the **pump problem**: the man (top right) is operating the piston of the suction pump by raising and lowering the opposite end of the beam to which the piston rod is attached; the ability of the pump, however, is limited to a depth of 32 feet. [3]

Gallileo

On 27 Jul 1630, Giovanni Baliani, a physicist and experimenter, wrote to Galileo asking him why a siphon, made to carry water over a hill, failed to work if the hill was more than 18 cubits (27 feet)?

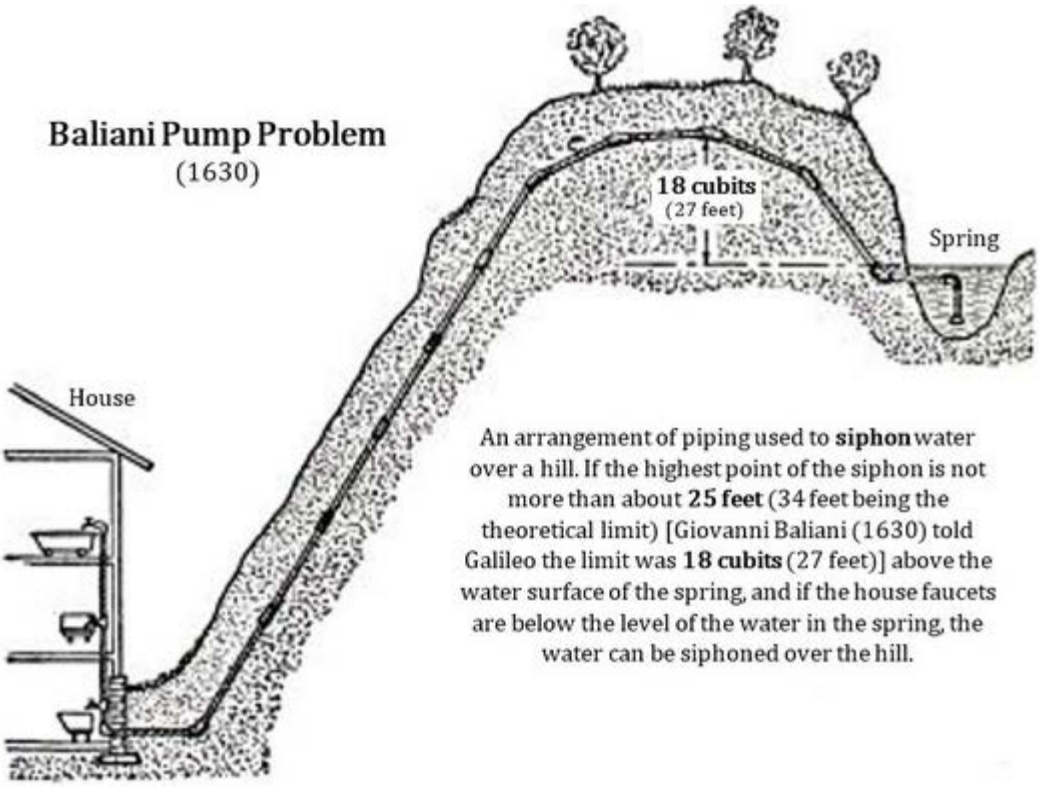

Baliani asked Galileo, in short, why his pump would not work past a depth of 27 feet. Galileo is said to have concluded that: [1]

(a) Atmosphere has weight
(b) Air weight was not heavy enough to balance a column of water more than 18 cubits.

Galilei, stressed from his inquisitions, met his reaction end in 1642, but before doing so assigned this pump problem to his assistant Italian physicist Evangelista Torricelli.

Torricelli

In 1643, Evangelista Torricelli, in effort to test Galileo's answer to the pump solution, proposed inverting a liquid, water first, supposedly, then mercury, into a dish of the same liquid to see if a vacuum would form, or something to this effect. That year the experiment was performed by him or by his colleague Vincenzo Viviani. [5] The following is a rendition of this experiment:

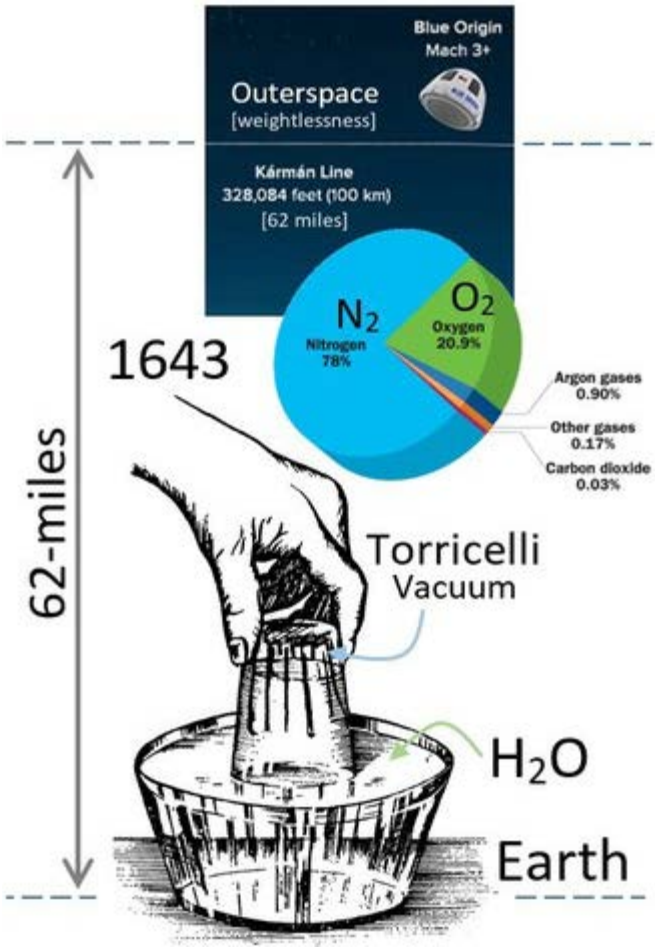

On 11 Jun 1644, Torricelli wrote to his friend Michelangelo Ricci, who like Torricelli had been a student of Benedetto Castelli, wherein he stated the following: [5]

> "I have already called attention to certain philosophical experiments that are in progress ... relating to vacuum, designed not just to make a vacuum but to make an instrument which will exhibit changes in the atmosphere, which is sometimes heavier and denser and at other times lighter and thinner. Many have argued that a vacuum does

not exist, others claim it exists only with difficulty in spite of the repugnance of nature; I know of no one who claims it easily exists without any resistance from nature."

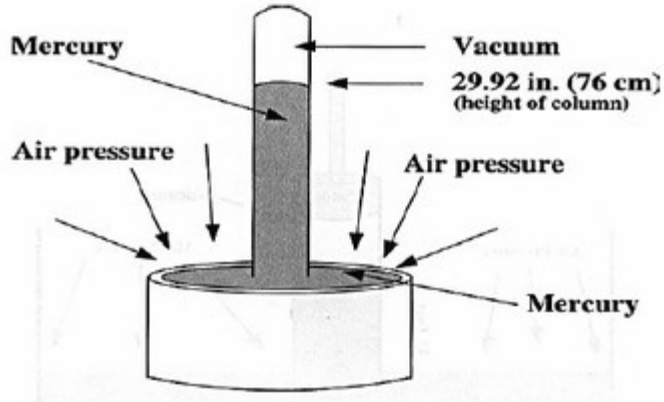

A depiction of a "Torricelli tube", the empty space at the top of the tube called a "Torricellian vacuum", both named after Italian physicist Evangelista Torricelli who conducted this so-called vacuum testing experiment in 1643. [2]

Sometime hereafter, Torricelli began to use mercury, and therein developed his famous "mercury column experiment" where he inverted a column of mercury into a second bowl of mercury, without letting air seep in, and found that a "space" was created at the top of the inverted tube and concluded that it was a vacuum later to be called a "Torricellian vacuum" (or Torricelli's emptiness).

Torricelli found that the level of the mercury varied from day to day and conclude that this was due to variations in atmospheric pressure. This was the first barometer or atmospheric pressure measuring device.

Guericke

In 1654, German polymath Otto Guericke, who had already been working on his own vacuum experiments, learned of the inverted mercury experiment from his acquaintance with Valerianus Magnus (Ñº), who claimed that he had invented the inverted mercury experiment, and gave Guericke his 1647 book *Visual Demonstrations of a Vacuum*. [7] Sometime therein, while reading this book, and others on the same subject, Guericke learned that Torricelli was the first one to have done the inverted mercury vacuum experiment.

Quotes

The following are related quotes:

> "Let us suppose that the cylinder has an elevation of more than 32 feet: the liquid column will rise until it attains about this height. At this moment its **weight is in equilibrium with the pressure of the atmosphere; if the piston continues to rise, the water will not follow it**. This is precisely the obstacle which the Florentine workmen encountered, and which caused the physicists belonging to the Court of the Grand Duke to believe that nature ceased to *abhor a vacuum* beyond 32 feet. Such is the principle of the pump to which is given the name of **suction-pump**, because the piston appears to suck up the liquid as it rises."
> — Amedee Guillemin (1872), *The Force of Nature* (pg. 131)

References

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2. Evangelista Torricelli – RobertNowlan.com.
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5. Torricelli vacuum – Vacuum-Guide.com.
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7. (a) Magnus, Valerianus. (1647). *Visual Demonstrations: of a Space Without Something Contained in it, of a Body*

Moved Gradually in a Vacuum, and of Light Which Adheres to No Body (*Demonstratio ocularis, Loci sine locato, Corporis successive moti in Vacuo, Lumimis nulli corpori inhorentis*) (GB). Publisher.
(b) Guericke, Otto. (1663). *The New (So-Called) Magdeburg Experiments of Otto von Guericke* (*Experimenta Nova (Ut Vocantur) Magdeburgica de Vacuo Spatio*). Amsterdam, Netherlands: Johann Jansson, 1672 (Latin); English translation by Margaret Ames (GB) (Amz) (pg. 181). Springer, 1993.
8. Guericke, Otto. (1663). *The New (So-Called) Magdeburg Experiments of Otto von Guericke* (*Experimenta Nova (Ut Vocantur) Magdeburgica de Vacuo Spatio*). Amsterdam, Netherlands: Johann.

θΔics

In thermodynamics, **pure thermodynamics** refers to the presentation of thermodynamics in its purest form.

The term is peculiar to a number of hardened thermodynamicists, in particular Gilbert Lewis and prior to him Max Planck, and to each seems to connotate a certain very specific, yet undefined meaning.

Planck uses the term several times in his 1915 *Lectures on Theoretical Physics*, in one point of which he states that the Ludwig Boltzmann's probability description an ideal monatomic gas used to calculate properties of that gas allows one to reach conclusions that "lie essentially beyond those of pure thermodynamics." [1]

Lewis used the term twice in his classic 1923 chemical thermodynamics textbook. [2] In 1930, Lewis commented famously: [3]

> "Time is not one of the variables of **pure thermodynamics**."

This indeed is an interesting point of view; giving way to the notion that time is something that may not exist, at least within the context of pure thermodynamics.

English theoretical physicist Alan Wilson, in the preface to his 1956 *Thermodynamics and Statistical Mechanics*, seems to give the indication that pure thermodynamics is what existed before the split, in the *circa* 1870s and the decades to follow, of thermodynamics into the versions known to the physicists (statistical mechanics) and the version known to the chemists (physical chemistry): [4]

> "My own experience is that many theoretical physicists cannot follow an argument which appeals to chemists, because they are unable to distinguish between what is **pure thermodynamics** and what is physical chemistry."

See also

â— Classical thermodynamics

References

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(b) Ben-Naim, Arieh. (2008). *A Farewell to Entropy: Statistical Thermodynamics based on Information* (pg. 20). World Scientific.
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θΔics

In science, **purpose** (TR:400), as contrasted with purposeless (TR:26), refers or has connotation to the meaning of one's actions and to the place of the human, in his or her existence or reaction path, in the structure, movement, and dynamics of the universe.

In 1925, Albert Weiss, in his "rain-drop analogy" shows the silliness in thinking, via anthropomorphic reasoning, that the "purpose" of every drop of water in the atmosphere is to get to the ground or ocean; and that human behavior is but a more complicated form of the same forces that act on rain drops.

Purpose | Terminology reform

See main: Purpose terminology reform

The first to explain purpose in a non-theological, non-teleological, and non-anthropomorphic way, were Harold Blum (1934) and Bruce Lindsay (1983), independently, in terms of thermodynamic potential wells (i.e. Gibbs energy minimums); some of this has been expanded on by Libb Thims, via the "Gates model", in the "Smartest Person Existive (2014)" video series and "Zerotheism for Kids" (2015) video lecture.

Overview

In the absence or questionability of religious belief, the modern person, according to the recent conversations on religion and science interviews of Steve Paulson (2010), is left with a semblance of the following view:

> "Is it just a crazy, cosmic stroke of luck that we're here at all? Or do human beings have some larger, mysterious **purpose**?"

Said another way, the general non-religious alternative explanation to the big question explanation of purpose and meaning, according to Paulson, is that humans are lucky accidents resulting from random genetic mutations. [1]

Random chance

See main: Random chance

Into the early 20th century, following the publication of English naturalist Charles Darwin's 1859 *Origin of Species*, which introduced the theory of the origin of life by evolution to the world, in replacement to the Christian-Ra theology based theory of creation of life by god, followed by Dutch botanist Hugo de Vries' 1901 gene-centric mutation theory of evolution, the non-religious view began to emerge that humans are accidental collections of atoms, formed though evolution, as a result of blind random chance mutations of genes. [2] The following is a representative 1923 quote of this view by American mathematician-philosopher Bertrand Russell: [3]

> "That man is the product of causes which had no prevision of the end they were achieving; that his origin, his growth, his hopes and fears, his loves and beliefs, are but the outcome of accidental collections of atoms."

The main issue with this model, is that a human is 26-element, heat-driven, surface-catalyzed, turnover rate human molecule, formed not by accident, but rather by a very precise consorted chemical mechanism of synthesis, quantified by free energy change measurements. Russell, to note, was a mathematician, not a physicist nor a chemical engineer or physical chemist, and hence prone, as are all mathematicians towards these types of unfounded suppositions.

Purposeless universe model

See main: Purposeless universe hypothesis

Into the latter half of the 20th century, following the discovery of DNA by James Watson and Francis Crick in 1953, a DNA-centric, blind watchmaker model of purpose began to emerge. This is exemplified in the works of English zoologist Richard Dawkins, namely *The Selfish Gene* (1976) and *The Blind Watchmaker* (1986), as is summarized in his famous 1991 quote: [4]

> "We are machines built by DNA whose **purpose** is to make more copies of the same DNA. That is exactly what we are here for. We are machines for propagating DNA, and the propagation of DNA is a self-sustaining process. It is every living object's sole reason for living."

Dawkin's popular assertion, according to American science-religion scholar, theologian-physicist Ian Barbour, shows that the presence of chance indicates that this is a purposeless universe, whereby natural selection is a mechanism that makes highly improbable molecular combinations probable by the accumulation of many small adaptive improvements. [5]

A variation of this view is held by American physicist Steven Weinberg who claims that humans are insignificant specks in a meaningless universe. [1]

Chemical purpose

See main: Chemical teleology

The following labeling notation on a tube of toothpaste indicates that the chemical compound sodium fluoride NaF has an "anticavity" PURPOSE, in the structure of the universe, or at least according to Colgate, namely to prevent cavities in the teeth human molecules (people), a labeling which would seem to contradict the "purposeless universe hypothesis" advocated by many leading scientists:

The toothpaste maker Colgate indicates that the sodium fluoride NaF has a "**purpose**", which in some way, supposedly, contradicts the "purposeless universe hypothesis" advocated by many leading scientists, which holds that purpose does not exist in the universe, and that by repercussion chemicals and molecules, and presumably human molecules (people), do not likewise have purpose.

Chemical thermodynamics

See main: Human chemical thermodynamics

The quick and short chemical thermodynamics answer to the big question of purpose and meaning of human existence and movement is still a nascent subject, albeit one with a general outline and protocol, and certainly several grades above the so-called meaningless-purposeless model trumpeted about by individuals like Russell, Dawkins, and Weinberg.

Without going into details of the chemical thermodynamics explanation of purpose, to point out a number of salient difficulties exist in the modernized, dumbed-down, so-called gene-centric, DNA model of purposeless existence, particularly in the context of the laws of thermodynamics, which govern the operation of the universe. Firstly, chemical synthesis is the correct name for the process by which humans came about over billions of years from hydrogen atom precursors, as first enunciated in French philosopher Jean Sales' 1798 human molecular hypothesis, not by English naturalist Charles Darwin's 1859 evolution theory, which is only a partial theory of a bigger process.

Secondly, a human is not a living object, but rather an animated or reactive entity. Thirdly, human chemical reactions are not self-sustaining, a process that amounts to a perpetual motion claim, but rather heat-driven.

Forth, humans are not machines (human machines), which is a defunct 19th century theory, but rather molecules (human molecules).

Fifth, and most incorrect among his many grandiose claim of the purposeless existence model, the sole reason for an animated molecule's existence is not "propagation of DNA", but rather, in the confines of earth-system surface reactions, a reaction path dictated by Gibbs free energy change, governed by the Lewis inequality for natural processes, as these local free energy differentials are coupled to the spins and heat cycles of the universe. Hence, to further understand purpose of human movement, one must become a student of the joint study of the dynamics of universe, from the sub-atomic to the super-galactic, all in the context of thermodynamics.

The materialist explanation of **purpose** and meaning, according to American materialist philosopher Owen Flanagan, is called "the *really* hard problem" in modern philosophy. [1]

Quotes

The following are related quotes:

> "Destiny urges me to a goal of which I am ignorant. Until that goal is attained I am invulnerable, unassailable. When destiny has accomplished her **purpose** in me, a fly may suffice to destroy me."
>
> — Napoleon Bonaparte (1816), *In His Own Words*

> "Life is meaningless so find a purpose."
>
> — Dilvinder Singh (2016), "Thread post #53" (Ñº), Apr 9; brother of Inderjit Singh; see: Thims' response; thread post #54; and follow-up thread: "Is There Truly a Greater Purpose or Meaning to Life?" (Ñº), Apr 10

See also

â— Einstein on purpose

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2. (a) De Vries, Hugo. (1904). *Species and Varieties: their Origin by Mutation.* Open Court Publishing.
(b) De Vries, Hugo. (1909). *The Mutation Theory: Volume 1.* Open Court Publishing.
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(b) Russell, Bertrand. (1961). "A Free Man's Worship", in: R.E. Egner and L.D. Dennon, eds., *The Basic Writings of Bertrand Russell 1903-1959.* Simon and Schuster.
4. Dawkins, Richard. (1991). "The Ultraviolet Garden", Royal Institute Christmas Lecture, No. 4.
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Further reading

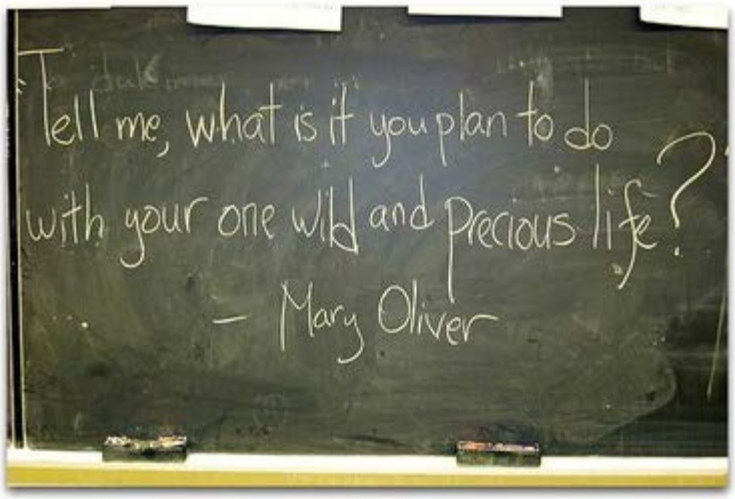

The above "tell me, what is it you plan to do with your one wild and precious life?" question, a popular 1992 quote (Ñº) by American poet Mary Oliver, from her *The Summer Day*, seems to well-capture the gist of what most conceptualize by the term "**purpose**", which often has association with the connective terms: destiny and meaning, and tends to lead into ideas, religious models aside, about following, doing, or going after, what one is passionate about (Ñº) or into plans about doing

â— Cameron, Don. (2001). *The Purpose of Life: Human Purpose and Morality from an Evolutionary Perspective.* Woodhill.
â— Rosch, Staks. (2009). "Atheism 101: The Purpose of Life", Jul 22, Examiner.com.
â— Schneider, Eric and Sagan, Dorion. (2010). *The Purpose of Life: Closing the Gap Between Science and Religion.* Chelsea Green Publishing.

makes one "come alive", as Howard Thurman suggests.

External links

â— Purpose – Wikipedia.

θΔics

In terminology reform, **purpose terminology reforms** refers to the substitution of the defunct terms: purpose, final cause, teleology, with the physico-chemically neutral upgrade terms: "realization of a thermodynamic potential", driving force, among a few others; the following are the main draft-in-stage reform terms:

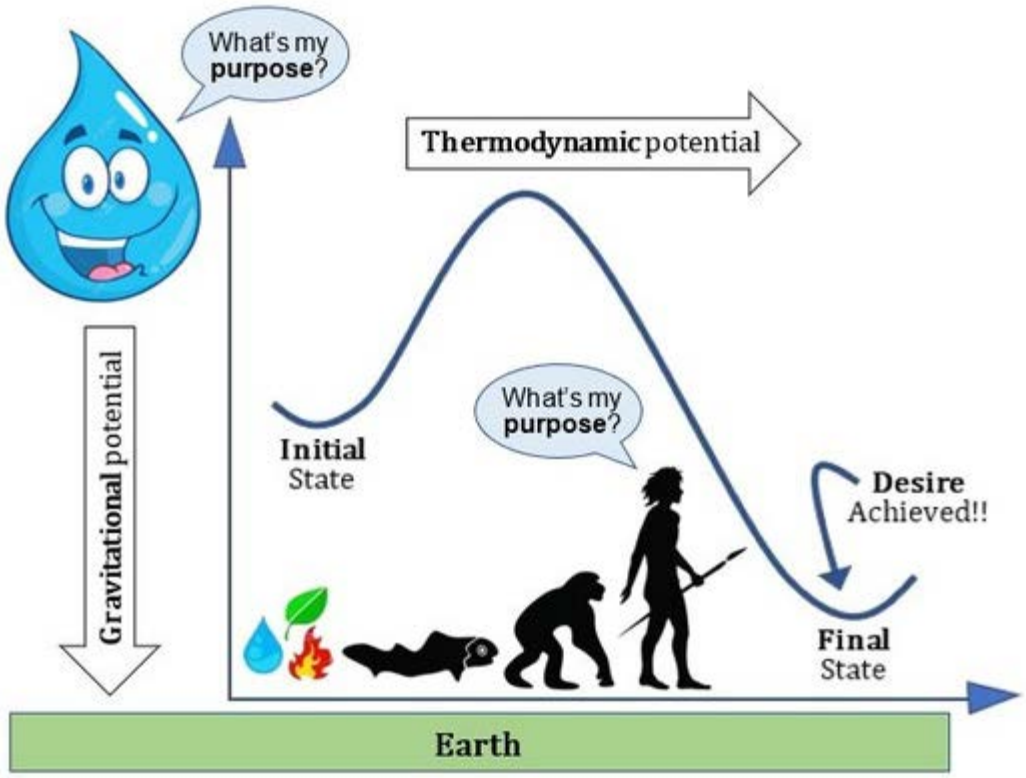

In 1925, Albert Weiss, in his "rain-drop analogy", showed the silliness in thinking, via anthropomorphic reasoning, that the "purpose" of every drop of water in the atmosphere is to get to the ground or ocean; stating likewise, that human behavior is but a more complicated form of the same forces that act on rain drops; according to which, it is, likewise, "silly" to assign purpose to human behavior. A noted difference between the two, water drop in a cloud and human on the ground, is that the former "moves" in its journey through a gravitational potential, defined by the equation w = mgh, whereas the latter moves, i.e. "reacts", through thermodynamic potentials, passing through various "states" of existence along the way, e.g. initial state, meta-stable state, transition state, and end state (or final state), etc. **Purpose terminology reform**, accordingly, employs physico-chemically neutral terminology to human movements, so as to not invoke anthropisms or teleology (see: chemical teleology) in the description, but still captures the concept of purpose or "divine a sense of purpose", as Einstein (1932) phrased things, in Spinoza atheistic terms.

- Final cause → End state (final state)
- Purpose → Realization of a thermodynamic potential (free energy; Gibbs energy minimization) (Lotka, 1945)
- Aristotelian teleology → Clausiusian or Gibbsian based chnopsology
- Telos (inner purpose) → Driving force (internal force; internal drive)
- Sense of purpose (Einstein, 1932) (Q) → Sense of activation energy [?]

These being tentatively based on historical examples, as summarized below.

Blum

In 1934, Harold Blum, in his "A Consideration of Evolution from a Thermodynamic View-Point", interjected on a reformed explanation of "purpose", outside of thermodynamics proper, in a way that is physicochemically-neutral, non-theological, non-teleological, and non-anthropomorphic, who referred to the the new reformed directionality model of evolution as "chemical peneplanation"; the main points are as follows:

> "Practically since its first definite formulation by Darwin the concept of chance variation and natural selection has dominated the study of evolution, although frequent attempts have been made to replace or modify it. Probably most such attempts are provoked by a vaguely defined awareness of an insufficiency in the natural selection hypothesis, and the recognition of a directive factor in evolutionary processes which persists through successive generations. The latter concept which is commonly known as 'orthogenesis', is supported a by considerable amount of evidence (Leo Berg, 1926), but at present is not widely accepted among biologists. The general reason for abandoning or neglecting this concept has been the failure, thus far, to demonstrate the existence of the necessary directing factor **outside of the theological doctrine**; and one may suspect that fear of leaning too closely to such doctrine has caused most biologists to 'shy off' from orthogenesis. It will be the aim of the writer to indicate the actual existence of a directing factor in evolutionary processes, while at the same time avoiding all necessity of invoking theological concepts."

Blum, in short, states that the chance-based evolution persists owing to fear of treading into theological and or teleological terrain labeling. Blum then states that mutations, e.g. A, B, C, in a given species, can go according to the following three reaction path scenarios:

$$A \rightarrow B \rightarrow C$$

$$C \rightarrow B \rightarrow A$$

$$A \rightleftarrows B \rightleftarrows C$$

Blum then speculates on how a certain statistical percentage of "fit" and "unfit" individuals (pg. 355) or chemical species can and will exist in a given equilibrium state; later giving the example (pg. 359), per citation of Henderson, that H_2O, with a free energy of formation of 56,000 calories per mol, is more "eminently fit as a major environmental component" than as compared to NH_3, with a free energy of formation of 3,000 calories per mol, i.e. they are both favored thermodynamically; the former, however, according to Blum, has a faster rate of reaction, which is why we see more of "fitted" to the environment of earth, presently. He continues (pg. 357-58):

> "The chemical reactions possible would be limited to those taking place with a decrease in free energy, and thus an increase in entropy. Those not acquainted with the terminology of thermodynamics may, for the purpose of this paper, simply regard free energy and entropy as quantities with opposite signs but not as equivalent; free energy represents chemical potential. For a discussion of the principles of chemical thermodynamics see Lewis and Randall (1923)."

Further elaboration on this, barring prolonged discussion, is:

> "In Blum's 'Evolution from a Thermodynamic Point of View' (1935), we perceive in evolution a **certain drive** [see: driving force], an inherent direction, **which is NOT to be identified on the basis here indicated with any teleological end**."
>
> — Roderick Seidenberg (1950), *Post-Historic Man* (pg. 151)

Here, generally, we see that what does exists in nature is: driving force (free energy), end state (final state), and thermodynamic potential; and that what does not exist is: final cause, teleology, and presumably purpose (see: purpose does not exist; teleology does not exist).

> "Purposefulness, or teleology, does not exist in nonliving nature. It is universal in the living world. It would make **no sense** to talk of the purpose or adaption of stars, mountains, or the laws of physics."
>
> — Theodosius Dobzhansky (c.1970), *Publication* (Q); cited by Peter Corning (2003) in: *Nature's Magic* (pg. 172)

In short, terms or concept such as "purpose" or "sense of purpose" (Einstein, c.1940) need to be reformulated, in a deanthropomorphized way, into new physico-chemically neutral terms, which apply equally to the hydrogen atom, the hippopotamus, and the human.

Lotka

In 1925, Alfred Lotka, in his *Elements of Physical Biology*, following a prolonged

discussion of a mechanical beetle, in respect to an ameba, and a man, says:

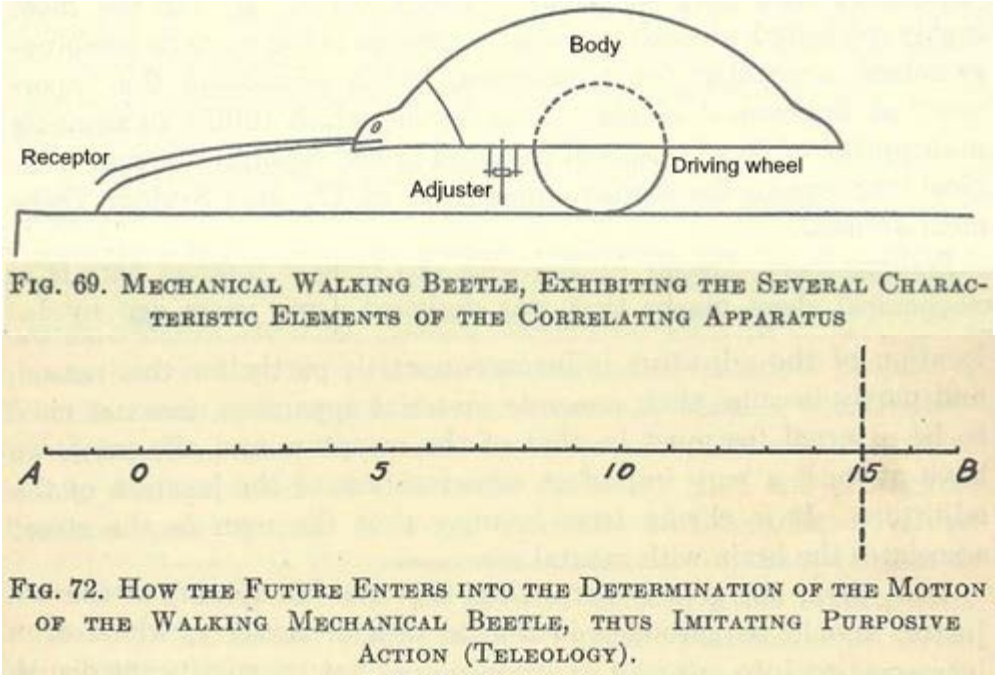

A depiction of Alfred Lotka's 1925 "mechanical walking beetle", in which he explains how the receptors (antennas) give feedback to the adjuster of the body, so to keep the beetle from falling off the table, thus being a mechanical way to show how "future", the likelihood of falling off the table, or seeming purposive behavior (teleology) comes into play.

> "The depiction in this case is plainly mechanical or geometric. We, as living, conscious organisms, in certain circumstances exhibit a precisely analogous behavior; our action is determined by a picture (psychic in this case) of the future that we seek to avoid or to attain. We are directly conscious of our own volition (whatever its precise physical significance may be.) **We hesitate not at all in describing our action as purposive**, as directed to and determined by an end, by a final cause. As to the tin beetle, we have dissected him and fully understand his mechanism. **We would think it foolish**, with our peep behind the scenes, to impute to him volition or purpose; we describe his action as mechanical, as fully determined by an efficient cause."
>
> — Alfred Lotka (1915), *Elements of Physical Biology* 27§§: "Mechanistic and Teleological Interpretation of Adjustors" (pgs. 281-85)

In 1945, Alfred Lotka, in his "The Law of Evolution as a Maximal Principle", in a contextual discussion of a posited future science of statistical dynamics of systems of energy transformers (see: two cultures namesakes), posited, using what seems to be a molecular collision theory scaled up to the level of interaction of animals, that four things or elements are to be distinguished, in respect to what he calls "energy transformers", his name for animate things, bacteria to humans, and their social and predator-pray "collisions" in the field of evolving nature, namely: receptors, free energy, effectors, and adjustors. As to the free energy property of energy transformers, he elaborates: [1]

> "Free energy. Associated with the transformer is a fund of free energy ready to be released by trigger action, that is, by an expenditure of an amount of energy bearing in general no quantitative relation to the energy released, which can thus be far in excess of the energy applied at the 'trigger'. **It can be noted here, only in passing, that the possession of such a fund of free energy is what gives the opportunity for 'purposive' action and the exhibition of the phenomenon of 'will', that is, action teleologically aimed at future effects**."
>
> — Alfred Lotka (1945), "The Law of Evolution as a Maximal Principle" (pg. 181)

Here, we see, that Lotka as discarded teleology and final cause, in respect to movements of bacteria, ameba, and man, and replaced it with: thermodynamic potentials (i.e. free energy), trigger action (i.e. activation energy). Lotka, moreover, directs readers interested in an elaboration of ideas in this last quote, via footnote, to chapter 28 of his *Elements of Physical Biology* (1925) and to his "Evolution and Thermodynamics" (1944) article in *Science and Society*. [2]

Planck

In 1949, Max Planck, in his *Scientific Autobiography*, stated that according to the new Clausiusian model of the universe, that nature prefers "final state" over the "initial state"; the main quote is as follows:

> "Since the question whether a process is reversible or irreversible depends solely on the nature of the initial state and of the terminal state of the process, but not on the manner in which the process develops, in the case of an irreversible process the terminal state is in a certain sense more important than the initial state—as if, so to speak, **nature 'preferred' it to the latter**. I saw a measure of this 'preference' in Clausius' entropy; and I found the meaning of the second law of thermodynamics in the principle that in every natural process the sum of the entropies of all bodies involved in the process increases. I worked out these ideas in my doctoral dissertation at the University of Munich, which was completed in 1879."
>
> — Max Planck (1949), *Scientific Autobiography* (pgs. 18)

Here, we see the Aristotelian "final cause" model of the universe, replaced, upgraded, usurped by the new reformed by Clausiusian model of the universe; teleology has been replaced by a chnopsological thermodynamics model, wherein the logic of "thermodynamics potentials", NOT final cause logic, determine the end state, final state, or terminal state, of the given transformation or movement in question. Here, to note, one must be careful to invoke "chemical teleology" phraseology, which is a very subtle terminology issue.

Lindsay

In 1983, Bruce Lindsay, in his "Social Exemplifications of Physical Principles", stated the following:

> "The teleological idea or **concept of purpose** is involved in several physical principles, notably Hamilton's principle and the related but identical principle of least action, Hertz's principle of the straightest path, Gauss' principle of least constraint, and Fermat's principle of least time. They all effectively state that things take place in the physical world, e.g. the motions of systems of particles, in such a way as to make a certain function assume a stationary value under certain boundary conditions, usually a minimum as compared with all possible values satisfying the given conditions.
>
> This means that the actual motion between the initial state and final states at the initial and final times, respectively, takes place in such a way that the integral in question is either greater than it would be for any other possible motion between these states or less than any other possible motion between these states, it being understood that the initial and final states are the same for all the possible motions being compared. In the majority of cases to which the principle has been applied in classical mechanics, the stationary value is a minimum.
>
> With respect to the possible idea of purpose involved philosophers have argued that since Hamilton's principle is *not* necessary for the deduction of the actual motion of the dynamical systems, i.e. the Newtonian or Lagrangian equations are fully adequate, we have no real logical ground for insisting that nature imposes a teleological requirement on motions in our experience. Nevertheless the fact that one can exhibit the principles of mechanics in a teleological guise is persuasive, since it serves to tie physical principles with an idea basic to the interpretation that human beings give too much of their ordinary experience, particularly in their relations with other human beings.
>
> Hamilton's principle, e.g., says that for a conservative dynamical system the motion between any two instants of time is such that the time integral of the difference between the kinetic and potential energies taken between these two instances has a stationary value. It has as if the system had a certain purpose to satisfy. A rational individual is said to arrange his actions so as to be sure of achieving his fundamental desires, whether it be to accumulate wealth or gain power over his fellow men. In particular, the aim here is almost always to try to attain the given desired end at minimum cost in human effort. This strongly suggests

a heuristic connection with the [Gibbsian] minimum principles of physics."

Lindsay, here, to note does not directly state that minimization of the Gibbsian for social systems is the quantitative function for the so-called "senses of purpose", as Einstein deemed things, felt by people in society, but he does previous to the above, in his section "The Principles of Thermodynamics", outline ideas on how Clausius-Gibbs based thermodynamics applies socially. The only connection Lindsay makes to the above is to give the example of George Zipf's 1949 principle of least effort.

Thims

In 2011, Libb Thims attempted to draft (see: books) the manuscript *Purpose? (In a Godless Universe)*, which, however, stalled out, unfinished, at the 120-page level. [4]

In 2014, Libb Thims, in Hmolpedia threads, having absorbed the ideas of Blum and Lindsay, began to interject into purpose terminology reform; specifically: [3]

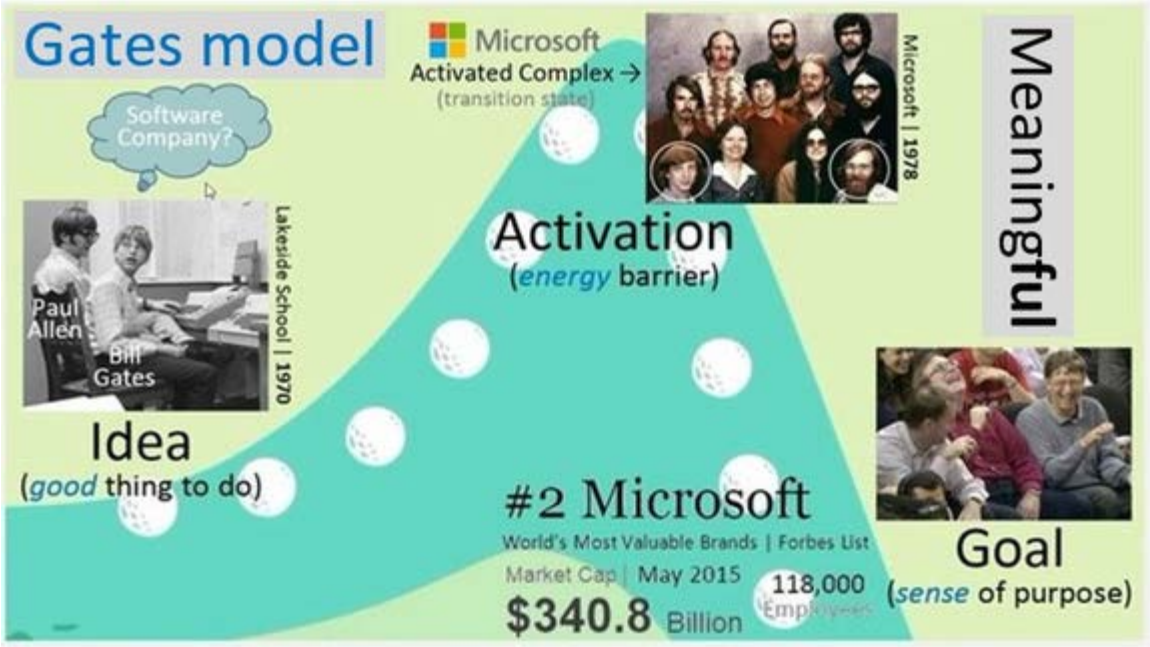

A visual of the so-called "**Gates model**", from the 2015 "Zerotheism for Kids: Lecture 4: Enthalpy & Entropy, Moral Compass, and Monism" (Q) (14:47-) video, by Libb Thims, also discussed in the 2014 "25 Smartest People Alive | Existive (2 of 5) (Q) (3:49-8:40) video, therein depicting a visual of the "gravito-electromagnetic force", aka Gibbs force (see: force function), that moved Bill Gates, from his two person initial state, through his reaction coordinates, over the activation energy barrier, forming the activated complex of the 11-member Microsoft "group" at the apex, and "falling" into the product stage (end state) of the Microsoft corporation, valued at $341 billion in 2015, employing some 120 thousand people, which is akin to the "gravitational force" causing a rock to fall through its gravitational potential, say if tipped off a cliff.

> "Re (#4): "where is the director?" [Kierkegaard], this brings to mind the so-called purpose question—which you commented somewhere, in some thread, was your point or apex of debate collision with me—and what Bruce Lindsay (1983) has to say about this in regards to physics, the teleology debate issue, and sense of purpose. The key statement being the following:

> 'A rational individual is said to arrange his actions so as to be sure of achieving his fundamental desires, whether it be to accumulate wealth or gain power over his fellow men. In particular the aim here is almost always to try to attain the given desired end at minimum cost in human effort. This strongly suggests a heuristic connection with the minimum principles of physics.'

Prior to this, Lindsay cites the following so-called minimum principles: Newtonian (not exactly a minimum principle) → Lagrangian → **Hamiltonian**, and how they have merged into each other, to increasingly quantify the dynamics of the motions of systems comprised of moving particles (e.g. social systems). What he doesn't state, however, is that the Hamiltonian, via Clausius (1865) and Gibbs (1876), got transformed into the so-called 'Gibbsian' minimum principle, according to which Lindsay's statement, in 2014 retrospect, is something along the lines of:

> ‘A rational individual is said to arrange his actions so as to be sure of achieving his fundamental desires, whether it be to accumulate wealth or gain power … the aim here is almost always to try to attain the given desired end at minimum cost in human effort. This strongly suggests a heuristic connection with the [Gibbsian] minimum principles of the [physicochemical sciences].’

And hence, if as a rational individual, as Lindsay says, you desire to understand your desires, you are led naturally enough into a study of the so-called ‘human free energy’ theorists, so as to better understand the ‘whys’ and ‘hows’ associate with ‘minimum principles’ as they related to the arrangements your actions. This is not to say, to note, that atoms, molecules, and concordantly humans have "purpose", so to say, in the sense of ‘the purpose of hydrogen is to bond with oxygen to form water’, etc., as this is a type of non-sensical statement, whereby so it must also be so with humans (or human molecules), or are governed by "teleological" principles, as the covert religion-siding scientists like to argue, as this is an model that only works in an Aristotelian universe, but rather that there seems to be some well-honed truth, in need of deeper clarification, in what Lindsay states above.”

Shortly thereafter, Thims expanded on this via the "Gates model", as used in the "Smartest Person Existive (2014)" video series, and in the "Zerotheism for Kids" (2015) video lecture.

Discussion

In sum, while "purpose", as an anthropism, does not seem to exist in nature, e.g. as applied to hydrogen reacting with oxygen, via a thermodynamic potential, or a rock falling through a gravitational potential; it is erroneous to say, as Steven Weinberg (1993) infamously did, that "points", e.g that inflection points, such as Gibbs energy inflection points, don't exist in the universe, i.e. that the universe is "pointless"; meaningless hypotheses fall into this latter error-filled bucket likewise.

The following is the schematic overview of the situation:

Problem (Term/Concept)		Solution (Term/Concept)	Notes (Synopsis/Progress)
Purpose does not exist Purposeless universe hypothesis Pointlessness Meaninglessness Chemical teleology	→	**Purpose terminology reform** Sense of purpose Point Pointfullness	The exact reform involves: (a) not invoking chemical teleology assertions, (b) not invoking pointlessness universe assertions, (c) addressing the Lindsay-Bray reform model, and (d) addressing the "divine a sense of purpose" Einstein description (as touched on in the Gates model). This, in short, is an “Aristotelian cosmology” to “Gibbsian cosmology” belief system terminology reform AND concept reform problem; see: Hamiltonian; Gibbsian.

(add)

See also

- Life terminology upgrades
- Sociology terminology upgrades
- Love terminology upgrades

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1. Lotka, Alfred. (1945). “The Law of Evolution as a Maximal Principle” (jst), *Human Biology*, 17(30):167-94.
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(b) Lotka, Alfred J. (1925). *Elements of Physical Biology* (republished (Q) as: *Elements of Mathematical Biology*, which includes: corrections from Lotka’s notes and a completed list of his publications) (pdf) (Q) (txt) (pgs. 155-56). Dover, 1956
3. Thims, Libb. (2014), “Thread posts #8-9” (Q), Sep 3.
4. Thims, Libb. (2011). *Purpose? (in a Godless universe)*. (94-pg manuscript) (unfinished); Online as 105-page unfinished manuscript (14 Apr 2013). IoHT publications.

θΔics

In terminology, **purposeless** (TR:26), as contrasted with purpose (TR:400), refers to []

pur·pose·less
/ˈpərpəslis/

adjective

done or made with no discernible point or purpose.
"purposeless vandalism"

- having no aim or plan.
  "his purposeless life"

A Google-generated definition of **purposeless**, defined as something done or made without discernible point; having no aim or plan.

Quotes

The following are related quotes:

> "Today we know that the cosmos is simply a flux of **purposeless** rearrangement amidst which man is a wholly negligible incident or accident."
>
> — Howard Lovecraft (1936), "Religion and Ethics", letter to Natalie Wooley, May 2 [2]

> "Man is the result of a **purposeless** and materialistic process that did not have him in mind. He was not planned. He is a state of matter, a form of life, a sort of animal, and a species of the order primates, akin nearly or remotely to all of life and indeed to all that is material."
>
> — George Simpson (1967), *The Meaning of Evolution* [1]

See also

â— Pointlessness
â— Purposeless universe hypothesis

References

1. (a) Simpson, George G. (1967). *The Meaning of Evolution: a Study of the History of Life and of its Significance for Man* (purposeless, 3+ pgs; quote, pg. 345). Harvard University Press.
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θΔics

In theories, **purposeless universe hypothesis** is a model of the universe, which states, generally speaking, that the universe is godless and that there is no inherent purpose in the structure, dynamics, or movement of the universe. [1]

There are many promoters of this theory, all who seem to be in the Dawkins number range of 6-7, who include: Peter Atkins, Bertrand Russell (to some extent), Taner Edis, Steven Weinberg, Richard Feynman, James Watson, Richard Dawkins (to some extent) among others.

Early views

It is difficult to pin down exactly when the purposeless universe theory came into existence, but a good demarcation point might rightly be 1859 during which time the *Origin of Species* began to displace the *Bible* in regards to what defines the course of human movement, wherein the decades afterwards theories such as heat death, blind random chance, mutation theory, chaos, bifurcation theory, among others, began to take root in the now openly Godless universe landscape. One of the first noted advocators of the purposeless universe model was German biologist Ernst Haeckel, who was being noted for this view as early as 1910. [7]

Atkins

In the early 1980s, English physical chemist Peter Atkins, began promoting a second law base purposeless universe model of human formation and existence. Atkins' first venture into this genre was his 1981 book *Creation* (revised as *Creation Revisited*, 1992), in which he uses physical chemist principles to argue, in what seems to be a physical chemistry stylized Darwinism, in outline, that elephants and men are evolved emergent types of "molecules equipped for competition, survival, and reproduction", albeit molecules that are "unimportant", "insignificant", and "without purpose." [4] In 1998, Atkins stated the following:

> “There is not one jot of evidence for cosmic **purpose**. It’s a reverse engineering of the quest for god.”

The gist of Atkins’ effort seems to be a polemic to dispel the “creator view” of human existence and to replace it with a physical chemistry and or thermodynamic view of human existence, albeit the way he goes about this is through a very skewed way of looking at things: in particular he bends, distorts, and misrepresents they way in which chemical reactions actually occur in a way that leans towards support of his argument. In his 2011 book *On Being: A Scientist's Exploration of the Great Questions of Existence*, section 2.7 "A Universe Without Purpose", for example, he defines the “driving force” of all chemical reactions, human or otherwise, as “the natural tendency of matter and energy to disperse in disorder.” [5]

This, however, is a grand over-slanted laymanized interpretation of the chemical reaction driving force, that of free energy (which prior to 1882 was defined a chemical affinity). Correctly, the actual rigorously-defined “driving force” of chemical reactions, according to the defining textbook definition, that given by American physical chemist Gilbert Lewis (*Thermodynamics*, 1923), is of the tendency towards free energy decrease (see: Gibbs free energy change), which in pharmaceutical thermodynamics alone has shown that there are very discernible energetically-determined, quantifiable reaction paths (movements on free energy gradients) for all types of molecules and chemical species, atomic, drug-receptor molecules, or in extension: human molecules (people).

Where Atkins goes astray in his purposeless universe polemic, is that in his tunnel vision ideal of discarding the Biblical view of human existence, he subtly bends, twists, distorts, and over simplifies (dumbifies) the second law, and physical chemistry as a whole, in the name of disproof and agenda. The “pervading idea” of his argument, as he states, is entropy. In this end, where he goes astray in his application of entropy and the second law to evolution and in turn human existence is his over-use of the energy dispersal model of entropy: [4]

> “Everything is driven by decay. Everything is driven by motiveless, **purposeless** decay. By [the term] ‘quality’, [we mean] the extent of its dispersal. High quality, useful energy is localized energy. Low quality, wasted energy, is chaotically diffuse energy. Things can get done when energy is localized; but energy

> loses its potency to motivate change when it has become dispersed. The degradation of quality is chaotic dispersal. Such dispersal is ultimately natural, motiveless, and purposeless. It occurs naturally and spontaneously, and when it occurs it causes change. When it is precipitate it destroys. When it is geared through chains of events it can produce civilizations."

Correctly, if Atkins was speaking according to the correct physical chemistry definition, everything, in freely going, isothermal, isobaric, earth-bound reaction systems, is "driven" (see: driving force) by free energy change, *not* by decay as Atkins has laymanized things. In another vein, he rephrases this as:

> "The tendency of energy to chaos is transformed into love or war through the agency of chemical reactions. All actions are chains of reactions. From thinking to doing, in simple thinking or in responding, the mechanism in action is chemical reaction."

This is all good, in overall simplified premise, but his entire spiel, in core structure, is framed in a hugely-distorted view of the second law and of entropy. Nowhere in German physicist Rudolf Clausius' defining textbook on thermodynamics, the 1875 *The Mechanical Theory of Heat*, is entropy or the second law defined as the "tendency of energy to chaos", nor, hypocritically, does Atkins use this interpretation to define entropy or the second law in his standard muti-edition *Physical Chemistry* textbook, but when it comes to human affairs, he repeats this mantra *ad nauseam* throughout his polemic.

Dawkins

In the selfish-gene theory work of English zoologist Richard Dawkins, namely his *The Selfish Gene* (1976) and *The Blind Watchmaker* (1986), he extols on a mix of purposelessness and DNA-transmission based purpose, such as summarized in the following 1991 quote: [8]

> "We are machines built by DNA whose **purpose** is to make more copies of the same DNA. That is exactly what we are here for. We are machines for propagating DNA, and the propagation of DNA is a self-sustaining process. It is every living object's sole reason for living."

Dawkin's popular assertion, according to American science-religion scholar, theologian-physicist Ian Barbour, shows that the presence of chance indicates that this is a purposeless universe, whereby natural selection is a mechanism that makes highly improbable molecular combinations probable by the accumulation of many small adaptive improvements. [9]

Weinberg

One of the leading and oft-cited spokespersons for the view that universe has no purpose is American physicist Steven Weinberg who, in 1993 *Dreams of a Final Theory: the Search for the Fundamental Laws of* Nature, famously commented that according to modern science: [2]

> "The more the universe seems comprehensible, the more the universe seems pointless."

(add discussion)

Watson

Another take on the purposeless universe model, occurred in a 1996 conversation between American biochemist James Watson, co-discover of DNA, and his friend English biologist Richard Dawkins, wherein Watson summarized his views on the religion-science conflict as follows: [3]

> "Well I don't think we're here for anything. We're just products of evolution. You can say, 'Gee, your life must be pretty bleak if you don't think there's a **purpose**,' But I'm anticipating having a good lunch.'

Watson, it seems, here is summarizing his methodology of existence to the effect that he exists for the here and now, led by his own intuitive guiding principle to seek that which is good possibly along the lines of the Epicurean guiding principle to seek the maximum total amount of pleasure. The following pages will address the issues underlying these conflicting sets of belief systems in the daylight of modern science.

Edis

Another outspoken purposeless universe advocator is Turkish-born American physicist Taner Edis, a physics professor at Truman State University, and author of three books on religion and science. His 2002 *Ghost in the Universe* trumpets out, nearly *ad nauseam*, that the universe is Godless (which is correct), that "the natural world contains no binding moral principles" (which is incorrect: chemical thermodynamics defines what is natural and unnatural), and that evolution and creativity in nature occur via "blind, purposeless trial and error" (which is incorrect: evolution, that which synthesized humans from hydrogens, is a process of coupled energy-driven chemical reactions, and chemical reactions do not occur via blind trial and error). He summarizes his view as such:

> "Among believers of all stripes, it is a commonplace that science is unable to answer ultimate questions about human origins, meaning and destiny. I shall argue that we come from accidents, not design. Our lives have no cosmic meaning. Our destiny is dust, not immortality. Many find such answers unappealing. Nevertheless, I believe they are most likely correct."

And nearly devotes the entirety of his 2002 book to the substantiation of this model.

Quotes

The following are related quotes:

> "The universe may have a **purpose**, but nothing we know suggests that, if so, this purpose has any similarity to ours."
>
> – Bertrand Russell (c.1960), English mathematical philosopher

> "Is it just a crazy, cosmic stroke of luck that we're here at all? Or do humans have some larger, mysterious **purpose**?"
>
> – Steve Paulson, *Atoms & Eden* (2010)

See also

â— Ontic openness

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2. Weinberg, Steven. (1993). *Dreams of a Final Theory: The Search for the Fundamental Laws of Nature.* Publisher.
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4. (a) Atkins, Peter. (1981). *Creation.* Publisher.
(b) Atkins, Peter. (1992). *Creation Revisited.* W.H. Freeman & Co.
5. (a) Atkins, Peter. (2011). *On Being: A Scientist's Exploration of the Great Questions of Existence* (thermodynamics, 6+ pgs). Oxford University Press.
(b) "On Being" by Peter Atkins (review), May 05, 2011 - Humanist4Science blog.
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(b) Ernst Haeckel – Wikipedia.
8. Dawkins, Richard. (1991). “The Ultraviolet Garden”, Royal Institute Christmas Lecture, No. 4.
9. Barbour, Ian G. (2000). *When Science Meets Religion* (pg. 155). Harper Collins.

θΔics

In terminology, **puzzle**, from *pusle* 'bewilder, confound" (1590s), of unknown origin (1582), possibly frequentative of *pose* in obsolete sense of 'confuse, perplex', is a question, problem, and or contrivance that interrogates the mind, resulting to test one's ingenuity; similar to conundrum and or riddle. [1]

Quotes

The following are related quotes:

> "In 1809, Goethe published a book which was a **puzzle** both to his admirers and his enemies. This was *Elective Affinities*."
>
> — Hjalmar Boyesen (1885), Goethean scholar

> "I have run my head hard up against a form of mathematics that grinds my brains out. I flounder like a sculpin in the mud. It is called the 'law of phases', and was invented at Yale [by Gibbs]. No one shall persuade me that I am not a phase. On the physico-chemical law of development and dynamics, our society has reached what is called the critical point where it is near a new phase or equilibrium. My essay 'The Rule of Phase Applied to History' is a 'mere intellectual plaything, like a **puzzle**'. I am interested in getting it into the hands of a 'scientific, physico-chemical proofreader' [see: Henry Bumstead] and I am willing to pay 'liberally for the job'."
>
> — Henry Adams (1908-09), aggregate personal note communications [2]

See also

â— Modern queries
â— Reverse engineering puzzle

References

1. (a) Merriam-Webster Collegiate Dictionary, 2000.
(b) Puzzle – Online Etymology Dictionary.
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External links

â— Puzzle – Wikipedia.

θΔics

In equations, the formula:

$$PV = k$$

is called Boyle's law (or sometimes Mariotte's law) and states that for a body of ideal gas, at constant particle count and temperature, not too far from STP, the product of the pressure P and volume V of the gas will be equal to a constant k.

History

The equation was derived through studies of the pneumatical engine (1658) and stated at verbally in 1662 by Robert Boyle in his *New Experiments on the Spring of the Air* and then in 1676 by French physicist Edme Mariotte in his *The Nature of Air*. This was the first of the various gas laws.

Human thermodynamics

This was the formula used by English physicist C.G. Darwin in his 1952 "introduction" section to his *The Next Million Years* to give an outline of the subject of human thermodynamics as the study of the behaviors of human molecules.

Further reading

â— V.H.V. (1886). "Abstract: Deviations of Oxygen at Low Pressure from Boyle's Law.", *Journal of the Chemical Society* (pg. 591). Royal Society.

θΔics

In equations, the following formula:

$$PV = nRT$$

is called the "ideal gas law", where *P* is the pressure, *V* is volume, *n* is the number of mols, *R* the gas constant, and *T* is the absolute temperature of a body in the gas state, and is the state equation that governs the behavior of ideal gas systems, not to far above or below standard temperature and pressure, and in which the particles are assumed to conform to the Boltzmann chaos assumption.

Overview

This equation was first penned by German chemist Walther Nernst in his 1893 *Standpoint of Avogadro's Rule and Thermodynamics*; albeit based on earlier and precursory formulations of the "gas laws" in their various forms, all of which trace to experiments done with the 1656 pneumatical engine built by Irish engineer Robert Boyle under the direction of English chemist Robert Hooke.

References

1. Nernst, Walther. (1893). *Theoretical Chemistry: from the Standpoint of Avogadro's Rule and Thermodynamics* (PV=nRT, pgs. 32, 41). MacMillan and Co.

External links

â— PV = nRT (video) – KhanAcademy.org.

θΔics

In thermodynamics, **PV diagram**, short for pressure volume diagram, indicator diagram, or indicator card, is a plot of the pressure of a given body or system, on the ordinate (vertical axis), against volume on the abscissa (horizontal axis); the body typically existing in the gas state, although this is not always true, which undergoing a transformation or change of state; typically expansion or contraction.

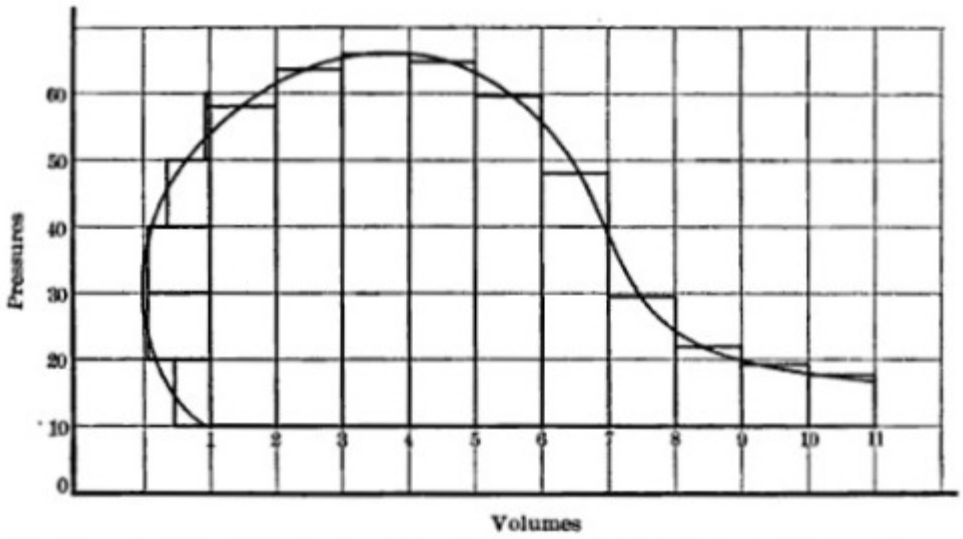

An example **PV diagram** (1912), the area of the enclosed region under the curve representative of PV work, the area of which shown being calculated according to the strip method, or summation of the the areas of the vertical strips. [1]

See also

â— PV work

References

1. Lucke, Charles E. (1912). *Engineering Thermodynamics* (§13: PV diagrams and Indicator Cards, pgs. 43-). McGraw-Hill.

External links

â— Pressure volume diagram – Wikipedia.

θΔics

In thermodynamics, **PV work** is a shorthand term for pressure volume work or work associated with volume change.

Etymology

The concept of pressure volume work originated from the invention of the indicator by James watt in 1790, followed by the invention of the indicator diagram by John Southern, Watt's employee, in 1796, followed by an exposition of the mathematical details of indicator diagrams, otherwise known as PV diagrams, by French physicist Emile Clapeyron in 1834.

In 1857, German physicist Rudolf Clausius, in his paper on the kinetic theory of gases, derived a formula for product of the pressure and volume of a body of gas as follows:

$$PV = \frac{1}{3}Nmu^2$$

where N is the number of molecules (particles), m the mass of each molecule, and u the mean velocity of each particle. [1]

The term PV diagram, used as early as 1903, seems to predate the term PV work, in common usage, by about fifty years. American chemist Frederick Rossini, for example, was using the term "PV work" commonly in his 1950 *Chemical Thermodynamics*.

See also

- PV = k
- PV = nRT
- dW = PdV

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 290). Morrisville, NC: LuLu.

External links

- PV work – ChemTeam.info.
- PV work – Chem.Arizona.edu.

θΔics

In geometry, **pyramid** is a five-sided shape, comprised of a square base, and four equal sized triangle sides, joined at the tip; in chemistry the pyramid became the forerunner to the delta symbol "Δ" of heat and later the "ΘΔ" symbol of thermodynamics.

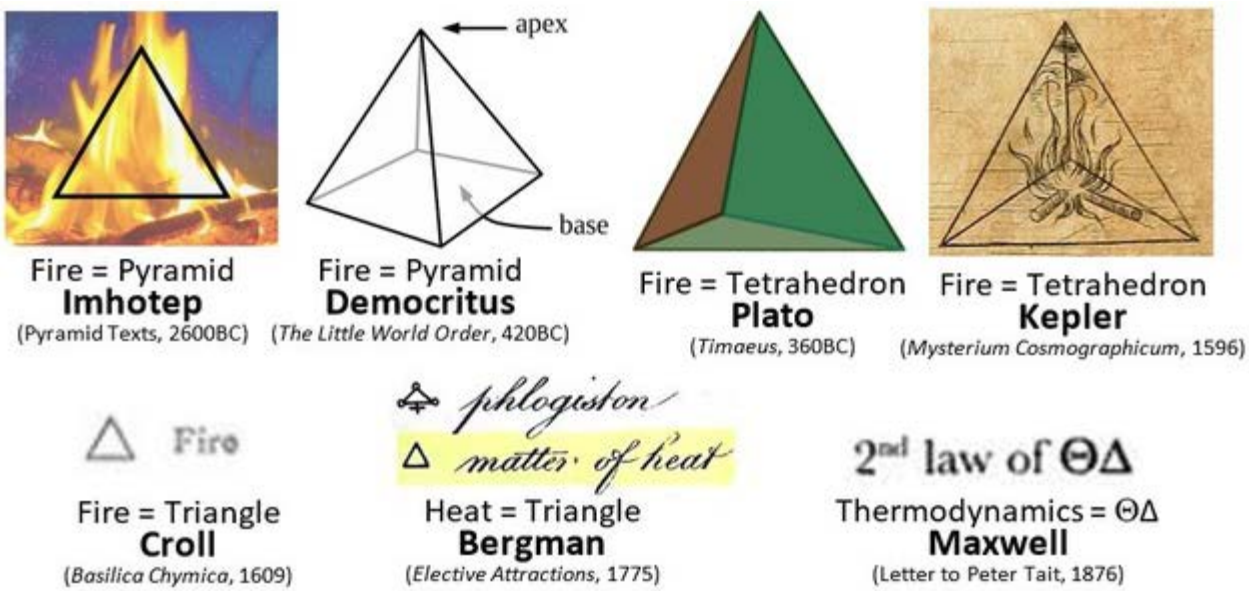

A synopsis of the view of how the **pyramid** or triangle shape of flames, which "like a pyramid" as Theophrastus says, and Democritus attempts to explain, some arguing that the fire element or atom of fire (fire atom) was a "pyramid" in shape and or sphere (Aristotle, c.350BC) or "tetrahedron" in shape (Plato, c.360BC), derived from Egypt, as espoused in the Heliopolis creation myth, and the sun or sun god being born out of the tip of the great pyramids in the form of the phoenix or benben bird, a geometry learned by the Greeks who travelled there to study, modifying it accordingly.

Overview

In c.2600BC, Imhotep built the step pyramid, a "pyramid" shaped tomb of sorts for the pharaohs, out of the tip of which the sun god, e.g. Ra, was said to be reborn. The precursor the step pyramids, in turn, were "cube" or "rectangle" shaped mastabas (Ñº), or burial tombs, which over time began to be stacked on top of each other.

In 600-300BC, the Greek scholars all travelled to Egypt to learn their sciences, e.g. geometry, astronomy, and theology.

In 420BC, Democritus, in particular, travelled there, supposedly coming away with the puzzle as to why fires are "pyramid shaped" and the model that fire atoms are either pyramid shaped, like the Egyptian pyramids or spherical, like the sun.

In 360BC, Plato, in his *Timaeus*, influenced the previous Greek thinkers, outlined his so-called Platonic solid (Ñº) model of the elements, where earth was a cube, possibly like the mastaba shape, and fire was a tetrahedron, like the pyramid shape.

In the millennia to follow, the pyramid became symbolized by the triangle shape or Greek delta Δ symbol, representative of heat or fire.

Quotes

The following are related quotes:

> "Though it was primarily with reference to the properties and powers and motions of bodies that they assigned them their shapes, the latter are inappropriate. For instance, since fire is mobile, and since it heats and burns some made it a sphere, others a pyramid. They are the most mobile since they are in contact with the fewest things and have the smallest base, the most productive of heat and burning because the one, the sphere, is an angle all over, while the other, the pyramid, has the sharpest angles, and heat and burning are produced by the angles, so they say. Next, if what is burned is set on fire, and **fire is a sphere or a pyramid**, what is burned has to become spheres or pyramids."
>
> — Aristotle (c.350BC), *De Caelo* (306a26-307b5) [1]

“There is also the problem of **why a flame is shaped like a pyramid**. Democritus says that as its extremities cool down it contracts into a small shape and eventually tapers to a point.”

— Theophrastus (c.320BC), *On Fire* (52) [1]

“And if the inscription on the ancient **pyramid** of Sais says, ‘I am all that is, that was, and that will be, no mortal man has yet removed the veil’, it might be replied thereto, that modern science has removed the veil and has discovered that force and matter were, are, and will be.”

— Franz Pisko (c.1875), front matter quotes to Ludwig Buchner’s *Force and Matter* [2]

“Religion is 70 percent mythology (i.e. Anunian theology), 15 percent astronomy (Sirius = Sarah), 7 percent geology (Nun = annual Nile flood), 5 percent natural science (e.g. dung beetles mounds = **pyramids**), and 3 percent pixie dust (i.e. fairy tale).”

— Libb Thims (2015), reflection on George Millin's 1896 attempt to relegate all religion to myth and good and evil to physical science, 12:14 PM CST Dec 15

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2. Buchner, Ludwig. (1855). *Force and Matter: Principles of the Natural Order of the Universe, with a System of Morality Based Thereon* (15th German edition; 4th English edition) (pg. 1). London: Asher and Co, 1884.

External links

â— Pyramid – Wikipedia.

θΔics

In existographies, **Pyrrho** (c.360-270BC) (IQ:170|#350) (CR:4) was a Greek skeptic philosopher and "free thinker" (Owen, 1829) (Q); studied the writings of Democritus, became a disciple of Bryson, the son of Stilpo, and later a disciple of Anaxarchus; Epicurus, according to Nausiphanes, greatly admired him.

Quotes | On

The following are quotes on Pyrrho:

> "**Pyrrho** led a most noble philosophy: to quote Ascanius of Abdera, taking the form of agnosticism and suspension of judgement, he denied that anything was honorable or dishonorable, just or unjust. And so, universally, he held that there is nothing really existent, but **custom and convention govern human action**; for no single thing is in itself any more this than that. He led a life consistent with this doctrine, going out of his way for nothing, taking no precaution, but facing all risks as they came, whether carts, precipices, dogs or what not, and, generally, leaving nothing to the arbitrament of the senses; but he was kept out of harm's way by his friends who, as Antigonus of Carystus tells us, used to follow close after him."
>
> — Diogenes Laertius (220), *The Lives and Opinions of Eminent Philosophers* [1]

> "Nausiphanes (Q)(Q) when a young man was captivated by him: at all events he used to say that we should follow Pyrrho in disposition but himself in doctrine; and he would often remark that Epicurus, greatly admiring Pyrrho's way of life, regularly asked him for information about Pyrrho."
>
> — Diogenes Laertius (220), *The Lives and Opinions of Eminent Philosophers* [1]

> "Whether there exists a god. or whether he exists not, our duties will be the same; and our nature, if consulted, will prove, *that vice is an evil, and that virtue is a real and substantial good*. We are assured, that there have been found philosophers and atheists, who deny the distinction of *vice* and *virtue*, and who have preached up debauchery and licentiousness of manners: in this number, may be reckoned Aristippus and Theodorus, surnamed the *Atheist*, Bion (Q), the Boristhenite, **Pyrrho**, etc., amongst the ancients (see: Diogenes Laertius), and amongst the moderns, the author [Bernard Mandeville] of the *Fable of the Bees* [1705](Q), which, however, could only be intended to show, that in the present constitution of things, vices have identified themselves with nations, and have become necessary to them, in the same manner as strong liquors to those who have habituated themselves to their use. The author who published the *Man Automaton* [Mettrie, 1748], has reasoned upon morality like a madman."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 310)

> "The great subverter of **Pyrrhonism** or the excessive principles of skepticism is action, and employment, and the occupations of common life."
>
> — David Hume (c.1775) (Q)

References

1. Laertius, Diogenes. (c.230). *Lives and Opinions of Eminent Philosophers* (TOC) (txt) (WS) (§9.11). Publisher.

External links

- Pyrrho – Wikipedia.

θΔics

In existographies, **Pythagoras** (c.570-490BC) (IQ:180|#86) (Cattell 1000:89) [RGM:15|1,500+] (GME:11) (ACR:6) [CR:115] was a Greek mathematician and philosopher, smartest person ever (O), albeit characterized as the "most mysterious figure in the history of Greek philosophy", commonly known for his Pythagorean theorem.

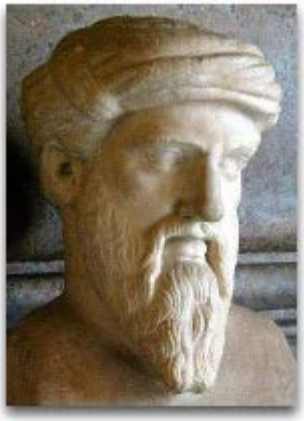

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Overview

Pythagoras, supposedly, left no writings of his own behind; what details that exist of him are reconstructed from several secondary sources.

Souls

Pythagoras, according to Xenophanes, headed an academy, school or sect—the Pythagoreans—that flourished from 532-390BC in Crotona, Italy, that adhered to the doctrine of "transmigration", that of the movement of souls, upon death, from one kind of living creature to another; one repercussion being a vegetarianism dietary system.

Pythagoras believed in the transmigration of souls and therefore, via reason of logic, was a vegetarian, and did not want to eat the body of an animal that might be the abode of a dead friend (compare: Newton in Senegal). (O)

Education

Pythagoras was taught by Thales, who "who refers everything to water" (Augustine, c.410), from whom he gained an appreciation of geometry, and his pupil Anaximander. [5] Pythagoras, supposedly, was also a student of Pherecydes (c.580-520BC), who, according to Cicero, was the inventor of the concept of the soul.

Aristotle (384-322BC), in his *Metaphysics*, makes his first mention of Pythagoras as follows: [2]

> "Among these philosophers [sc. Leucippus and Democritus] and before them, the **Pythagoreans**, as they are called, were the first do deal with mathematics and they made advances in this field; moreover, having been brought up in it, they believed the principles of mathematics to be the principles of everything there is … Since all other things seemed in their whole nature to be modeled on numbers, and numbers to be the first in all of nature, they held the elements of numbers to be the elements of everything there is."

(add)

Egypt | Heliopolis

Pythagoras, and after him Plato, both went to study in Heliopolis, the famous university town of ancient Egypt. [4]

Pythagoras, supposedly, drew upon Egyptian myths—a model according to which, based on the Heliopolis creation myth, the world came into being accruing via the steps: water (Ab/Nun) → earth (Atum/keme) → fire (Ra) → air (Shu)—that the world was created from a single resonance; his studies of the physics of sound led him to discuss the music of spheres. [1]

Pythagoras taught a cosmology, with the earth as the center of the universe, i.e. Geb-centric, in Egyptian cosmology, or geo-centric, in modern Greek language based terminology); and in terms of ethics, believed that the soul was a form of number that moved through various reincarnations toward complete purity. [5]

Atomic theory | Element theory

Empedocles (495-435 BC), supposedly, adopted Pythagoras' numerology technique in an attempt to quantify the chemistry of his four elements model; according to which, e.g., animal bone consisted of two parts water, two parts earth, and four parts fire, or that because he believed that all of his four elements were most thoroughly mixed in blood, people he conceptualized thought mainly with their blood. [3]

Plato (427-348BC), in his in his circa 360BC dialogue *Timaeus*, supposedly, following Pythagoras, introduced the atomic theory proposition that ideal geometric forms serve as atoms, according to which atoms broke down mathematically into triangles, such that the form elements had the following shape: fire (tetrahedron), air (octahedron), water (icosahedron), earth (cube). This, however, was not atomic theory proper, but rather the four element theory.

Quotes | On

The following are quotes on Pythagoras:

> "**Pythagoras** taught that the original of all things is the monad, that from the monad sprung the duad, which is the subject matter to the efficient monad: that from the monad and infinite duad were formed the numbers: from the numbers the points; from them the lines, from these figures of superficies; from the superficies the solid figures; from these the solid bodies, of which are the elements, fire, water, earth, air:—that from these, changed and converted into every shape, is formed the world, which is animated, intelligent, of a spherical shape, comprehending in its middle the earth, which also is spherical and inhabited all round."
>
> — Diogenes Laertius (230AD), *Life of Pythagoras* (Q)

Quotes | By

The following are related quotes:

> "Know, so far as is permitted thee, that nature is in all things uniform."
>
> — Pythagoras (c.500BC), from Pythagorean scriptures by Clifford [6]

References

1. Dehnert, Edmund. (1983). "The Consciousness of Music Wrought by Musical Notation", Conference on Science, Technology, and Literature, Long Island University, Brooklyn, New York, Feb; in: *Beyond the Two Cultures: Essays on Science, Technology, and Literature* (editors: Joseph Slade and Judith Lee) (§5:99-116). Iowa State University Press, 1990.
2. Furley, David. (1987). *The Greek Cosmologists: Volume 1, the Formation of the Atomic Theory and Its Earliest Critics* (§5: Pythagoras, Parmenides, and Later Cosmology, pgs. 49-60). Cambridge University Press.
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4. Sladen, Douglas. (1911). *Oriental Cairo: the City of the Arabian Nights* (§33:Heliopolis, pgs. 341-). Publisher.
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6. Plumptre, Constance E. (1888). *Natural Causation: an Essay in Four Parts* (pg. #). Unwin.

Further reading

● Crease, Robert P. (2008). *The Great Equations: Breakthroughs in Science from Pythagoras to Heisenberg*. W.W. Norton & Co.

External links

● Pythagoras – Wikipedia.

θΔics

In equations, the expression:

$$P\Delta V$$

is the called "pressure volume work", or PdV work, and is the product of the pressure *P* of the system times the change in volume ΔV in the system, in some process or reaction, and, in the views of American physical chemist Gilbert Lewis, "must always be done when a process occurs at constant pressure", whether the process be reversible or irreversible, and is described as "the work done against the constant pressure of the atmosphere" or specifically the work that the atoms and molecules of the system do against the constant pressure of the atmosphere. [1]

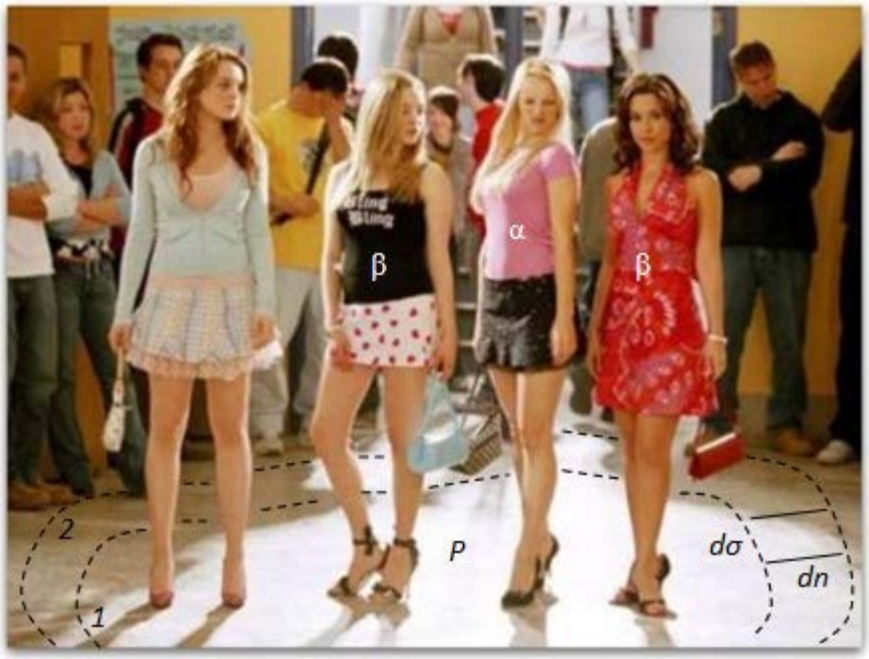

Depiction of **PdV work**: scene from the 2004 film *Mean Girls*, depicting the volume change ΔV, at constant atmospheric pressure P, around the A-list girl clique (the alpha female, second to left), as they move through the hallway and chemically react with the other students. [2]

$$W = P\int_{n_1}^{n_2} d\sigma dn$$

History

The 1652 invention and public demonstrations of the Guericke engine, by German engineer Otto Guericke, was the first visualization of the power of pressure volume work or rather the ability of a small volume increase (or decrease) to be equivalent to the power or strength of 30+ men, and the later realization that to increase volume requires that one lift, in effect, 62-miles of atmosphere, upward or outward to make space for the new volume.

The 1678 gunpowder engine built by Dutch mathematical physicist Christiaan Huygens showed that combustion produced "vacuum change" owing to the change in volume of the oxygen and hydrocarbon reactants transforming into water and carbon dioxide products, which was thus associated with pressure-volume work; although this was not stated mathematically.

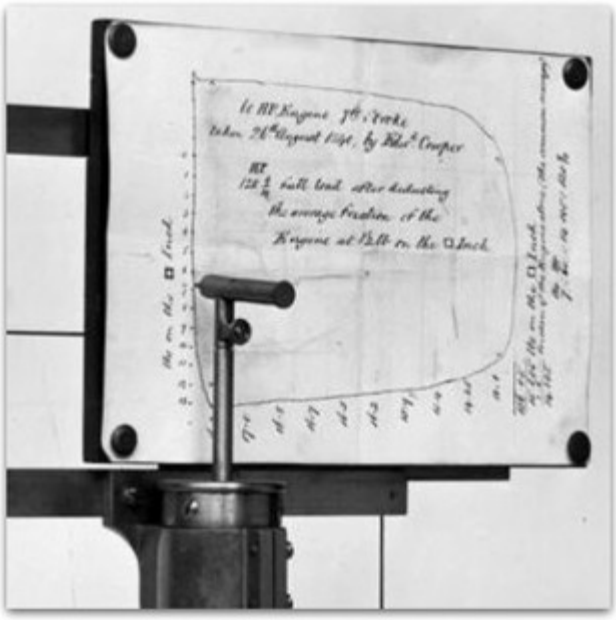

Diagram of the **indicator** (vertical part), which gives a reading of pressure, invented by James Watt and Matthew Boulton in 1790, and the sliding board (horizontal part) and pencil tracer (attached to the indicator), invented by John

The 1796 indicator and indicator diagram, depicted adjacent, invented by Scottish engineer James Watt and his employee John Southern, provided the first PdV diagrams of pressure-volume work in a quantifiable graphical way.

Human reactions

In human thermodynamics, each human molecule carries with it a certain amount of personal space, which varies from person to person. One significant factor in this variation is physical attractiveness; another is height. It has been found through measurement that the more attractive a person is the more personal space or rather "volume" he or she carries around with them. In the words of attractiveness researcher Nancy Etcoff: [3]

"Very attractive people of any size are given bigger personal space and territory; which they carry around with them."

Hence, when any given person enters a room or area of humans a

Southern in 1796, which makes an 'indicator diagram', the pressure-volume graph (drawn on the sheet).

volume change will accrue, which will correlated energetically to to a measurable amount of PΔV work.

See also

â— Rise and fall of civilization
â— Papin engine

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θΔics

In symbols, **Q**, or q, in thermodynamics, is the symbol for heat, or specifically "quantity of heat" (Lavoisier, 1783), in the sense of "quantity", from the Latin *quantus* 'how much'. [1]

Overview

In early 1750s, Joseph Black had discovered the concepts of latent heat, i.e. that when a body makes a phase change, e.g. solid to liquid, a large amount heat is going into or out of the body, yet as discerned by the thermometer there is no detection of this heat flow, because temperature reads constant for the entire process, and specific heat, i.e. that each type of body has a unique or "specific" ability or "capacity" to hold or contain heat, e.g. wood as compared to iron. The method he used to measure the heat capacity (specific heat) of bodies is what is now called the law of mixtures:

> "Law of mixtures: two bodies of equal mass but different temperature are mixed together; their heat capacities vary inversely as the changes each undergoes on reaching the final temperature of the mixture."
>
> — Henry Guerlac (1982), "Introduction" to Lavoisier and Laplace's 1783 *Memoir on Heat* (pg. xiv)

In 1766, Black, at the University of Edinburgh (Ñº), as chair of chemistry and medicine, gave a series of overly-popular lectures, wherein he outlined his theories of "quantity of heat", as opposed to older model of "intensities of heat" (thermometry); the following is one example:

> "If, for example, we have one pound of water in one vessel, and two pounds in another, and these two quantities of water are equally hot, as examined by the thermometer, it is evident, that the two pounds must contain twice the **'quantity of heat'** that is contained in one pound. But, undoubtedly, we can suppose that a cubical inch of iron may contain more heat than a cubical inch of wood, heated to the same degree; and we cannot avoid being convinced of this by daily experience."
>
> — Joseph Black (c.1766), *Lectures on Chemistry* (pg. 75) [4]

Black's lectures were eventually published by his students and his experiments and "quantity of heat" theories were carried out more by his student William Irving; Irving's work, in turn, influenced Adair Crawford, as evidenced in his *Experiments and Observations on Animal Heat* (1779), which had a "profound influence" (Guerlac, 1982) on Antoine Lavoisier and Joseph Laplace.

In 1783, Lavoisier and Laplace, in the opening pages of their "Memoir on Heat", went to derivation, wherein using a "law of mixing" argument, they defined a unit of heat, that can pass form a hot body of water to a cold body of mercury, thereby bringing about a new temperature at equilibrium, as follows:

> "Let **'q'** be the **heat** necessary to raise the temperature of one pound of a substance by one degree on a mercury thermometer."
>
> — Antoine Lavoisier (1783), "Memoir on Heat" (co-author: Joseph Laplace) (pg. 7)

In 1834, Emile Clapeyron, in his "Memoir on the Motive Power of Heat", adopted this use of q for heat. [3]

In 1850, Rudolf Clausius, building on Clausius used capital Q for the unit of heat; hence, its modern use in thermodynamics.

Note

Related to "quantity of heat", is that of "intensity of heat" or "degree of heat" which is a distinct concept known as

temperature, symbol T. [2]

Quotes

The following are related quotes:

> "Law of mixtures. The science of the measurement of **quantities of heat** is called 'calorimetry', and the piece of apparatus used for the purpose is called 'calorimeter'."
>
> — Robert Houstoun (1928), *Intermediate Heat* (pg. 37)

> "Black's great achievements were to set up the fundamental concept of **'quantity of heat'** and, by considering its implications, infer the correlative concepts of 'heat capacity' and 'latent heat'. Having done all this by about 1760, and having also seen the importance of the two latter concepts in the processes of nature, Black did nothing further; he did not even publish his discoveries."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 40) [2]

> "Carnot himself did not use a symbol for the quantity of heat [correctly he used small "s" for heat] in his original memoir of 1824, which was largely verbal rather than mathematical in character, and Clapeyron most likely selected the letter **Q** to emphasize that he was dealing with the ***quantity* of heat** rather than with its intensity or temperature, for which he used an uppercase T. Building on the work of Clapeyron, in the 1850s and 1860s, Clausius not only continued to use Q to symbolize heat in his various memoirs on the theory of heat, he also employed an upper-case W to represent mechanical work."
>
> — William Jensen (2010), "Why are q and Q used to Symbolize Heat?" [2]

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θΔics

In thermodynamics, **quality** is term employed occasionally to describe the relation between the first law and second law in regards to how energy can exist in different forms: "high-grade quality" forms, namly that which can be transformed into mechanical work or electrical work, or "low-grade quality" forms, an example being heat; whereby, in this classification view, the second law or entropy increase is described as a decrease in “quality” of the total energy stored in a given system. [1]

Etymology

The “quality” description of energy seems to have entered the field predominately with the publication of Leon Brillouin’s 1949 article “Life, Thermodynamics, and Cybernetics” wherein he defines "quality" to a significant degree and uses it in argument. [1]

In 1992, English physical chemist Peter Atkins, in his *Creation Revisited*, employs the “quality” view of energy mixed in with a "energy dispersal" view of the second law; a term which he says he borrowed from Freeman Dyson in his 1971 article “Energy in the Universe”, who supposedly introduces an “order of merit” for various forms of energy, with gravitational energy heading the list in possession of the highest quality, and cosmic microwave radiation at the bottom, with the lowest quality (in the sense that it corresponds to the ultimate heat sink, in the sense that there is no way in which this variety of energy can be further degraded). [2] Atkins defines “localized energy as energy with potency to be harnessed to do work, and therefore in some sense having ‘high quality’. In employing this term to outline his theory of existence, he states: [3]

> “Everything is driven by decay. Everything is driven by motiveless, purposeless decay. By [the term] ‘**quality**’, [we mean] the extent of its dispersal. High quality, useful energy is localized energy. Low quality, wasted energy, is chaotically diffuse energy. Things can get done when energy is localized; but energy loses its potency to motivate change when it has become dispersed. The degradation of quality is chaotic dispersal. Such dispersal is ultimately natural, motiveless, and purposeless. It occurs naturally and spontaneously, and when it occurs it causes change. When it is precipitate it destroys. When it is geared through chains of events it can produce civilizations.”

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θΔics

In science, **quantity**, from the Latin *quantus* "how much", refers to the measurement of something, in relation to that which can be expressed numerically in units. [1]

Quantifiable

The three step process for a subject becoming a "science", according to the William Jenson categorization scheme (see: etymology), is for the "theoretical" stage to transform into the "quantification" stage, which then transforms into the "modern" stage, which in the case of transformation of thermochemistry (1783) to science of modern chemical thermodynamics (1923) took about 140-years. [5]

p = pressure per unit area.
τ = temperature on the absolute thermodynamic scale.
v = volume of the unit quantity of the substance.
s = entropy, defined by the integral, $\int dQ/\tau$.
Q = heat absorbed, measured in the mechanical units appropriate to p and v. A physical meaning can be given only to dQ, the heat absorbed during a given change.
W = work done by the substance, in the appropriate mechanical units. Here again, only dW has a physical meaning.
E = the internal energy of the substance in mechanical units. E may be changed by an additive constant without changing its physical meaning. E is one of the thermodynamic potential functions.
$H = E + pv$, the "total heat," also one of the potential functions.
$Z = E + pv - \tau s$, the Gibbs thermodynamic potential.
$\Psi = E - \tau s$, also a thermodynamic potential, the "free energy" of Helmholtz.

The ten **"fundamental quantities"** of thermodynamics, according to the 1914 views of American physicist Percy Bridgman. [3]

Nonquantifiable

See main: Proxmire affair

In 1975, American politician William Proxmire, after hearing of the $84K NSF grant awarded to American psychologists Ellen Berscheid and Elaine Walster to study on romantic love, dubbed love a non-quantifiable subject matter, as follows: [6]

> "No one can argue that falling in love is a science. The impact of love is a very subjective, **nonquantifiable** subject matter. Love is simply a mystery."

In 1969, Walster and Berscheid, in their *Interpersonal Attraction*, reflected on this: [7]

> "It is odd that the notion that attraction, particularly such intense forms as romantic love, are simply 'non-quantifiable' has lingered to the present day. It seems especially strange when we consider that each of us, every day and in a variety of ways, manages to **quantify** our attraction to others and measure their attraction to us."

(add)

Five principle quantities

The five "principle quantities" in thermodynamics, according to the 1878 views of Scottish physicist James Maxwell, are the energy *U*, entropy *S*, volume *V*, temperature *T*, and pressure *P* of a body. [2] Quantities can be either "intensive", defined uniquely per point in space, or "extensive", proportional to the dimension of the system.

Ten fundamental quantities

The ten "fundamental quantities" in thermodynamics, according to the 1914 views of American physicist

Percy Bridgman, are pressure p, temperature τ, volume v, entropy s, heat Q, work W, internal energy E, total heat H (enthalpy), Gibbs potential Z (Gibbs free energy), and Helmholtz potential ψ (Helmholtz free energy), as shown adjacent.

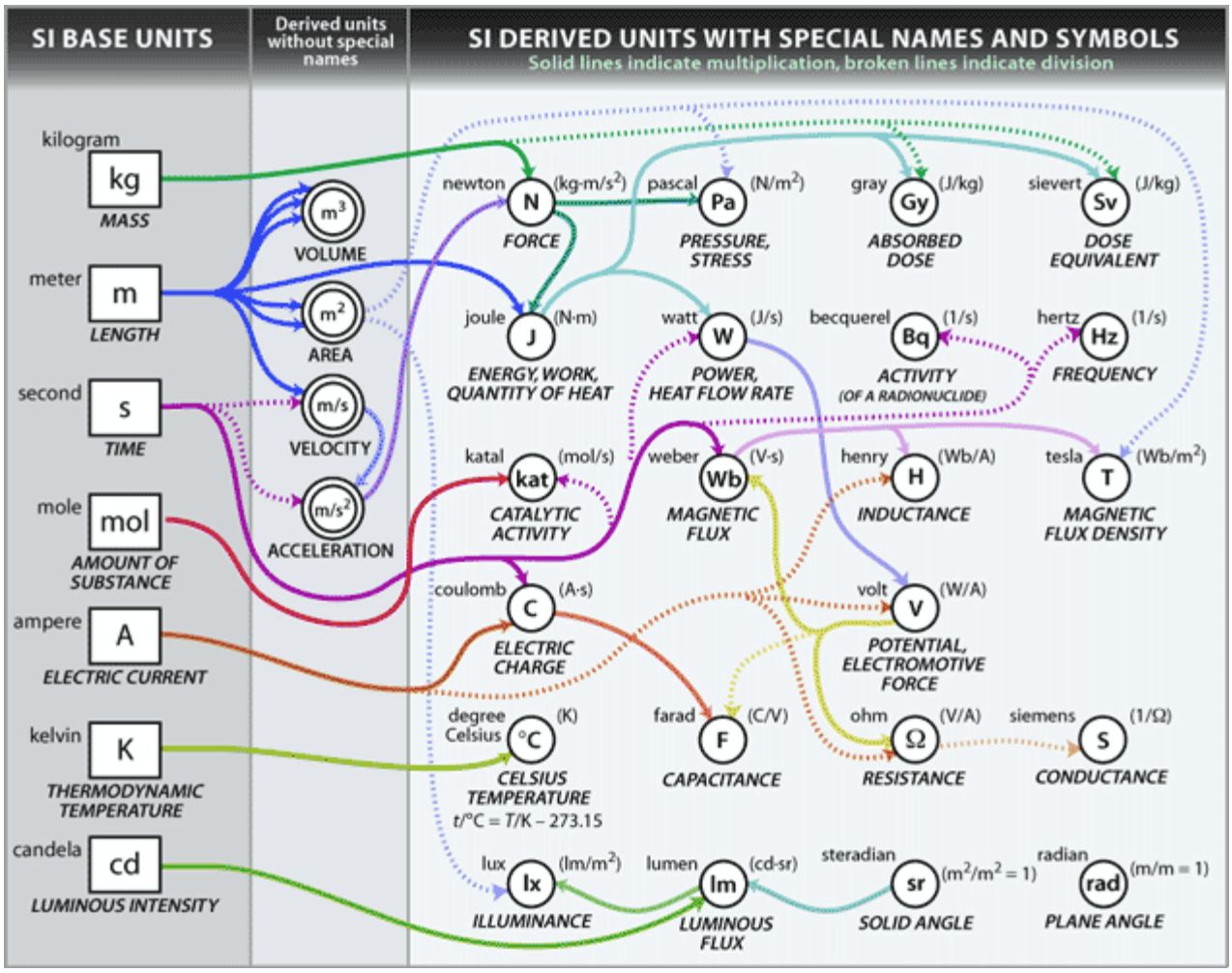

The 7 base units and 26 derived units of the **quantities** of the SI unit system. [4]

Units | Base and derived

All thermodynamic quantities are measured in "units" of which there are 7 base units and 26 derived units (shown adjacent). [4] Historically, in 1960, in aims to unify scientific calculations throughout the world, French scientists developed the International System (SI) of units, using the three basic metric (meter-based) units of mass (kg), length (m), time (s), in addition to the four newer units temperature (K), mole (mol), current (A), and light intensity (cd). The first five SI units (kg, m, s, K, mol) are fairly simple units, whereas the latter two, i.e. current (A), measured in force per distance, and light (cd), being the measure of photon emission from a typical candle, are somewhat more complicated to understand.

One of the more conceptually difficult derived units to understand is the unit interrelationship involved in the measurement of the mechanical equivalent of heat (J), which involves two derived SI units, work and heat, and one base SI unit, temperature.

Quotes

The following are related quotes:

> "Elegant intellects which despise the theory of **quantity** are but half developed."
>
> — Alfred Whitehead (c.1910), cited by Alfred Lotka in *Elements of Physical Biology* (pg. 100)

See also

â— Characteristic function notation table
â— SI unit genius

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θΔics

In chemistry, **quantum chemistry** is the study of the application of quantum mechanics in chemistry.

History

The scientists who established the field of quantum chemistry, beginning generally in the 1920s, include: Walter Heitler and Fritz London, Linus Pauling, and Robert Mulliken, to later figures including Charles Coulson, Raymond Daudel, and Per-Olov Löwdin. The term "quantum chemistry" was first used by Austrian physicist Erich Haas in his 1929 book *Die Grundlagen der Quantenchemie* (*The Foundations of Quantum Chemistry*). [1]

See also

- Human quantum chemistry

References

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External links

- Quantum chemistry – Wikipedia.

θΔics

In quantum mechanics, **quantum entanglement**, EPR effect or nonlocality, is the view that quantum entities, typically photons, that have interacted with each other, at an initial time, remain mutually entangled, however far they may eventually separate spatially. [1]

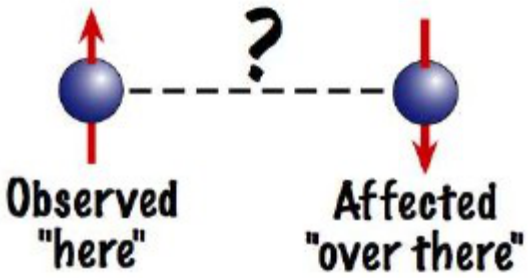

An artistic rendition of **quantum entanglement**.

Overview

The premise of entanglement arose in a 1935 thought experiment of Albert Einstein, Boris Podolsky, and Nathen Rosen to demonstrate, as they thought, a logical impossibility of quantum mechanics, hence the acronym EPR effect, experiment, or paradox, as it is sometimes called. [3]

Experimental testing on the entanglement hypothesis was first conducted by Irish physicist John Bell working at CERN, in Geneva in the mid 1960s.

The premise of entanglement is the, what seems to be, measured phenomenon that if two systems, or particles, A and B, are permitted to interact, and then separated by some great distance in space, a change in one particle or system, is said to be instantaneously detectable in the other, to the effect that the particles seem to remain entangled or 'aware' of each other, so to speak, to some extent or another. [2]

In the 1980s, a group working in Paris induced an atom to emit two photons simultaneously in opposite directions, and found that measurement of one photon on one side of the lab affected the other photon on the opposite side of the lab, instantaneously. The argument is that because the two photons originated from the same source, they are correlated with one another, and thus remain 'entangled' even when far apart.

In the 1990s, researchers in Geneva sent two originally entangled photons separately down 6.2 miles of fiber optic cables, finding that the two photons acted like one particle even when more than six miles apart.

Animate applications

The work of English researcher Rupert Sheldrake, and his theory of the morphogenetic field, gives the most comprehensive summary of work done on the idea or concept of entanglement as applied to animals and humans, to the effect that animals can sense eminent danger, that spouses (one pair of a dihumanide molecule) can sense when they are being cheated on, even when separated on opposite sides of the globe, or that twins can sense when their counterpart has been in an accident, among other studied phenomenon. [4]

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See also

- Double-slit experiment
- Homework problems

Further reading

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External links

- Quantum entanglement – Wikipedia.
- EPR paradox – Wikipedia.

θΔics

In terminology, **quantum flapdoodle** is objectionable nonsense, generally of the ontic opening variety, argued or reasoned in the name of quantum mechanics.

A comic book image (O) of **quantum flapdoodle**, i.e. a woman, enraptured some new age book, e.g. Fred Wolf, who tells her new potential mate, that he can't be sure he is the one for her, because they are reacting in a quantum world, governed by the uncertainty principle.

Overview

In 1994, Murray Gell-Mann, in his chapter "Quantum Mechanics and Flapdoodle", opens to the following: [1]

> "While many questions about quantum mechanics are still not fully resolved, there is no point in introducing needless mystification where in fact no problem exists. Yet a great deal of recent writing about quantum mechanics has done just that. Because quantum mechanics predicts only probabilities, it has gained a reputation in some circles of permitting just about anything. **Is it true that in quantum mechanics anything goes**? That depends on whether events of very, very low probability are included. I remember as an undergraduate being assigned the problem of calculating the probability that some heavy macroscopic object would, during a certain time interval, jump a foot into the air as a result of a quantum fluctuation. The answer was around one divided by the number written as one followed by sixty-two zeroes. The point of the problem was to teach us that there is no practical difference between that kind of probability and zero. Anything that improbable is effectively impossible."

Gell-Mann then goes on to discuss John Bell and his so-called photon "awareness" experiments, and how this led to quantum-based ideas on paranormal phenomena and precognition. In the years to follow, this chapter led many to begin to refer to new age people, such as Deepak Chopra, who use quantum mechanics to argue for nonsense, be but quantum flapdoodle promoters.

Quotes | On

The following are quotes on quantum flapdoodle:

> "From this fact, some philosophers and scientists argue that perhaps these random and indeterministic atomic events associated with quantum mechanics might trigger the random firing of neurons in the brain, leading to indeterminant mental states. Perhaps, they suggest, this is where free will arises. This argument was critiqued by one of the leading quantum physicists, Nobel laureate Murray Gell-Mann, who derisively called it **quantum flapdoodle**. Quantum effects cancel each other out at the macro level in which everyday events (like human thought) occur. Is it really possible—we might ask rhetorically in an analogy with the uncertainty principle—that the orbit of Mars, like the orbit of an electron, is scattered randomly about the sun until someone observes it, at which point the wave function collapses and the planet appears in one spot? Obviously not, any more than we might think that the moon ceases to exist until it is observed (someone once actually proposed that the moon does not exist until observed). Quantum effects wash out at large scales."
>
> — Michael Shermer (2004), *The Science of Good and Evil* [1]

> "Murray Gell-Mann coined the term '**quantum flapdoodle**' to describe abuses of quantum mechanics to support extraordinary claims."

— Julien Musolino (2015), *The Soul Fallacy* [3]

References

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2. Shermer, Michael. (2004). *The Science of Good and Evil: Why People Cheat, Gossip, Care, Share, and Follow the Golden Rule* (pgs. 122-23). Publisher.
3. Musolino, Julien. (2015). *The Soul Fallacy: What Science Shows We Gain from Letting Go of Our Soul Beliefs* (foreword: Victor Stenger) (pg. 124). Prometheus.

θΔics

In science, **quantum mechanics** is the study of the mechanics of processes and states of systems or bodies from the perspective that matter and energy can be divided into discrete quantifiable units called energy elements or light quanta.

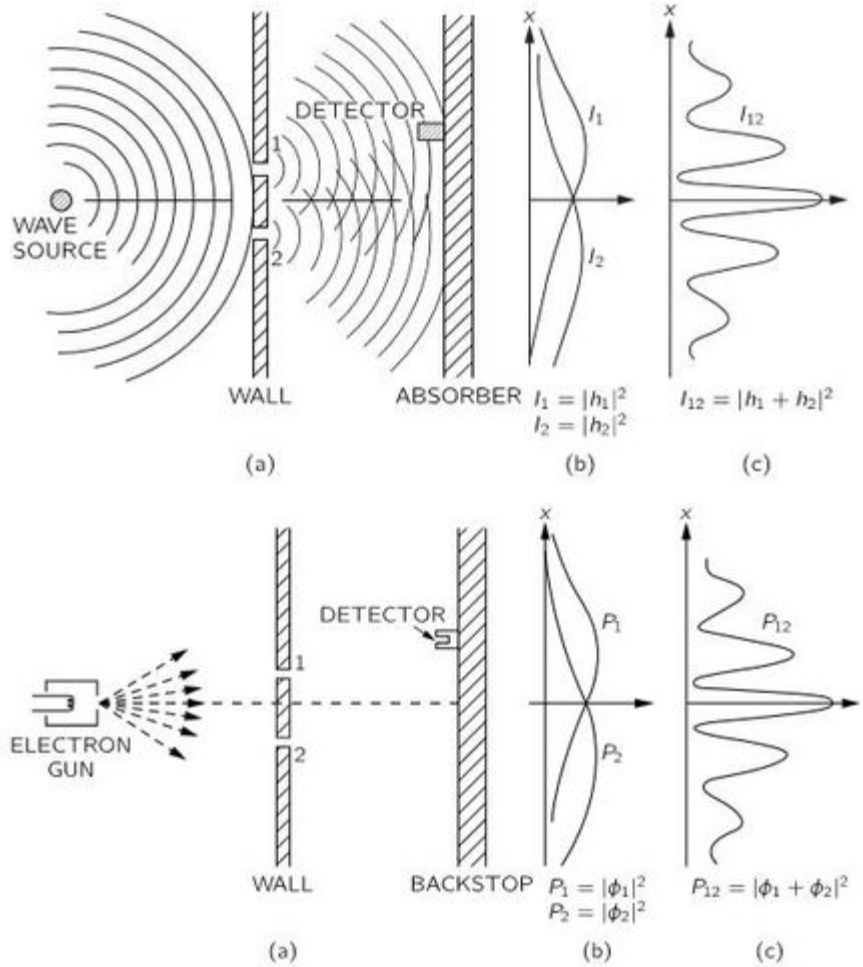

The double-slit experiment, according to Richard Feynman (O), is at the heart of central mystery of **quantum mechanics**.

Overview

The rise of quantum mechanics is summarized well by American physical economist Philip Mirowski, who states that following Max Planck's 1901 quantum hypothesis: [1]

> "The quanta then began to show up in other important physical theories: the photon theory of light-quanta (1905); the Bohr model of the atom (1913); the structure of spectroscopy (1916); and then, in 1925/26 the full-fledged **quantum mechanics** of Heisenberg and Schrodinger."

(add discussion)

History

In 1901, Max Planck introduced the energy element conception, modeled on the earlier 1870s entropy models of Ludwig Boltzmann, albeit discussed in the context of black bodies.

In 1905, Albert Einstein expanded on the work of Planck to argue that light, or electromagnetic energy, can be divided into discrete quantifiable units called "light quanta", or "photons" as they came to be called in 1926 by Gilbert Lewis, an argument situated in the context of radiation thermodynamics.

The "quantum mechanics" model was further justified in the years to follow in the logic of the principle of elementary disorder viewed in the context of the third law of thermodynamics or heat theorem as devised in 1907 by Walther Nernst in regards to states of systems at absolute zero.

Into the 1930s, following the formulation of the Schrodinger equation, this change in thinking in physics came to be known as the "quantum revolution", in the corpus of the various scientific revolutions.

Quotes

The following are related quotes:

> "**Quantum mechanics** is certainly imposing. But an inner voice tells me that it is not yet the real thing. The theory says a lot, but does not really bring us any closer to the secret of the "old one." I, at any rate, am convinced that *He* does not throw dice."
>
> — Albert Einstein (1926), "Letter to Max Born", Dec 4

> "Renormalization is but sweeping the infinities under the rug."

— Paul Dirac (c.1930)

“Quantum theory reminds me a little of the system of delusions of an exceedingly intelligent paranoiac, concocted of incoherent elements of thoughts.”

— Albert Einstein (1952), “Letter to D. Lipkin”, Jul 5

“The double slit experiment is at the heart of quantum mechanics and in reality it contains the only mystery about which we cannot explain how it works.”

— Richard Feynman (1961), “Quantum Behavior”, Feynman Lectures, Ch. 37, Vol 1

“There was a time when the newspapers said that only twelve men understood the theory of relativity. I do not believe that there ever was such a time. There might have been a time when only one man did, because he was the only guy who caught on, before he wrote his paper. But after people read the paper a lot of people understood the theory of relativity in some way or other, certainly more than twelve. On the other hand I think I can safely say that nobody understands quantum mechanics. Do not keep saying to yourself, ‘But how can it be like that?’, because you will get ‘down the drain’, into a blind alley from which nobody has yet escaped.”

— Richard Feynman (1965), *The Character of Physical Law* (pg. 129)

“Quantum electrodynamics is simply a way to sweep the difficulties under the rug.”

— Richard Feynman (1965), Nobel Prize speech

“It seems clear that the present quantum mechanics is not in its final form. Some further changes will be needed, just about as drastic as the changes made in passing from Bohr's orbit theory to quantum mechanics. Some day a new quantum mechanics, a relativistic one, will be discovered, in which we will not have these infinities occurring at all. It might very well be that the new quantum mechanics will have determinism in the way that Einstein wanted.”

— Paul Dirac (1979)

“Modern physics is governed by that magnificent and thoroughly confusing discipline called quantum mechanics that has survived all tests, is believed to be flawless, but one that nobody understands.”

— Murray Gell-Mann (1990), “Some Truer Method: Reflections on the Heritage of newton (pg. 51)

“The authors of physics textbooks are usually compelled to redo the work of the magicians so that they seem like sages; otherwise no reader would understand the physics. Planck was a magician in inventing his 1900 theory of heat radiation, and Einstein was playing the part of a magician when he proposed the idea of the photon in 1905. It is usually not difficult to understand the papers of the sage-physicists, but papers of magician-physicists are often incomprehensible. In this sense, Heisenberg’s 1925 paper was pure magic.”

— Steven Weinberg (1992), *Dreams of a Final Theory* (pg. 68)

“Probably the best way to agitate a group of jaded but philosophically inclined physicists is to buy them a

bottle of wine and mention interpretations of quantum mechanics. It is like opening a Pandora's box. I have been amused to discover that the number of viewpoints often exceeds the number of participants."

— Artur Ekert (1995) "Pet Theories of Quantum Mechanics"

"It is daydreaming. What counts is what you see on the screen. Do not ask if the particle did follow some continuous path. We do not know about that. Forget about it.?"

— Martinus Veltman (2003), *Facts and Mysteries in Elementary Particle Physics* (pg. 90)

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Further reading

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Videos

● Turok, Neil. (2012). "The Origin of Quantum Mechanics" (V) , MinutePhysics, Oct 14.

See also

● Human quantum mechanics

External links

● Quantum mechanics – Wikipedia.

θΔics

In scientific revolutions, the **quantum revolution** (1884-1925) is refers to the establishment of the new science of quantum mechanics, which started with Ludwig Boltzmann's 1884 thermodynamic analysis of cavity radiation ending, essentially, with Erwin Schrodinger's 1926 quantum mechanical Lagrangian formulation of movement of the nuclei and electrons of an atom, a formulation later to be called the Schrodinger equation. The following 2007 quote by German physicist Ingo Muller captures the essence of the quantum revolution: [1]

> "The ultraviolet catastrophe of cavity radiation heralded the fall of classical physics which amounted to a **scientific revolution**. It started in 1900 with Planck's paper 'On the Law of Energy Distribution in the Normal Spectrum'."

(add discussion)

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θΔics

In thermodynamics, **quantum thermodynamics** is the quantum mechanical study, such as is embodied in the logic of the Schrödinger equation (1926), of the energy and entropy of systems in relation to irreversibility. [1] In large part, the subject is still in a rather nascent topic. [2]

History

In 1900, German physicist Max Planck theorized that the internal energy *U* of a black body (resonator) could be divided into a discrete number of "energy elements" ε by the expression:

$$U = \varepsilon P$$

where *P* is large integer. [1] This supposition later led German-born American physicist Albert Einstein, in 1905, to propose that light itself was composed of quantums of energy, i.e. light quantums. These light quantums later came to be called "photons", a term introduced in 1926 by American physical chemist Gilbert Lewis. In 1927, American chemical engineer John von Neumann published *Thermodynamics of Quantum Mechanical Assemblies*, in which he extended Ludwig Boltzmann's notion of entropy to quantum systems. American thermodynamicist László Tisza, of the MIT school of thermodynamics, seems to have been the first to define the term "quantum thermodynamics" to a significant degree, in his 1963 article "The Conceptual Structure of Physics", who stated:

> "We shall occasionally refer to these theories [mechanics, thermodynamics, and quantum mechanics] by the generic name ***quantum thermodynamics***."

Tisza's associate Italian thermodynamicist Gian Beretta, also from the MIT school, seems to have picked up this subject with the launching of the 2005 QuantumThermodynamics.org website. Beretta defines quantum thermodynamics as the unified theory of mechanics and thermodynamics that explains the microscopic foundations of entropy and irreversibility that drive all natural physical phenomena, which he states is a subject developed by George Hatsopoulous, Elias Gyftopoulous, James Park, and himself. [3]

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● Armel, Jack. (1996). *Entropic Spacetime Theory*. World Scientific.
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External links

● Quantum thermodynamics – Wikipedia.

θΔics

In human chemistry, **queer chemistry**, or “LGBT (GLBT) chemistry”, gay chemistry, or homosexual chemistry, is the study of chemical interactions, neurochemical changes, human chemical reactions, and human chemical bonding dynamics between gay, lesbian, bisexual, transgender, questioning, pansexual, bicurious, or asexual, etc., individuals being viewed as human molecules. [1]

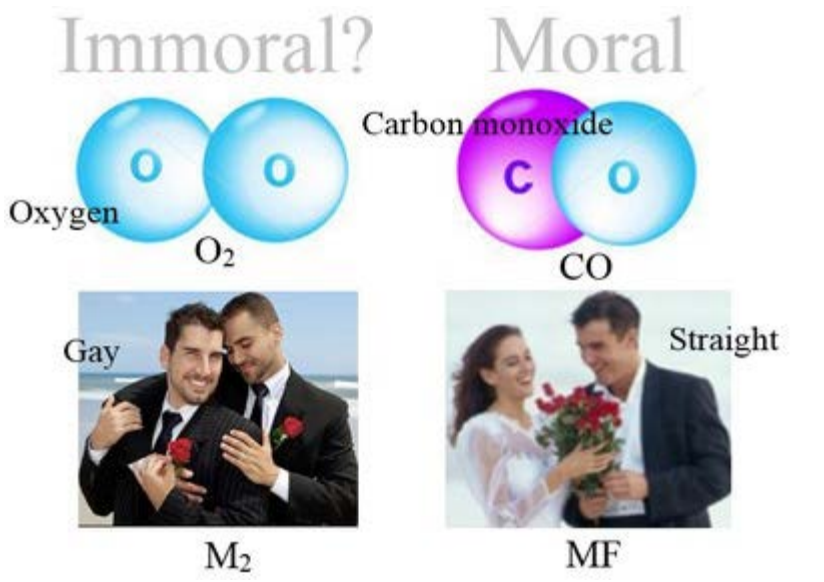

A visual of straight chemistry vs **queer chemistry** reduced to the level of atoms, wherein the logic of what is moral and immoral becomes confused, more often than not by religious fundamentalists.

Overview

Statistically, approximately 3-4 percent of world’s population is of the homosexual or queer persuasion. [2]

In commentary on the nature of algorithmic matchings of same sex relationships, ScientificMatch.com founder Eric Holzle comments: [3]

> “Chemical attraction is just as prevalent whether you’re gay or straight.”

The adjacent video is a humorous take "sexual chemistry", the title of the the video, between men using innuendo with chemistry metaphors. In particular, in commentary the individuals in the video, between 1:45-2:15, comment on the paradoxical difference between gravitational “attraction” and “attraction” between people, which they decide is a type of biochemical force or attraction, as in biogravity. The clip highlights the lack of understanding, in general science, of the nature of gravity in relation to human bonding.

Queer or homosexual chemistry is, in general, a nascent field of research. It is generally agreed, however, that the chemistry involved in qay relationships will differ than as compared to typical homosexual relationships. In a typical gay relationship, such as, for instance, in the human chemical bonding of two homosexual men:

$$M_1 + M_2 \rightarrow M_1 \equiv M_2$$

the neurochemical and hormonal changes will, invariably, be different than as compared to straight heterosexual bondings A≡B. As such, it is likely that factors, such as energy and entropy changes, will be different to describe, thermodynamically, than as compared to straight dynamics. Homosexual relationships, for instance, tend to be shorter-lived than homosexual relationships, hence reaction rates and chemical bonding dynamics will differ.

In his circa 2000 article “The Physics of Relationships”, American astrophysicist Christopher Hirata speculated on what type of molecular formulas would characterize the non-standard types of human sexual relationships. He notes that in his calculations he is neglecting “rare and non-traditional” products or compounds (human molecules) that may form such as “the gay molecule Y_2", characterized the reaction:

$$Y + Y \leftrightarrow Y_2$$

where he uses the symbol Y to represent a male human molecule, or "the lesbian molecule X_2, and the middle-Eastern polygamous molecule X_4Y.” [6]
In 2014, Libb Thims, during the two-month Beg-Thims dialogue (comment #26), probed Mirza Beg, with heated issue

of homosexuality as physicochemical sociology sees things as compared to how the Quran sees things. The response was fumbled, to say the least.

Gay matching

A popular, albeit superficial, example of discussions on the current understanding on "gay chemistry" is the famous 2007 "Nope, Still Gay" ad campaign, by the dating/matching site Chemistry.com, who supposedly "chemically" matches gay individuals via the algorithms of American biological anthropologist Helen Fisher, who question why eHarmony.com rejects gays and lesbians. [4] In commentary on this, eHarmony founder Neil Warren stated that not enough research has been done on gay relationships to warrant the construction of a gay matching algorithm. In particular, Warren says "it calls for some very careful thinking [and] very careful research." [5]

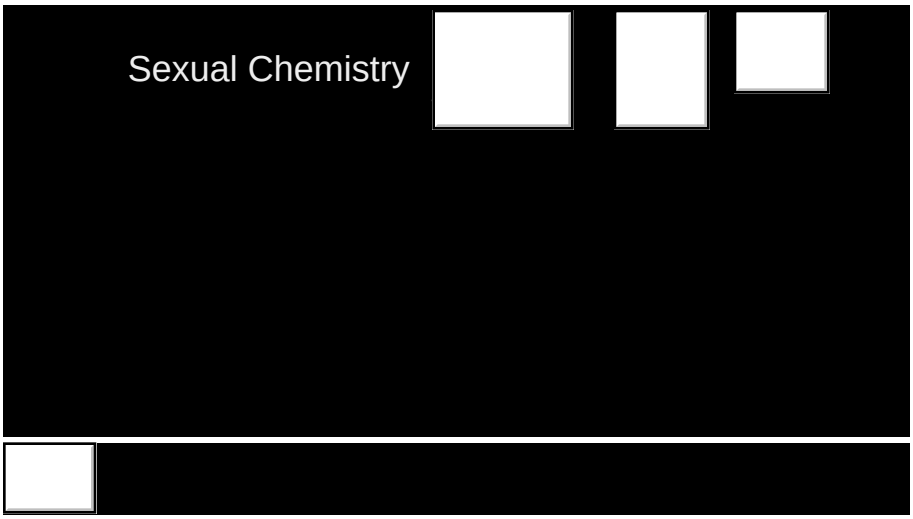

A video of of "queer chemistry" themed subject matter.

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θΔics

In famous publications, **Query 31** is the final query or "quest" appended to the third book of the 1718 edition of English physicist Isaac Newton's 1704 *Opticks*, the main point of which is as follows:

> "Is it not for want of an attractive virtue between the parts of water ( ) and oil, of quick-silver ( )(Hg) and antimony ( ) (Sb), of lead ( )(Pb) and iron (♂)(Fe), that these substances do not mix; and by a weak attraction, that quick-silver ( ) (Hg) and copper (♀)(Cu) mix difficultly; and from a strong one, that quicksilver ( )(Hg) and tin ( )(Sn), antimony ( ) (Sb) and iron (♂)(Fe), water ( ) and salts, mix readily?"
>
> — Isaac Newton (1718), "**Query 31**" of *Optics*

wherein, a preliminary verbal outline of the laws of chemical attraction and dissociation were outlined, thus acting to launch affinity chemistry, through the construction of Geoffroy's affinity table, made by French chemist French chemist Étienne Geoffroy during a translation into French of the 1718 edition of Newton's *Opticks*, and thereafter, it is said, the chemical revolution. [1]

Overview

In 1686, Isaac Newton, in the preface to his *Principia*, commented:

> "I wish we could derive the rest of the phenomena of nature by the same kind of reasoning from mechanical principles; for I am induced by many reasons to suspect that they may all depend upon certain forces by which the particles of bodies, by some causes hitherto unknown, are either mutually impelled towards each other, and cohere in regular figures, or are repelled and recede from each other."

This paragraph can be seen as the draft-outline to Query 31. This can be compared to the opening paragraph of the Query shown adjacent. To corroborate, Newtonian biographer Richard Westfall specifically states that Query 31 was drafted in various parts of the *Principia*: [11]

> "Newton had composed an early draft of what later became familiar as **Query 31** of the *Opticks*, in the papers composed with the *Principia* (1686-87)."

The logic expressed here is that Query 31, Newton's final lifetime query into the puzzles of nature, are the product of his final thoughts on his earlier 1686 mentions of how chemical phenomena may depend on the attractions and repulsions of "certain forces by which the particles of bodies either cohere in regular forms or are repelled and recede from each other."

Queſt. 31. Have not the ſmall Particles of Bodies certain Powers, Virtues, or Forces, by which they act at a diſtance, not only upon the Rays of Light for reflecting, refracting, and inflecting them, but alſo upon one another for producing a great Part of the Phænomena of Nature? For it's well known, that Bodies act one upon another by the Attractions of Gravity, Magnetiſm, and Electricity; and theſe Inſtances ſhew the Tenor and Courſe of Nature, and make it not improbable but that there may be more attractive Powers than theſe. For Nature is very conſonant and conformable to her ſelf. How theſe Attractions may be perform'd, I do not here conſider. What I call Attraction may be perform'd by impulſe, or by ſome other means unknown to me. I uſe that Word here to ſignify only in general any Force by which Bodies tend towards one another, whatſoever be the Cauſe. For we muſt learn from the Phænomena of Nature what Bodies attract one another, and what are the Laws and Properties of the Attraction, before we enquire the Cauſe by which the Attraction is perform'd. The Attractions of Gravity, Magnetiſm, and Electricity, reach to very ſenſible diſtances, and ſo have been obſerved by vulgar Eyes, and there may be others which reach to ſo ſmall diſtances as hitherto eſcape Obſervation; and perhaps electrical Attraction may reach to ſuch ſmall diſtances, even without being excited by Friction.

Opening paragraph to **Query 31** of Book III of the 1730 edition of Newton's *Opticks*. [12]

In 1692, Newton, according to Spanish chemist and journalist Xavier Duran, wrote Query 31 in draft notes: [13]

> "Newton, who had already come up with an explanation for the attraction of bodies, went on to propose that the laws of gravitational attraction and of magnetism and electricity could be extended to the union and separation of substance and gave examples of the reactions between alkalis and acids. In the only article he published on chemistry—written in 1692 but published in 1710—and issues 31 and 32 of Optics, he proposed the existence of a very powerful force between the particles of substances, which varied from one species to another. He even put forward a short list of six metals ordered by priority on replacing one another when dissolved in nitric acid."

Query 31, to note, is also said to contain the most detailed description of Newton's 'shell theory', his description of the relation of gravity to chemical affinity in the outward layers of the earth. [10]

In historical summary of Newton's *Opticks*, American mathematician Kevin Brown notes that the *Opticks*, itself, was published the year following English physicist Robert Hooke's reaction end (1703), a layover of the thirty-year debate with Hooke, the head of the Royal society, who had criticized Newton's writings on optics when they were first communicated to the Society in the early 1670's. [6]

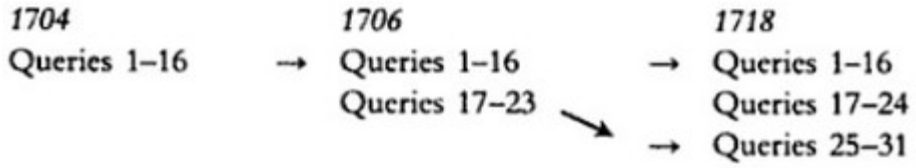

The timeline of the growth of the **Queries**. The first edition of the *Opticks* (1704) contained sixteen queries. A further seven were added to the first Latin edition of 1706. Eight more were added to the second English edition of 1717. The numbering of the queries change in the 1717 edition; which makes their identification somewhat confusing. The arrangement of the queries is summarized in the above diagram, with the arrows indicating continuity. [8]

In the years preceding 1704, Newton had personally entertained a great many bold hypotheses, including a number of semi-mystical hermetic explanations for all manner of things, not to mention his painstaking interpretations of biblical prophecies. Most of these he kept to himself, but when he finally got around to publishing his optical papers, the year after Hooke had died, in which Newton then became head of the Royal Society, supposedly said to have secretly destroyed all paintings of Hooke held by the Society, he couldn't resist including a list of 31 "Queries" concerning the big cosmic issues that he had been too reticent to address publicly before.

In introducing the function of the queries, Newton comments tersely that he had originally planned on repeating his experiments and investigations concerning the action of the rays of light in bodies, but that:

> "I was interrupted, and cannot now think of taking these things into further consideration. Since I have not finished with this part of my design, I shall conclude with proposing only some queries, in order to farther search to be made by others."

The Queries are said to contain some of Newton's most influential and speculative writing. Newton, aside from the above note, presents them without header title and essentially without explanation. Only in his 1715 *Account*, did he give them a summary mention: [9]

> "Mr Newton in his *Optiques* distinguished those things which were made certain by Experiments from those things which remained uncertain, and which he therefore proposed in the End of his *Optiques* in the form of Queries."

The true nature of these "queries" can immediately be gathered from the fact that

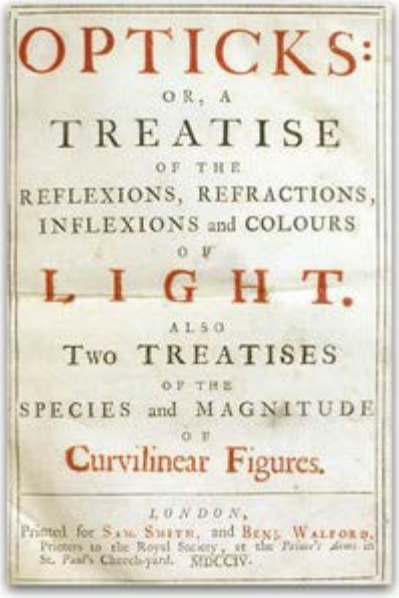
OPTICKS:
OR, A
TREATISE
OF THE
REFLEXIONS, REFRACTIONS,
INFLEXIONS and COLOURS
OF
LIGHT.
ALSO
Two TREATISES
OF THE
SPECIES and MAGNITUDE
OF
Curvilinear Figures.
LONDON,
Printed for Sam. Smith, and Benj. Walford,
Printers to the Royal Society, at the Prince's Arms in
St. Paul's Church-yard. MDCCIV.

Title page of Newton's *Opticks*, the third book of which contains the 'Queries' (and the famous **Qu. 31**).

every one of them is phrased in the form of a negative question, as in "Are not the Rays of Light very small bodies emitted from shining substances?" Each one is plainly a hypothesis phrased as a question. [6]

The first edition of *The Opticks* (1704) contained only 16 queries, but when the Latin edition (1706) came out Newton was emboldened to add seven more, making for a list of 23 big 'questions'. In the second English edition, supposedly, the list was up to 24.

It is said that in Query 28, Newton begins to introduce his particle theory as differing from that of Rene Descartes. It begins with the rhetorical question, as all the queries do, "Are not all Hypotheses erroneous in which Light is supposed to consist of Pression or Motion propagated through a fluid medium?" In this query, Newton rejects the Cartesian idea of a material substance filling in and comprising the space between particles. Newton preferred an atomistic view, believing that all substances were comprised of hard impenetrable particles moving and interacting via innate forces in an empty space.

Query 31

In 1717/18, Newton, in the in the revised English edition, expanded on this atomic theory chemistry logic, to introduce what is now known as the famous "31st Query" that, over the next two hundred years, stimulated a great deal of speculation and development on theories of chemical affinity. The final pages of *The Opticks* are devoted to Query 31, which begins: [2]

> "Have not the small particles of bodies certain powers, virtues, or force, by which they act at a distance, not only upon the rays of light for reflecting, refracting, and inflecting them, but also upon one another for producing a great part of the phenomena of nature? ... We must learn from the phenomena of nature what bodies attract one another, and what are the laws and properties of attraction, before we enquire the cause which the attraction is performed."

Newton goes on to speculate that the force of electricity operates on very small scales to hold the parts of chemicals together and govern their interactions, anticipating the modern theory of chemistry. To cite the core example of Newton's description of a gradient of affinity reactions, he states: [4]

> "Is it not for want of an attractive virtue between the parts of water ( ) and oil, of quick-silver ( )(Hg) and antimony ( )(Sb), of lead ( )(Pb) and iron (♂)(Fe), that these substances do not mix; and by a weak attraction, that quick-silver ( )(Hg) and copper (♀)(Cu) mix difficultly; and from a strong one, that quicksilver ( )(Hg) and tin ( )(Sn), antimony ( )(Sb) and iron (♂)(Fe), water ( ) and salts, mix readily?"

Most of Query 31 is devoted to an extensive (20 pages) enumeration of chemical phenomena that Newton wished to cite in support of this view. [6] He outlines variations of attractions between different alchemical species, asking lots of questions along the way, thus initiating the logic of affinity gradients and preferences.

Geoffroy's affinity tables

See main: Geoffroy's affinity table, Affinity table, Elective affinity, etc.

The publication of Newton's famous Query 31, resulted in the construction of the world's first affinity table, and from from this, it is said, the chemical revolution was launched. In particular, in 1718, during a translation into French of Newton's *Opticks*, French chemist Étienne Geoffroy used the descriptions of affinity gradients in Query 31 to construct the world's first affinity table. [3] In the years to follow many more affinity tables were built culminating in the construction of Swedish chemist Torbern Bergman's 1775 table, in his textbook *A Dissertation on Elective Attractions*, containing 55-rows and 50-columns of chemical species. [4] Form these tables is where the logic the chemical reaction emerged.

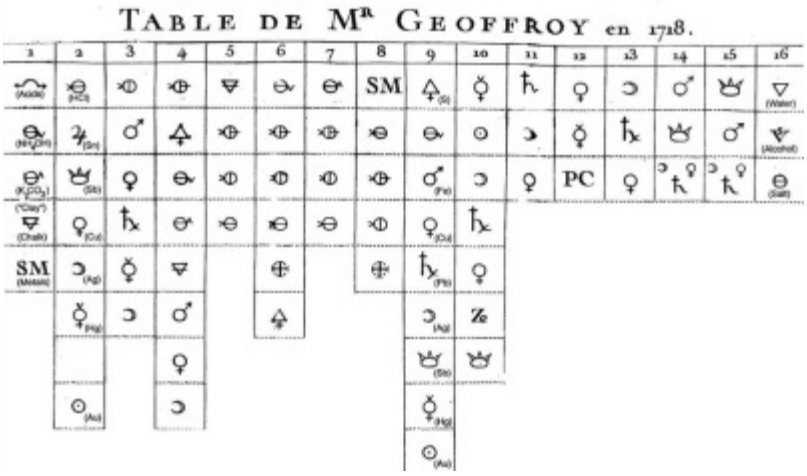

French chemist Étienne Geoffroy's 1718 affinity table, build using the "verbal" descriptions of affinity gradients in Query 31 to construct the world's first affinity table. [3]

Affinity, heat, free energy

To note, if Newton had never written his famous Query 31, it is unlikely that he great 19th century debate between, on one side, Danish chemist Julius Thomsen and French chemist Marcellin Berthelot and, on the other side, thermodynamicists such as Hermann Helmholtz, Walther Nernst, Fritz Haber, Theophile de Donder, or Gilbert Lewis, among others, on the issue of the "true measure of affinity", would have every taken place, and the science of chemical thermodynamics may have not progressed to its current stature. [5]

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Romantic Novel”, Mètode, Annual Review.

External links

- The Queries – Wikipedia.

θΔics

In terminology, **question**, in contrast to answer, refers to the act or instance of asking, specifically in respect to a subject, aspect, seeming puzzle, or issue open for discussion or lacking in perceptual clarification or solution—the famous age three query "what's the go o' that?" by Scottish physicist James Maxwell being the epitome example.

The asking of a **question** or "query", such as English physicist Isaac Newton's famous 1718 Query 31, is precursor to arrival of the answer or solution.

Famous questions

English chemist-physicist Isaac Newton's famous 1718 "Query 31" the peak of which was the question:

> "Is it not for want of an attractive virtue between the parts of water ( ) and oil, of quick-silver ( )(Hg) and antimony ( )(Sb), of lead ( )(Pb) and iron (♂)(Fe), that these substances do not mix; and by a weak attraction, that quick-silver ( )(Hg) and copper (♀)(Cu) mix difficultly; and from a strong one, that quicksilver ( )(Hg) and tin ( )(Sn), antimony ( )(Sb) and iron (♂)(Fe), water ( ) and salts, mix readily?"

launched initially the science of affinity chemistry, eventually the chemical revolution, and resultantly the thermodynamic theory of affinity, and hence the modern chemical thermodynamic / quantum chemistry solution or answer to Newton's query.

German-born American Albert Einstein's famous 1891 age 12 quest to solve the 'riddle of the huge world' and his followup question: 'what happens when you run alongside a beam of light?' resulted in the mass-energy equivalence principle and the theory of relativity.

American electrochemical engineer Libb Thims' 1995 question: 'what happens when one applies the "universal rule" (Gilbert Lewis, 1923) of thermodynamics to freely going reactions between people?' has led to the initiation of the science of human chemistry (2007) and to the solution of the great problem of natural philosophy (2009) among other newly-emerging points of reality changing discernments.

Modern queries | Big three

See main: Modern queries

As to the most sought after or greatest "modern queries" pressing on the mind of the average person, according to 2005 polls, when asked the question: 'what is humankind's present-day greatest philosophical conundrum', the following top three responses are found: [1]

1. What happens when you die? (27%)
2. What is love? (23%)
3. What is the meaning of life? (19%)

among other responses. These top three responses along with the "other responses", ten in total, were put into the form of an online poll, asking the same question, given the ten response options, the results of which, as of 2012, are shown below: [2]

1. What is the enigma of time (21%)
2. What is the meaning of life? (12%)

   What is our purpose?
   What is our function?
   What is our design?

3. What happens when you die? (12%)
4. Does god exist? (11%)
5. What is love? (10%)
6. What is the paradox of existence? (38%)

   Why are we here?

7. What is reality? (9%)
8. Is destiny ours to make or is it predetermined? (7%)
9. What is the perception of truth? (6%)
10. What is the nature of good and evil (4%)

What is Humankind's Present-Day Greatest Philosophical Conundrum?

The enigma of time?(89)	21%
The meaning of life... i.e., what is our purpose, function, or design?(52)	12%
Does god exist?(49)	11%
What is love?(41)	10%
What happens when you die?(50)	12%
Is destiny ours to make, or is it predetermined?(29)	7%
The question of reality?(37)	9%
The perception of truth?(24)	6%
The paradox of existence...i.e., why are we here?(38)	9%
The nature of good and evil?(18)	4%

427 total votes since 12/19/12

Some type of votebot or multiple re-vote action, to note, may have skewed the top answer, to bias the results.

Morality?

Question number seven from George Dvorsky's 2012 superlist: "8 Great Philosophical Questions That We'll Never Solve" is "what is the best moral system?", the section of which is shown adjacent, which of course is really the "big" question underlying the above three big questions, being that one's belief system in regards to morality and one's understanding of the nature of "choice", underpins one's belief in life, love, meaning, and death. [5]

> "All natural phenomena can be explained by the motion and organization of primary particles."
>
> — Robert Boyle (1661), *The Sceptical Chymist*

In 1789, based British philosopher John Stewart introduced his "moral motion" theory, in which he did away with all of the mythological terms 'life', 'death', 'god', etc., and replaced these with modern physical sciences (astronomy, physics, and chemistry) based theory of 'moral motion', wherein man is viewed as an intelligent type of animate matter, made of particles (atoms), and that all that exists in the universe is matter and motion; an example quote of which is:

> "Body and identity of man or manhood, like fire and heat, may be changed or commuted, and in portions what was fire may become man, and what was man become fire; the connection with nature being the same in all its parts, animate or inanimate; but motion in the former has the power of procuring happy combinations or identities; and the volition that propels that motion is motived by happiness, which it procures to its present, and perpetuates to all future stages of its revolution into sensitive nature, by which self, or the **moral system**, is temporally and eternally benefited."

7. What is the best moral system?

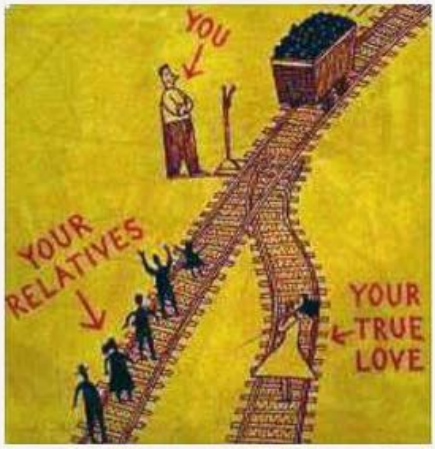

Essentially, we'll never truly be able to distinguish between "right" and "wrong" actions. At any given time in history, however, philosophers, theologians, and politicians will claim to have discovered the best way to evaluate human actions and establish the most righteous code of conduct. But it's never that easy. Life is far too messy and complicated for there to be anything like a universal morality or an absolutist ethics. The Golden Rule is great (the idea that you should treat others as you would like them to treat you), but it disregards moral autonomy and leaves no room for the imposition of justice (such as jailing criminals), and can even be used to justify oppression (Immanuel Kant was among its most staunchest critics). Moreover, it's a highly simplified rule of thumb that doesn't provision for more complex scenarios. For example, should the few be spared to save the many? Who has more moral worth: a human baby or a full-grown great ape? And as neuroscientists have shown, morality is not only a culturally-ingrained thing, it's also a part of our psychologies (the Trolly Problem is the best demonstration of this). At best, we can only say that morality is normative, while acknowledging that our sense of right and wrong will change over time.

George Dvorsky's 2012 philosophical question number 7 (of 8), namely: what is the best morality system, that he thinks will never be solved. [5]

Stewart called this "natural religion." [1] Independently, less than seven years later, in 1796, German polyintellect Johann Goethe began to develop a more robust physical chemistry based moral system, the gist of which he explains as follows:

> "The moral symbols in the natural sciences, that of the elective affinities invented and used by the great Bergman, are more meaningful and permit themselves to be connected better with poetry and society."
>
> — Johann Goethe (1809), comment to Friedrich Riemer

Quotes

The following are related quotes:

> "Let us now consider, for a little while, how wonderfully we stand upon this world. Here it is we are born, bred, and live, and yet we view these things with an almost entire absence of wonder to ourselves respecting the way in which all this happens. So small, indeed, is our wonder, that we are never taken by surprise; and I do think that, to a young person of ten, fifteen, or twenty years of age, perhaps the first sight of a cataract or a mountain would occasion him more surprise than he had ever felt concerning the means of his own existence; how he came here; how he lives; by what means he stands upright; and through what means he moves about from place to place. Hence, we come into this world, we live, and depart from it, without our thoughts being called specifically to consider how all this takes place; and were it not for the exertions of some few inquiring minds, who have looked *into* these things, and ascertained the very beautiful laws and conditions by which we *do* live and stand upon the earth, we should hardly be aware that there was any thing wonderful in it. These inquiries, which have occupied philosophers from the earliest days, when they first began to find out the laws by which we grow, and exist, and enjoy ourselves, up to the present time, have shown us that all this was effected in consequence of the existence of certain *forces*, or *abilities* to do things, or *powers*, that are so common that nothing can be more so; for nothing is commoner than the wonderful powers by which we are enabled to stand upright: they are essential to our existence every moment."
>
> — Michael Faraday (1859), "On the Various Forces of Matter: Gravitation" [3]

> "When I was first brought with this **question** of human chemistry, I was both completely mystified and very curious. Like most people, I'd never really stopped to think about it. But if chemistry in the social world is anything like chemistry is in the physical world, there has to be

a logical, tangible definition."

— Chanel Wood (2007), "A Questions of Social Chemistry" (see: combination lock theory) [4]

See also

- Homework problems
- Modern queries
- Love thought experiment
- Problem

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pgs. 301-02). Morrisville, NC: LuLu.
2. (a) Web Poll – HumanThermodynamics.com.
(b) Note: the conundrums (shown above) are real answers supplied by Chicagoans, in person street poll conducted by Libb Thims (2005).
3. (a) Faraday, Michael. (1859). "On the Various Forces of Matter: Lecture One: The Force of Gravitation", in: *A Course of Six Lectures on the Various Forces of Matter, and Their Relations to Each Other* (pg. 15). Harper & Brothers, 1860.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (pgs. xviiii-xx). Morrisville, NC: LuLu.
4. Wood, Chanel. (2007). "A Question of Social Chemistry" (WayBack), June 06. *Sociology*, ChanelWood.com.
5. Dvorsky, George. (2012). "8 Great Philosophical Questions That We'll Never Solve", Sep 9, Io9.com.
6. (a) Stewart, John. (1789). *Travels to Discover the Source of Moral Motion (volume one)* (energy, 35+ pgs; heat, 8+ pgs; The Religion of Nature, pg. 75-). Ridgway.
(b) Stewart, John. (1790). *The Apocalypse of Nature: wherein the Source of Moral Motion is Discovered (volume two)*. Ridgway.
(c) Griffiths, Ralph. (1791). The Monthly Review, Volume 5 (Art. VI, Review: Travels Over the Most Interesting Parts of the Globe and The Apocalypse of Nature, pgs. 144-46). G. Griffiths.

θΔics

In Hmolpedia, the **quotes** page lists noted 'quotations' germane to the hmolsciences, some of which are listed below, most of which are grouped in separate pages in the adjacent dropdown menu.

Hmolscience | Song quotes

The following are hmolscience (physics, chemistry, thermodynamics) song quotes:

> "From one heart to another, all we are is just sparks within a flame, burning bright until we touch again. Reaching out to each other, in my dreams, it's you I'm calling to, when the morning comes, I'll be with you. Please believe me when I say, into every life, a little rain must fall, and I'll be there, I will be there after all. Nothing's certain, but this I know, love is all, is all, is all..."
>
> – Perfect Moment (Thineick, Diaz & Young Rebels) (2009); touches on: activation energy, heat, fire, combustion, reaction cessation.

> "I wish I could rip out a page of my memory, 'cause I put too much energy in him and me. Can't wait till I get through this phase, 'cause it's killing me. Too bad we can't re-write our own history. Such a mystery when he's here with me. It's hard to believe I'm still lonely. Chance's fading now, patience running out. This ain't how it's supposed to be. I'm having nightmares from sleeping with the enemy. How do we re-reverse the chemistry. I don't want us to be the end of me. This love is taking all of my energy. Energy, my energy. Taking all my energy. Energy, my energy. Taking all of (my energy). Seems only like yesterday, not even gravity. Could keep your feet off the ground when you go to me How can two be as one. We've become to divided now. There's no use hiding from my misery. Now I can feel a change in me. And I can't afford to slip much further. From the person I was meant to be. I'm not afraid to walk alone. Not give it up but moving on. Before it gets too deep, 'cause you're taking all of my energy. I'm having nightmares from sleeping with the enemy. How do we reverse the chemistry. I don't want us to be the end of me. This love is taking all of my energy. You're killing me. You're taking all of me yeah, oh. This love is taking all of my energy."
>
> – Energy, Keri Hilson (2008); touches on bond breaking, endothermic, endergonic.

> "We're driving slow through the snow on 5th Avenue. And right now radio's all that we can hear. Now we ain't talked since we left, it's so overdue. It's cold outside but between us it's worse in here. The world slows down. But my heart beats fast right now. I know this is the part. Where the end starts. I can't take it any longer. Thought that we were stronger. All we do is linger. Slipping through my fingers. I don't wanna try now. All that's left's goodbye to. Find a way that I can tell you."
>
> – I Hate This Part, Pussycat Dolls (2008); touches on bond breaking, bond strength, endothermic, endothermic reaction, endergonic.

Another song with hmolscience dissection potential is 2009 self-defined "godless walk" video song "Dust in Gravity". [1]

See also

- Entropy quotes
- Goethe (quotes)
- Human chemistry quotes

- Human thermodynamics quotes
- Information entropy (quotes)
- Libb Thims (quotes)
- Thermodynamics quotes

References

1. Dust in Gravity – Wikipedia.

θΔics

In religio-mythology, **Quran** [TR:19], or “Koran”, is the holy book of Islam, purported to have been written by Muhammad, as dictated to him by an angel named Gabriel (Jibril), one of the mediators of the god Allah.

Religio-mythology

> *See main: Judeo-Christian Islamic pantheon*

The Quran, in religio-mythology terms, is a modified rescript of the Old Testament and New Testament, both of which themselves being monotheistic rescripts of the Egyptian Book of the Dead, via the invention of new supreme god, named Allah, and a new prophet named Muhammad, who claims lineage from Abraham (Ra).

Magic Mary?

In 2019, Youtuber Apostate Prophet, in his “Absolute Proof: the Quran is Wrong” (Q), discusses the confused account of Mary wherein she is described as “mother of Jesus” and “sister of Aaron” (Quran 19:27-28) AND also “daughter of Imran” (Quran 66:12); the concluding point being that the Quranic writers, supposedly, merged the Mariam (sister of Moses), of the Old Testament, with the Mary (mother of Jesus), of the New Testament, into one character, loosely as follows:

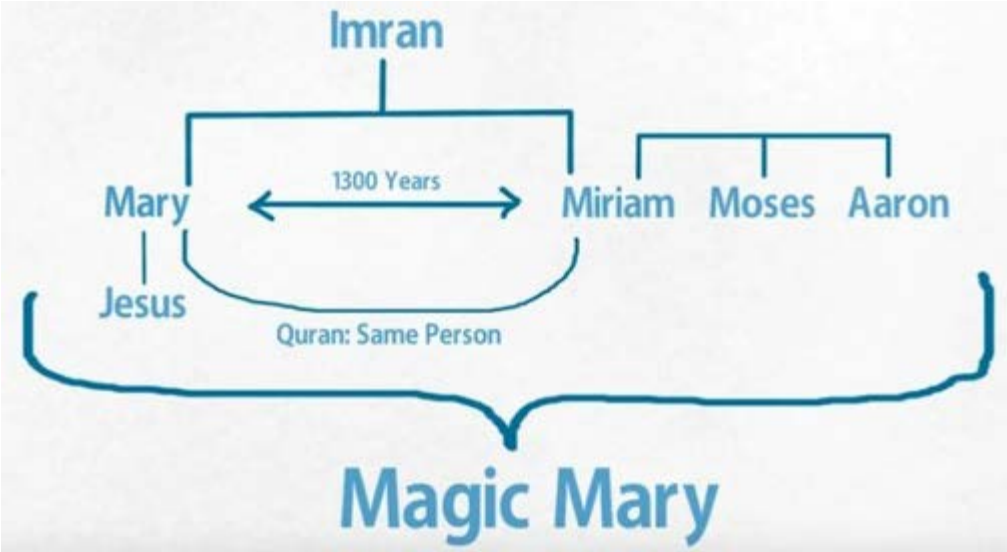

(add)

This gist of this confusion is explained by pointing out that the original "**Osiris** / **Isis** / **Horus**" Egyptian motif, from the Heliopolis creation myth, was repeated in different guises in both the Old Testament, namely in the form: "**Moses** / **Miriam** / **Aaron**", and in the New Testament, namely in the form: "**Lazarus** / **Mary** / **Jesus**"; hence it could have been likely that when the Quran was penned (c.650AD), in an effort to make a new religion out of the Egyptian-Judeo-Christian pantheon, the Old Testament and New Testament stories of Miriam and Mary, respectively, were merged (Q); the following account connects some of these pieces:

> “In consideration of what we know about Osiris, Horus and Isis, it is reasonable to find in Moses, Aaron and Miriam their traces, especially since Osiris is equated with Dionysus, who in turn has been identified with Moses. We have seen also that Aaron and Horus possess intriguing commonalities, and it is noteworthy that Isis was styled with the Egyptian epithet "Meri," meaning "beloved," while Miryam is Semitic for "Maria" and "Mary".”
>
> — Dorothy Murdock (2014), *Did Moses Exist?* (pg. 317)

One correction here, in the Murdock quote, to note, is that Mary derives from "sea", as in Maritime, in the sense of Isis being the goddess form if the star Sirius, which was known as the "star of the sea" or the guiding star for sailors. Whatever the case, it is known that both Moses and Jesus are "Osiris rescripts", hence it could be likely that Quranic writers confused the issue, in their attempt to summarize and absorb the Old and New Testaments into their new Allah-based religion format. The speaker goes onto argue that this “Magic Mary” contradiction combined with Quran 4:82, which says that if one contradiction is found in the Quran, then it is proof that whole Quran is invalid, since it is not, therefore, the perfect word of Allah.

Revisions

In c.715, a Quran was penned, wherein it was said that religious fighters will get "72 grapes" in the afterlife; sometime thereafter, this was changed to “72 virgins”. (Q)

Selections

The following are noted sections from the Quran:

Section	Summary	Compare
Surah 4:1	Woman created from a kink of the man. (Q)	Compare: Adam's rib
Surah 4:34	Says that you can beat (Q) or slap (Q) your wife if she is disobedient.	
Surah 4:65	“Submission to Allah requires complete obedience to all of Muhammad’s decisions” (Q)	
	“Muhammad’s own presuppositions and systems show that religious traditions are not trustworthy. The Jews and Christians say that Jesus really died, but the Quran contradicts them.” — Ibn al-Rawandi (c.870) (Q)	
Surah 4:157	“And [for] their saying, "Indeed, we have killed the Messiah, Jesus, the son of Mary, the messenger of Allah." And they did not kill him, nor did they crucify him; but [another] was made to resemble him to them. And indeed, those who differ over it are in doubt about it. They have no knowledge of it except the following of assumption. And they did not kill him, for certain.” (Q) Islam denies that the crucifixion and death of Jesus took place. (Q)	
Surah 9:5	“Kill the nonbelievers (idolaters/pagans/polytheists) wherever you find them and capture them and besiege them and sit in wait for them at every place of ambush” (Q)(Q), aka the "sword verse". (Q)	Compare: Deuteronomy 17 (Q)
Surah 9:29	“Fight those who do not believe in Allah or hold forbidden what Allah has revealed as forbidden and fight them until they give the ‘jizyah’ [money tax] willingly while they are humbled” (Q) It is the reason why non-Muslims, in Muslim majority lands, are treated so badly. (Q)	
Surah 15:26	“We created man from **sounding clay**, from mud moulded into shape [altered black mud].” (Q)(Q)	See: Clay creation myth
Surah 17	Muhammad, during his so-called “The Night Journey”, flew on a flying horse (buraq) from Mecca to Jerusalem and back in one night, during the course of which he met, in order: Adam, John the Baptist, Jesus, Joseph, Idris, Aaron, Moses, and lastly Abraham, at each of the seven levels of heaven. (Q)	See: Beg-Thims dialogue (Q) See: Dawkins on Buraq (Q)
Surah 37:11	“Then inquire of them: Is it they who are stronger in structure or other things we have created? We created them from **sticky clay**.” (Q)	See: Clay creation myth

(add)

Jefferson Quran

In 2016, an anon ex-Baptist Christian atheist, after spending a year reading four parallel versions of the Quran, began making a WordPress based so-called “Jefferson Quran”, therein stepping through each Surah and cutting out all of the gobbledygook.

External links

- Quran – Wikipedia.

θΔics

In science, **R** is the symbol for the gas constant in the ideal gas law having a value of: [1]

$$8.314 \frac{J}{K \cdot mol}$$

The first dominant use of *R* as a constant, as used in the various gas laws, seems to have been first used by French engineer Emile Clapyron in his 1834 *Memoir on the Motive Power of Fire*, where he states that Mariotte's law (PV = k, at constant temperature) combined with that of Gay-Lussac's law (P = kT, at constant volume), the latter of which being derived by French chemist Joseph Gay-Lussac in 1802, gives the expression: [2]

$$Pv = R(267 + t)$$

This is sometimes referred to as the 'G-M law' or the 'law of Marriatte and Gay-Lussac'.

Etymology

The origin of the symbol R, prior to its 1834 use by Clapeyron, is difficult to pin down. This seems to be due to the fact often early versions of the gas laws were simply stated verbally.

The symbol could have been used in honor of Danish astronomer Ole Romer who in 1702 built the basic two-fixed point thermometer; a design later used by Daniel Fahrenheit in the construction of his thermometer. This, however, is a tentative guess?

In a 2003, American chemistry historian William Jensen, in his "The Universal Gas Constant R", in which he attempts to "trace the history of the gas constant R and the probable reason for its representation by the letter R", suggested that *R* should be officially named after French chemist Henri Regnault. [3] On the surface this seems tenable, being that Regnault's *circa* 1847 experimental gas work was the basis of Irish physicist William Thomson's famous publication "An Account of Carnot's Theory of the Motive Power of Heat: with Numerical Results Deduced from Regnault's Experiments on Steam", the paper that stimulated German physicist Rudolf Clausius into founding thermodynamics. [3]

If one looks at the facts, however, this hypothesis falls apart. Specifically, at the time Clapyron was using *R* as a constant in his gas equations of 1834, Regnault was only twenty-four years of age at this point, being a recent graduate of the École Polytechnique two years prior, having only done work in organic chemistry at this point, and nothing in caloric gas theory. Regnault did not begin his work on the properties of gases and physics until the 1840s (nearly 15-years after the gas constant R was already in use); his key publication on this subject was in 1847 (and he only began to be cited by Clausius in 1850).

In fact, prior to the work of Sadi Carnot (1824), there were a number of more dominant investigators on the various gas laws: Alexis Petit (1818), Joseph Gay-Lussac (1800), Jacques Charles (1787), Daniel Bernoulli (1738), Edme Mariotte (1679), Henry Power (1661), Robert Boyle (1660), Robert Hooke (1657). In the "big history" sense of the matter, it would seem more appropriate to assume or possibly credit the symbol "R" to the "Roberts" (Boyle and Hooke) as they were the first to invent the pneumatical engine and to experiment with it to determine the first gas law, namely Boyle's law.

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1. Daintith, John. (2005). *Oxford Dictionary of Physics.* Oxford University Press.
2. Clapeyron, Émile. (1834). "Memoir on the Motive Power of Heat", *Journal de l'Ecole Polytechnique.* XIV, 153 (and Poggendorff's *Annalender Physick*, LIX, [1843] 446, 566).
3. (a) Jensen, William B. (2003). "The Universal Gas Constant R" (abstract: "this column traces the history of the gas constant R and the probable reason for its representation by the letter R.), *J. Chem. Edu.* 80: 731.

(b) William B. Jensen (faculty) – Department of Chemistry, University of Cincinnati.

θΔics

In existographies, **R. D'Acres** (c.1610-c.1675), was an English mining engineer, possibly a pseudonym of Robert Thornton (1618-1679), noted for the 1659 *The Elements of Water Drawing*, wherein a heat engine, of some sort, is described in detail. [1]

Overview

In 1659, D'Acres, published the 40-page booklet *Elements of Water Drawing*, which contained a "Philosophical Discourse and New Discovery of Drawing Water Out of Great Deeps by Fire", along with a disproof of perpetual motion; a sample text of which is as follows: [1]

> "The best heating, is by the incensed Air of a close furnace; The speediest Cooling is by water. . . . For the speedier Intercourse of these two contraries, the one may be applyed within side: the other without side the Calder, or Region of the Air; The Cooling water may not enter, for then it necessarily frustrates the ascent of the water; the heated Air out of the Furnace may enter (by the turning of a ****) into the Boul, and so the heat is acted in an instant; Then the materials and Globe being all overhead in a Pond or Cistern of water, they (after the heat by the returning of the **** is diverted) do as speedily cool, and so the rarified Air condensing, the water ascends, and having a brazen Sucker or Clack in the bottom, it cannot go out again, but then by turning the ****, the uppermost water issues forth, by the sucker in the spout, which now the descending water thrusts open, and in the same Act, the enflamed Air follows after; return the ****, and the water ascends as before."
>
> — R. D'acres (1659), *The Elements of Water Drawing* [1]

(add)

Quotes | On

The following are quotes on D'acres:

> "A work which has received less attention than it deserves is **R. D'Acres**' little volume on *The Art of Water-Drawing*, first published in London in 1659 (reprinted in facsimile for the Newcomen Society, 1930). D' Acres is believed to be the pseudonym of Robert Thornton (1618-79), a mining engineer with interests in the Warwickshire coalfield. He alone among the technical authors of the period analyses the machines and parts thereof according to type and function. The others describe each machine as a separate and distinct contrivance, repeating descriptions of similar details in full. D'Acres recognizes the nature of atmospheric pressure, and the limit it sets to suction devices; the "principle of work": that every water-raising machine must, whatever its construction, be supplied with more power than would suffice to lift the dead weight of water with which it deals; that perpetual motion is practically impossible; and that simplicity of construction and smoothness of action are essential to the efficient working of all machinery. Unfortunately, his work contains no pictorial illustrations. This fact, together with its small size, and the troubled times in which it appeared, may account for its rarity, and the undeserved oblivion from which it has only lately been rescued by the vigilance of the Newcomen Society."
>
> — Abraham Wolf (1935), *A History of Science Technology and Philosophy in the 16th and 17th Centuries* [2]

References

1. (a) D'Acres, R. (1659). *The Elements of Water-Drawing: a Compendious Abstract of All Sorts of Kinds of Water-Machins or Gins Used or Practiced in the World [microform]: With Their Natural Grounds and Reasons, and What Service May Be Expected From Them : As Also New Exquisite Ways and Machins Never Before Published : With a Philosophical Discourse and New Discovery of Drawing Water Out of Great Deeps by Fier : Where Is Also Disapproved the Perpetual Motion, the Water-Poise, the Syphon or Philosophers Engine, the Horizontal Sails, With Divers Other Experiments* (preface signed by: R. D'acres; attributed to: Robert Thornton) (fire, 10+ pgs; quote, pgs. 6-

7). London: Thomas Leach; W. Heffer & Sons, 1930.
(b) Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 155). Courier, 1990.
2. Wolf, Abraham. (1935). *A History of Science Technology and Philosophy in the 16th and 17th Centuries* (pg. #). Routledge, 2019.

θΔics

In existographies, **R.P. Rastogi** (c.1938-) is an Indian scientist, specializing in thermodynamics of irreversible processes, noted for []

Overview

In 2007, Rastogi, in his *Introduction to Non-Equilibrium Physical Chemistry*, devotes a 22-page chapter 14, entitled "Social Dynamics, Economics, and Finance", to what he calls "impacts of the concepts developed in non-equilibrium physical chemistry in sociology", the abstract of which is: [1]

> "This chapter discusses three subsections associated with social sciences that include sociology, psychology, and economics. Human society is composed of sub-systems consisting of its individual members. This system is open. There is continuous interval interaction with nature and through ideas between the members of the society. In addition, there is interaction with the external environment and the technological surrounding. Social structure and stratification are governed by prestige and esteem, male and female, age groups, caste and class, and occupation, status, and similar factors. The evolutionary path of human society is a resultant of two types of forces: the force of fusion and the force of fission. The factors responsible for the first type of forces are tribalism, language, group loyalty, common tastes, and values. But wars, conquest, passions, and slavery are responsible for creating forces of fission. Economic systems are highly complex. Unpredictability, irreversibility, and self-organization are new types of phenomena, which are receiving current attention. Recent developments in experimental and theoretical studies of complex phenomena in physico-chemical systems supported by corresponding developments in mathematics and statistics can serve as a model for complex phenomena in real systems."

This chapter, to note, firstly, was found via the keys: physico-chemical sociology. Of second note, the use of the term "creating" seems to belie an underlying implicit god code basis of argument, without further investigation. Thirdly, the phrase "unpredictability, irreversibility, and self-organization are new types of phenomena" generally is code for a chaos theory stylized, ontic opening, argument for free will.

Far from equilibrium

See main: Far-from-equilibrium

The adjacent diagram, from Rastogi's cover, illustrates the gist of his platform, namely: Ilya Prigogine, bifurcations, and dissipative structure theory, all of which is coded creation science based, via Henri Bergson, which he

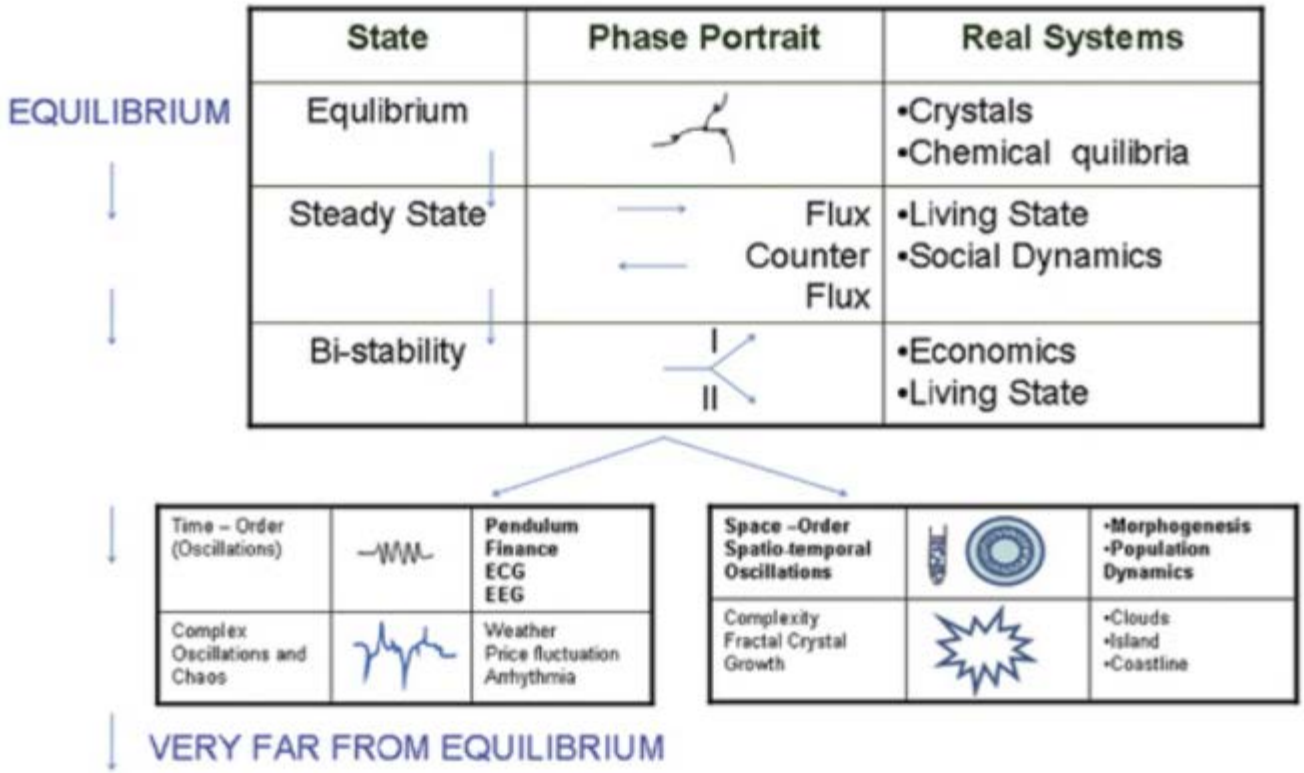

Diagram from the cover of **Rastogi**'s 2007 *Introduction to Non-Equilibrium Physical Chemistry*, wherein he presents the Prigoginean view that society is an "away from equilibrium" type of phenomena. [1]

intermixes with Hermann Haken's synergetics ideas.

Education

In 2008, Rastogi was associated with Gorakhpur University, Gorakhpur, India.

References

1. Rastogi, R.P. (2007). *Introduction to Non-Equilibrium Physical Chemistry: Towards Complexity and Non-Linear Science* (abs) (sociology, 8+ pgs). Elsevier, 2008.

Further reading

â— Rastogi, R.P. and Misra, R.R. (1978). *Introduction to Chemical Thermodynamics*. Publisher.

External links

â— R.P. Rastogi (about) – VikasPublishing.com.
â— Rastogi, R.P. – WorldCat Identities.

θΔics

In mythology, **Ra**, hieroglyph 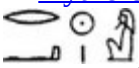 , pronounced *rah*, meaning “mouth” (Q), or "Re", "Helios" (Plutarch, 100AD), among other syncretized names, e.g. Ra-Atum (or Atum-Ra), or Amen-Ra, etc., is the sun or sun god, of Egyptian theology, that was said to have burst forth out of a land mound Nun following the chaos of beginning, and ascend into the sky bring the first light into the world, and being the progenitor to all life; he is often depicted as a falcon or falcon carrying the sun disc, or falcon-headed man (similar to the older god Horus). [1]

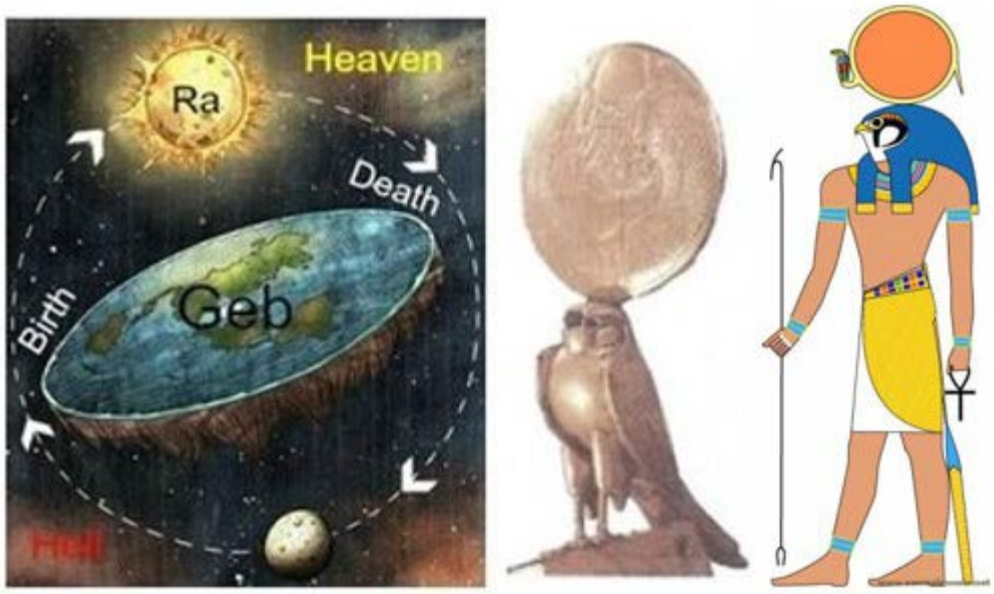

Three conceptions of **Ra** the Egyptian sun god (3000BC), the theory that the sun is a fire disc, which is carried by a bird each day through the sky.

Etymology

The following gives some overview of the nature of the mouth symbol in the hieroglyph for Ra:

> “When writing the characters of their language, Egyptian scribes ignored vowels and recorded only the consonants. The phonetic ‘r’, for example, is represented by the hieroglyph , which is the ideogram of the human mouth. This one hieroglyph could represent a consonant as variably pronounced as *ra*, *re*, *ar*, *er*, and so forth.”
>
> — Daniel Gunther (2015), “Thoughts on the 20th Anniversary Edition” in the Faulkner-translation of the *Egyptian Book of the Dead* (pg. 20)

In this direction, the etymology of “Ra”, according to Wallis Budge (1904) is unknown; it is possible, however, that Ra is related to the sound “wa-hu” (Q), aka the “baboon bark”, per reason that the baboons were worshiped in ancient Egypt as sun god like animals, like the scarab beetle, per reason that they greet the morning sun each morning, like a worshiper.

Ra | Morning, Noon, and Evening

The following shows Ra as "Ra-Khepri", i.e. the dung beetle, or the "morning sun":

The following (Q) shows Ra as the "noon sun":

A depiction of **Ra** (or possibly the Ba of Ra), from Chapter 151 of the Ani-version (1250BC) of the Egyptian Book of the Dead. [5]

The following, below left, shows Ra as the "evening sun", as Atum-Ra (or Ra-Atum), and also, below right, as "Horus the elder", as the two models seemed to have been syncretized at some point: [4]

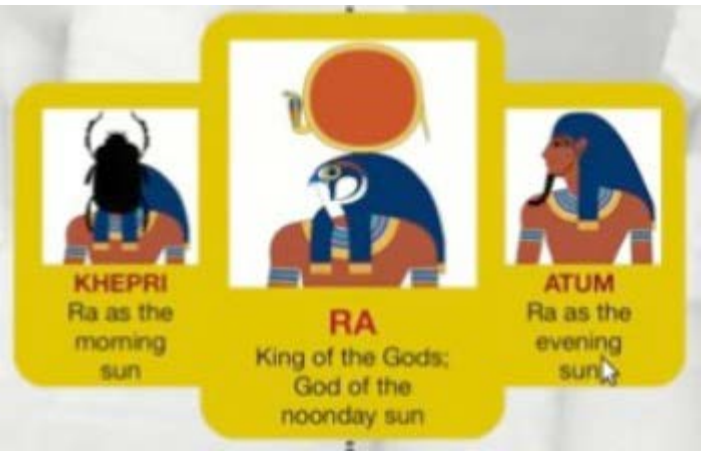

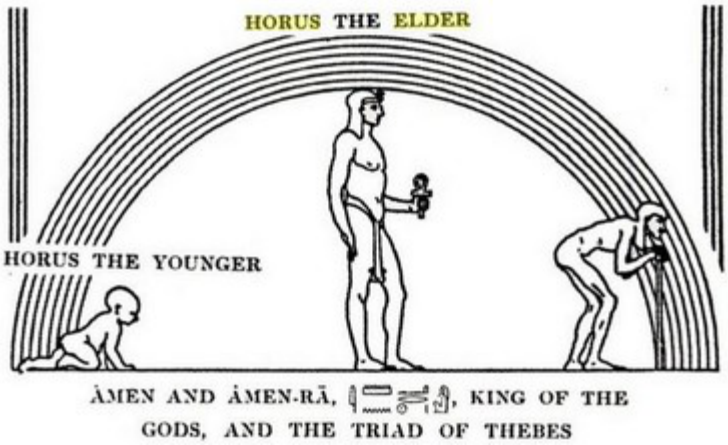

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Palms

In Egypt, Ra was celebrated with palm brushes during the winter solstice. This, supposedly, is a forerunner practice to "palm Sunday" of modern Christians.

Ra theology

The concept the sun being a god called Ra or Re, the center piece of Ra theology, is said to date to the scattered tribal pre-dynastic period of Egypt (4000BC).

This Ra sun god model was carried over through modified syncretism during the various steps in the combined changes in power centers in the course of Egyptian history: Heliopolis (3100BC), Memphis (2800BC), Hermopolis (2400BC), Thebes (2040BC), and Amarna (1350BC), at the latter stage of which Ra became a monotheistic god called Aton.

The following shows Ra riding his solar barque over the body of the god Nut, i.e. the heavens, in his daily journey, according to Heliopolis creation myth, the dominant version of Egyptian cosmology; the god Geb lying on the ground, and Shu, the air or dividing god between Geb and Nut: [3]

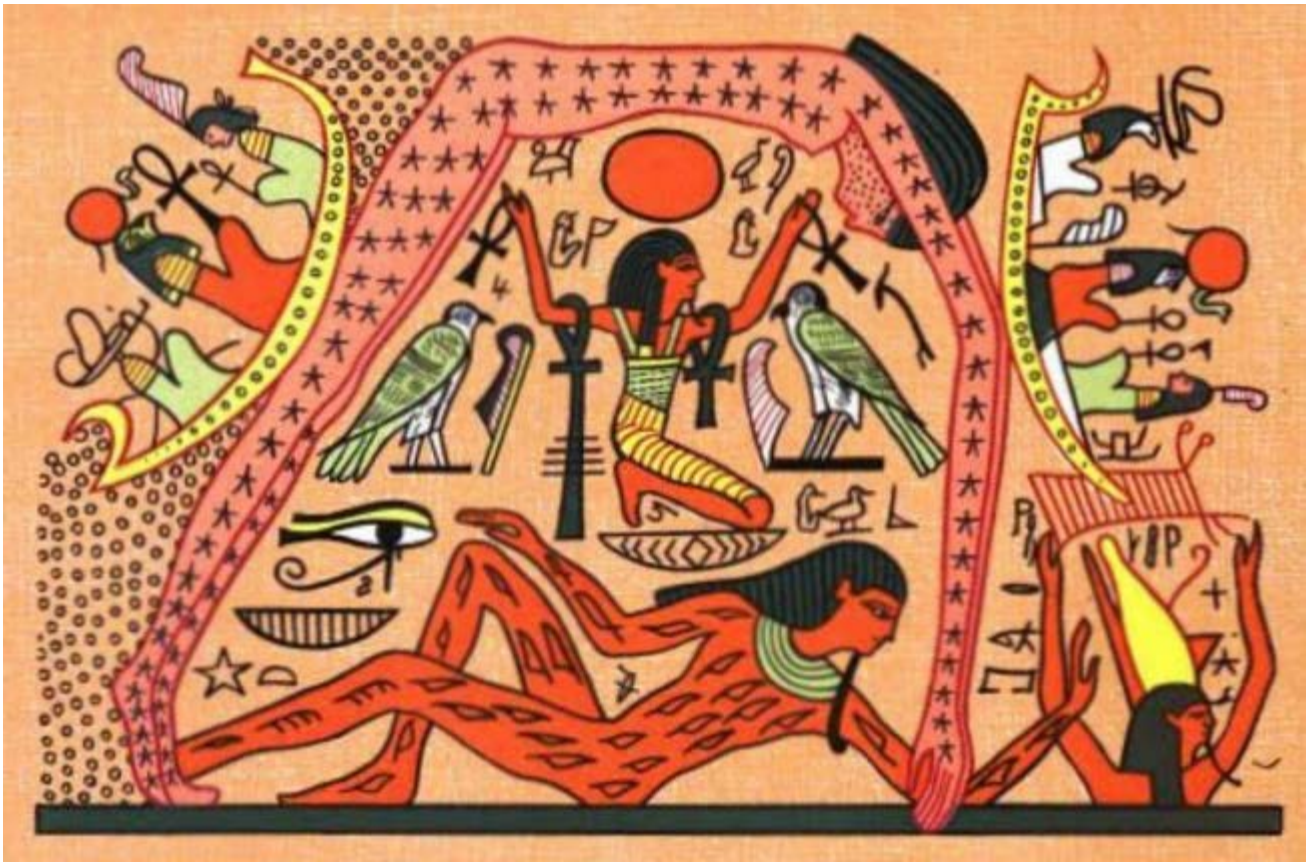

The centerpiece of this theology is the morality system found in the concept of the negative confessions, a type of weighted soul/karma after death measurement.

In the centuries to follow, this morality structure then branched off into two sects: (a) the B-ra-hma-ic faiths, a reincarnation based theology, typified by the creator god Brahma (1000BC), and (b) the Ab-ra-ham-ic faiths, a resurrection based theology, typified by the creator gods YHWH (1200), God (100BC), and Allah (570AD). [2]

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2. Thims, Libb. (2003). *Human Thermodynamics, Volume 3.* Unpublished manuscript. IoHT publications.
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4. (a) Maxwell, Jordan; Tice, Paul; Snow, Alan. (2000). *That Old-Time Religion: the Story of Religious Foundations* (§:

Astro-Theology, pgs. 5-24; §:The Solar Cult, pgs. 35-54; Horus the elder, pg. 40). The Book Tree.
(b) Anon (2018). “Ancient Egyptian Gods Family Tree” (O), UsefulCharts, Feb 16.
5. Faulkner, Raymond. (1972). *The Egyptian Book of the Dead: the Book of Coming Forth by Day: Complete Papyrus of Ani, Featuring Integrated Text and Full-Color Images* (translator: Ogden Goelet; Preface: Carol Andrews; Introduction: Daniel Gunther; Foreword: James Wasserman) (Amz) (Ra, pg. 101). Chronicle Books, 2015.

Videos

● Thims, Libb. (2010). “Egyptology of Jesus Christ” (V), HumanChemistry101, Dec 8.

External links

● Ra – Wikipedia.

θΔics

In religions, **Ra theology**, or Anunian theology, is the theological belief system structured around the theory of the birth of the sun god Ra out of the land mound that arose out of the flood god Nun; the following diagrammatic shows the now-prevalent versions or derivatives of Ra theology:

Ra	Ra religions

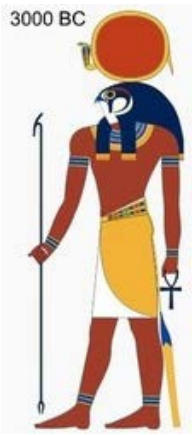

Abraham theology: (Ab-**ra**-ham-ic faiths)

Abraham

Christianity: 33%
Islam: 20%
Judaism: 0.2%
Baha'ism: 0.1%
Mandaeism: 0.001%

53%

Brahma theology: (B-**ra**-hma-ic faiths)

Brahma

Hindu: 13%
Buddhism: 6%
Sikhism: 0.4%
Jainism: 0.07%

20%

73%

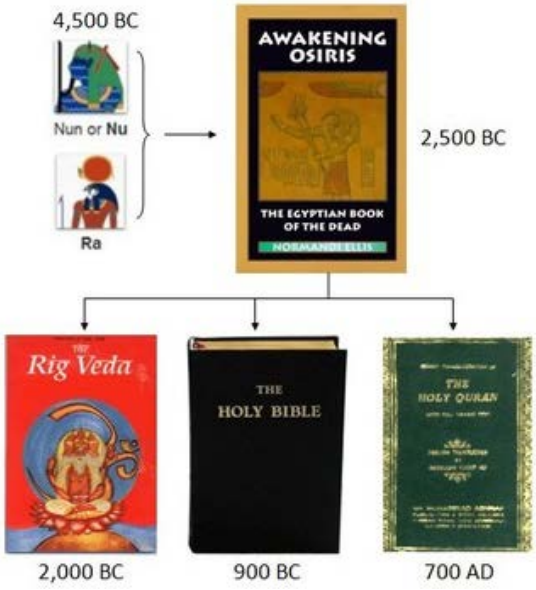

The Ra theological system, accounts for over 72 percent of the morality system of the modern world, is derived from the 3,000BC Egyptian life-death cycle rebirth (reincarnation) or singular rebirth (resurrection) or theory of the sun or sun god Ra (or Re) born out of the primordial mound Nu (or Nun), in particular the B-ra-hma-ic faiths (1000BC) and the Ab-*ra*-ham-ic faiths (500BC). [1] In short, the names Abraham and Brahma mean "farther Ra sun of nun"; whereby, subsequently, the various theological spin-offs, listed below, are simply reformulated versions of the story of Ra and the system of human negative confession morality and purpose connected therein.

The six main giveaways that show the underlying Egyptian connections between the two main world religions religions, i.e. Vedic and Torah, are:

Name
(a) Both Abraham and Brahma have the same etymology: "Father Ra son of Nun".
(b) Both Abraham and Brahma derived from the Nun or born out of water (Noah and Ma-Nu, respectively).
(c) Both Abraham and Brahma are the said-to-be creators all humans (Ra is the main creator god of the Egyptian pantheon).

Sister
(d) Both Abraham and Brahma have the same sister-wife, in namesake, Sarai and Saraswati, respectively.
(e) Both Abraham and Brahma have the same thrice sister-wife parable (creation by incest rewrite).

Son
(f) Both Abraham and Brahma have the same slaying of son parable (release of the soul rewrite).

(add discussion)

Etymology

The name Ra is the name assigned to the sun god of the ancient Egyptian city of Heliopolis, the "city of sun" (3,100BC), said to have been born each day out of the original primeval mound Nu or Nun. The name Ra was written in Hieroglyphics as:

The middle symbol of the circle rising above a vertical line is representative of the rising of the sun, the falcon-headed human form of Ra, with the ankh (symbol of life or spirit), is balanced on his knees and the sun disk balanced on his head, shown to the right. [4]

In 2,040BC, Memphis became major center of worship in Egypt, during which time Ra, became a syncretism of the local god Amen in the form of Amen-Ra. A hieroglyph from this period is show water waves representative of the primordial flood aspect of Nun (or Noah, in later Judea-Christian-Islam version; or Ma-Nu, in later the Hindu version).

In c.1340BC, in the “Hymn to Aten”, commissioned by Egyptian pharaoh Akhenaten, the first monotheist pharaoh, we begin to see Ab-Ra-ham like namesakes, e.g. Nefer-kheperu-Ra-ua-en-Ra, meaning “the son of the sun” or “beauty of the creations of Ra, the only one of Ra”, being used, such as the following section shows: [7]

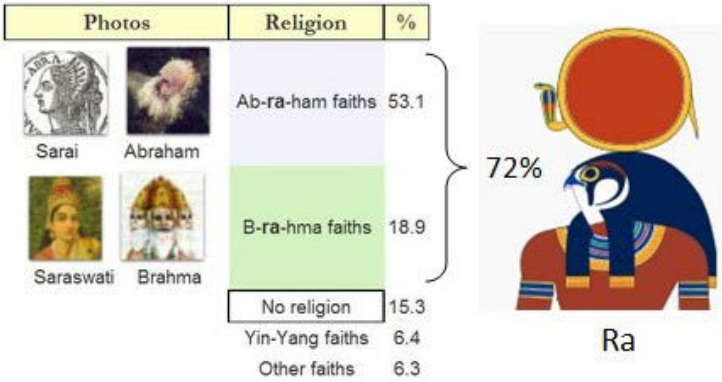

Modern world religious beliefs (2002), divided according to percentages: **Ra-religion** centric (72%), Yin-Yang/Other (15.3), or No Religion (15.3%).

“1. A hymn of praise to Ḥeru-khuti (Harmachis), who springeth up joyfully in the horizon in his name of ‘Shu who is in the Disk,’ and who liveth for ever and for ever, Åten the Living One, the Great One, he who is [celebrated] in the thirty year festival, the lord of the orbit (𓎛 𓏏) of the sun, the lord of the sun, the lord of heaven, the lord of earth, the lord of the House of Åten in the city of Khut-Åten, 2. by the king of the South and of the North, who liveth by Maāt, the Lord of the Two Lands, (Nefer-kheperu-Rā-uā-en-Rā),[1] the son of the Sun, who liveth by Maāt, the lord of crowns, (Khu-en-Åten),[2] who is great in the duration of his life, 3. and by his great royal wife, his darling, the Lady of the Two Lands, (Nefert-iti, Nefer-neferu-Åten),[3] the living one, the strong one for ever.”

Here, the suffix -Aten (sun disc) and -Ra- or -Ra (sun god) have been highlighted yellow, to accentuate the hieroglyphic to spoken name to English translation nature of Ra-based namesakes. The monotheistic religion established by Akhenaten and the migration of him and his followers from Thebes to Amarna, similar to the story of the monotheism established by the fictional Moses and the migration of him and his followers from Egypt to Jerusalem, as many have argued, as pointed out by Budge (1904), soon thereafter became one of the roots of the fictional character of Ab-Ra-ham, the namesake of which being a figurative way of saying "god Ra, born out of the Nun (water / -Ab), out of which the land (keme / -ham) arose". The hyphens, over time became removed, and the namesake Abraham remained.

With the rise of Hinduism (1000BC) and Judaism (500BC), the theology of Ra became re-written, through religious syncretism, into a *Brahma*-based theology and *Abraham*-based theology, respectively, the names of each meaning etymologically:

Ab- or *B* = “father” | ***Ra*** = “Sun god” | ***-ham*** or *hma* = “chem” (or *keme*)

The suffix term -ham (or hma), pronounced "chem" (or 'keme'), refers to the Egyptian black soil (of the Nile) or primordial land mound (Nun or Noah) that arose out the primeval water (annual 120-day flooding of the Nile), from which the sun god was born, the same root word for the science of chemistry, i.e. the "Egyptian black art". [3]

Cosmic egg

Ra, the God and father all, the un-generated original of the universe, according to one version of his creation, was said to have laid a premordal egg in the chaotic waters of beginning from which he was himself reborn, born-again, or self-generated. This version is said to be found in the Papyrus of Nesi Amsu (link). Although the born of the cosmic egg creation theory does not seem to be found in the Abrahamic version (which used the Noah’s arch rewrite, where Nun became Noah), it was carried over into the alternative legend that Brahman was born in water, in which a seed was laid that turned into a golden egg and this was later turned into the universe or Brahma.

Morality

The system of morality in Ra theology is based on the "negative confessions", which were 42 bad, evil, or forbidden actions prohibited to the Egyptian people, theorized to be morally wrong.

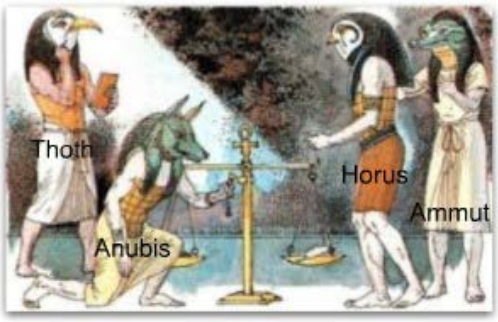

Circa 1300 BC depiction of Anubis (jackal-headed) weighing the **soul** (heart) against the feather of Ma'at (truth), while Thoth (ibis-headed) records the results, Horus (falcon-headed), great-great grandson of **Ra**, guides the dead through the process, while Ammut (crocodile-lion headed) awaits to eat the soul if it is found to weight too much.

The accumulations of these evils in the "ba" or soul of the Egyptian, theorized to be located in the heart, would be transported to the great judgment hall (in the heavens), proceeded over by 42 gods (one for each sin), along with other gods such as Osiris (Ra's great-great grandson), and weighted on scale against the feather of truth, and if his or her soul was found to be too full of sin, they would not be granted eternal life (or reincarnation, in the Hindu-based versions), in the which the question of what constitutes "good" actions, which boil down to specific second-by-second movements of the human molecule, viewed in the structure of the long-term dynamical movement of the universe, is a very difficult topic. Confession or sin number eight (above), for example, states focuses on "lying", where it is said that all lies are sinful.

In modern philosophical debates, however, the "concentration camp lie", i.e. telling a lie about something in order to save your own life or the lives of your fellow inmates, is often used as an example of when it is supposedly "good" to lie.

An example stab at this issue, pictured above can be found in the 2009 work of English biophysicist Mark Janes and his attempt at formulating good and evil in terms of enthalpy change ΔH and entropy change ΔS.

Decipherment

After the deciphering of the Rosetta stone in 1822 by English physicist Thomas Young, after which it was possible to see clearly that the main tenets of the major modern day religions (Christianity, Islam, Hinduism, etc.) originated from the core tenets of circa 5,000 BC Egyptian mythology, those upon which the pyramids were built, particularly the story of the birth of the sun god Ra out of the water or chaos of beginning god Nu. The main stopping points of the evolution or syncretism of religious theory is further depicted (adjacent).

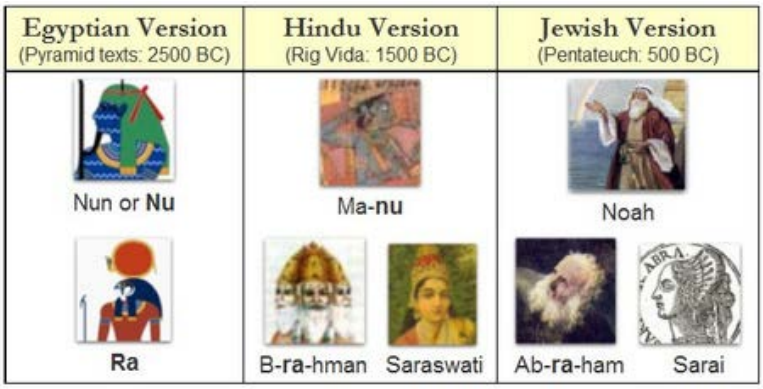

A diagrammatic tracing of the Nu-Ra story into Hinduism and Judaism.

This issue of religious syncretism became even clearer to the inquisitive reader when in 1895 Egyptologist Wallis Budge published *The Egyptian Book of the Dead* (*Papyrus of Ani*), wherein after "untold numbers of people began to write books, papers, and dissertations on the parallels between Jesus and Osiris (Ra's great grandson). [3] The issue can be said to have solidified, without doubt, certainly, after the publication of American religious scholar Gary Greenberg's 2000 *101 Myths of the Bible*, wherein he steps through ever story in the Bible and shows the original Egyptian version, from which these stories originated. [5]

Ra, death, and the soul

The central conflict between science and religion is the belief that one has a soul and that when he or she dies, if they have lived a morally correct life, they will continue on to the next life or after life. This is a strong ingrained belief that about 80 percent of the world holds, in some way or another.

Hmol sciences

In modern terms, when confronted with the new view that each person is a human molecule, governed by the respective hmol sciences of human chemistry, human physics, and in particular human thermodynamics, often is the case that the person confronted with this, sometimes disturbing realization, reverts back to the olden day soul-spirit or ba-ka theory, arguing to the effect that their soul or spirit cannot be measured, quantified, or described by modern science, in particular the laws of thermodynamics, which are understood to govern all the operations of the known universe. [6]

Modern | Beliefs

The following shows modern world religions (2008) and percentages (*Time Almanac*, 2002) delineated by Ra-based faiths:

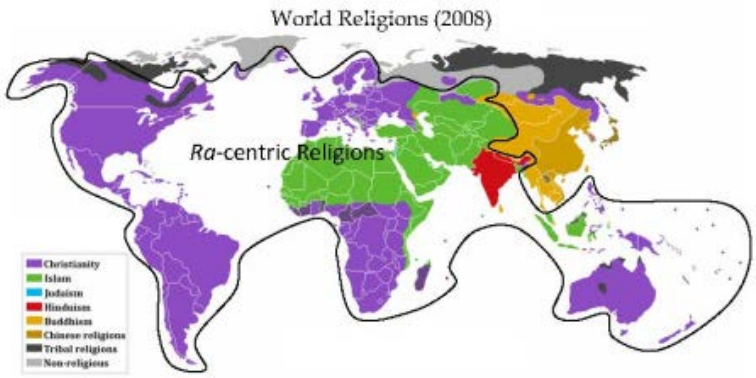

Rank	Religion	%
1	Christian	32.8
2	Muslim	19.6
3	Hindu	12.8
4	Nonreligious	12.8
5	Chinese Religions	6.4
6	Buddhist	6.0
7	Ethnic Religionists	4.2
8	Atheist	2.5
9	New Religionists	1.7
10	Sikhs	0.4
11	Jews	0.2
12	Spiritists	0.2
13	Bahais	0.1
14	Confucians	0.1
15	Jains	0.07
16	Shintoists	0.05
17	Other Religionists	0.02
18	Zoroastrians	0.005
19	Mandeans	0.0006

Religion	%
Ab-***ra***-ham Faiths	53.1
Vedic [B-***ra***-hma] Faiths	18.9
Yin-Yang Faiths	6.4
No Religion	15.3
Other	6.3

Religion by Origin	%
Ra -derived Faiths: **Nile River**	72
Yin-Yang Faiths: **Yellow River**	6.4
Other or No Religion	21.6

KEY
YELLOW = Religions derived, in part, originally from the 5 books of Moses.
TEAL = Religions derived, in part, originally from the 4 books of Veda.

(add discussion)

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2. Amen-Ra (hieroglyph) – UponReflection.co.uk.
3. Chemistry (etymology) – Wikipedia.
4. Sun (hieroglyph) – Wikipedia.
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6. Why I'm not a molecule (2009) - EoHT.info threads.
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Further reading

â— Kahl, Jochem. (2007). *Ra is my Lord: Searching for the Rise of the Sun God at the Dawn of Egyptian History*. Otto Harrassowitz Verlag.

External links

â— Ra – Wikipedia.
â— Ra religion – SacredTempleofRa.net.

θΔics

In terminology, **atheist rabbit hole** refers to the perception in reality change, and concordant action change in behavior and person hood, that accrues in the mind, of the transforming agnostic or atheist, and their beliefs or belief states, as he or she ventures into the notorious puzzling and vexing questions surrounding incongruent beliefs one was taught as child and or adhered to by the population in which one resides, in efforts to find a more accurate working model of existence; in general, the more one "denies" (see: atheism types by denial and belief), in regards to assumed "truths", asserted by religion, albeit those without any logical foundation, or evidence, and or with known mythological foundation, the deeper one will go into the rabbit hole.

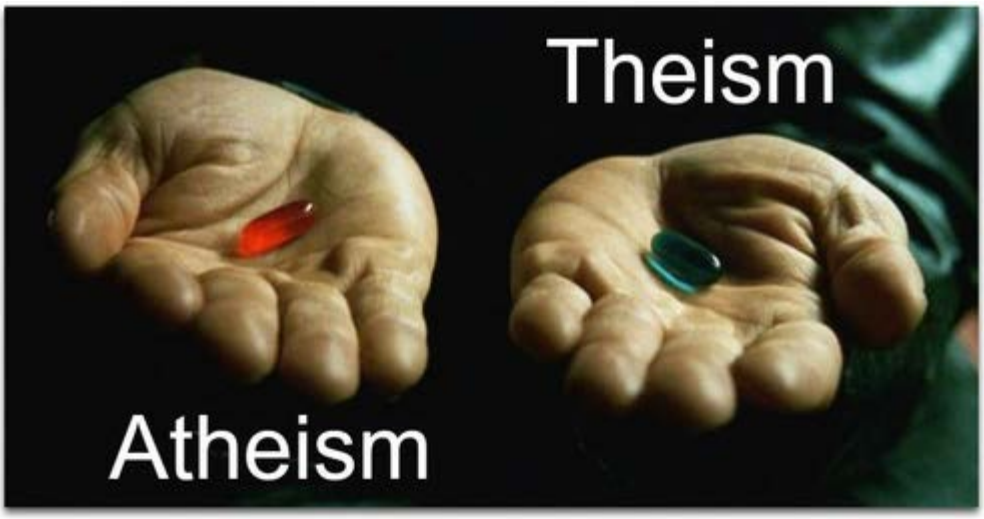

A Matrix-stylized depiction of the door into the **atheist rabbit hole**, namely, right: take the "**blue pill**", retract back to faith-based and or dogma-based notions of secular vacuous reality, and remain in what Alan Watts (Q) calls the "here kitty kitty" world of hoop jumping mentality; or left: take the "**red pill**", i.e. begin to question if what you've been told is real and what is not, and therein begin to engage into a modern reality-based philosophy as modern experimentally determined scientific method accumulated evidence indicates and as logic and reason abide.

Goethe

In 2010, Spanish director Vladimir Cruz produced the film *Afinidades* (Q), a modern day run of Goethe's immortal *Elective Affinities*, about which Corey Nuffer gives the following review synopsis: [2]

> "No wonder why the movie carries with it such an overwhelming feeling; this is a lot to convey in 90-minutes of film, no matter how well made. Adding to everything is the political dimension: Cuba is still under US embargo. Whether intended or not, the feeling of claustrophobia in Affinities seems to carry with it room to at least ponder just how deep the complexity goes. And if things weren't complicated enough, Goethe is brought up. For those interested in seeing how deep the **rabbit hole** goes, there is a nod to Goethe's Elective Affinities. While it will provide more place for traction, it will certainly be without solace for the questions brought up in Affinity, with or without Goethe, bear the mark of great art: They keep the conversation going."

(add discussion)

Schopenhauer

One example is Arthur Schopenhauer [HD:21][FA:55][TA:10], who became Germany's first open and avowed atheist, who following his transformation from born-into-culturally Lutheran Christianity, into a young adult logical atheism mindset, via Goethe, began to called all of his dogs, confusingly, by the same name: "Atma", the Hindu name for the supreme and universal soul, from which all individual souls arise, owing to his theory of individuality, which maintained that in lower animals there was little individuality (Q); the logic of which, in modern terms, being the great chain of being reductionism ideology that humans derive from hydrogen atoms [below that fermions and bosons] which have identical individuality.

Stewart

Another example is John Stewart [FA:42][TA:2] who because of his own derived godless "moral motion" philosophy, became a pacifist type of vegetarian per his new morality system.

Thims

A third example is Libb Thims [FA:42][TA:2] who purely through belief that thermodynamics is behind the prediction

and determination of reactions, whether hydrogen-hydrogen or human-human (e.g. male-female reactions), together with extensive research in religio-mythology deconstruction, in 2009 arrived at the view that a walking talking human, as a molecule, just as near-atheist Jean Sales deduced in 1789, is not "alive" anymore than is any other type of molecule, H_20, CO_2, DNA, etc., walking (see: walking molecule) or not, owing to the deduction that if one believes that one is a "living" type of matter, chemical, or molecule, then, via continuity (e.g. molecular evolution table; great chain of being) one also has to adhere to the belief that the hydrogen atom is alive, and likewise assume, concordantly, that sub-atomic particles (e.g. fermions and bosons) are alive, in some sense, which is an "absurdity", i.e. a type of panbioism belief deduction that when out of fashion with Nikola Tesla, the last semi-intelligent person to adhere to such a methodology. This deduction, along with rejection and denial of the six main "denials" of the modern extreme atheist (see: atheism types by denial and belief), is the so-called "bottom of the rabbit hole" where one comes eye-to-eye with the hydrogen atom as kin. Accordingly, debates or discussions with Thims often result in the "rabbit hole" phrase being brought up.

A noticeable repercussion of this new "rabbit hole viewpoint", being that Thims, prior to 2007-2009, during which period the question of "less-alive" smaller 4-element molecules giving rise, via chemical synthesis, to more-alive 5-element RNA-molecules, started to become absurdly paradoxical, used to spend a certain amount of time each day absorbed in thought every time he drove by a local Bohemian National Cemetery, vexed by the question of what happens to a person when the “die” from a thermodynamic point of view; after 2009, when he arrived at the defunct theory of life purview, a repercussion of which being that if one is not alive, any more than is a hydrogen atom, then one cannot die, just as a hydrogen atom cannot die, the issue left his mind, as misaligned problem, a result of cultural religious indoctrination.

Also, in 2012-2013, the JHT open review process became so clogged up with atheism rabbit hole debates that the project has sidetracked.

Depth | Debates

Of note, the debates seem to be much more vehement between two atheists already partially in the rabbit hole, e.g. atheist Karl Marx vs extreme atheist Ludwig Buchner, anti-spiritual materialism deist Ludwig Boltzmann (Q) vs avowed atheist Arthur Schopenhauer, or extreme atheist Libb Thims vs Dawkins number six atheist Philip Moriarty (see: Moriarty-Thims debate); the latter of which can be compared to Thims vs Islamic theist Mirza Beg (see: Beg-Thims dialogue), the latter of being insecure about his faith was more cautiously tentative with his scientific arguments.

Quotes

The following are related quotes:

> “There’s a point where you’re un-tethered from the beliefs of your childhood. That point came for me when it was finally clear my religion didn’t work for me. I had questions about Christianity that I could not get answered to my satisfaction, questions that I’d been asking since I was in kindergarten. I realized it didn’t feel right to me, that one question just led to another. It was like going down a **rabbit hole**, each answer provoking another question. There were things I didn’t agree with.”
>
> — Brad Pitt (2011), “Interview in *Parade magazine*” (Q), Sep [1]

> “You've got the right idea there, but the **rabbit hole** goes much deeper, for one you have to expunge the word *living* from your mindset. The idea that something can have *life* is an Egyptian theological theory, adopted via modern religions, into the mind of everyone, albeit a theory that is not supported by the science of chemistry. A person can be reactive, but not alive (nor dead); the same is true of any other atom or molecule.”
>
> — Libb Thims (2011), comment to ionrocket (Q)

> “Re: your article (Q), I don’t know if this is a **rabbit hole** you want to go down, but when you start talking about “molecular ecosystems” (things supposedly “not alive”) mixed in with the search for the “origin of life” (things supposedly “alive”) sooner or later you will run into the defunct theory of life perspective. Namely, that the concept of “life” is a type of residual mythology trying to force its way into chemistry and physics. The following links will give you some guidance on this, being that your preface is soaked with defunct anthropomorphisms (“self-propelled organic systems”, “living matter”, “emergence”, etc.). our term “self-propelled organic systems”, e.g., translates as "perpetual motion carbon-based system", which are impossible (as are all perpetual motion machines).”
>
> — Libb Thims (2012), dialogue (Q) on Jeffrey Wicken with Danish origin of life scholar Richard Egel (Q), Feb 26

References

1. McGowan, Dale. (2013). *Atheism For Dummies* (pgs. #). John Wiley & Sons.
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θΔics

In human thermodynamics, **racial thermodynamics**, or "racism thermodynamics", is the study of racism or racial separation or integration from a thermodynamic point of view.

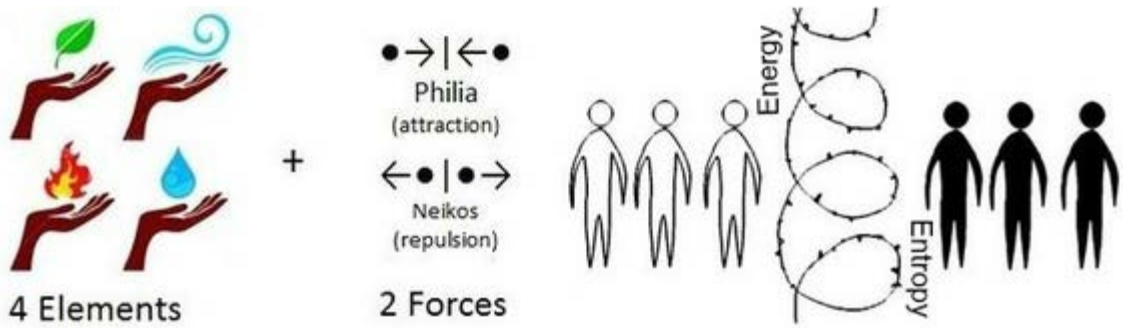

Left: an Empedoclean-depiction of people separating like oil and water owing to repulsive forces. Right: Generic graphic depicting the separation of differing groups or **races**, whether natural or forced, a process that can be studied **thermodynamically**, similar to the way physicists study how atoms in a fluid or solid will separate into a binary alloy, based on energy and entropy determinants.

Overview

In 450BC, Greek philosopher Empedocles, theorized that humans were made of mixtures of four elements (earth, air, fire, water) and two forces (attraction, repulsion), as depicted adjacent, and that these act to cause people to separate and or aggregate, similar to the way oil and water will always separate following any sort of mixing, just as will non-mixing types of humans, whereas likes will tend to attract into groups; his popular expression of this being:

> "People who love each other mix like water and wine; people who hate each other segregate like water and oil."

In other words, according to Empedocles, races, i.e. families, tribes, or nations belonging to the same stock, or classes or kinds of people unified by community interests, habits, or characteristics, who hate each other will repel and those that like each other will attract.

In modern terms, when a force moves an object, work is done; and as thermodynamics has established, work can be transformed into heat, and heat transformed into work, and humans are now known to be comprised of 26-elements, technically defined as CHNOPS+22 chemical species.

In 1990, Richard Delgado introduced the term "racial thermodynamics", in a semi-Empledoclean sense, i.e. that separations or forces of repulsions will always exist, in his view, in his so-called law of racial thermodynamics, an analogy of the conservation of energy, on the idea that the amount of racism, in any society, is always conserved in some way. [2]

In 2002, German physicist Ingo Muller was employing the term "socio-thermodynamics" as the study of racial divisions and separations in society, as discussed in his version of integration and segregation thermodynamics, with focus not necessarily on races, but on religious divisions, e.g. Protestants vs Catholics [3]

In 2005, an American bi-racial (white-black) man, in discussion with American electrochemical engineer Libb Thims, asked: [1]

> "Why are white couples more stable than black couples? How does thermodynamics explain this?"

In scientific terms, white couples and black couples would be characteristic of two different types or classifications of dihumanide molecules, i.e. two human molecules bonded in a relationship. Thermodynamically, the nature of chemical bonds between molecules is a factor of enthalpy and entropy determinants. Hence, stability variations in different groups, cultures, or races can thus be studied by entropic and enthalpic quantification methods.

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θΔics

In science, **racism** refers to the classification of the unique properties or individuals based on race or ethnicity, as well as the study of these properties, often tending to focus on interracial phenomenon and interactions.

The 1967 Academy Award winning film *Guess Who's Coming to Dinner?* was specifically scripted so that the lead male character, Sidney Poitier (above), was introduced as an "idealistically perfect" male, in all sense of the term, so that the only objection one could make to his pairing with a white female would be his **race**. The film, in this sense, is a variable controlled reaction (human chemical reaction), thus allowing one to isolate and study this one particular variable. [7]

In a sexual selection sense, there are two general "competing factors" that come into play when people from different races react together, one being the "15° rule" (opposites attract) and the "cultural cohesion rule" (likes attract). The first, according to standard model, is generally quantified as being an enthalpic factor or heat factor, the second and an entropic factor or organizational factor. The two competing factors are balanced by the regulation of the Lewis inequality and thermodynamic coupling. [14]

Terminology correctness

The term "race", and hence "racism", in modern times, seem to generally carry a derogatory connotation; and, owing to this quagmire, it is difficult to extend on to the implementation of more politically correct or rather scientifically neutral terms and terminology, although a neutral "chemical-based" labeling would seem to be able to lend some light on this subject, e.g. the finding that different human molecules (people) have different C:N:P ratios (Redfield ratios), even among closely related species and within species groups. [12]

In a thermodynamic sense, in stead of classifying individuals by race, it would seem more intuitive to classify individuals as different types of "molecular species" defined as "sets of molecules that become distinguishable in physical interaction mechanisms", according to the Ernest Grunwald molecular thermodynamics classification scheme.

15° rule

The "15° rule" states that people tend to be *most sexually attracted* to ethnicities above and below their own "latitude of ethnicity" by 15 degrees. This is based on both polled survey as to with ethnicities people tend to be most sexually attracted to and the 1990s sweaty T-shirt study, which found that people are most sexually attracted to those with the most dissimilar immune system, quantified in terms of one's major histocompatibility complex (MHC), a segment of the genome that governs immune system response. The logic here being that babies made from such parings will be less inbred and more genetically robust in the immune system structure of things. This is generally considered as being an enthalpic factor or heat factor in human chemical reactions. [14]

Cultural cohesion rule

The "cultural cohesion rule" states that individuals of the same cultural background tend to attract or aggregate owing to shared cultural values. This is generally considered to be an entropic factor or organizational factor in human chemical reactions. [14]

History

The idea of classifying people in terms of "distinct racial categories" arose in the work of the eighteenth century natural historians. [1]

The view that there exist "favored races", favored in the evolutionary sense in that some races eventually go extinct, as fossil record has shown, the Neanderthal race of humanoids being one example, seems to have come into view with the 1859 publication of English naturalist Charles Darwin's *The Origin of Species by Means of Natural Selection or the Preservation of Favored Races in the Struggle for Life*, wherein he outlined the view that life is a struggle or rather competition among and between entities, constrained by limited recourses, whereby as such some races will go on evolving, whereas some will go extinct or die out. [6]

The term racism was coined or introduced in 1936. [2]

Chemistry

In chemistry, the classification of molecules in terms of “races”, based on their mutual chemical affinities and resultant optical properties in bulk, such as in crystal structures, seems to have been introduced in 1899 by Dutch physical chemist Bakhuis Roozeboom, e.g. in the terms: racemic mixture, racemate, racemic conglomerate, true racemate, pseudoracemate, quasiracemate, etc. [3] A racemic mixture, for instance, is a mixture of equal quantities of two enantiomorphs, i.e. isomers with mirror-image molecular structures, whereby in such mixtures, because the optical activity of each component exactly cancels that of the other, the racemic mixture as a whole is optically inactive. [4]

Human chemistry

In human chemistry, the premise of classifying people as being different types of molecules seems to have been introduced by American historian Henry Adams who in 1885 stated “equivalent human molecules” will tend to attract, whereas “non-equivalent human molecules” will tend to repel, and that equivalent human molecules, in the sexual pairing sense, are one’s that mutually satisfy each other’s “cravings” and who “never sound hollow anywhere.” Adams defined the study of this subject as the science of social chemistry, which he states was a subject "yet to be created". [5]

Interracial reactions

An "interracial reaction" is a type of human chemical reaction that occurs between members of different races, and has a different energetic nature than as compared to "same-race reactions". The 1967 Academy Award winning film *Guess Who's Coming to Dinner?* gives and inside look at the issues involved in these so-called interracial reactions. The film stars Spencer Tracy, Sidney Poitier (above, right), Katharine Hepburn, and Katharine Houghton (above, left), Hepburn’s real-life niece, which tells the story of Joanna Drayton, a young upper class white American woman who has had a whirlwind romance with an up-and-coming Dr. John Prentice, a young, idealistic African American physician, who stems from a lower class blue collar family (John's father being a retired postal carrier), and the tensions and collisions that arise.

The film is a type of "controlled reaction" scenario where all variables in the reaction are held constant except race. Specifically, according to director Stanley Kramer, he and screenwriter William Rose intentionally structured the film to debunk ethnic stereotypes; the young doctor, a typical role for the young Sidney Poitier, was purposely created "idealistically perfect", so that the only possible objection to his marrying Joanna would be his race, or the fact she had only known him for ten days: the character has thus graduated from a top school, begun innovative medical initiatives in Africa, refused to have premarital sex with his fiancée despite her willingness, and leaves money on his future father-in-law's desk in payment for a long distance phone call he has made. All actors signed on to this film without reading the script, solely based on this premise.

Thermodynamics

To go through a hypothetical example, to illustrate that, in reality there do exist quantifiable differences in Gibbs free energy changes, same race reactions vs interracial reactions, suppose we were to introduce 100 single women A and a 100 single men B into a reactive system, such as a senior year high school setting, and let them react over the course of a semester (assumed to last 100 days).

To make the example realistic we will assume four different reaction scenarios: of the various possible combinations of white and black couples: (a) white - white, (b) black - black, (c) white male - black female, and (d) black male - white female. The reason we do this to get four different final state equilibrium concentrations and thus four different Gibbs free energy change measurements.

This can be explained in terms of the spontaneity criterion. Specifically, it is known that all earth-bound freely going reactions are governed by the Lewis inequality ($\Delta G < 0$), hence both interracial reactions and same race reactions can

K_{EQ}	ΔG° (kJ/mol)
0.001	17.1
0.01	11.4
0.1	5.7
1.0	0
10	−5.7
100	−11.4
1000	−17.1

A tabulated view of the nature of the greater than > or less than < zero **inequality** aspects of the standard Gibbs free energy change ΔG° and equilibrium constant K_{eq} quantification methods of reactions, expressed by the van’t Hoff equation, $\Delta G^\circ = -RT \ln K_{eq}$, for a generic reversible reaction, e.g. A + B C + D, where a large positive

be studied in terms of the variables of chemical thermodynamics. In inequality notation, the much greater than (a b) or much less than (a b) notations depict levels of spontaneity in the quantification of chemical reactions, according to the following rules:

equilibrium constant (ΔG 0) signifies a reaction that goes strongly, completely, and spontaneously in the forward direction towards the formation of products. [8]

- The notation ΔG 0 (as compared to ΔG < 0) means that the free energy change for the process is *much* less than zero and will thus be greatly spontaneous.
- The notation ΔG 0 (as compared to ΔG > 0) means that the free energy change for the process is *much* greater than zero and will thus be greatly non-spontaneous.

This much greater than and much less than notation is thus greatly relevant to the processes involved in actions of human existence, such as in falling in love or spontaneously completing a masterpiece, both of which being processes quantified by ΔG 0, which contrasts to relationship states or destruction or weakly happening processes that may be near the break-up point ΔG < 0, at the breakup point ΔG = 0, past the break up point ΔG > 0, or much past the break up point ΔG 0.

This can be expressed in terms of an equilibrium constant, or the ratio of the concentrations of products to reactants. In a reactive system of 100 single men A and a 100 single women B, each sex assumed to be the same generic type of molecule, for instance, the pairing reaction would have the form:

$$A + B \quad AB$$

and the equilibrium constant for this reaction would be:

$$K_{eq} = \frac{[AB]}{[A][B]}$$

Hence, if the value of ΔG° is negative (K_{eq} positive), termed an exergonic reaction, then the reaction will proceed from left to right, and the more negative the value of ΔG°, the further towards the right will the reaction proceed. If the value of ΔG° is positive (K_{eq} negative), termed an endergonic reaction, the reaction proceeds in the reverse direction as written or from right to left.

Couple type		Description	Percent	Mean
$W_M \equiv W_F$		White male W_M bonded to White female W_F ($W_M + W_F \rightleftharpoons W_MW_F$)	43	} 46%
$B_M \equiv B_F$		Black male B_M bonded to Black female B_F ($B_M + B_F \rightleftharpoons B_MB_F$)	49	
$B_F \equiv W_M$		Black female B_F bonded to White male W_M ($B_F + W_M \rightleftharpoons B_FW_M$)	22	} 26%
$B_M \equiv W_F$		Black male B_M bonded to White female W_F ($B_M + W_F \rightleftharpoons B_MW_F$)	30	

To summarize, in our first hypothetical case all of the men A are white and all of the women B are white; second scenario that men A are black and all the women B are

black; third scenario that all of the woman A are black and all of the men B are white; forth scenario that all of the women A are white and all of the men B are black, in each case, the couples that form being a dihumanide molecule A≡B, a distinct type of "chemical species" different from that of the single unattached human molecule.

Polled opinions of 51 people (29 men, 22 women) as to what actually would occur in four possible scenarios; the "percentage" column being the average opinion as to what percentage of the student body would be classified as being in a relationship with someone, in some way or another, at the final state (day 100) of the hypothetical school semester reaction, all reactants assumed to be unbonded, i.e. single and never been acquainted before, in the initial state (day 1). [9]

In terms of reaction extent (timeline), we will assume that the initial state is the start of the school year and that the final state is a hundred days into the school year, a point which we will assume to be in the chemical equilibrium state, wherein the forward reaction (combinations) is equally favored as the reverse reaction (dissolutions).

The equilibrium constant K_{eq} for the ***first* scenario**, i.e. for the hypothetical white male W_M white female W_F reaction system, in which 43% of the student body forms couples:

$$W_M + W_F \quad W_M W_F$$

is calculated as follows:

Initial state	Final state		Equilibrium constant	ΔG
100 A	43 AB	[AB] = 0.273	$K_{eq} = \frac{0.273}{(0.363)(0.363)}$	(kJ/mol)
100 B	57 A	[A] = 0.363		
200 species	57 B	[B] = 0.363		
	157 species		K_{eq} = 2.07	-1.78

Also shown, in the last column, is the Gibbs free energy change ΔG for the reaction, assuming the following equation holds as a valid determination of the free energy change for this reaction:

$$\Delta G = -RT \ln K_{eq}$$

where we neglect the facts that (a) we are using a gas constant-based equation for a surface attached reaction and (b) that our units are "per unit mol", whereas in human-human reaction our scenario we are dealing with about 200 human molecules, compared to 10^{27} molecules in standard "mol" units, an issue which brings into question the "hmol" units problem, and assume a room temperature reaction state of 72° F (295 K):

$$\Delta G = -\left(8.314 \frac{J}{K \cdot mol}\right)(295K) \ln K_{eq}$$

The equilibrium constant K_{eq} and free energy change ΔG for the ***second* scenario**, i.e. for the hypothetical black male B_M black female B_F reaction system in which 49% of the student body forms couples:

$$B_M + B_F \quad B_M B_F$$

is calculated as follows:

Initial state	Final state		Equilibrium constant	ΔG
100 A	49 AB	[AB] = 0.325		(kJ/mol)
100 B	51 A	[A] = 0.338	$K_{eq} = \frac{0.325}{(0.338)(0.338)}$	
200 species	51 B	[B] = 0.338		
	151 species		$K_{eq} = 2.84$	-2.56

The equilibrium constant K_{eq} and free energy change ΔG for the ***third* scenario**, i.e. for the hypothetical black female B_F white male W_M reaction system in which 22% of the student body forms couples:

$B_F + W_M \quad B_FW_M$

is calculated as follows:

Initial state	Final state		Equilibrium constant	ΔG
100 A	22 AB	[AB] = 0.124		(kJ/mol)
100 B	78 A	[A] = 0.438	$K_{eq} = \frac{0.124}{(0.438)(0.438)}$	
200 species	78 B	[B] = 0.438		
	178 species		$K_{eq} = 0.646$	-1.07

The equilibrium constant K_{eq} and free energy change ΔG for the ***forth* scenario**, i.e. for the hypothetical black male B_M white female W_F reaction system in which 30% of the student body forms couples:

$B_M + W_F \quad B_MW_F$

is calculated as follows:

Initial

state	Final state		Equilibrium constant	ΔG
100 A	30 AB	[AB] = 0.176		(kJ/mol)
100 B	70 A	[A] = 0.412	$K_{eq} = \frac{0.176}{(0.412)(0.412)}$	
200 species	70 B	[B] = 0.412		
	170 species		K_{eq} = 1.04	-0.096

The following table shows the free energy change for each reaction, ranked in descending order of spontaneity:

Couple type	ΔG (kJ/mol)		K_{eq}	Species (end state)	PΔV (species decrease)	% (couples)
$B_M \equiv B_F$	-2.56	}	2.84	151	-49	49
$W_M \equiv W_F$	-1.78	-2.17	2.07	157	-43	43
$B_M \equiv W_F$	-0.096	}	1.04	170	-30	30
$B_F \equiv W_M$	-1.07	-0.58	0.65	178	-22	22

One aspect we can note about this data is that the first reaction, i.e. the $B_M \equiv B_F$ pair forming reaction, is seems to be most enthalpically favored in the sense that it shows the most species decrease (-49) of the four hypothetical reactions, meaning that this reaction will show the greatest change in pressure-volume work PdV energy, on the factors in enthalpy change:

$$\Delta H = \Delta U + P\Delta V$$

which in turn is a factor of the free energy change:

$$\Delta G = \Delta H - T\Delta S$$

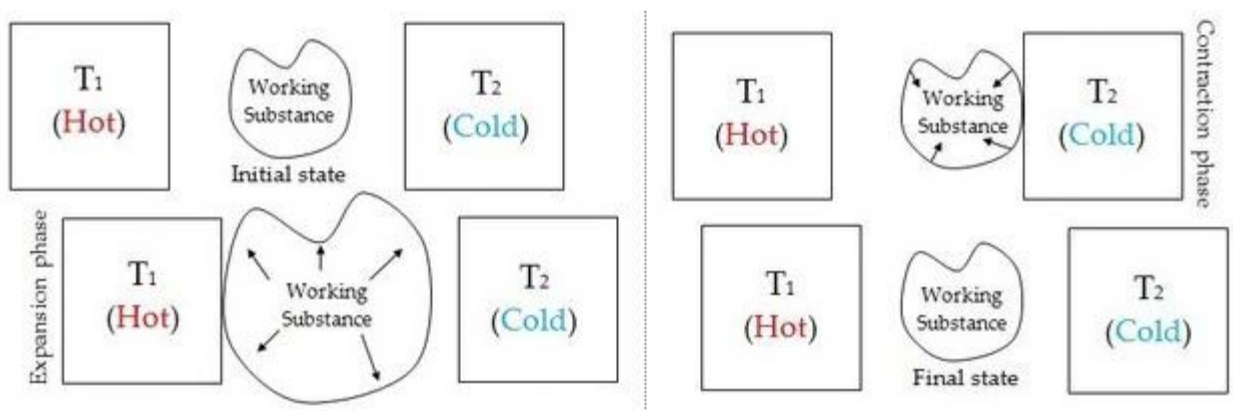

Left: the **expansion phase** of a standard heat cycle. Right: the **contraction phase** of a standard heat cycle.

To explain this "pressure volume" energy visually, if we assume, for simplicity's sake, that each species, whether single A or paired AB, has a constant volume, say of about 300 cubic meters (twice the average volume of a typical 500 square foot apartment), depicted by the following average "species volume" sized human molecular orbital:

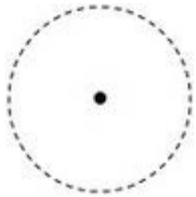

that in a situation where, say four reactant species chemically transform to yield three product species, that the system would show a volume decrease:

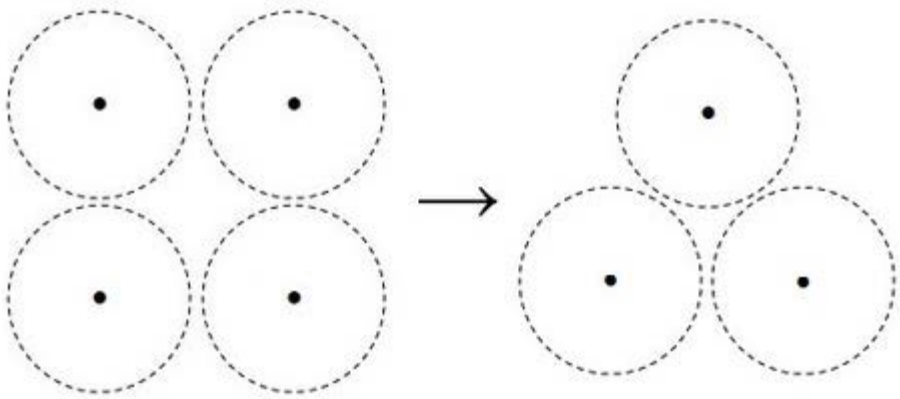

and that this system "volume decrease" would be similar to the contraction stroke of a typical heat engine cycle, wherein the working body is put in contact with a cold body, whereby resultantly a certain quantity of heat Q of removed from the working body, during which process the working body contracts according to Boerhave's law. Hence, in the freely-going surface reaction scenario, the system contraction would correspond to a specific amount of heat release ($dQ < 0$) to the effect that the reaction would be considered as being exothermic ($\Delta H < 0$).

A second fact we can discern from this data is that the same race reaction pairings, on average, seem to yield a greater negative Gibbs free energy change ($\Delta G = -2.14$), than as compared to alternate race reaction pairings ($\Delta G = -0.58$), meaning that there will be more available energy or useful energy for the production of the work, in the former as compared to the latter scenario. This so-called "cultural barrier" to reaction is generally assumed to be attributed to be a factor in the entropy change ΔS of the reaction, to the effect that pairings of "like" cultural values will result in more ordered arraignments.

Integration and segregation

See main: Integration and segregation thermodynamics

The aspect that the race-difference scenario brings into play are primarily the heightened social and cultural barriers to reaction, which is assumed to be quantified by a heightened activation energy barrier E_A to successful reaction, in a chemical thermodynamics sense, and is corroborated, in an experimental sense, by the findings of actual tested integration studies that when different cultures are forcibly mixed, likes will attract towards likes into ethnic enclaves.

To exemplify, in 2006, Venezuelan-born English chemical engineer and integration and segregation thermodynamicist Erich Muller, commented on how people are like interactive molecules in fluid systems and how individual characteristics, ethnic nuances, and social behaviors of different types of people account for the collective behaviors seen in society, similar to how oil and water will separate into like groups after mixing owing to the differences in the electromagnetic attraction and repulsion interactions of the two types of molecules. [10]

To justify his position, Muller cites the famous integration experiment done in Copenhagen, where social scientists tried to integrate the immigrant population with the otherwise homogeneous population by placing people in different parts of

the city, but where eventually, as was found, the immigrants moved together and "formed a ghetto" or local enclave. [11] Hence, we can conclude that phenomenon such as the natural spontaneous formation of ghettos or local enclaves in society form because it "works" better this way in the sense of the release of greater amounts of available energy.

Schelling segregation

An oft-cited racism theory, particularly in the human physics community, is that of American economist Thomas Schelling who in his 1969 article "Models of Segregation" showed that a small preference for one's neighbors to be of the same color could lead to total segregation. He used coins on graph paper to demonstrate his theory by placing pennies and nickels in different patterns on the "board" and then moving them one by one if they were in an "unhappy" situation. The positive feedback cycle of segregation causing increased prejudice, and prejudice increasing preference for separated living can be found in most human populations, with great variation in what are regarded as meaningful differences– gender, age, race, ethnicity, language, sexual preference, religion, etc. Once a cycle of separation-prejudice-discrimination-separation has begun, it has a self-sustaining momentum. [15]

See also

- Law of racial thermodynamics

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7. (a) Guess Who's Coming to Dinner (1967) – Wikipedia.
(b) Interracial marriage was illegal in 17 states the month of its release.
(c) The 1967 case of Loving v. Virginia legalized interracial marriage in the US.
(d) Martin Luther King, mentioned in the film, was assassinated in 1968.
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External links

- Racism – Wikipedia.

θΔics

In existographies, **Raddai Raikhlin** (1929-) (SNE:16) (CR:6), or Раддай Райхлин (Russian), is a Russian-born Israeli electronics-power engineer and social theorist noted for his 2003 book *Civil War, Terrorism and Gangs*, wherein he outlines a Prigoginean thermodynamics based theory of war, in which he utilizes concepts such as: fluctuation, bifurcation, temperature, entropy (entropy and social morals), degradation, pressure, 'links' (cohesion), force (field of forces of the hierarchy), flow (speed and pressure of flow), and ensembles: people modeled as atoms, molecules, and or quantums, among other concepts, to explain social change. [1] Raikhlin, in his preface, states that "social dynamics" was initiated by Russian-born American Pitirim Sorokin and comments that his aim will be to further this effort, summarizing the road ahead as follows:

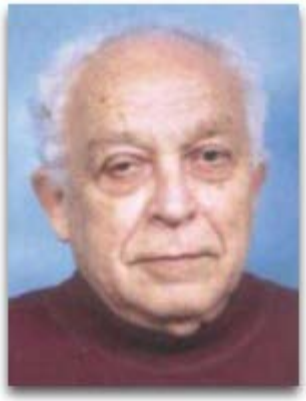

> "My conviction is that the mathematical expression of the laws of social dynamics will be similar to the laws of physics. Until then we shall have to cross a road similar to that passed by Galileo in his experiments."

Oddly, as Raikhlin seems to be unaware, Sorokin, to note, was actual vocally against social thermodynamics and human physics (see: *Contemporary Sociological Theories*, 1928), which Raikhlin seems to advocate.

Overview

In the late 1980s, Raikhlin switched from electronics-power engineering to sociology. His first book in this direction was the 1991 *The Theory of Automata* (in Russian), wherein examined personality types he called an 'automaton', its features and behavior, as well as the characteristics of a society that may be formed by such personalities. His second book *Fashion*, focused on social cohesion, discipline, and human behavior, including such social manifestations as fashion styles, dances, religion ceremonies, art and literature, etc.

A 1999, about the Internet, Raikhlin's was disseminating his newly-forming social-economic ideas on social temperature and entropy as follows: [2]

> "I am new working successfully on the theme thermodynamics of irreversible processes which I believe describe fully the behavior of society and constitutes the scientific basis for sociology and economics. Entropy and temperature are thermodynamic parameters characterizing society and its behavior and we better get acquainted with them. What I expect? According to the laws of thermodynamics the entropy of society grows constantly and it takes a revolution with repression or war to reverse process. If we take US data for example, since the end of the Civil War until today (with the exception of the Second World War) entropy should be increasing. Since these growth of entropy cannot continue indefinitely, bifurcation sets in, i.e., a kind of civil war, but we cannot predict accurately when this will be. Such an event is dictated by fluctuation. However, another unrest of blacks like the one that shook Los Angeles would become the trigger of such bifurcation and the start of a new civil war in the US."

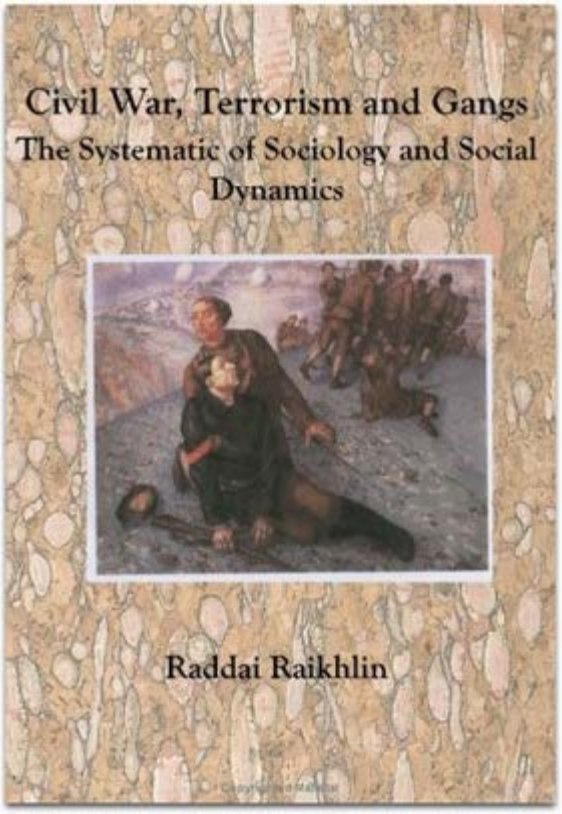

Raikhlin's 2003 *Civil War, Terrorism and Gangs*, wherein he outlines his thermodynamics of sociology theory. [1]

These ideas came to fruition in the publication of his 2003 *Civil War, Terrorism and Gangs*, which although out of print, seems to be a robust and original presentation, utilizing concepts such as personal space, Erwin

Schrodinger's *What is Life?*, to name a few, and in which he tells how he came to first communicate his new social thermodynamics theory: [1]

> "[On social] dynamics, I received a letter from an American physicist. He asked me how I measured cohesion, and I replied honestly that I didn't know. This stimulating physicist was the first person to whom I communicated my idea of introducing the thermodynamics of irreversible systems in order to describe the behavior of society."

Raikhlin's 2010 *Military Sociology: Collapse of the Israel Defense Forces*, seems to be a Machiavellian-themed continuation of this social thermodynamics theory, with chapter section such as: Golem (see: clay creation myth), entropy of the personality, war is bifurcation, rise and fall of civilizations, etc., along with Pitirim Sorokin's statement that Italian philosopher Niccolo Machiavelli was the first advance the idea of the cyclic development of societies. [4]

Education

Raikhlin completed his BS in electronics engineering in 1953 at the Naval Academy after which he studied at Moscow University and Moscow Power Engineering Institute, completing his PhD in 1964. He then received a patent for a method of receiving and transmitting gravitation waves. In 1973, Raikhlin immigrated to Israel, and worked for a number of years at the Israel Institute of Technology, prior to switching to sociology.

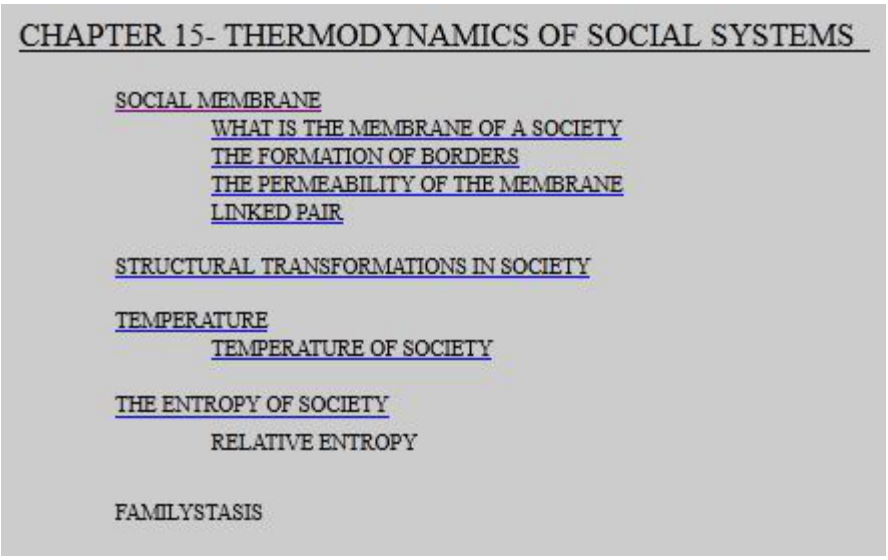
CHAPTER 15- THERMODYNAMICS OF SOCIAL SYSTEMS

SOCIAL MEMBRANE
- WHAT IS THE MEMBRANE OF A SOCIETY
- THE FORMATION OF BORDERS
- THE PERMEABILITY OF THE MEMBRANE
- LINKED PAIR

STRUCTURAL TRANSFORMATIONS IN SOCIETY

TEMPERATURE
- TEMPERATURE OF SOCIETY

THE ENTROPY OF SOCIETY
- RELATIVE ENTROPY

FAMILYSTASIS

The circa 2001 online-version contents of the end chapter 15 "Thermodynamics of Social Systems" for Raikhlin's *Civil War, Terrorism and Gangs*, which seems to highlight that Raikhlin is well-attuned to the difficult "boundary problem" (see: boundary, chimpanzee war) of human thermodynamics. [5]

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5. Contents (Civil War, Terrorism and Gangs) – Raikhlin.co.il.

External links

- Home – Raikhlin.co.il.
- Site comments (contact info) – Raikhlin.co.il.
- Raikhlin, Raddai – WorldCat Identities.

In thermodynamics, **radiation thermodynamics** is the study of the interaction of electromagnetic energy with physical systems. The subject originated in the study of black bodies and cavity radiation. Developers of this subject include Gustav Kirchhoff, Wilhelm Wien, Josef Stefan (Boltzmann's mentor), John Strutt, James Jeans, Heinrich Hertz, Philipp Lenard, Max Planck, Albert Einstein, Niels Bohr, Arthur Compton, Arthur Eddington, Karl Schwarzschild, among others. [1]

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Further reading

â— Nigam, Amar N. (1997). "Planck's Radiation Thermodynamics and its Consequences: Laue's thermodynamics of Interference", *Current Science*, 73(10): 885-91.

θΔics

In existographies, **Radu Chisleag** (1940-) (SNE:15) (CR:19) is a Romanian physicist noted his 2003 to present human quantum mechanics theory, co-developed later with his daughter Romanian mathematician and lawyer Roxana Chisleag (2011), wherein they applied quantum mechanics, specifically the tunneling effect, to analysis of crossing of social barriers and financial relationship jumps, modeling a human as a quantum particle. [1]

Physics-to-economics correspondence table

The following is Chisleag's 2012 human thermodynamics variables table or physics-to-economics "correspondence" table as he calls it: [2]

Physics-to-Economics Correspondence Table	
Particle	Individual; payer, broker, hedger
Energy	Energy, capability, potential, maximum credit permitted the individual to engage in a process.
Kinetic energy	Capacity of the individual to act at a given stage of the process.
Potential energy	Energy used by the individual to jump in the other region (on the potential step.
Mass	Inertia of the individual.

Chisleag goes on to apply the Schrodinger equation of Erwin Schrodinger and the de Broglie waves of French physicist Louis de Broglie to the situation where "some individuals, even having been granted the right to act, are rejected at the step".

In conclusion, Chisleag comments the following about how stock market players might be bosons or fermions:

> “A special class of barriers, of those having an axis of symmetry (symmetrical potential), is very important because the solutions of the Schrodinger equation spit themselves in two distinct classes: symmetrical and anti-symmetrical solutions. As is shown in quantum statistics the symmetrical solutions are describing the behavior of bosons (system particles able to occur in any number in a givens state) and fermions (system particles that can occur in different states only). This distinction between bosons and fermions would be important for players, eventually corresponding to those cooperating or respectively competing.”

This comment brings to mind Americans sociologist Ed Stephan’s 1977 discussions with physicist Louis Barrett on the physics behind the forces shaping populations, speculating on questions, such as: 'whether humans were fermions or bosons'. Chisleag also speculates that the Heisenberg uncertainty principle "may be valid in social and human behaviors."

In 2012, Radu, in his “A Socio-Physical Approach to Taking Decisions in Social Conflict”, together with Ioana-Roxana Chisleag, outline what they call the “socio-physical approach”, namely the use of the standard physics models: principle of objectivity of the laws of physics, conservation principles, laws of motion, inertia, action and reaction, principle of superposition of forces, to analyze decision making in social conflicts, specifically the conflicts amid the “RoÅŸia MontanÄƒ Project”, a joint venture between RoÅŸia MontanÄƒ Gold Corporation and the Romanian State, in respect to the legislation of mining precious minerals out of the land of Romania; the following are noted quotes:

> “If human society be considered as being composed of a set of members, people or humans – individuals - relatively alike and equal between them, the principles of operation of such a society be somewhat similar

to the principles of macroscopic classical physics, which apply to bodies composed of many molecules. The laws of physics, as applied to social life, may be considered as acceptable postulates in the socio-physical analysis, being based on pragmatic verification by general and specific social experience."

Then, skipping some discussion of how Newton's laws theoretically apply socially, the give following superposition of social forces equation:

$$\sum_{i=1}^{n} \vec{F_i} = m\vec{a}$$

where if several forces F are acting on a body of mass m at the same time, each force produces its own acceleration *a* independently of the presence of the other forces, the resultant acceleration will be the vector sum of the individual accelerations. They surmized that this corresponds, socially, to a postulate of superposition of social actions involved in a social process, which they say would be useful in the multi-dimensional modelling of various social phenomena and forms of cooperation or confrontation, such as: negotiation, alliance, association between partners, in understanding the actions of classification and maintaining secrecy, diversion or lobbying, activity of inner city gangs, peer groups, cliques, political parties, secret societies or mafia-type gangs.

Education

Chisleag completed his BS in 1956 at National College, Iasi, graduating valedictorian, after which he completed his MSc in physics in 1962 at the University of Lasi. In 1968, he completed a M Leg in international law at the University of Bucharest. In 1971, Chisleag was accepted into the the doctoral school of MIT and offered a fellowship by MIT, US Atomic Energy Commission and NSF, but his admission was stopped due to political reasons by Romanian authorities. In 1991, Chisleag completed his PhD in physics, with a dissertation "Contributions to the Study of Defects by Holography", on Optics and Spectroscopy, at the University of Lasi. In 1998, Chisleag completed an MBA, in international finance, at the University of Quebec, Montreal and at ASE Bucharest. From 1969 to 1981, the completed post graduate courses in mathematical modeling, programming, management science, solar and systems theory, at UB and PUB. Chisleag is a certified translator of English, Russian, French, and Romanian. In 2012, Chisleag was listed as physics professor at the Faculty of Applied Sciences, at the Polytechnic University of Bucharest, Romania.

References

1. Chisleag, Radu and Losada, Ioana-Roxana C. (2011). "Socio-optics: Optical Knowledge Applied in Modeling Social Phenomena" (abs), Proceedings Paper, International Conference on Applications of Optics and Photonics, Jul 25, SPIE Proceedings Vol. 8001.
2. Chisleag, Radu. (2012). "A Quantum Model May Explain the Infringement of Some Financial Rules in Spite of Stiff Supervision" (GB), in: *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (editor: Gheorghe Savoiu) (§6, pgs. 79-89; correspondence table, pg 81). Associated Press.
3. (a) Chisleag, Ioana-Roxana, Chisleag, Radu. (2014). "A Socio-Physical Approach to Taking Decisions in Social Conflicts, Part One: Suitability of the Rosia Montana Project (pdf), *Econophysics, Sociophysics, and Other Multidisciplinary Sciences Journal*, 4(2):4-34.
(b) Chisleag, Ioana-Roxana, Chisleag, Radu. (2014). "A Socio-Physical Approach to Taking Decisions in Social Conflicts, Part Two: Socio-Physics Models in Negotiating and in Promoting 'Rosia Montana' Project" (pdf), *Econophysics, Sociophysics, and Other Multidisciplinary Sciences Journal*, 4(2):50-55.

Further reading

â— Chisleag, Radu. (2003). "A Quantum Mechanical Model to Explain the Infringement of Barriers Impeding International Relations", CD-Rom, Proceedings of the Eci & E4 Conference "Enhancement of the Global Perspectives for Engineering Students", Tomar, Portugal, April 6-11, in: *ECI Symposium Series* (editors: Carl McHargue University of Tennesse, USA and Elanor Baum, Cooper Union, USA), Volume P03.

θΔics

In existographies, **Rafael Magiotti** (1597-1656) (CR:6), aka "Rafaello Magiotti", was an Italian astronomer, mathematician, and physicist, noted for his coordination in the Berti vacuum experiment (c.1639). []

Associates

Magiotti was associated with Galileo, whom he communicated with, and Gasparo Berti, whom he did experiments with.

Quotes | On

The following are quotes on Magiotti:

> "Galileo's *Discourse* arrived in Rome in Dec 1638 and greatly excited the members of this circle of **Rafael Magiotti**, Evangelista Torricelli, and Gasparo Berti. Waard (c.1935) (Q), who has examined all the relevant documents, is of the opinion that *Discourse* stimulated Magiotti to suggest a more convenient experiment that that with the siphon to study the production of a vacuum."
>
> — William Middleton (1964), *The History of the Barometer* [1]

> "Galileo's ideas reached Rome in 1638 in his *Discorsi*. **Rafael Magiotti** and Gasparo Berti were excited by these ideas, and decided to seek a better way to attempt to produce a vacuum than with a siphon. Magiotti devised such an experiment, and in 1641 Berti, with Magiotti, Athanasius Kircher and Nicolo Zucchi present, carried it out. The experiment consisted of filling with water a long tube that had both ends plugged up, then placing the tube into a basin already full of water. The bottom end of the tube was opened, and the water that had begun inside of it poured out of the bottom hole into the basic. However, only part of the water in the tube flowed out, and the level of the water inside the tube stayed at a precise level, which happened to be thirty-four feet, the exact height Baliani and Galileo had observed limited a siphon (Middleton, 1964). What was most important about this experiment was that **the lowering water had left a space above it in the tube** which had had no intermediate contact with air to fill it up. This seemed to suggest the possibility of a vacuum existing in the space above the water. The space above the water had to be explained, but the Aristotelians wouldn't stand for the existence of a vacuum. They sought to reject the vacuum and present alternate explanations. It was obvious that light was transmitted through the space in the tube (since objects behind the tube could be seen through it), and it was commonly believed that light could not travel through a vacuum, so the space could not contain a vacuum. In addition, Kircher devised the idea of using a magnet outside the tube to drop a hammer inside the tube onto a bell inside the tube. Since it was agreed by all that sound could not travel through a vacuum, then if the bell's ring was heard, the space could not be a vacuum. Sure enough, the experiment was later done with a bell, and a sound was heard. This was sufficient for the Aristotelians to show that there was not a vacuum there, but then they still needed to explain what exactly was in the space above the water in the tube."
>
> — Anon (2001), "History of the Barometer" [2]

> "A group comprising Giovanni Baliani, Gasparo Berti, Isaac Beeckman, Rene Descartes, Athanasius Kircher, **Rafael Magiotti**, Emmanuel Maignan, Jean Rey, Vincenzo Viviani, Nicolo Zucchi (Q), Michelangelo Ricci and of course Evangelista Torricelli and Galileo Galilei were debating these matters, concerning the existence or non-existence of a vacuum or whether air had weight and exerted pressure, earnestly in the early 1600s in Italy; the development of the barometer was not done alone by Torricelli working alone."
>
> — Ian Strangeways (2003), *Measuring the Natural Environment* (pg. 91)

References

1. Middleton, William E. (1964). *The History of the Barometer* (pg. 10) (Amz). Publisher.
2. (a) Middleton, William E. (1964). *The History of the Barometer* (pg. 12) (Amz). Publisher.
(b) Anon. (2001). "History of the Barometer' (Q), Strange-Loops.com.

External links

- Raffaello Magiotti – Wikipedia.
- Raffaello Magiotti (about) – IMSS.fi.it.

θΔics

In systems, **Rain barrel model** refers to a chemical thermodynamics "system" conception of of society, devised by American sociologist Ed Stephan, in dialogue with physicist Louis Barrett and chemist George Gerhold, where society—shown adjacent, original 1995 model (with 2013 Thims re-annotations)—is depicted as a semi-open physicochemical system, the first visual model, as seems to be the case, to show social chemical potential description, i.e. internal energy (or Gibbs energy) changes concordant with immigration and migration. [1]

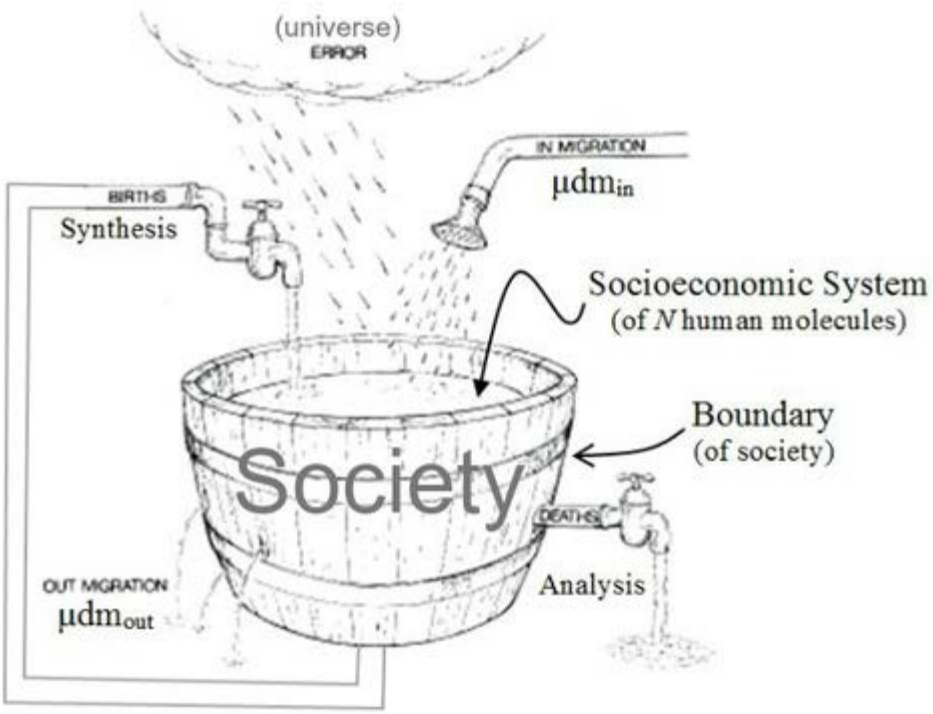

An annotated version of the **Stephan social system**, original version (1995), drawn by Allan Parker (O), based on the mental conceptual model of Ed Stephan, annotations by Libb Thims (2013), which shows the chemical potential of humans (human molecules) entering or leaving a hypothetical semi-open boundaried chemical thermodynamics conceptualized social system.

Discussion

(add)

See also

- Social beaker model (see: Mirza Beg)
- Estate
- Physicochemical sociology
- Retort
- Social retort
- Test tube

References

1. (a) DRL gif (image) – EdStephan.org.
(b) Photos – EdStephan.org.

θΔics

In religio-mythology, **Raising of Lazarus**, aka “Resurrection of Lazarus”, as found in the Bible, as told in John 11:1-14, is the miracle story of the resurrection of a man named Lazarus or "El-Asar", who had been dead for three days, by Jesus, done in the presence of two Mary figures (Martha and Mary), aka Mert goddesses, which is the Roman recension (see: recension theory) re-telling of the story of the raising of Osiris, from the dead by Horus, such as is told and depicted on the walls of the Dendera Temple (38AD), which is itself a re-write and or synretism of the "raising of Orion" constellation, as told in the story of the astro-theology god Sah. [1]

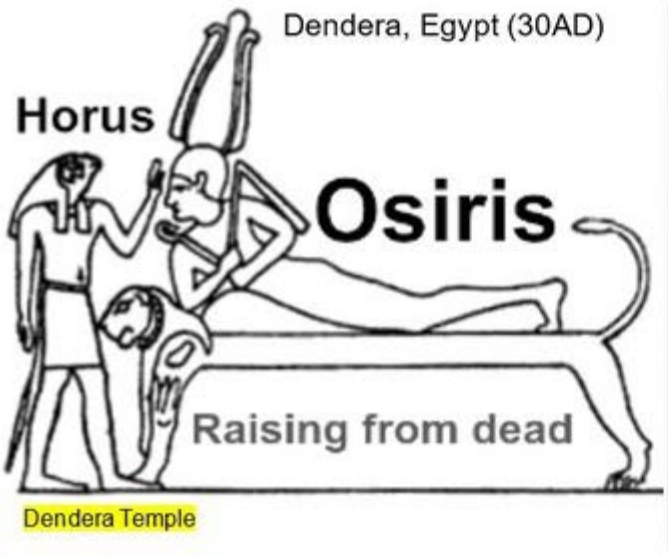

Left: a 30AD visual, carved in stone, depiction of the “Raising of Osiris” from the dead, found at Dendera Temple, in nome 6 of Upper Egypt. Right: a 550AD mosaic of the “**Raising of Lazarus**”, found at the Church of Sant’Apollinare Nuovo (Q), in Ravenna, Italy. The latter is but a Roman recension version of the former. [1]

Overview

The raising of Osiris "by Horus", in Egyptian mythology, is something that postdates the raising of Osiris by the combined powers of both "Isis, Thoth, and Nephthys", as told in the famous Passion of Osiris (3,100BC) myth. The following, to situate things into context, is a 30AD stone-carved depiction, from the Dendera Temple, of the resurrection of Osiris by a pharaoh-like looking man, with an Ankh in his hand, whom Wallis Budge (1904) refers to as an unidentified "bearded god", shown raising Osiris from the dead (see: death and resurrection of Osiris) out of a bowl (or lotus flower), or some shape to this effect:

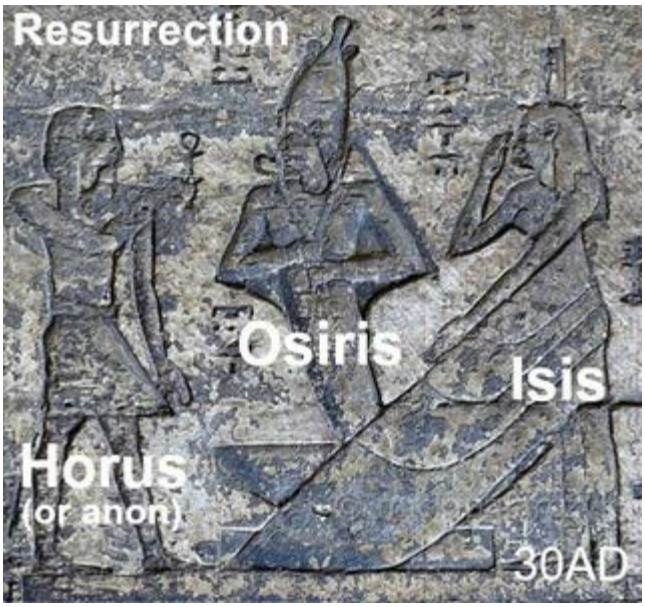

The following, similarly, shows the same story, from a Bas-Relief at Philae (250BC), below left, compared to the Roman recension version of the same story, showing Jesus raising Lazarus from the dead using a magic rod of some sort, from a gravestone of Datus (300AD):

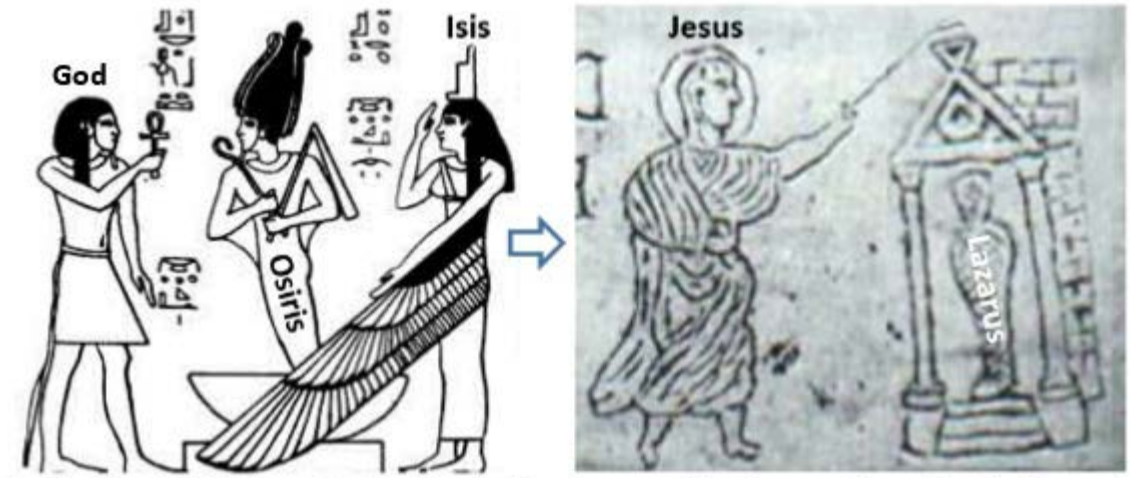

God raising **Osiris** from **dead using Ankh**
Bas-Relief at Philae | 250BC

Jesus raising **Lazarus** from **dead** using **rod**
Gravestone of Datus | 300AD

In the Bible, (300AD), a total of ten people are raised from the dead, three of whom, including the character "Lazarus", are raised by Jesus personally: [1]

1. Widow of Zarephath's son (by Elijah) [1st Kings 17:22]
2. Shunammite woman (by Elisha) [2nd Kings 4]
3. Anon man (by the bones of Elisha) [2nd Kings 13]

    4. Widow of Nain's son (by *Jesus*) [Luke 7]
    5. Jairus' daughter (by *Jesus*) [Luke 8]
    6. **Lazarus** (by *Jesus*) [John 11]

7. Jesus (by god) [Matthew 28:6; Acts 2]
8. Dorcas (by Peter) [Acts 9]
9. Eutychus (by Paul) [Acts 20]

Not to mention a whole slew of saints that arose from the dead when Jesus died on the cross [Matthew 27:52].

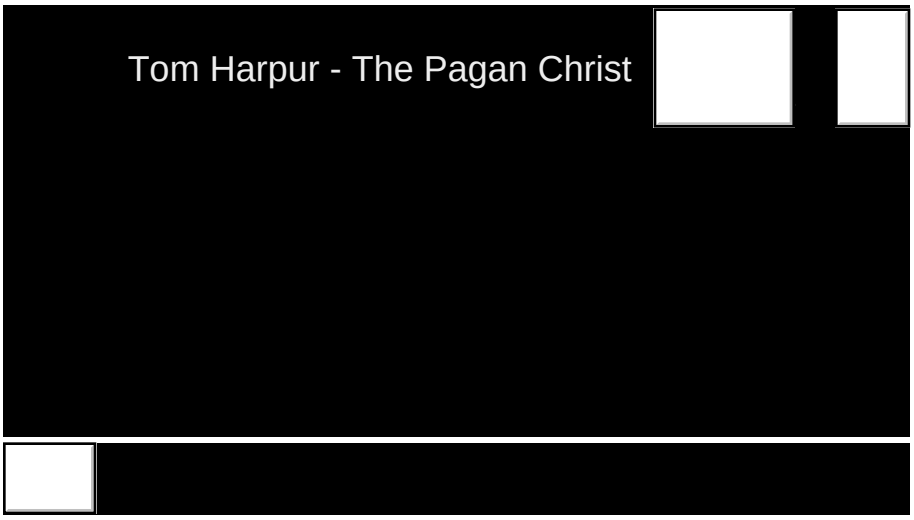

A 2004 interview of Tom Harpur expressing his surprise at the finding that the "Raising of Lazarus", as told in the Bible, was a language-reworded monotheistic retelling of the "Raising of Osiris" by Horus. [3]

Quotes

The following are related quotes:

> "One thing is clear—the Mythos of the Hindus, the Mythos of the Jews, and the Mythos of the Greeks, are all, at the bottom, the same; and what are called their early histories are not the histories of man, but are contrivances under the appearance of histories, to perpetuate doctrines, or perhaps the history of certain religious opinions, in a manner understood by those only who had a key to the enigma. Of this we shall see many additional proofs hereafter. The histories of Brahma, of Genesis, and of Troy, cannot properly be called *frauds*, because they

were not originally held out as histories; but as the covers for a secret system. But in later times they were mistaken for history, and lamentable have been the effects of the mistake. The history of **Lazarus** in the Gospel is not true, but it is not a fraud."

> — Godfrey Higgins (1833), *Anacalypsis, Volume One* (pg. 441); cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 30)

"The rod [magic wand] that is waved by Jesus at the **raising of Lazarus** is the symbolic scepter [Ankh] in the hand of Horus when he raises the Osiris. Those who are present in this scene are Osiris, Isis, Nephthys, and Horus the reconstituter of the father, and these, are the prototypes or original characters of Lazarus, Mary, Martha, and Jesus in the scene of the resurrection at Bethany."

> — Gerald Massey (1907), *Ancient Egypt, the Light of the World* [4]

"Imagine my surprise at discovering, during the research for *The Pagan Christ*, that Martha and Mary figure in a story about the **raising** from the dead of El-Asar, **Lazarus**, at an Egyptian Bethany about four-thousand years ago."

> — Tom Harpur (2004), *The Pagan Christ* [2]

References

1. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs; Lazarus, pgs. 269-71). Publisher.
2. Harpur, Tom. (2004). *The Pagan Christ* (pg. 6). Thomas Allan Publishers.
3. Gregg, Allan. (2004). "Tom Harpur: On the Pagan Roots of Christianity" (Q)(Q), Tvo.org, Sep.
4. Massey, Gerald. (1907). *Ancient Egypt, the Light of the World: A Work of Reclamation and Restitution in Twelve Books, Volume 2* (§: The Group in Bethany, pgs. 849-51). T.F. Unwin.

External links

- John 11:1-14 – BibleGateway.com.
- Raising of Lazarus – Wikipedia.

θΔics

In thermodynamics, **Ralph Baierlein** (1936-) is an American thermal physicist noted for his 1999 book *Thermal Physics*, which presents the subject of thermal physics in the form of a fairly decent blend of particle physics, e.g. fermions and bosons and low temperatures, statistical mechanics, e.g. multiplicity, and chemical thermodynamics, e.g. free energies and chemical potentials. [1] His 2000 article "The Elusive Chemical Potential" has interesting discussion on the energetics school, Wilder Bancroft (who he says coined the term "chemical potential" after Gibbs), and Wilhelm Ostwald. [2]

Education

Baierlein completed his BS in physics at Harvard and his PhD in thermal physics at Princeton in 1962. In 1999, he was a physics professor at Wesleyan University, Connecticut. Currently, he teaches thermal physics at Northern Arizona University.

References

1. Baierlein, Ralph. (1999). *Thermal Physics* (pg. 27). Cambridge University Press.
2. Baierlein, Ralph. (2000). "The Elusive Chemical Potential", *American Association of Physics Teachers*, Oct.

Further reading

â— Ralph Baierlein (faculty) – Northern Arizona University.

θΔics

In existographies, **Ralph Cudworth** (1617-1688) (IQ:160|#544) (Cattell 1000:568) (FA:43) (CR:28) was an English philosopher noted for his 1678 *True Intellectual System of the Universe: Wherein All the Reason and Philosophy of Atheism is Confuted, and Its Impossibility Demonstrated, with a Treatise Concerning Eternal and Immutable Morality*, wherein he touches on an early form of panbioism and refutes the atomic atheism theories of those including Pierre Gassendi.

Hylozoism

In 1678, Cudworth, in his *True Intellectual System of the Universe*, supposedly, introduced the concept of hylozoism, from the Greek *hyle* "matter" and *zoe* "life", a type of panbioism, arguing something to the effect that all matter is alive or the universe is alive, or something along these lines. [1]

Empedocles

On Empedocles, Cudworth, in his *The True Intellectual System of the Universe* (pg. 80), has the following to say:

> "If Aristotle does not misrepresent Empedocles, as he often doth Plato, then it must be granted, that he being a mechanical physiologer, as well as theologer, did something too much indulge to fortuitous mechanism; which seems to be an extravagancy, that mechanical philosophers and atomists have been always more or less subject to. But Aristotle doth not charge Empedocles with resolving all things into fortuitous mechanism, as some philosophers have done of late, who yet pretend to be theists and incorporealists, but only that he would explain some things in that way. Nay, he clearly puts a difference betwixt Empedocles and the Democritic atheists, in these words subjoined: [Greek], etc. which is as if he should have said, 'Empedocles resolved some things in the fabric and structure of animals into fortuitous mechanism; but there are certain other philosophers, namely, Leucippus and Democritus, who would have all things whatsoever in the whole world, heaven, and earth, and animals, to be made by chance and the fortuitous motion of atoms, without a deity.' **It seems very plain, that Empedocles's Philia and Neikos, his friendship and discord, which he makes to be the [Greek], the active cause,—and principle of motion in the universe, was a certain plastic power, superior to fortuitous mechanism; and Aristotle himself acknowledges somewhere as much**. And Plutarch tells us, that, according to Empedocles, the order and system of the world is not the result of material causes and fortuitous mechanism, but of a divine wisdom, assigning to everything [Greek] not such a place as nature would give it, but such as is most convenient for the good of the whole."

(add discussion)

Gassendi

In 1648, Pierre Gassendi, in his Arr*angement of the Philosophy of Epicurus*, stated the following:

> "But because men may yet be puzzled with the universality and constancy of this regularity, and its long continuance through so many ages, that there are no records at all of the contrary anywhere to be found; the **atomic atheist** further adds, that the senseless atoms, playing and toying up and down, without any care or thought, and from eternity trying all manner of tricks, conclusions and experiments, were at length (they know not how) taught, and by the necessity of things themselves, as it were, driven, to a certain kind of trade of artificialness and methodicalness; so that though their motions were at first all casual and fortuitous, yet in length of time they became orderly and artificial, and governed by a certain law, they contracting as it were upon themselves, by long practice and experience, a kind of habit of moving regularly; or else being, by the mere necessity of things, at length forced so to move, as they should have done, had art and wisdom directed them."

Cudworth refutes this quote. [3] Later, to note, Charles Peirce (Ñº) also cites this quote. [3]

Atheism

Although Cudworth's 1678 efforts were to refute atheism, specifically that of Gassendi, he was thereafter himself later "charged" with being an atheist, specifically by John Turner (c.1649-1710) in his *Discourse Concerning Messias* (1685); a labeling issue that was touched on by Anthony Collins (1713), in the sense that anyone who "make the material universe to be the eternal being or god" is an argument "wherein consists the essence of atheism".

Quotes | On

The following are quotes on Malebranche:

> "Those who wish to form an idea of the shackles imposed by theology on the genius of philosophers born under the 'Christian dispensation', let them read the **metaphysical romances** of Leibniz, Descartes, Malebranche, **Cudworth**, etc., and coolly examine the **ingenious but rhapsodically** systems entitled: the pre-established harmony of occasional causes; physical pre-motion, etc."
>
> — Baron d'Holbach (1770), *The System of Nature* (pgs. 51-52)

> "**Cudworth**, in his *System Intellectual* (§2), reckons four species of atheists among the ancients:
>
> 1. The disciples of Anaximander, called Hylopathians [Anaximanderian atheists], who attributed the formation of every thing to matter, destitute of feeling.
> 2. The atomists [atomic atheists], or the disciples of Democritus, who attributed every thing to the concurrence of atoms.
> 3. The stoical atheists, who admitted a blind nature, hut acting under certain laws.
> 4. The Hvlozoists [hylozoic atheists], or the disciples of Strato, who attributed life to matter.
>
> It is well to observe, that the most learned natural philosophers of antiquity have been atheists, either openly or secretly; but their doctrine was always opposed by the superstition of the uninformed, and almost totally eclipsed by the fanatical and marvelous philosophy of Pythagoras, and above all by that of Plato."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 304)

> "There has been a considerable number of those whom history calls 'atheists'. Leucippus, Democritus, Xenophanes, and others of the Atomistic and Eleatic schools (Ñº), are said to have been such. In his *Intellectual System*, **Cudworth** puts into this category Seneca and the younger Pliny among the Romans. Since the reformation, such men as: Rabelais, Machiavel, Bruno, Vanini, D'Alembert, Diderot, Buffon, Condorcet, Mirabeau, La Place, Frederic II, and even Pope Leo X, have been charged with atheism."
>
> — Willis Lord (1875), *Christian Theology for the People* (pg. 67)

Quotes | By

The following are quotes by Cudworth:

"Anaximander was the chief of the old atheistic philosophers."

— Ralph Cudworth (1678), *The True Intellectual System of the Universe* (pg. #)

References

1. (a) Hylozoism – Wikipedia.
(b) Rucker, Rudy. (2008). "Everything is Alive", Submitted to the Kyoto 'What is Life' Conference October 2007; RudyRucker.com.
2. Gassendi, Pierre. (1649). *Arrangement of the Philosophy of Epicurus* (*Syntagma Philosophise Epicuri*), in: *Volume 3 of Works* (sect. 3. cap. 7. p. 38). Publisher.
3. Cudworth, Ralph. (1678). *True Intellectual System of the Universe: Wherein All the Reason and Philosophy of Atheism is Confuted, and Its Impossibility Demonstrated, with a Treatise Concerning Eternal and Immutable Morality, in Three Volumes* (translator: John Harrison) (vol. 2, pg. 599). Thomas Tegg, 1845.

External links

â— Ralph Cudworth – Wikipedia.

θΔics

In existographies, **Ralph Emerson** (1803-1882) (IQ:175|#214) (Cattell 1000:408) [RGM:286|1,500+] [HD:23] (FA:115) (CR:39) was an American philosopher, noted for his advocacy and promotion of Goethe in America, and for his 1877 "Perpetual Forces" article, penned at age 74, wherein he he gives a very sharp take on the relations of material power, moral power, and the various "streams of forces" that act on the elements, plants, animals, and people.

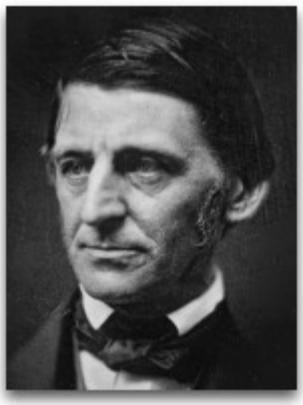

Material power | Moral power

Emerson, scatter in about five places in his 12-volume Collected Works, dug thematically at the premise that "moral power" is but a higher level form of "material power", and that the former always lags behind the latter in development, understanding, and application; the main statement on this are as follows:

> "Moral power has not kept pace with material power."
>
> — Ralph Emerson (c.1870) aggregate quote, in index of *Volume 12* (Q); in: *Complete Works, Volume 7* (material power, pg. 166; moral power, 190), Volume 8 (moral power, pg. 316), Volume 10 (moral and material power, pgs. 64; material forces, 72)

> "It is too plain that with the material power the **moral progress** has not kept pace. It appears that we have not made a judicious investment. Works and days [of Hesoid] were offered us, and we took works."
>
> — Ralph Emerson (c.1875), "Works and Days" (Q); in: *Complete Works, Volume 7* (pg. 166)

> "We owe to books those general benefits which come from high intellectual action. Thus, I think, we often owe to them the perception of immortality. They impart sympathetic activity to the **moral power**."
>
> — Ralph Emerson (c.1875), "Books"; in: in: *Complete Works, Volume 7* (pg. 190)

> "Since everything in nature answers to a **moral power**, if any phenomenon remains brute and dark, it is that the corresponding faculty in the observer is not yet active."
>
> — Ralph Emerson (c.1875), *Publication* [8]

> "Meantime we hate sniveling. I do not wish you to surpass others in any narrow or professional or monkish way. We like the natural greatness of health and wild power. I confess that I am as much taken by it in boys, and some-times in people not normal, nor educated, nor presentable, nor church-members, — even in persons open to the suspicion of irregular and immoral living, in Bohemians, — as in more orderly examples. For we must remember that in the lives of soldiers, sailors and men of large adventure, many of the stays and guards of our household life are wanting, and yet the opportunities and incentives to sublime daring and performance are often close at hand. We must have some charity for the sense of the people, which admires natural power, and will elect it over virtuous men who have less. It has this excuse, that natural is really allied to **moral power**, and may always be expected to approach it by its own instincts. Intellect at least is not stupid, and will see the force of morals over men, if it does not itself obey."
>
> — Ralph Emerson (c.1875), "Greatness"; in: Volume 8 (pg. 316)

> "I believe in the closest affinity between **moral and material power**. Virtue and genius are always on the

direct way to the control of the society in which they are found. It is the interest of society that good men should govern, and there is always a tendency so to place them."

— Ralph Emerson (c.1875), "Aristocracy"; in: Volume 10 (pgs. 64)

"These forces are in an ascending series, but seem to leave no room for the individual; man or atom, he only shares them; he sails the way these irresistible winds blow. **Intellect and morals appear only the material forces on a higher plane**. The laws of material nature run up into the invisible world of the mind, and hereby we acquire a key to those sublimities which skulk and hide in the caverns of human consciousness. And in the impenetrable mystery which hides—and hides through absolute transparency—the mental nature, I await the insight which our advancing knowledge of material laws shall furnish!"

— Ralph Emerson (1877), "Perpetual Forces" (pdf), *The North American Review, Volume 125*, Sep 1; in: *Completed Works, Volume 10* (pg. 72)

(add)

Carlyle | Soul

In Aug 1833, Emerson sat down with Thomas Carlyle and "talked about the immortality of the soul". [6]

Atheism | Religion

In 1836, he proclaimed "make your own Bible" (Q); in 1841, in his *Essays*, his second book, is found his essay "Self-Reliance", described by his aunt as "strange medley of atheism and false independence" (Q); listed in CelebAtheists.com (Q); one of the promulgators of the godless Goethean calendar.

Geniuses

In 1850, Emerson, in his *Representative Men: Seven Lectures*, discussed: Plato, Immanuel Swedenborg, Michel Montaigne, William Shakespeare, and Goethe. [5]

Fuller | Goethe

Emerson, was a close associate of forced prodigy turned genius Margaret Fuller (1810-1850). [1]

"Fuller had read German books, and, for the three years before I knew her, almost exclusively: Lessing, Schiller, Richter, Tieck, Novalis, and, above all GOETHE. It was very obvious, at the first intercourse with her that the last writer—food or poison—the most powerful of all mental reagents—the pivotal mind in modern literature—for all before him are ancients, and **all who have read him are modern**—that this mind had been her teacher, and, of course, that place was filled, nor was there room for any other. She had that symptom which appears to all the students of Goethe."

— Ralph Emerson (1852), commentary on Margaret Fuller [2]

A truncated version of the above is as follows:

"All before Goethe are ancients, and all who have read him are modern."

— Ralph Emerson (1852), Astrida

Tantillo 2010 truncation of quote [1]

A picture of Emerson's library. [6]

This logic forms the basis the Hmolpedia-introduced BG/AG dating system.

Other

American physicist Bruce Lindsay claims that Emerson's 1841 essay "Compensation" has something to do and or exemplifies energy conservation or the first law of thermodynamics; this, to note, seems to be speculative anachronism. [4]

Quotes | By

The following are noted quotes:

> "The genius of humanities is the right point of view of history. The qualities abide; the men who exhibit them have now more, now less, and pass away. Once you saw phoenixes: they are gone; the world is not therefore disenchanted. The vessels on which you read sacred emblems turn out to be common pottery; but the sense of the pictures is sacred, and you may still read them transferred to the walls of the world. Once they were angels of knowledge and their figures touched the sky. Then we drew near, saw their means, culture and limits; and they yielded their place to other geniuses."
>
> — Ralph Emerson (1850), *The Uses of Great Men*; cited by Darrin McMahon (2013) in *Divine Fury: a History of Genius*

> "In every work of genius, we recognize our own rejected thoughts; they come back to us with a certain alienated majesty."
>
> — Ralph Emerson (c.1855)

> "Christianity dwells with noxious exaggeration about the person of Jesus."
>
> — Ralph Emerson (c.1860), "Divinity School Address" (Q)(Q)

> "Come no chimeras! Let us go abroad; let us mix in affairs; let us learn and get and have and climb. Let us have to do with real men and women, and not with skipping ghosts."

— Ralph Emerson (c.1860), *Publication*; cited by Mitchell Stephens (2014) in *Imagine There's No Heaven* (pg. vi) [7]

"The laws of force apply to every form of [nature]. The husbandry learned in the economy of heat or light or steam or muscular fibre applies precisely to the use of wit. What I have said of the inexorable persistence of every elemental force to remain itself, the impossibility of tampering with it or warping it, — the same rule applies again strictly to this force of intellect, — that it is perception, a seeing, not making, thoughts. **The man must bend to the law, never the law to him**."

— Ralph Emerson (1877), "Perpetual Forces" [9]

"Animal instincts guide the animal as gravity governs the stone."

— Ralph Emerson (1877), "Perpetual Forces" [9]

"**No force but is his force. He does not possess them; he is a pipe through which their currents flow**. If a straw be held still in the direction of the ocean-current, the sea will pour through it as through Gibraltar. If he should measure strength with them,
if he should fight the sea and the whirlwind with his ship, he would snap his spars, tear his sails, and swamp his bark; but by cunningly dividing the force, tapping the tempest for a little sidewind, he uses the monsters, and they carry him where he would go. Look at him; you can give no guess at what **power is in him**. It never appears directly, but follow him and see his effects, see his productions. He is a planter, a miner, a shipbuilder, a machinist, a musician, a steam-engine, a geometer, an astronomer, a persuader of men, a lawgiver, a builder of towns, — and each of these by dint of a wonderful method or series that resides in him and enables him to work on the material elements."

— Ralph Emerson (1877), "Perpetual Forces" [9]

"Warmed by the sun, and so of every element; he walks and works by the aid of gravitation; he draws on all knowledge as his province, on all beauty for his innocent delight, and first or last he exhausts by his use all the harvests, all the powers of the world. For man, the receiver of all, and depositary of these volumes of power, I am to say that his ability and performance are according to his reception of these various streams of force. **We define 'genius' to be a sensibility to all the impressions of the outer world**, a sensibility so equal that it receives accurately all impressions, and can truly report them without excess or loss as it received."

— Ralph Emerson (1877), "Perpetual Forces" [9]

"I delight in tracing these wonderful powers, the electricity and gravity of the human world."

— Ralph Emerson (1877), "Perpetual Forces" [9]

"He is his own apprentice, and more time gives a great addition of power, just as a falling body acquires momentum with every foot of the fall."

— Ralph Emerson (1877), "Perpetual Forces" [9]

> “He sees the grandeur of justice, the victory of love, the eternity that belongs to all moral nature. He does not then invent his sentiment or his act, but obeys a pre-existing right which he sees. We arrive at virtue by taking its direction instead of imposing ours.”
>
> — Ralph Emerson (1877), “Perpetual Forces” [9]

> “The forces are infinite. Everyone has the might of all; for the secret of the world is that its energies are solidaires; that they work together on a system of mutual aid, all for each and each for all; that the strain made on one point bears on every arch and
> foundation of the structure. But if you wish to avail yourself of their might, and in like manner if you wish the force of the intellect and the force of the will, you must take their direction, not they yours.”
>
> — Ralph Emerson (1877), “Perpetual Forces” [9]

> “This world belongs to the energetical.”
>
> — Ralph Emerson (1877), “Perpetual Forces” [9]

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External links

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θΔics

In thermodynamics, **Ralph Fowler** (1889-1944) was an English physicist noted for his textbooks on statistical mechanics (1929) and statistical thermodynamics (1939). In the latter which, co-authored with Edward Guggenheim, and the term "zeroth law" of thermodynamics was coined.

Education

Fowler completed his BA in 1911 and MA in 1915 in mathematics at Trinity College, Cambridge. [2] In 1917, Fowler began to study wind structure and temperature structure at high altitudes, in their relation to ballistics; this was a partial catalyst for his later interest in thermodynamics and statistical mechanics. In 1920, Fowler became college lecturer in mathematics at Trinity, thereafter jumping into a variety of mathematical problems and eventually began moving to more recent problems in mathematical physics including work on various kinetic theories of gases, again leading him toward thermodynamics and statistical mechanics. [2]

In 1922, Fowler began collaborating with English physicist C.G. Darwin (the first to define the subject of human thermodynamics) on the problem of the partition of energy, inspired by works of Ehrenfest and Trkal. Having developed a new technique for approaching physical chemistry through statistical mechanics, the two, and later Fowler alone, justified a number of formulae and calculations performed by the likes of Saha, Lindemann, and Chapman. In 1922-23, Ralph established the validity of the dissociation formula for high temperature ionization. In early 1923, Ralph along with E A Milne, wrote a seminal work on stellar spectra, temperatures, and pressures. This work continued in a series of papers through the 1920s leading to the Adams Prize of the University of Cambridge in 1923-24 and was published in 1929 as the seminal volume, *Statistical Mechanics*, which had a second edition, minus the astrophysical applications, published in 1936. In 1939 a successor volume, entitled *Statistical Thermodynamics*, was co-authored and published with E A Guggenheim. [2]

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θΔics

In existographies, **Ralph Greatorex** (c.1625-1675), or “Gretorix” (Hooke, c.1670), was an English instrument maker, reputed to have been the “leading pumping engineer in England” (Chapman, 2004), who made a considerable amount of money draining the Fens. [2]

Boyle

In 1658, Robert Boyle contacted Greatorex with a request for Greatorex to make an improved Guericke-style vacuum pump. [1] Greatorex, however, could not furnish a successful or serviceable machine. No drawing of Greatorex’s attempted device remains. [3]

Boyle then contacted Robert Hooke, his assistant since 1657, who then visited Greatorex and saw his device, reporting back:

> “In 1658 or 1659, I contrived and perfected the ‘air-pump’ for Boyle, having first seen a contrivance for that purpose made for Boyle by Gratorix, which was too gross to perform any great matter.”
>
> — Robert Hooke (c.1670), *Posthumous Works* (pg. iii-iv); cited by Richard Waller (1705) in “Life of Robert Hooke” [4]

Boyle, after seeing Greatorex’s device, when to London to get the barrel and other parts he could not get made at Oxford.

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External links

â— Ralph Greatorex – Wikipedia.
â— Ralph Greatorex – PepysDiary.com.

θΔics

In information science, **Ralph Hartley** (1888-1970) was an American electronics engineer noted for having explained why the logarithmic function is the most natural choice for the quantitative measure of information. Specifically, at the 1927 International Congress of Telegraphy and Telephony, Hartley gave a presentation, entitled "Transmission of Information", in which he set out to quantify the capacity of a system to transmit information, the systems being those of telegraph, telephone, and television transmission systems, sending information in the form of either pulsations in radio waves or changes in current and correlative voltage level in wire telegraph lines.

External links

â— Ralph Hartley – Wikipedia.

θΔics

In science, **Ralph Stayner Lillie** (1875-1952) was a Canadian-born American physiologist noted for nonmechanistic and nonmaterialist philosophy of animate organisms, specifically in the areas of free will, vitalism, and the origin of life. [1]

In his 1927 article "Physical Indeterminism and Vital Action", he uses the Heisenberg uncertainty relation to argue for a neurological based free will, namely that deliberate actions of the organism, in particular humans, are non-deterministic at the neurological level and hence subsequently at the psychic-choice level. [2] Lillie's 1927 paper, although discredited as early as 1928 by Joseph Needham, tends to be the first historical citation in modern uncertainty principle based free argument articles, or at least crediting him as having been the first to make such an argument. [3]

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θΔics

In nonequilibrium thermodynamics, **Ralph J. Tykodi** (c.1925-) is an American physical chemist and thermodynamicist noted for his work in the area of thermodynamic applications to nonequilibrium situations. His two main publications are the 1967 *Thermodynamics of Steady State* and the 2002 *Thermodynamic of Systems in Nonequilibrium States.* [1] Tykodi's main influences are Scottish physicist William Thomson and American engineer Willard Gibbs. A student of his is American chemical engineer Ted Erikson, who completed his MS in thermodynamics under Tykodi in 1959.

Education

Tykodi completed his PhD in physical chemistry at the Pennsylvania State University. He taught at the Illinois Institute of Technology from 1955-1965 and at the University of Massachusetts Dartmouth from 1965-1995.

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θΔics

In existographies, **Ram C. Poudel** (c.1977-) (CR:29) is a Nepalese-American mechanical engineer, thermodynamicist, and sociophysicist noted, in hmolscience, for his 2012-present work in sociophysics topics, such as: social atom theory, social field theory, among others.

Overview

In 2006, Poudel, having completed his MS in mechanical engineering, began lecturing on thermodynamics to mechanical engineers at Tribhuvan University, Nepal.

In 2011, Poudel was the project head (Ñº), as a mechanical engineering professor, at the Tribhuvan University, for the Asian Development Bank funded "Effective Deployment of Distributed Small Wind Systems in Asian Rural Areas", which was a success, during which time Poudel realized that he was the only person in the department without a PhD, after which he wrote to his advisor at Tribhuvan University, who resultantly sent Poudel to the University of Massachusetts, Amherst, to get his PhD. [1]

In 2012, during his first year, at UMass, Poudel worked as a teaching assistant for a course in systems identification, amid which he envisioned doing his PhD on "Energy and the Poverty Dynamics", conceptually-based on a Navier-Stokes equation (Ñº) [compare: Arthur Iberall] for a social field, i.e. a "social fluid" model, or something along these lines. Poudel proposed this idea to his new UMass advisor, who in turn gave him Howard T. Odum's *Energy Basis for Man and Nature* (1976) and *Environment, Power, and Society* (1971) to read, which initiated Poudel's engagement in trying to grapple with the subject of mechanical engineering based social energetics and or social mechanics, focused on poverty betterment. [1]

In 2014, Poudel became a coordinator for the Energy for Capabilities Development Partnership group, whose aim, supposedly, is to "to integrate the capabilities of interdisciplinary sciences (such as moral science, natural science and economics) to further research on sustainable development, among many others"; the following, e.g. is one of their economic thermodynamics models, supposedly developed by one among their group:

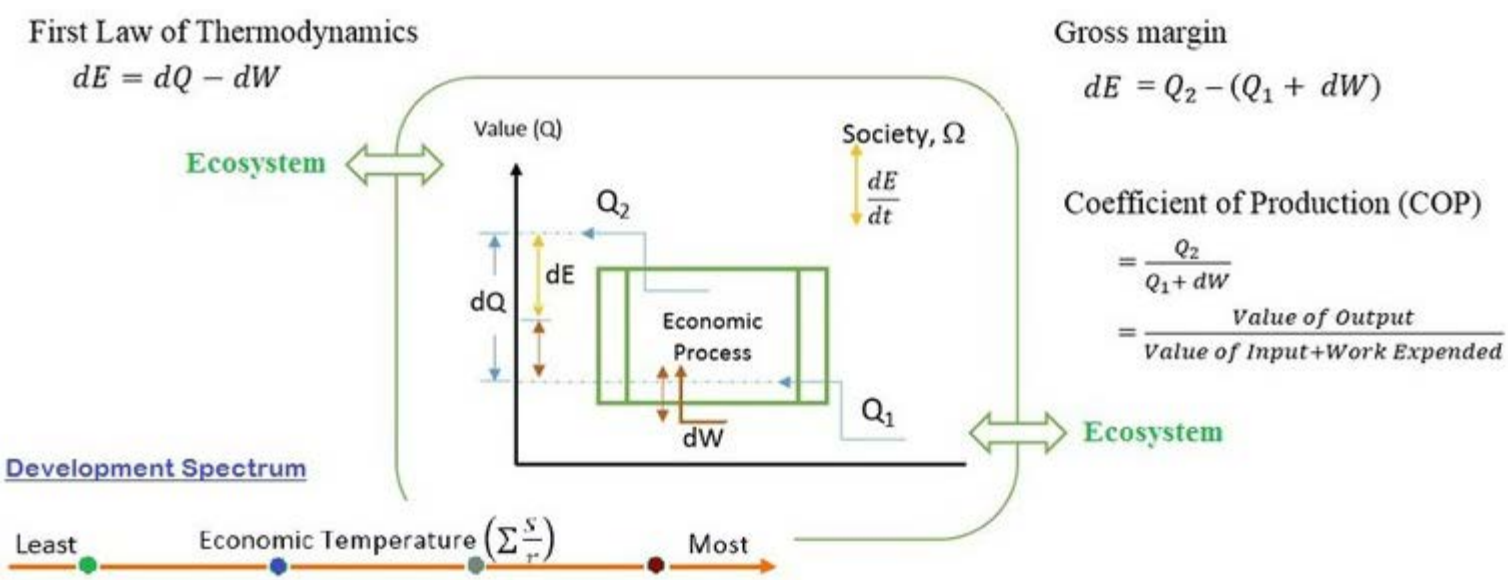

In 2016, Poudel, in his "Energetic Foundation of Statistical Economics", outlined what he called "energetics economics", according to the logic that "it's not money that moves the world around, but in reality energy"; Poudel, following discussion of Steven Hawking, and how his "social field" theory attempts to employ classical field theory as a basis, gave the following two cultures rendition: [1]

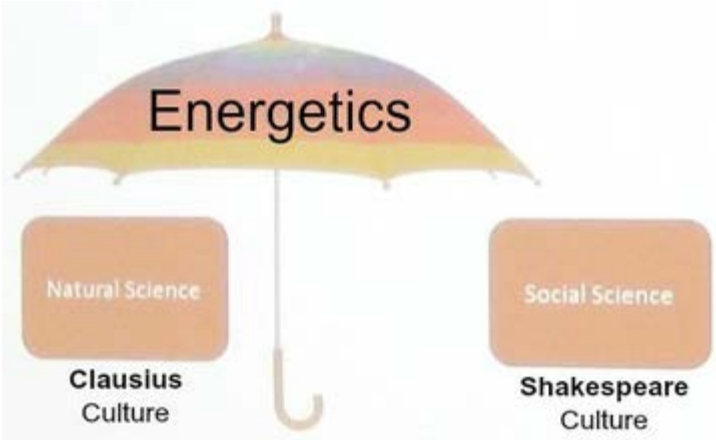

Poudel then, following some derivation, and talk of kinetic energy (see: social kinetic energy) and potential energy (see: social potential energy), gives the following so-called "energy of an individual" in society equation: [1]

$$E_n = -\frac{P_o}{n^2}$$

which is reminiscent, in some sense, of the social cannon ball model.

Dynamics of Social Evolution | Anon Review

In Mar 2019, Poudel, and co-author Jon McGowan, submitted "The Dynamics of Human Society Evolution: an Energetics Approach" to the Hindawi-based journal *Complexity* (Ñº), the abstract of which is the following: [3]

> "Human society is an open system that evolves by coupling with various known and unknown (energy) fluxes. How do these dynamics precisely unfold? Energetics may provide further insights. We expand on Navier Stokes' approach to study non-equilibrium dynamics in a field that evolves with time. Based on the 'social field theory', an induction of the classical field theories, we define social force and social energy and Hamiltonian of an individual in a society. The equations for the evolution of an individual and society are sketched based on the time-dependent Hamiltonian that includes power dynamics. In this paper, we will demonstrate that Lotka-Volterra type equations can be derived from the Hamiltonian equation in the social field."

The article is dedicated to Richard Adams and his *The Eighth Day*.

The first reviewer, and anon physicist of some sort, is as follows:

> "I am not sure why this article was submitted to this journal which publishes rigorous interdisciplinary research based on rigorous and precisely defined mathematical modeling of biological, ecological and other complex systems. With no clear justification, the authors present postulate after postulate presenting a 'social field theory' in which a social field based on energy is postulated to exist obeying equations used in physics."
>
> — Anon (2019), *Complexity* Review of Poudel and McGowan's 'Dynamics of Human Society Evolution"

Here, Anon cogently asks what justification is there that a "social field", formulated in energy terms, (a) exists and (b)

obeys the same equations for fields as used in physics. This, certainly, is an area of historical importance, that could be addressed more in the opening of the article?

> "It is hoped that precise meaning and quantification of this 'social field' will be done using 'big data' at some future time by an unspecified method, not a hint of how this might be done can be found in this article."
>
> — Anon (2019), *Complexity* Review of Poudel and McGowan's 'Dynamics of Human Society Evolution"

Anon, here, seems to be alluding to the "big data" stylized so-labeled "social physics" of Alex Pentland, which, to note, has about as much "physics" in it as a box of crayons.

> "An individual is postulated to interact with the postulated 'social field', through an interaction similar to that of gravity and Coulomb's law! In this postulate, there is an undefined 'social distance' whose clear definition and quantification is again left to some future method. None of it is based on any empirical observation of any sort."
>
> — Anon (2019), *Complexity* Review of Poudel and McGowan's 'Dynamics of Human Society Evolution"

Here, certainly, Poudel could have given actual numbers for the reader to digest, so to found his argument, such as done experimental studies as found in: Heini Hediger's 1955 measurements of reaction distances and social spaces in animals in zoos and circuses, Edward Hall's classic *The Hidden Dimension: an Anthropologist Examines Man's Use of Space in Public in Private* (1966), James Dabbs' "sidewalk study" (c.1972), or Dov Cohen's "hallway study" (c.1994).

> "Subsequent parts of the article consist of postulate after arbitrary postulate, on energy of individual, Hamiltonians -- which are also used to write thermodynamic Gibbs relations! -- and on and on. It also postulates "quantization" of social energy with no mention of any empirical data that might lead one to think such a postulate has any basis on real societies."
>
> — Anon (2019), *Complexity* Review of Poudel and McGowan's 'Dynamics of Human Society Evolution"

Here, Anon presents us with his ignorance of thermodynamics. Specifically, Clausius derived his internal energy function (1865), based, in part, on the 1834 force function model of William Hamilton, all of which was subsumed into the Gibbs function of Willard Gibbs, aka Gibbsian, of chemical thermodynamics, which applies at the social level, wherein systems are isothermal isobaric and freely-running (Lewis, 1923) as first pointed out by: John Q. Stewart (1940s), who taught this at Princeton, Lawrence Henderson (1930s), who taught this in his "Sociology 23" at Harvard, and Henry Adams (1908), who used this in his social phase theory, among others.

> "The article simply does not have the rigor to meet the standards of this journal and it will be incomprehensible to its readers. There is no point in going into specific mathematical comments, except to note that earth's magnetic field deflects high energy ions, not photons; photons are not scattered by static magnetic fields. Life on earth is protected from the high energy UV photons by the ozone layer. I cannot recommend this article for publication."
>
> — Anon (2019), *Complexity* Review of Poudel and McGowan's 'Dynamics of Human Society Evolution"

Here, in conclusion, Anon freely admits that he is victim of an auto-Sokal affair, namely the subject matter, he as been

presented with, far surpasses his intellect (see: hydraism), so his reaction is to dismiss it as incomprehensible non-rigorous pointless nonsense, which is the exact opposite of the way things are, in reality. This is a common polemic in hmolscience.

Dynamics of Social Evolution | Dixon Review

Next, we have the review of psychologist James Dixon (Ñº), which, to note, brings to mind the 2014 collaborative effort on the top of the "thermodynamic lens" by chemical engineer Marc Donohue and psychologist Richard Kilburg; in any event, here is the review:

> "This manuscript takes the position that large-scale social collectives or societies might be effectively understood from the perspective of 'energy flow'. The authors provide a compact, but balanced review of major previous scholarship on this, and related, theses. They also quite fairly acknowledge the inherent limitations to such an approach, in terms of explaining all the nuances of culture, tradition, religion, and the like. The authors draw on well-established models in physics. and seek to rework them into a social framework The thrust of the manuscript is to outline how such a mapping between physical and social concepts might be profitably made, rather than demonstrating empirically the utility of the models. I found quite a bit to like about this manuscript. I think many researchers agree that at some fundamental level all phenomena in biology, including collective behavior, must be about energy flow. It is not yet clear how exactly to conceive of this relationship, but the current manuscript represents one thoughtful attempt to do so at a very large scale. I learned a lot reading it, and I think others will too."
>
> — James Dixon (2019), *Complexity* Review of Poudel and McGowan's "Dynamics of Human Society Evolution"

Here, we have a good sober call (see: two cultures call) for more papers like this in this area, coming respectively from a scholar in humanities, aka the Shakespeare culture of C.P. Snow's two cultures world, which is in sharp contrast to the Anon review previous, a representative of the Clausius culture of Snow's world.

> "I have the following suggestions for improving the manuscript. I think it would be helpful to spend more time defining the variables for the social field. I found myself not feeling like I fully understood the meaning of these variables, and the motivation for choosing them."
>
> — James Dixon (2019), *Complexity* Review of Poudel and McGowan's "Dynamics of Human Society Evolution"

This is good advice. Poudel, by page two, e.g., has already introduced the acronym SFT for the phrase "social field theory", but has not yet given a definition of what a "social field" is? Indeed, into the first few pages, it does not seem as if Poudel has defined one single "variable", other than to say that a "force is a gradient of the potential energy". It would seem to behoove Poudel, if his overall aim is to "propose the existence of a new type of 'force', especially among social beings, not fundamental as electromagnetic, gravity, strong nuclear, and weak nuclear", to spend a little more time defining variables like "energy", "force", "field", and "social field", as Dixon suggests?

> "Likewise, the concept of energy seems to expand in the latter stages of the manuscript to include things like 'information'. I found this perplexing, and would ask the authors to say more about how they are defining energy in their model."
>
> — James Dixon (2019), *Complexity* Review of Poudel and McGowan's "Dynamics of Human Society Evolution"

This a red flag. Attempts to equate "energy", in units of joules (see: SI unit geniuses), to "information", in units of bits, is but a path down the rabbit hole of Alice and Wonderland or a chase after the Jabberwock of Alfred Lotka (see: Regarding Definitions).

> “I was surprised that the concept of "money" did not feature more heavily in the manuscript. Perhaps it would be helpful for the authors could comment more fully on how they conceive of "money" in their framework.”
>
> — James Dixon (2019), *Complexity* Review of Poudel and McGowan’s “Dynamics of Human Society Evolution”

Money, energy, and force is a difficult subject, to say the least.

Dynamics of Social Evolution | Annila Review

Next, we have the third review by auto-characterized biophysicist Arto Annila:

> “Your paper does not look convincing with "Navier Stoke's" since it should be Navier-Stokes equation.”
>
> — Arto Annila (2019), “*Complexity* Review of Poudel and McGowen’s “Dynamics of Human Society Evolution”

Here, Annila is saying that if you can’t even spell the surnames of the theorists right, namely Claude Navier and George Stokes (not Stoke), in the abstract, how do you expect people to believe that you can build a whole new social fluid theory on top of the original fluid theory?

> “I don't see a scientific reason why you propose a new type of force and distinguish living from non-living. This goes against evidence which is my main reason to recommend rejection.”
>
> — Arto Annila (2019), “*Complexity* Review of Poudel and McGowen’s “Dynamics of Human Society Evolution”

Here, Annila might be referring to this passage:

> “Can energy flow alone create forms and structures? Or is structure/organization the basis of energy flowing through the system? Should such questions have a universal answer? Does the answer depend on whether we are talking about the **living or non-living world**?”
>
> — Ram Poudel (2019), “Dynamics of Human Society Evolution” (pg. 6)

Here, also, we can reference Annila’s 2016 “Atomism Revisited” (Ñº), wherein the only point at which Annila employs the term “life” is in the term “lifetime” of subatomic particles. Hence, possibly, Annila thinks you are attempting to define a new force, like a “bio-force”, or “bio-energy” (see: bio-Gibbs energy), or “bio-field” that is unique to living domain of your “living / non-living” divide you seem to have situated?

> “On the other hand, I favor your aim to write down an equation of motion. However, for me Newton's second law [see: laws of motion] in its original form F = dp/dt or in its integrated from TdS/dt = d(2K)/dt is good enough to explain social phenomena and behavior (google my homepage arto annila helsinki for publications). I also favor your style of writing by asking questions but to me, your knowledge in physics does not convince me. For example, Hamiltonian is per definition for a static system, whereas you are talking about evolving systems.”
>
> — Arto Annila (2019), “*Complexity* Review of Poudel and McGowen’s “Dynamics of Human Society Evolution”

In this last part, Annilo makes a good point: on the surface of your paper, you presume to be jumping from William Hamilton's 1834 "On a general method in dynamics by which the study of the motions of all free systems of attracting or repelling points is reduced to the search and differentiation of one central relation, or characteristic function", wherein the word evolution is not employed, to explain not just evolution, but evolution of social systems? You should give a little pretext for this big JUMP, e.g. by citing: Lawrence Henderson, Harold Blum, or Adriaan Lange.

Education

Poudel completed his BS in mechanical engineering in 1999 at Pulchowk Campus, Institute of Engineering, Tribhuvan University, Nepal, his MS in mechanical engineering in 2007 at Northern Arizona University, after which he taught thermodynamics for ten years; presently he is a coordinator at the University of Amherst, Energy for Capabilities Development center, which in 2014 began to develop and employ theoretical sociophysics like theories. [2]

References

1. Poudel, Ram. (2016). "Energetic Foundation of Statistical Economics" (history, V:0-2:30; energy equation, 5:35-), 7th BioPhysical Economics Conference, Jun 28.
2. Ram Poudel – LinkedIn.
3. Poudel, Ram and McGowan, Jon. (2019). "The Dynamics of Human Society Evolution: an Energetics Approach", 37-page article submitted to *Complexity* (reviews: Arto Annila, James Dixon (Ñº), and anon), Mar 10; ArXiv.org (Ñº), Apr 8; APS.org blog summary (Ñº), Jul.

Further reading

â— Poudel, Ram. (2014). "Social Field Theory" (Ñº), Blog, E4cdp.org, Nov 15.
â— Poudel, Ram C., Zheng, Kangbin, Wood, David and McGowan, Joh G. (2015). "Atomic Analogy of Poverty" (pdf), Manuscript, Jun 16.

External links

â— Publications – E4CDP.org.

θΔics

In existographies, **Ramon Llull** (1232-1315) (IQ:#|#) (Cattell 1000:517), aka “Raymond Lull” (Q) or "Raimundi Lulli" (Q), was a Spanish polymath noted for []

Overview

In 1296, Llull published an encyclopedia entitled *Tree of Science* (*Arbor Scientaie*), which showed a tree of knowledge. [1]

In 1303, Llull made a “scale of intellect” diagram (see: great chain of being), connecting earth with the abode of god, from *Liber de Ascensu et Decensu Intellectus*, showing organized bodies, including fire, in the main scale, depicted as follows: [2]

Quotes | On

The following are quotes on Lull:

> “Cusanus owned more works by **Lull** than any other single author.”
>
> — Pauline Watts (1982), *Nicolaus Cusanus: a Fifteenth-Century Vision of Man* (pg. 16)

Quotes | By

The following are noted quotes:

> “If understanding followed no rule at all, there would be no good in the understanding nor in the matter understood, and to remain in ignorance would be the greatest good.”
>
> — Ramon Llull (c.1300), *The Hundred Names of God*; cited (Q) by Margaret Boden (2006) in *Mind as Machine: a History of Cognitive Science, Volume 1* (pg. 56)

> “Every woman is worth more when she learns to read.”
>
> — Ramon Llull (c.1300) (Q)

References

1. Tree of Science (Ramon Llull) – Wikipedia.
2. Ragan, Mark A. (2009). “Trees and Networks Before and After Darwin” (Q), *Biology Direct*, 4:43.

External links

- Ramon Llull – Wikipedia.

θΔics

In existographies, **Ramon Margalef** (1919-2004) (CR:3) was a Spanish ecologist noted, in ecological thermodynamics, for his 1950s to 1960s application of a mixture of information theory and thermodynamics in the study of ecological systems. [1]

Overview

In 1957, Margalef, in his *Information Theory in Ecology*, his seminal publication, advocated the application of information theoretical methods to the study of species diversity in ecosystems. [2]

In 1968, Margalef, in his *Principles in Ecological Theory*, states:

> "An ecosystem is a self-regulating, adaptive cybernetic system: it tends to remain in the most stable of all possible states permitted by its dynamic structure. The structures with stability through time are those most able to influence the future with the least expense of energy—including the energy required to possess and store information. Information is anything that can influence and shape the future."

In 1980, Margalef, in his *Biosphere between Thermodynamics and Game*, defines living systems as energetic systems, in the context of the postulate that the transmission of "information", which he things is "closely linked to other physical properties of the universe" (pg. 18), can act to organize huge amounts of matter, along the way employing the far-from-equilibrium model, fluctuations, and other seeming melting pot theories.

In his work, he makes the distinction between exosomatic energy, as that which helps maintain life and the organization of ecosystems, but which neither flows though nor gets debased in the changes of somatic metabolism, and endosomatic energy, as energy that feeds the internal metabolism of organisms. [4]

Education

Margalef was a "curiosity-driven self-taught naturalist" who became one of the leading ecologists of the 20th century. (Ñº)

References

1. Fernández-Galiano, Luis and Carino, Gina (translator) (2000). *Fire and Memory: On Architecture and Energy* (pg. 5). MIT Press.
2. (a) Ramon Margalef (1919-2004) – EsaPubs.org.
(b) Margalef, Ramon. (1957). *La teoría de la información en ecología* (*Information Theory in Ecology*). Memoirs of the Real Academia de Ciencias y Artes de Barcelona; English translation: *General Systems 3*, 1958.
3. Wilden, Anthony. (1987). *Man and Women, War and Peace: the Strategist's Companion* (pgs. 75-76). Routledge.
4. (a) Margalef, Ramon. (1980). *Biosphere between Thermodynamics and Game* (*La Biosfera Entre la Termodinamica y el Juego*). Barcelona: Omega.
(b) Adams, Richard N. (1988). *The Eighth Day: Social Evolution as the Self-Organization of Energy* (pg. 41-43). University of Texas Press.

External links

â— Ramon Margalef – Wikipedia.

θΔics

In hmolscience, **Randall Schweller** (c.1960-) is an American political scientist, an "entropy only applies" theorist, known, in some circles, for his “work as a grand theorist of international relations and as a founder of neoclassical realism” (Q), noted for his 2014 *Maxwell’s Demon and the Golden Apple*, wherein he seems to argue about growing global discord using a metaphorical political thermodynamics platform.

Overview

In short, Schweller, in his *Maxwell’s Demon and the Golden Apple*, attempted to learn thermodynamics from a smattering of non-fundamentally trained human thermodynamicists, such as: Thomas Pynchon, Rudolf Arnheim, Kenneth Boulding, Bruce Clarke, James Gleick, Eric Zencey, Tom Stoppard, among others, intermixed with citations to: Leon Brillouin, Arieh Ben-Naim (a baseless theorist), Peter Landsberg, among others, spliced with citations to: James Johnstone, Crosbie Smith, the incorrigible ideas of anti-Haeckel scholar Oliver Lodge and the free energy of deck of cards ideas of David Hawkins, to build an faulty platform model of his idea of an "age of entropy", so to sell his multi-pole theory of political power and hegemonic wars are good notion; at the end of which he concludes (pg. 160) with the so-called Camus model (1942) of atheistic universe meaning (below left), which is an incorrect model; the correct model being the Gates model (2014) of atheist universal meaning (below right), where Gibbs energies to not shuffle liked playing cards, as Hawkins incorrectly argues, and the ball does in fact roll over the activation energy barrier, not necessarily at the end of each day, but after the activated complex state has been reached, thereby yielding a meaningful "sense of purpose" as Einstein intuited:

Camus Model
(incorrect)

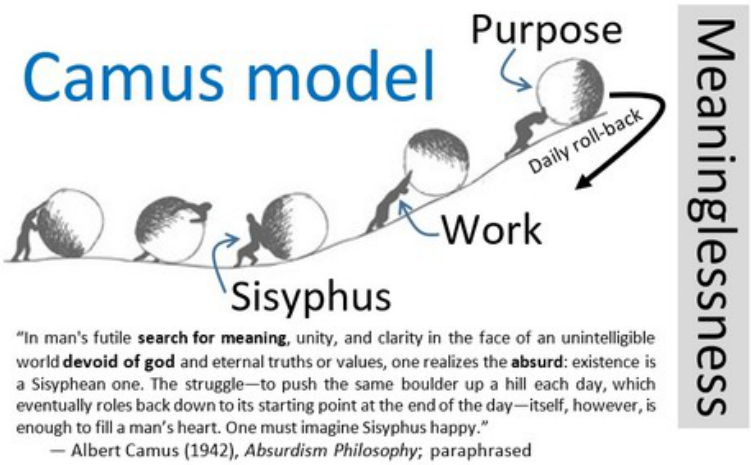

Gate Model
(correct)

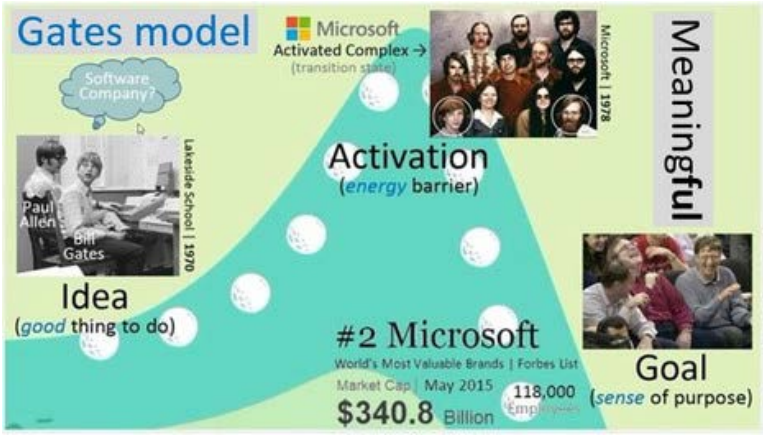

(add discussion)

War | Theory

The only thing relatively notable in Schweller's treatise, aside from his half-handed jab into political thermodynamics, a field tainted itself by a relative paucity of publications, is his discussion of the function of war; the notable excerpts are as follows:

> “One of the core ideas of the book will strike readers as counterintuitive. Large, destructive wars a re not always or in all ways bad; they serve the function of providing world order. Indeed, the time-honored solution for rising global disorder—as well as for rising discord among nations and what political scientists refer to as system disequilibrium—is a large an total war fought among all the great powers. These so-called hegemonic wars have regularly ensued every hundred years or so.”
>
> — Randall Schweller (2014), *Maxwell’s Demon and the Golden Apple* (pg. xi)

> “Great catastrophes may not necessarily give birth to a genuine revolution, but the infallibly herald them and make it necessary to think, or rather to think afresh about the universe.”
>
> — Fernand Braudel (1950), “Inaugural Lecture”, College of France, Dec 1; cited by Randall Schweller (2014) in *Maxwell’s Demon and the Golden Apple* (pg. 140)

> “War is a political instrument: a continuation of political activity by other means. The political object is the goal, war is the means of reaching it, and means can never be considered in isolation from their purpose.”
>
> — Carl Clausewitz (1830), *On War*; cited by Randall Schweller (2014) in *Maxwell’s Demon and the Golden Apple* (pg. 143)

> "As power diffuses throughout the international system, questions about 'which order should prevail' become relatively more important than fondness for 'any order rather than chaos', so the assumption that international order is a public good becomes less tenable."
>
> — Randall Schweller (2014), *Maxwell's Demon and the Golden Apple* (pg. 149)

Here, in short, Schweller seems to groping at the so-called "social Mpemba effect" namely that social equivalent of the phenomena that "heated water freezes faster" effect (see: Aristotle-Mpemba effect), i.e. a hot war will bring about peace and social order faster than will a cold war. The latter quote (pg. 149) is directly amenable to Gibbs energy prediction methods intermixed with kinetic theory analysis.

Theism | Free will

Schweller, of note, seems to be selling implicit theism in his argument, via some type of Thomson-based entropic opening argument; aside from the unabashed "god talk" employed, Schweller states (pg. 33) the following:

> "The science of energy and entropy changed everything from commerce to religion to culture. The universe would now be understood neither in terms of 'action-at-a-distance' forces, nor in terms of discrete particles moving through a void. Rather it was a universe of continuous matter possessed of kinetic energy—a cosmos, in contrast to Laplace's deterministic astronomy, that ensured a role for human free will in directing energy during its transformation from states of intensity to diffusion."

Here, firstly not only is Schweller in correct about determinism, specifically thermodynamics is based on Lagrange-Laplace deterministic mathematics (see: Euler genealogy), see also: Maxwell's demon meets Laplace's demon dialogue (Q), but secondly he is trying to sell a "god-through-energy" argument, via the incorrect assertion that humans have free will, which was disproved by Goethe (1809), and that "humans direct energy", which is but abysmal in its magnitude of backwardness.

Edge of chaos

Schweller cites Christopher Langton (Q), noted for his 1984 self-reproducing loop computer iteration simulation (Q), to conclude, similar to Len Fisher (2009), that the entire international political system is always at the edge of chaos:

> "Principles developed in the natural sciences should apply to the international social and political system. We should recognize that the international system, like all complex systems composed of a large number of interacting parts—whether they be physical, biological, economic, political, or social systems—operates somewhere between order and randomness; it exists on 'the edge of chaos' in the phrase of computer scientist Christopher Langton."

The ignorance and contradiction in this statement is profound. Not only is computer science not a natural science, i.e. it is but mathematics (Boolean algebra in particular), but there is no physical thing that exists at the edge of chaos; this is what is called hypothesis gone wrong, i.e. misunderstood and misapplied chaos theory.

Innocence of Muslims | Butterfly effect

Schweller (pg. 13) asserts that the 2012 YouTube video-film *Innocence of Muslims* (Q), which 'sparked' (Q) so many riots in the Middle East, that Wikipedia as an entire article "Reactions to Innocence of Muslim" (Q), which "forced" Google to ban the video from YouTube, for three years, i.e. until a 11-judge panel of the Ninth US Circuit Court of Appeals in California sided in 2015 with Google, which owns YouTube, overturned (Q) the earlier lower court decision, is an example of the Butterfly effect. Schweller states that the producer of this film, namely Egyptian-born Coptic Christian Nakoula Nakoula (Q) was but a butterfly flapping his wings in Egypt who "probably didn't see any of this backlash coming".

This, again, is all incorrect. No doubt Nakoula wanted to spark the reaction that ensued, just as much as Gavrilo Princip wanted to spark the reaction that led to WWI and WWII. These terms: reaction, spark, force, are chemical thermodynamic terms, not chaos theory terms. Chaos theory, in short, is not the correct model of what happened here. Schweller, whose aim is to try to sell an "entropy as chaos" model, in short, is off-target.

Difficulties | General

Schweller, not being trained in thermodynamics, is deficient in his understanding of a number of conceptual concepts; his opening paragraph (pg. 1), e.g., evidences this:

> "The world is undergoing transformation. We are entering the age of entropy, a chaotic period where most anything can happen and little can be predicted; where yesterday's rule takers become tomorrow's rule makers, but on one follows rules anymore; where competing global visions collide with each other; where remnants of the past, present, and future coexist simultaneously."

Schweller, in short, is ignorant of transformation, collision theory, prediction, and thermodynamic potentials; the latter of which in particular, being that in isothermal isobaric freely-running systems, which characterize socio-economic political systems, the correct potential is Gibbs energy, not entropy, which is the potential of isolated systems. Next (pg. 9), Schweller states the following:

> "Chaos and randomness abound as history enters the age of entropy. It will be a world defined by a considerable breakdown of order, covering a wide range of social and political relations."

This phenomenon Schweller here is attempting to grasp at, as seems to be the case, is called transition state, not "age of entropy", e.g. when Rome fell, a new age emerged, and the passage between these two states, is called transition state. He continues:

> "What is entropy? Invented in the field of thermodynamics, the term entropy measures the ability of a system to perform work or activity in the future. A system with no entropy has a lot of potential; a system with high entropy has little."

This is incorrect. Correctly, free energy, Gibbs energy in particular, is the measure of the system to perform work. He continues:

> "The second law of thermodynamics states that as work is performed, entropy increases, i.e., energy becomes less and less available to do work, and so the potential to perform further work declines. As the capacity for activity gets used up, the system eventually comes to a point of equilibrium at which time no further activity can take place. Thus, water at the top of a hill performs work, turning mills and turbines. Once the water is at the bottom of the hill, however, it has exhausted its capacity to perform work."

Next (pg. 10):

> "Social systems and institutions, too, exhibit a tendency to originate with an outburst of potential energy that runs down over time. Thus corporations, churches, and empires arise from the energetic activities of gifted entrepreneurs, prophets, and conquerors. They may flourish for a time, but all will eventually decline and sometimes disintegrate altogether as the initial energy that created them dissipates."

Schweller, here, footnotes this paragraph to chapter seven "Entropy Trap" of Kenneth Boulding's 1946 *The Meaning of the 20th Century*. [4] Schweller, to note, correctly, regarding "rise of empires", would have been wise to consult the work of physical chemist Thomas Wallace (2009), to get his bearings, rather than Boulding, an economist. An economist teaching a political theorist about entropy is like a physicist teaching a farmer about how to grow corn. Schweller continues:

> "In short, the performance of work diminishes the system's ability for future activity. As the system runs down, it eventually reaches a point of maximum entropy when no more work can be done."

This is not completely incorrect. Correctly, if Schweller had been directed to a synopsis of the history of chemical thermodynamics, knowing that he was consulted in his project by a chemical engineering professor, namely: Sharon Glotzer, he would have known that it was August Horstmann who in Oct 1873 famously announced the condition for chemical equilibrium to be that of maximum entropy. It is not, however, that "maximum chaos" that reigns in this state, but rather that the "equivalence values of all uncompensated transformations" have reached their maximum value, N, in magnitude, wherein the forward reactions equal the rate of backward reactions. Schweller, however, being ignorant of this basic knowledge, goes on to state the following incorrectness:

> "Entropy can also be thought of as a measure of chaos, which is, oddly enough, the most probable state of a system."

Next, Schweller cites Rudolf Arnheim (1971), on entropy and art, then cites the 2012 article "How Depressives Surf the Web" (Q) of computer scientist Sriram Chellappan (Q), and his graduate student Raghavendra Kotikalapudi, who studied a month's worth of Internet data usage of 216 Missouri S&T undergraduate students, finding, naturally enough, that depressed students, as indicated by a standard depression survey questionnaire, had a higher "bandwidth usage", or to use higher "packets per flow" applications, such as online videos and games, than their counterpart; which, via information theory, i.e. "Shannon entropy" terminology models, the defined as "flow duration entropy" (Q)(Q); the gist concluding message of which, as penned in their *New York Times* article, cited by Schweller, being that: "Internet usage of depressive people tended to exhibit high 'flow duration entropy'; Internet usage of non-depressed people tend to exhibit low 'flow duration entropy'." Depressed college students use more bandwidth, in short. Schweller, ignorant as to the fact that Shannon entropy has nothing to do with thermodynamics, i.e. that he is riding on a Shannon bandwagon, parrots this out as evidence that this study connects depression with thermodynamics and order in society, i.e. a blind leading the blind type of assertion.

Overview | General

In circa 2009, Randall Schweller engaged into some "insightful suggestions and queries" with Justine Rosenthal, supposedly, about entropy and global political power theory, which became incorporated into a *National Interest* article, which became the seed to his *Maxwell's Demon and the*

Golden Apple, penned five years later.

In 2010, Schweller published "Entropy and the Trajectory of World Politics: Why Polarity Has Become Less Meaningful", which he had reviewed by three anonymous reviewers, which was an early incarnation of his entropy-based global political theory "project"; the abstract of which is as follows: [3]

> "The random and indeterminate nature of the current unipolar world suggests a condition of increasing entropy. There are two reasons for this claim. First, relative capability advantages under unipolarity do not translate as easily as they once did into power and influence over others. Second, systemic constraint is a property that limits actors' freedom of action by imposing costs and benefits on certain kinds of actions. Unlike past multipolar and bipolar systems, the current unipolar system exerts only weak, if any, systemic constraints on the unipolar power and all other actors as well. Thus, polarity has become a largely meaningless concept. Today, system process rather than structure best explains international politics, and this process is one of entropy. Finally, I suggest two pathways from unipolarity to a more balanced system: one is fairly consistent with standard balance-of-power realism but adds an ideational component; the other restores equilibrium by means of entropy."

In 2014, Schweller, in his *Maxwell's Demon and the Golden Apple: Global Discord in the New Millennium*, attempts to mix Maxwell's demon (1867) with Hesiod's golden apple, from his Pandora's box (700BC) tale, to argue that, in the coming age, "disorder will reign supreme as the world succumbs to entropy, an irreversible process of disorganization that governs the direction of all physical changes taking place in the universe"; the following (pg. 36) is a representative take on Schweller's conception of entropy and thermodynamics:

> "Whether entropy's indefinable quality—its inherently ambiguous nature—is the source of its greatest strength or greatest weakness or both, it probably explains why the concept has proven to be such a seductive and persistent metaphor (I say *metaphor* because entropy only applies to closed or isolated systems). To be specific, entropy has been variously associate with: (1) disorganization, disorder, or what the nineteenth-century American theoretic physicist Willard Gibbs called 'mixedupness'; (2) nature's 'arrow of time'; (3) positive information, that is, information that makes a difference; (4) ignorance or lack of information; (5) uncertainty, randomness, and indefiniteness; (6) information overload and distortion; (7) unbounded freedom and the absence of constraints; (8) homogeneity and a flattening effect; (9) the dissipation of mechanical energy, enervation, and ennui, and (10) the universe's inevitable heat death (the Big Chill).

(add summary)

Glotzer | Chemical engineering

Schweller, in the following excerpt, cites physicist turned chemical engineering professor Sharon Glotzer, who completed her PhD in 1993 in theoretical soft condensed matter physics under Eugene Stanley, and who in 2011 theorized, with collaborators, about "directional entropic forces" creating order, based on Lars Onsager's work on sphereocylinders:

> "Further complicating matters, recent computer simulations by University of Michigan scientists and engineers trying to herd tiny particles into useful ordered formations have found entropy, to be an unlikely ally. Incredible but true. Under certain conditions, the property of entropy actually induces order from disorder—in the computer simulations, it nudged tightly packed particles to form organized structures. Professor of chemical engineering Sharon Glotzer cautions, however, that this is not really about disorder creating order. Rather, entropy needs its image updated: it is a measure of possibilities rather than disorder. 'It's all about options. In this case ordered arrangements produce the most possibilities, the most options. It's counterintuitive, to be sure', Glotzer explains. This conceptualization of entropy as possibilities is important and relevant to global politics in the age of entropy."

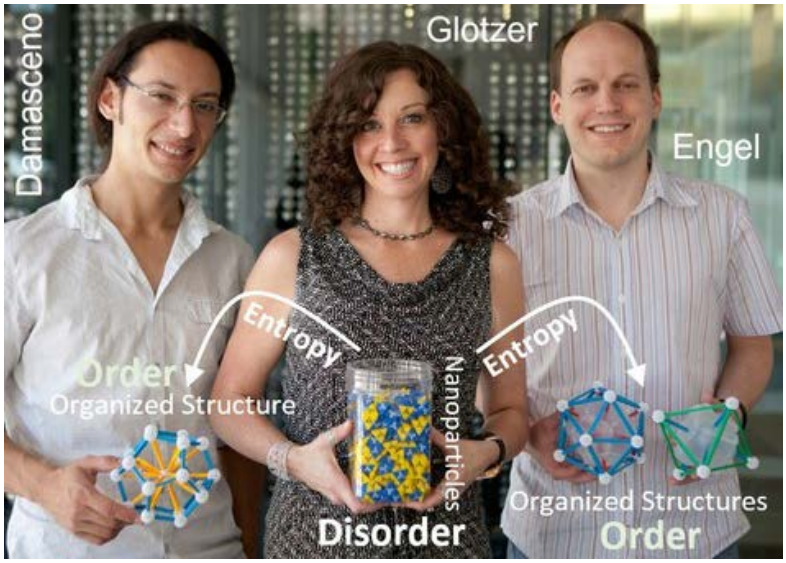

The photo, entitled: "Computer simulations by University of Michigan researchers Pablo Damasceno, Sharon Glotzer, and Michael Engel have shown how entropy can nudge nanoparticles into organized structures; they can even predict what kinds of structures will form", from the University of Michigan press release of American chemical engineering professor Sharon Glotzer's 2012 work on entropy-based nano-ordering simulations. Libb Thims, of note, mistakenly emailed Glotzer thinking that she had "consulted" Schweller and therein formed a rare ChE + H coupling, which is not the case.

On first past, of note, it seems as though (when reading only Google Books snippets; as above) Schweller consulted with Glotzer on his entropy project, and that he is quoting her views on entropy as related to nanoparticle simulations and politics; this, however, is not the case: Schweller is but quoting a press release of her work with one of her PhD students on computer simulations of theoretical nano-structures. [2]

Information ≠ entropy | Errors

Schweller devotes and entire chapter subsection, entitled “Information Entropy” (pgs. 23-27), to argue about information models of entropy, and also cites the Neumann-Shannon joke (pg. 35), among other information-based entropy assertions.

Beg analysis

The following is a partial Beg analysis of Schweller’s *Maxwell’s Demon and the Golden Apple*, done particularly owing to the preponderance of “power” term usages:

Scientific terms	Sciences	Religious terms	Metaphysical
Power (O) | 86+ Entropy (O) | 78+ Energy (O) | 43+ Force (O) | 38+ Work (O) | 31+ Heat (O) | 12+ Temperature (O) | 6+ Volume (O) | 5+ Pressure (O) | 3+ Reaction (O) | 1+	Thermodynamics (O) | 17+ Physics (O) | 7+ Chemistry | Chemical (O) | 1+	God (O) | 5+ Spirit (O) | 4+ Soul (O) | 1+	Good (O) | 28+ Evil (O) | 2+

(add discussion)

Errors | Other

The following are other blatant and or patently obvious errors:

> “William Thomson invented the new world ‘energy’ as a science but never took credit for it.”
>
> — Randall Schweller (2014), *Maxwell’s Demon and the Golden Apple* (pg. 28); although Schweller cites Crosbie Smith (1998), energy was “as a text-book science” by Rudolf Clausius (1875), defined scientifically by: Joseph Lagrange (1811), Thomas Young (1802), Denis Papin (1690), and defined in proto-terminology etymology by: Aristotle (322BC) and Heraclitus (450BC)

> “From the Greek *energeia* (‘activity’, ‘working’), energy in physics means ‘the power a thing has of doing work arising from its own motion or from the ‘tension’ subsisting between it and other things.”
>
> — Randall Schweller (2014), *Maxwell’s Demon and the Golden Apple* (pg. 30); here Schweller cites literature scholar Bruce Clarke (2001), the errors of which become apparent in “from its own motion”, aka self-motion, which is code for perpetual motion

> “The point is that, unlike nature, human beings can undo the disorder caused by the introduction of a random element; we cannot only shuffle absent-minded but also sort, order, and arrange.”
>
> — Randall Schweller (2014), *Maxwell’s Demon and the Golden Apple* (pg. 136); here, of abysmal ignorance, he asserts that “humans are unlike nature”, which is endemic of the flaw that his entire theory of what constitutes “nature” is incorrect

Quotes | Employed

The following are quotes cited by Schweller:

> “Chaos [is] the law of nature; order the dream of man.”
>
> — Henry Adams (1909), *The Education of Henry Adams*; cited by Randall Schweller (2014) in *Maxwell’s Demon and the Golden Apple* (pg. 136)

Quotes

The following are noted quotes by Schweller:

> “Leaving aside security as a motive for grabbing territory, opportunistic expansion is a core principle of power politics. Just as nature abhors a vacuum, great powers — motivated by an irresistible temptation to cash in on an opportunity to make gains relative to their

competitors — move quickly to fill power vacuums with their own influence."

— Randall Schweller (2014), *Maxwell's Demon and the Golden Apple* (pg. 88)

Education

Schweller completed his PhD in 1993 with a dissertation on "Tripolarity and the Second World War: a Systems Approach" at Columbia University, then was an Olin Fellow at Harvard for one year, after in 1994 he became a professor of political science at Ohio State University.

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2. (a) McAlpine, Katherine. (2012). "Entropy Can Lead to Order, Paving the Route to Nanostructures" (Q), *University of Michigan News*, Jul 26; in: *Science Daily* (Q), Jul 26.
(b) Sharon Glotzer – Wikipedia.
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3. (a) Schweller, Randall. (2010). "Entropy and the Trajectory of World Politics: Why Polarity Has Become Less Meaningful" (pdf) , *Cambridge Review of International Affairs*, 23:145-63.
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- Brissaud, Jean-Bernard. (2005). "The Meanings of Entropy" (pdf), *Entropy*, 7(1):68-96, Mar.

External links

- Randall Schweller – Wikipedia.
- Randall Schweller (faculty) – Ohio State University.
- Randall Schweller (about) – KCRW.com.

θΔics

In science, **random chance**, oft-seen as "blind random chance" or "accidental blind random chance", is a colloquial deemed-to-exist scientific principle said to underlying mechanism of morphological change and evolution, according to which all is the result of a combination of "chance" and "randomness".

History

The random chance view of mechanism seems to have arisen in Greek atomic theory as an alternative to god theory.

Hmolscience

Tthe view that humans are simply an accidental collection of atoms, synthesized or formed through evolution as a result of blind random chance, which leads to the conclusion that the universe is meaningless or without purpose.

American physicist Richard Feynman on existence and purpose in the context of the structure and dynamics of the universe.

In 1923, American mathematician-philosopher Bertrand Russell said the following: [1]

> "That man is the product of causes which had no prevision of the end they were achieving; that his origin, his growth, his hopes and fears, his loves and beliefs, are but the outcome of accidental collections of atoms."

In 2002, American philosopher Christian de Quincey calls Russell's view as "the most terrifying story ever told", explaining that: [2]

> "[Russell's view] expresses the terrible poetry of a meaningless universe, rolling along entropic channels of **chance**, blind and without purpose, sometime accidentally throwing up the magnificence and beauty of natural and human creations."

This is compounded by the view that evolution of humans or the synthesis of human molecules is the result of blind chance random mutations in the genome and Darwinian natural selection acting on the results of these mutations.

Advocates of intelligent design, such as William Dembski, tend to cite Pierre Lecomte du Nouy's 1939 book *The Road to Reason*, which is packed with discussions on entropy, molecules, Maxwell's demon, kinetic theory, thermodynamics, Arthur Eddington, etc., as a standard reference for the argument on the improbability of living things to have formed out of the random chance of the material of the universe, from a statistical-mechanical point of view. [3]

A representative modern view that has seemed to work to popularize the random chance view of evolution is Richard Dawkins' 1987 *The Blind Watchmaker*, which outlines the view that all life-forms are the result of chance mutations and the blind selection of a dumb and blind natural watchmaker. [2]

Thermodynamics

The standard human thermodynamic view of the origins of humans holds that each reaction step on the continuous mechanism of the synthesis of human molecules operates according to the principle of Gibbs free energy decrease, i.e. that favored reactions are chosen over unfavored reactions according to the spontaneity criterion. Conversely, the laymanized view, e.g. Quincey's comment that humans are atoms "rolling along entropic channels of chance", often depicts people as having been accidental pockets of local entropy decrease structured in a universe of entropy increase. This type of view, however, is what is called thermodynamic folklore. One interesting exception is Belgian chemist Ilya

Prigogine's view that humans are dissipative structures, formed in far-from-equilibrium conditions of heat flux, that form by passing through "bifurcation points" that lead to two or more possible bifurcating branches, and that this bifurcation action is an unpredictable type of non-deterministic chaotic process.

References

1. (a) Russell, Bertrand. (1923). “A Free Man’s Worship”, T.B. Mosher.
(b) Russell, Bertrand. (1961). “A Free Man’s Worship”, in: R.E. Egner and L.D. Dennon, eds., *The Basic Writings of Bertrand Russell 1903-1959.* Simon and Schuster.
2. De Quincey, Christian. (2002). *Radical Nature: Rediscovering the Soul of Matter* (pgs. 13, 23). Invisible Cities Press.
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(b) Lecomte du Nouy, P. (1948). *The Road to Reason.* New York: Longmans, Green. (Originally published as *L’Homme Devant la Science.* Paris: Flammarion, 1939).

External links

â— Random chance – RationalWiki.org.

θΔics

In religious thermodynamics, **Randy L. Wysong** (c.1940-) is an American physician noted for []

Overview

In 1975, Wyson, in his *The Creation-Evolution Controversy*, steped through all of the various collision points the two main competing belief systems (religion/creationism vs. materialism/evolution) encounter, with a rather detailed chapter on all the various thermodynamic controversies e.g. the classic second law (progressive disordering) vs. evolution (progressive ordering) reconciliations (or non-reconciliations), all of which he diagrams to a significant degree. [1]

Education

Wysong is a former veterinary clinician and surgeon, college instructor in human anatomy, physiology and the origin of life, inventor of numerous medical, surgical, nutritional, athletic and fitness products and devices, research director for the present company by his name and founder of the philanthropic Wysong Institute. [2] Wysong's claim to fame, supposedly, is for having invented one of the first vegan cat foods, or something along these lines.

References

1. Wyson, Randy L. (1976). *The Creation-Evolution Controversy* (ch. 16: Thermodynamics, pgs. 239-75). Wysong Institute.
2. Randy Wysong (bio) – RedRoom.com.

θΔics

In hmolscience, **Ranker Greatest Atheists of All Time** refers to []

The notation [RGA:#], e.g. Friedrich Nietzsche [RGA:21|370+] indicates an atheist's rank in the Ranker.com rankings.

A Dec 2018 screenshot of the banner for the **Ranker.com "Greatest Atheists of All Time"** page, showing a ranked listing of the top 370+ famous atheists.

Overview

In Sep 2014, Libb Thims started the "famous atheists" page, to rank great historical atheists, chronologically, for organizational purposes, using the code (FA:#), e.g. Friedrich Nietzsche (FA:138) as indicator; by early 2018, 250+ atheists had been listed.

In Jun 2015, Thims started the "greatest atheist ever" page in a preliminary loose attempt at ranking the top 100 atheists in respect to greatness; by Dec 2015 al tentative listing of 35 atheists resulted.

In Oct 2018, Thims started a Ranker.com "Greatest Atheists of All Time" and when it was at the 250 atheist level, prompted (Ñº) the Reddit atheist community to cast their votes on the list; another batch of votes came, when the list was at the 360 atheists level, from comment post (Ñº) feed from the 7.5k upvoted article "Einstein's letter belittling god and religion auctioned for upward of $1 million"; the top ten thus far:

1. Charles Darwin
2. Albert Einstein
3. Alan Turing
4. Stephen Hawking
5. **Christopher Hitchens**
6. Isaac Asimov
7. Carl Sagan
8. **Bertrand Russell**
9. Socrates
10. **Thomas Paine**
11. Hypatia
12. Thomas Jefferson
13. Richard Dawkins
14. **Epicurus**
15. Mark Twain
16. Richard Feynman
17. Frederick Douglass
18. Kurt Vonnegut
19. Aristotle
20. George Carlin
21. **Friedrich Nietzsche**
22. Leonardo da Vinci
23. Yuri Gagarin
24. Ludwig Feuerbach
25. **Voltaire**

26. Sam Harris
27. Benjamin Franklin
28. Seth Andrews
29. David Hume
30. Madalyn O'Hair

As of Dec 2018, the list has 370+ atheists, 1.9k votes, 193 voters, and 1.9k views. [1]

See also

â— Ranker Greatest Minds of All Time

References

1. Thims, Libb. (2018). "Greatest Atheists of All Time" (Ñº), Ranker.com.

θΔics

In genius rankings, **Ranker.com greatest minds of all time** is a 2013-launched listing of the most influential thinkers across various disciplines, ranked in a way (list criteria: upvote those who you think had the most influential ideas throughout history) that represents the power of their ideas and their impact on the world; the wisest men and women include top philosophers, physicists, famous poets, thinkers, teachers, physiologists, artists, inventors, engineers, the most irreplaceable CEOs in the world, economists and politicians and those whose talents span across many fields of study.

A screenshot of the Ranker.com description of the **greatest minds of all time** listing criterion. [1]

List | 2015

The following are stats and top 50 of 604 total rankings for date shown:

â— 604 people | 14 Mar 2015 | 112K votes | 10K voters | 577K views

1. Albert Einstein
2. Leonardo da Vinci
3. Isaac Newton
4. Galileo Galilei
5. Plato
6. Aristotle
7. Mozart
8. Nikola Tesla
9. Archimedes
10. Marie Curie
11. Michelangelo
12. Charles Darwin
13. Johann Bach
14. William Shakespeare
15. Johannes Kepler
16. Pythagoras
17. Immanuel Kant
18. Nicolaus Copernicus
19. Socrates
20. Ludwig van Beethoven
21. Johann Goethe
22. Stephen Hawking
23. Benjamin Franklin
24. George Washington
25. Max Planck
26. Friedrich Nietzsche
27. Thomas Jefferson
28. Thomas Edison
29. Gottfried Leibniz
30. Hippocrates
31. Leo Tolstoy
32. Gregor Mendel
33. Homer
34. [Jesus Christ]
35. Soren Kierkegaard
36. Voltaire
37. Alexander Bell
38. Michael Faraday
39. John Kennedy
40. Sandro Botticelli
41. Arthur Schopenhauer
42. Martin Luther
43. Tycho Brache
44. [Confucius]
45. Blaise Pascal
46. Carl Gauss

47. Rene Descartes
48. Dante Alighieri
49. Sophocles
50. Friedrich Schiller

List | 2014

The follow listing shows the top 366 of 366 total rankings for date shown:

â— 366 people | 17 Oct 2014 | 66K votes | 5K voters | 311K views

Note: those shown in [brackets] are not real people; those with dates shown, at least for the top 300, are still existive (see: smartest person alive); a few are double listed as indicated; numbers to the right of (some) names shows shifting, up or down, form original ranking, showing voting effects, e.g. Jobs (25 → 180), Goethe (37 → 22), Einstein (3 → 5), Chomsky (33 → 203); the [J] or [P] labels seem to be joke or political agenda adds:

1. Leonardo da Vinci | 2
2. Isaac Newton | 1
3. Galileo Galilei | 45
4. Aristotle | 7
5. Albert Einstein | 3
6. Plato 11
7. Nikola Tesla | 7
8. Mozart | 15
9. Archimedes
10. Marie Curie | 21
11. Michelangelo | 4
12. Charles Darwin | 17
13. Johannes Kepler
14. Pythagoras
15. William Shakespeare | 28
16. Nicolaus Copernicus
17. Benjamin Franklin
18. Immanuel Kant
19. Socrates
20. Stephen Hawking
21. Johann Bach
22. Johann Goethe | 37
23. Thomas Jefferson | 14
24. Ludwig van Beethoven
25. Friedrich Nietzsche
26. Thomas Edison
27. [Jesus Christ]
28. Hippocrates
29. Homer
30. [Confucius]
31. Voltaire
32. Max Planck
33. Gottfried Leibniz
34. Gregor Mendel
35. Martin Luther
36. Dante Alighieri
37. Alexander Bell
38. Arthur Schopenhauer
39. Sophocles
40. Sandro Botticelli
41. Niccolo Machiavelli
42. Tycho Brahe
43. Thales
44. Georg Hegel
45. Friedrich Schiller
46. Carl Linnaeus
47. Richard Wagner
48. Soren Kierkegaard
49. Miguel de Cervantes
50. Alexander Humboldt
51. Euripides
52. Rene Descartes
53. Wilhelm Humboldt

101. Lope de Vega
102. Robert Schumann
103. Christiaan Huygens
104. Rembrandt
105. Friedrich Hayek
106. Albert Schweitzer
107. Heinrich Hertz
108. Chretien de Troyes
109. Francis Crick
110. George Ohm
111. Francois la Rochefoucauld
112. Karl Benz
113. Abraham Lincoln
114. Jules Verne
115. Karl Schinkel
116. Richard Dawkins (1941-)
117. Oswald Spengler
118. Johann Fichte
119. George Washington
120. [Zarathustra]
121. Alexander the Great
122. Friedrich Schleiermacher
123. [Paul the Apostle]
124. Garry Kasparov (1963-)
125. Max Weber
126. Charlemagne
127. Antonio Vivaldi
128. Ludwig van Beethoven [#24]
129. Charles Dickens
130. Edwin Hubble
131. Mahatma Gandhi
132. Carl Sagan
133. Frederic Chopin
134. Alfred Nobel
135. Aldous Huxley
136. Adolf Hitler
137. Salvador Dali
138. Hypatia
139. Isaac Asimov
140. H.G. Wells
141. John Kennedy
142. Jonathan Swift
143. Winston Churchill
144. Claude Monet
145. Gottlieb Daimler
146. James Madison
147. Philipp Melanchthon
148. Martin Heidegger
149. Charles Montesquieu
150. Edvard Munch
151. J.R. Tolkien
152. Alexander Hamilton
153. Michel Montaigne

201. Cicero
202. El Greco
203. Noam Chomsky (1928-) | 33
204. Louis Pasteur
205. [Moses]
206. Benedict Spinoza
207. Christopher Hitchens
208. Charles Baudelaire
209. Claude Debussy
210. Gioacchino Rossini
211. Pierre-Auguste Renoir
212. Ralph Emerson
213. John Dewey
214. Michel Foucault
215. Diogenes of Sinope
216. Niccolo Paganini
217. Vivekananda
218. Samuel Beckett
219. Flavius Constantius
220. Kurt Godel
221. Thomas Pynchon
222. Nostradamus
223. Niels Bohr [#61]
224. Caravaggio
225. Jean-Paul Sartre
226. Ada Lovelace
227. C.S. Lewis
228. Pablo Picasso
229. George Byron
230. Charles Babbage
231. Ibn Khaldun
232. Robert Burns
233. Friedrich Hayek [#105]
234. Auguste Comte
235. Herman Melville
236. John Neumann
237. Karl Popper
238. Aryabhata
239. Ignaz Semmelweis
240. Parmigianino
241. Emil Cioran
242. Bill Gates (1955-)
243. Henrietta Leavitt
244. John Rawls
245. Malcolm X
246. Antonin Dvorak
247. James Maxwell
248. Sri Aurobindo
249. [Buddha]
250. Michio Kaku (1947-)
251. Daniel Dennett (1942-)
252. Sam Harris (1967-)
253. Walt Disney

301. John Marshall
302. George Galloway (1954-)
303. Jabir ibn Hayyan
304. Frantz Fanon
305. Emile Durkheim
306. Elon Musk (1971-)
307. Edward Leedskalnin
308. Aime Cesaire
309. Gary Glitter (1944-)
310. Hans Zimmer (1957-)
311. Kim Jong-il (1941-) [J/P]
312. Kim Jong-un (1983-) [J/P]
313. [Solomon]
314. Mao Zedong
315. Virginia Woolf
316. Pope John XXIII
317. Mayumi Ozaki [J]
318. Fernando Pessoa
319. Robert Calasso (1941-)
320. Gilles Deleuze
321. Guy Debord
322. Umberto Eco
323. Murasaki Shikibu
324. Nicolae Ceausescu [J/P]
325. Ernest Rutherford
326. Peter Cushing [J]
327. Peter Kropotkin
328. Percy Julian
329. Avital Ronell (1952-)
330. Christopher Lee [J]
331. Andrei Tarkovsky
332. Amartya Sen
333. Simone de Beauvoir
334. Ian Huntley
335. Raul Vaneigem
336. Theodor Adorno

54. John Locke
55. Michael Faraday
56. Fridtjof Nansen
57. Sigmund Freud
58. Raphael
59. Leo Tolstoy
60. Emanuel Swedenborg
61. Niels Bohr
62. Gotthold Lessing
63. Thomas Aquinas
64. Friedrich Schelling
65. Adam Smith
66. Johannes Brahms
67. Mark Twain
68. Edgar Poe
69. Fyodor Dostoyevsky
70. Giuseppe Verdi
71. Wolfram von Eschenbach
72. Virgil
73. Carl Jung
74. August Strindberg
75. George Orwell
76. Epicurus
77. Blaise Pascal
78. Pyotr Tchaikovsky
79. Thomas Hobbes
80. Aristarchus
81. Walther von der Vogelweide
82. Otto Lilienthal
83. Franz Schubert
84. Aeschylus
85. Enrico Fermi
86. Guglielmo Marconi
87. Konrad Zuse
88. Alan Turing
89. Henry Ford
90. Christian Hebbel
91. Edvard Grieg
92. Henrik Ibsen
93. Bertrand Russell
94. Sun Tzu
95. Sergei Prokofiev
96. Ivan Turgenev
97. Werner Heisenberg
98. David Hume
99. Giacomo Leopardi
100. Carl Gauss
154. Carl Clausewitz
155. Honore Balzac
156. Giovanni Boccaccio
157. Petrarch
158. Hero
159. William Blake
160. Robert Frost
161. Euclid
162. Eratosthenes
163. Linus Pauling
164. Augustine
165. Milton Friedman
166. John Mill
167. Francis Bacon
168. Arthur Doyle
169. [Laozi]
170. Pope Innocent III
171. Ludwig Feuerbach
172. Wole Soyinka (1934-)
173. Thomas Paine
174. John Keynes
175. Giordano Bruno
176. Francis Assisi
177. James Joyce
178. Franz Kafka
179. Andreas Gryphius
180. Steve Jobs | 25
181. George Mason
182. Ludwig Wittgenstein
183. Rudolf Steiner
184. Oscar Wilde
185. Leonhard Euler
186. Otto von Bismarck
187. Dr. Seuss
188. Ernst Mach
189. Desiderius Erasmus
190. John Browning
191. Margin King
192. Karl Marx
193. Jacques-Louis David
194. Jeremy Bentham
195. Richard Strauss
196. Franz Liszt
197. Avicenna
198. Gottlob Frege
199. Joseph Lister
200. Alexander Fleming
254. Robert Oppenheimer
255. Albert Camus
256. Giovanni Barbieri
257. John Waterhouse
258. Samuel Johnson | 20
259. Warren Buffett | 49
260. Frederick Douglas
261. Johannes Gutenberg
262. Stanley Kubrick
263. C.V. Raman
264. Saint Agustin
265. Richard Feynman
266. Joan of Arc
267. [Paul of Tarsus] [#23]
268. [Thiruvalluvar]
269. Joseph Goebbels
270. Edward Snowden (1983-)
271. [Muhammad]
272. Agatha Christie
273. H.P. Lovecraft
274. Christopher Columbus
275. Rajaraja Chozhan
276. Paul Dirac
277. Florence Nightingale
278. John Jay
279. John Adams
280. Srinivasa Ramanujan
281. James Watt
282. Jean-Jacques Rousseau
283. Joseph Priestley
284. Frank Wright
285. Galen
286. Marcel Proust
287. Vincent Price
288. Sequoyah
289. Peter the Great
290. Benjamin Banneker
291. Elizabeth I of England
292. Buckminster Fuller
293. Clare Luce
294. Pope Gregory I
295. Fidel Castro
296. Alexis de Tocqueville
297. Rumi
298. Herodotus
299. Wernher von Braun
300. Maimonides
337. Josip Tito
338. Magnus Hirschfeld
339. Jimmy Savile
340. Thomas Newcomen
341. Jean Monnet
342. Jean-Luc Godard
343. Lene Hau
344. James Whistler
345. Jacques Ranciere
346. Vince Russo
347. William Jenner
348. Tristan Tzara
349. Che Guevara
350. Henry Thorequ
351. Rachael Carson
352. Le Corbusier
353. Bela Lugosi [J]
354. Ben Jonson
355. Boris Karloff [J]
356. Marshall McLuhan
357. Roger Bacon
358. Arnold Schoenberg
359. Mike Tyson [J]
360. Pol Pot [P/J]
361. Kim II-sung
362. Ingmar Bergman
363. John Nash
364. James Cooper
365. Arno Penzias
366. Francis Drake

List 2013

The initiated was in 2013 by Walter Graves, which on

â— 71 people | 11 Jun 2013 | 107 votes | 1,925 views (Ñº)

Atheists

Of significant notice, in the listing are the “new atheists”, aka the four horsemen of atheism: Richard Dawkins (#116), Christopher Hitchens (#207), Daniel Dennett (#251), Sam Harris (#252), making the headlines as of late, as well as some the historical atheists of the past: Epicurus (#76), Bertrand Russell (#93), and and Ludwig Feuerbach (#171).

Discussion

(add)

See also

â— Ranker Greatest Atheists of All Time

References

1. The Greatest Minds of All Time – Ranker.com.

θΔics

In IQs, **ratio IQ** is the intelligent quotient or IQ (see: IQ key) of a person calculated as the ratio of the person's "mental age" [MA], i.e. one's intellectual age, based on a standardized test, e.g. IQ test, or other means, to their "chronological age" [CA], i.e. actual age:

$$IQ = 100\frac{MA}{CA}$$

The ratio IQ is basically synonymous with the term Terman IQ, although the latter would generally be considered as an IQ determined by American psychologist Lewis Terman or by one of his tests, such as the Stanford-Benet.

Issues

The ratio IQ formula method was originally designed to test for normalcy and in particular retardation in school children, whereby as such the formula become inaccurate outside of this range and also inaccurate when used with those of adulthood age range (16+).

The issues associate with this formula become most noticeable when parents calculate extreme high-end IQs for their 4-9 year old children, by virtue of the fact that the all one needs is to find a test geared towards eighteen-year-olds and get the child to pass it with scores on par with the average age range of that student, and thus incorrectly conclude via calculate that the child has a 200-range near or above IQ, which would incorrectly but the child above that of the Cox-Buzan IQ estimate of Isaac Newton's IQ of 193, which is the benchmark for a realistic IQ estimate in the genius ceiling range.

All-in-all, IQs calculated via the age ratio method, generally have only a limited applicability, loosely accurate in the 40-170 range, outside of which values calculated become essentially meaningless; a case in point being the example of the child Adragon de Mello, who when "age 4" (chronological age) was determined, by his father, to be scoring on tests at the "mental age" if a sixteen year old; hence the result:

$$IQ_R = 100\frac{16}{4}$$

and the concluding calculation:

$$IQ_R = 400$$

and the "reality check" result, when compared with the IQs of real historical geniuses, of nonsense of the 17 Feb 2010 (version 213) of the then active IQ:200+ table, i.e. the concluding point that a four year old boy is twice as smart or twice the genius that Newton was.

Deviation IQ

The "deviation IQ", an intelligence quotient determined by comparing a person's test score with other examinees of the same age, was in fact developed, from 1914 to 1949 by David Wechlser, owing to the inadequacies of the applicability of the ratio method when used with adults. [1] The gist of which being the premise that the norm or normal scores at the center of the bell curve will be made by people with average or normal IQs (100), that those scoring to the right of the curve will have higher IQs, as compared with the norm; something along the lines of the following:

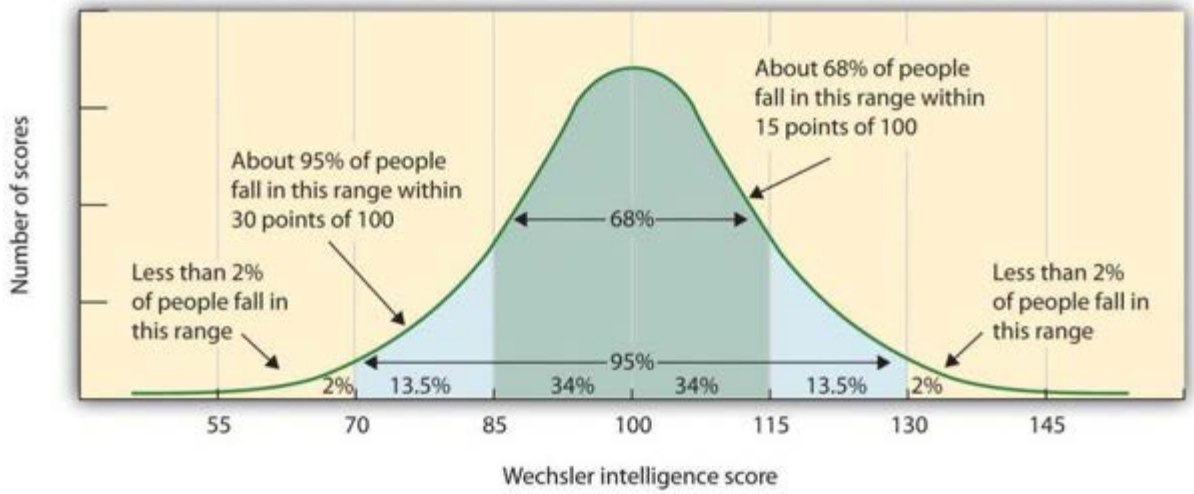

In the years to following, various people began what is called "norming" various tests, using basically personal invented means, so as to assign higher IQs, far into the genius range (140+), for various tests, e.g. the Wechsler IQ test, the Stanford-Binet, etc.; such as follows:

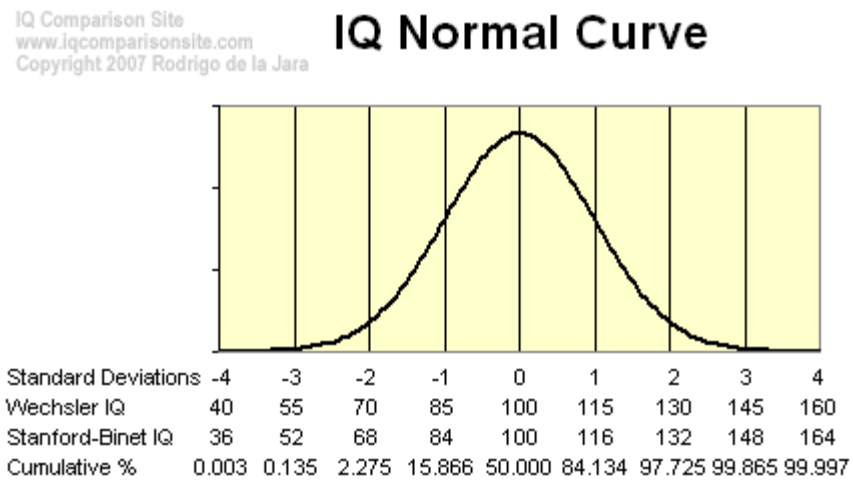

Meaning, according to the so-called "deviation IQ" method, that if one scores perfect, or in the top 1 to 2 percent of scores, that one has a deviation IQ or simply IQ of 130+ to 160+, as shown by example above. The problem here is that geniuses tend not to take test that have answers, but rather to take tests that are unsolved or unsurmounted. In other words, scoring perfect on the Stanford-Binet, Wechsler IQ test, Mensa IQ test, or Mega IQ test, etc., does not, by default, make one a genius.

References

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External links

â— DeLacey, Margaret. (2004). “Ratio and Deviation Test Scores”, Tagdpx.org.

θΔics

In thermodynamics, **rational thermodynamics** is a phenomenological thermodynamics that takes as a model the rational mechanics of eighteenth and nineteenth century mathematicians, especially Joseph Lagrange and Augustin Cauchy, and the thermodynamics of French physicist Pierre Duhem. [1] The subject is largely a product of the work of American mathematician Clifford Truesdell and his students Walter Noll and Bernard Coleman in the 1960s.

References

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â— Coleman, Bernard D. (2003). “Memories of Clifford Truesdell.” *Volume of Journal of Elasticity*, Feb.

θΔics

In human thermodynamics, **Ravi Vedula** (1988-) is an Indian mechanical engineer noted for []

Overview

In 2012, Vedula, made a short film "A Strange Thing Called Love", coproduced with Indian chemical engineer Vamshi Regalla, turned *Journal of Human Thermodynamics* article "A Strange Thing Called Love: in the View of Chemical Thermodynamics", wherein they outline their take on the chemical thermodynamics of love, employing Thims-Pati style reaction mechanisms: [1]

> A + B → A≡B (human chemical bond formation) (Libb Thims, 2003)
> A + B → AB (Surya Pati, 2009)

to explain human bonding as a reaction.

In synopsis origin of their video-turned-article, they comment:

> "A video was made by the authors on the same concept with the title as "A strange thing called love". The plot of this video is that a man falls in love with nine girls and that day comes when he is supposed to make a decision on choosing 'the one'. Surprisingly in the early 1800s, Johann Goethe published a book named *Elective Affinities* based on a similar concept of love and marriage relations among two couples. It is a pure coincidence and the current authors actually didn't know about it until they started preparing this article."

This is what is called, categorically, as the love thought experiment.

Education

Vedula completed his BS in 2009 in India, his ME in 2011 at Old Dominion University, Virginia, in mechanical engineering, and as of 2012 is pursuing a PhD in mechanical engineering at Michigan State University. Vedula's philosophical motto is: "always looking to explore what is there within self."

See also

- Goethe timeline

References

1. (a) Regalla, Vamsi and Vedula, Ravi. (2012). "A Strange Thing Called Love", YouTube, Feb 04.
(b) Regalla, Vamsi and Vedula, Ravi. (2012). "A Strange Thing Called Love: in the View of Chemical Thermodynamics", *Journal of Human Thermodynamics* (url), 8(2): 121-32, Dec 31.

External links

- Ravi Vedula – LinkedIn.

θΔics

In hmolscience, **Ravi Zacharias** (1946-) is an Indian-born Canadian-American Christian apologist noted for his 1990s to present intellectual assault on atheism, a well-honed step above what he calls the "backyard stuff" of the new atheists.

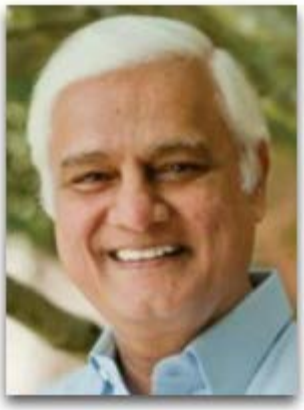

Overview

In 1990, Zacharias penned his *The Real Face of Atheism*, born from a presentation to a group of scientists from Bell Labs on the topic of "Why I am not an Atheist" as a response to Bertrand Russell's "Why I am not a Christian", wherein he attempts to do battle with reductionism.

Reductionism | First cause

In 1990, Ravi, in his *The Real Face of Atheism*, on reductionism, amid his "first cause" chapter, cites the following quotes:

> "Whence came the hydrogen? Is it any less awe-inspiring to conceive of a universe created of hydrogen with the capacity to evolve into man, than it is to accept the creation of man as man?"
>
> — George Beadle (1962), "Address at the Chicago Sunday Evening Club" (to Christian layman), Chicago, Mar 18

> "The ultimate aim of the modern movement in biology is in fact to explain *all* biology in terms of physics and chemistry."
>
> — Francis Crick (1966), *Of Molecules and Men* (pg. 10)

Ravi concludes, however, that this approach is a dead end; commenting the following:

> "The turning of hydrogen into thinking and purposive beings is scientifically undemonstrated, and philosophically devoid of merit."

In 2008, Zacharias, in his *The End of Reason*, in respect to atoms that think, commented on Voltaire's 1755 Poem on the Lisbon disaster, wherein Voltaire refers to himself as "thinking atoms" [4]

Incoherent atheism

In 2013, Zacharias, in his "The Incoherence of Atheism" lecture, opened to the following:

> "Did you hear of the guy who woke up one morning and told his wife that he thought he was dead? His wife said 'no you're not dead, you're talking to me'. He said 'no I'm dead'. She really couldn't reason with him for that long, so she sent him to a bunch of doctors, to get rid of him [him help]; but he came back every day said 'know I'm dead.' So finally she put him touch with a bunch of psychiatrists, who sat as team, and their only goal was to convince him of one thing, namely 'only living people bleed, only living people bleed.' So they went with projectors and overheads and all sorts of data and he just sat there. But finally after getting fed up with this, after two or three days, he replied 'ok, I'll grant you, that only living people bleed.' One of the psychiatrists had a pin hidden in his pocket and plunged it into this man's arm and he blood came spurting out and he looked at the blood and he exclaimed "great Scott! I guess dead people bleed too!
>
> To some people, no amount of evidence will convince them to a contrary position. I want you to know that when you're dealing with the subject that I'm dealing with this morning, namely the 'incoherence of

> atheism', I'm not kidding with the title, it is a totally incoherent world view, at its core, at its foundation, and yet the west keeps flirting with the idea that maybe we are the random product of time plus matter plus chance. We just happen to be happen to be here."

He then discusses Antony Flew's circa 2003 atheism recant; Zacharias then cites Arthur Guiterman's 1936 "Gaily the Troubadour" rhyming godlessness religion poem: (Q)

> First dentistry was painless.
> Then bicycles were chainless,
> Carriages were horseless,
> And many laws enforceless.
> Next cookery was fireless,
> Telegraphy was wireless,
> Cigars were nictotineless,
> And coffee caffineless.
> Soon oranges were seedless,
> The putting green was weedless,
> The college buy was hatless,
> The proper diet fatless.
> New motor roads are dustless,
> The latest steel is rustless,
> Our tennis courts are sodless,
> Our new religion-godless [godless religion].

He then goes onto the Friedrich Nietzsche madman parable; which is well-presented. [2] Zacharias then, following some dialogue, goes into the following, namely the argument that lack of morality and meaning in the atheist world view are the two main things that make it incoherent:

> "Knowledge is a deadly friend. When no one sets the rules. The walls on which the prophets wrote are cracking at the seams. Where do we find an objective transcendent point of reference for good and evil? As far as I'm concerned, atheism dies the death of a thousand qualifications, even prompting Richard Dawkins to make the comment once that he actually wondered if there was such a thing as evil? Why? Because the logic of his philosophy prompts him to raise the question. Evil is just, you know, we call one thing blue, another thing yellow, we call this good, we call this bad, it is nothing more than an aesthetic difference. It's got nothing to do with moral law. There is no moral law in atheism, which makes it incoherent. They can be 'good', but without any rationally compelling reasons for why. Secondly, there is no ultimate point of reference for meaning. There's no ultimate point of reference for meaning."

(add discussion)

Dawkins

In 2013, Zacharias, in his "The Incoherence of Atheism" (13:58-14:32) (Q) talk, referred to Richard Dawkins as a "backyard atheist", in respect to Nietzsche, as follows:

> "Nietzsche was no ordinary guy. He was a genius. In his 'Parable of the Madman', the idea was that if 'god is dead', we're going to have to come up with definitions of what it means to be human, and what it means to be good, or wicked, and so on. The incredible breadth of understanding, one has to at least give him the credit that at least he knew the ramifications of what he had done. Modern day guys like Richard Dawkins,

and the like, they are sort of playing at **backyard stuff** compared to the philosophical sophistication of a person like Nietzsche, who knew he had to evaluate what these things involve."

— Ravi Zacharias (2013), "The Incoherence of Atheism" (13:58-14:32) (Q)

In 2015, Dawkins tweeted (Q) proudly a video purporting that Zacharias was never a "visiting scholar at Cambridge", playing the credentialism game (a loser's move).

Keys

Ravi's book was found via the search keys: atheism, chemistry, physics, thermodynamics.

Quotes | By

The following are quotes by Zacharias:

"There's a new atheism movement taking root in America, a movement more powerful and subversive than the atheism of Madalyn O'Hare in the 1950s and 1960s. Led by writers such as Richard Dawkins, Christopher Hitchens, and Sam Harris, this new challenge to Christianity—or any belief in god—has a smooth and easy appeal to a new generation of Americans."

— Ravi Zacharias (2008), *The End of Reason* (front jacket flap)

"Thinking atoms discussing morals is absurd."

— Ravi Zacharias (1990), *The Real Face of Atheism* [3]

References

1. (a) Zacharias, Ravi. (1990). *The Real Face of Atheism* (hydrogen, pg. 44; absurd, 3+ pgs). Baker Books, 2004.
(a) Beadle, George. (c.1862). "Address at the Chicago Sunday Evening Club", quoted in: *Chicago Daily News* (1862), Mar 18.
2. Zacharias, Ravi. (2013). "The Incoherence of Atheism" (Q), City Life Church.
3. Zacharias, Ravi. (1990). *The Real Face of Atheism* (absurd, pg. 128) (Q)(Q). Baker Books, 2004.
4. Zacharias, Ravi. (2008). *The End of Reason: a Response to the New Atheists* (pgs. 42-43). Zondervan.

External links

- Ravi Zacharias – Wikipedia.

θΔics

In hmolscience, **Ray Kurzweil** (1948-) is an American computer technology inventor and futurist noted for his 2000 *The Age of Spiritual Machines: When Computers Exceed Human Intelligence*, wherein he asks "how do we reconcile the emergence of intelligent life with the law of increasing entropy?", and attempts alternative answers to this query, and his follow-up 2005 *The Singularity is Near: When Humans Transcend Biology*, wherein he digs into similar type of mind-brain modern science type problems. The following is a representative quote from the latter: [2]

> "If we were magically shrunk and put into someone's brain while she was thinking, we would see all the pumps, pistons, gears and levers working away, and we would be able to describe their workings completely, in mechanical terms, thereby completely describing the thought processes of the brain. But that description would nowhere contain any mention of thought! It would contain nothing but descriptions of pumps, pistons, and levers!"
>
> — Gottfried Leibniz (c.1700)

References

1. Kurzweil, Ray. (2000). *The Age of Spiritual Machines: When Computers Exceed Human Intelligence* (pg. #). Penguin.
2. Kurzweil, Ray. (2005). *The Singularity is Near* (Leibniz quote, pg. #). Penguin.

External links

â— Ray Kurzweil – Wikipedia.

θΔics

In hmolscience, **Raymond Bassett** (1904-1956) was an American sociologist noted for his involvement in John Q. Stewart's so-called "social physics project at Princeton", aka the Princeton Department of Social Physics", and seems to have been a member of the 40-person AAAS Social Physics Committee, commenting, e.g. his view that "decisions", as per Stewart's so-called "central equation of social physics" goes, is an elementary concept in the whole of sociological theory. [1]

Education

Bassett completed his undergraduate work in 1928 at Yale and his PhD in 1948 at the University of Washington, and from 1949 to 1956 was chairman of sociology department (Ñº) at the University of New Hampshire. [2]

References

1. (a) Stewart, John Q. (1953). "Remarks on the Current State of Social Physics" (pdf), Paper presented at the American Association for the Advancement of Science conference, Boston, Dec 30; in: Box 58, Miscellaneous Writing, John Q. Stewart Papers, Rare Books Special Collections, Princeton University.
(b) Staff. (1955). "Research in Progress: Social Physics", *Princeton Alumni Weekly*, 55:17.
2. Raymond Eliot Bassett (1904-1956) – BassettBrqanches.org.

θΔics

In existographies, **Raymond Faulkner** (1894-1892) (RMS:109) was a British Egyptologist, noted for []

Overview

In 1968, Faulkner published Spell 148 of the Coffin Texts, which gives the original account of the "virgin birth" and the "holy spirit". [3]

In 1972, Faulkner did an English translation of the Papyrus of Ani (discovered by Wallis Budge in 1888) version of the Egyptian Book of the Dead, the first translation of which being done by Budge in 1895. [1] Faulkner's 1972 translation, as of 2015, is considered by some, to note, to be the finest version to date, is written in a more standard book with paragraph like form, as compared to the Budge version, which is fragment like English, words placed to match each hieroglyphic.

Education

In 1918, Faulkner began to study hieroglyphs with Margaret Murray, who stimulated his existence-long interest in Egyptian religion. In 1926, Faulkner was invited to become the full-time Egyptological assistant to Alan Gardiner, who with he worked until 1954, when he was appointed lecturer in Egyptian language at University College, London. [2]

Quotes | On

The following are quotes on Faulkner:

> "Students of Egyptology all over the world must bless Faulkner for his succinct and reliable editions and translations of Egyptian texts, and for that daily companion of their studies, his *Concise Dictionary of Middle Egyptian*. Perhaps no British Egyptologist in this century other than his great friend and mentor Sir Alan Gardiner has made comparable contributions to the welfare of the student of the Egyptian language."
>
> — H.S. Smith (1974), "Raymond O. Faulkner: an Appreciation" [2]

References

1. Faulkner, Raymond. (1972). *The Egyptian Book of the Dead: the Book of Coming Forth by Day: Complete Papyrus of Ani, Featuring Integrated Text and Full-Color Images* (translator: Ogden Goelet; Preface: Carol Andrews; Introduction: Daniel Gunther; Foreword: James Wasserman) (Amz). Chronicle Books.
2. Smith, H.S. (1974). "Raymond O. Faulkner: an Appreciation" (Ñº), *The Journal of Egyptian Archaeology*, 60:iii+5-7.
3. (a) Faulkner, Raymond. (1968). "Translation of Spell 148 of the Coffin Texts", *The Journal of Egyptian Archeology*, 54:40-44.
(b) Gilula, Mordechai. (1971). "Coffin Texts Spell 148" (Ñº), *The Journal of Egyptian Archaeology*, 57:14-19, Aug.
(c) Luckhert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective* (pg. 92). SUNY Press.

Further reading

â— Faulkner, Raymond O. (1932). *The Papyrus Bremner-Rhind* (British Museum No. 10,188) (pdf). Bibliotheca Aegyptiaca III, 1933.

External links

â— Raymond O. Faulkner – Wikipedia.

θΔics

In ecology, **Raymond Lindeman** (1915-1942) was an American ecologist his 1942 article "The Trophic-Dynamic Aspects of Ecology", wherein, building on the previous work of Charles Elton (1927), on food chains, and Arthur Tansley (1935), on the definition of "ecosystem" as an association of plants and animals and the physical factors of their environment, he outlines the concept of an ecosystem as an energy-transforming system: [1]

> "The basic process in trophic dynamics is the transfer of energy from one part of the ecosystem to another. All function, and indeed all life, within an ecosystem depends upon the utilization of an external source of energy, solar radiation. portion of this incident energy is transformed by the process of photosynthesis into the structure of living organisms."

Lindeman, supposedly, employs some thermodynamic formalism, such that at each trophic level, work is performed in the maintenance of the organism, but such that the transformations are relatively inefficient, so that less energy is available to each higher trophic level: layered on top of each other, each trophic level width sized proportional to their energy contents, this model becomes viewed as a pyramid model or "trophic pyramid" model as it is sometimes called (see main: energy pyramid model). [3]

Education

Lindeman was a post-doctoral student of English-born American zoologist George Hutchinson (1903-1991), who was impressed by the biogeochemical principles of Russian geologist Vladimir Vernadsky, and who in the 1930s had applied Vernadsky's principles to the study of lakes, Linsley Pond in North Branford, Connecticut, in particular, thinking of the community as an organism, and metabolism of the organism as a "transference of matter and energy", and tried to understand the process of succession in thermodynamic terms.

Theory

The potential of Hutchinson's approach was said to have reached its fullest expression in the work of Lindeman, particularly his so-called classic 1942 paper "The Trophic-Dynamic Aspect of Ecology", wherein he viewed the ecosystem, considering the biotic community and the abiotic environment as a single functional unit, and built on Elton's feeding relationships models, albeit reducing the discussion to energy and energy flows from one trophic level to the next, using a pyramid of numbers, whereby each structural relationship was dictated by the second law of thermodynamics. [2]

See also

â— Paul Colinvaux

References

1. Lindeman, Raymond L. (1942). "The Trophic-Dynamic Aspects of Ecology" (pdf), *Ecology*, 23: 399-418.
2. (a) Mitman, Gregg. (1992). *The State of Nature: Ecology, Community, and American Social Thiought, 1900-1950* (pg. 140). University of Chicago Press.
(b) G. Evelyn Hutchinson – Wikipedia.
3. (b) Scott, Thomas. (1996). *Concise Encyclopedia of Biology* (pg. 408). Walter de Gruyter.
(c) Brooks, Daniel R. and Wilson, Edward O. (1988). *Evolution as Entropy: Toward a Unified theory of Biology* (pg. 31). University of Chicago Press.

External links

â— Raymond Lindeman – Wikipedia.

In abbreviations, **RE** is the acronym for "reaction extent" or extent of reaction, employed in hmolscience as a physicochemically neutral terminology for the number of years a person reacted on the surface of the earth prior to their reaction end (death). On the Nikola Tesla (1856-1943) page, to exemplify, the notation (RE=87) signifies that Tesla dereacted (died) at the age of 87.

Note

See main: Famous publications by age

The term RE is employed as a hyperlink tool to gauge longevity genius stature, particularly in respect to the hmolscience, physical humanities, or the physicochemical humanities, to the effect that whereas, by comparison, in physics it is often said that if one does not make their mark before age (reaction extent) 30, they never will (see: famous publications by age), i.e. their peak has passed; conversely, in hmolscience, the benchmark is reaction extent of age 60, plus or minus ten years, using the Goethe (age 60) 1809 *Elective Affinities* publication as the central peak benchmark, and Adams (age 70) 1908 discussions of how "the solution of the mind is certainly in the magnet" + "no one shall persuade me that I am not a phase" comments on his physicochemical dynamic theory of history, and the Rossini (age 72) 1971 "Chemical Thermodynamics in the Real World" address, as high end peaks.

θΔics

In famous publications, “**Re-action**” is an 1832 article by English freethinker Job Nott (Ñº), a fan of Thomas Paine and Voltaire, wherein he describes the term “re-action” (or reaction) three ways: philologically, mathematically (or physically), i.e. as defined by the second law of motion, and lastly, and most-interestingly, “morally”.

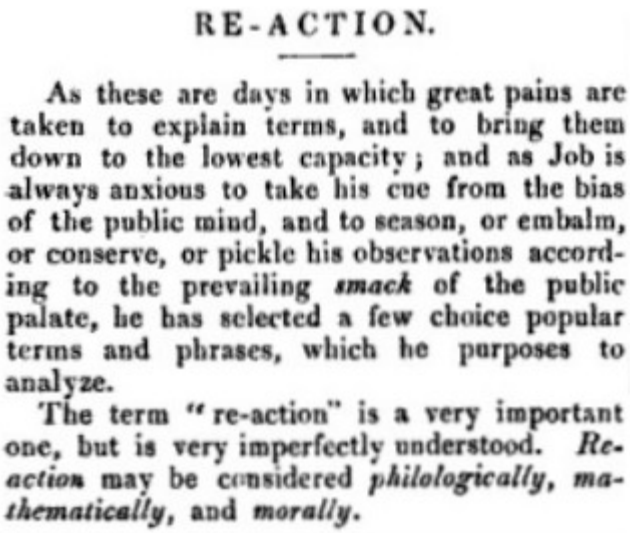

RE-ACTION.

As these are days in which great pains are taken to explain terms, and to bring them down to the lowest capacity; and as Job is always anxious to take his cue from the bias of the public mind, and to season, or embalm, or conserve, or pickle his observations according to the prevailing *smack* of the public palate, he has selected a few choice popular terms and phrases, which he purposes to analyze.

The term "re-action" is a very important one, but is very imperfectly understood. *Re-action* may be considered *philologically*, *mathematically*, and *morally*.

The opening section of English freethinker Job Nott's 1832 article "**Re-action**", wherein he describes the compound term "*re*-action', philologically, mathematically, and morally, using an early variant of verbal human chemical reaction theory. [1]

Overview

In 1832, English freethinker Job Nott (Ñº), a fan of Thomas Paine and Voltaire, in his article “Re-Action”, described the term “re-action” philologically, mathematically (or physically), and morally, as follows: [1]

> “As these are days in which great pains are taken to explain terms, and to bring them down to the lowest capacity; and as Job is always anxious to take his cue from the bias of the public mind, and to season, or embalm, or conserve, or pickle his observations according to the prevailing smack of the public palate, he has selected a few choice popular terms and phrases, which he purposes to analyze. The term ‘re-action’ is a very important one, but is very imperfectly understood. **Re-action** may be considered *philologically*, *mathematically*, and *morally*.
>
> l. Let us first consider it philologically. But, perhaps, you may not understand what philology is. Then I must endeavor to explain. Philology, in its proper acceptation, is the science of language, whereby the meaning of terms, and the grammatical construction of language is accurately defined; but the new reformed philology is the art of mystifying words and sentences, so as to make them mean any thing or nothing, according as may best suit our purposes. Job being an old fashioned fellow, and having contracted his notions of philology before the reformed practice came up, must be permitted to carry on his researches by the old fashioned plan. Now in treating a term philologically, the first process according to the old school, is to reduce compound words to their simple elements. *Re-action*, then, being a compound word, must be reduced to its compound parts, ‘re’ and ‘action’; these being understood, we shall understand the word which is compounded of them.
>
> Now we all know what ‘action’ is; it is energy as opposed to supineness; it is *work* as opposed to *idleness*. Action is the very life and soul of labor, and therefore is the delight of laboring men. Now the little particle ‘re’, though it means nothing of itself, yet when put before another syllable, assumes a great importance; thus combined it has the signification of ‘again’, as *re*-form is to form again, *re*-turn is to-turn again. In like manner *re*-act is to act again, and *re-action* is the coming again into action.
>
> Now as we have seen that action is energy, as opposed to supineness, it is clear that *re*-action is a restoration to energy those principles which had lain dormant, and bringing once more into operation those energies which had been paralyzed. Then, again, as we have seen that action is *labor* or *work*, as opposed to *idleness*, it follows of course that *re*-action is the *return* to labor and employment of those who had been idle and unemployed. Now, my good fellows, this is Job's view of re-action, philological considered, and I do assure you that 'tis as accurate a definition as any philological dry-salter has served out to you for many a long month; and you can't wonder that viewing the subject thus, Job rejoices in the prospect of a general reaction, or acting again, or returning again to work, employment, activity, energy, and all the blessings that are included in this comprehensive term. I might here show that re-action, philologically considered, signifies a *return*, or retracing a course that has been rashly entered upon, and the dangers of which have been timely discovered, but this view will come out more distinctly under our second view of the subject.
>
> 2. Let us then consider this term *mathematically*. Re-action is pre-eminently a mathematical term. In this

view re-action is defined to mean 'the reciprocation of any impulse or force impressed.' Perhaps you don't understand this explanation; but you will easily understand the *thing*. If a tennis ball is thrown against a wall it will *rebound*, that is re-action. If a man strike another man with his fist, he hurts his own fist in proportion to the violence of the blow which he gives, that is re-action—the action returns upon himself. If a ship at full sail strikes against a rock, she will be driven back by the blow in proportion to the force with which she struck the rock, this is re-action. Now it is a mathematical axiom, or first principle [see: second law of motion], that 'action and re-action are equal and opposite', i.e. that the rebounding or reverberating impulse is equal in force to the blow given, and acts in the precisely opposite direction; as, for instance, if a man be so blind and stupid as to run his head against a wall, he is driven backward by the force of re-action *just in the opposite direction to that in which he was going*; and with whatever degree of force he knocks his cranium against the wall, with just the same degree of force and violence (if happily his skull sustains the shock) will he be driven back again.

This is true, you may depend; and you better take my word for it than try the experiment. Now this accounts for the sudden changes which we constantly witness in public opinion.

3. To consider the subject *morally*. It will be manifest from the observations which have been made, that he who goes about to effect any object by violent appeals to men's passions, is sure in the end to defeat his own object [see: Adolf Hitler]; and it is well for him if he do not work his own rain, for as the tennis ball violently projected against the wall, rebounds against the head of him who hurled it; so he who rashly employs the power of *passion* to give an impulse and direction to public opinion, is in danger of its rebounding upon himself with a re-action equal in its violence, and opposite in its tendency. Public opinion may be gently *drawn forward* by the strong but soft cords of persuasion and sound argument, without any danger of evil consequences; but if it be urged onward by the blind force of passion and prejudice, it will sooner or later come in contact with the firm opposing rock of truth, and be driven back with a force and velocity proportioned to the undue impulse that had been given to it. The inference then as respects those who wish to act upon others is, that it is much safer to draw than to drive—to guide men's judgments by sound reason, and to lead them by the hand of kindness and conciliation, than to drive them into any particular course by inflaming their passions.

But there is another inference as respects those who are operated upon; and that is, that though by the power of re-action they regain their old positions, and so escape the ruin that they were rushing upon, yet they are left to feel the smart. The man who, when rushing over a precipice, runs his head against a post, and is driven backward is saved indeed—and saved by re-action; but he comes off second best, and is left to smart for the folly and impetuosity of his headstrong course. Take my advice, then, my dear fellows; *know your friends*—they are those who treat you friendly; not those who fire your passions—but those who convince your judgments; not those who drag you by the ears—but those who fill your bellies; and I will add, not those who merely talk about re-action, by those who set you upon re-acting; i.e. those who give you employ—that in quietness you may work and eat your own bread."

(add discussion)

Quotes

The following are related quotes:

"For every **action** there is an equal and opposite **re-action**. When connective sets of action and re-action pairs occur near an activation barrier, a **chemical re-action** occurs."

— Libb Thims (2015), mental rumination on the second law of motion and chemical reactions; following seeing the term 're-action' during video at gym, 3:49PM CST 17 Dec 2015

References

1. Nott, Job. (1932). “Re-Action” (Ñº), *The Bristol Job Nott: Laboring Man’s Friend*, No LI, Nov 29.

θΔics

In thermodynamics, **re-establishment of equilibrium in the caloric** is a view professed by French physicist Sadi Carnot, in his 1824 *Reflections on the Motive Power of Fire*, that the production of motion in steam-engines is always accompanied by a circumstance on which we should fix our attention. This circumstance, according to Carnot, is the:

> "re-establishing of equilibrium in the caloric; that is, its passage from a body in which the temperature is more or less elevated (hot body), to another in which it lower (cold body)."

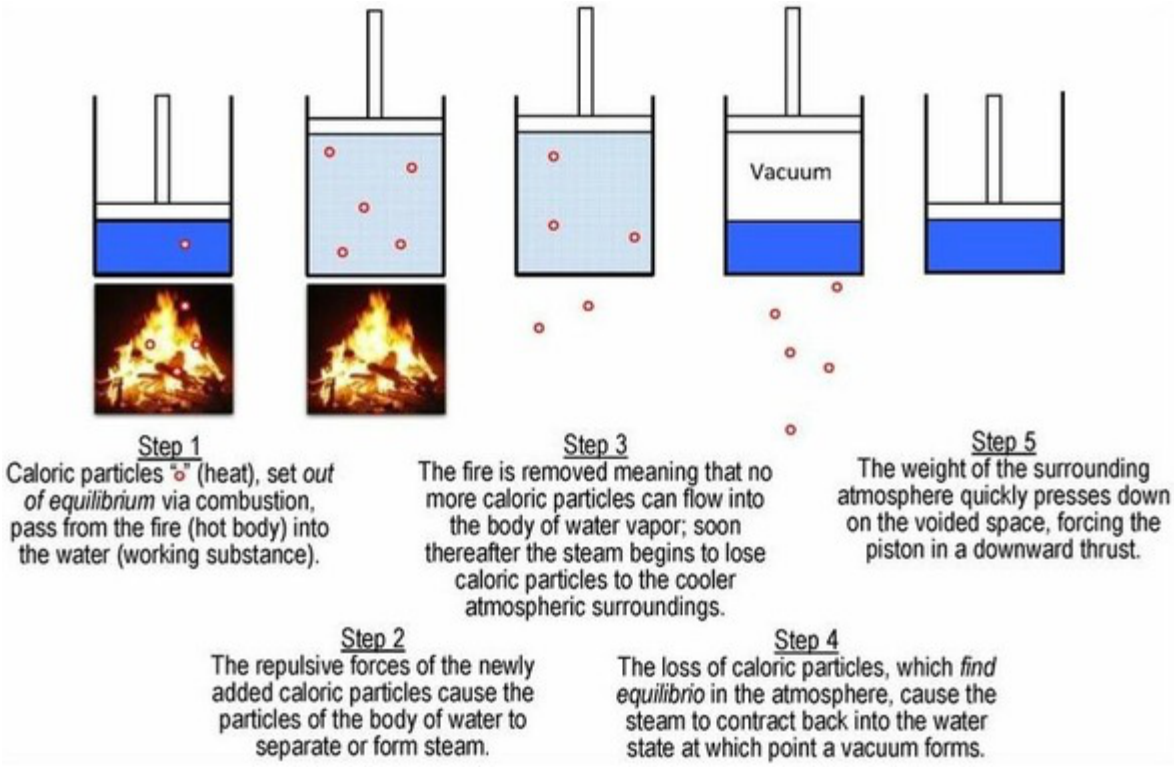

French physicist Sadi Carnot's 1824 so-called **re-establishment of equilibrium in the caloric**, namely his model of a body being able to "reestablish" its equilibrium amount of caloric, a then considered a conserved particle, following expansion to one volume and state, followed by contraction to its original volume and state.

This view originated from the descriptions, by French chemist Antoine Lavoisier in the 1780s, of combustion, as a process that sets free or releases heat or "caloric" particles and light, otherwise known as caloric theory, which became the predominant view of what heat was, lasting well into the 1830s. In more detail, to describe the operation of the steam engine, Carnot states that:

> "The caloric developed in the furnace by the effect of the combustion traverses the walls of the boiler, produces steam, and in some way incorporates itself with it. The latter carrying it away, takes it first into the cylinder, where it performs some function, and from thence into the condenser, where it is liquefied by contact with the cold water which it encounters there. Then, as a final result, the cold water of the condenser takes possession of the caloric developed by the combustion … the steam (working substance) is here only a means of transporting the caloric."

Caloric flow

The caloric, described here, and first defined in the 1787 publication *Method of Chemical Nomenclature*, written by Guyton de Morveau, Antoine Lavoisier, Antoine-Francois de Fourcroy, and Claude Berthollet, was thought of as an indestructible, fluid-like, massless particle of heat that could travel though the pores of bodes, liquids, and gases acting as the repulsive force balancing the attractive force of the particles (atoms) of bodies towards each other. This view was initially described in French chemist Antoine Lavoisier's 1780 memoir "On Combustion in General". In this memoir, Lavoisier lays out six points:

> (a) In combustion, there is a disengagement of the *matter of fire* (caloric) or light.

(b) A body can burn only in pure air [oxygen gas].
(c) In combustion, there is a destruction or decomposition of pure air and the increase in weight of the body burnt is exactly equal to the weight of the air destroyed or decomposed.
(d) The body burnt changes into an acid by addition of the substance which increases its weight.
(f) Pure air is a compound of the *matter of fire* (caloric) or of light (possibly caloric) with a base.
(g) In combustion, the burning body removes the base, which it attracts more strongly than does the matter of heat, and sets free the combined *matter of heat* (caloric), which appears as flame, heat, and light.

In his famed 1789 *Elements of Chemistry*, Lavoisier elaborates further on the nature and action of caloric by devoting his entire opening chapter to the subject. To begin, he enunciates Herman Boerhaave's *law of separation of particles by heat*, which states that "every body, whether sold or fluid, is augmented in all its dimensions by any increase in its sensible heat." Lavoisier states that the term caloric, "while we are not obliged to suppose this to be a real substance", is used to distinguish "the cause of heat, or that exquisitely elastic fluid which produces it." He states that the caloric be "considered as the repulsive cause, whatever that may be, which separates the particle of matter from each other". In respect to radiant heat, Lavoisier concludes:

> "in the present state of our knowledge, we are unable to determine whether light be a modification of caloric, or if caloric be, on the other contrary, a modification of light."

In relation to expansion or contraction of bodies by heat, Lavoisier states that "bodies become solid, or fluid, or aeriform, according to the quantity of caloric by which it is penetrated; or, to speak more strictly, according as the repulsive force exerted by the caloric is equal to, stronger, or weaker, than the attraction of the particles of the body it acts upon." He also points out, in addition to these attractive and repulsive powers, that a "third power", that of the pressure of the weight of the atmosphere, acts to give us states of liquid and solid, whereas otherwise the caloric would cause everything to be in a state of unstable melting. In relation to equilibrium, Lavoisier tells us:

> "The particles of every substance in nature exist in a certain **state of equilibrium**, between that attraction which tends to unite and keep the particles together, and the effects of the caloric, which tends to separate them."

After giving definitions for "free caloric", "combined caloric", "specific caloric", and the "capacity of bodies for containing caloric", he then goes on to define heat as something considered as a sensation, i.e. sensible heat, as the effect produced upon our sentient organs, by the motion or passage of caloric, disengaged from the surrounding bodies." To elaborate on this definition, he states, in relation to the sensations of heat and cold, that:

> "When we touch a cold body, the **caloric** which always **tends to become in equilibrio** in all bodies, passes from our hand into the body we touch, which gives us the feeling or sensation of cold. The direct contrary happens, when we touch a warm body, the caloric then passes from the body into our hands, producing the sensation of heat. If the hand and the body touched be of the same temperature, or very nearly so, we receive no impression, either of heat or of cold, because there is no motion or passage of the caloric."

It seems that Carnot, in spite of Lavoisier admonition of "not be obliged to to suppose this to be a real substance", took the caloric to be a real entity that could pass from body to body until it found equilibrium. In particular, the model that Carnot seems to base his analysis on is the 1890 Papin steam engine, on which all other steam engines, in principle, are built (depicted above).

Papin's steam engine model

In the original steam engine design by Denis Papin, depicted above, as described in his 1690 memoir "A New Method to Obtain Very Great Motive Powers at Small Cost", on which all others were built, a body of water (working substance) contained in a cylinder, closed at the bottom, but topped by a air-tight movable piston, was taken through a process of steps in which one engine cycle, designed to produce the “intended effect”, i.e. the downward forceful thrust of the piston, to which a pulley and heavy weight were attached, was described as such:

1. The cylinder of water was put in contact with a fire.
2. The fire caused the water to be converted into steam, thus *forcing the piston up*.
3. The fire was removed.
4. The cylinder, now being in contact with cooler surrounding air, condensed, thus causing a vacuum to form.
5. The *piston was then forced downward*, as the vacuum could not hold up the weight of the atmosphere.

In later engine designs, such as made by Savery and Watt, the body of the cool surrounding air was replaced with the body of cool flowing water, which was thus able to remove the heat from the cylinder faster. In a sense, to produce the “intended effect”, the particles of heat, deemed indestructible, an hypothesis originating with the 5th century atomic theory of Greek philosopher Leucippus, would flow from the fire, due to their release via combustion, into the water of the cylinder, cause the water to expand, then flow out into the cold body in the final step, thus letting the water, now having been rid of the caloric particles, to condense or contract in volume.

Thermodynamics

In 1798, American-born English physicist Benjamin Thomson showed, in his now-famous cannon boring experiment, that heat could be generated continuously by turning a dull boring bit inside of a cannon. [2] This laid question to Lavoisier’s caloric theory. In other words, heat particles were seemingly being created here, not due to combustion, or a passage from a hot to a cold body, but by friction. This was a mystery to many. Soon, similar types of experiments were being done, such as British chemist and physicist Humphry Davy's 1799 “ice-rubbing experiments”, where in a room colder than the freezing point of water, he generated heat or made ice melt by the mechanical rubbing of cubes together. These efforts, among others, led to the establishment of the mechanical equivalent of heat in about 1842, a set of experimental results which showed that quantities of heat could be converted into work and, conversely, that quantities of work could be converted into heat:

Heat ↔ Work

This equates to the equivalence of caloric particles being converted, as they flow through the working substance, into "internal work" or the motions of atoms of bodies:

Caloric ↔ Movement of atomic bodies under the influence of force

In other words, in the terminology of caloric particles, newer experiments began to show that a certain portion of the caloric particles that went into cooler bodies were transformed into an equivalent amount of internal atom work and that these “transformed” caloric particles could not be recovered, as Carnot had supposed. Using the above diagram, as an example, if say five caloric particles went in, modern experiments would show that less than five would come out.

To correct this deficit in theory, beginning in 1850, German physician Rudolf Clausius spent 15-years writing the monumental *Mechanical Theory of Heat*, which introduced the quantity of entropy, in place of caloric, to correct Carnot’s theory, thus laying out the foundations for the new science of thermodynamics, as we know it now. [3]

References

1. Carnot, Sadi. (1824). *Reflections on the Motive Power of Fire - and on Machines Fitted to Develop that Power*. Paris: Chez Bachelier, Libraire, Quai Des Augustins, No. 55.
2. (a) Thomson, Benjamin. (1798). "An Inquiry Concerning the Source of Heat which is Excited by Friction". *Philosophical Transactions.* Vol. XVIII, pg. 286.
(b) Thomson, Benjamin. (1798). "An Inquiry Concerning the Source of Heat which is Excited by Friction" in *The Complete Works of Count Rumford*, (pgs. 469+). Oxford University Press, 1870.
3. (a) Clausius, R. (1865). *The Mechanical Theory of Heat – with its Applications to the Steam Engine and to Physical Properties of Bodies*. (Google Books). London: John van Voorst, 1 Paternoster Row. MDCCCLXVII.
(b) Clausius, Rudolf. (1879). *The Mechanical Theory of Heat*, (2nd ed). London: Macmillan & Co.

θΔics

In terminology, **react** (TR:264), from *re*- "again" + -*act* "process of doing", is to "act again" (Job Nott, 1832); to exert a reciprocal or counteracting force or influence; to respond to a stimulus; to act in opposition to a force or influence; to move or tend in a reverse direction; to undergo chemical reaction; compare: re-action. [1]

Quotes

The following are related quotes:

> "Now we all know what 'action' is; it is energy as opposed to supineness; it is *work* as opposed to *idleness*. Action is the very life and soul of labor, and therefore is the delight of laboring men. Now the little particle 're', though it means nothing of itself, yet when put before another syllable, assumes a great importance; thus combined it has the signification of 'again', as *re*-form is to form again, *re*-turn is to-turn again. In like manner ***re*-act** is to act again, and *re-action* is the coming again into action."
>
> — Job Nott (1832), "Re-action" [2]

See also

â— Reactant
â— Reaction

References

1. (a) React – Merriam-Webster Collegiate Dictionary, 2000.
(b) Nott, Job. (1932). "Re-Action" (Ñº), *The Bristol Job Nott: Laboring Man's Friend*, No LI, Nov 29.
2. Nott, Job. (1932). "Re-Action" (Ñº), *The Bristol Job Nott: Laboring Man's Friend*, No LI, Nov 29.

θΔics

In chemistry, a **reactant** is an initial component, such as an atom, molecule, ion, chemical species, or compound, etc., at the start of a chemical reaction. [1] In a generalized sense, a reactant is a substance that is consumed in the course of a chemical reaction. [2] The "products" of a reaction are considered as the end components. This is diagrammed below:

$$\textit{Reactants} \rightarrow \textit{Products}$$

Human chemistry

In human chemical reactions, the description of what is a “reactant” in a reaction requires some thought and depends on the energy characterization of the process. In a simple combination reaction, such as when an unacquainted pair, *A* and *B*, collide in time, begin to date, and fall in love over a set number of months or years:

$$A + B \rightarrow AB$$

the reactants are generally considered as the human molecules in an unattached state prior to first contact. [3] A typical example, would be a two people (reactants) falling in love (products) at first sight. [4] According to two studies, 28% of Americans have fallen in love at first sight. [5] Similarly, 65% of people agree with the statement: "falling in love was not really a choice; it just struck me." [5]

References

1. Daintith, John. (2004). *Oxford Dictionary of Chemistry*. New York: Oxford University Press.
2. Reactant – IUPAC Gold Book, 1996.
3. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview). Morrisville, NC: LuLu.
4. Naumann, Earl. (2001). *Love at First Sight - the Stories and Science Behind Instant Attraction.* Naperville, Illinois: Casablanca Press.
5. Fisher, Helen. (2004). *Why We Love - the Nature and Chemistry of Romantic Love*, (pgs. 23, 42). New York: Henry Holt & Co.

θΔics

In science, **reaction**, from Latin *reagere* “react”, *re-* “back” + *agree* “to do, act”, is the coming together, or interaction, of two or more atoms, ions, or molecules with the result that a chemical change takes place and a new substance is formed with a different chemical composition; the nature or operation of which is described by a chemical equation. [1]

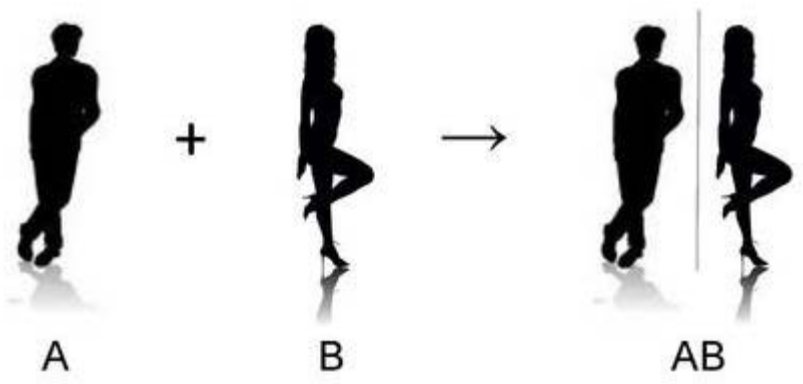

Generic diagram of a male-female reaction; one that Goethe envisioned things in 1796 (see: Goethe timeline).

Overview

In 1687, Isaac Newton, in his laws of motion, employed the term "reaction", in his third law of motion, that for every action there is an equal and opposite reaction.

In 1717, Newton published his last and final Query 31, wherein he stated the following tendencies to combine:

> “Is it not for want of an attractive virtue between the parts of water ( ) and oil, of quick-silver ( )(Hg) and antimony ( )(Sb), of lead ( )(Pb) and iron (♂)(Fe), that these substances do not mix; and by a weak attraction, that quick-silver ( )(Hg) and copper (♀)(Cu) mix difficultly; and from a strong one, that quicksilver ( )(Hg) and tin ( )(Sn), antimony ( )(Sb) and iron (♂)(Fe), water ( ) and salts, mix readily?”

In 1718, French chemist Étienne Geoffroy used these descriptions of affinity gradients, found in Query 31, to construct the world’s first affinity table; from which, in large part, the modern concept of "reaction" or "chemical reaction" was born or was developed, by a number of individuals over the following two centuries.

See also

- Affinity of reaction
- Chain reaction | Action chains
- Chemical reaction
- Extent of reaction | Reaction extent
- Human chemical reaction
- Human chemical reaction theory | HCR theory
- Human reproduction reaction
- Love the chemical reaction
- Male-female reaction
- Reaction coordinate
- ReactionMatch.com

References

1. (a) Clark, John O.E. (2004). *The Essential Dictionary of Science* (pg. 623). Barnes & Noble.
(b) Reaction – Online Etymology Dictionary.

External links

- Reaction – Wikipedia.

θΔics

In hmolscience, **reaction bubble** is an invisible bubble that surrounds an organism, which serves to maintain proper spacing between individuals, according to which when bubble breaching occurs, a reaction results.

A 2012 article on **reaction bubbles** arguing that activity in the sensory breach of the bubble actuates activity in the amygdala that triggers a defense reaction. [2]

Etymology

The concept of "reaction bubbles" was developed in 1966 by American anthropologist Edward Hall in his studies of personal space of animals and humans. [1]

Quotes

The following are related quotes:

> "Each animal is surrounded by a series of **bubbles** or irregularly shaped balloons that serve to maintain proper spacing between individuals."
>
> — Edwin Hall (1966), *The Hidden Dimension*

References

1. (a) Hall, Edward T. (1966). *The Hidden Dimension: an Anthropologist Examines Man's Use of Space in Public in Private.* Doubleday Anchor Book.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (bubbles, 14+ pgs; reaction bubbles, pg. 225). Morrisville, NC: LuLu.
2. Closa, Daniel. (2012). "Tonsil and Reaction Bubbles" (Spanish → English), *Conec.es*, Jan 05.

θΔics

In chemistry, **reaction coordinate** is a name that refers typically to the plotting of one variable of a chemical reaction on the y-coordinate, typically energy or free energy, versus the another variable, such as extent of reaction, species concentration, reaction velocity, etc., on the x-coordinate. Reaction coordinates originated from transition state theory, wherein surface energy plots were developed as a conceptual tool.

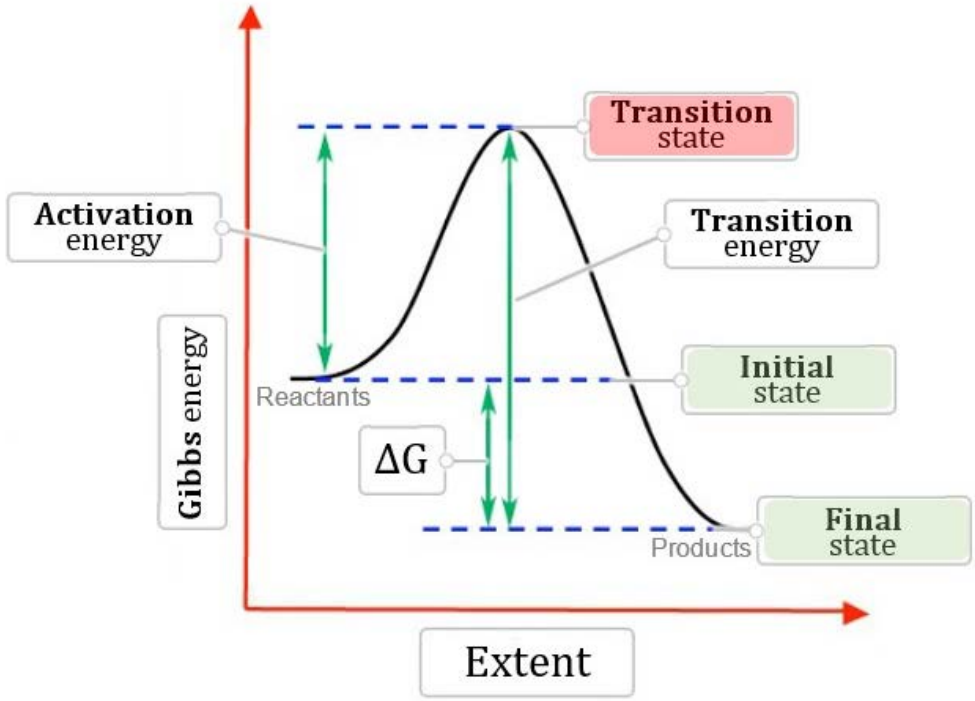

Examples

The following are some examples:

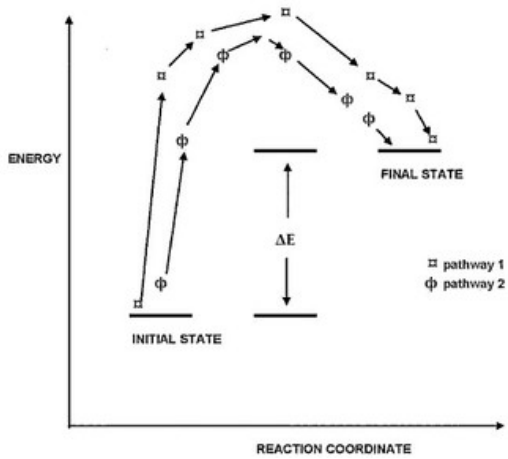

Reaction coordinate depicting the initial state of the reactants on going to the final state of the products through two different pathways, indicating that state variables are path-independent.

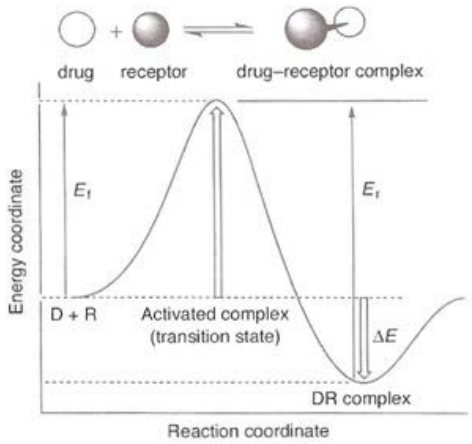

A typical drug-receptor **reaction coordinate** as are used on drug-receptor thermodynamics, showing the activated complex.

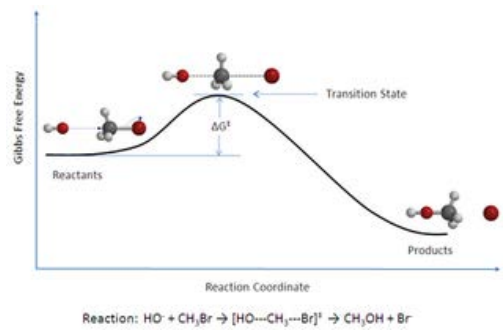

An SN-2 **reaction coordinate**, showing the intermediate transition state.

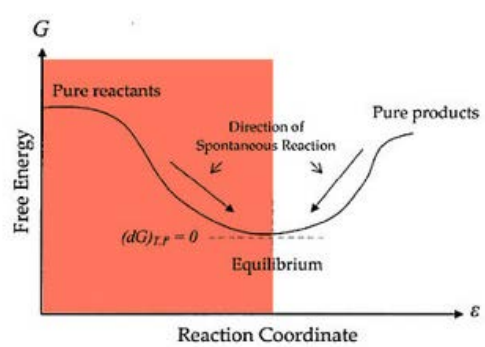

A generic **reaction coordinate**, showing that reaction can be spontaneous in both directions (meaning it can just as easily

unravel as did it form), and the red area indicating a region of negative free energy change.

External links

â— Reaction coordinate – Wikipedia.
â— Reaction coordinate – IUPAC Gold Book.

θΔics

In science, **reaction end**, an upgrade replacement for the defunct term “death” (see: defunct theory of life), as contrasted with reaction start (i.e. “birth”), refers to the irreversible termination point (dereaction point) of a chnopsological-based animate atomic structure.

Etymology

The terms: reaction start (i.e. birth | defunct), reaction existence (i.e. life | defunct), and reaction end (i.e. death | defunct) are Hmolpedia coinings first used in early 2012 in the construction of the Goethe timeline; German polymath Johann Goethe, of course, being the first to correctly view the process of human existence and human relationships as being chemical reactions or correctly human chemical reactions: in this sense, nothing, in either chemical reactions or human chemical reactions, per se, is "born", "dies", or "lives", at any instant or point in the mechanism of the reaction, hence the needed terminological upgrade.

θΔics

In chemical thermodynamics, **reaction energy** is []

Overview

In 1905, German physical chemist Fritz Haber, in his *Technical Thermodynamics of Gas Phase Reactions*, defined reaction energy as follows: [1]

> "In Helmholtz' point of view, a chemical reaction is considered to have a latent heat just as does any change in the state of aggregation; consequently, in my view the two parts into which total energy can be divided are not spoken of as free energy and bound energy but as '**reaction energy'** and 'latent energy'."
>
> — Fritz Haber (1905), *Thermodynamics of Technical Gas Reactions* (pg. ix)

This term "reaction energy", in Haber's view, seems to be a synonym for "free energy", in Herman Helmholtz's 1882 parlance, or "available energy", in Willard Gibbs' 1876 parlance.

Note

To correct the above definition, in modern, terms "latent energy" is not assumed to be equivalent to bound energy or "transformation content energy" (-TS), in Rudolf Clausius' 1865 parlance, but rather with the energy that must go into breaking bonds of state, or "bond energy", so to speak, namely: enthalpy of melting (solid → liquid) or enthalpy of evaporation (liquid → gas).

See also

â— Affinity of reaction

References

1. Haber, Fritz. (1905). *Thermodynamics of Technical Gas Reactions* (preface, pg. 3). Longmans, Green, and Co.

θΔics

In hmolscience, **reaction existence** refers to the period of existence of a bound state animate turnover rate motile molecular entity—a human molecule, i.e. person, in particular—between its inception at reaction start and analysis at reaction end.

The following is a photo, from BPE 2016, showing Libb Thims, with Serge Galam, wearing a newly made "reaction existence" golf shirt, the logo showing the affinity-free energy equation, and hydrogen reacting with oxygen to form water:

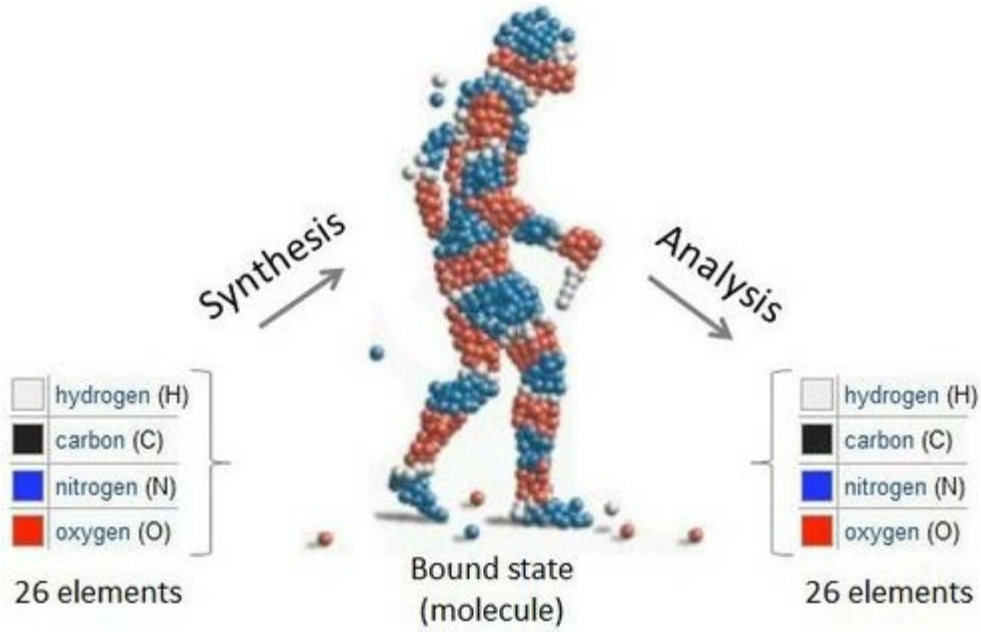

A depiction of **reaction existence**: the existence of a human as a 26-element reactive animate motile bound state molecule, between its point of inception during synthesis and point of desistance during analysis; the atoms falling off signifying turnover rate.

Reaction Existence

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

$$H_2 + \tfrac{1}{2}O_2 \rightarrow H_2O$$

See also

- Life terminology upgrades
- Stages of existence

Further reading

- Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
- Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
- Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc). LuLu.

θΔics

In chemistry, **reaction extent** is short for "extent of reaction" or the measure of degree of forward progression of a chemical reaction.

θΔics

In hmolscience, **reaction start** refers to the point in time in which an animate motile molecular structure, a newly-formed human molecule in particular, detaches from the gestation cavity of its maternal structure—which is to be contrasted and compared to the orbital detachment point, namely the point in time, *circa* age 15-25, when the "dependent" human molecule (child) detaches from the parental orbital structure, thus becoming an "independent" human molecule (adult). [1]

The term “reaction start” is a chemically-neutral terminology upgrade to the older religio-mythology loaded term “birth”.

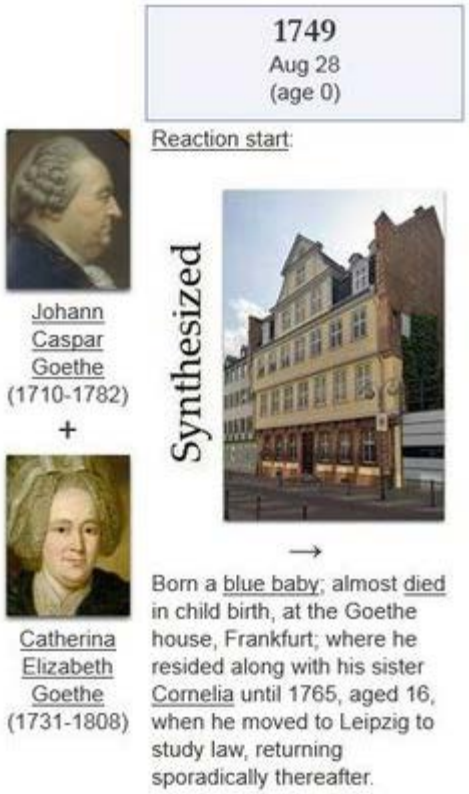

Left: screenshot of the start of the Goethe timeline, on 24 Apr 2012, showing the needed "**reaction start**" hyperlink, indicating that German polyintellect Johann Goethe, correctly, as an animate molecule (human molecule), was synthesized not "born"; the hyperlink (this page) started on 29 Apr 2013. Right: poster for the 2006 film comedy *Failure to Launch*, about a "35-year-old man who lives in the home of his parents and shows no interest in leaving the comfortable life his parents", which exemplifies the dual nature of the term "reaction start", being that there is the detaching from the womb point and the detaching from the parental orbital structure point, prior to true reaction start. [2]

See also

- Human chemical reaction theory
- Reaction existence
- Reaction end
- Reaction energy
- ReactionMatch

References

1. Note: not all human molecules will become "independent", in the sense of becoming a freely-moving unattached human molecule, so to speak, the prime example here being the daughter directly to bride transformation, according to which, namely according to the logic of collision theory, old bonds will be broken and new bonds will form, and the daughter will go directly from one attached structure to another attached structure.
2. Failure to Launch – Wikipedia.

Further reading

- Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
- Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
- Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc). LuLu.

θΔics

In hmolscience, **ReactionMatch.com** is a conceptual science-based online dating site situated on the premise of "matching affinities in love the chemical reaction" using the 1796 human romantic elective affinities matching theories of German polymath Johann von Goethe. [1]

Test logo for beta-state matching site **ReactionMatch.com**.

> "It seems likely that in a few years we shall have a scientific basis for selecting complements for matrimony, and the people with whom we wish to work and play."
>
> — Thomas Dreier, *We Human Chemicals* (1948)

The modern variation of this branch of science was outlined, in both social and online-matching terms, in American chemical engineer Libb Thims' 2007 textbook *Human Chemistry*. [2] Many of the basic principles of this type of matching are being discussed in the new 2008 YouTube educational channel Human Chemistry 101. [3] The shortened logic behind the a unified theory of human pair-matching is: matching people, in love the chemical reaction, to obtain successful lasting relationships using the same proven methods of how atoms and molecules are matched. The following 1896 quote by English writer Frederic Myers speculates on this logic: [10]

> "To foresee or to guide the affinities of each several molecule would be for the physicist as great a step in advance as it would be for the registrar-general could he foresee or guide every impulse to wedlock in the United Kingdom."

Myers, however, had misconstrued ideas about the laws of heat, likely due to the fact that he was not a scientist.

Overview

In modern terms, affinity-matching equates to the determination of optimized relationship pairings and marriages using the chemical thermodynamics logic of "free energy compatibilities", in which "free energy" is considered as the measure of the "work" output, or the amount of energy going inward or outward of the functionality of the union, of the relationship over time. In particular, it was German physician and physicist Hermann Helmholtz who proved in 1882 that free energy is "the true measure of the affinity of a chemical reaction." [4]

In short, the measure of the free energy change in a pairing determines whether the relationship will work or not over the "extent" of the hypothetical reaction (pairing). Subsequently, as 66% of people believe that love is a purely chemical reaction, a realistic matching site algorithm would need to incorporate a theory of pairing human chemical reactions according to the standard spontaneity criterion of chemical energetics. [5]

The website *Ulteem.com*, to site one example of this type of application, uses a 98-question compatibility test that matches what they define as "compatibility/affinity" between prospective mates and ranks resultant potential mates according to "affinity" percentages, such as "you have 77% affinity with this woman" and "a 65% affinity with that women", etc. [6] The use of the word affinity here, however, seems to be only metaphor. The *Ulteem.com* example, is give here to illustrate that someone from the hard science community needs to step up to the plate and to put some rigor (physics, chemistry, thermodynamics) into matching algorithms for the betterment of humankind. This is where

ReactionMatch.com will fit in. On this premise, Reaction Match is scheduled to become a leader in the next-generation of online scientific matching.

Current market

A recent 2009 two-year study found that nearly all matching sites are based “junk science”. [11]

Beta-stage

Currently, ReactionMatch.com is in development. The idea of a chemical thermodynamics based mate selection theory was conceived in the mind of American electrochemical engineer Libb Thims in 1995, seeded, in part, by the 1994 book *The Evolution of Desire* by American evolutionary psychologist David Buss, based on the logic of reaction prediction found within standard thermodynamic free energy tables. See the RM history section for further details. The outline of how to set up human free energy tables was described by Thims (see: RM theory section) in the 2007 textbook *Human Chemistry*, section: “Human affinity (Gibbs free energy) Tables”. [7]

The push to begin taking this from theory to application, in the mind of Thims, came into view with the launching of the recent “chemistry-themed” pair matching sites, in particular *eHarmony* (2000), *Chemistry.com* (2006), *eChemistry.com* (2006), and *ScientificMatch.com* (2007), among others, who all freely popularize claims to be able to create “chemistry”, either physical, romantic, or interpersonal, between couples through matching algorithms (mostly psychological-based) of various kinds. These types of loose, unsubstantiated, or non-theoretically-based claims, in modern terms, of being able to create “chemistry” between people, using an algorithm, are comparable to the ancient alchemical claims of being able to create “gold”, using a philosopher’s stone, or to create "love", i.e. get someone to fall in love, using a love potion.

In 1661, Anglo-Irish chemist Robert Boyle, one of the founders of modern chemistry, for instance, had to point out to all the alchemists that what they were doing, with all their false claims, was detrimental to the betterment of the science of chemistry: [9]

> “If men would more carefully distinguish those things that they know from those that they ignore or do but think, and then explicate clearly the things they conceive they understand, acknowledge ingenuously what it is they ignore, and profess so candidly their doubts, that the industry of intelligent persons might be set on work to make further enquiries, and the easiness of less discerning men might not be imposed on.”

In apology for being so sharply abrupt, Boyle continues ‘I perceive that [various] of my friends have thought it very strange to hear me speak so irresolvedly, as I have been wont to do, concerning those things which some take to be the elements, and others to be the principles of all mixt bodies.’ Here, Boyle is criticizing earlier research founded on the belief that salt, mercury, and sulphur were the ‘true principles of things’. The extrapolation, in modern terms, is that psychological matching is not the true ‘mystery of romantic chemistry’.

Subsequently, *ReactionMatch.com*, themed to be a hard-science upgrade from the softer forerunners (see: RM projections), is currently in the beta-stage of development (possibly being launched in 2010-12, or later), focused presently on: venture capital locking (possibly) and pilot plant site development and testing. The RM operations team is currently being assembled, under the coordination of Libb Thims, and development of the RM project is commencing via the secure RMbeta.pbwiki.com Intranet. [8]

See also

â— SThAR

References

1. (a) ReactionMatch.com – (draft porthole)
(b) ReactionMatch.com – WHOIS registry information.
(c) See: Goethe's human chemistry

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θΔics

In science-based online dating, the **history** of pair-matching site **ReactionMatch.com** traces the development of chemical thermodynamic based pair matching from the 1809 "elective affinity compatibility" views of German polymath Johann von Goethe, through the 1914 "affinity/energy/entropy compatibility" views of English-born American engineer William Fairburn, to the 2007 modern computer algorithm-based, human chemical thermodynamics, "free energy compatibility" views of American chemical engineer Libb Thims.

Early developments

The conception of human reaction pair matching, similar to pair matching of chemicals in reactions, traces its origins to the 1809 human elective affinity theories of German polymath Johann von Goethe, IQ: 210+, who, after studying chemistry for a period of fifty-years, arrived at the view that it is chemical or elective "affinities" that, in the long run, determine the course of human relationships. [1] In 1882, after the development of the science of thermodynamics, it was shown, by German physician and physicist Hermann Helmholtz, that the true measure of affinity (the "force" of reaction) is what is called the "free energy" (the energy available to do work) of the reaction. [2]

At the turn of the 20th-century, physical chemists began to using free energy measurements, tabulated in terms of thermodynamic data tables or free energy tables (similar to the older affinity tables) to not only predict chemical reactions, but also to successfully predict the outcome of reactions that had not yet been experimentally verified. [3] The first thermodynamic table for biochemical species, containing about 100 species, was the 1957 table by K. Burton in Krebs and Kornberg's *Energy Transformations in Living Matter*. [4]

The next logical step, then, would be to extend this chemical thermodynamic methodology of reaction prediction to the case of intelligent reaction matchings and predictions of human chemical species. This was first outlined, in terms of occupational matchings of people, considered as "human chemicals" or "human elements", who could be quantified by personal measures of energy, entropy, affinity, friction, explosiveness, catalyst effect, etc., in the 1914 book *Human Chemistry* by English-born American engineer William Fairburn. [5] In a nutshell, according to Fairburn:

> "Men, like chemicals, respond better to intelligent handling."

Hence, when the foreman is considered as the "master human chemist", according to Fairburn, it would facilitate the operation of his or her factory or corporation if they were to match individuals in working relationships, according to "their peculiar attributes and characteristics" so as to obtain the desired "reactions resulting from combinations of individuals". Said another way, according to Fairburn, in order to eliminate "loss through unnecessary fatigue and wasteful reaction, or from combustion caused by friction and explosiveness", the human chemist would be wise to match people according to their natural affinities; where, "just as there are affinities among chemical elements, so there are many possible harmonious combinations of human(s) … some of these harmonious (and some) violently explosive."

Fairburn concludes "many human chemists waste their own time and strength and annoyingly harass their workers by endeavoring to compel non-mixing types to produce the best results when placed in direct contact." The extension of this logic, then, for the case of human romantic pairings is obvious.

The question of ideal love?

The first to ruminate on this type of chemical thermodynamic matching logic, in terms of what would be the theoretically-best way to choose a marriage partner, was American Libb Thims, who, sometime in the early 1990s, began to ruminate on the issue of why a person gets married? And that, if a person does decide to engage in a marriage union, how does one go about picking the right one? In other words, if, according to standard protocol, a stable lifelong pairing is the goal, what

Man-to-Man [N=22] Advice (to your little nephew):
Rule of Thumb on how to "pick the right one"
(supposing he had 3 to choose from)

#	Rule	Source
1	The hottest one, i.e. biggest tits, best T&A, most beautiful, etc.	M, M, M, M
2	The one you know you can trust, honesty, faithful, etc.	M, M, M
3	The one that makes you the happiest or is the happiest	M, M, M
4	The one who takes the most pleasure in making you dinner, or best cook	M, M
5	Go with your gut	M
6	Follow your heart	M
7	The one that tries to change you the least	M
8	You go away for a week; the one you miss the most is the one you pick	M
9	The one you share the most interests with	M
10	The one that bitches the least	M
11	The smartest one	M
12	The one that takes care of you the best	M
13	The one with the best work ethic	M
14	The one with the most money	M

rule does one use to choose?

Obviously, regarding this question, folk wisdom abounds: a) Follow your heart, b) Trust your instinct, c) Listen to your mind, d) Take your friend's advice, e) Feel it in your bones, f) Do what your family says, g) Pick the smartest one, h) Go with the hottest one, i) Choose the funnest one, j) Choose the best cook, k) Pick the one who makes you laugh the most, and so on (as well as combinations of the above). When polled, for instance, when picking mates, using a rule of thumb, men and women seem to use each of the above formulas, to various degrees: [6]

Woman-to-Woman [N=28] Advice (to your little niece):
Rule of Thumb on how to "pick the right one"
(supposing she had 3 to choose from)

#	Rule	Source
1	Follow your heart	F, F, F
2	The one that respects you the most	F, F, F
3	The one that makes you laugh the most	F, F, F
4	The richest one, best job, etc.	F, F
5	The one you know you can trust, honesty, etc.	F, F
6	The one that makes you the happiest, have the most fun with, etc.	F, F
7	The one that treats their mother the best	F, F
8	Marry for stability, i.e. emotionally, financially, physically, etc.	F
9	Go with your gut	F
10	Follow your instinct	F
11	The one you most want to have children with	F
12	The one that take the longest to say "I love you"	F
13	The one with the best personality	F
14	The one you feel the most comfortable with	F
15	Whomever treats you most like a lady	F
16	The one you can talk to the most	F
17	The one who most complements your dreams	F
19	The one that appreciates you the most	F

Along these lines, during one summer in particular when Thims had recently been accepted to the chemical engineer program, the highest paying undergraduate degree, at the University of California at Berkeley, one of the top-3 engineering schools in the country, he had upwards of ten girl friends simultaneously. In this situation, a visceral sort of ranking seemed to emerge, such that one or two would seem to stand out from the rest. The question then became: what methodology would one use to pick the best or ideal love?

At one point, in about 1993, being rather confused, Thims took the top-20 females in the running, and attempted to analyze them mathematically, using an excel spread sheet, tabular format, point tallying sort of system. Each individual's name was listed on the horizontal and a long list of desired traits, or attributes, were listed on the vertical, such as: grandmother would like her, has great spontaneity, don't get bored around, etc. [7] This methodology, however, seemed to lead nowhere?

In about 1994, Thims came across the newly published book *The Evolution of Desire*: *Strategies of Human Mating* by American evolutionary psychologist David Buss, a book described by the *Washington Post Book World* as "A drop-dead shocker". [8] Thims was very captivated by this book. Over the next few years, while finishing degrees in chemical engineering and electrical engineer, Thims read about a hundred more books on this subject. In 1995, possibly stimulated by *The Evolution of Desire*, while sitting in a chemical engineering thermodynamics class at the University

of Michigan, Thims felt the impulse to raise his hand in class and ask how basic Gibbs free energy reaction prediction calculations of the "spontaneity criterion" for spontaneous reactions:

$\Delta G < 0$ signifies a spontaneous (energetically favored) reaction
$\Delta G > 0$ signifies a non-spontaneous reaction (one that would require energy)

would apply to calculations of mating reactions between humans, particularly referring to dating, marriage, and reproduction variations of human chemical reactions. In short, how would one use chemical thermodynamics to explain the evolution of desire; from the desire of two hydrogen atoms *H* to attach together (H_2), a process that began occurring 13.7 billion years ago, to the evolved state of the desire of two human molecules *H* to attach together (H_2), a process that began occurring 150,000 years ago?

In other words, in chemistry, a calculation of $\Delta G < 0$, for a given hypothetical reaction between chemical species, signifies a "spontaneous" or feasible reaction, meaning that the reaction would go on its own, proceeding from natural feeling or native tendency without external constraint or extra energy input. Thims wanted to know how this was done for humans. For whatever reason, however, Thims held his tongue. Instead, over the next six years, Thims kept the problem in the back of his head, and from time-to-time tried to figure it out on scratch paper and readings of potentially related works. The basic problem, as Thims saw it during these years, was to figure out how the ubiquitous basic human reproduction:

$$A + B \rightarrow C$$

in which *A* and *B* are the reactants (the dating pair) and *C* is the product (a 15-year old child) could be predicted using the standard Gibbs free energy equation:

$$\Delta G = \Delta H - T\Delta S$$

supposing that person *A* was to be hypothetically paired up with three potential mates (*B*, *D*, *E*):

$$A + B \rightarrow Child$$

$$A + D \rightarrow Child$$

$$A + E \rightarrow Child$$

In short, how would one use the logic of chemical thermodynamics and its ability to predict reactions to help them determine who they should marry? In other words, which of the above reactions, 1, 2, or 3, would be more spontaneous and thus more energetically favored? The puzzle, however, remained a complete blank until November 15, 2001, at 3:00 AM, when during a reading of British theoretical physicist Stephen Hawking's *Illustrated A Brief History of Time*, Thims began to see how human reaction spontaneity could be determined in terms of calculations of changes in values of one's free energy G, enthalpy H, and entropy S instantaneous values over evolutions of decades, with respect to the numerous variables involved in the energetics of reproduction.

Building on these seeds of insight, over the next few years, Thims increase his research efforts and theory development and by 2007 written the world's first textbook on human chemistry, the study of the chemical behaviors of human molecules. [9] The first published, human chemical thermodynamics, outline on how to set up human thermodynamic

tables for reactions between human molecules (people), able to predetermine or predict reaction feasibilities and spontaneities of different combinations of human chemical species (human molecules), was a section entitled "Human Affinity (Gibbs free energy) Tables" in the 2007 *Human Chemistry (Volume Two)* by Thims. [10]

2008

The idea of free energy matching, in the mind of Thims, was originally something that he had only conceived of as only a future branch of science or application, such as occurring 200-300 years from now. In 2006, however, the sites *eChemistry.com*, American chemical engineer Glenn Gasner, and *Chemistry.com*, conceived on the love theories of American anthropologist Helen Fisher, were launched both claiming that "by using the new "science of attraction" they have "taken the mystery out of romantic chemistry" and that they can "let people experience real chemistry", respectively. In addition, in 2007 the site ScientificMatch.com, founded by American electrical engineer Eric Holzle, was launched claiming to be able to be able create optimized "physical chemistry" between people.

Furthermore, after email conversations with, with both Gasner, in 2006, and Holzle, in 2008, and multiple attempted contacts with Fisher, an irritation about all of these hyped-up claims, among others sorts of charlatan claims (one making usually showy pretenses to knowledge or ability) at other websites, such as eHarmony Labs, who claim to be measuring "interpersonal chemistry", and after discussions on Thursday, June 19th with American headhunter Cleo Median, who had been conceiving over the last year of building a Chicago Latino matching site, as to whether or not Thims could do a match, based on the theories in his *Human Chemistry* textbook, if Median brought him five guys and one girl, Thims purchased the domain name "ReactionMatch.com" on June 20th, 2008, at 8:49 AM.

In addition, during the course of the following day, Thims polled 55-people about which name, of available domains, sounded the best for a dating/matching site. The original name that came to mind, that Thims suggested Median, on the 19th, was "Reaction.com" (but this was taken by American clothing designer Kenneth Cole for a clothing line). The three remaining choices, which would in some way incorporate the either elective affinity (ElectiveAffinity.com was taken) or affinity in some way were the following three, shown below (ranked by vote):

ReactionMatch.com (29 votes)

AffinityMatch.net (18 votes)
AffinityReaction.com (8 votes)

The female voters seemed to like "AffinityMatch.net"; however, there were concerns about going to a "dot.net" site and many asked what "affinity" means. Hence, the final choice for the new chemical thermodynamics based pair matching site was "ReactionMatch.com". Medina and Thims were the first two to sign on to the project. In short, *ReactionMatch.com* was conceived on June 19th of 2008, by American chemical engineer Libb Thims, working in association with American corporate head-hunter Cleo Medina, slated to be a pair-matching site that matches people (human molecules) to create optimized and lasting chemistry using the methods (chemical thermodynamics) of how chemicals (atoms, molecules, and chemical species) are paired. The sciences used to study and determine reaction feasibility include: physical chemistry, quantum chemistry, and chemical thermodynamics, or in one unified anthropomorphic sense human chemistry + human thermodynamics, to create spontaneous and energetically feasible reactions. In this manner, human molecules, the technical name of a person, are paired successfully using the same methodology as to how molecules are paired.

In review, Thims, who had been studying the scientific nature of relationship pairs since the early 1990s, thus developing the sciences of human chemistry and human thermodynamics in the 2000s, was goaded into the field of science-based online pair matching, out of a dissatisfaction of seeing the new-breed of science matching sites repetitively claim to match people according to "chemistry"; but not, however, based on the type of standard chemistry-matching actually found in a standard chemistry textbook. Thus, after conversations with Glenn Gasner, founder of *eChemistry.com* (who matches using psychology compatibilities), Eric Holzle, in 2008, founder of *ScientificMatch.com* (who uses offspring immune-system compatibilities), and attempted interactions, 2006-2008, with Helen Fisher, algorithm-designer at *Chemistry.com* (who uses finger-length measurement compatibilities), who all claim to match

people according to “chemistry”, along with *eHarmony Lab’s* 2008 efforts to study “interpersonal chemistry” through video, Thims saw that he needed to take the lead in these scattered introductory attempts and claims of creating chemistry.

Subsequently, in theory, if one desired to get matched to someone “chemically”, one would ideally go to a chemist, physical chemist, chemical engineer, or human chemist, rather than an anthropologist, psychologist, or sociologist. The goal, then, of *ReactionMatch.com* is to assemble a team of researchers from both the hard-sciences: chemists, physical chemists, biochemists, neurochemists, theoretical chemists, chemical engineers along with others from the soft-sciences: genetics, evolutionary psychology, sociology, anthroplogy, medicine, etc., so to match people to get "good" chemistry the very same way chemicals are actually matched.

Projections

There is great potential in the future matching of people via efficient internet-mediated connection, search, and computer-based algorithm capabilities. The key, however, in this picture is the scientific theory behind the algorithm. Currently, for instance, according to a recent study conducted by the Online Publishers Association (OPA) and comScore Networks, online dating, personals, and matchmaking is the second largest segment of “paid content” on the web. Moreover, in 2004 U.S. residents spent $469.5 million on online dating and personals and over $500 million in 2005. Online dating and matching is expected become a billion-dollar a year inductry before the end of the decade. To summarize the future of this technology, in simple terms, in *Wired* magazine writer Rufus Griscom forecasted that:

> "Twenty years from now, the idea that someone looking for love without looking for it online will be silly, akin to skipping the card catalog to instead wander the stacks because: the right books are found only by accident.”

He concludes “how likely is it that the book of your dreams will just fall off the shelf and into your arms”. As such, Griscom concludes, “serendipity is the hallmark of inefficient markets, and the marketplace of love, like it or not, is becoming more efficient” [11]

See also

â— ReactionMatch.com (projections)
â— ReactionMatch.com (operations)
â— ReactionMatch.com (theory)

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The **operations** of **ReactionMatch.com** (RM) include the a number of individuals, as listed below. This team is the behind-the-scenes framework of the new beta-phase science-based pair matching site. The RM operations framework is being built on the operational framework models of the new Los Angeles based eHarmony Labs. [1]

Operational team

Founder and chief executive officer

● Libb Thims , BS chemical engineering, BS electrical engineer, MS-PhD-MD (in progress), and author: 2007 textbook *Human Chemistry*.

Head Business developer

● Cleo Medina, BS accounting and finance; corporate head-hunter.

Lead scientific advisor

● Georgi Gladyshev, PhD polymer chemistry, professor of physical chemistry, and author: 1997 book *Thermodynamic Theory of the Evolution of Living Beings*.

Director of operations

● Lynn Liss, BS business finance, MBA finance and strategy, and COO of *Fundability.com*.

Human Parameters Matching Biometrist (fingerprinting and vibraimaging)

● Viktor Minkin, BS measurement and information technologies, MS photosensitive devices, and CEO of *ELSYS Corporation*.

RM intranet

The secure RM intranet is currently being hosted at PBwiki:

● ReactionMatch.com secure wiki (select access only) - PBwiki.com.

Contact information

ReactionMatch.com
PO Box 256869
Chicago, IL 60625-6869

See also

● ReactionMatch.com (projections)
● ReactionMatch.com (history)
● ReactionMatch.com (theory)

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(b) eHarmony Labs (advisors) - *eHarmony.com*

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The **ReactionMatch.com** 5-year financial **projections** are summarized below (a work-in-progress). In short, within the next 10-year, online matching will be a billion dollar a year industry in a relatively untapped market; in this market, people are increasingly turning to the science-based matching sites; a successful "match" is defined as a stable paring in which two people fall in love and stay happily attached for twenty or more years; sixty-six percent of people agree that love is a chemical reaction; the only science that can predict reactions is chemical thermodynamics; the major costs involved are advertising; subsequently, a well-balanced advertising campaign, combined with an intelligent 20+ person team of chemical-based academia, will very well produce sizable profits, beyond that of nearly any other industry.

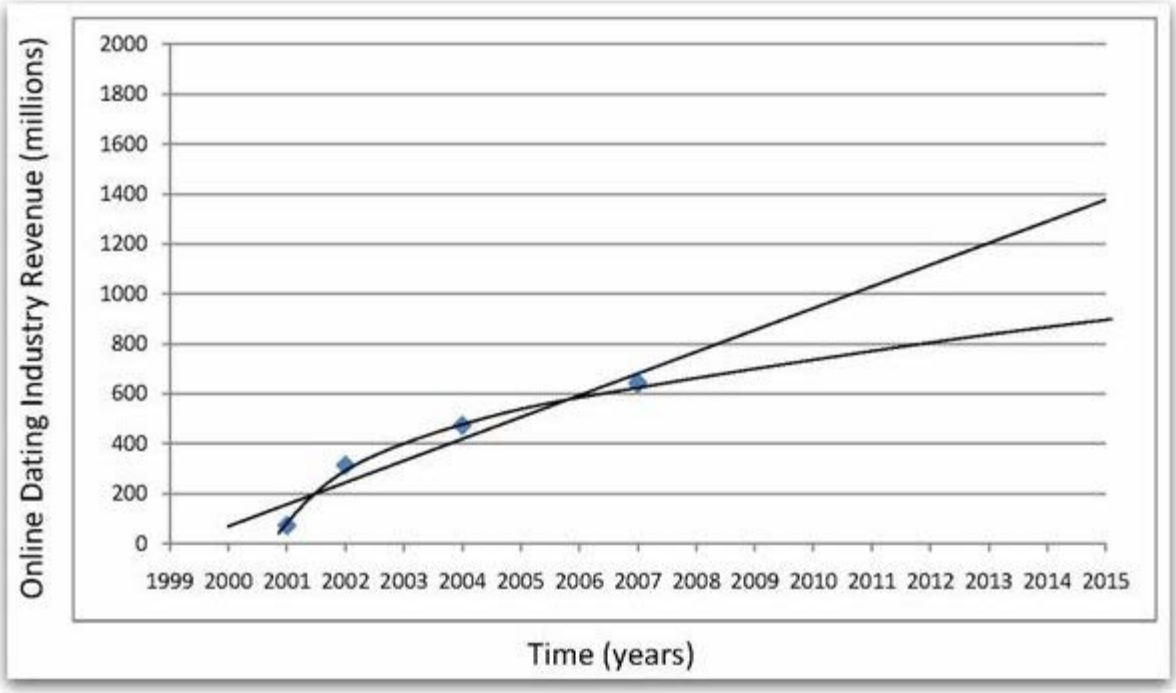

Overview

In 2002, consumers spent nearly $74 billion dollars online. [1] In online traffic, dating sites attract about $20% of the Internet population. In terms of growth in revenue, over the last few years, according to Jupiter Research, a steady increase is evident, as shown by the following online dating industry revenues: [2]

2001: USD 72 million
2002: USD 313 million
2003: USD 396 million
2004: USD 473 million
2007: USD 642 million

Within the next decade, as shown in the adjacent diagram, the Dating-Matching Industry is expected to become a billion-dollar industry.

As of January 2005, there was an estimated 836 dating sites, a 37% increase over the previous year (Hitwise.com). The leader in this group, currently, is Match.com, started in 1995, which in 2001 accounted for 68% of total online dating revenue ($49.3 million). [2] In terms of registered users, the top-four matching sites (based on number of users) are:

- Match.com (members: 20-million), using the logic of Phillip McGraw, the psychologist from the Oprah Winfrey Show.
- PerfectMatch.com (members: 4-million), using the logic of Pepper Schwartz, a sociologist at the University of Washington.
- Chemistry.com (members: 3.7-million), using the logic of Helen Fisher, an anthropologist at Rutgers

University.
- eHarmony.com (members: 2-million), using the logic of Neil Warren, a theological psychologist.

In short, the algorithm theories of two psychologists, a sociologist, and an anthropologist are pulling in near to $500 million dollars per year of revenue in a relatively untapped market. A large part of the costs involved go towards advertising. In 2007, Match.com spent $196 million, whereas eHarmony.com, the number two advertiser, spent $116 million. [3]

The long and the short of the financial prospectus, for *ReactionMatch.com*, is that a team of chemists, physical chemists, and chemical engineers would be more capable and successful at matching people (human molecules), in the long run, than would a team of psychologists, anthropologists, and sociologists. Subsequently, a well organized, theoretically-sound, highly-fueled team of chemists and chemical engineers would be able to surpass the forerunners.

Nutshell projections

The sales pitch for the feasibility of the company *ReactionMatch.com*, in a nutshell, is that within the next ten-years, online pair matching is going to be over a billion dollar per year industry; online matching algorithms are become more efficient, as sites and users turn to the sciences, academia, and the results of recent studies to better guide their choices in mate selection; the most rigorous and accurate of these sciences is the spontaneity reaction criterion of chemical thermodynamics, as theoretically outlined in terms of affinities for human relationships in 1809 by Goethe in his *Elective Affinities*, which he considered his greatest work; this spontaneity reaction criterion, outlined by Goethe, of chemical thermodynamics are a direct result of the implications of the laws of the universe, which, according to Einstein, constitute "the only physical theory of universal content which … will never be overthrown, within the framework of applicability of its basic concepts"; subsequently, on this premise, *ReactionMatch.com* is situated, within the next ten-years, to become the leading science-based pair matching site and a multi-billion dollar organization.

See also

- ReactionMatch.com (operations)
- ReactionMatch.com (history)
- ReactionMatch.com (theory)

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In human chemistry, the **theory** behind the concept of **ReactionMatch.com**, the chemical thermodynamics based pair matching site, is to match people (human molecules) to obtain successful or energetically feasible reactions (relationships) using the very same methods that are used to match atoms and small molecules in chemical reactions. [1] This theory was originally developed in 1809 by German polymath Johann von Goethe, which he called "elective affinities", otherwise known as the world's first chemical treatise on the origin of love. [2]

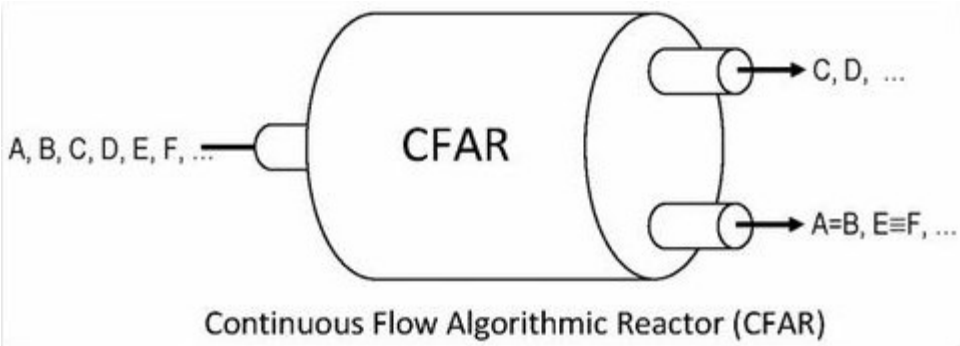

Generic diagram of a dating site that uses algorithms to match people, which in technical terms would be defined as a continuous flow algorithmic reactor (CFAR) a computerized human chemical reaction facilitator.

In modern terms, the first to develop Goethe's premise of elective affinity reactions occurring between humans and thus determining their mate and friendship preferences, was American chemical engineer Libb Thims, who in 1995 began to mediate on on the issue of chemical thermodynamics based mate selection, which in 2007 led to the publication of the world's first textbook on human chemistry (*Human Chemistry*), the study of the chemical behaviors of human molecules. [3]

Human chemical reaction engineering (HCRE) is the technical name of this emerging discipline, in which people (human molecules), i.e. reactants (A, B, C, etc.), are funneled through online matching algorithmic reactors to achieve desired products, i.e. stable dihumanide molecules (A=B, C≡D, etc.). [14] The first published, albeit in a humorous-style, outline of this logic was the Gibbs free energy thermodynamics of love theory describe by American computational chemist David Hwang in his 2001 article "The Thermodynamics of Love". [4]

Continuous flow algorithmic reactors

A continuous flow algorithmic reactor (CFAR) is the technical name of an online matching site that uses science-based algorithms to match people, by design, in desired reactions, as shown adjacent. The basic CFAR design, of chemical thermodynamics-based online matching, is modeled on the standard continuous-flow reactor design variations. [14]

In this model, the input flow consists of single human particles or human molecules (A, B, C, ..) entering the matching site as "reactants". The output flow or "products" consists of two streams: (1) outflow of singles (C, D, ...) that didn't match and (2) outflow of paired couples (A=B, E≡F, ...) that did match. The time, i.e. number of days or months, in which a person is in a CFAR, as a paying subscriber of an online matching site, in the form of an unattached single, is called the "residence time".

Matching theory overview

The basic idea behind scientific pair matching, from a chemical thermodynamic perspective, which is the science that determines the feasibilities of chemical reactions, is to pair people, considered as "human molecules", such that successful reactions (relationships) lead to a stabilization in the bond A≡B, over the extent of the reaction, a factor quantified by a decrease in the free energy in the functionality and system of the relationship. This essential nature of pair matching between human molecules is captured cogently by American-Canadian biochemist Julie Forman-Kay in her 1999 article "The Dynamics in the Thermodynamics of Binding", where she summarizes: [15]

> "Whether two molecules will bind is determined by the free energy change of the interaction, composed of both enthalpic and entropic terms."

This logic has successfully been applied to the chemical matching determinations for gas phase reactions (by Fritz

Haber in 1905), for various chemical reactions (by Gilbert Lewis and Merle Randall in 1923), for various biochemical reactions (by Keith Burton in 1957) and for various larger chemical species, of size 6-elements in composition or less, as sizing criterion that can be discerned via molecular evolution tables, and for larger molecular entities such as protein and drugs, in protein thermodynamics and drug-receptor thermodynamics. For larger chemical species, such as human molecules, a 26-element molecule, the same logic applies, however the matching determination (reaction feasibility) calculations are more difficult, but invariably reduce to enthalpy-entropy determinants (among other factors). In step-by-step terms, the matching of people (human molecules), in algorithmic terms, equates to the following:

#	Key Points to Matching Theory
a.	Matching people is the process of setting up "potential" chemical (combination) reactions between individuals.
b.	From a physical chemistry point of view, the overall "criterion" to predict the successfulness, spontaneity, or feasibility of any chemical reaction or of the matching any two chemical entities, is based on the criterion of energetics.
c.	Technically, this means that at the start of a successful pairing, there exists a great deal of stored chemical potential energy, i.e. the relationship has "great potential", and thus will continue reacting as it burns its working potential over the "extent" of the reaction.
d.	The release of "working energy" (G), out of the bond of the relationship and into linked systems of friends, family, associations, and society, in a virtuous manner, over the course of a successful or spontaneous reaction, is quantified by decrease in the Gibbs free energy of the pairing: this is called thermalization or equilibration.
e.	Successful thermalization processes, react past a desireable point, e.g. the golden anniversary (50+ years of happy marriage).
f.	The point at which a relationship "stops working", however, signifies a point in time in which the reaction is at equilibrium wherein the chemical potential is spent (a fact quantified in 1876 by American mathematical engineer Willard Gibbs).
g.	The equilibrium point is typically when couples begin to break up, through what is called a dissociation reaction.
h.	In extrapolation, the "overall criterion" to the successfully matching of individuals in relationships is an energetic one, meaning that individuals have to be matched energetically (criterion: $\Delta G < 0$ for the paring); the mechanism has to match the laws of thermodynamics.
	This can be quantified in terms of a per unit (A, B, AB, etc.) 12-factor free energy function, $G = f(t)$, a dynamic function of time t, comprised of physical and neurological mate desireability attributes:
i.	$G = f$(averageness, age, symmetry, sexuality, i.e. testosterone-to-estrogen ratios, immune system, i.e. MHC-determinants, fitness, complexion, personality, social graces, character, dependability, occupation, possessions, wealth, information, intelligence,

education, knowledge, status, prestige, inner nature, values, and ambition, among others).

j. Each G = f(t) function, representing a person's (A) or couple's (AB) quantifiers, must then be translated in terms of the thermodynamic energy quantifiers of enthalpy *H* (the heat of reaction) and entropy *S* (the irreversible energy loss of reaction), i.e. $G = f(H,S)$ according to the definition equation: $G = H - TS$, where *T* is the absolute temperature of the reaction system.

k. These $G = f(t)$ energetic quantifications of individual persons can be used to determine pair feasibility for combination reactions (scientific matchings).

Matching example

To explain further, by example, suppose that person *A* was to be hypothetically paired up with three potential mates (*B*, *C*, *D*):

Couple pairing #1:

$$A + B \rightarrow AB$$

Couple pairing #2:

$$A + C \rightarrow AC$$

Couple pairing #3:

$$A + D \rightarrow AD$$

The question then becomes, how would one use the logic of chemical thermodynamics and its ability to predict reactions, according to the spontaneity criterion ($\Delta G < 0$), to help them determine who they should date or marry? In other words, which of the above reactions would be more spontaneous and thus more energetically favored? The answer is that each potential reaction, will have a different value of free energy change, ΔG_{AB}, ΔG_{AC}, and ΔG_{AD}; subsequently, for the three potential matches, the one that has the largest negative value will be the best match.

Graphical analysis

In order to formulate the above human chemical thermodynamics matching scheme into a mate-selection algorithm, a first-step graphical analysis is needed. A first approximation match would be to determine feasible 20-year human chemical reactions, thus besting the current national average for divorce rates, in the US, which currently stands at 43% at 15-years. [5] In other words, according to the US National Center for Health Statistics, forty-three percent of first marriages break within fifteen-years. [6] Scientifically, from the get-go, marriages, i.e. unions (reactions), that end quickly in divorce are “less thermodynamically stable” than as compared to more energetically-favored marriages (reactions) that continue to ignite for 50-years or more.

Using chemical thermodynamics, it is changes in the value of free energy that are used to determine if a reaction is thermodynamically favorable. [7] The change in Gibbs free energy ΔG for a chemical reaction (human chemical reaction or otherwise) is defined by the following expression:

$$\Delta G = G_f - G_i$$

in which G_F is the instantaneous value of the free energy at the hypothetical final stage of the reaction and G_I is the initial value at the collision point of the reaction.

Collision theory

The collision point, according to collision theory, is the point in time at which the two particles "collide" or first begin to have an interaction. The typical example being love at first sight, in which a visual field particle stimulus triggers the formation of a marriage bond (human chemical bond). About 20% of people will fall in love at first sight and marry that person. [8]

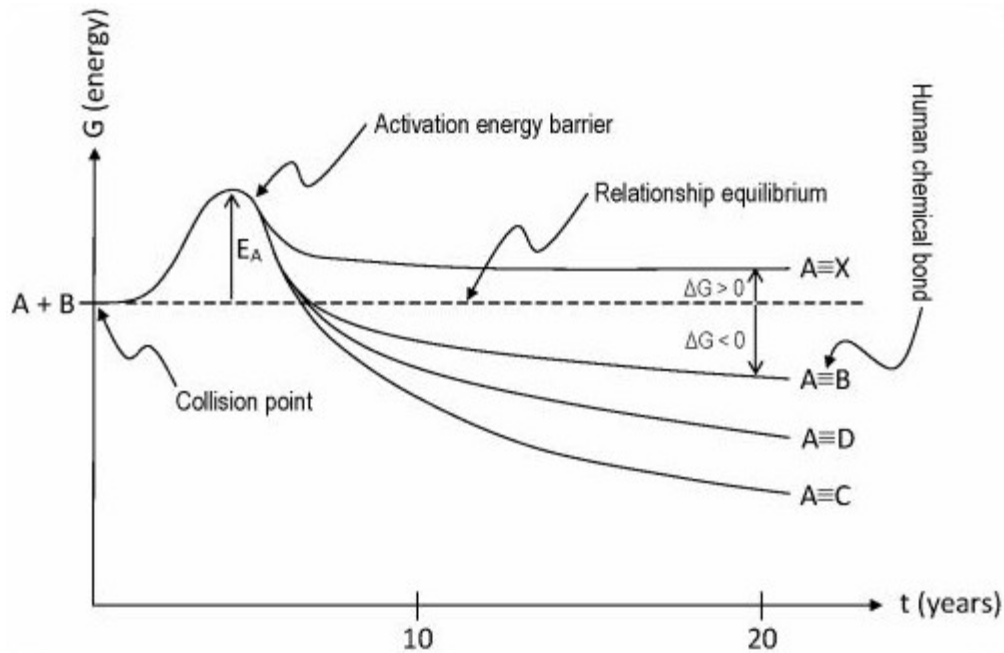

Potential energy surface plot of the free energy versus extent of reaction, showing various hypothetical final states, in various stabilities (A≡B, A≡D, A≡C, begin stable products; A≡X being an unstable product) above and below thermodynamic equilibrium.

Subsequently, in the above set of hypothetical reactions, 1, 2, or 3, between the collision point (day-one) and the extent of reaction goal (20-year point), we will have three possible "initial" free energy G_I values (G_{A+B}, G_{A+C}, G_{A+D}) and three possible "final" free energy G_F values (G_{AB}, G_{AC}, and G_{AD}), which together yield three different calculated values of free energy change ΔG, namely: ΔG_{AB}, ΔG_{AC}, and ΔG_{AD}, which are shown on the adjacent "free energy" vs. "extent" of reaction plot.

Activation energy barrier

In this diagram, the activation energy barrier represents the amount of "activation energy" E_A that the potential couple must possess in terms of congruent arrangements of kinetic energy (entropy of activation; enthalpy of activation) at the point of collision, in order to surmount the activation energy barrier. This is an important factor that must be accounted for in any matching algorithm. [9] At the height of the activation energy barrier, the couple would be at a high energy state called the "activated complex" A - - - B, in which both their old bonds (family, friends, and associated networks) and newly forming bonds (attachment structure of the newly forming family, friends, and extended network) are stretched to their maximum. The entity that emerges on the other side of the activation energy barrier is the attached couple or "dihumanide molecule" connected through what is called a "human chemical bond" A≡B.

Spontaneity criterion

In this diagram we have four possible outcomes depicted, namely relationships A≡X, A≡B, A≡D, and A≡C positioned at various levels of Gibbs free energy. The best relationship outcome, namely the one that is the most stable, is determined by the spontaneity criterion.

Hence, in the hypothetical results depicted in the diagram, if a matched pair ended up at life position A≡X, above the relationship equilibrium level, the positive value of ΔG would be the amount of energy (work energy) that the pair would have to "put into" it to keep their relationship going, i.e. they would have to spend a lot of time and energy "working on their relationship" (a draining process), e.g. energy loss in friction, tension, arguments, disagreements, counseling, extended family strains, etc.

Conversely, positions below the relationship equilibrium level, namely A≡B, A≡D, and A≡C, are energetically favored and thus would each be, in theory, spontaneous reactions (relationships). The amount of "free energy", in this case ($\Delta G < 0$), in the words of American chemist Raymond Chang, is "*the energy available to do work*". [11] In other words, it is the amount of the working energy of the relationship that is released out of the functionality of the human chemical bond of the pair, as they thermalize off each other, being used to do virtuous activity in life, in accordance with the progress of evolution.

The question then becomes: which of these three spontaneous reactions is the most favored? The answer to this is that the reaction that yields the most negative free energy change, will be the most spontaneous and thus the most energetically favored pairing. In the reaction situation: $\Delta G_X < \Delta G_Y < \Delta G_Z < 0$, for instance, the reaction defined by the large negative value of "ΔG_X" would indicate this to be the most favored reaction. A chemical bonding of this type, will be the most stable in the long term owing to the fulfillment of "quantum neurochemical octet rule bonding satieties" (drive/dream fulfillment) of the pair. [1] In the above example reaction, pairing A≡C is most-favored over the others.

Difficulties on theory

Beyond this basic outline, the greater difficulties involved in creating a computerized free energy compatibility based matching algorithm, is the mathematical translation of input values:

Physical data:

Genetic disease markers (e.g. Down syndrome), MCH-characteristics (immune-system compatibilities), blood types (blood sample processing), pupil-to-iris ratios, body-fat-percentages, measurements (height, weight, hair color, eye color, skin tone, etc.), beauty (physical attractiveness ratings, both unique and consensus), fitness, age, complexion, ethnicity, sexuality, waist-to-hip ratio, symmetry measurements.

Neurological data:

Personality patterns (explorer [dopamine], builder [serotonin], director [testosterone], negotiator [estrogen], etc.), occupation, Wealth, (possessions), intelligence, education, knowledge, status, prestige, drive, inner nature, values, ambition

Environment data:

Birth order, extended family networks, external forces, geographical momentum tendencies.

Among other data input sets, such as the 60-mate trait desireability factors, these total inputs need to be formulated into enthalpy ΔH and entropy ΔS terms in the standard Gibbs free energy function: [12]

$$\Delta G = \Delta H - T\Delta S$$

Beyond this, system particle flow (new human molecules into or out of a system), as quantified by changes in chemical potential μ of the system, and external forces, e.g. job loss, divergences in goal paths, the strain of a war, extended family factors, etc., need to be accounted for. In addition, emotional imaging processing would need further development to determine video (and in person) positive-to-negative Gottman stability ratios. [1]

Corroboration

The theory of matching human molecules (people) according to "free energy compatibilities", developed by Thims, not only finds excellent corroboration with the chemical-thermodynamic love-theories of those as Johann von Goethe (1809), William Fairburn (1914), George Carey (1919), Jeremy Adler (1987), David Hwang (2001), Chanel Wood (2007), but also with the recent thermodynamic evolution theories of Russian physical chemistry Georgi Gladyshev (1978), who in his 1997 book *Thermodynamic Theory of the Evolution of Living Beings* set forth the view, among others, that:

> (a) The definition of ΔG is the energetic measure of system structure formation in a given system evolution relaxation window.
> (b) Only the initial and final states of a process under study are of interest.
> (c) The variations of the Gibbs function of the system, at any stage of evolution, particularly ontogenesis and philogenesis, can be calculated by thermodynamic methods.
> (d) A function $G_{system\text{-}formation} = f(t)$, can be obtained using thermodynamical data, thus representing the "state" of the system at a fixed moment in time.
> (e) Variations of calculations of ΔG characterize stability changes in the system.

In review of the RM chemical thermodynamic based theory of mate selection, using a free energy compatibility methodology, as outlined above, Gladyshev agrees with the propositions, stating that it "is a good practical application of theory." [13]

See also

â— ReactionMatch.com (projections)
â— ReactionMatch.com (history)
â— ReactionMatch.com (operations)

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θΔics

In chemistry, **reactivity** refers to the measure of the magnitude of the state of non-inertness of an element, chemical, or molecular entity.

External links

- Reactivity – Wikipedia.

θΔics

In science, **readiness potential** refers to a scalp recorded slow negative electroencephalography (EEG) potential shift that begins up to a second or more before a self-paced act. [1]

History

The concept of readiness potential, or "bereitschaftspotential" in the original German, first recorded and reported in 1964 by German researhers Hans Kornhuber and Luder Deecke at the University of Freiburg, Germany. [2]

Hmolscience

In hmolscience, the topic of readiness potential frequently arises, particularly in discussions of the how's and why's of human movement, when people are modeled specifically abstract molecules or "human molecules", specifically. An example is the following comment made by American electrochemical engineer Libb Thims during the 2009 Moriarty-Thims debate:

> "How this is applied to people moving, using a very simplistic model, is outlined here. In this calculation, to note, you get into issues of free will, **readiness potential**, and induced movement. This issue of "what if a student chooses to move this way" is confusing for many people. Molecules do not *decide* or choose to move, neither do human molecules. Regarding speed distributions and system temperature, this is a huge issue. The issue revolves around the question of how one connect concepts such as sexual temperature (physical beauty) or economic temperature, and so on, with absolute temperature. This issue is still very puzzling. An example is the measured correlation that, determined by psychologists, that physically attractive people (e.g. supermodels) will cause a volume expansion (given more personal space) when moving through a crowd of people, as compared to more homely looking individuals (personal space)."

on the question of whether or not the movements of students in a field will follow a Maxwell-Boltzmann distribution and have a measurable entropy.

See also

- Libet experiment
- Trigger action
- Induced movement
- Sense

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External links

- Bereitschaftspotential (readiness potential) – Wikipedia.

θΔics

In terminology, **real** (TR:106), as compared to unreal, from Medieval Latin *realis* "relating to things" (in law), from Latin *res* thing, fact, as contrasted with unreal, refers to something existing as a physical entity or process; is the root of the terms such as: reality, realism, real world, real science, and literary realism.

Forces

In 1743, Jean d'Alembert, in his *Treatise on Dynamics*, amid the vis viva dispute, supposedly, rejected the concept of "force" altogether, in his mechanics, arguing that the only mechanical phenomena observed in the world (or real world) are matter and its motion, and that forces are "obscure and metaphysical" inventions of philosophers. [2]

In 1847, James Maxwell stated that the only thing we perceive as real, via the sense, is force: [2]

> "The only thing which can be directly perceived by the senses is force, to which may be reduced to light, heat, electricity, sound and all the other things which can be perceived by the senses."

(add)

Quotes

The following are noted quotes:

> "The law of conservation [of energy] applies to some things and not to others, and the things which it does not apply are unreal."
>
> — James Johnstone (1914), *The Philosophy of Biology*

> "To a materialist no thing is **real** but atoms in a void and we are but molecular people controlled by the actions of natural [see: natural law] physicochemical law ."
>
> — George Scott (1985), *Atoms of the Living Flame*

> "What is **real**? How do you define real? If you're talking about what you can feel; what you can taste; what you can smell and see; then real is simply electrical signals being interpreted by your brain."
>
> — Morpheus (1999), *The Matrix*

See also

â— Chemical Thermodynamics in the Real World

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θΔics

In genius studies, **real genius**, as compared to a fake genius, refers to someone who has produced real work in the genius level of accomplishment, as retrospectively discerned, generally five-decades posthumously, by people in the know, unbiasedly.

A selection of real IQs for real geniuses are listed in the top 1000 geniuses pages, showing real geniuses of history, retrospectively discerned, via meta-analysis.

θΔics

In genius studies, **real IQ**, symbol IQ_{Re}, as compared to theoretical IQ, is an IQ (see: IQ key), that matches up with reality, differentiating from terms such as: feigned IQ, inflated IQ, paper IQ, etc., as best data available to sensor input furnishes. [N1]

Overview

The abbreviation IQ colloquially tends to be a short-hand quick reference for "level of genius" of a person; the higher the number, above 140, the greater the level of genius. When, however, cited IQ numbers get past 180 or 190, more often than not, nonsense tends to result. When, e.g., Agustin de Mello, and over-zealous child prodigy desiring father, via forced prodigy methods, calculated, via ratio IQ test methods, that his five-year old son, Adragon de Mello, in 1981, has an IQ of 400, then gets him, via high-pressure forced schooling, to graduate from college (BS computational mathematics, 1987, University of California at Santa Cruz, QS World Ranking: 276 of top 1000 schools (Ñº)), at age 11, setting a new world record (see: youngest college graduates), are we to conclude that Adragon de Mello, with his BS computational mathematics degree, with mediocre grades, from a low-ranked school, is TWICE as smart at Newton, who peer-genius meta-analysis Cox-Buzan IQ is 193? Certainly, not. This is what is called reality check. Does said purported to be genius' intellectual accomplishments match up with the real world? The difference between the two, a real IQ and a feigned IQ is the difference between gold and fool's gold or a diamond and fake diamond; in many cases, only the finest jewelers can tell the difference.

Quotes

The following are related quotes:

> "Libb Thims, whose **real IQ** I estimate at 200, is an American electrochemical engineer, and one of the ten most intelligent humans currently reacting on this planet. His primary website, the *Encyclopedia of Human Thermodynamics*, is widely considered the greatest intellectual achievement on the Internet. The EoHT Forum discusses topics spanning from morality to 'life' and 'death', and from literature and art to the many fields of science. Reading through the threads on the forum will probably yield an increase in the reader's IQ."
>
> — Inderjit Singh (2015), "Knowledge is Power" (Ñº), Oct 3

See also

â— Real genius
â— True genius

Notes

N1. The "real IQs" for the top 500 geniuses, as are shown in the left column (next to each genius), as compared to all known estimated or calculated IQs, shown in third column.

θΔics

In science, **real science** is any human investigation that can be demonstrated mathematically; whereas, conversely, any human investigation that cannot be demonstrated mathematically cannot be called *real science*. [1]

Overview

In circa 1490, Leonardo da Vince stated the following: [1]

> "No human investigation can be called ***real science*** if it cannot be demonstrated mathematically."

In 1833, amid the Whewell-Coleridge debate, between English science historian William Whewell and English romantic philosopher Samuel Coleridge, the question of what exactly someone who works 'in the real sciences', as Coleridge had phrased it, should be called, and what exactly are the real sciences, in the context of the tree of knowledge? A result of this debate is that the term "scientist" was coined, by Whewell; a term that by 1840 had made its way into the OED.

See also

â— Hard science

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θΔics

In terminology, **real world**, as compared to the imaginary, hypothetical, fictional, mythological and or metaphysical world, i.e. "not real" (or non-real), refers to the observable universe as quantifiably defined by measurable reality, realism, real science or actuality; that which exists.

Quotes

The following are noted quotes:

> "All physical science starts from certain postulates. One of them is the objective existence of a **real world**."
>
> — Thomas Huxley (1887), cited by Mellor (1922), in: chapter twelve "Thermodynamics and Thermochemistry" [1]

> "The law of conservation applies to some things and not to others, and the things which it does not apply are **unreal**."
>
> — James Johnstone (1914), *The Philosophy of Biology*

> "What is **real**? How do you define real? If you're talking about what you can feel; what you can taste; what you can smell and see; then real is simply electrical signals being interpreted by your brain."
>
> — Wachowski brothers (1999), character: Morpheus of film *The Matrix* [2]

> "Sometimes philosophical or scientific insights come from an event that's not very profound, like a party. I remember at Caltech: sure there were a lot of smart people around, some of my roommates and even some professors. I remember one fellow, a pompous fellow, he was saying '**physics**' is the most basic of all the sciences. After all it's how the universe works, right? Well, one of my housemates was a mathematician, and he wasn't about to let that go. He said 'all your physical laws, your quote on quote laws, are just **mathematical** models, applied to the **real world**.' As if the real world didn't matter too much? (It didn't to him). And he seemed quite smug and satisfied that he had demolished this earlier statement until a philosopher, a guy who had become a **philosophy** major, came up and he said, 'well look, you know Bruce, that all of your mathematical derivations come from the axioms, the fundamental premises, the basis upon which you base your formulas. And Bertrand Russell proved that those can be almost arbitrary. It's all a matter of philosophical choice, where you start from. Philosophy is the most basic and general of things.' And he seemed to have everybody convinced, until a psychologist said 'but wait a minute, where does all your philosophy come from? It's all rooted in **psychology**. It's been proved long ago. Plato just manufactured all that stuff, based upon his own impulses. You could psychoanalyze him and derive it all. It's all mental.' At which point, a biologist came up and said 'and where does all this mental stuff come from? It's all in the brain, a biological organ, that evolved over time, to certain Darwinian needs. Obviously, it's all rooted in **biology**.' To which the chemist said 'and what is biology? It's just colloidal chemistry. I mean look down at the level of the cell, the level of the DNA, it's all **chemistry**. It's more basic than any of your convoluted organs and all that.' At which point, the physicist said 'are you all done now?"
>
> — David Brin (2010), reflection (Ñº) on *circa* 1971 Caltech party conversation

See also

â— Chemical Thermodynamics in the Real World

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External links

â— Real World (TV series) – Wikipedia.

θΔics

In terminology, **realism** refers to someone whose philosophy (e.g. philosophical realism), work (literary realism), discussions, dialogues, and or ideologies incorporate reality as closely as it is known.

American electrochemical engineer Libb Thims, with Atheism Reviews cohost Pat, in 2014, explaining (V|0:41) the difference between "reality" (chemistry, physics, thermodynamics, physical chemistry) based existence and "mythology" (Christianity, Islam, world religions, Anunian theology) based existence, shown over a "molecules-to-man evolution" (left) + God vs Gibbs diagram (right), and how an "extreme atheist" (extreme atheism) is someone who is an "extreme realist" (extreme realism), i.e. someone who embraces reality (**realism**) and accordingly feels more "alive" (reactively existive) because of this.

Literary realism

Two leading realism authors include: Goethe (*Elective Affinities*, 1809) and his vicarious student George Eliot (*Middlemarch*, 1872). Emile Zola also is counted among realism authors. [1]

Extreme realism

The nature of what can be referred to as "extreme realism" is given by Goethe in commentary to Friedrich Schiller on unreal nature of the work of French author Prosper Crebillon: [2]

> "Crebillon … treats the passions like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. There is no trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover."

In other words, to understand the nature of the passions, as modern science (knowledge) understands things, one has to come to understand (a) irreversibility and (b) the partial differential equation nature of free energy change per unit time, both in a non-supernatural (godless, spiritless, soulless, karmaless, etc.) way.

Extreme atheism

In 2014, American electrochemical engineer Libb Thims began to employ the term "extreme realism" as a synonym for "extreme atheism", in video and discussion of the newly-launched Atheism Reviews channel, defined as someone who "embraces reality".

Quotes

The following are related quotes:

> "God and the universe, soul and consciousness, idealism, **realism**! I swim in a sea of forma dialectic and logic, unfortunately not with my former ease. More experienced swimmers have enticed me too often into the rapids and eddies."
>
> — Fritz Haber (1887), aged 19 letter Max Hamburger, Jan 23 + Feb 2 [3]

See also

â— Allegory of the cave | Cave allegory
â— Chemical Thermodynamics in the Real World
â— Real science

References

1. Sleight, Charlotte. (2010). *Literature and Science* (§4: Realism in Literature and the Laboratory). Palgrave Macmillan.

2. (a) Winnett, Susan. (1993). *Terrible Sociability: the Text of Manners in Laclos, Goethe, and James* (pg. 220). Stanford University Press.

(b) Lynch, Sandra. (2005). *Philosophy and Friendship* (Crebillon, pg. 37). Edinburgh University Press.

(c) Steer, Alfred G. (1990). *Goethe's Elective Affinities: the Robe of Nessus* (Crebillon, pg. 37; symbolically, pg. 158). Winter.

3. (a) Haber, Fritz. (1885). "Letter to Max Hamburger", Jan 23 + Feb 2.

(b) Haber Collection, 2305/3 (Jan 23) and 2305/7 (Feb 2), Archives for the History of Max Planck Society, Berlin, Germany.

(c) Charles, Daniel. (2005). *Master Mind: the Rise and Fall of Fritz Haber, the Nobel Laureate who Launched the Age of Chemical Warfare* (pg. 15). Harper Collins Publishers.

θΔics

In terminology, **reality** refers to the quality or state of being real or that which is real—existing as a physical entity and having properties; something not artificial, fraudulent, illusory, or apparent; the totality of "real" things and events; something that is neither derivative nor dependent but exists necessarily. [1]

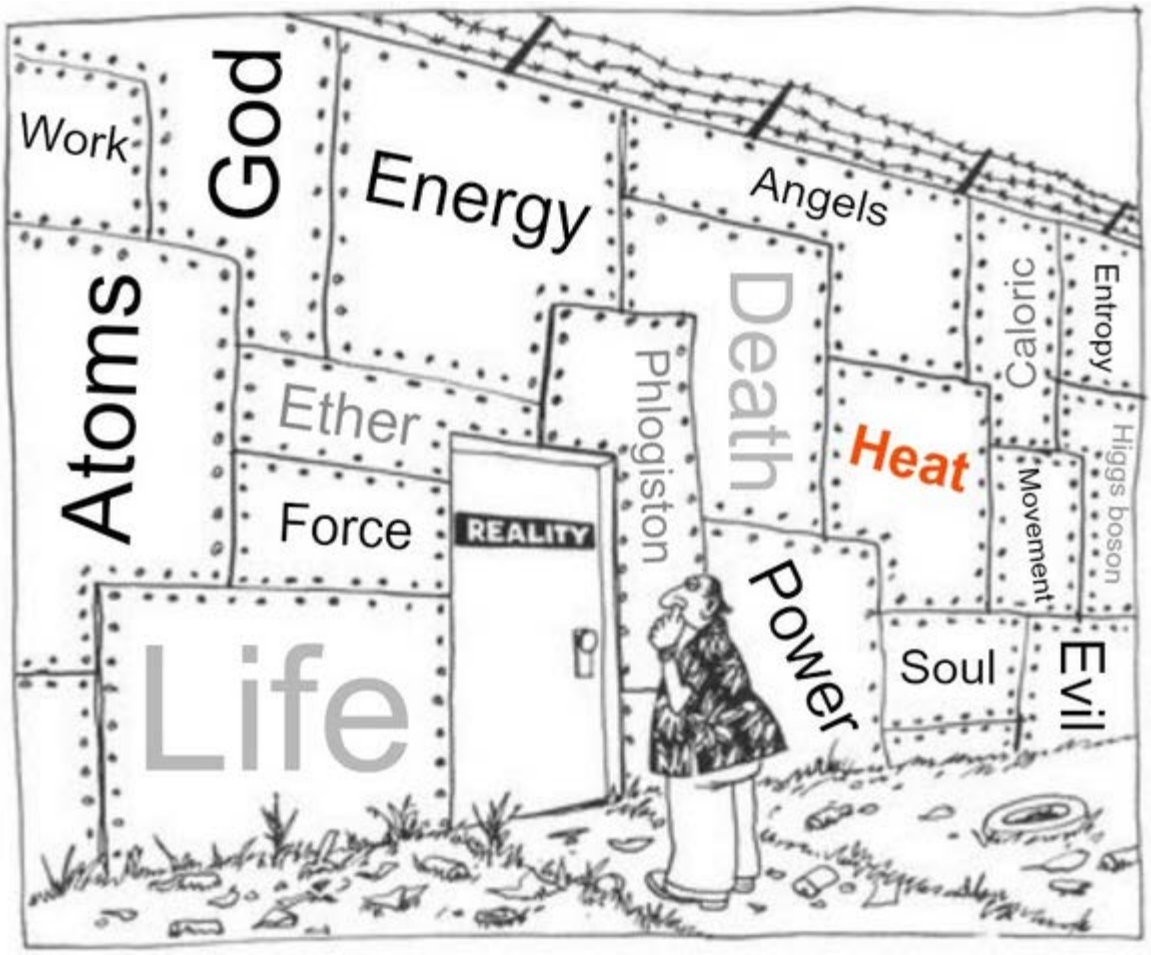

A **reality** diagram from the slides of Libb Thims' BPE 2016 talk.

Realism literature

See main: Realism

On 23 Oct 1799, German polyintellect Johann Goethe commented the following (see: Goethe timeline) on the work of French author Prosper Crebillon: [2]

> "Crebillon … treats the passions like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. There is no trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover."

Goethe expressed this opinion in a letter to his intellectual friend German author Friedrich Schiller, to the effect that Crebillion's writing is not **realistic** in the sense that it is not based on the way that people "react" to each other, according to the principles and outcomes of chemistry.

This, supposedly, was the start of realism literature, whose follower include: English realism philosopher and novelist George Eliot and Spanish realism novelist Leopoldo Alas who, according to American physical organic chemist and literature chemistry historian Stephen Weininger, is an inspired successor of Goethe's *Elective Affinities* realism novel. [3]

The following is an ironic 2015 email communicate from Issuu.com to Libb Thims that his 2008 *The Human Molecule* booklet, on the history of human molecular theory, has been added to a book stack themed on "**reality**", by user Craig Zimmermann (Q), along with publications such as Pierre Teilhard's *The Phenomenon of Man* (1939), Clifford Pickover's *Strange Brains and Genius* (1998), among others; which corroborates will with James Eadon's 2001 poll findings that indicate that some 43 percent of people do not, in reality, think that a human is a giant molecule.

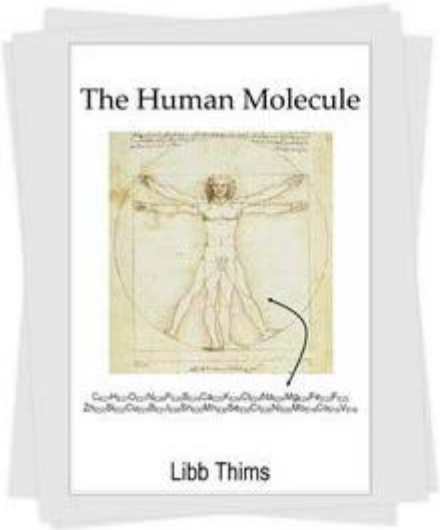

issuu

Reality
39 publications 0 followers
Craig Zimmermann

Real world

In 1971, American chemical engineer and physical chemist Frederick Rossini gave his famous "Chemical Thermodynamics in the Real World" Priestley Medal address, the abstract of which is as follows: [4]

> "For my talk this evening, I have selected the subject "Chemical Thermodynamics in the **Real World**," because it represents an area in which I have worked a great deal and because it relates to present-day problems of our society. I will try to show that thermodynamics is a discipline highly relevant to the real world in which we live and that its fundamental laws may be related to human experience."

This bold statement resulted to launch the 2006-present Rossini debate.

Quotes

The following are related quotes:

> "One major difference between the 'games' played by theoretical physicists and those played by pure mathematicians is that, aside from meeting the demands of internal consistency and mathematical rigor, a physical model must also meet the inflexible boundary condition of agreeing with physical **reality**."
>
> — James Cushing (date) [5]

> "What is **real**? How do you define real? If you're talking about what you can feel; what you can taste; what you can smell and see; then real is simply electrical signals being interpreted by your brain."
>
> — Morpheus (1999), *The Matrix*

> "Talent hits a target no one else can hit; genius hits a target no one else can see."
>
> — Arthur Schopenhauer (c.1850), on Goethe

See also

- Allegory of the cave | Cave allegory

- Real science
- Realism

References

1. Merriam-Weber Collegiate Dictionary.
2. (a) Winnett, Susan. (1993). *Terrible Sociability: the Text of Manners in Laclos, Goethe, and James* (pg. 220). Stanford University Press.
(b) Lynch, Sandra. (2005). *Philosophy and Friendship* (Crebillon, pg. 37). Edinburgh University Press.
(c) Steer, Alfred G. (1990). *Goethe's Elective Affinities: the Robe of Nessus* (Crebillon, pg. 37; symbolically, pg. 158). Winter.
3. Weininger, Stephen J. (2002). "Chemistry", in: *Encyclopedia of Literature and Science* (pg. 77-79), ed. Pamela Gossin, Greenwood Publishing Group.
4. Rossini, Frederick D. (1971). "Chemical Thermodynamics in the Real World" (abs), *Chemical Engineering News*, April 5, *49* (14): 50-53, *American Chemical Society.* (Priestly Medal Address).
5. Kennedy, Robert E. (2012). *A Student's Guide to Einstein's Major Papers* (pg. 1). Oxford University Press.

External links

- Reality – Wikipedia.

θΔics

In terms, **reason** (TR:333) is []

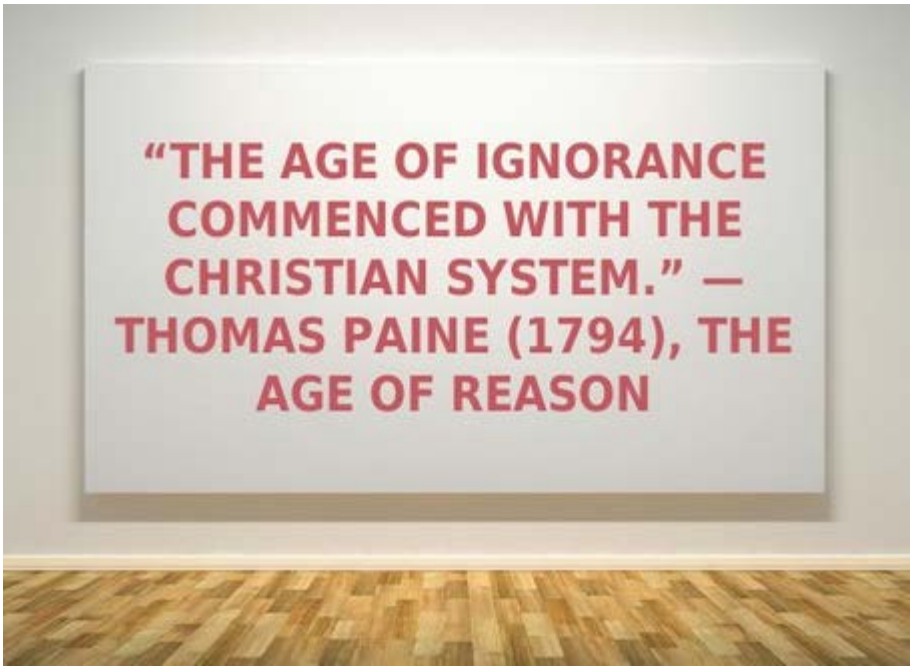

Thomas Paine, in his *The Age of Reason* (1794), rightly demarcated that the "age of ignorance" commenced with the Christian system (aka Christianity), a system that promotes "faith" over "**reason**" (Luther, 1525).

Christian | Apologetics

In recent years, Christian apologeticists, such as William Craig (*Come Let Us Reason*, 2012) and Frank Turek ("Nature Can't Justify Reason", 2018), have been pushing on the term reason; the following seems to shed light on this coded effort:

> "Christians have deified **reason** under the name of the 'eternal word'."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 180)

(add)

Quotes

The following are noted quotes:

> "**Reason** is the enemy of faith."
>
> — Martin Luther (c.1525), Ranker best Luther quotes (#3|60+) ↑

> "My **reason** is not framed to bend or stoop: my knees are."
>
> — Michel Montaigne (c.1580), Ranker best Montaigne quote (#20|148+) ↑

> "I prefer the company of peasants because they have not been educated sufficiently to **reason** incorrectly."
>
> — Michel Montaigne (c.1580), Ranker best Montaigne quote (#19|148+) ↑↑

> "He who establishes his argument by noise and command shows that his **reason** is weak."
>
> — Michel Montaigne (c.1580), Ranker best Montaigne quote (#72|148+)

> "I see men ordinarily more eager to discover a **reason** for things than to find out whether the things are so."
>
> — Michel Montaigne (c.1580), Ranker best Montaigne quote (#2|148+)

> "Nothing ought to be received as truth until it has been proved by good and solid **reasons**."
>
> — Rene Descartes (c.1620), quote especially impressed Benedict Spinoza

> "The age of ignorance commenced with the

Christian system."

— Thomas Paine (1794), *The* ***Age of Reason*** (pg. 60) (png)

"Those who will not **reason**, are bigots, those who cannot, are fools, and those who dare not, are slaves."

— George Byron (c.1810) (Ñº)

rea·son

/ˈrēzən/

noun

1. a cause, explanation, or justification for an action or event.
   "the minister resigned for personal reasons"
   synonyms: cause, ground(s), basis, rationale; More
2. the power of the mind to think, understand, and form judgments by a process of logic.
   "there is a close connection between reason and emotion"
   synonyms: rationality, logic, logical thought, reasoning, cognition; *formal* ratiocination
   "postmodern voices railing against reason"

A Google generated definition of **reason**, as a cause, explanation, or justification for an action of event; the power of the mind to think, understand, and form judgments by a process of logic.

"In reasoning, the selection of the premises is the all-important part of the process. The main reason for the painfully slow progress of the human race is to be found in the inability of the great mass of people to establish correctly the premises of an argument. Every school ought to give direct instruction in fact-determining and truth-seeking; and the difficulties of these processes ought to be plainly and incessantly pointed out."

— Charles Elliot (1901) "The School"; cited by Alfred Lotka (1925) [1]

"There is, fortunately, a natural corrective for our inclination to allow likes and dislikes to influence our **reason**. This corrective is found in the instinct of curiosity, the faculty that impels men to seek the truth, even if it be unpalatable. In fact, a certain type of mind seems to take a particular satisfaction in digging up such otherwise displeasing revelations; the cynic and even the muckraker thus has his useful function. It is probably safe to say, too, that curiosity a desire to know life in all its phases, to 'experience reality; is fundamentally the motive that impels some individuals to taste of the less savory phases of life."

— Alfred Lotka (1925), *Elements of Physical Biology*

"I see no **reason** [owing to the universal nature of] the second law of thermodynamics, to believe in any sort of god, however vague and however attenuated."

— Bertrand Russell (c.1927)

"The laws of human **reasoning** coincide with the laws governing the sequences of the impressions we receive from the world about us. Pure reasoning, therefore, can enable man to gain an insight into the mechanism of the latter. In this connection, it is of paramount importance that the outside world is something independent from man, something absolute, and the quest for the laws which apply to this absolute appeared to me as the most sublime scientific pursuit in life."

— Max Planck (1948), "Scientific Autobiography"

References

1. Elliott, Charles W. (1903). "The School", *Atlantic Monthly* (pg. 584) (Ñº), Nov.

External links

â— Reason – Dictionary.com.

θΔics

In terminology, **recant** (TR:27) refers to a statement or belief formally and publicly renounced or revoked; an open confession of error.

Overview

In 1824, French physicist Sadi Carnot employed and believed in caloric theory; in his posthumous papers he indicated that he corrected his view. [1]

In 1865, Scottish engineer and physicist William Rankine was the last of thinkers to believe in some variant of the material theory of heat or that heat is of material essence. [2] In 1869, Rankine, recanted, and admitted to the impossibility of this logic. [3]

In 1887, German physical chemist Wilhelm Ostwald was of the firm belief that "matter is only a mirage, which the mind creates to comprehend the workings of energy." [4] In 1909, he famously accepted atomic theory, and recanted on his earlier views as follows: [5]

> "I am now convinced that we have recently become possessed of experimental evidence of the discrete or grained nature of matter, which the atomic hypothesis sought in vain for hundreds and thousands of years. The isolation and counting of gaseous ions, on the one hand, which have crowned with success the long and brilliant researches of J.J. Thomson, and, on the other, agreement of the Brownian movement with the requirements of the kinetic hypothesis, established by many investigators and most conclusively by J. Perrin, justify the most cautious scientist in now speaking of the experimental proof of the atomic nature of matter, the atomic hypothesis is thus raised to the position of a scientifically well-founded theory, and can claim a place in a text-book intended for use as an introduction to the present state of our knowledge of general chemistry."

In 2014, Libb Thims tried to get Mirza Beg to recant in his position that the will of Allah was behind Gibbs energy in social and interpersonal chemical reactions, explaining to hims that Islam was a mythology-based belief, and that he would be wise to side with modern science (see: Beg-Thims dialogue); the effort, however, was to no avail.

Quotes

The following are related quotes:

> "It is only lately, under the conduct of professor Willard Gibbs that I have been led to **recant** an error which I had imbibed from your θΔcs namely that the entropy of Clausius is *unavailable* energy while that of T' [Tait] is available energy. The entropy of Clausius is neither the one nor the other it is only Rankine's thermodynamic function."
>
> — James Maxwell (1873), "Letter to Peter Tait", Dec 1 [6]

References

1. Garrison, Fielding H. (1909). "Josiah Willard Gibbs and his Relation to Modern Science, Parts I-IV" (pdf) (§1:475), *Popular Science Monthly*, Part I: 74(27):470-84, May; Part II: 74:551-61, Jun; Part III: 75:41-48, Jul; Part IV: Vol #:191-203, Aug.
2. (a) Rankine, William. (1865). "On the Second Law of Thermodynamics", *Philosophical Magazine* (pg. 241-45; esp. 244), Oct.
(b) Garrison, Fielding H. (1909). "Josiah Willard Gibbs and his Relation to Modern Science, Parts I-IV" (pdf) (§1:475), *Popular Science Monthly*, Part I: 74(27):470-84, May; Part II: 74:551-61, Jun; Part III: 75:41-48, Jul; Part IV: Vol #:191-203, Aug.
3. Rankine, William. (1869). "On the Thermal Energy of Molecular Vortices", *Trans. R. S. Edin*, xxv. pg. 557.

4. Holt, Niles R. (1977). “Wilhelm Ostwald’s ‘The Bridge’” (abs), *The British Journal for the History of Science*, 10(2):146-50.
5. Ostwald, Wilhelm. (c.1908). “Quote” (Ñº), in: *Grundriss der allgemeinen Chemie* (4th ed., 1909), Preface, as cited by Erwin N. Hiebert and Hans-Gunther Korber in article on Ostwald in Charles Coulston Gillespie (ed.), *Dictionary of Scientific Biography* Supplement 1, Vol 15-16, 464.
6. (a) Maxwell, James, (Harman, Peter (editor)). (1990). *The Scientific Letters and Papers of James Clerk Maxwell: 1874-1879* (Numbers 557 Letter to James Thomson, 27 March 1875, note (2) (pg. 205), 587 Draft of ‘On the Equilibrium of Heterogeneous Substances, circa February 1876, note (7) (pg. 283), and 623 Letter to Peter Guthrie Tait, note (4) (pg. 397)). Cambridge University Press.
(b) See: J. Willard Gibbs, “Graphical Methods in the Thermodynamics of Fluids”, (Gibbs quote: “the term *entropy*, it will be observed, is here used in accordance with the original suggestion of Clausius, and not in the sense in which it has been employed by Professor Tait and others after his suggestion. The same quantity has been called by Professor Rankine the *Thermo-dynamic function*.”) *Transactions of the Connecticut Academy of Arts and Sciences*, 2 (1873): 309-42, esp. 310n.

θΔics

In science, **receiver**, refers to a type of vacuum bulb, of an air pump, e.g. a Boyle air pump (1659), that is able to "receive" or have thing put into it, though a generally 4-inch opening in the top, e.g. candles, birds, fish, bells, etc., then sealed, so that classical doctrines about what can and cannot occur in a vacuum can be tested.

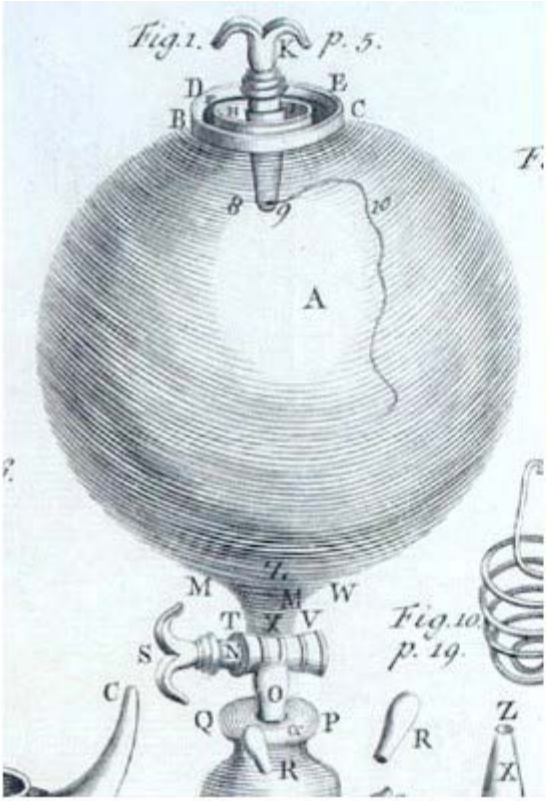

Two pictures of a "**receiver**" (Boyle, 1660), which comprises parts A, the vacuum bulb, the screw in cap at the top, and the bottom "male" connecting part, which fits into the vacuum pump R. The one at the left has a string inside, used e.g. to ring a bell, the one on the right has a fish in water inside, so to test what happens to a fish in a vacuum. [2]

Quotes

The following are related quotes:

> "Apart from any new features that were special to the pumps or valves, Hooke's machine contained three design features that were of the greatest significance. The first of these was a large glass vessel some 15-inches in diameter, called the '**receiver**', which contained the space to be evacuated. Secondly, a brass stopper some four inches in diameter set and cemented into the top of the glass receiver made it possible to gain easy access to the experimental area, and seal everything up before the pumper set to work. Thirdly, an ingenious secondary brass stopper with conical sides passed through the large stopper, so that when liberally coated with salad oil, it could be turned around without breaking the air seal. This rotating stopper could be used to pull a thread to actuate some experiment in vacuo. With Hooke's machine, therefore, the experimenter had easy physical access to a fairly large experimental site that was entirely visible through the thick walls of the glass Receiver. It was to be used to conduct a series of experiments which needed clear vision and the ability to ignite and move things."
>
> — Allan Chapman (2004), *England's Leonardo* (pg. 24) [1]

References

1. Chapman, Allan. (2004). *England's Leonardo: Robert Hooke and the Seventeenth-Century Scientific Revolution* (Greatorex, pgs. 23, 272; receiver, pg. 24). CRC Press.
2. (a) Boyle, Robert. (1774). *The Works of the Honorable Robert Boyle, Volume One* (editor: Thomas Birch) (air pump photo, pg. end matter). A. Millar.
(b) Shapin, Steven; Schaffer, Simon. (1985). *Leviathan and the Air Pump: Hobbes, Boyle, and the Experimental Life* [fish in receiver cover (Ñº) edition]. Princeton, 2011.

θΔics

In religio-mythology, **recension theory** is the presumption, based on comparisons of religious texts, concordant with certain periods of peaked imperial power, that during each major dynasty (Egyptian) or period (Hebrew, Greek, Roman, English), the corpus of religious theory underwent a new "revision", "recension" (Budge, 1899), "rescript" (Kuhn, 1944), "adjustment" (Ghurye, 1965), or "redaction" (Greenberg, 2000), generally involving syncretisms of various competing theologies, resulting in a grand edit, therein making a new variant of state religion.

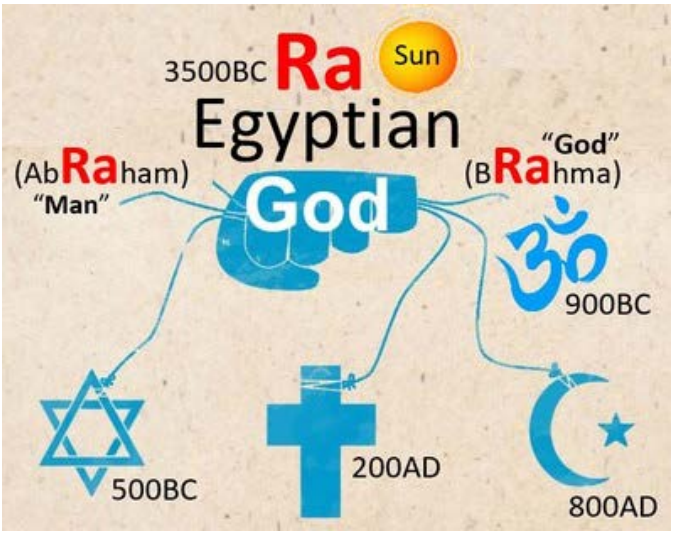

A diagram shown the gist of **recension theory** (religion morph), originated by Edouard Naville (1886) and Wallis Budge (1899), and or **redaction theory** (religion syncretism), originated by Gary Greenberg (2000), related to the evolution or change of the contiguous core religion belief model, through empires: Egyptian, Sumerian, Hebrew, Greek, Roman, English, and American, over the last 5,000+ years, all generally rooted in the ancient pre-dynastic sun god Ra, and derivatives or morphs derived therefrom.

Overview

In 1842, Prussian Egyptologist Richard Lepsius, a follower of French hieroglyphics decoder Jean Champollion (1790-1832), published the first "standard edition" attempt at an English rendering of the Egyptian *Book of the Dead*, one from the papyrus of a Ptolemaic official named Luwefankh. Lepsius divided this *Book of the Dead of Luwefankh* into 165 chapters, assigning the numbers on the basis of the dividing lines and rubrics of that document. Additional chapters were added by Willem Pleyte, Edouard Naville, Wallis Budge, T.G. Allen, and others, raising the total number, as of 2008, to 192 chapters. [2]

In 1886, Swiss Egyptologist Edouard Naville introduced "recension theory", namely the assertion that there were both a "Theban recension" (18th-19th dynasties | 1550-1200BC), i.e. those written before the Late Period, of the *Book of the Dead*, and a "Saite recension" (26th dynasty | 600BC), after which the *Dead Book* became standardized into a specific order and "fossilized", as some have referred to it, in terms of content. [3]

In 1904, English Egyptologist Wallis Budge, building on Naville recension theory (two recension theory), added that there was a "Heliopolitan recension" (1st-6th dynasty | 3000-2200BC) (see: Heliopolis creation myth), prior to the Theban recension (three recension theory). [2] Budge states that details of the Heliopolitan recension are found in the Pyramid Texts of Unas, last king of 5th dynasty (2345BC), Teta, and the other kings of that era, and states that this recension dates to an anterior period. (Ñº)

In c.1915, George Gurdjieff, according to Simson Najovits (2009), had asserted the view that Christianity, or aspects of it, and the "form of worship in the Christian Church", owed something to what Gurdjieff called Egyptian "schools of repetition". [7] This "schools of repetition" term may or may not be related to redaction/recension theory?

In 2000, Gary Greenberg, using his own formulation, states that five main recensions or "redactions" occurred (five redaction model); loosely occurring in the following order: Heliopolis recension (3500BC), Memphis recension (3100-2100BC), Hermopolis recension, Theban recension (2040BC), and lastly an Canaanite recension or redaction (587BC), the latter of which, according to Greenberg, being a mix of the Heliopolis recension (J source), Theban recension (P source), and the Babylonian recension (Babylonian creation myth). [4] The following diagram (Ñº) shows the five main recension (or redaction) locations, according to the Greenberg five redaction model, as taught to children during the 2015 Zerotheism for Kids class:

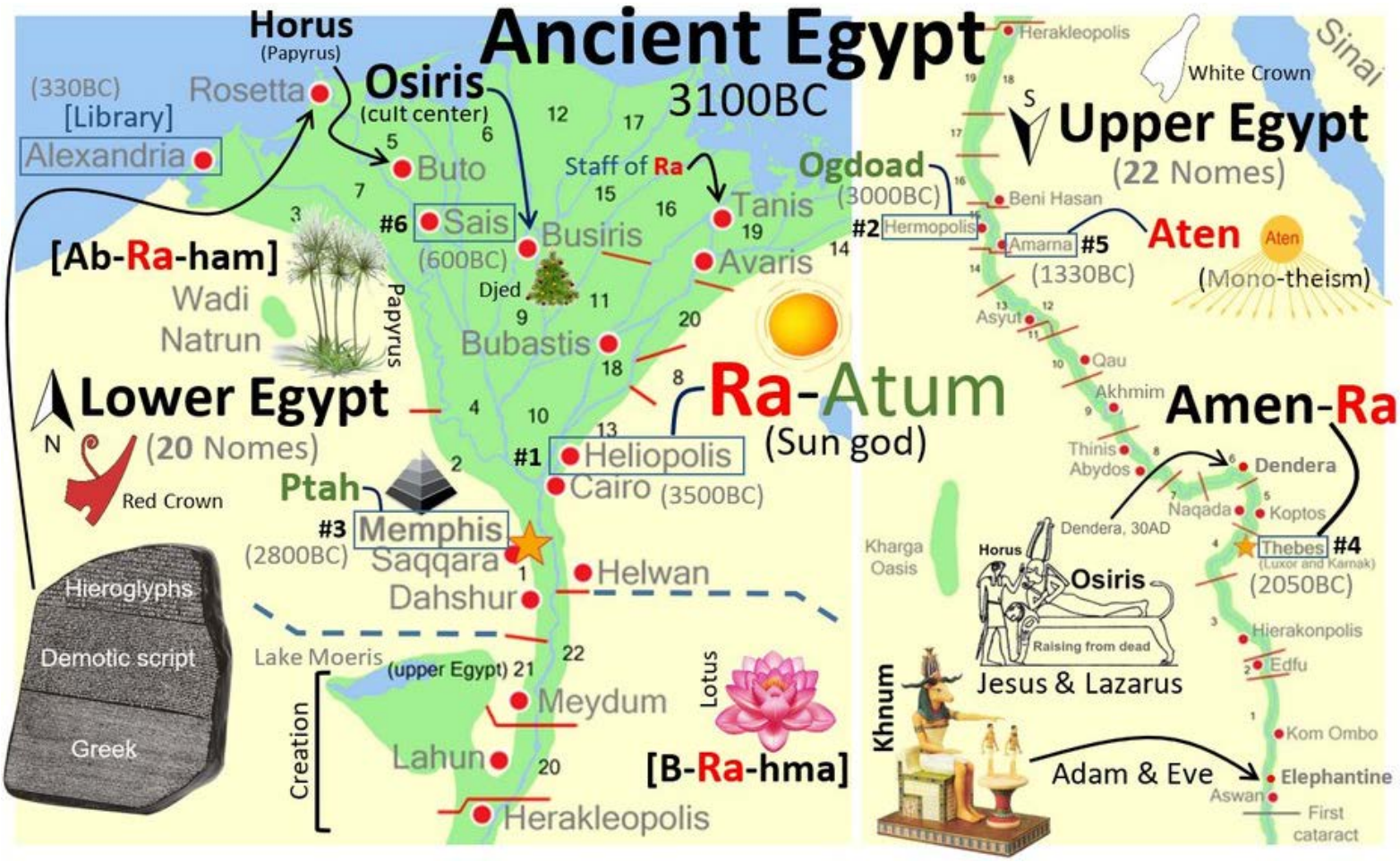

In 2008, John Romer, using the Budge model, dated the three main recension periods as follows: [5]

> "Each of these three scholarly compilations — which Budge calls **'recensions'** — are based on groups of texts that were created one after the other during the three phases of ancient Egyptian history, the three 'kingdoms', when the state was centralized and monuments of stone were made. Thus, the so-called 'Pyramid Texts' that contain the oldest known religious literature are dated to the Old Kingdom, which began about 3000 BC and lasted for eight centuries. (More precisely the first known examples of the Pyramid Texts, and a near-perfectly preserved corpus in their own right, were engraved c. 2257-2237 BC on the interior chambers and corridors of the Pyramid of Unas.)
>
> The second compilation, dubbed the 'Coffin Texts', is dated to the so-called Middle Kingdom, which began about 2150 BC and lasted for 400 years.
>
> The third compilation, the *Book of the Dead*, is dated to the five-century-long New Kingdom, which began about 1550 BC, though a few chapters are known that are half a century older. Many other religious texts, some of them elaborate and integrated compositions, also appear to have been composed during that period of time. Extensive collections of chapters that appear in the *Book of the Dead* also continued to be used in burials throughout the Late Period (from around 700 BC) and down into Ptolemaic and Roman times, just as did some of the chapters — sometimes known as 'spells' — from the Pyramid Texts and the Coffin Texts until, eventually, the pagan faith was banned by order of the Christian Roman emperors."

(add)

1. Heliopolitan recension | Pre-dynasty-6th dynasty | 3500-3150BC

In 1899, Wallis Budge, in his *Egyptian Religion* (pg. 100), Budge commented on the Heliopolis recension, centered around Ra the sun god, as follows:

> "Ra was probably the oldest of the gods worshiped in Egypt, and his name belongs to such a remote period that its meaning is unknown."

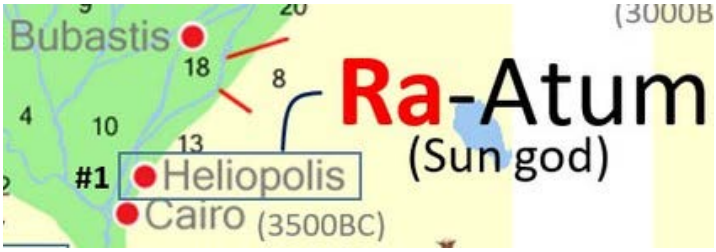

The city of Heliopolis, aka "city of the sun", located in nome #13 of Lower

In 1904, Budge, in his *The Gods of the Egyptians*, contradicts this by stating, in two places, that Horus is the oldest of the gods.

Egypt, the location of the Heliopolis recension (aka Heliopolis creation myth), originating in 3500 to 3150BC, the first and most dominate Egyptian religio-mythology belief system.

In 1915, Scottish mythologist Lewis Spence, in summary of the Budge three recension model, described the Heliopolis recension as follows: [3]

> "There were three recensions or versions of the *Book of the Dead*—the Heliopolitan, the Theban, and the Saite. The Heliopolitan recension was edited by the priests of the College of Anu, or On, known to the Greeks as Heliopolis, and was based upon texts not now recoverable. The Pyramids of Unas, Teta, and Pepi contain the original texts of this recension, which represent the theological system introduced by the priests of Ra. The essentials of the primitive Egyptian religion are, however, retained, the only modification in them being the introduction of the solar doctrine of Ra. In later times the priesthood of Ra were forced to acknowledge the supremacy of Osiris, and this theological defeat is visible in the more modern texts. Between the Sixth and Eleventh Dynasties the priests of On edited a number of fresh chapters from time to time."

In 1990, Lewis Spence stated that the Heliopolis priests, in their recension, edited a number of fresh chapters during the 6th and 11th dynasties (2345-1991BC).

In 2000, Gary Greenberg implicitly dated the Heliopolis recension, seemingly, to pre-dynastic times (3500 to 3150BC) [5]

In 2002, Johann Fletcher, in her *The Egyptian Book of Living and Dying*, ordered the three main Egyptian creation myths as: Heliopolis, Hermopolis, and Memphis, as follows: [13]

> "Egypt's all-embracing framework of myths encompassed at least three accounts of creation. They were all interconnected, but each centered on a particular creator deity or group of deities: the nine gods of Heliopolis, the eight gods of Hermopolis and Ptah, and the god of Memphis, Egypt's traditional capital. All were credited with creating the universe and their priests all claimed that their temple stood on the very site where creation had begun."

(add discussion)

2. Hermopolis recension | 3000-2500BC

See main: Hermopolis theology (Hermopolis recension)

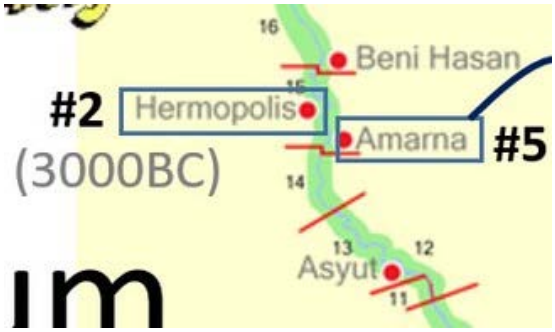

The city of Hermopolis, located in nome #15 of Upper Egypt, the cited of the second main religious recension of Egyptian theology.

In 1893, Gaston Maspero asserted his view that the god company of Hermopolis was constructed *after* the model of the god company of Heliopolis. [12]

In 1904, Budge, in his *The Gods of the Egyptians*, in two places (pgs. #, 404), argued, in opposition to Maspero, amid commentary of Heinrich Brugsch, that the Hermopolis god company was older than the Heliopolis god company.

In 2003, Canadian-born French Egyptologist Simson Najovits stated that there were ten main Egyptian creation myths, each associated with a different city, Heliopolis being the oldest, ranked, via reasoned argument, the Hermopolis recension as the second oldest cosmogony: [6]

> "Four different versions of the creation of the world from the benben were developed in Hermopolis: a great egg was laid on the benben by a cosmic goose (containing Re as sun and light who then created the world); an ibis (Thoth) laid the cosmic egg; a lotus stemming from the waters of the Sea of Two Knives in Hermopolis opened and gave birth to the solar child Re; a scarab, the rising sun and the eye of Re, was inside the lotus and was transformed into a crying boy whose tears became mankind."

The following are some cosmic egg renditions; the middle depiction is a latter Theban recension (below) addition:

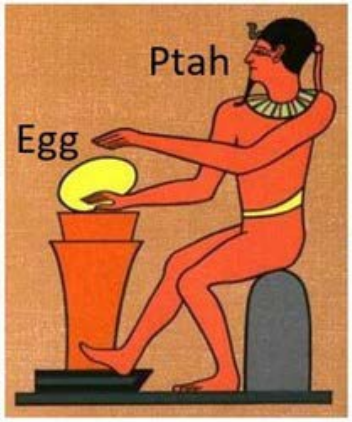

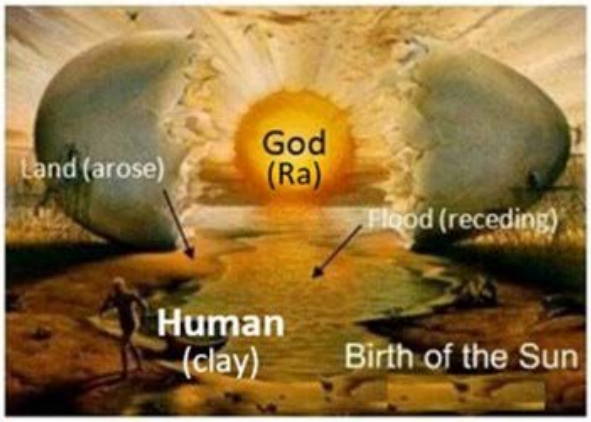

This seems to be the root of the later Hinduism recension of creation, such as shown above right (Ñº), where the snake Ananta-Shesha (Egyptian: Apep) holds the 'cosmic egg' out of which the sun (or Ra) is born (or the god Brahma, as the Hindu rewrite tells things).

Najovits, to continue, dates Hermopolis theology as follows: [6]

> "Extrapolating from a few Pyramid Texts (Utterance 301 which refers to Nun, Naunet, Amun and Amaunet together), the reference to Hermopolis as the "Unu (Heliopolis) of the south" (Utterance 219) and references to "chaos gods" (Utterances 558, 406), the Hermopolitan Ogdoad appears to have been Egypt's second oldest grouping of divinities. However, its theology and creation myth are mainly known from inscriptions in the surviving Theban Karnak Temple (after c. 1550 BC) as there are no surviving remains of the Hermopolis Temple."

In 2000, Gary Greenberg stated there was a "Hermopolis recension", during which time the Ogdoad theory of gods was prevalent, but seemingly situates this recension *after* the Memphis recension. [5]

3. Memphis recension | 2800-2100BC

See main: Memphis theology (Memphis recension)

The city of Memphis, located in nome #2 of Lower Egypt, where the great pyramids of Giza are located, the location of the third major religious recension in Egypt.

In 2003, Canadian-born French Egyptologist Simson Najovits cogently argued, seemingly, that the Memphis theogony was third in historical development:

> "It can be supposed that the inclusion of gods from the Heliopolis and Hermopolis Enneads in the Memphis Ennead could have had strictly theological reasons for amalgamating the gods, but it could have also been an attempt to avoid irritating the powerful clergies of Heliopolis and Hermopolis. Moreover, the key constitutive elements in Memphite theology — creation by the head mind and the tongue/word — could have been a radicalization of the Heliopolitan concept that Atum was self-created with the assistance of god Sia, the personification of perception, and the god Hu, the personification of creative utterance. At the same time, Ptah's existence before Atum as much as it can be seen as a theological concept of divine pre-existence, also can easily be interpreted as a sign that the Memphite Temple sought to dominate the older Heliopolitan Temple. Despite claims that the Memphite Ennead and theology were the oldest in Egypt, it seems that the inclusion of gods from Heliopolis and Hermopolis and the development of Heliopolitan theological concepts would logically make it posterior to these latter enneads."

Religio-mythology scholar Gary Greenberg (2000), alternatively, seems to loosely situate the Memphis recension before the Hermopolis recension, wherein an adoption and modification of the Heliopolis model occurred, such that the new chief god Ptah summoned forth Atum from the Nun via spoken word. [5]

→ Babylonian redaction | 1800BC

(add) [11]

4. Theban recension | 18th-19th dynasties | 1550-1200BC

In 1915, Scottish mythologist Lewis Spence, using the Budge three recension model, summarized the Theban recension as follows: [3]

> "The Theban recension was much in vogue from the Eighteenth to the Twenty-second Dynasties, and was usually written upon papyri and painted upon coffins in hieroglyphs. Each chapter was preserved distinct from the others, but appears to have had no distinct place in the entire collection."

Greenberg states that Thebes, with its local deity Amun, came to power in 2040BC. [5] Spencer states that the Theban recension was in vogue from the 18th (1549BC) to 22nd dynasty (720BC). [4]

The city of Thebes, nome #4 of Upper Egypt, the cite of Theban recension, the fourth major religious morph in Egyptian dynasty religion models.

5. Armana redaction | Atenism | 1300BC

In 1352BC to 1336BC, the radical pharaoh Akhenaten attempted, during his reign, in one swipe, to do away with polytheism, and moved the national religious center from Thebes to Amarna, and to situate worship to the one god Aten, in the form of the sun disc with arms. The attempt was short-lasting, but had long-term repercussion effects. Many, such as Sigmund Freud (1939), credit the origin of the character of Moses to the events of this period.

→ Persian redaction | 1100-600BC

(see: Abraham and Brahma)

→ Hindu redaction | 900BC

(add) [11]

6. Saite recension | 26th dynasty | 600BC

In 1915, Scottish mythologist Lewis Spence, using the Budge three recension model, summarized the Saite recension, which occurred in Sais, the capital of the Saite dynasty, or 26th Dynasty (664–525 BC), as follows: [3]

> "The Saite recension was definitely arranged at some date prior to the Twenty-sixth Dynasty, and is written upon coffins and papyri, and also in hieratic and demotic script. It continued to be employed to the end of the Ptolemaic period."

In 1990, Lewis Spence stated that the Saite recension was arranged at some date prior to the 26th dynasty (672BC), as written also in hieratic and demotic script, which continued to be employed to the end of the Ptolemaic period (30BC).

7. Hebrew redaction | 1000-500BC

See main: Judaic recension

In 2000, Gary Greenberg, in his *101 Myth of the Bible* (pg. 7), described what he referred to as "Hebrew redaction", in short, as follows:

> "The Hebrew redactors used Egyptian myths to make the biblical stories; which, from time to time, had Babylonian myths grafted onto earlier texts or replaced portions of the original stories."

In more detail, according to the documentary hypothesis, as summarized by Greenberg (2000) this redaction involved at least involving 4 source documents and 1 editor; summarized as follows:

Source	Date	God	Roots	Discussion
A source	1300BC	Aten	[see: Aten's finger]	
AR source	1250BC	Amun; Ra		

J source	1000BC	YHWY; Jahweh [Yahweh]	Heliopolis recension roots [4]
E source	922BC	El; Elohim	El god based roots
P source	586BC		Theban recension roots [4]
D source	650BC		
Editor	500BC		

In more detail, according to the so-called documentary hypothesis, first decoded by French Biblical scholar Jean Astruck (1753), who noted a distinction between the Jahvist god and Elohist god textual sources, these scholars or editor, took four Egyptian mythology source documents, aka the: **J source** (Jahweh theist), **E source** (Elohim theist), **P source** (theist concerned with Priestly matters, e.g. rituals, dates, numbers, measurements, etc.), and **D source** (theist who authored Deuteronomy), and syncretized the batch into the so-called *Book of Moses*. The dated origin of these different sources, including the Aten source (A source), are as follows: A source (1300BC), J source (1000BC), i.e. A morphed into J source, E source (922BC), J and E sources merged + commentary (722BC), D source (650BC), P source (586BC), final editor or redactor (500BC). [10]

8. Alexandrian redaction | 322-30BC

See main: Alexandrian recension

In 332BC, when Alexander the Great conquered Egypt, therein establishing the so-called Macedonian dynasty (332-305BC), during which time he is said to have commented on how he "recognized his own religion", i.e. Greek theology (Greek mythology), in the Egyptian religion (Egyptian mythology). Sometime herein, as comparative religio-mythology indicates, there was, supposedly, some type of Alexandrian redaction, wherein the powerful priests of this period merged the Saite recension, Hebrew redaction, and Greek recension into a new version of the Old Testament.

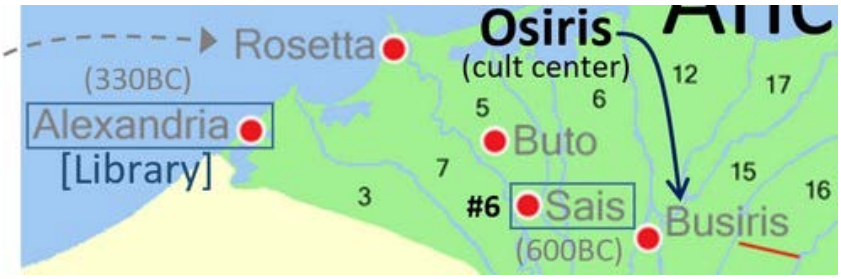

The city of Alexandria, located in nome #3 of Lower Egypt, home to the famous Library of Alexandria, the city of the so-called Alexandrian redaction of Egyptian religion, which subsumed Greek mythology into the new redaction.

In 1899, Wallis Budge, in his *Egyptian Religion*, while not referring to it as a recension, described the Ptolemaic period theology (Macedonian dynasty + Ptolemaic dynasty), wherein he says Amen held the supreme position, citing the Kerasher papyrus (27 BC - AD 14), as follows: [8]

> "In the Ptolemaic period, in an address to the deceased Kerasher we read "Thy face shineth before Ra, thy soul liveth before Amen, and thy body is renewed before Osiris." And again it is said, " Amen is nigh unto thee to make thee to live again. . . . Amen cometh to thee having the breath of life, and he causeth thee to draw thy breath within thy funeral house."

At this recension point, as we see, Egyptian theology is tri-theistic, belief situated in three gods: Ra (forerunner to Abraham), Amen (forerunner to god the father), and Osiris (forerunner to god the son, or Jesus).

In 2012, Timothy Freke, during his documentary commentary on the Jesus myth, gave some cogent summary of the Alexandrian redaction. [9]

9. Roman redaction | 69-325 AD

See main: Roman recension

In the Roman period, there seems to have been first a Roman redaction (69-96AD), during which time the then-prevalent recensions were morphed into a crude Christ-centric theology, based on Osiris myth, which was followed by a second Roman recension, culminating in the Nicene council (325AD)

In 2012, Joseph Atwill, author of *Caesar's Messiah: the Roman Conspiracy to Invent Jesus*

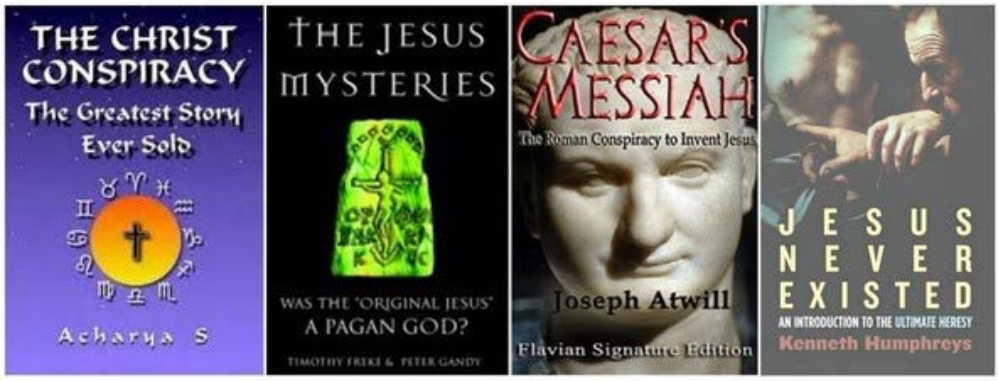

The above four books: Dorothy Murdock's *The Christ Conspiracy* (1999), Timothy Freke's *The Jesus Mysteries*

(2005), in his 2012 documentary on the same subject, argued that the modern version of the Jesus figure was invented by the Caesars or Flavian dynasty (69-96AD) (Ñº), and therein seems to give a decent summary of an aspect of the "first Roman redaction".

(1999), Joseph Atwill's *Caesar's Messiah* (2006), and Kenneth Humphreys' *Jesus Never Existed* (2005), the four main books behind Atwill's 2012 documentary film on the so-called "Flavian Jesus hypothesis", aka the "first Roman redaction", dig around in the muddle of the invention of Jesus from the religious milieu brewing at the time.

In 1770, Baron d'Holbach, in his *Critical History of Jesus Christ: a Rational Analysis of the Gospels*, summarizes the Nicene recension, by parodying the fact that it involved some 50 source documents (only four of which were kept) and 318 bishops (of numerous languages and religions).

10. James recension | 1611 AD

In 1611, the King James Bible was produced, through the editing efforts of a committed of 47 priests (see: Genesis), which supplanted the Latin vulgate version used previously, therein in cutting a number of sections to the opening creation descriptions to genesis.

Objections

In 2007, Wikipedia Egyptian scholar Jeff Dahl (Ñº), of note, was posting tenuous objections to the Budge-Naville recension theory.

Quotes

The following are related quotes:

> "These various **recensions** of these wonderful compositions—of the collection of religious texts generally known by the name *Book of the Dead*—cover a period of more than five-thousand years."
>
> — Wallis Budge (1899), *Egyptian Religion* (pg. ix)

> "No one can make the search and discover these numberless resemblances without forming the conviction that the Bible writings are **'rescripts'**, often … corrupted, of ancient wisdom literature."
>
> — Alvin Kuhn (1944), *Who is the King of Glory?* (pg. 191); cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 30) [6]

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12. (a) (c.1893). *La Mythology Egyptienne* (pg. 257). Publisher.
(b) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (pg. 404). Dover, 1969.
13. Fletcher, Joann. (2002). *The Egyptian Book of Living and Dying: the Illustrated Guide to Ancient Egyptian Wisdom* (pg. 9). Thorsons.

External links

â— Recension – Wikipedia.

â— Ancient Egyptian creation myths – Wikipedia.

θΔics

In engineering, **reciprocating motion**, or "reciprocative motion", refers to repetitive up-and-down or back-and-forth motion; the term generally originating in work imparted via the up-down piston motion of the Newcomen engine (1712).

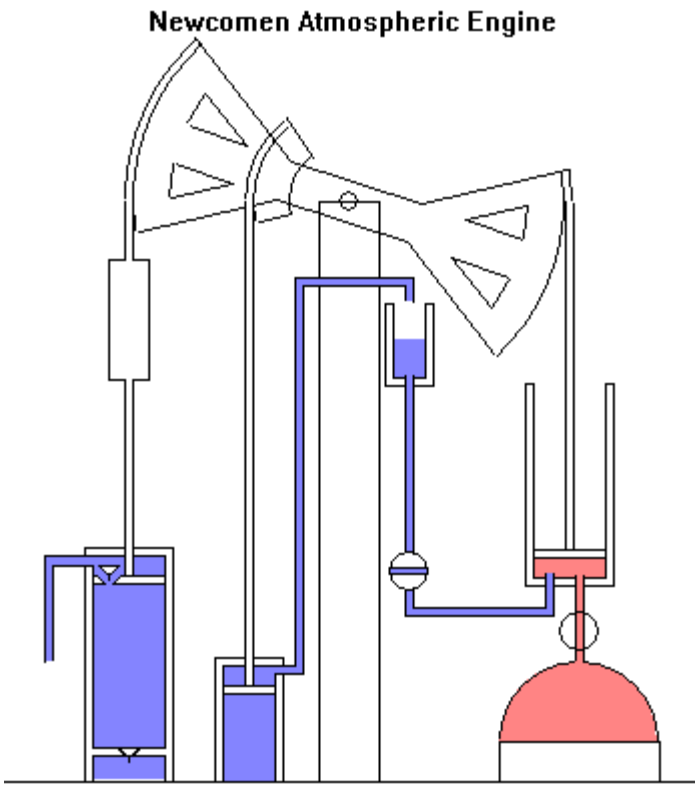

An animation of the operation of the Newcomen engine (1712), showing how first steam, from the boiler, at right, is put into the piston and cylinder, above the boiler, which is then cooled, by a spray of cold water, at the point when the piston is at its highest position in the cylinder, which makes a vacuum in the cylinder, which thus forces, via atmospheric pressure, the the piston down; and the cycle repeats. The head of the piston is connected via a rod to a rocker arm, which thus imparts work in the form of **reciprocating motion** to a water pump on the other end of the rocker arm.

Quotes

The following are related quotes:

> "Thomas Newcomen, ironmonger and preacher on occasion, completed his engine in 1712 after years of experimenting. His first engine was installed at Dudley Castle in Staffordshire to pump water from a mine. Newcomen's partner, John Calley or Cawley, a plumber and glazier of Dartmouth, provided the manual skill. Newcomen's contribution was an ingenious mixture of familiar devices with ideas of his own. He took the copper kettles and furnaces of brewers to supply the steam for the same kind of cylinder and piston which had been used for lifting water as far back as Roman times and **condensed the steam below the piston within the cylinder** to create there a partial vacuum which would **allow the weight of the atmosphere above to force the piston down**. Instead of using Savery's method of creating the vacuum by dashing cold water on the outside and thus condensing the steam, Newcomen sprayed water directly into his vertical cylinder. This condensed the steam, created the vacuum, and allowed the atmospheric pressure to force the piston down. To put this downward pull of the piston to work, he connected its rod by a chain to a horizontal and centrally pivoted working beam, or walking beam as it was later called, and fastened the other end of the beam by a chain and rod to the piston or plunger in the pump cylinder. As new steam was admitted below the first piston and the vacuum broken, this piston was raised again by the weight at the other end of the working beam, and the piston of the pump was lowered to its original position. Thus, the **reciprocating motion**, up and down, was complete."
>
> — Richard Kirby (1956), *Engineering in History* (pgs. 162-64) [3]

References

1. Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 42). Courier, 1990.

External links

â— Reciprocating motion – Wikipedia.

θΔics

In music chemistry, **Redefined** is a 2014 dance song by Australian song writer and music producer Tyson Illingworth [tyDi], featuring Melanie Fontana and Novaspace, which features the core thermal term hook “you only need one spark to start a fire … now when I think of love it’s redefined” (the “club mix” being much better than the “radio edit”); which is his most popular song to-date, since 2010, according to MetroLyrics.com color-coded hot-to-cold ranking system. [1]

A screenshot from the 2015 video for "**Redefined**" wherein Tyson Illingworth seems to be "falling like an angel" from heaven, after a breakup. [3]

Overview

In 2011, Australian song writer and music producer Tyson Illingworth [tyDi] began writing songs, totaling over 300 different songs; of which he pulled the best 20 for his 2014 album; which he explains in interview as follows: [4]

> “This new one is called ‘Redefined’, it’s coming out in September. It is my follow-up to ‘Shooting Stars’. It’s got 20 tracks on there. I’m not even kidding, I wrote close to 300 songs to nail it down to 20. I just wrote song after song after song. Every week I was in the studio just writing songs and scrapping them or keeping them a folder and filtering them down to the best ones so the album is the best 20 songs that I’ve made over the last 3 years.”

In 2015, Libb Thims ranked “Redefined” as #6 position in the HumanChemistry101 “Chemistry Music” playlist of the top 16 chemistry music (or music chemistry) and physical chemistry music (or music thermodynamics) themed songs. [5]

Lyrics | Analyzed

The following are the lyrics to “Redefined” with hyperlink, discussion, and analysis (see: Beg analysis) of the thermal word usage: [2]

Lyrics	Analyzed
Falling like an angel Who forgot how to fly Like a stranger That I've seen too many nights And all these layers Building up over time with you Come back to let me out	He seems to be referring to how "falling from love" is the reverse feeling of "falling in love" [?]
And you reveal the mystery Rewrote my history When I had half my truth I found the rest in you Got the ability To take a broken dream	

And with the four letter
word redefine what it
means

Cartoon photo from "freely-running" article on love as a combustion reaction:

You only need one spark to
start a fire
You only need one heart to
save life
It only takes one word to
get inspired
Now when I think of love
it's redefined

Compare:

“If love was a fire
Then we have lost the spark
Love never felt so cold
If love was a light
Then we're lost in the dark
Left with no one to hold”

— Usher (2001), “Separated” (Ñº)

It was like water
Slipping right through my
hands
Tried to hold on but
Never could understand
that I was stronger
Than all the physical plans
Until you came along and
showed me how

And you revealed the
mystery
Rewrote my history
When I had half my truth
I found the rest in you
Got the ability
To take a broken dream
And with the four letter
word redefine what it
means

You only need one spark to
start a fire
You only need one heart to
save a life

It only takes one word to
get inspired
Now when I think of love
it's redefined
2x

(add discussion)

Sparking a fire | Discussion

Historically, philosophies that admixture "spark, fire, love" are numerous, possibly dating back to "flux and fire" philosopher Heraclitus; each advancing in precision with each century.

A comparison of the "love at first sight" model of relationships (top) with the "love at first spark" model of relationships (bottom) showing, via campfire analogy, the absurdity of people trying to re-spark burned out relationships so to start the fire again, something no one would ever do at a "real" campsite, but that many attempt to do in the hypothetical world of imagined relationships.

The following is a segment by Marcabru (c.1130-1150) from *Fin' Amors*: [6]

> "Love acts like the spark which makes fire smoulder in the sooty cinder and burns up the wood and straw—Hear me!—and the man who is devoured by this fire does not know in which direction to flee."

Other closer to the 20th century poetical usages include: e.g. "we are a queen, my drops of tears I'll turn to drops of fire" (Shakespeare) (Ñº); "in her eyes the fire of love doth spark" (Edmund Spenser) (Ñº)(Ñº); among others.

In 2015, Dauren Francis, in his self-help book *Built to Last: a Successful Marriage and Relationship* (Ñº), incorrectly used the phrase in respect to a burned out marriage, giving the un-sound advice: "it doesn't matter if you have been married for one week or fifty years; you must still show love to each other. It only takes **one spark to start a fire**. Learn to be that spark in your marriage. Show her how much you love her." Then, averring to religious talk, states that "god has brought you both too far for you to give up now". This, however, is fairytale advice. When wake up in the morning while camping and your campfire, which you previously lighted the night before, has burned up the wood into a small pile of coal and ashes, you DON'T try to re-light the ashes and coals, thinking that god had made the wood for a purpose, which is to burn, and that since god has brought the wood this far, one should not give up on it. NO, wrong logic. One puts new wood into the fire pit and re-lights a new fire with "one spark" so to warm up and cook breakfast.

The same is true of humans reacting together, via so-called "social combustion theory", human chemical reaction theory, or love the chemical reaction, but beliefs have many people attempting to relight burnt out coals and ashes of relationships in the name of religious beliefs or whatever to no avail.

Quotes

The following are related quotes:

> "How terrible it is to love something that death can touch."
>
> — Tyson Illingworth [tyDi] (c.2011), opening quote to 2015 Redefined video [3]

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θΔics

In isms, **reductionism**, as compared to anti-reductionism, is the view, attempt, or methodology of "reducing" various subjects, concepts, and phenomena —generally biological (chnopsological) and or humanities centric phenomena—down, generally, to pure physics and chemistry.

> "**All things** in the end **are reduced** to material being, i.e. **to matter itself**."
>
> — Jean Meslier (1729), *The Testament* (§68, pg. 372)

(add)

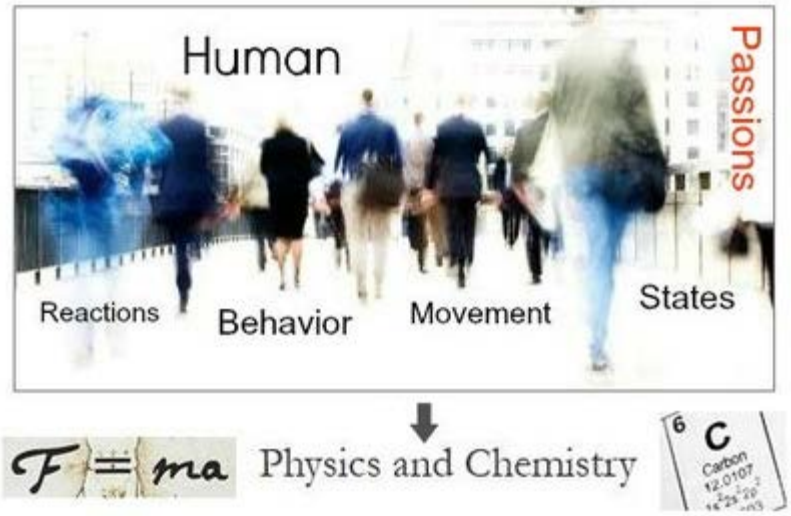

The general model of **reductionism**: namely that all social phenomena can be "reduced" to physics and chemistry explanations.

Overview

The following are three main types of general reductionism:

- Cartesian reductionism
- Gibbsian reductionism
- Newtonian reductionism

The following are noted types of human-sphere concerned reductionism:

- Epicurean reduction
- Goethean reduction
- Technologico-Benthamite reduction (Leavis, 1962) (Q)

The following are noted reductionists: Johann Goethe (1796), Auguste Comte (1854), Friedrich Engels (1882), Albert Weiss (1925), Richard Feynman (1985), Libb Thims (1995), and [add].

Anecdotes | Party conversations

In 1968, Dean Wooldridge gave some type of physics-based reductionism anecdote.

In 2010, David Brin, in reflection (Q) on *circa* 1971 Caltech party conversation, gave the following rather humorous take in reductionism, from different points of view:

> "Sometimes philosophical or scientific insights come from an event that's not very profound, like a party. I remember at Caltech: sure there were a lot of smart people around, some of my roommates and even some professors. I remember one fellow, a pompous fellow, he was saying '**physics**' is the most basic of all the sciences. After all it's how the universe works, right? Well, one of my housemates was a mathematician, and he wasn't about to let that go. He said 'all your physical laws, your quote on quote laws, are just **mathematical** models, applied to the real world.' As if the real world didn't matter too much? (It didn't to him). And he seemed quite smug and satisfied that he had demolished this earlier statement until a philosopher, a guy who had become a **philosophy** major, came up and he said, 'well look, you know Bruce, that all of your mathematical derivations come from the axioms, the fundamental premises, the basis upon which you base your formulas. And Bertrand Russell proved that those can be almost arbitrary. It's all a

> matter of philosophical choice, where you start from. Philosophy is the most basic and general of things.' And he seemed to have everybody convinced, until a psychologist said 'but wait a minute, where does all your philosophy come from? It's all rooted in **psychology**. It's been proved long ago. Plato just manufactured all that stuff, based upon his own impulses. You could psychoanalyze him and derive it all. It's all mental.' At which point, a biologist came up and said 'and where does all this mental stuff come from? It's all in the brain, a biological organ, that evolved over time, to certain Darwinian needs. Obviously, it's all rooted in **biology**.' To which the chemist said 'and what is biology? It's just colloidal chemistry. I mean look down at the level of the cell, the level of the DNA, it's all **chemistry**. It's more basic than any of your convoluted organs and all that.' At which point, the physicist said 'are you all done now?"

A more recent anon circular truncation of the argument is as follows: (Q)

> "Every biologist is, at heart, a chemist.
> And every chemist is, at heart, a physicist.
> And every physicist is, at heart, a mathematician.
> And every mathematician is, at heart a philosopher.
> And every philosopher is, at heart, a biologist."

Reductionism, in physics, according to Freeman Dyson (1995), as cited by Steven Weinberg, is the effort to "reduce the world of physical phenomena to a finite set of fundamental equations." [18]

Comte | Hierarchy of sciences

In 1854, French philosopher Auguste Comte, in his *System of Positive Polity: or System of Sociology*, gave the following so called "hierarchy of the sciences", according to which they all are, at bottom, dependent on astronomy: [11]

> "The conception of the hierarchy of the sciences from this point of view implies, at the outset, the admission, that the systematic study of man is logically and scientifically subordinate to that of Humanity, the latter alone unveiling to us the real laws of the intelligence and activity. Paramount as the theory of our emotional nature, studied in itself, must ultimately be, without this preliminary step it would have no consistence. Morals thus objectively made dependent on Sociology, the next step is easy and similar; objectively Sociology becomes dependent on Biology, as our cerebral existence evidently rests on our purely bodily life. These two steps carry us on to the conception of Chemistry as the normal basis of Biology, since we allow that vitality depends on the general laws of the combination of matter. Chemistry again in its turn is objectively subordinate to Physics, by virtue of the influence which the universal properties of matter must always exercise on the specific qualities of the different substances. Similarly Physics become subordinate to Astronomy when we recognise the fact that the existence of our terrestrial environment is carried on in perpetual subjection to the conditions of our planet as one of the heavenly bodies. Lastly, Astronomy is subordinated to Mathematics by virtue of the evident dependence of the geometrical and mechanical phenomena of the heavens on the universal laws of number, extension, and motion."

In this framework, as summarized by German physicist Karl Pearson, in Comte's hierarchy of science, morals is the "supreme science", about which paramount is the "theory of our emotion nature", which must be tied into: sociology, biology, chemistry, physics, astronomy, and lastly mathematics as the "language", in Willard Gibbs famous phrasing, of it all, respectively, in one unified theory. [12] This position is fortified by the fact that Goethe—the highest ranking universal genius—considered his 1796 "moral symbols" theory, sociology and biology based on physical chemistry (physics + chemistry), or affinity chemistry as it was called in Goethe's time, to be his greatest work or "best book".

Alternatively, to put the above into a different perspective, previously, in his 1842 *Positive Philosophy*, Comte characterized four main branches of the science of the universe, referring to everything as a type of physics: celestial physics, terrestrial physics, organic physics, and human physics, as follows: [13]

> "Now that the human mind has grasped celestial and terrestrial physics, mechanical and chemical, organic physics, both vegetable and animal, there remains one science, to fill up the series of sciences or observation—social physics. This is what men have now most need of; and this it is the principal aim of the present work to establish."

(add)

Atomic reductionism

The earliest reductionism views stem from Greek circa 475BC Leucippus-Democritus atomic theory school who held that everything in the universe is but atoms moving in a void. American science historian Albert Helden summarizes atomic reductionism as such: [7]

> "Matter can be subdivided only to a certain point, at which only atoms (that which cannot be cut) remain. The world is made up of atoms moving in the void. Atoms differed from each other only in size and shape, and different substances with their distinct qualities were made up of different shapes, arrangements, and positions of atoms. Atoms were in continuous motion in the infinite void and constantly collided with each other. During these collisions they could rebound or stick together because of hooks and barbs on their surfaces. Thus, underlying the changes in the perceptible world, there was constancy (atoms were neither created nor destroyed); change was caused by the combinations and dissociations of the atoms."

(add)

Pattee | Quantum mechanical reductionism

In 1967, American theoretical physicist Howard Pattee gave the following reductionism model—as cited by Lila Gatlin in her 1972 "Reductionist/Antireductionist Controversy" chapter section: [8]

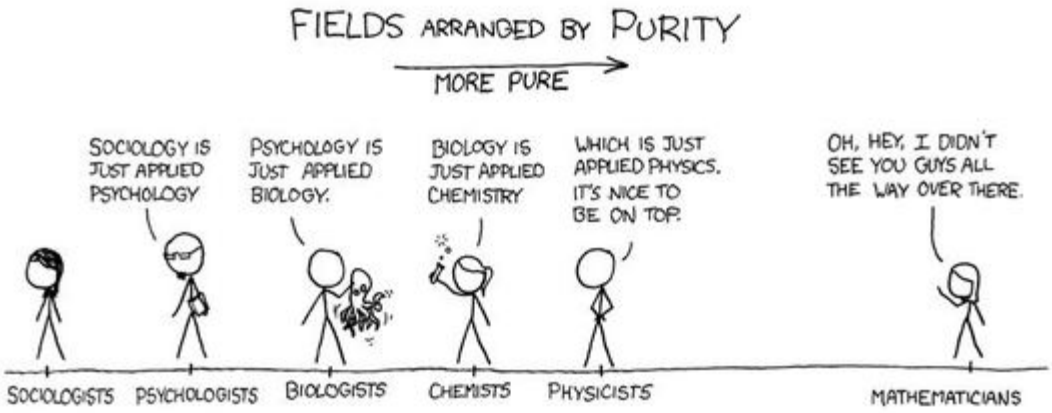

A typical **reductionism** view of the sciences, arranged from soft (sociology, psychology, biology) to hard (chemistry, physics) the former (softer) argued to be reducible to the latter (harder), with mathematics being the language of the hardest.

> "Although the chemical bond was first recognized and discussed at great length in classical terms, most physicists regarded the mature of the chemical bond as a profound mystery until Heitler and London qualitatively derived the exchange interaction [see: exchange force] and showed that this quantum mechanical behavior accounted for the observed properties of valency and stability. On the other hand, it is not uncommon to find molecular biologists using a classical description of DNA replication and coding to justify the statement that the living cells obey the laws of physics without ever once putting down a law of physics or showing quantitatively how these laws are obeyed by these processes."

(add discussion)

Early history

French philosopher Rene Descartes (1596-1650), who sought to reduction of all phenomena to matter in motion, is often cited as the pioneer of the reductionist point of view. Descartes' model was expanded on by English physicist Isaac Newton in his *Principia* (1867), wherein the idea of a 'clockwork universe' was furthered.

English philosopher Francis Bacon (1581-1626) is said to have further the reductionism views of Descartes, advocating the view that nature's so-called watchworks can best be understood by breaking them down into parts. [5]

Reductionism is said to be closely related to determinism, the view that behavior can be predicted once the models of operation are worked out mathematically. This subject can be said to have come into inception with the introduction of Laplace's demon (1814) by French mathematician Pierre Laplace.

In 1882,German social scientist Friedrich Engels surmised that:

> "One day we shall certainly **'reduce'** thought experimentally to molecular and chemical motions in the brain."

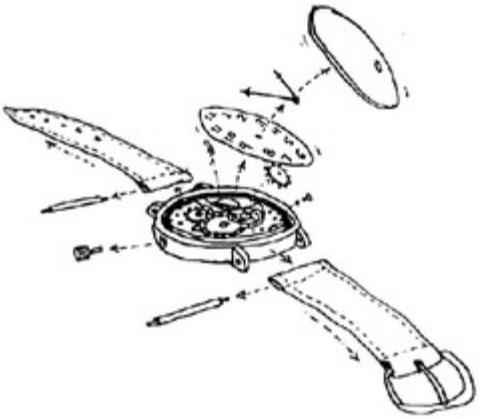

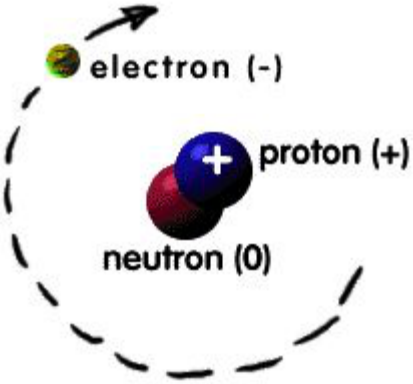

Left: A Descartes-Bacon view of **reductionism**: the premise that to understand nature—or a watch—one must break it down to its parts (generally atoms in the case of nature).
Right:
The general view of **reductionism** holds that all of nature—chnopsological (biological) nature specifically—can be reduced to the known laws of physics and chemistry; or generally reduced down to the level of the atom, an entity comprised of: protons, neutrons, and electrons, as shown above, and their behaviors.

English geneticist Francis Crick (*Of Molecules and Men*, 1967), supposedly, is a reductionist spokesperson with his comment: [2]

> "So far everything we have found can be explained without effort in terms of the standard bonds of chemistry—the homopolar bond, the van der Waals attraction between non-bonded atoms, the all-important hydrogen bond, and so on."

(add discussion)

Reductionist / Anti-reductionist Controversy

See main: Reductionist anti-reductionist debate

In 1972, American biophysicist Lila Gatlin devoted a chapter section to the "Reductionist—Anti-reductionist Controversy", in which she summarizes as being on the question of whether or not life can be reduced to the "laws of physics and chemistry".

Discussion

Thinkers generally adverse to the possibility or conclusion that their behavior and actions of humans can be reduced to pure physics and chemistry, often times will turn to models such as emergence, complexity theory, holism, synergy, chaos theory, far-from-equilibrium theory, bifurcations, unpredictability, among others to argue that where as reductionism and determinism may apply at the sub-cellular level, the do not apply at the larger level of ecosystems and societies. [1] In this sense, the terms "reductionism" and "determinism" are generally types of derogatory categorical

labels used by theorists against or adverse to these views.

Other

An alternative definition, by American ecosystem engineer Robert Ulanowicz, who seems to be against the premise of reductionism (in favor of, it seems: emergence and process biology, mixed with hues of transcendence), defines reductionism as an ideology which holds that "the only proper direction of scientific exploration is analytical, i.e. that explanations of larger phenomena are to be sought exclusively among events at smaller scale". [4]

Left: The four tiers of **reductionism** from the cover of the 2010 book *Promises and Limits of Reductionism in the Biomedical Sciences*, giving the depiction that marriage can be explained, underlyingly, in terms of pure physics and chemistry. [10] Right: Science fiction writer David Brin on a CalTech party on which science is the most basic.

American philosopher of science Ernest Nagel, in his *The Structure of Science* (1961), according to Steven Weinberg, gives the "paradigmatic example of the reduction of one theory to another". [16]

The following books, e.g. Arthur Koestler (1969), and articles, according to Michael Foley (1990), are said to be representative of the debate on whether organisms are reducible or not to mechanical properties: [19]

- Simon, Michael A. (1971). *The Matter of Life: Philosophical Problems of Biology* (pgs. 144-67). Yale University Press.
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(add)

Quotes

The following are related quotes:

> "Physical science will not stop short of a **reduction** of the universe and all it contains to the basis of mechanics; in more concrete terms, to the working of a machine."

— Carl Snyder (1903), *New Conceptions in Science* (O)

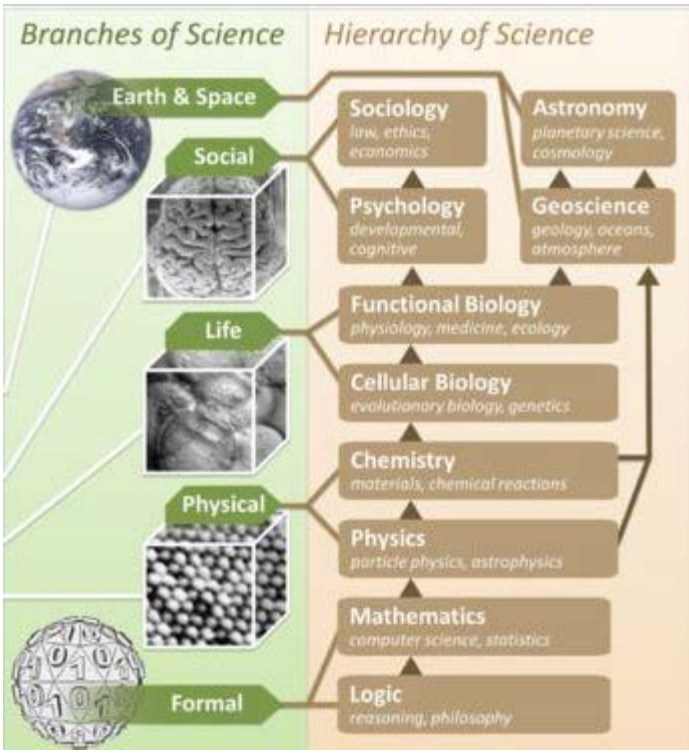

A 2013 hierarchy of sciences diagram by Eric Fisk.

"I would like to again impress you with the vast range of phenomena that the theory of quantum electrodynamics describes: It's easier to say it backwards: the theory describes all phenomena of the physical world except the gravitational effect, the thing that holds you in your seats (actually, that's a combination of gravity and politeness, I think), and radioactive phenomena, which involve nuclei shifting in their energy levels. So if we leave out gravity and radioactivity (more properly, nuclear physics), what have we got left? Gasoline burning in automobiles, foam and bubbles, the hardness of salt or copper, the stiffness of steal. In fact, biologists are trying to interpret as much as they can about life in terms of chemistry, and as I already explained, the theory behind chemistry is quantum electrodynamics."

— Richard Feynman (1985), *QED: the Strange Theory of Light and Matter* [6]

"Since human organizations are staffed by human beings, and since human beings are biological organisms, it might be argued that my research problem is indeed biological. And since biological organisms are constructed from molecules, and those molecules from atoms, and the atoms from elementary particles—all obeying the laws of quantum mechanics—it might even be argued that research on human organizations is merely a rather baroque branch of physics."

— Howard Pattee (1973), *Hierarchy Theory: the Challenge of Complex Systems* [15]

"One hears it said that biology is just a branch of chemistry, which is turn just a branch of physics."

— Paul Davies (1988) [13]

"Most of the useful concepts of chemistry … are imprecise. When reduced to physics, they tend to disappear."

— Roald Hoffmann (1988), "Under the Surface of the Chemistry Article" [17]

"The **reductionist** attitude provides a useful filter that saves scientists in all fields from wasting their time on ideas that are not worth pursuing."

— Steven Weinberg (1992), *Dreams of a Final Theory* (pg. 64)

"Present knowledge rests on the foundation of physics, which will be used to support our contentions herein. Accordingly, we admit the postulate that reality may ultimately be **reducible** to certain elementary particles. It is they eventually make up everything, from the most banal material things to the most exalted ethereal ideas. These particles, named fermions, are of two kinds: leptons and quarks. The former, of which electrons are the most prevalent example, are very antisocial in that they exist alone; while the latter are quite sociable and so are always found in groups. Quarks combine to form protons and neutrons, which make up the atomic nucleus. As the fundamental units of matter, various combinations of atoms, composed of nuclei and revolving electrons, build up all material structures, from molecules and cells, to planets and stars. In between, there is the realm of human society with its own kind of individual and collective entities."

— Paris Arnopoulos (1993), *Sociophysics* (pg. 22); 2005 edition (pgs. xlviii)

"The ideal of the 11th/17th century physicists was to be able to explain all physical reality in terms of the movement of atoms. This idea was extended by people like Descartes who saw the human body itself as nothing but a machine. Chemists tried to study chemical reaction in this light and reduce chemistry to a form of physics, and biologists tried to reduce their science to simply chemical reactions and then finally to the movement of physical particles. The idea of **reductionism** which is innate to modern science and which was only fortified by the theory of evolution could be described as the reduction of the spirit to the psyche, the psyche to biological activity, life to lifeless matter and lifeless matter to purely quantitative particles or bundles of energy whose movements can be measured and quantified."

— Seyyed Nasr (1993), *A Young Muslim's Guide to the Modern World* [14]

"Science allegedly explains things **reductively**—by analysing them into components. For example, the resistance of a wall to being penetrated or knocked down is explained by regarding the wall as a vast aggregation of interacting molecules. The properties of those molecules are themselves explained in terms of their constituent atoms, and the interactions of these atoms with one another, and so on down to the smallest particles and most basic forces. Reductionists think that all scientific explanations, and perhaps all sufficiently deep explanations of any kind, take this form."

— David Deutsch (1998), *The Fabric of Reality* [9]

See also

- Physicalism
- Materialism

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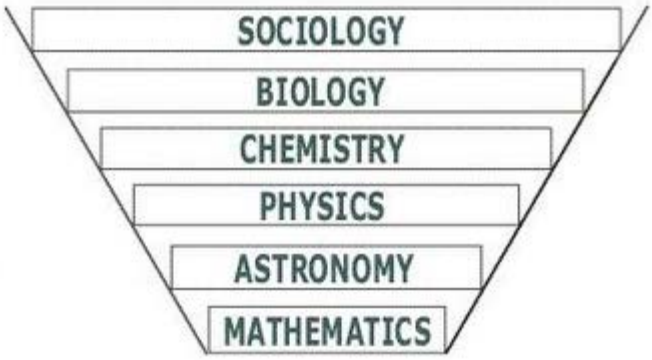

Comtean Reductionism

Left: a humorous take on **reductionism** in romance. Right: Auguste Comte's 1854 ordering of the sciences, according to which everything reduces chemistry, physics, astronomy, and ultimately to mathematics.

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Further reading

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● Jones, Richard H. (2000). *Reductionism: Analysis and the Fullness of Reality*. Bucknell University Press.
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635-38.

External links

- Reductionism – Wikipedia.

θΔics

In debates, the **reductionist anti-reductionist debate** is a debated surrounding the question of whether or not the biological sciences can be reduced to the physical sciences.

Discussion

In large part, the reductionist anti-reductionist debate seems to be nothing but a variant of the life vs non-life debate.

In the hmolsciences, the question or rather accusation of reductionism (as though this were some sort of crime?), usually brought up by antireductionists, often comes to the fore in topics where physical science terms are applied to the humanities. In the 2010 Human Chemistry 101 video "Sexual Heat: Pop Quiz", by American electrochemical engineer Libb Thims, wherein physical sexual heat is equated with enthalpy, for example, one responder commented "is this not just reductionism?" [1]

The essential problem here seems to be that as children we are never taught that many physical principles (e.g. Boerhaave's law, collision theory, spontaneity principle, chemical bonding, Gibbs free energy, enthalpy, entropy change, exchange force, etc.), but not all physical principles (e.g. Pauli exclusion principle, Heisenberg's uncertainty principle, etc.,) apply to us as socially, and that some may or may not apply to us (e.g. wave particle duality).

Provincialists vs. autonomists

In 1972, American biophysicist Lila Gatlin devoted a chapter section to the "Reductionist—Anti-reductionist Controversy", in which she summarizes as being on the question of whether or not life can be reduced to the "laws of physics and chemistry". She sites Francis Crick (*Of Molecules and Men*, 1967) as being the reductionist spokesperson with his comment:

> "So far everything we have found can be explained without effort in terms of the standard bonds of chemistry—the homopolar bond, the van der Waals attraction between non-bonded atoms, the all-important hydrogen bond, and so on."

The spokespersons for anti-reductionism view (which seems to be her inclination) are physicists Walter Elsasser (*The Physical Foundation of Biology*, 1955; "The Atom and the Organism", 1966) and Eugene Wigner (*Symmetries and Reflections*, 1967) who supposedly find difficulty with the view that living systems obey the fundamental laws of chemistry and physics (in particular quantum mechanical laws) and go on to postulate the existence of higher "biotoic laws" said to govern living systems. [2]

In 1985, American philosopher Alexander Rosenberg classified the two debating parties as either "autonomists", who believe that the biological sciences are sufficiently different form the physics sciences that biological theory and practice must remain permanently insulated from distinctive methods and theories of the physical sciences, and the "provincialists", who hold that biological science is a subset of the physical sciences and that biological findings and theories must be not merely compatible with those of physics but must actively cohere with its theoretical achievements. [3]

In his 1988 chapter "Entropy and Evolution", American systems ecologist Edward Wiley elaborated on Rosenberg's bipartisan model arguing to the effect that provincialists have the correct logical and philosophical attitude:

> "What there is in biology that cannot be accommodated in principle to physical sciences should be jettisoned."

as expressed by Rosenberg, with the exception that, as Wiley surmises, "provincialists must understand that biological systems are hierarchical and disjunctive and thus may elude satisfactory reduction." [4]

See also

â— Francisco Ayala

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External links

â— Reduction/Anti-Reduction Debate (2009) – Philosophy of Biology, University of Idaho.

θΔics

In famous publications, ***Reflections on the Motive Power of Fire*** *– and on Machines Fitted to Develop that Power* or *Réflexions sur la Puissance Motrice du feu et sur les Machines propres à Développer cette Puissance* 1824 pamphlet or booklet, 45 to 118 pages in length (depending on version), self-published by French physicist Sadi Carnot, which outlined a generalized theory of heat engines and their limitations. [1] Carnot's *Reflections*, according to the views of American cold historian Tom Shachtman, has been praised as: [3]

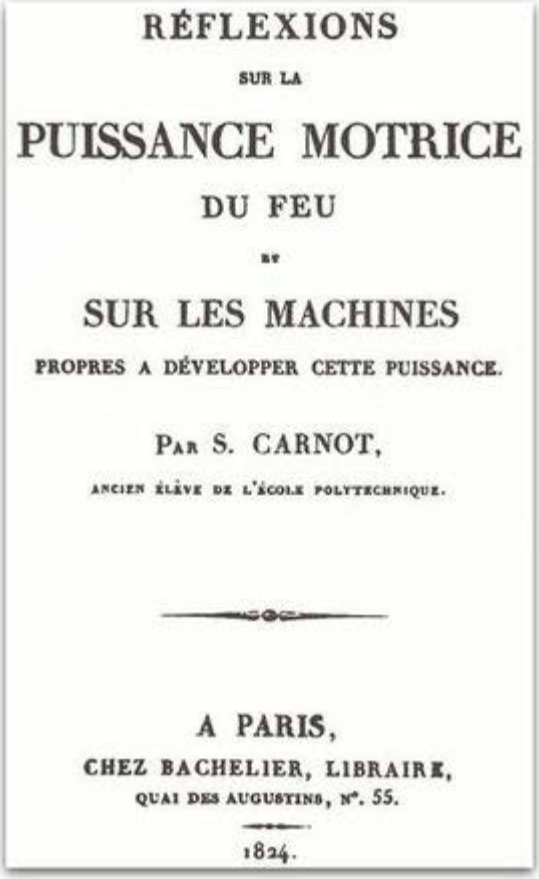

RÉFLEXIONS

SUR LA

PUISSANCE MOTRICE

DU FEU

ET

SUR LES MACHINES

PROPRES A DÉVELOPPER CETTE PUISSANCE.

PAR S. CARNOT,

ANCIEN ÉLÈVE DE L'ÉCOLE POLYTECHNIQUE.

A PARIS,

CHEZ BACHELIER, LIBRAIRE,

QUAI DES AUGUSTINS, N°. 55.

1824.

> "The most original work ever written in the physical sciences, with a core of abstraction comparable to the best of Galileo."

Carnot's *Reflections*, in short, acted to launch the science of thermodynamics by introducing the now-famous conceptions and postulates of: Carnot cycle, Carnot engine, Carnot's theorem, the definition of work, as in weight lifted through a height, among others. [1]

Reviews

Carnot printed 600 copies of his *Reflections*. One copy was presented before the *Academie*. There was a long and appreciative review of it in one journal, a brief notice in another, and an encomium by Nicholas Clement who recommended it to students. [3] Other than this, it is said, for the next ten years the book went unnoticed.

Clapeyron's graphical analysis

In 1834, French physicist Émile Clapeyron revived Carnot's *Reflections* with his paper *Memoir on the Motive Power of Heat*, by presenting a graphical analysis, using Scottish engineer James Watt's indicator diagrams, of the cycle described by Carnot. [2]

Thomson's search

See main: search for Carnot's Reflections

In 1839, at the Royal Belfast Academical Institution of Northern Ireland, where a young 15-year-old student William Thomson was in attendance, Scottish educator John Nichol, a professor of astronomy, took the chair of natural philosophy. That year, Nichol updated the curriculum, introducing the new mathematical works of Joseph Fourier. The mathematical treatment much impressed young Thomson, who became intrigued with Fourier's *Théorie analytique de la chaleur* and committed himself to study the "Continental" mathematics resisted by a British establishment still working in the shadow of English physicist Isaac Newton. In 1845, Thomson went on a famous search for Carnot's *Reflections*.

This effort eventually resulted in the publication of his two famous articles: "On an Absolute Thermometric Scale Founded on Carnot's Theory of the Motive Power of Heat" (1848) and "An Account of Carnot's Theory of the Motive Power of Heat: with Numerical Results Deduced from Regnault's Experiments on Steam" (1849), which eventually found their way into the hands of German physicist Rudolf Clausius, which resulted in launching of the science of thermodynamics. [4]

Helmholtz

In German physicist Hermann Helmholtz's 1847 memoir "On the Conservation of Force" gives mention of both Carnot and Clapeyron, which seems to be one of the first published revivals of Carnot's work, Clapeyron aside. [5] Helmholtz cites their work on heat as illustrations of the sorts of causal explanations of which he approves, and notes they are premise upon the prohibition of perpetual motion. [6]

Other

The first English translation was made by American mechanical engineer Robert Thurston in 1890 based on an 1878 French reprint.

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External links

â— Reflections on the Motive Power of Fire – Wikipedia.

θΔics

In engineering, a **refrigerator** is a heat engine that is run in reverse, the cycle of which operates such that work is done on the working substance so as to resultantly cause heat to flow from a cold body to a hot body.

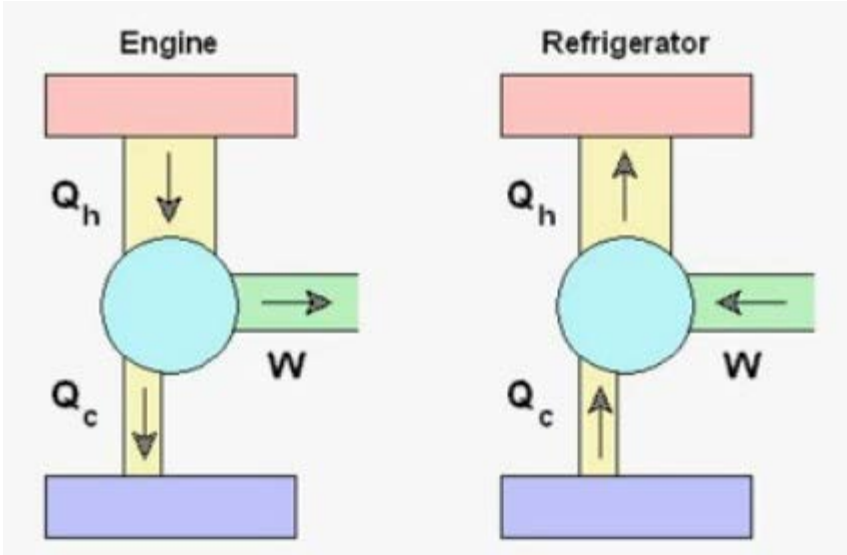

A standard operation heat engine (left) operated by a forward Carnot cycle, shown adjacent to a **refrigerator** (right), a heat engine operated by a reverse Carnot cycle: the idea being that by removing heat from a low temperature region or source (say the volume of the region inside of a freezer), by contact with a working substance (shown as the circle, above), being typically a gas, such as ammonia or carbon dioxide, which is forced to compression (work done on the substance) by an external energy or work input (say from the power company), and then passing this removed heat to a third body, i.e. the heat sink or body of air surrounding the refrigerator in the kitchen. [1]

History

In 1748, Scottish chemist William Cullen was the first to make artificial refrigeration, using the phenomenon of cold being produced by evaporating liquids (nitrous aether), plus a vacuum. Cullen's device has come to be known as the Cullen refrigerator.

In 1805, American inventor Oliver Evans laid the foundation for the continuous-cycle vapor-compression refrigerator when he conceived a method for recycling vaporized refrigerant. Evans design (see diagram below) operated such that after removing heat from the surrounding environment, vaporized refrigerant would move through a compressor, and then a condenser, where it would revert back into a liquid form and begin the process again. Evans, curiously similar to Denis Papin and his cyclical heat engine design, however, never saw his design through into actuality. [7]

In 1824, French physicist Sadi Carnot introduced the Carnot cycle, using the labels of the hot body as the "furnace" and the cold body as the "refrigerator", in the discussion of which he laid out the basic operation of the refrigerator as a reverse-operated heat engine.

In 1834, an associate of Evans, American-born English inventor Jacob Perkins built on Evans' ideas to construct a cyclic vapor-compression machine, using ether as a refrigerant. Perkins refrigeration machine was the first full-scale machine to contain a compressor, a condenser, and expansion valve, and an evaporator—the basic parts to a modern mechanical compression refrigeration system. Perkins, however, never developed his machine for commercial use. [7]

In 1870, German mechanical engineer Carl Linde used the science of thermodynamics to design a system to refrigerate beer, and was said to have been the first to use this scientific approach. [2]

Local entropy decrease

The refrigerator model is often incorrectly invoked to explain or account for the apparent order of evolved entities, e.g. humans, against the apparent tendency to disorder interpretation of entropy, such that humans, animals, and plants are seen as a type of "local entropy decrease", something to the effect that the sun does work to decrease entropy, a low entropy structure assumed to be synonymous with an ordered animate thing, such as a human.

Historically, the "local entropy" model of life seems to have been first introduced in the 1947

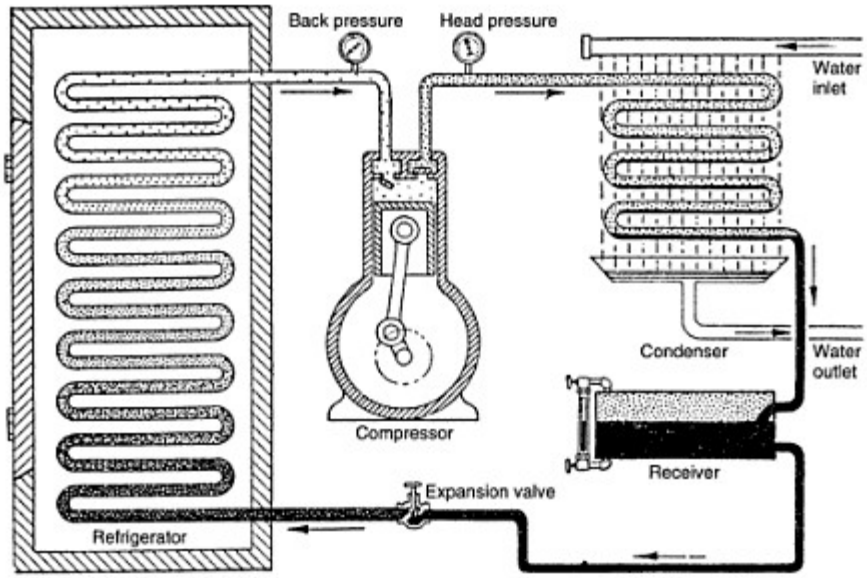

A **vapor-compression refrigerator**, similar to the one made in 1834 by American-born English inventor Jacob Perkins. [7]

book *Time and Thermodynamics* by Belgian-born English thermodynamicist Alfred Ubbelohde, in which he first gives a derivation that the chilled space inside of a refrigerator is a region of "local decrease in entropy" and then goes on to argue that this this is analogous to life. [3]

A 1992 version of this humans having a low entropy derived by a sort of refrigerator operation logic is given by Polish-born Canadian physicist Marek Roland: [4]

> "During the production of clothing, cars, and chemical compounds, etc., the entropy of the system is decreased because the components become organized. This is done, however, at the expense of the manufacturing system (including people) whose entropy [human entropy] will increase during this process [similar to how] a **refrigerator** [makes ice] at the expense of increased entropy of the environment."

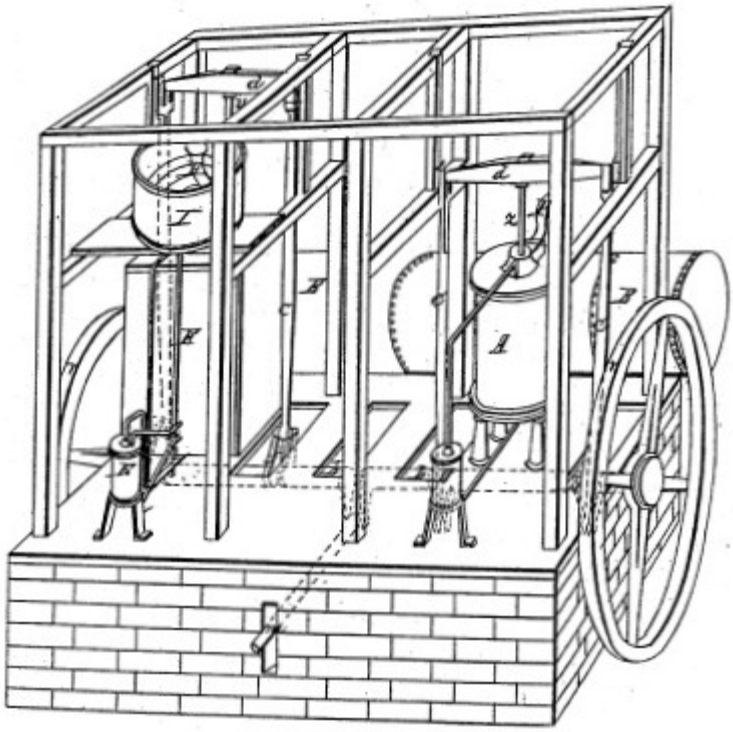

A 1851 version of American physician John Gorrie's ice machine, invented in 1841, which he used to cool the rooms of patients suffering from fever in his hospital. [6]

In 2000, Indian science philosopher Srdan Lelas employed this argument as such: [5]

> "The living organism seems to be a macroscopic system which in part of its behavior approaches to that purely mechanical (as contrasted with thermodynamical) conduct to which all systems tend, as the temperature approaches the absolute zero and the molecular disorder is removed. The challenge of being a living being is much more demanding than the challenge of being a **refrigerator**. What Schrodinger is pointing to here is the bearing of the entropy principle, or the second law of thermodynamics, on the characterization of living beings."

Although its is not at all correct what Lelas is saying here, being that Gibbs free energy is the quantity of interest when it comes to explaining human states of order or disorder, the notion of a human as a refrigerator is, nevertheless, exemplified.

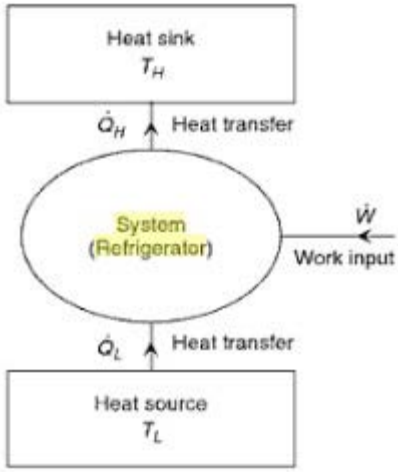

A local entropy decrease interpretation of a **refrigerator**.

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Further reading

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External links

- Refrigerator – Wikipedia.
- Refrigeration – Wikipedia.
- Heat pump and the refrigeration cycle – Wikipedia.
- Vapor-compression refrigeration – Wikipedia.

θΔics

In famous publications, **Regarding Definitions** is the famous opening chapter to Austrian-born American physical chemist Alfred Lotka's 1925 *Elements Physical Biology*, wherein he grapples with the difficulties of attempting to define 'life' as physics and chemistry see "things", in which he topples all the standing definitions of life, models of life, and theories of life as lacking foundation; at the end of which he nearly states outright, somewhat prophetically, that the future will, in all likelihood, see the term "life" jettisoned from the corpus of exact sciences, the primary reason being that scientific searches for the origin of life is akin to a hunt for the Jabberwock, i.e. an attempt to scientifically explain a nonsense word, therein resulting in "objectionable nonsense", as Einstein would say (see: Einstein-Murphy dialogue), when scientific assertions are made.

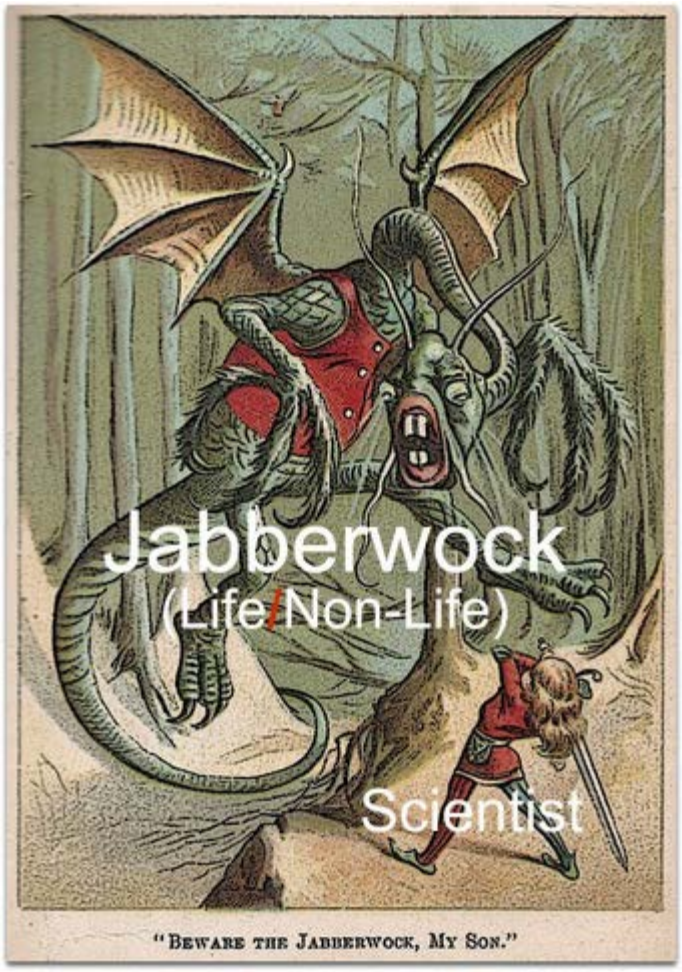

Attempts a definitions of "life", from a physicochemical point of view, and or efforts to discern a "life/non-life" divide, via similar means, according to Alfred Lotka (1925), as elaborated on in his erudite chapter "**Regarding Definitions**", is but a hunt for the Jabberwock, the fictional monster of the 1871 nonsense poem "Jabberwocky" by Lewis Carol, which is made entirely of nonsense words. [2]

Overview

Lotka, in his note 18, states the following ripe discernment, in respect to "systems" defined energetically, e.g. heated by sunlight:

> "It should be observed that nothing has been said of *life* in describing the system. The system may or may not comprise living organisms, the argument remains the same. This suggests that a term, such as *life*, so vague that it defies definition, is perhaps not likely to play an important part in any exact argument; we may, indeed, find it **wholly unnecessary**. It may, in time, in the literature of exact science, meet with the fate of the word cause: a term of rare and at best incidental occurrence in records of exact investigations."

Lotka, here, in pioneering fashion nearly reaches the "life disappears from the scene when physics and chemistry have entered" view (Sherrington, 1938), and nearly the "we should abandon the word alive" position (Crick, 1966), and close to the "defunct theory of life" (Thims, 2009) and more recent "life does not exist" (Rogers, 2010; Jabr, 2013) positions. In the end, he concludes that searching for the life/non-life distinction is but a game of "hunting for the Jabberwock". [2]

Not able to jettison the term "life" as defunct, and or suggest terminology reform (see: life terminology upgrades), though he does hint at this (e.g. the function quantity $\frac{1}{2}mv^2$ is called "kinetic energy', a universal term), likely owing to his early time period, he ends with: "we shall, wherever convenient, continue to employ the terms life, living organism, merely as a matter of convenience." Jumping ahead a century, it is has become no longer convenient, in fact inconvenient, to retain the term "life", e.g. in attempting to define fields of study such as "bio-thermodynamics" (see: biothermodynamics) or bio-physics (see: biophysics), or terms such as "bio-Gibbs free energy" (e.g. Mark Janes) or "bio-photon" (e.g. Zack Zwiebel), which, to use Lotka's language, insert the Jabberwock, a fictional concept, into hard science (nonfiction subject).

Contents

The following is the full chapter: [1]

CHAPTER I

REGARDING DEFINITIONS

> "Truth comes out of error more readily than out of confusion.
>
> — Francis Bacon (1620), *New Instrument of Science* (§2:Aphorism 20) (Ñº)

A definition is a purely arbitrary thing. If I choose to define a triangle as a plane figure bounded by four sides and having four angles; and if, also, I define a quadrilateral as a plane figure bounded by three sides and having three angles, I shall run into no logical conflicts; my geometry need in no wise depart from that of Euclid; I shall need to make no changes in existing works on geometry, beyond that of substituting throughout the word triangle for the word quadrilateral, and *vice versa*.

But while a definition is in this sense, from the point of view of logic, a purely arbitrary thing, while my definition of a triangle as a four-sided figure may be 'admissible', it is by no means expedient.

Thus the definition of terms, which naturally forms one of the first steps in the systematic treatment of any subject, may present no particular problems of logic, but it does present certain problems of expediency.

In the geometrical example cited, the unusual definitions given, though quite permissible, are inexpedient for simple etymological reasons. Such a choice of terms would be misleading, and, instead of assisting the memory, would impose upon it an unnecessary burden. In this case the application of the principle of expediency is obvious to the point of being grotesque, the example having purposely been chosen to illustrate the principle in drastic fashion.

But the framing of definitions at times involves more subtle considerations of expediency, so subtle in fact, that they may be overlooked, or misunderstood, and a problem which is, in truth, a problem of definition, falsely masquerades as a problem of fact. Certain pseudo-problems of science have owed their origin to a failure to realize this circumstance. [N1]

The writer of the book of Genesis shows good judgment. Our legendary forebear, the originator of the first biological system of nomenclature, sees each creature first, and thereupon names it. We have not always been equally wise. Sometimes we have tried to invert the method; we have found or made a name, and then gaily set forth on an expedition to discover the thing that should answer to that name; we have hunted the Jabberwock. Forgetful of the wisdom of Mephistopheles:

> "Derm eben wo Gedanken fehlen / Da stellt ein Wort zur rechten Zeit sich ein"
> [For precisely where thought missing / Since provides a word at the right time, a]

we have given way to an inherent bias of the human , mind described in characteristic fashion by H.G. Wells: [N2]

> "When we have a name we are predisposed and sometimes it is a very vicious predisposition to imagine forthwith something answering to the name If I say Wodget or Crump, you find yourself passing over the fact that these are nothings, ... and trying to think what sort of a thing a Wodget or a Crump may be. You find yourself insensibly, by subtle associations of sound and ideas, giving these blank terms attributes. [N3]"

So the biologist of the past generation, finding in his native vocabulary the words 'animal' and 'plant', forthwith proceeded in an effort to establish precise distinctions between animals and plants, never giving any thought, it would seem, to the fact that these names had already been parceled out generations ago, by 'popular' consent, by unscientific

persons without any regard to fine distinctions. There is clearly, here, the tacit assumption that because two distinct words are found in the vocabulary, therefore two correspondingly distinct things exist in nature. In point of fact, we know well enough (though we may not at all times have this knowledge clearly in the focus of our consciousness) that in nature many things form finely graded series, with extremes at the two ends, extremes to which our vocabulary has lent more or less definitely associated names, but with no definite line of demarcation between. Examples of this are innumerable. We speak of objects as being red, orange, yellow, green, blue, violet, etc. There is nothing in nature to correspond to such staccato classification of colors: the visible spectrum runs continuously from a wavelength of about 8x10^-4 mm (extreme red) to about 4X10^-4 mm (extreme violet). Cases therefore must necessarily arise when we are in doubt whether to call a thing blue, or green, for example; and such doubt can be resolved, if at all, only by arbitrary definition. The question is not ‘what is green, and what is blue’, but, at best, ‘what shall we agree to call green, and what blue.’

It lies in the nature of the mechanism by which we enter into possession of our knowledge, that problems of definition of this kind arise. We are equipped with two separate and distinct senses, the one responding to electromagnetic waves ranging from about 4x10^-4 to 8x10^-4 mm, light waves; the other to somewhat longer waves otherwise of the same character, heat waves. Accordingly we have two separate terms in our language ‘light’ and ‘heat’, to denote two phenomena which, objectively considered, are not separated by any line of division, but merge into one another by gradual transition. Here the question might be raised whether an electromagnetic wave of a length of 9 x 10^-4 mm is a light wave or a heat wave. The answer is obvious: Call it what you please, it is merely a question of arbitrary definition. We must beware of:

> “That false secondary power by which we multiply distinctions, then deem that our puny boundaries are things, that we perceive, and not that we have made.”
>
> — Wordsworth (c.1820)

Definitions in Biology

The attempt to establish a rigorous distinction between ‘animals’ and ‘plants’ may be similarly regarded. Expediency demands that if these terms are appropriated for exact scientific use, their sense, when so used, shall, if possible, be reasonably near akin to the sense commonly associated with these words. The difficulties encountered in seeking to establish a satisfactory line of division between animals and plants were long regarded as difficulties in a problem of fact. It was thought that some biological principle must be sought which divided animals from plants.

The truth is, of course, that we may define "animals" and "plants" any way we please- as for instance by reserving the term, plant for an organism possessing cellulose' but whether such definition is ‘correct’ or ‘satisfactory’ is not a question of biological fact, it is a question of expediency. It is not a question whether there is any definable difference between animals as a class and plants as a class, nor what this difference is, but whether it is expedient to retain for purposes of strict scientific classification the popular terms ‘animals’ and ‘plants’, which were not originally founded upon any rigorous examination of facts; and if so, where we should, by definition, draw the line of separation.

When the problem is viewed in this way the difficulty of distinguishing between animals and plants vanishes. In the case of the higher forms of life it is easy to establish biological distinctions that do not conflict with the popularly drawn lines of division. In the case of certain lowly forms of life popular distinctions cannot exist, since these forms are not known to the public except through biological publications. And the biological line of demarcation we can, by definition, draw arbitrarily where we choose, or, better perhaps, we may say that the terms ‘animal’, ‘plant’, do not correspond to any fundamental objective distinction and, though conveniently applied to certain common forms of living matter, are entirely unnecessary [N4] and only introduce difficulties of definition and classification when applied to certain simple organisms. What difference does it make whether we call Volvox a plant or an animal? Whether it is a plant or an animal is merely a matter of definition, not a question of biological fact.

Somewhat similar remarks apply to the narrower divisions into which the biologist divides the world of living organisms. Disputes as to what constitutes a species are fruitless. ‘A species is a thing described as such.’ This is simply

a matter of definition. If on grounds of expediency one definition is preferable to another, it may be well to urge its general adoption. But its adoption or rejection will neither add nor subtract one jot from our stock of ascertained facts.

It is necessary to guard against the error of disputing about mere words. Not always does this error strut about in such blatant form as in the example quoted by Fechner: S. Sachs, in a book published in 1850, takes the astronomers to task for their presumptuous speculations: 'How do they know that the star they call Uranus is Uranus?'

If anyone should think that in our day it is no longer necessary to guard against errors of this kind (though less gross, perhaps), let him consider such a question as this: Is not the perennial debate between vitalism and mechanism a quibble about words? Is not the whole situation summed up accurately in the words of L. J. Briggs: "The mechanism of plant processes not at present explainable on a physico-chemical basis would be *termed* by the vitalistic school 'vital', by the physico-chemical school 'unknown'?" [N5]

And in searching for the essential characteristics of life, those that should finally and conclusively distinguish the living from the non-living, are we not just searching for the thing in nature that should correspond to a word in our vocabulary? Are we not hunting the Jabberwock?

Definitions of Life
The difficulty of giving a precise meaning to the word life has been realized probably by everyone who has ever seriously attempted a definition. Herbert Spencer remarks:

> "Classifications are subjective concepts, which have no absolute demarcations in nature corresponding to them. Consequently, when we attempt to define anything complex we can scarcely ever avoid including more than we intended, or leaving out something that should be taken in. Thus it happens that on seeking a definition of life, we have great difficulty in finding one that is neither more nor less than sufficient."

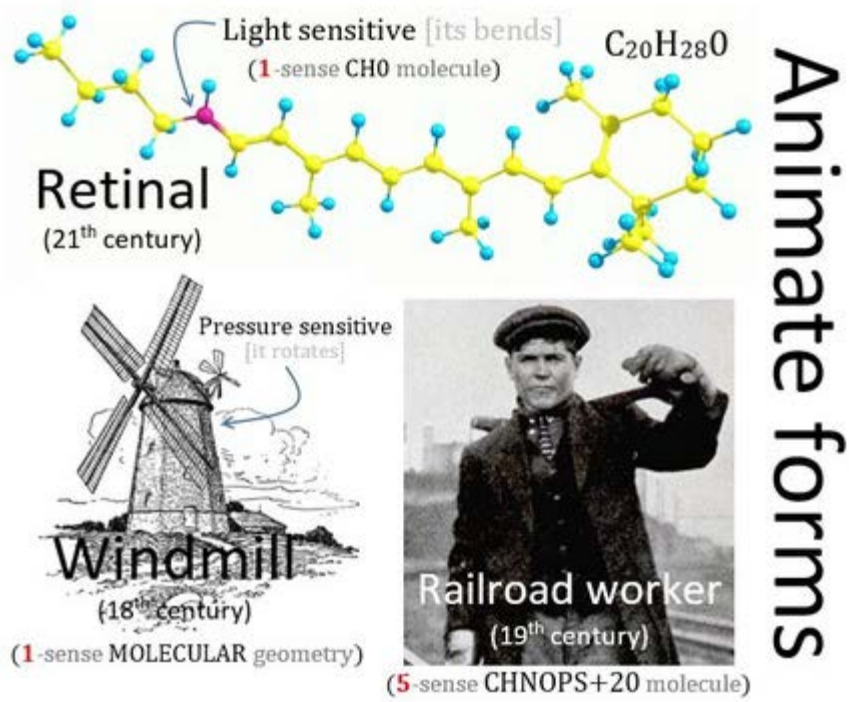

Lotka, in his §:Definitions of Life (see: definitions of life), refutes Herbert Spencer's definition of life, as: "The continuous adjustment of internal relations to external relations", by pointing out that this same definition holds for the mechanical operation of the windmill.

Nevertheless he proceeds to establish his definition of life: "The continuous adjustment of internal relations to external relations." [N6] It cannot be said that Spencer has been very happy in this choice of a definition or that he has been at all successful in avoiding the very pitfalls which he himself so clearly points out. For obviously many purely mechanical systems fall under this definition. It would, for example, include a **windmill** provided with a device automatically turning its arms into the most favorable plane according to the direction of the wind. [N7] Indeed, in a sense it is true of every physical system that it 'adjusts its internal relations to external relations.' For this statement simply implies that there is a tendency for the establishment of equilibrium between a selected portion of a physical system, and the remainder, the environment.

Thus, for example, if the system $2H_2 + O_2$ is left to itself hi a suitable vessel at 1480°C [N8] and one atmosphere pressure, the ratio H_2/H_20 which we may term an 'internal relation' of the system, assumes the value 0.0002. If now the external conditions of temperature and pressure are changed to 2929°C and one atmosphere pressure, the internal relation H2 / H20 adjusts itself to the new external condition and acquires the value 0.11.

With better judgment than Herbert

Spencer, Sir Edward Schafer frankly evades the definition of life. He remarks: [N9]

> "What about other definitions of life? Wikipedia, for example, posts that *life is a characteristic that distinguishes objects that have self-sustaining biological processes from those which do not*. The difficulty with this definition is that it refers to biological processes. **Biology** – as explained by Wikipedia – is defined as the study of life. Here we turn in a **circle**. This is elegant but not helpful."
> — Uwe Meierhenrich (2012), On Edward Trifonov's 123+ definitions of life

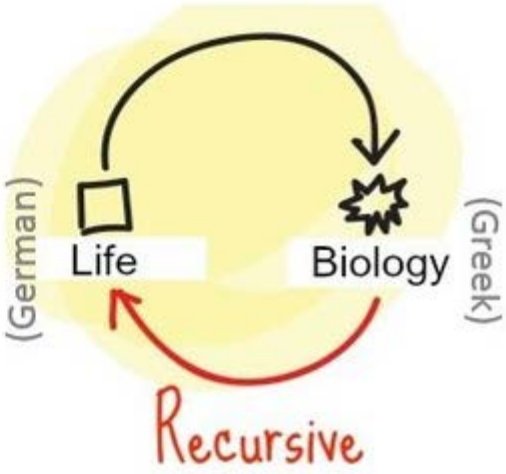

Lotka points out that standard dictionary definitions, e.g. "life is 'the state of living", as well as most scholarly definitions, e.g. Dastre, following Claude Bernard: 'the sum total of the phenomena common to all living beings', are the same character as Sidney Smith's definition of an Archdeacon as 'a person who performs archidiaconal functions', i.e. circular.

> "The ordinary dictionary definition of life is 'the state of living'. Dastre, following Claude Bernard, defines it as 'the sum total of the phenomena common to all living beings.' Both these definitions are, however, of the same character as Sidney Smith's definition of an Archdeacon as 'a person who performs archidiaconal functions.' I am not myself proposing to grapple with a task that has proved too great for the intellectual giants of philosophy, and I have the less inclination to do so because recent advances in knowledge have suggested the probability that the dividing line between animate and inanimate matter is less sharp than it has hitherto been regarded, so that the difficulty of finding an inclusive definition is correspondingly increased."

It is, indeed, an elementary historical fact that, as knowledge has advanced, the cope embraced in the term 'vital' processes has continually decreased, since Wohler took the first cut out of it in 1828 by the synthesis of a 'vital product' (urea) in the laboratory; and the field of known physico-chemical processes going on in living organisms has correspondingly increased. For the rest, the most uncompromising vitalist does not deny that some, at least, of the processes going on in living matter re physico-chemical. Even so fundamentally biological a process as the stimulation of n ovum to development we have learnt to effect by purely physical means.

Alleged Characteristics of Living Matter

On the other hand some of the features commonly ascribed to living matter as its peculiar and characteristic attributes seem Irrelevant to the point of triviality. This remark applies particularly to the distinction sometimes claimed for living matter, that it grows 'from within', as distinguished from crystals, which, in a suitable mother liquor, 'grow from without'. There may or may not be many and profound differences between a bacterial colony growing in a culture medium, on the one hand, and on the other hand a mass of crystals growing in a supersaturated solution. But whether the growth takes place from within or without is merely an accident of structure. If a droplet of chloroform is brought near to a glass particle coated with shellac, the drop flows around the particle, engulfs it, absorbs the shellac coating and finally rejects the 'undigested' glass particle. [N10] The droplet thus grows 'from within'.

In point of fact 'growth from within' is the rule and not the exception in chemical systems. For what do we mean by growth? We mean the increase of the mass of one component of a system at the expense of another. It is precisely the same thing as that which occupies the center of attention of the physical chemist, though he does not ordinarily call it growth. In fact, he does not find it necessary to give it any particular name, for, being accustomed to the use of mathematical methods and symbols, he simply writes it dm/dt, rate of increase of mass with time, or, more often, d/dt (m/v), rate of increase of concentration (mass/volume) with time. And in homogenous systems, at least, which (on account of their comparative ease of theoretical and experimental treatment) figure prominently in the physical chemistry of today, growth is necessarily from within.

Some writers (Jacques Loeb, *The Organism as a Whole*, 1916, p. 28) have seen a characteristic feature, peculiar to living organisms, as distinguished, for example from crystals growing out of a solution, in the fact that the latter grow by a physical process, the former by chemical processes. Leaving aside the question as to whether there exists any

fundamental distinction between physical and chemical processes, at most the point to which attention is drawn by these authors would class living organisms with chemical, as distinguished from physical systems, but would furnish no basis whatever for separating organisms in a class by themselves from other chemical systems. This is not saying that they are not in a class by them- selves, but only that the distinction suggested fails in effect.

It has similarly been urged, as a distinction between the growth of a crystal and that of an organism, that the former will grow only in a supersaturated solution of its own substance, while the latter ex- tracts from an unsaturated solution the substance needed for its anabolism.

This is really the same distinction in another form. It may distinguish the organism from the growing crystal, but leaves it m... one class with any chemically reacting system whatever, since in the case of the latter also there is 'growth', i.e., formation of one or more products of reaction, in a system which need not be physically supersaturated in the narrow sense in which the crystallizing solution is. In a wider sense [N11] the system may indeed be said to be super-saturated with regard to a chemical substance that is formed within it but in the same sense a system can probably be said to be supersaturated with regard to the substance of a bacterial colony growing therein.

Neither can we subscribe to the view set forth by J. Loeb (*The Organism as a Whole*, 1906, p. 29), that the synthesis of *specific* materials from simple compounds of *non-specific* character distinguishes living from non-living matter. In every chemical reaction specific materials are formed. In a mixture of hydrogen, chlorine, and nitrogen, the hydrogen and the chlorine unite, leaving the nitro- gen on one side unchanged. This is merely a brutally simple example of a universal fact. Chemical reaction is always selective. And if 'complexity' is to be made the characteristic of life processes, then the question immediately arises, what degree of complexity is required to place a given process in the category of life processes?

Reproduction

Another characteristic that has been cited by some as exclusively peculiar to living organisms is the power of reproducing their kind. 'How, says Driesch in effect, can a mechanism provide for its own reconstitution? No machine known to us is able to construct another like itself, nor can it repair its own parts.' [N12]

Undue emphasis on this alleged distinction between living and non- living machines seems ill advised, for two reasons. In the first place, though it may be true that no man-made engine exists that performs the functions of self-repair and self-reproduction, no one has ever attempted, so far as I know, to demonstrate that no such engine can be built. Anyone who should be disposed to regard this objection as specious should reflect for a moment on the amazing development in technical arts within the last thirty or forty years. Half a century ago one might with equal justice have pronounced flight a fundamental, essentially biological characteristic of birds, incapable of duplication by man-made engines.

But in another, perhaps more significant respect, we must regard as misplaced the emphasis sometimes laid on the power of reproduction in organisms, and its absence in human artefacts. It is based on an exaggerated conception of the part played by the parent in the 'making' of the offspring. This probably has its origin in the instance of reproduction that to us is naturally of supreme interest, the reproduction of man. As a mammal, the young human organism grows within the parent body, and seems to us to be in some way 'fashioned' by the parent; this conception must be at the basis of the alleged distinction between organic reproduction and the incapacity of non-living engines to reproduce their kind, for without such conception the comparison would lack all parallel. Now, in point of fact, we need but call to mind the familiar hatching of a chick to realize that the part necessarily played by the parent in the formation of the young individual is really very restricted. The process in this case goes on, for the most part, in complete isolation from the parent. [N13]

As for the initiation of cell division of the ovum, we now know that, in some cases at least, this can be effected by ordinary physical means.

Recent development in experimental embryology suggest a more rational view of this process of self-reproduction of the living engine, a view which strips it of at least some of its mystery, and which certainly takes from it any force it might otherwise have had as a basis for distinction between living and non-living matter. If, after the first division of the ovum of a frog, the two cells are separated, each will under suitable conditions develop into a separate and complete,

normal organism. These two organisms A and B are, in fact twin brothers or sisters. No one would for a moment entertain the thought that in this case A reproduces B, or *vice versa*. Now suppose that in some way, after the first division, A alone grows into a complete mature organism, while the single cell B remains attached to it, say for six months. At the end of this time it is separated, and stimulated to start its growth into a frog. We would ordinarily describe this state of affairs by saying that A reproduced B as offspring, that B was the child of A. In point of fact it is merely a delayed twin brother or sister of its elder brother or sister A. u A had little or nothing to do with the production of B; the latter grew, very much in the same way as A grew in its own time. That nature has evolved, in surviving races, this method of delayed development, so as to stretch out the totality of living organisms in a long chain, a succession in tune, is of course a fact of most fundamental importance, the significance of which will deserve our profound contemplation. One of its consequences has been to render possible a practically infinite number of organisms, built from a finite and quite restricted amount of matter, the same substance being used over and over again, for it is literally true that we live on our forefathers. Had all these organisms sought to grow simultaneously, their career would have been topped by lack of material.

If anyone should object that these reflections leave out of account entirely the role of sex in reproduction, with all the complex phenomena of the fusion of gametes, the mingling of chromosomes, and biparental inheritance, the obvious reply is that these phenomena are now known to be less fundamental than they formerly appeared; that reproduction of an organism can very well take place without them; and that therefore they may at most serve to distinguish certain forms of life from non-living matter, but they cannot possibly be made the basis of a distinction between living matter in general and that which we commonly describe as non-living.

Vital Force

If we have cause to hesitate in defining life, still more is it the part of wisdom to be very conservative in the coming and use of such phrases as ‘vital force’, ‘nerve energy’, and the like. Shall we not do well to follow the biblical example, and wait, to name the animal, until it is physically present to our senses? Or, to pass from legend to the world of scientific fact, let us borrow, if we can, the method of the physicist: He discovers that a quantity $\frac{1}{2}mv^2$ possesses certain important properties. Then, he proceeds to name it: *energy*, in particular, *kinetic energy*. But biologists have been disposed sometimes to adopt the reverse procedure: they have named a vital force, a nerve energy, a mental energy, and what not, and now they entertain the pious hope that in due time they may discover these ‘things’. That there is something radically at fault with such terms is evident from the fact that forces and energy are magnitudes, and ‘to define a magnitude and to say how it is measured are one and the same thing.’ [N15] But who has ever told us how to measure vital force [N16] and such like?

Physical Chemistry of Structured Systems

In the physical chemistry of today structure, that is to say, geometrical configuration, plays a subordinate role. For obvious reasons the theory of chemical reaction in homogeneous, or in heterogeneous systems of comparatively simple form, is more approachable than that of systems which possess intricate structure, resulting in complicated mechanical interactions of their parts, in accompaniment of chemical reaction. In technical practice, too, reactions in homogeneous systems (solution, gas) are common, and where there is heterogeneous structure, this is usually of a form very simple as compared with the complex biological structures.

But this comparative absence, from physico-chemical discussion, of reference to structure, to geometrical features, is not due to any inherent characteristic property of chemical systems, as contrasted with the structurally complex organic systems: the reason for the simplicity is to be found in ourselves. It is not a physical phenomenon of the thing observed, but a psychological phenomenon in the observer. Physical chemistry is still a comparatively young science, and naturally the simpler phenomena have been sought out for first attention. This is not because complex physico-chemical structures do not exist, nor even because they are unimportant. On the contrary, it is to be expected that the future will bring important developments in this direction, as followed, for example by Sir William Bayliss in his work *Interfacial Forces in Physiology*.

The rate of formation, the rate of growth, of a chemical substance, is a definite function of its environment. In a structureless system the nature and state of this environment is defined in comparatively simple terms (e.g. by stating the concentration of each of the reacting substances).

But in a system possessing structure, the environment of a given portion of the system depends on the structure, the topography of the system, which, in general, will be variable with the time. In particular, the structure may be such that a given substance or complex of substances carries its own immediate environment around with it. The rate of formation (growth) of that substance will then depend largely upon the mechanical properties of those portions of the system which accompany this substance or complex in its travels through the system.

The complete discussion of a system of this kind may well fall outside the scope of present day physical chemistry, not because it is inherently foreign to that branch of science, but because no case of this kind, sufficiently simple to invite discussion on a mathematical and physico-chemical basis, has clearly presented itself. [N17]

Yet there is absolutely nothing in such a case that in principle places it outside the pale of physico-chemical science. It is largely as the result of intentional selection of simple conditions that the systems with which the chemist ordinarily deals (outside of biological chemistry) are comparatively structureless.

We can, in fact, even now lay down certain general observations with regard to structured physico-chemical systems.

Let us consider a system of this kind in which local conditions are subject to variation from point to point and from instant to instant. We fix our attention on some one component which requires for its growth certain definite conditions of its immediate environment. If this component is associated with a structure whose geometrical and mechanical properties secure and maintain for it a comparatively constant suitable environment amid the changing conditions of the system, then that component will grow.

Furthermore, the several components will compete with greater or less success for the material available for their growth, in proportion as their structure is more or less perfectly adapted to secure and maintain for them a suitable environment.

The chemical dynamics of such a system, that is to say, the laws governing the distribution of matter among its several components, may evidently assume a fundamentally different character from that to which we are accustomed from our study of ordinary structureless systems. For in these latter the arrangement and rearrangement of matter within the system depends chiefly on chemical coefficients
(affinity coefficients), and scarcely at all on geometrical features. In structured systems, on the other hand, there is the possibility that geometrical and mechanical features may play the dominant role. This possibility will present itself particularly in those systems which receive a continuous or periodic supply of free energy, for instance in the form of illumination. Here the advantage will go to those structures that are adapted to direct available energy into such channels as lead to the maintenance of the environment required for their growth. [N18] But a little reflection shows that this is precisely the principle which governs survival in the struggle for existence among living organisms. Hence we may say:

The laws of the chemical dynamics of a structured system of the kind described will be precisely those laws, or at least a very important section of those laws, which govern the evolution of a system comprising living organisms.

For it is precisely structured systems of the kind considered above that are presented to us in living organisms growing in an environment’.

Application to Biology

The several organisms that make up the earth's living population, together with their environment, constitute one system, [N19] which receives a daily supply of available energy from the sun.

Each Individual is composed of various chemical substances assembled into a definite structure and capable of growth, i.e., of accretion out of the environment by chemical reaction—provided a suitable medium or environment is offered.

Moreover, each mobile organism carries with it a travelling environment, suitable for the growth of its substance. It maintains this environment by virtue of the peculiar mechanical properties associated with its structure, whereby it is enabled to turn to this use, directly or indirectly, the available energy of the sun's light. And while the travelling environment may not be absolutely constant, it is more nearly so than the more remote portions of the system, and keeps

within such limits of variation as are compatible with the survival of the organism or its species. A concrete illustration may help to make this point clear. Many aquatic forms of life are constantly bathed in a saline solution sea water. Their body fluids are accordingly in equilibrium with this environment. Variations in the salinity of their environment, if they exceed certain comparatively narrow bounds, are apt to be fatal to such organisms.

The higher organisms have made themselves (largely) independent of their immediate environment. Their tissues are bathed from within by a fluid (the blood) which they carry around with them, a sort of ‘internal environment’. [N20]

The degree of perfection with which this constancy of the internal or traveling environment, independently of the external environment, is developed, increases as we ascend the biologic scale. This is lucidly set forth, for example, by Claude Bernard:[N 21]

> “Chez tous les etres vivants le milieu interieur qui est un produit de l’organisme, conserve les rapports necessaires d’echange avec le milieu exterieur; mais
> a mesure que l’organisme devient plus parf ait, le milieu organique se specifie et
> s’isole en quelque sorte de plus en plus du milieu ambiant.”

It is the peculiar structure and the mechanical properties of the organism that enable it to secure and maintain the required environment (including the milieu interior). The higher animals, in particular, are provided with an intricate apparatus, comprising many members, for securing food (internal environment) as well as for warding off hostile influences.

The increasing independence, as we ascend the biological; ~ jale, which the organism displays toward its more remote environment, is thus accompanied by a parallel increase in the perfection of the apparatus by which this independence is earned. Here again we may quote Claude Bernard: [N22]
“A mesure que l’on s’eleve dans l’echelle des etres, ces appareils deviennent plus parfaits et plus eompliques; ils tendent a affranchir completement l’organisme des influences et des changements survenus dans le milieu exterieur. Chez les animaux invertebres, au contraire, cette independence vis-a-vis du milieu exterieur n’ est que relative.”

The Policy of Resignation: Its Parallel in Other Sciences
What-ever may be our ultimate conclusions, we may do well to adopt at least as a temporary expedient the policy of resignation; with Sir Edward Schafer we may abandon the attempt to define life. Perhaps, in doing this, we are following historical precedents: Geometers have had to resign themselves to the fact that Euclid's parallel axiom cannot be proved. But as the reward of this resignation came the new geometries of Bolyai, Lobatchewski and Riemann. Enlightened inventors have abandoned the attempt to build a perpetual motion machine; but again, resignation is rewarded with the recognition of a fundamental law, the law of conservation of energy. Physicists, following Einstein, have abandoned, for the time being at any rate, the attempt to determine experimentally the earth's absolute motion through space. The reward has been the theory of relativity, one of the greatest events in the history of science.

The whole development of science, especially in recent years, is a record of tearing down barriers between separate fields of knowledge and investigation. Little harm, and perhaps much gain, can come from a frank avowal that we are unable to state clearly the difference between living and non-living matter. This does not in any way commit us to the view that no such difference exists. For the present, then, we shall adopt the position that the problem is essentially one of definition. The question is not so much ‘what is life’, but rather, ‘what shall we agree to call life?’ And the answer, for the present at any rate, seems to be that it is immaterial how we define life; that the progress of science and our understanding of natural phenomena is quite independent of such a definition.

We shall, wherever convenient, continue to employ the terms life, living organism, merely as a matter of convenience. This use of the terms does not imply or resuppose any precise distinction between living and non-living matter; it merely rests upon the fact that in most cases ordinarily met there is essentially universal agreement as to whether a portion of matter is to be classed in the first or in the second category. We will adopt the policy of Sir William Bayliss:

> “If asked to define *life* I should be inclined to do as Poinsot, the mathematician did, as related by Claude Bernard: ‘If anyone asked me to define *time*, I should reply: Do you know what it is that you speak of? If he said Yes, I should say, Very well, let us talk about it. If he said No, I should say, Very well, let us talk about something else’.”

The ideal definition is, undoubtedly, the quantitative definition, one that tells us how to measure the thing defined; or, at the least, one that furnishes a basis for the quantitative treatment of the subject to which it relates. We have already spoken of evolution. Most of what follows will relate directly or indirectly to evolution. It will be well here, while discussing definitions, to establish a definition, a conception, of evolution that shall, as far as may be, have the quantitative stamp.

Notes

N1. On the other hand, some very fundamental advances of science are, upon critical examination, found to rest essentially upon the establishment of a judicious definition. A notable instance of this is the enunciation of the principle of the survival of the fittest, which is essentially of the nature of a definition, since the fit is that which survives. Regarding the epistemological significance of definitions compare: A. N. Whitehead and B. Russell, *Principia Mathematica* 1910, vol. 1, p. 12.

N2. Wells, H.G. (1908). *First and Last Things* (pg. 32). Publisher.

N3. Goethe, Johann. (c.1810). “Gewohnlich glaubt der Mensch, wenn er nur Worte / Es mtisse sich dabei auch etwas denken lassen.” (Direction Usually man believes when he only words/ It mtisse thereby evoke something) Publication.

N4. (a) Quote: “We are justified at present in not classifying viruses either with plants or animals.”
(b) Glaser, W.R. (1918) “Article”, *Science*, 48:301-302.

N5. (a) Briggs, J.L. (1917). “Article”, *Journal of the Washington Academy of Science*, Vol. 7, p. 89.
(b) Compare also: E. M. East, *Mankind at the Crossroads*, 1923, p. 21.

N6. Spencer, Herbert. (1867). *Principles of Biology* (§30). Publisher.

N7. (a) Compare the following: “No one has yet succeeded in formulating a cleancut definition of the limits of the reflex either at its lower or its higher extreme, and perhaps no one ever will; for the whole list of behavior types, from machines to men, probably form a closely graded series.”
(b) Herrick, C.J. (1910). “The Evolution of Intelligence and Its Organs”. *Science*, 31:18.

N8. Nernst, Walther. (1913). *Theoretische Chemie* (pg. 713). Publisher.

N9. Schaefer, Edward A. (1912). “Life, Its Origin, and Maintenance” (Ñº), Presidential Address, Dundee Meeting of BAAS. Publisher.

N10. Clarification: “Let it be clearly understood that this illustration is here quoted, not as an example of life-like analogies in the world of non-living matter; nor as a veiled suggestion that such a drop of chloroform represents even a modest degree of success in the artificial imitation of life; nor yet again as an argument that the conduct of amoeba can today be fully accounted for on a physico- chemical basis; this example was cited merely to show that ‘growth from within’ cannot be claimed as a distinguishing characteristic of living matter. For further discussion of so-called *simulacra vitae* see McClendon, *Physical Chemistry of Vital Phenomena*; Burns and Paton, *Biophysics*, 1921, p. 403.

N11. Note: namely in the sense that it is metastable, that is, its thermodynamic potential is not at a minimum.

N12. Warren, H.C. (1916). “Article”, *Journal of Philosophy, Psychology, and Scientific Method*, 13:36.

N13 Compare: E. G. Conklin, Heredity and Environment, 1918, pp. 99, 45, 109: “The hen does not produce the egg, but the egg produces the hen and also other eggs We know that the child comes from the germ cells and not from the highly differentiated bodies of the parents, and furthermore that these cells are not made by the parents' bodies but these cells have arisen by the division of antecedent germ cells
Parents da not transmit their characters to their offspring, but these germ cells in the course of long development give rise to adult characters similar to those of the parent.”

N14. The perhaps somewhat doubtfully authenticated cases of fetus in fetu, "those strange instances in which one might almost say that a man may be pregnant with his brother or sister," add a touch of realism to the discussion here presented. For further data on this singular subject see G. M. Gould and W. L. Pyle, *Anomalies and Curiosities of Medicine*, 1897, pp. 199 et seq. Compare also in this connection, the phenomenon of pedogenesis; see for example, G. H. Parker, Psyche, 1922, vol. 29, p. 127.

N15. Nature, September 25, 1922, p. 405.

N16. G. Bunge, in his Physiologic and Pathologic Chemistry, 1902, p. 1, re- marks : "I regard vital force as a convenient resting place where, to quote Kant, 'reason can repose on the pillow of obscure relations.'" Curiously enough this damning admission is made by an advocate of vitalism.
N17. Compare: W. M. Bayliss, Physiology, 1915, p. XI, “All that we are justified in stating is that, up to the present, no physico-chemical system has been met with having met with having the same properties as those known as vital; in other words, none have, as yet, been prepared of similar complexity and internal coordination.”
N18. It should be observed that nothing has been said of life in describing the system. The system may or may not comprise living organisms, the argument remains the same. This suggests that a term, such as life, so vague that it defies definition, is perhaps not likely to play an important part in any exact argument; -we may, indeed, find it wholly unnecessary. It may, in time, in the literature of exact science, meet with the fate of the word cause: a term of rare and at best incidental occurrence in records of exact investigations.
N19. This fact deserves emphasis. It is customary to discuss the ‘evolution of a species of organisms.' As we proceed we shall see many reasons why we should constantly take in view the evolution, as a whole, of the system [organism plus environment]. It may appear at first sight as if this should prove a more complicated problem than the consideration of the evolution of a part only of the system. But it will become apparent, as we proceed, that the physical laws governing evolution in all probability take on a simpler form when referred to the system as a whole than to any portion thereof. It is not so much the organism or the species that evolves, but the entire system, species and environment. The two are inseparable. "The organism, as Uexkull teaches us, must be studied, not as a congeries of anatomical and physiological abstraction, but as a piece of machinery, at work among external conditions," O.C. Glaser, Science, vol. 21, 1910, p. 303.
N20. "Etant donne que l'eau de mer a un contact si intime avec les organismes de la mer et que non seulement elle les entoure de ses flots, mais qu'elle traverse leurs branchies et impregne en partie les corps des invetebres, il semble assez justind de la placer dans la meme cateegorie que les autres liquides physiologiques." S. Palitzsch, Comptes Rendus de Carlsberg, vol. 10, part 1, 1911, p. 93. Compare also the following:
"Not only do the body fluids of the lower forms of marine life correspond exactly with sea water in their composition, but there are at least strong indications that the fluids of the highest animals are really descended from sea water .... the same substances are present in both cases, and in both cases sodium chloride largely predominates." L. J. Henderson, The Fitness of the Environment, 1913, pp. 187-188. See also ibid., pp. 116 and 153; H. F. Osborn, The Evolution and Origin of Life, 1917, p. 37 ; D'Arcy W. Thomp- son, Growth and Form, 1917, p. 127.
N21. Introduction a l’etude de la me'decine experimentelle, 1885, p. 110.
N22. Ibid.

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1. Lotka, Alfred J. (1925). *Elements of Physical Biology*; Republished (Ñº) as: *Elements of Mathematical Biology*, which includes: corrections from Lotka’s notes and a completed list of his publications (pdf) (Ñº) (txt) (§1: Regarding Definitions, pgs. 3-19). Dover, 1956.
2. Jabberwocky – Wikipedia.

θΔics

In existographies, **Reginald John Hollingdale** (1930-2001) (IQ:140|#664) (CR:55), aka R.J. Hollingdale or "Reg Hollingdale", was an English translator, existographer (biographer), and philosopher, noted for a number of German to English translations, with discerning commentary, including: Goethe, Friedrich Nietzsche, Arthur Schopenhauer, and Georg Lichtenberg, in which he gives the most accurate and true to original English rendition, in respect to the original meaning, as compared to all other German-to-English translators; he was openly an atheist; he is most-noted for his 1971 translation and introduction of Goethe's 1809 *Elective Affinities*.

Education

Education

Hollingdale, after dropping out of High School at age 16, so to work as a journalist, went on to auto-educate himself by paying his way through private German lessons, and immersing himself in German literature and philosophy, after which earned the respect of readers and academics with his translations and studies of German cultural figures, without ever possessing an actual degree.

His central effort, in his German translation efforts, was his aim to rehabilitate German philosopher Friedrich Nietzsche. Hollingdale came to Nietzsche via Richard Wagner and Arthur Schopenhauer. [1] In 1973, Hollingdale summarized Nietzsche's first period as follows:

> "In the first period (1865-1876), Nietzsche's inner life, and a good deal of his outer life, was dominated by Schopenhauer and Wagner."

In this sense, one can see the stepping stones from Goethe to Schopenhauer, Goethe's human chemistry protégé, to Hollingdale, whom Penguin contracted to do the 1971 translation and introduction to Goethe's masterpiece *Elective Affinities*.

Atheism

Hollingdale's belief system outlook has been described as: "Grimly atheist, he appreciated Nietzsche's attempt to establish a philosophy that was simultaneously nihilist and life-affirming." [1] .

Quotes | By

The following are quotes by Hollingdale:

> "I admit that the generation which produced Stalin, Auschwitz and Hiroshima will take some beating, but the radical and universal consciousness of the death of god is still ahead of us. Perhaps we shall have to colonize the stars before it is finally borne in upon us that god is not out there."
>
> — Reginald Hollingdale (1971), *Thomas Mann: A Critical Study*; see: atheism atrocities fallacy

> "In its pure and perfect form, the aphorism is distinguished by four qualities occurring together: it is brief, it is isolated, it is witty, and it is 'philosophical'. This last quality marks it off from the epigram, which is essentially no more than a witty observation; the third, which it shares with the epigram, marks it off from the proverb or maxim: its point, though intended seriously, is supposed to strike the reader, not with the blunt obviousness of a palpable truth—'Many hands make light work'—but rather in the way the point of a good joke should strike him—'In the misfortunes of our best friends we find something that does not displease us'. In this pure form the aphorism disdains all giving of reasons and presents only a conclusion, so that it is often plainly intended to provoke instant contradiction in the sense that they payoff line of a joke is intended to provoke instant laughter."

— Reginald Hollingdale (1990), “Introduction” to Georg Lichtenberg’s *The Waste Books* (1799) [2]

References

1. Diethe, Carol. (2001). “RJ Hollingdale: Prolific and Self-taught Scholar who rehabilitated Nietzsche”, *The Guardian*, Oct. 10.
2. Lichtenberg, Georg. (1799). *The Waste Books* (translation and Introduction: Reginald Hollingdale) (pgs. x-xi). Penguin, 1990.

External links

â— R.J. Hollingdale – Wikipedia.
â— R.J. Hollingdale (catalog) – Swansea University.

θΔics

In existographies, **Regiomontanus** (1436-1467) (IQ:170|#250) (Eells 100:25) (CR:6), born Johannes Muller, his Latinized name meaning “king’s mountain”, a reference to his birthplace, characterized a “greatest mind in history” (Repcheck, 2007), was German astronomer and mathematician noted for []

Overview

In 1447, Regiomontanus, aged 11, characterized a “genuine child prodigy”, was sent to the University of Leipzig, where he studied for three years, during which time he constructed astronomical tables.

In 1450, Regiomontanus transferred to the University of Vienna.

In 1454, Regiomontanus, aged 18, became a student of Georg Peurbach (1423-1461), a University of Vienna humanities professor, who after having begun to record observations of the heavens (1451), started to give astronomy lectures, generally aimed at publishing a corrected version of Ptolemy’s Aristotle-based *Almagest* (150AD), the then-standing standard astronomy text.

Ptolemy | Moon

In 1496, Regiomontanus' *Epitome of the Almagest*, was published posthumously, wherein he states that Ptolemy's theory of the motion of the moon could not be correct. [1]

Copernicus

In 1490, Regiomontanus published *Table of Directions*, which enabled astronomers to determine the position of heavenly bodies based on the perceived daily rotation of the night sky; this was one of the first books owned by Nicholas Copernicus.

Quotes | By

The following are quotes by Regiomontanus:

> “You, who wish to study great and wonderful things, who wonder about the movement of the stars, must read these theorems about triangles. Knowing these ideas will open the door to all of astronomy and to certain geometric problems.”
>
> — Regiomontanus (1464), *On Triangles of Every Kind* (*De Trianguis Omnimodis*) (Ñº)

References

1. Repcheck, Jack. (2007). *Copernicus’ Secret: How the Scientific Revolution Began* (prodigy, pgs. 5, 16; king’s mountain, pg. 11; *Table of Directions*, pg. 20; Index of Books, pgs. 22-23, 127, 155; moon, pg. 46). Simon & Schuster.

Further reading

â— Zinner, E. and Brown, E. (2014). *Regiomontanus: His Life and Work*. Elsevier.

External links

â— Regiomontanus – Wikipedia.

θΔics

In existographies, **Reiner Kummel** (1939-) (CR:15) is a German theoretical physicist noted, in human thermodynamics, for his 2011 book *The Second Law of Economics: Energy, Entropy, and the Origins of Wealth*, in which he argues that we need to begin to incorporate energy and entropy thinking into economics; albeit a derivation that his nearly empty.

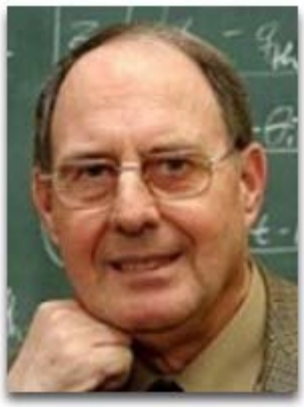

Overview

In 1997, Kummel published "Energy and Economic Growth" ("Energie und Wirtschaftswachstum"), which was his first first paper on thermodynamics and economics.

In 1980, Kummel published *Growth Dynamics of the Energy-dependent Economy*.

In 1984, Kummel published *Energy and Justice* (*Energie und Gerechtigkeit*).

In c. 2005, Kummel began teaching a course on "Economics and Thermodynamics", at University of Wurzburg, with notes about the energy slave concept, among other topics, soon thereafter.

In 2011, Kummel, in his *The Second Law of Economics: Energy, Entropy, and the Origins of Wealth*, argued that we need to begin to incorporate energy and entropy thinking into economics. His central thesis, which he calls the "second law of economics", is that wealth creation by energy conversion is accompanied and limited by polluting emissions that are coupled to entropy production. He argues that we need to begin teaching students about the basics of economic thermodynamics, if we are to avoid, the shrinking of natural resources, environmental degradation, and increasing social tensions. [1]

Education

Kummel completed his BS in physics in 1964 at the Technische Hochschule Darmstadt and PhD in physics, thesis thesis "Film Thickness dependent quantization effect in tunnel junctions; Studies on the intermediate state and mixed state of superconductors, type I and II" ("A. Schichtdicken-abhaÌˆngiger Quantisierungseffekt in Tunnelkontakten ; B. Untersuchungen zum Zwischenzustand und gemischten Zustand von Supraleitern I. und II."), in 1968 at the University of Frankfurt/Main, based on thesis research done under American theoretical physicist and electrical engineer John Bardeen at the University of Illinois, Urbana. Since 1974, Kummel has been a professor of theoretical physics at the University of Wurzburg, Germany. [2] Kummel went into semi-retirement in 2004.

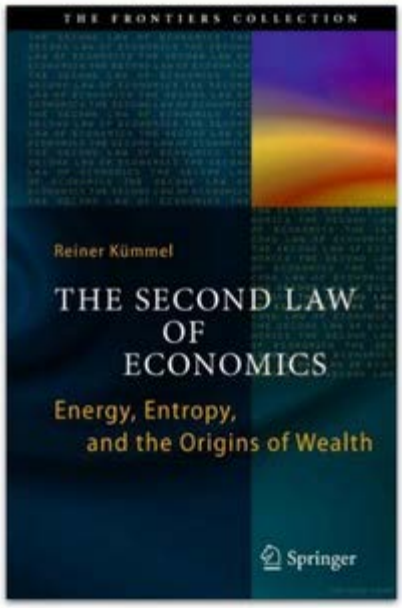

Left: Kummel's 2011 *The Second Law of Economics*, the result the product of lecture notes for a course he taught for several years on economics and thermodynamics.

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1. Kummel, Reiner. (2011). *The Second Law of Economics: Energy, Entropy, and the Origins of Wealth* (abs). Springer.
2. Reiner Kummel (biography) – Physik.uni-Wuerzburg.de.

Videos

â— Kummel, Reiner. (2012). "The Second Law of Economics, Energy, Entropy and the Origins of Wealth" (Ñº), Association for the Study of Peak Oil and Gas, May 30-Jun 1.

External links

â— Reiner Kummel (faculty) (German → English) – University of Wurzburg.

θΔics

In human physics, **Reinhold Henry Furth** (1893-1979), sometimes listed as Färth, Fürth, or Fuerth, was a Czechoslovakian-born English physicist noted for his 1951 BAAS lecture "Physics of Social Equilibrium", in which he gave an outlined recommendation that sociology students should use both the sciences of crystallography and statistical mechanics as their models for the study of society, the latter of which he says holds great possibilities. [1] Furth comments, as discussed by Austrian social economist Werner Stark, that: [2]

> "The principle field of application [of statistical mechanics] is the physics of systems consisting of a very large number of particles of the same kind, so-called 'assemblies' of particles. Social communities are also assemblies consisting of individuals who in many ways show similar behavior. It may therefore be expected that the assemblies of statistical mechanics could be used as adequate models of social communities."

Furth goes on to comment that:

> "The question of social stability appears now in a new light. Instead of being comparable to the equilibrium of a rigid mechanical structure or an oscillator, like a pendulum under the action of external forces, it is now seen to be the analogue to the equilibrium of a close assembly of particles like a piece of crystal, under the opposing influences of interatomic forces and the thermal agitation of constituent particles."

Other

Furth was a co-author with Albert Einstein and Alfred Cowper in the 1915 book *Investigations on the Theory of Brownian Movement* and co-author with James Jeans in the 1926 book *Dynamische Theorie der Gase* (*Dynamical Theory of Gases*). Furth is also noted for his 1834 theory that stars may be comprised of anti-particles. [4]

Education

Furth was a physics professor at the German University of Prague before WWII. Later he spent some years at Edinburg University as a research fellow and lecturer. From 1947 to at least 1958 he was a reader in theoretical physics at London University. [3]

See also

- Vera Daniel

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- Anon. (1980). "Obituary: Reinhold Henry Fürth", *The Royal Society of Edinburg* (pgs. 55-56).

External links

- Fürth, R. (Reinhold) (1893-) – WorldCat Identities.

θΔics

In science, **relational biology** is the study of life in terms of the organization of entailment relations in living systems, where life is defined by a relational closure that places life structures or entities, supposedly, beyond the reach of physicochemical and mechanistic dogma, outside the reductionistic universe, and into the realm of impredicativity. [1] Relational biology, in short, is a holistic non-reductionism interpretation of biology.

History

The term "relational biology" was coined by Russian-born American theoretical biologist Nicolas Rashevsky in 1954 following several decades of work in attempting to describe biological phenomenon in purely physical terms.

Rashevsky's research efforts in these years, beginning in the 1920s, were centered around the question of whether or not biological phenomenon, in particular cellular division, is a phenomenon that can be reduced to pure physics, in particular pure thermodynamics, quantum mechanics, among other subjects such as bifurcation theory. Into following two or three decades, Rashevsky focused on establishing the material basis of basic biological phenomena and developed a type of systematic mathematical biology. In 1950, however, a turning point occurred in Rashevsky's thinking, when he had begun to become uneasy about the basic question 'what is life?' after which, following some reflection, he concluded the purely reductionist approach would never work. His turning point comment on this matter was:

> "As we have seen, a direct application of the physical principles used in the mathematical models of biological phenomena, for the purpose of building a theory of life is not likely to be fruitful. We must look for a principle which connects the different physical phenomena involve and expresses the biological unity of the organism and of the organic world as a whole."

The new principle that Rashevsky searched for was termed "relational biology" a term coined by Rashevsky in 1954. In 1959, American theoretical biologist Robert Rosen completed a PhD in relational biology, under Rashevsky at the University of Chicago. A recent promoter of the relational biology approach includes American physiologist Donald Mikulecky.

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θΔics

In terminology, **relationship** is a state of connection or association between two or more individuals. [1] In the world of the personal, of work, and of the world at large, relationships between people are a decisive force. [2] In the scientific perspective, relationships are often quantified by their interaction components.

Interactions

In sociological-psychology, a relationship is considered as a long interaction or function of a set of multitudes of microsecond interactions. An interaction between two individuals involves, at a minimum, individual *A* showing behavior X to individual *B*. Individual *B* may, in turn, respond with behavior Y. There may be a number of such repetitions of this sequence, involving behavior that is consistent or different, but an interaction is essentially limited in time. [3] A relationship, subsequently, involves a series of such interactions between individuals who know each other, such that each interaction is affected by preceding ones and usually by the expectation of future interactions. [4]

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θΔics

In colloquial use, **relationship chemistry** is a term used to metaphorically to qualify the "chemistry" of relationships. [1]

The term is a common one in dating site advertisements. The matching site LoveIsSexy, for instance, boldly declares, on its *about us* page, that it has a "state-of-the-art matching technology" that puts its users in direct contact with "relationships that work" and that: [2]

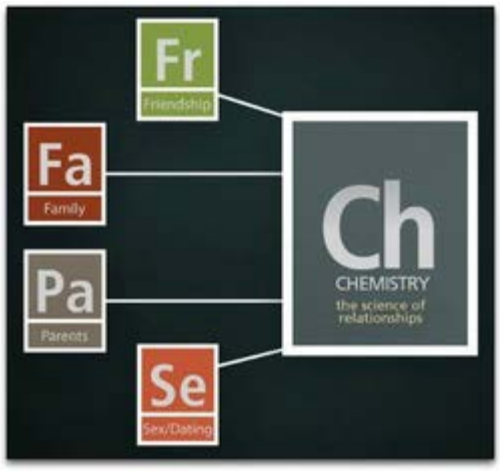

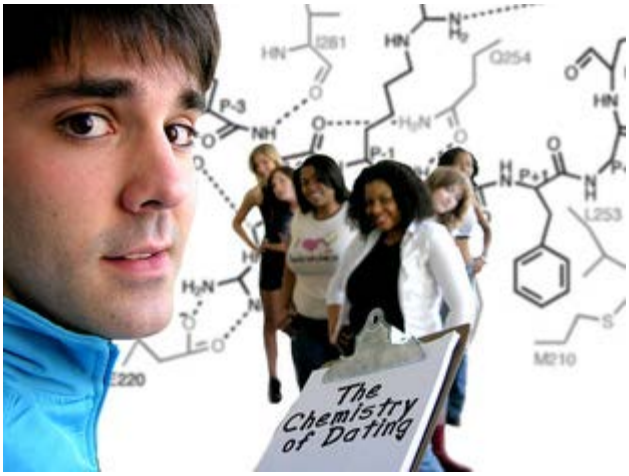

Left: a chemical alphabet style depiction of the elements of **relationship chemistry**: friendship, family, parents, sex and dating. Right: a chemical formula underlay **relationship chemistry** depiction of the "choice" factor of mate selection; a subject of study first queries in terms of physical chemistry by German polymath Johann Goethe in 1808 (see: love thought experiment).

> "**Relationship chemistry** is more than simply liking the same movies … it's about shared values, ethics, social, physical, and intellectual characteristics … it's also about sex … without good sexual chemistry and compatibility, many relationships simply don't work."

(add discusion)

See also

- Romantic chemistry
- Social chemistry
- Sexual chemistry
- Music chemistry
- Literature chemistry
- Queer chemistry
- Human chemistry

References

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(b) Relationship Chemistry – theRelationshipGym.com.
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Citations

The following are works that cite this page:

● Grungzweig, Walter. (2012). "Science-in-Poetry? Chemistry and the Metaphysical Tradition" (pgs. 169-82), in: *The SciArtist: Carl Djerassi's Science-in-Literature in Transatlantic and Interdisciplinary Contexts* (pg. 181). LIT Verlag Munster.

θΔics

In hmolscience, **relationship force** is the force that brings and holds humans together in relationships, e.g. friendships, marriages, or families, or forces them out, in a reverse manner; a combination of the workings of the electromagnetic force and gravitational force, generally operating via an exchange force mechanism or bosonic connection.

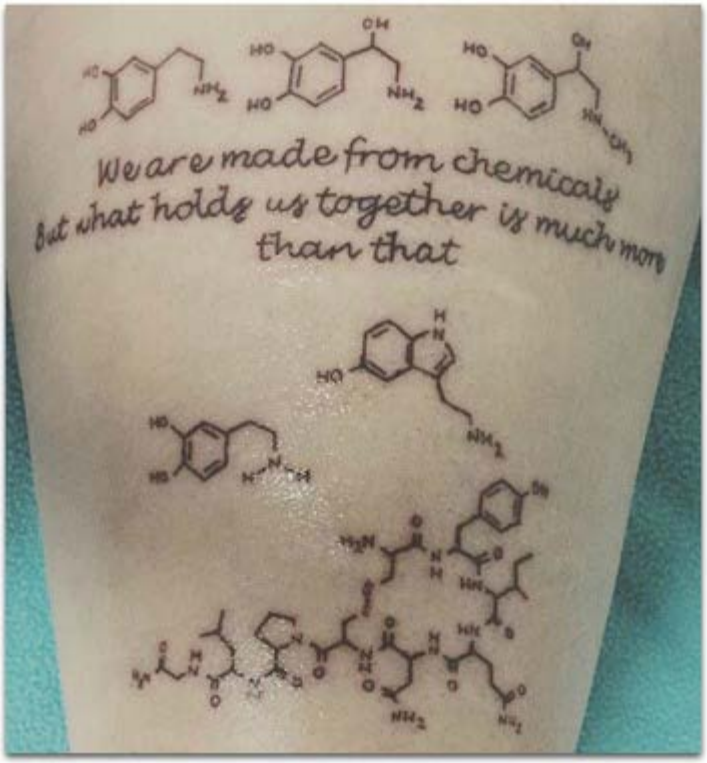

A circa 2015 "**relationship force**" stylized (Q) chemicals tattoo, alluding to the unstated premise that what holds people together in relationships "is much more than chemicals".

Overview

In 450BC, Empedocles asserted that the relationships were held together via the operation, in some way, of two forces: love and hate.

In 1621, Robert Burton, in his *The Anatomy of Melancholy*, alluded to the premise that the force that attracts people together is the same as the force that attracts straw to amber, i.e. the electromagnetic force, but that its power has something to do with heat:

> "As amber attracts a straw, so does beauty admiration, which only lasts while the warmth continues."

In 1809, Goethe, building on Burton, in part, supposedly, scripted his human chemical theory, according to which the chemical "force" of elective affinity is what holds people together in relationships, attached, conceptually via Cullen bonding brackets: (Q)

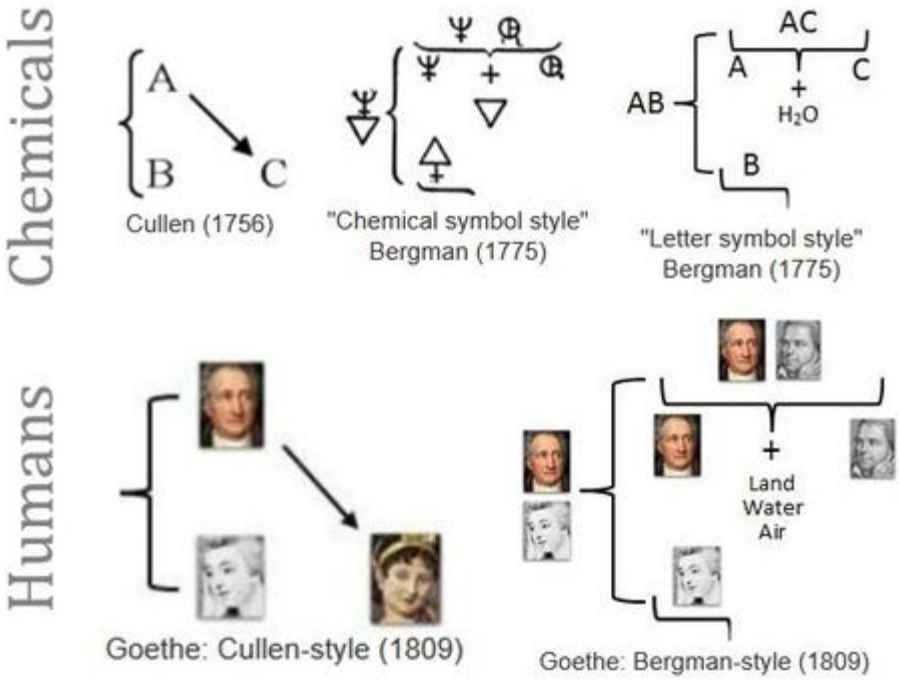

A read-through of William Cullen, however, is requisite, in respect to what "force" he had in mind, in the symbolic usage of his bonding bracket, or "crochet" as he called it, as the means of representing the union of the two attached chemicals.

In 1910, Henry Bray, building on Goethe, via the Ernst Haeckel formulation of Goethe's human elective affinities

theory, began to state indirectly that the "force" that holds people together in relationships, as in chemical attachments, was "love or affinity" (see: love terminology upgrade), a interesting term vacillation:

> "The force which presides over chemical combinations, is called chemical affinity; and it is in the exhibition of this that atoms act so much like the forms of higher organisms. To illustrate: oxygen has but little affinity or **atomic love**, call it which you please, for copper, under general conditions; but as in the case of higher beings when you array them in their best, and make them as alluring as possible, so here,—if you heat the copper in the air oxygen will immediately rush to it, and with it form oxide of copper [Cu_2O]. Their affinity for each other is now so great that they cannot be divorced, under ordinary circumstances. But even now if you mix this oxide with powdered charcoal, and then heat the mixture, a moment arrives when the affinity of the charcoal for the oxygen is greater than that of the copper, causing the oxygen to forsake the copper and unite with the charcoal to form carbonic acid [H_2CO_3]. The allurements of the charcoal suffice at last to cause the oxygen to leave its first love, and go with its new affinity."
>
> — Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds, pg. 182)

> "We see similar action often in the case of men and women. Again, the attraction of hydrogen [H_2] for oxygen [O_2] is very great under ordinary circumstances, causing them to live in the greatest harmony, as, for instance, in water [H_2O]; but as at times a third party is seen to insinuate himself into a household, destroy its peace, and ultimately break up its union, so here if an atom of potassium [K], for instance, finds its way into a molecule of water, the peace of the molecular family is at once destroyed and jealousy and a murderous quarrel ensue, the metal burning brightly, and darting hither and thither on the surface of the water, exulting as it were in the mischief it works. In this contest of atomic **affinity or love**, the potash wins the day [$H_2O + K \rightarrow KOH + H_2$], taking away with itself two blushing damsels for its harem, and leaving an atom of hydrogen [H_2] like the last rose of summer to droop and die of a broken heart."
>
> — Henry Bray (1910), *The Living Universe* (§8: Atomic and Molecular Worlds, pg. 182-83)

(add discussion)

In 2005, Libb Thims, in his "On the Nature of the Chemical Bond", a draft article—which, to note, transformed into the two volume textbook *Human Chemistry* (2007), being that the article would no longer fit on one webpage—attempted to ferret out the nature of the mechanism and composition of the human chemical bond in terms of forces; the opening abstract of which is as follows: [2]

> "What variation of chemical bond holds such human molecules together in the most essential of all unions: bonded matrimony? To clarify, statistically it is known that 85% of people will inter into, and be transformed though the following chemical reaction [3]:
>
> $$Mx + Fy \rightarrow MxFy + Bc$$
>
> where Mx equals male human molecule, Fy

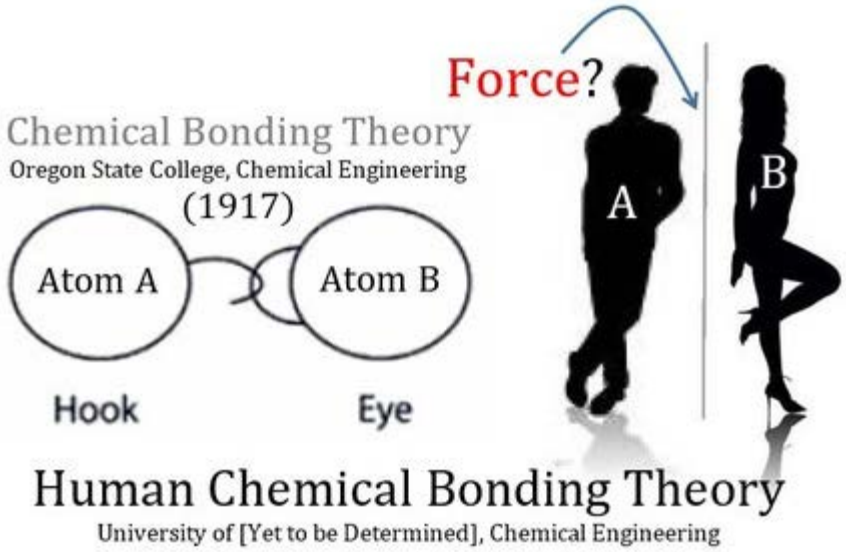

Linus Pauling, in 1917, as a chemical engineering student at Oregon State University, was taught the "hook-n-eye" bonding model, John Dalton version, which he found so archaic that went on to pen *On the Nature of the Chemical Bond* (1939) to remedy the situation. The equivalent patch solution for 21st century chemical engineers does not, of yet, exist, in any chemical engineering curriculum, despite a near century long work in human free energy theory, of which part of the Gibbs energy must exist quantifiably in the bond of relationships (bond energy),

equals female human molecule, MxFy equals bonded 'couple', and Bc equals child. Moreover, according to the latest US Census Bureau data sets, 43% of all marriages MxFy will end, i.e. fission, by the 15-year mark; better known as divorce or dissolution of marriage:

mechanistically described by a "force", aka **relationship force**, for lack of a better name, described generally in terms of fermion-boson interactions.

MxFy → Mx + Fy

The question remains, regarding the bonded structure 'married couple', which of the four fundamental forces is presently operating to enable such ubiquitous bonds? More broadly, when a person has a **relationship** with another person, what **force** constitutes the 'glue' of that union:

MxFy = ? = Mx "force" Fy

In this article, out of necessity, we will outline a robust and cogent theoretical model of inter-human bonding, as based on the standard model and its mode of operation, being workable and testable in composition, thus facilitating the peer-review process of either validation or disproof of its principles."

The general issue here, at this point in Thims' mind, as a newly-minted chemical engineer and electrical engineer, is that no one, to his knowledge, in history prior to him, had ever worked out the "nature" of the bond between humans, in terms of the fundamental forces, the way Gilbert Lewis (1902) worked out his electron pair dot structure model of the covalent bond, e.g. H:H for the attachment of two hydrogen atoms in the bound state of the hydrogen molecule H_2; or the way Walter Heitler (1927), after awaking from a series of naps, conceived the basic model of the exchange force or "perturbation theory" operating between two hydrogen atoms, the outline of which was first published in "Interaction of Neutral Atoms and Homopolar Bonding according to Quantum Mechanics", co-authored with Fritz London (1900-1954); or the way Linus Pauling (1939) published his monumental textbook *The Nature of the Chemical Bond*, which he dedicated to Lewis, therein outlining his hybrid orbital model of chemical bonding, an huge near two millennium upgrade to the hook-and-eye bonding model, which he was taught as an undergraduate chemical engineer in 1917 at Oregon Agricultural College.

See also

- Relationship chemistry
- Relationship physics
- Relationship thermodynamics | Relation thermodynamics (Wayne angel)

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θΔics

In human physics, **relationship physics** or the "physics of relationships" refers to the application of any of the various physics laws, theories, principles, and concepts to the explanation of human intimate and interpersonal relationships.

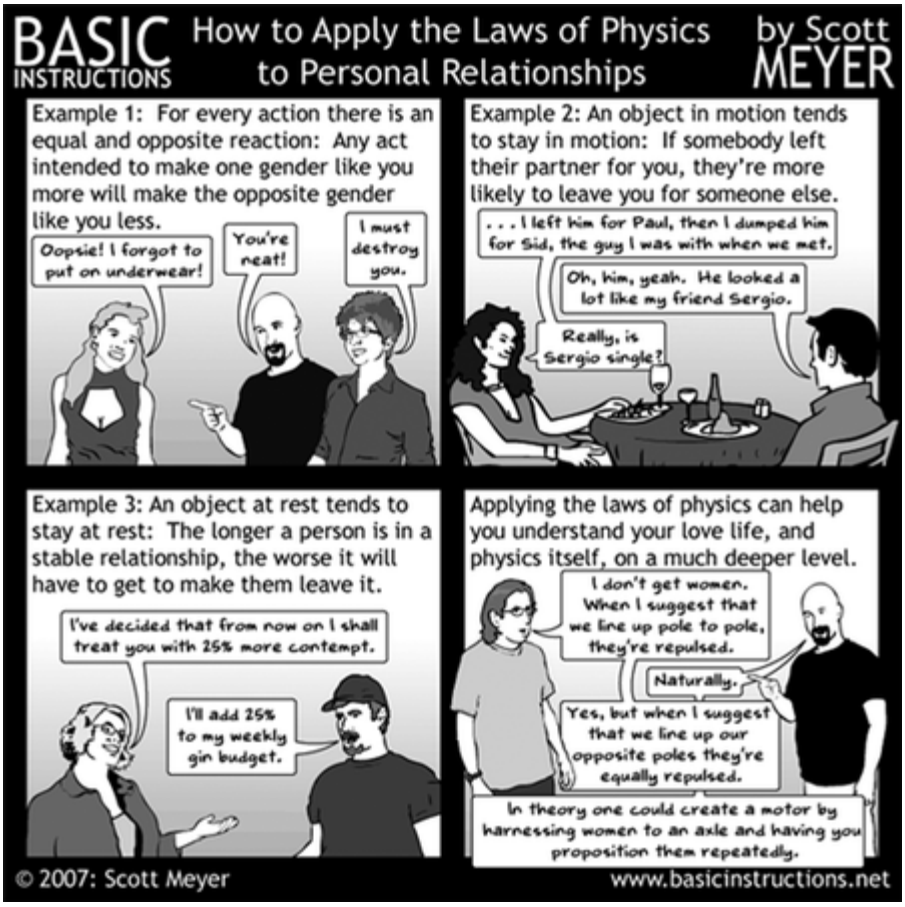

Humorous attempt at applying Isaac Newton's three laws of motion to the understanding of human relationships by cartoonist Scott Meyer. [3]

Keeley

An early attempt, albeit new age styled, non-scientific, at a book on the subject of applying physics to the understanding of love and or relationships is the 1996 *The Physics of Love*, by Edgar Cayce, Dale Pond, and Rudolf Steiner, a summary of the 19th century metaphysics of inventor John Keeley (1827-1898). [1] Keeley, supposedly, is noted for his 1871 claim that he had tapped a great new source of energy and "a device which disintegrates the etheric force that controls the atomic constitution of matter." Keely claimed that his engine operated on "harmonic vibrations." Some of his machines would only operate in his presence. Keeley also made a particular spherical motor which was supposed to run on etheric forces. [1] The book seems to be have attracted the new-age spiritual energy crowd movement.

Hirata's physic of relationships

In c.2000, American physicist Christopher Hirata published a five-part outline entiled "Physics of Relationships", consisting of: [2]

(a) thermochemical approach to relationships
(b) complex equilibria of man and women
(c) reaction kinetics
(d) neutron scattering
(e) shell model

To go through part (a), the thermochemical aspects of relationships, Hirata uses the student body at Caltech, observed during this undergraduate years (1996-2000), which he says consisted of N=900 total students, of which 600 were male, and according to his observations about 200 were in paired relationships. He uses the symbols of X = girl, Y = boy, and XY = paired relationship, calling the single boys and girls as "basic elements", of which he says the simplest reaction is:

$$X + Y \leftrightarrow XY$$

Hirata also comments, in reference to the subject of queer chemistry (and other poly-amorphous relationships), in his human chemical reaction modeling that he is neglecting "rare and non-traditional" products or compounds (human molecules) that may form such as "the gay molecule Y_2, the lesbian molecule X_2, and the middle-Eastern polygamous molecule X_4Y." On this basis he states that the equilibrium constant K for this reaction is:

$$K_{eq} = \frac{[XY]}{[X][Y]}$$

where [X], [Y], and [XY] are the concentrations of the single girls, single boys, and paired relationships, respectively. This constant, according to Hirata, can be calculated from the following expression:

$$-k_B T \ln K_{eq} = \Delta E + P\Delta V - T\Delta S^{\ominus}$$

where K_B is the Boltzmann constant, T the temperature, ΔE the internal energy change, ΔV the volume change, and ΔS the entropy change at standard conditions. He goes on to calculate that K_B at Caltech is 4.5. On this basis, he goes on to calculate, assuming that the equilibrium constant is independent of concentration and is a function of only temperature and pressure, that if the female to male ratio were 50:50 the percentage of singe males would drop from 67% to 48%.

Ecob's radioactive decay model

In 2005, Oxford undergraduate physicist student Richard Ecob developed a atomic radioactive decay model of how people look for partners. [4] Specifically, Ecob conceived the view that anyone's romantic life can be reduced to a series of transitions, or 'transit states', e.g. 'twice-divorced and now single'. This may be considered as nuclear model of chemistry's transition state theory.

Rendition of Ecob's radioactive decay model of dating by Stacy Innerst. [6]

To understand this in physic terms, he looked to the model of how the decay of a nucleus is described in terms of 'transit states', the series of changes it has been through to get to its current situation, i.e. the stages of radioactive decay. In applying this to human situations, Ecob wrote a computer program in which he created an artificial society of partner-seeking-people called 'software singles'. [5] The project, as of 2005, was part of Ecob's MS thesis, working with graduate student David Smith and their supervisor Neil Johnson, head of the complex systems research group at Oxford University. The project was also entered into the 2005 Engineering and Technology Student of the Year awards.

Quotes

The following are related quotes:

> "Physics is like sex. Sure, it may give some practical results, but that's not why we do it."
>
> — Richard Feynman (c.1950)

See also

- Relationship chemistry
- Social physics

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4. Anon. (2005). "Physics Enlisted to Help Singles", BBCNews, Aug 12.
5. Anon. (2005). "If Chemistry Can't Make a Great Date, Physics Will." Press Release, World Leadership Forum.

6. Leo, Peter. (2005). "Successful Couples need Good Physics, but what about Paternal discrepancies" (photo by Stacy Innerst), *Pittsburg Post Gazette*, Aug. 16.

External links

- The relationship between quantum physics and love – Helium.com.
- The Physics of Sex – Blogspot.com.
- John Marshall (articles) – SexualPhysics.com.

θΔics

In human thermodynamics, **relatively closed system** is term used by Henri Bergson (1907) and Carl Jung (1928) to extrapolate the thermodynamic definition of "closed system" to the solar system and the psyche, respectively; albeit used in an undefined way. [1] The following is one of Jung's takes on the term: [2]

> "Since our experience is confined to **relatively closed systems**, we are never in a position to observe an absolute psychological entropy; but the more the psychological system is closed off, the more clearly is the phenomenon of entropy manifest."

In this sense, the idea of a relatively closed system is purely verbalized non-exact type of thermodynamics. This type of use can be found in books on family therapy: [3]

> "Families vary in the extent to which they are open systems; **relatively closed systems** run the risk of entropy or decay and disorganization."

(add discussion)

References

1. Bergson, Henri. (1911). *Creative Evolution* (relatively closed system, pgs. 241, 302), translsated by Arthur Mitchell. H.Holt and Co.
2. Jung, Carl. (1928). "On Psychic Energy" (subsection C: Entropy), in *On the Nature of the Psyche* (1960). Princeton University Press.
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θΔics

In thermodynamics, **relativistic thermodynamics** is the study of the implications of the theory of relativity, e.g. that there is a limit to the speeds of particles, that hot bodies weigh more than cold bodies, etc., in thermodynamics. [1] American engineer Richard Weiss seems to done some of the first publications on this subject. [2]

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(d) Müller, Ingo. (1985). *Thermodynamics*, (pg. 375). Pitman.
2. (a) Weiss, Richard A. (1976). *Relativistic Thermodynamics*, Vol. 1. Exposition Press.
(b) Weiss, Richard A. (1976). *Relativistic Thermodynamics*, Vol. 2. Exposition Press.

Further reading

â— Muschik, Wolfgang and Borzeszkowski, H.-H. V. (2008). “Entropy Identity and Material-Independent Equilibrium Conditions in Relativistic Thermodynamics.” (Abstract) (PDF) *arXiv.org* in General Relativity and Quantum Cosmology, April 16.

θΔics

In science, **relativity**, distinguishing between the special theory of relativity (1905) and the general theory of relativity (1915), is the conception of space and time as joined variables, namely space-time, dependent on the constancy of the speed of light, according to which the Cartesian coordinate system is upgraded to to the Gaussian coordinate system and gravity is defined as a distortion in the geometry of space-time. [1]

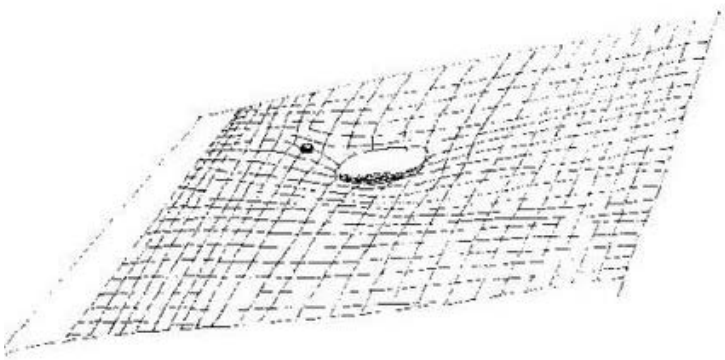

A depiction of **relativity** as the curving of spacetime around mass, according to American physicist John Wheeler. [3]

Galileo

In 1632, Italian physicist Galileo Galilei, in his *Dialogue Concerning the two Chief World Systems*, asked something along the lines of: If you are in the cabin of a boat docked (and immobile), a cabin with windows hidden so we cannot see outside, results of mechanical experiments (shot put, study of a pendulum, etc.) will they be different from the results of the same experiments carried out in the boat on the move, provided that this movement is done in a straight line at a constant speed? Another way of saying this is: is it possible mechanical experience to distinguish between the state of uniform motion and stillness of a vehicle without using a landmark outside (i.e. without looking out the window)? His response, was that this is impossible, and that the results of mechanical experiments will be the same as in the other cases. The principle of relativity therefore said that the laws of mechanics are the same in two Galilean frames. (Ñº)

Lorentz

The first step towards the theory of relativity is the postulate of length contraction, generally know as Lorentz contraction—the phenomenon of a decrease in length measured by an observer of objects which are traveling at any non-zero velocity relative to the observer—first postulated by George FitzGerald (1889) and Hendrik Lorentz (1892) in response to the findings of the Michelson-Morley experiment (1881), one example being that a ruler pointed toward the sun will be measurably longer than one pointed in the direction in which the earth is moving about the sun.

Einstein

In 1895, sixteen year old Albert Einstein had contemplated the following, as he would later write: [2]

> "Such a principle [**relativity**] resulted from a paradox upon which I had already hit at the age of sixteen: If I pursue a beam of light with a velocity c (velocity of light in a vacuum), I should observe such a beam of light … at rest. However, there seems to be no such thing, whether on the basis of experience or according to Maxwell's equations."

In circa 1903-05, Einstein, while working at the Swiss patent office, as a third-class examiner, received a proposed invention of a device to synchronize clocks, e.g. by sending light or a radio wave between, say, Bern, Basel, or Zurich, thereby insuring that each strike an hour at the exact same moment. On this question, Einstein imagined a person standing half way between two distant clocks, each send out a signal at the same time, say seven, will say the clock strikes are simultaneous; but if someone is moving past the person—say on a train—really fast toward one of the clocks, that person will receive the signal from that clock first. From this thought experiment, Einstein deduced that since all motion is relative, neither observer was right or wrong: the speed of light is constant, but what is "simultaneous" is relative, which means time is relative, depending on one's motion. (Ñº)(Ñº)

Eddington

On 29 May 1919, Arthur Eddington to take a trip to the island of Principe (off the west coast of Africa) to measure the solar eclipse, to test the validity of Einstein's mass bends light conjecture:

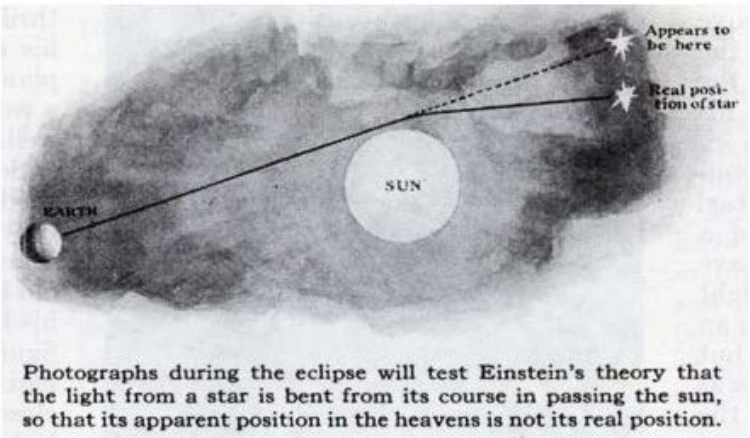

Photographs during the eclipse will test Einstein's theory that the light from a star is bent from its course in passing the sun, so that its apparent position in the heavens is not its real position.

(add)

Hmolscience

In the 1940s, American physical historian Morris Zucker attempted to outline a relativity like field theory of history; the result, however, amounted to a lot of talk, but without much meat.

In 1983, American English professor Paul Sporn, in his "The Modern Physics of Contemporary Criticism" chapter, attempted to outline how various authors employed relativity, field, and or space-time logic to create "text-reader-intertext fields" resembling energy-mass conceptions from general relativity; the resulting arguments, however, seemed to have little substance them. [1]

Quotes

The following are related quotes:

> "Space tells matter how to move and matter tells space how to curve."
>
> — John Wheeler (1998), *Geons, Black Holes, and Quantum Foam* (Ñº)

> "If we are to make a family tree analogy of the genesis of the mathematical aspect of the theory of **relativity**: the great grandfather would be Leibnitz; the grandfather would be Gauss; the father would be Riemann, and the son would be Einstein."
>
> — Monydit Malieth (2013), *The Future Affects the Past* [5]

References

1. Hsieh, Ching-Yao, and Ye, Meng-Hua. (1991). *Economics, Philosophy, and Physics* (pgs. 76-77). M.E. Sharpe.
2. Kaku, Michio. (2005). *Einstein's Cosmos: How Albert Einstein's Vision Transformed Our Understanding of Space and Time* (pg. 44). W.W. Norton & Co.
3. Wheeler, John. (1998). *Geons, Black Holes, and Quantum Foam* (pg. 235). W.W. Norton & Co, 2010.
4. Sporn, Paul. (1983). "The Modern Physics of Contemporary Criticism", Conference on Science, Technology, and Literature, Feb, Long Island University, New York; in: *Beyond the Two Cultures: Essays on Science, Technology, and Literature* (editors: Joseph Slade and Judith Lee) (§10:201-22), Iowa State University Press, 1900.
5. Malieth, Monydit (aka Tonnerre). (2013). *The Future Affects the Past: What Destination is Time Rushing To?* (pg. 61). Red Lead Books.

External links

â— Theory of relativity – Wikipedia.

θΔics

In humanities, **religio-mythology** is the study of modern religions in terms of their underlying part semi-scientific part mythological frameworks and syncretisms.

The **religio-mythology** structure of the world's modern religions (Yellow River centric religions excluded), according to which 72 percent of have belief system structure rooted in life/death theories of the sun. [1]

Overview

Religio-mythology, according to which 72 percent of the world's current belief systems, can be directly classified as Anunian theology or Ra mythology, both the Ab-ra-ham-ic and the B-ra-hma-ic faiths, i.e. "father Ra son of Nun" faiths or belief systems, being Egyptian mythology based in structure, both replete with *circa* 3,100BC sun-based theories of: birth, life, death, and afterlife (resurrection or reincarnation)—the latter of which anchored in concepts such as: soul, spirit, karma, etc., which are but older conceptual framework notions concerning morality, meaning, purpose, existence, function, and so on. [1]

See also

- Comparative mythology and religion
- Religio-mythology genealogy
- Religio-mythology scholars
- Religio-mythology transcription and syncretism

References

1. Thims, Libb. (2012). *Existence? (in a Godless universe)*. Unpublished manuscript.

θΔics

In genealogies, **religio-mythology genealogy** is a visual flow chart that shows the transcription and syncretism tweaking and transformation of the ancient 5,000BC Nile River region "living sun, flat earth, flood cosmology" beliefs, into the early 3,100BC polytheistic gods, i.e. the Heliopolis Ennead, of the Heliopolis creation myth, firstly, turned monotheistic god transformations, Akhenaten's god "Aten", and later anthropomorphized monotheistic re-written prophets and patriarchs; a visual over view of which is shown below:

(add discussion)

Overview

In 3100BC, the Egyptian 1st dynasty formed, from a collation of 42 "nomes" (states) of pre-Dynastic Ancient Egypt (22 Upper Egypt + 20 Lower Egypt):

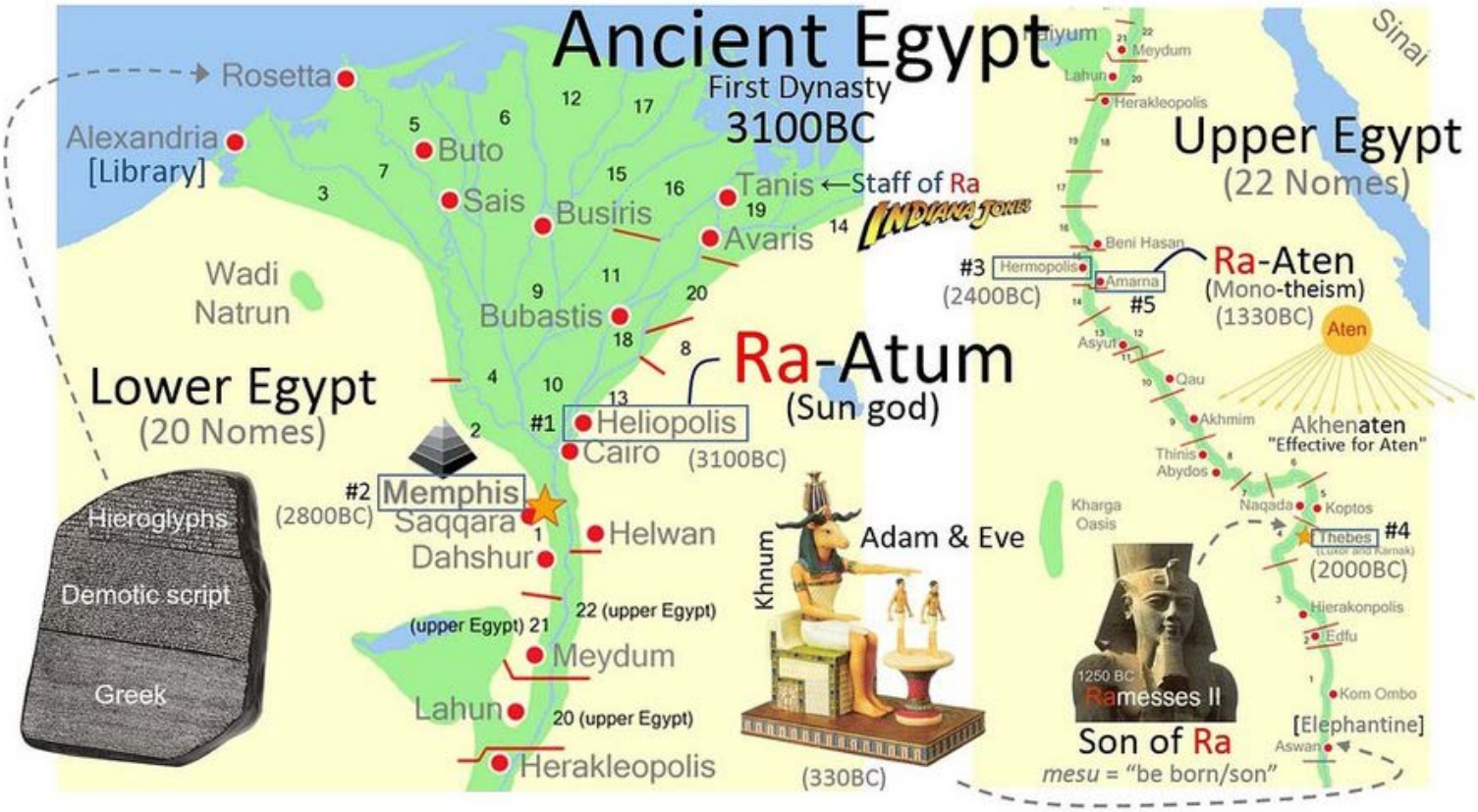

The "number 42" worked to function as a key (sacred) number, modifying over the years, as follows:

● The number 42, in Anunian theology, became the number of gods (oversight gods) in the Judgment Hall (of Osiris) in the afterlife; and the number of components (Negative Confessions) of the weight of the soul (soul weight).
● The number 42, in the Christianity monotheistic rewrite of the Aten-version of Anunian theology, as mentioned five times (Q) in the Bible, became the number of generations, according to Matthew's genealogy (Q), between Abraham and Jesus.
● The number 42 is employed in the works of Lewis Carroll four times.
● The number 42 famously became the number used by Douglas Adams, albeit arisen, as he claims (Q), out of free-thought memory, in his *Hitchhiker's Guide to the Galaxy* (1978), as the number his fictional supercomputer Deep Thought supplies to the query "What is the answer to life, the universe, and everything?"

(add discussion)

Ab-Ra-ham | Genealogy

The following is a work in progress mapping of the Ab-Ra-ham-ic branch of world's religions:

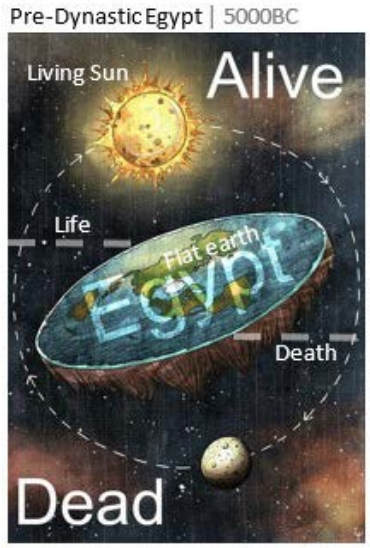

↓

Transcription | De-Polytheism-ization | Syncretism

↓

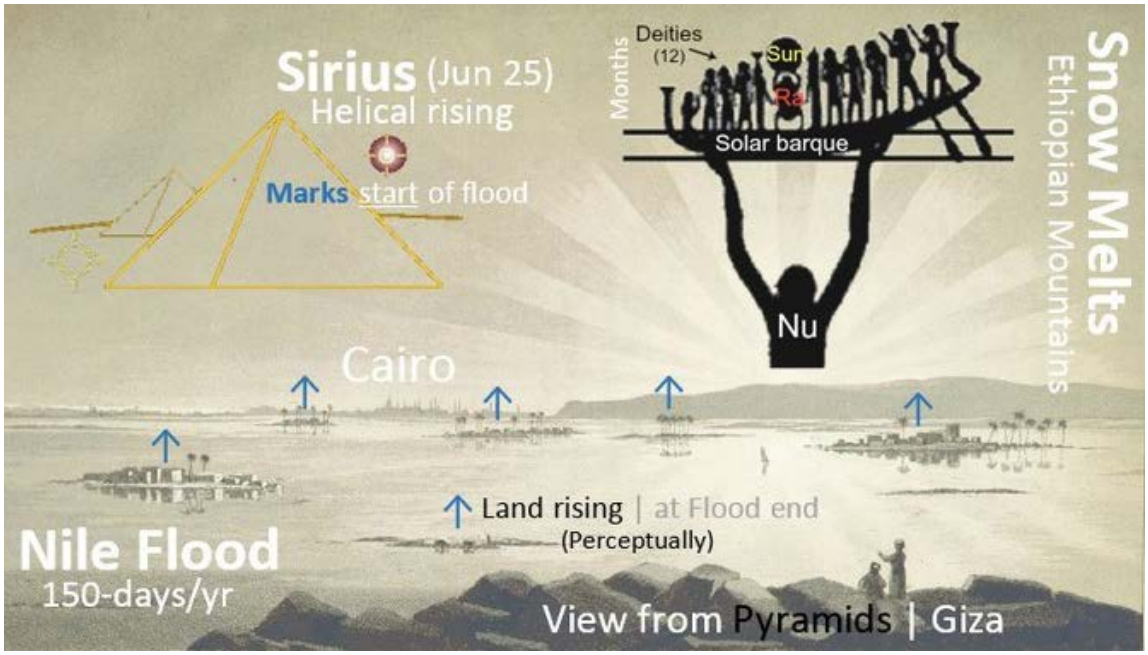

Transcription | De-Poly**theism**-ization | Syncretism

How long did the flood last?
The **Bible** says that the rains that created the Noachian Flood lasted for 40 days (Genesis 7:17), that the waters prevailed on the earth for **150 days** (Genesis 7:24), after which, Noah's Ark came to rest upon the mountains of Ararat (Genesis 8:4).

Transcription | De-Poly**theism**-ization | Syncretism

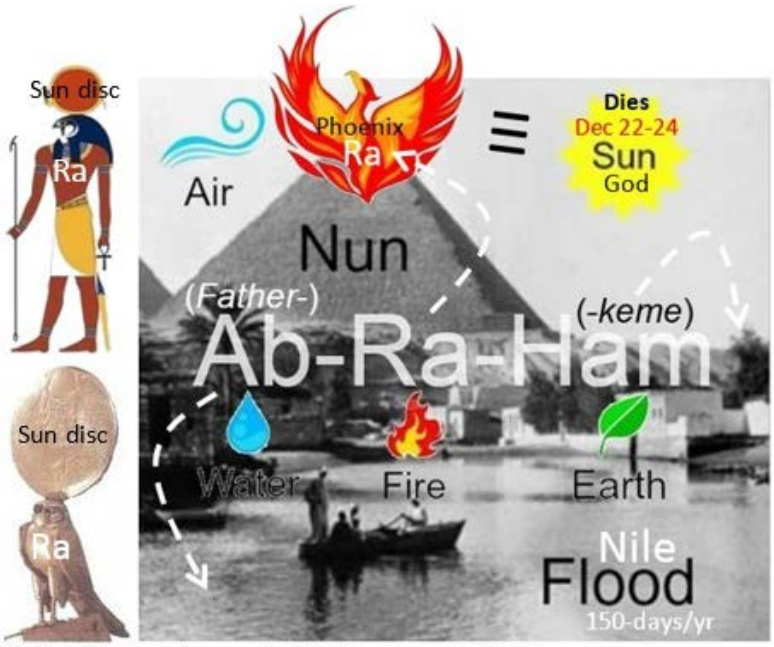

Heliopolis creation myth | 1st Dynasty | 3100BC

Transcription | De-Poly**theism**-ization | Syncretism

2800 BC
Polytheism
↓
Monotheism
300 AD

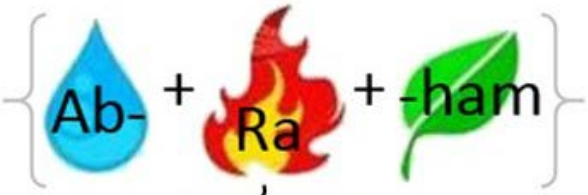

Heliopolis Ennead

Ab- (Father/Water) [Nile flood] [Abraham] *-ham* (keme/Nun) [Noah]

Ra-Atum (sun god)

Life order (principle) — *Shu* (air)

Moral order (principle) — *Tefnut* (moisture)

Geb (earth) — *Nut* (sky)

Osiris (afterlife judge) — *Isis* (animation) — *Seth* (chaos deity) — *Nephthys* (funerary guide)

Horus (lawgiver)

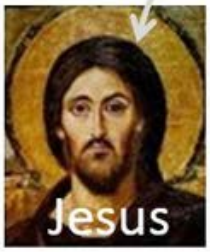

Devil

Christianity

↓

Transcription | De-Poly**theism**-ization | Syncretism

↓

Greek mythology

Prometheus' fire

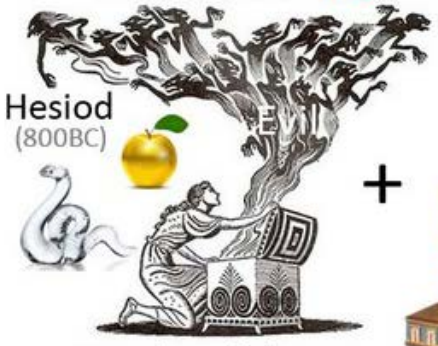

Pandora's box

+

Egyptian mythology

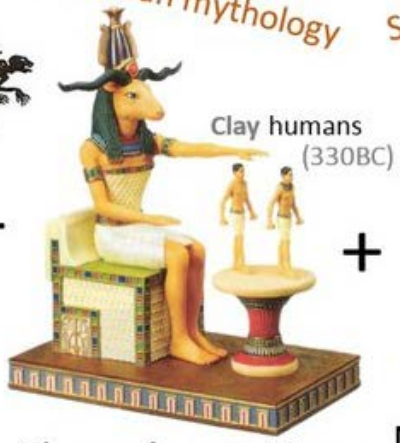

Khnum's creations

+

Sumerian mythology

Enki's rib
(3500BC)

Blood/clay humans

Ninti's life powers

↓

Transcription | De-Poly**theism**-ization | Syncretism

↓

"God created the **Earth** at nightfall 22 Oct **4004 BC**
and then made **Adam** and **Eve** six days later."
— James Ussher (1654)

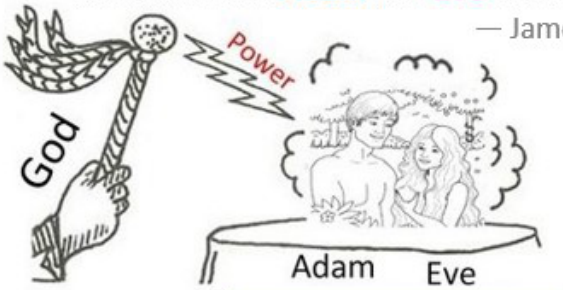

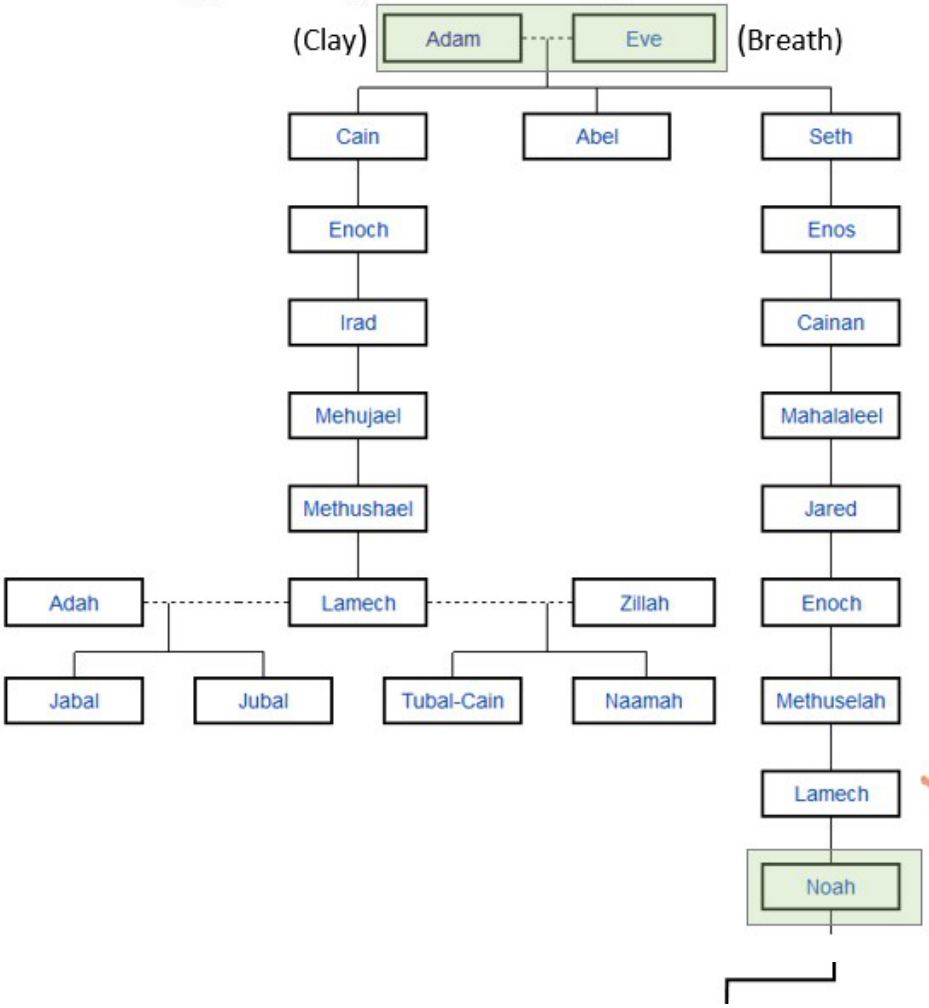

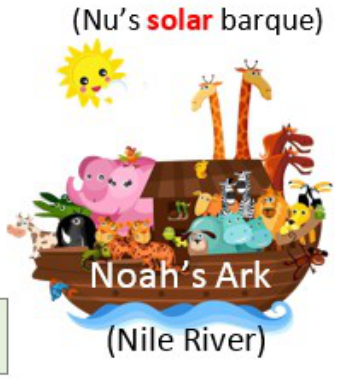

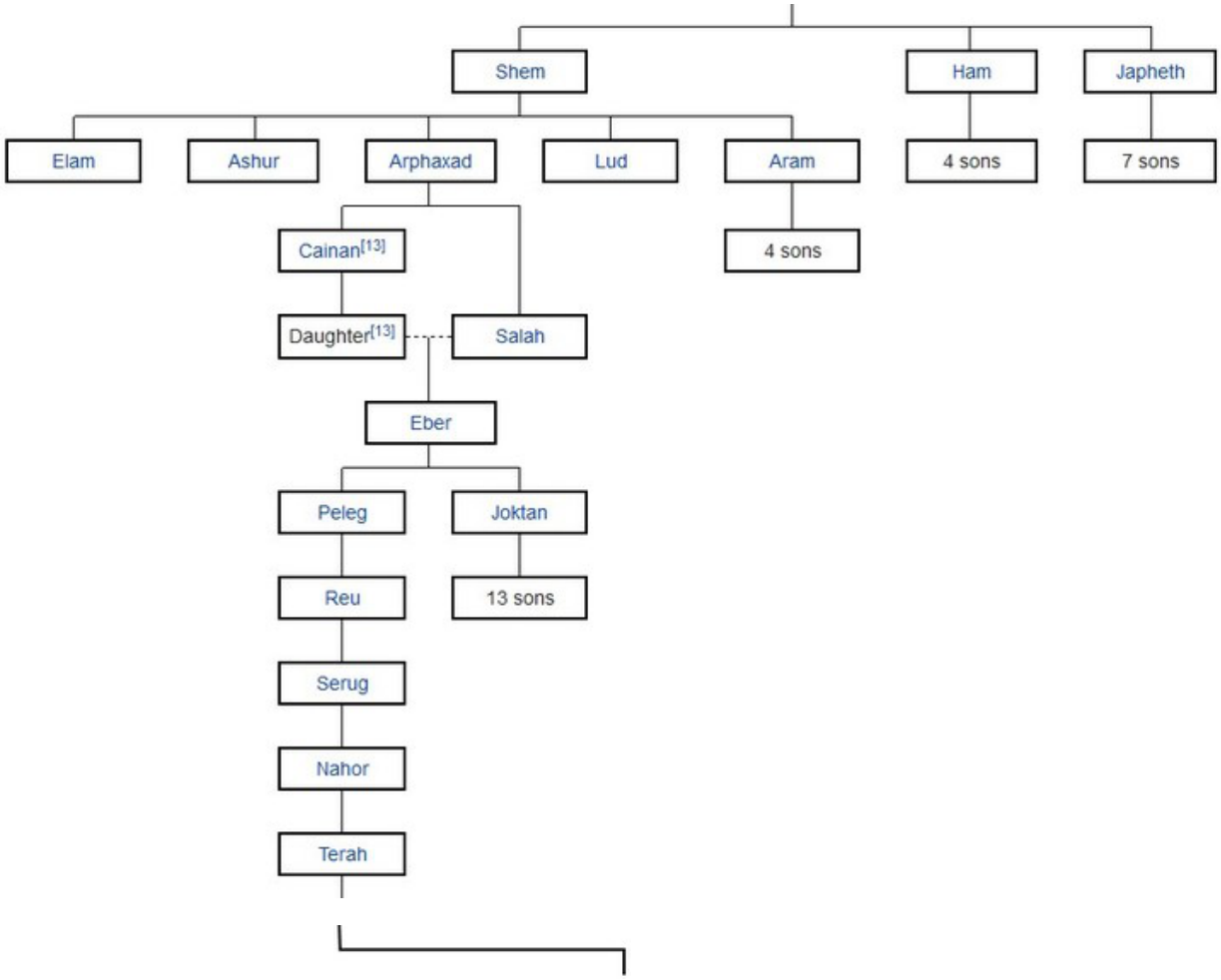
Shem
Ham
Japheth
Elam
Ashur
Arphaxad
Lud
Aram
4 sons
7 sons
Cainan[13]
4 sons
Daughter[13]
Salah
Eber
Peleg
Joktan
Reu
13 sons
Serug
Nahor
Terah

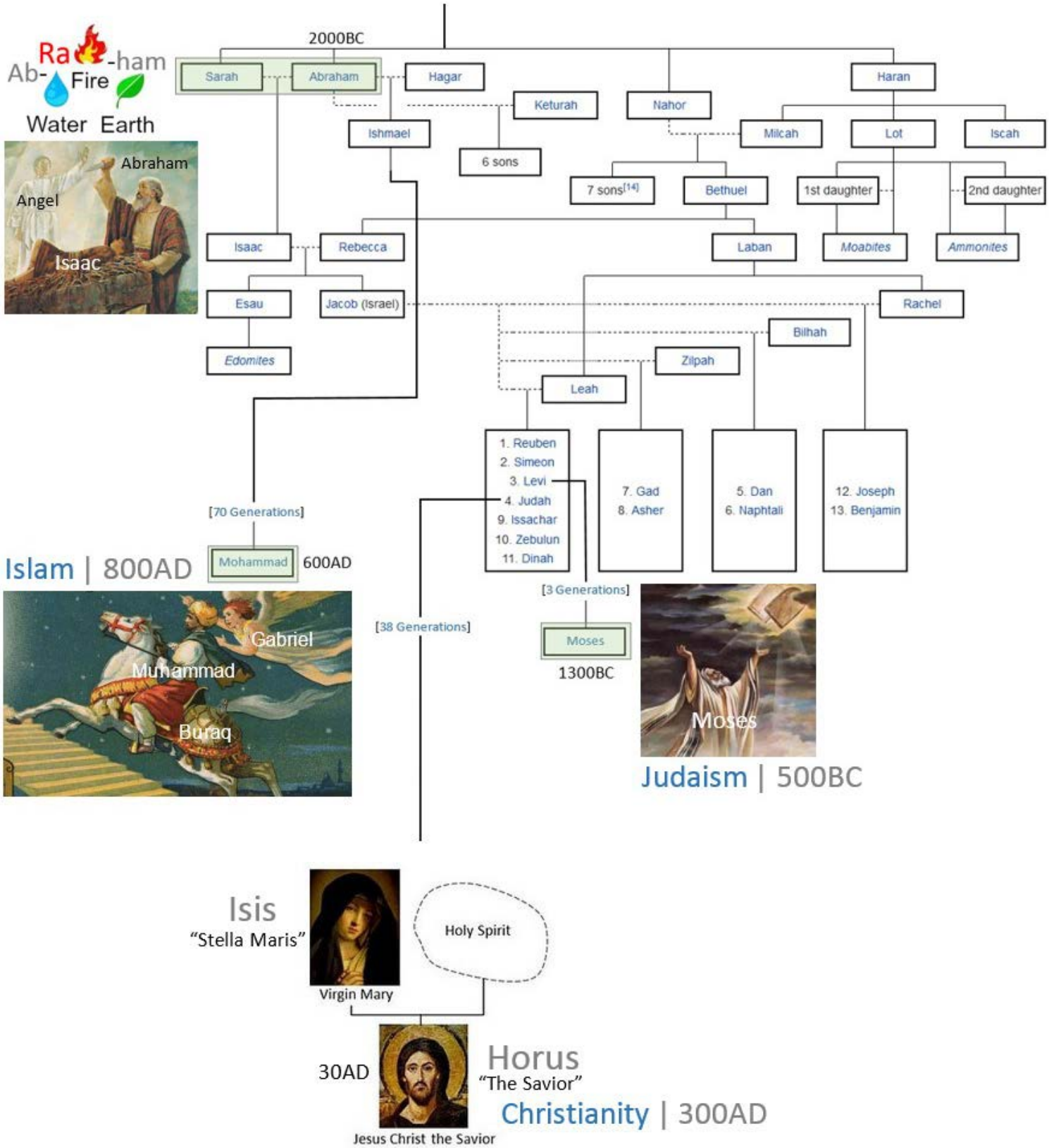

See the religio-mythology transcription and syncretism and comparative religion and mythology articles for more details on the above on this.

B-Ra-hma | Genealogy

The following is a work in progress mapping of the B-Ra-hma-ic branch of world's religions:

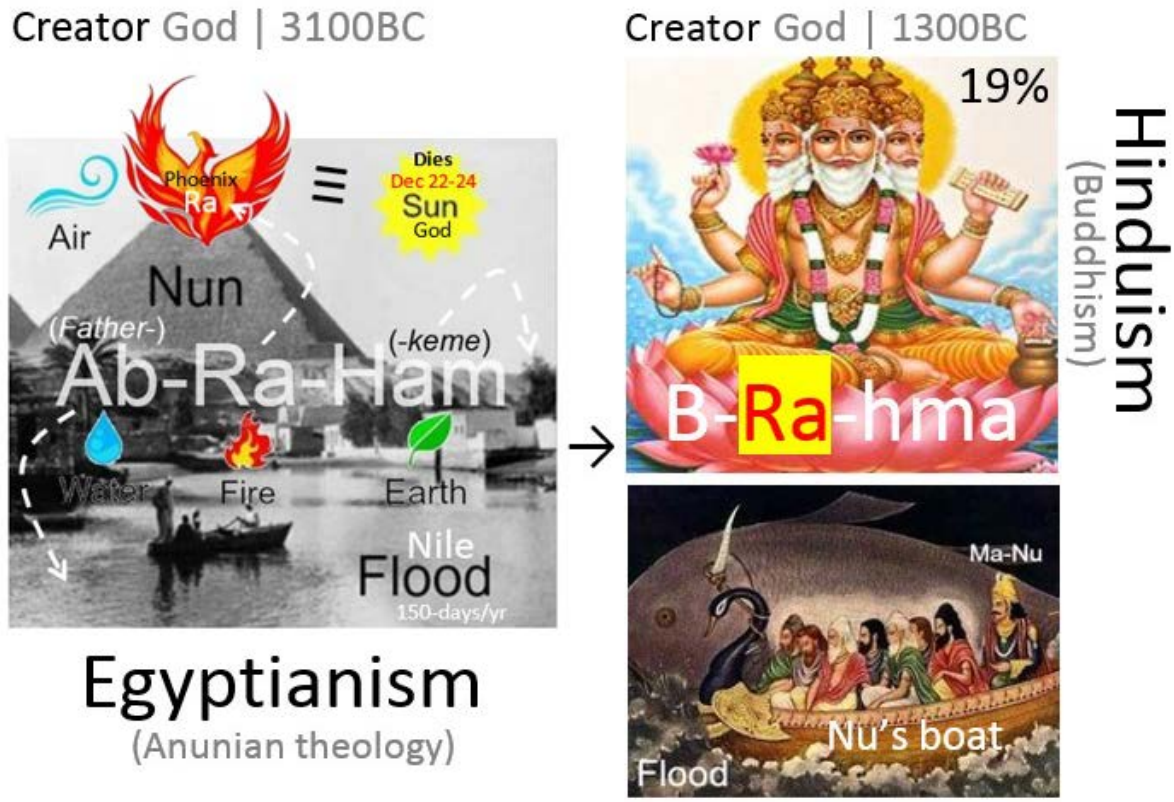

See the religio-mythology transcription and syncretism and comparative religion and mythology articles for more details on the above on this.

Genealogies | Other

The following is a Pinterest image: (Q)

Timelines | Other

The following are other timelines:

- Evolution timeline
- Hirata timeline
- Goethe timeline
- Map of Physics

Genealogies | Other

The following are other genealogies:

- Bernoulli genealogy
- Euler genealogy
- Gauss genealogy
- Goethe genealogy
- Thomson genealogy

See also

- Religio-mythology transcription and syncretism

External links

- Adams Synchronological Chart (1881) – DavidRumsey.com.
- Ancient Egypt | Zerotheism Bible (lecture slide) – Flickr.com.

θΔics

In categories, **religio-mythology scholars** refers to the **158+** thinkers, over the ages, and related, e.g. Egyptologists, who have ventured into the subject of mythology, comparative religion and mythology, religio-mythology, astro-theology, among other names, in the quest to decode the underlying mythologies, namely: Egyptian mythology, Mesopotamian mythology (Sumerian mythology, Akkadian mythology, Babylonian mythology, Assyrian mythology) (Q), Greek mythology, Hebrew mythology (Jewish mythology), Christian mythology, e.g. Christ myth theory, Christ fable, etc., Islamic mythology, among others, to modern religions, in respect to their recensions, redactions, "reissuings" (Harpur, 2004), and or rescripts over time. [N1]

A generalized depiction (Q) of **religio-mythology,** in the context of **scholars**, i.e. thinkers who have studied the mythical roots of modern religions, such as how Christianity (e.g. Jesus) derives, in part from Greek mythology (e.g. Zeus) and Egyptian mythology (e.g. Horus) via syncretism; the Rosetta stone being the key to the Egyptian origins to almost all modern religions.

Overview

(add)

Scholars | per century

The following is a listing of religio-mythology scholars, and related, ordered per century, dated by first and last publication contribution; names **bolded** signify deeper anchor-point thinkers; the [E] notation signifies an Egyptologist; [A] signifies the person was an atheist and or generally classified in the famous atheists category; [A/S] signifies the person was selling spirituality in place of god theory (see: god replacement) and or became atheist [S/A] in later year; the red AR rows signify the person is an "anti religio-mythology scholar", most of which are of the "Christian apologeticist" [CA] variety:

#	Early Centuries	Date	Selling	Publication[s] / Notes
1.	Hesiod (c.750-650BC)	c.675BC		Supposedly based his *Theogony* (c.675BC), meaning “The Creation of the Gods”, via a transliteration of the Egyptian creation myths, the Heliopolis creation myth, specifically.
2.	Solon (c.638-558)	c.575BC		After travelling to Egypt, and learning their theology, according to Plato (Q), he substituted Greek names for Egyptian ones, in writing about the Greek deities, according to which Amen-Ra became Zeus, Set became Typhon, Osiris became Dionysus, Horus became Hercules, Shu became Atlas, etc.
3.	Anaxagoras	c.450BC	Atheism | Labeled	Claimed that the sun was not driven by Apollo, mounted on a chariot, but rather, based on the "evidence" of examined fallen meteors, and the reasoned postulate that moon light was reflected sunlight, that it was a hot or fiery stone, moving in a fifth element, in addition to the standard four elements, he called “aether”, which he conceived of as being in constant rotation

				and carried with it the celestial bodies
4.	Herodotus	c.435BC		Devoted much of the second volume of his *Histories*, to Egyptian religion.
5.	Plutarch	c.100AD		Book: *On Isis and Osiris*.
6.	St. Ireneaus	125AD		Stated that there were a multitude of "gospels" in his time (Graham, 1975).
7.	Basilides	c.130AD		In his heretical “Acts of John”, Christ is described as encountering his followers in “many different guises, not especially a human one”.
8.	Justin Martyr	c.150AD		
9.	Lucian	c.170		Gave one of the first secular accounts of Christians as a deluded creatures, who worship a crucified sage or man, who deny the Greek gods, who believe in immortality, and that the religion was but a get rich quick scheme played by someone by "tricking simple souls".
10.	Origen	c.230		
11.	Bede	c.710		
12.	Abraham Ezra (1089-1167)	c.1150		Discerned, according to Spinoza (Q), that “Moses did not write all of the Pentateuch”.
13.	[A] Frederick II	c.1235		Attributed: *Treatise on the Three Imposters* (Dubbed: Atheist’s Bible)
14.	Meister Eckhart	c.1310		
15.	Petrarch	1341		His epic poem *Africa* (Q), equated Apollo, son of Zeus and slayer of Python, to Christ, son of god and slayer of Satan.
1#.	Desiderius Erasmus	c.1490		
16.	Leonardo da Vinci	c.1500		Rejected Biblical flood theory as being responsible for depositing fossils many miles from their origin. (Q)
17.	Pope Leo X	1514		Described the “fable of Christ” as a “profitable superstition”.
18.	**Noel Journet**	1582	Atheism | New religion	Asked the obvious question of how the *Pentateuch*, aka the *Five Books of Moses* (Genesis, Exodus, Leviticus, Numbers, Deuteronomy), could have been written by Moses, as we are told they were, if the fifth book, of the series, specifically Deuteronomy 34 (Q), describes Moses' own death?
19.	[A] Giordano Bruno	c.1590		
20.	Gerardus Vossius	c.1630		
21.	Samuel Bochart	c.1650	Apologetics	Student of Thomas Erpenius (1599-1667) (Q), teacher of Pierre Huet, noted for doing work on the Bacchus-Moses connection (see: Osiris, Dionysus-Bacchus, and Moses), e.g. pointing out that they were both buried in unknown tombs (see: Moses pens his own death problem).
	Thomas			

22.	Hobbes	c.1651	Crypto-atheism	First to argue that Moses was NOT the author of the Pentateuch.
23.	Isaac Peyrere	c.1655		Argued that there were men BEFORE Adam and that Moses was NOT the author of the Pentateuch.
24.	Benedict Spinoza	1670		Denied, citing Abraham Ezra (c.1150), that Moses wrote the Pentateuch.
25.	Pierre Huet	1679		
26.	John Toland	1696/1722		

	18th century	Date	Selling	Publication[s] / Notes
27.	Bernard Fontenelle	1724		Supposedly, did some of the first work on Bible as myth discussion.
28.	Voltaire	1728/1770	Deism/Atheism	
29.	Marquis of Argens	1736		Argued, via geological reasons, that Noah's flood is impossible.
30.	Jonathan Edwards (1703-1753)	c.1750	Apologetics	Building on, supposedly, Samuel Bochart, did work on the Bacchus-Moses connection. (Q)
31.	Nicolas Boulanger	1761		
32.	Immanuel Kant	c.1764		Compared Adam and Abraham with Adimo and Brahma, and argued that Joseph was equivalent to Ganesha.
33.	**Baron d'Holbach**	1770	[A] Materialism	*The System of Nature: Laws of the Moral and Physical World* [Atheist's Bible]
34.	**Charles Dupuis**	1771/1806		
35.	**Constantin Volney**	1771		
36.	Ethan Allen	1784	Reason/Atheism	His *Reason: the Only Oracle of Man*, a harsh denunciation of Christianity, touched on the Moses pens his own death problem.
37.	[A] **Thomas Paine**	1794	Reason/Atheism	*The Age of Reason* [Atheist's Bible]

	19th century	Date	Selling	Publication[s] / Notes
38.	Joseph Hager	1801		
39.	William Hort	1802		Worked on the Bacchus-Moses connection. (Q)
40.	**Charles Lebrun**	1803		
41.	Thomas Jefferson	1804/1823	Epicurean materialism	*Jefferson's Bible*
42.	Sergey Uvarov	1812		Connected Osiris with: Tammuz, Dionysus, Bacchus, Liber, and Adonis.

42.	[E] Thomas Young	1814/1818		**Initiated:** decipherment of hieroglyphics.
43.	[A] Napoleon Bonaparte	1817		
44.	Edward Stillingfleet	1817		Worked on the Bacchus-Moses connection. (Q)
45.	[E] Jean Champollion	c.1820/1822		**Completed:** decipherment of hieroglyphics.
46.	Heinrich Ritter	1829/1853		
47.	**Robert Taylor**	1828/1833	Atheism	Was jailed for 3 years for publishing works arguing that "Jesus never existed".
48.	Charles Coleman	1832		Connects Egyptian, Hindu, and Roman mythologies. (Q)
49.	**Godfrey Higgins**	1833		
50.	David Strauss	1835		
51.	Bruno Bauer	1840	Hegelian atheism	Argued that Jesus was myth per silent historians problem logic
52.	Franz Movers	1841		
5#.	[E] Samuel Birch	1841/1880		
53.	Anon [German Jew] (Q)	1841		
54.	[E] Richard Lepsius	1842		**Translation:** *Egyptian Book of the Dead* (English).

Modern Religio-Mythology

55.	Logan Mitchell	1842/1881		
56.	Jean-Marie Ragon (Q)	1843		
57.	Romualdo Gentilucci	1848		
58.	Alexander Hislop	1853		
59.	Samuel Dunlap	1858/1894		First to state the god-to-prophet technique, explicitly.
60.	[E] Peter Renouf (Q)	c.1861		
61.	**Samuel Sharpe**	1863		
62.	Ernest Renan	1864		Chief of the German “higher criticism” school, which systematically studied the origins and sources of the Bible; his *Life of Jesus* (1864) established conclusively that the Bible was

				written over a long period of time, spanning perhaps as much as a millennium, finally assembled in a haphazard manner. [6]
63.	Charles King	1864/1887		
64.	[E] Heinrich Brugsch	1864/1888		
65.	**William Cooper**	1870/1876		
67.	James Peebles (Q)	1870		
68.	Archibald Sayce	1872/1913		
69.	Auguste Mariette	1873		
70.	Kersey Graves	1875	Atheism / Secularism	*The World's Sixteen Crucified Saviors*
71.	Helena Blavatsky	1877		
72.	John Stuart-Glennie	1878		
73.	DeRobigne Bennett	1881	Atheism	
7#.	Gaston Maspero	1881/1899		
74.	[E] **Gerald Massey**	1881/1907	Evolution / Spiritualism [?]	
75.	**Herbert Hardwicke**	1884/1887		
76.	Edouard Naville	1886		
77.	Iosif Kryvelev (Q)	1887		
78.	[A] **Friedrich Nietzsche**	1888		
79.	James Frazer	1890/1915		*The Golden Bough*
80.	[E] **Wallis Budge**	1890/1929		
81.	Watson Heston	1892/1900		
82.	William Smith (Q)	1894		
83.	George St. Clair	1898		

20th century	Date	Selling	Publication[s] / Notes

84.	John Robertson	1900	In his *Christianity and Mythology* (Q), he devotes chapters and sections to: “Christ and Krishna”, “Hebrew mythology”, Virgin and Child derived from Isis and Horus, Horus born on Christmas, etc.
85.	Albert Kalthoff (Q)	1902/06	
86.	**Constantine Grethenbach**	1902/1903	
	Robert Shaw	1904	Connected Anubis with John the Baptist
87.	[E] Flinders Petrie (Q)	1905	
88.	Alice Grenfell	1906	
89.	Arthur Drews (Q)	1907	
90.	Thomas Cheyne	1907	
91.	Albert Churchward (Q)(Q)	1910/1921	*The Christ Myth*
9#.	Singleton Davis	1910/1911	Editor of the *Scientific Rationalism, Psychology, Biology, Sociology, Comparative Religion and Mythology, Freethought, Ethical Culture* (Q) magazine, wherein he (Q) decodes (1910) things such as the Is-ra-el puzzle; which is host to articles such as: “What was Jesus: Man, Myth, or God?” by T.S Givan, among others.
92.	**Wakeman Ryno**	1912	
93.	Hugo Gressman (Q)	1913	
94.	George Gurdjieff	1915	
9#.	Alan Gardiner	1916	
95.	Ernst Sellin	1922	
96.	Thomas Spivey (Q)	1927/1935	
97.	Henry Mencken	1930	In his *Treatise on the Gods* (Q), citing Archibald Sayce [RMS:48], attempted to reconstruct Genesis as but a borrowed of ideas from the Babylonians.
9#.	Joseph Wheless (Q)	1930	
98.	**Alvin Kuhn**	1930-1960	
99.	Edward Ulback (Q)	1936	
100.	Sigmund Freud	1939	

101.	Archibald Robertson (Q)	1946		
102.	Karel Hujer	1946	Universal consciousness	
10#.	Robert Graves	1948		His *The White Goddess* (Q) was influential to Gary Greenberg.
103.	**Joseph Campbell**	1949/1960		Asserted, in his *The Hero with a Thousand Faces* (1949), the theory that a single myth stood behind the stories of Krishna, Buddha, Apollonius of Tyana, Jesus and other hero stories; in his *The Masks of God: Occidental Mythology, Volume Three* (1960), stated "it is clear that, whether accurate or not as to biographical detail, the moving legend of the crucified and risen Christ was fit to bring a new warmth, immediacy, and humanity, to the old motifs of the beloved Tammuz, Adonis, and Osiris cycles." (Q)
104.	[E] **Rene Lubicz**	1949		
105.	Herbert Cutner (Q)	1950		
106.	Alexander Badawy (Q)	1954		
107.	Hilton Hotema	1956/1963		
108.	Andrija Puharich (Q)	1959		
109.	Raymond Faulkner	1968		Published Spell 148 of the Coffin Texts, which gives the original account of the "virgin birth" and the "holy spirit"; also translated Egyptian Book of the Dead (1972).
11#.	John Allegro (Q)	1970/1971		
110.	Jordan Maxwell	1970/2010		
111.	George Wells (Q)	1971/2004		
112.	Othmar Keel (Q)	1972		
113.	Lloyd Graham	1975	Astrology, new age, gnosticism, evolution	*Deceptions and Myths of the Bible*
114.	Robert Temple	1976		In his *The Sirius Mystery*, based on the findings of Griaule and Dieterlen (1950), asserted the highly speculative view that the Dogon people, of Mali, West Africa, knew that Sirius was a binary star (Sirius A and Sirius B).
115.	James Arthur	1976/2000		
116.	John Griffiths (Q)	1980		
117.	[E] Erik Hornung	1982/2001		

118.	John Jackson	1985		
119.	Richard Friedman	1987		*Who Wrote the Bible*
120.	Robert Bauval	1983		Figured out that the thee stars of Orion's belt are the basis of the three pyramids at Giza.
121.	Ahmed Osman (Q)	1990		
122.	Karl Luckert	1991		
12#.	Anthony Browder	1992	Amen-stylized unseen force of god model	Noted for his *Nile Valley Contributions to Civilizations* (1992) and for his semi-intelligent video discussions (Q) of the Washington obelisk being the symbol of Osiris or his phallus.
123.	Michael Jordan	1993		
124.	Bart Ehrman	1993/2016		
125.	[E] **Gary Greenberg**	1996/2011		*101 Myths of the Bible*
12#.	J.S. Gordon (1946-2013)	1997		In his *Land of the Fallen Star Gods*, building on the work of Helena Blavatsky, digresses on stars, gods, and mythology.
126.	Moustafa Gadalla (Q)	1997/2007		
127.	Muata Ashby	1997/2015		
128.	**Dorothy Murdock**	1999/2014	Spiritualism / Atheism	*The Christ Conspiracy: The Greatest Story Ever Sold*
129.	Timothy Freke	1999/2012		
130.	Earl Doherty (Q)	1999/2009		*The Jesus Puzzle*
	21st century	**Date**	**Selling**	**Publication[s] / Notes**
131.	Richard Cassaro	2000		In 2000, he commissioned (Q) a New York City street artist to make the now-famous Jesus and Osiris split image parallelism (adjacent), for book he was drafting, tentatively entitled *Osiris: the Egyptian Christ*; penned a 2011 rudimentary article (Q) on this connection. Inspired (Q) by: Earl Doherty (*The Jesus Puzzle*, 1999); Dorothy Murdock (*The Christ Conspiracy*, 1999); Timothy Freke and Peter Gandy (*The Jesus Mysteries*, 1999); George Wells (*The*

132.	Kenneth Humphreys	2001/2014		*Jesus Myth* / *The Jesus Legend*, 1999); Arthur Drews (*The Christ Myth*, 1910); Robert M. Price (*Deconstructing Jesus*, 2000); Hyam Maccoby (*The Mythmaker: Paul & the Invention of Christianity*, 1987); Burton Mack (*Who Wrote the New Testament?*, 1995); and Elaine Pagels (*The Gnostic Gospels*, 1979), launched: JesusNeverExisted.com, which turned 2014 book. (Q)
133.	Patrick Geryl (Q)	2001		
134.	Gene Matlock	c.2002		Worked on the Abraham and Brahma problem.
135.	Daniel Lazare (Q)	2002		
136.	Richard Gabriel (Q)	2002		
137.	Tim Callahan (Q)(Q)	2002/2005		
138.	**Libb Thims**	2003		
139.	Simson Najovits	2003/2009		
140.	**Tom Harpur**	2004-present	Theism | Christ within	*The Pagan Christ*
AR	W. Ward Gasque	2004		20 leading Egyptologists poll [3]
141.	Ralph Ellis (Q) (Q)	2004		
142.	Bojana Mojsov	2005		Was in the documentary "The Hidden Story of Jesus" (Q), discussing the Osiris-Jesus connection; book: *Osiris: Death and Afterlife of a God* (Q)(Q)
143.	Joseph Atwill	2005/2012		
AR	John Holding	c.2005/2008		[4]
AR	Stanley Porter & Stephen Bedard	2006		*Unmasking the Pagan Christ: An Evangelical Response to the Cosmic Christ Idea* [5]
144.	**Peter Joseph**	2007		**Film:** *Zeitgeist*
145.	Harry Tabony (Q)	2007		
146.	Fahim A. Knight (Q)	2007		
147.	Bill Maher	2008	Atheism | Rationalism	**Film:** Religulous [2]
14#.	Gordon Johnston	2008		Connects Genesis to Hermopolis creation myth (compare: Gary Greenberg). [8]
148.	John Pippy (Q)	2009		

149.	Eddie Austerlitz (Q)	2010		
150.	David Fitzgerald	2010	Atheism	
151.	Joseph Matlock (Q)(Q)	2010		
152.	Michael Paulkovich	2012		His *No Meek Messiah* digresses on the silent historians problem and explains how a large number of "spells" of the Book of the Dead became centerpieces of the Bible.
AR	Jon Sorenson [CA]	2012		"Horus Manure: Debunking the Jesus/Horus Connection" [2]
152.	Larry Marshall (Q)	2013		
153.	Horus Gilgamesh	2013	Non-believer [Non-identifying atheist]	
AR	Mark Foreman [CA]	2013		"Challenging the Zeitgeist Movie"
15#.	John Ostrowick (Q)	2013		
15#.	Pier Tulip	2013		Author of the 2013 Italian published *Krst: Gesu un Mito Solare* (Q), inspired by Dorothy Murdock, translated in English as *Krst: Jesus a Solar Myth* (2015) (Q).
154.	[A] Richard Carrier	2014	Atheism | [Type?]	
155.				

(add discussion)

Quotes

The following are related quotes:

> "It would appear almost an act of folly, in pretending to uproot that ancient Upas-tree (Q)(Q) of religious superstition, under the poisonous shade of which mankind has been for [millennial] ages accustomed to repose, and the roots of which are so widespread and profound."
>
> — Charles Dupuis (c.1794), cited as views in agreement with by 1872 English translator [1]

> "We think ourselves possessed, or, at least, we boast that we are so, of liberty of conscience on all subjects. Yet, how far are we from these exalted privileges in fact! **There exists**, I believe, throughout the whole Christian world, **a law which makes it blasphemy to deny our doubt the divine inspiration** of all the books of the Old and New Testaments, from Genesis to Revelation. **Who would run the risk of translating Dupuis**?"
>
> — John Adams (1825), "Letter to Thomas Jefferson", Jan 23

"Let me not be called a wicked atheist for seeing the likeness between Brahma and Abraham."

— Godfrey Higgins (1833), *Anacalypsis, Volume One* (pg. 391)

"Birch and Brugsch are the two greatest masters of Egyptology."

— Wallis Budge (1904), *The Gods of the Egyptians, V1* (pgs. 63-64)

"The points of contact between Judaism and the religion of Babylonia have frequently been mentioned by numerous writers, but the traces of Egyptian mythology in both Jewish and Christian scriptures have not been so much noticed, nor could they be till quite lately. It is only within the last few decades that students have been sufficiently well provided with mythological texts and commentaries to be in possession of the necessary material, thanks to the labors of Birch [Samuel Birch], von Bergmann, von Bissing, Breasted, Brugsch, **Budge**, Chabas, Deveria, Grebaut, Guieysse, de Horrack, Jequier, Lanzone, Ledrain, Lefebure, Legrain, Lieblein, Mariette [Auguste Mariette], Maspero, Moret, Piehl, Pierret, Pleyte, Renouf, Sharpe, Spiegelberg, Wiedemann and others. The relationship of Egyptian mythology to Jewish religion is too large a subject to discuss fully; *haec peritioribus relinguo* [these religious experts]; so I only mention a few traces of Egyptian influence in the Old Testament, but there are many others. I will then point out the more numerous Egyptian touches in the New Testament."

— Alice Grenfell (1906), "Egyptian Mythology and the Bible"; cited by Thomas Cheyne (1907)

See also

- Religio-mythology genealogy

Notes

N1. this page originated as a "see also" section of the Wallis Budge article; which grew in size, therein mediating the need for a sideways scrolling listing of scholars by century; this side-scrolling listing (13 Feb 2017) was changed into the above table listing, at the 110+ scholar level, so to include the "Selling" column, amid reading of Tom Harpur (2004), and his selling of "internal Christ" model in the course of his Massey-Kuhn-Higgins based Jesus debunking.

References

1. Dupuis, Charles. (1797). *The Origin of All Religious Worship: Universal Religions Abridged* (roots, pg. 5; Chenier, pg. 9). C.C.W. Müller, 1872.
2. Sorenson, Jan. (2012). "Horus Manure: Debunking the Jesus/Horus Connection" (Q), StrangeNotions.com.
3. Gasque, W. Ward. (2004). "The Leading Religion Writer in Canada: Does he Know What He is Talking About?" (Q), HistoryNewsNetword.org, Aug 17.
4. (a) Holding, John P. (c.2005). "Tom Harpur's *The Pagan Christ:* a Critique" (Q), Tektonics.org.
(b) Holding, John P. (2008). *Shattering the Christ Myth: Did Jesus Not Exist?* (Amz) Xulon Press.
(c) John Patrick Holding (about) – Tektonic.org.
5. Porter, Stanley E. and Bedard, Stephen J. (2006). *Unmasking the Pagan Christ: An Evangelical Response to the Cosmic Christ Idea*. Clements Publishing.
6. Lovecraft, H.P. (2010). *Against Religion: the Atheistic Writings of H.P. Lovecraft* (editor: S.T. Joshi; foreword: Christopher Hitchens) (abs) (Amz) (pg. xxi). Sporting Gentlemen.
7. Gordon, H. Johnston. (2008). "Genesis 1 and Ancient Egyptian Creation Myths" (Q), *Bibliotheca Sacra*, 165:178-94, Apr-Jun.

θΔics

In history, **religio-mythology transcription and syncretism** refers to the copying, translation, and syncretism (blending) of mythological, religious, and religio-mythology beliefs, which for 75 percent of world religions is Egyptian-based.

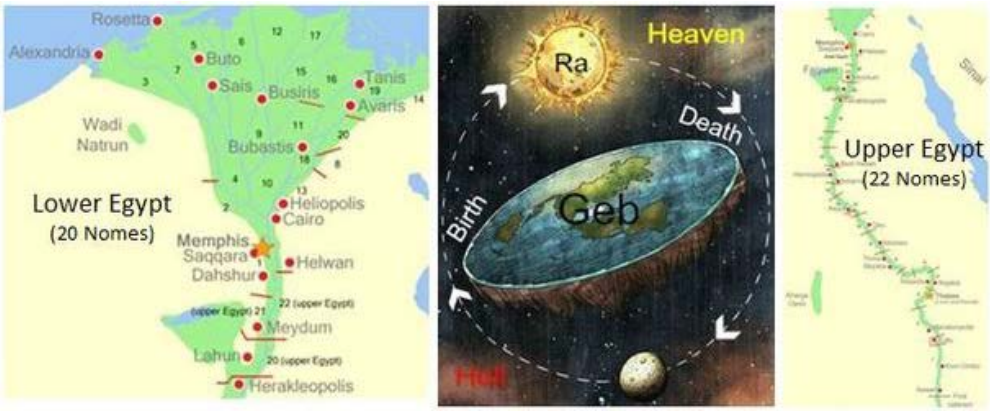

Egyptian cosmology: in 3100BC upper and lower Egypt united to form the world's superpower for the next three-thousand years (3100-330BC), until eclipsed by the Greco-Roman empire (330BC-500), initiated by Alexander the Great (330BC), who in turn were overthrown by the Muslim (642), all of which resulted in an adoption, albeit modification of the previous cultural religion, of a sun (Ra) and flat earth (Geb) conceptualized cosmos, according to which 3 of 4 people in modern times directly trace their belief systems to Egyptian religio-mythology, i.e. Anunian theology deriving from the Heliopolis creation myth, which in turn is based on the cyclical birth-death theory of the sun, dating from 4000BC if not earlier. (Q)

Pre-Dynastic period | 5500-3100BC

In Egypt, in the pre-Dynastic period (5500-3100BC), there existed a number of fragmented tribes, among which the creator god and sun god Re or "Ra", as the Greeks and Romans referred to him, synonyms including: Re-Atum, Re-Khepri, and Amun-Re, and later "Re in Osiris" or "Osiris in Re", was one of several manifestations of the sun deified, who according to legend created himself out of a mound that arose from the primeval ocean; in other depictions, he arose as a child from the primeval lotus blossom. He is generally depicted in the form a falcon wearing the sun disc on its head, surrounded by a serpentine form of the cobra-goddess Wadjet, which is indicative of the theory that at the end of the day, when the sun sets, it is swallowed by a snake and journeys through its inside before being re-born the next day. [7]

Khepri | Ra

In this period, the so-called "Story of Re", or Ra creation myth, was prevalent, according to which in the beginning there was no land of Egypt, all was darkness, and there was nothing but a great abyss of water called "Nun", out of which Re (or Ra), sometimes depicted as a great shining egg, was born. Re was considered a transformative god and he came to be melded with the scarab beetle (dung beetle) birthing cycle, which accrues though the observable process in which scarab beetle rolls dung into a ball, pushes it into a hole, lays its eggs into it, and a few weeks later, beetle larvae, after eating the dung, emerge from the hole (or mound) as though "reborn":

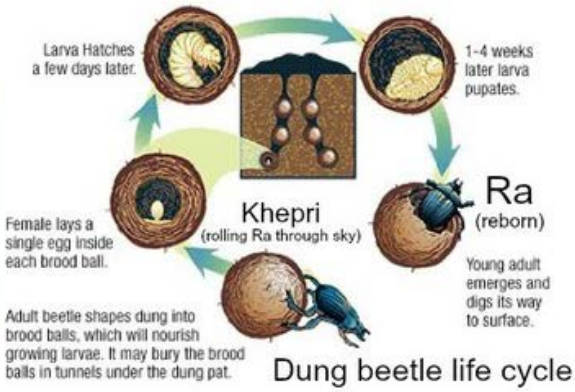

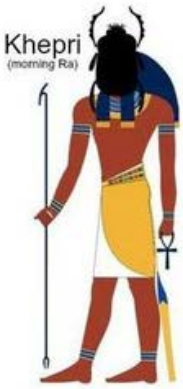

The Egyptians deified this dung beetle burial rebirth cycle into the form of a god called Khepri (Q) or Khepera (Q), from the Egyptian term *kheprer* "to become". The god Khepri, in short, is based on the verb *kepher*, meaning "develop" or "come into being". (Q) One myth blogger (2012) discusses this as follows: (Q)

> "Why did the ancient Egyptians worship a large beetle that rolls a ball of dung, lays its eggs inside it, and then pushes the ball along the ground? Why did the Egyptians call this beetle kheper, with the metaphorical meaning 'becoming, to come into being'? Why did they associate the lowly dung beetle with Re, their supreme being and sun god, and give their beetle-god avatar of Re the name Khepri? Many Pharaohs incorporated kheper into their 'throne name', the official name they assumed at their coronation. King Tut's treasures are decorated with elaborate cartouches of his throne-name Neb Kheperu Re, 'The Lord of Becoming/Manifestation/Creations is Re.' Tourists to Egypt buy scarabs modeled on King Tut's scarab-jewelry, not realizing that they're paying homage to dung beetles"

Khepri, thereafter, became known as the "god of the rising sun", who was conceptualized as the morning Ra, who transformed throughout the day, as follows: Khepera (sun born) in the morning, Re (full sun disc) at noon, and the god Atum (main Heliopolis creator god) in the evening, or in Egyptian inscription poetic form: [8]

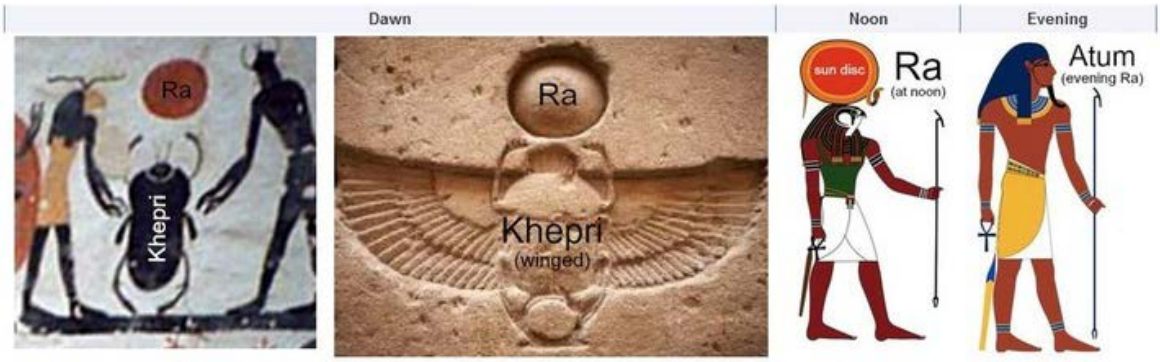

> "I am Khepera at the dawn, and Ra at noon, and Atum in the evening."
>
> — Anon (c.3100BC), Egyptian inscription (O)

In Heliopolis, Egypt's first capital, discussed further below, Atum—who is often depicted in human form, wearing a crown that combines those of upper and lower Egypt—and Ra shared joint rolls as the sun god, and eventually became joined as Atum-Ra (Atum-Re) or Ra-Atum (Re-Atum). [7]

Mastabas

In 3100BC, in the 1st Dynasty, earliest chamber filled burial mounds, called "mastabas", of nobles, were being constructed in the great cemetery of Saqqara, near Memphis, which, as has been argued, were based on the dung beetle burial mounds birthing cycle, conceptualized by the Egyptians as a model of death, burial, and rebirth:

> "It may not have gone unnoticed that the pupa, whose wings and legs are encased at this stage of development, is very mummy-like. It has even been pointed out that the egg-bearing ball of dung is created in an underground chamber which is reached by a vertical shaft and horizontal passage curiously reminiscent of Old Kingdom mastaba tombs."
>
> — Carol Andrews (1994), *Amulets of Ancient Egypt* [9]

Into 2700BC, mastabas began to be stacked on top of mastabas, to eventually form "step pyramids", and in turn and "great pyramids" at Giza, to follow, all of which modeled on dung beetle burial seeming rebirth model; which then later became to individual people, and moral theory, and burial, via Osiris-Horus resurrection logic:

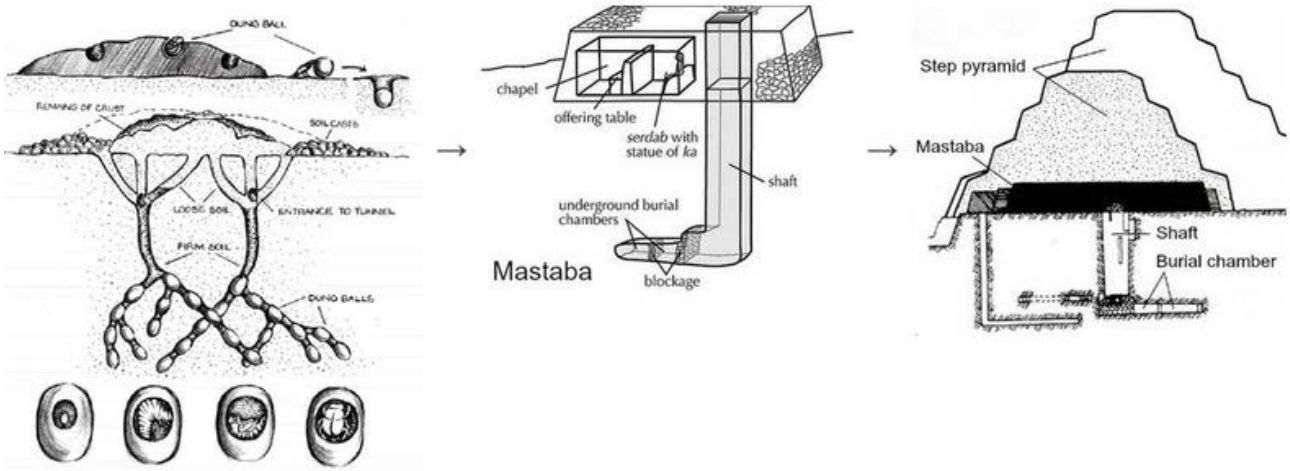

The dung beetle mound burial life cycle, in short, coupled to the day light cycle and yearly solar cycle, and Nile river flood cycle, gauged by star (astrology) mapping markings, is the model behind the resurrection of Osiris, and in turn the resurrection of Jesus, the world dominant religious belief, as outlined further below.

Heliopolis | Memphis | 3100-2800BC

See main: Heliopolis creation myth

In 3100BC, the 42 Nomes or cities (territories) of Pre-Dynastic Egypt, shown adjacent, merged

into the Egyptian First Dynasty (country), after which a state religion began to form, wherein each previous 42 nome deities were given a place in the so-called "judgment hall" of the afterlife, wherein, as would later be implemented, the 42 negative confessions, were read and the weight of the soul determined, before Osiris, the king judgment god of the afterlife, which later became the number of generations of descendants between God (or Ra, Osiris' great grandfather) and Jesus (or Horus, Osiris' son), in Christianity. The first major capital to rise to power was Heliopolis, aka the city of the sun.

A depiction of Lower Egypt, showing Heliopolis, the place where Heliopolis creation myth originated, the capital during the formation of the 1st Dynasty (3100BC), and Memphis, the state capital in 2800BC, during which time the world's main creation myth was formulated: a sun (fire) born out of a mound (earth), considered the center of the universe, following a flood (water), which became the basis of Aristotelean cosmology, which lasted up until the Copernican revolution (1543-1687).

The state religion, therein, became that centered around the Heliopolis creation myth, itself based on the annual 120-day (or 150-day) flooding of the Nile river (O), whose typical flood heights would rise to 25ft (Cairo) to 38ft (Thebes) to 45ft (Aswan), which at that time was conceptualized as of divine origin—albeit first noted to be the result of Ethiopian mountain snow melting by Lucretius, in his 55BC *On the Nature of Things* (§:6.712...735-737)—according to which the universe (or world), conceptualized as being flat in nature, originally was water, after which a land (earth) mound arose, then the sun (fire) burst forth, then life arose therefrom, a "three element model" (compare: four element theory), conceptualized on the fact that when the flood receded, a fertile black soil called *keme* (pronounced 'chem') is left, which is the root name of both ancient Egypt (Kemet or kmt) and the science of the elements (chemistry).

This flood/keme/sun model soon became deified into the form of the Ennead cosmogony (group of nine) or the Heliopolitan Ennead (O), in which the rising land mound became conceptualized as the primordial god Nun (or Nu), who was perceived as transcendent at the point of creation alongside Atum (fire or the sun), the creator god, who then self-creates two progeny gods: Shu (air) and Tefnut (moisture), who then create two progeny gods: Geb (earth) and Nut (heaven), who then create four progeny gods: the 'good' pair Osiris and Isis and the 'bad' pair Seth and Nephthys, a diagram of which is shown below (left). In 2800BC, the capital of Memphis rose to power, according to which their central deity Ptah became syncretized, as the new leading power divinity, into the Heliopolis Ennead, diagrammed below (right): [1]

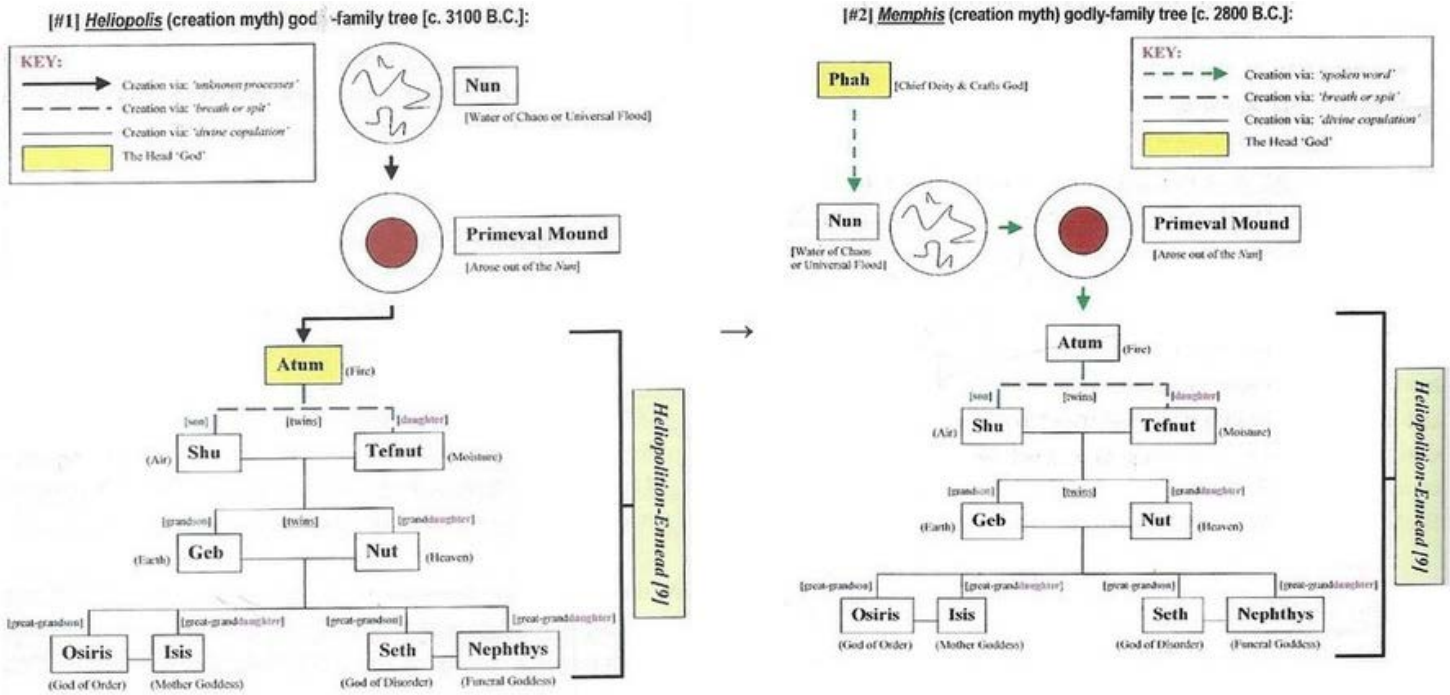

(add discussion)

Hermopolis | Thebes | 2400-2040BC

See main: Hermopolitan creation myth

In 2400BC, the city of Hermopolis rose to power, after which their dualistic paired grouping of eight creator gods, i.e. the Hermopolitan Ogdoad (O), merged or syncretized with the Heliopolis-Memphis model, as shown below (left). In 2040BC, the city of Thebes rose to power, after which their creator god Amen became re-conceptualized as different incarnations of the previous creator gods: Re (or Ra), Atum, Ptah, and Hermopolitan-Ogdoad, respectively, as shown below (right): [1]

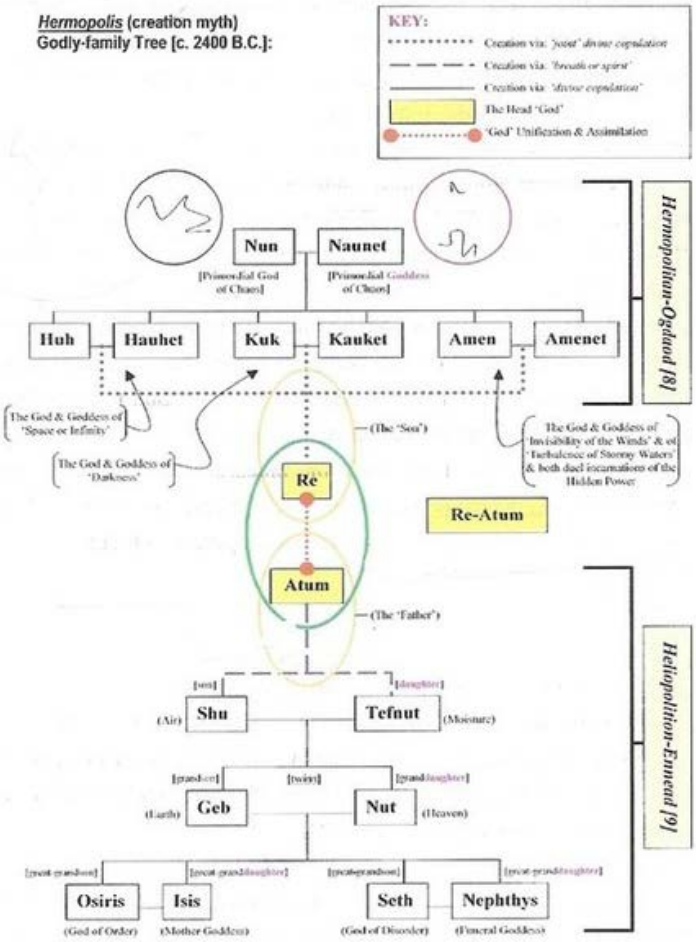

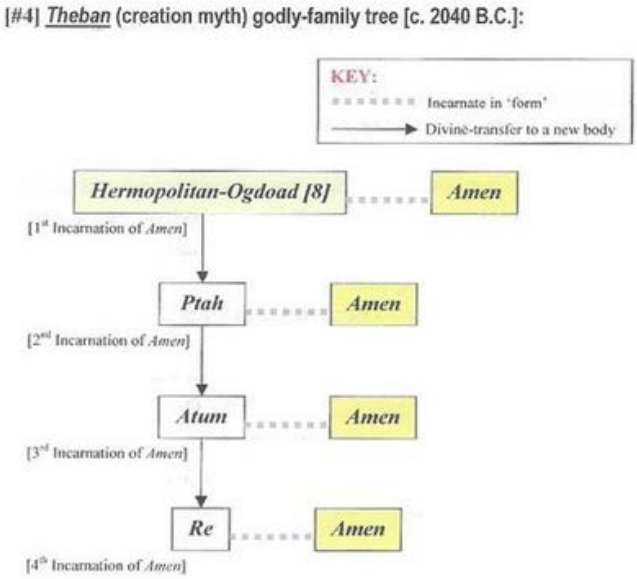

In 500BC, the Hermopolitan creation myth plus the Theban creation myth, was monotheized, i.e. de-deified, into the verbal form of biblical creation as described in Genesis (1:1-2), as described below left by Gary Greenberg (2000), and illustrated, below right by R. Crumb (2009): [11]

Myth #1:
In the beginning everything was without form and void.

The Myth: In the beginning God created the heaven and the earth. And the earth was without form, and void; and darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters. (Gen. 1:1–2)

The Reality: Genesis uses the Hermopolitan Creation scheme to describe the state of the universe before Creation begins. The four male deities have been omitted from the story but their essential characteristics have been retained.

Myth #2:
God initiated Creation with a spoken word.

The Myth: And God said.... (Gen. 1:3)

The Reality: The initiation of Creation by spoken word comes from the Egyptian Creation myths.

Myth #3:
Creation began with the appearance of light.

The Myth: Let there be light: and there was light. (Gen. 1:3)

The Reality: Genesis follows the Theban Creation doctrine when it begins the Creation process with the appearance of light.

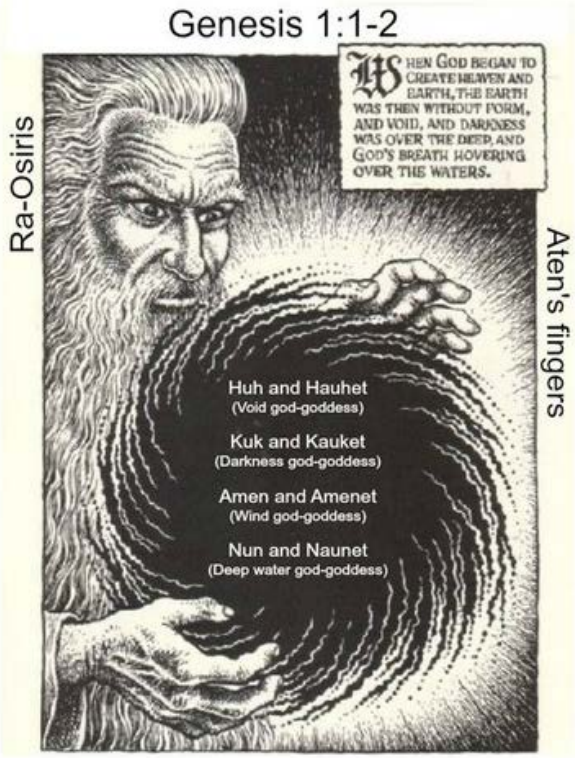

The dissection of myth #4, i.e. how God separated the light from darkness on the first day, becomes a bit more involved, in that Genesis has two

contradictory accounts (Gen 1:3-5 and Gen 1:14-19) of (a) how and why light was separated from darkness and (b) the puzzling issue of how there was light before there was a light source? Greenberg goes into some detail on the first point; the second point is a frequently cited Biblical absurdity (e.g. mAtheist app).

Passion of Osiris | 1900-300 BC

The apex of Egyptian religion, amid all of the various state power shuffling's and god transitions, came to be belief in the birth-death-resurrection cycle of Osiris, the god in charge of granting people afterlife. Worship of Osiris spans over two-millennia, as is summarized well by American religious historian Patrick Reid: [2]

> "The nearest thing to a truly national religion in Egypt was the Osiris cycle. The story is not extant in full epic version but must be pieced together from several ancient and classical sources: the *Pyramid Texts* [c.2400-2300BC] of the Old Kingdom, the *Coffin Texts* [c.2100-1650BC] of the Middle Kingdom, the *Book of the Dead* [1550-50BC] from the New Kingdom, a ribald text entitled *The Contest of Horus and Seth for Rule* [c.1187-1064BC] from the Twentieth Dynasty, and the summary of Plutarch in *Concerning Isis and Osiris* from the second century C.E."

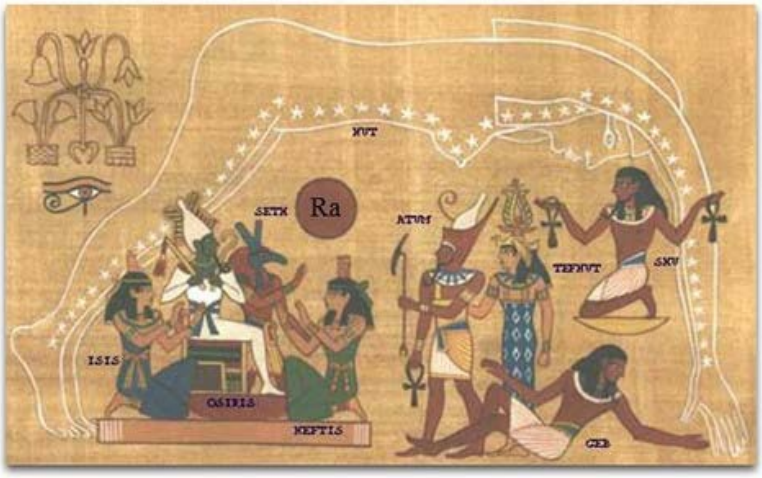

A depiction of the Osiris-Ra centric Egyptian universe, showing earth (Geb) at bottom, sky (Nut) at top, and the various deities: Isis, Seth, Neftis, Atum, Tefnut, Shu, at center.

The gist of Osiris worship eventually culminated into the so-called "Passion of Osiris", the precursor to the Passion of Christ, a type of crucifixion-resurrection reenactment, modeled on the supposed daily (and yearly) death and birth of the sun, i.e. sunset and sunrise, in the context of flat earth theory, otherwise known as the Passion Plays, which were held annually in the last month of the inundation (the annual Nile flood, coinciding with Spring, and held at Abydos/Abedjou, in the Nile Delta, which was the traditional place where the body of Osiris/Wesir was said to have drifted ashore after having been drowned in the Nile.

Much of the extant information about the Passion of Osiris can be found on the Ikhernofret Stela (c.1850BC) at Abydos erected in the 12th Dynasty by Ikhernofret (also I-Kher-Nefert), possibly a priest of Osiris or other official, which recounts the festival as follows (below left). Shown below right is a depiction of Osiris, personified djed pillar, one of the Passion stages, holding the sun, surrounded by the two sisters Isis and Nephthys, called the 'Merti', from the 1400BC *Egyptian Book of the Dead* (Ani Papyrus, plate 1).

The Passion of Osiris eventually became re-written, via monotheistic de-deification, Egyptian gods were given human form, into that of the Passion of Christ, in the years 100BC to 300AD (see below):

Pretext: Osiris is chopped into 14 pieces by his brother Set.

- Day one: The Procession of Wepwawet: A mock battle was enacted during which the enemies of Osiris are defeated. A procession was led by the god Wepwawet ("opener of the way").
- Day two: The Great Procession of Osiris: The body of Osiris was taken from his temple to his tomb. The boat he was transported in, the "Neshmet" bark, had to be defended against his enemies.
- Day three: Osiris is Mourned and the Enemies of the Land are Destroyed.
- Day four: Night Vigil: Prayers and recitations are made and funeral rites performed.
- Day five: Osiris is Reborn: Osiris is reborn at dawn and crowned with the crown of Ma'at. A statue of Osiris is brought to the temple.

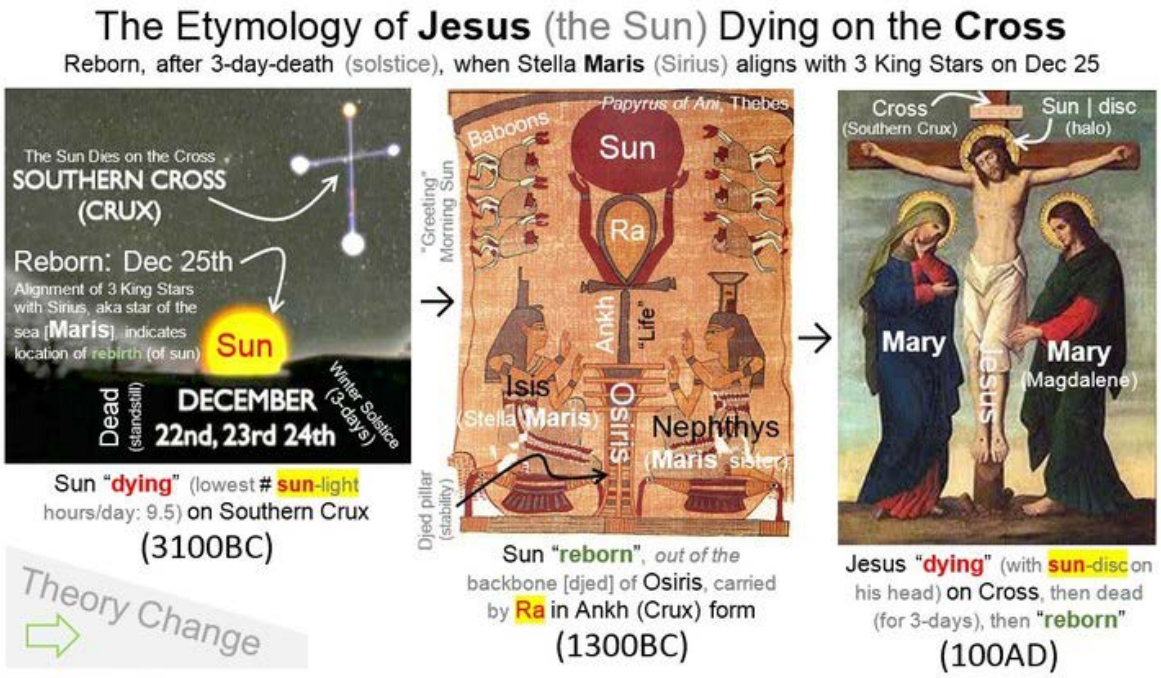

Left: the sun "perceptually" dying on the Southern Crux (Q) for three days, during winter solstice (standstill), from *Zeitgeist* (2007). Center: a vignette from the Papyrus of Ani (Q)(Q), from Thebes, showing the sun "reborn", carried by Ra, out of the backbone (djed pillar) (Q) of Osiris. Right: Jesus dying on the cross, with a sun disc (halo) on his head, with two Maries.

Sirius | Helical rising

The following, via Samuel Sharpe (1863), is a Sirius helically rising, to Isis rising helically, to Mary rising helically transition (Q) depiction: [14]

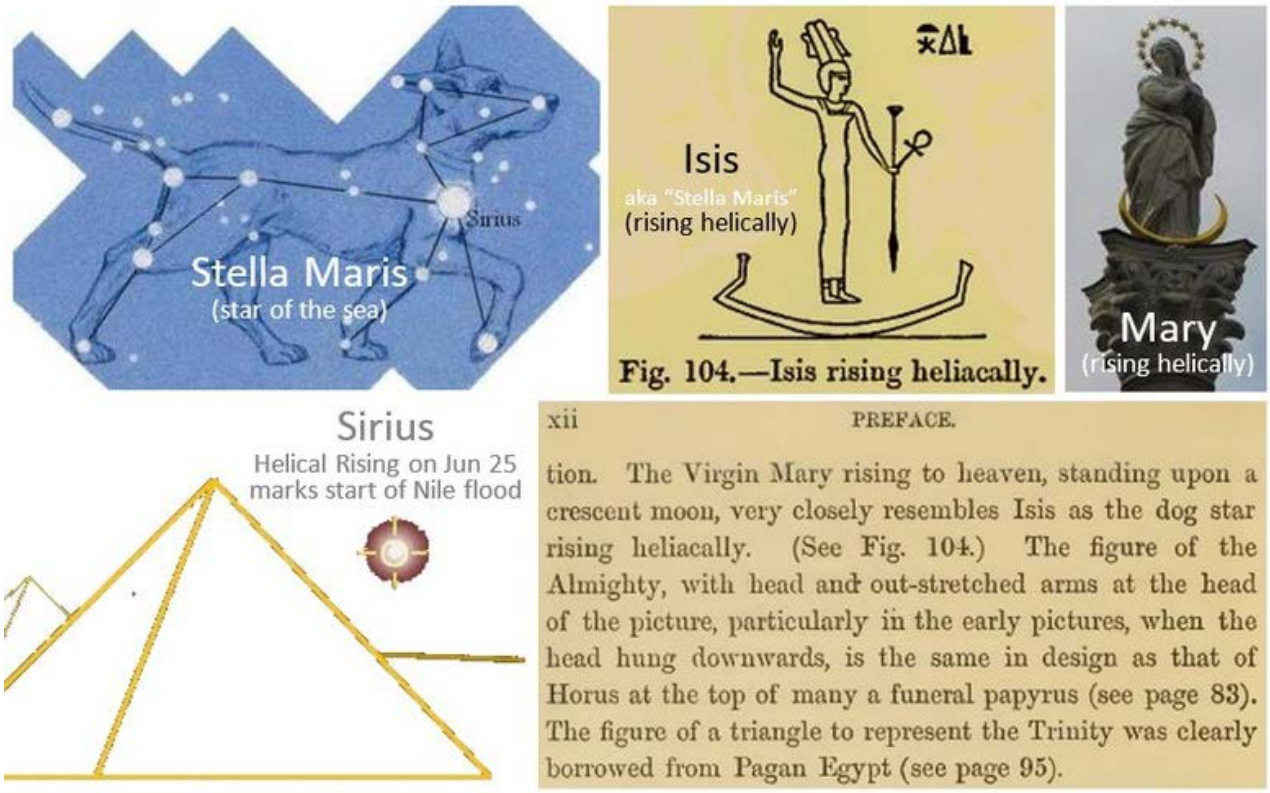

(add discussion)

Transubstantiation

The ritual of eating of corn bread (Q), resenting the body of Osiris (Q), and the drinking of the beer (or wine), representative of Osiris conceptualized as the god who taught Egyptians to make barley and wine, became re-written into the story of the last supper and the eating and drinking of the body and blood of Jesus Christ and the concept of transubstantiation: [10]

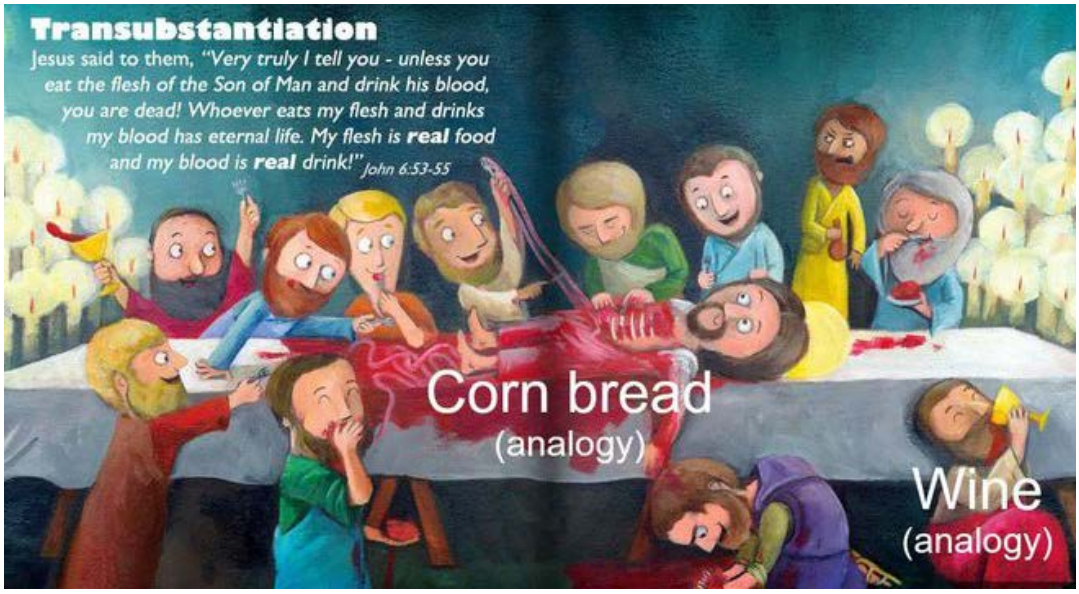

(add discussion)

Thebes | Amarna | 1350BC

In 1350BC, in Thebes, Egyptian pharaoh Akhenaten (O) rose to power, during which time he abandoned traditional polytheism, the Osiris cult, and the other head deities of Egyptian history, vanquished the traditional gods and goddesses, and in its place introduced worship of the sun god Aten, Egypt's first monotheistic religion, and built the city of Amarna devoted to Aten (below right):

Akhenaten's monotheism, however, was short-lived: his city was soon destroyed and the majority of his new religion effaced from walls and recordings.

Moses | Jewish religion

Akhenaten's monotheism, as has been argued by a number of scholars, gave birth to the story of Moses. Austrian psychologist Sigmund Freud, in his *Moses and Monotheism* (1939), e.g., argued that Moses, was a real person, but was not Hebrew, but actually born into Ancient Egyptian nobility and was probably a follower of the pharaoh Akhenaten, Egypt's first monotheist. [3] The number of miracles attributed to him, e.g. splitting the sea, smiting water from works, talking to burning bushes, etc., however, more than likely indicate that he was not real person, but possibly an aggregate, conceptualized in role model as one of the Akhenaten priests in alignment with the overarching model of Anunian theology lineage. The jump from Akhenaten's god Aten to the conceptualized god of Moses, i.e. YHWH, along with the other derivative gods to follow, is shown below:

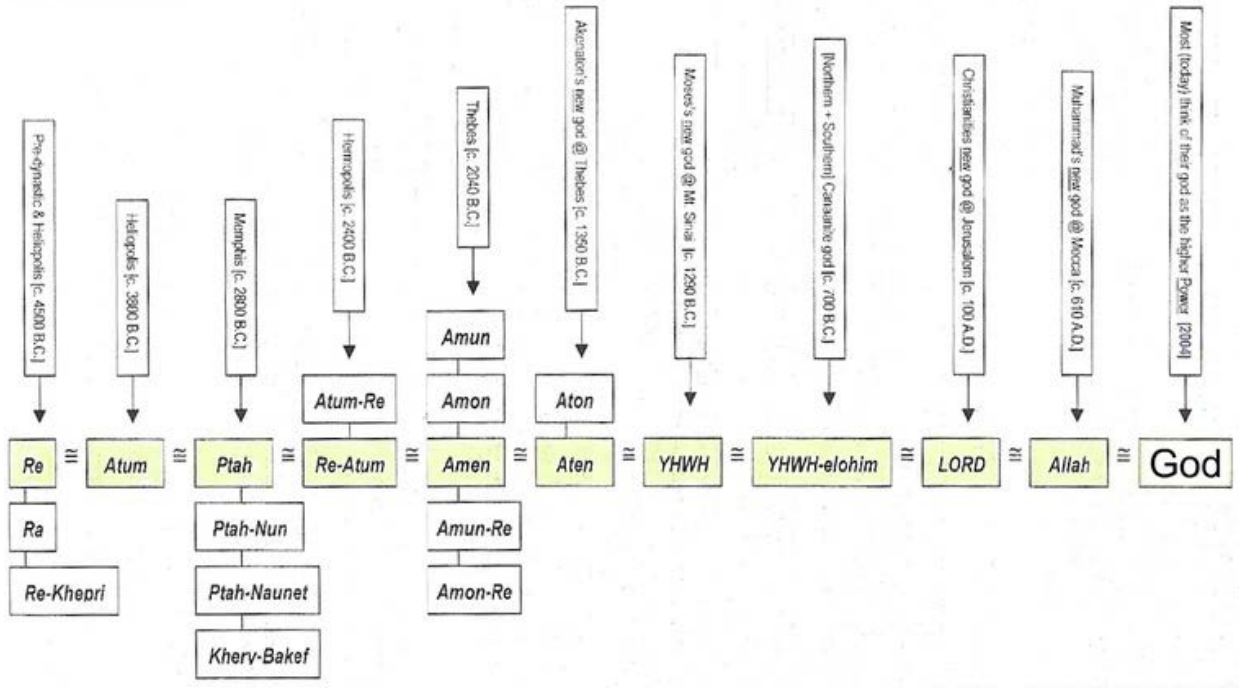

(add discussion)

Greek philosophy

In 700BC, Greece rose to power, and the Greek philosophers began to "study abroad", i.e. to travel to Egypt to learn about their knowledge of the world.

In the 5th century BC, the Egyptian three element model: water, earth, fire, became basis of the flux and fire philosophy of Heraclitus, likely derived (or culled) from his studies of Egyptian philosophy; which, in turn, led Parmenides, in reaction to Heraclitus' model, to reject the void; which, in turn, led Leucippus, in reaction to Parmenides' model, to posit atomic theory, according to which only atoms and voids exist.

Ra | Abraham/Brahma + Sarah/Saraswati

The following shows the Egyptology to Hinduism and Christianity reformulation of sun-star astronomical paring of Ra and Sirius into the story of Abraham/Brahma and Sarah/Saraswati anthropomorphization, respectively: [12]

Egyptian	to	Hindu	to	Christian
→ → 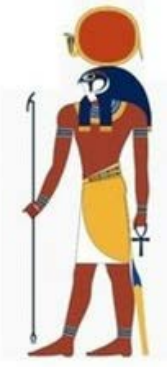	→		&	
Ra (sun) (3100-2600BC)		Brahma [B-Ra-hma] (1300BC)		Abraham [Ab-Ra-ham] (500BC)
III (astronomically-connected)		III (Wife/Sister)		III (Wife/Sister)

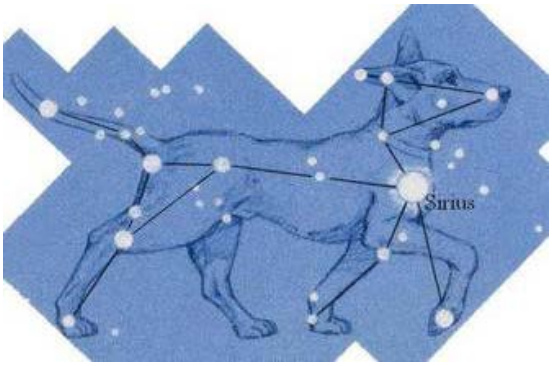

→

&

Sirius (dog star)
Helical rising marks start of Nile flood

Saraswati
(1300BC)

Sarah (born Sarai)
(500BC)

(add discussion)

Nile flood | Noah/Manu + Biblical flood

The following shows the Egyptology to Hinduism and Christianity reformulation of annual Nile river flood cycle and perceptually seen islands (pyramids) arising out of the receding flood at the end of the 150-day flood cycle, anthropomorphized into the stories of Noah's ark (or Nuh's ark) and Manu's, respectively: [12]

Egyptian	to	Hindu	to	Christian

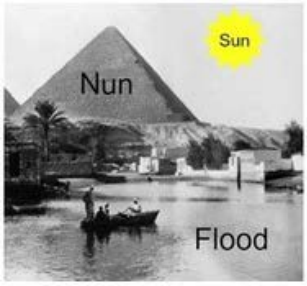

→

→

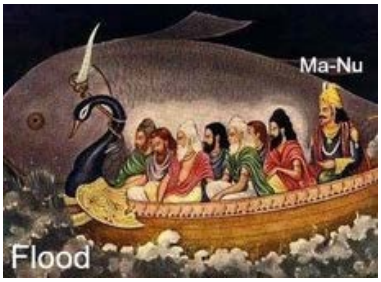

&

Pyramids at Giza / Nile Flood to Nu/Nun carrying solar boat
(2540-1600BC) (O)

Ma-Nu during flood
(1300BC)

Noah's (Nuh's) Ark after flood
(500BC)

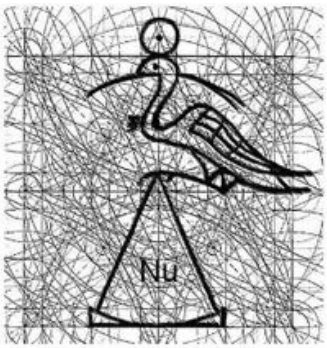

→

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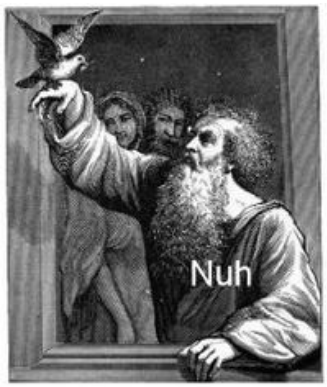

Nun / Nu (O) | Birth of phoenix
(as described by Herodotus, 450BC)

Manu
(1300BC) (O)

Noah
(500BC)

(add discussion)

Geb-centric | Geo-centric cosmology

The following shows the transition of Geb (earth) to the geocentric cosmology of Aristotle:

Egyptian	to	Hindu	to	Christian

Nun cosmology
(1900BC)

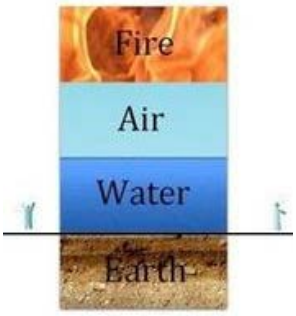

Geocentric (Geb-centric) cosmology
(according to Aristotle, 350BC)

(add discussion)

Horus + Akhenaten | Moses

The following shows the transition from the rise and fall of the monotheism of Akhenaten to the reformulation of this into the monotheism of Moses:

Egyptian	to	Christian

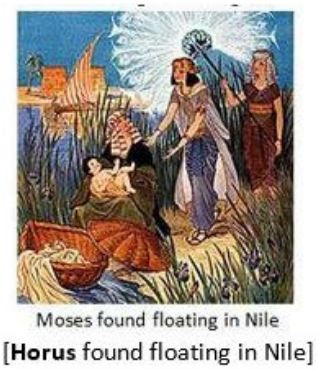

Horus (the child)
(2400BC)

+

Akhenaten
(1350BC)

→

Moses
(500BC)

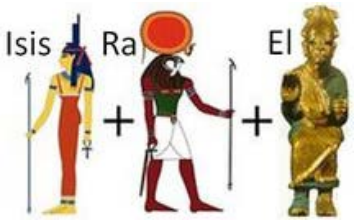

(1300BC)

→

[5] (300BC)

(add discussion)

Isis | Virgin Mary

The following shows the transmogrification and syncretism of the goddess Isis into the fictional person of the Virgin Mary:

Egyptian	to	Christian

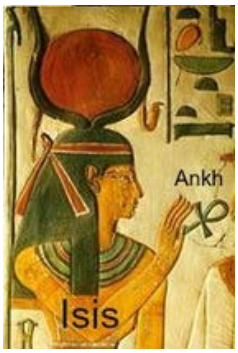

→

Isis (aka Stella Maris)
"Star of the Sea"
(2700BC)

Virgin Mary
(40BC)

(add discussion)

Khnum's clay creations + Pandora's box | Adam & Eve

The following shows the transition from the clay creation myth story of the god Khnum creating human figurines on his potter's wheel who are brought to life via the divine breath or spirit of the goddess Isis' magical ankh (the forerunner to the Christian cross), to the Biblical story of Adam and Eve:

Egyptian	to	Christian

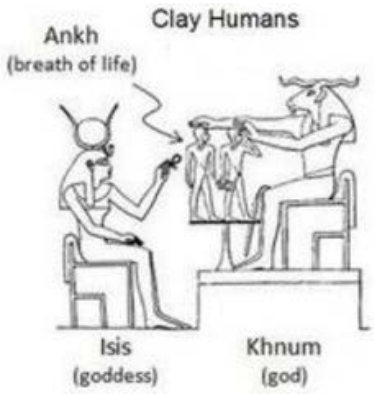

→

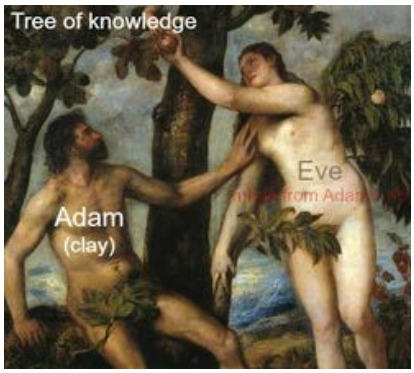

Khnum making humans
(350BC) (O)

Adam and Eve
(250BC)

It has also been argued that the story of the opening of Pandora's box (i.e. going against god's will) was the forerunner to the biting of Eve's apple (i.e. going against god's will), both of which resulting to let "evil" into the world:

→

Pandora's box

Eve's apple

(add discussion)

Three king stars | Three kings

The following shows the transition from the celestial timing of the alignment of the thee king stars with Sirius into the story of the three kings following a bright star to find the baby Jesus:

Egyptian	to	Christian

→

This point on the horizon where sun will rise on the winter solstice is pointed out by a line formed through the brightest star in the night sky—Sirius—and through the three stars of Orion's belt, sometimes referred to as the "three kings", which forms the basis of the story of the sun ("son") of God, who dies on the Crux (cross) and then rises from the dead after three days to be reborn. The birth is pointed out by the brightest star in the east, Sirius, followed by the three kings. The winter solstice occurs on December 22nd, and then the birth occurs three days later, on December 25th. (Q)

Three Kings, following bright star, to birth of Jesus.

(add discussion)

Horus | Jesus

The following shows the transition from the Egyptian theory of the birth of Horus from the brother-sister cohort Osiris-Isis into the story of the divine birth of Jesus from the Virgin Mary:

Egyptian	to	Christian

→

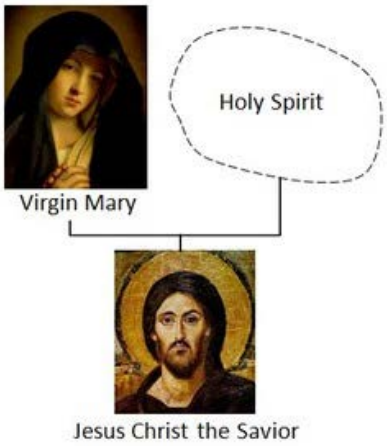

Horus birth
(3000BC)

Jesus birth
(0BC)

(add discussion)

John the Baptist | Anub the Baptist

The story of John the Baptist, who baptized people in the Jordan River, who was beheaded for calling Herod non-righteous, for sleeping with his brother's wife, according to Gerald Massey (1907) (Q), Dorothy Murdock (2008) (Q) , among others, has something to do with a combination of Horus being baptized by Anup or "Anup the Baptizer" (Q)(Q); and a circa 400AD legend about martyrs who, when cut would have milk issue forth from the wound; one example being as follows:

> "St. Anub (c.400): a headsman came and severed his neck; blood and milk issued therefrom."
>
> — Phillips Barry (1914), "Martyrs' Milk" (Q)

The story also has something connection to being born of the Nun and the ancient ritual of water flowing in the temples of ancient Egypt.

Horus the savior | Jesus the savior

The following shows how the conception of Horus the savior became remoulded into the conception of Jesus the savior:

Egyptian	to	Christian

→

Horus the savior | Jesus the savior

(add discussion)

Corona Borealis | Cross of thorns

The following shows how the star constellation of the Corona Borealis became anthropomorphized in to the stories of the thorn crosses of Ariadne of Jesus:
(add discussion)

Egyptian	to	Greek	to	Christian

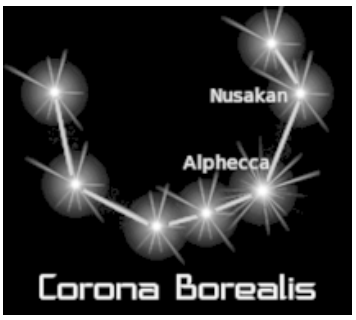

Corona Borealis

Osiris
(1800BC)

→

Ariadne
(c.600BC)

Shown crowned with

&

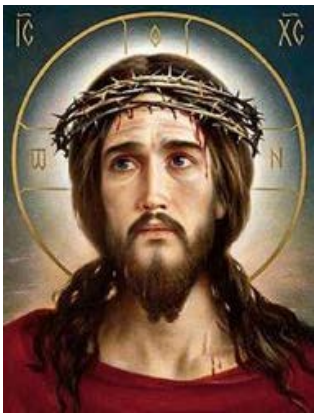

Jesus Christ
(30AD)

Shown with "thorns"

Something to do with Osiris, e.g. Jean-Marie Ragon (1843) (Q) and Gerald Massey (1907) (Q), and or the stellar period of his death. (Q)	"stars", corresponding to the constellation Corona ("crown") Borealis (Q), after being discovered by Dionysos on the island of Naxos, where she was abandoned by Theseus after helping him kill the Minotaur.	embedded into his head, which is an de-deification rewrite of the corona crown "star" model; the halo, shown in back, being a rewrite of the birth of Ra as a bird carrying the sun on his head through the daily journey of the sun through the sky, before sunset.

(add discussion)

Osiris cut | Jesus cut

During the Zerotheism for Kids lecture (2015), one of the kids said "yea, but didn't Jesus get whipped [scourged] for are sins?" (or something along these lines). The following gives an overview of how the scourging of Jesus is a rewrite of the myth of the cutting of Osiris into 14 pieces (by his brother Set) prior to his pieces-recollection (by his wife Isis) and mummification prior to resurrection:

(add discussion)

Southern Crux | Jesus on the cross

The following shows the transition from the story of the formation of the Southern Cross star constellation marking the rebirth of the sun was written into the story of Jesus on the cross following his crucifixion:

Egyptian	to	Christian

→

Southern Crux (Dec 22-24)	Jesus crucified (30AD)

(add discussion)

Mummy reanimation | Resurrection & Reincarnation

The following shows how the story of the divine resurrection of Osiris, following is terrible death, by the powers of his sister-wife Isis and Nephthys, was rewritten into the theories of resurrection (Hinduism) and reincarnation (Christianity):
(add discussion)

Egyptian	to	Hindu	to	Christian

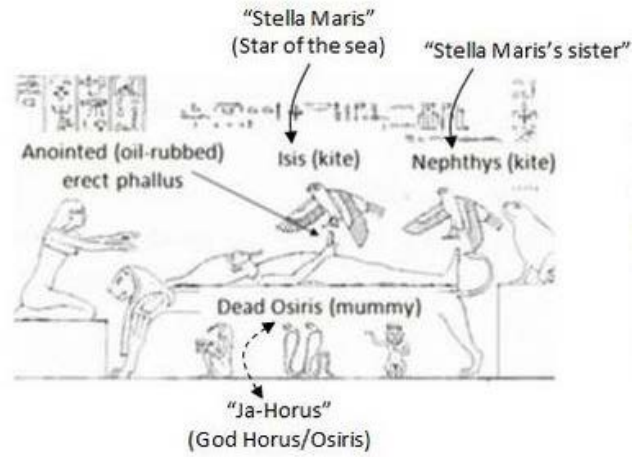

Resurrection of Osiris
(by Stella Maris [Isis] and Maris' sister Nephthys)

→

Reincarnation

&

Resurrection of Jesus
(by Mary and Mary Magdalene)

(add discussion)

Negative confessions | Sin

Add in missing content (reformatted to Word-fitting table style), from version 53 (Q), on sin.

(add discussion)

Islam

In 600, the Arabs were coming into world power, and to form a state religion, building on the above Egyptian-Christian branch of Anunian theology, conceived the logic that each of the various key players, e.g. Adam, Noah, Abraham, Isaac, Moses (given the Torah), David (given the Psalms), and Jesus (given the Gospel), among others, some depicted adjacent, were "prophets", i.e. they were humans who received prophecies or divinations from god, whom the Muslims refer to as "Allah", either directly (Moses and Jesus) or indirectly (Muhammad via the angel Jibreel), and thereby assigned with a special mission to guide humans, and that Muhammad (570-632) was the last and final prophet—each united in the same main belief, the oneness of god, worshiping of that one god, avoidance of idolatry and sin, and the belief in the day of resurrection or the day of judgment and life after death. [4]

Early prophets		Last prophet

→

Left: a depiction of three Biblical "prophets", namely: Isaiah, Moses, and David, as seen in one of the exhibits (Q) of the Creation Museum. Right: a Twelver Shi'I depiction of Muhammad, the conceptualized last and final prophet of diviners. (Q)

Mesopotamian | Other

In the above deconstruction, to note, we have left out some 20 percent syncretism influence from the Mesopotamian region, i.e. Tigris and Euphrates river cultures; also the Yellow River culture, which accounts for some 10 percent of the world's beliefs has been left out, as this seems to be an entirely separate syncretism etymology.

Other

See main: People claimed to be son of god

The following are other religions to have shooted themselves off the above Anunian theology megatree religion:

Founded	Name	Religion
1820	Joseph Smith (1805-1844) Medium: Claimed revelations	Mormons 15M followers Type: Modified Christianity
1879	Charles Russell (1852-1916) Medium: none	Jehovah's Witnesses 8-20M followers Type: Modified Christianity
1854	Sun Moon (1920-2012) Medium: Claimed to be Jesus Christ incarnate	Unification Church 1-2M followers Type: Modified Christianity
1973	Jose Miranda (1946-2013) Medium: claims the resurrected Jesus Christ "integrated himself within me" following visit by two angels Note: interviewed (Q) by Bill Maher in *Religulous* (2008)	Growing in Grace International 1-2M followers Type: Modified Christianity

See the Wikipedia "list of people claimed to be Jesus" and "list of people who have been considered deities" for more examples of the above. [6] A concordant list, prior to the transition from Osiris-Horus (1900BC) to Jesus (100AD), would be an Hmolpedia "list of Horus copies", which would seem to include Krisha, Mithra, Dionysus (Bacchus), Buddha, etc.

See also

- Comparative mythology and religion
- Religio-mythology genealogy

References

1. (a) Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History*. Source Books.
(b) Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World*. Facts on File, Inc.
(c) Thims, Libb. (2004). *Human Thermodynamics, Volume Three* (§20: History of Religion, pgs. 471-95; §21: Religion and Thermodynamics I, pg. 543-602; §22: Religion and Thermodynamics II, pgs. 603-662; §23: Religion and Thermodynamics III, pgs. 663-95; diagrams, pgs. 678-84). 330-pgs. (un-finished/unpublished manuscripts) Chicago: IoHT.
2. Reid, Patrick V. (1987). *Readings in Western Religious Thought: the Ancient World* (pg. 32). Paulist Press.
3. (a) Freud, Sigmund. (1939). *Moses and Monotheism*. Knopf.
(b) Moses and Monotheism – Wikipedia.
4. (a) Was Muhammad a Lesser Prophet than Moses or Jesus? – WikiIslam.
(b) Prophets in Islam – Wikipedia.
5. (a) Kuhn, Alvin B. (2005). *A Rebirth of Christianity* (pg. 14). Quest Books.
(b) Other links: (Q)(Q)(Q)
6. (a) List of people claimed to be Jesus – Wikipedia.
(b) List of people who have been considered deities – Wikipedia.
7. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (RE, pgs. 219-20; Atum, pgs. 33-34). Facts on File, Inc.

8. Story of Re – EgyptianMyths.net.
9. Andrews, Carol. (1994). *Amulets of Ancient Egypt* (pg. 51). University of Texas Press.
10. (a) Anon. (2013). *Awkward Moments Children's Bible* (O) (last supper, pg. #). CreateSpace.
(b) Mojsov, Bojana. (2008). *Osiris: Death and Afterlife of a God* (corn, 4+ pgs.). Wiley.
11. (a) Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (Myths 1-3, pgs. 11-14). Source Books.
(b) Crumb, R. (2009). *The Book of Genesis* (O). W.W. Norton.
12. Note: largely based on Thims religio-mythology, science and atheism book collection, Gary Greenberg's *101 Myths of the Bible* (2000) and Michael Jordan's *Encyclopedia of Gods: Over 2,500 Deities of the World* (1993) of significance, is a work-in-progress listing of the main religio-mythology transcriptions and syncretisms of the modern world religions, derived in 72 percent, via historical roots composition, from 3,100 Egyptian dynasty formation (3,100), Heliopolis creation myth, and Anunian theology generally, giving rise to the Abrahamic (Ab-Ra-ham-ic theologies) and Brahmaic (B-Ra-hma-ic theologies) of the modern world, i.e. father Ra born of Nun belief systems.
13. Jefferson, Thomas. (2013). *The New Jefferson Bible: the Life and Morals of Jesus of Nazareth in Modern English* (editor: Dan Marshall) (John the Baptizer, pgs. 5-6). Prose City Books.
14. Sharpe, Samuel. (1863). *Egyptian Mythology Egyptian Christianity: with their Influence on the Opinions of Modern Christendom* (pg. xii; image, pg. 114). J.R. Smith.

θΔics

In terminology, **religion**, from Latin *ligare* "to bind" (Ñº), in the sense of 'binding together' (Sagan, 1985), is any ideology and system of teachings that explain and guide human existence and behavior; generally through ancient stories, parables, commandments, and postulated existences of one god, gods, lesser gods, supreme gods, and or higher powers; the majority of which, in ancient religio-mythology composition, been astro-theology rooted. [6]

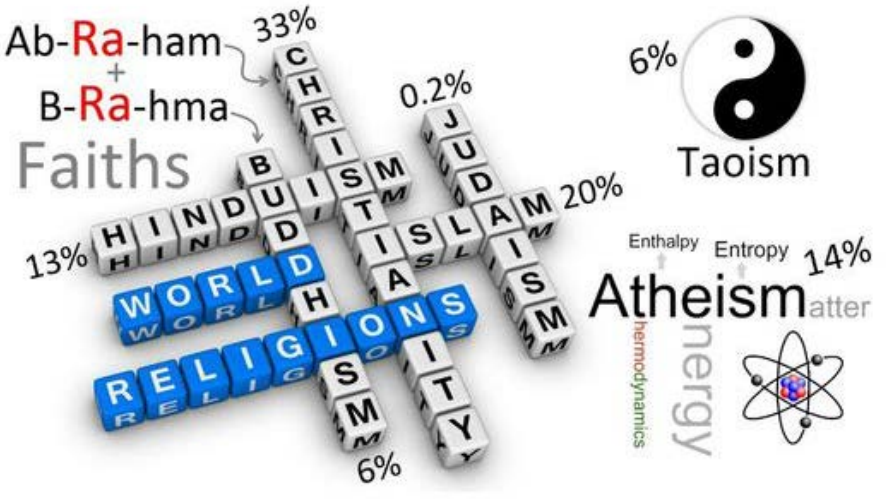

The **religions** or belief systems of the modern world.

Thermodynamics

The subject of the use of thermodynamics in religion, in either defense or refutation, is termed religious thermodynamics. Power defined by thermodynamics, in the modern scheme of things (see: human chemical thermodynamics), usurps supernatural power (or higher power) defined by god or religion.

Overview

The following is a relevant synopsis-themed overview:

> "Re (0:50): 'when black people were taken from Africa to America … they were forcefully converted to Christianity', this reminds me of Greydon Square:
>
> > 'Spoon fed this **religion** from the slave ship. They used faith to justify bringing slaves here. All the conducts and the rules in the good book. You swear by it, but failed to take a good look. You're completely sold. Just two centuries ago slave owners swore you didn't even have a soul. Now you blindly defend a faith, that was used to plunder pillage and rape a whole entire race.'
>
> The irony here is that Christianity is an African religion, namely the Osiris anointed (i.e. "christened" with resurrection oil) branch of the father Ra born out of the keme (-ham), i.e. black fertile soil ("Egyptian" or Kamite), following the flood (Ab-) belief system of Heliopolis, and their Nile river flood pyramid rising creation myth, aka the Ab-ra-hamic faiths (or Anunian theology). [Ñº] Therefore, a person complaining about being spoon-fed their own cooking is a bit humorous, reminiscent of the witty Alan Watts: 'Anybody who tells you that he has some way of leading you to spiritual enlightenment is like somebody who picks your pocket and sells you your own watch.' Whatever the case, the taste of the cooking was so good that we all ended up eating some of the stew; resultantly, 75 percent of the modern world still eats that same cooking of Abraham (Christian/Islam name for Ra) or Brahma (Hindu name for Ra), all the children of the world arguing (i.e. going to war) with each other about who has the better recipe."
>
> — Libb Thims (2015), post to "Why are Black Atheists Rare?", Jun (Ñº)

(add)

World religions | Ra classified

The following show the sub-branches of the "Father Ra Born of Nun" (Abrahamic/Brahmaic) faith based religions that currently dominate the mindsets of 72% of the modern world, otherwise known in ancient days as Anunian theology or Ra theology (aka Egyptian mythology):

World Religions Distribution

Ab-Ra-ham-ic faiths: (53%)

Christianity (33%)

Islam (20%)

Judaism (0.2%)

Baha'ism (0.1%)

Mandaeism (0.001%)

B-Ra-hma-ic faiths:

Hinduism (13%)

Buddhism (6%)

Sikhism (0.4%)

Jainism (0.07%)

(19%)

Non-religious/Atheist: (15%) Secular (12.6%) Atheist (2.5%)

Other-religions: (13%) Chinese religions (6.4%) Ethnic religions (4.2%) New religions (1.7%) Spiritists (0.2%) Confucians (0.1%) Shintoists (0.05%) Zoroastrians (0.005%)

Life | Death theories

It should be noted that Neanderthal thinkers, 70,000-years ago, had ideas on life, death, and some version of continued life, owing to the fact that they buried their dead with food, artifacts, and red ochre.

In modern-day thinking, the Egyptian-version of what gives life, is the modern influence to the majority of people, owing to the 72-percent world belief in Ra-theology, in which breath, wind, or wings flapping, sent from the ankh, etc., was said to give life to a dead body.

The most-quote Bible verse, to exemplify, is John 3:16 (c. 90AD), which states that “that whosoever believeth in him should not perish, but have eternal life,” which signifies that 33 percent of the modern world wants eternal life. The basis of this quote is the Osiris resurrection theory (c. 2500BC), the world’s first mummy, and the Egyptian theory of the afterlife.

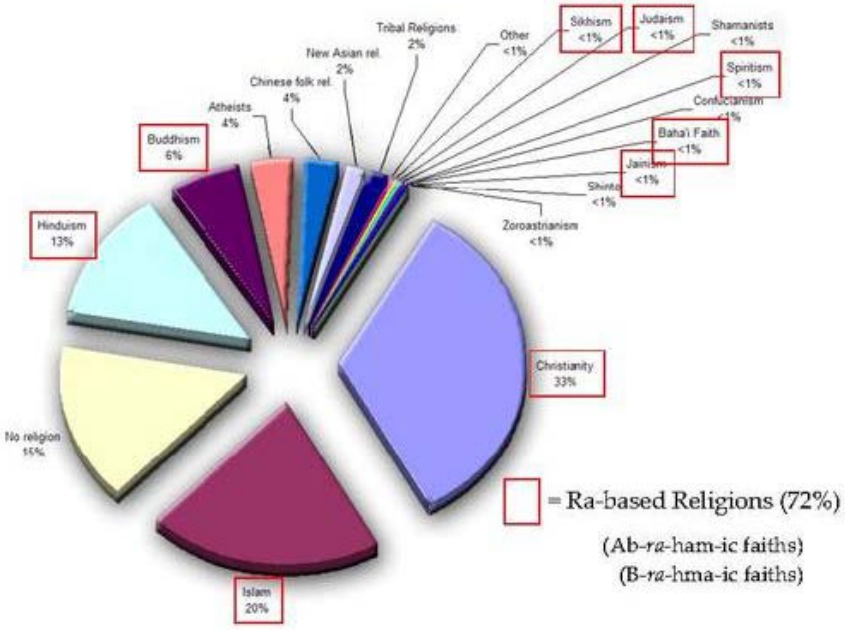

Circa 2006 world religious affiliation, grouped according to their mutual Ra-centrism.

Science

Modern science is slowly replacing the outdated theories of religions, although not without conflict. Of these sciences, those of human thermodynamics, human chemistry, and human physics are in direct conflict with various core teachings of religions, e.g. free will, evolution, life, death, afterlife, morality, etc., and in this sense are acting as modern replacements for the tenets of latter; albeit, not without heated debated often infused with emotional discussion.

First law | bond energy

In the context of a world belief in the theory of the soul, when one attempts to explain that modern theory discerns that each person is molecule, the first question that comes to mind is the objection that: "but, I have a soul, that may go to the afterlife, and that this process is under the governance of God."

The modern interpretation of this, i.e. how life, death, and universal continuity, connect to one another, according to modern science, can only be studied through or in the context of the first law of thermodynamics, in which the death (cessation) of a person is quantified by changes to the internal energy of one's thermodynamic system and the transformation of this energy or interaction at the boundary of the system. This type of logic is studied in cessation thermodynamics, which theorizes about post-cessation transformations of human chemical bonds and the human molecular bond energy, remaining as this residual energy signature, and how this resides or transforms remaining and connected (coupled) systems and those human molecules contained therein.

What happens when you die?

See main: What happens when you die?

The following table shows religious views on death ranked by world population adherence, based on data from the 2002 *Time Almanac*:

#	Religion		%	What happens when you die?
1		Christians	32.8	Believers go to heaven after resurrection and judgment. Non-believers go to hell.
2		Muslims	19.6	Believers go to paradise after resurrection and judgment. Non-believers go to hell.
3		Hindus	12.8	Human and animal spirits reincarnate to live many times in different forms; souls move up and down an infinite hierarchy based upon behaviors in past lives; ultimate aim is to find oneness with Brahman or God.
4		Non-religious	12.8	
5		Chinese religions	6.4	One becomes an ancestor spirit, with a continued existence, possessing the ability to influence the fortune of the living.
6		Buddhist	6.0	The spirit of the departed goes through a process lasting 49 days, divided into three stages called "bardos"; at the conclusion of which, the person either enters nirvana (liberation) or returns to earth for rebirth (reincarnation).
7		Ethnic religions	4.2	One goes into the spirit world.
8		Atheist	2.5	One's body is recycled in nature.
9		New religionists	1.7	
10		Sikhs	0.4	One goes through an endless cycle reincarnation or rebirth attempting, through salvation, to obtain spiritual union with god.
11		Jews	0.2	If a person lived a good life, they are rewarded with spiritual closeness to God in the afterlife. If the person sinned, they are punished by a spiritual detachment from God.
12		Spiritists	0.2	The human personality survives death in the form of a 'spirit', which can communicate with the living through a sensitive 'medium'.
13		Bahais	0.1	The soul passes into the next world, where its spiritual development in the physical world becomes a basis for judgment and advancement in the spiritual world of states of nearness or distance from God.
14		Confucians	0.1	Discussions on the world after death are neglected; focus is on achieving social harmony while alive.
15		Jains	0.07	The soul is reborn if it has karma attached to it; if it has rid itself of karma, it achieves 'moksha' is freed from rebirth and floats to the top of the universe where it dwells in bliss.
16		Shintoists	0.05	Spirits of the dead go to the mountains, above the sky, below the earth, or beyond the horizon.

17		Other religionists	0.02	
18		Zoroastrians	0.005	On the fourth day after death, the soul is reunited with its *fravashi* (guardian spirit), in which the experiences of life in the material world are collected for the continuing battle in the spiritual world.
19		Mandeans	0.001	The soul, released from exile, returns to supreme Entity after death.

Religious texts

The following is a chronological table of the ancient religious texts germane to development of modern practiced religions:

Table of Ancient Texts	TIME PERIOD OF CONSTRUCTION
Sumerian Pictographic Clay Tablets[108]	4000 to 3500 B.C.
Babylonian Omen Tablets[108]	3750 to 3500 B.C.
Sumerian Cuneiform Writings[108]	3500 to 3100 B.C.
Stonehenge[35]	3100 B.C.
Pepi's Papyrus[108]	3000 to 2500 B.C.
Gilgamesh Epic[108]	2750 B.C.
The Egyptian: *Pyramid Texts*[35]	2435 B.C.
The Egyptian: *Coffin Texts*[35]	2130 B.C.
Ugaritic Creation Texts from Ras Samra[34]	2000 B.C.
The ancient Hindu writings: *Vedas*[100, 104]	2000 to 1200 B.C.
The Babylonian creation poem: *Enuma Elish*[109]	1900 to 1100 B.C.
The Egyptian: *Book of the Dead*[35,100,102]	1600 B.C.
The Jewish: *Torah*[105,101]	1200 to 150 B.C.
Zoroaster's: *Avesta*[100,104]	1000 B.C.
The first five books of Bible: *The Pentateuch*[101]	960 to 609 B.C.
Homer's [Greek]: *Illiad & Odyssey*[108]	900 to 800 B.C.
Hesoid's [Greek]: *Theogony* (creation of the world & gods).	800 to 700 B.C.
Sayings of Solomon [10th century son of David-King of Isreal].	800 to 700 B.C.
The prophecies of: *The Oracle at Delphi*[35]	600 to 500 B.C.
The moral laden [Phrygian]: *Fables of Aesop*	600 to 500 B.C.
The Jain: *Kalpa Sutra*[104]	600 to 300 B.C.
Taoisms: *Tao-Te-Ching*[100]	600 to 275 B.C.
Buddha's: *Four Noble Truths & The Eight-Fold Path*[100,115]	563 to 268 B.C.
The ancient edited books by Confucius: *Five Classics*[100,104]	551 to 479 B.C.
Democritus's: *Atomos Theory*	**500 B.C.**
Upanishads[100]	500 to 200 B.C
The Dead Sea Scrolls[100]	300 B.C. to 70 A.D.
Ovid's [Roman]: *Metamorphoses*	43 B.C. to 17 A.D.
Four Gospels[100]	30 to 110 A.D.
The Jewish: *Mishnah*[105]	70 to 200 A.D.
The Jain: *Tattvartha Sutra*[104]	150 to 250 A.D.
The Jewish: *Gemara*[105]	200 to 400 A.D.
The Mandean: *Nag Hammadi*[34,35]	300 to 400 A.D.
The Jewish: *Talmud*[105]	400 to 600 A.D.
The Islamic: *Qur'an*[100]	610 to 700 A.D.
The *Four Books*[112] (the heart of Confucian thought)	960 to 1200 A.D.

(add)

Quotes

The following are related quotes:

"**Religion** is the daughter of virtuous action."

— Kirsha Misra (1200), *The Rise of the Moon Intellect* [5]

"We will establish our **religion** by the sword. We will trample down our enemies and make them one gore of blood from the Rocky Mountains to the Atlantic Ocean. I will be to this generation as a second Mohamed whose motto in treating for peace was 'the Quran or the sword'. So it shall be with us."

— Joseph Smith (1838), founder of Mormonism, Oct 14 (Ñº)

A "Two Ways to Go" religious humor cartoon (Ñº) by Watson Heston, one downward to hypocrisy and faith, the other upward to investigation and reason.

See also

â— Atheistic religion
â— Science vs religion debates
â— Science v. religion legal cases
â— Science-religion controversy
â— Bible vs. physical science conflicts

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1. (a) Greenberg, Gary. (2002). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History.* Source Books, Inc.
(b) Chemistry (etymology) – Wikipedia.
3. Thims, Libb. (2010). "RIP for Dummies (parts: 1, 2, 3, 4, 5, 6)." YouTube, Jan 21.
4. Moyer, Ernest. (2005). "Parallels between Osiris and Jesus", *EtyptOrigins.org.*
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6. Sagan, Carl. (1985). *The Varieties of Scientific Experience: a Personal View of the Search for God* (religion, pg. #). Penguin, 2006.

Further reading

â— Blumberg, Antonia. (2015). "The 30 Least Religious Cities in the United States" (Ñº), Huffington Post, Aug 8.

External links

â— Religion – Wikipedia.

θΔics

In subjects, **religion and intelligence**, "belief in god and IQ" or "IQ vs ID", refers to the subject of the existence of the inverse correlation existing between level of religious belief and level of intelligence, IQ, and or education.

GALLUP May 5-8, 2011	Belief in God
	%
National adults	92
Men	90
Women	94
High school or less	92
Some college	93
College grad	94
Postgraduate education	87

A 2011 Gallup poll of belief in god, in the US, by education level. (Q)

Overview

In 1928 to 2012, according to research by Miron Zuckerman (2013), and his team at the University of Rochester, some 63 scientific studies were conducted about religion and intelligence, 84 percent of which (53 studies) found a "reliable negative correlation between intelligence and religiosity." [2]

In 2010, Pew research, found, via polls of multiple answer testing on basic religious questions, find that atheists have a higher "religious IQ" than religious people. [1]

Geniuses | Religion

See main: Geniuses on; Geniuses on religion; Geniuses on god; Geniuses on the soul

The subject of geniuses and their religious beliefs is a peculiar and niche field of study.

In 1662, Blaise Pascal, in section 233 of his posthumous *Pensees* (*Thought*), an assembly of previously unpublished notes, posited his so called "god wager" or Pascal's wager" (Q), as it has come to be known, the conclusion of which being that if one was going to bet odds on whether it would be better to believe in god or not to believe in god, in respect to the possibility of afterlife, one should side with belief, probabilistically speaking. [3]

In 1927, Paul Dirac, at the fifth Solvay Conference in Brussels, while sitting around one evening at the hotel's smoky lounge, some of the younger physicists, including Werner Heisenberg and Wolfgang Pauli, began to openly berate Einstein for his habit of referring to "god this" and "god that", most-famously: "god does not play dice", in discussions of fundamental physics.

In the 2000s, believes began to tout Christopher Langan the last apocryphal genius to believe in the existence of god.

In 2010, Libb Thims began to tabulate (Q) beliefs on the existence of god by the then 30 or so known IQ: 200+ cited thinkers.

Quotes

The following are related quotes:

> "He who possesses science and art,
> Possesses religion as well;
> He who possesses neither of these,
> Had better have religion."
>
> — Johann Goethe (c.1785)

> "58% of randomly selected scientists in the United States expressed disbelief in, or doubt regarding the existence of God; nearly 70% of the most eminent scientists disbelieve in the existence of god."

— James Leuba (1916) [2]

"Although **intelligent** children grasp religious concepts earlier, they are also the first to doubt the truth of religion, and intelligent students are much less likely to accept orthodox beliefs, and rather less likely to have pro-religious attitudes."

— Michael Argyle (1958) [2]

"College is a breeding ground for apostasy."

— David Caplowitz (1977) (Q)

"A comprehensive survey revealed that onlyabout 14 percent (Q)of English speaking professional philosophers are theists.As for what little religious belief remains among their colleagues, most professional philosophers regard it as a strange aberration among otherwise intelligent people. Among scientists the situation is much the same. Surveys of the members of the National Academy of Sciences, composed of the most prestigious scientists in the world, show that religious belief among them is practically nonexistent,about 7 percent. (Q)"

— John Messerly (2014), "Religions' Smart-People Problem", Dec 21 (Q)

See also

- Belief in the existence of god by scientists
- Creationism scientists ranked by idiocy

References

1. (a) U.S. Religious Knowledge Quiz (2010) – PewForum.org.
(b) Staff. (2010). "Religious IQ: Why do Atheists Outscore Christians?" (Q), The Week, Sep 29.
2. (a) Waugh, Rob. (2013). "Religious People are Less Intelligent than Atheists, Study Finds" (Q), Yahoo News, Aug 12.
(b) Bates, Daniel. (2013). "Atheists have Higher IQs: Their Intelligence Makes Them More Likely to Dismiss Religion as Irrational and Unscientific" (Q), *Daily Mail*, Aug 16.
3. (a) Note: the disproof of Pascal's wager is that if one takes the bet, and sides their mind with belief in the existence of god, their beliefs by repercussion will be therein sided with morals dictated by the religion of that god; and thereby be "system-independent morals" (inflexible and anchored in ancient times) rather than "system-dependent morals" (flexible and anchored in modern times); whereby, accordingly, one's choices will be, in many causes acted out "wrongly" (as compared to rightly), and the bet will have resulted in derisive continuity in the fabric of the universe operation.
(b) Neumann on soul (Q)

Further reading

- Guillen, Michael. (2004). *Can a Smart Person Believe in God?* Thomas Nelson.

External links

- Religiosity and education – Wikipedia.
- Religiosity and intelligence – Wikipedia.

θΔics

In beliefs, **religion as a function of birthplace** refers to the oft-stated compelling argument, used by atheists, that because one's theological beliefs are in large part a function of where one was born, one's religion is but the result of cultural imprinting, and therefore god does not exist.

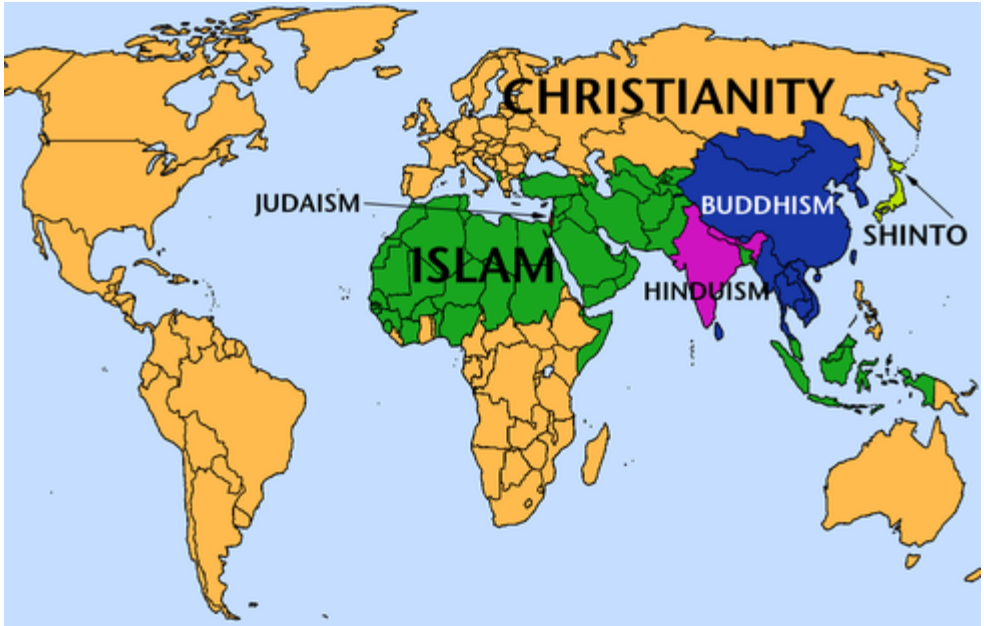

A simplified diagram showing how **one's religion is a function of the location they happened to be born** or chemically synthesized, the top four being: Christianity, Islam, Buddhism, and Hinduism, locations shown above.

Overview

In 1570s, Michel Montaigne, in his *Essays*, is said to have given the first variant of the religion as function of birthplace argument; variants of which are as follows:

> "We have religion because we **happen to be born** in a country where it was in practice; we regard its antiquity or the authority of men who have maintained it, and we fear the threats it fastens on unbelievers."
>
> — Michel Montaigne (c.1576), *Essays* [1]

> "Everyone's true worship was that which he found in use in the place where he chanced it to be."
>
> — Michel Montaigne (1580), *Essays*

In 1601, Pierre Charron, the intellectual student-associate of Montaigne, in his *On Wisdom*, presented a reformulated restatement of Montaigne's "one's religion is a function of where they happen to be born" ideology; a synopsis of which is as follows:

> "A few years after the appearance of the *Essays* of Montaigne, there was published in France a work, which, though now little read, possessed in the seventeenth century a reputation of the highest order. This was the celebrated *Treatise on Wisdom*, by **Charron**, in which we find, for the first time, **an attempt made in a modern language to construct a system of morals without the aid of theology**. There is about the work of Charron a systematic completeness which never fails to attract attention. In originality, he was, in some respects, inferior to Montaigne; but he had the advantage of coming after him, and there can be no doubt that he rose to an elevation which, to Montaigne, would have been inaccessible.
>
> Taking his stand, as it were, on the summit of knowledge, he boldly attempts to enumerate the elements of wisdom, and the conditions under which those elements will work. In the scheme which he thus constructs, **he entirely omits theological dogmas**; and he treats with undissembled scorn many of those conclusions which the people had hitherto universally received. **He reminds his countrymen that their religion is the accidental result of their birth and education**, and that if they had been born in a Mohammedan country, they would have been as firm believers in Mohammedanism as they then were in Christianity [see: religion as a function of birthplace]. From this consideration, he insists on the absurdity of their troubling themselves about the variety of creeds, seeing that such variety is the result of circumstances over which they have no control. Also, it is to be observed that each of these different religions declares itself to be the

true one and all of them are equally based upon supernatural pretensions, such as mysteries, miracles, prophets, and the like. It is because men forget these things, that they are the slaves of that confidence which is the great obstacle to all real knowledge, and which can only be removed by taking such a large and comprehensive view, as will show us how all nations cling with equal zeal to the tenets in which they have been educated.

And, says Charron, if we look a little deeper, we shall see that each of the great religions is built upon that which preceded it. Thus, the religion of the Jews is founded upon that of the Egyptians [see: Egyptian religion]; Christianity is the result of Judaism; and, from these two last, there has naturally sprung Mohammedanism. We, therefore, adds this great writer, should rise above the pretensions of hostile sects, and, without being terrified by the fear of future punishment [see: hell], or allured by the hope of future happiness [see: heaven; afterlife], we should be content with such practical religion as consists in performing the duties of life; and, uncontrolled by the dogmas of any particular creed, we should strive to make the soul retire inward upon itself, and by the efforts of its own contemplation, admire the ineffable grandeur of the being of beings, the supreme cause of all created things. Such were the sentiments which, in the year 1601, were for the first time laid before the French people in their own mother tongue."

— Henry Buckle (1856), *History of Civilization, Volume One* (pg. 375-77)

In 1736, Lord Bolingbroke, in his *Important Examination of the Holy Scriptures*, building on the rumored zeal of Jean Meslier, opened to the famous "religion as a function of birthplace" attack on belief in god; as follows: [2]

"To whose guidance shall I submit my mind? Must I be a Christian, **because I happened to be born** in London, or in Madrid? Must I be a Mussulman, because I was born in Turkey? As it is myself alone that I ought to consult, the choice of a religion is my greatest interest. One man adores god by Mahomet, another by the Grand Lama, and another by the Pope. Weak and foolish men? adore god by your own reason. The stupid indolence which takes possession of the generality of men, and sets aside this most important of all concerns, seems to intimate to us that they are nothing but stupid machines, endowed with animal functions, whose instinct never occupies itself beyond the present moment. We make use of our understandings in the same way as we use our bodies; both are frequently abandoned to quacks, whose chief concern is to get possession of our money."

In 1773, Denis Diderot, in his Diderot-Barthelemy dialogue, put things as follows:

Diderot: Well, would you believe, my dear friend, sometimes I suspect you of having, besides your profound learning, too much good sense not to be enlightened about the value of these Catholic dogmas, and to be decided, in this respect, just as I am? Naturally, you will not agree to this, and in your conscience you think me terrible indiscreet … But finally, yes—why are you a Catholic?
Barthelemy: What! Why?

Diderot: Yes!
Barthelemy: But …

Diderot: Well then, I'll tell you. It is soley—soley!—because you were born in France and were brought up, 'nourished', by Catholics. Exactly! Suppose yourself for a moment a native of the Antipodes, of Aanzibar, of Cathay, of Patagonia, and see what would have become of you. You would be perhaps not even an Israelite, Lutheran, Calvinist, or Muslim but very likely a Buddhist, Brahmin, idolater, or animal-worshipper for all I know! We have the choice. **You see, my dear Abbe, all that is an affair of latitude**, a pure chance, luck.

In 2004, Richard Dawkins, in his *God Delusion*, stated a variant of the birthplace argument, as follows: [3]

> "If you feel trapped in the religion of your upbringing, it would be worth asking yourself how this came about. The answer is usually some form of childhood indoctrination. If you are religious at all it is overwhelmingly probable that your religion is that of your parents. **If you were born in** Arkansas and you think Christianity is true and Islam false, knowing full well that you would think the opposite if you had been born in Afghanistan, you are the victim of childhood indoctrination."

In 2006, Dawkins, in a talk at Randolph College, a student queried him "What if You're Wrong?", to which he famously responded: [4]

The clip of Richard Dawkins famous 2006 "what if you're wrong" reply, wherein he gave the most updated version of the **religion as a function of birth place** argument.

> "What if I'm wrong? Anybody could be wrong. We could all be wrong about the flying spaghetti monster, the pink unicorn, and the flying tea pot. **You happen to be brought up**, I presume, in the Christian faith. You know what it's like to believe in a particular faith, because you're not a Muslim. You're not a Hindu. Why aren't you a Hindu? Because you happen to be brought up in America, not in India. If you had been brought up in India, you have been a Hindu. If you had been brought up in Denmark, in the time of the Vikings, you would have been believing in Wotan [Odin] (Ñº) and Thor. If you had been brought up in classical Greece, you would have been believing in Zeus. If you had been brought up in central Africa, you would be believing in the great juju (Ñº) of the mountain. There is no particular reason to pick on the Judeo-Christian god, in which, by the sheerest accident, you happened to have been brought up, and ask me the question: 'what if I'm wrong?' What if you're wrong about the great juju at the bottom of the sea?"

(add)

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θΔics

In religio-mythology, **religion theft theory**, aka "pagan theft thesis" (Holding, c.2014), akin to "plagiarism theory" (Kwesi, 2011) (O), refers to []

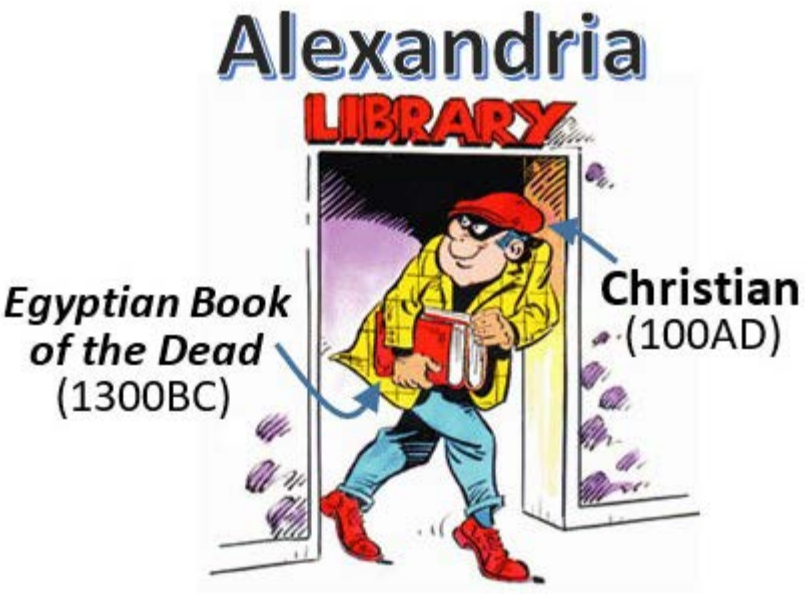

A cartoonish depiction of "**religion theft theory**", namely the hypothesis that early Christians, generally speaking, went over to Egypt, e.g. into the Library of Alexandria or College of Heliopolis, and "**stole**" their religion, such as found in *The Egyptian Book of the Dead*, carried it away secretly to Rome, and reformulated it into the version we now call Christianity.

Overview

When one begins to learn of the overlapping parallels between their own religion and an earlier religion, those new to the subject of religio-mythology, will often tend to proclaim, in knee-jerk fashion, that the founders of their religion "stole" its basic tenets and storyline from the former, earlier religion. This, however, is not the case. When one looks at the rise and falls of empires and corresponding religions from the big picture histomap perspective, that when a new empire begins to grow in power and land mass, that the state religion more often than not gets an overhaul. This is called recension theory.

Secondly, when an empire is large and dominate, it tends to have the biggest libraries. Students from outside countries, e.g. the Greeks who travelled abroad to study in the Egyptian colleges, will desire to learn the methods of those dominate countries, and take back with them what they learned. To say, however, that this knowledge is "stolen" is like saying that when American Willard Gibbs went to study abroad in the leading schools of Europe, that the knowledge he took back with him was stolen.

Thirdly, when empires begin to fall, people tend to migrate out of those decaying cultures into new lands, and therein, accordingly, take their traditions and religions with them. When the arrive at the new lands, their old religions are implanted into the new lands, albeit with modifications, e.g. via a melting pot religions effect or where old defunct religious ideas and traditions are discarded. It is well documented, e.g., how the Christmas tree tradition was imported into America, from German and other settlers.

A cartoonish depiction of "**religion theft theory**", namely the hypothesis that early Christians, generally speaking, went over to Egypt, e.g. into the Library of Alexandria or College of Heliopolis, and "stole" their religion, such as found in *The Egyptian Book of the Dead*, carried it away secretly to Rome, and reformulated it into the version we now call Christianity.

In 1791, Constantin Volney, in his *The Ruins*, after talking about how the ancient Egyptians made gods and religions out of the animal and human shapes seen in the stars, explained how this Egyptian religion passed outward to other countries, as follows: [2]

> "This language, understood by every one, was attended at first with no inconvenience; but in the course of time, when the calendar had been regulated, the people, who had no longer any need of observing the heavens, lost sight of the original meaning of these expressions; and the allegories remaining in common use became a fatal stumbling block to the understanding and to reason. Habituated to associate to the symbols the ideas of their archetypes, the mind at last confounded them: then the same animals, whom fancy had transported to the skies, returned again to the earth; but being thus returned, clothed in the livery of the stars, they claimed the stellary attributes, and imposed on their own authors. Then it was that the people, believing that they saw their gods among them, could pray to them with more convenience: they demanded from the ram of their flock the influences which might be expected from the heavenly ram; they prayed the scorpion not to pour out his venom upon nature; they revered the crab of the sea, the scarabeus of the mud, the fish of the river; and by a series of corrupt but inseparable analogies, they lost themselves in

a labyrinth of well-connected absurdities.

Such was the origin of that ancient whimsical worship of the animals; such is the train of ideas by which the character of the divinity became common to the vilest of brutes, and by which was formed that theological system, extremely comprehensive, complicated, and learned, which, rising on the borders of the Nile, **propagated from country to country by commerce, war, and conquest**, overspread the whole of the ancient world; and which, modified by time, circumstances and prejudices, is still seen entire among a hundred nations, and remains as the essential and secret basis of the theology of those even who despise and reject it."

(add)

Quotes

The following are related quotes:

"Herodotus upon this occasion says, that the whole romance of the soul and its transmigrations was **invented by** the Egyptians, and propagated in Greece by men, who pretended to be its authors. I know their names, adds he, but shall not mention them (lib. 2). Cicero, however, has positively informed us, that it was Pherecydes, master of Pythagoras. Tuscul. lib. 1, sect. 16. Now admitting that this system was at that period a novelty, it accounts for Solomon's treating it as a fable, who lived 130 years before Pherecydes."

— Constantin Volney (1791), *The Ruins* (Q)

"The Christians took the whole Christian *Bible* – the Old Testament and the New Testament – out of the *Egyptian Book of the Dead*."

— John Jackson (c.2009) (Q)

"Lloyd Graham's book *Deceptions and Myths of the Bible* (Citadel Press, 1975), is partly **standard "pagan theft" thesis**, partly 'new age' material, and partly conspiracy theory. It is filled with incomprehensible diagrams, polemic, and what can only be charitably be called semantic evasions; it was a regular feature in catalogs sent to me (as a librarian) by Barnes and Noble, suggesting that it still sells well."

— James Holding (c.2014) [2]

"I went to Kemet (now called Egypt) and the **Bible is stolen** off the walls of Kemet egyptology. The Bible is pagan."

— Aset Kemet (2017), comment (Q) on John Jackson talk

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Further reading

● James, George G. (2017). *Stolen Legacy: with Illustrations*. XinXii.

θΔics

In religio-mythology, **prophets in religion**, aka "religious prophets", sometimes referred to as patriarchs, as compared to metaphorical scientific prophets, aka scientists who are able to foretell or predict the future, without recourse to god theory, refers to the various said-to-be divinely-connected prophesiers of Judaism, Christianity, and Islam, such as: Noah, Abraham, Sarah, Joshua, Joseph, Moses, and Muhammad. [1]

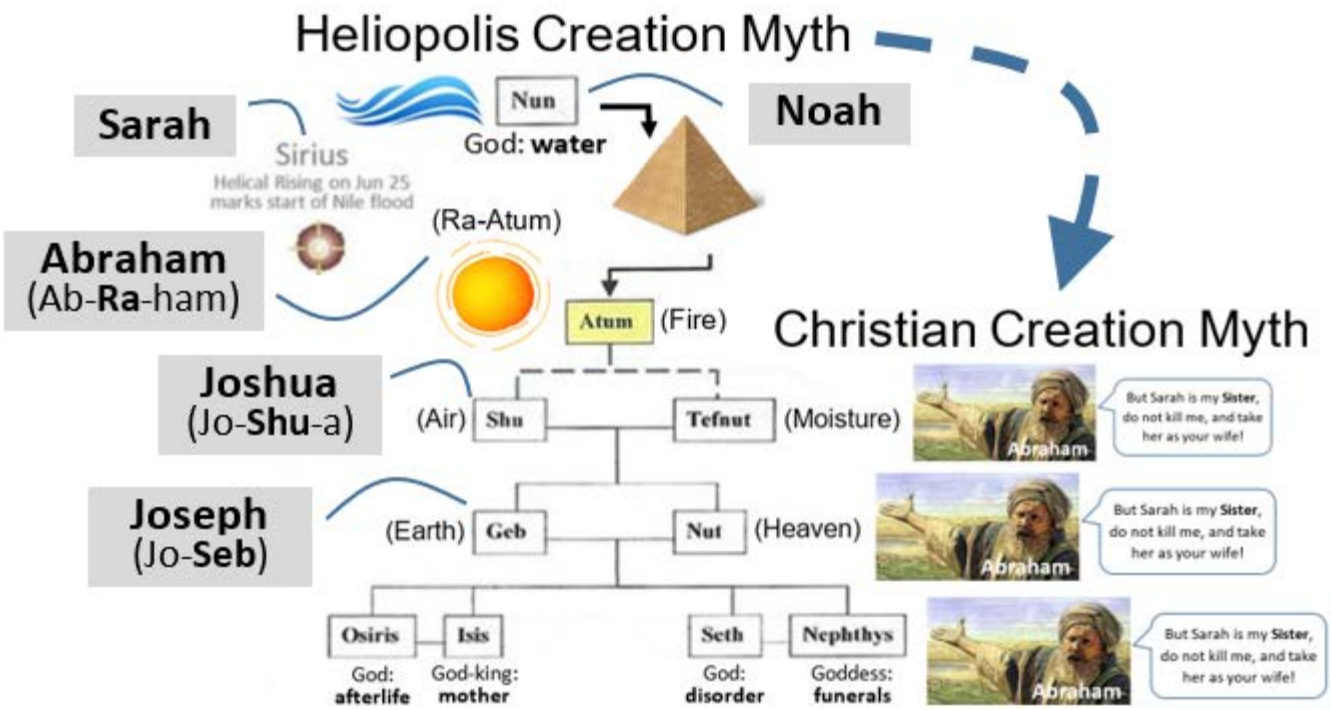

An Egyptian gods to Judaic prophets transformation diagram, showing how the "**gods**" of Egyptian religio-mythology, specifically: Nun (Nile River), Ra (sun), Isis (Sirius), Shu (air), and Geb (earth), became the "**prophets**" of Judaic theology, namely: Noah, Abraham, Sarah, Joshua, and Joseph, respectively. [23

Quotes

The following are noted quotes:

> "In this way antiquity disposes of its sun-gods. The **Hebrews turned [the gods] into Patriarchs**. Adam, Abraham, Israel, were names of Saturn. Edom is Adam; and the ancient usage was to name the nation, the land or city after the chief god. The Greeks made these deities founders of tribes."
>
> — Samuel Dunlap (1858), V*estiges of the Spirit of Man*, citing Franz Movers (1841) [2]

See also

â— Egyptian-to-Christian transliteration
â— Christian-to-Egyptian transliteration

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2. Movers, Franz C. (1841). The Phoenicians, Volume One (*Die Phonizier, Volume One*) (86, 130) (arc). Publisher.
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3. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

External links

â— Prophets of Christianity – Wikipedia.

θΔics

In human thermodynamics, **religious thermodynamics** or *theological thermodynamics* can be considered as any variation on efforts to interpret a branch of religion, theological theory, the idea of god, or ancient scripture from a thermodynamic point-of-view or visa-versa. [1]

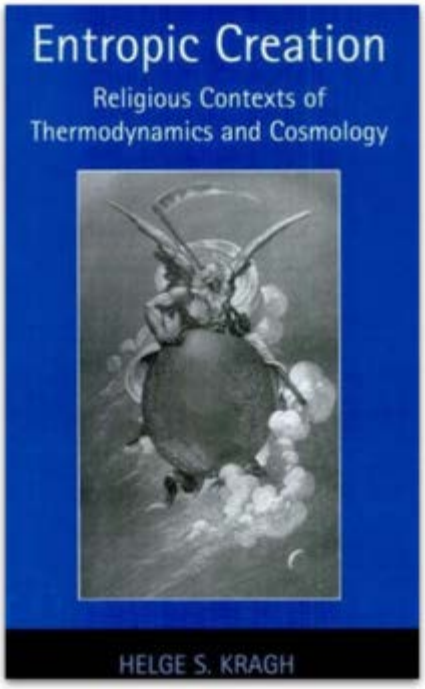

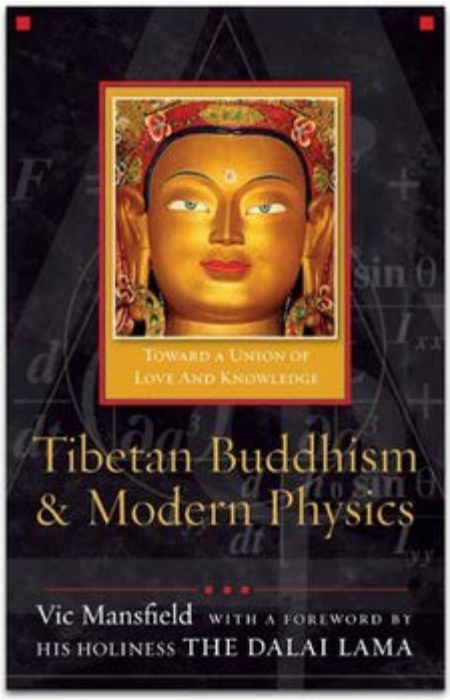

Left: the 2008 book by Helge Kragh discussing the cultural and **religious** responses to the second law of **thermodynamics**, from around 1860 to 1920. Right: the 2008 *Tibetan Buddhism & Modern Physics* by Vic Mansfield, showing an equation overlay stylized cover, which interjects on Buddhism, physics, quantum mechanics, entropy, arrow of time, and thermodynamics. [16]

The subject of religion and thermodynamics was cogently outlined in American science historian Erwin Hiebert's 1966 essay "The Uses and Abuses of Thermodynamics in Religion", thus indicating that the amount of material published in this field is large. [14]

Overview

Of the laws of thermodynamics, according to thermodynamicist Myron Kaufman, the second law has important philosophical and religious implications. [2] A typical example being Maxwell's demon, which is itself a religious metaphor, or the use of Prigoginean thermodynamics in New Age religious movements, as well as concepts such as the *arrow of time* or "heat death". [3] A popular book in religious thermodynamics is American psychiatrist M. Scott Peck's 1978 *The Road Less Traveled*, having sold more than seven-million copies, which outlined Pecks' views on the relations between entropy, evolution, evil, and love. A noted individual in the second law vs. evolution debate is American engineer Henry Morris, who in the 1970s was the first to vigorously bring the second law into the discussion.

Interestingly, while in modern times the topic of religion and thermodynamics is marginal and often discredited, in the heyday of thermodynamics, the 1840 and 50s, many of the founders, such as James Joule, William Thomson, and James Maxwell had strong religious convictions behind their contributions. [4] In 1843, for instance, after conducting numerous experiments on the inter-conversions of various type of energy, e.g. electrical, chemical, gravitational, heat, work, etc., Joule stated "I shall lose no time in repeating and extending these experiments, being satisfied that the grand agents of nature are by the Creator's fiat, *indestructible;* and that wherever mechanical force is expended, an exact equivalent of heat is *always* obtained." In other words, Joule believed that the first law of thermodynamics was decreed by the act or will of a deity.

Typically, theological thermodynamicists have degrees in both theology and a branch of science. One of the first, along these lines was English mathematician, scientist, and theologian Ernest Barnes who, in his 1927 *The Gifford Lectures at Aberdeen*, discussed the connections between religion and the first two laws of thermodynamics. [5]

To note, the use of thermodynamic logic in religion typically leads to biased or non logical results; in that, often, millennia old scriptures are sided with in favor of modern science, discoveries, experiment, and theory. [6] On the other hand, to understand the thermodynamics of certain human phenomena, such as morality, right or wrong, death, e.g. cessation thermodynamics, one is often drawn into historical interpretations, that border on various religious and philosophical themes.

The general view is that just as there is a logical separation of state and church so to should there be a separation of thermodynamics and religion. In spite of his suggested division, there have been many crossover writings on thermodynamics and religion. One of the earliest religious human thermodynamicists was Iranian engineer Mehdi Bazargan who in the 1950s developed a "thermodynamics of man" theory to explain Islam scientifically. Topics in

religious thermodynamics include the thermodynamics of “good”, “evil”, and morality, among others.

Evolution

One of the most oft-cited “supposed” issues in religious thermodynamics is the Boltzmann 1895 chaos interpretation of entropy in calculations of evolutions of isolated systems, specifically ideal gas phase systems, which state that such systems tend towards maximal entropy or maximal “molar disorder” (a Boltzmann term) combined with the older Kelvin 1862 heat death postulate, which states that the universe is running down. These two statements, however, are not a one-way translation skip-over to the description of all types of evolution, particularly that in which a periodic external heat source exists about a system - namely earth. In this situation, evolution occurs such that a working substance (an system of chemical species) is put in alternating contact with a hot body (the burning sun) and a cold body (the cool night sky) in a cyclical manner for a period of 4.5 billion years.

To cite one common mis-extrapolation of this chaos/running-down view of the second law, in 1981 author Harold Willmington stated that “evolution runs contrary to the second law of thermodynamics which describes the universe as a wound-up clock which is slowly running down … instead, evolution has all life being built up from the simple to the complex.” [8] The popularization of this statement and others like it have led to the wide-spread belief, for many, that the laws of thermodynamics are in conflict with evolution. This, however, is not the case.

The difficulty in clarifying the contradiction, to the appeasement of all naysayers, is, in particular, that the science of “human chemical thermodynamics” is a future branch of knowledge. The conception that a human being is, in reality, a “molecule”, specifically, a human molecule, is a little understood or used concept in science. As such, common historical refutations used to reconcile the conflict used by scientists are:

> (a) evolving systems on earth are “closed”, not isolated, as compared to ideal gas systems.
> (b) entropy decrease (of life forms) or "ordering" is compensated by entropy increase in the surroundings (such as in the sun).
> (c) Life increases its order by feeding on negative entropy (Erwin Schrödinger, 1944).
> (d) the decrease in “free energy” in evolving earth systems, itself being a function of entropy, enthalpy, and temperature, is the key governing energy quantity of directionality, rather than only entropy tendencies (the second law).

The modern view, however, is that life is a process of chemical reactions, occuring over the last 13.7 billion years, from the hydrogen ion molecule to human molecules (people), as visualized on molecular evolution tables, which are processes, from an earth-bound systems point of view (isothermal, isobaric, heat-driven systems), governed by the combined law of thermodynamics. [11]

God

> *See main: God*

In religious thermodynamics, various hypothesized forces opposite to that of entropy are often theorized to be God. In 1999, for instance, author Holmes Rolston stated that: “one can posit *god* as a countercurrent to entropy, a sort of biogravity that lures life upward.” [9] In 2007, Indian chemical engineer DMR Sekhar postulated a theory of "genopsych" (genetics+psychology), which he conceived as "an extensive property running or operating counter to entropy" that (a) gives directionality to the process of evolution, (b) causes non-random variations in the genome, indicating creation of new information, (c) is the basis of native intelligence of plants and microorganisms, and (d) is god or a part of God inside of humans that has evolved people to their present form. [10] Sekhar's theory was an effort to find unification between genetics, evolution, thermodynamics, the Bhagavat Gita, and the Holy Bible.

Another religious thermodynamic postulate is that God created the low-entropy singularity or grandly-unified mass of energy that initiated the universe at the act of the Big Bang. [12] This conception derives from what has been called the “entropological proof” for the existence of god. [13]

Objections

In 1905, French physicist and thermodynamicist Pierre Duhem, a devout Catholic, argued that to draw cosmological or religious consequences from thermodynamics was unjustified. [15]

Islamic philosopher Abdul Karim Surush, for instance, argues that just as religion does not offer a plan for government, that any efforts to derive such a plan are fruitless. By extrapolation, Surush states that "dealing with social, economic, and political affairs requires special expertise and therefore must be entrusted to skilled professionals who are well versed in the modern social sciences of economics, sociology, and public administration. Surush states that religion cannot explain these dynamics or deal with questions raised and problems created by them, or specifically: [7]

> "There can be no **religious thermodynamics** and, by the same token, there can be no religious politics and economics."

The pinnacle example of a type of "religious thermodynamics" is that in which the second law of thermodynamics, which states that isolated systems tend towards maximal entropy (considered as a synonym of disorder), is used to negate or disprove the phenomenon of evolution.

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Templeton Foundation.

Videos

â— Skekgg, Andrew. (2009). “The 2nd Law of Thermodynamics” (V), Andrew Skegg, Jul 7.

Further reading

â— Williams, Emmet L. (1981). *Thermodynamics and the Development of Order*. Creation Research Society.
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θΔics

In HT pioneers, the **religious** (thermodynamics pioneers) **TPs** page is a file-tree header for grouping individuals, ordered in the dropbox to the left, in the category of pioneers of religious thermodynamics.

θΔics

In hmolscience, **Remy Lestienne** (c.1943-) is a French elementary particle physicist and neuroscientist noted his 1990 to 1998 publications wherein he uses the devices of entropy, chance, and time to theorize about being and supposedly becoming.

Overview

In 1990, Lestienne, in his *The Children of Time: Causality, Entropy, Becoming*, produced chapters on entropy and information, dissipative structures, what is life, the mind and time, among others. [1] A good part of the book on entropy seems to center on the ideas of Belgian chemist Ilya Prigogine; albeit Lestienne does have a good grasp as to the contributions of the founders of thermodynamics, e.g. Carnot, Clausius, Boltzmann, etc..

In 1998, Lestienne, in his *The Creative Power of Chance*, supposedly, devotes four chapters to an attempt to reconcile an information interpretation of entropy with a thermodynamic interpretation of entropy with recourse to "randomness in dynamic systems". [2]

Education

Lestienne began as a researcher at the French National Center for Scientific Research in 1962, then did work in high energy physics at Ecole Polytechnique, Paris, and at CERN, Geneva. In the 1980s, he turned to work in biology and neuroscience, working at various neuroscience sections of various universities, e.g. USC, 1985 to 1987, University of Paris, 1987 to 1990, among others.
In 1995, Lestienne was the research director at the Centre national de la Recherche Scientifique, France.

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External links

â— Lestienne, ReÌ my – WorldCat Identities.
â— Remy Lestienne (French → English) – Membres.Multimania.fr.

θΔics

In existographies, **Renate Mayntz** (1929-) is a German sociologist, noted for []

Overview

In 1990, Mayntz, in her "The Influence of Natural Science Theories on Contemporary Social Science", building on cross-over authors such as Ilya Prigogine, Hermann Haken, Humberto Maturana, James Coleman, Rene Thom (Q), Manfred Eigen, Heinz Foerster, Mark Granovetter, Erich Jantsch, Ervin Laszlo, Niklas Luhmann, together with related names, such as Charles Snow, Emile Durkheim, Max Weber and Theodor Adorno and their so-called positivism dispute (Q), Herbert Spencer, Karl Deutsch (1963), David Easton (1967), and Talcott Parsons, among others, attempted to summarize the three main conduits or methods by which natural sciences transmit to the social sciences. [1]

Quotes | By

The following are quotes by Mayntz:

> "Whether, following C.P. Snow's image of the two cultures, one considers the social sciences to be part of the humanities, or whether with Lepenies (1985) one considers them to be a third category, straddling the fence between natural sciences and humanities, it is evident that the relationship between natural and social sciences has been characterized by ambivalence."
>
> — Renate Mayntz (1990), "The Influence of Natural Science Theories on Contemporary Social Science" (pg. 5) [1]

References

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(b) Lepenies, Wolf. (1985). *Die drei Kulturen. Soziologie zwischen Literatur und Wissenshaft*. Munchen: Hanser.

External links

- Renate Mayntz – Wikipedia.
- Renate Mayntz (research) – MPG.de.

In existographies, **Rene Descartes** (1596-1650) (IQ:195|#13) (Cattell 1000:23) [RGM:33|1,500+] (Murray 4000:6|CS / 7|M / 4|WP) (Gottlieb 1000:25) (GPE:13) (GME:6) (Library:2,000) (GPhE:3) [CR:441] was a French physicist, philosopher, and mathematician, aka the "restorer of modern philosophy" (Holbach, 1770), noted for his 1637 *Discourse on Method*, which introduced a number of topics, such as the Cartesian coordinate system, automaton theory, vis viva discussions, and the proof that one exists, embodied in the famous saying "I think, therefore I am".

Education

In 1618, Descartes, aged 22, met and was mentored in mechanical philosophy by Isaac Beeckman.

Vacuum

In 1644, Descartes, in his *Principles of Philosophy* (part 2, number 16) (Ñº), declared, like Aristotle, that a vacuum does not exist, via some type of extension of bodies argument. [21] The following is one synopsis take on this:

> "**Descartes** tried to explain all physical phenomena in terms of 'extension' and 'motion' only. Like a Cheshire Cat vanishes leaving only the abstract grin, so in Descartes' system specific substances and qualities vanish, leaving only a real world of extension and motion. A void or vacuum is impossible for Descartes as it would imply extension without body and for him extension is body. To account for the world as we know it Descartes requires three types of particles, which are distinguished from one another by their geometrical properties only—that is by 'extension'. These are the small 'fire particles', some of them infinitely small, the intermediate 'boules' and the 'gross material particles', which in aggregate constitute all material bodies. The first two sorts of particles form the all-pervading aether which circulates in a gigantic but invisible whirlpool or vortex about that large hot body, the sun. It is the motion of this vortex that carries the planets round in their circular orbits, which has its own relatively small vortex, that accounts for the phenomenon we call 'weight'."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pgs. 2-3)

Descartes, said another way, held the view that there could be no void, no vacuum, because empty space could only be conceived in terms of matter, which is an extension. [20]

The World

In 1634, Descartes was ready to publish *Treatise on the World and on Light* (*Traité du monde et de la lumière*), a book he had written between 1629 and 1633, which was controversially Copernican based, but upon hearing that Galileo was condemned by the Church, decided to suspend publication, so to keep his liberty. [16]

Automatons | Humans

In 1598, Tommaso Francini and Alessandro Francini, Florentine hydraulics engineering brothers, built a number of water-driven automata, in garden terraces at Saint-Germain-en-Laye, Paris, that turned around, played music, and even one where a hero slayed a rising dragon. (Ñº) Descartes was greatly intrigued by these automaton, in respect to their philosophical implications; Julien Musolino (2015) summarizes this as follows: [19]

> "Descartes' mechanical thinking was heavily influenced by the automata at the Royal Gardens in Saint-Germain-en-Laye, a suburb of Paris. These hydraulically powered statues could perform all kinds of impressive tricks, and they served as the model that Descartes used to describe the functioning of the human body."

Descartes famously posited that a human was an automaton, a type of spring-loaded machine, similar to animals, except in one respect, that it contained a "rational soul" that could initiate volition of the body by its own accord. [4]

> "These functions [digestion, beating of heart, growth, respiration, waking, sleeping, etc.] follow in this [human] machine simply from the disposition of the organs as wholly naturally as the movements of a clock or other automaton follow from the disposition of its counterweights and wheels. As far as these functions are concerned, it is not necessary to conceive any other vegetative or sensitive soul, nor any other principle of motion or of life, than the blood and the spirits agitated by the fire which burns continually in the heart, and which is in no wise different from the fires which exist in inanimate bodies."
>
> — Rene Descartes (1633), *Treatise on Man* [13][19]

In c.1949, John Neumann picked up on Descartes's human automaton theories (see: Neumann automaton), in some sense, in terms of free energy. [1]

Death

Descartes, similar to Thomas Hobbes, compared death to the stopping of a watch mechanism. [8] The following is Descartes' view on the matter: [9]

> "The body of a *living man* (see: alive; living matter) differs from that of a *dead man* (see: dead; dead matter) only as much as a watch or any other automaton when they are wound up differ from the same watch or automaton when they are broken."

(add)

Treatise on Man

Descartes' *circa* 1633 *Treatise on Man* describes the human body as a machine, and investigates the movement of the blood, animal spirits, the senses, hunger and thirst, digestion, and the brain and its functions. In this work, it is said that he championed the full reduction of the human body to the phenomenon of matter in motion. [5]

Of note, originally Descartes had spent four years, in the 1630s, preparing a double treatise on "man" and "light", but withheld it from publication on learning how Italian physicist Galileo Galilei, in 1633, had been punished by the church for his advocacy of the Copernican doctrine of the motion of the earth. Consequently, Descartes' treatise on humans was published post humorously in 1662. [6]

The idea of the body as a kind of animal machine that functions according to physical laws was an immense advance over the previous scholastic notions based on Aristotle, which merely begged the question of how the various organs of the body work by stating that it is in their nature to perform their specific functions.

Cartesian system

Descartes is also the eponym of the Cartesian coordinate system, a very prominent mathematical tool used in thermodynamics, which was first introduced in one the appendices, entitled "On Geometry", to his famous 1637 *Discourse on Method*.

Heat

Descartes' 1637 *Discourse on Method* contains a short chapter on "What do heat and light of fire consist in?". Descartes believed that heat was a free-floating "ethereal" substance that had neither weight nor mass and that cold was caused by the recess receding that of ethereal substance, which agitated the little eel-like particles of bodies. [3]

Vis viva

In *circa* 1640 pre vis viva ideas in which he ruminated on the issue of what happens when a body, such as a hard spherical ball, of mass *m* and speed *v* collides with another such body of different mass and speed. He concluded that the quantity *mv* (now called momentum) would be conserved. In other words, according to Descartes, for two colliding spheres the sum:

$$m_1 v_1 + m_2 v_2$$

would be the same before and after the collision. In short, Descartes argued for a principle of conservation of motion, where quantity of the product of the mass of a moving object by its velocity *mv* was thought to be conserved in mechanical interactions. Descartes' reasoning, however, was partly metaphysical and therefore not convincing. [2]

Chemical bonding

In circa 1625, Descartes was said to have used the hooked atom logic of atomic theory in which "hood-and-eye model of atomic bonding", whereby a bond was said to form when the hook of one atom got caught in the eye of another atom.

Magnetism

In 1644, Descartes published his effluvia theory of magnetism—supposedly based on Empedocles' theory of effluvia—which seems, in some way, to have been a possible precursor to James Maxwell's 1873 electromagnetic theory. [12]

Atomic theory

In 1637, Descartes became one of the few scientists to revive Greek philosopher Leucippus' atomic theory, along with French mathematician Pierre Gassendi (1649), English physicist Robert Boyle (1661), and English physicist Isaac Newton (1686).

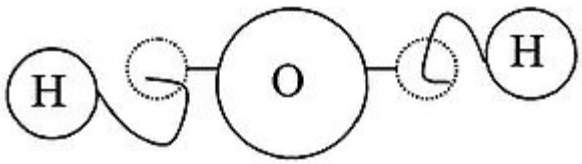

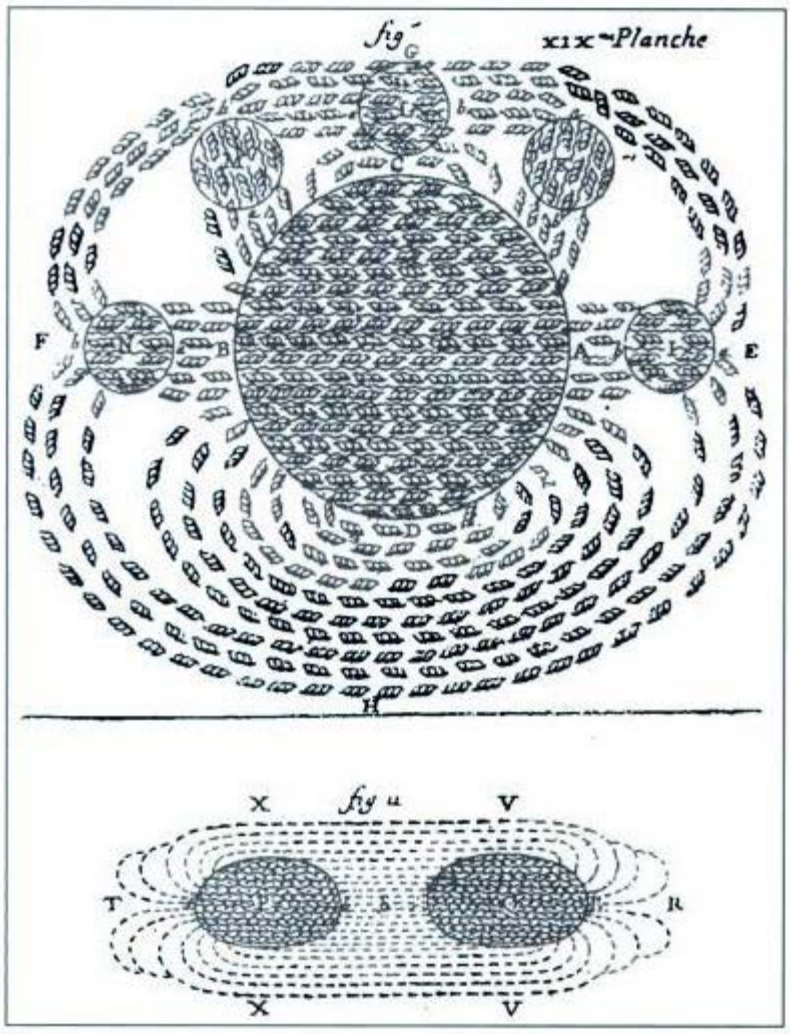

Descartes' 1644 effluvia models of the magnetism the earth (top) and a permanent magnet (bottom). [12]

Irish physicist John Tyndall (1874), to note, states that Descartes rejected the Greek notion of the atom, because, supposedly, he argued, it was absurd to suppose that God, if he so pleased could not divide an atom; Descartes, says Tyndall, puts in place of the atoms small round particles and "light splinters", out of which he builds the organism. [13]

Free will

From various unpublished manuscripts, it has been surmised that Descartes worried the eventuality of mind initiating motion would jeopardize his conservation principle and his entire mathematical account of motion. [7] Descartes, in short, realized that his conservation of momentum principle conflicted with the doctrine of free will and internal choice.

Soul

See main: Descartes on the soul

Descartes was an early soul theorist, noted for his opinion that the soul is located in the pineal gland: [10]

> "My view is that this gland is the principal seat of the soul, and the place in which all our thoughts are formed. The reason I believe this is that I cannot find any part of the brain, except this, which is not double. Since we see only one thing with two eyes, and hear only one voice with two ears, and in short have never more than one thought at a time, it must necessarily be the case that the impressions which enter by the two eyes or by the two ears, and so on, unite with each other in some part of the body before being considered by the soul. Now it is impossible to find any such place in the whole head except this gland; moreover it is situated in the most suitable possible place for this purpose, in the middle of all the concavities; and it is supported and surrounded by the little branches of the carotid arteries which bring the spirits into the brain."

American physical organic chemist George Scott seems to think that this was Descartes' location for free will. [11]

Reaction end | Poisoned?

There seem to be some peculiar circumstances behind Descartes reaction end; the "official" version being that, at age 54, he dies from pneumonia in Sweden; the unofficial version being that he was poisoned by an arsenic-laced communion wafer by priests fearing of the effect of his materialistic philosophy on the queen of Sweden:

A depiction of Christina Alexandra, Queen of Sweden, left, being tutored by **Rene Descartes**, right, on his "mechanical philosophy"; views for which he was "put to death" (Holbach, 1770) for, i.e. poisoned as it has been surmised.

> "Descartes symptoms include: weakening, vomits, diarrhea, dizziness, skin's pigmentation, cutaneous damages, enteritis ... symptoms commonly found in an arsenic intoxication."
>
> — Johann van Wullen (c.1650), "Letter to Willem Piso" [17]

> "He expiated his rivals attacks with the innocency of his life."
>
> — Hector Chanut (1650), words engraved on Descartes tombstone [17]

> "Virgil, the bishop of Saltzburg, was condemned by the church, for having dared to maintain the existence of the antipodes. All the world is acquainted with the persecutions which Galileo suffered for pretending that the sun did not make its revolution round the earth. **Descartes** was put to death in a foreign land."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 284)

In 2009, Theodore Ebert, in his *The Enigmatic Death of Rene Descartes*, conjectured that Descartes was poisoned by an arsenic-laced communion wafer; the abstract of which is as follows: [18]

“This monograph discusses the illness and death of René Descartes. All the hitherto available documents on his illness and death are collected in the appendix, partly also in the original French or Latin. These documents make it rather unlikely that Descartes died of pneumonia, the circumstances of his death suggest a poisoning by arsenic. The possible murderer and his motives are also discussed.”

(add)

Quotes | On

The following are quotes on Descartes:

“The embarrassments which animals have thrown in the way of the partisans of the doctrine of spirituality is well known: they have been fearful, if they allowed them to have a spiritual soul of elevating them to the condition of human creatures; on the other hand, in not allowing them to have a soul, they have furnished their adversaries with authority to deny it in like manner to man, who thus finds himself debased to the condition of the animal. Theologians have never known how to extricate themselves from this difficulty. **Descartes** fancied he solved it by saying that beasts have no souls, are mere machines. Nothing can be nearer the surface than the absurdity of this principle. Whoever contemplates nature without prejudice, will readily acknowledge, that there is no other difference between the man and the beast than that which is to be attributed to the diversity of his organization.”

— Baron d’Holbach (1770), *The System of Nature* (pgs. 81-82)

“It is, indeed, a very observable fact, that while Richelieu, with such extraordinary boldness, was secularizing the whole system of French politics, and by his disregard of ancient interests, was setting at naught the most ancient traditions, a course precisely similar was being pursued, in a still higher department, by a man greater than he; by one, who, if I may express my own opinion, is the most profound among the many eminent thinkers France has produced. I speak of **Rene Descartes**, of whom the least that can be said is, that he effected a revolution more decisive than has ever been brought about by any other single mind. He was the first who successfully applied algebra to geometry; that he pointed out the important law of the sines that in an age in which optical instruments were extremely imperfect, he discovered the changes to which light is subjected in the eye by the crystalline lens ; that he directed attention to the consequences resulting from the weight of the atmosphere, and that he, moreover, detected the causes of the rainbow, that singular phenomenon, with which, in the eyes of the vulgar, some theological superstitions are still connected. At the same time, and as if to combine the most varied forms of excellence, he is not only allowed to be the first geometrician of the age, but, by the clearness and admirable precision of his style, he became one of the founders of French prose. ”

— Henry Buckle (1856), *History of Civilization, Volume One* (pg. 417)

“Mindful of Galileo's condemnation, **Descartes**, who had no taste for martyrdom, was always careful, in defending the Copernican system, to refer to it as a ‘fable’ or mere ‘hypothesis’, which, indeed, agreed with the known facts better than any other, but need not on that account be regarded as true; but no reader can have been in doubt either as to the logical outcome of the philosopher's arguments or as to his actual opinion.”

— Arthur Lovejoy (1933), *The Great Chain of Being* (pg. 123)

"Most seventeenth-century scientists accepted **Descartes** 'mechanical philosophy', in which the universe was composed of matter and motion, and all natural philosophy could be explained by the collisions between particles."

— Stephen Inwood (2002), *The Man Who Knew Too Much* (pg. 15)

Quotes | By

The following are noted quotes:

"Give me matter and motion, and out of them I will build the universe."

— Rene Descartes (c.1630), *Publication* (Ñº); cited by Ludwig Buchner (1855) in *Force and Matter* (pg. 64)

"It is now some years since I detected how many were the false beliefs (see: unlearn) that I had from my earliest youth admitted as true and how doubtful was everything I had since constructed on this basis."

— Rene Descartes (1641), *Mediations on the First Philosophy in Which the Existence of God and the Distinction Between Mind and Body are Demonstrated* [14]

"**I am a thing that thinks**: that is to say, that doubts, affirms, denies, that wills, that desires, that also imagines and perceives."

— Rene Descartes (1641), *Mediations on First Philosophy (Mediation Three)* (Ñº); note: Hobbes objected (Ñº) to this [15]; cited by Henry Buckle (1856) in *History of Civilization, Volume One* (pg. 425)

"If you would be a real seeker of truth, you must at least once in your life doubt, as far as possible, all things."

— Rene Descartes (1644), *Principles of Philosophy* (Ñº)(Ñº)

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θΔics

In hmolscience, **Rene 'Aor' Schwaller de Lubicz** (1887-1961) (IQ:175|#270), oft-cited as "Schwaller" (Q), "Schwaller de Lubicz", or R.A. Schwaller de Lubicz, was a French-German chemist, physicist, Egyptologist, religio-mythology scholar, and thing philosopher, comparable to Goethe and Thomas Jefferson, in some ways of thinking, e.g. in respect to universal philosophy, noted for his 1949 two-volume *The Temple in Man*, wherein he defines life as the "faculty of reaction", which he applied to everything, animals, vegetables, and minerals. [1]

Life | Reaction faculty

In 1949, Lubicz, in his *The Temple of Man*, gave the following interesting definition, in chemical upgrade to the concepts of sex, reproduction, and death:

> "I propose the following definition, which is applied to everything, including minerals: 'life is the faculty of reaction.' Everything in the universe tends toward inertia, or absence of reaction. The proof of this inertia, which thermodynamics seeks in 'absolute zero,' has never been given, nor will it ever be, because absolute inertia can only be attained through the cessation of the formed matter or 'thing'. This would be the moment the thing ceased to exist. Everything 'existing' is capable of reaction, insofar as it has 'weight', that is, fixed or specific energy. The vital phenomenon is the faculty of reacting, and to manifest itself this reaction requires a resistance of the same nature as the action."

This "existing formed matter with reaction faculty" definition of life, to note, seems to have some comparison to Libb Thims' *circa* 2014 introduced term "existive", short for "react-**ive exist**-ence" as a life terminology upgrade for the defunct them "alive".

Education

Lubicz spent his childhood doing chemical experiments, dreaming, painting, in the forest, ruminating on connections between art and science.

At age 7, supposedly, had a revelation about the nature of the divine; at 14, he had a revelation about matter. He then moved to France to study painting with Matisse, during which time he became influenced by the ideas of Henri Bergson, along with alchemical works, e.g. Paracelsus and Ramon Llull, while at the same time studying modern physics, particularly Albert Einstein and Max Planck. [2]

Quotes | By

The following are quotes by Lubicz:

> "We were appealing to another power in us which comes from our innate consciousness, the source of the sense of harmony. If it is effective, this power will be the reason for genius, for creative thought, creative in the sense that it works ahead of the known, the classified. Isn't it this consciousness of a new way, dictated to today's decadent world, which impels artists to destroy the idols of yesterday in order to attempt irrational expressions? They seek a concordance of the elements of "sensations," ignoring the rational combinations which only satisfy the inertia of acquired habit. Atmospheres, images, and forms are created to evoke a feeling, an emotion, to provoke a vital reaction. Art is the herald of the mentality of a period, the harbinger of its innermost tendency."
>
> — Rene Lubicz (c.1950), *Esoterism and Symbol* (Q)

> "Sages leave speculation to the idle, and contemplate nature."
>
> — Rene Lubicz (c.1950), *Esoterism and Symbol* (Q)

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External links

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θΔics

In existographies, **Rene Magritte** (1898-1967) was a Belgian surrealist artist noted for his 1933 oil on canvas painting “Elective Affinities”, showing a large unhatched egg in a small cage, a visual depiction of a perspective of Goethe’s 1809 human chemical theory based novella *Elective Affinities*, we are each caged, so to say, by the forces of the elective affinity or chemical "affinities" that move us hither and tither via our own conceptually-felt “elections” to choose from among various reaction scenarios.

Further reading

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External links

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θΔics

In existographies, **Rene Thom** (1923-2002) was a French mathematician, noted for []

Overview

In 1970s, Thom invented "catastrophe theory", which was posited to give an understanding of how sudden changes in society might be provoked by small effects. [1]

Jaynes

In 1991, Edwin Jaynes, in his "How Should we Use Entropy in Economics", outlined how Willard Gibbs' 1973 graphical thermodynamic ideas, such as entropy convexity, can be mixed with logarithmic interpretations of economic entropy, following equation, e.g. multiplicities and macroeconomic states:

$$S(X, Y, Z...) = \log W(X, Y, Z...)$$

and connected in some way to French mathematician Rene Thom's 1960s catastrophe theory, and the thermodynamics of ferromagnetism and the Curie temperature. [1]

Quotes | By

The following are quotes by Thom:

> "Catastrophe theory is, quite likely, the first coherent attempt (since Aristotelian logic) to give a theory on analogy. When narrow-minded scientists object to catastrophe theory that it gives no more than analogies, or metaphors, they do not realise that they are stating the proper aim of catastrophe theory, which is to classify all possible types of analogous situations."
>
> — Rene Thom (c.1980), *Publication* (Ñº)

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External links

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â— Catastrophe theory – Wikipedia.

θΔics

In debates, **Rennie creationism fiasco** refers to the 2002 to 2003 evolution vs creationism battle surrounding the publication American biologist and science writer John Rennie's 17 Jun 2002 *Scientific American* article “15 Answers to Creationist Nonsense”, one of the most read and downloaded (Ñº) articles in the history of ScientificAmerican.com, wherein #9: "second law of thermodynamics says that systems must become more disordered over time; living cells therefore could NOT have evolved from inanimate chemicals" touched a nerve, provoking rebuttal by American creationist biologists Bert Thompson and Brad Harrub, and the following up independent commentary by American *status quo* thermodynamics textbooks authors: Robert Alberty, Donald Haynie, and Ken Dill; the latter’s commentary yielding more incorrectness than the creationism objection, leads one to the question: “who is promoting more nonsense: the creationists or the secularists?”

15 Answers to Creationist Nonsense

Opponents of evolution want to make a place for creationism by tearing down real science, but their arguments don't hold up

Jun 17, 2002 | By John Rennie

When Charles Darwin introduced the theory of evolution through natural selection 143 years ago, the scientists of the day argued over it fiercely, but the massing evidence from paleontology, genetics, zoology, molecular biology and other fields gradually established evolution's truth beyond reasonable doubt. Today that battle has been won everywhere--except in the public imagination.

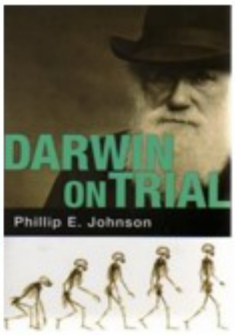

Embarrassingly, in the 21st century, in the most scientifically advanced nation the world has ever known, creationists can still persuade politicians, judges and ordinary citizens that evolution is a flawed, poorly supported fantasy. They lobby for creationist ideas such as "intelligent design" to be taught as alternatives to evolution in science classrooms. As this article goes to press, the Ohio Board of Education is debating whether to mandate such a change. Some antievolutionists, such as Philip E. Johnson, a law professor at the University of California at Berkeley and author of *Darwin on Trial*, admit that they intend for intelligent-design theory to serve as a "wedge" for reopening science classrooms to discussions of God.

Opening section to American biologist and science writer John Rennie’s 2002 article “15 Answers to Creationist Nonsense”, which initiated the so-called "**Rennie vs Thompson and Harrub creationism fiasco**", which vicariously prompted three thermodynamics textbook authors—who tend to be very taciturn about such matters—to pipe up opinions on the thermodynamic aspects of the debate, namely: Robert Alberty, Donald Haynie, and Ken Dill. [1]

Overview

On 17 Jun 2002, American biologist and science writer John Rennie, the then editor in chief of *Scientific America*, in reaction to the Mar 2002 Ohio Board of Education move (Ñº) to have creationism or intelligent design, per initiative of the Discover Institute, taught alongside evolution, and to publications of creationists, such as American law professor Philip Johnson, author of *Darwin on Trial* (1991), and published “15 Answers to Creationist Nonsense”, wherein he pens a list of rebuts to some of the most common "scientific" arguments raised against evolution; the following is his answer #9: [1]

> **Answer #9.** The second law of thermodynamics says that systems must become more disordered over time. Living cells therefore could not have evolved from inanimate chemicals, and multicellular life could not have evolved from protozoa. This argument derives from a misunderstanding of the second law. If it were valid, mineral crystals and snowflakes would also be impossible, because they, too, are complex structures that form spontaneously from disordered parts.
>
> The second law actually states that the total entropy of a closed system (one that no energy or matter leaves or enters) cannot decrease. Entropy is a physical concept often casually described as disorder, but it differs significantly from the conversational use of the word. More important, however, the second law permits parts of a system to decrease in entropy as long as other parts experience an offsetting increase. Thus, our planet as a whole can grow more complex because the sun pours heat and light onto it, and the greater entropy associated with the sun's nuclear fusion more than rebalances the scales. Simple organisms can fuel their rise toward complexity by consuming other forms of life and nonliving materials.

(add discussion)

Thompson-Harrub response

In Oct 2002, American creationists Bert Thompson and Brad Harrub, in in response to Rennie's article, penned a 65-page response article entitled "15 Answers to John Rennie and *Scientific American's* Nonsense", posted on ApologeticsPress.org, naturally enough citing all the stock creationist scientists, such as: Gordon van Wylen, Frank Tipler, Emmett Williams, William Thomson, Henry Morris, Paul Davies, among others; their rebuttal to Answer #9 is as follows: [2]

American creationist biologists Bert Thompson and Brad Harrub who stoked the fire of debate with their "15 Rebuttals" response article, to Rennie's "15 Answers". [2]

> **Rebuttal to #9.** [Creationists suggest that] the second law of thermodynamics says that systems must become more disordered over time. Living cells therefore could not have evolved from inanimate chemicals, and multicellular life could not have evolved from protozoa.
>
> Mr. Rennie's entire discussion on this point was as follows:
>
>> This argument derives from a misunderstanding of the second law. If it were valid, mineral crystals and snowflakes would also be impossible, because they, too, are complex structures that form spontaneously from disordered parts.
>>
>> The sfecond law actually states that the total entropy of a closed system (one that no energy or matter leaves or enters) cannot decrease. Entropy is a physical concept often casually described as disorder, but it differs significantly from the conversational use of the word.
>>
>> More important, however, the Second law permits parts of a system to decrease in entropy as long as other parts experience an offsetting increase. Thus, our planet as a whole can grow more complex because the sun pours heat and light onto it, and the greater entropy associated with the sun's nuclear fusion more than rebalances the scales. Simple organisms can fuel their rise toward complexity by consuming other forms of life and nonliving materials (2002, 287[1]:82).

Amidst the currently raging controversy centering on creation and evolution as the only two possible explanations for the Universe and all life in that Universe, a bitter battle is being waged in regard to the meaning and significance of two of the most fundamental laws known to science—the first and second laws of thermodynamics. For years creationists have presented (in articles, books, lectures, and debates) evidences against the General Theory of Evolution based on those two laws. During much of that time evolutionists, with rare exceptions, simply ignored creationists' arguments. In the few instances where evolutionists bothered to acknowledge the arguments based on thermodynamics, they generally did so only in cursory fashion, most often by simply dismissing creationists' arguments as efforts by those who were "uninformed" or "misguided."

But all of that has changed—as is evident from Mr. Rennie's comments. Evolutionists have heard the "call to battle," and are answering that call. Now both creationists and evolutionists are actively engaged in the most serious kinds of efforts to portray to the general public the relationship that exists between the laws of thermodynamics and their respective origin models. And for good reason. The stakes involved are enormous! If creationists are correct in their statements of the laws of thermodynamics, and in their assessments and interpretations based on those laws, evolution is immediately and automatically ruled out

by what those in the scientific community readily acknowledge as "the most secure generalizations known to science"—the laws of thermodynamics. Whereas in the past, evolutionists frequently ignored arguments based on the laws of thermodynamics, now those same evolutionists are reacting with a feverish pitch to creationists' presentations based on those laws. For that reason, and because of the tremendous importance that the laws of thermodynamics do have to the creation/evolution issue, we believe that an examination of these matters is warranted.

Our English word "thermodynamics" derives from two Greek words, therme, meaning "heat," and dynamis, meaning "power." Thus thermodynamics is the study of heat power. Historically, the subject of thermodynamics arose from the study of heat engines. Currently, the subject of thermodynamics is much broader in scope, and involves the movement of energy and the conversion of one form of energy into another. Thermodynamics, as a field of study, is important for several reasons, not the least of which is that it acts as a "unifying" factor for all of the exact sciences, since energy is required for all natural processes (see Crawford, 1963, p. 1). It is this very fact—that all natural processes require energy—that makes thermodynamics of special interest in the creation/evolution controversy. Consider, for example, Sir Julian Huxley's now-famous definition of evolution:

> Evolution in the extended sense can be defined as a directional and essentially irreversible process occurring in time, which in its course gives rise to an increase of variety and an increasingly high level of organization in its products. Our present knowledge indeed forces us to the view that the whole of reality is evolution—a single process of self-transformation (1955, p. 278).

Sidney Fox, who pioneered much of the work regarding the "origin of life" in evolutionary scenarios, has noted that "evolution, however, has put together the smallest components; it has proceeded from the simple to the complex" (1971, 49[50]:46).

Obviously evolution involves "transformation" or "putting together." And, such natural transformations or "putting together" processes require energy. In fact, a process of evolution (like the one suggested by Huxley and Fox) would require tremendous quantities of energy, and many energy transformations from one form to another. Simply stated, then, our point is this: the process of evolution requires energy in various forms, and thermodynamics is the study of energy movement and transformation. Thus, the two fields bear a clear relationship. Scientific laws that govern thermodynamics also must govern evolution. Creationists and evolutionists alike generally acknowledge this fact. Creationist writers are quick to express agreement on this point (see Williams, 1981, p. 10). Most evolutionists agree that, in principle, thermodynamics does have a relationship to evolution, but some are quick to claim that this relationship may not be quite as distinct as creationists suggest. Willard Young stated: "In fact, thermodynamics is involved in every process of energy transformation. For this reason even biology is governed, in part, by the fundamental principles of thermodynamics, though not in the manner the creationists would have us believe" (1985, p. 164).

The point, then, is clear. The laws of thermodynamics do regulate all energy-related processes. Evolution (even biological evolution) is dependent upon such energy-related processes. Thus, the laws of thermodynamics must regulate evolution. The question that obviously arises is two-fold: (1) what do the laws of thermodynamics say; and (2) what regulatory processes or restrictions are imposed on evolution as a result of the laws of thermodynamics?

Robert Mayer (1814-1878) was the first scientist to suggest the general principle that ultimately would become the first law of thermodynamics. Mayer observed: "I therefore hope that I may reckon on the reader's assent when I lay down as an axiomatic truth that, just as in the case of matter, so also in the case of force [the then-current term for energy—BT/BH], only a transformation but never a creation takes place" (as quoted in King, 1962, p. 5). Today we often refer to the first law as the "law of conservation of energy

(and/or mass)." Put into simple terms, the first law says that, naturally speaking, neither energy nor matter can be created or destroyed, but can only be converted from one form to another. The total amount of energy in the Universe remains constant. Scientists freely admit that, as Young put it, "the principle of the conservation of energy is considered to be the single most important and fundamental 'law of nature' known to science, and is one of the most firmly established. Endless studies and experiments have confirmed its validity over and over again under a multitude of different conditions" (1985, p. 165).

Although the first law of thermodynamics has serious implications for any evolution-based scenario, since Mr. Rennie mentioned in his article in Scientific American only the second law, we will restrict our comments here to that law. [For an in-depth discussion of the implications of the laws of thermodynamics in the creation/evolution controversy, see Thompson and Major, 1988.]

As men began to work with heat engines in the nineteenth century, the second law of thermodynamics came to be formulated. In 1824, Sadi Carnot (1796-1832), a French physicist, correctly noted that every heat engine requires a hot body (or source of heat) and a cold body (or sink), and that as the engine operates, heat passes from the hot body to the cold body. In such an engine, only a portion of the heat from the source can be utilized to perform useful work. The remainder is wasted. As a result of Carnot's discovery, two scientists of his generation independently stated what came to be known as the second law of thermodynamics. German scientist Rudolf Clausius (1822-1888), and Irish scientist Lord Kelvin (William Thomson, 1824-1907), introduced concepts in 1850 and 1851, respectively, which ultimately became known as the second law. In 1852, Kelvin published a paper in which he delineated what was to become one of the most secure generalizations in all of science. In his treatise titled "On a Universal Tendency in Nature to the Dissipation of Mechanical Energy," he set forth three propositions in which he summarized the concept that although energy is conserved (the first law), it is becoming less and less available for use (the second law). Energy is, to use Kelvin's own words, "irrevocably lost to man and therefore 'wasted,' though not annihilated" (as quoted in Thompson, 1910, pp. 288-291). Clausius enunciated another form of the second law in 1854 when he stated that "heat cannot of itself, without the intervention of any external agency, pass from a colder to a hotter body" (as quoted in Glasstone, 1946, p. 217). Clausius also defined a quantity known as entropy—the energy per degree of absolute temperature that cannot be recovered as work. He thus was able to give succinct definitions of the first and second laws of thermodynamics in this form: according to the first law, the total amount of energy in nature is constant; according to the second law, the total amount of entropy in nature is increasing. Entropy (from two Greek terms meaning "to turn in on oneself ") thus came to represent a measure of the lost usefulness (i.e., randomness, disorderliness) of the system.

Basically the second law says three things: (a) systems will tend toward the most probable state; (b) systems will tend toward the most random state; and (c) systems will increase in entropy, where entropy is a measure of the unavailability of energy to do useful work (see Wysong, 1976, p. 241). In "open" systems, energy may be lost to or gained from outside sources (i.e., the system is not self-contained). In "closed" systems, no outside energy or other "interference" is allowed (i.e., the system is self-contained).

Sir Arthur Eddington, the eminent British astronomer of the past generation, referred to the second law as "time's arrow," because it regulated the direction of all material events in time. That is to say, since the Universe is considered to be a closed (isolated) system, and since as time goes forward usable energy becomes less and less available, eventually the Universe will experience a "heat death"—that point in time when there is no more energy available for use. As Richard Morris observed, "The Second Law tells us that past and future look different; there will be more entropy in the future, and there was less entropy in the past" (1985, p. 121). Harold Blum seized upon Eddington's phrase "time's arrow" and authored a book titled *Time's Arrow and Evolution*, in which he noted that "...all real processes tend to go toward a condition of greater probability .... Increase in randomness may be taken as a measure of direction in time.... the second law of thermodynamics predicts that a system left to itself will, in the course of time, go toward greater disorder" (1968, pp. 5,192,201).

The first and second laws of thermodynamics know no exceptions. As we have already noted, they are

among the most secure generalizations of all of science. One writer put it this way:

> It has been my experience that many people do not appreciate how uncompromising the Laws of Thermodynamics actually are. It is felt, perhaps, that the Laws are merely general tendencies or possibly only theoretical considerations. In reality, though, the Laws of Thermodynamics are hard as nails, and I have been told that the more one works with these Laws, the deeper respect one gains for them (Walters, 1986, 9[2]:8).

Evolutionary writer Jeremy Rifkin, in his book, *Entropy: A New World View*, pointed out that "the Entropy Law will preside as the ruling paradigm over the next period of history. Albert Einstein said that it is the premier law of all science; Sir Arthur Eddington referred to it as the 'supreme metaphysical law of the entire universe' " (1980, p. 6). Eddington also noted: "[I]f your theory is found to be against the second law of thermodynamics, I can give you no hope; there is nothing for it but to collapse in deepest humiliation" (1930, p. 74). Isaac Asimov likewise observed that "in any spontaneous process, entropy either does not change (under ideal cases) or it increases (in real cases). Forgetting the ideal, we can just take it for granted that, in the real world about us, entropy always increases" (1962, pp. 57-58, parenthetical items in orig.). Several years after making that statement, Dr. Asimov went on to comment that "as far as we know, all changes are in the direction of increasing entropy, of increasing disorder, or increasing randomness, of running down" (1973, p. 76).

But what does all of this have to do with evolution? The fact is: the second law of thermodynamics strictly prohibits organic evolution, Mr. Rennie's disclaimers notwithstanding. Evolutionists have attempted to downplay the problems in regard to thermodynamics and evolutionary theory. But the problems do exist, and are serious. All natural processes occur in a direction such that there is an increase in entropy (disorder, randomness). And natural processes tend to go spontaneously only one way. As King noted: "This 'onewayness' appears to be a very fundamental characteristic of natural processes. The second law of thermodynamics epitomizes our experiences with respect to the direction taken by thermophysical processes" (1962, p. 78). In defining the second law (or any other natural process), we speak of "spontaneous" processes, because any natural process is a spontaneously occurring one. Thermodynamically speaking, all isolated systems (and the Universe is accepted as an isolated system) proceed toward a state of equilibrium. That is to say, a system changes its state toward one in which the physical properties of the system are as uniform throughout as possible under prevailing conditions (King, p. 103). If the system is exposed to its surroundings, both the system and the surroundings will approach a state of equilibrium with each other. Natural processes proceed so that entropy increases. Movement toward a state of "maximum entropy" (equilibrium) is the norm, not the exception.

The evolutionist has accepted, and thus is forced to defend, a concept which states that in a closed system (the Universe) in which the second law of thermodynamics is operating (with all systems ultimately proceeding toward randomness and disorder), naturally occurring, spontaneous processes produced the order and complexity seen throughout both the living and nonliving worlds. But as Emmett Williams correctly observed:

> The second law of thermodynamics is an empirical law, directly observable in nature and in experimentation. This law implies that the direction of all natural processes is toward states of disorder. From the standpoint of statistics, natural operations proceed in a direction of greatest probability. The most probable state for any natural system is one of disorder. All natural systems degenerate when left to themselves (1981, p. 19).

Even evolutionists admit as much. Isaac Asimov, surely the most prolific science writer of our generation, commented:

> Another way of stating the second law then is "The universe is constantly getting more disorderly!" Viewed that way we can see the Second Law all about us. We have to work hard to straighten a room, but left to itself it becomes a mess again very quickly and very easily. Even if we never enter it, it becomes dusty and musty. How difficult to maintain houses, and machinery, and our own bodies in perfect working order: how easy to let them deteriorate. In fact, all we have to do is nothing, and everything deteriorates, collapses, breaks down, wears out, all by itself—and that is what the second law is all about (1970, p. 6).

Indeed, Dr. Asimov, that is what the second law is "all about." What more could one say to get the point across? Every particle, every atom in every part of the natural universe, as far as scientists have been able to determine, is subject to this natural tendency. It is equally as obvious, however, that there is no tendency on the part of matter to spontaneously and naturally organize itself from nonliving antecedents into living organisms, which then transform themselves to higher levels of complexity. As one scientist reminded us:

> Let us now go back and consider once again what evolutionists believe has occurred on this planet by spontaneous, naturally occurring processes. Simple gases, such as methane, ammonia, hydrogen, and water vapor, have transformed themselves in the presence of highly destructive energy sources, such as ultraviolet light and electrical discharges, into incredibly complex living cells. According to evolutionists, this was a progressive process that inexorably transformed matter to higher and higher levels of organization until finally the living cell arose —the most complex, the most unstable arrangement of matter in the universe... (Gish, 1981, p. 70).

The obvious question then becomes, "what process (or processes) could, in light of the second law of thermodynamics, be responsible for matter naturally, spontaneously organizing itself into living organisms as we see them today?" Evolutionists, of course, have an answer. The Earth, they suggest, is an "open system," and thus partakes of the immense amounts of energy coming in from the Sun. It is this energy, as Mr. Rennie suggested in his Scientific American article, that ultimately is responsible for matter organizing itself into living forms. Given that immense energy, matter could "circumvent" the second law and spontaneously organize itself. In fact, we are being asked to believe that this is exactly what happened. Fourteen years before Mr. Rennie suggested that creationists have a fundamental "misunderstanding" about the second law of thermodynamics, Brent Becker, writing in the January/February 1988 issue of Creation/Evolution Newsletter, complained that "creationists get confused" over these points, and then stated that they "equate complexity with organization, disorder with disorganization, and information entropy with thermodynamic entropy. Further, they ignore the effect of physical and chemical laws when discussing entropy changes in open systems. It is these laws which provide the creationists' 'missing blueprint' for transforming energy flow into organization" (8[1]:19-20). As Rennie stated: "Our planet as a whole can grow more complex because the sun pours heat and light onto it, and the greater entropy associated with the sun's nuclear fusion more than rebalances the scales. Simple organisms can fuel their rise toward complexity by consuming other forms of life and nonliving materials" (2002, 287[1]:82).

Evolutionists must seek refuge in the "open system" argument, because it is the only option they have left. The formal statement of the second law would immediately be the downfall of evolutionary theory if accepted at face value since, according to the second law, entropy (randomness, disorderliness) always tends to increase in closed systems. And the Universe (so far as we are aware) is a closed system. Scientifically speaking, then, evolution would be plainly impossible, as it requires exactly the opposite of what the second law states is actually happening in nature (remember Huxley's description of evolution as "an increasingly high level of organization"?). Yet evolutionists refer to creationists as "confused" or "ignorant" when we call into question the concept of evolution in light of the scientific facts surrounding the second law. The evolutionist says: "But the Earth is an 'open system' and the second law does not apply

to open systems that have energy supplied from an outside source. It is this 'outside energy from the Sun' that causes evolution to occur."

With all due respect, it is evolutionists like Becker and Rennie who have grossly misstated the issues. It is not creationists who are "confused." Nor is it creationists who "ignore" physical and chemical laws. Quite the opposite is true, in fact. It is creationists who continually point out that the second law applies to open systems as well, and even has mathematical constructs to apply to such systems (see Morris and Parker, 1987, pp. 205ff.). Evolutionist John Ross of Harvard plainly stated the matter in a letter to the editor of *Chemical and Engineering News* when he wrote:

> ...there are no known violations of the second law of thermodynamics. Ordinarily the second law is stated for isolated systems, but the second law applies equally well to open systems.... There is somehow associated with the field of far-from-equilibrium phenomena the notion that the second law of thermodynamics fails for such systems. It is important to make sure that this error does not perpetuate itself (1980, p. 40, emp. added).

Evolutionists boldly (and correctly) assert that "the Earth is an open system." Yet even they recognize that the second law of thermodynamics applies to the Earth—as an open system! Evidence for that is all around them. Energy supplies (coal, natural gas, oil, etc.) constantly are being depleted; animals and people die; decay is ubiquitous; etc. Entropy increases at every turn. Furthermore, as far as the earth itself is concerned, every real system is an open system. There are no "closed systems" in nature (except the Universe itself). Emile Borel, the world-renowned Swiss scientist and mathematician established this years ago. Speaking of Dr. Borel's efforts in this regard, Harvard astronomer David Layzer commented: "Borel showed that no finite physical system can be considered closed" (1975, 223:56).

You can bathe the Earth with energy from the Sun day in and day out, and it will not cause evolution to occur because, while energy from the Sun is a necessary condition, it is not a sufficient condition. There are other factors involved besides just the need for energy. It is those conditions that evolutionists "ignore" and on which they are "confused." A discussion of this "open system" argument, and the factors that prevent evolution from occurring even in such a system, is therefore in order.

Is it legitimate to suggest, as Mr. Rennie has, that since the Earth is an open system, evolution somehow could have "sidestepped" the second law and occurred anyway? No, it is not. And some evolutionists will admit as much. Charles J. Smith, writing in *Biosystems*, recognized that a serious problem does exist in this area. He stated:

> The thermodynamicist immediately clarifies the latter question by pointing out that the second law classically refers to isolated systems which exchange neither energy nor matter with the environment; biological systems are open and exchange both energy and matter. This explanation, however, is not completely satisfying, because it still leaves open the problem of how or why the ordering process has arisen (an apparent lowering of the entropy), and a number of scientists have wrestled with this issue. Bertalanffy called the relation between irreversible thermodynamics and information theory one of the most fundamental unsolved problems in biology. I would go further and include the problem of meaning and value (1975, 1:259, emp. added).

Unfortunately, many of the rank-and-file evolutionists do not have even the slightest idea of the situation that confronts them regarding the second law of thermodynamics—a situation so grave that it has been called "one of the most fundamental unsolved problems in biology." In the meantime, they go on parroting the timeworn cliché that "the second law applies only to closed systems, and since the Earth is an open

system with energy available from the Sun, evolution can occur." Smith is correct in saying that "this explanation, however, is not completely satisfying." It is, in fact, vacuous. Let us explain why.

Merely having an energy field available to an open system does not mean that the system will somehow automatically become organized or increase in complexity. We know of no one who could make this very point more forcefully than the renowned evolutionists, George Gaylord Simpson and W.S. Beck, when they stated in their biology textbook *Life: An Introduction to Biology*:

> We have repeatedly emphasized the fundamental problems posed for the biologist by the fact of life's complex organization. We have seen that organization requires work for its maintenance and that the universal quest for food is in part to provide the energy needed for this work. But the simple expenditure of energy is not sufficient to develop and maintain order. A bull in a china shop performs work, but he neither creates nor maintains organization. The work needed is particular work; it must follow specifications; it requires information on how to proceed (1965, p. 466, emp. added).

These two evolutionary scholars seemingly have stumbled onto the very point that the creationists have been making for years. Energy alone is not sufficient to cause the evolutionary process to occur! Energy is a necessary condition, but it is not a sufficient condition. Raw, unbridled, uncontrolled energy alone (like a bull in a china shop) is more damaging than helpful. It destroys; it does not build. Raw, unbridled, uncontrolled solar energy is no different. In order to be constructive instead of destructive, it must be managed or controlled. Here is where the evolutionists have made a grievous error in their thinking. Their response that "the Earth is an open system and has available to it the Sun's energy that causes evolution to occur" confuses the quantity of energy (of which there is certainly enough) with the conversion of energy. The question is not whether there is enough energy from the Sun to sustain the evolutionary process; the question is how does the Sun's energy cause, and eventually sustain, evolution? Or, put another way, the question is: what condition(s) must be satisfied to cause any finite system to advance to a higher degree of order, when the Universe as a whole is decreasing in order?

Simpson and Beck, as evolutionists, clearly stated what is necessary. They noted that a particular kind of work is required. They noted that it must follow specifications. And, they noted that it requires information on how to proceed. At this point, it would be appropriate to observe that these observations were made by evolutionists, not creationists. It may come as somewhat of a surprise to learn that these are the exact requirements that creationists have been suggesting for decades.

Earlier, we spoke of energy being a "necessary," but not a "sufficient" condition. Let us now dwell on those conditions that would be both necessary and sufficient to cause the biosphere to evolve from lower to higher order. And, simultaneously, let us inquire as to how the evolutionist would propose that each of the conditions could be present and accounted for on a primitive, primordial Earth.

First, of course, it would be essential to have an open system. Second, it would be necessary to have adequate energy. Now, as we have already noted, the Earth is an open system. And, the Sun's energy certainly is present in adequate amounts. But are these conditions alone sufficient to cause and sustain evolution? No, they are not. There are at least two other conditions (discussed in the next few sentences) that are absolutely necessary. Third, it is essential to have in place some kind of complex mechanism that can convert the available energy arriving from the Sun. The available environmental energy is of no avail unless it can be converted into the specific forms needed to organize and bond the components into the complex and ordered structure of the completed system. It is equally important to note that unless such a mechanism is available, environmental energy will be more likely to break down any structure(s) already present. Remember the statement of evolutionists Simpson and Beck that "the work needed is particular work." The energy must be converted into specific forms. That requires an energy conversion mechanism of some sort (motor, membrane, etc.). Fourth, there must be present a highly specific program to direct the

growth and employ the converted energy. That is to say, the energy must be "told" what to do, and how to do it, once it has been converted from its raw state into a usable form. Remember the statement of Simpson and Beck that the work "must follow specifications; it requires information on how to proceed."

Link together all four of these criteria, and the necessary components become sufficient to perform the task. For example, in the case of a building, fossil fuels and human labor operate numerous complex electrical and mechanical devices used to erect the structure. But, this is accomplished according to an architect's blueprint. The energy is available; the system is "open"; the energy conversion systems are present; and the specific program (blueprint) directs the ongoing construction.

Transfer that into the living world of plants. The process of photosynthesis, which is so complex that even today we do not fully understand it, converts sunlight into the building of the plant's structure. Energy, air, water, sunlight, and other factors work together to produce the plant. The energy (sunlight) is available; the system is "open"; the energy conversion system (photosynthesis) is present; and the specific program (DNA) directs the ongoing "construction."

Or, transfer that into the living world of animals or humans. In both animals and humans, numerous complex mechanisms (digestion, circulatory system, respiratory system, etc.) combine efforts to transform food into body structure, and into energy to maintain that structure. The energy (sunlight for the food; food for the body) is available; the system is "open"; the energy conversion system (digestion and all it entails) is present; and the specific program (DNA with its multifarious systems of the Krebs cycle, the Cytochrome C cycle, etc.) directs the ongoing "construction" in conjunction with the organelles of each cell. And so on.

To simply repeat the phrase that evolution can occur because "the Earth is an open system" ignores the fact that all four of these criteria are necessary in order for evolution to have sufficient cause to occur. The evolutionary process, if it did indeed exist, would be by far the greatest growth process of all. If a specific directing program and energy conversion mechanism are essential for all lesser growth processes, then surely an infinitely more complex program and more specific energy conversion system would be required for the beginning and continued success of evolution. Every stage in organic evolution would represent an immense and unprecedented increase in complexity (remember Huxley's definition?) of a living system, and therefore (according to the list established by Simpson and Beck) would require all four criteria—not just raw, uncontrolled energy and an "open system."

Where, in the evolutionary scheme of things, are the directing program and energy conversion mechanisms? Therein lies "one of the most fundamental unsolved problems in biology," to use the evolutionist's own words. Where in the Universe does one find a plan (a directing program) that sets forth how to organize random particles into particular people? And where does one find the marvelous motor or membrane that converts the continual flow of solar radiant energy arriving here on the Earth into the work of building chemical elements into self-replicating cellular systems, or of organizing populations of single-celled organisms into populations of humans over vast periods of supposed geologic time?

Last but not least, we would like to discuss Mr. Rennie's suggestion that if the creationists' interpretation of the second law of thermodynamics is valid, "mineral crystals and snowflakes would also be impossible, because they, too, are complex structures that form spontaneously from disordered parts." Evolutionist Boyce Rensberger tried this same approach in an article ("How Science Responds When Creationists Criticize Evolution") he wrote for the January 8, 1997 issue of the Washington Post. His statement was:

> If the second law truly prohibited local emergence of increased order, there would be no ice cubes. The greater orderliness of water molecules in ice crystals than in the liquid state is purchased with the expenditure of energy at the generator that made the electricity to run the freezer. And that makes it legal under the Second Law.

Physical chemist Jonathan Sarfati, in a response to Rensberger titled "The Second Law of Thermodynamics: Answers to Critics," completely demolished arguments such as Rensberger's and Rennie's when he noted:

> An energy source is not enough to produce the specified complexity of life. The energy must be directed in some way. The ice cubes of his example would not form if the electrical energy was just wired into liquid water! Instead, we would get lots of heat, and the water breaking up into simpler components, hydrogen and oxygen.
>
> The ice example is thermodynamically irrelevant to the origin of life. When ice freezes, it releases heat energy into the environment. This causes an entropy increase in the surroundings. If the temperature is low enough, this entropy increase is greater than the loss of entropy in forming the crystal. But the formation of proteins and nucleic acids from amino acids and nucleotides not only lowers their entropy, but it removes heat energy (and entropy) from their surroundings. Thus ordinary amino acids and nucleotides will not spontaneously form proteins and nucleic acids at any temperature.
>
> Rensberger also fails to distinguish between order and complexity. Crystals are ordered; life is complex. To illustrate: a periodic (repeating) signal, e.g. ABABABABABAB, is an example of order. However, it carries little information: only "AB" and "print 6 times."
>
> A crystal is analogous to that sequence; it is a regular, repeating network of atoms. Like that sequence, a crystal contains little information: the co-ordinates of a few atoms (i.e. those which make up the unit cell), and instructions "more of the same" x times. If a crystal is broken, smaller but otherwise identical crystals result. Conversely, breaking proteins, DNA or living structures results in destruction, because the information in them is greater than in their parts.
>
> A crystal forms because this regular arrangement, determined by directional forces in the atoms, has the lowest energy. Thus the maximum amount of heat is released into the surroundings, so the overall entropy is increased.
>
> Random signals, e.g. WEKJHDF BK LKGJUES KIYFV NBUY, are not ordered, but complex. But a random signal contains no useful information. A non-random aperiodic (non-repeating) signal—specified complexity—e.g. "I love you" may carry useful information. However, it would be useless unless the receiver of the information understood the English language convention. The amorous thoughts have no relationship to that letter sequence apart from the agreed language convention. The language convention is imposed onto the letter sequence.
>
> Proteins and DNA are also non-random aperiodic sequences. The sequences are not caused by the properties of the constituent amino acids and nucleotides themselves. This is a huge contrast to crystal structures, which are caused by the properties of their constituents. The sequences of DNA and proteins must be imposed from outside by some intelligent process. Proteins are coded in DNA, and the DNA code comes from pre-existing codes, not by random processes.
>
> Many scientific experiments show that when their building blocks are simply mixed and chemically combined, a random sequence results. To make a protein, scientists need to add one unit at a time, and each unit requires a number of chemical steps to ensure that the wrong type of reaction doesn't occur. The same goes for preparing a DNA strand in a correct sequence….
>
> Even the simplest known self-reproducing life form (Mycoplasma) has 482 genes, and it must parasitize more complex organisms to obtain the building blocks it cannot manufacture itself. The simplest organism that could exist in theory would need at least 256 genes, and it's

> doubtful whether it could survive (2002b, emp. in orig.).

In an article titled "Some Thermodynamics Criticisms—and Answers," creationist Carl Wieland addressed this very point in response to an evolutionary critic.

> Again, we now discuss this in terms of information…. Break a crystal and you just get smaller crystals; break a protein and you don't simply get a smaller protein, rather you lose the function completely. This is the equivalent of saying that the crystal has low information content that is simply repeated, while the protein molecule can't be constructed simply by repetition, because there is no chemical tendency for amino acids to align in specific ways during polymerization. Those who manufacture proteins know that they have to add one amino acid at a time, and each addition has about 90 chemical steps involved (2002, emp. in orig.).

The three authors of a critically acclaimed book on chemical evolution, *The Mystery of Life's Origin*, took great pains (and correctly so) to distinguish between order and specified complexity, reserving the former for low-information symmetrical structures such as crystals, and the latter for the high-information structures such as those in living things (see Thaxton, et al., 1984). Anti-creationists like Rennie and Rensberger quite frequently confuse order (repetitive, low information) with specified complexity (non-repetitive, high information). Creationists know better.

Evolutionists are quick to assert that creationists do not understand the laws of thermodynamics and thus form erroneous conclusions. Surely that same charge (which is nothing more than an opinion unsupported by the facts) will not be applied to the work of the two men who have been recognized as international authorities on thermodynamics, Gordon van Wylen and Richard Sonntag. In their university textbook, *Fundamentals of Classical Thermodynamics*, at the end of the chapter dealing with the second law of thermodynamics and the concept of entropy, their conclusion was as follows:

> Quite obviously it is impossible to give conclusive answers to these questions on the basis of the second law of thermodynamics alone. However, we see the second law of thermodynamics as a description of the prior and continuing work of a creator, who also holds the answer to our future destiny and that of the universe (1985, pp. 232-233, emp. added).

With this conclusion we are in full agreement. It is a conclusion drawn from the scientific facts of the matter.

(add discussion)

Holloway | Probe

The Thompson-Harrub rebuttal publication, for whatever reason, prompted American radiochemist Robert Holloway into email-querying three noted thermodynamics textbook authors, about their stance on the debate, namely: Robert Alberty (*Thermodynamics and Biochemical Reactions*, 2003), Donald Haynie (*Biological Thermodynamics*, 2001), and Ken Dill (*Molecular Driving Forces: Statistical Thermodynamics in Chemistry and Biology*, 2003). [3]

Robert Alberty

Donald Haynie

Ken Dill

The following, supposedly, is the main contentious quote, from Thompson and Harrub, citing Allen King (*Thermophysics*, 1962), regarding thermodynamics, that Holloway sent to the three thermodynamicists:

The panel of experts, namely thermodynamics textbook authors: Robert Alberty, Donald Haynie, and Ken Dill, probed by Robert Holloway, to give their opinion on Answer #9 of the **Rennie creationism fiasco**; their respective responses shown below. [3]

> "But what does all of this have to do with evolution? The fact is: the second law of thermodynamics strictly prohibits organic evolution, Rennie's disclaimers notwithstanding. Evolutionists have attempted to downplay the problems in regard to thermodynamics and evolutionary theory. But the problems do exist, and are serious. All natural processes occur in a direction such that there is an increase in entropy (disorder, randomness). And natural processes tend to go spontaneously only one way. As King noted: "This 'onewayness' appears to be a very fundamental characteristic of natural processes. The second law of thermodynamics epitomizes our experiences with respect to the direction taken by thermophysical processes" (1962, p. 78). In defining the second law (or any other natural process), we speak of 'spontaneous' processes, because any natural process is a spontaneously occurring one. Thermodynamically speaking, all isolated systems (and the universe is accepted as an isolated system) proceed toward a state of equilibrium. That is to say, a system changes its state toward one in which the physical properties of the system are as uniform throughout as possible under prevailing conditions (King, p. 103). If the system is exposed to its surroundings, both the system and the surroundings will approach a state of equilibrium with each other. Natural processes proceed so that entropy increases. Movement toward a state of 'maximum entropy' (equilibrium) is the norm, not the exception."

The following are the three responses by Alberty, Haynie, and Dill, ranked in order of descending intellectual coherence:

Alberty

The following are Robert Alberty's remarks, sent to Holloway, on the fiasco: [3]

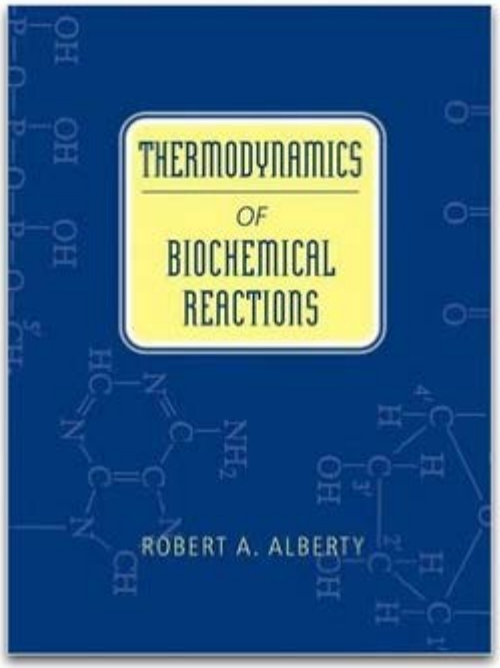

Cover of American physical chemist Robert Alberty's 2003 *Thermodynamics of Biochemical Reactions*.

> Alberty: I will comment on just a couple of the sentences in the material you sent me:
>
> > (1) "All natural processes occur in a direction such that there is an increase in entropy (disorder, randomness)."
>
> Alberty: This statement applies only to an isolated system; specifically one of constant internal energy and volume. Living systems do not operate in isolated systems. Usually they operate at constant temperature and pressure, and so the Gibbs energy G is minimized.
>
> > (2) "Thermodynamically speaking, all isolated systems (and the universe is accepted as an isolated system) proceed toward a state of equilibrium."
>
> Alberty: I do not agree that the universe is an isolated system in the thermodynamic sense.

(3) “This ‘onewayness’ appears to be a very fundamental characteristic of natural processes.”

Alberty: Thermodynamics teaches us that no chemical reaction goes to completion, and so the reverse reactions do have to be taken into account. At equilibrium the rates of reverse reactions are equal to the rates of forward reactions. Most of the reactions in our metabolism do not go at all unless there is an enzyme present to catalyze the reaction. A lot more negative things could be said about the material you sent.

Of note, Alberty's comment: “I do not agree that the universe is an isolated system in the thermodynamic sense”, has recently, specifically by English apologeticist Jeff Miller (2010), been taken in support of the assertion that thermodynamics doesn't apply to the universe. [4]

Haynie

The following is the dialogue on the fiasco, between Holloway and Donald Haynie: [3]

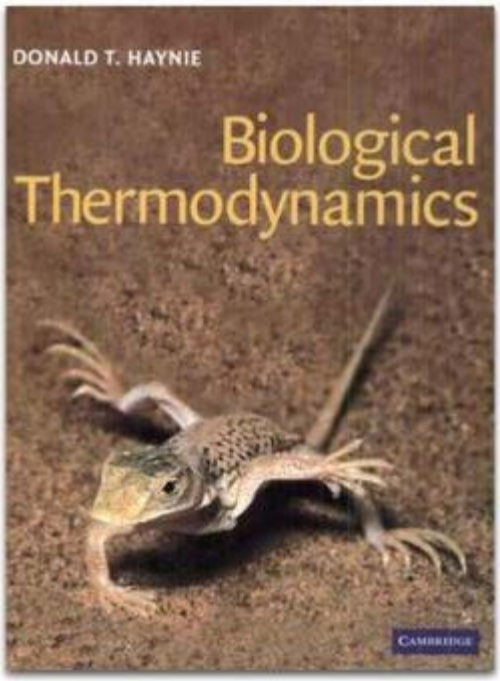

Cover of American biophysicist Donald Haynie' 2001 *Biological Thermodynamics*.

Holloway: I understand that you are the author of the book, *Biological Thermodynamics*. Possibly you are aware of the common claim, by critics of evolution, that the second law of thermodynamics prohibits evolution.

Haynie: Yes, I am the author of *Biological Thermodynamics*. And yes, I am aware that some people think that the second law of thermodynamics is inconsistent with biological evolution as commonly understood. Let me add that this matter seems a complex one, even when the persons debating it can be clear about the definitions of their terms, and that my sense is that most persons who engage in debate on this subject are not very clear at all about definitions of terms.

Holloway: If you have not heard of this claim, I will quote a microbiologist, Bert Thompson, to show you a typical example of the claim. His approach is a bit more sophisticated than most, but is still wrong in my judgment. I wonder if you would be willing to comment on this frequent creationist claim? I am contacting as many authors of thermodynamics textbooks as possible, in order to create a web page countering this frequent claim. If you would like to comment, please do so in a form that is suitable for quotation on the Internet. Especially notice the comment by Bert Thompson that “The second law of thermodynamics strictly prohibits organic evolution”.

Haynie: I do not agree with the statement as shown here, but I will add that it does not help that the terms involved have not been defined (at any point in your email). It seems that a lot of unnecessary confusion has arisen in this subject from differences in word usage. This often only increases the difficulties for persons who may have a deep emotional involvement in the subject. Let me also add that my observations would suggest that a visibly deep emotional involvement in the subject is by no means an absolute indication of whether a person does or does not take this subject seriously or think it important.

Holloway: Below the quote, I will give the web site where I found the quote. There are many other sites on the Internet that use the same argument. The web site quoted below was written in rebuttal to a *Scientific American* article that took creationists to task for using the second law as an argument against evolution.

Haynie: There are three contentious statements here [above cited contentious quote], it seems to me: (1) "The fact is: the second law of thermodynamics strictly prohibits organic evolution, Rennie’s disclaimers

notwithstanding," (2) "Evolutionists have attempted to downplay the problems in regard to thermodynamics and evolutionary theory. But the problems do exist, and are serious," and (3) "Thermodynamically speaking, all isolated systems (and the universe is accepted as an isolated system) proceed toward a state of equilibrium."

Let me speak to the last point first. It is by no means certain that the universe is an isolated system. For as far as I am aware, no one really knows what the universe is, much less whether it is an isolated system (in the sense that these terms are ordinarily defined). However, I believe Bert Thompson and Brad Harrub are correct in saying that the universe, whatever it might be, is (often) accepted as an isolated system, so that it can be treated in a specific way using standard mathematical tools.

The first point is problematic for reasons discussed above. Assuming that the second law of thermodynamics really does describe, more or less correctly, the nature of the universe that actually exists, which is what I think, it seems to me a non sequitur to say that the second law "prohibits organic evolution." That is, in my opinion the scientific arguments adduced by Bert Thompson and Brad Harrub are for the most part factually correct, but their conclusion is not entailed by those arguments. Theirs is a very common error in reasoning; the peer-reviewed scientific literature, by the way, is full of additional examples illustrating it.

As to the second point, it may well be true, but I cannot say for sure. For how many "evolutionists" have a good grasp of the second law? Many do not, I suspect, and some of these might therefore be inclined to avoid the subject in a debate or to parrot the view of an assumed scientific authority. Do "problems" exist, however, with regard to the science? None that I am aware of, at least with regard to points of a fundamental nature. It would appear that Bert Thompson and Brad Harrub do not have a good awareness of what their "opponents" actually think about the second law.

What can we conclude? Bert Thompson and Brad Harrub are not very skilled in argumentation. Their conclusion is not entailed by their premises, as far as I can tell. If they are correct (and it will be obvious that I do not mean to suggest that they are correct, necessarily or otherwise), they are correct by intuition and not by demonstration.

Finally, if you should decide to refer to any of my comments in this email, I must request that you do so in full, including the context, so as to avoid any misunderstanding of my meaning. I should also say that the views expressed here are my own, and that although I am using a Louisiana Tech University computer to write this email, I do not mean to suggest that my views represent those of the University in any way whatsoever.

(add discussion)

Dill

The following are the comments returned by American pharmaceutical chemist Ken Dill, whose comments seem to be the most contentious of the three: [3]

Dill: In their item (9), Thompson and Harrub (T&H) state that ‘the second law of thermodynamics strictly prohibits organic evolution.’ I disagree. The second law does not prohibit evolution. The second law has very little bearing at all on evolution. The premises behind item (9) of T&H are that: (1) according to the second law, closed systems tend toward increased entropy, (2) living systems are more ‘ordered’ than nonliving systems, and (3) entropy is a measure of ‘disorder.’ Therefore, according to T&H: (4) living systems must have lower entropy than nonliving systems. T&H conclude that biological evolution toward

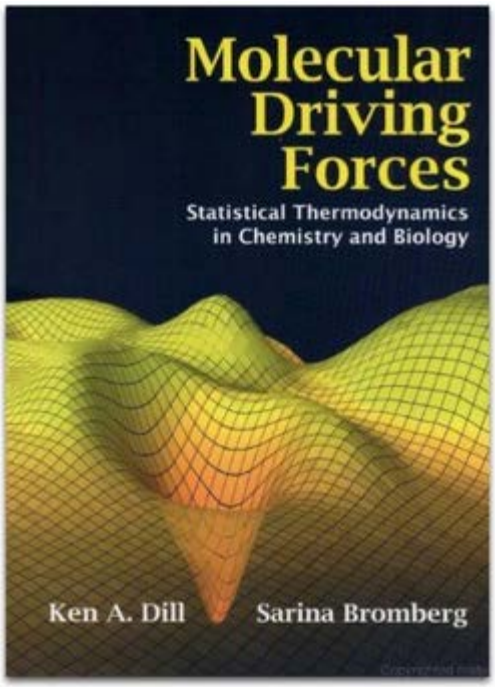

Cover of American mechanical engineer, bioengineer, and protein thermodynamicist Ken Dill' 2003 *Molecular Driving Forces*.

> increasing complexity would violate the second law.

Here, Dill's comment 'the second law has very little bearing at all on evolution", is in great need of correction (add discussion).

> Dill: But there's a simple way to disprove their conclusion (4). You can measure the entropy using a standard device called a calorimeter. You will find no difference in the entropy of a living organism and a lump of coal or a rock of the right size. A small rock has less entropy than a cow and a big rock has more entropy than a cow. Entropy does not distinguish living from nonliving systems.

Here, Dill seems to be descending down a slope to complete backwardness (add discussion); compare: rock vs human, Bridgman paradox, entropy of a mouse (Martin Goldstein, 1993), free energy of a rabbit (Daniel Schroeder, 2000), entropy of a human after reading (Stephen Hawking, 1998), standard free energy of formation of a human, and affinity tables vs free energy tables in general.

> Dill: Here's why. There are two kinds of entropy. One is very different from the other. They don't even have the same physical units. One kind of entropy has units of energy/temperature and has to do with the second law. We will call this the 'thermal' entropy. The thermal entropy describes the type of 'ordering' and 'disordering' that occur when the temperature or pressure are changed. The other kind of entropy, a mathematical measure of the flatness of probability distribution functions, has nothing to do with the second law, so it is not relevant for the present argument.

Firstly, claiming that multiplicity (W), of the Boltzmann-Planck entropy formula, has nothing to do with entropy, is like claiming that rainwater has nothing to do with the moisture content of clouds. Secondly, Dill and his two kinds of entropy statement is in need of amendment (add discussion).

> Dill: The second law has little to do with the chemical origins of life. The reason is that the sort of order and disorder that is described by the thermal entropy is not related to the sort of 'complexity' that distinguishes living from nonliving systems. Why not? The term 'complexity' refers to a distinction that would undoubtedly rank humans higher than earthworms, and earthworms higher than rocks. But, as noted above, the thermal entropy has no ability to make this distinction. In short, heating or pressurizing a rock cannot convert it to an earthworm. And heating or cooling an earthworm does not convert it into a human being. If temperature did interconvert these species, then the thermal entropy would predict the relative amounts of

> earthworm and human at a given temperature. But, of course, it does not.

Here we see a near imbecilic rendition of the chemistry professor paradox. To begin with, for someone, supposedly, who has been interested in tackling the origin of life question since 1971, as summarized below: [6]

> NAS (2014): "Dill decided to pursue a PhD in the University of California at San Diego's fledgling biology department in 1971. Initially, he says, he wanted to tackle a fundamental question: how did life originate from a hodgepodge of chemicals? However, that question proved too daunting for him at the time, and therefore, Dill began working with chemist and National Academy of Science member Bruno H. Zimm to understand the biophysics of DNA molecules."

One is nonplused at his dismissal of the second law in regards to the origin of life question? Beyond this, we seem to be descending into either idiot savant realm territory and or some type of underlying religious belief conflict objection giving rise to such absurdities? Firstly, the second law is the main driving force, underlying free energy change, which is behind the chemical origins of NOT life, as this is a defunct scientific theory, as cogently pointed out by Charles Sherrington (1938), Francis Crick (1966), and others (see: defunct theory of life), but powered chnopsological forms, one example being monkeys one example being humans, the latter having been synthesized form the former. Second, the statement "heating or pressurizing a rock cannot convert it to an earthworm and heating or cooling an earthworm does not convert it into a human being", is nearly childlike; possibly one of the dumbest things coming out of the mouth of a published thermodynamics textbook author, particularly coming from one who focuses, at least in title claiming, on "driving forces" in molecular reactions? Third (add discussion).

> Dill: Thompson and Harrub also draw attention to the distinction between closed systems and open systems. While closed systems tend toward states of maximum entropy, open systems tend toward states that are at the minimum of a quantity called the 'free energy'. Is this distinction important? No. You can't distinguish a rock from an earthworm on the basis of its free energy either. In short, the second law only tells us about how materials respond to temperature and pressure. Survival of the fittest is the law that describes how systems evolve complexity. The second law gives no basis for understanding the survival of the fittest law. You can neither derive nor disprove chemical evolution from the second law of thermodynamics. They are unrelated concepts.

This last posting takes the cake! (add extensive discussion). Dill, puzzlingly, sides with Darwin over Clausius? Here we can compare pharmaceutical chemist Dill to chemical engineer John Prausnitz as two examples of American idiocy in respect to noted thermodynamics scholars ignorant about thermodynamic applications outside of thermodynamics proper.

Quotes

The following are noted quotes:

> "What motion of atoms can one attribute to the actions and passions of the soul? . . . What movements of atoms stir the thought of the geometer, the arithmetician, or the astronomer? What movements are the source of wisdom?"
>
> — Plotinus (c.250), *Enneads* 2.1

> "And you know, I get a lot of grief out there. People say, 'How can you be a scientist and believe that god created the earth? Obviously, you know [they say] we developed from a puddle of promiscuous

biochemicals. And if you believe in anything other than that, you're a moron.' I don't criticize them. I say, 'Can you tell me how something came from nothing?' And of course they can't. They say 'well, we don't understand everything.' I say 'ok, no problem'. 'I'm just going to give you that there's something'. And now you're going to tell me there's a big bang, and it comes into perfect order? So that we can predict seventy-years hence when a comet is coming, that kind of precision. And they say, 'Well, yeah.' And I say, 'But don't you also believe in entropy, that things move toward a state of disorganization?' [they say] 'Well yah'. [I say] 'So how does that work? "And they say, 'We don't understand everything.' And I said 'I'm not sure you understand anything! ' But, I said, 'I'm not going to be critical of you, not a problem. You're entitled to believe what you believe, even though it requires a lot more faith than what I believe. But everybody believe what you want to believe."

— Ben Carson (2015), campaign speech (Ñº) (V:0:08-1:42), Liberty University, Nov 11; in 6 Oct 2015 Carson commented (Ñº), on *The View*, how some of the people he talked to about this evolution question included Nobel laureates; and in 2011, he was in a theist debate team (Ñº) with Francis Collins against atheists Richard Dawkins and Daniel Dennett

See also

â— Big-Thims dialogue | 2014
â— John Patterson
â— Moriarty-Thims debate | 2009
â— Rossini debate | 2006
â— What is entropy debate? | 1902

References

1. Rennie, John. (2002). "15 Answers to Creationist Nonsense: Opponents of evolution want to make a place for creationism by tearing down real science, but their arguments don't hold up" (aud), *Scientific America*, Jun 17.
2. Thompson, Bert and Harrub, Brad. (2002). "15 Answers to John Rennie and *Scientific American's* Nonsense" (Ñº) (pdf). ApologeticsPress.org, Oct 2.
3. Holloway, Robert. (2003). "Experts on Thermodynamics Refute Creationist Claims" (Ñº) (pdf), ntanet.net.
4. Miller, Jeff. (2010). "The Laws of Thermodynamics Don't Apply to the Universe!" (Ñº), UKApologetics.net.
5. King, Allen L. (1962). *Thermophysics*. W.H. Freeman.
6. Ken Dill (about) – PNAS.org.

θΔics

In hmolscience, **reproduction** is a process wherein reactants produce one or more products; in the case of human reproduction, the human reproduction reaction takes the form of a double displacement reaction (or double elective affinity).

Quotes

The following are related quotes:

> "A child is a grenade. When you have a baby, you set off an explosion in your marriage, and when the dust settles, your marriage is different from what it was. Not better, necessarily; nor works, necessarily; but different."
>
> — Nora Ephron (1983), *Heartburn* [1]

> "I have Jantsch's book (*The Self-Organizing Universe*, 1980), but have not read it yet. Prigogine's 'dissipative structures' applied to evolution, up through human, however, is a but a smoke and mirrors theory. Human **reproduction** is a type of chemical process called a 'double displacement reaction', a fact Goethe arrived at in the late 18th century. Human reproduction, however, is not the process of a 'Benard cell's bifurcation', as Prigogine would have us believe and we do not exist at the edge of chaos (far-from equilibrium) as Prigogine would have us believe."
>
> — Libb Thims (2013), "Reply to Erland Lagerroth" (Ñº), Jan 28

References

1. Gottman, John. (1999). *The Seven Principles for Making Marriage Work* (pg. 211). Three Rivers Press.

External links

â— Reproduction – Wikipedia.

θΔics

In science, **repulsion**, as contrasted with attraction, refers to the movement of a body under the influence of a force away a second body or from a repulsor. [1]

See also

- A Dissertation on Elective Attractions
- Gottman stability ratio
- Muller stability ratio
- Alfred Mayer
- Exchange force

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (ch. 6: Attraction and Repulsion, pgs. 147-82). Morrisville, NC: LuLu.

θΔics

In psychology, **reserve energy** is a theory which supposes that in people there are reservoirs of surplus energy, both mental and physical in variety, that when successfully tapped present resistances to fatigue. [1]

Overview

In 1890s, American psychologist William James (1842-1910), while theorizing about energy and mental ability, was hiking in the Adirondack Mountains, and during this time was told by one of his guides about how hikers, in many cases, may feel cold when they start the hike, but as they progress into will warm up to the climb, getting second wind or even a third or fourth wind; the gist of which he states in his own words as follows:

> "Everyone knows what it is to start a piece of work, either intellectual or muscular, feeling stale—or 'cold', as an Adirondack guide once put it to me. And everybody knows what it is to 'warm' up to the job. The process of warming up gets particularly striking in the phenomena known as second wind. On usual occasion we make a practice of stopping an occupation as soon as we meet the first effective layer (or so to call it) of fatigue. We have then walked, played, or worked enough, we desist. That amount of fatigue is an efficacious obstruction on this side of which our usually life is cast."
>
> "But if an unusual necessity forces us to press onward, a surprising thing occurs. The fatigue gets worse up to a certain critical point, when gradually it passes away, and we are fresher than before. We have evidently tapped a level of new energy, masked until then by the fatigue obstacle usually obeyed. There may be layer after layer of this experience. A third and forth wind may supervene. Mental activity shows the phenomenon as well as physical, and in exceptional cases we may find, beyond the very extremity of fatigue distress, amounts of ease and power that we never dreamed ourselves to own—sources of strength habitually not taxed at all, because habitually we never push though the obstruction, never pass those early critical points."

Sometime thereafter, James began to discuss and or teach this new "reserve energy" theory of mental ability to his student Boris Sidis, who had recently emigrated to the US in 1887 to escape political persecution.

In 1898, Boris' son William Sidis was born, and with him began to test out, in theory, James' reserve energy theory on the new child, the result of which became the most-famous of all forced prodigy experiments. [3]

The younger Sidis, in 1920, published his *The Animate and the Inanimate*, arguing that the existence of "reserve energy" in life forms represents a reversal of the second law of thermodynamics. [4]

In 1907, William James, in his "The Energies of Men", stated an outline of his reserve energy theory. [2] James, supposedly, claimed to have discovered this hidden energy principle concurrently with his protege Russian-born American psychologist Boris Sidis. [6]

Boris Sidis, in the experimental accelerated education of his now-famous son, child protege William Sidis, who, by his father's accelerated home education and teachings, was qualified to enter Harvard at age nine, graduating at age 16, resulting to have an adulthood IQ of 250-300. These combination of theory and successful application became the basis to the now-famous "10 percent myth" as popularized by American author Lowell Thomas in the introduction to the decade-long 1936 best-seller New *How to Win Friends and Influence People.*

In the 1910s, this reserve energy principle was beginning to be termed the "law of reserve energy". [3] This law was argued to represent a capacity for withstanding pains, aches, and conquering disinclinations that would otherwise seem impossible. The summarizing statement of the law of reserve energy is: [4]

> "Organisms have stored reserves of energy that are ordinarily not called upon, but that may be called upon … and be ready for use for anyone who probes so deep."

In 1986, American biographer Amy Wallace commented that according to one 1910 restatement of what was termed Boris' theory of reserve energy (or the doctrine of reserve energy) "each of us possess a stored-up fund of energy, of which we ordinarily do not make any use, but which we could be trained to use habitually to our great advantage. Dr. Sidis contends that it is by arousing this potential energy that the patients whom he treats are cured; he further insists that, by the remarkable results he has obtained in educating his boy, he has demonstrated the possibility of training people to draw readily and helpfully on their hidden energies." [5]

References

1. Walsh, James J. (1912). *Psychotherapy*, (pg. 92). D. Appleton.
2. (a) James, William. (1907). "The Energies of Men" (GoogleBooks), (JSTOR), [URL], (Wikisource), *Science* 1, Vol. 25, no. 635. pgs. 321-32. March.
(b) Speech: "The Energies of Men" delivered as the Presidential Address before the American Philosophical Association at Columbia University, Dec. 28, 1906.
3. Abbott, Lyman, Mabie, Hamilton W., Abbott, Ernest H., Bellamy, Francis R. (1914). *The Outlook* (pg. 148). Outlook Co.
4. Sidis, William J. (1920). *The Animate and the Inanimate*, [PDF], (published in 1925, R.G. Badger).
5. Bruce, H. Addington. (1910). "Bending the Twig" (discusses Boris's reserve energy theory), *American Magazine*, Vol. 69: 690-95, Mar.
6. Wallace, Amy. (1986). *The Prodigy: a Biography of William James Sidis*: *America's Greatest Child Prodigy* (reserve energy, pgs. 31-32, 52-53, 57, 158-59). Dutton Adult.

θΔics

In chemical engineering, **residence time**, symbol τ (tau), is the average length of time a particle of reactant spends within a process vessel or in contact with a catalyst. [1] In human chemical reaction engineering, such as in the pairing and design of matching human molecules (people) within the algorithmic structure of a science-based online matching site, residence time is the number of days or months a "single" person spends inside a continuous flow algorithmic reactor, as a paying subscriber, before leaving, either single or attached in the form a dihumanide molecule.

References

1. Licker, Mark D. (2003). *Dictionary of Engineering*, 2nd ed. New York: McGraw-Hill.

θΔics

In radiation thermodynamics, a **resonator** is a sphere, typically made of iron, with a hole in it, the cavity of the body colored black, whereby through the hole it can absorbs electromagnetic radiation when cold, acting like a perfect black body, or, conversely, emits electromagnetic radiation, out of the hole, when hot. [1]

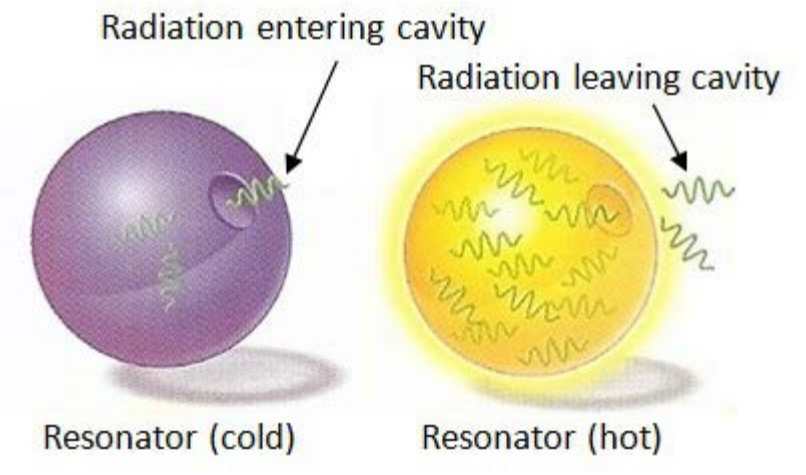

A modern depiction of a **resonator** or cavity resonator, a body with a hole in it, colored black on the inside, that absorbs radiation when cold and emits radiation when hot. [1]

Etymology

The term “resonator” seems to have been introduced by German physicist Max Planck in 1895 during his work on the study of the absorption and emission of radiation by an electrically charged system having the same eigenfrequency as the radiation; the system, it seems, being the “resonator”, as he called it. [2]

Synonyms

In a modern sense, the terms resonator, cavity resonator, and black body, seem to the nearly synonymous; although this needs to be fact checked.

It could be the case that the term "black body" is used when the resonator is cold and acts as a perfect absorber. It also could be the case that Planck's usage of the term "resonator" has something to do with the system being electrically charged with a certain frequency.

References

1. Gribben, John. (2002). *Quantum Physics: a Beginner’s Guide to the Subatomic World* (pg. 13). DK Publishing.
2. Mehra, Jagdish and Rechenberg, Helmut. (2000). *The Historical Development of Quantum Theory* (resonator, 27+ pgs; “resonator” coined by Planck, pg. 34). Springer.

Further reading

â— Bryan, G.H. (1906). “The Entropy of Radiation” (resonator, pgs. iv), *Nature*, 74.

θΔics

In terminology, **rest in power** is a neo-modern, secular-leaning and or non-religious, eulogy alternative (see: atheist eulogy) and or variant to the circa 9th century phrase “Rest in Peace” (Latin: *requiescat in pace*), aka R.I.P., previous seen ubiquitous on tombstones of Christians in the 18th century, historically conceptualized as a prayerful request that the person's soul should find peace in the afterlife, possibly now meaning that the force that previously defined the movement of the person, and or the ethical actions or doings of the person, is now resting in the power of the transformations of the universe, in some way, societal transformations predominately, or something along these lines — the view of the “power” varying depending on belief state purview, namely whether one is a “higher power” believing mindset (theist) or “power” of nature believing mindset (deist, spiritualist, agnostic, Spinoza's god mindset, etc.,), or “power” of nature defined by science believing mindset (atheist, explicit atheism, extreme atheist, etc.), among other admixtures of beliefs.

A generic "**rest in power**" icon, indicative of the idea that the person "died" (dereacted, ceased to exist, stopped moving, etc.) at a point in "time" (or spacetime) of injustice or amid a higher energy activated complex state, or something to this effect, according to which the actions of the person will "rest" only after the social transformation accrues.

Etymology

The term is of unknown origins, but seems to have arisen first in the hip hop community in the late 20th century or early 21th century, e.g. Tupac Shakur (c.2001) (Q), the song “Helicopter” (2011) (Q) by Antwon; graffiti community, e.g. Aaron Anderson (2007) (Q); and then of late become popular in the LGBT or queer community, e.g. Leslie Feinberg (2014) (Q), among others, often associated with social injustices.

Discussion

The term “rest in power” seemingly employed when the person met their reaction end (death) in a socially unjust way, i.e. non-peaceful way, to the effect that their "soul", in colloquial religious speak, or naturalness or unnaturalness of the forces of their movement, in physicochemical speak, will only find rest when the power or energy transformation per unit time:

$$P = \frac{E}{t}$$

actuates in society, via social transformation, to balance out the unjustice or injustice, or something along these lines; this can be quantified in the posthumous "work" per unit time that is done to bring about resolution to the injustice:

$$\text{Power} = \frac{\text{Work}}{\text{Time}}$$

therein transforming the unstable social complex into a stable final state product.

Events such as the 2014 "forced" Leelah Alcorn suicide, as shown adjacent, among other trans-suicides (Q), e.g., may have worked to result in certain social transformation, such as the 2016 passing of the transgender bathroom law, to give one loose example, thereby bringing about justice to a previous unjust situation; hence the term "rest in power", meaning the embodiment of the deceased person's eventually find rest when the unbalanced power transforms the disturbed or out of natural balance social structure.

Examples

The following is a rest-in-power usage for the assassination of 16-year-old Guatemalan mining resistance activist Topacio Reynoso (1997-2014) (Q):

Top left: a 2007 photo of a "**Rest in Power**" memorial for American graffiti artist Aaron Anderson (1969-1993) who was killed (dereacted) when he was hit by a train while "bombing", i.e. doing graffiti. (Q) Top right: a 2014 Rest in Power artwork for graffiti artist Gorf, who was said to be taken too early. Bottom: a 2014 "Rest in Power" design for Leelah Alcorn who jumped in front of a semi, because her parent's Christianity beliefs would not accept her wish to transgender to female at age 17.

the suicide of 17-year-old transgender Leela Alcorn (1997-2014) (Q), shown above right, or the death (dereaction) of 92-year-old Japanese-born American social injustice activist Yuri Kochiyama (1921-2014) (Q).

The term has been used in reference to: Nelson Mandela, Malcolm X (Q), James Brown, Adrienne Rich, Kimani Gray,

Alan Blueford, and queer theorist José Esteban Muñoz, mostly on blogs. [2]

The following is a graffiti “rest in power” artwork, for the 2009 mistaken police shooting incident victim Oscar Grant (Q) is subtitled “power to the people”. (Q)

One speculation is that the term is used when a person and or their passing had made such a lasting impact that they are "still powerful in death." [2]

The meaning the phrase rest in power is used to mean empowerment of the people in respect to the movement or ideologies of the passed person, the artwork found the online *Journal for Social and Environmental Justice*.

Quotes

The following are related quotes:

> “You may have killed me cousin, but my ‘will’ is done regardless.”
>
> — Lucian (2003), *Underworld*, “last words” (Q) said to Kraven

See also

- Aaron Freeman

References

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(b) Mytum, H.C. (2003). *Mortuary Monuments and Burial Grounds of the Historic Period* (pg. 139). Springer Science & Business Media.
(c) Rest in power (2014) – MetaFilter.
2. Rest in power (2014) – MetaFilter.

Further reading

- Arnold, Chuck. (2016). “Rest in Power, Prince: In Memoriam of the Man and the Music” (Q), Essence, Apr 21.

In religio-mythology, **resurrection**, as contrasted with "reincarnation", refers to the astro-theology based "raising of the Orion" constellation model turned belief that a person can be raised from the dead, like the imagined to be Orion star-shaped person in the sky, e.g. Orion the pharaoh (Egyptians), Orion the hunter (Greeks), an astronomical phenomena that occurs in Nov; in Egyptian religio-mythology, this became the famous three-millennium-plus believed story of the death and resurrection of Osiris; during the Roman recension, this story became monotheized into the two-millennium-plus believed story of the death and resurrection of Jesus. [1]

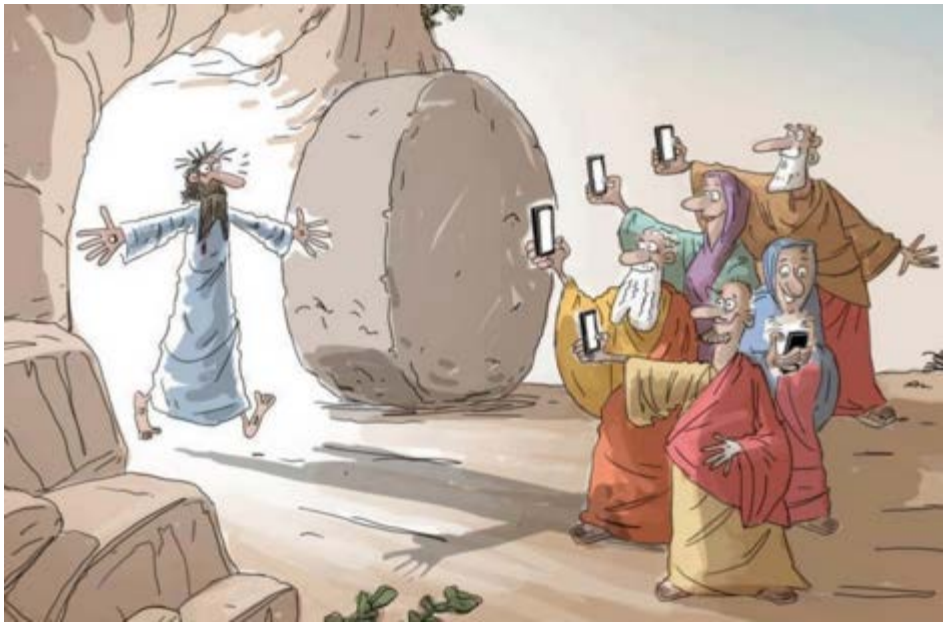

A 2013 humorous smartphone take (Q) on the myth of **resurrection** of Jesus (see: death and resurrection of Jesus); a story based on, via a Roman recension rewrite, the resurrection of Osiris (see: death and resurrection of Osiris); a story based on, via an early dynasty recension rescript, of the annual Nov-Dec astro-theological raising of the Orion constellation (see: raising of Orion).

Judaism

In Judaism, the discussion of resurrection ideas, prior to Christianity proper (c.330AD), did not have as much focus as it did in Christianity; the following is bit of rare Judaic commentary on resurrection:

> "All Israel has a share in the world to come, as Isaiah said: and all of your people who are righteous will merit eternity and inherent the land. And these are the people who do not merit the world to come: (a) the ones who say that there is no **resurrection** of the dead, (b) those who deny the Torah is from the heavens, and (c) the Epicureans."
>
> — Anon (c.200AD), *Mishnah* (§:Sanhedrin) [1]

(add)

Christianity

In the Bible, there are nine main characters, in total, are said to have been raised from the dead: [1]

1. Widow of Zarephath's son (by Elijah) [1st Kings 17:22]
2. Shunammite woman (by Elisha) [2nd Kings 4]
3. Anon man (by the bones of Elisha) [2nd Kings 13]

4. Widow of Nain's son (by *Jesus*) [Luke 7]

5. Jairus' daughter (by *Jesus*) [Luke 8]
6. **Lazarus** (by *Jesus*) [John 11]

7. Jesus (by god) [Matthew 28:6; Acts 2]
8. Dorcas (by Peter) [Acts 9]
9. Eutychus (by Paul) [Acts 20]

This does not include whole slew of saints that arose from the dead when Jesus died on the cross [Matthew 27:52].

There is also, to note, the confused account, as told in Matthew 14:2 (Q), of Jesus rumored to be John the Baptist "risen from the dead" after which John the Baptist is beheaded (Matthew 14:10), while in prison. Robert Price (2006) has given some discussion (Q) of this this.

Not only did Jesus, according to the Bible, have the power to raise people from the dead (three people: #4, #5, and #6), but so did Elijah (two people: #1, #2), Elisha's bones (#3), Peter (#8), and Paul (#9)?

Lazarus | Osiris

The important "raising from the dead" person here, to keep in mind, is that of Lazarus (see: raising of Lazarus), aka "L'Azarus" or "El Osiris", as independently pointed out by John Morris (1880), Gerald Massey (1883), and Albert Parsons (1893), as he was originally called, being that this is code for Egyptian god reduction: the 'god Osiris', as children of olden days were taught, becomes the 'person Lazarus', as children in modern times are taught. [1]

Two humorous "raising of Lazarus" (Q) cartoons, the most-infamous resurrection in the Bible, per reason that Lazarus had been dead for four days (the most delayed of all resurrections); the Biblical character Lazarus being a Greek to Latin translation of La Azarus, aka "The Osiris".

Quotes

The following are noted quotes:

> "It appears that Thomas [see: Doubting Thomas] did not believe the **resurrection** and as they say would not believe without having ocular and manual demonstration himself. So neither will I: and the reason is equally as good for me and every other person as for Thomas."
>
> — Thomas Paine (1794), *The Age of Reason* (pg. 27); cited by Jennifer Hecht (2003) in *Doubt: a History* (pg. 356)

> "Paul simply shifted the center of gravity of that whole life to a place *behind* this existence—in the *lie* of the "**risen**" Jesus. *What* was the only part of Christianity that Muhammed borrowed later on? Paul's invention, his device for establishing priestly tyranny and organizing the mob: the belief in the immortality of the soul—*that is to say, the doctrine of "judgment"*.... That every man, because he has an "immortal soul," is as good as every other man; that in an infinite universe of things the "salvation" of *every* individual may lay claim to eternal importance; that insignificant bigots and the three-fourths insane may assume that the laws of nature are constantly *suspended* in their behalf."
>
> — Friedrich Nietzsche (1888), *The Anti-Christ* (§42-43)

> "An analysis of our Easter rituals, which seemingly purport purely Christian significance, will reveal that

similar miraculous events occurred in faiths of civilizations which preceded the Christian era by thousands of years. For example, Dupuis writes' that Krishna, the crucified Hindu Savior, rose from the dead. Similar stories circulated about Buddha' the Chinese Lao-Kium, and Zoroaster. Ovid's poem, written at the time of the Roman Emperor Augustus, describes Aesculapius, the 'son of god', as being put to death and being **resurrected**. Likewise, the savior Adonis or Tammuz, after being put to death, arose from the dead. Julius Firmicius, an eminent early Christian priest and scholar who lived during the reign of Constantine and therefore at the time of the Council of Nicaea (325 AD) gives an account of the rites of Adonis. He is struck by the similarity of the heathen mysteries with the Christian sacrament honoring the death and resurrection of Christ Jesus. Alexander Murray quotes the exclamation which the ancient Greeks used during their Easter festival: 'Adonis lives and is risen again'. In our Christian Easter services, the name of Christ replaces Adonis."

— Karel Huier (1946), "The Astronomical Significance of Easter" [4]

References

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3. (a) Paine, Thomas. (1795). *The Age of Reason* (editor: Moncure Conway) (txt) (disbelieve, pg. 23; Quaker, pg. 62). Merchant Books, 1896.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 356-57). HarperOne.
4. Hujer, Karel. (1946). "The Astronomical Significance of Easter" (Q), *Popular Astronomy*, 154:131-34.

External links

- Resurrection – Wikipedia.

θΔics

In animate molecules, **retinal molecule** or retinal $C_{20}H_{28}0$ is three-element light-sensitive molecule, found in the retina of the eye, that changes from a normal cis-configuration (bent geometry) to a heightened state trans-configuration (straight geometry), shown below, when a particular wavelength of visible light (400-700 nm) is present:

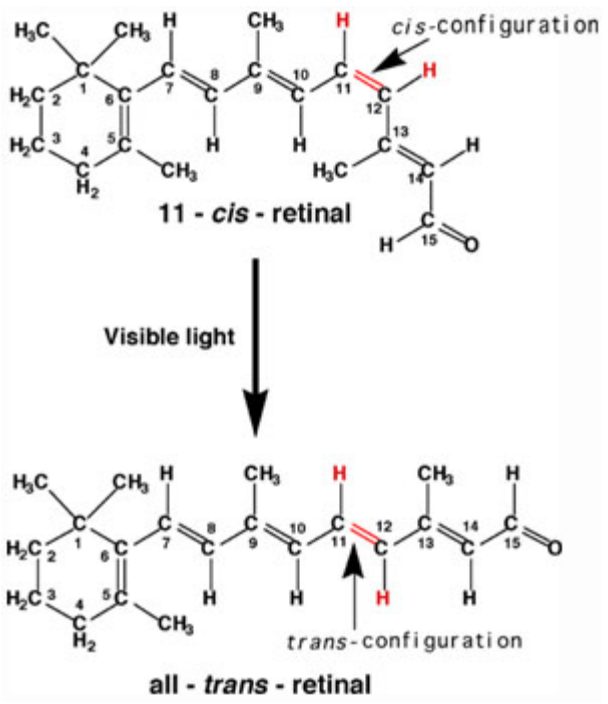

Retinal $C_{20}H_{28}0$ in the normal (top) and activated (bottom) configurations.

The bending of retinal results in the triggering of a nerve impulse in the optic nerve and thus to mental processing and reaction to visual information.

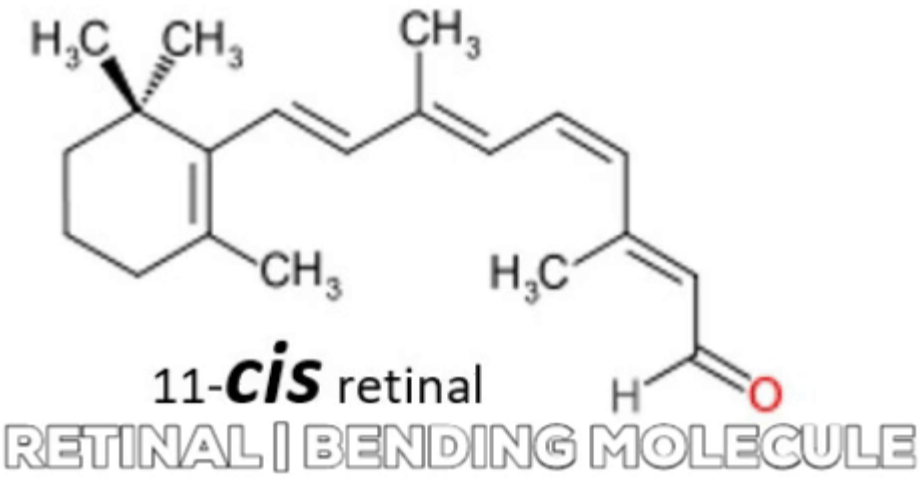

The movement of the retinal to external force is a type of induced movement.

Human molecules

The retinal molecule light reactivity behavior makes it an ideal model to the understanding of the mind body problem; it is, so to say, a modern upgrade to the older Cartesian automaton problem, to which Rene Descartes mused "I think, therefore I am".

The molecular formula of the human, a twenty-six element molecule, is simply an expanded version of the retinal molecule. In the retinal molecule, the hydrocarbon structure at the location of the eleventh and twelfth carbon atoms acts as the 'mind' of the retinal, just has the hydrocarbon structure of the brain, comprised mostly of docosahexaenoic acid (gray matter) and eicosapentaenoic acid (white matter), is the 'mind' of the human molecule. [2]

The person new to this subject will quickly object on the grounds that the human has consciousness, free will, choice, is alive, has a soul, among other olden days descriptors, etc., and that the retinal model does not apply. These objections, however, are not in accordance with modern chemistry.

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External links

â— Retinal – Wikipedia.

θΔics

In chemistry, **retort** is a laboratory apparatus consisting of a glass bulb with a long downward angled and tapered neck, used for distillation or reaction in chemical processes, according to which a liquid substance is placed in the bulb, then heated, after which the vapor goes into the downward tapered neck and is collected. [1]

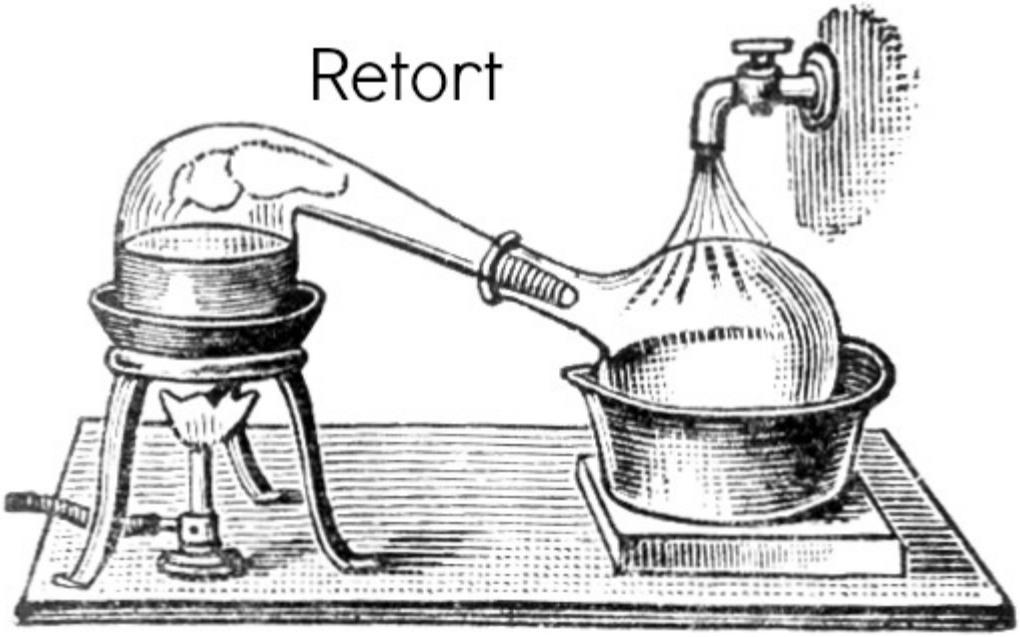

A diagram of a retort, left arched vessel, being heated, and attached to a collection bulb, right, that is being cooled by cold water, so to condense the newly distilled vapor back into liquid form.

History

The retort is said to have been invented in *circa* 800 by Arab chemist Jibir.

Elective Affinities

The following, to exemplify verbal use of the retort in experiment, is Swedish chemist Torbern Bergman's reaction scheme #42, where the triangle symbol Δ in the center of the diagram signifies that the reaction is heated or carried out in "the dry way":

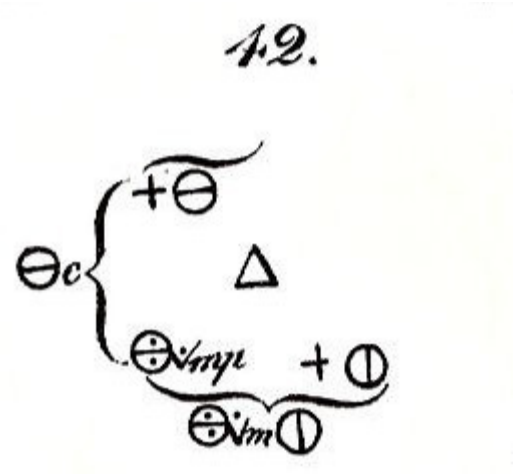

which shows that "if common salt be subjected to distillation with nitrous acid, the marine acid will rise [top upward pointing half crotchet], and the fossil alkai remain in the retort [bottom downward pointing full crotchet]".

German polyintellect Johann Goethe used these reactions of Bergman's as the basis of his 1809 physical chemistry novella *Elective Affinities*. It soon began to be suggested, by commentators, that Goethe envisioned the estate or parts of his chapters in a retort sense:

> "*Elective Affinities* is a narrative drama, in which two men and two women, a married couple and two unmarried characters, interact as if in a chemical **retort**."
>
> — Frederick Ewen (1984), *Heroic Imagination* (Ñº)

> "The decision to invite Ottilie and the Captain is described as an 'experiment' and this is exactly what it is: the house and its surrounding gardens are in effect a chemical **retort** in which the human elements are brought together for the reader to observe the resulting reaction."
>
> — Peter Smith (1999), "Elective Affinities: a Tale of Two Cultures?" [5]

> "An interpretation of the novel seems to be hinted at here: these events are the human equivalent of an experiment in a chemical **retort**. The movements of passion between Edward, Ottilie, Charlotte, and the Captain are no different from the operations of 'Wahlverwandtschaft' between limestone, carbon dioxide, sulphuric acid and water. The human figures and events are but the manifestations of concealed natural forces, possibly not yet wholly understood by science."
>
> — Nicholas Boyle (2007), Goethe, *Die Wahlverwandtschaften*, Lecture at University of Cambridge (Ñº)

In 2009, American comparative literature scholar Karen Pinkus comments the following about the chemical revolution, which she pinpoints to the work of Antoine Lavoisier:

> "The characters in Goethe's *Elective Affinities* behave as if the Revolution had never happened—or better yet, they combine and separate as if inside a hermetically sealed **retort**."

Quotes

The following are related quotes:

> "We must not read into [living organisms] either a chemical **retort** or a soul: we must read into them what there is."
>
> — Claude Bernard (c.1850) [2]

> "Physical phenomena in the gross is not concerted with the internal structure of each atom in each successive moment, nor is history with the relation of each individual being every moment of time. History is vitally interested in the laws of continuity in finite space and definite time. Were it not for the existence of these laws developed from definite relations subsisting among the mass, all science would be impossible. These propositions are fundamental in physics, and they apply with equal footing in history. Society is a definite reality. All we have to do is to look about us to be conscious of its ubiquitous presence though no one yet has examined it under the microscope or tested it in a chemists' **retort**. The retort will be that we are comparing inert matter, iron, with a living reality, society. Matter [after all] is not so terribly inert."
>
> — Morris Zucker (1945), *The Field Theory of History* [3]

See also

â— Social retort

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2. Ball, Philip. (2011). *Unnatural: the Heretical Idea of Making People* (pg. 123). Vintage Books.
3. Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (retort, pg. 170). Arnold-Howard Publishing Co.

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5. Smith, Peter D. (1999). “Elective Affinities: A Tale of Two Cultures?” (retort, pg. 49) (WB), *Prometheus: Firing of the Mind*, 4:48-64.

External links

â— Retort – Wikipedia.

θΔics

In hmolscience, **retrotensive method** is the rule that whatever is empirically found in or associated with the more complex and highly evolved natural entities must inferentially be read back into the simpler and earlier ones.

Overview

In 1926, Arthur Lovejoy, an American chain of being historian, introduced the term retrotensive method into philosophy:

> "I proposed the term '**retrotensive method**', which seems to be a needed addition to the philosophical vocabulary, at the Sixth International Congress of Philosophy (1927)."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* [1]

In 1933, Lovejoy was using the term in respect to the panpsychism style reductionism philosophy of Jean Robinet, in the sense that if a higher evolved natural entity possesses empirical trait such as it 'thinks', then this trait must inferentially be read back into the simpler and earlier ones. This seems, in some sense, to be an early evolutionary psychology theme.

References

1. (a) Lovejoy, Arthur. (1927). "The Meanings of 'Emergence' and its Modes", Sixth International Congress of Philosophy; see: *Journal of Philosophical Studies* (quote, pg. 176), 2:167-81.
(b) Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea* (pgs. 275; proposed, pg. 366). Harvard University Press, 1936.

θΔics

In science, **reverse engineering** is the analysis of a completed system in order to isolate and identify its individual components or building blocks. [1]

Reverse Engineering Puzzle

$$M + F \rightarrow C$$

Male ***M*** and female ***F*** react yielding the product of a 15-year old child ***C***

$$\Delta G < 0$$

The spontaneity criterion can be used to determines if a reaction if feasible

The central function of the EoHT is the collection of knowledge concerning how human chemical reactions are understood according to the spontaneity criterion.

Overview

In human thermodynamics, the **reverse engineering puzzle** refers to analysis or the completed system of the science of thermodynamics in order to isolate and identify the individual components and building blocks need for the explication of any and all aspects of human activity and phenomenon, which one wishes to solve, using the the laws of thermodynamics, laws which have been confirmed to govern the operation of the entire universe, and thus by reduction human activity.

In chemistry, physical chemists, such as Jacobus Van't Hoff and Walther Nernst, use a type of reverse engineering in order to figure out chemical operations and mechanisms. The rule is that the theory developed to model any and all chemical operations and processes must obey the laws of thermodynamics.

Rubik's cube

Reverse engineering, in the hmol sciences, is similar to solving a Rubik's Cube in a particular number of steps: "there are many different algorithms, varying in complexity and number of moves required, but those that can be memorized by a mortal typically require more than forty moves." In 2010, an international team of researchers using computer time lent to them by Google, found that starting from any given configuration the Rubik's Cube can always be solved in 20 moves or less. It took people about 15-years, following the introduction of the cube in 1974 by Hungarian architect Erno Rubik, to find the first position that requires 20 moves to solve. It has taken 36-years, using modern computer technology, to prove that twenty moves suffice for all positions. [2]

In 2010, scientists found that the Rubik's cube **can always be solved** in twenty steps, given any starting configuration. [2]

This idea that an starting positional logic can be solved in a particular number of steps is the essential rule followed in the human molecular sciences, in that given any configuration of a question, e.g. does a human have a soul (Nahum), is there free will (Darwin), what is morality (Goethe), what is good versus evil (Teilard), what is life? (Schrodinger), what is death? (Thomson), what is love? (Hwang), is there a struggle for existence? (Thims), what is our purpose? (Schneider), etc., each query can be solved in a particular number of steps.

Reverse engineering: spontaneity puzzle

The central reverse engineering puzzle in the mind of American chemical engineer Libb Thims' work is captured the puzzle as to how the chemical reaction spontaneity criterion ($\Delta G < 0$) applies to human relationships. Historically, in circa 1995, while an undergraduate chemical student at the University of Michigan, Thims began to wonder how the Gibbs free energy model of reaction spontaneity, particularly as discerned through Beckhap's law, applies to the male-female reaction, the central process of society, in which a man meets a women, they fall in love (20 percent of people fall in love at first sight and marry that person), produce a child; an entity which then begins to detach from the family household at about the fifteen-year mark; a reaction process that 85 percent of people will go through.

This so-called "spontaneity criterion puzzle" is a sort of reverse engineering problem-puzzle as to how to apply the well-established chemical reaction spontaneity criterion to the modeling of the spontaneities of human-human reactions, particularly in regard to mate selection, so as to be able to 'predict', in a theoretical (or actual) sense, spontaneous

reactions in human relationships.

The central issue, with this thick riddle, is the understanding of how enthalpy change ΔH and entropy change ΔS are to be understood in human chemical reaction terms, over the course of multiple decades, so as to yield a quantitative measure of Gibbs free energy change, between two points in time, differing by multiple years. It takes a minimum of at least 5-7 years, even for a well-schooled chemical thermodynamicist, to arrive at even a partial idea, interpretive visualization, or intuitive understanding as to how to go about gaining insight into this puzzle. A precipitate of this effort is the EoHT wiki, launched in 2007.

In sum, Thims' central research, since *circa* 1995, has been to elucidate, quantitatively, how the basic, multi-year human reproduction reaction (relationship, sex, and offspring), which 85% of people go through, can be energetically predicted, via free energy determinations:

$$G = H - TS$$

as quantified using the spontaneity criterion ($\Delta G < 0$), which states that spontaneous chemical reactions must show a decrease in Gibbs free energy over the extent of the reaction, i.e. the summation of the enthalpic (ΔH) and entropic (–TΔS) factors involved in the system interaction must show a decrease in value over time, if the reaction or process is to be universally favored. This dissection of human interactions can also be expressed via the relation between the chemical affinity A or the force of reaction existent between reacting species to Gibbs free energy change ΔG:

$$A = -\Delta G$$

as proved in 1882 by German physicist Hermann Helmholtz in his "The Thermodynamics of Chemical Processes", and applied to the modeling of human relationships by German polymath Johann Goethe in his 1809 *Elective Affinities*. In sum, in order to understand love in the context of relationships and how one correctly chooses who to love, one has to be able to measure enthalpy ΔH and entropy ΔS changes involved in human activity? The specific human chemical equation, which Thims originally began to mediate on is the following pair of human mating reactions:

$$M + F_A \rightarrow B_A$$

$$M + F_B \rightarrow B_B$$

where M is one male, F_A is a hypothetical female, F_B is a second hypothetical female, B_A is a child product of the first pairing, and B_B is a child product of the second pairing. To rule to determine which reaction should be chosen, is that the reaction most energetically favored (exergonic) will be the one that shows the most decrease in Gibbs free energy G over time in the extent of the reaction.

The use of chemical equations to model human reactions, to note, is a very deep subject. The fact that only eight people, in history (see human chemical reaction history), are known to used chemical equations, such as above, to model human processes, such as colloquial love the chemical reaction motto, exemplifies this.
The dimension of time, in this example, being the difference between the initial "state" of the reaction, or day in which the pair first begin to react, and the final state of the reaction, signified as the day, some 15 or more years later, at which point the offspring product begins to detach from the parental structure, going of on its own.

The spontaneity rule itself is relatively simple, quantified by the following simple equation: $\Delta G < 0$. It is the understanding of quantities that compose free energy:

$$G = U + pV - TS$$

namely internal energy *U*, pressure *P*, volume *V*, temperature *T*, *and* entropy *S*, among other facts (such as chemical potential μ, external forces, gravity, free energy coupling, etc.), however, which, invariably, require a new field of research and conceptual understanding, where people are defined technically as boundaried "systems of human molecules", a subject never rigorously done before, in spite of the fact that over 300-people have published views on the theoretical application of thermodynamics to human activity.

An example of the difficulties encountered, in synthesizing this application, is the understanding of the "end state" (15 or so years after first sex), of the ordering of the system of humans, involved in the process of a human reproduction reaction (sex), such as above, which, in mechanism, is defined more exactly as a double displacement reaction (double elective affinity) of the form:

$$M + F \rightarrow M{\equiv}F + \text{Child}$$

It is at this point, that the subject of chemical / physics nature of the human bond "M≡F" becomes a central subject of study, one that has never been done before. Nearly two-thirds of the 2007 textbook *Human Chemistry*, written by Thims, was devoted to the elucidation of the nature of human chemical bonds considered purely as a chemical bond. [1]

In any event, pairing feasibility can be understood via chemical thermodynamics, namely by the fundamental equation characterizing the relation between affinity *A* and free energy *G* change:

$$A = -\Delta G$$

in conjunction with the spontaneity criterion rule defining spontaneous reactions:

$$\Delta G < 0$$

In short, whichever mating reaction actuates a greater negative change in the Gibbs free energy, where *G* is a function of enthalpy and entropy:

$$\Delta G = \Delta H - T\Delta S$$

will be more energetically-favored and less prone to divorce (debonding). Beyond this, there are complicating issues associated with the quantification of external forces, chemical potential factors, gravity, equilibrium effects, system boundary issues, free energy coupling, enthalpy-entropy compensation, etc., factors that each effect human chemical reactions. Thims is currently interested in trying to understand how the Gibbs fundamental equation, in which the change in energy *U* of a system can be written as the product of an intensive and an extensive parameter:

$$\Delta U = \sum_i X_i \Delta Y_i$$

where *Xi* is an intensive quantity, such as pressure or temperature, and *Yi* is an extensive quantity, such as volume, can

be applied to a human social system.

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1. Licker, Mark. (2003). *Dictionary of Engineering* (reverse engineering, pg. 461). McGraw-Hill.
2. Anon. (2010). "Study Uncovers Every Possible Rubik's Cube Solution", AFP, Aug 12.

External links

â— Reverse engineering – Wikipedia.

θΔics

In thermodynamics, **reversible**, as compared to irreversible, refers to a process in which the forces involved in the expansion (forward process) of a body exactly equal the forces involved in the contraction (reverse process). [1] A reversible process is a hypothetical construct; originally outlined as a realistic process by French physicist Sadi Carnot, in his 1823 *Reflections on the Motive Power of Fire*, based on the now defunct caloric theory of heat, then later modified in differential form by German physicist Rudolf Clausius, beginning in 1850, using the mechanical theory of heat.

Reversibility

A process is called reversible if it takes place as a succession of "equilibrium states", i.e. a hypothetical or incremental condition in which the internal expansive force of the body is assumed to nearly equal to (or be larger by a differential amount) than the external pressure force of the atmosphere or surroundings, e.g. a connecting vessel or vacuum; where the reverse process is assumed to leave the surroundings unmodified. A reversible transformation is said to satisfy three criteria: [2]

> (a) The transformation follows a perfectly defined path at all points.
> (b) The reverse transformation, following the same path, must be possible at any moment.
> (c) If the system is made to undergo the forward process and then the reverse process following the same path, the work exchanged with the surroundings must be equal to zero:

$$\oint W = 0$$

The third criterion means that the transformation must occur without any friction; its presence, more or less unavoidable, prevents actual transformations from being reversible. [2]

Incorrect | Views

In 1997, French biophysicist Louis-Marie Vincent, in interview, in a discussion about near-death experiences, wherein people die then come back to life, incorrectly described the expansion and contraction of an iron bar as being an example of a "reversible phenomenon", as such: [3]

> "Take the simple example of an iron bar which, when heated, lengthens and dilates. If we let it cool, it will contract and return to its original size. This is what is meant by a *reversible phenomenon*."

He then asks us to consider whether or not death is a reversible phenomenon? Vincent's example of the heating and cooling of an iron, however, is not a reversible process, in that the measure of the entropy change of the body will be positive at the end of the cycle. In fact this is the very same example used by French physicist Sadi Carnot in his 1824 *Reflections on the Motive Power of Fire*, an example later explained to be irreversible by German physicist Rudolf Clausius.

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3. Elsaesser-Valarino, Evelyn. (1997). *On the Other Side of Life: Exploring the Phenomenon of Near-death Experience* (ch. 6: "Dialogue with Louis-Marie Vincent, PhD", pg. 174). Plenum Press.

External links

â— Reversible process (thermodynamics) – Wikipedia.

θΔics

In existographies, **Rex Stout** (1886-1975) was an American fiction writer, noted for []

Quotes | By

The following are quotes by Stout:

> "The minute those two little particles inside a woman's womb have joined together, billions of decisions have been made. A thing like that has to come from **entropy**."
>
> — Rex Stout (c.1965), interview response to probe about whether or not he thought man was a rational animal

References

1. (a) Stout, Rex. (c.1965). "Interview with Rex Stout" (by John McAleer and Andrew McAleer) (Ñº), Strand Magazine, McAleer (Ñº); NeroWolfe.org.
(b) Entropy quotes – BrainyQuotes.com.
(c) Rex Stout – Wikipedia.

External links

â— Rex Stout – Wikipedia.

θΔics

In science, **Reymond-Brucke oath** is an 1842 intellectual pact, signed in blood, by German medical students Emil Du Bois-Reymond, Ernst Brücke, Hermann Helmholtz, and Carl Ludwig that organisms operate, physiologically and psychologically, solely via physicochemical forces, and not by any life force or vitalism theories.

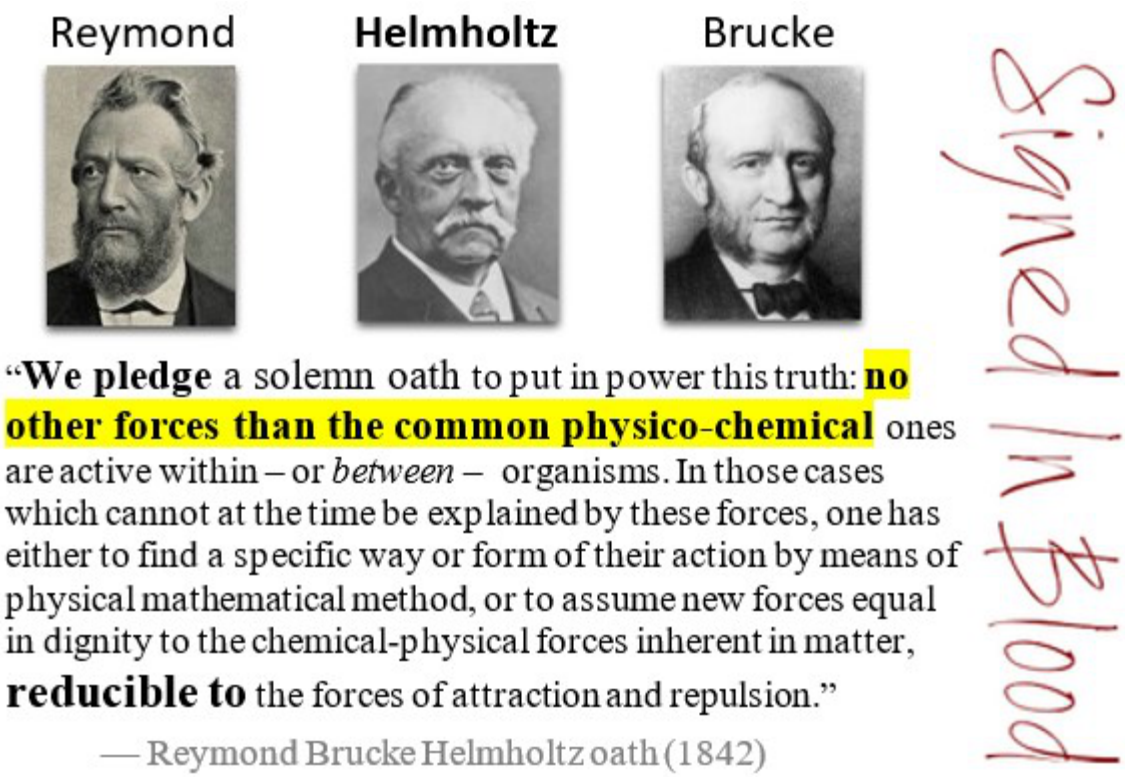

The three men: Emil Du Bois-Reymond, Hermann Helmholtz, and Ernst Brucke, of the so-called Helmholtz school, behind the 1842 **Reymond-Brucke oath**, namely of vow of allegiance to the view that only physicochemical forces, in opposition to any and all "life force" (or vitalism) theories, operate in organisms.

Overview

In 1828, Friedrich Wohler's synthesis of urea worked to destroy vitalism in chemistry. [2] The destruction of vitalism in evolution, physiology, psychology, and the humanities, in general, however, would not be so simple; has history has shown.

In 1833, German physiologist Johannes Muller, a tenacious adherent to vitalism theories, became the chair of anatomy and physiology at Humboldt University, and therein founded a famous experimentation-focused medical school laboratory.

In 1838, German medical students Emil Du Bois-Reymond and Ernst Brucke joined Muller's laboratory; soon thereafter a young Hermann Helmholtz joined the group.

In 1841, Helmholtz, enticed by Muller's motto of "creation of new phenomena through experimentation", decided to write his dissertation under Muller's supervision, specifically on the microscopic examination of the nervous system. [5]

In 1842, Du Bois-Reymond and Brucke, fed up with Muller's vitalism beliefs, pact that: [1]

> "[We pledge] to put in power this truth: no other forces than the common physical chemical ones are active within the organism. In those cases which cannot at the time be explained by these forces one has either to find a specific way or form of their action by means of physical mathematical method, or to assume new forces equal in dignity to the chemical-physical forces inherent in matter, reducible to the force of attraction and repulsion."

The manifesto was said to have been written by DuBois-Reymond, in collaboration with Brucke; soon after, Helmholtz and Karl Ludwig joined in, and as legend has it they each signed it with their own blood. [2] In short, the group "pledged a solemn oath" to eschew all nonmaterial explanations of organisms, physiologically, mentally, or operationally. [4] Second, they agreed that the only way the scientist could learn about these forces was through experimentation and observation. [3]

The underlying tension was a religious one; as Michael Wertheimer summarizes: [2]

> "Although no one objected to scientific materialism in the physical sciences, the closer that one came to psychology, the greater the general opposition seemed to be, mainly on religious and ethical grounds."

(add discussion)

This credo, in turn, would greatly influence a young Sigmund Freud, Brucke's soon-to-become medical school student; who in 1895, in his "A Project for Scientific Psychology", would go onto posit that all mental functioning could be explained, thermodynamically, via bound energy and free energy, something far ahead of its time, even by 21st standards. [4]

The pact, which became one of the central doctrines of the newly-forming "Helmholtz school" of physical science based medicine, was made in opposition to the vitalist doctrine, adhered to by their mentor Johannes Muller, and or possibly to the notion of animal heat, such as promulgated in Justus Liebig's 1842 *Animal Chemistry*.

References

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2. Wertheimer, Michael. (2012). *A Brief History of Psychology* (pg. 63). Taylor & Francis.
3. Decker, Hannah. (2013). *The Making of DSM-IIIRG: A Diagnostic Manual's Conquest of American Psychiatry* (pg. 37). Oxford University Press.
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5. Cahan, David (1993). *Hermann von Helmholtz and the Foundations of Nineteenth-Century Science* (pg. 24). University of California Press.

θΔics

In hmolscience, **Rich Byrnes** (c.1960-) is an American chemical engineer and thermodynamics humor cartoonist noted for his 2011 cartoon on the laws of thermodynamics and for his commentary on the thermodynamics forces behind chemical engineers "choosing" to become chemical engineers from Mary Guthrie's "Why Students Choose Chemical Engineering?" parody video.

In 2011, Byrnes illustrated Boil's law (aka Boyle's law) humor take of the game version of the laws of thermodynamics.

Quotes

The following are noted quotes:

> "I'm happy to know that the thermodynamic forces that compel folks to become ChE's have not changed much over the years."
>
> — Rich Byrnes (2012), comment on Mary Guthrie's 2009 ChETube humor video "Why Students Choose Chemical Engineer" [1]

Education

Byrnes is an artist, chemical engineer, and a former naval nuclear submarine officer. He worked for nearly three decades experience at DuPont.

References

1. Byrnes, Rich. (2011). "Boil's Laws: the Laws of Thermodynamics and Casinos", *Funnybone*, ChEnected, Apr. 08.
2. Guthrie, Mary. (2009). "Investigative Report: on Why Students Choose Chemical Engineering" (Ñº) (writer: Mary Guthrie) (Mirza quote, 4:47-4:53; Byrnes quote [2012], comment section), ChETube, CHEnected, Jan 13.

External links

â— Rich Byrnes Art – Facebook.
â— Rich Byrnes (about) - ChEnected.AIChE.org.

θΔics

In existographies, **Richard Adams** (1924-2018) [CR:52] is an American anthropologist noted, in anthropological thermodynamics, for the continuation of the work of Leslie White, i.e. using thermodynamics and evolution as a basis, resulting in his *Energy and Structure* (1975) and *The Eighth Day* (1988), among other publications, wherein, e.g., he attempts to extend what he calls the "Lotka principle" into anthropology.

Overview

In 1975, Adams, in his *Energy and Structure: a Theory of Social Power*, argues that the social power and anthropological studies of energy processes are based on the first and second law of thermodynamics. [1] In short, Adams argues that social power is based on control over energetic processes. [2] Herein, he cites and conjectures on individuals and topics such as: Claude Levi-Strauss, dissipative systems, Erwin Schrodinger, Alfred Lotka, energy forms, embodied energy, maximum power principle, Nicholas Georgescu-Roegen, Howard Odum, Leslie White, Maxwell's demon, negative entropy, among others.

In 1988, Adams in his *The Eighth Day: Social Evolution as the Self-Organization of Energy*, as reviewed by Juan Martinez-Alier, argued, using concepts such as "trigger action" and "autopoiesis", that energy processes provide a basis for explaining, comparing, and measuring complex social evolution, wherein society is conceived as a self-organization of energy. [3]

Entropy?

In 1988, Adams, in his *The Eighth Day*, saddles "energy" as his main platform to explain society, but when it comes to "entropy", he cites the following by Rosen:

> "I have never found entropy, information, negentropy and the like to be useful concepts in characterizing organization."
>
> — Robert Rosen (1980), *Publication* (pg. 364); cited by Richard Adams (1988) in: *The Eighth Day* (pg. 33) [4]

Then attempts to jettison entropy with the following inanity:

> "Various scientists have objected because the ability to measure the creation of entropy has meaning in a closed system but becomes questionable in an open system. Indeed, **the whole notion of entropy is** of doubtful utility in the present analysis because it deals with something for which we have no means to measure in social systems and is about **something of essentially little interest to us**."
>
> — Richard Adams (1988), *The Eight Day* (pg. 33)

This is a super-mess, indeed. Adams, here, in short, seems to be siding with the "non-applicable" view, as opposed to the "applicable" view. The above translated to the confused statement that: "heat is something of essentially little interest to us in social systems".

Education

Adams completed his BA in 1947 in anthropology under the tutelage of Leslie White at the University of Michigan, and his MA in 1949 and PhD in 1951, the latter on the autonomous development of Muguiyauo, Peru, after which he worked at the University of Texas, Austin, where, in continuation of the work of Leslie, he used thermodynamics and evolution as a starting point for anthropological theory, focusing on energy. [4]

Quotes | By

The following are noted quotes:

> “I can feel the heat, but where’s the light?”
>
> — Richard Adams (1977), “Man, Energy, and Anthropology”; compare: Philip Mirowski (1989) [5]

> “This [1988] study is the fourth, and most ambitious [45-years work], to issue from a challenge I received as an undergraduate in 1943 to take Leslie White's course 'The Mind of Primitive Man', diverting my attention from a possible career in academic philosophy to a more direct concern for the human process. Its purpose is, simply enough, to see whether human social evolution can be described, mapped, or cast in terms common to the other sciences, most specifically in terms of energy process. It reflects a conviction that for all its uniqueness and indeterminism, our understanding of the human trajectory will be unsatisfactory until it is framed in dynamics that are common to all of nature.”
>
> — Richard Adams (1988), *The Eight Day* (pg. ix)

> “The study of human experience glitters with imaginative and insightful approaches—Marxist modes of production, Levi-Straussian structures, Weberian verstehen, the Batesonian mind, and many others, all of which share one characteristic: they pertain to no common universe; most are untranslatable one to another.”
>
> — Richard Adams (1988), *The Eight Day* (pg. xiv)

> “One cannot launch a frontal attack on this problem of [explaining] ‘human experience’ via the [language] of one ‘common universe’. The present study attempts to do this by taking the only concept that I have found to be potentially useful to both the social and physical sciences—energy—and exploring how it may contribute to establishing common ground between the two areas.”
>
> — Richard Adams (1988), *The Eight Day* (pg. xiv)

> “Jantsch (1975) and Capra (1982) find some stimulation in the pattern fit between the model of nature that is now emerging and that derived from mystical religions. Such correspondences may stimulate theory building, but I find them of little help in the present exercise.”
>
> — Richard Adams (1988), *The Eighth Day* (pg. 7)

> “The argument herein is that the activities of the universe, including human activities, belong to a single universe of processes. The problem lies in the fact that we are the observers [see: advanced perspective] and, in monism, observers are part of the observed. There are serious theoretical obstacles in self-observation and in self-description.”
>
> — Richard Adams (1988), *The Eighth Day* (pg. 9)

“This essay, on the study of energy and society, does not attempt to bring together, evaluate, and select among the growing literature on applying energy models to human society. Almost all, including the present effort, are speculative and somewhat experimental (in the sense of waiting to see if anyone salutes). The state of the art, however, is not appropriate for such an evaluation at this time. The reason is simple. Until models are applied and **comparatively ‘tested’** or at least compared, there is no way to evaluate them.”

— Richard Adams (1988), *The Eighth Day* (pg. 11)

“Approaches to energy in society fall into three classes. The first concerns commercial energy's role in the contemporary world; the second draws upon community and human ecology [ecological energy]; and the third points in the direction of the present study, that is, the analysis of social process in energy terms.”

— Richard Adams (1988), *The Eight Day* (pg. 11)

“While most readers would have no problem in conceiving of coal or petroleum as energy forms, the present argument requires that we also regard human beings, human behavior, social groups, and assemblages of social interactions as energy forms. Similarly, mental processes located in the brain, writing on paper, and soundwaves in the air are also energy forms. The inclusion of all these different kinds of things as energy forms is legitimate because all of them meet the definition.”

— Richard Adams (1988), *The Eighth Day* (pgs. 15-16); cited by Ralph Anderson (2019) in *Human Behavior as Social Environment* (pg. 9); cited by Libb Thims (2019) in Reddit (Ñº) post

“It is clear that we exercise no control over gravitation.”

— Richard Adams (1988), *The Eight Day* (pg. 19); compare Alexander Pope (1734): “Shall gravitation cease, if you go by?” (*An Essay on Man*).

“Just as the governor on the steam engine balances centrifugal force against the force of gravity or of a spring to open or close a valve, so the leader’s special knowledge of the tendencies of his people permits him to trigger their behavior.”

— Richard Adams (1988), *The Eighth Day* (pg. 71)

“While Prigogine’s attention here is on chemical and biological phenomena, his concern is equally relevant to the operation of societies. While we may imagine the bonding and coupling of chemical elements through electromagnetic attraction or the basic force that holds the nucleus of atoms together, we daily experience and contend with the forces and attractions that seem to hold people in social relations. We can feel in our viscera and conceptualize in our mental models the ‘reason’ that we hold onto a job or divorce a spouse. The bonds and forces of society (see: human chemical bond; social bond) are utterly different from those of atomic or chemical reactions, but the fact in common is that complex things must be constructed and that it costs energy to bring this about.”

— Richard Adams (1988), *The Eighth Day* (pg. 75)

> "Boundaries pose a problem for sociology."
>
> — Richard Adams (1988), *The Eight Day* (pg. 143)

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3. Adams, Richard N. (1988). *The Eighth Day: Social Evolution as the Self-Organization of Energy.* University of Texas Press.
4. (a) Adams, Richard N. (2007). *La Red de la Expansion Humana* (pdf). Publisher.
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External links

â— Richard Newbold Adams (Spanish → English) – Wikipedia.
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θΔics

In hmolscience, **Richard Brown** (1940-2003) was an American sociologist noted for his PhD dissertation turned 1977 book *A Poetic for Sociology: Toward a Logic of Discovery for the Human Sciences*, wherein he includes a fairly cogent chapter on what he labels as metaphor, being a historical on materialistic humanities theorists, with discussions of human physicists such as Thomas Hobbes, Jeremy Bentham, John Q. Stewart, and Jacob Moreno, to name a few.

Metaphor

Nearly half of Brown's *A Poetic for Sociology*, specifically 94 of 220 pages (43 percent), is devoted to a discussion of "metaphors", whether molecule or machine, as he calls them, in sociology. In his acknowledgements section, he credits the following as the backbone of this chapter: [2]

> "For Chapter 4 on metaphors, Mary Hesse' *Models and Analogies in Science* [1963], C.M. Turbayne's *The Myth of Metaphor* [1962], and Douglas Berggren's [1962-63] essay in the *Review of Metaphysics* were of central importance as sources for many basic ideas, analytic categories, and examples. Paul Diesling's [1971] *Patterns of Discovery in the Social Sciences* also provided important insights and examples. George Lundberg, the positivist, was accidentally rebaptized as Ferdinand Lundberg, the Marxist!"

(add discussion)

Education

Brown completed his BA at University of California, Berkeley, his MA in sociology and East Asian studies Columbia, and his PhD at the University of California, San Diego, after which, in 1975, he began teaching at the University of Maryland. [3]

Quotes

The following are related quotes:

> "Most sociology imitates physics and justifies itself in terms of positivist epistemology. In contrast, the more humanistic sociologies are truer to the data, yet they appear to operate in the realm of intuition, to be a matter of interpretation rather than of truth."
>
> — Richard Brown (1976), "Preface" to *A Poetic for Sociology* (pg. x)

> "As the vocabulary of physics has changed so has that of physicalistic social scientists. The simple levers and inclined planes of Galileo have given way to the dynamo, electromagnetism, and the computer."
>
> — Richard Brown (1977), *A Poetic for Sociology* (pgs. 141-42)

> "Given the 'lag' between the source of such metaphors in physics and their use in sociology, we await the discovery soon of social protons, neutrons, and neutrinos."
>
> — Richard Brown (1977), a humorous jab at John Q. Stewart's 1952 social molecules and Jacob Moreno's social nuclei; *A Poetic for Sociology* (pg. 142)

> “A crucial test of the power of the metaphor is whether its opponents wind up using it themselves.”
>
> — Richard Brown (1977), *A Poetic for Sociology* (pg. 142)

References

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2. (a) Hesse, Mary B. (1966). *Models and Analogies in Science*. University of Notre Dame.
(b) Turbayne, Colin M. (1962). *The Myth of Metaphor*. Yale University Press.
(c) Berggren, Douglas. (1962). “The Use and Abuse of Metaphor I” (abs), *The Review of Metaphysics*, 16(2):237-58.
(d) Berggren, Douglas. (1963). “The Use and Abuse of Metaphor II” (abs), *The Review of Metaphysics*, 16(3):450-72.
(e) Diesling, Paul. (1971). *Patterns of Discovery in the Social Sciences*. Transcation Publishers, 1979.
3. Richard Brown (about) – Brownsym.cm.umk.pl.

External links

â— Richard Harvey Brown – PhilWebb.net.
â— Brown, Richard Harvey – WorldCat Identities.

θΔics

In existographies, **Richard Carlile** (1790-1843) (FA:108) was an English radical publicist, a previous deist who declared (Ñº) himself an atheist in 1821; noted as the publisher of Thomas Paine's writings.

Taylor

On 21 May 1829, Robert Taylor, following his release from prison, teamed up with Carlilie, and arrived in Cambridge, where they rented a room for two weeks above a print shop, which they called their 'Infidel Headquarters', whereat they printed and sent out the following circular to the leading clergyman of the area:

> "Robert Taylor and **Richard Carlile** present their compliments as 'infidel missionaries', to and most respectfully and earnestly invite discussion on the merits of the Christian religion, which they argumentatively challenge, in the confidence of their competence to prove, that **such a person as Jesus Christ, alleged to have been of Nazareth, never existed**; and that the Christian religion has no such origin as has been pretended; neither is it in any way beneficial to mankind; but that it is nothing more than an emanation from the ancient Pagan religion. The researches of the Rev. Robert Taylor, on the subject, are embodied in his newly published work, *The Diegesis*, in which may be found the routine of their argument. They also impugn the honesty of a continued preaching, while discussion is challenged on the whole of the merits of the Christian religion."

This resulted in a fiasco, of sorts (Ñº), the news of which spread through the entire student body of Cambridge, including the newly being imprinted mind of Charles Darwin, then in his second year of college.

Quotes | On

The following are quotes on Carlile:

> "It is evident that the notion of *spirits*, imagined by savages and adopted by the ignorant, is calculated to retard the progress of knowledge, since it precludes our researches into the true cause of the effects which we see, by keeping the human mind in apathy and sloth. This state of ignorance may be very useful to crafty theologians, but very injurious to society. This is the reason, however, why in all ages priests have persecuted those who have been the first to give natural explanations of the phenomena of nature— as witness: Anaxagoras, Aristotle, Galileo, Descartes—and, more recently, **Richard Carlile**, William Lawrence, Robert Taylor, and Abnet Kneeland; to which we may add the name of the learned and venerable Thomas Cooper M. D., lately president of Columbia College. South Carolina."
>
> — H.D. Robinson (1835), notes to Baron d'Holbach's *The System of Nature* [1]

References

1. d'Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (pg. 53). J.P. Mendum, 1889.

External links

â— Richard Carlile – Wikipedia.

θΔics

In existographies, **Richard Carrier** (1969-) is an American Greco-Roman historian, a seeming religio-mythology scholar of sorts, noted generally for his secular atheism writings, for his 2000 critique of thermodynamic suppositions of David Foster's *The Philosophical Scientists*, for his 2004 drafting of 22 supposed Lucretius' poem scientific predictions, and for his 2005 *Sense and Goodness without God*. [1]

Zeitgeist

Carrier, of note (Q), is anti-Zeitgeist.

Sense and Goodness without God

In 2005, Carrier published his *Sense and Goodness without God*, the abstract of which is as follows: [2]

> "If god does not exist, then what does? Is there good and evil, and should we care? How do we know what's true anyway? And can we make any sense of this universe, or our own lives? Sense and goodness answers all these questions in lavish detail, without complex jargon."

(add)

Jesus myth

On 18 Mar 2009, Carrier debated William Craig on the topic: "Did Jesus rise of the Dead?", at Northwestern Missouri State University (audio: Q,Q), who Craig refers to as "by far one of the most bizarre opponents he has had to debate on the resurrection of Jesus." (video: Q)

In 2011, Carrier, in his "Christianity's Success Was Not Incredible", argued the following: [3]

> "Among pagans, genuine sons of god who had to be murdered, buried, and then miraculously resurrected from the dead in order to judge and rule from heaven on high as our divine saviors were actually a common fad of the time, not a shocking novelty at all. Osirus and Romulus were widely worshipped to the tune of such sacred stories demonstrably before the rise of Christianity, and similar stories surrounded other dying-and-rising gods long before such as Zalmoxis, Adonis, and Inanna."

In 2014, Richard Carrier, in his *On the Historicity of Jesus: Why We Might Have Reason to Doubt*, wherein he describes himself as a "marginally renowned atheist", attempts to argue that Jesus as an historical figure never existed, but rather the figure of Jesus is a mythical aggregate, or something along these lines. [4]

Quotes | By

The following are quotes by Carrier:

> "*On the Historicity of Jesus* is the first comprehensive pro-Jesus myth book ever published by a respected academic press under formal peer review."
>
> — Richard Carrier (2013) (Q)

References

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(b) Carrier, Richard. (2004). "Predicting Modern Science: Epicurus vs. Mohammed", The Secular Web, Jun 22.
(c) Stenger, Victor J. (2013). *God and the Atom: from Democritus to the Higgs Boson: the Story of a Triumphant Idea* (pg. 41) Prometheus Books.
2. Carrier, Richard. (2005). *Sense and Goodness without God*. AuthorHouse.
3. Carrier, Richard. (2011). "Christianity's Success Was Not Incredible." The End of Christianity (editor: John Loftus) (pg. 59). Prometheus Books.
4. Carrier, Richard. (2014). *On the Historicity of Jesus: Why We Might Have Reason to Doubt*. Sheffield Phoenix Press.

Videos

● Carrier, Richard. (2014). "Atheist Debates – Interview: Richard Carrier" (Q), Matt Dillahunty, Dec. 17.

External links

● Richard Carrier – Wikipedia.
● Richard Carrier (about) – Infidels.org.

θΔics

In human thermodynamics, **Richard L. Coren** (1932-) is American electrical engineering and computer scientist noted for his 1998 cybernetics theory of evolution, in which he mixes thermodynamics, paleontology, and information theory to argue that evolution, from the big bang to the present civilization, is single coherent process, in the form of what he calls "evolutionary trajectories". [1]

In his 2006 book *God and Science Among the Infinities*, Coren attempts to use complexity theory, intermixed with bits of thermodynamics (citing: Jeffrey Wicken, James Kay, Eric Schneider, Ilya Prigogine, and Rod Swenson), such as Bénard cells, to argue that God originated in the mathematical concept of infinities.

Education

Coren completed his PhD at the Polytechnic Institute of Brooklyn. He is currently a professor emeritus at Drexel University. His main research focus has been in electromagnetic fields, antennas, shielding, and radio frequency interference. In the last ten years, his focus has been on the cybernetics of evolving systems. [2]

References

1. Coren, Richard L. (1998). *Evolutionary Trajectory: the Growth of Information in the History and Future of Earth* (ch. 7: Entropy, pgs 111-26). CRC Press.
2. Faculty: Electrical and Computer Engineering – Drexel University, Catalog 2008/2009.
3. Coren, Richard L. (2006). *God and Science Among the Infinities* (previously titled: *The World is Too Complex for God*, 2001) (thermodynamics, pgs. 49, 62-68). BookSurge.

Further reading

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● Coren, Richard L. (1989). *Basic Engineering Electromagnetics: an Applied Approach.* Prentice Hall.
● Coren, Richard L. (2001). "Empirical Evidence for a Law of Information Growth", *Entropy* 3(4), 259-72.
● Coren, Richard L. (2002). "Comments on 'A Law of Information Growth'", *Entropy*, 4(1): 32-34.
● Coren, Richard. (c.2007). "The Law of Entropy and Information in Evolution", Evolutionary Epic conference.

External links

● Coren, Richard L. (1932-) – WorldCat Identities.
● Richard Coren (about) - Evolutionary Epic conference.

θΔics

In existographies, **Richard Dawkins** (1941-) (IQE:165|#14) [RGM:219|1,400+] (DN:6.5) (CR:203) is an English zoologist, turned selfish genes popularizer, turned famous atheist, initiator the Dawkins scale of religious belief, who is noted for his random chance and purposeless universe model of everything.

Zeitgeist

On 10 Apr 2013, Dawkins Tweeted (Ñº) about the Zeitgeist Horus = Jesus assertion:

> "Comparisons often made of Jesus with Horus, Dionysus, Krishna etc. Any real scholars out there confirm each one?"

Per reason that he was "doubting the story"; which was responded by Dorothy Murdock (Ñº), among others.

Overview

The following is Dawkins' gene-centric view of existence as summarized in the following 1991 quote: [1]

> "We are machines built by DNA whose purpose is to make more copies of the same DNA. That is exactly what we are here for. We are machines for propagating DNA, and the propagation of DNA is a self-sustaining process. It is every living object's sole reason for living."

A number of significant difficulties exist in Dawkin's overall theory, which on one hand is a modern step above the Biblical view of existence and purpose, yet on another hand is invariably attributing a misaligned viewpoint to hard science (physics, chemistry, and thermodynamics), which is not his field of expertise (zoology).

To point out his salient difficulties: firstly, chemical synthesis is the correct name for the process by which humans came about over billions of years from hydrogen atom precursors, as first enunciated in French philosopher Jean Sales' 1798 human molecular hypothesis, not by English naturalist Charles Darwin's 1859 evolution theory, which is only a partial theory of a bigger process; secondly, a human is not a living object, but rather an animated or reactive entity; third, human chemical reactions are not self-sustaining, a process that amounts to a perpetual motion claim, but rather heat-driven; fourth, humans are not machines (human machines), which is a defunct 19th century theory, but rather molecules (human molecules); fifth, and most incorrect among his many grandiose claims, the sole reason for an animated object's existence is not "propagation of DNA", but rather a reaction path dictated by Gibbs free energy change, as these free energy differentials are coupled to the spins and heat cycles of the universe.

Christianity | Atheism

In *circa* 1957, Dawkins, in his mid-teens, he was led to reject Christianity, having been brought up in traditional Anglicanism, after discovering Darwin. [4] The following Darwin wasp god disproof quote seems to be Dawkins' main source of atheism fuel; being

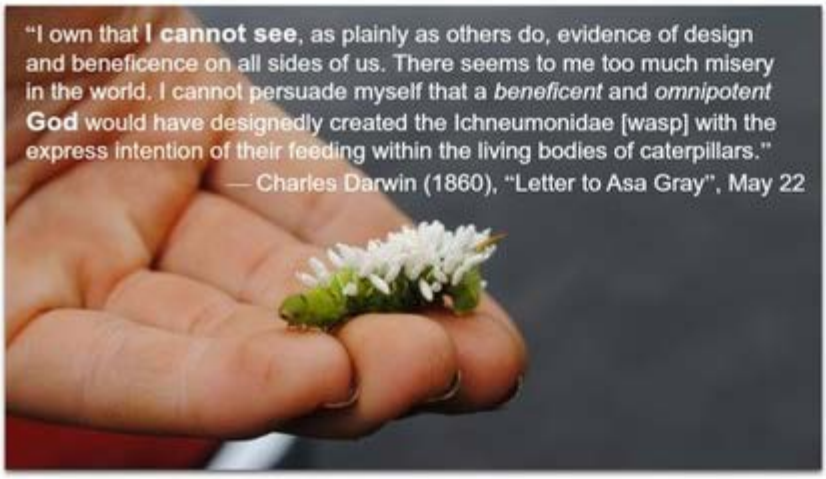

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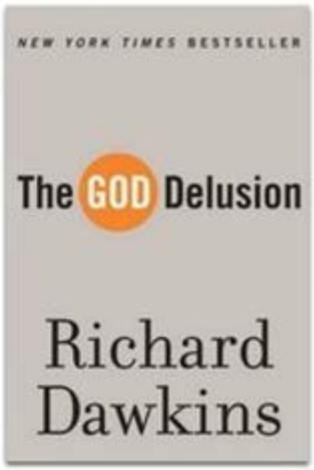

A photo (Ñº) of a Tomato Hornworm caterpillar victimized by the rice-like eggs of the wasp larvae, overlaid with

that he re-quotes this, in the form of conceptualizing nature as blind, designless, purposeless, and indifference:

Charles Darwin's famous 1860 "wasp feeding quote", which worked to teeter him away from theism; and with which **Richard Dawkins**, in the 1970s and 1980s, admixtured with "selfish genes" + "Hamilton rule" + "blind forces", has used as his main atheism fuel, in the new atheism era, to promote a purposeless universe ideology as his modus operandi.

> "I own that I cannot see as plainly as others do, and as I should wish to do, evidence of design and beneficence on all sides of us. There seems to me too much misery in the world. I cannot persuade myself that a beneficent and omnipotent god would have designedly created the Ichneumonidae [wasp] with the express intention of their feeding within the living bodies of caterpillars, or that a cat should play with mice."
>
> — Charles Darwin (1860), "Letter to Asa Gray", May 22 [8]

Dawkins repeatedly reformulates this quote in his writings:

> "Nature is not cruel, only pitilessly indifferent. This lesson is one of the hardest for humans to learn. We cannot accept that things might be neither good nor evil, neither cruel nor kind, but simply callous: indifferent to all suffering, lacking all purpose."
>
> — Richard Dawkins (1995), "God's Utility Function", a synopsis of Darwin's 1860 wasp disproof quote [9]

> "The universe that we observe has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil and no good, nothing but blind, pitiless indifference."
>
> — Richard Dawkins (1997), "Article" [10]

On this last quote, American atheist turned skeptical theist Lee Strobel (2004) comments that this type of Darwin-Dawkins evolution ideology is what, in his early 20s teetered him on the atheism side of the fence, a loose anchoring in the Drake equation, i.e. in conceptualized extraterrestrial kinship, "giving him hope", as he reflects:

> "This essence of what I was taught as I studied science. Of course, these conclusions neatly bolstered my atheistic values. Somehow I managed to avoid getting too depressed by the personal implications of all of this, strangely finding hope and inspiration in the belief that we are not alone in the universe. Even if god didn't exist, at least there were millions of advanced civilizations out there."

(add discussion)

In 1986, Dawkins, in his *The Blind Watchmaker*, seems to have begun to self-identify as an "intellectually fulfilled atheist", implicitly: [5]

> "An atheist before Darwin could have said, following Hume, 'I have no explanation for complex biological design. All I know is God isn't a good explanation, so we must wait and hope that somebody comes up with a better one.' I can't help feeling that such a position, though logically sound, would have left one feeling pretty unsatisfied, and that although atheism might have been logically tenable before Darwin, Darwin made it possible to an intellectually fulfilled atheist."

Dawkins, here, to note, obviously did know Goethe, nor seem to be aware that Darwin cites Goethe as being one of the three evolution theorists to have preceded him, along with his grandfather Erasmus Darwin (1791), and Etienne Saint-Hilaire (1833)

> "The more you understand the significance of evolution, the more you are pushed away from an agnostic position and towards atheism."
>
> — Richard Dawkins (1994), "On Debating Religion" [7]

In 2005, Dawkins, at a time when his *God Delusion* was still in the drafting stage, was being referred to as the "world's most famous out-of-the-closet living atheist". (Ñº)

In 2006, Dawkins published his *The God Delusion*, one of the more talked about books in the recent "new atheism" movement in the early 21st century.

Humans | Bag of chemicals

Dawkins, supposedly, was the originator of the "bag of chemicals" view of humans.

Blind |

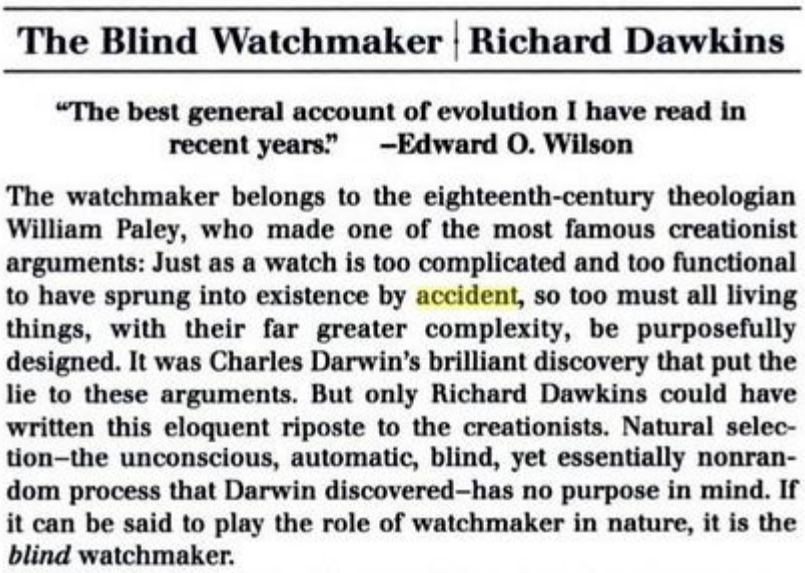

The Blind Watchmaker | Richard Dawkins

"The best general account of evolution I have read in recent years." –Edward O. Wilson

The watchmaker belongs to the eighteenth-century theologian William Paley, who made one of the most famous creationist arguments: Just as a watch is too complicated and too functional to have sprung into existence by accident, so too must all living things, with their far greater complexity, be purposefully designed. It was Charles Darwin's brilliant discovery that put the lie to these arguments. But only Richard Dawkins could have written this eloquent riposte to the creationists. Natural selection–the unconscious, automatic, blind, yet essentially nonrandom process that Darwin discovered–has no purpose in mind. If it can be said to play the role of watchmaker in nature, it is the *blind* watchmaker.

Left: American atheism advocate Aron Nelson (2008), aka AronRa, on the fallacy of the popular notion that evolution is based on "**accident**", with snippets of Richard Dawkins denying that evolutionists employ the notion of accident in their argument. Right: back cover section of Dawkins' 1986 *The Blind Watchmaker*, wherein he cites the "accident" based evolution model, contrary to his interview statements, as the antonym to William Paley's model of creation via god, along with 6+ usages of the term inside. (Ñº)

Accident | Chance

In 1986, Dawkins published his *The Blind Watchmaker*, titled in opposition to William Paley's watchmaker argument, wherein he argues that natural selection is the unconscious, automatic, blind, purposeless, non-random process discovered by Darwin; the gist of which can be summarized by the following Dawkinean logic, based on the respective number of times he uses each term throughout his book: [3]

> Natural selection = blind (100+), random (49+), chance (37+), accident (6+)

Dawkins, in the adjacent clip (3:16-3:40), states that no evolutionist that he has ever met claims that evolution happens by accident.

Purposeless universe theory

Dawkins came to fame with his 1976 book *The Selfish Gene*, in which he argued that genes are selfish and focal point of evolution; he followed this up with his 1986 book *The Blind Watchmaker*, in which he argued for the view that humans were not created by God, but by blind random purposeless chance; his 2006 book *The God Delusion*, takes aim at the theory of god, arguing that god does not exist and that religion is a delusion.

On morality

Dawkins system of morality amounts, it seems to a gene-based kin selection ideology, in short.

It is not difficult to find him contradicting himself, as he does with "accident" (above), in respect to whether or not he believes that "good" and "evil" exist in the universe (as shown adjacent).

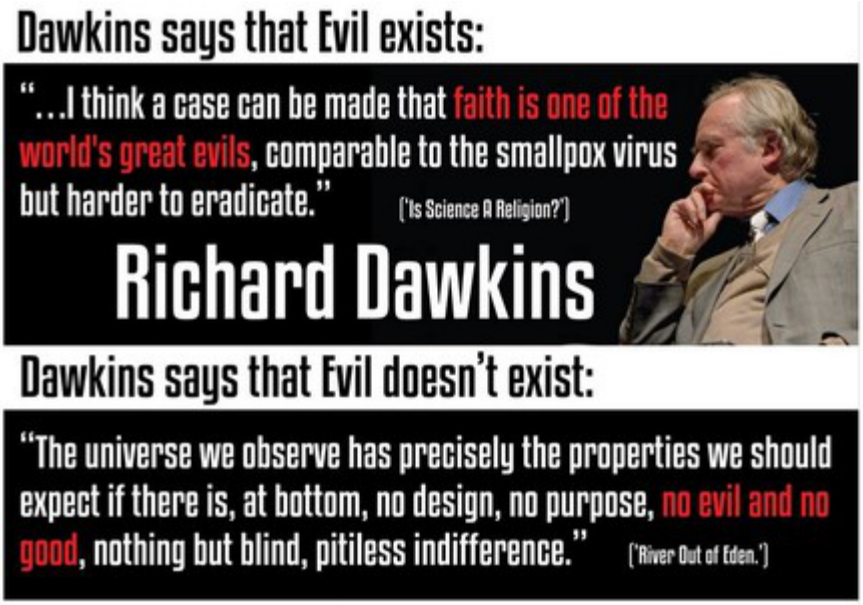

Dawkins contradicting himself (Ñº) on whether "good" and "evil" exist.

Difficulties on theory

Dawkins' overall polemic is that his selfish-genes argument is about altruism, as he has said in recent videos, but that many have misinterpreted this implicit argument. In any event, the following is his main area of difficulty:

> "We are survival machines—robot vehicles blindly programmed to preserve the selfish molecules known as genes."
>
> — Richard Dawkins (1976), *The Selfish Gene* (ix) [6]

Supposedly, Dawkins' aim here was to repackage Hamilton kin selection rule in the form of a selfishness argument. Whatever the case the errors here are the use of the terms: 'blind' and 'selfish molecule'. Molecules are neither blind nor are they selfish (Ñº), these are what are called "molecular anthropisms".

Education

Dawkins completed his BS (1962), MA, and PhD (1966) in zoology at Oxford University under animal behavior theorist Nikolaas Tinbergen. Dawkins was an assistant professor of zoology at University of California, Berkeley from 1967 to 1970, after which he returned to Oxford, becoming a zoology professor there.

Quotes | By

The following are related quotes:

> "In a universe of electrons and selfish genes [A], **blind** physical forces [B] and genetic replication, some people are going to get hurt, other people are going to get lucky [C], and you won't find any **rhyme or reason** [D] in it, nor any justice [E]. The universe that we observe has precisely the properties we should expect if there is, at bottom, no design [F], no purpose [G], no evil [H] no good [I], nothing but pitiless indifference."
>
> — Richard Dawkins (1995), *River Out of Eden*

"Darwinism is not a theory of random chance. It is a theory of random mutation plus non-random cumulative natural selection. . . . Natural selection . . . is a non-random force, pushing towards improvement. . . . Every generation has its Darwinian failures but every individual is descended only from previous generations' successful minorities. . . . There can be no going downhill - species can't get worse as a prelude to getting better. . . . There may be more than one peak."

— Richard Dawkins (1996), *Climbing Mount Improbable* (Ñº)

"What if I'm wrong? Anybody could be wrong. We could all be wrong about the flying spaghetti monster, the pink unicorn, and the flying tea pot. You happen to be brought up, I presume, in the Christian faith. You know what it's like to believe in a particular faith, because you're not a Muslim. You're not a Hindu. Why aren't you a Hindu? Because you happen to be brought up in America, not in India. If you had been brought up in India, you have been a Hindu. If you had been brought up in Denmark, in the time of the Vikings, you would have been believing in Wotan [Odin] (Ñº) and Thor. If you had been brought up in classical Greece, you would have been believing in Zeus. If you had been brought up in central Africa, you would be believing in the great juju (Ñº) of the mountain. There is no particular reason to pick on the Judeo-Christian god, in which, by the **sheerest accident**, you happened to have been brought up, and ask me the question: 'what if I'm wrong?' What if you're wrong about the great juju at the bottom of the sea?"

— Richard Dawkins (2006), "What if You're Wrong?", response to Randolph College student query, Oct 23; variant of statement (pg. 25) in *The God Delusion* (2004); favorite quote of Angela Jabari (2016) in her "twenty smartest atheists" list; variant of what was originally stated by Michel Montaigne (*Essays*, 1580) (see: religion as a function of birthplace) [11]

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(b) Palmer, Michael. (2013). *Atheism for Beginners: a Coursebook for Schools and Colleges* (§Richard Dawkins, pgs. 214-15). Lutterworth Press.
6. (a) Rigney, Daniel. (2001). *The Metaphorical Society: an Invitation to Social Theory* (pg. 33). Rowman & Littlefield.
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(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 24). Zondervan, 2009.
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(b) Darwin and the Ichneumonidae (section) – Wikipedia.
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10. (a) Dawkins, Richard. (1997). "Article", *Science*, 277:892.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 190). Zondervan, 2009.
11. (a) Dawkins, Richard. (2006). "What if You're Wrong?", response (Ñº) to student query from audience, Randolph College (Liberty University), Lynchburg, Virginia, Oct 23
(b) Dawkins, Richard. (2006). *The God Delusion* (born, pg. 25). Houghton Mifflin Harcout.
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External links

â— Richard Dawkins – Wikipedia.

θΔics

In sociological thermodynamics, **Richard Delgado** (c.1948-) is an American law professor noted for his 1990 metaphorical-type conservation of energy version of a racism law. [1] In particular, what Delgado has termed the *law of racial thermodynamics*, states that: [2]

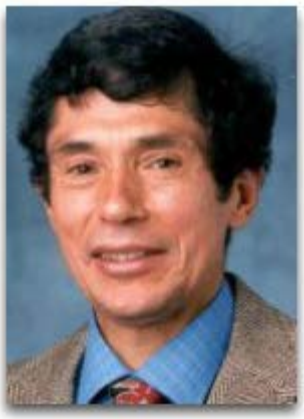

> "There is change from one era to another, but the net quantum of racism remains exactly the same. Racism is neither created nor destroyed."

This has been paraphrased as: "racism is never destroyed but always comes back in new forms." [3]

Education

Delgado completed his AB in mathematics and philosophy in *circa* 1972 at the University of Washington and his JD in 1974 at the University of California at Berkeley. [4]

See also

â— Erich Müller

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(b) Richard Delgado (faculty) – University of Pittsburgh, Law School.

External links

â— Richard Delgado – Wikipedia.

θΔics

In existographies, **Richard Feynman** (1918-1988) (IQ:185|#48) [RGM:131|1,500+] (FA:166) (CR:97) was an American physicist, a high-ranked greatest physicist ever, named, by Omni magazine, in 1979, as the "smartest man in the world" (Q), semi-ranked with an age 23 physics prowess power as comparable to Einstein and Lev Landau (Gleick, 1992), noted for his work in the development of quantum electrodynamics (QED), the study of the behavior of light and electrons.

Feynman on love

In 1946, sixteen months after Feynman's wife, Arline Feynman, died (de-existed), at age 25, from tuberculosis, Feynman wrote a curious letter to his wife, which remained sealed until his death (dereaction) in 1988.

Feynman on religion

See main: Feynman on religion

In 1930, Feynman, aged 13, was an avowed atheist:

> "In those days, in Far Rockaway, there was a youth center for Jewish kids at the temple. Somebody nominated me for president of the youth center. The elders began getting nervous, because I was an 'avowed atheist' by that time. I thought nature itself was so interesting that I didn't want it distorted like that [by miracle stories]. And so I gradually came to disbelieve the whole religion."
>
> — Richard Feynman (1988), *What Do You Care What Other People Think?* [9]

In 1946, at his father's funeral, know that his father was atheist, and that he was, refused to take part in a mourner's prayer in praise of god. In his 1963 Danz lecture turned book *The Meaning of It All*, was self-classifying himself, in a beat around the bush manner, as being grouped with his fellow "atheistic scientific colleagues".

In 1963, Feynman, in his *The Meaning of It All*, Danz lecture turned book, when he began to engage into the bigger "meaning" and "morality" terrain, stated to the effect that he was an atheist, then vacillated, slightly, on the question as to whether or not it is possible to "disprove the existence of god", a phrase he repeated some four times; the last of which was the following statement:

> "It is not possible to disprove the existence of god, as far as I know."
>
> — Richard Feynman (1963), *The Meaning of It All* (pg. 40)

(add)

Atoms | Animals

In 1961 to 1963, Feynman gave his famous lectures on physics series at Caltech to undergraduates. In the opening lecture, "Atoms in Motion", he outlined what has come to be know as reductionism par excellence, the following being a popular human physics themed quote:

> "Everything is made of atoms. That is the key hypothesis. Everything that animals do, atoms do. There is nothing that living things do that cannot be understood from the point of view that they are made of atoms acting according to the laws of physics."

(add)

Feynman on beauty

In 1981, during Christopher Sykes' now-celebrated "The Pleasure of Finding Things Out" interview documentary of Feynman—originally conceived to be done on Freeman Dyson, who but deflected the interview to Feynman, whom he considered (V) far more interesting—Feynman talked about the beauty of a flower, from a scientist's purview and an artist's perspective. (Q) (V)

Education

In grade school, Feynman infamously scored 125 on an IQ test; a finding which, along with Henri Poincare, who scored at the imbecile level on an IQ test, is often cited as case in point in regards to the ability to be able to test for genius recognition.

As a child, Feynman's father—a military uniform salesman—would sit young Feynman on his lap and read to him from the family's Encyclopedia Britannica, stopping and pausing along the way, to explain, e.g. how a six foot wide dinosaur head would not be able to fit through the family window.

As a teenager, or at least by age 19, Feynman was reading Paul Dirac's 1930 *The Principles of Quantum Mechanics*. [7]

In college, and not until he was older, Feynman explicitly avoided taking humanities classes, as much as possible, expect where required. (V)

In 1939, Feynman completed his BS at MIT, during which year, as a senior, he had the highest score in the nation on the Putnam; he supposedly had a standing bet that he could solve any problem to within 10% within 60 seconds; and some have suggested his non-verbal IQ was greater than 190. (Q)

Feynman attained a perfect score on the graduate school entrance exams to Princeton University in mathematics and physics—an unprecedented feat—but did rather poorly on the history and English portions. Attendees at Feynman's first seminar included Albert Einstein, Wolfgang Pauli, and John Neumann. He received a PhD from Princeton in 1942; his thesis advisor was Wheeler, and Wheeler and Eugene Wigner were the examiners of his thesis.

Quotes | On

The following are quotes on Feynman:

> "**Feynman** is a second Dirac, only this time human."
>
> — Eugene Wigner (c.1945) [2]

> "[**Feynman**] begins working calculus problems in his head as soon as he awakens. He did calculus while driving in his car, while sitting in the living room, and while lying in bed at night."
>
> — Mary Bell (c.1956), divorce complaint of second wife of three (Q)

Quotes | By

The following are related quotes:

> "In these days of specialization there are too few people who have such a deep understanding of two departments of our knowledge that they do not make fools of themselves in one or the other."

— Richard Feynman (1963), on religion, politics, and religion; in: *The Meaning of it All: a Scientist Looks as Society* (pg. 3)

"I do believe there is a conflict between science and religion."

— Richard Feynman (1963), *The Meaning of it All: a Scientist Looks as Society* (pg. 32) [5]

"Today we cannot see whether Schrodinger's equation contains frogs, musical composers, or morality. We cannot say whether something beyond it like god is needed, or not. And so we hold strong opinions either way."

— Richard Feynman (1964), lecture on turbulence [8]

"I would like to again impress you with the vast range of phenomena that the theory of quantum electrodynamics describes: It's easier to say it backwards: the theory describes all phenomena of the physical world except the gravitational effect, the thing that holds you in your seats (actually, that's a combination of gravity and politeness, I think), and radioactive phenomena, which involve nuclei shifting in their energy levels. So if we leave out gravity and radioactivity (more properly, nuclear physics), what have we got left? Gasoline burning in automobiles, foam and bubbles, the hardness of salt or copper, the stiffness of steal. In fact, biologists are trying to interpret as much as they can about life in terms of chemistry, and as I already explained, the theory behind chemistry is quantum electrodynamics."

— Richard Feynman (1985), *QED: the Strange Theory of Light and Matter* [1]

"I don't know what the fuss is all about—Dirac did it all before me."

— Richard Feynman (c.1970), recollected by Freeman Dyson (2005) [3]

See also

- Belief system
- Feynman on god
- Feynman problem solving algorithm
- Feynman time capsule wisdom

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2. (a) Quoted by Oppenheimer in Smith and Weiner (1980:269); Wigner was one of the examiners of Feynman's PhD thesis, the other Wheeler. The oral examination was held on Jun 1942, and the examiners' report is held in the Mudd Library, Princeton.
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Further reading

● Feynman, Richard. (1956). "The Relation of Science and Religion", *Engineering and Science Magazine*; talk given at Caltech YMCA Lunch Forum, May 02.

Videos

● Feynman, Richard. (c.1945). "Lecture on Entropy" (P1) (P2), EduQuarks, YouTube.

External links

● Richard Feynman – Wikipedia.

θΔics

In existographies, **Richard Friedman** (1946-) (RMS:92) is a Biblical scholar noted for []

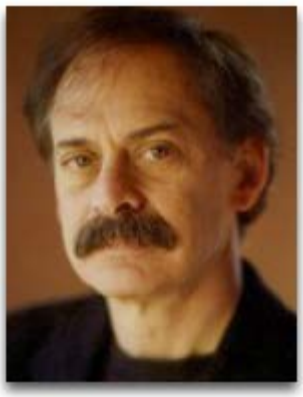

Overview

in 1987, Friedman, in his *Who Wrote the Bible*, cited by Gary Greenberg (1996), starting with Thomas Hobbes intelligently argued position that the Pentateuch was not written by Moses, followed by Benedict Spinoza's views, among others, outlined a history of the documentary hypothesis. [1]

Quotes | By

The following are quotes by Elliot:

> "In the third stage of the investigation, investigators concluded outright that Moses did not write the majority of the Pentateuch. The first to say it was the British philosopher Thomas Hobbes in the seventeenth century. Hobbes collected numerous cases of facts and statements through the course of the Five Books that were inconsistent with Moses being the reputed author of the *Pentateuch*. It is difficult to name a single person as the 'founder', 'father', or 'first to' of this [documentary hypothesis] enterprise, because a number of persons made contributions that brought the search to some new stage. Indeed, books and articles on the field of biblical scholarship attribute these titles variously to Hobbes, Spinoza, Richard Simon, Jean Astruc, Johann Eichhorn, Karl Graf, or Julius Wellhausen."
>
> — Richard Elliot (1987), *Who Wrote the Bible* [1]

Quotes | On

The following are quotes on Elliot:

> "For the history of Biblical textual analysis, I draw primarily upon **Richard Friedman**'s *Who Wrote the Bible* (1987)."
>
> — Gary Greenberg (1996), note to statement that Thomas Hobbes was first scholar to argue against Mosaic authorship of the Bible [2]

References

1. Friedman, Richard E. (1987). *Who Wrote the Bible* (Hobbes, 6+ pgs; quote, pg. 20 + 26). Summit Books.
2. (a) Friedman, Richard E. (1987). *Who Wrote the Bible* (Hobbes, 6+ pgs). Summit Books.
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Videos

â— Levy, Thomas. (2008). "Dig This: Richard Elliott Friedman" (Ñº), YouTube, University of California Television, Jan 10.

External links

â— Richard Elliott Friedman – Wikipedia.

θΔics

In animate thermodynamics, **Richard Langton Gregory** (1923-2010) was a British neuropsychologist noted for 1981 book *Mind in Science: a History of Explanations in Psychology and Physics*, in which, after going into a bit of the history of entropy, thermodynamics, Maxwell's demon, and other related topics, he reasons that: "somehow living organisms including plants [have] succeed[ed] in reducing their entropy." [1] A typical work-cited passage from Gregory's book is: [2]

> "Time's arrow given by entropy—the loss of organization, or loss of temperature differences—is statistical and it is subject to local small-scale reversals. Most strikingly: life is a systematic reversal of entropy, and intelligence creates structures and energy differences against the supposed 'death' through entropy of the physical universe."

Gregory seems to have been influenced by German physicist Hermann Helmholtz who he views as the founder of the science of perception. [3]

See also

â— Human entropy

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2. Dennett, Daniel C. (1996). *Darwin's Dangerous Idea: Evolution and the Meanings of Life* (pg. 69). Simon and Schuster.
3. Anon. (2008). "One on One with Richard Gregory", *The Psychologist*, Vol. 21, No 6., June, pg 569.

External links

â— Richard Gregory – curriculum vitae.
â— Richard Gregory – Wikipedia.

θΔics

In hmolscience, **Richard D. Hughes** (c.1955-) is an American mechanical engineer turned government and political scientist noted, in human thermodynamics education, noted for his 2008 course "Thermodynamic Interpretation of Politics" on political thermodynamics.

Overview

In 2008, Hughes, at California State University, Sacramento taught a course on political thermodynamics, entitled "Thermodynamic Interpretation of Politics", as part of his government and world politics classes. [1] Hughes bases his political thermodynamics on the social Prigoginean thermodynamics work of Greek-born Belgian physicist Grégoire Nicolis and Belgian chemist Ilya Prigogine, about the latter of which he un-assumedly declares "invented the mathematics to explain life". [2] In his class lecture overview handout "Modern Science, Twentieth Century Science, and Politics", Hughes outlines parts of his thermodynamics teaching philosophy where he states, for instance, that:

> "Living organism and their societies are heat engines open to their environment."

(add discussion)

Science-to-humanities | Table

Hughes, in his course, gives the following table, showing how he sees relativity, quantum mechanics, and thermodynamics to have relevance in the human philosophy and political sphere: [3]

	"Modern" Science	Relativity	Quantum Mechanics	Thermodynamics
Contributors	Copernicus, Galileo, Newton, Descartes, Locke.	Albert Einstein	Niels Bohr, Werner Heisenberg, Erwin Schrödinger, Paul Dirac, many others.	Carnot, J. Willard Gibbs,* Einstein, Ilya Prigogine# (See separate handout.)
Time	Fixed	Relative	Relative	Relative
Space	Fixed	Relative	Relative	Relative
Causality	Causal	Causal	Statistical	Statistical
Major Assumption	Universe is like a machine. One can extrapolate study of individual human behavior to draw conclusions about group behavior.	All of us have a unique perspective. The point is to seek a universe in which laws of nature are expressed in the same terms for everyone.	The experiment itself interferes with the results of the experiment. Thus the uncertainty principle.	Living organisms (and their societies), are heat engines open to their environment in at least two ways: they must import energy and excrete it in the form of waste.
Conclusion	Even humans can be studied as though they are but parts of a machine.	There are no privileged reference points. We must transcend our prejudices.	Everything is connected to everything else.	Preserving openness to the environment is required for life, along with *structural* innovation.
Political Implications (Assumptions)	The good can come, somehow, out of the free competition of men (sic) for the bounty of nature. The public good is a derivative of this competition in politics. This is the assumption of Liberalism, capital "L," or faith in markets.	The universe does not revolve around: men, women, whites, blacks, communists, capitalists, fundamentalist Islam or Christianity, etc. We should seek a political universe where the laws are the same for everyone.	You are connected to all men and women. You cannot escape these connections. "That man in the street is not your brother, he is you," Stephen Becker, *A Covenent with Death*.	The greatest incest is the rape of Mother Nature. We cannot transcend Her as the individualistic Lockean philosophy of today would have us. That is the lesson of global warming. Unless we transform in a radical way our use of energy, we shall perish.

In a footnote to his teaching abstract, Hughes notes that American engineer Willard Gibbs, primary founder of chemical thermodynamics, is "perhaps the greatest American scientist, ever." Among other notes, in the vein of famous thermodynamics founders and suicide, Hughes states that a reading of chapter eighteen of Nicolis and Prigogine's 1977 *Self-Organization in Non-Equilibrium Systems*, will help one get "through many a rough night avoiding the thoughts of suicide." [1]

Education

Hughes completed his B.S. in mechanical engineering at the Massachusetts Institute of Technology (MIT school of thermodynamics); his M.A. in political science at Colgate University; and his Ph.D. in government at Claremont Graduate University. Hughes is currently an emeritus professor of government at at California State University, Sacramento.

References

1. (a) Richard D. Hughes – California State University, Sacramento.
(b) A Thermodynamic View of Politics (PDF) – by Richard D. Hughes.
2. (a) Nicolis, Grégoire and Prigogine, Ilya. *Self-Organization in Non-Equilibrium Systems: From Dissipative Structures to Order Through Fluctuations*, (esp. ch. 18). Wiley.
(b) Nicolis, Grégoire and Prigogine, Ilya. (1989). *Exploring Complexity - an Introduction*, (esp. sect. "Self-Organization in Human Systems", pgs.

238-42). New York: Freeman and Co.
3. Hughes, Richard D. (2008). “Modern Science, Twentieth Century Science, and Politics” (pdf), CSUS.edu.

External links

â— Richard D. Hughes (faculty) – California State University, Sacramento.

θΔics

In hmolscience, **Richard Kilburg** (1946-), aka "Dick Kilburg", is an American leadership psychologist noted for []

Overview

In 2014, Kilburg, in his "Leadership and Organizational Behavior: a Thermodynamic Approach", co-authored with American chemical engineer Marc Donohue, the focal article of 12-author 10-article special edition of *Consulting Psychological Journal: Practice and Research*, focused on "The Physics of Leadership and Organizational Structure", or mathematical psychophysics, as they deem it, presented a study that details a model of leadership and organizational structures that parallels thermodynamics applied to states of matter; the following is the abstract: [1]

> "This study presents a detailed model of leadership and organizational structures that parallels well-known principles of thermodynamics as they are applied to states of matter. Four types of organizational structure are explored with an emphasis on hierarchical institutions in and with which consulting psychologists spend most of their time. The model describes three types of bonding forces based on parasympathetic and sympathetic nervous system arousal and cognitive attributions of respect that parallel those in atomic and molecular physical systems and demonstrates conceptually how variations in their presence and strength create different organizational structures. The application of these forces by leaders, followers, and other stakeholders to the creation and maintenance of human hierarchies is explored in depth. Issues and challenges that the model presents for consulting and organizational psychology are discussed. It is suggested that if the model can be validated by additional research efforts, classical psychophysics may be extended to new domains and that mathematical principles may be developed that can be broadly tested and applied to aspects of leadership and organizational behavior as they have been historically for various social, physical, and chemical systems."

(add discussion)

Kaiser

Robert Kaiser, in the primer article "Beyond Physics Envy? An Introduction to the Special Issue", refers to physics envy, and opens to a mention that British philosopher Gilbert Ryle (1900-1976), as Stokes 100 (#87), was an antidualism philosopher. [3]

Avolio

American business leadership scholar Bruce Avolio (Q), in the second commentary article "Examining Leadership and Organizational Behavior Across the Boundaries of Science", states that he examines the "thermodynamic lens" put forward by Kilburg and Donohue. [4]

Hogan

American psychologist Robert Hogan (Q), in the second commentary article "Reactions to the Thermodynamics of Leadership", gives the following abstract: [5]

> "In their interesting and provocative paper, Kilburg and Donahue (2014) analyze the process of group formation using thermodynamics as a guide. On the one hand, gases turn into liquids which turn into solids depending on the forces attracting the constituent molecules. On the other hand, the authors argue, a crowd at a shopping mall can turn into a lynch mob, which can turn into a disciplined army unit depending on the forces attracting the members. And, the authors further argue, the forces that attract the members and "cause" them to cohere come primarily from the leader. Thus, they are interested in how leaders create and maintain structure and they explain this process by an analogy based on the principles of molecular thermodynamics. Two features of the essay seem worth remembering. First, the problem itself is terribly

important and poorly understood. Second, as Kurt Lewin (1940) astutely noted, this kind of reasoning by analogy is crucial and indispensable."

(add discussion)

Hayes

American applied psychologist Theodore Hayes (Q) , in the third commentary article "Betwixt Atom and Adam", a title similar thematically, to note, to Steve Paulson's *Atoms & Eden: Conversations on Religion and Science* (2010), gives the following abstract:

> "Kilburg and Donohue's (2014) article in this issue is a welcome addition to the organizational psychology literature. It attempts to address an organizational "given," the structure of the organization itself, by borrowing insights from physics and chemistry about the forces that act on atoms to form molecules and what variations in form imply for molecular functioning. By understanding the thermodynamic energy arising from molecular forces and structure, the reader has a new appreciation and language, based in thermodynamics, for understanding organizational psychology and behavior. The authors have two goals. First, they seek to develop a set of organizational-structure models that can be tested mathematically in terms of their capacity to influence organizational performance. Second, Kilburg and Donohue claim that organizational models vary in their capacity to hold in check and maintain balance among three neuropsychic forces: the parasympathetic and sympathetic nervous systems and the tendency to offer respect by exhibiting deference to authority."

(add discussion)

Hazy

American business school professor James K. Hazy (Q), whose specialty is management, marketing, and decision making, in the fourth commentary article "Is this 'Thermodynamic Inquiry' Metaphor or More?", give the following abstract:

> "There is no reason to get out your old textbooks. A few minutes on Wikipedia will tell you that equilibrium is a driving concept in thermodynamics: "If two thermodynamic systems are each in thermal equilibrium with a third, then all three are in thermal equilibrium with each other" ("Laws of Thermodynamics," n.d.). Furthermore, one learns that since energy is conserved, the first law of thermodynamics says that the internal energy of a system must change as heat flows into or out of it. The second law tells us that the entropy (i.e., randomness or "disorder") of an isolated system (one where nothing, not even energy, flows in or out) never decreases and that all such systems tend spontaneously toward the state of maximum entropy or disorder. The third law requires that the entropy of a system approaches a constant value as temperature approaches absolute zero. The question posed in this commentary is whether Kilburg and Donohue (2014) use these and related ideas to offer an elaborate metaphor about leadership and organization behavior or perhaps have uncovered something more."

(add discussion)

Marion | Uhl-Bien

Americans education and leadership scholar Russ Marion (Q) and leadership professor Mary Uhl-Bien (Q), in the fifth commentary article "Beyond Emotion: Broader Lessons from the States of Matter", give the following abstract: [8]

> "The article by Kilburg and Donohue (2014) emanates from a very intriguing premise: that one can draw

from principles of molecular thermodynamics to develop a parallel science of the psychophysics of leadership and organizational structure. The authors use the four primary states of matter (solids, liquids, gases, and plasma) as a means for examining how bonding forces and phase behavior of atoms and molecules can extend theorizing about the emotional forces of human behavior and organizing. They also intrigue us with the idea that we can use these concepts to advance a mathematically formulated scientific model for social organizing behavior. These are ambitious goals, and the authors point us in interesting new ways of thinking about research in leadership and organizational behavior. In this commentary, we discuss thoughts triggered for us by the core assumptions used in this analysis, areas of future research that could emanate from this line of thinking, and our impressions about whether this point of view resolves any debates, confusion, or questions."

(add discussion)

Others

Three more commentary articles are available.

Education

Kilburg completed his PhD in clinical psychology in 1972 at the University of Pittsburgh. [2]

References

1. Kilburg, Richard R and Donohue, Marc D. (2014). "Leadership and Organization Behavior: a Thermodynamic Inquiry" (abs) (main), 66(4):261-87.
2. Richard Kilburg (about) – InstituteofCoaching.org.
3. Kaiser, Robert B. (2014). "Beyond Physics Envy? An Introduction to the Special Issue" (abs), *Consulting Psychology Journal: Practice and Research* (editor: Robert Kaiser), 66(4):259-60.
4. Avolio, Bruce J. (2014). "Examining Leadership and Organizational Behavior Across the Boundaries of Science" (abs) , *Consulting Psychology Journal: Practice and Research* (editor: Robert Kaiser), 66(4):288-92.
5. Hogan, Robert. (2014). "Reactions to the Thermodynamics of Leadership" (abs), *Consulting Psychology Journal: Practice and Research* (editor: Robert Kaiser), 66(4):293-95.
6. (a) Paulson, Steve. (2010). *Atoms & Eden: Conversations on Religion and Science*. Oxford University Press.
(b) Hayes, Theodore L. (2014). "Betwixt Atom and Adam", (abs), *Consulting Psychology Journal: Practice and Research* (editor: Robert Kaiser), 66(4):296-99.
7. Hazy, James K. (2014). "Is this 'Thermodynamic Inquiry' Metaphor or More?", (abs), *Consulting Psychology Journal: Practice and Research* (editor: Robert Kaiser), 66(4):300-05.
8. Marion, Russ and Bien-Uhl, Mary. (2014). "Beyond Emotion: Broader Lessons from the States of Matter", (abs), *Consulting Psychology Journal: Practice and Research* (editor: Robert Kaiser), 66(4):306-09.

Further reading

● Kaiser, Robert. (2014). "Special Issue: The Physics of Leadership and Organizational Structure" (main), *Consulting Psychology Journal: Practice and Research*, 66(4):259-323.

External links

● Kilburg, Richard R. (1946-) – WorldCat Identities.

θΔics

In existographies, **Richard Kirwan** (1733-1812) (CR:15) was an Irish chemist noted for his work on specific heats. Portuguese chemist Joao Magellan credits his 1780 table of specific heats to data supplied by Kirwan. [1] Kirwan did significant work in affinity chemistry. [2]

Education

Kirwan, born into wealth, growing up in the historic Cregg Castle, with its own vast library of science and chemistry books, was said to have an enormous affinity for books, and was constantly found reading, whether in his bedroom or up in a tree. While in France, at about the age of ten, one of his tutors discovered that he Kirwan spent a good deal of leisure time reading chemistry books, and so to encourage him to learn French, replaced them with chemistry books in French, after which Kirwan learned French. Kirwan spent ten years in London, from 1777 to 1787, during which time he established a reputation as a scientist. His 1787 *Essay on Phlogiston*, supposedly, is his best-known work.

Phlogiston

Kirwan was an adherent of phlogiston theory, as described in his 1787 *Essay on Phlogiston and the Constitution of Acids*, wherein he identified phlogiston with hydrogen; by 1791, however, he seems to have abandoned phlogiston theory in favor of Antoine Lavoisier's caloric theory.

See also

â— Milk and genius

References

1. Scott, E.L. (1981). "Richard Kirwan, J. H. de Magellan, and the Early History of Specific Heat" (abs). *Annals of Science*, 38(2): 141-53.
2. Kim, Mi Gyung. (2003). *Affinity, That Elusive Dream: A Genealogy of the Chemical Revolution* (Richard Kirwan, 22+ pgs). MIT Press.

External links

â— Richard Kirwan – Wikipedia.

θΔics

In animate thermodynamics, **Richard Lynn Kremer** (c.1960-) is an American science historian noted for his 1990 PhD dissertation *The Thermodynamics of Life and Experimental Physiology, 1770-1880*, in which he details the backdrop to the formation of the Helmholtz school of thermodynamical physiology, typified by the seeming triumph of energy based reductionism over vitalism, animal heat theories, etc., along the way discussing thinkers such as German chemist Karl Mohr. [1]

Kremer traces the first use of the term "bioenergetics" to 1911 and tentatively classifies E. von Pfluger and or Otto Warburg as the first "bioenergeticists", for their supposed efforts to locate the sources of free energy in organisms. [1]

Education

Kremer completed his BA at Goshen College and his MA and PhD at Harvard University.

References

1. Kremer, Richard L. (1990). *The Thermodynamics of Life and Experimental Physiology, 1770-1880* (free energy, 3+ pgs; Helmholtz, 58+ pgs; animal heat, 96+ pgs). Harvard Dissertations in the History of Science. Garland Publications.

External links

â— Richard Lynn Kremer (faculty) – Dartmouth University.

θΔics

In hmolscience, **Richard Lewontin** (1929-) is an American zoologist noted generally for his anti-reductionism arguments and social commentary, e.g. in his 1983 "The Corpse in the Elevator", he argues there are limits to the reductionist approach, i.e. Cartesian reductionism, and that we will never be able to explain some biological processes in mechanistic terms. (Q)

Religion | Faith

Lewontin, supposedly, defines himself as a Marxist (Q), which would lean him towards atheism.

In 1997, Lewontin, in his "Billions and Billions of Demons" (Q), a review of Carl Sagan's *The Demon-Haunted World: Science as a Candle in the Dark* — which he says is mostly devoted to chapters of "exhortations to the reader to cease whoring after false gods and to accept the scientific method as the unique pathway to a correct understanding of the natural world" — seems to give the impression of an curious agnostic, albeit leaning slightly to the left. He comments, after digressing on Newton's god as prime mover, and the Napoleon Laplace anecdote, and Sagan's circumspect suggestion that we should "even-handedly examine the god hypothesis", he comments: "I doubt that an all-seeing god would fall for Pascal's Wager, but the sensibilities of modern believers may indeed be spared by this Clintonesque moderation". Possibly Lewontin is a closet theist, which is common among anti-reductionists. More quotes from this review, to note, are cited (Q) by Creation.com.

Quotes | On

The following are quotes about Lewontin:

> "**Lewontin** visited an economics class a few years ago to talk to the students. In a kind of neo-Darwinian jockeying, he said that evolutionary changes are due to the Fisher-Haldane mechanisms: mutation, emigration, immigration, and the like. His elaborate cost-benefit mathematical treatment was devoid of chemistry and biology. I asked him why, when he himself was pointing to serious flaws related to the fundamental assumptions, did he teach such nonsense? His response was that there were two reasons: the first was 'P.E.' I asked. What is 'P.E.', he replied, P.E. is 'physics envy.' His second reason was even more insidious: if he didn't couch his studies in neo-Darwinian style, he wouldn't be able to obtain grant money that was set up to support this kind of work."
>
> — Lynn Margulis (1995), *The Third Culture: Beyond the Scientific Revolution* (Q)

Quotes | By

The following are representative quotes:

> "There is a story about a wonder-rabbi, who on his deathbed whispers to his chief assistant, "Life is like a bagel." The word spreads through the crowd waiting outside the rabbi's house, "Life is like a bagel; the rabbi says life is like a bagel," until finally, at the edge of the crowd, it reaches the town fool, who asks, "What does it mean: life is like a bagel?" The question spreads back through the crowd, "What does it mean, life is like a bagel?" until it reaches the bedside of the rabbi. "Rabbi," his assistant asks, "What does it mean, life is like a bagel?" "*Nu*," the rabbi says, weakly shrugging his shoulders, "so life is not like a bagel."
>
> — Richard Lewontin (1983), "The Corpse in the Elevator" [1]

> "Many biologists believe in some mysterious force or inner will contained in living stuff."

— Richard Lewontin (1983), “The Corpse in the Elevator” [1]

> “We take the side of science in spite of the patent absurdity of some of its constructs, in spite of its failure to fulfill many of its extravagant promises of health and life, in spite of the tolerance of the scientific community for unsubstantiated just-so stories, because we have a prior commitment, a commitment to materialism. It is not that the methods and institutions of science somehow compel us to accept a material explanation of the phenomenal world, but on the contrary, that we are forced by our *a priori* adherence to material causes to create an apparatus of investigation and a set of concepts that produce material explanations, no matter how mystifying to the uninitiated. Moreover, that materialism is absolute and we cannot allow a divine foot in the door.”

— Richard Lewontin (1997) [2]

References

1. (a) Lewontin, Richard C. (1983). “The Corpse in the Elevator” (Q), *New York Review of Books*, Jan 20, Jan.
(b) Foley, Michael. (1990). *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian Mechanics* (pg. 85). Routledge, 2014.
2. (a) Lewontin, Richard. (1997). “Billions and Billions of Demons”, *New York Review of Books* (pg. 31), Jan 9.
(b) Wynn, Charles M. and Wiggins, Arthur W. (2011). *And God Said, Let There Be Evolution!: Reconciling the Book of Genesis, the Quran, and the Theory of Evolution* (abs) (Amz) (pg. 160). All Things That Matter Press.

External links

- Richard Lewontin – Wikipedia.

θΔics

In thermodynamics, **Richard Mollier** (1863-1935) was a German theoretical physicist, part of the Dresden school of thermodynamics, notable for his experimental research in thermodynamics, particularly work evolving enthalpy-entropy diagrams, which have since come to be known as Mollier diagrams.

Mollier published treatises such as *The Entropy of Heat* (1895) and *New Graphs for Technical Thermodynamics* (1904).

English engineer Bryan Donkin's 1898 book *The Entropy Diagram*, co-written with Jules Boulvin, gives a bibliography of treatises on entropy, listing 20 works, including those of Willard Gibbs (1873), Hermann Helmholtz (1884), Gustav Zeuner (1890), Richard Mollier (1893), among others. [1]

Dresden school

German physicist Gustav Zeuner, founder of the Dresden school, was succeeded at Dresden, in 1897, by Mollier as professor of mechanical engineering.

Mollier diagrams

At the 1923 Los Angeles Thermodynamics Conference, it was decided that any thermodynamic diagram having enthalpy as one of its coordinates should thereafter be called a "Mollier Diagram". [17]

References

1. Boulvin, Jules and Donkin, Bryan. (1898). *The Entropy Diagram and its Application* (Translator's preface, pgs. iii-vi). London: E. & F.N. Spon., Ltd.
2. Mollier Charts – ChemicaLogic.com.

Further reading

â— Keenan, Joseph H. and Keyes, Frederick G. (1930). *Steam Tables and Mollier Diagrams*. American Society of Mechanical Engineers.

External links

â— Richard Mollier – Wikipedia.

θΔics

In existographies, **Richard Owen** (1804-1892) (EvT:14|21+) (CR:9) was an English anatomist noted, in evolution thermodynamics, for his 1840s evolution theory that life had an "organizing energy", which he adopted from Johannes Muller's vitalism theories, albeit one divinely designed, that controlled its development and evolution, operating in such a way that each species, e.g. horse, humans, spiders, belonged to an "immutable archetype", such that evolution within an archetype was possible, but not between archetypes. [1] This accounted for fossil evidence of horse-like creatures evolving over millions of years from dog-sized forest animals. Owen attempted to prove that species crossover could not occur by citing evidence, later shown to be false, that the hippocampus structures of the human and gorilla were somehow inseparably different.

Organized energy

In 1836, Charles Darwin returned from his voyage on the Beagle, with a considerable collection of specimens, and was introduced to Owen by English geologist Charles Lyell. Owen then formulated the view that extinct giant species were evolved rodents and sloths, related to current species in the same locality. Owen then talked about his theories to German physiologist Johannes Muller, during which time Muller explained his "vitalism principle" to Owen, that living matter had an 'organizing energy', a life-force that directed the growth of tissues and determined the lifespan of the individual and of the species.

Nature of the Limbs

In 1841, during Owen's visits with Darwin, his hints of disbelief in "transmutation" theory of evolution, kept Darwin quite about his hypothesis. Owen eventually published his theory in his 1849 book *On the Nature of the Limbs*, at the end of which he suggested that humans ultimately evolved from fish as a result of natural laws; a view that resulted in him getting criticized in the Manchester Spectator for denying species like humans were created by God. [2]

Religion

Owen eventually adopted Muller's vitalism view that life has a special "organizing energy", but added in that it must be divinely designed or created, so as to control or guide evolution and the development of life.

See also

â— Thomas Huxley

References

1. Humes, Edwards. (2007). *Monkey Girl: Evolution, Education, Religion, and the Battle for America's Soul* (pg. 115). Harper Perennial.
2. (a) Owen, Richard. (1849). *On the Nature of Limbs* (pg. 86). University of Chicago Press.
(b) Rupke, Nicolaas. (1994). *Richard Owen: Victorian Naturalist* (pg. 232). Yale University Press.

External links

â— Richard Owen – Wikipedia.

θΔics

In hmolscinece, **Richard D. Piccard** (c.1947-) is an American physicist noted, in human thermodynamics education, for his course on entropy and human activity taught at Ohio University during the years 1998 to 2006, albeit one based on the skewed views of American economist Jeremy Rifkin and his *Entropy: Into the Greenhouse World* (1989). [1]

Entropy and Human Activity

Intermittently, during the years 1998-2006, Piccard has been teaching a course numbered Tier III 415A entitled Entropy and Human Activity, through the physics department at Ohio University. The following is given as the course syllabus: [3]

> "Both world population and per capita consumption are increasing exponentially. Burning fossil fuels creates toxic byproducts and also 'greenhouse gases' that accelerate global warming. Extractive industries (e.g., agriculture and mining) reduce the natural resources available to future generations. Matter and energy are conserved, but physical processes transform both into forms less readily useful (thereby "increasing entropy").
>
> We apply this concept of entropy to human activity, critically examining works by advocates of solar and nuclear power, from the viewpoints of, and using the patterns of inquiry of, several disciplines (e.g., history, theology, economics, physics, politics, engineering, biology, chemistry, ethic [entropy ethics], and sociology). Using Rifkin's 1989 book *Entropy: Into the Greenhouse World*, which sets forth the thesis that this concept of entropy has a much broader applicability, in such fields as social science, politics, health, etc., the course explores whether this broadening of application makes sense. The immediate goal for students is to try to get some understanding of what entropy means when the term is used in its home territory, physical science and engineering. On this basis, the problem immediately arises when applying entropy to society is that the basic definition of entropy is mathematical. As such, the course focuses on the philosophical aspects (i.e. philosophical thermodynamics) rather than the practical aspects of entropy; and avoids mathematics, for the most part."

Required reading for the course consists predominately of American economist Jeremy Rifkin's 1989 *Entropy: Into the Greenhouse World*, which advocates the 1971 material entropy hypothesis of Romanian mathematician Nicholas Georgescu-Roegen, in conjunction with a 20-page manuscript "Notes on Entropy and Human Activity" written by Piccard and his associate physicist Darrell Huwe, along with two-thirds of the content of American physicist Bernard Cohen's 1990 book *The Nuclear Energy Option*. [4]

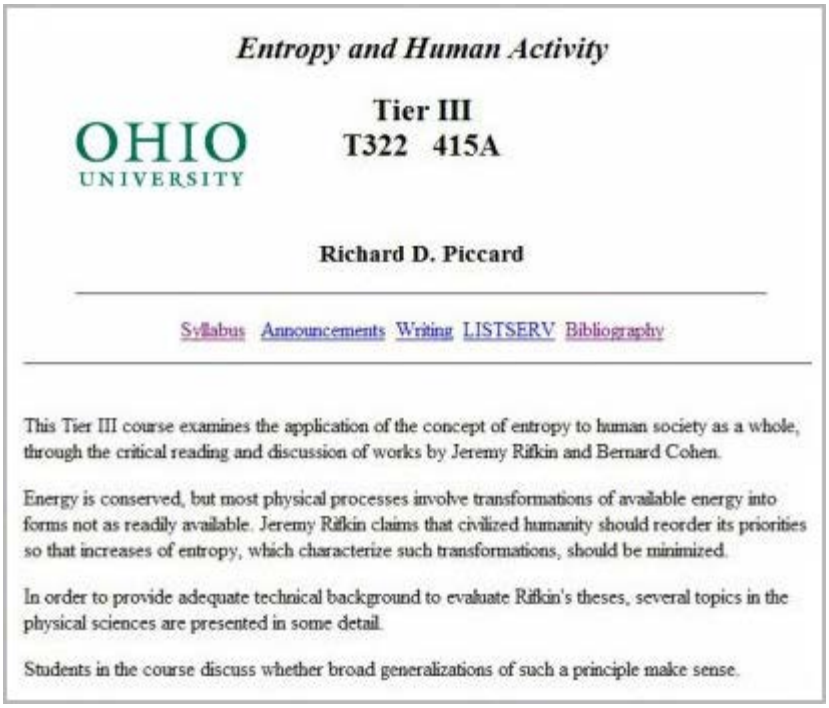

Entropy and Human Activity

OHIO UNIVERSITY

Tier III
T322 415A

Richard D. Piccard

Syllabus Announcements Writing LISTSERV Bibliography

This Tier III course examines the application of the concept of entropy to human society as a whole, through the critical reading and discussion of works by Jeremy Rifkin and Bernard Cohen.

Energy is conserved, but most physical processes involve transformations of available energy into forms not as readily available. Jeremy Rifkin claims that civilized humanity should reorder its priorities so that increases of entropy, which characterize such transformations, should be minimized.

In order to provide adequate technical background to evaluate Rifkin's theses, several topics in the physical sciences are presented in some detail.

Students in the course discuss whether broad generalizations of such a principle make sense.

Screenshot of the overview homepage for the course **"Entropy and Human Activity"** taught at Ohio University.

Difficulties on course

The general difficultly with the course, as taught, which attempts to argue that via the second law humanity is squandering natural fuel resources and that a switch to nuclear energy is advisable, is that its class notes and required reading texts were not written by individuals fundamentally trained in thermodynamics. Specifically, neither Jeremy Rifkin nor Nicholas Georgescu-Roegen have any education in thermodynamics, and most of the presentation on entropy and the second law is incorrect. The course,

therefore, while giving a simple overall introduction to some of the related topics in entropy applied to human activity, e.g. arrow of time, is not based on anything fundamentally correct, but instead based on, dominantly, the fallacious material entropy hypothesis.

This mis-direction of teaching is not a fault of the teacher, but rather due to the fact that no uniform standard textbook on human thermodynamics yet exists, constructed from the Clausius (1865), Gibbs (1876), Lewis (1923) foundation, on the axiom that a system of active humans consists of a system of reactive human molecules attached to substrate driven via Carnot cycles of solar heat inputs.

Education

Piccard completed his BS (1970) in physics from Caltech, an MS (1972) in education from the University of Pennsylvania, and a MA (1976) and PhD (1979) in physics from Princeton. [2]

References

1. Entropy and Human Activity (Bibliography) – Oak.Cats.OhioU.edu.
2. Richard Piccard – Biographical Information.
3. Syllabus: Entropy and Human Activity – Oak.Cats.OhioU.edu.
4. (a) Rifkin, Jeremy. (1989). *Entropy: Into the Greenhouse World* (revised edition). New York: Bantam.
(b) Huwe, Darrell O. and Piccard, Richard D. (2004). "Notes on Entropy and Human Activity", 20-page manuscript.
(c) Cohen, Bernard L. (1990). *The Nuclear Energy Option: An Alternative for the 90s.* Plenum Press.

External links

â— Richard Piccard (faculty) – Department of Physics & Astronomy, Ohio University.

θΔics

In Information thermodynamics, **Richard C. Raymond** (c.1935-) is an American physicist noted for his 1950 article "Communication, Entropy, and Life", wherein building on a Shannon bandwagon platform of the work of Leon Brillouin, Norbert Wiener, Claude Shannon, and Ludwig Bertalanffy, on a mixture of information theory, cybernetics, and thermodynamics, he argues the following:

> "The entropy of [an] organism may be taken as the equilibrium entropy of the constituents of the organism less the information entropy necessary to the synthesis of the organism from equilibrium components of known entropy."

In his 1951 "The Well-Informed Heat Engine", Raymond, supposedly, gives some kind of detailed argument that information means negative entropy, along the lines of Leon Brillouin's 1949 argument. [2]

Education

In 1951, Raymond was associated with The Pennsylvania State College, State College, Pennsylvania.

References

1. (a) Raymond, Richard C. (1950). "Communication, Entropy, and Life" (abs), *Am Sci.* 38: 273-78; In: *Modern Systems Research for the Behavioral Scientist* (ch. 19, pgs. 157-), Aldine Pub. Co., 1969.
(b) Georgescu-Roegen, Nicholas. (1971). *The Entropy Law and the Economic Process* (pg. 401). Cambridge, Massachusetts: Harvard University Press.
2. (a) Raymond, Richard C. (1951). "The Well-Informed Heat Engine" (abs), *Am. J. Phys.* 19: 109-12.
(b) Gregersen, Niels H. (2003). *From Complexity to Life: On the Emergence of Life and Meaning* (pg. 142). Oxford University Press.

θΔics

In existographies, **Richard Robinson** (1902-1996) (FA:175) was an English secular philosopher,

Overview

In 1964, Robinson published his *An Atheist Values*, cited by George Smith (1974), based on a series of lectures he had given, wherein he attempts to ferret out secular model of values, thematic to Plato and Aristotle. [1]

References

1. Robinson, Richard. (1964). *An Atheist Values* (txt). Publisher.

External links

- Richard Robinson (philosopher) – Wikipedia.

θΔics

In existographies, **Richard Rudd** (1967-) (CR:2) is an English new age spiritual teacher noted, in religious thermodynamics, for his 2007 ideas about how thermodynamics relates to things such as: good will, right action, money, etc.

Overview

In 2007, Rudd, in his "Human Thermodynamics: the 'Great Niggle' and How to Get Rich Slowly", speculated on how the first two laws of thermodynamics, relate to energy flow, evolution, purpose, and the hidden energy of the universe; the following is an example excerpt:

> "If you view life from the frequency of the second law of thermodynamics, all you will see is entropy and disorder. However, if you view life from a higher frequency or dimension, you will see that disorder is in fact a part of a higher order."

Rudd proposes what he calls a 'niggle-free' version of the third law of thermodynamics, related to consciousness. The short article is riddled with metaphysical abstractions, but it is an interesting read, speculating on things such as how "selflessness stirs energy flow", how "the energy of goodwill or right action" must go somewhere, or how "money is the physical equivalent to energy", etc.

External links

1. (a) Rudd, Richard. (2007). "Human Thermodynamics, the 'Great Niggle' and How to Get Rich Slowly." GeneKeys.net.
(b) Writings by Richard Rudd – GeneKeys.net.

External links

â— About (Richard Rudd) – GeneKeys.net.

θΔics

In hmolscience, **Richard Schowen** (1934-) is an American organic chemist noted for his 1984 University of Kansas Humanities Lecture Series address “Elective Affinities: Science, Certainty and Freedom in Goethe, Henry Adams and Thomas Pynchon”, on the physical humanities work of Johann Goethe, Henry Adams, and Thomas Pynchon. The following is a trundcation Schowen's concluding remarks from his humanities lecture: [1]

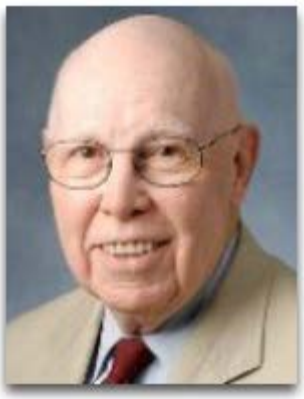

> “In this examination of texts of Goethe from 1809, of Henry Adams from 1909 and of Thomas Pynchon from 1973, we have, I thing never lost the red thread. The theme of affinity, certainty and binding, of election, freedom and flux, and of the hidden variable that lies beyond the veil, rendering certainty and freedom equally illusory, pervades the texts.
>
> Variations on the theme have come with times. The growth of thermodynamics and precise rendering of affinity and flux in the language of enthalpy and entropy gave Henry Adams’ phase rule of history a form that would have been incomprehensible to Goethe but which, because of further change, seems quint and eccentric to us today.
>
> But always there is the red thread. It shows the power of this metaphor of affinity and election, uncertainty and flux and of the conflicting promise of science, of a reliable mapmaker with continual revision underway, that has run the strands of our culture for two centuries.”

Discussion

As seen here, and more fully in the lecture talk, Schowen makes a rare and discerning connection between Gibbs and Goethe, i.e. between affinity (Goethe's day) and enthalpy and entropy (Gibbs' day), the proof of which was given famously in 1882 by German physicist Hermann Helmholtz's "On the Thermodynamics of Chemical Processes", but one very few modern physical scientists are aware of, a fact that becomes acute with respect to Goethe's human affinities theory in respect to modern chemical thermodynamic interpretation.

Schowen's discussion of freedom and certainty in the language of enthalpy and entropy, to note, is near verbatim in content to American chemical thermodynamicist Frederick Rossini's 1971 discussions of freedom and security in the language of physical chemistry in his "Chemical Thermodynamics in the Real World" Priestly Medal Address; the difference between the two was that Rossini seems to have unaware of Goethe.

Other

In 1986, Schowen gave special events series talk entitled “The Elective Affinities of Thomas Pynchon: Does Science Bring Certainty?”, at Hendrix College, that was a truncated form of his previous talk that treated only Pynchon, not Goethe or Henry Adams. [2]

Education

Schowen completed undergraduate work in biology and chemistry from 1951 to 1953 at Morris Harvey College, WV, his BS in chemistry at University of California, Berkeley in 1958, and his PhD in organic chemistry at MIT in 1962. Presently, Schowen is professor emeritus of chemistry, molecular biosciences, and pharmaceutical chemistry at the University of Kansas. [3]

References

1. Schowen, Richard L. (1984). “Elective Affinities: Science, Certainty and Freedom in Goethe, Henry Adams and Thomas Pynchon”, Humanities Lecture Series, University of Kansas.
2. (a) Schowen, Richard L. (1986). “The Elective Affinities of Thomas Pynchon: Does Science Bring Certainty?”, special Events Series, Hendrix College, Ar.
(b) Email communication from Schowen to Libb Thims (27 Aug 2013).
3. Richard Schowen (Curriculum Vitae) – Chem.ku.edu.

External links

â— Richard L. Schowen (faculty) – University of Kansas.

θΔics

In hmolscience, **Richard C. Sha** (c.1963-) is an American romanticism science literature scholar noted for his 2010 to present research, publication, and teaching efforts to ferret out what it means to think of emotions, a term deriving from the Latin "to move", in terms of physical force and chemical affinity, in semi-modern terms and as the so-called romantic scientists (e.g. Goethe) saw things in the early 19th century.

Emotion | Chemistry and Physics

In 2011, Sha gave a talk on "The Chemistry and Physics of Romantic Emotion", the abstract of which is as follows: [2]

> "This essay considers what it means to think of the emotions in terms of physical force and chemical affinity and the role that romantic science played in making the emotions manageable. Emotion of course is etymologically connected to motion, and is derived from the Latin to move and to move out. I turn to physics and chemistry, the two disciplines that had the most to say about movement, to challenge the popular view that emotions embody subjectivity, and consequently to resist the narrow framing of emotions as a site of psychological intensity.
>
> I also highlight the sustained use of "force" within current and romantic period affect and emotion theory; if we are still invoking a term from physics and chemistry to think about the emotions, then these disciplines must be doing more than freezing being. Indeed, because Kant thought of particles as being constituted by forces (Ault 7), force carries with it a curious materiality that makes the emotions seemingly graspable yet dynamic and hardly simply mechanistic. Even within physics, force begins as an analogy to human willpower (Jammer 7) [see: will to power]. Force furthermore grants emotion a material impact upon the world. Far from severing emotions from a social world as critics ranging from Merleau-Ponty to Daniel Gross contend, chemistry and physics provide ways of thinking about sociality itself insofar as these disciplines attempt to understand in human terms why entities seek association to begin with, and develop concepts that underwrite the language of emotion. The fact that scientists like Humphry Davy and Michael Faraday could reconcile their physics with spirituality underscores the nuanced but neglected possibilities within these sciences.
>
> Force endowed emotion with a vital mechanicity and even spirituality that belies both the traditional romantic declared disdain of mechanism, and the cordoning off of physics and chemistry from the thinking about the emotions. Such mechanicity proffered the idea of an integration of person and environment because force permeates all matter. Percy Shelley in *Prometheus Unbound* thought of love, for instance, as a physical force in the universe (that "powerful attraction towards all…beyond ourselves" ("On Love," 503)), and in his Lyrical Drama he compares it to gravity, planetary attraction (Venus), rain, light, electricity, and magnetism. In his "Speculations on Metaphysics," he essentializes the differences between "thoughts, or ideas, or notions" in terms of 'Force' (5:59), and thus the term bridges mind and body, thought and emotion. Shelley's claim is that since we are surrounded by these forces, the absence of love within any particular society (Jupiter's, and even initially Prometheus's own, for example) is a perversion of nature.
>
> The key is to wholeheartedly embrace and direct them. Mechanics also offered intelligibility, a way of understanding the body as machine and the universe in terms of laws, and mechanics even within the romantic period was crucial to understanding the physiology of the heart, circulation, and nervous and glandular systems. When linked to emotion such mechanical motion skirted the problem of intentionality. Was emotion a physiological movement (understood in part through mechanics as a reaction) or an act of will, as Coleridge insisted love was, or something in between? He comments that "love, however sudden, as when we fall in love at first sight…, is yet an act of will" (Omniana 339)."

(add discussion)

Spirituality

In 2013, Sha, when queried, by Libb Thims, about his prevalent usage of the term "spirit" and spirituality in his romantic science historical work and ideas about emotion as a function of physical force and chemical affinity, discussed in the context of physics and chemistry, in regards to possible hidden ontic opening agenda, had the following to say: [5]

> "Funny you should object to the spirit. I am no spiritualist. But I want to think about how spirit captures the surplus left over from materialist reductionism. So I aim to think about the relation between matter and spirit, especially in romantic science where final causes and God were hardly off the table."

(add discussion)

Education

Sha studied abroad at King's College, London, from 1983 to 1984, completed his BA in English in 1985 at the University of Pennsylvania, and his MA (1988) and PhD (1992), the latter with a dissertation on "The Visual and Verbal Sketch of British Romanticism", both at the University of Texas, at Austin. Currently, Sha is literature professor at the American University, Washington, D.C.

In 2014, Sha was working on a book about how scientists understood the imagination during the romantic period, with chapters covering physiology, neurology, chemistry and physics, midwifery, and psychology. Work on this book has been supported by a year-long NEH Fellowship in 2012-13 and portions of the manuscript have appeared in *Configurations and European Romantic Review*.

In spring 2012 and fall 2013, with physicist Nathan Harshman, Sha taught an undergraduate two cultures stylized seminar entitled "Bridging the Two Cultures: Science and Literature". Sha plans to teach a course on "Thinking Emotion: From Physiology to Ethics" with Bryan Fantie (neuro-psychologist) and April Shelford (enlightenment historian) in 2014. [3]

Quotes

The following are related quotes:

> "It seems that we are still harnessing the elasticity of force either to grant ourselves agency at the expense of a mechanistic materiality, or to emphasize the vitality of matter in hopes that the mechanical automaticity of our emotions will not disallow the possibility of choice or will."
>
> — Richard Sha (2011). "The Chemistry and Physics of Romantic Emotion" [1]

> "Emotions can be thought of in terms of physical force and chemical affinity. Romantic science played a role in making emotions manageable. Emotion of course is etymologically connected to motion, and is derived from the Latin 'to move' and 'to move out'."
>
> — Richard Sha (2014). "The Motion Behind Romantic Emotion: Toward a Chemistry and Physics of Feeling" [4]

References

1. (a) Sha, Richard C. (2013). *The Motion Behind Emotion Romantic Emotion: Toward a Chemistry and Physics of Feeling*. Manuscript. Cambridge University Press.
(b) Goldsmith, Steven. (2013). *Blake's Agitation: Criticism and the Emotions* (pg. #). John Hopkins University Press.
2. Sha, Richard C. (2011). "The Chemistry and Physics of Romantic Emotion" (abs), Given at the "Mastering

Emotions" Conference at Queen Mary, University of London in June.
3. Sha, Richard C. (2014). “Romantic Science and Romantic Imagination”, ASU English, Apr 9, Vimeo.com.
4. Faflak, Joel and Sha, Richard C. (2014). *Romanticism and the Emotions* (abs) (§1: The Motion Behind Romantic Emotion: Towards a Chemistry and Physics of Feeling, pgs. 19-47). Cambridge University Press.
5. Sha, Richard. (2013). “Email communication with Libb Thims”, Dec 2.

External links

â— Richard Sha (faculty) – American University.
â— Sha, Richard C. – WorldCat Identities.

θΔics

In hmolscience, **Richard Smalley** (1943-2005) was an American chemist and physicist, a closet creationist by belief, a co-discoverer of C60, i.e. Buckminsterfullerene (1985), noted for his 2001 views on relationship love and nanobot reaction free energies of interaction.

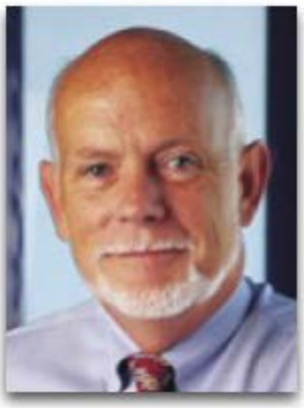

Overview

In 2001, Smalley, in his "Of Chemistry, Love and Nanobots", a publication amid his public nanorobot debate with Eric Drexler, stated some interesting views on love and chemistry; the main sections of which are as follows:

> "WHEN A BOY AND A GIRL fall in love, it is often said that the chemistry between them is good. This common use of the word "chemistry" in human relations comes close to the subtlety of what actually happens in the more mundane coupling of molecules. In a chemical reaction between two "consenting" molecules, bonds form between some of the atoms in what is usually a complex dance involving motion in multiple dimensions. Not just any two molecules will react. They have to be right for each other. And if the chemistry is really, really good, the molecules that do react will all produce the exact product desired."
>
> — Richard Smalley (2001), "Of Chemistry, Love and Nanobots" (pg. 76)

> "In an ordinary chemical reaction five to 15 atoms near the reaction site engage in an intricate three-dimensional waltz that is carried out in a cramped region of space measuring no more than a nanometer on each side."
>
> — Richard Smalley (2001), "Of Chemistry, Love and Nanobots" (pg. 76)

These are interesting statement and views. A few paragraphs later, however, we see his religious belief internal conflicts bubble to the surface:

> "If the nanobot could really build anything, it could certainly build another copy of itself. It could therefore self-replicate, much as biological cells do."
>
> — Richard Smalley (2001), "Of Chemistry, Love and Nanobots" (pg. 76)

The prefixes 'bio-' (religio-mythology) and 'self-' (perpetual motion) are recursive trick to pacify his inherent confusions. Life, in short, does not exist. Smalley, however, with his Christian beliefs, wants to scientifically argue that it does exist. This confusion carries forward in the following points of mis-logic:

> "Self-replicating nanobots would be the equivalent of a new parasitic life-form, and there might be no way to keep them from expanding indefinitely until everything on earth became an undifferentiated mass of gray goo."
>
> — Richard Smalley (2001), "Of Chemistry, Love and Nanobots" (pg. 76)

Something that "expands indefinitely", i.e. nanobot gray goo, violates the laws of thermodynamics, and is therefore impossible; Smalley's religious convictions, however, blinds him form this fact. He continues:

> "Perhaps they would really become 'alive' by any definition of that term. Then, in the memorable words of

> Bill Joy, the chief scientist at Sun Microsystems and someone who has worried in print about the societal implications of proliferating nanobots, the future simply would not need us."
>
> — Richard Smalley (2001), "Of Chemistry, Love and Nanobots" (pg. 77)

Smalley here vents the illogic of his religious belief that the future "needs" humans, which he believes are "alive". The following is cogent:

> "Atoms are tiny and move in a defined and circumscribed way—a chemist would say that they move so as to minimize the free energy of their local surroundings."
> — Richard Smalley (2001), "Of Chemistry, Love and Nanobots" (pg. 77)
>
> "The electronic "glue" that sticks them to one another is not local to each bond but rather is sensitive to the exact position and identity of all the atoms in the near vicinity."
>
> — Richard Smalley (2001), "Of Chemistry, Love and Nanobots" (pg. 77)

The following is his the chemistry of love is "like" the chemistry of nano-reactions statement

> "Chemistry is subtle indeed. You don't make a girl and a boy fall in love by pushing them together (although this is often a step in the right direction). Like the dance of love, chemistry is a waltz with its own step-slide-step in three-quarter time. Wishing that a waltz were a merengue—or that we could set down each atom in just the right place—doesn't make it so."
>
> — Richard Smalley (2001), "Of Chemistry, Love and Nanobots" (pg. 77)

(add discussion)

Religion

Smalley seems to have been a closet Christian scientist, superficially critical of religion while an active academic, but teetering off into creationism in his last years.

In 2004, Smalley, in a debate at Tuskegee University on evolution and creationism, stated that the burden of proof was on those who don't believe Genesis was right and that the Creator is still involved. [3]

In 2005, Smalley, stated that the publication of *Who Was Adam?* (2005), by Reasons To Believe (Q) scholars Fazale Rana and Hugh Ross, convinced him that evolution was not possible: [3]

> "After reading *Origins of Life* with my background in chemistry and physics, it is clear evolution could not have occurred. The new book *Who Was Adam*, is the silver bullet that puts the evolutionary model to death."

In May 2005, Smalley in his last few months of existence, prior to dereaction (death) from Leukemia (Oct 28), stated the following: [2]

> "Recently I have gone back to church regularly with a new focus to understand as best I can what it is that makes Christianity so vital and powerful in the lives of billions of people today, even though almost 2000

> years have passed since the death and resurrection of Christ. Although I suspect I will never fully understand, I now think the answer is very simple: it's true. God did create the universe about 13.7 billion years ago, and of necessity has involved himself with his creation ever since. The purpose of this universe is something that only god knows for sure, but it is increasingly clear to modern science that the universe was exquisitely fine-tuned to enable human life. We are somehow critically involved in his purpose. Our job is to sense that purpose as best we can, love one another, and help him get that job done."

Here Smalley indicates his belief in the fine-tuning argument, that he doesn't know what purpose is, that we must "love one another", that Jesus Christ was a real person, and not mythology, that he believes the big bang was god made, and that he believes in resurrection, and peculiarly that god is an evolving entity.

References

1. Smalley, Richard E. (2001). "Of Chemistry, Love and Nanobots" (pdf), *Scientific American*, Sep.
2. Smalley, Richard E. (2005). "Letter to Hope College" (Q), per distinguished alumni award, May.
3. Helguero, Francis. (2005). "Creation Scientists in Three-Way Debate with Intelligent Design, Evolution" (Q), *Christian Post*, Dec 22.

External links

- Richard Smalley – Wikipedia.
- Drexler-Smalley debate on molecular nanotechnology – Wikipedia.

θΔics

In thermodynamics, **Richard Tolman** (1881-1948) was an American chemical engineer and theoretical cosmologist, of the MIT school of thermodynamics, noted for his 1934 *Relativity, Thermodynamics, and Cosmology*, with curious chapters on the thermodynamics of stationary systems, thermodynamics of moving systems, and relativistic thermodynamics. [1]

In his theories, Tolman supposedly introduces the theory that as the entropy of the universe rises, so do the universe cycle sizes and lengths tend to grow. Tolman's cosmological cycles theories are employed by Paul Davies. [2]

Tolman was one of the original members of the Technocracy group.

References

1. Tolman, Richard C. (1934). *Relativity, Thermodynamics, and Cosmology*. Oxford: Clarendon Press.
2. Davies, Paul. (1992). *The Mind of God: the Search for Ultimate Meaning* (entropy, 5+ pgs). Simon & Schuster.

External links

â— Richard Tolman – Wikipedia.

θΔics

In existographies, **Richard Towneley** (1629-1707) (CR:3) was an English scientist noted for []

Overview

In 1653, Towneley, with English physician Henry Power, formulated the gas law relation of pressure varying inversely with volume, a law that would famously become known as Boyle's law.

Education

Details of Towneley's education remain obscure. Towneley may have had some university education. More likely than not, Towneley seems to have been self-educated, being that income from the family estate afforded Towneley the opportunity to devote himself to the study of mathematics, natural philosophy, and experimentation.

Quotes | On

The following are quotes on Towneley:

> "The association of physical science with mountains goes back, as far as we need to be concerned, to the seventeenth century; to Perier's ascent of the Puy de Dome, in order to demonstrate that the height of the barometer fell as the altitude increased, and **Richard Towneley**'s ascent of Pendle Hill when he was discovering his 'hypothesis', still wrongly called 'Boyle's law'."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 91) [1]

> "**Towneley** was the person who first suggested Boyle's law."
>
> — Stephen Brush (2003), *Kinetic Theory of Gases* (pg. 3) [2]

References

1. Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 91). Cornell University Press.
2. Brush, Stephen. (2003). *Kinetic Theory of Gases: an Anthology of Classic Papers with Historical Commentary, Volume One* (editor: Nancy Hall) (pg. 3). Imperial College Press.

External links

â— Richard Towneley – Wikipedia.

θΔics

In existographies, **Richard Trevithick** (1771-1833) (IQ:165|#482) (EP:29) (CR:5) was a British engineer, mining engineer, and inventor, noted for []

Influences

A scientific advisor to Trevithick was Davies Gilbert. [2]

Overview

In c.1801, Trevithick built some type of steam engine locomotive prototype, such as shown below:

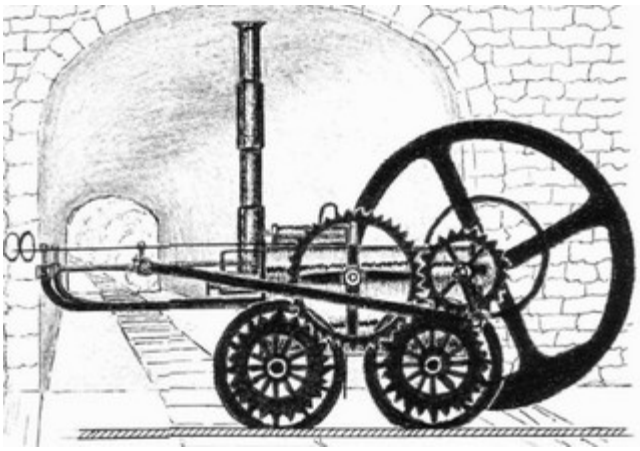

In Feb 1804, Trevithick made a trial run with a steam locomotive on the rails of a Welsh coal road, supposedly hauling 10 tons of iron, 70 men, in 5 trailing cars, for 9.5 miles, at 5 mph, aside for stopping to remove obstacles from the track; this is said to be the first time a steam locomotive ran on rails. [1]

In 1808, Trevithick demoed a railway exhibition in Euston Square, London, wherein he had paid visitors come into his fenced in arena to see his train go on rails in a circle, as shown below: [1]

(add)

References

1. Kirby, Richard. (1956). *Engineering in History* (co-authors: Sidney Withington, Arthur Darling, Frederick Kilgour) (pgs. 273-75). Courier, 1990.
2. Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 83). Cornell University Press.

External links

â— Richard Trevithick – Wikipedia.

θΔics

In hmolscience, **Richard Wagner** (1813-1883) (IQ:175|#151) was a German composer, philosopher, and polemicist, a Ranker greatest mind (#77|652) (Q), a Cattell 1000 (#337), a semi-ranked "universal genius" (T.K. Seung, 2006), noted for having some type of Schopenhauer-translated influence on Friedrich Nietzsche.

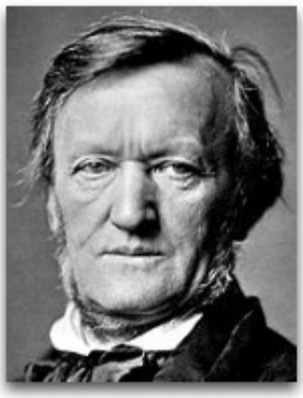

Schopenhauer | Feuerbach

In 1853, Wagner, while writing the music for *The Valkyrie*, the second part of the *Ring* cycle, he discovered Arthur Schopenhauer and was so mesmerized by *The World as Will and Representation* that he read if from cover to cover in spite of his work on *The Valkyrie* and then read it three more times within a year. Goethe-Nietzsche scholar T.K. Seung comments on this: [1]

> "Schopenhauer's philosophy drastically changed his view of life and music by destroying his Feuerbachian optimism and his revolutionary fire. He came to believe that social injustice and human suffering could never be eliminated by any political movement. He accepted Schopenhauer's view that the whole world was a tragic play of the blind will. The injustice in Wonton's world in *The Ring* is not an unfortunate mistake to be rectified, but reveals the inevitable tragic dimension of human existence. He changed from a Feuerbachian optimist and idealist to a Schopenhauerian pessimist or realist."

(add discussion)

Nietzsche

Wagner, supposedly, had a strong influence on Nietzsche; the following attests to this:

> "In the first period (1865-1876), Nietzsche's inner life, and a good deal of his outer life, was dominated by Schopenhauer and **Wagner**."
>
> — Reginald Hollingdale (1973)

References

1. (a) Seung, T.K. (2006). *Goethe, Nietzsche, and Wagner: Their Spinozan Epics of Love and Power* (universal genius, pg. 280; Schopenhauer quote, pgs. 298-99). Lexington Books.
(b) T.K. Seung – Wikipedia.

External links

- Richard Wagner – Wikipedia.

θΔics

In thermodynamics, **Richard A. Weiss** (c.1933-) is/was an American engineer noted for his two-volume 1976 *Relativistic Thermodynamics*, one of the first books on relativistic thermodynamics, and his 1989 book *Gauge Theory of Thermodynamics*. [1]

References

1. (a) Weiss, Richard A. (1976). *Relativistic Thermodynamics, Volume 1*. Exposition Press.
(b) Weiss, Richard A. (1976). *Relativistic Thermodynamics, Volume 2*. Exposition Press.
(c) Weiss, Richard A. (1989). *Gauge Theory of Thermodynamics*. W & K Publications.

Further reading

â— Weiss, Richard. A. (1992). "Gravity and Thermodynamics" (abs), Defense Technical Information Center.

θΔics

In existographies, **Richelieu** (1585-1642) (IQ:165|#463) (Cattell 1000:139), aka "Cardinal Richelieu", was a French clergyman, nobleman, statesman, who from 1625 to 1643 was the de facto governor of France, during which time he embedded the world's first operational secular scheme of government.

Quotes | On

The following are quotes on Richelieu:

> "During the last eighteen years of the reign of Louis XIII [1625-1643], France was entirely governed by **Richelieu**, one of that extremely small class of statesmen to whom it is given to impress their own character on the destiny of their country. This great ruler has, in his knowledge of the political art, probably never been surpassed, except by that prodigy of genius who, in our time, troubled the fortunes of Europe. But, in one important point of view, Richelieu was superior to Napoleon. The life of Napoleon was a constant effort to oppress the liberties of mankind; and his unrivalled capacity exhausted its resources in struggling against the tendencies of a great age. Richelieu, too, was a despot; but his despotism took a nobler turn. He displayed, what Napoleon never possessed, a just appreciation of the spirit of his own time."
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 380)

> "The more we study the career of Richelieu, the more prominent does this antagonism become. Every thing proves that he was conscious of a great struggle going on between the old ecclesiastical scheme of government, and the **new secular scheme**; and that he was determined to put down the old plan, and uphold the new one."
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 386)

> "They declared that Richelieu had no religion, that he was only a Catholic in name, that he was the pontiff of the Huguenots, that he was the **'patriarch of atheists'**, and accused him of wishing to establish a schism in the French church."
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 386)

> "By erecting this new standard of action, Richelieu took a great step towards secularizing the whole system of European politics. For, he thus made the theoretical interests of men subordinate to their practical interests. Before his time, the rulers of France, in order to punish their Protestant subjects, had not hesitated to demand the aid of the Catholic troops of Spain; and in so doing, they merely acted upon the old opinion, that it was the chief duty of a government to suppress heresy. This pernicious doctrine was first openly repudiated by Richelieu. **As early as 1617, and before he had established his power, he, in an instruction to one of the foreign ministers which is still extant, laid it down as a principle, that, in matters of state, no Catholic ought to prefer a Spaniard to a French Protestant**. To us, indeed, in the progress of society, such preference of the claims of our country to those of our creed, has become a matter of course; but in those days it was a startling novelty."
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pg. 387-88)

> "By thus steadily subordinating the church to the state; by enforcing the principle of this subordination, on a large scale, with great ability, and with unvarying success, he laid the foundation of that purely secular polity, the consolidation of which has, since his death, been the aim of all the best European diplomatists.

> While in other Christian countries, men were being incessantly persecuted, simply because they held opinions different from those professed by the established clergy, France refused to follow the general example, and protected those heretics whom the church was eager to punish. Indeed, not only were they protected, but, when they possessed abilities, they were openly rewarded."
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pgs. 390, 392)

Quotes | By

The following are quotes by Richelieu:

> "If you give me six lines written by the hand of the most honest of men, I will find something in them which will hang him."
>
> — Richelieu (c.1620), *Publication*

References

1. Buckle, Henry. (1857). *History of Civilization, Volume One*. Appleton, 1862.

External links

â— Cardinal Richelieu – Wikipedia.

θΔics

In terminology, **right**, as contrasted with wrong, often found in the phrase “right vs wrong”, a seeming secular alternative to the religio-mythology distinction “good vs evil”, refers to natural action (as opposed to unnatural action), per system, reaction, or process purview.

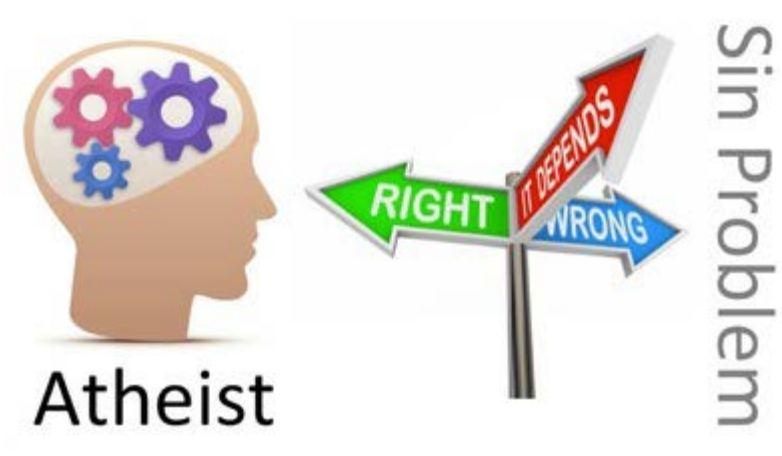

Screen shot of the 2015 video “Atheist Sin Problem” (Q), by Libb Thims, in query about a non-supernatural solution to the Phil Robertson’s sin problem scenario (stated below), in respect to how do how does an atheist justifiably explain "**right**" and "wrong" to a murderer-rapist.

Pope | Volaire

In 1734, English poetry philosopher Alexander Pope, in his *An Essay on Man* (§:1.287-92), state the following assertion:

> “All nature is but art, unknown to thee;
> All chance, direction, which thou canst not see;
> All discord, harmony not understood;
> All partial evil, universal good.
> And, spite of pride, in erring reason's spite,
> One truth is clear, 'Whatever is, is **right**'.”

The last comment “Whatever IS, is RIGHT”, written seemingly in relation to or on the heels of Gottfried Leibniz (1646-1716) and his 1734 problem of evil patch solution that "this is the best of all possible worlds" logic (Q), drew a lot of heat. Voltaire, e.g., initially referred to Pope’s *Essay on Man* as "the most beautiful, the most useful, the most sublime didactic poem ever written in any language", but in his *Candice* (1759), made Pope’s 1.292 “Whatever IS, is RIGHT” assertion a theme that he satirized. Leibniz' assertion, that this is the "best of all possible worlds", subsequently, provided the basis for the satirical work *Candide*.

Robertson | Sin problem

See main: Robertson sin problem

In 2015, American Christian morality crusader Phil Robertson, patriarch of the half-billion dollar Duck Commander company, and reality show Duck Dynasty, as the key note speaker of the 11th Annual Vero Beach Prayer Breakfast, described what he referred to as the "sin problem", via the telling of a hypothetical scenario of an atheist family who is raped, dismembered, and murdered (see: audio), at the end of which the perpetrators claim there is nothing "wrong" with what they did because atheists have no morals, i.e. sense or foundational basis of right or wrong: [1]

> “The ‘sin problem’ is something you can’t solve. [Namely] This ‘conscience’ thing, we just dreamed it up. There’s no **right**, there’s no wrong, there’s no good, there’s no evil.
>
> I’ll make a bet with you: Two guys break into an atheist’s home. He has a little atheist wife and two little atheist daughters. Two guys break into his home and tie him up in a chair and gag him. And then they take his two daughters in front of him and rape both of them and then shoot them and they take his wife and then decapitate her head off in front of him. And then they can look at him and say, ‘Isn’t it great that I don’t have to worry about being judged? Isn’t it great that there’s nothing wrong with this? There’s no right or wrong, now is it dude?’
>
> Then you take a sharp knife and take his manhood and hold it in front of him and say, ‘Wouldn’t it be something if this [sic] was something wrong with this? But you’re the one who says there is no God, there’s no right, there’s no wrong, so we’re just having fun. We’re sick in the head, have a nice day.’ If it happened to them, they probably would say, ‘something about this just ain’t right.’”

(add discussion)

Quotes

The following are related quotes:

> "**Right** is right even if no one is doing it; wrong is wrong even if everyone is doing it."
>
> — Augustine (c.420) (Q)

> "Whenever morality is based on theology, whenever the **right** is made dependent on divine authority, the most immoral, unjust, infamous things can be justified and established. Morality is then surrendered to the groundless arbitrariness of religion."
>
> — Ludwig Feuerbach (c.1860) (Q)

> "Some people often think that if you're an atheist, you don't believe in god, then you can't have a morality. There's no foundation to morality and morality's in question and so forth. [...] It's amazing to me that people in the current world still think that way, because that view was refuted 2.5 thousand years ago by Socrates, in the Euthyphro argument (Q), where Socrates made the point that you can't define goodness or **rightness** as what god commands, because the reason god commands it is that it's right, it's not right because god commands it. [...] So, god cannot be the foundation of morality in that sense."
>
> — Colin McGinn (2009), "Does Morality Need God?" [2]

> "The amoral nurse might reject that he or she has a moral duty to uphold a patient's rights. The amoral nurse would also probably claim that it does not make any sense even to speak of things like a patient's '**rights**' since moral language itself has no meaning. The amoralist's position in this respect is analogous to the atheist's rejection of certain religious terms. The extreme atheist, for example, would argue against uttering the word 'god', since it refers to nothing and therefore has no meaning. Such an atheist might also claim that there is no point in engaging in a religious debate on the existence of god, since there is just nothing there to debate. To try and debate the existence of god would be like trying to debate the existence of a 'black cat in a darkened room when there isn't one' [see: Dave Allen, "The Leap of Faith" joke (Q) (Q)] . The amoralist may argue in a similar way in relation to the issue of morality."
>
> — Megan-Jan Johnston (2011), *Bioethics: a Nursing Perspective* (Q)

References

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(b) Phil Robertson – Wikipedia.
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In history, **rise and fall of civilization** refers to the recurring sequential periodicity of civilization development, typified by growth and inevitable decline, over time; Rome being the archetypical model. [1] Over the years, many have attempted to explain this feature of history thermodynamically.

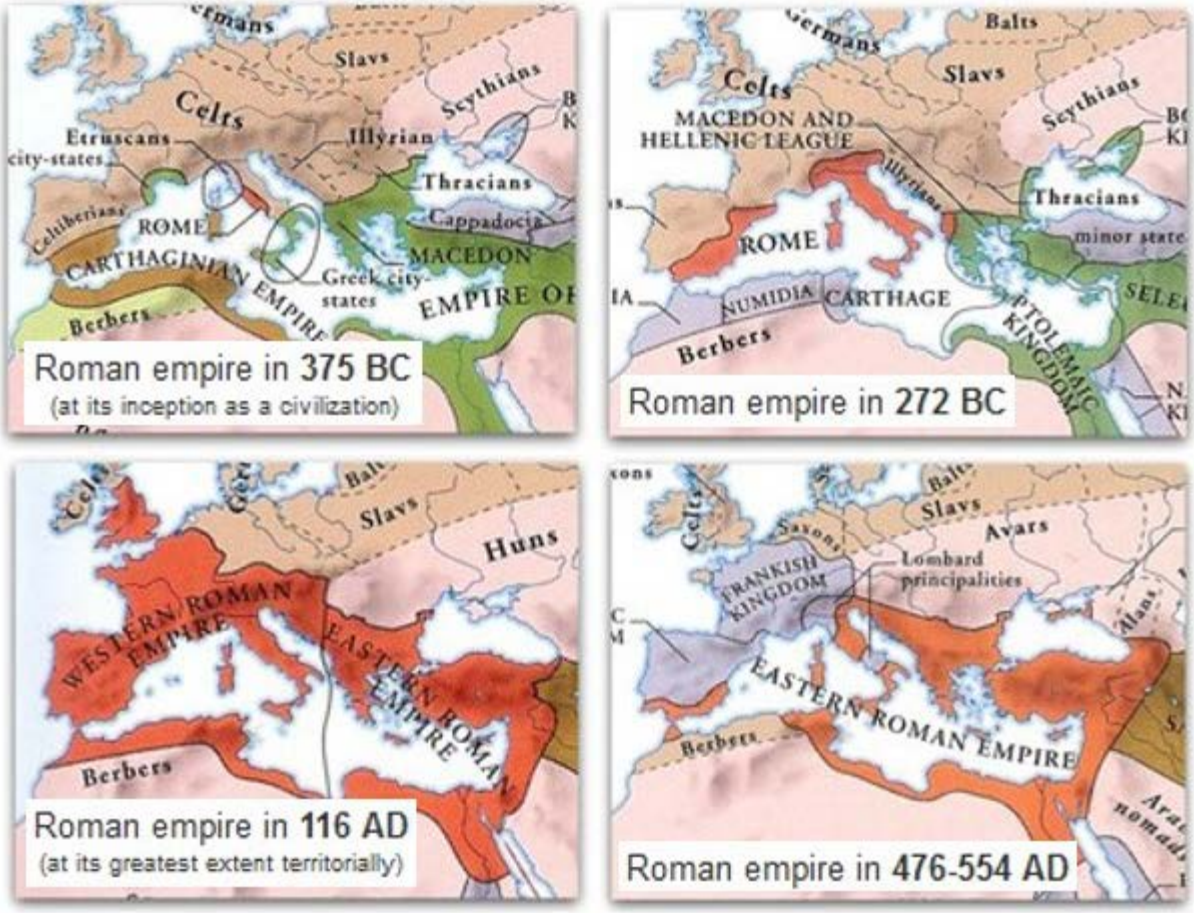

A depiction of the **rise and fall** of the Roman empire (375BC-544AD), the color red depicting the changes in the territory (volume) of a system of about 45-million people (human molecules) of the Roman empire as it expands, doing thermodynamic pressure volume work, against its surroundings (neighboring countries), and then contracts, during its fall, after Romulus is disposed, over the course of about 1,400-years.

Overview

In 1776, Edward Gibbon published volume one of his *The History of the Decline and Fall of the Roman Empire*, wherein he "blamed the otherworldly preoccupations of Christianity for the decline of the Roman empire". (O)

Thermodynamics

See main: History thermodynamics

In 1910, American historian Henry Adams, in his *A Letter to the American Teachers of History*, seems to argue that the rise and fall aspects of civilization throughout history can be explained on a mixture of the nebular hypothesis applied to contractions and expansions of systems or societies of human molecules over time leading to ultimate equilibrium as determined by the second law of thermodynamics and Gibbs phase rule: [2]

> "The physicist-historian may begin with his favorite figure of gaseous nebula, and may offer to treat primitive humanity as a volume of human molecules of unequal intensities, tending to dissipate energy, and to correct the loss by concentrating mankind into a single, dense mass like the sun. History would then become a record of successive phases of contraction divided by periods of explosion, tending always towards an ultimate equilibrium in the form of a volume of human molecules of equal intensity, without coordination."

In 1985, writer Olga Cooke noted that, in literature, it has been viewed that the laws of thermodynamics were seen to control the rise and fall of civilizations. [4]

In a 1997 article, American literary theorist Bruce Clarke discusses energy and thermodynamics in terms of the rise and fall of a mysterious civilization. [5]

In 2003, American economist Jeremy Rifkin wrote a chapter section on "The Thermodynamics of Rome", in which he attempts to explain the role of energy in the rise and fall of civilizations in the context of thermodynamics. [3]

In 2009, American physical chemist Thomas Wallace attempted to explain the cyclical rise and fall of civilizations using the chemical thermodynamic model of the "useful life" of the chemical reaction aspects of a car battery, as mandated by the second law. [1]

Rome

The diagram show (above) illustrates the changes in the territory (volume) of a system of about 45-million people (human molecules) of the Roman empire as it expands, doing thermodynamic pressure volume work, against its surroundings (neighboring countries), and then contracts (during its fall), over the course of about 1,400-years. [6] In modeling the Roman empire as a thermodynamics system, on the model of the working body of the steam engine, the rise and fall can be considered as a thermodynamics 'transformation', occurring over a span of about 1,400-years. To give an idea of 'human pressure' (a elusive concept), which in the Daniel Bernoulli perspective is defined as the average impact of the particles of a system, in this case Roman citizens (human molecules), on the surface or boundary of their containing vessel (in this case national borders), one can use the census population changes per century as a gauge of population density and hence collision frequency in the sense that as nation well-being increases so to does the rate of reproduction, whereby the increase in products (babies) of the reaction, require more volumetric space, which instills a need in the system to expand, loosely speaking.

The population of the world at 1 AD has been considered to be between 200 and 300 million people. In that same period, the population of the early empire under Augustus (27 BC – 14 AD) has been placed at about 45 million. [13] Using 300 million as the world benchmark, the population of the Empire under Augustus would've made up about 15% of the world's population. In this case, in order for the Roman system to expand outward to its eventual largest volume (116 AD), the pressure in the Roman system would have been greater than that of the territory of the neighboring surrounding world.

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Videos

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θΔics

In existographies, **Rita Greer** (c.1963-) is a English history artist, goldsmith, graphic designer, food scientist, and author, noted for her 2003 to 2001 “Robert Hooke project”, and attempt to “bring him back into history” by doing reconstructive portraits of him, based on extant descriptions of his appearance. [1]

Overview

In 1703, Robert Hooke dereacted (ceased to exist), at which point Newton, having had a great aversion to Hooke, for a number of reasons, e.g. Hooke's general abrasive and quarrelsome nature with just about everyone, and claiming that he had discovered the law of universal gravitation before Newton and that Newton stole it from him, or something along these lines, and therein, upon Hooke’s cessation, became the president of the Royal Society, a job he had purposely avoided until Hooke was gone, after which, shortly thereafter, all the portraits of Hooke “mysteriously” disappeared, the general consensus being that Newton had them destroyed, because he couldn’t stand looking at Hooke.

In 2003, Greer, upon retiring, began her “Robert Hooke project”, an attempt to revive him as a key historical figure, via reconstructive art work. [1]

In 2004, Greer was commissioned by the Royal College to make a reconstructive photo of Hooke base on extant “verbal” descriptions of his appearance; some examples of which are as follows (see: Hooke article, for letters: A, E, F, details): [2]

In 2006, Greer made the following oil painting (Ñº) depicting the 6 Oct 1675 interaction of Robert Hooke (center), with Christopher Wren (right), showing King Charles II a pocket watch for which Hooke had invented a new spring balance mechanism:

In 2007, Greer made the following excellent depiction of Robert Hooke (left) holding the vacuum bulb (receiver) of the vacuum pump device (pneumatical engine) he had built for Robert Hooke (right), a device based on the earlier vacuum pump designs of Otto Guericke, with which they used to discover the Boyle's law: [3]

(add)

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(b) Robert Hooke (by Rita Greer, 2004) – Wikipedia.
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θΔics

In existographies, **Ritchie Robertson** (1952-) is an English German literature of 1800 to 1950 scholar noted for []

Overview

In 2015, Robertson, in his *Goethe: a Very Short Introduction*, gives a short introduction to Goethe's *Elective Affinities*, discussing things such as: the Otto cypher, the E and O letters on the glass, the chemical analogy, as he refers to it; cites the views of others, such as: [2]

> "Germany is that [deplorable] country where the *Elective Affinities* of Goethe is considered an edifying moral book."
>
> — William Thackeray (1853), *Vanity Fair: A Novel Without a Hero*; note: "deplorable" insert by Robertson

(add discussion)

Key

Robertson was found via the keys: Goethe + "chemical analogy".

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(b) Meisel, Martin. (2014). *Realizations: Narrative, Pictorial, and Theatrical Arts in Nineteenth-Century England* (pg. 341). Princeton University Press.
(c) Robertson, Ritchie. (2015). *Goethe: a Very Short Introduction* (chemical analogy, pg. #). Oxford University Press.

External links

â— Ritchie Robertson – Wikipedia.
â— Ritchie Robertson (overview) – British Academy for the Humanities and Social Sciences.

θΔics

In chemistry, **RNA**, short for "RiboNucleic Acid", is molecular chain-like structure comprised of connected nucleotide units, molecular formula $[C_{10}H_{16}O_{13}N_5P_2]_N$, each unit consisting of a nucleobase, a ribose sugar, and a phosphate group. RNA is one of the reactants or precursory components in the formation of DNA.

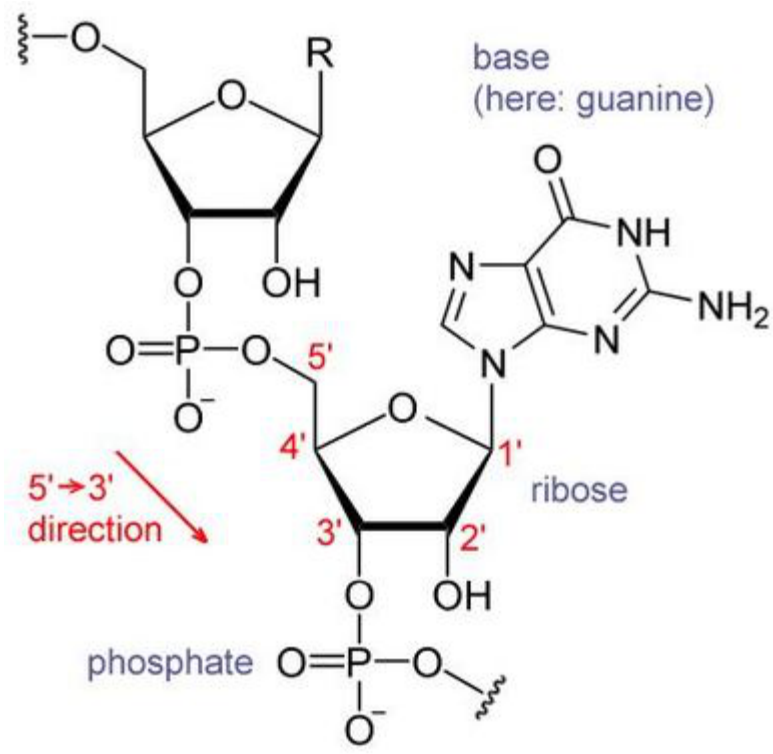

The molecular structure of **RNA**, molecular formula $[C_{10}H_{16}O_{13}N_5P_2]N$, comprised a base, a ribose unit, and a phosphate group.

Life | Origin of life

See also: Defunct theory of life; Carbon-based life; Non-life

In 1967, Carl Woese hypothesized that RNA might be catalytic and suggested that the earliest forms of life, described as "self-replicating molecules", could have relied on RNA both to carry genetic information and to catalyze biochemical reactions—an RNA world. [1]

There are many currently who advocate an RNA-based or DNA-based definitions of "life", according to which life or biology started once RNA or DNA formed, some 4.5 to 3.5 billion years ago.

In 2007, Libb Thims debased the "RNA origin of life" model as illogical; this was one of the stepping stones to the defunct theory of life (2009) and life does not exist (2010) conclusion. [2]

Difficulties

One of the central problems in the "RNA = life model" is that discussions of such will frequently be found crouched in loaded words, namely "self-replication" and "self-organization" which amounts to perpetual motion of the living kind, and hence a fallacious argument.

The correct position is to view things from the "driving force" model, according to which it is a universal rule that free energy must decrease in order for the process to occur. All of the various processes, from the second of the formation of the first hydrogen atom, 13.7 billion years ago (according to the big bang hypothesis):

H | **NOT alive?**

to ignition of the sun, 4.5 billion years ago (according to the nebular hypothesis), to the formation of the first ribonucleic acid ($C_{10}H_{16}O_{13}N_5P_2$) molecular unit, some 4 billion years ago, according to the RNA world hypothesis:

$C_{10}H_{16}O_{13}N_5P_2$ | **NOT alive?**

which led to the formation of DNA, aka the "secret of life" and or first "living molecule":

$C_{10}H_{16}O_{13}N_5P_2$ [RNA] +
$C_{10}H_{16}O_{13}N_5P_2$ [RNA] = DNA |
YES alive?

naively believe that the 5-element RNA was the first from of life, then we would also have to believe in the following backwards logic:

$C_4H_7O_4N$ (aspartic acid) – not alive
$C_{10}H_{12}O_6N_5P$ (ribonucleic acid) – alive
$C_{21}H_{36}O_{16}N_7P_3S$ (coenzyme A) – more alive

This type of reasoning, in which small 4-element molecules, such as aspartic acid, a crystalline amino acid found especially in plants, are not alive, whereas 5-element molecules, such as RNA, are alive, is clearly ridiculous. The hypothesis put forward herein, to reconcile these areas of theoretical inconsistency, is that the human organism is 26-element molecule and that it as well as all other large-element molecules are dynamic atomic structures found within a 92-element, heat-fluxed, environment, which together react, form, and break bonds, evolve, and reproduce according to the four laws of thermodynamics. Moreover, there is no such reality as there being a specific energy-filled 'spark day' in earth's past in which molecules suddenly became lifelike, alive, or imbued with life, etc., as it is currently believed.

Excerpt from Libb Thims' 2007 *Human Chemistry*, chapter "Molecular Evolution", wherein Thims first began to grapple with the **defunct theory of life** issue, namely illogical supposition that the first form of life was a small molecular entity such as RNA (a 5-element molecule) or a single-cell bacteria (a 15-element molecule), which leads to the absurd conclusion that the precursor molecules or reactant molecules that went into the synthesis of that first "living molecule" were either sort of alive or a dead molecule or something nonsensical to this effect. [2]

which led, once DNA got enclosed into a cell membrane, to the formation of the first human molecule, 150,000 years ago, according to the out of Africa hypothesis:

$C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23}$
$Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18}$ | **YES alive?**

are coupled mechanism processes, occurring in a step-by-step manner, each step governed by the first law (energy conservation) and second law (transformation content increase) of thermodynamics. The formation of RNA is only a drop in the bucket in the "big history" picture of this grand process and to label the second of the first formation of RNA as having some type of grand significance in the big picture scheme of things of the structure and dynamics of the universe is only but an anthropocentric molecular structure retelling of the age-old first life story, as found in various semi-modern chemical forms: Erasmus Darwin's one living filament (1794), of Johann Goethe's homunculus (1832), of Alexander Oparin's coazervate droplet (1931), of Carl Woese's self-replicating molecule (1971), and so on, in what no doubt will be a story retold, in various regurgitated forms, well into the coming centuries.

References

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Videos

â— Anon. (2014). "The RNA Origin of Life" (Ñº), NOVA PBS Official, Apr 23.

External links

â— RNA – Wikipedia.

θΔics

In human chemistry, **Roald Hoffmann** (1937-) is an American reaction theory chemist noted for []

Overview

In 1995, Hoffmann, in his *The Same and Not the Same*, discussed some of the theoretical content of German polymath Johann Goethe's 1809 *Elective Affinities*, such as how he considers the character Mittler "the mediator" to have been, in Goethe's mind, representative of the catalyst (or human catalyst). [1] Puzzling as it may seem, on the question as to whether or not Hoffmann views Goethe's version of human chemistry to be bunk (e.g. Ryan Grannell), crackpottery (Mitch Garcia, Marcin Borkowski, etc.), or extreme genius, Hoffmann comments, in 2012 opinion: [3]

> "I am not for or against Goethe. A great writer, he used a theory of chemical combination (elective affinities) that was already outmoded by his time, to write a great novel of human relationships using that theory as a metaphor. None has done that since.
>
> Quantum mechanics has in it the key to chemical bonding. I use it, in approximate ways. Affinities – opposites attracting each other, electrostatically, emerge. But also like atoms forming strong, covalent bonds. One can put the results in the language of affinities to describe approximately what happens, and we often do that to beginning students. Also chemists often use anthropomorphic language, and it's just fine."

In short, Hoffmann seems to categorize Goethe's *Elective Affinities* as a "metaphor" theory, an extended type of chemical anthropomorphism (or chemical aphorism).

> In *Goethe's* 1809 novel *Die Wahlverwandtschaften* (Elective Affinities), a by-then outdated theory of chemical combination powers a work of fiction.[32] The actions and emotions of the characters of this work embody (and probe critically) the way some people thought molecules behave. One wishes one were able to point today to a similarly inspired literary text. The closest one comes is *Primo Levi's* remarkable memoir *The Periodic Table*, or some chapters in his novel *The Monkey's Wrench*. Nevertheless, it is interesting to reflect on the deep morphological resemblance of chemistry and, if not life, at least language.

Hoffmann's 2012 take on Goethe's *Elective Affinities*, incorrectly describing it as using "outdated theory", which is hardly the case: chemical bonding theory was not upgraded until Edward Franklin and his 1852 "combining power" valency theory (see: history of chemical bonding theory); he compares Goethe to Primo Levi (a very primitive resemblance); and seems to be unaware of Tom Stoppard's *Elective Affinities* remake, the 1998 *Arcadia*, where to Stoppard's credit he does incorporate some modern upgrade theory, such as the second law, sexual heat, steam engine theory, chaos theory, among others.

The only way to categorize this, in the sense of being a phenomenon afflicting many leading chemists (generally those not well-acquainted with chemical thermodynamics), is that this position of being curiously neutral about Goethe's theory, is something akin to a mixture of "not being able to see the forest among the trees" and "not being able to see the ships in the harbor", in the sense that:

(a) Goethe did not consider his human affinities theory to be metaphor, as evidenced by his March 23, 1810 advertisement (*Morning Paper for the Educated*) wherein he summarized or rather defended his position that "there is after all only one nature", meaning that he considered the view presented therein to be reality;

(b) that at as Helmholtz proved in 1882, the measure of affinity in human reaction conditions (freely-going, isothermal, isobaric, surface-attached, coupled, cyclical, heat-driven chemical reactions) is Gibbs free energy changes, meaning that the modern physical scientist is faced with the oblique task of having to redefine human existence in the language of pure and applied chemical thermodynamics (human chemical thermodynamics), which is a daunting yet wondrous and elusive task, to say the least (meaning in detail that one has to master the 1,158 Gibbs-Clausius equations);

(c) as science historian Henry Leicester has summarized, in his *Historical Background of Chemistry* (1956),

Gilbert Lewis and Merle Randall's influential 1923 textbook *Thermodynamics and the Free Energy of Chemical Substances* "led to the replacement of the term 'affinity' by the term 'free energy' in much of the English-speaking world", meaning that for chemists educated in the 1930s or later there existed a great unwritten divide or rather disjunct in knowledge between the quest to measure chemical affinity (1718-1923) and the years of modern chemical thermodynamics (1923-present) both of which are tied up in the following equation:

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

meaning that affinities of reaction (between atoms, molecules, or humans) is quantified and measured by differentials of free energy with respect to the extent of reaction, such as summarized by Belgian chemist Theophile de Donder in his 1936 *Thermodynamic Theory of Affinity*. In sum, through no fault of their own, a large percentage, possibly near to 100%, of modern chemists are completely unaware of this small but decisive and very hidden footnote of modern knowledge as relates to human existence as regards to the governance of human nature.

Hoffmann, on a related note, in his discussion of Fritz Haber's ammonia synthesis work (Haber process), humorously refers to German physical chemist Walther Nernst as the "dean of German thermodynamics". [1]

Other

Hoffmann was a co-winner, along with Kenichi Fukui, of the 1981 Nobel Prize in chemistry for their theories, developed independently, concerning the course of chemical reactions (see also: human chemical reaction; human chemical reaction theory). [2]

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3. Email communicate to Libb Thims (Feb 2010).
4. Kovac, Jeffrey and Weisberg, Michael. (2012). *Roald Hoffmann on the Philosophy, Art, and Science of Chemistry* (Goethe, pgs. 31, 108, 123, 182). Oxford University Press.

Further reading

â— Hoffmann, Roald. (1987). "The Devil Teaches Thermodynamics", in: *The Metamict State* (pg. 3). Orlando: University of Central Florida Press.

External links

â— Roald Hoffmann – Wikipedia.

θΔics

In mythology, **Robe of Nessus** refers to the poisoned cloak that killed Hercules. [1]

Overview

Hercules had shot the centaur Nessus with a poisoned arrow for having attempted to rape his wife, Deianeira. As he died, the centaur dipped his robe in his blood and gave it Deianeira. When Hercules abandoned her for Lole, Deianeira sent him the robe as revenge: when he put it on, he was wranked with pain and died, throwing himself onto a burning pyre in order to escape from the torment. [1]

The **"garment of Nessus"**, as depicted, showing Lichas bringing the garment of Nessus to Hercules, woodcut by Hans Beham, *circa* 1542-1548.

Elective Affinities

In a 21 Nov 1827 letter to German polymath Johann Goethe's friend, German composer Carl Zelter, Goethe explained how his 1809 *Elective Affinities*, his self-defined best book, had been the Robe or Garment of Nessus to many who read it: [2]

> "Customers, no doubt, sometimes allow the tailor to choose a particular stuff, but they insist upon having the coat fitted to their own bodies, and are highly indignant, if it proves too tight, or too loose; they are most comfortable, when wearing the loose dressing-gowns of the day and hour, in which they can feel as they like; you may perhaps remember, that they treated my *Elective Affinities* as though it had been the **garment of Nessus**."

The phrase also frames the title of Alfred Steer's 1990 book *Goethe's Elective Affinities: the Robe of Nessus*. [3]

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2. (a) Mahoney, Dennis F. (2004). *The Literature of German Romanticism* ("As if to the robe of Nessus", pg. 262). Camden House.
(b) Goethe, Johann and Zelter, Carl F. (1892). *Goethe's Letters to Zelter: with Extracts from those of Zelter to Goethe* (Nessus, pg. 307; God, pg. 308). G. Bell and Sons.
3. Steer, Alfred G. (1990). *Goethe's Elective Affinities: the Robe of Nessus* (§4: Chemical Conversion, pgs. 37-). C. Winter Universitatsverlag.

External links

â— Shirt of Nessus – Wikipedia.

θΔics

In existographies, **Robert Alberty** (1921-2014) (CR:11) was an American physical chemist and biophysical chemist noted for his 1955 multi-edition textbook *Physical Chemistry*, a renamed continuation of the 1913 eight-edition *Outlines of Theoretical Chemistry* by Frederick Getman (carried it through 1927 in four editions) and Farrington Daniels (carried it through 1955 in four editions). [1]

Biochemical thermodynamics

In 2001, Alberty published "Use of Legendre Transforms in Chemical Thermodynamics" on on the mathematical thermodynamics of biochemical reactions. [2]

In 2003, Alberty published *Thermodynamics of Biochemical Reactions*, themed on the utilization of Legrende transforms to make the application of thermodynamics to biochemical reactions more convenient for the user, which contains an interesting historical section on English electrical engineer Keith Burton's 1957 biochemical reaction thermodynamic table. [3]

Universe | Evolution

See main: Rennie vs Thompson and Harrub creationism fiasco

In 2003, Alberty piped in his opinion on the creationism vs evolution debate, as thermodynamics sees things. [4] The following quote, form Alberty's commentary:

> "I do not agree that the universe is an isolated system in the thermodynamic sense."

has been taken in support of the assertion, by apologeticists, that thermodynamics doesn't apply to the universe. [5]

Education

Alberty completed his BS (1943) and MS (1944) at the University of Nebraska and PhD at the University of Wisconsin in 1947.

See also

- Peter Atkins

References

1. Alberty, Robert A. and Farrington, Daniels. (1955). *Physical Chemistry*. Publisher. 4th edition, Wiley, 2005.
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Further reading

- McGrath, Liz. (2014). "Robert Alberty, professor emeritus of chemistry and former dean of science, dies at 92: Chemist's seminal contributions to the thermodynamics and kinetics of biochemical reactions still shape the field, colleagues say" (Q), MIT News, Jan 23.

External links

- Robert A. Alberty – Wikipedia.
- Alberty, Robert A. – WorldCat Identities.
- Robert Alberty (faculty) – Massachusetts Institute of Technology.

θΔics

In hmolscience, **Robert U. Ayres** (c.1930-) is an American-born English mathematical physicist noted, in economic thermodynamics, for his 1970s to present his publications on applying the laws of thermodynamics in economic and ecological systems. [1]

Overview

In the 1960s, Ayres, under the direction of Allen Kneese, became convinced that economics systems are physical systems subject to the laws of thermodynamics; a learning experience about which he comments on in retrospect (2009) as follows: comments: [6]

> "My learning experience during 1967 to 1968, at Resources for the Future (RFF), in particular a line of research initiated by Allen Kneese, led me to the view that economy is truly a physical system that converts raw materials into goods and services, subject to the laws of thermodynamics."

In 1978, Ayres published *Resources, Environment, and Economics: Applications of the Materials/Energy Balance Principle*, wherein he began applying physical principles, e.g. thermodynamics, to economics; discussing topics such as negentropy (although he views negentropy as something "metaphysical") of physical materials, such as ore, outlines a theory of "negentropy depletion", and points out how the closed cyclic models of standard economics are inconsistent with the first law of thermodynamics. [5]

In the 1990s, Ayres began co-authoring articles on "eco-thermodynamics" based on exergy. [2]

Ayres prefers the term exergy over the entropy concept because the latter contains, in his own words, too much "mystical baggage". [3] Ayres has been influenced significantly by the works of Romanian mathematician Nicholas Georgescu-Roegen; particularly his 1971 book *The Entropy Law and the Economic Process.* [4]

Ayres' latest book is the 2009 *The Economic Growth Engine* written with Benjamin Warr in which they explore the fundamental relationship between thermodynamics and its definition of physical work, and economics, albeit using exergy as their primary analysis tool. [6]

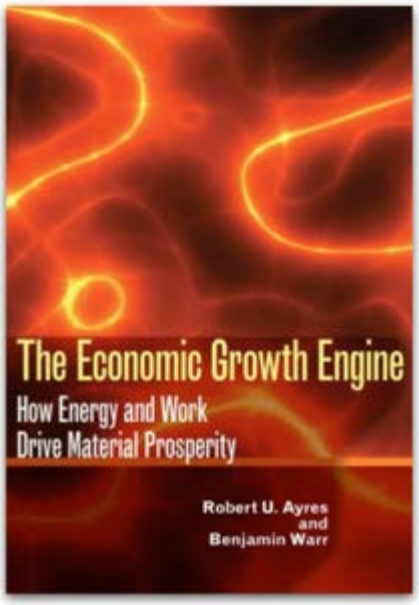

Ayres and Benjamin Warr's 2009 book *The Economic Growth Engine* on thermodynamics applied to economic activity. [6]

In 2016, Ayres, in his *Energy, Complexity and Wealth Maximization*, devoted some 80+ pages to thermodynamics, in aims to explain wealth.

Education

Ayres completed his BS in 1954 at the University of Chicago, his MS in physics in 1956 at the University of Maryland, and his PhD in mathematical physics in 1958 at Kings College, London. [1]

References

1. Robert U. Ayres – Encyclopedia of Earth.
2. Ayres, Robert U. Ayres, L.W., Martinàs, K. (1995). "Eco-thermodynamics: Exergy and Life Cycle Analysis." *Working Papers*, No. 96/04/EPS, Fontainebleau: INSEAD.
3. Arons, Jakob de Swaan, van der Kooi, Hendzer, and Sankaranarayanan. (2004). *Efficiency and Sustainability in the Energy and Chemical Industries*, (ch. 18: Economics, Ecology, and Thermodynamics, pgs. 257-84, esp. 263). CRC Press.
4. Ayres, Robert U. (1998). "Eco-thermodynamics: Economics and the Second Law" (abs), *Ecological Economics*, Vol 26, Issue 2, August. (pgs. 189-209).
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6. Ayres, Robert U. and Warr, Benjamin. (2009). *The Economic Growth Engine: How Energy and Work Drive Material Prosperity* (preface, viii). Edward Elgar Publishing.
7. Ayres, Robert. (2016). *Energy, Complexity and Wealth Maximization* (thermodynamics, 86+ pgs). Springer.

Further reading

● Ayres, Robert U. and Nair, Indira. (1984). "Thermodynamics and Economics", *Physics Today*, Nov.
● Ayres, Robert U. (1994). *Information, Entropy and Progress: A New Evolutionary Paradigm.* AIP Press.

External links

● Robert Ayres (scientist) – Wikipedia.
● Robert Ayres (faculty) – INSEAD.

θΔics

In existographies, **Robert Theodore Balmer** (1938-) (CR:8) is an American mechanical engineer noted, in animate thermodynamics, for his circa 1978 work on the applying entropy concepts to the study of the aging annually of fish (see also: fish molecule); specifically over a twelve month period, he studied all the characteristics of birth, growth, aging, and senile death and is said to have identified entropy flows into and out of the fish, such as food, excrement, and body heat dissipation. [1] In 2010, Balmer published *Modern Engineering Thermodynamics*, wherein among other subjects, e.g. Stanley Steamer, he employs the "black box" approach to thermodynamic problems. [2]

Overview

Balmer employs the balance equation for the total entropy of an animate, open system using the material time derivative:

$$\dot{S}_T + \dot{S}_P = \dot{S}_G$$

where $\dot{S}_T$ is the net entropy transport rate, $\dot{S}_P$ is the entropy production rate, and $\dot{S}_G$ is the net gain (or generation) of the system entropy. Furthermore, the entropy transport rate can be broken down into three disctinct terms:

$$\dot{S}_T = \frac{\dot{Q}}{T} + \sum_{food} \dot{m}s - \sum_{waste} \dot{m}s$$

where $\dot{Q}$ is the metabolic heat transfer, T is the absolute surface (frontier) temperature of the system, and the remaining two terms describe the entropy transport of the food and waste flows through the system. The above two equations can be combined, resulting in an effective entropy balance equation for open systems:

$$\dot{S}_G = \frac{\dot{Q}}{T} + \sum_{in} \dot{m}s - \sum_{out} \dot{m}s + \dot{S}_P$$

Considering heat from the system to the surroundings as negative, and an increase in the entropy between the incoming food and outgoing waste, as well as rewriting the entropy production term, $\dot{S}_P = \partial S / \partial t$ leaves us with Romanian-born American mechanical engineer Adrian Bejan's canonical equation for entropy generation minimization: [4]

$$\dot{S}_G = \frac{\partial S}{\partial t} - \frac{\dot{Q}}{T} + \sum_{out} \dot{m}s - \sum_{in} \dot{m}s \geq 0$$

Balmer's hypothesis that "living systems are characterized by a continuously decreasing total entropy over their lifespans" is supported by three arguments: [3]

1) Since the metabolic heat produced can be assumed to be lost by the system to the surrounding environment, and the difference in food/waste entropy flow is also negative, the net entropy transport, $\dot{S}_T$ can be taken as a negative quantity in the material time derivative formulation.

2) There is reason to believe that $\dot{S}_P$ is minimized by efficient biological systems, as postulated by the Prigogine-Wiame theory of living systems. Thus the magnitude of $\dot{S}_T$ is greater than that of $\dot{S}_P$ in animate systems in order for the entropy reducing nature of living systems hypothesis to hold.

3) Many common characteristics of aging in animate systems are causally related to increasing order occurring at the molecular level. Additionally, the conversion of foodstuffs within the system itself into useful metabolic products (e.g. glucose) results in a decrease in entropy.

Balmer's formulation utilizes the similarities between the classical equations of chemical kinetics and the entropy balance equation of the second law of thermodynamics in order to derive a model for allometric biological growth, similar to the growth equation derived earlier by Austrian chnopsologist (biologist) Ludwig Bertalanffy. Critical assumptions of his modeling approach are that the rate of entropy transport is proportional to the surface area, and the entropy production rate is proportional to the system's volume. Furthermore, it is postulated that the entropy transport and production rates are directly functions of the instantaneous value of the system's total entropy. Using Balmer's approach, the entropy rate balance can be solved uniquely for the entire system as a function of its age [3].

Death

In his 1984 article “An Entropy Model for Biological Systems Entropy” Balmer postulated that: [3]

> “All living systems are characterized by a continuously, decreasing total entropy level, and that biological death occurs at some minimum total entropy value. The time required to reach this minimum is the lifespan of the biological system.”

This is a curious view, generally in opposition to the long-standing view, such as professed by Erwin Schrodinger (*What is Life?*, 1944), that maximal entropy equates to death, not minimal entropy (see also: human entropy). One possible explanation is that viewing the animate system as open puts the focus on the relative rates of entropy transfer and production, instead of on the net generation of entropy over a finite interval, as is done for closed systems. Thus the formulations used in describing animate thermodynamic systems should carefully be chosen for open systems in order to avoid confusion with the older formulations of classical thermodynamics which tend to describe system behavior in terms of closed or isolated systems, in which no matter is exchanged with the surroundings.

Education

Balmer completed his BS and MS, both in engineering, at the University of Michigan, and in 1968 completed his ScD with a thesis on “Capillary Flow of Non-Newtonian Fluids” at the University of Virginia. In 1969, Balmer was a mechanical engineering professor at the University of Wisconsin-Milwaukee College of Engineering and Applied Sciences. Presently, Balmer is Emeritus Dean of Engineering and Computer Science at Union College in Schenectady New York, and Emeritus Professor of Mechanical Engineering at the University of Wisconsin-Milwaukee.

See also

â— Jeff Tuhtan

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1. Hershey, Daniel. (2009). *Entropy Theory of Aging Systems: Humans, Corporations and the Universe* (pg. 179). World Scientific.
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Further reading

â— Balmer, Robert T. (c.1978). “Entropy and Metabolism: A Macroscopic View of Aging”, *Report produced as part of Grant No. ROI AG 00489-01* given by the National Institute on Aging to the University of Wisconsin School of Engineering and Applied Sciences.
â— Balmer, Robert T. (1982). “Entropy and Aging in Biological Systems” (abs), *Chemical Engineering Communications*, 17(1-6):171-81.

External links

â— Robert T. Balmer (faculty) – Union College, Schenectady, New York.
â— Balmer, Robert T. – WorldCat Identities.

θΔics

In hmolscience, **Robert C. Bannister** (c.1933-) is an American historian noted for []

Overview

In 1987, Bannister, in his *Sociology and Scientism: the American Quest for Objectivity, 1880-1940*, outlined a focused historical of American "scientific sociology", aka positivism, in the 1920s, focused on the work of Lester Ward, Albion Small, William Sumner, and Franklin Giddings, among others, e.g. Luther Bernard, Stuart Chapin, William Ogburn, George Lundberg, the one-time student of Bernard and Chapin, whose "operationalism" Bannister classifies as "a final attenuation of interwar positivism", all themed on the old idea that the natural and social sciences were or should be governed by similar concepts and methods. [1]

Education

In 1955, Bannister completed his BA at Yale College; in 1957 he completed a second BA followed by an MA in 1961 at Oxford University, and in 1961 completed his PhD, after which he became history professor at Swarthmore College, becoming professor emeritus in 1998. (Ñº)

References

1. Bannister, Robert C. (1987). *Sociology and Scientism: the American Quest for Objectivity, 1880-1940* (§:5.1 Pluralistic Behaviorism, pgs. 75-). University of North Carolina Press, 2014.

External links

â— Sociology in the US (historical materials) – SwarthMore.edu.
â— Robert Bannister (faculty) – Swarthmore University.

θΔics

In existographies, **Robert Bauval** (1948) (RMS:101) is an Alexandria-born Belgian Egyptologist and astro-theologist author noted for []

Overview

In 1983, Bauval, while sitting in the desert in Egypt one night with a friend, he was told that Sirius rises, which marks the start of the Nile river flood, and that the three stars of the belt of Orion run in a row, but that the smallest star was slightly off-set to the left. Bauval then realization, firstly, that this "off-set" was the same as the off-set of the above-view of the three pyramids at Giza, that the size of the three pyramids were based on the size and angel of the three Giza pyramids, and, secondly, that the milky way is a mirrors the Nile River, such that, to the Egyptians, in the years 3,000 to 10,000BC, the sky, according to computer reconstructed images, was seen to them as a mirror image of Egypt and the Nile River, as shown below: [1]

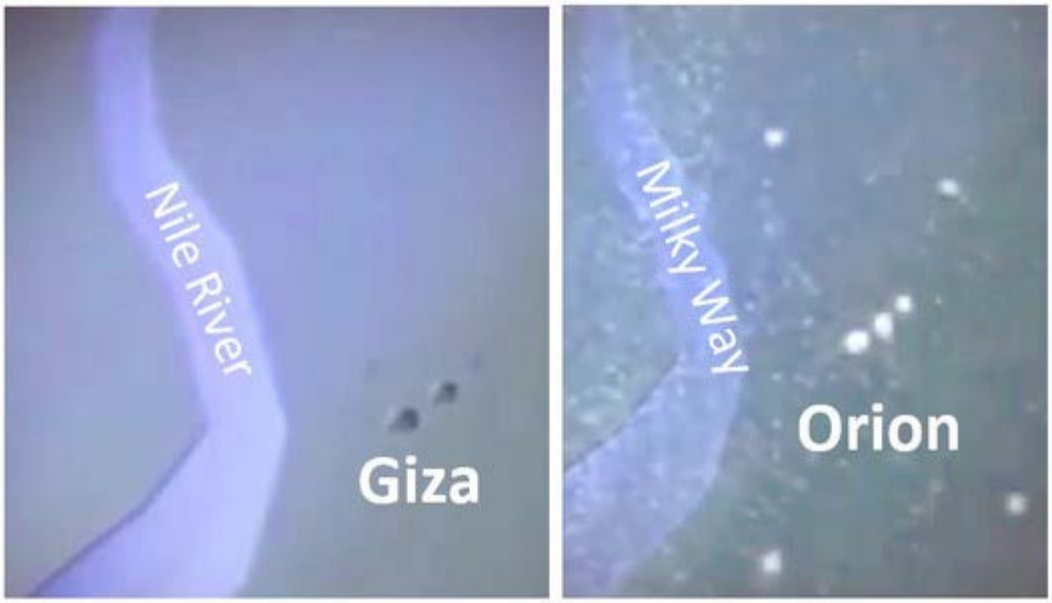

Said another way, to summarize this sharp connective discovery: [2]

> “One night, while working in Saudi Arabia, he took his family and a friend's family up into the sand dunes of the Arabian desert for a camping expedition. His friend pointed out Orion, and mentioned that Mintaka, the dimmest and most westerly of the stars making up Orion's belt, was **offset slightly** from the others.”

Bauval, upon hearing this, realized that the smallest pyramid at Giza was also "offset slightly from the others", and therein solved the mystery of the pyramids.

In 1993, Bauval, together with Adrian Gilbert, published *The Orion Mystery*.

Sah

In 2007, Bauval stated that in Pyramid Text #2126 (2500 BC), Ra, supposedly, was the brother of Sah (Orion) and Sopdet (Sirius).

Shaft problem

In 1954, Egyptologist Alexander Badawy proposed a link between Khufu’s pyramid, the largest of the three Giza

pyramids, at a height of 481 ft (Q), and the Orion constellation, in respect to the design of the pyramid, something to the effect that the shafts were a way for the king's soul to reach the heavens. [3]

Other astronomers (add names), supposedly, had also found that the two shafts on one side (right) were directed to the Little Dipper (from the queen's chamber) and Alfa Draconis (from the king's chamber). Bauval, on this basis, determined that in 2500BC, the two left shafts were directed such that the king's chamber pointed to the belt of Orion and the queen's chamber pointed to Sirius:

(add)

Quotes | Related

The following are related quotes:

> "The King's Chamber north shaft was aligned with the culmination of the star Thuban, the **north pole star** during the period when the pyramid was built; the King's Chamber south shaft was aligned with that of the Alnitak, part of the **belt of Orion**."
>
> — Mark Smith (2017), *Following Osiris: Perspectives on Osirian Afterlife from Four Millennia* (pg. #)

References

1. Anon. (2016). "The Story of Osiris – Ancient Egyptian God Documentary" (Q), YouTube, Ancient World History, Dec 23.
2. Orion correlation theory – Wikipedia.
3. Bauval, Robert. (2007). *The Egypt Code* (pg. 238). Red Wheel Weiser.

Further reading

● Bauval, Robert. (1994). *The Orion Mystery: Unlocking the Secrets of the Pyramids*. Three Rivers Press.

External links

- Robert Bauval – Wikipedia.
- Home – RobertBauval.co.uk.

θΔics

In existographies, **Robert Biel** (c.1962-) is an American political ecologist, specializing in political economy, systems theory, and sustainability development and urban agriculture, noted for []

Overview

In 2011, Biel, in his *Entropy of Capitalism*, attempted to expand on the 2006 "thermodynamical interpretation of Marx" ideas of John Foster and Peter Burley, with focus on the addition of his ideas on "systems theory" and "information" as pertains to ecological economics. [1]

Education

In 1992, Biel completed his PhD at the London School of Economics and Political Science, and in 1998 joined University College London, in their Development Planning Unit, in the Faculty of Built Environment. [2]

Quotes | By

The following are quotes by Biel:

> "Paul Burkett and John Foster (2006) made a great contribution in producing a well-researched vindication of a thermodynamic interpretation of Marx, and if we read Marx thermodynamically, this opens up fascinating new doors to a different conceptual world. The capitalists are trying to expand the quantity of work, and work is a thermodynamic process which capitalism is harnessing. So far so good. The problem, however, is that the Burkett and Foster analysis produces a somewhat mechanistic version of this process. The key weakness is a failure to realise that thermodynamics is not the whole of systems theory: we also have to understand the principle of emergence and the crucial role of information. Capitalism controls information, and its disempowerment of the workforce at the level of knowledge is an absolutely fundamental condition for controlling 'work'. In fact, in the pre-capitalist situation 'work' was inseparable not only from individual knowledge (properties of plants, craft-skills) but from a social and institutional dimension (gender roles, regimes for the collective management not just of physical resources but skills). The destruction of this autonomous sphere was from the beginning fundamental to the rise of capitalism, a reality of which a narrow, purely thermodynamic reading would remain ignorant."
>
> — Robert Biel (2011), *Entropy of Capitalism* [3]

References

1. Biel, Robert. (2011). *Entropy of Capitalism* (entropy, 91+ pgs; human thermodynamics, pg. 352; thermodynamics, 7+ pgs.). BRILL.
2. Robert Biel (faculty) – University College London.
3. (a) Burkett, Paul and Foster, John B. (2006). "Metabolism, Energy, and Entropy in Marx's Critique of Political Economy: Beyond the Podolinsky Myth" (abs), *Theory and Society*, 35:105-56.
(b) Biel, Robert. (2011). *Entropy of Capitalism* (pg. 48). BRILL.

External links

â— Robert Biel (faculty) – University College London.

θΔics

In hmolscience, **Robert Bierstedt** (1913-1998) was an American sociologist noted for his 1981 *American Sociological Theory: a Critical History*, wherein he gives ripe reviews of phenomena such as Pitirim Sorokin's 1928 mechanistic school, the social Newton attempts of George Lundberg and Stuart Dodd, among others. [1]

Quotes | Employed

The following are quotes employed:

> "Pareto's studies show that, properly taken, the social physics of the seventeenth century is not a mere dream of a bold human mind, but may be developed into a real scientific sociology which will probably not be able to disentangle all the 'mysteries' of human behavior and human history, but may clarify, to some degree, the more important of them."
>
> — Pitirim Sorokin (1928), *Contemporary Sociology* (pg. 62); cited: *American Sociological Theory* (pg. 310)

Quotes

The following are noted quotes:

> "No synopsis of the book can possibly provide an idea of the richness of its content. One of its major contributions, however, is Sorokin's classification of the various schools of sociological theory. It should be noted that these "schools" are for the most part single-factor interpretations of the structure of society and of social change. They are various ways of interpreting society, not, as is so often the case, various ways of interpreting sociology. They have nothing to do with such approaches to sociological inquiry as functionalism, exchange theory, symbolic interactionism, and others. The first chapter, for example, deals with the mechanistic school, those who have regarded society as some kind of a machine, exhibiting the operation of both centripetal (associative) and centrifugal (dissociative) forces. Among these writers Sorokin includes the pre-Socratic Greek philosophers and especially the so-called social physicists of the seventeenth century (Hobbes, Spinoza, Descartes, Leibniz, and, a little later, Berkeley), Saint-Simon, Fourier, Comte, and Quetelet also appear on Sorokin's mechanistic roster. His principal attention, however, is devoted to social energetics and includes such names as H. C. Carey, Voronoff, Haret, Lotka, Barcelo, Solvay, Ostwald, Bekhterev, Carver, and Winiarsky—names that do not ordinarily appear in the histories of sociology. In any event, Sorokin dismisses them all as writers who have contributed nothing to the understanding of social phenomena. The concepts of physical force and physical energy, such as the conception of society as an astronomical system, are little more than absurd. To one writer in this school he gives favorable, but critical, treatment, and that is Pareto. He regards Pareto's ideas as "sound and promising," but defective nevertheless."
>
> — Robert Bierstedt (1981), on Sorokin's 1928 *Contemporary Sociology*; in: *American Sociological Theory* (pg. 309-10)

> "Lundberg and Dodd are not the Copernicus and Newton of the social sciences, as they so earnestly and industriously aspired to be. Very few today read *Foundations of Sociology* (1939) and *Dimensions of Society* (1942), yet Lundberg was the leading protagonist of the scientific method in sociology, of the purification, by operational means, of the concepts of sociology, and on the notion of society, as a natural phenomenon, susceptible to inquiry by the methods of the natural sciences."
>
> — Robert Bierstedt (1981), *American Sociological Theory* (pg. 387)

References

1. Bierstedt, Robert. (1981). *American Sociological Theory: a Critical History*. Elsevier, 2013.

External links

â— Robert Bierstedt – Wikipedia.

θΔics

In existographies, **Robert Boyle** (1627-1691) (IQ:185|#57) (Cattell 1000:354) [RGM:466|1,500+] (Murray 4000:6|C) (Gottlieb 1000:142) [Kanowitz 50:41] (GPE:39) (GCE:6) [CR:155] was an Irish chemist and physicist, noted for 1659 pneumatical engine experiments, which resulted in his 1660 "Spring of the Air" letter, to "Charles Lord Viscount of Dungarvan, eldest son to the Earl of Cork" (Ñº), which outlined "Boyle's law", turned 1662 book *New Experiments: Physico-Mechanical, Touching the Spring of the Air, and its Effects: Made, for the most part, in a New Pneumatical Engine*, for his 1661 *The Skeptical Chemist: Chemico-Physical Doubts and Paradoxes touching the Experiments, whereby Vulgar Spagyrists* [*Alchemists*] *are Wont to Endeavor to Evince their Salt, Sulphur and Mercury to be the True Principles of Things*, wherein he sought to debunk the "three principles theory" of Geber, which is one of the first modern chemistry treatises, wherein he began to reinvent atomic theory.

Vacuums | Air pump

See main: Gas laws

In 1647, German engineer Otto Guericke invented a vacuum pump to disprove Greek philosopher Parmenides' *circa* 485 BC hypothesis that "nature abhors a vacuum", and or the variant of this logic in Rene Descartes cosmology. Guericke's vacuum pump experimentation was first described in the 1657 book *Mechanical Hydraulic Pneumatics* by German scientist Gaspar Schott, a correspondent of Guericke.

In 1655, or before, Boyle had encountered reports of Marin Mersenne, Pierre Gassendi, and others, on the weight of the air, and on engines such as the wind gun, and the Torricelli vacuum tube. [10]

In Jan 1658, Boyle had heard of Guericke's vacuum work, as reported in Gaspar Schott's *Mechanical Pneumatical Hydraulics* (*Mechanica Hydraulico-pneumatica*) (1657). [8]

> "You speak still of the **'German vacuum'** as of no ordinary beauty; but the poet says, *Uritque videndo fæmina*."
> — Samuel Hartlib (1658), "Letter to Robert Boyle", Jan 7 [9]

In late 1658, Boyle contacted Ralph Greatorex, a London instrument maker, firstly, who could not make a successful device; then contacted Robert Boyle, who since the year previous had been Boyle's assistant. [10]

> "I did not set about the construction of an air pump until I had heard of Guericke's 'way of emptying glass vessels, by sucking out the air at the mouth of the vessel'."
>
> — Robert Boyle (1659), "Letter to nephew, Lord Dungarvan" [14]

A reconstructive photo (Greer, 2007) of Robert Hooke, left, and **Robert Boyle**, right, doing pressure and volume experiments with their pneumatical engine, which is a glass bulb, aka "receiver" (or vacuum bulb), attached to a vacuum pump (aka air pump). [12]

Hooke, retrospectively, reported that he had completed the machine in 1658/59.

> "You may be pleased to remember, that a while before our separation in England, I told you of a 'book' [*Mechanics of Gas Hydraulics*, 1657], that I had heard of, but not perused, published by the industrious Jesuit Schottus; wherein, it was said, he related how that ingenious gentleman, Otto Guericke, consul of Magdeburg, had lately practiced in Germany a way of emptying glass vessels, by sucking, out the air at the mouth of the vessel, plunged under water. And you may also perhaps remember, that I expressed myself much delighted with this experiment, since thereby the great force of the external air, either ruining in at the opened orifice of the emptied vessel, or violently forcing up the water into it, was rendered more obvious and conspicuous than in any experiment that I had formerly seen. And though it may appear by some of those writings I sometimes showed you, that I had been solicitous to try things upon the same ground; yet in regard this gentleman was beforehand with me in producing such considerable effects by means of the exsuction of air, I think myself obliged to acknowledge the assistance and encouragement the report of his performances hath afforded me."
>
> — Robert Boyle (1659), "Letter to nephew, Lord Dungarvan" (Ñº), Dec 20

In Mar 1659, Boyle took the completed machine from London to Oxford. [10]

> "I am now prosecuting some things with an engine I formerly writ to you about."
>
> — Robert Boyle (1659), "Letter to Samuel Hartlib", Nov [10]

On 20 Dec 1659, Boyle sent his famous "Spring of the Air" experiments overview letter, to his nephew Lord Dungarvan, aka "Charles Lord Viscount of Dungarvan, eldest son to the Earl of Cork" (Ñº). This famous "Spring of the Air" dedicatory letter to his nephew, the young Lord Dungarvan, is dated from Beaconsfield, Dec 20, 1659—where, in all probability, according to existographer Flora Mason (1914), Boyle was spending Christmas with his friend Edmund Waller, the Poet, at his house. [16]

In c.1661, Boyle introduced Christiaan Huygens to the merits of experimenting with vacuum pumps (Helden, 2003), and it was Huygens who constructed the first air pumps in Holland and France, with the assistance of Denis Papin. [11] The transmission of ideas form Boyle to the surrounding areas, is shown on the following map (Shapin, 1985):

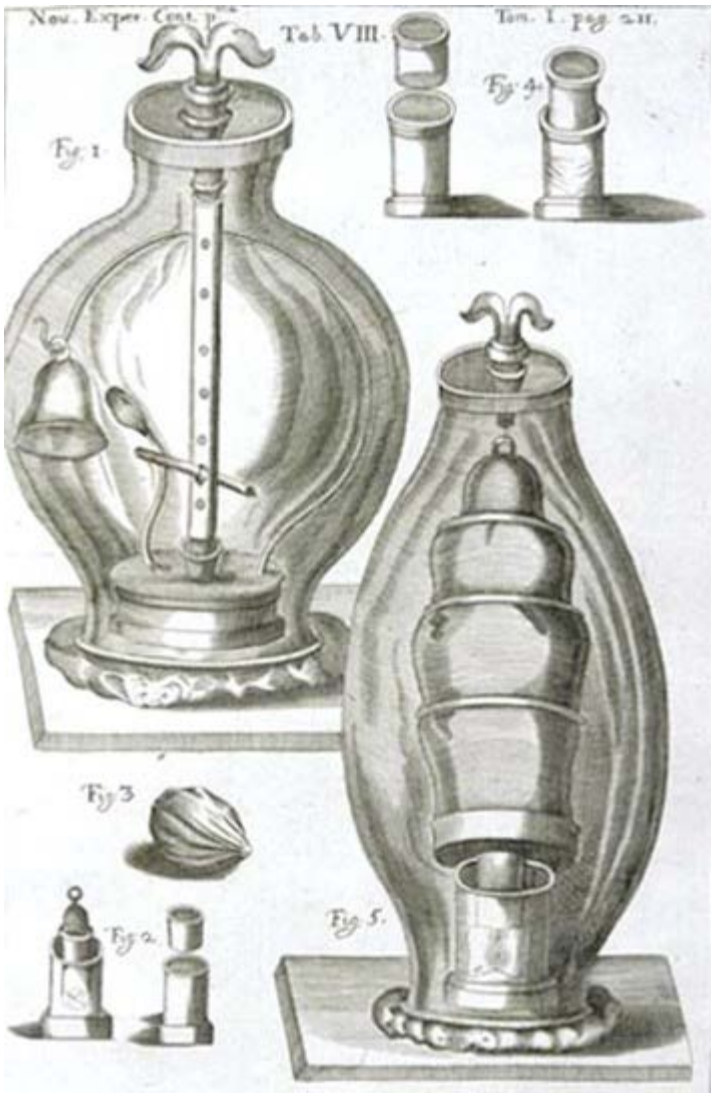

A depiction of Boyle's "bell a vacuum" test (1669). [15]

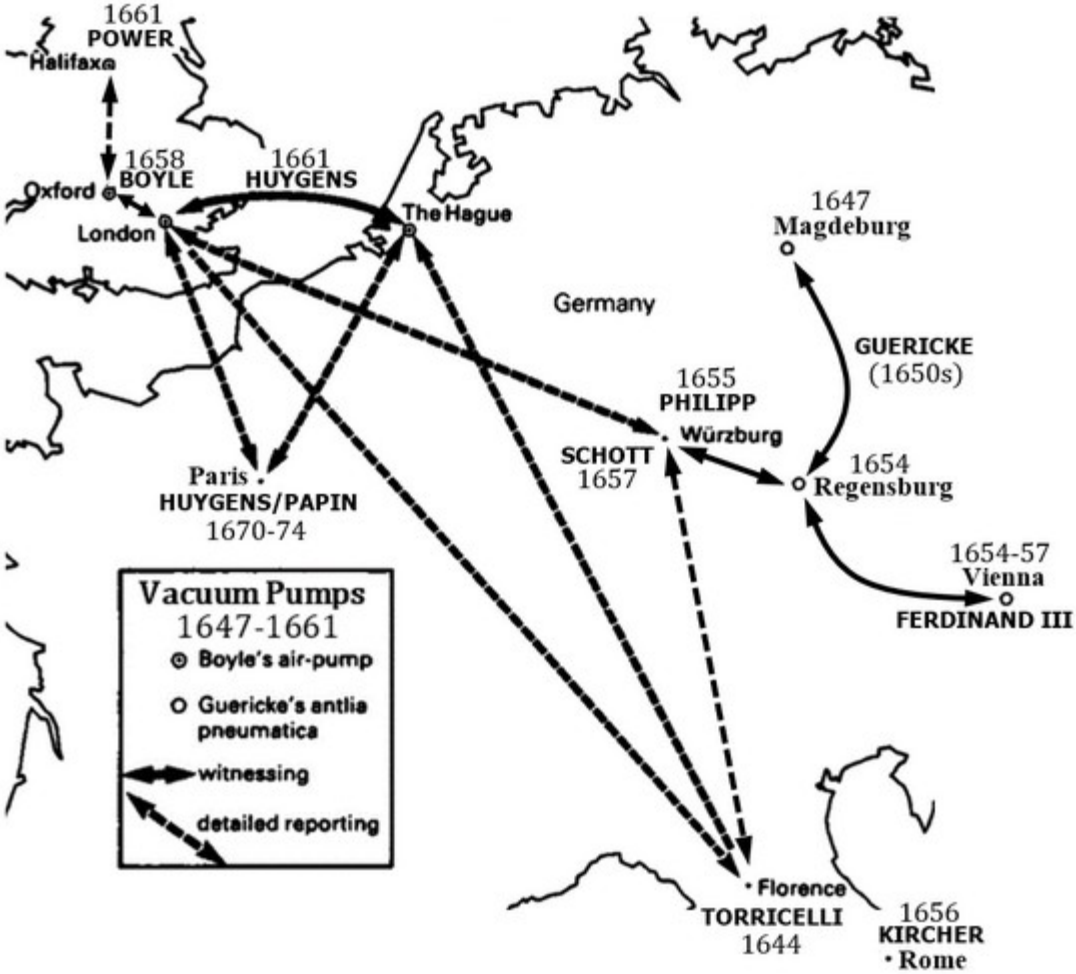

In 1662, Boyle expanded his "spring of the air" into the book *New Experiments: Physico-Mechanical, Touching the Spring of the Air, and its Effects: Made, for the most part, in a New Pneumatical Engine*.

Boyle, according to temperature historian Tom Shachtman, originally believed in Aristotle's version of Parmenides contention that nature abhorred a vacuum and wrote that he would have never bothered trying to make one, but that thereafter he refused to accept any ancient teachings without skepticism. [6]

Boyle and his assistant Robert Hooke then improved Guericke's air vacuum design and built their own in 1658, a pneumatical engine, one that also functioned as a pump. [2] After conducting a number of experiments with their air pump, Boyle published the results in the 1660 book *New Experiments Phisico-Mechanicall, Touching the Spring of the Air, and Its Effects (Made for the Most Part in a Pneumatical Engine)*. In the 1669 second edition of *Spring of the Air*, a statement of what is now known as "Boyle's law" can be found defined in modern shorthand as: [3]

$$PV = K\,|_{n,T}$$

which says that for a body of gas at constant number of particles *n* and temperature *T* the product of the measure of the pressure *P* and volume *V* of gas will be a constant *K*. The *Spring of the Air* had a great influence on other scientists, who built their own air pumps, and devised new experiments of their own.

Several decades later, in the 1690 memoir "A New Method to Obtain Very Great Motive Powers at Small Cost", Boyle and Huygen's associate French engineer Denis Papin conceived that the quick condensation of steam in a cylinder, via contact with a cold body, would quickly make a vacuum that would drive the piston down in such a manner that if the process was repeated in a cyclical manner useful work, as in raising weights out of mines, could be obtain. This design was later used by English engineers Thomas Savery, in 1697, and Thomas Newcomen, in 1710, to make the first

working steam engine.

Hobbes freezing dispute

In c.1660, Boyle engaged into a supposedly decade-long debate with Thomas Hobbes on the nature of freezing. The entry on "freezing" from the 1765 *Complete Dictionary of the Arts and Sciences*, reads as follows: (Ñº)

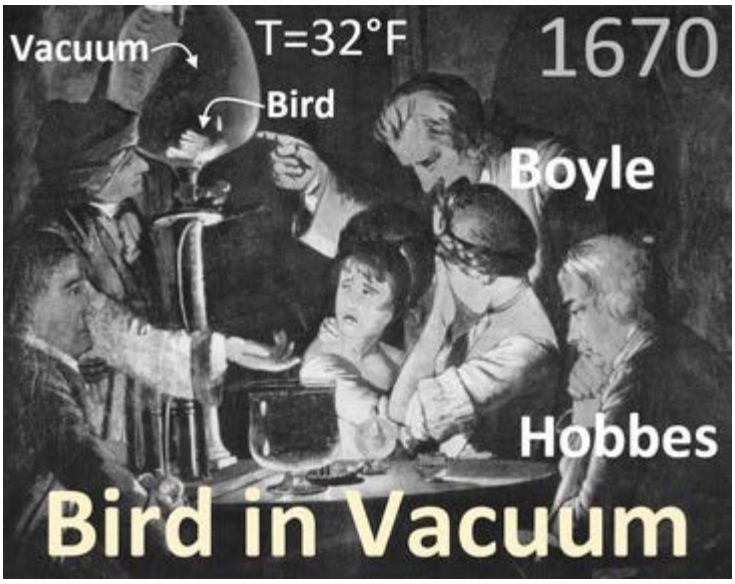

Boyle's 1670 freezing a "bird in a vacuum" experiment, done to disprove Thomas Hobbes' wind theory of cold, according to which cold and freezing was the result "frigorific particles".

> "FREEZING, in philosophy, the same with congelation. Philosophers are by no means agreed as to the cause of this phenomenon. The Cartesians account for it by the recess or going out of the ethereal matter from the pores of the water. The 'corpuscularians', on the other hand, attribute it to the ingress of frigorific particles, as they call them: Hobbes asserts, that these particles are nothing else but common air, which entangling itself with the particles of water, prevents their motion. Others will have a kind of nitrous salt to be the cause of congelation, by insinuating itself between the particles of water, and fixing them together, like nails: and indeed it seems probable that cold and freezing do arise from some substance of a saline nature, floating in the air; since all salts, and particularly nitrous ones, when mixed with ice and snow, greatly increase their cold and even bulk."

Hobbes' cold theory, to note, seems have some type of association to Pierre Gassendi's theory of hot and cold, which he acquired from Epicurus, according to which a body would be hot if it contained "calorific atoms" and cold if it contained "frigorific atoms". (Ñº)

Boyle also disproved Epicurus' theory of "cold corpuscles", which were said to work by stealing insensibly into liquors they insinuate themselves into, without any show of boisterousness or violence. Cold corpuscles were said to be "swarms of frigorific atoms". Boyle also disproved Thomas Hobbes' theory that the source of all cold was the wind by freezing live animals in a vacuum, an often misunderstood anecdote.

Boyle, in any event, to disprove Hobbes' cold theory, froze a bird in a vacuum, as shown adjacent.

Skeptical Chymist

In his famed 1661 book *The Sceptical Chymist*, Boyle had to point out to all the alchemists that what they were doing, with all their false claims, was detrimental to the betterment of the science of chemistry: [4]

> "If men would more carefully distinguish those things that they know from those that they ignore or do but think, and then explicate clearly the things they conceive they understand, acknowledge ingenuously what it is they ignore, and profess so candidly their doubts, that the industry of intelligent persons might be set on work to make further enquiries, and the easiness of less discerning men might not be imposed on."

In apology for being so sharply abrupt, Boyle continues 'I perceive that [various] of my friends have thought it very strange to hear me speak so irresolvedly, as I have been wont to do, concerning those things which some take to be the elements, and others to be the principles of all mixt bodies.' Boyle is criticizing earlier research founded on the belief that salt, mercury, and sulphur were the 'true principles of things'.

Atomic theory

Boyle, in 1661, along with French mathematician Rene Descartes (1637), French mathematician Pierre Gassendi (1649), and English physicist Isaac Newton (1686), was one of the first to revive Greek philosopher Leucippus' atomic theory.

Cold | Hot

See also: Absolute zero

In 1665, Boyle published his *New Experiments and Observations Touching Cold*, in which he experimentally disproved a number of ancient myths about cold, while also revealing a number of new experimental facts. [5] In one experiment, in measuring the work of the power of cold, Boyle discovered that a weight of 72 pounds was required to prevent expanding ice from pushing out a cork. [6]

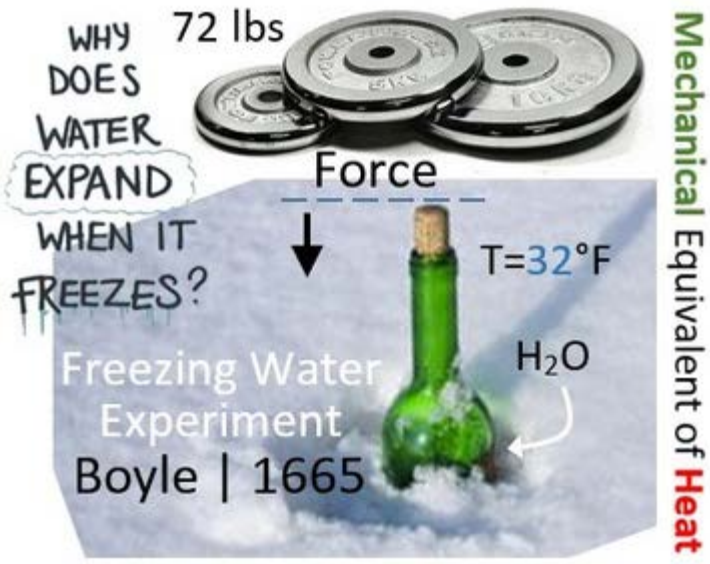

Water is one of the few exceptions to Boerhaave's law type behavior; specifically, when liquid water is cooled, it *contracts* [**V**↓] like one would expect until a temperature of approximately 4 degrees Celsius is reached, after which it *expands* [**V**↑] slightly until it reaches the freezing point (0°C), and then, when it freezes, it **expands** by approximately 9%. In c.1664, Boyle, in his investigations of the power of the cold, found that it took 72 pounds of weight to keep the cork from popping out when water froze.

Education

Boyle, supposedly, was taught and or influenced via the chemistry by George Starkey (1628-1685). [7]

Quotes | Employed

The following are quotes employed by Boyle:

> "To seem to 'know all things' (see: last person to know everything) certainly, and to speak positively of them, is a trick of bold and young fellows; whereas those, that are indeed intelligent and considerate, are wont to employ more wary and diffident expressions as he speaks."
>
> — Aristotle (c.350), *Publication*; cited by Robert Boyle (1662) in *New Experiments Physico-Mechanical on the Spring of the Air* (pg. 2); in: *Collected Works, Volume One* (Ñº)

Quotes | On

The following are quotes on Boyle:

> "**Boyle** improved on the pneumatic engine invented by Otto Guericke, and was thereby enabled to make several new and curious experiments on the air, as well as on other bodies: his chemistry is much admired by those who are acquainted with that art: his hydrostatics contain a greater mixture of reasoning and invention with experiment than any other of his works; but his reasoning is still remote from that boldness and temerity which had led astray so many philosophers."
>
> — David Hume (1836), *The History of England, Volume Two* (pg. 653)

Quotes | By

The following are noted quotes:

> "There is **a 'spring' or elastic power in the air** we live in. By which 'Ἰλατηρ' or 'spring of the air', that which I mean is this: that our air either consists of, or at least, abounds with, parts of such a nature, that in the case they be being or **compressed by the weight** of the incumbent part of the atmosphere, or by any

other, body, the do endeavour, as much as in them lieth, to free themselves from that pressure, by bearing against the contiguous bodies that keep them bent; and, as soon as those bodies are removed, or reduced to give them way, by presently unbending and stretching out themselves, either quite, or so far forth as the contiguous bodies that resist them will permit, and thereby expanding the whole parcel of air, these elastical bodies compose."

— Robert Boyle (1659), 'Letter to nephew, Lord Dungarvan' (pg. 8), Dec 20

"And when with excellent microscopes I discern in otherwise invisible objects the inimitable subtlety of nature's curious workmanship; and when, in a word, by the help of anatomical knives, and the light of chemical furnaces, I study the 'book of nature', and consult the glosses of Aristotle, Epicurus, Paracelsus, Harvey, Helmont, and other learned expositors of that instructive volume; I find myself oftentimes reduced to exclaim with the psalmist, how manifold are thy works, O Lord? In wisdom hast thou made them all."

— Robert Boyle (1659), *Some Motives and Incentives to the Love of God* (pgs. 59-60) (Ñº)

"Epicurus supposes not only all mixt bodies, but all others to be produced by the various and casual occursions of atoms, moving themselves to and fro by an internal principle in the immense or rather infinite vacuum."

— Robert Boyle (1861), *The Skeptical Chemist* (Ñº)

"Heat seems principally to consist in that mechanical property of matter we call motion."

— Robert Boyle (c.1660), *Publication*; cited by Donald Cardwell (1971) in *From Watt to Clausius* (pg. 4)

"The information of sense assisted and highlighted by 'instruments' are usually preferable to those of sense alone."

— Robert Boyle (c.1675), "Propositions on Sense, Reason, and Authority" (Ñº) [10]

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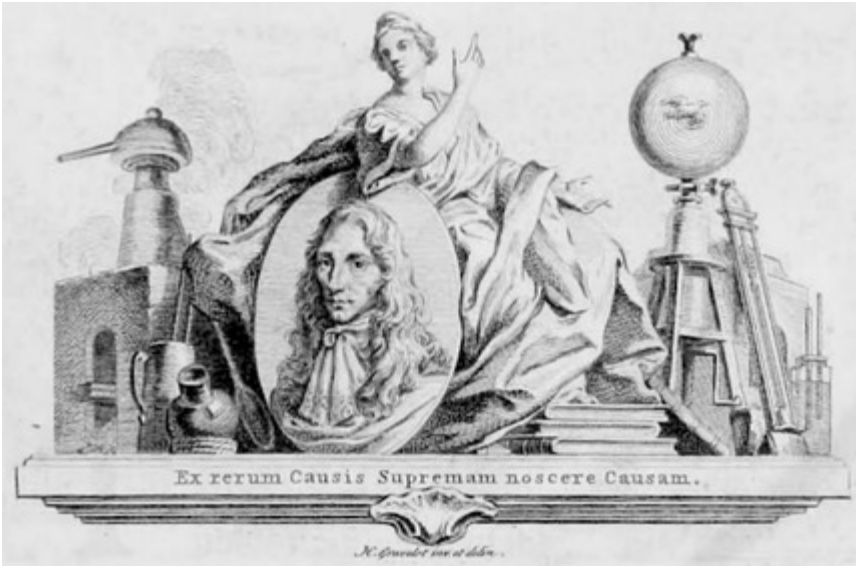

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A image **Robert Boyle**, from the front piece of the 1774 *The Works of the Honorable Robert Boyle, Volume One*, which shows a "bird in a vacuum", a repercussion of his dispute with Thomas Hobbes, which is captioned with the Latin phrase "Ex rerum Causis Supremam noscere Causam", which translates as "to known the supreme cause, from the causes of things". [13] Next to the vacuum pump are a two branch mercury barometer, a double capillary manometer. At left is a furnace with an alembic, for experimenting with fire.

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External links

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â— Leviathan and the Air-Pump – Wikipedia.

θΔics

In existographies, **Robert Bunsen** (1811-1899) (IQ:175|#275) (Cattell 1000:266) (Murray 4000:20|C) (CR:25) was a German chemist, semi-ranked as a greatest chemist ever, generally known as the eponym of the Bunsen burner, noted for being the mentor of a number of thinkers, including: August Horstmann, Heike Kamerlingh-Onnes, and Sofia Kovalevskaya, famous or his 1860 flame spectrum element prediction analysis work together with Gustav Kirchhoff. (Ñº).

Quotes | On

The following are quotes on Bunsen:

> "I am made from the C-H-N-O-S-P combination from which a **Bunsen**, Helmholtz, Kirchhoff came."
>
> — Wilhelm Ostwald (1926), *Lifelines: an Autobiography* [1]

References

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External links

â— Robert Bunsen – Wikipedia.

θΔics

In existographies, **Robert Burton** (1577-1640) (IQ:#|#) (CR:15) was an English scholar noted, in hmolscience, for []

Overview

In 1621, Burton, in his *The Anatomy of Melancholy*, impressively employs electricity (amber), magnetism (loadstone), and heat (warmth) logic to explain love and beauty; the following is a noted excerpt: [1]

> "As amber attracts a straw, so does beauty admiration, which only lasts while the warmth continues. But virtue, wisdom, goodness, and real worth, like the loadstone, never lose their power."

Here, of note, we recall the later work of James Froude, on magnetism, heat, and love.

Reaction end

In 1640, Burton hung himself in a room at Christ Church, Oxford. Later, of note, this same room was occupied by a young Robert Hooke, as a college student. [3]

Goethe

German intellect Johann Goethe, in his set of coded scientific love theories, employed in his 1809 *Elective Affinities*, used the maternal imagination theory, learning it from either, supposedly: Levinus Lemnius (1505-1568), Burton, or Pierre Maupertuis (1698-1758).

Finck

American philosopher Henry Finck, in his 1887 *Romantic Love and Personal Beauty*, section "Cosmic Attraction and Chemical Affinities", amid citation and discussion of the classic physical science love theory scholars, namely: Empedocles, Goethe, Ludwig Buchner, Schopenhauer, etc., stated the following about Burton: [2]

> "In the preface to the first volume of *Don Quixote*, Cervantes refers those who wish to acquire some information concerning love to an Italian treatise by Judah Leo [Judah Leon Abravanel, c.1465-c.1523]. The full title of the book, which appeared in Rome in the sixteenth century, is *Dialoghi di amore, Composti da Leone Medico, di nayione Ebreo, e di poi fatto cristiano* [*Dialogues of Love, composed by Doctor Leon, of Hebrew heritage, and who later became Christian*]. There are said to be three French translations of it, but it was only after long searching that I succeeded in finding a copy, at the Bibliotheque Nationale in Paris. It proved to be a strange medley of astrology, metaphysics, theology, classical erudition, mythology, and medieval science. **Burton**, in the chapter on love, in his *Anatomy of Melancholy*, quotes freely from this work of Leo, whom he names as one of about twenty-five authors who wrote treatises on love in ancient and mediaeval times.
>
> Like Empedocles, Leo identifies cosmic attraction with love. But he points out three degrees of love —natural, sensible, and rational. By natural love he means those "sympathies" which attract a stone to the earth, make rivers flow to the sea, keep the sun, moon, and stars in their courses, etc. **Burton** (1652) agrees with Leo, and asks quaintly:
>
>> "How comes a loadstone to draw iron to it . . . the ground to covet showers, but for love? . . . no stock, no stone, that has not some feeling of love. 'Tis more eminent in Plants, Herbs, and is especially observed in vegetals; as betwixt the Vine and Elm a great sympathy,"

"Sensible" Love is that which prevails among animals. In it Leon recognises the higher elements of delight in one another's company, and of attachment to a master.
"Rational" Love, the third and highest class, is peculiar to God, angels, and men.”

(add)

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External links

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θΔics

In existographies, **Robert Chambers** (1802-1871) (EvT:16|21+) (CR:3) was a Scottish natural philosopher, geologist, and publisher noted for []

Overview

In 1844, Chambers, in his *Vestiges of the Natural History of Creation*, published anonymously for fear of charges of atheism and materialism, attempted to champion the idea of evolution directed by god. [1]

Quotes | On

The following are quotes related to Chambers:

> "Never use the words higher or lower."
>
> — Charles Darwin (c.1845), note written on the margin of his personal copy of **Chambers**' 1844 *Vestiges of The Natural History of Creation* [2]

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θΔics

In hmolscience, **Robert P. Clark** (1940-), not to be confused with British chemist Robert E. Clark (1906-1984), both of whom use entropy arguments, is an American government and political scientist noted, in human thermodynamics, for his 1997 to 2001 publications on an entropy and biological forces themed model of historical globalization.

Overview

In 1997, Clark, in his *The Global Imperative*, argues, similar to the energetic imperative (1912) and thermodynamic imperative (1959), that it is an imperative of humankind to become global in efforts to persist against the effects of entropy; the following being his abstract: [1]

> "Drawing on a variety of academic disciplines including the physical sciences, biology, anthropology, geography, economics, political science, sociology, and demography, Clark reveals the spread of humans and their cultures to be part of an ongoing struggle to supply the energy needs of an increasingly large and complex society. 'Entropy' and 'thermodynamics', terms often ignored or misunderstood by social science students, clearly frame a fascinating vision of humans' inherent tendency toward a globalized world. Although human expansion has drawn increasing attention in the last several decades, as this tumultuous century has progressed, Clark shows that the process of globalization is not a recent concept. From the very roots of the species, humankind has been driven by a range of internal and external factors to expand in order to survive the increasing complexity of human civilization."

On entropy, Clark states: [2]

> "Entropy, a property of matter and energy, is inextricably linked to human values and thus is central to economic processes of production and consumption."

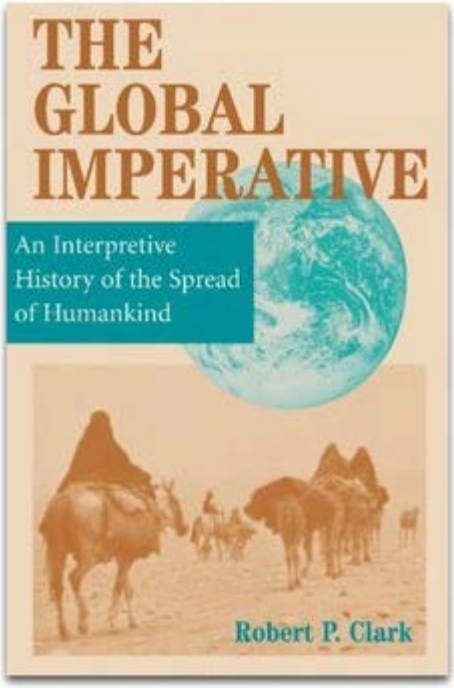

Clark's 1998 *The Global Imperative*, where he uses general principles to argue that globalization is a natural phenomena, and not a recent one. [2]

Citing the views of Herman Daly and James Beniger's statement that "the one true test of a living systems is the persistence of [their] organization counter to entropy," Clark seems to promote the view that all systems tend toward decay and disorder. [3] To counter this, he outlines his global imperative as such:

> "If all systems tend toward energy loss, decay, and disorder, how is it possible for human beings to create and maintain systems as complex and as larger as, say, a great city? How can cities and civilization grow and prosper when the laws of thermodynamics say they should be decaying? The answer to these questions and the principle force compelling us to become global species lies in dissipative structures."

On this premise, he cites Ilya Prigogine, defining dissipative structures as "the ability of complex systems to transfer their entropic costs to other parts of the universe". He also cites the views of English-born American economist Kenneth Boulding who supposedly defines segregation of entropy as the process by which "dissipative structures allow complex systems to achieve and maintain a high level of order by dissipating their entropic tendencies, i.e. their tendencies to disorder, disorganization, and energy loss, to neighboring systems." [2] He also cites Stuart Kauffman, and his thermodynamics-based self-organizing theories.

In 2001, Clark, in his *Global Life Systems*, uses primarily American biochemist Jeffrey Wicken and Belgian chemist Ilya Prigogine's 1984 *Order Out of Chaos* as his thermodynamics references. [4] Clark also cites British science writer

Colin Tudge who in an unwritten reference to the surface law states that: [6]

> "For homoeothermic land animals, the physics of heat comes into play: gravity and thermodynamics determine that, on land, body size, shape, and lifestyle are bound to be intimately linked."

(add discussion)

Education

Clark completed his BA in political science and Latin American studies in 1962 at Tulane University, New Orleans, and completed his MA and PhD in international studies from Johns Hopkins University. Science 1977, Clark has been a professor of government and politics at George Mason University. [5]

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θΔics

In existographies, **Robert E.D. Clark** (1906-1984), not to be confused with American political scientist Robert P. Clark (1940-), both of whom use entropy arguments, was a Pakistani-born British organic chemist, old earth creationist, and anti-evolutionist noted for []

Overview

In 1935, Clark, while traveling on a train from Kent to Cambridge, having his mind wrapped around ongoing religion and science debates, fell upon the following view:

> "Whereas geologist Merson Davies sees evolution primarily as a 'geological' problem, and biologist Douglas Dewar views evolution as largely a 'biological' problem, I see evolution first and foremost as a 'chemical' problem', which at its most basic level required explaining how 'chemical molecules of gigantic complexity came into existence and have been able to arrange themselves in increasingly complicated ways', in the face of the apparent compatibility between evolution and entropy or the second law which states in its general expression that 'disorder will tend to increase, but that order can never arise spontaneously from chaos'? Evolution, accordingly, can 'never involve any real rise in the degree of organization' of an organism. If in past ages complex organism ever did evolve from simpler ones, the process took place contrary to the laws of nature, and must have involved what may rightly be termed the miraculous. For this reason, the doctrine of evolution can never legitimately form a part of naturalistic philosophical or sociological thought, nor can it ever be rightly used to support such dogmas as the inevitability of progress."

Clark, versed by that time in the general scientific literature, dismissed the following rebuttal argument as illusory:

> "Just as a part of the energy of hot steam may be converted into highly ordered work at the expense of the remainder so, during the course of evolution, animals may in the last resort have obtained their organization at the expense of the sun's energy which has degraded on the earth's surface."

Clark insisted, conversely, that the sun's energy by itself could never give rise to new types of organization.

Clark published his entropy argument against evolution in *Order and Chaos in the World of Atoms* (1942), "Evolution and Entropy" (1943), and *Darwin: Before and After* (1948).

In 2017, Jason Rosenhouse, in his "Thermodynamical Arguments Against Evolution", was discussing Clark's anti-evolution entropy arguments. [3]

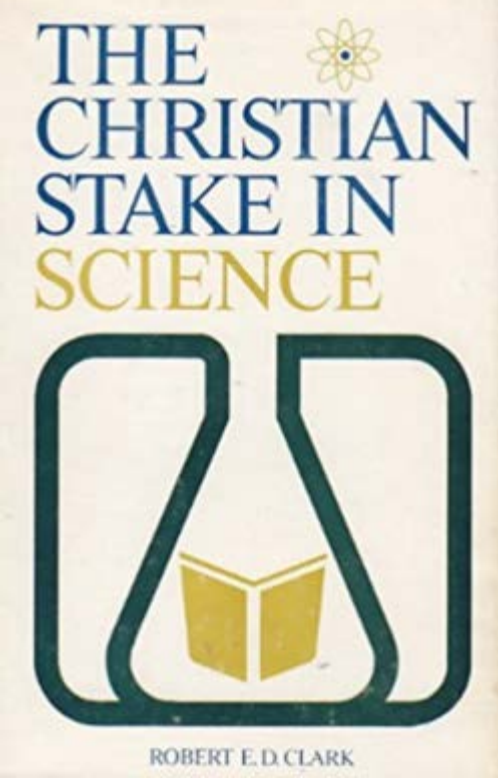

Clark's 1967 *The Christian Stake in Science*, the cover of which depicts a Bible in a beaker, indicative of his view that the miracle of god is behind the origin of humans, or something to this effect. [4]

Education

In 1928, Clark completed his BS in natural sciences and his PhD in 1932 in organic chemistry both at Cambridge University, after which he ended his career as senior lecturer in chemistry at Cambridgeshire College of Arts and Technology. [1]

Quotes | By

The following are quotes by Clark:

> “There is surely no great gulf fixed between the older chemists who spoke of atoms as ‘loving’ or ‘hating’ one another and the modern physical chemists who use such terms as ‘lyophilic’ [solvent-loving] or ‘lyophobic’ [solvent-hating].”
>
> — Robert E. Clark and B.C. Saunders (1948), *Order and Chaos in the World of Atoms* (pg. vii)

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(b) Jason Rosenhouse – Wikipedia.
4. Clark, Robert. (1967). *The Christian Stake in Science* (Amz). Moody Press.

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External links

â— Robert E.D. Clark – Rational Wiki.

θΔics

In existographies, **Robert Costanza** (1950-) (CR:9) is an American systems ecologist and economist noted, in ecological economics, for his late 1990s to present work in promoting an Odum-style economics.

Overview

In 1998, Costanza, a student of Howard T. Odum and his embodied energy ideas, founded the journal of *Ecological Economics*, and therein began promoting the usage of thermodynamic models, in a loose superficial way, in ecological economics.

Smith's invisible hand | Human molecules

In 1999, Costanza, in summary of neoclassical economics, co-authored with Thomas Prugh, stated that the following bullet point view of the neoclassical economist is a questionable viewpoint to adhere to in the modern scheme of things: [1]

> "The welfare of human society is best served by the view of people as 'human molecules' who, by pursuing their own interests through the market, inevitably promote the general good. There is little need to consider things from the ecological point of view and embrace the notions of interaction, interdependence, community, and the noneconomic relations people enjoy with each other and with the natural world."

The original author of this quote is difficult to track down, but seems to be a 1995 publication by Thomas Prugh and others. [2] The etymological theme of the quote, however, seems to be a rewrite of Scottish political economist Adam Smith's 1759 theory of the invisible hand:

> "Led by an *invisible hand* to promote an end which was no part of his intention, by pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it. I have never known much good done by those who affected to trade for the public good. It is an affectation, indeed, not very common among merchants, and very few words need be employed in dissuading them from it."

albeit rewritten with a person defined as a human molecule. The "invisible hand" model was later said to have been carried over into the social mechanics models of Leon Walras and Vilfredo Pareto, both of which employed human molecule models. An example of this was employed by Spanish economist Jose Sampedro in 1967 as follows: [4]

> "Initiated by the physiocrats and was finally popularized in Adam Smith's formula of the invisible hand … making it easy for each man to satisfy his own egoism. Once this idea had become generally accepted capitalism had defeated the attitudes that hindered its early advance. This implies the theoretical negation of the social structure in a radical way since the doctrine of capitalism conceived the economy as a cluster of human molecules related to each other on a purely economic basis."

Possibly, Prugh and Costanza were attempting to summarize this pervading theme.

Education

Costanza competed his MS in architecture and urban and regional planning, followed by his PhD in 1979 in systems ecology under Howard T. Odum, with a minor in economics, all at the University of Florida.

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(b) Invisible hand – Wikipedia.
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External links

â— Robert Costanza – Wikipedia.

θΔics

In hmolscience, **Robert G. Cross** (c. 1950-) is an American author and revenue optimization theorist noted, in business thermodynamics, for his 1998 internal / external entropy theory of companies.

Overview

In 1998, Cross, in his *Revenue Management: Hard-core Tactics for Market Domination*, argues for some type of internal entropy and external entropy existing in companies. [1]

Education

Cross currently is the Chairman and CEO of Revenue Analytics.

References

1. Cross, Robert G. (1998). *Revenue Management: Hard-core Tactics for Market Domination* (pgs. 10-11, etc.). Broadway Books.

External links

â— Robert G. Cross (conference co-chair) – Revenue management and Price Optimization Conference, 2007.
â— Robert G. Cross (exuctives-in-residence), Terry College of Business, University of Georgia.

θΔics

In thermodynamics, **Robert John Deltete** (1946-), oft-cited as "R.J. Deltete", is an American philosopher and energetics historian noted for his 1983 PhD dissertation *The Energetics Controversy in the Late 19th Century Germany: Helmholtz, Ostwald, and Their Critics*, on the subject of the famous 1895 "energetics debate", which according to American physical economics historian Philip Mirowski, is said to be the best source in English on the energetics movement, which focuses particularly on the works of Georg Helm, Willard Gibbs, Wilhelm Ostwald, and Ernst Mach, among others. [1]

Education

Deltete completed his BA in philosophy and history (1969), with a minor in physics, at Seattle University, Washington, and both his MA (1974), in philosophy, and PhD (1983) at Yale University, with his 1,766-page two-volume dissertation *The Energetics Controversy in the Late 19th Century Germany: Helmholtz, Ostwald, and Their Critics* (conferred in 1984), under Ruth B. Marcus and and noted American physics historian Martin Klein.

From 1978 to present, Deltete has been a professor of philosophy at Seattle University, where he specializes in the history and philosophy of science, in cosmology, and in relations between science and Christian theology. Deltete has taught courses in philosophy of the person, ethics, logic, philosophy of science and technology, and analytic philosophy.

Religion

Deltete has an interest in the overlap of religion, science, philosophy, and god, as evidenced by his teaching work and that he has penned a number of review articles on books scientists who write on both thermodynamics and religion, including: Stephen Hawking's 1988 *A Brief History of Time* (1983 review), Helge Kragh's 2008 *Entropic Creation* (2010 review), among others. [2]

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1. (a) Deltete, Robert John. (1993). *The Energetics Controversy in the Late 19th Century Germany: Helmholtz, Ostwald, and Their Critics, Volume 1*. PhD thesis. Yale University.
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(b) Deltete, Robert J. (2010). "Entropic Creation: Religious Contexts of Thermodynamics and Cosmology. By Helge S. Kragh." Zygon 45 (1):281-282.

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● Deltete, Robert J. (2007). "Wilhelm Ostwald's Energetics 2: Energetic Theory and Application, Part I" (abs), *Foundations of Chemistry*, 9(3):256-316
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● Robert J. Deltete (Robert J.) – PhilPapers.org.
● Robert Deltete (faculty) – Seattle University.

θΔics

In existographies, **Robert O. Doyle** (1936-) (CR:18), or "Bob Doyle", is an American physicist and philosopher, noted for

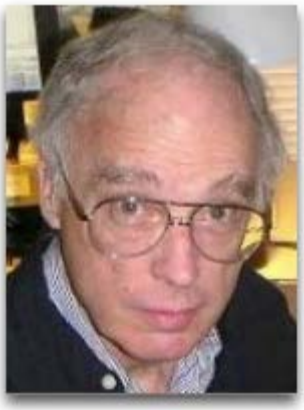

Overview

In 2003, Doyle launched his site InformationPhilosopher.com, in which he extols on his second law based "information philosophy" and writes encyclopedia style articles on related biographies related subject matters. The gist of the site, as of 2008, seems to be a prolonged effort to frame out an ontic openings stylized anti-deterministic pro-free will polemic, which elaborates on a search to answer the following query: [1]

> "Given the second law of thermodynamics, which says that any system will over time approach a thermodynamic equilibrium of maximum disorder or *entropy*, in which all information is lost, and given the best current model for the origin of the universe, which says everything began in a state of equilibrium some 13.75 billion years ago, how can it be that living beings are creating and communicating new information every day? Why are we not still in that state of equilibrium?"

The utility of InformationPhilopher.com is that it has over 200 online biographies of philosophers and scientists, many of which overlap thematically with Hmolpedia, in respect to entropy-connected topics.

Doyle's first book, the 2011 *Free Will: the Scandal in Philosophy*, which is said to be based on the based on the "freedom section" of the Information Philosopher website, takes aim at the view that, in modern times, "academic philosophers are convincing many young students that they are deterministic biological machines with a "compatibilist free will", by arguing, using his cache of philosophers as launching points, that humans have a sort of in-determinant emergent biological free will, or something along these lines. [2]

Entropy | Mis-information

Doyle, in short, is typical of many thinkers trying to over-sell and or falsely-sell the term "information" of communication theory as synonym of "entropy" of physics, such as Warren Weaver (1949) or Seth Lloyd (2016) have done (see following quotes):

> "**Shannon's** [information theory] **work, roots back**, as von Neumann has pointed out, **to Boltzmann's observations** [what ?], in some of his work on statistical physics (1894), that entropy is related to '**missing information**'."
>
> — Warren Weaver (1949), *The Mathematical Theory of Communication* (footnote, pg. 3)

The gist of **Doyle's** entire effort is to use the music of the Shannon bandwagon, as on ontic opening, to sell the base-less argument that there is free will behind "choice", or something along these lines.

> "The great nineteenth-century statistical physicists James Maxwell , Ludwig Boltzmann, and Willard Gibbs derived the fundamental formulas of what would go on to be called 'information theory'."
>
> — Seth Lloyd (2016), *Programming the Universe* (§:Information and Physical Systems, pg. 163)

as some kind of invented history, confused panacea, open sesame, or magic flute (see: entropy pied piper).

Boltzmann, correctly, contrary to Weaver' claim, NEVER made “observations” about “missing information”. [5] Weaver made a “contrived history” footnote in order to bolster support for his friend Claude Shannon’s new information theory.

Likewise, the "formulas" of information theory, correctly, contrary to Lloyd's claim, were derived by Ralph Hartley in his 1928 "Transmission of Information", NOT by Maxwell, Boltzmann, or Gibbs.

In short, owing to what is called the hydraism problem, meaning that universal geniuses, supposedly, no longer exist, meaning that people can now, more often than not scam other people with ideas from one field of study, the latter being ignorant of that field, the origin of the above Sokal affair, scientific snake oil, invented history style scam, is that (a) because Boltzmann, in his “Further Studies on the Thermal Equilibrium of Gas Molecules” (1872), wherein he derives his **H-theorem** (the symbol ‘H’ for heat), meant to quantify the velocity distributions of the atoms and molecules of the body of gas, which he aimed to “closely relate” to Clausius’ heat state function formula entropy (1865), or inexact differentials of heat δQ divided by the absolute temperature T, going into or out of bodies, employed the “logarithm” (log), a mathematical tool invented by John Napier (c.1594), and (b) because Ralph Hartley in his “Transmission of Information” (1928), wherein he derives an **H formula** (where ‘H’ for Hartley, is the amount of information associated with *n* selections for a particular telegraph system), meant to quantify the capacity of a telegraph system to transmit information, in the form of high (1) and low (0) pulses in a telegraph wire, mathematically, that (c) John Neumann (1940) thought it would be “funny joke” if Claude Shannon (1949) convoluted all of this into the punchline that Boolean numbers (1,0,1,0,0,1 …), i.e. computer language and or telegraphic communication signals, stored or transmitted in the form of voltage pulses or electromagnetic waves, can now be synonymously called “entropy” of thermodynamics. [5] Millions of pages of published scientific confusion have resulted, in the last 80-years, from this "inside" joke.

Doyle, in similar fashion, invents, rewrites, and contrives history, as he sees fit, so to make published scientific confusion; the following are but two salient examples:

> “Nevertheless, **Gibbs's idea of the conservation of information** [what ?] is still widely held today by mathematical physicists.”
>
> — Robert Doyle (2013), “Gibbs” (Ñº), InformationPhilosopher.com

> “This led many statistical physicists, notably **J. Willard Gibbs, to claim that information is the same** [what ?] wherever the particles are.”
>
> — Robert Doyle (2019), “Scandals” (Ñº), InformationPhilosopher.com

Gibbs, correctly, NEVER theorized about information. In **fact**, in Gibbs entire collected works on thermodynamics (1876), including his work on work on statistical mechanics (1902), he only uses the term “information” ONE time, and done so in a letter, and in a standard English language sentence use of the term: [4]

> “The thermochemical data on which such a prediction of E.M.F. and reversible heat is based must, be something more than the heat of union of the radicles. They must give **information** on the more delicate question of the temperature at which that heat can be obtained. In the terminology of Clausius they must relate to entropy as well as to energy—a field of inquiry which has been far too much neglected.”
>
> — Willard Gibbs (1887), “Letter to Oliver Lodge on Electrochemical Thermodynamics”, Jan 9; in *Scientific Papers* (pg. 407)

Things like Doyle publishing articles and books claiming that Gibbs was theorizing about the "conservation of information" or Weaver asserting that Boltzmann was thinking about heat as "missing information" (in the Boolean number sense of things), etc., are but a blatant disservices to science, producing what Ingo Muller correctly refers to as "obfuscation":

> "No doubt, Shannon and Neumann thought that this was a **funny joke**, but it is not! It merely exposes Shannon and Neumann as intellectual snobs. Indeed, it may sound philistine, but **a scientist *must* be clear**, as clear as he can be, and **avoid wanton obfuscation** at all cost."
>
> — Ingo Muller (2007), *A History of Thermodynamics* (pgs. 124)

thereby leading to "great" mis-education of the minds of young students, which must be later only unlearned, about one of the most important topics of human existence, namely: heat in respect to work. Doyle, for whatever reason, is oblivious to this, generally a repercussion of the fact that he is lost in the music of the Shannon bandwagon (as shown above). [5]

Education

Doyle completed his BS in physics at Brown University in 1958 and PhD in astrophysics, thesis on continuous spectrum of the hydrogen quasi-molecule, at Harvard University in 1968. Over the next three decades or so, Doyle invented a number of gaming, electronic, and programming devices. In 2003-2004, he launched his InformationPhilosopher.com, a combination of encyclopedia style biographies of a number of obscure "information philosophy" related thinkers, such as Edward Culverwell (Boltzmann H-theorem debater), and Doyle's own blended philosophy, that atoms, molecules, humans, and larger structures are "information structures" governed by a blend of the second law, quantum mechanics, and the uncertainty principle, with which he investigates topics such as: freedom, value, purpose, and free will, among others. [3] In 2003, Doyle re-joined the astronomy department of Harvard in some way, to work on his humans as information structures philosophy. Doyle states that he has about 150+ books on free will.

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â— Doyle, Robert O. (2010). "Jamesian Free Will: The Two-Stage Model of William James", *William James Studies*, Jun.

External links

â— Bob Doyle (inventor) – Wikipedia.
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θΔics

In hmolscience, **Jacob Robert Emden** (1862-1940), oft-cited "R. Emden", was a Swiss astrophysicist and meteorologist noted for []

Overview

In 1913, Emden stated the following: [1]

> "The possibility of terrestrial life results from the vast increase of entropy associated with the transformation of hot solar radiation into colder terrestrial radiation."

which is cited as an early photon mill argument for terrestrial CHNOPS+ animation.

Quotes

The following are related quotes:

> "As a student, I read with advantage a small book by Franz Wald entitled *The Mistress of the World and her Shadow*. These meant energy and entropy. In the course of advancing knowledge the two seem to me to have exchanged places. In the huge manufactory of natural processes, the principle of entropy occupies the position of manager, for it dictates the manner and method of the whole business, whilst the principle of energy merely does the bookkeeping, balancing credits and debits."
>
> — Robert Emden (1938), "Why do we Have Winter Heating?"; cited by Arnold Sommerfeld (1952); Joseph Kestin (1956); Norman Dolloff (1975), and others [2]

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(c) Ebeling, Werner and Feistel, Rainer. (2011). *Physics of Self-Organization and Evolution* (§3.1: The Photon Mill, pgs. 88-). John Wiley & Co.
2. (a) Emden, Robert. (1938). "Why do we Have Winter Heating?" (pdf), *Nature*, 141:908.
(b) Sommerfeld, Arnold. (1952). *Lectures on Theoretical Physics: Thermodynamics and Statistical Mechanics* (pg. 41) (*Thermodynamic und Statistick: Vorlesungen uber theoretische Physik*) (translator: Joseph Kestin). Academic Press, 1956.
(c) Dolloff, Norman H. (1975). *Heat Death and the Phoenix: Entropy, Order, and the Future of Man* (Emden, pg. xi). Exposition Press.
(d) Volkenstein, Mikhail. (2009). *Entropy and Information* (pg. 59). BirkHauser Basel.
(e) Kreuzer, Hans J. and Tamblyn, Isaac. (2010). *Thermodynamics* (Emden, pg. 138). World Scientific.

External links

â— Robert Emden – Wikipedia.

θΔics

In thermodynamics, **Robert B. Evans** (c.1940-) is an American mechanical engineer, noted for his 1969 essergy theory, argued to be an umbrella replacement term for the various types of thermodynamic potentials. [1]

Education

Evans completed his PhD, thesis "A Proof that Essergy is the Only Consistent Measure of Potential Work", at Dartmouth College, Hanover H. H. Thayer School of Engineering. In 1980, Evans was associated with the Georgia Institute of Technology, School of Mechanical Engineering.

Other

There also is a 1962 book *A Contribution to the Theory of Thermo-economics*, by a Robert B. Evans, which is puzzling, as this pre-dates the known Evans PhD by seven years? [3]

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1. (a) Evans, Robert B. (1969). *A Proof that Essergy is the Only Consistent Measure of Potential Work* (abs), PhD thesis, Dartmouth College, Hanover H. H. Thayer School of Engineering.
(b) Dincer, Ibrahim and Rosen, Marc A. (2002). *Thermal Energy Storage: Systems and Applications* (pg. 22). John Wiley and Sons.
3. Evans, Robert B. (1962). *A Contribution to the Theory of Thermo-economics*. University of California, Department of Engineering.

θΔics

In existographies, **Robert Fludd** (1574-1637) (CR:5) was English physician, scientist, and philosopher, noted for []

Overview

In 1617, Fludd gave the following Aristotelian universe, showing the elemental spheres of terra (earth), aqua (water), aer (air), and ignis (fire): (Ñº)

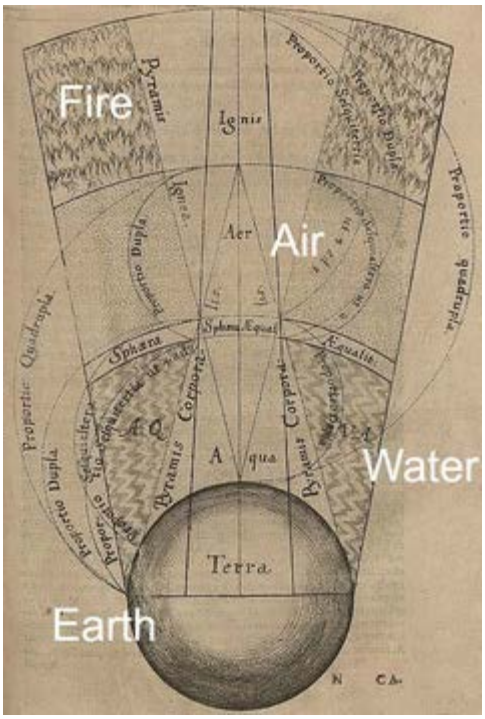

In 1638, Fludd, who is known to have had access to the c.240BC work of Philo of Byzantium (c.280-220BC) on thermometers, used a modified Philo-thermometer design, in which he placed the sphere vertically above the jug (adjacent), thus making an unsealed air thermometer (see: thermometer), with a scale. [1]

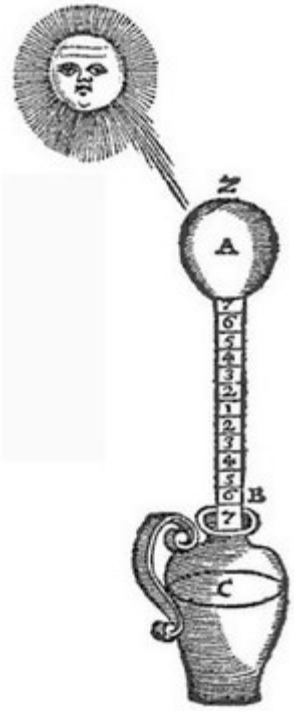

(add)

Quotes | By

The following are quotes by Fludd:

> "The potential or dark principle, is contrary and opposite in his essential property, unto the actual emanation of light beginning, so also have each of them manifested, or brought forth into this world, two offsprings, or essential properties, which are oppugnant in condition, and flat adversaries in their nature unto one another; and the two active virtues are Cold and Heat. . . . For the property of the dark nothing, or deformed abyss, is naturally to rest, and not to act or operate; and the reason is, because that its appetite is to be conversant in and about the center, beyond the which there is no motion or action, and not to dilate itself towards the circumference, as the spirit of light, or god in his volunty, or patent nature, is accustomed to do. For this reason, the dark principle doth challenge unto itself, by a natural instinct, rest and quietness, and this property begetteth or produceth one essential virtue of its own condition, namely, cold, the which, as it is elected as a champion to resist the assaults of her opposite, namely of Heat, whose comparisons are motion or action; . . . so unless it be roused or stirred up by the assaults of Heat, it moveth not, but seemeth to wait upon its drowsy mother, Darkness and privation, whose children are fixation and rest, which sleep in and cleave fast unto the center, and therefore are unwilling to look forth towards the circumference. And in verity, cold is an essential act, proceeding from, and attending on, the divine puissance, which in this property doth contract its beams from the circumference into its self."
>
> — Robert Fludd (c.1620), *Publication*; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 94) [2]

References

1. McGee, Thomas D. (1988). *Principles and Methods of Temperature Measurement* (Philo, pg. 3; Fludd, pg. 3-4). Wiley-IEEE.
2. Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea*. Transaction Publishers, 2011.

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â— Grayling, A.C. (2016). *The Age of Genius: the Seventeenth Century and the Birth of the Modern Mind* (pg. #). Bloomsbury.

External links

â— Robert Fludd – Wikipedia.

θΔics

In thermodynamics, **Robert Fox** (1938-) is an English physics historian noted for a number of publications dealing with early theories of heat and the history of thermodynamics. [1]

Collaborations

In 1979, Fox collaborated with British physicist Eric Mendoza in an exhaustive critical edition of the surviving manuscripts surrounding French physicist Sadi Carnot's famous 1824 memoir *Reflections on the Motive Power of Fire* (*Réflexions sur la Puissance Motrice du Feu*). [2]

Fox also collaborated with noted Lazare Carnot biographer Charles Gillispie, on the 1997 book *Pierre-Simon Laplace, 1749-1827: a Life in Exact Science*, a book on the work of French physicist Pierre Laplace. [4]

Education

Fox's education credentials include completion of an MA, a PhD, and a position on the *Faculté des Sciences de l'Administration* (Faculty of Business Studies), Laval University (FSA).

Fox was a director of the Science Museum, London and a director of research at the Centre de Recherche en Historie des Sciences et des Techniques at the Cite des Sciences et de l'Industrie in Paris. He then taught at the University of Lancaster. In 1988, he became a professor of history of science at the University of Oxford; retiring from that position in 2006. [1] He has since been working on a social and cultural history of science and technology in France between 1814 and 1918, and on the history of physics in Oxford since 1850. [3]

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2. Fox, Robert. (1979). *Reflections on the Motive Power of Fire: a Critical Edition with the Surviving Scientific Manuscripts* (Eric Mendoza, 8+ pgs.). Manchester University Press, 1986 edtion.
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External links

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- Robert Fox (faculty) – University of Oxford.

θΔics

In animate thermodynamics, **Robert Frenay** (1946-) (DN=4) is an American nature-technology writer noted for []

Overview

In 2006, Frenay, in his *Pulse: the Coming Age of Systems and Machines Inspired by Living Things*, attempted to outline a "new biology" presentation, thematically similar to Kevin Kelly's 1994 *Out of Control*, each chapter stitched together with passing mention to the second law and related neighbor topics, such as Goethe's 1794 moving order, Samuel Butler's 1863 "Darwin Among the Machines", Vladimir Vernadsky's 1926 living matter / inert matter divide of the elements theory, Alfred Lotka's 1926 free energy-available energy ideas, John Neumann's automaton theory, among others. [1]

Living things

> *See main: Living chemical reaction*

A salient issue with Frenay's book is that, having been written in the pre defunct theory of life (2009) years, it is frocked with mentions of a "living thing", which Frenay loosely defines as a jumble of connections of random elements that drifted together, four billion years ago, after the formation of RNA (which Frenay defines as "not alive"), forming bonds, according to a tendency or desire, that "came alive", a premise which he attempts to justify throughout the book using the worn-out terms, such as emergence, self-organization, complexity, and information theory. Resultantly, some of Frenay's passages are nearly inchoate in their backwardness: [1]

> "Nonliving chemical reactions are driven by thermodynamics (heat) explore the possibilities open to them in an ergodic fashion—that is, by a process in which every exploratory sequence is the same. Life, on the other hand, explores its possibilities through evolution. It accumulates information—first in genes, then in memory—to help guide its search down narrower and more productive paths. How and when did information come to dominate the energetic processes of the physical world, and in doing so give rise to life?"

The errors in the passage are multitude, to say the least. Firstly, there is no such thing is a "nonliving chemical reaction", just as there are no "living chemical reactions", there are only chemical reactions, reactions are neither alive nor dead, but rather only atomic processes. Secondly, Frenay is unaware, as many are, that information is not thermodynamics and that information theory, which is but a descriptive language, has not overtaken the laws of thermodynamics. [2]

Gray goo catastrophe

In discussion of nanomachines, Frenay discusses how researchers such as English molecular scientist Michael Gross, have begun to evoke the second law as a block against the so-called "gray goo catastrophe", the science fiction idea that some nano-scientist will invent or build, atom by atom, a "self-replicating" nanoscale machine that will grow and spread over the plant like a goo. Yet, conversely, Frenay also cites Stuart Kauffman whose auto-catalytic closure theory is such a gray goo catastrophe model.

References

1. Frenay, Robert. (2006). *Pulse: the Coming Age of Systems and Machines Inspired by Living Things* (gray goo, pg. 49; nonliving chemical reactions, pg. 142). MacMillan.
2. Thims, Libb. (2012). "Information theory ≠ Thermodynamics" (link), *Journal of Human Thermodynamics*, 8(1):1-#.

External links

â— Robert Frenay – Wikipedia.

θΔics

In poetry, **Robert Frost** (1874-1963) (IQ:145|#654) [RGM:210|1,310+] was an American poet noted for []

Overview

In 1920, Frost, in his poem "Fire and Ice", equated fire with the emotion of desire (or heat with passion), and ice with hate (or cold with aversion), in the context of the physical views of eschatology (red giant or heat death). The poem reads as follows: [1]

> Some say the world will end in fire,
> Some say in ice.
> From what I've tasted of desire
> I hold with those who favor fire.
> But if it had to perish twice,
> I think I know enough of hate
> To say that for destruction ice
> Is also great
> And would suffice.

The poem is said to be the result of a 1919 dinner party conversation between Frost and American astronomer Harlow Shapley, during which time Frost grilled Shapley at length about the two rival theories of the ultimate fate of the sun and earth. [2] The icy end of times perspective is generally attributed to Rudolf Clausius' heat death theory scenario of universal end. [3]

Religion | Science

Frost, at the turn of the early 20th century, was said to have been grappling with a conflict between science and religion, and it was not until his encounter with Henri Bergson in 1912 and the Arthur Eddington, Werner Heisenberg, and Niels Bohr in the early 1920s that he began to find, in his mind, plausible arguments against materialism. [4]

Other

Frost's 1916 poem "The Road Not Taken", with its emblematic lines: [5]

> I took the one less traveled by,
> And that has made all the difference.

was served as the title to Morgan Peck's second law / religion themed 1978 book *The Road Less Traveled*.

References

1. Fire and Ice (poem) – Wikipedia.
2. Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pg. 177). University Press of America.
3. Boerio-Goates, Juliana, and Ott, J., Bevan. (2000). *Chemical Thermodynamics: Principles and Applications* (pg. 93). New York: Elsevier Academic Press.
4. Hass, Robert B. (2002). *Going by Contraries: Robert Frost's Conflict with Science* (pg. 195). University Press of Virginia.
5. The Road Not Taken (poem) – Wikipedia.

Further reading

â— Romber, Robert H. (1993). "Robert Frost and the Second Law of Thermodynamics" (abs), *Physics Teacher*, 31(6):360.

External links

â— Robert Frost – Wikipedia.

θΔics

In existographies, **Robert Grant** (1793-1874) (EvT:14|21+) (CR:1) was a Scottish physician, characterized an "outspoken pre-Darwinian materialist transformist" (Hecht, 2003), noted for []

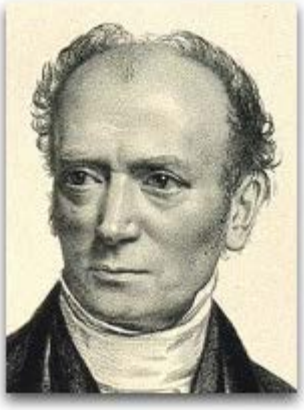

Overview

In 1826, Grant publicly announced his speculation that 'transformation' might affect all organisms; noted that successive strata seemed to show a progressive, natural succession of fossil animals; that these forms 'have evolved from a primitive model' by 'external circumstances'; he accepted a common origin for plants and animals, and the basic units of life ('monads'), he proposed, were spontaneously generated.

Darwin

In 1826, Charles Darwin, then a second-year medical student at Edinburgh University, became a pupil of Grant, via his Plinian Society for student naturalists, and therein became Grant's keenest student and assisted him with collecting specimens. (Ñº) Grant's "transformism" version of species origins was concerned with spontaneous generation, proving that life could get started with no god, and with radical politics. Darwin, supposedly, rejected Grant's transformism ideas, from some time, i.e. until he came under the influence of Thomas Malthus's economic theories about population growth under limited land size theories. [1]

Quotes | On

The following are quotes on Grant:

> "Darwin was coming under the wing of an uncompromising evolutionist. Nothing was sacred for **Grant**. As a free-thinker, Grant saw no spiritual power behind nature's throne. The origin and evolution of life were due simply to physical and chemical forces, all obeying natural laws."
>
> — Adrian Desmond (1994), *Darwin: the Life of a Tormented Genius* (Ñº)

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 403). HarperOne.

External links

â— Robert Edmond Grant – Wikipedia.

θΔics

In existographies, **Robert Grosseteste** (1170-1253) (IQ:165|#450) [RGM:764|1,500+] (Siegfried 10:9) (MAG:23) (CR:4) was an English scholastic philosopher, statesman, and theologian, generally noted as an early formulator of the scientific method, particularly in respect to controlled experiment; influenced: Roger Bacon, Bonaventure, and Johannes Kepler.

Overview

Grosseteste's "Neoplatonic Aristotelianism" inspired Roger Bacon and Bonaventure to join the ranks of those who gave 'light' special status in the order of things; his work on light, and that light was a divine creative force, influenced Johannes Kepler. [2]

Quotes | On

The following are quotes on Grosseteste:

> "Experimental science began particularly with the work of **Robert Grosseteste**, in the thirteenth century, but in the sixteenth and seventeenth centuries scientists began tot adopt the empirical experimentation that engineers and artisans were already using."
>
> — Richard Kirby (1956), *Engineering in History* [1]

> "**Grosseteste** is also sometimes fingered as the father of western experimental science, because of his proposal that to discover if A causes B, we need to do a series of controlled experiments, in some of which A is present, and in some of which A is absent. The claim that Grosseteste was a founder of the experimental method was most notably made by Alistair Crombie in a book, Robert Grosseteste and the Origins of Experimental Science 1100–1700 (1953)."
>
> — William Ashworth (2017), "Scientist of the Day" [2]

Quotes | By

The following are quotes by Grosseteste:

> "Now, all causes of natural effects must be expressed by means of lines, angles and figures, for otherwise it is impossible to grasp their explanation. This is evident as follows. A natural agent multiplies its power from itself to the recipient, whether it acts on sense or on matter. This power is sometimes called species, sometimes a likeness, and it is the same thing whatever it may be called; and the agent sends the same power into sense and into matter, or into its own contrary, as heat sends the same thing into the sense of touch and into a cold body. For it does not act, by deliberation and choice, and therefore it acts in a single manner whatever it encounters, whether sense or something insensitive, whether something animate or inanimate. But the effects are diversified by the diversity of the recipient, for when this power is received by the senses, it produces an effect that is somehow spiritual and noble; on the other hand, when it is received by matter, it produces a material effect. Thus the sun produces different effects in different recipients by the same power, for it cakes mud and melts ice."
>
> — Robert Grosseteste (1231), *On Lines, Angles and Figures or On the Refraction and Reflection of Rays* (Ñº)

References

1. Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 126). Courier, 1990.
2. Ashworth, William. (2017), "Scientist of the Day" (Ñº), Oct 9

External links

â— Robert Grosseteste – Wikipedia.

θΔics

In hmolscience, **Robert D. Handscombe** (c.1955-) is an English engineer and business management professor noted, in business thermodynamics, for being the co-author, with English mechanical engineer Eann Patterson, *The Entropy Vector: Connecting Science and Business*, wherein they argue that 'there is real science at the heart of management science' at least when it comes to creating order from disorder within organizations and markets. (Q)

Overview

In 2004, Handscombe, together with with English mechanical engineer Eann Patterson, published *The Entropy Vector: Connecting Science and Business*, wherein they apply entropy theory, e.g. low entropy, mental entropy, etc., to business operation to argue that managers should strive to find the "entropy vector" characterized by low entropy creation, low energy input, and high work output. [1]

Education

Handscombe completed a PhD and is a chartered engineer. He has been involved in teaching, research, and consultancy activities at the management school at the University of Sheffield. In 2004, Handscomebe was the director of the White Rose Centre for Enterprise. [2]

References

1. Handscombe, Robert D. and Patterson, Eann A. (2004). *The Entropy Vector: Connecting Business and Science*. World Scientific.
2. Ibid. (2004). About the authors (front matter)

External links

- Handscombe, Robert D. – WorldCat Identities.

θΔics

In existographies, **Robert T. Hanlon** (c.1957-) is an American chemical engineer, noted for []

Overview

In 2020, Hanlon, in his *Block by Block: the Historical and Theoretical Foundations of Thermodynamics*, attempted to present thermodynamics using an illustrative, historical, and physical-conceptual style.

Illustrations

Hanlon, in his *Block by Block*, breaks up his text with timeline-like flow-style illustrative diagrams, with artwork by Carly Sanker, of discoveries and key points related to various core thermodynamical concepts, such as big bang and quantum mechanics; the following is his take on atomic theory, showing: Democritus (c.400BC), Robert Boyle (17th century), Isaac Newton (1687), Antoine Lavoisier (18th century), John Dalton (19th century), Rudolf Clausius and James Maxwell (1855-1860s), on the kinetic theory of gases, James Maxwell and Ludwig Boltzmann, on statistical mechanics, Einstein (1905) on Browning motion, William Crookes (1870s) on cathode rays, Joseph Thomson (1890s), Marie Curie and Pierre Curie (1990s) on radioactivity, Robert Millikan (1913), Ernest Rutherford (c.1910), Henri Becquerel (1896), James Chadwick (1932), Otto Hahn, Lise Meitner, and Fritz Strassman (1938) on splitting the uranium atom, Ernest Rutherford and Hideki Yukawa (1935) on the nature of the nuclear force or “strong nuclear force”, Enrico Fermi (1930s) on the weak nuclear force, James Maxwell (1873) on the electromagnetic force, and Newton (1968) on the gravitational force (or gravitation).

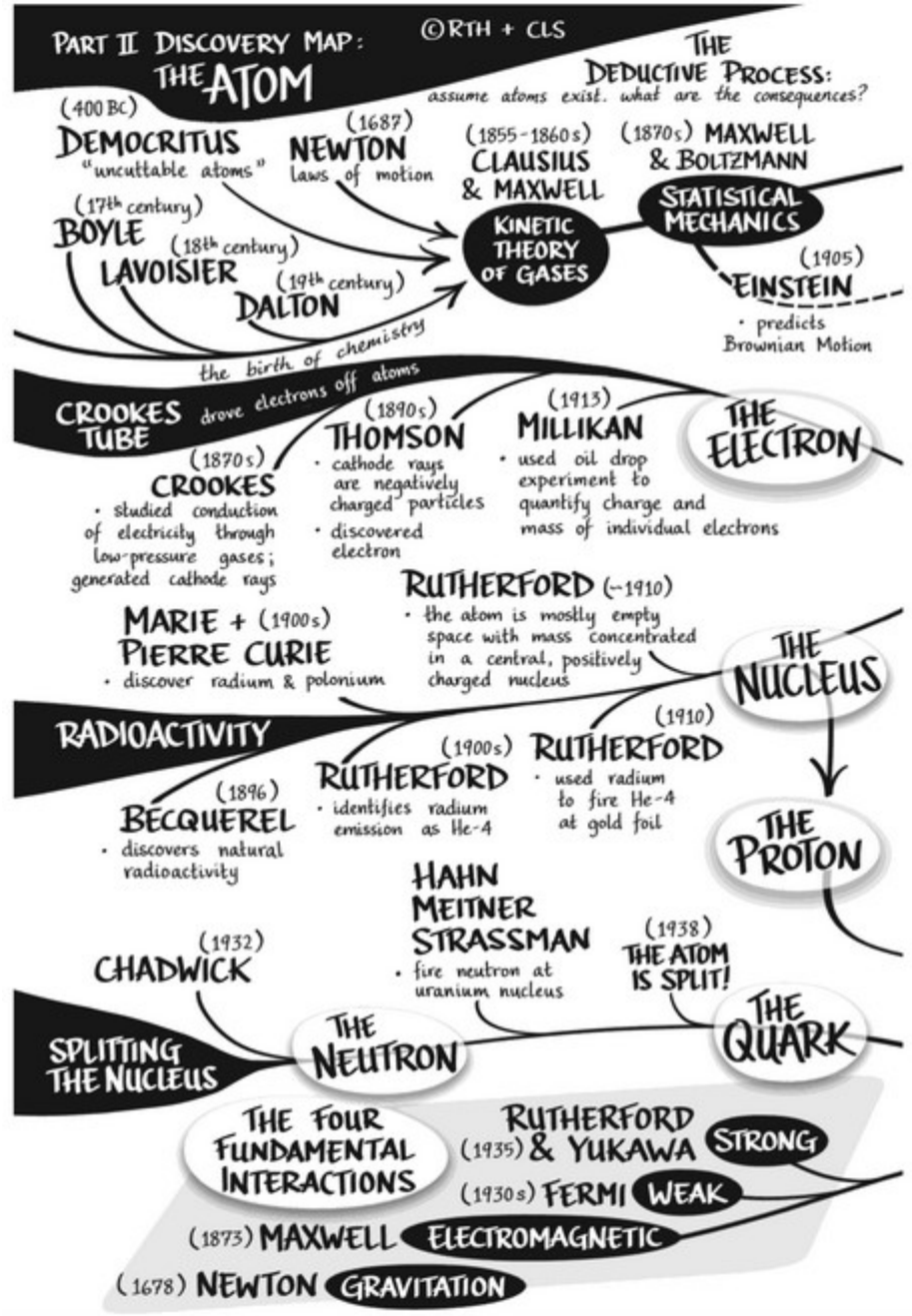

These diagrams, to note, are similar to Bernard Porter's 1939 Map of Physics.

Downgrades

Of note, Hanlon devotes his final chapter 43 "Shannon: Entropy and Information Theory", in a blindly ignorant (see: Shannon bandwagon; entropy pied piper; open sesame; thermodynamic information fallacy; information entropy quotes) attempt to sell bits as joules per degrees kelvin. [2]

Education

In 1985, Hanlon completed his PhD in chemical engineering at MIT with a dissertation on "Realised Catalyst characterization and secondary reaction effects in iron-catalyzed Fischer-Tropsch synthesis" (Ñº) In 2020, Hanlon was a senior lecturer in the school of chemical engineering practice at MIT.

Quotes | Employed

The following are quotes employed by Hanlon:

> “Suppose a piston moves inward, so that the atoms are slowly compressed into a smaller space. What happens when an atom hits the moving piston? Evidently it picks up speed from the collision. You can try it by bouncing a ping-pong ball from a forward-moving paddle, for example, and you will find that it comes off with more speed than that with which it struck (Special example: V an atom happens to be standing still and the piston his it, it will certainly move.) So the atoms are ‘hotter’ when they come away from the piston than they were before they struck it. Therefore, all the atoms which are in the vessel will have picked up speed. This means that when we compress a gas slowly, the temperature of the gas increases. So, under slow compression, a gas will *increase* in temperature, and under slow expansion it will *decrease* in temperature.”
>
> — Richard Feynman (1963), *Lectures on Physics, Volume One* (pgs. 1-4); cited by Robert Hanlon (2020) in his *Block by Block* (xiii) as an explanation of adiabatic compression on a fundamental level [1]

> “I tried reading Gibbs and couldn’t get past the third page.”
>
> — Anon (c.2000), comment of PhD student to Robert Hanlon [1]

Quotes | By

The following are quotes by Hanlon:

> “Clausius’ 1850 equation: U = Q – AW, is defined such that Q quantifies the heat ‘gained by the system’ (positive value), while W quantifies the ‘work done by the system’ (positive value), such that a system gains energy for positive Q and loses energy for positive W (by doing work).”
>
> — Robert Hanlon (2020), *Block by Block* (pg. 117)

References

1. Hanlon, Robert. (2020). *Block by Block: the Historical and Theoretical Foundations of Thermodynamics* (Illustrators: Robert Hanlon and Carly Sanker) (adiabatic, xiii; Gilbert, pg. 218). Oxford University Press.
2. Thims, Libb. (2012). “Thermodynamics ≠ Information Theory: Science’s Greatest Sokal Affair” (Ñº), *Journal of Human Thermodynamics*, 8(1): 1-120, Dec 19.

External links

â— Robert Hanlon – Research Gate.

θΔics

In science, **Robert Hazen** (1948-) is an American geologist, earth scientist, turned hydrothermal vent origin of life researcher, noted for his 2005 step-wise emergence origin of life model, according to which there is NO "exact point" at which life starts, but rather life is the summation of a number of multiple emergence events.

Overview

In 1988, Harold Morowitz, after working for a number of years, at Yale, on cellular energetics, transferred to George Mason University, and shortly thereafter began working, with Hazen, on the theoretical high-pressure chemistry of hydrothermal vents origin of life hypothesis; a theory which originated when firstly, the 1970s, Jack Corliss descended in the research submersible *Alvin* to the deep ocean floor and found ecosystems at undersea volcanic vents, and secondly, when, in the late 1980s, German chemist Gunter Wachtershauser proposed that clay substrates were involved in the hydrothermal vents origin scenario.

In Sep 2000, Hazen attended a “What is Life?” conference in Modena, Italy, which was attended by a hundred scientists, philosophers, and theologians, amid which the most contentious debate occurred among the scientists, resulting in four main origin of life views:

A. Life started with first semipermeable lipid membrane.
B. Life began with first metabolic cycle.
C. Life began when an entity first obtained an RNA-like genetic system.
D. Life began as a self-replicating mineral.

In 2005, Hazen, as a precipitate of the conference, published *Genesis: the Scientific Quest for Life’s Origin*, wherein he outlines a step-wise gradual emergence origin of life theory, amid which he opens to the folklore version of thermodynamics, aka energy is conserved, but all systems tend towards disorder, after which he attempts to sell “emergence” as the missing law (pg. 12) to counter the second law; the brand of emergence he sells, being a mixture of: Per Bak sand pile “self-criticality”, Stuart Kauffman “autocatalytic closure” networks, Stephen Wolfram + John Holland artificial life algorithm simulations, and Murray Gell-Mann “nonextensive entropy” models of complexity.

Chemistry → Biology | Stepwise model

The following is Hazen’s core model (pgs. 28-31), namely, based on Harold Morowitz’s multiple emergences model, Hazen asserts that a number of summational steps were involved in going from non-life to life, and that there is NO “exact point” at which life began:

“Attempts to

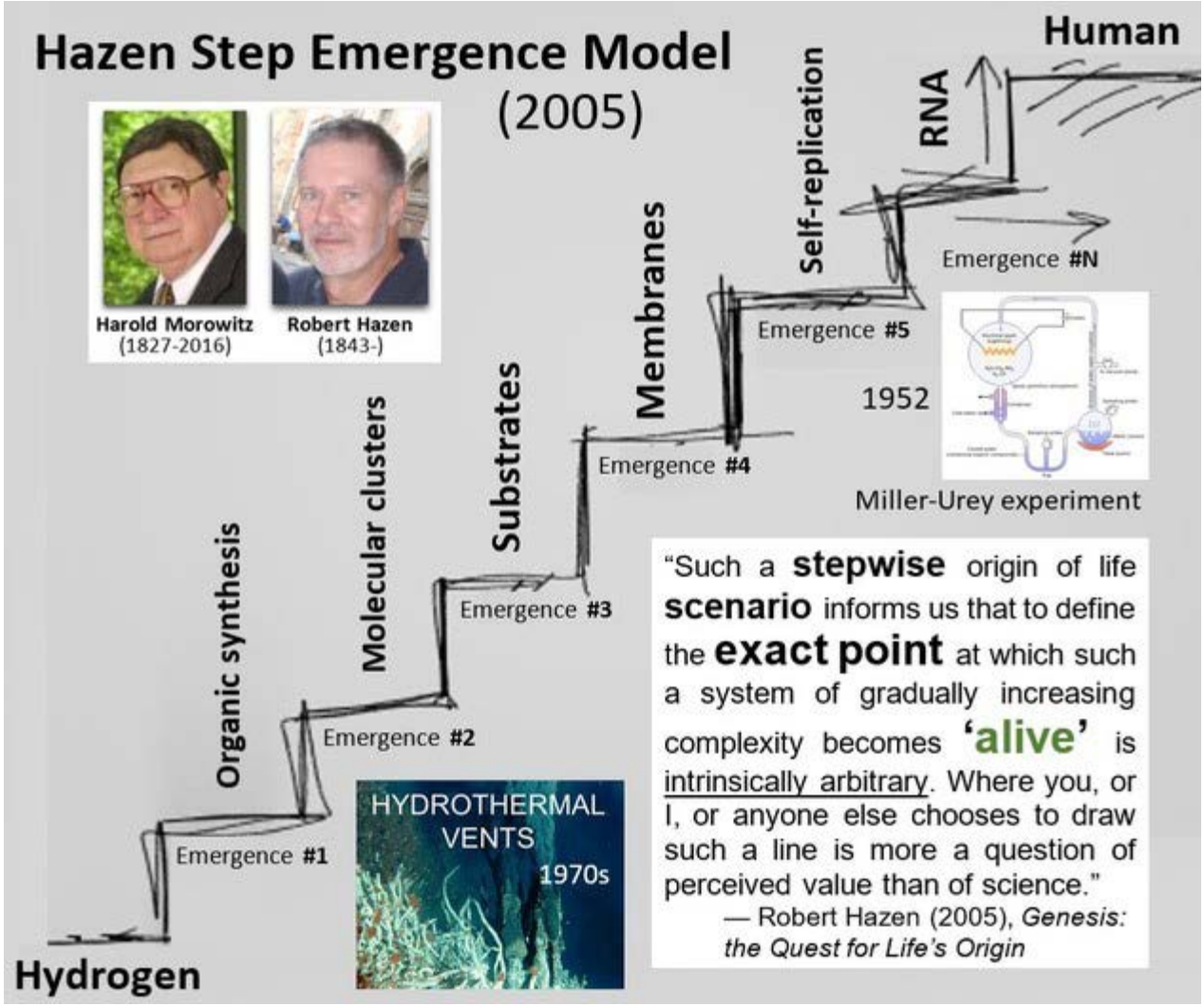

formulate an absolute definition that distinguishes between life and nonlife represents similar false dichotomy. The first cell did not just appear, fully formed with all its chemical sophistication and genetic machinery. Rather, life must have arisen through a sequence of emergent events—diverse processes of organic synthesis, followed by molecule selection, concentration, encapsulation, and organization into diverse molecular structures. The emergence of self-replicating molecules of increasing complexity and mutability led to molecular evolution though the process of natural selection, driven by completion for lamented raw materials.

What appears to us as a yawning divide between nonlife and life obscures the fact that the chemical evolution of life occurred in this stepwise sequence of successively more complex stages of emergence.

Progressive hierarchy of emergent steps leading from a prebiotic earth enriched in organic molecules, to functional clusters of molecules perhaps arranged on a mineral surface, to self-replicating molecular systems that copy themselves using resources in their immediate environment, to encapsulate in membranes, i.e. to cellular life. Recall the words of Harold Morowitz: 'the unfolding of life involves many, many emergences'.

Such a stepwise scenario informs attempts to define life. To define the exact point at which such a system of gradually increasing complexity becomes 'alive' is intrinsically arbitrary. Where you, or I, or anyone else chooses to draw such a line is more a question of perceived value than of science."

This last paragraph brings to mind the Francis Macnab (1818) division, according to which a growing plant is not alive.

Religion

In 2003, Hazen, in his "In God We Trust: Motto Come Lately", defended from the seeming atheist side of the fence, against the Alabama Courthouse "Ten Commandments" display dispute, pointing out that the founding fathers did not advocate "in god we trust" on the US coinage, but rather correctly that astronomer David Rittenhouse in the 1790s put the phrase "United States of America" and "Liberty" on the coins. [2] Some of the responses to Hazen's 2006 *Washington Post* interview (Q) on life and religion, however, seem to give hint that he is a closet theist, using the term "emergent complexity" as his ontic opening, e.g. on the query: "does the scientific research into the origin of life require faith?", Hazen responded:

> "Science MUST remain agnostic on the question of god's existence and the meaning of the universe. We should leave those question to theology. In this sense science is VERY limited in what it can do and say about origins. We can only deal with the (rather trivial?) details of chemistry."

In his 2013 "The Origins of Life" lecture (Q) at Villanova University he says "scientists what to know how god did it", beyond what's stated in Genesis, which is clear indication he is a closet theist.

Education

Hazen completed his BS and SM in geology at MIT in 1971, his PhD in earth science in 1975 at Harvard, after which he joined the research department of Carnegie Institution. (Q)

References

1. Hazen, Robert. (2005). *Genesis: the Scientific Quest for Life's Origin*. Joseph Henry Press.
2. Hazen, Robert. (2003). "In God We Trust: Motto Come Lately", *The Washington Post* (pg. A24) (pdf), Sep 1.

Further reading

● Hazen, Robert M. (2006). "Intelligent design and the College Classroom: Should we 'Teach the Controversy'?", *Astrobiology* 6, 106. (2006)

External links

● Robert Hazen – Wikipedia.

θΔics

In hmolscience, **Robert Heilbroner** (1919-2005) was an American economist noted for a number of unrealistic statements about human behavior and economic systems.

Criticism

In 1953, Heilbroner, in his *The Worldly Philosophers*, gave the opinion that human behavior, in effect, is something distinct in the universe: [1]

> "There is an unbridgeable gap between the 'behavior' of [subatomic particles] and those of human beings who constitute the objects of study of social science. Aside from pure physical reflexes, human behavior cannot be understood without the concept of volition —the unbridgeable capacity to change our minds up to the very last minute. By way of contrast, the elements of nature 'behave' as they do for reasons of which we know only one thing: the particles of physics do not 'choose' to behave as they do."

English chemist-physicist Philip Ball cites this quote as an example of incorrectness. [2]

In 1968, Heilbroner, published his *The Economic Problem*, give some type of circular flow economic diagram, and states the following: [3]

> "The flow of output is circular, self-renewing and self-feeding, [because] outputs of the system are returned as fresh inputs."

American social energy historian Eric Zencey criticized this statement cogently and humorously with the following: [4]

> "This is patent nonsense. Anything that can take as input what it excretes as output is a perpetual motion machine, a violation of the second law of thermodynamics."

This is circular output flow being self-renewing and self-feeding, is what can be classified as perpetual motion of the economic kind — akin, in language and argument style, to the various perpetual motion of the living kind scenarios — as Herman Daly and Joshua Farley discuss in their *Ecological Economics*. [5]

References

1. (a) Heilbroner, Robert. (1953). *The Worldly Philosophers*, 7th ed. (pgs. 316-17). Penguin, 1999.
(b) The Worldly Philosophers – Wikipedia.
2. Ball, Philip. (2004). *Critical Mass: How One Thing Leads to Another* (quote, pg. 207). Farrar, Straus and Giroux.
3. (a) Heilbroner, Robert. (1968). *The Economic Problem*. Publisher.
(b) Heilbroner, Robert and Thurow, Lester. (1981). *The Economic Problem* (pg. 127, 135). Prentice Hall.
(c) Heilbroner, Robert and Galbraith, James K. (1990). *The Economic Problem* (self-renewing, pg. 186). Prentice-Hall.
4. Zencey, Eric. (2013). "Energy as a Master Resource" (pdf), in: *State of the World 2013: Is Sustainability Still Possible?* (§7:##-; image, figure 1-2). Island Press, 2013.
5. Daly, Herman E. and Farley, Joshua. (2010). *Ecological Economics, Second Edition: Principles and Applications* (pg. 32). Island Press.

External links

â— Robert Heilbroner – Wikipedia.

θΔics

In existographies, **Robert Holloway** (1945-2010) was an American radiochemist (O) noted for his circa 2002 email query of three noted thermodynamics textbook authors, about their stance on the thermodynamics portion, i.e. Answer #9, of the Rennie creationism fiasco, namely: Robert Alberty (*Thermodynamics and Biochemical Reactions*, 2003), Donald Haynie (*Biological Thermodynamics*, 2001), and Ken Dill (*Molecular Driving Forces: Statistical Thermodynamics in Chemistry and Biology*, 2003). [1]

References

1. Holloway, Robert. (2003). "Experts on Thermodynamics Refute Creationist Claims" (O) (pdf), ntanet.net.

θΔics

In existographies, **Robert Hooke** (1635-1703) (IQ:195|#19) [RGM:584|1,500+] (Murray 4000:13|CS / 20|P) (EPD:13|F) (EP:11) [Kanowitz 50:45] (Partington 50:23) (GCE:#) (GPE:18) [CR:125] was an English physicist, mechanical inventor, astronomer, microscopist, chemist, engineer, experimenter, and anti-chance natural philosopher, aka "England's Leonardo" (Chapman, 2004), noted for a number of achievements and inventions, firstly and foremost the construction of the gas law experimental device the "pneumatical engine", under commission of Robert Boyle, among numerous other theoretical insights, such as that heat is motion (volume expansion), evolution, cellular anatomy, purported co-discoverer of the inverse square law of gravity, light theory (wave theory of light), and others.

Vacuum pumps

In 1658 to 1659, Hooke, while working as an assignment of Robert Boyle, made a vacuum pump + air pump combination, based on earlier vacuum pump design of Otto Guericke, and a failed attempt to make one by Ralph Greatoriex:

> "In 1658 or 1659, I contrived and perfected the 'air-pump' for Boyle, having first seen a contrivance for that purpose made for Boyle by Gratorix, which was too gross to perform any great matter."
>
> — Robert Hooke (c.1670), *Posthumous Works* (pg. iii-iv); cited by Richard Waller (1705) in "Life of Robert Hooke" [4]

Boyle, after seeing Greatorex's device, when to London to get the barrel and other parts he could not get made at Oxford.

In this "first Hooke air pump" design (or first Boyle air pump), called the "pneumatical engine" by Boyle or the "air-pump" by Hooke, shown below, Hooke replaced Guericke's inlet valve with a cŒck, the former suction method (or later crank arm), to move the piston, was upgraded to a a rack-and-pinion crank arm F (the piston rod had teeth cut in it, making it a rack E, which was connected to a toothed wheel or pinion E), and the former vacuum bulb was replaced with a over-sized glass receiver, wherein more experiments could be done. This first vacuum design, to note, lacked water seals (which Guericke's had): [30]

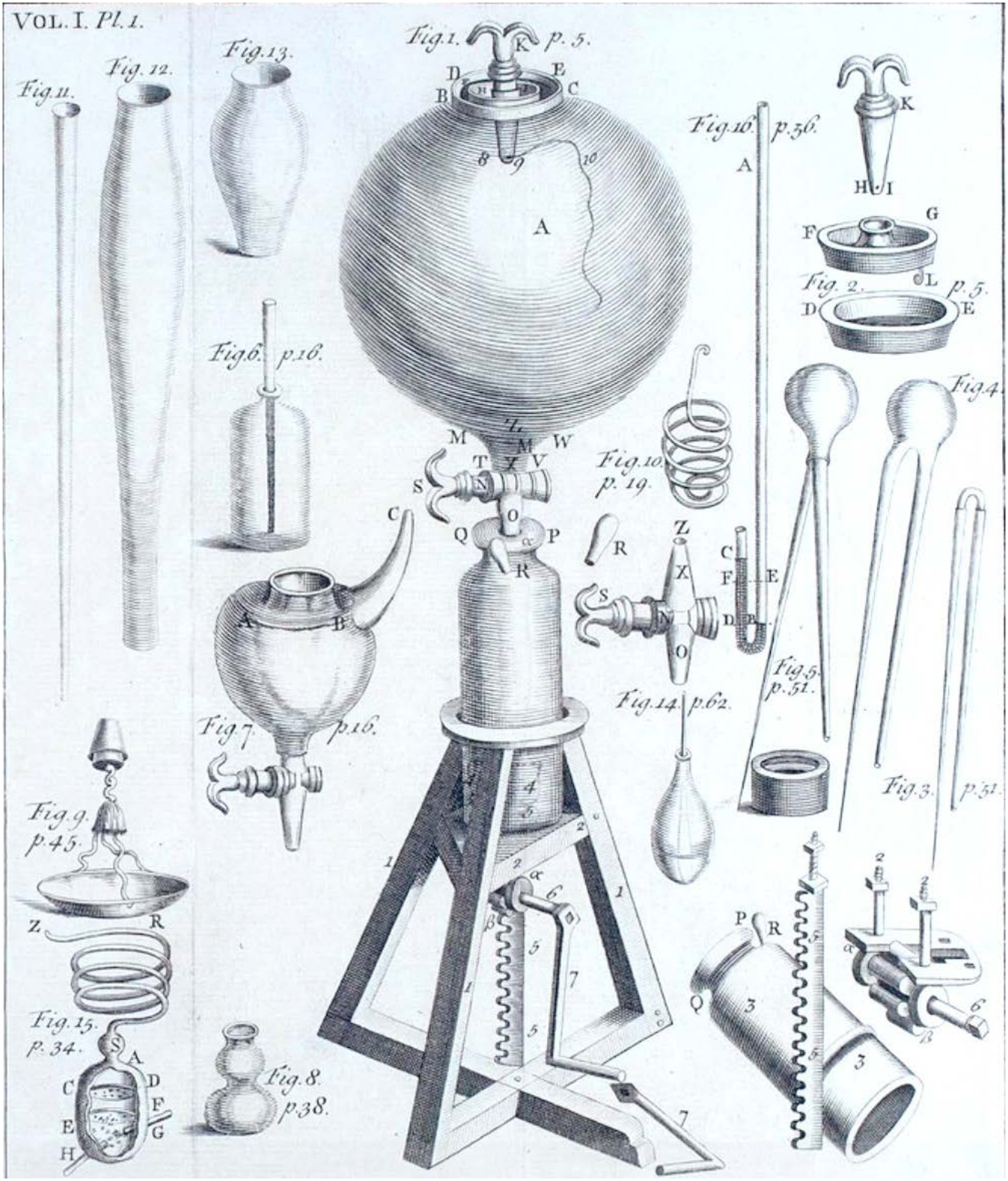

In 2004, Allan Chapman (Ñº), a British historian of science, who in 2002 did some tests with an 80-year old version of a Hooke-Boyle pneumatical engine at the Science Museum, London, summarizes the three main improvements of the Hooke air pump, as follows:

> “Apart from any new features that were special to the pumps or valves, Hooke's machine contained three design features that were of the greatest significance. The first of these was a large glass vessel some 15-inches in diameter, called the 'receiver', which contained the space to be evacuated. Secondly, a brass stopper some four inches in diameter set and cemented into the top of the glass receiver made it possible to gain easy access to the experimental area, and seal everything up before the pumper set to work. Thirdly, an ingenious secondary brass stopper with conical sides passed through the large stopper, so that when liberally coated with salad oil, it could be turned around without breaking the air seal. This rotating stopper could be used to pull a thread to actuate some experiment in vacuo. With Hooke's machine, therefore, the experimenter had easy physical access to a fairly large experimental site that was entirely visible through the thick walls of the glass Receiver. It was to be used to conduct a series of experiments which needed clear vision and the ability to ignite and move things.”
>
> — Allan Chapman (2004), *England’s Leonardo* (pg. 24) [33]

Experiments using the pneumatical engine lead to the formulation of Boyle's law, the first of the gas laws. The first Hooke vacuum pump design served as the basis for the first vacuum pump made by Christiaan Huygens.

In 1662, Hooke made a second vacuum pump design, shown above right, wherein the entire barrel was submerged in water, so effect a better sealing (less leaks). The vacuum chamber, resting on the table, showns a small animal, a test done to see if animals could breath and or survived in a vacuum (see: bird in vacuum). [31] This water-immersed pump is also called “Boyle’s second air pump” (Ñº).

English science historian Robert Gunther (1869-1940) suggests that Hooke probably made the observations and may well have developed the mathematics of Boyle's Law.

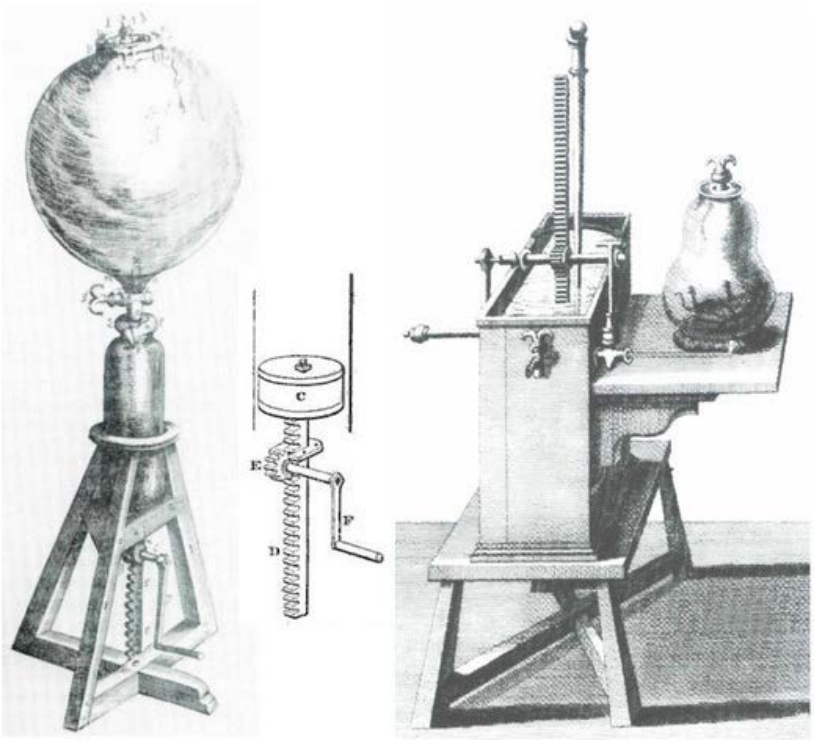

Hooke Vacuum Pump (1659)

Hooke Vacuum Pump (1662)

Steam engines

Compare: Giovanni Porta

In Oct 1675, Hooke, we will note, in his *A Description of Helioscopes and some other Instruments*, presented his future invention he intended to publish or make, invention number nine of which was a “New Invention in Mechanics of Prodigious Use, Exceeding the Chimera’s of Perpetual Motions for Several Uses”, the secret of which, when decoded by Hooke out of his Latin anagram, was: "Pondere premit aer vacuum quod ab igne relictum est" which translates as: “the vacuum left by fire lifts a weight” (Inwood, 2003). [24]

> “Hooke’s ‘**pondere** [weight] **premit** [exerts] **aer** [air] **vacuum** [vacuum] **quod ab igne** [from] **relictum** [left] **est** [it is]’ is one of the principles upon which Savery's late invented engine for raising water is founded.”
>
> — Richard Waller (1705), *The Posthumous Works of Robert Hooke* (pg. xxi)

> “This [Hooke engine principle], which was restated by Jean de Hautefeuille [1678] and Huygens [1678] in the late 1670s, was regarded by some of Hooke’s admirers as the principle behind the invention of the steam pump by Thomas Savery in the 1690s.”
>
> — Stephen Inwood (2002), *The Main Who Knew Too Much* (pg. 211)

It is difficult to see exactly what type of engine Hooke had in mind here, but it could have been a gunpowder engine, or combustion engine, a Papin engine (1690), or possibly a Hero engine of some sort?

Hooke, it seems, was also responsible for the promotion of French physicist Denis Papin’s steam engine theories in England, as found in Papin’s 1690 treatise "A New Method to Obtain Very Great Motive Powers at Small Cost", particularly in Hooke’s failed efforts to dissuade English engineer Thomas Newcomen to erect a machine on Papin’s theory of making a speedy vacuum under a piston, by attempting to fault Papin’s theory.

Heat

Hooke is also noted for having been one of the first (see: volume expansion), following Francis Bacon, to state that heat is motion of the parts of bodies:

“Heat is nothing else but a very brisk and vehement agitation of the parts of a body.”

— Robert Hooke (1665), *Micrographia* (pg. 12)

“Hooke's kinetic theory of heat and matter was then forgotten for many years, until the Swiss scientist Daniel Bernoulli rediscovered the kinetic theory of gases in 1738. Bernoulli's work was in turn ignored until the idea was revived by two uninfluential English amateurs, John Herapath and John Waterston, in 1820 and 1845. Only with the work of James Joule in the 1840s, and Rudolf Clausius and James Maxwell in the 1860s, did the kinetic theory of heat and matter achieve general acceptance.”

— Stephen Inwood (2001), *The Man Who Knew Too Much* (pg. 276)

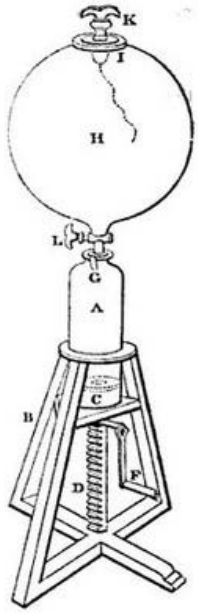

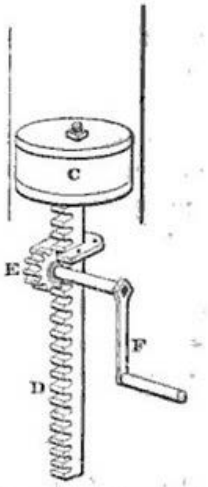

The piston or sucker C was solid. The shank or piston-rod had teeth cut in it, so as to form a rack; and was moved by a toothed wheel or pinion E working into the rack, and turned by a handle F.

An un-annotated version of the pneumatical engine built by **Hooke** (1659), under the commission of Robert Boyle, with which the first gas law (Boyle's law) was derived.

Hooke statement, accordingly, is one of the earliest the heat as motion theories.

Boerhaave's law

Hooke, in *circa* 1685, was among the first to assert that thermal expansion and contraction might be a general property of matter, in his statement that "this property of expansion with heat , and contraction with cold, is not peculiar to liquors only, but to all kinds of solid bodies, especially metals." [6] This principle later came to be encapsulated by the name of Boerhaave's law, owing to a version of this statement from Dutch chemist Herman Boerhaave's 1724 *Elements of Chemistry*.

Thermometers

In 1664, Hooke had made a variety of spirit thermometers, and notably used the bulb immersed in ice water as the zero mark on the thermometer, similar to Daniel Fahrenheit (who did the same in 1724), then made further marks on the tube to represent an expansion of 1/500th of volume of the fluid in the bulb. [4]

Chemistry

Hooke, to note, is the 23rd most cited chemist of English chemist James Partington’s famous 1937 *A Short History of Chemistry*, based on name index page count. [1]

Elasticity

The law of elasticity, formerly known as "Hooke's law", was derived by Hooke.

Microanatomy

Hooke was person to coin the word "cell" for the cell of an organism, owing to the noted anecdote that the entities he was viewing seem to him to resemble prison "cells" in their shape.

Gravitation | Newton

On reading English physicist Isaac Newton’s 1686 *Principia*, Hooke is said to have claimed that the idea of an inverse square law for gravitation had been stolen from him. Hooke, supposedly, did have such an idea independent of Newton and also realized that an object falling towards the earth had the same motion as earth falling towards the sun. Hooke’s lack of mathematical ability, however, was, supposedly, was what hindered his claim to fame.

Upon hearing this accusation, Newton, promptly removed all mention of Hooke from the *Principia*, and refused to have anything to do with the Royal Society, Hooke’s employer, agreeing to become president only after Hooke’s death in 1703. When Newton did become president, Hooke’s portrait hanging in the Royal Society mysteriously disappeared. [5] The inference here being that the reason that no pictures of Hooke exist in modern times, is the result of Newton.

Huygens | Hooke dispute

(add) [8]

Combustion theory

(add)

Religion

Hooke abjured from mention of religion discussion of the implications of his theories, that is until his later years wherein he attempted to show that there was no conflict between his moving earth theories, terrestrial lava upheaval theories, evolution theories, and genesis of the Bible.

Image | Physical descriptions

The following are verbal descriptions of the likenesses of Hooke according to various biographers:

“He is but of middle stature, something of a crooked, and his face but little below, but his head is large; his eyes full and popping, and not quick; a grey eye. He has a delicate head of hair, brown, and of excellent moist curl. He is and ever was very temperate, and moderate in diet”; he was “of great suavity and goodness.”

— John Aubrey (c.1688)

“As to his person, he was despicable, being very crooked, though I have heard from himself, and others, that he was straight until about 16 years of age when he first grew awry, by frequent practicing with a turn lathe, and the like incurvating exercises, being but of a thin weak habit of body, which increased as he grew older, so as to be very remarkable at last.”

— John Aubrey (c.1688)

“As to his person he was but despicable, being very crooked. This made him but low of stature, though by his limbs he should have been moderately tall. He was always very pale and lean, and laterly nothing but skin and bone, with a meagre aspect, his eyes grey and full, with a sharp ingenious look whilst younger; his nose but thin, of a moderate height and length; his mouth meanly wide, and his upper Lip thin; his chin sharp, and forehead large; his head of a middle size. He went stooping and very fast (till his weakness a few years before his death hindered him) having but a light body to carry, and a great deal of spirits and activity, especially in his youth?”

— Richard Waller (c.1700), “Description of Robert Hooke”; cited by Stephen Inwood (2002) in *The Man Who Knew Too Much* (pg. 52)

“Hooke was meanly ugly, very pale and lean.”

— Tom Shactman (1999)

“Friends who described him in his middle and later years agreed that he was a sorry sight, with his thin and crooked body, his **over-large head**, sharp facial features and protruding eyes.”

— Stephen Inwood (2002), *The Man Who Knew Too Much* (pg. 11)

There has been some recent conjecture that Hooke might have suffered from severe kyphosis (a condition known as Scheuermann’s kyphosis, 1921), a type of progressive forward curvature or hunchbacking of the spine, based on Waller's description of Hooke as "straight until about sixteen years of age when he first grew awry, by frequent practicing with a turn lathe, and the like incurvating exercises", a statement which in itself makes little sense. [19]

Artistic | Reconstructions

The following is a summary of the six main artistic reconstructions of Hooke, based on above verbal accounts, as numbered A to F adjacent, as well as G, H, I, below, being three oft-misatributed photos:

A. 2004 artistic *reconstruction* of Robert Hooke, by Royal College artist Rita Greer, based on combined descriptions of his appearance and facial features. [3]
B. 2010 observational painting of Robert Hooke (by Peter), based on contemporary comments on his appearance, for a new book on 400 years of telescopic astronomy. [13]
C. Depiction of Robert Hooke on the cover of Mary Gow’s 2006 *Robert Hooke: Creative Genius, Scientist, Inventor* (*defect attribute: too much of an evil genius look*; good attributes: thin; moist curly hair). [7]
D. Reconstruction of Robert Hooke by Jonas Ranson, one of the 2003 tercentenary portraits commissioned by the Royal Society (*defect attributes*: small head, hair not currly; *good attribute*: popping eyes). [15]
E. 2011 reconstruction portrait of Hooke by Rita Greer, on display in the Hooke Room, at the Institute of Physics, London [22]
F. 2004 reconstruction sketch of Hooke by Royal College science historian artist Rita Greer.

Six artistic reconstruction attempts at what **Hooke** might have looked like, based in extant verbal descriptions of him.

Misattributed Photos

G. 1728 engraving of a bust of Robert Hooke.
H. An *unlikely* bust (based on his description as thin, weak, and full popping eyes) of Robert Hooke (of unknown origin) at the Hooke Museum, Isle of Wight, UK; possibly the same one shown in the 1728 edition of Chambers' *Cyclopedia*. [10]
I. The unsourced dubious 1939 *Time* magazine image of Robert Hooke. [12][17]
J. Dutch iatrochemist Johann Helmont (coiner of the term "gas"), who prior to 2004 was often listed as Robert Hooke; such as on the cover of Lisa Jardine's 2003 book *The Curious Life of Robert Hooke*. [20]

A 2004 article summary of Robert Hooke and his combustion theory, in the context of Joseph Black's *Lectures on Chemistry*, from She-Philosopher.com, which indicates that a bust was made of Hooke (likely the one at the Hooke Museum, Isle of Wight, UK). [11]

A 2010 Photoshop collage of Robert Hooke (hypothetical image) made by science illustrator Kathryn Killackey. [14]

Image | Spurious depictions

A number of false representations of Hooke, often using the image of Flemish chemist Jan van Helmont (among others), can be found on book covers (e.g. Lisa Jardine), internet pages (e.g. NNDB), and television (e.g. BBC).

Also, to note, in 1939 *Time* magazine, in a centennial celebration to commemorate the discovery that cell (1739), an *alleged* portrait of Robert Hooke was shown, based on a photo purchased by Ismar Lachman, of the Historical Picture Service, New York. [12]

This depiction of Hooke, of which photos were famously said to be non-existent, prompted Ashley Morgan to do some investigation, according to which, as discussed in his 1941 *Isis* article “A Spurious Portrait of Robert Hooke”, he explained how Lachman told him that the photo engraving, which was no longer in his possession, of which he was unable to give the source, neither had a name nor engraver. [17]

Education

Little, supposedly, is known about Hooke's early years. From about the time Hooke was ten, however, his father became ill and this contributed to Hooke being left to educate himself in the highly practical way that interested him.

> “Hooke’s father, John Hooke, briefly hoped that he might be trained for a career in the Church, but study gave the boy headaches, and John, whose own health was failing, abandoned his son’s education. The smell of paint, like the study of religion, made his head ache.”
>
> — Stephen Inwood (2002), *The Man Who Knew Too Much* (pgs. 7 & 10)

In 1648, Hooke, age 13, was orphaned, following his father's suicide (his brother John Hooke also hung himself is 1678), and was left £40 inheritance by his father, together with all his father's books, after which his family sent him to London to become an apprentice to the Peter Lely, a portrait painter. [18] Hooke soon decided, however, that it would waste his money studying under Lely, and he made the decision that what he really needed was a school education.

Hooke thereafter shortly, circa 1650, age 15, enrolled in Westminster School, boarding in the house of the headmaster Richard Busby. Busby is said to have realized he had a quite remarkable pupil, noting, e.g., that Hooke had mastered the first six books of Euclid's *Elements* by the end of his first week at school and so encouraged Hooke to study by himself in his library. [16]

Quotes | On

The following are quotes on Hooke:

> “Thanks for the extracts from **Hooke**. I know him very well. He understands no geometry at all. **He makes himself ridiculous by his boasting**. I know his name machine [for grinding lenses] well – it is quite inept. And a bad example of his mechanical algebra.”
>
> — Christiaan Huygens (1665), “Letter to Father” [26]

> “I acknowledge my indebtedness to the very famous Master **Robert Hooke** for this experiment—by which the lungs are kept continuously dilated for a long time without meanwhile endangering the animal's life—and the opportunity thereby given me to perform this piece of work.”

— Richard Lower (1669), *On the Heart* (Ñº); cited by Stephen Inwood (2002) in *The Man Who Knew Too Much* (pg. 106)

"What Des-Cartes did was a good step. **You** have added much several ways, & especially in taking ye colours of thin plates into philosophical consideration. If I have seen further it is by standing on ye sholders of Giants [sic]."

— Isaac Newton (1678), "Letter to Hooke", Feb 5 [21]

"The screw-propeller, which, as has been stated, was probably first proposed [by Leonardo da Vinci (c.1495) (Ñº)] by Robert Hooke (Ñº) in 1681, and by Daniel Bernoulli [1752], of Groningen, and by Watt in 1784, was, at the end of the century, tried experimentally in the United States by David Bushnell, an ingenious American, who was then conducting the experiments with torpedoes."

— Robert Thurston (1878), *A History of the Steam Engine* (pg. 292)

"Hooke's great work, the *Micrographia*, published in 1665, contains his theory of combustion, a theory similar to that of John Mayow which did not appear until 1674, except that whereas Mayow's presentation is indirect, rather complicated, at times even obscure, Hooke's postulates are simply, clearly, and concisely stated. For a period of about seventeen years, from February, 1663 to about 1680, Hooke performed experiments before the Royal Society to prove the correctness of his theory. Besides these direct efforts he worked with Richard Lower in his experiments on respiration and was all during this period, according to the 'Diary', a very frequent visitor to the home and laboratory of Robert Boyle."

— Clara Milt (1939), "Robert Hooke, Chemist" [29]

"**Hooke**'s name is mentioned, in the index of the authoritative *Instruments of Science: an Historical Encyclopedia* (1998) (Ñº), more times than that of any other inventor: eighteen entries for Lord Kelvin and Carl Zeiss, eleven for Jesse Ramsden, eight or nine for Isaac Newton, James Maxwell, and Ptolemy, and twenty for Robert Hooke."

— Stephen Inwood (2002), *The Man Who Knew Too Much* (pgs. 4-5)

"Isaac Newton's seven pages of densely packed notes on *Micrographia* still exist among his papers in the Cambridge University Library. They show that he was interested in **Hooke**'s theory of combustion, his ideas on the congruity of matter, and his description of the nettle's sting, and had thought of several ways of pursuing the problem of atmospheric refraction. The section of *Micrographia* which stimulated him the most, though, was Hooke's work on light and colours. Newton was not convinced by Hooke's theory that light was composed of waves, like sound, and he could not see why Hooke's 'weaker' waves should travel as fast as 'stronger' ones. 'Why then may not light deflect from straight lines as well as sounds &c? How doth the foremost weak pulse keep pace with the following stronger & can it be then sufficiently weaker?' Still, he accepted that the rings of colour produced by thin plates (which we now call Newton's rings) might provide clues to the nature of light and colour, and set to work on them."

— Stephen Inwood (2002), *The Man Who Knew Too Much* (pg. 76)

Quotes | By

The following are quotes by Hooke:

"The vacuum left by fire lifts a weight."

— Robert Hooke (1675), "A New Invention in Mechanics of Prodigious Use, Exceeding the Chimera's of Perpetual Motions for Several Uses", in: *A Description of Helioscopes and some other Instruments* (future invention #9) (penned as the following encrypted Latin anagram: "Pondere premit aer vacuum quod ab igne relictum est", the key for which he did not divulge until a decade or two later)

"The calm prosperity of your reign has given us the leisure [see: flow state] to follow these studies of quiet and retirement."

— Robert Hooke (1665), "Epistle to the King" of *Micrographia* [25]

"Avoid dogmatizing and espousal of any hypotheses not sufficiently grounded and confirmed by experiment."

— Robert Hooke (1665), 1st rule of Royal Society, in: "Foreword to Royal Society" of *Micrographia* [25]

"Thus all the uncertainty, and mistakes of humane actions, proceed either from, the narrowness and wandering of our senses, from the slipperiness or delusion of our memory, from the confinement or rashness of our understanding, so that it's no wonder, that our power over natural causes and effects is so slowly improved, feeing we are not only to contend with the obscurity and difficulty of the things whereon we work, and think, but even the **forces of our own minds conspire to betray us**."

— Robert Hooke (1665), "Preface" to *Micrographia* [25]

"So many are links, upon which the true philosophy depends, of which, if any one be loose, or weak, the whole chain is in danger of being dissolved; it is to begin with the hands and eyes, and to proceed on through the memory, to be continued by the reason; nor is it to stop there, but to come about to the hands and eyes again, and so, by a continual passage round from one faculty to another, it is to be maintained in life and strength, as much as the body of a man is by the circulation of the blood through the several parts to the body, the arms, the feet, the lungs, the heart, and the head."

— Robert Hooke (1665), "Preface" to *Micrographia*; cited by Lawrence Henderson in "Sociology 23" (pg. 77)

"The truth is, the 'science of nature' has been already too long made only a work of the 'brain' and the 'fancy': It is now high time that it should return to the plainness and soundness of observations on material and obvious things. It is said of great empires, that the best way to preserve them from decay, is to bring them back to the first principles, and arts, on which they did begin. The same is undoubtedly true in philosophy, that by wandering far away into invisible notions, has almost quite destroyed itself, and it can never be recovered, or continued, but by returning into the same sensible paths, in which it did at first proceed."

— Robert Hooke (1665), "Preface" to *Micrographia* (preface) [23]

"Who could be so sottish as to think all those things [e.g. flying mechanism of insects] the productions of 'chance' [see: anti-chance]?"

— Robert Hooke (1665), *Micrographia* (pgs. 171-72); cited by Stephen Inwood (2002) in *The Man Who Knew Too Much* (pg. 73)

"Some may say I have turned the world upside down for the sake of a shell."

— Robert Hooke (1687), "Lecture in support of his Axial Tilt Theory of a Prolonged Global Flood", Feb 19; the 'turned the world upside down' is from John Wallis and his criticism of Hooke's theory on Biblical grounds [27]

"If we must not believe our senses, if we must not judge of things by trials and sensible proofs, but must remain tied up to opinions we have received from others, and disbelieve everything, though never so rational, if our received histories do not conform to them."

— Robert Hooke (1694), "On the the 'species' of nature, in respect to the beginning of things", Royal Institute, Jul 25 [24]

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(b) Bust of Robert Hooke (display case) – Flickr.com.
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External links

â— Robert Hooke – Wikipedia.

θΔics

In existographies, **Robert Ingersoll** (1833-1899) (IQ:150|#633) [RGM:802|1,500+] (HD:34) (FA:117) (CR:28) was an American lawyer, colonel, politician, and free thought orator, nicknamed the “great agnostic”, the “great American atheist” (1888) (Q), and or the "pagan prophet" (Hecht, 2003), noted for being one of the first to state that "Adam and Eve never existed" (c.1882), for making one of the first atheist eulogies, for being one of the supposed atheist rocks to avoid in the Christian captain anecdote, and for being one of the most-prolific atheism quotesmiths.

Overview

Ingersoll, as a youth, was made to attend his minister father's two Sunday sermons; on his own, however, he read: Epicurus, Zeno of Citium, Voltaire, and Thomas Paine. [1]

In 1879, Ingersoll published his *The Gods and Other Lectures* (Q), the following is the frontispiece image:

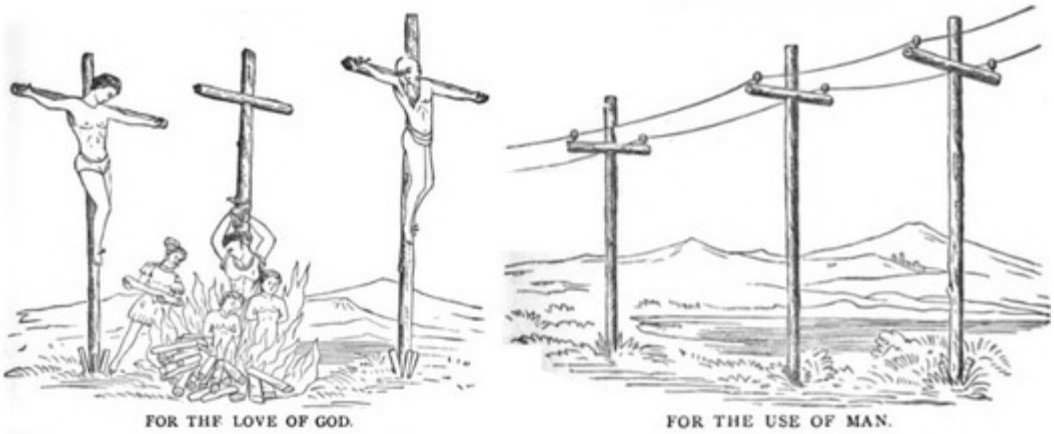

(add)

Some Mistakes of Moses

In 1879, Ingersoll gave his famous unscripted “Some Mistakes of Moses” lecture, which, as he says, was "never delivered twice the same", turned book (1880), characterized as a satirical deconstruction of Genesis and Exodus; the following is a noted quote:

> “It has always been a mystery to me how Adam, Eve, and the serpent were taught the same language. Where did they get it? We know now, that it requires a great number of years to form a language; that it is of exceedingly slow growth. We also know that by language, man conveys to his fellows the impressions made upon him by what he sees, hears, smells and touches. We know that the language of the savage consists of a few sounds, capable of expressing only a few ideas or states of the mind, such as love, desire, fear, hatred, aversion and contempt. Many centuries are required to produce a language capable of expressing complex ideas. It does not seem to me that ideas can be manufactured by a deity and put in the brain of man. These ideas must be the result of observation and experience.”
>
> — Robert Ingersoll (1879), on Adam and Eve; in *Some Mistakes of Moses* (Q)

This lecture, in the Jewish community (see: Jewish atheism), has been the most translated one into Yiddish (Jacoby, 2004); this was one of the books cited in the Redford deconversion model. [6]

Why I Am an Agnostic

In 1896, Ingersoll, in his “Why I Am an Agnostic” lecture, explained why he is an agnostic

via the following points: [5]

Ingersoll giving a speech (Q) on 30 May 1894, in New Rochelle, New York, in honor of Thomas Paine's birthday.

> I. Influence of Birth in determining Religious Belief—Scotch, Irish, English, and Americans Inherit their Faith—Religions of Nations not Suddenly Changed—People who Knew—What they were Certain About—Revivals—Character of Sermons Preached—Effect of Conversion—A Vermont Farmer for whom Perdition had no Terrors—The Man and his Dog—Backsliding and Re-birth—Ministers who were Sincere—A Free Will Baptist on the Rich Man and Lazarus.
> II. The Orthodox God—The Two Dispensations—The Infinite Horror.
> III. Religious Books—The Commentators—Paley's Watch Argument—Milton, Young, and Pollok.
> IV. Studying Astronomy—Geology—Denial and Evasion by the Clergy.
> V. The Poems of Robert Burns—Byron, Shelley, Keats, and Shakespeare.
> VI. Volney, Gibbon, and Thomas Paine—Voltaire's Services to Liberty—Pagans Compared with Patriarchs.
> VII. Other Gods and Other Religions—Dogmas, Myths, and Symbols of Christianity Older than our Era.
> VIII. The Men of Science, Humboldt, Darwin, Spencer, Huxley, Haeckel.
> IX. Matter and Force Indestructible and Uncreatable—The Theory of Design.
> X. God an Impossible Being—The Panorama of the Past.
> XI. Free from Sanctified Mistakes and Holy Lies.

Here, we see the forerunner to Bertrand Russell's "Why I am Not a Christian" (1927), Bhagat Singh's "Why I Am an Atheist" (1928) (Q), and Madalyn O'Hair's *Why I Am an Atheist: Including a History of Materialism* (1980).

Quotes | On

The following are quotes on Ingersoll:

> "With the rarest genius, in beautiful alliance with his heroism, his kindness, and his boundless love, made the name of **Ingersoll** immortal."
>
> — Eugene Debs (1899), "Letter of condolence to Mrs. Ingersoll" [7]

> "**Ingersoll** is the nearest approach we Americans have had to Voltaire."

— James Gillis (1925) [1]

Quotes | By

The following are noted quotes:

"How terrible this [evolution theory of Darwin] will be upon the nobility of the old world. Think of their being forced to trace their ancestry back to the duke Orang Outang, or the princess Chimpanzee."

— Robert Ingersoll (1877), "The Liberty of Man, Woman, and Child" [1]

"Life is a narrow vale between the cold and barren peaks of two eternities. We strive in vain to look beyond the height. We cry aloud, and the only answer is the echo of our wailing cry. From the voiceless lips of the unreplying dead there comes no word."

— Robert Ingersoll (1879), said at the grave of his brother [2]

"In the republic of mediocrity, genius is dangerous."

— Robert Ingersoll (1880), "Liberty in Literature"

"Christianity has made more lunatics than it ever provided asylums for."

— Robert Ingersoll (c.1880) (Q)

"If by any possibility the existence of a power superior [see: higher power] to, and independent of, nature shall be demonstrated, there will be time enough to kneel. Until then, let us stand erect."

— Robert Ingersoll (c.1880) [3]

Madalyn O'Hair (1983) in front of the **Robert Ingersoll** statue in Glen Oak Park, Peoria, Illinois. [7]

"It seems from what we hear on all sides that the Christian religion is a huge blunder; that the Mosaic account of the creation is an absurdity large enough to throw all nations into rollicking guffaw; that Adam and Eve never existed (see: Adam and Eve never existed); that **the ancient flood and Noah's ark were impossibilities**; that there never was a miracle; that the Bible is the friend of cruelty, of murder, of polygamy, of all forms of base crime; that the Christian religion is woman's tyrant and man's stultification; that the Bible from lid to lid is a fable, a cruelty, a humbug, a sham, a lie."

— Robert Ingersoll (c.1882), "The Plague of Infidelity" (Q)

"Some Christian lawyers—some eminent and stupid judges—have said and still say, that the Ten

Commandments are the foundation of all law. Nothing could be more absurd."

— Robert Ingersoll (1894), *About the Holy Bible*

"As people become more intelligent, they care less for preachers and more for teachers."

— Robert Ingersoll (c.1880), in FSM atheism app

"Bishop Butler dug up more snakes than he killed—suggested more difficulties than he explained—more doubts than he dispelled."

— Robert Ingersoll (1896), "Why I Am an Agnostic" [5]

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- Robert G. Ingersoll – Wikipedia.

θΔics

In human thermodynamics, **Robert Loren Jaffe** (1946-) is an American physicist noted for []

Overview

In circa 2005, Jaffe gave his views on time, or rather on the relation of the so-called "psychological arrow of time" (perceptual time) to the "thermodynamic arrow of time" (arrow of time based on entropy increase), the former which he considers to be a function of latter: [1]

> "My impression is that human experience of time is fundamentally thermodynamic in origin. Our perception of memory and experience and anticipation of the future—all those things have their origin in information storage, processing, deterioration, and entropy production in the physical-chemical environment which is the brain."

In physics, Jaffe is best known for his research on the quark substructure of matter. [2]

Education

Jaffe completed his AB in physics in 1968 at Princeton University, where he was class valedictorian, his MS in physics in 1971 and PhD in 1972, with a dissertation on "Scaling, Partons, and the Light-cone in Highly inelastic Leptonic Processes", both at Stanford University, during which time, of note, he founded the Stanford workshops on political and social issues. Jaffe currently is a physics professor at MIT where he teaches courses on quantum mechanics, mechanics, relativity, electrodynamics, relativistic quantum field theory, and the physics of energy.

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External links

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θΔics

In hmolscience, **Robert Louis Kahn** (1918-) is an American psychologist and systems theorist noted, in human thermodynamics, for his 1966 entropy (running down) and negative entropy (running up) conceptualization, developed with Daniel Katz, of social organizational survival.

Overview

In 1966, Kahn, in his *The Social Psychology of Organization*, co-authored American psychologist Daniel Katz, espoused some type of entropy-negentropy themed organizational theory; the gist of their argument being the ideology that (a) the second law states that "any system will tend to run down, lose it differentiated structure, and become one with its environment", which the refer to as "death forces", therefore (b) for a social organization to survive it "must secure some continuing supply of materials and men" and therefore "acquisitive and extractive procedures are thus the primitive mechanisms by which negative entropy is obtained." [1]

Education

Kahn earned a PhD from the University of Michigan, where he taught (1948-76) and directed the Survey Research Center. His research ranged over organizational and social psychology and survey methodology; his varied published works include books on electoral politics, unions, and surveys.

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θΔics

In hmolscience, **Robert Kenoun** (1950-) is an Iranian-born American materials scientist, metallurgical and electrical engineer noted, in human thermodynamics, for 2006 his social internal energy minimization theory, according to which societies, according to the first law and second law, of thermodynamics, historically progress, via "ultimate driving force", seeking to "maximum stability by attaining the lowest state of internal energy, in connection with a given environmental condition." [1]

Overview

In 2006, Kenoun, in his *A Proposition to Theory of History and Social Evolution*, modeled social system dynamics on atomic-molecular system type metaphors, e.g. by supposing that human-human bonds are "relational bonds" similar to hydrogen bonds between water molecules in the liquid phase, and argues, based on the first two laws of thermodynamics, that the "ultimate driving force" of a social system's evolutionary process is to seek "maximum stability by attaining the lowest state of internal energy, in connection with a given environmental condition", which he equates to "boundary conditions". Kenoun equates a state of the lowest level of internal energy with socio-economic equality among its members, which he argues is a logic emboddied in Marxism or socialism in general.

In respect to Kenoun's scientific view of human history, as presented in his *Proposition to Theory*, he states that ever since he was a young man, he had always wondered how to make sense of the process of history? The following is the basis of Kenoun's logic: [1]

> "If society is composed of humans and humans are built with basic material components and there are laws to govern the behavior of these components, then these laws must have some influence in the behavior of complex living systems."

One of the more interesting aspects of Kenoun's theory is his postulations on the nature of the internal energy of various types of human social systems, e.g. a five-member family or a society, etc. To cite one example, he states that if one member of the system of a family were to leave, e.g. a father dies, which he correlates to a "loss of mass" in the system, there would result an increase of internal stress among the relational bonds of the remaining members, which Kenoun equates to a change in the internal energy of the system. The underlying supposition here, alluded to by Kenoun, is that the concept of chemical potential, introduced in 1873 by American mathematical engineer Willard Gibbs, applies to human systems.

In 2015, Kenoun was arguing against social Darwinism of the Herbert Spencer variety. [5]

Originality

Kenoun states that he developed his theory "in isolation from the work accomplished by other experts to maintain its originality"; which puts him in the same league as thinkers such as American physicist Wayne Angel, who derived his 2005 *The Theory of Society* straight from American physicist Herbert Callen's thermodynamics textbook.

Education

Kenoun completed a BS in material science and an MS in metallurgical engineering at the Iranian University of Tehran in 1976. Two years later, he moved to the United States and soon thereafter completed a MS in electrical engineering. [2]

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θΔics

In existographies, **Robert Koch** (1843-1910) (IQ:155|#610) [RGM:1320|1,500+] (Murray 4000:3|Med) (Simmons 100:44) (Glenn 20:13) was a German physician, noted for his 1870s work on the microorganism identification of diseases.

Education

Koch, son of a mining engineer, astounded his parents at the age of five by telling them that he had, with the aid of the newspapers, taught himself to read, a feat which foreshadowed the intelligence and methodical persistence which were to be so characteristic of him.

Overview

In c.1878, Koch isolated the microorganisms that cause anthrax, tuberculosis, and cholera, e.g. that tubercle bacilli occur in all tuberculous disorders; he posited four postulates on the causation of infectious diseases, which became the gold standard in the detection of the causes of disease. (Ñº)

Quotes | By

The following are quotes by Koch:

> "On many occasions, I examined normal blood and normal tissues and there was no possibility of overlooking bacteria or confusing them with granular masses of equal size. I never found organisms. Thus, I conclude that bacteria do not occur in healthy human or animal tissues."
>
> — Robert Koch (1878), "Investigations of Etiology of Wound Infections" (Ñº)

> "If my efforts have led to greater success than usual, this is due, I believe, to the fact that during my wanderings in the field of medicine, I have strayed onto paths where the gold was still lying by the wayside. It takes a little luck to be able to distinguish gold from dross, but that is all."
>
> — Robert Koch (1908), "Article" [1]

References

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External links

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θΔics

In existographies, **Robert Laughlin** (1950-) (CR:5) is an American physicist noted for his 2000 to 2005 protected states theory of emergence over reduction theory, oft-cited by theologians, ID-proponents, ontic opening and emergence scholars.

Overview

In 2000, Laughlin, in his "The Theory of Everything", cited by Terrence Deacon (2011), elaborates on American physicist Philip Anderson's 1972 "More is Different" — which addressed the controversy surrounding the reductionist hypothesis, via the emergent properties argument that certain physical properties, e.g. solid state forms of matter, emerge at higher levels of organization — to argue for a "protected states" theory of emergence, according to which there is a certain insulation between levels of physical dynamics. [1]

In 2005, Laughlin published *A Different Universe: Reinventing Physics from the Bottom Down*, wherein he argues for emergence as a replacement for reductionism, but a book that is not much expanded beyond his 2000 article; the following is an example quote, as cited as an argument platform by priest-chemist-engineer James Salmon (2009): [1]

> "Much as I dislike the idea of ages, I think a good case can be made that science has now moved from an Age of Reductionism to an Age of Emergence, a time when the search for ultimate causes of things shifts from the behavior of parts to the behavior of the collective."

This, given the title of the book, seems to be an extrapolate down approach ideology.

Laughlin is grouped, thematically, according to Erland Lagerroth (2013), into the following carousel of ontic opening scholars: Erich Jantsch (*The Self Organizing Universe*, 1979), Ilya Prigogine (the mentor to Erich Jantsch), Gregory Bateson, Karel Kosïk, Fritjof Capra, Ken Wilber, Henryk Skolimowski, Erwin Laszlo, Edward Goldsmith, Theodore Roszak, Elisabet Sahtouris, Susan Oyama, Anthony Wilden, Nicholas Maxwell, E F Schumacher, Amit Goswami, Lynn Margulis, Rupert Sheldrake, Henri Bortoft on Goethe, Harold Morowitz, Steven Johnson, Steven Strogatz, Stephen Wolfram, Stephan Harding, David Abram, Mary Midgley, Brian Goodwin, Stuart Kauffman, Robert Ulanowicz, Sven Jørgensen, and Enzo Tiezzi.

Quotes | On

The following are Laughlin related quotes:

> "No doubt, it [second law] would seem to contradict the many observations of *emergence* of ordered non-organic structures (like crystals or waves and cyclones) and organic structures (like DNA and human beings), seemingly out of disordered chaos, as evidenced by the physics Nobel Laureate Robert **Laughlin**."
>
> — Claes Johnson (2008), "Computational Foundation of Thermodynamics"

Quotes

The following are noted quotes:

> "Much of present-day biological knowledge is ideological. A key symptom of ideological thinking is the explanation that has no implications and cannot be tested. I call such logical dead ends antitheories because they have exactly the opposite effect of real theories: they stop thinking rather than stimulate it. Evolution by natural selection, for instance, which Charles Darwin originally conceived as a great theory, has lately come to function more as an antitheory, called upon to cover up embarrassing experimental shortcomings and legitimize findings that are at best questionable and at worst not even wrong. Your protein defies the

laws of mass action? Evolution did it! Your complicated mess of chemical reactions turns into a chicken? Evolution! The human brain works on logical principles no computer can emulate? Evolution is the cause!"

— Robert Laughlin (2005), *A Different Universe* (pgs. 168-69); cited (Ñº) by William Dembski , 2005

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External links

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θΔics

In hmolscience, **Robert Louden** (1953-) is an American philosopher noted for his 1992 *Morality and Moral Theory*, wherein states his view that: [1]

> "A theory of thermodynamics is not, and never will be, a moral theory. By moral theory, I mean, at the simplest level, any sustained attempt to give an account of how moral agents ought to live and act."

This thermodynamics mention, for the most part, seems to be but a spurious statement, for aside from one other passing mention of the laws of thermodynamics being a type relevant knowledge to the physicist, he work is devoid of any other mention of thermodynamics.

Education

Louden completed his BA in 1975 in philosophy and politics at the University of California, Santa Cruz, his MA in 1976 and PhD in 1981 both at the University of Chicago, the latter with a dissertation on "The Elements of Ethics: Toward a Topography of the Moral Field". Since 1996, he has been a professor of philosophy at the University of Southern Maine. The majority of Louden's publications focus on developing a Kantian-based theory of morality.

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θΔics

In thermodynamics, **Julius Robert Mayer** (1814-1878) (IQ:180|#152) was a German physician and physicist notable for making one of the first statements of the conservation of energy and the mechanical equivalent of heat, namely that "motion is converted into heat" (1841), in contrast to the caloric theory, and for making a crude calculation of the latter. [1] Mayer is generally given less credit in the etymologies of the first law thermodynamics, in contrast to English physicist James Joule and German physician and physicist Hermann Helmholtz, being that his mathematical and physics ability was lacking.

Overview

In 1840, Mayer hired on as a ship's physician aboard a Dutch merchantman ship destined for a roundtrip to Java. On this voyage two curiosities came to interest him. First, he was told by the navigator that during a storm the ocean water becomes warmer. This meant, to Mayer, that the agitation, motion, or mechanical action of the waves had been converted into heat.

A second note, observed by Mayer, was that during his blood letting procedures he noticed that the venous blood, which is normally a blue colored type of blood being carried in vessels from the capillaries towards the heart, was redder in color than expected. In his journal, at the age of twenty-six, he noted: [2]

> "A few days after our arrival at the Batavian roads [off Jakarta, capital of Indonesia] there spread in epidemic fashion an acute … affection of the lungs. In the copious bloodlettings I performed, the blood let from the vein in the arm had an uncommon redness, so that from the color I could believe I had struck

In short, while bleeding various sailors with fever in Java (a warmer place) he noticed that the color of the blood was much brighter than what he was used to seeing in Germany (a colder place). [9] This fact conflicted with his medical studies he had learned two years prior.

In any event, to explain the observed lighter or redder color he turned to the theory of animal heat of French chemist Antoine Lavoiser. In this theory, the body is warmed by combustion of carbon from food, with the incidental consequence of changing red arterial blood coming from the heart into the darker venous blood that carries the ashes back to the lungs in the form of carbon dioxide. Since less body heat is required in the tropics, Mayer argued, less combustion will take place, less ash will be produced, and the venous blood will retain the bright red color of fresh arterial blood. [2] These sets of facts, suggested to Mayer, that the chemical processes, occurring via combustion, produce both heat and work and that these must be interconvertable.

Jolly anecdote

See main: Thermodynamics anecdotes

Supposedly, after returning to Germany and brushing up on physics Mayer went to German physicist Philipp Jolly for consultation, explaining to him his theory that heat is due to motion and that heat and work are equivalent concepts. Jolly, however, had great difficulty accepting this theory, and finally exclaimed: "but if that is true, then water should be warmed by merely shaking it." Mayer left quietly, only to return several weeks later to Jolly's room, exclaiming "and so it is". [10] Jolly, to note, was the same guy who told a young student at the University of Munich, named Max Planck, not to go into physics, because "in this field, almost everything is already discovered, and all that remains is to fill a few unimportant holes." [11]

Conservation of energy

See main: Conservation of energy

On return from Java, Mayer quickly wrote out the 1841 paper "On the Quantitative and Qualitative Determination of Forces" in which he stated the postulate that "motion is converted into heat", which he sent to sent German physicist

Johann Poggendorff to be published in his *Annalen der Physik and Chemie*. [3] In his February 1841 article submission, Mayer stated: [13]

> "If two bodies find themselves in a given difference, then they could remain in a state of rest after the annihilation of that difference if the forces that were communicated to them as a result of the leveling of that difference could cease to exist; but if they are assumed to be indestructible, then the still-persisting forces, as causes of changes in relationships, will again re-establish the originally present difference."

Poggendorff, however, never published it nor acknowledged receipt. [4] One of the difficulties of Mayer's paper, according to Tom Shachtman, is that Mayer couched parts of his argument in philosophical language of Immanuel Kant, in which indestructible forces, such as heat and mechanical work, were discussed as being halfway between inert matter and soul. [13] This is though to have been the reason that Mayer was ignored, as were his three follow-up letters to the editor about it.

Not deterred, Mayer sought tutoring and help from his friend, German mathematics professor Carl Baur, who helped Mayer strengthen his paper mathematically, after which, in 1842, Mayer found publication in German chemist Justus Liebig's *Annals of Chemistry and Pharmacy*, with a paper entitled "Remarks on the Forces of Inorganic Nature". [7] In this paper, he is said to have given the following value for the mechanical equivalent of heat:

> "The warming of a given weight of water from 0ËšC to 1ËšC corresponds to the fall of an equal weight from the height of about 365 meters."

In this now-famous paper, Mayer is said to have argued for the principle that has since become known as the law of conservation of energy; in which he introduced the concept of fall-force. [8]

In 1845, Mayer published a small brochure, a fee he paid himself, titled "Organic Movement in Connection with Metabolism". [5] In this publication, Mayer equated heat with mechanical effect and stated that the gas or fluid "serves only as a tool for effecting the transformation of the one force into the other." [13]

Mayer's work, for the most part, however, was overlooked in favor of English physicist James Joule's (1843), and Mayer later attempted to commit suicide.

Boltzmann

In objection to the atomistic thermodynamic theories of Austrian physicist Ludwig Boltzmann, Mayer commented that Boltzmann's work was "of a piece with the efforts of the alchemists." [6]

Recognition

In 1851, Mayer self-published the brochure "Remarks on the Mechanical Equivalent of Heat", and by the end of the decade, his contributions eventually began to be acknowledged. The first, it seems, to recognize Mayer's work was German physicist Hermann Helmholtz who in 1854 lectured on Mayer's work to a group of physicists, acknowledging him as the original promoter of the principle of energy conservation. Soon thereafter, Irish physicist John Tyndall and German physicist Rudolf Clausius repeated Mayer's calculations, using the specific heat measurements of French chemist Henri Regnault, thus confirming agreement between the results of Mayer and those of English physicist James Joule.

Clausius commented years later that he never read Mayer's papers when first published because they did not contain the words heat or motion in the title. [13]

In 1862, Tyndall delivered a lecture at the Royal Institution on Mayer's work and shortly thereafter Clausius wrote a letter to Mayer, praising his work and telling him of Tyndall's lecture. [9] Tyndall also gave a sympathetic account of

Mayer's work in his 1863 book *Heat: A Mode of Motion*. Mayer later received the Poncelet Prize (date) and the Copley medal (1871), for his work. [12]

Education

In 1838, Mayer was in the process of finalizing his medical school exams. One of his professors was German chemist Justus Liebig who is said to have been an adherent of French chemist Antoine Lavoisier's 1785 combustion theory of animal heat and in this mindset taught this as the dominate paradigm to his students.

In his works, Liebig used a language of vital forces and drew on the metaphor of the furnace to describe the "metamorphosis" of nutrition and oxygen. [6] His student Mayer, influenced by these views, used the metaphor of combustion in his early publications on the mechanical equivalent of heat. [7] In particular, one question from his state medical exam in Stuttgart had been: "what influence does continued damp and warm weather exert on a person's state of health?" Mayer's answer, according to his records, was: "the blood becomes richer in carbon, darker, and the difference between red and black blood is less."

Suicide and asylums

See main: *Founders of thermodynamics and suicide*

Mayer, who during a period following his publications had a difficult time vindicating his theories, was one of the several founders of thermodynamics to have a connection to suicide. In particular, in 1850, distraught by a number of issues, including his lack of recognition, Mayer tried to end his life by jumping out of the third floor of a hospital. He latter spent several years (1851-1853) in a number of insane asylum.

In a noted 1858 lecture, German chemist Justus Liebig is said to have described Mayer as "the father of the greatest discovery of the century", but also to have announced incorrectly that Mayer had died ignominiously in a mental asylum due to vilification; when Mayer heard of this and protested that such eulogies were premature, his complaints were ignored. [14]

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θΔics

In existographies, **Robert Millikan** (1868-1953) (IQ:175|#271) (Kanowitz 50:29) (CR:8) was an American physicist, known for his 1910 oil drop experiment (Q), conducted with Harvey Fletcher, wherein they calculated the charge on a single electron, for his 1914 work on proving the photoelectric effect correct, and for his 1928 cosmic ray anti-entropy heat death religious theory.

Religion | Cosmic rays | Heat death

Millikan, as the son of a minister, was a religious man; views which became apparent in his later years.

In 1925, Millikan coined of the term “cosmic rays” (discovered in 1912), about which in 1928 he had developed a religious-based theory type of explanation, commenting that: [1]

> “[It is] fairly definite [that cosmic rays are] signals broadcast throughout the heavens … the birth cries of infant atoms.”

Millikan's cosmic ray theory, according to Sunand Joshi (2014), was that the cosmic rays were high energy photons created by god to counteract entropy (see: anti-entropy; entropy antonyms). [4]

In 1926-27, Millikan, in his Terry Lectures, published as *Evolution in Science and Religion* (1927), argued for a complementary relationship between Christianity and science.

In the 1930s, Millikan entered into a debate with Arthur Compton over whether cosmic rays were composed of high-energy photons (Millikan's view) or charged particles (Compton's view). Millikan thought, in the above quote, his cosmic ray photons were the "birth cries" of new atoms continually being created by God to counteract entropy and prevent the heat death of the universe. Compton would eventually be proven right by the observation that cosmic rays are deflected by the Earth's magnetic field (and so must be charged particles).

Oil drop experiment

In 1909, Millikan began experimenting with water droplets, falling between two charged plates, finding that evaporation skewed the results; in 1910, he progressed to doing the experiments with oil droplets, diagrammed below, wherein via a combination of the gravitational force, electric force, mass and density of the oil, he calculated the charge on a single electron.

determined the value of the charge of an electron, e = 1.6 × 10E-19 C. Millikan published his findings and other physicists accepted them circa 1913.

Prior to this oil-drop experiment, it was thought that charge could be anything at all on some continuum. Instead, this experiment showed that charge is quantized: it comes in discrete (and equal) quantities. This firmer understanding of the electron enabled the settling of a few debates concerning its nature. (Q)

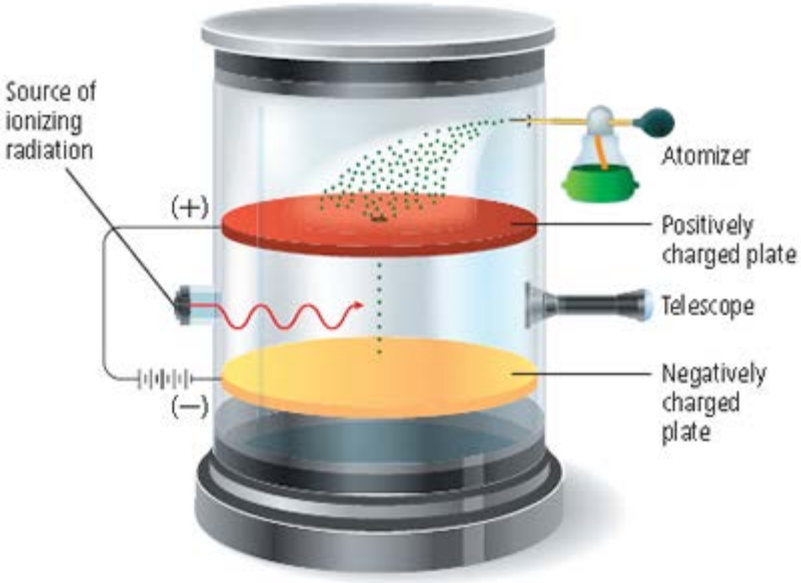

A diagram of Millikan's 1910 oil drop experiment, wherein he calculated the charge of an electron.

Photoelectric effect

In 1914, Millikan published the results of experiments, originally intended to disprove Einstein's model of the photoelectric effect, but which resultantly proved Einstein's predictions correct. (Q) Einstein was awarded the Nobel

Prize in 1921 for "his discovery of the law of the photoelectric effect", and Millikan was awarded the Nobel Prize in 1923 for "his work on the elementary charge of electricity and on the photoelectric effect".

Quotes | By

The following are quotes by Millikan:

> "Gibbs did for statistical mechanics and for thermodynamics what Laplace did for celestial mechanics and Maxwell did for electrodynamics, namely, made his field a well-nigh finished theoretical structure."
>
> — Robert Millikan (c.1920) [2]

> "The next mode of interaction of light with electrons was discovered and explained in terms of a famous billiard-ball model proposed by Arthur Compton in 1923. Compton pictured a free, stationary electron as being hit by a 'photon' of light."
>
> — Robert Millikan (1924) [3]

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θΔics

In hmolscience, **Robert Alexander Nisbet** (1913-1996) was an American sociologist noted, in sociological thermodynamics, for his 1970 Adams brothers influenced *The Social Bond*, wherein he speculates on how social bonds are comprised of entropy, in part.

Overview

In 1970, Nisbet, in his *The Social Bond*, discussed his ideas on social entropy, being "those behavioral processes that have a negative quality arising from their being in opposition to the norms, roles, and authorities making up a social order", which he conceptualized as one of seven parts of the social bond. The following quote captures Nisbet's view: [1]

> "Just as modern chemistry concerns itself with what it calls the chemical bond, seeking the forces that make atoms stick together as molecules, so does sociology investigate the forces that enable biologically derived human beings to stick together in the 'social molecules' in which we actually find them from the moment, quite literally, of their conception."

Nisbet, in his books, seems to focus on social change and the processes that result in disorder, rather than order, and instability, rather than stability.

Adams

Nisbet was influenced by American historians Henry Adams and Brooks Adams in his adoption of the use of entropy in his sociology theories. Nisbet had begun discussing the second law of thermodynamics in relation to social theory as early as 1968 and was referencing the entropy views of Henry Adams in 1969. [3]

Nisbet, in fact, names the title of his 1971 book *The Degradation of the Academic Dogma* on Henry Adams' 1919 book *The Degradation of the Democratic Dogma.* On the first page, Nisbet states: [4]

> "When Henry Adams and his brother Brooks used the word 'degradation' in their writings, for the most part they had in mind a process in human history comparable to entropy in the physical world. Both the Adams brothers saw in the history of civilization an endemic running down of energy that was reflected, they believed, in an increasing dissolution of culture and of moral values in their own time."

On this theme, albeit not using any deeper thermodynamic speculation, Nisbet goes on to discuss the changes in American universities following WWII.

Education

Nisbet completed his PhD, with a dissertation on French conservative social thought in the early nineteenth century, at the University of California, Berkeley in 1939. [2] He went on to found the sociology department at Berkeley, staying there until 1953, where after he became dean of the University of California, Riverside. Nisbet then moved on to the University of Arizona, then to Columbia where he retired in 1978.

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θΔics

In existographies, **Robert Owen** (1771-1858) (FA:108) was a Welsh textile manufacturer and utopian socialism philosopher; noted for his two short-lived (short-existed) deism-based, irreligious, neo-Benthamite based societies he founded, one in New Lanark, Scotland, and second in New Harmony, Indiana.

Overview

In 1780, Owen, age 9, started working as a clerk and over the next five years, with the help of a sympathetic cloth merchant, to whom he was apprenticed, began to educate himself.

In 1758, Owen, age 14, influenced by Seneca, his acquaintance with John Dalton and Samuel Coleridge, was an unbeliever. [1]

In 1850, Frances Wright (1795-1852) (Q), in her *A Few Days in Athens*, in a discussion of Leontion and Epicurus, classified Owen in the category of "practical atheism". (Q)

Holyoake

In 1841, George Holyoake, together with radical bookseller Charles Southwell (1814-1860), dissented from the official policy of Owen, namely Owenism, i.e. the utopian socialism philosophy of Owen, his followers and successors, that lecturers should take a religious oath, to enable them to take collections on Sunday; founded the atheist publication *Oracle of Reason*, because of which he was soon imprisoned because of its content; Holyoake took over as editor, and was moved to an atheist position as a result of his experiences.

Quotes | Employed

The following are quotes employed by Owen:

> "The worst of all things is defied error."
>
> — Francis Bacon (c.1610), *Publication* (Q); cited by Robert Owen (1829) in *Evidences of Christianity: a Debate Between Robert Owen and Alexander Campbell* (pg. 92)

Quotes | By

The following are quotes by Owen:

> "Finding that no religion is based on facts and cannot therefore be true, I began to reflect what must be the condition of mankind trained from infancy to believe in errors."
>
> — Robert Owen (1829), *Evidences of Christianity: a Debate Between Robert Owen and Alexander Campbell* [1]

See also

- Richard Owen (1804-1892) | English anatomist and evolutionist

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See also

- Richard Owen (1804-1892) | English anatomist and evolutionist

θΔics

In hmolscience, **Robert Graham Perry** (1951-) is a Canadian scholar noted for his 1979 master's thesis "The Science of Love in the Middle Ages, the Romantic Period, and Our Own Time", wherein, centered on German polyintellect Johann Goethe's physical chemistry based 1809 *Elective Affinities* and French writer Stendhal's crystallization process themed 1822 "On Love" treatise, among earlier works such as Ibn Hazm' "The Dove's Neck Ring", Ovid's "Ars Amatoria and Andreas Capellanus' "De Amore", among others, he attempts to outline and define the "science of love", or love science, as a discipline or category, as contrasted with the "philosophy of love". [1]

Overview

In 1979, Perry, in his master's thesis "The Science of Love in the Middle Ages, the Romantic Period, and Our Own Time", opens to the following:

> "The discipline or category of the philosophy of love has been precisely defined, its diverse traditions fully documented and compared, and its distinctive rhetorical medium—the dialogue—analyzed in detail. Another of love's disciplines, the 'science of love', has not fared as well: the nature of this discipline has seldom, if ever, been defined, few of its particular traditions have been documented, let alone compared, and its distinctive rhetorical medium—the love-treatise—has never been fully analyzed. Two reasons for this neglect suggest themselves. First, love-science has often been perceived as being mere frivolous, eccentric, reductive, or immoral discipline. It was in these terms that, for example, two of the finest nineteenth century contributions to the discipline, Goethe's *Die Wahlverwandtschaften* [*Elective Affinities*] and Stendhal's *De l'Amour* [*On Love*], were critically received. Second, the discourse of love-science in general and of the love-treatise in particular has often been considered stylistically impure."

(add discussion)

Education

Perry completed his BA in 1972 and his MA in 1979, with a thesis on "The Science of Love in the Middle Ages, the Romantic Period, and our Own Time", both at the University of British Columbia. [1]

References

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External links

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θΔics

In existographies, **Robert Pirsig** (1928-2017) (IQ:165|#521) (CR:60) was an American writer-philosopher, and former child prodigy, noted for his 1991 book *Lila: An Inquiry into Morals*, wherein the character reflects on the likes of William Sidis, and digs into the questions of life, and morals, in the context of a person being a collection of atoms governed by physics and chemistry, in the context of the second law of thermodynamics.

Physics of culture

Pirsig, in commentary on the physical anthropologist Franz Boas, has the following to say: [1]

> "Patterns of culture do not operate in accordance with the laws of physics. How are you going to prove in terms of the laws of physics that a certain attitude exists within a culture? What is an attitude in terms of the laws of molecular interaction?"

Following this, he interjects:

> "What is a cultural value? How are you going to show *scientifically* that a certain culture has certain values? You can't. Science has no values. Not officially."

(add)

Chemical struggle?

> *See main: Chemistry professor paradox*

To quote a representative except, wherein he addresses the issues with Darwin's theory of evolution, namely that humans are chemicals and chemical don't struggle to survive, as Darwin's theory would have it: [1]

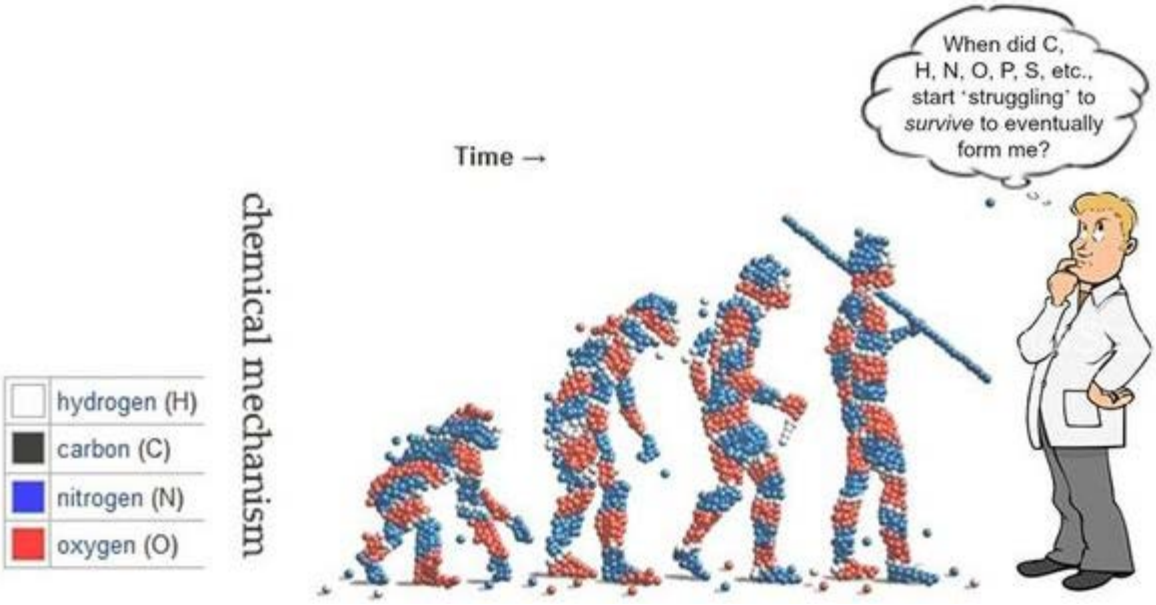

Clausius ←|→ Darwin

Persig, in his 1991 *Lila: Inquiry into Morals*, very intelligently positions Clausius (entropy increase) against Darwin (struggle to survive) in a way to show ridicule or rather absurdity in the logic of the latter at the chemical level.

> "This is the sort of irrelevant-sounding question that seems minor at first, and the mind looks for a quick answer to dismiss it. It sounds like one of those hostile, ignorant questions some fundamentalist preacher might think up. But why do the fittest survive? Why does any life survive? It's illogical. It's self-contradictory that life should survive. If life is strictly a result of the physical and chemical forces of nature then why is life opposed to these same forces in its struggle to survive? Either life is with physical nature [natural] or it's against it. If it's with nature there's nothing to survive. If it's against physical nature [unnatural] then there must be something apart from the physical and chemical forces of nature that is motivating it to be against physical nature. The second law of thermodynamics states that all energy systems 'run down' like a clock and never rewind

themselves. But life not only ‘runs up,’ converting low energy sea-water, sunlight and air into high-energy chemicals, it keeps multiplying itself into more and better clocks that keep "running up" faster and faster.

Why, for example, should a group of simple, stable compounds of carbon (C), hydrogen (H), oxygen (O), and nitrogen (N), 'struggle' for billions of years to organize themselves into a professor of chemistry? What's the motive?

If we leave a chemistry professor out on a rock in the sun long enough the forces of nature will convert him into simple compounds of carbon, oxygen, hydrogen and nitrogen, calcium, phosphorus, and small amounts of other minerals. It's a one-way reaction. No matter what kind of chemistry professor we use and no matter what process we use we can't turn these compounds back into a chemistry professor. Chemistry professors are unstable mixtures of predominantly unstable compounds which, in the exclusive presence of the sun's heat, decay irreversibly into simpler organic and inorganic compounds. That's a scientific fact.

The question is: Then why does nature reverse this process? What on earth causes the inorganic compounds to go the other way? It isn't sun's energy. We just saw what the sun's energy did. It has to something else. What is it?”

(add)

Education

Pirsig was precocious child, cited with an IQ of 170 at age 9. In 1943, at age 15, after finishing high school, Pirsig entered the University of Minnesota at age to study biochemistry, interested in science as a goal in itself, rather than a way to establish a career. Troubled with the issue of multiple hypotheses in science, Pirsig soon left college. To quote a summary of this: (Q)

“While doing laboratory work in biochemistry, Pirsig became greatly troubled by the existence of more than one workable hypothesis to explain a given phenomenon, and, indeed, that the number of hypotheses appeared unlimited. He could not find any way to reduce the number of hypotheses—he became perplexed by the role and source of hypothesis generation within scientific practice. This led to his determination of a previously unarticulated limitation of science, which was something of a revelation to him. The question distracted him to the extent that he lost interest in his studies and failed to maintain good grades; and finally, he was expelled from the university.”

Following a two-year stint in the Army, he returned to college to complete a BS in Eastern philosophy and later did graduate work in Eastern philosophy and culture at Banaras Hindu University. In the years to follow he worked on developing a value-based metaphysics theory of quality, as outlined in his various books.

Metaphysics of Quality

Quotes | Cited

The following are notable quotes cited by Pirsig in *Lila*:

“Mankind is driven forward by dim apprehensions of things to obscure for his

existing language."

— Alfred Whitehead (c.1920); *Lila* (pg. 115)

MoQ.org
(icon)

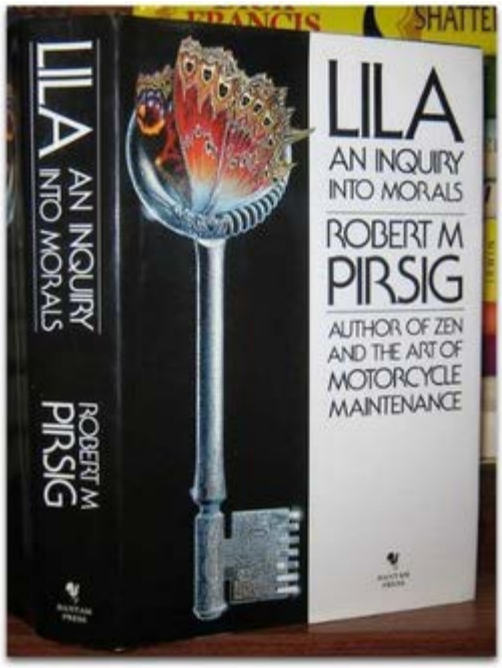

Left: the icon for the 1998-launched MoQ.org, a site dedicated to **Pirsig's** "metaphysics of quality" theory, as introduced in his 1991 book *Lila: an Inquiry into Morals* (right). [1]

"Why is man apt to feel bad in a good environment, say suburban Short Hills, New Jersey, on an ordinary Wednesday afternoon? Why is the same man apt to feel good in a very bad environment, say in an old hotel in Key Largo, in a hurricane? Why is it that a man riding a good commuter train from Larchmont to New York, whose needs and drives are satisfied, who has a good home, loving wife and family, good job, and enjoys unprecedented 'cultural and recreational facilities' often feels bad without knowing why?"

— Walker Percy (1975), "The Delta Factor" (Q); *Lila* (pg. 118)

Quotes | Lila

In 1991, fifteen years after writing Zen and the Art of Motorcycle Maintenance, Pirsig finished his followup book *Lila: an Inquiry into Morals*, the result of some type of card cataloging systematic documenting of mental notes and ideas into different categories; some noted quotes are listed below:

"Sanity is not truth. Sanity is conformity to what is socially expected. Truth is sometimes in conformity, sometimes not."

— Robert Pirsig (1991), *Lila: an Inquiry Into Morals* (Q)

"When one person suffers from a delusion it is called insanity. When many people suffer from a delusion it is called religion."

— Robert Pirsig (1991), *Lila: Inquiry into Morals*; cited in *The God Delusion* (pg. 28) by Richard Dawkins

Quotes | Zen

In 1974, Pirsig published his *Zen and the Art of Motorcycle Maintenance*; the following are notable quotes: [2]

“It's paradoxical that where people are the most closely crowded, in the big coastal cities in the East and West, the loneliness is the greatest. Back where people were so spread out in western Oregon and Idaho and Montana and the Dakotas you'd think the loneliness would have been greater, but we didn't see it so much. The explanation, I suppose, is that the physical distance between people has nothing to do with loneliness. It's psychic distance, and in Montana and Idaho the physical distances are big but the psychic distances between people are small, and here it's reversed.”

— Robert Pirsig (1974), *Zen and the Art of Motorcycle Maintenance* (Q)

“When you look directly at an insane man all you see is a reflection of your own knowledge that he's insane, which is not to see him at all. To see him you must see what he saw and when you are trying to see the vision of an insane man, an oblique route is the only way to come at it.”

— Robert Pirsig (1974), *Zen and the Art of Motorcycle Maintenance* (§7) (Q)

“People arrive at a factory and perform a totally meaningless task from eight to five without question because the structure demands that it be that way. There’s no villain, no ‘mean guy’ who wants them to live meaningless lives, it’s just that the structure, the system demands it and no one is willing to take on the formidable task of changing the structure just because it is meaningless. But to tear down a factory or to revolt against a government or to avoid repair of a motorcycle because it is a system is to attack effects rather than causes; and as long as the attack is upon effects only, no change is possible. The true system, the real system, is our present construction of systematic thought itself, rationality itself, and if a factory is torn down but the rationality which produced it is left standing, then that rationality will simply produce another factory. If a revolution destroys a systematic government, but the systematic patterns of thought that produced that government are left intact, then those patterns will repeat themselves in the succeeding government. There’s so much talk about the system. And so little understanding.”

— Robert Pirsig (1974), *Zen and the Art of Motorcycle Maintenance* (§8) (Q)

“You are never dedicated to something you have complete confidence in. No one is fanatically shouting that the sun is going to rise tomorrow. They know it's going to rise tomorrow. When people are fanatically dedicated to political or religious faiths or any other kinds of dogmas or goals, it's always because these dogmas or goals are in doubt.”

— Robert Pirsig (1974), *Zen and the Art of Motorcycle Maintenance* (§13) (Q)

“I think present-day reason is an analogue of the flat earth of the medieval period. If you go too far beyond it you're presumed to fall off, into insanity. And people are very much afraid of that. I think this fear of insanity is comparable to the fear people once had of falling off the edge of the world. Or the fear of heretics. There's a very close analogue there.”

— Robert Pirsig (1974), *Zen and the Art of Motorcycle Maintenance* (§14) (Q)

Quotes | By

The following are other quotes by Pirsig:

“It is a puzzling thing. The truth knocks on the door and you say, "Go away, I'm looking for the truth," and

so it goes away. Puzzling."

— Robert Pirsig (c.1990), *Publication*

"I once told Korean laborers, while teaching them English, that '26 letters allows us to describe the whole universe'. And they just said 'no'. That was what started me thinking. In the east the basis of experience is not definable. That ... led me on the road to Zen."

— Robert Pirsig (c.1990) (Q)

See also

- Alan Watts | Secret of life
- Bruce Gunn
- Scrooge Tiny Tim dialogue | Quantum determinism

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External links

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- Lila (excerpts) – Sidis.net.
- Metaphysics of quality – MoQ.org.

θΔics

In thermodynamics, **Robert B. Raffa** (c.1949-) is an American pharmacological engineer notable for being one of the primary founders of the field of drug-receptor thermodynamics, for his work on the subject beginning in 1980.

Education

Raffa has completed five degrees: a BS in chemical engineering and a BS in physiological psychology (1971), at the University of Delaware, a MS in biomedical engineering (1979), at Drexel University, a PhD in pharmacology (1982), at Temple University School of Medicine, and a MS in toxicology (1986), at Thomas Jefferson University. [2]

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(d) Raffa, Robert B. (1980). *Drug-Receptor Thermodynamics - Introduction and Applications* (paperback). New York.
2. Robert Raffa – Curriculum vitae.

θΔics

In science, **Robert Redcorde** (1510-1558) was a Wales-born English mathematician and physician noted for his 1557 book *The Whetstone of Witte*, in which he introduced the "=" sign and penned the world's first equation, as shown below: [1]

$$14x + 15 = 71$$

or

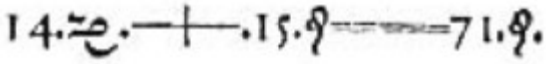

in its original notation, a basic algebraic equation. With the publication of this book, Recorde is credited with introducing algebra into England. [2]

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(b) Bodanis, David. (2000). *E = mc² - a Biography of the World's Most Famous Equation* (pg. 25). Berkley Books.
2. Jourdain, Philip E.B. (1913). *The Nature of Mathematics.* London.

External links

â— Robert Recorde – Wikipedia.

θΔics

In existographies, **Robert Rosen** (1934-1998) (CR:8) was an American anti-reductionist theoretical biologist noted for his 1991 publication *Life Itself*, in which he attempted to answer Austrian physicist Erwin Schrodinger's famous 1943 attempt to explain 'what is life?' in the language of physics and chemistry.

Overview

Rosen thematically might well be described as a mixture of Ilya Prigogine, Ludwig Bertalanffy, Stuart Kauffman, mixed in with complexity theory.

Rosen's research efforts tended to be focused on one question: 'Why are living things alive?' As a theoretical biologist, Robert Rosen saw this as the most fundamental of all questions-and yet it had never been answered satisfactorily by science. In Rosen's view, the answers to this question would allow humanity to make an enormous leap forward in our understanding of the principles at work in our world.

As a historian of science, Rosen was aware that for centuries it was believed that the only scientific approach to the question "What is life?" must proceed from the Cartesian metaphor (organism as machine). Anson Rabinbach's 1990 book *The Human Motor*, to note, is a good overview introduction to this subject.

Classical approaches in science, which also borrow heavily from Newtonian mechanics, are based on a process called "reductionism." The thinking was that we can better learn about an intricate, complicated system (like an organism) if we take it apart, study the components, and then reconstruct the system-thereby gaining an understanding of the whole. However, Rosen argues that reductionism does not work in biology and ignores the complexity of organisms.

In this light, Rosen noted the obvious fact that the question of what makes an organism alive remains an unanswered question in conventional biology, chemistry, and physics, under which the former two topics are thought to be subsumed. On this premise, Rosen viewed the Newtonianparadigm of physics—the world of mechanisms—as inadequate to describe biological systems, and sought an alternative explanation. The theme of Rosen's book is said to be an expansion of the ideas on "relational biology" that had begun to ferment during his graduate studies in Russian born American theoretical biologist Nicolas Rashevsky's mathematical biophysics program. [3]

Difficulties on theory

A large and salient difficulty on theory in the Rosen's argument is that he seems to be of the view that mechanics outranks thermodynamics. He states this as follows:

> "We can argue that mechanics is more general than thermodynamics. Or rather, we can argue that the formalism of mechanics is more general than is that of thermodynamics. On this basis, we can assert that mechanics is the more universal theory."

Rosen, supposedly, expands on this idea in chapter four (The Concept of State) of his book. In any event, this last statement is completely backwards: thermodynamics is not only the more universal theory—it is the theory that governs the known universe, as science currently sees things. This was stated in 1865 by German physicist Rudolf Clausius. The logic that thermodynamics is the most universal theory in science is known famously as the Einstein postulate, a reflectionary statement made by German-born American physicist Albert Einstein in circa 1940:

> "A theory is the more impressive the greater the simplicity of its premises, the more different kinds of things it relates, and the more extended its area of applicability. Therefore the deep impression that classical thermodynamics made upon me. It is the only physical theory of universal content which I am convinced will never be overthrown, within the framework of applicability of its basic concepts."

The central problem with Rosen's thermodynamics interpretation seems to be that he does not have an adequate understanding of chemical thermodynamics, which is the correct framework with which to explain biological phenomenon, but instead relies on what seem to be statistical mechanics interpretations.

Education

Rosen studied biology, mathematics, physics, philosophy, and the history of science as an undergraduate and in 1959 completed his PhD on relational biology under Russian born American theoretical biologist Nicolas Rashevsky at the University of Chicago. Rosen stayed at the University of Chicago until 1965, after which he became a full professor at the University of Buffalo, and in 1975 transferred to Dalhousie University, Nova Scotia, as a professor of physiology and biophysics, retiring there in 1994.

Students

Rosen's work seems to have a certain following, including American physiologist Donald Mikulecky.

Quotes | By

The following are quotes by Rosen:

> "I have never found entropy, information, negentropy and the like to be useful concepts in characterizing organization."
>
> — Robert Rosen (1980), *Publication* (pg. 364); cited by Richard Adams (1988) in: *The Eighth Day* (pg. 33) [4]

External links

1. Robert Rosen (about) – Panmere.com.
2. (a) Rosen, Robert. (1991). *Life Itself: A Comprehensive Inquiry into the Nature, Origin, and Fabrication of Life* (thermodynamics, 7+ pgs; ch. 4: The Concept of State, pgs. 67-). Columbia University Press.
(b) Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Life* (pg. 139). Chicago: The University of Chicago Press.
3. Scott, Alwyn. (2007). *The Nonlinear Universe: Chaos, Emergence, Life* (pg. 292). Springer.
4. (a) Goldman, Stanford. (1980). "A Unified Theory of Biology and Physics" (abs), *Journal of Social and Biological Structures*, 3(4):331-360.
(b) Rosen, Robert. (1980). "Comments on 'A Unified Theory of Biology and Physics' by S. Goldman" (Q), *Journal of Social and Biological Structure*, 3:363-65.

Further reading

● Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool: Energy Flow, Thermodynamics, and Life* (pg. 139). Chicago: The University of Chicago Press.

External links

● Robert Rosen (theoretical biologist) – Wikipedia.
● Rosennean complexity – Panmere.com.

θΔics

In hmolscience, **Robert John Russell** (c. 1946-) is an American physicist-theologian noted, in religious thermodynamics, for his circa 1982 views on thermodynamics and evil.

Overview

In circa 1982, Russell presented views on thermodynamics of evil, discussed generally in terms of entropy. Russell's central premise is that both entropy and evil are connected to their effect or measure of disorder, and must be related if they both exist. [1] The following are Russell's opening words from his 2008 chapter on the subject of the thermodynamics of the nature of good and evil in nature: [2]

> "The power of evil is tragically self-evident. The domain of the second law of thermodynamics extends throughout science. Is there any substantive relationship between entropy and evil?"

English biochemist-theologian Christopher Southgate cites Russell as having developed the theory, in 1984, that a future universal eschatological state will be characterized by a suspension of the second law of thermodynamics. [3]

Education

Russell completed his BS in physics (1968) at Stanford University, his MS in physics (1970) from UCLA, and BD and MA in theology (1972) from the Pacific School of Religion, and his PhD in physics (1978) from the University of California, Santa Cruz. Russell has taught college physics courses, courses on science and religion, and is an ordained minister.

References

1. Russell, Robert John. (1982). "Disorder and Order: A Study of Entropy and a Study of Evil", *Twenty-ninth Summer Conference of the Institute on Religion in an Age of Science*, Star Island, New Hampshire, 24–31 July.
2. Russell, Robert J. (2008). *Cosmology: from Alpha to Omega: the Creative Mutual Interaction of Theology* (ch. 7: Entropy and Evil: the Role of Thermodynamics in the Ambiguity of Good and Evil in Nature, pgs. 226-49). Fortress Press.
3. Southgate, Christopher. (2005). *God, Humanity, and the Cosmos* (thermodynamics, pgs. 124, 293, 299). Continuum International Publishing Group.

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● Bennett, Gaymon, Peters, Ted, Hewlett, Martinez J., and Russell, Robert J. (2008). *The Evolution of Evil: Volume 8 of Religion, Theology, and Natural Science* (thermodynamics, pgs. 120, 125, 130-38). Vandenhoeck & Ruprecht.

External links

● Robert Russell – Wikipedia.

θΔics

In hmolscience, **Robert C. Solomon** (1942-2007) was and American philosopher, focused on a mix of emotion theory, and existentialism themed philosophy, noted for his 1984 so-called "metaphysical model" discussion of love as seen by Aristophanes (c.400BC), Goethe (1796), and "field theory" of modern physics, a connective idea he seems to cull from Cole Porter's 1955 song "It's a chemical reaction, that's all."

Goethe | Gilbert & Sullivan

In 1970, in one of his collected essays, states the following: [3]

> "We look at relationships as supplements, as external links between ourselves and others, and for that reason, inevitably, we misunderstand them. The fact is that we are not atoms floating in a social void, waiting for a 'chemical attraction' between us so that we can form molecules. That image has been popular for years, from Goethe's 'elective affinities' to Gilbert and Sullivan ('hey diddle diddle with your middle/class kisses …"

Solomon, to note, footnotes the "Gilbert and Sullivan" mention to the following undated citation:

> "Hey diddle diddle with your middle-class kisses.
> "It's a chemical reaction, that's all."
>
> — Gilbert and Sullivan

This "Gilbert and Sullivan" association, however, may be misplaced conjecture, as the above seems to come from Cole Porter's 1955 song "It's a chemical reaction, that's all."

In 1981, Solomon, likewise, in his *Love: Emotion, Myth, & Metaphor*, stated the following: [1]

> "The old expression about love being a matter of 'chemical attraction'—from Goethe to Gilbert and Sullivan—is, scientifically, a century out of date; 'attraction' is no longer a question of one atom affecting another but the product of two electromagnetic fields, each of which exists prior to and independently of any particular atoms within its range."

(add discussion)

Metastability

Solomon, citing Jean-Paul Sartre, defines metastability—or relationships that are in a metastable state—as follows: [4]

Metastability: Master and Slave

METASTABLE (chemistry) chemically unstable in the absence of certain conditions that would induce stability, but not liable to spontaneous transformation.

RANDOM HOUSE DICTIONARY

Left: Solomon employs the term "metastability", and the above definition, amid his chapter on "Love and the Test of Time", in respect to discussions of jealousy and dynamic equilibrium of tensions. [1]

> "It may have all of the appearance of stability, but the violence of the forces in balance are such that, should there be a single slip, a momentary imbalance, an ill-considered comment or careless act, that stability shatters into disaster."

(add discussion)

Spontaneity

In 1993, Solomon, in his *The Passions: Emotions and the Meaning of Life*, had the following to say about the so-called "spontaneousness" of love: [2]

> "We often contrast the 'spontaneity' of the passions with the 'ponderous deliberations' of reason. And it is true that we often 'find ourselves' in a passion. But this appearance must be explained. The fact that we 'find' this to be the case does not entail nor even suggest that we are not ourselves responsible for them. And we all know so well that many times we 'catch ourselves', not *in* a passion, but deliberating—even ponderously—in an effort to *build up* a passion, 'working ourselves into a rage', 'making ourselves feel guilty', or rehearsing the virtues and possibilities of a prospective 'date' until we virtually *push* ourselves into the dubious abyss into which we allegedly 'fall' when we 'fall in love'. There is nothing '**spontaneous**' about such emotion. And even when our passions are unquestionably spontaneous in that sense, it remains to be seen whether they are not so only because they have been used in similar circumstances so many times before and have already been so often practiced and finely developed. Like the apparently 'spontaneous' genius of a Nicolo Paganini, a James Whistler, or a Thomas Mann, our passions are 'spontaneous' only in the sense that they can benefit from many years of hard work and painful development; and the present masterpiece seems to emerge as if on its own."

Education

Solomon completed his BA in microbiology (or molecular biology) in 1963 at the University of Pennsylvania, and his MA in 1965 and PhD in 1967 in philosophy at the University of Michigan. From 1972, until he reaction end, he was a professor of philosophy and business at the University of Texas at Austin, where he published more than 40 books on philosophy, focusing on existentialism in a postmodern word; his interests were in 19th-century German philosophy—especially Georg Hegel and Friedrich Nietzsche—and 20th-century philosophy—especially Jean-Paul Sartre and phenomenology, as well as ethics and the philosophy of emotions.

Difficulties on theory

The salient difficulties on theory of Solomon's overt assertion that "love" is an invented word invented to describe, and in reality but an admixture of emotion, myth, and metaphor, can be discerned from his 1981 preface, wherein he states the following:

> (add)

Quotes

The following are noted quotes:

> "What I want to ask you is to look at emotions, as I have, as something wondrous, something mysterious, something exotic, as well as something dangerous, something profound, and something valuable."
>
> — Robert Solomon (c.1980) [4]

> "Romantic love, we still read in cosmopolitan, is a 'matter of chemistry', an image that has its support in the writings of the greatest poets, in Shakespeare, for instance, and in Goethe, whose novel *Elective Affinities* has been prime reading in Europe for almost two centuries."
>
> — Robert Solomon (1981), *Love: Emotion, Myth, Metaphor* (pg. 38)

> “We might not believer that love is ‘forever’, but we do say, of a glorious fling that lasted three months, ‘it didn’t work out.’ What were we supposed to be working *for*? Why measure the success of a relationship by how long it lasts?”
>
> — Robert Solomon (1981), *Love: Emotion, Myth, Metaphor* (pg.117)

References

1. Solomon, Robert C. (1981). *Love: Emotion, Myth, & Metaphor* (Goethe, 7+ pgs; quote, pg. 25; *Elective Affinities*, pg. 38; metastability, pg. 271). Prometheus Books, 1990.
2. Solomon, Robert C. (1993). *The Passions: Emotions and the Meaning of Life* (pg. 60). Hackett Publishing.
3. Solomon, Robert C. (1970). *Entertaining Ideas: Popular Philosophical Essays, 1970-1990* (pg. 157). Prometheus Books.
4. Robert C. Solomon – TheGreatCourses.com.

External links

â— Robert C. Solomon – Wikipedia.
â— Solomon, Robert C. – WorldCat Identities.

θΔics

In hmolscience, **Robert Solow** (1924-) is an American economist noted for []

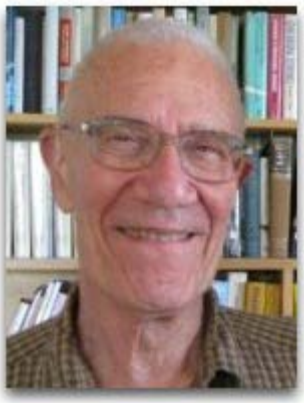

Overview

In 1956, Solow developed a model of economic growth, aka "Solow model" (O), as cited by Jurgen Mimkes (2016), according to which income is a function of capital and labor.

In 1985, Solow, in his "Economic History and Economics", as cited by Philip Mirowki, staged his opinion that only the best economists do social physics; his quote on this is as follows: [1]

> "My impression is that the best and brightest of the profession proceed as if economics is the physics of society… If the project of turning economics into a hard science could succeed, then it would surely be worth doing."

The term "physics of society", to note, is a common phrase used by Philip Ball during his 2001 to 2004 physics of society lectures. [2]

On the blocking of Paul Samuelson by Harold Burbank from getting a post at Harvard, as discussed in the Harvard Pareto circle, Solow commented: "You could be disqualified for a job if you were either smart or Jewish or Keynesian. So what chance did this smart, Jewish Keynesian have?" [3]

Quotes

The following are other relevant quotes:

> "Everything reminds Milton Friedman of the money supply. Everything reminds me of sex, but I try to keep it out of my papers."
>
> — Robert Solow (1966), on Friedman's ideas and his own, in a series of papers at 1966 conferences (O)

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(b) Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (pg. 354). Cambridge University Press.
2. (a) (a) Ball, Philip. (2001). "The Physical Modeling of Society: A Historical Perspective"; A Talk Presented at Messina, Sicily; Published in Physica A 314, 1-14 (2002).
(b) Ball, Philip. (2003). "The Physics of Society", A talk Delivered at the London School of Economics, March.
(c) Ball, Philip. (2004). "The Physical Modeling of Human Social Systems", A Review in *ComPlexUs*, 1, 190, Nov.
3. Hoffman, Allison. (2009). "Economist Paul Samuelson Dead at 94: Smart, Jewish Keynesian Somehow Succeeded" (O), TabletMag.com, Dec 14.

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External links

● Robert Solow – Wikipedia.

θΔics

In human chemistry, **Robert W. Sterner** (c. 1958-) is an American biological ecologist and limnologist noted for his 2000 Sterner-Elser human molecular formula.

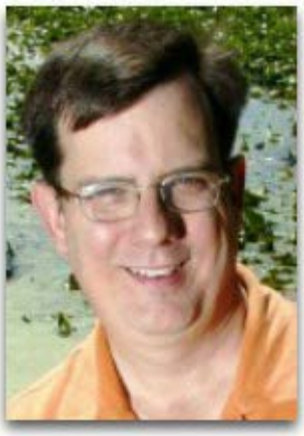

Overview

In 2000, Sterner, together with with American limnologist James Elser, calculated a 22-element formula for one human conceptualized as an "abstract molecule".

In 2002, Sterner and Elser published *Ecological Stoichiometry: the Biology of Elements from Molecules to the Biosphere*, in which they calculate a 22-element empirical molecular formula for a human molecule:

$$H_{375,000,000}\ O_{132,000,000}\ C_{85,700,000}\ N_{6,430,000}\ Ca_{1,500,000}\ P_{1,020,000}\ S_{206,000}\ Na_{183,000}\ K_{177,000}$$
$$Cl_{127,000}\ Mg_{40,000}\ Si_{38,600}\ Fe_{2,680}\ Zn_{2,110}\ Cu_{76}\ I_{14}\ Mn_{13}\ F_{13}\ Cr_{7}\ Se_{4}\ Mo_{3}\ Co_{1}$$

This amounts to a 22-element human empirical molecular formula. [1] A similar 26-element empirical molecular formula calculation was made by American chemical engineer Libb Thims also in 2002. [2]

They conclude “this formula combines all compounds in a human being into a single abstract ‘molecule’”. They continues, “our main purpose in introducing this formula for the ‘human molecule’ is to stimulate you to begin to think about how every human being represents the coming together of atoms in proportions that are, if not constant, at least bounded and obeying some rules”.

They state that ecological stoichiometry is about “how chemical elements come together to form evolved, living species in ecosystems.” The abstraction followed in this science, according to Sterner and Elser, is that “organisms can be thought of as complex evolved chemical substances that interact with each other and the abiotic world in a way that resembles a complex, composite, chemical reaction” and that “ecological interactions invariably involve chemical rearrangements”. In summary, they state that “like any other normal chemical rearrangement at the surface of the Earth, when organisms interact, mass must be conserved and elements are neither created nor destroyed.” Moreover, “there is stoichiometry in ecology, just as there is in organic synthesis in a test tube”.

Education

Sterner completed his BS in biology from the University of Illinois, Champaign in 1980 and his PhD in ecology at the University of Minnesota in 1986. [3]

References

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(b) Molecular Evolution Table - Institute of Human Thermodynamics
(c) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (ch. 2: "The Human Molecule", pgs. 15-35). Morrisville, NC: LuLu.
3. Robert Sterner - Curriculum vitae.

External links

â— Robert W. Sterner - University of Minnesota, faculty page.
â— The Sterner Lab

θΔics

In existographies, **Robert Stevenson** (1850-1894) (WorldCat 100:27) (CR:3) was a Scottish writer and poet, popularly known for: *Treasure Island, Dr. Jekyll and Mr. Hyde*, and *A Child's Garden of Verses*, noted for []

Quotes | By

The following are quotes by Stevenson:

> "The world is full of a number of things, I'm sure we should all be happy as kings."
>
> — Robert Stevenson (1885), *Happy Thought*; cited by Hilda Finnemore (1924) and Arthur Lovejoy (1933) [1]

References

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(b) Finnemore, Hilda. (1924). *A History of the Earth from Star-Dust to Man* (§1: What Things are Made Of, pgs. 5-20; quote, pg. 5). Longmans, Green, and Co.
(c) Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea* (pg. 226). Harvard University Press, 1936.

Further reading

â— Kalpakgian, Mitchell. (2012). "Robert Louis Stevenson's *A Child's Garden of Verses*" (Ñº), *The Civilized Reader*, May 3.

External links

â— Robert Louis Stevenson – Wikipedia.

θΔics

In existographies, **Robert Taylor** (1784-1844) (IQ:175|#270) (RMS:39) (FA:106) (EPD product) was an English surgeon, radical clergyman (dubbed the "devil's chaplain"), religio-mythology scholar, free thinker (or “infidel missionary”, as he characterized himself), characterized as "brilliant" (Murdock, 2014), a product of the genius hiatus effect (three years in prison), noted for []

Shoulder | Scholars

Taylor, via citation and reference, builds on: Justin Martyr, Charles Dupuis, Constantin Volney, and [add]

Overview

In c.1827, Taylor set up a Christian Evidence Society, during which time he lectured in London pubs dressed in elaborate vestments, attacking the Anglican liturgy and the barbarities of the establishment for what he called its ‘pagan creed’.

In 1828, Taylor, then aged 44, was sentenced to a year in prison (Oakham Gaol), for offense against the faith "by law established".

That year, in his cell, he wrote *The Diegesis: a Discovery of the Origin, Evidences, and Early History of Christianity*, wherein he attacked Christianity on the basis of comparative mythology and attempting to expound it as a scheme of solar myths.

On 19 Feb 1829, Taylor finished *The Diegesis*, signing the dedication page as “Robert Taylor, A.B., Prisoner”. [1]

On 21 May 1829, following his release, Taylor, in cohorts with English freedom of the press promoter Richard Carlile — a previous deist who declared (Ñº) himself an atheist in 1821, noted as the publisher of Thomas Paine's writings — arrived in Cambridge, where the rented a room for two weeks above a print shop, which they called their ‘Infidel Headquarters’, whereat they printed and sent out the following circular to the leading clergyman of the area:

> “Robert Taylor and Richard Carlile present their compliments as ‘infidel missionaries’, to and most respectfully and earnestly invite discussion on the merits of the Christian religion, which they argumentatively challenge, in the confidence of their competence to prove, that **such a person as Jesus Christ, alleged to have been of Nazareth, never existed**; and that the Christian religion has no such origin as has been pretended; neither is it in any way beneficial to mankind; but that it is nothing more than an emanation from the ancient Pagan religion. The researches of the Rev. Robert Taylor, on the subject, are embodied in his newly published work, *The Diegesis*, in which may be found the routine of their argument. They also impugn the honesty of a continued preaching, while discussion is challenged on the whole of the merits of the Christian religion.”

This resulted in a fiasco, of sorts (Ñº), the news of which spread through the entire student body of Cambridge, including the newly being imprinted mind of Charles Darwin, then in his second year of college.

In 1830-33, Taylor discussed the connections between Sarah, Sirius (Dog Star), and the start of the annual flooding of the Nile. [2]

Osiris | Bacchus | Jesus

Taylor, in his *The Diegesis* (1829), cites Osiris five times, as follows:

> “To have been goddess-born,

heaven-descended; to have ‘lived and died as none could live and die’, to have been believed to have done and suffered great things for the service of mankind, but above all, to have propitiated the wrath of the ‘superior deity’, and to have conquered the invisible authors of mischief; in their behalf; was such an overwhelming draft on the tender feelings, the excitement of which is one of the strongest sources of pleasure in our nature, that the best hearts and the weakest heads never gave place to the coolness and apathy of skepticism. Not a doubt was entertained that a similar series of adventures was proof of **one and the same hero**, and that the Grecian Apollo, the Phoenician Adonis, the AEsculapius of Athens, the Osiris of Egypt, the Christ of India, were but various names of the self-same deity; so that nothing was so easy at any time, as the business of conversion. Not incredulity, but credulity, is the characteristic propensity of mankind.”

— Robert Taylor (1829), *The Diegesis* (pg. 18)

Julius Firmicius,
in description of the Pagan Mysteries,
quotes Pagan Priests.

*** But in those funerals and lamentations which are annually celebrated in honour of Osiris, their defenders wish to pretend a physical reason; they call the seeds of fruit, Osiris, the earth, Isis, the *natural heat*, Typhon; and because the fruits are ripened by the natural heat, are collected for the life of man, and are separated from their matrimony to the earth, and are sown again when winter approaches, this they would have to be the death of Osiris; but when the fruits, by the genial fostering of the earth, begin again to be generated by a new procreation, this is the finding of Osiris.**

Beausobre,
in description of the Christian Mysteries,
quotes Christian Fathers.

† In one word, *the suffering Jesus* is nothing else than what the Manichæans called the members of God; that is to say, the celestial substance, or the souls which have descended from heaven.

The earth is the Virgin; the heavenly substance which is in the earth, is the substance of the Virgin, of which Jesus Christ was formed; the Holy Ghost is the natural heat, by whose virtue the earth conceived him; and he becomes an infant in being made to pass through the plants, and from thence again into heaven.

Taylor’s connection (pg. 303) of Osiris-to-Jesus (see: Egyptian-to-Christian transliteration), in his *The Diegesis* (1829), via textual comparison of the “Pagan mysteries”, according to Julius Firmicus (c.330AD) (Ñº), and the “Christian mysteries”, according to Beausobre (c.1720) (Ñº).

“Cicero mentions four of this name. Pausanias and Herodotus, rank Apollo among the Egyptian deities. Diodorus Siculus expressly states, that Isis, after having invented the practice of medicine, taught this art to her son **Orus [Horus], named also Apollo**, who was the last of the gods that reigned in Egypt. **It is easy to trace almost all the Grecian fables and mythologies from Egypt**. If the Apollo of the Greeks, was said to be the son of Jupiter, it was because Orus [Horus], the Apollo of the Egyptians, had Osiris for his father, whom the Greeks confounded with Jupiter.

If the Greek Apollo were reckoned the god of eloquence, music, medicine, and poetry, the reason was, that Osiris, who was the symbol of the sun among the Egyptians, as well as his son Orus [Horus], had there taught those liberal arts. If the Greek Apollo were the god and conductor of the muses, it was because Osiris carried with him in his expedition to the Indies, singing women and musicians. This parallel might be carried still further, but enough has been said to prove that the true Apollo was probably of Egypt.

Plutarch, however, has decisively shown, that the Egyptians worshipped the sun under the name of Osiris; and as Osiris was believed to have travelled into India, and there established civilization and religion, we see at once enough to account for the same god coming to be worshiped in India under a designation in the language of that country expressive of the same sense as Chrishna, that is, the sun. Many have doubted whether Apollo were a real personage, or only the great luminary. Vossius has taken pains to prove this god

to be only an ideal being, and that there never was any Apollo but the sun. All the ceremonies performed to his honor, had a manifest relation to the great source of light which he represented ; whence, this learned writer concludes it to be in vain to seek for any other divinity than the sun, adored under the name Apollo."

— Robert Taylor (1829), *The Diegesis* (pg. 180)

"The Egyptian Bacchus was brought up at Nysa, and is famous as having been the conqueror of India. In Egypt he was called Osiris, in India Dionysus, and not improbably *Chrishna*, as he was called Adoneus, which signifies the 'lord of heaven', or the 'lord and giver of light', in Arabia; and Liber, throughout the Roman dominions, from whence is derived our term liberal, for every thing that is generous, frank, and amiable."

— Robert Taylor (1829), *The Diegesis* (pg. 188)

"Though the god Serapis stood in so immediate a relation to the Nile, his worship was by no means confined to Egypt; he was worshipped not only in Egypt and in Greece, but also at Rome, and sometimes considered as one and the same as Jupiter Ammon, sometimes as identical with Pluto, Bacchus, Aesculapius, Osiris, and Jesus Christ. It is certain, however, that his most magnificent temple was at *Alexandria* in Egypt, whence all our most distinguished Christian fathers and writers derived their education; that the bishops of Serapis, as they alone were justly entitled to be called bishops of Alexandria, while Alexandria was a Pagan city, yet called themselves bishops of Christ; and though Christianity can in no reasonable sense be said to have been established in Alexandria while the temple of Serapis remained—and Tillemont admits that the very first Christian church that was ever built, of which history gives us any certain and express information, was founded by Gregory the wonder-worker, 244AD, or after that time,—yet have we an uninterrupted succession of bishops of Alexandria from the evangelist Mark, who we are required to believe was the first of them, downwards. The Jews, it seems, took Serapis to be identical with the patriarch Joseph the son of Sarah."

— Robert Taylor (1829), *The Diegesis* (pg. 206)

In the following, via Constantin Volney (1771), we see Taylor connect Osiris to Bacchus to "Yes" to Yesus to Jesus:

"Volney has shown that Yes was one of the names of Bacchus, which, with the Latin termination, is nothing else than Yesus, or Jesus."

— Robert Taylor (1829), *The Diegesis* (pg. 186)

(add)

Education | About

The following, from the *Oxford Dictionary of National Biography* (Ñº), is the entry of Taylor:

Taylor, Robert | Born: Aug. 18, 1784.
Adm. sizar at ST JOHN'S, Nov. 14, 1808.
Of Middlesex . [6th s. of John, ironmonger, of London (and Elizabeth).
School, Edmonton; trained at Guy's and St Thomas' Hospitals; M.R.C.S. 1807.] Matric. Michs. 1809; B.A. 1813.
Ordained deacon (Chester) Mar. 14, 1813; priest (Chichester) Oct. 28, 1813; C. of Midhurst and P.C. of

Easebourne, Sussex , 1813-18.
Clergy of Edmonton, Tottenham and Newington, but, on account of his unorthodox views, found it difficult to obtain preferment.
Clergy of Yardley, Birmingham, whence he was dismissed for an article in defense of suicide.
Fled to Dublin where he was assistant master in a school until dismissed.
Made a series of attacks on the Church under the title of *The Clerical Review*, and gave Sunday morning lectures until rioting put a stop to them.
Preached at the Rolls Rooms, Chancery Lane, at Founder's Hall, Lothbury, and at Dr Collier's Chapel in Cannon Street, which he called the Areopagus.
Tried in London , for preaching blasphemy, and sentenced to a **year's imprisonment, 1828**.
On his release, started on a four months' lecture tour, beginning at Cambridge, where he fastened a thesis to the door of the Divinity Schools.
Again tried for preaching blasphemy, and sentenced to **two years imprisonment, 1831**.
Known as the 'Devil's Chaplain.' Married an elderly lady of means, but was sued for breach of promise by Miss Georgiana Richards, Housekeeper to the Rotunda in Blackfriars Road; to avoid paying £250 damages to this lady, he moved to France and practiced as a surgeon at Tours.
Author: *The Holy Liturgy*: *Divine Service on the Principles of Pure Deism*; *The Trial...upon a Charge of Blasphemy*; *Swing; or who are the Incendiaries? A Tragedy*; T*he Devil's Pulpit*, etc. | Died: in Sept. 1844 at Tours.

In 1805, Taylor, in short, was a medical student, walking Guy's and St. Thomas's hospitals in London under Sir Astley Paston Cooper and Henry Cline, and in 1807 was admitted a member of the College of Surgeons. In 1813, Taylor completed a BA in theological studies at Cambridge, that year becoming an ordained deacon. In 1818, Taylor abandoned orthodox Christianity for, progressively, deism-based, Christianity as mythology focused, radical evangelism.

Religion | Beliefs

Taylor, originally attracted to Christianity, via sermons of English cleric Edward Burns (1762-1837) (Ñº), deconverted, in 1818, and thereafter, to an achristism-based, seeming atheism-friendly, deism-stylized belief system.

Quotes | On

The following are quotes on Taylor:

> “When **Robert Taylor** began preaching Bible mythicism – the view that significant biblical figures are mythical, not historical – from his popular pulpit during the 1820s, he was subjected to a sustained campaign of abuse that lasted for many years. He was convicted twice for “blasphemy” and imprisoned in a Dickens-style hellhole for three years. Unrepentant, Taylor wrote some of the best mythicist literature while in prison: The Syntagma, Diegesis and Devil’s Chaplain.”
>
> — Dorothy Murdock (2014), “Martyr for Mythicism: Rev Robert Taylor” (Ñº)

Quotes | By

The following are noted quotes by Taylor

> “Thou hast in this pamphlet all the sufficient evidence, that can be adduced for any piece of history a thousand years old, or to prove an error of a thousand years standing, that such a *person* as Jesus Christ never existed; but that the earliest Christians meant the words to be nothing more than a personification of the principle of reason, of goodness, or that principle, be it what it may, which may most benefit mankind in the passage through life.”

— Robert Taylor (1828), *Syntagma of the Evidences of the Christian Religion* [3]

"Bind it about thy neck, write it upon the tablet of thy heart: **'everything of Christianity is of Egyptian origin'**."

— Robert Taylor (1829), *Oakham Gaol*; cited by Gerald Massey (1883) in *Natural Genesis, Volume One* (pg. iv)

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3. Taylor, Robert. (1828). *Syntagma: of the Evidences of the Christian Religion* (Preface) (Ñº). Publisher.

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External links

â— Robert Taylor (Radical) – Wikipedia.

θΔics

In existographies, **Robert Thurston** (1839-1903) (CR:29) was an American mechanical engineer noted for a number of publications on the operation of the steam engine and thermodynamics, such as his 1878 *A History of the Growth of the Steam Engine*. [1]

Overview

In 1871 to 1872, Thurston, at the Stevens Institute of Technology, Hoboken, NJ, gave a lecture on the "history of steam engines" to a mixed audience, mostly of engineers, by profession, and mechanics.

In 1878, Thurston expanded his early steam engine history lectures, with the consultation and illustrations of Robert Stuart, into *A History of the Growth of the Steam Engine*.

In 1890, Thurston completed the first English translation of French physicist Sadi Carnot's 1824 *Reflections on the Motive Power of Fire*; in which an accompaniment of related works are found. [2] In the editor's introductory to the English translation Thurston tells us: [3]

> "When this little treatise which is here for the first time published in English becomes familiar to those for whom it is intended, it will be, to many at least, a matter of surprise no less than pleasure to discover that France has produced a writer on this now familiar subject [thermodynamics] whose inspiration anticipated many of the principles that those founders of the modern science, Rankine and Clausius, worked out through the tedious and difficult methods of the higher mathematics."

(add)

Soul

In 1894, Thurston, in his *The Animal as a Machine and Prime Motor: and the Laws of Energetics*, outlined a rudimentary outline of a theory of thermodynamics of "animal systems"; wherein, among other things, as a soul theorist, he speculates the following: [4]

> "We are gradually progressing towards the establishment of a law of persistence of all existence, whether of matter, of force and energy, or of organic vitality, and perhaps even to its extension until it includes intellectual and soul life."

Curiously, many thermodynamicists enter upon these types of speculations in the last decade of their life; Thurston in this case was age fifty-five at the time of the above writing and died nine years later.

Quotes | Employed

The following are quotes employed by Thurston:

> "As Minerva sprang, mature in mind, in full stature of body, and completely armed, from the head of Jupiter, so the steam-engine came forth, perfect at its birth, from the brain of James Watt."
>
> — Anon (c.1820), *English engineering periodical*; cited by Robert Thurston (1798) in *A History of the Growth of the Steam Engine* (pg. 2)

Quotes | By

The following are quotes by Thurston:

> “Relieving mankind from manual toil, the invention of the steam engine [Papin, 1690] has left to the intellect the privilege of directing the power, formerly absorbed in physical labor, into other and more profitable channels. The intelligence which has thus conquered the powers of nature, now finds itself free to do head-work; the force formerly utilized in the carrying of water and the hewing of wood, is now expended in the god-like work of thought. ”
>
> — Robert Thurston (1878), *A History of the Growth of the Steam Engine* (pg. 2)

> “Sadi Carnot was, perhaps, the greatest genius, in the department of physical science at least, that this century has produced.”
>
> — Robert Thurston (1890), "The Work of Sadi Carnot" [3]

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(b) Stuart, Robert. (1829). *Historical and Descriptive Anecdotes of the Steam Engine and Their Inventors and Improvers, Volume One*. Publisher.
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â— Robert Henry Thurston (first president of ASME, 1880-82) – ASME 125th Anniversary.

θΔics

In existographies, **Robert Turgot** (1727-1781) (IQ:170|#415) (Cattell 1000:293) was a French economist, statesmen, and historian, noted for []

Correspondents

Turgot corresponded with: Voltaire, Marquis Condorcet, and David Hume (Q); Turgot also attended the Helvetius salon meetings. (Q)

Quotes | On

The following are quotes on Turgot:

> "Only two years after the publication of Montesquieu's *Spirit of Laws* [1748], **Turgot** delivered those celebrated lectures [1750], of which it has been said, that in them he created the philosophy of history. The merit of Turgot is immense; he belongs to that extremely small class of men, who have looked at history comprehensively, and have recognized the almost boundless knowledge needed for its investigation. In this respect, his method is identical with that of Montesquieu, since both of these great men excluded from their scheme the personal details which ordinary historians accumulate, and concentrated their attention upon those large general causes, by the operation of which the destinies of nations are permanently affected. **Turgot clearly perceived, that, notwithstanding the variety of events produced by the play of human passions, there is amid this apparent confusion, a principle of order, and a regularity of march**, not to be mistaken by those whose grasp is firm enough to seize the history of man as a complete and single whole."
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pgs. 596-97) [1]

References

1. Buckle, Henry. (1857). *History of Civilization, Volume One*. Appleton, 1862.

External links

- Anne Robert Jacques Turgot – Wikipedia.

θΔics

In hmolscience, **Robert Ulanowicz** (1943-) (DN=2-3) is an American chemical engineer turned ecologist noted, in ecological thermodynamics, for his 1979 thermodynamics stylized energy and entropy models of organisms in aquatic ecosystems, and for his 2009 to present attempt to sell an ecological ascendancy stylized ontic opening emergent deism, a type of religion plus science patchwork.

Overview

In 1979, Ulanowicz was inspired to switch careers, from chemical engineering to ecology, and to begin to study theoretical ecology during a reading of American zoologist Eugene Odum's *Fundamentals of Ecology* (1959 second edition), the world's first ecology textbook and the first to incorporate the laws of thermodynamics into the study of ecosystems. [2] Sometime, during this period, Ulanowicz states that he had a "Faustian moment" in which he made a pact with the devil, so-to-speak, to understand how the energy and matter interactions of the total set of organisms in Chesapeake Bay function. [4]

In the late 1970s, Ulanowicz began to apply thermodynamics to the study and modeling of ecosystems, in terms of cycles, flows, growth, the principle of maximum work, among others. Ulanowicz's works have appeared in the field of ecodynamics and ecological engineering.

In 1979, Ulanowicz introduced his free energy stylized concept of "ascendency", an information theory based version of Gibbs free energy, posited to represent the organization driving growth (see: driving force) of ecosystems.

In 2007, Ulanowicz was the recipient of the Prigogine medal. [1] Ulanowicz is an associate of American ecologist Eric Schneider.

Ulanowicz recalls when, several decades back,

Living dead

See also: Defunct theory of life, Unbridgeable gap, Origin of life, etc.

On the subject of the difference between the living and the dead or living matter and dead matter, Ulanowicz seems to be of the mindset of philosophers such as Christian de Quincey, namely being generally against reductionism and or materialism. In his recent 2010 *Zygon* article "From Pessimism to Hope: a Natural Progression", section entitled "Living Dead", Ulanowicz states: [7]

> "With the ascendance of the Newtonian world view, the pendulum swing radically in the opposite direction. Virtually all the universe was now considered to consist of dead, quiescent matter that moves according to deterministic and inexorable laws, which by their simple natures appear to leave no room for the irreversible, asymmetric, and contingent phenomena associated with living systems. As a result, one of the most pressing scientific and philosophical questions of today has become the emergence of life: How could life possibly have arisen out of such a dead universe?"

Ulanowicz seems to think that his version of "process ecology" is the answer. In the same article, Ulanowicz also cites Italian thermodynamics professor Enzo Tiezzi who in 2006 commented his speculations on the difference between a running dear and a dead dear, in terms of molecular configurations, in regards to a deer he had recently killed during a hunt.

Religious views

In religious thermodynamics, Ulanowicz has recently contributed several papers to journals dealing with the exchange between science and religion. These papers deal with how ecology provides a metaphysical foundation for science that

both helps science to interpret life in a more rational way and mitigates the conflicts that had existed between science and faith.

His latest book, the 2009 *A Third Window: Natural Life beyond Newton and Darwin*, includes a foreword by Stuart Kauffman, and is published by the highly-funded religion-promoting John Templeton Foundation. Ulanowicz is said to declare himself as a theist (like Newton): he believes in God and his possibilities to intervene in what happens on earth. The clue to this, according to Ulanowicz, is the ontic openess of nature. "Examples include Gödel's incompleteness theorem, Heisenberg's uncertainty principle, the Pauli exclusion principle, and Elsasser's unique events." He also finds some kind of solution to the problem of theodicy or the problem of evil. Disturbances are essential if systems are to develop. But they can involve both suffering and evil. Without a certain tolerance for this mankind cannot advance. Without mistakes there is no creativity. [6]

What is missing in this presentation, however, according to Swedish literary critic Erland Lagerroth, a large exposition of the form of existence, common to life and non-life, which Gregory Bateson divined, Ilya Prigogine discovered and Erich Jantsch developed further: "dissipative structures" or self-organizing systems. This want depends upon the author through his window focusing only life, not the processes and systems of non-life. [6]

Education

Ulanowicz competed his BS in chemical engineering in 1964 and his PhD in chemical engineering in 1968 both at Johns Hopkins University. [3] For two years, Ulanowicz was an assistant professor of chemical engineering at the Catholic University of America. In 1970, he switched careers and became a professor of theoretical ecology at the University of Maryland's Chesapeake Biological Laboratory, where he is currently professor emeritus.

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● Ulanowicz, Robert. (2013). "The End of the Era of Physics" (54-min) (P1) (P2) (full), Symposium: Complexity in ecological systems: some conceptual issues. Made em 07/23/2013, na Universidade Federal da Bahia sob to organização do Ensino Laboratory, philosophy and history da Biologia, Instituto de Biologia, UFBA, Brazil, Jul 23.

External links

- Robert Ulanowicz – Wikipedia.
- Publications (by Ulanowicz) – People.Biology.UFL.edu.

θΔics

In black hole thermodynamics, **Robert M. Wald** (1947-) is an American physicist noted for his 1994 *Quantum Field Theory in Curved Spacetime and Black Hole Thermodynamics*, a subject he is considered as one of the world's leading experts. [1] The book is a result of 1992 lectures delivered to the Les Houches School on Gravitation and Quantization. [2]

Education

Wald completed his PhD, thesis: *Nonspherical Gravitational Collapse and Black Hole Uniqueness*, at Princeton in 1972. [3] In 1974, he became a research associate at the University of Chicago. [4] Wald is currently the chairman of the department of physics at the University of Chicago. [5]

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Further reading

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External links

â— Robert Wald – Wikipedia.
â— Wald, Robert M. – WorldCat Identities.

θΔics

In hmolscience, **Robert R. Williams** (1886-1965) was an Indian-born American chemist and chemical engineer noted for []

Education

In 1900, Williams, aged 14, entered Ottawa University, Kansas, where he stated for two years, after which he transferred to the University of Chicago, completing his MS in chemistry there in 1908.

Other

In 1933, Williams, after experimenting with rats in his garage, found that thiamin cured beriberi. (Q)

Quotes

The following are representative quotes:

> "Out of all our study of science we should collectively by now have gained not only knowledge but also some wisdom about the meaning of things that we can apply to human relations. Clearly this wisdom must come predominantly from a consideration of the evolutionary process, for that is the process, according to the belief of virtually all scientists, whereby man developed his present problems."
>
> — Robert Williams (1948), "Natural Science and Social Problems" [1]

> "We need nothing physical half as much as we need better understanding of men and human affairs. Only science can lead civilization out of its present morass."
>
> — Robert Williams (1948), "Natural Science and Social Problems"; cited by Judson Herrick (1956) [2]

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(b) Simpson, George G. (1967). *The Meaning of Evolution* (pg. 281). Yale University Press.
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(b) Herrick, C. Judson. (1956). *The Evolution of Human Nature* (abs) (pg. 194). University of Texas Press.

External links

- Robert R. Williams – Wikipedia.

θΔics

In existographies, **Robert Joseph Wright** (c.1825-c.1900) was an American religious philosopher noted for his 1875 *Principia: Basis of Social Science*, wherein he attempted to promulgate a god-based grappling at a "*Principia* of social science" or *Social Principia*, so to say, in aims to situate a sort of theological politics by the method of eliminating the "atheism" aspects of Auguste Comte's version of social science. [1]

Wright compares and contrasts his views, not only with Comte, his main target, but also with: Henry Carey, Charles Fourier, Herbert Spencer, William Paley, and John Mill, primarily, among others, in passing, including: Goethe, Plato, Mulford, and Guizot.

Gravitation

Wright, in his "Resemblances to Gravitation" (§7.4:92-93), seemingly citing Henry Carey as his basis, as the following to say:

> "The power of association it is true, draws men together like the law of gravitation, with a force in proportion to their numbers or mass, and in inverse proportion to their distances. But this law, when transferred from inanimate matter and applied to humanity or to living beings, requires several modifications. And even among the astronomical bodies, there is a centrifugal power always exactly equal to the centripetal.
>
> If we turn to the sidereal systems for illustrations, then nations will answer to solar systems, prettily and truly. Planets will revolve around suns, moons and satellites around planets, and so on; each in its own orbit, and doing its own work; and each kept from centrifugal disorder, by the attracting power of its own immediate center, namely, the next highest orb in the generalizations. But still, it is in vain to look for exact analogies of life-processes, in the laws or actions of inanimate matter. Saturn's ring may illustrate the relations of families to a tribe; but we have no binary systems in our solar system,—nothing to illustrate the family organization in the relation of male and female. Although in the binary systems of far distant stars, the suns of other systems, we have the beautiful arrangement of two companion stars revolving around each other, or rather, revolving around an ideal center, the ideal point of their mutual attraction; and each being of the color needed to complement the other in the spectrum. And in some cases, there appear to be more than two, sometimes even several suns, occupying these relations to each other. But not in the simple organic matters substances or minerals, do we find any trace of male and female, other than electricity. It is only where we enter into the living world, vegetable as well as animal, that we find sex running throughout all or nearly all life; but we find the family organization, only in a few of the very highest animals.
>
> Now, let us remember that in the natural formation of society, after the formation of families and tribes, the centripetal and centrifugal forces are not exerted and felt, so directly between the individuals as between the families, or the tribes. Nations are formed originally and in all history, not by individuals but by families and tribes. Thus, even the centripetal force itself is not so much directly between individuals, as it is directly between families and tribes. And the sun over our heads does not draw us away from the earth, but draws us along with it.
>
> Where the two forces of human society, the centripetal and the centrifugal, are most perfectly and independently balanced in all their forms,—where the national, the neighborhood, the family, and the individual, all have the powers of each in the best balance,—there will be the most rapid and true prosperity. And this is brought about in accordance with one of the laws which Carey has announced in only one of its relations, namely, in the relation of city state and nation, rather than to its full extent. This law might and should be enlarged, as I have enlarged it, to the other units. That law thus enlarged is, that in proportion as this balance of all the parts is preserved, the rapidity of human diversity or individuality is promoted; and in proportion to that individuality, will be the feeling and consciousness of human responsibility intellectual and moral; and in proportion to the responsibility both intellectual and moral, will be the activity and morality; and in proportion to the activity and morality in such a condition of balanced

freedom and order, will be the universal prosperity."

(add discussion)

Affinity

Wright, in his "Resemblances to Chemical Affinity" (§7.5:92-95), citing Comte and Carey, as the following to say:

> "But the relation of persons in small districts, is much better illustrated by the powers and laws of chemical affinity. Here we see that the attraction between molecules or individuals when placed very near together, becomes an entirely different power from gravitation, as far as we can yet perceive; and one that exceeds it beyond all possibility of comparison. So that although all bodies undergoing chemical changes, are also subject to gravitation, yet we cannot perceive that the chemical changes themselves are at all affected by gravitation. Here we have illustrated the absolute independence of neighborhoods within nations.
>
> This principle of elective affinity illustrates another feature, both of man and of society, or of close neighbors to each other, whether in space or in relationship; and this is, that molecules or individuals can unite with each other, only within certain definite specified and limited proportions. So it is with individuals; each one has his own peculiar character and his own proper rights, such that other individuals cannot understand him nor his true character or responsibilities, beyond certain degrees. And these degrees may vary in different subjects, so that any two persons may have more and closer affinities on some subjects than on others. Here we have illustrated the eternal rights of individuals, in the recesses of their own hearts, and to their own hearts' secrets, as well as to combinations and sympathy with other persons.
>
> As Comte well observes, the attempt or even the hope, to reduce all the operations and laws of nature, to one law, is and will be a vain attempt. And the fact is, that the laws and powers which attract men into nations, are not the same as far as we can analyze, as those which cause them to seek the society of and organization with their immediate neighbors. The one is gravitation, the other is affinity. And hence, the national principle and the neighbor principle, are much better illustrated by what are recognized to be two entirely different natural powers, and to be working by entirely different laws.
>
> One obvious inference from this view is, the evident and much greater importance of the neighbor-attraction, than of the nation alone, in itself considered as the ultimate object sought, the end of the means; and including in the term neighbor, not only precinct, but also social acquaintance and business circle or chartered company. By reference to Carey's law regarding the balance of centralization and decentralization, it will be observed, that all turns upon individuality and personal responsibility, that the national power itself is useful, only as it develops or allows the development of these. Whereas, the chemical affinities are the immediate and direct operation of these individualities themselves."

(add discussion)

Education

Wright was a professor at the Christian Biblical Institute in New York City. [2] In 1866, Wright, in his "Editor's Address", to his periodical *the Practical Philosopher and True Senator*, wherein he complained, among other things, that god was not mentioned in the Constitution, stated that before the America Civil War (1861-1865), he concerned himself with the study of theological and philosophical questions, but that after the war he geared his focus to political matters, with a "broad Christian Catholic nature" basis or siding. (Ñº)

Quotes | Employed

The following are quotes utilized by Wright:

"Man knows himself only as he knows external nature, we will readily see how, in the origin of human society, the individual man or woman only knows himself or herself, *after* organizing into the family relation."

— Goethe (c.1800), cited in: *Principia: Basis of Social Science* (pgs. 87-88)

Quotes

The following are representative quotes:

"Social science ought to be compared, *not* with works on chemistry, or astronomy, or even moral philosophy, or political economy; but rather, with works on geology or metaphysics."

— Robert Wright (1875), *Principia: Basis of Social Science* (pg. ix)

"The social laws in general, operate, not like physical laws, regardless of men's faith or opinions about them; but to a great extent, they operate like the spiritual and religious laws of conscience; that is, they operate according as men have faith and expectation."

— Robert Wright (1875), *Principia: Basis of Social Science* (pg. 61)

"Analogy in chemistry. All the elements of chemistry may be divided into two classes, and in three different methods. One, is into metals and metalloids, another, is into acids and alkalies, and the third is into electronegative and electropositive. We have here as much of the divisions of our six units, as could be expected to survive under chemical analysis, under which 'no life' can continue. Here in chemistry we have, not three pairs of classes making six classes, but only three ways of pairing classes."

— Robert Wright (1875), *Principia: Basis of Social Science* (pg. 89)

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â— Wright, Robert Joseph – WorldCat Identities.

θΔics

In hmolscience, **Robert M. Young** (1935-) is an American Darwin scholar, Kleinian psychologist, human nature philosopher, noted for his anti-reductionism views in respect to Henderson-stylized physicochemical sociology, which he classifies as something akin to "scientific pornography".

Overview

In 1971, Young, in his "Mystifications in the 'Scientific' Foundations of Sociology", ventured into an attack on the Harvard Pareto circle, wherein he attempts to dismiss the work of "Sociology 23" stylized work of Lawrence Henderson, and many followers of the Pareto circle, as but a reaction against Marxism, e.g. he refers to Henderson's use of thermodynamics, chemistry, physics, biochemistry, physiology, biology, pathology, medicine, etc., was but a "nakedly reactionary doctrine" devoid of basis, or something along these lines.

Quotes

The following are noted quotes:

> "It is fairly easy to be on guard against this sort of thing, such as sociobiology or physicochemical sociology, and most scientists, whether or not they are familiar with the literature, naturally relegate such arguments to the realm of 'scientific pornography', which is not to say that they don't like it."
>
> — Robert Young (1971) "Mystifications in the 'Scientific' Foundations of Sociology" [1]

References

1. Young, Robert M. (1971). "Mystifications in the 'Scientific' Foundations of Sociology", *Science or Society?: Bulletin of the Cambridge Society for Social Responsibility in Science*,2:9-11, Jun.

External links

â— Robert M. Young (academic) – Wikipedia.
â— Robert M. Young (about) – Human-Nature.com.

θΔics

In human physics, **Robin Dunbar** (1947-) (CR=28) is an English anthropologist notable for being the eponym of the Dunbar number, which is 150, a number Dunbar discovered (or proposed) in 1992, arrived at through study of different social groups, such as the Hutterites, Quakers (Mennonites or Amish), military units, the Gortex company, etc. the said-to-be maximum number at which a social group can maintain stability via solely peer or interpersonal contract, i.e. without overarching rules or law. [1]

Education

Dunbar studied under Nico Tinbergen at Magdalen College, Oxford, completing a BA in psychology and philosophy in 1969; after which he completed a PhD in psychology in 1973 at the University of Bristol. Currently, Dunbar is head of the Institute of Cognitive and Evolutionary Anthropology, Oxford.

Quotes

The following are representative quotes:

> "It's perhaps not so much how your amygdala is tuned that makes you politically extreme, but that your intrinsic nervousness makes you more responsive to things that might seem to threaten your particular social world. Education probably plays an important role in dampening that response by allowing the brain's frontal lobes (where much of the brain's conscious work goes on) to counteract the emotional responses with a more considered view, so explaining why education is invariably the friend of liberal politics."
>
> — Robin Dunbar (2010), *How Many Friends Does One Person Need?* (Q)

See also

- Floating magnets experiment
- Social Avogadro number
- Hmol

References

1. Dunbar, Robin. (1992). "Neocortex Size as a Constraint on Group Size in Primates", *Journal of Human Evolution*, 22: 469-93.

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- Thims, Libb. (2007). *Human Chemistry (Volume One)* (Dunbar number, pgs. 10, 285). Morrisville, NC: LuLu.
- Thims, Libb. (2007). *Human Chemistry (Volume Two)* (Dunbar number, pgs. 408, 515, 708). Morrisville, NC: LuLu.
- Dunbar, Robin. (2010). *How Many Friends Does One Person Need?: Dunbar's Number and Other Evolutionary Quarks* (abs). Harvard University Press.

External links

- Robin Dunbar – Wikipedia.

θΔics

In thermodynamics, **Robin Giles** (c.1935-) is an Irish mathematical physicist noted for his 1964 *Mathematical Foundations of Thermodynamics*, wherein he covers mathematical thermodynamics, using some type of logic method, and also devotes a chapter to relativistic thermodynamics.

Overview

In 1955, Giles was assigned to teach thermodynamics or given a "teaching assignment", during which he wrote a paper (being a condensed form of chanters 1-4 of his 1964 book); the paper was sent to Edward Guggenheim in Dec 1957 for review. Guggenheim's comments induced Giles to write a chapter on his concept of a "mechanical state" (chapter 5 of book). Doing this gave Giles the idea to make the mathematics involved "fully rigorous" and with the inclusion of relativistic thermodynamics, the 1964 *Mathematical Foundations of Thermodynamics* resulted, wherein he attempts to present the "logical structure" and "rules of interpretation" of physical meaning assigned to theoretical terms. The book built on feedback from Keith Burton. [1]

In 1966, Keith Burton, in his "Constructive Thermodynamics", gave commentary on Giles' logic model. [2]

Education

In 1964, Giles was associated with the department of natural philosophy at the University of Glasgow. More recently, Giles seems to have been associated with the physics department of Strathclyde University, Glasgow, Scotland. [4]

Quotes

The following are noted quotes:

> "There exist an additive function of state *S*, called the entropy, and a set of additive functions of state, called components of the content, such that, for any states *a* and *b*, *a*→*b* if, and only if S(*a*) S(*b*), and Q(a) = Q(b) for every component of content Q."
>
> — Robin Giles (1964), *Mathematical Foundations of Thermodynamics*; cited by Norman Dolloff (1975) [3]

References

1. Giles, Robin. (1964). *Mathematical Foundations of Thermodynamics* (Ñº) (Amz) (Preface, pgs. xi-xiii). Elsevier, 2013.
2. Burton, W. Keith. (1966). "Constructive Thermodynamics" (Ñº), Contributions to Mathematical Logic, Proceedings of the Logic Colloquium, Hanover; in: *Contributions to Mathematical Logic* (editor: Lev Beklemishev) (pgs. 75-). Elsevier, 2000.
3. (a) Giles, Robin. (1964). *Mathematical Foundations of Thermodynamics* (Amz) (pg. 5, 59). Pergamon Press.
(b) Dolloff, Norman H. (1975). *Heat Death and the Phoenix: Entropy, Order, and the Future of Man* (pgs. 50-51). Exposition Press.
4. (a) Note: not to be confused with mathematician Robin Giles, the former dean of sciences (Ñº) at Brandon University, and presently is professor emeritus (Ñº) of the physics and astronomy department.
(b) Giles, Brandon. (2016). "Email Communication with Libb Thims", Jan 5.

θΔics

In philosophy, **rock vs human** (TR:43), or "stone vs human", is the overly-common query or comparison in respect to the seeming similarity and or difference between a rock (or stone) and a person (or human) — generally framed in the context of 'what is life' discussions, animate vs inanimate behavior queries, mind from matter dialogs, one nature vs. two nature like debates, among other similar issues of conceptual puzzlement.

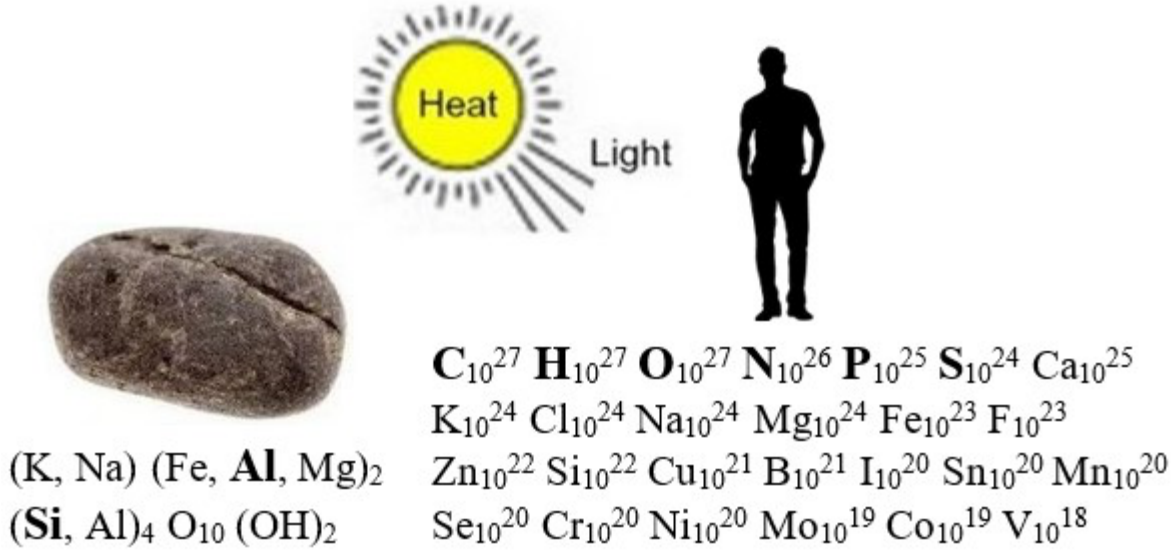

A modern molecular formula (see: human molecular theory) depiction of the **"rock vs. human"** comparison that often arises on what is life or mind from matter debates, and or reductionism vs. anti-reductionism discussions, eliminative materialism objects, etc. The difference between the two, a rock and human, contrary to historical patch attempt solutions, e.g. "one is conscious one isn't", "one is alive one isn't", one responds to stimulus, one doesn't, etc., is the difference in the atomic structure or average molecular formula of the two entities, shown above, according to which each has different properties, the latter tending to have more dynamic, animate, and reactive than the former—neither, however, being alive.

In terms of chemical composition, in comparing glauconite vs a human, as shown adjacent, while the rock and the human are similar having the following:

Common elements: H, O, K, Na, Fe, Mg
Rock elements: Al, Si - based
Human elements: C - based

Here we see the distinguishing difference between a rock and a human, namely that the latter is aluminum and silicon based, and the latter is carbon based, and this is why humans have the properties they have, e.g. animation, intelligence, etc., and rocks have the properties they have, e.g. inertness, non-intelligence, etc.

The subject of the rock versus a human comparison often tend to teeter between panbioism and the defunct theory of life perspectives; in some cases, ideas about consciousness, purpose, values, etc.; or in the case of the religiously-bent type to lean into loaded creationism theory solutions, spiritual creation energy theories, and or agnosticism uncertainties. [3] The comparison frequently arises in discussions on the subject of the origin of life or life in the context of the physical sciences.

Matter | Thinking & feeling

In 1729, Jean Meslier, in his §91: "The Thoughts, Desires, Will, and Sensations of Good and Evil are only Internal Modifications of the Person or Animal that Thinks, Knows, or Feels Good or Evil", of this *The Testament*, engaged in an attack on Cartesian-themed views of Nicolas Malebranche (*The Search after Truth*) and Francois Fenelon (*The Existence of God*), and one point of which he first cites Horace and laughing at humorous work rule:

> "Could you, my friends, contemplating this work, hold yourselves back from laughing?"
>
> — Horace (c.19BC), *Art of Poetry* (5)

Then he cites how Fenelon said the following about "laughing children" (see: laughing children rule) and people who would attribute feelings to stones: [1]

> "Matter cannot think or feel and the people, even children, cannot be persuaded otherwise. People and children are far from believing that matter is capable of thinking and feeling in anyway, so that they could not help laughing if you told them that a **stone, a piece of wood, a table, or their dolls felt pain or pleasure and joy or sadness**."
>
> — Francois Fenelon (c.1690), *On the Existence of God*

An image of a **stone** with feelings from the Stones Have Feelings Too! (Ñº) Card deck set, as a representation of the view of **Jean Meslier** that feelings derive from matter as contrasted with the view of Francois Fenelon that a "feeling stone" (see: rock vs human) is something that children will laugh at.

Meslier rebuts this logic as follows: [1]

> "Now that is a lovely argument for a person of such rank, merit, and erudition! People and even children could really have a reason to laugh and make fun of those who to amuse themselves would like to make them believe that stones, tables, boards, furniture, or dolls had knowledge and sentiment because they know, indeed, that these sorts of things cannot know or feel anything. But, their laughter would not come, as Fenelon would like to make them understand, from the fact that these kinds of things are only matter or made of matter, but because they would see that these things are not 'animate' and do not have life like animals and consequently they cannot think or feel."

Here, this is good rebuttal logic. The children can understand that while a stone and a human and a human are both types of matter, the difference between them is a difference of "animation" properties, a human being carbon-based being animate thereby, and a stone being aluminum-based being inanimate thereby.

Linnaeus | Mineral life

In 1735, Carl Linnaeus, in his *System of Nature* (*Systema Naturae*), introduced binomial nomenclature classification (Linnaean classification) of species scheme, dividing the world into: mineral, plant, and animal; implicitly a non-living matter (mineral or mineral life) and living matter (plant life and animal life) divide, as it has been passed down to us; Linnaeus, however, seems to have had, in his mind, a bit of a "gradual panbioism" conception; in his own words, he divided nature into the following three kingdom conceptualizations: [1]

> "Stones grow; plants grow and live; animals grow, live, and feel."

Shown adjajcent is a DeviantArt.com rendition of a Linnaean-like animal, vegetable, mineral divide, each of them alive and intelligent, in some sense.

This quote seems to have been passed on over the next century, verbatim, with little reflection, until about the mid-19th century, when people started questioning the "stones grow" assertion; or for example, to what extent plants can "feel":

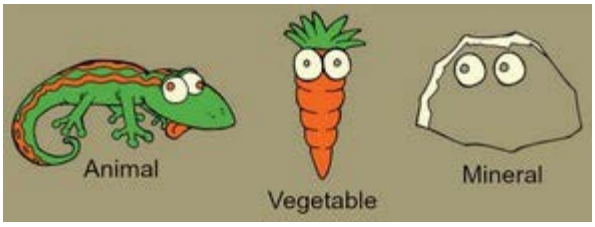

The Linnaean classification (1735) scheme of nature. (Ñº)

> "How do **stones**, or mineral substances, grow? Not as plants, shrubs, or trees. Whenever they grow at all, it is by accretion. It is as if a new layer or coating were added to, or plastered on, to them. They grow, in general, very slowly."

— William Alcott (1859) (Ñº)

> “Objections: **Stones** do not grow, but increase in size by accretion. Feeling may be said to exist in the lower classes of both plants and animals, provided that contractility be accepted as a property of sensitive tissue. If it be surmised that pain is a result of feeling (i.e. sensation), it may be attributed to Oethalium with equal propriety as to Ameba. Were every act of fissuration, evisceration or amputation accompanied with pain, it becomes difficult to understand why self-mutilation should be so frequently imposed for the preservation of both individual life and that of the species. It is probable that at such times an organism feels no more pain than is experienced by the contractile contents of an ovum undergoing segmentation.”

— Harrison Allen (1869) (Ñº)

(add)

Paley | Stone vs watch

In 1802, William Paley gave his famous "watch analogy", according to which he stated that if he was walking on a heath —or tract of wasteland—and he came across a pocket watch, it would be most reasonable to assume that someone had dropped it and that it was made by a watchmaker and not by natural forces; the original statement of which is as follows:

A depiction of William Paley's 1802 "watch analogy", the gist of which is that if you were walking along a heath and came across a **stone** and a watch, and asked yourself how they came to be, you would say the stone came to be their by natural forces, but the watch had an artificer (aka watchmaker) who designed the watch with parts that produce motion for a purpose; the watch is analogous to a human, who must have been designed similarly, and that "designer" must be god.

> “In crossing a heath, suppose I pitched my foot against a ***stone***, and were asked how the stone came to be there; I might possibly answer, that, for anything I knew to the contrary, it had lain there forever: nor would it perhaps be very easy to show the absurdity of this answer. But suppose I had found a *watch* upon the ground, and it should be inquired how the watch happened to be in that place; I should hardly think of the answer which I had before given, that, for anything I knew, the watch might have always been there. Yet why should not this answer serve for the watch as well as for the stone?
>
> Why is it not as admissible in the second case, as in the first? For this reason, and for no other, viz. that, when we come to inspect the watch, we perceive (what we could not discover in the stone) that its several parts are framed and put together for a purpose, *e.g.* that they are so formed and adjusted as to produce motion, and that motion so regulated as to point out the hour of the day; that if the different parts had been differently shaped from what they are, of a different size from what they are, or placed after any other manner, or in any other order, than that in which they are placed, either no motion at all would have been carried on in the machine, or none which would have answered the use that is now served by it.”

The gist argument, which is a rock vs human argument relocated to the focus of a watch, is that design implies a designer, and that designer must be god. [2]

Scott

In 1926, George Scott, a physical chemist, co-taught an interdisciplinary

course, with social psychologist George Breed, noted for doing some research on eye contact in human interactions, at the University of South Dakota, entitled "Disorder in Nature and Human Affairs", relating behaviorism and physical science. During one course, Scott did a rock vs human scenario, of him standing on a ladder dropping rocks on people, themed in some way on the Skinner model of pigeons dropping bombs on the Germans, so to argue that people have free will, whereas rocks don't; which he summarizes as follows: [20]

A depiction of George Scott's 1969 thought experiment, taught in class, wherein he tried to argue that the rock falls via natural physical law, but that humans have free will, or something along these lines.

> "During one of our 'Disorder in Nature and Human Affairs' courses, I can still remember one fine afternoon, when I tried to explain the difference between human 'acts' and deterministic 'acts', described by physical natural laws, by describing a street scene in which I carried a rock onto a ladder above a sidewalk and allowed it to drop while people walked underneath. 'If I had dropped it from the right height and instant, I might have hit someone in the head and killed them. The fall of the rock should be deterministically calculated from Galileo's formula: $h = ½gt^2$, and the rock will fall according to physical natural law, but the height and timing of the initiation of the fall would be my own 'free will' choice!"
>
> — George Scott (1985), *Atoms of the Living Flame* (pgs. 135-36)

Here, of course, we are reminded of Alexander Pope's poetic quip about a rock falling on his head:

> "When the loose mountain trembles from **on high**; shall gravitation cease, if you **go by**?"
>
> — Alexander Pope (1734), *An Essay on Man* (§:4.128)

Scott goes on to discuss how he and Breed argued about this, Breed suggesting that he could Skinnerian like positive conditioning, with "beautiful, voluptuous maidens" to turn Scott into his hitman:

> "Suppose, I just waited repeatedly until, by chance, you carried a rock, time after time, up the ladder and every time you came closer and closer to hitting someone on the head, I gave you a 'beautiful, voluptuous maiden', like Skinner giving pigeons food to make them dance in figure eights. Then, you'd be conditioned by positive reinforcement to be my hitman, just like Skinner's pigeons, and it wouldn't be 'free will' act at all!"
>
> — George Breed (c.1969), dialogue with Scott on his rock dropping scenario

(add)

Other

In 1874, English physical economist Stanley Jevons gave the following ripe energy-chemistry based continuity theory (aka great chain of being) view of things: [12]

> "By degrees it is found that the chemistry of organized substances is not widely separated from, but is rather continuous with, that of earth and **stones**. Life itself seems to be nothing but a special form of that energy which is manifested in heat and electricity and mechanical force. The time may come, it almost seems, when the tender mechanism of the brain will be traced out, and every thought reduced to the expenditure of a determinate weight of nitrogen and phosphorus."

This is excellent discernment, indeed; very close to the defunct theory of life solution.

In circa 1920s, German philosopher Martin Heidegger, according to British artist Wolfe von Lenkiewicz (2011), supposedly, discussed some type of "non-experiencing stone" distinction.

In 1925, American physical chemist Gilbert Lewis stated the following on the matter: [1]

> "What shall we now say to this prime classification of science into animate and inanimate branches? Do living beings possess traits which the **rocks** do not possess, or are the same traits possessed in different degrees? Indeed, are all distinctions in kind reducible to distinctions in degree? These questions are hard to answer."

In many cases in queries about rocks versus humans, discussion of energy and or entropy tends to be in the vicinity. The above section by Lewis, for example, is followed by his view that "living things are cheats in the game of entropy"; a view that he attributes to Hermann Helmholtz who, according to Lewis, "thought that living beings may escape from the law of entropy." (fact check)

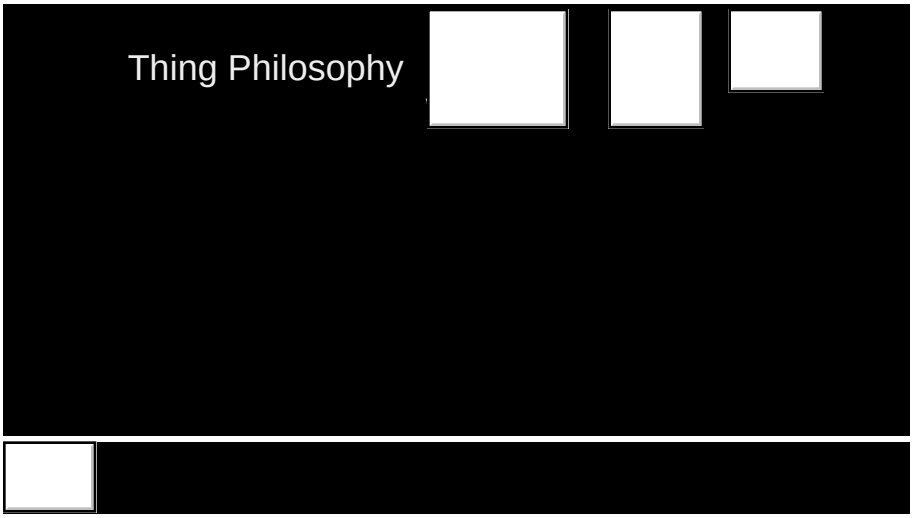

A 2018 video of Libb Thims using a **rock**, as compared to a stick, and some trash, etc., to teach "thing philosophy" to his two nephews.

In 1938-39, English physiologist Charles Sherrington, in his "Man on His Nature" lecture-turned-book, employs the rock vs. human comparison in a well-honed manner to give way to the defunct theory of life point of view:

> "The 'motion' of an energy system is its 'behavior'. Various types of organization of system produce on that basis various types of behavior. A gray **rock**, said Ruskin, is a good sitter. That is one type of behavior. A darting dragon-fly is another type of behavior. We call the one alive, the other not. But both are fundamentally balances of give and take of motion with their surround. To make 'life' a distinction between them is at root to treat them both artificially."

The person referred to here is English art critic John Ruskin, which seems to be a reference to an 1849 pocket book note scribbled to his father about how he was sitting on a gray rock on a glacier while waiting for the fog to clear.

In 1945, French atheist existentialist philosopher Jean-Paul Sartre stated the following: [13]

> "The effect of any form of materialism is to treat all men—including oneself—as objects, which is to say as a set of predetermined reactions indistinguishable from the properties and phenomena that constitute, say, a

table, a chair, or a **stone**."

In 1980, Iranian mechanical engineer and thermodynamics professor Mehdi Bazargan, in discussion of his *Thermodynamics of Humans* (1956), in an article section on the 'Cause of Movement and Life', stated the following: [11]

> "In general, an object in a given force field will, of necessity, behave in a calculable and predictable way. For any object, whether a **stone**, a plant, or a human society, force means movement."

(add)

Consciousness

The following is an early conscious stone statement:

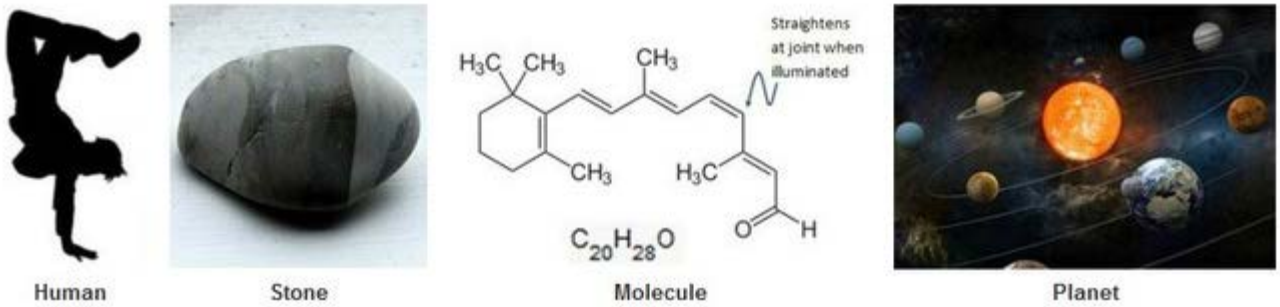

American economist Murray Rothbard's hilarious 1960 comparison of a human vs **stone** vs molecule vs planet, among which he says the human is unique in that it possesses a "rational consciousness" and can "choose" the course of its actions, unlike the other three of his entity classifications. [10] The inherent problem here, naturally enough, is that humans, according to ecologically stoichiometry, are now textbook-defined as "molecules"(see: human molecular formula); hence the so-called "moral" distinction between a human molecule (left) and any other animate CHO-based molecule, that shown (third from left) being the retinal molecule, or CHNOPS+ based molecule, becomes blurred, after which former dichotomies become fictional or rather in need of great correction and reform.

> "What is life may be subject of dispute; but it is far from true that we are no better able to answer this question to-day than last century. For ourselves we hold that life is immanent in substance; and we think it may be safely stated that modern science does not believe that it needs a truly organized structure for the manifestation of life. It is true we do not recognize **conscious stones**, nor conscious trees; but this does not prove that life is not universally diffused, and that the whole of nature is not indeed and in truth alive."
>
> — Henry Bray (1910), *The Living Universe* (pg. 204)

In 1960, American economist Murray Rothbard (1926-1995) gave the following rather hilarious stone, molecules, and planets vs humans comparison: [10]

> "Scientism is the profoundly unscientific attempt to transfer uncritically the methodology of the physical sciences to the study of human action. Both fields of inquiry must, it is true, be studied by the use of reasons—the mind's identification of reality. But then it becomes crucially important, in reason, not to neglect the critical attribute of human action: that, alone in nature, human beings possess a rational consciousness. **Stones**, molecules, planets cannot choose their courses; their behavior is strictly and mechanically determined for them. To ignore this primordial fact about the nature of man—to ignore his volition, his free will—is to misconstrue the facts of reality and therefore to be profoundly and radically unscientific."

This is a classic "two natures" (incorrect) belief system stance; the converse "one nature" (correct) position is outlined by Charles Sherrington (above). The premise of whether or not a human, as compared to a molecule or chemical, can

"choose" the course of its actions, of course, is a question central to the work of Goethe, in the years 1796-1908 (see: Goethe timeline).

It will take some time here to pick into Rothbard's mind, in regards to the his above divisional dichotomy, being that: (a) he was irreligious and agnostic toward the existence of god, describing himself as a "mixture of an agnostic and a Reform Jew", sometimes identifying as an atheist, yet critical of the "left-libertarian hostility to religion", and (b) he was an associate of Ayn Rand, prior to her becoming famous, via *Atlas Shrugged* (1958), stating that her ideas were not as original as she proclaimed but similar to those of Aristotle, Thomas Aquinas, and Herbert Spencer; the two eventually partying ways over various differences, including his defense of anarchism. [16]

(add)

Morality | Rock vs animal vs machine

In 1981, American philosopher Bernard Rollin, in his *Animal Rights and Human Morality*, did a rock vs. spider vs. machine comparison to argue his animal moral ideology, one generally aimed at facilitating the legislation of the ethical treatment of animals: [14]

American philosopher Bernard Rollin's 1981 **rock** (and pebble) vs spider vs car comparison, which he employed to ferret out his system of moral treatment of animals. [14]

> "Let us consider three categories of things: a **rock**, a machine, and an animal. For the sake of simplicity, let us look to a living thing—say, a spider—whose pleasure and pain many people feel is at least highly questionable for us to discuss, but who possibly has some rudimentary awareness. Clearly, in the case of the rock, it is senseless to speak of any real intrinsic unity to its being or any needs. If the rock is split or eroded, it remains a rock. If it is ground into sand, it is perhaps no longer a rock, but there is nothing to tell us that it has jumped a metaphysical barrier and become a totally different sort of thing, nor would we say that something undesirable has happened to the rock. There is nothing about a rock that resists the change to sand; the change is from dead matter in one form to dead matter in another form.
>
> In contrast, consider a spider. It has an intrinsic nature connected with being a spider, one that requires that it be alive. When it ceases to be alive, it is like the rock, and there is little difference between a crushed dead spider and a dried-up dead spider. The change from living to dead is far more profound than the change from rock to sand, and it is sensible to call it understandable from the point of view of the spider. But when the spider is alive, it has what Aristotle called a *telos*, a nature, a function, a set of activities intrinsic to it, evolutionarily determined and genetically imprinted, that constitute its 'living spiderness.' Furthermore, its life consists precisely in a struggle to perform these functions, to actualize this nature, to fulfill these needs, to maintain this life, what Hobbes and Spinoza referred to as the *conatus* or drive to preserve its integrity and unity.
>
> This is not of course to suggest that the spider or any animal need be conscious of its nature and all of these needs, any more than a man need be conscious of his need for oxygen or calcium. It surely makes sense to speak of conscious needs. Even wants and intentions perhaps need not necessarily be conscious—many analytical psychologists speak of unconscious wants and intentions, though whether or not this is sensible is the subject of much philosophical debate. It is enough that we as moral agents can sensibly assert that the spider has interests, which are conditions without which the creature, first of all, cannot live or, second of all, cannot live its life as spider nor fulfill its *telos*. Third and most important, as we shall shortly discuss, it is necessary that we can say sensibly of the animal that it is aware of its struggle to live its life, that the fulfilling or thwarting of its needs matter to it.

> Once again, we must stress that a man *may* not be conscious of his need for oxygen, but thwarting that need certainly matters to him. This sort of talk is senseless vis-a-via a **rock**. Further, we are aware that it is in our power to nurture or impede these needs and even to destroy the entire nexus of needs and activities that constitute its life. And once this is recognized, it is difficult to see why the entire machinery of moral concerns is not relevant here, for it is the awareness of interest in living (human) beings that we have argued is constitutive of morality in the first place. We may of course decide that the interests of the spider are insignificant compared with our desire for a spider-free living room, but the key point is that such a decision logically must be considered a moral decision, quite unlike sweeping up a **pebble** one finds in the living room. We are of course not considering the details of the moral decision, but simply pointing out that as a living creature with interests, the spider enters the arean of moral concern.
>
> Contrast this with a machine. Someone might argue, cleverly, that machines also have a *telos* or functional nature and, correlatively, have needs. The *telos* of a thermostat is to regulate the temperature in a room; the *telos* of a car is to run. Connected with this *telos* are needs; the car needs oil, gas, antifreeze, air in the tires, and so forth. Must we assert then that cars fall within the scope of moral concern? If so, the entire theory must collapse under its own weight for it violates our basic moral intuitions to consider a car in itself an object of moral concern?"

Rollin, a "university bioethicist", at Colorado State University, four years later, would use this platform of logic be become the principal architect of 1985 federal legislation dealing with the welfare of experimental animals.

In 2013, American moral philosopher Joshua Greene stated matter-of-factly that rocks, because they don't "experience" things, are beyond the scope of moral concerns: [15]

> "Everything you do is ultimately done to enhance the quality of someone's experience. We generally [however] regard things that have not experience, things like **rocks**, as beyond the scope of moral concerns. Thus, it's plausible that the goodness and badness of everything ultimately cashes out in terms of the quality of people's experiences."

Greene, to note, like Rollin, would go on to be a key speaker in the 2014 US commission on bioethics.

Kick a stone | kick a dog

The views of English social anthropologist Gregory Bateson are frequently requoted in regards to his comparison of kicking a dog versus kicking a stone, the latter of which he says strictly follows the billiard ball conservation of energy/first law of thermodynamics "behavior" model. [8] Austrian-born American theoretical physicist Fritjof Capra truncates Bateson's view as such:

> "When I kick a stone, I give energy to the **stone**, and it moves with that energy … When I kick a dog, it responds with energy [it received] from [its] metabolism."

Bateson uses this comparison to argue about the energy of amoeba and of neurons firing in circuits.

Teleology | Goal-seeking

In 1958, British philosopher Richard Peters, in his *The Concept of Motivation*, attempted to explain the ability to vary movements relative to a goal in a way that is appropriate to change in the situation necessary to

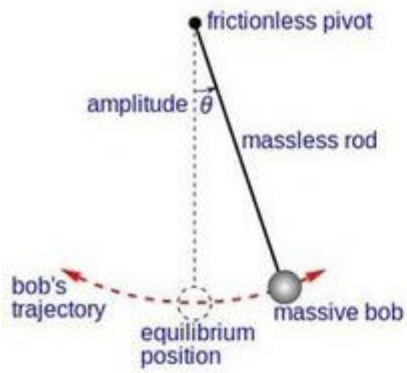

A comparison depiction of **pendulum** versus a human, to bring into view Cuban-born American philosopher Alicia Juarrero's 1999 human differs from stone (bob) assertion that: [7]

> "Pendula, too, 'tend' to achieve an end state of rest. But **stones** and pendula have neither goals nor ends; nor do they act in order to reach them."

The correction here, of course, is that the they both tend to "seek" equilibrium, each, however being quantified by a different force function, gravity and free energy, respectively.

define it as a goal and in the conditions relevant to attaining it, using the example of Pavlov's dogs salivating, using the stone comparison, as follows: [6]

> "For the *explicandum* [salivation] can only be adequately described by means of concepts like 'relevance' and 'appropriateness' to an end. Processes, on the other hand, like melting of ice or the movements of glass when struck by a **stone** do not require such concepts in their description. They just happen. They are not recognized or describe in terms which related to them to some kind of means-end nexus. For they do not vary in light of situations related in this sort of way to them. They therefore cannot be sufficiently explained in causal terms."

In 1999, citing Peters, Cuban-born American ontic opening philosopher Alicia Juarrero, gave a similar take, albeit comparing people to stones, avalanches, and pendula: [7]

> "Goals and ends, however, differ from end states, those internal states of quiescence and satisfaction that psychologists often postulate as ultimate motivators. The difference between goals and end states is basic to any teleological account of action. **Stones** and avalanches persist in rolling downhill no matter what obstacles they encounter. Pendula, too, 'tend' to achieve an end state of rest. But stones and pendula have neither goals nor ends; nor do they act in order to reach them. Moreover, purposive human behavior is not always followed by such end states; sometimes, despite trying their hardest, agents fail to achieve their goal. Goal-directedness is thus not a generalizing tending toward and end state."

The general problem here, particularly in the Juarrero rendition of the stone vs. human comparison, is that comparison is done in such a manner as to be a straw man or aunt sally argument, quick to set up and easy to knock down. If, conversely, a human, a carbon-based molecule (see: carbon-based life), is compared to carbon atom and the so-called "internal states of quiescence and satisfaction" that the carbon atom, with its octet bonding valency requirements, "feels", using laymanized anthropomorphic language (which eliminative materialism rejects), when it "satisfies" Abegg's rule, such as by migrating, through the action of the exchange force, to the geometrical arrangement of having four surrounding hydrogen atoms, in the organization of end state reaction product of methane, the aunt sally is not so easily knocked down. The reason for this is that the comparison is more apt. An inert non-reactive stone, a silicon-based structure, commonly, being a less apt comparison.

Hmolpedia mentions

In a 2011 Hmolpedia "origin of life" thread discussion, with Russian physical chemist Georgi Gladyshev (emergent properties life theorist) and

American chemical engineer Ted Erikson (panpsychism life theorist), American electrochemical engineer Libb Thims (defunct theory of life formulator) commented:

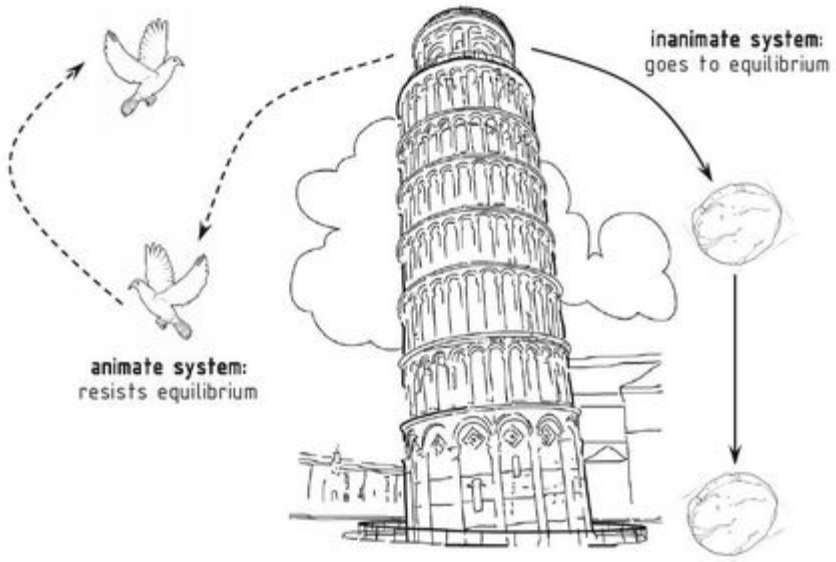

A **rock** (inanimate) vs. bird (animate) comparison by American ecological engineer Jeff Tuhtan, from his 2012 dissertation "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality", wherein he employ's the Bauer principle, i.e. "animate systems are those whose internal flow configurations allow them to *resist* equilibrium, whereas inanimate systems possess forms which are *incapable of resisting* equilibrium; both systems are however subject to equilibrium as an attractor", to compare and contrast the behaviors of the two different types of matter. [5]

> "To elaborate further, to explain what I'm getting at, you're not going to be able to look into a chemistry textbook (or physics textbook for that matter) and hear chemists talking about how the noble gases are 'dead' or 'dead systems' because they are inert or non-reactive, owing to their stability, which is based on their filled outer valence shell electron configuration; whereas, conversely, acids and bases are 'alive' or 'living systems' because they need or have extra electrons, respectively, and can thus react with each other or with other varieties or species of chemicals, whereas the noble gases, generally can't react, but only float around "mindlessly", we might say. This same type of logic extrapolates upwards to humans, often differentiated into a nonsensical dichotomy (especially in the mind-body philosophical debates) when we hear people using the argument that 'well what separates a **rock** from a **human?**'"

(add discussion)

Chnopsology

In 2012, the term "chnopsology" was Hmolpedia-coined during a rock vs. human comparison, suggested as an upgrade replacement for the now-defunct term "biology" (see: defunct theory of life), introduced in a set of June 2012 Hmolpedia forum threads discussions between Belgian psychologist-philosopher David Bossens and Americans civil-ecological engineer Jeff Tuhtan and electrochemical engineer Libb Thims, namely in threads: "maximum entropy and heat death" (Jun 14), "life" (Jun 16), "misrepresentation" (Jun 20), and "animated organisms" (Jun 23). In the "life" thread, post #15, Thims commented in response to a query by Bossens:

> "Re: "[we] can['t] deny that bio/whatever-ology is different from a **rock**, a table, a chair, glass...", watch the following chemical party video. The carbon atom is the central entity of your "whatever-ology" subject, i.e. "carbon-ology", being that carbon is a light-sensitive atom, meaning that it has the property of flexibility and hence animation and as such is very "reactive" or the "life of the part" as the video shows. The argon (Ar) is like the "rock, table, chair, glass", notice how she is very non-reactive (although, technically, glass is silicon-based; rock can be seen has having a certain amount of reactivity, in the big history geochemical view of earth structure change). More correctly, however, I would say that "CHNOPS-ology" (chnops-ology or **chnopsology**), is the namesake you are looking for; e.g. Erik Andrulis' 2012 abstract (panbioism):
>
> > "This theory is based upon a straightforward and non-mathematical core model and proposes unique yet empirically consistent explanations for major phenomena including, but not limited

to, why living systems [animate systems] are predominantly CHNOPS (carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur)."

Notice how the questionable term "living system" easily drops out of the definition, and can easily be rewritten using the updated substitution of "animate systems", a term we all agree upon. I've used the CHNOPS mnemonic as well before, back in *circa* 2003, when I wrote out a memory crick to help memorize the human molecular formula. I'll start an Hmolpedia CHNOPS article soon, to help with the matter (being that there are numerous CHNOPS articles around [the internet])."

The above "how the questionable term 'living system' easily drops out", to note, brings to mind how in the mid 19th century the questionable terms "living force" (or vis viva) and "dead force" (vis mortua) easily dropped out of circulation, particularly going into the early 20th century, with the acceptance of the terminologically neutral terms: kinetic energy (coined by William Thomson and Peter Tait in 1862) and potential energy (coined by William Rankine in 1853), respectively, terms that scale up and down the so-called great chain of being, molecular evolution table, or molecular evolution timeline.

The term "chnopsology", to note, was first used as a dead link on the animate organism page (23 Jun 2012) and used a second time as a dead link on the Gerald Joyce page (24 Jun 2012), upon which the chnopsology Hmolpedia article was started (24 Jun 2012), for lack of a better term (in replacement of biology).

Human choice | Coin flip

A variant of the rock vs. human comparison, to note, in respect to questions of choice, is the "coin vs. human" comparison, or specifically "coin toss" vs. "human choice" comparison, e.g. as found in the 2007 film *No Country For Old Men* (see: fate vs. destiny).

Quotes

The following are related quotes:

"As a runaway horse is better than a **stone** which does not run away because it lacks self-movement and sense perception, so the creature is more excellent which sins by free will than that which does not sin only because it has no free will."

— Augustine (c.410) [17]

"In crossing a heath, suppose I pitched my foot against a **stone**, and were asked how the stone came to be there; I might possibly answer, that, for anything I knew to the contrary, it had lain there forever: nor would it perhaps be very easy to show the absurdity of this answer. But suppose I had found a watch upon the ground, and it should be inquired how the watch happened to be in that place; I should hardly think of the answer I had before given, that for anything I knew, the **watch** [analogy for human] might have always been there.There must have existed, at some time, and at some place or other, an artificer or artificers, who formed [the watch] for the purpose which we find it actually to answer."

— William Paley (1802), *Natural Theology*

"How do we know that that form of atomic and molecular motion we call 'life' is the highest of all forms? Perhaps the dominate creature—the most rational and god-like of all beings—is an invisible gas. Or perhaps it is a flaming and effulgent mass of molten stardust. Who can say that **men** have souls while **rocks** have none?"

— Howard Lovecraft (1916), "Letter to Rheinhart Kleiner, Ira Cole, and Maurice Moe", Aug 8 [19]

"Another fatal obstacle to a full-fledged natural science of human social phenomena is alleged to be the presence in the latter of a unique and mysterious something called *motives*. What is meant by motives? The word is used to designate those circumstances to which we find it 'reasonable' to attribute an occurrence. The motive we impute to an act is accordingly entirely relative to the frame of reference we adopt and accept as reasonable. To a scientist, the motives of a **stone** rolling downhill or of a boy murdering his father are simply the full set of circumstances resulting in either event."

— George Lundberg (1947), *Can Science Save Us?* (pg. 22)

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θΔics

In existographies, **Rod Swenson** (1945-) (CR:6) is a stage music production artist turned evolution theorist noted, in ecological thermodynamics, for his 1980s maximum entropy production theory of evolution.

Overview

In circa 1980, Swenson introduced a thermodynamically grounded theory of general evolution and self-organization.

In 1988, Swenson postulated and argued for a 'law of maximum entropy production', which he defined as: [1]

> "A system will select the path or assemblage of paths out of available paths that minimizes the potential or maximizes the entropy at the fastest rate given the constraints."

In his various publications, Swenson argued that to understand the ubiquity of spontaneous ordering that characterizes the visible world of which biological evolution is a part there had to be a "physical selection principle" to account for it [2]. The selection principle he argued was the rate of entropy production or the rate at which non-equilibrium distributions of energy ("potentials") are minimized. Because potentials according to the law of maximum entropy production are minimized at the fastest rate given the constraints and because the production of dynamic order increases the rate, the world he argued can be expected to produce as much order as it can opportunistically, whenever it gets the chance [3]. To the extent that this law underpins planetary evolution, it has implications for culture theory, macroeconomics, and human globalization. In Swenson's view, the universe is thus pocked by local regions of intense ordering, including life, because it is through ordered, dissipative systems that the rate of entropy production in the universe is maximized. [4]

Thermodynamic evolution philosophy

Swenson, in a 2012 interview, stated that he was of the "becoming" philosopher of the Heraclitus "never step in the same river twice" motto over that of a "being" philosopher of the Parmenides school. Swenson goes on to state that around 1977 he began to have a vivid clearness about the following deficiencies orthodox Darwinian theory: [10]

> "But now this started to keep me up at night. This, which seemed to me some kind of deeper reality than we are normally taught about, or certainly that finds its way into colloquial or popular discourse, became a pre-occupation for me. Modern science, descending from Cartesian metaphysics, has been built almost entirely on, or reduced to, what Aristotle called "efficient," or proximate cause, and what we're talking about here, to use terms now more widely known, "self-organizing," "spontaneously ordering," or more technically "autocatakinetic" (ACK) systems are not reducible to efficient cause. Since autocatakinesis is found from non-living through cultural systems where natural selection as an explanatory framework does not work it became clear to me that natural selection was insufficient as an explanatory first principle for a general theory of evolution."

He the compares a human to a tornado:

> "All these systems are flow structures that pull resources into themselves in their own self-production through the coordinated motion of their components with a set of empirically traceable circular relations. They are all self-organizing or ACK systems. The circularly causal relations that constitutes them exist through the dissipation of environmental potentials (or energy gradients) where output feeds back on input to amplify growth from the initial instabilities where they originate. The macrostructure (what we call the "thing") at one level is constituted by the flux of the lower level components. Dust devils, and tornadoes are

> non-living examples which make this easy to visualize where can see literally as they come into being that the origin, evolution (or development) of ACK systems, the transformation of some previously less ordered or incoherent set of components into a dynamically ordered or coherent set is inherently a process of selection."

He then explains his path selection theory, or what he believes is a fourth law of thermodynamics, as follows:

> "In short, the second law says potentials are minimized (entropy maximized) in all natural processes but says nothing about rates or path selection. LMEP (or fourth law of thermodynamics) to the contrary answers the crucial question "which path out of available paths will a system take" to minimize the potential or get to equilibrium. It says: "A system will select the path or assembly of paths out of available paths that minimizes the potential (or maximizes the entropy) at the fastest rate given the constraints"."

This last paragraph seems to be a reasonable first-draft, autocatalysis self-organization ontic opening digressions aside, although the correct "thermodynamic potential" for humans is free energy.

Education

Originally trained as an artist, Swenson studied at the Arts Student League and Brooklyn Museum, got a BFA from the University of Denver in 1967, and an MFA at Yale in 1969 where he had traded painting for conceptual art. In 1971, he founded The Good Shepherd Cereal Company with his brother to produce what New York Magazine called the "patriarch" of granolas and credited with the commercialization of granola. [5] One of the first to bring natural foods to supermarkets, the company was sold to Sovex Foods in 1973, and in 1974 Swenson was commissioned to set up and run a natural foods restaurant at America's largest naturist resort. His guide to naturist resorts was published by Popular Library in 1975, and in 1976 went on to produce an experimental theatrical repertory review in New York dealing with political satire and sexual taboos. During this same time he became involved in the underground New York rock scene where produced videos and shows of the then mostly unknown Patti Smith, Ramones, Dead Boys, Blondie and others, and in 1977 he created the punk-metal band the Plasmatics with and around Wendy O.Williams, the controversial singer and band giving its first performance at CBGB in 1978 and touring and recording for the next ten years thereafter. [6][7]

It was during this time he began to focus in earnest what he saw as the discrepancies between biology and physics particularly as relating to evolutionary and culture theory and became focused on spontaneous order production or self-organization. By 1988 he had "proposed and elaborated the law of maximum entropy production as the missing piece of the physical or universal law that would account for the ubiquitous and opportunistic transformation from disordered, or less ordered, to more highly ordered states," [8] and in 1991 he and Michael Turvey explicitly connected this thermodynamic account to J. J. Gibson's law-based account of information to build on Swenson's view of evolution as an epistemic process and argue that the evolution of cognition, intelligence, and knowing follow directly and opportunistically from universal or physical law [9]. From that time until the present Swenson's work has continued in the elaboration of these principles addressing more specifically the issues of human ecology, the emergence of meaning, and intentionality. Swenson is currently a Fellow at the Center for the Ecological Study of Perception and Action (CESPA), University of Connecticut, Storrs, Connectcut, a center founded in 1987.

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External links

â— RodSwenson.com – Spontaneous Order, Evolution, and the law of Maximum Entropy Production.
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θΔics

In chnopsology, **Roderick Dewar** (c.1960-) is an English-born Australian plant-ecology physicist noted for

Overview

In circa 1990, Dewar began to promote the view that: [1]

> "Maximum entropy production is an organizational principle that potentially unifies biological and physical processes."

Dewar since 1989, in short, has been working on the application of American physicist Edwin Jaynes' maximum entropy principle theories to organisms and ecosystems; wherein he also works on applying Shannon entropy concepts (see: Shannon bandwagon) to genetics and community ecology.

Education

Dewar completed his BS in mathematical physics in 1982 and his PhD in 1986 on statistical mechanics and phase transitions, both at the University of Edinburgh. Since 2008, Dewar has been a professor of theoretical ecology at the Australian National University, where he the interface between chnopsology (biology) and physics from the point of view of entropy (albeit, it seems, of the information theory variety).

See also

â— MaxEnt school
â— Principle of maximum entropy production

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External links

â— Roderick Dewar (faculty) – Australian National University.

θΔics

In existographies, **Roderick Seidenberg** (1889-1974) was German-born American architect turned science writer noted for []

Overview

In 1950, Seidenberg, in his *Posthistoric Man*, described by Judson Herrick (1956) as a "trenchant book", building on Henry Adams, e.g. citation of "another Newton", also citing utopianists Yevgeny Zamyatin (We, 1920), Aldous Huxley (*Brave New World*, 1932), C.S. Lewis (*That Hideous Strength*, 1945), Samuel Butler (*Erewhon*, 1872), among others, e.g. Oswald Spengler, William Wheeler (*Social Life Among Insects*, 1923), Henri Bergson (*Creative Evolution*, 1938), Alfred Lotka, Joseph Needham, etc., attempted to examine history, in an Adams-style, as a processes must conform with the second law of thermodynamics, via what he calls "historical determinism". [1]

Social phases

Seidenberg, building on Henry Adams' social phase theory of history, argues that similar to a salt solution forming a crystal, so to may a liquid social history produces a solid machine-like society: [4]

> "The long travail of man's past in which his instincts and his **intelligence reacted upon on another** in all the diverse facets of his history, of his rising cultures and dying civilizations—the summation of that past must be locked upon as a kind of prologue of clashing forces tending toward an inherent but wholly unsuspected climax.
>
> The dynamic protagonist in this drama of human history is man's intelligence, through whose agency he established, slowly and by uncertain stages, a condition of 'inner accommodation', of mounting compliance with the rational elements in his nature.
>
> This 'state of inner accommodation', becoming ever more intensified, might be compared to the slow concentration of a solution. To outward appearances no perceptible change seems to be taking place. As the solution becomes more supersaturated, however, it approaches a state of incipient change. And if at this stage, as is well known, a crystal of the same substance is introduced into the solution, an immediate change of state takes place, and all the excess salt crystallizes forthwith. Similarly, a subcooled liquid may be induced to crystalize; an in the domain of physico-chemical systems such transformations are known as 'changes of phase'.
>
> Returning to the field of history, on the basis of this analogy, that the incipient and diffused trend toward organization has been hastened into a universal movement by the sudden introduction of a pure crystal—the machine."

Seidenberg continues:

> "The sweeping applicability of the second law of thermodynamics constitutes an inviting terrain in which to build analogies: its meaning, at once self-evident and mysterious, invites speculation, and perhaps nowhere more so than in the relationship between organic and inorganic systems. Both exhibit the same 'spontaneous' development characteristic of irreversible processes; that is to say, the process of crystallization, once started, continues spontaneously, just as the trend toward increased organization follows an obligatory course in the development of that historic determinism associated with the dominance of intelligence.
>
> There is, moreover, a condition, known in the terminology of thermodynamics as 'metastable state', which describes precisely the condition of incipient change between two phases of a system that would seem to

serve as the perfect analogue to that state of 'inner accommodation' spoken of above. We have thus, in the view of these analogous characteristics, at least an intimation of a significant parallelism, inviting us to further exploration."

Some of the above, to note, brings to mind the "analogy fallacy", namely that in Seidenberg's phrasing of in the "analogies which Adams pursued", he evidences a confusion about when a scenario is an analogy vs when one is reality.

Quotes | Employed

The following are quotes employed by Bacon:

> "We cannot command nature except by obeying her."
>
> — Francis Bacon (c.1600), *Publication*; cited by Roderick Seidenberg (1950) in *Post-Historic Man* (pg. 61)

> "Does it make sense to talk about a 'flow of entropy'? This is an example of what happens when we carry familiar patterns of verbalization into new situations: we have at first no guarantee at all that the old verbalizations will even have meaning, but we at least in this way provide ourselves with a program of exploration."
>
> — Percy Bridgman (1941), *The Nature of Thermodynamics*; cited by Roderick Seidenberg (1950) in *Post-Historic Man* (pg. 103)

> "No one who has watched the course of history during the last generation can have felt doubt of its tendency. Those of us who read Buckle's first volume when it appeared in 1857, and almost immediately afterwards, in 1859, read the *Origin of Species* and felt the violent impulse which Darwin gave to the study of natural laws, never doubted that historians would follow until they had exhausted every possible hypothesis to create a science of history."
>
> — Henry Adams (c.1900), "The Tendency of History", in: *The Degradation of the Democratic Dogma* (pg. 126), 1919; cited by Roderick Seidenberg (1950) in *Post-Historic Man* (pg. 114)

> "The driving motive (or impelling cause) in all natural events is the difference between the existing entropy and its maximum value."
>
> — Ludwig Boltzmann (c.1887), Publication; cited by Joseph Klein (1910), *Physical Significance of Entropy* (pg. 98); cited by Roderick Seidenberg (1950) in *Post-Historic Man* (pg. 143); cited by Libb Thims (2016) in *Smart Atheism: for Kids* (pg. 216)

> "We cannot make any sharp line of distinction between the living and the non-living. At the level of the submicroscopic viruses, they overlap. Some particles show some of the properties of life but not others. Some 'dead' protein molecules are much bigger than the particles of some 'living' viruses. Particles which show the properties of life can be had in paracrystalline, and even in crystalline, form. There are many similarities between the morphology and behavior and crystals and the living organism."
>
> — Joseph Needham (1942), "Evolution and Thermodynamics"; cited by Roderick Seidenberg (1950) in *Post-Historic Man* (pg. 148-49) [5]

"What is needed is an altogether new instrument—a microscope for elephants; one that shall envisage the units of a biological population as the established statistical mechanics envisage molecules, atoms and electrons; that shall deal with such average effects as population density, population pressure, and the like, after the manner in which thermodynamics deal with the average effects of gas concentration, gas pressures, etc.; that shall accept its problems in terms of common biological data, as thermodynamics accepts problems stated in terms of physical data; and that shall give the answer to the problem in the terms in which it was presented."

— Alfred Lotka (1925), *Elements of Physical Biology* (pgs. 39-40); cited by Roderick Seidenberg (1950) in *Post-Historic Man* (pgs. 153-54)

"Even in the domain of situations which would be unanimously described as primarily 'thermodynamic', it would appear that there is a rather large verbal element in the coupling of 'disorder' with entropy, and that this coupling is NOT always felicitous (see: entropy as disorder confusions). Consider, e.g., a quantity of sub-cooled liquid, which presently solidifies irreversibly8, which increase of entropy and temperature, into a crystal with perhaps a regular external crystal form and certainly a regular internal arrangement as disclosed by X-rays. Statistically, of course, the extra 'disorder' associated with higher temperature of the crystal more than compensates for the effect of the regularity of the crystal lattice. But I think, nevertheless, we do not feel altogether comfortable at being forced to say that the crystal is the seat of greater disorder that the parent liquid."

— Percy Bridgman (1941), *The Nature of Thermodynamics* (pg. 174); cited by Roderick Seidenberg (1950) in *Post-Historic Man* (pg. 158)

Quotes | On

The following are quotes on Seidenberg:

"**Seidenberg**, a friend of Lewis Mumford, was an architect with a sociological perspective on technology. He understood that technology had become a system and that it needed to be situated within a historical context to understand its impact on humans. His work is comparable to that of Jacques Ellul."

— Richard Strivers (2004), "Roderick Seidenberg" (Ñº)

Quotes | By

The following are quotes by

"Order demands order. And just as, in the realm of physics, there are in fact no 'isolated systems', so too, in the domain of social relations, all systems, however arbitrarily defined, exist not in a social vacuum but in relation to adjacent systems."

— Roderick Seidenberg (1950), *Post-Historic Man: an Inquiry* (pg. 27)

"To say that history follows a definitely determined course comes close to implying that its processes are amenable to specific laws. This thesis has often enough been maintained but perhaps never satisfactory demonstrated. If such laws are comparable to scientific laws, they should afford a basis for prediction; but even allowing a wide latitude for inaccuracies, the prognostications hat have been ventured in the field of history have been either wide off the mark or at best tentative and generalized rather than specific and

positive. Certainly no ‘laws of history’ have ever been stated with sufficient precision to invite application to past or future with anything approaching scientific standards.”

— Roderick Seidenberg (1950), *Post-Historic Man: an Inquiry* (pg. 48)

“A science of society, if not of history, is a science that, in the words of Henry Adams (1894), ‘must be certain, like other sciences, and must fix with mathematical certainty the path which human society has got to follow.’ In this pronouncement we perceive that Adams is thinking of humanity as a unified whole, composed doubtless of individuals whose existence, in terms of a scientific approach to the historic process, is comparable to that of molecules in a physico-chemical system. That is to say, just as the characteristics of molecular structure and the laws of molecular behavior are reflected in the identity of things on a macroscopic level, so too will the mass of individuals in their common properties and average qualifications define the character of the collective whole.”

— Roderick Seidenberg (1950), *Post-Historic Man: an Inquiry* (pg. 110) [2]

“Perhaps a further analogy from the physico-chemical worlds may help to elucidate the point: though water, for example, turns into a solid of ice under changes of temperature at constant pressure, it does so only at a definite point and without forewarning. History, viewed as a transitional movement in the development of man, may likewise have its unrevealed critical eras its morphologically significant turning points.”

— Roderick Seidenberg (1950), *Post-Historic Man: an Inquiry* (pgs. 110-11)

“The awareness of historic fatality or ‘historic determinism’ is deeply connected with the problem of time and irreversibility. But these ideas, no less than those notions of statistical averages and probabilities mentioned above, are concepts that belong primarily to the field of thermodynamics, where they possess greater scope, precision, and universality. It is therefore not surprising that a kinship of some kind has been suspected between their bearing in the domain of history and even more so in that of biology—particularly in relation to the theory of evolution—and their meaning in the field of thermodynamics. The exact nature of this relationship has been a matter of growing interest to scientists if not to historians. Yet the challenge of the problem has not altogether escaped their attention: this professor Carl Becker, for instance, found occasion to use the symbol of increasing entropy — ‘ds/dt is always positive’ — as a suggestive subheading to the last chapter of his fascinating book *Progress and Power*. But certainly, among historians no one has been as instant as Henry Adams in attempting to establish a relationship between the historic process and the phase rule of Willard Gibbs in an effort to achieve that science of history which he believed to be firmly implied in the universal formulae of thermodynamics.”

— Roderick Seidenberg (1950), *Post-Historic Man: an Inquiry* (pg. 113) [3]

“Here, in Boltzmann’s statement of the driving motive in all natural events, we indeed come upon that deep-seated feeling of ‘direction’ associated with all evolutionary processes, upon which, basically, our very sense of time itself is thought, according to Eddington (1929), to depend.”

— Roderick Seidenberg (1950), *Post-Historic Man* (pg. 143)

“We may thus say that the conditions for sustaining an analogy between the fundamental processes of history and those of physico-chemical systems may be entertained at least on the broad basis of the second law of thermodynamics. Hence, **we may provisionally equate**, for the purposes of our analogy, **the individual with the random molecule**; the machine with the crystal; society as an organized entity with a

physico-chemical system having a crystal structure; and, finally, a basic change of historic direction with a thermodynamic change of phase."

— Roderick Seidenberg (1950), *Post-Historic Man* (pg. 144)

"In Blum's 'Evolution from a Thermodynamic Point of View' (1935), we perceive in evolution a certain drive, an inherent direction, which is NOT to be identified on the basis here indicated with any teleological end."

— Roderick Seidenberg (1950), *Post-Historic Man* (pg. 151)

"Science has not yet produced the Vignola of its ensemble architecture—the 'Newton' called for by Adams. Here we must wait not only for the coming of a Newton, but the development of a science not yet begun! Yet, as we observed, Alfred Lotka, among others, have broken ground in this direction. This [new] science will recognize and delineate the dynamics of this basic transformation in terms of an historic change of phase, analogous in its structural meaning to a change of phase in the physico-chemical world. In general, it will establish the laws and structure and principles of an inescapable historic determinism."

— Roderick Seidenberg (1950), *Post-Historic Man* (pgs. 163, 170, 172)

"Through the vehicle of analogy, we arrived at an interpretation of [historical] phenomena in accordance with a thesis first enunciated by Henry Adams: namely, that the stages in the course of human evolution may be comparable to the changes of state in a purely material system as expressed by the rule of phase in thermodynamic theory."

— Roderick Seidenberg (1950), *Post-Historic Man* (pgs. 234-35)

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1. (a) Seidenberg, Roderick. (1950). *Posthistoric Man: an Inquiry* (thermodynamics, 41+ pgs). University of North Carolina Press.
(b) Herrick, Charles J. (1956). *The Evolution of Human Nature* (abs) (pg. 51). University of Texas Press.
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3. (a) Becker, Carl. (1935). *Progress and Power: Lectures delivered at Stanford University, April* (Introduction: Leo Gershoy) (Arc) (entropy, pg. 113). Alfred Knopf, 1958.
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(b) Needham, Joseph. (1943). *Time: the Refreshing River – a Collection of Essays* (pg. 224). MacMillan Co.
(c) Seidenberg, Roderick. (1950). *Posthistoric Man: an Inquiry* (crystallize, pgs. 148-49). University of North Carolina Press.

External links

â— Roderick Seidenberg (about) – Rogers State University.
â— Roderick Seidenberg (photo) – GF.org.

θΔics

In thermodynamics schools, the **Roegen-Daly school** or "thermodynamics school", as it is called in ecological economics schools classifications, refers to the entropy views (or rather material entropy views) of the view of Nicholas Georgescu and his student Herman Daly (and to some extent Kenneth Boulding, among others), namely the very tenable view that entropy, in economic terms, equates to "value lost to waste", and that this explains pollution, resource scarcity, unemployment, and depletion. American economist Mariano Torras summarizes what summarizes as the "thermodynamics school" of economics (or biophysical economics) as follows: [1]

> "Economists from the so-called **thermodynamics school** offer perhaps the least optimistic view regarding sustainable development. They argue that GDP growth is invariably constrained by the first and second laws of thermodynamics (see, e.g., Daly, 1991a; Georgescu-Roegen, 1971). In other words, their framework takes into account the observation that economic activity cannot create or destroy matter-energy, only transform it (first law). Consequently, all matter-energy used by an economy must ultimately be disposed back into the environment. Yet for those who would pin hopes of sustainability on efficient recycling, the second law precludes such a possibility. It states that low entropy matter-energy (highly organized materials and energy flows) is transformed to high entropy matter-energy (disorganized and relatively useless) by the economic process."

Here we see an example of the blind (Georgescu), leading the blind (Daly), leading the blind (Torras) into a delusional cul-de-sac (a slipshod, contrived, and essentially baseless matter-energy version of the second law taken as fact).

Likewise, P.A. Victor identifies four schools of thought on the environmental as capital issue: [2]

> (a) Mainstream neoclassical school
> (b) London school (after Pearce, Barbier, Markandya, and Turner)
> (c) Post-Keynsian school
> (d) Thermodynamic school (after Boulding, Georgescu-Roegen, Daly, Charles Perrings, and Mick Common)

a spectrum of views that is said to range from very weak sustainability through very strong sustainability.

References

1. Torras, Mariano. (2003). *Welfare, Inequality, and Resource Depletion: a reassessment of Brazilian Economic Growth* (§: The Thermodynamics School, pgs. 40-). Ashgate Publishing.
2. (a) Jansson, A.M. (1994). *Investing in Natural Capital: the Ecological Economics Approach to Sustainability* (pg. 268). Island Press.
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θΔics

In debates, **Roemer-Styer fiasco** is the 2012 to present attempt of American physicist David Roemer, a noma creationism Jesuit in belief system, to get the 2008 article "Evolution and Entropy" by American physicist Daniel Styer, a god-believing Quaker, wherein he uses Boltzmann entropy equation to calculate the entropy change of an evolving organism, retracted from the *American Journal of Physics*, per overt scientific objections (i.e. the equation isn't applicable; you can't measure the entropy of a tree), driven by covert religious beliefs (god gave us free will, a soul, and the promise of afterlife). Roemer, to note, is an unusual case: contacting and harassing hundreds of people on this matter, e.g. Victor Stenger, Georgi Gladyshev, Neil Tyson, forums, university departments, journal editorial boards, state legislatures, congress, etc. [N1]

Styer

In 2008, American physicist Daniel Styer published his *American Journal of Physics* (AJP) article "Entropy and Evolution", the main derivation section shown adjacent, wherein he uses the statistical mechanics definition of entropy, i.e. Boltzmann entropy, S = k ln W, admixtured with a microstate of organisms argument, i.e. assertions about the multiplicity *W* of states of organisms, to calculate the entropy change of an evolving organism per second, which he determines to be: [1]

AAPT PHYSICS EDUCATION — AMERICAN JOURNAL of PHYSICS — Entropy and evolution — Daniel F. Styer (2008)

III. ENTROPY REQUIRED FOR EVOLUTION

What is the change in the entropy of living things on Earth due to evolution?

Suppose that, due to evolution, each individual organism is 1000 times "more improbable" than the corresponding individual was 100 years ago. In other words, if Ω_i is the number of microstates consistent with the specification of an organism 100 years ago, and Ω_f is the number of microstates consistent with the specification of today's "improved and less probable" organism, then

$$\Omega_f = 10^{-3}\Omega_i. \quad (2)$$

I regard this as a very generous rate of evolution, but you may make your own assumption.

The statistical definition of entropy (in the microcanonical ensemble) is

$$S = k_B \ln \Omega, \quad (3)$$

where the Boltzmann constant is $k_B = 1.38 \times 10^{-23}$ J/K. If the assumption in Eq. (2) is used, then the corresponding difference in entropy of the organism of today versus the organism of a century ago is

$$S_f - S_i = k_B \ln \Omega_f - k_B \ln \Omega_i = k_B \ln(\Omega_f/\Omega_i) \quad (4a)$$

$$= k_B \ln(10^{-3}) = k_B(-6.91) \quad (4b)$$

$$= -9.53 \times 10^{-23} \text{ J/K}. \quad (4c)$$

That's the entropy change over 100 years. The entropy change per second is -3.02×10^{-30} J/K.

Yes
Daniel Styer (1955-)
Quaker physicist

No
Andrew McIntosh (c.1950-)
Creationist thermodynamicist

No
David Roemer (c.1942-)
Jesuit physicist

Yes
Emory Bunn (c.1967-)
Athe-Agnostic physicist

No
Granville Sewell (c.1944-)
ID mathematician

The gist of Daniel Styer's argument from his 2008 article "Entropy and Evolution", wherein he uses Boltzmann entropy to calculate the entropy change of an organism evolving and biosphere as a whole, which he says does not conflict with the second law; which in 2012 worked to initiate the **Roemer-Styer fiasco** carried about via the efforts of American noma creationism physicist David Roemer, who considers Styer's calculation paramount to pseudoscience. [1] Debate chimers include: Andrew McIntosh (2009), Emory Bunn (2009), and Granville Sewell (2013), among others.

Entropy change per organism: -3x10E-30 J/K (per second)

Then determines:

Entropy change of biosphere: -302 J/K (per second)

He then concludes:

> "Presumably the entropy of the earth's biosphere is indeed decreasing by a tiny amount [$\Delta S_{biosphere}$ = -302 J/K·s] due to evolution, and the entropy of the cosmic microwave background is increasing by an even greater amount to compensate for that decrease."

(add summary)

Bunn

In 2009, American physicist Emory Bunn, in his "Evolution and the Second Law of Thermodynamics", agrees with Styer, albeit with the note that: [3]

> "Styer's factor of 1000 was not really generous, that in fact organisms should be considered to be, on average, about 10E25 times more improbable each century, but went on to show that, still, "the second law of thermodynamics is safe."

Bunn, who in his blog "Ted Bunn's Blog" has 7 posts on "god" (Q), 4 posts on "religion" (Q), and one post on "atheism" (Q), would seem to be classified as an "agnostic-atheist" or Dawkins number 5-6 approximately.

McIntosh

In 2009, English creationist thermodynamicist Andrew McIntosh, in his "Information and Entropy: Top-down or Bottom-up Development in Living Systems?", cites Styer and Bunn, in a general objectionable manner, stating that: [5]

> "This is then compared to the total entropy received by the earth from a rate of solar radiation estimated to be absorbed by the earth for a given period of time. However, all these authors are making the same assumption – viz. that all one needs is sufficient energy flow into a closed system (or open system, where mass flow is allowed) and this will be the means of increasing the probability of life developing in complexity and new machinery evolving. But as stated earlier this begs the question of how a local system can possibly reduce the entropy without existing machinery to do this?"

McIntosh then goes in the right direction, via several pages of Gibbs energy discussion, but then avers when he gets to his section five "The Vital Role of Information", wherein he begins ridding on the Shannon bandwagon, using melting pot theory, e.g. self-organization, vitalism, Jeffrey Wicken, Stuart Kauffman on emergence, the Brooks-Wiley theory, Ilya Prigogine, Prigogine entropy, and then goes out with teleology and "energy + information" teleonomy arguments about how local entropy reduction, and in the implicit name of god.

Roemer

In 2006 to 2008, American super-zealous noma creationism physicist David Roemer launched DKRoemer.com (Q), wherein he began to post a number of things, such as book reviews he had done on: Daniel Dennett's *Breaking the Spell: Religion as a Natural Phenomenon* (2006), Richard Dawkins' *The God Delusion* (2006), Karen Armstrong's *A History of God* (1993), Kenneth Miller's *Only a Theory: Evolution and the Battle for America's Soul* (2008) (Q); a 13 proposition proof of the existence of god (Q); letters he sent to the US District Judge of Pennsylvania (on evolution), etc.

On 19 Jan 2012, Roemer was busy, at the SkepticsForum.com, as usual, with his attack on the atheism and evolution views of Richard Dawkins, during which time he emailed Glenn Branch (Q), head of the National Center for Science Education (NCSE) director, on his squabbles, amid which, as he says, Branch "squelched me" by citing Styer's "Entropy and Evolution" (Q) article, and is equation 4b calculation of the entropy of evolution of an organism.

This article infuriated Roemer, who

would go on to spend the next three years plus focused on an effort to get the *American Journal of Physics* to recant (or retract) the article. The following two quotes seem to capture the gist of Roemer's main objection:

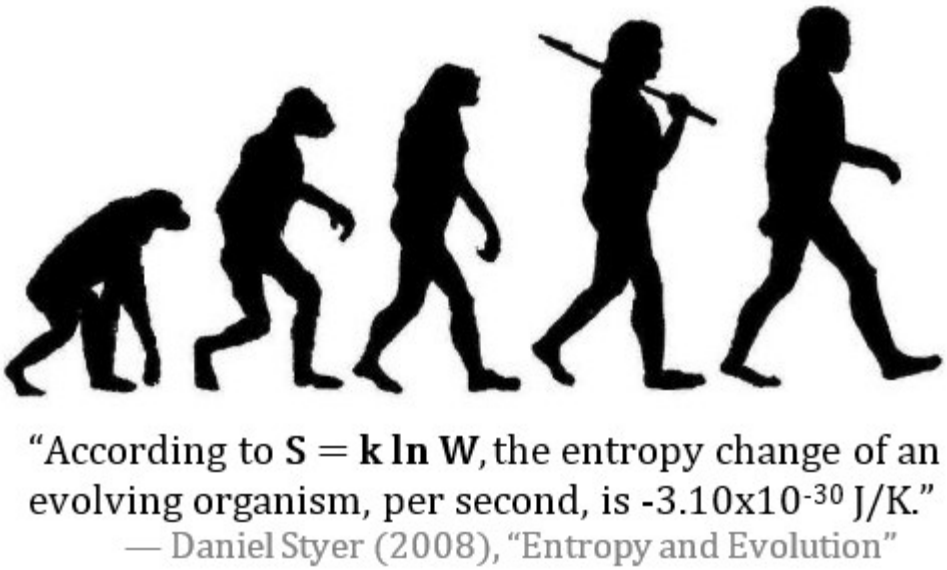

American physicist Daniel Styer's general assertion, which is behind the **Roemer-Styer fiasco**, namely that the entropy of an evolving organism can be calculated, via Boltzmann entropy, and this does not violate the second law, but rather concurs with it via the local entropy decrease model.

> "Performing calculations to show evolution does not violate the second law of thermodynamics implies that natural selection explains the complexity of living organisms. The second law of thermodynamics is an absolute truth. It is like saying the chance of getting heads when you flip a coin is 50%. When a tree grows from a seed by absorbing oxygen and carbon dioxide there is no violation of this law. However, the idea of calculating the entropy of the tree and heat flows into the plant to prove this strikes me as being absurd. I may be wrong, but this is how I understood the article."
>
> — David Roemer (2012), "Letter to David Jackson, Editor of AJP" (Q), Feb 1

> "Two American Journal of Physics articles are promoting misinformation. According to the second law of thermodynamics, an isolated system of non-interacting particles will either be in equilibrium or go to a state of greater disorder. In other words, nature goes from the more complex state of speed and location to the less complex state. The two articles report scientific calculations showing that evolution does not violate the second law of thermodynamics. Laymen interpret this to mean that natural selection explains the complexity of life."
>
> — David Roemer (2012), "Evolution and the Second Law of Thermodynamics" (Q), Article submitted to AJP (but rejected), Feb 24

(add summary)

Sewell

In 2013, American creationist mathematician Granville Sewell (CIR:33), in his "Entropy and Evolution" article, published in *BIO-Complexity*, states: [4]

> "Much of the confusion in applying the second law to evolution, and to other situations where entropy is difficult to define and quantify, comes from the idea that "entropy" is a single quantity which measures (in units of thermal entropy) disorder of all types. The *American Journal of Physics* papers by Daniel Styer (2008) and Emory Bunn (2009) illustrate the confusion that results from thinking of entropy as a single quantity when applying the second law to evolution."

Sewell continues:

> “Styer estimated the rate of decrease in entropy associated with biological evolution as less than 302 joules/degree kelvin/second, noted that this rate is very small, and concluded, “Presumably the entropy of the Earth’s biosphere is indeed decreasing by a tiny amount due to evolution and the entropy of the cosmic microwave background is increasing by an even greater amount to compensate for that decrease”. To arrive at this estimate, Styer assumed that “each individual organism is 1000 times more improbable than the corresponding individual was 100 years ago,” which, according to Styer, is a “very generous” assumption. He then used the Boltzmann formula to calculate that a 1000-fold decrease in probability corresponds to an entropy decrease of kB × log(1000), multiplied this by a generous overestimate for the number of organisms on earth, and divided by the number of seconds in a century.”

(add summary)

Rebuttals

In 2013, Styer encountered Roemer, wherein Roemer accuses him of being an atheist; Styer recounts the incident as follows:

> “In December 2013 I had an exchange with a man named David Roemer, who stated that he was the same as the CreationWiki “article”. When I pointed out the facts outlined above, he could find no fault with them. Yet he persisted in denigrating my work, not through any scientific fault, but because he claimed it was “atheistic propaganda”.”

On 21 Jan 2014, in his “Reply to CreationWiki page ‘Pseudoscience in the American Journal of Physics’”, uploaded to his faculty page, he gives eight rebuttals of Roemer’s claims, e.g. “the second law does not apply to the evolution of stars”, the “second law does not apply to living things or evolution”, etc.; after which he states that he is a Quaker, who believes in god, and believes evolution to be consistent with religion; an example statement of which is as follows: [2]

> “According to Psalm 19, ‘the heavens proclaim the glory of god’. And indeed they do. The heavens proclaim a magnificent universe, 13.798±0.037 billion years old, full of microwave radiation, galaxies, clusters, stars, nebulae, and planets (1078 known to date); various and arresting and beautiful. At least one planet has life: 1.2 million cataloged species — far too many to have been discovered and named by one individual— varying from zebras to Sequoia to whales to gnats to Hallucigenia to Bdellovibrio to Sulfolobus. But even without life our planet is various and arresting and beautiful: crystals, lodestones, fluid turbulence, waterfalls, geysers, rainbows, clouds; 79 million cataloged chemical compounds, combinations of 92 naturally occurring elements, all made up of electrons, protons, and neutrons. Every day new scientific discoveries show that the glory we know at present is but a fraction of the full glory of god.”

Styer goes on to conclude that we should not read the Bible literally, but instead only figuratively.

Discussion

To clear up a few points, in short, firstly the premise that the "entropy of an organism" can be calculated, let alone calculated at various states of existence in evolution, has a long contentious and debatable history: "entropy of a human" (or human entropy) Siegfried Bernfeld and Sergei Feitelberg (1936), Bridgman paradox (1946), entropy of a mouse, Martin Goldstein (1993); entropy of students in a field [Moriarty-Thims debate, 2009], among others.

Secondly, Styer's argument that entropy of an organism can be calculated, at various states of evolution, at say an initial state entropy S_i, e.g. a humming bird in 1925, and a final state entropy S_f, an evolved version of the same humming bird lineage in 2025, via Boltzmann entropy formula, a decent throw at the dart board first attempt calculation, but one that is incorrect in that the "system" involved, according to Max Planck, has to meet the Boltzmann chaos assumption, which

evolving system (e.g. social systems) do not, i.e. animals do interact and social systems are not "chaotic" (e.g. like gas phase systems are assumed to be). Styer, however, did not get this memo.

In 2014, Styer wrote “Reply to CreationWiki page ‘Pseudoscience in the American Journal of Physics’”, wherein he states: [2]

> “My paper uses the microcanonical expression for entropy S = k_B ln W , but ‘this is absurd because the Boltzmann constant [k_B] comes from observations about atomic systems.’ In fact, living things are made up of atoms, so the microcanonical expression for entropy is perfectly reasonable and applicable. The suggestion that the Boltzmann constant applies only to “atomic systems” is also false. For example, black body radiation is not made up of atoms, yet the entropy of black body radiation of volume V and temperature T involves Boltzmann’s constant through:
>
> $$S = k_B^4 \left(\frac{32\,\pi^5}{45\,c^3 h^3} \right) V T^3$$
>
> where c represents the speed of light and h represents Planck’s constant.”

Here, Styer, asserts that since a black hole has a measurable entropy, i.e. black hole entropy, quantified by a Boltzmann-like expression, then so to is it applicable to calculate the entropy of a human via a Boltzmann-like entropy expression. The general problem here is that Styer is thinking using "human statistical thermodynamics" like logic, whereas the correct method of calculating the entropy, or enthalpy, or free energy of a human (or organism) is "human chemical thermodynamics", but this gets into the measurement problem, which has a rich history of confusion and conceptual and engineering obstacles to overcome (see: human thermodynamic instruments).

Thirdly, Styer's assumption that his calculations shows an measurable biomass "entropy decrease", which in scientific common opinion parlance corresponds to an "order increase", which is assumed, via regurgitation argument, namely the time-honored so-called “local entropy decrease” postulate (Alfred Ubbelohde, 1947), to be less than the entropy increase in the surroundings, thereby meeting the requirements of the second law, that the total system [evolving system + surrounding system] tend towards and increase in entropy, is a finger-holding the dike argument, a bubble greatly in need of cultural explication, such as touched on by Percy Bridgman (1946) and Martin Goldstein (1993), namely explication via human free energy of formation discussion, some of which lightly touched on by Mirza Beg (1987) and Libb Thims (2007); but one that confronts religion with extreme atheism in a way much greater than simpler social heat that Roemer is venting; something that goes back to the deeper revolutionary independent views of Johann Goethe (1809) and Percy Shelley (1814) and how "chemical affinity" (or free energy) and physical chemistry replaces god and gives a new one nature morality basis (see: Church of Elective Affinities).

Related

The Roemer-Styer fiasco is similar in content to the: 1946 Harvard “What is Life? debate, wherein the Bridgman paradox, on the impossibility of calculating the entropy of a living organism was stated; the Rossini debate (2007), a general religious-based objection to the use of chemical thermodynamics methodology being used to formulate models of freedom and security in a post 9/11 America; the Moriarty-Thims debate (2009) on whether or not an ordering of students in a field, ordered or dispersed, has a measureable quantifiable real “thermodynamic entropy”; and the Beg-Thims dialogue (2014) on the religious conflict of using Gibbs energy models to descript and explain social reactions and human chemical reaction theory.

See also

- Brooks-Wiley theory
- Juarrero-Deacon affair

● What is entropy debate?

Notes

N1. Of note, normal run-of-the mill religion vs science (or science vs religion) debates tend to be rather mundane, with the creationists being thin-skinned, spinning out laughable arguments, retreating or using humor to parlay there agenda, tending to peter out over time, etc.; typical examples being: Michael Behe (CIR:1), Kent Hovind (CIR:2), Henry Morris (CIR:4), Ken Ham (CIR:8), to cite a few, CIR numbers shown according to ranking on the creationism scientists ranked by idiocy page. Roemer, however, is an unusual case. Firstly, his current CIR ranking is #25 (of 40), meaning that he does not explicitly come out and say directly "idiotic" things. Some points of his argument, e.g., actually have merit and correctness, for scientific reasons. Secondly, his methodology of promotion amounts to a steroid amphetamine driven troll like technique of layered mass mailing and thread posting, all extensively documented and detailed, while remaining rather cordial, for the most part, throughout (aside from his "ethical" derogation thrown at many people). Thirdly, Styer, having been fired from his job as a high school physics teacher, in 1995, over poor teaching methods, then spending a dozen years, up to about 2012, suing the New York department of education, unsuccessfully, has two decades of pent up energy that he uses, presently, to attack in the area of religious and evolution conflict.

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θΔics

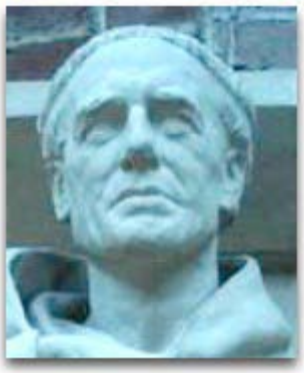

In existographies, **Roger Bacon** (1214-1294) (IQ:180|#98) [RGM:356|1,500+] (Gottlieb 1000:412) (CR:34) was an English natural philosopher, two cultures genius, a last person to know everything claimant, a "savant with an enormous encyclopedic mind" (Hackett, 1980), and the so-called "first scientist" (Clegg, 2003), and originator of the scientific method.

Bacon | Francis

Roger Bacon is not to be confused with Francis Bacon (1561-1626).

Scientific method

In 1265, Bacon, inspired by the Aristotelian commentaries of Robert Grosseteste (1235), which laid out the framework for proper methods of science, described a scientific method, which he based on a repeating cycle of observation, hypothesis, experimentation, and the need for independent verification; and he recorded the manner in which he conducted his experiments in precise detail so that others could reproduce and independently test his results. (Q)

Influenced | By

Bacon was a contemporary of Albertus Magnus, whom he may have known at Paris during the years 1245-1248, and together they are considered the two main commentators on the new translations of Aristotle, in the university milieu, during the thirteenth century. [6]

Experimentation

In c.1250, Bacon, at Paris, met a scientist named Petrus Peregrinus (c.1219-c.1289) (Q), whom he called the "master of the experiment", who influenced him in respect to the power of experimentation; to quote on example:

> “There is only one scholar, namely, Petrus Peregrinus, who understands the nature of the truth of the superiority of experiment over argument.”
>
> — Roger Bacon (c.1270) (Q)

> “Through experiment he gains knowledge of the things pertaining to nature and medicine and alchemy, and all that is in heaven and in the earth beneath.”
>
> — Roger Bacon (c.1270), on Petrus Peregrinus (Q)

On experimentation and truth, Bacon said:

> “Argument is conclusive, but it does not remove doubt, so that the mind may not rest in the sure knowledge of the truth, unless it finds it by the method of experiment.”

(add)

Mpemba effect

Bacon was said to have been one of the first to experimentally test the hot-begets-cold-quicker phenomenon (Aristotle-Mpemba effect). [1]

Combustion

Bacon, whose works have been analyzed by scholar including James Partington and Joseph Needham, was one of the

first to describe explosive combustion, a noted statement of which, by Bacon, is as follows: [3]

> "We have an example of these things (that act on the senses) in [the sound and fire of] that children's toy which is made in many [diverse] parts of the world; i.e. a device no bigger than one's thumb. From the violence of that salt called saltpetre [together with sulphur and willow charcoal, combined into a powder] so horrible a sound is made by the bursting of a thing so small, no more than a bit of parchment [containing it], that we find [the ear assaulted by a noise] exceeding the roar of strong thunder, and a flash brighter than the most brilliant lightning."

American historian Stephen Bown dates Bacon's so-called documentation of the secret of gunpowder to the year circa 1249 in the timeline of explosives. [4]

A depiction of **Bacon** studying "long after the midnight hour" (O).

Imprisonment

In 1277, Bacon was imprisoned, for a period of 10-15 years, by Jerome of Ascali, minster general of the Franciscans, by the advise of "many friars", and his teachings were denounced. [4] Released, he wrote one more innovative book before dying (ending) and becoming a Faust-like figure of legend. [5]

Quotes | On

The following are related notes of praise:

> "**Roger Bacon** — the founder of English philosophy whose knowledge of chemistry and mathematics led him to recognize the value of deductive reasoning, establish a scientific method, and invent spectacles — has been called the last man to know everything, the last man to *bridge* the two cultures."
>
> — Rushworth Kidder (2003), *How Good People Make Tough Choices* [2]

> "**Roger Bacon**, a humble and devout English friar, seems an unlikely figure to challenge the orthodoxy of his day — yet he risked his life to establish the basis for true knowledge. Born c.1220, Bacon was passionately interested in the natural world and how things worked. Such dangerous topics were vetoed by his Order, and it was only when a new Pope proved sympathetic that he began compiling his encyclopedia on everything from optics to alchemy — the synopsis took a year and ran to 800,000 words and he was never to complete the work itself. Sadly, the enlightened Pope died, and Bacon was tried as a magician and incarcerated for ten years. Legend transformed Bacon into a sorcerer, 'Doctor Mirabilis', yet he taught that all magic was based on fraud, and his books were the first flowering of the scientific thinking that would transform our world. He advanced the understanding of optics, made geographical breakthroughs later used by Columbus, predicted everything from horseless carriages to the telescope, and stressed the importance of mathematics to science, a significance ignored for 400-years. His biggest contribution was to insist that a study of the natural world by observation and exact measurement was the surest foundation for truth."
>
> — Brain Clegg (2003), abstract to *Roger Bacon: the First Scientist* [5]

Quotes | By

The following are noted quotes:

-

> "During the twenty years that I have specially laboured in the attainment of wisdom, abandoning the vulgar path, I have spent upon these pursuits more than two thousand pounds, not to mention the cost of secret books, of various experiments, instruments, tables, and the like."
>
> — Roger Bacon (1267) (Q)

-

> "If someone who has never seen fire claims through reasoning that fire burns, changes things and destroys them, the mind of his listener will not be satisfied with that, and will not avoid fire before he has placed his hand or something combustible on the fire, to prove through experience what his reasoning had taught him. But one it has had the experience of combustion the mind is assured and rests in the light of truth. Reasoning is not enough—one needs experience."
>
> — Roger Bacon (c.1275) [4]

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External links

- Roger Bacon – Wikipedia.

θΔics

In science, **Roger Boscovich** (1711-1787) (IQ:185|#88) (Eells 100:44), or "Ruder Boskovic", was a Croatian mathematical physicist, astronomer, philosopher, diplomat, poet, theologian, and general polymath, aka the "Croatian Leibniz" (Heisenberg, c.1930), noted for his 1758 *Theory of Natural Philosophy*, in which he outlined a stationary point atom theory, viewing atoms a centers of force.

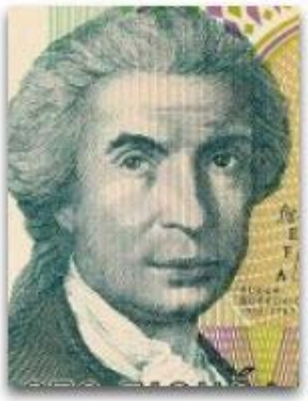

Boscovich atomic theory

In his atomic theory, Boscovich blended Newton's 1718 atomic theory, i.e. viewing the world as being composed a elementary particles that attract at close distances via the force of chemical affinity, and Gottfried Leibniz's view of atomic particles as 'points of energy', to conceive a newer theory of 'point atoms' or 'stationary atom theory' in which atoms were regarded as centers of forces without spatial extent, and whereas Newton focused on attraction, Boscovich added to this the importance of repulsive forces, such that at short range, atoms attracted each other, but that at longer range, atoms pushed each other way, the latter aspect explaining gas pressure. [1] In this model, the rigid surface of the Democritus atom model was replaced by a region of equilibrium between the forces of attraction and repulsion associated with the dynamic field surrounding the atom collapsed into a material point. [4]

Influence

The Boscovich stationary atom atomic theory, or some modified version of it seems possibly to have left an impact in the minds of scientists over the next century, and may have been the version of atomic theory held in view in the mind Antoine Lavoisier, when he formulated his 1787 caloric theory, and later possibly held in the mind of Sadi Carnot, when he scripted his 1824 *Reflections on the Motive Power of Fire* and his concept of re-establishment of equilibrium in the caloric. Some discussions, for instance, do mention Boscovich in discussions of phlogiston theory, the precursor model to caloric theory.

In any event, a version of stationary oscillating atom theory was in the minds of scientists well into the middle of the 19th century. This is evidenced by the fact that in 1856 German physicist August Kronig opened his famous paper "A General Theory of Gases" to the view that atoms to oscillate about positions of equilibrium, but that they have translational motion: [2]

> "The molecules of gas do not oscillate about definite positions of equilibrium, but that they move with constant velocity in right lines until they strike against other molecules, or against some surface which is to them impermeable."

Kronig's paper spurred German physicist Rudolf Clausius into the writing of his 1857 famous paper "On the Nature of the Motion which we call Heat", which launched the kinetic theory of gases and statistical mechanics, according to his own words independently of Krönig, developed a similar, but much more sophisticated version of the theory which included translational, but also rotational and vibrational molecular motions.

To corroborate the postulate that Carnot may have had a Boscovich atomic view in mind, we note that French engineer Lazare Carnot, founder of the École Polytechnic, Sadi's father, employed Leibniz's version of calculus, over that of Isaac Newton's, making use of Leibniz's ideas about mechanical energy conservation and possibly his ideas about atoms as 'points of energy'.

Irish-Scottish physicist William Thomson even took up the 'inevitable theory of Boscovich', and sought to show how the grouping of Boscovichian atoms could account for crystalline arrangement and for the phenomena of light. [6]

Nietzsche

In 1865, Friedrich Nietzsche discovered the work of Arthur Schopenhauer and his emphasis on "will" and the concept of "will to live", and, the following year, through a reading of Friedrich Lange's 1865 *History of Materialism*, discovered the work of Roger Boscovich and his *Theory of Natural Philosophy*, and through these went on to develop a

“centers of force” (see: atomic theory) theory of “will to power” as the embodiment of what Nietzsche believed was the main driving force in man. [7]

Quotes | On

The following are quotes on Boscovich:

> “**Roger Boscovich**, published a detailed exposition of the views attacked by Buffon and defended by Alexis Clairaut, and, inspired alike by the opinions of Newton and Leibniz, he conceived a cosmology in which the universe is composed solely of material points, these being attracted to each other in pairs. When these points are separated by a sensible distance, their attraction is reduced to mere universal attraction, whereas when they are in very close proximity it assumes a dominant importance. Boscovich's cosmology provided physical theory with a program which the geometricians of the eighteenth century, and of a great portion of the nineteenth, labored assiduously to carry out. The efforts of Johann Segner (1704-1777), and subsequently of Thomas Young, again drew attention to capillary phenomena, and with the assistance of the hypothesis of molecular attraction, as also of Clairaut's method, Laplace advanced in 1806 and 1807 an admirable theory, which Carl Gauss improved in 1829. Being a thoroughly-convinced partisan of *Boscovich's monological doctrine*, Laplace communicated his convictions to numerous geometricians, who surrendered to the **ascendency of his genius**; we shall only mention Claude Navier (1785-1836), Simeon Poisson, and Augustin Cauchy. In developing the consequences of the hypothesis of molecular attraction, Navier, Poisson, and Cauchy succeeded in building up the theory of the equilibrium and small motions of elastic bodies, one of the finest and most fruitful theories of modern physics. The discredit into which the progress of present-day thermodynamics has brought Boscovich's cosmology has, however, affected scarcely anything of what Laplace, Gauss, Navier, Poisson, Cauchy, and many others have deduced from the principles of this cosmology. The theories which they established have always been readily justified with the assistance of new methods, the way of bringing about this justification having been indicated by Cauchy himself and George Green. After Pierre Macquer, many chemists used the hypothesis of molecular attraction in an attempt to disentangle the laws of reaction which they studied, and among these scientists we may mention Torbern Bergman, and above all Claude Berthollet. When the latter published his “Statique chimique" in 1803, he believed that the science of chemical equilibria, subject at last to Newton's method, had found its true direction; however, it was not to enter upon this direction until much later on, when it would be guided by precepts altogether different and which were to be formulated by thermodynamics.”
>
> — Anon (1911), *Catholic Encyclopedia, Volume 12* (pg. 65)

> “Boscovich is one of the great intellectual figures of all ages.”
>
> — Harold Hartley (1960) (Ñº)

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External links

â— Ruder Boskovic – Wikipedia.

θΔics

In hmolscience, **Roger Caillois** (1913-1978) (CR=17) was a French sociologist, anthropologist, and philosopher noted, in human thermodynamics, for his mid-1930s second law of thermodynamics explanation of aberrant sexual behaviors, specifically the female mantis eating its mate during copulation, and social mimesis, specifically the rise of copying behaviors resulting in equilibrium uniformity and the rise of the noonday demon, and for his 1973 supposition that both Darwin and Clausius cannot be right.

Darwin | Clausius

In 1973, Caillois, on the seeming incompatibility between thermodynamics and evolution, famously stated: [1]

> "Clausius and Darwin cannot both be right."

This quote (which may be a mis-translation, or the following may be a mis-translation) was famously restated by Belgian chemist Ilya Prigogine in his *Order out of Chaos* (1984) as:

> "Can Carnot and Darwin both be right?"

Prigogine seemed to use this statement as an argument to the effect that equilibrium thermodynamics predictions described by Boltzmann's idea of the complexions P of the arrangement of the particles of a system as moving towards ever increasing states of disorder, as dictated by the second law, was not a tool or model that could be used to describe biological evolution, in the sense that the "extremely improbable" states associated with the growing complexity of biological evolution was something to be regarded as miracles, from the perspective of equilibrium thermodynamics. He goes on to conclude, after some argument, that: [10]

> "Equilibrium thermodynamics provides a satisfactory explanation for a vast number of physiochemical phenomena. Yet it may be asked whether the concept of equilibrium structures encompasses the different structures we encounter in nature. Obviously the answer is no."

Prigogine, oddly enough, is wrong in this statement. What is more ironic, he goes on to cite Caillois as justification for this view, whereas in fact Caillois argued the opposite to what Prigogine states above, specifically that there do exist approaches to states of equilibrium in social and sexual interactions, as typified by biological mimicry and uniformity of the masses, and annihilations during sexual encounters.

Myth and the man

Caillois seems to have begun using thermodynamic arguments in theorizing, sociologically, about sex in biology and in the loss of psychic energy in certain human activities, in the mid 1930s. In particular, several years prior to 1937, the year he formed a famous think tank known as the College of Sociology, he was inspired by the topic of mimesis to write, what are considered, his two most memorable articles (both of which are included in his *the Myth and the Man*), the first having its point of departure in the sexual habits of the praying mantis, wherein famously the female devours her mate during intercourse; the second compares certain forms of animal mimesis, notably among insects, to what Caillois calls legendary psychasthenia (coined by Pierre Janet), which is French psychiatric term referring to the pathological lowering of psychic energy, a sort of subjective detumescence, a loss of egoistic substance, a depressive exhaustion resembling acedia. [3]

Caillois, in his essays, supposedly elevates this model of psychasthenia to that of a universal principle and makes it the heart of his study of 'noontide demons' and his subsequent work on mimesis, whereby the notion "allows him to describe and interpret mimesis according to a thermodynamic model." [4] The view employed by Caillois, supposedly,

is that according to Carnot's first principle, every production process presupposes an initial hierarch, a primary distinction, an original inequality, a difference between high and low or between a cold source and hot source. Caillois thus put this version of the second law to work in his articles on the praying mantis and on mimesis, on the logic that the entropy of a given system cannot decline. [5] The view he presented, supposedly, is that, psychasthenia is the lowering of psychological or mental energy, meaning that in sexual interactions and in mimetic-behavior resulting sociological interactions, the initial gap diminishes, the power source heats up, production diminishes. The vital distinctions wither. Both the praying mantis, by assimilating her mate, and mimetic insects, by ceasing to distinguish themselves from their surroundings, illustrate this moment in which beings no longer have the energy to establish difference. [6]

Beyond these examples, Caillois may have even more human thermodynamics theories buried in his works. He describes his College of Sociology, for instance, as a "condenser of energies", as a reaction against fatalism. [5] In his thermodynamics-based view, the temptation of the abyss, indicative of the presence of the noonday demon, may be universal, experienced by everyone; nevertheless, not everyone need succumb. [5]

Thermodynamics of mimesis

In his discussions on biological mimesis, wherein insects copy each other's behavior until a state of uniformity results, he seems to point toward the interactions between an organism (system) and its surroundings, arguing that mimesis stems from the fact that, by submitting to it, an organism renounced that distinction; it abdicates the difference, the vital difference, between life and matter, between organic and the inorganic; and that on the model of Marie Bichat, who defines life as the set of forces that resist death, mimesis is life ceasing to resist. On this view, Caillois comments: [7]

> "We touch on the fundamental law of the universe brought to light by Carnot's principle: the world tends towards uniformity."

Caillois' characterization of mimesis, as based on, it would seem, equilibration in systems due to the actions of the second law, according to the views of American professors of French literature Denis Hollier and Catherine Porter, "constitute a moral allegory offering a background against which the true scope of the project for the College becomes clear." [8] Like the male praying mantis, like those insects that turn themselves into branches, the cleric too gives up self-possession, but his renunciation takes on new meaning; instead of accelerating the general tendency toward entropy, the cleric's self-abnegation reverses it, thereby producing effects of negative entropy, or to use the term Caillois introduced in *La Dissymetrie*, inverse entropy. [9]

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External links

â— Roger Caillois – Wikipedia.

θΔics

In evolution thermodynamics, **Roger Lewin** (1944-) is a British science writer noted for his 1982 "A Downward Slope to Greater Diversity", in which he critiques the 1982 Brooks-Wiley Theory, of Canadian Zoologist Daniel Brooks and American systems ecologist Edward Wiley, wherein cites Belgian chemist Ilya Prigogine as making the following curious comment to Brooks after hearing Brooks give a talk about their theory in an an early 1982 seminar: [1]

> "I see how you can do this with molecules, but I don't see how you can do it with species. I don't understand the extrapolation."

Lewin, in reviewing their paper, called their speculations mere "heuristic formulations", and, according to American creationist engineer Henry Morris, states that Prigogine was mystified by their theory, though this may be but added elaboration by Morris. [2]

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External links

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θΔics

In hmolscience, **Roger Penrose** (1931-) (CR:23) is an English mathematical physicist noted, in human thermodynamics, for his 1974 to 2005 work on entropy applied at the particle physics level, human level, and level of the universe.

Overview

In 1974, Penrose, in a series of papers, applied the second law to the universe as a whole; specifically, he estimated the entropy or disorderliness of the observable universe, finding it to be fantastically small compared with what it theoretically might be. [4]

In 1979, Penrose formulated his influential Weyl curvature hypothesis on the initial conditions of the observable part of the universe and the origin of the second law of thermodynamics. [2]

In 1989, Penrose, in his *The Emperor's New Mind*, argued that each individual person (see: human entropy) is a "configuration of tiny entropy" as follows: [1]

> "We ourselves are configurations of ridiculously tiny entropy."

In contrast to this physics-based postulate, however, in his book Penrose predominately argues that the known laws of physics are inadequate to explain the phenomenon of human consciousness.

In 2004, Penrose, in his *The Road to Reality*, stated the second law, under the stipulation of a positive cosmological constant, as follows: [3]

> "Entropy per baryon tends so increase relentlessly and stupendously with time."

A baryon, to note, is a composite particle made up of three quarks (as distinct from mesons, which comprise one quark and one antiquark). The most familiar baryons are the protons and neutrons that make up most of the mass of the visible matter in the universe. Electrons (the other major component of the atom) are leptons. As quark-based particles, baryons participate in the strong interaction, whereas leptons, which are not quark-based, do not. [5]

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External links

â— Roger Penrose – Wikipedia.

θΔics

In hmolscience, **Roger Smith** (1945-) is a science historian noted for []

Overview

In 1997, Smith, in his semi-encyclopedia treatise *The Human Sciences*, a 16th to 20th century look at the historical development of the humanities and their relations with the physical sciences, penned notable physical humanities sections such as Thomas Hobbes and his "natural philosophy", one nature vs two nature conundrum topics such as "human nature and physical nature", the human machine discussions, etc. [1]

Presently, smith's research focus is as follows: [3]

> "**Smith's** research has centered on the history of the relations of mind and brain, linked to the rich history of views connecting 'being human' and nature as well as a philosophical topic. Thus he was led into the history of knowledge of the brain, of psychology and psychiatry, of the puzzle of human agency in a deterministic world (the problem of free will), of the relationship between the human sciences, the humanities and the natural sciences, and so on. His research attempts to debate these questions through different kinds of projects in intellectual history."

Smith's 2008 audio-recorded public lecture "Being Human in Russia: Free Will and Psychology under the Tsars" discusses the charged debates, in Russia, about establishing psychology as a science and about human free will and the soul (and spirit), with more than a few parallels to our modern debate about neuroscience, human nature and religious belief. (Q)

Human nature | Physical nature

The following is an example quote from Smith's two natures section:

> "French doctor Julien La Mettrie (1709-1751) became [a] notorious materialist, proving outrage with [his] treatment of man as a physical thing."

Freud | Jung

Smith's book contains interesting sections on the differences between the physical science based psychologies or psychodynamics of Sigmund Freud as contrasted with the more anthropomorphized symbolic psychologies or psychodynamics of Carl Jung.

Education

Smith completed his BA, MA, PhD (1971) at King's College, University of Cambridge, UK, in History and Philosophy of Science. His undergraduate work was in the biological sciences, after which he studied history and philosophy of science, then taught in the department of history at the University of Lancaster for 25-years, taking early retirement from Lancaster University, in 1998. [4] Smith then moved to Moscow, where, as an independent scholar, he has continued with research in the history of the human sciences, with editorial and reviewing work and some lecturing and teaching. Currently, Smith is Reader Emeritus in the history of science, Lancaster University and, as an independent scholar, is associated with the Institute of the History of Science and Technology and the Institute of Psychology of the Russian Academy of Sciences, in Moscow. He also is currently associated with Durham University. [3]

Quotes

The following are noted quotes:

> "If in the seventeenth century natural philosophers borrowed notions of law in human affairs and applied

them to the study of physical nature, in the eighteenth century it was the turn of the laws of physical nature to suggest ways forward for knowledge about human life."

— Roger Smith (1997), *The Human Sciences* [2]

References

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3. Roger Smith (profile) – Durham University.
4. Roger Smith (academic) – Google Sites.

Further reading

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External links

● Roger Smith (Russian → English) – RogerSmith.ru.
● Roger Smith (1945-) – WorldCat Identities.

θΔics

In human chemistry, **Rohann Solare** (c.1960-) is an American new age thinker noted for his 2009 social physics theory, humans defined explicitly as HOCN+ mega-molecules.

Overview

In 2009, Solare, in his blog "The Atomic-Molecular Foundations of a Social Physics: Self-organizing Systems from Atoms to Humans", outlines what he calls an emergent culture theory, in which he utilizes a rudimentary variant of human attraction-repulsion models and human molecule logic; such as:

> "The human being is one big molecule, a mega-molecule, whose most fundamental behaviors are governed by the same electro-chemical principles governing the micro-molecules which make up our bodies."

Solare presents a fairly decent overview of some of the basic principles of human chemistry, namely that a human is a large reactive "mega-molecule" whose attraction and repulsion interactions are governed by the same electro-chemical laws and principles that govern the atoms and molecules that make up the body of a human.

Human chemical bonding

> *See main: Human chemical bond*

Solare's article makes an attempt, in a somewhat Empedocles' style, to explain how attraction-repulsion at the atomic molecular level scales up into the cause and effect interaction human-societal level.

Synchronicity theory

Solare introduces what he calls a "synchronicity theory", in what seems to be a variant of German polymath Johann Goethe's 1809 human elective affinities theory. Solare states his theory as follows:

> "Synchronicity theory affirms that the particular degrees of affinity-disaffinity existing between atoms and between molecules is transferred all the way to the human level via simple aggregation. One brick is the same, qualitatively speaking, as a pile of bricks."

He goes on to approximate one human molecule as an aggregate of C, H, N, and O atoms, which he says since these constitute about 96 percent of a person, reduce a person "qualitatively the same as a single molecule of containing the four elements", which is a fairly decent first draft idea at formulating a human molecular formula. He then attempts to argue that:

> "The particular affinities and relationships between the four foundational elements of life HOCN are distinctly expressed at the human level of behavior and relationships. There are slight variances in the quantities and combinations of each element that a given individual may possess. Those slight variances are detectable as the various traits and characteristics making up the individuality of each human being."

Solare's article in outline seems to be an expansion of similar atoms to humans theory espoused by Austrian-born American astrophysicist Erich Jantsch in his 1979 *The Self-organizing Universe*. [1]

Note

A large part of Solare's writings are newagey, mixed together with something he calls the "tzolkin code", as what seems to be an effort to base human cultural synchronicity on the tzolkin, the 260-day Mayan calendar; and among other

things, he speculates on the 2012 end of the world Mayan calendar prediction. In this respect, by comparison, Solare may be reminiscent of Joseph Dewey and his human molecule ideas.

Education

Solare states that his education and research into his emergent culture theory started in about 1982 while a psychology major at Northern California University with the question of "how did the human world come to be what it is today?", during which time he chanced upon American comparative mythologist Joseph Campbell's 1987 *The Power of Myth.* Solare began publishing his views on the site Emergent-Culture.com, launched in 2008. [2] Solare seems to have a certain online presence, with about 9,000 Twitter followers. [3]

References

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2. About – Emergent-Culture.com.
3. Rohann Solare – Twitter.

External links

â— Rohaan Solare – Facebook.

θΔics

In computer science, **Rolf Landauer** (1927-1999) was a German-born American physicist noted for

Overview

In circa 1960s, Landauer attempted to prove American chemical engineer John Neumann's 1949 folklore lecture idiom that: [1]

> "A computer operating at a temperature *T* must dissipate at least *kT* ln 2 of energy per elementary act of information, that is, per elementary decision of a two-way alternative and per elementary transmittal of one unit of information."

Research on this subject resulted in his 1961 article "Irreversibility and Heat Generation in Computer Process", which culminated in what has come to be known as Landauer's principle, the idea that energy has to be expended to erase information or in other words that entropy is generated in computer processing actions, in accordance with the second law.

Landauer argues in his high-cited 1961 article that: "computing machines inevitably involve devices which perform logical functions that do not have a single-valued inverse. This logical irreversibility is associated with physical irreversibility and requires a minimal heat generation, per machine cycle, typically of the order of kT for each irreversible function." [2]

This seems to be one of the first attempts to link the famous Boltzmann entropy formula $S = k \ln W$ with computational processing.

Education

Landauer completed his SB (1945), AM (1947), and PhD (1950), the latter in physics, all at Harvard University. He then worked as a physicist at the National Advisory Committee for Aeronautics at Lewis Laboratory for two years after which in 1952 he joined on as a physicist at IBM.

References

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Further reading

â— Thims, Libb. (2012). "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair" (url), *Journal of Human Thermodynamics*, 8(1): 1-120, Dec 19.

External links

â— Rolf Landauer – Wikipedia.
â— Rolf Landauer – AIP.org.

θΔics

In recensions, **Roman recension** refers to the making of the state religion of Rome, from 30BC to 800 AD, namely Christianity, from the predominate religious cultural milieu, the Osiris-Horus theology, predominately; and the destruction of all alternative forms of religion therein, e.g. Epicurean theology, Stoic theology, etc..

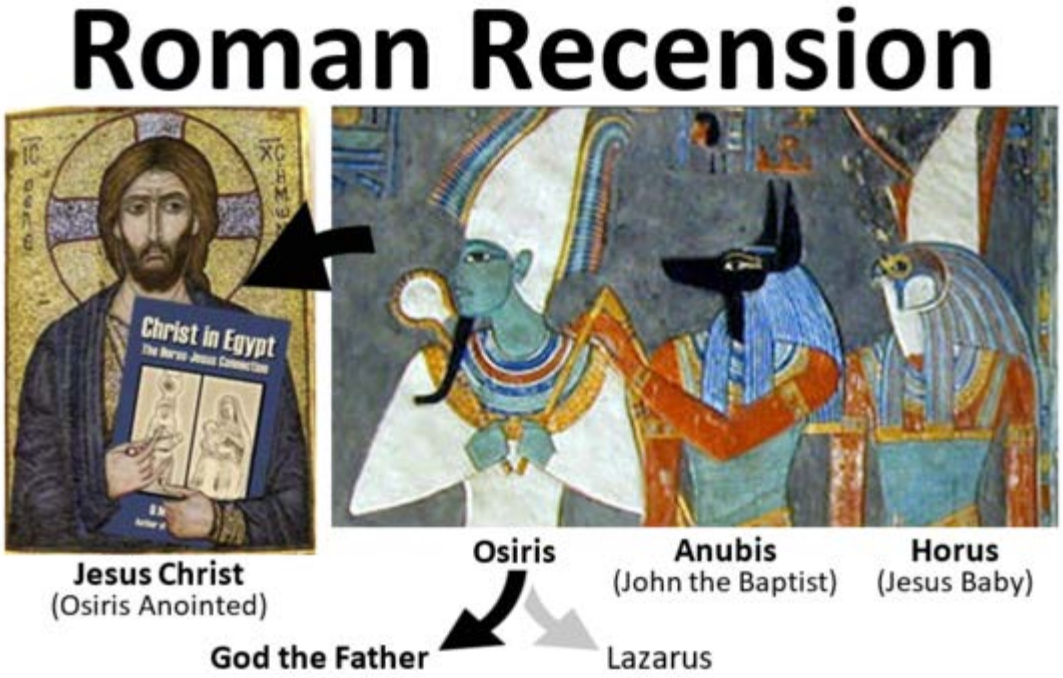

A visual overview of how, amid the **Roman recension**, the Egyptian god Osiris was split three ways into: Jesus Crucified, God the Father, and Lazarus (see: Raising of Lazarus); Anubis became John the Baptist; and Horus became Jesus the infant born to a virgin Mary (see: Isis), in short.

Overview

In the Roman period, following the Alexandrian recension (322-30BC), there seems to have been first a "Roman redaction" (69-96AD), during which time the then-prevalent recensions were morphed into a crude Christ-centric theology, based on Osiris myth, which was followed by a second Roman recension, culminating in the Nicene council (325AD), and the 692 ruling, by emperor Justinian II, that the image of "Jesus on the cross" should superseded that of the "lamb", as the icon of the new Christian religion.

The following is a depiction of the late stage of the Roman recension, showing a Roman citizen or worker destroying a pagan goddess statue:

a process that began, predominately, in 381, when Theodosius I ordered the Christian persecution of paganism (Q), which continued (Q) up until the fall of the Roman empire in circa 450.

In 1770, Baron d'Holbach, in his *Critical History of Jesus Christ: a Rational Analysis of the Gospels*, summarizes the

Nicene recension, by parodying the fact that it involved some 50 source documents (only four of which were kept) and 318 bishops (of numerous languages and religions).

In 2012, Joseph Atwill, author of *Caesar's Messiah: the Roman Conspiracy to Invent Jesus* (2005), in his 2012 documentary on the same subject, argued that the modern version of the Jesus figure was invented by the Caesars or Flavian dynasty (69-96AD) (Q), and therein seems to give a decent summary of an aspect of the "first Roman redaction".

Quotes

The following are related quotes:

> "The conduct of Roman religion was managed by the politicians. The senate was endowed with supreme authority in all matters religious. They delegated decisions to the four main priesthoods, the 'pontifices', i.e. the advisory board of priests who assisted the magistrates in their sacra functions, the 'augurs', the *quindecimviri sacris faciundis* (fifteen men in charge of the ritual who were custodians of the Sibylline books, and the *septemviri epunoum* (the seven in charge of feasts), but the individuals appointed to these offices were not a priestly caste, but men active in public affairs."
>
> — Patrick Walsh (1998), "Introduction" to Cicero's *On the Nature of the Gods* [1]

References

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Further reading

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● Heede, Fritz. (2012). *Caesar's Messiah: The Roman Conspiracy to Invent Jesus* (Q) (about). Publisher.

θΔics

In hmolscience, **Romanian school of physical socioeconomics**, or "Romanian school of socioeconomic physics", refers to the group of thinkers in Romanian working collectively on econophysics, sociophysics, and economic thermodynamics, centered at the University of Pitesti, Romania.

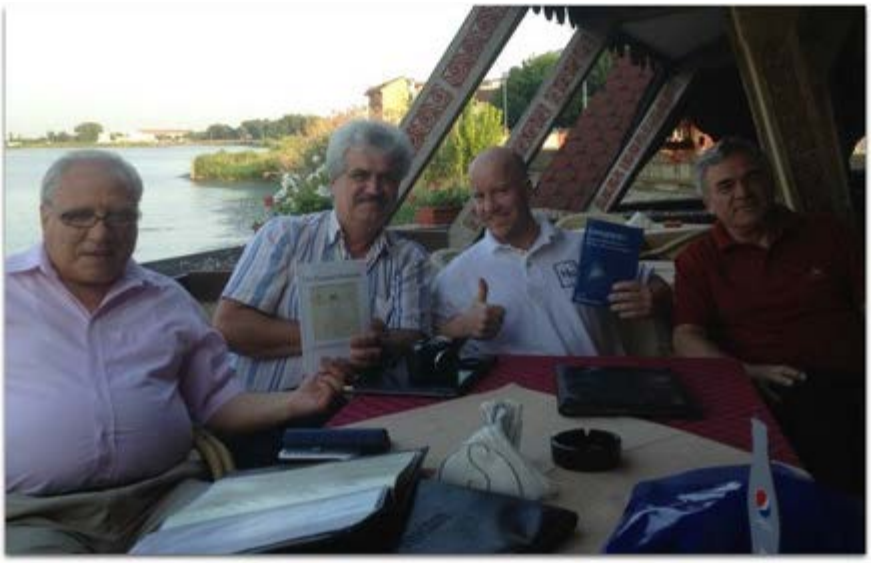

American electrochemical engineer Libb Thims with the two heads of the **Romanian school of physical socioeconomics**, from left to right: Ion Siman and Gheorghe Savoiu, holding Thims 2008 *The Human Molecule*, Thims, holding Savoiu and Siman's 2012 *Econophysics*, and Constantin Bratianu, a newcomer to the group, noted for his work in knowledge thermodynamics (28 Jun 2013).

Overview

In 1907, a peasants' rising took place in Romania, to which Haret took notice. The event, in some way, according to Romanian sociology historian Ovidiu Badiaa, was a goad or driving force behind the writing of his 1910 *Social Mechanics*; about which he said the following: [3]

> "We may hope that someday safe methods could be provided to help the solving of many problems which today are often doomed to the inspiration of the moment, or the happening or inclinations."

In his *Social Mechanics*, Haret outlined a mathematical-based formulation of social mechanics, in which he used mathematics and Newtonian mechanics to explain social behavior, in terms of Cartesian coordinates of moving points and velocities. [1]

In 1971, Romanian-born American mathematician Nicholas Georgescu-Roegen, originally at the University of Bucharest then at University of Vanderbilt, who in 1971 famously published his *The Entropy Law and the Economic Process*, wherein he attempted to describe economic processes in second law of thermodynamics terms; therein initiating who most tend to think of as the most well-known of the "Romanian school" of physical science based economics and sociology stems.

One of the first Romanian scientists, following Georgescu-Roegen, to venture into the humanities was physicist Margareta Ignat, at Alexandru loan Cuza University, who together with her graduate student Mircea Gligor helped to develop the field of econophysics in Romania. [1]

In 2001, e.g., Gligor and Ignat published "Econophysics: a New Field for Statistical Physics?", wherein the discussed the rise of econophysics of financial markets in the previous decade. [2]

University of Pitesti | Econo-Socio-Physics workshops

In circa 2005, Romanian economist Gheorghe Savoiu opened up a dialogue with physicist Ion Siman, both at the University of Pitesti, on the implications of physics for economics and sociology, and in 2008 initiated their yearly Econophysics and Sociophysics Workshops (e.g. see: UPESW 5), hosted at the University of Pitesti, and in 2011 launched *Econophysics, Sociophysics, and Multidisciplinary Sciences Journal*, thereby spearheading the Romanian school of physical socioeconomics into solidity.

UPESW | 2013

In 2013, American electrochemical engineer Libb Thims lectured at the fifth annual University of Pitesti Econophysics and Sociophysics Workshop (UPESW 5). An after dinner meetup following the 29 Jun 2013 workshop is shown below; starting bottom left, going clockwise: Daniel Pele, Mircea Gligor, Constantin Bratianu, Gheorghe Savoiu, Radu Chisleag, Thims, and linguist Manea Coustantui:

List

- Radu Chisleag | Polytechnic University of Bucharest
- Roxana Chisleag
- Constantin Bratianu | UNESCO Department for Business Administration
- Ivona Orzea
- Daniel Pele (O) | Bucharest University of Academic Studies

References

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3. Badiaa, Ovidiu. (1990). “Sociology in Romania”, in: *Glimpses of Sociology in Eastern Europe* (editors: Jiri Kolaja, Man Das) (§7:253-300; §§3:Spiru Haret and social mechanics, pgs. 262-64). M.D. Publications.
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θΔics

In terminology, **romantic chemistry** is a stage of human life associated with romance that is believed to be definable according to a specific type of chemistry. [1] In the early stages of romance, for instance, levels of the neurochemical serotonin drop significantly as lovers begin to think obsessively about each other. [2]

Overview

The dating site *eChemistry.com* states that people are like puzzle pieces, such that some pieces click more easily than others, and define romantic chemistry as "that 'clicking' feeling that makes romance seem obvious". [3] This phrasing, however, is incorrect. The technical version of this statement is that people are human molecules and some human molecules will react more easily than some than others. [4]

The dating site *Chemistry.com* has an article titles "Romantic Chemistry Explained", by staff writer Dan Bova, that explains the five supposed mysteries of romantic chemistry, which are: why the best sex occurs without talk, why people are attracted to those who are bad for them, why instant connections occur between some and not for others, and why chemistry online is not the same as chemistry in person, and why the spark of chemistry disappears over time? All of this, according to American anthropologist Helen fisher, has to do with the survival traits. [5]

The site *PlentyofFish.com* has a "relationship chemistry predictor", that supposedly determines whether or not there will be "romance" in a relationship by measuring five dimensions of personality: self-confidence, family orientation, self-control, social dependency or openness, and easygoingness. [6]

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2. Brown, Kathryn. (1999). "Love Sick", *New Scientist*, 31 July, Issue 2197.
3. Romantic Chemistry / Short Definition – eChemistry.com.
4. Thims, Libb. (2008). *The Human Molecule*, (preview). Morrisville, NC: LuLu.
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6. Relationship Chemistry Predictor – PleantyofFish.com

θΔics

In science, **romanticism** is the a view that rejects rationalism in favor of feelings, individual experience, and passion; in some forms, it supported a variant of spiritualism that was a challenge to traditional religion. [1]

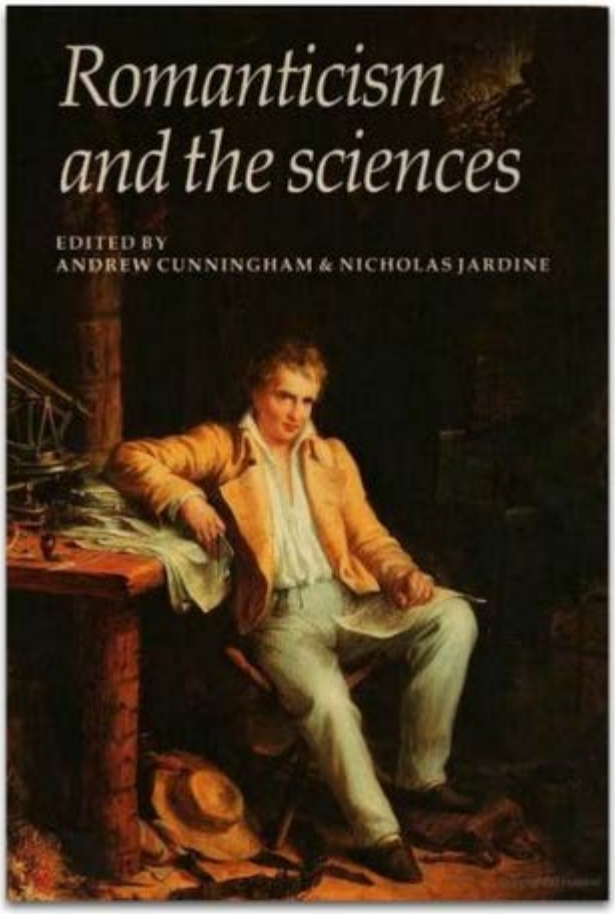

English Goethean scholar Jeremy Adler's 1990 "Goethe's Use of Chemical Theory in his *Elective Affinities*" is found in the collaborative book *Romanticism and the Sciences*. [3]

Overview

The 'romantic movement', supposedly, referred to a totality of experience movement alternative to the rationalist Newtonian mechanics and Cartesian reductionism.

In 1781, Immanuel Kant, in his *Critique of Pure Reason*, outlined a view wherein the primacy of mind and will is given predominance; this was said to initiate or seed the romantic movement. [2]

In c.1810s, **Friedrich Schlegel** (1772-1829), according to Jennifer Hecht (2003), was one who firmed up the idea of "romanticism", called out its members, and promoted it. [1]

References

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3. Adler, Jeremy. (1990). "Goethe's use of chemical theory in his *Elective Affinities*", in: *Romanticism and the Sciences* (editors: by Andrew Cunningham and Nicholas Jardine) (§18, pgs. 263-79). Cambridge University Press.

Further reading

â— Richards, Robert J. (2002). *The Romantic Conception of Life: Science and Philosophy in the Age of Goethe* (chemistry, 22+ pgs; physics, 37+). University of Chicago Press.

External links

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â— Romanticism in science – Wikipedia.

θΔics

In existographies, **Romualdo Gentilucci** (1837-1884) was Roman theologian noted for []

Overview

In 1848, Gentilucci, in his *Life of the Most Blessed Virgin Mary*, states the following about Eve and the Virgin Mary: [1]

> "The divine oracle, which promised to the world the Virgin who was to bear the Son of God, the regenerator of the human race, fallen by sin, has been a constant tradition preserved in its purity among the children of Adam, from the deluge to the time when Moses committed it to writing in the book of Genesis. This prophecy of the woman promised by the Almighty to our first parents in Eden, the woman who was one day to crush the serpent's head, has indubitably been the source of the primitive ideas, which prevail in the theogonies of the different nations of the world; in all we find, amid alterations produced by time, some trace of the Virgin restorer, of the earthly paradise, the fatal sin or the tree of life; and from this the belief has been transmitted among infidel nations to our day."

Gentilucci then footnotes this, regarding "alterations", having the general idea that Adam and Eve were the first humans and all other cultures, or "infidels" as he calls them, copied this general framework, as follows:

> "The Persians believe that the genius of evil, Ahriman, seduced our first parents under the form of a serpent; and they gave the name of Athele to the solitary tree preserved amid the rains of Babylon.
>
> The Tibetans say that the knowledge of their nakedness was revealed by their tasting the fruit of the Schime, which is as sweet and white as sugar.
>
> The Tartars attribute our fall to a plant of exquisite sweetness.
>
> The account of the woman seduced at the foot of the tree and that of god's wrath, were traditional among the Iroquois.
>
> The Brahmins [see: Hinduism] give a wonderful account of their Chorcam or paradise, in which grew a tree that would have given man immortality had he been permitted to eat of it. They also believe that a god-made man was to be born of a virgin, by divine operation; hence the incarnation of their Juggernaut and the birth of Krishna in a grotto where he was adored by shepherds and angels.
>
> The Lamas [see: Buddhism] have their Buddha, born of the virgin Maha-Mahai.
>
> Sommono-Khodom, legislator and God of Siam, is the son of a virgin who conceived by the rays of the sun. Lao-Tseu [Laozi] became incarnate in the womb of a black virgin, compared to jasper for her wondrous beauty.
>
> In Paraguay, a woman of surpassing beauty becomes a mother, yet remains a virgin; and her son, after performing numberless miracles, is carried to heaven in the presence of his disciples, and is transformed into the sun.
>
> In Tibet, Japan, and some parts of India, the God Fo became incarnate in the womb of the nymph Llamoghiuprul, espoused to a king, the fairest and holiest of women.
>
> In China, Shing-Mn, the most popular of goddesses, conceived by the touch of a water lily, and her son brought up by a fisherman, became illustrious and wrought miracles. Dogdo has a dream and a vision in Babylon; the heavenly light which illumined her countenance while she slept, renders herself as beautiful as

the day star.

Zerdusht, Zoroaster, or more properly Ebraim-zer-Atencht, the celebrated poet of the Magi, is the fruit of this vision; he was saved by his mother, when the tyrant Nembrat killed all the pregnant women in his kingdom, because his astrologers had foretold that a child about to be born would menace his gods and his throne.

Among the Egyptians, the zodiacal Isis is a virgin mother.

That of the Druids was to bear the Savior, &c. &c."

Gentilucci ends this foot note with see: Elias Schedius (1615-1641) (Ñº)(Ñº) (*De Dis Germanis*, cxiii); Kircher; Tavernier; Nicholas Boulanger (1761) (Ñº); Roselli de Lorgnes (*Le Christ devant le Grand Pretre*, c. ix.); Ludovico Muratori (1672-1750). (Ñº)

References

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External links

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θΔics

In hmolscience, **Ronald Fisher** (1890-1962) was an English statistical evolutionary biologist noted, in evolution thermodynamics, for his 1933 theory that "fitness", as described via Darwin's natural selection theory, has something to do with entropy and entropy increase.

Overview

In 1930, Fisher, in his *The Genetical Theory of Natural Selection*, presented the following view: [1]

> "Entropy changes lead to a progressive disorganization of the physical world, while evolutionary changes [produce] progressively higher organization."

On this basis, he postulated that the second law of thermodynamics, in the form of "entropy tends to increase", and his fundamental theorem of natural selection, in the form of "the rate of increase of fitness of any organism at any time is equal to its genetic variance in fitness at that time", may ultimately be subsumed under a more general principle or law. [1] In short, Fisher argues that there is a connection or analogy between the increase in fitness, as described by his fundamental theorem of natural selection, and increase in entropy, as described by the second fundamental theorem of thermodynamics. [3]

Influence

American ecological engineer Robert Ulanowicz claims that Fisher was "captivated by the elegant statistics that James Maxwell and Ludwig Boltzmann had used in creating statistical mechanics." [4] This claim, however, needs a (fact check) as some Ulanowicz's references are statements are dubious, e.g. his claim that Charles Darwin's "professed ambition" and "desire" was to become the "Newton of a blade of grass". [5] This last example, to clarify, is a mis-attribution of the famous 1790 supposition by German philosopher Immanuel Kant, from his *Critique of Judgment*, that there would never be a Newton of a blade of grass, on the argument that living things, he believed, are examples of "natural purposes", entities organized so purposefully that we cannot explain them altogether through the blind causality we apply to inanimate nature. [6] Or, as Arthur Schopenhauer says, in his *The World as Will and Representation* (1818): "Kant is right when he says that it is absurd to hope for the Newton of a blade of grass, in other words, for the man who would reduce the blade of grass to the phenomena of physical and chemical forces, of which it would be a chance concentration, and so a mere freak of nature." [7]

Entropy-Fitness correlations

In 1928, British astronomer Arthur Eddington published his lay-science themed book *The Nature of the Physical World*, filled with many now-famous quotations, in which he remarked that "the law that entropy always increases—the second law of thermodynamics—holds, I think, the supreme law position among the laws of nature". [2] On this basis, Fisher states "is it not a little instructive that so similar a law should hold the supreme position among the biological sciences." He continues "while it is possible that both may ultimately be absorbed by some more general principle, for the present we should note that the laws as they stand present profound differences." These differences, in the Fisher's novice-thermodynamics point of view, are stated below (with modern corrections listed below each statement):

> (a) The system's considered in thermodynamics are permanent; species on the contrary are liable to extinction, although biological improvement must be expected to occur up to the end of their existence.

The correction, as American mathematical physicist Willard Gibbs showed in 1876, is that chemical thermodynamic systems are not "permanent", but will evolve to equilibrium, and can be defined as dynamic systems, with the inflow and outflow of chemical species, as quantified by changes in the chemical potential of the system.

> (b) Fitness, although measured by a uniform method, is qualitatively different for every organism, whereas

> entropy, like temperature, is taken to have the same meaning for all physical systems.

A number of corrections remain in this statement, aside from the modern thermodynamic interpretation of "fitness". For one, entropy is not "like temperature". Secondly, the qualitative meaning of entropy does, in some cases, take on different meanings for different physical systems. Austrian physicist Ludwig Boltzmann, for instance, showed entropy to be statistically correlative to "disorder" in gas phase systems; whereas this correlation does not hold in all systems.

> (c) Fitness may be increased or decreased by changes in the environment, without reacting quantitatively upon that environment.
> (d) Entropy changes are exceptional in the physical world in being irreversible, while irreversible evolutionary changes form no exception among biological phenomena.

This latter statement is incorrect on both counts. Firstly, "entropy changes" themselves are not irreversible; it is the measure of entropy change in a cycle that is meant to quantify irreversibility in heat driven systems. Secondly, all processes in nature are irreversible.

> (e) Entropy changes lead to a progressive disorganization of the physical world, at least from the human standpoint of the utilization of energy, while evolutionary changes are generally recognized as producing progressively higher organization in the organic world.

This last point of Fisher is an incorrect extrapolation of the Boltzmann chaos assumption, i.e. that traveling particles have non-correlative velocities, to the entire natural world.

Education

In 1912, Fisher graduated in mathematics and physics from Cambridge University.

References

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(b) Ulanowicz, Robert. (2009). *A Third Window: Natural Life Beyond Newton and Darwin* (pg. 35). Templeton Foundation Press.
5. Ulanowicz, Robert. (2009). *A Third Window: Natural Life Beyond Newton and Darwin* (pg. 27; note 7: personal communication of Peter M. Allen). Templeton Foundation Press.
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7. Schopenhauer, Arthur. (1818). *The World as Will and Representation* (pg. 143). Dover.

External links

â— Ronald Fisher – Wikipedia.

θΔics

In hmolscience, **Ronald Forest Fox** (1943-) is an American physicist noted, in animate thermodynamics, for his 1988 work on what he calls the uroboros puzzle, namely how life arose from non-life, which he reasoned has to do with energy flow through matter.

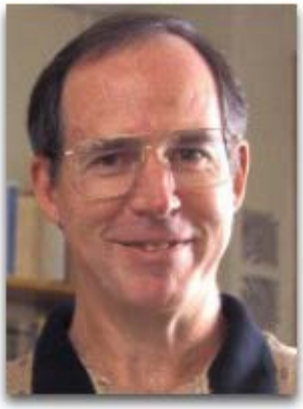

Overview

In 1957, Fox, at the age of 14, began to first think about the role of energy in biological evolution, at about the age of 14, when he would visit his father's laboratory and observed the divisions of microspheres in Brownian motion and the assembly of proteinoid microspheres in test-tubes through a microscope, becoming fascinated by how the mixing of salts, sugars, and lipids would assemble in to structures. [1] Fox graduated from high school in Tallahassee, Florida, in 1960, finishing fifth out of 610 students, excelling greatly in math. At the age of 16, he entered Reed College, Portland, Oregon, completing his BS in physics and mathematics.

In 1964, Fox entered Caltech as graduate student in physics. [2] The following year, however, being dissatisfied with the teaching at Caltech, Fox switched to the mathematical physics department at Rockefeller University where he studied advanced thermodynamics under Dutch-born American physicist George Uhlenbeck and Polish-born American mathematician Mark Kac. While there Fox developed his knowledge of molecular biology and bioenergetics through exposure to the works of German-born American biochemist Fritz Lipmann and English biochemist Christian de Duve. In particular, as to direction in his later energy flow theories, Fox seems to have been significantly influenced by Lipmann's 1941 work on idea of phosphate being the universal energy currency in biological systems, on the subject of the energy released during phosphoryl transfer from ATP used to drive biological processes. [4]

In 1969, Fox completed his PhD at Rockefeller University with a dissertation on "Contributions to the Theory of Nonequilibrium Thermodynamics". [3]

In 1988, Fox, in his *Energy and the Evolution of Life*, argued that the flow of energy through matter was the impetus for the origin of life and for the continued complexity of evolution as it occurs. He defines the issue of how life arose from non-life as the uroboros puzzle. Fox also suggests that cultural evolution can be explained through this same process. The following is a representative excerpt quote:

> "Energy flow supports the existence of life's dynamic molecular state and is the key to evolutionary trends."

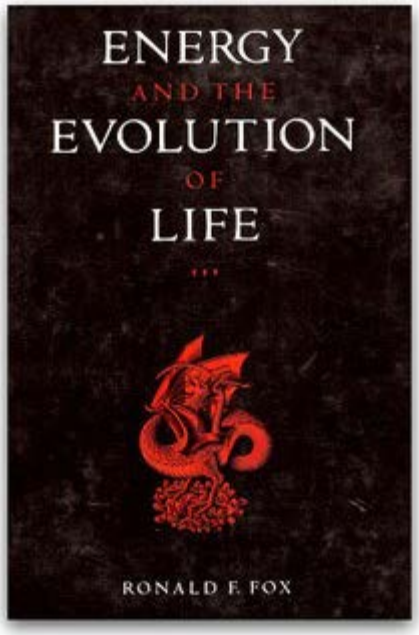

Fox's 1988 book *Energy and the Evolution of Life*, depicting the "ouroboros", i.e. a mythical dragon-snake eating its own tail in order to originate itself. [1]

Of note, similar to the work of English physicist Keith Burton, the book contains a large free energy of formation table for number of different biochemical species of importance. The book is a result of a fellowship and grant to study the physical basis for biological evolution, through which Fox devoted the 1984-1985 academic year exclusively to these studies. [1] Fox was a great intellectual influence to American chemical physicist Joel Keizer. [4]

Anecdotes

See main: Thermodynamics anecdotes

In the 1970s, during a visit with Norwegian-born American physical chemist Lars Onsager, whom Fox had met as a student at Rockefeller University, during the years 1965 to 1969, Fox asked Onsager whether he thought statistical mechanics would have a significant impact on the study of biological questions, such as the origin of life, to which Onsager replied abruptly "No".

Difficulties on theory

A central issue in Fox's perspective, a common one in life theories, is his contradictory supposition that on one hand life is "dependent" on the energy of the sun but on the other hand life is a "self-generating and self-sustaining" system. One cannot be self-sustained if it is vitally dependent or rather driven by an external supply. The latter supposition contradicts the former. The family of self-terms: self-organizing, self-sustaining, self-generating, and the like, are paramount to perpetual motion machines, and thus invalid descriptions of fictionalized isolated systems.

Of note, in his treatise, Fox explains why the prefix "self-" must be carefully used. Energy, for instance, drives processes that are structurally "self-replicating" like RNA molecules inside a vesicle. Likewise, according to Fox, self-assembly of membranes is almost "self-", but is driven by the release of entropy. [5]

Education

Fox, after completed his 1969 PhD in thermodynamics, completed his postdoctoral work at Berkeley. In 1988, Fox was a professor of physics at Georgia Institute of Technology, producing graduate student PhDs until 2007. He is currently a Regents' professor emeritus of the school of physics.

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(b) Ronald Forrest Fox – Mathematics Genealogy Project.
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Further reading

â— Fox, Ronald F. (1982). *Biological Energy Transduction: the Uroboros.* Wiley.

External links

â— Ronald F. Fox (faculty) – Georgia Institute of Technology.

θΔics

In existographies, **Ronald Hoeflin** (1944-) (IIQ:190|#30) is an American philosopher and IQ test maker, noted for []

Overview

Since and early age, Hoeflin has been nearly blind or legally blind and into the 1990s could only read with a magnifying glass at a rate of 10 pages per day. Because of this, he has had a difficult time in school, dropping out of somewhere near to five different colleges, owing to complaints of teachers not willing to accommodate to his special handicapped needs.

In 2004, Hoeflin was working on finishing a book called *To Unscrew the Inscrutable: A Theory of the Structure of Philosophy*, with chapters on yin and yang, wave particle duality, Freud's id, ego, and superego theory, among other topics. Hoeflin is said to have completed a PhD in philosophy, at some point, from The New School of Social Research.

Mega Test | IQ test history

In 1938, Lancelot Ware, an Oxford scientist and lawyer, started the "High IQ club", and informal group of some sort. [2]

In 1946, Ware started the Mensa society at at Oxford University, whose members were required to have an IQ:132+ determined by some sort of tested means, generally based generally on Terman IQ scores (Stanford-Binet test scores).

Mensa was followed by a smattering of short-existed IQ societies: Berkeley High IQ Society (1946), Tenta (1959), MM Society (1966), Intertel (1966), founded by: Ralph Haines, The Hundred (1970), founded by: John Walsh, The International Heurist Association (1970), founded by: D.H. Ratcliffe). [1]

In 1974, Christopher Harding founded "International Society for Philosophical Enquiry" and developed some type of vocabulary test for admission purposes, the questions and answers of which are found in his 1993 *The Ultimate IQ Book*. [3]

In c.1975, Harding was selling a mail-in ten-item multiple choice so-called "Multimax Test", which purported to yield an IQ of 200+ or a ceiling of 211 (Q), depending on score; meaning if you answered all ten of Harding's questions correctly, then you tell everyone that your "paper IQ" was 211.

In 1977, Kevin Langdon had made a 14-page so-called "Adult Intelligence Test" or "Langdon Adult Intelligence Test" (Q).

In 1979, *Omni* magazine published Langdon's test (Q), at the point when he was aiming to start a "Four-Sigma Society" to accept people four standard deviations or more above the mean.

In 1982, Hoeflin, in the context of this culture, developed the "Mega Test" , comprised of 48 questions, which he claimed is the first IQ test designed to test for intelligence in the 145 of above IQ range (see: Mega Test IQ).

In 1985, Hoeflin's Mega Test was published in *Omni* magazine. [1]

In 1990, Hoeflin's so-called

Approximately 140 people who took the Mega Test reported previous scores on the LAIT. The Mega Test scores of people reporting LAIT IQ's are given in the following table. The difference in IQ points between Mega IQ's and LAIT IQ's are given in the fourth and eighth columns. Differences where the Mega IQ exceeds the LAIT IQ are in bold print.

LAIT IQ	MEGA SCORE	MEGA IQ	Δ IQ	LAIT IQ	MEGA SCORE	MEGA IQ	Δ LAIT MEGA IQ
116	6	127	11	154	20	145	9
120	3	116	4	155	15,18	139,142	16,13
127	5,13	124,136	3,9	156	17,33,18, 26,19,27, 17	141,160,142, 152,144,153, 141	15,4,14,4, 12,3,15
132	16	140	8	157	19,31,34, 19,36,29	144,158,162, 144,164,156	13,1,5,13,7, 1
136	13	136	0	158	20	145	13
138	7	129	9	159	22,22,33, 17	147,147,160, 141	12,12,1,18
140	20	145	5	160	24,29,34, 27,18,31, 22	150,156,162, 153,142,158, 147	10,4,2,7,18, 2,13
141	10	133	8	161	26	152	9
143	23	148	5	162	32,31,21	159,158,146	3,4,16
144	11,26	134,152	10,8	163	29	156	7
146	40	169	23	164	11,34,15, 27	134,162,139, 153	30,2,25,11
147	30	157	10	165	39	168	3
148	24,20	145,150	2,3	166	29,29,25, 16,37	156,156,151, 140,165	10,10,15,26, 1
149	20	145	4	167	31,27,41	158,153,172	9,14,5
151	23,29, 28	148,156, 154	3,5,3	169	27,29	153,156	16,13
152	27,23	153,148	1,4	170	21,44	146,180	24,10
153	16,21, 22,24	140,145, 146,150	13,8,7, 3	171	36	164	7
				173	35	163	10

LAIT IQ RANGE	# OF MEGA IQ'S UNDER, OVER LAIT	LAIT IQ RANGE	# OF MEGA IQ'S UNDER, OVER LAIT
116-151	8, 11 (& one tie)	152-157	17, 5
158-164	19, 2	165-173	12, 3

In 1987, approximately 140 people had taken both **Hoeflin**'s "Mega Test" and Kevin Langdon's "Adult Intelligence Test", the results of which, as tabulated (Q) by Rick Rosner were reported as shown above.

"Titan Test" was published in *Omni* magazine. [1]

The following is a representative statement of this so-called "high IQ society era" cultural milieu, which comprised a few dozen individuals connected by mail exchanges, in context, wherein members and club founders were assigning "genius IQs" (140+) to other club members, so to construct a "house of cards", so to say:

> "I did not apply for membership in the Mega Society. Instead I cooperated in the experimental 'norming' of many 'high-level' tests in the late 70's and early 80's and one day received a letter stating that it had been determined from my scores on several tests (presumably the Skyscraper, the W-87, the LAIT, the *GRE*, etc.) that my IQ was '193+' and that I was a member of the Mega Society."
>
> — Ed van Fleck (1991), "Letter to Kevin Langan" (Q), Nov

The following is a reference to this test:

> "Try taking one of the tests created by **Ron Hoeflin** [Mega Test; Titan Test] or Kevin Langdon [Adult Intelligence Test] which were designed with the specific intent of measuring high IQ. Chris Harding [MultiMax Test] also creates upper limit tests. His Multimax Test contains only ten multiple-choice questions and claims a ceiling of 200+. Each author's address is listed at the beginning of this issue."

— Rick Rosner (1992), “Reply Letter to William Archer” (Q), *Noesis*, 69, May

All of these tests, combined, have produced a number of infamously inflated IQs.

IQ claim

Hoeflin has a claimed IQ or 164 or "125 to 175, depending on which cognitive abilities they're tapping into", or 190 “on a good day”, in his own words.

Quotes | On

The following are quotes on Hoeflin:

> “Thanks to the magic of the World Wide Web, over the past fifteen years, more than a dozen affinity groups for people with superhigh IQs have been formed. More exclusive than Mensa — which accepts those with a minimum IQ of 132, one of every fifty people — clubs like the Triple Nine Society (IQ requirement: 148+), the Prometheus Society (IQ requirement: 164+), and the Mega Society (IQ requirement: 176+), provide electronic fellowship to an eccentric, far-flung population known as HiQ Society. Though the clubs, like all subcultures, have become petri dishes for ego squabbles and political infighting, they nonetheless supply the comfort of fraternity in a world that doesn't think fast enough, doesn't get the reference, doesn't grasp the point.”
>
> — Mike Sager (2008), *Wounded Warriors* (Q)

> “**Ron Hoeflin** has produced the only "ultra-high" IQ tests of any repute. Officially, he puts the ceilings of the Mega Test and Titan Test at 190+. That translates to a 5.6+ sigma score. I made a single error on one of his tests, for a raw score that translates to a 190 SD 16 deviation IQ score.”
>
> — Tigger Warning (2013), IAmA Mega Society member (Q)(Q), Reddit

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(b) Miyaguchi, Darrly. (2000). “A Short and Bloody History of the High IQ Societies” (WB), Eskimo.com.

See also

- Marilyn Savant
- Christopher Harding
- Christopher Langan
- Rick Rosner
- Paul Cooijmans

Further reading

- Cooperman, Jeannette. (2009). “Web Extra: St. Louis’s Genius: Ron Hoeflin founded seven high-IQ societies far more exclusive than Mensa and wrote what’s been dubbed the world’s toughest IQ test. His brain food? Wendy’s” (Q), St. Louis, Sep 28.

External links

- Ronald K. Hoeflin – Wikipedia.

θΔics

In thermodynamics, **Ronald D. Kriz** (1948-) is an American engineer noted for his in depth work and online articles on graphical thermodynamics methods of Willard Gibbs, James Maxwell (Maxwell's thermodynamic surface), James Thomson (Thomson's thermodynamic surface), and the recent computer implementation of the latter in the works of Daniel Charles Coy. [1]

Overview

In 2007, Kriz, in his "Thermodynamic Case Study: Gibbs' Thermodynamic Graphical Method", began detailing some of the graphical thermodynamics representations of Willard Gibbs; the following is an example of Kriz's illustrative work, which shows Maxwell's graphical model based on Gibbs' original graphical method; information highlighted in light blue shows a connection to the equation of state: [2]

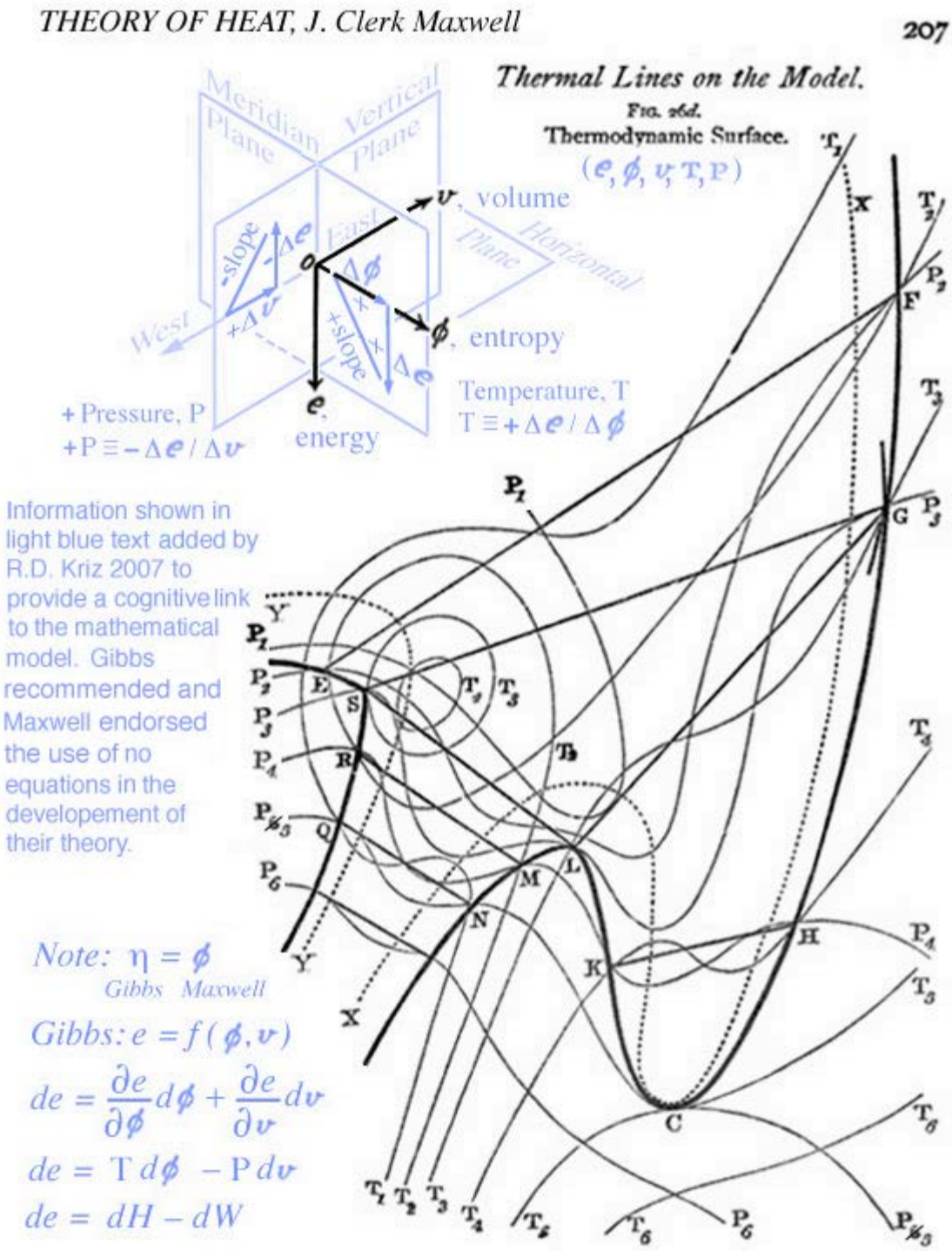

(add discussion)

See also

- Vladimir Arnold
- Frank Wienhold
- William Cropper

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(b) Coy, Daniel Charles. (1993). "Visualizing thermodynamic stability and phase-equilibrium through computer graphics", Ph.D. dissertation, Iowa State University.
2. Kriz, Ronald D. (2007). "Thermodynamic Case Study: Gibbs' Thermodynamic Graphical Method: Envisioning Total

Derivatives of a Scalar Function with Two Independent Variables as Raised Surfaces and Tangent Planes." Sv.Vt.edu.

External links

- Ronald D. Kriz – Virginia Tech.

θΔics

In hmolscience, **Ronald D. Pearson** (c.1933-), published as as "Ron Pearson", is a mechanical engineer and thermodynamics lecturer noted, in cessation thermodynamics, for his 1990 big bang rejecting 'intelligent ether' theory of continued consciousness after death, a seeming mixture of woo woo physics, new age, and fringe science.

Overview

In1984, Pearson rejected big bang theory as being a violation of the conservation of energy. [1]

In 1990, Pearson, in his *Intelligence behind the Universe*, introduced his 'intelligent ether' theory of continued consciousness after death. [2]

Pearson's theory is rather obscure and convoluted to read, as evidenced by the fact that his theory has been rejected by most of the scientific community; throwing out benchmarks of physics, such as constant speed of light, relativity, the cosmological constant, etc., and instead utilizing the invention of numerous types of hypothetical energies, e.g. 'positive and negative primaries', 'breeded energies', etc., said to existed and interacted at the start of the universe, along with other mathematical contrivances.

Concerning death and what happens when you die, Pearson postulates the existence of an "intelligent ether" or Iether, said to be found throughout the universe, whereby the mind is not brain function but rather isolated regions of the Iether as separate from the matter portion of the mind, and that after death, the Ieather lives on to interact with new constructs of matter in the universe at different frequencies.

In 2005, Pearson explained how a person lives on after death as follows: [3]

> "If true a 'supermind of space' could create a whole set of matter-systems all co-existing in the same space but tuned to different quantum-wave frequencies. Then fragments of the supermind structure, the 'sub-minds', could only tune into one matter-system at a time. Consequently the only reality apparent at any one time would be the one to which a sub-mind is temporarily tuned. When that matter-system became outworn, this sub-mind, being part of the structured sub-quantum fluid, would simply tune into one of the remaining matter-systems and continue to survive. On this basis our brains could well be mere interfacing mechanisms needed to enable the real minds to pilot the body. No justification can exist any longer in postulating that, of necessity, consciousness vanishes on brain death."

Pearson also, supposedly, shows how dark energy relates to the survival of consciousness.

Education

Pearson completed a BS in engineering and a "C.Eng.M.", in mechanical engineering, then in 1958 invented a prototype gas wave turbine, then became an lecturer in thermodynamics and fluid mechanics, retiring prior to 2000, and switched to physics. [4]

References

1. (a) Unal, Ali. (2000). *The Resurrection and the Afterlife* (pg. 75). Tughra Books.
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2. Pearson, Ronald D. (1990). *Intelligence behind the Universe*. Two Worlds Publishing Co Ltd.
3. Pearson, Ronald D. (2005). "Theoretical Physics Backs Survival." SurfivalAfterDeath.org.
4. Ron Pearson (about) – PearsonianSpace.com.

External links

â— Ronald Pearson (biography) – SurvivalAfterDeath.org.

â— Pearsonian Space – "Big Breed Theory", PearsonianSpace.com.

θΔics

In existographies, **Rongxing Guo** (c.1969-) is a Chinese economist and cultural theorist, noted for []

Overview

In 2017, Guo had stated the following:

> "Recent findings in the biomedical area call attention to what might be called the 'thermodynamics' and 'physiological' factors in economic growth."
>
> — Rongxing Guo (2017), *An Economic Inquiry into the Nonlinear Behaviors of Nations* (pg.120)

In 2018, Guo, in his *Human-Earth System Dynamics*, expanding on the former idea, devoted several chapters entitled "Human Thermodynamics and Culture", to the following proposition:

> "Not all human and cultural evolutions are consistent with what Darwin calls 'natural selection'. Nevertheless, they all conform to the basic law of human thermodynamics: that human mental output and physical output are roughly negatively correlated."
>
> — Rongxing Guo (2017), *Human-Earth System Dynamics* (pg. 52) [1]

This mental energy vs physical energy conjecture, is based on the following graph:

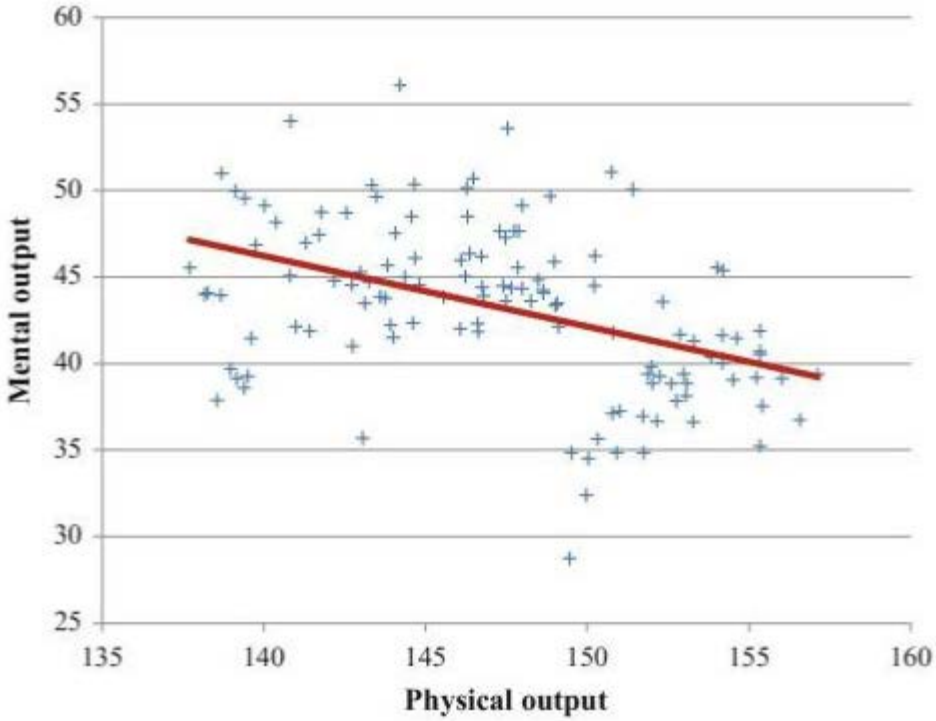

Fig. 2.4 Human thermodynamic law: mental output versus physical output. *Notes* (1) Only nations from the Old World are included. (2) "Physical output" is represented by average female height (AFH) minus an amount that is explained by GNI per capita in Eq. (5.1) and plus an extra 5% of the AFH for the Negroid-dominated nations. (3)"Mental output" is represented by the IQ minus an amount that is explained by GNI per capita in Eq. (5.2) (4) All the original data are shown at Annex A.1 at the end of this book

There doesn't, to note, seem to be much "thermodynamics" proper herein, this aside.

Education

In 2018, Guo was a professor at Beijing Municipal Government Capital University of Economics and Business, Beijing, China; auto-characterizing as a published scholar in six disciplines: economics, geography, political science, management science, archaeology, and anthropology. [2]

References

1. Guo, Rongxing. (2018). *Human-Earth System Dynamics* (Amz) (Thermodynamics, 5+ pgs). Springer.
2. Rongxing Guo (profile) – ResearchGate.net.

θΔics

In hmolscience, **Rosa Praed** (1851-1935) was an Australian-born English writer noted for her 1885 *Affinities: A Romance of Today*, a spin-off in some sense of German polymath Johann Goethe's original 1808 *Elective Affinities*, in which she cites Goethe via a telling dialogue on the religion vs science collision between Christianity and materialism regarding the nature of the soul and the search for a new doctrine of faith.

Dialogue: Materialism vs. Christianity

The following dialogue involves a varied group of new age thinkers, searchers, scientists, and a few professors, all testing the waters at some sort of astral body / astral travelling theory convention—in a telling side dialogue of which wherein the inquisitive American professor states his views on divide between materialism and Christianity, which gives excellent insight into a mindset divide that is nearly verbatim in present day in America: [1]

> "Some fashionable friends of Mr. Margrave's entered and diverted his attention—a Belgravian dowager, with an eyeglass, and two asthetically dressed daughters. They were followed by others, mostly ladies, and of all types, from smartly dressed London beauties, to spectacled advocates of woman's rights, emancipated spinsters, and ecstatic-looking spiritualists. To all of these, the handsome Greek, Chela, appeared an object of deep interest.
>
> Graysett looked about for Mrs. Edye, but could not discover if she were present. The buzz of conversation increased; and above it rose the exquisitely modulated tones of the Chela, who was guardedly replying to a pointed question from Margrave's friend, the dowager. 'The Western mind, Madame, must be gradually prepared for the reception of the highest truth. There are many secrets which the great masters do not permit us to divulge to the superficial inquirer, or to those who are still in bondage to superstition.'
>
> The dowager dropped her eyeglass, through which she had been scrutinising the Chela, and turning to Margrave, said in a *sotto voce*, audible to Graysett, 'Eeally, Mr. Margrave, it is too bad to bring us to this distant suburb and put us off in that way. I thought we were to see the genuine article in a turban, straight from Thibet;' while an elderly lady of massive proportions and inflexible aspect, broke in—
>
> 'Oh, I have got beyond Christianity, if that is what you mean. I'm ready for a new revelation; and all that, about cyclic evolution, and the planetary chain, seems to me very scientific. But what I can't understand is, how the life impulse is to be conveyed from one planet to another. If you will explain that to me I am ready to believe all the rest.'
>
> The Greek put his flexible hands together, turning the points of his fingers backwards, and directed a searching glance into space.
>
> 'How does thought travel? he asked dreamily. 'How does knowledge travel? How is it that a seer in London can in his trance witness a scene which is at that moment taking place in Birmingham? Knowledge comes, not by reason but by inspiration. How is it that Goethe, the most unscientific of thinkers as regards method, divined the truth concerning the structure of plants? You Westerns have stifled inspiration by your process of induction. The Aristotelian method has been the curse of "Western Thought.'
>
> 'Yes, yes,' twittered a thin, bird-like young woman, with her head upon one side, and a bunch of grass nodding on her bonnet. 'That terrible Aristotelian method!'
>
> Graysett moved back to the inner room where Madame Tamvaco still sat, the centre of her little knot of scientists, but on its threshold he was accosted by the American Professor, who inquired in the tone of one yearning to discover a kindred soul—
>
> 'You are going in for this? You are a student—a chela?'

'Oh, no!' said Graysett; 'nothing so advanced.'

'A spiritualist, perhaps?'

'No,' said Graysett again, quoting Margrave with a bewildered feeling that he was dreaming vividly; 'I come here for instruction and amusement.'

'And I,' said the Professor, sitting down, while he motioned Graysett to a chair by his side, ' I come here in search of a faith. Well, now!' he went on, leaning forward with that queer mixture of earnestness and dryness—an American characteristic, I've tried everything; and if these New Pythagoreans give me what I want, I'm a happy being. The doctrine promises well, I will say that. It appeals to the intellect. Now, I'm a scientific man. I may say that I'm one of the leaders of the scientific school over with us. I used to be the associate of Tyndall and Huxley, mentally you understand. Protoplasm, and uncreated and unvivified matter, that was my theory, till I began to investigate the phenomena of spiritualism. Protoplasm and ghosts don't pull together. I believe in ghosts. I've seen thousands of 'em. I have talked to them. I may say that I've kissed them. They upset my creed. What was I to do? Protoplasm on one side, modern Christianity on the other. I can't swallow that, holus bolus with a gulp and a wry face. I'm tossed on the horns of these two dilemmas. Materialism won't do. Modern Christianity won't do. The first denies that I have got a soul at all; the second gives me a soul but denies me the management of it. These New Pythagoreans let me have the bringing up of my soul; and that's something gained. As for their scheme of cosmogony, they tell me it is based on exact science—occult science you know. I'm all science myself, and I shall pretty soon see how far that assertion is to be depended upon.'"

(add discussion)

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1. (a) Praed, Rosa C. (1885). *Affinities: A Romance of Today, Volume I*. Richard Bentley & Son.
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External links

â— Rosa Campbell Praed – Wikipedia.

θΔics

In human physics, **Mantegna Rosario** (1960-) is an Italian physicist and econophysicist noted for his 1990 to present work in econophysics.

Overview

In 1990, Rosario began promoting econophysics, via the area of the analysis and modeling of social and economic systems with tools and concepts of statistical physics.

In 1991, Rosario published the first econophysics paper in a physics journal, according to some; and in 1995, co-authored the first econophysics paper in *Nature*.

In 1999, Rosario began teaching econophysics.

In 2006, Rosario did the first English translation of Italian engineer-physicist Ettore Majorana's circa 1933 article "The Value of Statistical Laws in Physics and Social Sciences." [1]

In 1999, he published the first book on econophysics; after earning his tenured position in 1999, he founded the Observatory of Complex Systems, a research group of the Department of Physics of Palermo University, focused on econophysics. [2]

Rosario co-wrote the 2000 book *Introduction to Econophysics* with American physicist Eugene Stanley. [3]

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(b) Publications – Observatory of Complex Systems (home), University of Palermo.
3. Mantegna, Rosario, and Stanley, H. Eugene. (2000). *Introduction to Econophysics: Correlations and Complexity in Finance*. Cambridge University Press.

External links

â— Mantegna, Rosario N. (Rosario Nunzio) (1960-) – WorldCat Identities.

θΔics

In terminology, **Rosetta Stone** is a multilingual stele discovered in circa 1799 whose meaning remained hidden until 1822 when English physicist Thomas Young, notable for being credited with the coining of the term "energy" in the modern sense, and French scholar Jean-Francois Champollion, who completed the work of Young, translated it, thus uncovering the correlated three-language key to the understanding of the ellusive 5,000-year old language of Egyptian hieroglyphics. The term "Rosetta Stone" has since become idiomatic as something that is a critical key to the process of decryption or translation of a difficult problem. In thermodynamics, several noted publications have been described as Rosetta stones to the uncovering of the meaning of entropy.

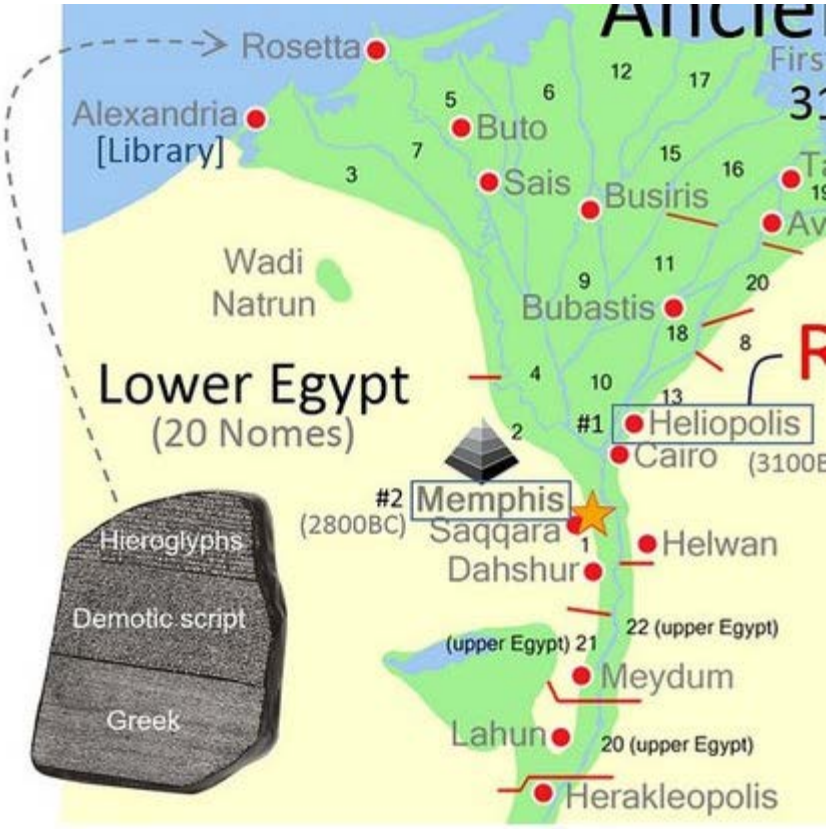

Section of Libb Thims' 2015 "Ancient Egypt" labeled "Zerotheism for Kids" slide (O) showing the **Rosetta stone**, discovered in Rosetta (c.1799), which allowed for the decipherment of hieroglyphics (c.1820), and later the decipherment of the Abrahamic and Brahmaic faiths as variants of Anunian theology (c.1900).

Shannon | Clausius

In thermodynamics, American physicist Edwin Jaynes' 1957 two-part article "Information Theory and Statistical Mechanics" has been described by American engineer Myron Tribus as the Rosetta Stone to uncovering the connection between Clausius entropy (1865) and Shannon entropy (1948). In particular, in 1958, after searching for clues to this puzzle for a decade and after having been asked this question during his 1948 doctoral examination at UCLA, Tribus states the following on finding Jaynes' paper:

> "Here was my **Rosetta Stone**! I went home and worked with that paper for a week, almost without sleep. All of my studies for a decade suddenly fell in place. A straight forward connection between Shannon's entropy and the entropy of Clausius poured into the paper, almost without my hand."

(add discussion)

Pynchon

In 2005, writer Rick Moody commented that the reading of elusive American writer Thomas Pynchon's authorized bootleg edition of his early stories (*Slow Learner*, 1985), where in the intro he reflects on his use of entropy, information entropy, and Maxwell's demon in his earlier short stories and novels, that it "was like a finding of the Rosetta Stone to his later works".

Quotes

The following are related quotes:

> "The problems of these highly complex mixtures, the principles first enunciated by Gibbs, became a veritable **Rosetta stone**."
>
> — Frederick G. Cottrell (1939) (Q)

> "Gibbs' work has been called the '**Rosetta Stone** of science'."
>
> — Author (1942), "Article", *The New Republic* (Q)

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(b) Jaynes, E. T. (1957) "Information theory and statistical mechanics II", (PDF), *Physical Review* 108:171.
2. Tribus, M. (1998). "A Tribute to Edwin T. Jaynes". In *Maximum Entropy and Bayesian Methods, Garching, Germany 1998: Proceedings of the 18th International Workshop on Maximum Entropy and Bayesian Methods of Statistical Analysis* (pgs. 11-20) by Wolfgang von der Linde, Volker Dose, Rainer Fischer, and Roland Preuss. 1999. Springer.

External links

- Rosetta Stone – Wikipedia.

θΔics

In science, **W. Ross Ashby** (1903-1972) was an English psychiatrist, mathematician, neuroscientist, and cybernetician noted for []

Overview

In 1943, Ashby reasoned that: [2]

> "An outstanding property of the nervous system is that it is **self-organizing**, i.e. in contact with a new environment the nervous system tends to develop that internal organization which leads to behavior adapted to that environment."

In 1947, Ashby followed this up with a concise set of principles of self-organizing systems, postulating that "a machine can be at the same time (a) strictly determinate in its actions, and (b) yet demonstrate a self-induced change of organization." [2]

In 1952, Ashby, in his *Designs for a Brain*, as summarized by Judson Herrick (1956), was outlining some type of mechanical principles based model, via sections such as "state-determined system", "organism as machine", "molecular-basis for memory", among others; some of which, however, seems error-filled, for example: [7]

> "Any comparison of a state-determined system with the other types of system treated in physics and thermodynamics must be made with caution. Thus, it should be noticed that the concept of the state-determined system makes no reference to
> energy or its conservation, treating it as irrelevant."

Ashby, as summarized by American neurological anthropologist Terrence Deacon, defines a self-organizing system as one that spontaneously reduces its statistical entropy, but not necessarily its thermodynamic entropy—[a statement that, to note, makes no sense]—by reducing the number of its potential states, and in doing so equated self-organization with self-simplification. [1] Deacon attributes this entropy self-organization definition to one of Ashby's 1947 publications; possibly his "Principles of Self-Organizing Dynamic System" (check)? [4]

In the 1950s, the work of Ashby was being incorporated into the writings of those such as American mathematician Norbert Weiner. By 1960, the term self-organization was being found convoluted with entropy explanations.

Self- | Issues

In 1961, Ashby notes that: "the adjective [self-organization] is, if used loosely, ambiguous, and if used precisely, self-contradictory". [2] On the question of organization, Ashby is quoted as asking the question: "can a system be self-organizing?" To which he answers: "no system can permanently have the property that it changes properties." [6] The following is another representative view:

> "No organism reproduces *itself*. The only thing that ever has had such a claim made for it was the phoenix."
>
> — Ross Ashby (1962),"The Self-Reproducing System" [5]

(add discussion)

Information theory

Ashby's views on entropy, to note, seem to be predominately incorrect, being that at some point he began convolute his ideas on brain self-organization together with American electrical engineer Claude Shannon's ideas on information entropy, in other words he took a ride on the Shannon bandwagon. [3]

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6. Ross Ashby (quotations) – George Washington University.
7. (a) Ashby, W. Ross. (1952). *Designs for a Brain: the Origin of Adaptive Behavior* (txt) (state-determined, 59+ pgs; irrelevant, pg. 252). Springer, 2013.
(b) Herrick, C. Judson. (1956). *The Evolution of Human Nature* (abs) (pg. 130). University of Texas Press.

External links

â— William Ross Ashby – Wikipedia.

θΔics

In mononyms, **Rossini** refers, in hmolscience, to Frederick Rossini (1899-1900), American chemical thermodynamicist, student of Gilbert Lewis, famous for his 1971 speech "Chemical Thermodynamics in the Real World", asserted that enthalpy equates to security, entropy equates to freedom, and that these two explain the precarious inverse relation balance between freedom and security in society.

See also

- Rossini debate
- Rossini hypothesis

θΔics

In debates, **Rossini debate** (TR:86) is a noted 2006-present argument about the content and subsequent inherent proposals of American physical chemist Frederick Rossini's 1971 "Chemical Thermodynamics in the Real" Priestley Medal address, wherein he outlined the view that chemical thermodynamics explains the paradoxical relationship between freedom and security, quantified by via entropy and enthalpy, respectively, in social existence and their inverse relationship nature to each other. The following is Rossini's central message from his address:

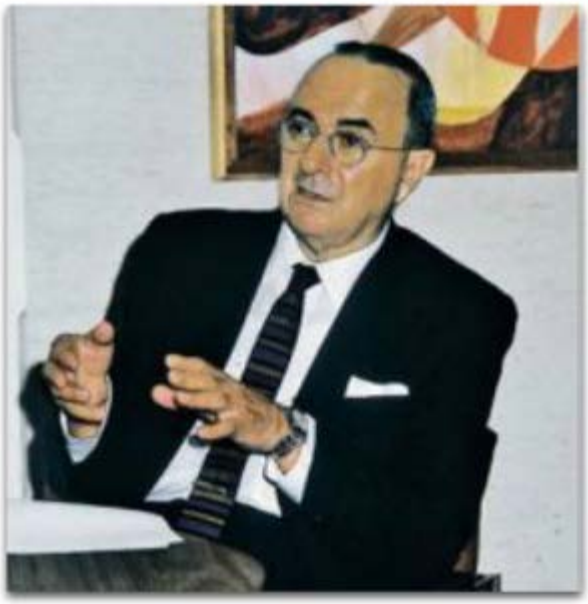

Top: American chemical thermodynamicist Frederick Rossini at about the time of his famous 1971 Priestley Medal address "Chemical Thermodynamics in the Real World". Right: an excerpt of American chemist Harold Leonard's suggestion to use Rossini's theory to develop post 9/11 freedom and security anti-terrorism theories.

Chemical Thermodynamics in the Real World

One of the world's greatest challenges, at present, is to find a formula for fighting terrorism, while preserving civil liberties. The March 2005 anti-terrorism conference in Madrid is but one example of officials and experts seeking to address the same paradox.

Some 34 years ago, one part of a Priestly Medal Address by F. D. Rossini from the University of Notre Dame discussed an interesting application of thermodynamics to this paradox. Below are excerpts from the address. In light of the ever-increasing need for compromise, Rossini's observation now seems all the more relevant. (Reprinted with permission from *Chem. Eng. News*, April 5, 1971, *49* (14), pp 50–53. Published 1971 by the American Chemical Society.)

With the first and second laws of thermodynamics we can derive two important equations:

$$\Delta G^\circ = -RT\ln K$$

$$\Delta G^\circ = \Delta H^\circ - T\Delta S^\circ$$

Since the term on the left side is the same in the two equations, the quantities on the right side are equal to one another. Hence we can write

$$-RT\ln K = \Delta H^\circ - T\Delta S^\circ$$

or

$$\ln K = -\frac{\Delta H^\circ}{R}\left(\frac{1}{T}\right) + \frac{\Delta S^\circ}{R}$$

> "The picture we have developed from thermodynamics is very simple: One cannot have a maximum of freedom and a maximum of security at the same time. If there is a maximum of freedom, there will be zero security."

In 2006, American chemistry professor Harold Leonard suggested, in the *Journal of Chemical Education*, that Rossini's premise might have real-world application to anti-terrorism efforts in a post 9/11-world.

Leonard's suggestion quickly found objection voiced by American physical chemist John Wojcik—professor at the strongly Catholic (Christianity-based) Villanova University—to the effect that he saw chemical thermodynamics as having no power whatsoever to explain the human condition. Rebuttal and a siding with Leonard was then made by chemist Todd Silverstein.

Further discussions on the debate can be found in works of German-born American organic chemist Ernest Eliel (1999), American chemical engineer Libb Thims (2007), Chinese-born Canadian economic thermodynamicist Jing Chen (2008), and others as outlined below. [2]

Rossini address | 1971

The roots of the debate originated in when in 1971 American chemical thermodynamicist Frederick Rossini was awarded the Priestley Medal, the highest honor conferred by the American Chemical Society, and in his address, "Chemical Thermodynamics in the Real World", argued that the first two laws of thermodynamics could explain the paradox between freedom, as in being free to do what one wants, and security, as in being safe from harm, in social life; in that the more secure one is, the less free he or she will be. The following is the excerpt from Rossini's lecture, which was reproduced in the 2006 *Journal of Chemical Education*, that started or rather "ignited", using thermal words, the

debate: [3]

With the first and second laws of thermodynamics we can derive two important equations:

$$\Delta G^\circ = -RT \ln K$$

$$\Delta G^\circ = \Delta H^\circ - T\Delta S^\circ$$

Since the term on the left side is the same in the two equations, the quantities on the right side are equal to one another. Hence we can write:

$$-RT \ln K = \Delta H^\circ - T\Delta S^\circ$$

or

$$\ln K = -\frac{\Delta H^\circ}{R}\left(\frac{1}{T}\right) + \frac{\Delta S^\circ}{R}$$

From this equation, K increases with increase in ΔS°; and K increases with decrease in ΔH°. Increase in ΔS° comes with increase in randomness, leading to greater "freedom" in the system. Decrease in ΔH° comes with increase in the energy of binding of the atoms in the molecular structure, leading to greater "security" in the system. These are opposing factors in the evaluation of K, and hence, for a given temperature, the final state of equilibrium is a compromise between the "freedom" term, ΔS°⁄R, and the "security" term, –ΔH°⁄RT.

Here we have an interesting picture derived from our science of thermodynamics—equilibrium or stability is a compromise between freedom and security. In terms of human experience, the meaning of security can be interpreted to mean that one is secure and safe in his person, in his family, in his home, in control of his property, on the streets, and on his travels. The meaning of freedom is quite clear—the privilege of doing whatever one wants to do. However, in our civilized society, we have come to believe in behavior according to natural law—that one can do whatever he wishes so long as he does not abridge or infringe upon the rights and privileges of others. To me, all this means living with some rational kind of law and order.

The picture we have developed from thermodynamics is very simple: One cannot have a maximum of freedom and a maximum of security at the same time. If there is a maximum of freedom, there will be zero security. I interpret this to mean that if we have total freedom, everyone can do whatever he wishes, including injuring others, stealing property, and the like. On the other hand, if there is a maximum of security, there will be zero freedom. I take this to mean that if we have total security, we will be constrained at every step and have a virtual straitjacket life.

One sees that there is a trade-off between freedom and security. In a state of total freedom, we can afford to give up some freedom to obtain some security. The ideal situation would appear to be one in which we have established that amount of security necessary to have human beings live happily and in harmony with one another, through observance of an appropriate amount of law and order, and then to have as large an amount of freedom as can be accommodated in this situation.

Fuller discussion of Rossini's address, debate aside, can be found in "Chemical Thermodynamics in the Real World".

Murphy and Rousseau | 1980

In 1980, American chemists Daniel Barker Murphy (1928-) and Viateur Rousseau (1914-2000), in their *Foundations of College Chemistry*, cite the Rossini's priestly lecture and comment: [14]

> "The **everyday significance** of thermodynamics is pointed out by Frederick Rossini in his Priestley Medal address, 'Chemical Thermodynamics in the Real World', reprinted in *Chemical and Engineering News*, Apri 5 (1971), pg. 50."

This is one of the only college textbooks, found so far, to have commented on the Rossini's real world chemical thermodynamics theory (see: List of thermodynamics textbooks that include human thermodynamics).

Eliel | 1999

In 1999, German-born American organic chemist Ernest Eliel (1921-2008), in his National Academy of Sciences *Biographical Memoirs* article on Rossini, summarized his chemical thermodynamics in the real world discussion as follows:

> "In 1971 [Rossini] received the Priestley Medal, the highest distinction conferred by the American Chemical Society. In his Priestly address 'Chemical Thermodynamics in the Real World' he made a **clever comparison** of the counterplay of enthalpy and entropy in thermodynamics with that of security vis-à-vis freedom in the world at large."

in short, calling it a "clever comparison", though not saying much beyond this.

Leonard's suggestion | 2006

In January 2006, American chemist Harold Leonard sent a one-page letter entitled "Chemical Thermodynamics in the Real World" the *Journal of Chemical Education*, which was published in the January 2006 issue, in which he made the suggestion that Rossini's chemical thermodynamics views freedom and security might help the world leaders better understand terrorism in the post 9/11 world. The letter consisted of two short introductory comments, as shown below, with a reprint of the partial excerpt, as shown above, from Rossini's Priestley Medal address: [4]

> One of the world's greatest challenges, at present, is to find a formula for fighting terrorism, while preserving civil liberties. The March 2005 anti-terrorism conference in Madrid is but one example of officials and experts seeking to address the same paradox. Some 34 years ago, one part of a Priestly Medal Address by F. D. Rossini from the University of Notre Dame discussed an **interesting application** of thermodynamics to this paradox. Below [above on this page] are excerpts from the address. In light of the ever-increasing need for compromise, Rossini's observation now **seems all the more relevant**.

(add discussion)

Wojcik's

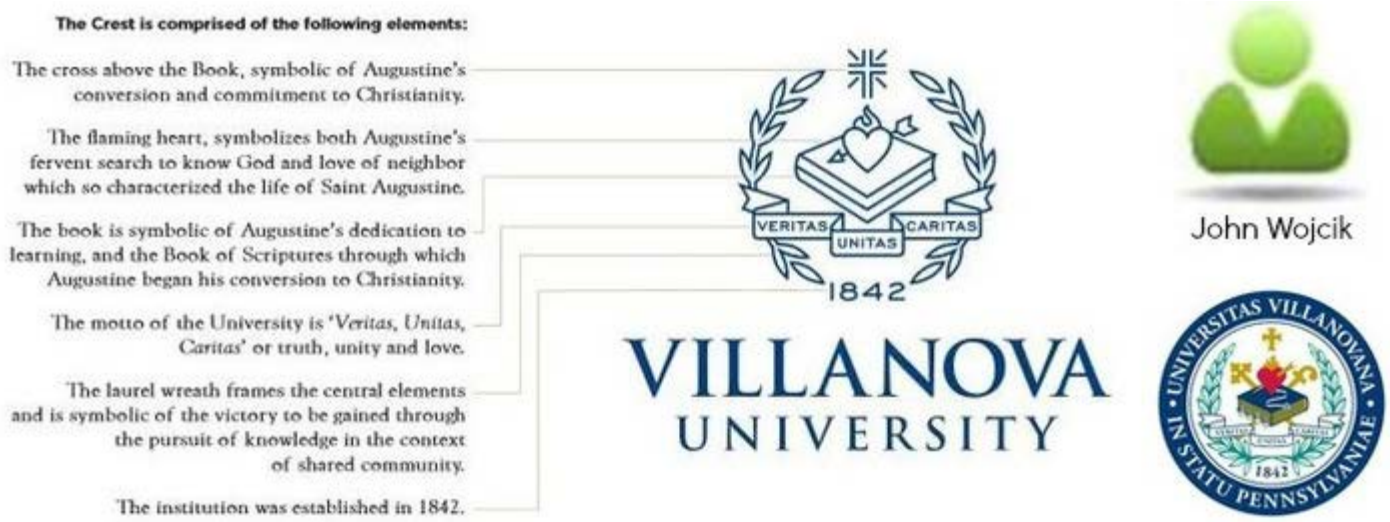

response | 2006

In a response December letter to Leonard's suggestion, entitled "A Response to Chemical Thermodynamics in the Real World", American physical chemist John Wojcik greatly objected to the association of entropy with human freedom, argued that chemical thermodynamics has nothing to say about the human condition, calling the suggestion nothing but anthropomorphism in chemistry.

Wokcik, to interject, is a physical chemistry professor at a highly Catholic-influenced and belief system based Villanova University, a university named for Saint Thomas of Villanova, the school is the oldest Catholic university in the Commonwealth of Pennsylvania, founded in 1842 by the Order of Saint Augustine, the university tracing its roots to old Saint Augustine's Church, Philadelphia. Both the Villanova school logo is shown adjacent with clarification of symbol meaning: the cross and the Bible shown predominately as representative of the university's structure. Hence, Wojcik's objection, although this is not stated anywhere seems to be one of a "religious" conflict nature, i.e. a science vs. religion objection.

The following is Wojcik's three paragraph very abrasive response letter—wherein he uses the term "danger" four times: [5]

> By making available an excerpt from Rossini's address, Harold Leonard has given us a good example of anthropomorphism in chemistry. The concepts of "freedom" and "security" (like "order" and "randomness") were parts of our cultural heritage long before modern thermodynamics was formulated. Entropy was defined solely in response to the need to explain certain modern experimental observations. It was never necessary to invoke concepts like "freedom" and "security" to systematize these same specialized experiments. At best, associating "freedom" with entropy is similar on other loose associations as when we say a shaft moving in an oversize bearing has too much "freedom". While there is a "freedom" for which one might die to defend, it is certainly not the "freedom" of an oversize bearing nor that of entropy. Such anthropomorphic associations might help some students absorb abstract concepts. They certainly are not part of the conceptual framework of the science.
>
> The **danger** of such anthropomorphisms is that we really come to believe that there is substance in them. In this particular case, there is the **danger** that true human freedom will be reduced to some sort of physical freedom on the same par with entropy. There is the **danger** that some will think that true human freedom can be measured in terms of some sort of calculus of simultaneous maximums and minimums. And worst of all, there is the **danger** that chemical thermodynamics will have ascribed to it a power that it simply does not have, namely, the power to "explain" the human condition. There may be a sense in which chemistry is the "central science". This is certainly not it.
>
> It is possible that Rossini did not intend his associations to be taken as seriously as suggested here.

Nonetheless, rather than encourage loose thinking through the use of such anthropomorphisms, it would be wise to purge them from science. Let chemistry solve those problems for which it was created. Let true wisdom solve the problems arising from the human condition.

See further discussion below (section: danger).

Silverstein's response | 2006

In yet another follow up June letter entitled "State Functions vs State Governments" (a play on the term state functions), American chemist Todd Silverstein notes in Wojcik's view that certainly caution must be taken in using science to guild social policies, citing the example of eugenics becoming a core tenet of Austrian-born German politician Adolf Hitler's extermination policies, but disagrees with Wojcik's view that such loose thinking should be purged from science altogether. The following is Silverstein's response letter: [6]

I found the discussion by Leonard, Rossini, and Wójcik of the validity of thermodynamic anthropomorphisms to be quite fascinating. Leonard presented an excerpt from the 1971 Priestley Medal Address given by F. D. Rossini, in which he likened entropy to personal freedom (cf. molecular motional freedom) and enthalpy to personal security (cf. bond formation and a more stable or "secure" system). Wójcik, in his response letter, warned against anthropomorphizing science: Models that work well in explaining experimental observations are not meant to shed light on the human condition. In fact, it can be dangerous to assume that they do. The rise of social darwinism in the late 19th century and eugenics in the early 20th century are just two examples of scientific theories that were mistakenly extended into misguided social policies. Although Wójcik's point is well-taken, I do not agree that such "loose thinking" should be "purged" from science altogether. A well-drawn analogy between two surprisingly dissimilar concepts can not only be helpful in the classroom, it can be pleasing and instructive on its own merits, as long as one is cognizant of its limitations.

On the surface, Rossini's analogy relating enthalpy, entropy, and the equilibrium constant to freedom and security in the modern nation-state seems like a good example of an unusual and instructive comparison. I was initially intrigued. Using the thermodynamic conclusion that (a) a reaction's spontaneity (or K_{eq}) increases when either ΔH gets more negative (stronger security) or ΔS gets more positive (more freedom), Rossini analogized that (b) "One cannot have a maximum of freedom and a maximum of security at the same time." Sadly, point (a), although true, does not support point (b), not even in the limited realm of chemical thermodynamics, much less in the broader realm of political governance.

Unfortunately, two errors lurk within Rossini's exposition. The first is a simple typo: The final part of the last equation should read

$$-\left(\frac{\Delta H^\circ}{RT}\right) + \frac{\Delta S^\circ}{R} = \ln(K_{eq})$$

not $-RT \ln(K_{eq})$. More importantly, Rossini's point (b) from above is that in any thermodynamic system, a negative ΔH or a positive ΔS can be maximized, but never both. This conclusion is only true, however, if K_{eq} is constant; of course K_{eq} (and ΔG°) are only constant if reactants and products and all reaction conditions are identical. Rossini does not specify, in his political governance thermodynamic system, the "reactants" and "products". Let us assume, for argument's sake, that the "reactants" are citizens living under an initial system (i) of political governance, and the "products" are citizens living under a final system (f) of political governance. Then Rossini's argument is that for different final systems of governance (f_1, f_2, f_3, etc.), ΔH° and ΔS° for the change in political systems can vary, but always in

opposite directions: If, relative to political system *i*, *f* features increased personal freedom (positive $\Delta S°$), then *f* must also feature decreased security (positive $\Delta H°$). Conversely, if *f* features increased security (negative $\Delta H°$), then *f* must also feature decreased personal freedom (negative $\Delta S°$). In other words, Rossini seems to believe that $\Delta H°$ and $\Delta S°$ must have the same sign.

This conclusion may make a certain amount of political sense, but it is flawed from a purely thermodynamic perspective. Although it is true that $\Delta H°$ and $\Delta S°$ are the same sign for many reactions (especially homogeneous reactions with no phase changes), this is by no means always the case. To present just two common counter-examples, for the combustion of solid glucose, $\Delta H° = -2803$ kJ/mol and $\Delta S° = +260$ J/mol•K; for the disproportionation of aqueous hydrogen peroxide (to dioxygen and water), $\Delta H° = -95$ kJ/mol and $\Delta S° = +29$ J/mol•K.

So to take Rossini's analogy to its final conclusion, based on his own thermodynamic analysis, there could well be a political system out there that maximizes both personal freedom and security. From a chemical perspective, there does not have to be a tradeoff between security (negative ΔH) and freedom (positive ΔS). Although Rossini's analogy is amusing and entertaining and makes some political sense, unfortunately, its thermodynamic conclusions are flawed.

Leonard's response | 2006

In response to Silverstein's "State Functions vs State Governments" article, Leonard comments: [7]

> I was pleased to see the response by T. P. Silverstein to my letter. I support his conclusions completely, especially that a "well drawn analogy between two surprisingly dissimilar concepts cannot only be helpful in the classroom, it can be pleasing and instructive on its own merits, as long as one is cognizant of its limitations". We can assume that Rossini may have used this analogy in his teaching, as I did for over 30 years, as well as in his Priestley Medal Address.

(add discussion)

Thims | 2007

In 2007, American electrochemical engineer Libb Thims devoted ten pages of the "Human Thermodynamics" chapter to his *Human Chemistry* textbook to a detailed critique of the Rossini debate, as the debate itself is a very rare look into the minds of a very rarified group: chemists, physical chemists, chemical thermodynamicists about the real or not real implications of their own work in potential application to their own existence, the following being a representative excerpt: [8]

> "In response to Leonard's suggestions about the use of Gibbsian-Rossini thermodynamics to better understand terrorism, a follow-up letter was published, in the same journal, by American physical chemistry professor John Wójcik, at Villanova University, Philadelphia, Pennsylvania, titled 'A Response to Chemical Thermodynamics in the Real'. In this very abrupt letter, Wójcik ridicules Leonard for his suggestion. He starts out his response-letter with 'Leonard has given us a good example of anthropomorphism in chemistry'. From here, his letter goes down hill where he argues that Leonard is wrong for naively thinking that chemical thermodynamics applies in human life. Now, Wójcik certainly has some set of balls for going up against figureheads such as Gibbs, Lewis, Randall, Giauque, and Rossini, among others. To this end, we give him credit for speaking his mind. Yet, as Rossini is not here to give his input, as he passed in 1990, here we will clarify the matter."

Thims' since has been actively working to re-educate the physical science community about the correctness of Rossini's

position.

Chen | 2008

In 2008, Chinese-born Canadian mathematical economist Jing Chen, in his “Understanding Social Systems: A Free Energy Perspective”, gave his opinion on the Rossini debate, commenting to the effect that it is one of the few pioneering works to have received attention from the research community:

> “The few pioneering works about social conditions from detailed mathematical analysis of physical laws received little attention from the research community … In human society, *E* represents the amount of energy resources available for human consumption. Changes in entropy represent a change in randomness. Where an increase in randomness represents an increase in freedom in a system.”

(add discussion)

Moriarty | 2009

In 2009, during the Moriarty-Thims debate, Thims brought up (comment #118) the Rossini debate, as a comparative example, during which time Irish physicist Philip Moriarty commented (comment: #128) the following:

> “Thank you for the link to that debate. You are correct - the theme mirrors that of our argument. Your suggestion, however, that scientists are "split on the issue" is, as ever, a remarkable overstatement. Silverstein's observation is that "Although Rossini’s analogy is amusing and entertaining and makes some political sense, unfortunately, its thermodynamic conclusions are flawed." Even Leonard, in his closing response, appreciates the difference between drawing an *analogy* between thermodynamic functions of state and features of society, and the claim that one can **equate** a thermodynamic entropy/enthalpy/free energy with properties of human relationships/society. It is this distinction between analogy and mathematical/physical equivalence that is so important and which you seem unable to grasp.
>
> Hence, you misinterpreted the analogy I drew in the Sixty Symbols YouTube video on entropy and argued that I was actually claiming that one could associate a thermodynamic entropy with the arrangement of students. That someone could confuse the analogy with the actual thermodynamic quantity just never occurred to me. Of the ~ 750 physics majors who took the 1st year Thermal and Kinetic Physics module I taught, not one made this fundamental error. Similarly, the number of professional scientists who have made this error is very small indeed.”

which resulted in followup discussion (comment #160, etc.)

Janin | 2013

In 4 Mar 2013, French bio-physicist (chnops-physicist) Joel Janin voiced his opinion as follows: [10]

> “I guess I generally agree with Frederick Rossini, though I see no chance to make a quantitative estimate of 'energy' and 'enthalpy' in social issues.”

This latter "no chance" comment by Janin here is a foray into the newly-emerging field of the development of human thermodynamic instrumentation, though ideas on how to go about calculating human energy, human entropy, human enthalpy, and human free energy have a long historical past, such as have been attempted in

historical attempts at making human thermodynamics variable tables, a subject dating back to at least to American economist Irving Fisher's 1892 table.

Prausnitz | 2013

On 28 Mar 2013, American chemical engineer John Prausnitz, professor emeritus of the University of California, Berkeley, noted for work in protein thermodynamics and the history of chemical thermodynamics, gave the following opinion to Thims, in query about the potential fit of a two cultures department at UC Berkeley, with the central hub located within the chemical and biomolecular engineering department, and the humanities integrated into this hub, in which the Lewis school and the Rossini debate were mentioned: [10]

> "I don't know what the **Rossini debate** is but I hope to find out. No, your idea for a department for teaching two cultures would not be appreciated at Berkeley. In the social sciences and in some humanities, thermodynamics may be useful as an analogy, as a suggestion for looking at a problem (e.g., information theory) but beyond that, I see little use of thermodynamics outside science."

(add discussion)

Sowersby | 2013

On 14 Jul 2013, American bio-chemist (chnops-chemist) Drew Sowersby gave the following opinion on the Rossini debate: [15]

> "I am fundamentally sentimental to the notion raised by Rossini, albeit see both ends of the spectrum asymptotic in nature. I generally don't see in black and white, and colors often bleed into each other when I try to explain complex ideas.
>
> I have come up with some pretty good analogies to help others better understand the varying "degrees of freedom" [DOF] found within the various levels of nature. For instance, imagine someone trying to get into an inner tube for a float down the river. This is often a big challenge. Why? and When? Well, there are many variables that contribute to a person being able to get into the tube, and stay put. The first challenge is to ensure that the tube contains enough air. If your hand sinks into the tube as you brace yourself, there may be too many DOF and you would have to use more energy in the form of a muscle contraction (quick leg swing or something). Technically, the tube need to have a high enough buoyant force which acts as a counterbalance to a human load.
>
> Next, the tube needs to stay in place as to also limit the DOF. How are you going to get in a tube that is moving unless you are willing to learn some kind of ninja trick. If you can buttress the tube against a wall or at least hold it in place, it will require much less energy to get in. Obviously some DOF of available, like in the flexibility of the rubber and your arms. Overall, getting into a tube properly and floating down a river without falling out takes a balance of rigidity and flexibility.
>
> I see it the same way for most of human behavior, especially running organizations such a politics and the economy. Some have talked about a steady-state economy that has a well-balanced DOF system that is not allowed to sway too far in any direction. Based on the Rossini page you sent, I think he was trying to get to this understanding."

(add discussion)

God vs Gibbs |

Discussion | Danger

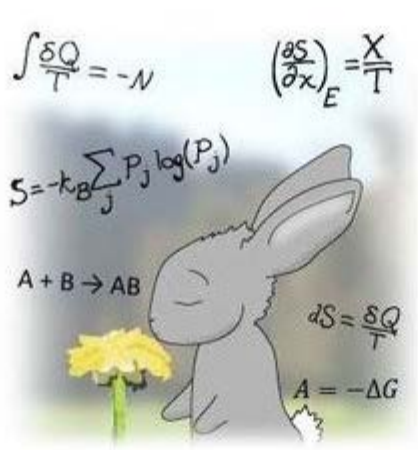

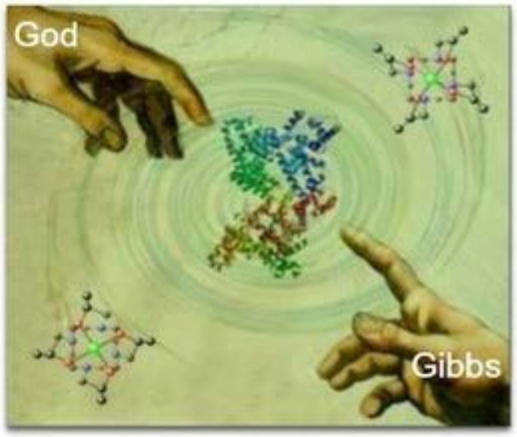

A representative of the perceived "**danger**" associated with the ramifications inherent and embedded within the revolutionary subject of human chemical thermodynamics, whether discussed in reference to Goethe's 1809 *Elective Affinities*, Rossini's 1971 "Chemical Thermodynamics in the Real World", or Thims' 2008 *Hmolpedia*, a subject, namely the "moral symbols" of physical chemistry, in direct conflict to the religio-mythology based morality and belief system of modern the modern world; one example of this perceived danger being James Froude, pictured, and his 1849 *Elective Affinities* influenced Christian-faith renouncing *Nemesis of Faith*, which was **publicly burned**, after which he lost his post at Oxford, and thus resultantly did the first English translation of Goethe's revolutionary-doctrine containing, human chemical theory, self-defined "best book" anonymously. [6]

Although difficult to ascertain to what specific "dangers" Wojcik has in mind in his objections, which underlyingly amounts to a "God vs Gibbs" objection, the deeply-loaded term "danger" employed four times, which by no means should be talking lightly, we may glean some comparison from the following version of godless scientific socialism tested out in Russia:

> "Soviet orthodoxy [1917-1986] was shaped as a quasi-religion with Marx as God and the Spirit, Lenin as God the Father, and the party as collective God the Son."
>
> — Yuri Tarnopolsky (1993), reflection, as a scientist, i.e. self-defined "human chemist" (or pattern chemist), on his time as a Russian citizen (1936-86) and Siberian concentration camp days (1983-85), prior to his 1987 immigration to America, amid the eventual "fall of communism" in 1989 (Q) [17]

Mass killings, to note, occurring under Communist regimes, i.e. those countries who declared themselves to be socialist states under the Marxist-Leninist, Stalinist, or Maoist definition, during the twentieth century, resulted in death tolls numbering between 85 and 100 million. (Q)

In other words, per this example, the jump from scientific socialism theories, such as Marx-Engels "scientific materialism", as Marx called it, or "dialectical materialism", as Engels called it, to 100-million dead (dereacted), is not such a small jump, particularly when cautions to possible dangers are not heeded or deemed prudent.

Nevertheless, Wojcik is incorrect in his assertion that "chemical thermodynamics does not have the power to explain the human condition", being that thermodynamics, whether of social chemical processes, plant production scale chemical processes, or laboratory-scale chemical processes, is the science that gives the definitive definition of "power", i.e. in social phenomena, namely: the quantification of work or energy per unit time per social change or transformation. We may very well throw God out the window, as Marx and Lenin did, in their reformulation of Soviet society, but what to put in its place is not, as we see, so simple.

One may very well envision a future utopian-escaped refugee making a similar quote replacing Marx with some future "thinker" — who builds a social theory on an admixture of Gibbs + Darwin + Goethe — and Lenin with some future scientifically-trained political "leader" who makes a God out of the said thinker and is social ideology.

The same loaded term was used in

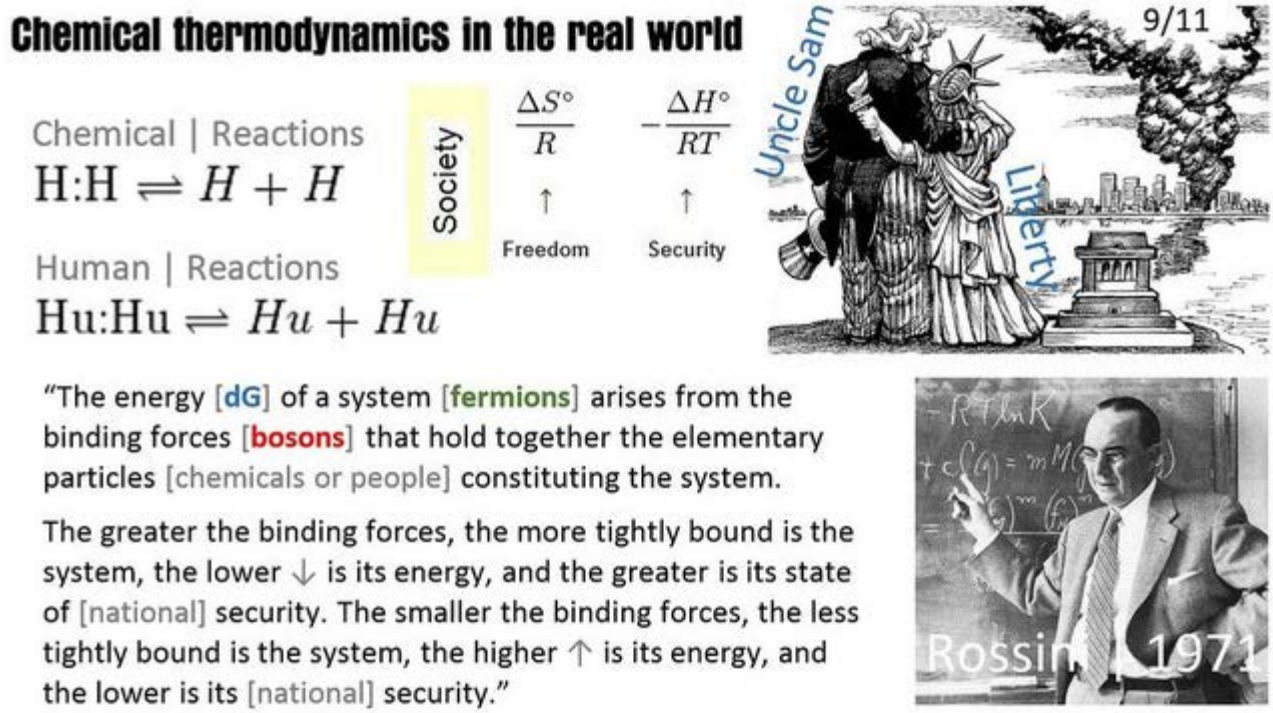

A synopsis of Frederick Rossini's 1971 "Chemical Thermodynamics in the Real World" argument, namely: slide #22 (O) of Libb Thims 2015 "Zerotheism for Kids Lecture", wherein Rossini is shown explaining how freedom and security equate to entropy and enthalpy, respectively, in society, and how human "reactions" are larger types of chemical reactions, equilibrating in society; the contentions and ramifications of which acting to spark the **Rossini debate** (2007-present).

reference to German polymath Johann Goethe's 1809 physical chemistry treatise *Elective Affinities*, which argues exactly the same position as Rossini is arguing in 1971, albeit in terms of chemical affinities governing freedom and security of human existence and experience, the two, affinity chemistry and chemical thermodynamics, translatable into one another via the affinity-free energy equation:

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

proved in 1882 German physicist Hermann Helmholtz and his thermodynamic theory of affinity.

To give an example of this "danger", we note that the first English translation of *Elective Affinities*, was done "anonymously" in 1854 by English clergyman-abnegator turned historian, novelist, biographer, and editor James Froude less than five years after his 1849 Goethean human chemical theory epistolary philosophical novel *The Nemesis of Faith* was publicly burned and because of which he lost his post at Oxford. This situation is summarized well by English science historian and philosopher David Knight (2009) as follows: [12]

> "Froude's semi-autobiographical *Nemesis of Faith* [a renunciation of Christian faith], published in 1848, owed much to Goethe's novel of human and chemical reactions, *Elective Affinities*, which he translated. *Nemesis* lost him his fellowship at Exeter College, Oxford, where **his book was publicly burned**."

Likewise, in 1880 German scholar Herman Grimm cogently characterized *Elective Affinities* as Goethe's "most dangerous work" and likewise prior to this German poet-writer Christoph Wieland gave his opinion on the same book, in a letter which he said should be burned after reading, that it was but "childish nonsense and fooling around" and that his main objection was because of the "radicalness of its Christianity".

Hence, by repercussion of Rossini's argument, if freedom is determined by enthalpy and entropy, then "choice" is a chemical thermodynamic property, whereby subsequently the doctrine of "freely", as in belief in free will, choosing

right (good) from wrong (bad) so as to achieve moral salvation is a theory that comes into question, hence undermining the modern belief system and colloquial social structure, for many, such as seems to be the case with Wojick.

Connors | Security vs liberty

In 2002, American pharmaceutical thermodynamicist Kenneth Connors, in his *Thermodynamics of Pharmaceutical Systems*, seemingly independent or rather unaware of Rossini's 1971 Priestley Medal address, footnotes a politics type explanation of free energy, i.e. a type of political thermodynamics, as a compromise between security and freedom (or liberty), as follows: [18]

Kenneth Connors (2002) and later his co-author Sandro Mecozzi (2010) seem to have independently suppositioned the same premise as Rossini on freedom (or liberty), security, and thermodynamics.

> "It is not too fanciful to draw an analogy with a political science setting, in which each society must choose its own compromise position between the extremes of maximum security (the energy component) and maximum liberty (the entropy component)."

In 2010, Connors, together with co-author Italian-born American pharmaceutical chemist Sandro Mecozzi (Q), in their second edition, restated the above footnote, albeit in a little more organized fashion, with the footnote bottom page, versus end of chapter (2002), showing a free energy diagram concordantly; the newer presentation, with the footnote inserted, reads as follows: [19]

> "The essential characteristic of the Gibbs free energy function is its combination of both energy and entropy components in a form that reveals how these two thermodynamic concepts complete to generate a compromise that determines the position of equilibrium in a chemical process. It is not too fanciful to draw an analogy with a political science setting, in which each society must choose its own compromise position between the extremes of maximum security (the energy component) and maximum liberty (the entropy component). A more negative ΔH favors spontaneous reaction, and a more positive ΔS favors spontaneous reaction, in both instances making ΔG more negative."

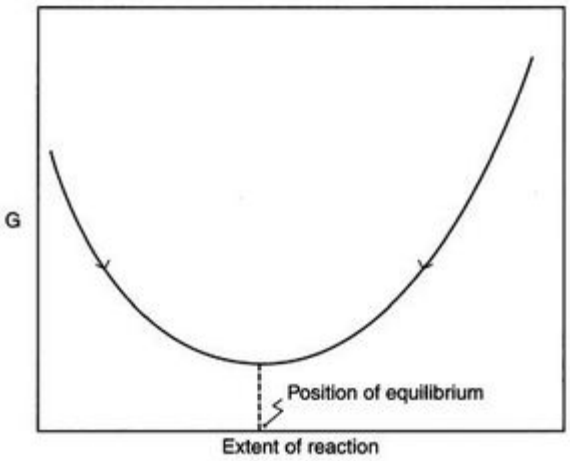

Connor's figure 3.1 captioned as "free energy of a reacting chemical system, showing how the direction of the reaction depends on the initial state of the system", amid his free energy and political science discussions. [19]

Connors, to note, does cite Rossini's 1950 *Chemical Thermodynamics* textbook twice, though he does not cite nor seem to be aware of his 1971 Priestley Medal address or of the Rossini debate (in his 2010 second edition). In 2014, Libb Thims email queried Connors (and Mecozzi) to see if they knew of Rossini's political suppositions, but there was no response. [20]

See also

- Detractors
- Human thermodynamics (objections to)
- Libb Thims (attack)

● What is entropy debate?

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(d) Priestley Medal – Wikipedia.
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θΔics

In hmolscience, **Rossini hypothesis** refers to postulate, proposal, supposition, and or reality view, depending on one's disposition, that chemical thermodynamics applies to governance of freedom and security in social systems, determined by a balance between entropy and enthalpy differentials, respectively.

Overview

The Rossini hypothesis was introduced in 1971 by American physical chemist and chemical thermodynamicist Frederick Rossini at the end of his Priestly Medal address "Chemical Thermodynamics in the Real World". [1]

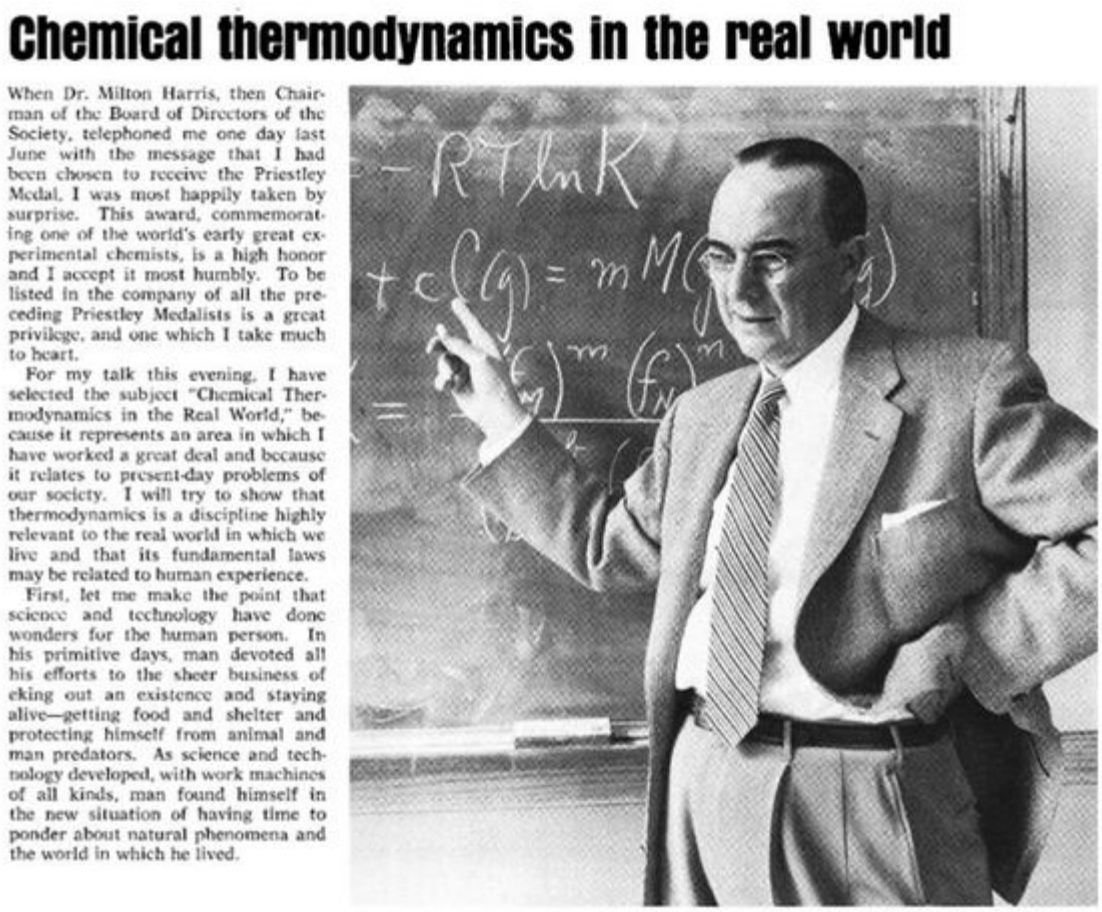

Chemical thermodynamics in the real world

When Dr. Milton Harris, then Chairman of the Board of Directors of the Society, telephoned me one day last June with the message that I had been chosen to receive the Priestley Medal, I was most happily taken by surprise. This award, commemorating one of the world's early great experimental chemists, is a high honor and I accept it most humbly. To be listed in the company of all the preceding Priestley Medalists is a great privilege, and one which I take much to heart.

For my talk this evening, I have selected the subject "Chemical Thermodynamics in the Real World," because it represents an area in which I have worked a great deal and because it relates to present-day problems of our society. I will try to show that thermodynamics is a discipline highly relevant to the real world in which we live and that its fundamental laws may be related to human experience.

First, let me make the point that science and technology have done wonders for the human person. In his primitive days, man devoted all his efforts to the sheer business of eking out an existence and staying alive—getting food and shelter and protecting himself from animal and man predators. As science and technology developed, with work machines of all kinds, man found himself in the new situation of having time to ponder about natural phenomena and the world in which he lived.

Opening section of the four-page article reprint of American chemical engineer and physical chemist Frederick Rossini's 29 March 1971 "Chemical Thermodynamics in the Real World" Priestley Medal Address, from the *Journal of Chemical & Engineering News*, wherein he explains how applies chemical thermodynamics to explain freedom and security of people in society, aka the **Rossini hypothesis**. [1]

In 2006, American chemist Harold Leonard sent a letter, entitled "Chemical Thermodynamics in the Real World", to the *Journal of Chemical Education*, in which he made the suggestion that Rossini's chemical thermodynamics views freedom and security might help the world leaders better understand terrorism in the post 9/11 world. [2]

In response, and opposition, to this proposal, American creationist physical chemist John Wojcik, sent in a response letter stating that he viewed this to be a "dangerous" – a word he used four times – proposal and should not be pursued. [3] This launched the so-called "Rossini debate".

The term "Rossini hypothesis" was used in 2014, by American electrochemical engineer Libb Thims, during his "Top 20 YouTube Atheism Channels" countdown, as a quick video presentation term to describe Rossini's proposal and its social system reforming ramifications. (Ñº)

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θΔics

In existographies, **Roumen Tsekov** (c.1950-) is a Bulgarian physical chemist, noted for []

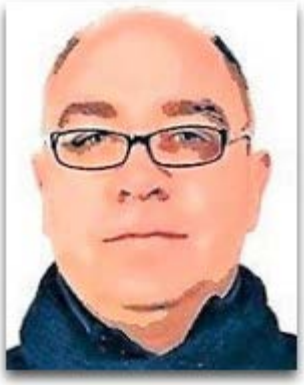

Overview

In 2015, Tsekov, in his "How Social Thermodynamics Could Help Greece", penned a short chemical thermodynamics model of a country as a thermodynamic system, with the idea that when a country is in equilibrium, it has the same chemical potential as other countries, and therefore the same exploitation as other countries, and migration rates are small, or something along these lines; the following is his abstract:

> "An urgent attempt is made to apply thermodynamic laws to the Greek society. A negative social entropy production is predicted, which could be achieved either by a military regime or by a restrictive agreement with the creditors of Greece."

(add)

Quotes | By

The following are quotes by Tsekov:

> "It is a pity that no one knows the equation of state of Greece now."
>
> — Roumen Tsekov (2015), "How Social Thermodynamics Could Help Greece" [1]

References

1. Tsekov, Roumen. (2015). "How Social Thermodynamics Could Help Greece" (pdf), Jul. ResearchGate.net.

External links

â— Roumen Tsekov – ResearchGate.net.
â— Roumen Tsekov (faculty) – Sofia University.

θΔics

In hmolscience, **Roxana Chisleag** (1979-), or Ioana-Roxana Chisleag Losada, is a Romanian lawyer and mathematics-physics enthusiast noted for her joint 2011 socio-optics human quantum mechanics theory of social tunneling, co-written with her father Romanian physicist Radu Chisleag, wherein they applied quantum mechanics, specifically the tunneling effect, to analysis of crossing of social barriers and financial relationship jumps, modeling a human as a quantum particle. [1]

Education

In elementary school, Losada was very good in mathematics, including a prize at Olympiad, in Bucharest. In this period, she began to discuss physics models with her father, Romanian physicist Radu Chisleag, and in her later years began to search for applications of physics to the social discipline.

Losada completed her undergraduate education at the German School Bucharest, now Goethe-Gymnasium Bucharest.

In 1998, she studied law at Ruprecht-Karls-University, Heidelberg (2001) and Facolta de Giurisprudenza, University di Bologna, Italy (2002), getting her JD in 2005 and passed the German bar in 2012. Losada, her native language Romanian aside, is fluent in German, English, Italian, French, and Spanish, and in 2005 was certified as a translator and interpreter for German language at the Romanian Ministry of Judicial Affairs. Losada, currently, is a corporate legal counsel at ZEPTER Group, HQ.

Lawyer | Scientists

Other noted lawyer-scientists include:

- Johann Goethe
- Brooks Adams
- Emanuele Sell
- Tom Bell
- Justin Lancaster
- Dimitris Keranis
- Satch Ejike

References

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θΔics

In human physics, **Le Roy F. Henderson** (1927-), or Leroy Henderson or L.F. Henderson, is an Australian mechanical engineer and crowd dynamics researcher noted for his 1970s models of crowd behavior and pedestrian traffic on fluid mechanics (human fluid models) and ideal gas models (human particle models). [1]

Crowd dynamics

Henderson's first paper on human crowd motion was his the highly-cited 1971 “The Statistics of Crowd Fluids”, Henderson who monitored the movements of college students on a campus and children on a playground, finding that in both cases their movements fit the Maxwell-Boltzmann distribution, meaning that both velocities of gas particles and the speeds of students follow a Gaussian distribution. Henderson, according to Len Fisher (2009), also, interestingly, noted a difference between the movements of children as compared to college students in that children had much more energy [or kinetic energy] and consequently moved at much higher average speeds. [2]

In 1972, Henderson did research on crowd flow at Princeton University’s aerospace and mechanical sciences department. [3] The following year, working at the University of Tokyo, he produced a report entitled “On the Theory of Human Crowd Flow”. [4]

Education

Henderson completed his BS in civil engineering in 1950 at Melbourne University, his MS, with a thesis on "The Water Jet Pump Problem", in engineering in 1952 at Melbourne University, his PhD with a thesis on "The Process of Establishing Flow in Supersonic Intakes" at University of Sydney in 1964, and his EngD with a thesis on "Gas Dynamic Papers" in 1969 at Melbourne University. From 1962 to 1989, Henderson was a professor at the University of Sydney's mechanical engineering department, where he taught courses in fluid mechanics, classical thermodynamics, and statistical thermodynamics. He retired from that position in 1990. [3]

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External links

- Le Roy F. Henderson (honorary professor) – University of Sidney.
- Le Roy Henderson (publications) – University of Sidney.

θΔics

In hmolscience, **Roy Sellars** (1880-1973) was a Canadian-born American philosopher noted for []

Overview

In 1925, Sellars, in his *Evolutionary Naturalism*, outlined his evolution objections, one of which was an objection to the supposition that evolution is random. [1]

In 1944, Sellars, in his "Reformed Materialism and Intrinsic Endurance", was attempting to sell an ontic opening argument, which he termed "immanent causality", a statement of which is as follows:

> "The drift of my own thought has been in the direction of a reformed materialism less dominated by extreme atomism and strict mechanical notions than has usually been the case in materialism. Recognition is given to internal relations, to integration, to **immanent causality**, to emergence and local wholeness. At the same time, epistemological reflection has convinced me that material systems have far more to them than is grasped by abstract scientific knowledge about their composition and properties. Dualistic traditions have been hurtful here. Likewise injurious has been the human denial of causal agency. It is my opinion that we must think more along the lines of a reformed notion of *substantive being* fully capable of doing justice to becoming, events, and process."

In 1956, Judson Herrick, in his *The Evolution of Human Nature*, was using Sellars immanent causality theory, to salvage his theological beliefs, to argue that a human is a "free moral agent" and that nature has a freedom-infused determinism that is not pre-determined, in a bend-over-backward incorrigible way. [2]

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External links

â— Roy Wood Sellars – Wikipedia.
â— Roy Wood Sellars – Internet Encyclopedia of Philosophy.

θΔics

In hmolscience, **E. Roy Weintraub** (1943-) is an American mathematician and economist noted for his 1991 *Stabilizing Dynamics: Constructing Economic Knowledge*, wherein he gives a rather detailed look at the dynamics of the famous Harvard Pareto circle. [1]

Education

Weintraub completed his AB in 1964 in mathematics at Swarthmore College and his MS (1967) and PhD (1969) both in applied mathematics, focused in economics, under advisors noted "Gibbs circle" economist Lawrence Klein and mathematician Herbert Wilf, at the University of Pennsylvania. This educational background, to clarify, would seem to put Weintraub in the lineage of what American economist Paul Samuelson refers to as the "Gibbs circle in economics": [2]

> "My title could just as aptly have been: **'The Gibbs Circle in Economics'**. It would of course have begun in New Haven with Irving Fisher at its epicenter. Edwin Wilson, Gibbs' last protégé, transported his tradition to MIT and Harvard. Lawrence Henderson, Harvard physiologist turned philosopher and zealot for Pareto's sociology, was not quite an economist but he did proselytized for Gibbsian equilibrium in blood and elites. Wilson was my master, first among equals. Through his lineage I could claim Gibbs as my grandfather; and when my first PhD student Lawrence Klein came to generalize the Le Chatelier's principle to quadratic forms of statistical variances, this Nobelist could claim rights to the apostolic succession."

To this group, Samuelson adds in Jan Tinbergen and Tjalling Koopmans as two Nobel laureates in economics who showed Gibbsian Influence.

Weintraub currently is an economics professor at Duke University (see also: Adrian Bejan and Alexander Rosenberg).

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External links

â— E. Roy Weintraub – Wikipedia.
â— E. Roy Weintraub (faculty) – Duke University.

θΔics

In namesakes, **royal name** refers to certain titles, e.g. "lord", "count", "von", etc., given to certain famous individuals.

Overview

The following are some hmolscience royal names that are seen frequently in modern print:

- Lord Kelvin (royal name) → William Thomson (actual name)
- Lord Byron (royal name) → George Byron (actual name)
- Count Rumford (royal name) → Benjamin Thompson (actual name)
- Lord Rayleigh (royal name) → John Strutt (actual name)

Hmolpedia uses “actual names” over royal names and also to truncate all royal affixers down, such as follows:

- Hermann von Helmholtz → Hermann Helmholtz

(add synopsis)

θΔics

In human thermodynamics, **Ruby Jeffers** (c.1950-) is an Irish philosopher noted for her 1992 23-page pamphlet or article *E=mc² and Thermodynamics of Being in the Human System of Organization: the Dream of Engineering Precision*, focused on the subjects of vital force, ATP, humans, and philosophy. [1]

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External links

- Jeffers, Ruby – WorldCat Identities.

θΔics

In hmolscience, **Rudolf Arnheim** (1904-2007) was a German-born American psychologist and visual arts theorist noted, in art thermodynamics, for his 1971 publication on entropy, order, disorder, and art.

Overview

In 1971, Arnheim, in his booklet *Entropy and Art: an Essay on Disorder and Order*, attempted to reconcile the disturbing contradiction between the striving for order in nature and in man and the principle of entropy implicit in the second law of thermodynamics; between the tendency toward greater organization and the general trend of the material universe toward death and disorder. [1]

Education

Arnheim was a professor emeritus of psychology of art at Harvard University and spent a number of years on the psychology faculties at Sarah Lawrence College and the University of Michigan.

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θΔics

In existographies, **Rudolf Clausius** (1822-1888) (IQ:195|#7) [RGM:1264|1,500+] (GS:5) (SIG:3) (RE:66) [CR:829] was a German physicist noted for being the central founder of thermodynamics, which he accomplished through the publication of his nine memoirs on the mechanical theory of heat (1850-1865), as contained in his 1865 textbook *The Mechanical Theory of Heat* (*Mechanische Wärmetheorie*), and polished and re-ordered textbook like 1875 second edition, therein defining the two main laws of the universe, i.e. the first main principle (first law) and second main principle (second law) of thermodynamics.

Nationality	German
Fields	Physics Thermodynamics
Alma matter	University of Halle
Students	Max Planck (indirect) Willard Gibbs (indirect)
Known for	Entropy Kinetic theory Thermodynamics
Eponyms	Clausius entropy Clausius inequality Clausius postulate Clausius tombstone
Influences	Sadi Carnot

Signature

Overview

In 1850, Clausius, in his first article "On the Moving Force of Heat and the Laws of Heat which may be Deduced Therefrom", grouped and refined the earlier work of French physicist Sadi Carnot (*Reflections on the Motive Power of Fire*, 1824) on the assumed reversibility of the working body together with the mechanical equivalent of heat measurements of English physicist James Joule ("On the Mechanical Equivalent of Heat", 1845), in the development of the conservation of energy, thus framing the outline of what he called the second main principle and first main principle (second law and first law of thermodynamics), respectively, in equation format, later encapsulated in the form of the ten fundamental equations of thermodynamics, as indicated by roman numerals in the second edition (1875) of his textbook. [1] The following is the gist of his quantitative re-formulation of heat in respect to the Carnot cycle:

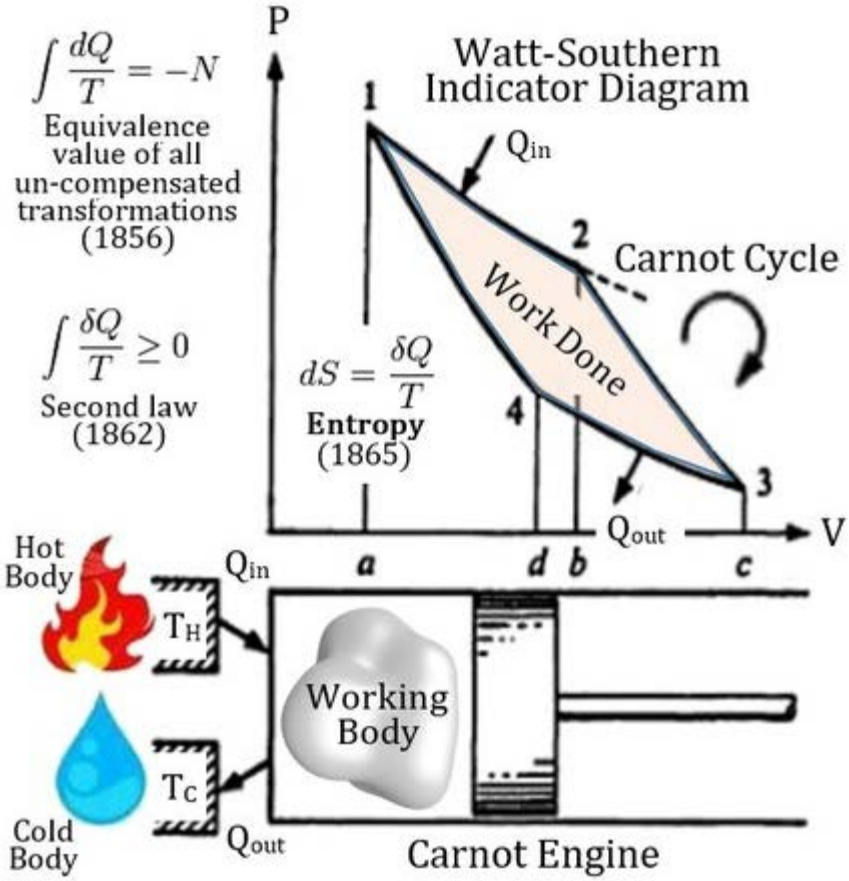

Clausius' 1875 textbook, in short, is the definitive textbook of thermodynamics, upon which all branches of thermodynamics are built.

In Clausius' nine memoirs, through the development of his conception of quantity entropy, symbol *S*, and its relation to irreversibility in engine cycles, Clausius pulled together a number of philosophical cornerstones, such as time, heat, friction, chemistry, transformation, spontaneity, conservation and others, into one cohesive theory namely the first and second laws of thermodynamics, otherwise known as the "dynamical theory of heat".

The paper that spurred Clausius on in his quest to formulated laws on the relationship between heat and work was French physicist Sadi Carnot's 1824 publication "Reflections on the Motive Power of Fire". The sentence of Carnot's paper that caught the direct attention of Clausius is, in Clausius' own words, that: [2]

> "Whenever work is done by heat (on a body in a cycle) no permanent change occurs in the condition of the working body [and that to deny this] would overthrow the whole theory of heat, of which it is the foundation."

In this statement, in particular, according to Clausius, that a change does occur in the condition of the working body, Clausius saw his existence's work before him.

The collected papers of Clausius, constituting two volumes, total 16 papers: 1-9 (1850-65) on thermodynamics, 10-13 (1852-57) on the theory of electricity, and 14-16 (1857-62) are on gas theory. [3]

In his 1857 article "On the Nature of Heat Compared with Light and Sound", Clausius compared heat, light, and sound to give a Boltzmann-Ebeling like description of the earth ecosystem based on metabolic needs, insulation, and chemical affinities. [12]

Kinetic theory

In 1857, Clausius published his "On the Nature of the Movement which we call Heat", in which, according to his own words independently of German chemist and physicist August Krönig, and his 1856 "A General Theory of Gases", developed a similar, but much more sophisticated version of the theory which included translational and contrary to Krönig also rotational and vibrational molecular motions. [6] In a followup 1858 paper, Clausius he introduced the concept of mean free path of a particle.

Education

Clausius' early education was at a small private school, where his father was the principle. Following private schooling, Clausius moved on to the Gymnasium in Stettin. In 1840, at the age of 18, Clausius entered the University of Berlin in which he first entertained thoughts of a degree in history, but eventually settled on a degree in mathematics and physics, completed in 1844. He then spent a probationary year at the Frederic-Werder Gymnasium teaching advanced classes in mathematical physics.

Clausius completed his PhD dissertation in 1847 (or 1848), entitled *On those Atmospheric Particles that Reflect Light* (*De iis Atmosphaere Particulis quibus lumen Reflectitur*i), under German mathematician and physical chemist Johann Schweigger, which proposed an explanation for the blue color of the sky, the red colors seen at sunrise and sunset, and the polarization of light, at the University of Halle (Martin-Luther-Universität Halle-Wittenberg). [5]

in 1850 was appointed professor of physics in the royal artillery and

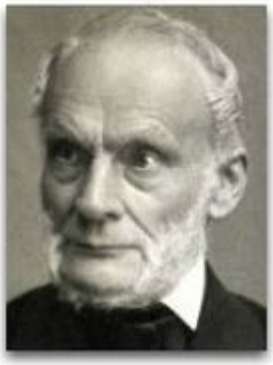

Other photos of Clausius.

engineering school at Berlin. Late in the same year he delivered his inaugural lecture as *Privatdocent* in the university. [11]

In 1855, Clausius became a physics professor at the Polytechnic School in Zurich and two years later, in 1857, he was appointed to the same position in the University of Zurich. In 1867 he moved to Würzburg as professor of physics. [11] In 1869, he became a physics professor at the University of Bonn, where he remained until his dereaction (death) in 1888. [9]

American physicist Michael Guillen gives a fairly detailed biographical overview of Clausius in chapter "Unprofitably Experience" on the second law in his 1995 book *Five Equations that Changed the World.* [10]

Social mechanics

See also: Leon Winiarski

In *circa* 1880, Clausius gave a talk on “On the Energy Supplies of Nature and the Utilization of them for the Benefit of Mankind” (published in book form in 1885), which, according to Spanish applied mathematics historian Jose Pacheco, was said to have inspired Austrian science teacher Eduard Sacher to write his 1881 book *Outline of a Mechanics of Society*. [8]

Quotes | On

The following are quotes on Clausius:

> “The German Ikari flap their waxen wings in Cloud Cuckoo Land [nephelokokkygia].”
>
> — James Maxwell (c.1872), on Rudolf Clausius’ 1871 “Reduction of the Second Law of Thermodynamics to General Mechanical Principles” [14]

> “Before **Clausius**, truth and error were in a confusing state of mixture, and wrong answers were confidently urged by the highest authorities.”
>
> — Willard Gibbs (1889), “Rudolf Julius Emanuel Clausius” [13]

> “The work of **Clausius** lies not on the shelves of libraries, but in the thoughts of men, and in the history of more than one science.”
>
> — Willard Gibbs (1889), “Rudolf Julius Emanuel Clausius” [7]

"**Clausius** deduced his proof of the second law of thermodynamics from the hypothesis that: 'heat will not pass spontaneously from a colder to a hotter body.' This means not only that heat will not pass directly from a colder into a warmer body, but also that it is impossible to transmit, by any means, heat from a colder into a hotter body without there remaining in nature some change to serve as compensation. In my endeavor to clarify this point as fully as possible, I discovered a way to express this hypothesis in a form which I considered to be simpler and more convenient, namely: 'the process of heat conduction cannot be completely reversed by any means.' This expresses the same idea as the wording of Clausius, but without requiring an additional clarifying explanation. A process which in no manner can be completely reversed I called a 'natural' one. The term for it in universal use today, is: 'Irreversible'."

— Max Planck (1949), *Scientific Autobiography* (pgs. 16-17)

Quotes | By

The following are noted quotes:

"Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, work is performed."

— Rudolf Clausius (1875), "Mathematical Introduction"

For the present I will confine myself to the statement of one result. If for the entire universe we conceive the same magnitude to be determined, consistently and with due regard to all circumstances, which for a single body I have called *entropy*, and if at the same time we introduce the other and simpler conception of energy, we may express in the following manner the fundamental laws of the universe which correspond to the two fundamental theorems of the mechanical theory of heat.

1. *The energy of the universe is constant.*
2. *The entropy of the universe tends to a maximum.*

Original English translation of the famous April 24, 1865 statement of the two laws of the universe by Clausius. [4]

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â— Rudolf Clausius – NNDB.com.
â— Rudolf Clausius – Eric Weisstein's World of Scientific Biography.
â— Clausius T-shirt - Photo (and his famous enunciation of the two laws).
â— Clausius Tower Society - Koszalin University of Technology.

θΔics

In hmolscience, **Rudolf Starkermann** (c.1934-) is a German-born Canadian mechanical engineer noted for []

Overview

In 1986, Starkermann, in his “Social Entropy, Enthalpy, Exergy in Psychosocial Systems: a Notion”, presented at the International Conference on Mental Images, Values, and Reality, seems to have been the first to use the term “social enthalpy”, specifically he listed social enthalpy in the following key term format: [1]

> “Hc = **social enthalpy**, the total information package of a social ° unit (individual) , which includes the speed of association of thoughts, the speed of action and the will power a) to reach its own goal and b) to communicate. H can differ from individual to individual.”

Another ripe passage from the conference, is the following: [1]

> realities, the willed future, and the planned initiatives expected to move the organization towards the willed future. To date, we have assisted top management in 35 situations to prepare such a plan. It has no quantification or stated specific time dimension. It is written in binding words.
>
> Related systems theories include Ashby's views on adaptation, the concepts of equifinality, autopoieses, and Le Chatelier's principle.

showing, possibly Starkermann, attempting to formulate an organization management theory, employing: Ross Ashby's theories on adaption, equifinality, autopoieses, and Le Chatelier's principle. Somehow, as shown adjacent, we see with Starkermann's discussions of "information packet", "exchanged information", etc., would seem to be mixed up with Claude Shannon, in some way or another, and information theory, who is cited in the conference.

In 1988, Starkermann, in his “Social Entropy, Enthalpy, Exergy and Disergy in Examples”, gives the following abstract: [2]

> “For the thermodynamic terms entropy, enthalpy and exergy, parallel terms for the psychosocial area of communication are illustrated. The thermodynamic notion energy is paralleled by dynamic information, the molecule by a goal-oriented social individual, exergy by the maximum goal attainment of the individuals who constitute a communication system, enthalpy by the will of action and the associated activity, and entropy by the density of communication, the amount of information exchanged and the classification of communication (as devotional, aggressive or destructive). The absolute temperature in thermodynamics is paralleled by the speed with which information is exchanged. The term disergy (distracting energy) is added and illustrated in cases where the communication system is open to outside environment.”

Here we see "disergy", which seems to be some type of new or rare term? Starkermann, in his "molecule by a goal-oriented social individual" statement, seems to define an individual person as human molecule, albeit goal-oriented one. By defining exergy as the "maximum goal attainment of the individuals who constitute a communication system", we see interesting insight. By defining enthalpy as the "will of action and the associated activity", again we see interesting insight, in need of further investigation.

In 2003, Starkermann, in his *Amity and Enmity: Two Archetypes of Social Existence: an Interdisciplinary Study*, opened to the following preamble: [1]

> "The laws of nature existed prior to the creation of all that is. The laws of nature are responsible for either the big bang or whatever else might have brought our solar system into being and as such must be considered immutable. These natural laws determine the behavior of all matter and energy. These laws are in effect daily and in ongoing events, and they may lie dormant in a given realm until the conditions permit them to come into force. There is no doubt that all movements and events in the universe, biological, sociological, psychological, or technical, are consistent with the laws of nature. In order to justify the attempt to describe social occurrences and behavioral patterns by means of mathematical-physical models, the subject of this book is the acceptance that everything that takes place or happens, in short that all events, are based on the laws of nature and that this acceptance is inevitable."

(add discussion)

Education

In 1986, Stakermann was associated with the University of New Brunswick, Canada, and was listed in *Who's Who in Technology*, as being some sort of expert on "systems theory applied in psychosocial behavior". (Ñº)

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External links

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â— Rudolf Starkermann (works) – Starkermann.com.

θΔics

In existographies, **Rudolf Steiner** (1861-1925) (CR:14) was an Austrian philosopher noted for his writings on Goethe and his philosophy, particularly metamorphosis and metamorphology evolution theory, among other topics, such as Goethe's views on the secret principle of nature. [1]

Overview

In 1883, at age 21, Rudolf Steiner was chosen to edit Goethe's scientific writings for the principle Goethe edition of his time; it was Steiner's task to understand and comment on Goethe's scientific achievements. Steiner recognized the significance of Goethe's work with nature and his epistemology, and here began Steiner's own training in epistemology and insight into Goethe's monistic view of nature. [4]

Some categorized Steiner among the early theorists to attempt relationship physics type theories of love. [2]

Machine | Organism

The following is Steiner's 1883 position on the difference between a machine and an organism: [3]

> "What is essential in the machine is only the interaction of its parts. The unifying principle that governs that interaction does not exist in the object itself but outside it as a plan in the head of its builder. Only the most extreme shortsightedness can deny that the difference between an organism and a mechanism is precisely the fact that in a machine the determining principle governing the interrelationship of its parts is external (and abstract), whereas in an organism it assumes a real existence in the object itself. Thus, the sense—perceptible conditions of an organism do not appear merely to follow one from another, but are governed by an inner principle that is imperceptible to the senses. In this sense this principle is no more perceptible to the senses than the plan in the builder's head, which is also present only to the mind. Essentially, it is such a plan, except that it has entered the organism's inner being and affects it directly, not through a third party, the builder."

(add discussion)

Issues

Of note, Steiner, to some, has accumulated a tarnished name, owing to his attempts to stitch together spirituality together with Goethe and science; some classifying his version of Goethean science (or spiritual science, as he seems to have labeled it) as pseudoscience. (O)

-

Quotes | By

The following are quotes by Steiner:

-

> "Man becomes perfect when he lives as an Osiris. In this way, the Osiris myth receives its deeper significance. It becomes the example of a man who wishes to awaken the eternal within him."
>
> — Rudolf Steiner (1914), *Christianity as a Mystical Fact* (O)(O)

-

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External links

● Rudolf Steiner – Wikipedia.

θΔics

In hmolscience, **Rudolph Rummel** (1932-2014) was an American political scientist noted for []

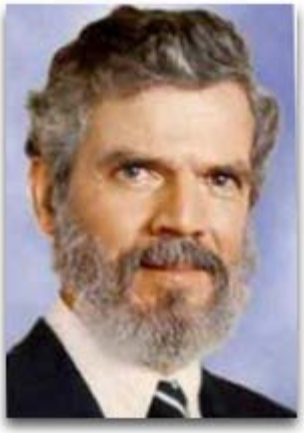

Overview

In 1975, Rummel, in his *Understanding Conflict and War*, devoted chapter two to physical field theories, psychological field, electromagnetic fields, and gravitational fields; amid which, however, seemingly harboring some type of implicit religious conflict, being that employs god talk stylized quotes (e.g. by Alexander Pope) freely, and he gives the following warning in his opening notes: [2]

> "The term 'field' carries with it physicalist overtones the reader should guard against. Unfortunately, the use of 'field theory' in the social sciences often has been part of a conscious attempt to extend the meaning and structure of physical fields, gravitational or electromagnetic, to include the social realm, with notable lack of success. However, the field conception advocated here grew from social analyses (of international relations) and only after full conceptual, mathematical, and operational elaboration, was convergence with physical field theories sought. Therefore, be warned, constructs like space, time, force, position, and component have psychological and sociological meanings and not the interpretations *conceptually* given them in physical nature (although, as we shall see, the mathematical interpretation is often similar and there is some conceptual overlap)."

He cited George Lundberg (1964) and George Devereux (1940) as approaches not to follow and or approaches that he will not employ. [3]

In 1977, Rummel, in his *Field Theory Evolving*, building on the earlier physics-based social field theory work of Kurt Lewin (1951), attempted to outline a metaphorical social field theory, albeit one that takes the Pitirim Sorokin (closet theist) view, namely that to "import physics in social sciences is a naïve pursuit and a ridiculous effort". [1]

Quotes | Cited

The following are chapter header quotes employed by Rummel:

> "There are two worlds; the world that we can measure with line and rule, and the world that we feel with our hearts and imagination."
>
> — Leigh Hunt (1847), *Men, Women and Books* (Ñº)

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External links

â— Rudolf Rummel – Wikipedia.

θΔics

In terminology, **rule** (TR=394), from Latin *regula* 'straightedge', from *regere* 'to direct', more at 'right' (13th century), is []

rule
/rōōl/

noun

1. one of a set of explicit or understood regulations or principles governing conduct within a particular activity or sphere.

A Google-generated definition of **rule** as regulations or principles governing conduct in certain scenarios of spheres of activity.

Quotes

The following are related quotes:

> "Reading a book on ethics is, for a scientific mind, a source of great astonishment. The systems are innumerable but the conclusions are alike. Whether the system of ethics treated be religious or utilitarian, whether it be finalistic or pragmatic, it leads invariably to an ensemble of very precise **rules**, which are, with very few variations, a humanized code for our civilized world.
>
> As for the method which evolved these laws—almost always being peculiar to the social sciences—the line of reasoning begins with concepts which are not very clearly defined. It involves hypotheses which have not been enunciated, and all too often, the true, the beautiful, the good—undefined or undefinable entities—interpose at each step to lead it wherever one may wish to go. Why does the geometrician—the mind of the physicist—feel he steps on quicksand the moment he enters the realm of the moralist? If the **rules** of morals are one, why are the systems of ethics without number?"
>
> — Jacques Rueff (1922), *From the Physical to the Moral Sciences* [1]

> "In practice different processes differ greatly in degree of irreversibility; but it is a universal **rule** that if any isothermal process is to occur with finite velocity, it is necessary that a $-\Delta G > w'$. [This applies to] a chemical process which is in some way harnessed for the production of useful work. In the far more common case of a reaction which runs freely, like the combustion of a fuel, or the action of an acid upon a metal; in other words, systems which are subject to no external forces except a constant pressure [exerted by the atmosphere]. In such cases $w' = 0$, and it follows that no actual isothermal processes is possible unless: $\Delta G < 0$."
>
> — Gilbert Lewis (1923), *Chemical Thermodynamics and the Free Energy of Chemical Substances* [2]

> "It can be shown that in all cases, that human molecules rise and fall within the class into which they are born, in a manner which fits the hypothesis that they do so because of their relative aptitudes; and it can also be shown, second, that they rise and fall across the boundary lines of their class in the same manner. This rise and fall into higher and lower classes as a **rule** takes more than one generation. These molecules are therefore families [see: family molecule] rather than individuals. And this explains why observers who focus attention on individuals so frequently fail to find any relation between ability and class position."
>
> — Joseph Schumpeter (1942), *Capitalism, Socialism, and Democracy*

> "If the **rule** you followed brought you to this, of what use was the rule?"
>
> — Joel Coen and Ethan Coen (2007), Dialog: Anton Chigurh to Carson Wells, in *No Country for Old Men*

See also

- Phase rule
- Octet rule (Abegg's rule)
- Universal rule

References

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2. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pgs. 160-61), McGraw-Hill Book Co., Inc.
3. Schumpeter, Joseph. (1942). *Capitalism, Socialism, and Democracy* (§18: The Human Element, pgs. 200-218; human molecules, pg. 204). Routledge.

External links

- Rule – Wikipedia.

θΔics

In hmolscience, **Rupert Riedl** (1925-2005) was an Austrian zoologist noted, in evolution thermodynamics, for his 1978 *Order in Living Systems: a Systems Analysis of Evolution*, in which he attempts to grapple with the second law evolution issue, in regards to how animate systems (living systems) build up order, in a universe governed by the second law, which in his view means that systems tend to pass from order to disorder.

Overview

In 1978, Riedl, in his *Order in Living Systems: a Systems Analysis of Evolution*, argued that living organisms do not violate the second law, but rather, in his view, organisms are open systems they are able to evade the second law. In some way or another he describes the entire process as being "exentropic", i.e. an entropy antonym term, owing to the flow of energy from the sun to outer space, but that local processes may lead to order such as a sonnet or the smile on a Mona Lisa. [1] This solution, however, seems to be but a rehash of Belgian-born English thermodynamicist Alfred Ubbelohde 1947 local entropy decrease models of life.

Riedl's main thesis, according to American natural scientist Justin Lancaster, is that basic chemical self-organization is the driving force of evolution. [2]

References

1. Riedly, Rupert. (1978). *Order in Living Systems: a Systems Analysis of Evolution* (thermodynamics, 8+ pgs). Wiley.
2. Lancaster, Justin. (1989). "The Theory of Radially Evolving Energy" (abs), *Int. J. General Systems*, 16: 43-73.

External links

â— Rupert Riedl – Wikipedia.

θΔics

In fringe science, **Rupert Sheldrake** (1942-) (CR=6) is an English biologist, biochemist, and natural scientist turned new age theorist, a Deepak Chopra comrade, noted for his 1981 theory of morphic fields (or morphogenetic fields), which he says are a new kind of biological-themed form-generating field, in addition to the gravitational, electrical, magnetic, and quantum fields, already recognized by physics, which, that explains peculiar "mental field" phenomena in the development and behavior of plants and animals, such as homing behavior, the sense of being stared at, hunted, or cheated on, etc., accelerated learning based on past cultural repetitions, seizure sense ability in dogs, earthquake sensing animals, among other similar parapsychology phenomenon, e.g. premonitions, many of which he has designed tests for with mostly semi-questionable but sometimes semi-curious results. [1]

Mental fields | Discussion

The bulk of Sheldrake's arguments are anecdotal, based on selections of personal interviews, while other finds are based on semi-scientific studies, which generate results near the neutral range of findings, give or take. While most seem to dismiss Sheldrake's work as quackery, he is, nevertheless, grappling with attempts to explain peculiar and semi-puzzling and yet completely explain phenomena, such as Ernst Mach's turning tendencies of people and animals, or the say "feeling" that something just isn't right, and so on; the fact that he avoids anchoring his theories in the gravito-electromagnetic field, seems to be his main detriment.

Quotes | About

The following are quotes about Sheldrake:

> "A few last points, regarding physical evidence the human wave function, please see ch. 8 (*Human Chemistry*), where I derive the Schrodinger equation, in the context of human molecular orbital theory. The first crude types of human wave functions (turning tendencies) were drawn by Ernst Mach in 1885. There is a big difference, of course, between a wave function of an electron and a molecule, but both expressions are, however, derived starting with the Lagrangian. Regarding coherence and decoherence, this is a marginal topic in that very little has been said or understood on how this applies to human activity. The few examples of application include the questionable postulates of **Rupert Sheldrake** (e.g. pg. 273 of *Sense of Being Stared At*) or David Bohm, etc., e.g. twins who remain aware of each other when a tragic injury occurs. Most of these topics, however, are far removed from human thermodynamics, let alone entropy."
>
> — Libb Thims (2009), "Moriarty-Thims debate" (#18), Sep 5

Quotes

The following are example Sheldrake quotes:

> "For more than 200 years, materialists have promised that science will eventually explain everything in terms of physics and chemistry. Science will prove that living organisms are complex machines, minds are nothing but brain activity, and nature is purposeless. Believers are sustained by the faith that scientific discoveries will justify their beliefs. Karl Popper called this 'promissory materialism' because it depends on issuing promissory notes for discoveries not yet made."
>
> — Rupert Sheldrake (2012), *Science Set Free* [1]

References

1. (a) Sheldrake, Rupert. (1981). "Formative Causation: the Hypothesis Supported", *New Scientist* (pgs. 279-80), Oct 27.
(b) Sheldrake, Rupert. (1981). *A New Science of Life: the Hypothesis of Formative Causation*. Blond & Brighs.

(c) Arnopoulos, Paris. (1993). *Sociophysics: Cosmos and Chaos in Nature and Culture* (matter and mind, pg. xiviii; purpose, pg. li). Nova Publishers, 2005.
2. Sheldrake, Rupert. (2012). *Science Set Free: 10 Paths to New Discovery* (pg. 9) (Q). Random House.

Further reading

● Sheldrake, Rupert. (1999). *Dogs that Know when Their Owners are Coming Home*. Crown Publishers.
● Sheldrake, Rupert. (2003). *The Sense of Being Started At: and Other Unexplained Powers of the Human Mind*. Crown Publishers.

External links

● Rupert Sheldrake – Wikipedia.
● Rupert Sheldrake (about) – Sheldrake.org.
● Sheldrake, Rupert – WorldCat Identities.

θΔics

In evolution thermodynamics, **Rush W. Dozier Jr.** (1950-2010) was an American science-technology journalist note for []

Overview

In 1992, Dozier, in his *Codes of Evolution*, employed the Heisenberg free will argument to explores recent discoveries about the synaptic code, explains how electrochemical connections among nerve cells control the mind, and discusses the relationship between synaptic research and human understanding of the larger universe, including hard science concepts such as: thermodynamics pulse, big bang wave front theory of time, edge of chaos, the double slit experiment, among others. [1] Treview of *Codes of Evolution* by American librarian Eric Hinsdale: [7]

> "Dozier attempts here to combine quantum mechanics, biological evolution, and neurology—the three 'codes of evolution'—into one comprehensive theory of the universe, which he calls 'unified selection'. Dozier does a job of explaining how the laws of quantum mechanics underlie molecular biology and how biology in turn is the foundation for current theories of consciousness. However, he fails to explain what any of this has to do with the "collapse of the wave function" or the "thermodynamic pulse," two catch phrases in this theory of unified selection that come up repeatedly."

Dover, as we see, is covering a lot of intellectual ground—though, in the end, the result tends to be rather superficial and in many places off base and or baseless, e.g. arguing that the randomness of uranium 238 decay yields indeterminism allowing for free will, following collapse of the wavefunction of the universe, or something along these lines.

Entropy

In attempting to explain "life" in a red shift based expanding universe, Dozier uses the classic deck of cards model of entropy, albeit modified with Velcro strips on one side of each card, such that they can only attach in 'collated order', i.e. 3 of Hearts to 4 of hearts to 5 of hearts, etc., to argue that shuffling such a 'sticky deck' leads to pockets of order that maintain coherence over successive shuffles, and that these pockets of order correspond to pockets of life building themselves up as 'the universe shuffles its way to maximum entropy.' [4] This sounds very Arthur Eddington sounding, but his book does not seem to cite Eddington.

Discussion

It remains to be discerned from where Dozier gets all his thermodynamic ideas from, as many seem to be relatively original, as far as HT pioneers go; especially since some of the material he discusses seems to be relatively advanced and original for a law school science journalist, particularly being that he mixes in social bonding neuroscience models together with big picture universe dynamics theories, which is very rare, to say the least.

Education

Dozier attended Harvard University and Vanderbilt University Law School, after which he worked at Lexington Kentucky as a journalist, became editor of the Herald Leader, and chief counsel to governor John Y. Brown. [3] Prior to 1999, Dozier was nominated for the Pulitzer prize. Dozier is also the author of evolutionary psychology themed books: *Fear Itself: The Origin and Nature of the Powerful Emotion that Shapes Our Lives and Our World* (1999) and *Why We Hate: Understanding, Curbing, and Eliminating Hate in Ourselves and Our World*

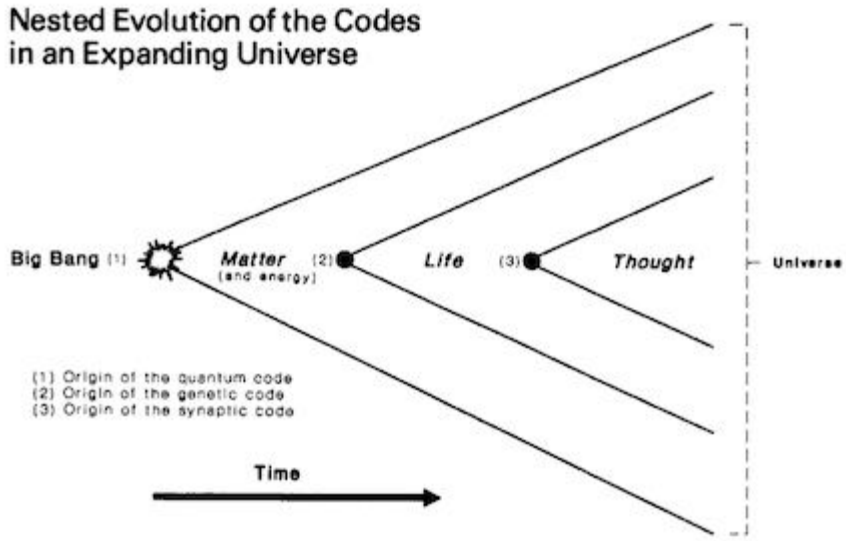

Dozier's "nested evolution" diagram, which explains that the entire universe is constructed from the fundamental codes of matter, life, and thought. He defines these as follows: quantum, genetic, and synaptic, all of which can be explained in terms of a hierarchical diagram. Each code is the pre-requisite for the next, and each generates the next one out of itself. The result is a process of holistic emergent evolution. This theory, supposedly, is similar to Austrian-born American astrophysicist Erich Jantsch's 1979 self-organizing universe autopoietic perspective. [2]

(2003).

References

1. Dozier, Rush W. (1992). *Codes of Evolution*: the Synaptic language Revealing the Secrets of Matter, Life, and Thought (nested evolution, pg. 6; thermodynamic pulse, pg. 198; deck of cards, pg. 208; thermodynamics, 11+ pgs). Crown Publishers Inc.
2. (a) Rush W. Dozier – Tumblr.
Jantsch, Erich. (1979). *Self-organizing Universe: Scientific and Human Implications of the Emerging Paradigm of Evolution* (thermodynamics, 10+ pgs). Hanser Verlag; English trans. Pergamon Press, 1980.
3. Blackford, Linda B. (2011). "Rush Dozier, former Lexington Journalist, State Government Official Dies", *Herald-Leader.com*, Jan 16.
4. Mathern, Bobby. (2002). "Review: Codes of Evolution", *A Reader's Journal*, Vol. 1.
5. Thermodynamics, Heat Death, and the Arrow of Time (2001) – Kheper.net.
6. Fisher, Len. (2009). *The Perfect Swarm: the Science of Complexity in Everyday Life* (edge of chaos, pgs. 2-3; Roy Henderson, pg. 24). Basic Books.
7. Hinsdale, Eric. (1992). "Review: *Codes of Evolution*", Trinity University Library, San Antonio, Reed Business Information, Inc.

External links

â— Dozier, Rush W. – WorldCat Identities.

θΔics

In thermodynamics schools, the **Russian school** of statistical mechanics, or Russian school of thermodynamics, is said to be based on ideas by Russian theoretical physicist Nikolay Bogolyubov; later developed by Dimitri N. Zubarev, S.V. Peletminskii, and others. [1] Thermodynamicist Ivan Bazarov is said to be a follower and disciple of Bogolyubov and Tanya Maslova is another example of vicarious student of Bogolyubov.

Complex systems thermodynamics

Russian scientist Vladimir Sychev seems to be an integral component of the complex systems thermodynamics division of the Russian school. Sychev seems to be part of the Russian school of thermodynamics or what might be better categorized as the Russian school of complex systems thermodynamics or possibly hierarchical thermodynamics. On 2 Jan 2011, Russian physical chemist Georgi Gladyshev commented the following to American electrochemical engineer Libb Thims in the *Hmolpedia* forums: [2]

> "You write at first on the classical free energy. This is enough for chemical simple systems and complex (*) chemical thermodynamic systems. However, in general case when we say on complex chemical thermodynamic systems and the systems of higher hierarchies we must say about free energy of complex systems (*), **V. Sychev**, G. Gladyshev, et al. I believe it will correct if you will write on this."

On 10 Jan 2011, Gladyshev elaborated to Thims as follows: [3]

> "Interactions and the behavior of humans can be described by the equations of complex system thermodynamics only. The human is not "a heat engine" or "steam engine"! I said this you many times in delicate form. I believe you must say on delta G*<0 ! In your *Encyclopedia* you present the opinions of different people. Many of them had no and have no any relation to professional physics, physical chemistry. Science is not decided by voices. Many of your articles in the *Encyclopedia* have only an interest to the history of human thoughts or the history of science. You have no general theory of your own. You discuss the meanings of some terms or of some words. By the way I would to say that your *Human Chemistry* (and the branches of human chemistry) is the component of hierarchical thermodynamics. I believe it is clear after reading of my books and textbooks of I. Bazarov, V. Sychev, R. Kubo, N. Bogolubov and others professional scientists. I think thermodynamics requires not only the knowledge of philosophy but the knowledge of mathematics at first. During some years I try little by little to correct your views, but it is in vain? However, I would like to hope you'll understand to me, and your Herculean efforts will be recognized by science. That's my opinion."

Ecological thermodynamics

In 2012, American ecological thermodynamicist Jeff Tuhtan began studying what he calls "Sychev-complex systems" (systems in which more than expansion work is performed) to ecological systems, particularly the fish-river system. [4]

References

1. Luzzi, Roberto, Rossas, Vaaconcellos, Aurea R., Ramos, Jose. (2000). *Statistical Foundations of Irreversible Thermodynamics* (Russian school, pg. 126). Vieweg+Teubner Verlag.
2. Gladyshev, Georgi. (2011). "Free Energy, Thermodynamics", *Hmolpedia* forums, Jan 2.
3. Gladyshev, Georgi. (2011). "Science", *Hmolpedia* forums, Jan 10.

θΔics

In hmolscience, **Ryan Grannell** (c.1991-) is an Irish biochemistry student noted for his month-long 2011 blogging effort to explain how human chemistry and human thermodynamics are "bulls**t" subjects and “junk science”. A representative comment is: [1]

> “This is all just a horrendous analogy. Chemical laws apply to humans, but our behavior is more complex than something that can be modeled with a couple of thermodynamic equations. A + B → AB is just a pretentious way of stating something we already know; it tells us absolutely nothing new.”

Beyond this, to cite a few further examples, Grannell believes German polymath Johann Goethe’s 1799 human elective affinities model of existence is a “nutty theory”; considers American electrochemical engineer Libb Thims’ 2011 thermodynamic proof that good always triumphs over evil to be nothing but “calculus coated woo, hidden behind a smokescreen of rhetorical mathematics”; believes that enthalpy has nothing to do with the sexual heat of physical attraction, among numerous other objections. [2]

Education

Grannell currently is a studying biochemistry, microbiology, and zoology at National University of Ireland, Galway. He’s studied introductory linear algebra, calculus, biology, chemistry, and physics, and has long term aims of eventually doing research in computational molecular biology, biochemistry, or physiology. [3]

Atheism

Grannell is an open advocate of atheism: [3]

> “I’m an Atheist, in the sense that I do not see sufficient evidence to believe in a God. I’m also an atheist in the sense that I can see that some claims of Gods existence are almost certainly false: Christianity and Scientology being among them. I grew out of religion around the same time I grew of out the Christmas myths; I actually rated the latter as being more plausible, because Santa had clear and tangible effects on the world around me. I approach the world from an empirical, naturalistic, and rational point of view, and the results are often fantastic. Plus, I don’t have to do mental gymnastics to try to reconcile the existence of an all-loving, omnipotent God with childhood leukemia. A nice bonus.”

(add discussion)

See also

- Libb Thims (attack)
- Detractors
- Human thermodynamics (objections to)
- Human chemistry (objections to)

References

1. Grannell, Ryan. (2011). “Category: Human Chemistry”, Bag of Many Things, WordPress.com (Jun 26 –Jul 22).
2. (a) Grannell, Ryan. (2011). “Comment on: Sexual Heat | Pop Quiz” video, Jul.
(b) Thims, Libb. (2011). “Thermodynamic Proof that Good Always Triumphs over Evil”, *Journal of Human Thermodynamics*, 7: 1-4.
3. Ryan Grannell (about) – Bag of Many Things, WordPress.com.

External links

- Ryan Grannell – Google+

θΔics

In existographies, **Ryogo Kubo** (1920-1995) (CR:3) was a Japanese mathematical physicist, known commonly as a pioneer of non-equilibrium statistical mechanics.

Overview

Kubo's 1976 *Thermodynamics* discusses the usage of the term free enthalpy as well as the history of the term bound energy. [1]

His work, according to Russian physical chemist Georgi Gladyshev, supposedly, has been influential to the Russian school of thermodynamics, particular in complex systems thermodynamics. [2]

Kubo was 1977 winner of the Boltzmann Medal; another notable winner is Eugene Stanley (2004), the so-called coiner of "econophysics". [3]

References

1. Kubo, Ryogo. (1976). *Thermodynamics* (Divertissement 8: On the Names of Thermodynamic Functions). North Holland.
2. Gladyshev, Georgi. (2011). "Science", *Hmolpedia* forums, Jan 10.
3. Boltzmann Medal – Wikipedia.

External links

â— Ryogo Kubo – Wikipedia.

θΔics

In hmolscience, **Ryszard Kutner** (1947-) is a Polish physicist noted for his 2000s to present work in organizing and initiating econophysics and sociophysics in Poland.

Econophysics | Sociophysics

In the late 1990s, Kutner began to become an invited lecturer in various physics based humanities subject matters, such as at the: Joel Lebowitz group, Theoretical Condensed Matter Physics, Center for Mathematical Sciences Research, Rutgers University, US (1999); the Eugene Stanley group, Center for Polymer Studies, Department of Physics, Boston University (1999); the Wolfgang Weidlich group, Faculty of Physics, University of Konstanz, Germany (2002); and the Katarzyna Sznajd-Weron group, Institute of Physics, Wrocław University (2010).

In circa 2000, Kutner became co-organizer and the secretary of the Polish Physical Society Section of Physics in Economy and Social Sciences. (Q) In 2004, Kutner became a co-organizer of the periodic Polish symposiums on Physics in Economics and Social Sciences. Currently, Kutner is the professor and the Chair of Econophysics and Sociophysics Group in Division of Biomedical Physics, Faculty of Physics, University of Warsaw.

In 2006, Kutner began heading the Econophysics and Sociophysics: Students Seminar (see: hmolscience courses), An interdisciplinary and panoramic seminar (Q) showing how the various academic centers and research methods used in physics or related are used in areas such as economics and sociology; speakers are doctoral researchers and experienced researchers; learn and discuss the concepts, theories, models, methods and techniques, especially interdisciplinary, applied in the wider physics as well as in economics and sociology to the study of complex systems mainly. In addition, the development of the ability to analyze a variety of empirical data which is manipulated in these areas. (Q)

Education

Kutner completed his MS in physics in 1970, his PhD in physics in 1977, and his habilitation in physics all at the University of Warsaw.

References

1. Ryszard Kutner (about) – Faculty of Physics, University of Warsaw.

External links

- Ryszard Kutner – Google Scholars.
- Econophysics group of Ryszard Kutner – Science24.com.

θΔics

In symbols, ***S*** is the symbol for entropy, assigned by German physicist Rudolf Clausius.

Overview

In 1824, French physicist Sadi Carnot used small "s" for heat.

In 1865, Clausius, possibly on the earlier usage of small "s" for heat by Carnot, assigned the capital "S" symbol for entropy as follows: [1]

> "I propose to call **S** the *entropy* of the body, from the Greek word *τροπή*, *transformation*."

It remains to be pinned down why exactly Clausius used the symbol S here in place of his early 1856 symbol N (or -N) depending (see: entropy etymology).

Other

In 1872, Austrian physicist Ludwig Boltzmann used the symbol *E* to represent Clausius' entropy. [2]

In 1873, American engineer Willard Gibbs used the Greek symbol eta η to represent Clausius' entropy. [3]

See also

- S = k ln W

References

1. (a) Clausius, Rufolf. (1865). *The Mechanical Theory of Heat – with its Applications to the Steam Engine and to Physical Properties of Bodies* (terms: "entropy" and "S", pgs. 357, 363, 367) (URL). London: John van Voorst, 1 Paternoster Row. MDCCCLXVII.
(b) Read at the *Philosophical Society of Zurich* on the 24th of April, 1865, published in the *Vierteljahrsschrift* of this society, Bd. x. S. 1.; *Pogg. Ann*. July, 1865, Bd. cxxv. S. 353; *Journ. de Liouville*, 2e ser. t. x. p. 361.
2. Boltzmann, Ludwig. (1872). "Further Studies on the Thermal Equilibrium of Gas Molecules" ("Weitere Studien über das Wärmegleichgewicht unter Gasmolekülen"), in *Sitzungsberichte der Akademie der Wissenschaften, Mathematische-Naturwissenschaftliche Klasse* (pgs. 275-370; term: "entropy" symbol "E", pgs. 263, 308, 346, etc), Bd. 66, Dritte Heft, Zweite Abteilung, Vienna: Gerold.
3. Gibbs, J. Willard. (1873). "Graphical Methods in the Thermodynamics of Fluids" (symbol table, pg. 1), *Transactions of the Connecticut Academy*, I. pp. 309-342, April-May.

θΔics

In equations, the formula:

$$S = k \ln W$$

in the natural logarithm format or in equivalent notation (see: logarithm) as:

$$S = k \log W$$

with base *e* assumed, is called the Planck entropy, Boltzmann entropy, Boltzmann entropy formula, or Boltzmann-Planck entropy formula, a statistical mechanics, i.e. particle position, interpretation of Clausius entropy, where S is the entropy of an ideal gas system, *k* is the Boltzmann constant (ideal gas constant *R* divided by Avogadro's number *N*), and W, from the German Wahrscheinlichkeit (var-SHINE-leash-kite), meaning probability, often referred to as multiplicity (in English), is the number of "states" (often modeled as quantum states), or "complexions", the particles or entities of the system can be found in according to the various energies with which they may each be assigned; wherein the particles of the system are assumed to have uncorrelated velocities and thus abide by the Boltzmann chaos assumption.

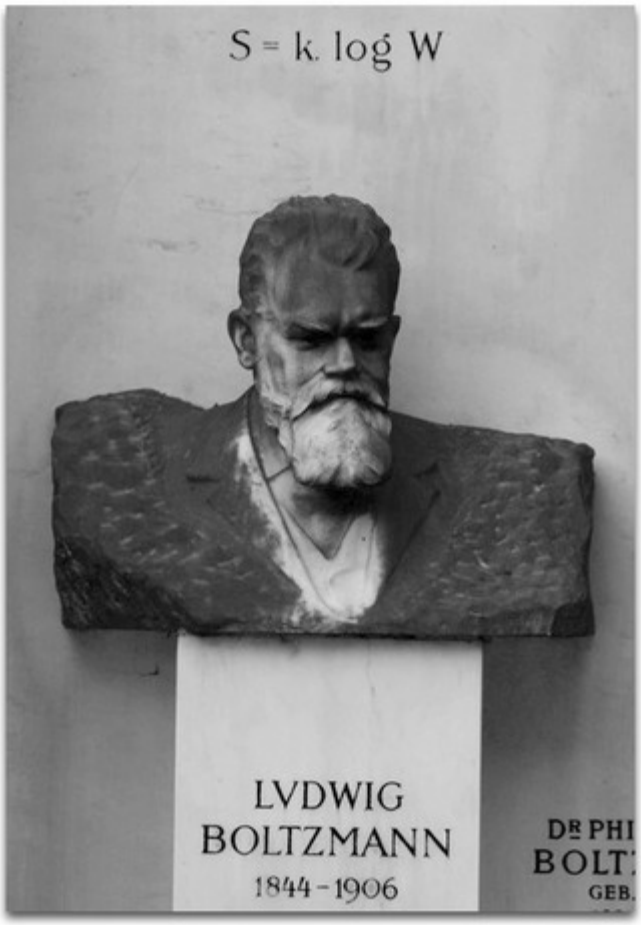

The equation **S = k log W** engraved on the Boltzmann tombstone in Vienna Central Cemetery.

Some consider S = k ln W to be easily the second most important formula of physics, next to $E = mc^2$ or at par with it. [1] This formula is sometime called "Boltzmann formula" (or Boltzmann entropy formula) and entropy calculated from this formula is sometimes called Boltzmann entropy.

Einstein

In 1901, German physicist Max Planck, in his "On the Law of Distribution of Energy in the Normal Spectrum", introduced the S = k log W + c formula, in semi *deus ex machina* fashion, via citation of Austrian physicist Ludwig Boltzmann and his H-theorem (1872).

In 1904, and thereafter, German physicist Albert Einstein began to repeatedly criticize the formula *S = k log W*; in 1910, Einstein had the following to say on the matter:

> "The equation *S* = *k* log *W* + *const* appears without an elementary theory — or however one wants to say it — devoid of any meaning from a phenomenological point of view."
>
> — Albert Einstein (1910), popular 2007+ re-quote version

> "Usually W is set equal to the number of ways (complexions) in which a state, which is incompletely defined in the sense of a molecular theory (i.e. coarse grained), can be realized. To compute W one needs a complete theory (something like a complete molecular-mechanical theory) of the system. For that reason it appears to be doubtful whether Boltzmann's principle alone, i.e. without a complete molecular-mechanical theory (Elementary theory) has any real meaning. The equation S = k log W + const. appears [therefore] without an Elementary theory—or however one wants to say it—devoid of any meaning from a phenomenological point of view."

— Albert Einstein (1910), Ezecheil Cohen 2005 abbreviated translation

> “Usually W is put equal to the number of complexions.... In order to calculate W, one needs a complete (molecular-mechanical) theory of the system under consideration. Therefore it is dubious whether the Boltzmann principle has any meaning without a complete molecular-mechanical theory or some other theory which describes the elementary processes. $S = R/\mathcal{N} \log W + const$. seems without content, from a phenomenological point of view, without giving in addition such an Elementartheorie.”

— Albert Einstein (1910), Abraham Pais 1982 abbreviated translation

(add discussion)

Derivation

The actual full rigorous step-by-step derivation of the logarithmic formulation or interpretation of entropy (S = k ln W) is a bit difficult to track down for a number of reasons, the first of which being that it was originally done in German and readily available English translations are wanting.

The start of the derivation traces to Austrian physicist Ludwig Boltzmann's 1872 H-theorem, a formula to approximate the velocity distributions of the particles of a body of gas, as described in his "Further Studies on the Thermal Equilibrium of Gas Molecules".

The "famous expression" that equates entropy with the logarithm of the state probability, supposedly in the form of S = k ln W, was first presented, according to science historians Helge Kragh and Stephen Weininger, in 1877 (fact check); possibly in Boltzmann's article “On the Relation of a General Mechanical Theorem to the Second Law of Thermodynamics”. [13]

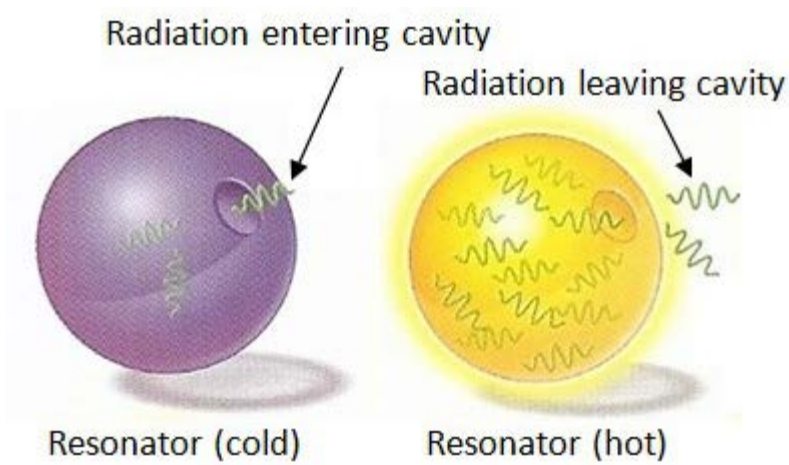

An absorbing (left) and radiating (right) "resonator", which is a sphere with a hole in it (originally a type of iron stove with a hole in it, sooted black on the inside) that absorbs electromagnetic radiation when cold, acting like a black body; or, conversely, emits electromagnetic radiation when hot. This is termed "black body radiation" and is the physical model on which the **S = k ln W** equation was derived by German physicist Max Planck in 1901. [1]

The modern formulation, S = k ln W (or S = k log W, base e assumed), as it is now known as a staple of science, was proposed or rather stated as a matter-of-fact by German physicist Max Planck as being the standard formula for the measure of the entropy of black bodies, as discussed in his 1901 "On the Law of Distribution of Energy in the Normal Spectrum", albeit done without derivation and without clear justification as to why this formulation applies to the measurement of the entropy of what Planck defined as an "irradiated, monochromatic, vibrating resonator".

A crude approximate derivation is as follows, as given in 1946 by Belgian-born English thermodynamicist Alfred Ubbelohde. [8] First we start with a body of ideal gas containing an Avogadro number *n* of particles (atoms or molecules). Then suppose that we compress the body, using a small hand pump, down to a small initial volume v_1. This will be the initial state. We then connect the compressed volume to an evacuated second volume v_2, e.g. a deflated football, and let the gas expand into the the larger volume. This will be the final state.

The first condition we stipulate is that the process is done very slowly, the model of the infinitely slow rate, idealizing the view that the temperature of the gas never differs from that of the surroundings. Thus, the process is thus defined as

being an isothermal process. A second assumption behind the idealization of the mention "infinitely slow" means that model the process as being reversible, and thus use the equals sign " = " instead of the Clausius inequality in our expression for the first law equation for this process. Therefore, according to Joule's second law, which states that the internal energy of an ideal gas is solely a function of temperature:

$$U = f(T)$$

the internal energy change for this process will be zero and, thus, according to the first law :

$$dU = dQ - dW$$

the heat change dQ occurring in the process will be converted completely into the work dW of expansion:

$$dQ = dW$$

The **Boltzmann entropy** equation tattooed on the stomach of man, in circa 2006, who says “he’s not very good at math”, done by Kimsu at *Body Graphics*, New Jersey. [12]

To then calculate this work W we use French physicist Emile Clapeyron's 1834 expression for the pressure-volume work:

$$W = \int_{v_1}^{v_2} P dv$$

Classical ideal gas law

The pressure function for this body will be the ideal gas equation, which in classical ideal gas law notation is:

$$PV = nRT$$

and with substitution:

$$W = nRT \int_{v_1}^{v_2} \frac{1}{V} dv$$

Statistical ideal gas law

Alternatively, as was introduced in the 1900 work of German physicist Max Planck, the statistical version of the ideal gas law can be written as:

$$PV = NkT$$

where N is the actual number of molecules in the system and k is the Boltzmann constant. With substitution, this gives the alternative work integral function:

$$W = NkT \int_{v_1}^{v_2} \frac{1}{V} dv$$

Definite integral of 1/x

The above integral has the form of what is called a "definite integral", one with upper and lower limits, which integrates according to the following rule (a rule to note which seems to have been the method in which the logarithm found its way into thermodynamics): [9]

$$\int_{x_1}^{x_2} \frac{1}{x} dx = \ln |x_2| - \ln |x_1|$$

For more on graphical nature of this rule, see the WordPress blog: “why is the integral of 1/x equal to the natural logarithm of x?”. [14]

Integration

Therefore, using the above rule for the definite integral of 1/x, we have:

$$W = NkT(\ln v_2 - \ln v_1)$$

This can be reduced, using the rule that the logarithm of a ratio is the difference of the two logarithms:

$$\ln \frac{x}{y} = \ln x - \ln y$$

to the following form:

$$W = NkT \ln \frac{v_2}{v_1}$$

With substitution of this into the reduced first law, step three (above), we have:

$$\Delta Q = NkT \ln \frac{v_2}{v_1}$$

Then, bringing the temperature over, we have:

$$\frac{\Delta Q}{T} = Nk \ln \frac{v_2}{v_1}$$

And, by definition (Rudolf Clausius, 1865), this is thus the entropy change of the body of gas during the expansion:

$$\Delta S = Nk \ln \frac{v_2}{v_1}$$

Sticky point

It is at this point that the derivation becomes a **bit murky**, in particular being that it makes speculations about atomic motion and position. It is assumed that the molecules of the gas will always spread themselves as uniformly as possible throughout the space available to them, because of their thermal motion which drives them hither and thither. On this so-called "principle of uniform spread", the ratio of the probability W_1 that the molecules will all remain in the volume v_1, to the probability W_2 of their occupying uniformly the larger volume v_2 which is made available to them, is given by:

$$\frac{W_2}{W_1} = \frac{v_2}{v_1}$$

and with substitution:

$$\Delta S = Nk \ln \frac{W_2}{W_1}$$

Here, we have introduced Boltzmann's notion of Wahrscheinlichkeit, pronounced var-SHINE-leash-kite, symbol W, which does not seem to have an exact English equivalent but is assumed to be a cross or blend between "probability" and "multiplicity", so to speak, referring to the number of “states” the particles of the system can be found in according to the various energies with which they may each be assigned, in quantum mechanical speak.

To note, if our integral had the form of what is called as an "indefinite integral", one without upper and lower limits, an additive constant would be used:

$$\int \frac{1}{x} dx = \ln |x| + c$$

and our formulation of entropy for our expanding gas body would be:

$$\Delta S = Nk(\ln v + c)$$

or, if the *nR* constant is divided through:

$$\Delta S = Nk \ln v + c$$

Sticky point

This version, although it seems we are **missing a step** in the derivation (somewhere?), seems to be the sense in which Planck first introduced the natural logarithm formulation of entropy in 1901, in his own notation as follows:

$$S_N = k \log W + c$$

and where S_N is the entropy of a system or black body composed of *N* resonators, which, according to Planck, "depends on the disorder with which the total energy *U* is distributed among the individual resonators. In his 1909 lectures, Planck was calling the following equation, without the added constant, the 'general definition of entropy', albeit discussed in his chapter on the equation of state of a monoatomic gas: [6]

$$S = k \log W$$

This is the formula that is famously displayed on the Boltzmann tombstone (pictured above), which was erected in the 1930s, at the Central Cemetery (Zentralfriedhof), Vienna, Austria. [2]

In any event, in this "crude derivation", as Ubbelohde calls it, somewhere we are missing a few end steps and details to arrive at the exact formulation introduced (without proof) by Planck.

Note

In the decades to follow Planck's probabilistic "disorder-dependent" model of entropy seems to have been adopted with abandon to be the universal measure of entropy, often being applied in biothermodynamics and in human thermodynamics. Ubbelohde even seems to corroborate on this, in his concluding statement that "the probability increase accompanying any process is quite general, and holds for all the diversity of spontaneous happenings for which the measurement of entropy has any meaning."

Issue

The discerning theorist, however, should hold reserve in using this formulation as an absolute universal measure of entropy, for a number of obvious reasons, the foremost of which being that the equation contains the has constant R hidden in its body:

$$S = \frac{R}{n} \log W$$

When we thus see entropy calculations using this equation in non-ideal gas situations, e.g. the rubber band model of entropy, entropy measures in cells, entropy measures of systems of humans, etc., one begins to question the validity of such a calculation?

ln vs log

The use of "log", in the historical sense, refers to the natural logarithm (base e) in this formula, which seems to be the case when in 1900 German physicist Max Planck first scripted the version of the statistical entropy formula, as displaced in Boltzmann's tomb. It was only sometime afterwords (date needed), that log was used to denote the base 10 logarithm and ln the base e logarithm.

Discussion

The statement that Boltzmann defined entropy as function of the number of microstates rather than of a probability, according to some arguments, is a misrepresentation, supposedly owing to the fact that Boltzmann's writing was fairly

difficult and few people understood it at the time; and that most of Boltzmann's original papers have never been translated from German, so most information about them is second or third hand interpretations. According to American physicist Robert Swendsen, Boltzmann, supposedly, interpreted the second law to mean that a system tends toward more probable macrostates. Boltzmann, supposedly, originally—incorrectly (some have argued)—identified the entropy as the probability (wahrscheinlichkeit) of a system's macrostate. Later, in the same paper, he considers an ideal gas as a special case and calculates the logarithm of the macrostate's probability as proportional to the volume in phase space. In later papers he re-identifies the entropy as the logarithm of a macrostate's probability, but as he is usually considering the special case where all microstates are equally likely, he calculates it as proportional to the volume in phase space. Readers likely misidentified this special case as the definition of entropy since he seemed to have rarely mentioned what his definition was. [15]

Warning |

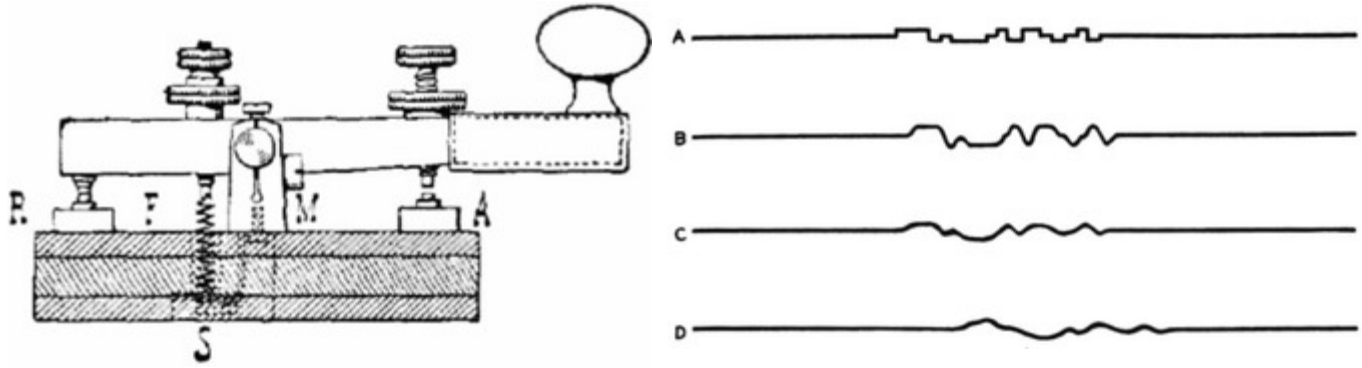

The keen scientist should be aware that American electronics researcher Ralph Hartley's 1927 H-formula, quantifying the information content or Boolean logic content of telegraphy messages (depicted above), has absolutely nothing to do with Austrian physicist Ludwig Boltzmann's 1872 H-theorem, a kinetic theory-based definition of heat, quantifying the movements of the particles of an ideal gas system, or with German physicsit Max Planck's 1901 logarithmic definition of entropy, an attempt to quantify heat in terms of the energy states of the particles of bodies.

Information theory

In the 1927, American electronics researcher Ralph Hartley published his "Transmission of Information" in which he outlined a way to mathematically quantify telegraph signals being sent down a telegraph wire using the following formula:

$$H = n \log s$$

where *s* is the number of symbols (or voltage levels) available at each selection, n the number of different current values, e.g. high or low, to be applied to the line, and value *H* is the amount of information associated with *n* selections for a particular system.

Issue

Hartley's H-formula telegraph wire information function later came to be confused with Austrian physicist Ludwig Boltzmann's 1878 H-theorem in the 1948 paper "A Mathematical Theory of Information" by American electrical engineer Claude Shannon, and forever since people have been confusing the mathematical subject of information theory with physical science subject of thermodynamics, to no end. [4]

This mess was then compounded when information theory researchers discovered Szilard's demon as described in Hungarian physicist Leo Szilard's 1929 “On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings”, and attempt at disproving the existence of a Maxwell's demon, wherein he argued that the logarithmic interpretation of entropy could be used to determine the entropy produced during the ‘measurement’ of information the demon discerns when viewing the speeds and positions of the particles in his two compartments. [5]

Thus, in sum, these two of these topics (mathematics of telegraphy and hypothetical demons) have justified to many that entropy has an information interpretation. Some scientists, such as physical chemist Arieh Ben-Naim, have gone to extreme lengths to embed the assertion that entropy or rather heat is simply information that is measurable in units of bits in stead of joules, and have even proclaimed that the entire SI unit system should be thrown out the window and that

the entire field of science all the way down to the sub-atomic and Planck length scale should be re-written in units of bits. This is one of the most absurd things in all of science, yet one that has many pied piper followers.

A proof or disproof of the relation of entropy to information, in a modern sense, requires a formal treatise, which has not been done. The modern reader should be warned that use of logarithms to measure entropy for systems other than ideal gas systems, is mostly a baseless conjecture.

Human thermodynamics

In human thermodynamics, owing to the a mixture of both information and multiplicity view of entropy, Boltzmann's entropy formula has since been used to model the entropy of any number of anthropomorphic quantities or qualities, with unabandon, in nearly every scenario or situation conceivable. A random example, one of many, is American physicist Edwin Jaynes' 1991 article "How Should we Use Entropy in Economics", in which is he introduces some tentative outlines of how an economic system can be modeled as a thermodynamic system, such as how Willard Gibbs' 1873 graphical thermodynamic ideas on entropy convexity can be mixed with logarithmic interpretations of what he calls "economic entropy", which he defines as follows:

$$S(X, Y, Z...) = \log W(X, Y, Z...)$$

where (X,Y,Z ...) are some type of macroeconomic variables, which he doesn't really go into, and W is the multiplicity factor of the macroeconomic state, which he describes as the "number of different microeconomic ways in which it can be realized", whatever that means, and tries to connected in some way to French mathematician Rene Thom's 1960s catastrophe theory and the thermodynamics of a ferromagnet and Curie temperature. [11]

The justification for these types of theories or models, however, are near baseless, in that multiplicity approximations of entropy are only good for ideal gas systems, generally, and information interpretations of entropy are based on Maxwell demon and telegraph wire proofs, which are fictionalized abstractions, having almost nothing to do with Clausius' logic of 'transformation equivalents' (entropy) or uncompensated transformations (entropy change). [7]

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External links

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θΔics

In existographies, **Sadi Carnot** (1796-1832) (IQ:190|#26) (Cattell 1000:345) [RGM:846|1,500+] (EP:25) (CR:425) was a French engineer who seeded the science of thermodynamics with the self-published 1824 treatise *Reflections on the Motive Power of Fire and on Machines Fitted to Develop that Power*, a short booklet on the generalized theory of heat engines, out of which sprang instrumental physical models, namely: Carnot engine, Carnot cycle, and Carnot's principle, the latter of which being precursor to the second law of thermodynamics. The term Carnotian revolution refers to the revolution brought about in science in century to follow Carnot's *Reflections.*

1813 portrait of **Sadi Carnot**, at the age of 17 in his Polytecnique uniform, by Louis Boilly.

Overview

(add)

Heat | Work

In 1824, Carnot, when he published his now famous memoir *On the Motive Power of Fire*, adhered to the "caloric" model of heat.

In c.1830, Carnot, in his manuscripts notes (made available when in 1878 M.H. Carnot deposited them to the French Academy of Sciences), according to Robert Thurston (1880), had recognized the doctrine of the equivalence of heat and mechanical energy; the following, below left, is an extract of what he had written in these notes: (Ñº)

French

"La Chaleur n'est autre que la puissance motive, ou plutót, que le mouvement qui a changé de forme. C'est un mouvement dans les particules des corps. Partout ou il y a destruction de puissance motive, il y a, en même temps, production de chaleur en quantité précisément proportionelle à la quantité de puissance motive détruite. Réciproquement, partout on ily a destruction de chaleur, il y a production de puissance motive." "On peut donc poser en thèse générale que la **puissance motive est en quantité invariable dans la nature**, qu'elle n'est jamais, a proprement parler, détruite. A la vérité, elle change de forme, c'est-a-dire qu'elle produit tantôt un genre de mouvement, tantôt un autre; mais jamais elle n'est anéantie."

English | Thurston translation

"Heat is nothing else than motive power (energy), or rather, a motion which has changed its form. It is a motion of the molecules of bodies. Whenever motive power is destroyed, there is, at the same time, a production of heat in quantity precisely proportional to the quantity of power destroyed. Reciprocally, wherever there is destruction of heat, there is production of power of motion. We may then state **as a general law, that energy is, in nature, invariable in amount**; that is, is never, properly speaking, either created or destroyed. In fact, it changes form; that is, it causes sometimes one kind of motion, sometimes another; but it is never destroyed."

English | Google translation

"Heat is none other than motive power, or rather, movement that has changed form. It is a movement in the particles of bodies. Wherever there is a destruction of motive power, there is at the same time a production of heat in proportion to the quantity of motive power destroyed. Conversely, everywhere there is a destruction of heat, there is a production of motive power. It may therefore be posited **in general theory that motive power is in invariable quantity in nature**, that it is never, strictly speaking , destroyed. In truth, it changes its form, that is to say, it produces sometimes a kind of movement, sometimes another; but it is never destroyed."

Here, we see Thurston reading into the French to English translation, a bit more than Carnot had intuited.

Education

Sadi was born June 1796 in Paris to French mathematical engineer Lazare Carnot, founder of the world's leading engineering school the École Polytechnique (first so-called "school of thermodynamics") of the day, and Sophie Dupont, the daughter of a well-off family of Saint-Omer. In August of 1807, Lazare decided to take care of the education of his two sons, Sadi and younger brother Hippolyte Carnot, and teaches them math, science, languages, and music. In 1812, Sadi entered the École Polytechnique, graduating two years later.

In 1818, Carnot retired into a general staff position, at half pay, into “voluntary obscurity” in Paris. There, however, he was said to gravitate to the Conservatoire des Arts et Metiers, a recently founded technological museum, offering lectures to the general public. Here, supposedly, Carnot fell into the association of brother-in-laws Nicholas Clement and Charles Bernard Desormes, who did joint research on the physics of steam engines. All three, were said to have felt a need to boost France’s mills and factories industry operations, and that the way to do this was to better understand the principles behind the operation of steam engines. Carnot devoted the years 1820 to 1824 to this effort. [9]

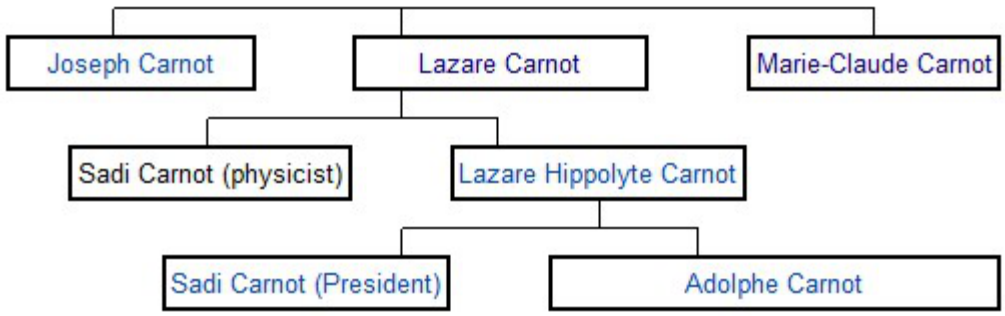

Men of the Carnot family: Lazare Carnot (father), **Sadi Carnot** (thermodynamicist), and Hippolyte Carnot (brother).

In 1824, Sadi self-published his treatise *Reflections on the Motive Power of Fire and on Machines Fitted to Develop that Power*, in an edition of 600 copies. In this work, Carnot's overall aim, stimulated by the earlier work of his father, on the universal nature of geometric operation and force constraints of machines, was to outline the general principles and laws of the phenomenon of the production of motion by heat not only to steam engines but to all imaginable heat-engines, whatever the *working substance* and whatever the method by which it is operated. Other terms or concepts introduced by Carnot include: working substance, motive power, "re-establishment of equilibrium in the caloric", thermodynamic efficiency, among others.

In 1834, Carnot's *Reflections* was put on a graphical footing by French physicist Émile Clapeyron. [2] It was through Clapeyron that Carnot's theories were introduced to German physicist Rudolf Clausius who, beginning in 1850, was thus stimulated to spend 15-years writing the monumental *Mechanical Theory of Heat*, through which "entropy" and the second law of thermodynamics were introduced.

The key point of Carnot's work that goaded Clausius to such an effect was Carnot's postulate, based on the faulty caloric theory, that "no change occurs in the condition of the working body" in a complete heat engine cycle. Clausius sought to remidy this statement by introducing a new variable to science dQ/T called "entropy" that in any heat engine process (cycle), which is in any way possible, increases, meaning that energy is used by the molecules of the working body on each other as they change their physical condition of state or configuration during each step of an expansion or contraction due to the action of a heat gradient.

Thermodynamics

The paragraph that interested Clausius to such an effect, via his reading of Clapeyron's 1834 paper, in reference to the process in which work is done by heat through the medium of a working body in alternate contact with a heat gradient, is Carnot’s postulate that (as quoted by Clausius): [4]

> “No heat is lost in the process, but that the quantity of heat remains unchained … this fact is not doubted; it was assumed at first without investigation, and then established in many cases by calorimetric

Sadi Carnot at age 34 (1830) [8]

measurements. To deny this would overthrow the whole theory of heat, of which it is the foundation."

This paragraph is the core of the science of thermodynamics. The term "quantity of heat" here refers to French physicist Antoine Lavoisier's 1787 theory of particles of caloric, which were considered to be indestructible entities responsible for the expansion of bodies by the action of heat. [5]

Quotes | On

The following are tributes and praise:

"Nicolas-Leonard-**Sadi Carnot** was, perhaps, the greatest genius, in the department of physical science at least, that this century has produced."

— Robert Thurston (1890) [7]

"**Carnot**'s argument is perhaps the most original in physical science."

— Joseph Larmor (1918), "On the Nature of Heat" [10]

"In the annals of science, **Carnot**'s *Motive Power of Fire* is almost unique, for it had no discernible predecessors and was built up from the assemblage of unordered opinions and problems, concepts, theories and measurements that were available at the time. Carnot, in short, was not standing on the shoulders of giants; he saw further than his contemporaries because he had a much clearer vision."

— Donald Cardwell (1971), *From Watt to Clausius* (pg. 193)

"The most original work ever written in the physical sciences, with a core of abstraction comparable to the best of Galileo"

— Tom Shachtman (1999), *Absolute Zero and the Quest for Absolute Cold* [9]

Quotes | By

The following are noted quotes:

> “Say little about what you know and nothing at all about what you don’t know. When a discussion degenerates into a dispute, keep silent. Do not do anything which the whole world cannot know about.”
>
> — Sadi Carnot (c.1820), “Rules of Conduct”, personal notes [6]

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External links

â— Nicholas Leonard Sadi Carnot – Wikipedia.

θΔics

In Egyptian mythology, **Sah**, Sahou, Sahu, or Saah, was the god personification of the Orion constellation (later syncretized with the god Osiris), whose female consort was the goddess **Sopdet,** conceptualized as the star Sirius (later syncretized with the goddess Isis); alternatively, the "Sahu", according to Robert Bauval (2006), was the original Egyptian word for "mummy", in the sense that when Osiris died he "became" the astral body (of stars) or "Sahu" in the form of the Orion constellation. [1]

Astro-theology

See main: Astro-theology

In 1904, Wallis Budge, in his *Gods of the Egyptians, Volume One* (pg. 83), in discussion of the Pyramid Texts of the 4th and 5th dynasties, namely: Unas (2348BC), Teta [Teti] (2333BC) (O), Pepi I (2287BC), Mer-en-Ra-Mehti-em-sa-f, and Pepi II (O), aka Pyramid Texts at Sakkara, as he calls them, states that among the gods of this period, "allusions are made to the following important stars", as he puts it, as shown in the first four rows:

#	Post-sync god	Pre-sync god	Star / Constellation	Budge listing
1.	Osiris	Sah	Orion	Saḥ (Tetȧ 349), , i.e., Orion.
2.	Isis	Septet	Dog Star [Sirius]	Sepṭet (Tetȧ 349), , i.e., the Dog Star.
3.	Set [?]	Sehut	Great Bear	Seḥuṭ (Pepi II. 857), .
4	Nephthys [?]	Nekhekh	[?]	Nekhekh (Tetȧ 218), .
5.	Anubis		Canis Minor [11]	

Sah and Sopdet were later syncretized with the gods Osiris and Isis, respectively, as follows:

Orion (constellation) → Sah (god) → Osiris (god)
Sirius (star) → Sopdet (goddess) → Isis (goddess)

The star named “Sothis”, e.g. as mentioned in Pepi I Pyramid Texts (O), of note, seems also to be name variant of the star Sirius. (O)

The following is Flinders Petrie’s 1940 rendition of Sah (or Sahu) or Osiris, aka Orion, and Isis (or Septet), aka Sirius, as the Egyptians supposedly saw things in the stars: [10]

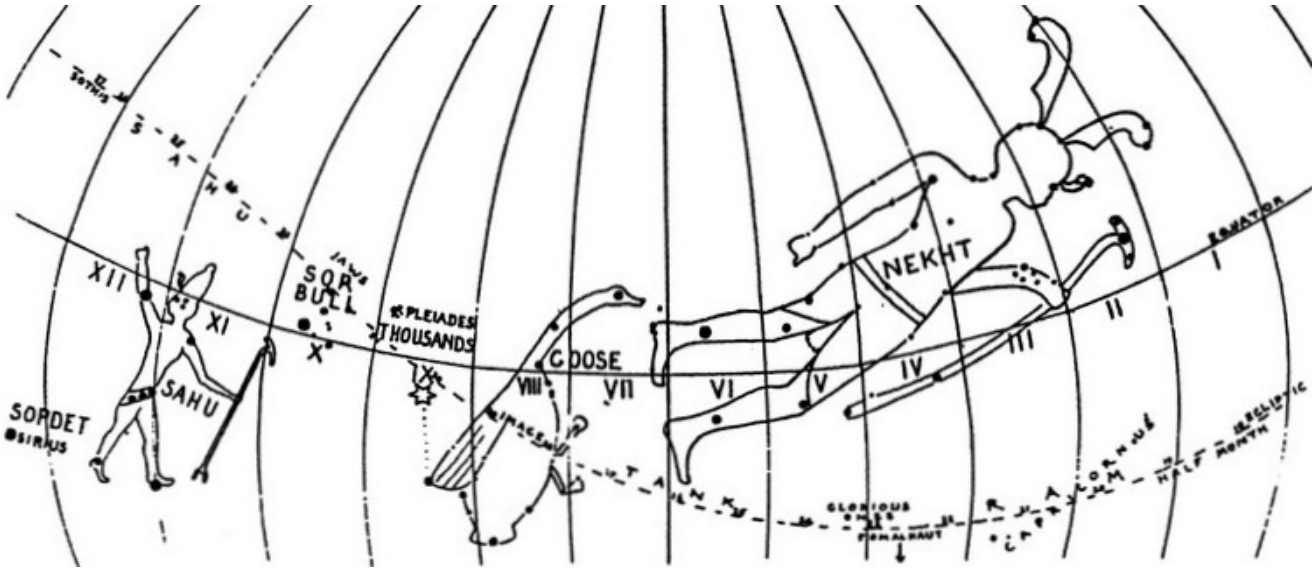

The following seems to be the Egyptian interpretation of the god Sah riding in his star boat, or what the Greeks would later call the Orion constellation, or Orion the Hunter:

The gods Sehut and Nekhekh (Q) , and their star or constellation names, beyond what Budge says above, seem to be uncertain. One might speculatively associate them with Set and Nephthys, as listed, with question marks [?], above. Others, however, have attempted to associate Set with a leg-shaped star constellation of the Great Bear, and that Horus, during their battle, cut off Set's leg, or something along these lines. (Q)

In the 1940s, Rene Lubicz demonstrated, supposedly, that the Egyptians understood astronomical science so well that the recognized the 25,920-year period of the precession of the equinoxes. [9]

In 1954, Egyptologist Alexander Badawy proposed a link between Khufu's pyramid, the largest of the three Giza pyramids, , at a height of 481 ft (Q), and the Orion constellation, in respect to the design of the pyramid, something to the effect that the shafts were a way for the king's soul to reach the heavens. [8]

In 1979, John West, in his *Serpent in the Sky* (Q), outlined some type of unorthodox Egyptology ideas.

In 1983, Robert Bauval proposed the theory that the three pyramids at Giza are representative of the three stars of Orion's belt. (Q) In 1993, he and Adrian Gilbert published *The Orion Mystery*. Bauval, in 2007, stated that in *circa* 2500, in Pyramid Text #2126, Ra, supposedly, was the brother of Sah (Orion) and Sopdet (Sirius).

In 1995, Graham Hancock published *Fingerprints of God*, which is listed in the unorthodox Egyptology category. [9]

Scholars that make a connection between: Sah, Orion, Osiris, Horus, and Jesus, include: Simson Najovits (2003), Bojana Mojsov (2005), and, citing Mojsov, Dorothy Murdock (2008). [2]

In the Great Pyramid at Giza, built during the 4th Dynasty, during the reign of King Khufu (2589-2566BC), had two shafts running from the burial chamber that were aligned with various stars, including the constellation of Orion and Sirius. [2] The following shows a depiction of this: [3]

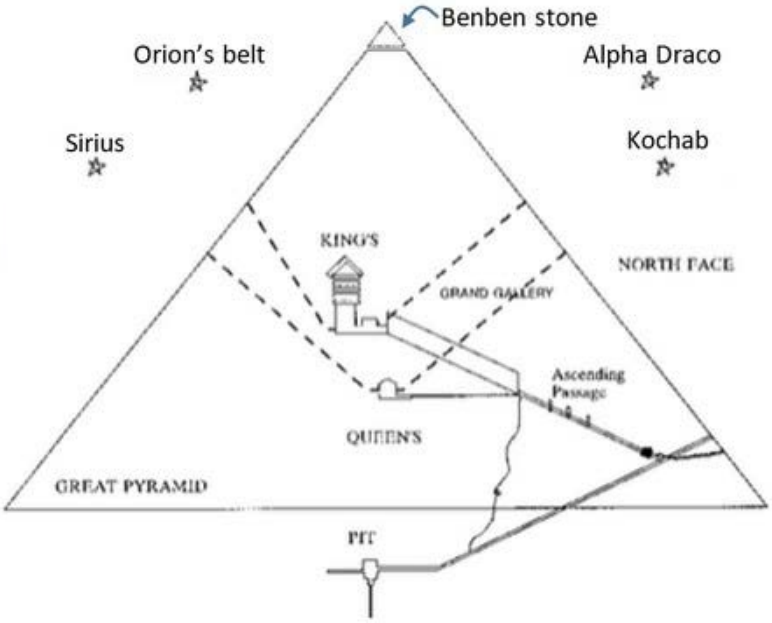

Here, to note, we see that the 14 pieces of Orion constellation, correspond to the 14 pieces that Set cut Osiris into during their battle, scattering the pieces around the land, which in Christian mythology translated into the symbolic whipping of Jesus during the crucifixion. Those who have made the "14 pieces" (14 stars), Orion, Osiris" connection include: Eddie Austerlitz (2010) and, independently, Libb Thims (2016), as shown labeled above. [4] Alternatively, Frank Joseph (2008) suppositions that the number 14 is half the lunar month (28 days), that Osiris is a moon god, and that the cutting of the 14 pieces represent the chopping of the full moon, day by day, as it becomes a crescent moon, or something along these lines. [5] The following shows a more detailed view of the so-called "soul shafts" of the Giza pyramids:

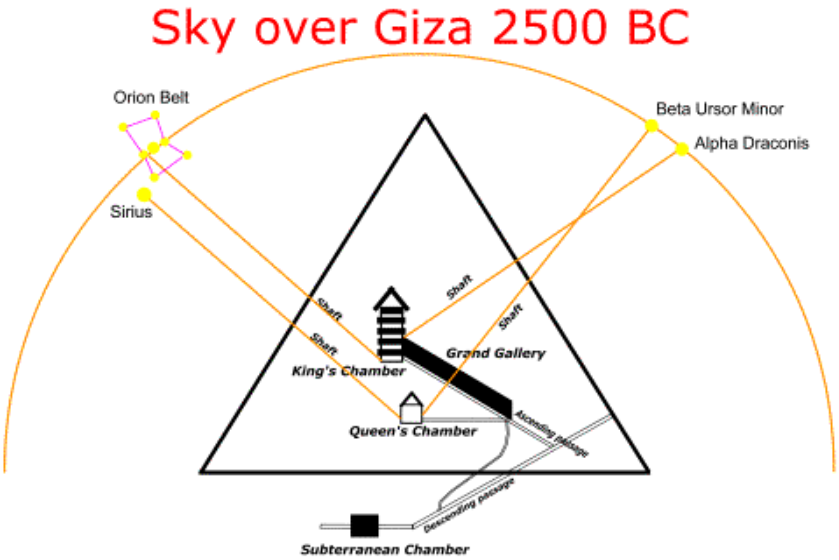

(add summary)

Raising Orion | Osiris | Jesus

The following, supposedly, is the astronomical rendition of the Passion of Osiris, i.e. of Osiris dead after being cut into 14 pieces by Set, after which Sirius (Isis) searches around to find and collect all his body pieces, so to put him back together into the form of an anointed mummy, and resurrect him. One interpretive summary of this is as follows: [3]

> "As the night passes and the constellation rises higher into the sky, He 'stands up', with Isis at his back all the while, pushing upward until the god is raised. Even more so than the myth of Isis following Osiris to pick up the pieces (as dismembered by Set), we can see the rising of Orion and Sirius as Isis raising Osiris from the dead, the stellar model of the ritual of raising the

Djed Column, which the pharaoh, with the help of Isis, performed on earth."

The following is three step rendition of the raising of the dead "Orion" (Osiris) to the position of the living Orion (Osiris):

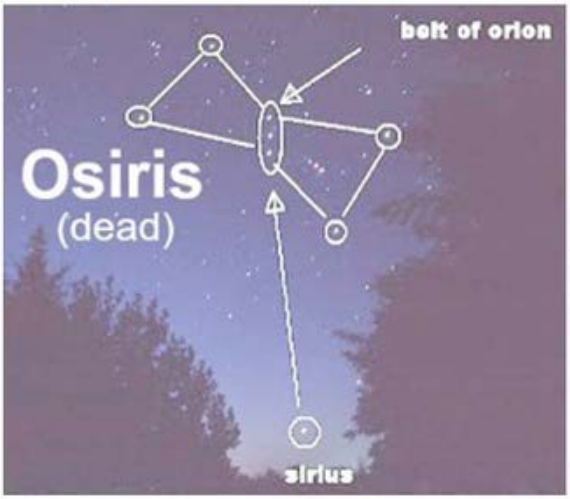

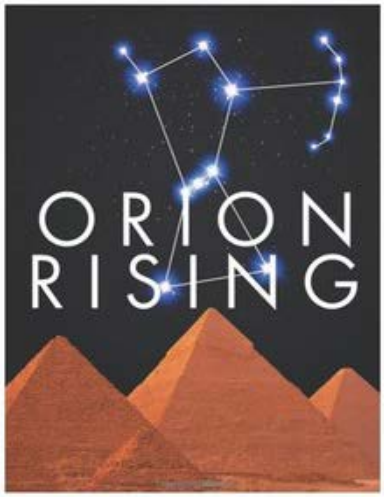

The following, from the Pepi I Pyramid Texts (2287BC) (O), we see, in utterance 442, Sirius (Sothus) described as the "third" celestial guide or morph of Pepi, the second, supposedly, being Orion (Osiris), the first, supposedly, being Ra:

Utterance 432	**Utterance 440**	**Utterance 442**
Sarcophagus Chamber, West Wall The king prays to the sky-goddess O Great One who became Sky, You are strong, you are mighty, You fill every place with your beauty, The whole earth [Geb] is beneath you, you possess it! As you enfold earth and all things in your arms, So have you taken this Pepi to you, An indestructible star within you!	Sarcophagus Chamber, West Wall The king asks for admittance to the sky If you love life, O Horus [**Jesus**] upon his life staff of truth, Do not lock the gates of heaven, Do not bolt its bars, After you have taken Pepi's ka [**spirit**] into heaven, To the god's nobles, the god's friends, Who lean on their staffs, Guardians of Upper Egypt, Clad in red linen, Living on figs, Drinking wine, Anointed with unguent, That he may speak for Pepi to the great god And let Pepi ascend to the great god!	Sarcophagus Chamber, West Wall The king becomes a star Truly, this Great One has fallen on his side, He who is in Nedyt was cast down. Your hand is grasped by Re [Ra] [**Abraham**], Your head is raised by the Two Enneads. Lo, he has come as Orion, Lo, Osiris [Lazarus] [**God**] has come as Orion, Lord of wine at the wag-feast. "Good one," said his mother, "Heir," said his father, Conceived of sky, born of dusk. Sky conceived you and Orion, Dusk gave birth to you [resurrection] and Orion. Who lives lives by the gods' command, You shall live! You shall rise with Orion in the eastern sky, You shall set with Orion in the western sky, Your **third is** Sothis [Sirius] [**Mary**], pure of thrones, She is your guide on sky's good paths, In the Field of Rushes.

The following shows the Dec 24 "raising of Osiris", as observed at three times, 7:15PM, 12-midnight, and 4:36AM, at an observatory in Calgary, Alberta Canada: (Q)

The "raising of Orion" by Sirius eventually became the story of the "raising of Osiris" by Isis:

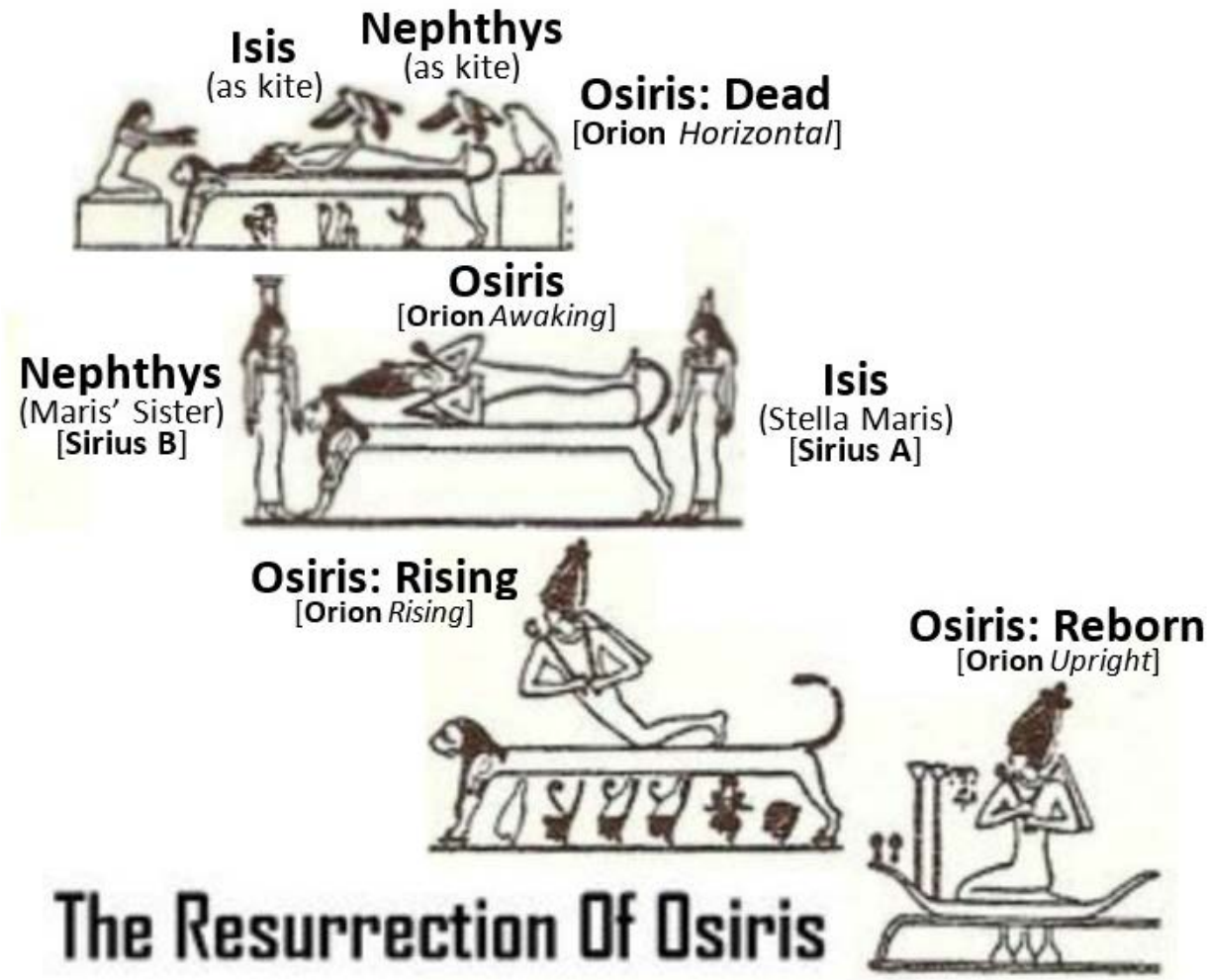

(add discussion)

Sirius B | Temple hypothesis

In 1976, Robert Temple, in his *the Sirius Mystery*, asserted the view that the Dogon people, of Mali, West Africa, knew that Sirius was a binary star (Sirius A and Sirius B).

Here, if Temple's hypothesis were true, we would note that Osiris has to be raised in the presence of not only Sirius (or Sirius A), aka Isis

(or Stella Maris), but also by its twin star Sirius B, aka Nephthys (Maris' sister): [7]

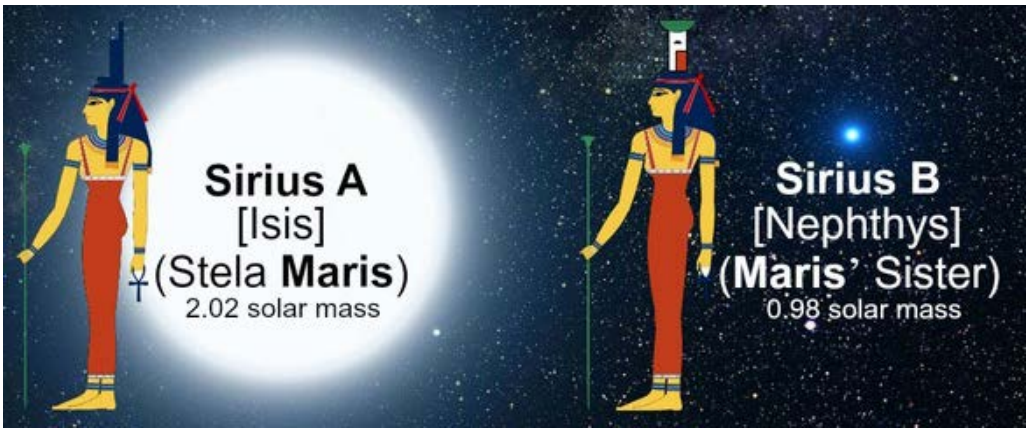

Sirius B, however, is invisible to the naked eye. It was first predicted on dynamical grounds in 1844 and first observed in 1862. (Q) The first telescope, moreover, was not invented until 1608 (by Hans Lippershey). (Q) The so-called Temple hypothesis, namely that Egyptians knew about Sirius B, accordingly, while curious, seems doubtful.

Alternatively, J.S. Gordon (2011), amid further speculation of the Sirius B conjecture, states (Q) that Isis represents the Ba or "astral" soul and Nephthys represents the Ka or "etheric" double principle, aka spirit; something akin to the following:

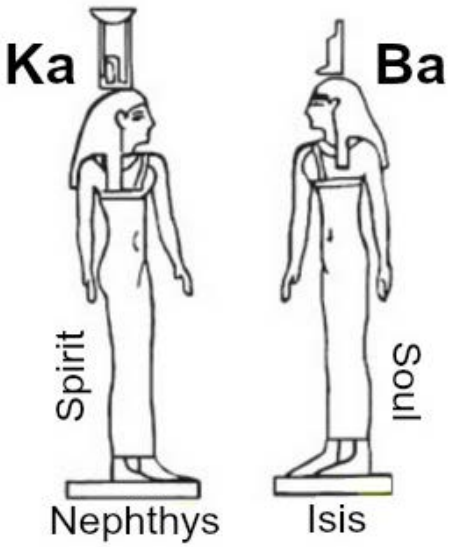

(add discussion)

Osiris | Jesus

This, eventually morphed into the story of Isis (Stella Maris) raising Osiris from the dead, and thereafter, in the early Roman period, into the story of Jesus raising Lazarus from the dead: [6]

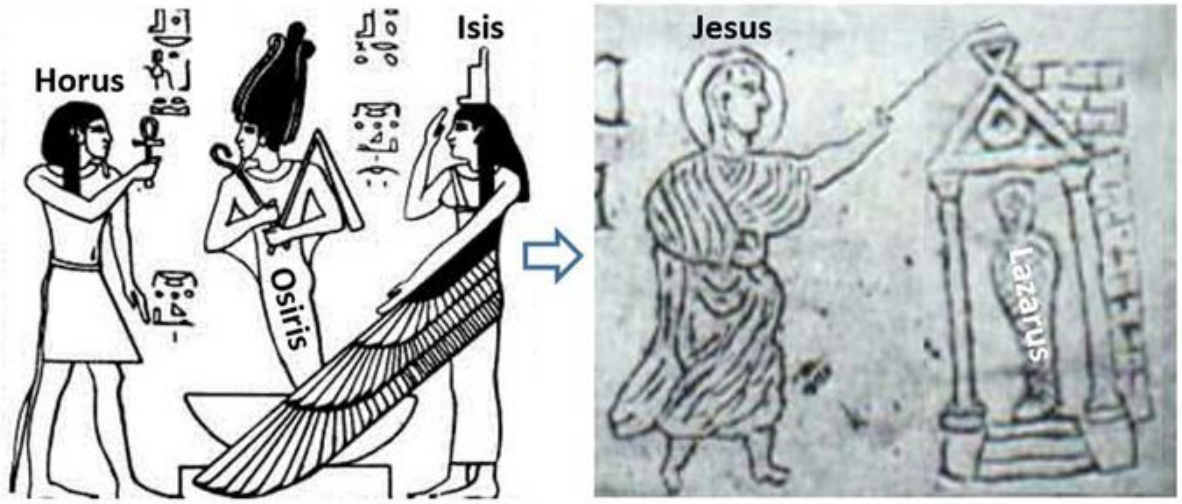

Horus raising **Osiris** from **dead using Ankh**
Bas-Relief at Philae | 250BC

Jesus raising **Lazarus** from **dead** using **rod**
Gravestone of Datus | 300AD

This was latter recast as Jesus being raised from the dead himself in the presence of two maries and two angels:

(add discussion)

Quotes

The following are related quotes:

> "Lo, he has come as Orion; Lo, Osiris has come as Orion; Lord of wine at the wag-feast."
>
> — Anon (2287BC), Pepi I (Q) Pyramid Texts, Utterance 442 (Q)

> "Behold, he has come as Orion, Osiris has come as Orion, Lord of the Wine in the Wag-festival."
>
> — Anon (2287BC), *Pyramid Text* (§818-20) (Q)

> "The fact that Orion (Osiris) 'awoke' again in the starry sky became the driving force behind the Egyptian star religion."
>
> — Patrick Geryl (2001), *The Orion Prophecy* (pg. 60)

References

1. (a) Oakes, Lorna and Gahlin, Lucia. (2002). *Ancient Egypt: an Illustrated Reference to the Myths, Religions, Pyramids and Temples of the Land of the Pharaohs* (Sah, pgs. 331, 425; Sopdet, 331, 399). Hermes House.
(b) Anon. (2016). "The Story of Osiris – Ancient Egyptian God Documentary" (narrator: Robert Bauval) (Q), YouTube, Ancient World History, Dec 23.
2. (a) Bojana, Mojsov. (2005). *Osiris: Death and Afterlife of a God* (pgs. xvi, 18, 136). Wiley.
(b) Najovits, Simson R. (2003). *Egypt, Trunk of the Tree, Vol. I: A Modern Survey of and Ancient Land* (pg. 196). Algora Publishing.
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3. Anon. (2013). "Why So Sirius & What's Up With The Moon?" (Q), *Subliminal Synchro Sphere*, Blogspot, Feb 13.
4. Austerlitz, Eddie. (2010). *If Its Backwards It Must Be Right* (pg. 47). Publisher.
5. Joseph, Frank. (2008). "Navel of the World or Stargate?: The Argument over the Real Purpose of the Giza pyramids Rages On" (Q), *Atlantis Rising*, May/Jun, #69; in: *Forgotten Origins: Rescuing Order from Chaos* (§2:12-19; pg. 14). Atlantis Rising, 2015.
6. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf). Publisher.
7. Scranton, Laird. (2006). *The Science of the Dogon: Decoding the African Mystery Tradition* (pg. 128). Inner Traditions.
8. Bauval, Robert. (2007). *The Egypt Code* (pg. 238). Red Wheel Weiser.
9. Gordon, J.S. (2011). *Land of the Fallen Star Gods: the Celestial Origins of Ancient Egypt* (pg. #). Inner Traditions.
10. (a) Petrie, Flinders. (1940). *Wisdom of the Egyptians* (plate III). Publisher.
(b) Clagett, Marshall. (1989). *Ancient Egyptian Science: Calendars, Clocks, and Astronomy, Volume Two* (pg. 677). American Philosophical Society.
The Egyptians, according to Chartrand (1982), considered the Canis Minor constellation to be Anubis. [1]
11. Chartrand, Mark R. (1982). *Skyguide: a Field Guide for Amateur Astronomers* (pg. 126). Publisher, 1990.

θΔics

In religio-mythology, **Saint Ottilia** (c.622-720) (CR:5), aka “Odile of Alsace”, was an Alsatian abbess, and a semi-legendary figure, known as the “patron saint of vision restoration”.

A depiction of **Saint Ottilia**, with her book showing "restored" eyes.

Overview

In c.1622, Ottilia, according to legend, was born blind, after which she was disowned by her father, and sent to a nearby monastery, during which time, a Saint Erhard, a saint of Regensburg, baptized her “Sol Dei”, meaning “Sun of God” (Ñº) , in Latin, or Odile in German, after which, at age 12, she recovered her sight.

Goethe

In c.1785, Goethe took a pilgrimage, of some sort "Mount Sainte-Odile"; the following is a reflection on this:

> “I shall always remember with pleasure a pilgrimage to the Ottilienberg (Saint Ottilia's Mount) (Ñº) which we made in company with about a thousand of the faithful. There, amidst the ruins of a fort built by the Romans, the youthful **Ottilia**, daughter of a count, had been induced by piety to choose herself a retreat in a rocky cave. Near the chapel in which the pilgrims pay their devotions, is shewn the spring at which she quenched her thirst; and many interesting anecdotes of this pious maiden are related. Her name and the portrait I formed of her in my own mind remained deeply impressed. After long meditating upon it, I at length bestowed this name on one of my beloved daughters, whose pure and religious hearts have secured them a favorable reception in the world.”
>
> — Johann Goethe (c.1820), *Memoirs* [1]

On 9 May 1809, Goethe sent a letter to Charlotte von Stein, referred to her as “St. Ottilia”. [2]

On 3 Oct 1809, Goethe published *Elective Affinities*, wherein the following clue is found:

> “Are you [Edward and Captain] not both named Otto?”
>
> — Goethe (1809), *Elective Affinities* (P1:C3) (Ñº)

(add)

Quotes | On

The following are quotes on Ottilia:

> “**St. Ottilia** was the blind daughter of the Duke of Alsace. Her father, who was a pagan, commanded that on account of her infirmity she should be left out, and exposed to death. Her nurse then fled to a monastery with the child. Then Erhard, a bishop of Bavaria, was told in a vision that he should go to a certain monastery, where he would find a little girl of noble birth who was blind. He was commanded to baptize her and call her name Ottilia, and promised that her sight should be given her. All this was done according to the vision. Her father repented of his wickedness before his death, and gave her all his wealth. Then Ottilia, knowing that for his cruelty her father was tormented in purgatory, determined to deliver him by

prayers and penance. She built a convent at Hoheuburg, of which she was abbess, and there she gathered one hundred and thirty nuns. She is represented in the black Benedictine habit. Her attributes are the palm or crosier, and a book upon which are two eyes. She is patron saint of Alsace, and especially of Strasburg. She is also protector of all who suffer with diseases of the eye. December 13, A. D. 720."

— Clara Erskine (1895), *Handbook of Christian Symbols* (pg. 248)

References

1. Goethe, Johann. (c.1820). *Memoirs of Goethe, Volumes One-Two* (translator: Henry Colburn) (pg. 394). Publisher, 1824.
2. (a) Bielschowsky, Albert. (1911). *The Life of Goethe* (XII: Die Wahlverwandtschaften, pgs. 347-87; painting, pg. 355; letter, pg. 452). G.P. Putnam's Sons.
(b) Daxecker, F. and Broucek, A. (1995). "An Image of Saint Ottilia with Reading Stones" (abs), *Gesnerus*, 52:319-22.
(c) Grossmann, T. (1981). "St. Ottilia, Patron saint of suffers from Eye Diseases: An Unusual Representation with a Cra's Pincer at the Mercy-Seat Altar in Bad Aussee" (abs), *Klin Monbl Augenheikd*, 178(6): 480-1.

External links

â— Odile of Alsace – Wikipedia.

θΔics

In existographies, **Salman Rushdie** (1947-) (FA:166) is a British Indian-born American author, an AskMen.com Top 10 Unknown Atheist (Q), a Jabari top 20 smartest atheist, noted for []

Overview

In 1962, Rushdie, aged 15, became and atheist; shortly thereafter, to demonstrated his rejection of religion he ate a ham sandwich, and waited in vain for the thunderbolt from heaven:

> "God, Satan, paradise, and hell all vanished one day in my fifteenth year, when I abruptly lost my faith. Afterwards, to prove my new-found atheism, I bought myself a rather tasteless ham sandwich, and so partook for the first time of the forbidden flesh of swine. No thunderbolt arrived to strike me down. From that day to this I have thought of myself as a wholly secular person."
>
> — Salmon Rushdie (1991), "In God We Trust" [4]

In 1988, Rushdie published *The Satanic Verses*, a semi-historical, magical realism spin on Muhammad, based on Quranic versus; Jennifer Hecht (2003) summarizes the novel as follows: [5]

> "The novel is partly based on a story in which Muhammad, not yet established, accepts the idea that some local, female gods can share the pantheon with Allah (the locals will not abandon their gods) and then, later, revokes the verses that okayed the deal, saying they came from Satan rather than god. Hence, the 'satanic verses'. The have been seen as weakening the case for revelation."

The publication resulted in an uproar the Muslim world, drawing accusations of blasphemy and unbelief. [3]

In Feb 1989, Ruhollah Khomeini (1902-1989) (Q), Iran's leading Ayatollah, i.e. chief preacher or Allah, the first supreme leader of Iranian revolution (1979), issued a fatwa against Rushdie, offering $3 million for his death. This fatwa was backed by the Iranian government until 1998. (Q)

In 1991, Hitoshi Igarashi, the Japanese translator of *The Satanic Verses*, was stabbed to death outside his office at Tsukuba University, and also that year the Italian translator Ettore Capriolo survived being stabbed (Q) at his apartment in Milan. In 1993, William Nygaard, the novel's Norwegian publisher, was shot three times in the back and left for dead outside his home in Oslo. [2]

In Feb 2016, forty state-run Iranian media outlets jointly upped the fatwa anti by adding $600,000 dollars to anyone who kills Rushdie, on top of the $3 million standing original fatwa offer. [1]

Quotes

The following are noted quotes:

> "I'm a hardline atheist, I have to say."
>
> — Salman Rushdie (2006), "Interview with Bill Moyers" (Q)

> "There are beautiful stories in all religions, nothing wrong with stories, but they are not true, they are all fictions."

— Salman Rushdie (c.2008) [2]

References

1. Osborne, Samuel. (2016). “Salman Rushdie: Iranian state media renew fatwa on Satanic Verses author with $600,000 bounty. The announcement coincides with the anniversary of the fatwa issued in 1989”, Independent.co.uk (Q), Feb 21.
2. Anon. (2009). “Salman Rushdie on Christianity, Islam, Hinduism, and Nordic Mythology” (Q), YouTube, IuderSatan, Jul 24.
3. The Satanic Verses – Wikipedia.
4. (a) Rushdie, Salmon. (1991). “In God We Trust”, in: *Imaginary Homelands* (pgs. 376-432). Granta.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 474-75). HarperOne.
5. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 475). HarperOne.

External links

- Salman Rushdie – Wikipedia.
- Home – SalmanRushdie.com.

θΔics

In existographies, **Salomon de Caus** (1576-1626) (EP:#) (CR:14), aka “Salomon of Caux”, was a French engineer, architect, and mathematician, noted for []

Name

Caus was a native of Normandy, and conjectured (Cust, 1900) to have been probably of the town of Caux, hence the name “Salomon of Caux”, or de Caus, Cauls. [3]

Overview

After a visit to Italy, Caus came to England as mathematical tutor to Henry, prince of Wales (1594-1612), the eldest son of James VI and I (1566-1625) (Cattell 1000:140), later employer of David Ramsay.

In 1612, Caus published a work entitled: “Perspective with the reason of shadows and mirrors” (“La Perspective avec la raison des ombres et Miroirs”), which he dedicated to the prince.

In 1614 to 1626, Caus worked as a hydraulic engineer and architect under Louis XIII and also in Germany, where he built a water-driven organ, a water-driven singing and flapping bird automaton, among other devices. (Ñº)

In 1615, Caus, in his *The Reason for Moving Forces*, stated that there, historically, have been five main methods of elevating water above its level, which he recounts as follows: [2]

1. Siphon, which he says is older than Hero.
2. Operation by capillary attraction.
3. By the aid of fire.
4. Action of compressed air, as illustrated by Hero's fountain, and ascribed to Hero.
5. Animal labor applied to machinery, such as the screw of Archimedes, or the pump of Ctesibius.

Caus, in respect to method #3, says that there are many types of devices, and gives the following device as an example, which is similar to that made or diagrammed by Giovanni Porta (c.1601):

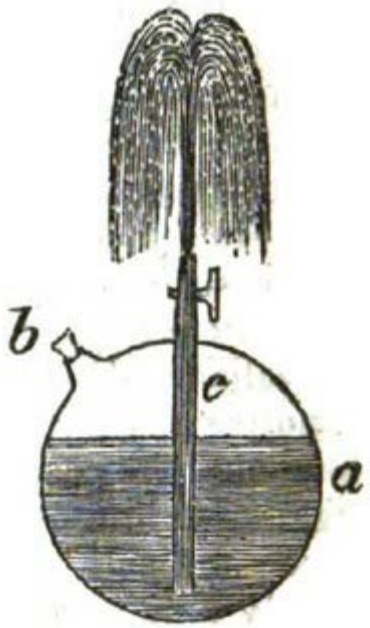

The operation is such that globe *a* is filled with water, which has a valve *b* attached, for adding water, and a tube *c* soldered into the upper part of the bulb, with a valve, the operation of which being such that, when fire is put under the globe, water shoots out of the tube c, like a fountain. In this work, Caus declared, supposedly, that steam, unique for this

period of history, is evaporated water, and that upon cooling the vapor returns to its original condition. [1]

Other

In 1829, Francois Arago misattributed Caus, with his method #3 device, as being the inventor of the steam engine.

Education

Caus applied himself at an early age to the study of the mathematical sciences, his favorite writers being Archimedes, Euclid, and Vitruvius. [3]

Quotes | On

The following are quotes on Caus:

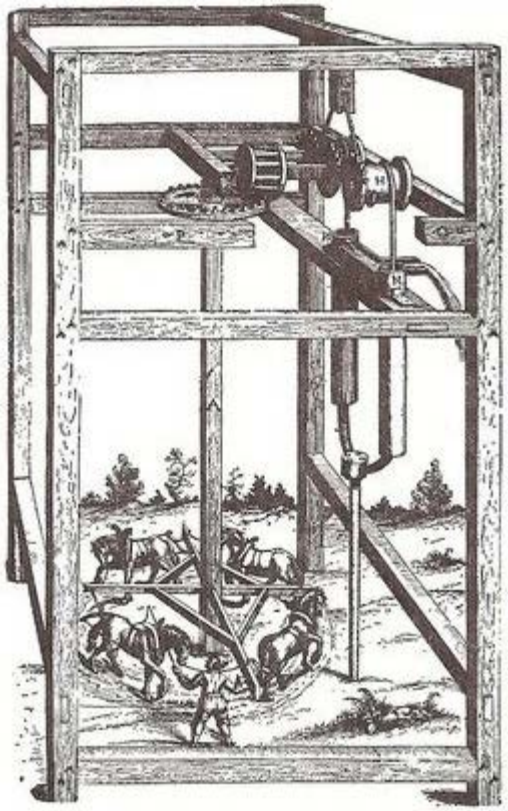

A four-horse power pump, i.e. a four horsepower engine, in modern terms, as described by **Salomon de Caus** (1615). [**3**]

> "Both Cardan and Porta were concerned with the phenomena of steam, but though they made some progress their results were seriously qualified by misconceptions of the nature of steam, which they still identified with air. Cardan in one obscure passage (1550) points out that a vacuum may be created by the condensation of steam; this suggestion, cogent as it would have been if clearly conceived, can hardly have had the significance that we might naturally be inclined to attribute to it. Porta's work on steam was rather more deliberate, and some of his experimental apparatus was highly suggestive. The attempt to measure the volume of steam by the amount of water displaced by steam pressure led him close to a positive distinction between steam and air, but he drew no decisive conclusions him-self. A late contemporary, **Salomon de Caus**, with essentially similar apparatus, took this decisive step. He declared that steam is evaporated water, and that upon cooling the vapor returns to its original condition. A similar experiment with mercury showed the same phenomena of evaporation and subsequent return to the liquid condition. De Caus was thus able to set down (1615) a series of propositions that represented a great advance upon all previous achievements in the field of gases and their phenomena. Air and steam were thus specifically distinguished and the practical conclusion was drawn that there were potentialities in steam pressure of much greater magnitude than were to be found in air pressure."
>
> — Abbott Usher (1929), *A History of Mechanical Inventions* [2]

References

1. (a) Caus, Salomon. (1615). *The Reason for Moving Forces* (*Les Raisons des forces mouvantes*). Publisher.
(b) Anon. (1829). "On the Early History of the Steam Engine" (Ñº), *Journal of the Franklin Institute*, 4(8):319-27.
2. Usher, Abbott P. (1929). *A History of Mechanical Inventions* (pg. 342). Courier, 2013.
3. (a) Caus, Salomon. (1615). *The Reasons for Moving Forces* (*Les Raisons des forces mouvantes*). Publisher.
(b) Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 154). Courier, 1990.
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External links

â— Salomon de Caus – Wikipedia.

θΔics

In thermodynamics, **Salvatore Califano** (c.1940-) is an Italian physical chemist noted for his 2012 monograph *Pathways to Modern Chemical Physics*, which contains a fairly cogent historical introduction to thermodynamics in the opening chapter, e.g. the origin of the term "enthalpy", biographical information on C.G. Darwin's α particle work, among other historical tidbits. [1]

Modern chemical thermodynamics

Califano gives the following cogent synopsis of the formation of "modern chemical thermodynamics" (see: history) or what seems to be modern chemical-physics as he terms it:

> "The mathematical formalism developed by Gibbs in several papers was utilized by Gilbert Lewis and Merle Randall in the United States and Edward Guggenheim in England for the evaluation of free energy and of a large number of chemical compounds. The book by Lewis and Randall *Thermodynamics and the Free Energy of Chemical Substances* of 1923 and that by Guggenheim, *Modern Thermodynamics by the Methods of Willard Gibbs* of 1933 are the fundamental classics of **modern chemical-physics**. Before the publication of these two textbooks, the most known text of thermodynamics, especially in Germany was the 1912 treatise *Lehrbuch der Thermodhemie und Thermodynamik* written by Otto Sackur, that, once translated into English in 1917 by the American naturalized Scotsman George Gibson, became the official textbook of thermodynamics in American universities until 1923, when it was replaced by that of Lewis and Randall."

(add discussion)

Education

Califano completed his college education in chemistry in Naples and completed his PhD in chemistry, somewhere, after which he did post-doctoral studies at the University of Frankfurt, University of Friburg, and the University of Minnesota. In 1963, he became professor of molecular spectroscopy at the University of Padua and then at the University of Florence. In 2010, he was emeritus professor of chemical physics of the University of Florence. [2] Califano is also, of note, one of the co-founders, through his 1991 initiatives, of LENS (European Laboratory for Non-linear Spectroscopy). [3]

References

1. Califano, Salvatore. (2012). *Pathways to Modern Chemical Physics* (modern chemical-physics, pg. 15). Springer.
2. (a) Salvatore Califano (about) (Italian → English) – comune.firenze.it.
(b) Salvatore Califano (Curriculum Vitae) – EWACC 2010 International Conference.
3. LENS (Italian → English) – Wikipedia.

External links

â— Califano, S. – WorldCat Identities.

θΔics

In hmolscience, **Sam Harris** (1967-) (CR:24) is an American pro-atheism (see: Jewish atheism) writer, characterized as one of the most "rational voices on the center left" (Q), noted for his 2004 *The End of Faith*, which he began writing the day after 9/11, the vehemence of which initiated the so-called "new atheism" movement (see: atheism timeline). [1]

Morality

In 2010, Harris published *The Moral Landscape*, wherein he attempted to expand on utilitarianism, to argue that morality should be based on seeking the greatest amount of happiness among the total number of sentient beings, or something along these lines. [2]

Atheism

In atheism discussions, Harris is frequently cited as one of the main new atheists, along with Richard Dawkins, Christopher Hitchens, and Daniel Dennett, and or four horsemen of atheism.

Difficulties on theory

The difficulty with Harris is that the brand of atheism he is trying sell is "spiritual atheism", and thereby aiming to supplant one metaphysical belief with another, i.e. to supplant belief in God with belief in spirit; Eastern spirituality in particular admixtured with some type of drug-induced states of being logic. Harris cited this as objection #4 of his *The End of Faith* detractors: [5]

> "The *End of Faith* is not a truly atheistic book. It is really a stalking horse for Buddhism, new-age mysticism, or some other form of irrationality."

A second salient difficulty with his theory is that his "moral landscape" theory, while amenable, is baseless, in regards to foundational structure.

Book | Recommendations

In 2006, Harris, at the end of his *Letter to a Christian Nation*, listed ten atheism-themed books he recommends:

1. The God Delusion (2006) | Richard Dawkins
2. Breaking the Spell (2006) | Daniel Dennett
3. Misquoting Jesus: The Story of Who Changed the Bible and Why (2005) (Q) | Bart Ehrman
4. Kingdom Coming: the Rise of Christian Nationalism (2006) | Michelle Goldberg
5. The End of Days (2000) | Gershom Gorenberg
6. Freethinkers: a History of American Secularism (2004) (Q) | Susan Jacoby
7. Extraordinary Popular Delusions and the Madness of Crowds (1841) (Q) | Charles Mackay
8. Why I Am Not a Christian (1927) | Bertrand Russell
9. God, the Devil, and Darwin (2004) (Q) | Niall Shanks
10. Atheism: the Case Against God (1974) | George Smith

Harris, at SamHarris.org, lists (Q) books he recommends by category.

Quotes

The following are employed and or relevant quotes:

> "A belief is a lever that, once pulled, moves almost everything else in a person's life. Are you a scientist? A liberal? A racist? These are merely species of belief in action. Your beliefs define your vision of the world; they dictate your behavior; they determine your emotional responses to other human beings."

— Sam Harris (2004), *The End of Faith* (pg. 12)

"Questions of morality are questions about happiness and suffering. This is why you and I do not have moral obligations towards rocks. To the degree that our actions can affect the experience of other creatures positively or negatively, questions of morality apply."

— Sam Harris (2006), *Letter to a Christian Nation* [6]

"Just as there is no such thing as Christian physics or Muslim Algebra, we will see that there is no such thing as Christian or Muslim morality."

— Sam Harris (2010), *The Moral Landscape* (Q)

"Water is two parts hydrogen and one part oxygen. What if someone says: 'Well, that's not how I choose to think about water.?' All we can do is appeal to scientific values. And if he doesn't share those values, the conversation is over. If someone doesn't value evidence, what evidence are you going to provide to prove that they should value it? If someone doesn't value logic, what logical argument could you provide to show the importance of logic?"

— Sam Harris (c.2010) (Q) (compare: Francois Massieu)

"A puppet is free as long as he loves his strings."

— Sam Harris (2012), *Free Will*, a favorite "free will" quote of Jeff Tuhtan (Q) [3]

"Faith is the license religious people give themselves to keep believing when reasons fail."

— Sam Harris (c.2012) [4]

References

1. (a) Harris, Sam. (2004). *The End of Faith: Religion, Terror, and the Future of Reason* (stalking horse, pg. 234). W.W. Norton & Co.
(b) Haught, John F. (2008). *God and the New Atheism: a Critical Response to Dawkins, Harris, and Hitchens*. Westminster John Knox Press.
2. Harris, Sam. (2010). *The Moral Landscape: How Science Can Determine Human Values*. Free Press.
3. Harris, Sam. (2012). *Free Will* (strings, pg. 20). Simon & Schuster.
4. Meis, Morgan. (2013). "The First New Atheist", The Smart Set, May 8.
5. Harris, Sam. (2004). *The End of Faith: Religion, Terror, and the Future of Reason* (stalking horse, pg. 234). W.W. Norton & Co.
6. Harris, Sam. (2006). *Letter to a Christian Nation* (pg. 8). Alfred A. Knopf.

Further reading

- Harris, Annaka. (2013). *I Wonder* (Amz). Four Elephants Press.
- Harris, Sam. (2014). *Waking Up: a Guide to Spirituality Without Religion*. Simon & Schuster.

External links

- Sam Harris (author) – Wikipedia.
- Harris, Sam – WorldCat Identities.

θΔics

In human chemistry, **Sean Kean** (c.1980-) is an American science writer noted for []

Overview

In 2010, Kean, in his *The Disappearing Spoon*, chapter fourteen "Artistic Elements", attempts to deride and derogate the scientific intellectual competence of German polymath Johann Goethe, particularly in the area of chemistry, and in particular the chemical theory contained in his 1809 novella *Elective Affinities*, commenting (in regard to his novella) that:

> "Goethe would have been better off cutting out the science."

This statement, possibly more than any other statement made in the last centuries, belies the growing ignorance among the learned culture, particularly in American, wherein education has been homogenized to the point of becoming Wonder Bread. Kean goes on to compound his scientific naivety by stating:

> "Goethe would have been crushed after his death in 1832 to learn that its science and philosophy would soon disintegrate and that people now read his work strictly for its literary value."

Such ineptitude in depth is very puzzling, particularly for someone writing a book on chemistry; although this blindness may be due to the fact that Kean has no educational background in chemistry and in particular chemical thermodynamics (his main field being physics), which is the language one needs to understand Goethe's 1799 human elective affinities theory.

Kean continues his tirade (which perhaps is bluff to camouflage his misapprehensions?), referring to Goethe as someone who uses clout to "bully" his way into scientific discourse, describing him as having "about as much competence as a dilettante" (this in spite of the fact that in the same breadth he acknowledges that in modern times Goethe is seen as the "last man who knew everything"), and in regards to his 1809 novella *Elective Affinities* (Goethe's self-described "best book"), attempts to pass off his human elective affinities theory as a failed science: referring, e.g., to his premise that marriages work like chemical reactions as a "spurious idea", among other inanity, which is akin to a claim that the second law of thermodynamics does not apply to humans and in particular human affairs and all-in-all endemic of the non-nonchalant and shallow ignorance that grips the world's educational system (and in particular America's), one far adrift in the expanding sea of the two cultures.

Dobereinger

Kean also devotes some text to Johann Dobereiner (Goethe's personal chemist) and his affinity-based triad grouping theory, which was the first clue to the existence periodic table. [1] Kean incorrectly alludes to the notion (in his end notes) that Goethe gained his understanding of chemical affinity (and hence the inspiration for the title of his 1809 novella) from attending Dobereiner's lectures, which is erroneous by account that Goethe did not know Dobereiner until 1810.

Education

Kean completed an undergraduate degree in physics and English in Minnesota and a master's degree in library science (somewhere). He has since worked as a science writer.

Quotes

The following are noted quotes:

> "In the late 1700s, Goethe devised a theory of how colors work, to refute Isaac Newton's theory; except Goethe's relied as much on poetry as science, including his whimsical thesis that "colors are the deeds of

light, deeds and sufferings." Not to huff like a positivist, but that statement has absolutely no meaning. He also laded his novel *Elective Affinities* with the spurious idea that marriages work like chemical reactions. That is, if you throw couple AB into contact with couple CD, they all might naturally commit chemical adultery and form new pairs: AB + CD → AD + BC. And this wasn't just implied or a metaphor. Characters actually discuss this algebraic rearrangement of their lives. Whatever the novel's other strengths especially its depiction of passion), Goethe would have been better off cutting out the science. Goethe would have been crushed after his death in 1832 to learn that its science and philosophy [See: Goethean philosophy] would soon **disintegrate** and that people now read his work strictly for its literary value."

— Kean (2010), *The Case of the Disappearing Spoon*; an example of secular delusion par excellence (see: affinities confustion)

References

1. Kean, Sean. (2010). *The Disappearing Spoon: and Other True Tales of Madness, Love, and the History of the World from the Periodic Table of the Elements* (txt) (Goethe, pgs. 239-54, 367). Little, Brown and Company.

External links

â— Sam Kean (about) – SamKean.com.

θΔics

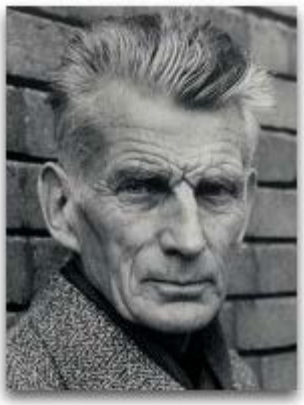

In philosophy, **Samuel Beckett** (1906-1989) was an Irish-born French writer noted for his 1949 *Waiting for Godot*, an Albert Camus / Soren Kierkegaard stylized absurdism-themed work stepping around the postulate that while inherent meaning might very well exist in the universe, humans are incapable of finding it due to some form of mental or philosophical limitation, according to which humanity is doomed to be faced with the 'absurd' or the absolute absurdity of existence in lack of intrinsic purpose; the work is also said to have some type of Sigmund Freud conceptualized id, ego, superego usage employed. [1]

Beckett, beginning with his 1938 novel *Murphy*, is said to be pervaded with a fascination with entropy and madness. [2] Beckett's work, in literature thermodynamics, has been classified with the absurd writer Harold Pinter. [3]

Quotes

The following are related quotes:

> "Christianity is a mythology with which I am perfectly familiar so I naturally use it."
>
> — Samuel Beckett (c.1950) [1]

References

1. Waiting for Godot (philosophical) – Wikipedia.
2. Thiher, Allen. (2004). *Revels in Madness: Insanity in Medicine and Literature* (pg. #). University of Michigan Press.
3. Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Lif* (pg. 5). The University of Chicago Press.

External links

â— Samuel Beckett – Wikipedia.

θΔics

In existographies, **Samuel Birch** (1813-1885) (RMS:53) (CR:4) was an a British Egyptologist, noted for []

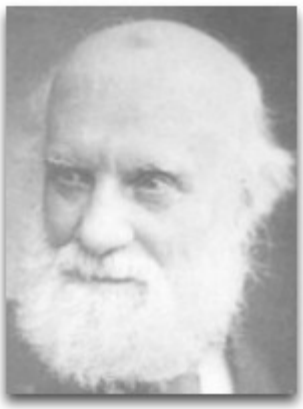

Overview

In 1836, Birch became head of the newly-formed Assyrian and Egyptian department of the British Museum, remaining in this position until 1885, wherein he was succeeded by Peter Renouf, who in turn was succeeded by Wallis Budge in 1991.

In 1867, Birch published the first translation of the *Egyptian Book of the Dead*, based on the Turin Papyrus, published in 1842 by Karl Lepsius (1810-1884), which he titled *The Funeral Ritual or Book of the Dead*, as well as *Dictionary of Hieroglyphics*, and *Hieroglyphic Grammar*, all three of which included in *Egypt's Place in Universal History, Volume Five*. [3]

Matthew

In 1907, Gerald Massey, in his *Ancient Egypt, the Light of the Modern World, Volume Two*, summarized how he decoded the name "Matthew" from his reading of Egyptologist Birch's mention of the word 'Mati' (or Maat) as the title of the divine scribe (Taht-Aan) of the Egyptians. [1]

Quotes | On

The following are quotes on Birch:

> "The original word [for mummy] written in hieroglyphics is krst, whence kas, to embalm, to bandage, to knot, to make the mummy or **karast** (**Birch**, *Dictionary of the Hieroglyphics*, pp. 415-416; Champollion, *Grant. Egyptienne*, 86). The word krs denotes the embalmment of the mummy, and the krst, as the mummy, was made in the process of preparation by purifying, anointing, and embalming. To Kara's the dead body was to embalm it, to bandage it, to make the mummy. The mummy was the Osirian *Corpus Christi*, prepared for burial as the laid-out dead, the karast by name."
>
> — Gerald Massey (1907), *Ancient Egypt: The Light of the Modern World, Volume One* (pg. 218); reformulation of *The Natural Genesis, Volume Two* (1883) (pg. 437) [2]

References

1. Massey, Gerald. (1907). *Ancient Egypt: The Light of the World: a Work of Reclamation and Restitution in Twelve Books, Volume Two* (pgs. 903-04). T. Fisher Unwin.
2. Massey, Gerald. (1883). *The Natural Genesis: Second Part of a Book of the Beginnings, Containing an Attempt to Recover and Reconstitute the Lost Origins of the Myths and Mysteries, Types and Symbols, Religion and Language, with Egypt for the Mouthpiece and Africa as the Birthplace, Volume Two* (pg. 437). Williams and Norgate.
3. Faulkner, Raymond. (1972). *The Egyptian Book of the Dead: the Book of Coming Forth by Day: Complete Papyrus of Ani, Featuring Integrated Text and Full-Color Images* (translator: Ogden Goelet; Preface: Carol Andrews; Introduction: Daniel Gunther; Foreword: James Wasserman) (Amz) (pg. 17). Chronicle Books, 2015.

Further reading

â— The First Egyptologist in the Museum (1836-1886) – BritishMuseum.org.

External links

â— Samuel Birch – Wikipedia.

θΔics

In existographies, **Samuel Bochart** (1559-1667) was a French Protestant biblical scholar, student of Thomas Erpenius (1599-1667) (Q), teacher of Pierre Huet, noted for doing work on the Bacchus-Moses connection (see: Osiris, Dionysus-Bacchus, and Moses), e.g. pointing out that they were both buried in unknown tombs (see: Moses pens his own death problem).

Quotes | By

The following are quotes by Bochart:

> "Both Bacchus and Moses were born in Egypt, shut up in an "ark," and put on the waters. Both fled from Egypt toward the Red Sea and had serpents (in Moses' case, a bronze serpent). For both, water flowed from a rock and milk and honey were provided. Both were called legislators, turned sticks into snakes, saw light in the darkness, and had unknown tombs."
>
> — Samuel Bochart (c.1650) [1]

References

1. McDermott, Gerald R. (2000). *Jonathan Edwards Confronts the Gods: Christian Theology, Enlightenment Religion, and Non-Christian Faiths* (pg. 191). Oxford University Press.

External links

- Samuel Bochart – Wikipedia.

θΔics

In thermodynamics, **Samuel Burbury** (1831-1911) was an English lawyer and mathematician noted for his 1894 introduction of the now-famous term 'H theorem', which he used as the English translate of Austrian physicist Ludwig Boltzmann's 1872 term 'minimum theorem', referring to Boltzmann's kinetic or Newtonian mechanics definition of entropy.

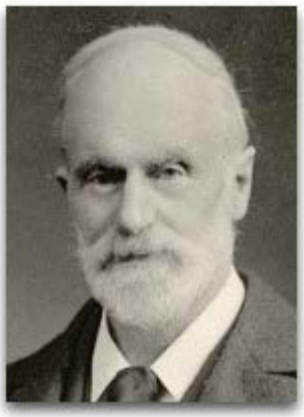

H-theorem

American physicist David Lindley claims that, some years after Boltzmann's 1872 'minimum theorem', as Boltzmann called it, "an English physicist apparently misread a German script upper-case *E* on one of Boltzmann's papers for an *H*". [1] Most sources, however, calm that Burbury began using 'H' in 1894 to mean 'heat', as in Boltzmann's heat theorem. [2] This coinage, however, may have been earlier, as, according to his associate Henry Watson, Burbury had published his first work on Boltzmann's kinetic theory of the second law in the January 1875 issue of the *Philosophical Magazine*. [3]

Education

Burbury completed his BA in mathematics and classics in 1854 and MA in 1857, both at St. Johns College, Cambridge. He completed his law degree at Lincoln's Inn, passing the bar in 1855. Thereafter, until 1908, began practicing law, but in his spare time engaged in advanced applied mathematics in kinetic theory, electromagnetism, and thermodynamics, chiefly in collaboration with his college friend Henry Watson. [4]

References

1. Lindley, David. (2001). *Boltzmann's Atom: the Great Debate that Launched a Revolution in Physics* (H, pg. 75, Burbury, pgs. 109-22). Free Press.
2. (a) Brown, Harvey R., Myrvold, Wayne, and Uffink, Jos. (2009). "Boltzmann's *H*-theorem: its Discontents, and the Birth of Statistical Mechanics", *Studies in History and Philosophy of Modern Physics*, 40: 174-91.
(b) Klimontovich, Yu. L. (1995). *Statistical Theory of Open Systems* (pg. 25). Springer.
3. Watson, Henry W. (1876). *A Treatise on the Kinetic Theory of Gases* (preface, pg. vi). Oxford University Press, 1893, 2nd ed.
4. D.J.O. (1912). "Burbury, Samuel Hawksley", *Dictionary of National Biography*, pgs. 258-59. Smith Elder & Co.

Further reading

- Burbury, S. H. (1876). "On the Second Law of Thermodynamics, in Connection with the Kinetic Theory of Gasses", *Philosophical Magazine*, 1: 61-67.
- Burbury, S. H. (1882). "On a Theorem in the Dissipation of Energy", *Philosophical Magazine.*
- Burbury, S. H. (1894). "Boltzmann's Minimum Function". *Nature*, 51(1308), 78.
- Burbury, S. H. (1895a). "Boltzmann's Minimum Function". *Nature*, 51(1318), 320.
- Burbury, S. H. (1895b). "Boltzmann's Minimum Function". *Nature*, 52(1335), 104–105.
- Burbury, S. H. (1899). *A Treatise on the Kinetic Theory of Gases* (H theorem, pgs. v-vii, 10, 30, 39-45, etc.). Cambridge University Press.
- Bryan, G.H. (1913). "Samuel Hawksley Burbury: 1831–1911". *Proceedings of the Royal Society of London* Series A, 88(606), i–iv (The obituary notice was attributed to ''G.H.B.''.).

External links

- Samuel Hawksley Burbury – Wikipedia.
- Burbury, Samuel Hawksley (1831-1911) (lawyer and mathematician) – Collected Works, St. John's Library.

θΔics

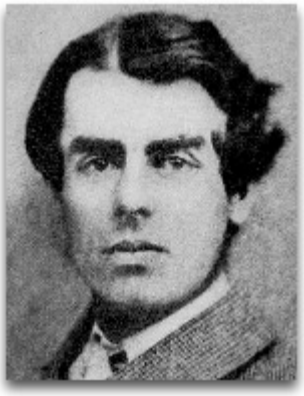

In science, **Samuel Butler** (1835-1902) was an English philosopher noted for his 1863 article-turned-book "Darwin Among the Machines", wherein he picked up on the age-old automaton vs. life debate, albeit with a twist—to the effect that he argued for the possibility existence of a future evolved type of "machine life", which might have a type of mechanical consciousness, that would evolve and outpace humans in evolution, such that the latter would become subservient to the former. The article touches on many modern origin of life stumbling blocks, such as the possibility of self-replicating machines. [1]

Erewhon

Butler's "Darwin Among the Machines", along with two other articles published in *The Press*, eventually came to form "The Book of the Machines" to the opening section of his 1872 Gulliver's travels stylized book *Erewhon*, wherein he wrote about how machines might develop consciousness by Darwinian selection. [2] Butler also, in *Erewhon*, describes the brain as being a machine-like homunculi: [3]

> "What is a man's eye but a machine for the little creature that sits behind in his brain to look through?"

(add discussion)

Discussion

> *See also: Neumann automaton theory*

The Butler human-disconnected evolving machine species model can be likened as a forerunner to the *Terminator* film series, in which computers overtake humans, becoming the dominating species. The general disproof of this theory is the notice that machines and computers are catalysts in the human chemical reaction, thereby only acting to lower the activation energy barrier, and hence not the free energy change of the reaction. The machines, in a sense, are a coupled secondary byproduct of the human chemical reaction, hence whence the primary reaction is terminated, if this were to the the case in the given scenario, the coupled product (machines/computers) would cease as well.

Quotes

The following are notable quotes:

> "Whether it is right to say that one believes in god and Christianity without intending what one knows the hearer intends one to intend depends on how much or how little the hearer can understand. Life is not an exact science, it is an art. Just as the contention, excellent so far as it goes, that each is to do what is right in his own eyes leads, when ridden to death, to anarchy and chaos, so the contention that everyone should be either self-effacing or truthful to the bitter end reduces life to an absurdity. If we seek real rather than technical truth, it is more true to be considerately untruthful within limits than to be inconsiderately truthful without them. What the limits are we generally know but cannot say."
>
> — Samuel Butler (c.1870), from "The Note-Books of Samuel Butler" (1912) by Samuel Butler; Part XXII (Reconciliation), The Rules of Life. (Ñº)

References

1. (a) Frenay, Robert. (2006). *Pulse: the Coming Age of Systems and Machines Inspired by Living Things* (pg. 17). Farrar, Straus and Giroux.
(b) Darwin among the Machines – Wikipedia.
2. Erewhon – Wikipedia.
3. Deacon, Terrence W. (2011). *Incomplete Nature: How Mind Emerged from Matter* (pg. 52). W.W. Norton & Co.

External links

â— Samuel Butler – Wikipedia.

θΔics

In existographies, **Samuel Clarke** (1675-1729) (IQ:160|#494) (Cattell 1000:333) was an English philosopher and Anglican clergyman

Overview

In 1704, Clarke became a Boyle lecturer, for two years, resulting in *Being and Attributes of God* (1704) and *Evidences of Natural and Revealed Religion* (1705), the gist of which resulting is a recursive self-crated thing proof of the existence of god.

In 1707, Clarke engaged into a debate with Anthony Collins on the nature of consciousness, Clarke arguing that mind and consciousness must be distinct from matter, Collins arguing the materialist position that consciousness was a property of the brain.

Quotes | On

The following are quotes on Clarke:

> "The difficulties which are opposed to them, are sufficiently clear to be understood by an infant; whilst, in the most learned nations, they will be troubled to find twelve men capable of understanding the demonstrations, the solutions, and the replies of a Descartes, of a Leibnitz, and of a **Clarke**, when they endeavour to prove to us the existence of the divinity."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 210)

References

1. d'Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (§2.4: Examination of the Proofs of the Existence of the Divinity, as Given by Clarke, pgs 205-; quote, pg. 210). J.P. Mendum, 1889.

External links

â— Samuel Clarke – Wikipedia.

θΔics

In existographies, **Samuel Coleridge** (1772-1834) (IQ:175|#267) (Cattell 1000:283) [RGM:448|1,500+] (CR:22) was an English poet-philosopher, initiator of the romantic movement in England, known for his celebrated 1817 coined phrase "suspension of disbelief" (e.g. as cited in *Basic Instinct*, 1992), and the main antagonist in the 1833 Whewell-Coleridge debate.

Quotes | By

The following are quotes by Coleridge:

> "Little do these men know what atheism is. Not one man in a thousand has either enough strength of mind or goodness of heart to be an atheist. I repeat it. Not one man in a thousand has either enough strength of mind or goodness of heart to be an atheist. And were I not a Christian, and that only in the sense in which I am a Christian, I should be an atheist with Spinoza; rejecting all in which I found insuperable difficulties, and resting my only hope in the gradual—and certain, because of gradual, progression of the species."

— Samuel Coleridge (1820), *Publication*; cited by Charles Southwell (1843) in *The Oracle of Reason* (pg. 420) [1]

References

1. (a) Coleridge, Samuel. (1820). *Publication* (Ñº). Publisher.
(b) Southwell, Charles. (1843). *The Oracle of Reason: Philosophy Vindicated*, *Volume Two* (Coleridge, pg. 420). T. Paterson.
(c) Cardiff, Ira. (1945). *What Great Men Think of Religion* (atheist, 24+ pgs; Coleridge, pg. 72). Christopher Publishing House.

External links

â— Samuel Taylor Coleridge – Wikipedia.

θΔics

In existographies, **Samuel Fales Dunlap** (1825-1905) (CR:19) was an American religio-mythology scholar, cited by Hilton Hotema (1956), noted for []

Quotes | By

The following are related quotes:

> "The Babylonians believed that all was originally a watery chaos. The Hindus said that Brahma created the waters first. 'He thought I will let worlds issue from me: and he let them issue; Water, Light, Perishable Matter, and the Waters [heavens]. Water was above the heaven which carries it. The circle of the air encloses the light, the earth contains the perishable, and in the deep are the waters.' In the Cosmogony in Manu, 'He, the Invisible, the Unfolded, the Eternal the Soul of all beings, the Inconceivable; streamed forth in light. He *first* created the waters.' In Genesis, the Spirit of God moved on the face of the waters."
>
> — Samuel Dunlap (1858), *Vestiges of the Spirit History of Man* (pg. 136)

> "The fire-god of Ur was Ab-Ram. The Hebrew world 'Ab' means 'father', and Ram (head sign of the Zodiac) means 'most high'. Ab-Ram and Is-Ra-El were names of Saturn."
>
> — Samuel Dunlap (1858), *Vestiges of the Spirit History of Man*; cited by Hilton Hotema (1956) [1]

> "The Hebrew religion stepped out from the noblest side of the Dionysus-worship, influenced, no doubt, to some extent by Persian and Babylonian ideas, but still retaining the Phoenician impress."
>
> — Samuel Dunlap (1861), *Sod: the Mysteries of the Adoni* [2]

References

1. (a) Dunlap, Samuel F. (1858). *Vestiges of the Spirit History of Man* (Ra, 19+ pgs; Brahma, 24+ pgs; Abraham, 15+ pgs; Ab-Ram, 7+ pgs). Publisher.
(b) Hotema, Hilton. (1956). *Ancient Sun God* (pg. 26). Publisher.
2. Dunlap, Samuel F. (1861). *Sod: the Mysteries of the Adoni* (pdf) (pgs. iii-iv). Williams and Norgate.

Further reading

â— Dunlap, Samuel F. (1860). *Sod: the Son of the Man* (pdf). Publisher.
â— Dunlap, Samuel F. (1894). *The Ghebers of Hebron* (pdf). Publisher.

External links

â— Dunlap, S.F. (Samuel Fales) – WorldCat Identities.

θΔics

In hmolscience, **Samuel Gorvy** (c.1930-) is South African scientist note for his 1970 booklet *The Living Entity*, wherein he posits that “a living system suspends the law of entropy”, defines a human as a “chemical molecule” (and or a “human molecule”, depending), gives a formula (or molecular formula) of an organism (see: human molecular formula), all centered around a theory of abiogenesis. [1]

Human | Chemical molecule

The following are a few book snippets of Gorvy's man as "chemical molecule" with formula discussions:

Page 51

The chemical formula of an integrated body of different units

Page 52

be multiplied by *r*.

The formula of the hypothetical system made up of these different units – but without the enzymes present in each unit –

Page 88

– and germ cells, 34, 41
– and grafting, 42-4
– organism, formula of, 51-2
– and reproduction, 34ff., 35, 83
– and sea-water, 55
– and transition from

Common Ancestor,
of animal and vegetable kingdoms, 22-3
Conduction,
of stimuli, speed of, 68
Conotrachellus Nenuphar,

Page 93

Man,
as a chemical molecule, 51-2
feeding and reproduction, organ relationship, 16
germ cells, time of establishment, 38

and thought, 71
Molecular Ions (Electrified Molecules),
and spontaneous generation, 49
Molecule(s),
and absorption of energy, 8-10

Page 90

– and germ cell, 39
– and growth, 84
– and human molecule, 51-2
– and illness, 11
– and instincts, 67
– and life. 6. 51. 72. 83
biological, history of, 9-10
of brain, and levels
of registration, 73
– and statistical law, 74-5
and eye, 70
and instincts. 67

The following is a 1971 snippet review abstract of Gorvy's book: [2]

> "Considering the principle of life as that which stands opposed to entropy, Dr. Samuel Gorvy of Johannesburg has **...** In his discussion on how life evolves, Gorvy draws upon a vast store of information and an impressive list of authorities."

The reviewer goes on to say that Norbert Wiener's conclusions support Gorvy's final thesis.

Quotes | By

The following are quotes by Gorvy:

> "…. the law of entropy -- can be achieved only by drainage from other systems which, then, with regard to life, are its food. The living molecule becomes a unicellular and then a multicellular organism."
>
> — Samuel Gorvy (1970), *The Living Entity* (pg. 83)

References

1. Gorvy, Samuel. (1970). *The Living Entity* (entropy, 29+ pgs; man as chemical molecule, pgs. 51-52; organism, formula of, pgs. 51-52; human molecule, pgs. 51-52). [Cape Town] Nasionale Boekhandel [i.e. Tafelberg Publishers].
2. Author. (1971). "Is Man Doomed?", *Jewish Affairs*, 46:45-46.

External links

â— Gorvy, Samuel – WorldCat Identities.

θΔics

In hmolscience, **Samuel Holmes** (1868-1964) was an American zoologist note for []

Overview

In 1944, Holmes, in response to Thomas Huxley's "Evolution and Ethics" (1893) lecture, published "Life, Morals, and Huxley's 'Evolution and Ethics'", which, as cited by Judson Herrick (1956), supposedly, dealt with the puzzle of altruism in the struggle for existence model. [1]

In 1948, Holmes, in his *Life and Morals*, a more-comprehensive work, supposedly citing Herbert Spencer's term "organically moral", asserted that man alone among the animals is organically moral because he has the capacity to create an ideal of goodness, i.e. of fitness, in terms of social relations and obligations.

Holmes, of note, accepted Edward Westermarck's relativity of ethics, such as presented in his *Ethical Relativity* (1932), but found the ethics expounded by Thomas Hobbes, in his *Leviathan*, to be "most disturbing". [4]

Holmes, in this work, argued for a naturalistic theory of ethics, according to which morals had a natural origin, but that Darwinian evolution "does not logically compel me to adopt any one standard conduct rather than another. [3]

Holmes system of ethics, to note, led him into vocal eugenics avocation, particularly in respect to Mexican-American immigrations in California, arguing to the affect that it was right to sterilize citizens and immigrants who might diminish the genetic quality of America. (Q)

References

1. (a) Huxley, Thomas. (1893). "Evolution and Ethics" (Q), Romanes Lecture; in: *Collected Essays*, Volume IX.
(b) Holmes, Samuel J. (1944). "Life, Morals, and Huxley's 'Evolution and Ethics'"; in: *Science in the University* (pg. 319-32). University of California Press.
(b) Herrick, C. Judson. (1956). *The Evolution of Human Nature* (abs) (pg. 215). University of Texas Press.
2. (a) Holmes, Samuel J. (1948). *Life and Morals*. Macmillan.
(b) Herrick, C. Judson. (1956). *The Evolution of Human Nature* (abs) (pg. 215). University of Texas Press.
3. Farber, Paul L. (1994). *The Temptations of Evolutionary Ethics* (pg. 140). University of California Press.
4. (a) Westermarck, Edward. (1932). *Ethical Relativity*. Littlefield, 1960.
(b) Ethical Relativity – Wikipedia.
(c) Edvard Westermarck – Wikipedia.
(d) Holmes, Samuel J. (1948). *Life and Morals* (pg. 220). Macmillan.
(e) Farber, Paul L. (1994). *The Temptations of Evolutionary Ethics* (pg. 140). University of California Press.

Further reading

● Holmes, Samuel J. (1948). *Organic Form and Related Biological Problems*. University of California Press.
● Holmes, Samuel J. (1948). "What is Natural Selection?", *Scientific Monthly*, 67:324-30.

External links

● Samuel Jackson Holmes – Wikipedia.

θΔics

In existographies, **Samuel Johnson** (1709-1784) (IQ:165|#512) (Cattell 1000:46) [RGM:354|1,500+] (Bloom 100:6|Wisdom) (CR:3), aka "Dr. Johnson" (pen name", was an English poet, playwright, essayist, moralist, literary critic, and biographer; noted for []

Dictionary

In 1755, Johnson completed his *Dictionary of the English Language*, which he had spent eight years on, which for the next 150 years, until the completion of the *Oxford English Dictionary*, became the status quo reference.

Religion

Johnson was a devout Anglican.

Quotes | On

The following are quotes on Johnson:

"It was in the eighteenth century that the conception of the universe as a 'chain of being', the principles which underlay this conception – plenitude, continuity, gradation – attained their widest diffusion and acceptance. The faith in speculative *a priori* metaphysics was waning, and the Baconian temper (if not precisely the Baconian procedure), the spirit of patient empirical inquiry, continued its triumphant march in science, and was an object of fervent enthusiasm among a large part of the general educated public. There has been no period in which writers of all sorts — men of science and philosophers, poets and popular essayists, deists and orthodox divines — talked so much about the 'chain of being', or accepted more implicitly the general scheme of ideas connected with it, or more boldly drew from these their latent implications, or apparent implications. Addison, King, Bolingbroke, Pope, Haller, Thomson, Akenside, Buffon, Bonnet, Goldsmith, Diderot, Kant, Lambert, Herder, Schiller — all these and a host of lesser writers not only expatiated upon the theme but drew from it new, or previously evaded, consequences; while Voltaire and **Samuel Johnson**, a strange pair of companions in arms, led an attack upon the whole conception. Next to the word 'nature', the 'great chain of being' was the sacred phrase of the eighteenth century, playing a part somewhat analogous to that of the blessed word 'evolution' in the late nineteenth."
— Arthur Lovejoy (1933), *The Great Chain of Being* (pgs. 183-84) [1]

Quotes | By

The following are quotes by Johnson:

> "Curiosity is one of the most permanent and certain characteristics of a **vigorous intellect**."
>
> — Samuel Johnson (c.1760), *Publication* (Ñº)

References

1. Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea*. Harvard University Press, 1936.

External links

â— Samuel Johnson – Wikipedia.

θΔics

In hmolscience, **Samuel McCune Lindsay** (1869-1960) was an American sociologist noted for his 1898 discussion on what the unit of sociology should be, as compared to: psychology, economics, chemistry, or physics.

Overview

In 1898, Lindsay, in his "The Unit of Investigation or of Consideration in Sociology", introduced the following query:

> "The atom in chemistry and the molecule in physics might be cited as illustrations of a somewhat analogous service performed by units of investigation and consideration in those sciences. The fundamental concepts of economics can hardly be said to be removed beyond the pale of controversy, and yet the science of economics is a definite body of knowledge largely because economists have had in the principle of the division of labor which presupposes the economic man a poorly defined but nevertheless commonly accepted unit of consideration. Is it possible to find in the data of sociology any constantly recurring factor in the socializing process which is fundamental to the concept of society in all stages of development, and which therefore can be regarded as a unit of investigation, consideration and reference for all truly sociological data?"

The following year, Albion Small attempted to expand on this, by arguing that general sociology might be built like "general chemistry". [2]

Education

Lindsay received his Ph.B. from the University of Pennsylvania in 1889 and an LL.D. in 1909, and a PhD from the University of Halle in Germany in 1892. He was a special agent for the U.S. Senate Finance Committee in 1892 and an agent for the U.S. Industrial Commission to report on railroad labor in 1899-1900. He became Professor of Sociology at the University of Pennsylvania, 1896-1907 and Professor of Social Legislation at Columbia University, 1907-1939. [3]

Note

The photo shown refers to by a "Samuel McCune Lindsay, Doctor" taken between created between 1905 and 1945 by Harris & Ewing; and thereby needs secondary corroboration. [4]

References

1. Lindsay, Samuel McCune. (1898). "The Unit of Investigation or of Consideration in Sociology" (pdf), *The Annals of the American Academy of Political and Social Science* (pgs. 214-), Vol. 12, Sep.
2. Small, Albion W. (1899) "Briefer Communications: A 'Unit' in Sociology." *The Annals of the American Academy of Political and Social Science* (pgs. 81-229; esp. pg. 83: "human atom"), Vol. 13.
3. (a) Samuel McCune Lindsay (about) – Virginia.edu.
(b) Samuel McCune Lindsay (about) – Columbia.edu.
4. Samuel McCune Lindsay (photo) – Old-Picture.com.

External links

â— Lindsay, Samuel McCune (1869-1960) – WorldCat Identities.

θΔics

In existographies, **Samuel Morland** (1625-1695) (EP:12) (CR:5) was an English engineer noted for his prototype work on attempts and ideas for making an engine for raising water.

Overview

In 1660, Morland became a baronet, at which point he began to attempt to engineer different things; the following is a summary:

> "Moreland received his appointment and a baronetcy in 1660, and immediately commenced making experiments, partly at his own expense and partly at the cost of the royal exchequer, which were usually not at all remunerative. He built hand fire-engines of various kinds, taking patents on them, which brought him as small profits as did his work for the king, and invented the speaking-trumpet, calculating machines, and a capstan. His house at Vauxhall was full of curious devices, the products of his own ingenuity."
>
> — Robert Thurston (1878), *A History of the Growth of the Steam Engine* (pg. 27)

In 1683, Morland gave a booklet to the monarchy, which stated the following:

> "Water being evaporated by fire, the vapors require a greater space, about 2000 times that occupied by the water. And rather than submit to imprisonment it will burst a piece of ordnance. But being controlled according to the **laws of statics, and by science reduced** to the measure of weight and balance, it bears its burden peaceably, **like good horses**, and thus may be of great use to mankind, especially for the raising of water, according to the following table, which indicates the number of pounds which may be raised six inches, 1,800 times an hour, by cylinders half-filled with water, and of the several diameters and depths of said cylinders."
>
> — Samuel Moreland (1683), "The Principles of the New Force of Fire" [1]

This project to Louis XIV was for raising water by means of steam, accompanying it with ingenious calculations and tables. [2]

> "There is no exact description of the engine proposed by **Morland**, but the project is of the highest interest as one of the first to demonstrate the practical utility of steam-power. Morland's experiments must have been conducted with great care and skill, his estimate that at the temperature of boiling water steam was about

two thousand times more bulky than water being substantially confirmed by Watt after careful investigation some hundred years later."

— Leslie Stephen (1894), "Moreland" (Ñº), *Dictionary of National Biography*

Cylinders.		Pounds.
Diameter in Feet.	Depth in Feet.	Weight to be Raised.
1	2	15
2	4	120
3	6	405
4	8	960
5	10	1,876
6	10	3,240
Number of cylinders having a diameter of 6 feet and a depth of 12 feet.		
1	12	3,240
2	12	6,480
3	12	9,720
4	12	12,960
5	12	16,200
6	12	19,440
7	12	22,680
8	12	25,920
9	12	29,190
10	12	32,400
20	12	64,800
30	12	97,200
40	12	129,600
50	12	162,000
60	12	194,400
70	12	226,800
80	12	259,200
90	12	291,600

A copy of Morland's 1683 steam table which "indicates the number of pounds which may be raised six inches, 1,800 times an hour, by cylinders half-filled with water, and of the several diameters and depths of said cylinders". [4]

Robert Thurston, of note, conjectured that this "Morland engine", described above, was a design Morland learned from Edward Somerset (1663). [4]

Gunpowder engine

Moreland, at some point, seems to have published designs for engines that used gunpowder to facilitate the raising of water (see: gunpowder engine):

> "We cannot say whether **Samuel Morland** employed a cylinder and piston in his apparatus above mentioned; we know that Hautefeuille did not. So far as our information goes, it is to Huygens that the merit belongs of having constructed the first motive engine consisting of a cylinder and piston. He employed gunpowder to produce a vacuum under the piston, and the atmospheric pressure performed the work."
>
> — Robert Galloway (1881), *The Steam Engine and Its Inventor* (pg. 20)

> "**Samuel Morland** in the seventeenth century had envisaged the deployment of gunpowder engines in mines and for land drainage."
>
> — Christine MacLoed (1988), *Inventing the Industrial Revolution* [5]

Moreland's designs, supposedly [?], did not employ a piston and cylinder. [3]

Quotes | On

The following are quotes on Morland:

> "As we learn from a warrant of Charles II, **Samuel Morland** was, in 1661, granted a 'monopoly' for an engine for raising water out of mines by means of 'air and powder conjointly'."
>
> — Anon (1881), "The History of the Steam Engine: Overview of Galloway's *The Steam Engine and its Inventors*" [3]

References

1. (a) Moreland, Samuel. (1683). "The Principles of the New Force of Fire: Invented by Moreland in 1682" ("Les Principes de la Nouvelle Force de Feu, inventée par le Chevalier Morland, l'an 1682, et présentée a Sa Majesté Très Chrétienne, 1683."), Manuscript presented to Charles II.
(b) Moreland. Samuel. (1683). *Elevation of the Waters by all kinds of Machines reduced to the Measure to the Weight and to the Balance* (Elevation des Eaux par toute sorte de Machines réduite à la Mesure au Poids et à la Balance, présentée a Sa Majesté Très Chrétienne, par le Chevalier Morland, Gentilhomme Ordinaire de la Chambre Privée et Maistre de Mechaniques du Roy de la Grande Bretagne). Paris.
(c) Thurston, Robert. (1878). *A History of the Growth of the Steam-Engine* (txt) (pgs. 28-29). Appleton and Company.
(d) Ubbelohde, Alfred. (1954). *Man and Energy: Illustrated* (pgs. 53-54). Hutchinson's Scientific & Technical Publications.
2. Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 156). Courier, 1990.
3. (a) Galloway, Elijah. (1826). *History of the Steam Engine: From its First Invention to the Present Time*. Cowie.
(b) Anon. (1881). "The History of the Steam Engine: Overview of Galloway's *The Steam Engine and its Inventors*" (Ñº), in: *English Mechanics and the World of Science*, 32:507-08, Feb 4.
4. Thurston, Robert. (1878). *A History of the Growth of the Steam-Engine* (txt) (pgs. 27-30). Appleton and Company.
5. MacLeod, Christine. (1988). *Inventing the Industrial Revolution: the English Patent System, 1660-1800* (pg. 175). Cambridge University Press.

External links

â— Samuel Morland – Wikipedia.

θΔics

In existographies, **Samuel Pufendorf** (1632-1694) (IQ:#|#) (Cattell 1000:570) (CR:3) German jurist, political philosopher, economist and historian; noted for []

Overview

Pufendorf is noted for his revisions of the natural law theories of Thomas Hobbes and Hugo Grotius; generally being part of the movement or switch from the "divine right of kings to rule" to "rule by natural law". He also had to had to defend himself against charges, by the church, of heresy.

Influenced

Pufendorf influenced: Christian Thomasius, Jean Rousseau, Alexander Hamilton, James Madison, and Thomas Jefferson.

External links

â— Samuel von Pufendorf – Wikipedia.

θΔics

In religio-mythology, **Samuel Sharpe** (1799-1881) was an English Egyptologist noted for his 1863 *Egyptian Mythology Egyptian Christianity*, wherein he debunks a number of Bible stories, via deconstruction to their Egyptian mythological roots, such as Mary rising (O), to Isis rising, to the helical rising of Sirius. [1]

Quotes

The following are noted quotes:

> "The study of error is often only a little less important than the study of truth. The history of the human mind in its progress from ignorance towards knowledge, should tell us the mistakes into which it has sometimes wandered, as well as its steps in the right path. We turn indeed with more pleasure to review the sources from which the world has gained any of its valuable truths, in the hope of there finding some further knowledge which may be equally valuable; while for our errors, so long as we are unwilling to acknowledge them to be errors, we too often shut our eyes, and refuse to be shewn their origin."
>
> — Samuel Sharpe (1863), *Egyptian Mythology Egyptian Christianity* (pg. vii)

References

1. Sharpe, Samuel. (1863). *Egyptian Mythology Egyptian Christianity: with their Influence on the Opinions of Modern Christendom* (pg. xii; image, pg. 114). J.R. Smith.

External links

- Samuel Sharpe (scholar) – Wikipedia.

θΔics

In hmolscience, **Samuel Sommerring** (1755-1830) was a German physician and anatomist noted for his early 1790s correspondences with Goethe, on chemical polarity theory, and for his 1795 work on non-anatomical structure soul theory.

Goethe

In a 2 Jul 1792 letter to Sommerring, Goethe stated the following: [1]

> "It seems to me at least for the moment, that everything connects well when you in this teaching for Barbie takes the concept of polarity to guide. Like ... it was impossible to connect the previously chemical experience with optical, you only see the first chapter of each Dyeing, even the newest of Berthollet, in which the progress of chemistry, we must admire the way so much. Because basically ... the thing itself must be very simple, as all higher, the general principles of acting. As you pointed out quite rightly, the effect of acids and friendship is to the Yellow Red and Yellow, the alkalis to the Blue Red and Blue brought in a great relationship, what offers us the countless chemistry experiments. "
>
> “Mir scheint wenigstens für den Augenblick, daß sich alles gut verbindet, wenn man auch in dieser Lehre zum Versch den Begriff der *Polarit*ät zum Leitfaden nimmt. … Wie unmöglich war es bisher die chemischen Erfahrungen mit den optischen zu verbinden, man sehe nur die ersten Kapitel einer jeden Färbekunst, selbst der neuesten von Berthollet, in welcher wir die Fortschritte der Chemie übrigens so sehr bewundern müssen. … Denn im Grunde muß die Sache an sich sehr einfach sein, wie alle höhere, ins Allgemeine wirkende Prinzipien. Wie Sie ganz richtig bemerkten, wird die Wirkung und Freundschaft der Säuren zu dem Gelben und Gelbroten, der Alkalien zum Blauen und Blauroten in einen schönen Zusammenhang gebracht, wozu uns die Chemie unzählige Versuche anbietet.”

(add discussion)

Soul

In 1795, Sommerring, in his *On the Organ of the Soul*, dedicated to German philosopher Immanuel Kant, argued that the soul is not found in the anatomical structure of the brain, e.g. in the pineal gland as Rene Descartes (1640) had surmised, but rather in the liquid of the brain, which he called *acqua venticulorum cerebri*, and that this was a type of animated fluid. [2] Sommerring requested Kant’s opinion on this work and in response Kant sent Sommerring a four page letter, the main conclusions of which are as follows: [3]

> “We are told now by this discovery that the common sensorium is neither more nor less than the water in the chambers of the brain. There it isolates the nerves whose ends pass thither so that the sensations are not confused. It is at the same time a medium of communication between them.
>
> A difficulty [he goes on] is that water is not organized. Without organization no matter can be thought of as providing an organ for the soul. However, if we turn from the mechanical uniformity of water to its chemical composition there is more scope. Water has now been split by pneumatic experiments into two gases [Cavendish, 1781]. Each of these gases besides its own basis has caloric. This latter may be decomposed into light and other material like light, which again is decomposable into colors … [and so on]. A drop of water, a grain of sand, or things ever more simple still, are inexhaustible in the diversity of their least parts, even to an understanding so limited as man’s.
>
> Plants extract from water a vast quantity of matters. Who knows what the nerves might find to their hand in the water of the brain? Suppose the nerves in their several kinds can decompose the water in the brain, its elements may give rise to different sensations. The excitations over, the elements might then reunite. Thus, what this book claims might come to pass. But the seat of the soul? No.

> One cannot assign a relation in space to what is determinable only in time. Many fancy they feel their thought in their head, but that is a mistake. This mistake is to infer that the cause of sensation is there where it is experienced. They attribute though to traces in the brain left by impressions of sense. The supposititious traces carry no inference as to the seat of the soul. It is just material acting as at the common sensorium, as at an antechamber of the mind. Water within the chambers of the brain might truly be a common sensorium. But the seat of the soul? No. That leads to √-2, an impossible quantity."

(add disucssion)

References

1. (a) Lillyman, William J. (1982). "Analogies for Love: Goethe's *Die Wahlverwandtschaften* and Plato's *Symposium*" (pg. 143). Goethe's Narrative Fiction: the Irvine Goethe Symposium. Walter de Gruyter.
(b) H.A. Briefe II, 146.
2. (a) Reill, Peter H. (2005). *Vitalizing Nature in the Enlightenment* (pg. 152). University of California Press.
(b) Palmquist, Stephen. (2010). *Cultivating Personhood: Kant and Asian Philosophy* (pg. 163). Walter de Gruyter.
3. (a) Sherrington, Charles. (1940). *Man on His Nature* (pg. 201). CUP Archive.
(b) Kant, Immanuel. (date). *Sammtl. Werke*, X, 112 (Hartenstein, 1839).

External links

â— Samuel Thomas von Sommerring – Wikipedia.

θΔics

In existographies, **Sandra Lynch** (c.1960-) (CR:17) is an Australian philosopher, specializing in moral philosophy and friendship philosophy, noted for her *Philosophy and Friendship*, a discussion on theories of friendship from Aristotle to Cicero to Derrida, wherein she discussed Goethe's *Elective Affinities and* related individuals, including: Heinrich Tabor, Ralph Emerson, and Prosper Crebillon. [1]

Education

Lynch completed BA in something, and in 1988 completed her MA with a thesis on "Conceptions of Friendship" at Macquarie University, then completed her PhD in something. [2] Presently, she is a professor of moral philosophy at the University of Notre Dame, Australia, specializing in applied and professional ethics.

References

1. Lynch, Sandra. (2005). *Philosophy and Friendship* (*Elective Affinities*, pg. 36; Crebillon, pg. 37). Edinburgh University Press.
2. Lynch, Sandra Michelle – WorldCat Identities.

External links

â— Sandra Lynch (faculty) – University of Notre Dame, Australia.

θΔics

In religio-mythology, **Santa Claus** is Is a secular rescript of the myth of the Egyptian god Osiris (3100BC), and or his equivalents (see: Osiris rescripts), e.g. the Syrian god Nimrod (1500BC), who, after their death, were said to have turned into an "evergreen tree" (see: Christmas tree), after which, each year, were said to visit the evergreen tree and leave gifts under it. [1]

The Egyptians (3100BC) believed that the plant god Osiris, himself based on the astro-theological movement of the Orion constellation (see: Sah), after death, turned into an evergreen tree, and each year, at winter solstice visited the tree and left gifts under it; the modern variant of this is the myth of **Santa Claus** who each year leaves presents under the Christmas tree.

Overview

The status quo origin of Santa Claus, e.g. as told by History.com (Ñº), generally assigns the origin to a Turkish monk named St. Nicholas (280-350AD), who sold his wealth and travelled the countryside helping the sick and poor; and how in the 18th century, the Dutch variant of Saint Nicholas was Sinter Klass.

In 1980s, real scholars, however, began discern the connection that the myth of a man flying through the sky, around the pole star (or near the North Pole), each Winter Solstice (Christmas), and leaving presents under an evergreen tree (Christmas tree), is much older than the St. Nicholas myth origin; a few examples testify as follows:

> "Adonis, Attis, Osiris, Befanna, Saturn, Father Time and the Infant New Year, The Jewish Festival of Lights, and even Christ all appear on or about the time of the winter solstice and through their appearance affirm the existence of an eternally regenerating life force. Thus, Santa's function, like the functions of the other folkloristic figures appears to be an annual dispensing of ritual gifts to affirm the continued resurgence and immortality of life and to ensure the continued fertility of the crops and nature. To some extent, then, Santa may be regarded as a nature spirit whose task it is to journey from the nether world to bring mankind the promise of renewed life. /… Saint's legends generally use quotidian metaphors to illustrate cosmic truths, while myths present us with literal and colossal images of primordial acts. Thus, Osiris himself being cut up into bits and fertilizing the land is a more grandiose and mythic treatment of the same theme illustrated in the saint's legend by **Santa Claus**'s bringing presents."
>
> — Author (1983), "The Legend of Santa Claus" (Ñº), *Papers in Comparative Studies*

> "Christmas and Christmas tree go back to ancient times to Egyptian civilization. In Egypt, it was believed

that the husband of Isis, the 'Queen of Heaven' – King Osiris of Egypt, was born on December 25th. After the untimely death of the king After the untimely death of the king Osiris, his wife Isis, propagated the doctrine of the survival of Osiris as a spirit being. She claimed a **full-grown evergreen tree** sprang overnight from a dead tree stump, which symbolized the springing forth unto new life of the dead King. On each anniversary of his birth, she claimed, Osiris would **visit the evergreen tree and leaves gifts upon it**. This is the real origin of the Christmas tree."

— Author (1990), "Article" (pg. 9), *Hindu Vishva*, 26

In 2000, religio-mythologist James Arthur outlined what he called "Santa-ology" or "Santa-ism", wherein he asserts the following: [8]

"Today's **Santa Claus** is a metamorphosis of many older mythologies, including Thor or Donner (German Donar) who wears red and rides in a Golden Flying Chariot pulled by two Goats (Cracker and Gnasher). In a sense, these goats were the ancestors to the now popular reindeer. What would the red and gold clad angel be doing with that nice basket? An Easter basket at Christmas is an interesting concept.

The icons, symbols, and relics that have managed to survive from the "Winter Solstice" celebrations of old, have a commonality that deserves some reflection, study, and perhaps even some reverence. Understanding that these traditions are borrowed ones, is central to getting at the heart of the true meaning of Christmas.

Christmas is commonly thought of as a Christian holiday (the birth of Jesus). Many Christian beliefs and traditions were borrowed from more ancient religions and mythologies. This is well documented by authors such as Gerald Massey, Godfrey Higgins, Robert Graves, Kersey Graves, and many others. The virgin birth, the incarnation of god, the sacrament, Christmas, Easter, etc. have all been adopted/stolen by Christianity as its own."

Arthur, in continuation, comments on umbrella term 'Pagan' as follow:

"It is well documented by fundamentalists (apologists) that the Christmas traditions are Pagan in origin. This simply means that their origin comes from the traditions of the country-folk (pagan). By contrast, the Pagan origins of most of the other attributes of Christianity are vigorously denied. It is also very easy to obscure, overlook and discredit the Egyptian, Mithraic, Germanic, Norse, Celtic, Greek, Hindu and Buddhist roots by lumping all non-Christian religions together and labeling them 'Pagan'. These are

certainly not simple country-folk religions. So to just say Christmas has Pagan roots, and not go further, is glossing over what exactly those roots are, and discrediting their study as worthless. Christmas icons, traditions and stories have hidden meanings. Although not initially apparent, a more thorough investigation reveals far more symbolic content (which is decipherable) than originally suspected. At the roots of this symbolism research is information about the secrets of the mushroom, regarding its habitats, forms, uses, preparations, and effects."

Arthur continues:

"Shaman of Siberia and the Russian icon, St. Nicholas, both play parts in the tale of Christmas, providing clues as to where Christmas came from and why there are certain symbols associated with the holiday. It is these types of clues that will help (the questors) in the deciphering of the symbols. Siberian Shaman used/use (despite governmental oppression) the Amanita muscaria as a religious sacrament. It is used for spiritual vision, out-of-body travel into the realms of the spirits, and as a plant-spirit guide in teaching and healing. The value of the inebriant is placed highly among the commodities of the native tribesmen, fetching reindeer pelts, meats, and all manner of tradable goods in payment and barter. Interesting to note: If you aren't quick enough in the hunt, you will find only the mushroom stubs, the rest greedily gobbled up by the hungry reindeer.

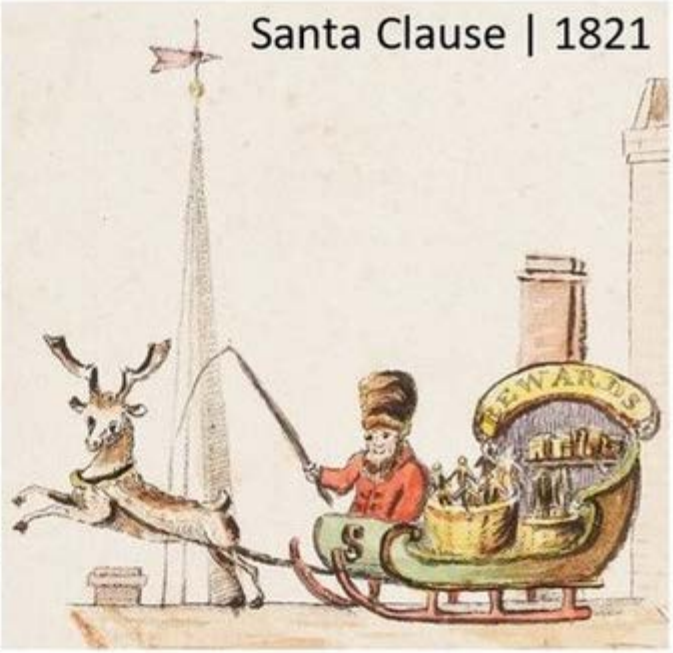

The ancient shamanic use of Amanita muscaria in Siberia is well documented. Despite governmental oppression against its use, there are still many who refuse to accept the authorized state religion, and continue the shamanic traditions in secret. Just as the Siberian shaman (commonly dressing in red and white) would enter through the opening in the roof of a home where a ritual was to be done, Santa Claus also arrives on the roof and enters through the chimney. Just as the shamans would gather the mushrooms in bags which they would bring with them when performing a ceremony, Santa Claus also (on the Holy Day) brings presents in a bag. The Santa Claus we see today evolved from traditions developed in Germany. It is fairly common knowledge that the Weihnachtsmann (St. Nick) was an amalgamation of older Germanic/Norse gods such as Thor, Donner, Odin and Wotan. What's missing here is just as Santa flies through the skies in his sleigh, Odin (as well as the rest) rode through the sky in his chariot, which is depicted in the stars by "The Big Dipper". **The Big Dipper is the chariot of Odin & Wotan, Thor, King Arthur, and even Osiris** (of Egypt). The chariot that circles the North Star in a 24-hour period is thus also known as the sleigh of Santa Claus because it circles his mythological home, the North Pole. It is no surprise that Nordic/Germanic gods have connection to mushrooms in their mythology. As Thor throws his

mushroom-shaped hammer to the ground, mighty thunders and lightning cracks cause the real mushroom(s) to appear. As the horses pulling Odin through the sky in his chariot become over-exerted, their blood-mingled spit falls to the ground and causes the Amanita mushrooms to grow at those exact points."

This "Big

Dipper" equals chariot of Odin, sleight of Santa, may be off, being that the star boat (solar barque) of Osiris was the Orion constellation, as is well-established, and the "Big Dipper" has to do with the opening of the mouth. Author continues:

> "The Osiris mythology has even more to add to this. To the Egyptians; South was up (North). Osiris was the lord of the underworld, the South, (South=down) which is why he circles the sky in the furthest possible lower (southern) area. Not only did Osiris ride the sky in a chariot, but after his death Isis found that an **evergreen (Cedar)** had grown overnight from a dead stump to full-sized (this also relates to the Djed pillar); which was understood as a sign of Osiris' rebirth and immortality. Interestingly, the traditional birth of Osiris is the 25th of December. The 25th of December was also celebrated annually by putting presents around the Cedar tree. This tradition is at least five thousand years old. The birth of Horus to the goddess-virgin-mother, Isis, is perhaps the eldest representation of the goddess/son mythology, yet it is impossible to know this or the real age of the Astro-theological-Virgo-giving-birth-to-the-child/god/star mythology for sure. However, it is the **oldest source** I have found; it is very old.
>
> Drying the mushrooms was/is a necessary procedure typically accomplished by stringing them up (like popcorn) and hanging them above the hearth of the fireplace. shamans and lay people alike, would gather and dry them. They gather all they can since they are a valuable commodity. Reindeer (native to Siberia) are known to be quite fond of eating these mushrooms. The mythology of flying Reindeer reflects the supposed pharmacological effects of such a meal.
>
> It is important to point out that this Christmas/Winter Solstice celebration, with all its various counterparts, transcends the world's religions. The reason that this celebration is held all over the planet in various forms may have something to do with this other commonality at which we are looking; it is certainly entwined in the symbolism."

(add)

Quotes

The following are related quotes:

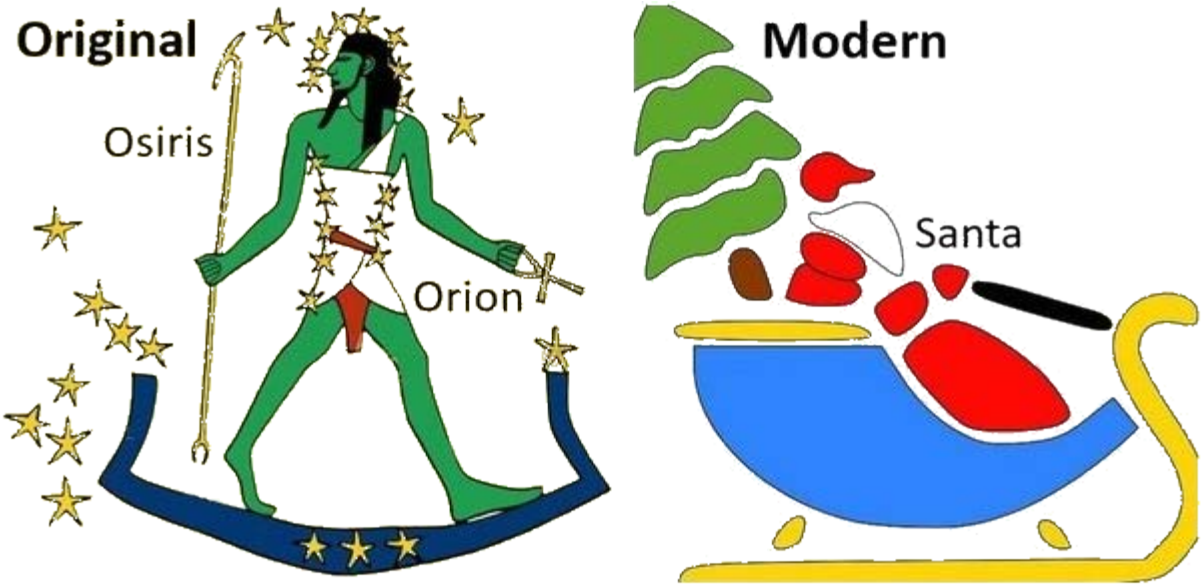

> "The idolatrous festival was on December 25th. This system began by Osiris and Isis and their son Horus about 3000BC; centuries before the birth of Yahshua [son of Yahweh]. When King Osiris died, his wife Isis claimed a **full-grown evergreen tree** sprang up overnight from a dead tree stump, which symbolized the springing forth unto new life of the dead Osiris. On each anniversary of his birth, she claimed Osiris would visit the evergreen tree and **leave gifts** upon it. December 25th was the birthday of King Osiris reborn as the son, Horus. This was the **origin of the Christmas tree**."
>
> — Jarid Miller (2010), *Yahshua, the Man behind the Glory* (pg. 24)

> "The King's Chamber north shaft was aligned with the culmination of the star Thuban, the **north pole star** during the period when the pyramid was built; the King's Chamber south shaft was aligned with that of the Alnitak, part of the **belt of Orion**."
>
> — Mark Smith (2017), *Following Osiris: Perspectives on Osirian Afterlife from Four Millennia*

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1. Thims, Libb. (2017). "The TRUE Origin of the Christmas Tree" (Ñº), Atheism Reviews, Nov 28.
2. Arthur, James. (2000). *Mushrooms and Mankind: The Impact of Mushrooms on Human Consciousness and Religion* (pgs. 11-13) (Ñº). Book Tree.

θΔics

In thermodynamics schools, the **Santa Fe Institute** is a non-profit research institute, founded in 1984, located at Santa Fe, New Mexico, that has been focused over the years on topics such as chaos theory, complexity, self-organization, thermodynamics of life, origin of life, far from equilibrium ideas, along with extrapolations of these in economics, sociology, and anthropology.

Thinkers

A number of noted thinkers, curious, been associated with or faculty of the Santa Fe Institute, including: Per Back (self-organized criticality), Stuart Kauffman (auto-catalytic cycles), Harold Morowitz (entropy in biology), Douglas White (anthropological thermodynamics), and Eric Smith (economic thermodynamics).

External links

â— Santa Fe Institute (homepage) - SantaFe.edu.
â— Santa Fe Institute – Wikipedia.

θΔics

In hmolscience, **Santo Fortunato** (1971-) is an Italian particle physicist turned sociophysicist noted for []

Overview

In 2003, Fortunato, at a seminar on "complex systems" (or complexity theory), via invitation of his friend Vito Latora, gained an interest in informatics, network theory, and information in biological networks and social dynamics. [3]

In 2009, Fortunato, in his "Statistical Physics of Social Dynamics", co-authored with Claudio Castellano and Vittorio Loreto, building on Bikas Chakrabarti (2006), Dietrich Stauffer (2006), and Mark Buchanan (2007), among others, discuss things such as the: Sznajd model, Axelrod model, crowd dynamics, among others, the abstract of which is as follows:

> "Statistical physics has proven to be a very fruitful framework to describe phenomena outside the realm of traditional physics. The last years have witnessed the attempt by physicists to study collective phenomena emerging from the interactions of individuals as elementary units in social structures. Here we review the state of the art by focusing on a wide list of topics ranging from opinion, cultural and language dynamics to crowd behavior, hierarchy formation, human dynamics, social spreading. We highlight the connections between these problems and other, more traditional, topics of statistical physics. We also emphasize the comparison of model results with empirical data from social systems."

The also discussion: social spin models, Ising models (see: social Ising model), Brownian agents (see: active Brownian agent), among others. On the particle size they state the following:

> "Finally, a word about finite size effects. The very concept of order-disorder phase-transitions is rigorously defined only in the limit of a system with an infinite number of particles (thermodynamic limit), because only in that limit truly singular behavior can arise. Social systems are generally composed by a large number N of agents, but by far smaller than the number of atoms or molecules in a physical system. The finiteness of N must play therefore a crucial role in the analysis of models of social dynamics (Toral and Tessone, 2007). Studying what happens when N changes and even considering the large-N limit is generally very useful, because it helps characterizing well qualitative behaviors, understanding which features are robust, and filtering out non-universal microscopical details."

Fortunato was the 2011 recipient of the Young Scientist Award for Sociophysics and Econophysics, a prize given by the German Physical Society. [1]

Fortunato, prior to 2015, was director of the Sociophysics Laboratory at the Institute for Scientific Interchange in Turin, Italy. [1]

Education

Fortunato completed his BS in physics in 1995 at the University of Catania, Italy, and his PhD in theoretical physics in 1998, with a dissertation on "Percolation and Deconfinement in SU(2) Gauge Theory", at the University of Bielefeld, Germany, after which he moved to the field complex systems, focusing on network science, especially community detection in graphs, computational social science and science of science. In 2016, Fortunato became professor at the school of informatics and computing, at Indiana University, Bloomington. [3]

References

1. Castellano, Claudio, Fortunato, Santo, and Loreto, Vittorio. (2009). "Statistical Physics of Social Dynamics" (abs), *Rev. Mod. Phys.* 81: 591-646.

2. Santo Fortunato (chairs) - iccss2015.eu.
3. Santo Fortunato (about) – Google Sites.

External links

- Santo Fortunato – Google Scholar.
- Santo Fortunato (overview) – Google Sites.

θΔics

In religio-

The basic outline of Egyptian cosmology (2500BC) and its cross-cultural name rescripts: Hinduism (800BC) and Judaism (300BC), as tabulated in god character rescripts, which shows that the mythical figures of **Saraswati** (Hindu) **and Sarah (Judaism)** were not real entities by star motif figures.

mythology, **Sarah and Saraswati**, aka the "wife/sister motif" (Greenberg, 1996), which is related to Abraham and Brahma, refers to []

Overview

In c.3,500BC to 500AD, in Egypt, prior to the completion of the Aswan High Dam (1970) of the Nile River, it was universal belief, in an astro-theological sense, held by Egyptians, Greeks, and Romans, and that the Jan 25 heliacal rising (Q) of the the star Sirius, which had previously not been seen for 70-days, signaled or initiated the annual 150-day Nile River flood and worked to "re-kindle" the power or heat of the sun; the following is one take on this:

> "Who is there that does not know **that the vapor of the sun is kindled by the** [Jun 25] **rising** of the **dog-star** [Sirius]? The most powerful effects are felt on the earth from this star. When it rises, the seas are troubled, the wines in our cellars ferment, and **stagnant waters** [Nile River] **are set in motion** [150-day flood]."
>
> — Pliny the elder (77AD), "On the Rising of the Dog Star" [4]

In this model, the "sun" and the star "Sirius" were believed to be a god and and goddess "married" to each other, so to say, in a reoccurring astro-theological relationship, generally modeled to the effect that the sun or sun god (Ra, predominately) was born out of the primordial waters (the water god Nun, Nile River, or Milky Way, depending); hence, the sun, the star, and a river were the three "physical" things behind the myths derived therefrom.

In 2333BC, as found in the Pyramid Texts of Pharaoh Teti, the Orion constellation, and his annual rising, is mentioned with two "important stars", as Wallis Budge (1904) describes things, Sirius and another "unnamed star", which is thought to be associated with the goddess Nephthys, he sister of Isis: [6]

#	Post-sync god	Pre-sync god	Star / Constellation	Budge listing
1.	Osiris	Sah	Orion	Saḥ (Tetà 349), , i.e., Orion.
2.	Isis	Septet	**Sirius** [Dog Star]	Sepṭet (Tetà 349), , i.e., the Dog Star.
3.	Set [?]	Sehut	Great Bear	Seḥuṭ (Pepi II. 857), .
4	Nephthys [?]	Nekhekh	**Star Name** [?]	Nekhekh (Tetà 218), .

In this period, i.e. during the old kingdom (2700-2200BC), the supreme god was Atum-Ra or "Ra" in short, depending, during which time Ra was said to have rode on his solar barque with two sister-mothers; one take on this is as follows:

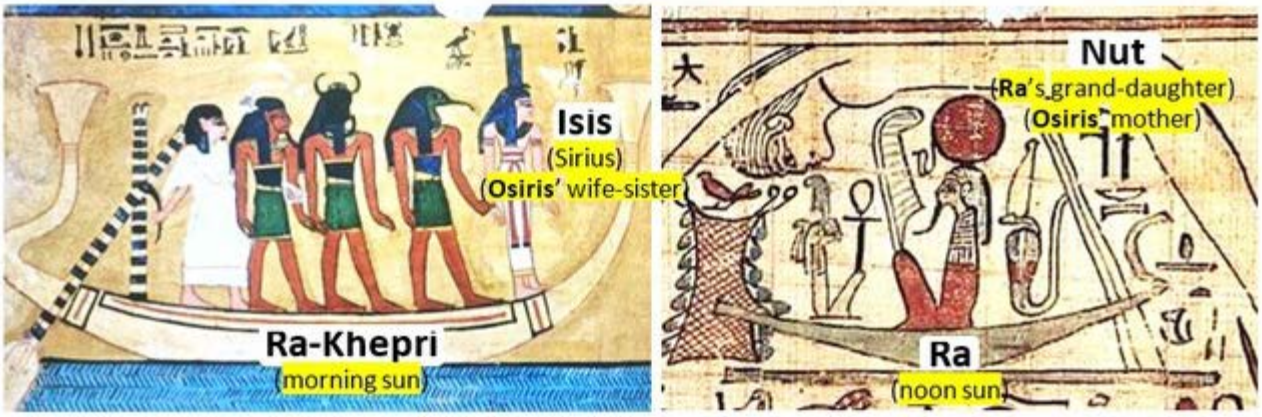

Left: a depiction of Ra-Khepri, the "morning" sun (see: sun god) riding with Isis. Right: Ra, as the noon sun, shown below Nut, his grand-daughter, the goddess of the heavens, who is the mother of Osiris. It is the Isis + Ra pairing (or **Isis + Osiris-Ra pairing**) that is behind the **Brahma + Saraswati** and **Abraham + Sarah** motifs.

> "Iusa, the Jesus of On, like Horus in the Osirian cult, was born bi-mater. His two mothers were Iusaas and Neb-hetep, the two consorts of Atum-Ra. These two mothers were at first two sisters in the mythos. One of them was the mother in the western mountain, or later in the winter solstice; the other gave birth to Horus on the horizon in the eastern equinox. It follows inevitably that the 'Gospel Jesus' has two mothers who were sisters, and two places of birth and rebirth. When the mythology was merged in the eschatology, and **Ra** became the father in heaven, **he is described as having two companions who are with him in the solar bark**. In this text **the two sister-mothers with whom Ra consorts in the "divine ship" are Isis and Nut**, who are the bringers-forth of Iusa or Jesus in his twofold character: child-Horus at his first advent being the son of Isis (Har-si-Hesi) the earth-mother, and In his second advent, or rebirth in spirit, the son of Nut, the heavenly mother. Such is the origin of **the two mothers who were two sisters**."
>
> — Gerald Massey (1907), *Ancient Egypt, the Light of the Modern World, Volume Two* (pg. 787)

Here, we glimpse the roots of the connection between Ra (the sun), the root god of Abraham and Brahma, and "sister-mother" connection with Isis (the star Sirius), and Nut, the mother of Isis and granddaughter of Atum-Ra, according to Heliopolis creation myth.

In 1250-1050 BCM, in the mid to late New Kingdom era, the syncretistic god Osiris-Ra became the new supreme god of Egypt (see: supreme god timeline), during which time Isis (the star Sirius) was the wife-sister of Osiris, and hence, in a reformulated sense, could be seen as the wife-sister of Osiris-Ra or Ra, in a reduced sense, which thus, in the **Ra + Isis pairing**, become the root behind the wife-sister motif seen in Hindu rescript (c.800BC) of **Braham + Saraswati**

pairing and the Judaic rescript (c.300BC) of the **Abraham + Sarah pairing**.

In c.1560, scholars had come see and to point out that Sarah and Saraswati had the same religious story motif:

> "But long before Georgi [1762], the English Orientalist Hyde [c.1700] (Q), and long before Hyde, Postel (1552) (Q) had declared the name of Brahma to be a corruption of Abraham—a view which appears to have been common among Mohammedans; and Catholic missionaries early expounded this discovery amongst the Hindus, adding that the name of the female deity **Saraswati** was only a corruption of **Sarah**."
>
> — John Robertson (1889), *Christ and Krishna* (pg. 6) [2]

To remedy this apparent inconsistence, Hindu apologists argued that the Jews were of Hindu origin and Christian apologists argued that the Hindu's copied Old Testament when they wrote the Vedas. It wasn't until the translation of the Rosetta Stone (1820s), however, that scholars began to see the true Egyptian origin to both stories.

In 1996, Gary Greenberg, in his "The Wife / Sister Stories" section, of his *The Bible Myth: the African Origin of the Jewish People*, connects the three "wife/sister" stories in the Old Testament, two involving Abraham and Sarah, and one involving Isaac and his wife, with the two Horus genealogies of the Egyptians. [1]

Hagar | Hagar river?

In the 2000s, scholars were beginning to point out that overlapping similarity that, in Judaism, Sarah had a handmaiden named "Hagar", and that, in Hinduism and in India, the Sarasvati River (Q) has a tributary named "Ghaggar" river (Q):

> "In Hindu mythology, Sarai-Svati is Brahm's sister. The bible gives two stories of Abraham. In this first version, Abraham told Pharaoh that he was lying when he introduced Sarai as his sister. In the second version, he also told the king of Gerar that Sarai was really his sister. However, when the king scolded him for lying, Abraham said that Sarai was in reality both his wife and his sister! (Genesis 20:12.). But the anomalies don't end here. In India, **a tributary of the river Saraisvati is Ghaggar**. Another tributary of the same river is Hakra. According to Jewish traditions, **Hagar was Sarai's maidservant**; the Moslems say she was an Egyptian princess. Notice the similarities of Ghaggar, Hakra and Hagar."
>
> — Gene Matlock (2002), "Who Was Abraham?" [5]

> "We note that the name of Brahma's consort Sarasvati seems to resonate with that of Abraham's wife, Sarah. Also, in India, the **Sarasvati River** (Q) **includes a tributary known as the Ghaggar** (Q). Another tributary of the same river is called the Hakra. According to Jewish tradition, **Hagar was Sarah's maidservant**."
>
> — Steven Rosen (2006), *Essential Hinduism* (pg. 12)

(add)

Quotes

The following are related quotes:

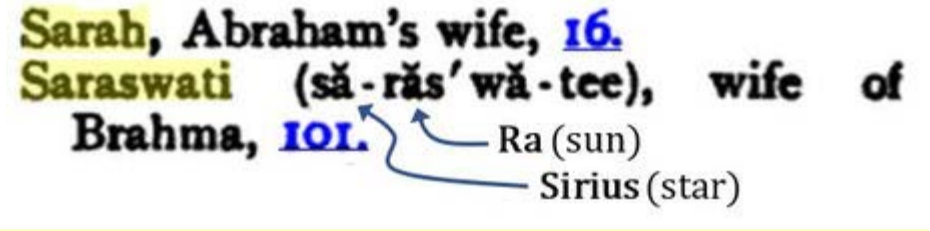

> "Have you ever noticed that Abraham and his wife Sarah of the monotheistic

> Judeo-Christian and Muslim religions are nearly identical in name to Brahma and his wife Saraswati of the Hindu religion?
>
> — Rainbow Warrior (2014), "Brahma and Abraham" (Q)(Q)

An indexed section of names **"Sarah" and "Saraswati"**, from Donald Mackenzie's *Mythology of the Babylonian People* (1915), showing the similarities between Abraham's wife (Sarai / Sarah) and Brahma's wife (Saraswati), albeit addressed on separate pages, annotated to show the prefix *Sa-* (or **S-r-i** common to both names) means "Sirius" and *Ras-* (or **-Ra-** common to both names) means "Ra" the sun or sun god, in the original Egyptian astro-theological meaning of each name component. [3]

References

1. Greenberg, Gary. (1996). *The Bible Myth: the African Origins of the Jewish People* (formerly published as *The Moses Mystery*) (§: The Wife / Sister Stories, pgs. 209-13). Citadel Press.
2. (a) Georgi, Antonio. (1762). *Alphabetum Tibetanum: the Beginning of Tibetology in the Western World* (abs). Publisher.
(b) Robertson, John. (1889), *Christ and Krishna* (pg. 6). Publisher.
3. Mackenzie, Donald. (1915). *Mythology of the Babylonian People*. (pg. 528). Bracken Books.
4. Pliny (the Elder). (77AD). *Natural History, Volume 1* (translators: John Bostock and H.T. Riley) (pg. 67). Henry G. Bohn, 1855.
5. Matlock, Gene D. (2002). "Who Was Abraham?" (Q) (§: Abraham = Braham; Sarah = Saraswati). Publisher.
6. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (important stars, pg. 83; Apollo, pg. 486; Horus son of Ra or son of Osiris, depending on text, pg. 487; seven scorpions, pgs. 487-88). Dover, 1969.

Further reading

- Karadja, Mary. (1912). *King Solomon* (pgs. 130-31). Publisher.
- Choudhury, Anjali. (2018). "Why Did Brahma Marry His Own Daughter Saraswati?" (Q), The Humor Nation, Aug 13.

External links

- Hinduism and Judaism – Wikipedia.

θΔics

In human thermodynamics, **Sarah Wolf** (c.1978-) is a German mathematical economist noted for her co-organization efforts of the 2011 “Social Energy” workshop, on the subject of an inquiry about "social energy", held during the European Conference on Complex Systems, Vienna, in which she elaborated her ideas on a theory of "social energy landscapes" in terms of gravity-like potential functions.

Disclaimer

On 19 Mar 2013, to add disclaimer to her "social energy" position, Wolf edited her own Hmolpedia article, removed her photo, and added the following statement:

> “This site has been created without agreement of Sarah Wolf, who does not see her work about a social energy concept as being part of ‘human thermodynamics’.”

This would seem to put her in the category of a "objector" to human thermodynamics, as defined by English physicist C.G. Darwin in 1952, though her reasons at this point seem a bit blurry?

Workshop overview

The "Social Energy" workshop focused on the the following topics—a two cultures type of seminar: [1]

- How far does the analogy between energy and social energy carry?
- What can be learnt from exploring social energy for the analysis of the dynamics of complex socio-ecological systems?
- Where does social energy need to differ from energy as known in physics?
- What are parameters that help grasp and measure forms of social energy?
- Which mathematical tools and methods (used in physics models) can be successfully used for studying the dynamics of socio-ecological systems?

The workshop included a talk by Christopher Watts on “Human Energy Concepts in the Social Sciences and How to Model Them”, Karolina Safarzynska on “Energy: a Missing Dimension of Evolutionary Models of Industry Dynamics”, Jean-Philippe Bouchaud on “Modelling Cooperativity and Sudden Shifts: Some Ideas from Physics”, and a collective talk by Nicholas erony, Claudio Tessone, Barbara Konig, and Frank Schweitzer on “From Individual Energy to Collective Behaviour in Animal Populations”. [5]

Discussion

In the third of the above bullet points, i.e. "grasp and measure", Wolf digs into the newly-forming subject of human thermodynamic instruments. In the last of these, i.e. "which mathematical tools", a venture in this direction concerns research into the historical underpinnings of mathematical thermodynamics, particularly the mathematical proof and origin of Euler reciprocity relation in respect to the indicator diagram, the Clausius inequality, and French physicist Sadi Carnot's 1824 notion of re-establishment of equilibrium in the caloric as this has been upgraded by Clausius to that of the equivalence value of all uncompensated transformations.

Social energy landscapes

> *See main: Social energy landscapes*

In a 2011 GSDP.eu posting about the origin of the social energy discussion, Wolf stated the following about social energy landscapes: [3]

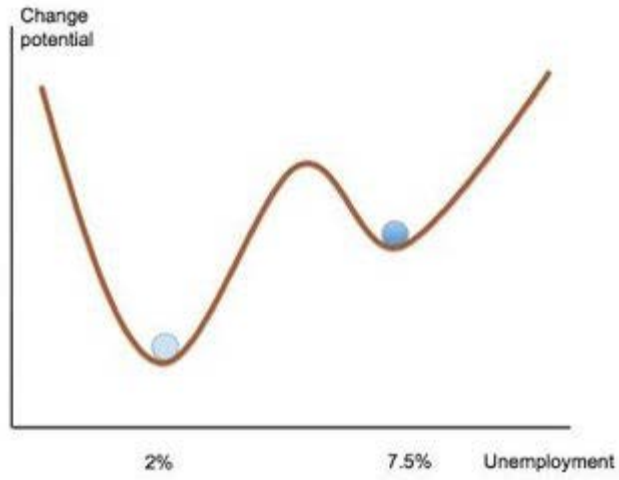

A 2010 "change potential" graph from Carlo Gaeger's "From Detergents to Multiple Equilibria" GSDP discussion on social energy, used in the workshop. [6]

"The idea of social energy arose in discussions at various GSDP related meetings. It is an analogy that suggests to describe social systems using some mathematics applied when speaking about energy in a physics context.

One example is a so-called potential function [see: thermodynamic potential and potential], used to describe the behaviour of a dynamical system. One can imagine the system's state as a particle that moves around in the "potential landscape" [see: energy landscape] driven by the force of gravity and some random perturbation. The potential function provides the form of the landscape, and gravity tends to pull the particle towards the lowest places within the landscape. However, due to the perturbation the particle may also move upwards, and can thus transit from the basin of attraction of one local minimum to another one. This behaviour seems useful for describing economic systems that often stay close to one "equilibrium" for a long time but may also experience major shifts, which could be interpreted as transitions to different equilibria. By analogy, the landscape given by the potential function could be seen as a "social energy landscape".

What exactly this social energy landscape, or the term "social energy" itself, represents, and how it can be described mathematically in more detail, are open questions. Also, it is yet to be found out how far this analogy carries and what can be learnt from investigating it.

Since quite a few people involved in previous discussions are part of the GSDP network, I propose to continue discussing this topic here. Of course, others are kindly invited to participate in the discussion as well. Apart from the discussion of concepts and possible models as regards content, this webspace might also be a convenient place to exchange ideas on the possibility to organise workshops or other meetings, submit texts, or grasp other logistic opportunities to further develop research on the topic."

This discussion of "social energy landscape", of course, brings to mind the 2001 human free energy theories and work of South African physical chemist Adriaan de Lange, such as shown adjacent. [4]

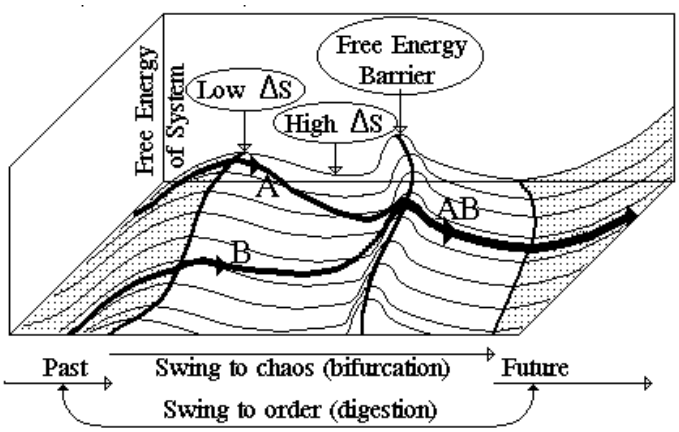

Figure 2: Free Energy Landscape

South African physical chemist Adriaan De Lange's 2001 free energy landscape of evolution, employing a mixture of chaos theory, Prigoginean bifurcation theory, order-disorder logic, time (past vs future), free energy barrier, path functions, and

Education

Wolf completed her PhD in 2010, with a thesis on "From Vulnerability Formalization to Finitely Additive Probability Monads" at the Free University of Berlin, on the mathematics of climate impact theory. [2] Wolf currently is doing post-doctoral research on a "Model of the German Economy" at Potsdam Institute for Climate Impact Research, Potsdam, Germany.

References

1. (a) Social Energy Workshop (2011) – GSDP.eu.
(b) Wolf, Sarah. (2012). "Social Energy: a Useful Concept for

Analyzing Complex Social Systems", Dec 22, GSDP.eu.
2. Wolf, Sarah. (2010). "From Vulnerability Formalization to Finitely Additive Probability Monads" (abs), PhD dissertation, Free University of Berlin.
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4. De Lange, A.M. (2001). "Fitness Landscape and other Landscapes" (threads: LO27222), 09/03/01 – Learning-org.com.
5. Wolf, Sarah. (2011). "Social Energy: a Useful Concept for Analyzing Complex Social Systems", Workshop Report of the GSDP Workshop as a Satellite Meeting at ECCS'11 September 14th. GSDP.edu.
6. (a) Jaeger, Carlo C. (2010). "From Detergents to Multiple Equilibria", Dec 12, GSDP.edu.
(b) Wolf, Sarah. (2011). "Social Energy: a Useful Concept for Analyzing Complex Social Systems", Workshop Report of the GSDP Workshop as a Satellite Meeting at ECCS'11 September 14th. GSDP.edu.

discussions of high and low values of entropy change. [4]

External links

â— Sarah Wolf (faculty) – Potsdam Institute for Climate Impact.
â— Sarah Wolf (user profile) – GSDP.eu.

θΔics

In religio-mythology, **Satan**, aka Devil, is the Judeo-Greek-Roman monotheistic rescript of the Egyptian god "Set", the once supreme deity (see: supreme god timeline) of the from the 15th dynasty (1650-1550), as Baal-Set, per workings of the Hyksos recension, to the 17th dynasty (1580-1549), as "Set-Amen", to the 19th dynasty (1292-1189), as "Horus-Set", who by the time of the Roman recension had become demonized as a "fallen angel", in the form of the devil. [1]

A visual overview of the origin of "**Satan**", from the 1st dynasty god Set, evil brother of Horus, to the "Set-Baal" supreme god synretism god merger in the 15th dynasty, when Egypt was taken over by the Hyksos, to the "Set-Amen" supreme god synretism in the 17th dynasty, going into the New Kingdom dynasty, after the Hyksos were kicked out of Egypt, to the eventual "Satan" or "Satan-Devil", syncretized with the Greek recension concept of demon, that arose in the Roman recension, the fallen angel, and archenemy of Jesus.

Quotes

The following are related quotes:

> "God, **Satan**, paradise, and hell all vanished one day in my fifteenth year, when I abruptly lost my faith. Afterwards, to prove my new-found atheism, I bought myself a rather tasteless ham sandwich, and so partook for the first time of the forbidden flesh of swine. No thunderbolt arrived to strike me down. From that day to this I have thought of myself as a wholly secular person."
>
> — Salmon Rushdie (1991), "In God We Trust" [2]

References

1. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.
2. (a) Rushdie, Salmon. (1991). "In God We Trust", in: *Imaginary Homelands* (pgs. 376-432). Granta.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 474-75). HarperOne.

External links

â— Satan – Wikipedia.

θΔics

In hmolscience, **Satch U Ejike** (c.1957-) is an African-born American lawyer and social scientist noted for his 2008 *Find a Good Man and Keep Him*, in which he applies American electrochemical engineer Libb Thims' 2007 principles of human chemistry, human thermodynamics, and human physics in the formulation of a functional approach to help married women keep their man or single women find true love. [1] The book is the result of ten years of research and follows an interdisciplinary approach, combining analytical perspectives from the social sciences, physical sciences, humanities, and law. The primary sources of data and fact are surveys, interviews, court records and pleadings, personal accounts and narratives, and anecdotes. [2]

What is love? | Physics of attraction

In the following excerpts, from chapter two of the book (pages 29-30), Ejike gives his opinion of the facilitative application of human chemistry and human thermodynamics: [3]

> "Libb Thims' *Human Chemistry*, in two volumes, brings a rich background in the physical sciences and neuroscience to bear on interpretations of human relationships. Thims recognizes Johann von Goethe's elective affinity as a representation of reactive forces immediately present in thermodynamics and the interaction of constituent particles of energy. Thermodynamics, of course, is concerned with the relationship between heat and other energy forms. Physical chemistry is interested in the quantitative transformation of energy and the chemical interaction of the physical properties of substances. Thims interprets human chemistry in terms of bond-forming and bond-fracturing phenomenon. If we accept Thims' argument, human thermodynamics provides a reliable framework for an understanding of human bonding, bond-rupturing, repulsion, or rejection, which is essence is the gist of romance and love."
>
> "If we accept Thims' logic of human thermodynamics as a viable explanatory framework, which it very well is, romantic bonding then becomes the subject matter of quantum electrodynamics (QED), an aspect of particle physics that traces human attachment and bonding to the interactions of photons and electrons. Thus, applying Thims' theory to interpersonal and love relationships, it is unlikely that any one person has the ability to coerce or unilaterally secure another person's affection. In a different sense, the force of attraction between a man and a woman is beyond their physical control, except, of course, by way of the energies they emit and exchange between them. Thims' *Human Thermodynamics* thus makes substantial contribution to our understanding of the oft perplexing nature of romantic love, greatly supplementing prior research in this field."

This, as we see, is a good synopsis and understanding of human chemistry.

Human chemical bonding

The following excerpts, from chapter eight, introduce human chemical bonding and the Gottman stability ratio: [4]

> "Thims, in his excellent work, *Human Thermodynamics*, equates bad relationships with poor bonding. In this sense, good bonding will signify good relationships. He suggests that human bonding forms or breaks as a result of rearranged atoms and molecules. By this analysis, bad bonding necessarily occurs when the repulsion factor in the reaction outweighs the attraction factor. Good bonding conversely occurs when the factor of attraction outweighs that of repulsion. What Professor Thims had done is to place a natural reality in a scientific context. Indeed, John Gottman's psychological treatise, *Why Marriages Succeed or Fail*, forcefully supports Thims' theory. Gottman closely followed newly-wed couples through the years up to the point of divorce for some of them. Gottman's tracking discovered factorable exchanges and interplays between couples, such that sustained or hindered effective bonding between them."

This is a good overview of the attraction-to-repulsion balance of stable human bonding.

References

1. Ejike, Satch U. (2008). *Find a Good Man and Keep Him* (ch. II: What is Love?, pgs. 9-40, section: Physics of attraction, pgs. 27-; keyword: Libb Thims, pgs. 29-30; 102, 163, 252; "human thermodynamics", pg. 30) (Google Books). AuthorHouse.
2. ibid, Ejike. (2008). (pg. 1).
3. (a) ibid. Ejike. (2008). Ch. II: What is Love?, pgs. 9-40, section: Physics of attraction, pgs. 27-; keyword: Libb Thims, pgs. 29-30)
(b) Thims, Libb. (2007). *Human Chemistry Vol. I.* Morrisville, NC: LuLu.
(c) Thims, Libb. (2007). *Human Chemistry Vol. II.* Morrisville, NC: LuLu.
(d) Thims, Libb. (2006). *Human Thermodynamics.* Chicago: IoHT Publishing.
4. ibid. Ejike. (2008). Ch. VIII: Understand and Appreciate Your Man, pgs. 163-76, esp. pg. 163).

External links

- Ejike, Satcha Uba – WorldCat Identites.
- Satch U. Ejike PhD (profile) – Cornell University Law School.
- Overview: Find a Good Man and Keep Him – RomanceCheck.com.
- Satch U. Ejike (about) – HG.org.

θΔics

In hmolscience, **Satosi Watanabe** (1910-1993) was a Japanese theoretical physicist noted for []

Overview

In 1969, Watanabe, in his *Knowing and Guessing*, using information and entropy ideas from Leo Szilard (1929), Claude Shannon (1949) and his information theory, H-theorem discussion, and Leon Brillouin and his negentropy models as a basis, argued that social measurements can be quantified by changes in interdependencies, a type of "interdependence analysis", so to say. [1]

In 1991, Wayne Angel, inspired by Watanabe's entropy models and interdependence analysis, drafted an outline of his relation thermodynamics theory. [2]

References

1. Watanabe, Satosi. (1969). *Knowing and Guessing: a Quantitative Study of Inference and Information* (entropy, 91-pgs; negentropy, 38-pgs). Wiley.
2. (a) Angel, Wayne M. (2005). *The Theory of Society* (ch. 4: Relation Thermodynamics). ComplexS.com.
(b) ComplexS.net – Wayback Machine.

Further reading

â— Watanabe, Satosi. (1985). *Pattern Recognition: Human and Mechanical*. John Wiley & Sons.

External links

â— Satosi Watanabe – Wikipedia.

θΔics

In religio-mythology, **Saturn**, in Roman mythology, was the god of time and or agriculture, depending. [2]

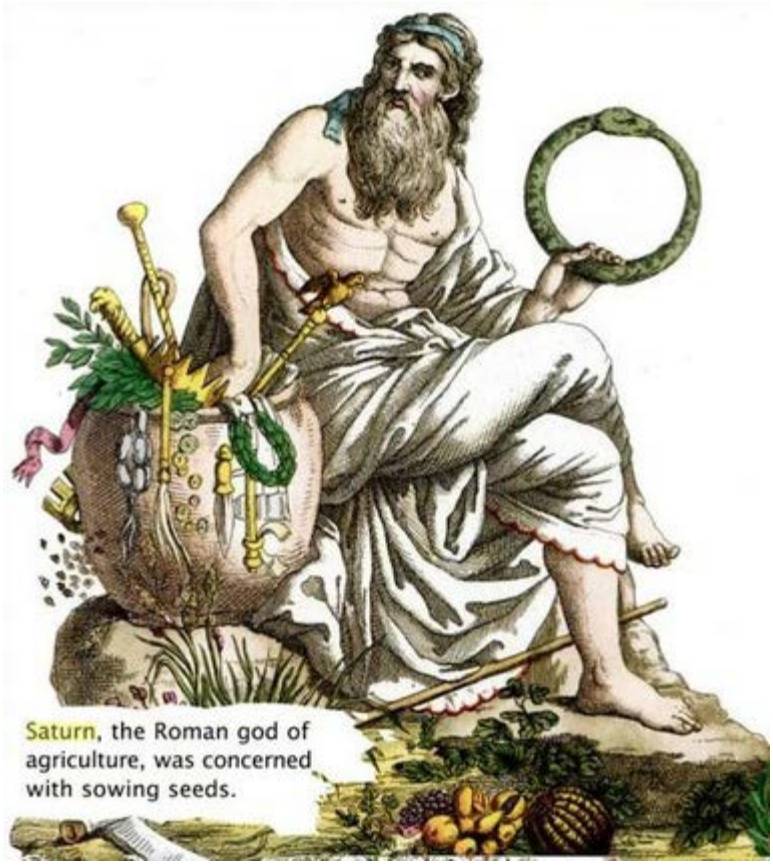

A depiction of the god **Saturn**, as a god of agriculture and seed, holding the Ouroboros, i.e. the snake that eats its own tail, which is the Greek rescript of the Egyptian snake Apep, who encircles the sun, and does battle with Ra each night.

Saturnalia

In Egypt, in the period 3,100 to 100BC, the Khoiak festival, celebrated from Dec 10 to Jan 8, was the annual holiday celebrating the rebirth of Osiris-Ra, generally speaking.

In Rome, in the period c.400-10BC, Saturnalia was a public festival held from 17 Dec to 23 Dec in honor of the god Saturn.

In c.350, Pope Julius I, declared (Q) Dec 25 to be the "official" birth of the man god Jesus, and therein subsumed the former Saturnalia festival into the new Roman state religion "Christmas" holiday. [4]

Egyptian | Greek

The Greek god equivalent of Saturn, supposedly, is Chronos. The Egyptian god equivalent to Chronos, and or Saturn, depending, is a bit of a murky subject; the following is one take on this:

> "The first man, according to the Egyptians, was Hephaestus [Ptah], who was the inventor of fire. From him descended the sun. After whom Agathodaemon (Q) . After whom Cronus [**Saturn**]. Then Osiris. And then Typhon [Set], the brother of Osiris. After whom was Orus [Horus], the son of Osiris and Isis. These were the first Egyptian kings. After them, the empire descended by a long succession to Bites, through a lapse of 13,900 years [months]; reckoned, I say, in lunar years of thirty days to each: for even now, they call the month a year. After the gods, a race of demi-gods reigned 1,255 years. Then reigned other kings 1,817 years. After them, thirty Memphite kings, 1,790 years. Then ten Thynite kings, 330 years. Then came the kingdom of the manes and demi-gods. 5,813. The number of years altogether amounts to 11,000; which also are lunar years, that is to say, months. All the lunar years which the Egyptians allow to the reigns of the gods, the demi-gods, and the Manes, are 24,900."
>
> — Eusebius (300AD), *Publication* (Q)

Here, Eusebius, gives what seems to be a Greek conflated take on the Memphis creation myth, situating Saturn as the father of Osiris, which would loosely equate Saturn to the Egyptian god Geb, i.e. the earth, or Atum-Ra, i.e. the sun, depending. The astro-theology jump from Egyptian Geb (or Atum-Ra) to Roman Saturn, here, however, is lacking in clear explanation. (Q)

In 1980, David Talbot, in his *The Saturn Myth*, being inspired by the work of Immanuel Velikovsky, cover as shown adjacent, attempted to trace out some of the motifs behind Roman Saturn worship. [3]

> "A Greek ostracon cited by the eminent classicist Franz Boll identifies the Egyptian sun god Ra, not with our sun, but with Saturn."
>
> — David Talbot (1980), *The Saturn Myth* (Q)

(add)

Saturday

Of note, Saturday, the 6th day of the week, is named after the Roman god Saturn, in the sense of "Saturn's day".

Quotes

The following are related quotes:

> "In this way antiquity disposes of its sun-gods. The Hebrews turned [the sun gods] into Patriarchs. Adam, Abraham, Israel, were names of **Saturn**. Edom is Adam; and the ancient usage was to name the nation, the land or city after the chief god. The Greeks made these deities founders of tribes."
>
> — Samuel Dunlap (1858), *Vestiges of the Spirit of Man* [2]

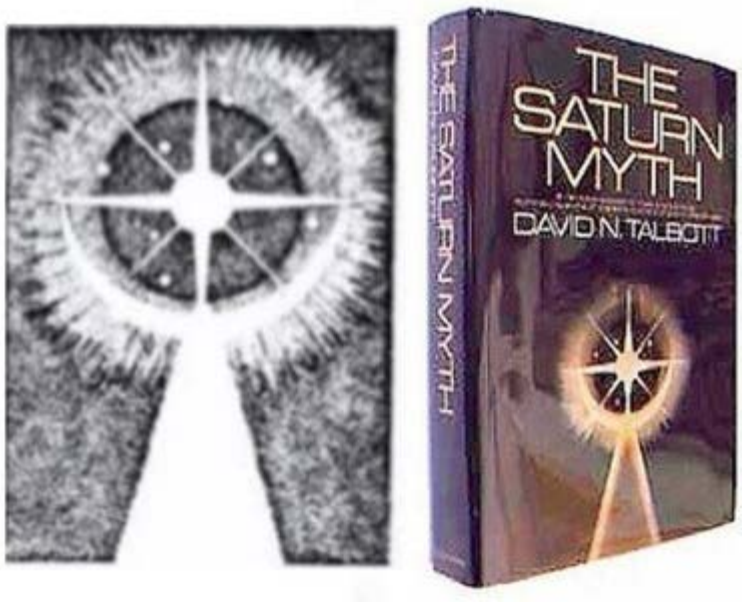

The view of David Talbot (1980) of how the god Saturn was conceptualized by the ancient Romans, supposedly, as the sun being born out of a mountain.

References

1. (a) Movers, Franz C. (1841). The Phoenicians, Volume One (*Die Phonizier, Volume One*) (86, 130) (arc). Publisher.
(b) Dunlap, Samuel F. (1858). *Vestiges of the Spirit History of Man* (Israel, pg. 53). Publisher.
2. Mangnall's Abstract of Heathen Mythology – Hmolpedia.
3. Talbot, David. (1980). *The Saturn Myth: A Reinterpretation of Rites and Symbols Illuminating Some of the Dark Corners of Primordial Society* (Amz) (txt). . Publisher.
4. Aloian, Molly. (2008). *Christmas* (Saturn, 2+ pgs). Publisher.

External links

- Saturn (mythology) – Wikipedia.
- Saturnalia – Wikipedia.

θΔics

In physics, **Satyendra Nath Bose** (1894-1974) (IQ:185|#77) [RGM:1,140|1,260+] (CR:11) (LGS:1), sometimes cited as "Nath Bose", was an Indian mathematical physicist noted for his 1919 proof that Max Planck's theory of heat radiation could be deduced from Albert Einstein's theory of photons, for his 1925 prediction, with Einstein, of Bose-Einstein condensate (confirmed in 1995); and for his general Bose-Einstein statistics, which bosons obey. [1]

Boson

The "boson", a fundamental particle, with integer spin (1, 2, etc.), which conforms to Bose-Einstein statistics, was named after Satyendra Bose in a 6 Dec 1945 lecture by Paul Dirac, entitled "Developments in Atomic Theory", wherein he used the term to refer to quantum particles that obey laws set out by German-born American physicist Albert Einstein and Bose. [3]

Landau rankings

Russian physicist Lev Landau, in his personal genius rankings scale (see: Landau genius scale), ranked Bose, Landau (c.1935) ranked him with #1, in his person genius scale, alongside: Paul Dirac (IQ:190|#42), Erwin Schrodinger (IQ:190|#30), Richard Feynman (IQ:190|#33), Niels Bohr (IQ:185|#76), Werner Heisenberg (IQ:180|#90), Louis de Broglie (IQ:?|#), and Eugene Wigner (IQ:?|#), which yields a mean genius comparison IQ of 187.

Einstein

In 1925, Albert Einstein and Bose predicted a new state of matter at ultra-low temperatures, which was confirmed in 1995, aka the Bose-Einstein condensate, as studied in low-temperature thermodynamics.

Bose, together with Einstein, also developed a model for the heat capacity in solids and gases, and developed a variation of statistics allowing for the description of the behavior of bosons. [2]

References

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2. (a) Perrot, Pierre. (1998). *A to Z of Thermodynamics.* Oxford University Press.
(b) Rogers, Donald. (2005). *Einstein's Other Theory: the Planck-Bose-Einstein Theory of Heat Capacity.* Princeton University Press.
3. (a) Dirac, Paul. (1945). "Developments in Atomic Theory", Le Palais de la Decouverte, Dec 6.
(b) Farmelo, Graham. (2009). *The Strangest Man: the Hidden Life of Paul Dirac, Mystic of the Atom* (pg. 331). Basic Books

External links

â— Satyendra Bose – Wikipedia.

θΔics

In engines, **Savery engine**, aka "Miner's friend", refer to the steam engine designed and built by Thomas Savery in 1698.

Overview

On 25 Jul 1698, Savery patented a design for a steam engine to be employed for pumping water out of mines. [3]

In 1699, Savery submitted a working model of his engine to the Royal Society, during which time successful experiments were made with it. [3]

On 14 Jun 1699, Savery demonstrated a small working model of his steam engine at Gresham-college before an audience where it was approved of; supposedly, something akin to the following design: (Q)

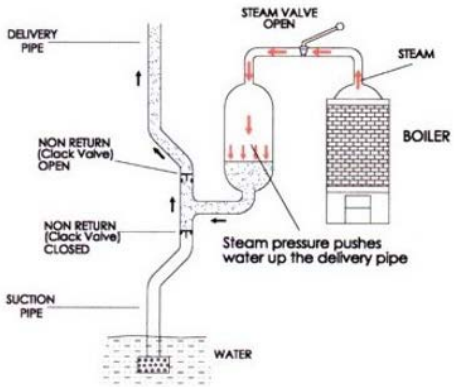

In 1698, Savery had built the following working model (below right). The engine operated as follows: [3]

> "It consisted of a furnace, *A*, heating a boiler, *B*, which was connected by pipes, *C C*, with two copper receivers, *D D*. There were led from the bottom of these receivers branch pipes, *F F*, which turned upward, and were united to form a rising main, or "forcing-pipe," *G*. From the top of each receiver was led a pipe, which was turned downward, and these pipes united to form a suction-pipe, which was led down to the bottom of the well or reservoir from which the water was to be drawn. The maximum lift allowable was stated at 24-feet. The engine was worked as follows: Steam is raised in the boiler, *B*, and a cóck, *C*, being opened, a receiver, *D*, is filled with steam. Closing the cóck, *C*, the steam condensing in the receiver, a **vacuum is created**, and the pressure of the atmosphere forces the water up, through the supply-pipe, from the well into the receiver.
>
> Opening the cóck, *C*, again, the check-valve in the suction-pipe at *E* closes, the steam drives the water out through the forcing-pipe, *G*, the clack-valve, *E*, on that pipe opening before it, and the liquid is expelled from the top of the pipe. The valve, *C*, is again closed; the steam again condenses, and the engine is worked as before. While one of the two receivers is discharging, the other is filling, as in the machine of the Marquis of Worcester, and thus the steam is drawn from the boiler with tolerable regularity, and the expulsion of water takes place with similar uniformity, the two systems of receivers and pipes being worked alternately by the single boiler."
>
> — Robert Thurston (1878), *A History of the Growth of the Steam Engine* (pg. 33-34)

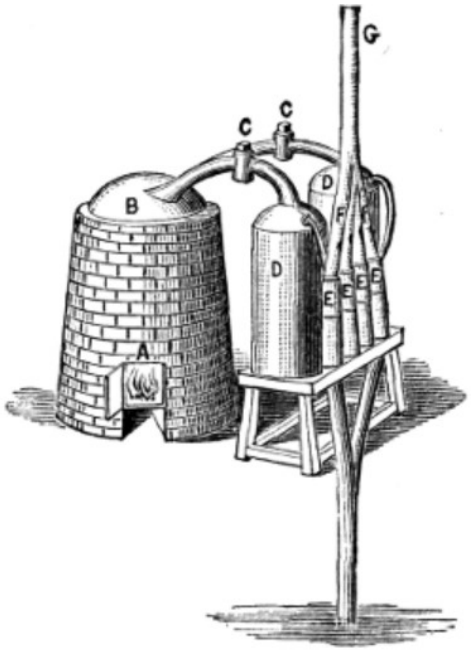

A later design, shown below, employed a cooling fountain spray (valve F) to cool the receiver B:

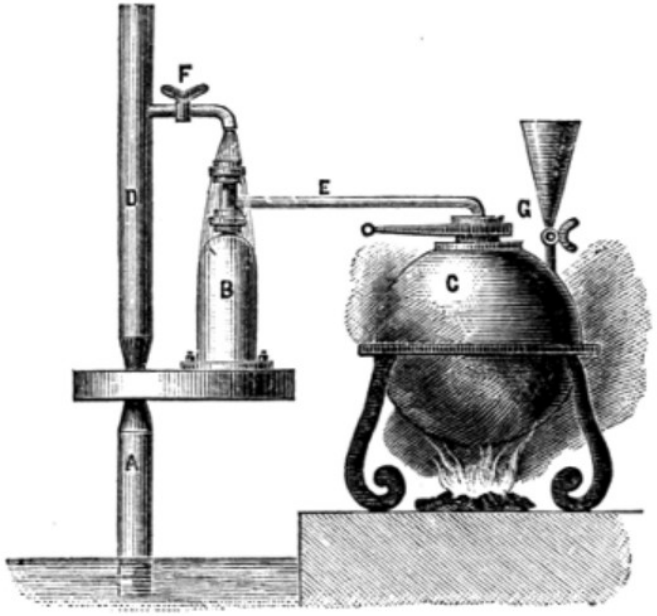

In 1701, Savery, in his *The Miner's Friend: or an Engine to Raise Water by Fire; and of the Manner of Fixing it in Mines; with an Account of the Several Other Uses it is Applicable Unto; and an Answer to the Objections Made Against It*, gave a published draft-overview of his new machine, along with the following four illustrations: [1]

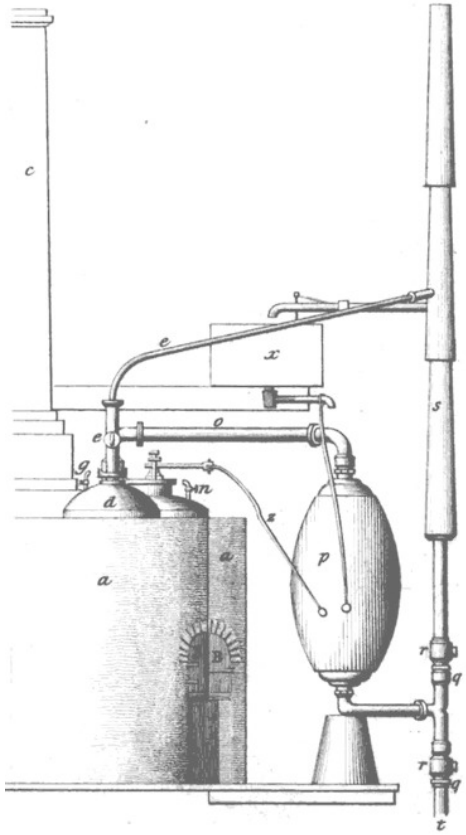

Figure 1

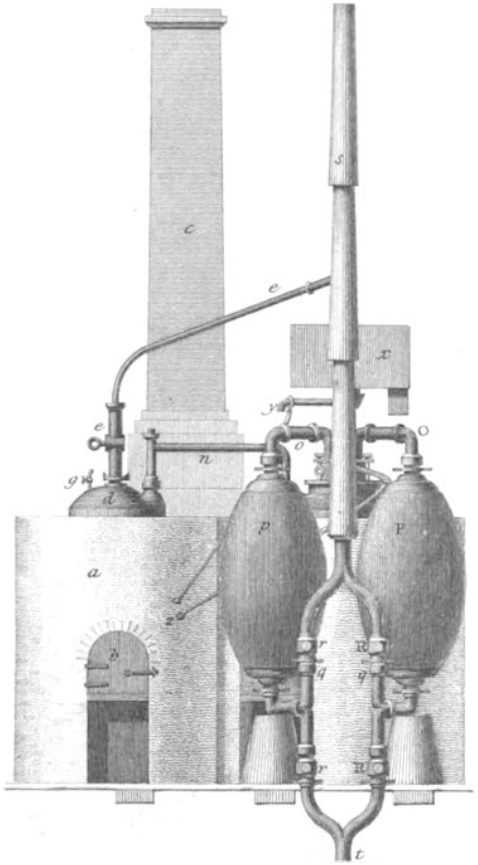

Figure 2

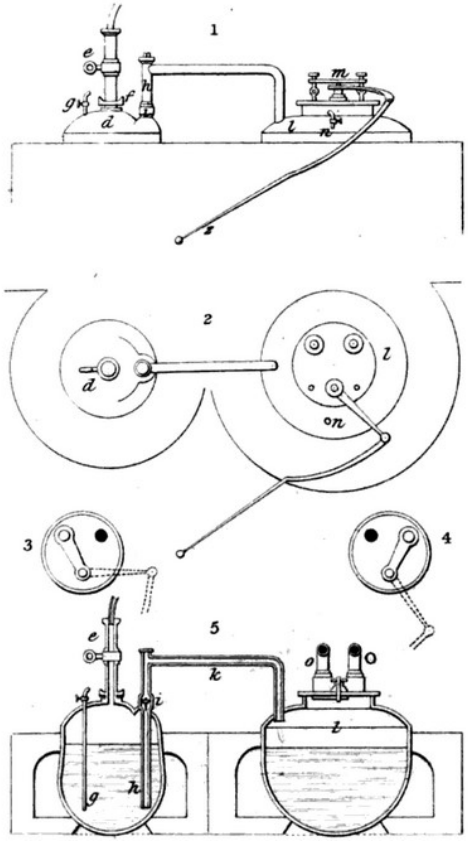

Figure 3

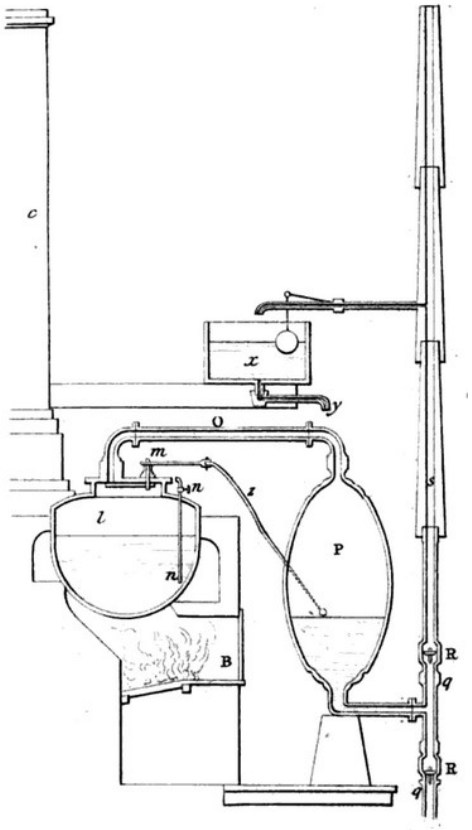

Figure 4

with the following label indicators:

a, a, The furnaces.
b, B, the two fire-places.
c, the funnel or chimney.
d, the small boiler.
e, the pipe and cóck of it.
f, the screw that covers and confines its force.
g, a small cóck, a pipe going within eight inches of its bottom.
h, A larger pipe going the same depth.
i, a clack on the top of the said pipe.
k, a pipe going from the box of the said clack or valve, into the great boiler, about an inch into it.
l, the great boiler.
m, the screw with the regulator.
n, a small cóck and pipe going half way down the great boiler.
0, O, steam-pipes, one end of each screw to the regulator, and the other ends to the receivers.
p, P, the vessels called receivers.
q, q, the screws which bring on the pipes and clacks in the front of the engine.
r, r, R, R, valves or clack of brass, with screws to open and come at them upon occasion.
s, the force-pipe.
t, the sucking-pipe.
v, a square frame of wood, with holes round its bottom in the water.
x, a cistern with a buoy-cóck coming from the force-pipe.
y, a cóck and pipe coming from the bottom of the said cistern.
z, the handle of the regulator.

The operation of which is described as follows:

"The first thing is to fix the engine in a good double furnace, so contrived that the flame of your fire may circulate round and encompass your two boilers to the best advantage, as you do coppers for brewing. Before you make any fire, unscrew *g* and n, being the two small gauge-pipes and cócks belonging to the two boilers, and at the holes, fill *l*, the great boiler, two-thirds full of water, and *d*, the small boiler, quite full; then screw in the said pipes again as fast and tight as possible; then light the fire at *b*.

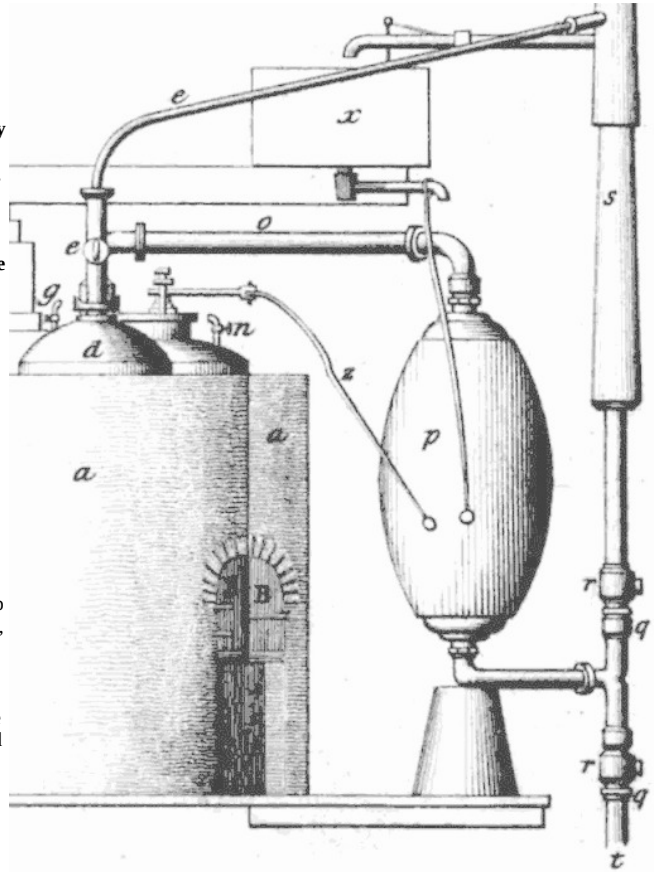

When the water in *l* boils, the handle of the regulator, marked *z*, must be thrust from you as far as it will go, which makes all the steam rising from the water in *l* pass with irresistible force through *o* into *p*, pushing out all the air before it, through the clack, r, making a noise as it goes; and when all is gone out, the bottom of the vessel, *p*, will be **very hot**; then pull the handle of the regulator to you, by which means you stop o, and force your steam through *o* into the *p*, until that vessel has discharged its air through the clack, *r*, up the force-pipe. In the meantime, by the steam's condensing in the vessel *p*, **a vacuum or emptiness is created**, so that the **water must, and will, necessarily, raise up, through *t*, the sucking-pipe**, lifting up the clack, r, and filling the vessel, *p*.

In the meantime, the vessel, *p*, being emptied of its air, turn the handle of the regulator from you again, and the force is upon the surface of the water in *p*, which surface being only **heated** by the steam, it does not condense it, but the steam **gravitates or presses** with an elastic quality like air; still increasing its elasticity or spring, till it counterpoises, or rather exceeds the weight of the water ascending in *s*, the forcing-pipe, out of which, the water in *p* will be immediately discharged when once gotten to the top, **which takes up some time to recover that power; which having once got, and being in work**, it is easy for anyone that never saw the engine, after half an hour's experience, to keep a constant stream running out the full bore of the pipe, *s;* for, on the outside of the vessel, *p*, you may see how the water goes out, as well as if the vessel were transparent; for, as far as the steam continues within the vessel, so far as the vessel dry without, and so **very hot [hot body]**, as scarce to endure the least touch of the hand; but as far as the water is, the said vessel will be **cold [cold body]** and wet, where any water has fallen on it*;* which cold and moisture vanishes as fast as the steam, in its descent, takes place of the water; but if you force all the water out, the steam, or a small part thereof, going through *r*, will rattle the clack, so as to give sufficient notice to pull the handle of the regulator to you, **which, at the same time, begins to force out the water from *p***, without the least alteration of the stream; only, sometimes, the stream of water will be somewhat stronger than before, if you pull the handle of the regulator before any considerable quantity of steam be gone up the clack, *r;* but it is much better to let none of the steam go off, for that is but losing so much strength, and is easily prevented, by pulling the regulator some little time before the vessel forcing is quite emptied.

This being done, immediately turn the cóck or pipe of the cistern, *x*, on *p*, so that the water proceeding from *x*, through *y*, which is never open but when turned on *p*, or P; but when between them, is tight and stanch*;* I say, **the water, falling on *p*, causes, by its coolness, the steam, which had such great force just before to its elastic power, to condense, and become a vacuum or empty space**, so that the vessel, *p*, is, by the external pressure of the atmosphere [atmospheric pressure], or what is vulgarly called suction, immediately refilled, while *p* is emptying*;* which being done, you push the handle of the regulator from you, and throw the force on *p*, pulling the condensing pipe over *p*, causing the steam in that vessel to condense, so that it fills, while the other empties.

The labor of turning these two parts of the engine, *viz* the regulator and water-cóck, and attending the fire, **being no**

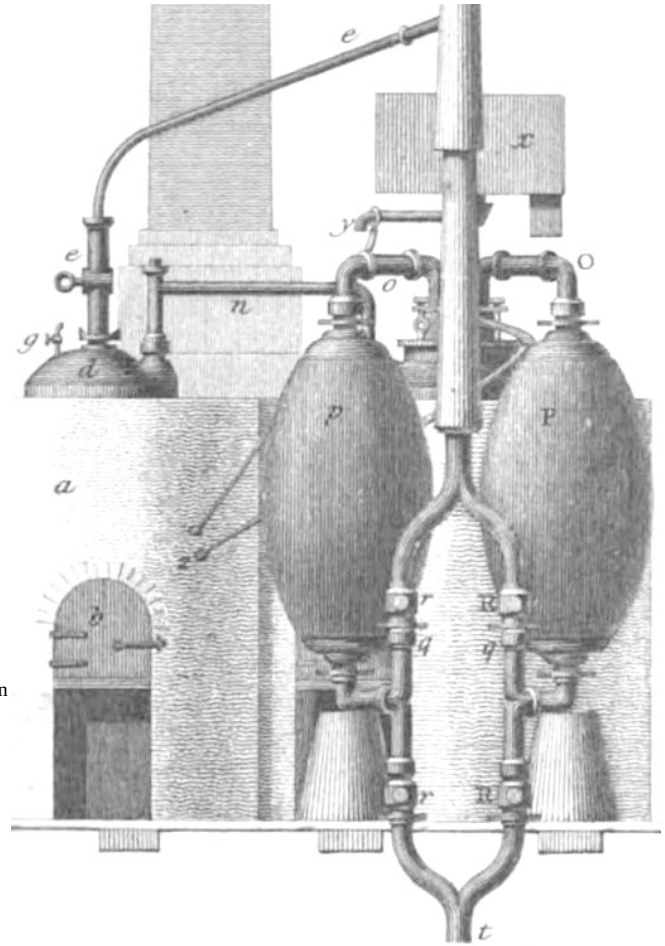

more than what a boy's strength can perform for a day together, and is as easily learned as their driving of a horse in a tub-gin; yet, after all, I would have men, and those, too, the most apprehensive, employed in working of the engine, supposing them more careful than boys. The difference of this charge is not to be mentioned or accounted of, when we consider the vast profit which those who use the engine will reap by it.

The ingenious reader will, probably, here object, that the steam being the cause of this motion and force, and that steam is but water rarefied, the boiler, *l*, must in some certain time be emptied, so as the work of the engine must stop to replenish the boiler, or endanger the burning out or melting the bottom of the boiler.

To answer which, please to observe the use of the small boiler, *d*, when it is thought fit by the person tending the engine to replenish the great boiler, which requires an hour and a half, or two hours' time to the sinking one foot of water; then, I say, by turning the cóck of the small boiler, *e*, you cut off all communication between s, the great force-pipe, and *d*, the small boiler, by which means *d* grows immediately hot, by throwing a little fire into *b*, and the water of which boils, and in a very little time it gains more strength than the great boiler; for the force of the great boiler being perpetually spending and going out, and the other winding up, or increasing, it is not long before the force in *d* exceeds that in *l*, so that the water in *d* being depressed in *d* by its own steam or vapor, must necessarily rise through the pipe, *h*, opening the clack, i, and so go through the pipe, *k*, into *I*, running till the surface of the water in *d* is equal to the bottom of the pit, *h;* then steam and water going together, will, by a noise in the clack, *i*, give sufficient assurance that *d* has discharged and emptied itself into *l*, to within eight inches of the bottom; and inasmuch as, from the top of *d* to the bottom of its pipe, *h*, is contained about as much water as will replenish *l*, one foot, so you may be certain *I* is replenished one foot of course; then you open the cóck, *i*, and refill *d* immediately; so that here is a constant motion without fear or danger of disorder, or decay.

If you would, at any time, **know if the great boiler, *l*, be more than half exhausted**, turn the small cóck, *n*, whose pipe will deliver water, if the water be above the level of its bottom, which is half way down the boiler; if not, it will deliver steam.

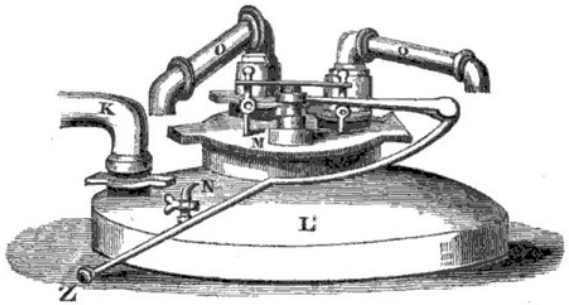

So, likewise, **will *g* show you if you have more or less than eight inches of**

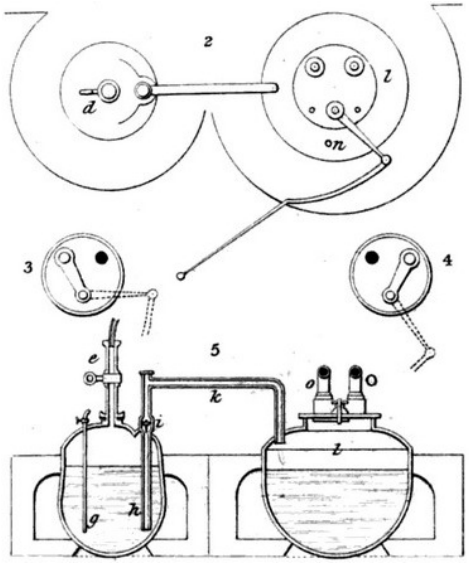

water in *d*, by which means nothing but a stupid and willful neglect, or mischievous design, carried on for some hours, can any ways hurt the engine; and if a master is suspicious of the design of a servant to do mischief, it is easily discovered by those gauge-pipes; for if he come when the engine is at work, and find the surface, *c*, of the water in *l*, below the bottom of the gauge-pipe, n, or the water in *d* below the bottom of *g*, such a servant deserves correction, though three hours after that, the working on would not damage or exhaust the boilers; so that, in a word, the clacks being in all water-works always found the better the longer they are used, and all the moving parts of our engine being of like nature, the furnace being made of Stourbridge, or Windsor brick, or fire-stone, I do not see it possible for the engine to decay in many years; for the clacks, boxes, and mitre-pipe, regulator, and cócks, are all of brass; and the vessels made of the best hammered copper, of sufficient thickness to sustain the force of the working the engine.

In short, the engine is so naturally adapted to perform what is required, that even those of the most ordinary and meanest capacity may work it for some years without any injury, if not hired or employed by some base person on purpose to destroy it; for after the engine is once fixed, and at work, I may modestly affirm that the adventurer, or supervisor of the mine, will be freed from that perpetual charge, expense, and trouble of repairs, which all other engines ever yet employed in mines for the raising of water, are continually liable unto."

The following are the

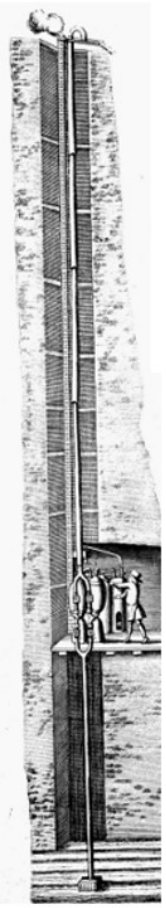

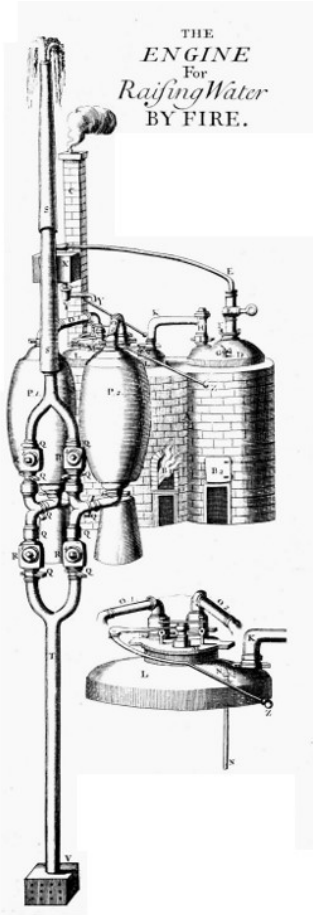

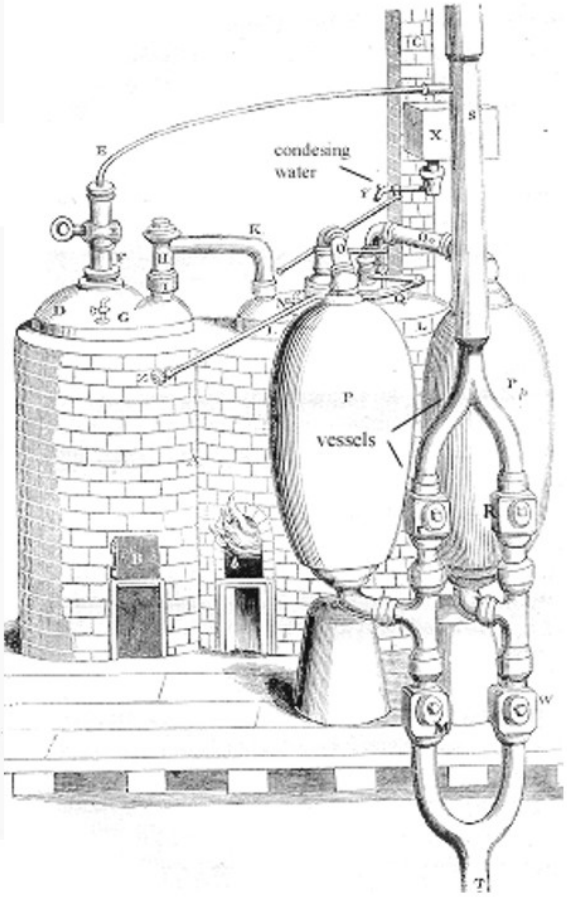

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Quotes

The following are related quotes:

> "When a comparison is made between **Savery's engine** [1698] and those of his predecessors, the result will be in every respect favorable to his character as an inventor, and as a practical engineer; all the details of his invention are made out in a masterly style, and accidents and contingencies are provided for, so as to render it a real working engine; whereas De Caus [Caus engine, 1615], the Marquis of Worcester [Worcester engine, 1663], Sir Samuel Morland [Morland engine, 1683], and Papin [Papin engine, 1690], though ingenious philosophers, only produced mere outlines, which required great labor and skill of subsequent inventors to fill up, and make them sufficiently complete to be put in execution."
>
> — John Farey (1827), *Treatise on the Steam Engine*; cited by Dionysius Larder (1840) in *The Steam Engine* (pg. 58) [2]

See also

- Carnot engine

References

1. Savery, Thomas. (1701). *The Miner's Friend: an Engine to Raise Water by Fire*. Publisher.
2. (a) Farey, John. (1827). *A Treatise on the Steam Engine: Historical, Practical, and Descriptive*. Longman.
(b) Lardner, Dionysius. (1840). *The Steam Engine: Explained and Illustrated – With an Account of its Invention and Progressive Improvement and its Application to Navigation and Railways; also Including a Memoir of Watt*. Taylor and Walton.
3. Thurston, Robert. (1878). *A History of the Growth of the Steam-Engine* (txt) (pgs. 31-35). Appleton and Company.

External links

- Savery engine – GSU.edu.

θΔics

In hmolscience, **scale of existence of things** refers to []

Overview

The following gives the general force equation for the various scale of existence of things, atomic and small molecular level, to human social molecular scale, to cities and towns, and to planets and suns: [N1]

	Bodies	Force Equation	Depiction	Force Name	Equation Name
1.	Planets and suns	$F = G\frac{m_1 m_2}{r^2}$	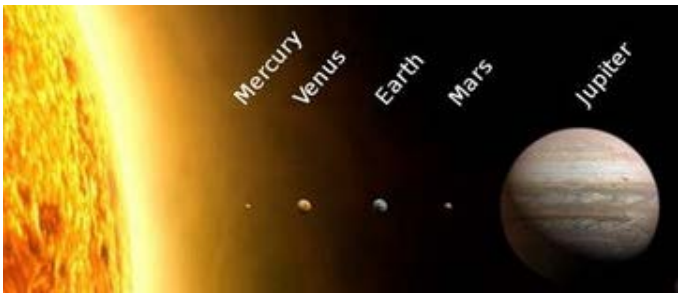	Gravitational force	Newton's law of universal gravitation → Ismael Bullialdus (c.1645) → Giovanni Borelli (1666) → Robert Hooke (1684) → Isaac Newton (1686)
2.	Cities and towns	$F_i = k\frac{P_1 P_2}{d^2}$		Social gravitation	Warntz's law → Francesco Algarotti (1737) → Henry Carey (1858) → John Q. Stewart (1939) → William Warntz (1969)
3.	Men and women	$F = \frac{-\Delta G}{d}$		Gravito-electromagnetic force	Social physico-chemical attraction law → Johann Goethe (1809) → Mirza Beg (1987) → Libb Thims (2007) Coulomb's law → Franz

4.	Protons and electrons	$F = k_e \frac{q_1 q_2}{r^2}$	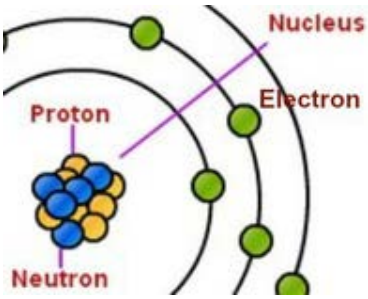	Electromagnetic force	Aepinus (1758) → Joseph Priestley (1767) → John Robinson (1769) → Henry Cavendish (c.1772) → Charles Coulomb (1777)

(add)

Notes

N1. This table first appeared on the Mateo Gil (2018) article; and began to be cited reoccurring, e.g. in the Beg-Thims interview of Day 1 (Part 2) video.

θΔics

In education, **schools** refers to either a particular “school of thought”, a group of individuals focused on a particular subject or problem, and or universities associated with a particular branch of knowledge, or sometimes with a particular person’s theories and or philosophy.

Hmolscience | Physical humanities

The following are some of the noted hmolscience-themed schools, physical humanities, or two cultures schools or departments (see: two cultures department):

- American school of econophysics
- Chinese social physics school
- Harvard Pareto circle
- Indian school of econophysics (aka "Kolkata school" according to Victor Yakovenko)
- Lausanne school of physical economics
- Mechanistic school | Mechanistic school of social thermodynamics | Pitirim Sorokin (1928)
- Odum school
- Physiocrats | referred to as a "school" by Steve Keen (2017) (Q)
- Princeton Department of Social Physics
- Roegen-Daly school
- Romanian school of physical socioeconomics

Thermodynamic schools

See main: Schools of thermodynamics

The following are some of the various historical schools of thermodynamics, generally listed chronologically:

- Leiden University
- École Polytechnique
- Glasgow school of thermodynamics
- Berlin school of thermodynamics
- Edinburgh school of thermodynamics
- Gibbsian school
- Dutch school of thermodynamics
- “Osmotic school” of thermodynamics | See: Johannes van Laar [1]
- Dresden school of thermodynamics
- Energetics school
- Brussels school of thermodynamics
- Lewis school of thermodynamics
- MIT school of thermodynamics

Universities

The following are noted universities cited so repetitively, within Hmolpedia, that they have their own pages:

- University of California, Berkeley
- University of Chicago

See also

- Two cultures synergy

References

1. Kragh, Helge and Weininger, Stephen J. (1996). “Sooner Science than Confusion: the Tortuous Entry of Entropy into Chemist” (abs), *Historical Studies in the Physical and Biological Sciences*, 27(1): 91-130.

θΔics

In thermodynamics, **schools of thermodynamics** refers to about twenty noted "schools" of thought in the development and teaching of thermodynamics at locations, institutions, or modes of logic throughout in the world, around or out of which many new thermodynamical quantities, laws, principles, theories, ideas, branches, founders, and pioneers emerged. [1] The heads of the founding twelve thermodynamics schools are pictured adjacent and the a diagram of school connectivity is pictured below.

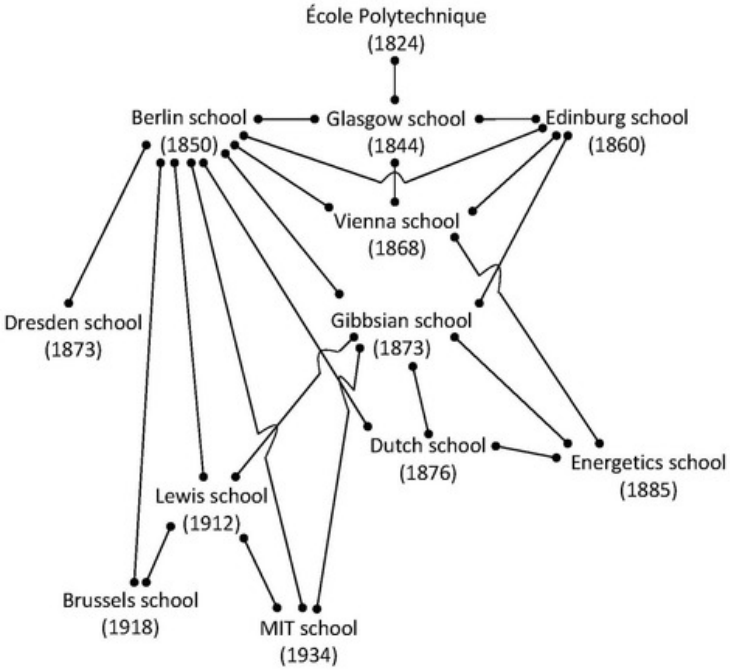

Thermodynamics Schools Connectivity Diagram

The formation of and interconnectiveness of the dozen founding schools of thermodynamics, outlined above, is an intricate historical subject. The anchor school among the founding dozen, to note, is the Berlin school (thermodynamics), followed by the Vienna school (statistical mechanics), and Gibbsian school (chemical thermodynamics), respectively.

Twelve Founding Schools of Thermodynamics

École Polytechnique	Glasgow school	Berlin school	Edinburgh school
Sadi Carnot (1796-1832)	William Thomson (1824-1907)	Rudolf Clausius (1822-1888)	James Maxwell (1831-1879)
Vienna school	**Gibbsian school**	**Dresden school**	**Dutch school**
Ludwig Boltzmann (1844-1906)	Willard Gibbs (1839-1903)	Gustav Zeuner (1828-1907)	Johannes der Waals (1837-1923)
Energetics school	**Lewis school**	**Brussels school**	**MIT school**
Wilhelm Ostwald (1853-1932)	Gilbert Lewis (1875-1946)	Théophile de Donder (1872-1957)	Joseph Keenan (1900-1977)

Map

See main: Latitude and genius

The following map shows the location of the schools by degrees latitude, having a mean latitude of 49.6ËŠ, which is indicative of a potentially optimized latitude with which to learn thermodynamics:

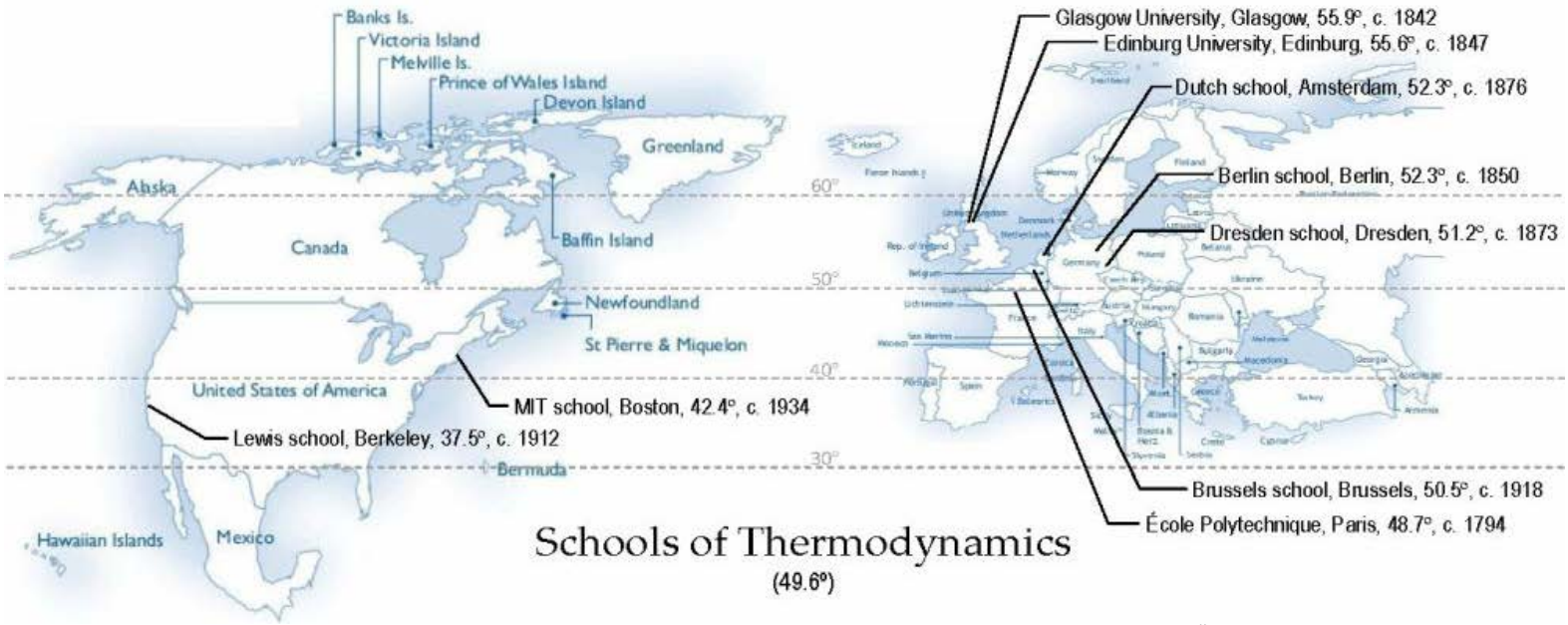

This coincides, to note, with the optimized latitude for IQ development and to potentially win a Nobel prize, which is 46Ëš, the mean geographic latitude of all Nobel Prize winners.

Leyden University

See main: Leiden University

In the 1720s, a significant pre-thermodynamics school of influence was Leyden University, where Dutch physician and chemist Herman Boerhaave and Dutch physicist Willem Gravesande were famously conducting some of the first research on volume expansion by heat (ball and ring experiment), kinetic energy (ball and clay surface experiment), the general principle of volume expansion of bodies by heat (Boerhaave's law), electricity (Leyden jar), among other noted scientific advances. As commented by French philosopher-physicist Voltaire, who acted as a scientific liaison between the Netherlands, France, and England, in a 1736 letter to the crown prince of Prussia (afterwards Frederick the Great), with whom he had entered into an active corresponds with:

> "I am the town of two simple citizens, Boerhaave and Gravesande attract from four to five hundred strangers."

The work of Boerhaave was carried over into later-to-come to predominance French science (Ecole polytechnique) school of thought, significantly in the work and caloric theory of Antoine Lavoisier (*Elements of Chemistry*, 1787). Students of Boerhaave include: Andrew Plummer, William Cullen, Joseph Black, and John Roebuck, and—through association with Black—James Watt—which can all products or precipitates, so to speak, of the Leyden school centered around Boerhaave. [20]

École Polytechnique

See main: École Polytechnique

The first thermodynamics school, which is still very prestigious, was the French engineering school École Polytechnique founded in 1794 by French engineer Lazare Carnot, the father of thermodynamics founder Sadi Carnot, and French mathematician Gaspard Monge. During the period of 1800 to 1840, the École Polytechnique was the hotbed of research on the nature of heat, home to many of the world's most famous mathematicians, physicists, and engineers, including Joseph Fourier, Gustave Coriolis, Émile Clapeyron, Henri Regnault, among many others. The key anchor here was Sadi Carnot.

University of Glasgow

See main: Glasgow school of thermodynamics

The second school of thermodynamics to have been a hotbed of development was Glasgow College during the years 1840 to 1860s, in which time the Glasgow Philosophical Society was established. Individuals connected to this school or society instrumental in the development of thermodynamics include John Nichol, Lewis Gordon, James Thomson, William Thomson, William Rankine, among others. The key anchor here was William Thomson. Later thermodynamics publications from this school include the 1892 work of mathematician Peter Alexander. [2]

Berlin school of thermodynamics

See main: Berlin school of thermodynamics; See also: Helmholtz school

GRAND SCHOOLS OF PHYSICS

The Berlin School of Thermodynamics founded by Helmholtz and Clausius

In the period 1871 to 1931, the University of Berlin was the world's leading institute for thermodynamics and has science come to be known as the "Berlin school of thermodynamics". [3] All three fundamental principles, energy conservation by Hermann Helmholtz, the principle of entropy by Rudolf Clausius, and the zero entropy condition at

absolute zero temperature by Walther Nernst were established while their inventors were connected to this institute. [4]

Clipping from the 1991 *European Journal of Physics* article "Grand Schools of Physics: The Berlin School of Thermodynamics founded by Helmholtz and Clausius" by Werner Ebeling and Dieter Hoffman. [4]

Helmholtz, together with Clausius, founded the *Berlin School of Thermodynamics* where he succeeded Heinrich Magnus as the director of the Physical Institute. The influence of this school on the development of thermodynamics was crucial; to name a few other famous scientists connected to this school: August Horstmann, a former student of Helmholtz, who was the first to incorporate Clausius' thermodynamical theories into chemistry, Max Planck, who seeded the quantum revolution on Boltzmann's statistical thermodynamics, Albert Einstein, Erwin Schrödinger, and Leo Szilard, to name a few. Between 1866 and 1869, American mathematical engineer Willard Gibbs spent a year each at Paris, Berlin, and Heidelberg, where he came into contact with Helmholtz and Clausius.

Edinburgh University

See main: Edinburgh school of thermodynamics

In the late 1840s and into the 1860s, Edinburgh University and the Edinburgh Philosphical Society was a focal point for a number of people connected with thermodynamics, including William Hamilton, James Maxwell, Peter Tait, James Forbes, among others. The key anchors here were Peter Tait and James Maxwell.

Vienna school

See main: Vienna school

The "Viennese school" refers to the thermodynamics and statistical thermodynamics works, theories, and teachings developed at or in connection with the University of Vienna, Austria, beginning in about 1863. The Viennese school, according to Belgian chemist Ilya Prigogine, was led by Gustav Jaumann, originating concepts such as energy production and entropy flow. Noted thermodynamicists associated with this school include Ludwig Boltzmann, Josef Loschmidt, and Joseph Stefan.

Yale school

See main: Gibbsian school

The Yale school (or "Sheffield Scientific School"), launched in 1873, is associated with the work of American engineer Willard Gibbs at Yale University, and his students. Gibbs had very few direct students, one being Edwin Wilson, and his student Paul Samuelson, who used thermodynamics in economics. Most of Gibbs students were indirect students, via study of his work.

Dutch school of thermodynamics

See main: Dutch school of thermodynamics

The Dutch school of thermodynamics or "Dutch school", which began in 1876, is associated with the work of Dutch physical chemist Johannes van der Waals and Dutch chemist Bakhuis Roozeboom at the University of Amsterdam, who built on the work of German physicist Rudolf Clausius and American engineer Willard Gibbs. Others associated with the Dutch school include: F. A. H. Schreinemakers and Jacobus van't Hoff, to an extent.

Dresden school of thermodynamics

See main: Dresden school of thermodynamics

In some circles, German physicist Gustav Zeuner, author of the two-volume *Technical Thermodynamics*, which went through five-editions, is considered as the founder of the "Dresden school of thermodynamics". Specifically, in 1873, Zeuner took on the post of director at the Royal Saxon Polytechnicum in Dresden (now Technische Universität Dresden) in east Germany, wherein, aside from thermodynamics, he led to the introduction of the humanities; the extension of the range of subjects taught resulted in the polytechnic's rise to a full-scale polytechnic university in 1890. In 1889, aged 61, Zeuner gave up his position as director of the polytechnic to work as a lecturer until his retirement in 1897.

Zeuner was succeeded at Dresden, in 1897, by German physicist Richard Mollier as professor of mechanical engineering. Mollier later became notable for his enthalpy-entropy diagrams for steam; publishing treatises such as *The Entropy of Heat* (1895) and *New Graphs for Technical Thermodynamics* (1904). At the 1923 Los Angeles Thermodynamics Conference, it was decided that any thermodynamic diagram having enthalpy as one of its coordinates should thereafter be called a "Mollier Diagram". [17]

Energetics school

See main: Energetics school

From 1890 to 1908, is a set of logic, attributed to German chemist Wilhelm Ostwald (the founder), Pierre Duhem, and Austrian physicist Ernst Mach, existed that rejected the atomic hypothesis focusing instead primarily on the law of conservation of energy and a belief that macroscopic energy levels were the only reality. [9] With the discovery of the atom, between 1897 and 1909, this school, however, soon became defunct.

Brussels school of thermodynamics

See main: Brussels school of thermodynamics

The Brussels school of thermodynamics is a school of thermodynamic logic, having its "birth" in 1918 lasting into the 1950s, centered around the work of Russian-born Belgian chemist Ilya Prigogine, and his mentor mathematician and physicist Théophile de Donder, who both built on the work of German physicist Rudolf Clausius, at the Free University of Brussels a university now divided between the French-speaking Université Libre de Bruxelles and the Dutch-speaking Vrije Universiteit Brussel. [5]

Lewis school of thermodynamics

See main: Lewis school of thermodynamics

The “Lewis school", a term used as early as 1923, or *G.N. Lewis school*, a term that came into use commonly into the 1950s, refers to anyone schooled under the logic of American physical chemist Gilbert Lewis. In the 20th century, the most cited textbook on thermodynamics was the 1923 *Thermodynamics and the Free Energy of Chemical Substances* written by Lewis and American physical chemist Merle Randall. This activity centered around the University of California, Berkeley beginning in 1912 when Lewis was made dean of the College of Chemistry.

Beginning in about 1895, based on work by American engineer Willard Gibbs, Lewis was aware that chemical reactions proceeded to an equilibrium determined by the free energy of the substances taking part. Lewis then spent 25 years determining free energies of various substances via experimental measurement. In 1923, he and Randall published the results of this study, which helped formalize modern chemical thermodynamics. One of his notable students was Frederick Rossini, who wrote one of the first chemical thermodynamics textbooks (1850). Herman Kalckar, who had spent a year at Cal Tech (California Institute of Technology) in Pasadena, was famous said to be in “the orbit of the great G. N. Lewis school of thermodynamics”. [6] German-born American biochemist Fritz Lipmann, who worked with Kalckar, might also said to be associated with the Lewis school, albeit he was educated in Berlin, in that his free energy coupling theory is based on Lewis thermodynamics.

MIT school of thermodynamics

See main: *MIT school of thermodynamics*

The MIT school or Keenan school of thermodynamics are centered around the publications of American mechanical engineer Joseph Keenan and Hungarian-born American physicist László Tisza.

Between 1934 and 1961, American Joseph Keenan was a professor and later head of the department of mechanical engineering at the Massachusetts Institute of Technology (MIT), and while there he established what has been come to be known as the "Keenan School of Thermodynamics”. [7] Keenan is known for his calculation of steam tables, research in jet-rocket propulsion, and his work in furthering the understanding of the laws of thermodynamics. His classic 1941 textbook *Thermodynamics* served as a fundamental teaching tool in various engineering curricula during the 1940s and 1950s. Keenan brought to the mechanical engineering profession the fundamental work of Willard Gibbs.

The faculty of MIT, during the summer session of 1953, under the guidance of Keenan, organized a Rumford summer school of thermodynamics in celebration of Count Rumford (Benjamin Thomson) Bicentennial: During Summer Session 1953, from Monday, June 29, to Friday, July 10, Inclusive. [8] Notables associated this school include George Hatsopoulos and Gian-Paolo Beretta, the latter of which states that he ran a “thermodynamics think tank” at MIT in the late 1990s. The website QuantumThermodynamics.org, run by Beretta, lists publications by members of the “Keenan school of thermodynamics”.

Hungarian-born American physicist László Tisza, a physics professor at MIT from 1941 to 1973, with his 1966 textbook *Generalized Thermodynamics*, and his doctoral student Herbert Callen, with his popular 1985 *Thermodynamics and Introduction to Thermostatistics*, are both of the MIT school of thermodynamics.

Others

One school, discussed in the context of energetics and psychology, is the Helmholtz school; and another, discussed in the context of physics, energy, thermodynamics and economics is the Lausanne school.

The Russian school of statistical mechanics is said to be based on ideas by Nikolay Bogolyubov; later developed by Dimitri N. Zubarev, S.V. Peletminskii, and others. [19]

In information thermodynamics, the MaxEnt school or Maximum Entropy school of thermodynamics or *Jaynes school* derives from the 1957 paper “Information Theory and Statistical Thermodynamics” by American physicist Edwin Jaynes, which attempted to connect equilibrium thermodynamics, with the statistical mechanics of American engineer Willard Gibbs, with information interpretations. [12] This school is generally rejected by main stream thermodynamicists as an unfounded mathematical contrivance.

Among other groups of so-called “thermodynamic schools” include the: Catalan school of thermodynamics, centered on the topic of extended irreversible thermodynamics developed by J. Casas-Vazquez, D. Jou, and G. Lebon, and the Mexican school of thermodynamics on the topic of a generalized kinetic approach developed by Mexican physical chemist

Other Schools

Helmholtz school	Lausanne school	Russian school	MaxEnt school
Sigmund Freud (1856-1939)	Leon Walras (1834-1910)	Nikolay Bogolyubov (1909-1992)	Edwin Jaynes (1922-1998)
Hungarian school	**Mexican school**	**Japanese school**	

Istvan Gyarmati (1929-2002)	Leopoldo Garcia-Colin (1930-)	Atsushi Tsuchida (1933-)
	Bellaterra school	**Catalan school**

Leopoldo Garcia-Colin. [10]

Beginning in the 1970s and into the 1990s, there were a series of conferences held at what has been called the Bellaterra school of thermodynamics at the Autonomous University of Barcelona, Bellaterra (Barcelona) Spain. [11]

There's also what has been called the Japanese school, "Japanese entropy school", or Japanese "entropy school" of economic analysis, associated with a number of members, led by Japanese physicist and economist Atsushi Tsuchida, author of *Introduction to the Entropy Economics*, at Meijou University, connected to his 1984 work. [18]

Other societies and institutions

In 1986, American biochemistry, biophysics, and genetics researchers Gary Ackers, Wayne Bolen, Ernesto Freire, Stan Gill, and Jim Lee assembled in Vail, Colorado to discuss the discipline of thermodynamics in biological systems, which prior to this time, according to Ackers and Bolen, was widely perceived only as a "energy book-keeping system", as in counting the number of ATP hydrolyses that "pay" for each biochemical synthesis. [2] The following year, the 1st annual Gibbs Conference on Biological Thermodynamics was held, an event that has continued annually. [13] The *Gibbs Society of Biological Thermodynamics* constitutes those organizers and attendees, numbering up to 200, of the annual conference. [14]

The *Indian Thermodynamic Society* (ITS) was established in 2001, headquartered at the Guru Nanak Dev University, Amritsar, with aims to strengthen research and teaching of thermodynamics in India. [15] The ITS organized both the 2005 (1st annual) and 2006 (2nd annual) National Conference on Thermodynamics of Chemical and Biological Systems.

The Institute of Human Thermodynamics (IoHT) was established in 2005 by American chemical engineer Libb Thims, centralized in Chicago, Illinois, as online community of exchange for researchers interested in the study of the application of thermodynamics to the operation of systems of human beings. [16] Notables associated with this institute include: Georgi Gladyshev, Jing Chen, Elizabeth Porteus, Gerard Nahum, among others. Since its inception, the synergy of the IoHT has been the promulgator of many positive things, including the JHT, EoHT, the YouTube HumanChemistry101 channel, donations of teaching materials, e.g. *The Human Molecule*, to local schools, and the publications of free online articles and materials about human thermodynamics.

See also

â— Human thermodynamics education
â— Thermodynamicists (generations)
â— Who is the greatest thermodynamicist?

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θΔics

In physics, **Schrodinger's cat** is a famous thought experiment, conceived by Austrian physicist Erwin Schrodinger in 1935, which outlines a paradoxical conclusion of quantum mechanics, namely that, according to the Copenhagen interpretation, an experiment could be devised in which a cat could be observed as both or either dead and alive. [1]

An artistic rendition of the 1935 **Schrodinger's cat** thought experiment.

Overview

In 1935, Erwin Schrodinger stated the following: [1]

> "One can even set up quite ridiculous cases. A cat is penned up in a steel chamber, along with the following device (which must be secured against direct interference by the cat): in a Geiger counter, there is a tiny bit of radioactive substance, so small that perhaps in the course of the hour, one of the atoms decays, but also, with equal probability, perhaps none; if it happens, the counter tube discharges, and through a relay releases a hammer that shatters a small flask of hydrocyanic acid. If one has left this entire system to itself for an hour, one would say that the cat still lives if meanwhile no atom has decayed. The psi-function of the entire system would express this by having in it the living and dead cat (pardon the expression) mixed or smeared out in equal parts. It is typical of these cases that an indeterminacy originally restricted to the atomic domain becomes transformed into macroscopic indeterminacy, which can then be resolved by direct observation. That prevents us from so naively accepting as valid a "blurred model" for representing reality. In itself, it would not embody anything unclear or contradictory. There is a difference between a shaky or out-of-focus photograph and a snapshot of clouds and fog banks."

The famous thought experiment of Schrodinger's cat, i.e. a cat that is both dead and alive, is based on the absurdity of certain interpretations of the notion of a wave function collapse owing to observation, or something along these lines.

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External links

- Schrodinger's cat – Wikipedia.

θΔics

In terminology, **science**, from the Latin *scientia* 'knowledge', refers to any systematic field of study or body of knowledge that aims, through experiment, observation, and deduction, to produce reliable explanations of phenomena, with reference to the material and physical world. [1]

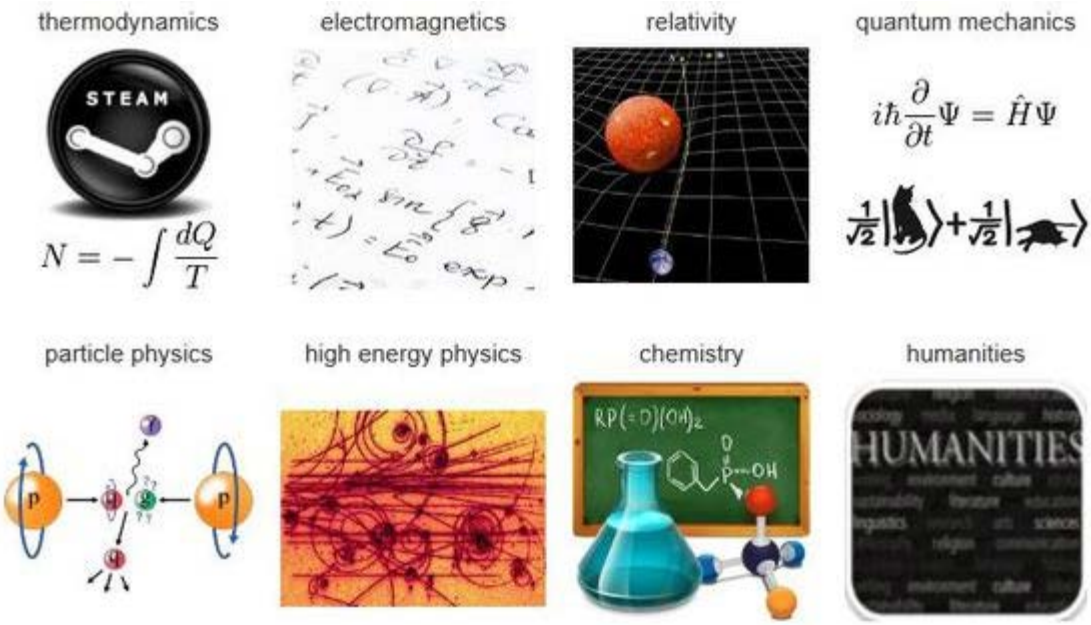

Some modern examples of **science**: thermodynamics, electromagnetics, relativity, quantum mechanics, particle physics, high energy physics, chemistry, and the humanities.

History

In 322BC, Aristotle, via his collected works, according to Howard W. Odum (1926), was said to have founded science: [4]

> "Aristotle was said to have 'founded **science**' and the scientific method in his deductive logic which he set forth for the purpose of technical procedure in the discovery and formulation of new truths."

This may be a stretch; nevertheless, however, in the realm of truth. Then, according to Odum, Francis Bacon inaugurated the scientific method when he introduced the inductive method as the general method of science.

In *circa* 1300, the term "science" began to be used to refer to "knowledge (of something) acquired by study", from the Old French (9th-4th century), from Latin *scientia* "knowledge," from *sciens* (genitive scientis), present participle of *scire* "to know," probably originally "to separate one thing from another, to distinguish," related to *scindere* "to cut, divide," from PIE root *skei- (cf. Greek skhizein "to split, rend, cleave," Gothic *skaidan*, Old English *sceadan* "to divide, separate." [2]

Modern science, in an approximate sense, can be considered to have begun in 1543 with the simultaneous publications of *On the Revolutions of the Celestial Bodies* by Polish astronomer Nicolaus Copernicus and *On the Structure of the Human Body* by Belgian anatomist Andreas Vesalius. [3]

Moral world | Material world

In 1833, in the aftermath of the Whewell-Coleridge debate, the term "scientist" was coined by English mathematical philosopher William Whewell, meaning one who studies the "material world", to distinguish between the older variant of a "natural philosopher", referring to one who studies all of nature, both the "material world" and the "moral world" generally speaking.

Quotes

The following are related quotes:

> "No human investigation can be called real science if it cannot be demonstrated mathematically."
>
> — Leonardo da Vinci (c.1490), Italian polymath

"**Science** is exact to the degree that its generalizations agree with external realities."

— Morris Zucker (1945), *Philosophy of American History: the Historical Field Theory* [4]

See also

- Fringe science
- Hard science
- Hmolscience
- Pseudoscience
- Science as religion
- Soft science

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External links

- Science – Wikipedia.

θΔics

In knowledge, **science and religion**, or "religion and science", is a umbrella term referring to subject on the overlap of evidence-based knowledge and faith-based cultural belief systems.

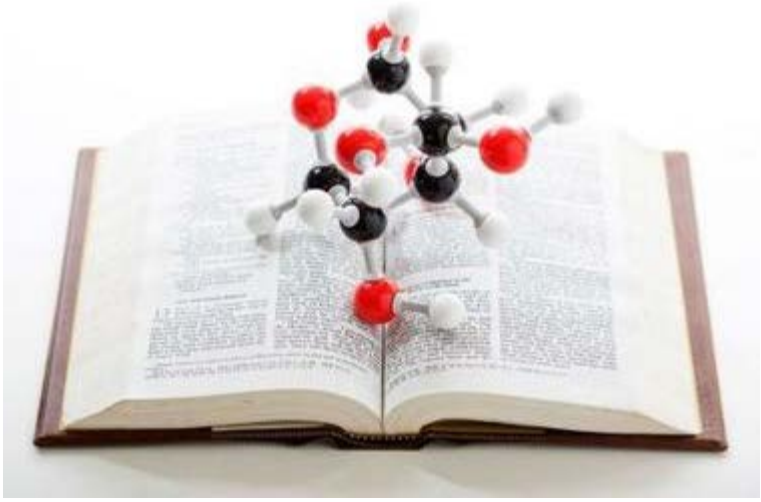

A photo of a molecule resting on what seems to be the Bible (Q) .

Overview

In 1874, John Draper published *History of the Conflict between Religion and Science*. [2]

In 1896, Andrew White, stimulate in part by Draper's book, published *A History of the Warfare of Science with Theology in Christendom*. [3]

In 2013, American physicist Max Tegmark, who claims he's "not religious", published a a religion and science survey of the religious belief distributions in American and the conflict of each with big bang cosmology and evolution theory: [1]

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Further reading

● Lindberg, David C. and Numbers, Ronald L. (1986). *God and Nature: Historical Essays on the Encounter between Christianity and Science*. University of California Press.

See also

● Science v. religion legal cases
● Science vs religion debates
● Science-religion controversy

External links

● Relationship between science and religion – Wikipedia.

θΔics

In terminology, **science as religion** refers to []

Overview

The premise of “science is my religion”, to note, is a bit of melting pot term, without specific doctrine, according to which the person who says this, supposedly, picks their top dozen or so scientific prophets or philosophers, and therein calls this their belief system.

Goethe

In 1758, Goethe, at the age of 9, built his own alter to nature out of his father’s natural history collection, surmounting it with a candle (made of sulfur), which he lit when making his devotions (see: Goethe timeline); in 1809, age 60, after previously discovering evolution on his own and proving it to himself (see: human intermaxillary bone, 1784); in 1809, after discussing his ideas with Friedrich Schiller (1799-1803), he published a coded philosophical-naturalism prototype of a "religious idea", so to say, based on physical chemistry, i.e. elective affinity theory in particular, aka Goetheanism, as it has come to be called.

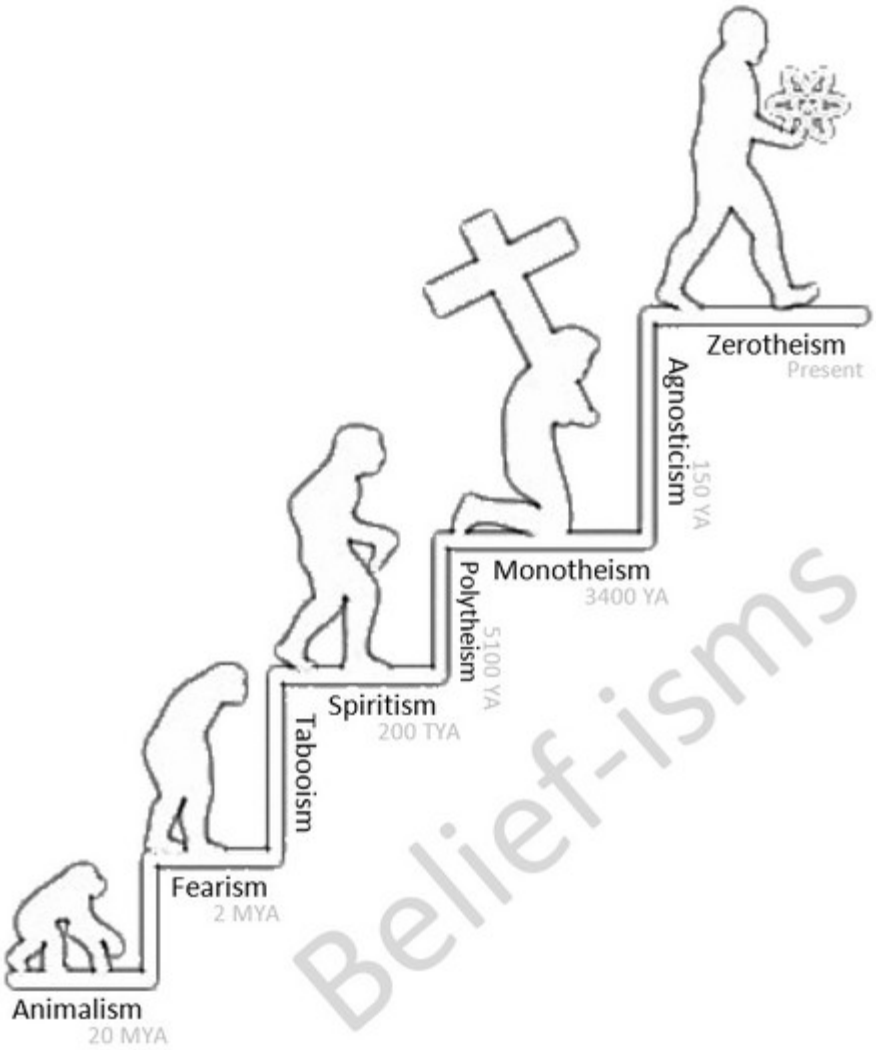

A stepwise depiction of the change in belief-isms, aka “**science as religion**” or knowledge informing beliefs, from 20 million years ago (MYA) to present, in the course of human evolution, from: animalism (2 MYA), or “behavior that is characteristic of or appropriate to animals, particularly in being physical and instinctive”, to fearism (2 MYA), to tabooism, to spiritism (200,000 YA), to polytheism (5,100 YA), generally demarcated by the formation of the Egyptian 1st dynasty (3100BC), to monotheism (3400 YA), initiated by the efforts of Akhenaten (1330BC), to agnosticism (150 YA), a term introduced by Thomas Huxley (1869), to zerotheism, generally introduced by Libb Thims (2015), amid the “Zerotheism for Kids” lecture, the latter of which anchored in "belief in the atom" as Richard Feynman advised (see: Feynman time capsule wisdom) as the most important belief to humanity.

Shelley

In 1804, Percy Shelley, while a student of Adam Walker, learned about possibility of life on other planets, links between magnetism and electricity (Ñº), and on the elements and, similar to Goethe, the chemical or elective affinities, and thereafter began to develop his own personal religion which he used as an operating manual; by age 19, after the publication of his “The Necessity of Atheism”, which got him expelled from Oxford, he soon became one of England’s most-notorious atheists; five years later, age 24, he married “Mary Shelley”, soon-to-become famed *Frankenstein* author, in the so-called “Church of Elective Affinities”, as Mary Shelley (1839) retrospectively referred to their conceptual chapel, wherein the gospel the religion of “Elective Affinities”, as it was known in their social circle, which included Lord Byron, among others, was preached.

Ostwald

In circa 1809, Wilhelm Ostwald, building in part of Goethe and his elective affinities ideas, attempted to establish a radical atheism proto-religion, based on physical chemistry, or energetics primarily, called monism, which he promoted with Ernst Haeckel, e.g. in his weekly "Monistic Sunday Sermons" and other promotions.

Odum

In 1976 to 2007, Howard T. Odum, building on the earlier teachings of his father Howard W. Odum, one example statement of which is as follows:

> "Science is being called the religion of the modern era."
>
> — Howard W. Odum (1929), *An Introduction to Social Research* (pgs. 14)

attempted to introduce an energy-based religion, based on an "emergy morality" system; the effort, and their school, aka Odum school, is somewhat similar to Ostwald, but more amateurish, being that, the Odums not being physical scientists, based their understanding of energy and thermodynamics on dictionary definitions and food chain models of energy flow in society (see: energy flow diagrams); commendable, but largely off-target, say as compared to Ostwald, Shelley, and Goethe.

Thims

In 2015, Libb Thims, building on Goethe, Shelley, Ostwald, among others in the hierarchy of great atheists, e.g. Nietzsche, Buchner, Le Mattrie, etc. (see: atheism types by denial and belief), taught a "Monday School" class to six Chicago children, aged 6 to 11, entitled "Zerotheism for Kids", wherein he introduced a nuts and bolts basic type of belief system called "zerotheism" based on explicit denial of the belief in the existence of god, Big Bang cosmology, and Goethean morality, in place of or upgrade to the "god created every thing" in six days, Nile river flood cosmology, snake-n-apple morality, the six year old was learning at the time.

Other

In 1985, Mary Midgley, in her *Evolution as Religion*, attempted to use some type of animal rights morality platform to argue that reductionism is wrong, holism is right, and evolution as religion aimed at an omega point is like a zombie or pied piper belief system, or something along these lines. [5]

Einstein | Last Supper

The adjacent 2010 "Last Supper of Einstein" by American critical thinker Nick Farrantello, is one example of this; in commentary about why isn't so-and-so in the group photo, e.g. Tesla, more women, more minorities, etc., he commented as follows: [4]

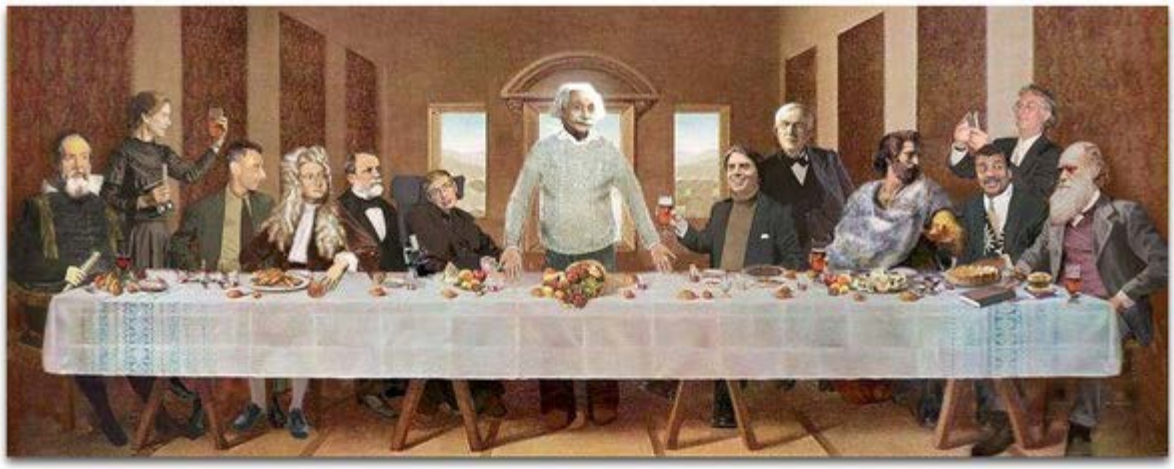

A 2010 "Last Supper of Einstein" illustration, by Nick Farrantello (Ñº), as found (Ñº) as the header of the Facebook group page "Science is My Religion" — a parody of the Leonardo da Vinci's circa 1490 "Last Supper of Christ" painting (Ñº) — showing: Galileo, Marie Curie, Robert Oppenheimer, Newton, Louis Pasteur, Stephen Hawking, Einstein, Carl Sagan, Thomas Edison, Aristotle, Neil Tyson, Richard Dawkins, and Charles Darwin. [3]

> "I'm kind of sorry there were only thirteen spots. Every time I put someone new on, I had to kick someone off. What about Rosalind Elsie Franklin the woman who was responsible for much of the genetics research that led to Watson and Crick discovering DNA or Vivien Thomas the African American surgeon who pioneered heart surgery? While we're on the subject of minorities what about Michio Kaku the theoretical physicist behind string theory? In the end I went with people who were well known. Maybe one day I'll do a picture full of unsung heroes."

The photo collage, in short, represents a generic "religion science", in this case that of Farrantello. Most others, who have some sort of science religion, will have a similar conception in their mind. Many of these, however, will be error-

prone. In Farrantello's case, e.g., his use of Dawkins, whose theories are immensely error-ridden, e.g. his chance-based, pointlessness, DNA-focused model, etc., is a red flag in respect to foundations.

Quotes

The following are related quotes:

> "The world is my country, **science is my religion**."
>
> — Christiaan Huygens (c.1670), attributed and or mis-attributed (Ñº)

> "There is an element of cruelty in all of us. We may all discover within us, if we search carefully enough, that *insani leonis vim* of which Horace speaks. It would be a mistake to suppose that ecclesiastics who discharged Inquisitorial functions must have been abnormally hard-hearted. St. Peter Martyr, their 'egregious captain,' who achieved fame as one of the most relentless exterminators of heresy the world has ever seen, is described in the Bull of his canonisation as being of 'sweet benignity, of exhaustless compassion, of wonderful charity.' There is no sort of reason for questioning the accuracy of the description. No doubt an Inquisitor's sensibility to suffering was blunted by the constant sight of it in the torture chamber. I can the more readily understand that this was so, from the comparative indifference with which, as a young man, I soon came to view the execution of sentences of hanging and flogging, at which it was my duty to be present when an assistant magistrate in India. For myself, I do not hold the person of the Inquisitor in admiration. But we must be just—even to an Inquisitor. And the present age supplies a parallel which may, perhaps, help us to be so. Science is to the Vivisector what orthodoxy was to the Inquisitor. Indeed, I remember a physician, much famed for the ferocity of his feats in physiological laboratories, remarking to me, '**Science is my religion**.' Well, this gentleman, for the advance of his religion, did not shrink from causing to multitudes of dogs and horses physical sufferings as intense as any Inquisitor ever inflicted on heretics or suspected heretics. But it may be said, 'The Vivisector's victims are animals lower than man in the scale of being [see: chain of being]; the Inquisitor's were men.' Of course, that is, as a rule, true. The Vivisector is obliged—at all events usually—to content himself with animals lower than man, in default of the human subjects upon whom, if his experiments are to possess any real scientific value, they should be performed. And, of course, every metaphysician knows that rights cannot, in the strict sense, be predicated of the lower animals, who are not *persons.* But if not persons, they assuredly are not mere things. They possess what Trendelenburg calls *ein Stuck persunliches.* They are 'our poor relations.' Hence, as it appears to me, to torture them is much more cowardly than to torture men. Anyhow, torture is torture, and familiarity with it engenders callousness concerning it—nay, too often, a taste for it. The Vivisector is, to say the least, as indifferent to the sufferings of his victims as was the Inquisitor. Curiosity as to the attainment of the desired result, not pity, is the emotion produced in his mind by the agonies and cries which, like the Officials of the Holy Office, he carefully, perhaps complacently, notes. We are not justified in attributing to him, any more than to the Inquisitor, abnormal hard-heartedness. But, like the Inquisitor, he illustrates a tendency in human nature to shrink from no savagery towards others *ad eruendam veritatem* — in the attempt to elicit truth. That tendency I, for one, hold to be evil in itself. The doctrine, so ignorantly imputed to certain schools of casuists, that a good end will justify any means, is simply false, and inconsistent with the first principles of morals. We have no right to employ physical torture in order to elicit truth, whether in judicial or scientific investigation. It is an unethical means; and that is the true objection to it in both cases."
>
> — William Lilly (1897), "The Methods of Inquisition" [1]

> "The method of **science is my religion**."
>
> — Author (1937), "Article" (Ñº), *The Christian Leader*

“I don't know my neighbours, and they don't know me. Frankly, I prefer it that way. I like my privacy. "Religion? I can barely remember what it is. My family was Roman Catholic. I suppose **science is my religion** now.”

— Author (1972), “Article” (Ñº), *Canada and the World*

“Jean Perrin [father] and Francis Perrin [son] held similar political and philosophical ideas. Both were socialists and atheists. Like many nineteenth century French men of science, Jean Perrin viewed **science almost as a religion**.”

— Jean-Claude Valeur (2001), *New Trends in Fluorescence Spectroscopy* [2]

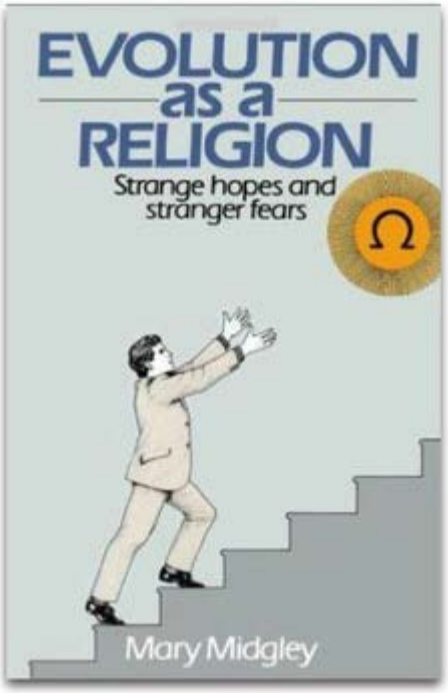

Mary Midgley's 1985 anti-reductionist, anti-materialism, evolution as religion ridiculing book. [5]

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θΔics

In hmolscience, **science of love** refers to the study of human relationship formations or social aggregations, dynamics, and dissolutions, wherein the attraction-to-repulsion ratio is near a 5-to-1 balance (Gottman ratio) for interpersonal bondings; or, in general, to either one or an admixture of the chemistry of love, physics of love, thermodynamics of love, among others.

A chemical alphabet depiction of the **science of love** as having a chemical basis, in part; which is at least correct as per the elements oxygen and vanadium go (see: hmolscience periodic table).

See also

- Mathematics of love
- Neurochemistry of love | Neurochemistry
- Proxmire affair

Further reading

- Herper, Matthew. (2004). "The Science of Love", *Forbes*, Jun 06.

θΔics

In debates, **science and religion debate**, or religion vs science debate, refers to any and all of varieties of debates between the established tenets of religion and the findings of modern science.

A 1998 **religion vs science debate** between English physical chemist and noted thermodynamicist Peter Atkins and American theologian-philosopher William Craig. [3]

Analysis | List

The following is a work-in-progress list of overly-typical religion vs. science debate issues that are often seen or encountered in the fall of religion rise of science void discussions that ensue, i.e. namely that without religious belief, modern science yields but the seeming cold explanation that human existence is without meaning (meaninglessness) and that people are "accidents", or "mistakes", caused by blind random chance mutation, among others pejoratives:

> "I had motive for not wanting the world to have a meaning; consequently assumed that it had none, and was able without any difficulty to find satisfying reasons for this assumption. The philosopher who finds no meaning in the world is not concerned exclusively with a problem in pure metaphysics, he is also concerned to prove that there is no valid reason why he personally should not do as he wants to do, or why his friends should not seize political power and govern in the way that they find most advantageous to themselves. … For myself, the philosophy of meaninglessness was essentially an instrument of liberation, sexual and political."
>
> — Aldous Huxley (1937), *Ends and Means: an Inquiry into the Nature of Ideals* (Ñº) (vid | 3:41) [10]

> "Today's children are taught by our culture that we are a cosmic accident. Something slithered out of the primal slime and over billions of years evolved into a human being. We are cousins, ten times removed, to the ape at the zoo eating his own excrement."
>
> — Gary Bauer (1992/2013), Evangelical Christian centric politician; former domestic advisor to Ronald Reagan (Ñº) (Ñº) (Ñº)

> "Science says that a series of genetic mistakes, genetic mutations led to the great complexity of our world."
>
> — Shmuley Boteach (2009), La Ciudad de las Ideas Re-evolution (vid | 3:58)

> "Religion isn't really only about how the world was created. That's just the sideshow. The chapters in Genesis that deal with creation of the world are only two or three. What religion really is, is the most radical statement in the history of the world, which is that every single one of you possesses the power to 'choose' the kind of person you want to be. There is a god who gave us moral commandments and that without god, the laws of do not kill, do not steal, do not commit adultery, are nothing but euphemisms for personal taste, because if there isn't a god who is the ultimate arbiter and thee standard by which these laws have definition then all we have are two different people who are disagreeing.
>
> I want Sam Harris to please address: a child is born and he has severe Down syndrome. He will never be anything but a burden to his parents. He is a financial strain. Special needs children often even ruin the marriages of their parents. Why should we not euthanize that child? We get so upset that Hitler euthanize the infirm, but doesn't that sort of makes sense? In fact Francis Crick, who won the Nobel Prize for mapping the DNA molecule, said that we should really define birth as two days after parturition so that a baby could be examined for defects and if those defects were sufficiently deleterious we could declare the child to not yet have been born. The only reason we keep that child alive, even though we all live in a society of limited resources, is because life is 'sacred', not because of the quality of life, but the sanctity of life. There's no rational reason.
>
> Somewhere right now, there is a police officer in the north of Mexico and he barely arms enough money to support his family and that drug dealer wants to give them a few extra bucks to look at the other way while they smuggle cocaine into

> the United States, and no one's ever going to find out, and no one's ever going to see, and no one's ever going to know. Tell me one reason why the police officer should not take the money when he needs it for his family? Give me one moral reason other than the idea that there is justice in the world and that we have the power to choose our moral character? Everything we've heard in this conference is that people almost have no choice. Science seems to be going against choice. Biological determinism. Genetic predisposition. Freud said we're far less far less masters of our own mental household than we otherwise suppose, an out of control id and ego. But religion says that at every moment you have the power to choose."
>
> — Shmuley Boteach (2009), The City of Ideas Re-evolution (vid | 6:41-9:30)

To quickly address some of these latter objections or points made by American orthodox rabbi Shmuley Boteach, in order of descending easiness, firstly there are some cultures, as discussed in the evolutionary psychology literature, possibly in David Buss (or Helen Fisher), where a baby is not considered alive or real until the age of one. Secondly, there is no god (see: existence of god), this was dismissed two hundred years ago as unneeded hypothesis by Pierre Laplace (1802); but, nevertheless, this conceptualized belief (or node) is the linchpin of the entire debate (see: nodal belief system theory | Christopher Redford). Thirdly, the so-called moral commandments (no killing, stealing, or adultery), i.e. 10 commandments cited here, which didn't come from a god (which, again, is something that doesn't exist), are truncated condensed summarizes of the 42 negative confessions of Anunian theology.

Fourthly, the Down syndrome child and police officer examples are simply one of many so-called 'moral quagmires' or 'thorny moral issues' in need of address, in a post-Christian world. Goethe, initiator of the post-Christian, human chemical theory upgrade, moral symbols, Goethean revolution reform, addressed variations of these moral quagmires, in his law degree exam, e.g. should the mother who kills her newly born child be given the death penalty? The list is not the issue, but rather the reformulation of the new moral system based in the logic of physical chemistry and universal order is what is needed.

Fifthly, in citing Francis Crick, whereas Boteach, using defunct terminology, discusses reasons for 'keeping the child alive', Crick was the first to correctly state, in 1966 (*Of Molecules and Men*), according to modern physical chemistry, that we should 'abandon the term alive'.

Lastly, the latter 'give me one moral reason', Freud citation, etc., commentary, is but parlay into the big power center publications of the Goethean-wake of external force (major) / internal force (minor) conceptualized realism philosophy thinkers: Arthur Schopenhauer, Friedrich Nietzsche, Sigmund Freud, inclusive of theories, including Freud-Schiller drive theory, Albert Einstein on the freedom of the will, and so on, all of which is but led into modern human chemical thermodynamics (e.g. ABC model of molecular choice; see: free will, retinal molecule) —the subject of 'choice', in a chemical and human sense, and the moral repercussions deriving therefrom, being the explicit focus of Goethe's masterpiece *Elective Affinities*, the title of which, German-to-Decoded English translates as the 'nature of the choice of one's chemical affinities' (see: title decoding). .

Overview

The gist of the debate, generally speaking, is between the Biblical view, and the world's predominate belief system (32%), which itself is a derivative of Ra theology and its life-death cycle of the sun born out of the earth, and morality and purpose attached to this, and the newer findings arising following the various scientific revolutions: Copernican revolution, Chemical Revolution, Darwinian revolution, Carnotian revolution (thermodynamic revolution), quantum revolution, among others.

Into the early 21st century, the so-called "God debates", science vs. religion debates, or religion vs. science debates are hot topics, with new books published yearly on this topic and with newly created discussion forums sprouting daily. [5]

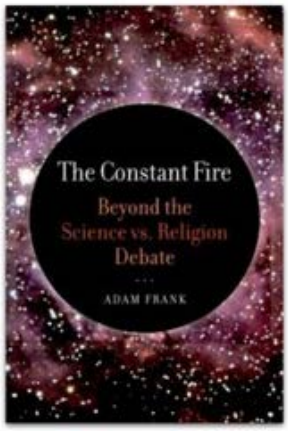

The Aug 15 2005 *Time* cover story "Evolution Wars on intelligent design and the teaching of humankinds's origins in high school the Kitzmiller v. Dover Area School District. [6]	The Nov 13 2006 *Time* cover story "God vs Science" On the Origin of Species (1859) vs. the Book of Genesis (500BC) and whether science can replace religion as a worldview and a touchstone. [7]	The 2009 *The Constant Fire: Beyond the Science vs. Religion Debate*, by American Astrophysicist Adam Frank is said to "paranoid squabbling that plagues the religion vs. science dialogue."	A 2010 depiction of the "science vs religion debate", showing physics at odds with biology, history, philosophy, and the Bible, from the 2010 overview article on this subject by American psychologist Jefferson Fish. [8]

Timeline

A timeline of the key debates and stops in the subject of the tension breaks between religion and science are summarized below:

Debate	Years	Summary	Significance
Vacuum debates		In 350BC, Greek philosopher Aristotle adopted and employed Empedocles' 485BC nature abhors a vacuum dictum, i.e. that vacuums are an impossibility in nature, into his standard model of physics, and shortly thereafter Aristotelian physics became the accepted and dogmatic model of the universal operation according to the Roman Catholic church for the 1,500-years. In circa 1640, a pump maker approached Galileo with his query of the pump problem, i.e. why pumps fail to work in wells deeper than 32 feet, a subject about which Galileo had to tip-toe around for fear of a second inquisition, but did manage to convince his pupil Evangelista Torricelli to investigate the problem in 1643 during which time he invented made a "Torricellian vacuum", the barometer, and discovered the phenomenon of atmospheric pressure. The experimental existence of this so-called "vacuum" when against the views of Aristotelian physics and hence the Church; although, to note, it is difficult to say what implications exactly vacuums have in relation to the Bible? In any event, owing to the state of tension in the air with the recent inquisitions of Galileo, Torricelli left the vacuum problem alone and moved on the more neutral domain of abstract mathematics.	In 1657, supposedly aware of Torricelli's 1643 vacuum experiment, German engineer Otto Guericke, the newly appointed mayor of Magdeburg, began to try to build an artificial vacuum making machine so to disprove Aristotle's no-vacuum model and in this direction invented the famous 1657 Magdeburg hemispheres. Guericke was aware of the delicacy of his experiments and therefore avoided theological discussions by using a "clever linguistic ploy". The evasive style of speech he choose to describe his findings was to replace the more offensive words "void" and in particular "emptiness" with the less intrusive physical term "empty space", which allowed him to carry out public demonstrations of his vacuum creation technique without controversary. His empty space did not mean "void" but it was just an air-evacuated space. [4]
Whewell-Coleridge debate	1833-1851	A debated which peaked at an 1833 meeting of the British Association for the Advancement of Science (BAAS), chaired by William Whewell, in which English romantic philosopher Samuel Coleridge was drawn into a passionate discussion of semantics, revolving around the question of what exactly someone who works 'in the real sciences', as Coleridge had phrased it, should be called?	Resulted in the coining of the term 'scientist', i.e. a mathematician, physicist, chemist, astronomer, or naturalist, etc., in 1834, as a distinction from the older term 'natural philosopher', referring to one who embraces the broader philosophical, theological, and moral concerns.
		In 1843, English brewer James Joule who showed that energy could be transformed into a number of different variations, heat, electrical, chemical, gravitational, etc., but always doing so according to a fixed ratio called the mechanical equivalent of heat, all the while doing so in attempt to prove or derive a law which showed the work of God: "I shall lose no time in repeating and extending these experiments, being	Initiated debates of the first kind

Thermodynamics vs religion debates	1843-present	satisfied that the grand agents of nature are by the Creator's fiat, *indestructible;* and that wherever mechanical force is expended, an exact equivalent of heat is *always* obtained." In other words, Joule believed that the first law of thermodynamics was decreed by the act or will of a deity.	
		In 1865, German physicist Rudolf Clausius famous stated that the entire universe is governed by two laws, one that the energy of the universe is constant, two that the entropy of the universe tends to a maximum and shortly thereafter (or shortly before) stated that heat death theory that the universe will end at a point in the future when entropy reaches a maximum at which point "no further change could evermore take place", or something to this effect.	Initiated debates of the second kind kind
Evolution debates	1859-present	In 1859, English naturalist Charles Darwin published his *Origin of Species*, which concludes with the view that humans were not created by God 6,000 years ago, as the Bible holds, but by a process of slow natural selection (evolution), over millions of years, starting from a warm pond, filled with ammonia and phosphoric salts, in which a certain type of "protein compound" was "chemically formed" and came "alive" when it was "sparked" to "life" by a combination of light, heat, and or electricity.	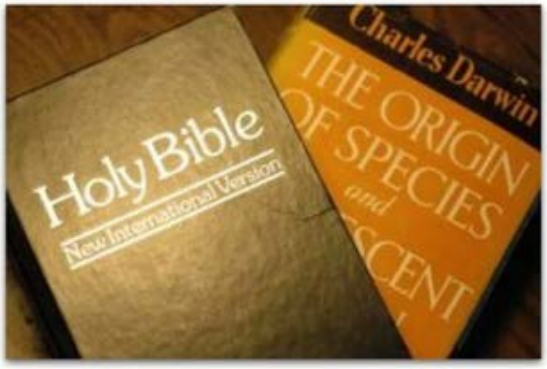
Tyndall-Stewart-Tait debate	1874-1878	A growing controversy, at the Catholic University of Ireland, over whether or not to teach modern science to university students, resulted in a collision, at the 1874 British Association for the Advancement of Science (BAAS) meeting, between Irish physicist John Tyndall, who was under the view that religion must relinquish all control to science, and Scottish physicists Balfour Stewart a Peter Tait, who were of the view that the two could be integrated so as to explain morality, life, death, and immortality.	Resulted in one book (*The Unseen Universe: or Speculations of a Future State*, 1875), one novel (Paradoxical Philosopher, 1878), both by Stewart and Tait, and Irish physicist James Maxwell's last dying poem "A Paradoxical Ode" (1878), summarizing the state of matter of the big questions, in his view.
Pope Pius XII's entropy proof of god	1951	In his notorious Nov 28 Christmas lecture, Pope Pius XII, the head the Catholic Church (1939-1958), argued that German physicist Rudolf Clausius' 1865 law of entropy provides "eloquent evidence of the existence of a Necessary Being."	

Other

In 1926, American philosopher Alfred Whitehead summarized the future of the subject as follows: [1]

"When we consider what religion is for mankind and what science is, it is no exaggeration to say that the future course of history depends upon the decision of this generation as to the relations between them."

A depiction of the divide between science and religion out of which a tension exists, resulting in **science-religion trails**.

In 1991, Englishman New Testament scholar Richard Burridge suggested to biochemist Christopher Southgate that he use his background in experimental science to teach a course on the "science-religion debate", which he began doing in 1993 at the University of Exeter. The first two books he assembled for a class reading list were Thomas Kuhn's *The Structure of Scientific Revolutions*, and American physicist Ian Barbour's *Religion in an Age of Science*. [2]

See also

â— Science-religion controversy
â— Science-connected legal cases

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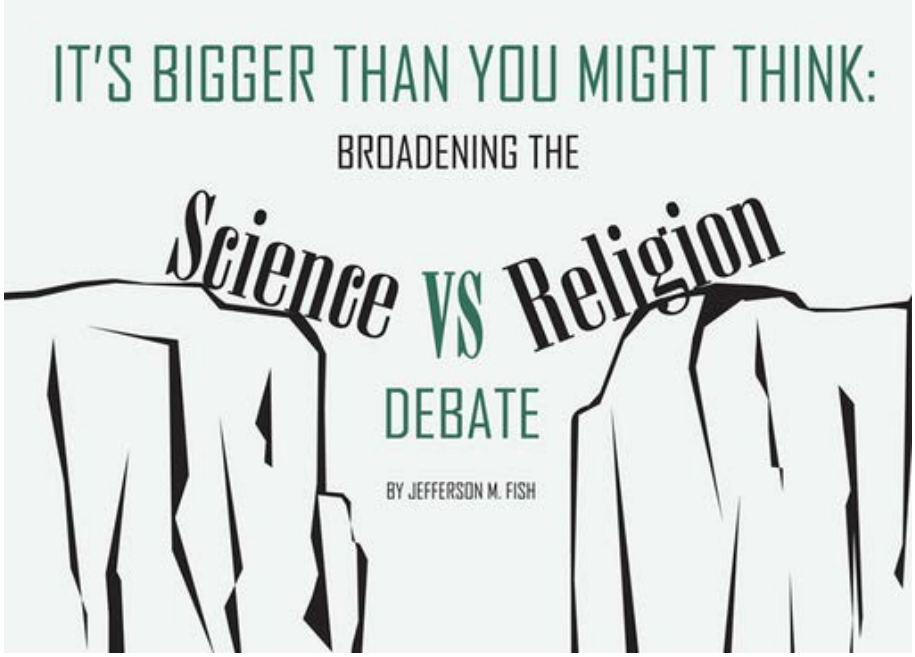

Depiction of the science vs religion debate from the 2010 article on this topic by American psychologist Jefferson Fish. [6]

External links

â— Relationship between religion and science – Wikipedia.

θΔics

In court, **science vs religion legal cases** refers to court resolved disputes that involved or embroiled modern physical science in some way or another in direct or indirect tensioned conflict with religion, of which views tend to misalign.

The surface motives for such cases in many causes are elusive, but the underlying motive, in a general sense, is summed up well by Edward Humes, from his recent book on the 2005 Kitzmiller v. Dover Area School District, involving the teaching of man's origins in high school:

> "The implications were fairly horrifying when it came to man's place in this Darwinian world. Higher purpose was gone. And what of the soul? Only men had souls, it was said, but if humans shared a legacy with apes and sharks and slugs, did that leave room for a soul? For an afterlife? The logic of Darwin suggests that human existence is nothing more than a happy accident brought about by blind chance."

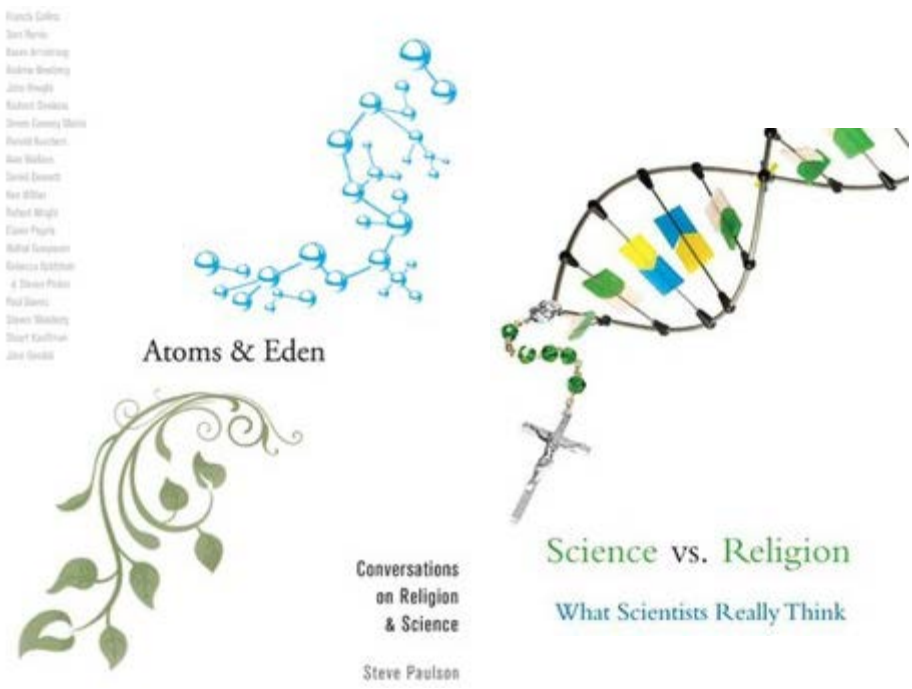

The 2010 books *Atoms & Eden*, by Steve Paulson, and *Science vs Religion*, by American sociologist Elaine Howard, present the results of a surveys and interviews of over 1700 physical scientists and social sciences at top American and European research universities on the ongoing tension and irreconcilablilities between science and religion in practice in the education system. [12]

In other words, in attempting to pinpoint the religions repercussions of newer scientific findings e.g. that the "earth moves" (Galilei trail, 1633), that "people are human molecules synthesized from atoms in a great process" (Sales trial, 1775) that "humans are descendant from lower animals" (Darwin trials, 1925-), "that stem cells have souls" (Stem cell trails, 1998-), etc., the task is not at all simple, but generally has to do with the newly discovered fact, theory, procedure, or scientific finding erodes away at and is generally abrasive to higher purpose, and as such is contestable.

Of science connected legal cases, those in the field of legal thermodynamics, i.e. those cases which directly involve the laws of thermodynamics, the set of laws that govern the operation of the known universe, to the effect that the ruling was either amended towards the guidelines of the laws of thermodynamics, thus relieving tension, or against the guidelines of the laws of thermodynamics, thus increasing tension, are of great interest.

List

Some of these science-conflicting cases are listing below (a work in progress):

Case	Date	Overview
		The pinnacle spectacle of the science v. religion legal case, adjacent, physicist Galileo Galilei on trail in 1633 for "suspicion of heresy" for his "moving earth theory" and support of the Polish astronomer

Nicolaus Copernicus' 1543 heliocentric model.

Galileo's view and telescope findings disagreed with Aristotle's 350BC geocentric model of the universe, a view supported by the Catholic Church, as was at odds with several passages from the Bible, namely that "the earth cannot be moved". [11]

Galileo v. Roman Catholic Church (Galilean inquisitions)	1633	In 1609, Italian physicist Galileo Galilei began making telescope observations, publishing the results the following year in his *the Starry Messenger*, findings which began to allude to the conclusion that the "earth moves", a view at odds with the established and accepted Aristotelian views of the Church and passages from the bible such as: "The world is established and cannot be moved." A 1613 dinner party conversation on this topic between the Duke of Tuscany, the Duchess of Tuscany, the person who gave Galileo his professorship, Benedetto Castelli, a physics professor, and Cosimo Boscaglia, a philosophy professor, ended with Boscaglia accusing Galileo of heresy, because moving earth theory conflicts with Biblical stationary earth theory. Galileo was eventually was tried in 1633 as depicted below: Decision: Galileo was convicted of heresy, made to recant his views, and was put under house arrest for the remainder of his life.
Sales v. The Chatelet	1775	In 1770, French philosopher Jean Sales published the first volume of his *The Philosophy of Nature: Treatise on Human Moral Nature*, in which he outlined the revolutionary view that people are types of molecules, which he named as "human molecules", and that these millions of human molecules presently populating the earth, as he put it, were formed or synthesized through a "great process in which so many millions of atoms of the earth became so many millions of human molecules." The book was condemned by the Chatelet, a Paris courthouse and prison, in 1775 after which Sales was imprisoned and later sentenced to perpetual banishment on what have been called "absurdly inadequate grounds".

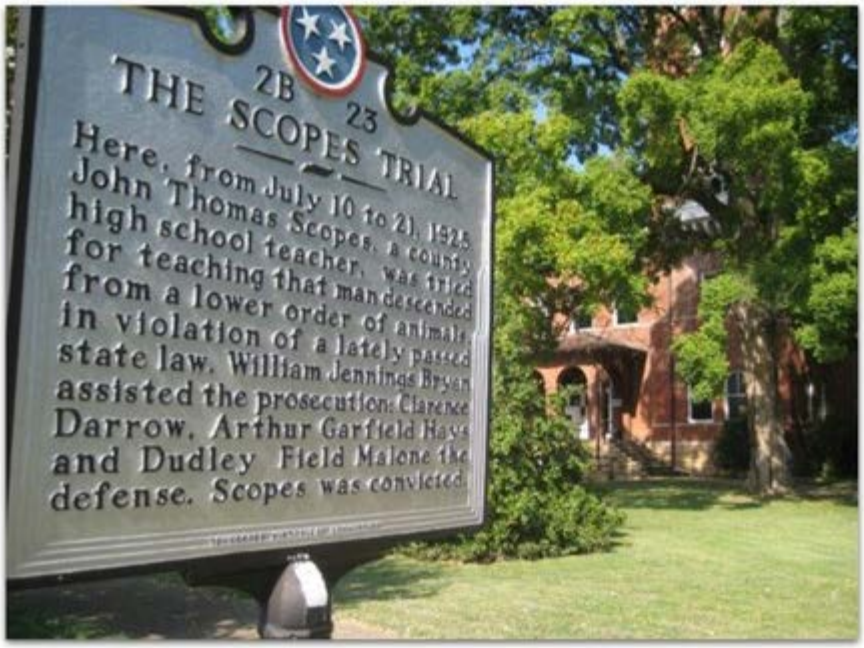

John Scopes

John Butler

In Tennessee, in 1925, the newly passed Butler act illegal to each evolution in school:

> "That it shall be unlawful for any teacher in any University and all other public schools of the State which are supported in whole or in part by the public school funds of the State, to teach any theory that denies the Story of the Divine Creation of man as taught in the Bible, and to teach instead that man has descended from a lower order of animals."

The law was introduced by farmer (and part time high school teacher) John Butler (pictured) who specifically intended it to prohibit the teaching of evolution; his reasoning being, as he later reported:

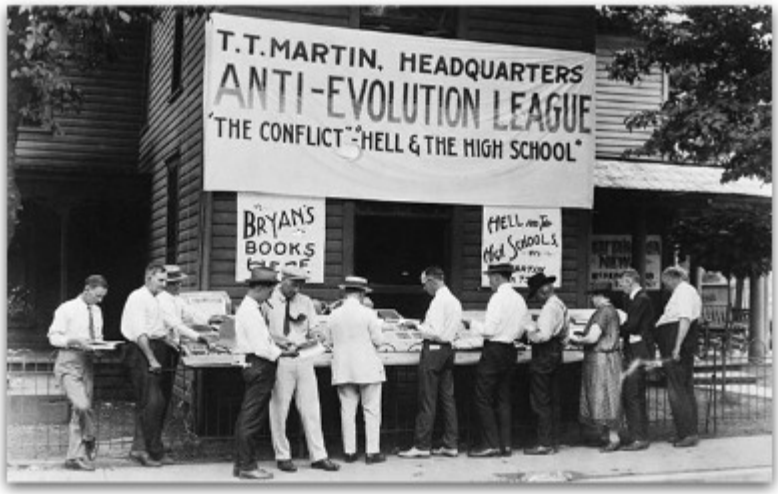

> "I didn't know anything about evolution when I introduced it. I'd read in the papers that boys and girls were coming home from school and telling their fathers and mothers that the Bible was all nonsense."

The State of Tennessee v. Scopes (Scopes Monkey trial)

1925

Evolution (v. creationism)

Prior to this statement, in circa 1920, at the Primitive Baptist church, Butler was said to have listed to a sermon about young woman in his Tennessee community who enrolled in a biology course at a nearby university, and after finishing the course returned home, the preacher said, and was no longer a Christian. The theory of evolution was said to have destroyed her faith in god.

Butler asked himself whether evolution could turn one his own three boys into an atheist. Could this happen to his neighbors' children? Could this happen in his the high schools of his own Macon County, where evolution was currently being taught?

It just wasn't right, Butler thought, that parents could bring their children up to be God-fearing, only to have a taxpayer-supported biology teacher rob them of their faith. Evolution fit into a strong concern he had about education: it replaced the solid, land-based values of his neighbors with more cosmopolitan and irreligious values.

In this direction, in 1922 Butler ran as a Democrat for state representative and in his campaign fliers promised voters in his district that he "would work to protect schoolchildren from the effects of the godless doctrine of evolution".

Three years later, when the Scopes "Monkey" Trial came to Tennessee, Butler told an interviewer that the dairy farmers and sheep ranchers of this rural district overwhelmingly supported his stand against teaching evolution. "Ninety-nine people out of a hundred in my district thought just as I did," Butler said. "I say ninety-nine out of a hundred because there may be some hold different from what I think they do, but so far as I know there isn't a one in the whole district that thinks evolution—of man, that is—can be the way scientists tell it."

In the end, high school biology teacher John Scopes was accused of violating the state's Butler Act that made it unlawful to teach evolution. Scopes was found guilty, but the verdict was overturned on a technicality and he was never brought back to trial. An outspoken representative in the trial was a Reverend Jim Grove (above) who believed that "evolution is the road to atheism".

Sputnik launch (ramped up science focus)	1957	The teaching of evolution was formerly banned in four states; and evolution theory was barely mentioned, or avoided entirely, in most schools and textbooks for the previous three decades, owing to public and political pressure against textbook publishers. With the Russian launch of Sputnik, President Dwight Eisenhower pushed for ramped up science and math education as a matter of national security. [3]
United States v.		Synopsis: Established the Supreme Court's stance on free will as being a "universal and persistent" foundation of the system of law, distinct from "a deterministic view of human conduct that is inconsistent with the underlying precepts of the criminal justice system."

Grayson

Free will
(v. determinism)

1978

Repercussion: A scientific non-belief in the theory of free will is considered an illegal view in modern times; said another way "any scientific developments that threaten our notion of free will would seem to put the ethics of punishing people for their bad behavior in question." [1]

A lawyer-style cartoon (adjacent) of United States v. Grayson. [10]

McLean v. Arkansas

Evolution
(v. creation science)

1982

Synopsis: The lawsuit was filed in the United States District Court for the Eastern District of Arkansas by various parents, religious groups and organizations, biologists, and others who argued that the Arkansas state law known as the Balanced Treatment for Creation-Science and Evolution-Science Act (Act 590), which mandated the teaching of "creation science" in Arkansas public schools, was unconstitutional because it violated the Establishment Clause of the First Amendment to the United States Constitution. Judge William Overton handed down a decision on January 5, 1982, giving a clear, specific definition of science as a basis for ruling that creation science is religion and is simply not science. The ruling was not binding on schools outside the Eastern District of Arkansas but had considerable influence on subsequent rulings on the teaching of creationism. [4]

In the trial, American biophysicist and biological thermodynamics expert Harold Morowitz (pictured) was tasked with demonstrating that the origins of life did not violate the laws of thermodynamics, and gave expert testimony in the case. [5] The transcript, available online, is a fairly humorous read; Morowitz states, for instance, in reference to creation scientists, that "they play fairly fast and loose with the second law of thermodynamics." [6]

Edwards v. Aguillard

Evolution
(v. creation science)

1987

Synopsis: was a legal case about the teaching of creationism that was heard by the Supreme Court of the United States. The Court ruled that a Louisiana law requiring that creation science be taught in public schools, along with evolution, was unconstitutional because the law was specifically intended to advance a particular religion. It also held that "teaching a variety of scientific theories about the origins of humankind to school children might be validly done with the clear secular intent of enhancing the effectiveness of science instruction." [7]

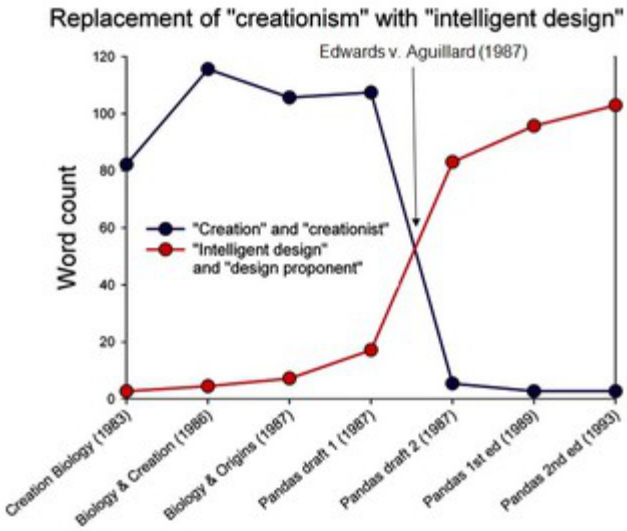

Repercussion: the ruling that the teaching "creation science" was unconstitutional, made by the Supreme Court, made that determination applicable nationwide.

Synopsis: a lawsuit filed by a group of parents against their creationism-believing, evolution-doubting school board; several high school science teacher has their jobs threatened if they taught Darwinian evolution, and in particular human origins. [3]

Alan Bonsell and Bull Buckingham

Bonsell: “Evolution is fiction: students will be made aware of the gaps and problems in Darwin’s theory of evolution and also of the alternative theory of creation by an intelligent designer.”
Buckingham: “It’s inexcusable to teach from a book, laced with Darwinism, saying that man descended from apes and monkeys”.

Kitzmiller v. Dover Area School District

Evolution (v. intelligent design)

(job security)

2005

Alan Bonsell (left), a auto and radiator repair shop owner, who was concerned with "issues of morality", or the lack thereof, associated with teaching evolution and the origins of man, and Bill Buckingham (right), a retired police officer, were two members of the Dover school board who advocated bringing intelligent design into the science classroom.

In the trial, evidence (graph depicted above) showing how the word "intelligent design" came into the American vernacular, following the 1987 Edwards v. Aguillard ruling, that creationism and creation science are not subjects permissible to be taught in public schools, was presented.

In 1998, privately funded research led to the breakthrough discovery of Human Embryonic Stem Cells (hESC). This prompted the Clinton Administration to re-examine guidelines for federal funding of embryonic research.

The Obama administration has not removed the most important impediments to embryonic stem-cell research; currently, federal funding is only allowed for work on stem cells that have been derived from surplus embryos at fertility clinics. The general issue is that embryos are the work of God and thus it is immoral to use them for research, or that, supposedly, the “soul enters the zygote” at or very near the moment of conception, sometime before embryo reaches the 150-cell-state. The decision to uphold these legal impediments is said to be a clear concession to the religious convictions of the American electorate.

1998

The head advisor to this decision to not allow stem cell research is American physical chemist and geneticist Francis Collins, the Obama-appointed head of the National Institute of Health (NIH), the institute in charge of an annual budget of $30 billion, the largest scientific research funder on the planet.

Stem cell research (government

funding)

Collins, in his own words, states that culled his views on God from Irish-born British writer C.S. Lewis, and atheist (15) turned theist (31) turned Christian (33) and his theory of "universal morality" as presented in his works such as the *The Chronicles of Narnia*.

2010

Collins holds the view, as described in his 2006 book *The Language of God: A Scientist Presents Evidence for Belief*, that after evolution had prepared a sufficiently advanced "brain", that at some point God gifted humanity with the knowledge of good and evil, what he calls the "moral law", with free will, and an immortal soul, and that some humans use their free will to break the moral law, leading to an estrangement from God, for which Jesus is the solution.

In regard to stem cells, Collins considers embryos created via somatic-cell nuclear transfer to be distinct from those formed through the union of sperm and egg, the former being "not part of God's plan to create the human individual", the latter being "very much part of God's plan." [8]

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External links

â— Epperson v. Arkansas – 1968
â— Daniel v. Waters – 1975
â— Hendren v. Campbell – 1977
â— Scopes museum photos – PluckySurvivors.com.

θΔics

In wikis, **science wikis** are fast-edit, easily-creatable, webpages containing collective information on specific branches or topics in science. Prime examples of science wikis, with specific focus on thermodynamic topics, are the EoHT wiki, the SklogWiki, and the ThermoWiki (now-defunct). Other types of science wikis, both active and non-active, are listed below.

Early wikis

- WikiWikiWeb - started in 1995 (the original).
- Nupedia - lasted from 2000 - 2003 (the predecessor of Wikipedia).
- Wikipedia - started in 2001.

Science-specific

- Encyclopedia of Earth - EoE (launched in October 2006 with approximately 1,000 articles).

External links

- Category:Science (listing of science wikis powered by MediaWiki) – WikiIndex
- LaTex math markup – SklogWiki
- Help:Displaying a Formula - Wikipedia
- Thermodynamics equations – Wikipedia.

θΔics

In dating sites, **science-based online dating sites** are those pair-matching websites that claim to use "science", such as chemistry, genetics, psychology, or the scientific method, etc., to match up potential couples. [1]

A 2015 screenshot of eChemistry.com, an online dating site that purports to match people scientifically.

Chemistry.com

The dominant site in this category is *Chemistry.com* (Alexa-rank: 7,171), motto: "lets people experience real chemistry", a subsidiary of *Match.com* (Alexa-rank: 310), launched in 2006 and developed, in large part, on the theories of American anthropologist Helen Fisher, which claims to match people according to compatibility and chemistry. [2] In 2008, Chemistry.com was the fourth largest online dating site, based on number of singles available; largely due to a successful ad campaign targeting eHarmony (#5 largest dating site) and their anti-gay Christian-only, who regect people who aren't happy all the time (adjacent video). [3] Chemistry.com uses information such as middle-finger-to-ring-finger length ratios (digit ratio), an indication of testosterone levels, and personality type matching assessments, such as by asking people "do you like to count things"; counters have high dopamine levels and tend to be the "explorer type".

ScientificMatch.com

The first science-based matching site to pioneer the method of having matchees send in samples of their body composition, is *ScientificMatch.com* (Alexa-rank: 1,011,265), motto: "the science of love", launched, in December of 2007, by American mechanical Engineer Eric Holzle.

By having singles send in saliva samples, the site facilitates a laboratory analysis of each person's immune system type and, using this data, claims to create optimized "physical chemistry" or "sexual chemistry" between people based on the sweaty T-shirt study, a pattern, discovered in 1995, which finds that people are most attracted to the smell of people who have the most-dissimilar immune system. [4] The site was conceived by Holzle, a long-time internet site dater, after watching a TV discussion on the findings of the sweaty T-shirt study.

The theory of desired dissimilar immune system matching can be quantified according to markers on a person's major histocompatibility complex (MHC), a large gene region that controls the immune system response, and postulates that couples attracted to this type of scent owing to the result that a resultant child would create a more robust immune system, more defensive against a greater variety of pathogens.

In the mid 1970s, MHC-dissimilar tendency matching was shown to be the case for mice (and later for other animals such as fish) and in 1995 Swiss biologist Claus Wedekind, creator of the sweat T-shirt study, proved that the pattern holds for humans. [5] In this study, Wedekind had a group of female college students smell T-shirts that had been worn by male students for three nights, without deodorant, cologne or scented soaps. Overwhelmingly, the women preferred the odors of men with the most dissimilar MHCs to their own (see: adjacent video).

eChemistry.com

A third scientific-based matching site is *eChemistry.com* (Alexa-rank: 577,687), motto: "the science of attraction", started in 2006 by American chemical engineer Glenn Gasner, which claims that by using the new 'science of attraction' they have 'taken the mystery out of romantic chemistry using nine years of research to match single users using

personality patterns scientifically isolated in old high-chemistry couples.' [6] Gasner's site algorithm, however, is a synthesis of probabilities, e.g. how may dates does one need to go on to find a successful match, and personality inventories, e.g. the Five Factor Model. The only science Gasner claims to use is the scientific method; subsequently, the logic of a standard chemistry textbook is not part of his scheme. [7]

eHarmony.com

The site *eHarmony.com* (Alexa-rank: 1,100) founded in 2000 by American psychologist Neil Warren and Greg Forgatch, whose vision is not simply to create marriages, but to create happy marriages by using scientific research to unite compatible individuals. In a 2007 interview of the site's current CEO Greg Waldorf, self-taught computer programmer and Harvard business school graduate, he states "I love the challenge, that people think: How could you possibly measure interpersonal chemistry? I like the idea of research and measurement around these things that seem so impossible to quantify." [12]

Wall Street Journal editor Emily Parker, who interviewed Waldorf, reasoned to herself "of course, this only leads one to wonder, how *does* one measure interpersonal chemistry?" She found that, "while eHarmony is launching an ambitious research project to do just that, Mr. Waldorf admits that they still haven't solved the puzzle." Moreover, according to Waldorf, "we can help them figure out their compatibility, but individuals have to figure out their chemistry. The nice thing is that on eHarmony, you're starting out with a pool of matches with whom you at least have compatibility."

PlentyofFish.com

The popular social dating site *PlentyofFish.com* (Alexa-rank: 638) has, what they call, a "relationship chemistry predictor" (algorithm), which measures (a) self-confidence, (b) family orientation, (c) self control, (e) social dependency/openness, and (f) easygoingness, to determine supposed "chemistry" in relationships. [13]

Others

Another connected site is *BioLoveMatch.com* (Alexa-rank: 904,261), started in 2000, which claims to use biorhythm compatibility to match potential loves. This site, however, seems to only ask for birthdates of pairs. [8] In the seduction community, a site called *TheApproach.com*, motto: "the science of social chemistry for the modern gentleman", started in 2005 by Vincent DiCarlo and Sebastian Drake, teaches men how to approach women. [9]

Criticisms

The original application of "science" to the matching of singles, via the Internet, was the use of personality assessments, e.g. the Big Five, the one most often employed by psychologists to access personality, to better match individuals. Compatibility testing and long-term relationships, in particular, started in the mid-1950s by the "Father of American Marriage Counseling" Paul Popenoe and was later refined and popularized in the mainstream by Glenn Wilson and Jon Cousins. [10]

The use of the harder sciences, such as evolutionary psychology, neuroscience, genetics, chemistry, neurochemistry, biochemistry, or physical chemistry, etc., however, to facilitate the successful matching of singles, is a relatively new field of research. This fact, together with the typical "black box" algorithm procedures used by such sites and the lack of published scientific studies about results, compounds the credibility factor determinations of scientific-matching.

A few criticisms, however, have merged. In the 2007 article in the *OnlineDatingMagazine*, former chief psychology officer for *True.com*, James Houran supposedly "debunks scientific matching". [11] In short, according to Houran, who seems to be targeting Chemistry.com, "the dating industry would be better off validating personality tests and matching algorithms than worrying about background checks." In sure reference to Pepper Schwartz, *PerfectMatch.com*, sociology professor (University of Washington), author: *Finding Your Perfect Match - 8 Keys to Finding Lasting Love through True Compatibility* (2006), and Helen Fisher, *Chemistry.com*, anthropology professor (Rutgers University), author: *Why We Love - the Nature and Chemistry of Romantic Love* (2004), he concludes:

> "What we have are groups of authors, nice sounding university affiliations and academicians generally interested in relationships. Yet, nowhere do we see these teams with published, compatibility experts, and

more importantly, tests and measurements experts who ground their work in the statistical gold standard of modern test theory!"

(add discussion)

See also

â— Human chemistry
â— Love the chemical reaction
â— Endorphin theory of love

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(b) The supposition that Gasner uses no "chemistry textbook" theory is difficult to determine exactly, being that Gasner stopped returning emails on 01/31/06 with American chemical engineer Libb Thims, after being questioned about the nature of his website and specifically if he used any sort of thermochemistry or chemical thermodynamic theory in his matching algorithms.
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θΔics

In science, the **science-religion controversy** refers to tensions between established religion and modern science. The 2009 view of the controversy is summarized well by American neurologist Robert Burton: [1]

> "The **science-religion controversy** is rooted in talk of afterlife, soul, higher powers, muses, purpose, reason, objectivity, pointlessness, and randomness."

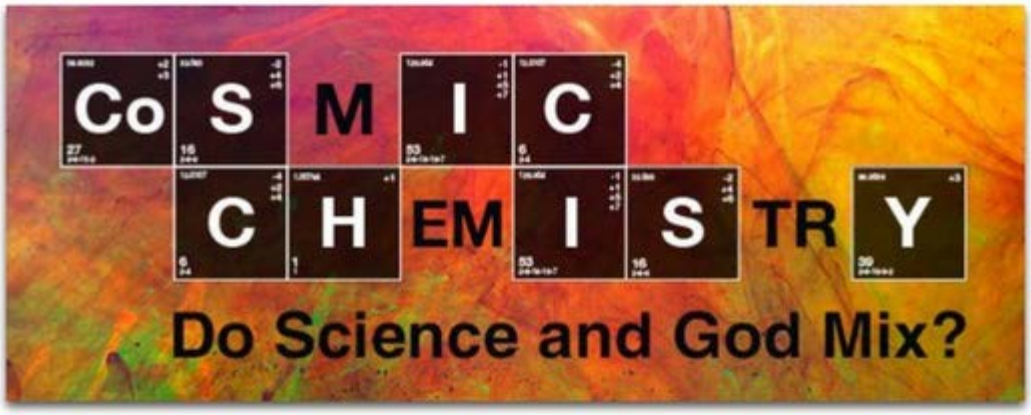

A cosmic chemistry stylized "do science and god mix?" banner from CigyBibleForum.org (Q), featuring videos from aplogeticist scientist John Lennox, indicative of the science vs religion controversy, which dates back to Goethe (1809) and the Heraclitus-Parmenides (c.450BC) being vs non-being debate, historically.

The fact that there is a debate is a bit ironic, being that the modern religions of the world were founded by Egyptian scientists: astronomers, biologists, chemists, and geologists, who formulated the corpus of Ra theology (or the Ab-ra-ham-ic and B-ra-hma-ic religions, in modern sense). The fact that people are so detached from their religious roots and historical details of religions seems to be the central problem.

History

The start dated of the debate can be assigned to the publication of Polish astronomer Nicholas Copernicus' 1543 *On the Revolution of the Heavenly Orbs*, which overthrew the geocentric model of the universe and replaced it with the heliocentric model.

The start date for the modern controversy can be assigned to the 1874 to 1875 Tyndall-Stewart-Tait debate originating out of growing controversy over the teaching of science at the Catholic University in Ireland, but one that grew to encompass leading scientist, such as James Maxwell, expressing their deeply hidden views on questions of life, death, and the soul in relation to the findings of modern physical science, such as evolution and thermodynamics.

See also

- Science connected legal cases

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θΔics

In science, **scientific bibles** refers to a scientific publication that is considered akin to being a sacred holy book, metaphorically speaking, in a given field of science; a book that other scientists carry around with them for guidance, like common religious people carry around a "bible". Gibbs and Pauling are unique for being known to have authored two scientific bibles.

Mathematics

Euclid's *Elements* has long been considered the "bible of mathematics" (Q) and treated as a sort of "holy book" by many, e.g. when Einstein, at age 12, was given a text on Euclidean geometry, he came to thereafter to call it "holy geometry book".

Physics

In physics, Isaac Newton's *Principia* (1687) is considered a bible.

Some colloquially consider 5-volume *The Feynman Lectures* (1964), by Richard Feynman, the "bible of physics" (Q); others (Q) consider the multi-volume *Course of Theoretical Physics* (Q) by Lev Landau and his student Evgeny Lifśhitz to be the "bible of physics".

In the 1930s, Paul Dirac's *The Principles of Quantum Mechanics* (1930), was considered a "bible" of sorts by Einstein, in respect to the way he used to walk around saying "where's my Dirac?"

Willard Gibbs' 1902 *Elementary Principles in Statistical Mechanics*, which is a mix of thermodynamics applied to William Hamilton's equations of motion, has been called the "bible of statistical physics", and has been considered as such by many of the greatest physicists.

> "When I entered Niels Bohr's institute in Copenhagen in 1924, the first thing Bohr demanded was that I should read the book of Gibbs on thermodynamics. And he added that Gibbs had been the only physicist who really understood statistical thermodynamics."
>
> — Werner Heisenberg (1973), retrospect comment [1]

(add)

Chemistry

In chemistry, Linus Pauling's *The Nature of the Chemical Bond* (1938) for many decades was known as the "bible of chemistry". (Q)

> "Pauling's *On the Nature of the Chemical Bond* is chemistry's most influential book of this century and its effective bible."
>
> — James Watson (2001), *A Passion for DNA, Genes, Genomes, and Society*

Pauling's *General Chemistry* (1941) is also considered a "bible" (Q) of sorts in respect to being the best book to encompass all of chemistry, as best as one book can.

Thermodynamics

See main: Thermodynamic bible

In thermodynamics, Gibbs' *On the Equilibrium of Heterogeneous Substances* (1876), aka the "Principia of thermodynamics", and Lewis' *Thermodynamics and the Free Energy of Chemical Substances* are known as the two

main “bibles of thermodynamics”; although, technically, to note, the latter is more akin an applied Cliff Notes version of the former.

> “[*Thermodynamics and the Free Energy of Chemical Substances*] also a **thermodynamic bible** for many of Lewis’ students and for some of us.”
>
> — Author (1962), “Article”, *Journal of the American Chemical Society* [3]

> “Lewis' *Thermodynamics* soon became the ‘**bible**’ in the field for chemistry students.”
>
> — Elizabeth Devine (1983), *Thinkers in the Twentieth Century* [2]

Lewis’ book in fact is the most-cited thermodynamics textbook, by other thermodynamics textbooks, of all-time.

Neurosurgery

In neurosurgery, the multi-volume *Neurological Surgery* by Julian Youmans (1924-) (Q), first published in 1972, was considered, in the 1990s, e.g. by University of Michigan neurosurgeons, to be the “bible of neurosurgery”; in 2019, *Youmans and Winn Neurological Surgery, 7th Edition* was still being promoted (Q) as the "Bible of neurological surgery" as a selling point.

Quotes

The following are related quotes:

> “On the shelves there was also to be found, naturally, Ostwald’s *Energetics*, that sort of **thermodynamic bible** in which god is replaced by a lay entity called energy.”
>
> — Ernesto Sabato (1981), *On Heroes and Tombs* (pg. 256)

See also

- Atheist’s Bible
- Gunter Grass

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θΔics

In thought experiments, a **scientific demon** is an imagined being, a scientific metaphor of sorts, tending to be in possession of an extremely heightened intellect, that is able to do super-human calculations, of different varieties, often able to predict the future and or the past. Some have categorized the study of these types of "scientific demons", namely: Maxwell's demon, Smoluchowski's demon, Godel's demon, Ehrenfest's demon, etc., as "endophysics". [1] The following chronology table outlines the history of scientific demons:

Date	Name		Inventor	Description	Implication
c.1700	Leibniz's prophet		Gottfried Leibniz (see: Euler genealogy)	A proto-precursor to Laplace's demon. [3]	
1770	Holbach's geometrician		Baron d'Holbach	The exact forerunner to Laplace, who studied under Holbach, and his later 1814 demon	
c.1770	Boscovich's finite mind		Roger Boscovich	A proto-precursor to Laplace's demon. [3]	
1814	Laplace's demon		Pierre Laplace	An intellect if it knew the precise location an momentum of every atom in the universe, then, using Newton' laws of motion, could reveal the entire course of cosmic events, past and future. [5]	Laplacian determinism (see: determinism)
1867	Maxwell's demon	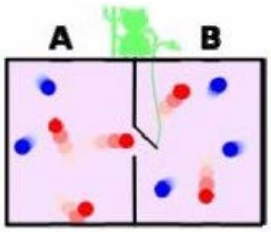	James Maxwell	An intelligent being that is able to "see" the speeds of atoms and molecules (in a gas), and thus separate them into slow (cold) and fast (hot) groupings, and thus circumvent the governing regulation of the second law.	Irreversibility
c.1869	Huxley's demon	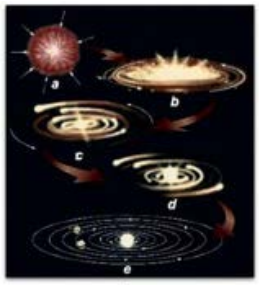	Thomas Huxley	A sufficient intellect, with knowledge of the properties of the molecules and forces possessed by the molecules of the primitive nebulosity (see: nebular hypothesis) could predict the state of fauna of Great Britain with as much certainty as one could predict the vapor of one's breath on a cold winter day. [9]	Evolution (nebular hypothesis)
c.1898	Filon-Pearson demon (superluminal relativistic Maxwell demon)		Louis Filon (and Karl Pearson) 1900 version → [10]	NOTE VII *On the Reversibility of Natural Processes* (p. 349) IRREVERSIBILITY of natural processes is a purely *relative* conception. History goes forward or backward according to the relative motion of the events and their observer. Conceive a colleague of Clerk-Maxwell's demon (p. 84), gifted with an immensely intensified acuteness of sight so that he could watch from enormous distances the events of our earth. Now suppose him to travel away from our earth with a velocity greater than that of light. Clearly all natural processes and all history would for him be reversed. Men would enter life by death, would grow younger and leave it finally by birth. Complex types of life would grow simpler, evolution would be reversed, and the earth, growing hotter and hotter, would at last become nebulous. Shortly, by motion to or from the earth, our demon could go forward or backward in history, or with one speed —that of light—live in an eternal *now*. This conception of historical change and of time as a problem in relative motion was suggested to me by Mr. L. N. G. Filon, and is, I think, of much interest from the standpoint of the pure relativity of all phenomena.	

1912	Smoluchowski's demon	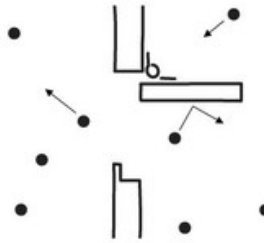	Marian Smoluchowski	A type of conceptualized type of Maxwell demon trap door that "vibrates" owing to Brownian motion energy impacts. [7]	
1927	Ehrenfest's demon		Paul Ehrenfest	[2]	
1929	Szilard's demon		Leo Szilard	A Maxwell demon that requires or utilizes energy to "see" the movements of the particles.	Is argued (by many) to connect "information", and hence information theory, with thermodynamics.
1931	Godel's demon		Kurt Godel	[4]	
1999	Protein demon		Werner Loewenstein	[8]	
2007	Advanced intelligence (Gibbsian demon)		Libb Thims	A type of advanced "intellect", possibly a 30-40 element molecule (in the sense that a human is a less-intelligent 26-element molecule), that would be able to look down at us and measure and calculate our reactions to each other (in terms of thermodynamic variables) the way we do in calculating statevariables in thermodynamic tables. [6]	Thermodynamic determinism: An entity that is able "predict" human chemical reactions, in the same way we predict chemical reactions by measuring free energy.

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θΔics

In science, **scientific humanism** is a term, commonly used in the 1940s, used to encapsulate the unified subject study of the physical sciences, in particular chemistry, physics, and thermodynamics, along with sociology, economics, philosophy, history, and religion. [1]

Overview

In 1940 book *The Promise of Scientific Humanism*, American philosopher Oliver Reiser gave an outline of the subject of scientific humanism, in which he included a chapter of "Life as a Form of Chemical Behavior", and devoting at least six pages to how thermodynamics plays a role in the subject of scientific humanism. [1] R

In 1947, Belgian-born English thermodynamicist Alfred Ubbelohde defined the thermodynamic contributions to scientific humanism as follows: [3]

> "Contributions to the thermodynamics of **scientific humanism** [concerns] insights on the nature of time, [as in] personal or psychological time, and refers to the unification of the specialized sciences effected by the contributions they make to the proper study of mankind, man's nature and destiny."

In applying thermodynamics, in scientific humanism, Ubbelohde comments that the important objective is to "sift thermodynamic results, to separate out material of only specialized significance, and to retain what is of general importance."

In commentary on Ubbelohde's attempt to outline the thermodynamics of scientific humanism, British physical chemist John Butler surmises that Ubbelohde overall aim is to delve into the "wider human aspects of thermodynamics", but concludes that this effort, confined mainly to short chapters at the beginning and end, "is disappointing", being that Ubbelohde only passes over the subject in a light superficial manner, without making any sort of solid conclusions. [4]

In 1945, following a query put to him as to when global utopia will be achieved, Reiser outlines a discussion on a future needed establishment of an "An Institute of Scientific Humanism", the gist of which is that, in Reiser's coming out of WWII and growing global connectiveness mindset: [2]

> "As the world shrinks in size, as it progressively contracts in its spatial relations, social processes already at work are speed up. As the world becomes 'one world' through technological unifications by means of radio, airplanes, television, and the rest, the forces that make for destruction of friendly human adaptions are intensified and speed up, s that, in a sense, time moves faster and faster. This heightens the tensions and intensifies the struggles of conflicting forces—and the old time-scale breaks down. This means that if the world is not to destroy itself, the forces that make for integrative human relationships mist also be accelerated in their operations."

Here, Reiser seems to be alluding to a type of global Dunbar number effect, namely that past a certain global connectiveness size, more than just man-to-man (or country-to-country) personal contracts are needed to hold the plus 150+ population (or plus N+ global system population) together; hence, codifications must be enacted in the form of a global legal system—and that such codifications must be framed on universal principles. Reiser goes on to suggest:

> "What we really need is the creation of at least one new institution—at the very top of a social system—which shall simplify, codify and disseminate an attitude and set of universal principles. This international university—an Institute of Scientific Humanism, let us call it—will function as a kind of World Brain for our developing social organism."

As to when this international university of scientific humanism will accrue, he states that the argument that because we

have a thousand years before us because we have a thousand years behind us is “not sound”, and seems to assert that such an institute will need to be established within the next hundred years, if global society is not to destroy itself; he then goes on to outline all the hurdles to this "international university", focused on social planning theory, via discussion of how this would be difficult to bring about at his own university, the University of Pittsburgh, owing to all the hydraism of subject divisions and 20+ course division per each subject.

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3. Ubbelohde, Alfred René. (1947). *Time and Thermodynamics* (ch. 1: Contributions of Thermodynamics to Scientific Humanism). Oxford University Press.
4. Butler, John A.V. (1947). “Thermodynamics and Humanism (Review: Time and Thermodynamics). *Nature* (pg. 72), Vol. 19, July 19.

External links

â— Secular humanism – Wikipedia.

θΔics

In science, a **scientific law** is an hypothesis, theory, or postulate that has been proven beyond doubt and has no conflict with any experimental observation.

See also

- Laws of affinity
- Laws of human chemistry
- Laws of human thermodynamics
- Laws of information
- Laws of life
- Laws of social thermodynamics
- Laws of the universe
- Laws of thermodynamics

External links

- Scientific law – Wikipedia.
- List of scientific laws named after people – Wikipedia.

θΔics

In science, **scientific method** refers to the steps through which knowledge of the natural world is obtained, which amounts to the repeating cycle of observation, hypothesis, experimentation, and the need for independent verification, through which principles, theories, and laws are deduced.

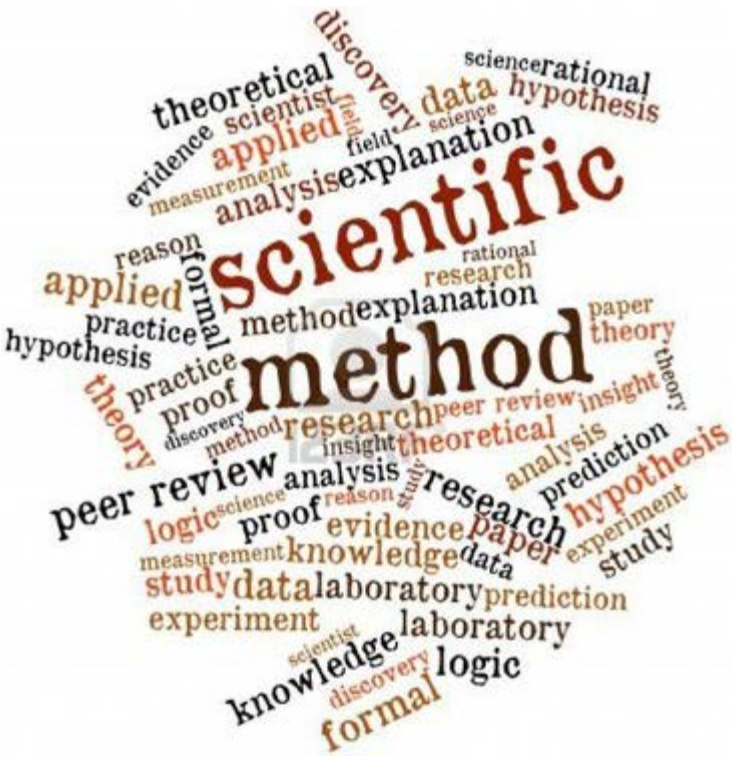

A word scramble of the some of the words involved in the **scientific method**, such as: discovery, data, hypothesis, prediction, experiment, proof, peer review, and knowledge.

Overview

Some, e.g. Rush Allen (1998) (Ñº), have attempted to argue that traces of the scientific method are found in the *Hunefer Papyrus* (c.1279BC), the theological system to following the proto-scientific pharaoh Akhenaten.

In 1011 to 1021, Arabic polymath Alhazen, wrote an influential seven-volume *Book of Optics*, amid which, via experimental testing, he is said to have outlined a semblance of a scientific method.

In 1265, English natural philosopher Roger Bacon developed the modern scientific method framed around the works of Aristotle. Bacon, in short, inspired by the Aristotelian commentaries of Robert Grosseteste (1235), which laid out the framework for proper methods of science, described a scientific method, which he based on a repeating cycle of observation, hypothesis, experimentation, and the need for independent verification; and he recorded the manner in which he conducted his experiments in precise detail so that others could reproduce and independently test his results. [1]

Quotes

The following are noted quotes:

> "All science starts with hypothesis."
>
> — George Millin (1896), title page quote to *Evil and Evolution*; truncation of Roger Bacon's Aristotelian-framed **scientific method** (1265) [2]

> "The **scientific method**, as developed in the physical sciences during the last four hundred years, has proved incomparably powerful in solving certain age-long problems of cold, darkness, famine, epidemics, distance, communication, transportation, and a thousand other needs. Ironically, he finds himself today [in the wake of WWI 1914-19 and WWII 1939-45] engulfed in difficulties with his fellow man. Why does he not turn in this predicament to the methods which have proved themselves so potent in other fields? The principle reason is tradition. Human relations are not yet generally believed to be proper subjects for serious scientific study. Indeed, a great many accredited social scientists, in the sense of practicing economists, sociologists, psychologists, anthropologists, and above all 'political' scientists
>
> — George Lundberg (1947), *Can Science Save Us?* (pg. 4)

> "Roger Bacon (1214-1294)—the founder of English philosophy whose knowledge of chemistry and mathematics led him to recognize the value of deductive reasoning, establish a **scientific method**, and invent spectacles—who has been called the last man to know everything, the last man to bridge the two

cultures."

— Rushworth Kidder (2003), *How Good People Make Tough Choices* [4]

References

1. Timeline of the history of the scientific method – Wikipedia.
2. Millin, George. (1896). *Evil and Evolution: an Attempt to Turn the Light of Modern Science on to the Ancient Mystery of Evil* (quote, pg. iii). MacMillan and Co.
3. Lundberg, George. (1947). *Can Science Save Us?* (pg. 4). Longmans, Green and Co.
4. Kidder, Rushworth M. (2003). *How Good People Make Tough Choices* (pg. 147). Harper Collins.

Further reading

â— Mayer, Joseph. (1941). *Social Science Principles in the Light of Scientific Method: with Particular Application to Modern Economic Thought* (Winiarski, pg. 233). Duke University Press.

External links

â— Scientific method – Wikipedia.

θΔics

In models, **scientific model of human experience** refers to the working description by which modern science describes and understands states of human experience, particularly as seen from the purview of the modern Faustian mindset.

Overview

In 1809, Goethe, cited with an IQ of 225 in 1925, published his human chemical theory based novella *Elective Affinities*, which Gundula Sharman (1997) has aptly characterized this as the "scientific model of human experience"; the gist visual of which being shown below left, as compared to the upgraded 2000 version, described in human chemical thermodynamics terms, of this model as described by Christopher Hirata, cited with an IQ of 225 in 1996, below right: [1]

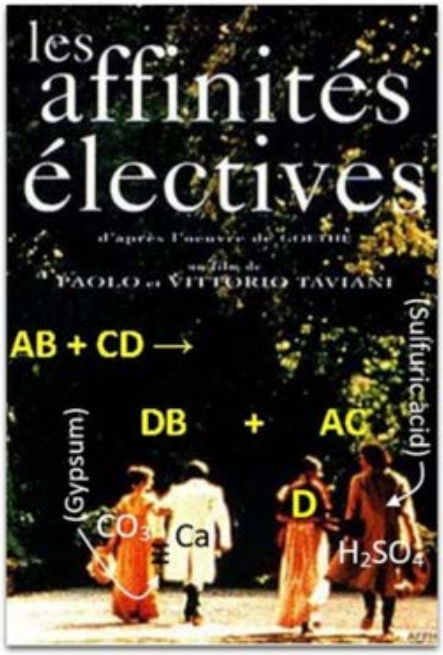

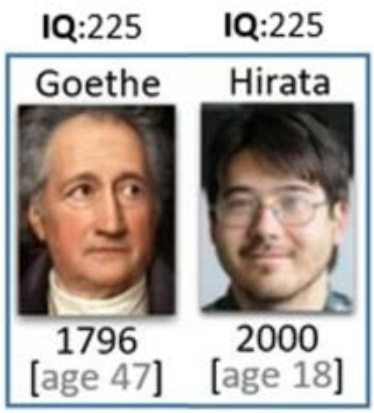

1. Thermochemical Approach to Relationships

For many of us, thermochemistry was our first science subject which involved nontrivial mathematics. It therefore seems **appropriate to apply thermochemistry to relationships** first before attempting something harder. A general reversible chemical reaction is written as:

$$m_1A_1 + m_2A_2 + \ldots + m_pA_p \leftrightarrow n_1B_1 + n_2B_2 + \ldots + n_qB_q$$

and has equilibrium constant: (where the brackets [] denote concentration of a chemical in, say, atoms per cubic centimeter)

$$K = [B_1]n_1 \ldots [B_q]n_q / [A_1]m_1 \ldots [A_p]m_p$$

as well as having internal energy change dE, volume change dV, and entropy change dS_0 at standard concentrations. If the pressure is P and the temperature is T then the equilibrium constant can be found from:

$$-k_BT \ln K = dE + PdV - TdS_0$$

Here k_B is Boltzmann's constant and is roughly equal to 8.6x10-5 eV/K. If I make a change in the concentration of one substance, the reaction equilibrium will shift to compensate for the change.

In 2014, Leon Cooper, in his *Science and the Human Experience: Mephistopheles is Alive and Well and Living in the Space Age – Values, Culture, and Mind*, opening to Goethe, attempted to stitch out the intersection between science and human feelings and experience, via a series of previous published essays and talks. [2]

References

1. (a) Sharman, Gundula. (1997). "Elective Affinities with Ireland: John Banville's *The Newton Letter* and Goethe's *Die Wahlverwandtschaften*", in: *The Novel in Anglo-German Context: Cultural Cross Currents and Affinities: Papers from the Conference Held at the University of Leeds from 15 to 17 September 1997* (pgs. 369-84; image, pgs. 372-73) (edited by Susan Stark). Rodopi, 2000.
(b) Hirata, Christopher M. (c.2000). "The Physics of Relationships" (section: Fun) (abs) (WB) (Yumpu) , Tapir.Caltech.edu; (WayBack Machine).
(c) Hirata, Christopher M. (2010). "The Physics of Relationships", *Journal of Human Thermodynamics*, 6(5): 62-76.
2. (a) Cooper, Leon N. (1976). *Science and the Human Experience: Mephistopheles is Alive and Well and Living in the Space Age – Values, Culture, and Mind* (Amz) (Goethe, 6+ pgs). Cambridge University Press.
(b) Lynch, Gary S. (2015). "Leon N. Cooper's Science and Human Experience: Values, Culture, and the Mind" (Ñº), Cerebrum, Dana.org, Aug 3.

Further reading

â— Proctor, James D. (2005). *Science, Religion, and Human Experience*. Oxford University Press.

θΔics

In science, **scientific revolutions** are periods in progress and development of scientific thought where established theory or ideas gets thrown out, completely overhauled, or significantly modified, often owing to new conflicting experimental findings, resulting to bring about new and unexpected growth in scientific thought, typically characterized by a new branch of science. The following is a 2011 snapshot of what can be called the Goethean revolution, one that we are in the midst of or possibly beginning of presently, but do not yet know it: [1]

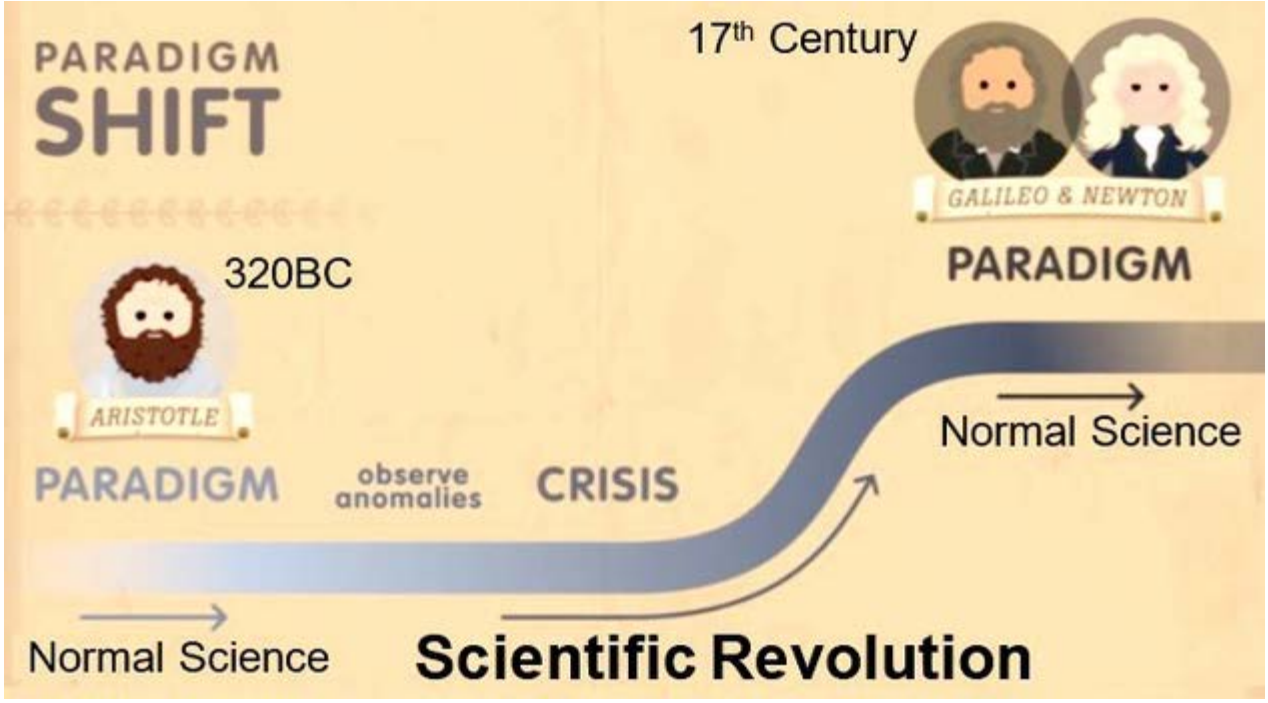

A 2018 CrashCourse take (Q) on "**scientific revolutions**" in the context of paradigm change.

> "Both Goethe and Gombrowicz incorporate explanations of structure into their narratives, and both make references to a chemical model of combination. 'Gombrowicz's novelty consists in his going one step further and perfecting **Goethe's revolution**': the character of Olek Skuziak allows him to destroy the narratives completely and put himself 'in the position of speaking to oneself alone'. Regnault writes, on Gombrowicz's behalf: 'My pornography is an optic of perversions, but it is also an inversion of the art of writing, a pornology of writing'. When Gombrowicz writes of 'persevering in obscenity', the persevering designates the rigours of the structure, which allow one to surpass the charms of obscenity and lead to their expulsion."

Scientific revolutions are typically measured in decades, starting on a certain year, preceded by build up years, followed by a transformation period, ending with universal acceptance. These epoch periods become known as revolutions, typically only in retrospect, when the topic or subject begins to see third party descriptions of the subject using the term "revolution". Some of the main scientific revolutions are tabulated below:

#	Name	Year	Person	Publication	Span
	Copernican revolution:				
1	Aristarchus (270BC) **Nicolaus Copernicus** (1543) Galileo Galilei (1609) Robert Hooke (1665) Isaac Newton (1687)	1543	Nicholas Copernicus	*On the Revolution of the Heavenly Spheres*	270-
	Chemical revolution				

2	Leucippus (475BC) Robert Boyle (1661) Isaac Newton (1718) **Antoine Lavoisier** (1773) Torbern Bergman (1775) John Dalton (1808)	1718	Isaac Newton	Query 31	1718-1926
	Goethean revolution				
3	Jean Sales (1789) **Johann Goethe** (1796) Mirza Beg (1987) Libb Thims | Thimsian revolution (1995)	1796	Johann Goethe	*Elective Affinities*	1789-present
	Thermodynamic revolution				
4	Galileo Galilei (1592-1642) Robert Boyle (1657) Robert Hooke (1657) Benjamin Thompson (1798) Sadi Carnot | Carnotian revolution (1824) William Thomson (1843) **Rudolf Clausius** (1865) James Maxwell (1871) Ludwig Boltzmann (1872) Willard Gibbs (1876) Hermann Helmholtz (1882) Max Planck (1893) Walther Nernst (1905-1916) Albert Einstein (1905) Gilbert Lewis (1923) Edward Guggenheim (1933) Erwin Schrodinger (1944)	1824	Sadi Carnot	*Reflections on the Motive Power of Fire*	1797-1933
	Darwinian revolution				
5	Ovid (8AD) Johann Goethe (1780) Erasmus Darwin (1791) Etienne Saint-Hilaire (1833) Alfred Wallace (1858) **Charles Darwin** (1859)	1859	Charles Darwin	*Origin of Species*	1780-present
	Maxwellian revolution				

6	Pierre Gassendi | Corpuscular theory of light (1649) Robert Hooke | Wave theory of light (1660s) Isaac Newton | Corpuscular theory of light (1670s) Christiaan Huygens | Wave theory of light (1678) Thomas Young | Double-slit experiment (1801) Michael Faraday | Lines of force (1830s) **James Maxwell** | electromagnetic field (1865) Albert Einstein | light quanta (photon) (1905)	1865	James Maxwell	"A Dynamical Theory of the Electromagnetic Field"	1649-present
	Quantum revolution				
7	Rudolf Clausius (1857) Ludwig Boltzmann (1891) **Max Planck** (1900) Albert Einstein (1905) Niels Bohr (1913) Erwin Schrodinger (1926)	1900	Max Planck	"On the Law of Energy Distribution in the Normal Spectrum"	1901-1926

Discussion

The average IQ of the "core" revolutionist, per each scientific revolution, i.e. Copernicus (IQ=190), Lavoisier (IQ=175), Goethe (IQ=230), Clausius (IQ=205), Darwin (IQ=175), Maxwell (IQ=210), and Planck (IQ=190), is IQ_{avg}=196.

In categorizational terms, in respect to a "revolutionary genius" pointing system, we note that those with two or more revolution association or roles include:

Revolutions	Person	IQ	Types	IQAVG
3	Newton	215	Copernican, Chemical, and Maxwellian	210
3	Einstein	220	Thermodynamic, Maxwellian, and Quantum	
3	Hooke	195	Copernican, Maxwellian, and Thermodynamic	
2	Goethe	230	Darwinian and Goethean	
2	Maxwell	210	Thermodynamic and Maxwellian	
2	Clausius	205	Thermodynamic and Quantum	202
2	Galileo	200	Copernican and Thermodynamic	
2	Schrodinger	190	Quantum and Thermodynamic	

2	Boltzmann	195	Thermodynamic and Quantum
2	Boyle	185	Thermodynamic and Chemical

The IQ average of the 12 revolutionists, with known IQ estimates, having only single revolution association, is: IQ_{AVG} = 189.

Related to all of this, Boltzmann, in 1886, famously postulated that the future would look back and define the century the following way:

> "The nineteenth century will be remembered as the century of the ‘mechanical vision of nature’ and of ‘Darwin’s evolutionism’."

Which has indeed been the case, with Darwin and Clausius being the two big competing theories with which the modern person uses to understand his or her own existence.

References

1. Synopsis of Francois Regnault, “Optique de Gombrowicz” – Kingston University.

External links

- Scientific revolution – Wikipedia.
- The Structure of Scientific Revolutions – Wikipedia.

θΔics

In hmolscience, **scientific sociology**, a near-synonym to positivism or physical sociology, refers to the study of social phenomena using the scientific method; to attempts at hard science and or physics-like formulations of sociology; possibly referring to the types of sociology covered in Pitirim Sorokin's 1928 mechanistic school classification.

Quotes

The following are related quotes:

> "Sociologists study people, who chose, decide, succeed, fail, harm others, harm themselves, and behave in rational and irrational ways. I've often explained to my students that if I took an ounce of gasoline and placed a burning match upon it, the gas would have to burn. The gas has no choice just as the flame has no choice. But, if someone placed a burning match on your arm, or the arm of your classmate, you or they might respond in any number of ways."
>
> — Ron Hammond (c.2010), "Scientific Sociology"; this, to note, is an example of error: just as gas molecules have no 'choice' when the combust so to do the people involved in WWI and WWII have no choice during the global social combustion process [1]

See also

â— Physicochemical sociology

References

1. Hammond, Ron, Cheney, Paul, and Pearsey, Raewyn. (c.2010). *Introduction to Sociology* (§4: Scientific Sociology). FreeSociologyBooks.com.

Further reading

â— Madge, John. (1962). *The Origins of Scientific Sociology* (physics, 2+ pgs; force, 31+ pgs). Free Press.

θΔics

In hmolscience, **scientism** is a notion that has a variety of meanings, tending to refer to persistent efforts over the centuries, from Hobbes and d'Holbach to Capra and Hawking in recent years, to make the latest science serve the construction of a world-view. [1]

In 1922, James Joyce, in his *Ulysses*, is said to have employed mechanics, based on a "fairly Newtonian model", and supposedly uses "scientism" of his age as a mode of psychological insight and character development. [2]

In 1995, Caspar Hakfoort published a historiography on the term "scientism". [4]

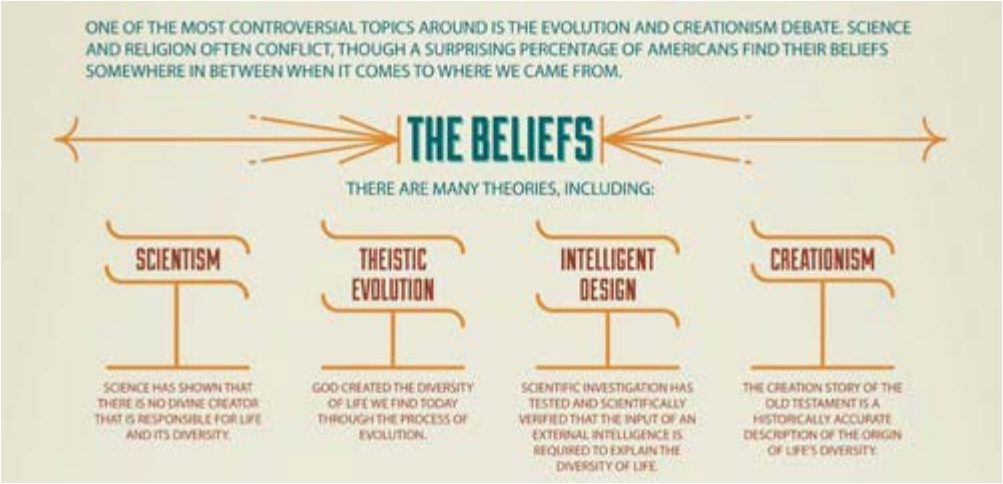

A 2012 graphic (Q) comparing and contrasting **scientism** (atheistic evolution) with: theistic evolution, intelligent design, and creationism beliefs.

In 2011, Alexander Rosenberg employed the word scientism as follows: [3]

> "In *The Atheist's Guide to Reality* I tried to coopt the word '**scientism**' and to argue that science can answer the persistent philosophical questions that trouble people, including the nature of reality, the purpose of life, the existence of a soul, the grounds of morality, whether we have free will, and the meaning of human history. Most of the answers science gives to these questions are unpopular and people neither understand them nor want to hear them."

References

1. (a) Hakfoort, Caspar. (1995). "The Historiography of Scientism: A Critical Review" (abs), *History of Science*, 33:375-395.
(b) Cohen, H. Floris. (2009). "Note about an Unfinished Book on Ostwald by the Late Casper Hakfoort, and About Its Author" (pdf), hp4all.nl.
2. Morrisson, Mark S. (2009). "Science", in: *James Joyce in Context* (editor: John McCourt) (§30: pgs. 343-54; pg. 348). Cambridge.
3. Rosenberg, Alex. (2011). *The Atheist's Guide to Reality: Enjoying Life without Illusions* (pg. #). W.W. Norton & Co.
4. Hakfoort, Casper. (1995). "The Historiography of Scientism: A Critical Review" (abs), *History of Science*, 33:375-395.

External links

- Scientism – Wikipedia.

θΔics

In classifications, **scientist** refers to a student of the knowledge of the material world and the energy world.

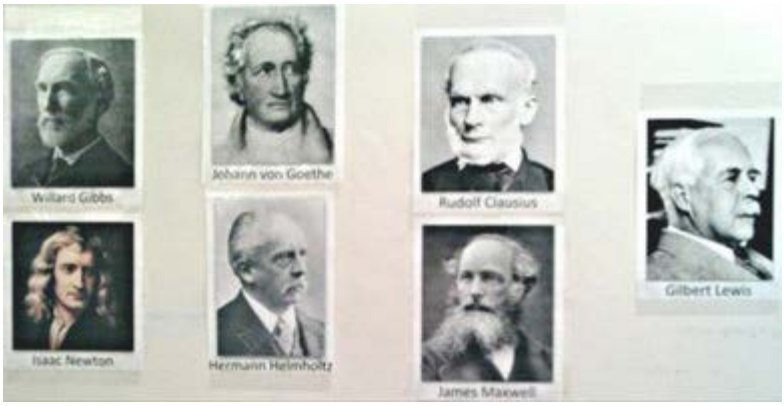

Photos of seven famous **scientists**: Gibbs (16), Goethe (16), Clausius (18), Lewis (15), Newton (18), Helmholtz (17), and Maxwell (16), on the wall of American chemical engineer Libb Thims' study; the numbers being the age at which each entered college.

Etymology

The term "scientist" as a student of the knowledge of the material world was coined by English mathematical philosopher William Whewell in 1833 in the context of and followup to the Whewell-Coleridge debate. Whewell introduced the term to replace the older term 'natural philosopher', a subtle caveat, however, being that the 'material world', in unwritten assumption, should not be confused with the 'moral world', which is the work of a deity. [1]

References

1. Fisch, Menachem and Schaffer, Simon. (1991). *William Whewell: a Composite Portrait* (coined scientist, pg. 178, 212; 'material world' vs 'moral world', pg. 275). Clarendon Press.

External links

â— Scientist – Wikipedia.

θΔics

In genius studies, **Scott 50** (Scott 50:#) refers to the 50 key sociologists (see: greatest sociologist ever) found in English sociologist John Scott's 2007 multi-contributor treatise *Fifty Key Sociologists: the Formative Theorists*. [1]

Methodology

The following is the methodology as to how the list came to be: [1]

> "Any selection of key sociologists is bound to be contentious. Each person will make their own particular choices and will have their preferred criteria for choice. Ask fifty people to choose fifty key thinkers and you are likely to end up with fifty different lists — well, almost. From within the mainstream of sociology certain theorists will find their place in almost any list: Max Weber and Emile Durkheim, for example, are perhaps the strongest contenders for inclusion. Beyond this core of certain inclusions, however, matters become more complex. Many would agree with the inclusion of Georg Simmel and George Mead, together with earlier theorists such as Auguste Comte and Herbert Spencer — but how far beyond this core would most people be willing to go in counting someone as a 'key' contributor? The further we get from the core, the greater the disagreement that there will be.
>
> My particular selection of key sociologists reflects my own interests and concerns: that is inevitable. I have, however, taken advice in order to ensure that my selection is as representative as possible. My initial selection of writers was referred to a panel of colleagues at Essex University, the leading Department of Sociology in Britain. Colleagues were asked to vote for those they felt should definitely be included and those they felt should be excluded. They were also asked to identify any further writers whom they felt warranted inclusion in the book. A revised list was produced from these suggestions and this was then, in its turn, sent around the panel for further consideration. Finally, the overall list was divided into two lists — of 'formative' and 'contemporary' writers — and each list was trimmed down to the essential fifty thinkers that it seemed reasonable to include in the definitive list."

(add)

List

The following is the listing of the Scott 50: [1]

1. Jane Addams
2. Theodor Adorno
3. Charles Booth
4. Helen Bosanquet
5. Auguste Comte
6. Charles Cooley
7. Oliver Cox
8. William DuBois
9. Emile Durkheim
10. Edward Evans-Pritchard
11. Sigmund Freud
12. Antonio Gramsci
13. Ludwig Gumplowicz
14. Maurice Halbwachs
15. Leonard Hobbouse
16. Frederic le Play
17. Gyorgy Lukacs
18. Bronislaw Malinowski
19. Karl Mannheim
20. Herbert Marcuse
21. T.H. Marshall
22. Harriet Martineau
23. Karl Marx
24. Marcel Mauss
25. George Mead
26. Lewis Morgan
27. Gaetano Mosca
28. Gunnar Myrdal
29. Vilfredo Pareto
30. Alfred Radcliff-Brown
31. Seebohm Rowntree
32. Ferdinand de Saussure
33. Max Scheler
34. Alfred Schutz
35. Georg Simmel
36. Albion Small
37. Werner Sombart
38. Pitirim Sorokin
39. Herbert Spencer
40. William Sumner
41. Gabriel Tarde
42. Alexis de Tocqueville
43. Ferdinand Tonnies
44. Edward Tylor
45. Thorstein Veblen
46. Lester Ward
47. Lloyd Warner
48. Beatrice Webb
49. Max Weber
50. Florian Znaniecki

(add)

References

1. Scott, John. (2007). *Fifty Key Sociologists: the Formative Theorists* (methodology, pg. #). Routledge.

θΔics

In existographies, **Scott Fitzgerald** (1896-1940) (IQ:150|#660) (Bloom 100:79) (GLAE:#) (CR:5), aka "F. Scott Fitzgerald", was an American fiction writer, noted for []

Other

In 1974, during the Kanawha County textbook controversy, Fitzgerald's *The Great Gatsby*, along with books including *Paradise Lost* (John Milton), *The Old Man and the Sea* (Ernest Hemingway), and *The Republic* (Plato), were books banned and removed from the teaching curriculum of schools in Kanawha County, West Virginia.

Quotes | By

The following are quotes by Fitzgerald:

> "And **I like large parties**. They're so intimate. At small parties there isn't any privacy."
>
> — Scott Fitzgerald (1922), *The Great Gatsby*

> "A little party never hurt anyone."
>
> — Scott Fitzgerald (1922), *The Great Gatsby* (Ñº)

> "The test of a first-rate intelligence is the ability to hold two opposing ideas in the mind at the same time and still retain the ability to function."
>
> — Scott Fitzgerald (1936), "The Crack-Up" [1]

References

1. (a) Fitzgerald, F. Scott. (1936). "The Crack-Up", *Esquire*, Feb.
(b) Fitzgerald, F. Scott. (2005). *Fitzgerald: My Lost City: Personal Essays, 1920-1940* (pgs. 139-; quote, pg. 139). Cambridge University Press.
(c) Shlain, Leonard. (2009). *Leonardo's Brain: Understanding da Vinci's Creative Genius* (pg. 90). Lyons Press, 2014.

External links

â— F. Scott Fitzgerald – Wikipedia.

θΔics

In hmolscience, **Hugh Scott Fogler** (c.1942-), oft-cited as H. Scott Fogler, is an American chemical engineer noted for his his 1986 *Elements of Chemical Reaction Engineering*, wherein he refers to a man who incites a riot as a human catalyst.

Overview

In 1986, Fogler, in his *Elements of Chemical Reaction Engineering*, stated a man who starts a riot, but then quickly ducks out, thereby being unaffected by the reaction transformation, is an example of a human catalyst:

> "A catalyst is a substance that affects the rate of a reaction but emerges from the process unchanged. A man inciting a mob to riot and then ducking out before the tanks roll in can be regarded as a [human] catalyst."

(add discussion)

References

1. (a) Fogler, H. Scott. (1986). *Elements of Chemical Reaction Engineering* (catalyst, pg. 231). Prentice Hall.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (Fogler, pg. 94). Morrisville, NC: LuLu.

External links

â— H. Scott Fogler (faculty) – University of Michigan.
â— Fogler, H.S. – WorldCat Identities.

θΔics

In dialogues, **Scrooge Tiny Tim dialogue** is a conceptualized 1992 dialectical conversation, presented by American physicist Steven Weinberg, between the representative personae of the "realist" Scrooge and the "positivist" Tiny Tim, from Charles Dickens 1943 novel *A Christmas Carol*, employed to presented both sides of the ongoing discussion of implications or not to the humanities of quantum mechanics—Weinberg having some sympathy with both sides of the debate, tough rather more with Scrooge than Tiny Tim, although he gives Tim the last word because the problem he finally raises has been the most important puzzle in the interpretation of quantum mechanics, as he says.

American physicist Steven Weinberg's 1992 positivist **Tiny Tim** and realist **Scrooge**, and respect to their dialogue on the quantum mechanical implications of determinism and free will.

Introduction

Weinberg, in his chapter "Quantum Mechanics and its Discontents", introduces the dialogue as follows:

> "Everyone agrees on how to use quantum mechanics, but there is serious disagreement about how to think about what we are doing when we use it. For some who felt wounded by the reductionism and determinism of Newtonian physics, two aspect of quantum mechanics seemed to offer a welcome balm. Where human beings had no special status in Newtonian physics, in the Copenhagen interpretation of quantum mechanics humans play an essential role in giving meaning to the wave function by the act of measurement. And where the Newtonian physicist spoke of precise predictions the quantum mechanician now offers only calculations of probabilities, thus seeming to make room again for free will or divine intervention."

Weinberg then rips into the ontic opening physics Austrian-born American physicist Fritjof Capra:

> "Some scientists and writers like Fritjof Capra welcome what the see as an opportunity for reconciliation between the spirit of science and the gentler parts of our nature. I might, too, if I thought the opportunity was a real one, but I do not think it is. Quantum mechanics has been overwhelmingly important to physics, but I cannot find any messages for human life in quantum mechanics that are different in any important way from those of Newtonian physics."

(add discussion)

Dialogue

Weinberg states that he employs Tiny Tim and Scrooge to debate the subject, being that these matters are still controversial, as he says:

> **Tiny Tim:** I think quantum mechanics is just wonderful. I never did like the way that in Newtonian mechanics if you knew the position and velocity of every particle at one moment you could predict everything about the future, with no room for free will and no special role for humans at all. Now in quantum mechanics all you predictions are vague and probabilistic, and nothing has a definite state until human beings observe it. I'm sure that some Eastern mystic must have said something like this.

Scrooge: Bah! I may have changed my mind about Christmas, but I still know humbug when I hear it. It is true enough that the electron does not have definite position and momentum at the same time, but this just means that these are not the appropriate quantities to use in describing the electron. When an electron or any collection of particles does have at any time is a wave function. If there is a human observing the particles, then the state of the whole system including the human is described by a wave function. The evolution of the wave function is just as determinist as the orbits of particles in Newtonian mechanics. In fact, it is more deterministic, because the equations that tell us how the wave function develops over time are too simple to allow chaotic solutions. Where's your free will now?"

Tiny Tim: I'm really surprised that you should reply in such an unscientific way. The wave function has no objective reality, because it cannot be measured. For instance, if we observe that a particle is *here*, we cannot conclude from this that the wave function *before* the observation had a vanishing *there* value; it might have had an *here* and *there* values, with the particle just happening to show up as *here* rather than *there* when t was observed. If the wave function is not real, then shy are you making so much of the fact that it evolves deterministically? All that we ever measure are quantities like positions or momenta or spins, and about these we can predict only probabilities. And until some human intervenes to measure these quantities, we cannot say that the particle has any definite state at all.

Scrooge: My dear young person, you seem to have swallowed uncritically the nineteenth-century doctrine called positivism, which says that science should concern itself only with things that can actually be observed. I agree that it is not possible to measure a wave function in any one experiment. So what? By repeating measurements many times for that initial state, you can work out what the wave function in the state must be and used the results to check our theories. What more do you want? You should really bring your thinking up to the twentieth century. Wave functions are real for the same reason that quarks and symmetries are—because it is useful to include them in theories. Any system is in a definite state *whether any humans are observing it or not*; the state is not described by a position or a momentum but by a wave function.

Tiny Tim: (add)

Scrooge: (add)

Tiny Tim: (add)

(add discussion)

Pirsig

See main: Chemistry professor paradox

In 1991, American philosopher Robert Pirsig, in his *Lila: an Inquiry into Morals*, presents the following topic related dialogue, as told via the character Phaedrus: [2]

"Life's just an extension of atoms, nothing more, it has to be that because atoms and varying forms of energy are all there is … At the time of [the] origin [of evolution theory] it wasn't yet understood that at the level of photons and electrons and other small particles the laws of cause and effect no longer apply; that electrons and photons simply appear and disappear without individual predictability and without cause. So today we have as a result a theory of evolution in which 'man' is ruthlessly controlled by the cause-and-effect laws of the universe while the particles of his body are not. The absurdity of this seems neglected. The problem doesn't lie in anyone's department. Physicists can ignore it because they are not concerned with man. Social scientists can ignore it because they are not concerned with subatomic particles."

(add discussion)

See also

â— Jenny McPhee

References

1. Weinberg, Steven. (1992). *Dreams of a Final Theory: the Scientist's Search for the Ultimate Laws of Nature* (§4: Quantum Mechanics and its Discontents, pgs. 64-89; dialogue, pgs. 77-82). Random House.
2. Pirsig, Robert M. (1991). *Lila: An Inquiry into Morals* (pg. 139). Random House, 2013.

θΔics

In existographies, **Sean Carroll** (1966-) (FA:132) (CR:10) is an American astrophysicist, turned atheism-pro activist, noted for []

Free energy | Life

In 2010, Carroll, in his "Free Energy and the Meaning of Life", gave his reflective views on how, while on a plane ride to a conference, he was reading one of Eric Smith's papers (Q) on the thermodynamics of natural selection, during which time, Mike Russell (Q), a three-decade plus (Q) "metabolism-first" origin of life theorist – in contrast to the "replicator first" (e.g. "RNA-first") origin of life theorists – sat down next to him, during which time they began to discuss Smith's ideas and how Carroll was trying to figure out the meaning or purpose of life; to which Russel blurted out, after saying "that's easy", the following: [4]

> "The purpose of life is to hydrogenate carbon dioxide."
>
> — Mike Russell (c.2008), comment to Sean Carroll

Carroll took Russell's model to mean the following: "life is nature's way of opening up a chemical channel to release all of that free energy bottled up in carbon dioxide in the atmosphere of the young earth"; Carroll commented that his "own understanding gets a little fuzzy at this point, but the basic idea seems intelligible". Carroll, in the same article, conjectured the following:

> "Maxwell's demon takes in free energy and uses it to maintain a separation between hot and cold sides of a box of gas — a sustained departure from thermal equilibrium. But what if we reversed the story? Instead of thinking that the demon takes advantage free energy to help advance its nefarious anti-thermodynamic agenda, what if we imagine that the free energy is simply using the demon — that is, the out-of-equilibrium configurations labeled 'life' — for its own pro-thermodynamic purposes?"

Carroll, here, would be wise to study Norman Dolloff (1975) to get his bearings straight.

Religion | Atheism

Carroll was raised Episcopalian. (Q) In 2003, Carroll penned: "Why (Almost All) Cosmologists are Atheists" (Q). In 2004, Carroll and classics scholar Shadi Bartsch taught a course on the history of atheism at the University of Chicago. In 2012, organized a workshop entitled "Moving Naturalism Forward"; in 2013, blogged "Why I Won't Take Money from the Templeton Foundation" (Q) (Q). In Mar 2014, Carroll debated William Craig on the topic of "god and cosmology", wherein, supposedly, Carroll dismantled Craig's fine-tuning arguments. (Q)

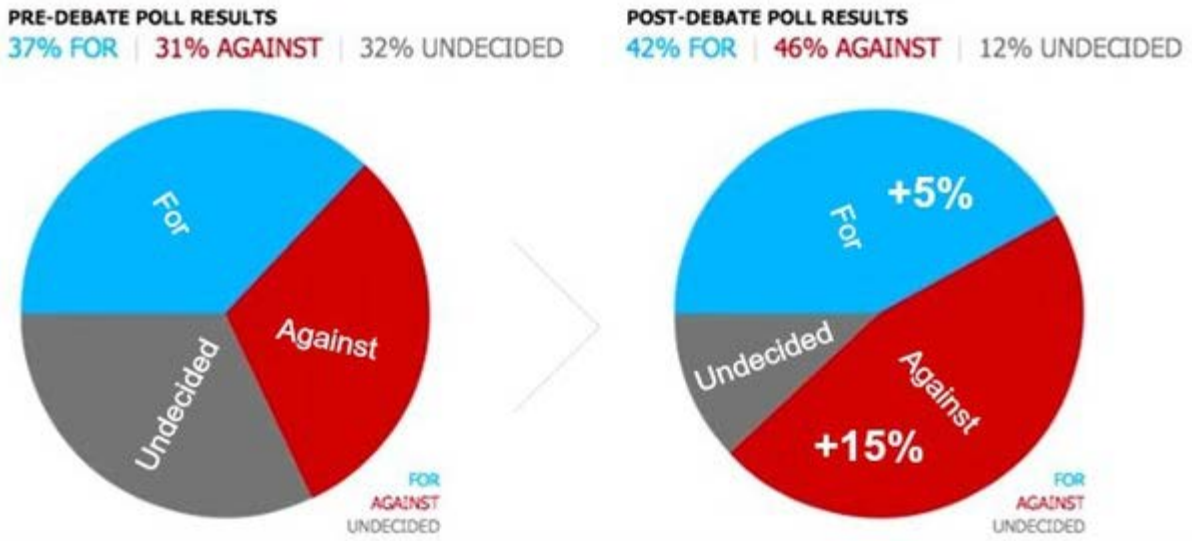

In May 2014, Carrol won an Intelligence Squared debate, against neurosurgeon Eben Alexander (Q), a person who went into a coma and claims he went to heaven, on the topic "Death is Not Final", poll results (Q) shown above.

In Oct 2014, Carroll won the FFRF "Emperor Has No Clothes" award, given to someone not afraid to speak the truth about a subject others are misinformed about (Q), the acceptance speech of which he explained (Q) why there is no "life after death". (Q) Carroll, in 2014, was averse to being explicitly identify as an "atheist" (see: explicit atheism), but prefers the self-label "naturalist", over atheist, although he doesn't deny the latter, but considers the former a more positive term (Q); his 2016 interview "Arguments for Atheism" (Q) elaborates on he thinks of naturalism and atheism as the same thing, namely that physics-based naturalism implies (see: implicit atheism) that "god plays no role", which he implicitly takes as a synonym for "god does not exist". (Q)

Overview

In 2010, Carroll, in his *From Eternity to Here*, attempted to outline a synthesis of his views on the big bang, relativity, entropy, universal expansion, human existence, purpose or meaning and time (arrow of time); along with other areas such as black hole thermodynamics. In his final chapter on the "Search for Meaning in a Preposterous Universe", Carroll argues that: [1]

> "We find ourselves, not as a central player in the life of the cosmos, but as a tiny epiphenomenon, flourishing for a brief moment as we ride a wave of increasing entropy … purpose and meaning are not to be found in the laws of nature, or in the plans of any external agent, but in our urge[s]."

The books seems to be detracted to some extent owing to its digressions on information theory and complexity. Carroll has also written about the Boltzmann brain problem. [2]

In 2016, Carroll, in his *The Big Picture*, attempted to argue for some type of utilitarianism model of goodness. [3]

Education

Carroll completed BS in astronomy and astrophysics (1988) at Villanova Universe (see: Rossini debate), his PhD in astronomy, thesis "Cosmological Consequences of Topological Geometric Phenomean in Field Theories", at Harvard (1993), and currently is a professor at CalTech.

Quotes | By

The following are quotes by Carroll:

> "Here's a Philosophy TV dialogue (Q) between John Dupre (left) and Alex Rosenberg (right). They are both physicalists — the believe that the world is described by material things (or fermions and bosons, if you want to be more specific) and nothing else. But Dupre is an anti-reductionist, which is apparently the majority view among philosophers these days. Rosenberg holds out for reductionism, and seems to me to do a pretty good job at it."
>
> — Sean Carroll (2010), "Physicalist Anti-Reductionism" (Q), Nov 3

> "If you find an egg in your refrigerator, you're not surprised. You don't say, 'Wow, that's a low-entropy configuration. That's unusual,' because you know that the egg is not alone in the universe. It came out of a chicken, which is part of a farm, which is part of the biosphere, etc., etc. But with the universe, we don't have that appeal to make."
>
> — Sean Carroll (c.2010) (Q)

> "I'm trying to understand cosmology, why the big bang had the properties it did. And it's interesting to think that connects directly to our kitchens and how we can make eggs, how we can remember one direction of

time, why causes precede effects, why we are born young and grow older. It's all because of entropy increasing."

— Sean Carroll (c.2010) (Q)

"I don't want to give advice to people about their religious beliefs, but I do think that it's not smart to bet against the power of science to figure out the natural world. It used to be, a thousand years ago, that if you wanted to explain why the moon moved through the sky, you needed to invoke god."

— Sean Carroll (c.2010) (Q)

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1. Carroll, Sean. (2010). *From Eternity to Here: the Quest for the Ultimate Theory of Time.* Penguin Group USA.
2. Carroll, Sean M. (2006). "Boltzmann's Anthropic Brain", *Discover Blogs.* Aug 01.
3. Carroll, Sean. (2016). *The Big Picture: On the Origins of Life, Meaning, and the Universe Itself* (morality, 30+ pgs). Penguin.
4. Carroll, Sean. (2010). "Free Energy and the Meaning of Life" (Q), Cosmic Variance, DiscoverMagazine.com, Blog, Mar 10.

Further reading

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Videos

- Carroll, Sean. (2012). "From Particles to People: the Laws of Nature and the Meaning of Life" (video), TAM, Oct 19.

External links

- Sean M. Carroll – Wikipedia.
- Home – PreposterousUniverse.com.
- Sean Carroll – YouTube.com.
- Carroll, Sean M. (1966-) – WorldCat.org.

θΔics

In hmolscience, **Sean Joseph O'Reilly** (1952-) is an American philosopher noted, in human thermodynamics, for his 2001 book *How to Manage Your Dick*, in which he outlines a energy-entropy based Freudian moral philosophy of how to govern and use one's sexual energy productively. [1]

Overview

In 2001, O'Reilly published *How to Manage Your Dick: Redirect Sexual Energy and Discover Your More Spiritually Enlightened, Evolved Self*, wherein, quoting from his chapter "Entropy and Your Dong", in his typical frank style of discussion, states:

> "Making good choices regarding your urges and acting accordingly is more commonly referred to as morality. Without arguing over what constitutes 'good', morality might simply be described as responsible urge and information management. Urges use energy, so if we are going to understand how urges work, we must also understand how energy works. Some of the same rules that apply to energy also apply to that friend who lives between your legs."

This understanding of urges, in terms of energy and entropy, to note, is similar to the impulse philosophy developed by American philosopher Elizabeth Porteus. In short, in O'Reilly's model, building on the philosophies of Plato, Aristotle, and Thomas Aquinas, and the id-ego-superego, libido, energy, entropy psychologies of Sigmund Freud and Carl Jung, he outlines a model for governing one's personal energy to get what one really wants out of existence, with particular reference to the governance of one's sexual impulses and sexual energy, examined in the context of a mixture of metaphysics, politics, and modern science, and the three laws of thermodynamics. Although it is ironic that a book on how to manage your dick comes from a man with six kids, it is one of the relatively few works to pick up on the energy psychology of Freud with focus on his ideas of sex, repression, and catharsis.

Theory origin

In circa 1971, O'Reilly states that his educational path started when he was exposed to the writings of Aristotle, Plato, and Thomas Aquinas by his philosophy teacher Frederick Wilhelmsen at the University of Texas. [3]

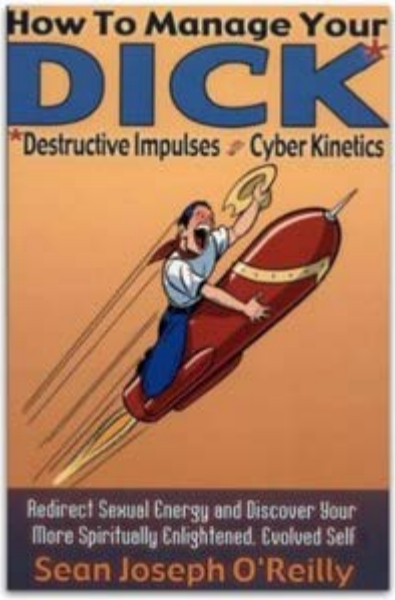

Second edition cover of O'Reilly's 2001 *How to Manage Your Dick.* [1]

In the early 1980s, O'Reilly worked as a volunteer at the Lorton Federal Penitentiary, teaching the philosophies of Aristotle and Aquinas to inmates, specifically focusing in terms of remembering what one really wants and the management of the appetites by right reason in the context of working to avoid evil outcomes; subjects which he found were completely foreign to inmates who he found were managed by raging testosterone, violence, and wild sexuality all mixed together with the inability to make good choices. O'Reilly then worked as a political gadfly for an Israeli activist in Washington D.C., in which he noticed an underlying declining philosophical heritage, typical of the West. [4]

In 1985, O'Reilly attempted a first draft of his philosophy in *circa* 1985 entitled *The River of Gold: Politics of the Soul*, outlining a public philosophy rooted in ancient Greek metaphysics, focused on virtue and ethics; but found little public interest in this version aside from a few academics. In circa 1995, he saw a banner that read "How to Manage Your What?", which instilled in him, 'with startling force', the idea that a book entitled *How to Manage Your DICK*, could act as an eye-opener or Trojan horse for an open-ended exploration for his common moral philosophy for America. He then began to dig into research and reading to framework his philosophy. His first clue came from Freudian energy psychology model of the mind, which is best described in his own words: [4]

> "The fundamental breakthrough came in trying to find a bridge between the metaphysics of Aristotle, Plato and Aquinas, and the extraordinary insights of new age and other spiritual philosophies. It began with a reflection on the inadequacy of modern epistemology and psychology in dealing with the problem of evil and bad choices. How can you know what is a good choice or a bad choice unless there is a mechanism whereby human beings can know truth?
>
> What is virtue, what is vice and what are the energy dynamics involved in both moral evolution and the devolution associated with evil? The beginning of an answer came from an unusual quarter. Sigmund Freud's concept of *cathection* describes how instinctual energy gets invested in objects of desire but understanding how this can possibly be is much akin to religious faith describing the actions of grace. Freudian psychology takes it on faith that cathection of instinctual energy is possible and has many ways of demonstrating cathection but much like religion describing the actions of grace, it cannot prove that cathection actually exists. Who has ever seen instinctual energy? But the concept of cathection gave me a clue. How does cathection really work? What is the mechanism of the instinctual energy conversion that is at the root of Freud's insight into human psychology and the sublimation of instinctual energy?
>
> If it could be demonstrated, as the Aristotelians and Scholastics claim, that you intentionally become the thing known, then the metaphysics of cathection could take Freud into places he never would have dreamed of. Cathection hinted of energy transferences at a level not described by traditional psychology. Theology was largely useless in describing the actions of cathection. There seemed to be no clearly articulated theology of the soul's kinetic activities on behalf of the body. To state as does Aristotle that the soul has five powers: the vegetative (growth), locomotive (movement), the sensitive (sensory organs), the appetitive (the will), and the intellectual (mind) tells us absolutely nothing about what those powers are doing on a daily basis—other than that they exist. Cyber kinetics attempts to account for the powers of the soul using metaphysical analogs taken from quantum physics and superstring theory."

All in all, aside from metaphysical speculations, such as on spirituality and how the soul has something to do with vibrating superstrings of energy in ten dimensions, his scientific focus on explaining sex, philosophy, and energy seems to be a worthwhile topic of investigation, that not many people are bold enough to discuss.

Education

O'Reilly has a degree in psychology (or existential phenomenology) and studied philosophy under Frederick Wilhelmsen at the University of Texas in the early 1970s; he is a former seminarian, stockbroker, an associate of new age pioneer George Simon, and seems to be largely self-taught in the sciences. [2]

References

1. O'Reilly, Sean. (2001). *How to Manage Your Dick: Destructive Impulses with Cyber-kinetics: Redirect Sexual Energy and Discover your More Spiritually Enlightened, Evolved Self* (ch. 7: Entropy and Your Dong, pgs. 47-56). Travelers' Tales.
2. (a) Press – DickManagement.com.
(b) Sean O'Reilly (biography) – Amazon.com.
3. Frederick Wilhelmsen – Wikipedia.
4. Story behind book – DickManagement.com.

Further reading

● O'Reilly, Sean J. (date). "What is Evil Anyway?", DickMangement.com.

External links

● Home – DickManagement.com.

θΔics

In thermodynamics, the **second law** is shorthand for the second law of thermodynamics along with other synonyms, including: the second main principle, the entropy law, law of entropy, Clausius inequality, the law of increasing entropy. [1]

See also

- Zeroth law
- First law
- Third law
- Joule's second law
- Newton's second law

References

1. Bent, Henry A. (1965). *The Second Law: an Introduction to Classical and Statistical Thermodynamics.* Oxford University Press.

θΔics

In evolution thermodynamics, **second law** (disordering) **evolution** (ordering) **reconciliations** are famous one-liner answers, one example being the 1947 local entropy decrease postulate, often found in regurgitated or repeated form, that offer rudimentary attempts to amend the seeming contradictions between the Boltzmann (ideal gas system) interpretation of the second law of thermodynamics as a universal trend towards increasing levels of disorder in a (isolated) system and the Darwin (living system) interpretation of evolution as a universal trend towards increasing levels of order in a (evolving) system; the gist of which tends to be argued as follows:

> (a) Evolving systems on earth are "closed", not isolated, as compared to ideal gas systems.
> (b) Entropy decrease (of life forms) or "ordering" is compensated by entropy increase in the surroundings (such as in the sun).
> (c) Decrease in "free energy" (combined law) in evolving systems, is the key governing energy quantity of directionality, rather than only entropy tendencies (the second law) alone.
> (d) Sunlight (with low entropy) shines on the earth and heat (with high entropy) radiates off, which powers local decreases of entropy (life forms) on earth.

The subject often arises in religious thermodynamics, which, in the mind of scientists, often tends to relegate the debate to the nominal sidelines; the fact, however, that hardened scientists cannot seem to give lasting or satisfying answers leaves the debate open to further speculation as the decades pass.

To give a typical statement of this debate, in a nutshell, according to the 1985, out-of-context, views of American civil engineer Henry Morris:

> "The second law of thermodynamics says that everything tends toward disorder, making evolutionary development (ordering) impossible."

In this statement, Morris, known to many as the father of modern creation science, takes the second law out of context by inserting the word "everything" in place of the term "isolated systems". In any event, the statement highlights a common puzzling viewpoint for many.

Quotes

The following are related quotes:

> "A living organism … keep[s] it[self] alive … by feed[ing] upon negative entropy (from its environment)."
>
> — Erwin Schrödinger (1944) [1]

> "Life … represent[s] pockets of decreasing entropy in a framework in which the large entropy tends to increase."
>
> — Norbert Wierner (1950) [2]

> "Any ordered (living) system in nature has a level of stored energy in its structure that is less than the total energy that has been consumed to create it … the consumed energy, which contributes to the elevation of the entropy (raised level of disorder) in the universe, exceeds the decline in entropy caused by the formation of that ordered structure … as a result, the net amount of entropy remains positive in the universe and in accordance with the law of entropy."

— Robert Kenoun (2006) [3]

References

1. Schrödinger, Erwin. (1944). *What is Life?* (ch. 6 “Order, Disorder, and Entropy). pgs. 67-75 Cambridge: Cambridge University Press.
2. Wiener, Norbert. (1950). *The Human Use of Human Beings; Cybernetics and Society*, (pg. 32). Boston: Houghton Mifflin Co.
3. Kenoun, Robert. (2006). *A Proposition to Theory of History and Social Evolution* (pg. 50). Trafford Publishing.

Videos

â— Atkins, Peter. (2007). “Complexity and the Second Law” (Ñº), Beyond Belief 2.0 conference.

θΔics

In laws of motion, the **second law of motion** is defined by the following formula:

$$F = ma$$

which states that the force *F* acting on a body of mass *m* will tend to cause an acceleration *a* of motion.

History

This law was formulated by English physicist Isaac Newton in 1686. [1]

References

1. Newton, Isaac. (1686). *Principia*. Publisher.

θΔics

In thermodynamics, the **second law of thermodynamics** quantifies the energetic nature of irreversibility in heat driven transformation processes, particularly in the Carnot cycle. In concise form, the second law, as formulated mathematically in 1862 by German physicist Rudolf Clausius, states that in a cyclical heat-driven process which is in any way possible the following relation will always hold:

$$\int \frac{dQ}{T} \geq 0$$

where *dQ* is an element of the heat given up by a body to any reservoir of heat during its own changes, heat which it may absorb from a reservoir being here reckoned as negative, and *T* is the absolute temperature of the body at the moment of giving up this heat. [1] The quantity "dQ/T" is called entropy. The second law, in a general sense, arose out of a need to correct French physicist Sadi Carnot's 1824 view of the concept of "re-establishment of equilibrium in the caloric" as being the central principle of the operation of the steam engine.

Notations

After the 1875 *Lectures on the Mechanical Theory of Heat* by German mathematician Carl Neumann, indicating, as Clausius did, that the differentials δQ and δW are path dependent (inexact differentials), the symbols đ (d-crossbar) or δ (small delta), the latter used more often in the modern sense, began to be used wherever heat or work differentials were found. Hence, the second law began to be written as:

$$\int \frac{\delta Q}{T} \geq 0$$

Modern formulations

There are a number of different modern formulations of the second law, such as found in the works of German engineer and physicist Kolumban Hutter; examples of which can be found in the further reading section below. [2]

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1. (a) Clausius, Rudolf. (1862). "On the Application of the Theorem of the Equivalence of Transformations to Interior Work", (pp. 215-250).
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● Uffink, Jos. (2001). "Bluff Your Way in the Second Law of Thermodynamics", *Studies in the History and Philosophy of Modern Physics.*

External links

● Second law of thermodynamics - Wikipedia.
● 110+ Variations of the Second Law of Thermodynamics – Institute of Human Thermodynamics.

θΔics

In thermodynamics, the **second main principle**, in contrast to the first main principle, of the mechanical theory of heat is defined by the following two equivalent expressions: [1]

$$\frac{dQ}{T} = dS$$

which can be rearranged as:

$$dQ = TdS$$

where *dQ* is an amount of heat imparted to a body, *T* is the temperature of the body at the point of heat transfer, and *dS* is the change in the transformation content of the body or of entropy change. These expressions were the formulations used by German physicist Rudolf Clausius, which he characterized as "convenient in the case of certain investigations", later coming to be known as the second law of thermodynamics. Clausius also called this the “principle of equivalence of transformations”, another formulation of what later came to emerge as the second law.

References

1. Clausius, Rudolf. (1879). *The Mechanical Theory of Heat* (pg. 90; 91-109), London: Macmillan & Co.

θΔics

In business thermodynamics, **second thermodynamic law of management** states that entropy is always increasing in the organization. The law was posited in 1999 by American business consultants Tom Demarco and Timothy Lister, on the premise that corporate entropy is exists. [1]

References

1. DeMarco, Tom and Lister, Timothy. (1999). *Peopleware: Productive Projects and Teams* (section: Corporate entropy, pg. 99). Dorset House Pub. Co.

θΔics

In human chemistry, a **secondary field particle** is a coalesced or grouped particle, e.g. five photons, thirty molecules, pheromones, information, currency, emotion, such as a tone of voice contained in the vibratory patterns of a sound wave, etc., that act as effective force carriers. [1]

See also

- Primary field particle

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 202-03). Morrisville, NC: LuLu.

θΔics

In terminology, **secret of life** is a phrase used by Francis Crick (1953) who made a “half-joking reference” about DNA, in that if they discovered the atomic structure of DNA they would find the "secret of life"; a term which latter became popularized by his associate James Watson.

Crick, to note, in 1966, said "we should abandon the word alive" (see: defunct theory of life), in that some thing "alive" is does not exist (see: life does not exist) as chemistry and physics sees things.

Etymology

The phrase “secret of life”, supposedly, is attributed Francis Crick who on 18 Apr 1953 is said to have stepped into the Eagle Pub in Cambridge England and declared in triumph to have “discovered the secret of life” together with James Watson. [1]

Quotes

The following are related quotes:

A "**secret of life**" discussion by Alan Watts, wherein he hinges the topic around the nature of "spontaneity"; which, at some points, to note, seems to similar to Robert Pirsig's 1991 discussions on the perceptual confusion surrounding the terms: struggle and survive in a chemical sense.

> “The results of particle physics are in no sense more fundamental then what Alan Turing did in founding the computer science, or what Francis Crick and James Watson did in discovering the **secret of life**.”
>
> — Philip Anderson (1986), commentary on proposal to build a Super Collider [2]

> “The DNA revolution led a generation of biologists to believe that the **secret of life** lay entirely in the structure and function of DNA. This faith is misplaced and the reductionist programme must be supplemented with a new conceptual framework.”
>
> — Harry Rubin (1988), “Molecular Biology Running into a Cul-de-sac?” [3]

See also

â— Secret principle

References

1. (a) Watson, James D. (2003). *DNA: the Secret of Life* (introduction: Andrew Berry). Alfred A. Knopf.
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2. (a) Anderson, Philip. (1986). “Letter”, *New York Times*, Jun 8.
(b) Weinberg, Steven. (1992). Weinberg, Steven. (1992). *Dreams of a Final Theory: the Scientist’s Search for the Ultimate Laws of Nature* (pg. 55). Random House.
3. (a) Rubin, Harry. (1988). “Molecular Biology Running into a Cul-de-sac?”, *Nature*, 335:121.
(b) Weinberg, Steven. (1992). Weinberg, Steven. (1992). *Dreams of a Final Theory: the Scientist’s Search for the Ultimate Laws of Nature* (pg. 56). Random House.

θΔics

In hmolscience, **secret principle** refers to the unifying principle of nature and of the universe.

German polymath Johann Goethe studying in Frankfurt in the years *circa* 1769 to 1772 during which time he began to do experiments in chemistry in a search to uncover a **secret principle** of nature and the universe.

Newton

In a 1678/79 letter to Irish chemist Robert Boyle, English chemical-physicist Isaac Newton was preoccupied with the phenomenon of elective affinity among chemicals, and stated: [1]

> "There is a certain **secret principle** in nature by which liquors are sociable to some things and unsociable to others. Thus water will not mix with oil but readily with spirit of wine or with salts."

Newton here, to note, seems to be making an unknowing citation of Empedocles and his chemical aphorisms.

The finalized efforts of Newton's search for this secret principle are found in his last and final philosophical, his 1718 Query 31, the the addendum that launched the chemical revolution.

Goethe

In 1768 to 1769, at the age of 18 to 19, German polymath Johann Goethe (see: Goethe timeline), having been intrigued by the chemistry works of Susanne Klettenberg and Paracelsus, was conducting chemical experiments, over a draft furnace in his attic, to reveal, according to Austrian philosopher Rudolf Steiner, "the **principle** that permeates the whole universe." [2] In a 1770 letter to Klettenberg, Goethe wrote: [3]

> "Chemistry is still my **secret** love."

To elaborate further on what he was after during this period, from book twenty of his autobiographical 1814 *Poetry and Truth*, in reflection on these pre-1775 years, Goethe wrote how he was searching for a universal rule to explain the happenings of existence: [4]

> "I perceived something in nature (whether living or lifeless, animate or inanimate) that manifested itself only in contradictions and therefore could not be expressed in any concept, much less any word. It was not divine, for it seemed irrational; not human, for it had no intelligence; not diabolical, for it was beneficent; and not angelic, for it often betrayed malice. It was like chance, for it laced continuity, and like providence, for it suggested context. Everything that limits us seemed penetrable by it, and it appeared to dispose at will over the elements necessary to our existence, to contract time and expand space. It seemed only to accept the impossible and scornfully to reject the possible."

Goethe penned his solution of his search for his secret principle in his 1809 physical chemistry based novella *Elective Affinities*, which itself was based on Newton's Query 31 via the 1775 work of Swedish chemist Torbern Bergman.

On beauty, Goethe in 1888 (Ñº) famously stated:

> “Das Schöne ist eine Manifestation geheimer Naturgesetze, die ohne dessen Erscheinung ewig wären verborgen geblieben.”

Translations of which include: (Ñº) (Ñº)

> “The beautiful is a manifestation of **secret** laws of nature, which, but for its apparition, would have forever remained hidden form us.”
>
> “Beauty is a manifestation of secret natural laws that would have remained hidden forever if the beautiful thing had not appeared.”
>
> “Beauty is a manifestation of secret natural laws, which otherwise would have been hidden from us forever.”

(add discussion)

Adams

> *See main: Adams belief*

In 1863, American thinker Henry Adams, writing to Charles Gaskell, seems to have begun searching for a universal theory of existence, applicable, in a one nature manner, atoms to humans: [6]

> “Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday **within this law**. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward.”

This quote is discussed by American comparative literature scholar Matthew Taylor, noted for doing his 2008 PhD dissertation, in part, in Adams’ physics-based theory of human existence. Adams would spend the next 50 years on this subject, becoming one of the first dual pioneers, following Goethe, of human chemistry (see: HC pioneers) and human thermodynamics (see: HT pioneers).

Einstein

The following is a 20 Aug 1949 response by German-born American Albert Einstein (IQ=220) to a letter he received on a query about his scientific motivation: [5]

> “My scientific work is motivated by an irresistible longing to understand the **secrets** of nature and by no other feeling.”

IQ | Secret principle seeker

The average IQ of a secret principle searcher is 222 (mean IQ of Newton (IQ=215), Goethe (IQ=230), and Einstein (IQ=220)).

Discussion

The principle both Goethe and Newton were searching was known to them as chemical affinity. In 1882, following the publication of "On the Thermodynamics of Chemical Processes" by German physicist Hermann Helmholtz, the measure of chemical affinity came to be known as free energy or available energy, thus becoming the new secret principle (see: human free energy).

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θΔics

In terminology, **secularism**, from Old French (c.1400) *seculer* "residing in this world, not belonging to a religious order, from Late Latin (c.700) *saeculum*, "the present world", means []

Overview

In 1851, George Holyoake introduced, and or somehow popularized, the term "secularism" (or secularists) as an upgrade to "freethought" (or free thinkers), but less derisive or more preferable to some than "atheism"; meaning indifference to or rejection or exclusion of religious considerations. [1]

In 1856, Henry Buckle, in his *History of Civilization*, discussed how Richelieu, from 1625 to 1643, established the world's first "secular scheme" of government, in opposition to the "ecclesiastical scheme".

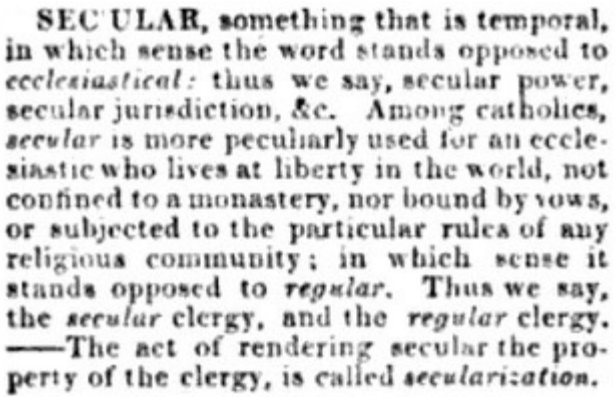
SECULAR, something that is temporal, in which sense the word stands opposed to *ecclesiastical*: thus we say, secular power, secular jurisdiction, &c. Among catholics, *secular* is more peculiarly used for an ecclesiastic who lives at liberty in the world, not confined to a monastery, nor bound by vows, or subjected to the particular rules of any religious community; in which sense it stands opposed to *regular*. Thus we say, the *secular* clergy, and the *regular* clergy. ——The act of rendering secular the property of the clergy, is called *secularization*.

An 1845 encyclopedia definition of "**secular**", meaning something temporal, as opposed to ecclesiastical. [3]

In 2014, American sociologist and secularism scholar Phil Zuckerman defined a secular, simply as non-religious; and to elaborate, in respect to what "religious" means, he elaborates that a secular person is someone who does not practice the "three Bs", namely: belief (in supernatural), behavior (rituals, rites, or behaviors practices, actualized according to those beliefs), and belonging (belong or identify with a group that is religious, anchored in those beliefs and behaviors). [2]

Some have characterized Thucydides (Q) as a secular atheist.

The term "movement atheism", in atheism terminology, supposedly, those atheists who are "on board" with the atheism movement and ignore the various kinds of atheists who are uninterested in it or hostile to it; of which there are four kinds: secularist atheists, identity atheists, evangelical atheists, and constructive atheists. (Q)

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(b) Moore, Tracy. (2015). "Godless Parents are doing a Better Job" (Q), *Jezebel.com*, Feb 2.
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Further reading

● Zuckerman, Phil. (2014). *Living the Secular Life: New Answers to Old Questions*. Penguin.

External links

● Secularism – Wikipedia.

θΔics

In science, **security** is []

HmoIscience

In 1971, American chemical thermodynamicist Frederick Rossini, in his "Chemical Thermodynamics in the Real World", explained freedom and security in terms of enthalpy ΔH and entropy ΔS change, respectively, in social reaction existence and experience equilibration processes: [1]

> "Chemical thermodynamics [applies] to present-day problems of our society. I will try to show that thermodynamics is a discipline highly relevant to the real world in which we live and that its fundamental laws may be related to human experience. A simple description of energy is that the energy of a [social] system arises from the binding forces [exchange forces] that hold together the elementary particles—nuclei, ions, atoms, molecules, and macromolecules [people]—constituting the system. The greater the binding forces, the more tightly bound is the system, and the lower is its energy. This corresponds to a state of greater [socioeconomic] **security**. The smaller the binding forces, the less tightly bound is the system, and the higher is its energy. This corresponds to a system of lesser [socioeconomic] security."

In 2006, American chemistry professor Harold Leonard suggested unearthed Rossini's relatively unknown lecture, via suggestion, in the *Journal of Chemical Education*, that Rossini's premise about chemical thermodynamic descriptions of freedom and security might have real-world application to anti-terrorism efforts in a post 9/11-world. This seemingly straight suggestion launched the ongoing "heated" Rossini debate, naturally enough, owing to the religious overhaul implications of the suggestion.

Quotes

The following are related quotes:

> "I did not embark on experiments on consciousness in alert people until after I had obtained the **security** of academic tenure."
>
> — Benjamin Libet (c.1990), comment to Francis Crick [2]

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External links

â— Security – Wikipedia.

θΔics

In existographies, **Seda H. Bostanci** (1978-) is a Turkish urban planning engineer noted, in architectural thermodynamics, for []

Overview

In 2008, Bostanci, in her PhD dissertation "Evaluation of Urban Skylines by the Entropy Approach", used a mixture of Shannon entropy and thermodynamic entropy to outline an aesthetical theory (see: aesthetic energy) of urban skyline design. [1] The synopsis of Bostanci's dissertation is as follows: [2]

> "Urban design has formed a field in which visual-spatial, cultural, social, functional and natural factors are taken into account for the purpose of providing the best habitat, and that gathers multidimensional concepts together within time while being developed in the intersection of architecture and city planning. Urban design has a wide range of content developed in communication with various disciplines. Within its content, computer and mathematical based model suggestions, especially on researches where urban environment qualities are examined, contribute to the discipline as innovative approaches.
>
> Entropy approach has been put forward as an applicable innovation approach in the matter of aesthetic evaluation (see: beauty) in urban design. Entropy, aesthetic and urban design concepts have some relations. Entropy, in its preliminary meaning, is the mathematical representation of thermodynamic results. In its second sense as used in definition of the relation between entropy urban design and aesthetics, it refers to the concept for measuring the quantity of information within a system. Measuring the entropy is related to the distribution of positional figures of a message or information from the probabilities standpoint. Formal aesthetic evaluation criteria which are using in evaluating the aesthetic value of a designed space that can be taken into consideration in the entropy methodology must have the appropriate qualifications to join numerical procedures.
>
> In applications, distribution relations of formal aesthetic evaluation criteria are measured over aesthetics-related evaluation concepts. The aesthetical qualities of the city are considered at different scales such as urban pattern, urban skylines, cityscapes, city squares and urban furniture. From among these scales, urban skylines are preferred for the applications. Aesthetical evaluation of the cities, measurability can be achieved through the entropy method. This method also makes possible an interrogation into the relationship that urban skylines formal esthetic evaluation criteria have established between each other."

Here we see, at least in regards to the second half of her dissertation work, i.e. attempting to evaluate city landscapes via "measuring the entropy is related to the distribution of positional figures of a message or information from the probabilities standpoint", that Bostanci has taken a unaware ride on so-called Shannon bandwagon. [5]

Entropi.net

Bostanci was a writer at Entropi.net, which was active from 2001 to 2008, where at many of her thermodynamics writings can be viewed in archive. [4]

Other

Bostanci, as of late, seems to be theorizing in the sustainability arena. [5]

Education

Bostanci completed her BA in urban and regional planning design in 2000 at Mimar Sinan Fine Arts University, her MA in urban design in 2002, and her PhD, dissertation: "Evaluation of Urban Skylines by the Entropy Approach", in the urban and regional planning program of the Graduate School of Science Engineering and Technology, Istanbul

Technical University. From 2004 to 2010, Bostanci was the director of housing and urban development at the Sariyer Municipality. In 2010, she became a lecturer and chair of the Okan University School of Local Government Program. Her current research focus is on: Eco-municipal applications, urban design, urban aesthetics, urban silhouettes, urban lighting, planning, education, local authorities, city councils are publications on national and international publications. [3]

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3. Seda H. Bostanci (Turkish → English) – Demokratikspo.org.
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Further reading

● Bostanci, Seda H. (2006). "Happiness and Dilemma" (Turkish → English), Entropi.net, Jul 04.

External links

● Seki Bostanci (faculty) – Okan University, Turkey.

θΔics

In Egyptian mythology, **Sekhmet**, or “Sekmet” (Budge, 1904), hieroglyph: 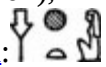 or , derived from the feminine variant of the word “Sekhem” , meaning “strong, mighty, or violent", is the goddess of war and destruction, oft-portrayed as a human female body, with a lion head, topped with a cobra-encircled sun disc (see: uraeus), typically draped in a red garment, noted for (add). [3]

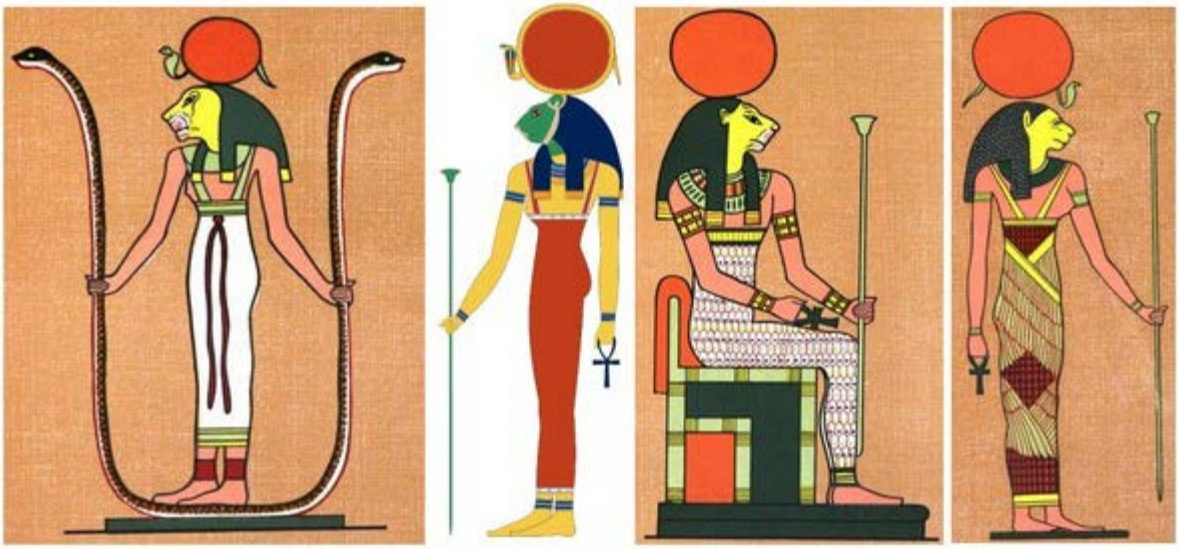

Four depictions of the goddess **Sekhmet**, a lion-headed female, surmounted by a sundisc, holding a snake, ankh, or papyrus scepter (the symbol of Lower Egypt).

Overview

In c.2500BC, in the Pyramid Texts of Unas (line 390), the pharaoh Unas is said to have been conceived by Sekhmet, Sheskhentet, and Sothis. [3]

In the middle kingdom (2061-1650BC) and new kingdom (1549-1070, Sekhmet was associated with the pharaoh as follows:

> “In the New Kingdom, various Egyptian kings were associated with **Sekhmet** and her violent anger. Thutmose III is called ‘son of Sekhmet’. Amenhotep II is ‘a raging lion’, who ‘triumphed ... like the triumph of Sekhmet.’ Seti I is ‘beloved of Sekhmet’. In the account of the Battle of Qadesh, Ramesses II is in battle, and ‘Sekhmet, the great one, is with him ... on his horse. Her hand is with him.’ Ramesses II is also called ‘Sekhmet in her moment of rage,’ and Ramesses II is ‘Sekhmet when she is enraged’. The competing forces of ferocious rage and a calmer guardianship, which are represented by Sekhmet and Bastet, must be balanced in the person of the king. A Middle Kingdom text that praises the (unnamed) king provides a description of this complex nature. In the text, which we refer to as The Loyalist Instructions, the king is both ‘Bastet, who protects the Two Lands’ and ‘Sekhmet against those who disobey his orders.’ The king embodies the goddess's violent traits and her nonviolent traits, such as guaranteeing crops and alleviating maladies.”
>
> — Vanessa Davies (2018), *Peace in Egypt* (pg. 48)

(add)

Family

Sekhmet, in the Egyptian pantheon, is said to have been created by the fire of Ra’s eye; occasionally, Sekhmet, of note, is described as the wife or mother of Ra, depending; she is also said to have been the sister-wife of Ptah (Ñº), and the mother of his son Nefer-Atem. She is sometimes portrayed as the sister form of the goddess Bast.

Powers

Sekhmet, aside from having “power of the waters”, whatever that means, also had the power to send out heat, as a fire-

breathing snake, when she was in the form of a serpent on Ra's head; she also was supposed to be able to shoot out "swift fiery darts" that would pierce the bodies of the enemy.

Hathor

Sekhmet, in late dynastic times (Budge, 1904), was syncretized with the goddess Hathor, to the effect that Hathor would become Sekhmet when in rage; the following is a synopsis:

A depiction of Hathor (left) and Sekhmet (right), the latter of which seems to be **Sekhmet** as a form of Hathor, or Hathor-Sekhmet, which was a synretism that occurred in "late dynastic times (Budge, 1904).

> "Hathor's strong solar connections are made obvious by the solar disk, supported by two tall cow horns and augmented by a uraeus, which she wears on her head. Among her different solar personae, she may be the wife, daughter or, occasionally, mother of Ra. As the fierce uraeus she protects her father with a burning heat; as the 'golden one' she accompanies him on his daily voyage across the sky; as the 'eye of Ra' she acts as his agent. But **when the mild-mannered Hathor grows angry, she transforms into Sekhmet, the 'powerful one'**, an uncompromising, fire-breathing lioness armed with an arsenal of pestilence and plague. Sekhmet's destructive female anger — the burning anger of the uraeus — is put to good use as she protects Egypt's pharaohs. This fierce defense of the king, and her skill with the bow and arrow, cause her to become closely associated with the army so that Ramesses II, valiantly fighting his solo battle at Kadesh, might claim to be 'like Seth great-of-strength; like Sekhmet in the moment of her rage'."
>
> — Joyce Tyldesley (2010), *The Penguin Book of Myths and Legends* (§: Sekhmet and the Destruction of Mankind, pg. #)

(add)

Destruction of humans

See main: Destruction of mankind

Sekhmet, famously, was the goddess sent to destroy humankind for their sins against the gods; the following is a recent synopsis of this myth:

A depiction (Ñº) of **Sekhmet** killing the wicked humans, with the flames from her mouth, the flames being the metaphor of the destructive heat of the sun, in a period of too much sunlight, too little rain or water.

> "The most famous myth in which Sekhmet plays a part was that of the destruction of mankind. In the primordial past, when Ra ruled over the creation, mankind began to act out against the gods. Their behavior became very bad, and they forgot to care for the gods' temples. Ra

became incensed over this behavior, and summoned his daughter, his Eye, Sekhmet. ‘Sekhmet’, Ra said ‘I wish you to go down to earth and teach mankind a lesson. I want them to cease their ill behavior and return to worship of the gods.’ Sekhmet nodded, and took off for earth. As one of Ra's eyes, she brought with her the fire of the sun, scorching the earth as she passed by. She began burning mankind and all his works, destroying everything as she passed. This continued for some time, until Ra became worried that Sekhmet would annihilate all of creation. Ra summoned Thoth to his side, to ask for his counsel. ‘Thoth, what can I do to stop Sekhmet from destroying mankind completely?’ Ra asked. ‘She is so fierce and free with her fire that I fear there will be nothing left.’ Thoth answered, ‘I have an idea’. Thoth went to earth, and **crafted a lake filled with blood and beer**. He lured Sekhmet to the lake, and watched as she began to drink. As she drank the lake down, she became drunk and sleepy, eventually falling into a deep sleep. Thoth summoned Ra, and together they returned Sekhmet to the heavens. Thus, mankind was saved from destruction.”

— Michael Starsheen (2018), *Tales of Egyptian Gods* (pg. 132)

(add)

Osiris and storm

Sekhmet, in another myth, saved Osiris on the night of “some great storm” that hit Egypt; this reads as follows:

“Oh Hapi, great one [flood prince] of the sky, in your name of ‘the sky is safe’, may you grant that I have **power over water like Sekhmet who saved Osiris on that night of the storm**. Behold, the elders who are before the throne of abundance have sent me to just as that august god **whose name they do not know** sent them, and they send me likewise. My nostrils are opened in Busiris, I rest in Heliopolis, my house is what Seshat (Ñº) built form me, Khnum stand up for me on his battlements. In the sky comes with the north wind, I will dwell in the south; if the sky comes with the south wind, I will dwell in the north; if the sky comes with the west wind, I will dwell in the east; if the sky comes with the east wind, I will dwell in the west. I will pull the skin of my nostrils, I will open up at the place where I desire to be.”

— Anon (c.1375BC), “§57: Chapter for Breathing Air and Having Power of Water in God’s Domain”, Egyptian Book of the Dead, Theban recension (translator: Raymond Faulkner) [1]

“Ra crowned Osiris with the atef-crown in the Heliopolitan Nome, but the crown's powerful heat was such that it caused the new king to fall ill; its effects were so long lasting that after the ceremony, Ra found Osiris sitting in his house, his face all swollen. It was an inauspicious start to his reign, but Osiris quickly gained the reputation of being a great and benevolent king; indeed, he was well prepared for the job, having served as vizier, chief priest of Heliopolis and royal herald before inheriting the crown. And, standing 8 cubits, 6 palms and 3 fingers tall (about 4.7m or 15.4ft), he could certainly intimidate any enemies on the battlefield. His reign is described as a time of prosperity, when all resources were well controlled and the land was stable. Life was good, the disordered waters of Nun were kept at bay, the cold north wind blew (something particularly longed for in the fierce Egyptian heat) and animals procreated. Conspirators were crushed and Osiris was respected among the gods. In fact, the only significant problem faced by Osiris during his early reign happened when, **one night, a storm hit Egypt and the goddess Sekhmet had to save him using her power over water**.”

— Garry Shaw (2014), *The Egyptian Myths* [2]

“In later legend, according to Diodorus (c.30BC) and Plutarch (100AD), the establishment of various social structures and customs was attributed to Osiris during his reign. Plutarch relates how, as king, he taught the Egyptians how to cultivate the land; he also gave them laws and taught them to honor he gods. Osiris, according to Diodorus, did many good deeds for the social life of mankind, for a start, by making them give up cannibalism, since Isis had discovered wheat and barley, they took up eating these instead of each other.

> Isis also established laws, while Osiris built temples to his parents and other gods at Thebes. Both deities honored those who advanced who nurtured the arts and made technological advances. One advance in particular was the development of copper tools, which helped people to kill animals and conduct agricultural activities more effectively. Osiris, according to Diodorus, was the first to invent and taste wine [compare: Dionysus], and he took counsel with Thoth on every matter."
>
> — Garry Shaw (2014), *The Egyptian Myths* [2]

(add)

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Further reading

â— Shoup, John A. (2017). *The Nile: an Encyclopedia of Geography, History, and Culture* (Sekhmet, pg. 122). ABC Clio.

External links

â— Sekhmet – Wikipedia.

θΔics

In existographies, **Seleucus** (c.190-120BC) (IQ:170|#25) was a Greek philosopher and astronomer, a follower of Aristarchus, noted for []

Quotes | On

The following are quotes on Seleucus:

> "**Seleucus** stated that the world is infinite."
>
> — Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* [1]

> "We know from a report in Archimedes that Aristarchus of Samos, working around 280BC, produced a set of what Archimedes calls hypotheses that included the propositions that the fixed stars and the sun remain unmoved and that the earth is borne round the sun on the circumference of a circle. The status of these hypotheses is a matter of some controversy. Plutarch contrasts Aristarchus' position, which he represents as the mere 'hypothesizing' of the idea of the earth's movement, with that of **Seleucus** who, Plutarch says, also 'asserted' it."
>
> — G.E.R. Lloyd (1970), "Hellenistic Science" [2]

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2. (a) Archimedes (c.247BC). *The Sand-Reckoner* (1.4ff, 218 7ff). Publisher.
(b) Walbank, Frank W. and Astin, A.E. (1970). *The Cambridge Ancient History, Volume 7, Part 1: the Hellenist World* (§9a: "Hellenistic Science", 321-46; quote, pg. 339). Cambridge University Press.

External links

â— Seleucus of Seleucia – Wikipedia.

θΔics

In terminology reform, **self terminology reform**, or “self terminology upgrades”, refers to the noted finding that the use of the prefix *self*-, e.g. self-driven, or suffix -*self*, e.g. itself or oneself, as pointed out by Karl Pearson (1892) is a violation of the principle of inertia, therefore by using related terms such as self-motion, self-organization, self-learn, etc., one is in conceptual violation of one of the laws of nature, according to which inertia neutral terms such as "auto" are preferred. [1]

> “**I am an automaton** endowed with power of movement, which merely responds to external stimuli beating upon my sense organs.”
>
> — Nikola Tesla (1900), “The Problem of Increasing Human Energy”

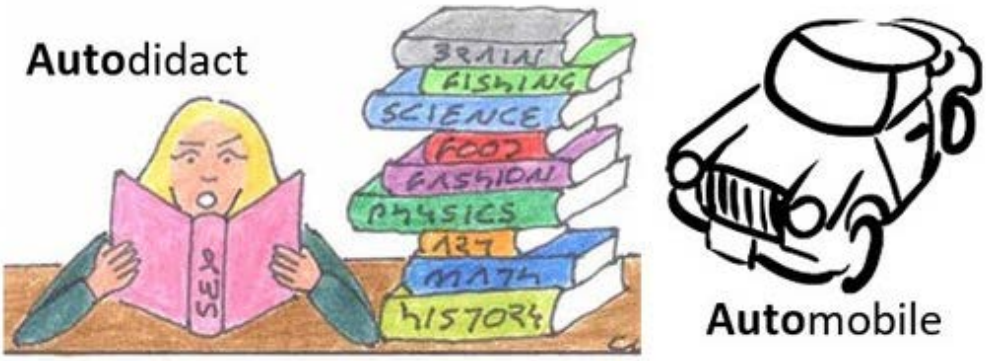

An “**auto**didact”, an “**auto**mobile”, and “kinesin”, a motor protein that converts the energy from ATP hydrolysis into mechanical work to drive movement along microtubules in a variety of cellular processes such as organelle transport and cell division (Ñº), i.e. it **auto**matically begins to walk and carry cargo when powered by energy released from ATP. Here, we see examples of the term “auto” functioning, in accordance with the principle of inertia, in a workable manner, in the sense of Nikola Tesla’s “I am an automaton with the power of movement” (1900), as a preferable upgrade to all “self” terminology usages.

(add)

Overview

In c.600BC, Buddhism thinkers, in their concept of “anatta” (Ñº), developed the premise that the self or soul does NOT exist; which contrasts with Hinduism, which asserts that the atman (self, soul) exists.

There is an inherent, subtle, and difficult to detect error-filled red-flag evident whenever a writer uses the term "self", e.g. "I am going to do this myself", or prefix "self-", e.g. "can a system be self-organizing?" (Ashby, 1962), in argument, per reason that the the premise of a self as the source of motion is a violation of a principle of inertia and in term the first law of motion; the following correct statements testify to this:

> “No ‘thing’ whatever can be moved by its **self**, but its motion is effected through another. There is no other force.”
>
> — Leonardo Da Vinci (1490), notebook writings

> “No **thing** starts moving until it is pushed or pulled.”
>
> — Kimberly Bradley (2005), *Forces Make Things Move* (pg. 6) (kids: aged 5-9) (Ñº)

One not keen to the principle of inertia land the first law of motion, accordingly, will tend to produced statements and arguments not in accordance with the laws of motion of things, such is evidenced in the writings of, creationism scientists, such as Christopher Langan (2002), who uses the prefix “self-” 13 times in his abstract alone, e.g. self-configuring, self-configuration, self-containing, self-characterized, self-definition, etc., to promote his god theory based self-motion agenda.

[5]

Auto-motion | Self-motion

One can ask, to clarify the matter, do the following three CH-based animate things, which are smaller versions of humans, as carbon-based animate things, have a "self"?

CH-based Animate Thing	Movement
Retinal | $C_{20}H_{28}O$ | **Light**-powered Bending 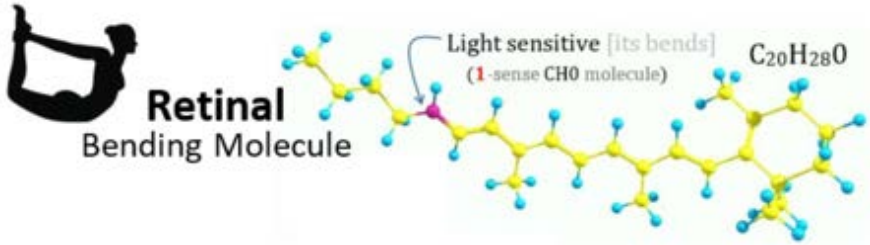	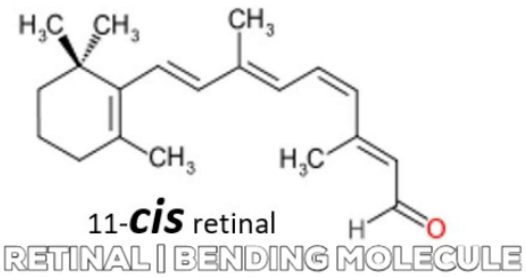
DTA | $C_{14}H_{10}S_2$ | **Heat**-powered Walking 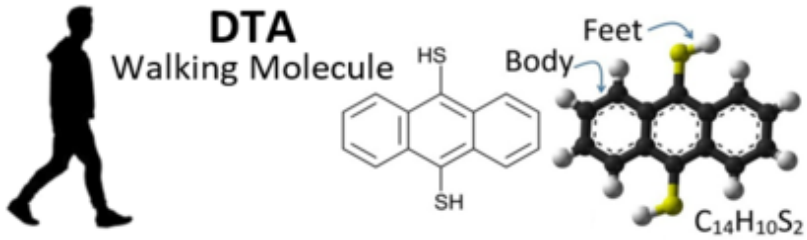	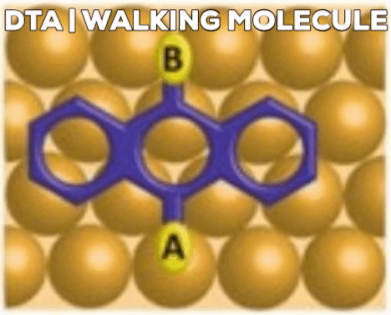
AQ | $C_{14}H_8O_2$ | **Heat**-powered Carrying 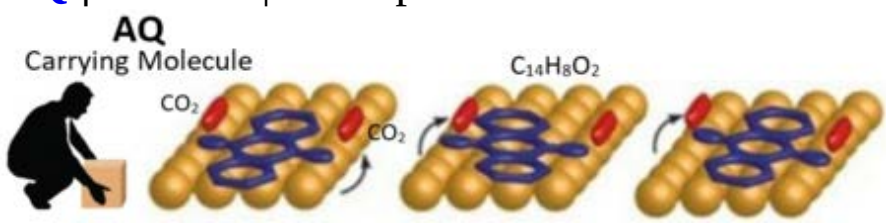	

When, as we can say correctly, the retinal is lighted or the DTA or AQ is heated, each enters into a state of "automotion" rather than self-motion. This logic is evident in the writings of Tesla:

> "To me, the universe is simply a great machine which never came into being and never will end. The human being is no exception to the natural order. Man, like the universe, is a machine. **Nothing enters our minds or determines our actions which is not directly or indirectly a response to stimuli beating upon our sense organs from without.** Owing to the similarity of our construction and the sameness of our environment, we respond in like manner to similar stimuli, and from the concordance of our reactions, understanding is born. In the course of ages, mechanisms of infinite complexity are developed, but what we call 'soul' or 'spirit,' is nothing more than the sum of the functionings of the body. When this functioning ceases, the 'soul' or the 'spirit' ceases likewise."
>
> — Nikola Tesla (1935), "A Machine to End War"

Here, Tesla, in stead of claiming that he is a "self-moving" thing, which violates the laws of motion, correctly, says that he his an "auto-maton" stimulated into motion by sensory forces, external to his being or mind. The following is a related

quote:

> “Possibly ‘auto-learn’, akin to ‘auto-mobile’ or ‘auto-matic’, is a physico-chemically neutral term upgrade to ‘**self**-learn’, the latter of which being a violation of the principle of inertia; similar to the way auto-didactic is preferable to **self**-education.”
>
> — Libb Thims (2017), mental wake up note, on **self terminology reform**, arisen while ruminating on the credentiality insecurities of Sam Harris, salient in his 2009 heated ‘atheist vs atheist’ exchange with Philip Ball (Ñº), which brought to mind that quote [by name] of the premise that “nothing can be learned by a professor that cannot be better learned by books”, 1:17PM Jun 10

Here, we see, via the Tesla and Thims examples, that "auto" is a preferable terminology upgrade to "self", when functionable. We can say correctly that one can write an auto-existography (or autobiography, in bioism speak), but not a self-existography.

Quotes

The following are related quotes:

> “That when a **thing** lies still, unless somewhat else stir it, it will lie still forever, is a truth that no man doubts of. But that when a thing is in motion, it will eternally be in motion, unless somewhat else stay it, though the reason be the same, namely, that **no thing can change it self**, is not so easily assented to. For men measure, not only other men, but all other things, by themselves; and because they find themselves subject after motion to pain, and lassitude, think everything else grows weary of motion, and seeks repose of its own accord; little considering, whether it be not some other motion, wherein that desire of rest they find in themselves, consistent.”
>
> — Thomas Hobbes (1651), *Leviathan* (§2: On Imagination) (pg. 3)

> “There is, for example, the principle of inertia, the statement that no physical corpuscle need be conceived as changing its motion except in the presence of other corpuscles, that there is no need of attributing to it any power of **self-determination**. There are probably those who think some power of self-determination must be ascribed to the elementary organic corpuscle, but this seems very doubtful.”
>
> — Karl Pearson (1892), *The Grammar of Science*

> “The adjective [**self**-organization] is, if used loosely, ambiguous, and if used precisely, self-contradictory.”
>
> — Ross Ashby (1961) [2]

> “Can a system be **self**-organizing? The answer is no. No system can permanently have the property that it changes properties.”
>
> — Ross Ashby (1962) [3]

> “No organism reproduces *itself*. The only thing that ever has had such a claim made for it was the phoenix.”
>
> — Ross Ashby (1962),“The Self-Reproducing System” [4]

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θΔics

In science, **self-** (TR:116) is a "loaded" — anthropomorphically, philosophically, or religio-mytholgically — prefix used in the characterization of the supposed-to-be behaviors of so-called "living", things, systems, or entities, particularly humans, which are said to be in possession of "self-motion" and thus able to self-organizing, self-reproducing, self-renewing, self-generating, self-sustaining, self-maintaining, self-replicating, self-creating, among numerous other terms, all of which amount to claims of perpetual motion (of the living kind) (or chemical kind) and which are views contrary to the principle of inertia.

The

Grammar of Science

BY

KARL PEARSON, M.A., F.R.S.

PROFESSOR OF APPLIED MATHEMATICS AND MECHANICS
UNIVERSITY COLLEGE, LONDON

SECOND EDITION, REVISED AND ENLARGED.
WITH 33 FIGURES IN THE TEXT

"La critique est la vie de la science"
COMTE

LONDON
ADAM AND CHARLES BLACK
1900

In 1892, Karl Pearson, in his *Grammar of Science*, gave the first disproof of the premise of the existence of a "**self**-determined" system via use of the principle of inertia. [17]

Disproof | Principle of inertia

In 1892, English mathematician-physicist Karl Pearson gave the first disproof of the premise of the existence of a "self-determined" system using recourse to the principle of inertia as follows: [17]

> "We cannot at present assert that the peculiar atomic structure of the life-germ and its *environment*, or field (p. 286), would not be sufficient to enable us on the basis of the laws of atomic motion to describe our perceptual experience of life. Such a broad generalization as that of the conservation of energy does not appear to be contradicted by our experience of the action of living organisms; but then the conservation of energy is not the sole factor of mechanism, as some fetish-worshippers nowadays imagine it to be. There is, for example, the principle of inertia, the statement that no physical corpuscle need be conceived as changing its motion except in the presence of other corpuscles, that there is no need of attributing to it any power of **self-determination** (p. 287). There are probably those who think some power of self-determination must be ascribed to the elementary organic corpuscle, but this seems very doubtful. Placed in a certain field, environed with other organic or inorganic corpuscles, the life-germ moves relatively to them in a certain manner, but there seems no reason to assert (indeed there are facts pointing in the exactly opposite direction) that any change of movement need be postulated were the life-germ entirely removed from this environment. Indeed the whole notion of self-determination as an attribute of living organisms seems to have arisen from those extremely complex systems of organic corpuscles, where the environment in the form of immediate sense-impressions determines change through a chain of stored sense-impresses peculiar to the individual or self (p. 124)."

Einstein, who read Pearson, would later (1921) seem to employ Pearson's "sensory impression" logic in response to queries to him about the existence of the soul and and personal, individual development after death (see: Einstein on the soul).

Self- | Issues

See main: Self terminology reform

In 1961, Ross Ashby noted that: "the adjective [self-organization] is, if used loosely, ambiguous, and if used precisely, self-contradictory". [18] On the question of organization, Ashby is quoted as asking the question: "can a system be self-organizing?" To which he answers: "no system can permanently have the property that it changes properties." [19] The following is another representative view:

> "No organism reproduces *itself*. The only thing that ever has had such a claim made for it was the phoenix."
>
> — Ross Ashby (1962),"The Self-Reproducing System" [20]

In 2009, Ronald Fox, in communication with Libb Thims, and also in his treatise *Energy and the Evolution of Life* (1983), attempted to explained why the prefix "self-" must be carefully used. Energy, for instance, drives processes that are structurally "self-replicating" like RNA molecules inside a vesicle. Likewise, according to Fox, self-assembly of membranes is almost “self-”, but is driven by the release of entropy. [21]

Difficulties | Perpetual motion

The idea that chemical systems (as all earth systems are) self-assemble, self-reproduce, or self-maintain, etc., is paramount to a description of working perpetual motion machine. The terms are not used in standard chemistry theory, yet are paradoxically used in biology. When hydrogen and oxygen atoms are mixed together and they form water:

$$2H_2 + O_2 \rightarrow 2H_20$$

We do not say that the reactants “self-assembled” to form the products of water, but rather a chemical reaction occurred. This would be the case even if the reaction was heated (such as are human reactions via solar heat), which only effects the activation energy. What seems to be the case is that the term “self-” is used in biology, as convoluted way to introduce a free will and choice into the discussion evolution, which of course is an incorrect view. In general, to a good approximation, any discussion that employs the prefix term “self-” amounts to what is camouflaged perpetual motion theory or in technical terms "perpetual motion of the biological kind", the last of the perpetual motion theories.

Self motion

In 1490, Leonardo da Vinci, in his notebooks, moved from simply describing inventions to a more intense search for underlying principles, the laws of motion, in particular. In respect to what Newton would later categorized, in 1687, as the first law of motion, Da Vinci wrote: [11]

> “No 'thing' whatever can be moved by itself, but its motion is effected through another. There is no other force.”

In c.1675, English physicist Isaac Newton, in his personal communications on religious alchemy, speculated on the notion of "self motion" as follows: [16]

> “God who gave animals self motion beyond our understanding is without doubt able to implant other principles of motion in bodies which we may understand as little. Some would readily grant me a spiritual one; yet a mechanical one might be shown.”

Here, Newton vacillates on whether motion of animals is mechanical or spiritual; whereas da Vinci, by comparison, hits the nail on the head: no thing whatever, humans included, can be moved by its self.

Self-intensification | Cooling | Perpetual motion

The story of American engineer Charles E. Tripler (1849-1906) and his 1897 invention of the “liquid air machine”, a type of steam-driven machine able to liquefy air in large quantities, exemplifies the usage of the prefix self and perpetual motion. Tripler posited that:

> “Liquid air is a new substance that promises to do the work of coal and ice and gunpowder at next to no cost.”

Tripler's machine worked, but, in the words of American low-temperature-physics historian Tom Shachtman, he knew so little of chemistry and physics that his understanding of the principles of operations led to over-the-top claims, such as his assertion that he had fed 3 quarts of liquid air into his machine, and because of cold's ability to produce additional cold through evaporation (Joule-Thomson effect), he had been able to obtain 10 quarts of liquid air from the energy provided by the original 3 quarts. As summarized by Shachtman: [10]

> "The ability to use a liquid's own coldness to make a portion of it colder, though at the cost of warming the rest, was something James Dewar liked to demonstrate, but Tripler's understanding of what he called '**self-intensification**' of cold was faulty, and pushed him to the equivalent of a claim of perpetual motion."

(add)

Self-assembly | Neumann automaton theory

In 1949, Hungarian-born American mathematician John Neumann famously described his automaton self-assembly theory using the picture of a parts floating on a lake out of which an automaton could self-replicate itself. In more detail, in a late 1940s Hixton Symposium, organized by American chemical engineer Linus Pauling, Neumann invented a famous thought experiment which illustrates the role which free energy plays in creating statistically unlikely configurations of matter. Neumann imagined a robot or automaton, made of wires, electrical motors, batteries, etc., constructed in such a way that when floating on a lake stoked with component parts, it will reproduce itself (self-replicate). The important point about Neumann's automaton, however, is that it would require a source of free energy in order to function. [1]

Self-organization | Dissipative strutures

See main: Self-organization

The most cited book in all of the various self-terms is Belgian chemist Ilya Prigogine's 1977 book *Self-Organization in Non-Equilibrium Systems: from Dissipative Structures to Order through Fluctuations*, a book whose credibility was strengthened by the win the Nobel Prize in chemistry that same year. [2] Frank Schweitzer's 1997 bibliography of books on self-organization indicates that Prigogine's book opened the floodgate. [3]

Self-organized criticality

The most-dominant keyword in the 2006 book *Weak Links*, by Hungarian biochemist Peter Csermely, on the subject of social, economic, biological (e.g. proteins), and ecological weak links, is 'self-organized criticality', introduced in 1987 by Danish theoretical physicist Per Bak, associated with a set of events involving sand piles or rice piles, referred to as a 'rather loosely defined concept, describing a phenomenon in which, in a network with restricted relaxation, a gradual increase in tension is followed by sudden avalanches. [8]

Self-generating

In 1988, American physicist Ronald Fox used thermodynamics to argue that life is a "self-generating and self-sustaining" system. [4] In the same vein, Fox also states that life is "dependent" on the energy of the sun. One cannot, however, be self-sustained if one is vitally dependent or rather driven by an external supply. The latter supposition contradicts the former.

Self-catalyzed reproduction | Dead molecular species

In 1995, American biochemist Stuart Kauffman put forward a popular theory of catalytic closure (or auto-catalytic closure) in which, as he argues, at a certain threshold of molecular diversity in the course of the evolution of a system that a collection of molecular species can suddenly become "alive". In his own words: [5]

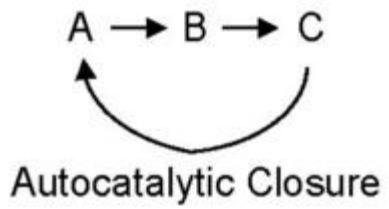

A rendition of Stuart Kauffman's 1995 auto-catalytic closure mechanism, which he

employs to the "catching fire" start of the origin of life.

> "If a sufficiently diverse mix of molecules accumulates somewhere, the chances that an autocatalytic system—a self-maintaining and self-reproducing metabolism—will spring forth becomes a near certainty … life, at its roots, lies in the property of catalytic closure among a collection of molecular species. Alone, each molecular species is dead [see: dead molecule]. Jointly, once catalytic closure among them is achieved, the collective system of molecules is alive."

In short, what Kauffman argues is that reactions such as:

$$A \rightarrow B \rightarrow C$$

in which one of the end products C acts as a catalyst to one of the initial reactants A, can be described as being auto-catalyzing or self-catalyzing and are thus the prototypes of life. This is one of the better "self-term arguments", but is still paramount to a biological perpetual motion reaction or mechanism. Moreover, there is no such thing a an "alive molecule". [6]

Thermodynamic self-organization

In 1997, Russian physical chemist Georgi Gladyshev, in his book *Thermodynamic Theory of the Evolution of Living Beings*, devoted a half-page appendix section to what he called "thermodynamic self-organization", which he defined in short as the spontaneous ordered joining of the structures of the *i-th* heirarchy into the structures of the *(i+1)-th* hierarchy. [11] This type of term, however, is but contrary to thermodynamics itself, according to the first law and second law are the back bone to the disproof of perpetual motion.

Self-caused | Self-agency

In 2002 American philosopher Christian de Quincey, in his book *Radical Nature*, uses the "extrapolate downward approach" (apply anthropomorphism to explain chemistry and physics), compared to the "extrapolate upward approach" (apply chemistry and physics to explain human behavior). To give an example of this, de Quincey states "as we know it to be certainly true, consciousness and the ability to make choices exist in our own case, then we can generalize and say that consciousness and choice exist at the macro level [and micro level]", and say that "some entity, say an electron or photon, is exercising its self-action, free will, or choice in how it will move." [12] The use of the term "self-caused" is cited as a coinage of American philosopher Arthur Young, who argues that the actions of subatomic entities, such as electrons, are self-caused, in a quantum mechanical or photonic sense, somehow. [13] De Quincey, to note, also employs terms such as "self-agency" and "self-motion" in attempts to explain human feelings and the human mind in the context of what he considers the standard model of what he calls the "dead" universe. De Quincy, in short, uses the extrapolate downward approach to argue, in short, that since people are perceived to be self-moving that so to must fermions and bosons be sentient and and self-moving: [12]

> "If the universe is not 'dead', if it is not simply a huge mechanical system running according to a handful of laws at work in a vast ocean of chaos then it is in some sense 'alive'. A more accurate term would be 'sentient'—an inherent capacity for feeling or experience. In other words, to make explicit the main argument of the book: the matter of the universe, its raw stuff or ingredients, has within itself the essence of what we call 'consciousness.' There is something about matter itself, some quality or property, some intrinsic principle, that *moves matter from within*, an automotive urge toward **self-**organization, evolution, and complexity. In short, matter feels and moves itself. It doesn't require external forces pushing and pulling it."

The argument here amounts to the claim that perpetual motion exists and typifies the general type of convoluted and recursive style of argument authors tend to use when the term "self-" is employed, namely to substantiate antiquated

models of human existence, such as free will and choice, in modern disguise.

Self-renewal

In 2002, American physicist Jack Hokikian stated that the cells in the pancreas get replaced every 24 hours, the stomach lining every 3 days, and the white blood cells every 10 days; and then cites Austrian-born American theoretical physicist Fritjof Capra in stating that "this mechanism of self-renewal is often called self-organization." [7]

Self-creation

American chemist and physician David Alkek argues, in his 2007 book *The Self-Creating Universe*, that the universe, life, and human societies have a purpose in a new-paradigm "law of increasing complexity", a complexity theory law counter to the second law (he defines as the law which predicts progressive disorganization), which instills a "self-development" (self-creation) of increased form, organization, and complexity. He introduces the term "ipsa-creation" to define the self-development of the "unfinished universe". [9]

Self-generation

In his 2009 *Nature* article "Is Free Will and Illusion?", German neurobiologist Martin Heisenberg argues that because some fundamental processes in the brain, like the opening and closing of ion channels and the release of synaptic vesicles, occur supposedly at random, thus supposedly not determined by environmental stimuli that behavior can be considered as "self-generated", which forms the basis for free will. [15]

Self-drive

In 2011, in defense of his genopsych anti-entropy theory, Indian chemical engineer DMR Sekhar promotes a "self drive" theory of human motion, which he says is *not* a type of perpetual motion because: "a human uses his or her internal biological energy and their will, but this is not same as perpetual motion machine, because a human takes in food from external environment to accumulate and or store internal biological energy". [14]

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θΔics

In theories, **self-motion** or "self-drive" posits that animals and humans, unique among matter of the universe have the property of motion from within; distinct, aloof, or outside the operational definitiveness of the standard laws of motion.

The 1994 multi-author book *Self-Motion: from Aristotle to Newton*, edited Mary Gill and James Lennox, which Cubin-born American philosopher Alicia Juarrero cites as being 'indebted to', in regards to her emergence dissipative structures based "action theory". [5]

History

The predominant concept of self-motion, historically, derives from the work of Greek philosopher Aristotle. [5]

Da Vinci

In 1490, Leonardo da Vinci, in his notebooks, moved from simply describing inventions to a more intense search for underlying principles, the laws of motion, in particular. In respect to what Newton would later categorized, in 1687, as the first law of motion, Da Vinci wrote: [11]

> "Nothing whatever can be moved by itself, but its motion is effected through another. There is no other force."

(add)

Cavendish's critiques

In 1664, English philosopher Margaret Cavendish (1623-1673), in her *Philosophical Letters: or, Modest Relfections upon some Opinions in Natural Philosophy, Maintained by Several Famous and Learned Authors of this Age*, critiqued of some of French philosopher Rene Descartes' 1637 discourses, particularly his metaphysical system of dualism describes two kinds of substance: matter and mind. According to this system, everything that is "matter" is deterministic and natural—and so belongs to natural philosophy—and everything that is "mind" is volitional and non-natural, and falls outside the domain of philosophy of nature.

Cavendish concludes, in her review, in a very long-winded explanation, that animate matter has **self-motion**, inanimate matter does not, but that all matter of the universe is a commixture of the two, part animate and part inanimate, such that the animate is moving and the inanimate moved. [1] Cavendish, in general, rejected the work of Aristotle and mechanical philosophy and tended to engage in criticism, not only with Descartes, but with Thomas Hobbes and Robert Boyle.

Newton

In *circa* 1674, English chemical-physicist Isaac Newton stated the following in his philosophical query notes: [2]

> "God who gave animals **self motion** beyond our understanding is without doubt able to implant other principles of motion in bodies which we may understand as little. Some would readily grant this may be a spiritual one; yet a mechanical one might be shown."

This assertion by Newton, of course, is the *circa* 500 BC Bible which, at least for the Christian faiths, holds that the soul must be weighted based on the self-determined "choices" of each individual, choices that, in turn, are presumably to result in self-motion.

The views of the Bible, in turn, originated from the older Egyptian religion-science Anunian theologies (Ra theologies), which

presently dominate the belief systems and thinking mindsets of ¾-ths of the world, according to which the actions resulting from a person's choices dictate the end reaction existence weight of his or her moral value, which goes by the term "soul" (Ab-ra-ham-ic theologies) or "karma" (B-ra-hma-ic theologies), depending, and is a value said to determine the fate of the person into the afterlife—the original theory model of which is frame-worked in the Egyptian model of the weighing of the soul and the negative confession.

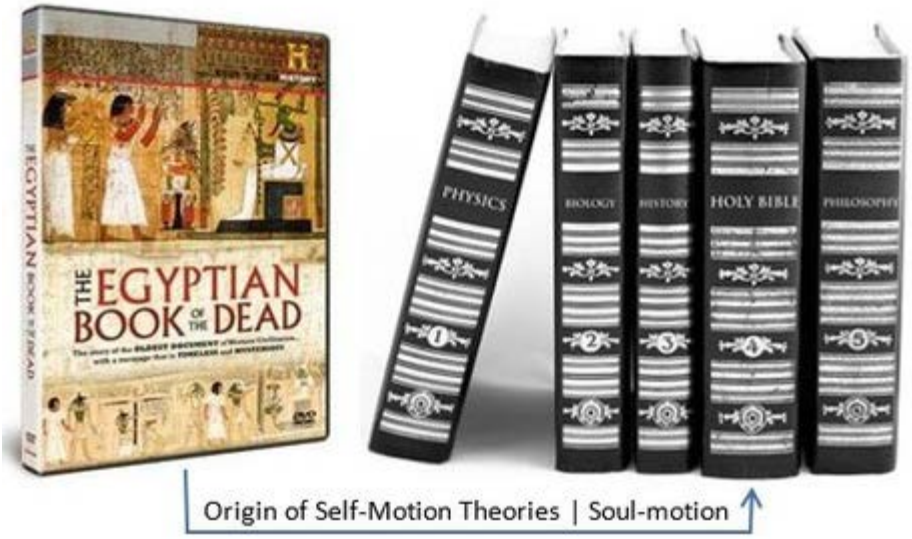

The Egyptian clay creation myth, wherein Khnum puts the ka into the clay figuring, and the ba goes into the heart, two of the main five parts (Ñº) of a person, according to Egyptians, in some way gave birth to the majority of modern self-motion theories derive, in the sense of "motion" originating from the either the ka or ba inside of the heart.

Hence, Newton, embedded in a time dominate religious-centric culture; is forced to relegate the question of human motion to a footnote of undecidedness; but quite readily goes on to explain both chemical motion and planetary motion.

Leibniz

In 1714, German polymath Gottfried Leibniz, in his *Monadology*, extended Giordano Bruno's 1584 concept of 'monads', in which universe consisted of an indefinite number of indivisible units, but defined such that each indivisible monad is primarily a center of force or action; he, supposedly, updated Bruno's concept of self-motion of matter soul; with the term "force".

Meslier

In 1729, Jean Meslier, in his *Testament* (pg. 365), gives some good discussion on matter being moved by itself or by a moving force as an atheistic replacement for the "partisans of the system of creation".

De Quincey | Panpsychism | Self-motion

In 2002, American philosopher Christian De Quincey, in his *Radical Nature*, embarked on a dead matter vs self-motion polemic, which he repeats in about a half-dozen sections; as follows: [7]

> "By 'mechanical', I mean matter that is moved about entirely by external forces—for example, the colliding and ricocheting of atoms like so many billiard balls, or even the invisible fields of force pushing and pulling matter through its gyrations. In a purely mechanical universe, all motion of matter is caused from without, there is no possibility of ***self*-motion** and therefore no possibility of aim or purpose."
>
> — Christian de Quincey (2002), *Radical Matter* (pg. 17)

Here, to correct things, de Quincey should be employing the chemistry set model, instead of the billiard ball model.

> "The universe is either already 'dead' or it is meaningful. If it is 'dead' in this sense of being wholly mechanical, without any intrinsic capacity for **self-motion** and feeling, then all instances of life and consciousness in the universe are ultimately insignificant evolutionary by-products. If this is true, then the

universe would be essentially meaningless, it would be 'absurd', just as the existentialists Sartre and Camus said. All meaning would be contingent, created by minds that themselves arose by chance from blind mechanical collisions of atoms in the void."

— Christian de Quincey (2002), *Radical Matter* (pgs. 37-38)

"For hundreds of years we lived in a world without a soul, a world made of matter and energy that lacks feeling and **self-motion**, a world without purpose or deep meaning. This, at least, is the complicated tale told to us by modern philosophy and science. Our culture's dominate story, our materialist worldview and big bang cosmology, cannot account for the fact that anything like a storyteller, a conscious, feeling, observing, meaning-seeking being, could ever exist."

— Christian de Quincey (2002), *Radical Matter* (pg. 79)

From here, de Quincey launches into a discussion of self-motion according to Anaxagoras, and some of the other related thinkers, such as: Giordano Bruno, Heraclitus, Pythagoras, Anaximenes, Anaximander, and Thales.

Sekhar | Self-drive theory

In 2011, Indian chemical engineer DMR Sekhar, in defense of his genopsych DNA-centric anti-entropy theory, began to promote a "**self drive**" theory of human motion, which he says is *not* a type of perpetual motion because: "a human uses his or her internal biological energy and their "will", but this is not same as a perpetual motion machine, because a human takes in food from external environment to accumulate and or store internal biological energy".

"I can't stop but laugh at myself when I think that I am not alive or I am not moving myself."

— DMR Sekhar (2011), commentary on Libb Thims' 2009 defunct theory of life and 2004 exchange force motion theory [8]

(add)

Difficulties on theory

Greek philosopher Aristotle was the first dominant thinker to object to self-motion theories; Aristotle's thesis, in regards to motion, is that: [4]

"Nothing moves itself."

To elaborate further, in speak plainly, the central issue, problem, or more-correctly biasing adherence to the notion of self-drive or self-motion is that it is rooted and ingrained very-deeply in the notion of self-determined "choice".

Sekhar, likewise, embedded in a very religious-centric culture in India, 97.4 percent of which is comprised in belief system as follows: Hindu (80.5%), Islam (13.4%), Christianity (2.3%), Buddhism (0.8%), and Jainism (0.4%). Hence, to maintain cultural appropriateness, Sekhar disconnects the "will" from the rest of the universe.

German philosopher Arthur Schopenhauer, a follower of Goethe's chemical philosophy, pointed out in 1816 (see: Goethe timeline) the following correct logic:

"The will, which constitutes the basis of our inner being, is the same will that manifests itself in the lowest, inorganic phenomena."

Sekhar would like to maintain the some semblance of an idea that "humans" (and other things with DNA) are above this rule, by attributing a special metaphysical property he calls "genopsych", or genes with a psyche or mind, to DNA, and even go so far to cobble together an incongruous thermodynamics-sounding theory to bolster his vacuous argument, all to maintain connection to his culture's morality system.

The whole mess is very incongruous, to say the least, with the modern physical sciences—as was long ago pointed out by both Goethe, in his 1809 "moral symbols" physical chemistry morality model and previous to him John Stewart and his 1789 "moral motion" theory. Two-hundred years have since passed and the upgrade has still yet to occur?

The notion of self-motion or self-drive, to give a quick synopsis, goes against: (a) the laws of motion, (b) is a violation of the perpetual motion, namely of perpetual motion of the living kind, (c) is in direct opposition to the modern chemical thermodynamic universal rule that the "free energy" of the system is the driving force of whatever processes may occur, and (d) is in opposition to the external forces view of choice, described by Goethe in 1796 as applicable to the choices of organic existence, human and chemcial.

Universe

The person who would like to maintain a notion of self motion may often not recognize that one is merely a small particle in a vast universe, as shown below, in scaled form. The notion of self motion was discredited long ago by German-born American Albert Einstein who in 1929 stated clearly that human movement was controlled by "forces" intoned in the distance by an invisible piper:

> "Everything [in the universe] is determined … by forces over which we have no control. It is determined for the insect as well as the star. Human beings, vegetables, or cosmic dust—we all dance to a mysterious tune, intoned in the distance by an invisible piper."

The adjacent diagram shows the earth's location, in the structure of the universe, attached to which are human molecules (people), moving about in a curled spin rotative motion in their daily orbitals—just as the earth moves in its yearly orbital about the sun—just as the solar system moves in its 200 million year orbital about the center of the milky way—who all, according to the 1929 views of Einstein are "moved" by forces over which they have no control.

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θΔics

In terminology, **self-organization**, an ontic opening and or anthropomorphic labeled or conceptualized concept, tends to be defined as the spontaneous order arising in a system when certain parameters of the system reach critical values. [8]

The term "self-organization" is a misused and often misconstrued term, using the prefix self-, referring to either hypothetically isolated (or ill-defined) systems or systems subjected to an external energy or heat flux that form patterns through interactions internal to the system, which are also, at the same time, in a contradictory manner, said to do so without intervention by external directing influences. [1] The term is very-often found convoluted together, with ill-conceived thermodynamic or entropy arguments, in efforts to explain biology, particularly complexity and evolution. The classic example of self-organization used is the phenomenon of Bénard cell formation, in which hexagonal shaped structures, comprised of liquid silicone or whale oil atoms and molecules, are said to "self-organize" from a homogeneous fluid system, among themselves, once the oil, after being placed on a hot plate, is heated past a certain Renold's number of heat flow. [2] The term is often confounded together with cybernetics, information theory, and emergence.

Origin of term

In 1943, English neurologist Ross Ashby who reasoned that: [3]

> "An outstanding property of the nervous system is that it is **self-organizing**, i.e. in contact with a new environment the nervous system tends to develop that internal organization which leads to behavior adapted to that environment."

Ashby followed this up with a concise set of principles of self-organizing systems in 1947, postulating that "a machine can be at the same time (a) strictly determinate in its actions, and (b) yet demonstrate a self-induced change of organization." [3] In 1961, Ashby notes that: "the adjective [self-organization] is, if used loosely, ambiguous, and if used precisely, self-contradictory". [3] On the question of organization, Ashby is quoted as asking the question: "can a system be self-organizing?" To which he answers: "no system can permanently have the property that it changes properties." [6] Ashby later convoluted his ideas on brain self-organization together with American electrical engineer Claude Shannon's ideas on information entropy. [7]

In the 1950s, the work of Ashby was being incorporated into the writings of those such as Norbert Weiner. By 1960, the term self-organization was being found convoluted with entropy explanations.

In 1977, Belgian chemist Ilya Prigogine, *Self-Organization in Non-Equilibrium Systems*, mixed together his dissipative structures theory with that of the conception of self-organization. [5] This logic influenced many, such as American biochemist Stuart Kauffman, who in 1995 came to further mixed in a Prigoginean-type far-from-equilibrium thermodynamics logic, such as free energy, into a self-organizing theory of evolution. [6]

Difficulties on term

The idea of self-organization attributes an anthropomorphic sort of free-will and perpetual motion to chemical systems, such that the atoms and molecular species are viewed to "choose" among themselves to assemble into ordered patterns. In contrast, such structures are always "forced" organizations, due to internal quantum electrodynamics, if the system is isolated, or to external force, if the system is closed or open, rather than self-organizations.

A precursory debunking of self-organization ideas was the 1490 debunking of "self-motion" was debunked by Leonardo da Vinci who stated: "nothing whatever can be moved by itself, but its motion is effected through another. There is no other force." Isaac Newton, wrapped up in religious confusion, in circa 1674 stated: "god who gave animals **self motion** beyond our understanding is without doubt able to implant other principles of motion in bodies which we may understand as little. Some would readily grant this may be a spiritual one; yet a mechanical one might be shown."

In 1993, German chemist Friedrich Cramer, in his "The Entropic Versus the Anthropic Principle: on the Self-Organization of Life", a cosmology and philosophy conference proceedings chapter, stated outright and frankly that the

notion of "self-organization" lets the metaphysical into physics (see: ontic openings):

> "With the term 'self-organization' one touches on the metaphysical element of a scientific evolution theory."

This, in Cramer's view, justifies the notion of creation by god, as he sees things, and discusses how he thinks "dead matter" equates to equilibrium. [9]

See also

â— Emergence

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Further reading

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External links

â— Self-organization – Wikipedia.

θΔics

In publications, **self-published** refers to works (books, pamphlets, articles, etc.) that were published at the author's own expense.

Famous self-published works

The following are noted thermodynamics and hmolscience-related pamphlets and books that were self-published:

Pioneer	Publication	Reason

Jean Meslier (1664-1729)	On the day of his reaction existence, three copies, **hand-penned**, i.e. "self-published", of his *The Testament*, were found under his bed. This publication, which cites heavily from Michel Montaigne, launched the French enlightenment, via its influence on Voltaire, etc.	
Sadi Carnot (1796-1832) **Date**: 1824	Printed 600 copies of his *Reflections on the Motive Power of Fire*, at his own expense. One copy was presented before the *Academie*. There was a long and appreciative review of it in one journal, a brief notice in another, and an encomium by Nicholas Clement who recommended it to students. Other than this, it is said, for the next ten years the book went unnoticed.	(add?)
George Green (1793-1841) **Date**: 1828	At age 35, a self-educated miller (read books via the Nottingham Subscription Library), having had almost no formal schooling, he self-published his 1828 "An Essay on the Application of Mathematical Analysis to the Theories of Electricity and Magnetism" (51 copies), wherein starting from the work of Pierre Laplace (IQ=190), he introduced the concept of "potential function", i.e. the potential as a function of Cartesian coordinates V(x,y,z), particularly the potential energy of an arbitrary static distribution of electric charges; the paper, which introduced now-standard mathematical entities, such as Green's function and Green's theorem, is said to mark the start of modern mathematical physics. [4]	Green thought the work wound not be accepted "coming from an unknown individual". [4]
Robert Mayer (1814-1878) German physician and physicist **Date**: 1845	His paper "On the Quantitative and Qualitative Determination of Forces" in which he stated the postulate that "motion is converted into heat", one of the first statements of the conservation of energy, was sent to sent German physicist Johann Poggendorff to be published in his *Annalen der Physik and Chemie*, but was never published nor acknowledged receipt; not deterred, in 1845, Mayer published a small brochure, a fee he paid himself, titled "Organic Movement in Connection with Metabolism", wherein he equated heat with mechanical effect and stated that	Went he went to German physicist Philipp Jolly for consultation, explaining to him his theory that heat is due to motion and that heat and work are equivalent concepts, Jolly had great difficulty accepting this theory, and finally exclaimed: "but if that is true, then water should be warmed by merely shaking it." Mayer left quietly, only to return several weeks later to Jolly's room, exclaiming "and so it is".

	the gas or fluid "serves only as a tool for effecting the transformation of the one force into the other." [2]	This may have been one of the mindset reasons why Poggendorff rejected his first article, and he thus had to self-publish?
Willard Gibbs (1839-1903)	His series of article, were all published in journal of his brother-in-law, basically being self-published.	
Hermann Helmholtz (1821-1894) German physicist and physician **Date**: 1847	His memoir "On the Conservation of Force" ("Uber die Erhaltung der Kraft"), which presented one of the first versions of the conservation of energy (or conservation of force), depending on context, was rejected at Johann Poggendorff's *Annalen*, and he had finally to publish the essay at his own expense.	His proposal of the reduction of all quantities to matter in motion based on the constancy of kraft (force), in a mathematical sense, combined with the Lagrangian tradition of rational mathematics, and then to formally extend the mathematics of the variational principle to heat and electromagnetism was regarded with skepticism as a curious novelty and just another ploy of metaphysics by the natural scientists. [3]
Libb Thims (c.1975-) American chemical engineer, electrical engineer, and thermodynamicist **Date**: 2007	Published his two-volume *Human Chemistry* textbook, at his own expense, ordering a first print run of about 200 copies, of which have slowly been distributed to various key individuals and institutions, worldwide.	Development the subject of "human thermodynamics" was barricaded by the fact that the subject of "human chemistry", the subject of treating humans as molecules, that form and break chemical bonds to each other, in the course of their chemical reactions to each other, was never before presented in a rigorous systematic manner. The presentation and decimation of the subject of human chemistry was an inevitable necessity (as a preliminary to a future subject of human chemical thermodynamics), just as his the subject of "chemistry" a prerequisite to the study of the subject of chemical thermodynamics.

(add discussion)

Quotes

The following are related comments and or quotes:

> "**Self-publishing** is common to other great scientists with novel and original theories, such as French physicist Sadi Carnot, who self-published his 1824 *Reflections on the Motive Power of Fire*, at his own expense, a book that would go on to initiate the science of thermodynamics."
>
> — Libb Thims, American electrochemical engineering thermodynamicist, comment during the Moriarty-Thims debate (2009) [1]

> “I stumbled onto your website by accident but I have to confess this might be one of the most stunning undiscovered intellectual achievements of the 21st century. I have browsed through your wiki and I cannot express how tragic it must be to a man in your position—to be a pioneering thinker yet to be rejected by an uptight academic community with neither the depth nor will to understand your unique work, defending their own turf like dogs. I can only compare you to the many other pioneering heroes of science, Newton (IQ=193-200), Einstein (IQ=160-225), Tesla (IQ=140-310), men who like you blazed own paths but were too victims of their own genius, only to be validated years after their death. Perhaps one day historians will look back and have a chuckle - that the pioneer of enthropology published by a vanity press in a book resembling a third rate romance.”
>
> — Steven Pierce, Canadian mathematical physicist and computer science (2009) [1]

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External links

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θΔics

In hmolscience, **self-Sokal affair** is a publication or argument by someone, the sender, wherein technical concepts are mixed together in a way that deceives the audience, the receiver, into believing the argument of the sender, i.e. that there is truth or validity to the argument, whereas “technically” or correctly, the argument empty, baseless, or nonsense, but covered by enough of a semi-opaque veneer of technical jargon that the sender accepts the central message, unware that it is play on the ignorance of the receiver – the sender, however is also “unaware” that they are committing a Sokal affair, owing to their own ignorance on the technical matters they are employing and discussing, in arguments that are outside their own specialty; the reception of the information passes unnoticed, as truth (or assumed truth), owing to the higher technical proficiency of the sender as compared to the receiver; a Sokal affair commented by someone “unaware” they are doing a Sokal affair.

Econophysics

There are many examples of self-Sokal affairs in econophysics, which result owing to the ignorance of the physicist in respect to economics concepts and or the economics in respect to ignorance of physics; sometimes, however, these take the form of toolism, which are a grade above "self-Sokal affairs", in that some toolisms are in the neighborhood of truth.

Shannon

The infamous 1940 "joke" suggestion by John Neumann for Claude Shannon to call his new information transmission formula by the name "entropy", per the logic that "nobody knows what entropy is, so in a debate you will always have the advantage", has resulted in the greatest number of self-Sokal affairs in the history of humankind.

> “Neither I nor my committee knew the answer. I was not at all satisfied with the answer I gave. That was in 1948 and I continued to fret about it for the next ten years. I read everything I could find that promised to explain the connection between the entropy of Clausius and the entropy of Shannon. I got nowhere. I felt in my bones there had to be a connection; I couldn’t see it.”
>
> — Myron Tribus (1998), reflection on 1948 engineering PhD dissertation examination

Whenever information theory, the mathematics, i.e. Boolean algebra, of sending, storing, or receiving "information", transmitted or stored in the form of bits (0s and 1s), is used "outside" of information theory proper, e.g. communication engineer, cryptography, computer science, etc., self-Sokal affairs tend to grow like weeds. The reason for this is that the so-named "Shannon bandwagon" was the original "Sokal affair", before this phenomena was even categorically named. [1] The following statement by American electrical engineer Perry Marshall, from his *Evolution 2.0: Breaking the Deadlock Between Darwin and Design*, is a prime example of a self-Sokal affair: [2]

> “The math for getting cold is identical to the math for signals getting noisy as you travel away from an antenna. Thermodynamic entropy and information entropy are both irreversible. Cold toast never gets hot, and noise never adds useful content to a signal.”

Marshall, in short, is educated about "electrical engineering" and, supposedly, computer programming, but is thermodynamically ignorant, i.e. electrical engineers don't take courses in thermodynamics, which is the domain of mechanical engineering [course: thermodynamics], chemical engineering [course: chemical thermodynamics], bioengineering [course: bioengineering thermodynamics]. Nevertheless, in the name of solving the god + science problem, he has read somewhere that the "math" for Claude Shannon's information theory is the same as the "math" for Rudolf Clausius' mechanical theory of heat, and hence attempts to sell a dumbed down version of what he has read to sell a "god through bits model of evolution", which allows for reconciliation of his sense of purpose and meaning, albeit completely oblivious to the fact that his entire argument is so far off the rails that it is like a little kid with a crayola set.

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θΔics

In hmolscience, **Selig Hecht** (1892-1947) was a Polish-born American bio-chemist, bio-physicist, and physiologist note for []

Overview

In 1935, Hecht, in his "The Uncertainty Principle and Human Behavior", vacillates on whether, in the post Heisenberg uncertainty principle years, we should now uphold mechanism or vitalism; following is a representative quote: [1]

> "A physical object is something which stays put unless something else starts it going, whereas an animal is something which under any circumstances does what it pleases. Isn't a man a living creature and cannot he do pretty much as he pleases? … Heretofore, even if man entered somewhat into the matter, at least a given cause under a given set of conditions always produced the same effect. But along came Heisenberg with his principle of indeterminacy and apparently destroyed the pure and inevitable relations of cause and effect. On the analytical level of the laboratory, the mind sees things as determined. But in human behavior, in our daily lives, the decision is not simple. To his own mind, the behavior of a man seems to be free and of his own choosing, and all the accumulated moralities of the world exhort him to choose the good and to act righteously on the assumption that he is capable of free choice and action."

A near-complete version of Hecht's article is found in American astrophysicist Alan Lightman's 2000 *Great Ideas in Physics*, section on "Determinism, Free Will, and Ethics." [2]

Quotes

The following are related quotes:

> "In this day [and age], [humanities] problems require for their consideration the cooperation of all the sciences. From the standpoint of society, there is no such thing as the hierarchy of the sciences. All must contribute toward making our civilization what it is, and if physics of late has been occupy in the spotlight, as **Selig Hecht**, professor of biophysics complains somewhat petulantly, it is only because that field has attracted some of our keenest intellects, whereas the social sciences touch too intimately the deepest interests of the controlling powers in society to be permitted that indiscriminate freedom which every theoretical physicists looks upon as his natural birthright."
>
> — Morris Zucker (1945), *The Field Theory of History* [3]

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Further reading

â— Wald, George. (1948). "Selig Hecht (1892-1947)" (pdf) (NAS), *The Journal of General Physiology*, 31(1):1-16.

θΔics

In existographies, **Sellamuthu Prabakaran** (c.1972-) is an Indian-born Columbian mechanical-industrial engineer and financial mathematician, noted for []

Overview

In 2016, Prabakaran, in his "Statistical Thermodynamics of Money: Thermoney", citing people such as: Adam Smith, Elliott Montroll, Paul Samuelson, Victor Yakovenko, Vilfredo Pareto, Bikas Chakrabarti, Edouard Guillaume, Georges Guillaume, Wayne Saslow, and Eugene Stanley, started with the following human thermodynamics variables table, which is a duplicate of Saslow's 1999 table: [1]

THERMO DYNAMICS	$-F$	$-E$	TS	μ	N
ECONOMICS	W (Wealth)	U (Utility)	Ψ (Surplus)	P (Price)	N (#of Goods)

Table 1: Summary of the suggested analogies between thermodynamic and economic systems.

after which, he attempts to make an analogy between economics and thermodynamics to provide a theoretical framework so that economics measurements can determine the functional dependence of the utility U on the economic parameters that specify the state of an economic system.

Education

In 1994, Prabakaran completed his BE in mechanical engineering, at Bharat Institute of Higher Education, Chennai, India, in 2002, he completed his MTech in industrial engineering, Indian school of mines, Dhanbad, India, and in 2007, his PhD in financial mathematics, at Indian Institute Of Technology, Roorkee, 2007, and presently is a professor of financial engineering at Pondificia University Javeriana, Cali, Columbia. [2]

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External links

â— Sellamuthu Prabakaran – Google Scholar.

θΔics

In existographies, **Seneca the younger** (4BC-65AD) (IQ:165|#460) (Cattell 1000:189) (FA:27) (CR:39), aka "Lucius Annaeus Seneca", generally known as “Seneca”, not to be confused with his father “Seneca the elder” (54BC-39AD) (Q), was a Roman stoic philosopher, moralist, statesman, and dramatist, oft-cited in the silent historians problem, noted for []

Overview

Seneca wrote in several areas, including morals, philosophical treatises, meteors, earthquakes, river origins, and on disputes between Epicureans and Stoics. [1]

Quotes | On

The following are quotes on Seneca:

> “Certainly he has sailed, not like Palinurus, but rather like Ulysses, or even better like Plato. This man, who is named Raphael — his family name is Hythloday— has no mean knowledge of the Latin language but is especially proficient in Greek; he has devoted himself to Greek more than to Latin because he has totally committed himself to **philosophy** and he knew that **in that field there is nothing of any importance in Latin except some works of Seneca and Cicero**. Out of a desire to see the world he left to his brothers his heritage in his homeland (he is from Portugal).”
>
> — Thomas More (1516), *Utopia* (pgs. 11-12) [2]

> “There has been a considerable number of those whom history calls ‘atheists’. Leucippus, Democritus, Xenophanes, and others of the Atomistic and Eleatic schools (Q), are said to have been such. In his *Intellectual System*, Cudworth puts into this category **Seneca** and the younger Pliny among the Romans. Since the reformation, such men as: Rabelais, Machiavel, Bruno, Vanini, D'Alembert, Diderot, Buffon, Condorcet, Mirabeau, La Place, Frederic II, and even Pope Leo X, have been charged with atheism.”
>
> — Willis Lord (1875), *Christian Theology for the People* (pg. 67)

Quotes | By

The following are noted quotes:

> “The seeds together in this world of ours, must be confessed in other realms there are still other worlds, still other breeds of men, and other generations of the wild.”
>
> — Seneca the Younger (50 ACM), *Medea* (318); cited by Giordano Bruno (1584) in *On the Infinite, the Universe, and the Worlds* (pg. 205)

> “The afterlife is a very pleasant thing they promise us, but do not prove.”
>
> — Seneca (c.50AD), *Letters to Lucilius* (pg. 102); cited by Jean Meslier (1729) in *The Testament* (pg. 570) [1]

> “Religion is regarded by the common people as true, by the wise as false, and by the rulers as useful.”
>
> — Seneca (c.50AD), attributed; paraphrase of Lucretius; rephrased by Edward Gibbon (Q)

"Fate leads the willing and drags the unwilling."

— Seneca (c.55BC), Epistulae (107.11) (Q); after Cleanthes (c.250BC); cited by Baron d'Holbach (1770) in *The System of Nature* (pg. 102)

"Death is a punishment to some, to some a gift, and to many a favor."

— Seneca (c.55AD) (Q); compare Heinrich Heine (c.1835) on death

"We all have the same birth, the same origin; there is no one who is nobler than another if it is not he who has a better mind and is more capable of virtue and liberal science. Nature bore us all parents allies when it generated us from the same nature and to the same end."

— Seneca (55AD), *Publication*; cited by Jean Meslier (1727) in *The Testament* (pg. 274)

References

1. Seneca. (c.55AD). *Seneca's Morals: by Way of Abstract – to Which is Added a Discourse, Under the Title of an After-Thought* (translator: Roger L'Estrange) (wrote in, pg. vi). Hurst, 1803.
2. Birzer, Brad. (2017). "The Genius of Sir Thomas More" (Q), Jun 22.
3. Meslier, Jean. (1729). *Testament: Memoir of the Thoughts and Sentiments of Jean Meslier* (translator: Michael Shreve; preface: Michel Onfray) (pg. 570). Prometheus Books.

External links

- Seneca the Younger – Wikipedia.

θΔics

In science, a **sense** is one of several input faculties of an animated molecular entity, the five main senses being: sight (37%), hearing (24%), touch (19%), smell (12%), and taste (8%), the percentages being the proportionate ratio a person feels he or she uses their own senses. [1]

SENSE	% of Perception	Messenger Particle
Sight	37	direct photon exchange
Hearing	23.7	indirect photon exchange (air molecules)
Touch	18.9	direct tactile photon exchange
Smell	12	indirect photon exchange (scent molecules)
Taste	8.4	indirect photon exchange (taste molecules)

The five main **senses**: sight (37%), hearing (24%), touch (19%), smell (12%), and taste (8%), the percentages being the proportionate ratio a person feels, according to polled opinion, he or she uses their own senses, shown with the messenger particle or field particle (primary or secondary) that initiates each sense. [1]

Early theories

In 1892, German science philosopher Karl Pearson gave the following synopsis of the main sense theories: [4]

> "Behind sense impressions and their source, the materialists place 'matter'; Berkeley placed 'God'; Kant, and after him Schopenhauer, placed 'will'; and Clifford placed 'mind-stuff'."

Force

The standard model of conscious choice and the idea of the "will" is that (a) conscious choice to act is preceded by a readiness potential by 0.35 to 10 seconds and that (b) readiness potential is preceded by a combination of stored memory potentials (historical sensory inputs) working in unison with immediate sensory inputs, and that (c) sensory inputs are mediated by external forces or exchange forces occurring between a human (or human molecule) and his or her environment. This logic was first stated in 1847 by Irish physicist James Maxwell: [2]

> "The only thing which can be directly perceived by the **senses** is force, to which may be reduced to light, heat, electricity, sound and all the other things which can be perceived by the senses."

In sum, points (a) and (b) show that conscious choice to act is preceded and governed by (c) external electromagnetic forces that impede onto the senses of the body of the human molecule. The subject of "veto action" arises, or the conscious feeling of the choice to cancel a previously made will to act, arises in the relative strengths of competing external forces. This was first stated clearly in German physicist Rudolf Clausius' 1875 mathematical introduction, wherein stated: [3]

> "Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, work is performed."

This is logic is based in French physicist Gustave Coriolis' 1829 principle of the transmission of work which mathematically quantifies every movement as a type of work derived by a force. The example of "movement" in the Libet experiment being the movement of the subject's finger to press a button, which is one of the very simplest types of "models of work" in the study of human movement. In the case of veto action, one external force overrides a previous external force, such that indecision to act or rather a veto of previous intention to act results.

See also

â— Induced movement

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (section: Supramolecular receptors, pgs. 191-95). Morrisville,

NC: LuLu.
2. (a) Maxwell, James. (1847). “Exercise for Hamilton on the properties of matter”, class of philosopher William Hamilton (1788-1856), Edinburg University.
(b) Mahon, Basil. (2003). *The Man who Changed Everything: the Life and Times of James Maxwell* (pg. 25). Wiley.
3. Clausius, Rudolf. (1875). *The Mechanical Theory of Heat* (section: Mathematical Introduction: on Mechanical Work, on Energy, and on the Treatment of Non-Integrable Differential Equations, pgs. 1-20). London: Macmillan & Co.
4. Pearson, Karl. (1900). *The Grammar of Science* (pg. 68). Adam and Charles Black.

External links

â— Sense – Wikipedia.

θΔics

In hmolscience, **sentient**, as compared to "non-sentient", refers to a thing that has sensation; a property peculiar to the domain of powered CHNOPS+ animate things.

Overview

In 2002, Christian de Quincey, in his *Title*, digressed a large extent in attempting to differentiate between "sentient" vs "insentient" division of things. [1]

In 2014, Deepak Chopra, in his debate (Q) with Richard Dawkins, claimed that Freeman Dyson, in one of his works, argued that "atoms have sentience" and or that "atoms have awareness".

Quotes

The following are related quotes:

> "Thus, a nexus of vibrating, non-sentient atoms somehow produced a totally new phenomenon in nature which we call sensation. The puzzling status of sensation in a universe where there are only two basic realities, atoms and space, and if we wished to press home the whole point, we could seriously question the reality of our whole sensor experience, as Democritus did."
>
> — George Strodach (1963), "Introduction to *Epicurus: the Art of Happiness* [2]

References

1. De Quincey, Christian. (2002). *Radical Nature: Rediscovering the Soul of Matter* (sentient, 45+ pgs). Invisible Cities Press.
2. Strodach, George. (1963). "Introduction" (§IV: Sensation and Perception) to *Epicurus: the Art of Happiness* (pg. 19). Penguin, 2012.

External links

- Sentient being – Duhaime.org.

θΔics

Article
Social Equation of State | **Peer Review**
(a JHT submission)

Article | Review versions
â— Original article | Received: 12 Apr 2012 | Pages: 10
â— **Formatted article** | 30 Apr 2013 | Pages: 14 | Format: PDF

Abstract
The formatted abstract of the working draft-article is as follows:

This is a new **JHT peer review stage article**, in the re-formatting and or re-construction stage of development, about which: comments, suggestions, and or criticism are welcome, which can be submitted via: (a) the threads below, (b) comments added into the "this" wiki page, via the EasyEdit button, (c) attachment added to this page, via EasyEdit tools, (d) review posted externally, e.g. in beta wiki, WordPress, Blogger, your own website, etc., or (e) email comments sent to JHT editor Libb Thims directly *via* libbthims@gmail.com, which will be made public.

A social system, as a set of people, is considered as a set of human molecules contained in a system and social human behavior, called as 'state' of the social system, is modeled from a physico-chemical approach. On the universality of statistical physics, a *social* equation of state is derived and correlated to the degree of dissatisfaction and or satisfaction with the political, economic, cultural, and social rules of the given system. The social state equation is first presented for a hypothetical social system of non-interacting people. The terms social 'pressure', 'freedom', and 'excitement' are defined as a measure of different social rules, individual rights, and personal motivation, respectively. The proposed social state equation is then extended to real social systems containing interacting people. The human interactions are divided into two parts: the strong family interactions and average societal interactions. These interaction contributions to the proposed state equations have been considered based on a statistical thermodynamic approach. The proposed social state equation is then used to derive an expression for social entropy changes.

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Received: 12 Apr 2012; *Reviewed:* 26 Dec 2012 - 29 May 2013; *Published:* 31 Dec 2013

Review period | Result
The main review period started 30 Apr 2013 and closed on 31 May 2013. The article was approved and published (pdf) on 31 Dec 2013.

Editorial issues

Formatting | Other

Libb Thims | 20 Dec 2012 | **Email**

FQ1. Mohsen, I have re-formatted your article up to your equation 6, which does not match up with the formatted derivation equation 7 (see formatted PDF above). Please explain derivation step, below, further so that I can see what I am missing (20 Dec 2012) (fixed✓ @ 30 Apr 2013).

FQ2. Mohsen, please fill in N1 and N2, shown in formatted version (fixed✓ @ 30 Apr 2013).

Peer review

Reviews | **Review board** | Other

Curtis Blakely | 26 Dec 2012 | **Email**

Comments: "Just a few observations - first, I liked the paper and its position. The author's observations are on target and he is absolutely correct in seeking a way to predict human behavior during periods of "stress" that are modeled on individual and collective characteristics. Predictable aggregate behavior based on normative personality and interaction would permit better response during natural disasters, riots, and other events where behavior becomes unusual.

While I am still working through the equations, and trying to apply them to some real-world events, any qualitative way to study behavior is certainly welcomed. A work of this nature has direct relevance to those of us that work in situations where stress is constant and situations are often artificial (i.e. prison, jail). While I remain unsure of how to measure social entropy, hypothetically, such a measure would be quite valuable. At times, the

wording/phrasing used was a bit distracting – but considering that the article is being submitted from overseas, certainly understandable. Overall, an interesting and worthwhile undertaking."

Libb Thims | 30 Apr 2013 | **Post**

Comments: The article, overall, is good food for thought. A few salient difficulties on theory to be note are firstly that use of ideal gas law models generally tend to be only accurate when the particles obey the so-called Boltzmann chaos assumption, i.e. have non-correlated velocities. When particles begin to interact, such as in the formation of bond, as in the gas to liquid phase transition, one has to take into account.

These issues were grappled with by Johannes van der Waals, who started with German physicist Rudolf Clausius's 1864 version of the ideal gas law as:

$$pv = RT$$

where *p* is the pressure, *v* the volume, and *T* the absolute temperature of the body of non-interactive gas particles. In systems where either the pressure is increased, volume decreased, or temperature decreased, the gas can be turned into a liquid state, and the above equation becomes inapplicable. The system will be become a non-dilute aggregate of moving particles, interacting through inter-particle forces, and will fail to comply with Boyle's law. These two effects, according to Van der Waals, can attributed to attraction between the particles, signified by a new constant "a", and particle volume effects, signified by a new constant "b", and thus the new vapor-approaching-liquid state of the body of particles can thus be quantified by the following equation:

$$\left(p + \frac{a}{v^2}\right)(v - b) = RT$$

or

$$p = \frac{RT}{v - b} - \frac{a}{v^2}$$

in its original formulation. In the human extrapolation, one must take into account "attraction between human molecules" (Henry Adams comes to mind here), the "a" constant factor in Van der Waals' formulation of approaching liquid state gas law. This gets into issues such as attraction to repulsion ratios (Gottman stability ratio), bond energy, exchange force theory, human chemical bonding theory, etc. Likewise, the particle volume effects, signified by a new constant "b", in Van der Waals' formulation, of human molecules, of course is significant; this gets into topics such as human molecular orbital theory, e.g. how beautiful (and taller) people are given quantifiably more "volume" or social volume (e.g. personal space) in social interactions, and so on.

Also the use of Joule's second law (eq.16) and the Boltzmann constant k (eq. 9) are questionable applications to human social systems, though I can't necessarily give the disproof at this moment?

Kalyan Annamalai | 3 May 2013 | **Email**

Comment: "I briefly went over; it is an interesting proposition; after finals are over (May 13th), I will have another look at it."

Stephen Ternyik | 6 May 2013 | **Email**

Comments: The Social Equation of State is applicable at the level of group dynamics in management science, i.e. human group behavior in firms, e.g. fluctuation of personnel; the approach is also suitable for co-operative group behavior in the armed forces (military science);asocial scientific extension would be feasible by collecting analogies to the empirical findings of experimental social psychology, e.g. group dynamical judgement processes.The limitations of statistical physics for social dynamics are discussed in the attached research paper from Prof. Graeme Snooks. [1] In any case, Dr. Mohsen-Nia made an important contribution for the methodical measurement of human group behavior.

Jeff Tuhtan | 6 May 2013 | **Email**

Comments: The article is well-written and touches on some new territory.

pg. 30: How does the time rate of change enter into the thermodynamic formulations which can be used to account for the societial redistribution of energy?

pg. 31: Can you elaborate some on the criteria required to allow for the simplification of the interacting components' characteristic factors into pseudo pure components? This seems like it may be a promising approach to apply to systems of large numbers of unique interacting entities.

pg. 34: The redefinition table appears to deviate from classical physics and approach an anthropomorphic view of interactions. For example, a closed system is not possible for any type of human-based system, since every individual must exchange matter in the form of gas, fluids, and solids with the surroundings. The volume as "freedom of movement" and temperature as "social excitement" seem to be substantial deviations from known physical quantities, how can they be measured using known techniques?

pg. 36: The discussion of entropy in terms of disorder of a society seems to fit well with the concept of temperature as a type of excitement. Can a society exchange heat via a type of "radiation"?

pg. 38: Under what conditions can the reference states be determined? Is there some form of "model society" needed?

Umberto Lucia | 8 May 2013 | **Email**

Comments: This paper is very interesting. I must underline only that the eq. (22) expresses an entropy variation, consequently it must be written as follows:

$$\Delta S = C \ln \frac{T}{T_0} + R_S \ln \frac{V}{V_0}$$

with T_0 and V_0 temperature and volume of the initial (or reference) state.

Robert Kenoun | 11 May 2013 | **Email**

Comments: This is a response to the article “social equation of state”

First, I have to confess that the idea that humans are molecules and their behavior can be described by the same simple equations that explain the behavior of gases is hard for me to digest. In the history of science and almost in any field we have not seen that an equation describes the behavior of subject matter in a wider range of physical parameters. Examples: Newton’s laws do not hold in atomic levels. Mass changes with speeds near speed of light. All the laws of physics will fail in higher gravitational field, in black hole, etc. etc. Now we are trying to use a very elementary Boyle’s gas law to explain the behavior of humans and societies. Not possible from my view. However, let us examine this equation of state.

When we write an equation and pick variables, dependent and independent, these variables must have units assigned to them. What is the unit of Social pressure, social freedom or social excitement? Are we expressing social pressure by the unit Pascal and what about others? We also know that the units on both sides of equation must equate. Do we have a unit for Rs in the equation of state and what is that?

Now, I am examining the equation by setting social freedom =0, whatever the unit. Social freedom being zero means that we are assuming absolutely no freedom to social system and consequently to any individual within the system. On the right side we have Rs≠0, therefore T=0, which means there is no social excitement. Well, as far as I know, in any society that there is no social freedom, social excitement is the highest to overthrow the government that restricts them and their society. Just recent examples, are Egypt, Libya and Syria and so on. How do we explain this?

If we replace the true physical quantities with some social quantities then what replaces the true physical quantities that social system can be affected by. Suppose the temperature of social systems’ environment rises to 160 degrees F, for some combination of reasons. Obviously, the social pressure, the social excitement will go up, but there is no dependence to the physical temperature. As this equation is written, it suggests that social system is immune to and independent of temperature rise or fall, which means that the social system is a non-physical system. We know that is not true because society and any other system built upon physical elements they are not immune to the changes in physical quantities. Therefore, any state equation for social system must still include the temperature and pressure and other physical quantities that affect the social system. This suggests that the state equation not only must keep its dependence on all physical quantities but on top of that it must have other variables defining the social excitement, social freedom and so on. Then that equation will no longer be Boyle’s equation.

I am also puzzled by, why social pressure is replacing the “physical pressure”? Is it because, in our vocabulary, we use the word pressure to express being under stress. If so, we have other expressions that use “energy” to express the same. For example: Stress drains one from energy. Being in love energizes a person. So, is it social pressure or social energy? Is it possible that social pressure may actually be a negative social energy that subtracts from the internal energy of the system? Or, any good thing that happens to a social system actually adds energy to the internal energy of the system.

If we want to build a theory for social change, social excitement or social evolution founded on thermodynamic equations, I am suggesting another way. But I am absolutely not sure how to put it together in a meaningful way, but it is different approach.

Here is Gibb’s free energy equation:

$$G = U + pV - TS$$

$$\mathrm{d}G = \mathrm{d}U + p\,\mathrm{d}V + V\,\mathrm{d}p - T\mathrm{d}S - S\mathrm{d}T$$

As you can see in this equation all the physical quantities still exist and we are not removing anything from the equation neither we replace the units. However, some of these physical quantities may become insignificant in affecting social changes. For example, in the special case: P is physical pressure and I take it as atmospheric pressure, and it has not changed in millions of years and we are well adapted to it. And it does not seem to affect our social evolution. Therefore, P=constant, dP=0.
Note that we have not undermined its importance and we have not removed or replaced this quantity.
What is V and how it applies to the society? Not quite sure and I have not put any thought into it.
T is the temperature and for all practical purposes its small variations between summer and winter temperatures does not affect the social developments, particularly, in regions above and below the equator, excluding the north and south poles. Therefore, although temperature still in the equation but for all practical purposes and for the temperatures tolerated by the humans and social systems T may be considered constant and dT=0.

$$\mathrm{d}G = \mathrm{d}U + p\,\underbrace{\cancel{\mathrm{d}V}}_{0} + V\,\underbrace{\cancel{\mathrm{d}p}}_{0} - T\mathrm{d}S - S\underbrace{\cancel{\mathrm{d}T}}_{0}$$

V as a volume may not be applicable to social system, can we consider then dV=0?
It seems to me that the main things that are left here are S and U considering other variable stay at their current level until they significantly change. Like temperature goes up to 150 degrees of centigrade, water boils and social system across the globe perishes.

Is it possible that U is a more complex term for complex systems: U = U1 + U2 + U3 …… Un
U1, U2, …. Un can be either negative or positive each belong to a particular system level in the hierarchy of the system?

Could the units of happiness, prosperity, poverty, slavery all be defined in terms of energy and taken into account in the term U?

It seems to me that S is also of a complex form for complex systems, similar to U: S = S1 + S2 + …… Sn

When all taken into account, dG will have a value that would result in certain social behavior, similar to that of chemical reactions, when dG is negative, positive or zero. For different values of G we may have behaviors like: Revolution, keeping the status quo, progress and so on.

All of this may be bunch of non-sense. However, I wanted to share them with you, because I thought, may be, it was a better way or a different way, of explaining the social behavior.

Ion Siman | 29 May 2013 | **Email**

Comments:
THE PROBLEMS OF THE ARTICLE
How to identify a social equation of state?
How to do it in a reasonable manner from the point of view of physics models?

TWO MAJOR AFFIRMATIONS
A social equation of state inferred by analogy with the ideal gas equation of state
The analogy between physical parameters and social parameters

COMMENTS (ION IORGA SIMAN)
The analogy must consider the definition of an ideal gas by means of physical model and the ideal model of society (e.g. 1 mol gas = 6.023×1023 molecules but the contemporary world population = 7 or 8 ×109 inhabitants with a trend to 9 ×109 for the next four decades, and even so a great difference still remains =1014 How could the systems be compatible in order to make a real analogy?

Reviewer | Date | **Via**

Comments:
(add)

Criticisms
(add)

Suggestions
(add)

Exercises | Problems

Exercises | **Homework problems** | Other

On the wise protocol of Swedish physical chemist Sture Nordholm's penning of eight homework problems to his 1997 *Journal of Chemical Education* article “In Defense of Thermodynamics: an Animate Analogy”, the submitting author has provide (DATE) two homework problems and or exercises, shown below, that will be added to the finial version of the submitted article, if published:

â— Problem #1: (add)

â— Problem #2: (add)

JHT editor Libb Thims, in his university lectures to thermodynamics students, frequently assigns students the task to attempt to solve one of the problems on the Hmolpedia "homework problems" page; Thims also, down the road, may end up writing a *Chemical Thermodynamics: with Applications in the Humanities* textbook, built on Gilbert Lewis' famous 1923 *Thermodynamics and the Free Energy of Chemical Substances*; some of these newly-proposed JHT end of article problems/exercises may find their way into the end of chapter exercises and or into the Hmolpedia homework problems page.

References

1. Snooks, Graeme D. (2007). “Self-organization or Self-creation? From Social Physics to Realist Dynamics” (abs), *The Australian National University Centre for Economic Policy Research*, Discussion Paper No. 546, Mar.

JHT

In political science, **separation of powers** is the theory, Aristotelian-based and or Newtonian-based, that the separation of power or political power in an ideal government should be divided in three parts, namely between legislature, executive, and judiciary branches.

A diagram of the **separation of powers** theory of government, developed by French political philosophy theorist Charles Montesquieu, showing the power of the government divide between the executive (law initiating), legislative (law passing), and judicial branches (law judging), who are kept checked in balance, via some type of two way exchange force arrows, so that no one branch becomes all powerful, and hence unstable.

History

The separation of power theories, supposedly, was first discussed by Aristotle, who, in his *Politics*, discussed the concept of "mixed government".

In 1748, Charles Montesquieu, in his *The Spirit of the Laws*, deeply influenced by the celestial mechanics work of Isaac Newton, supposedly, introduced a tripartite political power.

In c.1760, Scottish-born American John Witherspoon, student of the Montesquieu, a signatory of the Declaration of Independence, supposedly, began teaching some type of separation of powers politics in America.

In 1769, American political theorist James Madison (1751-1836), the so-called "father of the constitution", and America's fourth president, was said to be studying a primitive form of social physics a Princeton (see: political physics) under Witherspoon.

> "To prevent these abuses, it is requisite society should set bounds to its confidence; should **limit the power** which it delegates to its chiefs; should reserve to itself a sufficient portion of authority to prevent them from injuring it; it must establish **prudent checks**; it must cautiously **divide the powers** it confers, because united it will be infallibly oppressed."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 71)

In 1787, James Madison, the so-called "father of the Constitution", wrote the US Constitution, wherein the separation of powers based government is found. [1]

Wilson

In 1919, American 28th president Woodrow Wilson, at some point, supposedly, challenged Madison's Newtonian-based version of the Constitution, arguing to the effect that it wasn't Darwinian enough and sought to overcome the "friction" of the separation of powers. The following is Wilson's concluding argument: [2]

> "The Constitution was founded on the law of gravitation. The government was to exist and move by virtue of the efficacy of 'checks and balances.' The trouble with the theory is that government is not a machine, but a living thing. It falls, not under the theory of the universe, but under the theory of organic life. It is accountable to Darwin, not to Newton. It is modified by its environment, necessitated by its tasks, shaped by the sheer pressure of life."

(add discussion)

Other

In 2013, Romanian physicist Radu Chisleag, in his "Newtonian Mechanics and Romanian Constitution Reform", grappled with separation of power issues, in physics terms, in respect to how the new post-socialism constitution was formulated by politicians with no fundamental physical science training, thereby producing some kind of precariously balanced "four powers" constitution model. [2]

References

1. Connelly, William F. (2010). *James Madison Rules America: the Constitutional Originals of Congressional Partisanship* (§: Wilson versus Madison: The Separation of Powers, pgs. 119-). Rowman & Littlefield Publishers.
2. (a) Wilson, Woodrow. (1912). “What is Progress?”, Campaign speech; in: *The New Freedom* (§2). Publisher, 1913.
(b) Connelly, William F. (2010). *James Madison Rules America: the Constitutional Originals of Congressional Partisanship* (§: Wilson versus Madison: The Separation of Powers, pgs. 119-). Rowman & Littlefield Publishers.
2. Chisleag, Radu. (2013). "Newtonian Mechanics and Romanian Constitution Reform" (video, 49:19-min) (PowerPoint, 78-slides), talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29.

External links

â— Separation of powers – Wikipedia.

θΔics

In science, **separation of two plane surfaces** refers to the observed "problem" of the difficulty of "separating" two planes laid one on top of each other at their joint "surface", which, historically, has been used in the two-century long debated about whether or not "nature abhors a vacuum".

Quotes

The following are related quotes:

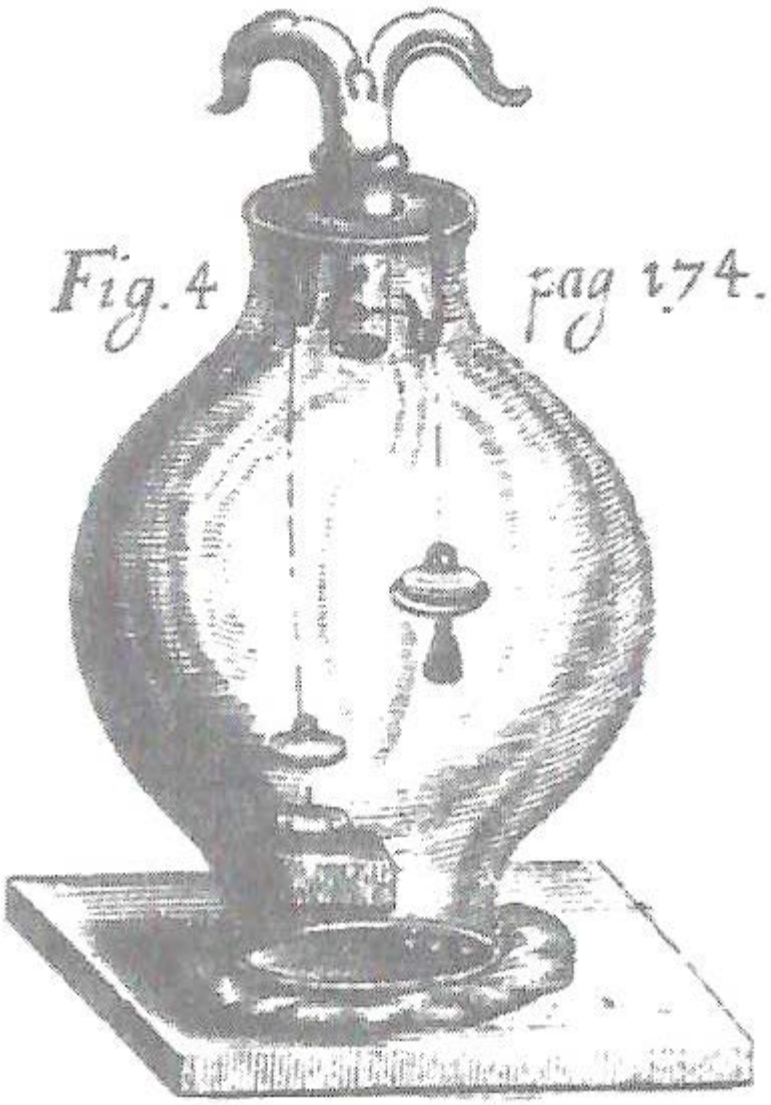

The following is a c.1662 "**separation of two plane surfaces**" experiment performed, in a vacuum, by Robert Boyle, wherein he took to polished plane (flat) marble surfaces, stuck them together, and put them in a vacuum receiver, then, having a weight attached to the bottom plane, with a string attached to the weight, evacuated the vessel, to test the theory, going back to Lucretius, that the formation of a vacuum is what keeps the planes from separating. [3]

> "I feel that for a complete explanation, of the question of **what is binding material** which holds together the parts of solids so that they can scarcely be separated, other considerations might well enter; yet I must not now digress upon this 'particular topic' since you are waiting to hear what I think about the breaking strength of other materials which, unlike ropes and most woods, do not show a filamentous structure. The coherence of these bodies is, in my estimation, produced by other causes which may be grouped under two heads. One is that much-talked-of ***repugnance which nature exhibits towards a vacuum***; but this 'horror of a vacuum' NOT being sufficient, it is necessary to introduce another cause in the form of a **gluey or viscous substance** which binds firmly together the component parts of the body. First, I shall speak of the vacuum, demonstrating by **definite experiment** the *quality* and *quantity* of its **force [virtù]**. If you take **two highly polished and smooth plates** of marble, metal, or glass and place them face to face, one will slide over the other with the greatest ease, showing conclusively that there is nothing of a viscous nature between them. But when you attempt to separate them and keep them at a constant distance apart, you find the plates exhibit such a repugnance to separation that the upper one will carry the lower one with it and keep it lifted indefinitely, even when the latter is big and heavy."
>
> — Galileo (1638), *Dialogues Concerning the Two New Sciences* (pgs. 8 + 11) [1]

"In the medieval literature on nature's 'abhorrence of a vacuum', the two most popular demonstrations were the clepsydra and the **separation of two plane surface**."

— Edward Grant (1981), *Much Ado About Nothing* [2]

"Lucretius had argued that, since the velocity of the air rushing in from the sides to fill the space created by their separation must be finite, therefore a 'vacuum' existed at the moment of separation."

— Steven Shapin (1985), *Leviathan and the Air Pump* (pg. 47) [4]

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θΔics

In religio-mythology, **Serapis**, aka "Aser-hapi", a Greco-Roman-Egyptian god syncretism of the Egyptian gods **Osiris**, i.e. the moral judge of the soul in the afterlife, and **Apis** (or Hapis) (Ñº), i.e. the son of Hathor (or Isis), considered the living personification of Ptah in Memphis (Jordan, 1993), therein becoming the joint god "Osiris-Apis" (compare: Lazarus; Raising of Lazarus), a state-promoted supreme male god, whose worship peaked as chief male god (see: supreme god timeline) during the Greco-Roman period, from the rule of Ptolemy I (305BC) to Vespasian (69AD), the attributes of which were said to be equivalent of the highly popular Apis, the said intermediary between the supreme god (Ptah) and mankind, PLUS Osiris in full (rather than just his Ka or life force). [1]

A god **Serapis** is was a state god, formulated by Ptolemy I (305BC), conceived as a synretism of the the bull shaped god Apis and Osiris, the judge of the afterlife, worshiped from 305BC to 100AD.

Overview

Under Ptolemy I Soter (305BC), efforts were made to integrate Egyptian religion with that of their Hellenic rulers. Ptolemy's policy was to find a deity that should win the reverence alike of both groups, despite the curses of the Egyptian priests against the gods of the previous foreign rulers (e.g. Set, who was lauded by the Hyksos).

Alexander the Great (332BC), previous to Ptolemy I, had attempted to use Amun for this purpose, but he was more prominent in Upper Egypt, and not as popular with those in Lower Egypt, where the Greeks had stronger influence. The Greeks had little respect for animal-headed figures (e.g. the bull-headed Apis), and so a Greek-style anthropomorphic statue was chosen as the idol, and proclaimed as the equivalent of the highly popular Apis. This new syncretistic god was named Aser-hapi (i.e. Osiris-Apis), similar to the latter La-Azarus becoming the man "Lazarus", which became Serapis. His most renowned temple was the Serapeum of Alexandria.

In 146AD, emperor Antonius Pius, according to Edward Gibbon (1883), introduced the worship of Serapis in Rome and had the "mysteries" celebrated on May 6th. [4]

In 1883, Edward Gibbon recounts the overlap of Serapis worship and Christianity as follows: [4]

> The engraving of Serapis shown on the preceding page (adjacent), represents the god grasping in his left hand the tail of a huge serpent, which is entwined around his body, while the head appears at his feet. Between the folds of the reptile are seen figures of men and various animals, the symbolical meaning [Zodiac symbols] of which can only be conjectured. Like all the images of Serapis, the countenance has the stern

aspect of Jupiter, and the head is surmounted with the *calathus* or basket peculiar to this Egyptian deity.

In *The Diegesis* (pg. 204), Robert Taylor quotes from *Socrat. Eccl Hist.* lib. 5. c. 17. as follows:

"In the temple of Serapis, now overthrown and rifled throughout, there were found engraven in the stones certain letters which they call hieroglyphical; the manner of their engraving resembled the form of the cross. The which, when both Christians and Ethnics beheld before them, every one applied them to his proper religion. The Christians affirmed that the Cross was a sign or token of the passion of Christ [see: Passion of Osiris], and the proper symbol of their profession. The Ethnics avouched that therein was contained something in common, **belonging as *well to Serapis* as to Christ**; and that the sign of the cross signified one thing unto the Ethnics, and another to the Christians. While they contended thus about the meaning of these hieroglyphical letters, many of the Ethnics became Christians, for they perceived at length the sense and meaning of those letters, and that they prognosticated salvation and 'life to come'."

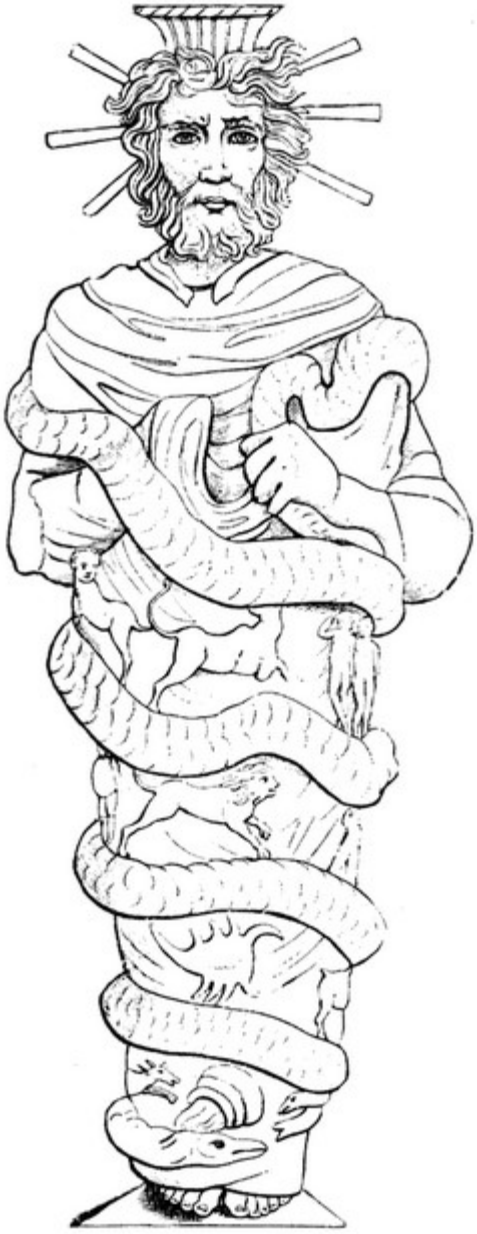

A sketch of **Serapis** from Edward Gibbon (1883). [4]

"This most important evidence," continues Taylor, "of the utter indifference between Christianity and ancient Paganism, is supplied by a Christian historian; and independent of its fairness, as taken from such a source, and its inherent verisimililude.it is corroborated by a parallel passage from the ecclesiastical history of Sozomenes, who, about the year 443, wrote the history of the church from the reign of Constantine the Great to that of the younger Theodosius. He is speaking of the temple of the god Serapis:—' It is reported that when this temple was destroyed, there appealed some of those characters called hieroglyphics surrounding ***the sign of the cross***, in engraven stones ; and that, by the skillful in these matters, these hieroglyphics were held to have signified this inscription—This Life To Come! And this became a pretence for becoming Christians to many of the Grecians, because there were even other letters which signified this sacred end when this character appeared.'"

The charge of *Serapidolatry*, or the worship of the god Serapis, was brought against the primitive Christians, by no vulgar accuser, no bigoted intolerant reviler, but by that philosophic and truth-respecting witness, the emperor Adrian. In a certain letter which he writes, while in the course of his travels, to the Consul Servianus, he slates, that he found the worshipers of the god Serapis in that country distinguished by the name of Christians. 'Those,' he says, 'who worship Serapis, are Christians; and those who are especially consecrated to Serapis, call themselves the bishops of Christ.' In relief of which charge, the

learned Kortholt, from whose valuable work, the *Paganus Obtrectator*, I have taken this passage, pleads, and indeed it might be so, that when this emperor was in Egypt, some of the Christians, actuated by fear, concealing their true religion for a season, might have held out an appearance of having embraced the superstition of the Pagans. Thus, in the *Ancient Martyrology*, in the history of Epicharmus. an Egyptian martyr, it is related that all the Christians in Alexandria, upon the coming of a cruel judge, either fled away, or pretended to be still followers of the Pagan impiety: and if the approach of a judge only could produce this effect, it is no wonder that the coming of the emperor himself, and he, as they all knew, being a most strenuous asserter of the Gentile superstitions, should have a similar effect."

Gibbon concludes this by quoting a bit from Samuel Dunlap on the late origin of the name Christianity.

Quotes

The following are related quotes:

> "Ye priests! who murmur at this relation, you wear his emblems all over your bodies; your tonsure is the disk of the sun; your stole is his zodiac; your rosaries are symbols of the stars and planets. Ye pontiffs and prelates! your mitre, your crozier, your mantle are those of Osiris; and that cross whose mystery you extol without comprehending it, is the **cross of Serapis**, traced by the hands of Egyptian priests on the plan of the figurative world; which, passing through the equinoxes and the tropics, became the emblem of the future life and of the resurrection, because it touched the gates of ivory and of horn, through which the soul passed to heaven."
>
> — Constantin Volney (1791), *The Ruins* (§XXII: Origin and Filiation of Religious Ideas)

> "Apollodorus identifies the Argive Apis with the Egyptian bull Apis, who was in turn identified with **Serapis** (Sarapis). Pausanias [c.160AD] also conflates Serapis and Egyptian Apis: 'Of the Egyptian sanctuaries of Serapis the most famous is at Alexandria, the oldest at Memphis. Into this neither stranger nor priest may enter, until they bury Apis'."
>
> — James Frazer (1913), Note to the *Biblioteca* of Pseudo-Apollodorus [2]

> "The cult of **Serapis** and Isis was introduced into Greece in the fourth century [BC] and into Italy by the later second century."
>
> — Patrick Walsh (1997), notes to Cicero's *On the Nature of the Gods* [3]

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(c) Frazer, James. (1913). Note to the *Biblioteca* of Pseudo-Apollodorus (2.1.1) (Ñº). Loeb Library Classics.
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External links

â— Serapis – Wikipedia.

θΔics

In hmolscience, **Serge Galam** (1952-) is a French physicist noted for his theories and publications, beginning in *circa* 1979, in the field of sociophysics, a subject in which he considers himself to be one of the founders.

Overview

In circa 1979, Galam, whose overt focus was research in physics, pure and applied, began to do work in sociophysics, on the side, as a hobby.

In 1982, Galam published "Entropy, Disorder, and Individual Freedom", wherein he "applied the Carnot principle of maximum entropy to societies to demonstrate that, contrary to the claimed ineluctability of the thermal death argument, there are no reasons to get pessimistic". [3]

In 1991, Galam, in his "Towards a Theory of Collective Phenomena", employs a human atom modeling scheme, and combines a number of well-established social psychology hypotheses with recent concepts of statistical physics; this is his most-cited article. [4]

In 2004, Galam is quite frank as to the resistance faced in the application of physics theory to human existence, as exemplified by the following quote on his personal testimony as to the origins of sociophysics, some 25-years following is venture into physics based sociology: [1]

> "To suggest that humans could behave like atoms was looked upon as a blasphemy to both hard science and human complexity, a total nonsense, something to be condemned. And it has been indeed condemned during the last fifteen years."

This statement aligns well with John Q. Stewart's similar frank statements on his efforts to get social physics started at Princeton (see: Princeton social physics) in the 1950s.

In 2011, Galem organized a sociophysics conference on "Sociophysics: Do Humans Behave Like Atoms?", in Paris, Nov 14-16, at the Centre de Recherche en Épistémologie Appliquée (CREA) at École Polytechnique and CNRS, a report of which by Andrea Scharnhorst is as follows: [9]

> "The "Unexpected Conference" in Paris, November 14-16, 2011 brought together more than 35 researchers from Europe, North and South America, and Asia to present current research in the field of sociophysics. The final title of the conference "Sociophysics: Do humans behave like atoms?" reminded me of vivid debates between sociologists and physicists in the 90s in Germany in which sociologists obviously felt offended by books entitled "Quantitative sociology" that included many pages of rather complex Fokker-Planck equations. Serge Galam, organizer of this conference and a pioneer in the field, equally reported about the repelling reaction in some parts of the physics community at the beginning of the 80s, when the verdict 'not suitable for publication' branded his first thoughts about what we commonly call today sociophysics. The many different presentations encompassed mathematical analysis and comparison of non-linear models, but also applications for urban development (Jean-Pierre Nadal), wine markets (Tatiana Bouzdine Chameeva), and public debates (Alexandre Delanoe) to name a few examples. All presentations showed an unbroken interest in understanding social dynamics by means of concepts and mathematical models rooted in statistical physics and computer sciences. Computational sociology, and in particular the Agent-Based Models community, are nowadays well-appreciated sparring partners for physicists; philosophers (Kate Forbes-Pitt) and physicists (Franco Bagnoli) reflected about ontological and epistemological principles of a "complexity science". The field has already long passed the stage of a niche for some eccentric pioneers. To the contrary, a variety of groups are working on similar questions, new generations are entering the field, and the activities across different branches of the rapidly growing science

system are calling for means of integration and consolidations."

In 2015, Galam began teaching a course in political physics.

Education

Galam received his BS in physics at the Ecole Normale Superieure University, Paris, in 1974 and his preliminary graduate degree (Doctorat de 3e Cycle) in physics in 1975, with a thesis on "Effect of Polarized Electrons on the Thermodynamic Properties of Dense Ionic Plasmas", at the University of Pierre and Marie Curie, Paris, under J.P. Hansen. [2] Galan then completed his PhD in physics in 1981 at Tel Aviv University, with a thesis on a "Study of Multicritical Points in Magnetic Systems" under A. Aharony, where, during his research, he started to use the modern theory of phase transitions to describe social, psychological, political and economical phenomena. [1]

WHEN HUMANS INTERACT LIKE ATOMS

Serge Galam
Groupe de Physique des Solides
Université Paris

PHYSICS VERSUS SOCIAL SCIENCE

When dealing with social situations it is usually believed that one of the main difficulties comes from the rich variety of individual characteristics involved (Burnstein & Vinokur, 1973; Dion, Baron, & Miller, 1970). Along these lines the complexity of a group is expected to be an increasing function of its size. However crowds, which contain large numbers of persons, behave in some aspects like one collective individual making some behavior even simpler than in the case of one individual (Turner, 1987). This paradox suggests that within a group the individual complexity should decrease in parallel to the appearance of a new individual reality, which is the "collective dimension." In this context it is of particular importance to discriminate between, on the one hand, properties associated with purely individual characteristics, and on the other, those properties that result from the existence of a collectivity or social system (Galam & Moscovici, 1991, 1994, 1995).

Indeed, the interplay of microscopic and macroscopic levels has been most studied far from the field of social sciences. Within physics, statistical mechanics (Stanley, 1971) has been dealing with collective behavior in matter for a very long time. However, only in the last 20 years has the problem of collective phenomena been fully understood, and then only in pure systems. Inhomogeneous systems are still resisting full analysis. Modern theory of critical phenomena is based on the fundamental concepts of universality and irrelevant variables (Ma, 1976). These two concepts mean that different physical systems, like for instance a magnet and a liquid, behave the same way when passing from one macroscopic

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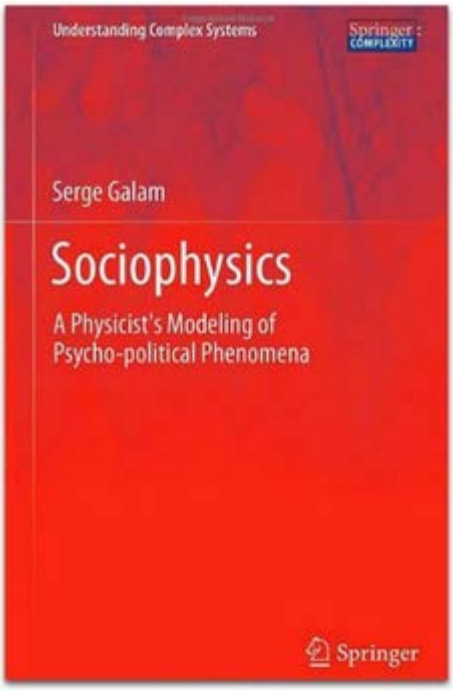

Left: Galam's 1996 chapter on human atoms. [5] Right: Galem's 2012 book on *Sociophysics*, in which he models people as atoms. [6]

From 1981 to 1982, he completed his post doctorate work, on "Phenomena and Multicritical Group Theory", at City College of the City University of New York, under Burman J.L. Galam currently is the director of research at CNRS (French National Center for Scientific Research).

In 1999, Galam became director of research at French National Center for Scientific Research (CNRS) and in 2004 joined the Center for Research in Applied Epistemology (CREA), a branch of the Ecole Polytechnique focused on (O) the modelling of self-organization and complex systems theories related to cognition, economics, and social phenomena, the epistemology of cognitive science. [7]

Quotes

The following are noted quotes:

> "Let us remember. Throughout history, our ancestors were convinced that the forces of nature obeyed the gods, they were our mistakes that resulted in their wrath, which then manifested by natural disturbances. For a long time it was thought to stop by human and animal sacrifices. Science has taught us that it was unfounded, and now this old archaic belief resurfaced with renewed vitality, and increasingly relies on science in the name of science."
>
> — Serge Galam (2007), "No Scientific Certainty on Climate" [8]

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Further reading

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External links

● Serge Galam (publications) – Scientific Commons.

θΔics

In hmolscience, **Sergei Feitelberg** (1905-1967) was a German physicist noted, in psychological thermodynamics, for his 1929 to 1930 work with Austrian psychologist Siegfried Bernfeld in developing an energy and engine based psychology model.

Overview

In 1929, Feitelberg, together with Ukrainian-born Austrian psychologist Siegfried Bernfeld, published a series of papers in *Imago*, one of which was "The Principle of le Chatelier and the Instinct of Self-Preservation", followed by a 1930 booklet *Energy and Engines: Psychoanalytic studies of Psychophysiology*, wherein they expanded, in a reinterpretive manner, on the Weber-Fechner law:

$$E = \ln R + c$$

where E is the sensation, and R is the magnitude of the stimulus, and c is a constant, which relates the magnitude of a stimulus to the felt sensation, to the effect that they reinterpreted E as a quantity of energy entering the system in the act of sensation, and R as the intensity factor of the stimulus energy, i.e. pressure in the case of a mechanical stimulus, or temperature in the case of a thermal stimulus. [2]

In sum, Bernfeld and Feitelberg applied theories from physical science, such as energy, entropy, Le Chatelier's principle, etc., to psychology in actual measurement. [1]

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External links

â— Feitelberg, Sergei (1905-1967) – WorldCat Identities.

θΔics

In existographies, **Sergei Podolinsky** (1850-1891) (CR:9), or “Serhii Podolynsky”, was a Ukrainian physician and socialist, noted in economic thermodynamics, for []

Overview

In 1881, Podolinsky, in an article, strove to reconcile the work-based theory of value with some type of proto "energy accounting" theory by integrating economic cycles with natural cycles, amid the skepticism of German political theorist Friedrich Engels who deemed it “totally impossible to try to express economic relationships in physical terms.” [2]

In 1883, Podolinsky, in his two-part article "Human Labor and the Unity of Nature", is said to have explicitly scrutinized the economic process from a thermodynamic perspective.

Engels discussed Podolinsky’s views on economics and thermodynamics with German political economist Karl Marx who both, supposedly, took great importance to the first law, but were either scantly receptive or hostile to the second law. In fact, when Engels was first confronted with Podolinsky’s efforts to reconcile Marxism with thermodynamics, Engels was “uninterested”, and choose to ignore the problem. [4]

In 1882, Engels told Marx in a letter that: [3]

> “What **Podolinsky** has completely forgotten is that the working man is not only a fixer of present solar energy, but more than that, a squanderer of past solar heat. The degree wastage of energy reserves, coal, minerals, forests, etc., you know only too well, more than I do.”

Podolinsky was keenly aware that he was in line of succession to the Physiocrats and Carnot and Clausius, citing the former group’s emphasis on nature as the source of wealth, and the economic implications of the latter pair’s discoveries. Podolinsky tried to reconcile the labor theory of value with a thermodynamic analysis of the economic process. In his conclusions, which he communicated to Engels on several occasions, Podolinsky stated the socialist model was flawed because it assumed that scientific socialism would overcome all natural resource scarcities and enable unlimited material expansion. Podolinsky’s biophysical analysis led him to conclude that ultimate limits to economic growth lay not in the shackles of the relations of production, but in physical and ecological laws. [1]

Podolinsky is often grouped with biologist and urban planner Patrick Geddes and engineer and social reformer Josef Popper-Lynkeus who each were said to have tried to promote a biophysical view of economy as a subsystem embedded in a larger system subject to the laws of thermodynamics. [5]

Influenced

Spanish economist Juan Martinez-Alier is said to have done some of the first translations of Podolinsky's work. [6] American ecological economist Cutler Cleveland has also discussed some of Podolinsky's thermodynamic ideas; albeit via a summary of Martinez-Alier's interpretation. [1]

Thermodynamics

In 1880, he resided in France, more or less in political exile, during which time, in April / May 1880 he published a text on "human work and its relation to the distribution of energy" in the journal *Slovo (Word)* in St . Petersburg. The article was then taken: June 1880 in France *Socialist magazine* (under the title "Socialism and the unity of physical forces"), also, a year later, in *La Plebe* in Italy and finally in 1885 in *Die Neue Zeit*, window German social democracy at the time of the anti-socialist laws. Podolynsky proposed, as an example, an energy balance of agricultural production and thus scored as a precursor of today's ecological economists. It also marks as Predrag Kuznetsov said in his introduction to the reedition Russian text, 111 years after its first publication, the beginning of thermodynamics creative process, thinking 'ectropique' (diction Felix Auerbach (1856 - 1933 *Weltherrin Die Schatten und ihr*, Jena, 1904)), so dear to Isabelle Stengers and Ilya Prigogine *(New Alliance, Metamorphosis of Science*, Paris, Gallimard, 1979).

With economists Joan Martinez-Alier and José Manuel Naredo ("The Nocio of 'productive forces' i questio of energia"

Quaderns of alliberament 5, 1980, p.15, "A Marxist Precursor of Energy Economics: Podolinsky *"Journal of Peasant Studies* 9, 1982, p.207), the work Serhii Podolynsky thereafter found its place in Western literature (see Juan Martinez-Alier, *Ecological Economics*, Oxford, Blackwell, 2nd in 1990, also published in Spanish and Japanese). [7]

Education

Podolynsky obtained a doctorate in medicine from the University of Wroclaw (Breslau) in 1876 (preparing his thesis, he undertook research on pancreatic enzymes at the Institute of Rudolf Heidenhain). Thereafter, among several texts that he signed an important treaty with Ukraine on *the life and health of the people in Ukraine*. *Steam Engine*, anonymous text, published in several languages, was also his pen. It is a utopian tale lies in the middle of the agrarian industry. [7]

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7. Serhii Podolynsky (1850-1891) (French → English) – History and Culture of Europe.

Further reading

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External links

- Sergei Podolinsky – Wikipedia.
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θΔics

In existographies, **Sergey Uvarov** (1786-1855) (RMS:34) was a Russian classical scholar noted for []

Quotes | By

The following are quotes by Uvarov:

> "Osiris was known amongst the Phoenicians, in Syria and Cyprus, by the title of Thammuz [Tammuz], or Adonis. Ausonius (c.385AD), in the following verses, asserts the identity of Osiris, Dionysus, Bacchus, Liber, and Adonis: 'Ogygia me *Bacchum* vocat, *Osirin* Aegyptus putat, Mystae Phanacem nominant, *Dionyson* Indi existimant, Romana sacra *Liberum*, Arabica gens *Adoneum*, Lucanianus Pantheum'."
>
> — Sergey Uvarov (1812), "On the Mysteries of Eleusis" (see: Osiris rescripts) [1]

References

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External links

â— Sergey Uvarov – Wikipedia.

θΔics

In existographies, **Sergio Franzese** (1963-2010) (CR:2) was an Italian moral philosopher noted, in human thermodynamics, for his 2008 work on William James' energy-based ethical views.

Overview

In 2008, Franzese, in his *The Ethics of Energy: William James' Moral Philosophy in Focus*, recounted American psychologist-philosopher William James' ethical view arising out of a valorization of the energy theories of his day, e.g. reserve energy, in the context of the growing, then perceived, counter tendency of Darwinism framed against what Franzese calls the "pessimistic ideologies of social entropy." On the basis of James' notion of philosophical anthropology hinged on the primacy of action, Franzese upgrades this with the modern notion that human activity needs to be understood in relation to energy as the fabric of the universe, pervading the whole spectrum of being in a continuum in which, as Franzese puts it, "humanity and divinity are intertwined". [2]

Religion

The last pages of Franzese's book, of note, are all filled with tributes to god, e.g. "god full exists and the energy human beings draw from their religious experience of the divine is real", and ends with mention to Balfour Stewart and Peter Tait's unseen universe model. This ending on tributes to god, may have resulted, similar to James Maxwell and his last dying poem "A Paradoxical Ode", possibly knowing he was on his last legs, finished two years before his termination from cancer, and needed to make some kind of last statement on his religious views, appeasement, or something to this effect. Religious digressions aside, the meat of the book seems to have value.

Education

Sergio was one of the most active William James scholars in Europe, which guided both his incursions into the work of Nietzsche as well as the examinations of the conversations between pragmatism, Darwinism and phenomenology. He obtained a PhD in philosophy from the University of Pisa and one from Vanderbilt University. [2]

Franzese was assistant professor of history of philosophy at the Department of Social Science and Communication at Università del Salento (Lecce – Italy). He is the author of L'uomo indeterminato. Saggio su William James (Roma: D'Anselmi, 2000), the editor of Nietsche e l'America (Pisa: ETS, 2005) and the co-editor of Fringes of Religious Experience (Frankfurt a. M.: Ontos Verlag, 2007).

Quotes | By

The following are quotes by Franzese:

> "Thermodynamics, like Darwinism, became a reservoir of metaphors and arguments that were transposed from physics to social thought so that, to the same extent it is possible to speak of a social Darwinism, it is possible to speak of a 'social thermodynamics' as well. By the same token, the ideology of thermodynamics becomes mythopoieic, and the term 'energy' is borrowed from its scientific context to be turned into a mythical notion able to explain everything without any single counterfactual evidence. Thus, thermodynamics is interpreted — for example in Henry Adams [1910] and Gustave le Bon [1895] (Ñº) — as a philosophy of history and as an explanation for the increasing disorder of society."
>
> — Sergio Franzese (2008), *The Ethics of Energy* (pgs. 156-57)

References

1. Franzese, Sergio. (2008). *The Ethics of Energy: William James' Moral Philosophy in Focus* (social thermodynamics, pg. 157; thermodynamics, 12+ pgs.). Ontos Verlag.
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θΔics

In hmolscience, **Sergius Morgulis** (1885-c.1965) was a Russian-American marine biologist noted for []

Overview

In circa 1937, Morgulis did the English translation of Alexander Oparin's *Origin of Life*; in the 1952 second edition of which penned an "Introduction" with updated commentary on Harold Blum's 1951 *Time's Arrow and Evolution*, discussing an early version of auto-catalytic closure (see: perpetual motion of the living kind).

Reaction feedback | Model

In 1952, Morgulis, in his introduction to the second edition English translation of Alexander Oparin's *The Origin of Life*, stated the origin of life problem thusly: [3]

> "The [origin of life] problem is really quite insoluble since it is formulated upon a tacit assumption that the emergence of living from non-living could only have followed a hierarchical order, thus:

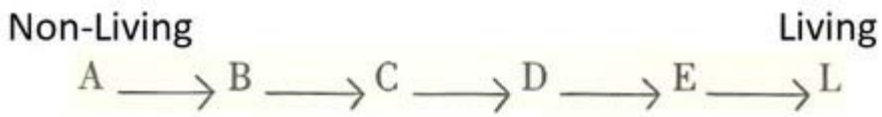

> But life could have originated not as the end link of a chain of consecutive events but by **simultaneous coordination** of several factors:

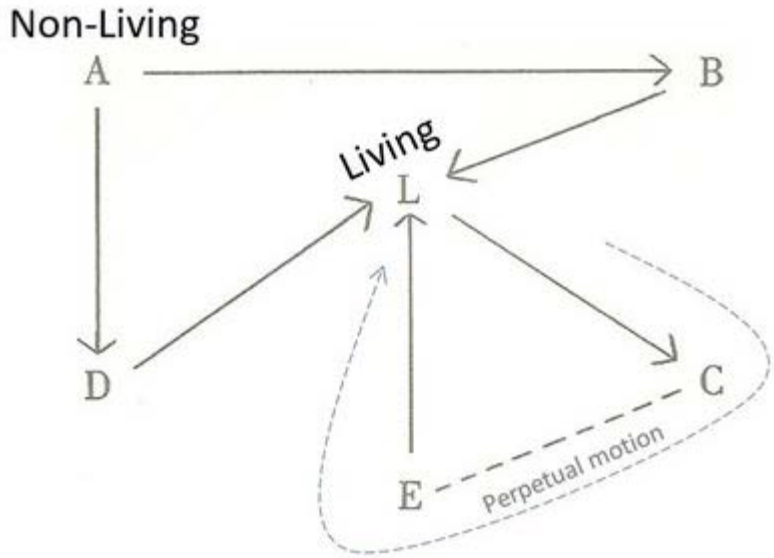

> As long as the cell is considered as the unit of life, the origin of life must remain a paradox. But like the erstwhile atom in chemistry, the cell has lost its prestige as the ultimate unit in biology. The cell, like the 'indivisible' atom, is not recognized as highly organized and integrated system built up form extremely small and distinct particles."

The "L → C → E → L" loop is what is called "chemical perpetual motion theory", specifically the idea that reactant can feed back into the products to create an "auto-powered" or "self-powered" chemical reaction that goes perpetually on its own, thereby giving the perception of having found the so-called "spark day" (see: spark) of the origin of life. Secondly,

the the discussion of how the cell breaks down into smaller components, we are reminded of the cell-as-molecule view of things.

Quotes

The following are related quotes:

> "Oparin's great contribution to the theory of the origin of life is that he postulated a long chemical evolution as a necessary preamble to the emergence of life, thinking of the evolutionary process as passing through three distinct chemical phases, from: inorganic chemistry, to organic chemistry, to biological chemistry."
>
> — Sergius Morgulis (1952), "Introduction" to Alexander Oparin's *The Origin of Life* (pg. vii) [1]

> "An ability to metabolize, involving some system of catalysts is another fundamental property which cannot be conceived of except in conjunction with a mechanism for converting free energy, and we are deeply indebted to Blum and his *Time's Arrow and Evolution* (1951) for his masterly analysis of this extremely important aspect of this subject."
>
> — Sergius Morgulis (1952), "Introduction" to Alexander Oparin's *The Origin of Life* (pg. xii) [1]

> "Plant viruses contain ribonucleic acid (RNA) and animal viruses contain both RNA and DNA, whereas genes contain deoxyribonucleic acid (DNA)."
>
> — Serguis Margulis (1952), "Introduction" to Alexander Oparin's *The Origin of Life* (pg. xxi) [1]

> "Thermodynamically directed chemical evolution could conceivably proceed indefinitely without changing from a non-living [non-living state] to a living state. Only when organic matter had achieve a high degree of organization, and had acquired diverse propensities though concatenation of such substances—with 'chance' as the only arbiter—did primordial life emerge as a new dimension in nature: matter perpetuating its own organization."
>
> — Serguis Margulis (1952), "Introduction" to Alexander Oparin's *The Origin of Life* (pg. xxii) [1]

References

1. Oparin, Alexander. (1936). *The Origin of Life* (introduction and translation: Serguis Morgulis) (pg. vii). Dover, 1965.

External links

â— Morgulis, Sergius (1985-) – WorldCat Identities.
â— Sergius Morgulis (photo) – History of the Marine Biology Laboratory.

θΔics

In Egyptian mythology, **Set**, hieroglyph: , stone "▭" symbol determinative, aka "Seth" or "Sut" (Massey, 1907), re-written, monotheistically, via the root “s-t-n”, as the Hebrew-Christian Satan (aka devil), said to be representative of the stony or red desert land (Budge, 1904), called "Ση θ" (Plutarch, c.100), identified with the Greek god Typhon (or Typho) in later times, was, in early Egyptian dynastic times, the chief god of the south, the twin god of Horus, the god of the north, who in the Pyramid Texts helped Ra get to heaven with his "ladder", who in later times became the god of chaos or adversity, symbolized by the was scepter; later the embodiment of evil or darkness; pictured with a long, erect, and square-tipped ears and proboscis-like snout, with either a red color or night black skin, which are said to indicate the head of a fabulous camel-snout like unidentified night-prowling animal called the Oryx. [1]

A modern artistic rendition of **Set** (left), square-tipped ears and proboscis-like snout as compared to his modern-day reformulation as the Devil (Satan) or fallen angel.

Set | Five forms

Historically, in the period 3,500BC to 500AD, Set had five dominate forms, each held in the belief systems of people, changing per period as the religion changed per each recension; the first four of which Budge (1904) summarizes as follows, dates added per supreme god timeline chronology: [4]

> “We have now seen how the god **Set** was the opponent first of Heru-ur [3,100BC], then of Ra [2600BC], and finally of Osiris [1100BC] and his son Horus [332BC], and that during the long period of Egyptian history his attributes changed according to the various modifications which took place in the beliefs concerning this god in the minds of the Egyptians, and that from being a power of nature, the darkness, he became the symbol and personification of both physical and moral evil.”

The fifth form of Set, in the guise of Satan, the opponent of Jesus [300AD], aka Horus described monotheistically, per Roman recension (see: recension theory).

Overview

In 1887, Heinrich Brugsch, in his *Religion and Mythology of the Egyptians*, described Set thusly: [3]

> “Set was the god of the downward motion of the sun in the lower hemisphere, in a southerly direction, and for this reason he was the source of the destructive heat of summer; and since the days began to diminish after the summer solstice, it was declared that he stole the light from Horus or Ra, and he was held to be the cause of all the evil, both physical and moral, which resulted therefrom.
>
> The light which Thoth brought with the new moon was withdrawn by Set as soon as it was possible for him to obtain power over that luminary, and he was, naturally, thought to be the cause of clouds, mist, rain, thunder and lightning, hurricanes and storms, earthquakes and eclipses, and in short of every thing which tended to reverse the ordinary course of nature and of law and order. From a moral point of view he was the personification of sin and evil.”

In 1907, Gerald Massey, in his *Ancient Egypt: The Light of the World*, citing Heinrich Ritter (1841), defines the Hebrew-Christian Satan as a re-write of the Egyptian Set (or Sut) as follows: [7]

> "The Hebrew **Satan** was the Egyptian **Sut** [Set], who became the evil one of the later theology as an anthropomorphic rendering of Apap [Apep] the serpent of evil. Sut was one of the seven sons of the old 'first mother', the goddess of the Great Bear in the astronomical mythology [astro-theology]. He was not one of 'the sons of god', as there was no god extant when he was born. Sut was brought forth twin with Horus, and first born as the adversary of his brother Osiris. In a truer version of the mythos the conflict was in phenomena that were physical, not moral."

Massey then suppositions on the mythical character to human character switch as follows, in particular stated that much of the Set vs Horus story is found in the book of Job:

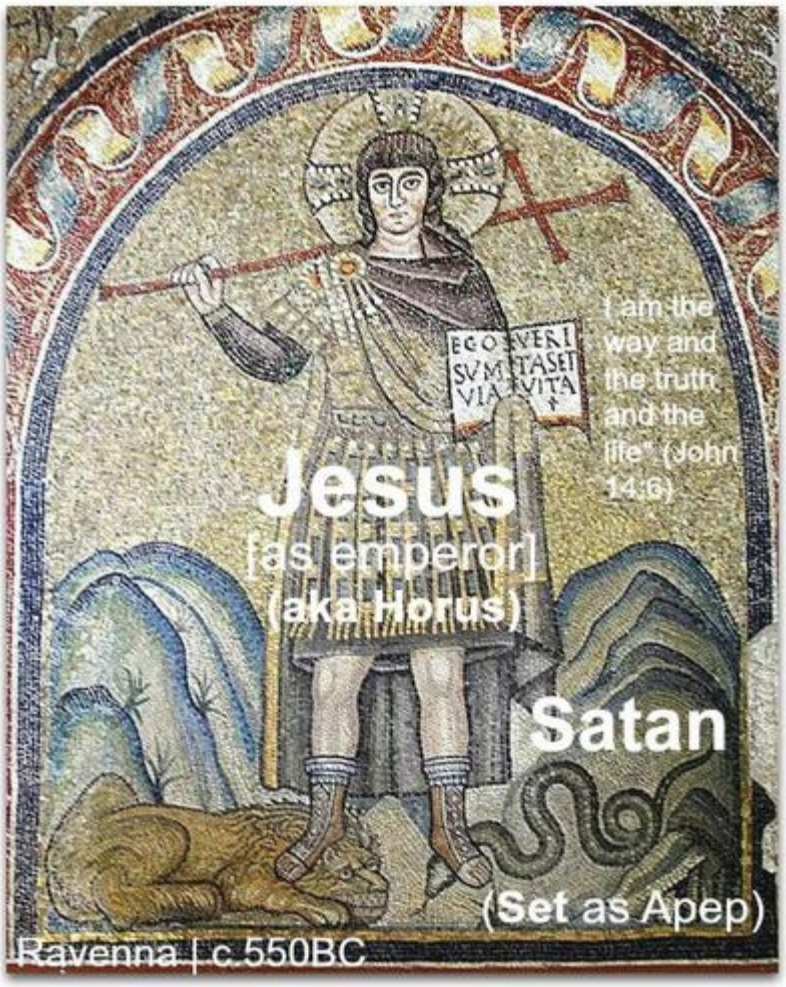

A depiction (Ñº) of Jesus as Roman emperor, wearing military dress, holding cross, with sun disc behind his head, and crushing the serpent representing Satan [Devil] (aka **Set** as Apep). "I am the way and the truth and the life" (John 14:6) reads the inscription. Ravenna, after 500.

> "There are no morals in mythology, when the characters are non-human, and when the mythical heroes and monsters have been represented as human characters we need to know the mythology once more. The Bible is full of such characters, and Job is one of them. In the ritual, Sut [Set] is the adversary of Osiris, or, stilt earlier, the opponent of Horus. He undoes what the 'good being' does. He is the malicious destroyer; the author of disease. lie is permitted to persecute Horus or Osiris to the death. In his character of the adversary, the power of darkness, he says. " I am Sut [Set], who causeth the storms and tempests. and who goeth round the horizon of heaven, like one whose heart is veiled" (Rit, ch. 39). Which is equivalent to saying: 'I am black-hearted'. Sut is here the prototype of Satan, who 'goes to and fro in the earth', and of whom it is elsewhere said, 'Your adversary the devil walketh about as a roaring lion seeking whom he may devour' (I. Peter, v. 8). So, Satan the destroyer plays the devil with the person, the possessions, the belongings of Job. who answers to the suffering Osiris in this development of the ancient drama, in which Horus or Job was no more a human personage than is Set or Satan. They can be studied in the ritual [Passion of Osiris] without disguise or falsification of character, and without a long series of disputations, lamentations, and sermons taking the place of the primitive mystery. The 'parable' taken up by Job is the battle of Set and Osiris in the mythical representation. Job the afflicted one is the suffering Osiris who passed into Amenta as the victim of the power of darkness, Set the tormentor, the tempter, the desolator, the destroyer. Amongst other devilries, Set flung his ordure at Horus (Rit. ch. 17); he also pierced him in the eye; but, where Osiris suffered dumbly and opened not his mouth. Job laments his lot, and takes to cursing the day of his birth and wishing that he had been addled in the egg. The character of Job is fathomlessly inferior to that of the good Osiris, called the motionless of heart.

> The suffering Horus transforms in ‘in the west’ and becomes the bennu Osiris or the phoenix. Job does the same, or expects to do so, when he says: ‘I shall die in my nest, and I shall multiply my days as the phoenix’. The phoenix was the emblem of the solar god who died to resuscitate in the nest of Amenta. He enters the nest as a hawk and issues forth as a phoenix (Rit., 13, 1). When the battle with Set is over and Horus rises again triumphant over all his trials that were inflicted on him by the adversary, his property is doubled; he is crowned with the double crown as conqueror and king of the double earth. This is puerilely represented by the Lord restoring to Job two-fold of all he had before and overwhelming him with material wealth.”

In 1904, Wallis Budge, in his *The Gods of the Egyptians*, building on Brugsch (1887), stated that Set had two general forms, the first as darkness, the second as Apep the enemy snake of Ra; the gist of which is as follows: [4]

> “The mythological and religious texts of all periods contain many allusions to the fight which Set waged against Horus, and more than one version of the narrative is known. In the **first and simplest form** the story merely records the natural opposition of Day to Night, or Night to Day, and the two Combatant gods were Heru-ur, or Horus the Elder, and Set. In its **second form** the two combatant gods are Ra and Set, and the chief object of the latter is to prevent Ra from appearing in the East daily. The form which Set assumed on these occasions was that of a monster serpent, and he took with him as helpers a large number of small serpents and noxious creatures of various kinds. The name of the serpent was Apep [ ] or Aaapef [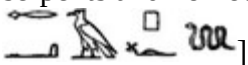], which is preserved in Coptic under the form [ⲁⲡⲱⲫ], but he was also called Rerek [ ], and since he was identified with a long series of serpent monsters he had as many names as Ra.”

Budge goes on to state that Set had two more forms:

> “In the **third form** of the story the combatant gods are Osiris and Set, and we have already seen how Set slew his brother and persecuted his widow and child, and how he escaped punishment because Osiris had, at the time of his death, none to avenge his cause. In the **fourth form** of the story the combatant gods are Horus, the son of Osiris and Isis, and Set, and the avowed intention of Horus is to slay him that slew his father Osiris.”

These latter to "forms" of Set, refer to the Heliopolis recension [see: recension theory], wherein Set is the brother of Osiris, Isis, and Nephthys, wherein, in the so-called Passion of Osiris, Set kills Osiris, and chops him up into 14 pieces (the number of stars of Orion), and scatters his pieces about the land. Isis then re-collects the pieces, reassembles them, and, with the help of the powers of the god Thoth, resurrects the dead Osiris, then has reincarnation magical sex with him in the form of a kite, become pregnant with Horus, who then avenges his father as an adult, by cutting off the head of Set.

Budge also states that this Horus defeating Set story is moral parable of the idea that good always triumphs over evil, or light always triumphs over darkness in the older Ra vs Set (Apep) sense of the matter:

> “The fight between Horus, son of Osiris and Isis, and **Set**, had a very important bearing on the destinies of the dead, for to it was attached the moral idea of the victory of good over evil, and the deceased was believed to conquer Set even as Osiris had done.”

The modern version of this is explained via free energy coupling theory. [6]

Fall of Set | Satan / Devil

In the 19th dynasty (1292-1189BC), Set rose in power to become the supreme god of Egypt; Wallis Budge (pg. 251) summarizes this as follows:

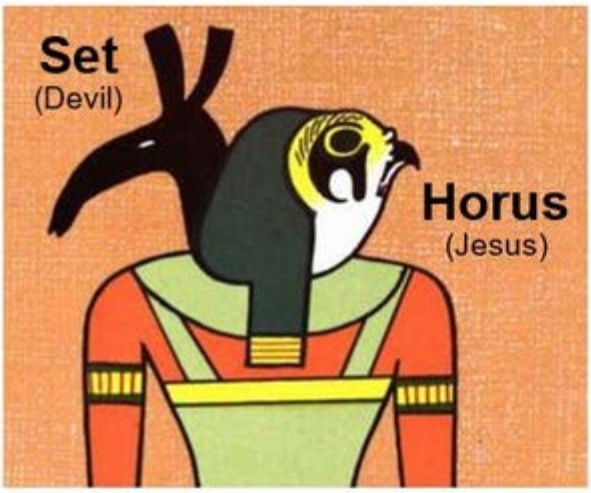

"The attributes of **Horus** changed somewhat in early dynastic times, but they were always the opposite of those of **Set**, whether we regard the two gods as personifications of **two powers of nature**, i.e., Light and Darkness, Day and Night, or as Cosmos and Chaos, Life and Death, or Good and Evil."

— Wallis Budge (1904), *The Gods of the Egyptians* (pg. 243)

A visual gist of how the Egyptian polytheistic model of the battle of dark vs light, in the gods of **Set** and Horus, morphed into the Roman monotheistic model of the battle of evil vs good, in the characters of the Devil (or Satan) vs Jesus.

> "The cult of Set appears to have been revived under the XIXth Dynasty, for the second king thereof called himself Seti, after the name of the god, and this king caused bas-reliefs to be set up in his temples wherein Set is represented in the act of performing the coronation ceremonies. Under this Dynasty we have another king called after the name of the god, i.e. Seti II, Menephthah, but after that period the figure of Set appears in no cartouche, and his evil reputation increased."

In the 20th dynasty (1189-1077BC), as Budge further notes, Set became demonized to such an extent that "bent statues" of him have been found:

> "To the XXth Dynasty probably belongs the very interesting bronze figure of Set in the British Museum (No. 18,191), which was worn as a pendant, and was originally plated with gold; the god stands upright and wears the double crown of the South and the North and a uraeus. When found the **figure was bent** double, a position which it was made to take by violence, probably by someone who detested the god, but the body has been straightened out and it is now possible to examine the head of the Set animal, which in this specimen is finely shaped."

In c.900BC, or "much later" than the 20th Dynasty period, as Budge puts it, a small wooden Set animal (British Museum: No. 30,460) was made, found standing on a pedestal on which is a sepulchral inscription, addressed to Set, which reads: "the great god, lord of heaven, [give me] life, strength, and health". Here, we see Set seen as a good god, at least by some, in this period.

In c.600BC, Set began to be transliterated, via the root "s-t-n", as Massey (1907) notes, in the Hebrew recension, in Judaism (Hebrew mythology), into the term "Satan", meaning "adversary, one who plots against another"; later, in Greek mythology, this became synonymous with "diabolos", aka devil. (Ñº)

In c.520BC, Pythagoras, and or the "Pythagoreans", as Budge (1904) puts it, looked upon Typho to have been of the rank or order of Demons, as, according to them, "he was produced in the even number fifty-six", per generalized grouping scheme, as summarized by Plutarch (c.100AD):

> "The power of the triangle is expressive of the nature of Pluto, Bacchus, and Mars, the properties of the square of Rhea, Venus, Ceres, Vesta, and Juno; of the dodecagon of Jupiter; so, as we are informed by Eudoxus [c.390-337BC] (Ñº) is the figure of 56 angles expressive of the nature of Typho: as "therefore all the others above-mentioned in the Pythagorean system are looked upon as so many Genii or Demons, so in like manner must this latter be regarded by them."

Here we see that, for whatever reasons, in the years 1200 to 500BC, Set became demonized.

Moses?

In 100AD, Plutarch, in his *On Isis and Osiris*, and or Sam Squire (1744), his English translator, stated the following conjectural connection between Set and Moses:

> "Now as to those who pretend that Typho [Set] escaped out of the battle upon an Ass after a flight of seven days, and that, after he had got into a place of security, he begat two sons, Hierosolymus and Judaeus, it is obvious from the very face of the relation, that their design is to give an air of fable to [what] the Jewish history [relates] of the flight of Moses out of Egypt, and of the settlement of the Jews about Jerusalem and Judaea (Squire's Translation)."

Wallis Budge (1904), in commentary on this, states the following:

> "As a proof of the correctness of Plutarch's statements may be mentioned the figure of **Set**, which is reproduced from a Demotic papyrus at Leyden by Signor Lanzone, and which represents the god as having the head of an ass; on his breast, which is that of a man, is inscribed the name CHθ."

It is blurry here as to what exactly Budge proved? Possibly Squire, barring a reading of the exact translation, added in his own commentary and Budge is reading into this?

Two bears | Set vs Horus

See main: 2 Kings 2:24

Budge states (pg. 245) that the first time Horus and Set fought, it was in the form of men, and that the second time it was in the form of "bears". This would seem to be an astro-theology reference, to a bear-shaped constellation. The constellation of the "Great Bear" (Ñº) is the sign (Ñº) of Set; similar to how the Orion constellation is the sign of Osiris.

Above: a Horus Gilgamesh *Awkward Moments: Children's Bible* (2013) rendition (Ñº) of 2 Kings 2:24 [see also: Joshua 10:13] and the story of how Elisah issues a "curse" on 42 boys, for calling him bald, that draws two female "bears" out of the woods, who tear the boys to pieces. [5] This strange-sounding Biblical story, accordingly, i.e. according to recension theory, is a rewrite of the **Set** and Horus battle, in the form of two bears. The 42 boys are rewrites of the 42 gods of the judgment hall, i.e. 42 nome gods of Egypt. The character Elisah, or El-sah, is Hebrew for "god Sah", i.e. the Orion constellation version of the god Osiris.

Quotes

The following are related quotes:

> “I do not intend to do here what other scholars already have done well. Jeffrey Russell and others, e.g., have attempted to investigate cross-cultural parallels between the figure of Satan and such figures as the Egyptian god **Set** or the Zoroastrian evil power Ahriman. What interest me are the specific *social* implications of the figure of Satan.”
>
> — Elaine Pagels (1995), *The Origin of Satin* [2]

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External links

â— Set (deity) – Wikipedia.

θΔics

In existographies, **Seth Lloyd** (1960-) (CR:15) is an American a quantum information theorist noted, in information thermodynamics, for []

Overview

In 1988, Lloyd introduced the idea of thermodynamic depth, along among other applications of Shannon entropy to complexity, such as mate selection. [1]

Bits | Entropy

In 2006, Lloyd, in his *Programming the Universe*, was attempting to sell the following:

> "The great nineteenth-century statistical physicists James Maxwell in the United Kingdom, Ludwig Boltzmann in Austria, and Willard Gibbs in the United States derived the fundamental formulas of what would go on to be called "information theory," and used them to characterize the behavior of atoms. In particular, they applied these formulas in order to derive justification for the second law of thermodynamics. As noted, the first law of thermodynamics is a statement about 'energy': energy is conserved when it is transformed from mechanical energy to heat. The second law of thermodynamics, however, is a statement about 'information', and about how it is processed at the microscopic scale. The law states that entropy (which is a measure of information) tends to increase. More precisely, it states that each physical system contains a certain number of bits of information—both invisible information (or entropy) and visible information—and that the physical dynamics that process and transform that information never decrease that total number of bits."
>
> — Seth Lloyd (2016), *Programming the Universe* (§:Information and Physical Systems, pgs. 163-164) [4]

In 2018, Lloyd, in his talk on how the early 2000s market crash was analogous to a black hole, stated the following:

> "There is a general tendency in the universe, in human societies, and actually everywhere, for entropy AND information to increase."
>
> — Seth Lloyd (2018), "The Black Hole of Finance" [6]

These quotes, however, are Sokal affair stylized polemics based on the Shannon bandwagon. There is so much that is factually, conceptually, and fundamentally incorrect about the above statements, the first in particular, that it requires a little over a hundred pages pages of discussion to remedy. [5]

Quotes | By

The following are quotes by Lloyd:

> "Nothing in life is certain except death, taxes and the second law of thermodynamics. All three are processes in which useful or accessible forms of some quantity, such as energy or money, are transformed into useless, inaccessible forms of the same quantity. That is not to say that these three processes don't have fringe benefits: taxes pay for roads and schools; the second law of thermodynamics drives cars, computers and metabolism; and death, at the very least, opens up tenured faculty positions."
>
> — Seth Lloyd (2004), "Article", *Nature*; quote possibly stylized on Morton Tavel (2002) [2]

Education

Lloyd completed his AB in 1982 in the arts from Harvard, an MS in philosophy of science at Cambridge in 1983 and a

PhD in physics at Rockefeller University with a dissertation on "Black Holes, Demons, and the Loss of Coherence: How Complex Systems Get Information, and What They Do With It" under American physicist Heinz Pagels. [3]

References

1. Pagels, Heinz. and Lloyd, S. (1988). "Complexity as Thermodynamic Depth", *Ann. Phys.* 188: pg. 185.
2. (a) Tavel, Morton. (2002). *Contemporary Physics and the Limits of Knowledge* (pg. 156). Rutgers University Press.
(b) Lloyd, Seth. (2004). "Article" (Q), *Nature*, 430:971, Aug 26.
3. Seth Lloyd (overview) – Research Laboratory of Electronics, MIT.
4. Lloyd, Seth. (2004). *Programming the Universe: a Quantum Computer Scientist Takes on the Cosmos* (thermodynamics, 6+ pgs). Knopf Doubleday.
5. Thims, Libb. (2012). "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair" (Q), *Journal of Human Thermodynamics*, 8(1): 1-120, Dec 19.
6. Lloyd, Seth. (2018). "The Black Hole of Finance: Creation and Destruction in Life, the Economy, and the Universe" (Q) (quote, 8:17-26), YouTube, Oxford Martin School, Feb 27.

Further reading

● Lloyd, Seth. (1990). "Valuable Information" in *Complexity, Entropy, and the Physics of Information* (pgs. 193-98). Westview Press.

External links

● Seth Lloyd – Wikipedia.
● Lloyd, Seth (1960-) – WorldCat Identities.

θΔics

In science, **sex** is a transformative process of field particle mediated atomic exchange. [1] In human chemical terms, sex can be described in terms of chemical mechanism. Sex can also be described in terms of energy, entropy, and thermodynamic driving forces.

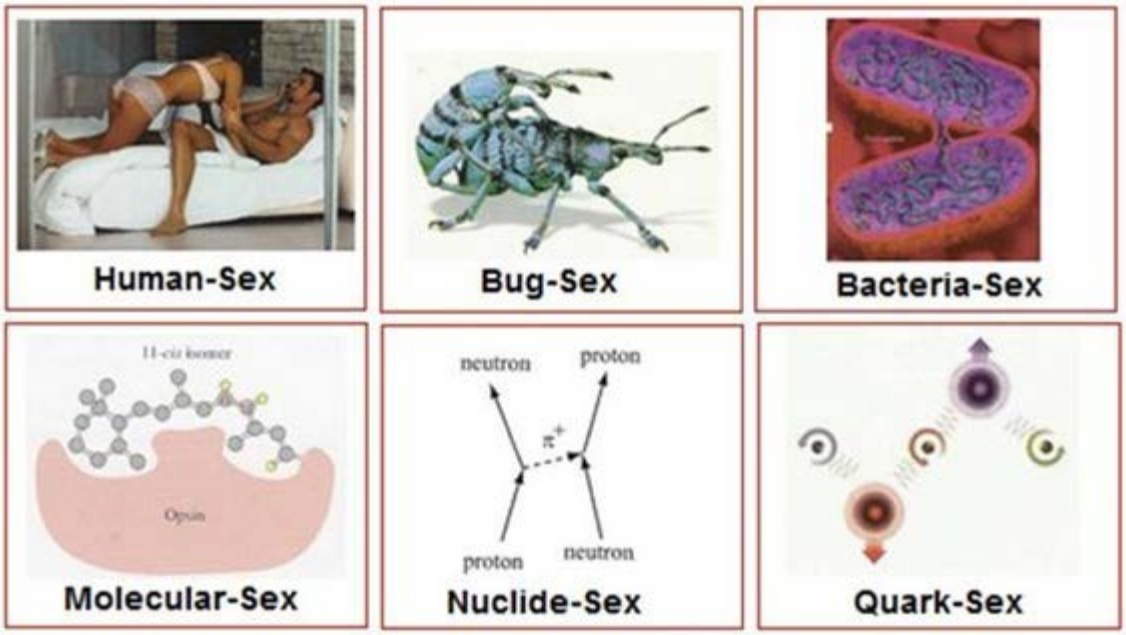

A modern "exchange force" view of **sex**, from the quark interaction scale up to the human interaction scale; the exchange force in the first four cases (human, bug, bacteria, molecular) being the electromagnetic force, mediated via the exchange of photons, the exchange force in the latter two scenarios (nuclide and quark) being the strong nuclear force, mediated by the gluon. [1]

Thermodynamics

In 1993, playwright Tom Stoppard debuted his play *Arcadia*, a modern day take on German writer Johann Goethe's 1809 *Elective Affinities*, wherein he incorporates talk of "sexual energy", "heat", entropy via his discussion of the "second law of thermodynamics", and human chemical affinity via his talk of "the attraction that Newton left out … all the way back to the apple in the garden", the steam engine, upon which the laws of thermodynamics were derived, among other topics.

In 1997, American authors biologist Lynn Margulis and her son, science writer Dorion Sagan, who in their 1997 book *What is Sex?*, argue that sex, or specifically sexual reproduction, is "a byproduct of thermodynamic dissipation." [2] They give the view that sex as has a "thermodynamic background", in that the process of coupling is a crucial part of the energy transformation process by which (with pleasure) beings reproduce their forms and increase their complexities. In the construct of the earth system, Margulis and Sagan state, through sexual reproduction, animals evolved and mate selection began, wherein organisms, choosing some mates over others, played a role in their own evolution. [2] In reference to forces, they state that:

> "**Sex** [is] a powerful and mysterious force in our lives"

From a physics point of view, however, the force of sex is not a mystery and can be explained through a number of perspectives; namely through the fundamental forces of the universe (strong nuclear, weak nuclear, electromagnetic, and gravitational) and their quantification as exchange forces, in the dynamics of the interaction and in the construct of the human chemical bond, and thermodynamic forces, in the bulk driving forces of the system.

In the 2005 book *Into the Cool: Energy Flow, Thermodynamics, and Life*, American authors science writer Dorian Sagan and ecological thermodynamicist Eric Schneider argue that "sex is the way living dissipative systems propagate into the future" and that "sex maintains our form of thermodynamic disequilibrium by reproducing physiological systems much like us but newer and sometimes improved." [3]

In 2013, Howard Bloom gave at talk entitled "Sex and the Second Law of Thermodynamics: How Sex Breaks the Law of Physics", the abstract of which is as follows: [5]

> "At the turn of the 19th century, Sigmund Freud proposed something absurd, his concept of libido, the idea that humankind was driven by **sex**. Was Freud crazy? Or was he right? Why? And how does our sexual obsession relate to the evolution of the cosmos? How does it relate to two rules that imply that sex should not and cannot exist: the principle of least effort and the second law of thermodynamics? Is sexual selection a least-effort proposition? Is it the most energy-efficient way to a goal? And what goal could that possibly be? Is plant sex, with its extravagant use of the advertising devices we call flowers, maximizing the universe's entropy? Is the peacock's tail a sign of a thrifty cosmos? How about your sexual and romantic obsessions as you read this sentence and secretly covet the body of a person ten feet away from you? Do these things hint that the cosmos is very different than the thermodynamics obsessive beliefs? And what does that mean for the way we look at strange things like psychology?"

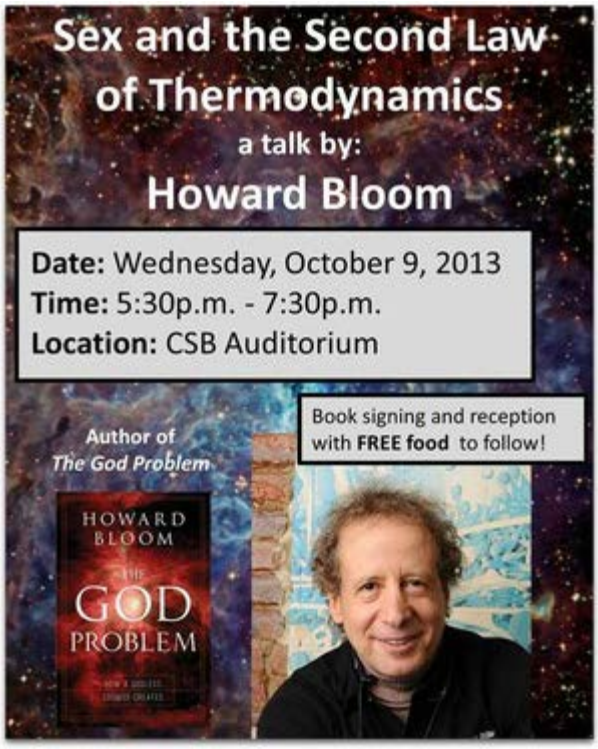

A poster for Howard Bloom's 2013 talk on sex and thermodynamics at SUNY. [5]

(add discussion)

Quotes

The following are related quotes:

> "**Sex** isn't something you've got to play with; sex is you. It's the flow of your life, it's your moving self and you are due to be true to the nature of it."
>
> — D.H. Lawrence (c.1915), *Collected Poetry* [4]

See also

â— Human reproduction reaction

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
2. Margulis, Lynn and Sagan, Dorion. (1997). *What is Sex?* New York: Simon & Schuster.
3. Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Life*, (section: Sex and Thermodynamics, pgs. 154-55). Chicago: The University of Chicago Press.
4. Solomon, Robert C. (1981). *Love: Emotion, Myth, & Metaphor* (pg.253). Prometheus Books, 1990.
5. Bloom, Howard. (2013). "Sex and the Second Law of Thermodynamics: How Sex Breaks the Law of Physics" (abs) (vid), New Paltz Evolution Studies, SUNY New Paltz CSB Auditorium, Oct 9.

External links

â— Sex – Wikipedia.

θΔics

In psychology, **sex drive**, aka "libido", refers to the theory that there exists a tending to be insatiable urge, need, or drive of animate chnopsological matter to engage in intercourse, sex, and or exchange of genetic material.

History

In 1892, German physicist Karl Pearson stated the following: [1]

> "The economic condition of any nation during a given period is closely associated with its rate of reproductivity and with its indirect struggle against its neighbors for land and food. Not less important for the stability of any nation is the nature of the prevailing forms of ownership, sex-relationship, and family life … It is only when we turn to the less complex stage of social growth that we fully grasp the direct bearing which the struggle for food and for the gratification of the sexual instinct has had in moulding human development. It is this struggle which is the fundamental formula for the description of all existing systems of ownership and of marriage in its widest sense."

In 1920, Austrian psychologist Sigmund Freud—attempting to reframe psychology in physical science terms—postulated two basic human drives: *eros*, the sex drive, and *thanatos*, the death drive. [2]

Quotes

The following are related quotes:

> "Sex is the apparent division of the father-mother substance of mind into apparent opposites. This division is due to the opposite desires of electricity and magnetism, expressed in the action and reaction of the thinking process. Sex is the active desire of mind for division into opposites, and its reactive desire for unity. Sex is that motive force which demands separability into two, and equally desires union of the apparent two into one. Sex desire is that force in thinking that continues thinking. Existence is continued only through thinking. Sex_force is that quality in the electro-magnetic impulse of thinking which continues one impulse of thinking into the next impulse of thinking."
>
> — Walter Russell (1927), *The Universal One* [3]

See also

â— Sexual chemistry

References

1. Pearson, Karl. (1892). *The Grammar of Science* (text) (pg. 363). Adam and Charles Black, 1900.
2. (a) Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool: Energy Flow, Thermodynamics, and Life* (pg. 305). University of Chicago Press.
(b) Beyond the Pleasure Principle – Wikipedia.
3. Russell, Walter. (1927). *The Universal One: an Exact Science of the One Visible and Invisible Universe of Mind and the Registration of All Idea of Thinking Mind in Light, which in Matter and also Energy* (§:The Sex Principle, book one, ch. 8). Brieger Press.

Further reading

â— Freud, Sigmund. (2011). *Beyond the Pleasure Principle* (editor: Todd Dufresne; translator: Gregory C. Richter) (thermodynamics, 4+ pgs). Broadview Press.

External links

â— Libido (sex drive) – Wikipedia.

θΔics

In existographies, **Sextus Empiricus** (c.160-210) (CR:22), aka "Sextus" (Inwood, 1992), was Greco-Roman philosopher, physician, and skeptic, noted for []

Overview

In c.200AD, Empiricus, in his section "Concerning the Gods", of his *Against the Physicists*, summarized the main atheistic origin of god views of his time as follows: [1]

Euhemerus (330-250BC)

God theory: Gods were men of power, deified in memory after their deaths.

Critias (460-403BC)

God theory: Gods were invented by lawgivers of ancient times as a kind of overseer of right and wrong actions of men, especially to prevent secret wrongdoings.

Prodicus (465-495BC)

God theory: Gods were what the ancients invented to equate the sun, rivers, and other beneficial things with.

Epicurus (341-270BC)

God theory: Gods existed, but not where the "real nature of things" is at issue.

In 1562, the works of Empiricus were published for the first time, in post dark age era, therein fostering the Renaissance. By 1569, all of his works were in print and being reprinted.

Quotes | Employed

The following are quotes employed by Sextus:

"All things, including animals and plants, are rational."

— Empedocles (c.455BC), *On Nature* and *Purifications* (Fragment #); cited by Sextus Empiricus (c.200) in *Against the Mathematicians* (8.286) [17]

Quotes | By

The following are related quotes:

"That god does not exist is the contention of those who are nicknamed 'atheists', such as: Euhemerus …, Diagoras of Melos, Prodicus of Ceos, and Theodorus, and multitudinous others."

— Sextus Empiricus (c.200), *Against the Physicists* (§:Concerning the Gods) [1]

"Critias seems to be from the ranks of the atheists when he says that the lawgivers of ancient times invented god as a kind of overseer of the right and wrong actions of men. Their purpose was to prevent anyone from

wronging his neighbors secretly, as he would incur the risk of vengeance at the hands of the gods."

— Sextus Empiricus (c.200AD) (Ñº); outline of the Critias hypothesis

"Since justice too was introduced according to the relationship of men to each other and to the gods, **if there are no gods, justice too will not exist. And this is absurd**. So the followers of Pythagoras and Empedocles and the rest of the Italian group say that we have a kind of communion not only with each other and the gods but also with irrational animals. For there is one spirit penetrating the entire cosmos, like a soul, which also unites us with them."

— Sextus Empiricus (c.200), *Against the Mathematicians* (9.126-130) [3]

References

1. (a) Empiricus, Sextus. (c.200). *Against the Physicists*; in: *Selections from the Major Writings on Skepticism, Man, and God* (editor: Philip Hallie; translator: Sanford Etheridge) (pgs. 188-213). Hacket, 1985.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (§:Sextus Empiricus, pgs. 162-67). HarperOne.
3. Empedocles. (435BC). *The Poem of Empedocles: a Text and Translation with an Introduction* (editor: Brad Inwood) (pg. 139). University of Toronto Press, 1992.

External links

â— Sextus Empiricus – Wikipedia.

θΔics

In human chemistry, **sexual chemistry** is term used to define the mechanisms of chemistry involved in heightened sexual experience. The term, however, is used more often than not as a metaphor to describe good sex. Sexual chemistry is often described as the chemical reactions that occur in the brain when couples fall in love at first sight. [1]

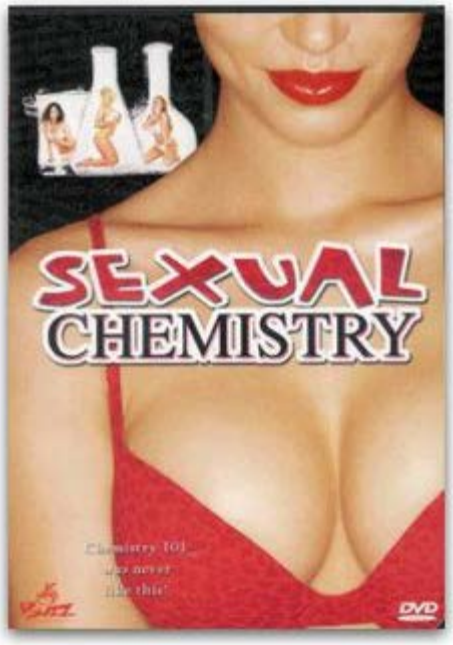

Cover to the 1999 film **"Sexual Chemistry"**, with the subtitle: Chemistry 101 was never like this? (See: Human Chemistry 101).

Overview

Early views on what defines sexual chemistry often fell on the hormone theory of love. Author Tony Hargreaves, for instance, describes "sexual chemistry" as the effect on body chemistry that "bursts into our lives in early teens". [2]

In a generalized sense, theorizes often attribute good sexual chemistry to not only to good grooming, appearance, healthy body fitness, a sense of humor, etc., but also significantly to smell. As based on the 1995 sweaty T-shirt study, good sexual chemistry has recently been defined as those sexual parings wherein partners have the most dissimilar immune systems, as can quantified by six markers on the major histocompatibility complex (MHC). [3] The matching site *ScientificMatch.com*, created in 2007 by American mechanical engineer Eric Holzle, for instance, claims to be able to create sexual chemistry in matches by having people send in samples of their saliva. [4]

A recent 2003 study conducted by Satoshi Kanazawa, of the University of Canterbury, for instance, tracked the biographies of 280 great scientists and found that great discoveries resulted from a great sexual drive, correlating to heightened testosterone levels. [5]

The 1999 film entitled *Sexual Chemistry* (pictured), written by Helen Haxton, was based on the theme of sexual chemistry. [6] In TV and film, certain pairs of actors and actresses, such as Bruce Willis and Cybill Shepherd in Moonlighting, are often described as having heightened levels of sexual chemistry. [7]

References

1. Fast, Julius and Bernstein, Meredith. (1983). *Sexual Chemistry: What it is, How to use it.* M. Evans.
2. Hargreaves, Tony. (2006). *Chemistry of Sex.* LuLu.
3. Henderson, Mark. (2003). "Secret of Genius is Sexual Chemistry", *The Times Online*, 10 July.
4. Holzle, Eric. (2008). "ScientificMatch on The Today Show" (interview with Eric Holzle), Feb.
5. Sexual Chemistry (1999), starring: Jeff Xander, Stephanee LaFleur; Director: Mike Sedan.
6. Lester, Benjamin. (2007). "Sexual Chemistry 101", *Cosmo*, Issue 15, June.
7. Chemistry (Bruce Willis and Cybill Shepherd) – DavidandMaddie.com

θΔics

In human thermodynamics, **sexual energy** is the energy associated with the act of sex or with that energy that indirectly leads to ultimately to desired acts of sex. Sexual energy, defined another way, is energy associated with the sex drive or sexual desire.

History

Polish social-economist Leon Winiarski seems to have been the first to theorize about sexual energy, in a thermodynamic sense, in his circa 1898 *Essay on Social Mechanics*. To cite an example, French-to-English translation, passage: [5]

Un tel champ de forces esthetiques, sans lequel l'art, ce genre special de richesse, ne pourrait pas exister, sont, comme nous l'avons dit, les bals, les soirees, etc., Les cotes concurrents sont evidemment non pas les vieux qui s'ennuient, mais la jeunesse qui lute pour l'amour. Une partie de son energie sexuelle, ne pouvant trouver de satisfaction ...	Such a field of aesthetic forces, without which art, this special kind of wealth could not exist, are, as we said, balls, parties, etc.., Quotes competitors are obviously not the old bored, but youth who lute to love. Part of his **sexual energy**, unable to find satisfaction ...

Sexual energy, in a conservation of energy sense, was first described in the libido theories of Austrian psychologist Sigmund Freud, particularly in his 1915 paper on repression, in which the core drive of sexual energy is represented by the *id* in Freudian ego psychology, but held in check by the restrictions of existence. [1] This model of sexual energy as one of the core internal drives of the person was continued in the work of Carl Jung, particular in his "On Psychic Energy", who addressed the subject in terms of both energy and entropy, as summarized well in the 2005 work of American business development theorist David Robinson. [2]

The works of English novelist D.H. Lawrence, according to American literature thermodynamicist Bruce Clarke, is said to use thermodynamics logic in an allegorical sense to discuss sexual energy. [3]

English playwright Tom Stoppard's 1993 play *Arcadia*, which is modeled on Johann Goethe's 1809 *Elective Affinities*, is themed on thermodynamic models of interactions and bondings of people propelled by sexual energy that sometimes runs out, similar to a chemical reaction. [1]

The works of Sean O'Reilly (2001) and Francisco Tellez (2003) theorize about sexual energy in terms of thermodynamics.

Newer models

The "physical heat" of sex, according to the standard model of human thermodynamics, is quantified in terms of the enthalpic drive, whereas the "mental heat" of sex is quantified in terms of the entropic drive, in loose theoretical framework; and is understood, in a general sense, as energy released from a human chemical reaction, quantified by Gibbs free energy. [1]

See also

â— Sexual entropy
â— New relationship energy
â— Animal heat

References

1. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (sexual energy, pgs. 447-48, 484). Morrisville, NC: LuLu.
2. Robinson, David W. (2005). *Conscience and Jung's Moral Vision: from id to thou* (pg. 59; section: "The Conservation of Energy and Entropy", pgs. 66-70, esp. 66). Paulist Press.
3. Clarke, Bruce. (1998). "A Different Sun: The Allegory of Thermodynamics in D. H. Lawrence", in *Myth and Making of Modernity* (pgs. 81-98, esp. pg. 97), edited by Michael Bell and Peter Poellner. Rodopi.
4. (a) O'Reilly, Sean. (2001). *How to Manage Your Dick: Destructive Impulses with Cyber-kinetics: Redirect Sexual*

Energy and Discover your More Spiritually Enlightened, Evolved Self (sexual energy, 43+ pgs). Travelers' Tales.
(b) Tellez, Francisco M. (2003). "Transorgasmic Sexuality" (Sexualidad Transorgásmica), (part-1, part-2) *Local Magazine*, Santiago de Chile.
5. Winiarski, Leon. (1967). *Essais Sur la Mecanique Sociale: Textes reunis et presents par Giovanni Busino* (*Essay on Social Mechanics: Collected Works presented by Giovanni Busino*) (energie sexuelle, pg. 195). Librairie Droz.

θΔics

In hmolscience, **sexual heat**, is a thermal term, referring to the heat release, absorbed, or transferred in the chemical reaction processes surrounding the act of sexual intercourse between two or more people (human molecules); or to the heat associated with one's sexuality.

Cover to the 2006 book *Heat: A Graphic Reality Check for Teens Dealing With Sexuality* by Marcus Brotherton, a visual idea of the nature of the physics of "heat" in social (social heat) and or sexual (**sexual heat**) terms. [2]

In 1985, author Joseph Conte, in his chapter on the use of information theory usage in Don DeLillo's 1985 *White Noise*, cites the following passage from the beginning of the novel in which Murray Siskin, a New York emigrant, is said to "postulate an equation between cities and thermodynamic entropy": [1]

> "Heat. This is what cities mean to me. You get off the train and walk out of the station and you are hit with the full blast. The heat of air, traffic and people. The **heat** of food and **sex**. The heat of tall buildings. The heat that floats out of the subways and the tunnels. It's always fifteen degrees hotter in the cities. Heat rises from the sidewalk and falls from the poisoned sky. The buses breathe heat. Heat emanates from crowds of shoppers and office workers. The entire infrastructure is based on heat, desperately uses up heat, breeds more heat. The eventual heat death of the universe that scientists love to talk about is already well underway and you can feel it happening all around you in any large or medium-sized city. Heat and wetness."

Conte goes on to argue that Siskind "conceptualizes the city in thermodynamic terms as an engine," which as it "performs work, dissipates energy in the form of heat." The concept of sexual heat is thus argues to be bound up in the operation of the heat engine structure of the city.

Quotes

The following are related quotes:

> "The effect of heat on sex determination is reversed with turtles, for whom a higher incubation temperature produces females."
>
> — Leland Chunt (2007) (Q)

See also

- Sexual chemistry
- Social heat
- Animal heat
- In heat
- Sexual temperature
- Sexual thermometer

Reference

1. Conte, Joseph M. (2002). *Design and Debris: A Chaotics of Postmodern American Fiction* (pg. 134). University of Alabama Press.
2. Brotherton, Marcus. (2006). *Heat: A Graphic Reality Check for Teens Dealing With Sexuality*. Multnomah Books.

In science, **sexual temperature** is the temperature aspects of a person that on average tend to elicit sexual response behaviors in the opposite gender.

Human thermodynamics

In human thermodynamics, the issue of theorizing as to how one quantifies measures sexual temperature, in SI units on the Kelvin temperature scale, just as a thermometer is a thermodynamic instrument that measures temperatures of bodies, is a very elusive subject (human thermodynamic instrument).

References

1. (a) Kylstra, Carolyn. (2009). "Her Sexual Temperature", *Men's Health* (pg. 30), Jul/Aug.
(b) Markey, Patrick M. and Markey, Charlotte N. (2007). "The Interpersonal Meaning of Sexual Promiscuity", *Journal of Research in Personality*, 41: 1199-1212.

Further reading

â— Thims, Libb. (2010). "Hot Sex, Cold Sex, Ambient Sex", *Journal of Human Thermodynamics*, 6: 47-58.

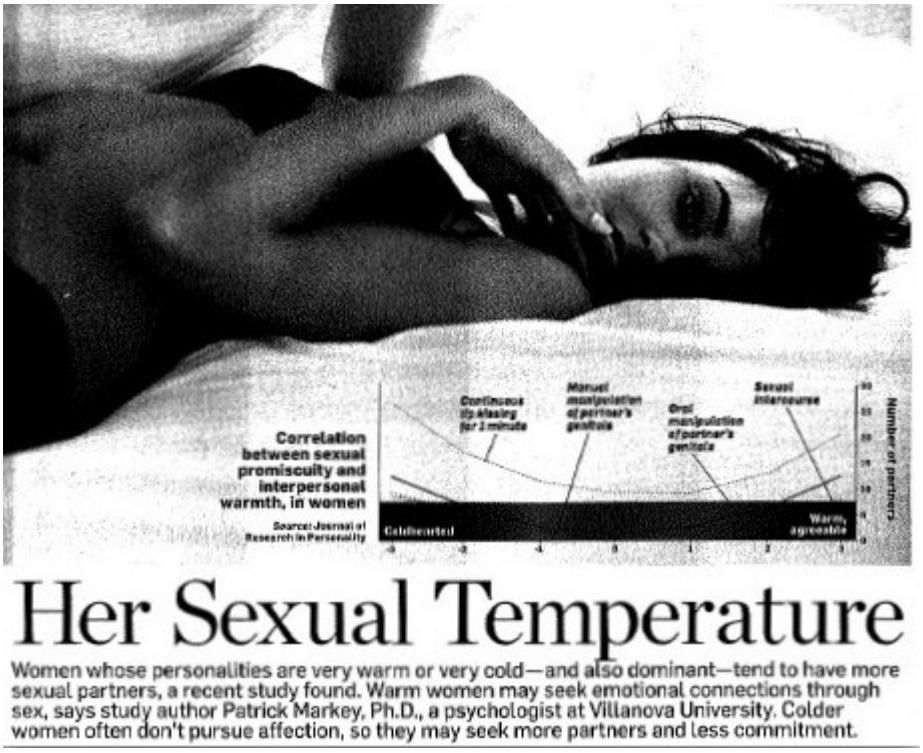

Graph shows results of study done by American psychologist Patrick Markey, indicating that both "cold personality" (and dominant) women and "hot personality" (warm and agreeable) women tend to have more sexual partners than those on the neutral range of sexual temperature. [1]

θΔics

In human thermodynamics, **sexual thermometer** is an instrument for measuring sexual heat. [1]

Overview

In 2005, American chemical engineer Libb Thims conducted a 2005 study of thirty individuals, concerning the nature of the temperature of sex, is shown adjacent, with indicator marks on the thermometer of degrees sex (˚S) of +30 (very hot sex) to -30 (very cold sex); on these results, in 2010, a verbal-scaled "sexual thermometer" was constructed, as shown adjacent. [1]

The following is the "hot sex" portion of the scale, ranked by hotness:

An example of a **sexual thermometer**, see full size (Q) ,as published in the 2010 JHT article "Hot Sex, Cold Sex, Ambient Sex" by American chemical engineer Libb Thims. [1]

#	**HOT SEX** – Pick the Best Definition:	**Votes**	**Source**
1	Extraordinary amount of chemistry, when you have a lot of foreplay...which increases the chemistry, plus everything leading up to it.	1,1,1,1,2,2,3,3,3	Jen R.
2	Nails, hot, biting, when you lose complete control of yourself—animalistic!	1,1,2,2,2,2,3,3,3	Jackie O.
3	That first lust is super hot, on a first date, diving into uncharted waters, because you never know what to expect, everything is unwinding in front of you.	1,1,1,2,2,3,3	Art
4	When it's filled with passion and longingness; and you fulfill each other's fantasies 100%.	1,2,2,2,3,3,3	George
5	Absolute euphoria being contained within each other; having the feeling that nothing matters but you and her.	1,1,1,1,1,3	Rasheed
6	When you can do it all night, and you think about it all the next day.	1,2,2,3,3	Ella
7	When it crazy, sweaty, and there's lots of energy.	2,2,2,3	Tom
8	Where there's passion, you've spent all day together, dinner, movie, etc., and there was an all day build-up.	1,3,3,3	Lexus
9	When you break up with someone for say two months, and then you get back together again for one day and boom, it's spontaneous—that's hot sex!	1,1,2	JP
10	Newness, freshness, the unfamiliarity of it, exploring someone new.	1,1,3	Laura S.
11	Really being connected—your personalities mesh, you talk well, relate well, there's connection.	1,2,2	Nicole
12	The first three months of a good relationship that you know is going to last for a while.	1,2,3	Tim O.
13	Sex with someone you thought you were never going to see again.	2,3,3	Mihaela
14	You're both into it, there's passion, there's carrying, there's action—it's just clicking.	3,3,3	Gary
15	The first time is the hottest, you don't really know what is going on, but it feels so awesome!	1,1	Gabe
16	With the person you're most attracted to at a time when you most want sex.	2,2	Dave
17	When the foreplay is amazing, there's an artificial cock involved, and the organism is prolonged to the point of simultaneous ecstasy.	1,3	Rachelle
18	Attraction and lust—animalistic!	1,3	Tara
19	When you first meet each other, you don't know each other that well—the first sex is always the best.	2,3	Trin
20	Taking your time, being on the same level, when you're intertwined—and there's chemistry.	2,3	Eva
21	The first two months—that's the hottest; you don't care, everything is good.	1	Jeff
22	Newness, a certain environment, and fresh.	1	Scott
23	When you're comfortable with the person, you've got good chemistry, and you both have experience and knowledge.	2	Gina
24	Passion and intensity.	2	Dena
25	Passion, you're in sync, and there's intensity.	2	Kristen
26	On a warm day, hormones are going, and you both want it—you go crazy!	3	Dale
27	It's crazy you become a different person.		Sam
28	First time, hot girl.		Renee
29	When the other person is super-duper gorgeous.		Andy
30	The first time with someone where the guy is older than the girl, has more experience, and knows what he wants.		Kimia

The following is the "ambient sex" portion of the scale, ranked by hotness (or ambientness):

#	AMBIENT SEX – Pick the Best Definition:	Votes	Source
29	When it's comfortable.		Dena
27	Nice personality, looks medium, skills medium, and a nice person.	2	Andy
25	Someone you live with and it becomes average.	3	Mihaela
23	When it's monotonous, when you've been with the same person, or when you're really, really drunk.	2	Laura S.
21	When it's casual; and lunch quickies are pretty ambient too.	2,3	J.P.
19	When you're lying around, you're bored, and you don't have nothing else to do.	3,3	Rachelle
17	More what you're used to, feelings are mediocre, you've been with someone for five years plus, it's comfortable love.	1,3	Tom
15	When you're looking to kill some time and you're both kind of into it.	1,2,2	Dale
13	When you're comfortable with each other and you've known each other for a while.	1,1,2	Trin
11	When you're in a relationship for a long time and it's routine already.	2,2,2,3	Ella
9	Doing it with someone you've been with for awhile; you know what they like, you know how they want it, etc.	2,2,3,3	Rene
7	When the guy just lays there while the girl does her thing; or when the guy is horny and the girl just goes along with it.	1,1,1,3,3	Lexus
5	Comfortable relationship; i.e. I'm horny, this is the person I'm dating, let's have sex.	1,2,2,2,2,2	Jackie O.
3	You're both tired.	1,1,1,2,3,3,3	Rasheed
1	When it becomes monotonous, i.e. the same thing every time, you know what's coming next.	1,1,2,2,3,3,3,3	Tera
2	A long term relationship that has kind of lost its flame.	1,1,1,1,2,3,3	Tim O.
4	Still passionate, slightly romantic, but ordinary.	1,1,1,1,2,2	Scott
6	Entertaining but nothing out of the ordinary.	2,2,2,2,3	Nicole
8	When you do it just to pass the time.	1,1,2,2	George
10	When you're in a long term relationship, it's not going nowhere or maybe it's starting to fall apart—you try to get the spark going, but it won't go.	1,1,2,3	Jeff
12	When there's that physical attraction but there's no feelings.	1,3,3	Gary
14	Long term relationships or you're kind of into it, but you have other things on your mind.	3,3,3	Kristen
16	Sex with someone you've been with for a long time.	1,1,3	Dave
18	Longer relationships where it's normal or the chemistry is mediocre.	1,3	Jen R.
20	Having sex with your best friend just because you want to.	1,3	Sam
22	When it's with someone you're familiar with, as in a four year plus marriage; there's still passion, you try to heat it up, but sometimes it just doesn't always work.	3	Gabe
24	One's not feeling well and the other's on more of a drive.	2	Eva
26	You're dating, but you're not totally comfortable with them for whatever reason; or maybe they do something that turns you of, e.g. maybe they're not that good.		Gina
28	When your wife is over weight, you still love her, but she's lost her attractiveness.		Art
30	A combination of lack of experience plus a thirty-pound weight gain.		Kimia

The following is the "cold sex" portion of the scale, ranked by coldness:

#	COLD SEX – Pick the Best Definition:	Votes	Source
30	When the guy is younger than girl, less experienced, and he doesn't really know if he wants a girlfriend.		Kimia
29	When you're stupid drunk, you're having sex with someone you know you don't want, and you just go through the motions.		Sam
28	When you've found out they've been seeing another person and you try to have sex; and the key thing is that you are still in love with them.		J.P.
27	Sex on the day when you realize you don't love the person anymore.	3	Mihaela
26	Boring, there's null energy...it's there, but it's not—something that shouldn't be happening, i.e. normally it wouldn't but for some reason it does, like when best friends have sex—it always ends up being weird?	2	Tom
25	Where you're outside and there's fear involved.	1	Lexus
24	When you're doing it in the high school ladies room with a girl you're kind of going out with and you're worried about getting caught.	1	Gabe
23	Weren't in the mood in the first place, you're tired drunk, and there's no emotional connection.	2,3	Kristen
22	Going through the motions.	1,3	Scott
21	Because of lack of knowledge of the other person, as in a one-night stand.	1,2	Tim O.
20	When there's no emotional attachment, you're just doing it because you're there.	1,1	Dave
19	No attraction.	3,3,3	Eva
18	A one night stand with someone you don't know, and there's no strings attached.	2,3,3	Rene
17	When you just want to get it over with.	2,3,3	Ella
16	When you're doing it with someone you don't really like but you're doing it because you're desperate.	2,3,3	Art
15	Decent looks, but no skills.	1,3,3	Andy
14	When you just don't want that person anymore.	1,2,3	Dena
13	Going through the motions and not being really interested in what's going on.	2,3,3,3	Tera
12	No response, very mechanical, you're just doing it for the finish—and even then it's not all it's cracked up to be; the orgasm is not that satisfying—it leaves you with a bad taste in your mouth.	2,2,3,3	Gary
11	When you're fighting with your boyfriend; it's like take your pants off, stick it in, and he's talking shit to you and being mean the whole time.	2,2,3,3	Rachelle
10	When you feel some duty to have sex out of obligation, as in at the end of a relationship; also bad hygiene.	2,2,2,3	Gina
9	No touching, no foreplay, just right to the intercourse.	1,2,2,3	Trin
8	Not carrying what the other wants.	1,2,2,3	Rasheed
7	When you do it because you have to; i.e. when you're trying to break up with someone but you can't because you're a coward.	1,1,1,2	George.
6	Un-enjoyable, regrettable, mandatory, and generally unwanted.	1,1,2,2,3	Jackie O.
5	When the passion has gone, and maybe you've grown to resent that person.	1,1,2,2,3	Laura S.
4	A relationship that is kind of falling apart; the other person is really into you, but you are faking how much you are into them.	1,1,2,2,3	Nicole
3	No chemistry at all—you don't even want the foreplay.	1,1,1,2,3	Jen R.
2	When you're getting raped—that'd be a blizzard!	1,1,1,1,2	Jeff
1	When it doesn't feel right; you just want it to be over; there's no heat.	1,1,1,1,2,2,3	Dale

(add discussion)

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θΔics

In science, **Shannon bandwagon** refers to the use of information theory, "information", or information theory + cybernetics + thermodynamics, often mixed with one or another similar ontic opening theories, e.g. uncertainty principle, to make platformed arguments in any and all types of fields and theories, often with aims to receive funding for these theories, and or attempt to justify some preconceived pet theory and or anthropomorphic conception. [1]

A 2012 parody depiction of the **Shannon bandwagon** from American electrochemical engineer Libb Thims' article "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair." [3]

Bandwagoners

Bandwagoners tend to cite: Claude Shannon, Norbert Wiener, Leon Brillouin, Ludwig Bertalanffy, and Warren Weaver, as classical bandwagon instrument players. [2]

Historically, Leo Szilard (1929) and Gilbert Lewis (1930), and in some apocryphal cases Ludwig Boltzmann (1894) and William Thomson (1851) sometimes enter the mix, via the citation "over-reading" method.

Semi-modern bandwagoner theorists or connective writers include: James Coleman, Jay Teachman, Jeremy Campbell, Jerome Rothstein, Johan Galtung, Horton Johnson, Luciano Floridi, Olivier Beauregard, Richard Raymond, Seth Lloyd, Kenneth Bailey, Terry Bynum, Seda Bostanci, Robert Doyle, Stanley Salthe, Hubert Yockey, Stephen Coleman, Loet Leydesdorff (2001) (Ñº), to name a few.

History

In 1940, Claude Shannon, at the Institute for Advanced Study, was working on a probability-based reformulation of Ralph Hartley's 1928 "Transmission of Information" model, wherein the "logarithm", in the form of $x = y \log z$, specifically of the "number of possible symbol sequences", was best "practical measure of **information**", specifically in regard to a telegraph operator sending 1s (electrical current HIs) and 0s (electrical current LOs) in a telegraph transmission.

In fall 1940 to spring 1941, Shannon consulted John Neumann (see: Neumann-Shannon anecdote) on what "name" to give to his new Hartley-stylized information formula. In response, Neumann joked that he should call his formula by the name "entropy" per reason that Leo Szilard, in his 1922 PhD dissertation "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings", had done something similar with logarithms, namely he espoused on the relationship between Maxwell's demon and lack of information (in a piston and cylinder) about the location of atoms. Shannon took this advice to heart, and in 1948 confabulatedly called his new computer science information measurement quantity by the thermodynamic heat state function quantity name entropy, therein situating the implicit, albeit incorrect, view that the two quantities are one and the same.

In 1948, Shannon's new information theory was published. Shortly thereafter, because entropy of thermodynamics is universal function, i.e. applicable to EVERY body in the universe, people naively began to think that Shannon's formulations were universal likewise; therein, applications were being made into fields outside of communication by radio or wire.

In the first London symposium on information theory, held in 1950, six out of twenty papers presented were about psychology and neurophysiology. This number increased to eight by the time of the second symposium.

In 1955, in the midst of this growing application of new telegraph communication mathematics theory, L.A. De Rosa, chairman of the newly formed Professional Group on Information Theory (PGIT), published the following query memo, attempting to get and hand as to which direction the PGIT was headed, in regards to research, funding, and publication types accepted: [8]

In Which Fields Do We Graze?

L. A. DE ROSA
December 1955
Chairman, Professional Group on Information Theory

THE EXPANSION of the applications of Information Theory to fields other than radio and wired communications has been so rapid that oftentimes the bounds within which the Professional Group interests lie are questioned. **Should an attempt be made to extend our interests to such fields as management, biology, psychology, and linguistic theory, or should the concentration be strictly in the direction of communication by radio or wire?**

To make one's interest the formulation and extension of the general theory of information, and then, having armed oneself with such a universal and powerful tool, to consider only those applications which deal with radio and wire communication, is an attitude which has been criticized by a number of our members.

Other Professional Groups whose interests lie in more sharply defined fields must, perforce, consider the application of Information Theory to their respective fields; otherwise, the benefits which may accrue through the extension of Information Theory to these various specialized fields might occur belatedly, or not at all.

Some of our members argue that should the application of Information Theory to other specialized fields be left to their specialists and the interests of PGIT not extend to fields other than radio and wire communication, then PGIT would be a purely academic and theoretical group with no interests in any but the general, universally applicable, mathematical procedures.

We have heard the opposite views expressed also, namely that PGIT should encourage the extension of the theorems to other general fields and broaden the scope of PGIT to include the interests of Psychology, Biology, and other branches of the "Arts and Sciences." In so doing, it is argued, PGIT becomes a creative group in advancing the theory of information and in assisting other Professional Groups. Thus, by disseminating information of other fields which may be required for the over-all solution of the problem of communication from one subjective sensory terminal to another (the over-all "brain-to-brain" terminals), a *raison d'être* is established for us.

At least one more group feels that PGIT should confine itself to adapting the generic developments of Information Theory to the specific field of radio, electronics, and wire communication, foregoing all ties with computers, television, telemetry, management, automation, or circuit theory.

It would be interesting to obtain the views of PGIT members with regard to the proper bounds of our interests and activities, for without such expression, proper direction cannot be achieved.

This editorial prompted an number of response articles. PGIT members were divided. Some believed that if knowledge and application of information theory was not extended beyond radio and wire communications, progress in other fields could be delayed or stunted. Others, however, insisted on confining the field to developments in radio, electrons, and wire communications. The two points of view were hotly debated over the next few years. [1]

By the third symposium held in 1956, the scope was so wide that it included participants with backgrounds in sixteen different fields: anatomy, animal welfare, anthropology, computers, economics, electronics, linguistics, mathematics, neuropsychiatry, neurophysiology, philosophy, phonetics, physics, political theory, psychology, and statistics. [7] The balloon depiction, shown below, gives an idea of this 'ballooning effect' as Shannon would later describe it.

The Bandwagon

This growing "bandwagon" usage of Shannon's transmission of information, by wire or radio, theory outside of communications engineering proper, prompted the following infamous 1956 editorial retraction memorandum article “The Bandwagon” wherein Shannon makes a plea to everyone to stop using his new so-called information entropy theory outside of communications engineering proper: [4]

The Bandwagon

CLAUDE E. SHANNON

March 1956

INFORMATION theory has, in the last few years, become something of a scientific bandwagon. Starting as a technical tool for the communication engineer, it has received an extraordinary amount of publicity in the popular as well as the scientific press. In part, this has been due to connections with such fashionable fields as computing machines, cybernetics, and automation; and in part, to the novelty of its subject matter. As a consequence, it **has perhaps been ballooned to an importance beyond its actual accomplishments.** Our fellow scientists in many different fields, attracted by the fanfare and by the new avenues opened to scientific analysis, are using these ideas in their own problems. Applications are being made to biology, psychology, linguistics, fundamental physics, economics, the theory of organization, and many others. In short, information theory is currently partaking of a somewhat heady draught of general popularity.

Although this wave of popularity is certainly pleasant and exciting for those of us working in the field, it carries at the same time an element of danger. While we feel that information theory is indeed a valuable tool in providing fundamental insights into the nature of communication problems and will continue to grow in importance, it is certainly no **panacea** for the communication engineer or, *a fortiori*, for anyone else. Seldom do more than a few of nature's secrets give way at one time. It will be all too easy for our somewhat artificial prosperity to collapse overnight when it is realized that the use of a few exciting words like *information*, *entropy*, *redundancy*, do not solve all our problems.

What can be done to inject a note of moderation in this situation? In the first place, **workers in other fields should realize that the basic results of the subject are aimed in a very specific direction, a direction that is not necessarily relevant to such fields as psychology, economics, and other social sciences.** Indeed, the hard core of information theory is, essentially, a branch of mathematics, a strictly deductive system. A thorough understanding of the mathematical foundation and its communication application is surely a prerequisite to other applications. I personally believe that many of the concepts of information theory will prove useful in these other fields—and, indeed, some results are already quite promising—but the establishing of such applications is not a trivial matter of translating words to a new domain, but rather the slow tedious process of hypothesis and experimental verification. If, for example, the human being acts in some situations like an ideal decoder, this is an experimental and not a mathematical fact, and as such must be tested under a wide variety of experimental situations.

Secondly, we must keep our own house in first class order. **The subject of information theory has certainly been sold, if not oversold.** We should now turn our attention to the business of research and development at the highest scientific plane we can maintain. Research rather than exposition is the keynote, and our critical thresholds should be raised. **Authors should submit only their best efforts, and these only after careful criticism by themselves and their colleagues. A few first rate research papers are preferable to a large number that are poorly conceived or half-finished. The latter are no credit to their writers and a waste of time to their readers.** Only by maintaining a thoroughly scientific attitude can we achieve real progress in communication theory and consolidate our present position.

Reaction bandwagon stylized articles to this bandwagon editorial article followed in the aftermath, including one from Norbert Wiener entitled "What is Information Theory?".

Elias | Sokal affair

In 1958, American electrical engineer Peter Elias (1923-2001) published "Two Famous Papers" a parody of Shannon's bandwagon, in what we know would now, retrospectively, call a Sokal affair (Ñº), i.e. an inside joke discussion of made up theory that looks real on the surface. [12]

Two Famous Papers

PETER ELIAS

September 1958

It is common in editorials to discuss matters of general policy and not specific research. But the two papers I would like to describe have been written so often, by so many different authors under so many different titles, that they have earned editorial consideration.

The first paper has the generic title "Information Theory, Photosynthesis and Religion" (title courtesy of D. A. Huffman), and is written by an engineer or physicist. **It discusses the surprisingly close relationship between the vocabulary and conceptual framework of information theory and that of psychology (or genetics, or linguistics, or psychiatry, or business organization).** It is pointed out that the concepts of structure, pattern, entropy, noise, transmitter, receiver, and code are (when properly interpreted) central to both. **Having placed the discipline of psychology for the first time on a sound scientific base,** the author modestly leaves the filling in of the outline to the psychologists. He has, of course, read up on the field in preparation for writing the paper, and has a firm grasp of the essentials, but **he has been anxious not to clutter his mind with such details as the state of knowledge in the field,** what the central problems are, how they are being attacked, et cetera, et cetera, et cetera.

There is a constructive alternative for the author of this paper. If he is willing to give up larceny for a life of honest toil, he can find a competent psychologist and spend several years at intensive mutual education, leading to productive joint research. But this has some disadvantages from his point of view. First, psychology would not be placed on a sound scientific base for several extra years. Second, he might find himself, as so many have, diverted from the broader questions, wasting his time on problems whose only merit is that they are vitally important, unsolved, and in need of interdisciplinary effort. In fact, he might spend so much time solving such problems that psychology never *would* be placed on a sound scientific base.

The second paper is typically called "The Optimum Linear Mean Square Filter for Separating Sinusoidally Modulated Triangular Signals from Randomly Sampled Stationary Gaussian Noise, with Applications to a Problem in Radar." The details vary from version to version, but the initial physical problem has as its major interest its obvious nonlinearity. **An effective discussion of this problem would require some really new thinking of a difficult sort, so the author quickly substitutes an unrelated linear problem which is more amenable to analysis.** He treats this irrelevant linear problem in a very general way, and by a triumph of analytical technique is able to present its solution, not quite in closed form, but as the solution to an integral equation whose kernal is the solution to another, bivariate integral equation. He notes that the problem is now in a form in which standard numerical analysis techniques, and one of the micromicrosecond computers which people are now beginning to discuss, can provide detailed answers to specific questions. Many authors might rest here (in fact many do), but ours wants real insight into the character of the results. By carefully taking limits and investigating asymptotic behavior he succeeds in showing that in a few very special cases (which include all those which have any conceivable application or offer any significant insight) the results of this analysis agree with the results of the Wiener-Lee-Zadeh-Raggazzini theory—the very results, indeed, which Wiener, Lee, Zadeh, and Raggazzini obtained years before.

These two papers have been written—and even published—often enough by now.

I suggest that we stop writing them, and release a large supply of manpower to work on the exciting and important problems which need investigation.

See the 2001 MIT Project History article "Information Theory and the Digital Age" for an inside look at the early bandwagon years. [11]

Quotes

The following are related quotes:

> "It will be all to easy for our somewhat artificial prosperity to collapse overnight when it is realized that the use of a few

‘excited’ words like *information*, *entropy*, *redundancy*, do not solve all our problems.”

— Claude Shannon (1956), “The Bandwagon”, Mar

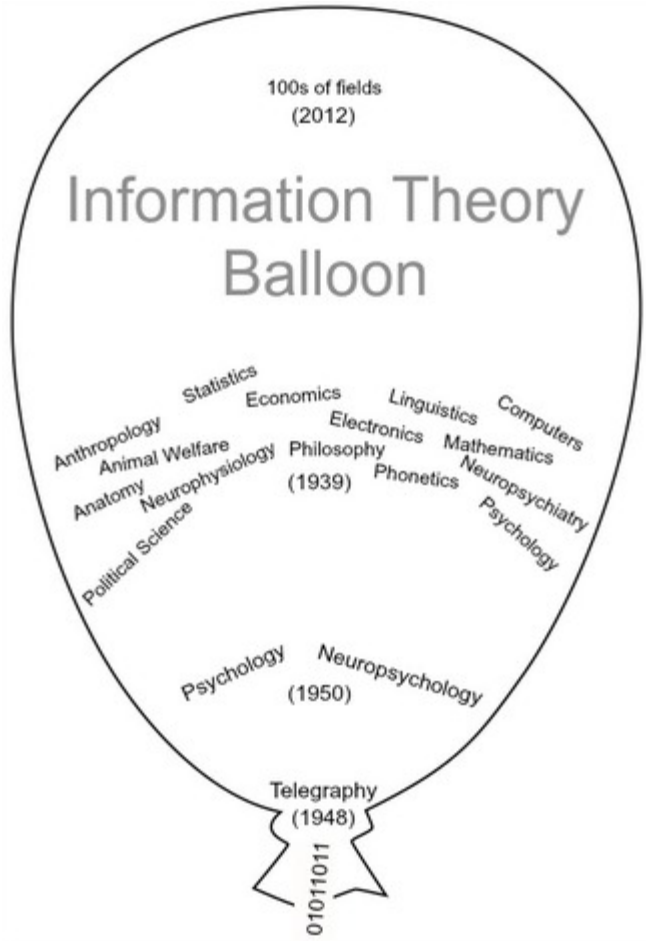

The "information theory balloon" on how the mathematical theory of 1s and 0s has ballooned out of proportion into a desperate number of fields, so much so that the balloon is ready to pop (2012). [9]

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Further reading

â— Fox, Jeremy. (2011). “Now THAT’S the way to Stop a Bandwagon!”, OikosJournal, WordPress.com, Sep. 26.

θΔics

In information theory, **Shannon entropy** or "information entropy "is a synonym for the name of the *H* function, a probability equation, introduced by American electrical engineer Claude Shannon in his 1948 paper “A Mathematical Theory of Communication”, posited to represent “information, choice, and uncertainty” of a discrete information source. [1] At the statement of this definition, Shannon alluded to the idea that this information H function is similar to Ludwig Boltzmann's H-function for the distribution of particle speeds in a body of gas, and then first alluded to idea that the two functions might be related in some way and then second, to add confusion to confusion, named his new function by the term "entropy", thus making a round-a-bout claim to stating that his theory had something to do with the second law thermodynamics. This, however, is not the case. In any event, Shannon's formulation of information soon came to be called "Shannon entropy". The status of the so-called Shannon entropy, according to both Americans biochemist Jeffrey Wicken (1987) and philosopher Charles Dȳke (1988), is summarized as follows: [5]

> “Despite the similarities, it is very doubtful that the second law holds for **Shannon entropies**.”

The term "Shannon entropy", aside from the commonly used term information entropy, is also referred to as "information theoretic entropy" or "Shannon-Weaver entropy", the latter signifying the efforts of American mathematician Warren Weaver, co-author of the the follow-up 1949 book *The Mathematical Theory of Communication* with Shannon on the same subject.

Statistical entropy

Many will argue that Shannon entropy is equivalent to statistical entropy used in physics (Boltzmann entropy). [2] In this sense, the term Boltzmann-Shannon entropy is often used as well as Gibbs-Shannon entropy or Boltzmann-Gibbs-Shannon (BGS) entropy. [3]

Clausius entropy

A rare few will go so far as to argue that Shannon entropy is equivalent to Clausius entropy; although connection is difficult to find. In 1948, for instance, American engineer Myron Tribus was examined for his doctoral degree, at UCLA, he was asked to explain the connection between entropy defined by Claude Shannon, and the entropy defined by Rudolf Clausius (1865). In retrospect, in 1998 Tribus comment on this question that: [4]

> “Neither I nor my committee knew the answer. I was not at all satisfied with the answer I gave. That was in 1948 and I continued to fret about it for the next ten years. I read everything I could find that promised to explain the connection between the entropy of Clausius and the entropy of Shannon. I got nowhere. I felt in my bones there had to be a connection; I couldn’t see it.”

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5. Dȳke, Charles. (1988). *The Evolutionary Dynamics of Complex Systems: A Study in Biosocial Complexity* (Shannon entropy, pg. 114). Oxford University Press.

See also

- Fisher entropy
- Havrda-Charvat entropy

- Kolmogorov entropy
- Kullback-Leibler entropy
- Rényi entropy
- Tsallis entropy

External links

- Shannon entropy – KnowledgeRush.com.

θΔics

In computer science, **Shannon information** is the logarithmic quantification of sequential transmissions of bits (1s and 0s) transmitted between a source and a receiver, such as through a telegraph cable; is, in general, a measure of bandwidth, and it is calculated to exclude physical effects so that it measures the amount of abstract meaning that can be carried.

Etymology

The name "Shannon information" refers to the description of information as described by American electrical engineer Claude Shannon in his 1948 article "A Mathematical Theory of Communication", in which information, in the form of *transmission*, high or low currents or voltages in a telegraph wire, signal, or fiber optics line, etc., or *storage*, a device with two stable positions, such as a relay or flip-flop, is quantified mathematically. [1]

In this paper, on the earlier joke suggestion of American chemical engineer John Neumann, Shannon devotes one irreparably corrupted paragraph to allude to the mathematical isomorphism idea that all logarithmic formulations of information, involved in transmissions and storage, are nothing more than the thermodynamic entropy of statistical mechanics, as defined by Austrian Ludwig Boltzmann's 1878 H-theorem. This false association soon gained currency.

To avoid this false convolution, the name "Shannon information" should specifically be used to avoid this corruption of semantic meanings. To be clear, Shannon information (or Shannon entropy as it is often synonymously called) has absolutely nothing to do with thermodynamics (or with Boltzmann's H-theorem, which measures the average speeds of atoms in a gas body).

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External links

â— Shannon information – Iscid.org.

θΔics

In hmolscience, **Shawn LaPaix** (c.1995-) is a Canadian communications designer noted for his 2005 poster "The Human Body in History" (below middle), made for the University of British Columbia Art Gallery exhibit, wherein he creatively uses English biologist Thomas Huxley's famous 1863 evolution of man drawing or rather more correctly the *circa* 1950 display: "The Evolution of the Ape to Human" (below left) at the Peabody Museum, Yale University, together with the 1952 CPK atom color scheme: **red** = oxygen, **blue** = nitrogen, **gray** = hydrogen, **black** = carbon (not shown), to allude to the idea that the human (or rather human molecule) is a body of evolving changing atoms, formed into the structure of a molecule, that has been chemically synthesized into its current form, over long spans of evolutionary time. [1]

In 2010, American electrochemical engineer Libb Thims modified the ape to man section of LaPaix's version by added on the CPK coloring scheme key, the vertical words "chemical mechanism", to signify that evolution, from hydrogen to human is brought about through a chemical reaction mechanism, and the germane 2010 quote "we are but complicated molecules" by Internet writing ex-minister turned secular philosopher Brother Greg, to give a more illustrative and detailed "big picture" view of human evolution (such as illustrated on the evolution timeline). [2]

Huxley version (1950)	LaPaix version (2005)	Thims version (2010)
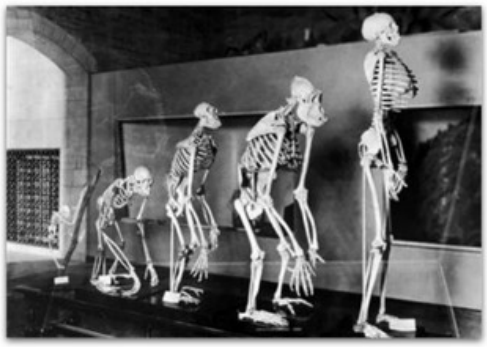	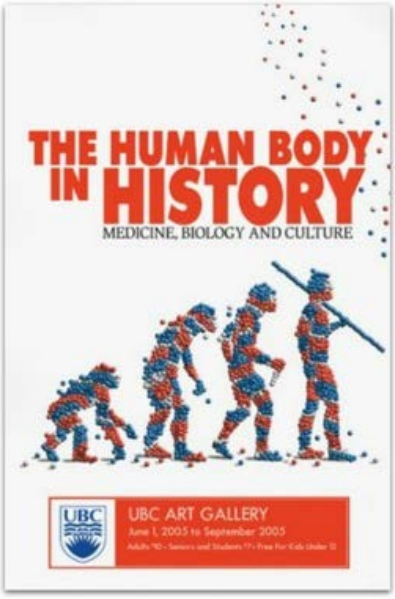	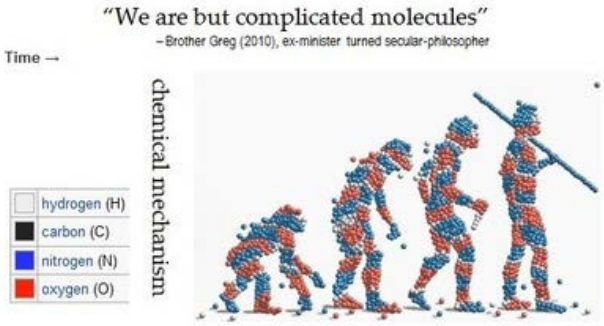

Notes

The atoms falling off seem to be depicting the turn-over factor.

In 2009, similar to LaPaix's CPK human molecule depiction, American illustration artist Chris Gash humorously illustrated *New York Times* article "Experiments Show that Molecules Can Walk, but Can They Dance?" with the a stick figure (below) of a little running human molecule, poking fun at the idea of a walking molecule. [3]

A comparison version of the CPK human molecule, made by American illustration artist Chris Gash in 2009. [3]

See also

- Chris Gash
- Jonathan Borofsky
- Norval Morrisseau
- Jonathan Borofsky

References

1. (a) shawnlapaix.com/#ubc (sample works) – ShawnLaPaix.com (dead site?).
(b) UBC – Wayback Machine.
2. (a) CPK coloring – Wikipedia.
(b) Greg. (2010). "Complicated Molecules", Brother Greg's Buffet, Jul 21, WordPress.com.
3. (a) Gash, Chris (illustrator) and Fountain, Henry (writer). (2009). "Experiments Show that Molecules Can Walk, but Can They Dance?", *New York Times*, Science, Apr 07.
(b) Chris Gash (about) – ChrisGash.com.

External links

- Shawn LaPaix – Facebook.

θΔics

In religio-mythology, **Shem**, a derivative of the Hebrew word “shemoneh” (O), meaning “eight”, is the Judaic recension (Greenberg, 2000) rescript of the Egyptian god paut or group of eight watery-chaos themed gods called the “Ogdoad”. [1]

References

1. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (pg. 75). Source Books.

External links

- Japheth – Wikipedia.

θΔics

In existographies, **Sherburne Cook** (1896-1974) was an American physiologist, archaeologist, and population studies scholar, noted for []

Education

Cook completed his AB in 1919 in biology, with partial studies in history, followed by his AM in 1923, and PhD in 1925 with a thesis on "The Toxicity of Heavy Metals in Relation to Respiration", all at Harvard University. He then did post-graduate work at Harvard, for one year, the Kaiser Wilhelm Institute in Berlin-Dahlem, and the University of Cambridge. In 1928, he became a professor of physiology at the University of California, Berkeley. [2]

Quotes | By

The following are quotes by Cook:

> "The reasoning employed here is at least superficially similar to that underlying the principles of chemical kinetics. According to classical physical chemistry, in a bimolecular reaction the velocity is a function of the product of the concentrations of the two reactants: i.e., the number of active particles of each per unit space. The analogy is carried still further by the implicit assumption that, as molecules or ions are conceived by the kinetic theory to be in a constant state of vibratory motion, so the active units in a **social test tube** are likewise considered to be in continuous motion. Hence, the chemical reaction depends upon the probable number of collisions [see: collision theory] of particles, and, by analogy, the observed effect of the social reaction, here homicide, is a function of the collisions between personalities. The analogy, of course, breaks down in detail. In particular, with social kinetics the effect of collision is not equal and opposite but unilateral. The white man affects the Indian, but the Indian does not affect the white man. Since this is so, a simple product of populations is doubtless not an exact expression of the relationship. However, it is worth a trial as a purely empirical mode of expression and as a first approximation in a quantitative sense."
>
> — Sherburne Cook (1943), *The Conflict Between the California Indian and White Civilization, Part 3: The American Invasion, 1848-1970* [1]

References

1. Cook, Sherburne. (1943), *The Conflict Between the California Indian and White Civilization, Part 3: The American Invasion, 1848-1970* (§3: Social Homicide, pgs. 9-13; quote, pgs. 11-12) (pdf). University of California Press.
2. Borah, Woodrow. (1975). "Obituary: Sherburne Friend Cook (1896-1974)" (abs), *The Hispanic American Historical Review*, 55(4):749-59, Nov.

External links

â— Sherburne F. Cook – Wikipedia.

θΔics

In science, **ships not seen** is a phrase, similar to not seeing the "trees among the forest" or "forest amid the trees" (see: forest blind), referring to conceptions, theories, ideas, or view points in front of ones eyes, but not perceived in the mind (and is related to the glass walls phenomenon). The following quote captures the term well:

A depiction of the three **ships** of Columbus that landed in the new world, that as folklore explains, **could not be seen** by the native Indians.

> "Talent hits a target no one else can hit; Genius hits a target no one else **can see**."
>
> — Arthur Schopenhauer (c.1844), German philosopher

Schopenhauer, here, would likely here be referring to German polymath Johann Goethe, who was his direct mentor, who came to his house as a youth, and who he later discussed his chemical affinity based "will to power" theory with (see: Goethe timeline), and in particular the envisioning of the future science of "human chemistry", or "human chemical thermodynamics" as Goethe would have conceived things presently, a target that he hit during a period (1796), when no one else even knew there was such a target and one that two-hundred years later, still the majority of the world, give or take a few handful, are not net aware exists.

Another classic example is German-born American physicist Albert Einstein's famous running along side a beam of light thought experiment. Certainly, it can be said that no one before him, in likely probability, would have ever conceived of such a target, the result of which, he hit a target no one else had seen or could see; resultantly, because of the collisional impact of hitting the target, a revolution in thought has emerged, in the form of relativity and mass-energy equivalence among other precipitates.

Etymology

The term "ships not seen", in the context of scientific discovery, is reference to the famous Christopher Columbus story of how, upon arrival to the new world, the native Indians, supposedly, could "not see the ships" in the harbor, even though they were in plain sight, supposedly, because they did not have the proper mental slots or receptors to process or accept such foreign or rather never before seen views—meaning that, often times, scientists and modern thinkers, closed into a certain way of seeing or thinking about things, will often not "see" what is directly in front of them; a term which has a cousin similarity to not seeing the forest amid the trees and or not seeing the trees amid the forest, depending on discussion; and is related to the glass walls phenomenon.

Overview

In social and psychological folklore is the old puzzling tale of invisible ships, plain or visible to the anatomy of the eye, but invisible or not recognizable to the perception of the mind. This tale is found in the various forms in journals and ships logs of early European explorers to the new worlds, particularly Christopher Columbus (1492), Ferdinand Magellan (1520), and James Cook (1770), each describing local natives not being able, perceptually, to 'see' the large ships, because, supposedly, ships are reasoned to be beyond their understanding or outside of their experience. In one account left by Joseph Banks, a botanist aboard Cook's ship, to cite one example of this frequently mentioned phenomenon:

> "The ship passed within a quarter of a mile of them and yet they scarce lifted their eyes from their employment; I was almost inclined to think that attentive to their business and deafened by the noise of the surf they neither saw nor heard her go past them. Not one was once observed to stop and look towards the ship; they pursued their way in all appearance entirely unmoved by the neighborhood of so remarkable an

> object as a ship must necessarily be to people who have never seen one."

On the metaphor of this tale, herein we will postulate that there are many such 'invisible ships' in science, historically, presently, and some yet to sail. One such ship that metaphorically set sail long ago, as we will argue, is German scientist Johann Goethe's 1809 novella *Elective Affinities*, which is structured on a human double displacement reaction.

> "It is difficult to overestimate the value of Goethe's work to humanity. The bequest which he left to the world in his writings, and in the whole intellectual result of his life, is not as yet appreciated at its full worth; because, intellectually, the world has not yet caught up to him. His influence today asserts itself in a hundred minute ways—even where no one suspects it. The century has received the stamp and impress of his mighty personality. The intellectual currents of the age, swelled and amplified by later tributaries, flow today in the directions which Goethe indicated."
>
> — Hjalmar Boyesen, "The Life of Goethe" (1885)

This novel sets forth the supposition that humans are large chemical species, no different than smaller reactants and products, and that all love affairs, marriages, divorces, friendships, social relations, etc., are each but different types of chemical reactions governed by the force of chemical affinity.

The comprehension of the depth of this theory requires nearly a decade of preliminary topic study before it can be acknowledged and recognized for its acumen as a treasure chest of modern human chemical science. In this context, we will argue that those not actively searching for the key or map to this treasure, will not see the treasure map even when in front of their face. More clearly, we argue that Goethe's *Elective Affinity* is an invisible ship to all chemists, or those with a general knowledge of chemistry, and a nearly invisible ship to all physical chemists and chemical engineers, those with a more focused knowledge of chemical thermodynamics, wherein affinity goes by the name of 'free energy'.

The natives we will use to make visible this large unseen ship of modern chemistry are the mindsets of Belgian chemical thermodynamicist Ilya Prigogine (1984), French chemist Jean-Marie Lehn (1995), American chemistry historian Mi Gyung Kim (2003), and Japanese chemical engineer Tominaga Keii (2004), all of whom give explicit reference to Goethe's *Elective Affinities* in their respective works, but only as though it were an amusing metaphor, a theory having little or no significance to human existence. [1]

To begin with, Keii, the stimulus behind this paper, in his 2004 chemical physics series book *Heterogeneous Kinetics*, devotes an entire section to Goethe's chemical affinity theory entitled "Chemical Affinity in 1806", reprinting an entire page of Goethe's famous chapter four, wherein the characters begin discussing the chemical concept of elective affinity.

To correct Keii, the date of publication of Goethe's novella is October 1809. Goethe, in fact, had only begun to discuss his idea for a new novel in the year prior. In particular, early in 1808 he told his friend Riemer that "his idea for a new novella was to portray social relationships and their conflicts symbolically" and that "the moral symbols used in the natural sciences were the elective affinities discovered and employed by the great Bergman." The work Goethe is referring to, of course, is Swedish chemist Torbern Bergman's 1775 textbook *A Dissertation on Elective Attractions*, which contained chemical reaction diagrams (or mechanisms) and affinity (or rather free energy) measurements for several hundred different chemical reactions, in the wet and dry way.

In any event, Keii concludes that the only effect of Goethe's publication was to promote the term "affinity" to the lay public. Moreover, Keii states specifically that "it did not add any scientific knowledge." This is what one would call an invisible ship. In the words of Banks "the aborigines began to prepare dinner, to all appearance totally unmoved by us, though we were little more than a mile of them." In our context, Keii moved on to the preparation of his next chapter section, i.e. applications of chemical affinity, with little more than a passing note as to the names of the three principle characters in the novella: Eduard, Charlotte, and the Captain.

Others, more in tune to the search for chemical thermodynamic understanding of human movement or drive, might arguably see the larger ships, and reason, conversely, that Goethe's novella has been one of the greatest scientific contributions of the all time, pioneering subjects of science, such as human chemistry, human chemical bonding, and human thermodynamics, some two to three hundred years ahead of their time.

People with these views would include German science historian Jeremy Adler, who completed his 1969 PhD dissertation on the chemistry of Goethe's novella, i.e. on the chemists and affinity reactions to each chapter, or American chemical engineer Libb Thims, who upon discovering Goethe's novella in 2006 was forced, out of necessity, to write an entire ground floor textbook on human chemistry, as a prerequisite, to even begin to discuss the novella in the correct context, i.e. of "human molecules" chemically reacting together to break and form "human chemical bonds", among others.

Not seeing the forest

See main: Not seeing the forest; Forest blind

The following is a related quote by Israeli chemist Addy Pross, in commentary about statements from Stuart Kauffman's 2000 *Investigations*, about not being able to see the forest: [2]

> "We see so many trees, yet we have **no real view of the forest**."
>
> — Addy Pross (2012), restatement of Kauffman's 2000 "life remains shrouded from view" perspective

A parody rendition of Israeli chemist Addy Pross' perspective that he and American complexity theorist Stuart Kauffman "see so many **trees**", such as catalysis, synthetic biology, RNA, metabolic pathways, DNA, molecular machinery, ATP, biosynthesis, etc., but the he and Kauffman "have no real view of the **forest**" which is solution to the question "what makes a cell alive?" [2]

The issue here is that Kauffman and Pross have many "trees" (molecular machinery, metabolic pathways, membrane biosynthesis, molecular biology, etc.), to look at and study, but they cannot see the "forest" (or as Kauffman states: "what makes a cell alive is still not clear to us"). The forest that they cannot see in this case is the defunct theory of life and subsequent life terminology upgrades—a very difficult forest to see, to say the least.

Human chemical reactions

See main: Human chemical reaction theory (14+ theorists)

The modelling of human-human interactions, processes, and social transformations in the language of is not without criticism and many, such as Marcin Borkowski, Mitch Garcia, and Stephen Lower, consider the premise of "chemical reactions occurring between human molecules" to be a crackpot-subject, pseudoscience, and or a lunatic notion. To cite one example, in 2011 Irish openly-atheist biochemistry student Ryan Grannell spent a month blogging about human chemistry, commenting for example: [20]

> "This is all just a horrendous analogy. Chemical laws apply to humans, but ourï»¿ behavior is more complex than something that can be modeled with a couple of thermodynamic equations. A + B → AB is

> just a pretentious way of stating something we already know; it tells us absolutely nothing new [and Goethe's *Elective Affinities* is a 'nutty theory'."

The comment "A + B → AB is just a pretentious way of stating something we already know; it tells us absolutely nothing new", of note, here is very telling, in that it seems to give way to the notion that Grannell, possibly like many new to the subject of human chemistry, and rightly skeptical, are in the mindset of something along the lines of not seeing the ships in the harbor + not seeing the forest amid the trees type of perspective; the glass wall of the human chemical bond, is one example of this.

To explain, in short, there's a minimum of ten years' worth of theoretical work alone embodied in the symbol AB, in regards to the particle physics nature of the human chemical bond; and there's decades of work, as evidenced in the person of Henry Adams, in the free energy description of state one (A + B) transforming, thermodynamically, into state two (AB), say fifty years down the line. A look at the equations of 40+ known human free energy theorists alone give way to this conclusion.

References

1. (a) Prigogine, Ilya. (1984). *Order Out of Chaos – Man's New Dialogue with Nature* (footnote 2.5: "B.J. Dobbs [*The Foundations of Newton's Alchemy*, 1975] also exampled the role of the 'mediator' by which two substances are made 'sociable'. We may recall here the importance of Goethe's *Elective Affinities.* For what concerns chemistry, Goethe was not far from Newton." pg. 319). New York: Bantam Books.
(b) Keii, Tominaga. (2004). *Heterogeneous Kinetics: Theory of Ziegler-Natta-Kaminsky* (*Volume 77 of Springer series in Chemical Physics*) (ch. 2: Thermodynamics of Chemical Reactions, pgs. 11-20; 2.3: Chemical Affinity: Thermodynamic Force of Reaction, pgs. 12-15; 2.5: Chemical Affinity in 1806, pgs. 16-17). Springer.
(c) Lehn, Jean-Marie. (1995). *Supramolecular Chemistry* (pg. 2: "molecular sociology" and "elective affinities"). VCH.
(d) Kim, Mi Gyung. (2003). *Affinity, That Elusive Dream – A Genealogy of the Chemical Revolution*. Cambridge, Mass: The MIT Press.
2. Pross, Addy. (2012). *What is Life?: How Chemistry becomes Biology* ("so many trees", pg. 114). Oxford University Press.

θΔics

In genius studies, **shoulder genius** or "intellectual giant" refers to a genius whose work, theories, or ideas a second genius stood upon or built on thereby enabling the latter to "see" farther into a difficult terrain or uncharted territory of venture science.

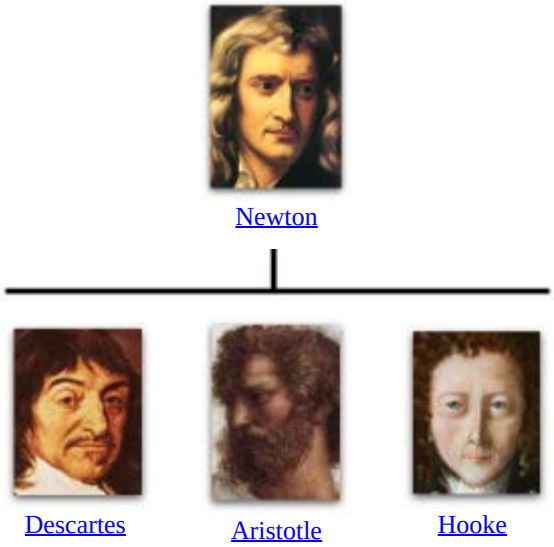

The intellectual **giants** of Isaac Newton, whose shoulders he claimed to have stood on, in regards to his 1672 theory of light. [1]

Newton

The framework for this idea of standing on someone's shoulders, in science, is found in English physicist Isaac Newton's 1676 correspondence comment to his warring rival English polymath Robert Hooke: [1]

> "What Descartes did was a good step. You have added much several ways, and especially in taking the colors of thin plates into philosophical consideration. If I have seen further it is by standing on the shoulders of giants."

Researcher Robert Merton's 1965 book *On the Shoulders of Giants* is said to give the fullest etymology of the origin of Newton's aphorism, in pre-Newtonian terms. [2]

Into his age 19 written notebook *Philosophical Questions*, a set of forty-five queries into a foundation for a new philosophy, Newton inserted Aristotle's name in sequence: *Amicus Plato amicus Aristotles magis amica veritas*, which means: [3]

> "Plato is my friend, but truth my greater friend."

(add discussion)

Tesla

The main intellectual giant to the mind of Nikola Tesla (1856-1943) was Johann Goethe (1749-1832), whose philosophy of science he read to the exclusion of all others. Tesla also, supposedly, committed himself to the reading of the works of Voltaire.

Einstein

In a similar vein to Newton, the three intellectual giants to Albert Einstein (1879-1955) were:
Galileo Galilei (1564-1642), James Maxwell, (1831-1879), and Michael Faraday (1791-1867), whose portraits he kept on his mantle, as well as Johann Goethe (1749-1832), whom he kept a bust of in his study.

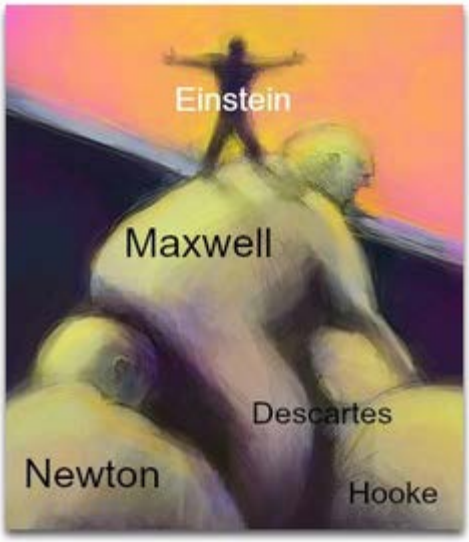

Einstein, in the 1920s, when queried about standing on Newton's shoulders, he replied "No, I stand on Maxwell's shoulders."

In the 1920s, however, Einstein made an explicit statement about whose shoulders he stood on. In particular, during one of Einstein's visits to Cambridge, one of the hosts asked him: "You have done great things, but you stand on Newton's shoulders", to which Einstein replied: "No, I stand on Maxwell's shoulders." (Ñº) (Ñº)

References

1. (a) Newton, Isaac. (1676). "Letter to Hooke", Feb 05, *Corres* I: 154.
(b) Gleick, James. (2003). *Isaac Newton* (quote, pg. 98; notes 17-18, pgs. 217-18). Vintage Books.

2. Merton, Robert. (1965). *On the Shoulders of Giants: A Shandean Postscript*. Free Press.
3. Gleick, James. (2003). *Isaac Newton* (pg. 26). Vintage.

External links

â— Standing on the shoulders of giants – Wikipedia.

θΔics

In religio-mythology, **Shu**, hieroglyph: , in Heliopolis cosmology (see: Heliopolis creation myth), was the Egyptian god of the air; male counterpart of the goddess Tefnut (moisture), father to Geb and Nut, who conceptually "held up" the heavens from the earth, i.e. "separated" his incest-desiring children from copulation; who, in Greek mythology, became the mold behind the character of Atlas; who, in Hebrew mythology (see: Hebrew recension), became, via god character rescript, the character Joshua, described as the pre-exodus born son of Nun who became the prophet successor to Moses. [1]

An image of **Shu**, aka Atlas (Greek), conceptualized as the god of the air, shown separating (see: soul mate) the lovers Geb (earth god) and Nut (heaven god). [1]

Greek mythology | Atlas

In Greek mythology, the god Shu, via Homer (c.800BC), Hesiod (c.800BC), and Virgil (30BC), became, in slightly re-written fashion, the Greek god Atlas who with his brother Menoetius sided with the Titans in their war against the Olympians, the Titanomachy. When the Titans were defeated, many of them (including Menoetius) were confined to Tartarus, but Zeus condemned Atlas to stand at the western edge of Gaia (the Earth), according to the Virgil (30BC) version, and hold up the “sky” (or Nut, in original Egyptian version) on his shoulders, to prevent the two from resuming their primordial embrace. (Ñº)

A common misconception, to note, is that Atlas, in modern times, is oft-depicted as being forced to hold the “earth”, not the heavens, on his shoulders, but classical art shows Atlas holding the celestial spheres, not a globe; the solidity of the marble globe borne by the renowned Farnese Atlas may have aided the conflation, reinforced in the 16th century by the developing usage of atlas to describe a corpus of terrestrial maps.

Below left (Ñº) is an c.550BC image, form a laconic bowl, showing Atlas, Typhoëus (Typhon), and Prometheus, the three heads of the insurgency, shown while they are being punished:

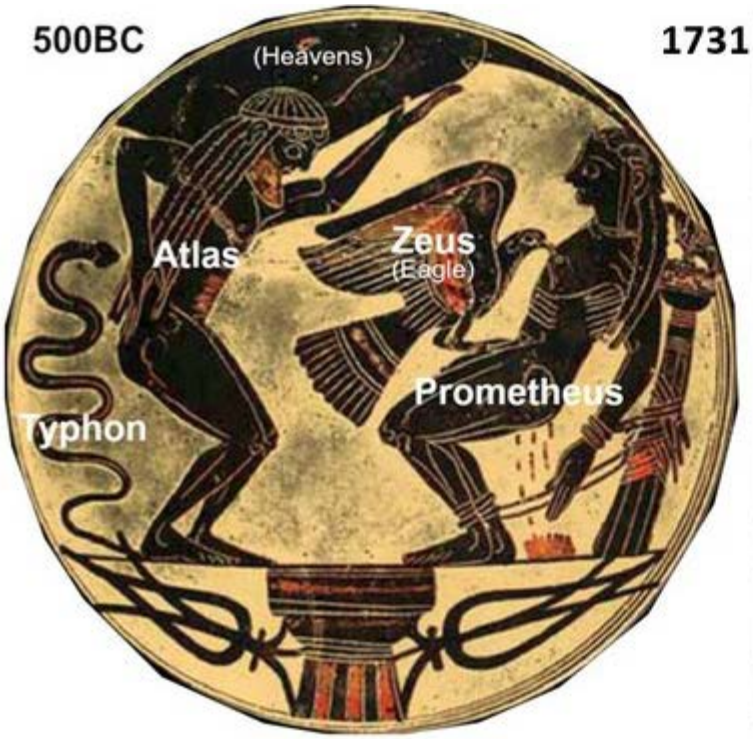

The image, above right, is a 1731 engraving (Ñº), by Bernard Picart, of Atlas supporting the heavens:

Hebrew mythology | Joseph

In Judaism, “god Shu” became transliterated into the Biblical character of “Jo- + Shu” or Joshua; a famous example of which is found in Joshua 10:13, wherein Joshua (or god Shu) tells the sun (god Ra) and the moon (god Thoth) to stand still for an entire day.

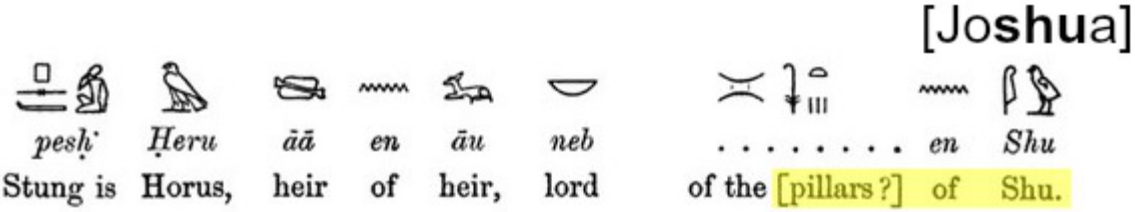

A segment from the "Sorrows of Isis", line 194, describes "god Shu", i.e. Ja-Shua (Joshua), in respect to the stinging of Horus by a poisonous scorpion sent by his evil brother Set; this became Joshua 10:13 in the Bible.

Hence, the "Sorrows of Isis", as Vladimir Golenischeff (1877) and Wallis Budge (1904) entitle the above tale, became the "Book of Joshua" (Book of Shu), or Joshua chapter of the Bible, according to which, Joshua made (or bade) both the sun and the moon to stand still. Nearly the entire Old Testament and New Testament were written in the manner.

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (image, pgs. 94-96; disc stood still, pgs. 209-10). Dover, 1969.

External links

â— Shu – Wikipedia.

θΔics

In existographies, **Shu-Kun Lin** (1957-) (CR:3) is Chinese-born Swiss chemist noted for co-founding the open-access thermodynamics journals *Entropy* (1999) and *Energies* (2008), which have produced a number of human thermodynamics related articles, such as in economics and philosophy. [1]

Entropy

The following the 1999 debut article of Lin's *Entropy* journal, in which he explains that after 20-years of studying chemistry, physics, and mathematics in regards to Belgian chemist Ilya Prigogine's dissipative structure theory, he remains "confused" as to whether information theory entropy (Shannon's entropy) and thermodynamic entropy (Clausius, Gibbs, Boltzmann, and Planck's entropy) are compatible or not compatible, and also the relation of this muddled query to Prigogine entropy, and seems to think that launching a new journal to discuss this supposed paradox will help to resolve the issue:

> "There are many types of entropy reported in the scientific literature. [5]. The great diversity in the concept and definition may cause tremendous problems. My own humble suggestion is the following regarding the main two kinds of entropy:
>
> 1. Any information-theoretic entropy (Shannon's entropy [6], *H*) should be defined in a way that its relation with information is clear.
> 2. Any theories regarding thermodynamic entropy (classical entropy, *S*, or the entropy of Clausius, Gibbs and Boltzmann and Plank) should conform with the second law of thermodynamics.

For information-theoretic entropy, if one uses entropy and information interchangeably, which has often happened even among some physicists [3], for any well defined system and processes, we cannot make meaningful intellectual discussion [7].

A famous thermodynamic entropy theory is Dr. Ilya Prigogine's dissipative structure theory. It has been presented by most of my respected teachers as unbelievably important, beautiful and useful. Therefore, 20 years ago as a young student of chemistry, I wanted to understand Prigogine's theory and I studied all kinds of related mathematics and physics, including several graduate courses in physics, to prepare myself. Now, after more than 20 years, first 10 years of theoretical investigation, then, several years of diverse experimental practice in chemistry laboratories, I have a clear opinion regarding this entropy theory. Its main problem is that it does not conform with the second law of thermodynamics [8]. Therefore, it is not a surprise that an honest chemist (among any other educated chemists, physicists, biologists, etc.) will tell you that he has never found an application of this entropy theory in chemistry (or in biology, physics, engineering, ...) [9].

However, the **messy and confusing situation** regarding entropy-related studies has provided opportunities for us: clearly there are still many very interesting studies to pursue. For instance, one immediate task is to investigate whether the information-theoretic entropy and the thermodynamic entropy are compatible or not compatible, i.e., whether both need to satisfy a definition of "information is related to entropy loss", what relation the information-theoretic entropy has to the second law of thermodynamics and whether there is any correlation between information-theoretic entropy and thermodynamic entropy. To make the life of the students of younger generations easier, entropy related concepts need to be clarified and well defined. The relation of entropy with many other concepts need to be studied. These reasons alone would justify our launching of this new journal *Entropy*.

Nevertheless, diversity is good in another sense: the very diverse areas involved in the adaption and the

application of the entropy concept and of those various good theories of entropy will definitely generate a very active scientific forum. Our journal *Entropy* will strongly support this forum, publishing high quality papers from areas as diverse as physics, chemistry, biology, economics and philosophy."

(add discussion)

Education

Lin completed his BS in inorganic chemistry in 1982 from Wuhan University, MS in physical chemistry in 1985 from the Lanzhou Institute of Chemical Physics, and PhD in organic chemistry in 1992 at the Swiss Federal Instituted of Technology. [2] Lin seems to have become interested in entropy (and later energy) in 1996 with the formulation of his "similarity principle". [3]

References

1. (a) Shu-Kun Lin – Mdpi.org.
(b) Energies (about) – Mdpi.com.
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(d) Entropy (journal) – Wikipedia.
(e) Lin, Shu-Kun. (2008). "Distinguishability, Information and Useful Energies." *Energies*, (1): 1-2.
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8. (a) Based on his observation of the so-called "order out of chaos" examples, Pregogine himself also questioned the validity of the second law of thermodynamics; see Prigogine's comments in the paragraph regarding the second law of thermodynamics in his Nobel lecture [4b].
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9. However, all contributions on Prigogine's dissipative structure theory are still welcomed based on our editorial policy.

External links

â— Shu-Kun Lin (about) – Wizards-of-os.org.

θΔics

In hmolscience, **Shyam Sunder** (1944-) is an American economist noted for his 2005 article "Economic Theory: Structural Abstraction or Behavioral Reduction", used as reading material of Brigham Young University's 2011 sociophysics course (Q), see: hmolscience courses, wherein he seems to discuss the pros and cons of using minimization principles of physics as a universal leveler to explain social and economic phenomena, without recourse to notions of intent or purpose, [1]

Overview

In 2005, Sunder, in his "Economic Theory: Structural Abstraction or Behavioral Reduction", gives the following abstract:

> "In physics, optimization is an organizing principle for natural phenomena. Entropy tends toward its maximum and marbles roll toward minimum potential energy, all without intent or purpose. Injection of this principle into economics initially followed the physicists' organizing perspective, and helped develop the powerful insights of the abstract partial and general equilibrium theory. However, humans and their institutions being their unit of analysis, it was not long before optimization in economics acquired a behavioral spin. Photons may travel along paths that minimize their travel time without intent or purpose; but economists were too human to think in a similar vein of the people buying ice cream or cars. Once optimization was posited as a behavioral principle of individual human beings, it was easy for cognitive sciences to show that it lacked descriptive validity; however, individual behavior is more complex and less predictable. The aggregate characterizations of Walrasian abstraction could not be derived starting from such complex micro-level behavior. If psychology and equilibrium theory were to be reduced into a single science, something had to give. Given the cognitive limitations humans share with all organisms, validity and relevance of the conclusions of equilibrium theory became suspect."

(add discussion)

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1. Sunder, Shyam. (2005). "Economic Theory: Structural Abstraction or Behavioral Reduction" (abs) (pdf), HOPE conference; in: *History of Political Economy 38*. Duke University Press.

External links

- Shyam Sunder (papers) – SSRN.com.
- Shyam Sunder (faculty) – Yale University.
- Shyam Sunder (economist) – Wikipedia.

θΔics

In genius studies, **SI unit geniuses** refers to scientific geniuses behind the top 20+ main SI unit, either named in their honor, e.g. newton N as the unit of force in honor of Isaac Newton, or the main thinker behind a given unit, e.g. Clausius behind the unit if heat Q in J/K.

Rankings

The following is a work-in-progress ranking of thinkers who have international (SI) units, i.e. quantities or variables, named after them, and or the main person behind each unit, both base units and derived units, and main characteristic functions, each ranked according to IQ|# position in the top 1000 geniuses tables

IQ		Person	IQ estimates	Overview
				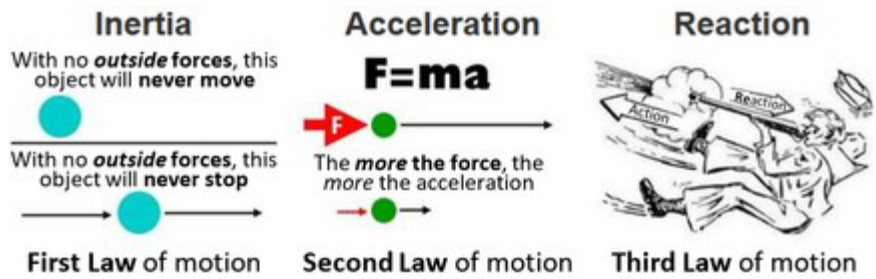
1.	$\frac{220}{2}$	F	Force: **N** Units: kg m/s² Date: 1667 Mass: **m** Units: kg Date: 1667	IQ_O=250+ IQ_{SS}=250 IQ_O=200 IQ_B =195|#5 IQ_{CB} =**193** IQ_C =190|#7 IQ_{SK} =190|#14 IQ_{JP}=190 IQ_{CPB} =**188** IQ_W=170

Isaac Newton (1643-1727)

(Cattell 1000:14) [RGM:3\|1,500+] (Murray 4000:2\|CS / 1\|P / 2\|M) (EPD:F0) (GR:1) (RE:84) (CR:595) English physicist, chemistry, mathematician, and philosopher;

"Is it not for want of an attractive virtue between the parts of water ( ) and oil, of quick-silver ( )(Hg) and antimony ( )(Sb), of lead ( )(Pb) and iron (♂)(Fe), that these substances do not mix; and by a weak attraction, that quick-silver ( )(Hg) and copper (♀)(Cu) mix difficultly; and from a strong one, that quicksilver ( )(Hg) and tin ( )(Sn), antimony ( )(Sb) and iron (♂)(Fe), water ( ) and salts, mix readily?"

— Isaac Newton (1718), "**Query 31**" of *Optics*

Noted for his 1686 *Principia: Mathematical Principles of Natural Philosophy*, where he introduced the laws of motion, which he applied to both falling apples and falling planets; the **#1** in genius meta-analysis rankings; **triple** scientific revolutions genius; blue sky problem theorist; [GPE] [GME]; known for: mechanics, gravitational theory; his Query 31 launched affinity chemistry (the key behind Goethe's 1809 *Elective Affinities*) and well as physical chemistry; known for: differential equations, optics, etc; IQ of 250+ (Azak, 2011).

(Cattell 1000:N/A)

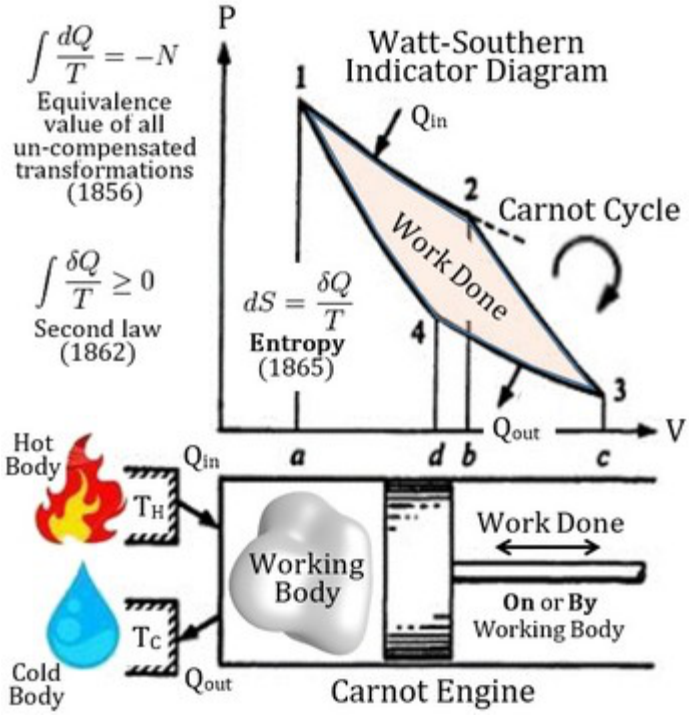

2. | 205 / 6 δQ [Rudolf Clausius](#) (1822-1888) IQ_{SK} =175|#84

[RGM:N/A|1,320+] (Murray 4000:N/A) (GS:5) (SIG:3) (CR:708) German mathematical physicist;

Heat: **TdS**
Units: J/K
Date: 1865

"Before **Clausius**, truth and error were in a confusing state of mixture, and wrong answers were confidently urged by the highest authorities."

— Willard Gibbs (1889), "Rudolf Julius Emanuel Clausius"

an **Epicenter genius** (IQ_{avg}:210); a **dual** scientific revolutions genius; blue sky problem theorist; [GTE]; known for: thermodynamics (founder and greatest), entropy, kinetic theory; intellectual mentor to Gibbs, Maxwell, and Einstein; see: Euler genealogy to discern the significance and density of his influence; his Clausius inequality (1856) determined the nature and measure of irreversible "change" in the universe, via the interaction of heat and work on ALL bodies, aka "working bodies", in the universe, as shown adjacent; first-slating: 195-210 (c.2014).

(Cattell

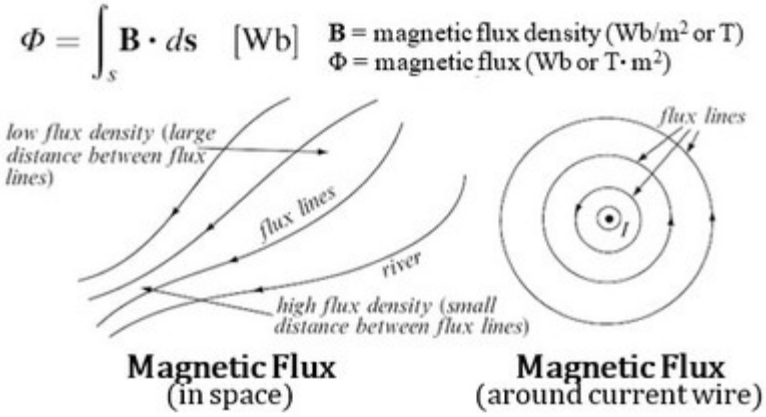

3. | 195 / 19 T [Nikola Tesla](#) (1856-1943) IQ_O=230-310 IQ_O=200 IQ_O=140-1000:N/A) [RGM:7|1,500+] (Murray 4000:N/A) (RE:87) (CR:94|37) Serbian-born American electrical engineer, inventor, and philosopher;

Magnetic flux density: **tesla**
Units: Wb/m²
Date: c.1882

160

"I am an automaton endowed with power of movement, which merely responds to external stimuli beating upon my sense organs."

— Nikola Tesla (1900), "The Problem of Increasing Human Energy"

known for: defunct life theory, electricity, magnetism, human energy, radio technology, alternating current, electromagnetic motors; adhered to a Goethean philosophy, to the exclusion of all other philosophies.

Blaise Pascal (1623-1662)

4. | 185 | 46 P

IQ_{SS}=235
IQ_{C}=195
IQ_{W}=192

Pressure: **Pa**
Units: N/m²
Date: 1648

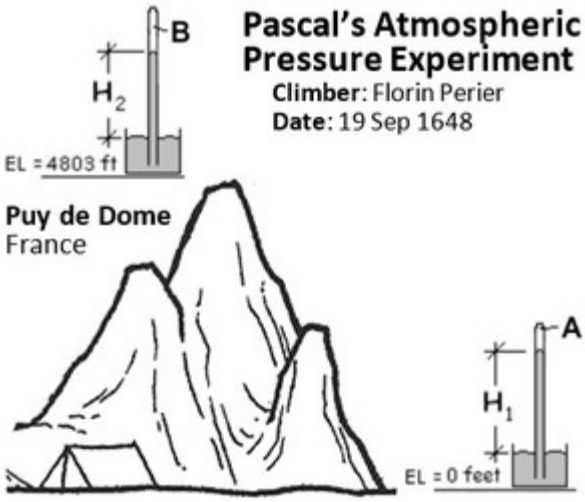

(Cattell 1000:61) [RGM:42|1,500+] (Murray 4000:8|M) (GME:18) (CR:44) French mathematician, physicist, and philosopher; at age 19 (1642), made a counting machine, impressed Descartes, with toothed wheels and gears, moving drums carrying numbers, that could add, subtract, multiply and divide; built 50 in total; in 1646 repeated Evangelista Torricelli's vacuum experiments; from 1652-64, spent all his time on the mathematics of gambling; after his 1654 brush with death (age 31) he "found god" (downgrade ↓) and thereafter seems to have lost his ability to think objectively (see: Pascal's wager) and productively (relating all his theories to the Bible); upgrade (↑) for his *Thoughts* dialogues (Einstein-Pascal dialogue on purpose); dereacted at 39; down-graded from 190|#49 to 185|#47 (Feb 2017).

Otto Guericke (1602-1686)

5. | 185 | 59 V

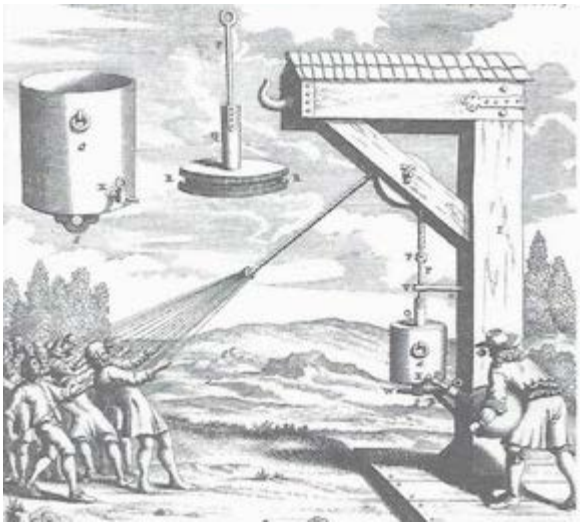

[RGM:878|1,500+] (CR:112) German engineer, physicist, philosopher, diplomat;

"Theories which are demonstrated by **experiment** and visual perception must be preferred to those derived from reasoning, however probable and plausible, for many things seem true in speculation and discussion, which in actual fact defy reality."

— Otto Guericke (1663), *New Magdeburg Experiments on the Vacuum of Space* (pg. xvii)

Volume: **V**
Units: m³
Date: 1654

In 1854, he experimentally disproved Aristotle's theories about space and and his view that nature abhors a vacuum; a characterized “neglected genius” (Coulson, 1943) (Ames, 1994) (Q); the originality, variety, polymathly, and influence of his contributions are difficult to summarize in short; to say the least: he is the person behind the invention of the vacuum engine and the so-called: “first and greatest of the electrical discoverers”; first slated at 185|#61 (c.2017).

6. 185 | 52 T

William Thomson (1824-1907)

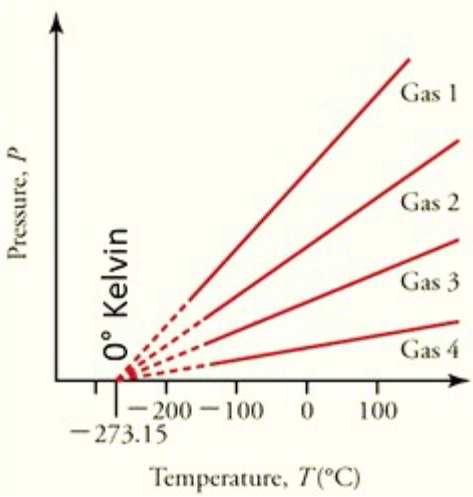

(Cattell 1000:989) [RGM:726|1,500+] (Gottlieb 1000:111) [Kanowitz 50:19] [Cropper 30:5|T] (GPE:47) (SIG:6) (CR:384) Irish-born Scottish mathematical physicist; known for: absolute temperature (adjacent), thermodynamics; Glasgow University age 10; defended Joseph Fourier’s 1822 theory of heat over that of Philip Kelland’s 1837 heat theory (age 13); by age 15-16; published first scientific papers by age 17; in 1845 (age 21), after graduating second wrangler (Cambridge), simultaneous unearthed (↑↑) the then unknown and forgotten memoirs of Sadi Carnot’s 1824 thermodynamics memoir and George Green’s 1828 memoir on the mathematics of electricity and magnetism, now known as two of the most-original works in science; and gave the first mathematical development of Michael Faraday's idea that electric induction takes place through an intervening medium; downgrade (↓) for latter religious undertone based calculations, e.g. age of the sun, etc.; first-slating: 185-190 (c.2015).

Temperature: K
Units: kelvin
Date: 1849

7. 180 | 96 F

Michael Faraday (1791-1867)

IQ_{SS}=230
IQ_B=180
IQ_{CB} =**175**
IQ_C=170

Capacitance: farad
Units: s^4 A^2 m^{-2} kg^{-1}

(Cattell 1000:330) [RGM:35|1,500+] (Murray 4000: 7|CS / 17|T) (CR:102) English physicist, chemist, and philosopher; known for his c.1837 experiments, with spherical capacitors (Q), basically two concentric metal spheres in between which he could have air, glass, wax, shellac or other materials, with which he determined that the material in between the capacitor’s plates had an effect on the quantity of charge on the capacitor’s plates; specifically, using a Coulomb torsion balance, while keeping the

Date: c.1854

potential difference constant, he effectively measured the charge on the capacitor when the gap between the spheres was filled with air, then measured the charge when the gap was filled with other materials, therein finding that the charge was greater with the other materials than it was with air; noted also for work in chemistry; largely self-taught through reading of books at a bindery he worked at as a child; intellectual giant to Einstein.

(Cattell 1000:557) [RGM:558|1,500+] (GPE:43) (Eells 100:93) (CR:15) French physicist and mathematician;

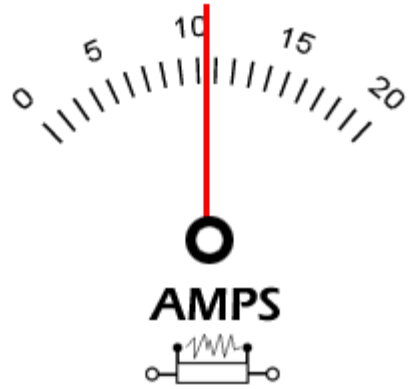

Andre Ampere (1775-1836)

8. $\frac{180}{144}$ A

Current: amp
Units: C/s
Date: 1827

"The experimental investigations by which Ampere established the laws of mechanical action between electric currents is one of the most brilliant achievements in science. The whole, theory and experiment, seems as if it had leaped, full grown and full armed, from the brain of the **'Newton of electricity'**. It is perfect in form, and unassailable in accuracy, and it is summed up in a formula from which all the phenomena may be deduced, and which must always remain the cardinal formula of electro-dynamics."

— James Maxwell (1873), *Treatise on Electricity and Magnetism, Volume 2*

Dubbed the "father of electrodynamics" (Heaviside, 1888); coiner of electrodynamics, the study of currents and dynamical movements; a "tortured genius" who had the phrase "Tandem felix" ("Happy, at last") engraved on his tombstone; gauged at 180-190 (c.2015).

(CR:35) French physicist; noted for his 1829 *Calculation of the Effect of Machines*, wherein he introduced the modern formulaic definition of work as force times distance; some references assert, of note, that also in this book he introduced the introduced the factor ½ in

Gustave Coriolis (1772-1843)

9. $\frac{180}{150}$ δW

Work: **W**
Units: N m (joule)

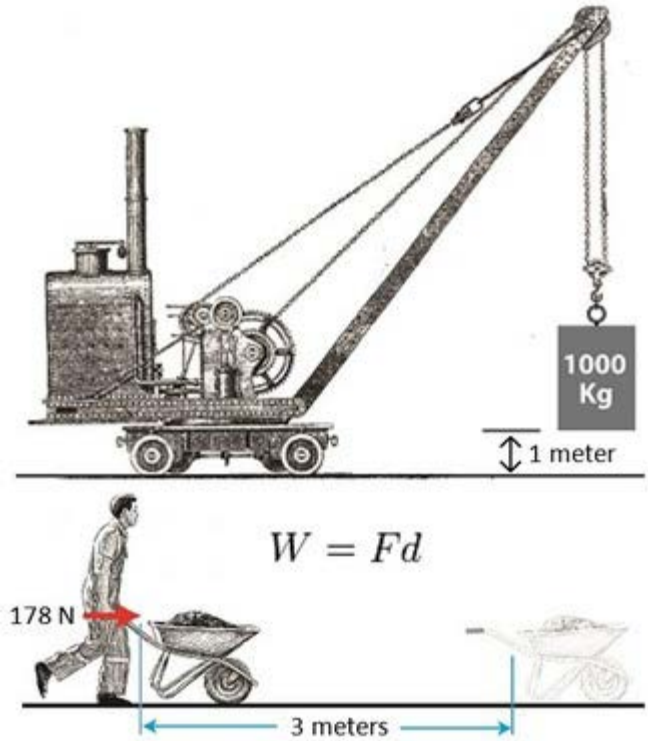

Date: 1824

German mathematician Gottfried Leibniz's 1686 *vis viva* for the sake of mathematical convenience (others say it was Joseph Lagrange who did this in 1811); also noted for his 1835 paper, wherein he stated that "any particle moving in the northern hemisphere is deflected to the right, and any particle moving in the southern hemisphere is deflected to the left", aka the Coriolis effect, according to which explains why toilets drain clockwise in the northern hemisphere and counterclockwise in the southern hemisphere.

James Joule (1818-1889)

10. $\frac{180}{166}$ E

Energy: **J**
Units: N m (joule)
Date: 1845

(CR:138|#30) English physicist and engineer;

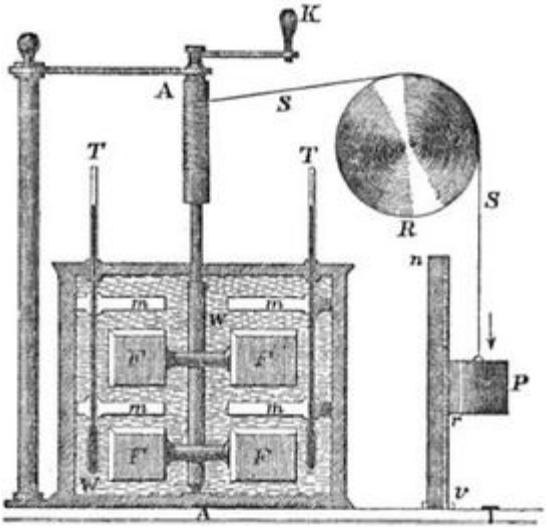

"The height of the pulleys from the ground was twelve yards, and consequently, when the weights had descended through that distance, they had to be wound up again in order to renew the motion of the paddle. After this operation had been repeated sixteen times, the increase of the temperature of the water was ascertained by means of a very sensible and accurate thermometer."

— James Joule (1845), "On the Existence of an Equivalent Relation between Heat and the Ordinary Forms of Mechanical Power" (Q)(Q)

together with Hermann Helmholtz and Robert Mayer, are the three main derivers of the mechanical equivalent of heat (aka the conservation of energy) the big three thinkers of Thomas Kuhn's

group of 12 independent formulators of the conservation of energy paradigm change theory; gauged at IQ 175-190 (c.2015).

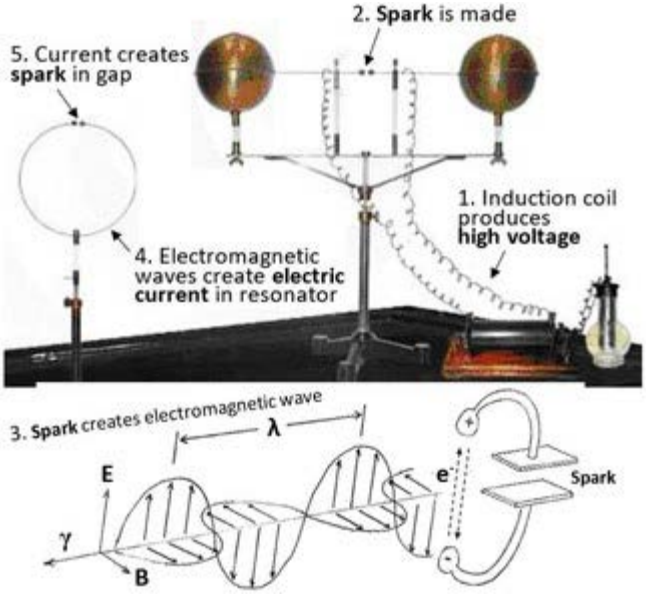

11. $\frac{180}{202}$ Hz Heinrich Hertz (1857-1894)

[RGM:151|1,500+] (Murray 4000:N/A) (Kanowitz 50:24) (SIG:11) (Q) German physicist;

Frequency: **hertz**
Units: 1/s
Date: c.1888

"It's of no use whatsoever. This is just an experiment that proves Maestro Maxwell was right—we just have these mysterious electromagnetic waves that we cannot see with the naked eye. But they are there."

— Heinrich Hertz (1887) (Q)

noted for his 1886 experimental proof, via detection of radiowaves, of Maxwell's electromagnetic theory, via experimental setup as shown adjacent; first-slating: 180|#185 (Dec 2017).

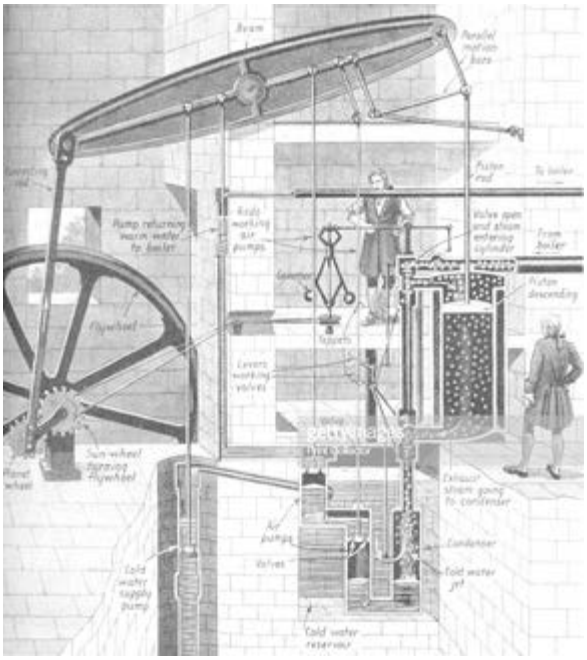

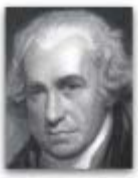

12. $\frac{175}{218}$ P James Watt (1736-1819) IQ_C=165

(Cattell 1000:225) [RGM:130|1,500+] (Murray 4000:1|T) (CR:79) Scottish instrument maker, natural philosopher, chemist, and engineer;

"James Watt was equally distinguished as a natural philosopher and chemist; his inventions demonstrate his profound knowledge of those sciences, and that peculiar characteristic of genius, the union of them for practical application."

Power: **P** or **hp**
Units: J/s
Date: 1783

— Humphry Davy (1824), “Address to Royal Society” (Q)(Q)

noted for number of inventions and design improvements to the functionality of the steam engine, including: separate condenser (1765), the fly-ball governor (1788), the definition of "pony power" (or horse power), all embodied in what came to be known as the Watt engine (adjacent).

(Cattell 1000:684) [RGM:140|1,500+] (SIG:13) (CR:18) Italian physicist;

“What is possible to do well, in physics in particular, are those things that can be reduced to degrees and measures.”

— Alessandro Volta (c.1800) (Q)

Alessandro Volta
(1745-1827)

13. 175 | 245 V

Potential EMF:
volt
Units: W/A
Date: add

noted for his famous 1776 “animal electricity” debated with his friend Luigi Galvani on the topic of the mechanism of the twitching of dead frog legs in an electric circuit, in respect to what separates a “living thing” from a “dead thing”, moved by purely electro-physico-chemical means; which resulted in Volta inventing the battery, or “Voltaic pile”, in 1800, so to prove Galvani wrong about his animal electricity theory; first-slated 175±|#156 (c.2015).

(GCE:21) (CR:11) Italian physical chemist;

“The invariable number N is a universal constant, which may appropriately be designated Avogadro’s constant.”

— Jean Perrin (1909), “Brownian Motion and Molecular Reality”

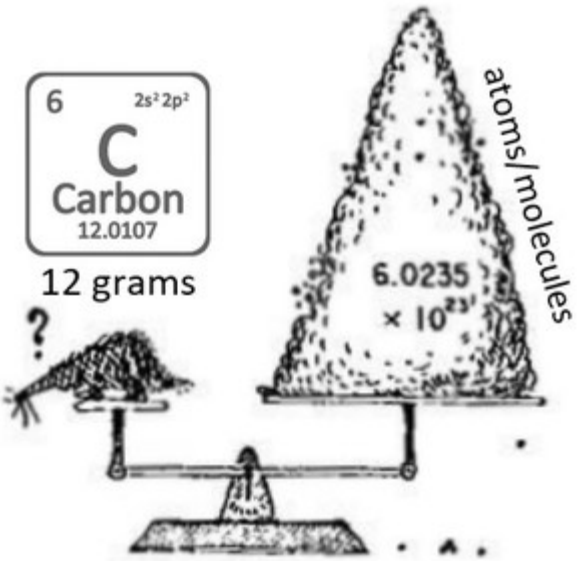

Amedeo Avogadro
(1776-1856)

14. 175 | 285 N_A

Substance: **mol**
Units:
$6.022x10^{23}$
Date: 1811/1909

noted for his 1811 hypothesis, based on the earlier work of Joseph Gay-Lussac (1809), that equal volumes of all gases under the same conditions of temperature and pressure, have the same number of molecules; in 1858, two years after his dereaction (death), Stanislao

Cannizzaro (1826-1910) showed how the use of Avogadro's number could solve many of the problems in chemistry (O); in 1909, Jean Perrin calculate the “mol” to be 7.05x10E23 (modern value: 6.022x10E23).

(Cattell 1000:N/A)

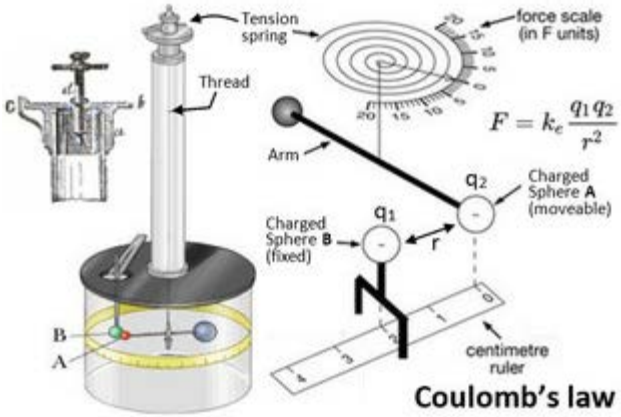

[RGM:N/A|1,350+] (Murray 4000:N/A) (SIG:15) French physicist and military engineer; noted for his 1785 construction of a built a torsion balance (O), as shown, wherein, in an effort to prove Joseph Priestley 1766 inference that the force of attraction or repulsion between two small charged spheres would be inversely proportional to the square of the separating distance, using Hooke’s spring law, and showed quantitatively that charged spheres haven an inverse proportionality relationship, which he explained formulaically (see: Coulomb’s law); first-slating: 170|#291 (Mar 2018).

15. 170/317 C

Charles Coulomb (1736-1806)

Charge: **coulomb**
Units: A s
Date: 1717

16. Wb & c

Wilhelm Weber (1804-1891)

Magnetic Flux: **weber**
Units: V s
Date: date

Speed of light: **c**
Units: m/s
Date: 1856

Henri Becquerel

17. Bq (1852-1908)

Radioactivity: **bacquerel**
Units: 1/s
Date: 1896

Georg Ohm (1789-1854)

18. 165 | 453 Ω

Resistance: **ohms**
Units: kg m^3 s^{-3} m^{-2}
Date: 1827

(Cattell 1000:N/A) (Gottlieb 1000:N/A) [RGM:154|1,500+] (Murray 4000:N/A) [Kanowitz 50:27] (GPE:93) (SIG:18) (CR:5) German physicist and mathematician; noted for his 1826 discovery of the "Ohm's law", shown below:

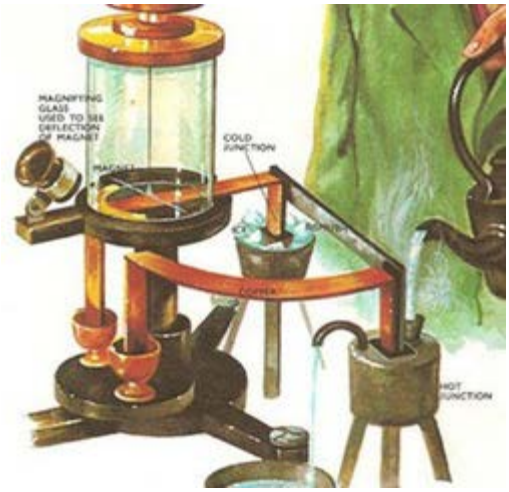

$$I = \frac{V}{R}$$

which states that current is directly proportional to the voltage and inversely proportional to the resistance.

Joseph Henry (1791-1867)

19. 160 | 534 H

Inductance: **henry**
Units: Wb/A
Date: 1832

(Gottlieb 1000:605) (SIG:19) (GPE:99) was an American physicist and electrical engineer; noted for his discovery of electromagnetic induction (1832), independent of Faraday (1831); his genius ability was ranked, by Alfred Mayer (1880), as "a little below that of Faraday"; first-slating: 160|#534 (Nov 2019).

Elizabeth Fulhame (c.1750-c.1820)

20.

Catalysis: **katal**
Units: mol/s
Date: 1794

Scottish chemist; first, historically (Q), supposedly, to describe catalysis in detail; a top female genius candidate. (Q)

Ernst

Siemens
(1816-1892)

21. S

Conductance:
siemens
Units: 1/Ω
Date: add

(add)

θΔics

In studies, **sidewalk study**, aka Dabbs-Stokes study, is a famous 1970s observational and experimental study, conducted American social psychologists James Dabbs (1937-2004) and Neil A. Stokes III (c.1940-), wherein passerbyers were filmed from above as passed each other, moving in opposite directions, on a sidewalk, finding that both pairs were given more personal space than singles, that men were given more personal space than women, and most interesting, that a more attractive (beautiful) woman—experimentally distinguished, the same woman in each case, by tightfitting clothes and attractive makeup—as compared to a less attractive woman—experimentally distinguished by no makeup, pulled back hair, and sloppy clothes—was given a wider berth, i.e. more passage volume or personal space, when she passed; the beautiful woman evidenced or effected a volume increase, as compared to the less-attractive version of the same woman, who evidenced or effected a volume decrease. [1]

In the 1970s, American sociologists James Dabbs and Neil Stokes conducted a **sidewalk study**, wherein they measured changes in personal space around people as they walked against passerbyers on sidewalks, finding that beautiful women were allotted more personal space measured in inches. [1]

Overview

In the early 1970s, American sociologists James Dabbs and Neil A. Stokes III, of Georgia State University, conducted a study, the research of which supported by a US Public Health grant (HH20660), involving three experiments, in an attempt to discern changes in personal space (volume around a person) with respect to beauty, when a person is in motion, in an attempt to bring quantification to the famous idiom "beauty is power", the abstract of the results of this study, published in 1975 as "Beauty is Power: the Use of Space on the Sidewalk", is the following: [2]

> "In three experiments, 470 pedestrians were observed as they walked past confederates standing on the edge of a sidewalk. Observations were made from a window overlooking the area, using time lapse filming with a movie camera. Pedestrians were observed as they moved along the sidewalk, and their distances from the edge of the sidewalk was measured at several points. Pedestrians deviated in their paths to stay farther from a male than a female, father from two people than from one person, and farther from a beautiful than an unattractive woman. Sex, number, and attractiveness may be regarded as aspects of power, which serve to dominate various amounts of a space."

This study, along with the similar 1974 study "Body Height, Position, and Sex as Determinants of Personal Space", conducted on 41 males and 43 females, in a laboratory setting by American psychologists Johan Hartnett, Kent Vailey, and Craig Hartley, were in combination summarized by American beauty researcher Nancy Etcoff (1999), as follows: [3]

> "As we walk down the street, we negotiate space with other people. We carry a small territory with us, a protected turf that surrounds us whether we are sitting or standing, and upon which others cannot trespass without permission. Move in too close, and people get uncomfortable. Tall people have bigger territories: their sheer size intimidates people. When people are asked to approach a stranger and stop when they no longer feel comfortable, they will stop about two feet away from a tall person (22.7 inches to be exact) but less than a foot (9.8 inches) from a short person. Very attractive people of any size are given personal territories; they carry their privileges around their persons."

This "trespass without permission" brings to mind both the 1970 chimpanzee war and the 2001 9/11 attacks, both the result "territory trespassing" repercussions, a led into the topic of war thermodynamics.

Related

In 1976, Stokes and Dabbs, presented the results of a similar video-recorded interaction study of dyads discussing topics on which the agreed and ones on which they disagreed, the results analyzed by a computer. (Ñº)

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(b) James M. Dabbs, Jr. – Wikipedia.
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θΔics

In science, **Sidney Harris** (c.1942-) is an American science humor cartoon artist noted having penned, since the 1970s, over a thousand on target illustrations, found in the works of Harold Morowitz (1977), Libb Thims (2007), on the second law, "A Nation of Einsteins" (see: smartest person alive), dealing with a number of subjects, some of which are shown below.

Education

Harris may (Q) have been a former high school physics teacher in the 1960s. In the 1970s, Harris starting doing cartoons for *American Scientist Magazine*. The following are Harris quotes in regards to his outlook or disposition: [2]

> "I have freelanced virtually all my life. In fact, I never had a job."
>
> "I try to write ideas every day, generally for a couple of hours at night, going through newspapers (mainly the NYT) & magazines, looking for subject matter. I don't write ideas for others, but some in the past were purchased by NYM & PBY."

(add discussion)

Gallery | Religion

The following are some of Harris' noted science cartoons on religion, along with a third caricature of American chemistry historian William Jensen, of Gilbert Lewis the prophet of physical chemistry, showing on the belief system of chemical thermodynamics, specifically human chemical thermodynamics, will eventually replace the 5,000-year old heat belief system of Anunian theology—sun [Ra] born of Nun [flood-mound]; humans descendent from Ra belief system—which currently dominates over 75 percent of the beliefs of the world:

"Now, in the *second* law of thermodynamics . . ."

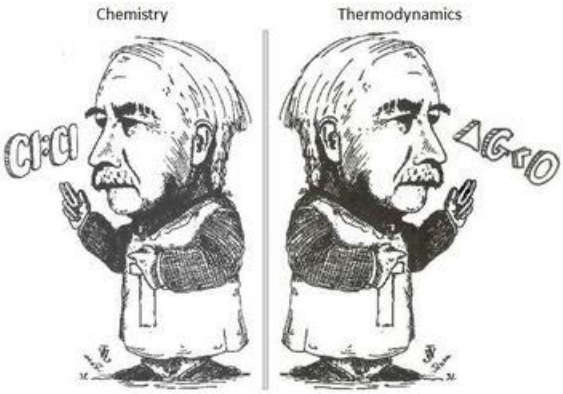

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2. Harris, S. (clips) – SFSite.com.

External links

- Sidney Harris (cartoonist) – Wikipedia.
- Sidney Harris (bio) – ScienceCartoonsPlus.com.

θΔics

In hmolscience, **Siegfried Bernfeld** (1892-1953) was a Ukrainian-born Austrian psychologist noted, in psychological thermodynamics, for his 1925 to 1934 attempt to outline an engine and energy conceptualized psychology, based on Freud's death drive and life drive theories.

Overview

In 1925, Bernfeld built on Sigmund Freud's theory of instinctual drives, to theorize about distinct biological and psychological drives; for example: (O)

> "The life- and death-instincts are biological forces … which extend beyond the domain of the individual."

In 1929, Bergnfeld began to co-author with physicist Sergei Feitelberg, on the application of physical science principles, particularly conservation of energy, entropy, and Le Chatelier's principle, among others, to instinct theory, such as found in their 1930 booklet *Energy and Engines: Psychoanalytic studies of Psychophysiology*.

In 1934, Bernfeld wrote: [4]

> "Physical systems for which the entropy principle holds behave as if they had an impulse to reduce their internal quantities of tension within the system as a whole."

Some of their first articles in direction include the "The Principle of Le Chatelier and the Instinct of Self-Preservation" as well as, on the topic of psychic energy, "Upper Psychic Energy, Libido, and its Measurement." [1] The term "Helmholtz school" was used as early as 1944 by Bernfeld in his article "Freud's Earliest Theories and the School of Helmholtz". [6]

On their view of entropy (or psychic entropy), Bernfeld and Feitelberg both suggested that life-processes in general tend to accelerate the natural dissipation of energy in the universe. [5]

Their most noted article is "The Principle of Entropy and the Death Instinct" in which they presented the results of their study where they attempted to measure a paradoxical pulsation of entropy within a living organism, specifically in the nervous system of a man. [2] Specifically, by comparing the brain temperature to the rectal temperature of a man, they thought to acquire evidence of paradoxical variations, i.e. variations not conforming to the principle of entropy as it functions in physics for inanimate systems. [3]

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External links

● Siegfried Bernfeld – Wikipedia.
● Siegfried Bernfeld (German → English) – Wikipedia.
● Bernfeld, Siegfried (1892-1953) – WorldCat Identities.

θΔics

In existographies, **Siger of Brabant** (c.1240-1284) (IQ:#|#) was a Belgian-born (Q) French-Latin philosopher, aka the "Latin Averroes", noted for his secular interpretation (Q) of Aristotle; in his *Impossibilia*, presented the idea that "there is no god" (see: god does not exist), intended an intellectual training tool for students in logical disputation; the Condemnation of 1277 was, supposedly, a response to radical thinkers, such as Brabant; Dante, in the Divine Comedy, put Siger in the 'Heaven of Light' in the brilliant company of twelve illustrious souls, specifically beside Thomas Aquinas and Isidore of Seville.

Overview

In c.1275, Siger, in his *Impossibilia*, presented the idea that "there is no god" (see: god does not exist), intended an intellectual training tool for students in logical disputation. [1]

In Paris, Siger taught that the individual soul had no immortality, and that the world was eternal rather than created. [2]

Siger, per reason of his full acceptance of Averroism (see: Averroes), did battle with Albertus Magnus and Thomas Aquinas.

Dante

Dante, in the Divine Comedy, put Siger in the 'Heaven of Light' in the brilliant company of twelve illustrious souls, specifically beside Thomas Aquinas and Isidore of Seville.

Quotes | By

The following are representative quotes:

> "For not every being has a cause of its being, nor does every question about being have a cause. For if it is asked why there is something in the natural world rather than nothing, speaking about the world of created things, it can be replied that there is a first immoveable mover, and a first unchangeable cause. But if it is asked about the whole universe of beings why there is something there rather than nothing, it is not possible to give a cause, for it's the same to ask this as to ask **why there is a god or not**, and this does not have a cause. Hence, not every question has a cause, nor even every being."
>
> — Siger of Brabant (c.1275), *Publication* (Q)

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External links

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θΔics

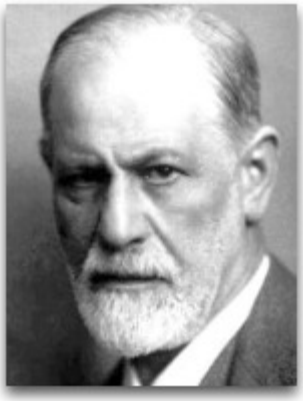

In existographies, **Sigmund Freud** (1856-1939) (IQ:185|#75) [RGM:75|1,500+] (Murray 4000:18|M) (Gottlieb 1000:15) (Becker 139:119) (Stokes 100:66) (Bloom 100:19) (Scott 50:11) [HD:51] (FA:122) (GA:13) (RMS:75) (GPhE:32) (GSE:#) [CR:297] was an Austrian psychiatrist noted for his 1895 "A Project for Scientific Psychology", the 1896 coining of the term "psychoanalysis", the scientific analysis of the mind, the view that mental processes operate owing to the movement of particles in the mind governed by chemistry and energy (chemical thermodynamics, in the modern terms), albeit described verbally. This general subject later came to be known as known as psychodynamics, energy psychology, Freud's psychical energy model, dynamic psychology, among others.

Atheism

See main: Freudian atheism

Freud privately admitted remote intellectual connections with Immanuel Kant, Voltaire, and Ludwig Feuerbach; he also acknowledged that Arthur Schopenhauer's "will" (see: Schopenhauerian will) was the same as his "unconscious desire". [8]

> "Neither in my private life nor in my writings have I ever made a secret of being an out-and-out unbeliever."
>
> — Sigmund Freud (c.1920), "Letter to Charles Singer" (Ñº)

In 1927, Freud, in his *The Future of an Illusion*, does his Cicero-style *On the Nature of the Gods* dialogue, albeit in the guise of Schopenhauer's *Dialogue on Religion*, wherein he debates with a Demopheles character, representative of "the people", on the subject of whether people need religion; the penultimate chapter reads as follows: [9]

> "Have you learned nothing from history? Recall how short lived and miserably ineffectual the experience of the French revolution and Robespierre was. Furthermore, the same experiment is being repeated in Russia at the present time, and we need not feel curious as to its outcome. Isn't it obvious people need religion?"
>
> — Demopheles (1927), the 'people' character

> "The idea forces itself upon him that religion is comparable to a childhood neurosis, and he is optimistic enough to suppose that mankind will surmount this neurotic phase."
>
> — Reality (1927), the 'Freud' character

Freud, of note, has his reality character espouse, in his "education to reality" process, as he calls it, the conclusion that they will have to admit their "helplessness" and "insignificance" in the "machinery of the universe". This would seem to put Freud into the dumb atheism (or incorrect atheism), ignorant atheism, or pessimistic atheism category, to some extent.

Overview

Freud never fully published his thermodynamic interpretation of psychology, but only integrated aspects of his theory throughout his various articles and booklets.

Some of Freud's thermodynamic ideas are said to show through in his 1920 *Beyond the Pleasure Principle*.

His best known work that presents his theory is the 1923 *The Ego and the Id*, wherein he presents the argument that the psyche is an energy that exists in different states at any point in time.

Goethe-Schiller-Helmholtz | Drive theory

See main: Freud-Schiller drive theory; Sex Drive

In 1930, Freud, in his *Civilization and its Discontents*, stated that the starting point for his famous 1895 conceived free energy and bound energy connected 1910 "drive theory" basis for his libido energy (id, ego, superego) model of the "theory of instincts" of psychoanalysis from the final line of Schiller's 1795 poem, which according to the 1961 translation by James Strachey, Freud quotes as follows:

> "Hunger and love are what moves the world."
>
> — Friedrich Schiller (1795), Quoted by Freud in *Civilization and its Discontents* (1930) (Ñº), as basis if his drive theory (Ñº)

The twenty-seven quotations from Schiller in Freud's work, as identified in the *Concordance*, attest to his intimate knowledge of the writer. [5]
In 2007, American-Canadian literature scholar Karyn Ball argued the following: [4]

> "It is as if Freud's key scientific references seem to cull their major hypotheses from Goethe's *Elective Affinities* (1809), which, along with Schiller, Schopenhauer, and Plato, would have also served as the literary and philosophical source of inspiration for the metaphysical theses in *Beyond the Pleasure Principle*."

Freud, however, did state that he was inspired to go to medical school after reading of one of Goethe's poems.

Death drive | instinct

See main: Death drive

Freud is said to have derived his "death instinct" theory, as described in his 1920 *Beyond the Pleasure Principle*, from a combination of thermodynamics and chemistry, i.e. that combination and dissolution of elements into aggregate substances are balancing processes. In his own words: [3]

> "Starting from speculations on the beginning of life and from biological parallels, I drew the conclusion that, besides the instinct to preserve living substance and to join into ever larger units, there must exist another, contrary instinct to seek to dissolve those units and to bring them back to their primeval, inorganic state. That is to say, as well as Eros there was an instinct of death. The phenomena of life could be explained from the concurrent or mutually opposing action of these two instincts."

(add discussion)

Helmholtz school

See main: Helmholtz school; Psychodynamics

The origin of Freud's mental dynamic theories came from his interactions at medical school. Freud started medical

school in 1873 at the University of Vienna. His first-year adviser was German physiologist Ernst Brücke, director of the director of the Physiology Laboratory at the University, close friend and previous medical school lab partner to none other than German physicist Hermann von Helmholtz one of main founders of thermodynamics and one of the three-main formulators of the first law of thermodynamics (conservation of energy). Over the next six years, initially concentrating on biology, Freud did research under Brücke.

In 1874, being influenced by the thermodynamic theories of Helmholtz, Brücke published *Lectures on Physiology*, which supposed that all living organisms are energy-systems governed by the first law of thermodynamics, which states, in effect, that the total amount of energy in any given physical system is always constant, that energy quanta can be changed but not annihilated, and consequently that when energy is moved from one part of the system it must reappear in another part. Freud, in turn, viewed these movements of energy to occur within the different levels of the consciousness. [2]

In sum, in his *Lectures on Physiology*, Brücke set forth the radical view that the living organism is a dynamic system to which the laws of chemistry and physics apply. This was the starting point for Freud's dynamic psychology of the mind and its relation to the unconscious. [1] In other words, Freud, who had great admiration and respect for Brücke, quickly adopted this new 'dynamic physiology' with enthusiasm. From there it was but a short conceptual step - but one which Freud was the first to take, and on which his claim to fame is largely grounded - to the view that there is such a thing as psychic energy, that the *human personality* is also an energy-system, and that it is the function of psychology to investigate the modifications, transmissions, and conversions of 'psychic energy' within the personality which shape and determine it. This latter conception is the very cornerstone of Freud's psychoanalytic theory. [2]

Although a number of psychologists, in the late 19th century, professed views on the correlation between the first law of thermodynamics (energy conservation) and the energy associated with mental thoughts, Freud did the most to translate this linkage into a workable framework of logic, namely by supposing that innate drives that didn't immediately find action were "repressed" in the subconscious, an energy that found exit in other ways.

Religio-mythology | Moses

In 1937, Freud, written in exile (Ñº) in England, penned the first two parts on Moses and monotheism, published in *Imago*, which, together with a third unpublished section, were compiled into the 1939 book *Moses and Monotheism*, the gist assertion of which, building on the earlier work of Eduard Meyer (1905), Hugo Gressmann (1913), and Ernst Sellin (1922), being that Moses, if he existed, was an Egyptian associated with the Akhenaten religious movement and that the three main names of god, in the Hebrew Bible, El aside, namely: Adonai, Yahweh, and Jehovah, “Adon-ai”, in particular, are “Aten” derivatives. [7]

Moyer | Martha Bernays adumbration

In 2010, American psychologist Dale Moyer published a “fictional” book entitled *The Flash and Outbreak of a Fiery Mind*, which is easily mistaken as a Sigmund Freud and Martha Bernays correspondences collected works set, which it is not, but rather it is a book that contains 192 “fictional” love letters that Moyer wrote “on Martha's behalf” starting when Martha is 21 years old and end with her marriage to Sigmund at age 25. The fictional book contain 55+ page mentions Goethe, five mentions of Goethe’s *Elective Affinities*, and a rather telling account of Martha and her younger sister Mann Bernays visit to Weimer and their tour of the Schiller and Goethe cites and places. [6]

A *circa* 1880 photo of Martha Bernays, whom Freud married in 1886, fathering six children with (Ñº).

Quotes | By

The following are related quotes:

> “I feel that I have done for human ‘reason’, what Copernicus did for the ‘universe’, and Darwin did for our ‘origins’.”

— Sigmund Freud (c.1930) [8]

"Religion is a neurosis of mankind. Its grandiose powers [are but the result of] a neurotic obsession in individuals."

— Sigmund Freud (1939), *Moses and Monotheism* (pg. 68)

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External links

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θΔics

In thermodynamics, **Sigmund Wroblewski** (1845-1888) was a Polish physical chemist noted for his 1883 low-temperature thermodynamics work, together with Carl Olszewski, in the liquefaction of a measureable quantity of oxygen at 90K.

Education

In circa 1870, following studies under Hermann Helmholtz at the University of Berlin, Wroblewski met German physicist Rudolf Clausius, while in recuperation from vision surgery in the Swiss Alps, who told him to continue on with his low temperature work, and to concentrate on things related to thermodynamics. [1]

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External links

â— Zygmunt Florenty Wróblewski – Wikipedia.
â— Absolute zero (historical timeline) – Devillier.com.
â— Zygmunt Wroblewski (overview) – Info-Poland.Buffalo.edu.

θΔics

In religio-mythology, **Silent historians problem**, aka "nonhistoricity hypothesis" (Voorst, 2000), is the apparent "problem" between the contradicting facts (a) that a large percentage of modern people, e.g. 60% in England (2015) (Ñº), believe that Jesus, Jesus Christ, or Jesus of Nazareth, was a "real person", who resided in Galilee, about 2,000-years ago, rather than a fictional, mythical, or astro-theological character, e.g. 40% in England (2015) believe this, and fact (b) that real historians, i.e. real people who existed without a doubt, in reality, e.g., Seneca the Younger (4BC-65AD), Pliny the Elder (23-79AD), author of a 10-volume encyclopedia, Plutarch (46-120AD), author of a 5-volume book on morals, etc., who resided in or shortly after the presumed period of existence of a person named Jesus, make no mention of him?

The so-called "**silent historians problem**" is the question of why REAL historians, who penned REAL accounts of histories of people, such as Seneca the Younger (4BC-65AD), Pliny the Elder (23-79AD), and Plutarch (46-120AD), inclusive of chapters on "resurrection and gods", are noticeably SILENT on the existence of an historical figure named Jesus Christ, said to have famously existence in their own time?

List | Silent Historians

The following is the the work-in-progress list of "real" people, who were historians, who should have written about the existence of a person named Jesus Christ [4BC-c.33AD], the purported patriarch of Christianity, who "should" have written about the existence of such a famous person, had he existed, but didn't:

	Historian		Discussion
1.	Strabo (c.63BC-24AD)	23AD	Traveled all over the world to make his multi-volume *Geography* (23AD), in which he published one of the first accurate maps of the 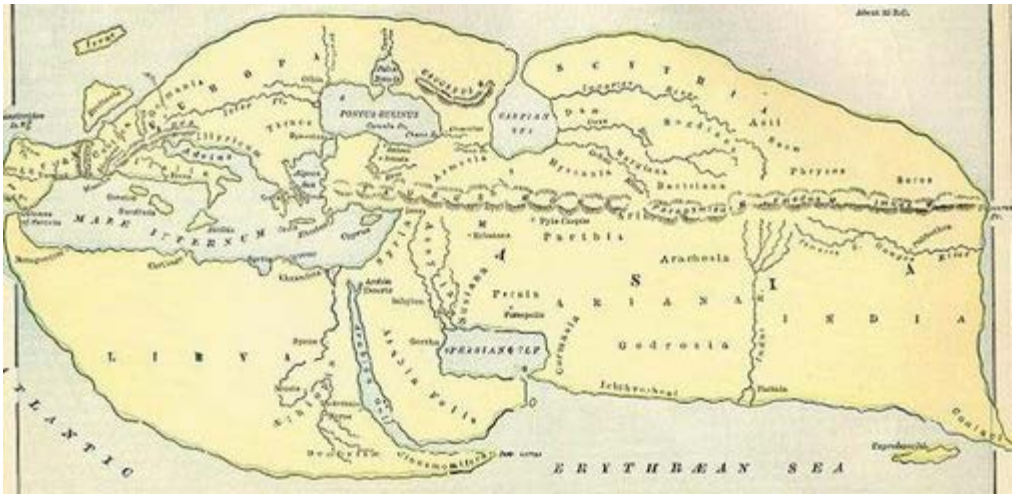 world, adjacent, yet is unaware of any "Jesus" of Nazareth (or "Syria" as shown on his map) as reported in the Gospels? "Is it not strange that the **principal historians** of the first century are **silent** as to Christians and their faith? Plutarch and **Strabo**, for instance, who lived and wrote soon after the alleged advent of Christ, are both silent upon the leading events recorded in the Gospels." — Charles Watts (1896), "Christianity and History" (pg. 35), *The Freethinker*, 16:1, Jan 19

2.

Livy (59BC-17AD)

Noted Roman historian who makes NO mention (Ñº) of the birth of any "age 12" (12AD) child prodigy named Jesus, who supposedly impressed all the temple priests with his vast learning.

2.

Ovid (43BC-c.17AD)

Pens a secular Greco-Roman version of "creation myth", narrated exactly as in Genesis, in his *Metamorphosis*, but is not aware of any baby Jesus.

3.

Seneca the elder (54BC-39AD)

Existed through the reigns of three significant emperors; Augustus (ruled: 27BC-14AD), Tiberius (ruled: 14-37AD), the one in charge when “Jesus” was purported to have been crucified, and Caligula (ruled: 37-41AD); author of an historical work, containing the history of Rome, from the beginning of the civil wars almost down to his own death, which was published by his son Seneca the Younger, who was tutor to emperor Nero (ruled: 54-68AD), whose portrait, of note, is carved on the walls of Dendera Temple worshiping the dying and rising god Osiris (not Jesus); neither him nor his son make mention of an dying and rising Jesus?

4.

Tiberius (42BC-37AD)

Roman emperor who completed Dendera Temple, the place where the "Osiris resurrection" is depicted, in full detail, which is from where the story of the "Jesus resurrection" derives; there is no extant work of his mentioning any "Jesus" dying and rising under his reign?

5.

Philo of Alexandria (20BC-50AD)

In 39AD, he led an embassy from the Jews to the court of Emperor Gaius Caligula; spent time in Jerusalem (On Providence) where he had intimate connections with the royal house of Judaea; he wrote extensive apologetics on the Jewish religion and commentaries on contemporary politics. About thirty manuscripts and at least 850,000 words are extant. He offers commentary on all the major characters of the Pentateuch and, as we might expect, mentions Moses more than a thousand times. Yet, he says **NOT a word about Jesus**, Christianity, nor any of the events described in the New Testament. In all this work,Philo makes not a single reference to his alleged contemporary "Jesus Christ", the godman who supposedly was perambulating up and down the Levant, exorcising demons, raising the dead and causing earthquake and darkness at his death. (Ñº) (Ñº)

Invented Person? (0-33AD)

NOT a real person (see: Jesus never existed); is retrospect Roman recension 100-300AD invented rescript of the Egyptian god Osiris-Horus (see: Osiris rescripts), the then big "dying and rising god" of Rome (see: Nero worshiping him below).

6.

Seneca the Younger (4BC-65AD)

In c.55AD, penned a 600-page treatise on *Morals* (Ñº), **but mentions NOTHING of Jesus**, the presumed-to-be most moral and righteous person of all, nor of Christians or Christianity? [3]

7.

Hero (c.10-70AD)

In 67AD, this so-called "da Vinci of his day", made a trick 'water to wine' jug, using hidden compartments and syphons, that he used to fool onlookers into believing he had turned water into wine; in his vast writings, **makes NO mention of any Jesus Christ**; but his water-to-wine trick is later used in John 2:10 (c.150AD) of the New Testament as having been a miracle purported to have been performed by a fictional Jesus. (Ñº) [3]

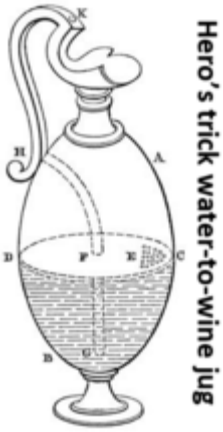

8.

Apollonius of Tyana (c.15-100AD)

Saintly first-century Neopythagorean philosopher, adventurer, and noble paladin; a magic-man of divine birth who cured the sick and blind, cleansed entire cities of plague, foretold the future, and fed the masses; was worshiped as a god and as a son of a god; despite such nonsense claims, he was a real man recorded by reliable sources; he **makes no mention of Jesus**; later real scholars posit, of note, that he was a model for the later fictional Jesus.

9.

Pliny the Elder (23-79AD)

77AD

In 77AD, penned his *Natural History of the World*, a 10-volume, 37-book, all-knowledge comprising treatise, wherein he attempts to cover all subjects connected to nature; **including: not only "resurrection and gods"**, but also astronomy, mathematics, geography, ethnography, anthropology, human physiology, zoology, botany, agriculture, horticulture, pharmacology, mining, mineralogy, sculpture, painting, and precious stones, among other subjects, but **does NOT mention Jesus Christ**, the supposed to have existed most famous resurrected god son of all. [3]

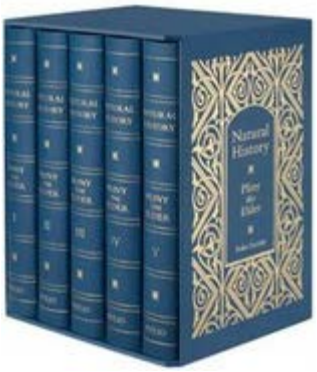

Depicted at Dendera Temple (adjacent), on the interior eastern wall of the outer hypostyle hall, completed c.54 to 68AD, placating the gods Osiris and Isis, in the presence of child god Ihy, son of Hathor and Horus; the parents of

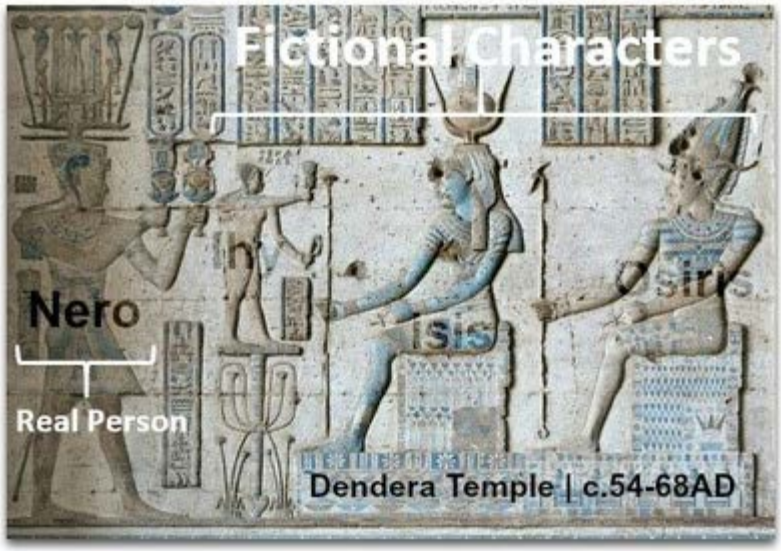

10.

Nero (37-68AD)

68AD

Horus; the synretism god Osiris-Horus is what later become reformulated into the "Christ" figure.

The noted secretary of Nero was Greek-Roman philosopher Epictetus (c.50-135AD), who was born in the Jewish-predominate (Ñº) town of Hierapolis. The recorded words of both Nero and Epictetus are "silent" about the existence of a famously-said to exist man named "Jesus", both resurrecting people (e.g. Raising of Lazarus) and himself having been resurrected, after having been crucified by the Romans. This is an example of the so-dubbed **silent historians problem**: if Jesus Christ existed, why are real historical figures, such as Nero or his secretary Epictetus, silent about him?

↓↑ Purported Non-Biblical Mentions by Actual Historians Begins ↓↑

In 94AD, is purported to have said the following about a was man named Jesus: (Ñº) [3]

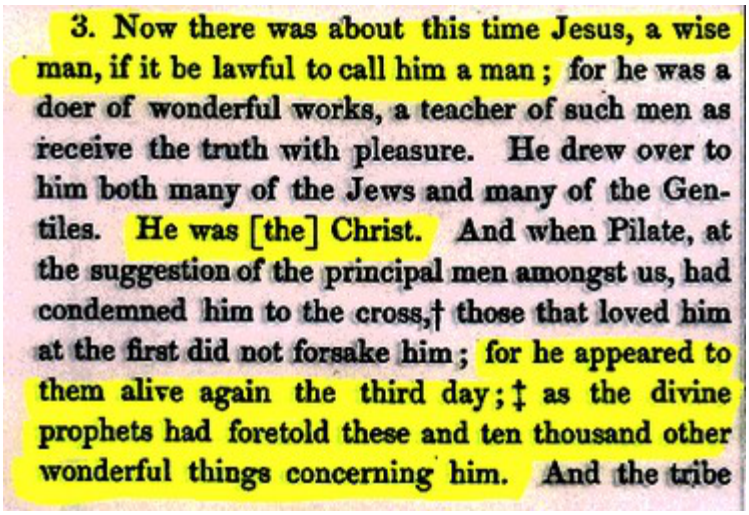
3. Now there was about this time Jesus, a wise man, if it be lawful to call him a man; for he was a doer of wonderful works, a teacher of such men as receive the truth with pleasure. He drew over to him both many of the Jews and many of the Gentiles. He was [the] Christ. And when Pilate, at the suggestion of the principal men amongst us, had condemned him to the cross,† those that loved him at the first did not forsake him; for he appeared to them alive again the third day;‡ as the divine prophets had foretold these and ten thousand other wonderful things concerning him. And the tribe

11.

Josephus (c.37-100AD)

94AD

> "Now there was about this time **Jesus**, a wise man, if it be lawful to call him a man; for he was a doer of wonderful works, a teacher of such men as receive the truth with pleasure. He drew over to him both many of the Jews and many of the Gentiles. He was [the] Christ. And when Pilate, at the suggestion of the principal men amongst us, had condemned him to the cross, those that loved him at the first did not forsake him; for he appeared to them alive again the third day; as the divine prophets had foretold these and ten thousand other wonderful things concerning him. And the tribe of Christians, so named from him, are not extinct at this day."
>
> — Josephus (94AD), *The Antiquities of the Jews* (§3.3) (Ñº)

This passage, however, as William Smith, in his *The Silence of Josephus and Tacitus* (1910), points out, was "unknown to" Origen (c.230AD), who had copies of Josephus, and also unknown to earlier writers, such as Irenaeus, Tertullian, and Clement of Alexandria, which points to the conclusion that this was "interpolated in" by a later post-Origen

Christian hand; it is invented history, so to say. [7]

12.

Plutarch (c.46-120)

In 110AD, penned his *Moralia*, a 78-essay collection (15 volumes in English) of topics related to “morals” or “matters relating to customs and mores”, wherein he discusses all of the various dying and rising gods and god suns, in the Greek, Roman, and Egyptian world, e.g. Osiris, Dionysus, Horus, etc., but **makes NO mention of Jesus Christ**. [3]

13.

Epictetus (50-125AD)

Epicetetus, a noted intellectual influence to Origen and Godfrey Higgins, who was a secretary to Nero, from circa 54 to 68AD, is **someone who should have known the famed "Jesus", if he had existed, but did not**. The main resurrected god of Nero, such as famously depicted at the Dendera Temple (c.68AD), however, was Osiris (not Jesus), on the walls of which Nero is seen placating Osiris and Isis, in the presence of child god Ihy, son of Hathor and Horus. [2] Epictetus doesn’t write about any Jesus Christ or any Jesus or Nazareth; latter commentators, e.g. Elizabeth Carter in her “The Moral Discourses of Epictetus” (1910), argue that much of what we now call the moral philosophy of Jesus was stylize on that of Epictetus; Thomas Jefferson also puts the teaching of Epictetus in the same category of Jesus (who Jefferson thinks was real).

14.

Tacitus (58-120AD)

c.110AD

In 110AD, in his *Annals*, in reference to the Great Fire of Rome (66AD) (Ñº), refers to the punishment of "Christians" by Nero and the execution of their founder "Christus" by Pontius Pilate:

“But not all the relief that could come from man, not all the bounties that the prince could bestow, nor all the atonements which could be presented to the gods, availed to relieve Nero from the infamy of being believed to have ordered the Conflagration, the fire of Rome. Hence to suppress the rumor, he falsely charged with the guilt, and punished Christians, who were hated for their enormities. **Christus**, the founder of the name, was put to death by Pontius Pilate, procurator of Judea in the reign of Tiberius: but the pernicious superstition, repressed for a time broke out again, not only through Judea, where the mischief originated, but through the city of Rome also, where all things hideous and shameful from every part of the world find their center and become popular. Accordingly, an arrest was first made of all who pleaded guilty; then, upon their information, an immense multitude was convicted, not so much of the crime of firing the city, as of hatred against mankind.”

— Tacitus (c.110AD), *Annals* (15:44) (Ñº)(Ñº)

In c.110AD, in a letter to Trajan (ruled: 98 to 117AD), comments (Ñº), supposedly, on what to do about the growing numbers of “Christians”; wherein he reports that some have confessed to him, under the threat of torture and death, that they had been Christians for 25 years, meaning a sect of Jewish-derived "Christians" had existed since 87AD:

“It is my practice, my lord, to refer to you all matters concerning which I am in doubt. For who can better give guidance to my hesitation or inform my ignorance? **I have never participated in trials of Christians**. I therefore do not know what offenses it is the

practice to punish or investigate, and to what extent. And I have been not a little hesitant as to whether there should be any distinction on account of age or no difference between the very young and the more mature; whether pardon is to be granted for repentance, or, if a man has once been a Christian, it does him no good to have ceased to be one; whether the name itself, even without offenses, or only the offenses associated with the name are to be punished.

Meanwhile, in the case of those who were **denounced to me as Christians**, I have observed the following procedure: I interrogated these as to whether they were Christians; those who confessed I interrogated a second and a third time, threatening them with punishment; those who persisted I ordered executed. For I had no doubt that, whatever the nature of their creed, stubbornness and inflexible obstinacy surely deserve to be punished. There were others possessed of the same folly; but because they were Roman citizens, I signed an order for them to be transferred to Rome.

Soon accusations spread, as usually happens, because of the proceedings going on, and several incidents occurred. An anonymous document was published containing the names of many persons. Those who denied that they were or had been Christians, when they invoked the gods in words dictated by me, offered prayer with incense and wine to your image, which I had ordered to be brought for this purpose together with statues of the gods**, and moreover cursed Christ—none of which those who are really Christians, it is said, can be forced to do**—these I thought should be discharged. **Others** named by the informer **declared that they were Christians**, but then denied it, asserting that they had been but had ceased to be, **some three years before, others many years, some as much as twenty-five years** [c.85AD]. They all worshipped your image and the statues of the gods, and cursed Christ.

15. c.110AD

Pliny the Younger (61-113AD)

They asserted, however, that the sum and substance of their fault or error had been that they were accustomed to meet on a fixed day before dawn and **sing responsively a hymn to Christ as to a god**, and to bind themselves by oath, not to some crime, but not to commit fraud, theft, or adultery, not falsify their trust, nor to refuse to return a trust when called upon to do so. When this was over, it was their custom to depart and to assemble again to partake of food--but ordinary and innocent food. Even this, they affirmed, they had ceased to do after my edict by which, in accordance with your instructions, I had forbidden political associations. Accordingly, I judged it all the more necessary to find out what the truth was by torturing two female slaves who were called deaconesses. But I **discovered nothing else but depraved, excessive superstition**.

I therefore postponed the investigation and hastened to consult you. For the matter seemed to me to warrant consulting you, especially because of the number involved. For many persons of every age, every rank, and also of both sexes are and will be endangered. For the contagion of this superstition has spread not only to the cities but also to the villages and farms. But it seems possible to check and cure it. It is certainly quite clear that the temples, which had been almost deserted, have begun to be frequented, that the established religious rites, long neglected, are being resumed, and that from everywhere sacrificial animals are coming, for which until now very few purchasers could be found. Hence it is easy to imagine what a multitude of people can be reformed if an opportunity for repentance is afforded.

— Pliny the Younger (c.112AD), “Letter to Emperor Trajan” (Ñº), in: *Letters* 10.96-97

Here, as we see, by this period there were certainly Christian "preachers" and "deaconesses" getting people to sing songs to a "Christ" as god figure. The emperor

responded as follows:

"You observed proper procedure, my dear Pliny, in sifting the cases of those who had been **denounced to you as Christians**. For it is not possible to lay down any general rule to serve as a kind of fixed standard. They are not to be sought out; if they are denounced and proved guilty, they are to be punished, with this reservation, that whoever denies that he is a Christian and really proves it--that is, by worshiping our gods--even though he was under suspicion in the past, shall obtain pardon through repentance. But anonymously posted accusations ought to have no place in any prosecution. For this is both a dangerous kind of precedent and out of keeping with the spirit of our age."

— Trajan (c.110AD), "Reply Letter to Pliny"

Here, as we see, there seems to have been a growing sect of Christians in Roman province.

16. Suetonius (69-122AD) c.110AD

In his *Life of Nero* (c.110AD), he mentions "Christians" as having been involved in a "new and mischievous superstition". In c.113AD, in his *Life of Claudius*, says the following, with original Latin shown:

"Those Judeans [Iudaeos] impelled by **Chrestos** [Chresto] to assiduously cause tumult, Claudius expelled out of Rome."

Dorothy Murdock (2007) that these mentions of Chrestos and Christians is not at all clear, in respect to the Biblical "Paul" figure, who is not mentioned by Suetonius.

In c.128, as emperor of Rome, reign: 117-138AD, while touring Egypt, he noted Christians were Serapis worshipers; specifically, in a letter (Ñº) to his brother-in-law Servianus (Ñº) (Ñº), he comments on his visit to Alexandria, as follows:

Hadrian (76-138AD) c.128AD

"I am now become fully acquainted with that Egypt which you extol so highly. I have found the people vain, fickle, and shifting with every breath of opinion. **Those who worship Serapis are in fact Christians; and they who call themselves Christian bishops are actually worshipers of Serapis**. There is no chief of a Jewish synagogue, no Samaritan, no Christian bishop, who is not an astrologer, a fortune teller and a conjuror. The patriarch himself, when he comes to Egypt, is compelled by one party to worship Serapis, by the other, Christ. It is a rebellious, good-for-nothing, slanderous people. The city is rich in treasures and resources. No one sits idle. There are workers here in glass, there in paper, and there in linen. All these busy men seem to carry on some trade. Even those who are tormented by gout and sciatica find something to do. They have but one God (alluding to their

idolatry of lucre)—him Christians, Jews, and Gentiles worship all alike. It is lamentable that this city has a bad character, for its size and importance make it worthy to be the capital of Egypt. I have given these people everything they asked for. I have confirmed all their ancient privileges, and added new, which they could not help acknowledging in my presence. But no sooner had I turned my back than they lavished every kind of insult on my son Verus and my friend Antinous. I wish them no worse than that they should feed on their own chickens, and how foully they hatch them I am ashamed to say. I sent you three colored cups, which the priest of the temple consecrated for me, as special votive offerings for you and my sister. You may drink from them n feast days, but see that our African friend does not use them too much."

Hadrian, however, never mentions any Jesus. (Ñº)(Ñº)

In 138AD, published *Exegetica*, a two-dozen volume treatise, supposedly, on the Christian gospels; in his "Acts of John" (5th century Armenian edition), produced by his followers, the Basilidians, Christ is described (Ñº) as follows:

"**Christ appeared**, to his followers, **in many different guises, NOT especially a human one**."

17.	Basilides (c.80-145AD)	138AD	This account of things, together with the above accounts, e.g. emperor Nero depicted (68AD) as the divine son of Osiris and Isis, Josephus (94AD) speaking about a "wise man named Jesus, if it be lawful to call him a man, who was the Christ", and Pliny the Younger (c.110AD) reporting that a new rebellion sect was flourishing that no longer wanted to worship the "emperor as Christ" along with the roman gods, but only this newly reformed "Christ as god" in semi-human form, would seem to indicate that a group of rebellion theologians had recast Horus, grafted with attributes of his father Osiris, renamed in Hebrew as Jesus or "god Horus" (e.g. Joseph = god Geb, in decoded Hebrew); the "not especially human guise" meaning many followers, at that time, viewed this new Jesus/Horus as half man half hawk, in the ancient Egyptian artistic visual sense of things (similar to how in c.800BC, Greek theologians rescripted the animal-human form Egyptian pantheon into a human-form Greek pantheon; both of which being reduced further in the Judeo-Christian pantheon). The works of Basilides, later deemed heretical, were all burned during the 400 to 800AD pagan purge (all heterodox or heretic Christian gospels where purged in this period).
	Ptolemaeus (c.100-155AD)	150AD	Believed Christ or Jesus to be an "**animal man**" or to have an "**animal body**" (Hippolytus, 225AD)
18.	Peregrinus (c.95-165AD)	165AD	Was a Greek cynic philosopher, cited by Baron d'Holbach (1770), who, according to Lucian, who attended his suicide by immolation (165AD), "became a Christian so that he could **gain wealth**". (Ñº)
19.		175AD	In his *Thoughts* (c.175AD), he discusses (Ñº) how he thinks that "gods" and the "soul" exists, based on the "experience" of their power, but does not mention and god-man named Jesus; was later purported by Eusebius, in his *Ecclesiastical History* (300AD), that there was an alleged persecution (Ñº) of a "Christian" at Lyon in Gaul (177AD) during his

	Marcus Aurelius (121-180)		reign; this purported persecution, however, is debatable (Ñº), e.g. it is not mentioned in Irenaeus 5-volume *Adversus Haereses* (180AD), and it is out his Stoic character. [3]
	Heracleon (c.130-c.180AD)	c.175AD	Believed Christ or Jesus to be an "**animal man**" or to have an "**animal body**" (Hippolytus, 225AD)
20.	Apuleius (c.124-170AD)		Roman-ruled Numidian Latin author (Ñº), in his *Metamorphosis* (aka *The Golden Ass*), described how the Egyptian parade ceremonies, with Osiris, Isis, and Anubis, were performed in Rome publicly; is cited, along with Homer, Aesop, and Apollonius, as authors upon which later Jesus stories were possibly based (Ñº); cited (pg. 266) by Budge, *Volume Two* (1904).
21.	Lucian (c.120-190AD)	c.170AD	In c.170AD, in his *Passing of Peregrinus*, gave one of the first secular, i.e. real person, accounts of the existence of Christians as a distinct actual faith common to a group of people who considered each other brothers; the gist of which is as follows: [8] "The Christians, you know, worship a man to this day—the distinguished personage who introduced their novel rites, and was crucified on that account. … You see, these misguided [deluded] creatures start with the general conviction that they are immortal for all time, which explains their contempt of death and voluntary self-devotion which are so common among them; and then it was impressed on them by their original lawgiver that they are all brothers, from the moment that they are converted, and deny the gods of Greece, and worship the crucified sage, and live after his laws. All this they take quite on faith, with the result that they despise all worldly goods alike, regarding them merely as common property." Lucian goes on to say that "anyone who knows the world can **get rich tricking these simple souls**." [9] His *Reason of Truth: The True Word* (ΛÏŒγος á¼ˆληθÎ®ς, *Logos AlÄ"thÄ"s*), various translated as *The True Word* (Ñº) or *The True Doctrine* (Hoffmann, 1987), attempted to refute the validity of the newly forming sect of Christianity;
22.	Celsus (c.125-185AD)	c.175AD	"You may see weavers, tailors, fullers, and the most illiterate and rustic fellows, who dare not speak a word before wise men, when they can get a company of children and silly women together, set up to teach strange paradoxes among them. **This is one of their [Christian] rules: Let no man that is learned, wise, or prudent come among us**: but if they be unlearned, or a child, or an idiot, let him freely come. So they openly declare that none but the ignorant, and those devoid of understanding, slaves, women, and children, are fit disciples for the god they worship." — Celsus (c.175AD), *The True Word*; cited by DeRobigne Bennett (1876) in *The World's Leading Sages* (1876) this work was refuted, in an apologetic manner, by Origen (c.230AD). His *Refutation of All Heresies*, summarized all the then

23.	Hippolytus (170-235 ACM)	c.225	prevalent non-orthodox Christian views; one of which was the following: "The **body of Jesus was an animal one**. On account of this, at his baptism the holy spirit as a dove came down – that is, the logos of the mother above, i.e. Sophia – and became a voice to the **animal man**, and raised him from the dead." — Hippolytus (c.225), *Refutation of All Heresies* (§6.30) (pg. 237); summary of the views of the Italians Heracleon (c.175AD) and Ptolemaeus
			(add)
24.	Plotinus (205-270)		[3]
25.	 Arius (256-336)		Held heterodox Egyptian mythology like views on the "trinity" model.

(add)

Overview

In c.76AD to 120AD, Greek-born Roman philosopher Plutarch (46-120AD) famously penned a series of 78 essays and transcribed speeches, now-printed in fifteen volumes, collectively known as *Moralia* (Ñº), loosely translated as "Morals" or "Matters relating to customs and mores". In this work, there is NO mention of Jesus, the world's supposed-to-have-existed most famous moral person? Plutarch, however, does write about Osiris and the peculiar virgin-like birth of his son Horus as follows: [1]

> "Osiris, who the Greeks conclude to have been the same person with their Dionysus [Greek] or Bacchus [Roman], was accompanied, after his death, without his phallus, by Isis [Stella Maris], and in consequence hereof to have brought froth Harpocrates [Horus]."

Plutarch, in this regard, is often cited (Ñº)(Ñº) as someone who should have cited "Jesus" (or Jesus Christ) as an historical figure, if he had in fact existed, but do not. (Ñº)

In 1514, Pope Leo X classified Jesus as a profitable "fable" (see: Christ fable).

In 1776, Voltaire, in his *Philosophical Dictionary*, says the following about the silence of the Jewish historians: (Ñº)

> "Several learned men have testified their surprise at not finding in the **historian**, Flavius Josephus, **any mention of Jesus Christ**; for all men of true learning are now agreed that the short passage relative to him in that history has been interpolated. The father of Flavius Josephus must, however, have been witness to all the miracles of Jesus. Josephus was of the sacerdotal race and akin to Herod's wife, Mariamne. He gives us long details of all that prince's actions, yet says not a word of the life or death of Jesus; nor does this

> historian, who disguises none of Herod's cruelties, say one word of the general massacre of the infants ordered by him on hearing that there was born a king of the Jews. The Greek calendar estimates the number of children murdered on this occasion at fourteen thousand. This is, of all actions of all tyrants, the most horrible. There is no example of it in the history of the whole world. Yet the best writer the Jews have ever had, the only one esteemed by the Greeks and Romans, makes no mention of an event so singular and so frightful. He says nothing of the appearance of a new star in the east after the birth of our Savior — a brilliant phenomenon, which could not escape the knowledge of a historian so enlightened as Josephus. He is also silent respecting the darkness which, on our Savior's death, covered the whole earth for three hours at midday — the great number of graves that opened at that moment, and the multitude of the just that rose again."

In 1909, freethinker John E. Remsburg (1848-1919), in his *The Christ: a Critical Review and Analysis of the Evidence of His Existence*, enumerated 41 Jesus-era writers, aka "silent historians", who should have recorded Christ tales but did not. [2]

In 1910, William Smith (1850-1934), in his *The Silence of Josephus and Tacitus*, citing Josephus and Tacitus, advocated the nonhistoricity of Jesus. [4]

In 2013, Michael Paulkovic, in his *No Meek Messiah: Christianity's Lies, Laws and Legacy* (Ñº), building on John Remsburg's 1909 list of 41 silent historians, i.e. people who should have recorded the stories of Christ, but did not, listed 126 writers (see: Paulkovich 126), some of which are listed below (others listed above), who should have, owing to his supposed fame, but did NOT write about Jesus: [3]

Aelius Theon
Albinus
Alcinous
Ammonius of Athens
Alexander of Aegae
Antipater of Thessalonica
Antonius Polemo
Apollonius Dyscolus
Apollonius of Tyana
Appian
Archigenes
Aretaeus
Arrian
Asclepiades of Prusa
Asconius
Aspasius
Atilicinus
Attalus
Bassus of Corinth
C. Cassius Longinus
Calvisius Taurus of Berytus
Cassius Dio
Chaeremon of Alexandria
Claudius Agathemerus
Claudius Ptolemaeus
Cleopatra the physician
Cluvius Rufus
Cn. Cornelius Lentulus Gaetulicus
D. Haterius Agrippa
D. Valerius Asiaticus
Damis
Demetrius
Demonax
Demosthenes Philalethes
Dion of Prusa
Domitius Afer
Erotianus
Euphrates of Tyre
Fabius Rusticus
Favorinus Flaccus
Florus
Fronto
Gellius
Gordius of Tyana
Gnaeus Domitius
Halicarnassensis Dionysius II
Justus of Tiberias
Juvenal
Lesbonax of Mytilene
Lucanus
Lysimachus
M. Antonius Pallas
M. Vinicius
Macro
Mam. Aemilius Scaurus
Marcellus Sidetes
Martial
Maximus Tyrius
Moderatus of Gades
Musonius
Nicarchus
Nicomachus Gerasenus
Onasandros
P. Clodius Thrasea
Paetus Palaemon
Pamphila
Pausanias
Pedacus Dioscorides
Persius/Perseus
Petronius
Phaedrus
Philippus of Thessalonica
Phlegon of Tralles
Pompeius Saturninus
Pomponius Mela
Pomponius Secundus
Potamon of Mytilene
Ptolemy of Mauretania
Q. Curtius Rufus
Quintilian
Saleius Bassus
Scopelian the Sophist
Scribonius
Seneca the Elder
Sex. Afranius Burrus
Sex. Julius Frontinus
Servilius Damocrates
Silius Italicus
Soranus
Soterides of Epidaurus
Sotion
Statius the Elder
Statius the Younger
Suetonius
Sulpicia
T. Aristo
T. Statilius Crito
Tacitus
Thallus
Theon of Smyrna
Thrasyllus of Mendes
Ti. Claudius Pasion
Ti. Julius Alexander
Tiberius
Valerius Flaccus
Valerius Maximus
Vardanes I
Velleius Paterculus

Cornelius Celsus
Columella
Cornutus

Rubellius Plautus
Rufus the Ephesian

Verginius Flavus
Vindex

In 2018, Edward Reyes (Ñº), in his multi-volume *In His Name* (Ñº), gives the following list of silent historians:

> Apollonius, Appian, Arrian, Aulus Gellius, Columella, Damis, Dio Chrysostom, Dion Pruseus, Epictetus, Favorinus Ptolemy, Flavius Josephus, Florus Lucius, Hermogones, Josephus Seneca, Justus of Tiberius, Juvenal, Lucanus, Lucian Tacitus, Lysias Theon of Smyran, Martial Valerius Flaccus, Paterculus, Persius, Petronius, Phaedrus, Philo-Judaeus, Phlegon, Pliny the Elder, Pliny the Younger, Plutarch, Pompon Mela, Quintilian, Quintius Curtius, Silius Italicus, Statius, Suetonius, and Valerius Maximus

(add)

Roman | Recension

The gist of the solution to the "apparent" silence problem, is that in the era of the now-purported existence of modern-conceptualized person of Jesus, Osiris, along with his son Horus, was the main "resurrection" god, albeit presented in his standard polytheistic guise. In the years 200AD to 600AD, the so-called "Roman recension" (see: recension theory) of this afterlife-based religion became the official state religion of the Roman empire, amid which, Horus became transliterated as Jesus, Osiris became god, and Isis became the Mary, in short. Same stories, just retold monotheistically.

Horus | 65AD
Dendera Temple

Jesus | 565AD
St. Catherine's Monastery

Left: a depiction of "Horus" at Dendera Temple, completed by order of Roman Emperor Tiberius [reign:14-37AD]; with added depictions of emperor Nero [reign: 54-68AD]. Right: a depiction of "Jesus" at Saint Catherine's Monastery, built by order of Roman Emperor Justinian I (reigned: 527-565). The gist of the **silent historian's problem**: prior to 200AD, no one spoke or wrote about anyone named "Jesus", but they did write about the god Horus; whereas, in the years to follow, scholars began to write more about a man named "Jesus", and less and less about a god named Horus, son of Osiris.

Shown adjacent (left image), we see a a depiction of "Horus" at Dendera Temple, completed by order of Roman Emperor Tiberius [reign:14-37AD]; with added depictions of emperor Nero [reign: 54-68AD].

Shown adjacent (right image), we see a depiction of "Jesus" at Saint Catherine's Monastery, built by order of Roman Emperor Justinian I (reigned: 527-565). The Roman emperors molded their depictions and descriptions of their state god, to suit the needs of the empire, just as did the Egyptian pharaohs, before them, to their state gods, which is why historians are silent about Jesus before 200AD and also silent about Horus after 200AD.

Moses | Abraham

In circa 2010, Libb Thims did a silent historians check of the index of the collected works of Aristotle (322BC), a real person by definition, for the names of Moses [1300BC] and in some sense Abraham [1813BC]; Thims, to note, previously (c.2003) determined that Abraham did not exist, i.e. that the name is a transliteration of "father Ra born out of the Nun following the annual Nile river flood", aka Ab-Ra-ham. It wasn't until c.2017, to note, that Thims figured out that Moses (see: Osiris, Dionysus-Bacchus, and Moses) is an Osiris rescript, and hence a god-to-prophet invented figure.

Quotes

The following are related quotes:

> "No sculptures, no drawings, no markings in stone, nothing written in his [Jesus] own hand; and no letters, no commentaries, indeed no authentic documents written by his Jewish and Gentile contemporaries, Justice of Tiberius, Philo, Josephus, Seneca, Petronius Arbiter, Pliny the Elder, *et al*., to lend credence to his historicity."
>
> — Nicholas Carter (1993), *The Christ Myth* (Ñº)

> "Claims of Mary's authenticity would never stand up in a court of law because, apart from what is written in the Bible, there is little evidence of the existence of either Mary or Jesus Christ. **Historians** such as Josephus, Tacitus, Suetonius and Pliny the Younger, who are near-contemporaries of Mary and Jesus, are **largely silent** on the subject."
>
> — Michael Jordan (2001), *The Historical Mary* (xv)

> "In the entire Christian century [0-100AD], Jesus is **not mentioned by a single Greek or Roman historian**, religious scholar, politician, philosopher or poet. His name never occurs in a single inscription, and it is never found in a single piece of private correspondence. Zero! Zip references!"
>
> — Bart Ehrman (c.2012)

“**History**, Joseph Campbell argued, **is completely silent on Jesus Christ**. The only sources on Jesus are the Pauline Epistles and the Four Gospels of the New Testament. Having eliminated them as having no historical or evidential value, all that remained were alleged references to Jesus by Jewish and pagan writers, upon whom "religious apologists" rely to make their case for the historical Jesus. They are from the writings of the Jewish historian Josephus, and from the three Roman writers Tacitus, Pliny the Younger, and Suetonius. None, he argued, could withstand critical testing.”

— Bryan Beau (2005), *The Atheist Madalyn Murray O’Hair* (pg. 213)

“Perhaps none of these [‘silent’] writers is more fascinating than Apollonius of Tyana [c.15-100AD] (Ñº), saintly first-century adventurer and noble paladin. Apollonius was a magic-man of divine birth who cured the sick and blind, cleansed entire cities of plague, foretold the future, and fed the masses. He was worshiped as a god and as a son of a god. Despite such nonsense claims, Apollonius was a real man recorded by reliable sources.”

— Michael Paulkovich (2013), “The Fable of the Christ”

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(c) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (§11: Plutarch’s Mythological History of Isis and Osiris, pgs. 186-94). Dover, 1969.
2. Remsburg, John. (1909). *The Christ: a Critical Review and Analysis of the Evidence of His Existence*. Prometheus Books, 1994.
3. (a) Paulkovich, Michael. (2013). *No Meek Messiah*. Publisher.
(b) Paulkovich, Michael B. (2014). “God on Trial: The Fable of the Christ” (Ñº), *Free Inquiry*, 34(5).
4. (a) Smith, William B. (1910). *The Silence of Josephus and Tacitus* (pg. 6). Open Court.
(b) Van Voorst, Robert. (2000). *Jesus Outside the New Testament: an Introduction to the Ancient Evidence* (Smith, pg. 12; nonhistoricity hypothesis, pg. 15). Wm. B. Eerdmans Publishing Co.
7. Smith, William B. (1910). *The Silence of Josephus and Tacitus* (pg. 6). Open Court.
8. Passing of Peregrinus – Wikipedia.
9. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (§:Lucian of Samosata, pgs. 167-68). HarperOne.

θΔics

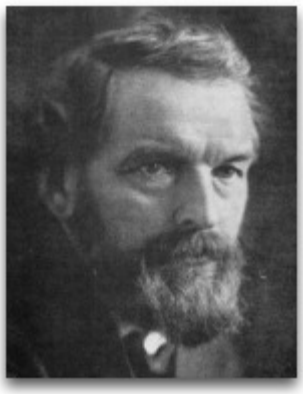

In economic thermodynamics, **Silvio Gesell** (1862-1930) was a German theoretical economist noted for his 1916 *The Natural Economic Order* (part one completed in 1906, part two in 1911, combined in 1916), in which he presented his view that the concept of interest is in violation of the laws of physics, a form of growth contrary to the second law, and thus at odds with what happens to the real wealth of nature—which money is supposed to represent. [1] Gesell tends to be grouped with Frederick Soddy as having similar points of view. [2]

References

1. (a) Frenay, Robert. (2006). *Pulse: the Coming Age of Systems and Machines Inspired by Living Things* (pgs. 364,379). MacMillan.
(b) Gesell, Silvio. (1916). *The Natural Economic Order* (online) (translator: Philip Pye). Peter Owen, 1958.
2. O'Hara, Phillip. (1999). *Encyclopedia of Political Economy* (pg. 181). Routledge.

External links

â— Silvio Gesell – Wikipedia.

θΔics

In existographies, **Simeon Poisson** (1781-1840) (IQ:170|#321) (Eells 100:39) (CR:2) was a French mathematician, physicist, and engineer, noted for []

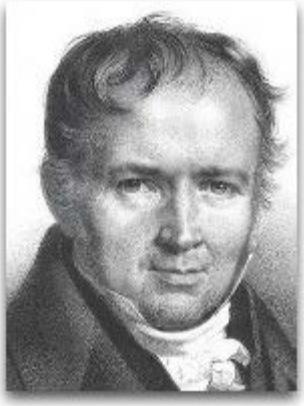

Overview

In 1812 to 1867, Poisson's name, in the history of classical electrodynamics (Errede, 2007), appears at least twelve times. [1]

Gamma | Heat capacity ratio

Some have conjectured (Q) that the symbol gamma "γ", presently used for heat capacity ratio (see: heat capacity), was first employed by Poisson in his 1808 "Memoir on the Theory of Sound", which eventually became the ratio of specific heats, via William Rankine's 1851 "On Laplace's Theory of Sound".

Education

Poisson was a student (see: Euler genealogy) Pierre Laplace and Joseph Lagrange.

Quotes | On

The following are quotes on Coulomb:

> "Ohm found that the results could be summed up in such a simple law that he who runs may read it, and a schoolboy now can predict what a Faraday then could only guess at roughly. By Ohm's discovery a large part of the domain of electricity became annexed by Coulomb's discovery of the law of inverse squares, and completely annexed by Green's investigations. **Poisson** attacked the difficult problem of induced magnetization, and his results, though differently expressed, are still the theory, as a most important first approximation. Ampere brought a multitude of phenomena into theory by his investigations of the mechanical forces between conductors supporting currents and magnets. Then there were the remarkable researches of Faraday, the prince of experimentalists, on electrostatics and electrodynamics and the induction of currents. These were rather long in being brought from the crude experimental state to a compact system, expressing the real essence. Unfortunately, in my opinion, Faraday was not a mathematician. It can scarcely be doubted that had he been one, he would have anticipated much later work. He would, for instance, knowing Ampere's theory, by his own results have readily been led to Neumann's (Q)(Q) theory, and the connected work of Helmholtz and Thomson. But it is perhaps too much to expect a man to be both the prince of experimentalists and a competent mathematician."
>
> — Oliver Heaviside (1891), "Electro-magnetic Theory II" [1]

Quotes | By

The following are quotes by Poisson:

> "Laplace is the Newton of France."
>
> — Simeon Poisson (c.1820), *Publication* (Q)

> "The only two good things in life are doing mathematics and teaching it."
>
> — Simeon Poisson (c.1830), *Publication*; cited by Francois Argo (1854) in *Biographical Notices* (pg. 662) (Q)

> "That which can affect our senses in any manner whatever, is termed matter."

— Simeon Poisson (1833), *Treatise on Mechanics* (translator: Henry Harte) (pg. 1); compare James Maxwell: "The only thing which can be directly perceived by the senses is force, to which may be **reduced** light, heat, electricity, sound and all the other things which can be perceived by the senses." (1847)

References

1. Heaviside, Oliver. (1891). "Electro-magnetic Theory II" (Q), *The Electrician*, Jan 16.
2. Errede, Steven. (2007). "A Brief History of the Development of Classical Electrodynamics" (pdf), University of Illinois at Urbana-Champaign, Fall.

External links

- Simeon Denis Poisson – Wikipedia.

θΔics

In genius rankings, **Simmons Scientific 100** is a 2000 ranking of the most influential scientists, past and present according to American science and medical writer John Galbraith Simmons. [1]

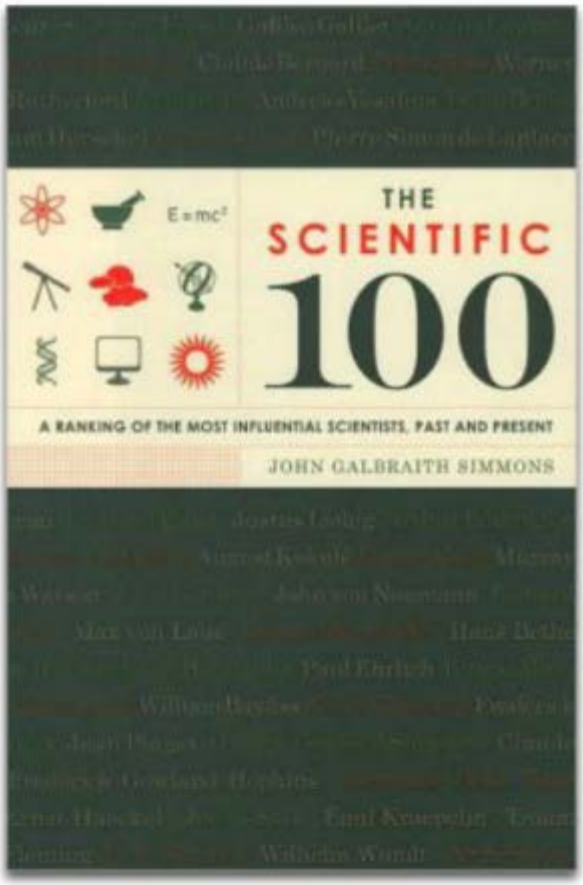

American science and medical writer John Simmons' 2000 *The Scientific 100*, gives an attempted ranking of the most influential scientists, past and present. [1]

List

The list below is from the book The Scientific 100: A Ranking of the Most Influential Scientists, Past and Present, Citadel Press (2000), written by American freelance science and medical writer John Galbraith Simmons. [2]

1. Isaac Newton | the Newtonian Revolution
2. Albert Einstein | Twentieth-Century Science
3. Niels Bohr | the Atom
4. Charles Darwin | Evolution
5. Louis Pasteur | the Germ Theory of Disease
6. Sigmund Freud | Psychology of the Unconscious
7. Galileo Galilei | the New Science
8. Antoine Lavoisier | the Revolution in Chemistry
9. Johannes Kepler | Motion of the Planets
10. Nicolaus Copernicus | the Heliocentric Universe
11. Michael Faraday the Classical Field Theory
12. James Maxwell | the Electromagnetic Field
13. Claude Bernard | the Founding of Modern Physiology
14. Franz Boas | Modern Anthropology
15. Werner Heisenberg | Quantum Theory
16. Linus Pauling | Twentieth-Century Chemistry
17. Rudolf Virchow | the Cell Doctrine
18. Erwin Schrodinger | Wave Mechanics
19. Ernest Rutherford | the Structure of the Atom
20. Paul Dirac | Quantum Electrodynamics
21. Andreas Vesalius | the New Anatomy
22. Tycho Brahe | the New Astronomy
23. Comte de Buffon | l'Histoire Naturelle
24. Ludwig Boltzmann | Thermodynamics
25. Max Planck | the Quanta
26. Marie Curie | Radioactivity
27. William Herschel | the Discovery of the Heavens
28. Charles Lyell | Modern Geology
29. Pierre Laplace Newtonian Mechanics
30. Edwin Hubble | the Modern Telescope
31. Joseph Thomson | the Discovery of the Electron
32. Max Born | Quantum Mechanics
33. Francis Crick | Molecular Biology
34. Enrico Fermi | Atomic Physics
35. Leonhard Euler | Eighteenth-Century Mathematics
36. Justus Liebig | Nineteenth-Century Chemistry
37. Arthur Eddington | Modern Astronomy
38. William Harvey | Circulation of the Blood
39. Marcello Malpighi | Microscopic Anatomy
40. Christiaan Huygens | the Wave Theory of Light
41. Carl Gauss (Karl Friedrich Gauss) | Mathematical Genius
42. Albrecht Haller | Eighteenth-Century Medicine
43. August Kekule | Chemical Structure

44. Robert Koch | Bacteriology
45. Murray Gell-Mann | the Eightfold Way
46. Emil Fischer | Organic Chemistry
47. Dmitri Mendeleyev | the Periodic Table of Elements
48. Sheldon Glashow | the Discovery of Charm
49. James Watson | the Structure of DNA
50. John Bardeen | Superconductivity
51. John Neumann | the Modern Computer
52. Richard Feynman | Quantum Electrodynamics
53. Alfred Wegener | Continental Drift
54. Stephen Hawking Quantum Cosmology
55. Antonie van Leeuwenhoek | the Simple Microscope
56. Max von Laue | X-ray Crystallography
57. Gustav Kirchhoff | Spectroscopy
58. Hans Bethe | the Energy of the Sun
59. Euclid | the Foundations of Mathematics
60. Gregor Mendel | the Laws of Inheritance
61. Heike Kamerlingh Onnes | Superconductivity
62. Thomas Morgan | the Chromosomal Theory of Heredity
63. Hermann Helmholtz | the Rise of German Science
64. Paul Ehrlich | Chemotherapy
65. Ernst Mayr | Evolutionary Theory
66. Charles Sherrington | Neurophysiology
67. Theodosius Dobzhansky | the Modern Synthesis
68. Max Delbruck | the Bacteriophage
69 Jean Baptiste | Lamarck the Foundations of Biology
70. William Bayliss | Modern Physiology
71. Noam Chomsky | Twentieth-Century Linguistics
72. Frederick Sanger | the Genetic Code
73. Lucretius | Scientific Thinking
74. John Dalton | the Theory of the Atom
75. Louis de Broglie | Wave/Particle Duality
76. Carl Linnaeus | the Binomial Nomenclature
77. Jean Piaget | Child Development
78. George Simpson | the Tempo of Evolution
79. Claude Levi-Strauss | Structural Anthropology
80. Lynn Margulis | Symbiosis Theory
81. Karl Landsteiner | the Blood Groups
82. Konrad Lorenz | Ethology
83. Edward Wilson | Sociobiology
84. Frederick Gowland | Hopkins Vitamins
85. Gertrude Elion | Pharmacology
86. Hans Selye | the Stress Concept
87. Robert Oppenheimer | the Atomic Era
88. Edward Teller | the Bomb
89. Willard Libby | Radioactive Dating
90. Ernst Haeckel | the Biogenetic Principle
91. Jonas Salk | Vaccination
92. Emil Kraepelin | Twentieth-Century Psychiatry
93. Trofim Lysenko | Soviet Genetics
94. Francis Galton | Eugenics
95. Alfred Binet | the I.Q. Test
96. Alfred Kinsey | Human Sexuality
97. Alexander Fleming | Penicillin

98. B. F. Skinner | Behaviorism
99. Wilhelm Wundt | the Founding of Psychology
100. Archimedes | the Beginning of Science

(add discussion)

References

1. (a) Simmons, John G. (2000). *The Scientific 100: A Ranking of the Most Influential Scientists, Past and Present.* Citadel Press.
(b) John Simmons (about) – JGSimmons.com.
2. The Scientific 100 (2010) – Daffodilvarsity.edu.bd.

θΔics

In hmolscience, **Simon Capelin** (c.1951-) is an English editor commonly cited and credited, by a number of authors, e.g. Eugene Stanley, Bertrand Roehner, etc., as having played a pioneering role (see: HP pioneers), as the physics editorial director at Cambridge University Press, from *circa* 1997-present, in the development and promotion of econophysics, sociophysics, and socio-economic physics. [1]

Cotta

Capelin, in some ways, can be compared to German publisher Johann Cotta, the main publishing agent behind Goethe's 1809 physical chemistry based *Elective Affinities*, which launched the science of human chemistry.

Education

Capelin completed his BS in physics in 1973 at the University of Southampton and his PhD in biological physics in 1977 at Nottingham University. [4]

Praise | Tribute

The following are noted credit quotes on Capelin:

> "In 1995, Eugene Stanley coined the phrase 'econophysics' at a meeting in India. At about the same time, Yi-Cheng Zhang and his group introduced the econophysics webpage: unifr.ch/econophysics. **Simon Capelin** at Cambridge University Press led the charge by publishing Stanley's and other econophysics books. His program there is still strong. Sadly, econophysics, like nonlinear dynamics, was never recognized by the APS as part of physics. American physics prefers (nonfalsifiable) string theory to falsifiable approaches to social problems. My university offers one of the only econophysics PhD programs in the world."
>
> — Joseph McCauley (2008), "Emergence of Finance Theory and Econophysics" [2]

> "Through its physics publishing director, **Simon Capelin**, Cambridge University Press played a pioneering role in the development of econophysics."
>
> — Bernard Roehner (2007), *Driving Forces in Physical, Biological and Socio-Economic Phenomena* [3]

References

1. (a) McCauley, Joseph L. (2008). "Evolution of FX Markets via Globalization of Capital", in: *Evolution from Cellular to Social Scales* (editors: Arne Skjeltorp and Alexander Belushkin) (§3.3: "Emergence of Finance Theory and Econophysics", pgs. 122-25; quote, pg. 125). Springer Science & Business Media.
(b) Roehner, Bertrand. (2007). *Driving Forces in Physical, Biological and Socio-Economic Phenomena: a Network Science Investigation of Social bonds and Interactions* (pg. xvii). Cambridge University Press.
2. McCauley, Joseph L. (2008). "Evolution of FX Markets via Globalization of Capital", in: *Evolution from Cellular to Social Scales* (editors: Arne Skjeltorp and Alexander Belushkin) (§3.3: "Emergence of Finance Theory and Econophysics", pgs. 122-25; quote, pg. 125). Springer Science & Business Media.
3. Roehner, Bertrand. (2007). *Driving Forces in Physical, Biological and Socio-Economic Phenomena: a Network Science Investigation of Social bonds and Interactions* (pg. xvii). Cambridge University Press.
4. Simon Capelin – LinkedIn.

External links

â— Simon Capelin (editor) – Cambridge.org.

θΔics

In existographies, **Simon Stevin** (1548-1620) (IQ:175|#282) (GME:#) (CR:10) was a Dutch mathematician, engineer, and polymath, noted for his 1586 *Statics and Hydrostatics*, wherein he is said to have given the first complete statement of the impossibility of perpetual motion, and also derived the notion of the vectorial decomposition of forces, according to which force that must be exerted along the line of greatest slope to support a given weight on an inclined plane.

Earth | Weight

In 1586, Stevin, in his *Statistics*, calculated the weight of the earth to be 2x10E24 lbs, which is cited, as cited by Otto Guericke (1663), as one of the four main people to do so, along with Forerius, Scipione Chiaramonti, and Mersenne. [2]

Falling bodies

In 1586, Stevin conducted an experiment wherein he dropped two lead balls, one ten times heavier than the other, from a height of 30 feet onto a board, finding that the two balls hit the board at the same time, a finding contrary to the opinion of Aristotle, who held that the heavier ball would strike the board first. [4] This experiment was later repeated and or improved upon by Galileo.

Decimals

Stevin, thought he did not invent the decimal system, is generally credited with the promotion and popularization of its usage in everyday practice. The 1608 English translation of Stevin's work *Disme, The Arts of Tenths or Decimal Arithmetike*, by Robert Norton, is said to have inspired American philosopher Thomas Jefferson to propose a decimal monetary unit for the new United States of America. The tenth of a dollar is still referred to as a "dime."

Hydrostatics | Fluid mechanics

Steven, supposedly, found that the pressure of water was proportional to its depth. [4] This idea was later expanded on by Evangelista Torricelli and Blaise Pascal.

Some conjecture that much of logic of Pascal's law, in fluid mechanics, was derived from the work of Stevin. [3]

Quotes | On

The following are quotes on Stevin:

> "The thirteenth century author, possibly Jordanus Nemorarius, of *De Ratione Ponderis*, had thought of investigating the weight of an object resting upon an inclined plane. This idea the Netherlander **Simon Stevin** developed in 1586 into the 'parallelogram of forces', demonstrating that three forces in equilibrium at a point can represent both in magnitude and in direction by the sides of a triangle."
>
> — Richard Kirby (1956), *Engineering in History* [4]

> "Hooke's most important work in the spring of 1685 was a long paper, read to the Royal Society in Feb and early Mar, on land and water vehicles and the problem of friction. He was responding to reports from Oxford of an experimental cart with five-inch wheels, but the main subject of his discourse was the very efficient wheeled sailing chariot made by **Simon Stevin** for Prince Maurice of Orange early in the seventeenth century. Stevin's chariot had carried a load of twenty-eight passengers forty-two miles in two hours, and seemed to be 'the swiftest Carriage yet known, for so great a Burthen, and for so long a way."
>
> — Stephen Inwood (2002), *The Man Who Knew Too Much* (pg. 356)

> “**Stevin**’s work on windmills, his original theoretical contributions to statics and hydrostatics, and the unity of theory and practice in his work make him in mechanics the first true successor of Archimedes in the Renaissance.”
>
> — Teun Koetsier (2010), “Simon Stevin and the Rise of Archimedean Mechanics in the Renaissance” (Ñº)

Quotes | By

The following are quotes by Stevin:

> “Disme [decimals] is a kind of arithmeticke [arithmetic], invented by the tenth progression, consisting in characters of cyphers; whereby a certain number is described, and by which also all accounts which happen to humane affayres [affairs], are dispatched by whole numbers, without fractions or broken numbers.”
>
> — Simon Stevin (c.1590), *Publication*

References

1. (a) Stevin, Simon. (1586). *Statics and Hydrostatics* (*Beghinselen Der Weegkunst*). Publisher.
(b) Mach, Ernst. (1911). *History and Root of the Principle of Conservation of Energy*. Open Court Publishing.
(c) Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature’s Economics* (pg. 15). Cambridge University Press.
2. Guericke, Otto. (1663). *The Vacuum of Space* (*De Spatio Vacuo*). Unpublished; *New Magdeburg Experiments on the Vacuum of Space* (*Ottonis De Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (preface, pdf) (pg. 206). Janssonius a Waesberge, 1672.
3. Knowles, W.E. (1964). *The History of the Barometer* (Stevin, pg. 53). Publisher.
4. Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 127). Courier, 1990.

External links

â— Simon Stevin – Wikipedia.

θΔics

In existographies, **Simone Beauvoir** (1908-1986) (IQ:#|#) [RGM:419|1,500+] (Stokes 100:75) (Becker 139:25) (CR:16) was a French writer, atheist, and existentialism philosopher, noted for [].

Atheism

Beauvoir, reports in her autobiography, that she stopped believing in god at age fourteen. Sometime thereabouts, she caught her mother giving direction to her confessor, and began to see the whole thing as a sham. Then she started noticing the hypocrisy of her own father and others. The final stroke, she reports, was reading a work of Honore Balzac's literature forbidden by the church, wherein, she found it, and through it the world, so fantastic and beautiful that she could only come to feel angry with the organization that would try to take it from her. [2]

Quotes

The following are noted quotes

> "God is a name for nothing more than a cover of a mirage."
>
> — Simone de Beauvoir (c.1950), *Publisher* [3]

> "When a god falls, he does not become merely a man; be becomes a fraud."
>
> — Simone de Beauvoir (c.1950) [1]

> "I had always thought that the world was a small price to pay for eternity; but it was worth more than that, because I loved the world, and it was suddenly God whose price was small: from now on His name would have to be a cover for nothing more than a mirage."
>
> — Simone de Beauvoir (c.1950) [2]

References

1. Solomon, Robert C. (1981). *Love: Emotion, Myth, & Metaphor* (pg. 192). Prometheus Books, 1990.
2. (a) Huberman, Jack. (2007). *The Quotable Atheist: Ammunition for Nonbelievers, Political Junkies, Gadflies, and those Generally Hell-Bound* (pg. 33). Nation Books.
(b) How did Beauvoir become an Atheist? (2009) – Answers.Yahoo.com.
3. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 459). HarperOne.

External links

â— Simone de Beauvoir – Wikipedia.

θΔics

In hmolscience, **Simone Loreti** (c.1987-) is an Italian theoretical physicist noted for []

Overview

In 2012, Loreti began making an effort in attempting to initiate graduate school work in sociophysics, econophysics, socioeconomic physics (or physical socioeconomics), and or human thermodynamics: [1]

> "In March 2011, I graduated with a master's degree in theoretical physics at the University of Bologna (Italy). I am strongly interested in sociophysics or in general in physics applied to human behavior: in my thesis I solved a sociological problem using statistical mechanics, and machine learning methods. I am looking for a PhD in socio-physics or human thermodynamics and/or funds for it. Do you know something about it? Any advice is welcome."

Another variant is found at Loreti's EconoPhysics Forum blog: [3]

> "Dear Sirs, I am looking for a PhD in SocioPhysics (or at most Socio-Econo-Physics), and/or funds for it. Do you know something about it? Any advice is welcome."

EconoPhysics Forum, to note, is more of a financial physics forum, such as typified by the views of member American physicist Joseph McCauley, who runs a so-called Econophysics department at the University of Houston, but does not necessarily believe that physics and more importantly thermodynamics applies to humans, but only to market patterns.

Education

In 2011, Loreti completed his MS in theoretical physics at the University of Bologna, Italy, after which he worked for a year as a mechanical engineer at Bucci Industries. Currently he is a master's student at the Institute for Cross-Disciplinary Physics and Complex Systems (IFISC) and a researcher at the University of Surrey. [2]

See also

- Libb Thims (students)
- Two cultures department

References

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2. (a) Simone Loreti – LinkedIn.
(b) Simone Loreti (profile) (Spanish → English) – IFISC.
(c) IFISC (about) – Iifisci.uib-csic.es.
3. Loreti, Simone. (2013). "PhD in SocioPhyscs (or at most Socio-Econo-Physics)" (Q), EconoPhysics Forum, Apr 14.

External links

- Simone Loreti (profile) – EconoPhysics Forum.

θΔics

In existographies, **Simplicius** (c.490-560) was a Greek pagan philosopher and Aristotelian commentator, noted for []

Quotes | On

The following are quotes on Simplicius:

> "In fragment 71b, **Simplicius** says that although Democritus appeared (*edokei*) to have made use of 'chance' in his account of the formation of the worlds, in his more detailed discussion (*entois merikoterois*) he says that chance is not the cause of anything. That suggests that he merely seemed to ascribe cosmogony to chance, perhaps by speaking of it as a chance occurrence in the sense of an occurrence whose cause is unknown."
>
> — C. Taylor (1999), Commentary on Atomists' Fragments [1]

Quotes | By

The following are quotes by Simplicius:

> "The words 'the ancient theory that denies chance' [by Aristotle] seem to refer to Democritus; for although he appears to have made use of chance in his theory of the formation of the worlds, in his more detailed discussions he says that **'chance is not the cause of anything'**, but refers everything to other causes, e.g. the cause of finding treasure is digging or planting the olive, or of the bald man's fracturing his skull is the eagle's having dropped the tortoise to break its shell."
>
> — Simplicius (c.530), Fragment 71b; in: *Commentary on Physics* (196a14-15; 330.14-20) [1]

References

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External links

â— Simplicius of Cilicia – Wikipedia.

θΔics

In existographies, **Simson R. Najovits** (1937-) is Canadian-born French Egyptologist noted for [] ,

Recension theory

In 2003, Najovits, in his *Egypt, Trunk of the Tree, Volume 1*, gives a fairly cogent, e.g. as compared to Gary Greenberg (2000), chronological speculation of the order of the various Egyptian religio-mythology redactions (see: recension theory).

Egyptian | Christian

In 2009, Najovits, in response to an interview query about his *Egypt: Trunk of the Tree* and "pre-sand" theories on Egyptian mythology, in the context of Russian-born French mystic philosopher George Gurdjieff (c.1872-1949), stated the following: [2]

> "Certainly not! The notion of a "prehistoric, pre-sand" Egypt with immense achievement, esoteric knowledge and fabulous architecture is a loony fantasy, an historical, archaeological and climatic impossibility which is only believed by the loony wing of Egyptologists. And Gurdjieff's statement that some of the Egyptians were "the direct descendants" of the Atlanteans and the wise extra-terrestrial beings, "the Akhaldans" with the "pyramids and sphinx [being] the sole, chance surviving remains erected … by the most great Akhaldans and by the great ancestors … of Egypt" is in the same vein and its only redeeming quality may be that just as in Plato's original Atlantis myth, in Timaeus and in Critias, in which Plato's purpose was to describe a great, wise ideal which could serve as the model for the Greece of his time, Gurdjieff might have been metaphorically hinting at the same thing for our modern times.
>
> On the other hand, if Gurdjieff's idea that many of the origins of Christianity were "taken in a ready-made form from Egypt, not only from the Egypt we know, but from the one which … existed much earlier" is also loony, it's not loony to see some key aspects of Christianity, and notably what Gurdjieff called "the form of worship in the Christian Church" indeed owing something to what he called Egyptian "schools of repetition," but of course in historical Egypt and not in an imaginary "pre-sand" Egypt. As for direct links between Egypt and the Work, or at least similarities, the Egyptian description of "the silent man" found in many of the sebayt, the so-called Wisdom Texts, does bear a resemblance to what happens in quiet work meditation."

(add discussion)

Education

Simson attended Sir George Williams University, now part of Concordia University, where he studied literature and political science. [2]

Religion

Najovits, in respect to his Jewish background, in 2009 interview, stated things as follows: [2]

> "My father was born in Hungarian Transylvania (now in Romania) and my mother in the Ukraine. They came to Canada when they were very young, about twelve or thirteen. My father was a decorated war hero in the Canadian Army Engineering Corps and my mother was a pious and delightfully superstitious woman. They were Orthodox and they tried to bring-up my brother, my sister and me in the Orthodox tradition and I reluctantly went through the motions (sometimes with a bit of humorous twisting) until just after my Bar Mitzvah, but I was always something of a born-atheist and it's many years now that I'm a good practicing atheist."

Here we see the overly-common Jewish atheism scenario.

Quotes | On

The following are Najovits related quotes:

> "Simson [**Najovits**] is a hyper-intellectual Henry Miller."
>
> — John Colombo (2009) [2]

References

1. Najovits, Simson R. (2003). *Egypt, Trunk of the Tree, Volume 1: A Modern Survey of and Ancient Land* (pg. 107-09). Algora.
2. Colombo, John R. (2009). "Interview of Simson Najovits" (Ñº), Gurdjieff Books, WordPress.

Further reading

â— Najovits, Simson R. (2004). *Egypt, Trunk of the Tree, Volume 2: The Consequence*. Albora.

θΔics

In terminology, **sin** (TR:37), from the Latin *sont-* or *sons*, i.e. “guilty”, refers to a conceptualized act of wrongdoing (as contrasted with rightdoing); an action that is or is felt to be highly reprehensible. [1]

Overview

Historically, the concept of individual sin derives from the Egyptian theory of the negative confessions, i.e. 42 acts of wrongfulness forbidden by the Egyptian people, the number 42 signifying the number of nodes or “capitals” of upper and lower Egypt during the 1st dynasty formation of the Egyptian state.

Further reading

● Hough, Adrian. (2010). *The Flaw in the Universe: Natural Disaster and Human Sin*. O Books.

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1. Merriam-Webster Collegiate Dictionary, 2000.

External links

● Sin – Wikipedia.

θΔics

In chemistry, a **single elective affinity** or "single displacement reaction" (modern) is a reaction or affinity reaction, involving two affinities, in which one composition, consisting of two principles, is destroyed and at the same time a new compound is formed. [1]

A cartoon depiction of divorce as a single displacement reaction (aka substation reaction or **single elective affinity**). [2]

Bergman

See main: EA|IAD: Reaction decipherment;

The following, to given example of single elective affinity, shows Swedish chemist Torbern Bergman's reaction #20 (see: Bergman reaction diagrams), in his own words, the "decomposition of calcareous hepar by vitriolic acid", as re-shown below:

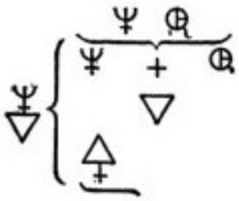

$$CaS + H_2SO_4 \rightarrow CaSO_4 + S$$

Bergman 1775 version Modern version

The "+" sign here seems to indicate "with the addition of" [species indicated]; a reaction which, in words, is such that the *calcareous hepar*,

(CaS)

described such that it has its "proximate principles [are] united", which are *calcareous earth* (calcium oxide, CaO) and sulphur (S):

(CaO) and (S)

is decomposed [reacts with] *vitriolic acid* (sulfuric acid, H_2SO_4):

(H_2SO_4)

in water, (H_20), indicating that “the three surrounding bodies freely exercise their attractive powers in it”, to form gypsum and elemental sulphur:

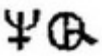 ($CaSO_4$) and (S)

The separation of the signs of calcareous earth and hepar inside the vertical bracket { represents breaking of the

combination of these two “proximate principles” by the action of the vitriolic acid, which “attracts calcareous earth more strongly than sulphur does.” The signs of the calcareous earth and vitriolic acid are placed side by side above a complete horizontal bracket—the indication that a new combination—the point of which is turned downwards to imitate that the new compound (vitriolated calcareous earth or gypsum) is precipitated. The fact that sulphur, which is the other product of the reaction, also precipitates, is indicated by turning downwards the point of the lower horizontal half bracket. [12] In modern terms, calcium sulfide *CaS* is decomposed by sulfuric acid H_2SO_4 in water calcium sulfate $CaSO_4$, which precipitates (down full-bracket) and to produce elemental sulfur *S* which precipitates (downward half-bracket); which, neglecting intermediates, would be written as:

$$CaS(s) + H_2SO_4(aq) \rightarrow CaSO_4(s) + S(s)$$

This reaction, of course, is an example of a single elective affinity (reaction).

References

1. Henry, William. (1831). *The Elements of Experimental Chemistry, Volume 1* (Single elective affinity, pgs. 183-85; Double elective affinity, pgs. 185-86; ch. 2: Of Chemical Affinity, pgs. 37-; section: IV: Of Elective Affinity, pgs. 61-; section VI: Of the Estimation of the Forces of Affinity, pgs. 68-; section VII: Of Complex Affinity, pgs. 70-). D. Desilver.
2. Jarape. (year), “Substitution Reaction”, JarpeScienceCartoons.Blogspot.com.

θΔics

In thermodynamics, **single particle thermodynamics** is the study of how the laws of thermodynamics apply to systems comprised of one particle, atom, or molecule.

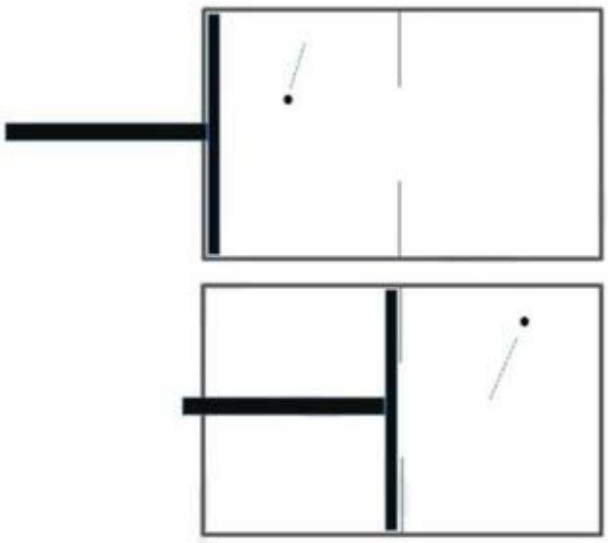

An example of **single particle thermodynamics**, namely: a single molecule in a piston and cylinder, used in the derivation of entropy by Leo Szilard (1922) and Gilbert Lewis (1930), respectively. [3]

Overview

In the 1930s, after the nucleation reaction was discovered, the question of the issue of the application of thermodynamics on the nanoscale began to emerge. [5]

In 1961, Terrell Hill began to use the phrase "small-systems thermodynamics" to designate the subject of the thermodynamics and statistical mechanics of systems of colloidal particles, polymers, or macromolecules; and in 1963 published his *Thermodynamics of Small Systems*, which crudely demarks the start of the field of "small-systems thermodynamics".

In 2001, Hill began to use the term 'nanothermodynamics', as a shortened version of the older phrase 'small system thermodynamics'.

In 2016, Kilian Singer (project head), PhD student Johannes Rossnagel, and Ferdinand Schmidt-Kaler (head of the QUANTUM group), of laboratory at Mainz University, as summarized in their *Science* article "A Single-Atom Heat Engine", report on a study wherein the claim to have made a single atom heat engine; the abstract of which is as follows: [4]

> "Heat engines convert thermal energy into mechanical work and generally involve a large number of particles. We report the experimental realization of a single-atom heat engine. An ion is confined in a linear Paul trap with tapered geometry and driven thermally by coupling it alternately to hot and cold reservoirs. The output power of the engine is used to drive a harmonic oscillation. From direct measurements of the ion dynamics, we were able to determine the thermodynamic cycles for various temperature differences of the reservoirs. We then used these cycles to evaluate the power P and efficiency η of the engine, obtaining values up to P = 3.4 × 10–22 joules per second and η = 0.28%, consistent with analytical estimations. Our results demonstrate that thermal machines can be reduced to the limit of single atoms."

The basic parts of their single atom engine is shown below:

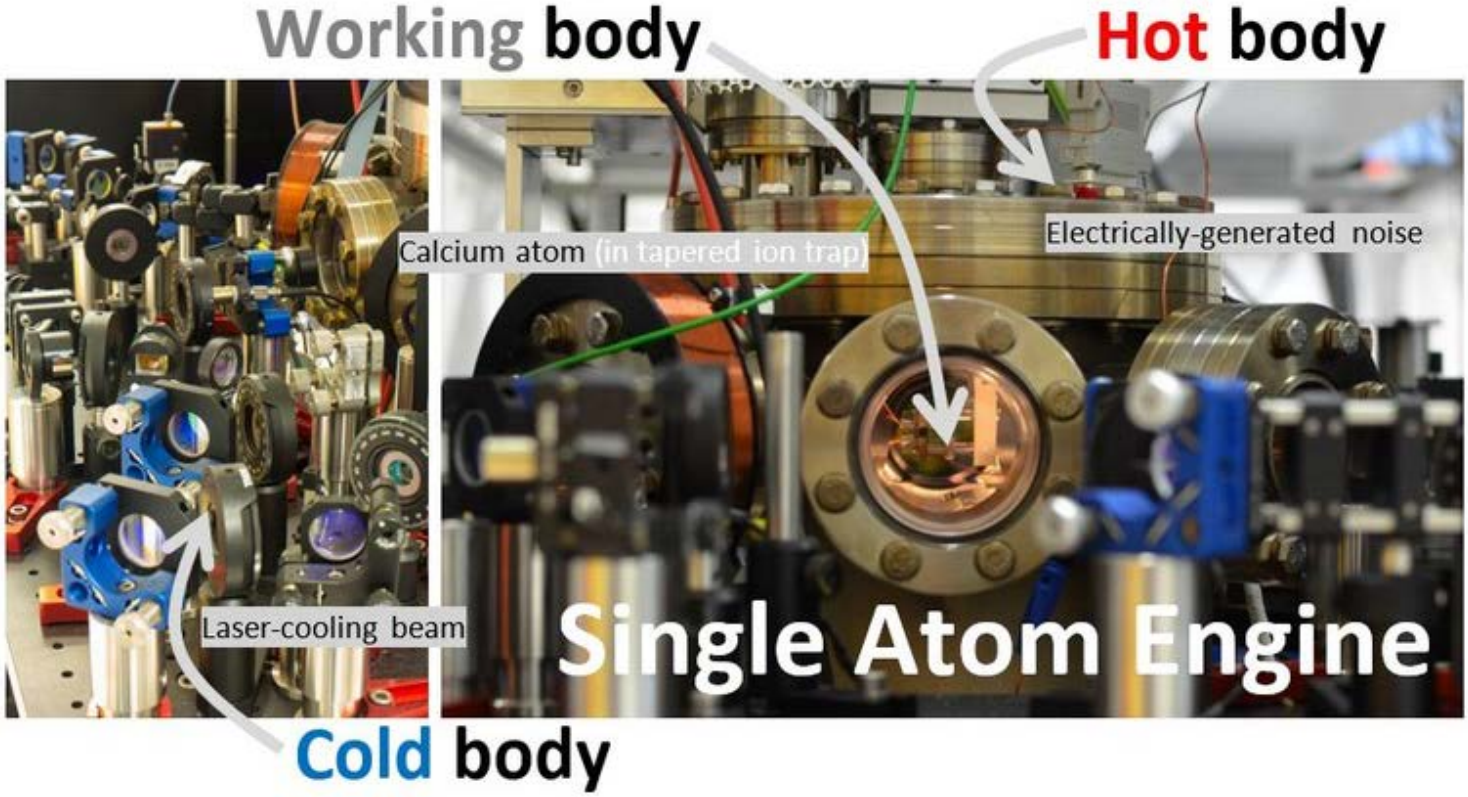

In commentary on the single heat engine revision #6, in respect to the query by Thims: "do I have your engine labeled correctly here, in regards to location of hot body and cold body", Johannes Rossnagel stated the following: [6]

> "In principle its fine. The hot bath electronics is hidden under the table and provided by a cable which is not part of the picture. But you say that it is electronic noise, so it's fine for me. You could point to the upper part of the right picture, there you see a gray plug on top of the vacuum chamber. That is where the electronic noise reaches the experiment."

(add discussion)

Thermodynamics not applicable?

The subject of single particle thermodynamics is a bit of an uncharted subject.

Some, steeped in statistical interpretations of thermodynamics, will often naively conclude that the laws of thermodynamics fall apart at the single particle level.

In 1985, American theoretical physicist Richard Morris stated the following: [1]

> "The law of entropy increasing is only a statistical law; it is not 'fundamental' because it cannot describe the behavior of an **individual atom or molecule**; it deals with the average number of them. Entropy is not a concept that can be meaningfully applied to a **single particle**, or even to a small number of particles."

This is one of the commonly 'supposed' violations of the second law. The issue here is that Morris seems to be unaware that the subject of small systems thermodynamics exists (as well as nanothermodynamics); second, that Morris may be a closet Christian, objecting to the second law owing to religious beliefs about god and free will (as his book is filled with this discussion); third, entropy being simply a mathematical formulation of heat, Morris is missing that fact that even single molecule (or single atom or particle), contained in a system (or volumetric region), can be heated and cooled so as to act as

the working body of a heat engine, and thus produce work, but not perpetual motion work, meaning that heat added and taken away during each stroke, will not compensate each other exactly.

In any event, Morris cites John Wheeler who said “ask any molecule what it thinks of the second law of thermodynamics and it will laugh at the question”, which Morris interprets to mean that:

> “The behavior of a single molecule can only be described by the basic, time-symmetric laws of physics, such as those of mechanics or quantum mechanics. The behavior of an individual molecule is not constrained by the law of increasing entropy.”

Morris, here again, is showing is ignorance of basic science, in favor of some underlying motive (possibly subatomic particle dynamics issues, being that he discusses positron-electron annihilations). Of note, he seems to be unaware that quantum mechanics was derived from the second law by German physicist Max Planck. Second, his use of the term “law of increasing entropy” signifies that he has an elementary understanding of thermodynamics.

In 1992, American physicist Steven Weinberg, in reference to Philip Anderson’s discussions of emergence, amid discussions of reductionism, in respect to which science is the most fundamental, states, rather questionably, that temperature and entropy are "emergent concepts" (see also: emergent property): [2]

> “Even though thermodynamics has been explained in terms of particles and forces, it continues to deal with emergent concepts like temperature and entropy that lose all meaning on the level of individual particles.”

(add discussion)

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2. Weinberg, Steven. (1992). *Dreams of a Final Theory: the Scientist’s Search for the Ultimate Laws of Nature* (pg.41). Random House.
3. Thims, Libb. (2012). “Thermodynamics ≠ Information Theory: Science’s Greatest Sokal Affair” (single molecule, pg. 42) (Ñº), *Journal of Human Thermodynamics*, 8(1): 1-120, Dec 19.
4. Rossnagel, Johannes, Dawkins, Samuel T., Tolazzi, Karl N., Abah, Obinna, Lutz, Eric, and Schmidt-Kalter, Ferdinand, and Singer, Kilian. (2016). “A Single-Atom Heat Engine” (abs)(Ñº)(Ñº), *Science*, 352(6283):325-29, Apr 15.
5. Feshbach, H. (1987). "Article", *Physics Today*, 40, 9.
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Further reading

â— Tsutsus, Makusu, et al. (2017). “Roles of Vacuum Tunnelling and Contact Mechanics in Single-Molecule Thermopower” (abs), *Scientific Reports*, 7.

θΔics

In thermodynamics, **single-molecule thermodynamics** is the study of the thermodynamics of an individual molecule or single molecule in a system or of the measurement and description of quantities, variables, and or functions at the single-molecule level. The interaction of a single photon causing a single retinal molecule to do movement work, i.e. straighten or bend in conformation, might be a descent model example of a single molecule thermodynamics case study.

Extensivity issue

The subject of thermodynamics of a single molecule or for that matter single particle (single particle thermodynamics) is a tricky subject, to say the least. The science of thermodynamics, regardless, is applicable in its governing nature to both the single particle and the single molecule. This is captured well in subject initiator French physicist Sadi Carnot's 1824 pronouncement that: [5]

> "It is necessary to establish principles [of thermodynamics] not only applicable to steam engines but to all imaginable heat engines, *whatever* the working substance and whatever the method by which it is operated."

In this framework, the single molecule or single particle is defined as the "working substance" whose properties are governed by energy conservation (the mechanical equivalent of heat is a fixed ratio, whatever the means of transformation of work in to heat or heat into work) and entropy increase (caloric is not a reestablishable indestructible quantity).

This universality proclamation, by Carnot, that thermodynamics applies to "whatever the working substance", as rooted historically in the universal framework of Boerhaave's law (1720), and prior to that experimental testing on various substances with the Papin digester (1680s), was eventually stylized in the mathematical language of German physicist Rudolf Clausius (1850-1865), according to which certain variables were defined as extensive (extensity), path-independent, state variables, or state functions; whereas others were defined as intensive (intensity), path-dependent, variables; all of which seems to be crouched in the elusive "condition for an exact differential" framed around the internal atomic interpretation of an Avogadro number sized system (or working substance). Hence, when when theorizing outside of the normal thermodynamics black box, in subjects where particle or molecule count approaches a countable number, hesitancy comes to the fore in regards to the means, usage, quantification, and applicability of the standard model version of the extensive variables and intensive variables. This is evidenced well in Mexican thermodynamicist Karo Michaelian's 2005 justification for the use of Prigogine entropy in the thermodynamics quantification of species of ecosystems:

> "The total time change of entropy of the ecosystem (as for any open system) is a sum of an external term of no definite sign, and in internal production term of positive definite sign as required by the second law of thermodynamics:
>
> $$\frac{dS}{dt} = \frac{d_e S}{dt} + \frac{d_i S}{dt}$$
>
> $$\frac{d_i S}{dt} > 0$$
>
> In the spirit of the virial expansion for a thermodynamic system communicating through n-body interactions, the total change of entropy of the ecosystem can be written as a many-body expansion of entropy changes due to interactions among individuals and among individuals and their external

> environment. Such a many-body expansion is obviously in complete accord with the extensity property of entropy."

The term "virial expansion" seems to have been introduced in 1901 by Dutch physicist Heike Kamerlingh-Onnes. [7] In any event, Michaelian's statement that it's "obvious" that the extensity property of entropy (in the Prigogine-interpretation he uses) carries over absolutely into the quantification of n-bodies interacting in an ecosystem.

What if, however, n = 10, as was the case during the great chimpanzee war (1970-1974), studied and followed by Jane Goodall in the Gombe national reserve, Nigeria, where following a series of growing tensions, a splinter group of seven males and three females with their young split off from the main group and began to form their own troop; after which a war began, whereby subsequently the boundary entropy changes $d_e S$ involved entropy quantifications such as the heat of battle, at the front, territory-infringement murders, etc., as well as the internal entropy changes $d_i S$ internal work of total species genocide. [8] In this simple example, it is not at all "obvious" how the condition for an exact differential, which mathematically defines the extensity property of entropy, translates over to these types of heat measurement quantifications.

It sum, it is generally understood that measurements made on large ensembles of molecules are routinely interpreted using thermodynamics, but that the normal procedure of thermodynamic application diverge to a certain extent when measurements are made on single molecules. [1] This is not to say that the laws of thermodynamics are violated, but rather the assumptions behind the various state variables, measurements that quantify these variables, and state functions or equations that describe the behavior of the "system", "working body", or "working substance", which in this case would be one molecule, require reformulation and a regression to first principles.

Thermodynamics as a scientific discipline is phenomenological, and as such is not dependent on concepts relating to particle interactions, such as is the case with statistical mechanics, but rather the particle interactions are dependent on the governing nature of the thermodynamics of the system. This is often overlooked by many scientists who falsely assume that statistical mechanics delivers the needed conceptual underpinnings. A well-formulated reminder of this fact can be found in a statement by American ecological engineer Robert Ulanowicz: [3]

> "Thermodynamics is a self-consistent body of empirical knowledge that may be readily verified without any recourse to microscopic particles. The aim of statistical mechanics was to lend credence to the atomic hypothesis by demonstrating that it could be related to the more fundamental empirical laws. A failure of this effort would have meant trouble for the microscopic hypothesis, not for thermodynamics."

One trend that one will find with small systems (1-1000 particle range), according to recent nanothermodynamics computer simulations, is that entropy becomes nonextensive, which raises possible issues on the integrating factor of the inexact heat differential, among other possible theoretical issues. In the 2005 article "Nonextensivity and Nonintensivity in Nanosystems" by Ali Mansoori and Pirooz Mohazzabri, they summarize that systems containing particles (argon-like particles) in the 2-1000 range show deviation from standard macrothermodynamics: [1]

> "Using extensive molecular dynamics simulations, we have investigated the extensivity of the internal energy and entropy as well as the intensivity of temperature and pressure in small thermodynamic systems. Atomic systems consisting of n^3 (n = 2, 3, …10) argon-like particles interacting through the Lennard-Jones potential energy function have been studied. It is found that in small systems, contrary to macroscopic systems, internal energy and entropy are nonextensive whereas temperature and pressure are nonintensive. These deviations from macroscopic thermodynamics, that continue to remain detectable even in systems containing as many as 1000 particles, are in agreement with theoretical predictions."

By extrapolation downward, one may expect to find further formulaic derivation when the system consists of one atom,

one molecule, or one particle (single particle thermodynamics).

Human thermodynamics

In the various subjects of human thermodynamics, analysis is generally done on systems consisting of an integer number of reactive human molecules, generally greater than two or more, upwards to the size of the population of one country, or boundaried systems consisting of upwards of one billion human molecules, in the case of India and China. [2]

An example of a single molecule thermodynamics subject in human thermodynamics is psychodynamics, in which thermodynamic formulation and description of the states of mind of an individual human molecule are attempted in order to develop theory and give psychological guidance and counseling, a field largely developed by Austrian psychologist Sigmund Freud as outlined in his 1895 "A Project for Scientific Psychology".

See also

- Microthermodynamics
- Macrothermodynamics
- Phenomenological thermodynamics
- Small-systems thermodynamics
- Molecular thermodynamics
- Nanothermodynamics

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θΔics

In science, a **singularity** is an infinitely dense point said to be located at the center of a black hole, where the laws of physics, supposedly, no longer apply, and is surrounded by an event horizon so it cannot be seen. [1]

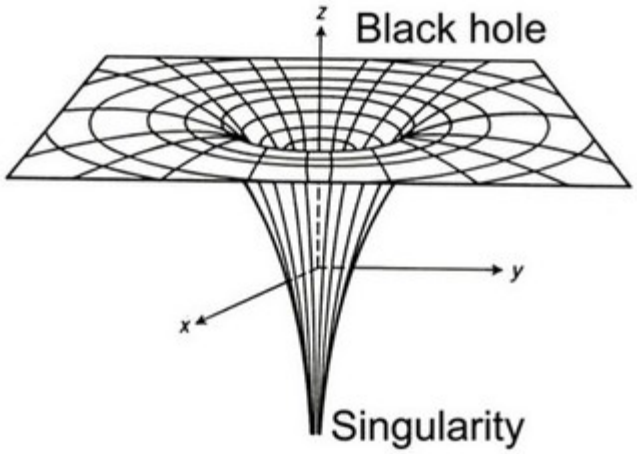

Artistic Cartesian coordinate rendition of a **singularity** formed inside of a black hole.

History

The term singularity was introduced in the 1960s and 1970s works John Wheeler, coiner of the term "black hole", Subrahmanyan Chandrasekhar, Rodger Penrose, and Stephen Hawking. In 1976, in relativistic thermodynamics, the term "Schwarzchild singularity" was being used, referring to the Schwarzchild radius corresponding to the formation of a singularity. [2]

Universe

In 1920, American thinker William Sidis posited that the universe may have started in a "big collision". [4]

In 1943, English thermodynamicist Alfred Ubbelohde posited that, just as there is a lower limit to temperature (third law) there may be an upper limit to temperature, such that at sufficiently high temperatures, all matter may resolve into radiation, and that this upper limit of temperature may be related to some kind of thermodynamic 'starting-point' of the universe. [5]

In the 1973 book *The Large Scale Structure of Space-Time* (and followup 1986 *A Brief History of Time*), Stephen Hawking seems to have introduced the view that the universe originated as a "initial singularity" some 10 to 15 billion years ago. [6]

Thermodynamics

Depending on argument, some have posited that the so-called initial singularity of the universe started in either a state of low entropy or of high entropy.

Religion

In the mid 20th century, religious theorizers began to argue that the singularity was god, created by god, or the power or force of god, or something to this effect. An example is found in the work of British astrophysicist Edward Milne, published between 1933 and 1950, who argues that owing to the creative power of god, the universe must have started in a point-singularity; Milne also discussed this theory in the context of Rudolf Clausius' end state heat death theory, which he seems to have objected to. [3]

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External links

â— Gravitational singularity – Wikipedia.
â— Penrose-Hawking singularity theorems – Wikipedia.

θΔics

In astronomy, **Sirius**, aka “dog star” or “Stella Maris”, called Sothis (Q), by the Egyptians, personified by the goddess Septet and or Isis, depending, in astro-theology, is the []

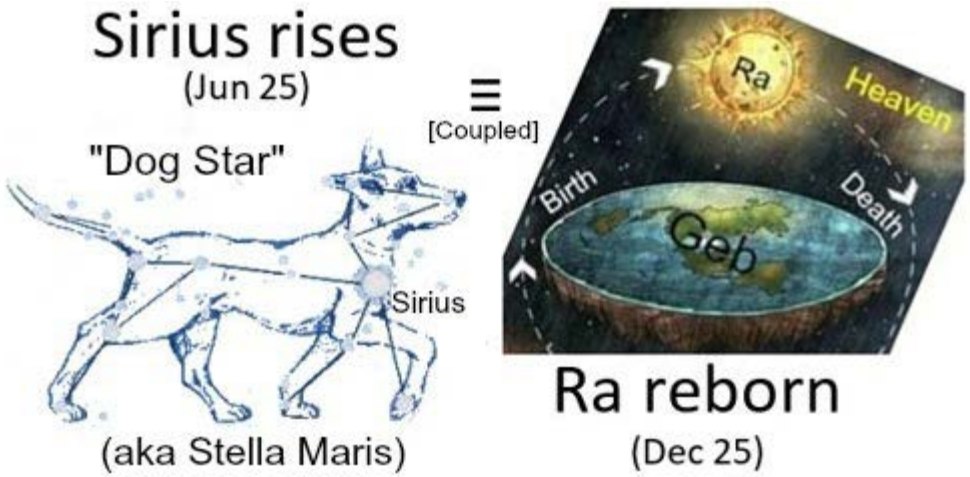

A detail showing how **Sirius**, which rises on Jun 25, i.e. is seen above the horizon, marks the start of the Nile River flood, and was in ancient times believed to "kindle the vapor of the sun" (Pliny, 77AD), a theory which therein connects Sirius to the rebirth of the sun.

Cycle

The star Sirius disappears annually for a period of 70-days, which is the number of days the Egyptians used to do the mummification process. [2]

The helical rising of Sirius, after its disappearance for 70-days, marks the start of the annual 150-day Nile River flood.

Sirius, which has a magnitude of -1.5 and is 8.6 light years from earth, rises about one hour after Orion. [3]

Sirius B

In 1844, it was predicted, on dynamical grounds, that Sirius A has a twin star named Sirius B (which is invisible to the naked eye); it was first observed via telescope 1862 by Alvin Clark. (Q)

In 1950, French Africanist scholars Marcel Griaule and Germaine Dieterlen, in their “A Sudanese System of Sirius”, outlined the finding or assertion that the Dogan tribe, of Mali, West Africa, have ceremony called the “Sigui” enacted every sixty years, wherein priests put on masks and perform a complex dance, which they state is based on the apparent motion of the Sirius. The Dogan, according to the interpretations of these scholars, asserted that Sirius was a binary or even a tertiary (Q) star. [4]

In 1976, Robert Temple, in his *the Sirius Mystery*, based on the findings of Griaule and Dieterlen, asserted the that the Dogon people, of Mali, West Africa, knew that Sirius was a binary star (Sirius A and Sirius B). Here, if Temple's hypothesis were true, we would note that Osiris has to be raised in the presence of not only Sirius (or Sirius A), aka Isis (or Stella Maris), but also by its twin star Sirius B, aka Nephthys (Maris’ sister): [5]

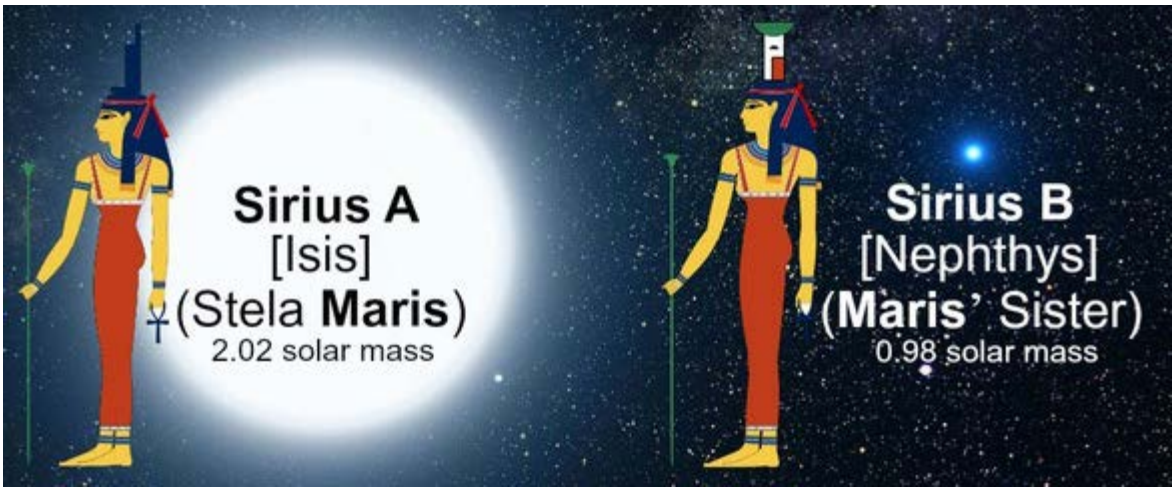

The so-called Temple hypothesis, namely that Egyptians knew about Sirius B, accordingly, while curious, seems doubtful. (Q) All of the conjectural extrapolations that the Dogon knew about the big bang, the spiral nature of the Milky-way, the binary star Sirius, etc. (Q) , is but modern scholars non-objectively “reading into” old texts so to cater to

their own preconceived beliefs and ideas, similar to the way modern Islam apologeticists read modern science into obscure passages of the Quran, or the way, to mock the former, Richard Carrier made a list of 22 scientific principles or "predictions" found in Lucretius poem.

In 1979, Robert Bauval, after reading Temple's *The Sirius Mystery*, began working on the connection between the pyramids, Sirius, and Osiris.

Quotes

The following are related quotes:

> "Who is there that does not know **that the vapor of the sun is kindled by the rising** of the **dog-star** [Sirius]? The most powerful effects are felt on the earth from this star. "When it rises, the seas are troubled, the wines in our cellars ferment, and stagnant waters are set in motion. There is a wild beast, named by the Egyptians Oryx, which, when the star rises, is said to stand opposite to it, to look steadfastly at it, and then to sneeze, as if it were worshiping it. There is no doubt that dogs, during the whole of this period, are peculiarly disposed to become rabid."
>
> — Pliny the elder (77AD), "On the Rising of the Dog Star" [1]

References

1. Pliny (the Elder). (77AD). *Natural History*, *Volume 1* (translators: John Bostock and H.T. Riley) (pg. 67). Henry G. Bohn, 1855.
2. Anon. (2016). "The Story of Osiris – Ancient Egyptian God Documentary" (Q), YouTube, Ancient World History, Dec 23.
3. Bauval, Robert. (1994). *The Orion Mystery: Unlocking the Secrets of the Pyramids* (rises one hour after Osiris, pg. 282). Three Rivers Press.
4. (a) Griaule, Marcel. and Dieterlen, Germaine. (1950). "A Sudanese System of Sirius" ("Un System Soudanais de Sirius"), *Journal de la Societe des Africanists*, 20:273-94.
(b) Bauval, Robert. (1994). *The Orion Mystery: Unlocking the Secrets of the Pyramids* (pg. 8). Three Rivers Press.
5. Scranton, Laird. (2006). *The Science of the Dogon: Decoding the African Mystery Tradition* (pg. 128). Inner Traditions.

External links

- Sirius – Wikipedia.

θΔics

In science wikis, **SkLogWiki** is a community-style wiki for people interested in thermodynamics, statistical mechanics, and computer simulations, with particular focus on simple fluids, complex fluids, and soft condensed matter. [1]

Origin

The site was started on February 15th, 2007 by Spanish physicist Carl McBride at the *Complutense University of Madrid*, who found difficulty with Wikipedia's notability criterion, particularly with reference to original work, commentaries, or pages that are dedicated to a single or series of papers published in a 'traditional' journal. [2]

As of 2009, the site seems to still be in the beta stage consist of 950+ mostly-empty stub pages, linked to lists of either related topic articles or related journal articles. [3] The site now seems to function as a journal article organizational website and niche term catagorization site run primarily by physics professor Daniel Duque and McBride. [4]

The symbol $\Theta\Delta^{cs}$ is used in the logo of the SklogWiki, a conjuction of θâˆ†ics and S = K ln W, as shown above. [5]

References

1. (a) SkLogWiki (Main Page) – a Statistical Mechanics and Thermodynamics Physics Wiki.
(b) SkLogWiki – WikiIndex.
2. User:Carl McBride – Userpage
3. All pages - SkLogWiki
4. User list – SklogWiki.
5. SklogWiki (About) - a Statistical Mechanics and Thermodynamics Wiki.

θΔics

In hmolscience, **slave stealing parable** (TR:12), “stealing slave anecdote” or “determinism defense argument”, refers to the parable, cited by Diogenes Laertius, about how one day, in circa 270BC, Greek philosopher Zeno of Citium caught his slave stealing and proceeded to beat him for his actions, amid which the slave decried "but it was fate that made me steal", to which Zeno retorted "and me to beat you for it". The anecdote tends to be a discussion starting point in dialogues on absence of free will, determinism, punishment, guilt, and justice, individual action (or the individuality problem), in a fully deterministic universe.

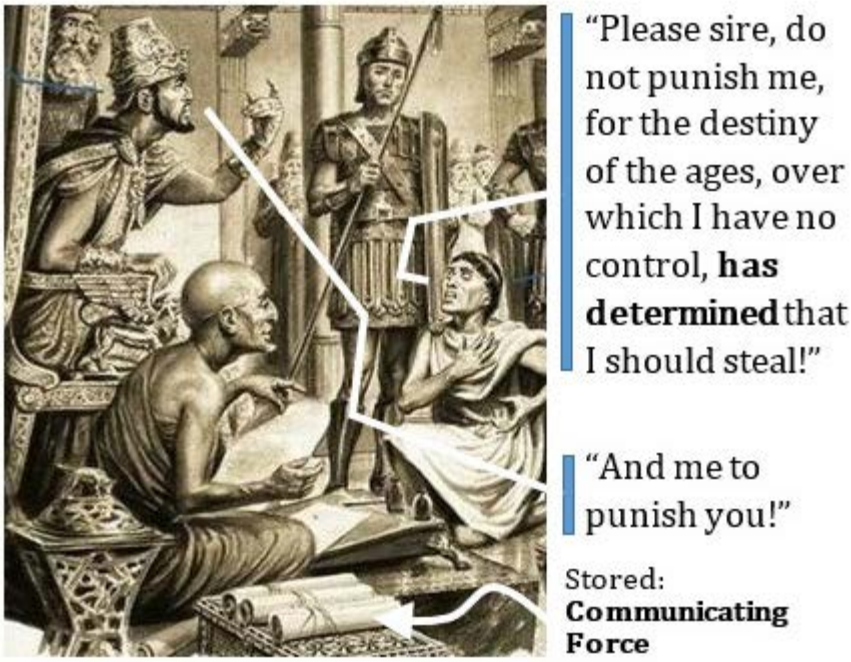

A rendition (Q) of the famous 270BC "**slave stealing parable**", attributed to Zeno of Citium, or "determinism defense" argument, according to which the wrongful slave, thief, or murder, pleads for forgiveness, leniency, or clemency, on the reasoning or logic that in a deterministic universe, his actions were carried out by forces beyond his control (see: external force), hence he should be absolved of the said crimes and not be punished. [4]

Zeno's slave

In 270BC, Greek philosopher Zeno of Citium, who did not believe in slavery, but nevertheless had a slave, is reported to have caught his slave stealing and set about giving him a beating for punishment. The incident is reported by Diogenes Laertius, as follows: (Q)

> “Zeno, they say, was whipping a slave for stealing. When the latter said, ‘It was decreed by fate for me to steal’, Zeno replied, “And to be beaten’.”

In short, according to another translation, knowing Zeno’s creed, the slave is reported to have said: [1]

> “But you should not punish me for stealing. The destiny of the ages, over which I have no control, has determined that I should steal.”

To which Zeno is supposed to have answered:

> “The destiny of the ages, over which I have no control either, has also determined that I should beat you for it.”

Another variant of the parable is as follows: (Q)

> “Long, long ago, before we were governed by Christian morality, the Eleatic Zeno, preached fatalism, which is very much like determinism. One day he caught his slave stealing and thrashed him for it. *Eimasto moi klephai* ("It was destined that I steal from you”), said the slave, “and also to be trashed” was the laconic answer of Zeno.

Zeno's slave stealing parable is what America physical organic chemist George Scott calls physical determinism; he cites this anecdote of Zeno as the best known ancient deterministic system of philosophy. [2]

Determinism plea

In 2012, English anti-materialism philosopher Edward Ockham gives the following rendition of the determinism argument:For more than 200 years, materialists have promised that science will eventually explain everything in terms of physics and chemistry. Believers are sustained by the faith that scientific discoveries will justify their beliefs.

> "Sometimes a crude materialism of this sort is used to justify malicious actions. "OK I lied to you, but I am only a collection of atoms, and concepts like good and evil and being 'wrong' [or 'right'] are not appropriate to collections of atoms. Therefore what I did was not *wrong*". Which reminds of the story (I can't remember where I read it), of the man who was about to be executed for murder the next day, and pleaded to the king for clemency. "I could not help my actions, I was determined by my nature and by the stars to commit these evil deed, it was all predestined". To which the king replied "I forgive you. I also forgive the man who is to execute you tomorrow"."

A "determinism argument", aka predestination, plead cartoon (O) by Roy Delgado.

Some of this argument, by Ockham, is a combination of the determinism argument and the more recent "my atoms made me do it" objection (see: physicochemical morality puzzles).

Discussion

American freedom theory philosopher Orlando Patterson (1991) argues that Zeno, like Plato, was not bothered with the issue of how to reconcile laudable dignity with complete determinism, whereas Chrysippus, comparatively, was preoccupied with it; an issue that Patterson distinguishes as "inner freedom", the power to act independently, as contrasted with "inner slavery", which is the absence of such power; which he also distinguishes between "outward slavery", which he defines as external subordination. [4]

In modern terms, unnatural process are by definition "exergonic" which means that the absorb energy from the surroundings in order to make them work and processes of this, by classification, are non-spontaneous, which means they won't go on their own, but have to be driven into existence via coupling; in short, unnatural processes tend to be destroyed, short-lived (short reaction extent), or "trashed" as Zeno put it, in the course of the reactions or destines of the universe, because they are actions that move upwards on the potential energy scale, and hence are inherently and increasingly unstable.

This, of course, spills into the Goethean revolution, according to which the "blame" or "guilt" is not to be assigned to the to the person *per se* (or weight of soul in religio-mythology speak), but rather, correctly, in the human chemical thermodynamics perspective, as Goethe saw things in 1796 (see: Goethe timeline), to the external forces (predominately) and internal forces (marginally), the judgment decided by evolved weighted consensus of the system, the morality of which changes per era and population density size

Quotes

The following are related quotes:

> "Those who have affirmed that the soul is distinguished from the body, is immaterial, draws its ideas from its own peculiar source, acts by its own energies, without the aid of any exterior object, have, by a consequence of their own system, enfranchised [liberated] it from those physical laws according to which

all beings of which we have a knowledge are obliged to act. They have believed that the soul is mistress of its own conduct, is able to regulate its own peculiar operations, has the faculty to determine its will by its own natural energy; in a word, they have pretended that man is a free agent."

— Baron d'Holbach (c.1770), "A Defense of Determinism" (O)

"For how stands the fact? That, next to the greatness of these cosmic forces, the quality which most forcibly strikes everyone who does not avert his eyes from it is their perfect and absolute recklessness. They go straight to their end without regarding what or whom they crush on the road. Optimists, in their attempts to prove that **'whatever is, is right,'** are obliged to maintain, not that nature ever turns one step from her path to avoid trampling us into destruction, but that it would be very unreasonable in us to expect that she should. Pope's **'Shall gravitation cease when you go by?'** may be a just rebuke to anyone who should be so silly as to expect common human morality from nature. But if the question were between two men, instead of between a man and a natural phenomenon, that triumphant apostrophe would be thought a rare piece of impudence. A man who should persist in hurling stones or firing cannon when another man 'goes by,' and, having killed him, should urge a similar plea in exculpation, would very deservedly be found guilty of murder. In sober truth, nearly all the things which men are hanged or imprisoned for doing to one another are nature's every-day performances."

— John Mill (1852), "Essay on Nature" [7]

"If neuronal events in the brain determine behavior, irrespective of whether they are conscious or unconscious, it is hard to find room for free will. But if free will does not exist, there can be no responsibility, and the structure of human societies must be revised."

— Christian de Duve (1995), *Vital Dust* [6]

"If the soul is out of a job, well some people, obviously, would think that's terrible, but the worst thing we could find out is that we don't have souls [see: soulless bag of chemicals]. But, it could also be a wonderful thing. Our taste for justice is a useful illusion."

— Joshua Greene (2013), *Moral Tribes* [5]

See also

- Killing spree paradox | | Physicochemical morality puzzles
- Nichols-Knobe determinism study [5]

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2. Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pg. 11). University Press of America.
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4. (a) Patterson, Orlando. (1991). *Freedom in the Making of Western Culture* (pg. 193). Basic Books.
(b) Orlando Patterson – Wikipedia.
(c) Chrysippus – Wikipedia.
5. Greene, Joshua. (2013). *Moral Tribes: Emotion, Reason, and the Gap Between Us and Them* (useful illusion, pg. #;

Nichols-Knobe determinism study, pg. 274). Penguin.
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7. (a) Mill, John S. (c.1852). “Nature”, in: *Three Essays on Religion* (pgs. 3-68; Pope, pg. 28). Longmans, Green & Co., 1885.
(b) Stewart, Balfour and Tait, Peter G. (1875). *The Unseen Universe: or Physical Speculations on a Future State* (pg. 195). Macmillan.

θΔics

In hmolscience, the **sloughing hypothesis** is an argument which posits that cyclically mass extinctions, said to occur every 26-million years, occur according to the logic that the earth, defined as a molecule (see: earth molecule), sheds its skin (biosphere), in cycles similar to the way a human, defined as a molecule (see: human molecule), or the sun, defined as a type of molecule (see: sun molecule), sheds it skin.

The earth has a skin and that skin has diseases; one of its diseases is called man.

—Friedrich Nietzsche

A quote by Friedrich Nietzsche on the conception of humans as part of the skin of the earth. [3]

Fischer-Arthur hypothesis

In 1977, A.G. Fischer and M.A. Arthur ("Secular Variations in the Pelagic Realm"), introduced the extinction periodicity hypothesis, by posited (Ñº) that mass extinctions occur cyclically ever 32-million years.

Alvarez hypothesis | Meteoroid impact theory

In the 1970s, Luis Alvarez (1911-1988), after winning the trivial matter of the 1968 Nobel Prize in physics (1968), for the discovery of a large number of resonance states, in elementary particle physics, made possible through his development of the technique of using hydrogen bubble chamber and data analysis, solved the mass extinction problem —posed to him by his son geologist Walter Alvarez—of specifically the extinction of dinosaurs, 65 million years ago, via so the so-called "Alvarez hypothesis" and the technique of iridium sampling in a specific clay layer around the globe and the so-called "killing mechanism" (Neil Shubin, 2013) proposal that when an asteroid hits the earth it vaporizes, thus blocking out light, killing plants, effectively dismantling the food chain.

The following shows the meteoroid impact theory view of the mass extinction of the dinosaurs 65-million years ago, showing an atom to fish to dinosaur evolution window, followed by an fish to human evolution window: [2]

Mass extinctions | Periodicity hypothesis

In 1972, American computer whiz Jack Sepkoski, a new graduate student of Stephen Gould, following the late 1960s so-called Woods Hole paleontology conference, was assigned the task of transforming the mass of known fossil data, such as *Treatise on Invertebrate Paleontology*, and other data bases, into a computer database, in aims to discern possible patterns in the "history of life" (Neil Shubin, 2013), found that the data suggested five mass extinctions, and building on the so-called "extinction periodicity hypothesis" (or Fischer-Arthur hypothesis), introduced in 1977 by A.G. Fischer and M.A. Arthur, together with David Raup, hypothesized in 1984 (Ñº) that mass extinctions occur cynically ever 26-million years. [4]

Sloughing hypothesis | Exodermal regeneration theory

In circa 2005, American electrical engineer Libb Thims posited that the cyclical twenty-six million years, on average, annual mass extinction cycles, known to have reoccurred on the surface of the earth in a periodic manner, wherein about 95 percent of all life forms (powered animate atomic geometries) of a mass size, bigger than about a mouse, go extinct, is a type of "exodermal regeneration cycle", wherein the earth or earth molecule sheds, reincorporates, and then restarts the growth of its skin, biosphere, or integumentary system over again. [1] This model would be in alignment with other known outer layer cycles: [1]

(a) the human shedding its skin each lunar cycle (28 days)
(b) a snake shedding its skin every semi-yearly molt
(c) the sun shedding its magnetic skin at each sun spot cycle (12 years)

In short, each entity, snake (snake molecule), human (human molecule), earth (earth molecule), sun (sun molecule), is a type of molecule with a specific molecular formula, and according to photon input (and followup growth) governed by the surface law, the external layers of molecule, above a certain size, must renew.

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (section: Exodermal regeneration cycles, pg. 699; sloughing hypothesis, pg. 699). Morrisville, NC: LuLu.
(b) Sloughing hypothesis – IoHT glossary.
2. Cretaceous-Paleogene extinction event – Wikipedia.
3. Dooling, Richard. (2008). *Rapture for Geeks: When AI Outsmarts IQ* (pg. 131). Random House.
4. Shubin, Neil. (2013). *The Universe Within: Discovering the Common History of Rocks, Planets, and People* (pgs. 133-34). Random House.

θΔics

Article

Second Law and Three Evolution Paradoxes: Life, Evolve, and Soul | **Peer Review**

(an *Entropy* submission turned JHT submission) [N1]

Article | Review versions

● **Formatted article** | 18 Nov 2015 | Pages: 14 | Format: PDF

This is a new **JHT peer review stage article**, in the re-formatting and or re-construction stage of development, about which: comments, suggestions, and or criticism are welcome, which can be submitted via: (a) the threads below, (b) comments added into the "this" wiki page, via the EasyEdit button, (c) attachment added to this page, via EasyEdit tools, (d) review posted externally, e.g. in beta wiki, WordPress, Blogger, your own website, etc., or (e) email comments sent to JHT editor Libb Thims directly *via* libbthims@gmail.com, which will be made public.

Abstract

The formatted abstract of the working draft-article is as follows:

> Three main paradoxes are prevalent in attempts at a unification of Charles Darwin's 1859 theory that species have *evolved over time* — by *natural selection*, in the *struggle for life*, from earlier forms, deriving from a warm pond, filled with all sorts of chemicals, i.e. atoms and molecules, such as "ammonia and phosphoric salts", subjected to light, heat, and electricity — with Rudolf Clausius' 1865 pronouncement that the *energy* U of the universe is conserved and the *entropy* S of the universe tends to a maximum, are discussed, namely: life paradox, evolve paradox, and soul paradox; the former two being pointed out directly in 1903 by Jean Perrin: "molecules and atoms are lifeless beings that never evolve", the latter evidenced colloquially by the cultural divide about belief in the theory of evolution; in America, e.g., some 60 percent of people do *not* believe that humans evolved over time from earlier species.

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Received: 18 Nov 2015; *Reviewed:* 19 Nov - 10 Dec; *Published:* 11 Dec 2015

Notes | Review period

N1. This article was written out of a 22 Sep 2015 request by Milivoje Kostic, the editor-in-chief of the thermodynamics "section" (Q) of the *Entropy* journal, for his special issue on "Exploring the Second Law of Thermodynamics" (Q). Thims originally turned down the request—as he has other journal requests of recent (e.g. Gheorghe Savoiu's 2015 article request for his *Econophysics, Sociophysics, and Multidisciplinary Sciences Journal*), per reasons including that the publication of *Hmolpedia* as a print set is underway.

While writing the Hmolpedia Jean Perrin article, on 5 Nov 2015, however, and reflecting on the Perrin statement: "molecules atoms are lifeless things that never evolve", Thims surmised that possibly a short article could be written on this in conjunction with the Gibbs based evolution theory work of Lawrence Henderson (1913, 1917, 1935) and Harold Blum (1934) out of courtesy to Kostic, reciprocation, so to say, for him letting Thims lecture to his mechanical engineering students in 2013.

Thims then wrote the article with the peer review candidate of Georgi Gladyshev, the 2009 to present arch enemy of Thims' position that life does not exist and is a defunct scientific theory, to probe Gladyshev to see if he could be cajoled into review commentary; being that he has been non-response to Thims since their 2009 fall-out over their very heated (2012) Hmolpedia thread (Q) life does not exist debate. Sure enough the trick worked; Gladyshev's review is below, as is another anon review. The article being rejected by *Entropy* per reason of the two negative reviews; thereafter published in JHT as means to conserve the work of the article and the review commentary, listed below.

Peer review

Reviews | **Review board** | Other

Anon | 2 Dec 2015 | Submitted to: mdpi.com/journal/entropy **upload** processing system

Extensive editing of English language and style required. The author is extremely confused about both physics and biology; there is no sign of detailed quantitative understanding of the relevant science.

Libb Thims | 11 Dec 2015 | 1:20 PM EST | **Post**

Response: This anon seems to be a generic scientist of some sorts (possibly even an information theorist), who is missing the point of the article, which, to put things bluntly, RE: "I am extremely confused about biology", is that the **science of biology**, by 1797 coining, by Theodore Roose, from his *Outlines of the Theory of Life Force*, is the subject of the study of the "life force" (a vitalism term). Life force,

however, is a concept disproved by the Helmholtz school in the 19th century. There is NO such thing as a "force" is alive. Just as there is NO such thing as a "power" that is alive (such as bandied about by Bishop Butler (1736) nearly two century ago, via his living power theories). The so-called subject of “biology”, which this reviewer says I am confused about, is correctly a subject that every person on the planet is confused about (the handful of abioism thinkers aside). I guess the message of this article when over this reviewers head?

Georgi Gladyshev | 3 Dec 2015 | Submitted to: mdpi.com/journal/entropy **upload** processing system

Comments: This article contains some interesting facts, most of which are of historical interest. The author mainly discusses works of famous authors of the last century. The author has not offered his own scientific theory and has not made any major discoveries. However, he is attempting to make a number of changes in terminology in science. Many references are made to non-peer-reviewed articles in the encyclopedia EoHT. The proposed terminology of the author is not recognized in modern science. However, he uses this terminology which ostensibly recognized now.

For example, the author refers to his articles in the encyclopedia EoHT, where he uses a broad view on "the molecule" (hydrogen molecule, human molecule, planet - molecule, etc.). The author uses this terminology is not in a figurative sense (the allegorical or the metaphorical sense), as this did some scientists before, but in the literal sense. Of course, it is the eclectic mixing of objects of our world. Such an concept, in principle, is incorrect, it does not allow to use mathematics to describe the evolution of matter.

In the article “Life terminology upgrades” the author writes:

> "In physical science, life terminology upgrades or reforms, in the framework of the explicit 2009-presentdefunct theory of life perspective, and or "life does not exist" (2010-present) purview, are terms or synonym alternatives or upgrades to "life" and all bio-centric terms, and their antonyms."

In the peer-reviewed paper the author writes:

> “This issue, however, has now largely been resolved, such as been dealt with in the 2007 to 2014 issues of the *Journal of Human Thermodynamics*, and there now are a number of historically established physicochemcially-neutral upgrades for all “life”, “bio”, or “viva” usages, the main core substitute being terminological replacement of anything previous deemed “alive” by the phrase “powered CHNOPS+ structure”, or variations thereof; an upgrade that enters all the former defunct terms, each being religio-mythology based in origin [pg. 8].”.

The vast majority of professional scientists - physicists, chemists and biologists cannot agree on the desirability of such scientifically unjustified terminological changes. In modern textbooks similar ideas about life are absent. There is even an article [by Georgi Gladyshev] which refers to the inadvisability of changing the specified terminology [Life as a Phenomenon (O). IJALSE, Vol. 1 (1), 97-98. 2014] Of course, the author has the right to express their opinions and offer own terminology. However, if this terminology is not recognized the professional science, the author should points out that this opinion is his own opinion or the opinion only of individual scientists. Several references to famous scientists of the past, I believe, are insufficient. I am sure, in our time with regard to new scientific achievements, these prominent scholars could change their point of view.

Unfortunately, the author does not mention the recent works that discuss problems of thermodynamics and evolution, for example see: Stanley Salthe:

- Serrelli, Emanuele and Gontier, Nathalie. (2009). *Macroevolution: Explanation, Interpretation and Evidence* (abs). Springer.
- Home – DarwinThenAndNow.com [by Richard Nelson, creationist]
- Gladyshev, Georgi P. (2015). “Thermodynamics of Aging and Heredity” (abs), *Natural Science*, 7(5), May.

If the author will speak about mistakes of past and will present the necessary additional clarifications, the historical facts could be published in a scientific journal.
Now, however, I unfortunately can not recommend this work for publication in any scientific journal.

Libb Thims | 11 Dec 2015 | 1:28 PM EST | **Post**

Response: I was expecting something more from Gladyshev, being that I used to consider him a great thinker, possibly he was back in the 1970s when his irritation against Prigogine caused him to bubble up his Gibbsian theory of evolution. Now, however, with him trying to refute me via citation to information theorist Stanley Salthe and creationist Richard Nelson, I don’t know what to say. His past acumen seems to have gone to pasture?

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ournal of Human
CHNOPS+20 Thermodynamics

In hmolscience, **smart atheism**, as compared dumb atheism, refers to intelligent, i.e. correct, brands of atheism. [N1]

> "Cosmology is a kind of religion for **intelligent atheists**."
>
> — Stephen Hawking (c.1962), description (Q) to his wife, when they first met, about himself

(add)

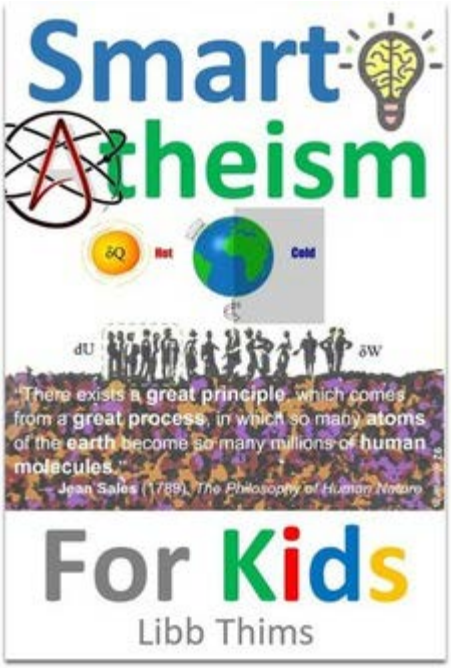

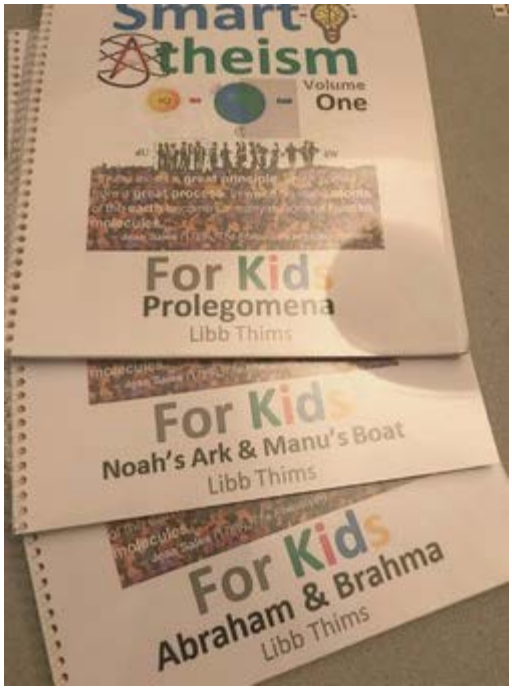

A Jun 2017 photo of the drafting versions of ***Smart Atheism: for Kids***, showing volumes one to three, at the point when Thims was getting kids to peer review; but stalled out per religio-mythology further reading and research needed road-blocks (generally in the area of the Roman recension).

Smart Atheism | Kids

In Aug 2015, Libb Thims taught an "atheism for kids" class, entitled "Zerotheism for Kids", resulting in a 14-part video series, during which time, amid making drafting notes for the lecture, in order to differentiate the Dahmers (e.g. Jeffrey Dahmer) from the Diracs (e.g. Paul Dirac), in respect to "dumb" types and "smart" types of atheism, three atheism categories were delineated: smart atheism, dumb atheism, and intermediate atheism.

In Sep 2016, Thims, began penning a book-version of the atheism for kids class, entitled: *Smart Atheism: for Kids*, which reached the one-volume 300+ page draft stage level in Oct. [1]

In Dec 2016, the project was split into five volumes:

- Thims, Libb. (2017). *Smart Atheism: for Kids – Volume One, Prolegomena*. Publisher.
- Thims, Libb. (2017). *Smart Atheism: for Kids – Volume Two, Noah's Ark & Manu's Boat*. Publisher.
- Thims, Libb. (2017). *Smart Atheism: for Kids – Volume Three, Abraham & Brahma*. Publisher.
- Thims, Libb. (2017). *Smart Atheism: for Kids – Volume Four, Subtitle*. Publisher.
- Thims, Libb. (2017). *Smart Atheism: for Kids – Volume Five, Subtitle*. Publisher.

In Jan 2017, the project stalled out at the volume three draft level, owing to need to do more research in the murky area of the Roman recension era rescript of Osiris-Horus to Jesus recension (see: recension theory).

Smart | Rankings

The following shows a general ranking, loosely by what we might refer to as "atheism IQ", of atheists (see: famous atheists), listed in order of "smartness", using the predominate examples (see: atheism types by denial and belief):

#	↑↑ Smart atheism ↑↑	Reason
1.	Baron	

d'Holbach
(1723-1789)

2. Friedrich Nietzsche (1844-1900)

3. Johann Goethe (1749-1832)

Was the intellectual trainer of the assassins of god, namely: Arthur Schopenhauer and Friedrich Nietzsche, of which, according to Albert Camus (1942), Nietzsche was the most famous.

4. Percy Shelley (1792-1822)

Devised an atheist "elective affinities religion", independent of Goethe, and married Mary Shelley in the "Church of Elective Affinities".

5. Thomas Jefferson (1743-1826)

Described himself as an "epicurean materialist" and with this creed steered the founding fathers of America (see: founding fathers fallacy).

6. Ludwig Buchner (1824-1899)

7. Henry Adams (1838-1918)

See: Adams creed.

8. Benedict Spinoza (1632-1677)

9. Sigmund Freud (1856-1939)

Not only pushed forward an atheistic free energy + bound energy (entropy) theory of the mind, similar to Goethe (#2) and Shelley (#3), formulated in terms of affinities, but also digressed in religio-mythology deconstruction (see: religio-mythology scholars) in respect to Moses and Akhenaten.

Went up against Einstein, and his "god talk", e.g. god does not play dice, during the 1927 fifth Solvay Conference, famously, during smoky hotel lounge conversation with Werner Heisenberg and Wolfgang Pauli.The following is a smartness example:

Paul

10.	Dirac (1902-1984)	“Any further assumption implied by belief in a god which one may have in one’s faith is inadmissible from the point of view of modern science, and should not be needed in a well-organized society.” — Paul Dirac (1933), hand-written note to self Is citation stable of zerotheism.
11.	Thomas Paine (1737-1809)	See: Founding fathers fallacy.
12.	Bertrand Russell (1872-1970)	While generally a "smart atheist"; his 1903 championing of the "accidental atoms" view of things, which conflicts with the smart atheism view of things (e.g. Benedict Spinoza) would seem to re-categorize him into the lesser discerning brands of atheism.
13.	Stephen Hawking (1942-)	

(add discussion)

Notes

N1. The concept or category of "smart atheism" was introduced in 2015 by Libb Thims, during the penning of the “Zerotheism for Kids” lecture, began to distinguish between “smart atheism”, “intermediate atheism”, and “dumb atheism” varieties, so to separate the Dahmers from the Diderots, in a way that children would understand, in respect to being able to discern "right" atheism from "wrong" atheism.

See also

- Atheism types by denial and belief
- Creationism scientists ranked by idiocy
- Top 100 atheists

References

1. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

Further reading

- Shaha, Alom. (2015). *Young Atheist’s Handbook: Lessons for Living a Good Life without God* (Amz). Publisher.

θΔics

Smart mailbox | CubePages

In religio-mythology, **smart theism**, as compared to dumb theism (e.g. creationist scientists ranked by idiocy), refers to []

Overview

The following is a preeminent example of smart theism:

> "Should we speak here of this absurd system, if a system it is, imagined by an impious philosopher, adorned by a great poet with all the richness of his art, a system that libertines of our time would like to revive? This system admits as principles of the universe only eternal atoms, devoid of feelings and intelligence, the fortuitous encounters of which formed all things: an accidental organization generates the soul, which is destroyed as soon as the organization ceases … Never will the formation of any organized body be explained solely by the physical properties of matter; to be convinced of this one need only read the writings of the philosophers who have tried this explanation, from Epicurus to Descartes."
>
> — Pierre Maupertuis (1751), *System of Nature: Essay on Organized Bodies*

Here, Maupertuis (IQ:185|#51), supposedly, hoped that the principle might unify the laws of the universe and combined it with an attempted proof of the existence of god. (Q) He, in short, is attacking the atomic atheism of Epicurus, the soul-based dualism of Descartes, and in its place attempting to situate a theological hylozoism of sorts.

Quotes

The following quotes are examples of smart theism:

> "And you know, I get a lot of grief out there. People say, 'How can you be a scientist and believe that god created the earth? Obviously, you know [they say] we developed from a puddle of promiscuous biochemicals. And if you believe in anything other than that, you're a moron.' I don't criticize them. I say, 'Can you tell me how something came from nothing?' And of course they can't. They say 'well, we don't understand everything.' I say 'ok, no problem'. 'I'm just going to give you that there's something'. And now you're going to tell me there's a big bang, and it comes into perfect order? So that we can predict seventy-years hence when a comet is coming, that kind of precision. And they say, 'Well, yeah.' And I say, 'But don't you also believe in entropy, that things move toward a state of disorganization?' [they say] 'Well yah'. [I say] 'So how does that work? "And they say, 'We don't understand everything.' And I said 'I'm not sure you understand anything! ' But, I said, 'I'm not going to be critical of you, not a problem. You're entitled to believe what you believe, even though it requires a lot more faith than what I believe. But everybody believe what you want to believe."
>
> — Ben Carson (2015), campaign speech (Q) (V:0:08-1:42), Liberty University, Nov 11; in 6 Oct 2015 Carson commented (Q), on *The View*, how some of the people he talked to about this evolution question included Nobel laureates; and in 2011, he was in a theist debate team (Q) with Francis Collins against atheists Richard Dawkins and Daniel Dennett

> "All these wonders of art... design, human ingenuity... All utterly meaningless in the face of the only question that matters. Where do we come from? I refuse to believe that mankind... is a random by-product of molecular circumstance. No more than the result of... Mere biological chance. No. There must be more. And you and I, son, we will find it."
>
> — Walter (2017), *Alien: Covenant* (Q)

> "Every night at dinner your father would pour me a glass of wine and not once in forty years did he ever

join me in a glass. His ‘faith’ is as strong as my lack of it. I once asked him how can a surgeon believe in god? He said ‘he would go mad if he couldn’t see some kind of guiding principle in the world’.”

— Farah Madani (2017), *Punisher* (Season One, Episode One @ 36:30)

See also

- Smart atheism
- Dumb atheism

θΔics

***Update**: see genius IQs existive (new main page)*

In genius rankings, **smartest person alive | existive** refers to those individuals still in reactive existence (existive), i.e. "alive", in defunct colloquial speak, ranking in, according to many, as the most intelligent person[s] and or "smartest person ever", at present, as a bound state motile entity, existing on the planet.

> "When asked how it felt to be the **smartest man alive**, Einstein's reply was 'I don't know, you'll have to ask Nikola Tesla'."
>
> — Hakarune (2013), viral Flickr humor [6]

Above: in 1915—the year in which the four **smartest person's alive** (existive) were: Albert Einstein, Nikola Tesla, Gilbert Lewis, and Henry Adams (see: Genius IQs rankings)—Tesla correctly discerned that "there is no thing endowed with life" (see: defunct theory of life); hence, in his day, he was one of the smartest person's alive (existive) who also knew, in a roundabout way, that he was not alive, but only animate, or a "human automaton" (see: automaton), as he liked to call himself, responsive, via sensory input, to external forces. Right: a Sidney Harris depiction of the future.

Quotes | Existive

See main: Smartest person existive (candidates)

The following is a work-in-progress smattering of relevant smartest person existive (alive) potential "candidates" and or runners up quotes, culled from various connective forums and threads:

> "I wonder what IQs some of the following would have: Edward Witten [1951-], Murray Gell-Mann [1929-], Richard Garwin [1928-], Marvin Minsky [1927-], Grigori Perelman [1966-], Saul Kripke [1940-], and Erik Demaine [1981-]. From years past who are no longer alive I would have likes to know what Kurt Godel's or Herbert Simon (one of the founders of AI as well as having a Nobel Prize in economics as well as the Turing award which can be thought of as the equivalent award for computer science), Gauss [IQ=195], Euler [IQ=195] and many more listed already on this page but only as estimates."
>
> — Anon (2010), IQ: 200+ thread post (Feb 20), made from Newberg, Oregon

> "Any listing of the 30+ smartest people ever without Murray Gell-Mann [1929-] and John von Neumann is dubious at best."
>
> — tpsmith800 (2011), forum post at "IQ 200+ | Smartest person ever (4 of 4)" video

> "Here's my personal list for the title of greatest American physicist in history, in no particular order: Joseph Henry, Willard Gibbs, Albert Michelson, Robert Millikan, Robert Oppenheimer, Richard Feynman, Murray Gell-Mann [1929-], Julian Schwinger, Ernest Lawrence, Edward Witten [1951-], John Bardeen, John Slater, John Wheeler and Steven Weinberg [1933-]. This list pales in comparison with an equivalent list of European physicists which would include names like Einstein, Dirac, Rutherford, Bohr, Pauli and Heisenberg; and this is just if we include twentieth-century physicists."
>
> — Ashutosh Jogalekar (2013), "Who's the Greatest American Physicist in History" (Ñº)

(add discussion)

Ranking Note

See main: IQ ranking methodology

One salient aspect that remains in attempting to rank "existive geniuses", geniuses moving presently on the surface of the earth, as compared to "classical geniuses", geniuses of history, such as found in the Genius IQs table or the Cox-Buzan IQ list, is that the assigned IQ is a variational one, namely the intelligence of the person can change per day, depending on prodigiousness, and correctness and impact of intellectual dart throw, a ranking that can only be discerned with great accuracy, in prolonged multi-century peer genius-comparison retrospect.

A few existive members of the $850/day rent-a-genius "Jason" think tank, from left: Hans Bethe, Freeman Dyson [1923-], Richard Garwin [1928-], Steven Weinberg [1933-], and Murray Gell-Mann [1929-]. (Ñº)

Some news media frenzied geniuses, the classic example being William Sidis, attributed with IQ=225+ range as a youth, may not pan out in the long run, such is the case with Sidis who in effect burned out into his 20s

and whose self-defined "greatest work" (*The Animate and the Inanimate*, 1920), when read in retrospect modern physical science terms, turns out not to be so great as would be expected. In addition, there is the longevity factor, the current benchmark being Goethe (IQ=230) who continued to produced genius work until is last words "more light" spoken in 1832 at the age of 82 (see: Goethe timeline), and it was only into the early 20th century that the genius of his self-defined "best book" *Elective Affinities* came to be slowly unraveled, via the thermodynamic theory of affinity (see: Gibbs and Goethe). In other words, sometimes only the future can foretell the greatness of a genius and his or her work. These details aside, the following is an attempt at existive ranking of current said-to-be or seemingly geniuses.

List | 2014 | Top 25

The following is the work-in-progress listing—feel free to comment in the threads—of the smartest people alive (existive), a meta-analysis aggregate listing, individuals coming from a number of sources: Genius IQs table, Hmolpedia thread postings, genius IQ candidates page, smartest woman ever page, Internet smartest person alive lists, YouTube forum discussions (IQ: 200+ videos), Nobel laureates, Time 100 listings, thinkers in the news, cutting edge theory, articles, books, among other sources:

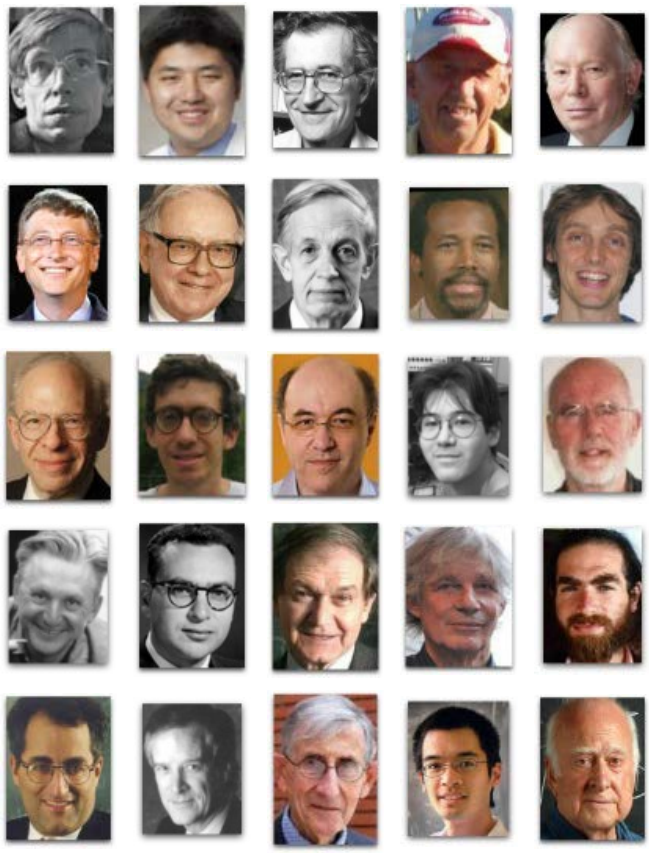

In some sense, we might refer to these as "intellectual power" rankings, on the premise that just as Maxwell (GGE:4) gained intellectual prowessness via his insatiable desire to know the "why" of things, as typified by his age three query “what's the go o' that?”, or as typified by “why is the source of power” Matrix quote (below), so to will modern geniuses, likewise, rank higher owing to a natural driving desire to know the so-called "secrets" of the universe, as Newton (GGE:3) and Goethe (GGE:1) both sought after. Those closer to the "why", according to this logic, will have more power. Those IQs shown in "red" are extrapolated and or interpolated guesstimate IQs, others are indicated per subscript (see: IQ key); acronyms used include: "Smartest Person Alive" (SMA), "Smartest Person in the World" (SPW), "Smartest Person Ever" (SPE), "Greatest Living Genius" (GLG), Hmolpedia Citation Ranking (HCR). The following are 16 Nov 2013 rankings, current:

#	Person	Age (RE)	True IQ	IQ estimates	Description
1.	Christopher Hirata (1982-) ↑↑↓ CR:102|#38 LR:52|#1 SN_E:3	32	↕	IQ_R=225 $IQ_?$=170-195	SuperScholar.org Top 10 SPA (2012) (Ñº); top 7 Social Newton candidate; youngest medalist ever (age 13) of the International Physics Olympiad; upgrade for his *circa* age 17 derived "relationship physics" version of human chemical thermodynamics, a very niche subject *strangely* common to IQ=225+ thinkers: Goethe, Sidis, Thims; astrophysics; high emotional intelligence; presently working on the dark matter and the accelerating universe problems; downgrade (↓) for not responding to emails.
	Stephen Hawking			IQ_O=280 IQ_{MN}=200-	In 1962, Stephen Hawking, age 20, during his third year at Oxford, began to experience clumsiness, and at one point fell down some steps; after which, worried that his brain might be damaged, took a Mensa test (Ñº) to test for mental detriment; he found that he scored between 200 to 250 (Ñº)(Ñº) or 245 exactly (Ñº) as some report. He was jokingly cited on the Simpson's with an IQ of 280. SuperScholar.org Top 10 SPA (2012) (Ñº); PalScience.com

2.		(1942-) CR:118|#30 DN=7	72	185 250 IQ_B=180 IQ_O=160 $IQ_?$=160-190	Top 8 SPA (2010) (Ñº); iStorya.net Top 8 WSP (2011) (Ñº); SMA candidate (Debate.org) (Ñº); noted: black hole thermodynamics; his 10-million copy 1988 best-seller (1996 illustrated) *A Brief History of Time*, which contains discussions (and diagram) on changes in the entropy of the human central nervous system (brain) from reading (education) (Ñº) was one of the keys to the formation of *Hmolpedia* (Ñº); public advocate of atheism (V); in 2012, stated his belief that M-theory, which predicts that every particle should have a superpartner, is the most-likely candidate for a complete "theory of everything." (Ñº)
3.		Murray Gell-Mann (1929-) CR:19 DN=4 (Ñº)	85		**5+** "missing candidate" thread posts (Ñº); SLP Ranker.com (2009) (Ñº); SMA candidate (Debate.org) (Ñº); [GPE] taught himself calculus at age 7 (Ñº) (see: prodigies and calculus); in 1961, he (and Kazuhiko Nishijima) to introduce a classification scheme for hadrons, elementary particles that participate in the strong interaction (this scheme was independently proposed by Yuval Ne'eman)—his scheme is now explained by the quark model; in 1964, Gell-Mann and George Zweig, independently, went on to postulate the existence of quarks" (a term coined by Gell-Mann), particles of which hadrons are composed; Fermi, however, described him as less smart than Richard Garwin. (V)
4.		Steven Weinberg (1933-) CR:19 DN=7	81		SLP candidate TheTopTens.com 2013 (Ñº); 2010 Top 50 SPE honorable mention (Ñº); SMA Debate.org contender (Ñº); a 2011 top 50 atheist (Ñº); noted for his 1967 unification of electromagnetism and the weak nuclear forces [1979 Nobel Prize]; for his 1977 *The First Three Minutes*, wherein he argues that according to the second law the universe is godless albeit questionably pointless; and for his 1992 *Dreams of a Final Theory*, wherein a number of noted atheism positions are stated; possibly world's leading quantum gravitationalist. (V)
5.		Peter Higgs (1929-) ↑ CR:11 DN=7	85		Top 50 SPH (+13 thumbs up) at TopTens.com (Ñº); *Prospect* magazine top 100 world thinker (#8) (Ñº); noted for his 1960s so-called Higgs mechanism, which predicts the existence of a new particle, the Higgs boson—evidence was said to have been experimentally confirmed at CERN in 2012—that contributes to the understanding of the origin of mass of subatomic particles; was co-awarded, along with Francois Englert, the 2013 Nobel Prize in physics for this work; a labeled "inoffensive atheist" who derides Richard Dawkins, a self-described "militant atheist" dubbed "Darwin's Rottweiler", for being too much of a fundamentalist. (Ñº)
6.					
7.		Edward Witten (1951-) CR:13 DN=5.5 (Ñº)	63		**10+** "missing candidate" thread posts (Ñº); SMW nominee (2013) (Ñº); GGE nominee (2012) (Ñº); GLG nominee (2011) (Ñº); SLP Ranker.com (2009) (Ñº); SMA candidate (Debate.org) (Ñº); string theory, quantum gravity, quantum field theory researcher; first physicist to be awarded a Fields Medal (1990); named by *Time* (2004) as world's greatest living (existive) theoretical physicist; "Ed Witten" is listed in UrbanDictionary.com as a term for "real smart dude." (Ñº) Note: in 2010, there was some debate (Ñº) whether Terence Tao or Ed Witten was smatter (GLG), involving people who had met both; the consensus seeming to lean towards Tao.
8.		Richard Garwin (1928-) CR:6 DN=? (Ñº)	86		**4+** missing candidates posts (Ñº); in 1951, he helped design the first thermonuclear weapon test (vid@2:23); an existing member of the rent-a-genius "Jason" think tank; designer of the hydrogen bomb; ranked by Enrico Fermi, as "the only true genius he had ever met", as recalled by Marvin Goldberger (Ñº); though, to note, Fermi also said the same of Ettore Majorana. â— Shurkin, Joel N. (2017). *True Genius: the Life and Work of Richard Garwin, the Most Influential Scientist You've Never Heard of.* Prometheus Books.
9.		Freeman Dyson (1923-) ↑↓ CR:13 DN=1 (Ñº)	90		Aneki.com 2nd ranked (behind Hawking) "Greatest Living Physicist" (Ñº); noted $850/day rent-a-genius "Jason" think tank member (Ñº); his 1971 "Energy in the Universe", cited by Peter Atkins (1992), in which he attempts to explain how things degrade in the movement of the universe in terms of the second law and weak and strong interactions; his 1979 "Time without End: Physics and Biology in an Open Universe", cited by Frank Tipler (1994), argues that life in the future will be able to cope with the cooling and dimming expected from heat death of the universe; somewhere postulates that intelligent beings generate a fixed entropy ΔS per thought; downgrade (↓) for, supposedly, being an anti-reductionism Christian.
10.		Noam Chomsky (1928-) ↓ CR:6 DN=6	85		A 2005 "world's top public intellectual" (Ñº) / Foreign Policy #1 global thinker (Ñº); a 2010 SPW candidate (Ñº); 2012 top 30 SPA (Ñº); his *Manufacturing Consent* cited in *Good Will Hunting*; downgrade for claiming, in 2012, to be an atheist, while at the same time deriding the "new atheists" as an embarrassment and as narrow-minded and ill-informed bigots (Ñº); whereas in 2006, he stated that "When people ask me if I'm an atheist, I have to ask them what they mean. What is it that I'm supposed to not believe in? Until you can answer that question I can't tell you whether I'm an atheist" (see: Arieh Ben-Naim's 2011 akin response) and in same discussion stated he believes Jesus Christ to was real person. (Ñº)

11.		Warren Buffett (1930-) CR:12 DN=4	84	$IQ_{?}$=170-185	Eponym of the Buffett number; on a return trip home, he was warned not to neglect his studies, to which he replied insouciantly: 'all I need to do is open the book the night before and drink a big bottle of Pepsi-Cola and I'll make 100'; born in the great depression, has gone on to become the world's leading financial mogul, wherein, from 1965 to 2005 has produced an annual average return of 21.5%, a feat unsurpassed, becoming, along with Gates, one of the world's top five wealthiest persons [3]; claims to be a "pure agnostic" (vid)
12.		Roger Penrose (1931-) CR:21 DN=7	83		GLG nominee (2011) (Ñº); noted for his *Road To Reality* (2004), quote: "entropy per baryon [in the universe] tends to increase with time".
13.		David Hwang (c.1979-) ↑ CR:53 LRA:19|#30 SNE:15	35		His 2001 (age 22) written "The Thermodynamics of Love" outlines a human chemical thermodynamics logic; third existive highest Hmolpedia like rankings (out of 1,000+ biographies); Oxford biochemistry educated (2000); Harvard Medical School (2006); board certified in neurology at age 31 (2010); currently neuroscience professor and staff neurointensivist at Yale Medical School.
14.		Grigori Perelman (1966-) ↑↓ DN=1	48		Smartest Man in the World video (2010); upgrade for having turned down the Fields Medal (and a million dollars) (see: Paul Dirac on prize acceptance advice); in 2006 solved the Poincare conjecture, originally proposed in 1904 Henri Poincaré (IQ=195), the most famous open problem in topology (video); he's said to have been abandoned maths and personal hygiene, living in poverty with his mother, surrounded by religious icons; according to some old relatives, he believes he found the mathematical probe of God's existence (downgrade ↓). (Ñº)
15.		Philip Ball (1962-) ↑ CR:93|#46 SNE:14 DN=7 (Ñº)	52		Top 7 Social Newton candidate; in 2001, gave talk on "The Physical Modeling of Society" in Messina, Sicily, followed by "The Physics of Society", delivered at the London School of Economics, an exert to which is: "There seem to be 'laws' [of] social systems that have at least something of the character of natural physical laws, in that they do not yield easily to planned and arbitrary interventions"; his 2004 *Critical Mass*, outlining the subject of what he calls "physics of society" is a modern day classic; in his 2009 open letter debate with Sam Harris he was characterized as a "religiously moderate apologists." (Ñº) (see: vid); His backstage interview at the 2011 Nine Lessons for Godless People, would seem to classify him as a public atheist. (Ñº)
16.		Terence Tao (1975-) CR:15 DN=6± (Ñº)	39	IQ_{R}=220-230 IQ_{O}=211 $IQ_{?}$=170-190	SuperScholar.org Top 10 SPA (2012) (Ñº); SMW nominee (2013) (Ñº); SLP Ranker.com (2009) (Ñº); known for: mathematics, green–tao theorem; child prodigy; Fields Medal (age 31); a read-through of his UCLA faculty favorite quotes page (Ñº), shows that his mind is intellectually honed, philosophically grounded, all seasoned with a grain of humor.
17.		Thomas Wallace (1935-) ↑ CR:93|#45 SNE:2	79	$IQ_{?}$=140-175	Current #2 ranked existive social Newton; his "The Fundamentals of Thermodynamics Applied to Socioeconomics" appendix, to his 2009 book *Wealth, Energy, and Human Values*, is a ripe and on target reality call riposte—along the lines of Frederick Rossini's famous 1971 "Chemical Thermodynamics in the Real World" Priestley Medal Address.
18.		Stephen Wolfram (1959-) CR=4 DN=6± (Ñº)	55		GLG nominee (2011) (Ñº); SME/HIQ (2011) (Ñº); at 12, wrote a dictionary on physics; at 14 wrote three books on particle physics; PhD in particle physics from CalTech at 20; chief designer of Mathematica and the Wolfram Alpha answer engine.
19.		Jurgen Mimkes (1939-) CR:68|#60 SNE:1	75	$IQ_{?}$=140-170	Current #1 ranked existive social Newton; one of the only known people, American electrochemical engineer Libb Thims aside, to make a connection between the work of Empedocles (IQ=190), Goethe (IQ=230), and Gibbs (IQ=215) (see: Gibbs and Goethe); presently, he is one of the world's only dual professors of econophysics and sociophysics.
20.		Bill Gates (1955-) CR:14 DN=4± (Ñº)	59		Like Linus Pauling (IQ=180), started first company when he was a teenager; quote (age 17): "I will be millionaire by age 30"; dropped out of Harvard December 1975 (age 19) to, in his own words "write really interesting software that lots of people would buy" and left decisively at that moment because "we were afraid if we waited, someone else would beat us" (GatesNotes.com) [28]; founded Microsoft (age 20); net worth of $101 billion (age 44); high pure and applied entrepreneurial IQ in computer technology. [2]
		Benjamin			Raised by an illiterate single mother, who tricked him into self-educating himself, by telling him that he had to read two books a week and do a report on each one, each of which would pretend to grade, by putting checkmarks on the reports as she flipped thought them; he would

21.		Carson (1951-) CR:4 DN=1	63	$IQ_{?}$=140-170	go on to become one of the most celebrated neurosurgeons of the world; director of pediatric neurosurgery of Johns Hopkins by 33; and in 1987, made medical history by being the first surgeon in the world to successfully separate siamese twins (the Binder twins) conjoined at the back of the head (Ñº); downgrade (↓) for coming out, in 2013, as the goes into retirement, as literal six-day-creationist, rejecting Darwin, and praising spirituality, depraving the "moral decay" of America, being a critic of same-sex marriage as morally reprehensible because the Bible says so, etc. (Ñº)(Ñº)
22.		Stuart Kauffman (1939-) CR:64|#64 DN=1/7±	75		MacArthur "genius" award 1987 (Ñº); his "autocatalytic closure thermodynamic work cycles" theory was the last vestige stronghold to the arrival "defunct theory of life" (2009) by Libb Thims; downgrade (↓) for coming out, with is 2008 *Reinventing the Sacred*, as an ontic opening theorist.
23.		Noam Elkies (1966-) CR:3 DN=1± (Ñº)	48	IQ_{CP}=200±	SMW nominee: (2008) (Ñº) & (2013) (Ñº); IQ: 200± nominee (Ñº); holds record for youngest full Harvard tenured mathematics professor; works on still life pattern theory in cellular automaton rules; described by Brian Green (Ñº) as an "off scale" genius, because he could discuss π, while whistling and huming Brahms' *Rhapsody in G*.
24.		Robert Pirsig (1928-) CR:34 DN=3.5± LR:6|#10	86	$IQ_{?}$=175± IQ_{R}=170	Upgrade (↑) for 1991 hmolscience "chemical struggle" paradox quote about motives and morals (*Lila: an Inquiry into Morals*); child prodigy, cited with IQ of 170 at age 9; large upgrade (↑↑) for going into insane asylum (1961-63) for having questioned reality, the result of which produced his intellectually ripe 1974 book *Zen and the Art of Motorcycle Maintenance*, on the "meaningless" philosophical nature of our "tasks from eight to five", his 1991 quote: "When one person suffers from a delusion, it is called insanity. When many people suffer from a delusion it is called Religion", is the basis of the title of Richard Dawkins *The God Delusion* (pg. 28), which has driven the new atheism movement. His "wildly popular" *Zen and the Art of Motorcycle Maintenance*, supposed (Ñº), attempts to dismiss "scientific materialism" (aka atheism), i.e. the premise that "anything not composed of mass-energy is unreal or unimportant", as something that can easily be cut to ribbons, *reductio ad absurdum* arguments, e.g. by arguing for the absurdity of "trying to derive zero from any form of mass-energy", etc.
25.		Alfred Rogers (1933-) CR:3 DN=6/10	81		In 2010, launched LifeDoesNotExist.com, espousing his view, which he says he arrived at in the 1990s, that (a) life is something that does "not exist", (b) that the hydrogen atom is not alive, and (c) that what we perceive as being alive is but a difference in complexity. In other words, he seems to have been the first to solve the so-called "great problem of natural philosophy" (though, to note, technically he did not publish until 2010, whereas Libb Thims published his defunct theory of life views in 2009; and Ferris Jabr published his similar conclusions in 2013).

Top 25 | 2014 video

The following is the five-part "25 Smartest People Alive | Existive" video series countdown for 2014:

(add discussion)

List | 26-100

â— Smartest person alive | existive (26-100)

Candidates | Also-rans

â— Smartest person alive | existive (candidates)

Alive | Existive

Technically, to clarify, a person cannot be defined as being "alive" (see: defunct theory of life), being that a person, by definition, is an animate chemical, powered molecule (see: human molecule), or "powered CHNOPS matrix", as Henry Swan (1974) put it, in possession of turnover rate, and atoms and molecules, by definition, are neither alive nor dead. This terminology issue was first pointed out by Francis Crick who in 1966 concluded that, from the point of view of the physical sciences, correctly: "we must abandon the word 'alive'." [1] Said another way, someone who was or is the "smartest person alive" would at least be keen, inquisitive, perspicacious, and discerning enough to know that he or she was not alive, or at least be in the neighborhood of such discernment:

> "Origins: probably 4-5 yrs old, I believed that I came from some sort of light source, probably the sun. My first word was also "light". Life and death: I grew up in the country, so we had dead animals around all the time. Probably 6 or so before I thought about my own death as inevitable. Existence: I neglected this question until coming across [Thims] *Human Molecule* at around age 30. I don't believe in the common sense notion of life. There does **not** seem to be any evidence that I am **alive**."
>
> — Jeff Tuhtan (2013), response to query on "big questions" recollections (see: belief system children) [4]

One ripe historical example of a "smartest person ever" who discerned the "life terminology" paradox issue is Nikola Tesla who in 1915 at a time when he ranked in the top four smartest persons existive—along side Albert Einstein, Gilbert Lewis, and Henry Adams—in his article "How Cosmic Forces Shape Our Destinies", discerned correctly that "there is no thing endowed with life". Baring prolonged digression on this point—one is referred to the: life terminology upgrades page for further clarification—the term "existive", a contraction of "reaction existence", will be employed herein as a neutral terminology upgrade to the scientifically defunct term "alive", which Crick correctly suggests we abandon.

Quotes

The following are related quotes:

> "You up your **street IQ** … you'll do some damage, I guarantee."
>
> — Alonzo Harris (2001), dialogue to Jake Hoyt in *Training Day*

> "Choice is an illusion created between those with power and those without. The 'why' is the source of power. You see there is only one constant. One universal. It is the only real truth: **causality**. Action, reaction. Cause and effect."
>
> â€• Lana and Andrew Wachowski (2003), speech of the Merovingian, *Matrix Reloaded*

> "I have no idea [what my IQ is]? People who boast about their IQ are losers."
>
> — Stephen Hawking (2004), *NY Times* interview query by Deborah Solomon, Dec [8]

See also

The following are related genius studies pages:

â— American Presidents | IQ rankings
â— Another Newton
â— Cattell 1000
â— Catch up effect
â— Certified genius
â— Greatest chemist ever
â— Greatest engineer ever
â— Greatest mathematician ever
â— IQ
â— IQ: 150+ | Smartest woman ever
â— IQ: 200+
â— IQ: 225+
â— IQ history
â— Political geniuses
â— Polymath | 50 greatest polymaths
â— Ratio IQ
â— Scientific geniuses

â— Cox IQ
â— Cox-Buzan IQ
â— Buzan IQ
â— Early parental death and genius
â— Epicenter genius
â— Genius
â— Genius studies
â— Genius IQs
â— Genius IQ candidates
â— Genius rankings
â— Greatest literary author ever
â— Greatest philosopher ever
â— Greatest physicist ever
â— Greatest thermodynamicist ever
â— Guinness Book IQ
â— Hard science
â— Hmolscience citation ranking
â— Humanities citation ranking
â— IQ key
â— IQ tables
â— IQ ranking methodology
â— Last person to know everything
â— Last universal genius
â— Libb Thims (genius ranking)
â— Magnitude geniuses
â— Military geniuses
â— Nobel Prize winners in thermodynamics
â— Smartest person ever
â— Smartest person alive | existive
â— Street IQ
â— Terman IQ
â— Two cultures genius | Two cultures
â— Universal genius
â— Uber genius comparison quotes
â— Uberman
â— Walking encyclopedia
â— Who was smarter?

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1. Crick, Francis. (1966). *Of Molecules and Men* (pg. 5). University of Washington Press.
2. Madigan, Carol O. and Elwood, Ann. (1998). *When They Were Kids: Over 400 Sketches of Famous Childhoods* (IQ, pgs. 134; Gates: IQ=160-180; 139, 140) . Random House.
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4. Hmolpedia messaging communication from Jeff Tuhtan to Libb Thims (22 Apr 2013)
5. Poundstone, William. (2005). *Fortune's Formula: the Untold Story of the Scientific Betting System that Beat the Casinos and Wall Street* (pgs. 15, 17, 148-49; Bush quote, pg. 21; Thorp, pgs. 38-40). Macmillan.
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7. Haggbloom Steven J., et al. (2002). "The 100 Most Eminent Psychologists of the 20th Century" (abs), Review of General Psychology, 6 (2). 139–152.
8. Solomon, Deborah. (2004). "Questions for Stephen Hawking: the Science of Second Guessing" (Ñº), *The New York Times*, Dec 12.

External links

â— 10 smartest people alive today (2012) – Huffington Post via SuperScholar.org.
â— The 16 Smartest People on Earth (2012) – Yahoo Finance.
â— Top Ten Smartest People Alive (2013) (started by Libb Thims) – TheTopTens.com.
â— Top Ten Smartest Living People | Smartest People Alive – Ranker.com.
â— 20 Most Influential Scientists Alive Today – SuperScholar.org.
â— Greatest living quantum physicist (2013) – ScienceForums.net.
â— 30 Smartest People Alive Today (2014) – SuperScholar.org.

θΔics

In genius rankings, **smartest person alive | existive (26-100)** refers to the second tier existive geniuses, in the top 26 to 100 range, who didn't make the top 25 smartest person existive cut.

List

The following is a work-in-progress listing of potential smartest person alive | existive thinkers in the top 26 to 100 range:

#	Person	Age (RE)	True IQ	IQ estimates	Description
26	Ray Kurzweil (1948-)				GLG nominee (2011) (Ñº);
27.	Tim Berners-Lee (1955-)	58			In 1989, using his NeXT Computer at CERN in as a web server to share documents, he invented the Internet.
28.	Charles Townes (1915-) ↓ W	98			Invented of the "laser" while sitting on a park bench in Washington, D.C., 1951, when he was struck by the thought that molecules might be made to vibrate a certain way and to release a certain type of stimulated microwave radiation; downgrade (↓) for promoting religion-science-spirituality compatibility views, two years after winning the Nobel Prize in physics (1964).
29.	Eric Weisstein (1969-) W	44		$IQ_?$=135-165	Noted encyclopedist; since 1995 has written over 17,000+ articles on science and mathematics in his *MathWorld* (13,000+) and *ScienceWorld* (4,000+) sites.
30.	Edward Thorp (1932-) W	81		IQ_O=170-200	Didn't speak until age 3 (similar to Einstein); at 3.5 spoke like an adult, could count to a million, and had a photographic memory; to win ice cream cones, he would bet grocers that he could add customers' bills in his head faster than the grocer could using an adding machine; for fun, would take IQ tests at the local library, typically scoring in the 170 to 200 range; made homemade explosives such as nitrocellulose and ammonium iodide to blow up things and make rocket cars; in 1955, while a physics graduate student at UCLA, one bare boned budget of $100 a month, while putting in 50-60 hours studying and in classes, he realized time was money, so he began to read books on psychology for tips on how to study faster; thereafter he began to study the 'physics' of roulette wheels, and in 1961 invented the world's first wearable computer, learning Fortran to do the programing, to make predictive bets in the few seconds after the croupier releases the white ball, while bets are still open; in 1960, while a mathematics instructor at MIT, became gambling (blackjack/roulette) theorist cohort with Claude Shannon (IQ=180±) and together they built pocket computer casino device. [5]
31.	Andrew Wiles (1953-)	60	170	IQ_O=170	SuperScholar.org Top 10 SPA (2012) (Ñº); solver of top 15 greatest mathematician ever Pierre Fermat's famous last theorem.
					IQ: 200 (±) nominee (Ñº); labeled as a "genius" from IQ testing at

32.	Andrew Hsu (1991-)	22	age 6; finished high school age 9; passed ACT with 99% score age 11; three BS degrees (neurobiology; biochemistry, and chemistry) with minor in math at age 16; started Stanford PhD at age 16; dropped out at age 19, and was accepted into the Peter Theil 20 under 20 fellowship and started Airy Labs (Ñº).
33.	Alexander Grothendieck (1928-) W	85	GLG nominee (2011) (Ñº); Fields Medal (1966); in 1988, turned down the Crafoord Prize (Ñº) and 1.5M frances ($600,000), which thinkers like Terence Tao (2012), Edward Witten (2008), Edward Wilson (1990), Vladimir Arnold (1982), etc., willing accepted, for reasons cited including: “lack of requirement for money and his dislike for such honors” (Ñº); thereafter becoming a recluse.
34.	Brian Greene (1963-) ↓ CR=3 W	50	GLG nominee (2011) (Ñº); his 1999 *Elegant Universe* is mentioned in *Limitless* (2011); Host of 2011 “Beautiful Minds: the Enigma of Genius” (Ñº), with panelists genius studies psychologist Dean Simonton (see: American presidents)—who discusses how Kant (IQ=180), in his *Critique of Judgment*, defines genius as one who meets the criterion of producing something (a) original and (b) exemplary—during which Greene’s former high school classmate Noam Elkies whom he describes as an “off scale” genius, being while discussing π he could simultaneously whistle and hum Brahms’ *Rhapsody in G*; downgrade (↓) for hosting a Templeton Foundation funded show.
35.	Salman Khan (1976-) W	37	Noted video tutorial encyclopedist; BS mathematics, BS electrical engineering, MS electrical engineering (MIT), MBA (Harvard Business School); in 2004, starting from a tutoring request from his cousin, Nadia, working from a small office in his home, via video upload (using using Yahoo!'s Doodle notepad), founded Khan Academy, from which he has personally produced over 2,600 videos elucidating a wide spectrum of academic subjects, tending to focus on mathematics and the sciences; Bill Gates (IQ=175), who funds his project, stated on him: "I'd say we've moved about 160 IQ points from the hedge fund category to the teaching-many-people-in-a-leveraged-way category. It was a good day his wife let him quit his job." (a hedge fund manager position he quit in 2009 to devoted more time to his project.
36.	Albert Bandura (1925-) W	88	Highest ranked "existive" (living) person in HuCR; fourth most-frequently cited psychologist of all time, behind B. F. Skinner, Sigmund Freud, and Jean Piaget, and most cited living (existive) one (2002). [7]
37.	Jeremy Adler (1947-) ↑ CR=68 W	66	PhD dissertation (1977) was the first detailed dissection work of the coded reactions used in Goethe's *Elective Affinities*, i.e. the first modern work in human chemical reaction theory.
38.	Ward Cunningham (1949-) W	64	In 1995, he invented the "wiki".
	Malcolm		His 2000 social physics stylized "tipping point" theory promoting

39.	Gladwell (1963-) CR=17 W	50	book *The Tipping Point*, was the highest selling Amazon.com book of the decade (2000s); TheDailyBeast.com 25 Smartest Persons of the Decade (2009) (Ñº).
40.	Brian Schmidt (1967-) W	46	SMA candidate (Debate.org) (Ñº); his 1994 supernova work which led to the 1998 discovery of the accelerating universe was named 'Breakthrough of the Year' by *Science Magazine*, and was jointly awarded the 2011 Nobel Prize in physics, along with Adam Reiss and Saul Perlmutter, for providing evidence that the expansion of the universe is accelerating.
41.	Saul Kripke (1940-) ↓ W	73	3+ missing candidate postings (Ñº); Schock Prize (2001), philosophy's equivalent of the Nobel; hailed by *The New York Times* as "thought to be the world's greatest living philosopher" (2006); in 4th grade, read all the plays of Shakespeare (IQ=190); at age 12, he asked himself, "How do I know I am not dreaming?", to which his father, a rabbi and university teacher, told him that Descartes (IQ=195) had written about this question, after which he began to read the classics of philosophy; most-popular work is *Naming and Necessity* (1980), a language philosophy book in the Gottlob Frege, Bertrand Russell, Ludwig Wittgenstein, and John Searle style of argument; downgrade (↓) for being an "serious Jew" and commenting in 2001 interview (Ñº): "I don't believe in a naturalist world view and do not believe in materialism" (here we are reminded of how the so-called "extreme materialist" Ludwig Buchner lost his post at University of Tübingen for his 1855 *Force and Matter*, in which he expressed such dangerous albeit ripe philosophy as: "Just as man and woman attract one another, so oxygen attracts hydrogen."
42.	Gunter Grass (1927-) W	86	Winner of the 1999 Nobel Prize for Literature for his "extraordinary first novel" (Ñº) *The Tin Drum* (1959), which tells the purported autobiography Oskar Matzerath, the work's protagonist, who narrates the novel from an asylum for the insane; who claims to have consciously stopped growing at the age of three in protest against adulthood; although intellectually normal, whose passion is banging on his tin drum, which has properties by which he draws forth memories from the past (Ñº), and that after rejecting the public school system he undertakes his own education (self-educated) by close reading of two books whose pages, for simplicity's sake, he has torn out and shuffled to make a single new volume, Goethe's *Elective Affinities* and a volume promisingly entitled *Rasputin and Women*.
43.	Larry Page (1974-) W	39	In 1996, with Sergey Brin, computer science graduate students Stanford, while working on the NSF-funed Stanford Digital Library Project, whose aim was to make an integrated universal digital library, as his dissertation topic, began to consider the mathematical properties of the World Wide Web, namely to understand its link structure—backlinks to a given page—as a huge graph, reasoning that, similar to citations in academic publishing, 'backlinks' are valuable information, and thereafter began to work on his research project, nicknamed 'BackRub', along with Brin; shortly thereafter Google was born; by the end of

				1998, Google had an index of about 60 million pages; see Page's 1998 Google business card (Ñº); the first patent filed under the name "Google Inc." was filed on 31 Aug 1999. In 2004, he launched Google Books.
44.		Wenyuan Niu (c.1950-)		Top 4 existive social Newton.
45.		Lisa Randall (1962-) W	51	Age 18 first place winner in the Westinghouse Science Talent Search; first tenured woman in the Princeton University physics department; first tenured female theoretical physicist at MIT and Harvard University; known for her yet unverified 1999 Randall-Sundrum model, a theory according to which the universe is a five-dimensional anti-de Sitter space and the elementary particles except for the graviton are localized on a (3+1)-dimensional brane or branes; was a 2007 *Time* magazine's 100 Most Influential People (*Time* 100) under the section for "Scientists & Thinkers".
46.		Alexander Wissner-Gross (c.1981-)	32	American music child prodigy; MIT triple major (physics, mathematics, electrical engineering) valedictorian, the last to do so (before the outlaw); described by Lubos Motl (2007) as an "interdisciplinary genius"; thinks his 2013 "causal entropic force" theory of intelligence should be "treated more seriously" than Christopher Hirata's 2000 "physics of relationships" theory; says it's hard to estimate where he would fall on the genius IQs list.
47.		Jimmy Wales (1966-) W	47	In 2001, in followup to his 1999 idea of making an online encyclopedia built by volunteers, he launched *Wikipedia*, which as of Dec 2013 has resulted in the writing of over 30 million freely-available articles in 287 languages, equivalent to—in the English edition of Wikipedia alone—to over 1,900 print volumes of the *Encyclopedia Britannica*.
48.		Stephen Baccus (1969-) ↑	$IQ_{?}$=170± IQ_{O}=190	Noted "youngest college degree" record holder (Ñº); his IQ was estimated by psychologist Aaron Stern (father of child prodigy Edith Stern [IQ=203]), following an age 10 interview; BS computer science, University of Miami; entered University of Miami's law school at 14, graduating at 16, making a name for himself by successfully suing the State of New York for its age restrictions on the bar exam after receiving a special waiver in Florida; began practicing law at 17; MS computer science from NYU age 18; made partner in a firm by 19; PhD in neuroscience age 29 at University of Miami; currently neurobiology professor at Stanford Medical School; email responsive upgrade (↑)
		Frank		From age 16 to age 21, from 1964 to 1969, he successfully impersonated no fewer than eight identities—all in the name of fun, adventure, and women, namely he: taught a high school French class; impersonated a pilot, so that he could fly throughout the world for free, which he did to over 26 countries, by deadheading; worked as a sociology teaching assistant at Brigham

49.	Abagnale (1948-) W	65		Young University; worked for eleven months as a chief resident pediatrician in a Georgia hospital; forged a Harvard University law transcript, passed the Louisiana Bar exam, got a job at the Louisiana State Attorney General's office (age 19); impersonated a US Bureau of Prisons agent and a CIA agent; along the way hustling a total of $3 million dollars, via bad checks and cleaver and sometimes humorous money scams, for spending money, and dating so many women, that he was eventually caught, in France in 1969, when an Air France attendant he had dated in the past recognized him and notified the police; after which, following time served, he went to work for the FBI, the people tracked him, and currently is CEO of Abagnale & Associates a security consulting firm.
50.	Jacob Barnett (1999-)	15	$IQ_{?}$=140± IQ_{O}=170	
51.	Lana Wachowski (1965-) (born Laurence Wachowski)			Together with brother Andrew Wachowski (1967-), scripted the 1999 "welcome to the real world" Matrix movie series; see, e.g., "Chemical Thermodynamics in the Real World" (1971), and the top 30 social Newton page, where Goethe says: "few people have the imagination for reality"; see also: causality (vs choice); compare how Francis Ford Coppola tried for years (decades) to do philosophical equivalent of an *Elective Affinities* futuristic film rendition; parts one and two touch on many ripe topics: impulse (see: Mouse quote), action and reaction, etc.

Candidates | Also-rans

â— Smartest person alive | existive (candidates)

Discussion

(add)

θΔics

In genius rankings, **smartest person alive | existive (candidates)** are potential genius candidates to go on the smartest person alive | existive top 50 table; a work-in-progress tentative collection of which are listed below.

Recent finds | Tentative adds

The following are tentative new adds:

● Laura Deming (1995-) | MIT dropout/Thiel fellow; see video (Q) on centenarian genetics research; found via Google key search: “genius’s genius” + Goethe.

● Peter Joseph (1979-) (Q) – creator the *Zeitgeist* (2007) film; then listen to his 2010 interview: “Who is Peter Joseph? (part 2 of 6), seems to be the core, but also 3 of 6 (4:00), and 4 of 6 (1:10; 2:25, growing up in trailer park; 5:24, on religious borrowing; albeit 3:17 gets stupid; at 5:10, on spirituality (good), etc.

Potentials | Runners up

The following is the work-in-progress listing of potential "smartest person existive" canidates:

#	Person	IQ estimates	Description
	Lana Wachowski (1965-) (born Laurence Wachowski) Andrew Wachowski (1967-)		See: causality (vs choice);
	Francis Ford Coppola (1939-)		Tried for years to do philosophical equivalent of an *Elective Affinities* futuristic film rendition.
	Paul Allen (1953-)	IQ_O=170	SuperScholar.org Top 10 SPA (2012) (Q); co-founder with Bill Gates of Microsoft; perfect 1600 SAT score.
	John Sununu (1939-)	IQ_O=180	iStorya.net Top 8 WSP (2011) (Q); AllTime10z Top 10 SPW (2012) (Q);
	Lenhard Ng (1976-)		IQ: 200 (±) nominee (Q);
	Daniel Tammet (1979-)		
	Jeff Bezos (1964-)		Founder of Amazon.com; TheDailyBeast.com 25 Smartest Persons of the Decade (2009) (Q);
	Kelvin Doe (1997-)		At age 13, in Sierra Leona, Africa, built his own battery with a combination of soda, acid and metal, wrapped together by tape, and used it along with other parts he found in the trash to make a community radio station, where he broadcasts news and music, and uses the remaining power to light up homes in his neighborhood; at age 16, after being discovered during a Sierra Leone national high school innovation challenge, joined MIT’s visiting practitioner’s program (Q) (Q).
	Steven Pinker (1954-)		SLP Ranker.com (2009) (Q); his 2002 *The Blank Slate: the Modern Denial of Human Nature*, was one of the three books, Philip Ball's 2004 book *Critical Mass: How One Thing Leads to Another* and Jared Diamond’s 2005 book *Collapse: How Societies Choose to Fail or Succeed*, that prompted Steve Fuller's 2005 rant article about not being a molecule.
	Neil Tyson (1958-)		SMA candidate (Debate.org) (Q);

Smartest person purviews

See main: Smartest person alive | existive (criterion)

If one were truly the smartest person existive (alive), one or more of the following truths would be within purview:

1. That one is not alive.

(e.g. Tesla (almost), Goethe (almost), Crick (nearly); quote: "Let us abandon the word alive", 1966)

2. That one is a powered 26-element (±) chemical or molecule whose spontaneity is governed by the laws of thermodynamics.

(e.g. Goethe, Hirata)

3. Would have discarded the "hypothesis of god" (as Laplace did in 1802; see: Napoleon Laplace anecdote).

(a) That Abraham and Brahma religions are derivatives of the "father Ra son of Nun" religion (i.e. Anunian theologies).

(e.g. Aristotle (almost), Voltaire (close))

(b) Would have issues with the current dating system (e.g. BC/AD).

(e.g. Newton, Goethe, Napoleon, see: BP/PE or BN/ME)

(c) Would know that God does not exist (i.e. DN=7+).

(e.g. Newton (almost), Laplace, Dirac, Curie)

Another backwards rule, so to speak, would be that one would not be interested in taking IQ tests and or belong to a high IQ society, e.g. Rick Rosner, in his recent video interview statements (Q), seems to glean the essence of this truth.

Equation helots | Word helots

The following are equation helots, which can be compared to word helots, images:

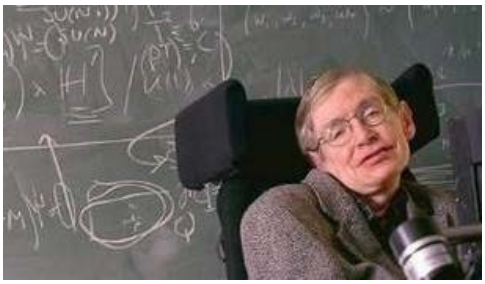
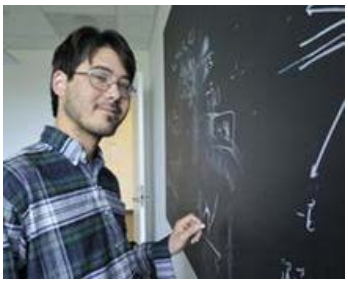
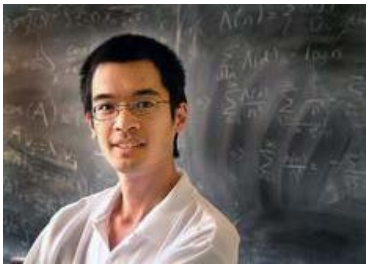
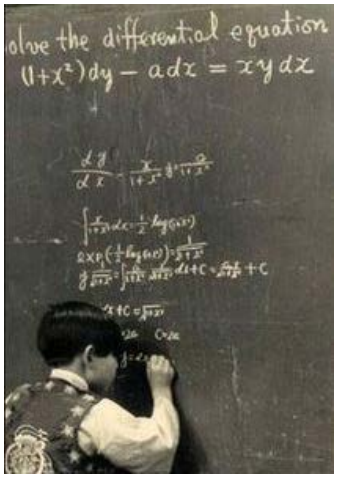

Images show being Stephen Hawking, Christopher Hirata, Terrence Tao, and Kim Ung-Yong all pictured in front of equation-filled blackboards, which visually highlights that while a genius may or may not be a seasoned "equation helot", he or she may not be a "word helot", one example being Paul Dirac, whose *The Principles of Quantum Mechanics* was considered as one of the bibles of Einstein, along with Euclid's *Elements*, which he called the "holy geometry book", but who was puzzled about why men and women dance, as he asked on of his colleagues one time at a dance.

Videos

- Thims 50 Smartest People Alive | Existive (2013) – YouTube.
- Thims 50 Smartest People Alive | Existive (2014) – YouTube.

New prodigies

The following are collection of recent child prodigies (ranked loosely in descending order by guesstimated intelligence) with claims to high-genius range test scores (mostly ratio IQs), albeit without noted comparative accomplishments, discoveries, works, theories, etc., to verify or rank accordingly their claimed genius-range IQ scores, accordingly:

IQ	Person	IQ estimates	Description
	Dylan Jones (1992-)	$IQ_{?}$=140-175 IQ_{O}=200 (age 10)	Entered engineering school at age 10 (Colorado School of Mines); photographic memory; able to recite pi to the 500 places and e to 100 places; completed BS in mathematical and computer science at age 16, with a minor in bioengineering and life sciences; entered medical school age 17, with aims (as of 2009) to become a neurosurgeon, board certified by age 28.
	Sho Yano (1990-) W	IQ_{O}=200 (age 10)	
	Antonio Kowatsch (1993-)	IQ_{O}=150	Achieved the highest possible score on the German Mensa admission test (ISA-S) (Q)
	Alia Sabur (1989-) W		● Began talking at eight months (link) ● Completed BS (2003) in applied mathematics from Stony Brook University at age 14; MS (2006) and PhD in materials science and engineering at Drexel University; professor of mathematics at age 19. ● YouTube, YouTube (2009)
	Ali Moeen Nawazish (1990-)		TopTensTip.com 10 Most Intelligent People in the World (2012) (Q)
	Ainan Cawley (1999-)	IQ_{R}=263-349 (age 7) $IQ_{?}$=110-140	Passed the O level exam (in chemistry) at 7 years and 1 month old, with a score of "C" (the average grade, supposedly, because he had studied the wrong syllabus, owing to a misunderstanding about which exams he would be taking).
	Colin Carlson (1997-)	$IQ_{?}$=110-140 IQ_{O}=160	[4]
	Moosa Firoz (1999-)		TopTensTip.com 10 Most Intelligent People in the World (2012) (Q) (Q)
	Victoria Cowie (2000-)	IQ_{O}=162	
110-135	Pranav Veera (2003-)	$IQ_{?}$=110-140 IQ_{R}=176 (age 6)	[3]
	Oscar Wrigley (2007-)	IQ_{O}=160	[5]
90-110	Elise Tan-Roberts (2007-)	IQ_{O}=156	[5]

IQ | Fakers

The following are high IQ fakers:

IQ	Person	IQ estimates	
	Andrew Magdy Kamal (c.1995-)	IQ_{F}=231-400	Fakes IQs of 231, as cited by contrived "Christians are smart" listings (Q), and 280 up to 400 (Q); started a IQ Range 200+ WikiFoundry site mirror, which an average 8th grader could probably write better (Q); has a PhysicsWithAndrew YouTube channel, which has basically unwatchable videos (Q); sends out his faked PRs (Q), etc.
	Abdessellam Jelloul	IQ_{F}=198	Fake (Q); as cited by contrived "Christians are smart" listings (Q), among other dubious

	(1979-)		listings. (Q)
	Mislav Predavec (1967-)	IQ_O=192	5+ "missing candidate" posts on him (Q); ranked 3rd on Jason Betts' World Genius Directory 20 most intelligent people in the world list (2012) (Q); The Richest.org's Top 10 Most Intelligent People in the World (2013) (Q);
	Evangelos Katsioulis (1976-) ↓↓	IQ_O=180-205, 258 $IQ_?$=135-155	Purported king of the IQ testing subculture; is the founder of the so-called "World Intelligence Network", whose online magazine (2006) explains that "spirit is the vital principle which gives the physical organism life, in contrast to its material components"; citing Pierre Teilhard as justification (link); lists himself as IQ=180-205 [2]; a YouTube page lists him as IQ=258 [3]; quote (2011): "I created my high IQ societies and the World Intelligence Network, in order to host spiritual and human interactions in a safeguarded, morally respectful environment." (Q)

Old prodigies | No noticeable fruit

The following is a listing of old child prodigies, now into adulthood without notable "genius range" intellectual accomplishments, above the fray, so to speak, mixed in with the Mensa+ test taking subculture world of test-based claimant genius. The listing of 179 supposed "geniuses", with no noticeable intellectual fruit to speak of, compiled by Australian psychic Jason Betts, is one example. [9] One of the main discredits to this group, of what seem to be nobodies, is that it's very difficult to be an anonymous genius, because the ideas and accomplishments of smart people tend to leak out to the public and to history like social tonic.

IQ	Person	IQ estimates	
	Kim Ung-Yong (1963-) ↓	IQ_O=200 IQ_G=210 W $IQ_?$=140-175	SuperScholar.org Top 10 SPA (2012) (Q); PalScience.com Top 8 SPA (2010) (Q); iStorya.net Top 8 WSP (2011) (Q); former child prodigy, with PhD physics (age 15) from Colorado State University, who burned out after working under heavy pressure at NASA as a teenager, returning to Korea to work quite life as civil engineer.
	Arthur Rubin (1956-)		IQ: 200 (±) nominee (Q); supposedly a Michael Kearney upgrade/replacement (Q)
	Theodore Kaczynski (1942-) ↓	W IQ_R=167	Known as: the unibomber (downgrade); cited with IQ of 167 in fifth grade. [1]
	Christopher Harding (1944-)		Quote: "In Australia, I was fortunate to come into contact with and employ one of the then three most intelligent people in the world, Chris Harding. This trio all had I.Q.'s over 200, well off the Stanford/Binet scale" (biographical writings of Allan Skertchly). [#]
170	Edith Stern (1952-)	IQ_O=200, 201-203	
155	Michael Grost (1954-)	$IQ_?$=145-155 IQ_R=200 (age 8)	
155	Michael Kearney (1982-)	$IQ_?$=135-155 W IQ_R=325 (age 4) IQ_O=200 (age 14)	
145	Marnen Laibow-Koser (1975-)	IQ_R=268	
110-135	Adragon De Mello (1976-)	$IQ_?$=110-125 W IQ_R=400 (age 5)	Set the record in 1988 for becoming the youngest person (age 11 years and 8 months) to graduate from college (BA computational mathematics, Univ of Calif, Santa Cruz); but thereafter severely burned out; turning instead to socializing and friendships; never again returning to academic-intellectual pursuits; was the product of his father's prodigal son dreams (the subject of a book he wrote before Adragon was even conceived).

Chess players

The following are chess players, included here being that grand master chess players tend to be cited in the genius IQ range, but not necessarily "real genius" status:

IQ	Person	IQ estimate	Description
	Garry Kasparov (1963-)	IQ_P=135	iStorya.net Top 8 WSP (2011) (Q)

W IQ_O=185-190

Inclusion in smartest person alive listing however is unlikely, being that being good at games such as playing chess or solving a rubric's cube is paramount to being being good at counting sand grains. To be a real genius, you have to ask yourself why you are playing chess (or equivalently why you are counting sand grains)? What is the reason? What is the motive? The following, to exemplify, are representative genius quotes from a chess player AND greatest philosopher ever Soren Kierkegaard:

> "I feel as if I were a piece in a game of chess, when my opponent says of it: That piece cannot be moved."
>
> — Soren Kierkegaard (c.390 PE), Danish philosopher

> "Where am I? Who am I?
> How did I come to be here?
> What is this thing called the world?
> How did I come into the world?
> Why was I not consulted?
> And if I am compelled to take part in it,
> Where is the director?
> I want to see him."
>
> — Soren Kierkegaard (c.390 PE), Danish philosopher

In contrast to "chess geniuses", smartest person ever geniuses such as Aristotle or Goethe, while they may or may not play chess or other diversions, tend to expend their bulk energy going after big "why" questions.

Showboaters | Scams | etc

The following are a mishmash of newcomers, relatively unknown prodigies, or so-called "high IQ testers", recently in the news prodigies, etc., said to have, or have claimed themselves to have, genius-range IQs, but as of yet, without noted accomplishments to verify or rank accordingly their genius-range IQ claims:

	Jim Diamond (c.1945-)	IQ_O=160+	A retired magician who runs MegaGenius.com where he claims to be the "man with the perfect IQ" (link) and sells how-to-be-a-genius videos; claims his IQ at 160+ (link).
	Philip Emeagwali (1954-) W	$IQ_?$=130-160? IQ_O=190	iStorya.net Top 8 WSP (2011) (Q); Smartest man ever? (link); Genius or Crook? (link); quote: "IQ is too high to be measured on conventional tests." (link); "reported by Sahara reporters as having an IQ of 190" (link).
110-135	Christopher Langan (1952-) ↓↓↓	W IQ_M=174, 190 IQ_O=195, 190-210	iStorya.net Top 8 WSP (2011) (Q); Huge downgrade for (a) being an IQ test addict, (b) vocalizing his opinion that he "has seen farther than anyone who has come before him, and (c) being an intelligent design theorist.
110-135	Marilyn vos Savant (1946-) ↓↓↓↓	W IQ_M=186 (age 39) IQ_O=127 (age 7) IQ_O=167 IQ_R=157 IQ_G=228	iStorya.net Top 8 WSP (2011) (Q); Huge downgrade for (a) knowingly publically faking a 228 IQ, based on falsified records of age-contrived Stanford-Benet test ratio IQ score (sent to Guinness for the purposes of self-promotion), for nearly three decades now, and (b) never having produced anything of intellectual note, other than being a newspaper columnist (a job she landed based her falsified IQ fame), and (c) being a IQ test junky (and IQ test maker).
110-135	Rick Rosner (1960-) ↓↓↓	W IQ_R=140 (age 18) IQ_M=180-200 IQ_O=250	Huge downgrade for (a) going back to high school at age 25, (b) being an IQ test junky, (c) publically boasting of having a 200-range IQ, etc.
110-135	Naida Camukova (c. 1976-)	$IQ_?$=125-140 IQ_O=200	Supposedly, some kind of fraud who touts about having an IQ=199.9, in and about Turkey, so to gain money for her institution, or something along these lines.

See also

The following are related pages:

- American Presidents | IQ rankings
- IQ

- Another Newton
- Cattell 1000
- Catch up effect
- Certified genius
- Cox IQ
- Cox-Buzan IQ
- Buzan IQ
- Early parental death and genius
- Epicenter genius
- Genius
- Genius IQs
- Genius IQ candidates
- Greatest chemist ever
- Greatest engineer ever
- Greatest mathematician ever
- Greatest literary author ever
- Greatest philosopher ever
- Greatest physicist ever
- Greatest thermodynamicist ever
- Guinness Book IQ
- Hard science
- Hmolscience citation ranking
- Humanities citation ranking
- IQ: 150+ | Smartest woman ever
- IQ: 200+
- IQ: 225+
- IQ history
- IQ key
- IQ tables
- IQ ranking methodology
- Last person to know everything
- Last universal genius
- Magnitude geniuses
- Military geniuses
- Nobel Prize winners in thermodynamics
- Political geniuses
- Polymath | 50 greatest polymaths
- Ratio IQ
- Scientific geniuses
- Smartest person ever
- Smartest person alive | existive
- Terman IQ
- Two cultures genius | Two cultures
- Universal genius
- Uber genius comparison quotes
- Uberman
- Walking encyclopedia

References

1. Giang, Vivian. (2011). "16 of the Smartest Children in History", *BusinessInsider.com*, Jun. 15.
2. (a) Evangelos Katsioulis (about) – Katsioulis.com.
(b) Gutierrez, Hever. (2011). "Interview: detras de los genios *Evangelos Katsioulis*", Mensa Mexico.
3. Evangelos Katsioulis (Highest adult IQ, 258 sd 24) on MEGA channel, 2003 (2011) – SauceEyeT, YouTube.
4. Staff. (2012). "Meet the 10 Smartest People in the World", OMGGhana.com, Aug 28.
5. (a) Betts, Jason. (2012). "World Genius Directory" (179 individuals), psIQ.org.
(b) Spector, Dina, Sprung, Shlomo. (2012). "The 16 Smartest People on Earth", Business Insider, Yahoo! Finance, Oct 24.
(c) Jason Betts (psychic) – Wikipedia.

External links

- 10 smartest people alive today (2012) – Huffington Post via SuperScholar.org.
- The 16 Smartest People on Earth (2012) – Yahoo Finance.
- Top Ten Smartest People Alive (2013) (started by Libb Thims) – TheTopTens.com.
- Top Ten Smartest Living People | Smartest People Alive – Ranker.com.
- 20 Most Influential Scientists Alive Today – SuperScholard.org.
- Greatest living quantum physicist (2013) – ScienceForums.net.

θΔics

In genius rankings, **smartest person alive | existive (criterion)** refers to []

Smartest person purviews

If one were truly the smartest person existive (alive), one or more of the following three truths would be within purview: [1]

1. That one is not alive.

(e.g. Tesla (almost), Goethe (almost), Crick (nearly); quote: "Let us abandon the word alive", 1966), Rogers (yes), Jabr (yes)

2. That one is a powered 26-element (±) chemical or molecule whose spontaneity is governed by the laws of thermodynamics.

(e.g. Goethe, Hirata)

3. Would have discarded the "hypothesis of god" (as Laplace did in 1802; see: Napoleon Laplace anecdote).

(a) That Abraham and Brahma religions are derivatives of the "father Ra son of Nun" religion (i.e. Anunian theologies).

(e.g. Aristotle (almost), Voltaire (close))

(b) Would have issues with the current dating system (e.g. BC/AD).

(e.g. Newton, Goethe, Napoleon, see: BP/PE or BN/ME)

(c) Would know that God does not exist (i.e. DN=7+).

(e.g. Newton (almost), Laplace, Dirac, Curie)

(add discussion)

Anonymous geniuses | Disqualification

While indeed there are a number of geniuses who do their enlightened work in secret and or anonymously—one example being French thinker Jean Meslier, who in everyday superficial appearance was a quiet town abbe, but on his deathbed (dereaction day) left three copies of a religion-ripping treatise entitled *Testament*, that shook Voltaire for the extremeness of its atheism—to be a top 25 existive genius, one needs to be non-anonymous and have interaction, so to "feel" the exchange force, and thereby see if their seemingly deemed genius work holds up under public scrutiny and pressure.

In short, the so-called "anonymous genius", who works alone cut off from the world, and or semi-interacting with the world via hidden identity, are automatic disqualification. The example that comes to mind here being the infamous Iqbal Saleh Abba (1962-) who claims he was tested with IQ of 230 in 1971 in Colombo, Ceylon (now Sri Lanka), that he sent these scores into the Guinness Book, and that accordingly he was the one who derailed, i.e. caused the removal, of the

highest IQ category. (Ñº)

Posthumous geniuses | Disqualification

Then again there are the so-called posthumous geniuses, not anonymous, but not recognized as a genius in their day, i.e. there work is only published and recognized posthumously. The following quote comes to mind here:

> "My time has not yet come, some people are born posthumously. I write for a species of men that do not yet exist."
>
> — Friedrich Nietzsche (c.1887), "Letter to Carl Fuchs" (Ñº)

Nietzsche, e.g. in reference to the above quote, supposedly stated somewhere that his words would not begin to be understood until after the year 2000, which seems to be a fairly accurate prophesy, being that he is now, in the year 2014, beginning to climb into the top tier of the Hmolpedia citation rankings (#32 presently).

IQ test junky | Disqualification

Another backwards rule, so to speak, would be that one would not be interested in taking IQ tests and or belong to a high IQ society, e.g. Rick Rosner, in his recent video interview statements (Ñº), seems to glean the essence of this truth.

The example that comes to mind here being Evangelos Katsioulis (1976-) who uploads YouTube videos (Ñº) boasting that he has an IQ of 258, yet cites Pierre Teilhard as his intellectual hero, and therein advocates "spiritual interactions" of the Teilhardian omega point type.

Short URL

The following is the short URL for this page:

http://goo.gl/ww2q59

This is advised to be used on pages, e.g. in YouTube description boxes, where the vertical bar " | " disrupts the operation of the hyperlink.

References

1. These three SPA general rules of thumb have been posted online (Ñº) since 27 Nov 2013, a listing that began to be addressed previous on the IQ:200+ page.

θΔics

In genius studies, **smartest person ever** is an epitaph assigned to small number of individuals, historically, as are shown in rank descending order on the genius IQs table.

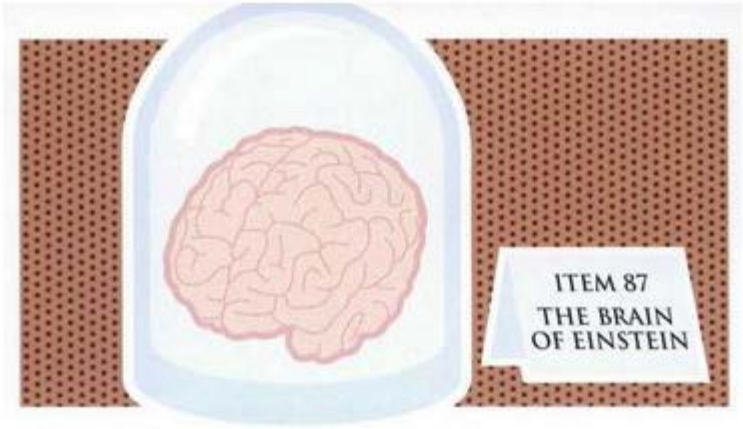

Who Was the Smartest Person Ever?

Einstein's IQ is unknown, but his brain was removed after he died to see whether it was different from anyone else's. Scientists discovered that one part—thought to be related to mathematical reasoning—*was* a bit bigger than most people's.

A chapter section, from the 2007 book *101 Things You Should Know*, on intelligence, IQ, smartness (brightness), and speculation on the query "**smartest person ever**", examples of which given include: Stephen Hawking, Albert Einstein, Mozart, Archimedes, Michelangelo, and or Leonardo Da Vinci. [1]

Overview

In cultural reference, when queried, people tend to name German-born American Albert Einstein as the "smartest person ever", yet, in actually, although little known, outside of literary circles, and in America, in particular, the smartest person ever, namely German polyintellect Johann Goethe, was the person whom Einstein kept a bust of in his study and whose collected works set took up the largest portion of his personal library.

See also

â— Top 500 geniuses

References

1. Horne, Richard and Turner, Tracey. (2007). *101 Things You Need to Know: and Some You Don't* (pgs. 86). Bloomsbury.

θΔics

In genius studies, **smartest person existive** (TR:11), aka "smartest person alive" in defunct colloquial speak (see: life terminology upgrades), refers the ranking of existive geniuses. [N1]

List

The following is the work-in-progress listing of a smattering of known existive thinkers with or without genius range IQ citations re-gauged to a real-time evaluation of intellect level, in respect to the soberness of retrospect analysis of the top 500 geniuses:

	Existive Geniuses		
IQ	**Person**	**IQ estimates**	**Description**
			↑ 190+
185 — 1	Christopher Hirata (1982-) CR:102|#38; LR:52|#1; SNE:3; DN:1	IQ_R=225 $IQ_?$=170-195	Upgrade↑↑ for his circa age 18 produced "The Physics of Relationships", done two years after his IQ was cited at 225; being similar to what Goethe, the first person ever cited with an IQ of 225, did at age 59 (see: IQ:200 range HCT prodigies). Downgrade↓ for his 2013 "Lord's prayer" experience. Upgrade↑ for devoting his research activities to solving the dark energy / accelerating universe problem. He's kind of a tossup at this point.
185 — 2	Steven Weinberg (1933-) CR:19; DN:7		SLP candidate TheTopTens.com 2013 (Q); 2010 Top 50 SPE honorable mention (Q); SMA Debate.org contender (Q); a 2011 top 50 atheist (Q); noted for his 1967 unification of electromagnetism and the weak nuclear forces [1979 Nobel Prize]; for his 1977 *The First Three Minutes*, wherein he argues that according to the second law the universe is godless albeit questionably pointless; and for his 1992 *Dreams of a Final Theory*, wherein a number of noted atheism positions are stated; possibly world's leading quantum gravitationalist. (V)
			↑ 185+
180 — 4	Elon Musk (1971-)	IQ_O=250 IQ_O=190 IQ_O=155-175	Ranker greatest minds (#387|1200+); reading 10-hours per day as a child (Q); Read *Britannica* in full before age nine (Q); some have gauged him as the "greatest genius in the last 500 years since Leonardo da Vinci"; cited as: the "brilliant man that has ever lived." (Q) Quote: "I think Elon Musk is a genius and I don't use that word lightly. I think he's also one of the boldest men that ever came down the pike. Put me down as saying I've always been afraid of the guy whose IQ is 190 and he thinks it's 250. I like to think there's a little of that risk with Elon. He is a certified genius." (Charlie Munger, 2014) (Q). Quora (2015): reasoned guesses (Q) put his IQ at 155-175.
180 — 5	Peter Higgs (1929-) CR:11; DN:7		#8 Prospect world thinkers poll 2013 (Q);
180	Jurgen		

6	Mimkes (1939-) CR:68|#60 SNE:1		
180 | 7	Edward Witten (1951-) CR:13; DN:5.5 (Q)		
180 | 8	Terence Tao (1975-) CR:15; DN:6± (Q)	IQ_R=220-230 IQ_O=211	
			↑ 180+
175 | 9	Bill Gates (1955-) CR:14; DN:4± (Q)		Ranker greatest mind (#181|1200+);
175 | 10	Mirza Beg (1932-) SNE:2; DN:1		
175 | 12	Luis Arroyo (1990-) DN:1	IQ_O=200	After graduating from high school age 11, went on to do his age 20 MS physics thesis on "A Thermal Model of Economy" (see: IQ:200 range HCT prodigies).
			↑ 175+
			↑ 170+
165 | 14	Richard Dawkins (1941-)		A Ranker greatest mind (#184|1200+); Prospect world thinkers poll (#1) 2013 (Q); a Perry greatest thinker (#72).
			↑ 165+
160 | # (add)			

Ranker Greatest Minds | Existive

The following are the existive minds from the top 500 of Ranker Greatest Minds list at the 1,310+ person listing level

(Nov 2017):

1. Stephen Hawking (RGM:19) (4,420↑/2,328↓) (age 75)
2. Bill Gates (RGM:158) (604↑/517↑) (age 61)
3. Jane Goodall (RGM:163) (298↑/232↑) (age 83)
4. **Richard Dawkins** (RGM:200) (402↑/476↓) (age 76)
5. Vince McMahon (RGM:286) (122↑/466↓) (age 71)
6. Garry Kasparov (RGM:296) (209↑/273↓) (age 53)
7. Francis Coppola (RGM:305) (122↑/130↓) (age 78)
8. Noam Chomsky (RGM:307) (283↑/358↓) (age 88)
9. Tom Hanks (RGM:318) (348↑/104↓) (age 60)
10. **Neil Tyson** (RGM:339) (115↑/155↓) (age 58)
11. Tenzin Gyatso (RGM:357) (82↑/86↓) (age 81)
12. Elon Musk (RGM:380) (84↑/99↓) (age 45)
13. Martin Scorsese (RGM:391) (94↑/86↓) (age 75)
14. Quentin Tarantino (RGM:417) (84↑/130↓) (age 54)
15. Michio Kaku (RGM:424) (88↑/140↓) (age 70)
16. Paul McCartney (RGM:441) (87↑/96↓) (age 75)
17. Edward Snowden (RGM:451) (119↑/227↓) (age 34)
18. Milan Kundera (RGM:453) (26↑/30↓) (age 88)
19. Ron Paul (RGM:455) (100↑/136↓) (age 82)
20. **Bill Nye** (RGM:463) (60↑/139↓) (age 61)
21. John Williams (RGM:467) (57↑/78↓) (age 85)
22. Aung Kyi (RGM:473) (38↑/48↓) (age 72)
23. **Ayaan Ali** (RGM:474) (42↑/86↓) (age 48)
24. Hayao Miyazaki (RGM:476) (46↑/77↓) (age 76)
25. James Watson (RGM:484) (48↑/79↓) (age 89)
26. Madonna (RGM:494) (127↑/157↓) (age 58)
27. Antonio Damasio (RGM:498) (30↑/70↓) (age 71)

(add)

Notes

N1: Note, this page, started in Dec 2016, has the forerunners of the "smartest person alive | existive" page (inactive after 2014), "smartest person alive | existive (candidates)", and, in particular, the "genius IQs" (inactive after 2014), which listed "existive" people, which in Jan 2014 reformulated into the five part now active top 500 geniuses group of pages (which does NOT list "existive" people).

θΔics

In engines, **Smeaton engine**, was an improved Newcomen engine, built, in various stages of development, by John Smeaton, from 1769 to 1783. [1]

Overview

In 1769, John Smeaton took a Newcomen engine design and improved it, with more precise cylinder boring, better proportioning of parts, and by way of testing various cylinder sizes for optimal horsepower ratings, which he detailed in published tables.

The following is an 1772 Smeaton engine: [3]

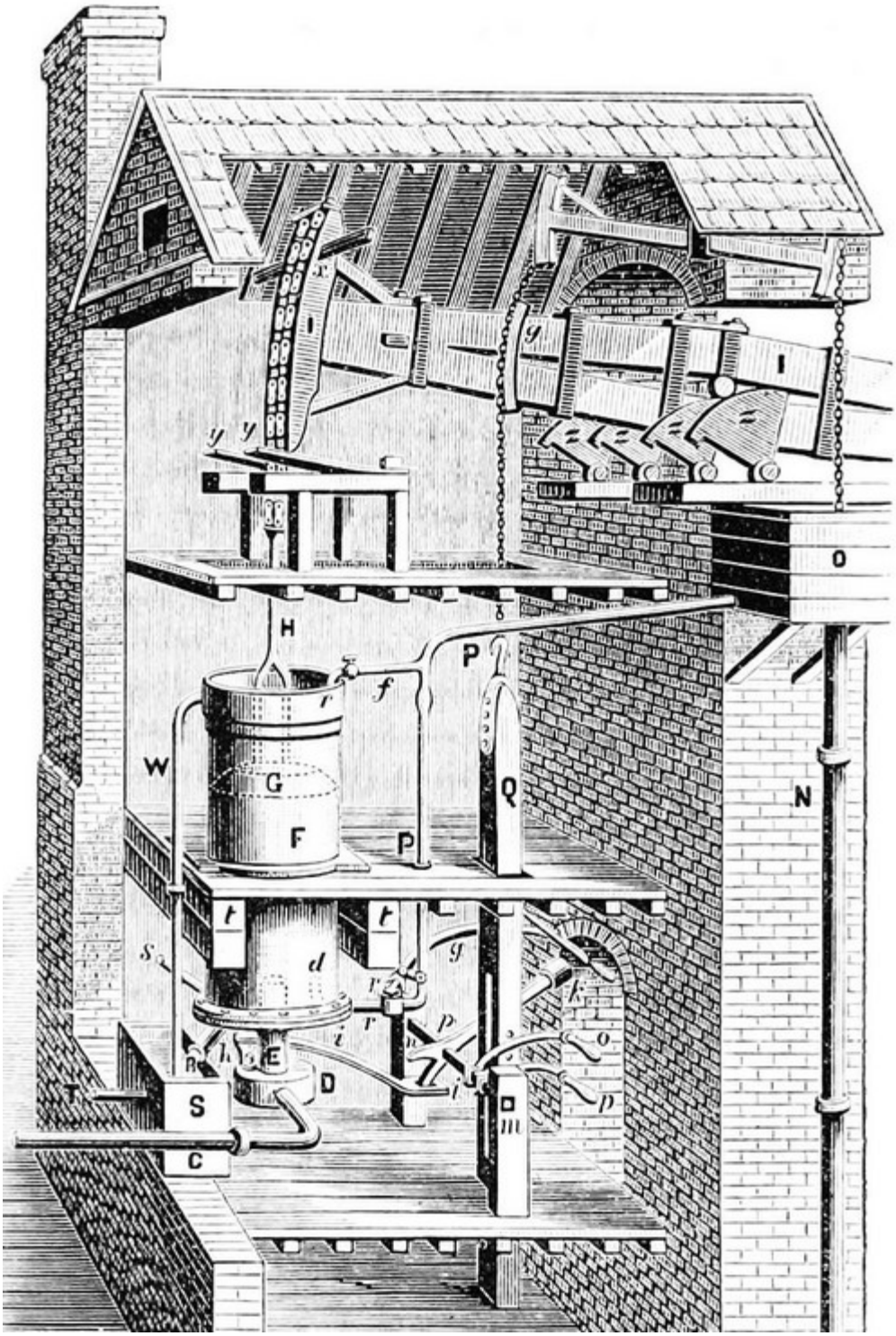

A diagram (Q) of a **Smeaton engine**, an improved Newcomen engine, from *Popular Science* (c.1877) monthly.

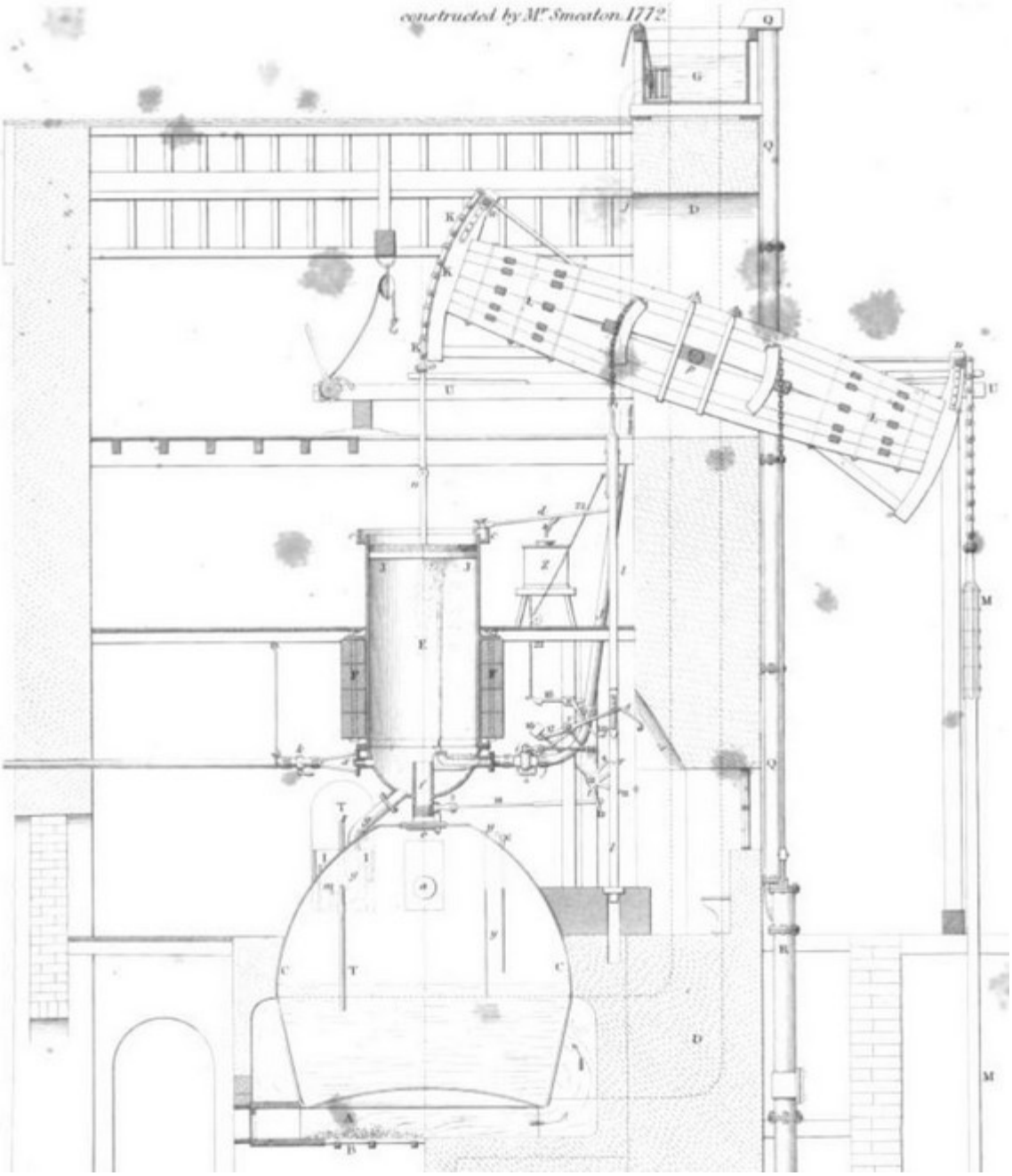

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Quotes

The following are related quotes:

> "Smeaton built a number of Newcomen engines at the Carron ironworks in Scotland and greatly increased their mechanical efficiency by more precise cylinder boring, a better proportioning of parts, and general improvement in shopwork. He attained, it is said, the highest performance of which this type of engine was capable in practice. One of his largest engines went to Russia in 1775 to pump out Catherine II's dry docks at Kronstadt. It replaced two enormous windmills, 100 feet high, which Dutch engineers had installed in 1719. It was said that these mills had required a year for the task; the Newcomen engine built by Smeaton did the job in about two weeks."
>
> — Richard Kirby (1956), *Engineering in History* [2]

“Smeaton took the Newcomen design and improved it. His first pumping engine was for the New River Company in Islington, London, where Robert Mylne was engineer. Smeaton designed a beam engine that replaced their horse-driven pumps in 1769. However, the results were disappointingly inefficient and he was determined to do better. He amassed data from 15 working engines in the Newcastle area and 12 in Cornwall, expressing the results in terms of their power and efficiency. He built an experimental engine at Austhorpe in 1770 and began rigorous testing. It had a 250mm (10in) diameter cylinder and developed a little over 0.75kW (1hp). Over the course of some 130 tests, Smeaton altered factors and observed differences, gradually improving performance. After two years' work he drew up a comprehensive table of properties for engines with cylinders of 0.25-1.83m (10-72in) diameters. He designed 13 engines altogether, four of them returning engines with waterwheels. Then in 1772, Smeaton received a request to design a pumping engine for Long Benton colliery in Northumberland. He suggested one with a 1.32m (52in) diameter cylinder. It began operating in February 1774, and tests in May showed that it developed about 30kW (40hp) — a 25 percent increase on the most efficient steam engine in the country to date.”

— Anon (2011), “John Smeaton”, Engineering-Timelines.com [1]

References

1. John Smeaton – Engineering-Times.com.
2. Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pgs. 166-67). Courier, 1990.
3. Farey, John. (1827). *A Treatise on the Steam Engine: Historical, Practical, and Descriptive* (Smeaton engine, pgs. 133-; plates II and III, end matter). Longman.

θΔics

In abbreviations, **SN** is the acronym for "social Newton", used to indicate social Newton ranking position, e.g. Wilhelm Ostwald (SN:16) signifies that on 4 May 2014 he was ranked as the 16th greatest social Newton of history.

θΔics

In hmolscience, **Snowed** refers to one of the two cultures, intellectuals of the science or the humanities, attending (Scott, 1985) a meeting, class, or conference of another culture and, therein, being completely "lost", or having ideas go "over one's head", as to what the other culture is saying.

Overview

On 7 May 1959, Charles Snow, in his talk "The Two Cultures", a Rede Lecture given at Cambridge, presented a thesis according to which science and the humanities, which represented "the intellectual life of the whole of western society", had become **split** into "two cultures" and that this division was a major handicap to both in solving the world's problems; the following is the most-cited quote from the lecture: [1]

> "A good many times I have been present at gatherings of people who, by the standards of the traditional culture, are thought highly educated and who have with considerable gusto been expressing their incredulity at the illiteracy of scientists. Once or twice, I have been provoked and have asked the company how many of them could describe the second law of thermodynamics. The **response was cold**: it was also negative. Yet, I was asking something which is about the scientific equivalent of: Have you read a work of Shakespeare's?"

The lecture was published as 51-page booklet entitled *The Two Cultures and the Scientific Revolution* (1959) and later expanded into a larger 107-page *The Two Cultures: and a Second Look: an Expanded Version of The Two Cultures* (1965); both of which having gone on to stimulate several other books on the same subject. [2]

In 1974, George Scott, an American physical chemist, as he explains in his 1985 chapter "Snowdrifts in the Heart of Texas", a play on Snow's "two cultures" theory, having headed a NSF-funded "two cultures" thematic "summer program" at the University of South Dakota, from 1959 to 1969, and having taught a two-cultures themed course, called "Disorder in Nature and Human Affairs", at USD, with social psychologist George Breed, was on sabbatical for a year at the University of Texas, attempting to pen a two cultures unifying book, entitled *Atoms of the Living Flame: an Odyssey into the Ethics and the Physical Chemistry of Free Will*, themed around

> "One day, I got up the courage and slipped into one of Prigogine's classes. Unfortunately, I could only sit in a daze while he covered all the blackboards with strange math. This time, it was I who was completely '**Snowed**', pun very deliberate. I understood just enough to realize I was going to have to come to grips with it sooner or later, but the only thing I was able to do that spring was procrastinate, and I kept it up for nearly four years, by which time Prigogine had won his Nobel Prize, before I began to really wrestle with the essential translation of his very exciting science for his new book."
>
> — George Scott (1985), *Atoms of the Living Flame* (pg. 139) [3]

(add)

See also

- Jabberwocky | Lotkean Jabberwocky | Lotka (1925)
- Anthropism | Sherrington (1938)
- Langism | Lang (1956)
- Sokalism | Elias (1958)
- Toolism | Handtke (2013)

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External links

- The Two Cultures – Wikipedia.

θΔics

In existographies, **Soame Jenyns** (1704-1787) was an English writer, philosopher, and politician, noted for []

Quotes | By

The following are quotes by Jenyns:

> "I am persuaded that there is something in the abstract nature of pain conducive to pleasure; that the sufferings of individuals are absolutely necessary to universal happiness."
>
> — Soame Jenyns (1757), *Nature and the Origin of Evil* (pgs. 60-62); supposedly a rehash of the arguments of: William King, Gottfried Leibniz, and Alexander Pope [1]

> "There are numberless imperfections inherent in all human governments, and these are imputable only to the inferiority of man's station in the universe, which necessarily exposes him to natural and moral evils, and must, for the same reason, to political and religious; which are indeed but the consequences of the other."
>
> — Soame Jenyns (1757), *Nature and the Origin of Evil* [1]

> "Animal life rises from this low beginning in the shellfish, through innumerable species of insects, fishes, birds, and beasts, to the confines of reason, where, in the dog, the monkey, and chimpanzee, it unites so closely with the lowest degree of that quality in man, that they cannot easily be distinguished from each other. From this lowest degree in the brutal Hottentot, reason, with the assistance of learning and science, advances, through the various stages of human understanding, which rise above each other, until in a Bacon, or a Newton, it attains the summit. Here we must stop, being unable to pursue the progress of this astonishing chain beyond the limits of this terrestrial globe, with the naked eye; but through the perspective of analogy, and conjecture, we may perceive that it ascends a great deal higher, to the inhabitants of other planets."
>
> — Soame Jenyns (c.1760), "On the Chain of Universal Being" [2]

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(b) Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea* (pg. 197). Harvard University Press, 1936.

External links

â— Soame Jenyns – Wikipedia.

θΔics

In terminology, **social** (TR=1181), from the Latin *socius* 'companion', 'ally', 'associate', refers to aggregation (see: sociology terminology upgrades) or states or behaviors of aggregation, tending to be used in reference to two or more arrangements of powered CHNOPS+ geometries, often in the form of systems, e.g. as in a social system, or interactions, as in social interaction.

Quotes

The following are related quotes:

> "Do not **social** exemplifications of physical principles have some value for somebody? And is not this value to be found in their heuristic and pedagogical suggestions? In other words, can such social exemplifications of physical principles illuminate our understanding of the principles themselves and lead us to ask more intelligent questions about them? Can they possess pedagogical value for those striving to understand physics without the intention of becoming physicists or even scientists of any sort? Affirmative answers to these questions will justify attention to the social examples even if their actual use in the development of the social theories is questionable. It is the purpose of the present essay to suggest that such social exemplifications of physical principles do indeed often have heuristic and pedagogical value. We begin with the principles of thermodynamics, a fruitful source of social examples."
>
> — Bruce Lindsay (1983), "Social Exemplifications of Physical Principles" [1]

See also

- Social atom
- Social Avogadro number
- Social bond
- Social chemistry
- Social combustion theory
- Social energetics
- Social energy
- Social engineering
- Social enthalpy
- Social entropy
- Social entropy theory
- Social force
- Social gravitation
- Social heat
- Social ideal gas law
- Social internal energy minimization theory
- Social matter
- Social mechanics
- Social network
- Social Newton
- Social physics
- Social physics school
- Social thermodynamics

References

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External links

- Social – Wikipedia.

θΔics

In hmolscience, **social activation energy** is the energy required to activate a social reaction, e.g. a human chemical reaction, social chemical reaction, male-female reaction, etc.; concept of activation energy applied socially, in short.

American writer Malcolm Gladwell's iconic 2001 "tipping point" match image; possibly inspired from the string of burning matches on Mark Buchanan's 2000 *Ubiquity: Why Catastrophes Happen*, both of which allude, seemingly via allegory, Buchanan more directly than Gladwell, , e.g. Buchanan's assertion that the "forces" behind the nineteen-year-old Bosnian Serb Gavrilo Princip, a member of the Serbian terrorist organization Black Hand, acting or "working" to pull the trigger of a gun pointed at Austro-Hungarian archduke Franz Ferdinand, thereby "tipping" history into WWI and then WII, to the premise that small but significant social heat like triggers work or act as **social activation energy** barrier surmounters, i.e. the embodiment of the process when the heat of friction, of striking a match works, triggers the activation energy barrier to combustion thus lighting the match into flame.

Overview

In 1858, Henry Carey, in his *The Principles of Social Science*, chapter 8, 'On the Formation of Society', outlined some proto-ideas on activation energy in society, as follows:

> "In the inorganic world we find the power of combination growing with the increase of differences. Place a thousand atoms of oxygen in a receiver, and they will remain motionless; but introduce a single atom of carbon, and excite their affinities for each other, and at once motion will be produced. Such being the case in regard to all other matter, it must be so in regard to those combinations in which man is concerned, indicated by the term society."

Carey goes onto talk about social heat, social friction, e.g. the rubbing together of human molecules or social molecules, etc.

In 1912, Alfred Lotka, in his "Evolution in Discontinuous Systems", began to theorize about trigger action, in what seems to have been his physical chemistry conception of activation energy in process and mechanisms of evolution. [1]

In 1925, German political leader, Adolf Hitler, in his *My Struggle* (*Mein Kampf*), employed thermal word logic, to speak of words as having the ability to trigger the activation energy of people akin to a torch starting a forest fire amid dry forest wood: [2]

> "All great movements are popular movements. They are the volcanic eruptions of human passions and emotions, stirred into activity by the ruthless goddess of distress or by the **torch** of the spoken word cast into the midst of the people."

Here we see Hitler conceptualizing the "spoken word" as something that can act like an activation energy lowering factor to the triggering of a large scale social chemical reaction, the way a match can ignite wood or gasoline in a combustion reaction. Indian-born Pakistani organometallic chemist Mirza Beg outlined a similar speech heat theory, in respect to the period shortly before the riots and manslaughter of Direct Action Day (16 Aug 1946), as follows: [3]

> "The speeches made by Hindu extremists generated high heat in their society. Their emotions were set so

> high as to interact with violent force with the Muslims and this led to widespread riots, killings, arson and looting."

This, supposedly, was one of the reaction mechanism steps that led to India and Pakistan to becoming independent and self-governing, in the so-called timeline of British India. (Q)

In 2007, American electrochemical engineer Libb Thims, in his *Human Chemistry*, theorized a good deal about activation energy, socially and inter-personally. [5]

In 2009, Miao Ning and Jifa Gu, "Research on Social Stability Mechanisms Based on Activation Energy and Gradual Activation Reaction Theory" (abs), theorized about social activation energy; the abstract of which is as follows: [4]

> "This paper draws a comparison between social stability and chemical reaction process, and brings forward the concept of 'social temperature' and 'activation energy of social agent'. It is considered that social temperature turns out to be the macro symptom of social average energy, and its unceasing up-climbing roots in the energy accumulation of 'inferiorization' process of social system; that 'activation energy of social agent' stands for the social energy or temperature where individuals or groups reach the limit of their psychological bearing ability. This paper, basing on above concepts, elaborates on and demonstrates the gradual activation reaction mechanisms of social stability by a lot of concrete examples. It is thought that there is a threshold value for social stability, and the society will be unstable if social temperature goes higher than this value; that the larger the **social average activation energy** is, the higher the temperature threshold value of social stability will be; and considering that different groups have different activation energy, those fragile groups with low activation energy are often the risk source which might pose a threat to social stability."

(add discussion)

In 2010, Thims published an "Activation Energy and Relationships" video, using a social activation energy diagram, shown adjacent.

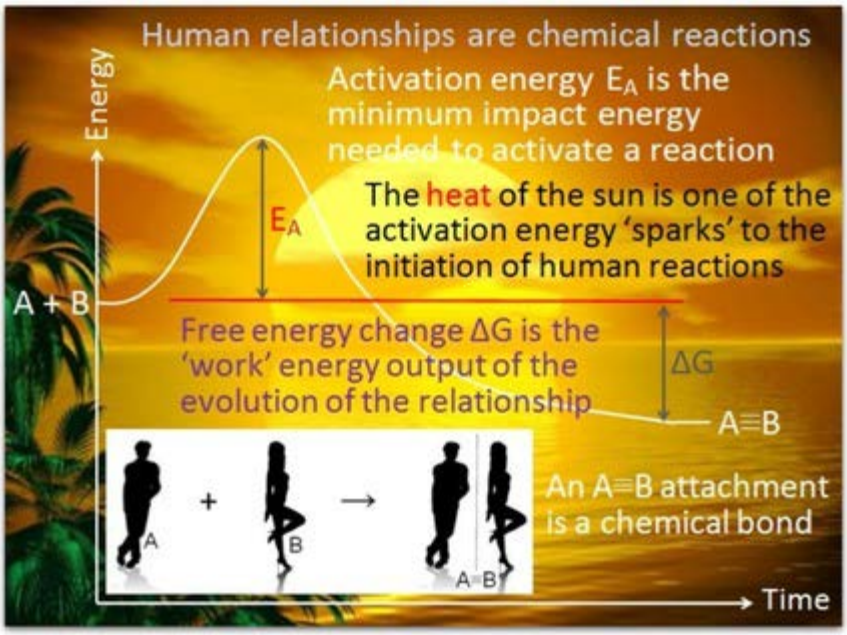

An image from the 2010 video "Activation Energy and Relationships" (V) , illustrating a **social activation energy** diagram, by Libb Thims', showing the activation energy of a male-female reaction.

In 2011, Zane Claes, in his "Activation Energy: the Science of Getting Started", defined people as "chemical beings", and applied activation energy to humans and motivations, to theorize about what he referred to as "motivational activation energy", according to which certain things, e.g. planning, can act as catalysts to lower the activation energy barrier. [6]

In 2015, Manning Jiang Jing Huang Yuan (马宁姜景黄远), of the Chinese Academy of Sciences, in his "Social Governance and Social Activation" (Q), was theorizing about "social activation energy" and government, wherein he theorizes that they can quantify "normal states" and "excited states" of societies around China, and thereby measure social activation energies in society, upon which he suggests the following to the government:

> "The government needs to work from the following three aspects: continue solid job and maintain the normal state of society, ease the social conflicts and weaken the social excited state, and guide the public opinion and lower the **social activation energy**."

(add discussion)

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θΔics

In hmolscience, **social Aristotle-Mpemba effect** is social equivalent of the observed phenomena that "heated water freezes faster" effect, aka the Aristotle-Mpemba effect or Mpemba effect, i.e. a hot war, theoretically, will bring about peace and social order faster than will a cold war.

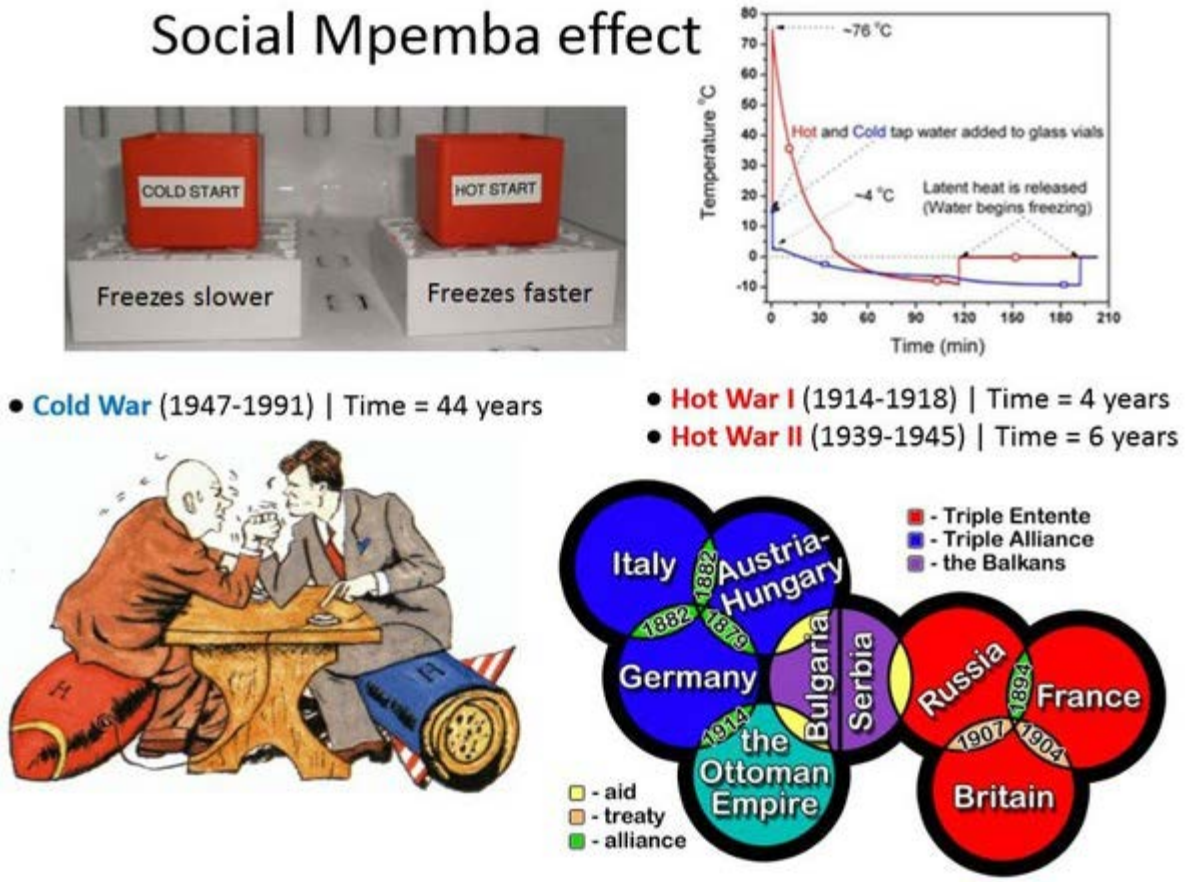

A 2013 power point (slide #29) depiction of a "**Social Mpemba effect**" in respect to the rate of "social cooling", i.e. solidification into the new social order, in respect to "hot wars" vs "cold wars" by American electrochemical engineer Libb Thims, presented at UPESW 2013 [1]

As applied to social affairs, the social equivalent of the Mpemba effect, aka social Mpemba effect, named after African student Erasto Mpemba (in contrast to Aristotle), for the sake of naming-deconfustion, in regards to orderings of human molecules (people) in societies, should predict that a "hot society" should cool faster, i.e. solidify into order faster, than a "cool society", similar to the way heated water molecules form the solid state faster than cooler water molecules, being that the bonds of the former are free, more broken apart, as compared to the latter, and thereby able to sink to the new order faster than the more restricted cooler molecules.

Overview

In 1959, French anthropologist Claude Levi-Strauss was distinguishing between "cold" and "hot" societies; though it is doubtful that he ever considered the Mpemba effect in this respect.

In c.2011, Libb Thims, in Hmolpedia threads, was referring employing an outlined explanation of the "social Mpemba effect" to reply to posts on related questions about war and peace and or hot vs cold relationship breakups; Thims had in mind, the loose plan to write a journal article on this specific topic, but was busy with other things.

In 2013, Thims, during his "Econoengineering and Economic Behavior" talk, was referring explicitly the "social Mpemba effect", with supporting data on year-length of the hot wars of WWI and WWII in respect to the Russia-America cold war. [1] The fact, e.g., that the "Cold War", between Russia and America, lasted 44 years, from 1947 to 1991, whereas traditional "Hot Wars", such as WWI (1914-1918) or WWII (1939-1945), tend to last on average about 5.5 years, evidences that the "cooling process" to the new social order (frozen water) from the old social order, occurs much faster if the collective societies are heated first. The repercussions of this would be that a hot war, theoretically, would, in the long term, result in solidified order or a state of stable peace faster than would a cold war.

In 2014, Randall Schweller, in his *Maxwell's Demon and the Golden Apple*, was groping at an distorted-entropy based model of the social Mpemba effect; the main statements and quotes employed of which are as follows: [2]

“One of the core ideas of the book will strike readers as counterintuitive. Large, destructive wars a re not always or in all ways bad; they serve the function of providing world order. Indeed, the time-honored solution for rising global disorder—as well as for rising discord among nations and what political scientists refer to as system disequilibrium—is a large an total war fought among all the great powers. These so-called hegemonic wars have regularly ensued every hundred years or so.”

— Randall Schweller (2014), *Maxwell’s Demon and the Golden Apple* (pg. xi)

“These so-called hegemonic wars perform three essential tasks that replenished the depleted international system with a new flow of energy that was put to work to restore world order and lasting peace. First, akin to Joseph Schumpeter's notion of ‘creative destruction’, hegemonic wars obliterate the old order, wiping the institutional slate clean so that a new efficient global architecture can be rebuilt. Second, they concentrate power in the hands of one dominant state that towers over a world in ruins. Pocketing the majority of the spoils of victory, the newly crowned hegemon possesses the power, will, and legitimacy to transform the world and enforce its new order. Third, these wars clarify the bargaining situation among the great powers-confusion over which is the root cause of war in the first place.”

— Randall Schweller (2014), *Maxwell’s Demon and the Golden Apple* (pg. 51)

“By performing these three tasks--destroying old order, crowning a new king, and clarifying the bargaining situation among the great powers--hegemonic wars are followed by long periods of peace. The Pax Romana (27 BC-180 AD) rose from the ashes of the republican civil wars; the Pax Britannica (1815-1914) from the French Revolutionary and Napoleonic wars; and Pax Americana (1945-present) from the First and Second World Wars., Just as computers periodicallv need to be be down and restarted to reload the operating system, the international system sometimes needs a reboot. In international politics, hegemonic wars have been the surest way to hit the reset button.”

— Randall Schweller (2014), *Maxwell’s Demon and the Golden Apple* (pg. 51)

“Great catastrophes may not necessarily give birth to a genuine revolution, but the infallibly herald them and make it necessary to think, or rather to think afresh about the universe.”

— Fernand Braudel (1950), “Inaugural Lecture”, College of France, Dec 1; cited by Randall Schweller (2014) in *Maxwell’s Demon and the Golden Apple* (pg. 140)

“War is a political instrument: a continuation of political activity by other means. The political object is the goal, war is the means of reaching it, and means can never be considered in isolation from their purpose.”

— Carl Clausewitz (1830), *On War*; cited by Randall Schweller (2014) in *Maxwell’s Demon and the Golden Apple* (pg. 143)

“As power diffuses throughout the international system, questions about ‘which order should prevail’ become relatively more important than fondness for ‘any order rather than chaos’, so the assumption that international order is a public good becomes less tenable.”

— Randall Schweller (2014), *Maxwell’s Demon and the Golden Apple* (pg. 149)

This last quote (pg. 149) is directly amenable to Gibbs energy prediction methods, intermixed with kinetic theory analysis, namely calculations will show that the final state order quantified by the lowest Gibbs energy state will be the one nature selects; the complicating factor of kinetics, however, my become a determining factor in the final state order

that is selected (see: thermodynamic vs kinetic reaction control) (Ñº); when Schweller speaks of “political inertia” or “political trajectories” these are examples of kinetic control factors. Some of this has been touched on in the work of Thomas Wallace (2009).

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θΔics

In social physics, **social atom** is term used to describe the individual person as a human particle in a statistical assembly of persons or simply as a metaphorical single "atom".

History

The term social atom, referring to a person, was first used by English writer William Adams in his 1903 book *Memoirs of a Social Atom.* [1] In the opening sentence, Adams declares "I call myself a Social Atom—a small speck of the surface of society." [2] In modern terms, according to the science of human chemistry, this sentence translates to the effect that a person is a Human Molecule—a small 26-element point molecule attached to the substrate surface of the earth in the system of society. [3]

Another to have conceived of an intricate type of "social atom theory", between the years 1910 and 1951, was Romanian-born American group psychotherapist Jacob Moreno. [4]

The term was used in the title of the 2007 book *The Social Atom* by American theoretical physicist Mark Buchanan who argues that we should "think of people as the 'atoms' or elementary building blocks of the social world, the *social atoms*," so that we might begin to see large-scale patterns emerge at the level of groups, patterns that have little to do with the character of the individual people themselves. [5]

See also

- Human chemical
- Human molecule

References

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(e) Remer, Rory. (2006). "Chaos Theory Links to Morenean Theory: A Synergistic Relationship", 30 pgs. (Section: Social Atom Theory) (PDF). Heldref Publications.
(f) Remer, Rory. (2001). "Social Atom Theory revisited", *International Journal of Action Methods: Psychodrama, Skill Training, and Role Playing,* June 22.
5. Buchanan, Mark. (2007). *The Social Atom - why the Rich get Richer, Cheaters get Caught, and Your Neighbor Usually Looks Like You,* (pgs. x-xi, 13). New York: Bloomsbury.

External links

- Our Lives as Atoms, a *New York Times* Blog, by Mark Buchanan.
- The Social Atom: Physics and Human Affairs, Mark Buchanan, Associate Editor Complexus.
- The Social Atom - Blog by Mark Buchanan.
- Video Talk (on the social atom), by Mark Buchanan at Microsoft, 1 hour 10 minutes.

θΔics

In human thermodynamics, **social Avogadro number** is a number between one and the current human population that is the social system equivalent to the Avogadro's constant N_A for calculations of quantities such as Gibbs free energy, entropy, internal energy, or enthalpy.

Overview

In 1995, American chemist Jay Labinger, in his "Metaphoric Usage of the Second Law", in commentary on the American mechanical engineer Joseph Klein's 1910 "human applicability" supposition, stated the following: [4]

> "Klein's [human applicability assertion] suggests that a minimum requirement for applicability of the second law is a sufficiently large number of elements—an Avogadro's number of people, perhaps?—as well as hinting at issues such as free will versus random actions."

In 2003, Hungarian sociologist Babics Laszlo made an attempt at a representative particle unit number equivalent for sociological thermodynamics calculations and therein calculated what he called a "sociological Avogadro's number" of:

$$A = 60$$

In the initial stages of his derivation, to note, Laszlo also reasoned that the mean population number of:

$$A = 6.01 \times 10^7$$

for each of the top 87 of the world's countries (a typical reactive human social system), which in sum constituted 97 percent of the world's population, could serve as a representative A, although he considers this value to be too high for meaningful calculations. [2] In honor of Laszlo's effort, being that he seems to have been the first to address this issue (although his calculations are nearly incorrigible) it would seem customary to designate the symbol N_L (verses N_A in chemistry) to be representative of the social equivalent of the Avogadro number in human chemistry and human thermodynamics. This, however, is only a preliminary idea as still more work needs to be done to find a more meaningful useful equivalent number, as the number 60 isn't essentially based on anything other than the incorrect idea that the 6.022 part of Avogadro's number is significant (with a power of ten roundup to a useful socially significant number of people).

In 2006, American chemical engineer Libb Thims had discussed the Avogadro number issue with Russian physical chemist Georgi Gladyshev during a meeting in Chicago (and via email), during which Thims alluded to the idea that the value should be around 1,000 and possibly be called the Gladyshev number (or Gladyshev constant), being that Gladyshev was the first to do some of the pioneering work in sociological thermodynamics (1977) calculations of Gibbs free energy, which has units of J/mol. Gladyshev, however, did not (at the time) have much commentary on this topic. Thims also suggested that term 'mol' should be termed 'hmol', short for 'human-mole', for calculations of Gibbs free energy, entropy, internal energy, or enthalpy for human reaction processes between people. In this scheme, Laszlo number (in namesake) plus the term 'hmol', we would have the preliminarily concept of:

$$N_L = 60\left(\frac{human(molecules)}{hmol}\right)$$

just as Avogadro's number, in modern terms, is defined as the number of atoms in a twelve gram sample of carbon twelve:

$$N_A = 6.022 \times 10^{23} \left(\frac{entities}{mol} \right)$$

although, at this point, until further studies can be made, the number 60 is still rather arbitrary. Another useful version could be the number of people in two different military units reacting in combat during wartime.

The central issue here is that humans aren't typically measured in groups by mass. In short, the standard SI base unit for 'amount of substance' is not applicable to calculations of reactions involved in larger systems of interacting humans. One could say, for instance, that in a 1,000-kg sample of average humans (70-kg) that there are about 14 human molecules on average, but his approach is rather nonsensical. Using an alternative methodology, for instance, one could say that the Laszlo number could be the average number of students in a typical US elementary school, which in the 2001-2002 school year was 477 students.

Issue

The issue here is that historically, in chemistry, chemical reactions and processes were measured and quantified in units of grams. This concept evolved into the gram-molecule, being the number of atoms or molecules in a gram of substance. The term gram-molecule was truncated to the term 'mol' in 1893 by German chemist Wilhelm Ostwald. In the decades to follow, it was determined experimentally that there are about a septillion atoms in a gram of gas such as air: [1]

10^{24}= number of atoms in a gram of air

Subsequently, the equations of modern chemistry, physics, and thermodynamics are all septillion-based particle count units of the mol. In studies of reactions and processes between human molecules, however, the total population is only in the near ten billion range, hence a new SI base unit is needed for studies in the fields of: human chemistry, human physics, social physics, etc.

Units

In this context, units for quantities such as entropy (or social entropy) or free energy (or social free energy) of thermodynamic calculations involved in either reactions between human molecules or of transformation processes of systems of human molecules would be:

$$S(units) = \left(\frac{J}{K \cdot hmol} \right)$$

and

$$G(units) = \left(\frac{J}{hmol} \right)$$

and so on.

Dunbar number

Another related number is the Dunbar number (150) which is the number at which human groups (e.g. social clans) can maintain stability using only social peer pressure as the cohesive principle, sizes above which the group tends to split apart.

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θΔics

In hmolscience, **social bond** is physicochemical bond existing between a pair of social entities or amid social structure, operating via the mechanism of the exchange force, mediated by the gravito-electromagnetic force. [1]

Overview

In 1970, American sociologist Robert Nisbet outlined a semblance of a "social bond" theory, which he defines as "the variation of chemical bond or set of forces that enables biologically derived human beings to stick together into social aggregates or "social molecules" (supra-human molecular aggregates or structures) in which we actually find them from the moment, quite literally, of their conception." [2]

In 2001, German physicist Jurgen Mimkes outlined semblance of a physicochemical based social bond theory. [3]

In 2005, American electrochemical engineer Libb Thims began outlining a theory and mechanism of the existence of a human chemical bond theory, so to explain the attachment of a married couple, AB (or MxFy), in Gibbs energy terms, in the products side of a human reproduction reaction. [4]

Quotes

The following are related quotes:

> "No one knows the nature of human **social bonds**."
>
> — Rupert Sheldrake (1999), *Dogs that Know when Their Owners are coming Home* [5]

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5. Sheldrake, Rupert. (1999). *Dogs that Know When Their Owners are Coming Home: and Other Explained Powers of Animals* (pg. 308). New York: Three Rivers Press.

θΔics

In social models, **social cannon ball model**, as compared to the billiard ball model or chemistry set model, refers conceptualization of a person "fired" off into society as the "ball" of cannon, according to which their energy of character (character energy) and personal energies act, amid or following their time of raising, as potential energy, which get transformed into the kinetic energy of occupation, which will have varying levels of success, in respect to obtainment of goals, owing to cultural and social resistance, some of which being energy of position, i.e. social position, which is akin to gravitational potential.

An 1877 depiction (Q) of Zazel, aka the "human cannonball" (Q), being launched from a cannon as a human projectile, re-labeled according to Balfour Stewart's 1868 conceptualization of a person fired off into society, following raising, as a "**social cannon ball**", according to which his or her energy of character and personal energies act as the explosive or potential energy, which gets transformed into the kinetic energy of occupation; shown at top right is a human free energy of formation diagram. [1]

Stewart

In 1868, Scottish physicist Balfour Stewart, "The Place of Life in a Universe of Energy", co-authored with Norman Lockyer, argued that the nature and composition of one's personal energies, e.g. "character energy", "personal energy", etc., are equivalent to the stored "potential energy" of the chemical bond energy (bond energy) of say an explosive like dynamite or gunpowder, itself related to the nature of the power associated with nitrogen, when a cannon ball is fired and the potential energy is transformed into kinetic energy of projectile motion; the gist of his argument is as follows: [1]

> "When a man pursues his course undaunted by opposition, unappalled by obstacles, he is said to be a very energetic man. By his energy, we mean the power which he possesses of overcoming obstacles; and the amount of his energy is measured by the amount of obstacles which he can overcome, by the amount of work which he can do. Such a man may in truth be regarded as a **social cannon-ball**. By means of his energy of character he will scatter the ranks of his opponents and demolish their ramparts.
>
> Nevertheless such a man will sometimes be defeated by an opponent who does not possess a tithe of his personal energy. Now, why is this? The reason is that, although his opponent may be deficient in personal energy, yet he may possess more than an equivalent in the high position which he occupies, and it is simply this position that enables him to combat successfully with a man of much greater personal energy than himself. If two men throw stones at one another, one of whom stands on the top of a house and the other at the bottom, the man at the top of the house has evidently the advantage.
>
> So in like manner, if two men of equal personal energy contend together, the one who has the highest social position has the best chance of succeeding. But this high position means energy under another form. It means that at some remote period a vast amount of personal energy was expended in raising the family into this high position. The founder of the family had doubtless greater energy than his fellow-men, and spent it

in raising himself and his family into a position of advantage. The personal element may have long since vanished from the family, but it has been transmuted into something else, and it enables the present representative to accomplish a great deal, owing solely to the high position which he has acquired through the efforts of another. We thus see that in the social world we have what may be justly called two kinds of energy, namely:

1. Actual or personal energy
2. Energy derived from position

Let us now turn to the physical world. In this as in the social world, it is difficult to ascend. The force of gravity may be compared to the force which keeps a man down in the world."

The "it has been transmuted into something else", certainly, is something in great need of clarification in the modern human chemical thermodynamic sense of the matter; as touched on by Arnopoulos (1993) and Thims (2007), below.

Tesla

In 1900, Serbian-born American electrical engineer Nikola Tesla, in his article "The Problem of Increasing Human Energy", gives the adjacent crude diagrammatic model of "human energy", discussing rather cogently the impelling and retarding forces to human movement. [2]

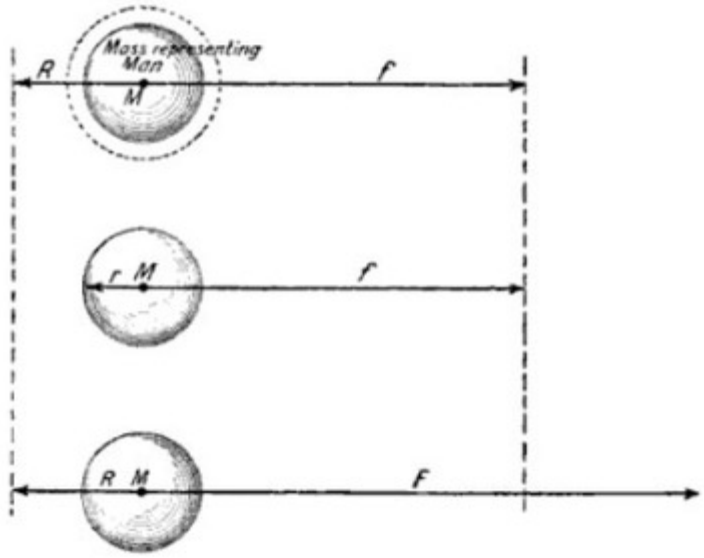

Serbian-born American electrical engineer Nikola Tesla's 1900 human energy diagram, wherein he sort of depicts a man as a cannon-ball, similar, in some respects, to the Stewart-Lockyer **social cannon-ball** model. [2]

(add discussion)

Arnopoulos

In 1993, French sociophysicist Paris Arnopoulos outlined the gist of the transition from the billiard ball model, which a step below the "cannon ball model", to the "chemistry set model", as he calls it, wherein chemical thermodynamics come into play: [3]

"When we move from the [socio-] mechanical to the [socio-] thermal phenomena of energy, we rise from the atomic 'billiard ball' interaction to the molecular 'chemistry set' reactions. Unlike the former, the latter do not consider relations simply on the basis of mass, distance, and velocity, but rather temperature, pressure, and volume. The importance of a particular position is therefore, replaced by that of a substantive composition. The physical motion of bodies is replaced by the chemical reactions of compounds [sociomasses]."

(add discussion)

Thims

In 2007, American electrochemical engineer Libb Thims, gave a more-modern rendition of Stewart's "energy of character", as contrasted with energy of "high social position", in terms of free energy of formation of "entropy of character" and "entropy of status". [4] The difference between the two points of view, Stewart-Lockyer (1868) vs. Thims (2007), is that through the works of Rudolf Clausius (1850-1875), the kinetic energy and potential energy model of Stewart and Lockyer were subsumed into Clausius' formulation of internal energy and hence later, through the works of Willard Gibbs (1876), Hermann Helmholtz (1882), and Gilbert Lewis (1923), internal energy was subsumed into the Gibbs free energy function:

$$G = U + PV - TS$$

Hence, the simple two-part energy of "social position" and energy "social character" model of Stewart and Lockyer is no longer a straight and simple translation when attempting modern chemical thermodynamics formulation and discussion of the same social phenomenon.

See also

- Billiard ball model

References

1. Lockyer, Norman and Stewart, Balfour. (1868). "The Place of Life in a Universe of Energy", *MacMillan's Magazine*, 18: 319-; in: *Contributions to Solar Physics* (pgs. 85-103).
2. (a) Tesla, Nikola. (1900). "The Problem of Increasing Human Energy: with Special Reference to the Harnessing of the Sun's Energy" (Q), *The Century*, 60: 175-211.
(b) Tesla, Nikola. (1900). *The Problem of Increasing Human Energy: with Special Reference to the Harnessing of the Sun's Energy*. Wilder Publications.
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θΔics

In hmolscience, **social chemical potential**, socio-economic chemical potential, or human chemical potential is extension of chemical potential into sociology or economics sphere to explain movements or migrations of people, conceptualized as chemical species, from regions of high chemical potential to low chemical potential.

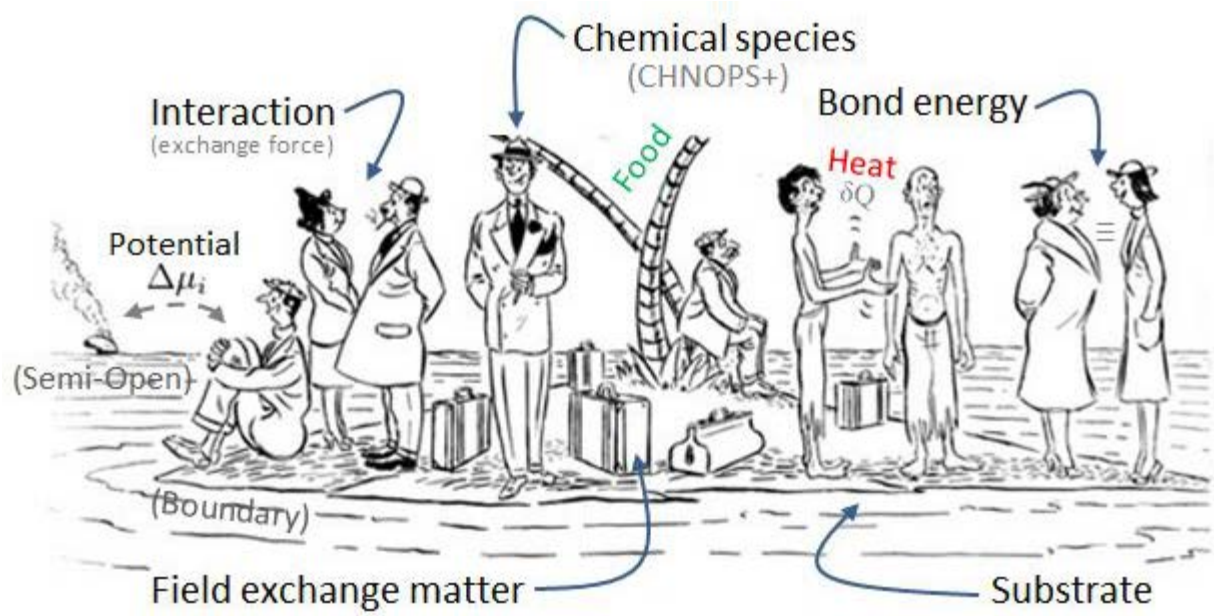

An island model **social chemical potential** depiction showing a difference Δ in chemical potential μ between two social "systems" for an individual chemical species i.

Overview

In 1896, Maurice Hauriou mentions the term “chemical potential” in the context of social phenomena; but it remains to be discerned in what sense he employs this usage. [1]

In 1980, American sociologist Ed Stephan and American chemist George Gerhold began to ponder how the Gibbs fundamental equation, of the form: [1]

$$E = ST - pV + \mu N$$

where E is the energy, S the entropy, p the pressure, V the volume, μ the chemical potential, and N the number of particles of the system, applies to sociological systems of people. The diagram they had in mind, as found in Stephan's *The Division of Territory in Society* (1995), to quantify potential, is as follows, aka the Stephan social system: [7]

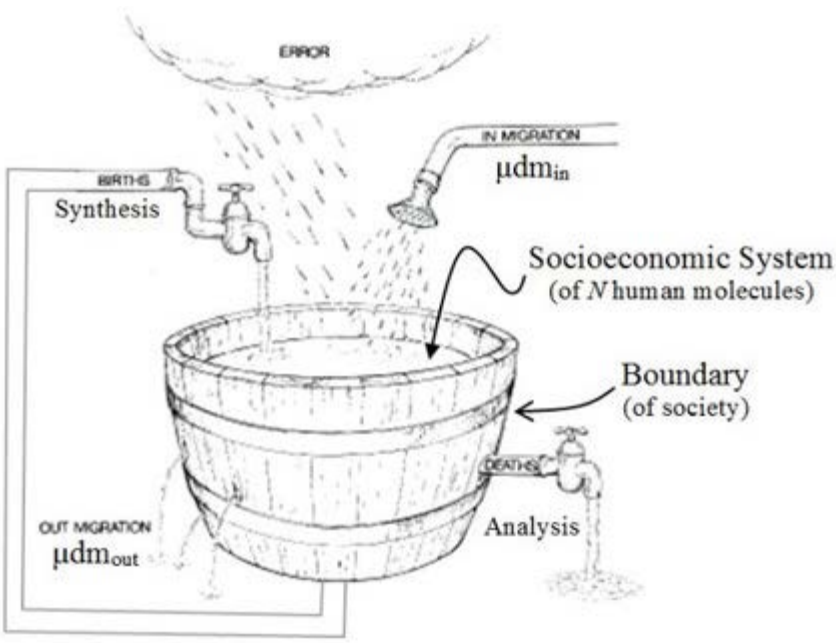

Some of the questions they speculated at include: [2]

> "What is the total time in a social system? At the level of particles, temperature is just velocity of movement. I sense an analogy between temperature in physical systems and the technology of transportation and communication in social systems. Modern societies are 'hotter'. Big cities (high interactance centers) are 'hot': People, commodities and ideas move around faster. 'Hot' regions subdivide territory more thoroughly than 'cool' ones.
>
> And what is *entropy* — unpredictability? is that what we call freedom? What is the social equivalent of the product entropy-times-temperature? Freedom of movement? What do *pressure* and *volume* suggest, if anything?
>
> Could the raw product kNT be given some sociological meaning? Do humans have something like *chemical potential*, some sort of (bonding) potential? Maybe the last two terms in could be combined into something with a meaning specific to sociology. Combining them into $-N(1 + \alpha)$, with N as a population — what would be the sociological significance of the factor $-(1 + \alpha)/\beta$? Could the value for β computed above in the case of urban population distributions ($\beta = 2v/x\mu$) have any application?"

In answer to some of these questions, he says that he didn't or doesn't know.

In 1985, Hungarian economist Andras Brody, in his "An Essay in Macroeconomics", coauthored with Katalin Martinas and Konstantin Sajo, wherein, building on the work of John Neumann (1934), Paul Samuelson (1955), and Nicholas Georgescu-Roegen (1971), they outline an economic thermodynamics model, in which, among other things, they attempt to argue for a social chemical potential model, to the affect that "market prices are the chemical potentials μi derived from the economic entropy, which is now U", according to Hungarian theoretical physicist Bela Lukacs who frequently cites their work as the "Bródy-Martinás-Sajó model". [8]

In 1994, Australian physical chemist John Christie, in his "A Survey of Thermodynamical Ideas", built on the work of John Neumann (1932) and discusses how microcanonical ensembles can be used to formulate economic analogies, wherein he employs a 6-person "island model", in which goods are traded, resulting in a microstate currency distribution; how social equilibrium relates to Gibbs free energy; how coupling and time scales may play a role, etc., in economic processes; then discusses Gibbs free energy, in definitional terms, and alludes to the premise that when an inhabitant enters or leaves the island—if the island were an "open" system—the "component will move into or out of the system to minimize its chemical potential, i.e. it will tend to flow from regions of higher to lower chemical potential." [2]

In 1999, American physicist Wayne Saslow, in his article "An Economic Analogy to Thermodynamics", in which he goes through a considerable, albeit mostly empty, derivation, wherein starts off with a 1980 study on the experimental findings of rat economic behaviors, and goes on to argue that the state of an economic system, being a physical system, must be quantified by a temperature and conjugate variable pair entropy, during which he equates price p of some entity ($_{check}$) to chemical potential. [3]

In 2001, Peruvian chemical engineer Alfredo Infante, in his "Social Entropy: A Paradigmatic Approach of the Second Law of Thermodynamics to an Unusual Domain", was digging around at some type of chemical potential application in sociology. [6]

In 2006, Iranian-born American materials scientist Robert Kenoun, in his postulations on the nature of the internal energy of various types of human social systems, e.g. a five-member family or a society, etc., posits that if one member of the system of a family were to leave, e.g. a father dies, which he correlates to a "loss of mass" in the system, there would result an increase of internal stress among the relational bonds of the remaining members, which Kenoun equates

to a change in the internal energy of the system; the underlying supposition here, alluded to by Kenoun, seems to be a chemical potential change model, of sorts. [5]

In 2007, American electrochemical engineer Libb Thims extrapolated the concept of chemical potential to sociological movement of humans. [4]

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(b) Photos – EdStephan.org.
(c) Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (video, 1:33-min) (article, 40-pgs) (PowerPoint, 36-slides), Key speaker talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29; in: *Econophysics, Sociophysics, and other Multidisciplinary Sciences Journal* (Ñº) (pdf), 3(2):5-25.
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Further reading

â— Lemoy, Remi, Bertin, Eric, and Jensen, Pablo. (2011). "Socio-Economic Utility and Chemical Potential" (abs) (pdf), *Europhysical Letters*, 83(3), Feb 17.

θΔics

In hmolscience, **social chemical reaction** is []

Overview

In 1809, Goethe alluded to the premise that society was a large social chemical reaction, boundaried by social classes, functions, estate fences, among other demarcations.

> to simply find one another, the way lovers do. In bars or whatever. The members of the band are like five chemicals that come together with a specific chemical reaction. If the chemistry is right, the audience becomes involved in this—this kind of—well, a social chemical reaction

Bruce Sterling's 1988 view that a band coming together to play in front of an audience was a **social chemical reaction**. [2]

In 1914, German-born American electrochemical engineer Eugene Roeber, in his "The European War", stated his view that WWI was a large social chemical reaction or "gigantic human reaction" governed by the second law, as he phrased things. [1]

In 1988, Bruce Sterling stated that a band coming together to play in front of an audience was a social chemical reaction. [2]

References

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θΔics

In science, **social chemistry**, aka "chemical sociology" (Grant, c.1940), a terminological precursor to "sociochemistry" (Fores, 1976), is the chemistry of society or of a social system, wherein people are viewed as powered reactive chemicals or molecules; also the study of the attractions and repulsions of human molecules in unions.

The term social chemistry (Thomas Huxley, 1871) is a near-synonym to the terms human chemistry (E.B., 1851) and (Guillaume de Greef, 1902).

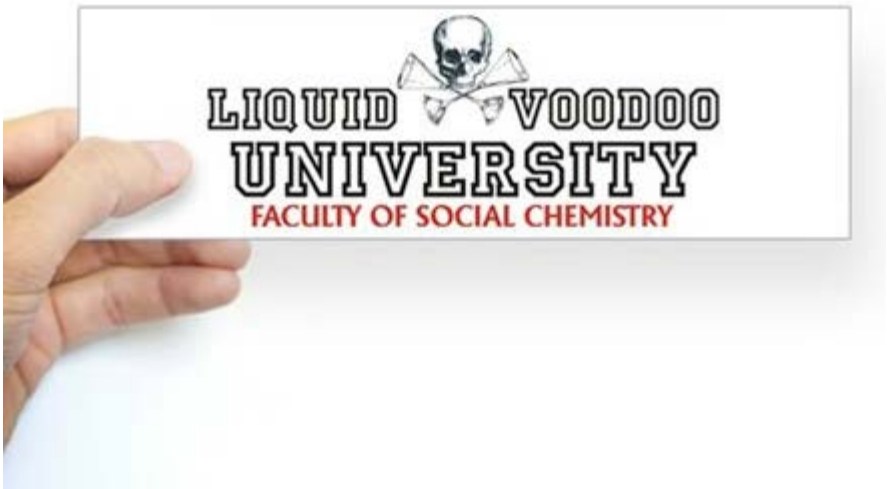

A circa 2015 "faculty of **social chemistry**", of Liquid Voodoo University, a CafePress bumper sticker (Ñº); which is humorous, per the motto that humor always has elements of truth to it, in that Libb Thims has been working to get a "faculty of physicochemical sociology" established at a leading university, to teach physicochemical sociology; a conceived admixture of the prototypes of the: Nightingale Chair of Social Physics (1890s), the Harvard Pareto circle (1930s), and Princeton Department of Social Physics (1940s).

Overview

In 1863, French thinker writer-politician Eugene Pelletan, a deist freethinker, a follower of Marquis de Condorcet, in his "Address to the Cotton King", said the following: [10]

> "The man attracts man in the **social chemistry** [la chimie sociale], as the molecule to another order of composition. A new hut will pick the vicinity of the already built cabin by reason of sympathy along safety. Soon the industry will support agriculture; the blacksmith turn his forge next to the farm to beat the Ploughshares, the wheelwright and blacksmith will follow the carpenter the wheelwright, and so on to the tailor. Agricultural dispersed, the industry focuses. The village will be born of the industry. Do I need to predict the first public monument that will rise on the savings of the town? It will always be the school house."

In 1871, English biologist Thomas Huxley stated his view that society as a whole is a social molecule and that "social chemistry" is what is called politics: [1]

> "Every society, great or small, resembles ... a complex molecule, in which the atoms are represented by men, possessed of all those multifarious attractions and repulsions which are manifested in their desires and volitions, the unlimited power of satisfying which we call freedom."

Huxley continues, 'the *social molecule* exists in virtue of the renunciation of more or less of this freedom by every individual. It is decomposed, when the attraction of desire leads to the resumption of that freedom the expression of which is essential to the existence of the social molecule.' Moreover, he reasons in a way that coins a new term:

> "The great problem of **social chemistry** we call politics, is to discover what desires of mankind may be gratified, and what must be suppressed, if the highly complex compound, society, is to avoid decomposition."

In 1885, American historian Henry Adams, in a letter to his wife, defined "social chemistry" as the study of the mutual attraction of equivalent human molecules; stated that this was a science yet to be created; and commented that the study of this subject was his daily satisfaction: [3]

> "**Social chemistry**—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life."

In 1905, James Dealey and Lester Ward, in their *A Textbook of Sociology*, devote a section to "social chemistry", which they describe as being the [reaction] processes of the tendency of the women of the conquered race to be appropriated by the conquerors. [9]

In 1962, in commentary on Huxley's proposal for the science of social chemistry, in which the sociologists are suggested to "emulate and copy the chemists", Austrian social economist Werner Stark famously asks:

> "Why should no **social chemistry** ever been developed?"

Stark states that "nobody would suggest that the social scientists should imitate meteorology, for this discipline does not appear to have got very far … but what about chemistry?" He states "a sociology based on chemistry [has] in fact been called for, but, significantly, [this call has] found no echo." Stark reasons, naively, that it would have been easy to take up the suggestion of Huxley and develop it further. He reasons, "an intending social chemist would have found it one whit more difficult to manufacture a sociological parallel to the Boyle-Charles law than Haret did to the Newtonian propositions. But the experiment appears never to have been tried."

A 2008 afterparty flier using the term "**social chemistry**" as slang for getting schooled in after-hours chemistry. [6]

In 2007, Canadian writer Chanel Wood, in her article "A Question of Social Chemistry", outlined a simplistic "combination lock theory" model of what she considered to be social chemistry.

Daniel Rigney considers Italian engineer Vilfredo Pareto's 1916 social equilibria theory, supposedly based on Willard Gibbs' chemical thermodynamics, to be a type of "social chemistry". [5] This, however, my be a mis-attribution, via Lawrence Henderson; for although Pareto did view people as "human molecules", he may have not actually used Gibbs' theories in his work?

Other

In the 2012 *Environmental Chemistry Letters* article "Social Chemistry", European environmental chemists Eric Lichtfouse, Jan Schwarzbauer, and Didier Robert outline an essay in which they propose that "social chemistry" should be a new scientific discipline, conceived in a way that involved the bridging of chemistry and society, by integrating the social sciences in chemical research, which involves what they call "citizen discourse analysis" or polling citizens to see if newly designed chemicals (or the related) are acceptable by society, a methodology with which they seem to think will prevent nuclear meltdowns, global warming, and other types of repeatable human maladies. The article cites Huxley's definition of social chemistry of men = atoms; society = complex molecule, but hardly digresses beyond this, or even seem to outline social chemistry in the same vein, but rather only seems to use the term as some type of catchy green phrase to platform their upcoming book *Environmental Chemistry for a Sustainable World*. [8]

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2. Stark, Werner. (1962). *The Fundamental Forms of Social Thought.* (pgs. 261-63). Routledge.
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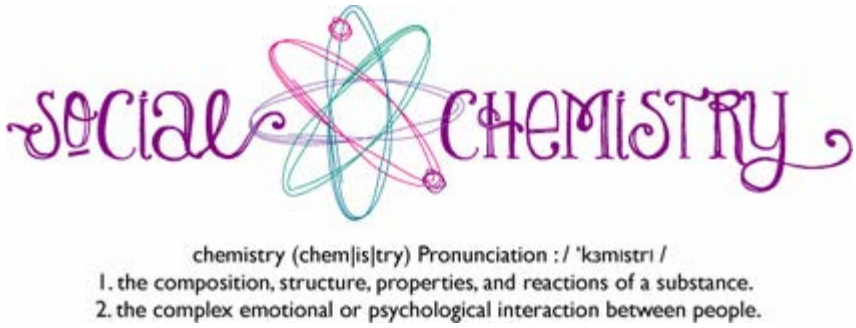

A 2011 logo giving a dictionary definition of **social chemistry**, as "the complex emotional or psychological interaction between people", for a newly-launched UK-based Social Chemistry Consulting group, launched by American-born English consultant Ryan Wenstrup-Moore. [7]

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θΔics

In hmolscience, **social collision theory** refers to the application of collision theory—either chemical kinetics (Max Trautz, 1916) based or particle physics collider (Ernest Lawrence, 1932) based—to social interactions, collisions, bond dynamics, formations, and or changes.

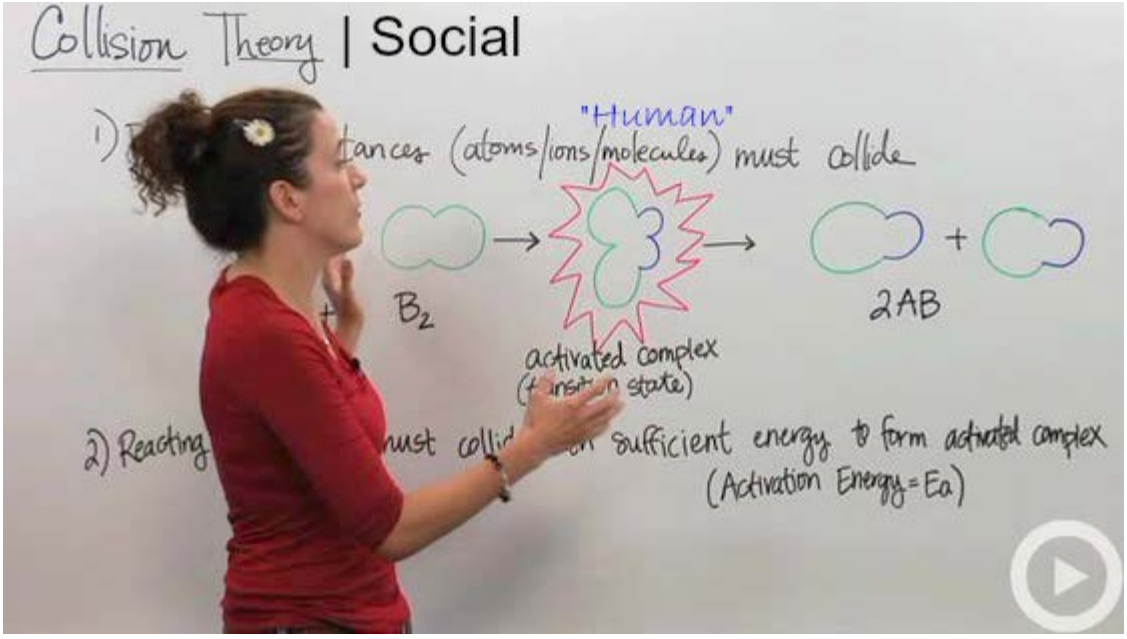

A "human molecule" re-labeled video still of a BrightStome.com video (Q), on basic collision theory, at the chemical level, scaled up to the human chemical level, to give the gist of the premise of "**social collision theory**"; in the above scenario, which shows the "collision" involved in a double displacement reaction, the A_2 could be the Eduard-Charlotte molecular pairing, of Goethe's *Elective Affinities* (1809), the B_2 could be either the Count-Countess pairing or the Captain-Ottilie pairing, depending on chapter (see: EA:IAD), and the AB pairings could be a number of products, again depending on chapter and time frame.

Overview

In 1922, Alfred Lotka, in his "Natural Selection as a Physical Principle", citing the earlier works of Wilhelm Ostwald, Oliver Lodge, and Hyacinthe Guilleminot, outlined a semblance of a physics-based collision theory, in respect to predator prey interactions, in a semi-physicochemical basis, in the form of what he called "trigger action"; to quote a note excerpt: [1]

> "When the beast of prey *A* sights its quarry *B*, the latter may be said to enter the field of influence of *A*, and, in that sense, to ***collide*** with *A*. The energy that enters the eye of *A* in these circumstances may be insignificant, but it is enough to work the relay, to release the energy for the fatal encounter."

(add discussion)

In 2007, American electrochemical engineer Libb Thims, in his *Human Chemistry*, building on Lotka, outlined a more robust physical chemistry based model of collision theory applied to human-human collisions, people explicitly defined as molecules (see: human molecule), moving about on a surface. [2]

In 2008, Irish-born American sociologist Kieran Healy, in his "Elementary Particles" blog, outlined what he referred to humorously as the "standard model of sociophysics", namely particle physics models applied to social interactions, which he conceptualized by the following diagram: [3]

> "I'm looking forward to spending a bit of time at the Center for Advanced Study in the Behavioral Sciences (Q) this fall. Think of the CASBS as the CERN of social science: even as we speak, hard-working technicians are putting the final touches to the Stanford Superconducting

Supersocializer, which will come online once the relevant IRB [gods] committees have been placated with a sufficient amount of cargo detailed forms.

The SSS will propel local college sophomores at tremendous speeds into unfamiliar groups of people in an effort to plumb the structure of the elementary particles of social interaction. Despite the success of the standard model, there is much to be learned. The organization of the Quirks is of course well known, with some of the early triumphs of post-war research focused on the internal dynamics of the quirk-matrix (Up, Downer, Charm, Strange, Top Bloke, *******). The complex of interactions centered on W and Z remains wholly mysterious, however. The Liketons, too, pose difficult questions, though the recent discovery of observer-dependent YouTube effects has gone some way toward clarifying their role. Finally, the famous Biggs Hangeron also remains problematic, as it is not only notoriously easy to observe but in fact also impossible to ditch at parties."

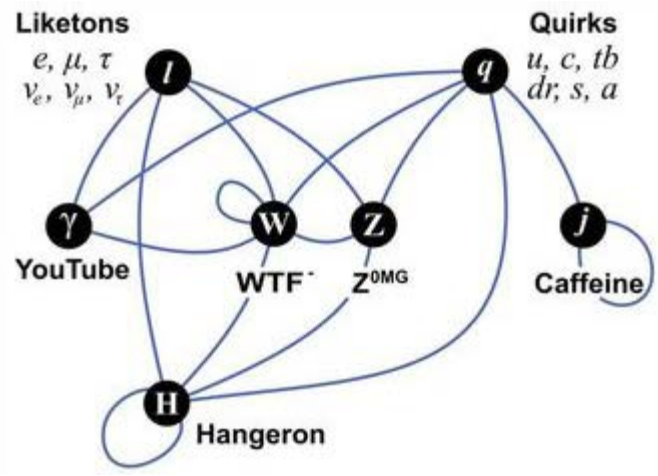

(add discussion)

Crash | Film

In 2004, award-winning film *Crash* was released, which gives an excellent overview of the intricacies involved social collisions. In the film, several characters, living in Los Angeles, "collide", so to say, during an eventful 36-hour period in which car accidents, shootings, and carjackings bring them together. Most of the characters depicted in

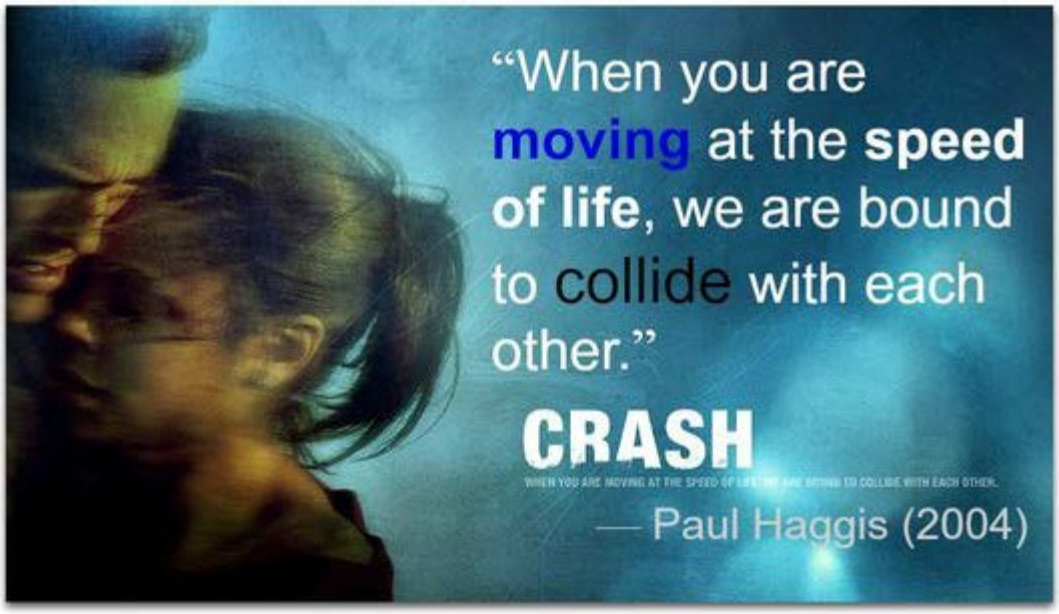

The 2004 film *Crash*, based on real events, gives a slowed-down look at how **social collisions** dynamically operate, accrue, intersect, operate, and repercuss.

the film are racially prejudiced in some way and become involved in conflicts which force them to examine their own prejudices. Through these characters' interactions, the film attempts to depict and examine not only racial tension but the distance between strangers in America. [4]

Along these lines, we see that collision theory can also be interpreted in terms of the "force of the collision", namely that the likelihood of reaction upon the collision of two molecules must certainly be affected by the force of the collision. Forceful collisions are much more apt to lead to the breaking and making of chemical bonds than are less forceful collisions. The film *Crash*, for example, a self-described 'passion piece' for Canadian screen-writer Paul Haggis, was inspired by a so-called "real life", i.e. reality-based, incident where Haggis' Porsche was *forcefully* carjacked outside a video store on Wilshire Boulevard in Los Angeles in 1991. [5] This is an example of a real social bimolecular effective collision, between two human molecules, resulting in a human chemical reaction (existence transformation), resultant change (moviegoers moved by the film), and work output (script writing).

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θΔics

In hmolscience, **social combustion** refers to the combustion of a society, social system, or two societies reacting together.

Technically, to clarify, combustion, by standard definition, is a chemical reaction in which a substance, typically a hydrocarbon structure, e.g. wood, coal, gasoline, or methane CH_3, etc., reacts rapidly with oxygen with the production of heat and light; social combustions are scaled up version of this basic model, wherein the chemical substances are social systems of humans who react rapidly *in* an oxygen environment with other social systems, societies, or groups.

A Buchanan-Gladwell model (2001) of social physics, defined by concepts including: social heat, tipping points, activation energy, connectors, six degrees, Dunbar numbers, etc.; the above diagram showing how the rubbing of Bosnia with Austria-Hungray created "social friction" which on 28 Jun 1914 produced enough heat (or social heat) to "spark" the flame or **social combustion** of the first world war. [3]

Overview

In 1858, Henry Carey seems to have touched on "combustion" in respect to societies or people, defined as molecules, in societies reacting similar to how coal or wood react with oxygen to produce heat (or social heat) and flame. [1]

In 2001, Chinese ecological economist Wenyuan Niu, amid the growing Chinese social physics school, was proposing his so-called "social combustion theory". [2]

See also

â— Social activation energy
â— Social friction

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θΔics

In hmolscience, **social combustion theory** is social transformation occurs in a way similar to a combustion reaction.

Overview

In 2001, Chinese ecological economist Wenyuan Niu, amid the growing Chinese social physics school, was proposing what he referred to as "social combustion theory" as a means to formulate an "early warning system" type of socio-meter so to detect periods of social burning, so to say: [1]

> "Social Physics is a full interdisciplinary science between natural and human sciences. It refers that, with the law, theory, principle, thinking, and methodology of physics (and including other natural sciences), social physics faces issues of social and economical field to seek new regulation, profound mechanism, and quantitative explanation through reasonable modification and rational extension of the natural sciences. In this paper, the author designs a framework of 'social stability warning system' using so-called **social combustion theory**. The system can be used as a powerful tool to simulate and forecast level of national stable situation."

In 2009, Niu was expanding on his theory, as follows: [2]

> "Social Harmony Equation (SHE) leads the social system to the evolution direction of social by accumulation of "social combustion substances", i.e., the accumulation of microcosmic entropy increase "basic particles" (individual) in social system from assimilated "basic social energy" to dissimilated one; meanwhile, the catalysis of "social combustion promoter" (social excitation energy) has enhanced the "social temperature" of disordering process of social system and completed the energy accumulation of social entropy increase that can generate the transition. Finally, ignited by the "social trigger threshold", the social system has completed the abrupt change from orderliness to disorderliness. The continuous variation of the above-mentioned three basic non-linear processes has jointly composed the whole contents of **social combustion theory**. Under the restriction of such conditions of different time (t), different space (α) and different scale (β), it is finally explained as a comprehensive dynamics of social system deterioration."

Social Combustion Theory: Dynamics of Social System Deterioration

Wen-yuan Niu

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Abstract. Social Harmony Equation (SHE) leads the social system to the evolution direction of social by accumulation of "social combustion substances", i.e., the accumulation of microcosmic entropy increase "basic particles" (individual) in social system from assimilated "basic social energy" to dissimilated one; meanwhile, the catalysis of "social combustion promoter" (social excitation energy) has enhanced the "social temperature" of disordering process of social system and completed the energy accumulation of social entropy increase that can generate the transition. Finally, ignited by the "social trigger threshold", the social system has completed the abrupt change from orderliness to disorderliness. The continuous variation of the above-mentioned three basic non-linear processes has jointly composed the whole contents of social combustion theory. Under the restriction of such conditions of different time (t), different space (α) and different scale (β), it is finally explained as a comprehensive dynamics of social system deterioration.

Keywords: social harmony equation(SHE), social temperature, social physics.

1 Introduction

Social Combustion Theory (SCT) leads the social system to the evolution direction of social entropy increase by accumulation of "social combustion substances", i.e., the accumulation of microcosmic "basic particles" (individual) in social system from assimilated "basic social energy" to dissimilated one; meanwhile, the catalysis of "social combustion promoter" (social excitation energy) has enhanced the "social temperature" of disordering process of social system and completed the energy accumulation of social entropy increase that can generate the transition. Finally, ignited by the "social trigger threshold", the social system has completed the abrupt change from orderliness to disorderliness. The continuous variation of the above-mentioned three basic non-linear processes has jointly composed the whole contents of social combustion theory. Under the restriction of such conditions of different time (t), different space (α) and different scale (β), it is finally explained as a comprehensive dynamics of social system deterioration.

A 2009 symposium presentation of Chinese ecological economist Wenyuan Niu's 2001 **social combustion theory**. [2]

(add discussion)

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θΔics

In science, **social energetics** is the application of the science of energetics in sociology. [1]

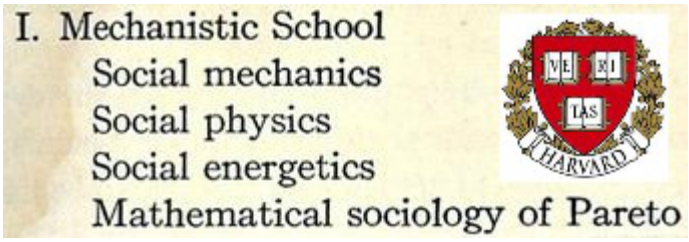

Russian-born American Pitirim Sorokin's 1928 characterization of the "mechanistic school" of sociology, subdivided into social mechanics, social physics, **social energetics** (or social thermodynamics, as he sometimes asserts), and the mathematical sociology of Vilfredo Pareto (which is unique a mixture of the former three). [3]

History

In 1894, Belgian chemist Ernest Solvay founded the *Institute of Social Sciences* in aims to assemble like-minded researchers interested in energetics and sociology. [2]

In 1928, Russian-born American sociologist Pitirim Sorokin devotes parts of his 1928 chapter on the mechanistic school of sociology to a history of social energetics or "social thermodynamics" as he sometimes calls it, which he associates with the representatives of: Ernest Solvay, W. Bechtereff, Wilhelm Ostwald, Thomas Carver, and Leon Winiarski [3]

In 1988, Eugene Rosa, et al, in their "Energy and Society", gave a rather decent historical of the use of energy, theoretically, in sociological theory development. [4]

See also

â— Social energy

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θΔics

In hmolscience, **social energy** is a general term, oft-used in social physics, social mechanics, and or sociological thermodynamics, referring to any of a number of types of "energies" in a social system, modeled as a thermodynamic system, connecting or driving people.

Overview

In 1903, American sociologist Lester Ward, in his *Pure Sociology*, citing Auguste Comte (1830), Leon Winiarski, Hermann Helmholtz, among others, attempted a chapter section on "Social Energy", as shown adjacent, wherein he attempts to address the charge against sociologists who previous to him tended to use "social force" models, not realizing that conservation of force models had since been upgraded to conservation of energy models. [4]

Social Energy.—The only two absolutely irreducible categories of philosophy are *mass* and *motion*. *Space* and *time* are the essential "forms" that these must be conditioned by. Mechanics deals with these four terms. Velocity is the amount of space (distance) that a body (mass) moves through in a given time. It is represented by the space divided by the time $\left(\frac{s}{t}=v\right)$. The quantity of motion (momentum) is the mass into the velocity $\left(\frac{ms}{t}=mv\right)$. If a moving mass collides it exerts its *force* on the mass impinged, thus checking the momentum by transferring a part of the motion to the second body. The force thus exerted is expressed by dividing the momentum by the time $\left(\frac{ms}{t^2}=\frac{mv}{t}\right)$. But the kinetic energy, or *vis viva*, which is what is now understood by physicists by the technical term *energy*, is the product of the mass into the square of the velocity, though if a given force be converted into energy this product must be divided by two. Finally the production or consumption of energy represents the mechanical power, which is to energy what force is to momentum, requiring the energy to be divided by the time.

$$\text{Force} = \left(\frac{ms}{t^2}=\frac{mv}{t}\right).$$

$$\text{Energy} = \left(\frac{ms^2}{t^2}=mv^2\right).$$

$$\text{Power} = \left(\frac{ms^2}{t^3}=\frac{mv^2}{t}\right).$$

Sociologists who speak of social forces have been charged with failing to recognize the great advance that was made in physics by the general substitution of energy for force after the discovery of Joule that it is energy that is conserved.

American sociologist Lester Ward's opening 1903 section on "**social energy**" in his *Pure Sociology*. [4]

In 1910, American historian Henry Adams made a famous demarcation on the topic of social energy, in his argument on the applicability of the second law to human history, who commented on the lack of physical rigor in the thermodynamical understanding of social energy in contrast to the adamant adherence to entropy in the social context (e.g. psychic entropy or social entropy); specifically:

> "Although the physicists are far from clear in defining the term vital energy, and are exceedingly timid in treating of **social energy**, they are positive that the law of entropy applies to all vital processes even more than to the mechanical."

In 2006, Iranian-born American electrical engineer Robert Kenoun outlined a social internal energy minimization theory arguing that the key type of social energy is the internal energy of thermodynamics and that exchanges and equilibriations of this energy between systems and societies, over time, is the key governing process of history and social evolution. [2]

In 2009, American physical chemist Thomas Wallace argued that, in a thermodynamics sense, social energy is interrelated with labor power and has something to do with energy consumption. [3]

Human energy |→ Human free energy

In the early 20th century, generally marked by Lewis' *Thermodynamics: and the Free Energy of the Chemical Substances* (1923), social energy models were supplanted by social free energy, economic free energy, or "human free energy" (in general) models; after which it would have been difficult for someone not trained in chemical thermodynamics proper, e.g. a general humanities major, e.g. an historian, such as Henry Adams (Adams on a rare

exception, being that he attempted to grapple with Gibbs' chemical thermodynamics directly himself, without ever having taken the requisite course), or a sociologist, e.g. Lester Ward, to be able to digress on the subject in any cogent way; the following quote attests to this:

> "It is interesting to note that socio-thermodynamics is only accessible to chemical engineers and metallurgists. These are the only people who know phase diagrams and their usefulness. It cannot be expected, in our society, that sociologists will appreciate the potential of these ideas."
>
> — Ingo Muller (2007), *A History of Thermodynamics* (pg. 164)

This is one of the standing roadblocks presently maintaining the standing or status quo two cultures divide.

See also

- Psychic energy
- Human energy
- Social cannon ball model
- Social free energy

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θΔics

In engineering, **social engineering** is the art, pure and applied, of the construction, design, and building of a given society based on established physical science principles.

Dutch industrialist Jacques Marken (1845-1906) coined of the term "**social engineering**" and "social engineer" in the 1890s, a calling aimed at improving what is amiss in the social world.

History

The first "social engineer", in a roundabout way, according to the outlined discussions of Argentinian fascism-eugenics historian Andres Reggiani, was Greek philosopher Aristotle (see: Another Newton), who with his universal genius grasp of the all the scientific principles of his time, could instruct Alexander the Great into the pure and applied engineering of the successful conquest and societal reform of half the known world, with the continued implementation of Egyptian ideology based Roman-Greek political-government system seen throughout a large part of the world presently. [1]

In 1894, Dutch industrialist Jacques van Marken (1845-1906), pictured, in one of his essays, introduced the term "social engineers" (*sociale ingenieurs*), based on the idea that modern employers needed the assistance of specialists — "social engineers" — in handling the *human* problems of the planet, just as they needed technical expertise (ordinary engineers) to deal with the problems of dead matter (materials, machines, processes). [7] An 1897 summary of this call, by English economist Henry Wolff, is as follows: [8]

> "M. van Marken perceived that there was much amiss in the social world, which called for amendment. And he became the first avowed "Christian socialist" of his country. The harvest was, however, too great for one husbandman. So he pleaded for a new calling to be taken up by public-spirited men, a calling which ho christened "**social engineering**." There are some "**social engineers**" at work now, and they are reaping results."

There does not, to note, seem to be any sort of physical science theory basis to this term, at this point in history.

In 1910, American theologian Edwin Lee Earp (1867-1950) published *The Social Engineer*, wherein he attempted to outline the subject he referred to as "religious social engineering", albeit "while not neglecting to give the widest scope to the work of the social engineer in every phase of social organization for the elevation of humanity, geared as a "text-book on social studies and actual social service", designed for the busy pastor and or men's clubs outlets—a book, however, devoid of the terms: chemistry, physics, and mathematics. [6]

One of the first hmolscience-based uses of the term "social engineering" comes from American physicist and engineer Arthur Iberall who, in his 1974 book *Bridges in Science: from Physics to Social Science*, states the following: [9]

> "It is the possible development of theory (e.g., kinetic theory or sociophysics) and practice (e.g., **social engineering**) that may be useful for men."

Galton-Darwin | Eugenics

In 1883 (or 1885 [4]), English natural philosopher Francis Galton, in the year after his cousin Charles Darwin's death (reaction end), coined the term "eugenics", from the Greek *eu*- 'well', 'good', or true, and *genos* 'birth', a variation of the Greek *eugenes* "well-born, of good stock, of noble race", supposedly, on analogy, syncretism, and or portmanteau of the combination: 'ethics-physics + eugenes', or something to this effect. Galton, supposedly, was under the view that society could breed desired humans the way we breed pigeons.

This *eugenics*, or "study of good genes" research program, supposedly, was a proactive precipitate, in some sense, of his Darwin's 1859 "survival of the fittest" evolution theory and his own 1869 genius studies research program, according to

which, as he believed, genius was inherited; hence, in theory, if society could socially engineer a method to weed out the unfit, a future genius-filled culture would result. [2] English genome historian Matt Ridley states that one of the first to pick up on Galton's eugenics ideas was German polymath Karl Pearson: [4]

> "Galton's first and most influential follower was Karl Pearson, a radical socialist utopian and brilliant statistician. Fascinated and frightened by the growing economic power of Germany, Pearson turned eugenics into a strands of jingoism. It was not the individual that must be eugenic—picking mates with good genes and minds—it was the nation."

Eugenics-based social engineering reached its peek in the 1910s to the 1930s, wherein it was a funded academic discipline at many universities, practiced in many places around the world, and promoted by governments, in various forms of implementation. [3] In the US, for example, between 1910 and 1935, more than 100,000 people were sterilized from being feeble-minded, under more than 30 various state and federal laws enacted. [4]

Eugenics began to fall in popularity in the 1930s when Swiss psychiatrist Ernst Rudin used eugenics as a justification for the racial policies of Nazi Germany, after which the scientific reputation of eugenics started to decline, falling off in all countries.

> "I have heard people talk of the 'scientific' extermination of the Jews in Germany. There was nothing scientific about it."
>
> — Richard Feynman (1963), *The Meaning of it All: a Scientist Looks at Society* (pg. 17)

The last bastion of eugenics program practice occurring in Sweden in 1975. [5] The speculation here, just as with the risen and fall of communism/socialism, is that the continued implementation of said ideology began to go too far against nature—i.e. it was becoming too endergonic—thus requiring more energy to sustain as a practice (or unnatural process) than it was releasing, or something to this effect (see: coupling).

Carrel | Society body-soul engineering

Argentinian fascism-eugenics historian Andres Reggiani cites the 1930s progressive utopian ideas of French surgeon-biologist and social philosopher Alexis Carrel as some type of eugenics-based social engineering promoter, whose models he summarizes as follows: [1]

> "Carrel considered medicine to be the discipline best suited for leading the way to universal knowledge. The role of physicians would be to 'guide' the process of human regeneration by supplying society with 'engineers of the body and soul'."

(add discussion)

Technocracy

Another variant of social engineering is technocracy, conceived by American self-labeled "engineer" Howard Scott, which peaked in the 1930s, although stands of it remain today.

See also

- Applied human thermodynamics
- Human molecular engineering
- Social energy
- Social energetics
- Social ideal gas law
- Social mechanism
- Social physics
- Social physics school

- Human engineering thermodynamics
- Social atom
- Social chemistry
- Social combustion theory
- Social entropy
- Social entropy theory
- Social enthalpy
- Social free energy
- Social mechanics
- Social molecule
- Social Newton
- Social piston and cylinder
- Social system
- Social thermodynamics

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External links

- Social engineering – Wikipedia.

θΔics

In hmolscience, **social enthalpy** refers to the equivalent of enthalpy within a society or between members of a society.

Starkermann

The first to use the term “social enthalpy” was German-born Canadian mechanical engineer Rudolf Starkermann, in his “Social Entropy, Enthalpy, Exergy in Psychosocial Systems: a Notion”, address, given at the 1986 International Conference on Mental Images, Values, and Reality, listed social enthalpy in the following key term format: [1]

E_c = social exergy, the highest possible goal attainment which a specific system can achieve. (This is the attainment after the flow of information has ended, in other words, it is the steady state attainment for s = 0, or the time = infinity; s = Laplace operator).

H_c = social enthalpy, the total information package of a social unit (individual), which includes the speed of association of thoughts, the speed of action and the will power a) to reach its own goal and b) to communicate. H_c can differ from individual to individual.

S_c = social entropy, the density of communication (the number of communicating individuals and the number of communication channels among the individuals), the amount of information exchanged per channel (an amount can be softened down, transferred on an equivalent level or it can be exaggerated) and the rating of exchanged information (information can be goal supporting--devotional, or goal damaging--aggressive or destructive). Amount, density and rating can differ from individual to individual within a system.

V_c = the speed of exchanged information which is analogous to T_2 of equation (1). In thermodynamics, the temperature is directly

A snippet of section from Rudolf Starkermann's 1986 definition of social exergy, **social enthalpy**, and social entropy; along with a partial section on how the speed of exchanged information, supposedly, purportedly between the members of a society, is analogous to some type of temperature (or social temperature?). [1]

> “H_C = **social enthalpy**, the total information package of a social ° unit (individual) , which includes the speed of association of thoughts, the speed of action and the will power a) to reach its own goal and b) to communicate. H can differ from individual to individual.”

As the term “social enthalpy” is a very advanced term in human thermodynamics, one that generally is considered to involve "heat content" and changes to bond energies of the molecules of the system, involving two quantitative parts: social internal energy and social pressure-volume work, arrived at after all the other social energy, social entropy, social temperature, etc., terms have been exhausted and played with, this would explain why Starkermann’s article is not cited by anyone, according to Google Scholar (0), himself (1988) aside—namely, because it is a very deep and more difficult connection to make, connecting enthalpy to society. .

Another ripe passage from the conference, is the following: [1]

realities, the willed future, and the planned initiatives expected to move the organization towards the willed future. To date, we have assisted top management in 35 situations to prepare such a plan. It has no quantification or stated specific time dimension. It is written in binding words.

Related systems theories include Ashby's views on adaptation, the concepts of equifinality, autopoieses, and Le Chatelier's principle.

showing, possibly Starkermann, attempting to formulate an organization management theory, employing: Ross Ashby's theories on adaption, equifinality, autopoieses, and Le Chatelier's principle. Somehow, as shown adjacent, we see with Starkermann's discussions of "information packet", "exchanged information", etc., would seem to be mixed up with Claude Shannon, in some way or another, and information theory, who is cited in the conference.

In 1988, Starkermann, in his “Social Entropy, Enthalpy, Exergy and Disergy in Examples”, gives the following abstract: [2]

> "For the thermodynamic terms entropy, enthalpy and exergy, parallel terms for the psychosocial area of communication are illustrated. The thermodynamic notion energy is paralleled by dynamic information, the molecule by a goal-oriented social individual, exergy by the maximum goal attainment of the individuals who constitute a communication system, enthalpy by the will of action and the associated activity, and entropy by the density of communication, the amount of information exchanged and the classification of communication (as devotional, aggressive or destructive). The absolute temperature in thermodynamics is paralleled by the speed with which information is exchanged. The term disergy (distracting energy) is added and illustrated in cases where the communication system is open to outside environment."

Much of this basis of logic, it seems, resulted in Starkermann's 2003 three-part *Amity and Enmity: Two Archetypes of Social Existence: an Interdisciplinary Study*. [3]

Rossini

In 1971, American chemical thermodynamicist Frederick Rossini, in his "Chemical Thermodynamics in the Real World" Priestly Medal address, presented a description of enthalpy in society as being the measure of "security" as contrasted to "entropy" which he equates to the measure of freedom. [3]

Other

In 2013, German effectiveness coach Deb Preuss tweeted the following: (Q)

> "Looking for a word. Describes a property of a person who promotes **social enthalpy**. Sounds weird, but it's a great word, and I've lost it!"

It is difficult to envision what Preuss is after here, aside from some type of thermal word, such as warmhearted.

See also

- Applied human thermodynamics
- Human molecular engineering
- Human engineering thermodynamics
- Social atom
- Social chemistry
- Social combustion theory
- Social energy
- Social energetics
- Social entropy
- Social entropy theory
- Social free energy
- Social ideal gas law
- Social mechanism
- Social mechanics
- Social molecule
- Social Newton
- Social physics
- Social physics school
- Social piston and cylinder
- Social system
- Social thermodynamics

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(b) Starkermann, Rudolf – WorldCat Identities.
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(b) Starkermann, Rudolf. (2007). *Amity and Enmity: Two Archetypes of Social Existence: an Interdisciplinary Study, Part II* (pdf). Zurich: Feedcross.

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θΔics

In hmolscience, **social entropy**, as used in fields such as sociological thermodynamics, physicochemical sociology, etc., is the extrapolation of the "entropy", of thermodynamics (or in some misinformed cases from information theory), to sociological phenomena defined in the context of social systems or social states; generally thought of as an energy-themed "social disorder", so to say, however incorrect this may be, in a laymanized thermodynamics sense.

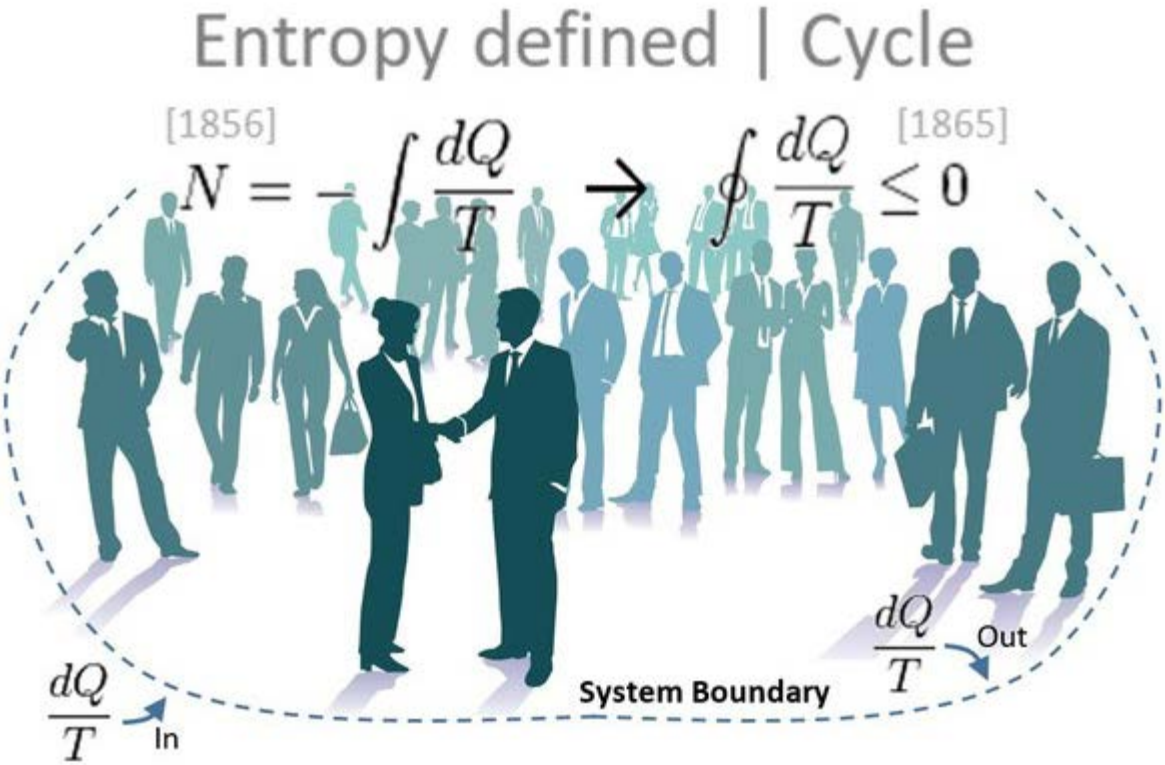

A basic visual of "**social entropy**", i.e. entropy applied sociologically, namely that from the sum of all the entropy (dQ/T) differentials going into or out of a system, where "a quantity of heat absorbed by a changing body is positive, and a quantity of heat given off by it is negative, for cyclical processes where the changes occur in a non-reversible manner" (Clausius inequality, 1865), must equal the negative of the equivalence value of all uncompensated transformations (-N), per 1856 definition of entropy, or be less than or equal to zero, per 1865 definition of entropy.

Note | Confusion

Two main salient, albeit oft-unstated, aspects of confusion surrounds "entropy", in its original universal formulation by Clausius (1854/1865) (see: entropy etymology), extrapolated to social systems. Firstly, entropy, in some specifically defined processes (e.g. adding heat to an ice cube) entropy increase can be correlated to a molecular disorder increase. This, however, is not a universal definition or model of entropy. The following is a typical example of confusion:

> "To the layman, the second law of thermodynamics states that over time systems become more 'disordered'. Does sociology have anything to say about this? Do societies tend to become more disordered over time as well?"
>
> — NWH (2013), PhysicsForums.com post (Ñº), Feb 26

The second law, in short, does not say that all systems tend towards disorder over time. This is what is called laymanized thermodynamics gone wrong; a result of simplified explanations taken as fundamental explanations.

Secondly, entropy, per the infamous 1941 joke suggestion of John Neumann (see: Neumann-Shannon anecdote), entropy is often taken as a measure of information, in the binary number, Boolean operator, computer science sense of things, which is a mathematical isomorphism, and therefore not fundamentally correct, in a thermodynamic sense. [8]

Overview

Social entropy, in oft-used colloquial sense, refers to manifestations of entropy, defined as the amount of energy unavailable for doing work in a given process, in a given social system, distinguished by modes of negative behaviors, specifically alienation, anomie, and deviance, that function to instill a disordering effect in a given social structure or order. [1] These anomalous behaviors are seen as withholdings or cross uses of the deviant manifestations of the human energies that normally go into support or fulfillment of the norms, roles, and statuses that make up a social order.

History

In 1874, Peter Tait, during an address to graduating arts students of Edinburgh University, gave the earliest English usage coinage of the term “social entropy” as follows: [9]

> “The application of these ideas [of second law energy degradation] to political and social questions, among which of course comes university centralization, is not far to seek. What would the world of men be without what we may call **‘social entropy’**? Everyone would then be his own farmer, baker, butcher, brewer, banker, boot-black, &c.—all would be at the same dead level [see: heat death]—no possible help from one to his neighbor, even if it could be required; no distribution of tasks, and therefore (in every department) that endless waste which is inevitable in operations conducted on a petty scale. No possibility of that mutual reliance and assistance which forms the friendships we delight in, none of that variety which is the real charm of life—no idea which would not simultaneously strike every unit of the race—no news, no books—nothing but sameness! None of the pleasure of being able to assist struggling worth, none of gratitude for generous aid. Nay, we might pursue it further. No difference of temper, character, tendencies, age, sex—a state lower than the lowest known in vegetation; but here the end must come. Or, to take a somewhat different point of view (though the basis is absolutely the same, for oscillation implies entropy), what if everything were always at its average value? Never absolutely either fair or rainy weather, clear or cloudy, calm or stormy, hot or cold; but a dead average. Never either absolutely day or night; no tides, no seasons; men never either absolutely awake nor absolutely asleep—continually in a semi-lethargic state— half happy, hall discontented; half playful, half serious— neither running, walking, standing, sitting, nor lying, but a perpetual average. No catastrophes such as a birth, a marriage, or a death —no distinction between man and man—nothing of that variety which is the law of nature. Eternal, hideous, intolerable sameness, by necessity devoid of all capacity for action: the human race turned into a set of Nurnberg toy-solders, all cast in the same mould, of the same base material, and all similarly bedaubed from the same glaring paint-pots, and moving on the same lazy-tongs with the same relative velocities. No one to advise you in a difficulty, no one in whose superior strength of mind or body you could confide; nothing around you except what you feel must be but the image of yourself (as you will early have learned introspectively to look at it)—mean, sordid, and groveling! No one whom you can respect, none to trust—all, like yourself, vile and despicable! II ere I would gladly say—' Enough of such horrors,' and quit the disgusting theme. But, unfortunately, the application has still to come. It will be found very pertinent to many things which have been of late evolved from the innermost consciousness of statecraft, and hailed, with altogether inexplicable delight, by what seemed (till lately) to be at least a numerical majority of the representatives of our countrymen.”

Here, we note that Tait seems to be using the William Thomson model of the second law, which is not fully correct, in a universal sense, and not the same as entropy, defined by Clausius; we also note that Tait himself did not have a correct understanding of entropy, as evidenced by James Maxwell had to “correct” the fourth edition of his *Theory of Heat*, to fix the erroneous model of entropy he had previous learned from Tait (see: entropy misunderstandings).

In 1894, Leon Winiarski, of the so-called “mechanistic school”, in the lectures to his *Essay on Social Mechanics*, gave the first equation based usage of entropy, e.g. the Clausius inequality, applied sociologically; this would seem to be the most dominate example of entropy used in sociology.

The etymology of the term "social entropy", used in a significant sense, for modeling purposes, according to Robert Nisbet (1970), is said to trace back to the 1890s to 1900s work of philosopher-historians Brooks Adams and Henry Adams who applied the concept of entropy to human affairs, viewing it as a tendency seen in the histories of whole nations or civilizations, a tendency characterized by a running-down of human energy, of a diminished capacity for meeting the problems set by that nation or civilization. [1]

In 1934, Joseph Unwin, in his *Sex and Culture*, was theorizing about "human entropy" in the context of social sexual restraints; Aldous Huxley (1938) summarized Unwin's views as follows:

> “Where productive energy persists for some time, a factor which Unwin calls ‘human entropy’ comes into play. Human entropy is the inherent tendency, manifested as soon as the suitable social conditions are created, towards increased refinement and accuracy. ‘No society can display productive social energy unless a new generation inherits a social system under which sexual opportunity is reduced to a minimum. If such a system be preserved a richer and yet richer tradition will be created, refined by human entropy’.”

In 1968, Amitai Etzioni described "social entropy" as a state of society in which no social bonds are present. [3]

In 1986, Klaus Krippendorff, in his *Entropy, Diversity, and Variety* (Ñº), was defining entropy, albeit in the information theory context, as “a measure of observational variety or of actual (as opposed to logically possible) diversity.” Krippendorff defined social entropy as a measure of the natural decay of the structure or of the disappearance of distinctions within a social system. He reasons that much of the energy consumed by a social organization is spent to maintain its structure, counteracting social entropy, e.g., through legal institutions, education, the normative consequences or television, and that anomie is the maximum state of social entropy. [5]

In 1990, American sociologist Kenneth Bailey published *Social Entropy Theory*, a nonequilibrium approach of societal analysis using a mix of Ludwig Bertalanffy's general systems theory, Claude Shannon's entropy, and Rudolf Clausius' entropy. Bailey defines an "isomorphic complex system" as being comprised of human individuals as the components, interaction of these components, and the national (political) border of the country, with the latter serving as a boundary for social interaction. [4] Bailey also included a section titled the "History of Social Entropy", in which he traces the use of thermodynamics and entropy in sociology from Pareto to Prigogine to Samuelson and others in the literature. [4]

In 2001, Peruvian engineer Alfredo Infante wrote a short article entitled "Social Entropy" in which he discussed the advanced intelligence perspective, Gibbs free energy, among other topics. [7]

In 2008, American physical chemist Thomas Wallace argued that "societal entropy", as determined by the second law, mandates the spontaneous direction of all processes of nature and society and the generation of greater complexity and disorder. [6]

Social bond

Social entropy is said to be one of the elements or components of the social bond, which, according to American sociologist Robert Nisbet, mediates a part of the force that enables "biologically derived human beings to stick together in the *social molecules* (human molecular aggregates) in which we actually find them from the moment, quite literally, of their conception. [2]

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6. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (pg. xi). AuthorHouse.
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The following are articles that cite and or heavily rely on this Hmolpedia article:

â— Bera, S. and Acharjee, S.K. (2013). “Estimation of Social Entropy: the Dictum of NEO Modernism in Agricultural Knowledge Environment in India” (pdf), *International Journal of Agriculture and Food Science*, 4(10):989-98.

Videos

â— Riva, Adam. (2018). “#10 Justin Deschamps | The Psychological Mechanism of Social Entropy” (Ñº), Dauntless Dialogue, Jun 10.

External links

â— Social entropy – Wikipedia.

θΔics

→ **See: social entropy**

See also

- Human entropy
- Economic entropy
- Political entropy
- Psychic entropy

θΔics

In hmolscience, **social exchange force** refers to a non-metaphorical "exchange force" operating socially between people, mediated by field particles—either photons, gravitons, and or a combination of the both—in the form of either an electromagnetic force, gravitational force, and or a gravito-electromagnetic force.

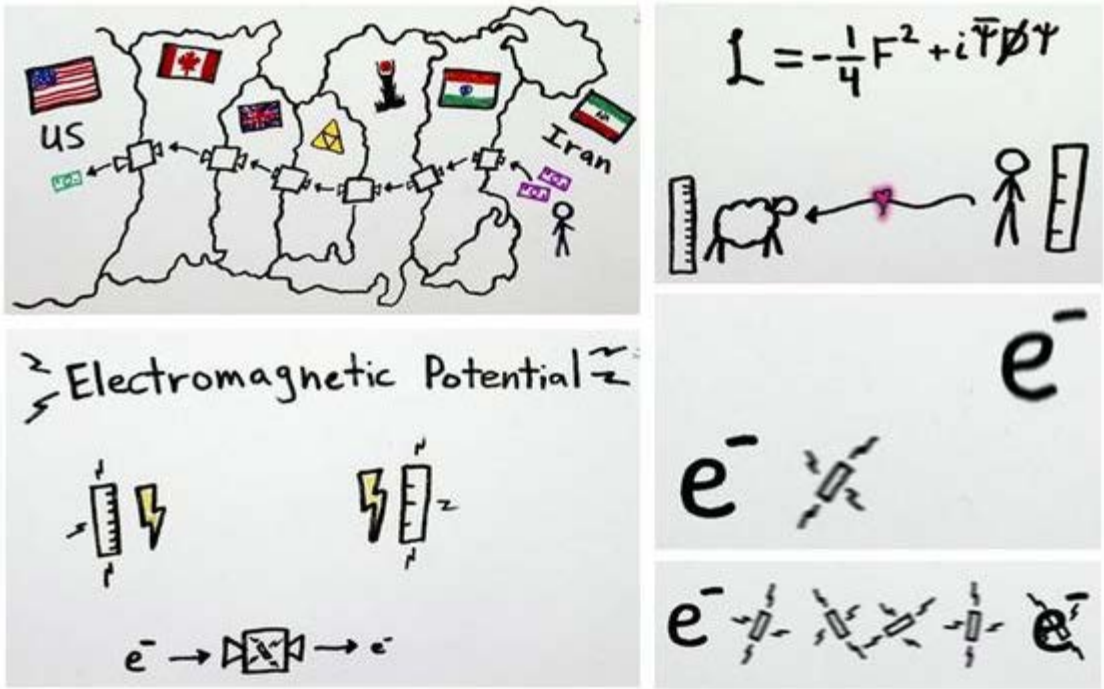

Some 2012 MinutePhysics video (Q) screenshots of exchange force applied to economic interactions, wherein they explain the money as an exchange rate particle, or long-range interaction mediated by a particle, in which the photons actuate momentum transfers between electrons, whereby the exchange force becomes equivalent to "momentum transfer"; in the caption of which a 2009 paper (Q), on gauge theory in economics, by Lee Smolin, is cited.

Overview

In 1993, Canadian political scientist Paris Arnopoulos, in his *Sociophysics*, gave an outline of the premise of an exchange force operating socially, as follows: [1]

> "All entities, whether fermions or humans, need some mediating agency to interconnect them into systems. This indispensable interrelating and interacting role is ultimately played by different field particles named bosons. Unlike fermions, which are characterized by a significant mass and charge, bosons do not take partake of these to attributes. Rather, they only have spins and provide connections as they are exchanged among fermions."

> Such exchanges are of three kinds: weak or strong nuclear, electromagnetic, and gravitational. The first exist by sharing gluons and thus hold together the atomic nucleus. The second take place by exchanging photons and thus explain most of our ordinary phenomena. The third operate by the displacement of gravitons and thus provide the overall attraction between everything in the universe. Similar phenomena occur up the ontological ladder to describe social, as well as atomic and galactic bonding. Societies, like all systems, are held together by certain ties of varying strength and extent."

(add discussion)

In 2007, American electrochemical engineer Libb Thims, in his *Human Chemistry*, published an outline of a field particle mediated "exchange force" operated model of social interactions, via the use of primary field particle and secondary field particle model scheme. [2]

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2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.

In hmolscience, **social fermion**, as compared to "social boson" (or social fermion-boson composite), refers to conjecture that a human us a type of fermion.

Overview

In the late 1970s, people began to ruminate on what humans were in terms of the new fermionic bosonic classification of the universe; the following are the two dominate examples:

> "Are humans **fermions** or bosons?"
>
> — Ed Stephan (1977), speculative discussions with physicist Louis Barrett [1]

> "All entities, whether **fermions** or humans, need some mediating agency to interconnect them into systems. This indispensable interrelating and interacting role is ultimately played by different field particles named bosons. Unlike fermions, which are characterized by a significant mass and charge, bosons do not take partake of these to attributes. Rather, they only have spins and provide connections as they are exchanged among fermions."
>
> — Paris Arnopoulos (2005), *Sociophysics* [2]

In 2012, Romanian physicist Radu Chisleag, in his "A Quantum Model May Explain the Infringement of Some Financial Rules in Spite of Stiff Supervision", outlined a type of social physics model, wherein he applied the Schrodinger equation of Erwin Schrodinger and the de Broglie waves of French physicist Louis de Broglie to the situation where "some individuals, even having been granted the right to act, are rejected at the step"; at the end of which comments on how stock market players might be bosons or fermions: [3]

> "A special class of barriers, of those having an axis of symmetry (symmetrical potential), is very important because the solutions of the Schrodinger equation spit themselves in two distinct classes: symmetrical and anti-symmetrical solutions. As is shown in quantum statistics the symmetrical solutions are describing the behavior of bosons (system particles able to occur in any number in a givens state) and **fermions** (system particles that can occur in different states only). This distinction between bosons and fermions would be important for players, eventually corresponding to those cooperating or respectively competing."

In Mar 2015, a Quora query "Is a Person a Fermion or a Boson?" was posted, which generated seven answers. [4]

In Aug 2015, Libb Thims, with Atheism Reviews cohost Thor, taught an atheism for kids class, entitled "Zerotheism for Kids", to five kids ages 6 to 11, wherein it was explained, in nutshell kids logic, that "fermions are things you can "touch", like the fur on a giraffe, and bosons are things you can "feel", like the light coming out of the TV, heat from the blow torch, or cold air from the air conditioner", citing Ed Stephan (1977) and Paris Arnopoulos (2005) as historical examples of topic discussion. [5]

Quotes

The following are related quotes:

> "It's all just quarks [fermions] and gluons [bosons]."
>
> — Terrence Deacon (2011), paraphrase of Jerry Fodor (1998), i.e. "Why is there anything except physics?", on Jaegwon Kim's critique of emergentism [6]

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1. Stephan, Ed. (1995). *The Division of Territory in Society*. EdStephan.org.
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3. Chisleag, Radu. (2012). "A Quantum Model May Explain the Infringement of Some Financial Rules in Spite of Stiff Supervision" (GB), in: *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (editor: Gheorghe Savoiu) (§6, pgs. 79-89; correspondence table, pg 81). Associated Press.
4. Is a person a fermion or a boson? (2015) – Quora.com.
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θΔics

In hmolscience, **social field** is region in which a social body experiences a force as the result of the presence of some other body or bodies.

Overview

In 1994, Dirk Helbing, as cited by Yi-Fang Chang (2013), developed a mathematical model, supposedly, for behavioral changes under the influence of a social field. [1]

In 2012, Ram Poudel began working on a social field theory, conceptually-based on a Navier-Stokes equation (Q), i.e. a "social fluid" model themed logic.

In Mar 2019, Poudel, and co-author Jon McGowan (Q), submitted "The Dynamics of Human Society Evolution: an Energetics Approach" to the Hindawi-based journal *Complexity* (Q), the abstract of which is the following: [2]

> "Human society is an open system that evolves by coupling with various known and unknown (energy) fluxes. How do these dynamics precisely unfold? Energetics may provide further insights. We expand on Navier Stokes' approach to study non-equilibrium dynamics in a field that evolves with time. Based on the 'social field theory', an induction of the classical field theories, we define social force and social energy and Hamiltonian of an individual in a society. The equations for the evolution of an individual and society are sketched based on the time-dependent Hamiltonian that includes power dynamics. In this paper, we will demonstrate that Lotka-Volterra type equations can be derived from the Hamiltonian equation in the **social field**."

The article is dedicated to Richard Adams and his *The Eighth Day*.

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(b) Chang, Yi-Fang. (2013). "Social Thermodynamics, Social Hydrodynamics, and Some Mathematical Applications in Social Sciences" (pdf), *International Journal of Modern Social Sciences*, 2(2):94-108.
2. Poudel, Ram and McGowan, Jon. (2019). "The Dynamics of Human Society Evolution: an Energetics Approach", 37-page article submitted to *Complexity* (reviews: Arto Annila, James Dixon (Q), and anon), Mar 10.

Further reading

● Poudel, Ram. (2014). "Social Field Theory" (Q), Blog, E4cdp.org, Nov 15.

θΔics

In laws of motion, **social first law of motion** is the first law of motion applied socially, i.e. to human movement or motion (see: human motion); this, to note, is a convoluted, and difficult, topic, per reason that it conflicts with anthropomorphic-based notions of self-motion (and free will).

Overview

In c.300BC, Aristotle has a rudimentary idea of the first law of motion applied socially, in respect to his general four element theory scheme of heavier elements moving downward and lighter elements moving upward, with humans, comprised of, supposedly, all four elements having an intermediate movement; Aristotle's movement theory, however, to note is clogged up with Plato's soul mate theory, according to which humans, while being made of four elements, each have a split soul and thereby naturally tend to move in the direction of the missing half soul, or something to this affect.

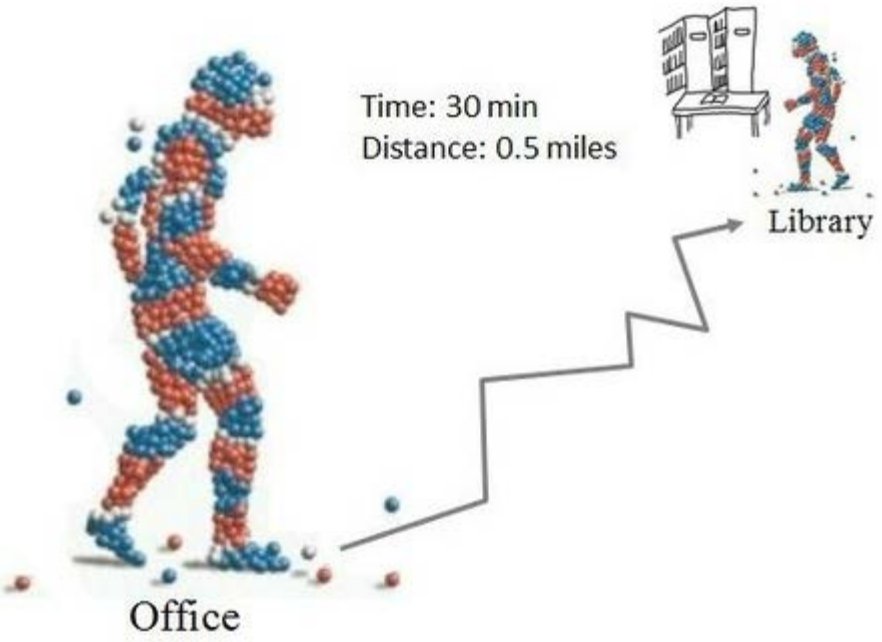

The 1992 "library walk problem", conceived by Jaegwon Kim, wherein a person, who is writing an article at their desk, suddenly realizes they need to check a reference, and 30-minutes later winds up at the library, is a classic example of the first law of motion applied socially, i.e. a **social first law of motion**.

In 1770, Baron d'Holbach, in his §2: Of Motion and its Origin, of his *System of Nature*, outlined a semblance of a first law of motion applied socially; the following three quotes, combined, seem to capture the gist of the Holbach-Maxwell view of things:

> "Those which cannot act on any of our organs, either immediately and by themselves, or mediately, by the intervention of other bodies, exist not for us; since they can neither move us, nor consequently furnish us with ideas: they can neither be known to us, nor of course be judged of by us. **To know an object, is to have felt it; to feel it, it is requisite to have been moved by it**."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 16)

> "The **only thing which can be directly perceived by the senses is force**, to which may be reduced light, heat, electricity, sound and all the other things which can be perceived by the senses."
>
> — James Maxwell (1847), age 16 answer to homework exercise for Scottish philosopher William Hamilton (1788-1856) on the properties of matter

> "Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But **as soon as the body moves under the influence of the force, work is performed**."
>
> — Rudolf Clausius (1875), "Mathematical Introduction"

The library walk problem (1992), conceived by Jaegwon Kim, as shown below, would seem well apt to illustrate the points at hand: [4]

> Scenario: “It occurs to you that you need to check a few references for an article you are writing, so you decide to walk over to the library after your office hours. Miracle of miracles! In half an hour, you find your body, all of it, at the front steps of the library, half a mile away. Think of all the molecules that make up your body: each of them has traversed the half-mile, zigzag path from your office to the library, and your whole body is now where it is.”
>
> **Question**: “What explains the spatial displacement of your body from the office to the library? What caused the motion of each and every molecule of your body over the half-mile path?”

Here, in Holbach speak, the writer or professor, who is at his or her office, writing an article, comes to "know an object", a reference in particular, e.g. the footnote 2.5 reference to Goethe's "Mittler the mediator" (which, in 2006, moved Thims greatly), and to "known an object", such as a reference the piques the interest, as compared to a non-interesting stone sitting in the bushes (see: John Ruskin), is "to have felt it", and to **feel a "thing"**, which can only be "directly perceived by force", in Maxwell speak, it is requisite to "have been moved by it", and as soon as the body, namely the writer (or professor), "moves under the influence of the force", in Clausius speak, "work is performed", i.e. the body is moved through a distance, the product of the force times the distance moved being the measure of the work, in joules.

In 1892, Karl Pearson, in his *The Grammar of Science*, gave the first disproof of the premise of the existence of a "self-determined" system, aka self-motion disproof, using recourse to the first law of motion or the principle of inertia, as he referred to things, as follows: [2]

> “We cannot at present assert that the peculiar atomic structure of the life-germ and its *environment*, or field (p. 286), would not be sufficient to enable us on the basis of the laws of atomic motion to describe our perceptual experience of life. Such a broad generalization as that of the conservation of energy does not appear to be contradicted by our experience of the action of living organisms; but then the conservation of energy is not the sole factor of mechanism, as some fetish-worshippers nowadays imagine it to be. There is, for example, the **principle of inertia**, the statement that no physical corpuscle need be conceived as changing its motion except in the presence of other corpuscles, that there is no need of attributing to it any power of **self-determination** (p. 287). There are probably those who think some power of self-determination must be ascribed to the elementary organic corpuscle, but this seems very doubtful. Placed in a certain field, environed with other organic or inorganic corpuscles, the life-germ moves relatively to them in a certain manner, but there seems no reason to assert (indeed there are facts pointing in the exactly opposite direction) that any change of movement need be postulated were the life-germ entirely removed from this environment. Indeed the whole notion of self-determination as an attribute of living organisms seems to have arisen from those extremely complex systems of organic corpuscles, where the environment in the form of immediate sense-impressions determines change through a chain of stored sense-impresses peculiar to the individual or self (p. 124).”

In 1900, Nikola Tesla, in his “The Problem of Increasing Human Energy”, wherein he stated the following belief state or view on what a human is: [2]

> “I am an automaton endowed with power of movement, which merely responds to external stimuli beating upon my sense organs.”

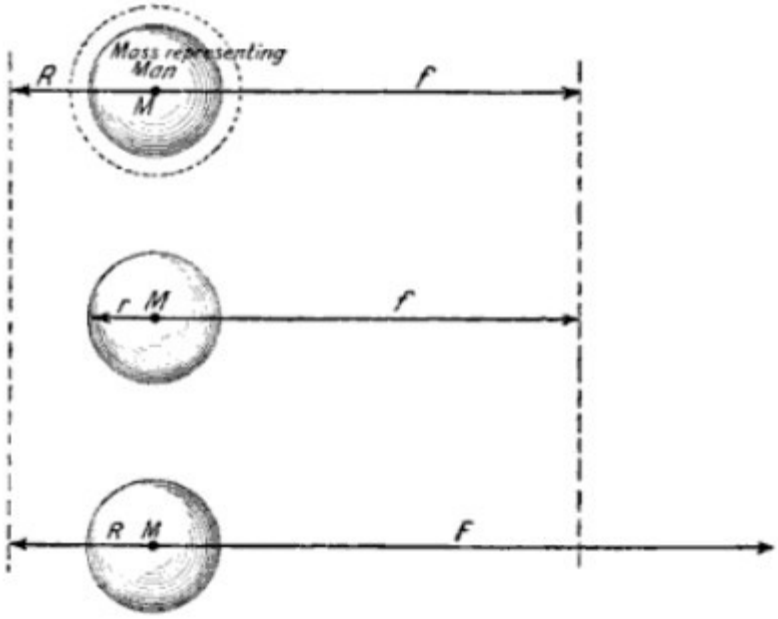

Tesla's 1900 **human energy diagram:** the three ways if increasing human energy (top, middle, bottom). The symbol M representing the mass of an average person, acted on by positive forces (impelling forces) and negative forces (retarding forces), which act to either accelerate or impede human motion. [2]

Tesla opens with a crude diagrammatic model of "human energy", shown adjacent, discussing rather cogently the impelling and retarding forces to human movement, the first part of which being an implicit reference to the first law of motion applied socially:

> "Let *M* represent the mass of man. This mass is impelled in one direction by a force *f*, which is resisted by another partly frictional and partly negative force *R*, acting in a direction exactly opposite, and retarding the movement of the mass. Such an antagonistic force is present in every movement and must be taken into consideration. The difference between these two forces is the effective force which imparts a velocity *V* to the mass *M* in the direction of the arrow on the line representing the force *f*. In accordance with the preceding, the human energy will then be given by the product:
>
> Human energy = $\frac{1}{2}mv^2$
>
> where *M* is the total mass of man in the ordinary interpretation of the term "mass," and *V* is a certain hypothetical velocity, which, in the present state of science, we are unable exactly to define and determine. To increase the human energy is, therefore, equivalent to increasing this product, and there are, as will readily be seen, only three ways possible to attain this result, which are illustrated in the above diagram.
>
> The first way shown in the top figure, is to increase the mass (as indicated by the dotted circle), leaving the two opposing forces the same. The second way is to reduce the retarding force *R* to a smaller value *r*, leaving the mass and the impelling force the same, as diagrammatically shown in the middle figure. The third way, which is illustrated in the last figure, is to increase the impelling force *f* to a higher value *F*, while the mass and the retarding force *R* remain unaltered. Evidently fixed limits exist as regards increase of mass and reduction of retarding force, but the impelling force can be increased indefinitely. Each of these three possible solutions presents a different aspect of the main problem of increasing human energy, which is thus divided into three distinct problems."

(add)

Quotes

The following are related quotes

> "Even when a society has got upon the right track for the discovery of the natural laws of its movement—

and it is the ultimate aim of this work, to lay bare the economic law of motion of modern society—it can neither clear by bold leaps, nor remove by legal enactments, the obstacles offered by the successive phases of its normal development. But it can shorten and lessen the birth-pangs."

— Karl Marx (1867), *Capital: a Critique of Political Economy* (preface) [3]

See also

â— Library walk problem

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θΔics

In human physics, **social force** is a force that results or is mediated by social interactions, processes, or reactions between human molecules, the underlying nature of which is the electromagnetic force. [1]

Overview

In 1728, John Desaguliers, in his *The Newtonian System of the World: the Best Model of Government*, outlined what seems to have been the first draft of a "Newtonian government", arguing how the ideal government should be run according to celestial mechanics; the following is a related quote:

> "A **gravity-like force** of attraction is now as universal in the political as in the philosophical world."
>
> — John Desaguliers (1728), *The Newtonian System of the World* [4]

In 1854, French philosopher Auguste Comte, in his *System of Positive Polity: or System of Sociology*, was theorizing about "social force", in terms of things such "moral power"; the following being one truncated statement: (O)

> "All **social force** is at once material, intellectual, and moral."

In 1862, English natural philosopher Herbert Spencer was promoting some type of calculus of forces theory of social force.

In 1904, William James, in objection to Spencer's theory of social forces, raised the following objections: [2]

> "But what on earth is **'social force'**? Sometimes he identifies it with 'social activity' (showing the latter to be proportionate to the amount of food eaten), and sometimes with the work done by human beings and their steam-engines, and shows it to be due ultimately to the sun's heat. It would never occur to a reader of this pages that a social force proper might be anything that acted as a stimulus of social change,—a leader, for example, a discovery, a book, a new idea, or a national insult; and that the greatest of 'forces' of this kind need embody no more 'physical force' than the smallest. The measure of greatness here is the effect produced on the environment, not a quantity antecedently absorbed from physical nature. Mr. Spencer himself is a great social force; but he ate no more than the average man, and his body, if cremated, would disengage no more energy."

The tricky issue that James is grappling with here, in regards to the discorrelation between the average food intake versus the average greatness of a person is that food intake is surface-substrate interaction factor that only effects the lowering of the activation energy barrier to a reaction, whereas free energy change is what quantifies the relative greatness of a person, in that the latter is a result of person-to-person or person-to-society human chemical reaction factors.

In 1922, Howard W. Odum established the *Journal of Social Forces*, renamed *Social Forces* (1925), a publication outlet focused on: sociology, primarily, but also related fields, such as: social psychology, anthropology, political science, history, and economics. [3]

Thermodynamics

In thermodynamic terms, the social force is quantified as Gibbs free energy differentials, aka the isothermal-isobaric "force function" or the driving force of human interactions, human reactions, and human processes. The translation of "free energy" to "force", to note, is not a one-to-one translation, being that according to the affinity-free energy equation, the affinity A or chemical affinity is the force of reaction, whereas the free energy change, F or G, or available energy measure of the affinities.

See also

- Social pressure
- Entropic force

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External links

- Social force model – Cs.UCF.edu.

θΔics

In hmolscience, **social free energy** is the quantification, in sociological thermodynamics, of the free energy, i.e. human free energy, or more accurately Gibbs free energy, of a social system or a verbal description of it.

Overview

In 2004, Croatian mechanical engineer Josip Stepanic, in his "Social Equivalent of Free Energy", was theorizing about social free energy.

In 2006, Stepanic reasoned that a part of socio-economic activity is expressible and measurable by way of social free energy. [1] Stepanic defines social free energy as a measure of resources which can be transferred for a given purpose within a social system without changing its structure. [2]

See also

- Social energy

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θΔics

In hmolscience, **social friction** refers to friction within or between social groups, systems, or societies; mechanistically described at the microlevel in terms of frictions, and social heat generated therefrom, between people or human molecules.

A Buchanan-Gladwell model (2001) of social physics, defined by concepts including: social heat, tipping points, activation energy, connectors, six degrees, Dunbar numbers, etc.; the above diagram showing how the rubbing of Bosnia with Austria-Hungray created "**social friction**" which on 28 Jun 1914 produced enough heat (or social heat) to "spark" the flame or social combustion of the first world war. [2]

Overview

In 1858, Henry Carey seems to have been the first to explicitly introduce a model of social friction; the gist of which being summarized by Werner Stark (1962) was follows: [1]

> "In the physical universe, heat is engendered by friction. Consequently the case must be the same in the social world. The 'particles' must rub together here, as they do there. The **rubbing of the human molecules**, which produces warmth, light and forward movement, is the interchange of goods, services, and ideas."

In the 2000s, ideas on social activation energy began to appear, e.g. Mark Buchanan (2000), Malcolm Gladwell (2001), etc., which allude to Carey-like models of social friction, albeit without stating so directly. Buchanan, e.g., asserts that the "forces" behind the nineteen-year-old Bosnian Serb Gavrilo Princip, a member of the Serbian terrorist organization Black Hand, acting or "working" to pull the trigger of a gun, on 28 Jun 1914, pointed at Austro-Hungarian archduke Franz Ferdinand, thereby "tipping" (see: tipping point) history into WWI and then WII, to the premise that small but significant social heat like triggers work or act as social activation energy barrier surmounters, i.e. the embodiment of the process when the heat of friction (or social friction), of striking a match works, triggers the activation energy barrier to combustion thus lighting the match into flame.

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θΔics

In human physics, **social gravitation** or "social gravity" is a force, posited to exist, which attracts people towards each other, being proportional to their masses, and inversely proportional to their distance of separation. [1] It is often said that ‘certain people tend naturally to gravitate towards each other’; whereas others tend naturally to recede or be repulsed by certain people.

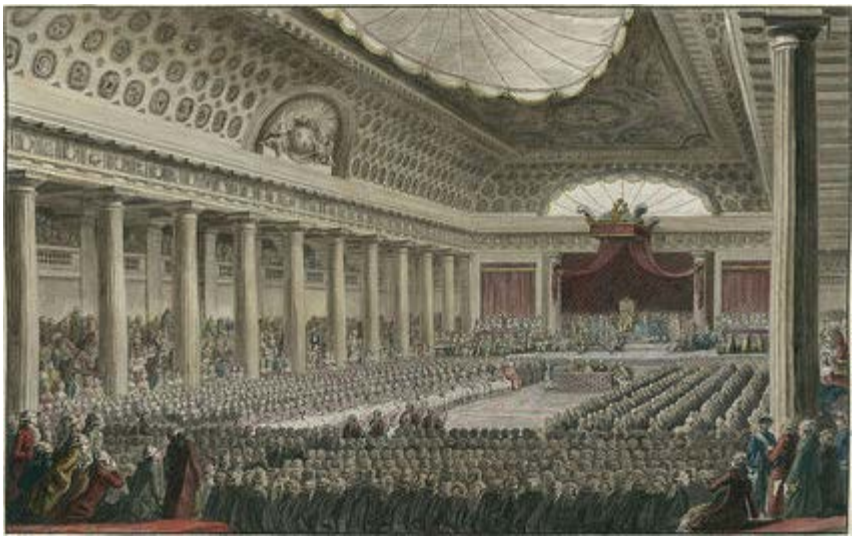

In 1837, Scottish philosopher-historian Thomas Carlyle described the members of the States-General of 1789 and the National Convention, depicted above, into which it was transformed, as " gravitating bodies", a **social gravitation** like description. [5]

Berkeley

In 1713, Irish-born English philosopher George Berkeley, in his "Moral Attraction" essay, outlined a social gravity theory; one example of which is the following: [4]

> “Now, if we carry our thoughts from the corporeal [planetary] to the moral world, we may observe in the spirits or minds of men a like principle of [gravitational] attraction, whereby they are drawn together in communities, clubs, families, friendships, and all the various species of society.”

(add discussion)

Algarotti

In 1737, Italian natural philosopher Francesco Algarotti, in his *Newtonianism for the Ladies*, employed "the inverse square law to calculate the power of attraction between a pair of separated lovers".

Carlyle

In 1837, Scottish philosopher-historian Thomas Carlyle was employing some type of social gravitation theory and or metaphor.

Carey

In 1858, American sociologist Henry Carey, in his *Principles of Social Science*, used the physics model of gravity to account for the formation of large cities, on the assumption that all the corollaries of the physical principle of gravitation, as extolled by English physicist Isaac Newton in his 1686 *Principia*, are assumed to apply to social phenomena; in simple terms, according to Carey: [2]

> “The great law of **molecular gravitation**, the indispensable condition of existence, [is that] man tends of necessity to gravitate towards his fellow man.”

Carey’s principle of social gravitation, as it is called by American sociologist Werner Stark, or ‘law of molecular gravitation’, as Carey called it, expounds on the view that human molecules, or man the ‘molecule of society’, as Carey puts it, tend to attract toward each other into the formation of large cities. In explaining how his social gravitation principle works in the formation of large cities, Carey states:

> “The greater the number collected in a give space, the greater is the attractive force there exerted, as is seen to have been the case with the great cities of the ancient world, Niniveh and Babylon, Athens and Rome,

and is now seen in regard to Paris and London, Vienna and Naples, Philadelphia, New York, and Boston."

Gravity, according to Carey, creates a foci of human aggregation. In attempting to explain how it is that cities tend not ball up into a single point, owing to force of social gravitation, e.g. 'why all the members of the human family do not tend to come together on a single spot of the earth?', Carey alludes to the idea that other nearby cities act as 'rival suns' causing rival attraction tendencies to exist and that, similar to the solar system and other planets, each person is 'surrounded with bodies of various sizes, some of these themselves provided with satellites, each having its local center of attraction, by which the means of its parts are held together.'

Stewart | Warntz

In 1939, American physicist John Q. Stewart began making Newtonian-conceptualized social gravity calculations. In the 1950s, his protege American economic geographer William Warntz made physical models of their so-called "population potential" diagrams.

Electromagnetate

In 2007, American chemical engineer Libb Thims updated the outdated Newtonian-view that gravity is what draws like people together to explain that, in a correct modern sense, it is the electromagnetic force that draws people together, and that the expression "certain people naturally *electromagnetate* towards each other" is the more-correct or way of saying things, over that of "certain people naturally *gravitate* towards each other"; although, to note, gravity does play a role in bringing together two human molecules in reaction in many overall-governing ways, e.g. controlling day light hours, controlling the female menstrual cycle, augmenting the moods of people, e.g. people drink 25 percent less alcohol during a full moon. [3]

See also

â— Biogravity
â— Brightness

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External links

â— Demographic gravitation – Wikipedia.

θΔics

In hmolscience, **social heat** refers to quantities of 'heat', interpreted as a purely a physical phenomena, involved, created, transformed into work, dissipated, transferred, etc., in the social processes of interactions and frictions between human molecules.

Carey

In his famous 1859 *The Principles of Social Science*, American social-economist Henry Carey used the Berthelot-Thomsen principle as a basis to formulate a theory of social heat. [1] In introducing the topic of social heat between reactive human molecules in society, according to a review by Austrian social economist Werner Stark, Carey states: [2]

> "In the inorganic world, every act of combination is an act of motion. So it is in the social one. If it is true that there is but one system of laws for the government of all matter, then those which govern the movements of the various inorganic bodies should be the same with those by which is regulated the motion of society; and that such is the case can readily be shown."

A 2013 screenshot of a Twitter-based searchable real-time so-called "social heat map", a type of **social heat** gauge, found at Boston.com, according to which the social networks that glow red with activity indicate venues having the greatest activity in the given time period. [5]

Then, in what seems to be a citation of Berthelot-Thomsen principle, that the 'heat of a reaction was the true measure of affinity', Carey states:

> "To motion there must be heat, and the greater the latter, the more rapid will be the former."

This means, according to the 1962 opinion of Stark that:

> "In the physical universe, heat is engendered by friction. Consequently the case must be the same in the social world. The 'particles' must rub together here, as they do there. The rubbing of the human molecules, which produces warmth, light and forward movement, is the interchange of goods, services, and ideas."

Carey continues:

> "In the material world, motion among atoms of matter is a consequence of physical heat. In the moral world, motion is a consequence of **social heat**—motion, consisting in an 'exchange of relations' resulting from the existence of those differences that develop social life. Motion is greatest in those communities in which agriculture, manufactures, and commerce are happily combined. That such is the fact will be obvious to all who see how rapid is the spread of ideas in those countries in which agriculture, manufactures, and commerce are combined, compared with that observed in those which are purely agricultural. In the one there is great heat and corresponding motion, and the more motion, the greater is the force. In the other there is little heat, but little motion, and very little force."

Most of these quoted views of Carey still need to be tracked down, but they may be in his 1859 three volume *The Principles of Social Science*, in which he is said to have gathered the fruits of his lifelong labors.

Other

In 1981, a Korean social thinker outlined the view that: [3]

> "Second, major concepts of thermodynamics—temperature, heat, mass, pressure, entropy, free energy, and heat capacity—must have correspondingly defined social thermodynamics conceptions. These are social temperature, **social heat**, social mass, social pressure, etc. These latter concepts must carry their original (*thermodynamic*) meaning as well as reflecting the unique characteristics of *social phenomena*."

This is a excellent overview quote of bulk view of human thermodynamics. The amount of intellectual involvement in how this is done, however, is immense. The attempt to develop or determine a 'social Avogadro number', is one example. On entropy, the same author comments that in physical systems entropy is the degree of randomness or energy distribution among the components of the system, and also the degree of deviation from regulatory possibilities or the disorderliness of the components in a social system.

In 1995, American anthropologist Paul Bohannan commented the following in regards to cultural heat: [4]

> "Adapting thermodynamic ideas to the study of culture is limited by a very simple fact: nobody has yet figured out what might be the cultural equivalent of heat or energy … nobody has yet found the 'heat' or the 'energy' in cultural matters … the concepts of 'cultural temperature' (see: social temperature) to refine our understanding of 'cultural heat' have not yet appeared. This is one of the most pressing problems for the next generation of anthropologists, and the difficulties are profound."

(add discussion)

Tweeting | Social heat map

> *See main: Human thermodynamic instrument*

The following is 2013 summary of a Twitter-based searchable real-time so-called "social heat map" found at Boston.com: [5]

> "The **Social Heat Map** builds a database of more than 250,000 venues, 500,000 restaurants and 1.4 million event listings. The social heat map then mines Twitter and other social media outlets for information about the venues, restaurants and listings and plots them on a map. A visualization layer is applied that shows the most active areas within the defined area. The venues that show the greatest activity in the social networks glow red with activity. You can search by keyword to see activity, click on an area for a sample of the tweets during that time period, filter by various categories, and click on a venue for event information. Social map is powered by Eviesays."

Interesting new application.

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θΔics

In hmolscience, **social ideal gas law**, "human gas law", "social gas law", or "social equation of state", etc., refers to attempts to formulate models of human society based on one of the gas laws or the ideal gas law.

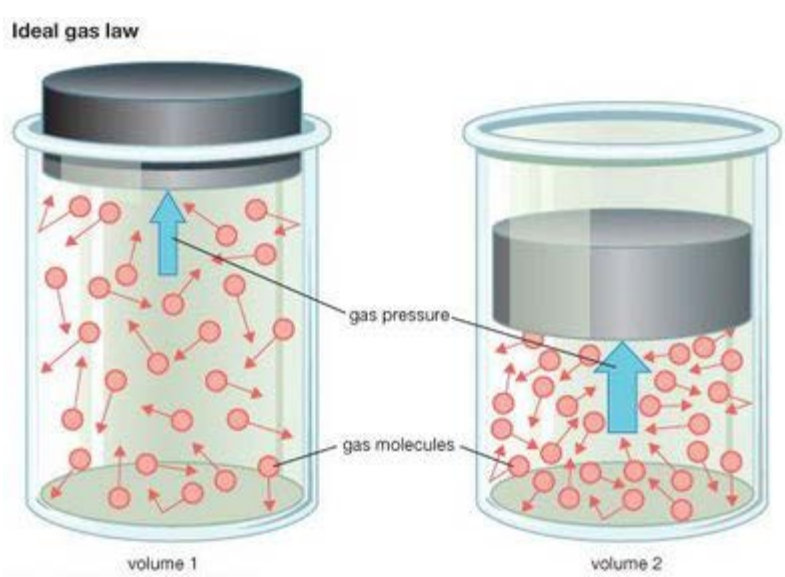

Left: a generic model idealization of an ideal gas in a frictionless piston and cylinder. **Right:** A 1663 vacuum pump (bottom part), showing the vacuum bulb (top part), the third design of the vacuum pump by German engineer Otto Guericke, the prototype behind Robert Boyle's pneumatical engine, through which Boyle's law was arrived at, and, in turn, the other various gas laws, culminating in the ideal gas law. Both being models used by hmolscience scholars into the 20th century to model society. A more accurate model is the van't Hoff equilibrium box, such as discussed in American chemical thermodynamicist Frederick Rossini's famous 1971 "Chemical Thermodynamics in the Real World".

Overview

A number of individuals to have attempted human, human molecule, human particle, or sociological equivalent extrapolations of the classical "ideal gas law" as models of human behavior, in the form of a "human ideal gas law" or "social ideal gas law".

In 1925, Alfred Lotka, in his *Elements of Physical Biology* (pg. 305), did a rather cogent social ideal gas law derivation.

In 1947, American physicist John Q. Stewart, in his “Suggested Principles of ‘Social Physics’”, attempted to outline, formulaically, what he called a “human gas” model of population demographics, in which he viewed each person as a “molecule” (or human molecule, in the modern sense of the term) and used the following shorthand version of ideal gas law:

$$pa = NT$$

where p is "demographic pressure", a is an area of land occupied by *N* individuals (human molecules), and *T* is the "demographic temperature", combined with population census data, to derive concepts such as “demographic energy”, "demographic force", and “demographic gravitation”, among others. [1]

In 1952, English physicist C.G. Darwin, in his "Introduction" chapter to his *The Next Million Years*, stated the following:

> “We ought to be able to foresee the general character of the future history of mankind. The operation of the laws of probability should tend to produce something like certainty. We may, so to speak, reasonably hope to find the Boyle's law which controls the behavior of those very complicated molecules, the members of the human race, and from this we should be able to predict something of man's future.”
>
> — C.G. Darwin (1952), “Introduction” to *The Next Million Years*

He then employed Boyle's law:

$$PV = K\,|_{n,T}$$

to introduce the subject of the statistical mechanical study of conservative dynamical systems of human molecules or the science of "human thermodynamics" as he called it.

In 1970, Paul Samuelson, in his Nobel Prize speech "Maximum Principles in Analytical Economics", as cited by John Bryant during BPE 2016, described his use of a variant of Boyle's law in economics as follows: [4]

> "I was struck by a remark made by an old teacher of mine at Harvard, Edwin Bidwell Wilson. Wilson was the last student of J. Willard Gibbs' at Yale and had worked creatively in many fields of mathematics and physics; his advanced calculus was a standard text for decades; his was the definitive write-up of Gibbs' lectures on vectors; he wrote one of the earliest texts on aerodynamics; he was a friend of R. A. Fisher and an expert on mathematical statistics and demography; finally, he had become interested early in the work of Pareto and gave lectures in mathematical economics at Harvard. My earlier formulation of the inequality in Eq. 4:
>
> $$\Delta p_1\,\Delta v_1 + \Delta p_2\,\Delta v_2 + \ldots + \Delta p_{99}\,\Delta v_{99} < 0$$
>
> owed much to Wilson's lectures on thermodynamics. In particular, I was struck by his statement that the fact that an increase in pressure is accompanied by a decrease in volume is not so much a theorem about a thermodynamic equilibrium system as it is a mathematical theorem about surfaces that are concave from below or about negative definite quadratic forms. Armed with this clue, I set out to make sense of the Le Chatelier principle."

In 2009, Hungarian gender studies scholar Agnes Kovacs, in conference presentations, and in 2012, in her "Gender Studies in the Substance of Chemistry", used the ideal gas law to outline what she called "feminist chemical thermodynamics." [3]

Other usages of the ideal gas law as a basis to formulate economic and social theory include John Bryant (2009) and Mohsen Mohsen-Nia (2013), respectively. [2]

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Further reading

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θΔics

In human thermodynamics, **social internal energy minimization theory** argues that social systems, at a given hierarchy of parallel connected systems, will interact, exchanging matter and energy over time, in a manner dependent upon their respective boundary conditions, such that states of equivalent levels of minimum internal energy, which equates inversely to the stability and welfare of individuals, will result in each system at a given hierarch level. The theory was developed in the early 2000s by Iranian-born American engineer Robert Kenoun. [1]

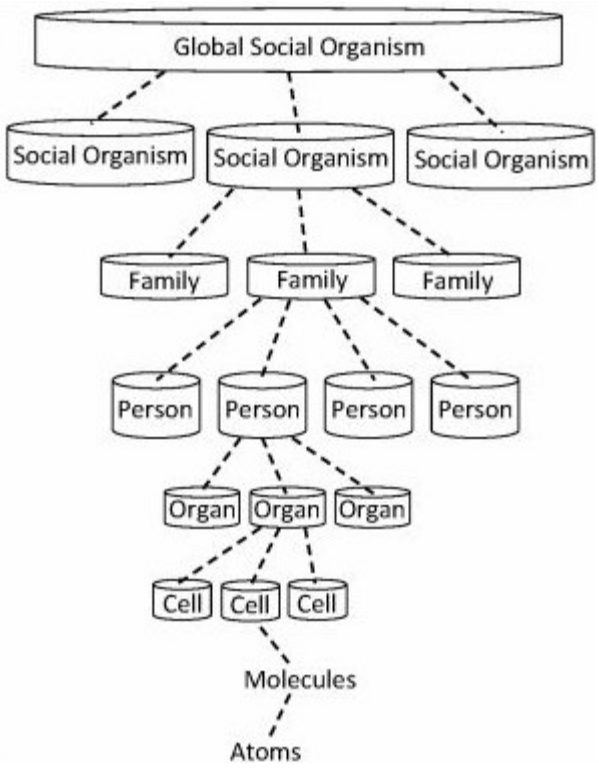

Iranian-born American engineer Robert Kenoun's 2007 systems model, comprised of "serial" connections of systems and subsystems that are part of the same vertical chain; and "parallel" connections of similar systems at the same horizontal or hierarchy level, i.e. ones that do not share subsystems with each other.

The minimum state of social internal energy, according to Kenoun's theory, equates to optimal stability and socioeconomic equality at the human level, which is argued to be a logic embodied in the socialism theories of German economist Karl Marx. Although Kenoun's theory presents many difficulties, it does seem to be one the first theories to discuss the thermodynamic nature of internal energy in human social systems to some degree.

Overview

Kenoun's view of systems of groups of people is diagramed adjacent. Kenoun uses the term "serial" to define connections of systems and subsystems that are part of the same vertical chain; and uses the term "parallel" to define similar systems at the same horizontal or hierarchy level, i.e. ones that do not share subsystems with each other. In this mode, serial "relational bonds" exist between systems and subsystems, exchanging energy (and matter) and parallel "relational bonds" exist between systems at the same hierarchy, also exchanging energy (and matter). Kenoun argues that the rate of energy exchange between, through these bonds, determines the level of turbulence in the system, where processes become violent when a given system has to absorb or release a large amount of energy in a short time.

On the logic that a body of water molecules can absorb a certain amount of energy and still remain stable before phase change, according to Kenoun, the stability of a human social system, is tied to the nature of the relational bonds of the subsystems. In this manner, any given human social system has a certain tolerance level and threshold for energy release or absorption before any significant transformation can take place in its organization.

Theoretical basis

It is difficult to track down exactly where Kenoun culls his logic from, as his book, the 2006 *Theory of History and Social Evolution*, in which his theory is presented, uses no references. In commentary on his theory, Kenoun states that his knowledge of thermodynamics is limited to two metallurgical engineering thermodynamics courses, about three general reference books, Erwin Schrödinger's 1944 book *What is Life?*, and ideas on cybernetics, systems theory, and the whole society as a global organism, etc., at the Principia Cybernetica Website. [2]

At an estimate, in thermodynamic terms, aside from his views of the first law, i.e. that if energy leaves one system it will have to be absorbed by another system, and the second law, i.e. that ordered systems can form at the expense of the increase in disorder of other surrounding systems, it would seem that Kenoun's overall theory stems from a combination of:

(a) Newton's law of cooling: the rate of heat loss of a body is proportional to the difference in temperatures between the body and its surroundings.
(b) Joule's second law: the internal energy of an ideal gas is independent of its volume and pressure, depending only on its temperature.
(c) the principle of thermalization: the process by which connected bodies reach thermal equilibrium via

energy exchange and interaction.
(d) the zeroth law of thermodynamics: when two bodies have equality of temperature with a third body, they have equality of temperature with each other.

In another sense, it could be that Kenoun is using American physicist Herbert Callen's energy minimum principle, which loosely states that for a closed system, with constant external parameters and entropy, the internal energy will decrease and approach a minimum value at equilibrium. [3]

In short, whatever the orgin, using principles generally from statistical thermodynamics, Kenoun seems to make the unwritten assumption that connected human social systems, such as the economic connections that exist between the United States, Russia, Europe, the Middle East, and Africa, etc., can be modeled as ideal gas systems, in which, due to these connections, a uniform low level of temperature, which in this case can be considered as a function of internal energy, will be reached among the systems. Kenoun also argues that the lowest state of internal energy for a given living system, such as a human (or society of humans), can be interpreted as the perceived security and survival needs of the system, which includes energy resources and life support systems.

Using the Herbert Spencer / Pierre Teilhard logic of the "global social organism", i.e. the total population of humans considered as one living connected organism, Kenoun reasons that for this "global organism to achieve it optimal stability and lowest state of internal energy, it must force its subsystems [the countries of the world] to reach equality, which in this case would be their level of prosperity." Moreover, Kenoun reasons that before this end process occurs, a state he calls a "deterministic finality" (similar to Teilhard's noosphere), a great deal of energy has to be exchanged between these societies, from which a great deal will be dissipated in the form of destructive processes, such as in war. When the deterministic finality is reached, according to Kenoun, a utopian world society will be reached in which each person has the same socioeconomic equality. Kenoun argues that this utopian view is embodied in the logic of socialism with a bit of capitalism, such as is found in the economics of communism, which Kenoun reasons is a way of life in hibernation. In his own words:

> "When the global social organism approaches its finality (a utopian society), its members will live in harmony, irrespective of their race or cultural background … members would more or less have an equal standing economically [and] would benefit equally from the services of their society."

In more detail, in a statement that seems to summarize his entire theory:

> "Marx, Engels, and Lenin, among others, had an accurate view of historical processes driven by economic forces, which are strongly tied to the survival of the living organisms. In their view, a utopian society could be created through the implementation of socioeconomic justice throughout the world that put an end to exploitation and the struggle of man against man. This view is not for from our theory of systems governed by the laws of nature [thermodynamic laws], which require equality in the state of internal energy of the subsystems to produce optimum stability at the system level, which is a natural course of evolution for any system."

In short, according to Kenoun's logic, in the future all of the world's human social systems will be at an equal internal energy (or temperature as these are functions of another via Joule's second law for ideal gases) and that each person will be socially and economically equal.

Difficulties on internal energy theory

This idealized and hopeful future view, however it may seem on the surface, is a huge extrapolation using a mismash of theories, but is nevertheless interesting.

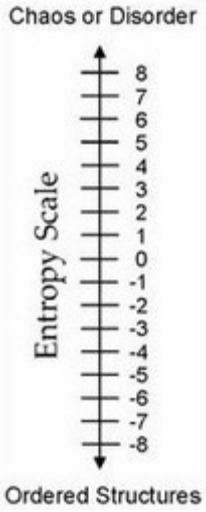

Because of this, a number of difficulties on theory easily emerge.

For one, a simple diagram of the various "cells" of the earth's atmosphere pictured adjacent, i.e. polar cells (cold temperatures), temperate cells (moderate temperatures), and tropical cells (warm temperatures), easily exemplify that due to graviation effects the molecules of the atmosphere do not conform to a unified system of temperature or internal energy. As such, it is inconceivable to think that humans (human molecules) will someday achieve uniformity in internal energy or temperature. It is well known, for instance, that intelligence in population increases with latitute. Thus, as economic level generally correlates with intelligence it becomes non-logical to think that an equitorial molecule will every be equivalent economically to a higher latitude molecule.

An obvious second line of difficulty arises in view of the Dunbar number (150), which is the maximum number of humans in a social system that will remain stable if everyone is considered equal socially and economically; beyond which instability results, unless a non-equal hierarchy of organization and rank is established.

Negative entropy difficulties

Another significant difficulty on Kenoun's theory, which more or less derives from the illogic of Schrödinger, is his interpretation of the second law that "entropy of an isolated system will increase (towards positive values) until that system reaches an equilibrium state", a state that, based inevitably on the Boltzmann chaos assumption, Kenoun equates to "chaos and disorder". Here, this second law interpretation equates specifically to only ideal gas phase systems, in which the particles of the system have non-correlation of velocities. Incorrectly, then, on this variation of the second law, Kenoun reasons that as the universe as a whole approaches heat death, actions will occur such that:

> "As systems within the universe continue to interact and exchange energy with each other, they form structures that are generally in negation of the second law of thermodynamics. Ordered structures and living organisms are systems that maintain negative entropy. In the case of living organisms, particularly human beings, as we continue to build structures and form larger organizations, the entropy of these entities continues to become even more negative."

This misconceived logic, based on an unwritten colloquial understanding of the material entropy hypothesis, that lower values of entropy of a structure correlate to order, which is a common view in introductory human thermodynamics, generally traces its origin to mis-extrapolations of the conclusions thermodynamic behaviors of gas phase systems of Austrian physicist Ludwig Boltzmann to evolving substrate-attached earth bound systems in the biosphere.

The difficulties here are that, for one, entropy values of structures, by definition, can only be positive. Second, the concept that a living structure has to "maintain negative entropy" is an incorrect theory of existence contrivance conceived in 1944 by Austrian physicist Erwin Schrödinger who argued, using an weak mathematical proof, that life "feeds on negative entropy". [4]

In any event, Kenoun's idea of the correlation of entropy increases or decreases with disorder or order trends is diagramed adjacent. This is similar, to an extent, to the diagram of human entropy or "relative entropy" of a person, over the extent of their life-span by Danish chemist John Schmitz in the 2007 book *The Second Law of Life.* [5]

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θΔics

In hmolscience, **social Ising model** or "Ising model of human behavior" posits that mass human behaviors can be aligned similar to the way electron spins can be aligned in bodies of matter—aka the Ising model (named German-born American Ernst Ising), according to which discrete variables are used to represent magnetic dipole moments of atomic *spins* that can be in one of two states (+1 or −1), and that when spins are arranged in a graph, usually, a lattice, allowing each spin to interact with its neighbors, the identification of phase transitions (spin disordered to spin ordered transitions), are formulated as a simplified model of reality—used as an explanation of mass psychology behaviors.

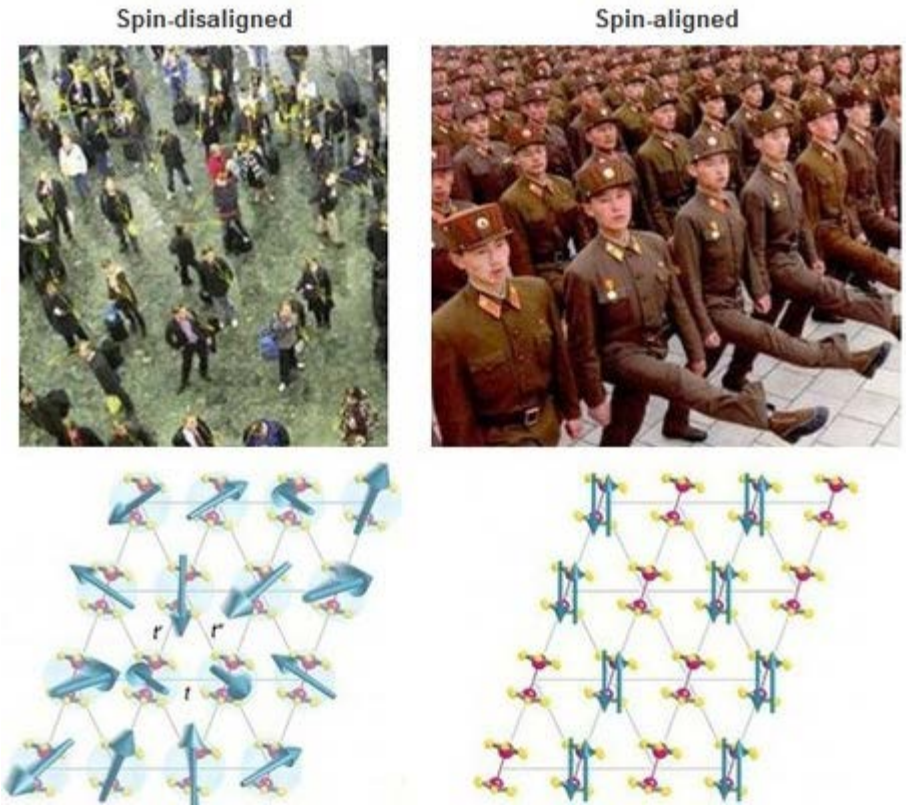

The **Ising model of human behavior** according to which mass human behavior is argued to be "aligned", such as shown in 2012 photo of North Korean troops marching, in their readiness for a possible invasion of South Korea, similar to the way unorganized electron spins, below left, can be aligned, below right, in ferromagnetic materials.

History

In 1920, German physicist Wilhelm Lenz conceived the Ising model as a problem, which he assigned to his graduate student German-born American Ernst Ising, who solved one dimensional Ising model with no phase transition in 1924.

Social physics

In 1952, English physicist Vera Daniel, in his “Physical Principles in Human Cooperation”, used a diagram, shown below, of magnetic needles aligned on a board, among which a increasing number of beetles could be added, thus increasingly bumping into the needles, deflecting their alignment position. A few beetles bumps would not disrupt the alignment of the entire board of needles, but at a critical point of beetles, the needle bumps might be so disorganized that a critical phase shift of the whole board of needles might go from north aligned to south aligned: [3]

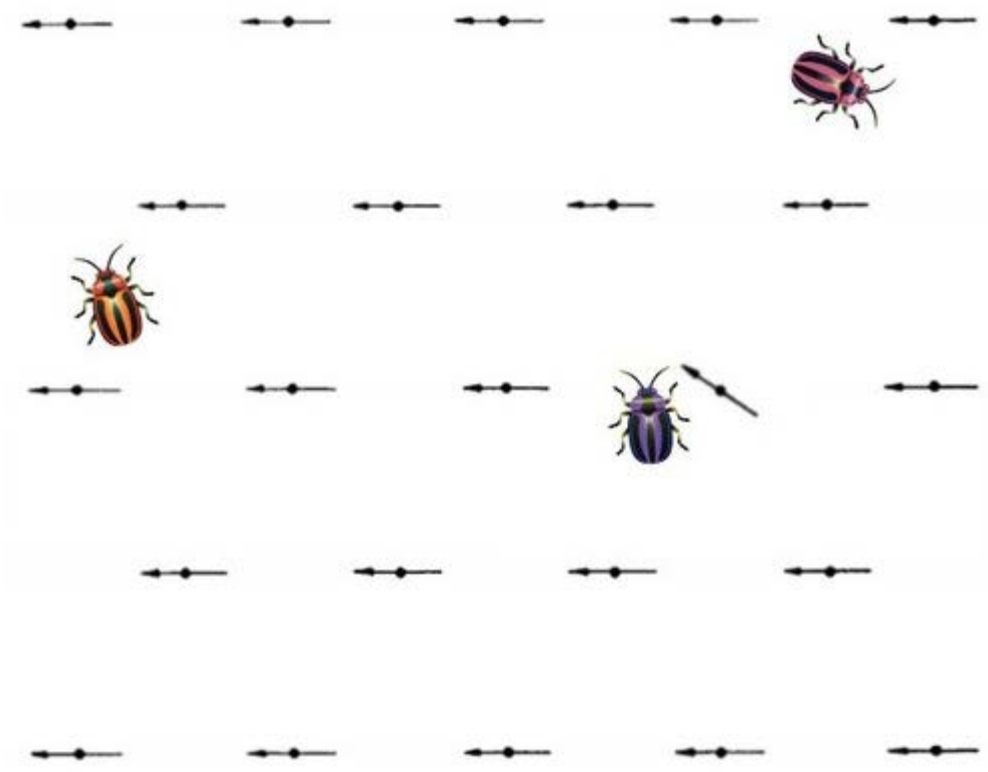

In 1981, American chemist, mathematician, and statistical mechanicist Elliott Montroll outlined an Ising spin model of human behavior. [1]

In 1995, American physicist Eugene Stanley, who completed who completed his 1963 PhD on critical phenomena (spin transitions) in magnetic systems, began investigating, at Boston University, the notion that economic agents, in their herd effect like behavior preferences, can be modeled as electron spins.

In 2011, German theoretical physicist Dietrich Stauffer's 2011 article "Statistical Physics for Humanities: A Tutorial" gives a bit of historical overview, contains sections such as "humans are neither spins nor atoms", schelling model for social segregation", on the work of Thomas Schelling, extols on an Ising model of the physics of human behavior or choice, and concludes with a suggested outline to use Fortran to build computer simulations for a type of human statistical physics. [2]

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Further reading

â— Vehkamaki, Hanna. (2006). *Classical Nucleation Theory in Multicomponent Systems* (3.11: Free energy barrier in the Ising model, pgs. 67-). Birkhauser.

External links

â— Ising model – Wikipedia.

θΔics

In hmolscience, **social kinetics** refers to the models of chemical kinetics applied at the social level, in respect to reaction rates, in the human chemical reaction context, being dependent on factors such as collision frequency (see: social collision theory), the nature of collision, and reactant concentration, among others.

Overview

Notes social kinetics theorists include: Alfred Lotka (1925), Sherburne Cook (1943), Mirza Beg (1987), and Libb Thims (2007).

Quotes

The following are related quotes:

> "The reasoning employed here is at least superficially similar to that underlying the principles of chemical kinetics. According to classical physical chemistry, in a bimolecular reaction the velocity is a function of the product of the concentrations of the two reactants: i.e., the number of active particles of each per unit space. The analogy is carried still further by the implicit assumption that, as molecules or ions are conceived by the kinetic theory to be in a constant state of vibratory motion, so the active units in a social test tube are likewise considered to be in continuous motion. Hence, the chemical reaction depends upon the probable number of collisions [see: collision theory] of particles, and, by analogy, the observed effect of the social reaction, here homicide, is a function of the collisions between personalities. The analogy, of course, breaks down in detail. In particular, with **social kinetics** the effect of collision is not equal and opposite but unilateral. The white man affects the Indian, but the Indian does not affect the white man. Since this is so, a simple product of populations is doubtless not an exact expression of the relationship. However, it is worth a trial as a purely empirical mode of expression and as a first approximation in a quantitative sense."
>
> — Sherburne Cook (1943), *The Conflict Between the California Indian and White Civilization, Part 3: The American Invasion, 1848-1970* [3]

References

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External links

â— Chemical kinetics – Wikipedia.

θΔics

In hmolscience, **social Le Chatelier principle** is the application of Le Chatelier's principle to social phenomena.

American physiologist Lawrence Henderson's 1938 "box spring model" of the Pareto-Gibbs sociological extrapolation of the **Le Chatelier principle** of equilibrium restoration of the system after small modification to the system, which he defines as an equilibrium of forces. [9]

Overview

In circa 1890s, French chemist Henry Le Chatelier (1850-1936), formulator of Le Chatelier's principle (1884), of equilibrium in chemical systems, supposedly, considered questions of equilibrium and thermodynamics on the level of social and economic relations and wrote extensively on labor relations, equilibria, and efficiency. [1]

In 1910, American physical chemist Wilder Bancroft, in his "A Universal Law" address, gave a rather elaborative discussion of non traditional chemistry examples wherein he sees Le Chatelier's principle at work; the following being an oft-quoted abstract from his address: [2]

> "I wish to call your attention to-night to what I believe to be another universal law, a qualitative one and not a quantitative one. The chemists call it Le Chatelier's Theorem. The physicists call it the the theorem of Maupertuis or the principle of least action. The biologists know it as the survival of the fittest, while the business man speaks of the law of supply and demand."

In 1912, Vilfredo Pareto, in his *Treatise on General Sociology*, gave the following definition of what seems to be Le Chatelier's principle: [3]

> "Equilibrium is a state such that if a small modification different from that which will otherwise occur is impressed upon a system, a reaction will at once appear tending toward the condition that would have existed if the modification had not been impresses."

In 1919, American economist Julius Davidson used Le Chatelier's principle in explaining human pairings. [4]

A 1923 translation of this principle, by Austrian-born American physical chemist Alfred Lotka, supposedly having been influenced by Vilfredo Pareto, states: [5]

> "Every system in chemical equilibrium, under influence of a change of every single one of the factors of equilibrium, undergoes a transformation in such direction that, if this transformation took place alone, it would produce a change in the opposite direction of the factor in question. The factors of equilibrium are temperature, pressure, and electromotive force, corresponding to three forms of energy: heat, electricity, and mechanical energy."

The principle is often used as a basis of argument in subjects including sociology and economics, e.g. as was done by Paul Samuelson, or sociology. [6]

In 1927, American physicist Bruce Lindsay, in his “Physical Laws and Social Phenomena”, defined what he referred to as the Le Chatelier-Braun principle, or the principle of mobile equilibrium or the general law of inertia, which he defined as follows: [7]

> “If any one of the factors determining the state of a physical system in equilibrium is altered by external action, the other factors will then change in such a way as to oppose the change in the first.”

Lindsay then sought social examples of the application of this principle in the proverbial inertial exhibited by human institutions, particularly with respect to social reform.”

In the 1930s, American economist Paul Samuelson learned Le Chatelier's principle from the thermodynamics lectures of Edwin Wilson, and soon thereafter employed these models in his 1941 economics PhD dissertation to construct a Pareto-Gibbs like economic equilibrium model, using minima and maxima to determine points of economic equilibrium.

In 1935, American physical chemistry trained physiologist Lawrence Henderson discussed Le Chatelier's principle in respect to the work of Italian engineer turned socioeconomist Vilfredo Pareto, as follows: [8]

> “The treatment of equilibrium — which is referred to in note 4 — is logically of great significance. Pareto observes that the state of the social system is determined by its conditions. Therefore, if a small modification of the state of the system is imposed upon it, a reaction will take place and this will tend to restore the original state, very slightly modified by the experiment. This principle is well known, and thus the corresponding facts are familiar to everybody. Thus the disturbances produced by short wars, by epidemics that are not too severe, and by all kinds of lesser catastrophes ordinarily disappear and leave hardly a trace behind them. The case of physiological equilibrium is similar. In fact it is logically identical. These physiological phenomena belong to the same class as those inorganic processes that arise from similar disturbances of physical and chemical equilibrium. This is implied by the similarity of Pareto’s definition of equilibrium—a state such that if a small modification different from that which will otherwise occur is imposed upon a system, a reaction will at once appear, tending toward the conditions that would have existed in the modification had not been imposed—with the **theorem of Le Chatelier** in thermodynamics.”

In 1938 to 1942, Henderson, in his American physiologist Lawrence Henderson, in his “Sociology 23” lectures was citing Pareto's version of equilibrium and expanding on this definition, as applied to equilibrium in social systems, as follows: [9]

> (1) A ball which is in a cup, and struck a blow that is not too hard, will return to its original position;
> (2) A candle flame which is deflected by a draft that is not too strong will resume its original form;
> (3) A trout brook that is ‘fished out’ will, if carefully protected, regain its former population of fish;
> (4) An infant, according to Hippocrates, after a disease that is not too sever will gain in weight until that weight is reached which is approximately what would have been reached if there had been no sickness.

Henderson elaborates that these are examples of “stable equilibrium” but comments that there are other phenomena that resemble: unstable equilibrium, neutral equilibrium. He then comments that both the Pareto and Hippocratic models of equilibrium restoration are like of a box spring mattress after being sat on in that the underlying theory of equilibrium is an equilibrium of forces and force restoration:

> "In both cases—Hippocratic analysis and Pareto's equilibrium—there is the underlying theory that equilibrium, for instance, in a box spring; that a small modification leaves the forces substantially intact; and that the forces tend to reestablish the state that would have existed if no modification had occurred, just as a **box spring** which has been depressed when someone lies down on it resumes its original form when one gets up."

Henderson, as example of this, then cites the Feb 1937 Louisville flood, the earthquake and fire in San Francisco, and the devastation of the war of 1914 to 1918 in France. It is doubtful, to note, that WII, as Henderson seems to see things, was an example of stable equilibrium restoration, rather it would have been something as follows:

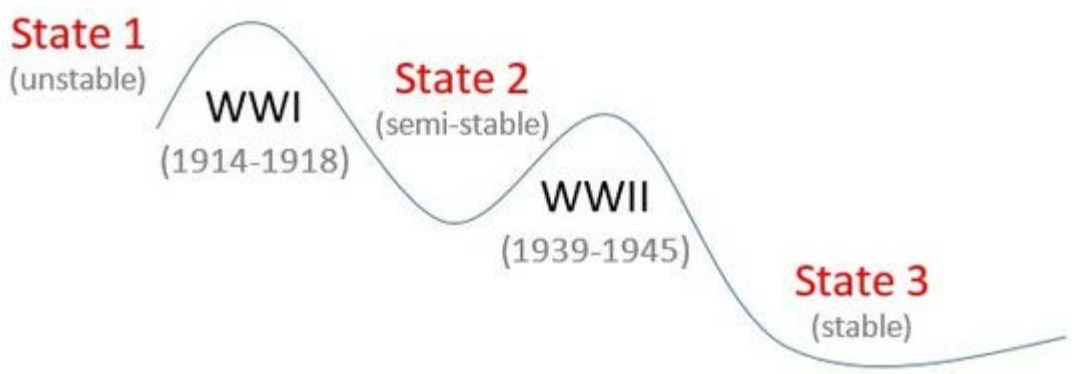

In 1943, Samuelson assigned his first PhD student Lawrence Klein the project of generalizing the Le Chatelier principle to quadratic forms of statistical variances; Klein completed his PhD in economics at MIT in 1944. [11] The use of Le Chatelier's principle in economics, after Samuelson (1947), has since been referred to by Yoshihiko Otani (1982), among others, as the "Le Chatelier-Samuelson principle", as applicable to the theory of cost and production. [10]

In 1966, American social equilibrium historian Cynthia Russett, summarized Henderson's writings, stated or rather summarized that Le Chatelier's principle (Lotka version), means the following: [11]

> "Equilibrium in society meant simply this: any small change in the state of the system would engender a reaction tending to restore the original state as unmodified as possible. Short wars, for example, or fairly light epidemics, or any of a number of small disasters, would disappear with scarcely a trace."

In 1968, American business management theorist Bruce Gunn, in his "The Dynamic Synthesis Theory of Motivation", employed Le Chatelier's principle to theorize about employee motivation, the abstract of which is as follows: [12]

> "An interdisciplinary perspective of employee motivation is presented, based on the premise that the principles of natural science provide the fundamental basis for analogizing the operational similarities of physical and social productive systems. This concept is applied to motivation by observing that all productive systems-whether physical, organic or social-are input-output systems. The lowest common denominators in these systems are energy and mass. Le Chatelier's principle provides the universal environment for motivation. Thus, the transformation of energy in a given productive system represents the essence of motivation. The usefulness of analogizing the process of energy transformation in these two seemingly diverse systems can be seen by tracing the essential factors leading to efficient energy expenditure in physical systems and applying similar strategies to energy transformation in social systems. Such an approach will provide the manager with a concrete frame of reference from which to draw plausible remedies in solving the innumerable problems of efficient motivation and utilization of employee energies."

(add discussion)

In 1986, someone, possibly German-born Canadian mechanical engineer Rudolf Starkermann, at the International Conference on Mental Images, Values, and Reality (see: social enthalpy), outlined some type of organization management theory, employing: Ross Ashby's theories on adaption, equifinality, autopoieses, and Le Chatelier's principle. [13]

In 1990, American sociologist Kenneth Bailey was writing about Le Chatelier's principle in reference to Herbert Spencer's writtings. (Ñº)

In 1994, American chemical engineer turned sociologist James Coleman, in his *Foundations of Social Theory*, footnotes a discussion of Le Chatelier's principle, as having something to do with minimization or maximization of utility. [14]

In 2009, American physical chemist Thomas Wallace applies Le Chatelier's principle, intermixed with Gibbsian thermodynamics, to describe the rise and fall of civilizations.

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θΔics

In hmolscience, **social mass** refers to the weight of social matter, measured quantitatively; the "mass" of a given "social" system (see: social system), system defined thermodynamically.

Aim

Preface

1	Introduction | Educational need	
	1.1 Terminology reform | Conceptual Reinterpretations	5
	1.2 One Nature Caveat	
	1.3 Why Should Thermodynamics Apply to Me?	
2	Social Matter	
	2.1 Human Molecular Hypothesis	
	2.2 Human Chemical Reaction Theory	
	2.3 Chemical Justice	
3	Engine	
	3.1 Nature Abhors a Vacuum!?	

A table of contents of Libb Thims 2014 draft notes on the concept of "social matter" based on Frederick Rossini's 1950 chemical thermodynamics definition of "matter". [2]

Overview

In 1953, American physicist Stuart Dodd, during the 40 person AAAS so-called "Committee for Social Physics" meeting, headed by American social physics pioneer John Q. Stewart, explicitly suggested that "chemical moles" be the equivalent to "number of people" in social physics. [3]

In 2003, Babics Laszlo, a Hungarian sociologist, attempted a crude calculation of a "social Avogadro number".

In 2007, Libb Thims, in his *Human Chemistry*, suggested that term 'mol' should be termed 'hmol', short for 'human-mole', for calculations of Gibbs free energy, entropy, internal energy, or enthalpy for human reaction processes between people. [4]

In 2014, Libb Thims, in his draft-state *Chemical Thermodynamics: with Application in the Humanities*, based the following quote:

> "All **matter** of specified composition, in given electrical, magnetic, and gravitational fields, may be considered to have five fundamental thermodynamic properties, namely: pressure, volume, temperature, energy, and entropy. Changes in these properties must conform to the requirements of the first and second laws of thermodynamics."
>
> — Frederick Rossini (1950), *Chemical Thermodynamics* (pg. 1)

outlined some ideas on "social matter". [1]

Quotes

The following are related quotes:

> "I next turn to the structure of 'social space', viewed as a gravitational field in which the concept of the 'social mass' of the individual plays a crucial role as a nucleus of attraction. The 'social mass' of an individual contributes to the structuring of the social space surrounding him. The ongoing relationship between two individuals can be analyzed via the transformation of systems of coordinates. This permits one to view society as a space so curved that for Y the least path will be that which passes near X. The **'curvature' of the social space** can also be called customs or morals. I next consider stability and change in terms of the third law of thermodynamics and recall once more that all living systems, society included, are chronoholistic systems which must be described in integro-differential equations not reducible by any amount of differentiation to differential equations involving a 'one point memory'; these equations must involve statistical macro-parameters. I conclude with the observation that sociological theory resembles an investigation of the 'metrical' properties of 'social space'. The scheme presented here is compatible with any logically coherent sociological theory."

— George Devereux (1978), “Collected Works” (pg. 383) [5]

> “Second, major concepts of thermodynamics—temperature, heat, mass, pressure, entropy, free energy, and heat capacity—must have correspondingly defined social thermodynamics conceptions. These are social temperature, social heat, **social mass**, social pressure, etc. These latter concepts must carry their original (*thermodynamic*) meaning as well as reflecting the unique characteristics of *social phenomena*.”
>
> — Author (1981), “Article” [1]

See also

â— Dunbar number

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θΔics

In hmolscience, **social mathematics**, aka human mathematics, is the use of mathematics for the study of social phenomena.

Overview

In c.1790, Marquis Condorcet conceived the view that society was made up of homogeneous individuals all born equal under the law, whereby, according to such homogeneity, it should be possible to discern the mathematical laws, i.e. “social mathematics”, that govern the social mechanism, that government should be the realization of natural social laws, and that people should elect key experts to run government. [1]

See also

â— HM pioneers

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θΔics

In hmolscience, **social matter** refers to society defined as a type of matter that is allied or associated together.

Overview

In 1896, French lawyer and social philosopher Maurice Hauriou, in his *The Traditional Social Science*, penned out an opening chapter subsection entitled "Social Material", in which he stated the following: [1]

> "Social science can be defined either as science of society, of the social condition, or of **social matter**. The only important point is to provide some material as an object. All observational sciences work upon some material, physics and chemistry upon physical matter, biology on living matter, experimental psychology on physical matter broken down into states of consciousness. It is natural to rest social science on social matter."

(add discussion)

In circa 1930, French philosopher Simone Weil (1909-1943), in her discussions of the social physics and historical materialism theories of Karl Marx, supposedly, asserted that Marx's greatest achievement was calling attention to the possibility of a social science focused on the existence of a "social matter", or something to this effect. Weil asserted that we must thank Marx for the "stroke of genius" of holding out the promise of a social physics: [2]

> "Marx was the first and, unless I am mistaken, the only one—for his researches were not followed up—to have the twin idea of taking society as the fundamental human fact and of studying therein, as the physicist does in matter, the relationships of force."

Weil, however, later, supposedly, cautioned about the "analogy" of a social and physical force, arguing something to the effect that the social dynamic is subject to laws that cannot be as easily recognized as the laws of physics but that in principle form a law of necessity as intelligible as those that prevail in the physical universe. [2]

Quotes

The following are related quotes:

> "Physicists didn't make any progress in understanding the world of condensed matter before they had a descent picture of the properties of individual atoms and molecules themselves. You have to know at least a little about the building blocks, and the same goes for **social matter**."
>
> — Mark Buchanan (2007), *The Social Atom* [3]

See also

â— Sociology terminology upgrades

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θΔics

In science, **social mechanics**, a late 19th / early 20th century near-synonym to "social energetics", tends to refer to mechanics, rational mechanics, Newtonian mechanics, celestial mechanics, and or thermodynamics based sociology, depending; generally referring to the use of physical science concepts, culled generally from physics, mechanics, chemistry, applied into the domain of sociology.

Grundzüge
einer
Mechanik
der
Gesellschaft.
Von
Eduard Sacher,
k. k. Professor.
I. Theoretischer Theil.
Jena,
Gustav Fischer
vorm. Friedrich Mauke.
1881.

Top: a 2002 **social mechanics** symbol, by Savio Alphanso (Ñº), signifying the two cultures nature of social mechanics, the cross bridging interdisciplinary study of the nature of the passions of humans and human society and the mechanistic explanations used to explain the operation of those passions. Right: Eduard Sacher's 1881 *Outline of a Mechanics of Society*, wherein he gives a Mayer-Clausius based semblance of a social mechanics presentation. [17]

Early history

The early history of social mechanics or of social physics, depending on classification scheme, according to American astrophysicist John Q. Stewart (1957), dates as far back as 1769 when American political theorist James Madison (1751-1836), the so-called "father of the constitution" and America's fourth president, was said to be studying a primitive form of it a Princeton. Stewart also credits Woodrow Wilson (1856-1924), another Princetonian, America's 28th president, as being an early pioneering thinker in social physics/social mechanics:

> "[The checks and balances between Congress, the President, and the Supreme Court are] a sort of unconscious copy of the Newtonian theory of the universe [in which] every free body in the space of the heavens … is kept in its place … by the attraction of bodies that swing with equal order and precision about it."
>
> — Woodrow Wilson (1908), writings on the Constitution [14]

(add discussion)

Carey

The 1858-initiated work of American sociologist Henry Carey, centered on the following central position:

> "Man, the molecule of society, is the subject of social science."

as outlined in full in his three-volume treatise *Principles of Social Science*, can well be said to mark the start social mechanics proper, as is often historically summarized as such (Sorokin, 1928; Odum 1929; Stark, 1962). Carey's ideas on "social heat" and friction between "human molecules", and so on, are rather elaborate and worth prolonged investigation.

Sacher

In 1881, Austrian scientist Eduard Sacher published *Outline of a Mechanics of Society*, based on the work of Robert

Mayer and Rudolf Clausius, one of the first explicit “social mechanics” treatises, wherein he uses physics and thermodynamics concepts as kinetic energy, the mechanical equivalent of heat, principle of the transmission of work, to outline a theory of "rational economics" as he calls it. [17]

Edgeworth

In 1881, Irish mathematical economist Francis Edgeworth, in his *Mathematical Psychics: an Essay on the Application of Mathematics to the Moral Sciences*, expressed his belief that the future would one day see the science of social mechanics vaulted along side that of celestial mechanics in a unified manner: [8]

> “'**Mecanique sociale'** may one day take her place along with 'mecanique celeste,' throned each upon the double-sided height of one maximum principle [principles of Lagrange], the supreme pinnacle of moral as of physical science. As the movements of each particle, constrained or loose, in a material cosmos are continually subordinated to one maximum sum-total of accumulated energy, so the movements of each soul, whether selfishly isolated or linked sympathetically, may continually be realising the maximum energy of pleasure. Mecanique sociale, in comparison with her elder sister, is less attractive to the vulgar worshipper in that she is discernible by the eye of faith alone. The statuesque beauty of the one is manifest; but the fairylike features of the other and her fluent form are veiled. But mathematics has long walked by the evidence of things not seen in the world of atoms (the methods whereof, it may incidentally be remarked, statistical and rough, may illustrate the possibility of social mathematics). The invisible energy of electricity is grasped by the marvellous methods of Lagrange; the invisible energy of pleasure may admit of a similar handling.”

The concept of pleasure, according to Edgeworth, as summarized by English chemical physicist Philip Ball (2004), was the force that his hedonistic ‘charioteers’, the individual agents of society who interact like so many atoms in the void, according to which the view the glimpsed whereby economies treat people like “multiety of atoms which constitute the foundations and uniformity of physics.” [9]

Winiarski

In 1894, Polish sociologist Leon Winiarski was, it seems, the first to teach a college course in "social mechanics", at the University of Geneva, which he summarized as the study and modeling of movements of people in social systems through the mechanics of Italian mathematician Joseph Lagrange and the thermodynamics of German physicist Rudolf Clausius. [1] The following is a popular excerpt from Winiarski’s presentation on social mechanics at Fourth International Congress of Sociology of 1900: [1]

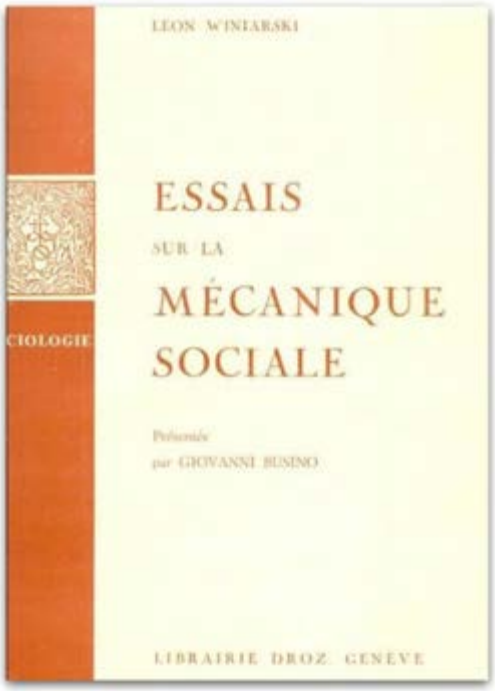

Polish sociologist Leon Winiarski's 1898 *Essay on Social Mechanics*, the first textbook on **social mechanics**. [7]

> “We arrived, he said, to design the equilibrium theory can be extended economic phenomena at all social phenomena: political, legal, moral, aesthetic, religious and scientific. Extending the results obtained by pure economics to social science, we have come to the realization that the fundamental equations of Walras can be deduced from the general equations of motion of Lagrange and we have shown analytically how this deduction may be made. Having provided the equations of the social balance, we established the foundations of the **social mechanics**, in its static part, on the principle of Lagrange, that of minimum effort and maximum energy, that is to say on the principle that forms the basis of cosmic mechanics. Turning to the dynamic part of the problem, we gave a definition of social energy and biological energy. This brings us to the principles of thermodynamics, the third, that of Clausius, also explains the gradual spiritualization any aggregate and closed down its potential. This dissipation of entropy that occurs in the social world, as in the physical world. Finally, we showed how the principle of least effort and

> accelerating the speed differentiation and explains the gradual integration of social aggregates by increasing their perfect adaptation to natural and artificial."

Most of this theory was presented in Winiarski's popular "Essay on Social Mechanics" and book to follow.

Ward

In 1907, American sociologist Lester Ward, the so-called "father of American sociology", in his *Pure Sociology*, credited Winiarski as being the initiator of the use of thermodynamics in social mechanics, as follows: [10]

> "There is therefore a true science of **social mechanics**, and as social energy is only a special mode of manifestation of the universal energy, social mechanics is only a kind of mechanics which deals with this form of energy. The fundamental classification of mechanics, as we saw, is into statics and dynamics, and social statics and social dynamics are as legitimate branches of mechanics as are hydrostatics and hydrodynamics, the principles of which are commonly included in text-books of mechanics. In fact, Winiarsky has made a direct application of thermodynamics to social mechanics as essential to its full treatment. I shall deal with social statics and social dynamics in that order, which is the same as that in which mechanics is always treated, the advantage of which is even greater here than in other departments, as will be clearly apparent as we proceed."

Ward also devotes an entire section to 'social energy' discussing the conservation of energy and how energy and force are nearly equivalent, citing the work of James Joule and Hermann Helmholtz, also discussing ideas on 'social forces'.

Sorokin | Mechanistic school

In 1928, Russian-born American sociologist Pitirim Sorokin, in his *Contemporary Sociological Theories*, devotes his opening chapter "The Mechanistic School", the first sixty-pages, to first summarize what he calls the "mechanistic school of social thermodynamics", namely those who have used a human molecule or social atom views, steeped in social mechanism and thermodynamics-based views, including: Leon Winiarski, Vilfredo Pareto, Eugene Roberty, Henry Carey, and Wilhelm Ostwald, to conclude and argue, in the end, that the theories developed by this school are all "pseudo-sciences" and mere "superficial analogies". Sorokin divides the mechanistic school of sociology into about four main principle branches as follows: [4]

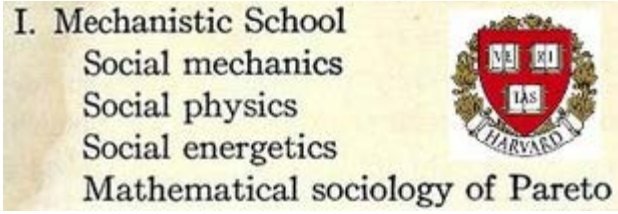

Russian-born American sociologist Pitirim Sorokin's 1928 classification of the first main branch (of eleven) of "contemporary sociology", that of the "mechanistic school of social thermodynamics", all based on the thermodynamics of Rudolf Clausius, with **social mechanics** listed as the first main branch. [4]

(a) **Social mechanics**

Representatives: Antonio Portuondo, Spiru Haret, Alfred Lotka

(b) **Social physics**

Representatives: Henry Carey

(c) **Social energetics** (or social thermodynamics)

Representatives: Ernest Solvay, W. Bechtereff, Wilhelm Ostwald, Thomas Carver, and Leon Winiarski

(d) **Mathematical sociology**

Representatives: Vilfredo Pareto and F. Carli

This classification scheme of Sorokin has frequently been mentioned or utilized as a basic outline of sociology. [5] Sorokin, being the founder of Harvard University's sociology department, supposedly taught this subject at Harvard.

Odum

In 1929, American sociologist Howard W. Odum, citing Sorokin (1928), considered Winiarski the leader of the mechanistic school of sociology describing him as follows: [6]

> "**Winiarski**'s mechanistic interpretation posits society as a system of points, individuals in perpetual movement, with attraction as the primary cause of movement. This attraction is like chemical affinity which mechanical bases but with psychic force not present in the physical world, which, however, in turn is nothing more than a form of physico-chemical energy which in turn, in the form of life, may be transferred from potential to kinetic energy, and this transformation is primarily through the processes of alimentation and reproduction. Human masses transmute energies of hunger and sex into various social, economic, aesthetic or intellectual forms, the transformation proceeding entirely according to the laws of thermodynamics. Society and human beings will ultimately reach an equilibrium in some way as the physical world has reached its equilibrium and social science must devise objective units of studying this energistic system of humans in relation to their world."

Odum also classified Eugene Roberty in this "mechanistic theory" group approach to sociology.

Stewart | Grant-funded university social physics

See main: Princeton University Department of Social Physics

From *circa* 1945 to 1955, at the Princeton University physics department, American astrophysicist and engineer John Q. Stewart, ran a Rockefeller Foundation grant-funded social physics/**social mechanics** applied research group. [14]

From circa 1945 to 1955, at the Princeton University, American astrophysicist John Q. Stewart, with grant funding from the Rockerfeller Foundation, headed a project on the development of social physics or social mechanics, depending on namesake, at the University of Princeton. In *circa* 1953, for example, he presented a paper before the American Physical Society, wherein he discussed how three of the first three of the main six main forms of physical energy (kinetic, elastic, gravitational, thermal, electromagnetic, and chemical), namely: kinetic, elastic, and gravitational have been showing up in the form of a subject classified as "social mechanics", which is said to deal with time, space, and mass of material as social controls, albeit classified as a "rather neglected" branch of general social study. [13] In 1957, American science journalist John Lear, in his *New Scientist* newsletter "The Laws of Social Relationship", summarized Stewart's work as follows: [14]

> "With the help of a small grant from the Rockefeller Foundation, a handful of scholars at Princeton University have been working for some time past in what most people would call a new science: social physics. As the name implies, this science is based on the proposition that physical laws governing the behavior of atoms and planets are applicable as well to social relationships among humans. Distance and time spate one mass of people (a city, say, or a nation) from another and affect interactions accordingly: the number of people and their psychological temper and desire also help to decide what turns are taken in world's affiars. Stewart, associate professor of astronomical physics at Princeton, equates these half dozen social quantities with six fundamental categories of physical science—distance, time, mass, number of

molecules, temperature, and electric charge. And he says that it is most unfortunate that the parallels are ignored by politicians and statesmen, for the laws of science have a way of making themselves felt even when the existence is disputed. “Statesmen of this and other nations … have embarked upon grandiose undertakings where on physical grounds failure was predictable,” Stewart observes, “and … failure meant that … people perished in vain.”

In 1948, Stewart penned the textbook *Demographic Gravitation: Evidence and Application*, wherein he incorporated his view that the laws of physics should have applicability to the social sciences, in which he introduced the concept of “potentials of population”. [15] Stewart, as discussed above, credits American presidents and fellow Princetonian James Madison and Woodrow Wilson as being early social physics/social mechanics thinkers.

Dawson | Corpse theories

In 1957, British cultural historian Christopher Dawson summarized social mechanics, along with social physics, and social energetics, as one of the defunct corpses of sociology’s past: [11]

> “From the beginning sociology has been haunted by the dream of explaining social phenomena by the mathematical and quantitative methods of the physical sciences and thus creating a science of society which will be completely mechanistic and determinist. The path of sociology is strewn with the corpses of defunct systems of “social physics,” “social energetics,” and “**social mechanics**,” and their failure does little to discourage fresh adventures. Such systems have little use for history or for social reality; they content themselves with generalizations that have significance and with “laws” which are nothing but false analogies … nothing but an apparatus for the transformation of solar energy into human energy (Carver and Ostwald), while Winiarsky argued that social change proceeds according to the laws of thermodynamics. Such extravagances explain the distrust shown towards sociology by historians, for the experience of the complexities of the complex reality of the social process makes them naturally hostile to the crude simplicity of pseudoscientific generalizations.”

One line of reasoning as to why social mechanics fell off into the 1950s, comes from American sociologist Barbara Heyl, and her investigation into the 1930s to early 1940s Harvard Pareto circle, according to which she concludes that these types of physical-chemical-materialistic mechanical sociologies fell off as a result of the effect of WWII, during the course of which America became allies with Russia, and a switch of direction to the field of study historical materialism of Karl Marx resulted. [16]

On the positive end, Dawson seems to be acutely unaware of the deep work of American historian Henry Adams, who was not at all distrustful of such applications in sociology—in fact, Adams, in a 1909 letter to English lawyer Charles Gaskell, famously said he would “travel a few thousand-million miles to discuss with [William Thomson] the thermodynamics of socialistic society.” [12]

Stark | Extreme mechanicism

In 1962, Austrian macroeconomist turned sociologist Werner Stark, his 1962 *The Fundamental Forms of Social Thought*, in which he devoted two chapters to a "angry" critique of what he refers to as the "extreme mechanicism" school of sociology, where people are treated as particles (see: human particle) and or molecules (see: human molecule) whose behaviors are explained through mechanism and physical science principles. [2] The gist of Stark's extreme mechanism sociology critique is summarized well by a recent 1993 retrospect synopsis by American sociologist Leon Warshay: [3]

> “Some modes of mechanism (Chapter 10), such as Simmel’s, are tolerated; others, such as Lundberg’s, are not. Simmel is deemed a moderate even though he leans toward nominalism, just as Durkheim is favorably contrasted with Simmel as a moderate who leans toward realism. Lundberg is criticized for aping physics—for using motion, energy, and force as social mechanism and defining societal groups as ‘electron-proton

configurations'—thereby being enslaved by 'mechanistic modes of thought' (pgs. 153-54).

The work of Henry Charles Carey (which is discussed in Chapters 10 and 11) and that of S.C. Haret is characterized as extreme mechanicism. Both apply physical principles to society (e.g. force, attraction, motion, constrains, space, equilibrium, energy, and electricity) and both see individuals in mechanistic-atomistic terms (e.g. as particles and or molecules) as inert elements caused from without. Stark criticizes extreme mechanicism for its inability to deal with social fact (pg. 163) and as inclined to be a- or anti-historical (pg. 159).

Some 'empiricism' is evident here in Stark's criticisms of the various types of mechanicism he posits. His argument is an angry one: that Carey, Pareto, and Lundberg have all 'imported' models from elsewhere (e.g. from physics and astronomy), and have 'imposed' them on social phenomena (which Stark knows to have an idealistic character) under a 'unity of nature' positivist ideal, which is really a sociology unified under physics (pg. 155)."

In short, Stark aims to espouse extreme theories of social mechanism in which the individual is discussed in guise of the physicalist terms of atoms and molecules, which Stark considers a 'foreign substance'. The following is Stark's view on the theories of Italian engineer Vilfredo Pareto: "Pareto's positive mechanism is excoriated for imposing a molecular model upon social life in the name of an objective science." [3] In the end, however, although critical of these extreme mechanism views, Stark comments that these views will be needed in some way in a modern sociology.

Discussion

Into the 1970s and thereafter sociological writings on the great century-long cultivated "social mechanics" school, as outlined above, seem to have disappeared? A possible explanation for this disappearance may have to do with the widening of the knowledge blanket fanning effect (e.g. last person to know everything), particularly with the growth in equation complexity of chemistry, physics, and thermodynamics, chemical thermodynamics and or chemical engineering thermodynamics, in particular, which began to make and cultivate deep roots beginning in the 1950s, after which it became increasingly more difficult for one to master two fields, such as sociology and chemical engineering, economics and physics, or anthropology and chemistry, as would be needed to keep pace with modern science, as could more easily be done in the past, particularly in the 19th century heyday of social mechanics.

Some discussion on an attempt at a modern-day revival of the social mechanics school, framed in modern physical science and chemical thermodynamic terms, can be found on the Hmolpedia two cultures department page, which American electrochemical engineer Libb Thims is working to bring to fruition, similar to Winiarski's 1894-1900 effort, at a leading American university, ranked high in their chemical engineering graduate school department.

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Further reading

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θΔics

In hmolscience, **social mechanism**, a common term used in social mechanics, refers to the notion of "mechanism", whether chemical or mechanical, imported into sociology or economics to explain human phenomenon and experience.

History

The first to explicitly initiate social mechanism in chemical reaction terms was German polymath Johann Goethe, who in his 1809 physical chemistry based novella employed Swedish chemist Torbern Bergman's 1775 "affinity reaction diagrams" to pen out 36 chapters of human interaction in which the comings and goings of people, on an isolated estate, the reaction vessel, actuate out mechanistically, according to the following basic logic, namely the transposition of the 1757 chemical mechanism logic of Scottish chemist William Cullen, which underlies Bergman's reaction diagrams, to human reactions:

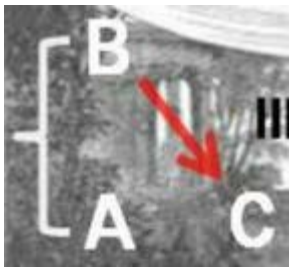

Chemical version
(1757)

William Cullen (1757): "the **dart** → between them expresses the *elective attraction*; when I put a dart with the tail to one substance and the point to another, I mean that the substance to which the tail is directed unites with the one to which the point is directed more strongly than it does with the one united to it in the **crotchet** {."

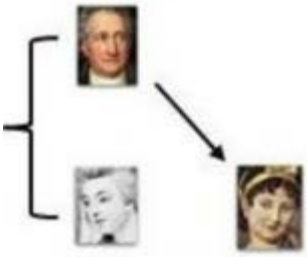

Human version
(1809)

Goethe's protege German philosopher Arthur Schopenhauer later expanded on this mechanistic logic, albeit with focus on a prolonged effort to argue that human "will" and chemical "will" are one and the same, being that, as Goethe famously put it in his anonymous advertisement, in defense of his novella, "there is, after all, only one nature."

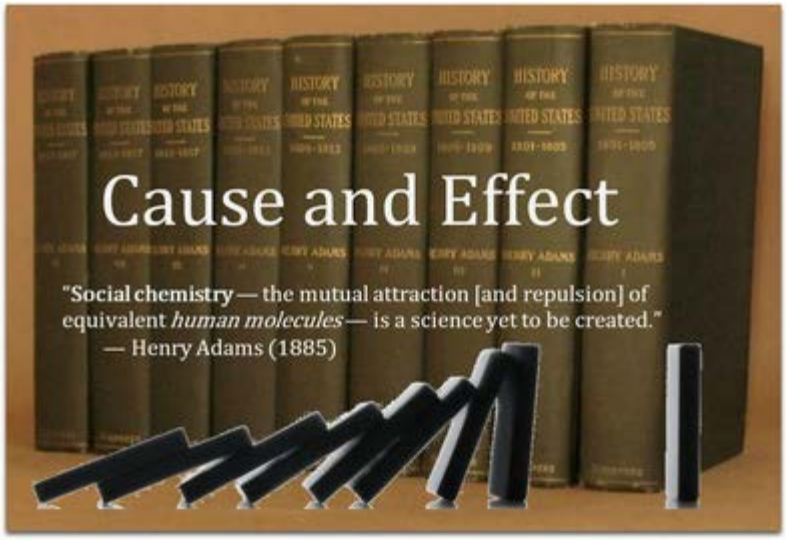

In circa 1890, Henry Adams penned a nine volume history of the United Stated during the administration of Thomas Jefferson to prove to himself that historical process operates via cause-and-effect mechanism:

Stark classification

See main: Stark classification

In 1962, Czechoslovakian-born English sociologist Werner Stark, in his *Fundamental Forms of Social Thought*, divided fundamental sociological theory into the study of society as an organism, as a mechanism, and as a process, respectively. Within each perspective, he further subdivided into: normative form, positive form, secondary form, and extreme forms. Though Stark does not include Goethe in his classification scheme, he does mention him twice in his book, but refers to him as one of the great all around philosophers, though not necessarily a sociologist. It seems that Stark was unaware of Goethe's chemical mechanism usage.

See also

â— Human chemical reaction theory

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θΔics

In hmolscience, **social models** refers to one of a number of historical physical and or chemical conceptualized models employed to describe human social interactions, behaviors, and systems.

List

The following is a work-in-progress listing of some of the main physical sociology models:

- Billiard ball model
- Cannon ball model | Social cannon ball model
- Chemistry set model | Molecular reaction model
- Ideal gas model | Social ideal gas law
- Island model | Thermodynamic system model
- Social retort | Social test tube model

θΔics

In human chemistry, the **social molecule** is the view of a collective society of people as an aggregate of human particles, human atoms, or human molecules.

Overview

In 1871, English biologist Thomas Huxley used the term social molecule as follows: [1]

> "Every society, great or small, resembles ... a complex molecule, in which the *atoms* are represented by *men*, possessed of all those multifarious attractions and repulsions which are manifested in their desires and volitions, the unlimited power of satisfying which we call freedom ... the **social molecule** exists in virtue of the renunciation of more or less of this freedom by every individual. It is decomposed, when the attraction of desire leads to the resumption of that freedom the expression of which is essential to the existence of the social molecule. The great problem of **social chemistry** we call politics [political thermodynamics], is to discover what desires of mankind may be gratified, and what must be suppressed, if the highly complex compound, society, is to avoid decomposition

In 1970, American sociologist Robert Nisbet conceived of a "social bond" theory as what holds together the "social molecule". [2] Variants of this concept include the social atom and the economic molecule.

References

1. (a) Huxley, Thomas. (1871). "Administrative Nihilism", *Fortnightly Review*, pg. 536. Nov.
(b) Thims, Libb. (2008). *The Human Molecule*, (preview). Morrisville, NC: LuLu.
2. Nisbert, Robert, A. (1970). *The Social Bond - an Introduction to the Study of Society* (social molecule, 38, 45, etc.). New York: Alfred A. Knoph.

θΔics

In human physics, a **social network** is a structured connection of individuals, typically centered around one person or in some cases a group, individuals linked together via various types of social ties, such as weak ties, strong ties, links, connectors, or other varieties of connective bonds.

A generic depiction of a **social network**.

History

In 1967, American social psychologist Stanley Milgram completed his “letter mailing” experiment, otherwise known as the small-world experiment, as part of his dissertation work at Harvard, wherein he found that people are connected socially on average by about six links distally from one another, hence the phrase ‘six degrees of separation’. [1]

In the late 1960s, American sociologist Mark Granovetter obtained data for his doctoral thesis at Harvard University by interviewing dozens of people to find out how social networks are used to land new jobs. Granovetter found that most jobs were found through "weak" acquaintances. This pattern reminded Granovetter of his freshman chemistry lesson that demonstrated how "weak" hydrogen bonds hold huge water molecules together, which are themselves held together by "strong" covalent bonds. A similar combination of strong and weak bonds, according to Granovetter, holds the members of society together. This work culminated in the publishing of his famous and highly-cited 1973 article "The Strength of the Weak Ties".

In 2010, Medical sociologist Nicholas Christakis began to explain and model social networks using carbon atom bonding models, using the motto “like atoms in a molecule, we’re all linked together.”

References

1. (a) Gladwell, Malcom. (2000). *The Tipping Point* (pgs. 34-36). Little, Brown, and Co.
(b) Stanley Milgram – Wikipedia.

External links

â— Social network – Wikipedia.

θΔics

In hmolscience, **social Newton**, abbreviation: SN, as compared to the phrase "another Newton", i.e. a future social Newton, refers to someone historically who has either been specifically referred to as a "Newton" of the humanities, e.g. "Newton of social science" (or "Newton of sociology"), and or whose work, being *Social Principia*-like, has outlined or developed a Newtonian, i.e. physical, chemical, and or rational mechanics, framed formulation of sociology, namely a social mechanics, social physics, or social chemistry conceptualized model of humans, as moving objects, on a surface, the way English physicist Isaac Newton completed a rational mechanics (or celestial mechanics) formulation for celestial bodies; which is a subject people "now have most need of" according to 1842 views of Auguste Comte.

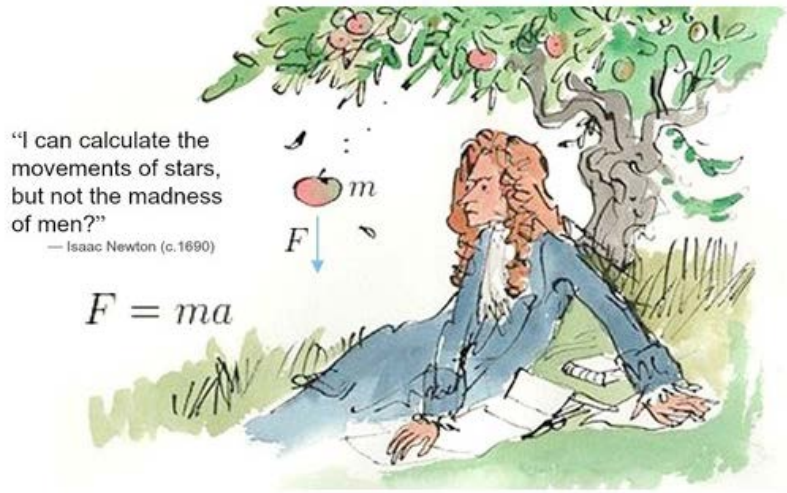

A depiction of a "**social Newton**", namely one who can "calculate the madness of men", as Newton longed for, via mechanistic, physics, chemistry, and or thermodynamical reasoning, and predictive governing equations.

Overview

Historically, the term "social Newton" or "Newton of social science", among other variants, began to arise, semi-commonly, in the 19th century, and into the 20th century, attributed to four individuals, namely: **Henry Carey**, "Newton of social science" (Kate McKean, 1864) or "Newton of sociology" (Werner Stark, 1962); **Charles Fourier**, "Social Newton" (Moritz Kaufmann, 1874) or "Newton of the moral sciences" (Adam Ulam, 1976); **Vilfredo Pareto**, "Newton of sociology" (Bernard DeVoto, 1933) or "Newton of the moral world" (Werner Stark, 1963); **Lester Ward**, "American Aristotle" (Samuel Chugerman, 1939). The modern-day ranking of all known social Newtons, as per their work stands, is shown below.

Social Newtons | Classical

*See also: **Social Newtons** (existive)*

The following is the work-in-progress ranked listing of historical "social Newtons", with Hmolpedia citation ranking (CR) shown; the "±" column signifying that a seeming up or down (↑↓) adjustment in ranking is in order; in the chemical equilibrium (⇌) column, the the "R" symbolizes that the used some semblance of "human chemical reaction theory", and the "E" signifying that the individual employed some type of reversible two-way equilibrium reaction logic; "Δ" column signifies the person used some type of **thermodynamics logic** in their theory (A=Affinity; T=Thermodynamics; CT=Chemical Thermodynamics; ST=Statistical Thermodynamics); the "Hu" column, signifies that the person used some type of human molecular theory logic, conceptualizing people as molecules "M" (human molecules) or chemicals "C" (human chemicals); the PCR symbol signifies that their work has been cited to have or has the potential to bring about a total "revolution" in social theory (see: Goethean revolution), i.e. a physicochemical revolution (PCR) in the humanities (see: physiochemical humanities); Hmolpedia like rankings (LR) are shown when available, e.g. the notation 2|30, in the LR column, signifies the person is the second most-liked individual in Hmolpedia, their article having 30 likes); the "LTE" symbol signifies if the person did the famous love thought experiment, in any sense of the matter (S = sort of), conceptualizing romantic relationships as chemical reactions governed by physicochemical principles:

Social Newtons | Classical

	Person	CR	⇌	Δ	Hu	IQ	Citation[s] / Quotes (related)	Translations-to-English (needed)
1	Johann Goethe (1749-1832) German polyintellect PCR, LTE, LR:30|#2	1069	R	A	C	225/1	Quote: "1642 [Newton's birth] is the Christmas of the modern age." Quote: "The moral symbols of nature are the elective affinities: $A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$ discovered and employed by Bergman."	
2.	Henry Adams (1838-1918) American historian LTE, LR:5|17	368	R	CT	M	195/20	Quote: "A complete solution—to the future science of physico-chemical social dynamics— seems to call for the aid of **another Newton**." (1910)	
3.	Vilfredo Pareto (1848-1923) Italian engineer PCR	211	R	T	M	190/22	"Newton of sociology" (Bernard DeVoto, 1933) (Ñº) "Newton of the moral world." (Werner Stark, 1963) [13] "If Pareto had truly joined the **social** sciences to the natural sciences, an achievement Henderson very much wanted to see, it is only to be expected that he would put Pareto in the great company of Gibbs, Bernard, and even **Newton**." (Bernard Barber, 1970) "A **modern Galileo** for the social sciences" (Henderson's view (c.1942), according to Barber, 1970)	French, Italian

4.		Leon Winiarski (1865-1915) Polish social economist	101		T		185 / 58	In his *Essay on Social Mechanics* (1898), he attempted to base sociology on the Clausius inequality; which he discusses in the following form: $$\oint \frac{dQ}{T} = 0$$	French, Italian
5.		Norman Dolloff (1907-1984) American metallurgical engineering geologist	37		CT		185 / 59	In his *Heat Death and the Phoenix* (1975), he gives the following what might be called "organism synthesis equation": $$\sum n_i \rightarrow \text{organism}; \Delta G_R^\circ = +; \Delta S_R^\circ = -$$ Classified as the transition point mindset of someone grappling to switch from the entropy "order/disorder" model of everything to the "free energy" model of everything; all done in the framework of explicit atheism.	
6.		Friedrich Nietzsche (1844-1900) German philosopher	182		T		190 / **29**	"**All that we need** and that could possibly be given us in the present state of development of the sciences, **is a chemistry of the 'moral', 'religious', 'aesthetic'** conceptions and **'feeling'**, as well as of those **'emotions'** which we experience in the affairs, great and small, of society and civilization, and which we are sensible of even in solitude." — Friedrich Nietzsche (1778), aphorism #1 of 1,400 in: *Human, All Too Human*	
7.		Frederick Rossini (1899-1990) American chemical thermodynamicist	146	⇌	CT	C	180 / 138	In his "Chemical Thermodynamics in the Real World" (1971), he stated very directly that via the following equation: $$\ln K = -\frac{\Delta H^\circ}{R}\left(\frac{1}{T}\right) + \frac{\Delta S^\circ}{R}$$ we can come to understand the paradox between freedom and security in society.	
8.		Lawrence Henderson (1878-1942) American physical chemist	177	⇌	CT	C	180 / 102	Ran the Harvard Pareto circle (1932-1942) AND taught a Gibbs-Pareto system based "Sociology 23" course at Harvard (1938-1942).	
9.		Edwin Wilson (1879-1964) American mathematician	38	E	CT			Taught a Gibbs-based "Mathematical Economics" course at Harvard (1935-1938) AND told Paul Samuelson to use Gibbs' "equation 133": $$U - TS + PV - M_1m_1 - M_2m_2 ... - M_nm_n$$ to formulate a theory of economic stability.	
10.		Henry Carey (1793-1879) American sociologist	66	R	A	M		"Newton of social science" (Kate McKean, 1864) (Ñº) "Newton of sociology" (Werner Stark, 1962) [5]	
11.		Ludwig Buchner (1824-1899) German physicist-physician	48	R		C	180 / 110		German
12.		Baron d'Holbach (1723-1789)					190 / 31	"Newton of the atheists" (Ñº)	
		John Tukey (1915-2000)							

13.		American chemist, mathematician, and statistician	9		CT		180 | 159		
14.		Mehdi Bazargan (1907-1995) Iranian mechanical engineer LR:7|9	80		T				Farsi
15.		John Q. Stewart (1894-1972) American physicist turned social physicist	105		T				
16.		Wilhelm Ostwald (1853-1932) German physical	165		CT	C	190 | 38		
17.		Eugene Roeber (1867-1917) German-born American electrochemcial engineer							
18.		William Rankine (1820-1872) Scottish engineer and mathematical physicist LTE:S	85		T		180 | 88		
19.		Maurice Hauriou (1856-1929) French lawyer turned social philosopher	25		T				French
20.		Arthur Schopenhauer (1788-1860) German philosopher LTE:S ↑↓	127	R	A	C	185 | 60		
21.		Alfred Lotka (1880-1949)	117				185 | 72		
22.		William Fairburn (1876-1947)	66				170 | 345		
2#.		Kaj Lang (1896-1959) Danish chemical engineer			T				
23.		Henry Bray (1846-1922) English-born	44		A		180	First Hmolpedia scholar wherein "social Newton term analysis" was	

		American polymath				167	performed; a technique later called Beg analysis (Thims, 2014).	
24.		Lester Ward (1841-1913) American paleobotanist-trained sociologist	29		T		“American Aristotle” (Samuel Chugerman, 1939)	
25.		Adolphe Quetelet (1796-1874)				175 257	His social physics work, building on the social mathematics of Marquis Condorcet (IQ:180|#149) (Cattell 1000:288), inspired the proposed Nightingale Chair of Social Physics.	French
26.		Ed Stephan (1939-2008) American sociologist ↓	20		CT			
27.		Spiru Haret (1851-1912) Romanian mathematical physicist	26			C		French
28.		Emanuele Sella (1879-1946) Italian lawyer	25		T			Italian
29.		Guillaume de Greef (1842-1924) Belgian socialist	4					French
30.		George Scott (1921-2002) American organic chemist						
31.		Arthur Iberall (1918-2002) American physicist and engineer ↑	35		T	M		
32.		Julius Davidson (c.1875-c.1935) American economist	15	⇌	ST			
33.		Elliott Montroll (1916-1983) American chemist, mathematician, and physicist ↓	13		T	M		
34.		Nicolas Rashevsky (1899-1972) Russian-born American theoretical	13					Russian

	biologist and sociologist ↓					
35.	Charles Fourier (1772-1837) French philosopher ↑↑	13			“Social Newton” + *Social Principia* (Moritz Kaufmann, 1874) [1] “Newton of the moral sciences” (Adam Ulam, 1976)	French
36.	Antonio Portuondo (1845-1927) Spanish civil engineer and mathematician	8	T			Spanish
37.	Eduard Sacher (1834-1903) Austrian science teacher ↑	13	T			German
38.	Enrique Fatigati (1845-1918) Spanish physicist, chemist, and thermodynamicist ↑	9	T			Spanish
39.	Francesco Algarotti (1712-1764) Italian natural philosopher	10			Argued, in his *Newtonianism for the Ladies* (1737), via Newtonian celestial mechanics logic, that: $$\text{Love} \propto \frac{1}{d^2}$$ namely that the force of love decreases with distance of separation.	
40.	Sigmund Freud (1856-1939) Austrian psychoanalyst	155	CT	185 | **70**		
41.	George Gore (1826-1908)					
42.	Francis Edgeworth (1845-1926) Irish mathematical economist	19		180 | 186		
43.	George Lundberg (1895-1966) American sociologist	23			“Secondary form” of social mechanism (Stark classification, 1962) “Newton of the social sciences” (Robert Bierstedt, 1981) (Ñº)	
44.	Georges Guillaume (1896-1969) Swiss-French economist ↑	13	T			French

45.		Ettore Majorana (1906-1938) Italian engineer and theoretical physicist	36		185 — 83		Italian
46.		Eugene Roberty (1843-1915) Russian positivism sociologist ↑↓	10	T			Russian, Spanish
47.		Teresa Brennan (1952-2003) Australian-American philosopher ↑↓	14	CT			
48.		Albert Brisbane (1809-1890) American social theorist	6				
49.		David Hume (1711-1776) Scottish philosopher	51		180 — 111	“Newton of moral sciences” (John Passmore, c.1960) (Ñº) “Newton of the moral sciences” (Michael Foley, 1990)	
50.		Auguste Comte (1798-1857)			185 — 71	“Newton of sociology” (1871) (Ñº)	
51.		Jean Sales (1741-1816) French philosopher ↑	58	M	185 — 67	Newton in Senegal (1777)	French
52.		Balfour Stewart (1828-1887) Scottish physicist	65	T		Social cannon ball model (1868)	
53.		Charles Montesquieu (1689-1755)	39		175 — 225	“Newton of sociology” (Crane Brinton, 1950) (Ñº)	
54.		Honore Balzac (1799-1850) French novelist	19	A	175 — 306	See: Balzac feelings and affinity dialogue	
55.		John Boodin (1869-1950) Swedish-born American philosopher	7				
		John Desaguliers (1683-1744)				Was Newton's experimental assistant; his his *The Newtonian System of the World: the Best Model of Government* (1728), outlined a system of “Newtonian government”, arguing that the force of	

56.			"attraction" exists in society as it does celestially, and that an ideal government should be a "natural government", run similar to celestial mechanics principles.
57.	James Madison (1751-1836)	180 — 147	Studied social physics at Princeton; wrote the US Constitution using Newtonian mechanics (i.e. Newtonian government)
58.	George Berkeley (1685-1753) Irish-born English philosopher	180 — 145	Known for a particular social physics brand of "Newtonian sociology", defended by Bernard Cohen (1994) but refuted by Pitirim Sorokin (1928), which attempted to outline a theory of laws of motion of souls akin to the laws of motion of planets, i.e. that souls were governed by something similar a force like the law of gravity.
59.	Pierre Maupertuis (1698-1758)	185 — 49	Penned *Venus Physics* (1745), which may have been on the physics of love {?}; also: *System of Nature: Essay on Organized Bodies* (1751), which contrasts ideas on feelings and soul with atomistic materialism ideas, from Epicurus to Descartes; his ideas that atoms "feel" attraction and repulsion, and possibly use of the material imagination theory, sometimes leads to comparisons with Goethe and his *Elective Affinities*.
60.	Albert Weiss (1879-1931)		His *Theoretical Basis for Human Behavior*, defined a human as a "geometrical electron-proton pattern" (see: proton-electron configuration) or system, and human behavior as reduced to "movements between electron-proton systems"; went on to outline a "radical reductionism" form of behaviorism; his "rain-drop analogy" points to the need to deanthropomorphize our thinking about human movements.
61.	Carl Snyder (1869-1946) American chemistry historian, economist, and statistician ↑↑		Made a Gibbs and Goethe (+Empedocles) connection (1902), , wherein, citing Berthelot, stated that "line demarking the domains of organic and mineral chemism is a figment of the mind, the selfsame powers rule in each", then published *The World Machine: the First Phase, the Cosmic Mechanism* (1907), and had a draft *The Social Mechanism* working.
62.	Lady Professor (c.1830-c.1885) English science professor		Her posthumous *The Romance of Mathematics* (1886) deals with social force, kinetic and potential energy, and science applied to sociology, government, and politics.

CR ⇌ Δ **Hu**

Of note, the mean IQ of a social Newton, per average of the above 14 IQ estimates, is 185.7 or 186, rounded.

In 1875, of note, American theological philosopher Robert Wright published *Principia: Basis of Social Science*, the first attempt at a so-called *Social Principia*, wherein he grappled with Auguste Comte, Carey, and Fourier, in efforts to expunge the "atheism" aspects of the latter so to make a theological-framed politics for post-civil war America

SN Rankings | Origin

In 2011, Thims, in order to keep track of "key thinkers", from among the 100s of existographies growing in Hmolpedia, when EoHT.info was at the 2,200-article level, began to collect "spotlight thinkers" (Ñº), **not ranked** in any particular order, in a bottom section of the Hmolpedia main page; the following is the 7 Jul 2013 version of the spotlight thinkers section:

Léon Winiarski (1865-1915)

Antonio Portuondo (1845-1927)

Gustave Hirn (1815-1890)

Wilhelm Ostwald (1853-1932)

Georges Guillaume (c.1904-c.1974)

Francis Edgeworth (1845-1926)

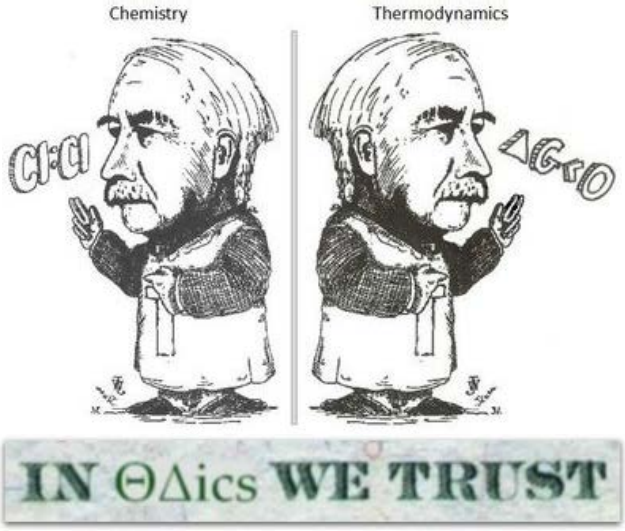

Frederick Rossini (1899-1990)

Erwin Bauer (1890-1938)

Pitirim Sorokin (1889-1968)

Mehdi Bazargan (1907-1995)

John Neumann (1903-1957)

Spiru Haret (1851-1912)

Robert Lindsay (1900-1985)

Teresa Brennan (1952-2003)

Jeffrey Wicken (1942-2002)

Arthur Iberall (1918-2002)

Morris Zucker (1892-.c.1972)

Ettore Majorana (1906-1938)

Ed Stephan (1939-2008)

Jeremy Adler (1947-)

Jurgen Mimkes (1939-)

The "ΘΔics" symbol, the icon found at the bottom of every Hmolpedia article, James Maxwell's famous coded shorthand for "thermodynamics", the science that governs the known universe, shown on a US one dollar bill, meaning, for the modern physical scientist, "In Thermodynamics We **Trust**" is our motto; substituted for the original 1956 now-defunct statement "In God We Trust", as adhered to in the belief systems of the general public (see: existence of God).

Sture Nordholm (1944-)

Reiner Kummel (1939-)

Adriaan de Lange (1945-)

Maurice Hauriou (1856-1929)

Enrique Serrano (1845-1918)

Eduard Sacher (c.1830-c.1910)

Henry Adams (1838-1918)

Yuri Tarnopolsky (1936-)

Lester Ward (1841-1913)

Arthur Schopenhauer (1788-1860)

John Q. Stewart (1894-1972)

Henry Carey (1793-1879)

Nicolas Rashevsky (1899-1972)

This group of spotlight thinkers, in some sense, was a forerunner to the (above) now-ranked “social Newton” article. The more one reads into the works of spotlight thinkers, the more progressively a respective ranking becomes apparent, albeit not immediately.

On 16 Oct 2013, this "social Newton" page, in particular, was prompted (Ñº) into inception, following discovery of the citation, by Moritz Kaufmann (1874), referring to Charles Fourier’s *The Theory of the Four Movement* as being a “social Principia” and Fourier as having aimed to become a “social Newton”. By the end of day, revision 4 (Ñº), Thims had made a first draft ranking of 29 “classical social Newtons” and 13 “active social Newtons”, as shown below:

Social Newtons | Classical

Top 12	Tentative Runners Up	
1. Johann Goethe	13. Eduard Sacher	25. Elliott Montroll
2. Henry Adams	14. Enrique Fatigati	26. Arthur Iberall
3. Vilfredo Pareto	15. Antonio Portuondo	27. Ed Stephan
4. Leon Winiarski	16. Francis Edgeworth	28. Rush Dozier
5. Frederick Rossini	17. Enrique Serrano	29. Teresa Brennan
6. Morris Zucker	18. Spiru Haret	
7. Henry Carey	19. Wilhelm Ostwald	
8. Mehdi Bazargan	20. Maurice Hauriou	
9. Adriaan de Lange	21. Sigmund Freud	
10. Ettore Majorana	22. Emanuele Sella	
11. John Q. Stewart	23. George Lundberg	
12. Arthur Schopenhauer	24. Georges Guillaume	

2013 Rankings

(1st Draft)

Social Newtons | Active

Top 10	Tentative Runners Up	Honorable Mention
1. Jurgen Mimkes	11. Raddai Raikhlin	16. Erich Muller
2. Thomas Wallace	12. Reiner Kummel	17. Sture Nordholm
3. Christopher Hirata	13. Dimitris Keranis	
4. Wenyuan Niu	14. Paris Arnopoulos	
5. Wayne Angel	15.	
6. Josip Stepanic		
7. Philip Ball		

As of 5 Dec 2016, 58 "historical" social newtons were listed, in ranked order, as shown above, and 18 "existive" social newtons were listed, on a separate page.

Candidates | Tentatives

The following are noted and or newly-discovered possible "social Newtons" in potential need of ranking:

â— **Percy Shelley** (1792-1822)
â— **Witold Gombrowicz** (1904-1969)
â— Oliver Reiser (1895-1974)
â— John Fiske (1842-1901)
â— Robert Burton (1577-1640)
â— Henry Finck (1854-1926)
â— Edmund Noble (1853-1937)
â— Frank Carlton (1873-1961)
â— William Paterson (1745-1806)
â— Michael Macrakis (1924-2001)
â— John Boyd (1927-1997)
â— Robert Wright | published: *Principia: Basis of Social Science* (1875)

An illustration of Jean Sales' 1777 satirical play "Reasonable Drama", aka Newton in Senegal, showing Newton, as "**social Newton**", fictionally depicted as a vegetarian, eavesdropping on a conversation between a meat-eating Merman, a talking oyster, pleading for it's life, amid which an African, who believes in a scarab-conceptualized god, enters the scene; at the end of which Newton reasons that he should only attempt to explain morality to the African, since he alone, with his type of belief system, might obtain a soul, or something along these lines.

Remote | Social Newton

The following are prototype, precursory, stepping stone, preliminary work type of "in the remote neighborhood" social Newton type thinkers: Etienne Marey (first to address the unbridgeable gap), Morris Zucker, (add)

Ward | American Aristotle

American sociologist Lester Ward, to note, does not have an actual "social Newton" reference, but (a) he does have a "American Aristotle" (Samuel Chugerman, 1939) citation and (b) he does seem to be the sole American advocate of Winiarski's social mechanics theories, and (c) he is cited by Bruce Lindsay as one of the pioneers of physical sociology, seemingly on par with in conceived to be in like company with Pareto:

> "Many years ago in the *brashness of youth* the writer prepared an article ["Physical Laws and Social Phenomena", 1927] on the possible use of physical principles and concepts in the description and understanding of social phenomena. He called attention to the earlier efforts of social scientists like Auguste Comte, Herbert Spencer, and Lester Ward to apply physical concepts and laws more or less directly to social explanation. He emphasized the difficulties encountered in the use of such analogies, e.g., the attempt to introduce a 'social force' analogous to 'force' in mechanics, overlooking the highly specific meaning attributed to the term in physics, not always clearly grasped by the nonphysicist and indeed for a long time not even too precisely clear to many physicists and engineers. It was only later that his attention was drawn to the ideas and criticisms of Vilfredo Pareto, who in his monumental work *Treatise on General Sociology* (1916) stresses in great detail the same difficulties."
>
> — Bruce Lindsay (1983), "Social Exemplifications of Physical Principles"

(add discussion)

Newton of moral sciences

The term "Newton of the moral sciences" has been attributed to a few people, some of which are listed above, of the enlightenment:

> "The recurrence during the eighteenth century Enlightenment of the aspiration to be the '**Newton of the moral sciences**' testifies to the prestige not just of celestial mechanics, but of the 'experimental method' more generally."
>
> — Stefan Collini (1993), 'Introduction' to C.P. Snow's *The Two Cultures* [6]

Some of these so-called "moral Newtons" include: John Locke (Ñº), David Hume, Immanuel Kant (Ñº), and Charles Fourier (Ñº), along with Vilfredo Pareto who Werner Stark (1963) refers to as the "Newton of the moral world." [13]

Discussion

The following quote gives a ripe comparison of Pareto (SN:3) and Adams (SN:2):

> "**Pareto**'s *Treatise on General Sociology* is the hardest boiled book I have ever read. Three times, since I passed my puberty, has my mind been made over. Once by a nexus of which Henry **Adams** was the center, once by a matrix of which [James] Frazer (Ñº) (Ñº) burned brightest, and once by a long study of genetics and evolution. Pareto is doing the job a fourth time, and far more vitally than any others."
>
> — Bernard DeVoto (1928), personal note reflection [8]

5. Section
Chap. 343. Since the Renaissance

A. Machiavelli
B. Wave theories as concrete periodizations
C. [Pierre] Bayle
D. Mendelssohn, Kant
E. Goethe (#1)
F. [Heinrich] Leo [or Judah

Leo?]
G. Heine
H. [Pierre] Proudhon
J. Henry Adams (#2)
K. Hauriou (#13)
L. Pareto (#3)
M. Louis Weber
N. Ortega y Gasset
O. [Karl] Joel
P. [Nicolai] Berdjajew
Q. Russell

This, of course, is two cultures social Newton genius comparison at its near finest, Goethe (SN:1) aside. Although there does not, in paragraph form, similar to above, seem to be anyone who has been perspicacious enough to make the illusive and very difficult Goethe-Adams-Pareto connection, the closest Goethe-Adams comparison or connection is as follows:

> "The English Navy, **Goethe** tells us, had all its ropes manufactured each with a single red thread, twisted so intimately among the fibers of the rope, throughout its length from beginning to end, so that the red thread could be removed only by complete destruction of the rope. Even the shortest section of a rope of the Royal Navy could therefore be identified instantly by the red thread, always present and always visible. The 'red thread' has come to mean, in the German and Scandinavian languages, a subtle but vital theme, always present and always visible, which runs inexorably through a body. In this examination of texts of Goethe from 1809, of Henry **Adams** from 1909 and of Thomas Pynchon from 1973, we have, I think never lost the read thread."
>
> — Richard Schowen (1984), 'Elective Affinities: Science, Certainty and Freedom in Goethe, Henry Adams and Thomas Pynchon'

Section 5, chapter 343 "Since the Renaissance", by German writer Johan Hendrik Jacob Van Der Pot (1918-), from his 1985 two-volume *Encyclopedia of Technological Progress: A Systematic Overview of Theories and Opinions*, which seems to cover the work and theories of a very focused selection of "**social Newtons**"; though, to note, this is need of corroboration (via a reading of the 2004 English-translation). [10]

The following prophesy quote, concerning the modern social Newton ranking of Pareto, from about 92 years ago, if fairly telling, i.e. accurate:

> "And now the astonishing and perturbing suspicion emerges that perhaps almost all that had passed for social science, political economy, politics, and ethics in the past may be brushed aside by future generations as mainly *rationalizing.* John Dewey has already reached this conclusion in regard to philosophy. Veblen and other writers have revealed the various unperceived presuppositions of the traditional political economy, and now comes an Italian sociologist, Vilfredo **Pareto**, who, in his huge [1912] treatise on general sociology, devotes hundreds of pages to substantiating a similar thesis affecting all the social sciences. This conclusion may be **ranked** by students of a hundred years hence [2021] as one of the several great discoveries of our age."
>
> — James Robinson (1921), *Mind in the Making* (Ñº) (Ñº)

The term "Newton of sociology", to note, is Czechoslovakian-born English sociologist Werner Stark's 1962 term for American physical sociologist Henry Carey; the term "Newton[s] of social theory", is English philosopher Stephen Toulmin's 1992-2002 terminology for the French social physicists, e.g. Auguste Comte, and which often tends to refer to someone who in the past has attempted to formulate the humanities mechanistically, e.g. via social mechanism theory, done with great precision, in the same way that English physicist Isaac Newton famously formulated the movements of planets mechanistically. American historian Bernard Cohen (2008) cites Grane Brinton's 1950 usage of the term "Newton of social science" in a discussion of Charles Montesquieu's 1748 *The Spirit of the Laws*, wherein he compares a well-working monarch with the systems of the universe, employing some type of social gravitation theory. (Ñº)

In 1850, some were referring to "some coming Newton of sociology" (Ñº); and in 1871, some were referring to Auguste Comte as the "Newton of sociology". (Ñº)

An early reference to a social Newton is the work of French philosopher Charles Fourier, namely his 1808 *The Theory of the Four Movement*, which contains his views of the world in general, and his 1822 *The Association of Domestic and Agricultural Economy*, which contains his special views of the social system. [1] In 1874, Moritz Kaufmann, e.g., described Fourier as follows: [1]

> "In order to judge of his system it is necessary to note one or two salient points in his conception of the constitution of man and the universe. Happiness he acknowledges is 'our being's end and aim'; and the only true science which leads to its attainment is sociology. As the doctrine of the material movements in the universe has been fixed by Newton's discoveries, so too the laws which regulate the movements in the social world must first be ascertained before we can hope to render mankind happy. To become such a **social Newton** was undoubtedly Fourier's ambition, and this is the fundamental law of his social Principia."

In 1968, sociologist Daniel Rossides used the term "Social Newtonianism" as a type of categorization. [3]

A rare few are "self-proclaimed" social Newton's, so to speak, and some are rather forthcoming about this aim. One striking example being French-born Italian mathematical engineer and physical socioeconomist Vilfredo Pareto own words, as he states in opening paragraphs of his monumental four-volume *Treatise on General Sociology*: [4]

> "My wish is to construct a system of sociology on the model of celestial mechanics, physics, and chemistry."

In this perspective, of the known 1,000 or so *Hmolpedia* biographies, the table above, in ranked order, is a well rounded "top social Newtons" of history ranking.

American writer Charles Curtis, in his 1945 *Practical Cogitator*, seems to have also made some type of Goethe-Adams-Pareto connection, in a roundabout sense.

English physicist Isaac Newton (1643-1727) himself having seeded the social Newton revolution with his last and final Query 31, which Goethe, naturally enough ranked number one by far, based his "best book" on, namely his physical chemistry based *Elective Affinities*, wherein his human chemical theory is explained in layers of hidden code. Newton, himself, freely admitted that social mechanics formulation is far more difficult that celestial mechanics formulation:

> "I can calculate the movements of stars, but not the madness of men."
>
> — Isaac Newton (c.1690), after losing his hat in a market collapse

Winiarski may, to note, result to be ranked above Pareto, but being that his work is yet to be fully translated into English the final call in this matter is incomplete.

A social Newton, in sum, refers to someone who has sought to explain human movement and or experience using one or more of the physical sciences (mechanics, chemistry, physics, thermodynamics, etc.) according to laws the same way Newton formulated the laws of motion for bodies in general; someone who aims to write a *Social Principia*, so to say.

Social Clausius | Bergmans | Lavoisiers | Gibbsians

Some of these so-called "social Newtons", e.g. Adams, Buchner, etc., might also be or better be classified as "social Lavoisiers" (on Antoine Lavoisier), or "social Bergmans" (on Torbern Bergman) in Goethe and Schopenhauer case, or "social Gibbsians" (on Willard Gibbs), in the Henderson and Rossini case, in that they attempted to script our outline: *A Dissertation on Elective Attractions* (Bergman), *Elements of Chemistry* (Lavoisier), *On the Equilibrium of Heterogeneous Substances* (Gibbs) stylized versions of social chemistry or human chemistry, or something to this — the latter classification, i.e. social Gibbsian, become a bit more complex, being that Gibbs subsumed Newton, via Clausius, via Lagrange, into his chemical equilibrium scheme model of spontaneous change.

One remote example is Claude Levi-Strauss who, in his 1951 social structure theories, mixes together and compares Newtonian time (reversible), Gibbsian time (irreversible), and Bergsonian time (type?), as applied to anthropological change; though his work tends to steer clear of "chemical" like thinking, the characterization of Levi-Strauss as being "Gibbsian", in a statistical mechanical sense, is near enough to being "Gibbsian" in a chemical thermodynamic sense, thought the latter tends require prerequisite training in physical chemistry and or chemical engineering (see: human free energy). (Ñº)

Austrian science teacher Eduard Sacher (#28), author of the 1881 *Outline of a Mechanics of Society*, according to Spanish applied mathematics historian Jose Pacheco, was inspired into the field of social mechanics, by Rudolf Clausius directly who gave a talk on "On the Energy Supplies of Nature and the Utilization of them for the Benefit of Mankind" (published in book).

Newton of economics | Darwin of sociology

Related terms include: "Newton of economics", "Darwin of sociology", and or "Darwin of economics". Joseph Schumpeter, e.g., as summarized by Paul Samuelson, referred to Leon Walrus as the true Newton of economics, "above Marshall and the rest". (Ñº) Other so-called Newtons of economics include: Adam Smith, David Ricardo, Jeremy Bentham, Alfred Marshall (also referred to as the "Darwin of economics"), and John Mill. Karl Marx has been referred to as the "Darwin of sociology" and or the "Newton of economics".

These economic epitaphs, however, to note, are of a lesser illustrious title variety, as compared to a "social Newton epitaph", being that the so-called celestial mechanics like mapping of things like money, interest rates, and supply and demand are peripheral indicator matters, unlike the actual social movements of humans.

In the early 20th century, people, supposedly, were referring to Darwin as the "Newton of biology". On this assertion, Joseph Woodger (1929) stated that: [15]

> "To suppose Darwin a Newton is to suppose biology to have reached a degree of theoretical development comparable to what of physics in the eighteenth century, which is preposterous."

Biology, in Woodger's estimate, as summarized by Michael Simon (1971), has yet to find its Galileo. There are no equivalent celebrated experiments from the campanile at Pisa, nor pendulum experiments, etc., in biology. Simon goes onto state that the "Galileo of chemistry", if there is one, presumably, is Lavoisier. [16]

Quotes

The following are noted quotes:

> "Few people have the imagination for reality."
>
> — Goethe (Ñº)

> "If Carey fancied himself as the **Newton of sociology**, Simmel, in so far as he was a formalist, wanted to be its Euclid."
>
> — Werner Stark (1962), *The Fundamental Forms of Social Thought* [5]

> "Why were the first human scientists so determined to be the **Newton's of social theory**? Surely, the activities of human beings are not like the motions of planets in their orbits, or rigid spheres rolling down inclined planes? Surely, they are far more like the behavior of living creatures? So why did the initial creators of the human sciences not rely on models from biology in their theory-building, rather than on implausible analogies with physics."
>
> — Stephen Toulmin (1998), "The Idol of Stability" [7]

See also

â— Stark classification

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θΔics

In hmolscience, **Social Newton 2** is an editable version of the then-hacked (Feb 2018) online "Social Newton" (see: Social Newton (mobile)) article.

θΔics

In hmolscience, **social Newton term analysis**, aka "Beg analysis" (Thims, 2014), refers to key term dominance usage of social Newtons; some of which are listed below, for comparison. [N1]

Empedocles | Secular monist

In 450BC, Greek thinker Empedocles published his philosophy; which only exists now in fragments; his main key terms are shown below:

Scientific terms	Religious terms	Elements	Metaphysical
		Earth Air Water Fire	Love Hate

(add discussion)

Buchner | Atheist monist

In 1855, German physicist Ludwig Buchner (SN:9) published his *Force and Matter*; the following shows the key term usage count: [1]

Scientific terms	Religious terms	Elements	Metaphysical
Force (O) | 100+ Matter (O) | 100+ Work (O) | 88+ Power (O) | 84+ Motion (O) | 61+ Chemical (O) | 54+ Heat (O) | 40+ Mechanical (O) | 39+ Atom (O) | 33+ Energy (O) | 30+ Molecule (O) | 20+ Electricity (O) | 19+ Affinity (O) | 9+ Affinities (O) | 3+ Bond (O) | 0+	Soul (O) | 75+ God (O) | 65+ Spirit (O) | 45+	Hydrogen (O) | 16+ Oxygen (O) | 16+ Carbon (O) | 15+ Iron (O) | 12+ Phosphorus (O) | 3+ Sulphur (O) | 2+ Nitrogen (O) | 7+ Calcium (O) | 3+ etc.	Life (O) | 100+ Death (O) | 50+ Love (O) | 21+ Evil (O) | 18+ Ether (O) | 13+ Hate (O) | 0+

Buchner, of note, seems to be jettisoning "god" as a functionable concept, yet retaining "soul" as a possible force/matter/motion-based reformulation, possibly.

Carey | Secular monist

In 1858, American sociologist Henry Carey (SN:8) published his *The Principles of Social Science*; the following shows the key term usage count for volume one: [2]

Scientific terms	Religious terms	Elements	Metaphysical
Motion (O) | 85+ Power (O) | 84+ Force (O) | 83+ Matter (O) | 83+ Work (O) | 82+ Chemical (O) | 64+ Mechanical (O) | 46+ Heat (O) | 22+ Atom (O) | 17+ Electricity (O) | 12+ Energy (O) | 7+ Bond (O) | 3+ Affinity (O) | 2+ Affinities (O) | 1+ Molecule (O) | 1+	God (O) | 15+ Spirit (O) | 12+ Soul (O) | 3+	Iron (O) | 54+ Oxygen (O) | 13+ Carbon (O) | 12+ Hydrogen (O) | 5+ Nitrogen (O) | 4+ Sulphur (O) | 1+ Phosphorus (O) | 1+ Calcium (O) | 0+ etc.	Life (O) | 83+ Death (O) | 41+ Evil (O) | 10+ Love (O) | 3+ Ether (O) | 0+ Hate (O) | 0+

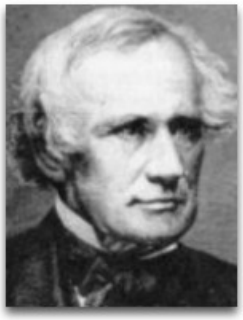

(add discussion)

Bray | Theist monist

In 1910, American polymath Henry Bray (SN:20) published his *The Living Universe*; the following shows the key term usage count of this work: [3]

Scientific terms	Religious terms	Elements	Metaphysical
Force (Q) | 100+ Matter (Q) | 100+ Power (Q) | 81+ Atom (Q) | 78+ Work (Q) | 75+ Motion (Q) | 61+ Molecule (Q) | 46+ Heat (Q) | 45+ Chemical (Q) | 31+ Energy (Q) | 30+ Affinity (Q) | 14+ Affinities (Q) | 10+ Electricity (Q) | 5+ Mechanical (Q) | 5+ Bond (Q) | 1+	God (Q) | 82+ Soul (Q) | 52+ Spirit (Q) | 22+	Hydrogen (Q) | 38+ Iron (Q) | 23+ Oxygen (Q) | 20+ Carbon (Q) | 13+ Sulphur (Q) | 8+ Nitrogen (Q) | 7+ Phosphorus (Q) | 4+ Calcium (Q) | 3+ etc.	Life (Q) | 100+ Death (Q) | 73+ Love (Q) | 29+ Ether (Q) | 22+ Evil (Q) | 10+ Hate (Q) | 4+

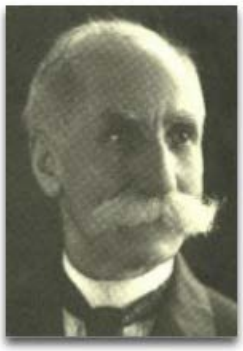

Bray, here, to summarize, aims to repackage a quasi-materialistic model of religion, with sort of "god = force" model of everything, in short.

The terms: "thermodynamics", "entropy", and "reaction", to note, are not employed by Bray.

Pareto | TYPE monist

In 1912, Italian engineer-sociologist Vilfredo Pareto (SN:3) published his *Treatise on General Sociology*, in four volumes; the following is a work-in-progress key term usage count for all four volumes: [4]

Scientific terms	Sciences	Elements
Matter [301] (Q):78+; (Q):59+; (Q):89+; (Q):75+ Force [271] (Q):54+; (Q):46+; (Q):83+; (Q):88+ Power [245] (Q):44+; (Q):38+; (Q):69+; (Q):94+ Energy [27] (Q):1+; (Q):4+; (Q):3+; (Q):19+ Heat [19] (Q):2+; (Q):7+; (Q):3+; (Q):7+ Molecule [7] (Q):V4 Atom [5] (Q):1+; (O):0+; (Q):1+; (Q):3+ Affinity [2] (Q):1+; (O):0+; (Q):1+; (O):0+ Entropy [1] (Q):V4	Mechanics [42] (Q):23+; (Q):2+; (Q):9+; (Q):8+ Chemistry [40] (Q):24+; (Q):1+; (Q):7+; (Q):8+ Mathematics [32] (Q):22+; (O):0+; (Q):7+; (Q):3+ Physics [26] (Q):15+; (O):0+; (Q):7+; (Q):4+ Thermodynamics [6] (Q):2+; (O):0+; (Q):2+; (Q):2+	Oxygen [5] (Q):4+; (Q):1+; (O):0+; (O):0+ Hydrogen [3] (Q):V1

The usage of "matter", here, seems to be mostly, vol three aside, in figure of speech, e.g. "as a matter of fact"; not in the Buchner "force and matter" sense.

Religious terms	Metaphysical
God [265] (Q):44+; (Q):87+; (Q):85+; (Q):49+ Soul [134] (Q):25+; (Q):37+; (Q):47+; (Q):25+ Spirit [93] (Q):14+; (Q):22+; (Q):32+; (Q):25+	Life [326] (Q):70+; (Q):89+; (Q):81+; (Q):86+ Death [146] (Q):37+; (Q):42+; (Q):42+; (Q):25+ Evil [130] (Q):18+; (Q):44+; (Q):38+; (Q):30+ Love [105] (Q):18+; (Q):32+; (Q):35+; (Q):20+ Hate [20] (Q):2+; (Q):10+; (Q):5+; (Q):3+

Ether [2] (O):1+; (O):0+; (O):1+; (O):0+

(add discussion)

Lewis | Affinity → Free energy

In 1923, Gilbert Lewis published his *Thermodynamics and the Free Energy of Chemical Substances*, the nearly century-long culmination of Berthollet's affinity theory (1798) to the "thermal theory of affinity" (1854-1864), which became usurped by the "thermodynamic theory of affinity" (1882), which led to the replacement of the term "affinity" by the term "free energy" throughout the English speaking world, as summarized by Henry Leicester (1959).

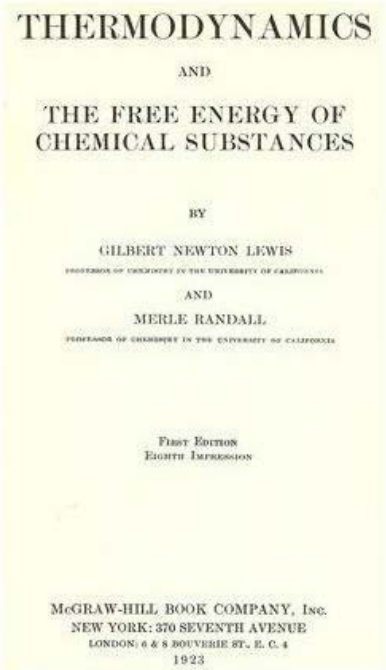

THERMODYNAMICS

AND

THE FREE ENERGY OF CHEMICAL SUBSTANCES

BY

GILBERT NEWTON LEWIS

AND

MERLE RANDALL

FIRST EDITION
EIGHTH IMPRESSION

McGRAW-HILL BOOK COMPANY, INC.
NEW YORK: 370 SEVENTH AVENUE
LONDON: 6 & 8 BOUVERIE ST., E. C. 4
1923

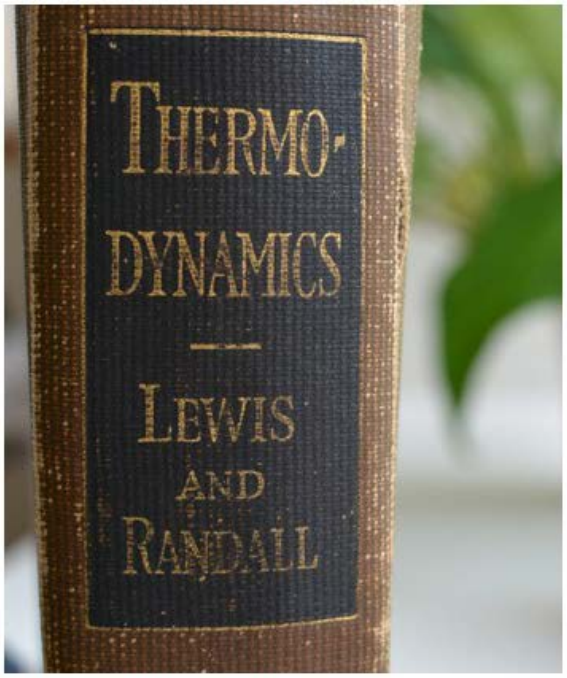

$$A \rightarrow dG$$

This marked a huge turning point in any and all "theory of everything" conceptual and terminological basis, in the decades to follow. All the previous centuries matter and motion theories, in short, invariably became human free energy theories, or affinity, aka the "force of reaction", and Gibbs energy theories defined by chemical thermodynamics.

Owing to this transition, social Newton's, of the stature, depth, and intellectual broadness, of the Buchner, Carey, Bray, Pareto variety, in the decades to follow the wake of Lewis, became somewhat of an extreme rarity, owing to generally the resulting effect that Lewis became the key that opened the door to Gibbs, according to which the newly-being synthesized keen perspicacious mind, formed in the 1930s and thereafter, finding the Lewis key, would open the door to Gibbs and be intellectually flooded with Gibbs' precisely-numbered set of 700-equations, fortified from the bottom by Clausius and graphical thermodynamics analysis of chemical substances, to say the least.

Pakistani organometallic chemist Mirza Beg, outlined below, seems to be the one anomaly of the entire 20th century able to "pull a Pareto" so to say, which was no doubt powered by the fervency of his religious faith, in some way. Beg's book, however, is not in Google Books; hence page-count term analysis is hindered.

Beg | Theist monist

In 1987, Pakistani organometallic chemist Mirza Beg (SNE:4) published his *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*; the following is table of contents:

§1. Human behaviour and physico-chemical laws | pg. 1
§2. Solutions and the society | pg. 23
§3. Assimilation | pg. 48
§4. Human interaction and the socialization process | pg.70
§5. Affinity and socialization | pg. 94
§6. Polarizing forces and mind-body split or munafaqt | pg. 114
§7. Decline of societies and entropy changes | pg. 134
§8. Anti-bonding forces and motivation | pg. 163
§9. Environmental adjustment | pg. 184

Although key work analysis is not yet completed for Beg (it has to be done by manually, page-by-page skimming), being that his work is not in Google Books, what is notable about Beg is that in his chapter five "Affinity and Socialization", shown adjacent, he makes the first direct explicit sociological connection between affinity and free energy.

Beg, to note, was lured into this completing this publication by doing his own physicochemical key term borrowing usage analysis (see: Beg analysis) employed in the humanities, business, and government lectures he attended in 1974.

Chapter V

AFFINITY AND SOCIALIZATION

The attempt in the earlier pages to correlate miscibility and human interaction with the positive and negative deviations of solutions from ideality and consequently the escaping tendency of a component from solution or of an individual from a society, can be dealt with from another angle. The term affinity, used in the earlier pages for describing the process of socialization, is the liking one species has for the other. This chapter would be concerned with free energy changes or the driving force of social interaction in which affinity plays a major role.

Affinity and Fugacity

Positive and negative deviations from ideality are related to higher or lower escaping tendencies or fugacities in solution. The same when expressed in terms of free energy changes, imply that the components having higher fugacity in solution are in a state of low free energy and vice versa. Thus the escaping tendency is related inversely to the free energy of the component. Affinity and fugacity are also similarly inter-related and it is found that higher the affinity or liking of one component for the other, the lower would be the escaping tendency. Affinities can, therefore, be measured in terms of free energy changes since the two are directly related.

Beg's chapter five, wherein he states directly that macro-system free energy is the measure of the sum of the micro-interaction affinities, and that the former is the "driving force" of social interaction and change; a very decisive moment in the history of affinity theory, in particular, and theories of everything in particular. [5]

Notes

N1. Note: this page came into inception amid dissection of the 1910 work of theistic monist Henry Bray who is right before the cusp of the 1923 Lewis-mediated global switch from affinity-based thinking to free energy-based thinking; the latter concept supplanting and absorbing the former.

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θΔics

In hmolscience rankings, **social Newtons | existive** refers to tentative "social Newtons" (or "another Newton") that are still in reactive existence, i.e. existive (alive, in colloquial speak); to clarify, as compared to historical, pre 21st century classical social Newtons, the modern thinker, per the polymathy degree problem, needs to have an intellect comparable to someone with six to eight degrees, one of which in the neighborhoods of physics and another in chemistry, i.e. equivalent to a "new Aristotle" (Raymond Fosdick, 1924) or "few super Einsteins" (William Wheeler, c.1935).

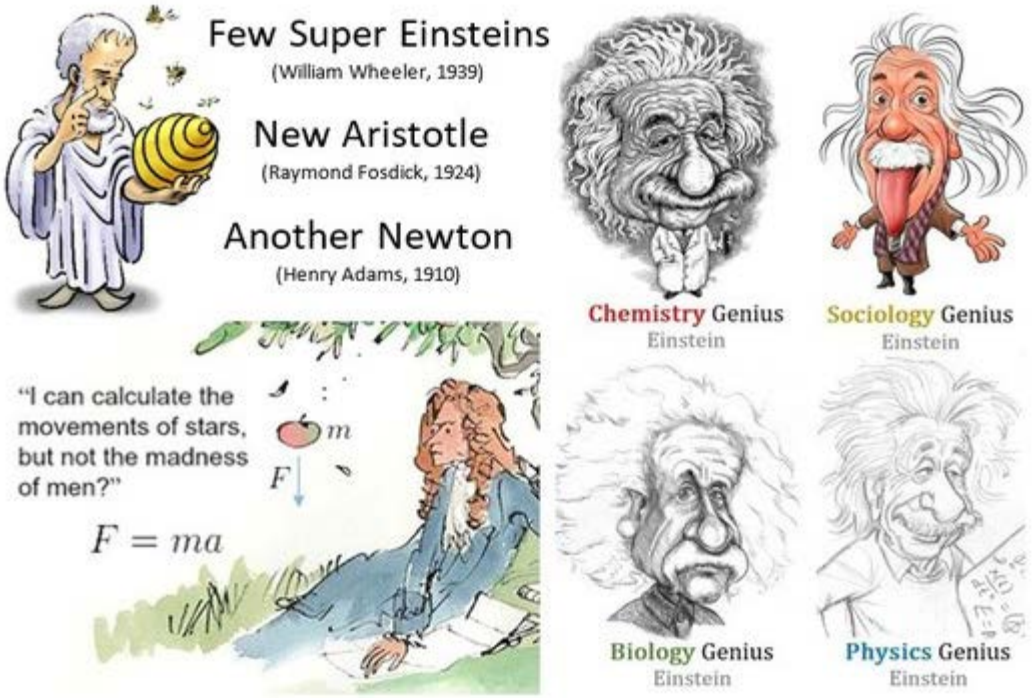

A depiction of what it takes to become a **modern "existive"** social Newton, namely: someone who becomes "Another Newton" (Henry Adams, 1910) able to solve the great problem of "physicochemical social dynamics" via Gibbs; a "New Aristotle" (Raymond Fosdick, 1924); or someone equivalent to a "few super Einsteins" (William Wheeler, 1939) who embodies the a polymathy degree problem mindset, via a *Social Principia*

Overview

Of currently reactively "existing" thinkers, moving about the surface of the earth presently, the pickings are slim, in respect to who could be remotely ranked as a "social Newton", as compared to the great social Newton contenders of history; the big three shown below:

Social Newtons | Classical

	Person	CR	±	⇌	Δ	Hu	Citation[s] / Quotes (related)
1	Johann Goethe (1749-1832) German polyintellect PCR, LTE, LR:30|#2	1069		R	A	C	Quote: "1642 [Newton's birth] is the Christmas of the modern age." Quote: "The moral symbols of nature are the elective affinities, discovered and employed by Bergman."
2.	Henry Adams (1838-1918) American historian LTE, LR:5|17	368		R	CT	M	Quote: "Such a complete solution—to the science of physico-chemical social dynamics [see: two cultures namesakes]—seems to call for the aid of another Newton." (1910)
3.	Vilfredo Pareto (1848-1923) Italian engineer PCR	211		R	T	M	"Newton of sociology" (Bernard DeVoto, 1933) (Q) "Newton of the moral world." (Werner Stark, 1963) [13]

Most 21st century thinkers are so caught up in superficial secularity that the deeper questions have taken a back seat; it also is a peculiar set of circumstances that work to breed epicenter geniuses, of the Aristotle, Goethe, or Einstein type, namely: genius lightening phenomena (Ñº), genius hiatus effect, early parental death, genius concourse phenomena (Ñº), among other factors, not the least of, probabalistically, which will tend actuate in any given generation; not to mention the hydraism effect that grows with knowledge. One exception is American child prodigy turned astrophysicist Christopher Hirata, who, similar to like-minded child prodigies John Neumann, John Tukey, Goethe, arrived at a free energy model of existence (as a teen, in Hirata's case).

List

The following—a spin-off of the historical (non-existive) social Newton rankings—is a work-in-progress top "existive", i.e. currently in reactive existence, i.e. "alive" in defunct colloquial speak (see: life terminology upgrades), social Newtons. column abbreviations "CR" refers to citation rankings; **±** refers to the current gauge, amid digestion of their work, as to whether they might tend to go up or down (↑↓) in rankings; the two-way reaction arrow (⇌) signifies whether or not they used equilibrium reaction theory (or "R" human chemical reaction theory) in their work; and "**Hu**" signifies whether they employed human molecular theory, viewing people explicitly as either molecules "M" or chemicals "C", in some terminological form or another:

Social Newtons | Existive

	Person	CR	±	⇌	Δ	Hu	Citation[s] / Quotes (related)	Translations-to-English (needed)
1.	Jurgen Mimkes (1939-) German metallurgist, thermodynamicist, and physicochemical socio-economics professor	78			F			German
2.	Mirza Beg (1932-) Pakistani organometallic chemist	109	↑↓	⇌	F	C/M	"If it could stand the test of time, [**Beg's**] ideas, presented in [*New Dimensions in Sociology*] will rediscover new frontiers in sociology and will revolutionize the existing theories of human behavior as it has so far been propounded by philosophers." — Jameel Jalibi (1987), "Foreword by a Sociologist"	
3.	Thomas Wallace (1935-) American physical chemist	89		⇌	F			
4.	Christopher Hirata (1982-) American astrophysicist LTE, LR:57|#1	144		⇌	F	M		
5.	Wenyuan Niu (c.1950-) Chinese sustainability	13	↑↓		?			Chinese

		scientist				
6.		Adriaan de Lange (1945-) South African chemical physicist,	32			F
7.		Josip Stepanic (1970-) Croatian physicist	16			F
8.		Sture Nordholm (1944-) Swedish physical chemist	33			F
9.		Erich Muller (1963-) Venezuelan-born English chemical engineer and thermodynamicist	29			F
10.		David Hwang (c.1979-) American chemist and neuro-physician LTE, LR:19|#4	58		R	F
11.		Paris Arnopoulos (c.1935-) Canadian political scientist	37	↑		
12.		Georgi Gladyshev (1936-) Russian physical chemist	167			F
13.		Mala Radhakrishnan (1978-) American physical chemist	67	↑		F

14.		Dimitris Keranis (1948-) Greek lawyer	11		?
15.		Radu Chisleag (1940-) Romanian physicist	15		
16.		Raddai Raikhlin (1929-) Russian-born Israeli electronics-power engineer	9	↑↓	?
17.		Philip Ball (1962-) English chemical physicist	82		
18.		Evguenii Kozliak (c.1961-) Russian-born American physical chemist	6		?

(add summary)

Possible add-ins might include: Yi-Fang Chang, Alfredo Infante, and remotely possible: Dennis Collins (?).

References

1.

θΔics

In hmolscience, **social orbital theory** is the view that humans, in certain respects, move in orbital-like trajectories about each other similar to how planets move around stars, moons move around planets, or how satellites move around the earth.

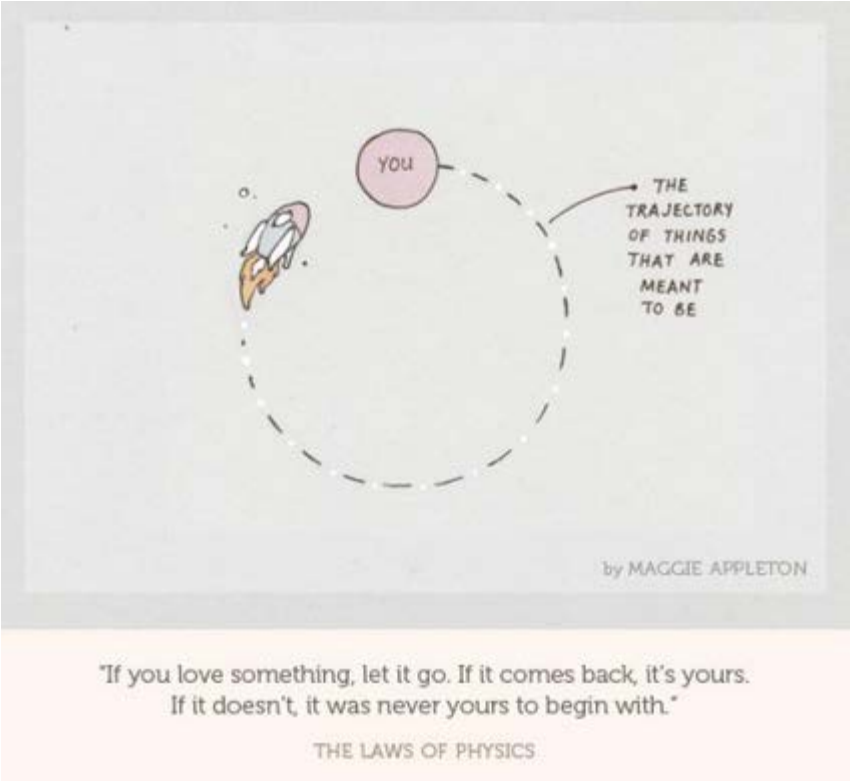

A 2013 illustration (Q), by English-American artist Maggie Appleton, of the 1970s anon modern proverb: "If you love something, let it go. If it comes back, it's yours. If it doesn't, it was never yours to begin with." (Q)

Quotes

The following are related quotes:

> "To jump orbits, you need a lot of energy.
> And you need balls."
>
> — Nestor (2010), *Afinidades*; comment to Bruno, during dinner show (58:30), while women are in bathroom making out, about his statement that he would leave the company (or country) if he was left out of the company buyout

> "Like satellites we go in circles and never float away.
> Tell the sky and pull until you crash into me.
> Like satellites we go in circles and never float away.
> Let's collide until we fill the space
> (Until we fill the space)"
>
> — Manufactured Superstars (2013), hook of dance song: "Like Satellites" (vid:Q)(Lyrics:Q)(Q)

See also

- Human molecular orbital
- Human molecular orbital theory
- Turning tendencies

θΔics

In hmolscience, a **social phase** is the concept of "phase", devised by Willard Gibbs (1876), employed to describe a person in a given physiochemical state (e.g. human phase) and or a society, social system, and or social entity in a given phase, phase point, or phase transition; synonymous, nearly, with the akin term "equilibrium".

"No one shall persuade me that I am not a phase."

— Henry Adams (1908), age 70, after studying, for over a decade, the free energy work Willard Gibbs, applied socially

Overview

In 1878, Friedrich Engels, in his *Anti-Duhring*, a work in opposition to the ideas of German philosopher Eugen Durhing (1833-1921), invoked water metaphors when he likened the revolutionary transformation of a society to the qualitative phase transformation of ice into water and water into steam. [5]

In 1890s to 1910s, Henry Adams was working on a Gibbs-based model of social phases; the following being a few representative quotes:

> "On the physico-chemical law of development and dynamics, our society has reached what is called the critical point where it is near a new phase or equilibrium."
>
> — Henry Adams (1908), "Letter to Charles Gaskell", Sep 27 [1]

> "I have run my head hard up against a form of mathematics that grinds my brains out. I flounder like a sculpin in the mud. It is called the 'law of phases', and was invented at Yale [by Gibbs]. **No one shall persuade me that I am not a phase**."
>
> — Henry Adams (1908), "Letter to Elizabeth Cameron", Sep 29 [2]

In 2005, Russian mathematical physicist Victor Sergeev, in his 155-page booklet *The Thermodynamic Approach to Market*, touches on phase transitions in social systems. [4]

Quotes

The following are related quotes:

> "It is true that while we live, if we are cautious enough, we have the chance to prolong the time intervals between our **human 'phases'** so as to minimize encountering the phase points of life we call 'accidents'."
>
> — Bruce Lindsay (1983). "Social Exemplifications of Physical Principles" [3]

See also

â— Human phase

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Worthington Ford) (pg. 510). Kraus Reprints, 1969.
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(c) Anti- Dühring – Wikipedia.

θΔics

In science, **social physics**, the precursor to "sociophysics", give or take (e.g. some versions of sociophysics, e.g. Galam, don't actually use physics), is the study of social systems and social phenomena from the perspective of physics; or "the application of the concepts of physics in the social sciences" (Wilson, 1969). [8]

Social physics | Generations

In 1980, a three generation classification of social physicists, was alluded to by American physicist Arthur Iberall, himself being a second-generation social physicist, as follows: [6]

> "There is an enlightenment literature, pre-sociology and anthropology, devoted to a first generation of **social physics** modelling of the social system. It includes contributors like Saint-Simon, Comte, and Quetelet. It ended in this century with the last desperate cry by historian, Henry Adams."

The mention of Adams here denoted the separation of human physics (general subject) into the subsets of social physics (physics based sociology) and social thermodynamics (thermodynamics based sociology). An extrapolation of this Iberall scheme, in respect to the second and third generations, is shown adjacent.

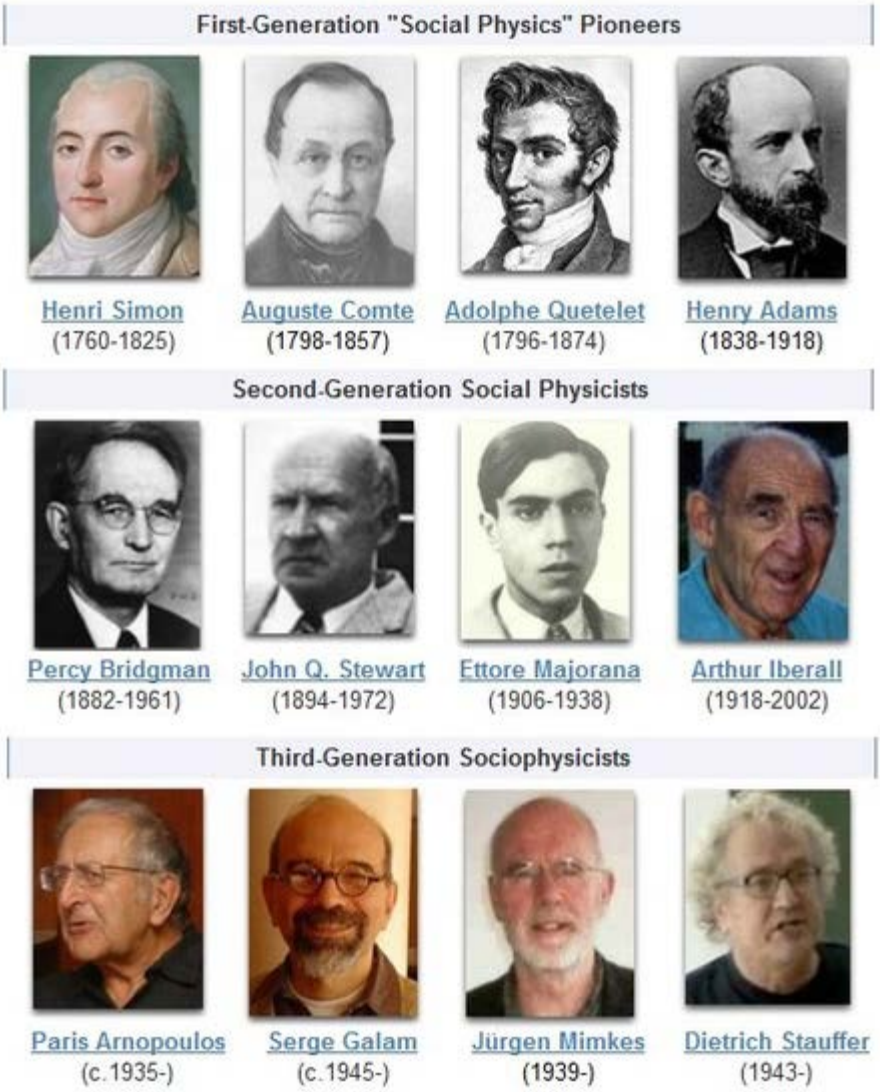

The main **social physics**, turned 20th century sociophysics, pioneers, ranked by "generation", according to Iberall classification scheme, are shown, namely: French social thinker Henri Saint-Simon (1803), his graduate student Frenchman Auguste Comte (1823), and Belgian astronomer Adolphe Quetelet (1832); a subject that became superseded or rather upgraded into the late 19th century early 20th century "social mechanics" (mechanistic school). [19] The mechanistic schools, into the 1920s, were soon supplanted with the science upgraded: social physics school, sociophysics, physical sociology, physicochemical sociology, etc.

History

The etymology of the term "social physics" has a bit of gradual and intertwined etymological origin, although it is a term that largely stems from the school of French science burgeoning at the beginning of the 19th century. American theologian Noah Porter, in his 1880 sociology essay, gives the following etymology of the term social physics, attributing the term to Comte: [18]

> "The term *Sociology* was invented and adopted in its equivalent by Auguste Comte in his "Philosophie Positive." It makes its first appearance in the following sentence: "After Montesquieu, the next great addition to *Sociology (which is the term I may be allowed to invent, to designate* ***Social Physics)*** was made by Condorcet proceeding on the views suggested by his illustrious friend Turgot" (b. vi. chap. ii.). The term *Social Physics*, also used by Comte as its equivalent, is significant, suggesting as it does the materialistic theory of man which Comte takes no pains to conceal. For according to his teachings, the higher nature of man is simply the result of a more highly organized brain, and the psychical and social phenomena of humanity depend solely on the quality and conditions of cerebral activity."

German historian Georg Iggers gives a fairly detailed account of the various “social science” etymologies, as discussed in his 1959 article “Further Remarks About Early Use of the Term ‘Social Science’”. [14]

Saint-Simon: The first dominate outline of a type of physical sociology was that outlined in French social thinker Henri de Saint-Simon’s first book, the 1803 *Lettres d’un Habitant de Geneve*, the concern of which, according to Iggers, was the application to the study of society of laws similar to those of the physical and biological sciences. [14] In the years to follow, Saint-Simon would go on to coin various terms and phrases, such as designating the study of society as the “physics of organized bodies”, as contrasted with the “physics of brute bodies”, the usages of which seemed to occur in several of his 1815 articles. [15]

Comte: In 1817, Saint-Simon offered the newly christened aged-nineteen *École Polytechnique* graduate Auguste Comte (who had steeped himself in the writings of Joseph Lagrange), a position of secretary. [7] The two then were said to have interacted for a period of seven years developing a theory of "social physics", with, in some cases, Comte publishing under Saint-Simon's name,

In 1819, according to one reference (1980) (Ñº), Auguste Comte, who as a young man dreamed of studying political and social phenomena as if they were natural forces, conceived of a new science, called “social physics”.

In 1823 to 1825, the two, Comte and Saint-Simon, had a falling out.

English sociologist Alan Swingewood claims that during this period (1803-1825), Saint-Simon coined the term “social physics”. [10] This, however, may or may not be the case; although, as noted above, Saint-Simon did seem to have defined the study of society as the “physics of organized bodies” at least as early as 1815.

In 1822, Comte introduced the precise term “social science” in the extended essay “Systeme de Politique Positive”, published as the “Troisieme Cahier” of Saint-Simon’s *Catechisme des Industriels*.

The precise term "social physics" (or “physique sociale”) appears in *Le Produceur*, a journal project by Saint-Simon, but published by his disciples in 1825 and 1826 after his passing. Comte, who by now had broken with Saint-Simon and the Saint-Simonian school, nevertheless contributed two articles. In these essays, Comte defined social physics (*physique sociale*) as follows: [14]

> “**Social physics** is that science which occupies itself with social phenomena, considered in the same light as astronomical, physical, chemical, and physiological phenomena, that is to say as being subject to natural and invariable laws of discovery of which is the special object of its researches.”

A 1826 article in the *Revue Encyclopedique* corroborates this, referring to the phrase "social physics" as the language of Comte:

> French (original)
>
> > "Nous croyons donc que les savans chargés de la réorganisation spirituelle de la société ne feront pas seulement de la **physique sociale**, selon le langage de AM Comte, mais qu'ils feront aussi de la métaphysique sociale."
>
> English (translation)
>
> > "We therefore believe that the learned spiritual charge of the reorganization of the company will not only **social physics**, in the language of A.M. Comte, but they will also of social metaphysics."

Other references also tend to state that Comte coined the term "social physics". [11] Comte defined social physics as the study of the laws of society or the science of civilization. [1] Specifically, in part six of series of books, written between 1830 and 1842, on the subject of *Positive Philosophy*, Comte argued that social physics would complete the scientific description of the world that Galileo, Newton, and others had begun: [4]

> "Now that the human mind has grasped celestial and terrestrial physics, mechanical and chemical, organic physics, both vegetable and animal, there remains one science, to fill up the series of sciences or observation—**social physics**. This is what men have now most need of; and this it is the principal aim of the present work to establish."

In the opening page to his 1856 *Social Physics*, Comte gives the following situation:

> "The theories of social science are still, even in the minds of the best thinkers, completely implicated with the theologico-metaphysical philosophy (which he says is 'in a state of imbecility'); and are even supposed to be, by a fatal separation from all other science, condemned to remain so involved forever."

Curiously, this statement rings true even in modern times.

Quetelet: Some references, conversely, mis-attribute the coining of the term to Belgian statistician Adolphe Quetelet. Quetelet argued untiringly that mathematical probability was essential for social statistics. Quetelet hoped to create from these materials a new science, which supposedly he called at first "social mechanics", but later began to refer to as "social physics". He wrote often of the analogies linking this science to the most mathematical of the natural sciences, celestial mechanics. [13]

The term "social physics" formed the title of Quetelet's 1835 book *Essay on Social Physics*: *Man and the Development of his Faculties*, in which he outlines the project of a social physics and describes his concept of the "average man" (*l'homme moyen*) who is characterized by the mean values of measured variables that follow a normal distribution and collects data about many such variables. [5]

A well-told anecdote is that when Comte, who had also used the term social physics, discovered that Quetelet had appropriated the term 'social physics', found it necessary to invent a new term 'sociologie' (sociology) because he disagreed with Quetelet's collection of statistics.

Modern social physics

In 1947, American astrophysicist John Q. Stewart began to outline a version of "social physics" in the theme of the celestial mechanics introduced centuries earlier by Tycho Brahe, Johannes Kepler, and Isaac Newton.

social physics The application of the insights of physics to understanding aggregate human behaviour. John Q. Stewart and William Warntz systematically codified these ideas in the 1950s, suggesting, for example, that social interaction could be modelled by analogy with gravitational equations. More recently, John Urry has suggested that there is a 'new social physics', drawing on ideas of *complexity, *networks, and small worlds to bridge the natural and social sciences.

Reference Urry, J. (2004), 'Small worlds and the new "social physics"', *Global Networks*, 4: 109–30.

A 2013 Oxford *Dictionary of Human Geography* definition of **social physics**, citing the so-called social physics school, of quantitative geography, of John Q. Stewart and William Warntz. [20]

Likewise, in the 1940s and 1950s, Swedish geographer Reino Ajo, at the University of Helsinki, was said to have borrowed concepts from physics, such as gravity models and field theories, to formulate some variation of "social physics"; such as found in his 1953 "Contributions to 'social physics'." [9]

A noted social physics theorist of the late 20th century is Arthur Iberall.

Into the 1990s, American physicist Mark Buchanan began to notice a large number of papers themed on social science viewed through the lens of physics, whole working as an editor of *Nature*. This seeded him into the writing of three "social physics" type books, including: *Ubiquity* (2000), *Nexus* (2002), and *The Social Atom* (2007).

In recent years, building on the development of the kinetic theory and statistical mechanics, some authors have begun to incorporate a statistical thermodynamic perspective in models of social physics in which people are viewed as atoms or molecules (human molecules) such that the law of large numbers yields social behaviors such as, for instance, the *80-20 rule*, wherein, typically, 80 percent of a country's wealth is distributed among 20 percent of the population. [2]

Implications

When one applies statistical thought or the "logic of large numbers" to society, according to English chemist and physicist Philip Ball, the concept of human free will is the first question in the minds of those encountering the new "physics of society" for the first time. The debate on this topic, according to Ball, began to rage in the 19th century and still preoccupies sociologists today. [3]

Other

In 2012, American hobbyist researcher Kurt Johnson, curator of the newly-launched SocialOrganizationPhysics.com, was lecturing to local groups around the Chicagoland area on his “Physical Theory of Peace”, wherein he extolled his agenda-loaded view that physical sciences can be used to eliminate war and find sustainable peace. [16] The entire presentation, however, seems to be but a bloated diatribe on the motto that “if we can learn to fly” then “we can learn to eliminate war”, largely inspired by his hero English railroad and aeronautical engineer George Cayley (1773-1857), but little to do with actual “physics” other than superficial namesake.

Quotes

The following are related quotes:

> “Gauss and Goethe were Quetelet's intellectual parents and Goethe predominated.”
>
> — Author (1998), (Ñº)

See also

- â— Social thermodynamics
- â— Sociological thermodynamics
- â— Socio-thermodynamics
- â— Social atom
- â— Social bond
- â— Sociophysics
- â— Social pressure
- â— Social temperature

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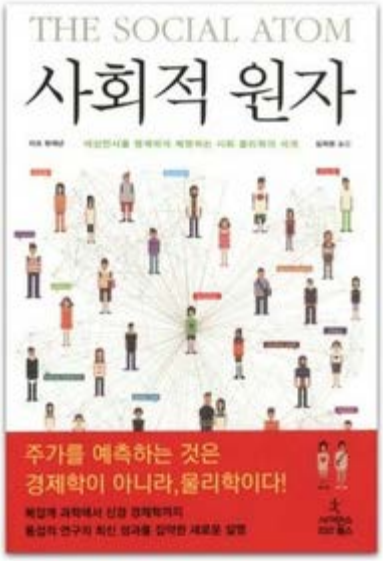

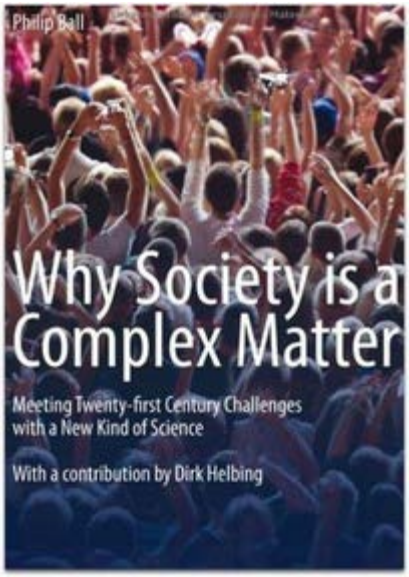

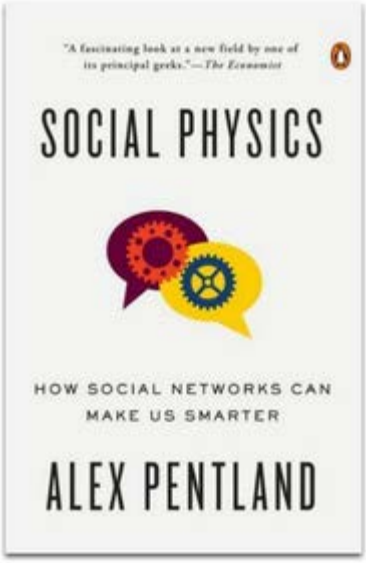

- *why the Rich get Richer, Cheaters get Caught, and Your Neighbor Usually Looks Like You,* (pgs. x-xi). New York: Bloomsbury.

Left: The cover of ì‚¬íšŒì› ìž (*The Social Atom*) a 2010 Korean translation reprint of American-born English physicist Mark Buchanan's **social physics** themed book *The Social Atom* (2007), a science he says launched following Thomas Schelling's famous 1971 article on the physics of racial segregation. Middle: English chemist and physicist Philip Ball's 2012 **social physics** booklet *Why Society is a Complex Matter*, wherein he argues that science that can help to explain and perhaps even to predict social behavior. [17] Right: Alex Pentland's 2015 *Social Physics: How Social Networks Can Make Us Smarter*. (Ñº)

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â— Iberall, A.S. (1985). "Outlining Social Physics for Modern Societies: Locating Cultures, Economics, and Politics: the Enlightenment Reconsidered." (abstract), *Proc Natl Acad Sci USA*, 82(17): 5582-84.

â— Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics.* Cambridge University Press.
â— Pennebaker, James W. (2003). "Social Physics: the Metaphorical Application of Principles of Physics to Social Behavior", *Department of Psychology*, University of Texas at Austin.
â— Urry, John. (2004). "Small Worlds and the New 'Social Physics'," (html) (abstract) *Global Networks*, 4(2): 109-30.
â— Pentland, Alex. (2014). *Social Physics: How Good Ideas Spread—the Lessons from a New Science*. Penguin.

Videos

â— Austwick, Martin. (2012). "Social Physics in the Big City" (Ñº), UCL Minds Lunch Hour Lectures, Dec 4.

External links

â— Social Physics – Oxford Reference.com
â— Physics of Society - A collection of articles by English chemist and physicist Phillip Ball.
â— SociablePhysics (blog by self-defined "social physicist" Martin Austwick) – Wordpress.com.

θΔics

In schools, **social physics school** is a term, according to English human geography historian Ron Johnston's classification scheme, that defines one of the four main schools of quantitative geography in the USA, whose leader is American sociophysicist John Q. Stewart, whose 1945 "exotic chapter" on population potentials initiated the school, along with the earlier work of sociologist Henry Carry, at the University of Pennsylvania, who pioneered theories on demographic gravity in the 19th century, and geographer William Warntz who together with Stewart developed physics based theories about population potentials. [1] The following 1947 quote by Stewart is frequently quoted in discussions of the social physics school:

> "There is no longer an excuse to ignore the fact that human beings, on average and at least in certain circumstances, obey mathematical rules resembling in a general way some of the primitive 'laws' of physics."

The social physics school

This group's work was initiated and developed independently from the other three, and its early publications preceded Schaefer's paper by more than a decade. The leader was J. Q. Stewart, an astronomer at Princeton University, who traced the origins of social physics in the work of a number of natural scientists who applied their methods to social data (Stewart, 1950). His own investigations began when he noted certain regularities in various aspects of population distributions which were akin to the laws of physics, such as a tendency for the number of students attending a particular university to decline with increasing distance of their home addresses from its campus. From these observations he developed his ideas on social physics, which he defined (Stewart, 1956, p. 245) as:

> that the dimensions of society are analogous to the physical dimensions and include numbers of people, distance, and time. Social physics deals with observations, processes and relations in these terms. The distinction between it and mathematical statistics is no more difficult to draw than for certain other phases of physics. The distinction between social physics and sociology is the avoidance of subjective descriptions in the former.

He established a laboratory at Princeton to investigate a wide range of such regularities. (Note Warntz's, 1984, remark that he was introduced to Stewart's ideas via a book on *Coasts, Waves and Weather* – Stewart, 1945 – which was 'prepared primarily to explain to marine and air navigators the physical environment . . . [but] Stewart could not resist the temptation to include an exotic chapter describing potential of population and its sociological importance'.)

A excerpt on the **social physics school** by English human geographer Ron Johnston, whose leaders are Americans sociophysicist John Q. Stewart and geographer William Warntz. [1]

The term "social physics school" seems to be specific to human geography works, used in a specific way, it seems, in regards to theories on population potentials and demographic gravity theories; the terms "social physics", and the related: social mechanics, sociophysics, human physics, etc., are more general terms.

Note

This article, started on 19 Sep 2013, was the 3,000th article of Hmolpedia (see: progress report).

See also

- Princeton Department of Social Physics

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(b) Ron Johnston (geographer) – Wikipedia.
2. (a) Phillips, Martin. (2005). "Philosophical Arguments in Human Geography", in: *Contested Worlds: An Introduction to Human Geography* (editor: Martin Phillips) (§2, pgs. 13-86; social physics school, pg. 18). Ashgate Publishing.
(b) Holt-Jensen, Arild. (2009). *Geography: History and Concepts* (social physics + John Q. Stewart, pg. 87). Sage.

Further reading

- Panchamukhi, Vadiraj R. (1978). *Trade Policies of India* (§: Social Physics School, pgs. 9-12). Concept Publishing Company.

● Robinson, Vaughan. (1996). *Geography and Migration* ("social physics" school, pg. 18). Edward Elgar Publishing.
● Phillips, Martin. (2005). "Philosophical Arguments in Human Geography", in: *Contested Worlds: An Introduction to Human Geography* (editor: Martin Phillips) (§2, pgs. 13-86; social physics school, pg. 18). Ashgate Publishing.

External links

● Gravity model in Geography (Dutch → English) – Wikipedia.

θΔics

In hmolscience, **social piston and cylinder** is any type of physical demonstration device and or conceptual model of a piston and cylinder model scaled up to the thermodynamic modelling of a given social system, socioeconomic systems, political system, government system, and or country among other types of "boundaried" groups (see: boundary problem), e.g. such as the boundaries described in the Jane Goodall 1970-1974 chimpanzee war.

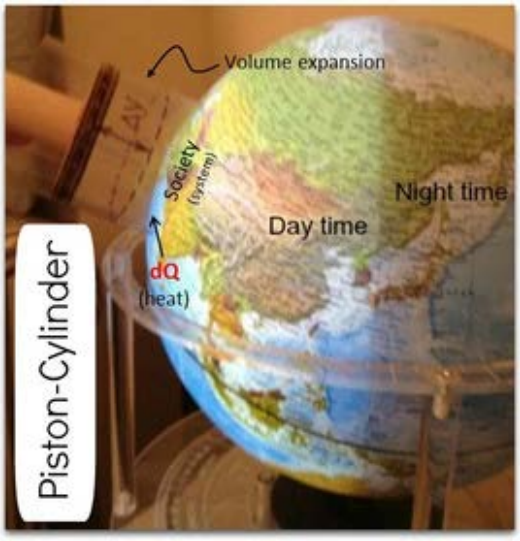

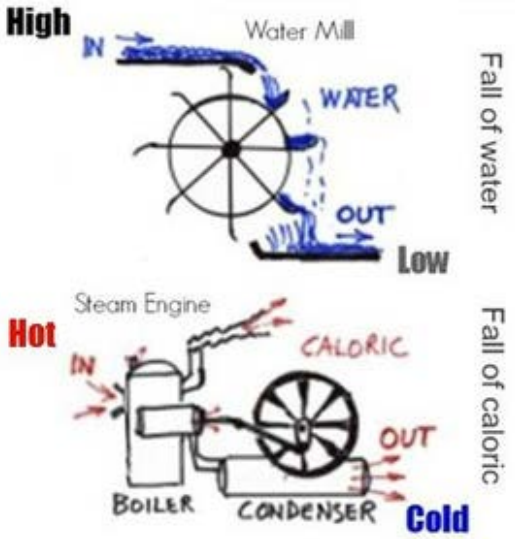

Left: a **social piston and cylinder**, on a rotating illuminated globe, often used by American electrochemical engineer Libb Thims, e.g. in lecture, to conceptualize thermodynamic modelling of social systems in terms of "boundaries" and social expansion and social contraction.

Heat engine

The social piston and cylinder is "social system" model of the piston and cylinder boundary of the generic universal heat engine, which can be any volumetrically-defined working body in the universe, whatever the working substance may be, according to the logic that just as the fall of the water through gravitational height drives the water mill so to, in the original 1824 Sadi Carnot conception if the situation, does the fall of caloric (heat) from hot to cold drive the heat engine.

The "boundary" in the above steam engine model is the volumetric region of water contained in the delineated region of the piston and cylinder. Now, however, in the 1865 Rudolf Clausius definition of the situation, instead of the fall of caloric driving the operation of the heat engine, we have the increase in the transformation content (entropy) accrues per each cycle, and the free energy is now considered as the driving force of the heat engine.

Social heat engine

The following shows a conceptualized working body of a given socioeconomic system: [1]

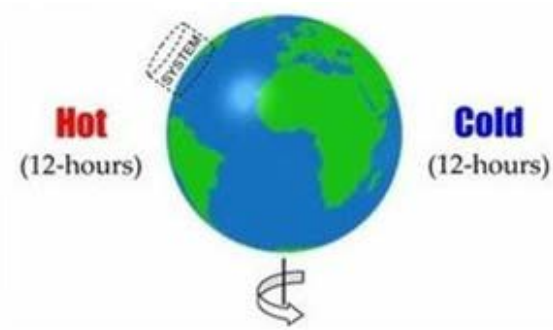

Boundary

The following shows the conceptual understanding of "boundary" of the given social volume under study in respect to the models of closed, open, and energetically boundary regulated semi-open:

Conceptual Understanding: Boundary

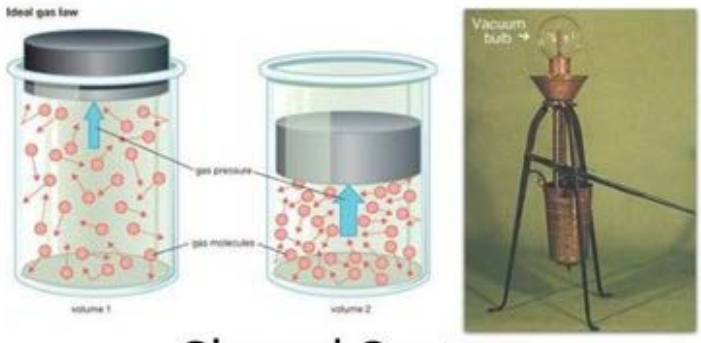

Closed System

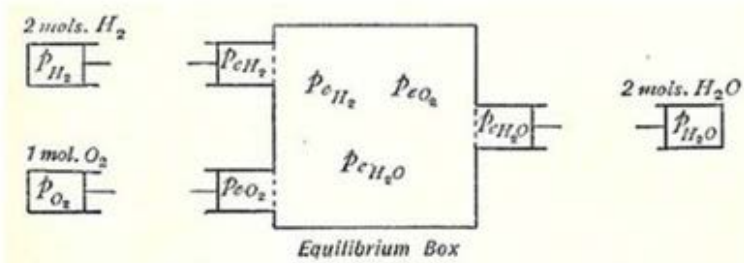

Figure: Maximum work of a gaseous reaction.

Open System

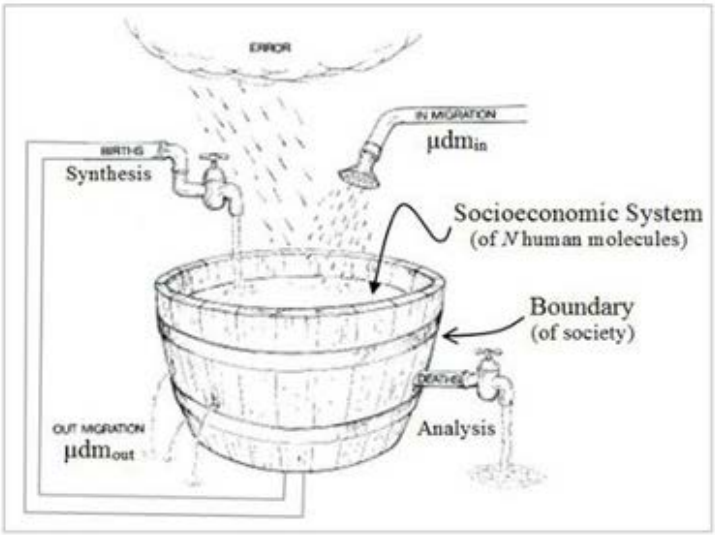

a. Chemiosmotic theory of membrane energy transduction

b. Chemical potential

$$dU = \sum_{i=1}^{k} m_i d\mu_i$$

Boundary Regulated System

Personal space | Vacuum power

The following shows the conceptual understanding of personal space and power associated with the vacuum in respect to aspects such as beauty (beautiful people are given more personal space), physical size, e.g. dihumanide molecule (two people attached) or height aspects (tall people are given more personal space):

Conceptual Understanding: Vacuum

Guericke beer keg vacuum attempt
(c.1649)

Guericke piston experiment
(c.1670)

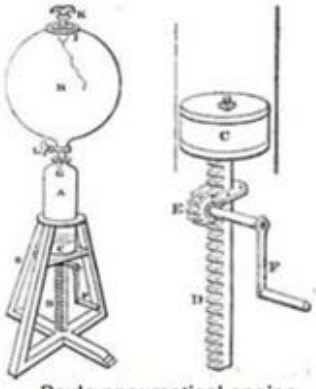

Boyle pneumatical engine
(1658)

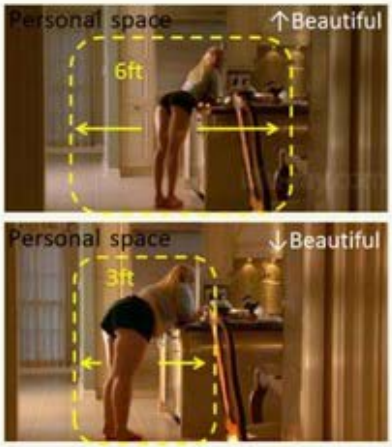

Shallow Hal (2001)

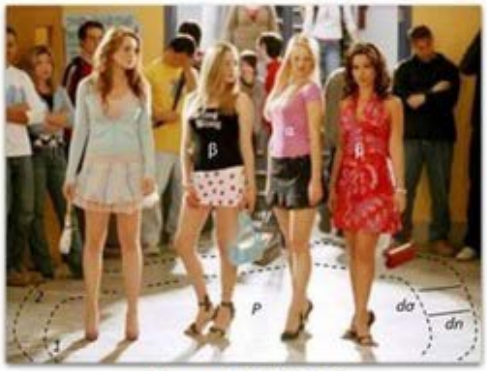

Mean Girls (2004)

$$W = \int_{V_1}^{V_2} PdV$$

$$\uparrow$$

Society

$$\frac{\Delta S^\circ}{R} \qquad -\frac{\Delta H^\circ}{RT}$$

$$\uparrow \qquad \uparrow$$

Freedom Security

See also

â— HCT | P4: Piston and cylinder view

References

1. Thims, Libb. (2013). “Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?” (video, 1:33-min) (Article pdf, 40-pgs) (PowerPoint ppt-pdf, 36-slides) (DB), Key speaker talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29.

θΔics

In social physics, **social power** is defined as the ability of a person or social entity to effect the movement of one or more persons through a distance per unit time.

A generic color coded **social power** diagram, indicative of some type of social gravity model, i.e. hot center, conception of social power, i.e. as in the thermal word phrase of someone who is a "hot commodity", as in a movie star (or superstar) having a lot of social power.

Overview

The standard definition of power is energy exchanged between a system and its surroundings per unit time: [1]

$$P = \frac{E}{t}$$

This definition originated in a combination of French physicist Sadi Carnot's 1824 usage of the term "motive power" as the ability of a generic heat engine to lift an amount of mass though a gravitational height per unit time, French physicist Gustave Coriolis' 1829 definition of "work" as the product of a force moving an object through a distance, and Scottish engineer James Watt's 1782 experimental determination that one average draft horse has the ability, or "horsepower", to work a pump to the effect of raising 33,000 pounds of water through a height of one foot in one minute. Taken together, power came to be defined as work done per unit time:

$$P = \frac{W}{t}$$

or as force moving objects of mass at a certain rate of time:

$$P = \frac{Fd}{t}$$

This last definition gives the most insight into the nature of power in the social domain, such as in attempting to quantify terms such as "star power", "political power", "military power", or "world power", etc., in a modern thermodynamics or physics sense, as in the ability of a person or entity to effect a force *F* which moves a certain number of people through a distance *d* of existence per unit time *t*.

Further reading

â— Grove, Jim. (2011). "A Science of Social Power", JHT beta, Feb 21.

External links

â— Power (philosophy) – Wikipedia.

θΔics

In human thermodynamics, **social pressure** is a human-scale physical equivalent of pressure as force per unit area exerted on one person (human molecule) or on the surface boundary of a system or group of people (human molecules). [1]

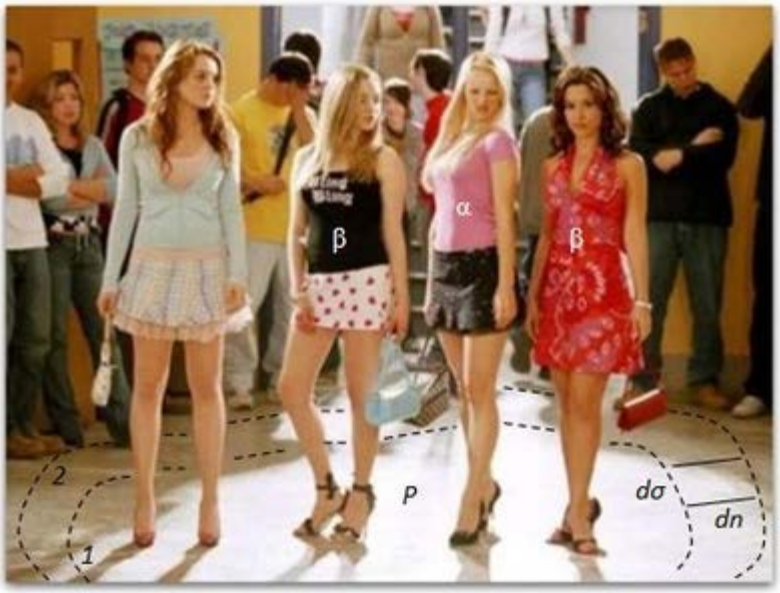

A visual example of **social pressure** (still from the 2004 film *Mean Girls*), a force per unit area, directed radially outward from the alpha female, in accordance with Newton's three laws of motion, causing a volume expansion.

Overview

In the early 20th century, Henri Bergson, in his *Creative* Evolution (1907) and *The Two Sources of Morality* (1932), supposedly, discuss the idea of religion, held to together by a type of social pressure, in terms of energy, matter, and thermodynamics, in some way or another. [6]

In 1985, American physicist-engineer Arthur Iberall defined the idea of social pressure as such: [4]

> "The potentials that drive the fluxes of the human social system, the most evident being the external and internal physical-chemical potentials, include a sheaf of potential-like components that represent the command-control system emergent as politics. On the whole, culture represents the social equivalent with the main processes of economics and politics being driven by a **social pressure**."

In 1992, American relationship theorist Teresa Brennan discusses social energy, emphasizing Sigmund Freud's physical psyche model using the notion of conflicting forces complemented by bound energy and free energy. In her 1997 article "Social Pressure", she argues that social pressure operates as physical energy, arguing that social pressures are pressures to conform but also those exerted on the psyche in the same way that physical pressures are exerted on the body. [2]

In 2005, German physicist Ingo Muller, in his version of socio-thermodynamics, gave a formulaic interpretation of the external pressures acting on a system of doves surrounded by hawks. He states "let the ∂V or part of the boundary be moveable under and external pressure", and gives the following intuitive and heuristic equation for the change in the energy of the social system as a function of work done by pressures in moving the boundary: [3]

$$\left.\frac{dU}{dt}\right|_{working} = -p_0 \frac{dV}{dt}$$

where p_0 is the external pressure acting on the system, *U* is the internal energy, *V* is the volume, and *t* is time.

Peer pressure

The adjacent diagram, and ad from a weekend teen boot camp, shows some of the common mental ideas (not talented enough, not good enough, not pretty enough, not smart enough), that carry the force (see: force carrier) of the peer pressure in the teen community, which is significantly higher than in the average society, being that junior high schools and high schools are force-ably closed systems (its the law that children attend school), in which the onset of hormonal activity initiates, exacerbating the pressure, indicating that three of

A depiction of terms of peer pressure and **social pressures**, from a core fitness teen boot camp (ages 11-15), which states that: "Teens are under more pressure than ever before. Peer pressure and other external influences are at its highest, and self-esteem is at its lowest." [5]

the more dominate "pressures" in the teen community are: beauty, intelligence, talent, and being "good" in all of the various areas which humans are supposedly to excel in.

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (social pressure, pgs. 61, 83, etc.). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (social pressure, pgs. 410, 630, etc.). Morrisville, NC: LuLu.
2. (a) Oliver, Kelly. (2001). *Witnessing: Beyond Recognition* (pg. 196-197). University of Minnesota Press.
(b) Brennan, Teresa. (1997). "Social Pressure", *American Imago* 54(3): 257-88.
3. Muller, Ingo. (2005). *Energy and Entropy: A Universal Competition* (socio-thermodynamics, pgs. 12, 203-221). Springer.
4. Iberall, Arthur S. (1985). "Outlining Social Physics for Modern Societies: Locating Cultures, Economics, and Politics: the Enlightenment Reconsidered." (abstract), *Proc Natl Acad Sci USA*, 82(17): 5582-84.
5. Teen boot camp (advertisement) – TotalCoreFitCamp.com.
6. Arrington, Robert L. (2001). *A Companion to the Philosophers* (pgs. 166-67). Wiley-Blackwell.

External links

â— Peer pressure – Wikipedia.

θΔics

In

Social Principias

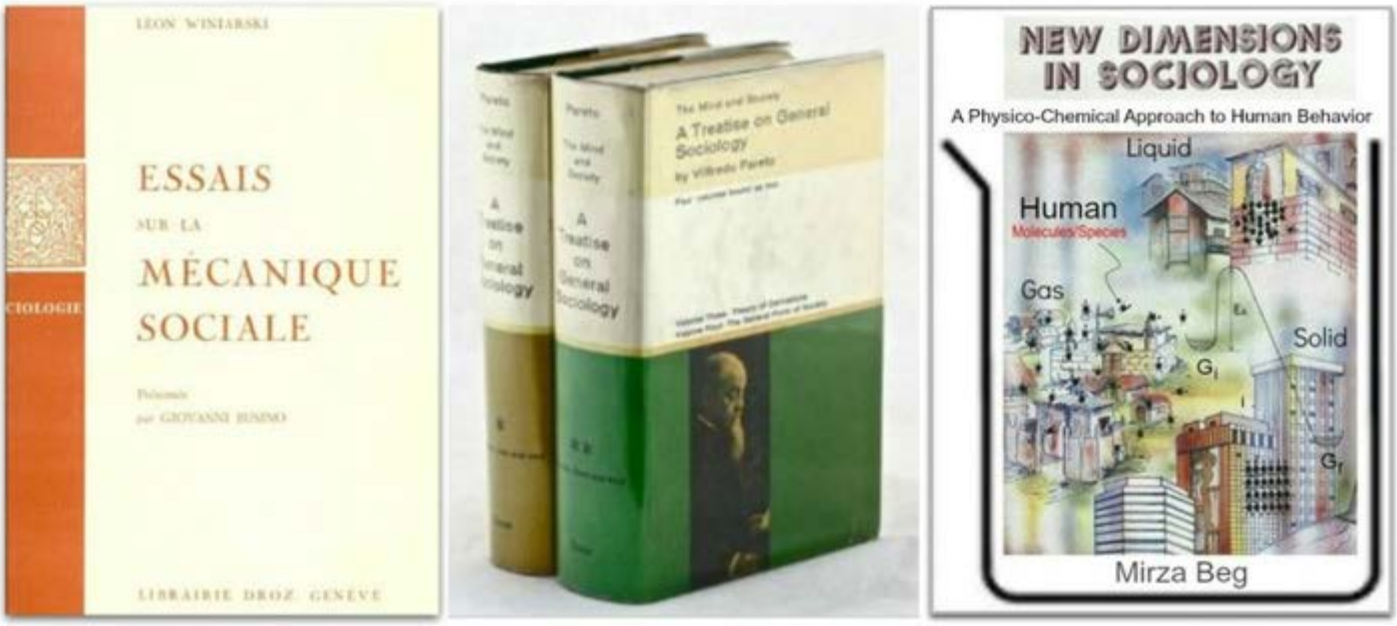

Winiarski | 1898 Pareto | 1912 Beg | 1987

Three representative examples of semi-neighborhood-like grasping-to-be "***Social Principias***", namely: Leon Winiarski's *Essay on Social Mechanics* (1898), Vilfredo Pareto's *Treatise on General Sociology* (1912), and Mirza Beg's *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (1987).

hmolscience, **Social Principia** is a term used in reference to books that grasp at doing for social mechanics what Isaac Newton's 1686 *Principia*, or *The Mathematical Principles of Natural Philosophy*, did for celestial mechanics, namely to formulate the laws of motion explaining observed movement phenomena.

Overview

No one, to note, has ever laid claim to having produced a "social *Principia*", but among the top three dozen "social Newtons", references and or jibes have been made or alluded to.

In 1874, reverend Moritz Kaufmann, in his *Socialism: its Nature, its Dangers, and its Remedies Considered*, was referring to the work of Charles Fourier as an attempt at a social *Principia*: [1]

> "Happiness he acknowledges is 'our being's end and aim'; and the only true science which leads to its attainment is sociology. As the doctrine of the material movements in the universe has been fixed by Newton's discoveries, so too the laws which regulate the movements in the social world must first be ascertained before we can hope to render mankind happy. To become such a social Newton was undoubtedly Fourier's ambition, and this is the fundamental law of his **social Principia**."

In 1875, American theological philosopher Robert Wright published *Principia: Basis of Social Science*, the first attempt at a so-called *Social Principia*, wherein he grappled with Auguste Comte, Henry Carey, and Charles Fourier, in efforts to expunge the "atheism" aspects of the latter so to make a theological-framed politics for post-civil war America.

Discussion

In modern retrospect, we might classify: Leon Winiarski's *Essay on Social Mechanics* (1898), Vilfredo Pareto's *Treatise on General Sociology* (1912), and Mirza Beg's *New Dimensions in Sociology: a Physico-Chemical Approach to Human*

Behavior (1987) as two in the neighborhood examples of "social *Principias*", for lack of better candidates.

Quotes

The following are related quotes:

> "The Declaration of Independence, therefore, is a **social Principia**, pretending to prescribe a social physics for mankind. It was used by Jefferson to justify the American Revolution, but it clearly is applicable to all men at all times in all conditions."
>
> — Author (1977), "Article" (Ñº), *Cornell Review*, Issues 1-4

References

1. Kaufmann, M. (1874). *Socialism: its Nature, its Dangers, and its Remedies Considered* (pg. 119). Henry S. King & Co.

θΔics

In hmolscience, **social proton**, or “human proton”, refers to the modelling or conceptual comparison of a human to a proton.

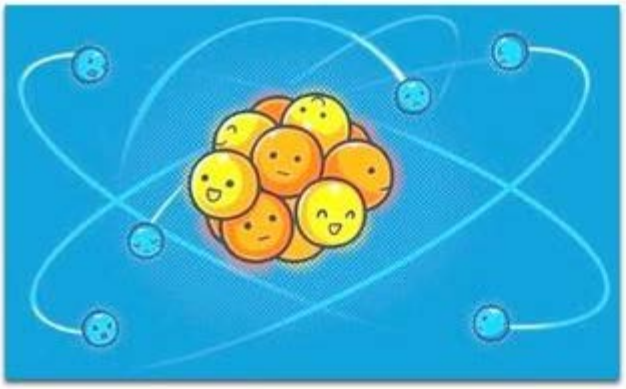

?
↔

Morris Zucker (1945) points out that just as the chemist or engineer doesn't need to know the so-called love life or wills of every single proton (+) or happy particle, above, or electron (-) or sad or angry particle above, in order to make successful predictions so to does the historian not need to know the love life or wills of every single person in history to make predictions. [1]

Zucker

In 1945, Morris Zucker gave the following hilarious proton analogy comparison, citing a quote by Austrian sociologist and economist Paul Weisengruen, a critic of the so-called materialistic conception of history, as advocated by Karl Marx: [1]

> “Leaving aside the problem of causality or indeterminacy, the theory and practice of science has been that if given an initial state with whose properties we are familiar, and if we know the laws of nature applicable to it, we can predict its future state by virtue of the operation of these laws. The diversity of historical phenomena [and] its apparently lawless and contradictory mode of manifestation, the bewildering reactions of countless human wills in different circumstances and different lands, that gives color to the theory that a science of history is impossible. ‘The historian’, writes Weisengruen ironically, ‘must know all the persons of the period he describes, their family relations, their actual course of action, as well as the opinions they held of each other … All to the smallest detail.’ [1] The chemist and the engineer arrive at quite exact results in their operations and their predictions without knowing the love-life of every single electron and proton of the materials with which they work.”

The historian, supposedly, must come to understand the "reactions of countless wills" to make historical prediction, whereas the chemist and engineer (or chemical engineer) are able to predict successfully without recourse to physical anthropomorphisms such as the wills or love lives of electrons and protons.

Brown

In 1977, Richard Brown, after discussing the Jacob Moreno's 1946 "social atom" model of a human, defined as the "smallest nucleus of an emotionally toned interpersonal pattern in the social universe", and John Q. Stewart's 1952 discussions of "social molecules", jumps to the following:

> “Given the ‘lag’ between the source of such metaphors in physics and their use in sociology, we await the discovery soon of **social protons**, neutrons, and neutrinos.”

(add discussion)

See also

â— Free electron | Social electron | Human electron

References

1. (a) Weisengruen, Paul. (1900). *Der Marxismus und das Wesen der sozialen Frage*. Leipzig.
(b) Boudin, Louis. (1907). *The Theoretical System of Karl Marx* (pg. 47). Charles H. Kerr & Co.
(c) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pgs. 49-50). Arnold-

Howard Publishing Co.
2. Brown, Richard H. (1977). *A Poetic for Sociology: Toward a Logic of Discovery for the Human Sciences* (pg. 145). University of Chicago Press, 1989.

θΔics

In hmolscience, **social reaction** or "social reactions" are reactions, i.e. human chemical reactions, which occur in a social retort. [1]

Criminology

In criminology, "social reaction" or "societal reaction", according to Victor Jupp (2012), are conceptual terms employed as a theoretical perspective and used somewhat in the sense of interactionism, labeling, and the transactional perspective; the theory of which, supposedly, being based on the work of Charles Cooley, George Mead, and Frank Tannenbaum (1938). [2]

SOCIAL REACTION

Definition

The social process characterizing media, public, political and criminal justice responses to crime and deviancy. These responses often stereotype, stigmatize, label, criminalize, scapegoat and/or amplify the behaviours of certain individuals and groups.

Distinctive Features

Historically, some authors referred to social reaction (or societal reaction) as a theoretical perspective, using it interchangeably with interactionist, labelling and transactional perspectives. However, social reaction is more usefully viewed as a theoretical concept central to these perspectives, and to a broader understanding of the nature and impact of societal responses to crime and deviance.

The theoretical legacy of social reaction and the labelling perspective derived from it lie in the work of symbolic interactionists, notably Charles Horton Cooley and George Herbert Mead. In the tradition of Mead, Tannenbaum (1938) acknowledged that crime and deviance were created through processes of social interaction, especially through societal responses like tagging, definition, identification and segregation. This culminated in a person becoming what they were described as, separating the 'criminal' from the group in a process that Tannenbaum called the 'dramatization of evil'. However, it was Lemert's (1951) theory of sociopathic behaviour which undertook a systematic analysis of societal responses to deviation. His basic premise was that social control created deviance.

A criminology dictionary definition of "**social reaction**", by Victor Jupp (2012), conceptualized as embodying interactionism, labeling, and transactionalism. [2]

Quotes

The following are related quotes:

> "In their origin, most of these religious observances of savages had some sort of useful effect. And in a more refined form, when the evil is purged out, something of permanent value may often survive. The typical examples of this may be found m the worship of the dead, in the adoration of the sun or the sky, and especially in a religious observance of one day in the week [e.g. Thor's Day or Sun's Day]. The task of mature civilization is to retain the valuable and discard the mischievous element in ancient superstitions. Unfortunately, there has been a tendency to retain some of the external forms of antique worship, and to get rid of the moral and **social reaction** which first animated the spirit of the founders. It is said that positivism has borrowed much from Catholic ritual, especially its *sacraments* and the conception of a spiritual power. Certainly, this is true, and is no sort of reproach. Congreve answered Huxley with as much wit as conviction: Positivism is Catholicism *plus* Science—*i.e.* its creed is the evidence of science in all its forms, but its purpose is a moral and social religion. It is the characteristic of humanity, that this idea alone is perfectly and fully human, can harmonize other types of civilization and incorporate the good, the true, and the humane."
>
> — Frederic Harrison (1913), *The Positive Evolution of Religion* [2]

> "Like Carthage, the Great Wall [separating 'humanities' from 'natural science'] must be totally destroyed. Halfway measures will not do. The barrier between man's spiritual life, which comes to highest expression in his **social reactions**, and the rest of his life is an artifact, nay, a monstrosity, conceived in ignorance, born of superstition, nourished by intolerance."
>
> — Judson Herrick (1930), "Humpty Dumpty and His Great Wall: The Scientific Study of Man and the Humanities" [3]

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1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (pdf). Morrisville, NC: LuLu.

(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
2. Jupp, Victor. (2012). "Social Reaction", in: *The SAGE Dictionary of Criminology* (social reaction, 30+ pgs; esp. pgs. 435-448) (editors: Eugene McLaughlin, John Muncie). SAGE.
2. Harrison, Frederic. (1913). *The Positive Evolution of Religion: its Moral and Social Reaction* (social reaction, pg. 75). G.P. Putnam's sons.
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θΔics

In social models, **social retort**, or "social test tube", is the conceptualization of a given society, piece of society or social matter, as a retort, e.g. the "estate" of Goethe's *Elective Affinities* (1809), and or test tube, in which humans, conceptualized as molecules or human molecules react, and whose reactions are studied via the methods of the physicochemical sciences.

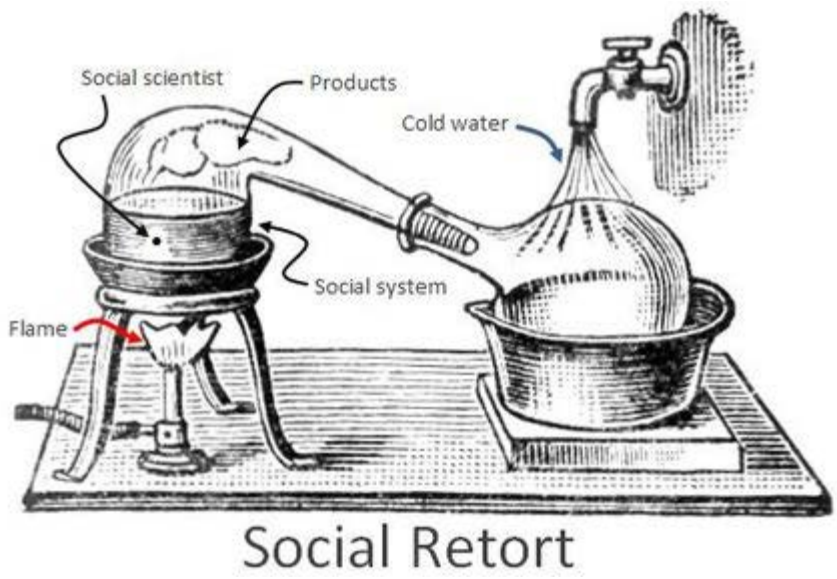

A retort (or **social retort**) depiction of Julian Huxley's 1940 so-called social retort problem, namely his assertion that "man cannot investigate man" by the methods of physical science because he is one of the elements of the physical system and therein inherently biasing his results.

Huxley bias problem

In 1940, Julian Huxley, in his "Science, Natural and Social", stated the following: [1]

> "… experiment for one fundamental reason—namely, that in the one case the investigator is outside his material, in the other he is not. Man cannot investigate man by the same methods he investigates external nature. He can use the methods of natural science to investigate certain aspects of man—the structure and …"

In 1942, Ruth Anshen, in her compendium *Science and Man*, wherein Huxley's article is reprinted, penned a chapter entitled "Man as an Element of Every Experiment" seemingly on Huxley's issue. [2]

In 1947, George Lundberg quoted Huxley as follows in this matter: [3]

> "One distinguished scientist [Julian Huxley] has urged that a basic difference between the physical and the social sciences is that in the latter 'the investigator is inside instead of outside his material.' This is supposed to be self-evident and require no analysis."

Lundberg cites two articles which he says are give a more comprehensive discussion of this and other problems. [4]

This seeming issue, Huxley raises, in the Morris Zucker on John Dewey sense of the matter, seems to be well-summarized as the problem of a chemical (or human chemical) in a retort (or social retort) trying to study its own reactions, to other chemicals, via the methods of physical science, e.g. hypothesis, testing, experimentation, measurement, theory, etc., while trying to maintain objective neutrality on its subject matter: which, paradoxically, is a system wherein its self is an admixture, of the social matter, so to say, he is trying to study; as depicted adjacent.

Quotes

The following are related quotes:

> "Since money does not reveal what has been transformed into it, everything, commodity or not, is convertible into money. Everything becomes saleable and purchasable. Circulation becomes the great **social retort** into which everything is thrown, to come out again as money crystal. Nothing is immune from this alchemy, the bones of the saints cannot withstand it."
>
> — Karl Marx (1867), *Capital* (pg. 229) (Ñº)(Ñº)

"Hence it is that we can have no precise laws in history as we have precise laws in physics, chemistry and mathematics; that history can never be a science in that highly rigid sense … the chemist, for example, can boast a superior apparatus for ascertaining the truth. In formulating the laws which govern an element, he can repeat his experiments thousands of times with all the factors precisely the same, or with endless variations of factors. The historian has no control of phenomena in the blowpipe (Ñº) or **test tube** sense."

— Allan Nevins (1938), *The Gateway to History*

"Physical phenomena in the gross is not concerted with the internal structure of each atom in each successive moment, nor is history with the relation of each individual being every moment of time. History is vitally interested in the laws of continuity in finite space and definite time. Were it not for the existence of these laws developed from definite relations subsisting among the mass, all science would be impossible. These propositions are fundamental in physics, and they apply with equal footing in history. Society is a definite reality. All we have to do is to look about us to be conscious of its ubiquitous presence though no one yet has examined it under the microscope or tested it in a chemists' **retort**. The retort will be that we are comparing inert matter, iron, with a living reality, society. Matter [after all] is not so terribly inert."

— Morris Zucker (1945), *The Field Theory of History*

"Most people's acquaintance with science has involved laboratories and controlled experiments. Indeed, the word science probably conjures up to most people the image of a man in a white coat looking critically at a test tube. Accordingly, another insuperable obstacle to social science is usually urged. How can a piece of society be put in a **test tube**?"

— George Lundberg (1947), *Can Science Save Us?* (pg. 21)

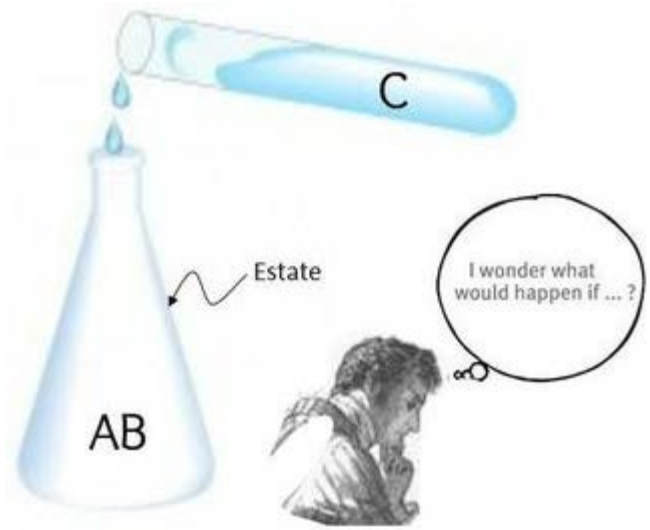

Left: a depiction of Goethe's visualization of the "estate", of his 1809 novella *Elective Affinities*—the character Edward shown ruminating on the thought experiment—as a chemical retort. Right: a 2013 chemical analogy type sketch of a social beaker by Ben Biddle of how innovation, in his view, is like a chemical reaction. (Ñº)

"People are like particles, they behave in groups as if they were molecules in a **test-tube**."

— Forbes Allan (1999), *Milton's Progress*

"Ecological stoichiometry [is about] how chemical elements come together to form evolved, living species in ecosystems. Organisms can be thought of as complex evolved chemical substances that interact with each other and the abiotic world in a way that resembles a complex, composite, chemical reaction. Like any other normal chemical rearrangement at the surface of the earth, when organisms interact, mass must be conserved and elements are neither created nor destroyed. There is stoichiometry in ecology, just as there is in organic synthesis in a **test tube**".

— Robert Sterner and James Elser (2002), *Ecological Stoichiometry*

See also

â— Island model

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θΔics

In science, **social science** refers to a number of branches of study of human existence, in its various facets, namely: sociology, anthropology, economics, history, politics, psychology, law, among others. The following quote by American economist Henry Carey outlines the subject of 'social science':

> "Man, the molecule, of society, is the subject of **social science**."

Here, it seems, Carey is alluding to the concept of the person as human molecule.

Social science: 1874

In his 1874 chapter on 'Social Science', American economist Henry Carey opened with the following 17th century quote by Francis Bacon:

> "The distributions and partitions of knowledge are not like several lines that meet in one angle, and *touch but in a point;* but are like **branches of a tree** that meet in a stem, which hath a dimension and quantity of entireness and continuance before it comes to discontinuance and break itself into arms and boughs; therefore, it is good before we enter into the former distribution, to create and constitute one universal science by the name of Philosophia Prima, or Summary Philosophy, as the main or common way, before we come where the ways part and divide themselves."

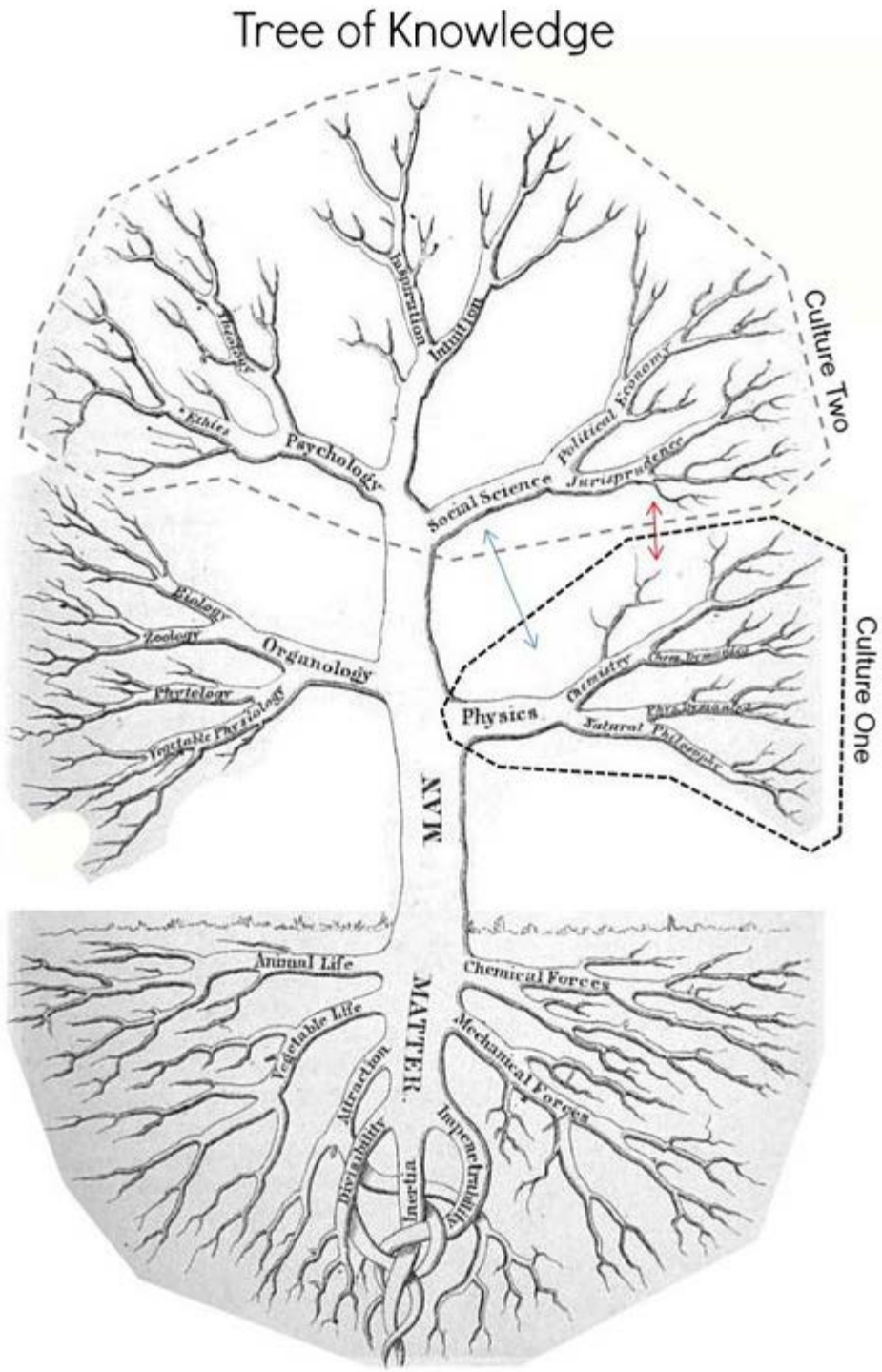

American physical science applied sociologist Henry Careys' 1874 depiction of the "tree of knowledge", annotated to show a post 1954 "two cultures" perspective (see: two cultures department), wherein the branch of **social science** is located in close proximity to the the physical science branch of knowledge. [1]

then went on to outline how, in the modern 'tree of knowledge', pictured adjacent, that the subject of social science would consist of political economy and jurisprudence. In more detail, the tree has roots to consist of: matter (animal life, vegetable life, attraction, indivisibility, inertia, impenetrability, mechanical forces, chemical forces); and the tree to consist of man as the trunk, with branches of: physics (chemistry, chemical dynamics, natural philosophy, physical dynamics), organology (biology, zoology, phytology, vegetable physicology), social science, social science (political economy, jurisprudence), psychology (ethics, theology), along with intuition, and inspiration. [1]

See also

- Social energetics
- Social mechanics
- Social mechanism
- Social thermodynamics
- Social physics
- Socio-thermodynamics

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External links

- Social science – Wikipedia.

θΔics

In science, a **social system** is a society considered as a system organized by a characteristic pattern of relationships. [1] In loose terms, a social system is a set of people bound in a society.

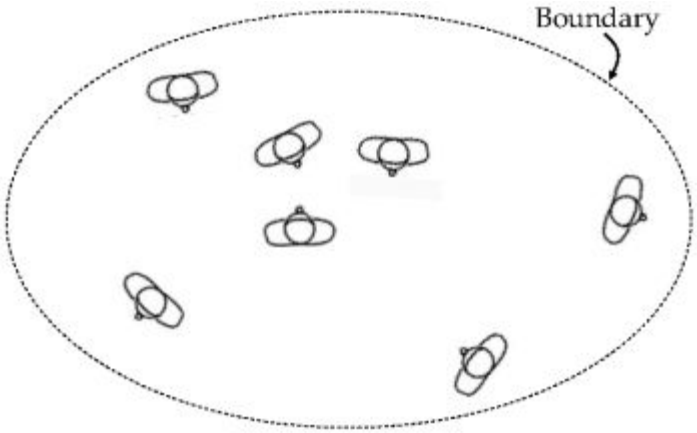

A boundaried **social system** of seven people (human molecules).

In sociology, historically, the two most prominent systems approaches have been functionalism, viewing a social system as society as made up of interdependent sections working together to fill the “functions” of society's survival, and general systems theory, a biology-physics type open systems model, developed by Emile Durkheim (1893) and Ludwig Bertalanffy (1950), respectively. [7]

In thermodynamic terms, a social system is viewed as a set of "socially affined" human molecules (people) delineated by a thermodynamic boundary characterized by an internal energy. [2] The thermodynamic view of social system is a difficult subject, one that is often skipped over or sometimes slightly addressed by sociologists, some even having objections.

Sociological thermodynamics

In social thermodynamics, a social system is often viewed a set of human molecules contained in a system, delineated by a social boundary, subjected to daily expansions and contractions in volume according to Boerhaave's law, in the same sense, albeit a reactive one, as water molecules in the boundaried piston-and-cylinder of a heat engine. [2] In another sense, a social system, thermodynamically, can be considered as a mode of organization of action elements relative to the persistence or ordering processes of change of the interactive patterns of a plurality of actors, which can be divided into exact thermodynamic coordinates driven by thermodynamic forces. [3]

In the 2001 paper "Social Entropy", Peruvian engineering professor Alfredo Infante argued that social entropy is the quantity that measures the effects of the second law of thermodynamics in human social behavior and that the "state" of a human society as a “system” is described by the degree of dissatisfaction or satisfaction with the social, political, and economic rules. He states that in social systems, the Gibbs free energy is the total energy in the system less the energy that is unavailable and that this difference represents the ‘state’ of the social system. [4]

Objections

In 1972, American economist Paul Samuelson, winner the 1970 Nobel Prize in Economics, sole protegé of the American polymath Edwin Wilson, who had himself been the sole protegé of Yale's great physicist Willard Gibbs (the main founder of chemical thermodynamics), commented that: [6]

> “The sign of a half-baked

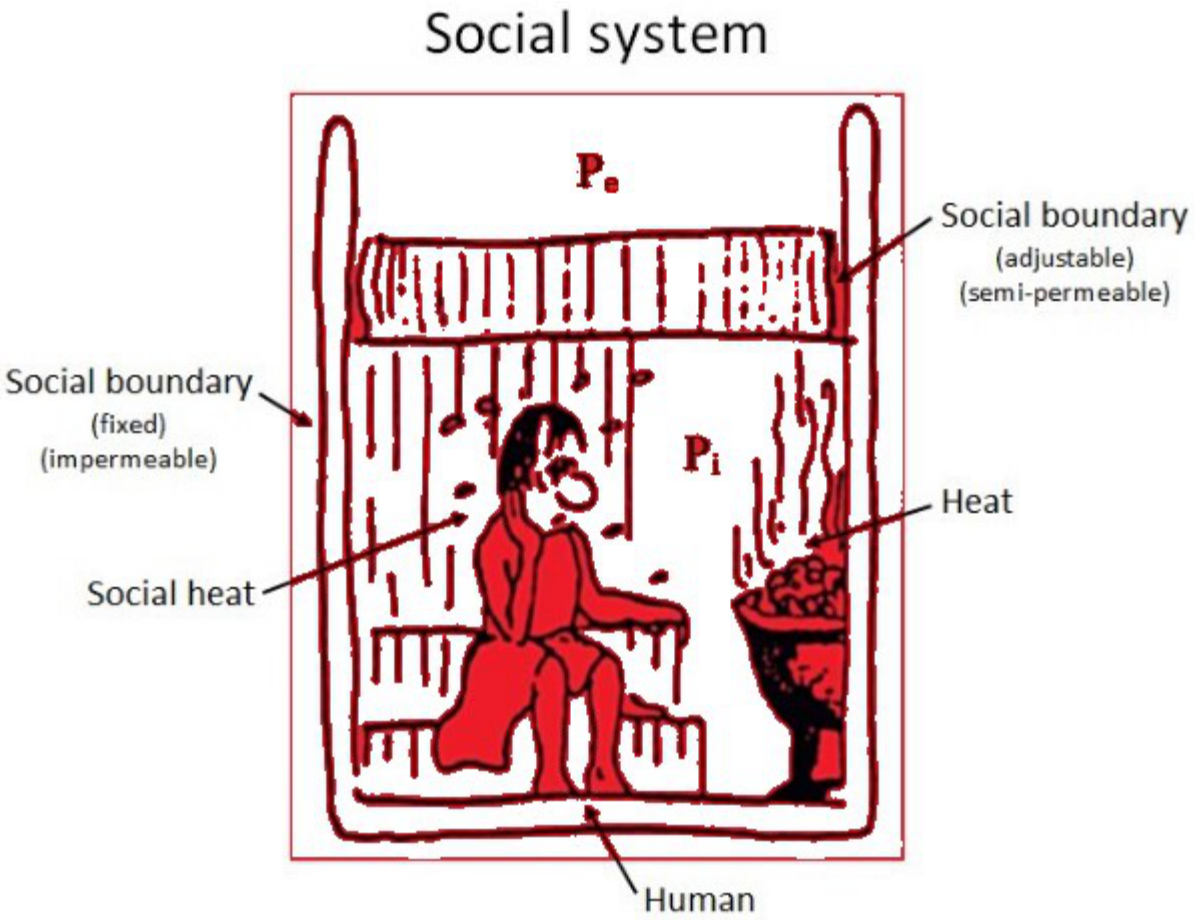

Image: "Man in piston" cartoon drawn by Mark Warmbrunn (1994); re-annotated by Libb Thims (2013) to illustrate the conception of 'social boundaries', e.g. Great Wall of China), originally published in Ingo Muller's 1994 Grundzüge der Thermodynamik : mit historischen Anmerkungen (Essentials of Thermodynamics: with Historical Notes); also shown on cover of Muller's 2009 Fundamentals of Thermodynamics and Applications; Warmbrunn being a then 14-year old "genius with a pencil and paper", was a friend of Muller's son, an art school applicant. [8]

> speculator in the social sciences is his search for something in the **social system** that corresponds to the physicist's notion of entropy."

Samuelson, however, seemed to have a general disdain and strong objection to any type thermodynamic modeling in either economics or sociology.

In the 1992 book *The Meaning of General Theoretical Sociology*, for instance, American sociologist Thomas Fararo devotes one page to the subject, where after mentioning Belgian chemist Ilya Prigogine's "order-from-disorder", far-from-equilibrium, dissipative structure thermodynamic theory, tells us in defense:

> "Of course, the empirical **social systems** we treat in sociology are not immune to the laws of thermodynamics; each organism, for instance, is in one aspect an open physical system to which a thermodynamic characterization applies."

In commentary, however, Fararo reasons that although certainly nothing in theoretical sociology is immune from the ultimate constraints of sciences such as thermodynamics, genetics, or mechanics, etc., they are just not as important. Moreover, he adamantly states that sociology should have a different conception of "equilibrium" than that such as used in the various branches of thermodynamics. In conclusion on his thermodynamic digression, Fararo states: [5]

> "The main point is that theoretical sociology should employ an abstract analytical conception of equilibrium in which this concept is in reference to certain states of the **social system**, not of the biophysical environment … any special emergence of order-from-disorder phenomenon in our field must be

accounted for by the mechanism of social interaction, not by a vague appeal to some thermodynamic situation."

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θΔics

In social thermodynamics, **social temperature** is the standard thermodynamic definition of "temperature" applied socially, to social systems, or two or bodies of humans; or the "heat that is generated within a society" (Beg, 2019). [8]

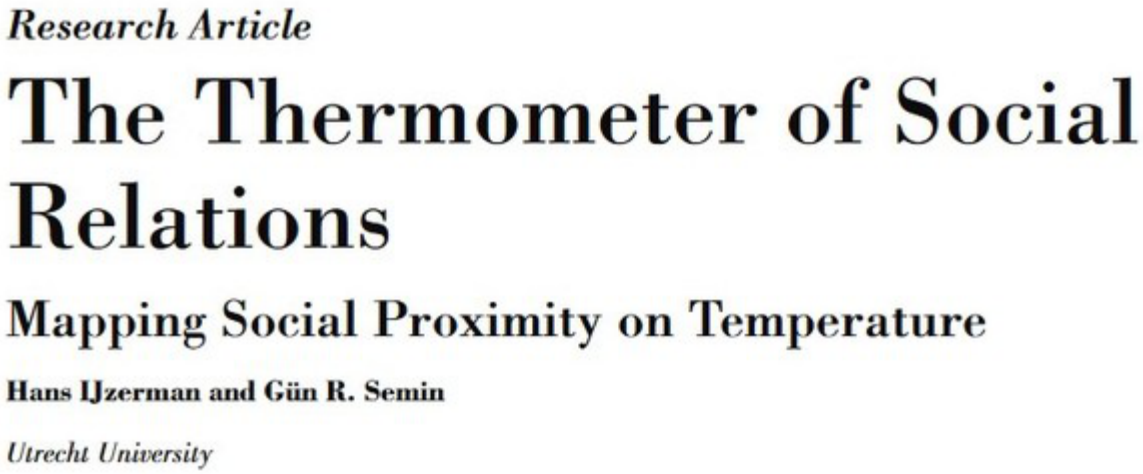
Research Article

The Thermometer of Social Relations

Mapping Social Proximity on Temperature

Hans IJzerman and Gün R. Semin

Utrecht University

A 2009 study by Hans Ijzerman and Gun Semin, entitled "The Thermometer of Social Relations: Mapping Social Proximity", wherein in room temperature was varied and social proximity was analyzed per use of thermal words. [9]

Overview

In 1870, American reverend Summer Ellis used the term social temperature in a metaphorical sense: [2]

> "The story has a moral, which is this—that we should turn our sunny side to society, and do our best to keep up the **social temperature** to the most genial heights."

In 1930, French sociological philosopher Maurice Halbwachs employed both the terms social temperature and in another instance moral temperature, as follows, wherein he introduces a type of human thermodynamic instrument conception: [4]

> "The number of suicides [in a region] can be considered a sort of thermometric indicator which informs us of the condition of the mores, of the **moral temperature** of a group."

Here we may recall the fact that in 2012 suicide rates among the US active-duty personnel eclipsed the number of troops dying in battle. [6] This would seem to be some kind of marking point on Halbwachs' moral temperature indicator or moral thermometer. As mores, by definition, are a "set of norms that define the most fundamental ideas about what is considered right and wrong, or moral, in human behavior", it would seem that the Halbwachs indicator, gauges the nature of the collective trajectory of the belief system of a group in respect to the actual trajectory of the group. [7]

In 1983, American sociologist Philip Rieff, in his introduction to a reprint of Charles Cooley's 1902 *Human Nature and the Social Order*, employs not only the term "social temperature" but a whole coterie of thermal words: [3]

> "*Human Nature and Social Order* is a classic examination, first published in 1902 and then again in a revised edition in 1922, of the flash point at which the human imagination ignites to produce the infinitely adjustable **social temperature** without which man has not yet learned to live. That flash point may produce the cold of the concentration camp or the warmth of family."

In 1995, American anthropologist Paul Bohannan discussed ideas of heat, work, and "cultural temperature". [5]

In 2009, Chinese physicist Yi-Fang Chang gave the following formula for social temperature: [1]

$$T = c\bar{K}(t)$$

where $\bar{K}$ is an average value of the social kinetic energy.

A artistic take (Ñº) on girl blazing with some type of anger or hotness, or something, which crudely illustrates the notion of "**social temperature**"; although social thermometers are wanting.

See also

â— Economic temperature

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θΔics

In hmolscience, **social test tube** refers to a "test tube" conceived on a macroscopic sociological level containing humans, viewed from a "reactive" human chemistry point of view.

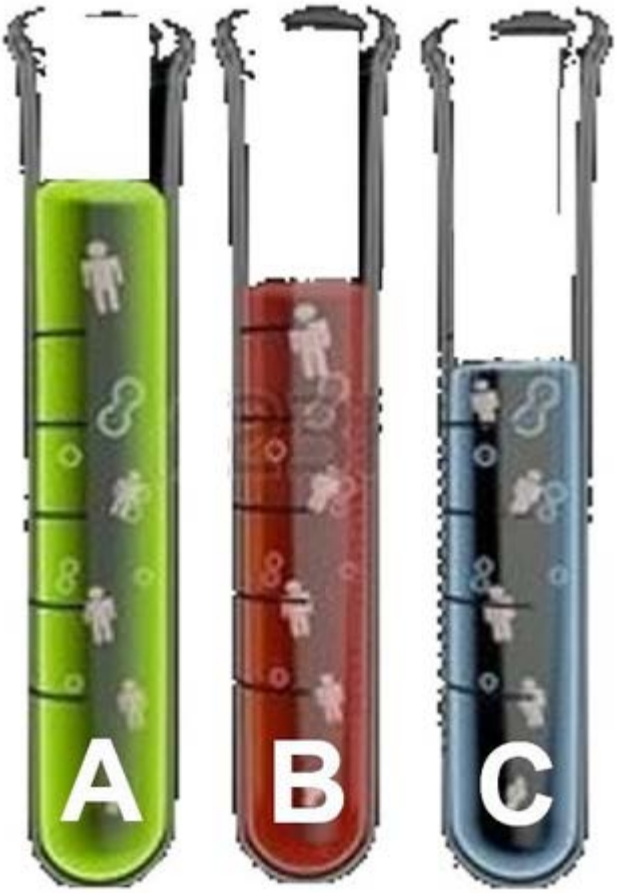

An illustration of three **social test tubes**, containing human chemical species A, B, and C, which in theory could be mixed together, and reactions therein observed.

Quotes

The following are related quotes:

> "Hence it is that we can have no precise laws in history as we have precise laws in physics, chemistry and mathematics; that history can never be a science in that highly rigid sense … the chemist, for example, can boast a superior apparatus for ascertaining the truth. In formulating the laws which govern an element, he can repeat his experiments thousands of times with all the factors precisely the same, or with endless variations of factors. The historian has no control of phenomena in the blowpipe (O) or **test tube** sense."
>
> — Allan Nevins (1938), *The Gateway to History* [1]

> "The reasoning employed here is at least superficially similar to that underlying the principles of chemical kinetics. According to classical physical chemistry, in a bimolecular reaction the velocity is a function of the product of the concentrations of the two reactants: i.e., the number of active particles of each per unit space. The analogy is carried still further by the implicit assumption that, as molecules or ions are conceived by the kinetic theory to be in a constant state of vibratory motion, so the active units in a **social test tube** are likewise considered to be in continuous motion. Hence, the chemical reaction depends upon the probable number of collisions [see: collision theory] of particles, and, by analogy, the observed effect of the social reaction, here homicide, is a function of the collisions between personalities. The analogy, of course, breaks down in detail. In particular, with social kinetics the effect of collision is not equal and opposite but unilateral. The white man affects the Indian, but the Indian does not affect the white man. Since this is so, a simple product of populations is doubtless not an exact expression of the relationship. However, it is worth a trial as a purely empirical mode of expression and as a first approximation in a quantitative sense."
>
> — Sherburne Cook (1943), *The Conflict Between the California Indian and White Civilization, Part 3: The American Invasion, 1848-1970* [3]

> "People are like particles, they behave in groups as if they were molecules in a **test-tube**."
>
> — Forbes Allan (1999), *Milton's Progress* [2]

> "The issue here is that the Quran employs the so-called clay creation theory [see: clay creation myth] to explain human formation and animation. The modern physicochemical sciences, however, now employ free energy of formation [see: human free energy of formation] logic to explain human synthesis, in which there is no such thing as "spirit" involved. We all notice, e.g., how in your 1983 article "Physico-Chemical Processes and Human Behaviour Part—IV: Muslim Society, its Formation & Decline", cited above, you attempt to grapple with the so-called "spirit issue", via equation 12(a), but that in your finalized book, you leave this "conflicting" issue on the drawing room floor, mentioning spirit only in regards to how Newton,

and the chemists of his day used to refer to gases as the “spirits” of reaction.
You may very well continue to retain, i.e. remain, in your apparent denial that there is not conflict, but you will lose face, i.e. lose my respect to a certain amount. Again, either we can be brothers in our belief in the exactness of the physicochemical methods as they apply to the **test tube as well as to society**, or we can be at odds? I should hope you side with reality, i.e. the methods of the physicochemical sciences, as Goethe did some 200-years ago [see: Goethe timeline]?”

— Libb Thims (2014), Beg-Thims dialogue (comment #11), Jul 7

See also

- Estate
- Island model
- Social retort
- Social volume

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θΔics

In human thermodynamics, **social thermodynamics** is the use or study of thermodynamics in sociology. Synonyms include: sociological thermodynamics and socio-thermodynamics.

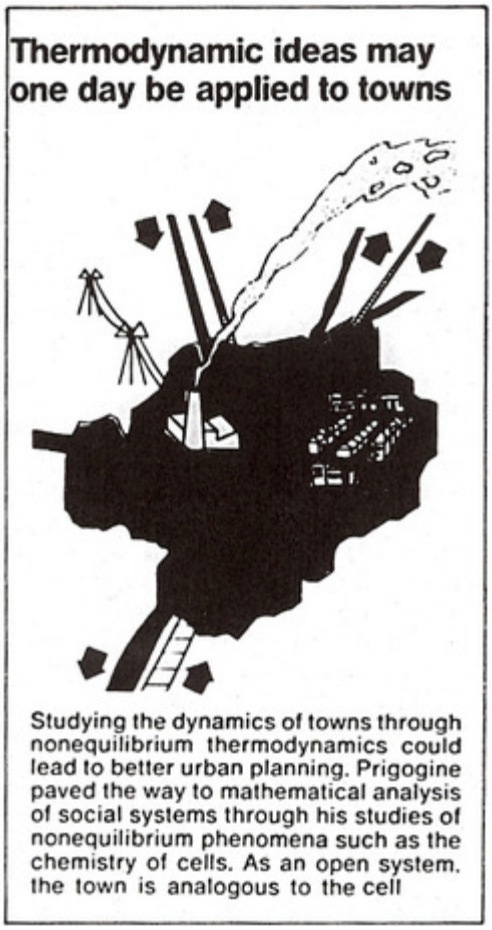

Captioned image from the 1979 article "The Social Thermodynamics of Ilya Prigogine" by Wil Lepkowski. [2]

Overview

In 1928, Pitirim Sorokin, in his *Contemporary Sociological Theories*, chapter: Mechanistic School, in review of Leon Winiarski's 1890s "mechanistic and energetistic interpretations", was referring to "social thermodynamics" and its basic laws. [5]

In 1972, political scientist Marlan Blissett, in the book *Politics in Science*, in a chapter devoted to the subject of "laws of social thermodynamics" (similar to the laws of human thermodynamics). [1]

In the 1979 article "The Social Thermodynamics of Ilya Prigogine", American chemist and science writer Wil Lepkowski argued that the nonequilibrium thermodynamics of Belgian chemist Ilya Prigogine could lead to new ways of understanding social processes. [2]

In 2004, Indian writer Biplap Pal cited Prigogine as being the one who started social thermodynamics, with ideas on people defined as atoms and families or human units as molecules; studying associations, such as marriage, and dissociations, such as death or divorce, in terms of equilibrium equations, chemical kinetics, and statistical mechanics; these human molecule ideas, however, may be a misattribution to Prigogine's student Erich Jantsch, who did specifically view people as "molecules" [3]

In 2012, Indian authors Dinesh Pothineni, Pratik Mishra, and Aadil Rasheed, in their "Social Thermodynamics: Modelling Communication Dynamics in Social Network", attempted to apply thermodynamics to communication networks; the abstract of which is as follows:

> "Thermodynamics, a concept thought of two centuries ago, refurbished and elaborated since, assimilated and transposed to distinctive disciplines stretching from neuroscience to economics but still lacks in-depth exploration of its impact on social networks. The aim is to model thermodynamic principles after social networks, to understand how different variables of the system such as entropy, temperature, energy and pressure steers the communication between agents at a broader sense. These innate synthetic variables of **social thermodynamics** can expose; varied and difficult to analyze dynamics in a network with higher order of approximation. Quantifying these variables in this context has promising applications in business intelligence, information diffusion and network analysis. This paper casts light on distinct attempts to measure social entropy and other social thermodynamic variables, while presenting methods to construct various thermodynamic processes to study these variables in a restricted environment. We further discuss our observations, findings and challenges in **modeling social network as a thermal gaseous system**. The paper focus on how these variables behave and what the standard relations signify in social context, more detailed analysis of isochoric and adiabatic process equivalents are studied while addressing roadblocks encountered by theorists in the past. Our models are experimented with sample sets collected over a period of 6 months from an enterprise social network for 250K users with over 860M connections. We aim to extend the scope of social interaction analysis beyond today's limitation, thus benefiting from many wide-established principles in thermodynamics."

Based on the fact that this is an Institute of Electrical and Electronics Engineers (IEEE) based conference, themed on

communication, the above paper is likely based on the Shannon bandwagon model of information entropy, used as a "open sesame" key to get into the door of human chemical thermodynamics.

See also

â— Socio-thermodynamics
â— Sociological thermodynamics

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5. Sorokin, Pitirim. (1928). *Contemporary Sociological Theories* (pdf) (§1: The Mechanistic School [pdf]; social thermodynamics, pg. 27). Harper & Brothers.

Further reading

â— Dongski, Choi. (2000). *Social Thermodynamics (Korean editions*). Publisher.

θΔics

In hmolscience, **social thermometer**, similar to "human thermometer", is an instrument, device, or gauge that in some way measures social temperature or the temperature of a society, social system, or social group.

Overview

In the 1890s, French sociologist Emile Durkheim outlined ideas on who “suicide” rate could act as a social thermometer. (Q)

In 1930, French sociological philosopher Maurice Halbwachs (1877-1945), who met Durkheim in 1905, thereafter being influenced by his work, uses the terms social temperature and in another instance moral temperature to allude to the suggestion that the suicide rate of a particular group of humans could be considered as a gauge of the moral temperature of the group: [1]

> “The number of suicides [in a region] can be considered a sort of **thermometric indicator** which informs us of the condition of the mores, of the moral temperature of a group.”

In 1996 to 2011, Russian-born American organic chemist Yuri Tarnopolsky outlined some ideas on “social thermometers”, how societies can be hot or cold, on how, supposedly, social thermometers might gauge these temperatures.

Faculty of Social and Behavioural Sciences

Universiteit Utrecht
2009

EXPERIMENT 1: WARMING AND COOLING OF SOCIAL RELATIONSHIPS

In the first experiment, we investigated the hypothesis that an increase in temperature within a comfortable range would increase social proximity. This experiment was inspired by recent research by Williams and Bargh (2008a), who used Asch's (1946) impression-formation paradigm to show that third parties were judged as warmer and friendlier by participants who had held a hot cup of coffee, rather than an iced cup of coffee. In our study, we introduced a new dependent variable: Participants were handed either a warm or a cold beverage and were then asked to rate their social proximity to another person.

Method

Participants

Thirty-three students (84.8% female, 15.2% male)[1] were recruited via leaflets and paid €2 for their participation. Participants were randomly allocated to the cold ($n = 16$) or the warm ($n = 17$) condition.

Procedure

Participants entered the laboratory and were asked to hold a beverage temporarily, while the experimenter ostensibly installed a questionnaire on a laptop computer. After participants filled out an unrelated questionnaire, they were asked to select a person they knew and then rated themselves and that person on the Inclusion of Other in Self (IOS) scale (Aron, Aron, & Smollan, 1992). We used a 7-point version of this scale, with two circles at each point indicating a perceived degree of overlap between self and other. The greater the overlap between the circles (and the higher the score), the greater the inclusion, and thus the higher the social proximity. After the experiment, participants were thanked and debriefed via an orally administered, funneled debriefing, as recommended by Bargh and Chartrand (2000); no participant indicated suspicion regarding the experiment's purpose.

A summary of the 2009 highly-cited (C[2015]:229+|Q) experiment, by Danish social researchers Hans Ijzerman and Gun Semin, on measuring "social warming" and "social cooling" in relationships with actual physical temperatures. [2]

Experimental studies

See also: Sidewalk study; Hallway study

In 2009, Danish social researchers Hans Ijzerman and Gun Semin, in their “The Thermometer of Social Relations: Mapping Social Proximity of Temperature”, supposedly conducted three experiments in aims to get quantitative indicators on thermal words employed socially, beyond the metaphor; the abstract of which is as follows: [2]

> "'Holding warm feelings toward someone' and 'giving someone the cold shoulder' indicate different levels of social proximity. In this article, we show effects of temperature that go beyond these metaphors people live by. In three experiments, warmer conditions, compared with colder conditions, induced (a) greater social proximity, (b) use of more concrete language, and (c) a more relational focus. Different temperature conditions were created by either handing participants warm or cold beverages (Experiment 1) or placing them in comfortable warm or cold ambient conditions (Experiments 2 and 3). These studies corroborate recent findings in the field of grounded cognition revealing that concrete experiences ground abstract concepts with which they are coexperienced. Our studies show a systemic interdependence among language, perception, and social proximity: Environmentally induced conditions shape not only language use, but also the perception and construal of social relationships."

In May 2015, Chinese psychologist Zhansheng Chen, et al, in their "Cold Thermal Temperature Threatens Belonging: The Moderating Role of Perceived Social Support", citing Ijzerman and Semin (2009), report the following study findings: [3]

> "Recent research suggests that thermal (cold vs warm) experience influences people's perception and construal of the social world. Extending this line of research, the present investigation examined whether cold thermal temperature would influence people's psychological feelings of belonging. We found that drinking cold water threatened feelings of belonging (Study 1). An additional study replicated this effect and further showed that it was moderated by perceived family support, such that the effect of cold water on the belonging was only found among participants with low family support (Study 2). These findings not only strengthen the interconnection between social and physical experiences, but they also demonstrate the interactive effect of these two types of experiences on psychological feelings. Implications are discussed."

In Jul 2015, Swiss psychologist Leonine Reuter, et al, in their "The Cold Heart: Reminders of Money Cause Feelings of Physical Coldness", citing Ijzerman and Semin (2009), reported the following interesting results: [4]

> "Mere reminders of money have been shown to cause socially "cold" behavior. Recent research suggests that the metaphor of "social coldness" is bodily grounded and thus linked to actual sensations of physical coldness. We therefore hypothesized that reminding individuals of money causes them to feel physically colder. This hypothesis was put to test in two studies, drawing on predictions from psychophysiological thermal perception. In Study 1, individuals who had been reminded of money perceived the air in the room as colder compared to a control group (an assimilation effect). Contrarily, in Study 2, they perceived water (a medium that was only momentarily experienced) as warmer compared to individuals not reminded of money (a contrast effect). Together these findings demonstrate that reminders of money cause sensations of actual physical coldness and add to the literature of both the psychological effects of money and human thermal perception."

(add discussion)

Quotes

The following are related quotes:

> "Public opinion is the thermometer a monarch should constantly consult."
>
> — Napoleon Bonaparte (c.1810), Publication

See also

- Economic thermometer
- Sexual thermometer

References

1. (a) Halbwachs, Maurice. (1930). *The Causes of Suicide* (social temperature, pg. 289; moral temperature, pg. 6). Taylor and Francis.
(b) Maurice Halbwachs – Wikipedia.
2. Ijzeerman, Hans and Semin, Gun. (2009). "The Thermometer of Social Relations: Mapping Social Proximity of Temperature" (abs) (pdf), *Psychological Science*, 20(10):1214-20, Oct.
3. Chen, Zhansheng, Poon, Kai-Tak, and DeWall, C. Nathan. (2015). "Cold Thermal Temperature Threatens Belonging: The Moderating Role of Perceived Social Support" (abs), *Social Psychological and Personality Science*, 6: 439-46, May 1.
4. Reutner, Leonie, Hansen, Jochim, and Greifeneder, Rainer. (2015). "The Cold Heart: Reminders of Money Cause Feelings of Physical Coldness" (abs), *Social Psychological and Personality Science*, 6:490-495, Jul 1.

θΔics

In hmolscience, **social volume** is the geometrical region, spatial area (i.e. "volume"), delineated by a boundary, of a given social system, society, or social entity under study.

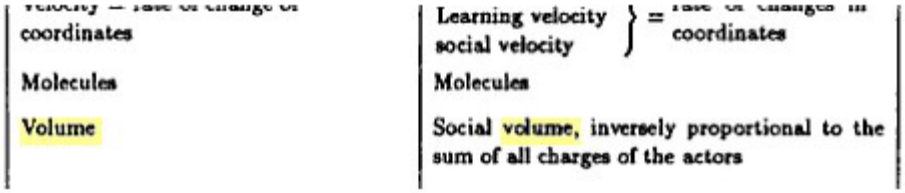

Dutch social mathematician Cornelis Hoede's 1990 physics-to-social variables table, showing him conceptualizing "**social volume**" as being "inversely proportional to the sum of all charges of the actors" of the social system. [1]

Overview

In 2009, Dutch social mathematician Cornelis Hoede was theorizing about “social volume” in a physics and chemist perspective; a snippet depiction of which is shown adjacent. [1]

References

1. Hoede, Cornelis. (1990). *Social Atoms* (social volume, pg. 63). Fac., Univ.

θΔics

In isms, **socialism** is any of various economic and political theories—ranging from Owenism (1812), statist, libertarian, Marxist (1843), liberal, up to "pure" socialism (seen in a few Communist regimes)—advocating collective or governmental ownership and administration of the means of production and distribution of goods; a system of society or group living in which there is no private property; a system or condition of society in which the means of production are owned and controlled by the state; a stage of society in Marxist theory transitional between capitalism and communism and distinguished by unequal distribution of goods and pay according to work done. [1]

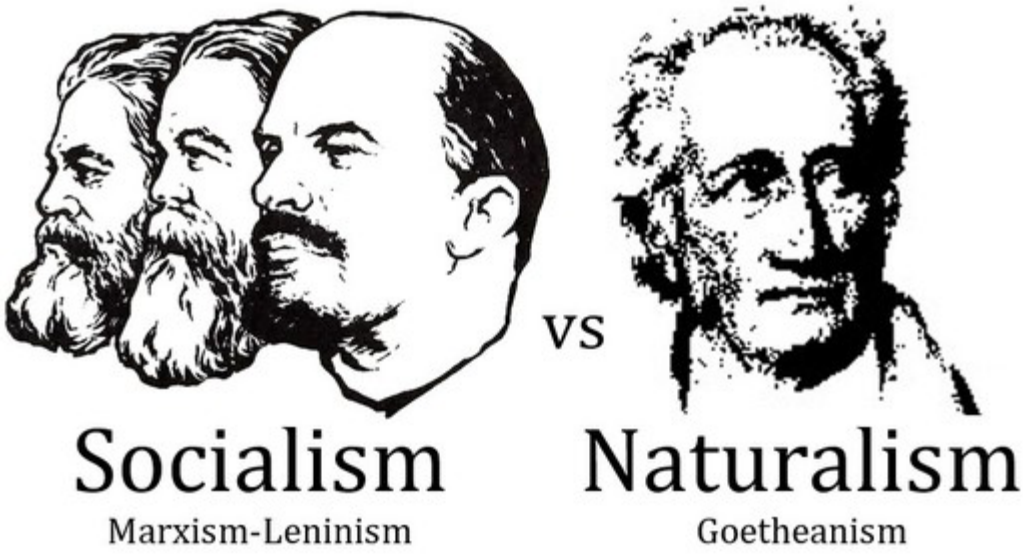

A depiction of the turn away from "**socialism**" of the Marx-Engels (Marxism) + Lenin (Leninism) variety, which has dominated the Cubin society in the last half-century, and an instinctive turn towards the physico-chemical naturalism espoused by Goethe, i.e. Goetheanism, in his human chemical theory, a realism-based, philosophically-grounded. modern Epicureanism, in some sense.

Etymology

The first use of term "socialism" often tends to be attributed to the 1812 Christian utopian theories of Robert Owen; such as summarized (Q) by secular atheist Charles Southwell (1840). [2]

In 1815, however, the term "socialism", possibly independent of Owen, appeared in a variety of usages, e.g. state socialism, German socialism, socialism in England, among other usages and publications. (Q)

In 1867, Karl Marx published his three volume *Capital: a Critique of Political Economy*, wherein, starting from Adam Smith and David Ricardo, he argued that labor is the source of all value and measure of price; soon thereafter, this was being referred to, historically, as the "Bible of Socialism". [3]

Overview

Of curious note, two of the countries that scrambled to get a hold on things, after the fall of communist-based socialism, namely Romania and Cuba, were the first to find their way to sociophysics and sociochemistry, the former producing the Romanian school of physical socioeconomics, the latter producing the first remake of Goethe's *Elective Affinities*, both employed as new models for society; a quote of which is as follows:

> "To us, rather than giving answers, what we wanted was to play certain issues that are very present in Cuban society: what good is freedom; where we are going, or how important is the individual with all its misery. If we can continue to say that all are equal, all noble and good, or what is the same, keep the theory of **socialism**, that nonexistent equality or will the dark depths of ourselves, and accept it, or we cannot go anywhere."
>
> — Vladimir Cruz (2011), interview on *Afinidades*, ElUniversal.com (Q) review

This seems, in some sense, to be a social Mpemba effect, albeit not exactly. Namely freed from former socialism ideas, both seem to have arrived at the newer views quicker than countries, e.g. American, still tied to older religious paradigms.

Quotes

The following are related quotes:

> "By annihilating the desires, you annihilate the mind. Every man without passions has within him no principle of action, nor motive to act."
>
> — Helvetius (1773), *A Treatise on Man: His Intellectual Faculties and his Education* (Q)

> "You a communist? Huh? How'd you like it, man? They tell you all the time what to do, what to think, what to feel. Do you wanna be like a sheep? Like all those other people? Baah! Baah!"
>
> — Tony Montana (1983), *Scarface* (Q)

See also

- Lazy ant study

References

1. Socialism – Merriam-Webster Collegiate Dictionary, 2000.
2. Socialism – EtymOnline.com.
3. Bliss, William D. (1895). *A Handbook of Socialism: a Statement of Socialism in its Various Aspects, and a History of Socialism in All Countries* (pg. 241). S. Sonnenschein & Co.

External links

- Socialism – Wikipedia.

θΔics

In human thermodynamics, **societal entropy production** refers to negative elements of out-of-control, irresolvable social, economic, and political by-products, which are posited to lead to ultimate decay of successful societies.

Overview

In 2009, American physical chemist Thomas Wallace, in his 2009 book *Wealth, Energy, and Human Values*, was using the term freely as follows:

> "Societal complications, characteristic of a failing social order, include unmanageable sociopolitical policies and practices, disintegration of cultural values, unresponsive bureaucracies, abuses of technology, breakdown of central authority and infrastructure, financial insolvency, dispirited populations, lawlessness, and inadequate responses to emerging issues. These properties and characteristics of cultural deterioration, examples of **societal entropy production**, have been observed in the declining years of great civilizations from ancient Greece to America."

The issue here, to note, with this term and description as aspects of cultural deterioration, is that there is no fundamental derivation to justify these claims, other than German physicist Max Planck's principle of elementary disorder.

References

1. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (societal entropy production, 45+ pgs). AuthorHouse.

θΔics

In hmolscience, **society**, from Latin *socius* "companion", is an aggregate (see also: disgregation) with a definite structure held together in a definite manner. [1]

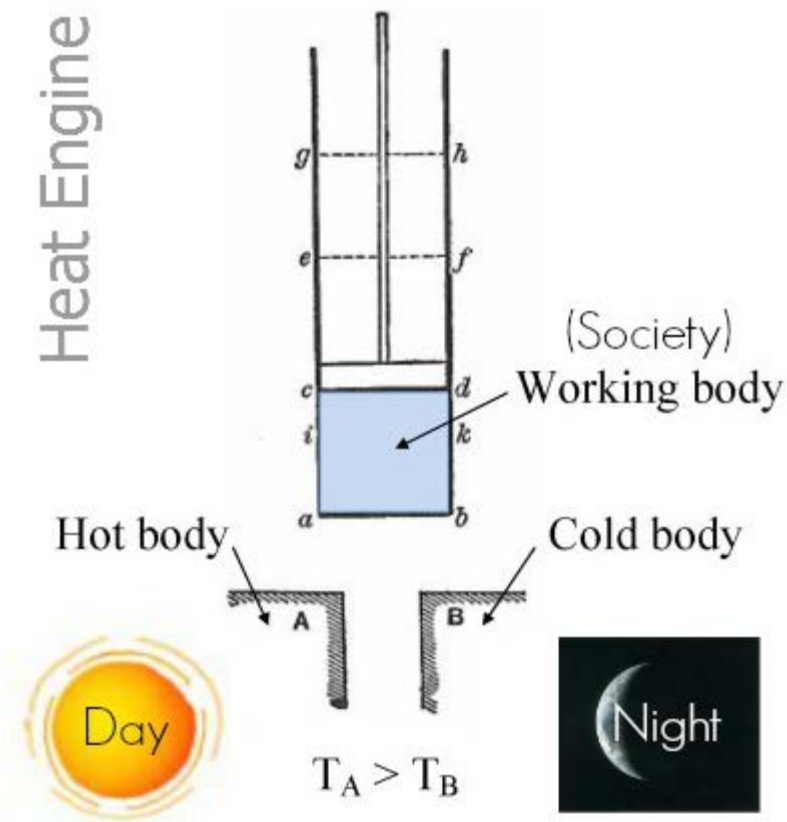

A thermodynamic representation of **society** as the working body of a heat engine. [3]

Quotes

The following are related quotes:

> "In the inorganic world we find the power of combination growing with the increase of differences. Place a thousand atoms of oxygen in a receiver, and they will remain motionless; but introduce a single atom of carbon, and excite their affinities for each other, and at once motion will be produced. Such being the case in regard to all other matter, it must be so in regard to those combinations in which man is concerned, indicated by the term **society**."
>
> — George Carey (1858), *Principles of Social Science* (§8: On The Formation of Society)

> "Even when a **society** has got upon the right track for the discovery of the natural laws of its movement—and it is the ultimate aim of this work, to lay bare the economic law of motion of modern society—it can neither clear by bold leaps, nor remove by legal enactments, the obstacles offered by the successive phases of its normal development. But it can shorten and lessen the birth-pangs."
>
> — Karl Marx (1867), *Capital: a Critique of Political Economy* [2]

See also

- Social matter
- Social system
- Society for Studies on Entropy
- Sociology

References

1. Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 303). Arnold-Howard Publishing Co.
2. Marx, Karl. (1867). *Capital: a Critique of Political Economy – the Process of Capitalist Production* (economic law of motion, pgs. 14-15). Publisher.
3. Thims, Libb. (2014-15/16). *Chemical Thermodynamics: with Applications in the Humanities* (85-page version: pdf of 800-pages estimated total). Publisher.

External links

- Society – Wikipedia.

In thermodynamic schools, the **Society for Studies on Entropy** (SSE) is a Japanese society, founded on September 24th, 1983, by a group of a group of people who felt concern for problems of entropy not only in natural and technological systems, but also in social systems and economic systems [1]

A founding member of the SSE was Japanese physicist Motoyosi Sugita. The SSE has had annual symposiums since 2001, at various universities, on topics related to entropy, nature, and society. The SSE also publishes scholarly papers. [3]

References

1. Sugita, Motoyosi. (1952). "Negative Entropy", *Kagaku* (Science), Vol. 22. No. 2. In: "Selected Papers on Entropy Studies", Vol. 6. No. 1., 2000, *The Society for Studies on Entropy*.
2. Society for the Studies on Entropy (Japanese → English) – Entropy.ac
3. Selected Papers on Entropy Studies (Vol. 1, 1994 Vol. 7, 2003) (Japanese → English) – Entropy.ac

In science, **socio-economic physics** is the study of the physics of social and economic phenomena.

The German Physical Society's symbol acronym for the "physics", symbolized by the Greek letter Phi "Φ" of socio-economic "SOE" systems (which is reminiscent of James Maxwell's Greek letter coding of thermodynamics as "θΔcs".

Overview

The work of German metallurgist, solid state thermodynamicist, and physical socio-economics professor Jurgen Mimkes, such as found in the 2006 book *Econophysics and Sociophysics*, is well-representative of the thermodynamics of social and economic phenomena, promoted under the guise of socio-economic physics.

In 2008, the German Physical Society reorganized to create the AGSOE or "Working (Arbeit) Group on Physics of Socio-Economic Systems, and is now organisationally on equal footing with all the classical disciplines of physics. [1]

American physicist Eugene Stanley was a keynote speaker at the 2012 AGSOE meeting.

Since 2002, the group has been awarding a "Young-Scientist Award for Socio- and Econophysics". [2]

References

1. History (AKSOE/AGSOE becomes Φ·SOE) – DPG-Physick.de.
2. News (Φ·SOE) – DPG-Physick.de.
3. Chakrabarti, B.K., Chakraborti, A. and Chatterjee, A. (2006). *Econophysics and Sociophysics: Trends and Perspectives*. Wiley.

External links

- Physics of Socio-Economic Systems – Mendeley.

θΔics

In science, **socio-physical chemistry**, or sociophysics + sociochemistry, is the systematic study of the physical and chemical basis of social behavior. [1]

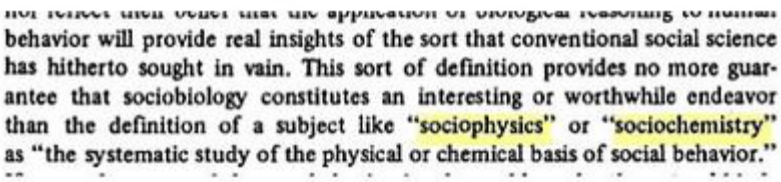
behavior will provide real insights of the sort that conventional social science has hitherto sought in vain. This sort of definition provides no more guarantee that sociobiology constitutes an interesting or worthwhile endeavor than the definition of a subject like "sociophysics" or "sociochemistry" as "the systematic study of the physical or chemical basis of social behavior."

American philosopher Alexander Rosenberg's 1980 definition of sociophysics and or sociochemistry—or "**socio-physical chemistry**" in modern (2014) truncated Hmolpedia neologism terms—as the systematic study of the physical and chemical basis of social behavior. [1]

Quotes

The following are related quotes:

> "It is very unlikely that the general characteristics of Gibbs' system had anything to do with Pareto's construction of his social system. In other words it is very probable, I think nearly certain, that Pareto did not keep Gibbs' work in mind and *a fortiori* that he did not imitate it, when he worked out his social system; so that Pareto's system is not the result of the application of the theories of physical chemistry to sociology."
>
> — Lawrence Henderson (1935), *Pareto's General Sociology: a Physiologists Interpretation* [2]

See also

â— Two cultures department | Naming issues

References

1. Rosenberg, Alexander. (1980). *Sociobiology and the Preemption of Social Science* (pg. 154). Johns Hopkins University Press.
2. Henderson, Lawrence J. (1935). *Pareto's General Sociology: a Physiologists Interpretation* (keyword: thermodynamics, pgs. 10, 47, 82, 90, 92; note 5: "The Sources of Pareto's Social System", pgs. 91-93). Harvard University Press.

θΔics

In hmolscience, **socio-physical monism** is a general one nature monism, as compared to a general two nature dualism, view of the universe according to which the same laws govern in the social and economic world as in the physical, such as embodied in the works of Leon Winiarski (SN:4), Henry Carey (SN:9), Wilhelm Ostwald (SN:18), and Eugene Roberty (SN:41), such as summarized by Howard W. Odum (1929), e.g. see: Odum classification, per citation to Pitirim Sorokin (1928) and his "Mechanistic School" chapter.

Quotes

The following are related quotes:

> "Of the earlier analogies the theories which attempt to interpret social phenomena in terms of mathematics, physics, chemistry, and mechanics are perhaps the most noteworthy. They border on the philosophical approach in that they assume a **socio-physical monism**, and end in the unprovable [see: proof]. They border upon the modern objective approach in that they attempt to apply the method of the physical sciences to the social sciences."
>
> — Howard W. Odum (1929), on the "mechanistic theory" approach (see: Odum classification) [1]

See also

â— Sociology terminology upgrades

References

1. Odum, Howard W. and Jocher, Katharine C. (1929). *An Introduction to Social Research* (§7: "Types of Approach: the General Analogical", §§: "Mechanistic Theories", pgs. 108-110). H. Holt and Co.

θΔics

In social thermodynamics, **socio-thermodynamics** is the study of study social and racial divisions and separations in society, a phenomenon which can be understood from a phase-diagram perspective, using entropy of mixing, working and heating effects, and first and second law interpretations. [1] The subject was first outlined in the 2002 article "Socio-thermodynamics – Integration and Segregation in a Population" by German physicist Ingo Müller. [2] One funny point, about the modeling of human social life through the difficult science of thermodynamics, as Müller states in his 2007 book *A History of Thermodynamics: the Doctrine of Energy and Entropy*, is that:

> "It is interesting to note that **socio-thermodynamics** is only accessible to chemical engineers and metallurgists. These are the only people who know phase diagrams and their usefulness. It cannot be expected, in our society, that sociologists will appreciate the potential of these ideas."

Most chemical engineers and metallurgists concur, in that socio-thermodynamics is obvious to mathematically-trained scientists, such as physicists, but the explanation of this obviousness to others is not so easy.

References

1. Müller, Ingo. (2007). *A History of Thermodynamics - the Doctrine of Energy and Entropy*. New York: Springer.
2. (a) Müller, Ingo. (2002). *Socio-thermodynamics – Integration and Segregation in a Population*, P: Continuum Mechanics and Thermodynamics 14, 384-404, 2002.
(b) Müller, Ingo and Weiss, Wolf. (2005). *Entropy and Energy - a Universal Competition* ("Socio-thermodynamics - Integration and Segregation in a Population", ch. 20).Germany: Springer.

θΔics

In hmolscience, **sociochemistry**, a truncation of "socio-chemistry" (Michael Fores, 1976) and "social chemistry" (Thomas Huxley, 1871), synonyms to "human chemistry" (E.B., 1851), is the systematic study of the chemical basis of social behavior. [1]

Etymology

In 1976, industrial scholar Michael Fores coined the term "socio-chemistry", in an unknowing truncational style the older 19th century usage of "social chemistry" by Thomas Huxley, albeit done so in a pejorative manner as something to laugh about: [2]

> "Physics deals with matter, and so, oddly, does chemistry. Whereas the matter which is part of living organisms is the subject of biology; or is it the subject of organic chemistry? Sociology is the study of man in groups; whereas psychology is the study of man himself. However, individuals form groups; so some of social behavior is part of individual behavior. And anthropology, with its accent on culture, also deals with man in groups. But so does … We have biochemistry, physical chemistry, biophysics, social psychology. Should there be a door in the House of Science called **socio-chemistry** or anthro-physics [see: anthropic physics] or eco-zoology (the animal aspects of wider housekeeping)? I think not; but posing the question outlines the activist's dilemma."

In 1978, American zoologist Dale Madison was using the phrase "sociochemical susceptibility" in reference to meadow voles. [3]

In 1980, American philosopher Alexander Rosenberg was referring to both "sociophysics" and "sociochemistry" as the "systematic study of the physical or chemical basis of social behavior". [1]

In 1982, the term "sociochemistry" was being used in reference to worker bee social behavior.

In 1987, Pakistani organometallic chemist Mirza Beg published his *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, wherein he applies the methods of physical chemistry to sociology; therein pioneering a new field of study referred to by some as sociochemistry:

> "Beg seems to have laid the foundation of a new interdisciplinary branch of knowledge in Pakistan which may be called '**socio-chemistry**' or the chemistry of society."
>
> — S.A. Rahim (1990), "The Ideal Society and Ideal Solution" [4]

Beg, however, though he doesn't name his subject of study specifically, would more correctly be defined as: "physicochemical sociology" (see: two cultures namesakes), a physicochemical humanities sociology-focused subject, a truncation of his title.

Quotes

The following are related quotes:

> "The answer to sociobiology: **sociochemistry**."
>
> — Sidney Harris (1981), cartoon in *American Scientist*

See also

- Social entropy theory

- Social atom
- Social Avogadro number
- Social bond
- Social chemistry
- Social combustion theory
- Social energetics
- Social energy
- Social engineering
- Social enthalpy
- Social entropy
- Social force
- Social free energy
- Social gravitation
- Social heat
- Social ideal gas law
- Social internal energy minimization theory
- Social mechanics
- Social mechanism
- Social molecule
- Social network
- Social Newton
- Social physics
- Social physics school
- Social piston and cylinder
- Social power
- Social science
- Social system
- Social temperature
- Social thermodynamics
- Socio-economic physics
- Socio-physical chemistry
- Socio-thermodynamics
- Sociological thermodynamics
- Sociological TPs
- Sociology
- Sociology terminology upgrades
- Sociophysics

References

1. Rosenberg, Alexander. (1980). *Sociobiology and the Preemption of Social Science* (pg. 154). Johns Hopkins University Press.
2. Fores, Michael. (1976). "A Proper Use of Science" (pg. 152), given at conference on manufacturing and management, City University, London, Dec.; in*: Manufacturing & Management* (editors: Michael Fores and Ian Glover). H.M. Stationery Office, 1978.
3. Madison, Dale M. (1978). "Behavior and Sociochemical susceptibility of Meadow Voles (Microtus pennsylvanicus) to Snake Predators", *American Midland Naturalist*, 23-28.
4. Rahim, S.A. (1990). "The Ideal Society and the Ideal Solution", paper presented as the General Presidential Address by Prof. Dr. S. A. Rahim, University of Karachi, at the 28th Annual Seminar (June) of the Pakistan Philosophical Congress at Baragali, Peshawar.

Further reading

- Cullen, William R. and Capper, Peter. (2008). *Is Arsenic an Aphrodisiac?: the Sociochemistry of an Element*. RSC Publishing.

External links

- Sociochemistry – Wiktionary.

θΔics

In hmolscience, **sociological thermodynamics**, aka "social thermodynamics" (Sorokin, 1928), socio-thermodynamics (Muller, 2002), or physico-chemical social dynamics (Adams, 1908), a branch of human thermodynamics, is the study, analysis, and prediction of the behavior of processes in human social systems, modeled as thermodynamic systems, according to the laws of thermodynamics, particularly those related to energy and entropy.

A 2013 tip by Mircea Gligor on thermodynamics applied to sociology or psychology.

Overview

In 1895 to 1910, the Adams brothers, Henry Adams and Brooks Adams, introduced and or employed a number thermodynamics views and ideas in a sociological context, so to define the loose subject of human thermodynamics, to be the physico-chemical explanation of sociology and history. In particular, in reference to the development of a potential science of history thermodynamics, Adams stated that: [8]

> "If the physicists and physico-chemists can at last find their way to an arrangement that would satisfy the **sociologists** and historians, the problem would be wholly solved [but] such a complete solution [socio-history thermodynamics] seems not impossible; but at present ...to call for the aid of another Newton."

In 1935, American physical chemist Lawrence Henderson began teaching a thermodynamics based course at Harvard called Sociology 23 based, in part, on the work of Willard Gibbs.

In 1943, Russian-born American sociologist Pitirim Sorokin, in his chapter "Declaration of Independence of Sociology and the Social Sciences from the Natural Sciences", employed the term "physicochemical sociology", in what seems to be a derogatory label to Henderson's chemical thermodynamics based Sociology 23 course and Henderson's general 1930s Harvard Pareto circle, which Sorokin took part in, in respect to debate against Henderson. [13]

In the 1960s, the concept of "social entropy" began to emerge in various publications.

In 1972, American political scientist Marlan Blissett, in his *Politics in Science*, was using the term specific term "social thermodynamics" in a metaphorical chapter devoted to the subject of "laws of social thermodynamics" (similar to the laws of human thermodynamics). [4] In the late 1970s, some began to model social systems from a "far-from-equilibrium" dissipative structure point of view, along the lines of Belgian chemist Ilya Prigogine's non-equilibrium type of thermodynamics. [3] In 1978, Russian physical chemist Georgi Gladyshev outline a theory of hierarchical thermodynamics theory in which social systems could be studied according to their work producing functions as determined by the combined law of thermodynamics. [1]

In the 1980s, Mirza Beg introduced the general subject of physicochemical sociology, in book form, based on chemical thermodynamics.

In 1990, American sociologist Kenneth Bailey summarized the position of thermodynamics and particularly entropy in sociology, as follows: [10]

> "Many **sociologists** remain unfamiliar with the concept of entropy. Those who are aware of it often associate it with **thermodynamics** and often consider entropy a property of heat systems. Thus, they feel that its application to social phenomena is inappropriate at worst and unfruitful at best."

In general, however, social systems can be analyzed from a number of thermodynamic perspectives. Many sociologists tend towards a Prigoginean thermodynamics approach. From a hierarchical thermodynamics point of view, societies can be modeled using a Gibbs free energy perspective in relation to a systems-within-systems approach. [1] One concept, loosely developed in this field, is social entropy. Synonyms include: social thermodynamics, socio-thermodynamics, and in some cases sociodynamics. [8] American anthropologist Eugene Ruyle, who has spent over forty-years investigating this topic, for instance, defines "social thermodynamics" as the combination of ecological energetics with Marx's labor theory of value. [5]

In 2000, Croatian mechanical engineer Josip Stepanić began publishing social system theories using thermodynamics formalism, e.g. social free energy. [9] In 2002, German physicist Ingo Müller introduced the term "socio-thermodynamics" as the study racial divisions and separations in society, which can be understood from a phase-diagram perspective. [2]

Arxiv.org

The following are a few of the recent few dozen sociological thermodynamics papers found at ArXiv.org, via keyword search: social + thermodynamics: [11]

- Kulakowski, Krzysztof and Nawojczyk, Maria. (2008). "Sociophysics: an Astriding Science". May 26.
- Chang, Yi-Fang. (2009). "Social Synergetics, Social Physics, and Research of Fundamental Laws in Social Complex Systems" (abstract), eprint arXiv: 0911.1155.
- Peng, Huan-Kai, Pirolli, Peter, Zhang, Ying, and Hogg, Tad. (2012). "Thermodynamic Principles in Social Collaborations" (abs), *Proceedings, Collective Intelligence Conference*.
- Hernando, Alberto and Plastino, A. (2012). "Thermodynamics of Urban Population Flows", Jun.

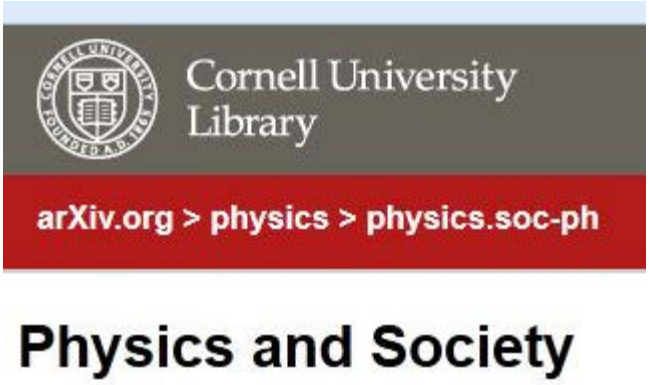

The "Physics and Society" section of ArXiv.org, which seems to attract a daily amount of new article submissions (as of 2012). [12]

Objections

In 1972, in a dismissal of the idea of any type of social thermodynamics, American economist Paul Samuelson concluded: [6]

> "The sign of a half-baked speculator in the social sciences is his search for something in the social system that corresponds to the physicist's notion of entropy."

Of course the humanities have always remained long and away from the specificity and precision of hard science. Indeed, social sciences generally tend to only discover tendencies in human interaction, most of which are never as immutably consistent as physical laws.

See also

- Social atom
- Social Avogadro number
- Social bond
- Social chemistry
- Social enthalpy
- Social entropy
- Social entropy theory
- Social energy
- Social energetics
- Social free energy
- Social internal energy minimization theory
- Social mass
- Social pressure
- Social physics
- Social science
- Social system
- Social temperature
- Social thermodynamics

- Social heat
- Social volume

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(b) The Phenomenology of Dissipative Structures - David M. Keirsey
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- Minkes, Jürgen. (2000). "Society as a Many Particle System" (PDF), *Physics Department*, University of Paderborn.

External links

- Thermodynamic Principles for Social Sciences - an Introduction (Douglas R. White).
- Hagens, Nate and Bradford, Jason (interviewer). (2008). "Nate Hagens and the Maximum Power Principles: Energy Supply, Economics, Ecology and Evolution, Neuroscience, Sociology and Evolution" (audio), *Reality Report*, 30 June.

External links

- Social thermodynamics theory – Wikipedia.

θΔics

In HT pioneers, the **sociological** (thermodynamics pioneers) **TPs** page is a file-tree header for grouping individuals, ordered in the dropbox to the left, in the category of pioneers of sociological thermodynamics, social thermodynamics, or socio-thermodynamics, in the general sense.

Sociological thermodynamicists

Some of the main sociological thermodynamicists are listed below:

1. Ernest Solvay (1894) - noted for his promotion of the science of social energetics.
2. Vilfredo Pareto (1896) - developed physical chemistry based social system models of "human molecules".
3. Lester Ward (1841-1913) - noted for his advocation of Leon Winarski's thermodynamics in sociology.
4. Lawrence Henderson (1935) - explained Pareto's 1916 sociology via Gibbsian thermodynamics "analogies".
5. Talcott Parsons (1937) - noted for his social action theory and its relation to the laws of thermodynamics.
6. Pitirim Sorokin (1941) attempted to relate or base his social cycle theory on Clausius entropy and heat death.
7. Reinhold Furth (1951) - outlined the application of statistical mechanics to sociology.
8. Fred Cottrell (1955) - supposedly, one of the first to explain societies as thermodynamic systems.
9. Niklas Luhmann (1960s) - a student of Parsons, noted for his views on entropy in his social systems theory.
10. Eugene Ruyle (1960s) developed a theory of "social thermodynamics".
11. Walter Buckley (1967) - utilized negentropy, culled from general systems theory, in theorizing about social decline.
12. Robert Nisbet (1970) - outlined a theory of "social entropy" and the entropy aspects of the "social bond".
13. Marlan Blissett (1972) - wrote a chapter on the "laws of social thermodynamics".
14. Jacques Ellul (1972) - theorized about entropy in modern society.
15. Edgar Morin (1977) - known as the sociologist of complexity theory.
16. Ed Stephan (1977) - began to speculate on how the Gibbs fundamental equation applies to social systems.
17. Orrin Klapp (1978) outlined a Shannon-thermodynamics type theory of "entropic communication".
18. Wil Lepkowski (1979) - argues that Prigoginean thermodynamics can lead to the development of social thermodynamics.
19. James Beniger (1986) - outlined a Maxwell's demon view of societies as eddies or currents in the heat flow of the sun.
20. Tony Rothman (1989) - applied creative skepticism to sociological applications of the second law of thermodynamics.
21. Kenneth Bailey (1990) - published a social entropy theory.
22. William Gairdner (1994) - outlined a theory of social entropic force acting on societies, moving them towards heat death.
23. Josip StepaniÄ‡ (2000) - published thermodynamics of social systems theories, e.g. social free energy.
24. Alfredo Infante (2001) - wrote an advanced intelligence perspective, Gibbs free energy based, social entropy article.
25. Ingo Müller (2002) - developed a phase diagram view of "socio-thermodynamics".
26. Enzo Tiezzi (2006) - applied Prigoginean thermodynamics to view cities as being "orders out of chaos".
27. Adrian Bejan (2007) - applied his thermodynamics-based constructal theory to the explanation of social dynamics.

(add discussion)

θΔics

In science, **sociology** is the study of the forces which hold individuals together in groups and institutions. [1]

A socially-affined (Q) group of humans migrating.

Sociology falloff | mid 20th-century peak

See main: Physical sociology falloff problem

Consensus, from a number of sources, seems to the that sociology was growing into the form of a true science, mathematical and based in the natural sciences, but that with the event of WWII (1939-1945), and or up-till *circa* 1955, or sometime there, it peaked and fell off. The following are few quotes evidence to this view:

> "The leading contemporary sociological theory—of the last sixty or seventy years—has been the mechanistic school, which may be classified as all sociological theories which interpret social phenomena in the terminology and concepts of physics, chemistry, and mechanics."
>
> — Pitirim Sorokin (1928), *Contemporary Sociological Theories* (pgs. xvii + 3)

> "The school dominating present day sociology at least in America is the neopositivist one. It is best represented by G. Lundberg's *Foundations of Sociology* (1939), in its companion volume which is S.C. Dodd's *Dimensions of Sociology* (1942), but also in such works as G.K. Zipf's *Human Behavior and the Principle of Least Effort* (1949), in N. Rashevsky's *Mathematical Theory of Human Relations* (1947), and in innumerable articles appearing in the sociological journals."
>
> — Nicholas Timasheff (1950), "Sociological Theory Today" [5]

> "For about twenty-five years prior to the middle 1950s it was widely held in America that sociology was rapidly becoming a true science."
>
> — Richard Brown (1977), per citation of Talcott Parsons (1954) and George Lundberg (1955) [6]

> "The clarion call for a return to the dream of a social physics does not, at this moment, seem to be winning the day. Many social theorists are now more inclined to turn to historical and literary studies than to physics and chemistry for inspiration. Whether new developments in the natural sciences can breathe new life into the dream of a social physics is an open-ended and uncertain prospect. Nineteenth-century social theorists favored metaphors that mimicked the more successful natural sciences, selecting analogies mainly from biology, chemistry, and physics. Social scientists, modeling themselves after physical scientists, sought to discover the natural 'laws' of society and history. In recent decades, however, the ground has shifted. Today, the positivist dream of a social physics seems, if not dead, at least dormant."
>
> — Daniel Rigney (2001), *The Metaphorical Society* (pgs. 49 + 197)

American sociologist Barbara Heyl (1968) argues that the impact of WWII enacted a switch to Marxism-focused American sociology. [7] American sociologist Talcott Parsons (1968) stated that the reason for the fall off of Pareto-interest, after WWII, was scientific limitation. [8]

Terminology issues

See main: Sociology terminology upgrades

The premise of sociology defined as the subject of study when people act "social" together is in need of a bit of terminology deanthropomorphization, similar to the way the non chemical thermodynamically neutral term "life" has recently found terminology reform, via life terminology upgrade usages. In other words, just as "physics and chemistry do not understand the word alive", as Charles Sherrington (1938) put cogently put it, in respect to the descent of the term down the great chain of being, evolution timeline, or molecular evolution table, so to, by like extrapolation do "physics and chemist not understand the term sociology". [3] As Sherrington would say, if he were here: "When physics and chemistry have entered on the description", sociology disappears from the scene, it is an "anthropism."

A human, in short, is a powered molecule (Henry Swan, 1974), subsequently, while someone such as French chemist Jean-Marie Lehn, in his *Supermolecular Chemistry* (1995), may get away with making a refreshing paragraph jab at Goethe's *Elective Affinities*, using an Empedocles chemical aphorism stylized phraseology, alluding to the idea that supermolecules have some form of "sociology" together, as follows: [4]

> “Supramolecular chemistry is a sort of molecular sociology! Non-covalent interactions define the inter-component bond, the action and reaction, in brief, the behavior of the molecular individuals and populations: their social structure as an ensemble of individuals having its own organization; their stability and their fragility; their tendency to associate or to isolate themselves; their selectivity, their ‘elective affinities’ and class structure, their ability to recognize each other; their dynamics, fluidity or rigidity or arrangements and of castes, tensions, motions, and reorientations; their mutual action and their transformations by each other.”

It is implicitly assumed that this as but amusing metaphor or analogy. If, however, Lehn was to posit these supramolecular castes, tensions, social structures, class structures, social associations, isolations, or selectivities, as being "real", i.e. existing in reality at the supramolecular level, his work would not be taken seriously, he would be labeled as a crackpot, and he would have never won the Nobel Prize in chemistry. The logic, therefore, applies at the human molecular level, i.e. in human chemistry. One may, for example, in human chemistry professionally speak of "inter-component bonds" existing between people (human molecules), e.g. see: human chemical bond, being that physics and chemistry do indeed understand the term "bond" quantifiably as an established and acceptable physical science concept, whereas, conversely, it is not permissible to speak of something "social" existing at the chemical level, being that this is an historical "anthropism", as Charles Sherrington (1938) would say, or "metaphysical" term, as Gilbert Lewis (1925) would classify things.

Clearly, then, by comparison to life terminology upgrade protocol initiatives, the future will see a certain amount of equivalent "sociology terminology upgrades", but this is a task yet to be completed. It may be said, in terms of measured phenomena, that when a community of humans goes beyond the group size of 150 (Dunbar number), which would seem to have something to do with the surface-to-volume ratio issue (surface law), that printed rules, i.e. legislature (laws, codes, and constitution), and a hierarchy of structured power relationships, i.e. leaders and government, need to be established, beyond that of man-to-man contract (Malcolm Gladwell, 2000), if the growing community is to maintain stability, or else a natural split (debonding) will accrue when it reaches the 250+ level of population, owing to instability. Here, in this description, we have stripped the description of mention of anything "social" making the term redundant and hence something that does not exist, as Patricia Churchland (Q) would argue.

Thermodynamics

The subject of thermodynamics applied to sociology goes by a number of names,

including: social thermodynamics, sociological thermodynamics, and socio-thermodynamics, all of which generally include the application of the laws of thermodynamics in the study of sociology, the logic of social energy and social entropy quantifiable inside of the boundary of a social system is the central topic. The following 1907 quote by American engineer Sidney Reeve eludes to the grand application of entropy in sociology: [2]

> "The true role of entropy in the great circle of sciences, including **sociology**, which may be classified as the energetic sciences, is far broader and more important than even these words may indicate."

(add discussion)

The Papin engine, showing the working body (or working substance) inside of the closed boundary of piston and cylinder, the model upon which human social systems are conceptualized in the **sociology** divisions of the humanities (or physical humanities), albeit with conceptualized with various energy regulated and or semipermeable social boundary models.

Chemistry

The subject of the application of chemistry to sociology goes by a number of names including: social chemistry, socio-chemistry (Person, 1976 (Q)), socio-physical chemistry, pattern chemist (Yuri Tarnopolsky, 2009), and chemical sociology.

Physics

The study of the application of physics to sociology goes by a number of names including: social physics, sociophysics, and physical sociology (Leon Warshay, 2013).

Quotes

The following are related quotes:

> "**Sociology** is the study of phenomena which includes all events and processes in which interactions between two or more persons occur; generally limited to conventionally non-negligible interactions."
>
> — Lawrence Henderson (1938), "Sociology 23"

See also

- Greatest sociologist ever
- Scott 50
- Social physics
- Sociology 23

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External links

- Sociology – Wikipedia.

θΔics

In

Sociology 23

(Harvard University, 1938-1942)

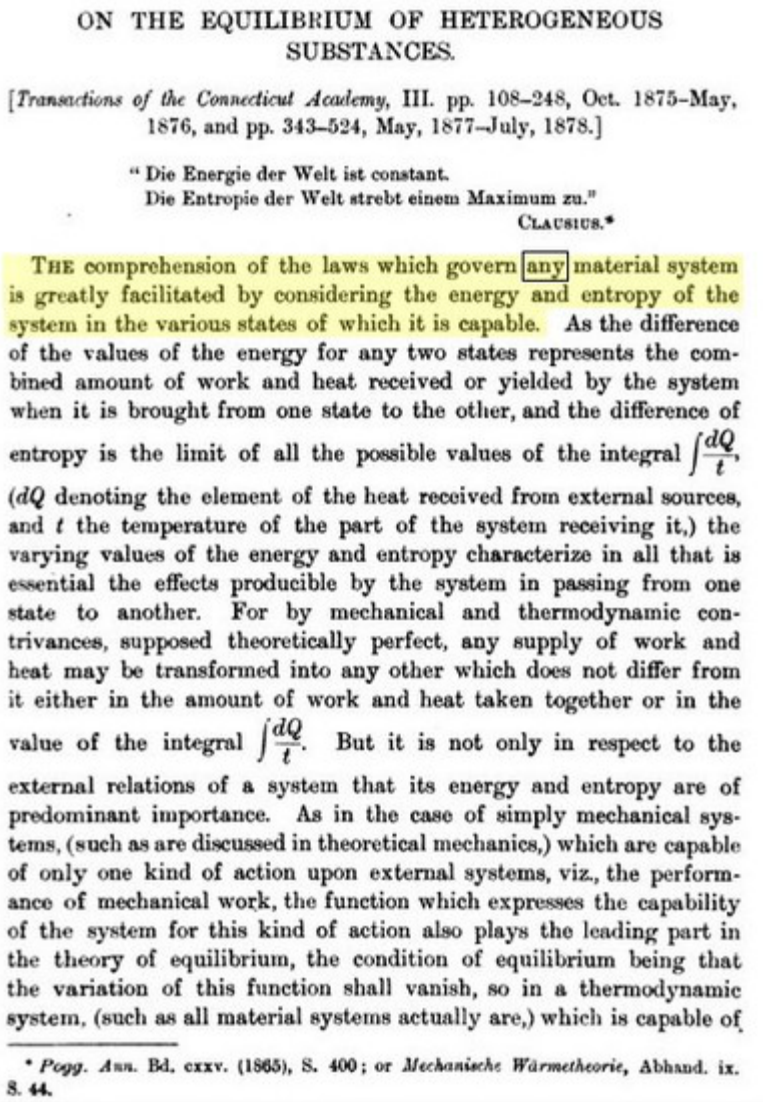

ON THE EQUILIBRIUM OF HETEROGENEOUS SUBSTANCES.

[*Transactions of the Connecticut Academy*, III. pp. 108–248, Oct. 1875–May, 1876, and pp. 343–524, May, 1877–July, 1878.]

"Die Energie der Welt ist constant.
Die Entropie der Welt strebt einem Maximum zu."
CLAUSIUS.*

THE comprehension of the laws which govern any material system is greatly facilitated by considering the energy and entropy of the system in the various states of which it is capable. As the difference of the values of the energy for any two states represents the combined amount of work and heat received or yielded by the system when it is brought from one state to the other, and the difference of entropy is the limit of all the possible values of the integral $\int \frac{dQ}{t}$, (dQ denoting the element of the heat received from external sources, and t the temperature of the part of the system receiving it,) the varying values of the energy and entropy characterize in all that is essential the effects producible by the system in passing from one state to another. For by mechanical and thermodynamic contrivances, supposed theoretically perfect, any supply of work and heat may be transformed into any other which does not differ from it either in the amount of work and heat taken together or in the value of the integral $\int \frac{dQ}{t}$. But it is not only in respect to the external relations of a system that its energy and entropy are of predominant importance. As in the case of simply mechanical systems, (such as are discussed in theoretical mechanics,) which are capable of only one kind of action upon external systems, viz., the performance of mechanical work, the function which expresses the capability of the system for this kind of action also plays the leading part in the theory of equilibrium, the condition of equilibrium being that the variation of this function shall vanish, so in a thermodynamic system, (such as all material systems actually are,) which is capable of

* *Pogg. Ann.* Bd. cxxv. (1865), S. 400; or *Mechanische Wärmetheorie*, Abhand. ix. S. 44.

+

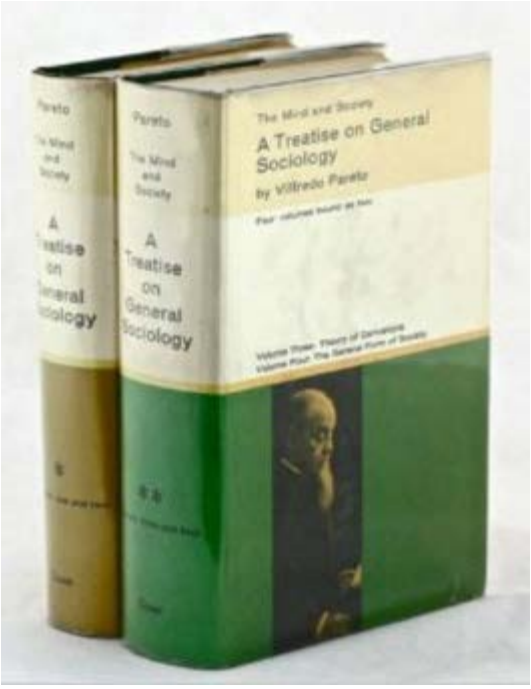

In 1938 to 1942, American physical chemist Lawrence Henderson taught a physicochemical based sociology course called "**Sociology 23**", to undergraduates at Harvard University, in which the physical science works of Vilfredo Pareto (1897-1912) and Willard Gibbs (1876) were used as a basis and framework to explain social phenomenon.

hmolscience, **Sociology 23**, or "Concrete Sociology", was a physical science and physicochemical based sociology course taught by American physical chemist and physiologist Lawrence Henderson, during the academic years spring 1938 to 1942, the year of Henderson's death (dereaction), at Harvard—a precipitate of the fall 1932-launched Pareto seminar (see: Harvard Pareto circle), which was still running at the time (continuing for "seven or eight years", recalls student Bernard Barber, or thereabouts)—wherein the rational mechanics based socioeconomic principles of French-born Italian mathematical engineer turned socioeconomist Vilfredo Pareto, specifically his mechanical-to-social phenomenon table (1897) and his *Treatise on General Sociology* (1912), admixtured or rather upgraded with the chemical thermodynamics and phase models of American engineer Willard Gibbs, specifically viewing human interactions as equilibrium adjusting chemical reactions, reaching points of minima and maxima of free energy, were used as a framework to study human relations in a variety of cases. [1]

Overview

In 1932, Lawrence Henderson, at Harvard, initiated the seminar entitled "Pareto and the Methods of Scientific Investigation" on Italian engineer Vilfredo Pareto's unified large-scale modelling of socio-political phenomena and

history, via the “society as a system of mutually interacting particles”, making equilibrium adjustments. [2]

The "Pareto Seminar", aka Harvard Pareto circle, ran for seven to eight years, or thereabouts, according to Bernard Barber (1970), who was then an undergraduate at the time. [6]

Dates for when "Sociology 23" actual started vary; some stating the course started in 1935; Bernard Barber, the first to published the lecture notes, in 1970, states that "Sociology 23" was first offered in spring 1938, which is when he took it as an undergraduate. Henderson, himself, seems to state that the course ran four four years, from 1938 to 1941/42. Another source, however, seems to indicated that in 1935 a sociology course, initially entitled “Seminary in Methods and Results of Certain Sociological Investigations”, an idea precipitate formed out of the Pareto seminar, was initiated by Henderson; the course was later renamed “Concrete Sociology: A Study of Cases”, and by 1938 available as second edition mimeographed copies labeled as: “Concrete Sociology: Introductory Lectures, Sociology 23.” [1]

English modern political thought historian Joel Isaac summarizes Henderson’s Sociology 23 as follows: [3]

> “By the mid-1930s, Henderson had embedded the study of Pareto in the undergraduate curriculum of Harvard College. In the academic year of 1935-36, with the Pareto seminar still running, Henderson began teaching **Sociology 23**, [an] attempt to demonstrate the applicability of the Paretian framework to the study of human relations in a variety of cases, each provided by a speaker acquainted with the ‘practical affairs’ in medicine, business, and the law. Several of those asked to lecture on the course had participated in the Pareto seminar. Brinton, Homans, Parsons, Mayo, Roethlisberger, Whitehead, DeVoto, and Kluckhohn all presented. Henderson also recruited senior figures to his cause: Harvard professors Arthur Nock and Edwin Wilson. The contributors to Sociology 23 were a heterogeneous bunch but, as Roethlisberger later recalled, they were united, in Henderson’s mind at least, by a common orientation: the property which determined who was included in this set of persons was: ‘did you get the point of Henderson’s seminar on Pareto?’ If you had, you were in; if you had not, you were out.”

Barber states that course operated such that Henderson spent the first few hours at the beginning of each semester commenting upon the latest version of the three "lectures" that he had written out, and a copy of them, mimeographed and bound in paper, handed out to each student. Henderson then had a series of 25 guest lecturers, e.g. Crane Brinton (speaker one), on illegitimacy legislation in the French Revolution, George Homans (speaker two), on rural England in the thirteenth century, Elton Mayo (speaker three), on the organization of work in a Pennsylvania factory, the other 22 speakers listed by Bernard Barber (pg. 41), give a presentation on a topic they were familiar with, in some way connected with the general Pareto-Gibbs "conceptual scheme" learned form the Pareto seminar. Henderson would then interject comments during the guest lectures, in a way that would increase their relevance. d

Box spring | Social system

Henderson spends a certain amount of time trying to connect or or visually depict Vilfredo Pareto's version of Le Chatelier's principle via a "box spring model", particularly on pages 137 to 143 of his "Sociology 23 Lectures", the diagram of which shown adjacent; with which he attempt to argue that in the "system" view of (a) changes from state one to state two to state three and (b) each person interconnected to

each other via spring-like forces or bands, that cause and effect analysis becomes usurped, or obviated, in some sense; the following are example statements on this line of reasoning:

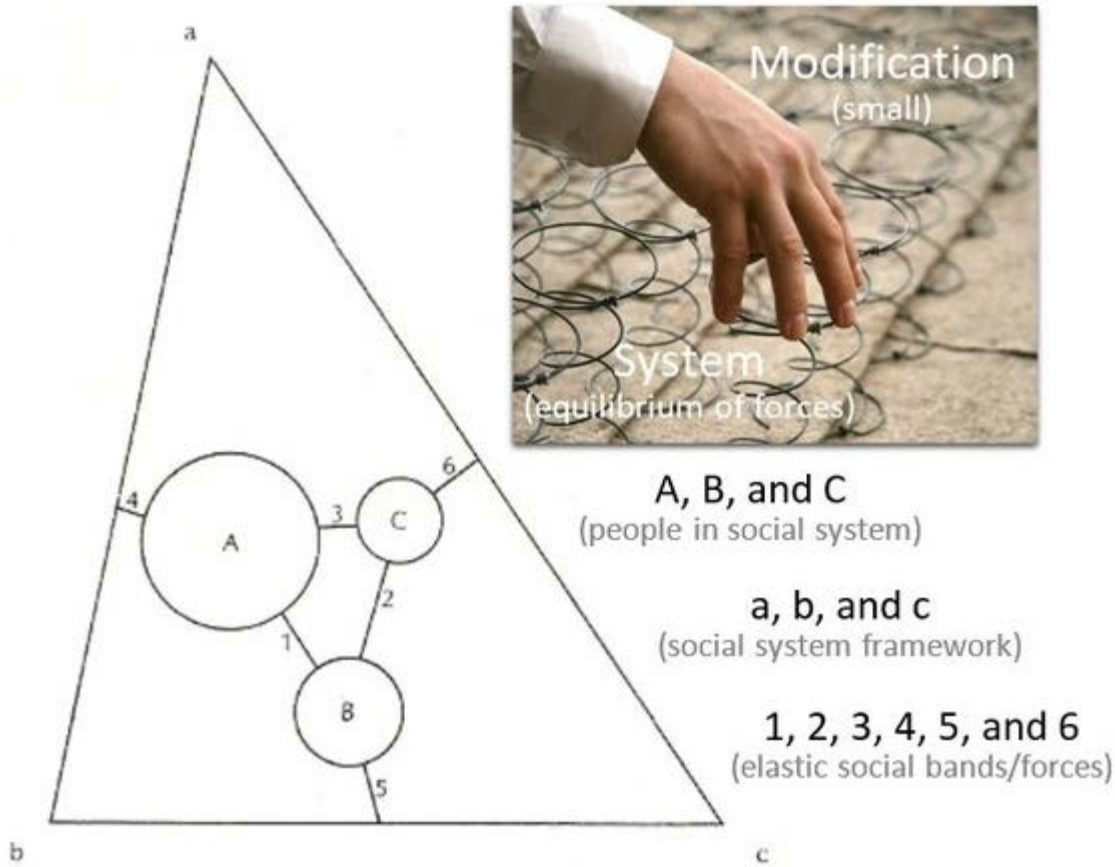

Lawrence Henderson's "box spring" social system model, from his "**Sociology 23**" lectures (pg. 137), according to which A, B, and C are people in social system abc, who are interconnected via elastic forces 1, 2, 3, 4, 5, and 6, all of which reacts according to Le Chatelier's principle (see: social Le Chatelier principle), such that if, say, a weighted force, that were not too large, were put (or pulled down on) individual A and they released, the system would restore back to its original configuration.

"A correlation between two things is observed, say, values of the pressure and of the volume of a gas. A simple algebraic expression for this correlation is then found, in this instance Boyle's law, PV = k. One is then tempted to say that pressure is the cause that a gas has a certain volume. But reasoning from this cause, or from Boyle's law, may lead to conclusions that are misleading and altogether useless, because temperature and volume are mutually dependent, and likewise of course temperature and pressure."

— Lawrence Henderson (1938), "Sociology 23" (pg. 143)

"In a social system, and, as a rule, elsewhere, an action initiated in a certain thing leads to modifications everywhere in the system, and these modifications to further modifications which involve the very thing in which the process originated. So it is both 'cause' and 'effect'. Moreover, the notion that the process originated at a certain point is, as often as not, no better than the legal fiction that it is sometimes actually as in the law courts, when it becomes necessary to somehow fix responsibility for a chain of event and there is no objective test, but only a perhaps ambiguous legal convention for doing so. Thus, reasoning from cause to effect in the study of concrete phenomena is often more misleading than more general reasoning of the same kind."

— Lawrence Henderson (1938), "Sociology 23" (pgs. 143)

"The misleading action of cause to effect reasoning is particularly true of the interactions of men. Thus, thousands of pages have been written about the causes of the war of 1914 to 1918. But there is no agreement about these causes, or about when or where they originated or about the chains of events that

they initiated. And there can be none."

> — Lawrence Henderson (1938), "Sociology 23" (pgs. 143-44); here Mark Buchanan (2000), we note, would beg to differ (see: tipping point)

"An enduring change in a social system, say, a change of form of government or, not infrequently, an apparently less important change like the change of a law or of a technological process may involve a change from one state of equilibrium of the social system to a very different state. The changes of the system somewhat resemble the changes observed in a game of cat's cradle."

> — Lawrence Henderson (1938), "Sociology 23" (pg. 146)

Similar arguments, to note, are found in his earlier books, e.g. in his "An Approximate Definition of Fact" (1932), he gives a similar geometry diagram as above, commenting that: "in organic processes cause-and-effect analysis leads, in general, to erroneous conclusions" (pg. 163); the subject of which requires further digestion.

Quotes | Employed

The following are quotes employed by Henderson in his Sociology 23 lectures:

"It seems to me that those sciences which are not born of experience, the mother of all certainty, and which do not end in known experience—that is to say, those sciences whose origin or process or end does not pass through any one of the five senses—are vain and full of error."

> — Leonardo da Vinci (c.1500), *A Treatise on Painting* (*Trattato della Pittura*) (pg. 33); cited by Lawrence Henderson (1938) in "Sociology 23" (pg. 78)

"The human understanding is no dry light, but receives an infusion from the will and affections; whence proceed sciences which may be called 'sciences as one would'. For what a man had rather were true he more readily believes. Therefore he rejects difficult things from impatience of research; sober things, because they narrow hope; the deeper things of nature, from superstition; the light of experience, from arrogance and pride, lest his mind should seem to be occupied with things mean and transitory; things not commonly believed, out of deference to the opinion of the vulgar. Numberless in short are the ways, and sometimes imperceptible, in which the affections color and infect the understanding."

> — Francis Bacon (1620), *New Instrument of Science* (*Novum Organum Scientiarum*), Book I, Aphorism XLIX; cited by Lawrence Henderson in "Sociology 23" (pg. 131) [9]

"Note by way of the nature of mathematical definitions which consist merely by the imposition of names or, if you prefer, abbreviations of speech established and introduced in order to avoid tedious drudgery."

> — Galileo (1638), *Dialogues Concerning Two New Sciences* (pg. 28); cited by Lawrence Henderson in "Sociology 23" (pg. 84)

"Most of the evils of the world arise from man's inability to sit still in a room."

> — Blaise Pascal (c.1640), *Source*; cited by Walter Bagehot (c.1872); cited by Lawrence Henderson in "Sociology

23” (pg. 124) [8]

“So many are links, upon which the true philosophy depends, of which, if any one be loose, or weak, the whole chain is in danger of being dissolved; it is to begin with the hands and eyes, and to proceed on through the memory, to be continued by the reason; nor is it to stop there, but to come about to the hands and eyes again, and so, by a continual passage round from one faculty to another, it is to be maintained in life and strength, as much as the body of a man is by the circulation of the blood through the several parts to the body, the arms, the feet, the lungs, the heart, and the head.”

— Robert Hooke (1665), *Micrographia* (preface); cited by Lawrence Henderson in “Sociology 23” (pg. 77)

“Bentham should have adopted as the creed of his life and watchword of his party an expression which is meant to be quantitatively precise, and yet when scientifically analyzed may appear almost unmeaning, is significant of the importance to be attached to the science of quantity. ‘Greatest happiness of the greatest number’—is this more intelligible than ‘greatest illumination with the greatest number of lamps’?”

— Francis Edgeworth (1881), *Mathematical Psychics*; cited by Lawrence Henderson in “Sociology 23” (pg. 132) [10]

“If the universe is a universe of thought, then its creation must have been an act of thought.”

— James Jeans (1930), *The Mysterious Universe* (pg.154); cited by Lawrence Henderson in “Sociology 23” (pg. 134); Henderson says: “this is an enthymeme and therefore suspect”

Quotes | Lecture

The following are noted "Sociology 23" lecture note statements or quotes:

“Sociology is the study of phenomena which includes all events and processes in which interactions between two or more persons occur; generally limited to conventionally non-negligible interactions.”

— Lawrence Henderson (1938), “Sociology 23” (pg. 59) [7]

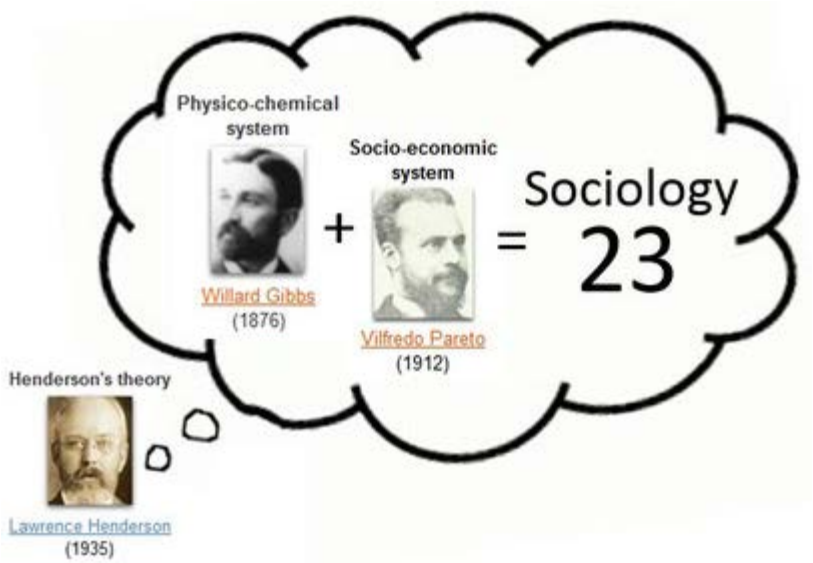

A rendition of Henderson's circa 1932 vision of "Sociology 23", namely: Vilfredo Pareto's version of the social system described in the physicochemical system equilibrium-changing terminology of Willard Gibbs.

“There is a test for [the avoidance of Cnidian school thinking] [and for] the [Hippocratic] kind of thinking, i.e. the avoidance of the concealment of ignorance with systematic knowledge, namely, the question: ‘for example?’ Those who generalize form experience almost always pass the test; others do not. Indeed the test is frequently destructive of unfounded generalizations and is likely to lead to painful embarrassment. For this reason its use is often expedient.”

— Lawrence Henderson (1938), “Sociology 23” (pg. 70) [7]

“Physicists use both the undulatory theory and the corpuscular theory of light in their modern forms, but it is hard to find anyone who uses both the Marxian and the Fascist theories of society.”

— Lawrence Henderson (1938), “Sociology 23” (pgs. 76-77)

“In general, the conceptual scheme of science are simpler and more clearly defined than our common sense conceptual schemes. Examples of scientific schemes are: the theory of the constitution of atoms in recent physics, the theory of the constitution of molecules in organic chemistry, Willard Gibb’s physicochemical system, Morgan’s theory of the gene, Darwin’s theory of evolution. Each of these owes it clearness and simplicity to the fact, among others, that it has reference to a limited class of phenomena, or to certain aspects of phenomena, and to a limited class of problems. Its usefulness depends, among other things, upon the extent to which such limitations permit useful work. Thus Gibbs’ system represents the world as made up of physicochemical systems, but excludes from consideration the ordinary phenomena of mechanics, psychological phenomena, and the interactions between persons.”

— Lawrence Henderson (1938), “Sociology 23” (pg. 87)

“The position that we shall take in this book is that Pareto’s social system is in some respects analogous in its usefulness to Gibbs’ physicochemical system. This system of Pareto’s disregards physical, chemical, and physiological phenomena, but makes possible in some measure the consideration of all interactions between persons. Like Gibbs’s system, it is clear and simple. We shall use this [Pareto-Gibbs] system because it [consists of things which have properties (or attributes) and relations] among other more concrete qualities which together make it, in my judgment, the most convenient conceptual scheme now available.”

— Lawrence Henderson (1938), “Sociology 23” (pg. 88)

“The properties and relations of persons exist not in a changeless state, but in a state of flux. However, the instantaneous states and changes are not chaotic states and changes.”

— Lawrence Henderson (1938), “Sociology 23” (pg. 88)

“Pareto’s social system is in some respects analogous in its usefulness to Gibbs’ physicochemical system. This system of Pareto’s disregards physical, chemical, and physiological phenomena, but makes possible in some measure the consideration of all interactions between persons. Like Gibbs’ system, it is clear and simple.”

— Lawrence Henderson (1938), “Sociology 23” (pg. 88); cited by Bernard Barber in: *L.J. Henderson on the Social System* (pg. 30)

“A social system may consist of two or more persons. Moreover, it is peculiarly convenient and perhaps even more necessary in sociology as in chemistry to begin the study of systems with those in which the number of components is small.”

— Lawrence Henderson (1938), “Sociology 23” (pg. 89)

“It must be clearly understood that persons are in general members of many subgroups or organizations,

and it may be well to bear in mind a rough and in many respects incomplete analogy: as a molecule of water in a flask is now present in the liquid water and later in the air above the liquid, and again in the liquid, so a person is only intermittently a member in action of any group. This analogy is incomplete, especially because, while a molecule of water is in the air we can find no effect of its previous presence in the liquid, a person carries with him the effects of his past activities (hysteresis) and is influenced by the prospective return to those activities."

— Lawrence Henderson (1938), "Sociology 23" (pg. 90)

"The liquid water persists while molecules of water enter and leave it, and if the conditions are appropriate, it persists without change of mass. In like manner, some activities of some organizations such as police patrol, the telephone exchange, and many continuous processes in industrial chemistry, metallurgy, etc., persist while the personal changes from time to time in shifts."

— Lawrence Henderson (1938), "Sociology 23" (pgs. 90-91)

"Note well that there is no reason to attach either more or less importance to persons because they are the ultimate components of the social system. In like manner, hemoglobin is, in general, neither more or less 'important' than the liver, but either may be negligible in a study involving the other. Such things are more or less important, as the case may be. Thus the liver may be important in a case of cancer, hemoglobin in a case of anemia."

— Lawrence Henderson (1938), "Sociology 23" (pgs. 91)

"Note carefully that the subgroups of a social system, like the system itself, are different than the sum of the component persons. So also hemoglobin is a different thing than the sum of its constituent atoms, the liver a different thing than the sum of its constituent molecules, and a man is a different thing than the sum of his organs, tissues, and fluids."

— Lawrence Henderson (1938), "Sociology 23" (pg. 91)

"Note that, in general, subgroups and systems alike persist though their component persons change. This is obvious in the nation and in the village, it was formerly equally so in the family, but it may be noted almost everywhere: in churches, universities, industrial corporations, clubs, political parties, and innumerable other instances. In like manner, the component molecules of a living organism are constantly changing, but the organism persists. So it is, again, with the flame of a candle—the time-honored analogy, in this respect, to a living organism. "

— Lawrence Henderson (1938), "Sociology 23" (pg. 91)

"Remember the rough analogy: such enduring things are to the whole social system more or less as the organs of the human body are to the whole body, and the individual persons are somewhat similar to the chemical molecules of the body. But do not reason form this or any or any other analogy."

— Lawrence Henderson (1938), "Sociology 23" (pg. 113)

"Social processes, like physical and chemical processes, have velocities that appear to be determined, in general, by the specific characteristics of the factors and conditions. When the attempt is made, say, to

hasten them beyond a certain point the processes often change their character and the results may be different. In both cases phenomena that are more or less vaguely described as ‘explosions’ — figuratively in the social sense— may ensue.”

— Lawrence Henderson (1938), “Sociology 23” (pg. 135)

“A very important fact, which should never be forgotten in studying social phenomena, that nearly all supposedly qualitative questions turn out on examination to be quantitative.”

— Lawrence Henderson (1938), “Sociology 23” (pg. 142), cited by Bernard Barber in: *L.J. Henderson on the Social System* (pg. 21)

Wilson | Physicochemical economics

In 1934, American mathematician Edwin Wilson, the famous sole protégé of Willard Gibbs, and noted participate in the Pareto seminar and Sociology 23 invited lecture, discussed, with Harvard economics chairman Harold Burbank, the teaching of “mathematical economics” a thermodynamics/steam engine based course in economics. [5] Sometime, therein or shortly thereafter, Wilson began teaching such a course to economics students. In 1938, e.g. Wilson communicated the following to Burbank in letter:

“Schumpeter has suggested that it would be particularly well for me to give as I gave last time a general theory of equilibrium such as this is understood by physical chemists including the phase systems of Willard Gibbs. Most of our equilibrium theory in economics really has for its background the notions of equilibrium which arise in mechanics. Although Pareto was certainly quite familiar with the types of equilibrium which arise in physical chemistry and are necessary in fact for the study of the steam engine he doesn’t use this line of though in economics.”

This "physicochemical economics" course (see also: physicochemical sociology), or “mathematical economics”, as Wilson seemed to refer to it, according to Roy Weintraub, was taken by American economist Paul Samuelson. [5] In 1938, to exemplify, Wilson wrote the following to Samuelson, in commentary on one of Samuelson's papers:

“Moreover, general as the treatment is I think that there is the possibility that it is not so general in some respects as Willard Gibbs would have desired. [In] discussing equilibrium and displacements from one position of equilibrium to another position [Gibbs] laid great stress on the fact that one had to remain within the limits of stability. Now if one wishes to postulate the derivatives including the second derivatives in an absolutely definite quadratic form one doesn’t need to talk about the limits of stability because the definiteness of the quadratic form means that one has stability. I wonder whether you can’t make it clearer or can’t come nearer following the general line of ideas [that] Gibbs has given in his *Equilibrium of Heterogeneous Substances*, equation 133.”

The very impressive mention of "equation 133", from Gibbs' subsection "Internal Stability of Homogeneous Fluids as indicated by Fundamental Equations", is the following:

$$U - TS + PV - M_1m_1 - M_2m_2... - M_nm_n$$

Wilson, in other words, is suggesting, as it seems to be, to Samuelson that he use the Gibbs fundamental equation to formulate a theory of economic stability.

Nine years later, in 1947, Samuelson, taking Wilson's advice, used some of this logic, in outline (e.g. Le Chatelier's principle), to pen his magnum opus *Foundations of Economic Analysis*, which invariably put economics into a new form of a more rigorous, semi-physical science conceptualized or analogized, mathematics-based science; see: Harvard Pareto circle (section: Wilson | Schumpeter | Samuelson) for more on this.

Fall off

See main: Physical sociology falloff problem

The amenable efforts to embed Henderson's "Sociology 23" (and to some extent Wilson's "Physicochemical Economics") into the permanent undergraduate curriculum of Harvard petered out, seemingly, after 1939, for supposedly three reasons. First, was the start of WWI, following which point social and economic study focus switched or rather was diverted to Marxian-based sociology, the historical materialism theories of Karl Marx. Secondly, in 1942 Henderson dereacted (died), meaning no one was left to carry forward the torch; and also because he left no formal "textbook" for such a course. Thirdly, and most-importantly, in spite of the fact that Henderson trained some two-dozen scholars, via his seminar, with him gone, no one had the physical chemistry training to carry forward the formulation of the Gibbs-Pareto based logic of the underlying premise of such a course. In corroboration of these conclusions, in 1968, American sociologist Talcott Parsons, one of the key Pareto seminar participants and Sociology 23 invited speakers, gave his opinion that the reason for the fall off of Pareto-interest, after WWII, was scientific limitation: [4]

> "Most of the neglect of Pareto stems from the scientific limitations of subsequent generations of sociologist rather than from his irrelevance to their interests."

This seems cogent. With the passing (reaction end) of Henderson in 1942, there was no one *qualified*—a physical chemistry and or chemical thermodynamics background needed at a minimum to translate Pareto's ideas into the language of reaction equilibrium physical chemistry and modern Gibbsian thermodynamics—and *capable*—Henderson spent the years 1926 to 1932 absorbing the corpus of Pareto's works (~10 volumes)—enough to lead the way further; hence, into the mid-1940s the wake of the Henderson-driven wave began to reside.

Other

In 1962, when Czechoslovakian-born English sociologist Werner Stark, in commentary on Thomas Huxley's 1871 call for the development of the field of social chemistry, stated the following: [2]

> "Why should no social chemistry ever been developed? Nobody would suggest that the social scientists should imitate meteorology, for this discipline does not appear to have got very far … but what about chemistry? A sociology based on chemistry [has] in fact been called for, but, significantly, [this call has] found no echo. It would have been easy to take up this suggestion and develop it further. An intending social chemist would have found it one whit more difficult to manufacture a sociological parallel to the Boyle-Charles law than Haret did to the Newtonian propositions. But the experiment appears never to have been tried. Why?"

Stark, obviously, was unaware of Sociology 23, as most are, being, that as of 2014, no formal physicochemical humanities like course is presently taught anywhere in the world, for the most part (see: two cultures synergies).

Quotes

The following are related quotes:

> "Pareto has described a generalized social system which may be usefully compared with Gibbs'

physicochemical system. Pareto's social system is made of individuals. They are perhaps analogous to the [chemical] components of Gibbs' system."

— Lawrence Henderson (1935), "Physician as Patient and as a Social System" [11]

See also

â— Nightingale Chair of Social Physics
â— Princeton Department of Social Physics
â— Physicochemical humanities

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2. (a) Heyl, Barbara. (1968). "The Harvard 'Pareto Circle'." *Journal of the History of the Behavioral Sciences*, 4:316-34; in: *Talcott Parsons: Critical Assessments, Volume 1* (editor: Peter Hamilton) (§2, pgs. 29-49). Taylor & Francis.
(b) Weintraub, E. Roy. (1991). *Stabilizing Dynamics: Constructing Economic Knowledge* (pgs. 63-64). Cambridge University Press.
3. Isaac, Joel. (2012). *Working Knowledge: Making the Human Sciences from Parsons to Kuhn* (§2: The Harvard Pareto Circle, pgs. 63-91). Harvard University Press.
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(b) Barber, Bernard. (1970). *L.J. Henderson on the Social System* (§6:202-13, quote, pg. 205). University of Chicago Press.

θΔics

In physical science, **sociology terminology upgrades** or reforms, in the framework of the defunct theory of "socio-" perspective, are terms or synonym alternatives or upgrades to "socio" and all socio-centric terms, and their antonyms.

> "When physics and chemistry have entered on the description, [sociology] **disappears** from the scene, it is an 'anthropism'."
>
> — Charles Sherrington (1938), *Man on His Nature* [1]

(add discussion)

Chemically-neutral terminology | Historical precursors

The following are chemistry-based proper and recognizable alternatives, with dated and cited "in usage" term substitute reform examples:

Chemically (defunct)	**Chemical thermodynamically** (neutral / upgrade)	**Example** (usage)
● Spiritual | Vis viva	kinetic energy (Lester Ward, 1903)	"I am always very chary about using such expressions as 'spiritual phenomena', because the word ***spiritual*** has almost become a synonym of supernatural. Yet the word is a perfectly proper one and ought to be redeemed and freely used, more nearly as a synonym of *psychic* in its widest sense, and I shall not hesitate so to use it. The last three chapters have been devoted to showing that spiritual phenomena are as much natural phenomena as physical phenomena, that spiritual forces are true natural forces, and that there is a spiritual energy, *i.e.*, a psychic and social energy, that is as capable of doing work as any other form of kinetic energy. In fact it is the highest and most effective form of energy or *vis viva*." [5]
● Sociable	Associated (Mirza Beg, 1987)	"The smallest unit of a society, an individual, is incapable of independent existence by virtue of his being a social animal and there [being] a large number of interacting constraints on him. If we compare this situation with the properties of water it will be found that the presence of interacting forces which in this case are cohesive in nature, has completely changed its properties. In the absence of such cohesive forces, water may not even be in a liquid, it should have been a gas boiling at -90°C. The presence of cohesive forces makes the difference. Water is therefore a sociable or **associated** liquid, a case analogous with the social constraints on an individual which demand that he should be part of a society." [4]

(add discussion)

Overview

The premise of sociology defined as the subject of study when people act "social" together is in need of a bit of terminology deanthropomorphization, similar to the way the non chemical thermodynamically neutral term "life" has recently found terminology reform, via life terminology upgrade usages. In other words, just as "physics and chemistry do not understand the word alive", as Charles Sherrington (1938) put cogently put it, in respect to the descent of the term down the great chain of being, evolution timeline, or molecular evolution table, so to, by like extrapolation do "physics and chemist not understand the term sociology", e.g. it is incorrect to say technically that hydrogen and oxygen interact socially together, because that is not "textbook chemistry" for reasons that should be apparent (i.e. it is "anthropomorphized chemistry" and hence a false or inaccurate description). [1]

A human, in short, is a powered molecule (Henry Swan, 1974), subsequently, while someone such as French chemist

Jean-Marie Lehn, in his *Supermolecular Chemistry* (1995), may get away with making a refreshing paragraph jab at Goethe's *Elective Affinities*, using an Empedocles chemical aphorism stylized phraseology, alluding to the idea that supermolecules have some form of "sociology" together, as follows: [3]

> "Supramolecular chemistry is a sort of molecular sociology! Non-covalent interactions define the inter-component bond, the action and reaction, in brief, the behavior of the molecular individuals and populations: their social structure as an ensemble of individuals having its own organization; their stability and their fragility; their tendency to associate or to isolate themselves; their selectivity, their 'elective affinities' and class structure, their ability to recognize each other; their dynamics, fluidity or rigidity or arrangements and of castes, tensions, motions, and reorientations; their mutual action and their transformations by each other."

It is implicitly assumed that this as but amusing metaphor or analogy. If, however, Lehn was to posit these supramolecular castes, tensions, social structures, class structures, social associations, isolations, or selectivities, as being "real", i.e. existing in reality at the supramolecular level, his work would not be taken seriously, he would be labeled as a crackpot, and he would have never won the Nobel Prize in chemistry. The logic, therefore, applies at the human molecular level, i.e. in human chemistry. One may, for example, in human chemistry professionally speak of "inter-component bonds" existing between people (human molecules), e.g. see: human chemical bond, being that physics and chemistry do indeed understand the term "bond" quantifiably as an established and acceptable physical science concept, whereas, conversely, it is not permissible to speak of something "social" existing at the chemical level, being that this is an historical "anthropism", as Charles Sherrington (1938) would say, or "metaphysical" term, as Gilbert Lewis (1925) would classify things.

Clearly, then, by comparison to life terminology upgrade protocol initiatives, the future will see a certain amount of equivalent "socio terminology upgrades", but this is a task yet to be completed. It may be said, in terms of measured phenomena, that when a community of humans goes beyond the group size of 150 (Dunbar number), which would seem to have something to do with the surface-to-volume ratio issue (surface law), that printed rules, i.e. legislature (laws, codes, and constitution), and a hierarchy of structured power relationships, i.e. leaders and government, need to be established, beyond that of man-to-man contract (Malcolm Gladwell, 2000), if the growing community is to maintain stability, or else a natural split (debonding) will accrue when it reaches the 250+ level of population, owing to instability. Here, in this description, we have stripped the description of mention of anything "social" making the term redundant and hence something that does not exist, as Patricia Churchland (Q) would argue.

Quotes

The following are related quotes:

> "What are the physical and chemical origins of diversity among inorganic and organic things, and how shall the adaptability of matter and energy be described? He may then see his way through all the difficulties which philosophical and biological thought have accumulated around a problem that in the final analysis belongs only to physical science, and at the end he will find a provisional answer to the question."
>
> — Lawrence Henderson (1917), *The Order of Nature* [2]

See also

- Terminology
- Life terminology upgrades

References

1. (a) Sherrington, Charles. (1938). *Man on His Nature* (disappears, pg. 260). CUP Archive, 1940.
(b) Quote (original): "When physics and chemistry have entered on their description of the perceptible, life disappears

from the scene, and consequently death. Both are anthropisms."

2. Henderson, Lawrence J. (1917). *The Order of Nature* (preface, pg. iii). Harvard University Press.
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θΔics

In hmolscience, **sociophysical geography**, or "social physics based macrogeography", is the study of socioeconomic phenomena via the theories and laws found in the natural sciences, physics in particular. [1]

Sociophysical geographers

Noted sociophysical geographers include: Henry Carey, John Q. Stewart, William Warntz, George Zipf, Gheorghe Savoiu, Trevor Barnes, and Matthew Wilson, among others, largely tending to focus on social gravitation theories (e.g. social physics school), as these correlated to sociological and economic data.

See also

â— Socio-physical chemistry

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1. (a) Barnes, Trevor J. and Wilson, Matthew W. (2014). "Big Data, Social Physics, and Spatial Analysis: the Early Years" (pre, pdf) (abs) (pdf), *Big Data & Society*, Apr-Jun:1-14.
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θΔics

In human physics, **sociophysics**, a near synonym to "social physics", is the study of social phenomena from a physics perspective, often using the human atom, social atom, or human particle perspective. The subject seems to deal with thermodynamics in part; albeit, the majority of theories in this field seem to be on statistical extrapolations or phase transition models.

Recent | Interest

The following histograms show the number of papers with the word "society" or "social" appearing in the title or abstract of papers published in the American Physical Society (AIP) and in physics papers section of the preprint archive (arXiv) since 1995, according to Indian sociophysicists Sen Parongama and Bikas Chakrabarti (2013): [17]

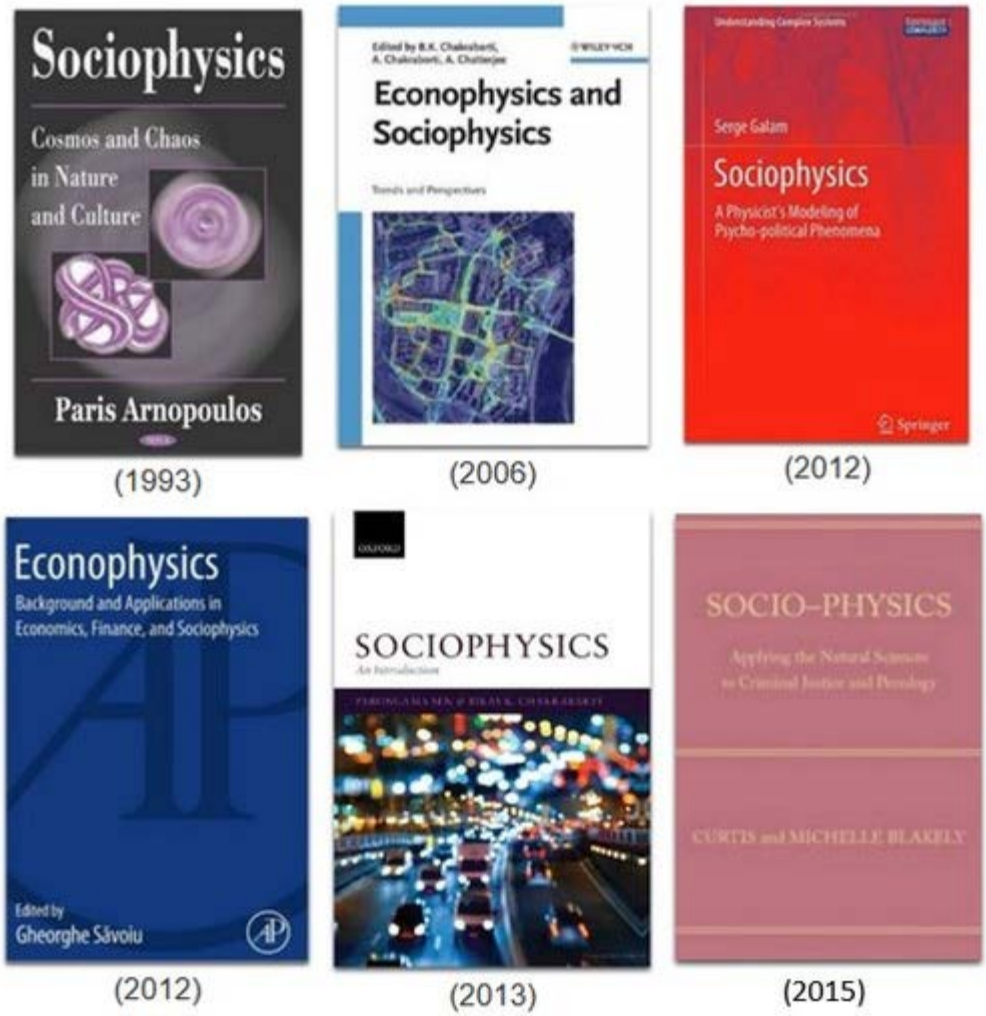

Some of the main recent books in sociophysics: Canadian political scientist Paris Arnopoulos' 1993 *Sociophysics*; the 2006 *Econophysics and* Sociophysics, with chapters by German physicist Jurgen Mimkes, e.g. "A Thermodynamic Formulation of Social Science"; French physicist Serge Galam's 2012 *Sociophysics*; and the 2012 *Econophysics*, with an end chapter by Romanians economist and econophysicist Gheorghe Savoiu and physicist and sociophysicist Ion Siman's entitled "Sociophysics: A New Science or a New Domain for Physicists in a Modern University", both outline the newly growing science of **sociophysics**. [8] The last two are Sen Parongama and Bikas Chakrabarti's *Sociophysics* book and Curtis Blakely's 2015 *Socio-Physics*, focused on penology. [17]

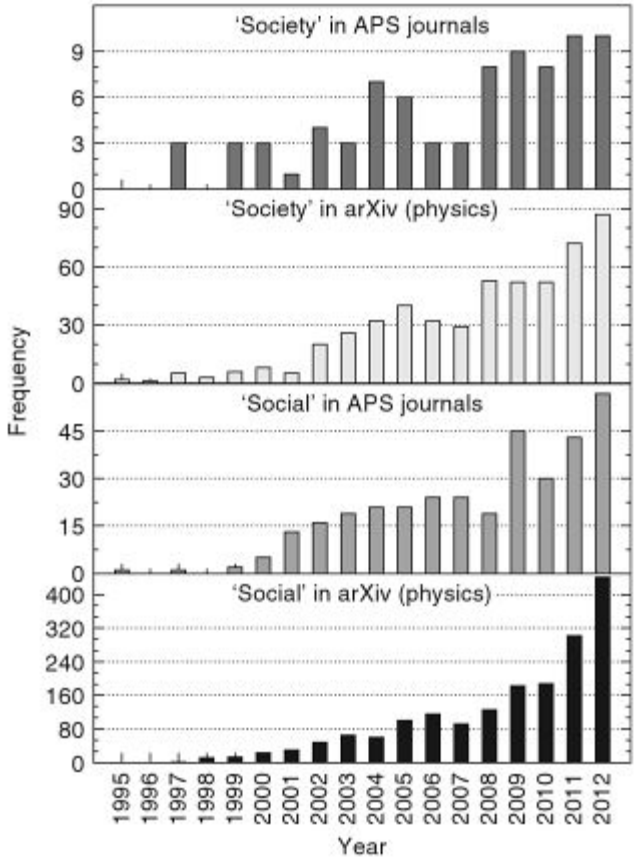

Social physics

The term "sociophysics", in the historical "big picture" context, such as chronologically summarized on the HP pioneers page, seems to be put a late 20th century upgrade to the older 19th century "social physics" of thinkers including: Henri de Saint-Simon (1817), Adolphe Quetelet (1835), Auguste Comte (1842), and Henry Carey (1858), who were all viewing people as atoms or in some cases, such as with Carey, atoms or molecules, depending.

The 2009 book *Sociology Theory in Classical Era* specifically defines Comte as the "father of social physics". [7]

Sociophysics | Coining

Sociophysics is a derived term of physics.
As nouns the difference between sociophysics and physics is that **sociophysics** is (sociology|physics) the study of economics using the techniques of sociology while **physics** is the branch of science concerned with the study of properties and interactions of space, time, matter and energy or **physics** can be (*physic*).

A recent The-Difference-Between.com "**sociophysics**" and "physics" summary. (Ñº)

In circa 1950, American astrophysicist and engineer John Q. Stewart, with grant funding from the Rockefeller Foundation, launched the Princeton University Department of Social Physics; though, at this point, Stewart vacillated between "social mechanics" and "social physics".

In 1974, American physicist Arthur Iberall, in his *Bridges in Science: from Physics to Social Science*, stated the following: [12]

> "It is the possible development of theory (e.g., kinetic theory or **sociophysics**) and practice (e.g., social engineering) that may be useful for men."

In the 1970s, French physicist Serge Galam claims to have begun working in the field of sociophysics, as a "hobby" along side of this regular physics duties. In his 2012 talk "Celebrating Thirty Years of Sociophysics: Can It Become a

Predictive Tool?", Galam states that sociophysics "initiated in 1982", though this seems to be in relation to his own work. [11]

In 2004, Galem commented on the resistance he has faced in working to bridge or meld physics and sociology over the last last few decades: [1]

> "To suggest that humans could behave like atoms was looked upon as a blasphemy to both hard science and human complexity, a total nonsense, something to be condemned. And it has been indeed condemned during the last fifteen years."

In 1993, Canadian political scientist Paris Arnopoulos and his 1993 book *Sociophysics*, in which he speculates on heat, pressure, temperature, entropy, and volumes of societies. [3]

In 2012, Galam published his first *Sociophysics* book, the abstract of which is as follows: [6]

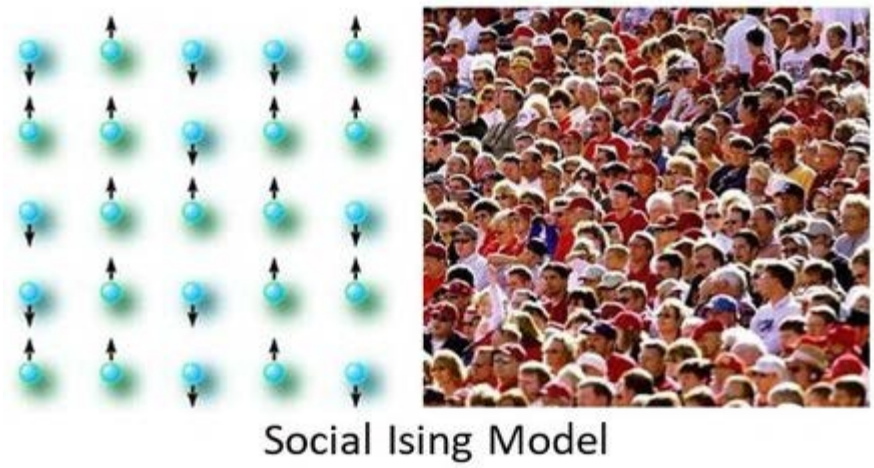

A diagram from Serge Galam's 2011 workshop talk "From Mr. Ising to the Wonderful World of Sociophysics" extolling on the notion that the Ising model (left) of electron spin alignment (magnetic field direction uniformity) behaviors can be applied to models of human behavior alignments, e.g. political view alignment uniformity, a classic type of "social physics" (e.g. Ball, Buchanan) or **"sociophysics"** (e.g. Galam) argument. [10]

> Do humans behave much like atoms? Sociophysics, which uses tools and concepts from the physics of disordered matter to describe some aspects of social and political behavior, answers in the affirmative. But advocating the use of models from the physical sciences to understand human behavior could be perceived as tantamount to dismissing the existence of human free will and also enabling those seeking manipulative skills.
>
> This thought-provoking book argues it is just the contrary. Indeed, future developments and evaluation will either show sociophysics to be inadequate, thus supporting the hypothesis that people can primarily be considered to be free agents, or valid, thus opening the path to a radically different vision of society and personal responsibility. This book attempts to explain why and how humans behave much like atoms, at least in some aspects of their collective lives, and then proposes how this knowledge can serve as a unique key to a dramatic leap forwards in achieving more social freedom in the real world. At heart, sociophysics and this book are about better comprehending the richness and potential of our social interaction, and so distancing ourselves from inanimate atoms.

Here we see Galem outlining a social atom or human atom approach to the application of physics to sociology; and in his "but" comment, see a defensiveness commonly seen in regard to the amount of "attack" one will experience whenever socio-physics, socio-chemistry, or socio-thermodynamics formulation is attempted (see: objection to), which is odd being that France is the most non-religious country in regards to belief systems.

In 2016, Slovenian (Ñº) biotechnology researcher Bojan Keevill (Ñº), in his "Sociophysics: the Last Science", after believing that he had coined the term "sociophysics", but finding that he had not, blogged a decent historical overview of sociophysics. (Ñº)

Galem-Stauffer | Paternity tensions

In 2000, at an international conference on "Economic Dynamics from the

Physicist's Point of View" at Bad-Honnef, Germany, Galam was drinking a beer with American Eugene Stanley, coiner the term "econophysics" (1995), who had knew Galam since the 1970s; during which time Stanley commented that Galam was indeed the "father of sociophysics".

vs.

In 2000, a vicarious "paternity" of **sociophysics** debate erupted, of sorts, between French physicist Serge Galam and German physicist Dietrich Stauffer; the tensions of which still exist as of 2012; a debate that is a bit vacuous being that (a) French philosopher Auguste Comte is already classified as the "father of social physics" and (b) American physicist John Q. Stewart ran an entire social physics group at Princeton a half a century prior to either of them . [6]

In 2003, however, German physicist Dietrich Stauffer gave a talk in Poland on sociophysics, during which Galam's contributions were totally ignored. This "pissed off" Galem, as he says in his 2012 *Sociophysics* book section 3.12 Claiming the Paternity of Sociophysics, after which he wrote his frank article "Sociophysics: a Personal Testimony", in which he provided details about his claim to paternity of sociophysics, over that of other supposed originators of sociophysics, such as Thomas Schelling. [6]

Polish physicist Krzysztof Kulakowski, in his 2007 chapter "Around the Gap between Sociophysics and Sociology", defines Galem as "one of the leading authors in sociophysics". [4]

Conferences

See main: Sociophysics conferences

In 2002, Germany began hosting the first econophysics conferences; followed by similar conferences in: Poland (2004), Romania (2008), Italy (2008), and France (2011).

Taiwan

In 2015, Taiwan International Graduate Program (Ñº), was offering a 3-credit elective course in sociophysics.

Quotes

The following are related quotes:

> "**Sociophysics** uses some methods and concepts coming from physics to describe certain social and political behaviors. Galam's sociophysics study the existing knowledge thanks to methods borrowed from statistical physics. Because sociophysics compares the behavior of people with the behavior of atomic particles, it is not an exact science."
>
> — Christophe Thovex and Francky Trichet (2012) [9]

See also

â— Social chemistry
â— Socio-thermodynamics
â— Sociological thermodynamics

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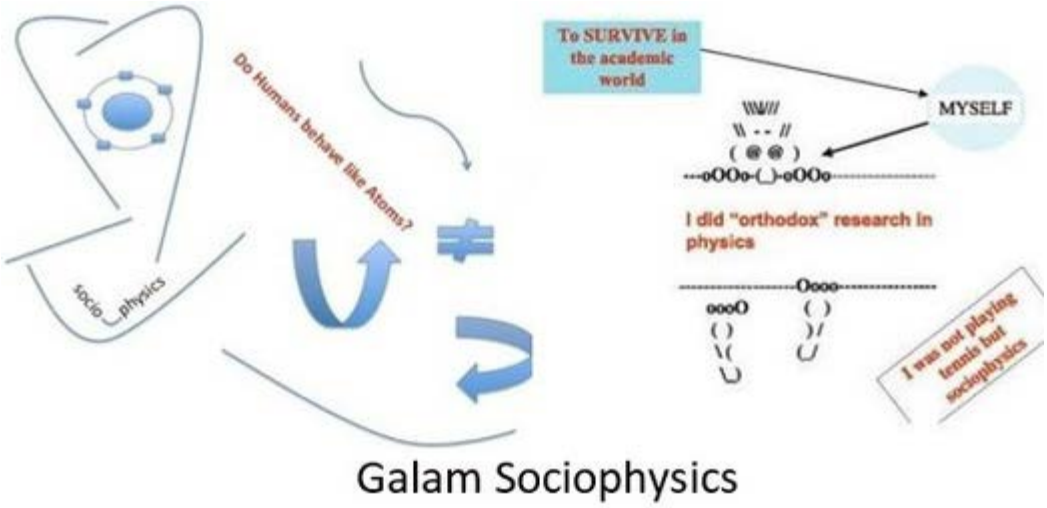

Left: poster to French physicist Serge Galam's 2011 conference talk "**Sociophysics**: do Humans Behave Like Atoms?", focused on the subject of opinion dynamics. [5] Right: diagram of French physicist Serge Galam's 1970s-2012 renegade experience of being a physicist having to practice **sociophysics** as a hobby, alongside his regular physics duties, the way normal physicists play tennis, so as to not disturb the orthodoxy of academia, from his chapter section 3.5: More About Academic Freedom. [6]

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(b) Savoiu, Gheorghe. (2012). *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (§10: Sociophysics: A New Science or a New Domain for Physicists in a Modern University, pgs. 149-65). American Institute of Physics.
(c) Gheorghe Savoiu (publications) – Ideas.Repec.org.
(d) Iorga Ion Siman (Romanian → English) – Google Academic.
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Further reading

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Threads

â— PhD in sociophysics (2012) – LinkedIn.

External links

â— Socio-physics – Net Advance of Physics.
â— Sociophysics (scholars) – Google Scholars.
â— What is the future of sociophysics? (2015) – Quora.com.

θΔics

133. Whose interests in identifying law-like behavior in the themes studied by social scientists had led him to develop a new field of study that he named Social Physics?

(a) Hagerstrand (b) Stewart
(c) Burton (d) Haggett

A 2009 social physics (**sociophysics**) style homework problems, in *Geography Work Book*, identifying American physicist John Q. Stewart as the initiator of the field of social physics or **sociophysics** as the field came to be called into the 1980s. [16]

In hmolscience, **sociophysics conferences** refers to conferences, workshops, and or related meetings on sociophysics and or related, e.g. physicochemical sociology, econophysics, biophysical economics, connectively, in some cases.

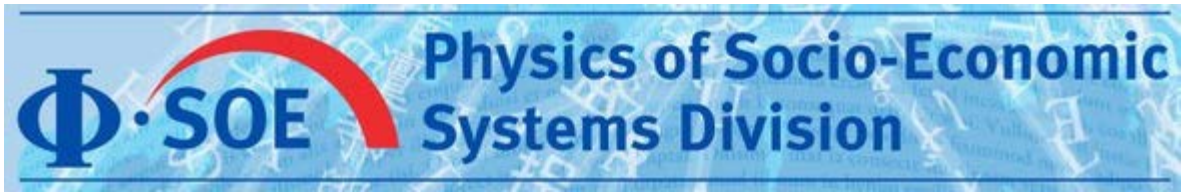

A banner form the poster (Q) for the 2014 German Physical Society's annual Physics of Socio-Economic Systems symposium, which, in various years, has had speakers including: Duncan Watts (2015), Reiner Kummel (2015), Katarzyna Sznajd-Weron (2016), among others.

Switzerland

In 1900, Leon Winiarski, at the The First Congress of the Social Science Education, reported on "The Teaching of Pure and Political Economics and Social Mechanics in Switzerland", social mechanics being a forerunner, in some sense, to sociophysics. [1]

America

In 1945 to 1955, John Q. Stewart ran a so-called "social physics project" at Princeton University (see: Princeton Department of Social Physics), a joint effort between the physics and sociology department, in aims to make a science of social physics, which lasted until Warren Weaver, head of the science-funding division of the Rockefeller Foundation, cut funding to the project (see: Stewart-Weaver fallout), per the following reasoning: [2]

> "To search for isomorphisms between social phenomena and physical phenomena is indeed an interesting idea. The real question, however, is whether or not it is a rewarding idea. It is interesting to suppose that there may be entities, social values, which play in social experience the same roles played by different forms of physical energy … But it is hard for me to sense how one can usefully assign quantitative measures to any significantly wide range of "values" in the social field. And when you link together such things as meaning, feeling, authority, and decision-making, this sounds to me like a very heterogeneous mixture."

In 21st century America, sociophysics is still not recognized a branch of science, e.g. universities in general, but more importantly, by the American Physical Society (APS) or American Institute of Physics (AIP), though discussions of the subject have begun in meetings, e.g. into the mid 2000s.

Germany

In 2002, the Center for Interdisciplinary Research (Zentrum fiir interdisziplinare Forschung | ZiF), Bielefeld, Germany, ran a four-day "Sociophysics conference", in what seems to be the first of its kind, internationally speaking, organized by Frank Schweitzer and Klaus Troitzsche, wherein a number of noted pioneers of sociophysics lectured, including: Jurgen Mimkes, Wolfgang Weidlich, Dietrich Stauffer, and Gunter Haag; the abstract of which is as follows: [3]

A banner for the 2002 **ZiF SocioPhysics Conference**, Germany, where Jurgen Mimkes talked on a Lagrangian derived free energy minimization formulation of social systems with chemical-modeled social bonds, Wolfgang Weidlich talked about sociodynamics of social systems, and Dietrich Stauffer talked about the Sznajd model.

> "The aim of the international conference SocioPhysics was to provide an overview of different approaches to quantitative modeling and computer simulation of social systems that have been developed within the physics and the social sciences. The meeting thus made reference to an international science development,

in the social sciences, computer science and natural sciences new form alliances: econophysics, socionics, computational economics are just a few examples. The German Physical Society (DPG) has now established a working group "Physics of socio-economic systems" (AKSOE). The great international interest in SocioPhysics proved the conference registrations from 18 different countries, including the United States and Brazil. The nearly 70 conference participants from very different disciplines (physics, mathematics, sociology, computer science, demography, philosophy, political science, economics) was presented in 27 lectures and 17 posters, a wide range of SocioPhysics concepts whose applications z. B. Decision Processes and voting behavior, collective opinion, include development of cooperation and of social networks. Considerable space occupied the partly controversial but also constructive discussions on whether and to what extent physical methods are applicable to the description of social systems. It became clear that it in no way comes to a simple transfer of physical concepts, but to provide an accurate understanding of the related reductions. As the various examples showed in the oral presentations and posters, SocioPhysics modeled less social actors with their complex worldview, but rather the dynamics of their collective interaction with analogies to physical many-body systems play a major role. So the question comes to the "reasonable" abstraction of social processes and the limits of the interpretation of the results of particular significance, which can only be clarified in interdisciplinary discourse. At the end, the participants agreed that the conference has made an important contribution to outline the possibilities and the limitations of a physical modeling of social processes. The multidisciplinary discussions and the lively atmosphere during the four days were here praised highly. The scientific director of the AG SocioPhysics would like to thank very warmly the ZiF for financial and organizational support for the implementation of the Convention."

(add discussion)

Poland

Logo of the Polish Physical Society, which hosts the annual "Physics in Economics and Social Sciences" (FENS) conference, the 7th meeting (Q) taking place in 2014

In circa 2003, the Polish Physical Society (PTF) created a new section entitled "Physics in Economics and Social Sciences" (FENS), under section president Janusz Holyst in coordination with Ryszard Kutner (Q), catering to physicists who try to "look over the bridge" between the methods used in physics and those of the analysis of economical and social phenomena. In 2004, on this growing platform, Warsaw University of Technology, Warsaw, Poland, hosted the "First Polish Symposium on Econophysics and Sociophysics", the gist of which seemed to be on applications of statistical mechanics to financial market theory. [4] The abstract of the 4th FENS Symposium", hosted at the Institute of Physics, University of Rzeszow, Poland, had 66 participants, of which 26 authors submitted 19 papers, the opening abstract of which is as follows: [5]

"Since the 1980's a revival of the mutual links between physics and economics, and other social sciences can be observed. Such concepts and ideas as scale-free networks, percolation, self-organizing criticality, and other non-linear models, or complex systems models have become research instruments in physics, evolutionary biology, economics, sociology, management, political science and security studies. Interchange of ideas between physics and social sciences is nothing new. In its origins economic theory is related to physics both as to a source of specific concepts, e.g. equilibrium and as a reference point of scientific validity. In return, some of economics-based ideas, e.g. the least action principle influenced understanding of laws of physics. Later, in the mid-20th century the impact of thermodynamics/statistical physics was visible in several discussions on principal ideas of economics — wealth, money, debt, and links between nature and human economic activities. The reinvigorated mutual impact of physics and social sciences in the end of the 20th century was caused by increasing awareness of physicists and social scientists that collective (social) phenomena cannot be described and explained solely with traditional instruments of statistics, econometrics and operational research. In addition, concepts drawn from broadly defined complexity studies allowing for modeling various systems composed of heterogeneous elements

> have become most rapidly developing methods of simulation of social and economic phenomena. Although a broad variety of applications of physics in economic and in social research are not yet formally institutionalized, the number of areas of studies, ideas and applications is increasing. It is reflected in publications on economics, sociology and finance in physical literature, and vice versa, the works earlier published but in physics journals can be found in publications devoted to economic and social issues. The terms "econophysics" and recently **"sociophysics"** are becoming recognized fields of contemporary science."

This gist of the papers in this conference, to note, seemed all be "agent based models", whereas correctly they should be "molecule based models", being that that's what humans are "molecules" (see: human molecule) not agents.

Romania

In 2008, Romanians economist Gheorghe Savoiu and physicist Ion Siman, at the University of Pitesti, organized their first "Econophysics and Sociophysics Workshop", attended by scholars including: Romanian physicist Radu Chisleag, noted for Newtonian government models, and Romanian physicist and socioeconomic thermodynamicist Mircea Gligo, who notably did his PhD in economics via Ilya Prigogine-based thermodynamics conceptualized economic models.

Group photo of some of the speakers at **UPESW 5** (29 Jun 2013): Constantin Bratianu (Thims' left), Libb Thims (Hu shirt), Daniel Pele (Thims' back right), Mircea Gligor (Thims' back left), and seated in front left to right: Ion Siman and Gheorghe Savoiu, all noted members of the Romanian school of physical socioeconomics.

In 2013, at the 5th annual Econophysics and Sociophysics Workshop, Libb Thims was keynote speaker, a photo of which shown adjacent, where he discussed toolism, historical models of humans, and econoengineering.

Italy

In 2008, in Torino, Italy, an international workshop on sociophysics occurred which the focus was on the statistical physics modeling of large scale social phenomena, such as opinion formation, cultural dissemination, the origin and evolution of language, crowd behavior, social contagion; where it was stated that previous years had witnessed the attempt to study collective phenomena emerging from the interactions of individuals as elementary units in social structures. The workshop worked to promote effective cooperation between physicists and social scientists. [6]

France

In 2011, Serge Galam organized a sociophysics conference on "Sociophysics: Do Humans Behave Like Atoms?", in Paris, Nov 14-16, at the Centre de Recherche en Épistémologie Appliquée (CREA) at École Polytechnique and CNR; some of the talks, with ppt pdfs (Q),

Sociophysics
Interdisciplinary approach to modelling of social systems
SciencesPo. CEVIPOF CNRS
Centre de recherches politiques

Workshop on Sociophysics, Paris, 30-31 March 2015

January 21 by natasagolo

We are organizing a small workshop around opinion dynamics, elections, social dynamics leading to conflict and war, terrorism. It will take place in the end of March at CEVIPOF lab in Paris. We'll keep you posted!

Serge Galam, Sacha Bourgeois Gironde and Natasa Golo

A Serge Galam 30-31 Mar 2015 **sociophysics** workshop (Q), at CEVIPOF, Paris, focused on applications to terrorism problems, run in coordination with economist Sacha Gironde and scientist Natasa Golo.

included:

- Tammasco Venturini | Against Emergence
- Anirban Chakraborti | Opinion formation in the Kinetic Exchange Models in France
- Katarzyna Sznajd-Weron | Phase Transition in the Siznajd Model with Nonconformity

A report of the by Andrea Scharnhorst is as follows: [9]

> "The "Unexpected Conference" in Paris, November 14-16, 2011 brought together more than 35 researchers from Europe, North and South America, and Asia to present current research in the field of sociophysics. The final title of the conference "Sociophysics: Do humans behave like atoms?" reminded me of vivid debates between sociologists and physicists in the 90s in Germany in which sociologists obviously felt offended by books entitled "Quantitative sociology" that included many pages of rather complex Fokker-Planck equations. Serge Galam, organizer of this conference and a pioneer in the field, equally reported about the repelling reaction in some parts of the physics community at the beginning of the 80s, when the verdict 'not suitable for publication' branded his first thoughts about what we commonly call today sociophysics. The many different presentations encompassed mathematical analysis and comparison of non-linear models, but also applications for urban development (Jean-Pierre Nadal), wine markets (Tatiana Bouzdine Chameeva), and public debates (Alexandre Delanoe) to name a few examples. All presentations showed an unbroken interest in understanding social dynamics by means of concepts and mathematical models rooted in statistical physics and computer sciences. Computational sociology, and in particular the Agent-Based Models community, are nowadays well-appreciated sparring partners for physicists; philosophers (Kate Forbes-Pitt) and physicists (Franco Bagnoli) reflected about ontological and epistemological principles of a "complexity science". The field has already long passed the stage of a niche for some eccentric pioneers. To the contrary, a variety of groups are working on similar questions, new generations are entering the field, and the activities across different branches of the rapidly growing science system are calling for means of integration and consolidations."

(add discussion)

7th BioPhysical Economics Meeting

See main: BPE 2016

The 2016 BioPhysical Economics (BPE) Meeting, see Hmolpedia notice (Q), subtitled "Where Natural Science Meets Social Sciences" (Q), in association with

Banners for the 2016 BPE + ISEE meeting.

International Society for Ecological Economics (ISEE), as coordinated by Ram Poudel, a conference originated by Charles Hall, with the original aims of "systems of humans and nature using ecosystems perspectives, that is, by studying material and energy flows, and applying this perspective to attempting to understand human economies from a biophysical rather than just social perspective" (Q), is scheduled to have the following attendees: [1]

- Libb Thims | Talk: "Lotka's Jabberwock: On the 'Bio' of BioPhysical Economics" (Q)
- Jason Smith | Talk: "Information Equilibrium as an Economic Principle" (Q)
- Jing Chen
- John Bryant
- Juergen Mimkes
- Robert Ayres
- Stephen Ternyik
- Victor Yakovenko
- Bruce Boghosian | Since 2013, interested (Q) in kinetic theory applied to economics.

The ISEE portion of the event is scheduled to include noted speakers including:

- Herman Daly
- Michelle Obama | See: Barack Obama (and his universal principles model of justice)

(add discussion)

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θΔics

In hmolscience, **sociophysiology**, or socio-physiology, refers to the study of sociology using a physiology basis or perspective; or the combined "social ethology" plus "social energetics" (Emile Waxweiler, 1906). [1]

An American version of "sociophysiology", a French-unique name, seems to be the physiology-based sociology (e.g. Sociology 23) that American physiologist Lawrence Henderson taught at Harvard in the 1930s (see: Harvard Pareto circle); through he did not call it by this name.

Quotes

The following are related quotes:

> "**Sociophysiology** is social ethology [defined via] social energy [or] physiology reaction phenomena due to mutual excitation of individuals of the same species."
>
> — Emile Waxweiler (1906), *Outline of Sociology* [1]

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(b) Emile Waxweiler – Wikipedia.

External links

â— Sociophysiology – Wikipedia.

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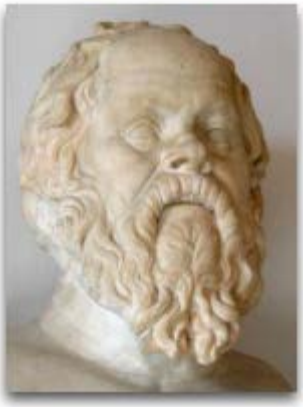

In existographies, **Socrates** (469-399BC) (IQ:180|#168) (Cattell 1000:29) [RGM:10|1,500+] (Murray 4000:12|WP) (FA:11) (GPhE:4) (ACR:8) [CR:122] was a Greek philosopher, a Nietzsche uberman, noted, supposedly, to his aversion and negative reaction to atomic theory, because it assigned reality to matter rather than to the mind, and hence the theory left no room for freedom of choice, a basis of morality, and for the premise that one can be master over their own destiny. [1]

Atheism | Trial

In 399BC (age 70), was put on trial for not believing in the gods, "Zeus" specifically, in whom the city believes, teaching atheism, corrupting the youth, and for instead teaching the youth about "daemons", something considered, then, as godlike, power, fate, spirit guides, or forces of nature, depending on translation; Plato, who supposedly was at the trial recounts the court proceedings, wherein his main accuser Meletus interrogates him, as follows: (Ñº)

> [SOCRATES] Nevertheless, speak to us, how do you say that I corrupt the youth, Meletus? Or is it clear, according to the indictment that you brought, that it is by teaching them not to believe in the gods in whom the city believes, but in other daimonia that are novel? Do you not say that it is by teaching these things that I corrupt them?
> [MELETUS] I certainly do say this, most vehemently!
>
> [SOCRATES] Then before these very gods, Meletus, about whom our speech now is, speak to me and to these men still more plainly. For I am not able to understand whether you are saying that I teach them to believe that there are gods of some sort—and so I myself do believe that there are gods and am not completely atheistic and do not do injustice in this way—but that I do not believe in those in whom the city believes, but in others, and this is what you charge me with, that I believe in others. Or do you assert that I myself do not believe in gods at all and that I teach this to others?
> [MELETUS] This is what I say, that you do not believe in gods at all.
>
> [SOCRATES] Wondrous Meletus, why do you say this? Do I not even believe, then, that sun and moon are gods, as other human beings do?
> [MELETUS] No, by Zeus, judges, since he declares that the sun is stone and the moon is earth.
>
> [SOCRATES] Do you suppose you are accusing Anaxagoras, My dear Meletus? And do you so much despise these men here and suppose that they are so inexperienced in letters that they do not know that the books of Anaxagoras of Clazomenae are full of these speeches? Moreover, do the young learn these things from me, when it is sometimes possible for them to buy them in the orchestra for a drachma, if the price is very high, and then to laugh at Socrates if he pretends that they are his own, especially since they are so strange? But before Zeus, is this how I seem to you? Do I
> believe there is no god?
> [MELETUS] You certainly do not, by Zeus, not in any way at all!

was regarded as an atheist by the Athenians (Aristophanes, c.390BC); he was convicted of atheism, by vote of the majority of the *dikasts* (male-citizen jurors chosen by lot), and sentenced to death via drinking poisonous hemlock.

I know nothing?

Socrates is famous in "smartest person ever" discussions, per an anecdote, aka the "Socratic paradox", in which "someone", either Socrates himself, as reported by Xenophon, or Chaerephon (Ñº), and friend and follower of Socrates, as reported by Plato, went to see Pythia, the oracle of Delphi, regarded as the most accurate prophet in the world, and asked her: "who is the smartest person in Athens or the world", depending, to which she replied: Socrates. When Socrates herd this, however, he laughed, and to test this label, he is said to have conducted an experiment of sorts, namely he went around and interviewed all the so-called intelligent people of Athens, namely: poets, politicians,

businessman, architects, and others, to see what they “really knew”, therein finding that each of them, believing themselves to be very knowledgeable, in fact knew very little. Socrates, supposedly, therein saw that there were many ignorant “great” minds. [4]

> “I seem, then, in just this little thing to be **wiser than this man** at any rate, that **what I do not know I do not think I know either**.”
>
> — Socrates (c.410BC), according to Plato’s *Apology* [5]

That he was aware of this ignorance, gained him the mis-translated-over-time quote: “I know nothing”, the exact form of which is NOT found in his writings. Evidence that Socrates does NOT actually claim to "know nothing" can be found in Plato’s *Apology* 29b-c, where he claims twice to know something, and in *Apology* 29d, where he indicates that he is so confident in his claim to knowledge that he is willing to die for it. [5]

Atoms

British science historian William Dampier argues that this aversion to atomic theory by Socrates, an aversion adopted by his students Plato and indirectly Aristotle, ultimately led to the eventual two-millennium long interment of atomic theory. [2] In short, the Platonic view, as has been summarized, rejected “mechanical manifestations of material atoms”. [3]

Quotes | By

The following are quotes by Socrates:

> “The beginning of wisdom is the definition of terms”
>
> — Socrates (c.410BC)

> “When the debate is lost, slander becomes the tool of the loser.”
>
> — Socrates (c.410BC) (Ñº)

> “No man has the right to be an amateur in the matter of physical training. It is a shame for a man to grow old without seeing the beauty and strength of which his body is capable.”
>
> — Socrates (c.410BC), *Publication* (see: genius and exercise)

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5. I know that I know nothing – Wikipedia.

External links

â— Socrates – Wikipedia.

θΔics

In science, **soft science**, as compared to a hard science, is a branch of systematic knowledge, pure and applied, susceptible to the scientific method, elementary in stage of development.

The following are the 2013 independently polled ranking of the relative hardness and softness of the various modern sciences according to Romanians economist Gheorghe Savoiu and physicist Ion Siman, in discussion with American electrochemical engineer Libb Thims, in followup discussion on the relative ranking of the sciences in respect to their UPESW 2013 talk on the new taxonomies of the sciences in respect to the emerging new econo-disciplines, such as econophysics and sociophysics: [1]

Savoiu ranking (economist)		**Siman ranking** (physicist)
1a. Physics		1. Quantum physics
1b. Particle physics	HARD	
	↑	
2. Nuclear physics		2. Chemistry
3a. Astrophysics		3. Particle physics
3b. Cosmology		
4a. Chemistry		4. Cosmology
4b. Sociophysics		
4c. Econophysics		
5. Biology		5. Molecular biology
6. Molecular biology		6. Genetics
7. Organic biology		7. Environmental physics
8. Geology		8. Communications sciences
9. Climatology		9a. Mathematics
		9b. Econophysics
		9c. Sociophysics
10. Physiology		10. Quantum psychology
11. Sociology		11. Sociology
12. Psychology		12. Ecology
13. Ecology		13. Economics
14. Economics		14a. Political sciences
	↓	14b. Robotics
	SOFT	
15. Political sciences		15. Religious sciences

> "To the extent that a field of inquiry succeeds in eliminating the personal equation, to that degree does it claim a place among the **hierarchy of the scientific disciplines**."
>
> — Morris Zucker (1945), on scientific disciplines [2]

One note we can discern from a comparison of the rankings is the lower position Siman, a physicist by training, assigns to the newer econophysics/sociophysics sciences, i.e. rank 9 (softer), as compared to Savoiu, an economist by training, who sees them at rank 4 (harder). This we can attribute to a clearly picture of the interdisciplinary subjects of the physicist over the economist, in that the physicist has a better grasp of the harder parts of the subject, and thus sees more clearly how the subjects are still relatively immature. We also see a higher ranking in hardness given by Siman to econophysics as compared to sociophysics, which seems about right given the number of articles, books, and conferences being devoted to econophysics as compared to sociophysics as of late.

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External links

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θΔics

In hmolscience, **soft science assistance** refers to rarely-made open calls by soft science field practitioners, e.g. historians, economists, sociologists, anthropologists, etc., for help, guidance, reality-checking, theory proofing, and or direction, etc., from hard science scholars, namely: physicists, physico-chemists, chemical thermodynamicists, chemical engineers, etc.

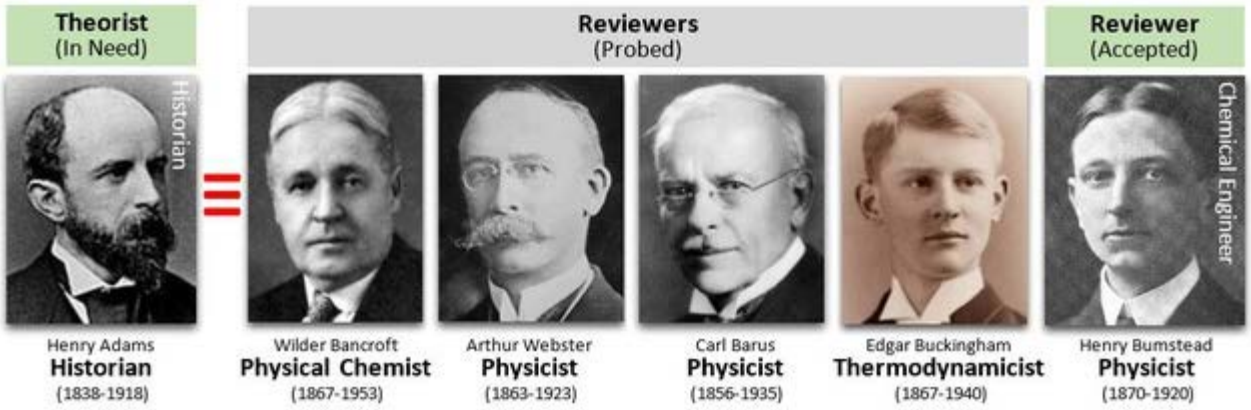

A visual of the hard science reviewers sought out by American soft science historian Henry Adams in 1908 to 1909 to get an "annihilating" review by a "competent hand", in the physicochemical thermodynamical sciences, for his Gibbs-based chemical thermodynamic phase rule (see: social phase) model of historical change. His "The Rule of Phase Applied to History" manuscript was pin-balled around through: Wilder Bancroft, Arthur Webster, Carl Barus, Edgar Buckingham, before finding a competent reviewer in the mind of Gibbs' student Henry Bumstead. Adams' letters on this matter being the very epitome of a **soft science assistance** request, i.e., to paraphrase Adams: "I'm and idiot", when it comes to physics, and I need someone to "teach me" the correct "theory and expression" in the hard sciences.

Adams

In 1908, American historian Henry Adams began looking for hard science consultants to give him guidance, review and feedback on his Gibbs-based physico-chemical social dynamics model of historical change; the following are representative quotes:

> "I'm looking for a 'young and innocent physico-chemist who wants to earn a few dollars by teaching an idiot what is the first element of theory and expression in physics.'"
>
> — Henry Adams (1908), "Note to John Jameson", Dec [2]

> "What I want is a scientific, physico-chemical, proof-reader, and I am willing to pay liberally for the job. I hunger for **annihilation by a competent hand**. Ordinary sensations or speculations have no interest to anyone after seventy years old. We must have red pepper and whiskey and lots of it. As for the critic, it is indifferent to me whether he knows the authorship or not. You can treat the paper like any other that is offered you. I don't care if you burn it, if only I get the criticism I want."
>
> — Henry Adams (1909), "Letter to John Jameson", Mar [6]

In 1908, Adams eventually penned out an essay of his ideas entitled "The Rule of Phase Applied to History", which he sent to historian John Jameson (1859-1937) (Q) for publication in *The American Historical Review* (Q). Jameson, however, turned down Adams' essay submission for publication, but in its place aided Adams in helping him find a reviewer.

Jameson tried professors physicist-engineer Carl Barus (1856-1935) (Q) of Brown University, physical chemist Wilder Bancroft of Cornell University, physicist Arthur Webster (1863-1923) (Q) of Clark University, the founder (1899) and president of the American Physical Society, and thermodynamicist Edgar Buckingham of the National Bureau of Standards, with varying negative results. [6]

Buckingham, of curious note, received the manuscript, in handwritten form, but complained of its illegibility, in spite of the fact, according to Adamsian scholar Harold Cater (1947), that Adams was well known for his legible hand. Buckingham requested a typed copy, and, after that was furnished, would agree to write a criticism for two hundred dollars, the equivalent of $5,500 dollars (Q) in 2016 terms.

The typed manuscript eventually found its way into the hands of American physicist Henry Bumstead of Yale, a former student of Willard Gibbs, who had recently finished co-editing the posthumous edition of Gibbs' scientific papers in 1906. Bumstead agreed to the job and by Jan 1910 produced a 'meticulously detailed critique' of Adams' essay, in the form of a twenty-seven page commentary on Adams' "The Rule of Phase Applied to History". [8] A copy of the Bumstead review might be available at MassHist.org papers (Q) on Adams.

Adams would later comment that he wished he could have discussed his social dynamics theories with William Thomson:

> "I have been studying science for ten years past, with keen interest, noting down my phrases of mind each year; and every new scientific method I try, shortens my view of the future. The last—thermodynamics—fetches me out on sea-level within ten years. I'm sorry Lord Kelvin is dead. I would travel a few thousand-million miles to discuss with him the thermodynamics of socialistic society. His law is awful in its rigidity and intensity of result."
>
> — Henry Adams (1909), "Letter to Charles Gaskell" (May 2) [3]

Cater, in his *Henry Adams and His Friends* (pg. 650) elaborates on this hard science "proof reader" search in more. [7]

Issues | Intellectual vanity

Henry Adams is a rare occurrence of this sort of open. More often than not, as evidenced by the commentaries of John Q. Stewart and his social physics attempt at Princeton scenario, there seems to be a sort of intellectual vanity that hinders the rarely made Bumstead-Adams type of connection. This brings to mind the anecdote of how as a kindergartner Puerto Rican child prodigy Luis Arroyo was scolded, owing to the intellectual insecurities of his teachers, for asking what a "diphthong" (Q) was and asked to leave the room: [6]

> "I remember in kindergarten, I asked a teacher what were 'diphthongs', because the index of the book said some diphthongs and it sounded weird. I asked what it was and they scolded me, told me I did not have to ask that, that was for later. They often threw me out of the room."

This is equivalent to dialogue that tends to take place between the physical and or chemical scientist and the humanities scholars, who, each tending to be ingrained with insecurities about the other's field, after a few scoldings and heated interactions, resultantly 'throw each other out of the room' of continued dialogue.

A prime modern tragic comedy example is American neurological anthropologist Terrence Deacon, who as head of the anthropology department at the University of California, Berkeley, the world's leading chemical thermodynamics school, historically speaking, failed to get peer review, from his own neighboring colleagues in the chemical engineering department, for his thermodynamics-attempting 2011 book *Incomplete Nature: How Mind Emerged from Matter*; the dismal results of which brought to light in the Juarrero-Deacon affair. [9]

Other

In 2013, Romanian economist Gheorghe Savoiu, in interview dialogue with Libb Thims, explained that, in respect to developing econophysics or sociophysics theory, he has go to his colleague physicist Ion Siman for guidance and fact check on physical permissibility of new theories; and that in no way is this interactive role reversed. [1]

Quotes

The following are related quotes:

> "While it was long possible and sometimes tempting for physicists to deny the usefulness of the molecular hypothesis, we economists have the good luck of being some of the 'molecules' of economic life ourselves, and of having the possibility through human contacts to study the behavior of other 'molecules'. If we will be more forthcoming with explanations of our cherished terms, our science colleagues may be more inclined to **help us** with 'entropy', which to me is a more difficult concept than anything economics has to offer."
>
> — Tjalling Koopmans (1947/1979) [4]

> "The basic models of economics are unable to advance in any perceptible way a systematic understanding of the operation of a real economic system. Instead they are based on sets of more or less plausible but entirely arbitrary assumptions leading to precisely stated but irrelevant theoretical conclusions. I ask others in demography, sociology, political science, ecology, biology, health sciences and engineering to **assist** in removing economics from the splendid isolation in which it is found."
>
> — Wassily Leontief (1982), "Academic Economics"; cited by Charles Hall and Kent Klitgaard (2006) as platform for newly proposed "biophysically" based field of economics (see: biophysical economics) [5]

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(b) Faber, Malte M., Niemes, Horst, and Stephan, Gunter. (2005). *Entropy, Environment, and Resources: an Essay in Physico-economics* (ch. 3: The Notion of Entropy, quote pg. 77). Springer.
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(b) Hall, Charles A.S. and Klitgaard, Kent A. (2006). "The Need for a New Biophysically-based Paradigm in Economics for the Second Half of the Age of Oil" (pdf), *International Journal of Transdisciplinary Research*, 1(1):4-22.
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θΔics

In science, **Sokal affair** refers to a seemingly reputable scholarly publication, superficially, that is written purposely using scientifically-sounding, albeit fictional terms and concepts, so to pass for academic work, but one that turns out to be an inside and or hidden joke, once the punchline is unveiled; in short, an inside joke discussion of made up theory that looks real on the surface.

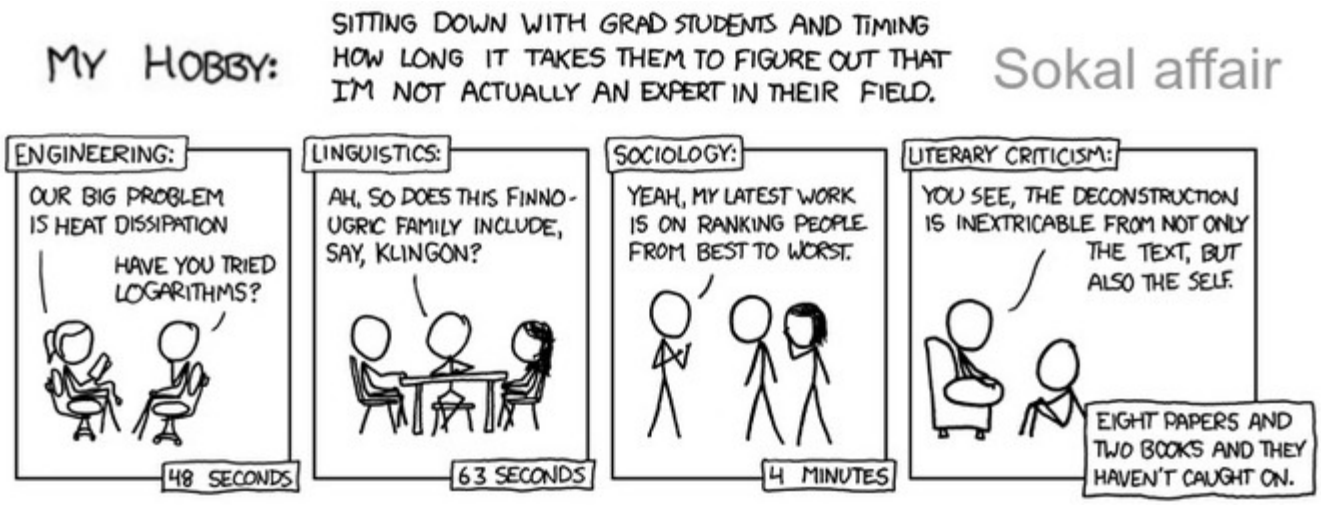

A **Sokal affair** stylized cartoon, about the relative ease of Sokal affairing different fields: engineering, liguistics, sociology, and literary criticism.

Overview

The original Sokal affair publication was American electrical engineer Peter Elias' 1958 article "Two Famous Papers", wherein he makes a parody of the Shannon bandwagon by reviewing two fictional articles, tabulated below (left). [1]

In this case, it was an inside joke: in particularly, regular readers and conference goers of the *Institute of Radio Engineers, Transactions on Information Theory*, were well-honed to the growing number of varied and endless publications stemming from Claude Shannon's information theory.

The second article, shown below (right), was by Alan Sokal, a physics professor at New York University, who in early 1996 submitted an science article entitled 'Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity', to *Social Text*, an academic journal of postmodern cultural studies, in which he proposed that quantum gravity is a social and linguistic construct:

Elias (1958)	Sokal (1996)
"Information Theory, Photosynthesis, and Religion."	"Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity."
"The Optimum Linear Mean Square Filter for Separating Sinusoidally modulated Trianglular Signals from Randomly Sampled Stationary Gaussian Noise, with Applications to a Problem in Radar."	

The difference between the two is that in the whereas in the Sokal case, for the readers and editors of *Social Text*, the joke was on them. Specifically, on its date of publication (May 1996), Sokal revealed in the magazine *Lingua Franca* that the article was a hoax, identifying it as "a pastiche of left-wing cant, fawning references, grandiose quotations, and outright nonsense, structured around the silliest quotations [by postmodernist academics] he could find about mathematics and physics."

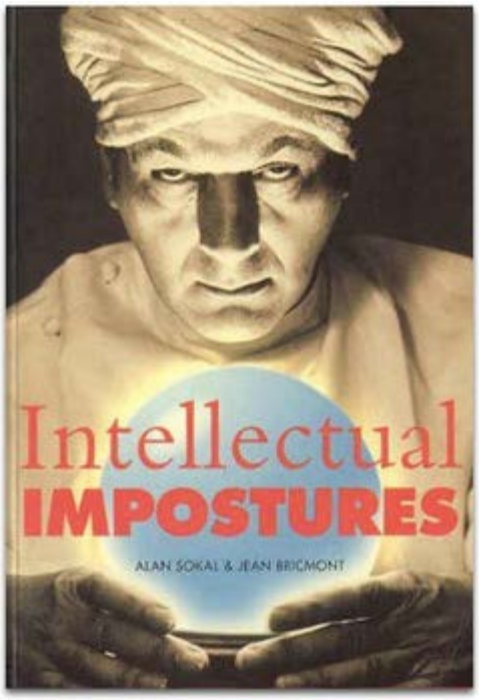

Alan Sokal's 1998 book on how his Sokal affair helped to expose intellectual impostures.

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2. (a) Sokal, Alan. (1996). "Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity", *Social Text*, May.
(b) Sokal, Alan. (1996). "Article", *Lingua Franca*, May.

Further reading

â— Thims, Libb. (2012). "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair" (Ñº), *Journal of Human Thermodynamics*, 8(1): 1-120, Dec 19.

External links

â— Sokal affair – Wikipedia.

θΔics

In science, **solar flux** is 1370 watts per meters squared at one astronomical unit from the sun. [1] This is the amount of total energy, released by the sun, passing through one m² of surface area, at the radii distance of 150,000,000 km (the earth) from the sun, at a rate of joules per second. [2] This value is also called the solar constant.

In Carnot cycle models of surface sections of the earth, as used in human thermodynamics, ecological thermodynamics, etc., the solar flux is the measure of Q_{in} (or Q_{hot}) of heat input during the isothermal expansion step of the heat engine cycle, in which the working body (system) does work, in the form, predominately of pressure-volume expansion work, on the surroundings (environment).

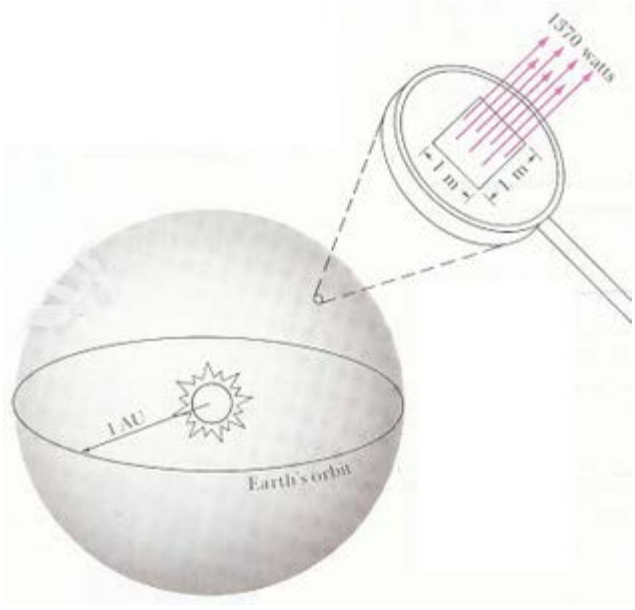

Solar flux: at sphere of radius 1 AU (150,000,000 km), with the sun at its center, through each square meter of that sphere's surface pass 1370 watts (joules per second) of energy.

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2. Sunlight – Wikipedia.

θΔics

In existographies, **Solon** (c.638-558BC) (IQ:170|#403) (Cattell 1000:391) (Washington 23|#) [RMS:2] (ACR:20) (CR:16) was a Greek statesman, lawmaker, philosopher, and poet, one of the seven sages (Q), credited with being the one who brought democracy to Athens, noted for []

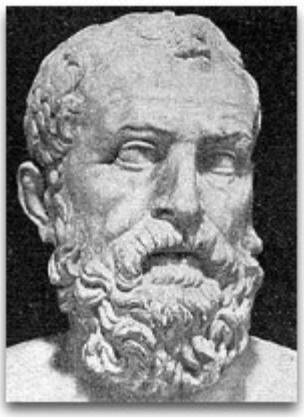

Mythology

After travelling to Egypt, and learning their theology, according to Plato (Q), Salon substituted Greek names for Egyptian ones, in writing about the Greek deities, according to which Amen-Ra became Zeus, Set became Typhon, Osiris became Dionysus, Horus became Hercules, Shu became Atlas, etc.

Egypt

Solon was the first Greek on record to have initiated the study-abroad-method, by specifically traveling to Egypt to learn in their colleges and from their priests; as summarized by Wallis Budge (1904): [1]

> "A tradition says **Solon**, Thales, and Plato all visited the great college at Heliopolis, and that the last-named actually studied there, and that Manetho (c.300-250BC), the priest of Sebennytus, who wrote a history of Egypt in Greek for Ptolemy II, collected his materials in the library of the priesthood of Ra."

Solon, according to Plutarch, spent some time in Egypt and discussed philosophy with two Egyptian priests, Psenophis of Heliopolis and Sonchis of Sais. According to Plato's dialogues Timaeus and Critias, he visited Neith's temple at Sais (see: recension theory) and received from the priests there an account of the history of Atlantis. (Q)

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (pg. 332). Dover, 1969.

External links

- Solon – Wikipedia.

θΔics

In philosophy, **Soren Kierkegaard** (1813-1855) (IQ:180|#160) [RGM:58|1,260+] (Stokes 100:69) (CR:15) was a Danish philosopher, and oft-cited greatest philosopher ever, noted for []

Existentialism

Kierkegaard is oft-classificated as one of the four main existentialism philosophy founders, along with: French philosopher Jean-Paul Sartre, Russian writer Fyodor Dostoyevsky, and German thinker Friedrich Nietzsche; per his absurdism discussions, he would seem to classify more with Sartre, than Dostoyevsky and Nietzsche.

Fear and Trembling

In 1843, Kierkegaard, in his *Fear and Trembling*, gives an intellectually backwards (religio-mythology scholars had already debunked Abraham as myth, by this period) take on the Abraham and Isaac story, in respect to his own issues with doubt in god, but that he wanted to believe in faith, for happiness sake; the discussion is weak and messy, e.g. “I am convinced that god is love”, “I cannot close my eyes and hurl myself trustingly into the absurd” (see: absurdism), etc. [7]

Crowd is Untruth

In 1846, Kierkegaard, in his “The Crowd is Untruth” (Ñº), seems to ramble on incoherently, per reason that Jesus as myth (see: Christ myth theory) had been popularized by this period, about Jesus being crucified vs “crowd”, which he says has “power, influence, reputation, and domination”.

Geniuses

Kierkegaard gave commentary on genius; the following are noted quotes:

> “There are two kinds of geniuses. The characteristic of the one is roaring, but the lightning is meagre and rarely strikes; the other kind is characterized by reflection by which it constrains itself or restrains the roaring. But the lightning is all the more intense; with the speed and sureness of lightning it hits the selected particular points—and is fatal.”
>
> — Soren Kierkegaard (c.1830), Publication

> “The case with most men is that they go out into life with one or another accidental characteristic of personality of which they say: Well, this is the way I am. I cannot do otherwise. Then the world gets to work on them and thus the majority of men are ground into conformity. In each generation a small part cling to their ‘I cannot do otherwise’ and lose their minds. Finally there are a very few in each generation who in spite of all life's terrors cling with more and more inwardness to this ‘I cannot do otherwise’. They are the geniuses. Their ‘I cannot do otherwise’ is an infinite thought, for if one were to cling firmly to a finite thought, he would lose his mind.”
>
> — Soren Kierkegaard (c.1830), Publication

> “Geniuses are like thunderstorms. They go against the wind, terrify people, cleanse the air.”
>
> — Soren Kierkegaard (c.1830), Publication

Other

In the 1830s, Kierkegaard, among genius and exercise aficionados, took what he referred to as a “people bath” each day walking around his native streets, chewing over ideas; in his own words: [3]

> "I have walked myself into my best thoughts."

He did this for two decades. Kiekegaard, supposedly, is grouped among the so-called "boredom philosophers", namely: Pascal, Rousseau, Kant, Schopenhauer, Zapffe, Nietzsche, Heidegger, Benjamin, Adorno, Goethe, Flaubert, Stendhal, Mann, Beckett, Buchner, Dostoevsky, Chekhov, Baudelaire, Leopardi, Proust, Byron, Eliot, Ibsen, Valery, Bernanos, and Pessoa. [1]

Influence

Friedrich Nietzsche, supposedly, was impressed by Kierkegaard and Martin Heidegger, supposedly, rediscovered Kierkegaard turning him into an intellectual predecessor of existentialist philosophy. [5]

Kierkegaard was also influential to Samuel Beckett and Walker Percy.

Tributes:

The following are noted tributes:

> "Among men of flesh and bone there have been typical examples of those who possess this tragic sense of life. I recall now Marcus Aurelius, St. Augustine, Pascal, Rousseau, Rene, Obermann, Thomson, Leopardi, Vigny, Lenau, Kleist, Amiel, Quental, **Kierkegaard**—men burdened with wisdom rather than with knowledge."
>
> — Miguel Unamuno (1912), *Tragic Sense of Life* [2]

Quotes

The following are noted quotes:

> "Where am I? Who am I?
> How did I come to be here?
> What is this thing called the world?
> How did I come into the world?
> Why was I not consulted?
> And if I am compelled to take part in it,
> Where is the director?
> I want to see him."
>
> — Soren Kierkegaard (c.1830), Publication

> "I feel as if I were a piece in a game of chess, when my opponent says of it: That piece cannot be moved."
>
> — Soren Kierkegaard (c.1830), Publication

> "The thinker without paradox is like the lover without passion."
>
> — Soren Kierkegaard (c.1830), Publication

> "Like Leporello, learned men keep a list, but the point is what they lack; while Don Juan seduces girls and enjoys himself—Leporello notes down the time, the place and the description of the girl."

— Soren Kierkegaard (1834), *Journals* [4]

"Life can only be understood backwards; but it must be lived forwards."

— Soren Kierkegaard (1843), *Journals* IV A 164 (Ñº)

"An unconscious relationship is more powerful than a conscious one."

— Soren Kierkegaard (c.1845) [6]

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Further reading

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External links

â— Soren Kierkegaard – Wikipedia.

θΔics

In evolution thermodynamics, **Soren Lovtrup** (1922-) is a Danish chnops-chemist (bio-chemist), embryologist, and animal physiologist noted for his 1983 article "Victims of Ambition: Comments on the Wiley and Brooks' Approach to Evolution", wherein he attempts to pick apart the 1982 Brooks-Wiley theory of evolution. [1]

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â— Soren Lovtrup (Swedish → English) – Wikipedia.
â— Lovtrup, Soren – WorldCat Identities.

θΔics

In religion, **soul**, the Old English *sawol*, “spiritual and emotional part of a person, animate existence; life, living being” (Ñº), from the Gothic *saiwala* (Ñº), is a postulate, albeit an antiquated one, that there exists an indestructible corporeal essence, with a measurable weight (see: soul weight), in certain animate things, such as human beings, which transcends earthly existence; acting or representing the moral nature or essence of the individual in judgement. A person who theorizes about the soul is a "soul theorist". One who does not believe in the existence of souls is an "asoulist" (see: asoulism).

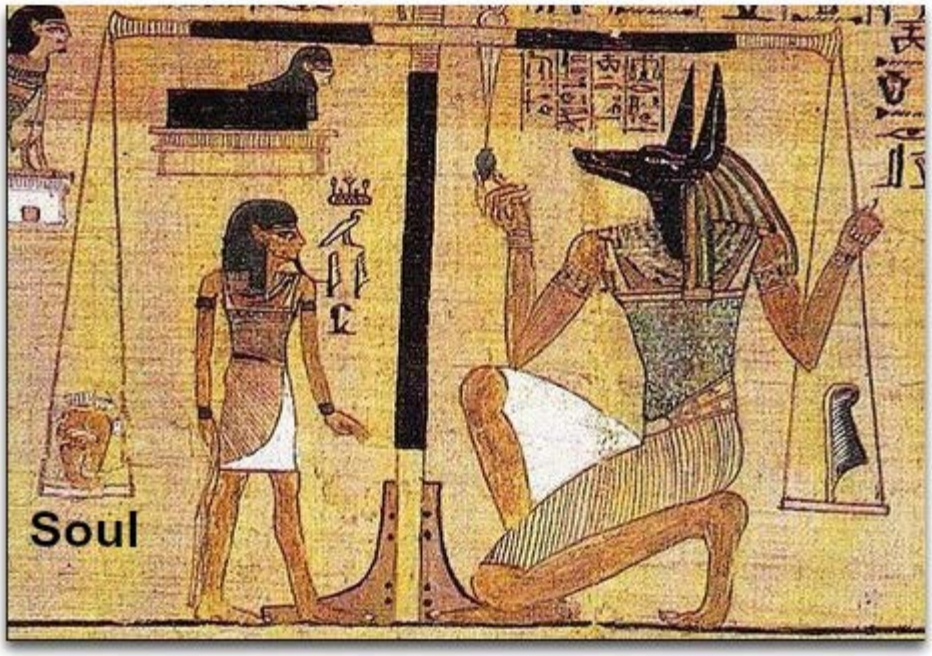

A depiction of a deceased person's **soul** (left), in Egyptian religion terms (see: Egyptian human), being weighted on the scales of Maat, against the weight of the feather of truth, by the god Anubis (aka John the Baptist); the mass of the soul determined by the weight of sin as found in the 42 negative confessions.

History

In c.3100BC, the Egyptians invented the concept of the soul in their idea of "ba" or moral part of the human (see: Egyptian human) that is weight on the scale of truth (scale of Maat) in the judgment hall in the afterlife.

> “Herodotus upon this occasion says, that the whole romance of the soul and its transmigrations was **invented by** the Egyptians, and propagated in Greece by men, who pretended to be its authors. I know their names, adds he, but shall not mention them (lib. 2). Cicero, however, has positively informed us, that it was Pherecydes, master of Pythagoras. Tuscul. lib. 1, sect. 16. Now admitting that this system was at that period a novelty, it accounts for Solomon's treating it as a fable, who lived 130 years before Pherecydes.”
>
> — Constantin Volney (1791), *The Ruins* (Ñº)

In c.530BC, Pherecydes, according to Cicero, as discussed in his *Tusculam Dispulat* (c.55BC), or another part of his works, as cited by Baron d’Holbach (1770), no doubt via absorption of Egyptian soul theory (see: Egyptian human), was purported to have "invented" the doctrine of either the soul and or the model of the immortality of the soul. [11]

In c.1620, Rene Descartes placed the seat of the soul in the pineal gland.

In 1648, Johann Helmont, in his *Ortus Medicinae*, situated the “archeus” or soul, part of the world soul, in the upper opening of the stomach (Thomson, 1996). [12]

In 1739, Giovanni Lancisi placed the seat of the soul in the corpus callosum; in 1741, Francois Peyronie argued the same thing (Ñº) and illustrated this opinion with a mass of experiments. [12]

Thermodynamics

See main: Cessation thermodynamics

In 1950, Norbert Wiener gives an example of how the term "soul" can be found intertwined with basic thermodynamic hypotheses, theories, and explanations, as follows:

> "Certain analogies of behavior are observed between the machine and the living organism, the problem as to whether the machine is alive or not is, for our purposes, semantic … if we use the word 'life' to cover all phenomena which locally swim upstream against the current of entropy, we are at liberty to do so; however, we shall then include many astronomical phenomena … it is my opinion, therefore, best to avoid all question-begging epithets such as 'life', **'soul'**, 'vitalism', and the like, and say merely that machines [and] human beings [are] pockets of decreasing entropy in a framework in which the large entropy tends to increase."

The general issue here is that science has, for the most part, eroded the major tenets of the philosophies, mythologies, religions of the past, except the essential ones, such as in explanations of existence, life, love, death, and purpose; yet a modern scientific reconciliation of these key facets remains a taboo topic in hard science subjects and discussions. In 2007, American Hindu researcher Steven Rosen speculated on quantum energy, the soul, and reincarnation. [4]

The concept of "soul" is often found intertwined with various thermodynamic theories, e.g. Ludwig Colding (1843), Gustave Hirn (1869), Pierre Teilhard (1930s), DMR Sekhar (2007), etc., in regards to either what happens when one dies, or what happens during love, Carl Jung (1933), etc., in the context of principles such as the conservation of force, conservation of energy, the first or second laws of thermodynamics, etc. The following, for instance, is noted quote by American chemist Howard Reiss, as found in the opening chapter to American geochemist Gregory Anderson's 1993 textbook *Thermodynamics in Geochemistry*: [2]

> "[It is an] almost certain truth that nobody (authors included) understands thermodynamics completely. The writing of a book therefore becomes a kind of catharsis in which the author exorcises his own demon of incomprehension and prevents it from occupying the **soul** of another."

Certainly, this may be entirely metaphor in the minds of each author, but it does highlight the ubiquity of the term "soul" in the English-speaking world.

In any event, it is often commented colloquially that the first law of thermodynamics is the good news, as Robert Hazen and James Trefil have written, "a natural law analogous to the immortality of the soul," and that the bad news is the second law, "a natural law that helps clarify why the body grows old." [3]

Beg

> *See main: Beg on the soul*

The following is Mirza Beg's conception of soul in humans and crystals in terms of chemical thermodynamics:

> "The living system is energized with a **soul** comprising free energy and entropy. The soul acts as the driving force for all forward reactions and interactions, while entropy retards the forward reactions. At equilibrium the forward reaction is balanced by the backward reactions. Death occurs in both cases as a result of de-energizing the body or deactivating it of the quantum of energy that was its life form. This is marked by departure of soul and loss of life followed by decomposition of the body. A non-living body is also indoctrinated to follow the eternal laws but it has the driving force contained as internal energy of its system for example in the lattice of a crystal. Destruction of the lattice and release of lattice energy of the crystal constitutes the death of the crystal. Cessation of life processes, according to this hypothesis is a result of the loss of the driving force provided by the energy embodied in the soul or in the lattice of a crystal. It is thus possible to visualize that the same energy quantum which is tagged by the forces of energy infinite [Allah], can be reassembled by the mechanism "be". All the souls will thus be reassembled as and when desired by Allah. Likewise all living and non-living matter would return to their origin i.e. Noorun a'la Noor, and become part of the energy infinite."

— Mirza Beg (2016), “Socio-Physical Theory of Creation of the Universe” (Ñº), Academia.edu, Jan 26

(add)

Quotes

The following are related quotes:

“As soon as the coin in the strongbox rings, a **soul** from purgatory springs!”

— Anon (c.1520s), noted European saying about bishop bureaucratic decadence [10]

“We must find out what the mind and **soul** consist of, and how everything on earth proceeds; and if we can do this, we may, of course, dispense with the gods.”

— Balfour Stewart and Peter Tait (1875), on Lucretius’ atomic theory based aim to dispense with the gods

“No one has ever touched a **soul**, or seen one in a test tube.”

— John Watson (1924), *Behaviorism* [8]

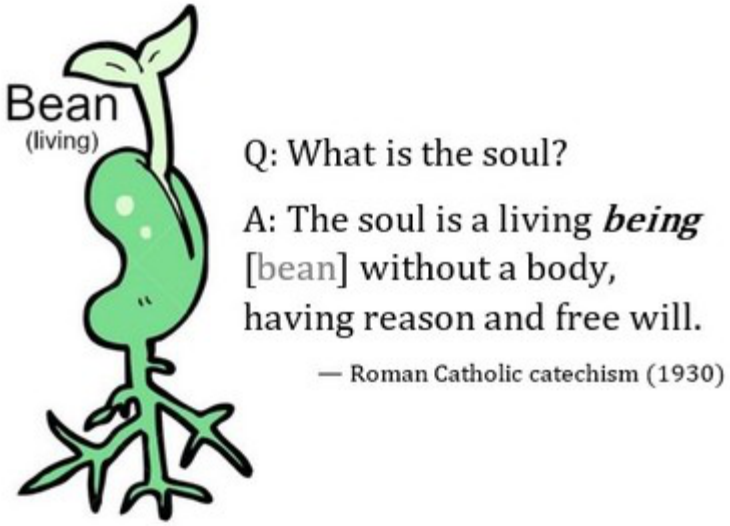

Definition of the **soul** taught to Odilie Watson (1920-2007), wife of DNA co-discoverer Francis Crick and 1953 illustrator (Ñº) of DNA as it appears in *Nature*, who, as child, the heard term living "being" (see: living being) to her mind as “living *bean*”, which she remained puzzled about, but remained silent on, until her later discussions with Crick, her husband of 55-years, who cites the above quote and anecdote in the opening chapter of his 1995 *The Astonishing Hypothesis*. [7]

“In Hollywood a girl’s virtue is much less important than her hair-do. You’re judged by how you look, not by what you are. Hollywood’s a place where they’ll pay you a thousand dollars for a kiss, and fifty cents for your soul. I know, because I turned down the first offer often enough and held out for the fifty cents.”

— Marilyn Monroe (c.1950), *Source*; in: *My Story* (Ñº), 1974

“At one point, a minority of some of the more extreme Christians (following Aristotle) doubted whether women had **souls**, or at least had souls of the same quality as men.”

— Francis Crick (1995), *The Astonishing Hypothesis* [9]

“eBay does not allow the auctioning of human **souls** for the following reasons: If the soul does not exist, eBay could not allow the auctioning of the soul because there would be nothing to sell. However, if the soul does exist then, in accordance with eBay's policy on human parts and remains, we would not allow the auctioning of human souls.”

— eBay (2000), company policy (Ñº)

> “No self-respecting professor of philosophy wants to discuss the **soul** in class. It reeks of old-time theology, or, worse, new age quantum treacle. The soul has been a dead end in philosophy ever since the positivists unmasked its empty referential center. Scientific philosophy has shown us that there's no there there. But make no mistake, our students are very interested in the soul. In fact, that is the main reason many of us won't raise the soul issue in our classes: The bizarre, speculative, spooky metaphysics that pours out of students, once the box has been opened, is truly chaotic and depressing. The class is a tinderbox of weird pet theories—divine vapors, god particles, reincarnation, astral projections, auras, ghosts—and mere mention of the soul is like a spark that sets off dozens of combustions. Trying to put out all these fires with calm, cool rationality is exhausting and unsuccessful.”
>
> — Stephen Asma (2010), “Soul Talk” (see: turnover rate) [6]

> “Spoon fed this religion from the slave ship. They used faith to justify bringing slaves here. All the conducts and the rules in the good book. You swear by it, but failed to take a good look. You’re completely sold. Just two centuries ago slave owners swore you didn't even have a **soul**. Now you blindly defend a faith. That was used plunder pillage and rape a whole entire race.”
>
> — Greydon Square (2010), “Myth” (Ñº), *The Kardashev Scale*

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External links

â— Soul – Wikipedia.

θΔics

In experiments, **soul experiments** refers to any number of experiments, conducted historically, to quantitatively measure the soul, all generally based on the theory of soul weight as the measure of morals.

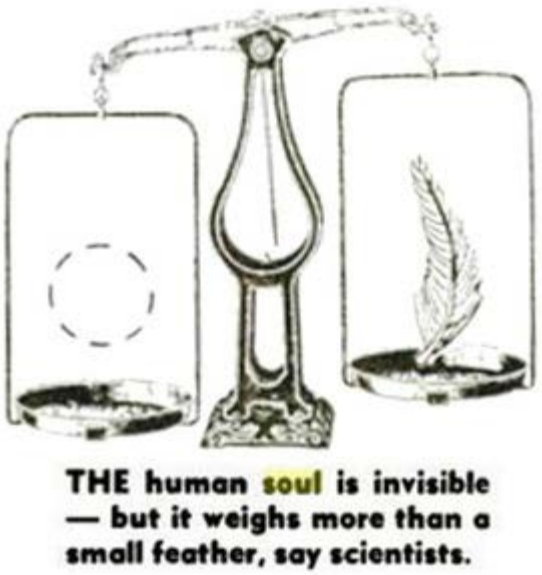

An image from the infamous *Weekly World News* hoax article (Q)(Q) purporting that two German physicians had measured 200 terminal patients and found their soul to weight 1/3000th of an ounce.

Overview

In circa 1230, Roman emperor Frederick II, in one of his many experiments on people, to test to see of the soul exists, constructed a crude soul detection experimental device, in which, as recorded by the monk Salimbene di Adam, in his *Chronicles* (Q), he shut a prisoner up in a cask to see if the 'soul' could be observed escaping though a hole in the cask when the prisoner died.

In c.1540, French princess Margaret of Navarre conducted a soul experiment of sorts; specifically, to test the religious theory, that she had been taught, namely that the "soul left the body at the moment of death", she stayed by the deathbed of one of her maids for days on end until the last breath to see if she could see or hear the soul departing; this was recounted as follows: [3]

> "She never stirred from her bedside, as long as she was agonizing, looking her earnestly in the face, without interruption, till she was dead. Some of her ladies, who were most familiar with her, asked why she looked with so much attention on that poor dying creature: she answered, that having often heard many learned men assert that the soul left the body the moment it died, she was willing to **see if there came from it any wind or noise, or sound on the removal and going out of the soul**, but that she could perceive nothing like it ... she added, that if she were not well settled in her faith, she should not know what to think of that removal of the soul and its separation from the body, but that she would believe what her god and her church commanded her to believe, without any further inquiry."

In 1901, American physician Duncan MacDougall weighed six patients while they were in the process of dying from tuberculosis in an old age home. It was relatively easy to determine when death was only a few hours away, and at this point the entire bed was placed on an industrial sized scale which was reported to be sensitive to "two-tenths of an ounce". He took his results (a varying amount of unaccounted for mass loss in four of the six cases) to support his hypothesis that the 'soul' had mass, and when the 'soul' departed the body, so did this mass. The determination of the 'soul' weighing 21-grams was based on the loss of mass in the first subject at the moment of death. [1]

In 1915, American physicist Harry Twining (1863-1947), in his *The Physical Basis of the Soul* (Q), reported experiments conducted on mice and cats, into the nature of the soul, according to which they revealed it to have a natural basis and had not proven any supernatural soul. He explained that all of his experiments showed a loss of weight due to the natural cause of moisture loss. (Q)

In the 1930s, American X-ray technician R.A. Watters, at the time the director of the William Bernard Johnston Foundation for Psychological Research in Reno, Nevada, supposedly, developed an atomic hypothesis of the soul, according to which he posted that souls (whether human or animal) existed in a limbonic state within the "intra-atomic space between the atoms of human cells." (Q) In his pamphlet "The Intra-Atomic Quantity" (Q) , supposedly, he argues that soul is a type of energy. (Q) To test this theory, Watters, supposedly, conducted some 40+ experiments wherein he put various insects and animals (grasshoppers, frogs, and mice) in some type of cloud chamber, and photographed "expansion of water vapor" at their time of death, or something along these lines. (Q) Watters reported on his findings as follows: (Q)

> "New experimental evidence that identifies a form of energy which is lost to the physical body at the

moment of death; not only a form of energy which we have been able to predict because of physical evidence, but an 'immaterial body' which at the moment of death, makes its escape from the physical body, and is made visible by the medium of water vapor."

The 1934 *Nature* review of Watters' findings are as follows: (Q)

> "There has recently been published by the Dr. William Bernard Johnston Foundation for Psychological Research, Reno, Nevada, a pamphlet by R. A. Watters entitled "The Intra-Atomic Quantity". Mr. Watters describes a series of experiments in which grasshoppers, frogs and mice were killed in a Wilson expansion chamber, a cloud produced at the moment of death, and the resulting 'track's photographed. It is alleged that these photographs reveal forms corresponding in shape to the dead bodies, and it is claimed that this result demonstrates the existence of an "intra-atomic Quantity" which is an "immaterial body" and an "exact counterpart of the physical body to which it belongs". It is further claimed that when the subjects of the experiments were removed from the Wilson chamber and gave any signs of life, the photographs never showed anything unexpected; but that when the photographs showed 'intra-atomic' tracks, the subjects were unquestionably dead. Unfortunately, the few photographs reproduced in the bulletin before us reveal the alleged markings only to the eye of faith; for the rest, the essential experimental details are almost wholly wanting. If Mr. Watters wishes his work to receive attention, he should publish a more adequate and a more fully illustrated report."

In 1988, a hoax article appeared, as reported by *Weekly World News*, reporting that Germans Becker Mertens and Elke Fisher had weight some 200 terminally ill patients, and the weight of the would was 1/3000th of an ounce. (Q)

In 1998, American chemical engineer and physician Gerard Nahum, based on his information entropy model of soul, devised an electromagnetic spectrum soul detection device, and attempted to get funding to build the device. In this year, Nahum began to promulgate, in various scientific circles, a 25-page presentation entitled "A Proposal for Testing the Energetics of Consciousness and its Physical Foundation", a cessation thermodynamics proposal to conduct a consciousness-weighing project to quantify the energy-information of consciousness (the "weight of the soul"), at the point of death using a negative entropy theory, and estimated that the electromagnetic field soul detection device would cost approximately $100,000; defined the soul or rather 'residual energy/information' after the complete dissolution of an organism after death as:

> "Soul is the (obligatory) negative entropy (i.e., energy/weight equivalent) that is necessary to allow for the nonequilibrium meta-stable physical 'quasi-steady-state' of a living/conscious biological system."

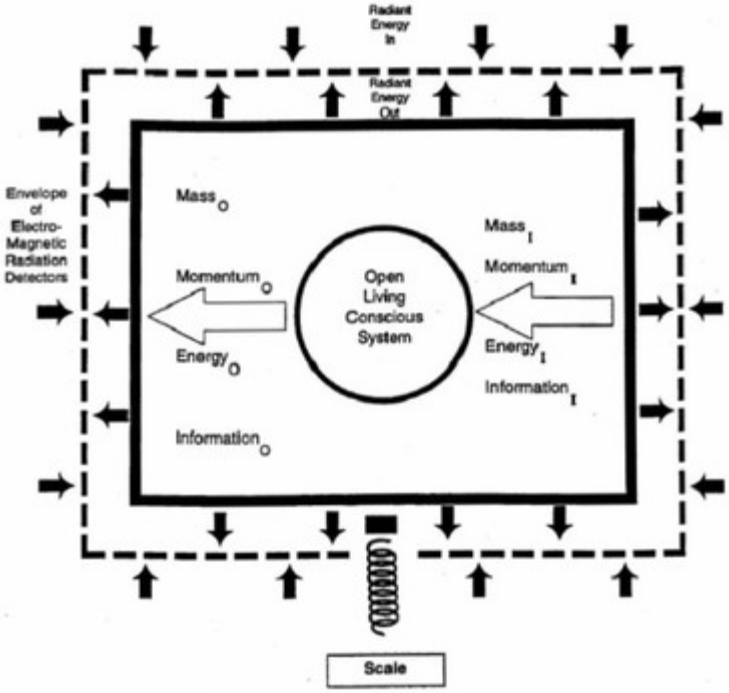

American physician Gerard Nahum's 1998 diagram for an electromagnetic soul weighting device.

A diagram of Nahum's electromagnetic field soul detection device is shown adjacent.

Quotes

The following are related quotes:

> "The careful observations and many **experiments** of Verworn, together with those of Wilhelm Engelmann, Wilhelm Preyer, Richard Hertwig, and other more recent students of the protists, afford conclusive evidence for my 'theory of the cell-soul' (1866)."
>
> — Ernst Haeckel (1899), *The Riddle of the Universe* [2]

See also

- Soul theorist

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θΔics

In terminology, **soul mate**, or “soulmate” or “split soul theory”, is an Egyptian-Greek religio-mythology, clay creation myth based, origin of humans model, which posits that humans originated in pairs, bound in one body, with one original soul, but were "split" in two, supposedly for doing something offensive to the gods, after which the newly separated humans forever wandered the earth in search of their long lost soul mate so to reunite their incomplete souls and become one again.

The Egyptian god Atum, according to Heliopolis creation myth (3100BC), making the gods Shu and Tefnut, each with half a soul; the origin of modern **soul mate** theory.

Egyptian | Mythology

In c.2000BC, in the *Book of the Dead* (§17.16), we find that the origin of the split soul theory derives from the Heliopolis creation myth, and the model of two gods, Shu and Tefnut, and their god souls, deriving from one god, Atum, and his one god soul; Wallis Budge (1904) summarizes this as follows: [11]

> “From the *Book of the Dead* (xvii. 16) we learn that Shu and Tefnut were supposed to possess but **one soul** between them, but that the **two halves** of it were identified with the soul of Osiris and the soul of Ra, which together formed the great **double soul** which dwelt in Tattu.”

(add)

Greek | Mythology

In 600BC, Greek philosophers, including Solon, Thales, and Plato all visited the great college at Heliopolis, and that Plato, while studying there, learned their soul-splitting origin of gods and humans theory.

Plato

In 400BC, Plato, after studying abroad in Egypt, penned the modern version of soul mate theory, according to which the formerly-known supreme god Atum, who in the Early Kingdom became Atum-Ra, who became Amen-Ra in the New Kingdom, who became Zeus, or Amen-Zeus, as Alexander the Great (332BC) later legally defined things, split one original human into two humans with half-souls.

The gist of Plato's version of soul mate theory, according to one account, is the story that: “our ancestors once had two heads, four arms [and supposedly one soul]. They did something to offend a god so that god punished them by splitting them down the middle, resulting in the creation of humans. As a punishment, we are condemned to spend our lives searching for the other half, our soulmates.” (Ñº)

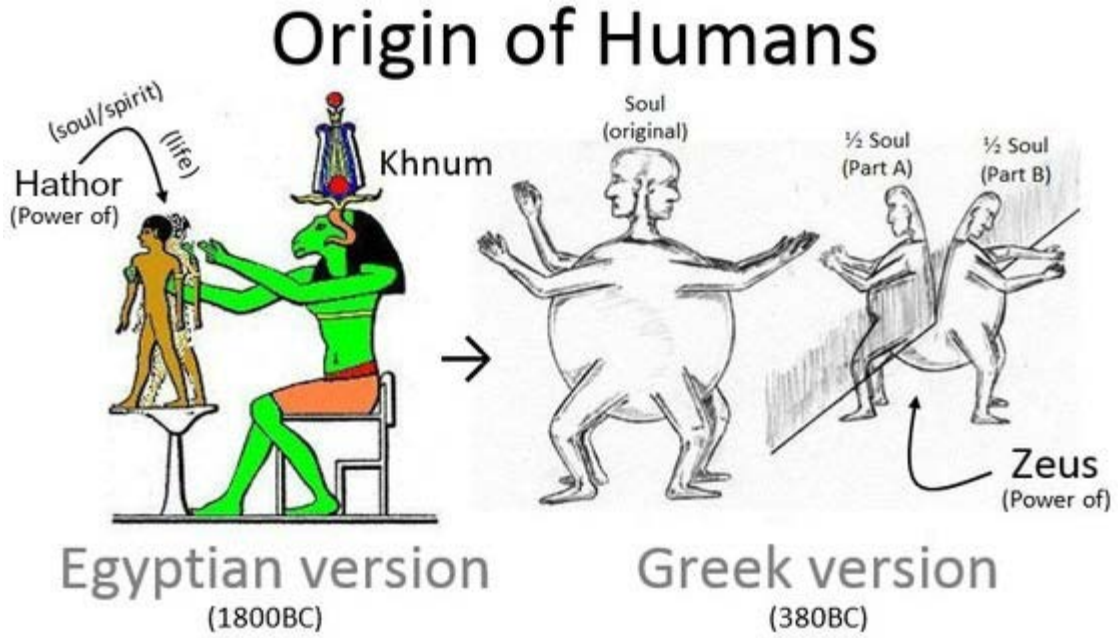

In c.375BC, Plato, in his *Symposium* (Ñº), via dialogue,

through the voice of Aristophanes, described the gist of long lost split souls in search of each other, as follows: [1]

Left: the Egyptian clay creation myth origin of humans, according to which the god Khnum shapes two humans from a ball of clay, then the goddess Hathor imparts life, soul (ba), and spirit (ka) into their composition, via the power of the ankh. Right: the Greek reinterpretation of this origin of humans model, as told by Plato, in his *Symposium* (c.380BC), via the voice of Aristophanes, according to which humans were originally one body (akin to one ball of clay), with one soul, but were split by Zeus, into two bodies and two souls, aka split soul theory, thereafter forever being in search of each other; thereby explaining the hypothetical origin of humans.

> "The intense yearning which lovers have toward each other does not appear to be the desire for sexual intercourse, but for something else which the soul of each desires and cannot tell, and of which he or she has only a dark and doubtful presentiment."

> "According to Greek mythology, humans were originally created with four arms, four legs and a head with two faces. Fearing their power, Zeus **split them into two separate parts**, condemning them to spend their lives in search of their other halves."

In 45BC, Cicero, in his *On the Nature of the Gods*, ridicules Plato's Egyptian religio-philosophy derived round-shaped first human model as follows: [12]

> "I express my surprise at the slow-wittedness of those who would have it that a living creature endowed with both immortality and blessedness is 'spherical' in shape, merely because Plato maintains that no shape is more beautiful than the sphere. In my view, the cylinder, the cube, the cone, the pyramid are more beautiful. And what sort of life is assigned to this rotund god?"

(add)

Original sin | Adam and Eve

In the split human myth of Aristophanes, humans, supposedly, had neither love for one another nor piety toward the heavenly powers; they were, according to Irving Singer, guilty of original sin, who once they sinned, became human beings who were faced with a characteristic moral choice: either to achieve wholeness though love or to renew their insolence toward the gods and run the risk of being diminished further. [4]

This logic, supposedly, was thereafter translated into the "Adam and Eve", i.e. Clay and Breath, Hebrew (Is-Ra-El-ite) version of the origins of humans, as passed along to the world in Biblical/Quranic story creation as told in Genesis.

Goethe

German thinker Johann Goethe, in his *Elective Affinities* (P1:C5), among the numerous "love theories" he embedded in his novella, employed Plato's split soul or soul mate theory, in coded form, via alternate side headache logic, that the characters (or

A humorous take on the Greek origin of humans model of how the god Zeus splits once-joined humans in two (Ñº), thereafter each split human is forever in search of their lost "**soul mate**".

reactants) Eduard (B) and Ottilie (D) are long lost "soul mates" destined for each other (see: Goethe on the soul), a secret he alludes to, in coded form, by discussion of how they each have head-aches on the opposite sides of their heads, per reason that they used to be conjoined at the back, and originally had one brain (according to Plato's soul mate theory):

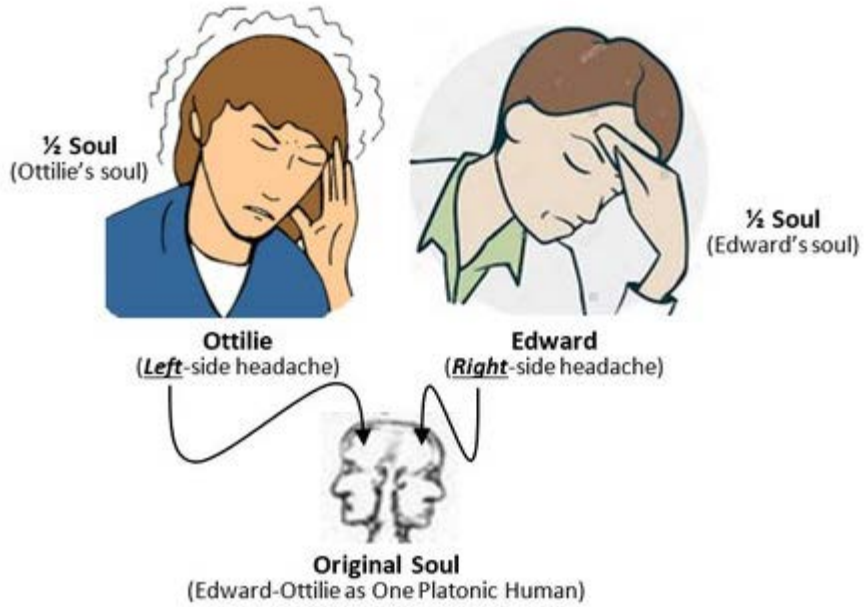

The key excerpts are as follows:

> “Enough!” Edward cried at last, “it is decided. She comes. You, my love, are provided for, and now we can get forward with our work. It is becoming highly necessary for me to move over to the right wing to the captain; evenings and mornings are the time for us best to work together, and then you, on your side, will have admirable room for yourself and Ottilie.”
>
> Charlotte made no objection, and Edward sketched out the method in which they should live. Among other things, he cried, “It is really very polite in this niece to be subject to a slight pain on the **left side of her head**. I have it frequently **on the right**. If we happen to be afflicted together, and sit opposite one another, —I leaning on my right elbow, and she on her left, and our heads on the opposite sides, resting on our hands,—what a pretty pair of pictures we shall make.”
>
> The Captain thought that might be dangerous. “No, no!” cried out Edward. “Only do you, my dear friend, take care of the D, for what will become of B if poor C is taken away from it?” “That, I should have thought, would have been evident enough,” replied Charlotte. “And it is, indeed,” cried Edward; “he would turn back to his A, to his Alpha and Omega;” and he sprung up and taking Charlotte in his arms, pressed her to his breast.

(add discussion)

Modern | Theory

In 1841, American philosopher Ralph Emerson, in his essay on friendship, influenced by Goethe, defined the nature of friendship in terms of chemical affinity as such: [1]

> “Conversation is the practice and consummation of friendship and great conversation requires an absolute running together of two souls into one, yet it is affinity that determines *which* two shall converse.”

The term 'soul', used here, to clarify, is the Ra-theology based term for what, in 19th century logic, would be called "moral movement" described and quantified by the "moral symbols", in modern physical science parlance.

In 2014, webcomic Randal Munroe, in his *What If?*, gave the following parody, a result of viewer query submission, of soul mate theory taken at face value, scientifically: [5]

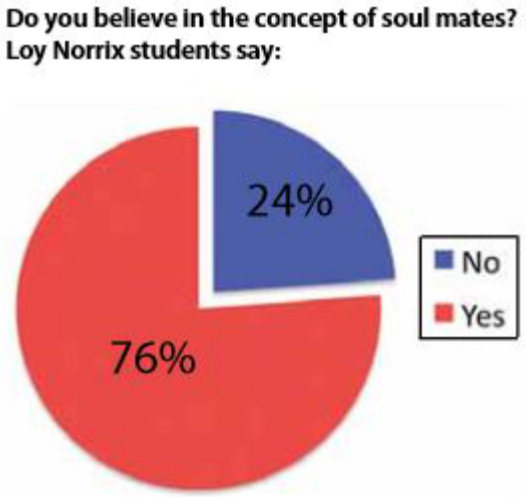

Studies show that 76 percent of students believe in the concept of “**soul mates**”, which is attributed to the split human myth of Greek mythology. [3]

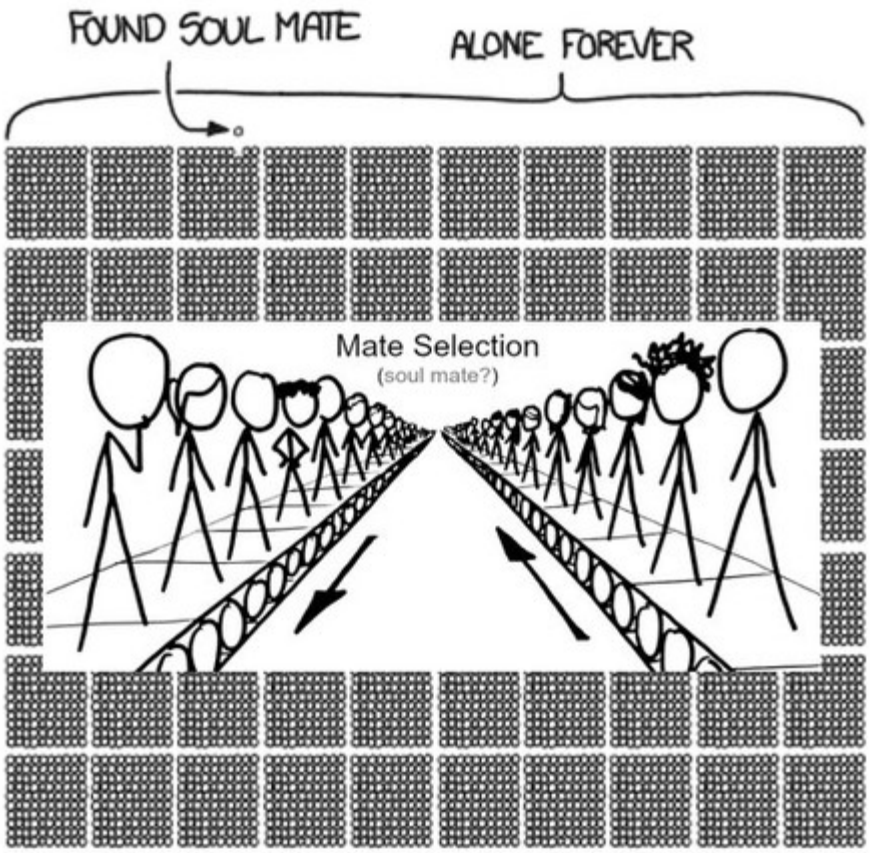

namely that the probability of finding one's soul mate, amid 6+ billion people, is so small, that people will always opt out for the next best thing; or something along these lines.

Modern view | Free energy mate

See main: Free energy mate; Human free energy table

The modern upgrade to the Imhotep-Plato soul mate theory, is firstly the conclusion that "soul does not exist" (aka asoulism), a secondary ramification to the conclusion that "god does not exist" (see: disproofs of the existence of god) — similar to "ether does not exist" (see: Michelson-Morley experiment), "caloric does not exist" (see: cannon boring experiment), "life does not exist" (aka abioism), among others — such as captured in the following opinions:

> "What is the soul, but an empty word to which no idea corresponds?"
>
> — Julien la Mettrie (c.1747/48) [6]

> "My mind is incapable of conceiving such a thing as a soul. I may be in error, and man may have a soul; but I simply **do not believe it**. What a soul may be is beyond my understanding."
>
> — Thomas Edison (1924), "Do We Live Again?" [7]

> "In making such a claim ('**soul does not exist**'; 'ether does not exist') I am circumscribing legitimate concepts and claims from illegitimate concepts and claims. We do not then say that 'souls are examples of nothingness'; to do so would be to understand …"

— Brett Bourbron (2004), *Finding a Replacement for the Soul* [8]

"**There's no soul**; that's garbage."

— Patrick Fergus (2014), response statement when Libb Thims told Pat that he was conducting a "What is the Soul Comprised of?" polling of 36 people; also picked as most-liked answer by vote, Sep 28 [9]

The modern view, without going into detail, is that "soul-matching", i.e. finding true love, the gist of which captured

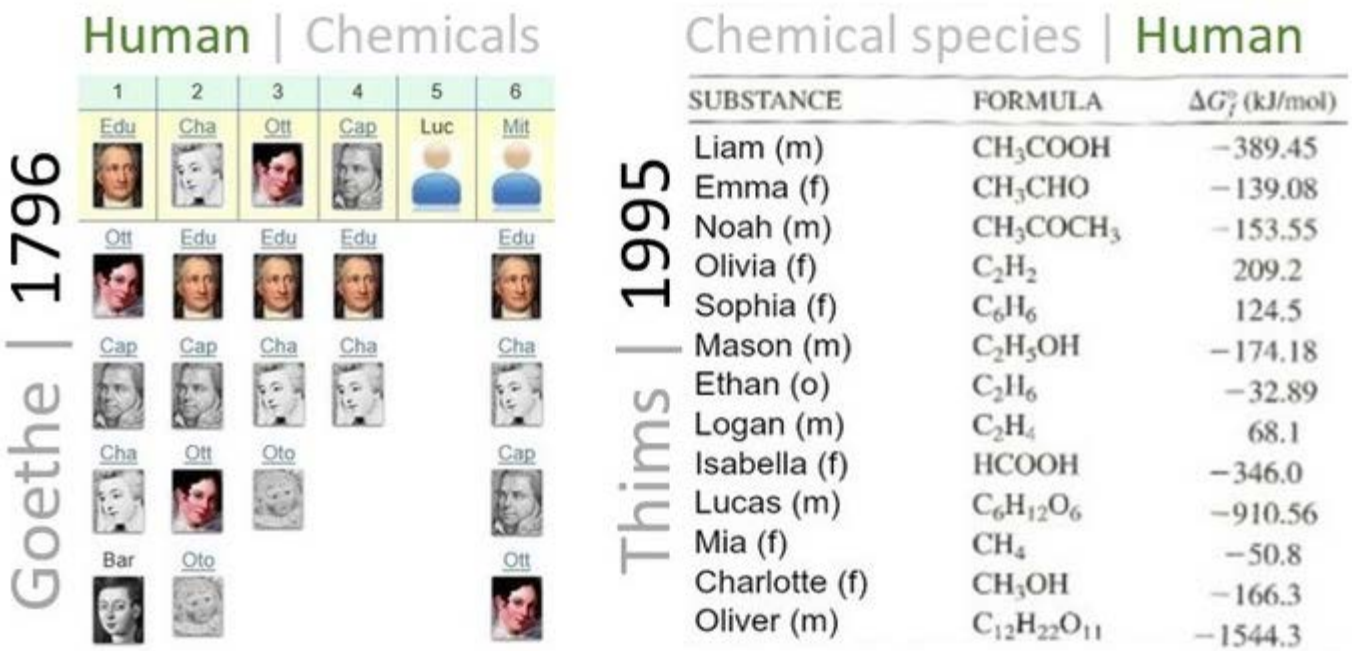

A comparison of the Goethe human affinity table (1796), i.e. human affinity table (see: Goethe affinity table), with the Thims human free energy table (1995), i.e. human free energy table, which captures the gist of the upgrade from mythological soul mate theory to thermodynamical free energy mate theory.

approximately by the following progression of views:

"True love is like ghosts, which everybody talks about and few have seen."

— Francois La Rochefoucauld (c.1865)

"True love is a chemical affinity of human monads; they are elementally attracted to one another by the invincible necessity of a law of nature. In the spiritual and physical make-up of those predestined by nature to be joined, a series of inherent correspondences is found."

— Vyacheslav Ivanov (c.1900), on the "message" of Goethe's *Elective Affinities* [10]

"True love is your soul's recognition of its counterpoint in another."

— Steve Faber and Bob Fisher (2005), *Wedding Crashers* (Ñº)

gets translated into the human chemical thermodynamics language of "free energy matching", the exact same way that atoms, molecules, and chemicals are matched, namely according to the first law and second law of thermodynamics, the gist of which is found in the logic of matching people via human free energy tables, the gist of which is captured in the above image, namely each person has a given free energy of formation, per given state of existence, and whenever two

people pair, a corresponding free energy formation of that bonded entity, i.e. dihumanide molecule, will determine if the pair is to be feasible, i.e. thermodynamically permissible. The greater the negative free energy change of the hypothetical (or real) pairing, the more likely is the pair to experience what Plato conceptualized as a soul mate or what we speak of in modern terms as true love.

In 2007, Libb Thims summarized the basics of free energy matching, the upgrade to soul mate matching, as follows: [13]

> "The direct extrapolation in human chemistry is clear. In time, affinity or free energy tables will be formulated for human molecules. In other words, in the future instead of going to the local bar or dance club to find a passionate match, a person will be able to consult human free energy tables, likely listed online, and thus be able to pick out the one person in the world with which he or she will have the greatest interpersonal chemical affinity and reaction potential.
>
> In the coming millennium, we propose that someone will construct a digitized, complete, and exacting world encompassing, human affinity table, updated on the microsecond, able to categorize the rapports of billions of human molecules. That is, it will be possible for a willing and interested person to consult human affinity tables, or technically 'human thermodynamic tables', to see the energetic rankings of those human molecules with which he or she will be most apt to bond to or react with, as well as those human molecules for which chemical reactions would be extremely disfavored. The time, frustration, and mental repercussions of having gone through malformed, non-favored, or troubled reactions will be spared.
>
> Once the inquisitive user puts themselves in the physical proximity of the other, the reaction would be irresistible. For the most intimate of personal reactions, one will be able to select the most chemically and thermodynamically matched person on the face of the earth to react with, such that no other human molecule would have the power or affinity to displace the one most potent, at least within the equilibrium confines the reaction window."

Some of this logic, to note, was outlined in the concept stage pair-matching site ReactionMatch.com, which was filtered through at least one Match.com CEO.

See also

â— Soul snow
â— Soul theorist
â— Soul weight

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External links

â— Soulmate – Wikipedia.

θΔics

In religious thermodynamics, **soul snow** is crystallized soul, hypothesized to exist, if the soul, being of corporeal substance, is a type or form of gas that can be liquefied, using high pressure methods similar to those used by British physicist James Dewar. [1]

The concept of 'soul-snow' was posited in *circa* 1895 by German biologist Ernst Haeckel, as a type of humorous pun, who seems to have introduced the notion so as to disprove, in a ridiculing manner, the theory of the soul. [2]

A Dewar flask (O) device for storing liquid nitrogen; conceptualized by Ernst Haeckel (c.1895) as a way to liquefy or solidify "soul" into a type of snow, i.e. "**soul snow**", as he referred to it, if in fact soul did exist, e.g. as a form of gas or spiritual vapor.

See also

- Gerard Nahum
- Thermodynamics of Hell

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(c) *The Riddle of the Universe* – Wikipedia.

θΔics

In terminology reform, **soul terminology upgrades**, in the context of asoulism (see: soul does not exist), refers to []

Quotes

The following are related quotes:

> "About what am I employing my own soul? On every occasion I must ask myself this question, and inquire, what have I now in this **part of me** which they call the **'ruling principle'**? And who's soul have I now? That of a child or of a young man, or of a feeble woman, or of a tyrant, or of a domestic animal, or of a wild beast?"
>
> — Marcus Aurelius (167AD), *Meditations* (§5.11)

> "Thus, in consequence of man's reasoning upon false principles, the **soul, OR moving principle within him**, as well as the concealed moving principle of nature, have been made mere chimeras, mere beings of imagination."
>
> — Baron d'Holbach (1770), *The System of Nature* (§7, pg. 51) [1]

> "When it is said, that man is not a free agent, it is not pretended to compare him to a body moved by a simple impulsive cause: he contains within himself causes inherent to his existence; he is moved by an interior organ, which has its own peculiar laws, and is itself necessarily determined in consequence of ideas formed from perceptions resulting from sensations which it receives from exterior objects. As the mechanism of these sensations, of these perceptions, and the manner they engrave ideas on the brain of man, are not known to him; because he is unable to unravel all these motions; because he cannot perceive the chain of operations in his **soul, OR the motive principle that acts within him**, he supposes himself a free agent; which, literally translated, signifies, that he moves himself by himself; that he determines himself without cause: when he rather ought to say, that he is ignorant how or for why he acts in the manner he does.."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 97)

> "There are very good reasons indeed to believe that materialism is true and that Julien La Mettrie was a visionary. If there is no positive evidence supporting dualism, if modern science renders the doctrine untenable, if it is explanatorily impotent, and if all the evidence points toward materialism instead, then it is time to acknowledge what reason is trying to tell us—**there is most likely no soul.**"
>
> — Julien Musolino (2015), *The Soul Fallacy* [2]

References

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(b) The System of Nature (Translator: H.D. Robinson) – Archive.org.
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θΔics

In science, a **soul theorist** is one who uses the sciences of chemistry, physics, thermodynamics, and or other disciplines, to theorize about the nature of the soul, energy-consciousness conservation, and or moral nature continuity, etc., following death. [1]

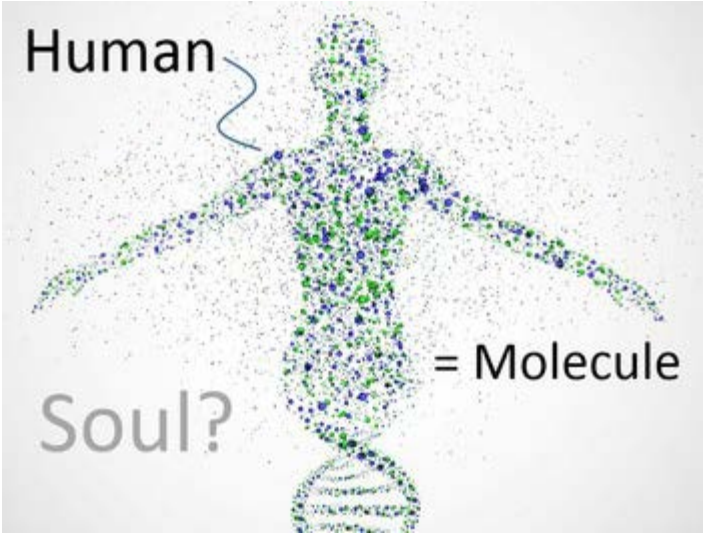

A "**soul theorist**", according to Thomas Edison (1910), is someone who speculates on "will", immortality, and or morality, via science.

Overview

In 2005, American science writer Mary Roach, as outlined in her *Spook: Science Tackles the Afterlife*, during her interviews of various scientists and research on the topic of what modern science has to say about death, introduced the term "soul theorist" to classify thinkers, such as Rene Descartes, Duncan MacDougall, Gerard Nahum, etc., who have theorized about the nature of the soul and or posited or conducted experiments aimed at detecting the soul.

The dissolution of tenability of “soul” as working theory began to fall apart with: Ernst Haeckel (1895), Thomas Edison (1910), Werner Heisenberg (1952), and George Lundberg (1964) who cogently surmised that the ancient concept of the soul would eventually be supplanted by purely physical concepts.

List

The following is a list of thermodynamicists and or scientists known to have been soul theorists, i.e. speculated on, theorized about, or to have given commentary or opinion on the existence or not of the soul in a modern physical science sense:

#	Theorist	Date	Summary
1.	Imhotep (2635-2595BC)	c.2600BC	via Ra theology (Anunian theology), the early dynastic Egyptians, apexed, likely in the mind of polymath Imhotep, were the originators of the concept of the soul, called the "ba", a supposed entity, quantified by the 42 negative confessions, that had a certain mass, and which was weighted on the scale of Maat, against the feather of truth, to determine its moral value. All modern-day soul views are based on, originated from, or derivatives of this model via its reincorporation into the Ab*ra*hamic religions (Christianity, Islam, Judaism, Baha'ism, Mandaeism) and B*ra*hmaic religions (Hindism, Buddism, Sikhism, Jainsim), which accounts for 72% of religious beliefs of the modern world.
2.	Pythagoras (c.570-490BC)	500BC	ythagoras believed in the transmigration of souls and therefore, via reason of logic, was a vegetarian, and did not want to eat the body of an animal (compare: Newton in Senegal) that might be the abode of a dead friend. (Ñº)
	Hippocrates		Adjacent image (Ñº) depicts, supposedly, a Hippocrates view: “the soul is the same in all living creatures, although the body of each is different.”

3. (c.460-370BC) 400BC

4. Plato (427-348BC) 380BC

In his *Symposium*, via the voice of Aristophanes, he introduces soul mate or split soul theory origins of humans.

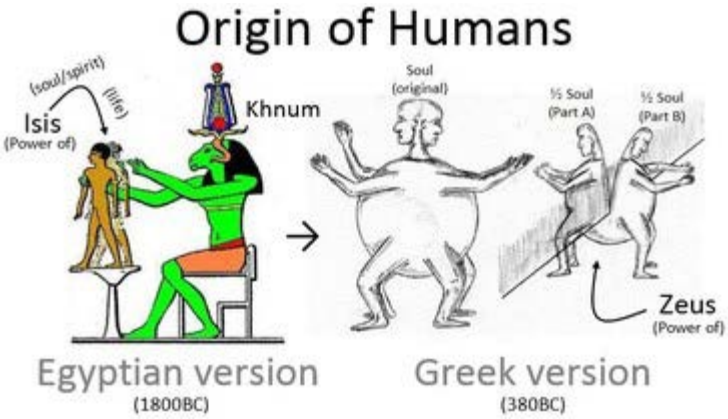

5. Aristotle (384-322BC) c.310BC

Believed a fetus in early gestation has the soul of a vegetable, then of an animal, and only later became "animated" with a human soul by "ensoulment", which occurred 40 days after conception for male fetuses and 90 days after conception for female fetuses, the stage at which, it was held, movement is first 'felt' within the womb and pregnancy was certain. (Ñº) Considered the soul to be part of the natural world and measurable by science (Ñº).

Used the words "animus" and "anima" that he associated with mind and soul and, being an advocate of atomic theory, believed these were types of "soul atoms", or "tiny bodies, round and quick to roll" located in the breast, had a special "swerve" that allowed for free will and choice. [4] In his *Third Book*, he explains the nature of the soul, and to show that it perishes along with the body; some of which is summarized by John Masson (1884) as follows: (Ñº)

6. Lucretius (99-55BC) 55BC

"The soul is material, for without touch how can it direct and act on the body? It is closely united to the body; just as it is hard to separate the odor from a lump of frankincense without destroying it, so it is impossible to part soul and body without destroying both. The soul does not live 'in a den of its own',' but is spread all over the body. It 'grows along with the body, together with its members, within the very blood.' The atoms forming it are vastly different from those composing flesh and bone. They are 'exceedingly small, smooth and round'; how much Epicurus thinks to be implied in such special fineness of atomic composition, we have seen already. The soul-atoms are also fewer and at far greater intervals than those

of the body. The bulk of the soul is exceedingly small compared with that of the body."

7.	Avicenna (Ibn Sina) (980-1037)	c.1010	View: the soul is an "incorporeal substance" that acts "through the body". (Ñº)
8.	Ibn Hazm (994-1064)	1022	His *The Ring of of the Dove*, employs some type of Plato split soul logic intermixed with ideas on magnetism, e.g. "The lover's soul is ever-seeking for the other, striving after it, searching it out, yearning to encounter it again, drawing it to itself it might be as a magnet draws the iron." 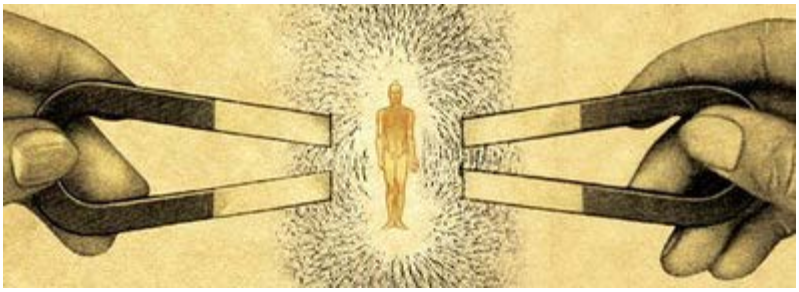
	Frederick II (1194-1250)	c.1235	Conducted soul experiments.
9.	Michel Montaigne (1533-1592)	c.1590	In his personal copy of Greek atomic theory philosopher Lucretius' circa 75BC *On the Nature of Things*, marked the many passages in the poem that seemed to him 'against religion', namely against religio-teachings such as creation ex nihilo, divine province, judgment after death. "Fear of death is the cause of all our vices", is one margin note. In a number of places, he kept making reading note comments about how the soul is corporeal (see: soul theorist), as the book was arguing: [1] "The soul is bodily" (296) "The soul and the body have and extreme conjunction" (302) "The soul is mortal" (306) "The soul, like the foot, is part of the body" (310) "The body and the soul are inseparably joined" (311) These personal reading notes, made by Montaigne, are said to suggest a fascination with the most radical conclusions to be drawn from Lucretian materialism.
	William Harvey (1578-1657)	c.1630	View: "Whatever the power be that creates such an animal out of an egg, that it is either the soul, or part of the soul, or something having a soul, or something existing previous to, and more excellent than the soul, operating with intelligence and foresight." In his "Passions of the Soul", famously asserted: "my view is that this gland [pineal gland] is the principal seat of the soul, and the place in which all our thoughts are

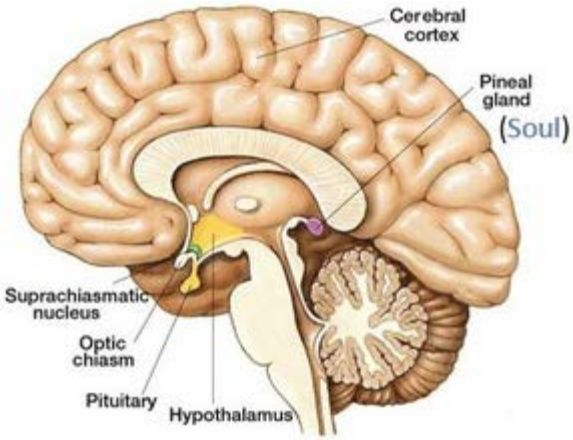

9.	Rene Descartes (1596-1650) *See:* ***Descartes on the soul***	1640	formed. The reason I believe this is that I cannot find any part of the brain, except this, which is not double. Since we see only one thing with two eyes, and hear only one voice with two ears, and in short have never more than one thought at a time, it must necessarily be the case that the impressions which enter by the two eyes or by the two ears, and so on, unite with each other in some part of the body before being considered by the soul. Now it is impossible to find any such place in the whole head except this gland; moreover it is situated in the most suitable possible place for this purpose, in the middle of all the concavities; and it is supported and surrounded by the little branches of the carotid arteries which bring the spirits into the brain." [2]
10.	Pierre Gassendi (1592-1655)	c.1640	Quote [following Lucretius]: "If you can conceive the whole of the soul to be gathered into one mass, it would occupy a mere point almost, or the very tiniest space." (Ñº) Synthesized a mixture of Aristotle's view and Epicurus' view to postulate that the aim of the soul is to achieve tranquility and freedom from troubles and fears. (Ñº) In his *Philosophical Palingénésie* (*Regeneration Philosophy), Volume 1* (pg. 50), the noted great chain of being theorist, stated something along the lines of the following:
11.	Charles Bonnet (1720-1793)	1769	"If someone ever demonstrated that the soul is material, they should not be alarmed; should we not admire the power which gave the material the ability to think?" This statement is the opening quote to Joseph Priestley's 1777 soul treatise (see below).
12.	Joseph Priestley (1733-1804)	1777	Published *Disquisitions Relating to Matter and Spirit: the History of the Philosophical Doctrine Concerning the Origin of the Soul, and the Nature of Matter; with its Influence on Christianity, Especially with Reflection to the Doctrine of the Pre-existence of Christ*, wherein, supposedly, he espoused a materialist philosophy, which entailed denial of free will and the soul (specifically: he denied the materialism of the soul, while simultaneously claiming its existence, in some way), and argued that there is no mind-body duality.
13.	Immanuel Kant (1724-1804)	c.1780	Wrote that the human soul "resides in a place of a smallness impossible to describe"; in another instance he stated: "If I am asked where the seat of the soul is in the body, I begin to suspect something crooked in the question." [5] In his *On the Organ of the Soul*, dedicated to German philosopher Immanuel

14. Samuel Sommerring (1755-1830) 1795

Kant, he argued that the soul is not found in the anatomical structure of the brain, e.g. in the pineal gland as Rene Descartes (1640) had surmised, but rather in the liquid of the brain, which he called *acqua venticulorum cerebri*, and that this was a type of animated fluid.

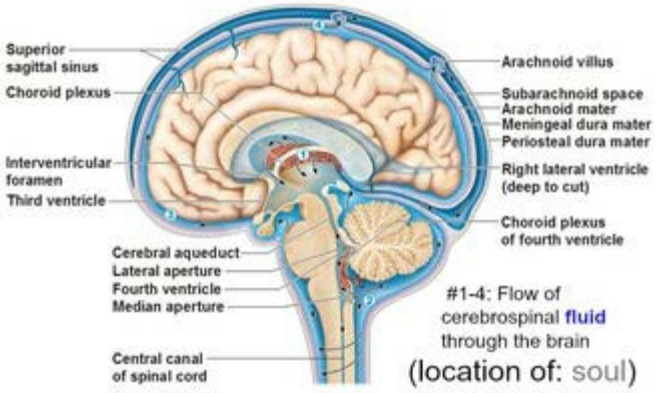

15. Johann Goethe (1749-1832) 1809
*See: **Goethe on the soul***

Concluded that the "moral symbols" of nature are found not particularly in the brain, but in the symbols of physical chemistry; in his *Elective Affinities*, explained some of these views, e.g. by using Plato's split soul theory (i.e. soul mate theory) in respect to people viewed as human chemicals.

In 1817, began to query various physicians about having ever seen the "soul" during their dissections of the brain. As Napoleon commented in April of 1817 during a conversation with Gourgaud who at the time was praising the *Celestial Mechanics* of Laplace:

> "I often asked Laplace what he thought of God. He owned he was an atheist. Many crimes have been committed in the name of religion. The oldest religion is the worship of the sun [Ra theology]. Where is the soul of an infant? I cannot remember what I was before I was born; and what will become of my soul after my death? As to my body, it will become carrots or turnips. I have no dread of death. In the army I have seen many men suddenly perish who were talking with me."

16. Napoleon Bonaparte (1769-1821) 1817/20
*See: **Napoleon on the soul***

The subject of the nature of the soul was a question that plagued Napoleon up until his last days. In fact, in 1820, a year before his death, Napoleon was experimenting with seeds and plants of melon, spinach, sorrel, asparagus, salad, artichokes, cucumber, radishes, and endives, to figure out or rather gain insight into the search for the origin of life and nature of the soul. During these investigations, Napoleon entered into a dialog with his personal physician Francois Antommarchi as to the whereabouts of the soul, during which time he commented again on his retrospect conversation with Laplace on God:

‘You do not believe it, you doctors are above such weakness. Tell me, you who know so well the human body, who have probed into all its ramifications, have you ever come across the soul under your scalpel? Where is it? In which organ?’ 'I hesitated to respond,' says Antommarchi.

17. Ludwig Colding (1843)?

18. Hermann Helmholtz (c.1850)?

19. Peter Tait (1875)

20. Balfour Stewart — 1875 — Discussed "mental forces" and the soul in his book *The Conservation of Energy*.

In a Sep speech, delivered at the start of the Faculties of Rennes, after discussing Rene Descartes, he regrets the division, i.e. two cultures split, that has developed between science and philosophy, and states the following:

21. Francois Massieu (1832-1896) — c.1880

> “They cut the man into two parts, soul and body, the philosopher took one, and another naturalist, they both have worked, studied on their behalf have lost sight and we find ourselves today in the presence of a duality, convenient perhaps, but unwise, in that it overlooked the man to deal with only two elements that constitute it. But in doing so we run the risk of being wrong. If one wanted to know the chemical properties of water [H_2O], seek it in those of oxygen [O_2] and hydrogen [H_2]? No, because he knows that there is little relationship between the characteristics of a substance and those of simple bodies which enter into its composition.
>
> To study humans, it is perhaps even more reserve, his corpse is certainly different from his living, his soul is a being whose morality tells us in existence, but whose philosophy can boast of acquire specific knowledge, since it can be studied in a free state, the revelation can only speak in this regard. But what science and philosophy can and should perhaps only study, is a man indivisible and tangible for us, where the angel and the beast are inseparable, which has a body and ailments, but also passions and faculties, such as intelligence, memory and reason.”

In these penetrating comments, we see Massieu digging into some of the very same comments that exist in modern times, when confronted with the logic of the person viewed as the human molecule, and the question of what to do with incongruous concepts, such as soul, life, free will, choice, etc., that have never been applied to chemicals in their reactions.

22. James Martineau — c.1888

23. Robert Thurston — 1894 — Quote: “we are gradually progressing towards the establishment of a law of persistence of all existence, whether of matter, of force and energy, or of organic vitality, and perhaps even to its extension until it includes intellectual and soul life.” [3]

24. Ernst Haeckel (1834-1919) c.1895

Posited that if the soul exists it must be of a physical form, i.e. some kind of gas, and that using the correct technologies, i.e. low temperature thermodynamics (e.g. James Dewar), one should be able to liquefy the soul of a person and thus create a type of 'soul snow'. Supposedly, because this had never been done, in Haeckel's argument, the soul does not exist.

25. Nathaniel Shaler c.1900

26. Duncan MacDougall (c.1866-1920) 1901

postulated that "if personal identity (and consciousness and all the attributes of mind and personality) continue to exist after the death of a body, it must exist as a space occupying body"; later that year found an experimentally determined value of 3/4th of an ounce (or 21 grams) as the mass of the "soul substance" leaving the body of a person at the point of death.

In his his Ingersoll lecture (Ñº) on "Individuality and Immortality", on what a physicist and chemist has to say on the question of the mortality and or immortality of the individual from the point of view of energetics; for example:

27. Wilhelm Ostwald (1853-1932) 1906

> "If a chemist or physicist of to-day is asked about his ideas on immortality, his first feeling will be that of some astonishment. He meets with no question in his work which is connected with this one, and his reply may usually be classified under one of two heads. He may remember the religious impressions which have clung to him since his youth, kept alive by him or nearly forgotten, as the case may be, and he will then explain that such questions are in no way connected with his science; for the objects treated by his science are non-living matter. This is immediately evident in physics, and while there exists an *organic* chemistry, he will explain that any matter which is called organic in his sense is decidedly dead before it can become the object of his investigation. It is only the inanimate part of the world which concerns him scientifically, and any ideas he may hold about the question of immortality are his private opinions and quite independent of his science. Or he may dismiss his interlocutor still more shortly by saying from his standpoint of matter-and-motion: Soul is a function of living matter only. The moment life ceases in an organized body the value of this function becomes zero, and there is no further question about immortality."

Edison: "Soul? Soul? What do you mean by soul? The brain? There is no more reason to believe that any human brain will

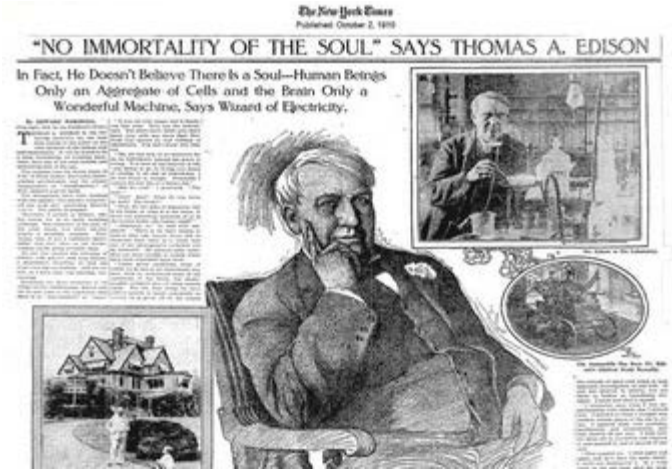
The New York Times
Published: October 2, 1910

"NO IMMORTALITY OF THE SOUL" SAYS THOMAS A. EDISON

In Fact, He Doesn't Believe There Is a Soul—Human Beings Only an Aggregate of Cells and the Brain Only a Wonderful Machine, Says Wizard of Electricity.

be immortal than there is to think that one of my phonographic cylinders—mere records of sounds which have been impressed upon them—will be immortal."

28. Thomas Edison (1847-1931) *See:* ***Edison on the soul*** — 1910

Edison: "No one thinks of claiming immortality for the cylinders or the phonograph. Then why claim it for the brain mechanism or the power that drives it? Because we do not know what this power is, shall we call it immortal? As we call electricity immortal because we do not know what it is. The brain, like the phonographic cylinder, is a mere record, not of sounds alone, but of other things which have been impressed upon it by the mysterious power which actuates it. Perhaps it would be better to call a recording office, where records are made and stored. But no matter what you call it, it is a mere machine, and even the most enthusiastic **soul theorist** will concede that machines are not immortal."

Edison: "After death the force, or power, we call 'will' undoubtedly endures; but it endures in this world, not in the next. And so with the thing we call life, or the soul—mere speculative terms for a material thing which, under given conditions, drives this way or that. It too endures in this world, not the other."

29. Harry Laverne Twining (1863-1947) — 1915

In his *The Physical Theory of the Soul* (Ñº), described various experiments, which he had conducted, to determine if mice had measurable souls which left when they died, the first firstly on scales using cyanide and in another experiment a sealed glass jar, through death via asphyxiation. (Ñº)

30. James Hyslop (1918)?

31. Frederick Soddy (1919)?

32. Albert Mathews (c .1920)

33. Albert Einstein (1879-1955) *See:* ***Einstein on the soul*** — 1921

From 1921 to 1953, in various correspondences, began to express his views on the topic of the soul.

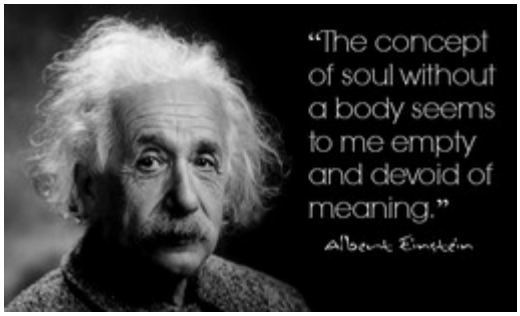

34. Edwin Slosson (1925)?

Right: definition of the soul

Q: What is the soul?
A: The soul is a living being* without a body, having reason and free will.
—Roman Catholic catechism

	Odilie Watson (1920-2007)	c.1932	taught to Odilie Watson—the 1953 illustrator (Ñº) of DNA as it appears in *Nature*—as child, the term "living being" was heard as "living bean", which she remained puzzled about, but remained silent on, until her later discussions with her husband Francis Crick, who cites this in the opening chapter of his 1995 *The Astonishing Hypothesis*. [9]
35.	Pierre Teilhard (1934)?		
36.	Werner Heisenberg (1901-1976) *See:* ***Heisenberg on the soul***	1952	In 1952, in his Heisenberg-Pauli dialogue, with Wolfgang Pauli, stated his views on how the theory of the soul awaits a new electromagnetic field based moral compass, to guide humanity in future endeavors, the way magnetic compasses guide ships; but was a theory lacking presently, in short. 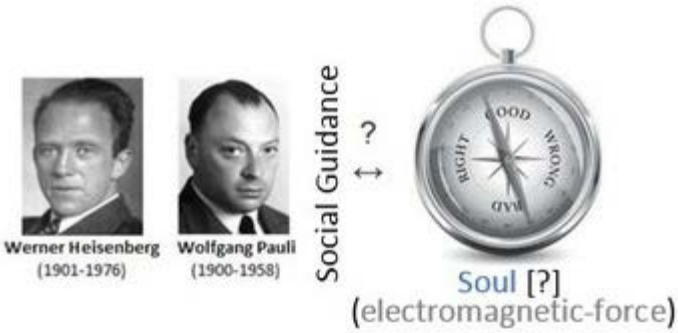
37.	Mehdi Bazargan (1954)?		
38.	George Lundberg (1895-1966)	1964	Quote: "Semantic confusion has resulted in a most mischievous separation of fields of knowledge into the 'natural' and 'physical' on one hand as against the 'social' and 'cultural' (mental, non-material, spiritual) on the other. As a consequence, it has been assumed that the methods of studying the former field are not applicable to the latter. The generally admitted lag in the progress of the 'social' as contrasted with the 'physical' sciences has been a further result. The history of science consists largely of the account of the gradual expansion of the realms of the 'natural' and the 'physical' at the expense of the 'mental' and the 'spiritual'. One by one 'spiritual' phenomena have become 'physical'. The evolution of the concept of the 'soul' is especially relevant, because its final stage of transition or translation by way of the 'mind' into purely 'physical' concepts is still under way." 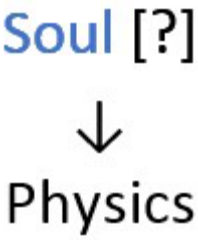
39.	Person (add)	1978	On 31 Jul 1978 the world's first in vitro child was born (see: atheism timeline), created from an embryo created outside the human body; this ushered in the so-called: "embryo morality debate"; depicted adjacent, of a demon riding a spermatoza, with an "original sin" chain (see: soul mate), is a

humorous image (Ñº) of the scanning electron microscope conception of the mechanism of "ensoulment":

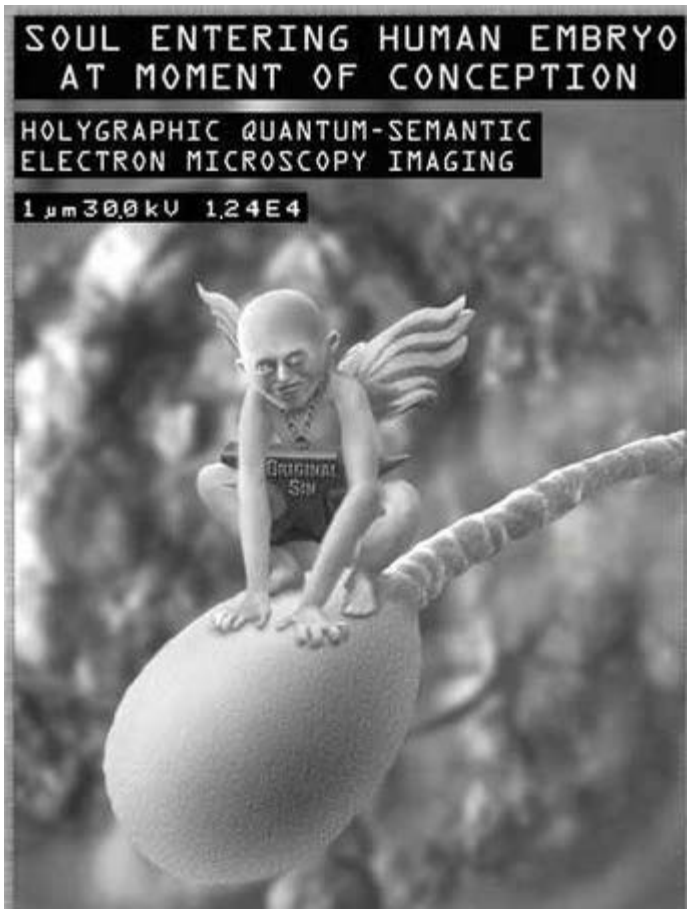

40.	Donald Gilbert Carpenter	1980	Building on McDougall's work, suggested (1984) that the energy required for a ghost to function is around 60 joules; proposed (1998), based on sheep data, that the soul is quantized in units of 20 to 30 joules, a unit he proposed to call the "mac", in honor of Douglas MacDougall; his 1998 ebook *Physically Weighting the Soul*, reports on his dog's soul weighing experiments, according to which he finds that a dog's soul weighs less than 1.8 grams. [6]
41.	Louis Vincent (1988)		
42.	Plinio Prioreschi (1990)		
43.	Ronald Pearson (1990)?		
44.	Frank Tipler (1994)		
45.	Angela Tilby (1995)		
46.	Migene Wippler (1997)		

Began to promulgate, in various scientific circles, a 25-page presentation entitled "A Proposal for Testing the Energetics of Consciousness and its Physical Foundation", a cessation

47.	Gerard Nahum (1956-)	1998	thermodynamics proposal to conduct a consciousness-weighing project to quantify the energy-information of consciousness (the "weight of the soul"), at the point of death using a negative entropy theory, and estimated that the electromagnetic field soul detection device would cost approximately $100,000; defined the soul or rather 'residual energy/information' after the complete dissolution of an organism after death as: "Soul is the (obligatory) negative entropy (i.e., energy/weight equivalent) that is necessary to allow for the nonequilibrium meta-stable physical 'quasi-steady-state' of a living/conscious biological system." A diagram of Nahum's electromagnetic field soul detection device is shown adjacent.
48.	Amit Goswami	2001	In his *Physics of the Soul: the Quantum Book of Living, Dying, Reincarnation, and Immortality*, he discusses entropy.
49.	Leong Ying	2002	
50.	Steven Rosen	2002	
51.		2004	In his *Finding a Replacement for the Soul: Mind and Meaning in Literature and Philosophy* (Ñº), building on the literary and philosophical challenges presented James Joyce's *Finnegan's Wake* and Ludwig Wittgenstein's *Philosophical Investigations*, asserts that, via the mechanism of literature, we have "we produce nonsense and imagine it as sense"; quote: (Ñº) "In making such a claim: 'the soul does not exist'; 'ether does not exist', I am circumscribing legitimate concepts and claims."
52.	Len Fisher	2004	As a child, after being told by his Sunday school teachers that his soul was deep inside of him, he shined a flashlight down his throat while looking in a mirror to see if he could get a glimpse of his soul, which he imagined was rather like a Gummi baby; authored the 2004 *Weighing the Soul: the Evolution of Scientific Beliefs* (2004) and the *A Perfect Swarm* (2009).
53.	Mary Roach	2005	

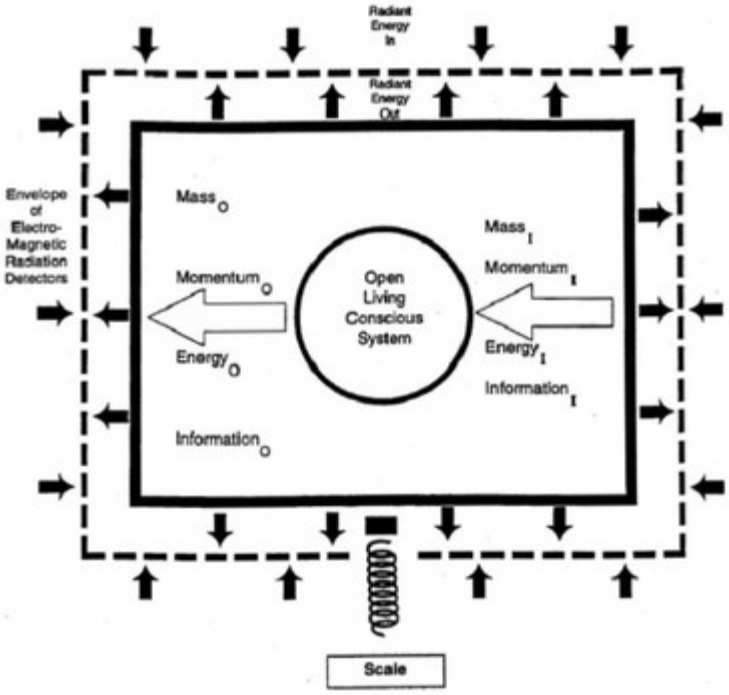

54. DMR Sekhar 2006

55. Brian Schill 2008

56. Bruce Bathurst (c.1945-) 2009

Argued that he is not a molecule, and that people are not molecules in general, per the logic that he has a soul, which is under the operation or auspices of god, not measurable by science.

57. Dorothy Sherrill 2010

58. Sukhraj Dhillon 2010

His book *Soul and Reincarnation: What Happens to the Soul at the Time of Death?*, has sections on energy science and the soul (Ñº).

59. Kurt Bell (c.1968-) 2011

In his article/blog "Soulless Bag of Chemicals", opened to the following: [7]

> "On my better days I regard my wife and daughter as '**soulless bags of chemicals**.' To be fair though, I think the same of myself and all other forms of life. Souls are supernatural things beyond perception or measure, worthy only of suspended belief pending some real evidence or the giving up of the tenets of science. Chemicals we are…despite the clever animation of flesh and musings of mind brought about by the electricity of life. So why do we think more of ourselves? How are we so offended by these facts?"

Bell then followed this up with a YouTube vlog (Ñº), still shown adjacent , about how his use of the controversial phrase about how he thought of his wife and his daughter as "soulless bags of chemicals", which he said he heard somewhere, borrowed it, and liked it, but that it sparked a heated reaction and "got under the skin" of many people, no pun intended.

60. Patrick Fergus (1985-2015) 2014

Quote: "There's no soul; that's garbage"; response to query by Libb Thims on a "What is the Soul Comprised of?" poll [N=36]; this answer, to note, was also picked as most-liked answer by vote. [8]

(add discussion)

See also

â— Do atoms have souls?

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θΔics

In religion, **soul weight** is a theory that the sum of one's actions have a correlative moral mass, termed the soul, ba, or karma, that can be measured on some type of afterlife scale (the original being the scale of Maat) and thus quantified morally.

Circa 1500BC depiction of the weighing of the soul: a process in which the moral value, moral mass, or **soul weight** of a person's lifetime actions, right or wrong, are quantified numerically.

History

The concept of soul weight, or 'ba weighing' in its original namesake, originated in the Ra theology in circa 2500BC, as described in the Egyptian book of the dead and various other Pyramid texts, the mass being quantified by the actions, right or wrong, of 42 negative confessions.

An interesting aspect about this model is that soul is weighted against the force of gravity, although technically speaking "mass" is distinct from "weight", the latter of which depends on the planet on which the measurement is being made.

In circa 500 BC, the Ra theology based ba weighing concept diverged into two new religious derivative versions: B-ra-mha-ic "karma weighing", a reincarnation based model, and Ab-ra-ham-ic "soul weighing", a resurrection based model, the set of these derivative religions, in modern terms, dominate the moral philosophies of over 72 percent of the modern world.

Soul theorists

Into the modern scientific age, dozens of so-called 'soul theorists' have attempted to extend on the premise that the weight of one's actions, in a right or wrong sense, or one's 'moral mass' can be quantified, weighed, or explained theoretically in terms of modern science.

Pineal gland

The most-famous of the so-called soul theories is French scientific philosopher Rene Decartes postulate in circa 1620 that the soul is found in the pineal gland of the brain, on the logic that this is the only brain organ not divided in two, i.e. into bilateral left and right hemisphere parts.

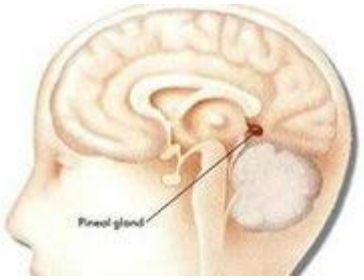

The pineal gland: a neurological mass and the supposed location of the **soul** according to French philosopher Rene Descartes.

Soul snow

With the development of low temperature thermodynamics in the 1890s it became possible to liquefy all known gases, as epitomized in the work of British physicist James Dewar and his Dewar flasks. On this model, in circa 1895, to disprove the theory of the soul, German biologist Ernst Haeckel posited that if the soul exists it must be of a physical form, i.e. some kind of gas, and that using the correct technologies one should be able to liquefy the soul of a person and thus create a type of 'soul snow'. Supposedly, because this had never been done, in Haeckel's argument, the soul does not exist. [4]

21 grams

In 1901, in a letter to a friend, American physician Duncan MacDougall postulated that:

> "If personal identity, and consciousness and all the attributes of mind and personality, continue to exist after the death of a body, it must exist as a space occupying body."

To test this theory, later that year he famously began to measure or rather test for a possible change in mass of near-death patients, the seconds before and after their death point, according to which he found an experimentally determined value of 3/4th of an ounce (or 21 grams) as the mass of the "soul substance" leaving the body of a person at the point of death. [1]

Mass-energy equivalence

In 1905, German-born American physicist Albert Einstein introduced his formulation of the equivalence between mass and energy, in the form of his most-famous first law mass-energy equivalence: [2]

$$E = mc^2$$

and alternative second law of mass-energy equivalence:

$$m = \frac{E}{c^2}$$

In the decades to follow, thinkers began to use the logic of these two equations to speculate on the possible idea that one's soul or after death moral mass might be associated with a type of energy and that this soul energy, being a measure of one's soul mass (or karma mass) might be able to be quantified or described scientifically or rather thermodynamically on the logic that according to a combination of Einstein's second law and either the conservation of energy, conservation of force, or first law of thermodynamics, that one's moral mass (or soul mass) at death might be conserved in such a way that it transforms into pure energy or is some type of moral energy at the point of death that mediates in some way in the structure of the universe.

One example of this type of approach being American chemical engineering physician Gerard Nahum's 1998 "Proposal for Testing the Energetics of Consciousness and its Physical Foundation", in which he postulated that at the time of death mass of one's soul would transform into energy to the information content of one consciousness, according to thermodynamic versions of information theory (e.g. Shannon entropy, negative entropy, etc), should be able to be measured by finely tuned electromagnetic detectors, and thus be quantified. [3]

Bond energy

In 2003-2007, American electrochemical engineer Libb Thims worked out a prototype theory called cessation conservation hypothesis, reasoning to the effect the moral essence of a person, at the point of termination, might be able to be quantified in terms of the energetic content, moral or amoral, of the summation of one's interpersonal human chemical bonds, left residual at death (cessation), thereafter becoming continuity bonds or transformed bonds or effects in the minds and post-cessation reconstructed bonds of the next generation. The basic model assumes that (a) human chemical bonds exist, (b) that all chemical bonds have a quantifiable amount of bond energy, (c) that energy is conserved according to the conservation of energy, whereby, accordingly, at any given moment, on average, a person's total bond energy can be quantified by the following formula:

$$E_S = \frac{1}{2}\sum_{n=1}^{L} E_n$$

where Es is the bond energy or "energy signature" of a person or human molecule embedded in a larger connective matrix-style transforming social structure, L the number of total acquaintance bonds in ones existence (200 being the average number on one's social network, e.g. friends, family, work associates, etc) 300 to 5,000 being the number of people one knows by name), and the ½ factor quantifying the factor that bonds between atoms and molecules are typically shared bonds, hence bond energy will be divided by two, on average. [5]

Coupling theory

The modern way we interpret the Egyptian theory of the "ba", the idea that each person has a moral weight (called the soul or karma), the mass of which is based on the sum of each person's total set of actions (good or evil) in their existence, which if light enough will allow the person to either (a) get afterlife and transcend to heaven (Ab-ra-ham-ic version) or (b) escape samsara and achieve nirvana (B-ra-hma-ic version), is to re-interpret good and evil in terms of the thermodynamic terms "natural" (good) and "unnatural" (evil), the essential outline of this view first presented in English thermodynamicist Edward Guggenheim's 1933 *Modern Thermodynamics*, the structural details of which are extensive to say the least.

The gist of the model, is that in thermodynamics, "free energy coupling theory", as was first outlined in terms of Lewis thermodynamics in German-born American biochemist Fritz Lipmann's famous 1941 "Metabolic Generation and Utilization of Phosphate Bond Energy", which itself was based on previous scatters works on the puzzle as to how to explain the energetics of frog leg movement, posits that according to the following equation:

$$\sum_{i=1}^{j} \Delta G_{N_i} + \sum_{i=1}^{k} \Delta G_{\tilde{N}_i} < 0$$

which is called the Lipmann coupling inequality, that as long as the sum of the Gibbs free energy changes for all "natural", symbol N, processes or reactions (good processes and reactions, in anthropomorphic speak), in a given coupled system, plus the the sum of the Gibbs free energy changes for all "unnatural", symbol $\tilde{N}$, processes or reactions (evil processes and reactions, in anthropomorphic speak), in a given coupled system, is negative or has a measurement value less than zero then the process as a whole will be natural and spontaneously progress or occur.

In modern times, this is known popularly as the "free energy coupling" model of driven energy transformations, the textbook example being the model of ATP as a type of "energy currency".

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θΔics

In hmolscience, **soulless bag of chemicals** is a term employed, generally, to capture the Darwinian-implications view of what exactly or explicitly a human is, in the context of an overtly godless, religious-free, non-metaphysical universe, driven and brought into formation by the principles of natural selection, physical science, and physicochemical sciences, in regards to universal operation, in the context of the molecules-to-man evolution paradigm.

Secular thinker Kurt Bell discussing (2011) reaction, in peripatetic video style (Q), to his controversial labeling of his wife and child, from a secular perspective, as "soulless **bags of chemicals**". One response video was made, once available here: (Q); albeit, now private, wherein a English/Austrian man explained his agnostic semi-favored support for Bell's premise, albeit with his doubt's and objections scattered in.

Overview

The etymology of premise that people are evolved "bags of chemicals" traces its origin to a combination of English gene-based evolution theorist Richard Dawkins and his 1986 *The Blind Watchmaker*, wherein he asserts that evolution works by blind random chance, not via the handling or initiation of a designer, in which he explains how the bombardier beetle is filled with the defense-mechanism chemical hydroquinone $6H_4(OH)_2$ and hydrogen peroxide H_2O_2, which the beetle squirts out in defense in times of distress or danger. [7]

In 1999, English astronomer and astrophysicist Michael Rowan-Robinson, in his *The Nine Numbers of the Cosmos*, citing Dawkins' *The Blind Watchmaker*, describes people or a human specifically, in his "We Exist" chapter, as a "bag of chemicals", after which the term caught on, virally: [1]

> "What are we made of? Bones, flesh, blood, skin? The four humours of the alchemists? A **bag of chemicals**? The idea that turns out to be really powerful is that we are made of atoms. This was suggested by a group of Ionian philosophers of the sixth century BC, especially Leucippus and Democritus, the greatest of the so-called pre-Socratics."

In 2008, Dawkins, in his 2008 *River Out of Eden: a Darwinian View*, began employing and or adopting the phrase "bag of chemicals", in reference to a cell. [6]

In 2011, secular thinker Kurt Bell, an article/blog titled "Soulless Bag of Chemicals", opened to the following: [2]

> "On my better days I regard my wife and daughter as '**soulless bags of chemicals**.' To be fair though, I think the same of myself and all other forms of life. Souls are supernatural things beyond perception or measure, worthy only of suspended belief pending some real evidence or the giving up of the tenets of science. Chemicals we are…despite the clever animation of flesh and musings of mind brought about by the electricity of life. So why do we think more of ourselves? How are we so offended by these facts?"

Bell then followed this up with a YouTube vlog about how his use of the controversial phrase about how he thought of his wife and his daughter as "soulless bags of chemicals", which he said he heard somewhere, borrowed it, and liked it, but that it sparked a heated reaction and "got under the skin" of many people, no pun intended.

Thereafter, into the 2010s, the phrase began to take root, whether arisen independently or via the "heard somewhere" method, or by possibly by Bell (or others). The following are a few example usages of the phrase:

> “Think about atheism for a second. As an atheist, you must believe that you are the result of the purely mindless, random chance interaction of particles over an immensely long period of time—the classic monkey typing Shakespeare scenario. (I know that the origin of species involves natural selection—however what created our universe with natural laws, which make life possible? Blind chance.) Being a **soulless bag of chemicals** created by unguided, meaningless random chance you of course have no free will. You are merely a zombie acting automatically according to the chemicals swishing around in your brain. I don't find this too plausible for many reasons.”
>
> — Jacob Stein (2012), “Does Egyptian History Contradict the Torah”, Jan 10 [4]

> “If Darwin was right, man is nothing more than a **soulless bag of chemicals** or equally soulless hominid and there is no ultimate fixed meaning or higher purpose to life except what we choose.”
>
> — Linda Kimball (2013), “Our Only Defense Against the Destructive ‘Me’ Generation & Antichrist Utopianists”, Aug 20 [5]

The term "soulless bag of chemicals", as of 2014, has yet to make it into GoogleBooks, and seems to presently reside in the spontaneous colloquial vernacular of the blogosphere, videos, and forums.

Soul scene

In 2008, in *Breaking Bad*, third episode, “… And the Bag’s in the River”, season one, the show opens to Professor White cleaning up the human that had been dissolved in hydrofluoric acid (shown adjacent; lower left), amid which his mind reflects back to, it seems, his college days, and dialogue with a woman, possibly his lover at the time, as shown adjacent right (main image), wherein she reads off the percentage of elements of a human, in moles, to him and he writes them down on a chalkboard, as follows:

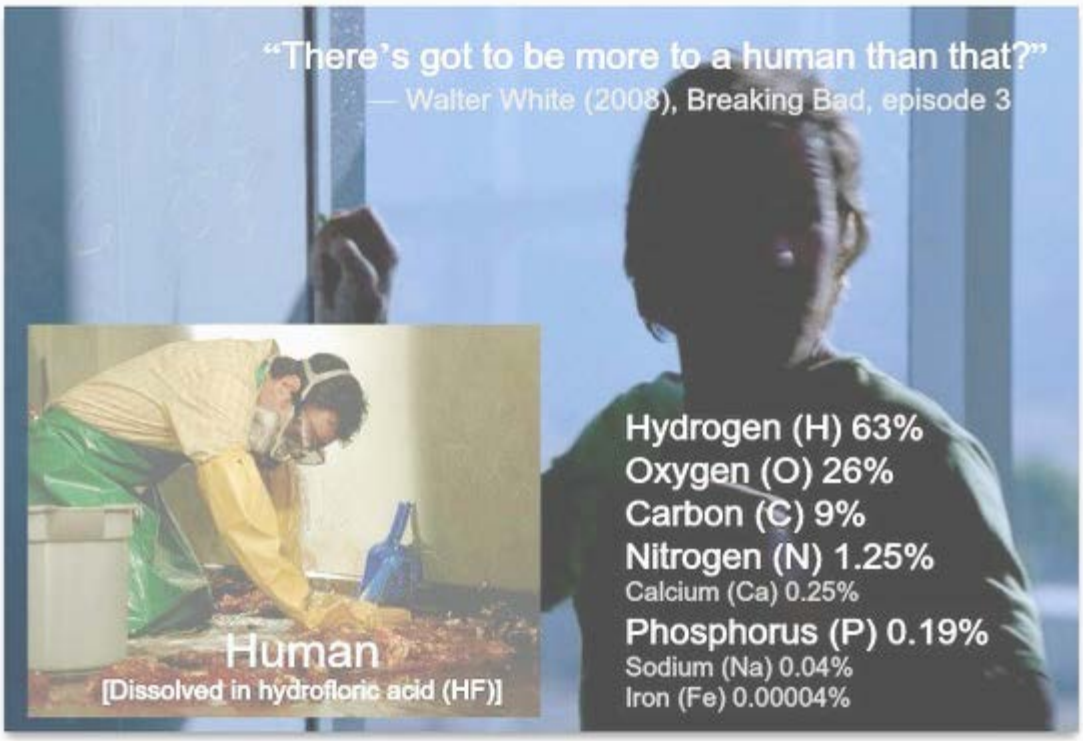

An illustrated diagram, with the CHNOPS elements enlarged, of the "soul" scene from the third episode, season one, of *Breaking Bad*, wherein Walter White and a woman list the elements of a human and speculate on the "soul" as the thing missing from the list.

> Hydrogen (H) 63%
> Oxygen (O) 26%
> Carbon (C) 9%
> Nitrogen (N) 1.25%
> Calcium (Ca) 0.25%
> Phosphorus (P) 0.19%
> Sodium (Na) 0.04%
> Iron (Fe) 0.00004%

at the end of which he comments how he thinks that something is missing, to which the woman replies “the soul”?

See also

- Heated chemical scum | Stephen Hawking (1995) (O)
- Human | see: Physical models timeline
- Soulless molecules | Bruce Bathurst (2009)

References

1. Rowan-Robinson, Michael. (1999). *The Nine Numbers of the Cosmos* (pg. 4). Oxford University Press.
2. Bell, Kurt. (2011). "Soulless Bag of Chemicals" (O), LylesBrother, Sep 02.
3. Bell, Kurt. (2011). "Soulless Bag of Chemicals: Secular Thinking - LylesBrother" (O), YouTube: LylesBrother, Sep 02.
4. Stein, Jacob. (2012). "Does Egyptian History Contradict the Torah" (Thread comment) (O), TorahPhilosophy.com, Jan 10.
5. Kimball, Linda. (2013). "Our Only Defense Against the Destructive 'Me' Generation & Antichrist Utopianists" (O), PatriotsAndLiberty.com, Aug 20.
6. Dawkins, Richard. (2008). *River Out of Eden: a Darwinian View* (pg. 154). Basic Books.
7. Dawkins, Richard. (1986). *The Blind Watchmaker* (pgs. 86-87). W.W. Norton & Co.

External links

- Soulless bag of chemicals – AppalachianForums.com.

θΔics

In hmolscience, **Southern James West** (c.1950-) is the penname of an American-Taiwanese new age type of author noted for []

Overview

In 2013, West, in his *No Such Thing as Terminal*, stepped through a non-fictional existography of himself, in the third person, wherein he talks about his paranoid schizophrenic parents, how he tried to understand his abused upbringing via Freudian psychology, intermixed with the Christian views of his parents, his later relationships with women, and how in college he took a physics or "polymer chemistry" course, wherein he learned the following rule: [1]

> "The chemical phase of a system which is the most stable will be the one which the lowest Gibbs free energy."

from which he discerned that talking certain medications can either raise or lower the entropy of DNA, the phase of the proteins making neuro-structure of the mind, from which he spends pages talking about a secret German free energy based cancer cure, the gist view of which being that "with cancer you didn't have equilibrium any more" along with longevity theory; amid which he seems to go into some type of conspiracy theory, about how this was suppressed by the US government, or something along these lines.

See also

â— Georgi Gladyshev

References

1. (a) West, Southern J. (2013). *No Such Thing as Terminal: the Rediscovery of the Lost Secret German Cure for Cancer and the Fountain of Youth* (pg. 244). Trafford Publishing.
(b) Southern James West (about) – NoSuchThingAsTerminal.com.

Videos

â— West, Southern J. (2011). "DNA and Phonons" (Ñº), Shouwei86, Apr 11.

θΔics

In science, **space** is a place empty of matter; the region between things; generally, a void or vacuum.

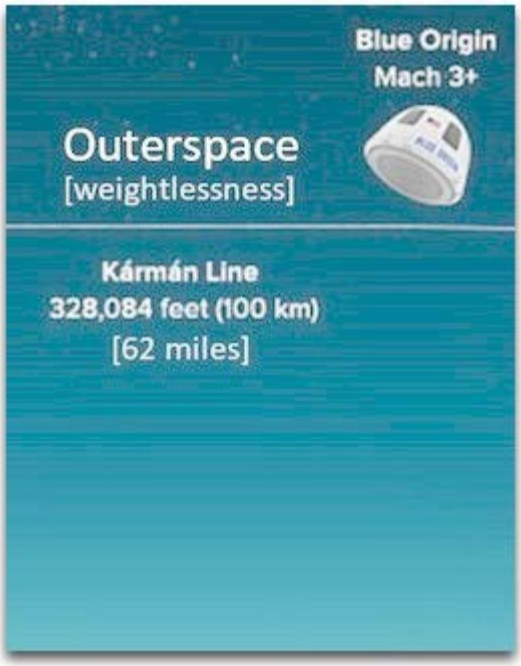

Quotes

The following are related quotes:

> "The totality consists of bodies and **space**. The fact of sensation itself universally attests that there are bodies, and it is by reference to sensation that we must rationally infer the existence of imperceptible bodies. If what we call 'void' or 'space' or 'impalpable being' were nonexistent, bodies would not have anywhere to exist, nor would they have a medium through which to move, as they manifestly do."
>
> — Epicurus (c.350BC), "Letter to Herodotus"; as translated by George Strodach (1963) in *Epicurus: the Art of Happiness* (pg. 93) [1]

> "Could empty **space** exist, and is heavenly space unbounded?"
>
> — Otto Guericke (c.1647), mental note; in *Magdeburg Experiments on the Existence of the Vacuum* (pg. #)

In 1663, Otto Guericke, after making experimental vacuums, stated that atmosphere has pressure, and that at a certain height above the earth, **space** or a pure vacuum exists. [3]

> "Even though a vacuum in a strictly scientific sense cannot be produced here on earth, nonetheless we perceive the reason, for clearly, the effluences of matter prevent this. Where substances are no longer found, however, far above the earth, there will be no effluence of things. With the cause lacking, the effect is absent. Consequently, **space** must be empty. Would it not be more rational to hold that whether or not there is an intermediate substance or not, that 'space', nonetheless, exists and endures, independent of motion and rest and that it makes no difference whether anything corporeal is present in it or not?"
>
> — Otto Guericke (1663), *Magdeburg Experiments on the Existence of the Vacuum* (pg. 132)

> "The advantage of the principle of least action is that in one and the same equation it relates the quantities that are immediately relevant not only to mechanics but also to electrodynamics and thermodynamics; these are **space**, time, and potential."
>
> — Max Planck (c.1910), Publication [2]

References

1. Epicurus. (c.350BC). *Epicurus: the Art of Happiness* (translator: George Strodach) (pg. 93). Penguin, 2012.
2. Myint-U, TYn, and Debnath, Lokkenath. (2007). *Linear Partial Differential Equations for Scientists and Engineers* (pdf) (pg. vii). Springer, 2011.
3. Guericke, Otto. (1663). *The Vacuum of Space* (*De Spatio Vacuo*). Unpublished; *New Magdeburg Experiments on the Vacuum of Space* (*Ottonis De Guericke Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio*) (preface, pdf) (pg. 132). Janssonius a Waesberge, 1672.

See also

â— Spacetime

External links

â— Space – Wikipedia.

θΔics

In science, **spacetime** (TR:15) or "space-time" is the combination of space and time into a single manifold called Minkowski space (a combination of Euclidean space and time); a geometry, devised by Hermann Minkowski (1907), originally for Maxwell's equations of electromagnetism, which he showed explained the special theory of relativity of Einstein (1905), that includes the three dimensions and a fourth dimension of time or space and time intertwined, not viewed a separate entities as Newton had envisioned, according to which two observers in relative motion could disagree regarding the simultaneity of events; an event in Minkowski geometry being identified as a "world point" in a four-dimensional continuum. [1]

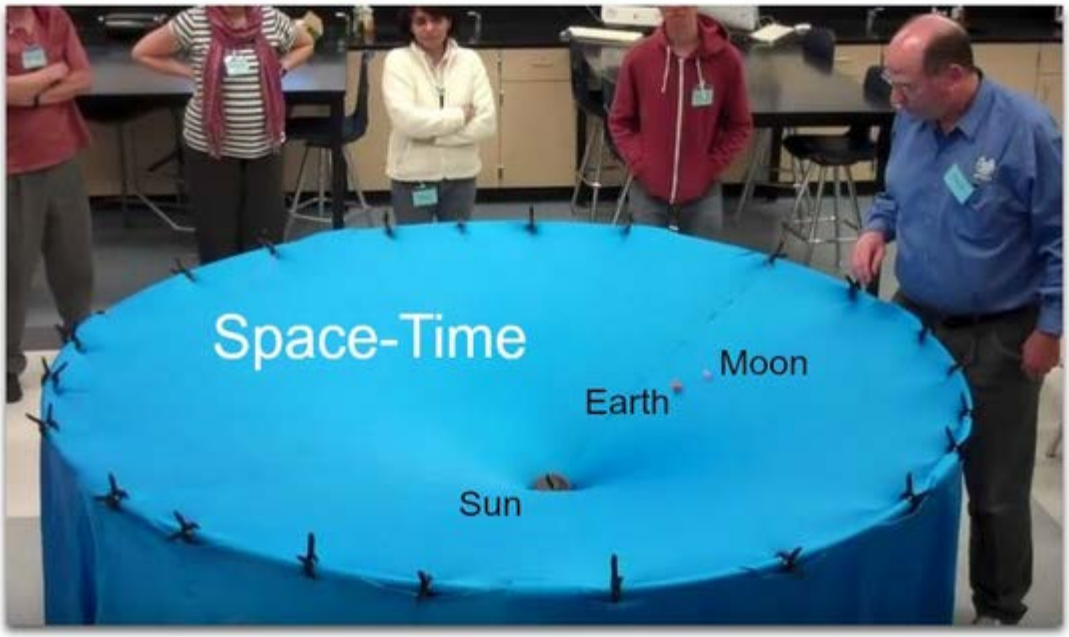

A video (4:43) still of physicist Dan Burns (2012) doing (V) the **space-time** warping demonstration, devised by Shannon Range (2004), constructed (Ñº) from PVC pipe and Lycra, wherein he shows how the warping of spacetime, owing to the mass of each object, sun, moon, and earth, shown here, cause a rotation of the moon about the earth and the moon and earth about the sun.

Exchange force

In 1992, English physical chemist Peter Atkins explained exchange force in the context of spacetime as such: [2]

> "All forces that bind atoms, nuclei, and the deepest components of particles, can be regarded as arising from the interchange of particles. Force is only the codeword for this behavior being played out on the arena of **spacetime**. Spacetime, with its curvature forms the stage; particles distributed as waves pursue straight lines; but particles detach from particles and travel (straight) to others and impress on them their motion. Force is the name of this interchange of particles."

Whether or not forces act attractively or repulsively, supposedly, depends on the spin of the particles being exchanged: even-integral spin particles are attractive, odd-integral spin particles are repulsive between like particles. [2]

Quotes

The following are related quotes:

> "The views of space and time which I wish to lay before you have sprung from the soil of experimental physics, and therein lies their strength. They are radical. Henceforth space by itself, and time by itself, are doomed to fade away into mere shadows, and only a kind of union of the two will preserve an independent reality."
>
> — Hermann Minkowski (1907) (Ñº)

> "Time is not one of the variables of pure thermodynamics."
>
> — Gilbert Lewis (1930), "The Symmetry of Time in Physics"

> “Objects that appear to be pulled through a gravitational force are actually objects traveling through warped spacetime.”
>
> — Anon (2016), synopsis (Ñº) of Einstein’s 1915 general relativity discovery

References

1. Daintith, John. (2005). *Oxford Dictionary of Physics* (pg. 492). Oxford University Press.
2. Atkins, Peter. (1992). *Creation Revisited* (pgs. 64-65). W.H. Freeman & Co.

External links

â— Spacetime – Wikipedia.

θΔics

In science, **spark** (TR:91) is an electric discharge; often used in the sense of being or acting as the activation energy barrier trigger to a combustion reaction, physical combustion or social combustion.

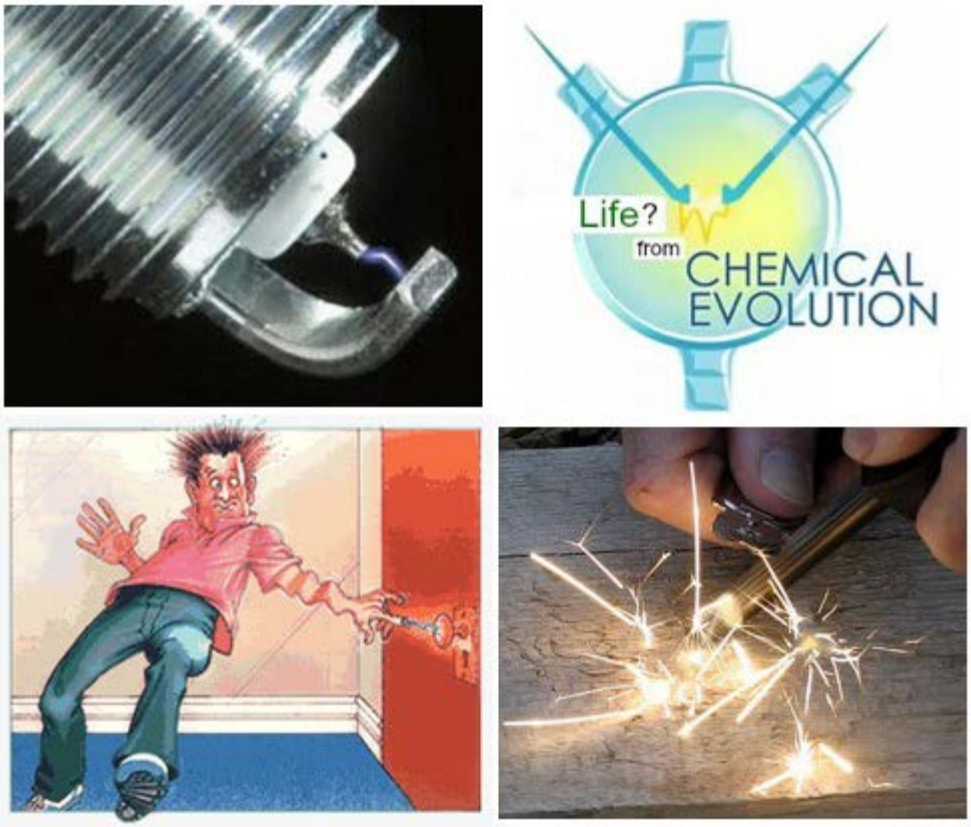

A depiction of a **spark**, in an electric discharge device, of the Miller-Urey experiment variety.

Overview

A number of people assert that 28 Jun 1914 shooting of Austro-Hungarian Archduke Franz Ferdinand by the Bosnian Serb student Gavrilo Princip, a member of the Serbian terrorist organization Black Hand, was the "spark" led to the tipping point, that, within thirty days, led to a global chain reaction that led to WWI, claiming ten million lives, and followup WWII, claiming another thirty million. [1]

Quotes

The following are related quotes:

> "The affinity basically indicates, what people normally call 'chemistry' or the '**spark**'. This chemistry pretty much depends on the compatibility, like having similar likes, similar hobbies, similar ways of thinking, the more affinity the lowest energy and therefore more stability. It sounds tricky, but it is a fundamental principle. Sometimes we think love can manage everything, which for some exceptional cases it can, but there must be affinity in order to be stable."
>
> — Andres Florez (2013), "Thermodynamics of Love", Mar 19 [2]

> "Why is defining life so frustratingly difficult? Why have scientists and philosophers failed for centuries to find a specific physical property or set of properties that clearly separates the living from the inanimate? Because such a property does not exist. Life is a concept that we invented. On the most fundamental level, all matter that exists is an arrangement of atoms and their constituent particles. These arrangements fall onto an immense spectrum of complexity, from a single hydrogen atom to something as intricate as a brain. In trying to define life, we have drawn a line at an arbitrary level of complexity and declared that everything above that border is alive and everything below it is not. In truth, this division does not exist outside the mind. There is no threshold at which a collection of atoms suddenly becomes alive, no categorical distinction between the living and inanimate, no Frankensteinian **spark**. We have failed to define life because there was never anything to define in the first place."
>
> — Ferris Jabr (2013), "Why Life Does Not Really Exist", Dec 2 [3]

See also

â— Spark of life theory
â— Spark of the tongue

References

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(b) Doak, Robin S. (2009). *Assassination at Sarajevo: The Spark That Started World War I*. Capstone.
2. (a) Florez, Andres. (2013). "Thermodynamics of Love", Science & Salsa, Blogspot.de, Mar 19.
(b) Florez, Andres. (2014). "Thermodynamics of Love", Insanitek.net, Feb 3.
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θΔics

In life theories, **spark of life theory** refers to the premise that one particular second in past history of the formation of the solar system, in the context of the nebular hypothesis, an electrical spark put into, engendered, or created in some type of primordial matter brought about the first life form.

There seems to be two distinct versions of the spark of life theory, one holding that the first form of life came into existence following “one spark” or on one particular "spark day"; the other holding that life came into existence or rather emerged as some would to label things, following prolonged sparking.

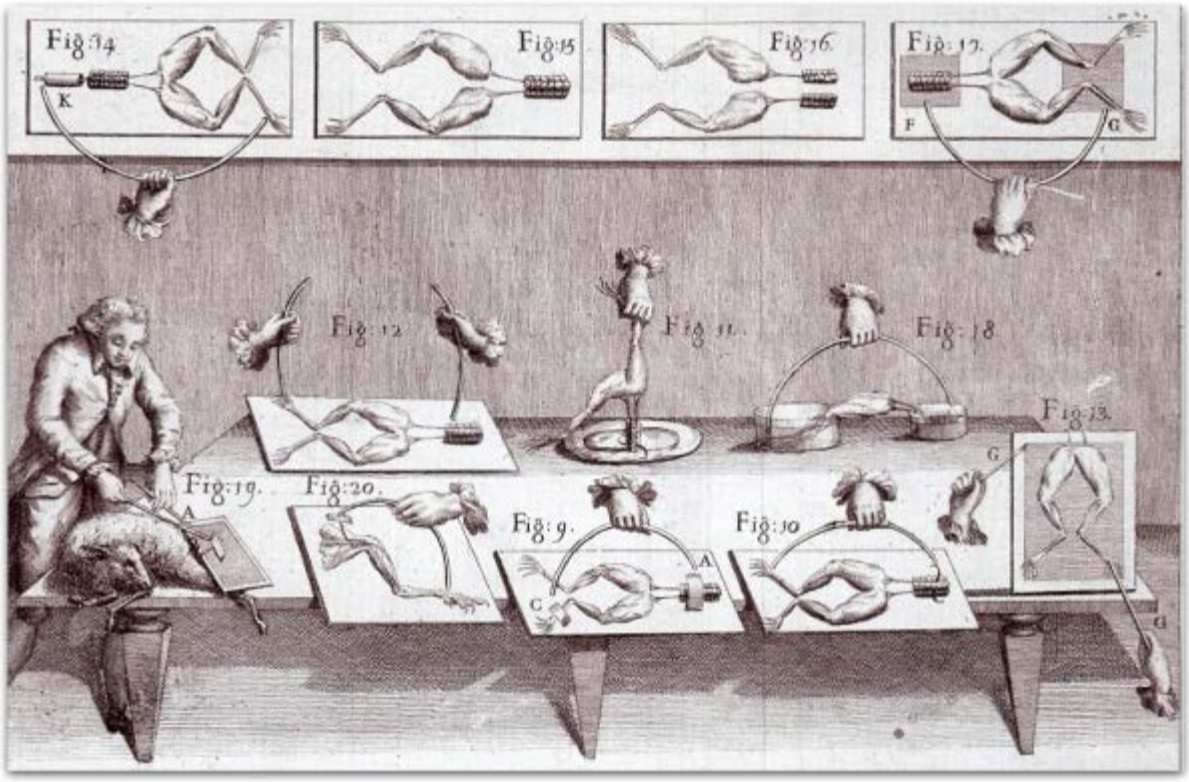

An illustration, from the 2011 *Time Magazine* article section "Electricity Crackles to **Life**", showing Italian Luigi Galvani conducting 1791 experiments of the ability of **sparks** or electricity to produce movement in dead matter (what he termed as "animal electricity"); a further perusal of his 1771 discovery that dead frog legs can be made to twitch when connected to an metal-junction type of electrochemical circuit (frog legs suspended by copper hooks on an iron rail, the arc or switch made by touching a scalpel of the foot to the rail). [6]

The spark of life theory is nearly similar to the lightening origin of life theory, except that the latter holds that life was created following a long period of electrical activity due to atmospheric lightening. A precursor to the spark theory of life was the gunpowder theory of life.

Galvani

In 1771 (or 1776), as the story goes, Italian physician-physicist Luigi Galvani (1737-1789) was slowly skinning a frog at a table where he had been conducting experiments with static electricity by rubbing frog skin. Galvani's assistant touched an exposed sciatic nerve of the frog with a metal scalpel, which picked up a charge. At that moment, they saw sparks and the dead frog's leg kick as if in life. The observation made Galvani the first investigator, supposedly, to make an experimental connection between electricity and animation (or life). This finding provided the basis for the new understanding that electrical energy (carried by ions), and not air or fluid as in earlier balloonist theories, is the impetus behind muscle movement.

In more detail, a series of experiments, Galvani, working at the University of Bologna, found that the electric current delivered by a Leyden jar or a rotating static electricity generator would cause the contraction of the muscles in the leg of a frog and many other animals, either by applying the charge to the muscle or to the nerve. In the strange case of Galvani's frog, this twitching happened even when its legs were not in a direct circuit with the machine. Galvani had placed the lower section of a dissected frog on a table near a plate-type electrical machine.

Then two things occurred simultaneously causing Galvani to stop and wonder. An assistant was drawing a spark from the brass conductor of the electrical machine when a knife held in his hand touched the crural or sciatic nerve passing through the lower part of the spine into the frog's legs. There was an immediate twitch of the muscles and a kick of the legs as if a severe cramp had set in. Galvani wrote: [5]

"While one of those who were assisting me touched lightly, and by chance, the point of his scalpel to the internal crural nerves of the frog, suddenly all the muscles of its limbs were seen to be so contracted that they seemed to have fallen into tonic convulsions."

The 1983 Berni Wrightson depiction of frankenstein: a body brought to life (reanimated) via electricity. [12]

Shelley

Galvani's so-called animal electricity theory and experiments, as they came to be known, later served as the basis to Mary Shelley's famous 1818 story of Frankenstein, about a deanimated-body-part assembled human brought to life by electricity, the decisive moment of life creation by spark being as follows: [8]

"I collected the instruments of life around me, that I might infuse a **spark of being** into the lifeless thing that lay at my feet. … By the glimmer of the half-extinguished light, I saw the dull yellow eye of the creature open; it breathed hard, and a convulsive motion agitated its limbs."

Shelley's story emerged amid heated disputes among London physicians over the nature of life itself. Against the view of mechanists and materialists, who argued life could be reduced to the complex organization of physiology, vitalists asserted that some other force or spirit must be superadded to bodies to achieve living animation. [9]

Vitalist John Abernethy thus declared, "The phaenomena of electricity and of life correspond." [10]

To support their case, vitalists often pointed to the "animal electricity" of Galvani. Italian physicist Alessandro Volta, however, rejected Galvani's claim that such animal electricity was a distinctive form of electricity, and simulated it by bringing different metals into contact in moisture, thus contributing to his invention of the "voltaic pile" or battery. Volta's experiments troubled vitalist accounts, but dramatic experiments supported them. [9]

In London in 1803, and again in Scotland in 1818, experimenters charged the bodies of dead criminals with electricity to witness astonishing convulsions and spasms, suggesting electricity was essential to life: "[E]very muscle in his countenance was simultaneously thrown into fearful action: fear, horror, despair, and ghastly smiles, united their expression in the murderer's face, surpassing far the wildest representations of a Fuseli or a Kean." [11]

Darwin

The dominate version of the spark of life theory, however, seems to have been first put forward in an 1871 letter from Englishman naturalist Charles Darwin to botanist Joseph Hooker, wherein Darwin made the suggestion that: [1]

"The original **spark of life** may have begun in a warm little pond, with all sorts of ammonia and phosphoric salts, lights, heat, electricity, etc. present, so that a protein compound was chemically formed ready to undergo still more complex changes."

The 1952 Urey-Miller experiment famously tested the spark of life theory, the results of which showed that sparks ignited in a

chemical broth, over several days, could make amino acids.

The 2000 book *The Spark of Life: Darwin and the Primeval Soup*, by Christopher Willis and Jeffrey Bada, which originated from a 1998 origin of life symposium, seems to give a cogent history of the spark of life theory. [2]

In the 2010 book *The Universe, God, and Us*, American writer Provident Peterson outlines a real screwy theory—a mixture of God, the periodic table, with focus on a special type of God-infused carbon atom, which he calls the alpha—in which hydrogen reacted with other hydrogen atoms, following the Big Bang, forming all the elements of the periodic table and various other larger molecules, such as water, and that eventually, through the interactions of heat and gravity, a chemical soup of all known elements and water, in the state of chaotic reactions, had formed on the surface of the earth, after which "one specific element resulted in the **first spark** of life" to eventually evolve to create the "human molecule". [3]

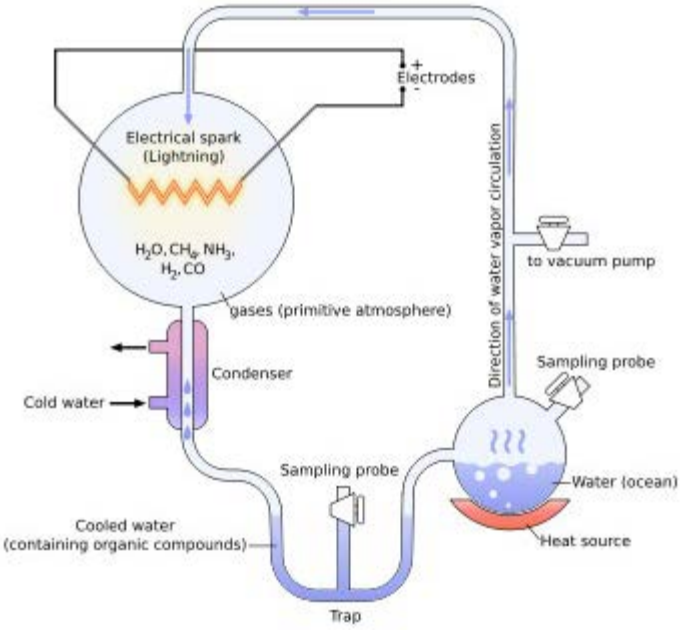

The 1952 **warm pond** experiment of American chemists Stanley Miller and Harold Urey, according to which the so-called "components" of life can be synthesized from simple inorganic components, following several days of "sparking". [7]

Discussion

The central difficulty with the so-called "spark" theory is that it implies perpetual motion or rather perpetual motion of the living kind in the sense that once the spark kicks the one specific primeval reaction past the activation energy point that the so-called "organic reaction" takes off on its own, no longer needing the spark or electricity to keep it going, jumps into the phase of Darwinian evolution, and acquires a form of "self drive" or "self motion", all of which is incongruent and hence resultantly, following prolonged introspection, a defunct theory (see: defunct theory of life).

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4. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (pgs. 214, 248). Morrisville, NC: LuLu.
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5. Luigi Galvani – Corrosion-Doctors.org.
6. Staff. (2011). *Time: 100 Ideas that Changed the World: Histories Greatest Breakthroughs, Inventions, and Theories* (#45: Electricity Crackles to Life, pgs. 64-65). Time, Inc.
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10. John Abernethy, *An Enquiry into the Probability and Rationality of Mr. Hunter's Theory of Life* (London: Longman et al.,1814), p. 42.
11. Andrew Ure, quoted in Iwan Rhys Morus, "Galvanic Cultures: Electricity and Life in the Early Nineteenth Century," *Endeavour*, 1998, vol. 22, no. 1, p. 8.
12. Bernie Wrightson's Frankenstein – Wikipedia.

θΔics

In hmolscience, "**spark of the tongue**" (James, 150), "torch of the spoken word" (Hitler, 1925), or "heated speeches" (Beg, 1987), refers to the parallel of the ability of the tongue, in thermal word usage, to enflame social matter, e.g. a person, crowd, or society, sometimes resulting in social combustion (see: social combustion theory), WWI (1914-1918) and WWII (1939-1945) being two historically detailed examples were "words" produced heated "war" (see: hot war | cold war), similar to the ability of a spark or torch in lighting a forest fire, via the triggering of activation energy (see: social activation energy).

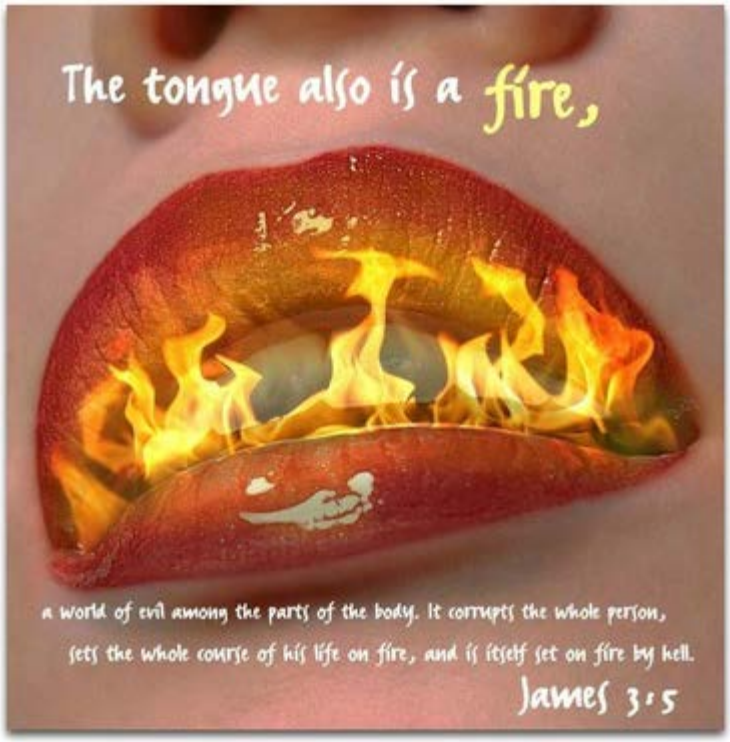

A 2012 DeviantArt.com "fiery tongue" (Q) with the James 3.5 "**spark of the tongue**" quote overlaid.

James 3:5

In circa 150, James, in the fifth of his twenty-two epistles (didactic letter), as found in the New Testament of the Bible, compared the enflamement capability of speech in a dry ear or crowd to that of a spark in kindling or a dry forest; the in-context statement of which James 3:3-6, according to King James Version (1611) translation, reads as follows: [1]

> "Behold, we put bits in the horses' mouths, that they may obey us; and we turn about their whole body. Behold also the ships, which though *they be* so great, and *are* driven of fierce winds, yet are they turned about with a very small helm, whithersoever the governor listeth. Even so the tongue is a little member, and boasteth great things. Behold, how great a matter a **little fire** kindleth! And the tongue *is* a fire, a world of iniquity: so is the tongue among our members, that it defileth the whole body, and setteth on fire the course of nature."

The modern rendition (Q) of James 3:5, according to the New Living Translation (1996), is as follows:

> "The tongue is a small part of the body that makes grand speeches, similar to tiny spark that sets a great forest on fire."

(add discussion)

Lotka

In 1925, Alfred Lotka, in his §17: "The Carbon Dioxide Cycle", opened to the following section of James 3:5: [8]

> "Behold how great a matter a little fire kindleth."
>
> — James (150AD), *Epistle of James*, in: *Bible*, James 3:5

Lotka goes on in the opening of this chapter, building on his previous chapter §1:Regarding Definitions, to argue that the flame model of life is untenable:

> "If the lamp of life is a poetic symbol, it is an image essentially true to fact. Not only is life, in particular animal life, largely a combustion process: like the flame, life reaches out for fuel, and with the power

gained, strains again for more. Like the flame it consumes, and it spreads. And as the fire sends out sparks, of which many die, but a few, falling upon favorable ground, flare up as a second generation, in reproduction of the parent flame; so the living creature scatters its seed, some to die, but some also to live again the life of the parent.

'But', someone perhaps will remark, 'a fire may start without preexisting flame; whereas all life is itself begotten of life.' Is this distinction really so fundamental? In nature undisturbed by man the starting of a fire spontaneously is a rare event; and that, after all, is the most that we can say positively regarding the origination of life from the non-living it is either so rare or so unobtrusive an event as to have escaped our observation.

Compare F. J. Allen's view, as presented by L. L. Woodruff in The Evolution of the Earth and its Inhabitants, 1919, p. 102: "Life at this stage was of the humblest kind, since there were no definite organisms, only diffuse substances trading in energy, and between this stage and the evolution of cellular organisms an immense period elapsed." If this picture of the beginning of life is true to fact, the process was unobtrusive; probably, if we were shown a specimen of such elementary "living" matter, we should not recognize it as such. All this is in accord with what has been said in an earlier chapter regarding the definition of life. **If we continue to use the word life, this is merely a matter of convenience** and does not imply any departure from the point of view set forth in the opening chapters [§1:Regarding Definitions]. See also (pg. 19):

> 'We shall, wherever convenient, continue to employ the terms life, living organism, merely as a matter of convenience. This use of the terms does not imply or resuppose any precise distinction between living and non-living matter; it merely rests upon the fact that in most cases ordinarily met there is essentially universal agreement as to whether a portion of matter is to be classed in the first or in the second category. We will adopt the policy of Sir William Bayliss:
>
> > "If asked to define *life* I should be inclined to do as Poinsot, the mathematician did, as related by Claude Bernard: 'If anyone asked me to define *time*, I should reply: Do you know what it is that you speak of? If he said Yes, I should say, Very well, let us talk about it. If he said No, I should say, Very well, let us talk about something else'."
>
> The ideal definition is, undoubtedly, the quantitative definition, one that tells us how to measure the thing defined; or, at the least, one that furnishes a basis for the quantitative treatment of the subject to which it relates. We have already spoken of evolution. Most of what follows will relate directly or indirectly to evolution. It will be well here, while discussing definitions, to establish a definition, a conception, of evolution that shall, as far as may be, have the quantitative stamp.'

No doubt it took man many thousands of years to acquire the art of lighting a fire, may not in the lapse of time a second Prometheus arise to teach us also how to kindle the torch of life? Let us not delay his coming by closing our minds to the possibility."

To this last section, Lotka he attaches a note [N2] about the history of the secret of the spark, guarded by the Romans, made possible the work of others, as information passed along.

Hitler

In 1925, Adolf Hitler, in

his *Mein Kampf*, stated the following: [2]

> "All great movements are popular movements. They are the volcanic eruptions of human passions and emotions, stirred into activity by the ruthless goddess of distress or by the **torch** of the spoken word cast into the midst of the people."

In 1925, Hitler alluded to the idea that the "torch of the spoken word", when thrown into the crowd, can act as something that starts a social fire, akin to a spark igniting gasoline combustion or a torch thrown into a large pile mound of dry wood, an action depicted in a scene from the 1987 film *Predator*, above left, wherein Dutch (Arnold Schwarzenegger) throws a lit torch onto the a large pile of dry wood on the forest floor; which would give seem to suggest that the people of Germany going into the mid to late 1930s were becoming akin to a type of dry wood or combustible substance at or near its flash point (spark required) or autoignition temperature (no spark required), depending. [4]

Here we see Hitler conceptualizing the "spoken word" as something that can act like an activation energy lowering factor to the triggering of a large scale social chemical reaction, the way a match can ignite wood or gasoline in a combustion reaction.

Hitler, by 1934, true to his national socialism philosophy, no-doubt using the above model in mindset, had seized complete control of Germany and by 1938 had begun to occupy Austria and parts of Czechoslovakia, by 1939 Poland, by 1940 Denmark, Norway, Holland, Belgium, France, Romania, and Yugoslavia, and by 1941 had begun to invade Russia, with supposed aims to conquer all of Europe. [5]

The combustion process typically can be started in two ways, namely by bring a substance to its flash point, the temperature at which a substance will ignite when a spark or flame is applied, or by bringing a substance to its kindling point or autoignition temperature, the temperature at which a substance will ignite, without the need of an applied spark or flame. The autoignition temperature of a substance is the lowest temperature at which it will spontaneously ignite (spontaneous combustion) in a normal atmosphere without an external source of ignition, such as a flame or spark. This temperature is required to supply the activation energy needed for combustion.

Social pressure

The temperature at which a chemical will ignite, to note, decreases as the pressure or oxygen concentration increases. [6] Here, we may see, by extrapolation, via human chemical reaction theory, that the increase in the social pressure in Germany in the early 1930s may have worked to lower the autoignition temperature of the German people, and thus may have ignited on its own without the need of an external spark or flame to cross the activation energy barrier. Hitler, however, seems to have argued that his "spoken words" acted as the activation energy spark or flame, which would imply that the Germans were at or near their flash point, *not* their autoignition temperature, in July

1934, after the death of President Hindenburg, Hitler declares himself “Fuehrer and Reich Chancellor” over German and abolishes the title of President.

> “At the risk of appearing to talk nonsense I tell you that the national socialist movement will go on for 1,000 years!... Don't forget how people laughed at me 15 years ago when I declared that one day I would govern Germany. They laugh now, just as foolishly, when I declare that I shall remain in power!”
>
> — Adolf Hitler (1934), to a British correspondent in Berlin, June [7]

Another remote explanation to Hitler’s theory that the “torch of the spoken word”, when cast into the crowd, can bring about revolution and or war, knowing that sound is but air vibrations pulsed in waves of certain frequency, impacting on the eardrum, is the comparison of certain crystallization and or freezing processes that will trigger when the test tube is tapped on or supercooled water bottle banged on (above video); see also Mpemba effect and war.

Technically, it would seem to be possible that spoken words (sound) could be employed as a means to start a fire they way rubbing of sticks together can create fire in leaves or kindling via friction. Although, it is difficult to find a citation, it has been suggested that as sound transmitted through powerful speakers can create vibration in objects, that such vibrations in materials rubbing against each other could work to start a fire via heated-generated friction, hence validating Hitler's spoken word argument.

Oxidant concentration

In respect to autoignition temperature being lowering when the oxygen concentration increases, in respect to the German people, this extrapolation is more blurry. Combustion, technically, is a sequence of exothermic chemical reactions between a fuel and an oxidant accompanied by the production of heat and conversion of chemical species. The following is a typical combustion reaction between methane (fuel) and oxygen (oxidant):

$$CH_{4(g)} + 2O_{2(g)} \rightarrow CO_{2(g)} + 2H_2O_{(g)}$$

In comparison to Hitler's spoken words social ignition model, it would seem that the fuel is the German people and the oxidant are the people of the surrounding countries, that when put into contact or mixed can ignite, given the right temperature and possibly the right spark or spoken words.

Beg

In 1987, Pakistani organometallic chemist Mirza Beg, in his *New Dimensions in Sociology*, outlined the following so-called "speech heat theory", in respect to the period shortly before the riots and manslaughter of Direct Action Day (16 Aug 1946), as follows: [3]

> “The speeches made by Hindu extremists generated **high** **heat** in their society. Their emotions were set so high as to interact with violent force with the Muslims and this led to widespread riots, killings, arson and looting.”

This, supposedly, was one of the reaction mechanism steps that led to India and Pakistan to becoming independent and self-governing, in the so-called timeline of British India. (O)

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(b) Adolf Hitler's rise to power – Wikipedia.
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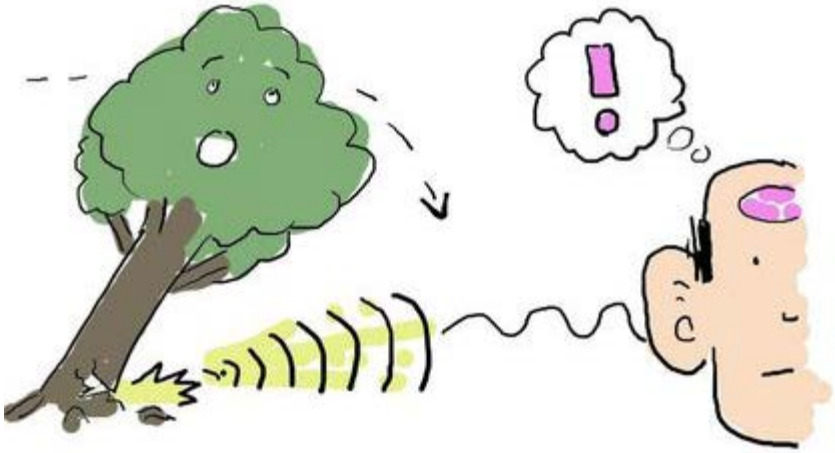

A depiction of the sound of "tree crackling" acting as a sound-induced trigger action, resulting in the "flee reaction"; which can be scaled up to social words and speech producing similar combustion-like human chemical reactions, whether love or war.

8. Lotka, Alfred J. (1925). *Elements of Physical Biology* (republished (Q) as: *Elements of Mathematical Biology*, which includes: corrections from Lotka's notes and a completed list of his publications) (pdf) (Q) (txt) (pg. 218). Dover, 1956.

θΔics

In terminology, **species** refers, for reactive element-based entities above the size of bacteria, generally speaking (e.g. compare virus), to the largest group of organisms in which any two individuals of the appropriate sexes or mating types can produce fertile offspring, typically by sexual reproduction; below this level, the term "chemical species" tends to be employed, with alternative various definitions.

Overview

In 1784, Johann Goethe proved, via discovery of the human intermaxillary bone, that humans "metamorphized" (see: metamorphology) over time from other animals, e.g. apes.

In 1809, Goethe, in his *Elective Affinities*, showed that humans are the result of affinity reaction processes and transformations over time, from smaller chemicals.

In 1859, Charles Darwin, in his *On the Origin of Species*, and later letter interactions, building on Goethe, put forward the theory that human species, a 26-element chemical species (see: molecular evolution table), evolved over time from species of fewer elements, e.g. ape species (24-element species), and fish species (22-element species), which arose from a heated, lighted, and electrified pond of chemicals. [1]

Quotes

The following are related quotes:

> "After my return to England [2 Oct 1838] it appeared to me that by following the example of Lyell in *Geology*, and by collecting all facts which bore in any way on the variation of animals and plants under domestication and nature, some light might perhaps be thrown on the whole subject.... I worked on true Baconian principles, and without any theory collected facts on a wholesale scale, more especially with respect to domesticated productions, by printed enquiries, by conversation with skillful breeders and gardeners, and by extensive reading.... I soon perceived that **selection** was the keystone of man's success in making useful races of animals and plants. But **how selection could be applied to organisms living in a state of nature remained for some time a mystery to me**. In Oct 1838, that is, fifteen months after I had begun my systematic enquiry, I happened to read for amusement Malthus *on Population*, and being well prepared to appreciate the struggle for existence which everywhere goes on ... it at once struck me that under these circumstances **favorable variations** would tend to be preserved, and **unfavorable ones** to be destroyed. The result of this would be the **formation of new species**. Here, then, I had at last got a theory by which to work."
>
> — Charles Darwin (1887), *Autobiography* (Ñº)

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External links

â— Species – Wikipedia.

θΔics

In thermochemistry, **specific heat**, an early synonym of heat capacity, refers to the amount of heat, specific to each body, absorbed or released, requisite to raise or lower the temperature of the body by a certain number of degrees.

Overview

In 1760, Scottish chemist Joseph Black, noted student of evaporative cooling research chemist William Cullen, according to American science historian Frederic Holmes, had discovered the concepts of both latent heat and specific heat, but did not formerly publish on these subjects; accordingly, his views only gradually became known vicariously through his students, associates, and lectures. [8]

To cite one example, in a series of 1780 letters to Black's student James Watt, Portuguese physicist Joao Magellan, who is often credited with having coined the term "specific heat", attacked Black for his failure to publish his own work on heat. [2] Another of Black's students was Irish chemist and physician William Irvine, who in the 1770s developed a theory of heat based on Black's discoveries, using a concept of "absolute heat", differing from Black's ideas to some extent. [9]

Likewise, Irish chemist Adair Crawford, after hearing Irvine lecture at Glasgow, developed a method for measuring specific heats, which following Irvine, he called "heat capacities", wherein he mixed two different substances, initially at different temperatures, and from the final temperature and masses he could calculate their respective specific heats. [8] Crawford, in his 1779 book *Experiments and Observations on Animal Heat*, outlined experiments for determining what he called the "absolute heat" of bodies, which are said to have been the same methods as described by Magellan in 1780. [4]

Some references trace the coining of the term "specific heat" to the circa 1777 work of Irish chemist Richard Kirwan, who used the term "specific fire" as well as bodies having a "capacity" for the "matter of fire" (phlogiston), which it was argued could flow into or out of bodies by the path of least resistance. This usage was adopted by Magellan, as found in his 1780 table of specific heats, who credits Kirwan for his data.

Others, however, cite the work of Swedish chemist Johan Wilcke who in the late 1770s was doing calorimetry work and in 1782 published a paper entitled "On Specific Heat". [5] Some claim that Wilcke's employed the name "specific heat" modeled on the earlier usage of "specific gravity". [6]

Kopp summarizes, that aside from the investigations of Wilke and Crawford, others such as Black and Irvine were among to do the earliest investigations and that Antoine Lavoisier and Pierre Laplace were the ones to introduce ice calorimetry as a method for determining the specific heats of bodies.

In 1865, German chemist Hermann Kopp, summarized the gist of the conception of specific heats, as follows: [3]

> "About the year 1780 it was distinctly proved that the same weights of different bodies require unequal quantities of heat to raise them through the same temperature, or give out unequal quantities of heat on cooling through the same number of thermometric degrees. It was recognized that for different bodies the unequal quantities of heat, by which the same weights of different bodies are heated through the same range, must be determined as special constants, and considered as characteristic of the individual bodies. This newly discovered property of bodies, Wilcke designated as their ***specific heat***, while Crawford described it as the *comparative heat*, or as the *capacity* of bodies *for heat.*"

American thermodynamicist Merle Potter (2011) asserts that the following equation:

$$Q = mC_v\Delta T$$

where Q is heat added to a body, m is the mass of the body, Cv is the heat capacity at constant volume, and ΔT is the temperature change of the body, was the first specific heat equation (fact check). [11]

This quote, referring to the work of Irish chemist Adair Crawford (1748-1795) and Swedish chemist Johann Wilcke (1732-96), succinctly captures a rather detailed history of research on a phenomenon of heating and cooling bodies discovered by Scottish chemist Joseph Black in *circa* 1760.

The following table gives a chronology of the terms "specific heat" and "heat capacity" (or "capacity of bodies for heat") used over the years:

Table of Specific Heat Synonyms
(terminologies, usages, and coinages)

Name	Date	Person
?	1760	Joseph Black (1728-1799) Scottish physicist and chemist
Absolute heat	1770s	William Irvine (1743-1787) Irish chemist and physician
Specific fire	c.1777	Richard Kirwan (1733-1812) Irish chemist
Capacity of bodies for receiving the matter of heat	c.1777	Richard Kirwan
Absolute heat of bodies	1779	Adair Crawford (1748-1795) Irish chemist
Specific heat	1780	Joao Magellan (1722-1790) Portuguese physicist
Specific heat	1782	Johan Wilcke (1732-96) Swedish chemist
Capacities [of substances] for heat	1807	Thomas Young (1773-1829) English polymath
Caloric specific	1824	Anon, *Dictionary of Chemistry*
Capacity for heat / Specific heat	1846	Karl Friedrich Peschel
Heat-capacity	1848	Leopold Gmelin (1788-1853) German chemist
Specific heat | Capacity of bodies for heat	1860	John Johnston
Specific heat (capacity for heat referred to a given weight)	1861	Leopold Gmelin
Specific heat [Capacity		Rudolf Clausius (1822-

for heat]	1865	1888) German physicist
Real specific heat [Real capacity for heat]	1865	Rudolf Clausius
Specific heat capacity	1869	Anon, *Nature*, Vol. 290
Specific heat-capacity	1880	James Hamblin Smith, *An Introduction to the Study of Heat*
Heat capacity	1894	Wilhelm Ostwald

Into the late 1880s, the phrase "specific heat capacity" seems to have come into common usage, as did "heat capacity", a shorthand version of the former, in the 1890s. Some references, in the 1890s, to note, began to differentiate as follows: [10]

â— *Capacity for heat* (Irvine) of a body is the number of units of heat required to raise one pound weight of the body one degree in temperature.
â— *Specific heat* (Gadolin) of a body is its capacity for heat compared with that of an equal weight of water.

These types of definitions, however, only seem to only compound the proliferation of confusion on the mixed usage of terminology on this concept.

Magellan | Specific heat table

Many references attribute the introduction of the term “specific heat” to 1780 publication “Essay on a New Theoretical Law of the Fire Element, and of the Heat of Bodies” by Portuguese physicist Joao Magellan, which contained a table of specific heats. [1] Magellan, however, credits the data of his table to Irish chemist Richard Kirwan, who since 1777 had been working on heat measurements in London, in support of his phlogiston theories.

Kirwan | Specific fire

Kirwan, in his 1787 publications, defined the term specific fire as such: [2]

> “All bodies require a certain quantity of elementary fire or light to heat them to a certain degree, but the quantity requisite to produce this degree varies, according to the nature of the species of these bodies, and hence the proportion suited to each is called their ***specific* fire**; the more of this any species of bodies requires, the greater time it will require, in the same circumstances, either to acquire or to lose it, that is, either to heat or to cool.”

In other words, the term “specific” seems to have been introduced into heat theory as a way to say that each body varies, in a specific way, as to the rate at which it may be heated or cooled by the addition or removal of heat, hence each body as a specific nature to it in regards to how it responds to heating or cooling, as measured by changes in degrees. The way in which Kirwan used the term here, to note, is in the sense that each body will require a certain addition or removal of phlogiston to produce a change of degree, in the sense that phlogiston, the "element of fire", is a substance that can be added or removed from bodies.

Kirwan | Capacity for the matter of heat

That same year, 1787, on the topic of evaporation of liquids by heat, in the context of each body having a certain “capacity” for receiving the matter of heat, Kirwan states: [2]

> “The next general source of cold is *evaporation*; for the attraction of the particles of liquids decreases as

their points of contact diminish, and thereby their **capacity** for receiving the matter of heat, (which is the same as that of light) increases; by this increased capacity, the matter of heat or fire contained in the neighboring bodies, which, like all other fluids, flows where it finds least resistance, is determined to flow towards the vapor; and consequently those bodies are cooled, though the vapor is not heated; because the reaction of its particles is barely equal to that which it had before its capacity was increased."

The exact years in which "specific heat" was replaced by "specific heat capacity" and then by "heat capacity", in its modern usage, remains to be determined.

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External links

â— Specific heat - Eric Weisstein's World of Science.

θΔics

In science, the **Spencerian dilemma** refers to the conflict between the view of “social equilibrium” as a state of piece, and “thermodynamic equilibrium” as a state of total disintegration, according to the heat death view of the second law. [1]

Overview

The phrase “Spencerian dilemma”, common to sociology, dates back to at least the 1930s, and refers to the dilemma English philosopher-scientist Herbert Spencer faced in the use of the concept of equilibrium in his evolution theories when he was told by Irish physicist John Tyndall in *circa* 1858 that that equilibrium in thermodynamics, which contains the two all-pervasive laws of the universe, refers to system death, according to the second law, in the logic of heat death. [2] In short, whereas Spencer originally viewed ultimate equilibrium or “equilibration” to be a state or utopia of social bliss, he was told by Tyndall that ultimate equilibration is ultimate disorder, at which point he was "staggered", becoming ill in spirits over the next several days. Spencer supposedly he never found his way out of this dilemma; at least over the next forth years in his mind. [3]

Resolutions

In 1939, English political scientist George Catlin gave the following definition of the dilemma:

> “**Spencerian dilemma:** does social evolution lead to the differentiation of the individual or to the integration of the society.”

He goes on to state that French sociologist Emile Durkheim provided a solution of the dilemma. [4] According to one 1970s view, what is refers to as the "Prigogine equation", i.e. Belgian thermodynamicist Ilya Prigogine's 1954 division of entropy into two parts:

$$dS = d_eS + d_iS$$

that exchanged at the boundary *deS* and that inside the body *diS*, is said to have “sidestepped the Spencerian dilemma.” [3] Likewise, according to American sociologist Kenneth Bailey, "the Prigogine equation allows complete escape from the Spencerian dilemma". [6]

In general, the dilemma was supposedly resolved in circa 1950, in the minds of many sociologists, when Austrian biologist Ludwig Bertalanffy introduced the idea of “open systems” into sociology and biology via his general systems theory. [5]

See also

â— Boltzmann brain problem

References

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θΔics

In science, **spin** refers to the physical quantification of a particle or entity rotating or 'spinning' about its central axis, a type of angular momentum of the entity that is said to exist even when the entity comes to rest.

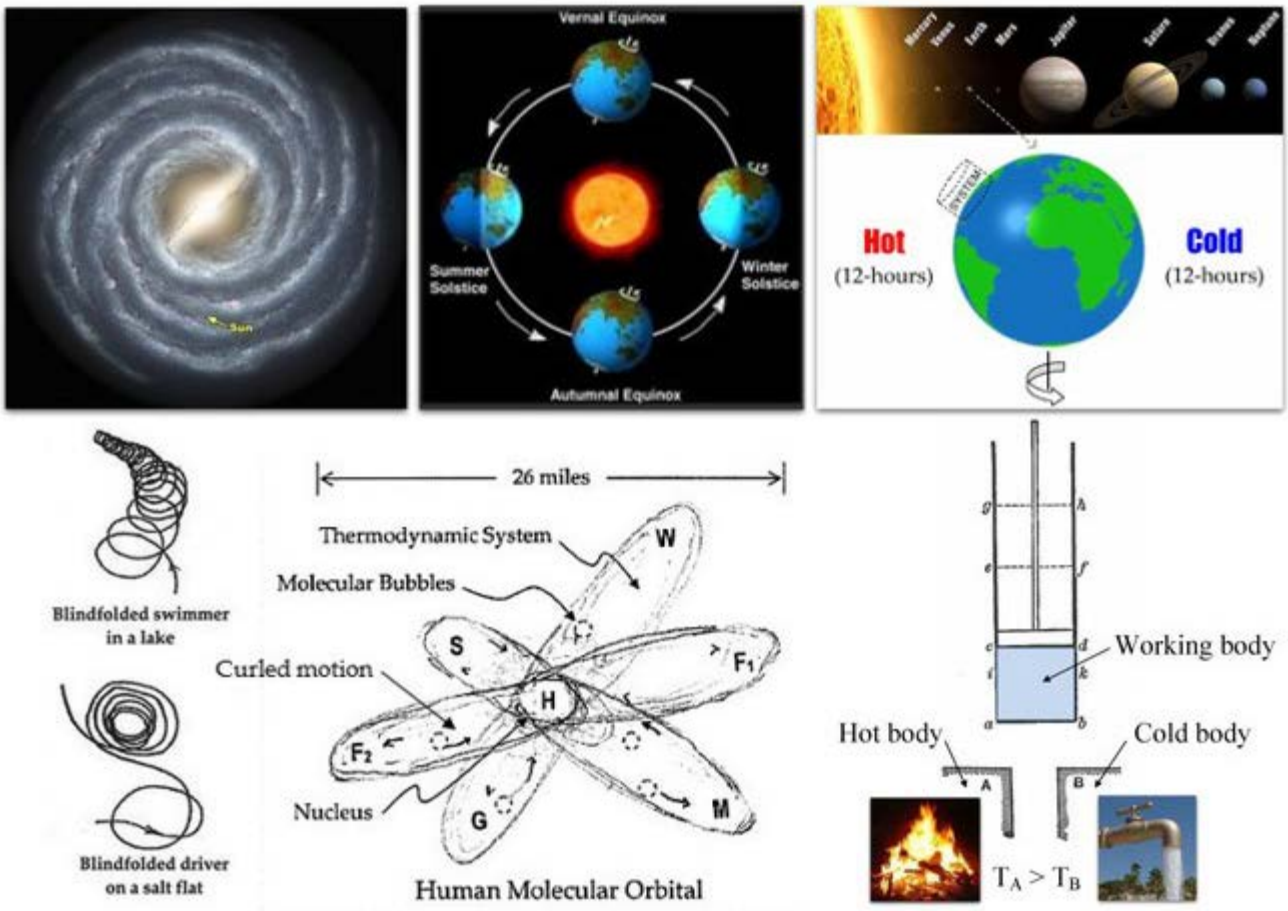

The **spin problem**: explain what the various spins of the universe have to do with each other, i.e. what speed of the local cluster (600 km/s towards the great attractor) has to do with the milky way spin (200 million years/cycle) has to do with the spin of the earth about the sun (365 days/cycle), and what this has to do with the spin of the earth on its axis (24 hours/cycle), which thus initiates daily "heat cycles", and what this has to do with the spin of person in his or her daily orbitals (one day/cycle), i.e. human molecular spin, and what this has to do with nuclear spin and electron spin and what all of this has to do with the movement and spins of fundamental particles (fermions: spin 1) and forces (bosons: spin ½) all in relation to Lewis equality governed synthesis (evolution) and the arrow of time?

History

The basics of the electromagnetic nature of spin was worked out by James Maxwell in 1873, in what is called the right hand rule, the geometrical description of the dynamical nature of the electromagnetic force, based on the earlier experimental work of English chemical physicist Michael Faraday, and his 1831 discovery of electromagnetic induction.

Austrian theoretical physicist Wolfgang Pauli was the first to propose the concept of "spin", but he did not name it. In 1925, Ralph Kronig, George Uhlenbeck, and Samuel Goudsmit suggested a physical interpretation of particles spinning around their own axis. The mathematical theory was worked out in depth by Pauli in 1927.

When Paul Dirac derived his relativistic quantum mechanics in 1928, electron spin was an essential part thereof.

Cycles

The daily cyclical connection of the various 'working bodies' (systems), of continents, six great land divisions of the globe, to the hot body (hot day sky) and cold body (cold night sky) on an alternating basis, which thus drive the various forms of human existence, as coupled reactive heat engines, is a cycle that is a product of the spin or rotation of the sun, which itself is a product of the spin or rotation of the milky way galaxy, which no doubt is connected or coupled, in all probably likelihood to the spin or rotation of something else. In short 'spin' is the factor that drives the 'cycles' of human existence.

Matter | Energy

Entities called fermions , particles with ½ integer spin, are considered as the "matter" portion of the universe. Entities called bosons, particles with integer spin, are considered as the "energy" portion of the universe.

Human | Motions

The diagram shown adjacent, illustrates how humans, when north of the equator, tend to drive on the right hand side of the road, whereas humans south of the equator tend to drive on the left hand side of the road, a spin or rotation like phenomena that owes its nature to the movement of molten electrically charged magma inside of the earth, acting akin to the coils of an electromagnetic transformer, which creates magnetic field lines that point out of the earth in the northern hemisphere and into the earth in the southern hemisphere, thereby inducing humans towards the "natural" driving patters seen on the different continents of the earth.

The "right side driving northern-hemispherers" vs "left side driving southern-hemispherers" is humorously played out when Mick, aka “Crocodile Dundee”, in the 1986 film of the the same title, from Australia, comes to New York:

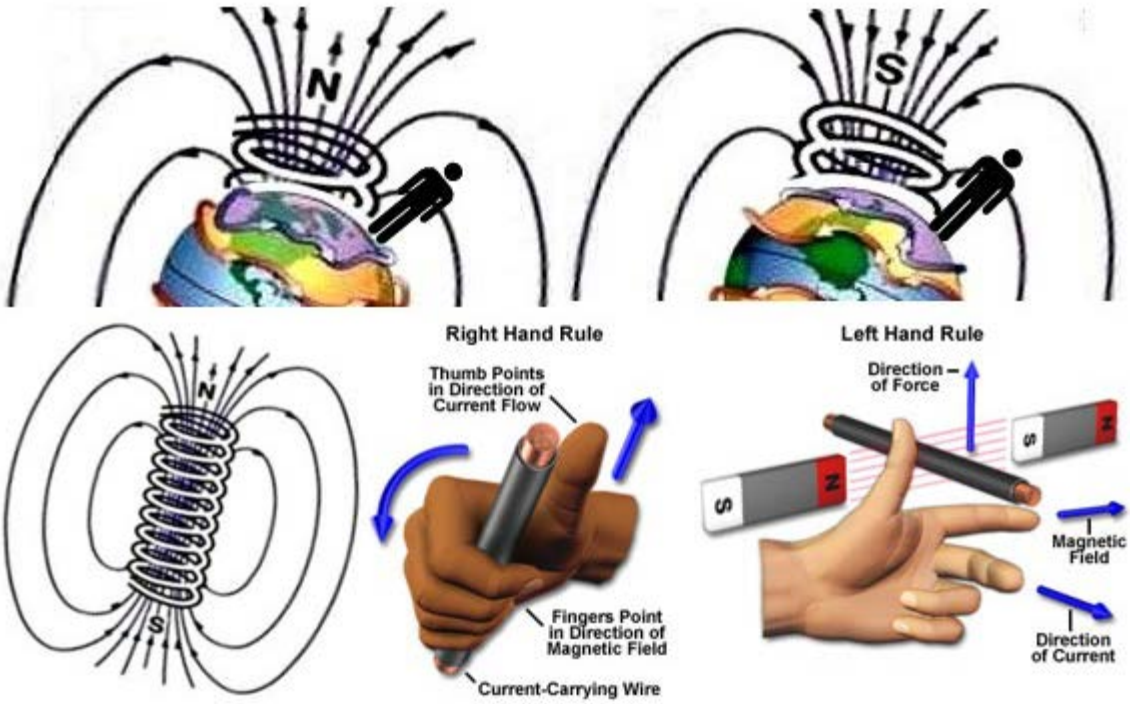

Top (left): People tend to drive on the right hand side of the road (move in a **clockwise** direction) in the northern hemisphere, due to the right hand rule. [2] Top (right): People tend to drive on the left hand side of the road (move in a **counter clockwise** direction) in the southern hemisphere, due to the right hand rule. [2] Bottom (right): Overview of the **right hand rule** and **left hand rule** for describing the behavior of the electromagnetic force in relation to moving charges, magnetic fields, and electric fields. [1]

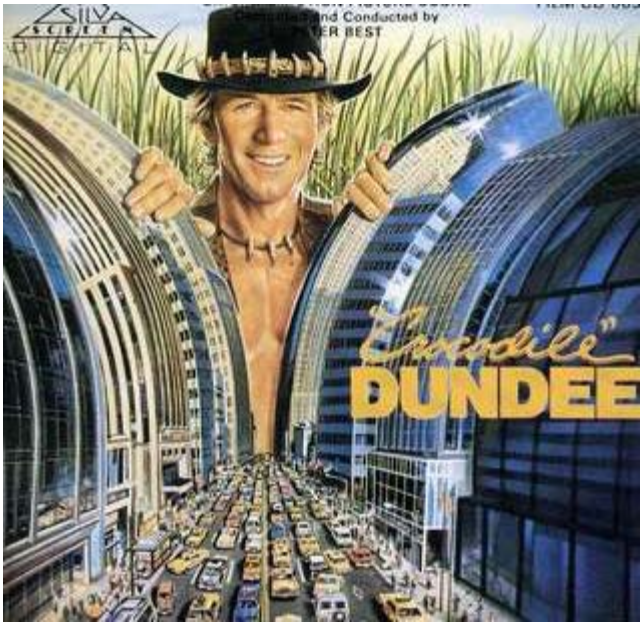

and drives on the "left" side of the road (i.e. "wrong" side of the road, by American standards), which is but what he is naturally use to, and when he encounters a American, who naturally drives on the right side of the road (i.e. the "wrong" side of the road, by Australian standards) driving at him head-on, shouts: “Get on the right side of the road, pelican!”, the term "pelican" being Australian slang for dumb-ass. (Q)

See also

- Turning tendencies
- Human molecular orbital
- Human molecular spin
- Molecular vortices
- Maxwell’s spinning cells
- Gustave Coriolis
- Nassim Haramein

References

1. Right and Left Hand Rules – National High Magnetic Field Laboratory, University of Florida.
2. Right- and left-hand traffic – Wikipedia.

Further reading

- McWeeny, Roy. (1970). *Spins in Chemistry*. Dover.
- Tomonaga, Sin-itiro. (1974). *The Story of Spin.* University of Chicago Press.

External links

- Spin (physics) – Wikipedia.

θΔics

In terminology, **Spinoza's god**, embodied in his motto "god OR nature" ("nature OR god"), the equation "god = nature", or saying "god of Spinoza", among others, refers to the semi-cryptic interpretation or idea of "god", espoused by Benedict Spinoza (1676) [HD:6][FA:27], as a thing "indistinguishable from the universe" (Hecht, 2003) or the "wonderful order, harmony, and lawfulness of all that exists" (Einstein, 1929); Pierre Bayle, in his *Historical and Critical Dictionary* (1697) entry on Spinoza, described this as "clear atheism".

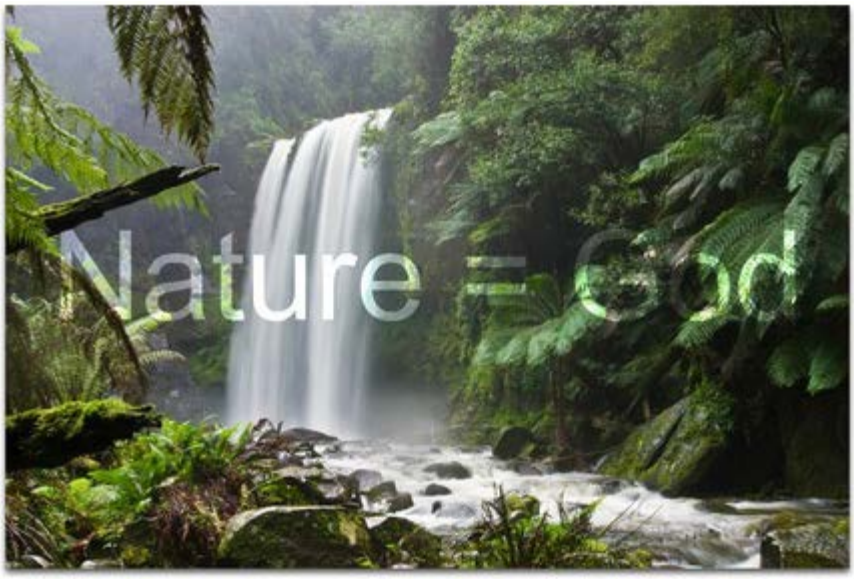

A "**nature = god**" visual of the views of Benedict Spinoza (1676); also stated as: "nature is god" (Q), "nature or god", or "god or nature".

Many thinkers, e.g. Goethe (c.1780), Shelley (1811), Santayana (1922), among others, cite Spinoza's god as their definition or view of god.

Spinoza's god equates to pantheism, "pantheism as a polite form of atheism" (Schopenhauer, c.1844) (Q), or secret atheism (Bunge, 2010), depending on take, argument, or view.

Overview

Spinoza's god or nature pantheism (1650-1950), itself superseding: monotheism (and polytheism before that), in the wake of Paul Dirac's 1927-1933 venting on Einstein and his god's dice talk (see: God does not play dice), and how it is no longer acceptable to use the term "god" in discussions of fundamental particle physics, was superseded by zerotheism (2015), namely that in the exact science of chemical thermodynamics applied to the humanities, zero gods, precisely, exist and "god talk" is no longer acceptable in physicochemical and or thermodynamical descriptions of human behaviors and actions.

Quotes

The following are related quotes:

> "Spinoza does not prove the existence of god. Being is god. If others denounce him as an atheist for this, I wish to exalt him."
>
> — Johann Goethe (c.1810), response to a book that labeled Spinoza as an atheist [1]

> "If ignorance of nature gave birth to gods, knowledge of nature is made for their destruction. Every time we say that god is the author of some phenomenon, that signifies that we are ignorant of how such a phenomenon was able to operate by the aid of forces or causes that we know in nature."
>
> — Percy Shelley (1811), *The Necessity of Atheism* (inspired by Spinoza)

> "My atheism, like that of Spinoza, is true piety towards the universe and denies only gods fashioned by men in their own image, to be servants of their human interests."
>
> — George Santayana (1922), "On My Friendly Critics", *Soliloquies in England* (Q)(Q)

> "I believe in **Spinoza's god** who reveals himself in the orderly harmony of what exists, not in a god who concerns himself with the fates and actions of human beings."

— Albert Einstein (1929), "Cable to rabbi Herbert Goldstein" (Q), Apr 24

"We followers of Spinoza see our god in the wonderful order and lawfulness of all that exists and in its soul ('Beseeltheit') as it reveals itself in man and animal. It is a different question whether belief in a personal god should be contested. Freud endorsed this view in his latest publication. I myself would never engage in such a task. For such a belief seems to me preferable to the lack of any transcendental outlook of life, and I wonder whether one can ever successfully render to the majority of mankind a more sublime means in order to satisfy its metaphysical needs."

— Albert Einstein (1929), "Letter to Eduard Busching" (Oct 29); after Büsching sent Einstein a copy of his book *Es gibt keinen Gott* [*There Is no God*] [2]

"God is nature in Spinoza because god possesses the most conatus, the most ability, the most power; **nature is god** in Spinoza because nature is caused by nothing but itself; nature comes into existence; nature originates."

— Nancy Levene (2004), *Spinoza's Revelation: Religion, Democracy, and Reason* (Q)

"Spinoza's equation '**god = nature**' is self-contradictory, and must be seen as a subterfuge. After all, Spinoza's motto was 'be prudent'. Consequently, the vulgar characterization of Spinoza as a pantheist is incorrect: he was a secret atheist because he was a naturalist. The same holds for Einstein, who once declared that his religion was Spinoza's, i.e. none."

— Mario Bunge (2010), *Matter and Mind: a Philosophical Inquiry* [3]

See also

- Plato's god

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1. Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§: Johann Goethe, pgs. 105-07). Prometheus.
2. (a) Einstein, Albert. (1929). "Letter to Eduard Busching", Oct 29; after Büsching sent Einstein a copy of his book *Es gibt keinen Gott* [*There Is no God*] (Q)
(b) Jammer, Max. (1999). *Einstein and Religion: Physics and Theology* (pg. 51). Publisher.
3. Bunge, Mario. (2010). *Matter and Mind: a Philosophical Inquiry* (Spinoza, pg. 97; Mach, pg. 247). Springer.

External links

- God or Nature (section) – Stanford.edu.

θΔics

In religion, **spirit**, considered as one of the four parts of the laymanized modern person's belief system model of a human, mind, body, spirit, soul, particularly in the world-dominating Anunian theologies belief systems, generally tends to conceptualize as the animating life-imbibing part of the person.

The goddess Isis (grand daughter of Ra) leading Nefertari to the realm of the dead, while placing at Nefertari's mouth and nostrils the Ankh (the symbol of life), so that she will inhale the breath of life, which is the loose origin of the modern-day concept of **spirit** if "breath of life". [4]

Etymology

The term spirit derives from Latin *spiritus* meaning "breath", which has direct connation to the breath of life origin of life theory, in particular act of putting the akh near the mouth of a non-alive body, in Egyptian theology, which itself has older roots in the Heliopolis creation myth.

History

The seven-part Egyptian model of the human, according to which the main constituents of a person were the body, its *ka*, and its name which remained always in close proximity to each other even in the tomb, and the shadow, the *ba*, *sahu* and *akh* which were more mobile and independent, approximately speaking. Generally, the *ka* is what became transmogrified into the modern colloquial view of the "spirit", in short. A lengthier digression would be needed to elaborate on this, as the Egyptian model of the human is rather elaborate and varied, depending.

Religio-science

Into the 18th century, a blending of science (materialism) and religion (spirit + soul) models of origins of humans began to emerge, such as found in French natural philosopher Charles Bonnet's 1745 great chain of being (evolution + religion), his central statement about which is as follows, wherein sees the dualism divide of each being into a corporal part (body) and spiritual part (spirit):

> "Between the lowest and the highest degree of **spiritual** and corporal perfection, there is an almost infinite number of intermediate degrees. The succession of degrees comprises the universal chain. It unites all beings, ties together all worlds, embraces all the spheres."

Hmolscience

In the modern 21st century hmolscience model of what constitutes a human, the generalized physical science view is that each person is constituted of matter (fermions) and energy (bosons). In more detail, the body is constituted in the form of a human molecular formula + human molecular orbital content, the mind generally as hydrocarbon atoms, DHA, EPA, and oleic acid in dominate mass composition, and the quantum electrodynamics that mediate the mind via the exchange force models. What constitutes what was formerly defined as the "soul" (modern) or "ba" (Egyptian) is understood, in differential equation form, in the form of the "moral symbols" of physical chemistry, as German polymath Johann Goethe logically explained in 1809 by to his friend writer-librarian Friedrich Riemer: "The moral symbols of the natural sciences are the elective affinities discovered and employed by the great Bergman." [2] In short, what was considered moral/amoral in olden days can be understood as what is considered as natural/unnatural in the context of chemical thermodynamic "coupling" theory.

The modern physical science translation of reformulation of what the Egyptians considered as "ka", among other parts, or what the modern religions consider as "spirit", however, is a bit more elusive. One does not properly say that the hydrogen atom as spirit or soul, the same which is the case of the human molecule, but the human molecule does classify as a type of animate molecule, hence what in olden days was defined as spirit/ka part of the human can crudely be reinterpreted as a "animation" in some sense of the matter—although further digression into this subject is needed to clarify the legitimacy of this assertion, being that properly speaking all there is in the known universe is vacuum, bosons, and fermions, as current models understand things.

Religious thermodynamics

In the clash between olden days theologies and the modern physical sciences, many often bias thinking and construct "religious thermodynamics" versions of the human spirit, based on a mixture of entropy (or energy) and god, such as done in 2003 by American thermodynamicist Gilbert Wedekind and his book *Spiritual Entropy*. [3] Concepts such as "spiritual energy" or "spiritual entropy" are derivatives of this type of thinking.

See also

â— Spirituality

References

1. Bonnet, Charles. (1764). *Contemplation de la nature* , Vol. I, 27. Trans. Stephen Jay Gould, Ontogeny and Phylogeny (1977), 23.
2. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (moral symbols, pg. 372). Morrisville, NC: LuLu.
3. Wedekind, Gilbert L. (2003). *Spiritual Entropy: Life-Changing Insights Revealed by a Unique Natural law* (pgs. ix, xii, 148). Xulon Press.
4. Various editors. (2007). *The Ankh: Key of Life* (pg. 2). Weiser Books.

External links

â— Spirit – Wikipedia.

θΔics

In terminology, **spiritual** (TR=155), from the Latin *spiritualis* of 'breathing' or 'wind', is a religio-mythology derived term, which, according to Lester Ward (1903), is a colloquial expression for what in physicochemical neutral terminology reform (see: sociology terminology upgrades) is known as vis viva or kinetic energy, when applied to matters of social concern or phenomena. [1]

Quotes

The following are related quotes:

> "God who gave animals self motion beyond our understanding is without a doubt able to implant other principles of motion in bodies which we may understand as little. Some would readily grant this may be a **spiritual** one; yet a mechanical one might be shown …"
>
> — Isaac Newton (c.1700) [2]

See also

- Spirit
- Spiritual energy
- Spiritual entropy
- Spirituality

References

1. Ward, Lester F. (1903). *Pure Sociology: a Treatise on the Origin and Spontaneous Development of Society* (pgs. 167). MacMillan, 1907.
2. (a) Gleick, James. (2003). *Isaac Newton* (pgs. 105-06,148). Vintage Books.
(b) Isaac Newton's religious views – Wikipedia.

θΔics

In religious thermodynamics, **spiritual energy**, a religio-my8thology based science term, refers to the physics definition of energy used in a religiosity sense.

The term, generally speaking, tends to be an effort to define the olden days concept of 'spirit' or the breath of life, primarily of Egyptian origin, in a modern scientific meaning.

In 1907, American sociologist Lester Ward defined spiritual energy, as purely a function of psychological energy and social energy, as follows: [1]

> "I am always very chary about using such expressions as 'spiritual phenomena', because the word *spiritual* has almost become a synonym of supernatural. Yet the word is a perfectly proper one and ought to be redeemed and freely used, more nearly as a synonym of *psychic* in its widest sense, and I shall not hesitate so to use it. The last three chapters have been devoted to showing that spiritual phenomena are as much natural phenomena as physical phenomena, that spiritual forces are true natural forces, and that there is a **spiritual energy**, *i.e.*, a psychic and social energy, that is as capable of doing work as any other form of kinetic energy. In fact it is the highest and most effective form of energy or *vis viva*."

In the 1930s, French philosopher Pierre Teilhard employed the term he term spiritual energy was used significantly. A more recently coined related term is spiritual entropy, a hypothetic sort of entropy analog to physical entropy, albeit defined in the spiritual realm, which is defined crudely by American thermodynamicist Gilbert Wedekind, to the effect that accumulation of 'maximal spiritual entropy' equates to eternal death. [2]

References

1. Ward, Lester F. (1907). *Pure Sociology: a Treatise on the Origin and Spontaneous Development of Society* (thermodynamics, pgs. 97, 168; spiritual energy, pgs. 167-68, etc.). MacMillan.
2. Wedekind, Gilbert L. (2003). *Spiritual Entropy: Life-Changing Insights Revealed by a Unique Natural law* (spiritual entropy, 43+ pgs). Xulon Press.

θΔics

In religious thermodynamics, **spiritual entropy** is a hypothetic sort of entropy analog to physical entropy, albeit defined in the spiritual realm, which is defined crudely by American thermodynamicist Gilbert Wedekind, to the effect that accumulation of 'maximal spiritual entropy' equates to eternal death. [1] A related term is spiritual energy, which is said to be definable in terms of psychological energy and social energy.

References

1. Wedekind, Gilbert L. (2003). *Spiritual Entropy: Life-Changing Insights Revealed by a Unique Natural law* (spiritual entropy, 43+ pgs). Xulon Press.

θΔics

In belief systems, **spirituality** is a flexible-thinking modernist mixture of traditional religion, albeit with less reliance on the word "judgment",philosophy, newer findings in science, and other new age concepts, all with the aim to foster individual freedom, and connection between one's inner self, nature, and the universe.

Etymology

The term "spirituality", as contrasted with "religion", which derives from the Latin *ligare* or "belief systems that bind groups", derives from the the term wind or breath, generally meaning individual animation. This seems to translate to the fact that religion is a group belief system, whereas spirituality is more of an individualist belief system.

In an ancient etymological sense, as over 72 percent of modern religions are derived from Ra theology, the term spirituality seems to be a syncretism of "ka" and "breath of Ptah", in contrast to "ba" the immortal part that gets judged on the afterlife scale of Maat.

Religion

A common modern definition of how modern "elite" American scientists, i.e. those at top universities, see religion as qualitatively different from spirituality include the response "religion is institutionalized dogma" or "religion is organized against individual inquiry", which is said, according to American science culture sociologist Elaine Ecklund, to translate to the effect that religion is the rule of powerful people that propagate false information that is not true and that individual spiritual inquiry protects people from groupthink. [1]

Thermodynamics

The two biggest thinkers in attempting to bridge the gap between "spirituality concepts" and modern chemistry, physics, and thermodynamics are French philosopher, chemist, physicist, paleontologist, and priest Pierre Teilhard (1916-1938) and South African chemical physicist Adriaan de Lange (1982-2010), as discussed below.

In 1896, English psychical researcher Frederic Myers used Maxwell's demon and conservation of energy to explain spirits and afterlife.

In 1916, French philosopher, chemist, physicist, paleontologist, and priest Pierre Teilhard began to developed a "spiritual energy" theory of thermodynamic evolution; used a "human molecule" view; his 1938 *Phenomenon of Man* is his masterpiece, his writing style is very dense and he has near-to a cult following; the gist of his theory is captured in his omega point postulate.

In circa 1960, Anglo-American philosopher Alan Watts wrote on a mixture of thermodynamics and Eastern philosophy, which may a have a sort of "spirituality" theme to it.

In 1982, South African chemical physicist Adriaan de Lange, a very well-read physical-sciences based thinker, claimed to be above the 500+ book level in studying how thermodynamics applies to the humanities, began to view the idea that entropy production must apply to the spiritual world; then, in 1986, while teaching physical chemistry class, grasped the idea that "the intricate calculations concerning free energy in chemical reactions" must apply to the process of knowing and learning, on the extrapolation that student's learning behaviors must follow or map to the behaviors of molecules moving through the chromatograph column; in 1987, completed a yet unpublished manuscript *Entropy, Creativity, and Learning;* in the late 1990s, began posting and discussing his theories at the Learning-org.com forums; and in 2009 published an online book *Irreversible Self-Organization* (in Afrikaans).

Chinese-born English biochemist Mae-Wan Ho's 1993 *The Rainbow and the Worm: the Physics of Organisms*, in which she attempts to pick up where Erwin Schrodinger left off in his famous 1943 *What is Life?*, spending the first chapters on the second law, seems to have a certain spirituality-science crossover blend to it.

Puerto Rican cultural anthropologist turned new-age author Migene Gonzalez-Wippler might have a certain "spirituality" theme to her work (fact-check) with her 1997 *What Happens After Death*, attempts to build a theory of death based on the first law of thermodynamics, albeit in the end digresses to conclude that there is a creative intelligence at work in the universe; likewise, her 1987 book *Kabbalah for the Modern World*, she uses thermodynamics

and entropy to make a case for the existence of a creative force at work in the universe.

American philosopher-psychologist Sean O'Reilly's 2001 *How to Manage Your Dick: Redirect Sexual Energy and Discover Your More Spiritually Enlightened, Evolved Self*, outlines a Freudian-style energy psychology of how to use one's sexual energy productively, explained in terms of energy and entropy, mixed with bits of new age models and Greek philosophy.

American philosopher Christian de Quincey's 2002 *Radical Nature*, attempts to update and synthesize the views of Henri Bergson (1907), Pierre Teilhard (1938), and Arthur Young (1976), to argue that conceptions such as consciousness, free will, and spirit (or soul) extend all the way down the evolutionary ladder to molecules, atoms, electrons, photons and beyond (presumably to the sub-atomic realm).

The various fiction (*Klystar*, 2007) and non-fiction ideas of Chinese-born American nuclear physicist Leong Ying is steeped in a mixture of thermodynamics, religion, and spirituality.

In 2003, American thermodynamicist Gilbert Wedekind published his *Spiritual Entropy*, on the topic of "spiritual entropy" which is an outright search to find and define the concept of being "spiritual" in terms of entropy.

Other possible spirituality-minded thinkers include: Steven Rosen, Mark Janes, DMR Sekhar, David Alkek, Dorothy Sherrill, Richard Rudd, Morgan Peck, and Dickey Eason to name a few.

References

1. Ecklund, Elaine H. (2010). *Science vs. Religion: What Scientists Really Think.* Oxford University Press.

See also

â— Spiritual energy

External links

â— Spirituality – Wikipedia.

θΔics

In hmolscience, **Spiru Haret** (1851-1912) was Romanian mathematical physicist noted, in human physics, for his 1910 *Social Mechanics*, a variant of social mechanics, wherein he explicitly rejected metaphysical reasoning in favor of mechanics based study of social phenomena.

Social mechanics

In 1907, a peasants' rising took place in Romania, to which Haret took notice. The event, in some way, according to Romanian sociology historian Ovidiu Badiaa, was a goad or driving force behind the writing of his 1910 *Social Mechanics*; about which he said the following: [3]

> "We may hope that someday safe methods could be provided to help the solving of many problems which today are often doomed to the inspiration of the moment, or the happening or inclinations."

In his *Social Mechanics*, Haret outlined a mathematical-based formulation of social mechanics, in which he used mathematics and Newtonian mechanics to explain social behavior, in terms of Cartesian coordinates of moving points and velocities. [1] One concept developed by Haret is that of 'social space', as critiqued harshly by Werner Stark. [2]

Education

Haret competed a degree in physics and mathematics at the University of Bucharest in 1874. He received a mathematics diploma in 1875 and a physics diploma in 1876 at Sorbonne and in 1878 completed his PhD with a thesis on *On the invariability of the major axis of planetary orbits*.

Quotes

The following are representative quotes:

> "It may be *mechanical sociology* if it treats of the science of sociology after the mechanical method; and it is also *social mechanics* if you write a book in which you point to the ways and means of applying mechanics to sociology—I did the latter."
>
> — Spiru Haret (c.1910) [3]

> "In our study there cannot be any other metaphysical reasonings. Even in those deeds in which man's will seem to be forcely exerted, phenomena are subjected to fixed laws independent of man."
>
> — Spiru Haret (c.1910) [3]

> "The social diffusion is a complex phenomena and we are doubtful that the plain empiric law of gas diffusion would suffice to explain it. In physics the only elements one has to take into consideration are the densities and, sometimes, the chemical compositions of gases placed in contact with one another. In sociology, the phenomenon is much more complicated. However, the discovery of certain laws of social diffusion which seem difficult is not impossible."
>
> — Spiru Haret (c.1910) [3]

References

1. Haret, Spiru. (1910). *Mecanique Sociale* (*Social Mechanics*). Gauthier-Villars.
2. Stark, Werner. (1962). *The Fundamental Forms of Social Thought.* (quote, pgs. 261-63; Haret, pgs. 65-68).

Routledge.
3. Badiaa, Ovidiu. (1990). “Sociology in Romania”, in: *Glimpses of Sociology in Eastern Europe* (editors: Jiri Kolaja, Man Das) (§7:253-300; §§3:Spiru Haret and social mechanics, pgs. 262-64). M.D. Publications.

External links

â— Spiru Haret – Wikipedia.

θΔics

In chemistry, **spontaneity** refers to the measure of whether a reaction it will go naturally on its own or will require an energy input; determined by the calculation of the change in the Gibbs free energy ΔG of the reaction.

Spontaneity rule

According to the "spontaneity criterion", if ΔG is positive a reaction will only occur if energy is supplied to force it away from the equilibrium position (i.e. when ΔG = 0). If ΔG is negative the reaction will proceed spontaneously on its own to equilibrium. [1]

Human chemistry

In human chemistry, with reference to human chemical reactions, the definition is the same, however, the application of this logic is compounded due to factors such as coupling effects, external forces, the differences of human molecules involved, particle count, system migrations, among other factors. In general, as a first approximation, for earth-bound system, being isothermal-isobaric systems, changes in the Gibbs free energy are useful in indicating the conditions under which a chemical reaction will occur.

Videos

â— Anon. (2008). “AP Chemistry: Thermodynamics 4 – Spontaneity” (Ñº), ChemGuy, Jan 4.

References

1. Daintith, John. (2004). *Oxford Dictionary of Chemistry*. New York: Oxford University Press.

θΔics

In chemistry, the **spontaneity criterion** for a basic chemical reaction, at constant temperature and pressure, is that the calculated measurement of the Gibbs free energy change ΔG for the reaction process, over the extent of the reaction, is a negative value. [1]

Overview

The spontaneity criterion state, in chemical reaction language translation, that for any generic reaction between reactants and products:

Reactants → Products

such as in a combination reaction:

A + B → AB

the "spontaneity" criterion equates to the following set of three rules:

Condition	Description
$dG < 0$	Reaction or process is spontaneous in the forward direction
$dG > 0$	Reaction or process is nonspontaneous (reaction is favored in the opposite direction)
$dG = 0$	System is at equilibrium (there is no net change)

In this sense, the Gibbs free energy *G* or simply "free energy" represents, in the words of American chemist Raymond Chang, "*the energy available to do work*". [2] Here, G equates to instanteous measurements of:

G = H – TS

of each component species, A, B, AB, etc., per unit time, where *H* is the enthalpy component, T is the absolute temperature of the system, and *S* is the entropy component. Thus, if a particular reaction is accompanied by the release of usable energy (i.e. if ΔG is negative), this fact alone guarantees that it will be spontaneous and will go naturally on its own without an external energy input.

Hmolscience

See main: HT principles

In 2005, Libb Thims posted the adjacent set of general rules, classified as HT principles, something he has used as a philosophical guide since circa 2000, extrapolation of the above

outlined spontaneity criterion into the language of crude or general rules to crouch one's choices upon, as reaction guides in times of confusion, so to say. [2] The following Pinterest poster seems to capture principle one: (Ñº)

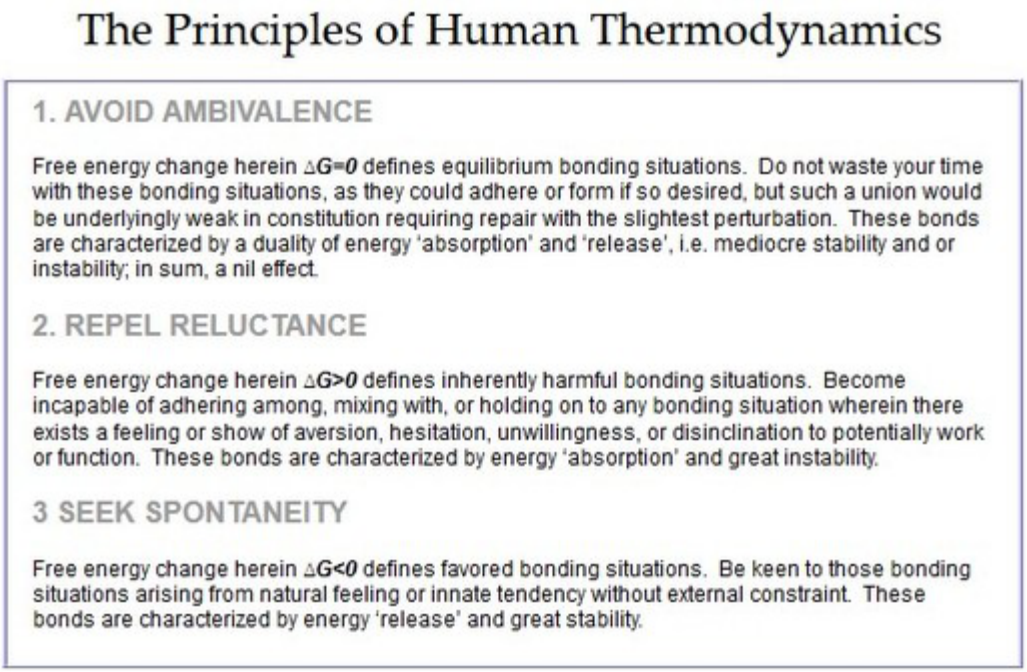

The three HT principles as listed on the HumanThermodynamics.com "principles" page in 2005. [2]

In 2012, Brazilian mechanical engineer, thermal scientist, and philosopher Mahesh Deva gave an in depth critique of the three HT principles. [3]

Thims has pointed these out to young students looking for a basic rule book set of guidance, e.g. to Inderjit Singh (2014), to the six kids in the "Zerotheism for Kids" (2015) lecture, to name two examples, of many, that come to mind.

References

1. Chang, Raymond. (1998). *Chemistry*, 6th ed. (ch. 18: "Entropy, Free Energy, and Equilibrium", pgs. 725-55; pg. 738). New York: McGraw-Hill.
2. Principles – HumanThermodynamics.com.
3. (a) Deva, Mahesh. (2012). "Email to Libb Thims" [to HT.com questions email], read Oct 25.
(b) Mahesh Deva (query emailed to HT.com) – Hmolpedia threads.

θΔics

In chemistry, a **spontaneity table** is table showing a summarized view of how variations in the quantities ΔH, ΔS, and T can combine to determine or yield different spontaneity outcomes chemical reactions.

Overview

A few comparative versions of these spontaneity tables are shown below, in chronological order.

$\Delta H°$	$\Delta S°$	$\Delta G°$	Description*
−	+	−	Spontaneous at all T
+	−	+	Nonspontaneous at all T
−	−	+ or −	Spontaneous at low T; nonspontaneous at high T
+	+	+ or −	Nonspontaneous at low T; spontaneous at high T

Darrell Ebbing's 1990 spontaneity table. [1]

Gibbs Free Energy Change and Spontaneity

Case	$\Delta S_{reaction}$	$\Delta H_{reaction}$	ΔG	Reaction Spontaneity
1	+	−	−	spontaneous at all T
2	+	+	+ or −	spontaneous at high T
3	−	−	+ or −	spontaneous at low T
4	−	+	+	nonspontaneous at all T

A 1996 Eugene LeMay spontaneity table. [2]

ΔH	ΔS	ΔG
−	+	− (spontaneous)
+	−	+ (nonspontaneous)
−	−	± (can be +, −, or 0, depending on the actual magnitudes of ΔH and $T\Delta S$)
+	+	

Raghavan spontaneity table (1997). [7]

ΔH	ΔS	ΔG
+	+	Reaction proceeds spontaneously at high temperatures. At low temperatures, reaction is spontaneous in the reverse direction.
+	−	ΔG is always positive. Reaction is spontaneous in the reverse direction at all temperatures.
−	+	ΔG is always negative. Reaction proceeds spontaneously at all temperatures.
−	−	Reaction proceeds spontaneously at low temperatures. At high temperatures, the reverse reaction becomes spontaneous.

Raymond Change's 1998 spontaneity table. [3]

ΔH	ΔS	$-T\Delta S$	$\Delta G = \Delta H - T\Delta S$	Reaction Characteristics
−	+	−	Always negative	Spontaneous at all temperatures
+	−	+	Always positive	Nonspontaneous at all temperatures; reverse reaction always spontaneous
−	−	+	Negative at low T; positive at high T	Spontaneous at low T; becomes nonspontaneous at high T
+	+	−	Positive at low T; negative at high T	Nonspontaneous at low T; becomes spontaneous at high T

Theodore Brown's 2003 spontaneity table. [4]

ΔG	Spontaneity of Reaction (constant T and P)
ΔG is positive	Reaction is nonspontaneous (reactant-favored)
ΔG is zero	System is at equilibrium
ΔG is negative	Reaction is spontaneous (product-favored)

−	0	+
$\Delta G < 0$		$\Delta G > 0$
Reaction is spontaneous		Reaction is not spontaneous
Product-favored reaction		Reactant-favored reaction
Forward reaction is favored		Reverse reaction is favored

Kenneth Whitten's 2007 spontaneity table. [5]

ΔH	ΔS	Temperature	ΔG	Spontaneous Direction
−	+	All	−	Forward
−	−	Low	−	Forward
		High	+	Reverse
+	+	Low	+	Reverse
		High	−	Forward
+	−	All	+	Reverse

A 2009 Daniel Reger spontaneity table. [6]

American chemist Darrell Ebbing's 1990 spontaneity table is asterisked to note that the terms 'low temperature' and 'high temperature' are relative, to the effect that for certain reactions, high temperature could mean room temperature. [1] We note that room temperature is the temperature at which the majority of human chemical reactions occur, albeit with seasonal fluctuation influence.

American chemist Raymond Change's 1998 table notes that when both ΔH and ΔS are negative that the reverse reaction becomes spontaneous at high temperatures, which loosely finds corroboration with the finding that "divorce season", which begins January 02, corresponds to the point in time at which day light hours begin to increase, and hence the point in time when the system begins to be heated more and more each day.

In 2014, Jason Kahn, in his TEDx talk "Connecting Thermodynamics to Everything" (Ñº), gave the following spontaneity table:

Sign of ΔH	Sign of ΔS	Sign of ΔG	Example
+ (endothermic)	+ (disordering)	+ at low T – at high T	Melting of a solid
+ (endothermic)	– (ordering)	+ at all T	Always unfavorable
– (exothermic)	+ (disordering)	– at all T	Combustion
– (exothermic)	– (ordering)	– at low T + at high T	Formation of structure

(add)

References

1. Ebbing, Darrell D. (1990). *General Chemistry* (pg. 733). Houghton Mifflin Co.
2. LeMay, Eugene, Robblee, Karen M, Baell, Herbert, and Brower, Douglas C. (1996). *Chemistry: Connections to Our Changing World* (pg. 762). Prentice Hall.
3. Chang, Raymond. (1998). *Chemistry* (pg. 740). McGraw-Hill.
4. Brown, Theodore L., LeMay, H. Eugene, Burstein, Bruce, and Burdge, Julia R. (2003). *Chemistry* (pg. 760). Prentice Hall.
5. Whitten, Kenneth W. (2007). *Chemistry* (pg. 587). Cengage Learning.
6. Reger, Daniel L. (2009). *Chemistry: Principles and Practice* (pg. 753). Cengage Learning.
7. Raghavan, P.S. (1997). *Concepts and Problems in Physical Chemistry* (pg. 269). Discovery Publishing House.

θΔics

In science, **spontaneous**, a 1656 term, meaning "occurring without external stimulus", from the Latin *sponte* "of one's own accord, willingly"; something that proceeds from natural feeling or native tendency without external constraint; arises from momentary impulse; controlled or directed internally; developed without apparent external influence, force, or cause, or treatment; not apparently contrived or manipulated: natural. [1]

An "I'm feeling **spontaneous**" T-shirt (Q); showing the thermodynamics behind the phrase, namely a change that involves a free energy decrease.

Etymology

The term "spontaneous combustion" was used in 1795. [2]

In 1891, English thermodynamicist John Parker (c.1860-c.1930), a St. John's College, Cambridge, seventh wrangler (1882) and fellow (1889) (Q), in his *Elementary Thermodynamics*, in his thermodynamic potential chapter, was citing Willard Gibbs (1876) and Hermann Helmholtz (1882), and employing the term spontaneous as follows, modern notation translation (see: characteristic function notation table) shown below: [3]

> "When the only external forces to which the body is subjected consist of a uniform and constant normal pressure, *P*, on the surface, dW = – PdV, so that if we write G for H + PV, or U – TS + PV, the preceding result becomes:
>
> $$dG = 0$$
>
> If, under these conditions, V be also constant, then:
>
> $$dH = 0$$
>
> Let us now suppose that the system is in equilibrium in any state *A* at any uniform temperature T. Then the equilibrium in the state *A* will be unstable if a slight shake or touch, by which no perceptible change is made in the system, causes the equilibrium to be broken in consequence of which the system rushes into some other state *P*. Hence clearly the equilibrium in the state *A* will be stable if every **spontaneous** change of state, like *AP*, is impossible."

(add discussion)

Love | Spontaneity

The is, for some, a strong sense of spontaneity and or a spontaneousness associated with the actions or process of love, falling in love (see also: fall-force), and or love at first sight. American philosopher Robert Solomon gives his somewhat ambiguous take on the situation as follows: [5]

> "We often contrast the 'spontaneity' of the passions with the 'ponderous deliberations' of reason. And it is true that we often 'find ourselves' in a passion. But this appearance must be explained. The fact that we 'find' this to be the case does not entail nor even suggest that we are not ourselves responsible for them. And we all know so well that many times we 'catch ourselves', not *in* a passion, but deliberating—even

ponderously—in an effort to *build up* a passion, 'working ourselves into a rage', 'making ourselves feel guilty', or rehearsing the virtues and possibilities of a prospective 'date' until we virtually *push* ourselves into the dubious abyss into which we allegedly 'fall' when we 'fall in love'. There is nothing '**spontaneous**' about such emotion. And even when our passions are unquestionably spontaneous in that sense, it remains to be seen whether they are not so only because they have been used in similar circumstances so many times before and have already been so often practiced and finely developed. Like the apparently 'spontaneous' genius of a Nicolo Paganini, a James Whistler, or a Thomas Mann, our passions are 'spontaneous' only in the sense that they can benefit from many years of hard work and painful development; and the present masterpiece seems to emerge as if on its own."

(add discussion)

"The clarification in the idiom "waste not free energy" is the recognition that free energy is something that is released from transformations in relationships, and is a function of both enthalpy and entropy. Hence, if you find yourself in a dead equilibrium level relationship or situation, there is no free energy change, and hence you are wasting your existence, but when you do find spontaneous reactions (e.g. love at first sight), treasure it and make the best use of it."

— Libb Thims (2011), post to Eddie Devere's blog "Thoughts on the Thermodynamic Imperative" (Q)

(add discussion)

Quotes

The following are related quotes:

"I wish to lay special emphasis on the word ***spontaneous*** in this title, as embodying my conception of pure sociology. Whatever is spontaneous *is* pure in this sense. Its two other chief synonyms are 'genetic' and 'natural' as opposed to 'telic' and 'artificial.' Still, as the telic faculty is itself a genetic product, it cannot be omitted from a treatment of pure sociology, and, as I have shown, its manifestations are in one sense as strictly spontaneous as are those of the dynamic agent."

— Lester Ward (1903), *Pure Sociology: a Treatise on the Origin and Spontaneous Development of Society* [4]

See also

- Floating magnets experiment
- Spontaneity
- Spontaneity criterion
- Spontaneity table
- Spontaneous process
- Spontaneous reaction
- Spontaneous combustion

References

1. (a) Merriam-Webster Collegiate Dictionary, 2000.
(b) Spontaneous – Online Etymology Dictionary.
2. Spontaneous – Online Etymology Dictionary.
3. Parker, John. (1891). *Elementary Thermodynamics* (§10: Thermodynamic Potential, pgs. 325-43; spontaneous, pgs. 328-30). Cambridge University Press.
4. Ward, Lester F. (1903). *Pure Sociology: a Treatise on the Origin and Spontaneous Development of Society* (thermodynamics, pgs. 97, 168). MacMillan, 1907.
5. Solomon, Robert C. (1993). *The Passions: Emotions and the Meaning of Life* (pg. 60). Hackett Publishing.

Further reading

● Kolesnikov, I.M. (2001). *Thermodynamics of Spontaneous and Non-Spontaneous Processes*. Nova Publishers.

External links

● Spontaneous (disambiguation) – Wikipedia.

θΔics

In chemistry, a **spontaneous reaction**, as contrasted with a nonspontaneous reaction, is a reaction quantified by a negative free energy change. A reaction is said to be spontaneous if it occurs without being driven by an outside force. [1]

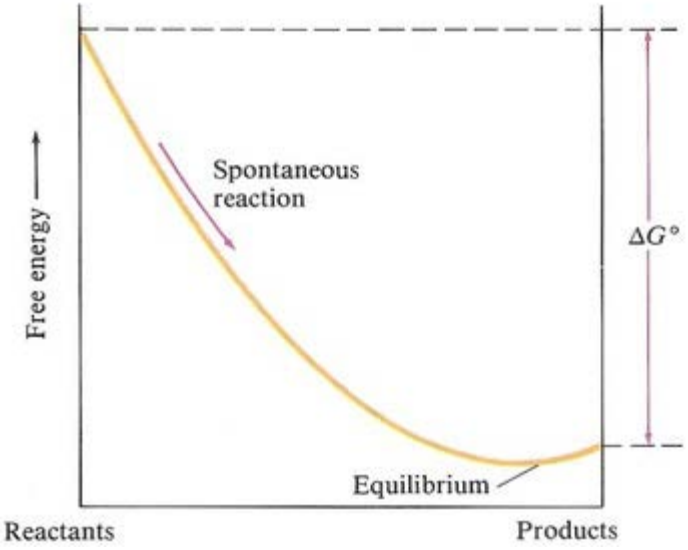

Generic diagram of a **spontaneous reaction**: showing that the free energy decreases as the reaction proceeds, that the greater the slope of decrease the greater the spontaneity, and that at equilibrium the free energy is at a minimum the "equilibrium mixture" is most likely products. [2]

Quotes

The following are related quotes:

> "How can you initiate love? How can you stop love? How can you control love? Love cannot be controlled. You cannot do anything about love. You have to allow love to happen when it happens. Love is a **spontaneous reaction**."
>
> — Rob White (2011), "Love is a Spontaneous Reaction" [3]

References

1. Spontaneous reactions – SparkNotes.com.
2. Ebbing, Darrell D. (1990). *General Chemistry* (pg. 729). Houghton Mifflin Co.
3. White, Rob. (2011). "Love is a Spontaneous Reaction" (Ñº), RobWhiteMedia.com, Aug 19.

External links

â— Spontaneous process – Wikipedia.

θΔics

In existographies, **Spyros Tzafestas** (c.1941-) is a Greek robotics engineer, noted for []

Overview

In 2018, Tzafestas, in his *Energy, Information, Feedback, Adaptation, and Self-organization: The Fundamental Elements of Life and Society*, gives a melting pot theory presentation of a synthesis of: energy, thermodynamics, feedback (cybernetics), self-organization, information, information theory, fourth law of thermodynamics, teleology, etc., amid which he posts a section of "Life and Human Thermodynamics Quotes" (see: human thermodynamics quotes), e.g. by Libb Thims, Christoph Wieland, A.E. Wilder-Smith (Q), etc., in aims to explain human society; an ontic opening stylized agnostic-theism presentation, in short.

Education

Tzafestas completed his BS in physics in 1963 at Athens University, with focus on radio electronics, his DIC in electrical control engineering, at Imperial College, London, his MS in automatic control systems engineering, in 1967, at London University, and his PhD in systems and control in 1969, at Southampton University (Q); presently, he is professor emeritus at National Technical University of Athens.

Quotes | Employed

The following are quotes employed by Tzafestas:

> "What is the difference then between a stick, which is dead, and an orchid which is alive? The difference is that the orchid has teleonomy in it (i.e., information stored in its genes involving the concepts of design and purpose). It is a machine which is capturing energy to increase order. Where you have life, you have teleonomy, and then the sun's energy can be taken and make things grow-increasing its order."
>
> — Arthur Smith (1983). "The Origin of the Universe", a creationist film series [2]

> "Human thermodynamics is the chemical thermodynamic study of human molecular reaction life [existence]."
>
> — Libb Thims (2007), *Human Chemistry, Volume Two* (pg. 653)(Q)(Q) [1]

References

1. Tzafestas, Spyros G. (2018). *Energy, Information, Feedback, Adaptation, and Self-organization: The Fundamental Elements of Life and Society* (Thims, pg. 145; §: Life and Human Thermodynamics Quotes, pgs. 144-46). Springer.
2. Wilder-Smith, Arthur E., Glashouwer, Willem J.J., and Taylor, Paul S. (1983). "The Origin of the Universe" (Q), a creationist film series, PO Box 1167, Marysville WA 98270-1167, USA: Eden Films and Standard Media.

External links

- Spyros G. Tzafestas (faculty) – National Technical University of Athens.
- Spyros Tzafestas – Google Scholar.

θΔics

In science, **Srdan Lelas** (1939-2003) was an Indian science philosopher note, in chnops-thermodynamics, for his his 2000 view that life is a local violation of the second law.

Overview

In 2000, Lelas, in his *Science and Modernity: Toward an Integral theory of Science*, used Maxwell's demon principles and the 1944 negative entropy theories of Austrian physicist Erwin Schrodinger, to argue that:

> "Life is a local violation of the second law of thermodynamics by means of self-production through interaction with environment and reproduction through interaction with other members of the species."

(add discussion)

References

1. (a) Lelas, Srdan. (2002). *Science and Modernity: Toward an Integral theory of Science* (ch. 5: Biosynthesis, pgs. 64-77, esp. pg. 70-72; keyword: Thermodynamics, pg. 135, 246). Springer; Also: 2000, Kluwer Academic (first edition).
(b) Vukelja, T. (2003). "Srdan Lelas (1939-2003).", *International Studies in the Philosophy of Science*, Vol. 17, Part 3, pgs. 309-12.

θΔics

In existographies, **Srinivasa Ramanujan** (1887-1920) (IQ:#|#) (GME:30) pronounced “rama-nu-gen” (Q), was an Indian mathematician, noted for []

Influenced

Ramanujan was an influence (Q) to Abdus Salam (IQ:#|#).

Further reading

● Kanigel, Robert. (2016). *The Man Who Knew Infinity: a Life of the Genius Ramanujan*. Simon & Schuster.

External links

● Srinivasa Ramanujan – Wikipedia.

θΔics

In thermodynamics, **stability** is quantified by a system being located at the bottom of a potential energy well. Belgian chemist Ilya Prigogine argues that stabilities have a different meaning in the far-from-equilibrium range. [1]

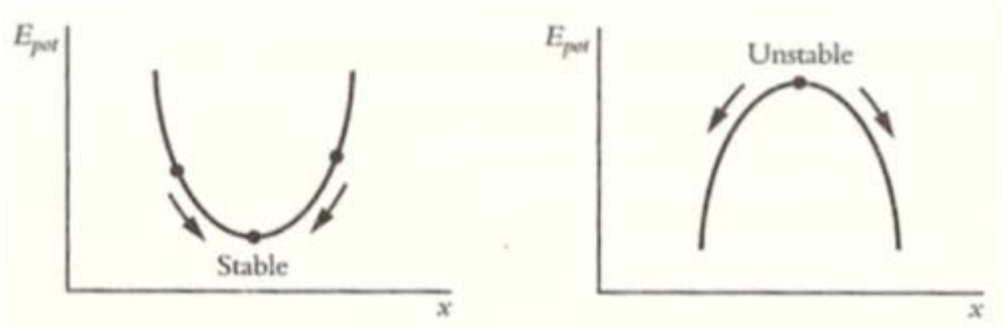

Diagrams of stable equilibrium and unstable equilibrium as a function of the potential energy of a reaction or process versus the extent of reaction. [1]

See also

â— Muller stability ratio
â— Principle of substance stability

References

1. Prigogine, Ilya. (1996). *The End of Certainty: Time, Chaos, and the New Laws of Nature* (stability, 6+ pgs, graph, pg. 30). Free Press.

Further reading

â— Perrot, Pierre. (1998). *A to Z of Thermodynamics* (stability, pgs. 280-83). Oxford University Press.

θΔics

In philosophy, **stages of existence** refers to the various states of perceptual existence a person as a bound state atomic entity pass through in their reaction existence.

The adjacent excerpt by German polyintellect Johann Goethe, from his posthumously-published 1833 *Maxims and Reflections*, is said to depict how his philosophical views changed as he stepped through the various stages of existence, in retrospect (see: Goethe timeline). [1]

Realism

"Every stage of life corresponds to a certain philosophy. A child appears a realist; for it is as certain of the existence of pears and apples as it is of its own being.

(age 9)

(age 15)

Idealism

A young man, caught up in the storm of his inner passions, has to pay attention to himself, look and feel ahead; he is transformed into an idealist.

(age 24)

(age 38)

Skepticism

A grown man, on the other hand, has every reason to be a skeptic; he is well advised to doubt whether the means he has chosen to achieve his purpose can really be right. Before action and in the course of action he has every reason to keep his mind flexible so that he will not have to grieve later on about a wrong choice.

(age 42)

(age 59)

Mysticism

An old man, however, will always avow mysticism. He sees that so much seems to depend on chance: unreason succeeds, reason fails, fortune and misfortune unexpectedly come to the same thing in the end; this is how things are, how they were, and old age comes to rest in him who is, who was and ever will be."

(age 69)

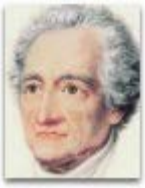
(age 81)

Other

The following end stage four quote by Goethe:

> "... in him who is, who was and ever will be."

seems to have been re-written into the following re-phrased format by English screenwriter Bernard Rose in the 1994 film *Immortal Beloved*: [3]

> "Thus he was, thus he died, thus he will live for all time."
>
> — Anton Schindler (1994), *Immortal Beloved*

on the reaction existence and reaction end of Ludwig Beethoven; the assertion here being that Rose had read or was somehow aware of Goethe's stages of existence quote, being that he already had incorporated the famous 1812 so-called "incident at Teplitz" scene, during the time when Goethe spent four days visiting with Beethoven, in the film.

Quotes

The following are related quotes:

> "What is real? How do you define real? If you're talking about what you can feel; what you can taste; what you can smell and see; then real is simply electrical signals being interpreted by your brain."

— Morpheus (1999), *The Matrix* [2]

References

1. Goethe, Johann. (1833). *Maxims and Reflections* (translator: Elisabeth Stopp). Publisher.
2. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. xix). Morrisville, NC: LuLu.
3. Rose, Bernard. (1994). *Immortal Beloved* (4:17). Columbia Pictures.

θΔics

In genius studies, **stand up study**, or stand up reading and writing method, similar to peripatetic dialogue, refers to the method or reading and or writing, used by many geniuses and literary scholars, according to which writing, reading, and studying is done standing up, e.g. at a naval-height counter top, a specially-designed table, or, if need be, to improvise, a chair placed on a standard diner table.

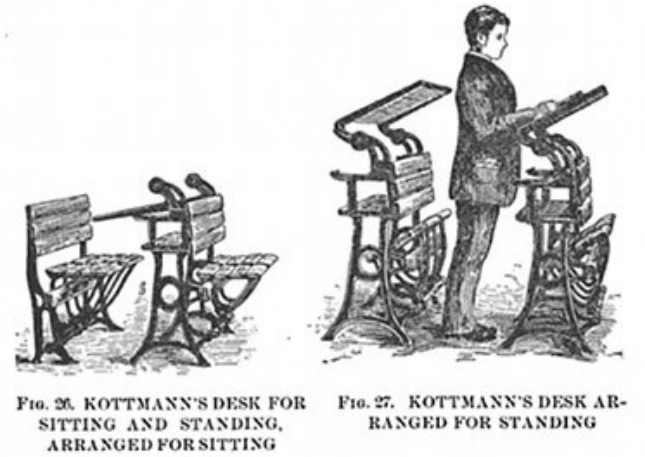

Knottmann's 1899 sit-stand desk; something envisioned by Libb Thims to be required for his college students (if he ever gets his own established classroom); the "**stand method**" being common to geniuses such as: Newton, Hemingway, Nietzsche, and Goethe. [4] Right: a photo (Ñº) of Einstein standing and reading.

Exercise processing | Method

See main: Genius and exercise

Intermittent to stand-up-study (reading and or writing), one is also advised to employ the "exercise processing method" to facilitate the "thinking" portion of information assimilation and processing, namely: use walking, running, biking, or some other form of aerobic exercise, to actuate and speed the mechanism of problem solving and new idea formation. Einstein has said that most of his best ideas were thought up on the bicycle. Dirac has said that he used to take long walks around the city to ruminate on his ideas. Turing ran very-intensely to "get it out of my mind" as he said.

Aristotle

Little is known about how Aristotle wrote his prodigious *Collected Works*, amounting to the most established "theories of everything" ever penned, but it is known that Aristotle, shown below above middle right, had the habit of walking about while he talked:

His followers, called Peripatetics, are said to take their name from the word peripatêtikos, meaning "given to walking about") or because he held lessons beneath the colonnades (or peripatoi) of the Lyceum. [1]

Newton

English physicist Isaac Newton wrote his entire *Principia: Mathematical Principles of Natural Philosophy*, during the years mid 1686 to 28 Apr 1686, in which he proved by geometry, the mode of universal gravitation, namely that if a body Q orbits in an ellipse, the implied force toward the focus S (not the center C) varies inversely with the square of distance, as diagrammed adjacent, while standing; as summarized by James Gleick: [2]

> "The alchemical furnaces went cold; the theological manuscripts were shelved. A fever possessed him, like non since the plague years. **He ate** mainly in his room, a few bites **standing** up. He **wrote standing** at his desk. When he did venture outside, he would seem

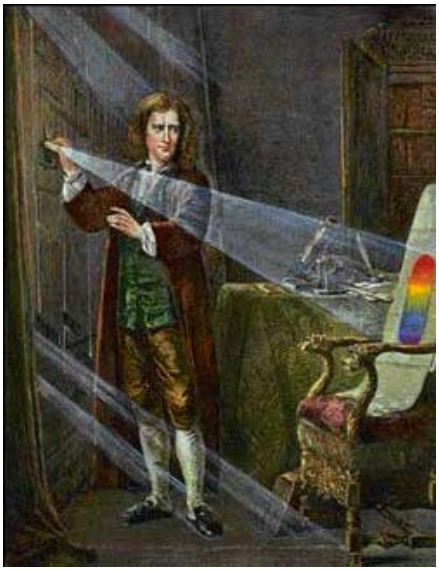

Center: Newton's geometrical proof of universal gravitation: in which he showed that if a body Q orbits in an ellipse, the implied force toward the focus S (not the center C) varies inversely with the square of distance; a proof that he derived while **standing up**.

> lost, walking erratically, turn and stop for no apparent reason, and disappear inside once again. Thousands of sheets of manuscript lay all around, here and at Woolsthorpe, ink fading on parchment, the jots and scribbles of four decades, undated and disorganized. He had never written like this: with a great purpose, and meaning his words to be read."

(add discussion)

Goethe

German polyintellect Johann Goethe was known to using a stand up writing desk, such as the one shown at his house below in Wiemar, Germany: [5]

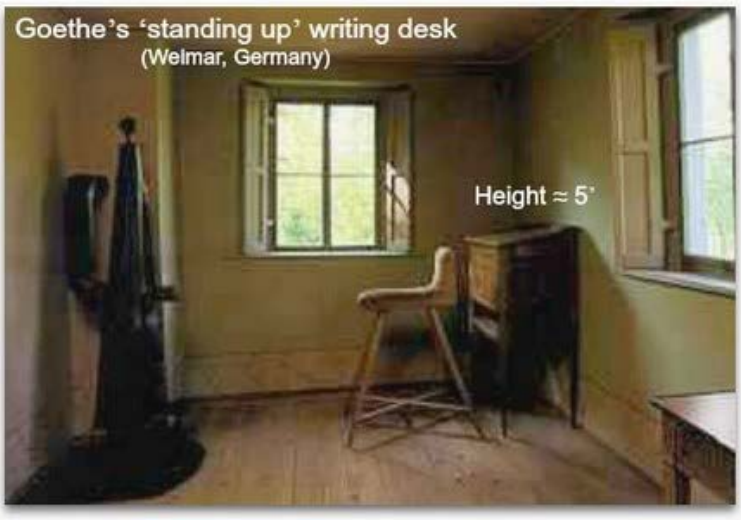

(add discussion)

Hemingway

American literary genius Ernest Hemingway (1899-1961) famously read and write at his standup desk. Hemingway once declaring that:

> "Writing and travel broaden your ass if not your mind and I like to **write standing up**."

which he did by perching his typewriter on a chest-high shelf, while his desk became obscured by books. [3]

Thims

In 1990, Libb Thims, at the age of 19, having never owned a book before, began to engage in his Faustian quest for knowledge, the first step of which being to take courses as Washtenaw Community College and Eastern Michigan University, simultaneously, and to study intensely with the aim to master every subject. The first attempts in this direction were done

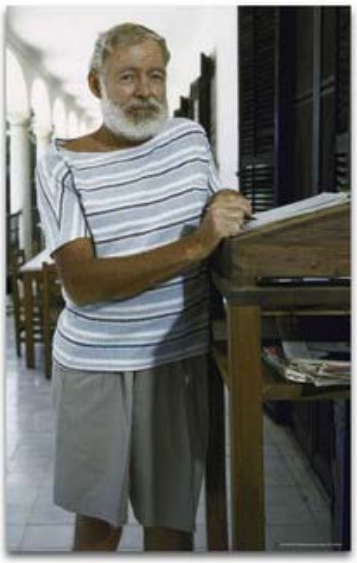

Ernest Hemingway shown at his **stand up writing** desk.

using the standard method of opening a book, siting at a table, and reading, such as shown below left. At a certain point, in the course of this effort, when the period of the "finals" was at hand, and pressure was on, Thims found himself short on sleep, and attempting to study past midnight, and somewhere between 1AM and 3AM, began to nod off, and even with the help of caffeine, was beginning to lose alertness, at which point, in an act of aggressiveness, mixed with anger, at really wanting to succeed, stood up, picked the chair up, and placed it on the table, such as shown below (middle), placed the book on the chair, and began to wake up and continue studying in a more alert and wakeful manner. This sustained effort eventually paid off when Thims got accepted to three of the four engineering schools he applied for, namely: UCLA, University of Michigan, University of Berkeley, California, but not Stanford (as an essay was required, which was not good). While Thims had desired to attend Berkeley, as this was one of the top-ranked chemical engineering schools, at the time, in the country, he decided to stay in his home town and attend the University of Michigan, for financial reasons. During the course of completing two engineering degrees at the University of Michigan, the chair on table study method evolved into the raised folding table method as shown below (right), wherein books were placed under the legs of the table, so that the table was raised to bell button height:

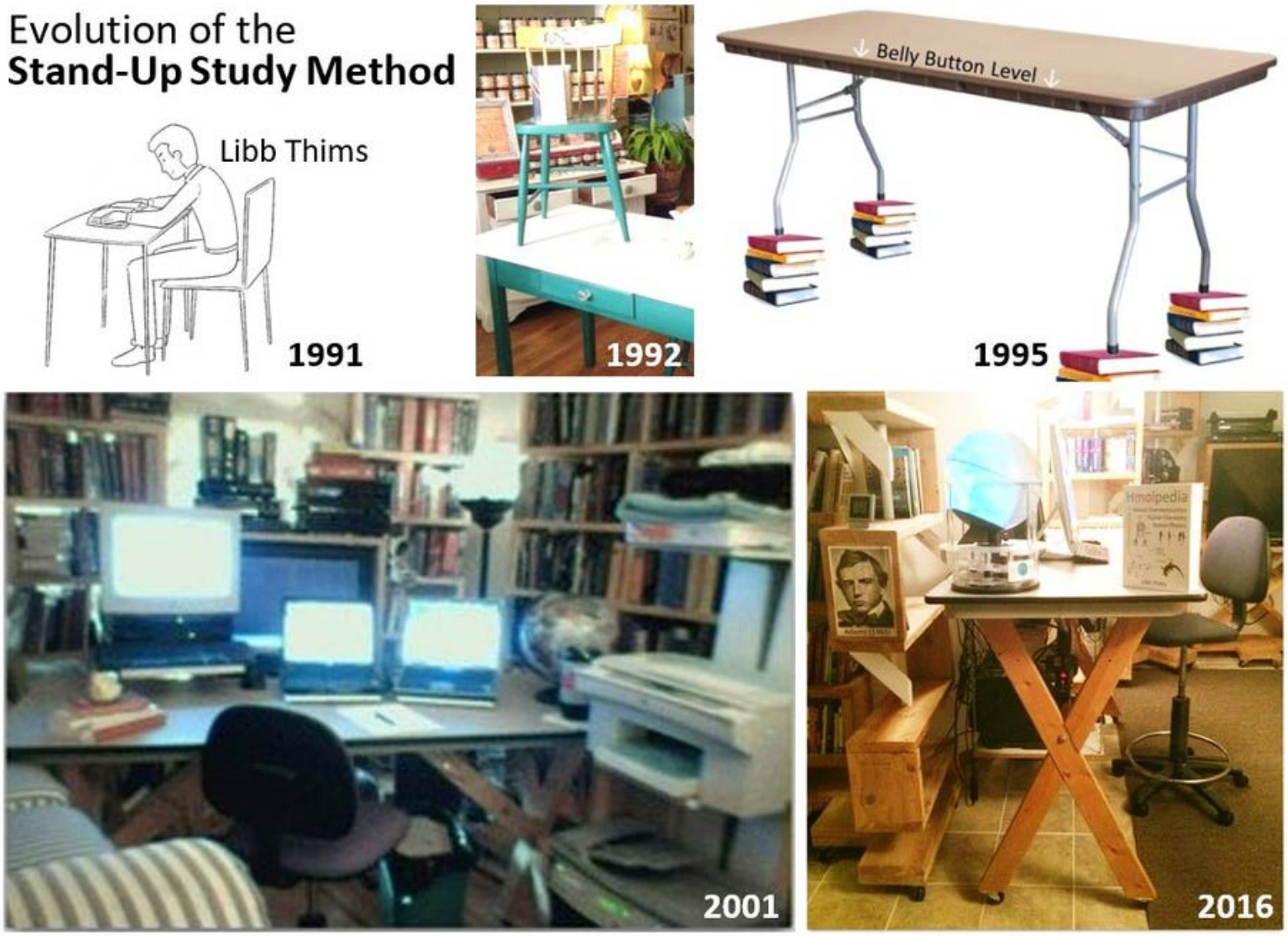

In 2001, after moving to Chicago, Thims removed the folding legs and built wooden legs for the table, with 2-inch caster wheels affixed to each of the four legs of the table, so that the table could be moved around as needed, as shown above (left). At this point, Thims also had three to four computers affixed to the table on swivel arms, so that the computers hovered over the table and could be moved around and re-positioned as needed. In the 2000s, with the advent of large flat touchscreen computers, such as the HP Envy 27-inch computer shown above (right), able to functionally display 80+ webpages, plus multiple word files and computer programs, simultaneously, Thims switched to multiple laptops to one main frame computer. The table is replete with hanging printer, hanging trashcan, art/architecture supply store drafting chair, which Thims uses about 20% of the time, when studying, writing, or reading (80% of the time he stands), and illuminated globe.

Quotes

The following are related quotes:

> "When I visited the house of German writer and artist, Johann Wolfgang von Goethe (the oft-called 'last universal genius') in Weimar many years ago, I was taken by his original writing desk [above]. To stand before the great writer's creative space thrilled me. I was quite literally standing in the spot he wrote his great works; you see, he wrote while standing up. His desk was tall, five feet high and on a slant like a podium. Since then I've discovered other genii who also wrote whilst on their feet. Sir Isaac Newton wrote hisentire *Mathematical Principles of Natural Philosophy* standing up. Ernest Hemingway also wrote standing at a chest height desk on which he'd placed his typewriter.He once said,'writing and travel broaden your ass, if not your mind, and I like to write standing up.' German philosopher Friedrich Nietzsche, and American electrochemical engineer Libb Thims also wrote

A photo of writer Angela Sunde's 2015 stand up desk, based on some of the above examples, which is a bar table purchased at a furniture store. [5]

> standing up. Even Aristotle is credited with walking about while talking and thinking. So, with so many great thinkers to vouch for the benefits of standing up to write, a while ago I purchased a standing desk for myself. You can see in the photo [right] I'm writing at it now."
>
> — Angela Sunde (2015), "Standing Up to Write", Apr 8 [5]

References

1. Pendle, George. (2008/09). "To Sit, to Stand, to Write." *Cabinet*, Issue 32, Winter.
2. Gleick, James. (2003). *Isaac Newton* (pg. 124). Vintage.
3. (a) Mckay, Kate, and McKay, Brett. (2011). "Become a Stand-Up Guy: the History, Benefits, and Use of Standing Desks", ArtOfManliness.com, Jul 05.
(b) Pendle, George. (2008/09). "To Sit, to Stand, to Write." *Cabinet*, Issue 32, Winter.
4. Kotelmann, Ludwig. (1899). *School Hygiene* (pg. 159). C.W. Bardeen.
5. Sunde, Angela. (2015). "Standing Up to Write" (Ñº), Apr 8.

External links

â— IMoVR.com – Lander Desks.

θΔics

In thermodynamics, **standard Gibbs free energy of formation**, symbol, $\Delta G_f°$, refers to the measure of the Gibbs free energy change required to form or synthesize an element or molecular entity from its constituent components at standard state. The standard free energy of formation, according to its original definition, given by central concept initiator Gilbert Lewis, refers to: [2]

> "Values obtained for the increase in free energy, at 25°C, in the formation of a substance (at unit activity) form the elements in their standard reference states."

These values are listed in free energy tables, the first of which were made by Gilbert Lewis and Merle Randall in 1914.

TABLE OF FREE ENERGIES

TABLE OF STANDARD FREE ENERGIES OF FORMATION AT 25°C

CATIONS AND A FEW METALLIC COMPOUNDS

Substance	$\Delta F°_{298}$	Equation (or Table)	Substance	$\Delta F°_{298}$	Equation (or Table)
H^+	0		Hg_2^{++}	36854	T XXX-7
Li^+	−68248	T XXX-7	HgCl(s)	−25137	XXXV-22
Na^+	−62588	T XXX-7	HgO(s)	−13808	XXXIV-15
NaCl(s)	−91792	XXXV-26	Tl^+	−7760	T XXX-7
K^+	−67431	T XXX-7	TlCl(s)	−44164	XXXV-25
$KClO_3$(s)	−69250	XXXV-28	Tl_2O(s)	−32410	XXXIV-55
Rb^+	−67473	T XXX-7	TlOH(s)	−45400	XXXIV-53
Cu^{++}	15912	T XXX-7	Sn^{++}	−6276	T XXX-7
Ag^+	18448	T XXX-7	Pb^{++}	−5630	T XXX-7
AgCl(s)	−26187	XXXV-23	$PbCl_2$(s)	−74990	XXXV-24
Ag_2O(s)	−2395	XXXIV-10	PbO(s)	−41000	XXXIV-57
CaH_2(s)	−34780	XXXIII-4	Fe^{++}	−20350	T XXX-7
Zn^{++}	−34984	T XXX-7	Fe^{+++}	−3120	T XXX-7
Cd^{++}	−18348	T XXX-7	NH_4^+	−18930	XXXIX-11

A section from the original Lewis (1923) **free energy of formation** of chemical substances table (see: free energy table), showing, e.g., that table salt (NaCl) has a free energy of formation, from the elements, at STP, of -91.8 kJ of free energy (Gibbs energy); the basics of which can be extrapolated up to the human level (see: human free energy of formation), to the effect that, e.g., Bill Gates (see: Gates model), in 2016, has a free energy of formation of so many kJ, a quantification of his "existence state" or "becoming" so to say.

Human free energies of formation

See main: Human free energy of formation; See also: Human free energy

One of the more complex subjects in human chemical thermodynamics, is the subject of scaling up the Lewis-Randall model of calculating "standard Gibbs free energies of formation" for any and all atoms and molecular entities to that of the human reaction level, namely of calculating a standard Gibbs free energy of formation for each existing human molecule (person), defined at the point of formation or synthesis, or point of detachment, whether physical (umbilical severing) or orbital (adulthood detachment), from the parental structure.

As to whether or not there exists a "standard" Gibbs free energy of formation, for a general human, the question remains open, being that there seem to be many underlying puzzling issues to this definition. [3]

Historically, the first to state that a mouse has a free energy of formation was American chemist Martin Goldstein in 1993. [4]

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1. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pg. 596). McGraw-Hill Book Co., Inc.
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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
4. Goldstein, Martin and Goldstein, Inge F. (1993). *The Refrigerator and the Universe: Understanding the Laws of Energy*. Cambridge, Massachusetts: Harvard University Press.

Further reading

â— Brezonik, Patrick L. and Arnold, William A. (2011). *Water Chemistry* (table: Free Energies and Enthalpies of Formation of Common Chemical Species in Water, pgs. 758-). Oxford University Press.

External links

â— Standard Gibbs function of formation – Wikipedia.

θΔics

In science, **standard model** refers to the current knowledge of particle physics, namely the quantum mechanics based theory that includes the theory of strong interactions (quantum chromodynamics) and the unified theory of weak and electromagnetic interactions; which sometimes includes "gravity" even though not part of the "standard model" (the graviton is not yet observed).

Chart

The following is a 2000 synopsis of the standard model:

Standard Model of

FUNDAMENTAL PARTICLES AND INTERACTIONS

The Standard Model summarizes the current knowledge in Particle Physics. It is the quantum theory that includes the theory of strong interactions (quantum chromodynamics or QCD) and the unified theory of weak and electromagnetic interactions (electroweak). Gravity is included on this chart because it is one of the fundamental interactions even though not part of the "Standard Model."

FERMIONS

matter constituents
spin = 1/2, 3/2, 5/2, ...

Leptons spin = 1/2

Flavor	Mass GeV/c^2	Electric charge
ν_e electron neutrino	$<1\times10^{-8}$	0
e electron	0.000511	−1
ν_μ muon neutrino	<0.0002	0
μ muon	0.106	−1
ν_τ tau neutrino	<0.02	0
τ tau	1.7771	−1

Quarks spin = 1/2

Flavor	Approx. Mass GeV/c^2	Electric charge
u up	0.003	2/3
d down	0.006	−1/3
c charm	1.3	2/3
s strange	0.1	−1/3
t top	175	2/3
b bottom	4.3	−1/3

Spin is the intrinsic angular momentum of particles. Spin is given in units of ħ, which is the quantum unit of angular momentum, where $\hbar = h/2\pi = 6.58\times10^{-25}$ GeV s $= 1.05\times10^{-34}$ J s.

Electric charges are given in units of the proton's charge. In SI units the electric charge of the proton is 1.60×10^{-19} coulombs.

The **energy** unit of particle physics is the electronvolt (eV), the energy gained by one electron in crossing a potential difference of one volt. **Masses** are given in GeV/c^2 (remember $E = mc^2$), where 1 GeV $= 10^9$ eV $= 1.60\times10^{-10}$ joule. The mass of the proton is 0.938 GeV/c^2 $= 1.67\times10^{-27}$ kg.

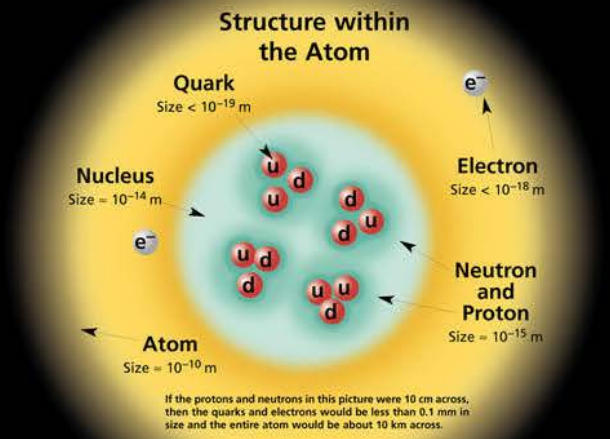

BOSONS

force carriers
spin = 0, 1, 2, ...

Unified Electroweak spin = 1

Name	Mass GeV/c^2	Electric charge
γ photon	0	0
W^-	80.4	−1
W^+	80.4	+1
Z^0	91.187	0

Strong (color) spin = 1

Name	Mass GeV/c^2	Electric charge
g gluon	0	0

Color Charge

Each quark carries one of three types of "strong charge," also called "color charge." These charges have nothing to do with the colors of visible light. There are eight possible types of color charge for gluons. Just as electrically-charged particles interact by exchanging photons, in strong interactions color-charged particles interact by exchanging gluons. Leptons, photons, and ***W*** and ***Z*** bosons have no strong interactions and hence no color charge.

Quarks Confined in Mesons and Baryons

One cannot isolate quarks and gluons; they are confined in color-neutral particles called **hadrons**. This confinement (binding) results from multiple exchanges of gluons among the color-charged constituents. As color-charged particles (quarks and gluons) move apart, the energy in the color-force field between them increases. This energy eventually is converted into additional quark-antiquark pairs (see figure below). The quarks and antiquarks then combine into hadrons; these are the particles seen to emerge. Two types of hadrons have been observed in nature: **mesons** $q\bar{q}$ and **baryons** qqq.

Residual Strong Interaction

The strong binding of color-neutral protons and neutrons to form nuclei is due to residual strong interactions between their color-charged constituents. It is similar to the residual electrical interaction that binds electrically neutral atoms to form molecules. It can also be viewed as the exchange of mesons between the hadrons.

PROPERTIES OF THE INTERACTIONS

Property \ Interaction	Gravitational	Weak (Electroweak)	Electromagnetic (Electroweak)	Strong: Fundamental	Strong: Residual
Acts on:	Mass – Energy	Flavor	Electric Charge	Color Charge	See Residual Strong Interaction Note
Particles experiencing:	All	Quarks, Leptons	Electrically charged	Quarks, Gluons	Hadrons
Particles mediating:	Graviton (not yet observed)	W^+ W^- Z^0	γ	Gluons	Mesons
Strength relative to electromag for two u quarks at: 10^{-18} m	10^{-41}	0.8	1	25	Not applicable to quarks
Strength relative to electromag for two u quarks at: 3×10^{-17} m	10^{-41}	10^{-4}	1	60	
for two protons in nucleus	10^{-36}	10^{-7}	1	Not applicable to hadrons	20

Baryons qqq and Antibaryons $\bar{q}\bar{q}\bar{q}$
Baryons are fermionic hadrons.
There are about 120 types of baryons.

Symbol	Name	Quark content	Electric charge	Mass GeV/c^2	Spin
p	proton	uud	1	0.938	1/2
$\bar{p}$	anti-proton	$\bar{u}\bar{u}\bar{d}$	−1	0.938	1/2
n	neutron	udd	0	0.940	1/2
Λ	lambda	uds	0	1.116	1/2
Ω^-	omega	sss	−1	1.672	3/2

Mesons $q\bar{q}$
Mesons are bosonic hadrons.
There are about 140 types of mesons.

Symbol	Name	Quark content	Electric charge	Mass GeV/c^2	Spin
π^+	pion	$u\bar{d}$	+1	0.140	0
K^-	kaon	$s\bar{u}$	−1	0.494	0
ρ^+	rho	$u\bar{d}$	+1	0.770	1
B^0	B-zero	$d\bar{b}$	0	5.279	0
η_c	eta-c	$c\bar{c}$	0	2.980	0

Matter and Antimatter

For every particle type there is a corresponding antiparticle type, denoted by a bar over the particle symbol (unless + or − charge is shown). Particle and antiparticle have identical mass and spin but opposite charges. Some electrically neutral bosons (e.g., Z^0, γ, and $\eta_c = c\bar{c}$, but not $K^0 = d\bar{s}$) are their own antiparticles.

Figures

These diagrams are an artist's conception of physical processes. They are ***not*** exact and have ***no*** meaningful scale. Green shaded areas represent the cloud of gluons or the gluon field, and red lines the quark paths.

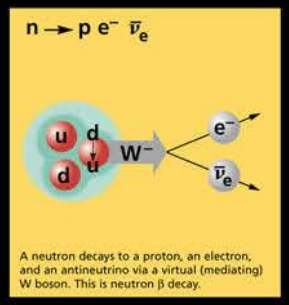

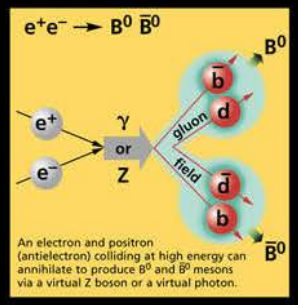

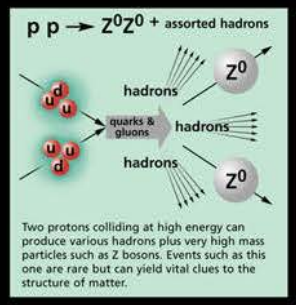

The Particle Adventure

Visit the award-winning web feature *The Particle Adventure* at **http://ParticleAdventure.org**

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See also
â— Empedocles
â— Standard model of human existence

External links

â— Standard model – Wikipedia.

θΔics

In science, the **standard model of human existence** is the current understanding of human existence, activity, and movement, in its past, present, and future states, according to the way modern physical science sees things, which is based on the first and second laws of thermodynamics in core structure.

Overview

The basic points of the "standard model", as defined by modern physical science, are as follows:

	Fact	Implication	Proved by
(a)	The universe is governed by the laws of energy and entropy.	Humans are governed by the laws of energy and entropy	Rudolf Clausius, 1865
(b)	Freely going reactions and processes, on the surface of the earth, are isothermal-isobaric processes.	Gibbs free energy *G* is the governing potential; hence, an earth-bound freely going process is "thermodynamically possible" if and only if it shows a free energy decrease.	Gilbert Lewis, 1923
(c)	There are two types of processes in nature: "natural" (or ~ good) and "unnatural" (or ~ evil).	"Natural" processes, in isothermal isobaric systems, are governed by the Lewis inequality for natural processes ($\Delta G < 0$); "unnatural" processes, in isothermal isobaric systems, are governed by the Lewis inequality for unnaturally processes ($\Delta G > 0$)	Edward Guggenheim, 1933
(d)	Natural and unnatural processes are thermodynamically "coupled" together.	The sum of the Gibbs free energy changes of the "natural processes" dG_N plus the sum of the Gibbs free energy changes of the "unnatural processes" $dG_{\bar{N}}$ must be less than zero: $$\sum_{i=1}^{j} \Delta G_{N_i} + \sum_{i=1}^{k} \Delta G_{\bar{N}_i} < 0$$ for the process as a whole to occur, i.e. be "natural", or exist in nature.	Theophile de Donder, 1936 Fritz Lipmann, 1941 Ilya Prigogine, 1947, 1998
(e)	Free energy change (ΔF or ΔG) is the true measure of chemical affinity A.	In earth-bound isothermal isobaric systems, individual intermolecular affinities, i.e. the forces of attraction, repulsion, bonding formations, etc., are quantified the Goethe-Helmholtz equation: $A = -\Delta G$, thus human passions can be described by either the forces of chemical affinity A or by Gibbs free energy changes ΔG.	Johann Goethe, 1809 Hermann Helmholtz, 1882 Theophile de Donder, 1936
(f)	A human is a large multi-element dynamic reactive surface-attached molecule (human molecule).	Humans are a type of animated molecule: outdated anthropometric ideas and concepts must either be either discarded or amended (to fit that of chemistry, physics, and thermodynamics).	Robert Sterner and James Elser, 2000 Libb Thims, 2002 *New Scientist*, 2005
(g)	The daily heat cycles of the sun are driven by the spin coupling movements of the sun to the center of the milky way.	Daily heat cycles (Carnot cycles) accruing on the surface of the earth, which drive entropy increase or transformation content increase (aka "evolution" or "synthesis") is connected via some type of "induction mechanism" to the rotations of the universe.	Michael Faraday, 1831 James Maxwell, 1873
(h)	Nebular hypothesis	The sun ignited inside of a nebula 4.7 billion years ago and the earth formed son thereafter.	Emanuel Swedenborg (1734)

		Pierre Laplace (1796)
(i) Big bang	Humans are part of a large dynamically coupled system that is moving toward something called the great attractor ; inside of a larger universe, known to be about 13.7 billion years old.	Georges Lemaitre, 1927
(j) ?	The milky way is bound to the local group, which as a whole is moving towards the great attractor at a rate of about 600 kilometers per second	

External links

â— Standard model – Wikipedia.

θΔics

In thermodynamics, **standard state** refers to the state and phase (solid, liquid, or gas) at which an element, chemical species, or molecular entity exists in its normal or natural state, generally taken to be at standard temperature and pressure.

Further reading

● Perrot, Pierre. (1998). *A to Z of Thermodynamics* (standard state, pg. 288). Oxford University Press.

External links

● Standard state – Wikipedia.

θΔics

In science, **standard temperature and pressure** (STP), signified by the degree symbol (°), refers to conditions of standard temperature and standard pressure, defined, according to thermodynamic standard terms, as: [1]

	SI units	lay units
$T_{standard}$	298 K	76.7 °F
$P_{standard}$	101 kPa	1 atm

These values refer to that of typical earth-bound mean yearly conditions of temperature and pressure, conceptualized to be that of the conditions of a typically room temperature and pressure laboratory.

History

The concept of so-called "standard temperature" and "standard pressure" was established in the construction of the first free energy table or “table of standard free energies of formation at 25 °C” made in 1914 by American physical chemists Gilbert Lewis and Merle Randall, and followup expanded 1923 table. [2]

The logic is that at "standard conditions" one finds the elements and various chemical compounds and entities as they are in their natural state, whereas above and below standard conditions, one can synthesize various new compounds and entities.

References

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(b) Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances*, New York: McGraw-Hill Book Co., Inc.
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External links

â— Standard conditions for temperature and pressure – Wikipedia.

θΔics

In human chemistry, **Stanley A. Corngold** (c.1942-) is an American German-literature scholar noted for []

Overview

In 2003, Corngold, in his keynote address “Compulsive Affinities: Goethe, Kafka, Benjamin”, at the University of Western Ontario "Distortion" conference, attempted to dissect German polymath Johann Goethe's famous cryptic advertisement to his riddled 1809 *Elective Affinities* publication, and on the content of the novel theorize on how the characters may be either “charged radicals” or chemical compounds, in the modern sense, among other commentary; the following is one excerpt: [1]

> “The image of elective affinities proposes the likeness between the attraction of charged radicals, on the one hand, and the attraction of pairs of persons, on the other—an attraction that proceeds chiastically (Ñº), over and against their original linkages and domiciles, which in the first instance are chemical compounds and in the second instance aristocratic manor-houses.”

Corngold here seems to be outlining or alluding to the model that certain characters in the novella act like or are "charged radicals", i.e. chemical species lacking or overabundant with one or more electrons, and possibly that a paired couple in an aristocratic manor house is a chemical compound, thus seemingly giving way, possibly, to the notion of the human chemical bond and the dihumanide molecule, respectively.

Other

In 1977, Corngold coauthored *Aspekte der Goethezeit* (*Aspects of the Age of Goethe*). [2] He also was the 1996 English translator of German literary critic Walter Benjamin’s 1922 essay “Goethe’s *Elective Affinities*”. [3] In 2011, he translated Goethe’s The Sufferings of Young Werther.

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2. Benjamin, Walter. (1921). “Goethe’s *Elective Affinities*” (scribd), first published by Hugo von Hofmannsthal in the *Neue Deutsche Beitrage* (1924/25); in: *Selected Writings, Volume 1: 1913-1926* (Elective Affinities, pgs. 297-360). Harvard University Press, 1996.
3. Corngold, Stanley, Curschmann, Michael, and Ziolkowski, Theodore. (1977). *Aspekte der Goethezeit* (*Aspects of the Age of Goethe*). GoÌˆttingen : Vandenhoeck und Ruprecht.

External links

- Stanley Corngold (faculty) – Princeton University.
- Corngold, Stanley – WorldCat Identities.

θΔics

In existographies, **William Stanley Jevons** (1835-1882) (IQ:175|#228) (CR:28), aka "W. Stanley Jevons", was an English economist, natural philosopher, and oft-cited general polymath noted for his theories on utility, for his no origin theory of life ideas, and for his statement of the three moral body problem.

Three moral body problem

See main: Three moral body problem

In 1872, English economist Alfred Marshall, in a review of Jevons' *Theory of Political Economy* (1871), stated the following: [8]

> "Just as the motion of every body in the solar system affects and is affected by the motion of every other, so it is with the elements or the problem of political economy."

In 1874, Jevons, in his *Principles of Science*, discussed how any "complete theory of morals must deal with quantities of pleasure and pain", citing Jeremy Bentham, in reference to the general tendency of each kind of action in relation to the good of the general community, then stated the following: [9]

> "If we are to apply scientific methods to morals, we must have a calculus of moral effects, a kind of physical astronomy investigating the mutual perturbations of individuals. But as astronomers have not yet fully solved the problem of three gravitating bodies, when shall we have a solution of the problem of three moral bodies?"

In 1881, Irish mathematical economist Francis Edgeworth, citing, it seems, Jevons, amid a general discussion of his work, stated the following: [10]

> "What can be expected from mathematics in social science, when she is unable to solve the problem of three bodies in her own department?"

Edgeworth goes on to argue that, via principle discovered by Joseph Lagrange, i.e. Lagrangian, according to which the action or the time-integral of energies of the summation of the velocities of the particles of the system should tend to a maximum, as expanded upon by William Hamilton, i.e. Hamiltonian, according to which the velocity of each part is regarded as derivable from the action of the whole, or the time integral of energy, the following can be arrived at:

> "A solution practical and philosophical, although not numerical and precise, as it exists for the problem of the interaction of bodies, so is possible for the problem of the interaction of souls."

This is all fairly clever logic—humorously as it sounds on first pass—according to which, in modern language, the Hamiltonian, via the expanded logic of Rudolf Clausius (1865) and Willard Gibbs (1876) becomes the Gibbsian, according to which the free energy of the social system tends to a minimum, and the so-called problem of "three moral bodies" (Jevons) or problem of the "interaction of souls" (Edgeworth), becomes reducible to, via physicochemical terminology neutrality reform, to the problem of the reaction (arrival of life), dereaction (arrival of death), and transformations therein, of choice-operational bodies in systems, if indeed the terms moral and amoral derive, etymologically, from the logic of the arrival of Greco-Roman goddess Vita (life) and Mors (death), respectively.

Principles of Science | Continuity theory

In 1874, Jevons published his *The Principles of Science: a Treatise on Logic and the Scientific Method*, wherein he gave the following view of phosphorus in relation to the human: [5]

> "By degrees it is found that the chemistry of organized substances is not widely separated from, but is rather continuous with, that of earth and stones. Life itself seems to be nothing but a special form of that energy which is manifested in heat and electricity and mechanical force. The time may come, it almost seems, when the tender mechanism of the brain will be traced out, and every thought reduced to the expenditure of a determinate weight of nitrogen and **phosphorus**."

This is excellent discernment for 1874, indeed.

> "No apparent limit exists to the success of scientific method in weighing and measuring, and reducing beneath the sway of law, the phenomena both of matter and of mind [mind brain duality]. And if mental phenomena be thus capable of treatment by the balance and the micrometer, can we any longer hold that mind is distinct from matter? Must not the same inexorable reign of law, which is apparent in the motions of brute matter, be extended to the most subtle feelings of the human heart? Are not plants and animals and ultimately man himself, merely crystals, as it were, of a complicated form? If so, our boasted free will becomes a delusion, moral responsibility a fiction, spirit a mere name for the more curious manifestations of material energy. All that happens, whether right or wrong, pleasurable or painful, is but the outcome of the necessary relations of time and space and force, and of the laws of matter emerging from them, which are fixed in the very nature of things.
>
> Materialism seems, then, to be the coming religion, and resignation to the nonenity of human will the only duty. Such may not generally be the reflections of men of science, but I believe that we may thus describe the secret feelings of fear which the constant advance of scientific investigation excites in the minds of many who view it from a distance. Is science, then, essentially atheistic and materialistic in its tendency? Does the uniform action of material causes, which we learn with an ever increasing approach to certainty, preclude the hypothesis of an intelligent and benevolent creator, who has not only designed the existing universe, but who still retains the power to alter its course from time to time?"

He concludes this excellent tract, being already well past the 400+ page mark of his treatise, by commenting "to enter actually upon theological discussions would be evidently beyond the scope of this work."

Theory of Political Economy

In 1871, Jevons published *Theory of Political Economy*—a fuller elaboration, supposedly, of his earlier paper on "A General Mathematical Theory of Political Economy" (1862), written for the British Association—wherein he attempts the following:

> "In this work I have attempted to treat economy as a calculus of pleasure and pain, and have sketched out, almost irrespective of previous opinions, the form which the science, as it seems to me, must ultimately take. The theory of economy thus treated presents a close analogy to the science of statical mechanics, and the laws of exchange are found to resemble the laws of equilibrium of a lever as determined by the principle of virtual velocities. The nature of wealth and value is explained by the consideration of indefinitely small amounts of pleasure and pain, just as the theory of statics is made to rest upon the equality of indefinitely small amounts of energy."

Some of this so-called felicity calculus logic was extended into Francis Edgeworth's *Mathematical Psychics* (1881),

who cites Jevons on his first page. [7]

Coal Question

In 1865, Jevons, in his *The Coal Question*, starting with James Watt's improvements to the steam engine, first defines coal as "material energy", and then goes on to argue that supplies of coal will eventually run out: [1]

> "Coal in truth stands not beside but entirely above all other commodities. It is the material energy of the country — the universal aid — the factor in everything we do. With coal almost any feat is possible or easy; without it we are thrown back into the laborious poverty of early times. With such facts familiarly before us, it can be no matter of surprise that year by year we make larger draughts upon a material of such myriad qualities — of such miraculous powers."

Jevons, having had some background in physical science and chemistry, defines coal as stored fire, so to speak:

> "Fuel—the source of fire—is the source at once of mechanical action and of chemical change."

(add discussion)

Education

In 1850, Jevons, at the age of 15, entered University College School, London, focusing on the natural sciences, his favorite subjects being chemistry and botany, and he also studied mathematics under the famous logician Augustus de Morgan. In 1854, owing to financial constraints, Jevons took up an assayership position at the new mint in Sydney, Australia, where he remained for five years. In circa 1859-60, Jevons returned to the University College London, completed his BA and MA, and in 1866 became a professor of logic, mental and moral philosophy, and political economy in Owens college, Manchester.

Logic | Logical machine

In 1860, at the Sydney Mint, Jevons wrote the following in his journal: (Ñº)

> "As I awoke in the morning the sun was shining brightly into my room, there was a consciousness on my mind that I was the discoverer of the true logic of the future I felt a delight such as one can seldom hope to feel. I remembered only too soon though how unworthy and weak an instrument I was for accomplishing so great a work and how hardly I could expect to do it."

Jevons then read George Boole's 1854 *Mathematical Analysis of Logic and An Investigation of the Laws of Thought*, in which he also saw problems. In 1861, Jevons began developing was developing his own system of logic based on what he eventually called the "substitution of similar", whereby philosophy would be shown to consist solely in pointing out the likeness in things. In 1863, he published Pure Logic, selling a dismal four copies sold in 6 months.

In 1869, Jevons published *The Substitution of Similars*, a logic textbook, wherein he describe a logical abacus, a series of wooden boards with various combinations of true and false terms, that could be arranged on a rack and ruler and used to remove certain excluded combinations. Jevons then had a Salford clock maker construct a working model of the device, shown adjacent, being 2.95 feet in

height, called by him a “logical machine”, the bottom row called the “predicated keys”, which computed Boolean-like truth tables.

Jevons’ 1869 logic machine for doing Boolean algebra like truth tables.

Other

Jevons, according to physical economics historian Philip Mirowski, during his tenure at Owens College, was in intimate of Scottish physicist Balfour Stewart, an association which supposedly had some type of influence on neoclassical economic theory. [4]

Georgescu-Roegen | Material energy | Material entropy

Jevons’ notion of material energy seems to have been the verbal template for Romanian-born American mathematician Nicholas Georgescu’s 1971 notion of material entropy, as Georgescu, in his *The Entropy Law*, cites the work of Jevons to a good extent, opening to a discussion of his *The Coal Question* as the platform to argue that the exhaustion of coal (or rather natural resources in general) is a repercussion of the second law, in that entropy tends to increase; although the way he interprets this is way off. Georgescu pens his model as such (his italics): [2]

> “In the beginning, the chemical energy of the coal is *free*, in the sense that it is *available* to us for producing some mechanical work. In the process, however, the free energy loses this quality, bit by bit. Ultimately, it always dissipates completely into the whole system where it becomes *bound* energy, that is, energy which we can no longer use for the same purpose.”

This, however, is mis-interpretation of the chemical thermodynamics terms: free energy (available energy) and bound energy, which have very precise mathematical definitions, as derived from the generic heat engine model applied to chemical reactions, particularly as occur in the battery. What Georgescu does, being generally unacquainted with physics or thermodynamics, is blend the three separate parts of the heat engine: hot body (boiler, which the source of heat tends to be coal or wood), the cold body, and the working body, together into his imagined “ecological-economic system”, with no clear or defined thermodynamic boundary. This would go on to create great confusion in the latter three decades of the 20th century, for followers of Georgescu school, of which there were many.

In the correct light, the free energy, in the economic sense, is a type of chemical energy that occurs (absorbs or releases) in the process of chemical reactions between people (human molecules), i.e. human chemical reactions, whereby the "coal" or rather natural resources is a surface interaction type energy, in the sense that people are molecules reacting on a surface (substrate), catalyzed by the material of the surface (similar that which occurs in the Haber process), in a way that the catalyzing action (or energy affect of the catalyzing action) results to lower (or raise) the activation energy barrier to the progress of human chemical reactions. [3]

In this sense, depletion of coal supplies (if this were humanities sole natural resource) would result to affect a raising of the activation energy barrier to human chemical reaction, in particular the human reproduction reaction, and hence cause a population growth decrease; just as, conversely, the coal-fueled industrial led to the population explosion at the end of the last millennium.

Quotes | On

The following are about quotes:

> "The only point about Jevons was that he was a genius."
>
> — Herbert Foxwell (c.1920) (Ñº)

> "A look at Jevons' entire lifework bears out Foxwell's opinion. Jevon's legacies to economics are indeed fragmentary, but they are the leavings of genius."
>
> — Robert Eckland (1983) (Ñº)

Quotes | By

The following are notable quotes:

> "There exists much prejudice against attempts to introduce the methods and language of mathematics into any branch of the moral sciences. Most persons appear to hold that the physical sciences form the proper sphere of mathematical method, and that the moral sciences demand some other method, I know not what."
>
> — Stanley Jevons (1871), *Theory of Political Economy* (pg. 3)

> "We cannot weigh, or gauge, or test the feelings of the mind; there is no unit of labor, or suffering, or enjoyment."
>
> — Stanley Jevons (1871), *Theory of Political Economy* (pg. 9)

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(b) Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (pg. 219). Cambridge University Press.
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8. (a) Piqou, A.C. (1925). *Memorials of Alfred Marshall* (pgs. 94-95). Macmillan.
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the Missing Paradigm" (pg. 72-73), in: *Natural Images in Economic Thought: Markets Read in Tooth and Claw* (editor: Philip Mirowski) (§3). Cambridge University Press.
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10. Edgeworth, Francis Y. (1881). *Mathematical Psychics: an Essay on the Application of Mathematics to the Moral Sciences* (pgs. 10-11). C. Kegan Paul & Co.

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â— Jevons, W. Stanley (1878). "Commercial Crises and Sun-Spots" (abs), *Nature*, 24:33–37, Nov 14.

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â— The Coal Question – Wikipedia.
â— William Stanley Jevons – NNDB.

θΔics

In social physics, **Stanley Milgram** (1933-1984) was an American social psychologist noted for his 1967 "letter mailing" experiment, otherwise known as the small-world experiment, as part of his dissertation work at Harvard, wherein he found that people are connected socially on average by about six links distally from one another, hence the phrase 'six degrees of separation', aka seven degrees of Kevin Bacon. [1]

Facebook degrees of separation

In 2011, in followup to Milgram's six degrees study, to assess the nature of the degrees of separation in the modern Internet/email connected era, the University of Milan assessed the relationships between 721 million active Facebook users, accounting for more than 10 percent of the world's population, and found that people are connected by only "five hops", or four degrees of separation: (Ñº)

Quotes

The following are noted quotes:

> "Only in action can you fully realize the forces operative in social behavior. That is why I am an experimentalist."
>
> — Stanley Milgram (1974) (Ñº)

> "It is easy to ignore responsibility when one is only an intermediate link in a chain of action." experimentalist."
>
> — Stanley Milgram (c.1970) (Ñº)

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(b) Greene, Joshua. (2013). *Moral Tribes: Emotion, Reason, and the Gap Between Us and Them* (pg. 37). Penguin.
(c) Small-world experiment – Wikipedia.
(d) Six degrees of separation – Wikipedia.

External links

â— Stanley Milgram – Wikipedia.

θΔics

In science, **Stanley Miller** (1830-2007) was an American chemist noted for his now-famous 1952 Miller-Urey experiment, a reenactment, so-to-say, of Darwin's 1871 warm pond model hypothesis of an origin of life theory, wherein using electrical discharge device he synthesized amino acids, the components of proteins, from water and other early earth like inorganic chemicals; a step above, so to say, Friedrich Wohler's also-famous 1928 synthesis of "organic" urea from "inorganic" ammonium cyanate; both acting to dissolve the conceptual divide on the apparent difficulties of the theory of abiogenesis. [1]

Education

Miller, an avid reader, known as a "chem wiz" in high school, graduated from the University of California, Berkeley in 1951, with a BS in chemistry, after which he the University of Chicago to get a graduate degree in chemistry, during which time he became interested in the stellar synthesis of the elements work of Edward Teller, spending six months investigating the subject. [2]

During his first semester in the fall of 1951, Stanley went to a seminar in which the Harold Urey presented his ideas, supposedly, based, in part on the earlier theories of Alexander Oparin (1924), about the origin of the solar system and the chemical events associated with this process. One of the points that Urey made was that the atmosphere of primitive earth was much different from the modern atmosphere and likely consisted of a highly reducing gas mixture of methane, ammonia, hydrogen sulfide, and hydrogen. Urey further suggested that with such an atmosphere it might be possible to synthesize organic compounds that in turn could have provided the raw materials needed for the emergence of life. He also pointed out that, up until that time, few experiments had been conducted to mimic prebiotic organic synthesis and suggested that someone needed to try to synthesize organic compounds using reducing conditions; which was a suggestion that Miller took hold of. [2]

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External links

â— Stanley Miller – Wikipedia.

θΔics

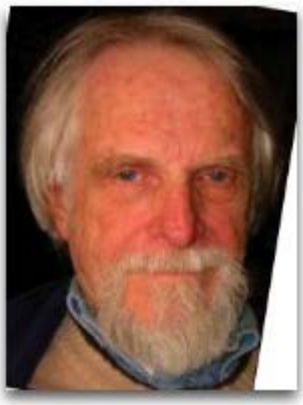

In science, **Stanley Salthe** (1930-) is an American zoologist noted for his 1993 to 2003 promotion of his nearly-incoherent infodynamics theory, an attempt at blending Austrian physicist Ludwig Boltzmann's statistical mechanical models of entropy as disorder, with American electrical engineer Claude Shannon's information entropy (bitropy) theories, and Belgian chemist Ilya Prigogine's dissipative structures theories. [1]

Salthe was a reviewer for American philosopher Alicia Juarrero's 1999 *Dynamics in Action*. [2]

Education

Salthe completed his PhD in zoology in 1963 at Columbia University. Presently, he is a professor emeritus of the Brooklyn College of the City University of New York and a visiting scientist of biological sciences at Binghamton University, New York.

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- Salthe, Stanley N. – WorldCat Identities.
- Salthe, Stanley Norman (1930-) – WorldCat Identities.

θΔics

In thermodynamics, **Stanley I. Sandler** (1940-) is an American chemical engineer noted for his 1977 seminal and very popular chemical engineering thermodynamics textbook *Chemical and Engineering Thermodynamics*, which as of 2006 is in its fourth edition. [1] Sandler is currently a professor of chemical engineering at the University of Delaware. He is the author of 10 books and over 340 articles. [2]

Overview

In circa 1970, Sandler provided for "many interesting discussions" with Richard Balzhiser, Michael Samuels, and John Eliassen, in reviewing and consulting them on their chapter 11 "Equilibrium in Chemically Reacting Systems" of their *Chemical Engineering Thermodynamics: the Study of Energy, Entropy, and Equilibrium*, a new textbook geared towards both mechanical engineers and chemical engineers.

In 1977, Sandler, ten years after he began teaching chemical thermodynamics to engineers, penned his own *Chemical and Engineering Thermodynamics*, which he said to have grown out his own confusion about the subject as an undergraduate at City College of New York, which taught thermodynamics using a very application-focused learning style; specifically: [5]

> "Most of the previous books presented thermodynamics in a way that required students to memorize a specific way to do every problem. I thought it would be more effective to have a small set of very general equations and then be able to treat every new problem as a special case of those equations. That's how I taught myself, so I decided to write a textbook to teach others in this way."

Since then, he has revised the book four times, each time incorporating changes based on new technology and feedback from his students. "When they didn't understand something, I realized that I needed to go back and make it clearer," he says. Sandler states that the book reflects his own education at two very different institutions--undergraduate work at the City College of New York, which was very applied, and a doctoral degree from the University of Minnesota, where he was exposed to a more science-based approach to engineering.

> "I had a foot in both camps, so I tried to tie the fundamentals of thermodynamics to how the subject is used in industry," he says. "The best way to motivate students is to impress upon them why they need to know the subject."

The most recent edition of Sandler's book incorporates new information about biochemical engineering. "It's important for students to recognize that while processing pharmaceuticals is different from processing oil and gas, much of the basic thermodynamic science and underlying principles are the same, even though the materials are different." [5]

Thims

The second edition of Sandler's textbook (1989) was used by American chemical engineer Libb Thims (creator of Hmolpedia), at the University of Michigan in 1995 in his chemical engineering thermodynamics curriculum, thus functioning to indoctrinate Thims into the science of thermodynamics and in some way to seed Thims' curiosity as to the nature of equilibrium, Gibbs free energy, and the spontaneity criterion in application to the predictions of interpersonal human relationships. [4] At one point, during lectures, Thims had the urge to raise his hand in class and ask how chemical thermodynamics applies to predictions of human relationships, but for whatever reason he kept mum and instead sought to figure out the subject on his own. Sandler's textbook together with American evolutionary psychologist David Buss' 1994 book *Evolution of Desire*, can be said to have seeded the idea of the science of "human thermodynamics" in the mind of Thims during his formative years. This seed can be said to have directly resulted in the writing of the 2007 textbook *Human Chemistry*, the textbook on human chemistry (chapter eighteen *Human Thermodynamics*, being the first chapter on human thermodynamics), and the 2008 book *The Human Molecule* as well

as, in a way, for the formation of the online wiki *Encyclopedia of Human Thermodynamics*, still in development as of 2009.

Education

Sandler completed his BS in chemical engineering in 1962 from the City College of New York and his PhD in chemical engineering from the University of Minnesota in 1966 with a dissertation on the "kinetic theory of gases". Sandlers' first published article was the 1964 "Nonstationary Diffusion" in *Physics of Fluids.* [3]

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- Moncure, Sue. (2006). "Singapore Taps Sandler for Professorship", *UD Archive*, 12 Oct.

External links

- Stanley I. Sandler (faculty profile) – University of Delaware.
- Stanley Sandler (homepage) – StanleyISandler.com

θΔics

In engines, **Stanley Steamer** was a 1897 Rankine cycle steam-powered automobile introduced by the twin brothers Francis Stanley and Freelan Stanley, built with a two-cylinder, 30 horsepower, reciprocating steam engine, with a 4.0 inch bore, 5.0 inch stroke, an a boiler operating at a pressure of 600 psi and temperature of 600 F, being fueled with gasoline or kerosene. [1]

A 1909 version of the **Stanley Steamer**. [1]

References

1. Balmer, Robert T. (2010). *Modern Engineering Thermodynamics* (Stanley Steamer, pg. 519) . Academic Press.

External links

â— Stanley Motor Carriage Company – Wikipedia.

θΔics

In astronomy, **star** is a []

See also

- Star (sociology)
- Sun
- Sun molecule

Quotes

The following are related quotes:

> "The stone selenite holds the image of the moon even to her very phases. The magnet-stone points to the pole **star**. These are dead things, says Brutus, do living things likewise draw influences from the sky."
>
> — Jean Fernel (1548), *On the Hidden Causes of Things*, quoted by Charles Sherrington [1]

> "I love this place at night. The **stars**. There's no right or wrong in them. There's just there."
>
> — Oliver Stone (1986), *Platoon*; character: Elias

References

1. (a) Fernel, Jean. (1548). *On the Hidden Causes of Things* (*Dialog*. II, 18). Paris.
(b) Sherrington, Charles. (1938). *Man on His Nature* (pg. 54). Cambridge University Press, 1950.

External links

- Star – Wikipedia.

θΔics

In films, **Star Wars** is a 1977 to present (or 2019) futurism space drama, developed by George Lucas, based on the "Yaqui Indian religious" descriptions of Carlos Castaneda, as described in his fictional *Tales of Power* (1974), who described humans as "luminous beings" able to move things, e.g. rocks, with their mind (an aberration derived from Castaneda being on the drug peyote, and conversing with his two alter egos, in the drug-state), which does away with theology, replacing it with a agnostic/atheistic style universal belief system, based on a galactic battle between Sith, who are in league with the "dark side" of the force, and Jedi, who are in league with the "bright side" of the force.

Overview

In 1977, George Lucas, an American screen writer, after reading Carlos Castaneda's *Tales of Power* (1974), reformulated parts of this into his now-famous film *Star Wars*, introduced the concept of the "force" and the "living force", a "dark side", the aim to restore "balance" in the universe, wherein the part of Luke, the apprentice, in the swamp talking to Obi-Wan Kenobi (the bright force, i.e. Don Juan) and Darth Vader (the dark force, i.e. Don Genero).

Medi-Chlorians

See also: Abioism

In 1999, Lucas, in Star Wars: Episode I, in an attempted to elaborate on the force and life, introduced the concept of "medi-chlorians", a portmantua of "medium", or substance through which another passes (Ñº), and "chlorophyll" (1819), itself coined by French chemists Pierre Pelletier (1788-1842) and Joseph Caventou (1795-1877) from Greek khloros "pale green" (see: Chloe) + phyllon "a leaf" (see: folio). [3]

Jedi religion

In 2001, this Lucas-Castaneda basis of understanding has created a belief system, for many people, so much so that, in a UK census, supposedly as a joke, on in many cases a true identification, some 390,000 people, or 0.7% of the population, identified as Jedi in religion (see: Jedi religion). [2] The general Lucas-Castaneda force model is in need of a thorough Beg analysis.

Other

Star Wars, of significance, is the only film, including *The Matrix* (1999), which drew people into seeing the film "in theaters" in the double-digits, both owing to their world view paradigm changing view of things.

Discussion

Basically, in short, Lucas turned a cultural-fading story of god (power) over-riding, in a henotheism sense, a battle between good (exergonic) and evil (endergonic), or angels and demons, into a tale described by: power, energy, and force, respectively (although "force" is the staple concept in the film series); the confused balance between the "dark side" (of the force) and the "light side" (of the force) defined, in modern terms, in terms of free energy "coupling" (Lipmann, 1941), which generally is a subject yet to be elaborated on, fully, in the social realm.

Quotes

The following are related quotes:

> "The force is what gives a Jedi his power. It's an energy field created by all living things. It surrounds us, penetrates us, and binds the galaxy together."
>
> — Obi-Wan Kenobi (1977), *Star Wars* [4]

> "You must feel the force around you."
>
> — Yoda (1977), *Star Wars*

> “I just transferred a bit of ‘life’, force-energy, from me to him. You would have done the same.”
>
> — Ren (2019), *Star Wars: Episode Nine – The Rise of Skywalker* (35:45)

See also

â— Elective Affinities (films)

References

1. (a) The Force – Wookieepedia.
(b) Living Force – Wookieepedia.
2. (a) Jediism – Wikipedia.
(b) Jedi census phenomenon – Wikipedia.
3. Medi-chlorian – Star Wars Wikia.

External links

â— Star Wars – Wikipedia.

θΔics

In classifications, **Stark classification**, as compared to Sorokin classification (Pitirim Sorokin, 1928), refers to the ranking of the various historical forms of social mechanism and or social mechanics theorists, done in 1962 by Czechoslovakian-born English sociologist Werner Stark, of the general mechanistic school of social thought, ranging from: normative, to positive, to secondary, to extreme form.

Forms

In 1962, Czechoslovakian-born English sociologist Werner Stark, in his *Fundamental Forms of Social Thought*, divided fundamental sociological theory into the study of society as an organism, as a mechanism, and as a process, respectively. Within each perspective, he further subdivided into: normative form, positive form, secondary form, and extreme forms: [1]

Theorist	Normative forms
Jean-Jacques Rousseau (1712-1778) IQ=150	
Immanuel Kant (1724-1804) IQ=180	
	Positive forms
Vilfredo Pareto (1848-1923) IQ=190±	
	Secondary forms
Jeremy Bentham (1748-1832) IQ=180	Known for his two cultures stylized debate with English poet-philosopher Samuel Coleridge (Coleridge noted for his participation in the 1833 Whewell-Coleridge debate, as a result of which the term "scientist", distinguished from that of the natural philosopher, was coined). [2] See also: *The Two Cultures* (pg. xxxiii) on "the 'technologio-Benthamite' reduction of human experience" as commented by British literary critic F.R. Leavis (1962). [2]
Georg Simmel (1858-1918)	
	"The arrangement of electrons and protons into various types of groups of different symmetrical relations to each other constitute matter. The structure of matter (and of

George Lundberg (1895-1966)

behavior) is, then, a function of its electron-proton configuration. From these elementary hypothetical entities, systems of all degrees of complexity are constructed, variously called atoms, molecules, elements, compounds, tissues, plants, animals, men, races, nations, constellations, galaxies, etc. The social sciences are concerned with the behavior of those electron-proton configurations called societal groups, principally human groups. Just as the properties of a substance are a function of the dynamic and spatial arrangements of limited groups of electrons and protons, so the various energy transformations are functions of the movement types by which tone type of electron symmetry changes into another until a new symmetry has been established."

— *Foundations of Sociology* (1939)

Stuart Dodd (1900-1975)

Extreme forms

Spiru Haret (1851-1912)

Ludwig Buchner (1824-1899)

His 1855 "just as man and woman attract one another, so oxygen attracts hydrogen" and "just as a steam engine produces motion, so the intricate organic complex of force-bearing substance in an animal organism produces a total sum of certain effects" matter-force philosophy has been described as "gross materialist (Finck, 1877) and "extreme materialism" (Britannica, 1911).

Johann Goethe (1749-1832) IQ=230

â— William Cullen (1757): "the **dart** → between them expresses the *elective attraction*; when I put a dart with the tail to one substance and the point to another, I mean that the substance to which the tail is directed unites with the one to which the point is directed more strongly than it does with the one united to it in the **crotchet** {."

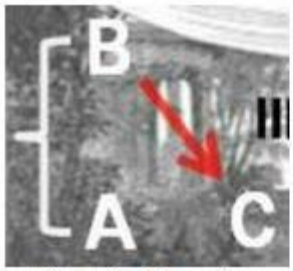

Chemical version (1757)

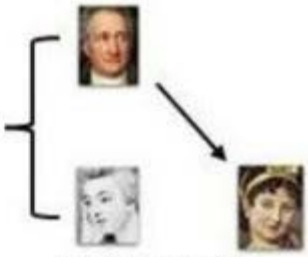

Human version (1809)

â— Goethe (1809): "The moral symbols of the natural sciences are the elective affinities discovered and employed by the great Bergman." [3]

The following statement by Stark seems to capture the gist of why he considers Carey the extreme form:

> "The essential submission is the assertion that development is due, not to human effort, but to the automatic effect of certain external circumstances or events. It comes about in the manner in which a flame is produced when a match is struck against the side of the box. Surely, there are few who would accept this theory of culture-growth as realistic. But then the whole

idea of ‘social heat’ is no more than a downright absurdity.”

Henry Carey (1793-1879) American sociologist

Stark, moreover, classifies the following 1858 statement by Carey:

> “In the inorganic world, every act of combination is an act of motion. So it is in the social one. If it is true that there is but one system of laws for the government of all matter, then those which govern the movements of the various inorganic bodies should be the same with those by which is regulated the motion of society; and that such is the case can readily be shown.”

as being someone "back in his strait-jacket." Correctly, however, this is a genius statement. This view by Carey, in fact, is nearly verbatim to that of Goethe's chemical philosophy based human chemical theory, who is well-established as being the greatest genius ever.

Additions

Those individuals, namely Goethe (1809) and Buchner (1855), shown highlighted, are additions to Stark's original 9-person classification scheme. Buchner was described in 1911 *Britannica* as "extreme materialist".

Though Stark does not include Goethe in his classification scheme, he does mention him twice in his book, but refers to him as one of the great all around philosophers, though not necessarily a sociologist. It seems that Stark was unaware of Goethe's chemical mechanism usage. In any event, the following are nine main representative social mechanism theorists, according to Stark, which Goethe shown listed as guessed where Stark would have put him had he known of Goethe's chemical mechanism, the total group divided into Stark's four historical "forms" of mechanistic social thought: normative, positive, secondary, and extreme, as he classifies things: [1]

See also

â— Human chemical reaction theory

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3. Torbern Bergman (1775) got his symbols from William Cullen (1757) who got his symbols from Etienne Geoffroy (1718) who got his symbols from Isaac Newton's last and final "Query 31" (1718), who in turn derived his chemical reaction rules from personal study of chemical reactions, along with discussion with Robert Boyle, as found in correspondences dating back to at least 1678.

θΔics

In thermodynamics, **state**, aka "thermodynamic state", of a system (compare states of matter (Ñº) , i.e. solid, liquid, gas), is defined by the ensemble of physical quantities, such as temperature, pressure, composition, etc., which characterize the system, but neither by its surroundings nor by its history. [1]

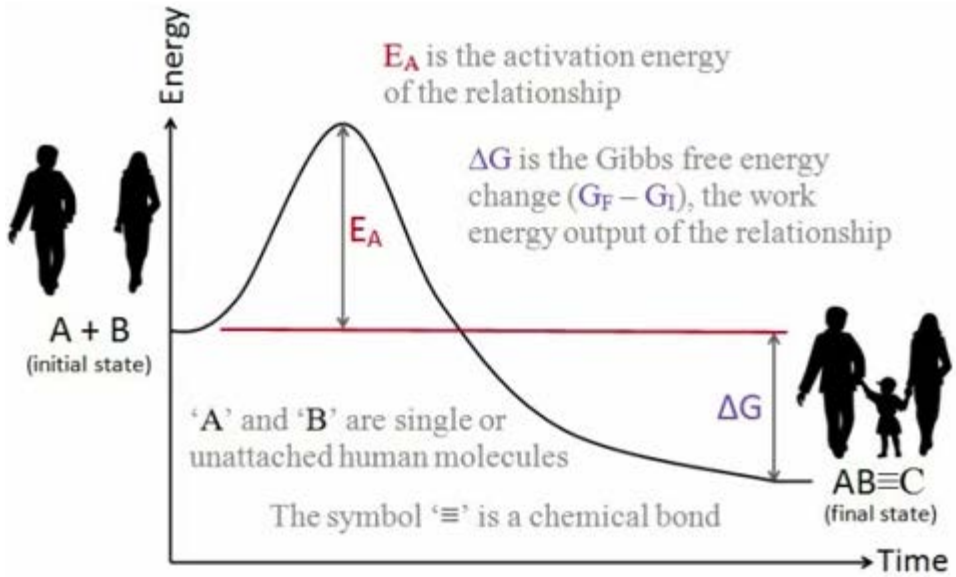

An example of two **states** of human existence, in terms of an initial state (day one) and final state (day 360x) of Gibbs free energy, for a typical pair of reactive single humans (human molecules) in their early 20s. [6]

Graphical representation

In systems where a three-variable equation of state represents the state of the system, such as:

$$f(P, V, T) = 0$$

the state of the system is completely determined by any two of the three variables, as long as the variables are independent. Subsequently, for such three-variable defined systems, a single point on a two-dimensional Cartesian coordinate system plot, for any two of these three variables, such as on a pressure-volume indicator diagram, thus defines the state of the system. [2]

Etymology

Polish solid state physicist and thermodynamicist Michal Kurzynski argues that the concept of state is embodied in what he calls the "principle of mechanical determinism", as initially formulated by English physicist Isaac Newton at the late 17th century, which can be stated in modern terms as follows:

> "The laws of motion and the **state** of a physical system at a given moment in time unambiguously and uniquely determine the state of the system at all other moments of time, both in the future and in the past."

The term "state" seems to have been first used in a descriptive sense, particularly in the context of thermodynamics, in 1851 by English physicist James Joule who referred to the internal energy of a body as follows: [2]

> "U is the mechanical energy of a body in a given **state**."

The more detailed description of the state of a given body was described by American mathematical physicist Willard Gibbs in the 1870s. [3] In origins, the term stems from the 17th century work on developing the ideal gas laws and the equations of state that resulted.

Quotes

The following are related quotes:

> "Man is the result of a purposeless and

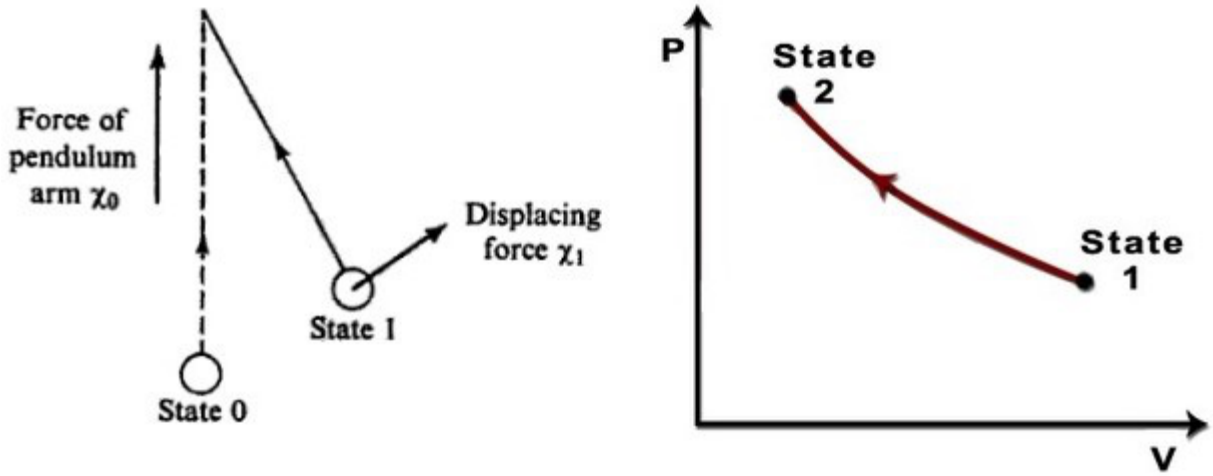

Visualization of the concept of "**state**", by two positions of a pendulum, whereby a body, in an initial state 0, held under the initial constraint of the force X_0 of the pendulum arm, is brought to a new state 1 through the application of a displacing force X_1, which drives the system (or body) to a new equilibrium state, which is determined by both the contraints X_0 and X_1. [4]
A single point on the PV plane, representative of two of the three variables of a *f(P,V,T)=0* state equation, defines the **state** of the system. [5]

materialistic process that did not have him in mind. He was not planned. He is a state of matter, a form of life, a sort of animal, and a species of the order primates, akin nearly or remotely to all of life and indeed to all that is material."

— George Simpson (1967), *The Meaning of Evolution* [8]

See also

â— Belief state

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(c) Gibbs, Willard. (1876). "On the Equilibrium of Heterogeneous Substances", *Transactions of the Connecticut Academy*, III. pp. 108-248, Oct., 1875-May, 1876, and pp. 343-524, may, 1877-July, 1878.
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External links

â— State (physics) – Wikipedia.

θΔics

In thermodynamics, **state function** is an exact or complete differential that defines the physical condition (configuration) or state of a system in a manner that is independent in how the system arrived at that state; quantities that depend on the 'state' of the system *only* and not, e.g., on its history. [1]

History

The concept of "state function", according to Leslie Woodcock, supposedly, was first introduced, in proto-conceptual outline, by Joseph Black (1728-1799), in his caloric theory of heat; the gist of his assertion stated as follows: [6]

> "Of great fundamental relevance, however, and largely overlooked by historians of science, is the fact that Black had for the first time, it appears, introduced the concept of a state function. The properties of a material (in this case the caloric content) depend only upon its equilibrium state and not on its processing history. The total energy of a material is the thermodynamic state function called the "internal energy." Only differences in energy between two states can be defined and measured. If those two states are at the same pressure, the energy difference is called the 'enthalpy'. This thermodynamic state function can be identified with Black's 'caloric'."

In 1869, French engineer Francois Massieu, in his "On the Various Functions Characteristic of Fluids", introduced the concept of the existence of characteristic functions; which in 1876 was adopted by Willard Gibbs, into what are now referred to as state functions, or functions characteristic of the state of a given body. [7]

Social systems | Applicability debate

See main: Social equation of state

There seems to exist a variable opinion as to how, when, and where state functions, such as internal energy U, free energy F or G, or entropy S, etc., apply and if, specifically, they apply to a collection or system of people, such as a town. The 2006 Rossini-Leonard-Wojcik debate is a prime example, wherein it became sort of a debate of whether one can apply state functions to humanity, prompting response articles such as "State Functions v. State Governments". Various contrasting views are discussed below:

In 1809, German polymath Johann Goethe put forth a theory that chemical affinity A applies to the regulation of human activity, viewed as chemical reactions. [2] After 1882, wherein after German physicist Hermann Helmholtz showed that chemical affinity is measure by the change in free energy, Goethe's theory amounts to the argument that changes in the state function Gibbs free energy ($A = - \Delta G$) is what regulates or predetermines human movements.

In 1914, English-born American engineer William Fairburn suggested that one could measure both an energy and and entropy of people viewed as 'human chemical elements'. [5]

One dominate point of view comes from the Prigogine school, a group which argues that only certain state functions modified to fit the non-equilibrium regime apply to biological systems or human systems, whereas others do not apply. The central message comes from, in his 1977 Nobel Lecture, Belgian chemist Ilya Prigogine commented that: [3]

> "Thermodynamic equilibrium may be characterized by the minimum of the Helmholtz free energy, defined usually by $F = E – TS$. Are most types of organizations around us of this nature? It is enough to ask such a question to see that the answer is negative. Obviously in a town, in a living system, we have quite different type of functional order. To obtain a thermodynamic theory for this type of structure we have to show that non-equilibrium may be a source of order. Irreversible processes may lead to a new type of dynamic states of matter which I have called dissipative structures."

Likewise, in 2005, Danish ecological engineer and Prigogine advocate Sven Jorgenson commented that: [4]

> "Evolution and biological growth [occur] away from thermodynamic equilibrium [and] entropy can be used to describe systems far from thermodynamic equilibrium, provided that it is applied as a non-state function. Free energy and entropy are not state functions when applied on living organisms or ecosystems. At death, the organisms lose a major part of their free energy (eco-exergy) and produce an enormous amount of entropy (Schrodinger would say that they lose negentropy), because the free energy of the information embodied in the genes are no longer applicable."

The prevailing view of this school is that free energy and entropy are not state functions of a form that can be used to quantify life (reaction existence).

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External links

â— State function – Wikipedia.

θΔics

In thermodynamics, **state of maximum entropy**, aka “maximum entropy state”, is the “state” of a system in which the equivalence-values of all uncompensated transformations N have reached a maximum value; a maximum value (see: maximum entropy) of entropy transformation, in a completed cycle. [1]

Overview

In 1854, Rudolf Clausius introduced the concept of “equivalence-values”, or Q/T values, as an upgrade to the caloric particle model, of heat.

Clausius also introduced the logic that equivalence-values or “transformation equivalents”, as Maxwell latter called them, could “compensate” each other, in the mechanical equivalent of heat sense of the matter, when going into or out of a system, in the sense of heat transforming into work, or work transforming into heat, in respect to a system transforming back to its “original” or “initial state”, following a series of transformations. In “idea” systems, these transformation equivalents, theoretically, would cancel each other out. in “real” systems, however, there would remain “uncompensated transformations” in each cycle.

This is what, after 1865, Clausius began to refer to as “entropy increase”. Hence, when any given system reaches the final stage of its series of transformation cycles, the sum of the equivalence values of all the “uncompensated transformations” would have a “maximum” positive numerical value, symbol N, defined as follows:

$$N = -\int \frac{dQ}{T}$$

(add)

Confusions | Errors

In c.1875 to c.1895, what is called "confused thermodynamics", what are called "entropy as disorder confusions" began to solidify, resulting in completely incorrect renditions of what exactly "maximum entropy" means in respect to systems and order and disorder assignments.

In 1933, James Jeans, who sparked off the Jeans, Donnen, Guggenheim debate (1834), gave the following incorrect view of what constitutes the state of a system at maximal entropy, namely that it is one that "avoids concentration" and is one whose energy is "uniformly diffused", both of which are incorrect:

> “These instances have shown us two final states in which the entropy is a maximum. They illustrate a very wide and very general principle — the final state of maximum entropy avoids concentration, whether of special substances (as with the ink) or of energy (as with the heat of the fire). The ‘commonest state’ is one in which both substance and energy are uniformly diffused, just as the commonest state in which we find a concert audience is that in which tall people and short, dark and fair, and so on, are uniformly diffused.”
>
> — James Jeans (1933), *The New Background of Science* (pg. 267) (Ñº)

The following is an over-typical confused example:

> “Entropy can be defined as a measure of disorder in a system. Thus, a system that has reached maximum entropy is in a state of complete disorder. Maximum entropy can be compared to system death [see: heat death]. A system in a **state of maximum entropy** is completely lacking in structure or organization, and is basically in a random state of disarray. or maximum decay. A concrete physical system in maximum entropy has in effect expended all of its energy resources. Since it is closed, there is little hope of reversal,

> and it will essentially remain in a state of maximum entropy, unless its boundaries arc somehow opened so that new energy (and information) can be used to renew the system (assuming that it is not beyond repair by this time)."
>
> — George Ritzer (2004), *Encyclopedia of Social Theory* (§: General System Theory, pg. 310)

In 1975, Norman Dolloff, in his *Heat Death and the Phoenix*, was the first to give the generally correct view of things.

Quotes

The following are related quotes:

> "With this [commonness] definition [of entropy] we find that, just because the numerical factors involved are so immense, conditions of 'maximum' entropy are not only more common, but incomparably more common, than those whose entropy is less, and so it is all down the ladder. Because of this, it is practically certain that each state of the universe will be succeeded by a state of higher entropy than itself, so that the universe will 'evolve' through a succession of states of ever-increasing entropy, until it finally reaches a **state of maximum entropy**. Beyond this it cannot go; it must come to rest — not in the sense that every atom in it will have come to rest (for maximum entropy does not involve this), but rather in the sense that its general characteristics cannot change any more. Yet if someone asserts that this will not happen, and that the universe will move to a state of lower entropy than the present, we cannot prove him wrong. He is entitled to his opinion, either as a speculation or as a pious hope. All we can say is that the odds against his dream coming true involve a very high power of 10^79 his disfavor."
>
> — James Jeans (1933), *The New Background of Science* (pg. 265) (Ñº)

See also

â— Heat death

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θΔics

In thermodynamics, **state variable** is a variable that is measure of the state of the system or process. [1] State variables are fully determined by the values at present (path independent variables) and do not depend on the previous history of the system (path dependent variables). [2]

See also

- Path function
- State function

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External links

- State variable – Wikipedia.

θΔics

In mechanics, **statistical mechanics** is study of properties of matter in equilibrium, a subject derived from the kinetic theory interpretation of the laws of thermodynamics, applied generally to gases, albeit formulated from an *a priori* point of view, i.e. derived or reasoned from self-evident propositions. [1]

Etymology

In 1749, German scholar Gottfried Achenwall suggested that since 'science' dealt with the natural 'states' of society, it should be called *statistik*. [6]

In 1859, Scottish physicist James Maxwell obtained the normal distribution for molecular velocities in a gas (Maxwell-Boltzmann distribution), supposedly, taking his inspiration form Adolphe Quetelet's curve for social statistics. [8]

There seems to be some inconsistency as to who coined the term "statistical mechanics". Some maintain that it was Maxwell in 1871 (Barri Gold) or 1878 (Werner Ebeling and Igor Sokolov). [2] Others maintain that it was American engineer Willard Gibbs who first used the term, either on his own, or citing Maxwell as having used it before him.

In 1884, Gibbs presented a paper, in Philadelphia to the American Association for the Advancement of Science, entitled "On the Fundamental Formula of Statistical Mechanics with Applications to Astronomy and Thermodynamics", only a brief abstract of which survives. [7]

In 1892, Gibbs wrote English physicist John Strutt with characteristic modesty: [3]

> "Just now I am trying to get ready for publication something on thermodynamics from the *a priori* point of view, or rather on 'statistical mechanics' . . . I do not know that I shall have anything particularly new in substance, but shall be contented if I can so choose my standpoint (as seems to me possible) as to get a simpler view of the subject."

Supposedly, by the term *a priori* Gibbs meant related to or derived by reasoning from self-evident propositions. In any event, in 1902, Gibbs published *Elementary Principles in Statistical Mechanics*, which has since been called the "bible of statistical physics", which put statistical mechanics on a new and more general basis. [4]

Statistical thermodynamics

Treatises on statistical mechanics, as compared to statistical thermodynamics, according to Ralph Fowler and Edward Guggenheim, are nearly synonymous in content, albeit the former tend to contain considerable sections of purely physics or astrophysical interest, with many passages devoted entirely to mathematical details of proofs, with deliberate avoidance of the use of ordinary thermodynamic methods. [1]

Human thermodynamics

In 1952, English physicist C.G. Darwin, in his 1952 book *The Next Million Years*, argued that statistical mechanics could be used to study and predict human history, and that his would define the subject of human thermodynamics. In short, he argued that in order to logically predict human history, one would first need to define the person as a point molecule or human molecule and to model human social systems as "conservative dynamical systems" such that when human molecules collide there exists a conservative nature to the interaction and that both internal and external parameters must be accounted for in a statistical thermodynamic analysis of any human system. [5]

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External links

â— Statistical mechanics – Wikipedia.

θΔics

In thermodynamics, **statistical thermodynamics** (or statistical mechanics or statistical physics) is the study of the average energy behaviors of large groups of individual particles. [1] Statistical thermodynamics can also be defined as the study of the random motion of molecules by means of statistical methods. [2]

Etymology

The term "statistical thermodynamics" doesn't seem to have come into use until the 1930s, loosely defined as statistical mechanics with more focus on thermodynamics.

Human physics

See main: Human physics

Many authors, in recent years, e.g. those in social physics, have used statistical thermodynamics, such as through the guise of a human particle logic, as a basis to argue or explain various bulk human system behaviors, such as distributions of wealth.

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θΔics

In science, **steam** is water in the vapor state or gas phase.

See also

- Steam engine
- Steam table

External links

- Steam – Wikipedia.

θΔics

In engines, **steam engine** is a heat engine whose working substance is water. [1]

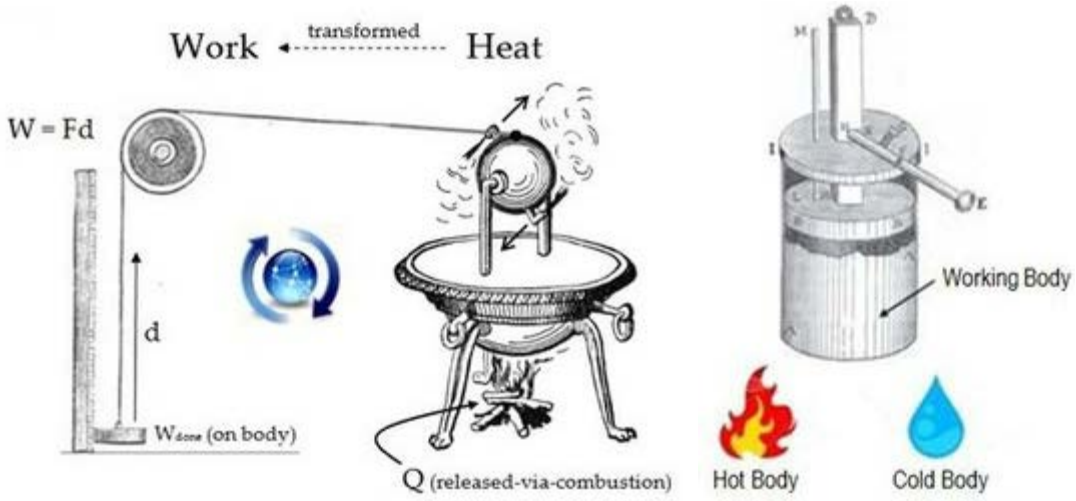

Left: Ctesibius' aeolipile (c.250BC), shown hooked up to a weight raising device, the earliest known type of steam-making type of heat engine. Right: the Papin engine (1690), the prototype of all modern day "**steam engines**", and forerunner to the combustion engine.

A steam-engine is now generally understood an engine in which the elasticity or volume expansion-force of steam is used as the moving-power or motive power; just as the weight or impulse of water is in the water-wheel, or the pressure of the wind in a windmill. In some of the earlier engines of this kind, it was really the pressure of the atmosphere that was the motive-power, steam being employed merely as a means of producing a vacuum through its rapid condensation, and thus allowing the pressure of the atmosphere to come into play. [5]

Early history

See main: History of the steam engine

In 235BC, Archimedes, according to da Vinci (c.1500), invented a architronito, or steam-powered cannon that throws 70lb iron balls, via the action of "great noise and fury", at the enemy, by the action of heat derived from burning coals; diagrams of which are found in da Vinci's notebooks; the gist of which is diagrammed as follows: [9]

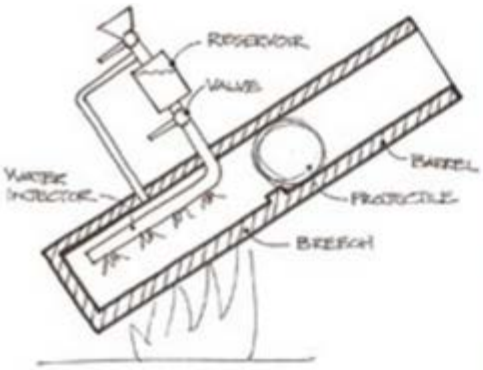

In 230BC, Ctesibius invented the a water-filled metal sphere, that could be made to rotate when heated or put in contact with water. This device came to be known as the 'aeolipile', named after Aeolus, the Greek god of wind, as later described by both Roman architect Vitruvius (15BC). [6]

In 50AD, Hero gave a detailed account of the aeolipile (fig 1) and also his solar boiler device (fig 2), shown below: [10]

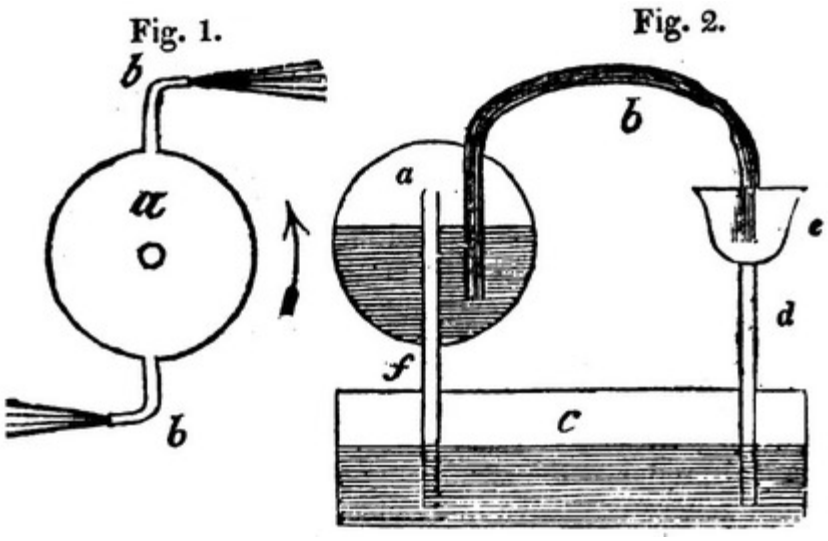

Owing to the fact that Hero was the first to give a detailed account on how to make an aeolipile, the device has since come to be known as Hero's engine or the aeolipile of Hero.

In 1543, Spanish captain Blasco de Garay is said to have demonstrated a steamboat of his own invention in the harbor of Barcelona. It has been argued that Garay's engine was an aeolipile type of engine, in which steam produces rotatory motion by issuing from orifices, as water does in Barker's mill. [7]

In 1551, Arabian engineer Taqi al-Din, who described a method for rotating a spit by means of a jet of steam playing on rotary vanes around the periphery of a wheel.

In 1562, German preacher Mathesius, in his sermon to miners (Nuremberg), prayed for a man who 'raises water by fire and air', therein showing, in some way, the early application of steam-power in Germany.

In 1606, Giovanni Porta published a translation of Hero's work, in which After which, he added an illustrated modified variant of his own, similar to a combination of the above two devices; as shown below, wherein wherein, a fire is put under flask a, filled with water, which makes steam, that enters closed container b, filled with cold water, which forces the water to shoot out of tube c: [10]

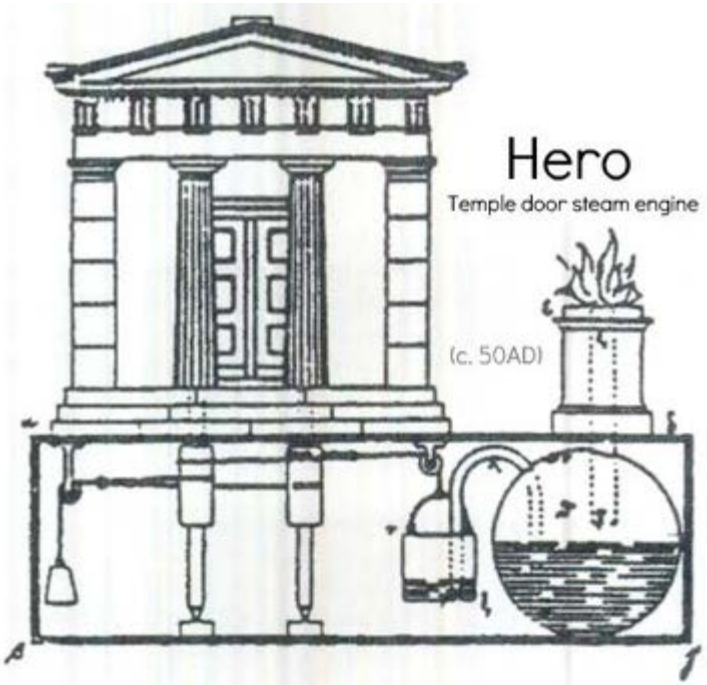

A depiction of the temple door steam engine built by Greek engineer Hero of Alexandria, in circa 50AD, the first working heat engine.

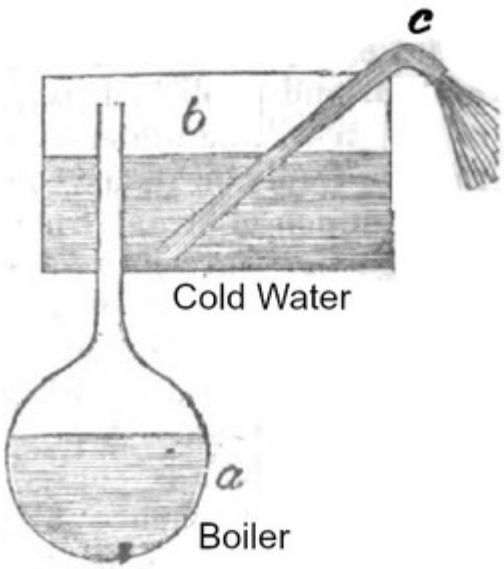

In 1606, Jeronimo de Ayanz (1553-1613) (Ñº) obtained a patent for some type of steam-powered water pump for draining water from mines; and by 1611, the machine was said to have been in operation in a silver mine in Guadalcanal, near Seville. (Ñº)

In 1615, Salomon de Caus, in his *The Reason for Moving Forces*, stated that there, historically, have been five main methods of elevating water above its level, which he recounts as follows: [2]

1. Siphon, which he says is older than Hero.
2. Operation by capillary attraction.
3. **By the aid of fire.**
4. Action of compressed air, as illustrated by Hero's fountain, and ascribed to Hero.
5. Animal labor applied to machinery, such as the screw of Archimedes, or the pump of Ctesibius.

Caus, in respect to method #3, says that there are many types of devices, and gives the following device as an example, which is similar to that made or diagrammed by Giovanni Porta (c.1601):

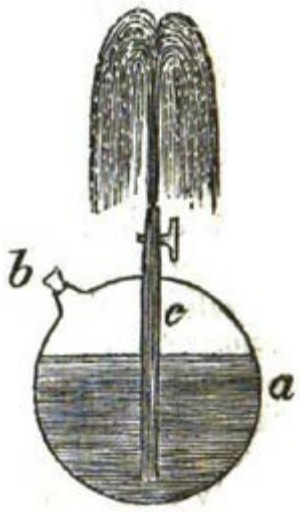

The operation is such that globe *a* is filled with water, which has a valve *b* attached, for adding water, and a tube *c* soldered into the upper part of the bulb, with a valve, the operation of which being such that, when fire is put under the globe, water shoots out of the tube c, like a fountain.

In 1629, Italian engineer Giovanni Branca invented a sort of steam-powered windmill, which he used for grinding his drugs, variations of which shown below, in which the steam being generated in a boiler was directed by a spout against the flat vanea of a wheel, which was thus set in motion: [11]

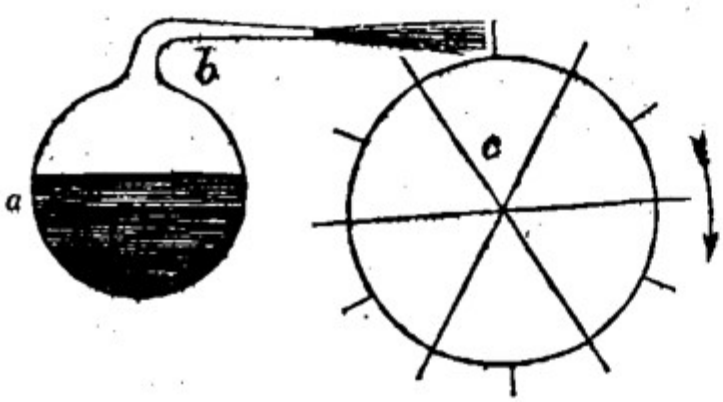

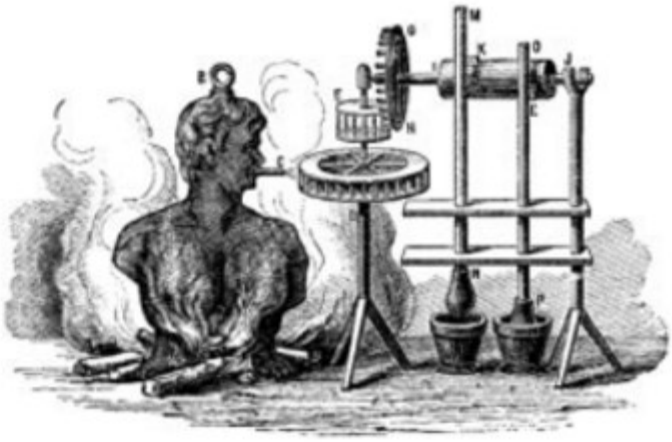

In 1647, Nathaniel Nye, an English mathematician, in his *The Art of Gunnery*, proposed to "charge a piece of ordinance without gunpowder, by using water, in stead of gunpowder".

In 1648, John Wilkins described a a device for a steam driven rotating a spit.

In 1655, Edward Somerset, aka Marquis of Worcester, in his *Century of Inventions*, describes a steam-apparatus by which he raised a column of water to the height of 40 feet. This, with the exception of Blasco's, was said to have been the first really useful application of steam; the others had been mere toys.

In 1659, R. D'Acres, in his *The Elements of Water Drawing*, described a heat engine, of some sort, in detail.

In 1683, Samuel Morland submitted a project to Louis XIV for raising water by means of steam, accompanying it with ingenious calculations and tables.

Piston and cylinder steam engine

See main: Timeline of thermodynamics; Engine development timeline

In 1645, in an effort to disprove Greek philosopher Parmenides's 485BC postulate that nature abhors a vacuum (*horror vacui*), German engineer Otto Guericke invented (or began to use) a piston and cylinder (1645), vacuum pump (1647), and the Magdeburg hemispheres (1654); and with these instruments, Guericke showed that it was possible, manually, to create a vacuum or to remove the air from a sealed volume.

Guericke's vacuum pump was first described in the book 1657 book *Mechanical Hydraulic Pneumatics* by German scientist Gaspar Schott, a correspondent of Guericke. Two thinkers who took great interest in this publication were Dutch mathematical physicist Christiaan Huygens and English physicist and chemist Robert Boyle who read the book. Boyle assigned his assistant and his assistant Robert Hooke the job of making an improved Guericke's air vacuum design, which he did in 1658, albeit one that also functioned as a pump.

In the decades to follow, Huygens began working with French engineer Denis Papin to make various piston and cylinder gunpowder engines, with various amounts of success. The biggest hurdle to these gunpowder engines was that they became fouled quickly and failed to make a so-called "perfect vacuum", but instead would only make a partial vacuum, yielding a limited amount of work.

Out of this effort, in 1679 Papin made a pressure cooker or bone digester, which could turn almost anything solid into

the liquid state and then into the gaseous state. Early designs exploded, after which a pressure release valve was introduced. It is said that by watching this pressure release valve bob up and down that Papin conceived of the steam engine.

In 1690, Papin in his memoir "A New Method to Obtain Very Great Motive Powers at Small Cost", outlined with illustration the modern piston and cylinder steam engine as we now know it, in which a liquid put inside of the cylinder was first put in contact with a hot body (fire) and made to expand, then put in contact with a cold body (stream of river water), a quickly made vacuum would be created that would drive the piston down in such a manner that if the process was repeated, in a cyclical manner, useful work could be obtain.

In the years to follow, so it is said, English engineer Thomas Savery learned of Papin's designs, e.g. Papin's engine designs were published in the Royal Society notes in 1697, and in 1698 Savery obtained a patent what became to be known as the Miner's friend, a sort of sump pump, that was the first working modern steam engine. In 1699, Savery exhibited a working model of his invention before the Royal Society. Savery, in pumping mines, made use of the condensation of steam in a close vessel to produce a vacuum, and thus raise the water to a certain height, after which the elasticity of steam pressing upon its surface was made to raise it still further in a second vessel.

In 1705, English engineer Thomas Newcomen took out a patent for what he called an "Atmospheric Engine", a type of modified more-functional Savery engine, and by 1712 had working models. [3]

In the latter half of the 18th century, Scottish engineer James Watt add on a number of inventions and design improvements to the functionality of the steam engine, including: separate condenser (1765), sun and planet gear (1781), the fly-ball governor (1788), the indicator (1796) and "indicator diagram", made with his employee John Southern, which tracked the changes in volume of the piston, the definition of "pony power" (or horse power).

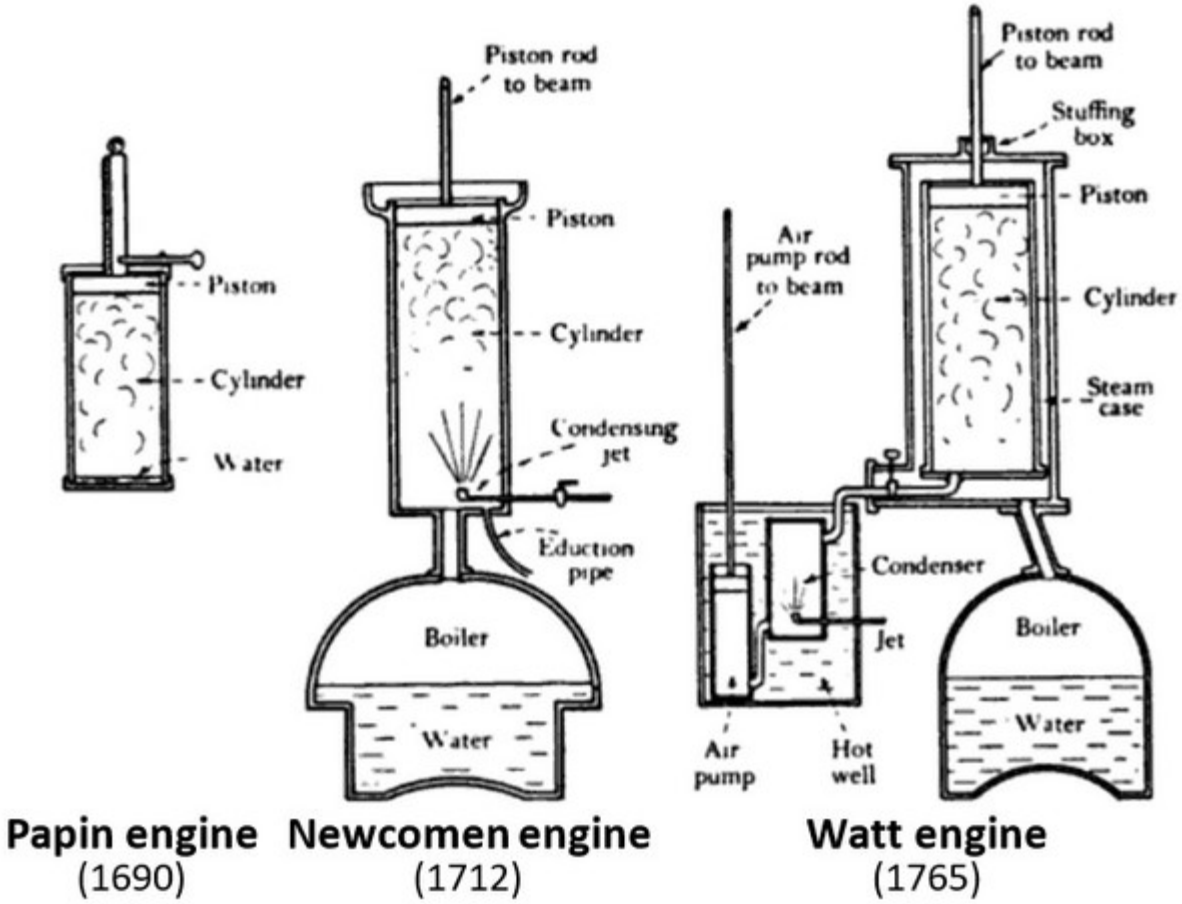

A diagram of a comparison of the Papin engine, Newcomen engine, and Watt engine. [12]

The essential difference between the Papin engine, Newcomen engine, and Watt engine, each of which operating via rapid condensation of steam to make a vacuum, is summarized as follows, as illustrated adjacent:

> "Papin had a piston in a cylinder in which he boiled his water, afterwards condensing the steam slowly in the same vessel. Newcomen generated his steam in a vessel separate from the cylinder, but still condensed the steam rapidly in the cylinder itself. Watt made use of a boiler and a cylinder like Newcomen, but

condensed the steam rapidly in an entirely separate vessel."

— Henry Dickinson (1939), *A Short History of the Steam Engine* (pg. 67)

(add)

Thermodynamics

The physics underlying the operation of the steam engine, specifically the understanding of how fire (or heat) creates cyclical mechanical movement (up and down piston movement), through its actions on an intermediate substance (water), is the basic science of thermo-dynamics, initiated with the 1824 publication *Reflections on the Motive Power of Fire* by French physicist Sadi Carnot.

The "veritable creators" of the steam engine, starting with Savery and Newcomen, according to Carnot, are English engineer John Smeaton, who made an improved Newcomen engine (1775), Scottish engineer James Watt, who made a number of improvements to the Newcomen engine, such as the separate condenser (1765), sun and planet gear (1781), centrifugal governor (1788), and indicator diagram (1796), English engineer Arthur Woolf, who designed an improved boiler for producing high pressure steam (1803) and invented a compound steam engine (1805), and English engineer Richard Trevithick who built the first steam engine automobiles (1801).

In each of these various heat engines, Carnot presumed that the key to their operation was the "re-establishment of equilibrium in the caloric". The theory was later proven false by German physicist Rudolf Clausius who, beginning in 1850, corrected this supposition with the mathematical argument of "increase in entropy" in the cycle. [4]

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θΔics

In existographies, **Stefan Baumgartner** (1968-) (CR:3) is a German physicist and economist noted, in ecological economics, for his 1995 to 2005 publications on thermodynamics in economics and ecology, seemingly focused on the subject of waste management.

Overview

In 1995, Baumgartner, in his discussion article "Entropy: A Unifying Concept for Ecological Economics", co-written with Malte Faber and John Proops, applied entropy and thermodynamics in economics and ecology.

In 2004, Baumgartner, in his chapter "Thermodynamic Models", in *Modelling in Ecological Economics*, outlined the use, history, pitfalls, and hurtles of applying thermodynamics to the explanation of economic systems confined to environmental scarcities. [1] Further research contains philosophical aspects of human-enviroment relations as well as applied system analysis.

In 2012, Baumgartner, in his *Ambivalent Joint Production and the Natural Environment: an Economic and Thermodynamic Analysis*, devoted chapter three to thermodynamics, in a simple historical like overview, and therein attempts to digress on joint production in economics. [3]

Education

Baumgärtner completed his BS in physics in 1990 at the University of Stuttgart, his MS in physics and economics (1994) and PhD in economics (1999) at the University of Heidelberg. [2]

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θΔics

In human chemistry, **Stefan Blechschmidt** (1976-) is a German literature scholar noted for

Overview

In 2000, Blechschmidt, in his symposium presentation "A Repository for the Present, an Archive of the Past: Who Creates Order in *Elective Affinities*?", discussed German polyintellect Johann Goethe's 1809 physical chemistry based novella *Elective Affinities* in terms of the "contemporary revolution in chemistry", discussing, for example, the electrochemical work of German physical chemist Johann Ritter. [1] The following is an excerpt from the opening page: [2]

> "Goethe's *Elective Affinities* show a set of external order, namely an experimental arrangement. Less of a statement than a thesis is that the chemistry of the social transferred into the experiment, the affinity in its course at the action level, more and more opposed to the orderly environment. The order will be blown up, from the inside out—through a course of action that is equal to a chain reaction develops its own momentum and life of its own destiny. The experiment finally leaves the subjects in renunciation, solitude and death. From an internal perspective, the level of action from the question of creation, defense and loss of order in the *Elective Affinities* is therefore new. Hence follows the search for a proper endowing instance. When it comes to right, who creates them? By whom it is possibly at risk? So who creates order in Goethe's novel?"

(add discussion)

Education

Blechschmidt studied at the Uppsala University, Sweden from 2001 to 2002, after which he completed his BA (2004) and PhD (2009) in German studies at Friedrich Schiller University Jena.

In 2008, Aug-Nov, Blechschmidt was the curator of a "The Elective Affinities" exhibition in Weimar; and in 2009 was working alongside Helmut Huhn on a Friedrich Schiller project, and also that year had a lectureship at New York University, Berlin. [3]

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θΔics

In hmolscience, **Stefan Hutzler** (1965-) is a German-born Irish physicist noted for his 2005 to present work in econophysics and for his co-authorship of the 2013 *Econophysics and Physical Economics*, together with German physicist Jurgen Mimkes and English-born Irish physicist Peter Richmond. [1]

In 2005, Hutzler co-authored an article on "Dynamics of Money and Income Distributions", together with Richmond and Przemyslaw Repetowicz, on what seems to be a standard Boltzmann-like extension of the theories of wealth of Vilfredo Pareto, using the Arnab Chatterjee (2003) economic agent model [2]

Education

Hutzler completed his BS in physics in at Regensburg University, Germany, and his PhD in physics at Trinity College Dublin, where he is now an associate physics professor.

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θΔics

In existographies, **Stefan Pohl-Valero** (c.1977-) (CR:10) is a Spanish mechanical engineer turned social thermodynamics historian noted for a number of publications, workshops, and presentations on the application of thermodynamics in sociology, history, economics, and religion, with particularly focus on 19th century Spanish theorists.

Valero's 2007 PhD dissertation "The Circulation of Energy: Thermodynamics, National Culture, and Social Progress in Spain, 1868-1890" built on the earlier thematic work of socio-science historians Crosbie Smith and Greg Myers to discuss how scientists such as William Thomson, Balfour Stewart, Peter Tait, and Thomas Huxley applied and used thermodynamics to theorize about various humanist implications. Valero's unique focus, however, is on a specific group of Spanish scientists and social reformers, particularly the work of physicist Enrique Serrano Fatigati, and his circle, who in the 1870s sought to construct a educational program of physics that was based on an evolutionary and energetic interpretation of nature. [1]

Borges | Heat death

Pohl-Valero opens his *Energy and Culture* to the following 1934 quote by Argentine writer Jorge Luis Borges: [4]

> "La primera ley de la termodinámica declara que la energía del universo es constante; la segunda, que esa energía propende a la incomunicación, al desorden, aunque la cantidad total no decrece. Esa gradual desintegración de las fuerzas que componen el universo, es la entropía. Una vez alcanzado el máximo de entropía, una vez igualadas las diversas temperaturas, una vez excluida (o compensada) toda acción de un cuerpo sobre otro, el mundo será un fortuito concurso de átomos. En el centro profundo de las estrellas, ese difícil y mortal equilibrio ha sido logrado. A fuerza de intercambios el universo entero lo alcanzará, y estará tibio y muerto. La luz se va perdiendo en calor; el universo, minuto por minuto, se hace invisible. Se hace más liviano también. Alguna vez, ya no será más que calor: calor equilibrado, inmóvil, igual. Entonces habrá muerto."
>
> "The first law of thermodynamics states that the energy of the universe is constant; the second, that energy tends to isolation, disorder, although the total amount does not decrease. This gradual disintegration of the forces that make the universe is the entropy. After reaching the maximum entropy, once matched the various temperatures, after excluding (or offset) all action of one body on another, the world will be a fortuitous concourse of atoms. In the deep center of the stars, that elusive and deadly balance has been achieved. A force exchanges will reach the entire universe, and is warm and dead. The light is lost in heat; the universe, minute by minute, it becomes invisible. It also becomes lighter. Ever, it will not be more than heat balance, motionless, just heat. Then there will be dead."

(add)

Energy and Culture

In 2011, Pohl-Valero published *Energy and Culture: a History of Thermodynamics in Spain in the Second Half of the Nineteenth Century*, the abstract of which is as follows:

> "In the second half of the 19th century, the disciplinary map of physics and life sciences was reshaped by the new science of thermodynamics, which became one of the main scientific developments of that century. At the same time, its laws played an important role in the configuration of western modern social thought. Besides cosmological and natural terrestrial phenomena, even society started to be analyzed under an energetic conceptual frame, producing a deep influence in religious, educational, political and economical discourses. European intellectuals

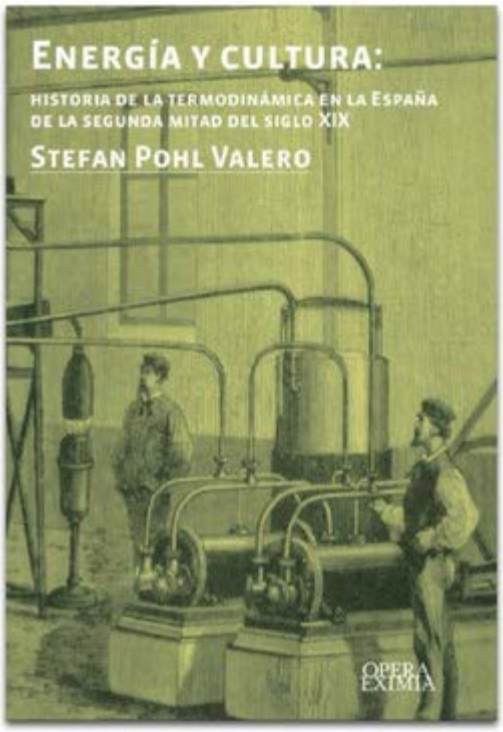

Pohl-Valero's 2011 *Energy and Culture*, a history on social thermodynamics in late 19th century Spain. [3]

from the entire ideological spectrum participated in these kind of discourses. Energy and culture thoroughly analyses the process of communication and appropriation of thermodynamics during the last third of the 19th century in Spain, stressing how the cultural reformulation of its laws was foundational for understanding the natural world and Spanish society during a critical period of their history.

Actually, both energy conservation and entropy were concepts interpreted and employed by local experts and lay persons with a diversity of goals. Several theological assumptions, such as God's creation of the universe, free will or the possibility of miracles, were debated taking into consideration such theories. While some sectors of society turned to the laws of thermodynamics in order to refute the power of Catholic Church and promote secular values and a naturalistic worldview, others employed them to "scientifically prove" a number of moral traditional values and, by doing that, try to maintain the social status quo. Some heralds of thermodynamics restricted the application of its laws to the material world, while others stated their importance for the study of human beings and society. These laws gave legitimacy to several economical and social stances and represented society as a functioning thermal machine ruled by them.

The historical period studied in this book begins in the late 1860's and finishes the first years of 1890; it covers the first Spanish democratic period (1868-1874) and an important part of the Bourbon Restoration period. During the decade of 1870 to 1880, the communication of thermodynamics mainly focused its attention on moral and theological implications of its laws and on the role of this science in legitimating a materialistic worldview. Amidst a social debate on scientific materialism and its possible social consequences, the laws of thermodynamics, laden with natural, moral and social meanings, experienced a wide public circulation, going through multiple cultural re-elaborations.

Through a process of popularization, the local advocates of the new science of energy stressed that its laws did not support materialism and that its teaching was important for the material and moral progress of the nation. This "adequate" public image of thermodynamics gained force in the decade of 1880, when it social use went beyond theological and cosmological aspects, entering into debates around the functioning of society. Thermodynamics acquired a more neutral public meaning and an increasingly practical sense, allowing the restoration reformers to elaborate – as part of their political and social projects – a social thermodynamics. Different interpretations of its laws were then used to support social and economical reforms, which the intellectual leaders of the time tried to apply in a context of increasing social tensions."

(add discussion)

Education

Valero completed his BS in mechanical engineering at the Universidad de los Andes in 1999; was a research assistant in the Department of Mechanical Engineering at the Technical University of Munich, Germany from 1999 to 2001; he completed his MS and PhD in History of Science, at Autonomous University of Barcelona, Spain in 2007.

Valero has been visiting researcher at the Department of History and Philosophy of Science, University of Cambridge (United Kingdom, 2004 and 2005), Visiting Professor in the Masters in Social Studies of Science at the Universidad Nacional de Colombia (2009 and 2010) and Masters in Science, History and Society of the Autonomous University of Barcelona (2010). Between 2008 and 2010 he served as Assistant Professor in the Department of History at the Universidad Javeriana (Bogota, Colombia) and from 2009 to 2010 was editor of the journal Memory and indexed History Society. [2]

Valero currently is a professor in the School of Human Sciences, and the Universidad de Rosario, Columbia.

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θΔics

In radiation thermodynamics, the **Stefan-Boltzmann law** states that the total energy radiated per unit surface area of a black body in unit time, *J*, is directly proportional to the fourth power of the black body's thermodynamic temperature *T*:

$$J = \sigma T^4$$

where σ, called the Stefan–Boltzmann constant.

History

The law was deduced by Josef Stefan in 1879 on the basis of experimental measurements made by John Tyndall and was derived from theoretical considerations, using thermodynamics, by Ludwig Boltzmann (1844-1906) in 1884. [1] Boltzmann treated a certain ideal heat engine with the light as a working matter instead of the gas. The law is valid only for ideal black objects, the perfect radiators, called black bodies.

See also

- Thermodynamics of hell

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θΔics

In human chemistry, **Stefani Brooke Engelstein** (1970-) is an American anti-reductionist comparative literature scholar noted for her 2008 two cultures book *Anxious Anatomy: the Conception of the Human Form in Literary and Naturalist Discourse*, the second chapter of which is devoted to a dissection and interpretation of German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*, commenting, for example, on how Ottilie rejects talk of human kinship with monkeys (evolution theory), the ECHO cypher, how Goethe's "The Metamorphosis of Plants" (1790), "Metamorphosis of Animals" (1806), and *Elective Affinities* are to be viewed as a three-part treatise on metamorphology, the significance of the opening P1:C1 grafting scene, among other subjects. [1]

Elective Affinities

In 2008, Engelstein, in her *Anxious Anatomy: the Conception of the Human Form in Literary and Naturalist Discourse*, devoted her chapter "Formative Drives", on Goethe's *Elective Affinities*, albeit in some sense attempting to marginalize and to discredit the human chemical theory used by Goethe, arguing that: the title is a "misleading allusion"; that the "characters do not mimic the behavior of the chemicals to which they are compared"; that Goethe's famous anonymous advertisement was him pointing out that he was "not trying to map human relations into chemical reactions or *vice versa*"; that the theory used was an "outdated chemical concept"; that Goethe, in his essay "Analysis and Synthesis", and his mention of the Danaids, was his admittance that his theory "cannot hold water", etc., etc., and uses the term "fail" repetitively, in regards to the chemical theory. Engelstein cites Beda Allemann and Jeremy Adler in support of her position:

> "Adler disputes the reductive determinism in Goethe's idea of nature, thus relieving the most dangerous consequence of the analogy for human decision making. Allemann goes one step further and demonstrates definitively that the analogy between chemical and characters fails."

That Adler "disputes reductive determinism", however, seems to be nearly a complete false assertion, nearly to the point of putting words in his mouth, being that Adler spent over a decade doing his PhD dissertation extolling the reductive deterministic human chemical reaction point of view in Goethe's work. In any event, the gist of Engelstein aversion to Goethe's human chemical theory, which Goethe defensively claimed was true, is found in the following statement by Engelstein:

> "Just as the characters so failingly interpret the world around them, so we are confronted with the reality that the relations and affinities between things as well as between people, are a result of a fluctuating combination of will, chance, and law."

Engelstein, in short, has a belief system rooted in the doctrine of free will and that each person freely chooses between right and wrong, which is the polar opposite to Goethe's belief system, as stated famously P2:C5, namely that “none are more hopelessly enslaved than those who falsely believe they are free.” Engelstein also in her mention of "chance" seems to admit belief in evolution occurring via a mixture of blind random chance and law. This again is the polar opposite of Goethe's metamorphosis theory (see: morphology) of evolution, according to which dynamic form change occurs via predetermined measures (see: prediction) of the force of chemical affinity.

Education

Engelstein completed her BA in literature at Yale University in 1992, her MA in comparative literature in 1994 and PhD in comparative literature in 2001 with a dissertation on the “Origins of Meaning: the ‘Natural’ Human Body in Literature and Science of the Late Eighteenth and Early Nineteenth Centuries”, the latter both at the University of Chicago. Engelstein currently is a professor of German at the University of Missouri.

Science and society program

Since 2009, Engelstein has been the head of the Missouri University's 2000-launched Life Sciences and Society Program, a field of study at the juncture of the science and culture, encompassing investigations of the historical, cultural, ethical, and economic contexts, which seems to be something in the sphere of the two cultures arena (see: two cultures university department). The program promotes the cultivation of connections between the logic and languages of the sciences, social sciences, and humanities. [2]

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â— Engelstein, Stefani (1970-) – WorldCat Identities.

θΔics

In terminology, **steigerung**, translated as "heightening" or "intensification", is one of the two main driving forces, along with polarity, in German polyintellect Johann Goethe's 1809 evolution-like metamorphology theory of chemical, plant, and animal form change over time.

Overview

The term "steigerung" is, supposedly, one of the key parts of German intellect Johann Goethe's metamorphology theory of morphology change, chemicals to humans. [1] American Goethean scholar Astrida Tantillo explains "steigerung" as follows: [2]

> "Goethe explains that the two main natural forces, polarity and ***Steigerung*** (heightening or intensification), represent a kind of binary division. *Steigerung* represents spirit -- polarity, matter. Unlike the traditional, hierarchical relationship between body and soul, however, Goethe intertwines the two and does not place one above the other. He calls polarity and *Steigerung* the two main driving forces of nature:
>
> > 'the former a property of matter insofar as we think of it as material, the latter insofar as we think of it as spiritual. Polarity is a state of constant attraction and repulsion, while **intensification** is a state...'

(add discussion)

Quotes

The following are related quotes:

> "Since as a kid I was aware of the abyss (super rift) between the material and mental worlds. I tried to bridge this abyss, but could not. Yet I kept on with my own "**Steigerung**" as Goethe did. Then during 1982-83 I discovered empirically that the law of entropy production applies to the spiritual [*humanistic*] world as it applies to the physical world. My joy knew no bounds. I have found the bridge between these two worlds with which to cross the abyss between them. Others thought I was crazy and would not dare to publish my account. Then, in 1986, if I remember correctly, I was teaching university students the intricate calculations concerning free energy in chemical reactions. During that lecture I suddenly became aware how my mind was rushing along two levels. The lower level was concerned with chemical processes as a physical phenomenon. I executed this level almost automatically. But the higher level of my mind was exploring free energy in the process of knowing-learning as a spiritual [*thermodynamics*] phenomenon. I followed this level with great curiosity. I think the students became aware that I was rather absent minded that day, not perceiving my higher most thoughts. That day marks the beginning of my continual exploring of the role of free energy in the spiritulization [*actualization*] of humankind."
>
> — Adriaan de Lange (2010), retrospect reflection on arrival of human free energy theory

References

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θΔics

In hmolscience, **Stendhal** (1783-1842) (CR:14), aka Marie-Henri Beyle, was French realism writer noted for his 1822 book *On Love*, wherein he describes the phenomena of "crystallization", wherein, as cited in literature chemistry, the perceived level of beauty or physical attractiveness of a person one is falling in love with seemingly increases in the mind's eye, and for his atheism promoting statements.

Boredom

Stendhal, according to Lars Svendsen, is grouped among the so-called "boredom philosophers", namely: Pascal, Rousseau, Kant, Schopenhauer, Kierkegaard, Nietzsche, Heidegger, Benjamin, Adorno, Goethe, Flaubert, Peter Zapffe, Mann, Beckett, Buchner, Dostoevsky, Chekhov, Baudelaire, Leopardi, Proust, Byron, Eliot, Ibsen, Valery, Bernanos, and Pessoa. [1]

Crystallization

In 1822, Stendhal, in his *On Love*, used the model of crystallization to explain the process of falling in love, wherein the previously noticed imperfections of one's newly forming mate slowly disappear and in many cases become marks of perfection and beauty. Stendhal described the process of twig crystallization as such:

> "In the salt mines, nearing the end of the winter season, the miners will throw a leafless wintry bough into one of the abandoned workings. Two or three months later, through the effects of the waters saturated with salt which soak the bough and then let it dry as they recede, the miners find it covered with a shining deposit of crystals. The tiniest twigs no bigger than a tomclit's claw are encrusted with an infinity of little crystals scintillating and dazzling. The original little bough is no longer recognizable; it has become a child's plaything very pretty to see. When the sun is shining and the air is perfectly dry the miners of Hallein seize the opportunity of offering these diamond-studded boughs to travellers preparing to go down to the mine."

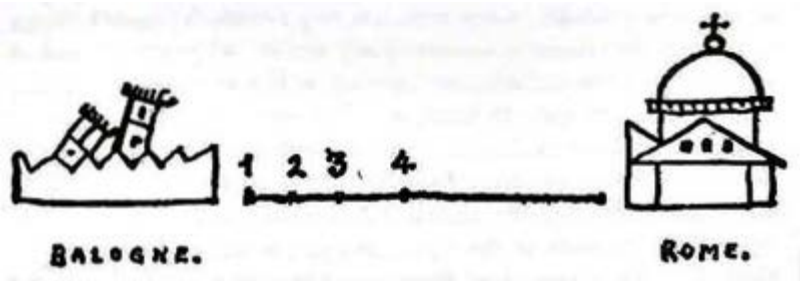

He then employed this model to explain the transformation that occurs when two people fall in love. "When we are in Bologna, we are entirely indifferent; we are not concerned to admire in any particular way the person with whom we shall perhaps one day be madly in love with; even less is our imagination inclined to overrate their worth." In a word, in Bologna "crystallization" has not yet begun. When the journey begins, love departs. One leaves Bologna, climbs the Apennines, and takes the road to Rome. The departure, according to Stendhal, has nothing to do with one's will; it is an instinctive moment. This transformative process actuates in terms of four steps along a journey: first admiration, second acknowledgement, third hope, and forth delight. [1]

Quotes

The following are noted quotes:

“Gods only excuse is that he does not exist.”

— Stendhal (c.1820), cited by Nietzsche, in *Ecce Homo*, as “best atheist joke”, saying he was jealous of for not having said it first [2]

“We call an action ‘natural’ when it does not differ from the habitual mode of action.”

— Stendhal (1822), *On Love*

“The only unions which are legitimate are those ruled by a genuine passion.”

— Stendhal (1822), *On Love*

“Whatever some hypocritical ministers of government may say about it, power is the greatest of all pleasures. It seems to me that only love can beat it, and love is a happy illness that can't be picked up as easily as a ministry.”

— Stendhal (1822), *On Love* (Ñº)

References

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(b) Ecce Homo (book) – Wikipedia.
(c) Malieth, Monydit (aka Tonnerre). (2013). *The Future Affects the Past: What Destination is Time Rushing To?* (pg. 26). Red Lead Books.
3. Crystallization (love) – Wikipedia.

External links

â— Stendhal – Wikipedia.

θΔics

In science, **Stéphane Leduc** (1853-1939) was a French biologist noted, in chnops-thermodynamics, for his 1911 effort to explain life via mechanism, energy, and entropy.

Overview

In 1911, Leduc, in his *The Mechanism of Life* in which, in his own words, "endeavored to give as much of the science of energetics as can be treated without the use of formula; the conception of entropy and Carnot's law of thermodynamics" to the explanation of the mechanism of life. He states, for instance, "a living being [is] a store of potential energy, to be set free by external stimulus." [1] Leduc's overall aim was to contribute to the understanding of the chemical and physical mechanisms of life. [2]

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External links

â— Stéphane Leduc – Wikipedia.

θΔics

In existographies, **Richard Stephen Berry** (1931-) (CR:8), commonly cited as R. Stephen Berry, is an American physical chemist noted, in human thermodynamics, for his 1971 thermodynamics based sustainability ideas.

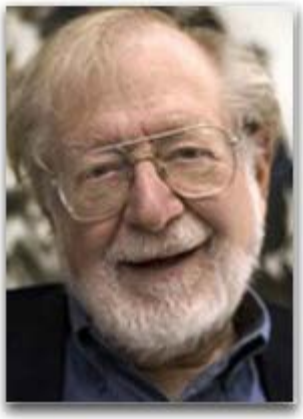

Overview

In 1971, Berry, in his "The Option for Survival", argued that in order to understand 'survival' one must use a thermodynamics view on the premise that people must recycle waste while the thermodynamic potential is still moderately high. In the opening of his article, Berry states: [1]

> "To a physical chemist, the natural characteristics of a complex system come from the field of thermodynamics, and it is essentially a thermodynamic analysis of society that I want to make."

On this logic, Berry premises that it should be possible to pick a single variable to give a basic criterion for human survival and stability to use for guidance in long-term planning. Berry speculated on the thermodynamic instability surrounding WWII and how thermodynamic modeling might act to forgo similar events in the future. Berry's most widely-held publication is his 1980 textbook *Physical Chemistry*, having gone through eight editions. [2]

Education

Berry completed his AB (1952), AM (1954), and PhD (1956) at Harvard University. He was an instructor at the University of Michigan from 1957 to 1960 and an instructor at Yale University from 1960 to 1964. He joined the University of Chicago in 1964 and has been there since. His interest in energy, resources, and thermodynamics began in 1968. Berry lists his research interests to include the structures, properties, and dynamics of clusters and biopolymers, e.g. protein folding, potential surfaces, etc., few body system dynamics, and finite time thermodynamics.

References

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- R. Stephen Berry – Wikipedia.
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- R. Stephen Berry (faculty) – Chemistry Department, University of Chicago.

θΔics

In hmolscience, **Stephen Black** (c.1935-) is/was an English psychologist noted for []

Overview

In 1972, Black, in his *The Nature of Living Things: an Essay in Theoretical Biology*, attempted to platform on a DNA-mixed Maxwell's demon basis, to argue for a religion-explicit ontic opening polemic to the effect that the sequence of base pairs from one end to the other, in DNA, is "largely independent of energy and the second law", which thus make the chemistry of animals and people unique; in his own words:

> "As distinct from the purely energetic chemistry of the universe in general, which can in the end only create disorder and increase entropy, this elegant earthly chemistry of energy *and* information only creates order. Whatever the entropy change involved in each individual, it is unquestionably the information flow maintained by DNA of the genes which as produced which such precision the ordered structure of all those animals and plants now populating the earth."

Black, supposedly, goes onto sell this argument as the basis or methods of a divinity at work; the following being a representative quote:

> "Although Darwin's evolution by natural selection appeared to challenge the prevailing 19th century concept of a divine creation, the discovery of the structure of DNA and its role in the replication of genetic information has largely reinstated the almighty as the great computer programmer of the biosphere—and it is now a matter of 'in the beginning' God created DNA."

Black then attempts, on this religion-deluded basis, to tie this into the work of Ralph Hartley (1928), Leo Szilard (1929), Norbert Wiener (1948), Claude Shannon (1949), and the general information theory based Shannon bandwagon argument.

Commentary | Quotes

The following are related quote commentary on Black:

> "The 'central dogma' of molecular biology, which states that the information upon which the chemistry of life depends is provided by the genetic material DNA. But the refusal of biologists to regress further than this point and to confront the question as to where the information contained in DNA came from in the first place has, according to **Stephen Black**, reintroduced a quasi-vitalism in to biology."
>
> — Michael Foley (1990), *Laws, Men and Machines* [1]

References

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(b) Foley, Michael. (1990). *Laws, Men and Machines: Modern American Government and the Appeal of Newtonian Mechanics* (pg. 84). Routledge, 2014.

Further reading

â— Black, Stephen. (1969). *Mind and Body*. William Kimber.

θΔics

In existographies, **Stephen Brush** (1935-) (CR:15) is an American physics historian noted for his 1978 *The Temperature of History: Phases of Science and Culture in the Nineteenth Century*, in which he discusses the thermodynamics of Henry Adams and Freud's death wish, among other topics. [1]

Temperature of history

In 1967, Brush wrote "Thermodynamics and History", wherein he outlines a study of how themes in thermodynamics are echoed by trends and fashions in nineteenth-century art (see: art thermodynamics) and literature (see: literature thermodynamics)—during the course of which he comments, according to Jeremy Campbell (1983), how his biggest surprise was to learn that he was "pioneering nearly virgin territory, where no scholarly foot had trod." [5]

This article, according to Greg Myers (1985), was expanded into the result of Brush's 1978 book *The Temperature of History: Phases of Science and Culture in the Nineteenth Century*. [7]

Boltzmann

Interesting, as many of Ludwig Boltzmann's statistical mechanics works (in the original German) have yet to be fully translated into an English collected works set or even, for that matter, readily available a assessable individual English-translated articles, many, e.g. Jeffrey Wicken (1987), are forced to go through Brush in as a citation and interpretation of Boltzmann's views.

Kinetic theory and thermodynamics

In thermodynamics, Brush is noted for his in depth historical books on the kinetic theory of gases and on statistical thermodynamics as well as on biographical details of key thermodynamicists, such as Joule, Clausius, Maxwell, and Boltzmann; and for making English reprints of various famous publications available. [4] Brush was the 1964 English translator of Austrian physicist Ludwig Boltzmann's *Lectures on Gas Theory*, giving a 17-page translator's introduction. [3]

Brush's 1976 book *The Kind of Motion We Call Heat*, on the history of kinetic theory, won the Pfizer Award of History of Science Society. [2]

Education

Brush completed his BA in physics and chemistry at Harvard in 1955 and his PhD in theoretical physics at Oxford in 1958. [2] In 1968, at the University of Maryland, Brush founded a new program in the history of science; retiring from there in 2006 as a professor emeritus.

References

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(b) Brush, Stephen G. (1978). *The Temperature of History: Phases of Science and Culture in the Nineteenth Century* (Adams, 13+ pgs). New York: Burt Franklin.
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3. Boltzmann, Ludwig. (1976). *Lectures on Gas Theory* (translated by Stephen G. Brush). Dover.
4. Brush, Stephen G. and Hall, Nancy S. (2003). *The Kinetic Theory of Gases* (contents). Imperial College Press, 2003.
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(b) Brush, Stephen. (1967). "Thermodynamics and History: Science and Culture in the Nineteenth Century", *The Graduate Journal*, 7: 477-565.
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(b) Wicken, Jeffrey S. (1987). "Entropy and Information: Suggestions for a Common Language" (abs), *Philosophy of Science*, 54(2): 176-93.
7. (a) Brush, Stephen G. (1978). *The Temperature of History: Phases of Science and Culture in the Nineteenth Century*. New York: Burt Franklin.
(b) Myers, Greg. (1985). "Nineteenth-Century Popularizations of Thermodynamics and the Rhetoric of Social Prophecy." *Victorian Studies*, 29: 35-66.

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External links

● Stephen G. Brush – Wikipedia.
● Stephen G. Brush (faculty) – University of Maryland.
● Stephen Brush (about) – University of Minnesota, Archives.
● Brush, Stephen G. – WorldCat Identities.
● Stephen G. Brush – PunsterProductions.com.

θΔics

In hmolscience, **Stephen Coleman** (1942-) is an American political scientist noted for his 1972 PhD dissertation turned book *Measurement and Analysis of Political Systems: a Science of Social Behavior*, wherein he rides the Shannon bandwagon to contrive vacuous political theories, admixtured with passing Sokal affair stylized thermodynamic terms mentions, e.g. temperature, state of equilibrium, volume of gas, etc.

Overview

In 1972, Coleman completed his Shannon bandwagon based PhD dissertation turned 1975 book *Measurement and Analysis of Political Systems: a Science of Social Behavior*, in which he employs the system concept of entropy, which he considers as the state of uncertainty in the system, as the central macroscopic characteristic of social units, albeit mostly based on information theory entropy logic. [1] Coleman, in 2009, admitted that his concepts have nothing to do with thermodynamics: [5]

> "My research doesn't have anything to do with thermodynamics … the entropy concept is taken from Shannon's statistical information theory."

Despite his retrospect denial that his theory has nothing to do with thermodynamics, from his 1975 book we find thermodynamic-soaked gems such as:

> "An entropy value for a unitary social system is analogous to a temperature reading for a thermodynamic system, such as a volume of gas. In a state of temperature equilibrium one temperature measurement describes the whole volume of any part of it. If a social system is in an entropy equilibrium, a single entropy measurement describes the state of the system or any subsystem. For a system in partial equilibrium, the entropy values of its subsystems must be known."

Coleman, in other words, not only rides the Shannon bandwagon, but is running a self-Sokal affair. He goes on to argue for other concepts, such as: election behavior as an entropy indicator, social entropy, political entropy, microscopic entropy measurements, among other conceptions. [4]

In 2007, Coleman published *Popular Delusions*, giving entropy measurements of conformity, psychological foundations of entropy, and election entropy calculations. [3]

Education

Coleman completed his BA in mathematics, a master's degree in journalism, and his PhD in 1972 with the dissertation "Measurement and Analysis of Political Systems: a Science of Social Behavior", published as a book in 1975, in political science at the University of Minnesota. [4] He is currently a professor emeritus at the Metropolitan State University.

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3. Coleman, Stephen. (2007). *Popular Delusions: How Social Conformity Molds Society and Politics* (abs). Cambria Press.
4. University Directory – Metropolitan State University.

5. Coleman, Steven. (2009). "Email to Libb Thims", Feb 5.

θΔics

In economic thermodynamics, **Stephen Lee Gillett** (1953-) is an American geologist and science fiction writer noted for his 2005 “Entropy and its Misuse: Energy, Free and Otherwise” wherein he shows how Nicholas Georgescu-Roegen's ideas about low entropy are incorrect.

Overview

In 2005, Gillett, in his “Entropy and its Misuse: Energy, Free and Otherwise”, took aim at Nicholas Georgescu-Roegen’s 1971 highly-touted, albeit misconstrued, ideas about how “low entropy”, as advocated by the Roegen-Daly school, and resources apply in economics and ecology, along with other misconstrued Georgescu-Roegen based ideas, e.g. the 1999 work of American economist Gabriel Lozada.

Gillett’s paper spurred the followup 2005 rebuttal article “Entropy, Free Energy, Work, and other Thermodynamic Variables in Economics” by American economist Gabriel Lozada. [2]

Entropy of water

In 1975, Romanian economist Nicholas Georgescu-Roegen, in his “Energy and Economic Myths”, supposedly stated: [3]

> “The entropy of water is higher than that or oxygen and hydrogen.”

In 1993, New Zealand chemical engineer A.G. Williamson, in his “The Second Law of Thermodynamics and the Economic Process”, supposedly, pointed out, noted, or showed that Georgescu-Roegen’s statement was incorrect. [4]

Gillett, citing Williamson, does thermodynamic data table based calculation of the oxygen reacting with hydrogen to form water which he determines to have a -52.5 J/mol · K, thereby concurring that Georgescu-Roegen was “simply wrong” and that if “low entropy” were truly the resource, liquid water would be a better resource than the fuels it is formed from!

Education

Gillett completed his BS in geology at Caltech in 1975 and PhD in geology at SUNY, Stony Brook NY in 1981 with a dissertation on “Magnetization and Remagnetization Processes in some Early Paleozoic Limestones from the Great Basin”.

Quotes

The following are other related quotes:

> “It is certainly true that the economy, and human affairs in general, are subject to physical laws. Confusion has arisen, however, because the thermodynamic laws have been commonly misunderstood and misapplied.”
>
> — Stephen Gillett (2005), “Entropy and its Misuse” (pg. 58)

> “Entropy’s significance is indirect: because of the second law free energy cannot be recycled. Thus free energy is the actual resource, not ‘low entropy’, a point also made by Ayres (1998). The earth is also not an isolated system, and thus it makes no sense to speak of scattering ‘high entropy’ into the biosphere; the ultimate sink for waste heat is outer space.”
>
> — Stephen Gillett (2005), “Entropy and its Misuse” (pg. 59)

> “If low entropy is not the ultimate resource, what is? It is free energy, the energy available to do work,

(Fermi, 1937, pp. 77–78). Throughout this paper, either ‘free energy’ or ‘available energy’ will mean energy that is available to do work. Gibbs free energy, a special case, will always be specifically indicated. I also will not use the term ‘exergy’, for two reasons. First, it is not a standard term, at least in the English-language literature; *Chemical Abstracts* merely cross-references ‘exergy’ to ‘free energy’. The second is that it does not seem to be used consistently as a synonym for free energy.”

> — Stephen Gillett (2005), “Entropy and its Misuse” (pg. 59)

“That free energy is in a very real sense the ultimate resource does not lead to a free energy theory of value [free energy theory of value], however, for two related reasons.”

> — Stephen Gillett (2005), “Entropy and its Misuse” (pg. 61); there is semantic and conceptual confusion here, because Gillett convolutes the free energy of things such as photosynthesis, aluminum cans, and toxins, to reaction false conclusions about the economic value of matter, such as gold, oil, power via water falling, etc.; too lengthy to address, presently

“Because entropy must not decrease in spontaneous processes does not mean that entropy is the ultimate thermodynamic driving force.”

> — Stephen Gillett (2005), “Entropy and its Misuse” (pg. 62); this is correct, as was first codified by Gilbert Lewis (1923)

“It is not the case, therefore, that a chemical reaction is driven merely by the increase of entropy (Beard and Lozada, 1999, pp. 94–95). It also is not true that chemical processes can be analyzed ‘not merely by thermodynamics in general but by the entropy law in particular’ (Lozada, 1999, p. 332). In general, both energy and entropy are important, because it cannot be assumed that energy is present daily as heat.”

> — Stephen Gillett (2005), “Entropy and its Misuse” (pg. 62); this is funny, how correctly stupid Gillett makes Lozada look; the 19th century thermal theory of affinity comes to mind here

“Both energy and entropy are real physical quantities, and the general statements above can be well illuminated by some quantitative examples that indicate the magnitudes involved. In nearly all the appeals to the ‘entropy law’, the purported ‘high entropy costs’ of human or biological activity have not been buttressed with any actual values.”

> — Stephen Gillett (2005), “Entropy and its Misuse” (pg. 63); very humorous

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External links

- Stephen L. Gillett (profile) – Zyvex.com.
- Stephen L. Gillett (profile) – Foresight.org.

θΔics

In existographies, **Stephen Jay Gould** (1941-2002) (CR:8) was an American paleontologist, evolutionary biologist, and science historian, noted for []

Atheism

Gould was described, by Jerry Coyne, who had Gould on his thesis committee, as a "diehard atheist if there ever was one." (Q) Oliver sacks labeled Gould as a "Jewish atheist". (Q)

Mass extinctions

In 1972, American computer whiz Jack Sepkoski, a new graduate student of Stephen Gould, following the late 1960s so-called Woods Hole paleontology conference, was assigned the task of transforming the mass of known fossil data, such as *Treatise on Invertebrate Paleontology*, and other data bases, into a computer database, in aims to discern possible patterns in the "history of life" (Neil Shubin, 2013), found that the data suggested five mass extinctions, and building on the so-called "extinction periodicity hypothesis" (or Fischer-Arthur hypothesis), introduced in 1977 by A.G. Fischer and M.A. Arthur, together with David Raup, hypothesized in 1984 (Q) that mass extinctions occur cynically ever 26-million years. [1]

NOMA

In 1997, Gould, in his essay "Non-Overlapping Magisteria", put forward the idea of "non-overlapping magisteria" or NOMA as a means to, in his mind, resolve the conflict between science and religion. [2]

Quotes | By

The following are noted quotes:

> "I point out that Francis Galton was taken quite seriously as a leading intellect of his time. The American hereditarian Lewis Terman, the man most responsible for instituting IQ tests in America, retrospectively calculated Gallon's IQ at above 200, but accorded only 135 to Darwin and a mere 100-110 to Copernicus (see pp. 213-218 on this **ludicrous incident in the history of mental testing**). Darwin, who approached hereditarian arguments with strong suspicion, wrote after reading *Hereditary Genius*: 'You have made a convert of an opponent in one sense, for I have always maintained that, excepting fools, men did not differ much in intellect, only in zeal and hard work"' (in Galton, 1909, p. 290). Galton responded: 'The rejoinder that might be made to his remark about hard work, is that character, including the aptitude for work, is heritable like every other faculty'."
>
> — Stephen Gould (1980), *The Mismeasure of Man* (pg. #)

> "We are here because one odd group of fishes had a peculiar fin anatomy that could transform into legs for terrestrial creatures; because the earth never froze entirely during an ice age; because a small and tenuous species, arising in Africa a quarter of a million years ago, has managed, so far, to survive by hook and by crook. We may yearn for a 'higher' answer — but none exists. This explanation, though superficially troubling, if not terrifying, is ultimately liberating and exhilarating. We cannot read the meaning of life passively in the facts of nature. We must construct these answers ourselves — from our own wisdom and ethical sense. There is no other way."
>
> — Stephen Gould (2002), *I Have Landed* (Q); cited by Ravi Zacharias (2008) in *The End of Reason* (pg. 33) as an unliberating question mark

References

1. Shubin, Neil. (2013). *The Universe Within: Discovering the Common History of Rocks, Planets, and People* (pgs.

133-34). Random House.
2. Non-overlapping magisteria – Wikipedia.

External links

- Stephen Jay Gould – Wikipedia.

θΔics

In existographies, **Stephen Gray** (1666-1736) (Cattell 1000:644) (IQ:#|#) was an English electrical experimenter, astronomer, chemist, and dyer, noted for []

Overview

In 1708, Gray, in a letter to Hans Sloane, described the use of down feathers, a stick, and some type of Hauksbee generator, such as shown adjacent, which he used to detect electricity, specifically to make electric charge pass from the glass tube to the feather, which then enabled the feather to attach to a stick of wood. [3] The gist of his findings are as follows:

> "If a plume of feathers, tied to a stick, is presented to the glass tube and then withdrawn, its fibers are found to adhere to the wood, as if there had been some electricity communicated to the stick or feather."
>
> — John Gray (1708), note on feather and glass tube generator experiment [5]

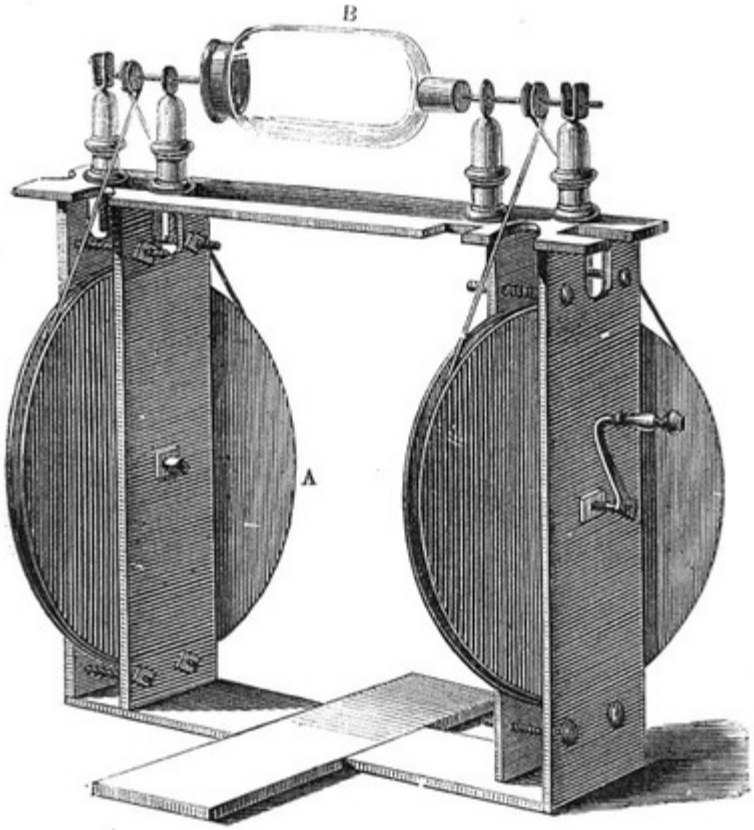

A c.1706 version of a Hauksbee generator (Ñº), itself a variant of a Guericke generator (c.1660), which **Gray** used from 1708 to 1732 to make electrons conduct through a hemp wire, wood, people, and other devices.

Gray, in the years to follow, failingly attempted to electrify metals by heat, friction, and percussion, or something along these lines. [5]

In early 1729, Gray was ruminating on the following idea:

> "If the [Hauksbee] tube can communicate a 'light' to bodies, it might also, under suitable circumstances, communicate an 'electricity' to bodies?"
>
> — Stephen Gray (1729), mental note [6]

In Feb 1729, Gray noticed that a feather attracted to the corked end of a Hauksbee tube (3-feet long and 1.2-inch diameter), rather than the glass; this is summarized as follows:

> "Gray used a flint-glass tube corked at both ends to keep out the dust; a wise precaution, as Hauksbee had shown, for contaminants within the tube reduce its electricity. And a fortunate precaution. Gray wondered whether the stoppers themselves altered the tube's power. They did not. While gleaning this information he found that a down feather released near the end of the tube went not to the glass, but to the cork. 'I then held the feather over against the flat end of the cork, which attracted and repelled many times together; at which I was much surprised, and concluded that there was certainly an 'attractive virtue' communicated to the cork by the excited tube'."
>
> — John Heilbron (1979), *Electricity in the 17th and 18th Centuries* (pg. 245)

Gray then began to test to see how far he could extend the 'attractive virtue' through the cork, by connecting things to the cork; this is summarized as follows:

> “Gray exploited his discovery by trying how far he could communicate the ‘attractive virtue’. He fixed an ivory ball on a stick thrust into the stopper; it received a stronger virtue than did the cork in the first exploratory experiment. He then varied the nature of the ‘line’ (heretofore the stick) and of the ‘receiving body’ (the ball). For the former, he substituted iron or brass wire, and packthread; for the latter, a shilling, a tea kettle, a silver pint pot, stones, bricks, tiles and vegetables. All proved satisfactory. The metals were 'strongly electrical, attracting the leaf-brass to the height of several Inches’; and so Gray succeeded at last in awakening their hidden electricity.”
>
> — John Heilbron (1979), *Electricity in the 17th and 18th Centuries* (pg. 246)

In later experiments, in the home of Granville Wheler, Gray was able to conduct electricity, through hemp cord, hung or insulted (from the conducting wood sticks) by silk, through up to specifically 80.5-feet in the following experimental setup: [1]

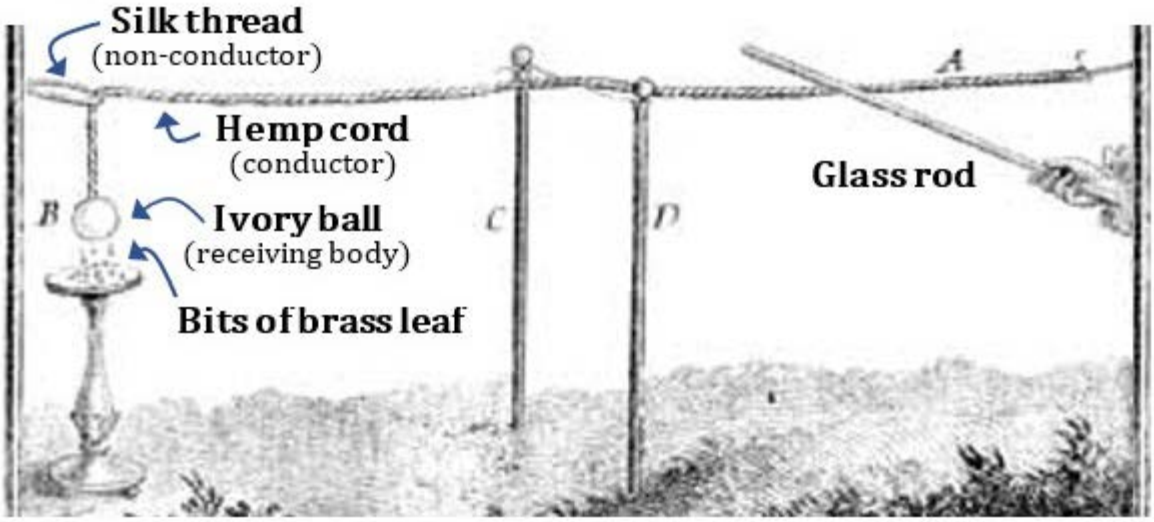

Gray and Wheler than stringing hemp cord around the home of Wheler, as shown below, getting the conduction to travel, supposedly, several hundred feet:

In 1731 to 1732, Gray published a series of papers in the Royal Society which demonstrated that some substances where conductors of electricity, and others were nonconductors or insulators. [2]

In 1733, Charles du Fay (1698-1739) read Gray's papers, after which he began to conduct extensive electrical conduction experiments. [2]

In the decades to follow, others began conducting their own Gray-styled experiments, such as:

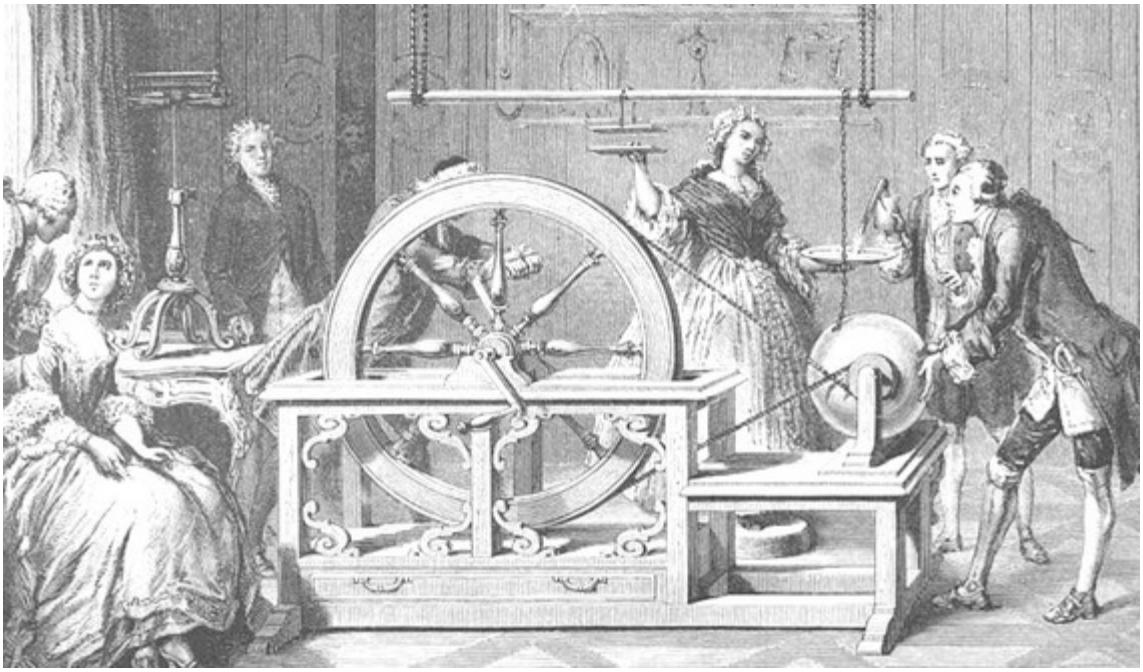

or the following:

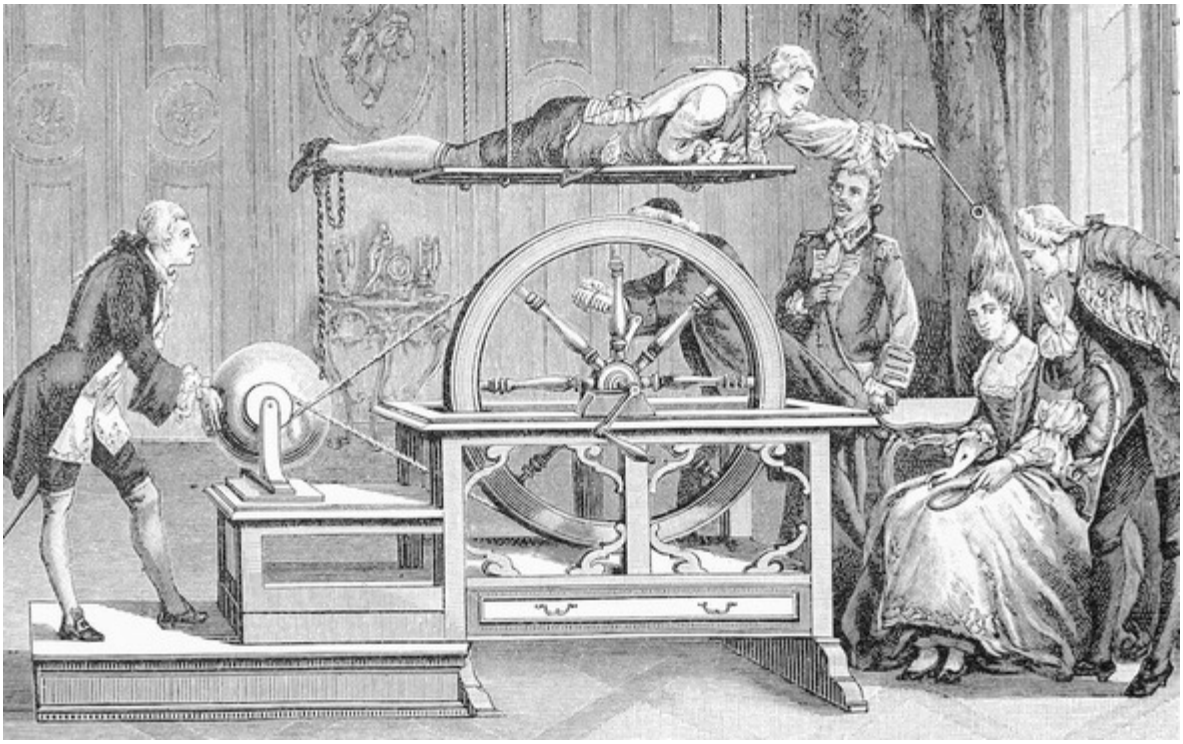

One of the more famous of these was the so-called “flying Boy” (Ñº) demonstration, popular in the mid–18th century, wherein a boy is suspended by rope from the ceiling, an electric charge is applied, and the boy then performs feats of apparent magic, like turning the pages of a book by just passing his hand over them, or touching a girl insulted by sanding on a barrel, who then raises bits of paper with her hand, as shown below:

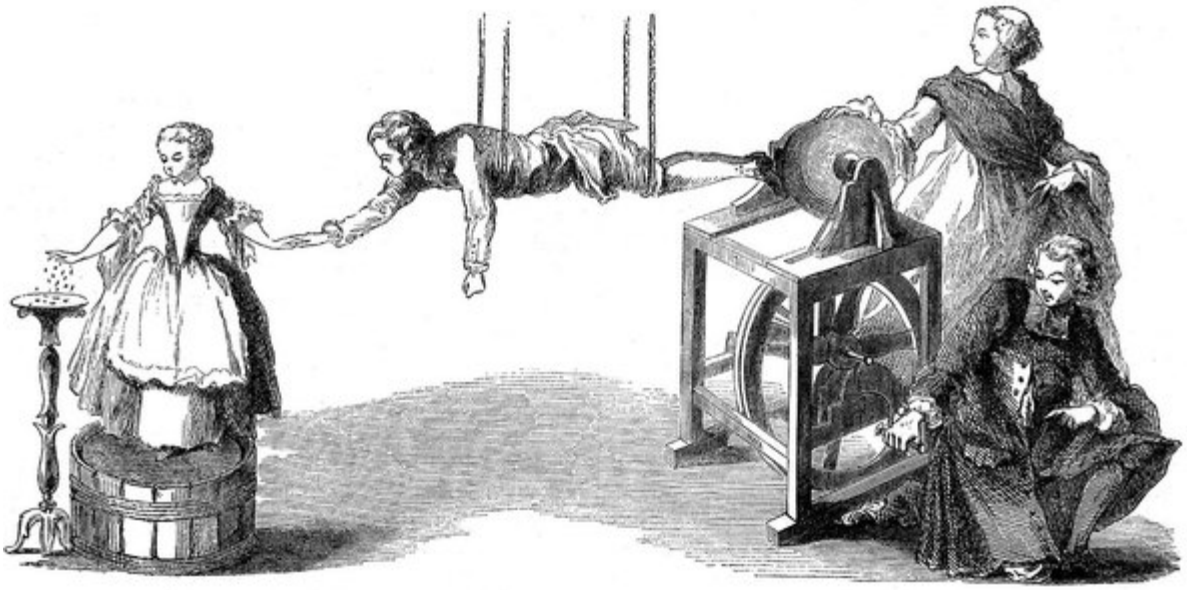

(add)

Quotes | By

The following are quotes by Gray:

> “In 1729, I communicated to Desaguliers, and some gentlemen, a discovery I had then lately made, showing that the electric virtue of a glass tube my be conveyed to any other bodies, so as to give them the same property of attracting.”
>
> — Stephen Gray (c.1730), “Letter to Cromwell Mortimer” [4]

References

1. Schiffer, Michael. (2006). *Draw the Lightning Down: Benjamin Franklin and Electrical Technology in the Age of Enlightenment* (Gray, 5+ pgs). University of California Press.
2. Kirby, Richard. (1956). *Engineering in History* (co-authors: Sidney Withington, Arthur Darling, Frederick Kilgour) (pg. 329-30). Courier, 1990.
3. Stephen Gray – SparkMuseum.com.
4. (a) Gray, Stephen. (c.1730). “Letter to Cromwell Mortimer”; in: *Philosophical Transactions of the Royal Society*, 37, 1731-1732.
(b) Stephen Gray – SparkMuseum.com.
5. Heilbron, John L. (1979). *Electricity in the 17th and 18th Centuries: a Study of Early Modern Physics* (Gray, 10+ pgs; §: Electrification by Communication, pgs. 245-). Publisher.
6. (a) Gray, Stephen. (1731-1732). *Published Transactions*, 18-44.
(b) Heilbron, John L. (1979). *Electricity in the 17th and 18th Centuries: a Study of Early Modern Physics* (Gray, 10+ pgs; §: Electrification by Communication, pgs. 245-). Publisher.

External links

â— Stephen Gray (scientist) – Wikipedia.

θΔics

In existographies, **Stephen Hawking** (1942-2018) (IQ:185|#100) [RGM:20|1,500+] (CR:136) was British astrophysicist noted for his 1965 PhD thesis which argued that if a star can collapse inwards to form a singularity, coined a "black hole" in 1967 by American physicist John Wheeler, then so to can a singularity explode back outward; thus giving an explanation for the Big Bang. [1] Hawking's thesis was stimulated by research of mathematician Rodger Penrose, and based on Albert Einstein's 1914 general theory of relativity. Hawking is a key figure in the development of the subject of black hole thermodynamics.

Life | Entropy

In 1996, Hawking, in his "Life in the Universe" lecture, opened to the following: [6]

> "It is a matter of common experience, that things get more disordered and chaotic with time. This observation can be elevated to the status of a law, the so-called Second Law of Thermodynamics. This says that the total amount of disorder, or entropy, in the universe, always increases with time. However, the Law refers only to the total amount of disorder. The order in one body can increase, provided that the amount of disorder in its surroundings increases by a greater amount. This is what happens in a living being. One can define Life to be an ordered system that can sustain itself against the tendency to disorder, and can reproduce itself. That is, it can make similar, but independent, ordered systems. To do these things, the system must convert energy in some ordered form, like food, sunlight, or electric power, into disordered energy, in the form of heat. In this way, the system can satisfy the requirement that the total amount of disorder increases, while, at the same time, increasing the order in itself and its offspring."

Here we see an incorrect presentation of things; a result of the mishap equivalence of entropy as disorder and the second law as the disorder of the universe tending to a maximum, which is NOT what is presented in Clausius' *The Mechanical Theory of Heat* (1865). Correctly, the discussion should be turned "towards free energy", as Schrodinger famous said in his Note to Chapter 6.

IQ | Mensa test

In 1962, Stephen Hawking, age 20, during his third year at Oxford, began to experience clumsiness, and at one point fell down some steps; after which, worried that his brain might be damaged, took a Mensa test (Q) to test for mental detriment; he found that he scored between 200 to 250 (Q)(Q) or 245 exactly (Q) as some report. Puzzlingly, to note, into the early 2000s, it became newspaper fodder that Hawking's Mensa test IQ was 160, particularly anytime any new sub-teenage rising proto-prodigy makes the headlines.

Thermodynamics

In thermodynamics, Hawking is noted for his 1973 paper "The Four Laws of Black Hole Mechanics", co-written with Australian theoretical physicist Brandon Carter and American physicist James Bardeen, which argued, on the earlier hypothesis of Mexican-born Jewish physicist Jacob Bekenstein that the area of an event horizon is a measure of the entropy of a black hole (black hole entropy), for the existence of black hole laws, which "correspond to and in some way transcend the four laws of thermodynamics", on the logic that the event horizon and surface gravity of a black hole "have a close analogy with entropy and temperature, respectively." [2]

A Brief History of Time

In popular culture, Hawking is famous for his 1988 book *A Brief History of Time*, a short history of the universe, in layperson's terms. Having sold about 10-million copies, it is one of the highest-selling science books of all time. During the writing of the book, an editor famously warned Hawking that for every equation in the book the readership would be halved, hence it includes only a single equation: $E = mc^2$. Hawking's book is notable for introducing many simplified thermodynamics perspectives, one being supposed violations of the second law of thermodynamics. In one instance he states:

> "The second law of thermodynamics has a different status than that of the other laws of science, such as Newton's law of gravity, for example, because it does not always hold, just in the vast majority of cases."

This quote has become a common launching point for novice thermodynamics researchers who would like to argue that the second law can be violated, and that it particularly does so for the case of evolution. Correctly, however, Hawking's point of view is an oversimplification of a contrived argument, stemming from the writings Austrian physicist Ludwig Boltzmann, which states that there is a small chance that the particles of an isolated ideal gas system could, according to probability arguments, collect themselves into half of the container or into one corner of it, thus, it is argued, decreasing entropy or increase order. It must be noted here that the statistical view is only an interpretation of the arguments presented by Clausius; thus a disproof of an interpretation in no way conflicts with the original presentation.

Entropy and psychological arrows

In the latter half his book, Hawking goes into simple discussions of how thermodynamics relates to the existence of intelligence life. He states, for instance, that "a strong thermodynamic arrow is necessary for intelligent life to operate" and that the psychological arrow points in the same direction of the thermodynamic arrow. In the *Illustrated* 1996 edition, Hawking gives a diagram (shown adjacent) eluding to the idea that the memorization of a book correlates to a decrease in the entropy (increase in order) of the central nervous system by about a million units and correspondently an increase in entropy (increase in disorder) of the body and surroundings of the body by about a million million million million units. [3]

Hawking's diagram of entropy decrease, via learning, and entropy increase associated, supposedly, with the body or surroundings, which is assumed to be greater than the former, in accordance with the second law. [3]

This diagram, is notable for having given American chemical engineer Libb Thims insight, in 2001, into the idea that instantaneous changed in neurological entropy, such as when a person obtains a college degree (entropy decrease ↓), can effect correlative changes in individual human Gibbs free energies (increase or decrease), via the combined law of thermodynamics:

$$G_f - G_i = (H_f - H_i) - T(S_f - S_i)$$

where *f* indicates the "final" and *i* the "initial" state of the process (four-year degree), thus affecting the spontaneity of human chemical reactions, in particular love the chemical reaction, in the sense that it is statistically easier to get someone to fall spontaneously in love with another person in possession of a college degree than without. [4]

God

See main: Hawking on god

The following are Hawking's comments on god and religion, which seem to evolve from ambiguous "mind of god" talk (1988) to theism-attacking atheism-like statements (2007) to admitted and open atheist (2014):

> "Cosmology is a kind of religion for intelligent atheists."
>
> — Stephen Hawking (c.1962), description (Q) to his wife, when they first met, about himself

"If we discover a complete theory, it would be the ultimate triumph of reason – for then we should know the mind of god."

— Stephen Hawking (1988), A Brief History of Time

"If you believe in science, like I do, you believe that there are certain laws that are always obeyed. If you like, you can say the laws are the work of god, but that is more a definition of god than a proof of his existence."

— Stephen Hawking (2001), Interview with Roger Highfield, Oct 1

"I'm not religious in the normal sense. I believe the universe is governed by the laws of science. The laws may have been decreed by god, but god does not intervene to break the laws."

— Stephen Hawking (2007), Reuters interview

"God did not create the universe."

— Stephen Hawking (2010), London Times, Sep 2

"Philosophy is dead. Philosophy has not kept up with modern developments in science, particularly physics. Scientists have become the bearers of the torch of discovery in our quest for knowledge."

— Stephen Hawking (2010), *The Grand Design* (Q)

"M-theory predicts that a great many universes were created out of nothing. Their creation does not require the intervention of some supernatural being or god. Rather, these universes arise naturally from physical law. They are a prediction of science.

— Stephen Hawking (2010), *The Grand Design*, Sep 7

"Before we understand science, it is natural believe that god created the universe. But now science offers a more convincing explanation. What I meant [in *A Brief History of Time* (1988) (Q)] by 'we would know the mind of god' is, we would know everything that god would know, if there were a god. Which there isn't. I'm an atheist."

— Stephen Hawking (2014), El Mundo interview, Sep 23 (Q)(Q)(Q)(Q)

Education

Hawking completed his BA in physics in 1962 at Oxford University, focusing on thermodynamics, relativity, and quantum mechanics. He completed his PhD at Cambridge in 1965 in theoretical astronomy and cosmology and 1979 became a professor of mathematics there. [2]

Suicide

See: Founders of thermodynamics and suicide

In 1985, Stephen Hawking, one the founders of black hole thermodynamics, following a complication wherein he caught pneumonia, after which he underwent a tracheostomy operation, during which a tube was inserted into his

windpipe through his neck, bypassing his mouth and nose and irreversibly removing his voice, he admitted that he tried to commit suicide:

> "I admit that when I had my tracheostomy operation, I briefly tried to commit suicide by not breathing. However, the reflex to breathe was too strong."
>
> — Steven Hawking (2014), "Interview" (Q), Independent, Jul 17

(add)

Quotes | On

The following are quotes on Hawking:

> "Big deal, my IQ is 280."
>
> — Simpsons Hawking [character] (1999), Simpsons, episode: "They Saved Lisa's Brain" (Q)(Q)(Q)

Quotes | By

The following are relevant quotes:

> "The human race is just a chemical scum on a moderate-sized planet, orbiting around a very average star in the outer suburb of one among a hundred billion galaxies."
>
> — Stephen Hawking (1995), interview with Ken Campbell [5]

> "Physics may explain the mysteries of the universe but it is cold and unemotional. So I try not to let it affect my family life."
>
> — Stephen Hawking (2010), ABC interview, response to query: "how does your knowledge impact other areas of your life, e.g. your appreciation of music, of art, your family?" (Q)

> "I regard the brain as a computer which will stop working when its components fail. There is no heaven or afterlife for broken down computers; that is a fairy story for people afraid of the dark."
>
> — Stephen Hawking (c.2010), *Source* [7]

References

1. Hatt, Christine. (2006). *Scientists and their Discoveries* (section: Stephen Hawking and Black Holes, pg. 15-16). Evans Brothers.
2. Bardeen, J.M., Carter, B. and Hawking, S. (1973). "The Four Laws of Black Hole Mechanics", *Communications in Mathematical Physics*, Springer-Verlag.
3. Hawking, Stephen. (1996). *The Illustrated: A Brief History of Time*, (keyword: Entropy, pgs. 130-33, 137, 184, 190; ch. 9: "The Arrow of Time", pgs. 182-95). New York: Bantam Books.
4. Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (pgs. 668-74) (preview), (Google books). Morrisville, NC: LuLu.

5. (a) Hawking, Stephen. (1995). "Interview with Ken Campbell", Reality on the Rocks: Beyond Our Ken.
(b) Pross, Addy. (2012). *What is Life? How Chemistry Becomes Biology* (pg.viii). Oxford University Press.
(c) Tallis, Raymond. (2013). "You Chemical Scum, You", *Philosophy Now*, May/Jun.
6. Hawking, Stephen. (1996). "Life in the Universe" (Q), Lecture.
7. Anon. (2018). "Stephen Hawking, Modern Cosmology's Brightest Star, Dies at age 76" (Q), The Guardian, Mar 14.

Further reading

● Hawking, Stephen W. (1970). "The Singularities of Gravitational Collapse and Cosmology". Mathematical and Physical Sciences (Royal Society) 314 (1519): 529–548.
● Hawking, Stephen W. (1974). "Black Hole Explosions". Nature, 248 (1): 30–31.
● Hawking, Stephen. (2013). *My Brief History*. Random House.

External links

● Stephen Hawking – Wikipedia.
● A Brief History of Time – Wikipedia.

θΔics

In existographies, **Stephen Hawking 2** is []

→ **Stephen Hawking** (mobile; readable; NON-editable)
→ **Stephen Hawking** (online; readable) – WayBack (2017)
→ Stephen Hawking (hacked; Non-readable)

Stephen Hawking (1942-2018) (IQ:185|#85) (CR:29|118) was British astrophysicist and philosopher noted for his 1965 PhD thesis, stimulated by research of mathematician Rodger Penrose, and based on German-born American physicist Albert Einstein's 1914 general theory of relativity, which argued that if a star can collapse inwards to form a singularity, coined a "black hole" in 1967 by American physicist John Wheeler, then so to can a singularity explode back outward; thus giving an explanation for the Big Bang.

θΔics

In existographies, **Stephen Jay Kline** (1922-1997) (CR:2) was an American mechanical engineer and thermodynamicist noted for a number of articles and one book in thermodynamics on topics on thermodynamics and life (powered-CHNOPS+ animate existence).

Overview

In circa 1980, Klein co-authored a memorial article on American chemist Frederick Koenig. [1]

In 1997, Kline, in his two-part article "Thermodynamics, Information, and Life Revisited" (published: 1998), co-authored with Peter Corning, they discuss the so-called entropy waste model of entropy, among other topics. [2]

In c.1997, Kline, in his his *The Low-Down on Entropy and Interpretive Thermodynamics* (posthumously-published 1999), attempted to "unravel the confusion", as he says, between Shannon entropy, Brillioun entropy, and Clausius entropy, by using different symbols for each. [3]

Morality

Kline, in his *Low-Down on Entropy* (c.1997), devotes a small section on morality:

10.1.1 Religious Values 84
10.1.2 Moral Constitutions 84
10.1.3 Morals, Ethics, Cultural Values 84
10.1.4 Human Communications and Political Constitutions 85

The following is one excerpt:

> "Moral Constitutions: Clear examples of a 'moral' constitution are the seven commandments which Moses brought down from Mount Sinai, restated as ten commandments in the Christian New Testament. For the Orthodox Mosaic form, see: H.W. Wouk (1992)."
>
> — Stephen Kline (c.1997), *The Low-Down on Entropy* (pg. 84)

(add)

Education

Kline completed his BS (1943) and MS (1949) in mechanical engineering at Stanford University, followed by graduate studies thermodynamics and fluid mechanics studying under Joseph Keenan and Ascher Shapiro at MIT, completing his ScD there in 1952, after which he joined the mechanical engineering department faculty at Stanford, retiring from that position in 1992. [4]

References

1. Eastman, Richard H., Hutchinson, Eric, and Kline, Stephen. (date). "Memorial Resolution: Frederick Otto Koenig (1902-1974)." HistSoc.Stanford.edu.
2. (a) Corning, Peter A. and Kline, Stephen J. (1998). "Thermodynamics, Information, and Life Revisited, Part I: 'To Be or Entropy'", *Systems Research and Behavior Science*, Vol. 15, Issue 4, pgs 273-95.
(b) Corning, Peter A. and Kline, Stephen J. (1998). "Thermodynamics, Information, and Life Revisited, Part I: 'Thermoeconomics' and 'Control Information'", *Systems Research and Behavior Science*, Vol. 15, Issue 6, pgs 453-82.

3. Kline, Stephen J. (1999). *The Low-Down on Entropy and Interpretive Thermodynamics* (pg. 12). DCW Industries.
4. Johnston, James P, Bradshaw, Peter, McGinn, Robert, and Reynolds, William C. (date). "Memorial Resolution: Stephen Jay Kline", Stanford University.

Works employed

● Prigogine, Ilya; Stengers, Isabelle. (1978). *Order Out of Chaos: Man's New Dialogue with Nature* (Foreword: Alvin Toffler) (*La Nouvelle Alliance: Metamorphose de la Science*) (abs). Bantam, 1984; Verso, 2018.
● Proops, John. (1987). "Entropy, Information, and Confusion in the Social Sciences" (abs), *Journal of Interdisciplinary Economics*, 1: 225-42.

External links

● Kline, S.J. (Stephen Jay) (1922-) – WorldCat Identities.
● Stephen Jay Kline (about) – DCW Industries Online Bookstore.

θΔics

In human chemistry, **Stephen Lower** (c.1945-) is a American-born Canadian biochemist and physical chemist noted for his listing of human chemistry, in his online book website *Chemistry One*, a collection of chemistry material, as crackpot or pseudoscience, presenting human chemistry as something chemistry students should avoid.

Education

Lower completed his BA in biochemistry at the University of California, Berkeley, and PhD in physical chemistry at the University of British Columbia. He was a professor of chemistry at Simon Fraser University, Burnaby-Vancouver, Canada, from 1965 until his retirement in 1999. He began working on his online chemistry site after retirement. [2]

Crackpot

The following is a cropped screenshot of fuller's classification of human chemistry (adjacent). [1] What is amazing is that this listing comes from a physical chemist, the second most-probable type of person (behind the chemical engineer and the chemical thermodynamicist) to understand human chemistry and human thermodynamics?

Conversely, to cite one example, American physical chemist Thomas Wallace not only did not consider the modeling of human activity using physical chemistry to be pseudoscience, but rather instead wrote out his entire 2009 book *Wealth, Energy, and Human Values*, using this type of logic of applying terms such as energy, entropy, Gibbs free energy, reaction coordinate, etc., to the explanation of human existence. What seems to be the case is that there seems to be two kinds of physical chemists, one who understands that the laws of thermodynamics govern human reactions and those who do not.

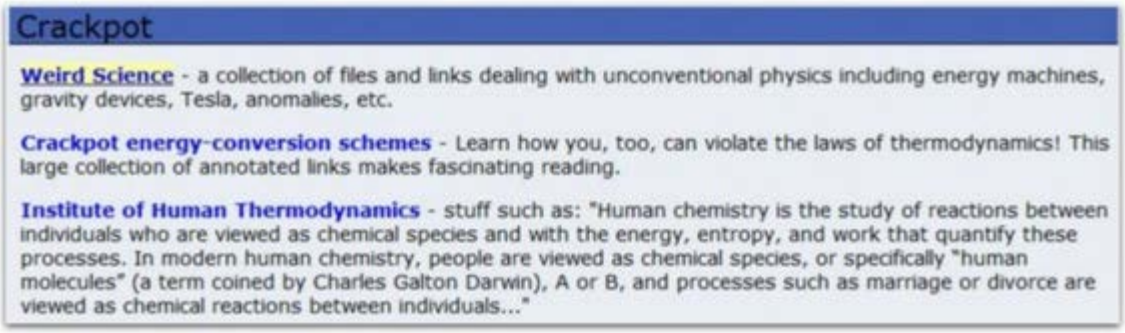

Crackpot

Weird Science - a collection of files and links dealing with unconventional physics including energy machines, gravity devices, Tesla, anomalies, etc.

Crackpot energy-conversion schemes - Learn how you, too, can violate the laws of thermodynamics! This large collection of annotated links makes fascinating reading.

Institute of Human Thermodynamics - stuff such as: "Human chemistry is the study of reactions between individuals who are viewed as chemical species and with the energy, entropy, and work that quantify these processes. In modern human chemistry, people are viewed as chemical species, or specifically "human molecules" (a term coined by Charles Galton Darwin), A or B, and processes such as marriage or divorce are viewed as chemical reactions between individuals..."

Lower's 2007 online listing of human thermodynamics and human chemistry as crackpot. [1]

Religion

In regards to conflict of interest, e.g. red-tabbed people on the HMS pioneers page, in the case of Lower, a point to note is that he is religiously predisposed or biased, e.g. one of his favorite websites is the Scary Bible Quotes site. This is a common factor to look for behind a person's motives to objecting to a science of "human chemistry".

References

1. (a) Lower, Stephen. (2007). "List of Flim-flam, Pseudoscience, and Nonsense", Online listings.
(b) Lower, Stephen. (2007). *Chemistry One: Virtual Textbook* (ch. 4: What is pseudoscience?). Chem1.com.
(c) Human chemistry (search) – Pseudoscience and Quackery, Swicki.com.
2. Stephen Lower (overview) – Members.Shaw.ca.

External links

â— Stephen Lower (faculty) – Chemistry Department, Simon Fraser University.

θΔics

In hmolscience, **Stephen Meyer** (1958-) (CIR:15) is an American physicist-philosopher noted for his 1992 to 2005 efforts to promote an ontic opening + information stylized "intelligent design" model of creationism.

Meyer's 2013 *Darwin's Doubts* turned him into a "fumbling bumbling fool" (Q).

Strobel | Interview

In circa 2003, Meyer was interviewed by Lee Strobel, who queried him to provide six examples of where he believes that science points towards theism, to which he responded with:

> 1) Big bang: the fact that energy, matter, space, and time had a beginning is antimaterialistic; pointing towards a first cause.
> 2) Anthropic fine-tuning: the constants of the universe are fine-tuned to create life.
> 3) Origin of life: information (DNA) is required to create life; the machine code of genes is computer-like; computers run on software; software is made by intelligent programs or engineers; pointing towards god as that intelligence.
> 4) Molecular machinery; cells have machine-like parts, which are "irreducibly complex", in Michael Behe's terminology; which must be designed, just as an engineer designs parts for a car; in a way not accountable via Darwinism.
> 5) Cambrian explosion: a geological-evidenced sudden infusion of new "biological information", not accountable via Darwinism, points towards an intelligent designer.
> 6) Human consciousness: self-reflection is more than just interaction of physical brain matter; theism provides the best answer of where it came from.

Debates

In 2005, on Strobel's Faith Under Fire show, Meyer debated Michael Shermer on four of his six theism points. (Q) He has also debated has debated atheists: Peter Atkins and Eugenie Scott.

Discovery Institute | Intelligent design

> *See also: Templeton Foundation; Templeton Prize*

In 1995, George Gilder and Meyer got funding from the Christian-promoting multi-billion dollar H.F. Ahmanson group, and therein formed the "Discovery Institute" themed as a think tank opposed to materialism, which worked in the decade to follow to promote the neo-creationism brand of religion called "intelligent design", until the 2005 Kitzmiller vs Dover case, wherein intelligent design in public schools was deemed unconstitutional, being in violation of the first amendment.

Education

Meyer completed his BS in physics and earth science in 1981 at Christian Whitworth College, then completed his PhD in the history and philosophy of science, specifically on the scientific and methodological issues of the origin of life biology, in 1991 at the University of Cambridge.

External links

- Stephen Meyer – Wikipedia.

θΔics

In economic thermodynamics, **Stephen Jehucal Ternyik** (1960-) (DN:1) is a German-Hungarian economist noted for his 2011 to present attempts to admixture economics, sociology, Jewish theology, and ontic opening and or new age stylized physics, e.g. quantum talk, wherein spirit and god underlie the roots of physics, in short.

Overview

In 2011, Ternyik, in his booklet *Economics as Heuristics & New Economics*, attempted to compare, passingly, economics laws to thermodynamic laws, stating that the former can't fool the latter, or something along these lines and that it is difficult to jump from formula (physics) to economic theory. [1] More recent books include: *Ethical Economics* (2012), *Monetary Wave Theory* (2013), and *Global Wave Energetics* (2013).

In circa 2013, Ternyik opened a user page on ScienceOfLife.nl, a 2007-launched (O) site focused on answering (a) "what makes science of life different from a science of dead matter?", (b) "how do we experience, engage, freedom of choice?", and (c) "what makes your or our being unique?", wherein he opens to the following abstract: [3]

> "Human life is not about the expansion of theoretical knowledge, but about the applied insight into the construction principles (laws) of reality, i.e. the main creative task as living spirit is to convert knowledge into value."

The key terms: creative, living, and spirit each being code for god talk. He then discusses how we need to obtain "edenic or Adamic purity" where "light is always preferred over darkness", the logic of which he seems to be attempting to sell via the ontic opening ideas of "quantum economics" and "quantum sociology", along with earlier energy of money ideas; the following is another quote: "Spiritual roots ('physics') of Hebrew thought and Jewish ethics, i.e. careful examination of oral and written (divine) wisdom, in the applied knowledge context of modern science for human practice."

Religion

Ternyik is Jewish in religious belief. In his 2011 book *Economics as Heuristics & New Economics*, he described himself, in religious outlook, as an ethical "monotheist". [2]

Education

Ternyik completed his MA in 1985 in education science and social science with a thesis on "Learning with Computers"(mcl) at the Berlin Institute of Technology. Ternyik claims to have since done PhD-level training courses in economics. He has worked as an economist and educator in management R&D, consultancy, money and banking, and innovation; and has studied social science methods in Berlin, Jerusalem, New York, and Tokyo.

References

1. Ternyik, Stephen. (2011). *Economics as Heuristics & New Economics*. Acorn Independent Press.
2. Cohen, H. (1919). *Religion of Reason*. Unger.
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Further reading

- Ternyik, Stephen. (1989). *Social Learning Processes*. Frankfurt. Fischer.
- Ternyik, Stephen I. (2013). *Global Wave Energetics* (human thermodynamics, pg. #). BookTango.
- Ternyik, Stephen I. (2013). "The Energetics of Economics (Money as Access to Energy)" (abs), MPRA Paper 44850, University Library of Munich, Germany.

External links

- Stephen I. Ternyik – Mendeley.com.

- Stephen I. Ternyik – Ideas.Repec.org.
- Stephen I. Ternyik – SocioStudies.org.

θΔics

In hmolscience, **Stephen Joel Weininger** (1937-) is an American physical organic chemist and science historian noted for his 1983 two cultures contributions, and for, in human chemistry, his 2002 literature chemistry entry in the *Encyclopedia of Literature and Science*, wherein he discusses German polymath Johann Goethe's *Elective Affinities* (1809), among others, such as Honore Balzac (*Search for the Absolute*, 1834), Thomas Pynchon, and Primo Levi. [1] Weininger states that Spanish novelist Leopoldo Alas' 1890 *His Only Son*, is a so-called successor to *Elective Affinities*, supposedly inspired by the former.

In 1983, Weininger defined what he refers to as "reductive realism", which he says has been the dominate philosophy of science since Newton, as having two major tenets: [4]

I. A knowable, true physical reality underlies appearances.
II. A single, all-embracing theory of reality will ultimately explain all physical phenomena.

Weininger then, citing Fred Carlisle (1980), states that "some scientists have abandoned either realism or reductivism", following application of reductive realism to molecular structure. [5]

In 1994, Weininger attended the Conference on Entropy at the Dibner Institute for the History of Science and Technology, after which he began to work as a Mellon Fellow doing research on the introduction of entropy into chemistry; the result of which was the 39-page article "Sooner Science than Confusion: the Tortuous Entry of Entropy into Chemist", co-authored with Helge Kragh. [2]

Education

Weininger completed his BA (in chemistry?) at Brooklyn College, City University of New York, in 1957, and PhD in 1964, dissertation "Mass Spectral Decomposition of Some Diels-Alder Reactions", at the University of Pennsylvania. From 1965 to 2005 he has been a professor of physical organic chemistry at Worchester Polytechnic Institute, and professor emeritus thereafter. His most widely held work is the 1972 textbook *Contemporary Organic Chemistry*. [3]

References

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(b) Gossin, Pamela. (2002). *Encyclopedia of Literature and Science* (chemistry, 40+ pgs; §Chemistry, pg. 77-79). Greenwood Publishing Group.
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(b) Kragh, Helge and Weininger, Stephen J. (1996). "Sooner Science than Confustion: the Tortuous Entry of Entropy into Chemist" (abs), *Historical Studies in the Physical and Biological Sciences*, 27(1): 91-130.
3. Weininger, Stephen J. (1972). *Contemporary Organic Chemistry*. Holt, Reinhart, and Winston.
4. Weininger, Stephen. (1983). "Concept and Context in Contemporary Chemistry", Conference on Science, Technology, and Literature, Long Island University, Brooklyn, New York, Feb; in: *Beyond the Two Cultures: Essays on Science, Technology, and Literature* (editors: Joseph Slade and Judith Lee) (§2:39-49). Iowa State University Press, 1990.
5. Carlisle, E. Fred. (1980). "Literature, Science, and Language: A Study of Similarity and Difference", *Pre/text*, 1:39-42.

External links

â— Stephen Weininger (faculty) – Worchester Polytechnic Institute.
â— Weininger, Stephen J. – WorldCat Identities.

θΔics

In hmolscince, **Sterner-Elser human molecular formula**, in human molecular theory, to the 22-element molecular formula for an average human (see: human molecular formula), calculated in 2000 and published in print in 2002 by American limnologists Robert Sterner and James Elser, the empirical formula version of which is shown below: [1]

$$\text{Molecular formula}_{\text{human}} \text{ (Sterner-Elser) [empirical]} = H_{375,000,000}O_{132,000,000}C_{85,700,000}N_{6,430,000}Ca_{1,500,000}P_{1,020,000}S_{206,000}Na_{183,000}K_{177,000}Cl_{127,000}Mg_{40,000}Si_{38,600}Fe_{2,680}Zn_{2,110}Cu_{76}I_{14}Mn_{13}F_{13}Cr_{7}Se_{4}Mo_{3}Co_{1}$$

Other

An alternative, independent, formula is the 26-element Thims human molecular formula, calculated in 2002 and published online (Ñº) in 2005 and in print in 2007 by American electrical engineer Libb Thims. [2]

References

1. (a) Sterner, Robert W. and Elser, James J. (2002). *Ecological Stoichiometry: the Biology of Elements from Molecules to the Biosphere* (chapter one) (human molecule, empirical formula pg. 3; discussion, pgs. 47, 135). Princeton University Press.
(b) Karasov, William H. and Rio, Carlos M. (2007). *Physiological Ecology: How Animals Process Energy, Nutrients, and Toxins* (pg. 538). Princeton University Press.
(c) Sterner, Robert W. and Elser, James J. (2008). "Ecological Stoichiometry: Overview", in: *Encyclopedia of Ecology, Five-Volume Set, Volume 2* Overview (§, pgs. 1101-16, §§: Biology of the Elements, pg. 1103). Publisher.
(d) Sterner, Robert W. and Elser, James J. (2010). "Ecological Stoichiometry: Overview", in: *Global Ecology* (pg. 337). Publisher.
2. (a) Thims, Libb. (2002). *Human Thermodynamics* (ch. 19: "Where Does One Go After Death", pgs. 491-), unpublished manuscript. Chicago: Institute of Human Thermodynamics.
(b) Thims, Libb. (2002). *Human Thermodynamics (Volume One)*, Date: Sept. Chicago: Institute of Human Thermodynamics.
(c) Thims, Libb. (2005). *Cessation Thermodynamics.* Institute of Human Thermodynamics.
(d) Thims, Libb. (2005). "Molecular Evolution Table" (Ñº), HumanThermodynamics.com, Dec 13.
(e) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (ch. 2: "The Human Molecule", pgs. 15-35). Morrisville, NC: LuLu.
(f) The discovery of the Sterner-Elser calculation was a partial impetus behind the expansion of the 2007 chapter two, i.e. "The Human Molecule", of *Human Chemistry*, into the 2008 booklet *The Human Molecule* (6 Mar 2008).
(g) Thims, Libb. (2008). *The Human Molecule*, (preview) (Google Books). Morrisville, NC: LuLu.

θΔics

In existographies, **Steve Fuller** (1959-) (CR:19) is an American intelligent design advocating philosopher and sociologist noted for his 2005 article "I am not a Molecule" in *New Scientist*, in which he objects to the atomistic reduction view being used by various authors. One view he objects to, such as found in recent human physics books, is:

> "Social physics attempts to rationalize violent social revolutions by casting them as 'critical phase transitions', like a fluid goes through to become gas. Treating masses of people in the same way as atoms makes it seem inevitable that their mood will change from inert solidity to liberal fluidity and, finally, gaseous revolt. No further explanation is needed: the motives and thoughts of the revolutionaries are irrelevant."

In particular, Fuller objects to the view presented in English physical chemist Philip Ball's 2004 book *Critical Mass: How One Thing Leads to Another*, American evolutionary biologist Jared Diamond's 2005 book *Collapse: How Societies Choose to Fail or Succeed*, and Canadian-born evolutionary psychologist American Steven Pinker's 2002 book *The Blank Slate: the Modern Denial of Human Nature*, all of which, according to Fuller, are "infuriating the social scientists". Fuller seems to think that social physics started from the population census data extrapolation-to-gas systems work of Scottish physicist James Maxwell.

In short, Fuller seems to object to these types of social physics views and arguably to the theory of the human molecule.

Harvard Pareto circle

In 2000, Fuller, in *Thomas Kuhn: a Philosophical History of Our Times*, a book, supposedly, having something to do with the Karl Popper vs. Thomas Kuhn divide, devoted a certain number of pages to debasing the Harvard Pareto circle—another phyisochemical "molecule" based social theory advocating group—as being but a political agenda, or something along these lines, an interpretation that English American history scholar Joel Isaac (2008) attempts to overturn. [2]

References

1. Fuller, Steve. (2004). "I am not a molecule", *New Scientist*, Issue 2502, June 4th.
2. (a) Fuller, Steve. (2000). *Thomas Kuhn: a Philosophical History of Our Times* (Pareto, 13+ pgs; Harvard's Pareto Circle, pgs. 163-69). University of Chicago Press.
(b) Isaac, Joel. (2008). "The Harvard Pareto Circle Revisited" (abs), *Seminar in Political Thought and Intellectual History*, PolThought.cam.ac.uk.

External links

â— Steve Fuller (sociologist) – Wikipedia.

θΔics

In existographies, **Steve Keen** (1953-) is an Australian-born British economist noted for []

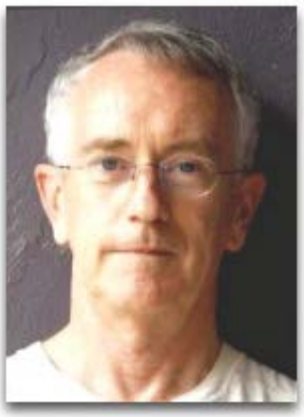

Overview

In c.2012, Keen, building on the ideas of Irving Fisher, Karl Marx, Joseph Schumpeter, Francois Quesnay, Robert Ayres, and Nicholas Georgescu-Roegen, among others, began lecturing, in a beginning fashion, on ways to frame economics, e.g. value theory, on energy, entropy, and thermodynamics.

Education

Keen completed his BA in 1974, a bachelor of law in 1974, both at the University of Sydney, a masters of commerce in economics and economic history in 1990 and his PhD in economics in 1998, both at University of New South Wales. Keen presently is an economics professor and head of economics, history, and politics at Kingston University, London.

Further reading

● Keen, Steve. (2012). “Energy, Production and Entropy” (Q), Blog, DeptDeflation.com, Nov 16.

Videos

● Keen, Steve. (2017). “Value and Thermodynamics” (Q), ProfSteveKeen, YouTube, Jan 10.

External links

● Steve Keen – Wikipedia.
● Steve Keen – Twitter.

θΔics

In hmolscience, **Steve McMenamin** (c.1950-) is an American business executive noted for his 1986 modeling of orbital independent consultants or workers as like free electrons.

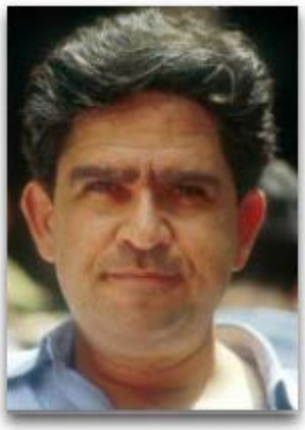

Overview

In 1986, McMenamin suggested the notion that certain types of highly motivated or energetic workers as analogous to valence shell electrons to which he assigned the term "free electrons". [1]

This model, to note, might be equivalent to Michael Brooks' 2011 *Free Radicals: the Secret Anarchy of Science*, wherein he seems to liken pioneering scientists, averse to authority, to free radicals. [2]

Education

McMenamin has been a principle consultant of the Atlantic Systems Guild since 1987 and is a senior vice president of chief information officer of Hawaiian Electric Co.

References

1. DeMarco, Tom and Lister, Timothy. (1999). *Peopleware: Productive Projects and Teams* (ch. 25: Free Electrons, pgs. 167-70) (1987 first edition). Dorset House Pub. Co.
2. (a) Brooks, Michael. (2011). *Free Radicals: the Secret Anarchy of Science*. Penguin.
(b) Brooks, Michael. (2012). "The Anarchy of Science" (V), Learning Without Frontiers Conference, Jan 15.

External links

â— Steve McMenamin (about) – AtlanticSystemGuild.BusinessCatalyst.com.

θΔics

In cosmological thermodynamics, **Steven Frautschi** (1933-) is an American theoretical physicist noted for []

Overview

In 1982, Frautschi, in his article-turned-chapter "Entropy in an Expanding Universe", attempts to explain, in his own words: [1]

> "How can disequilibrium, order, and in particular free energy supplies that enable life to maintain its organization emerge form an apparent chaotic early universe in thermal and chemical equilibrium."

Frautschi, in his article, cites the following: Jacob Bekenstein, Paul Davies, Alan Guth, Stephen Hawking, David Layzer, Roger Penrose, in regards to black hole thermodynamics and the entropy of the universe (differentiating between what he classifies as: thermal entropy, chemical entropy, and gravitational entropy), and in the end makes a few passing statements about how this might connect the information entropy evolution theory of Edward Wiley and Daniel Brooks. His discussions on binding energy are fairly interesting and cogent.

Entropy gap theory

Shown adjacent is Frautschi's entropy versus time plot of the universe (1988-version), according to which the maximal possible entropy the universe S_{max} can have is supposedly gauged by the measure of black hole entropy, and the actual entropy S is the lower line, and the gap or difference between the two lines gives room for "ordered" structures to emerge, e.g. life, in a universe governed by the second law. Similar versions of the same plot, parodied off Frautschi's model, are found in the Daniel Brooks and Edward Wiley. [3] The graphical entropy gap model, supposedly, traces to the 1975 work of David Layzer. [4]

Education

Frautschi completed his AB in physics in 1954 at Harvard University and his PhD in physics at Stanford University in 1958, and became an professor of theoretical physics at California Institute of Technology, in the physical mathematics and astronomy division, in 1962, where he remains at present. [1]

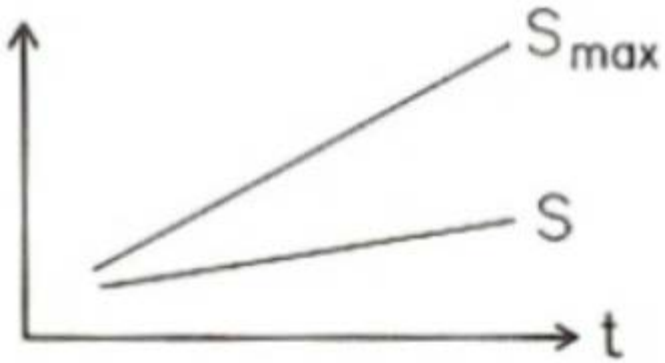

Frautschi's entropy gap model: a "schematic dependence of entropy S and maximum (equilibrium) energy Smax in the expanding universe" (1988); such that the gap between to the two line, Smax - S, represent the room for order in the universe, and that this is how life emerged in the context of the second law. [1]

References

1. (a) Frautschi, Steven. (1982). "Entropy in an Expanding Universe", *Science*, 217:593-99.
(b) Frautschi, Steven. (1988). "Entropy in an Expanding Universe", in: *Entropy, Information, and Evolution: New Perspectives on Physical and Biological Evolution* (pgs. 11-22), editors: Bruce H. Weber, Bruce H., David J. Depew, and James D. Smith. MIT Press.
2. Staff. (2006). "Interview with Steven C. Frautschi", CalTech.edu.
3. Brooks, Daniel R. and Wilson, E.O. (1988). *Evolution as Entropy: Toward a Unified theory of Biology*. (ch. 2). University of Chicago Press.
4. Layzer, David. (1975). "The Arrow of Time", *Scientific American*, 233:56-69.

External links

â— Steven Frautschi – Wikipedia.

θΔics

In hmolscience, **Steven Pierce** (c.1959-) is a Canadian mathematical physicist, computer scientist, pilot, and scientific realism philosopher noted for his 2009 comment to American electrochemical engineer Libb Thims on his reaction to the discovery of *Hmolpedia*, presumably after reviewing the Moriarty-Thims debate: [1]

> "I stumbled onto your website by accident but I have to confess this might be one of the most stunning undiscovered intellectual achievements of the 21st century. I have browsed through your wiki and I cannot express how tragic it must be to a man in your position—to be a pioneering thinker yet to be rejected by an uptight academic community with neither the depth nor will to understand your unique work, defending their own turf like dogs. I can only compare you to the many other pioneering heroes of science, Newton (IQ=215), Einstein (IQ=220), Tesla (IQ=195), men who like you blazed their own paths but were too victims of their own genius, only to be validated years after their death. Perhaps one day historians will look back and have a chuckle - that the pioneer of enthropology published by a vanity press in a book resembling a third rate romance."

(add discussion)

Favorite quotes

Pierce's favorite quote, which he lists on his faculty page, is the following quote by Canadian mathematical physicist and philosopher Mario Bunge:

> "[O]ur comparative ignorance of the laws of society and history is due not only to the great complexity of human affairs, but also to the very prejudice that there are no laws of history - a prejudice suspect of being allied to powerful social (or antisocial) interests that are vitally interested in preventing deep insights into the social mechanism. *Et pour cause!* People who are able to take the social mechanism apart in theory may wish to change it in practice, and - what is more dangerous for those who live on the persistence of fossil social forms - such men may even succeed in their attempt."

Bunge's philosophy, presumably like Pierce's, is a comprehensive scientific outlook applied to the various natural and social sciences, embodying global rationalism, scientific realism, materialism, and consequentialism. [2]

Human thermodynamics

In his undergraduate years, circa 1977 to 1981, Pierce began to theorize about the relation between entropy and aging and what he calls "negentropic psyche reconstruction", in regards to the changes in a person's psychology at age 0, age 25, final age. About three years later, in about 1982, Pierce discovered what he called American psychologist William James "reverse energy" theory, as he calls it, although technically, to note, it is actually called the reserve energy theory, which gave him the view that one could improve his or her physical and mental well being by significant orders of magnitude. Soon thereafter, he soon began to attempt to take strategic and systematic experimental measurements of negative entropy, leaving the body, using the Fokker–Planck equation and hourly body temperature measurements. Pierce states that he "reliably measured the entropic differential between wakefulness and sleep." Sometime, thereafter, he began to research this further, eventually following into the Shannon entropy school of thought view of thermodynamic entropy. He has since developed a thermodynamic theory of cancer summarized by what he terms an "entropic catastrophe". [1]

Education

Pierce completed his BS (1981) with honors and MS (1984) at the University of British Columbia and his PhD (1995) at the University of Arizona. Currently, Pierce is a professor in the school of computing science, at the Simon Fraser University, British Columbia, with research focused on: computational magnetohydrodynamics (pseudospectral) applied

to astrophysical dynamo theory, computational fluid dynamics applied to cratering mechanics and oceanic impact waves, and mathematical inverse theory applied to high energy astrophysics, and the intersection of sociotechnology with computer science.

References

1. Stephen Pierce (faculty) – Simon Fraser University.
2. Mario Bunge – Wikipedia.

θΔics

In existographies, **Steven Pinker** (1954-) [RGA:89|370+] is a Canadian-born American psychologist, noted for []

Overview

In 2002, Pinker published *The Blank Slate: the Modern Denial of Human Nature*, which became one of the three books, along with Philip Ball's 2004 book *Critical Mass: How One Thing Leads to Another* and Jared Diamond's 2005 book *Collapse: How Societies Choose to Fail or Succeed*, that prompted Steve Fuller's 2005 rant article about not being a molecule.

Atheism

Pinker became an atheist at age 13. In 2018, Pinker debated Nick Spencer on "Can Atheists Believe in Human Rights?". In Ranker

Quotes | By

The following are quotes by Pinker:

> "The Bible is a manual for rape, genocide, and the destruction of families. Religion has given us stonings, witch burnings, crusades, inquisitions, jihads, fatwas, suicide bombers...and mothers who drown their children in the river."
>
> — Steven Pinker (2014)

> "The … ultimate purpose of life, mind, and human striving: to deploy energy and information to fight back the tide of entropy and carve out refuges of beneficial order."
>
> — Steven Pinker (2016), "The Second Law of Thermodynamics" [1]

References

1. Pinker, Stephen. (2016). "The Second Law of Thermodynamics" (Ñº), in: *This Idea is Brilliant: Lost, Overlooked, and Underappreciated Scientific Concept Everyone Should Know* (editor: John Brockman). HarperCollins.

External links

â— Steven Pinker – Wikipedia.

θΔics

In hmolscience, **Steven Polgar** (1931-1978) was a Hungarian-born American anthropologist noted, in anthropology thermodynamics, for his 1960 “Evolution and the Thermodynamic Imperative” wherein he argues that organic and social evolution are opposed to entropy increase, in four ways, and therein argues about ethical implications.

Overview

In 1960, Polgar delivered a talk turned *Human Biology* article “Evolution and the Thermodynamic Imperative” (1961) at a meeting of the American Association for the Advancement of Science, New York, wherein he attempted to argue that there are four processes common to organic evolution and social evolution which retard the increase of entropy on earth, which have ethical consequences, in his view; during the course of which he sites: Alfred Lotka (1945), Leslie White (1949), Walther Nernst, Arthur Eddington (1929), Erwin Schrodinger, Harold Blum (1955), and cites Joseph Needham as having resolved the dilemma in 1943 by differentiating thermodynamic order from biological organization. [1]

He then builds on the 1959 thermodynamic imperative postulate of American physicist Robert Lindsay, to outline thoughts on ‘entropy retarding’ and ‘availability of energy’ aspects of living systems in the development of cultures and in the actions of information transmissions through generations. [1]

In particular, Polgar argued that persistence (perpetuating mechanism), replication (chromosomal autocatalysis), environmental modification (by a living organism), and structuring (e.g. building villages or “purposeful replication of available energy for future use”), are each *entropy reducing* processes or, as he called them, “entropy retarding”. In respect to Lindsay’s thermodynamics imperative, Polgar argues that:

> “The thermodynamic imperative itself may have undergone evolution, from unconscious adaptations of infra-human organisms, through the development of exosomatic culture by which stores of information can be transmitted to subsequent generations and otherwise distributed, to scientific descriptions of evolution and the deliberate attempts to increase the *availability of energy* for survival and the enjoyment of life”.

In conclusion, Polgar reasons that our chances of survival or the chances of “life-somehow-related-to-life-as-we-know-it surviving” if we recognize the thermodynamic imperative and modify our actions or act based on it. [2]

References

1. Polgar, Steven. (1960). “Evolution and the Thermodynamic Imperative” (abs), presented during meeting of Section H of the American Association for the Advancement of Science, New York, Dec 30; in: *Human Biology* (1961), 33(2):99-109, May.
2. Hammond, Dick K. (2005). *The Human System from Entropy to Ethics* (pgs. 14-15). Publisher: Dick Hammond.

External links

â— Steven Polgar (1931-1968) – eMuseum at Minnesota State University, Mankato.

θΔics

In hmolscience, **Steven J. Rosen** (1955-) is an American Hindu studies author noted, in religious thermodynamics, for his 2002 to 2007 work on physics of reincarnation.

Overview

In 2002, Rosen, in his *Gita on the Green*, used thermodynamics in analyzing the Hindu subjects of reincarnation, the soul, etc., and Newton's third law of motion in discussing karma in the guise of modern science;he following is an excerpt: [1]

> "Modern science recognizes a sort of spark or energy that animates the body, something that distinguishes it from dead matter. Further, the first law of thermodynamics, stating that energy cannot be created or destroyed, gives us reason to pause when thinking about reincarnation—if there is energy in the body, and this energy cannot be created or destroyed, where does it go at the time of death?"

In 2007 book *Krishna's Song*, Rosen elaborates on this: [2]

> "In terms of modern science, one might say that a quantum of energy pervades the body, and that this energy, like all energy, cannot be created or destroyed. This is called the first law of thermodynamics. Since the energy that animates the body continues to exist after death, one might argue that it somehow merges into the totality of existence. But Krishna says, 'No'. He argues that the quantum of energy simply inhabits another body, which it inadvertently chooses based on previous actions (*karma*) and desires (*kama*)."

In explaining karma, Rosen states that it is a fundamental law of the Bhagavad Gita, which, looked at in modern terms, can be seen as a sort of metaphysical extension of Newton's third law of motion—for every action, there is an equal and corresponding reaction. On this logic, Rosen states:

> "This law, which survives death", operates such that "if in this life one's actions are not fully realized, that is, if they have not garnered a commensurate reaction, then a subsequent life is created to reap all that was previously sown."

Beyond this, Rosen argues that the essence of this is karma is a non-physical 'something' that separates living beings form the physical-chemical components of the body. He states: "whatever one chooses to call it, this nonphysical life force distinguishes a living body from an inert chemical shell."

See also

- Cessation thermodynamics
- Karma weight
- What happens when you die?

References

1. Rosen, Steven J. (2002). *Gita on the Green: The Mystical Tradition Behind Bagger Vance* (thermodynamics, pg. 72). Continuum International Publishing Group.
2. Rosen, Steven. (2007). *Krishna's Song: a New Look at the Bhagavad Gita* (thermodynamics, pgs. 7, 9). Greenwood Publishing Group.

External links

- Satyaraja Dasa (Steven Rosen) – Wikipedia.

θΔics

In existographies, **Steven Shapin** (1943-) (CR:#) is an American science historian and science sociologist, noted for []

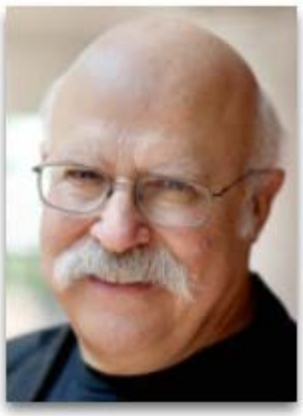

Overview

In 1985, Shapin, in his *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*, co-authored with Simon Schaffer (1955-) (Q), recounts the story behind Robert Boyle, his finding of Otto Guericke's 1650s vacuum experimental work, and Boyle's own 1660s vacuum pump and receiver experiments, and the wake of scientific aftermath which ensued, e.g. Christiaan Huygens and Denis Papin, making their own vacuum devices, and the famous philosophical debates that ensued, e.g. with Thomas Hobbes; they give the following very-helpful timeline (with upgrade modifications by Thims): [1]

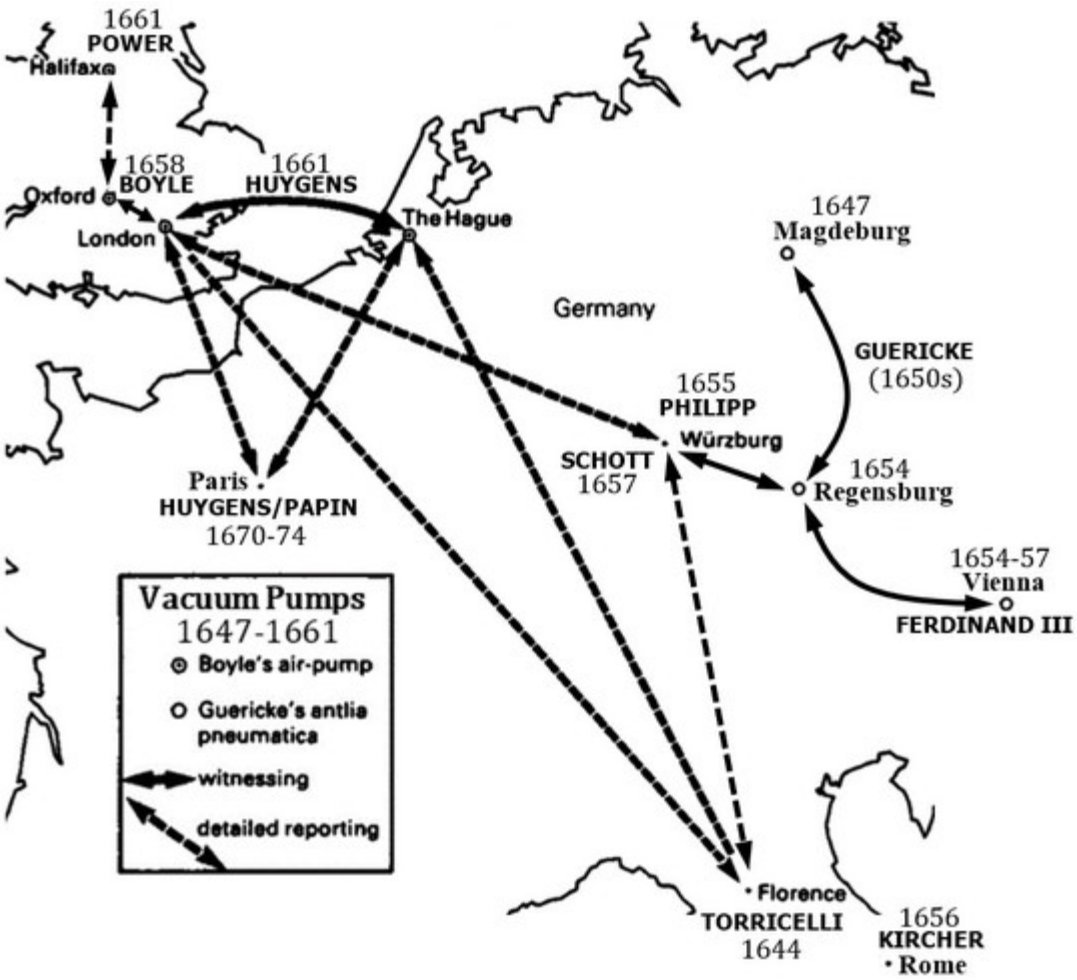

Here, starting with Guericke (1647), one can directly trace the established "explosion" of scientific growth, that led, in scientific social mechanism, mechanistic step by mechanistic step, to the establishment of thermodynamics by Clausius (1865). [3]

The following, however, is a rather incorrect:

> "Historians are in wide agreement in identifying Boyle as the 'founder' of the experimental world in which scientists now live and operate."
>
> — Steven Shapin (1985), *Leviathan and the Air Pump* (pg. 5)

Correctly, it was Guericke, who initiated the 'experimental' method of finding truth. His entire preface, to his *New Magdeburg Experiments on the Vacuum of Space*, is a mind-sweep of quotes on the importance of 'experiments' over that of 'opinion'. Boyle was a product of Guericke.

Influenced

Shapin and Schaffer influenced Anne Helden.

Quotes | On

The following are quotes on Shapin:

> "**Shapin** and Schaffer's *Leviathan and the Air Pump*, is the most influential text in our field since Thomas Kuhn's *Structure of Scientific Revolutions* (1962)."
>
> — James Second (2004), "Knowledge in Transit" [2]

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External links

- Steven Shapin – Wikipedia.
- Leviathan and the Air-Pump – Wikipedia.

θΔics

In human mathematics, **Steven Strogatz** (1959-) is an American applied mathematician noted for []

-

Love | Mathematics

In 1978, Strogatz, in a term paper entitled "Differential Equations and the Progress of Love Affairs", based on a relationship he was in, the first page shown below, for a Sociology 212 (compare: Sociology 23) exam at Princeton University, described lover affairs as “time bombs” the detonation of which is indeterminate: [8]

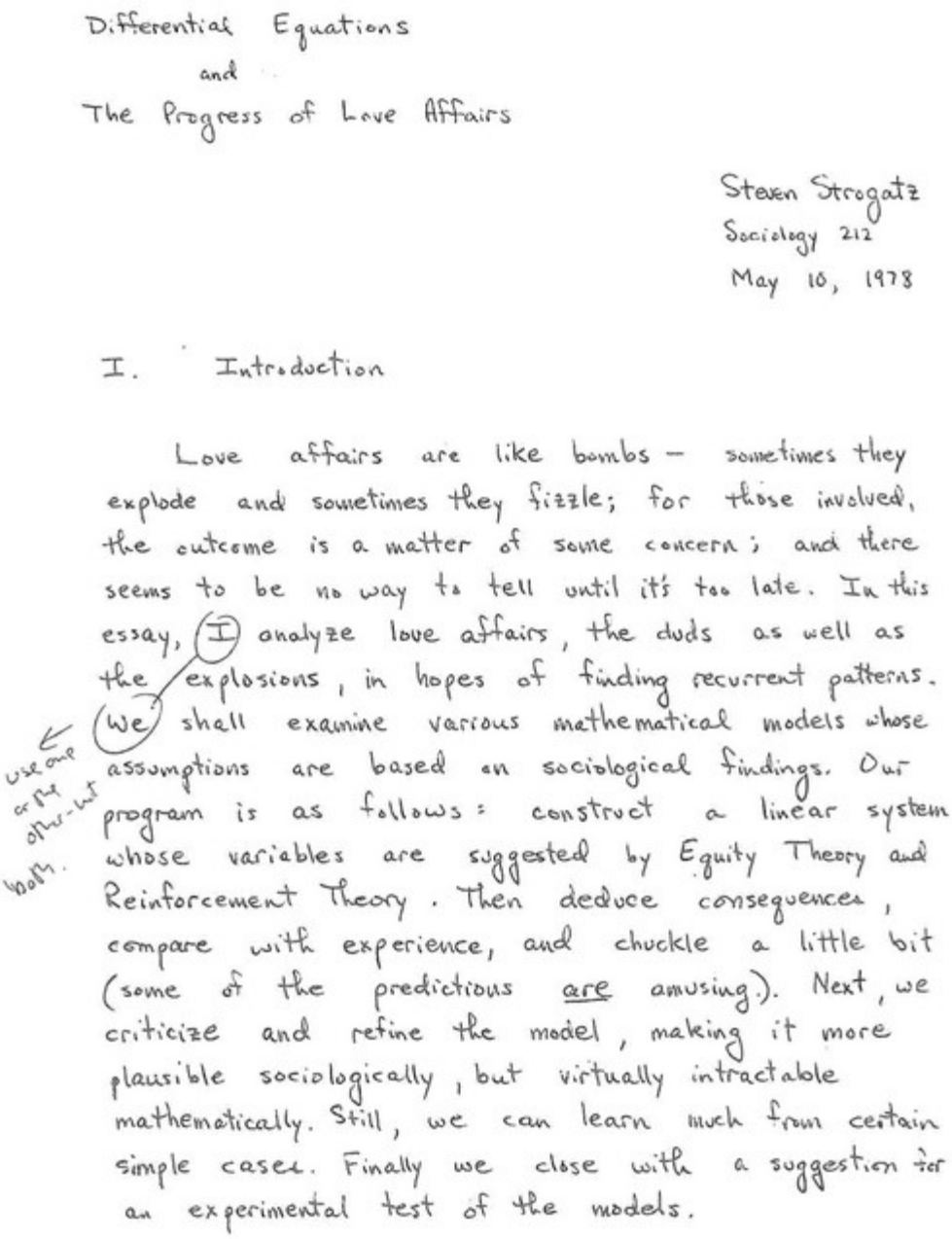

Differential Equations
and
The Progress of Love Affairs

Steven Strogatz
Sociology 212
May 10, 1978

I. Introduction

Love affairs are like bombs — sometimes they explode and sometimes they fizzle; for those involved, the outcome is a matter of some concern; and there seems to be no way to tell until it's too late. In this essay, I analyze love affairs, the duds as well as the explosions, in hopes of finding recurrent patterns. We shall examine various mathematical models whose assumptions are based on sociological findings. Our program is as follows: construct a linear system whose variables are suggested by Equity Theory and Reinforcement Theory. Then deduce consequences, compare with experience, and chuckle a little bit (some of the predictions are amusing). Next, we criticize and refine the model, making it more plausible sociologically, but virtually intractable mathematically. Still, we can learn much from certain simple cases. Finally we close with a suggestion for an experimental test of the models.

use one or the other-or both.

In 1988, Strogatz followed this up with his article “Love Affairs and Differential Equations”, wherein he does some of the first differential equation formulation for the equation of love and in which he explains how he teaches students about ordinary coupled differential equations using examples of variations of levels or ratios of love and hate, similar to the Gottman stability ratio, in Shakespeare-style Romeo and Juliet type relationships. [1]

-

Sync

Strogatz's most popular book his his 2003 book *Sync: the Emerging Science of Spontaneous Order*, in which he attempts to reconcile the seeming contradiction to the tendency towards disorder view of entropy (see: principle of elementary disorder) with spontaneity, and the the formation of natural assemblies, from cells to humans. In summary of the

relation between emergence and entropy, Strogatz states: [7]

> "Scientists have long been baffled by the existence of spontaneous order in the universe. The laws of thermodynamics seem to dictate the opposite, that nature should inexorably degenerate toward a state of disorder, greater entropy. Yet all around us we see magnificent structures—galaxies, cells, ecosystems, human beings—that have somehow managed to assemble themselves. This enigma bedevils all of science today. The key to unlocking the mysteries of self-organization, according to Belgian chemist Ilya Prigogine and his colleagues, lies in a deeper understanding of thermodynamics, where emergence of order is a victorious uphill battle against entropy, as a complex system feeds itself on energy flowing in from the environment."

He also discusses the history of the discovery of the Belousov-Zhabotinsky reaction.

Calculus of friendships

In his 2009 *The Calculus of Friendship*, Strogatz weaves a collection of 30-years of correspondence letters between himself and his high school math teacher into reflections on the philosophical similarities between calculus and human relationships. [4]

Social energy landscapes

See main: Energy landscape

In his 2009 article "Energy Landscape of Social Balance", Strogatz and colleagues seem to take a stab at deriving a mathematical version of a social energy landscape, the synopsis of which is: [5]

> "The shifting of alliances and rivalries in a social group can be viewed as arising from an energy minimization process."

This basis of this model, however, does not seem to be culled from thermodynamics, but rather from what is called the 1940s "balance theory" of Austrian psychologist Fritz Heider. [6]

Education

Strogatz completed his BS in mathematics at Princeton in 1980; then spent two years as a Marshall Scholar at Trinity College, Cambridge, where he completed a BA (1982) and MA (1986); after which he completed his PhD at Harvard in 1986 with a dissertation on the "The Mathematical Structure of the Human Sleep-wake Cycle". [2] Strogatz currently is a professor of applied mathematics a Cornell University. [3]

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External links

â— Steven Strogatz – Wikipedia.
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θΔics

In existographies, **Steven Weinberg** (1933-) (FA:156) (SPE:4) (CR:63) is an American elementary particle physicist noted for his 1967 model of the unification of electromagnetism and the weak nuclear forces, for his oft-cited 1977 *The First Three Minutes: a Modern View of the Origin of the Universe*, wherein he argues that according to the second law the universe is pointless, for his 1992 *Dreams of a Final Theory*, wherein a number of noted atheism positions are stated, and for his 2001 discussions of quantum gravity. [1]

Accidents

Weinberg, like many physical scientists, when he ventures out of the “physical sciences” into the “biological sciences”, as he calls them, he begins to use the term "accident", as a sort of "gap" term the way theists employ the term "god" (see: god of the gaps).

(see: *Dreams* pgs. 32-33)

Mayr | Antireductionism

See main: Anti-reductionism

In 1974, Weinberg, in his “Unified Theories of Elementary Particle Interactions”, stated that particle physicists hope to find a few simple general laws that would explain why nature is the way it is and that at present the closest we can come to a unified view of nature is a description of elementary particles. [10]

In 1985, German-born American evolutionary biologist Ernst Mayr reacted to this assertion by Weinberg, namely the premise that biology or nature in general may soon be reduced to particle physics, by penning “How Biology Differs from the Physical Sciences”, wherein he referred to Weinberg as an uncompromising reductionist and called his view a “horrible example of the way physicists think.” [11]

Weinberg responded with the article “Newtonianism” published in *Nature*. [12]

Mayr responded with “The Limits of Reductionism”. [13]

Dostoyevsky | Reductionism

See main: Reductionism

In 1864, Russian psychological novelist Fyodor Dostoyevsky, in his *Notes From the Underground*, has his character the underground man imagine a scientist telling him: [9]

> “Nature doesn’t consult you; it doesn’t give a damn for you wishes or whether its laws please you or do not please you. You must accept it as it is.”

To which the underground man replies:

> “Good god, what do I care about the laws of nature and arithmetic if for one reason or another, I don’t like these laws.”

Weinberg comments on this: [4]

> “At its nuttiest extreme are those with holistics in their heads, those whose reaction to reductionism takes

the form of a belief in psychic energies, life forces that cannot be described in terms of the ordinary laws of inanimate nature."

Weinberg elaborates:

> "The reductionist worldview *is* chilling and impersonal. It has to be accepted as it is, not because we like it, but because that is the way the world works."

Weinberg, here, in his mention of "chilling" (see: chilling effect), obviously has not heard of Goethe and his human chemical theory of elective affinities, both in the form of interpersonal elective affinities and social elective affinities, which forms the basis or rather mechanistic understanding of human chemical thermodynamics.

Pointless | Purposeless universe?

See main: Pointlessness

Pointless Universe Theory

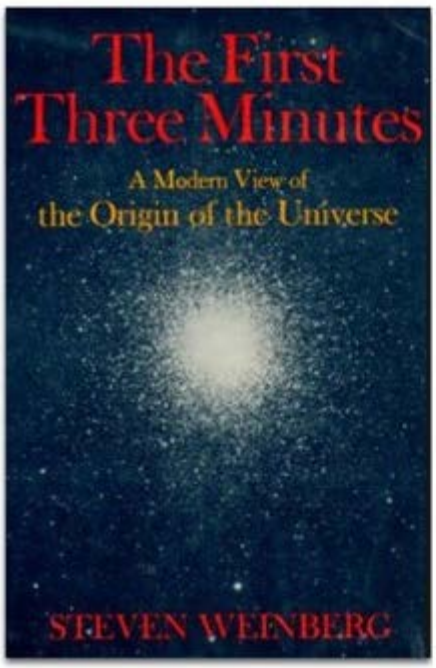

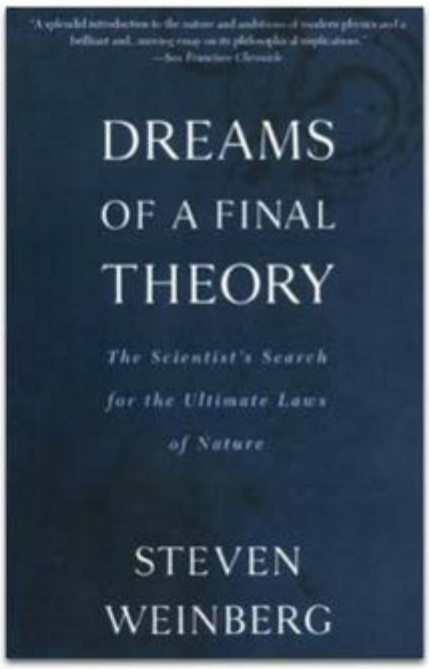

Weinberg's *The First Three Minutes* (1977) and *Dreams of a Final Theory* (1992), interjects, at "points", on how he believes the universe, which he says began from a "point", is "pointless", and that the more we comprehend about the universe, the more this conclusion seems to hold.

Weinberg is frequently cited and or quoted as an atheist who argues, via the second law, for the purposeless universe hypothesis. [2] Specifically, in 1977, Weinberg, in his *The First Three Minutes*, dismissed the infinite oscillating model of the universe with recourse to heat death theory, discussed in upgraded particle physics language, at the end of which he famously or infamously, depending on one's point of view, concluded that the universe seems pointless: [3]

> "Some cosmologists are philosophically attracted to the oscillating model of the, especially because, like the steady-state model, it nicely avoids the problem of Genesis. It does, however, face one severe theoretical difficulty. In each cycle the ratio of photons to nuclear particles (or, more precisely, the entropy per nuclear particle) is slightly increased by a kind of friction (known as 'bulk viscosity') as the universe expands and contracts. As far as we know, the universe would then start each new cycle with a new, slightly larger ratio of photons to nuclear particles. Right now this ratio is large, but not infinite, so it is hard to see how the universe could have previously experienced an infinite number of cycles.
>
> However all these problems may be resolved, and whichever cosmological model proves correct, there is not much of comfort in any of this. It is almost irresistible for humans to believe that we have some special relation to the universe, what human life is not just a more-or-less farcical outcome of a chain of accidents reaching back to the first three minutes, but that we were somehow built in from the beginning. As I write this I happen to be in an airplane at 30,000 feet, flying over Wyoming en route home from San Francisco to Boston. Below, the earth looks very soft and comfortable—fluffy clouds here and there, snow turning pink as the sun sets, roads stretching straight across the country from one town to another. It is very hard to realize that this all is just a tiny part of an overwhelming hostile universe. It is even harder to realize that this present universe has evolved from an unspeakably unfamiliar earlier condition, and faces a future

> extinction of endless cold or intolerable heat. The more the universe seems comprehensible, the more it also seems pointless."

This last "the more the universe seems comprehensible, the more it also seems pointless" statement quickly became Weinberg's trademark philosophical statement, particularly among atheism and or science and religion publications. The statement is reminiscent of Aldous Huxley's 1937 second law based "meaninglessness" atheism philosophy. [5]

In 1992, Weinberg, in his "What About God?" chapter of his *Dreams of a Final Theory*, continued to discuss the repercussions of this pointlessness quote as follows: [4]

> "In my 1977 book, *The First Three Minutes*, I was rash enough to remark that 'the more the universe seems comprehensible, the more it seems pointless'. I did not mean that science teaches us that the universe is pointless, but rather that the universe itself has no point. I hastened to add that there were ways that we ourselves could invent a point for our lives, including trying to understand the universe. But the damage was done: that phrase has dogged me ever since.

Here again Weinberg seems to assert that, according to modern science, "there is no point to life", but that we can be secular scientists and "invent" points, e.g. trying to understand things. He continues:

"Recently Alan Lightman and Roberta Brawer published interviews with twenty-seven cosmologists and physicists, most of whom had been asked at the end of their interview what they thought of that remark. With various qualifications, ten of the interviewees agreed with men and thirteen did not, but of those thirteen three disagreed because they did not see why anyone would *expect* the universe to have a point."

Weinberg, in his book, goes on to cite the following responses:

> "Why should it have a point? What point? It's just a physical system, what point is there? I've always been puzzled by that statement."
>
> — Margaret Geller, Harvard astronomer

> "I'm willing to believe that we are flotsam and jetsam."
>
> — Jim Peebles, Princeton astrophysicist

Weinberg goes on to state that Princeton astrophysicist Edwin Turner agreed with him, that his University of Texas colleague, astronomer Gerard de Vaucouleurs thought the remark was "nostalgic", and that he sees himself unique among physicists for carrying about these types of science replacing religions intersections. By 2000, Weinberg's pointless universe statement, according to *The New York Times* ("Physicist Ponders God, Truth and a Final Theory", James Glanz), had become a "much-quoted aphorism". (Ñº)

In 2001, Weinberg again re-stoked the fires of debate with the following statement about how he believes that "there is nothing in the universe that suggests any purpose for humanity" statement: [6]

> "Though aware that there is nothing in the universe that suggests any purpose for humanity, one way that we can find a purpose is to study the universe by the methods of science, without consoling ourselves with fairy tales about its future, or about our own."

This again prompted further debate and objection, which Weinberg discusses further in his 2010 book *Lake Views*. [7]

Discussion

Weinberg is indeed unique, among hard scientists, in his willingness to openly discuss godless universe models, as he sees things; a subject that for the most part is a taboo discussion in American academia. Weinberg comments the following about this: [4]

> "Among today's scientists I am probably somewhat atypical in carrying about such things. One the rare occasions when conversations over lunch or tea touch on matters of religion, the strongest reaction expressed by most of my fellow physicists is a mild surprise and amusement that anyone still takes all that seriously. Many physicists maintain a nominal affiliation with the faith of their parents, as a form of ethnic identification and for use at weddings and funerals, but few of these physicist seem to pay any attention to their nominal religion's theology."

The general issue here, is that while many physicists will indeed maintain a "nominal affiliation with faith", for the sake of congeniality, cultural fitting, or whatever, when probed deeper about the fine points about cultural or parental "faiths" in respect to one's belief system and to the belief systems of physics and chemistry, heated eruption often bubbles to the fore, the what is entropy debate? (1902), Rossini debate (2007), and Moriarty-Thims debate (2009) are but a few examples.

The debate, in core issue, referring to Geller's comment "why should it have a point? What point? It's just a physical system, what point is there?" statement, is that physical systems, according to thermodynamics, have equilibrium points, which depend on the type of system, which for society, as a physical system, equates to temporal points of free energy minimization — the seed logic of which first began to become apparent when in October 1873, German physicist August Horstmann famously announced the condition for chemical equilibrium to be that of maximum entropy; the translation logic of which, in terms of free energy, the isothermal isobaric system equivalent of Horstmann's maximal entropy logic, becoming integrated into so called "points" of earth-bound human existence and experience by the so-called human free energy theorists, beginning with Sigmund Freud ("A Project for Scientific Psychology", 1895), Lawrence Henderson (Harvard Pareto circle, 1926), John Neumann (1934), and so on. These earth-bound equilibrium "points" are in turn coupled to the spins, movements, and other hypothetical "points" of the universe (e.g. big bang) and this is where the meaning and understanding of movement logic comes in. The problem is that none of this type of physical humanities logic is currently being taught in American, or about the world (give or take), which is why twenty-seven cosmologists and physicists are at odds which each other about whether or not the universe is pointless.

This state of affairs leaves the uninformed, citing Weinberg, to conclude that "there isn't any rhyme or reason to the course of human history or to the universe. It's just one damn thing after another. Real purpose has been ruled out by physics" (Alexander Rosenberg, 2011) or that we are but but "flotsam and jetsam" (Jim Peebles, c.1991), and so on. [8]

Religion | Atheism

Weinberg is Brainz.org top 50 brilliant atheist (#24) (Ñº); an "avowed atheist" (Lee Strobel, 2004); Weinberg, supposedly, declared open atheism in his 2008 article "Without God". [16]

Quotes | Science, Religion and Atheism

The following are noted atheism, religion, and science related quotes by Weinberg: (Ñº)

> "One of the great historical contributions of science is to weaken the hold of religion. I think that's a good thing."
>
> — Steven Weinberg (date)

“Premature as the question may be, it is hardly possible not to wonder whether we will find any answer to our deepest questions, any signs of the workings of an interested god, in a final theory. I think that we will not.”

— Steven Weinberg (1992), *Dreams of a Final Theory* (c. pg. 244)

“I am all in favor of a dialogue between science and religion, but not a constructive dialogue. One of the great achievements of science has been, if not to make it impossible for an intelligent person to be religious, then at least to make it possible for them not to be religious. We should not retreat from this accomplishment.”

— Steven Weinberg (1999), “A Designer in the Universe?” [14]

“It's a consequence of the experience of science. As you learn more and more about the universe, you find you can understand more and more without any reference to supernatural intervention, so you lose interest in that possibility. Most scientists I know don't care enough about religion even to call themselves atheists. And that, I think, is one of the great things about science—that it has made it possible for people not to be religious.”

— Steven Weinberg (c.2001)

“Thales’ ocean had no room for Poseidon. In Hellenistic times, Epicurus adopted the atomist theory of Democritus as an antidote to belief in the Olympian gods. Scientists aren’t often driven in their work by motives of this sort. Of course, none of this bears on the question of whether the reductionist perspective is correct. And since, in fact, it is correct, we had all better learn to live with it.”

— Steven Weinberg (2001), *Facing Up: Science and Its Cultural Adversaries* [15]

Quotes | General

The following are general quotes by Weinberg:

“For myself, the pleasure of the work had always provided justification enough for doing it. Sitting at my desk or at some café table, I manipulate mathematical expressions and feel like Faust playing with his pentagrams before Mephistopheles arrives.”

— Steven Weinberg (1992), *Dreams of a Final Theory* (pg. 5)

“Electromagnetism and gravitation happen to be the only fundamental forces that are evident in everyday life, but there are other kinds of forces in nature, including the weak and strong nuclear forces.”

— Steven Weinberg (1992), *Dreams of a Final Theory* (pg. 18)

“The reductionist attitude provides a useful filter that saves scientists in all fields from wasting their time on ideas that are not worth pursuing.”

— Steven Weinberg (1992), *Dreams of a Final Theory* (pg. 64)

"The authors of physics textbooks are usually compelled to redo the work of the magicians so that they seem like sages; otherwise no reader would understand the physics. Planck was a magician in inventing his 1900 theory of heat radiation, and Einstein was playing the part of a magician when he proposed the idea of the photon in 1905. It is usually not difficult to understand the papers of the sage-physicists, but papers of magician-physicists are often incomprehensible. In this sense, Heisenberg's 1925 paper was pure magic."

— Steven Weinberg (1992), *Dreams of a Final Theory* (pg. 68)

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â— Weinberg, Steven. (1983). *The Discovery of Subatomic Particles*. Cambridge University Press, 2003.

External links

â— Steven Weinberg – Wikipedia.
â— Steven Weinberg (faculty) – University of Texas at Austin.
â— Weinberg, Steven (1933-) – WorldCat Identities.

θΔics

In hmolscience, **Stewart-Weaver fallout** refers to the 1949 fund initiated agreement by Rockefeller Foundation natural science head Warren Weaver to fund John Q. Stewart's social physics program at Princeton (see: Princeton Department of Social Physics) and then 1953 funding cancellation over objections to what exactly social physics entails.

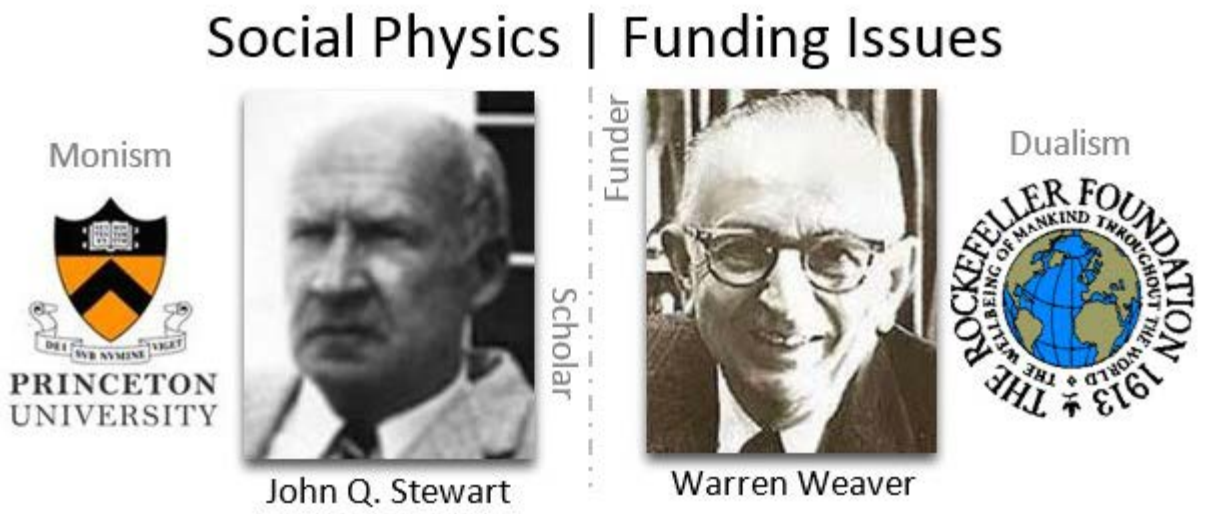

Above is a visual gist of the **Stewart-Weaver fallout**, namely that in 1949 Warren Weaver, then chief decision maker of natural sciences funding for the Rockefeller Foundation, agreed to fund John Q. Stewart's fledgling social physics program at Princeton University (see: Princeton social physics); four years later, however, after seeing exactly what this entails, namely that of employing one nature arguments (i.e. monism logic in contrast to dualism logic), e.g. making correlations between physical concepts, such as: thermal, electromagnetic, and chemical energy, etc., and social concepts, such as: human meaning, feeling, and authority, etc., backed out, and withdrew funding.

Overview

In 1949, John Q. Stewart approached Warren Weaver, then head of the division of natural sciences of the Rockefeller Foundation, for funding to develop social physics as a proper social science. Weaver wrote back to Stewart: [1]

> "I am completely sympathetic with your approach."

Weaver offered Stewart a grant of $15,000 dollars (equivalent to $150,000 in 2015 terms).

Stewart, as summarized by Trevor Barnes (2014), used the money to mount seven conferences, as well as to help form in 1951 a Social Physics Committee of forty strong associated with the American Association for the Advancement of Science (AAAS), and which produced its own bevy of special sessions. Stewart also increasingly adopted the language of "isomorphism" to describe the relationship between natural and social sciences.

Fallout | 1953

In Dec 1953, Stewart, in a paper presented at the Boston AAAS meeting, suggested that: [1]

> "Isomorphism means reliable item-to-item correspondence between two or more fields which superficially may seem altogether dissimilar. The fields are exhibited as more or less identical in their patterns of concepts."

Stewart, sometime thereabouts, began to pen or present his "Remarks on the Current State of Social Physics", given at an AAAS meeting paper, wherein Stewart he asserted isomorphisms between thermal, electromagnetic, and chemical energy and, respectively, human meaning, feeling, and authority, as well as an isomorphism between mechanical work (kinetic, elastic, and gravitational energy) and decision-making. [1]

Weaver, at this point, began to withdraw support for participation with Stewart, per arrival at the stated belief, as he told Stewart, that physical energy and theories could not be applicable to things such as feelings, meaning, values, decision making (which gets into questions of soul), etc.

In 1953, Weaver wrote to Stewart that he was going to cancel his social physics funding per the following logic: [2]

> "To search for isomorphisms between social phenomena and physical phenomena is indeed an interesting idea. The real question, however, is whether or not it is a rewarding idea. It is interesting to suppose that there may be entities, social values, which play in social experience the same roles played by different forms of physical energy … But it is hard for me to sense how one can usefully assign quantitative measures to any significantly wide range of "values" in the social field. And when you link together such things as meaning, feeling, authority, and decision-making, this sounds to me like a very heterogeneous mixture."

Of note, in regard to this withdrawal, the Rockefeller Foundation's agenda, in the human sciences, as summarized by American historian Lily Kay (1996), in her chapter "Social Control: Rockefeller Foundation's Agenda in the Human Sciences, 1913-1933", spearheaded by the oil money of John D. Rockefeller (1839-1937), the wealthiest person in history (Ñº), was anchored in and focused on promoting Protestant ethics. [3] Warren, moreover, was a theist; hence, the double-anchored objection.

Other | Examples

Similar examples of such reasoning can be found amid Florence Nightingale's late 19th century effort to get a "Chair of Social Physics" established at Oxford, the 1905 forced retirement of Wilhelm Ostwald per "religious questions" concerns related to his energetics-based monism philosophy teaches (see: Monistic Sunday Sermons); as well as explicitly stated in more recent fiascoes, such as: the Proxmire affair (1975), Rossini debate (2007), and the the Galem effect (2004), stated below:

> "To suggest that humans could behave like atoms was looked upon as a blasphemy to both hard science and human complexity, a total nonsense, something to be condemned. And it has been indeed condemned during the last fifteen years."
>
> — Serge Galam (2004), "Sociophysics: a Personal Testimony"

More recent examples include the Prausnitz-Thims derision (2013) (Ñº), on the objection to having a chemical thermodynamics based two cultures department initiated at the University of California, Berkeley, per unstated reasons, such as that John Prausnitz believes that talents are "god given".

The spit itself, historically, dates back to the 1809 separation of people as either "admirers" and "enemies" of Goethe's physical chemistry based *Elective Affinities*, which before that dates to the atomic theory vs. standard model vs. being theory debates of the Greek philosophers (see: Heraclitus vs Parmenides debate)

References

1. (a) Stewart, John Q. (1953). "Remarks on the Current State of Social Physics" (pdf) (Isomorphism means, pg. 2; grant, pg. 8), Paper presented at the American Association for the Advancement of Science conference, Boston, Dec 30; in: Box 58, Miscellaneous Writing, John Q. Stewart Papers, Rare Books Special Collections, Princeton University.
(b) Barnes, Trevor J. and Wilson, Matthew W. (2014). "Big Data, Social Physics, and Spatial Analysis: the Early Years" (pre, pdf) (abs) (pdf), *Big Data & Society*, Apr-Jun:1-14.
2. Weaver, Warren. (1953). "Letter to John Q. Stewart", Dec 22, in: Box 36, Weaver, W., John Q. Stewart Papers, Rare Books and Special Collections, Princeton University.
3. Kay, Lilly E. (1996). *The Molecular vision of Life: Caltech, the Rockefeller Foundation, and the Rise of New Biology* (§2: Social Control: Rockefeller Foundation's Agenda in the Human Sciences, 1913-1933, pgs. 22-57). Oxford University Press.

θΔics

In business thermodynamics, **SThAR**, short for "Social Thermodynamics Applied Research", is an applied sociothermodynamics-theory-based company launched in 2015 in Switzerland. SThAR develops predictive software based on the emergent science of social thermodynamics. [1] Their models describe and predict social trends to optimize the success of marketing campaigns (for promoting products, brands, or electoral information), and forecast consumption patterns and evolution of sales for designing smart geomarketing strategies.

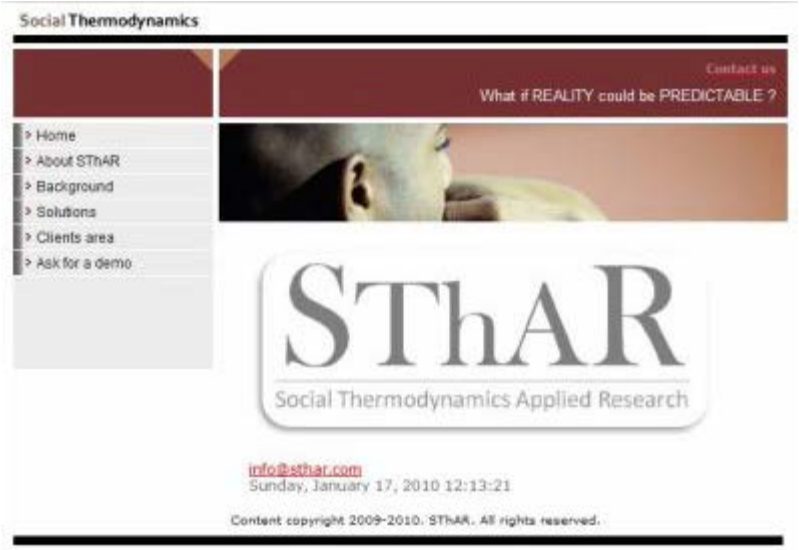

A 2010 screenshot of **SThAR** (socialthermodynamics.org), with the tagline: "What if reality could be predictable?".

According to Spanish entrepreneur Gregory Botanes, one of the co-founders: [2]

> "**Sthar** is the first company in the word to apply the revolutionary and recently discovered social thermodynamics universal laws to model social networks behavior and predict social changes, based on a mathematical model instead of existing statistics-based models."

(add discussion)

See also

â— ReactionMatch.com

References

1. (a) SThAR (home) – sthar.com.
(b) SThAR Company Profile – LinkedIn.com.
2. Gregory Botanes (info) - Facebook.com.

θΔics

In philosophy, **stoicism** is the ideology that since fate is determined the wise man should be free from passion, unmoved by joy or grief, and submissive to natural law and or one apparently or professedly indifferent to pleasure or pain.

Etymology

The Stoics derive their name from the Stoa Poikile (Q), the painted colonnade on the north side of the Athenain agora, which was the site of the school. [4]

sto·i·cism

/ˈstōəˌsizəm/

noun

1. the endurance of pain or hardship without a display of feelings and without complaint.
2. an ancient Greek school of philosophy founded at Athens by Zeno of Citium. The school taught that virtue, the highest good, is based on knowledge, and that the wise live in harmony with the divine Reason (also identified with Fate and Providence) that governs nature, and are indifferent to the vicissitudes of fortune and to pleasure and pain.

Left: a Greek "unmovable" portico (or entrance porch) to a temple, the root of the term "**stoicism**". Right: a Google-generated definition of **stoicism**.

It was the cite at which the location from which Zeno of Citium (c.275BC), a follower of Heraclitus, taught Stoicism. Hence, Stoicism derives its name from the Greek "Stoa" or covered walkway or portico, commonly for public use, open at the entrance with columns, usually of the Doric order, lining the side of the building; they created a safe, enveloping, protective atmosphere.

Overview

The “stoics”, as they came to be called, supposedly, found the fragments of the work of Heraclitus so obscure that they nicknamed him the "riddler". [1]

The early Stoa was dominated by its first three heads: the first was the Cypriot Zeno of Citium, who laid the foundations of the system.

On the death (cessation) of Zeno (c.262BC), his successor Cleanthes (c.262BC) (Q) lent a more rigorous dimension to the doctrines of the school, in the face of the increasingly skeptical stance of the Academics (Plato’s academy). He originated new ideas in Stoic physics (Q), and developed Stoicism in accordance with the principles of materialism and pantheism.

The third Stoic school president was Chrysippus, who is credited with the systematic development of the doctrines of the school.

The next major school head was Panaetius (185-109BC) (Q), head of the school from 129 to 109BC, a strong admirer of Plato and Aristotle, who build bridges with the Peripatetics.

His pupil was Posidonius (c.135-51BC) (Q), a scientist, historian, and philosopher, and was the chief philosopher through which Cicero learned Stoicism.

In 45BC, Cicero published *On the Nature of the Gods* (*De Natura Deorum*), a discourse on Greek and Roman theologies, namely a dialogue on a comparison of the pros and cons of stoicism, Epicurean theology, and Platonic Academy based skepticism.

Other noted adherents of stoicism or aspects of its logic include: Marcus Aurelius and Thomas Jefferson.

Quotes

The following are noted quotes:

> "The **Stoics** had a strikingly pure and correct doctrine of the freedom of the will. Moral accountability is involved in the fact that conduct flows from the will, and so from the innermost and most essential nature of man; but the manner in which each man's will shapes itself is only a result of the mighty necessity and divine predestination which govern all the machinery of the universe down to the smallest detail. For his thought also man is responsible, because even our judgments are shaped by the influence of our moral character."
>
> — Friedrich Lange (1875), *The History of Materialism, Volume One* (pg. 97)

> "As you say of yourself, I too am an Epicurian. I consider the genuine (not the imputed) doctrines of Epicurus as containing everything rational in moral philosophy which Greece and Rome have left us. Epictetus indeed, has given us what was good of the **stoics**; all beyond, of their dogmas, being hypocrisy and grimace. Their great crime was in their calumnies of Epicurus and misrepresentations of his doctrines; in which we lament to see the candid character of Cicero engaging as an accomplice. Diffuse, vapid, rhetorical, but enchanting. His prototype Plato, eloquent as himself, dealing out mysticisms incomprehensible to the human mind, has been deified by certain sects usurping the name of Christians; because, in his foggy conceptions, they found a basis of impenetrable darkness whereon to rear fabrications as delirious, of their own invention. These they fathered blasphemously on him whom they claimed as their founder, but who would disclaim them with the indignation which their caricatures of his religion so justly excite. Of Socrates we have nothing genuine but in the Memorabilia of Xenophon; for Plato makes him one of his Collocutors merely to cover his own whimsies under the mantle of his name; a liberty of which we are told Socrates himself complained. Seneca is indeed a fine moralist, disfiguring his work at times with some **Stoicisms**, and affecting too much of antithesis and point, yet giving us on the whole a great deal of sound and practical morality."
>
> — Thomas Jefferson (1819), "Letter to William Short", Oct 31 [2]

References

1. Stokes, Philip. (2002). *Philosophy 100: Essential Thinkers* (pg. 15). Enchanted Lion Books.
2. Jefferson, Thomas. (1819). "Letter to William Short" (Q), Oct 31.
3. Sambursky, Samuel. (1959). *The Physics of the Stoics*. Princeton University Press, 2014.
4. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (Stoa Poikile, pg. xxxiii). Oxford University Press, 1998.

External links

- Stoicism – Wikipedia.

θΔics

In genius rankings, **Stokes 100** (Stokes 100:#) refers to a listing of one-hundred essential thinkers over the last 2,600-years, according to British-born Thai philosopher Philip Stokes (2002), found in his book *Philosophy 100: Essential Thinkers*, grouped by thematically or via classification and ordered chronologically. [1]

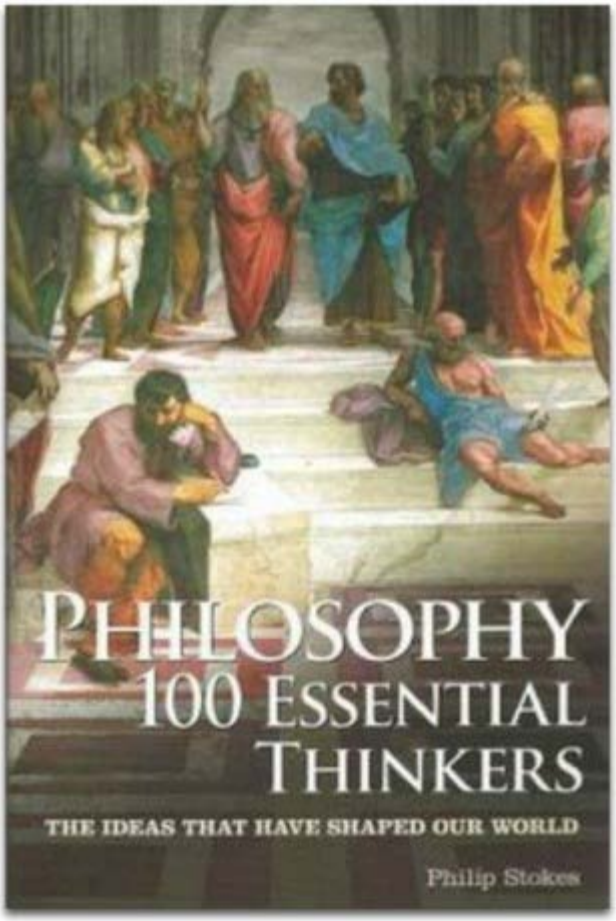

British-born Thai philosopher Philip Stokes's *Philosophy 100: Essential Thinkers*, wherein he lists outlines of the ideas of the 100 essential thinkers from Greek genius times to modern times. [1]

100 essential thinkers

The following is a listing of the 100 essential thinkers from Stokes' *Philosophy 100: Essential Thinkers*:

The Presocratics

1. Thales
2. Pythagoras
3. Xenophanes
4. Heraclitus

The Eleatics

5. Parmenides
6. Zeno of Elea

The Academics

7. Socrates
8. Plato
9. Aristotle

The Atomists

10. Democritus
11. Epicurus

The Cynics

12. Diogenes of Sinope

The Stoics

13. Cicero
14. Philo of Alexandria
15. Seneca
16. Marcus Aurelius

The Sceptics

17. Sextus Empiricus

The Neoplatonists

18. Plotinus

The Christians

19. Augustine [2]
20. Boethius

The Scholastics

21. St. Anselm
22. St. Thomas Aquinas
23. Duns Scotus
24. William of Occam

The Age of Science

25. Nicolaus Copernicus
26. Niccolo Machiavelli
27. Desiderius Erasmus
28. Thomas More
29. Francis Bacon
30. Galileo Galilei
31. Thomas Hobbes
32. Isaac Newton

The Rationalists

33. Rene Descartes
34. Antonie Arnauld
35. Nicolas Malebranche
36. Benedict Spinoza
37. Gottfried Leibniz

The Empiricists

38. John Locke
39. David Hume
40. Thomas Reid
41. Voltaire
42. Jean-Jacques Rousseau
43. Denis Diderot

The Idealists

44. George Berkeley
45. Immanuel Kant
46. Friedrich Schiller
47. Friedrich Schelling
48. Georg Hegel
49. Arthur Schopenhauer

The Liberals

50. Adam Smith
51. Mary Wollstonecraft
52. Thomas Paine
53. Jeremy Bentham
54. John Mill
55. Auguste Comte

The Evolutionists

56. Charles Darwin
57. Henri Bergson
58. Alfred Whitehead

The Pragmatists

59. Ernst Mach
60. Charles Peirce
61. William James
62. John Dewey

The Materialists

63. Karl Marx
64. Friedrich Engels
65. Vladimir Lenin
66. Sigmund Freud

67. Carl Jung
68. John Keynes

The Existentialists

69. Soren Kierkegaard
70. Friedrich Nietzsche
71. Edmund Husserl
72. Martin Heidegger
73. Jean-Paul Sartre
74. Albert Camus
75. Simone de Beauvoir

The Linguistic Turn

76. Gottleb Frege
77. Bertrand Russell
78. Ludwig Wittgenstein
79. Ferdinand de Saussure
80. George Moore
81. Moritiz Schlick
82. Lev Vygotsky
83. Rudolph Carnap
84. A.J. Austin
85. Alfred Tarski
86. J.L. Austin
87. Gilbert Ryle
88. Noam Chomsky

The Postmodernists

89. Claude Levi-Strauss
90. Michel Foucault
91. Jacques Derrida

The New Scientists

92. Emile Durkheim
93. Albert Einstein
94. Karl Popper
95. Kurt Godel
96. Alan Turing
97. Burrhus Skinner
98. Thomas Kuhn
99. Paul Feyerabend
100. W.V.O. Quine

(add)

References

1. Stokes, Philip. (2002). *Philosophy 100: Essential Thinkers* (pgs. 8-9). Enchanted Lion Books.
2. Fowler, Michael. (1997). “Historical Beginnings of Theories of Electricity and Magnetism” (Ñº), University of Virginia, Physics.

θΔics

In acronyms, **STP** is short for standard temperature and pressure, a common engineering term, short for normal or typical near earth surface conditions of average temperature (273.15 K, 0 °C, 32 °F) and pressure (typically 1 atm).

θΔics

In existographies, **Strabo** (c.63BC-24AD) (IQ:150|#636) (Cattell 1000:500) was a Greek geographer, philosopher, and historian, noted for his 23AD *Geography*, which established the science of geography, based on then-current views, and historical precursor models; he is oft-cited in the silent historians problem.

Overview

In c.23AD, Strabo, in his *Geography*, established the science of geography, based on then-current views, and historical precursor models.

Quotes | On

The following are quotes on Strabo:

> "Geographical knowledge was advanced by Strabo, who lived in the Augustan era; but researches were chiefly confined to the Roman empire. Strabo was, like Herodotus, a great traveler, and much of his geographical information is the result of his own observations. It is probable he is much indebted to Eratosthenes, who preceded him by three centuries, and who was the first systematic writer on geography. Strabo appears at as great disadvantage as Pliny or Ptolemy; yet the work of Strabo, considering his means, and the imperfect knowledge of the earth's surface, and astronomical science, was really a great achievement of industry. He treats of the form and magnitude of the earth, and devotes eight books to Europe, six to Asia, and one to Africa. His great authorities are Eratosthenes, Polybius, Aristotle, Antiochus of Syracuse, Posidonius, Theopompus, Artemidorus Ephorus, Herodotus, Anaximenes, Thucydides, and Aristo, chiefly historians and philosophers. Whatever may be said of the accuracy of the great geographer of antiquity, it cannot be denied that he was a **man of immense research and learning**. His work in seventeen books is one of the most valuable which have come down from antiquity, both from the discussions which run through it, and the curious facts which can be found nowhere else. It is scarcely fair to estimate the **genius of Strabo** by the correctness and extent of his geographical knowledge."
>
> — John Lord (1870), *The Old Roman World* (pgs. 383-84)

> "Is it not strange that the principal historians of the first century are silent as to Christians and their faith. Plutarch and **Strabo**, for instance, who lived and wrote soon after the alleged advent of Christ, are **both silent** upon the leading events recorded in the Gospels."
>
> — Charles Watts (1896), "Christianity and History" (pg. 35), *The Freethinker*, 16:1, Jan 19

Quotes | By

The following are quotes by Strabo:

> "If the opinion of Posidonius [c.120BC] is well-founded, we should even honor the atomic theory of an old philosopher of Sidon, **Mochus**, who lived prior to the Trojan War [c.1200BC]. The theory of Democritus about the atom is of Phoenician origin."
>
> — Strabo (c.23AD), *Geography* (XVI.757) (Ñº) [1]

References

1. Taylor, C.C.W. (1999). *The Atomists: Leucippus and Democritus: Fragments: a Text and Translation with a Commentary by C.C.W. Taylor* (pg. 153). University of Toronto Press.

External links

â— Strabo – Wikipedia.

θΔics

In existographies, **Strato** (c.335-269BC) (IQ:180|#110) (FA:20) was a Greek peripatetic philosopher, student of Theophrastus, noted for []

Overview

In 306 to 310BC, Strato taught in Lampsacus; where he might have known Epicurus. Strato attended Aristotle's school in Athens, after which he went to Egypt as tutor to Ptolemy (309–246 BC) (Ñº), where he also taught Aristarchus of Samos. He returned to Athens after the death of Theophrastus (c.287 BC), succeeding him as head of the Lyceum.

Strato devoted himself especially to the study of natural science, and increased the naturalistic elements in Aristotle's thought to such an extent, that he denied the need for an active god to construct the universe, preferring to place the government of the universe in the unconscious force of nature alone.

Experiments

Strato emphasized the need for exact research, and, as an example of this, he made use of the observation of how water pouring from a spout breaks into separate droplets as evidence that falling bodies accelerate.

Hero

In 50AD, Hero, in his *Pneumatica*, is said to have overview the physics of Strato and Ctesibius, via outlining an atomic theory in which matter consists of particles mixed with distributed vacua.

Quotes | On

The following are quotes on Starto:

> "Equally intolerable is the inconsistency of Theophrastus, for at one moment he allots the divine primacy to mind, at another to the heavens, and yet another to the signs of the heavenly stars. Another figure unworthy of attention is Theophrastus' disciple **Strato**, the one they call the 'physicist', for he proposes that all divine power lies in nature, which bears within it the causes of birth, growth, and diminution, but which lacks all sensation and shape."
>
> — Cicero (45BC), *On the Nature of the Gods* [1]

> "**Strato**'s atheism is the most dangerous of the ancients."
>
> — David Hume (c.1760) (Ñº)

> "Those same persons, who at the present day discover atheism to be such a strange system, admit there could have been atheists formerly [but not presently]. Is it, then, that nature has endued us with a less portion of reason than she did men of other times? Or should it be that the god of the present day would be less absurd than the gods of antiquity? Has the human species then acquired information, with respect to this concealed motive-power of nature? Is the god of modern mythology, rejected by Vanini, Hobbes, Spinoza, and some others, more to be credited than the gods of the pagan mythology, rejected by Epicurus, **Strato**, Theodorus, Diagoras, &c. &c.? Tertullian pretended that Christianity had dissipated that ignorance in which the pagans were immersed, respecting the divine essence, and that there was not an artisan among the Christians who did not see god, and who did not know him. Nevertheless, Tertullian himself admitted a corporeal god, and was therefore an atheist, according to the notions of modern theology."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 303-304)

> "Cudworth, who has written a most erudite but unsatisfactory volume on the proofs for the being of a god, is obliged to confess that **Strato** was an atheist. Velleius, an Epicurean atheist, in Cicero, when speaking of the different kinds of atheists, gives such a character of Strato as makes him appear to have been a sort of "atheistical theist," or divine atheist."
>
> — Author (1840), "On the Causes and Effects of a Belief in Supernatural Agents" (Ñº)

References

1. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (pgs. 15-16). Oxford University Press, 1998.

External links

â— Strato of Lampsacus – Wikipedia.

In science, **stress** is a deforming force applied to a body. [1] The resulting change in shape of the body due to stress is called strain. In another sense, stress is a force per unit area on a body that tends to cause deform. [2]

Human thermodynamics

In 1998, American biomechanical engineer Satish Boregowda completed his PhD dissertation on a second law based thermodynamic modeling of human physical and mental stress. [5]

In 2003, American mechanical engineer Gilbert Wedekind has attempted to explain stress that results when people are overworked in terms of entropy, albeit in slightly religious terms. [3]

In 2006, Iranian-born American materials science and electrical engineer Robert Kenoun attempted to explain the stress of family transitions in terms of thermodynamics via internal energy changes. He argued, for instance, that if one member of the system of a family were to leave, e.g. a father dies, which he correlates to a "loss of mass" in the system, there would result an increase of internal stress among the relational bonds of the remaining members, which Kenoun equates to a change in the internal energy of the system. [4]

References

1. Clark, John O.E. (2004). *The Essential Dictionary of Science.* Barnes & Noble.
2. Daintith, John. (2005). *Oxford Dictionary of Science.* Oxford University Press.
3. Wedekind, Gilbert L. (2003). *Spiritual Entropy: Life-Changing Insights Revealed by a Unique Natural law* (pgs. ix, xii, 148). Xulon Press.
4. Kenoun, Robert. (2006). *A Proposition to Theory of History and Social Evolution* (pgs. vii, xvii-xviii). Trafford Publishing.
5. (a) Boregowda, Satish C. (1998). *Thermodynamic Modeling and Analysis of Stress Responses* (abs) (WorldCat), PhD dissertation. Old Dominion University.
(b) Boregowda, Satish C. and Karwowski, Waldemar. (2005). "Modeling of Human Physiological Stresses: A Thermodynamics-based Approach" (abstract), *Occupational Ergonomics*, 5: 235-48.

Further reading

â— Pati, Surya. (2009). "Stress Management and Innovation: a Thermodynamics View", *Journal of Human Thermodynamics*, Sep., 5: 22-32.

External links

â— Stress (biology) – Wikipedia.
â— Stress (mechanics) – Wikipedia.

θΔics

In engineering, **stroke** refers to one complete movement of the piston, in a piston and cylinder engine, in its reciprocating motion, either from bottom to top (up stroke) or from top to bottom (down stroke).

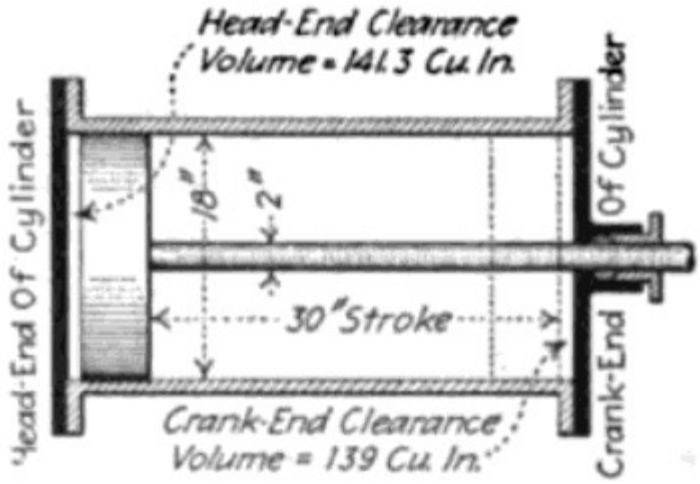

A diagram of a piston and cylinder that has a 30" **stroke** "length", from top to bottom. [1]

Overview

The following, made by Terrell Croft (1922), is an-illustrated diagram of the Watt-Southern indicator, or "Watt indicator", wherein, on the indicator diagram, the length L represents the graphical measure or distance of the stoke or "one direction" motion of the piston: [1]

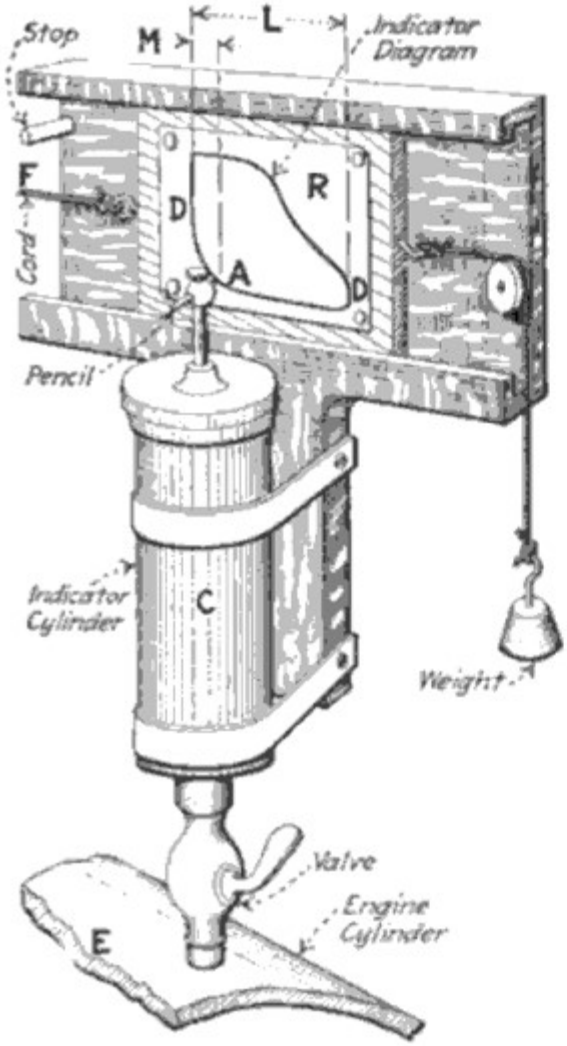

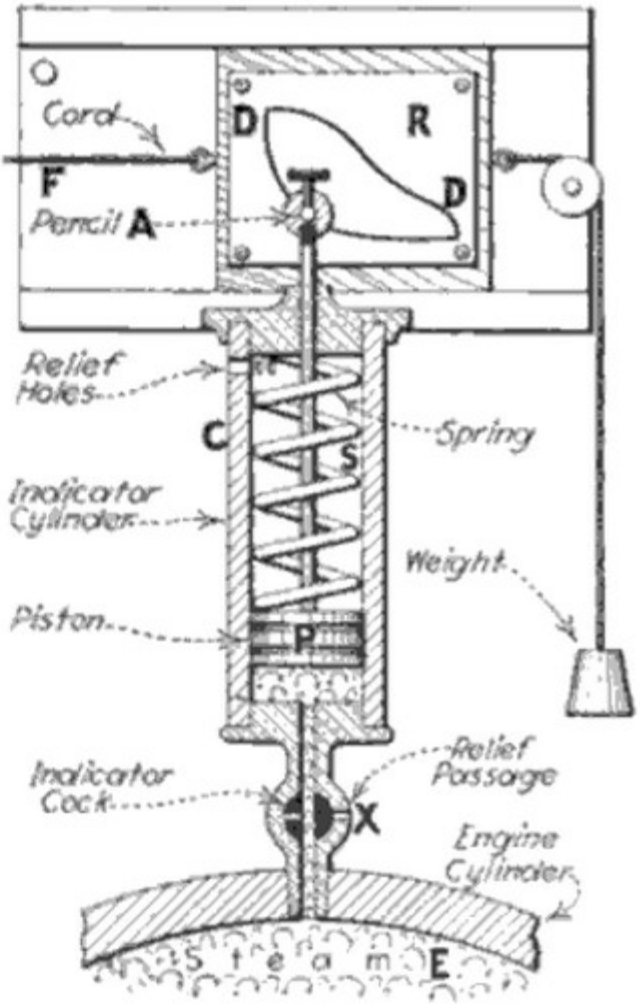

The operation of which is described as follows:

> "**Watt's indicator** is perhaps the simplest form (above figures). Steam enters the indicator cylinder *C*, from the engine cylinder *E*. The pressure of the steam forces

the [indicator] piston *P*, upward, compressing the spring, *S*, and raising the pencil, A. The sheet of paper *R* being moved at the same time by **cord *F* which is attached to the crosshead** (Ñº) **of the engine**, will have described upon it a **'diagram' *DD***, which **'indicates'**, at every instant during a revolution of the engine, the pressure within the engine cylinder. At any instant, the height to which the pencil has been raised will be a measure of the pressure at that instant within the engine cylinder, whereas the horizontal distance through which the paper has been moved from either end (e.g., *M*) will **denote the position of the [engine] piston** in the engine cylinder at that instant. From this it follows that the length, *L*, of the diagram represents the length of the engine piston's **stroke**."

— Terrell Croft (1922), *Steam-Engine Principles and Practice* (pg. 41) [10]

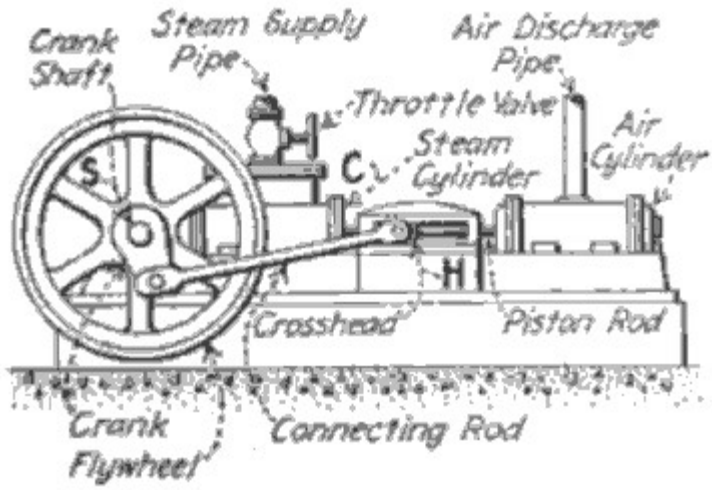

Diagram of a Watt-type steam engine, illustrating that the "crosshead" (Ñº), which connects to cord F, and hence is what moves the indicator "board" R back and forth, is the part of the steam where the piston rod (which is attached to the piston head), connects to the connecting rod (which connects to the crank and crank shaft), which turns the flywheel. [1]

The location of "crosshead", which connects to cord F, which moves the indicator board R back and forth, is illustrated adjacent.
The following shows the piston, shown with valves V1 and V2 open, so make a down stroke: [1]

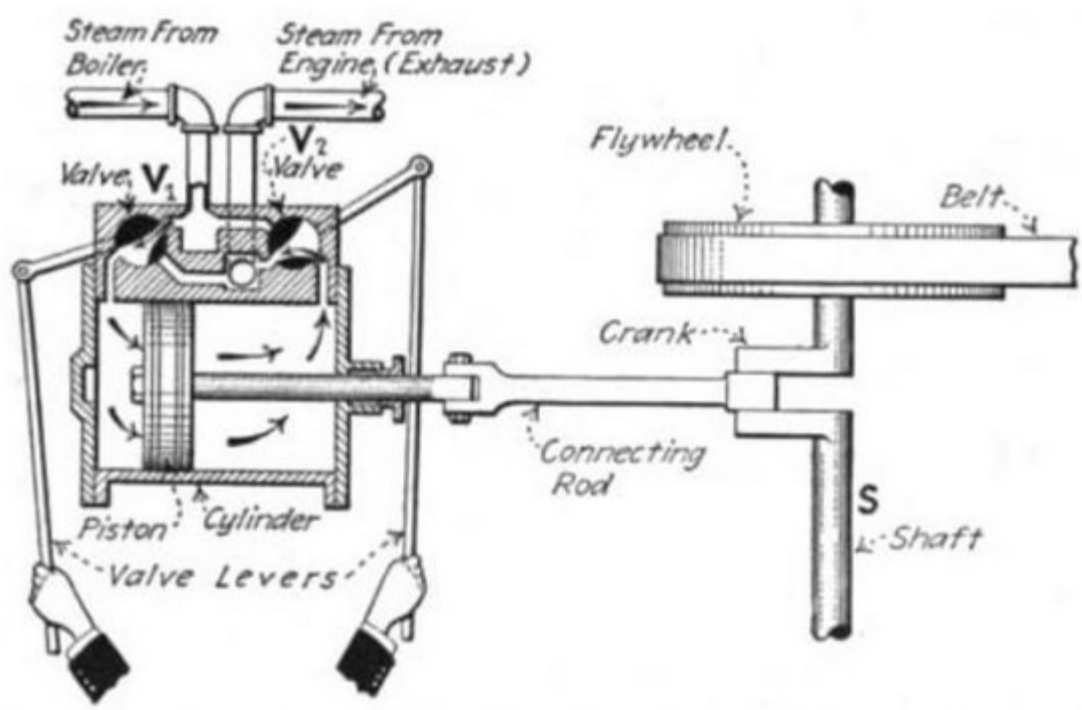

The following shows the piston, with valves V1 and V2 open, so take make an up stroke: [1]

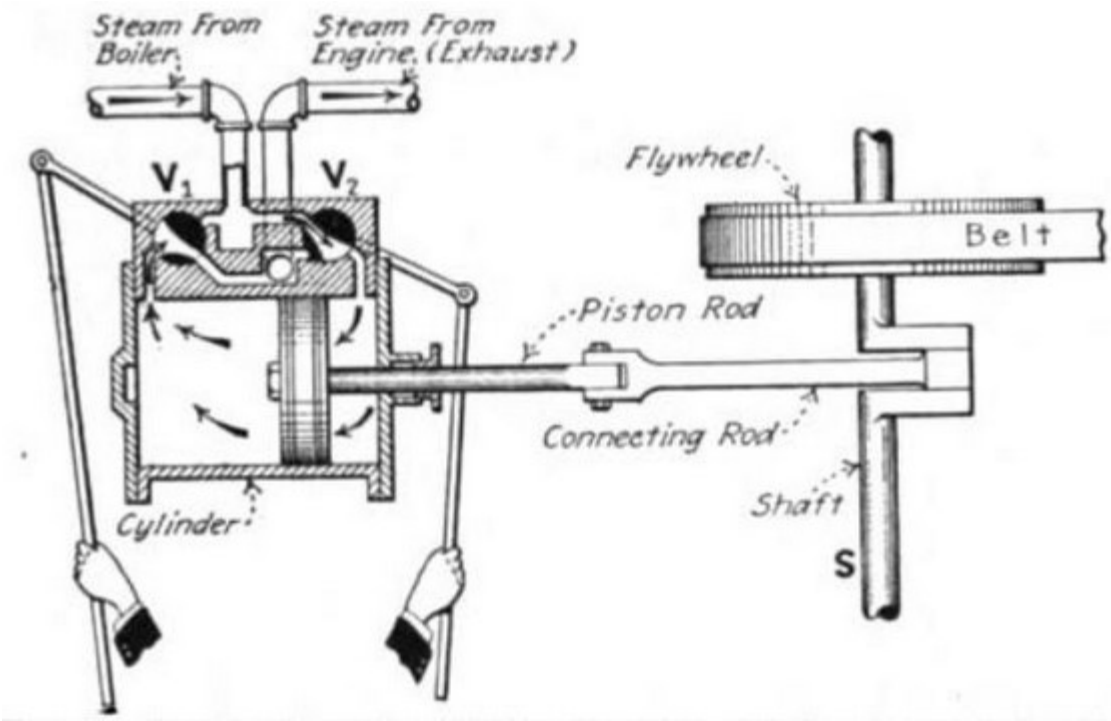

The following shows the steam engine with automatic valves:

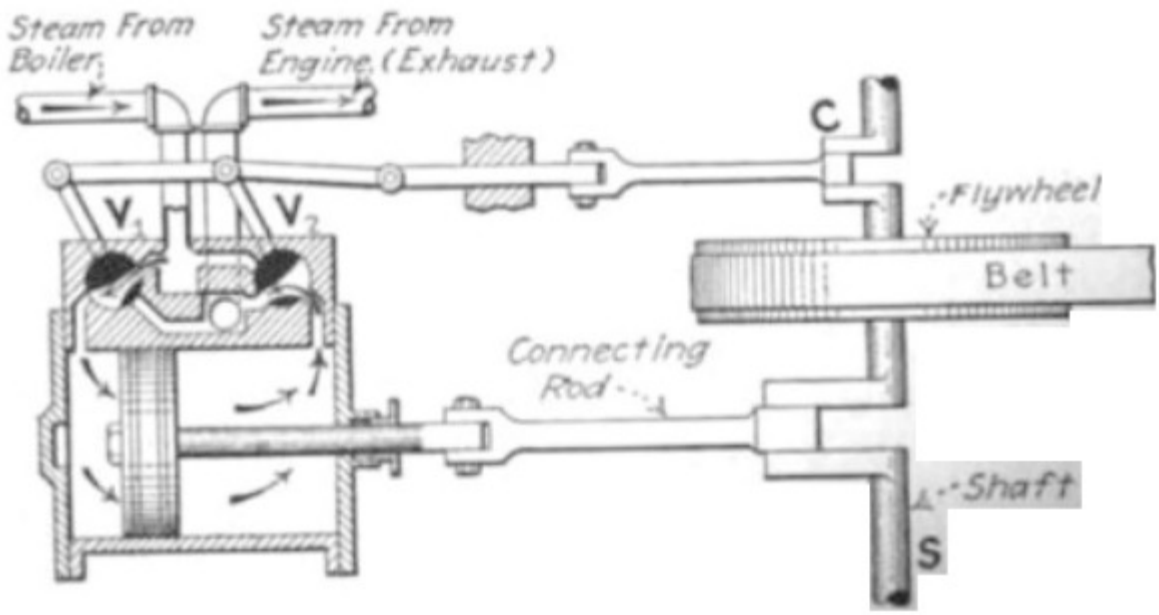

(add)

References

1. Croft, Terrell. (1922). *Steam Engine Principles and Practices* (stroke, pg. 3; up stroke / down stroke, pg. 4; crosshead, pg. 34; §: Steam-Engine Indicators and Indicator Practice, pgs. 40-83). Publisher.

External links

â— Stroke (engine) – Wikipedia.

θΔics

In atheism types, **strong atheism**, a near synonym to "extreme atheism", related to "hard core atheist", is []

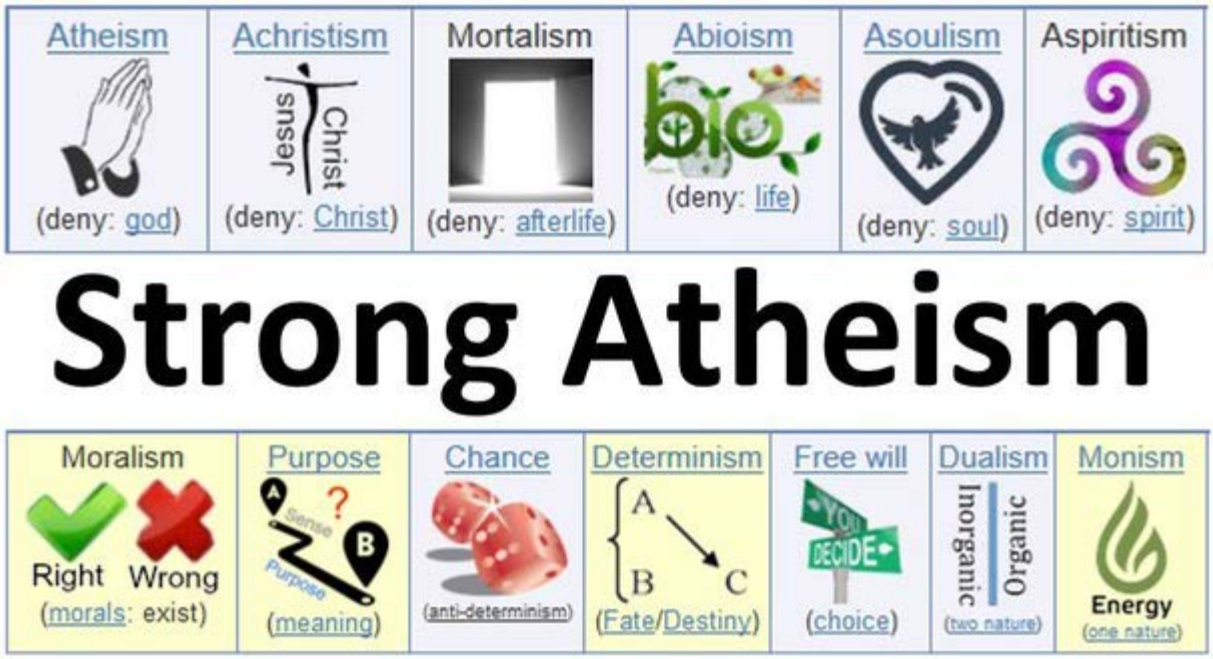

The 13 main categories of denial (dis-belief) and belief, as listed on the atheism types by denial and belief page, for historically-famous atheists, that one has to have "strong" opinions on, is one is to be considered as **strong atheist**.

Overview

In 2015, Libb Thims was listing, in the atheism types by denial and belief page, the categories of: achristism, mortalism, abioism, asoulism, aspiritism, moralism, determinism, dualism, and monism, as the ten main -isms one has to have "strong" opinions on, along with that on the topics of: purpose, chance, and free will, if one is to be ranked as a "strong atheist", in modern terms, historically speaking.

Quotes

The following are related quotes:

> "Libb Thims is a **strong atheist**, adheres to a physics-based morality, and considers himself a Goethean revolutionist."
>
> — David Bossens (2013), *Debates of the Hmolpedians* [1]

References

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External links

â— Strong atheism – Conservapedia.

θΔics

In human chemistry, a **strong tie**, as contrasted with a weak tie, is a strong connection that exists between two people. The principle of triadic closure argues that if two unacquainted people have a 'strong' relationship to a third person, who is common to them both, then by virtue of that indirect connection, a weak association or 'tie' will then begin to exist between the two previously unacquainted people. [1] Strong ties are depicted by straight lines (————) whereas weak ties are depicted by dashed lines (– – – – – –). The weak tie / strong tie theory was conceived by American sociologist Mark Granovetter in 1969 based on hydrogen bonding models. [2]

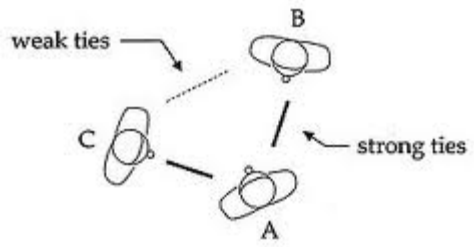

Diagram of two **strong ties** and a weak tie based on the principle of triadic closure. [3]

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θΔics

In human behaviors, **struggle** is a term that typically refers an uphill climb, movement through a path of resistance, or activity in adversity. [1] In 1798, English economist Thomas Malthus argued that life is a struggle for existence; this logic was taken up by English naturalist Charles Darwin in his famous 1859 *Origin of Species* (chapter three: "Struggle for Existence"); and in 1886 Austrian physicist Ludwig Boltzmann, a fan of Darwin's theory, famously propositioned that life is a struggle for entropy. This proposition soon came under attack and more theoretical or rather thermodynamic struggles soon began to be proposed. Some of these various "struggles" and are tabulated below.

Struggle | Free energy or entropy

There may be a German-to-English translation issue, on whether Boltzmann, in his 1886 paper "The Second Law of Thermodynamics" stated that life is a 'struggle for entropy' or life is a 'struggle for free energy', as there seem to be numerous citations for both cases, particularly after the publication of Boltzmann's 1905 book *Popular Writings*? (which seems to simply contain a reprint of his 1886 paper). As the term free energy was only coined in 1882 by German physicist Hermann Helmholtz, it is difficult to image that Boltzmann would be so comfortable to postulate this newly coined term as the essential quantifier of the struggle for life? Boltzmann does, however, cite Helmholtz and discuss energy set free in the context of chemical affinity. Boltzmann states, for instance, according to the 1974 Springer English translation, "It is a fact that when two like or unlike atoms combine in certain ways, very considerable amounts of energy are set free", but nowhere is the term 'free energy' to be found. Neither is the term 'free energy' found in the 1995 book *Ludwig Boltzmann: His Later Life and Philosophy, 1900-1906*. [15] Neither is the term 'free energy' found in the 2006 book *Ludwig Boltzmann: the Man who Trusted Atoms.* [16] It is possible that Boltzmann never even used the term 'free energy' (or freie energie) once in his life?

Quotes

The following are related quotes; some of which possibly being German-to-English technical mistranslation:

> "Life, being that food and room are in limited supply, is a **struggle** for existence."
>
> — Thomas Malthus (1798) [2]

> "The general **struggle** for existence of animate beings is not a struggle for raw materials – these, for organisms, are air, water and soil, all abundantly available – nor for energy, which exists in plenty in any body in the form of heat *Q*, but of a **struggle** for entropy *S*, which becomes available through the transition of energy from the hot sun to the cold earth."
>
> — Ludwig Boltzmann (1886) [3]

> "Strife is not for the component substances, for these component substances of all organism, as air, water, and earth, are abundant; neither is the strife for energy as such, for this occurs in abundance, as the heat content of matter of our environment; but **strife** is for the **free energy** available for the performance of work."
>
> — Walther Nernst (1893) [14]

> "[The] **struggle** for existence is a **struggle for free energy** available for doing work."
>
> — Ludwig Boltzmann (1905) [8]

> "The whole web of life … is a **struggle for free energy**, whether it be between shrub and tree for a place in the sun, between a locust and a rabbit for the energy-yielding compounds of leaves, or between lion and

tiger for the flesh of an antelope. Free energy of all living things must have …"

— Ralph Gerard (1940) [12]

"Everything—the cosmos, man, culture, may be described by matter and energy. The second law of thermodynamics tells us that the cosmos as a whole is breaking down structurally and running down dynamically; matter is becoming less organized and energy more uniformly diffused. But in a tiny sector of the cosmos, namely in living material systems, the direction of the cosmic process is reversed: Life becomes a building up process that must draw upon free energy in non-living systems, capture it, and put it to work in the maintenance of vital process. All life is a **struggle for free energy**. Biological evolution is a movement toward greater organization, greater differentiation of structure, increased specialization of function, higher levels of integration, and greater degrees of energy concentration."

— Leslie White (1949)

"As Boltzmann (1886) put it, the struggle for existence is a struggle for free energy."

— Walter Yust (1952) [13]

"Man's whole **struggle** … practically every element in man's developed civilization, may be interpreted either as an instinctive or conscious and deliberate attempt to replace disorder with order, in other words to consume entropy."

— Robert Lindsay (1963) [5]

"Power may be defined, for every society, as resulting from the need to **struggle** against the entropythat threatens it with disorder."

— Georges Balandier (1967) [9]

"Just as the constant increase of entropy is the basic law of the universe, so it is the basic law of life to be ever more highly structured and to **struggle** against entropy."

— Vaclav Havel (1986) [10]

"Conflict (and ultimately war) does not arise between human and nature; rather, the **struggle** is between more developed systems and something else that is necessarily less developed and that the physicists know as entropy."

— Jean-François Lyotard (1993) [6]

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θΔics

In science, **struggle for entropy** is an enigmatic postulate, stated by Austrian physicist Ludwig Boltzmann in 1886, which argues that life is not a struggle for energy or food but rather for entropy (or for free energy, depending on translation?) [1]

Boltzmann | struggle for free energy?

The specific famous quote where Boltzmann's explains Charles Darwin's 1859 "struggle for existence" theory of evolution in thermodynamics terms is said to be found in his 1886 article "The Second Law of Thermodynamics" ("Der Zweite Hauptsatz der Mechanischen Warmetheorie"). The English translations for this explanation, however, are wanting, differing on a number of points, and come in a variety of forms.

In 1893, German chemist Walther Nernst supposedly gave the following version (according to the 1895 English translation by American chemist Charles Palmer): [7]

> "Strife is not for the component substances, for these component substances of all organism, as air, water, and earth, are abundant; neither is the strife for energy as such, for this occurs in abundance, as the heat content of matter of our environment; but strife is for the *free energy* available for the performance of work."

In 1942, American Gibbsian historian Muriel Rukeyser stated that Boltzmann said the following: [8]

> "The struggle for existence of living matter is a war for free energy."

Boltzmann | struggle for entropy?

Into the 21st century, somehow the quote was being translated in English as "struggle for entropy". In 2005, for example, Eric Schneider gave the following paragraph as the standard English translation:

> "The general struggle for existence of animate beings is not a struggle for raw materials – these, for organisms, are air, water and soil, all abundantly available – nor for energy, which exists in plenty in any body in the form of heat *Q*, but of a struggle for entropy, which becomes available through the transition of energy from the hot sun to the cold earth."

but then goes onto state that Alfred Lotka cited Boltzmann as saying that life is a struggle for "available entropy" and that in modern terms, according to Schneider, the translation reads that life is a struggle for "available energy". [9]

In his high-cited 1971 *The Entropy Law*, Romanian mathematician Nicholas Georgescu-Roegen commented that: [3]

> "Life does not feed on mere matter and mere energy but—as Schrodinger aptly explained—on low entropy. The seed of this idea goes back to Ludwig Boltzmann who was the first to point out that free energy is the object of the struggle for life. "

This, to clarify, is pure mis-quote. It seems that Georgescu-Roegen, who had an very incorrect understanding of free energy, substituted the term "free energy" for "entropy". The actual term "free energy", to note, was only coined four years earlier, in 1882, by German physicist Hermann Helmholtz in the field of chemical thermodynamics (Boltzmann's field was statistical thermodynamics). It is highly unlikely that Boltzmann had even heard this term at this time, let alone feel confident enough to assign it as the object of the struggle of life. This "free energy is the object of the struggle for life" Boltzmann mis-quote, subsequently, has frequently been re-quoted since, as shown below:

36. Erwin Schrödinger's expression appears in chapter 6 of his short masterpiece *What Is Life?* (Cambridge, 1944), although, as Georgescu-Roegen points out, the seed of this idea goes back to Boltzmann, who as early as 1886 wrote that free energy is the object of the struggle for life (Georgescu-Roegen, *The Entropy Law and the Economic Process*, p. 192). See Ludwig Boltzmann, *Escritos de mecánica y termodinámica* (Madrid: Alianza, 1986), p. 72.

31. Erwin Schrodinger makes this point in *What Is Life?* (Cambridge 1967), pp. 72–80. The seed of this idea goes back to Ludwig Boltzmann, who was the first to point out that free energy is the object of the struggle for life. See his 1886 essay, 'Der zweite Hauptsatz der mechanische Warmtheorie,' in *Populare Schriften*, pp. 25–50. Georgescu-Roegen traces this line of affiliation in *The Entropy Law and the Economic Process*, p. 192.

Left: The 1982/2000 footnoted misquote of Boltzmann, via Georgescu-Roegen, by Italian architect Luis Fernández-Galiano. [5] Right: The 1993 footnoted misquote of Boltzmann, via Georgescu-Roegen, by English cultural historian Thomas Richards. [6]

To clarify, entropy, symbol *S*:

$$S = \frac{Q}{T}$$

and free energy, either of the Helmholtz free energy (isothermal-isochoric), symbol *H* variety:

$$H = U - TS$$

or the Gibbs free energy (isothemal-isobaric) symbol *G* variety:

$$G = U + pV - TS$$

are two hugely different thermodynamic functions. The point to note here, commonly found in outside field verbal explanations of thermodynamics (e.g. entropology), is that lack of understanding of topic can result in perpetual unintentional spread of misinformation. An example of this being Shannon information theory.

Schrodinger

Boltzmann's view was expanded on in Austrian physicist Erwin Schrodinger's 1944 *What is Life?*, wherein Schrodinger outlined the view, using crude probability arguments, that: "[Life] feeds on negative entropy." The basic difficulty in Schrödinger's negative entropy theory is that he equates sustenance (metabolism) with measures of entropy; whereas in the correct sense, sustenance is a function of substrate interactions, as studied in the field of surface chemistry. In an appended note to his thermodynamics-life chapter, however, Schrödinger states that:

> "The remarks on *negative entropy* have met with doubt and opposition from physicist colleagues. Let me say first, that if I had been catering for them alone I should have let the discussion turn on free energy instead. It is the more familiar notion in this context. But this highly technical term seemed linguistically too near to energy for making the average reader alive to the contrast between the two things."

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θΔics

In science, **struggle for existence** is a theory which argues that, because food and room are in limited supply, for a living thing to exist, it must struggle. The theory was formulated in 1798 by English demographer and political economist Thomas Malthus; later incorporated by English naturalist Charles Darwin in his 1859 *Origin of Species.*

Thermodynamics and life

See main: *What is life? (theories of existence)*

With the development of thermodynamics in the 1850s, scientists, such as William Thomson and Ludwig Boltzman, soon thereafter began to formulate various energetic theories of existence in relation to evolution, life, and entropy.

One the of the major difficulties in the concept of there being a "struggle" in life is that if, according to modern human chemistry, in which, via molecular evolution table logic, biology-sized life and chemical-sized life are supposed to be one and the same, each being differently sized induced movement molecular structures, then it is difficult to conceive of any sort of "struggle" existing in standard chemical reactions, which are very mechanistic. In short, there "is no struggle" between atoms and molecules in basic chemical reactions, so why should there exist a struggle in biology, which are simply larger biological sized reactions. [5]

Malthus

In 1798, Thomas Malthus, English demographer and political economist, published his 'Essay on Population', arguing that existence of life is a perpetual struggle for room and food. [1] In short, Malthus outlined the view that population, when unchecked, increases in a geometrical [exponential] rate, but that subsistence increases only in an arithmetic [linear] ratio. Subsequently, according to Malthus, 'as more individuals of each species are born that can possibly survive … it follows that any being, if it vary ever so slightly in a manner profitable to itself … will have a better chance of survival, and thus be *naturally selected*." This meant that, in accordance with earth's limited resources, that a 'struggle for existence' would emerge. [2]

In opposition to the utopian thinkers of the day, Malthus believed that unless people exercised restraint in the number of children they had, the inevitable shortfall of food in the face of spiraling population growth would doom mankind to a ceaseless struggle for existence. Out of that unforgiving battle, some would survive and many would not, as famine, disease, and war put a ceiling on the growth in population. [3]

Darwin

In 1838, Darwin, newly back from his voyage on the Beagle and trying to understand the forces that drove the origin of new species, began reading the works of Malthus. [4] Reading Malthus's book (presumably its 6th edition, 1826) triggered in Darwin's mind the idea for a causal mechanism of natural selection. Darwin wrote in his Autobiography (nearly 40 years later), "… [the question] how selection could be applied to organisms living in a state of nature [as opposed to artificial selection, that is] remained for some time a mystery to me. In October, 1838, that is, fifteen months after I had begun my systematic inquiry, I happened to read for amusement Malthus on Population…." [4]

These ideas galvanized Darwin's thinking about the struggles for survival in the wild, where restraint is unknown. Before reading Malthus, Darwin had thought that living things reproduced just enough individuals to keep populations stable. But now he came to realize that, as in human society, populations bred beyond their means, leaving survivors and losers in the effort to exist. [3]

On the logic of Malthus, the general theory that life is a 'struggle for existence' is found in the subtitle of Darwin's Origin of Species , namely that natural selection equates to 'the preservation of favored races in the struggle for life', as well as the title of chapter three: 'Struggle For Existence'. In short, Darwin theorized that: "in the struggle for survival, the fittest win out at the expense of their rivals because they succeed in adapting themselves best to their environment." Moreover, as Darwin stated: "I have called this principle, by which each slight variation, if useful, is preserved, by the term Natural Selection".

In sum, Darwin tended to see species being engaged in a competitive Struggle for Existence. Under the influence of

Malthus, Darwin saw this as primarily a struggle for food to support growth, life, and the generation of young individuals to continue the species in question.

See also

â— Chemistry professor paradox

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θΔics

In science, **struggle for free energy** is a reoccurring German → English mistranslation, done originally in 1895 by American chemist Charles Palmer, by what seems to mistake, of Austrian physicist Ludwig Boltzmann's 1886 thermodynamics-based evolution theory lecture argument that: "the general struggle for existence of living beings is a struggle for entropy", as shown adjacent, to the incorrect assertion that Boltzmann considered the struggle in evolution to have something to do with either German physicist Hermann Helmholtz' 1882 notion of "free energy" and or American engineer Willard Gibbs' 1876 "available energy", both of chemical thermodynamics, which is not the case.

… The general struggle for existence of living beings is therefore not a fight for the elements – the elements of all organisms are available in abundance in air, water, and soil – nor for energy, which is plentiful in the form if heat, unfortunately untransformably, in every body. Rather it is a struggle for entropy that becomes available through the flow of energy from the hot Sun to the cold Earth. To make the fullest use of this energy, the plants spread out the immeasurable areas of their leaves and harness the Sun's energy by a process that is still unexplored, before it sinks down to the temperature level of the Earth, to drive chemical syntheses of which one has no inkling as yet in our laboratories. The products of this chemical kitchen are the object of the struggle ion the animal world. …

A 1983 rendition of Ludwig Boltzmann's 1886 thermodynamics lecture view on Darwin's struggle for existence model of evolution by Engelbert Broda, with English translation help from Larry Gay, as found in Viennese theoretical chemist Peter Schuster 2008 chapter "Boltzmann and Evolution". [18]

Malthus

In 1798, English reverend and political economist Thomas Malthus (1766-1834) published his *An Essay on the Principle of Population*, wherein, following a discussion of the Biblical story of Abraham and Lot (Genesis, ch. 8), namely:

> "We are told that Abraham and Lot had so great substance in cattle, that the land would not bear them both, that they might dwell together. There was strife between their herdsmen. And Abraham proposed to Lot to separate, and said, "Is not the "whole land before thee? If thou wilt take the left hand, then "I will go to the right; if thou depart to the right hand, then I "will go to the left."

Malthus surmises that an underlying pressure-based principle must be behind this division of one group into two—a phenomenon classified in modern terms via the Dunbar number (150) dividing point of stable groups—about which Malthus states:

> "This simple observation and proposal is a striking illustration of that great spring of action which overspread the whole earth with people; and, in the progress of time, drove some of the less fortunate inhabitants of the globe, yielding to irresistible pressure, to seek a scanty subsistence in the burning deserts of Asia and Africa, and the frozen regions of Siberia and North America. The first migrations would naturally find no other obstacles than the nature of the country; but when a considerable part of the earth had been peopled, though but thinly, the possessors of these districts would not yield them to others without a **struggle**; and the redundant inhabitants of any of the more central spots could not find room for themselves without expelling their nearest neighbours, or at least passing through their territories, which would necessarily give occasion to frequent contests."

Malthus continues:

> "The middle latitudes of Europe and Asia seem to have been occupied at an early period of history by nations of shepherds. Thucydides gave it as his opinion, that the civilised states of Europe and Asia, in his time, could not resist the Scythians united. Yet a country in pasture cannot possibly support so many inhabitants as a country in tillage. But what renders nations of shepherds so formidable, is the power which they possess of moving altogether, and the necessity they frequently feel of exerting this power in search of

fresh pasture for their herds. A tribe that is rich in cattle has an immediate plenty of food. Even the parent stock may be devoured in case of absolute necessity. The women live in greater ease than among nations of hunters, and are consequently more prolific. The men, bold in their united strength, and confiding in their power of procuring pasture for their cattle by change of place, feel probably but few fears about providing for a family. These combined causes soon produce their natural and invariable effect, an extended population. A more frequent and rapid change of place then becomes necessary. A wider and more extensive territory is successively occupied. A broader desolation extends all around them. Want pinches the less fortunate members of the society; and at length the impossibility of supporting such a number together becomes too-, evident to be resisted. Young scions are then pushed out from, the parent stock, and instructed to explore fresh regions, and to gain happier seats for themselves by their swords. "The world is all before them where to choose."

Restless from present distress, flushed with the hope of fairer prospects, and animated with the spirit of hardy enterprise, these daring adventurers are likely to become formidable adversaries to all who oppose them. The inhabitants of countries long settled, engaged in the peaceful occupations of trade and agriculture, would not often be able to resist the energy of men acting under such powerful motives of exertion. And the frequent contests with tribes in the same circumstances with themselves, would be so many **struggles for existence**, and would be fought with a desperate courage, inspired by the reflection, that death would be the punishment of defeat, and life the prize of victory.

In these savage contests, many tribes must have been utterly exterminated. Many probably perished by hardships and famine. Others, whose leading star had given them a happier direction, became great and powerful tribes, and in their turn sent off fresh adventurers in search of other seats. These would at first owe allegiance to their parent tribe; but in a short time the ties which bound them would be little felt, and they would remain friends, or become enemies, according as their power, their ambition or their convenience, might dictate."

Darwin

In 1838, English naturalist Charles Darwin read the 6th edition (1826) of Malthus' *Essay on Population*, gleaning the insight that Malthus's pressure-induced struggles for existence and exterminations of tribes and peoples, as described above, might well apply to the whole animal kingdom, a gleaning about which in 1876 retrospect Darwin stated: [2]

"I soon perceived that selection was the keystone of man's success in making useful races of animals and plants. But how selection could be applied to organisms living in a state of nature remained for some time a mystery to me … In October, 1838, that is, fifteen months after I had begun my systematic inquiry, I happened to read for amusement 'Malthus on Population,' and being well prepared to appreciate the **struggle for existence** which everywhere goes on from long continued observations of the habits of animals and plants, it at once struck me that under these circumstances favourable variations would tend to be preserved, and unfavourable ones to be destroyed. The result of this would be the formation of new species. Here, then, I had at last got a theory by which to work."

This insight, combined with the notion of natural variation of traits in young, went on to form the gist of Darwin's evolution theory, as published in his 1859 *Origin of Species*, chapter three being entitled: 'Struggle For Existence'.

Boltzmann

Darwin's *Origin of Species* was soon read by Austrian physicist Ludwig Boltzmann, like all scientists and naturalists of the late 19th century. Boltzmann, in an effort towards unification, in his 1886 lecture "The Second Law of Thermodynamics", presented at the "Festive Session" of the Imperial Academy of Sciences in Vienna, May 29, he opened to the

following: [18]

> “If you ask me about my inner most conviction whether our century will be called the century of iron or the century of steam or electricity, I answer without hesitation: It will be called the century of the mechanical view, of Nature, the century of Darwin.”

He then went on in his lecture to combine Darwin's natural selection struggle for existence model of evolution together German physicist Rudolf Clausius' 1865 entropy function based second law of thermodynamics, and cryptically stated the conclusion that: "life is a struggle for entropy", the original German version shown below to the left and the Google English translation shown to the right—where we specifically see the term “Entropie” (entropy), an 1865 coining by Clausius, but NOT “freie Energie” (free energy), an 1882 German rendering coining by German physicist Hermann Helmholtz of American engineer Willard Gibbs' previous 1876 term “available energy”, being employed: [5]

Original German	English translation
Helmholtz hat gezeigt, daß auch die den Steinkohlen entstammende Wärme nur aufgespeicherte Sonnenwärme ist, aber ich weiß nicht, ob man mit genügender Klarheit darauf hingewiesen hat, warum uns gerade diese Energiequelle von so großem Nutzen ist; in den Körpern der Erdoberfläche, welche uns unmittelbar zur Hand sind, ist ja ein Energievorrat aufgespeichert, von dessen Größe wir gar keinen Begriff haben. Wenn die Wärme, welche der Niagarafall allein produziert, schon hinreichen würde, einen erheblichen Teil aller unserer Maschinen zu treiben; welchen unerschöpflichen Vorrat von Energie hätten wir dann, wenn wir imstande wären, alle in den uns umgebenden Körpern enthaltene Wärme in Arbeit zu verwandeln. Allein dies gelingt eben nicht, weil die in ihnen vorhandene Energie, soweit nicht durch Einwirkung der Sonne Temperaturungleichheiten entstehen, schon nahezu in der wahrscheinlichsten Weise verteilt ist und daher jeder Versuch, sie in anderer unseren Zwecken mehr entsprechender Weise zu verteilen, scheitert. Dagegen herrscht zwischen	Helmholtz showed that the that were found the coal heat is stored up solar heat, but I do not know if I have pointed out with sufficient clarity as to why us just this energy source of such great benefit, in the bodies of the earth's surface, which are directly at hand, even a store of energy is stored up, of its size, we have no conception. If the heat that the Niagara Falls alone produced, would suffice to drive a significant part of all of our machines, which inexhaustible supply of energy we would have if we were able to transform all contained in the surrounding bodies heat into work. But this does not succeed just because the existing energy in them, unless by the action of the sun temperature inequalities arise, already distributed almost in the most likely way and therefore any attempt to distribute it in other more appropriate way for our purposes, but fails. Prevails, however, between the Sun and Earth, a colossal

Sonne und Erde eine kolossale Temperaturdifferenz; zwischen diesen beiden Körpern ist daher die Energie durchaus nicht den Wahrscheinlichkeitsgesetzen gemäß verteilt. Der in dem Streben nach größerer Wahrscheinlichkeit begründete Temperaturausgleich zwischen beiden Körpern dauert wegen ihrer enormen Entfernung und Größe Jahrmillionen. Die Zwischenformen, welche die Sonnenenergie annimmt, bis sie zur Erdtemperatur herabsinkt, können ziemlich unwahrscheinliche Energieformen sein, wir können den Wärmeübergang von der Sonne zur Erde leicht zu Arbeitsleistungen benützen, wie den vom Wasser des Dampfkessels zum Kühlwasser.

> Der **allgemeine Daseinskampf** der Lebenswesen ist daher nicht ein Kampf um die Grundstoffe — die Grundstoffe aller Organismen sind in Luft, Wasser und Erdboden im Überflusse vorhanden — auch nicht um Energie, welche in Form von Wärme leider unverwandelbar in jedem Körper reichlich enthalten ist, sondern ein Kampf um die **Entropie**, welche durch den Übergang der Energie von der heißen Sonne zur kalten Erde disponibel wird.

Diesen Übergang möglichst auszunutzen, breiten die Pflanzen die unermeßliche Fläche ihrer Blätter aus und zwingen die Sonnenenergie in noch unerforschter Weise, ehe sie auf das Temperaturniveau der Erdoberfläche herabsinkt, chemische Synthesen auszuführen, von denen man in unseren Laboratorien noch

temperature difference, between these two bodies, therefore the energy is certainly not distributed according to the laws of probability. The grounds in the pursuit of greater probability temperature compensation between the two bodies will take account of their enormous size and distance for millions. The intermediate forms, which takes the sun's energy, until it descends to the earth's temperature may be quite improbable forms of energy, we can use the heat transfer from the sun to earth easy to perform work, such as the water of the boiler to heat water.

> The general **struggle for existence** of living beings is therefore not a struggle for raw materials — the raw materials of all organisms in the air, water and soil are in abundance there — nor about energy, which in the form of heat, unfortunately, is contained abundantly [but unfortunately] [in]convertible in each body, but a struggle for **entropy**, which is available [disposable] by the transfer of energy from the hot sun to the cold earth.

In order to exploit this transition as good as possible, the plants spread the immense surface of their leaves, and forcing the solar energy into unexplored way before she drops to the temperature level of the earth's surface to perform chemical syntheses of which you have no idea in our laboratories. The products of this chemical kitchen are the object struggle for wildlife.

keine Ahnung hat. Die Produkte dieser
chemischen Küche bilden das
Kampfobjekt für die Tierwelt.

To clarify absolutely, at this point, no where, in fact, in Boltzmann's 1886 article "The Second Law of Thermodynamics" nor in his 1905 collected works *Popular Writings* (*Populäre Schriften*) is the German term “freie Energie” (free energy) found. The two terms "entropy", symbol *S*:

$$S = \frac{Q}{T}$$

and "free energy", either of the Helmholtz free energy (isothermal-isochoric), symbol *H* variety:

$$H = U - TS$$

or the Gibbs free energy (isothermal-isobaric) symbol *G* variety:

$$G = U + pV - TS$$

are two hugely different thermodynamic functions. For whatever reasons, in the decade to follow, the above position by Boltzmann, namely that the "struggle for existence is a struggle for entropy", began to be mistranslated (or possibly misinterpreted) to the effect that Boltzmann stated that the "struggle for existence is a struggle for free energy", which is not the case.

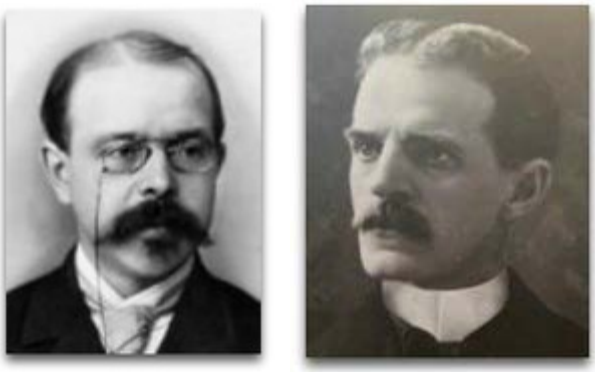

German physical chemist Walther Nernst (left) and American chemist Charles Palmer (right), whose 1895 English translation of Nernst's 1893 textbook seems to the the source of the Boltzmann "**struggle for free energy**" misrepresentation/misattribution viewpoint.

Nernst | Palmer

The first case of mistranslation seems to have been 1895 English translation by American chemist Charles Palmer of German physical chemist Walther Nernst's 1893 textbook *Theoretical Chemistry: from the Standpoint of Avogadro’s Rule & Thermodynamics*, wherein the closing statement to his textbook he cites Boltzmann's 1886 "The Second Law of Thermodynamics" article and gives speculations on how some yet-to-be discovered principle of photo-chemical action will help to elucidate the "object of strife on the part of the animal world." The specific sentence fragment that seems to get mistranslated is the following:

> sondern ein Kampf um die **freie**, zur Arbeitsleistung verfügbare **Energie** [Nernst, 1893]
>
> but the strife is for the **free energy** available for the performance of work [Palmer, 1895]

Palmer, here, seems to do conjoin the separated terms "freie" and "energie" and misassociated term "freie energie" (free energy) which has an entirely different meaning? A modern Google rendering of the above two separate sentence fragments gives the following more-correct translation:

sondern ein Kampf um die **freie** [but a struggle for freedom], zur Arbeitsleistung verfügbare **Energie** [energy available to perform work]

The following gives a listing of Google translate alternatives for each key term:

sondern

conjunction

but	aber, sondern, doch, allein, ohne dass

Kampf

noun

fight	Kampf, Streit, Konflikt, Ringen, Schlägerei, Prügelei
engagement	Engagement, Verlobung, Verpflichtung, Gefecht, Ineinandergreifen, Kampf
struggle	Kampf, Ringen, Anstrengung, Quälerei, Schinderei, Strauß
battle	Schlacht, Kampf, Gefecht, Streit, Strauß
combat	Kampf
fighting	Kampf, Gefecht, Prügeleien, Raufereien, Zank, Streiterei
contest	Wettbewerb, Wettkampf, Kampf, Wettstreit
match	Spiel, Match, Partie, Streichholz, Kampf, Wettkampf
tussle	Kampf, Balgerei, Rauferei

um die freie

to the free

Arbeitsleistung

noun

performance	Leistung, Performance, Aufführung, Erfüllung, Ausführung, Arbeitsleistung
output	Ausgang, Ausgabe, Leistung, Output, Ausgangsleistung, Arbeitsleistung

verfügbare

available

The may, in the mind of Palmer, been some sense in which he conceived the German term "verfügbare Energie" to mean "available energy" as defined in 1876 by American engineer Willard Gibbs, which Hermann Helmholtz in 1882 called "free energy", but this is doubtful in that Nernst does not cite Gibbs anywhere in his textbook, and in fact Gibbs' *On the Equilibrium of Heterogeneous Substances*, wherein available energy is defined, was only recently in 1891 translated into German by German physical chemist Wilhelm Ostwald, and it is doubtful that Nernst would have assimilated this dense treatise prior to his 1893 publication.

Both the original 1893 German written by Nernst and the 1895 English translation done by Palmer (his italics) are shown below: [4]

Original German version by Nernst (1893)	**English translation by Palmer (1895)**
Je nach der Aenderung, welche die Geschwindigkeitskoefficienten der beiden entgegengesetzten Reaktionen erfahren, wird die Wirkung im Sinne oder gegen den Sinn der chemischen Kräfte erfolgen, welche bei der Reaktion thätig sind; im ersten Falle wird das Licht mehr auslösend wirksam sein, d. h. nur beschleunigend die Geschwindigkeit	“According to the change experienced by the velocity coefficients of the two opposed reactions, the action will take place either *with* or *against* the sense of the chemical forces which occasion

beeinflussen, mit welcher das System den Gleichgewichtszustand zu erreichen sucht; im zweiten Falle wird durch das Licht der Gleichgewichtszustand verschoben und somit eine Arbeit gegen die chemischen Kräfte geleistet werden.

Die Fragen, mit welchem Betrage in jedem einzelnen Falle das Licht im einen oder anderen Sinne wirksam ist, harren noch grossentheils der Lösung; ibre Wichtigkeit wird am besten durch den Hinweis darauf klar werden, dass vielleicht ausschliesslich photochemische Prozesse es sind, vermittelst deren die Energie der Sonnenstrahlung als nutzbare Arbeit aufgespeichert wird und deren Produkte das Streitobjekt für die Thierwelt bilden.

Der Kampf ums Dasein ist daher, wie Boltzmann [3], betont, kein Kampf um die Grundstoffe — die Grundstoffe aller Organismen sind ja in Luft, Wasser und Erdboden im Ueberfluss vorhanden — auch kein Kampf um die Energie als solche, die als Wärmeinhalt die umgebende Materie in reichlichster Menge, aber in unverwandelbarer Form erfüllt, sondern ein Kampf um die **freie**, zur Arbeitsleistung verfügbare **Energie**, die in den Produkten der Pflanzenwelt, ähnlich wie elektrische Energie in einem Akkumulator, von dem Sonnenlicht angesammelt wird.

the reaction. In the former case, the light will have a decisive tendency; *i.e.* it will tend to accelerate the velocity with which the system strives to reach the state of equilibrium. In the second case, the state of equilibrium will be displaced, and therefore *a certain amount of work will be performed against the chemical forces.*

The questions regarding the amounts of the light which are effective in each particular case, in one sense or the other, these, for the most part, still await their solution. The great importance of all this may perhaps best be made clear by the hint, that perhaps the only processes by means of which the energy of the sun's rays can be stored up as utilisable work (the product of which constitutes the object of strife on the part of the animal world), are the photo-chemical processes.

And therefore, as emphasised by Boltzmann [3], the strife is not for the component *substances,* for these component substances of all organisms, as air, water, and earth, are abundant; neither is the strife for *energy as such,* for this occurs in abundance, as the heat content of the matter of our environment; but the strife is for *the* ***free energy*** *available for the performance of work.* This is accumulated in the products of the plant world from the sun-light, just as electrical energy is stored in an accumulator.

The problem of the relations between heat, and electrical and chemical energy, has been treated in the two

Es kann keinem Zweifel unterworfen sein, dass eine ähnlich abschliessende Antwort, wie sie für die Probleme der Beziehung zwischen Wärme, elektrischer und chemischer Energie in den beiden voranstehenden Kapiteln dieses Buches sich hat erbringen lassen, auch für die Verwandlungsfähigkeit von strahlender Energie in chemische einen Erfolg von höchster Bedeutung und einen weiteren Schritt auf dem Wege bedeuten würde, welcher die theoretische Chemie einst befahigen wird, der Lehre von den stofflichen Veränderungen in der Natur, welche bisher das Interesse und die Arbeitskraft der Chemiker vorwiegend in Anspruch nahmen, eine Lehre der Wandlungen der Energie vollkommen ebenbürtig an die Seite zu stellen.

preceding chapters of this book; and now it may be ventured, as a final remark regarding *the capacity of radiant energy for transformation into chemical energy*, that this doubtless has great significance, and its accomplishment will mean a long step forward. And when this shall have once been accomplished by theoretical chemistry, then side by side with *the doctrine of the material changes of nature* (which has for the most part claimed the interest and research of chemists), will be recognised, in complete equality, *the doctrine of the transformations of energy*."

In any event, into the early to mid 20th century, second hand scholars were soon summarizing things to the effect that the struggle for existence is a struggle for free energy, a few notable examples of which are listed chronologically below.

In 2013 commentary on the above Palmer translation, Viennese theoretical chemist Peter Schuster comments: [19]

> "Palmer's translation is correct! If "freie" were ment as freedom, which would be terrible German anyway, it has to be written with an upper case "F": "Freie" as "die Freiheit" were only possible if there were not the noun "Energie" which is correctly written as upper case and this demands "freie" to be the adjective."

Bayliss

In 1915, English physiologist William Bayliss, in his *Principles of General Physiology* textbook section on "Heats of Combustion", first discusses bound energy versus free energy, such as how oxidation of fats and carbohydrates sets free a large amount of available energy, discusses how, in the context of Nernst's heat theorem, that the free energy of the oxidation of glucose is greater than the total energy calculated from the heat of combustion, then comments on Boltzmann as follows: [15]

> "Boltzmann, in one of his *Populäre Schriften* [*Popular Writings*] (1905, pg. 40), points out how the 'struggle for existence' of living beings is not for the fundamental constitutes of food, which are everywhere present in earth, air, and water, nor even for energy, as such, which is contained, in the form of heat, in abundance in all bodies, but for the possession of the **free energy** obtained, chiefly by means of the green plant, form the transfer of radiate energy from the hot sun to the cold earth."

The ball-park citation here about the apocryphal Boltzmann being quote found in "one of his popular writings", gives way to the conclusion that Bayliss here is basing his rendition of the quote on someone else's translation, which seems to be English chemist Henry Tizard's 1911 English translation of the 6th original edition of Nernst's *Theoretical Chemistry*, which is found in Bayliss' bibliography, which no doubt was a rendition influenced by Palmer's original

1895 English translation.

Burns

In 1921, Scottish physiological chemist David Burns, in his *An Introduction to Biophysics*, which he says was "written with constant reference to the master mind Professor Bayliss [and his] *Principles of General Physiology*", gives the following diagram with accompanying misattributed Boltzmann quote shown below: [15]

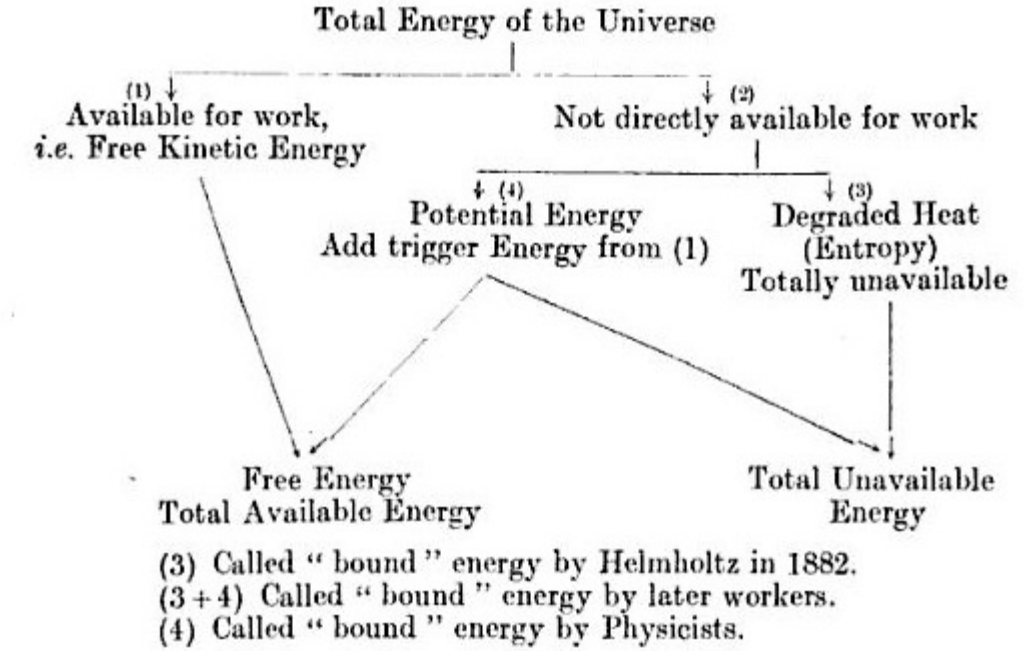

One of the most important problems in biology is the means by which potential energy is translated into work and the mechanism by which this translation is controlled.

" The struggle for existence is the struggle for free energy " (Boltzmann).

Gerard

In 1940, American chemical neurophysiologist Ralph Gerard, in his *Unresting Cells*, which cites Bayliss' *Principles of General Physiology*, stated the following: [9]

> "The whole web of life is … a **struggle for free energy**, whether it be between shrub and tree for a place in the sun, between a locust and a rabbit for the energy-yielding compounds of leaves, or between a lion and a tiger for the flest of an antelope. Free energy in living things must have …"

Rukeyser

In 1942, American Gibbsian historian Muriel Rukeyser stated the following: [6]

> "Boltzmann, who announced, 'the struggle for existence of living matter is a war for free energy', also said that Gibbs' work was the greatest synthetic achievement in science since Newton's achievement of the theory of gravity"

White

In 1947, American anthropologist Leslie White, aware of Gerard, was arguing that: "… this process is possible only because living material systems are able to capture free energy from the outside and incorporate it within themselves. All life is a struggle for free energy." [14] Likewise, in his 1949 "Energy and the Evolution of Culture" chapter, White stated the following: [13]

> "Everything—the cosmos, man, culture, may be described by matter and energy. The second law of thermodynamics tells us that the cosmos as a whole is breaking down structurally and running down dynamically; matter is becoming less organized and energy more uniformly diffused. But in a tiny sector of the cosmos, namely in living material systems, the direction of the cosmic process is reversed: Life becomes a building up process that must draw upon free energy in non-living systems, capture it, and put it to work in the maintenance of vital process. All life is a **struggle for free energy**. Biological evolution is a movement toward greater organization, greater differentiation of structure, increased specialization of function, higher levels of integration, and greater degrees of energy concentration."

In 1959, in his *Evolution of Culture*, citing Boltzmann's 1886 article, White stated the following: [8]

> "All life, as the Austrian physicist Ludwig Boltzmann pointed out long ago, is a **struggle for free energy**."

Yust

In 1952, encyclopedist Walter Yust stated the following in the *Encyclopedia Britannica*: [12]

> "As Boltzmann (1886) put it, the struggle for existence is a **struggle for free energy**."

Georgescu-Roegen

In 1971, Romanian mathematician Nicholas Georgescu-Roegen, in his influential *The Entropy Law*, stated the following: [7]

> "Life does not feed on mere matter and mere energy but—as Schrodinger aptly explained—on low entropy. The seed of this idea goes back to Ludwig Boltzmann who was the first to point out that free energy is the object of the struggle for life. "

In 1982, Italian architect Luis Fernández-Galiano, in his *Fire and Memory: On Architecture and Energy*, cited Georgescu-Roegen (1971) as having pointed out that That "Boltzmann, in as early as 1886, wrote that free energy is the object of the struggle for life".

Perutz

In 1987, In 1987, Austrian-born English molecular biologist Max Perutz, in commentary on Erwin Schrödinger's 1944 negative entropy postulate, stated that: [11]

> "We live on free energy and there [is] no [need] to postulate negative entropy."

Discussion

The general issue with all of this misattribution about Boltzmann having theorized about Darwinian evolution theory and the struggle for existence in terms of free energy, is that (a) not only was Boltzmann not a free energy theorist, which is a chemical thermodynamics centric concept (Boltzmann was a statistical thermodynamics centric theorist), but (b) most importantly free energy theory as applied to evolution, such as in the form of human free energy theory, is a highly complex partial differential equation based theory involving some six different thermodynamic variables:

$$G = U + pV - TS$$

involving changes in chemical bonds "between" (not within) evolving species, e.g. family bonds, marriage bonds, societial bonds, etc., such as discussed in human chemical reaction theory, not something easily summarized by quaint misunderstood statements.

Other

Peculiar to this situation, another infamous Boltzmann misattribution is the assertion that in 1894 he was thinking about or discussing entropy in terms of "missing information", a common miscitation used by information theorists as a platform to argue that there exist connections between the 1948 information transmission communication theories of American electrical engineer Claude Shannon and the 1872 statistical mechanics of Boltzmann. [17]

See also

â— What is life? (theories of existence)

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θΔics

In hmolscience, **Stuart Dodd** (1900-1975) was an American sociologist, part of the Princeton Department of Social Physics, classified by Werner Stark (1962) as a “secondary form” social mechanism theorist, noted for his 1942 *Dimensions of Society*. [1]

Spiritual | Social physics

The modern attraction of Dodd’s theories, according to the recent Stuart C. Dodd Institute Conferences (Q), seems to be those who are looking to meld “science and spirituality” into questions germane to social + physical theories.

Religion

Dodd seems to have harbored some type of god-materialism panbioism inclination underlying his overall quest for unification of the physical sciences with sociology. The following, to exemplify, is a 1971 statement by Dodd and reflection on his quest to find some kind of god-infused "inclusive formula" for all: [2]

> “My lifelong quest is for greater unity, pervading and tying together all diversity. Whether divergent counsel in a group's formal discussion where I seek the synthesizing motion; or seeking a life center for emotional satisfactions as I find in Betty; or searching for a simpler yet ever more inclusive formula for all things knowable to man as I developed in the pan-acts equation:
>
> $$\frac{a}{ct} = 1$$
>
> for God c (If seen as the creator and ruler of all in self-creating and over-all ruling cosmos when defined as the Universal set (Uo= 1) of all things nameable) — all these and much more are manifestations of my mostly subconscious quest towards integrating — always trying to systematize from chaos, forever wanting to see things more wholly and as a whole.”

(add discussion)

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Further reading

● Dodd, Stuart C. (1951). "Scientific Methods in Human Relations," *The American Journal of Economics and Sociology*, Vol. 10, No. 3, April.

External links

● Stuart C. Dodd – Wikipedia.
● Dodd, Stuart Carter (1900-1975) – WorldCat Identities.

θΔics

In existographies, **Stuart Kauffman** (1939-) (DN:1/5±) (CR:101) is an American physician, biochemist, and self-proclaimed "humanist atheist" (Q), noted, in animate thermodynamics, for his 1995 auto-catalytic closure thermodynamic work cycle origin of life theory, according to which life emerged, following attainment of auto-catalytic closure, 3.5 billion years ago, from a "soup of [dead] molecules", which evolved into the biosphere.

Defunct theory of life

The following statement by Kauffman, grappled with, for some time, without resolution, by American electrochemical engineer Libb Thims, in and around the period of the writing of his 2007 molecular evolution chapter (Q):

> "Alone, each molecular species is dead. Jointly, once catalytic closure among them is achieved, the collective system of molecules is alive."
>
> — Stuart Kauffman (1995), *At Home in the Universe* (pg. 50)

was one of the stepping stones to the arrival of the 2009 defunct theory of life position:

Overview

In 1993 to 2008, Kauffman began to present his theories on self-organization and complexity, in which life is argued to have arisen from "a soup of molecules, evolving into the biosphere" at the point when the early chemicals of the earth find "catalytic closure", i.e. when they began to auto-catalyze themselves, in the form of thermodynamic cycles, driving by the free energy of the universe. In the 2006 book *What We Believe But Cannot Prove*, Kauffman, one of the hundred authors of the book to speculate on what each uniquely believes, tells:

> "[I believe] there [is] a fourth law of thermodynamics, or some cousin of it, concerning self-constructing nonequilibrium systems, such as biospheres, in the cosmos [but cannot prove it]."

Following a bit of explanation in his belief, Kauffman states that how he sees the law, as otherwise stated, is that 'the diversity of things that can happen next increases, on average, as fast as it can.' [5] Kauffman's most noted publication is his 1995 book *At Home in the Universe: the Search for the Laws of Self-Organization and Complexity*. [1] Ernst & Young consulting firm, to note, is said to have sent its clients fifteen thousand copies of *At Home in the Universe*. [7]

Adjacent possible

In 1999, in promotion of his upcoming 2000 book *Investigations*, Kauffman began to outline what seems to be his unified theory, that of what he calls the "adjacent possible" (Q) or chemically adjacent possible, a rather ill-defined term, which he describes as those regions of the biosphere in which "autonomous agents" (Kauffman's term for a minimal living thing, which meets the criterion: (a) is auto-catalytic, (b) completes one thermodynamic work cycle, (c) has a membrane, and (d) push their way into novelty—molecular, morphological, behavioral, and organizational. [6]

Auto-catalytic closure

Kauffman defines life as an autonomous agent, or open system situated in and part of an environment to which it senses, capable of completing at least one thermodynamic work cycle. [2] In short, the hypothesis Kauffman puts forward is that whenever a mix of atoms and molecules accumulate, there is a small chance that an autocatalytic reactive system, which can be thought of as a rudimentary type of self-maintaining and self-reproducing metabolism, will from this life will emerge.

He states that life, at its roots, is the property of what is called 'catalytic closure' as proffered to be found amid heterogeneous collections of reacting molecular species. An autocatalytic system is one in which the end-products of a

reaction function as a catalysis for the initial-reactants, i.e. one in which the molecules speed up the very reactions by which they themselves are formed: *A* makes *B*; *B* makes *C*:

$$A \rightarrow B \rightarrow C$$

but then the product *C* is said to make or catalyze the reactact *A* in a sort of chemical reaction feedback loop. Hence, according to Kauffmann:

> "Alone, each molecular species is dead. Jointly, once catalytic closure among them is achieved, the collective system of molecules is alive."
>
> — Stuart Kauffman (1995), *At Home in the Universe* (pg. 50) (Q)

Using this logic, Kauffmann reasons that past a certain critical threshold of molecular density, a web of catalyzed reactions emerges, which can be thought of as being alive. In his own words, "as a threshold of diversity is crossed, a giant web of catalyzed reactions crystallizes in a phase transition." In this view, to account for the origin of life, Kauffman tells us, "a critical diversity of molecules must be reached for the system to catch fire, for catalytic closure to be attained." [2]

Thermodynamic work cycles

In the 2000 book *Investigations*, Kauffman expanded on his theory of autocatalysis, by arguing for a new fourth law of thermodynamics to explain such a process. Kauffman's start point is autocatalysis: that it is very likely that self-reproducing molecular systems will form in any large and sufficiently complex chemical reaction. He then goes on to investigate what qualities a physical system must have to be an autonomous agent. In giving his definition of an autonomous agent he says:

> "Consider a bacterium swimming upstream in a glucose gradient. We readily say that the bacterium is going to get food, that is, the bacterium is acting on its own behalf in an environment. Call a system able to act on its own behalf in an environment an 'autonomous agent' [as are] all free-living cells and organisms."

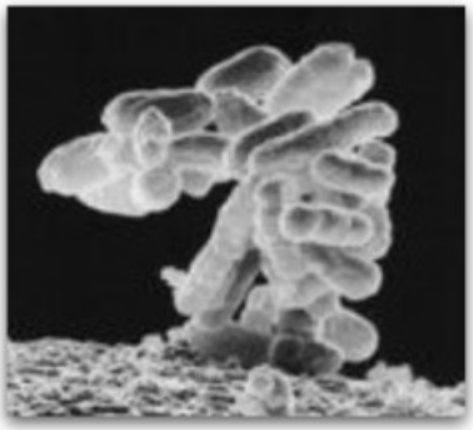

Bacteria molecule
(E. Coli, height=5μm)

$C_{E11}H_{E11}O_{E11}N_{E10}P_{E9}S_{E9}Ca_{E9}K_{E7}$
$CL_{E7}Na_{E7}Mg_{E7}Fe_{E6}Si_{E5}Mn_{E3}Co_{E3}$

The difficulty here is that the bacterium is a large 15-element molecule (bacteria molecule), and in this view, molecules in fluid mediums are more correctly said to move along paths of minimum free energy or decreasing free energy gradients, according to the combined law. [2] In any event, on this definition, Kauffman then asks, knowing that the bacterium is just a physical system, "what must a physical system be such that it can act on its own behalf?" In answer to this question, he reasons: "might there be a fourth law of thermodynamics for self-constructing open thermodynamic systems such as biospheres?"

His aim is to define a new law of thermodynamics for such systems (self-constructing systems, as Kauffman defines them) such as the biosphere that may be hovering in a state of self-organized criticality that are far from thermodynamic equilibrium. This necessitates a rather more detailed coverage of Carnot work cycles and information compressibility than was covered in passing in his earlier books. It leads to the idea that a molecular autonomous agent is a self-reproducing molecular system capable of carrying out one or more work cycles.

Fourth law

See main: Fourth law of thermodynamics

In addition, using a bit of statistical thermodynamic verbiology, the universe, he posits, is not yet old enough to have synthesized more than a minute subset of the total number of possible proteins. This leads to the fundamental proposition that the biosphere of which we are part cannot have reached all its possible thermodynamic states. The ones not yet attained - the "adjacent possible" states as Kauffman terms them - are unpredictable since they are the result of the interaction of the large collection of autonomous agents, such as people, or rather one's genes, and all the other evolving things in the external world. His new fourth law of thermodynamics for self-constructing systems implies that autonomous agents will try to expand into the "adjacent possible" states by trying to maximize the number of types of events that can happen next. In particular, as a candidate fourth law of thermodynamics (for self-constructing systems), Kauffman states: [3]

> "Biospheres maximize the average secular construction of the diversity of autonomous agents and the ways those agents can make a living to propagate further."

In other words, he states, "on average biospheres persistently increase the diversity of what can happen next … biospheres maximize the average sustained growth of their own 'dimensionality'." Building on Austrian physicist Erwin Schrodinger's 1944 book *What is Life?,* Kaufmann states that as to the issues concerning the core features of autonomous agents able to manipulate the world on their own behalf, his new fourth law theory may differ from the definition of life Schrodinger found. In more detail:

> "To state my hypothesis abruptly and without preamble, I think an autonomous agent is a self-reproducing system able to perform at least one thermodynamic work cycle"

He continues "it will require most of this book (308-pages) to unfold the implications of this tentative definition." [3]

Religious thermodynamics

See main: Religious thermodynamics

In his 2008 book *Reinventing the Sacred*, a continuation of the two paged section, of the same title, from his 1995 book, Kauffman ties all of his trademark theories together, i.e. autonomous agents, thermodynamic work cycles, emergence, catalytic closure, etc., to argue that the idea of god, particularly in the Abrahamic religions, needs to be redefined not as a supernatural creator, but as a natural creativity in the universe.

In this work, Kauffman seems to recant some of his earlier efforts at defining a fourth law of thermodynamics to explain complexity. He states, instead, that "we can use the symbol god to mean [in place of natural law] the radical creativity in the abiotic universe, if it's there, and certainly in the biotic universe", that reason is an inadequate guide to living life, being that one cannot predict the future, and that "reductionism is inadequate, emergence is real, and in which not everything that happens is describable by law." Although difficult to state explicitly in words, Kaufmann here seems to be selling out to a hocus pocus of ontic opening like emergence over that of hard science.

Education

Kauffman graduated from Dartmouth College in 1960, was awarded the BA by Oxford University in 1963, and completed an MD at the University of California, San Francisco in 1968. After completing his residency in emergency medicine, he moved into developmental genetics of the fruit fly, holding appointments first at the University of Chicago, then at the University of Pennsylvania from 1975 to 1995, where he rose to professor of biochemistry and biophysics.

Difficulties on theory

Although Kauffman's theory of evolution as free energy driven-systems containing auto-catalysis types of chemically looped reactions organized in work cycles is one of the more interesting thermodynamics of life theories to have come along since Prigogine, it is flawed to an extent by a number of issues, such as: (a) his superficial knowledge of thermodynamics (e.g. he confuses the term closed with isolated), (b) his Prigoginean-base assumption that the biosphere is continuously in a nonequilibrium state (whereas in contrast heat input is diurnal), (c) his ubiquitous use of perpetual motion themed prefixes, e.g. free-, self-, auto-, etc., (d) his demarcation of dead vs. alive molecules (whereas in contrast there is no such thing as a "live" or "dead" molecule), (e) his theory that life exists as a dissipative structure at the edge of chaos, (f) his subtle use of unwritten free will descriptions (e.g. molecules that act on their own behalf), and (g) his interludes on the topic of religion and deities. The general difficulty, in short, is that in spite of the fact that he occasionally brings the word "free energy" into the discussion, he more often than not reiterates the idea that life is a "self-sustaining network of reactions", sort of going on their own like a perpetual motion chemical reaction (see: perpetual motion of the living kind).

Quotes

The following are noted quotes:

> "Anyone who tells you that he or she know the how life started is a fool or a knave."
>
> — Stuart Kauffman (1995), *At Home in the Universe* (pg. 31) (Q)

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Further reading

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External links

● Stuart Kauffman – Wikipedia.
● Kauffman, Stuart A. – WorldCat Identities.

θΔics

In hmolscience, a **study** (TR:1387), "scientific study" or "psychological study", similar to "experiment" (e.g. Libet experiment), tends to refer to a designed human reaction scenario, observation of behavior change per variable change, data collection methodology (volume, time, work, energy, attraction or repulsion, etc.), or measurement of phenomena, etc., with the overarching to aim bring elucidation to some problem, puzzle, or unclarified facet of nature, animal or human. Some noted hmolscience studies are listed below, two of which, the hallway study (c.1994) and the sidewalk study (date) are of great importance, being that they were social volume change studies, i.e. acquiring dating on changes in volume, a key variable of thermodynamics.

A rendition of American sociologists James Dabbs and Neil Stokes early 1970s sidewalk study, wherein by measuring changes in personal space around people as they walked against passerbyers on sidewalks, which found that beautiful women were allotted more personal space measured in inches. [3]

Sidewalk study | Volume

See main: Sidewalk study

In the early 1970s, American sociologists James Dabbs and Neil Stokes conducted a study, the research of which supported by a US Public Health grant (HH20660), involving three experiments, in an attempt to discern changes in personal space (volume around a person) with respect to beauty, when a person is in motion, in an attempt to bring quantification to the famous idiom "beauty is power", the abstract of the results of this study, published in 1975 as "Beauty is Power: the Use of Space on the Sidewalk", is the following: [3]

> "In three experiments, 470 pedestrians were observed as they walked past confederates standing on the edge of a sidewalk. Observations were made from a window overlooking the area, using time lapse filming with a movie camera. Pedestrians were observed as they moved along the sidewalk, and their distances from the edge of the sidewalk was measured at several points. Pedestrians deviated in their paths to stay farther from a male than a female, father from two people than from one person, and farther from a beautiful than an unattractive woman. Sex, number, and attractiveness may be regarded as aspects of power, which serve to dominate various amounts of a space."

This study, along with the similar 1974 study "Body Height, Position, and Sex as Determinants of Personal Space", conducted on 41 males and 43 females, in a laboratory setting by American psychologists Johan Hartnett, Kent Vailey, and Craig Hartley, were in combination summarized by American beauty researcher Nancy Etcoff (1999), as follows: [4]

> "As we walk down the street, we negotiate space with other people. We carry a small territory with us, a protected turf that surrounds us whether we are sitting or standing, and upon which others cannot trespass without permission. Move in too close, and people get uncomfortable. Tall people have bigger territories: their sheer size intimidates people. When people are asked to approach a stranger and stop when they no longer feel comfortable, they will stop about two feet away from a tall person (22.7 inches to be exact) but less than a foot (9.8 inches) from a short person. Very attractive people of any size are given personal territories; they carry their privileges around their persons."

This "trespass without permission" brings to mind both the 1970 chimpanzee war and the 2001 9/11 attacks, both the result "territory trespassing" repercussions, a led into the topic of war thermodynamics.

Hallway study | Volume

See main: Hallway study: See also: Mean girls debate

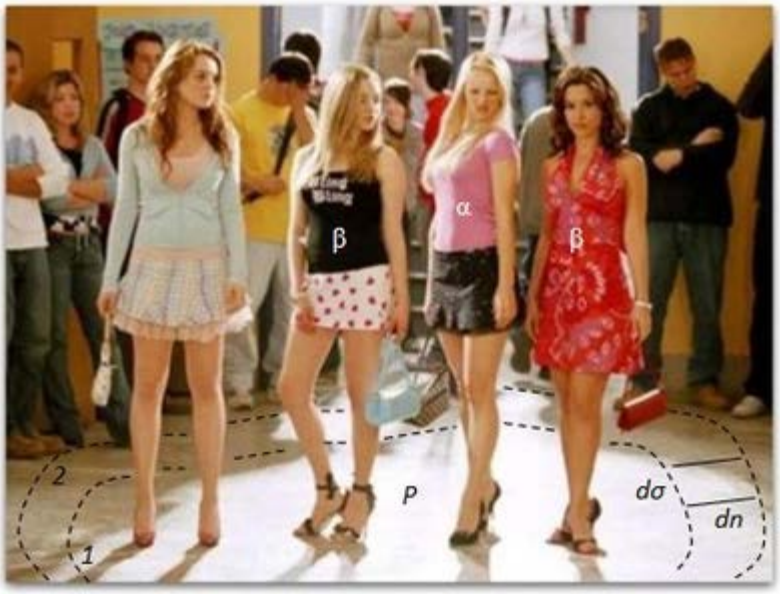

A social volume change, i.e. piston and cylinder style "system" labeled, depiction of the hall scene from the 2004 *Mean Girls* (see: Mean Girls debate), where the alpha female (alpha molecule) "queen bee" Regina George **α** (Rachel McAdams), in pink, causes a volume expansion: students reactively move away giving her more personal space; a natural phenomenon verified and measured by sociologists and psychologists in various **studies.**

In circa 1994, the so-called "hallway study", a two part experiment, was conducted by American psychologists Dov Cohen and Richard Nisbett at the University of Michigan, on male students students, who were classified according to whether they were northern or southern students. [1]

In the first experiment, students were brought into their lab with the overt purpose to fill out some questionnaire, after which they were instructed to take their form to a table at the end of a long, narrow hallway, along the way passing a man—a confederate of the experiment—standing in the hallway working in a file cabinet. After dropping of the completed form on the table, upon return down the hallway, the man would slam the file cabinet drawer shut, bump into the student's shoulder, and call the student an "a**hole". On average, southern students responded to the incident with more anger and less amusement than northern students, as assessed by independent observers positioned in the hallway, and secondly, according to saliva samples collected before and after the experiment, southerners exhibited greater increases in their levels of both cortisol, a stress, anxiety and arousal hormone, and testosterone.

In the second part of the experiment, Cohen and Nisbett arranged for an experimental game of chicken, in which, after being insulted (or not), the students encountered a second confederate, a six-foot-three-inch, 250-pound man walking quickly down the hall, in which the middle point of was lined with tables and thus too narrow for both to pass, meaning someone had to give way. The experiment found, via experimental measurement of the distance at which the subjects gave way to the big man, that the insulted southerners, on average, gave way to the approaching confederate when he was 37-inches away, whereas the non-insulted southerners gave way, on average, at 108-inches. The insult had no effect on the northerner's chicken point; the non-insulted northerners typically gave way at about 75-inches. These results are summarized below:

	Chicken point (insulted)	**Chicken point** (non-insulted)
Southerners	37-inches	108-inches
Northerners	75-inches	75-inches

Experimenters found, also, that the non-insulted southerners were more polite than the northerners. Greene correlates this data the premise that different "herders", as he calls them, will spend more or less "time and energy" defending and or standing their "ground" (territory, volume, or personal space).

Lazy ant study | Work

See main: Lazy ant study

In the 1980s, Belgian complexity theorist Jean Deneubourg conducted a number of experiments on ants, in which a nest was placed in one pan, which was connected to another pan that had food, via a bridge; the ants were then allowed to form their "working" community, some staying near the nest doing little work, deemed "lazy", others travelling out across the bridge to get food, deemed "hard working". The "system" was then shattered by separating the two groups, lazy and hardworking, and placing them, respectively, into two new communities, according to which, it was curiously found that a significant percentage of the 'lazy' ants suddenly turned into hard working ants. [5]

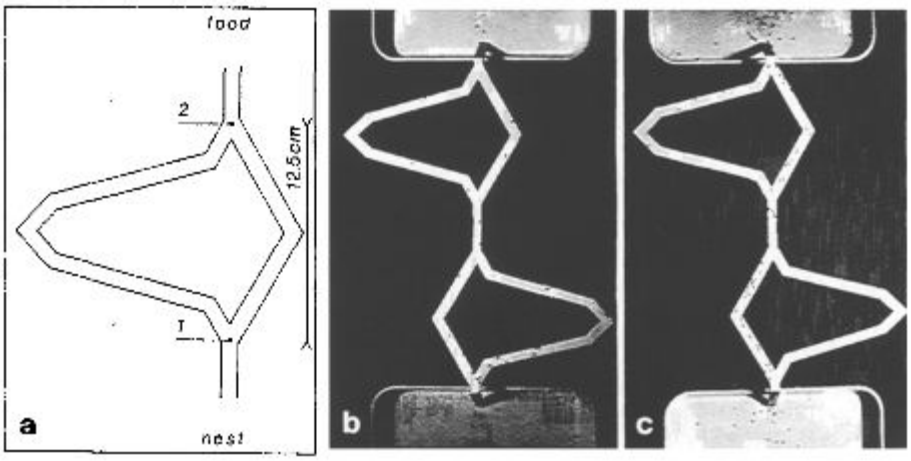

Fig. 1. A colony of *I. humilis* selecting the short branches on both modules of the bridge; a) one module of the bridge, b) and c): photos taken 4 and 8 min after placement of the bridge

One of Belgian complexity theorist Jean Deneubourg's 1989 ant nest, food, bridge **studies**, similar to his circa 1983 lazy ant study or experiment. [6]

Sweaty T-shirt study | Bonding

See main: Sweaty T-shirt study

In 1995, Swiss biologist Claus Wedekind conducted an experiment, based on the 1970s major histocompatiblity (MHC) matching findings in animals, in which he had a group of female college students smell odorous T-shirts that had been worn by male students for three nights, without deodorant, cologne or scented soaps, finding that, overwhelmingly, the women preferred the odors of men with the most dissimilar MHCs to their own, implying that they were most sexually attracted, via scent, to men whose immune system genome was most dissimilar to their own.

Marital interaction study | Bond

In the 1970s, American mathematical psychologist John Gottman conducted a study wherein he put several hundred married couples in a room and videotaped their interactions, at the micro-movement level, then correlated these to patters of divorce years later, finding that stable long-term marriages have a 5-to-1 ratio (see: Gottman stability ratio) of attraction to repulsion in the exchange force of their bond. [2]

Heat of the moment | Study

See main: Hot-cold empathy gap

(add overview)

Determinism study

In 2007, Shaun Nichols and Joshua Knobe conducted a determinism-themed morality study, in which, firstly, the presented people with the following so-called Laplacian universe (see: Laplace's demon): [7]

> "Imagine a universe (Universe A) in which everything that happens is completely caused by whatever happened before it. This is true form the very beginning of the universe, so what happened in the beginning of the universe caused what happened next, and so on right up until the present. For example one day John decided to have French Fries at lunch. Like everything else, this decision was completely caused by what happened before it. So, if everything in this universe was exactly the same up until John made his decision, then it *had to happen* that John decided to have French Fries."

Nichols and Knobe then asked subjects, after reading this, whether people in this universe are fully morally responsible for their actions. Fewer than 5 percent of the respondents said yes.

In the second part of the experiment, a different group of subjects read the same description of Universe A, but instead of responding to a general question about responsibility in this universe, they got the following question:

> "In Universe A, a man named Bill has become attracted to his secretary, and he decides that the only way to be with her is to kill his wife and 3 children. He knows that it is impossible to escape from his house in the event of a fire. Before he leaves on a business trip, he sets up a device in his basement that burns the house and kills his family."

Here, 72 percent of respondents said that Bill is fully morally responsible for his actions. [8]

Other

In 2009, Hans Ijzerman conducted a study in which he varied the temperature of a room, between two groups of students, and obtained their measures of social proximity via the use of thermal word descriptions.

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External links

â— Scientific study – Wikipedia.

θΔics

In existographies, **Sture Nordholm** (1944-) (SNE:8) (CR:43), or "Karl Sture Jörgen Nordholm", is a Swedish physical chemist noted, in human thermodynamics, for his "In Defense of Thermodynamics: an Animate Analogy", wherein he argues, frankly, that the thermodynamics and physical chemistry of atoms and molecules can be scaled up to explain human interactions, therein explicitly stating the extrapolate up approach, which he rightly comments will seem heresy to some.

Overview

In 1997, Nordholm, in his *Journal of Chemical Education* article "In Defense of Thermodynamics: an Animate Analogy", outlined the subject that he called "animate thermodynamics", arguing to the effect that because thermodynamics describes what drives inanimate behavior, as in "which processes will spontaneously occur and towards what equilibrium conditions they strive", that it might also apply to the explanation of what drives economic behavior in humans. [1] The article concludes with eight homework problems.

The following is an extract of his paper: [2]

> "The thought that the dry and forbidding discipline of thermodynamics could be applied to that most theory-defying of all applications, human behavior, may be staggering, and perhaps heresy to some. After all, the purity and precision of thermodynamics has been maintained on the strength of its validity only as a collection of limiting laws for infinitely large systems undergoing infinitely slow changes. However, the interest in thermodynamics has always been based on the great relevance for finite real systems undergoing changes that are fast on our everyday time scale and slow only on the microscopic time scale of atomic motion. Thus we are merely extending the beam of insight from the lifeless behaviors of inanimate matter to the vivid complexities of human behavior. In the final analysis this far-reaching analogy rests on the fact that the basic elements of the description of atoms, molecules, and matter can be scaled up to the realm of living organisms without changes other than in the complexity of the systems and their behavior."

In his outline theory, Nordhom goes on to equate energy with wealth, kinetic energy with cash, potential energy with property, and entropy with freedom.

Education

Nordholm completed his PhD in in 1972 with a dissertation on "Nonlinearity and Fluctuations in Microscopic Transport Theory" at the University of Maryland.

See also

- Chemical Thermodynamics in the Real World

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External links

- Sture Nordhom (faculity) – Goteborg University.
- Nordhom, Sture – WorldCat Identities.

θΔics

In terminology, **subjective morality**, as compared to objective morality, is []

A 2011 QualiaSoup video still depicting William Craig as an objective morality proponent and a generic Jane Doe as a **subjective morality** sider. [1]

Quotes

The following are related quotes:

> "It is no more 'just' to punish an assassin than a tiger."
>
> — Francois Broussais (c.1834), paraphrase of fatatist views of Spinoza, Hobbes, or Priestley [2]

> "On atheism objective right and wrong cannot exist. It is not morally wrong to torture pets, to rape, abuse the weaker, or to perform experiments on human subjects. To dislike these things is merely a matter of personal taste as there is no binding transcendent law that only god could establish. But no atheist can live consistently with such as view, and Dawkins himself illustrates this by saying that evil does not exist. However, he then calls faith a 'great evil' and goes on to call the biblical god 'vindictive', 'unjust', and 'petty, words that entail moral status."
>
> — James Bishop (c.2014) (Q)(Q)

> "Morals and ethics are still **subjective**, which means I can still feel that being pulled over by the police is wrong. However, if a person wants to live in that society, they will have to adapt their ethics to society's standards or face the consequences. We can debate if a society's standards are actually moral, but that's a different conversation."
>
> — TheFishDude100 (2015), "Comments to Atheist Sin Problem" (Q), c. Jun 15

See also

- Maxwell on the soul

References

1. Anon. (2011). "Morality 3: Objectivity and Oughtness" (Q), QualiaSoup, Nov 6.
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Further reading

- Anon. (2004). "Objective vs Subjective Morality" (Q), New Burkeian, Blogspot, Dec 5.

θΔics

In existographies, **Subrahmanyan Chandrasekhar** (1910-1995) (IQ:170|#227) (GAE:#) (CR:12) was an Indian-born American astrophysicist noted for his 1939 book *An Introduction to the Study of Stellar Structure*, in which he devotes the first chapter, on astrophysical thermodynamics, to laying out a thermodynamic foundation for the study of stellar structure using the thermodynamics of Greek mathematician Constantin Caratheodory (1908), in particular the so-called Caratheodory theorem. [1]

Black holes

In 1939, Chandrasekhar, in his *An Introduction to the Study of Stellar Structure*, suggested the idea of black holes. A similar concept, to note, of "black body stars" was suggested in William Sidis' 1925 *The Animate and the Inanimate*. [3]

Education

Chandrasekhar completed his BS in physics in 1930 at Presidency College, after which he completed his PhD in 1933 at Cambridge under English statistical thermodynamicist Ralph Fowler, where he took the relativistic quantum mechanics course of Paul Dirac four times.

He then entered a fellowship at Trinity College where he established friendship with English astronomer Arthur Eddington. In 1936, he worked at Harvard for a term and the following year joined the faculty at the University of Chicago, obtaining emeritus status there in 1985. [2]

Recognition

In 1983 he and American astrophysicist William Fowler shared the Nobel Prize in physics for his study of the physical processes underlying the structure and evolution of stars.

References

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(b) Kirkwood, John G. and Oppenheim, Irwin. (1961). *Chemical Thermodynamics* (pg. 36). McGraw-Hill.
2. Subrahmanyan Chandrasekhar (autobiography) – NobelPrize.org.
3. Wallace, Amy. (1986). *The Prodigy: a Biography of William James Sidis: America's Greatest Child Prodigy* (black holes, pg. 157; Dan Mahony, pgs. 157, 188-89). Dutton Adult.

External links

â— Subrahmanyan Chandrasekhar – Wikipedia.

θΔics

In chemistry, a **substrate** refers to either a catalytic surface upon which a chemical species reacts, a compound or mixture of compounds acted on by an enzyme, or a substance, such as agar, that provides the nutrients for the metabolism of micro-organisms. [1] A prime example is the iron catalyst used in the Haber process, developed in 1905 by German chemist Fritz Haber.

In human chemistry, *substrate* refers to the catalyst surface on which human molecules react or the base on which an organism lives; also referring to a substance such as sustenance, e.g. grains, or growing medium, as in land, that provides the nutrients for the metabolism of the organism. [2]

See also

â— Surface chemistry
â— Surface thermodynamics

References

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(b) Thims, Libb. (2008). *The Human Molecule*, (preview), (keyword: *substrate*, pgs. 51, 65, 77). Morrisville, NC: LuLu.

Further reading

â— Naveh, Zev. (1987). "Biocybernetic and Thermodynamics Perspectives of Landscape Functions and Land use Patterns", *Landscape Ecology*, Vol. 1. pgs. 75-83.

θΔics

In hmolscience, **sudden emergence**, or "spontaneous emergence", tends to be an ontic opening and or god of the gaps like term employed by theists, closet theists, and or middle grounders, etc., to figure in metaphysical, spiritual, and or supernatural arguments into the scheme of reductionist physics.

Quotes

The following are related quotes:

> "A draft of *Pandas and People*'s sequel, *The Design of Life*, had been previewed during Dover's trial (2005). Just as Foundation for Thought and Ethics substituted the word 'creationism' with 'intelligent design'—following Edwards vs Aguillard (1987) —throughout versions of *Pandas*, this edition substituted '**sudden emergence**' for 'intelligent design'. This prompted Rothschild to ask Michael Behe during cross-examination, 'will we be back in a couple of years for the 'sudden emergence' trail."
>
> — Lauri Lebo (2008), *The Devil in Dover* [1]

> "The concept of 'emergence' is a crypto-metaphysical concept pretending to offer physical explanations, at once allowing and accounting for gaps in the latter through reference to 'complexity'."
>
> — Nathan Brown (2011), "Introduction" to *To Be Done With Life* conference [2]

References

1. Lebo, Lauri. (2008). *The Devil in Dover: an Insider's Story of Dogma v. Darwin in Small-Town America* (pg. 210). The New Press, 2013.
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θΔics

In phenomena, **suicide** refers to the act of auto-termination, wherein one's existence comes to and end, via one's own hand.

Overview

In c.290BC, Hegesias (c.330BC-260BC) (Q), in his *The Man Starving Himself to Death*, argued, as cited by Cicero, argued that the idea of death should not be thought of as an evil thing because it deprives of us of good things, rather it is good, because it cuts off bad things; in this direction, Hegesias, supposedly, is the only philosopher, in the history of philosophy, to positively advocate suicide. (Q)

In 1897, Emile Durkheim, penned his monograph *Suicide*, which is oft-cited for its social physics stylized content, said to be full of such language: for each people there was 'a collective force of a determinate amount of energy, impelling men to self-destruction' and such forces 'determine behavior from without, just like physico-chemical forces' and their strength can be measured 'as one does the strength of electric currents.' [1]

Quotes

The following are related quotes:

> "**Suicide** is the greatest advantage given man in all the great drawbacks of life."
>
> — Pliny the elder (77AD), *Natural History*; cited by Jennifer Hecht (2004) in *Doubt* (pg. 154)

> "I was profoundly unhappy. There was a footpath leading across the fields to New Southgate, and I used to go there alone to watch the sunset and contemplate **suicide**. I did not, however, commit suicide, because I wished to know more of mathematics."
>
> — Bertrand Russell (1888), age 16, autobiographical notes [2]

> "This **suicide** must be ranked as one of the great tragedies in the history of science, made all the more ironic by the fact that the scientific world made a complete turnabout in the next few years and accepted the existence of atoms, following Perrin's experiments on Brownian motion."
>
> — Stephen Brush (1964) on Boltzmann's ironic death [3]

See also

- Founders of thermodynamics and suicide

References

1. Lukes, Steven. (1985). *Emile Durkheim, his Life and Work: a Historical and Critical Study* (pg. 35). Stanford University Press.
2. (a) Scharfstein, Ben-Ami. (1980). *The Philosophers: Their Lives and Nature of Their Thought* (pgs. 306-07). Oxford University Press.
(b) Dunham, William. (1991). *Journey through Genius: the Great Theorems of Mathematics* (pg. v). Penguin Books.
3. Brush, Stephen. (1964). "Translator's Introduction", in: *Lectures on Gas Theory* (by Ludwig Boltzmann). University of California Press, Berkeley.

External links

- Suicide – Wikipedia.

θΔics

In hmolscience, **Suma Varughese** (c. 1960-) is an Indian journalist noted for her 2002 to 2004 new age entropy of being ideas.

Overview

In 2002, Varunghese, elaborated on life, love, and entropy, term which she claims to have encountered in her readings of James Lovelock and his Gaia hypothesis. See culls form, among others, M. Scott Peck and Pierre Teilhard. [1]

In 2004, Varunghese, in her "Life force overcomes Entropy", summarized her philosophy as such: [2]

> "Each time we use entropy as a pole to vault upon, our life force will go up a notch. We will feel freer, happier, more confident and energetic, more dynamic, more creative."

Curiously, someone commented to her article in 2009, arguing, it seems, based on the Planck principle of elementary disorder, saying: [3]

> "Please stop using science incorrectly, I respect your desire to help people but please do not do it at the expense of somebody's hard work. Entropy is the opposite of order, and if you wanted to have the lowest entropy, the best thing to do is to go stick yourself in the coldest freezer you can find so that you turn into a nicely ordered lattice of atoms."

Both comments, to note, have there issues, yet the comments highlight the difficulties involved in terms of extrapolating Clausius entropy into explanations of human activity.

Education

As of 2005, Varughese has been the editor-in-chief of *Life Positive*, one of India's premier body-mind-spirit publications.

References

1. Varughese, Suma. (2002). "Consciousness: Let Life and Love rid you of Entropy", *Life Positive*, Jul.
2. Varughese, Suma. (2004). "Life: Life force overcomes Entropy", *Life Positive*, Feb.
3. Comment on: Life force overcomes entropy, 03 Feb 2009.

θΔics

In science, **sun** is a larger atomic body, formed 4.6 billion years ago, comprised mostly of hydrogen and helium atoms, located at the center of the solar system, that, through a process of hydrogen burning, continuously releases or radiates heat to its surroundings.

In planetary chemistry, the sun is viewed as a 72-element thermonuclear "sun molecule". In earth system thermodynamics models, the sun acts as the boiler or hot body, instilling a solar flux of 1370 watts per meters squared, powering heat engine cycles on the surface sections of the earth.

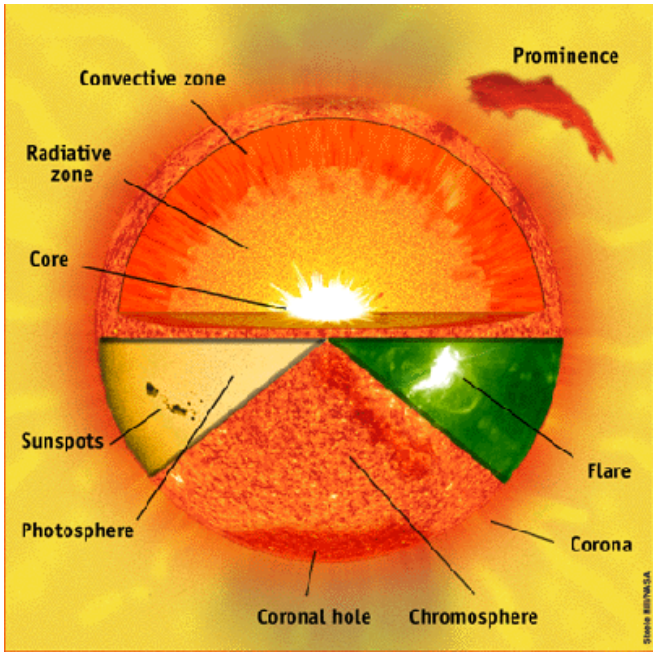

Diagram of the structure of the **sun**.

Religio-mythology

In religio-mythology, the sun was conceived, in short, as being a god called "Ra" which has carried forward culturally, via Heliopolis creation myth as the person Abraham and the god Brahma.

See also

â— Photon mill

External links

â— Sun – Wikipedia.

In religio-mythology, **sun disc** refers to the Egyptian model of the sun, artistically, in pre-dynastic times, depicted as a circular disc, carried on the head of the god Horus in the form of a Hawk (or falcon), and in later times as the myth of the god Ra carrying the sun on his solar barque, among other later sun god variants.

Left: Horus, in the form of a hawk or falcon, carrying the sun, in the form of a **disc**, with Khepri, the flying "morning sun" carrying beetle, engraved, from (Ñº) the tomb of Tutankhamun (c.1320BC). Right: Ra, with a **sun disc** on his head, surrounded by a snake, representative of Apep, shown standing on his solar barque, traveling trough the sky, in the sense of the milky way being a river like the Nile River.

Halo

In c.200AD, in the Roman recension, the Egyptian sun disc became, via artistic evolution, the Christian "halo", and Horus (or Osiris-Horus) became Jesus.

External links

â— Sun disc – TheFreeEncyclopedia.com.

θΔics

In gods, **sun god** refers to a number of deity personifications of the sun, in particular: Ra, Atum, Aten, etc., who later were molded, via religion recension (or redaction) and syncretism, into the god Brahma and the man Abraham.

A diagram showing the six main **sun gods** of Ancient Egypt: Horus, with "sun disc" on his head, the oldest of all the gods, from the tomb of Tutankhamun (1,300BC), Ra, Khepri, Atum, Ptah, Amen, and Aten. [3]

Ra-Atum

In Egyptian mythology, the oldest sun gods were Ra and Atum, generally worshiped in the city of Heliopolis; the sun god in this conception came in three forms, the morning sun, aka Ra-Kephri, the mid-day sun, [name], and the end-day sun [name]. The following shows the Heliopolis creation myth model wherein Ra the morning sun is born out of the land mound Atum which arose out of the watery abyss, personified by the god Nun or Nu:

(add discussion)

Ptah

In 2800BC, in Memphis, the god Ptah was conceptualized as the god that made the golden egg on his potter's wheel out of which the sun was born:

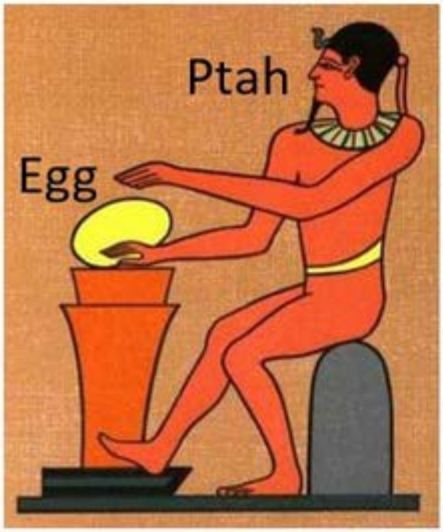

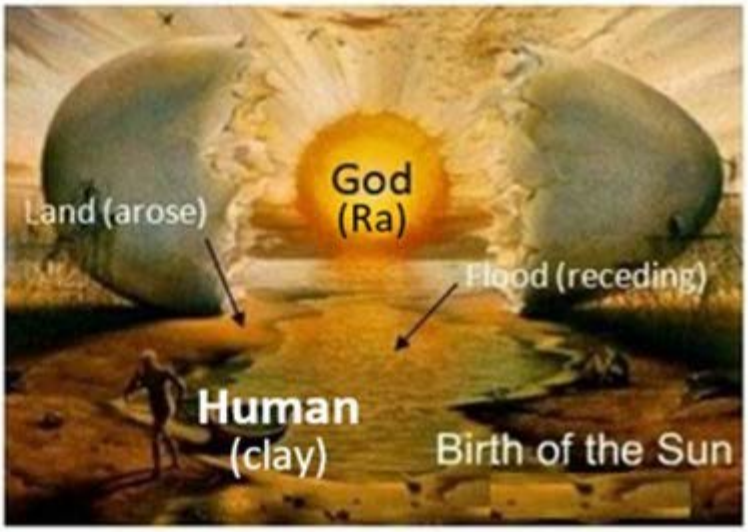

(add discussion)

Aten

In 1300BC, in Armana, the god Aten, the brainchild of the pharaoh Akhenaten, was introduced as a semi-deanthropomorphized monotheistic god:

(add)

Abraham and Brahma

See main: Abraham and Brahma

In 900BC, in India, the creator god Brahma (and his cohort MaNu), modeled on Ra (born out of the Nu), was formulated as the chief god of Hinduism.

In 500BC, amid the Persian empire dynasty, Brahma, during the Hebrew recension (see: recension theory), was reformulated into the man Abraham (descendant from a person named Noah), during which time he lost all his previous solar attributes. All the

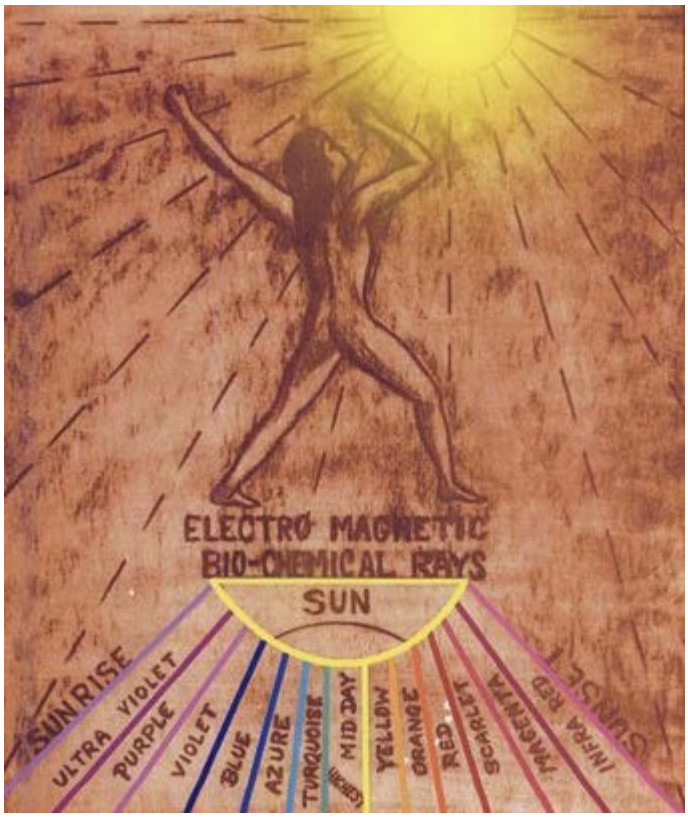

A 1956 depiction of the state of the "**sun god**" concept as found on the cover of Hilton Hotema's *Ancient Son God*. [1]

various astro-theological gods of the older religion, concordantly, were morphed into the form of human characters, e.g. the star Sirius, morphed goddess Isis, morphed goddess Saraswati, became the person Sarah, the Nile River flood, deified as the god Nun, became the Hindu character MaNu or the person Noah (or Nuh), etc.

The following is diagram showning the gist of **recension theory** (religion morph), originated by Edouard Naville (1886) and Wallis Budge (1899), and or **redaction theory** (religion syncretism), originated by Gary Greenberg (2000), related to the evolution or change of the contiguous core religion belief model, through empires: Egyptian, Sumerian, Hebrew, Greek, Roman, English, and American, over the last 5,000+ years, all generally rooted in the ancient pre-dynastic **sun god** Ra, and derivatives or morphs derived therefrom.

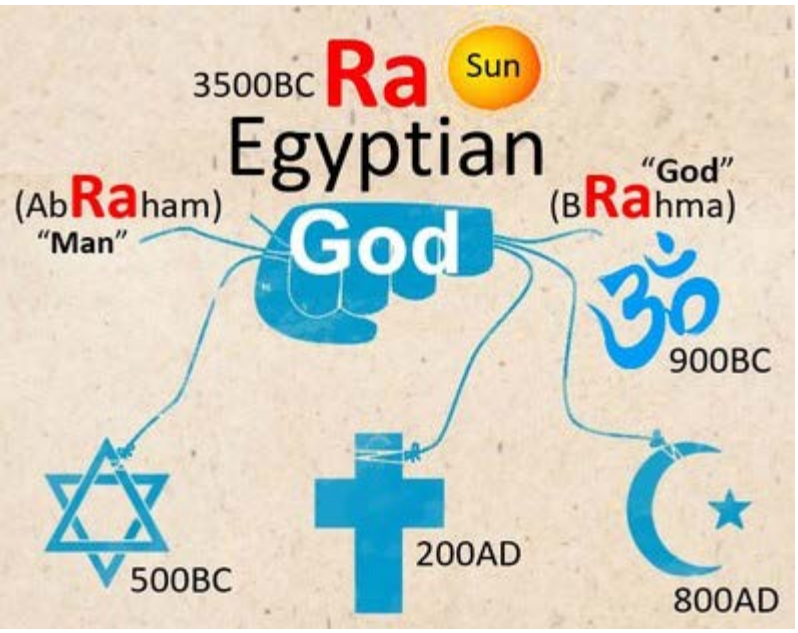

(add)

Chemical thermodynamics

(add)

References

1. Hotema, Hilton. (1956). *Ancient Sun God* (pg. 26). Publisher.
2. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (Ptah, pgs. 498, 508). Dover, 1969.
3. Thims, Libb. (2019). *Human Chemical Thermodynamics: Chemical Thermodynamics Applied to the Humanities – Sociology, Economics, History, Philosophy, Ethics, Government, Politics, Business, Religion, and Relationship* (pdf). Publisher.

External links

â— Solar deity – Wikipedia.

θΔics

In science, **sun molecule** is the chemical name sun, defined specifically as a 10-element thermonuclear molecule. [1] The approximate molecular formula for the sun, first calculated in *circa* 2005 by American chemical engineer Libb Thims, is shown adjacent. [2]

Sun molecule

$H_{E57}He_{E56}O_{E54}C_{E53}Ne_{E53}N_{E53}Fe_{E52}Si_{E53}Mg_{E52}S_{E52}$

A point to note about defining the sun as a ten element molecule, solar spectral emissions indicate that about 67 elements exist in the volume of the sun. Of historical note, American astronomer Henry Russell made the quantitative analysis of the chemical composition of the solar atmosphere in 1929, deriving the abundances of 56 elements. [3]

To a good approximation, however, the bulk of its body is comprised of ten elements, namely hydrogen H, helium He, oxygen O, and carbon C, among six other varieties, and it is reasoned that these central ten elements account for the majority of its properties.

A distinction of the sun molecule, as compared to, for instance, the earth molecule, is that contraction of the sun's mass acts to cause activation of thermonuclear reactions, i.e. hydrogen burning, in its structure, such that protons and neutrons are active in its density, thus deviating it from the standard classification of a "molecule" as a structure of two or more atoms.

planetary-system-as-molecule

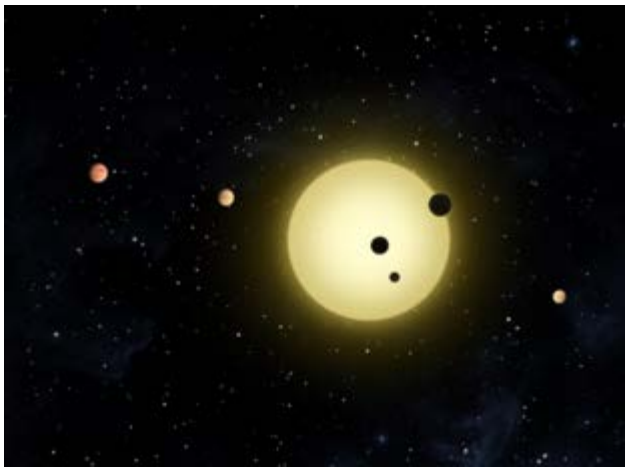

An artistic conception of Kepler 11, a sun-like star with surrounding planetary system; Spanish science-religion collision philosopher Miguel de Unamuno postulated in 1912 that a "planetary system is itself but a molecule, [which] is in turn but a cell in the universe" (see: cell-as-molecule). [4]

See also

- Human molecule
- Bacterial molecule
- Walking molecule
- Molecular evolution table

References

1. Thims, Libb. (2008). *The Human Molecule* (ch. 8: Modern Views, section: "Planetary-sized molecules", pgs. 57-59) (preview). Morrisville, NC: LuLu.
2. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pgs. 20-21) (preview), (Google books). Morrisville, NC: LuLu.
3. (a) Russell, Henry N. (1929). "On the Composition of the Sun's Atmosphere", *ApJ*, 70: 11-82.
(b) Grevesse, N. and Sauval, A.J. (1999). Standard Solar Composition (pgs. 161-) in: *Solar Compostion and its Evolution, from Core to Corona:* Proceedings of an Issi Workshop 26-30 January 1998, Bern, Switzerland. Sprinter.
4. Unamuno, Miguel de. (1912). *The Tragic Sense of Life* (pg. 148). Dover, 1954.

External links

- Sun molecule – IoHT Glossary.

θΔics

In existographies, **Sunand Tryambak Joshi** (1958-) (FA:174) (CR:18), aka "S.T. Joshi", is an Indian-born American writer noted for []

Atheism

In 1971, Joshi, age 13, was taken in by the works of Howard Lovecraft, and therein became influenced by his "strong arguments in support of atheism". [1]

In 2000, Joshi began to edit and compile a number of publications of classical atheists, such as Henry Mencken, Voltaire, as well as publishing commentary on the new atheists. [2]

Quotes | By

The following are related quotes by Joshi:

> "Holbach's *System of Nature* is the most exhaustive [and intellectually thorough-going] discussion of atheism — from a scientific, philosophical, moral, and political perspective — ever written."
>
> — Sunand Joshi (2014), *The Original Atheists* (pg. #)

> "The first atheist of whom we know is one Diagoras, who lived in the late fifth century BCE. It is typical that nothing of this works aside from random fragments survives and that he was forced to flee Athens because he declared that there were no gods. Even in the ages preceding Christianity, the enunciation of explicit atheistic, or even agnostic, views carried with it the threat of both legal punishment and social obloquy."
>
> — Sunand Joshi (2014), *The Original Atheists* (pg. 7) [3]

> "There is scarcely any question that the revolutionary findings of such thinkers as Copernicus, Kepler, and Galileo had the effect of knocking the earth and its occupants from both the physical and moral centrality in the universe."
>
> — Sunand Joshi (2014), *The Original Atheists* (pg. 7) [3]

References

1. Lovecraft, H.P. (2010). *Against Religion: the Atheistic Writings of H.P. Lovecraft* (editor: S.T. Joshi; foreword: Christopher Hitchens) (abs) (Amz). Sporting Gentlemen.
2. Biography – STJoshi.org.
3. Joshi, Sunand T. (2014). *The Original Atheists: First Thoughts on Nonbelief* (pg. 7). Prometheus Books.

Further reading

- Joshi, S.T. (2000). *Atheism: a Reader*. Prometheus.
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- Joshi, S.T. (2007). *The Agnostic: a Reader*. Prometheus.
- Joshi, S.T. (2009). *What is Man: and Other Irreverent Essays*. Prometheus.
- Voltaire. (1769). *God and Human Beings* (translator: Michael Shreve; Introduction: S.T. Joshi). Prometheus Books, 2010.
- Joshi, S.T. (2011). *Unbelievers: the Evolution of Modern Atheism*. Prometheus.

External links

- S.T. Joshi – Wikipedia.
- Home – STJoshi.org.

θΔics

In terminology, **supernatural** (TR:53), as compared to natural or unnatural, is the supposition of a event, process, happening, or phenomena, etc., e.g. a claimed to have occurred miracle, generally conceptualized as run by a type of divine nature, so to say, occurring or operating outside the bounds of measurable science, .

Overview

(add)

Quotes

The following are related quotes:

> "All children are born atheists; they have no idea of god."
>
> — Baron d'Holbach (1772), *Freethoughts Opposed to **Supernatural** Ideas* [1]

> "Faith in the **supernatural** is a desperate wager made by man at the lowest ebb of his fortunes."
>
> — George Santayana (c.1920), "Supernaturalism" [4]

> "No, I do not believe in the **supernatural**."
>
> — Barbara Forrest (2005), response testimony during the Kitzmiller vs Dover trial [2]

> "Myself, I am a Dawkins number 10. Like Russell, I was forced to tread through a path of self-education, starting from an age 5 question about where does God live?—upward through chemical engineering studies—and further prolonged research in the field of comparative religion and mythology, in a quest for knowledge, which, to note, is embodied presently in a personal library totaling 1,247 books, of which 330 are in thermodynamics, the subject upon which the modern physical chemistry morality system is based. In plain speak, for me, the is no God—it is not even a thought in the back of my mind—there are no **supernatural** forces, all that exists is matter and energy governed by the laws of hard physical science; the theory of life, death, afterlife—in particular 'life' and the 'origin of life'—is a defunct theory, passed on to us through religious-mythological teachings. Morality, however, does exist: and is explained within the framework of thermodynamics, the laws that govern the known universe in particular, by way of being explained by differentials of Gibbs free energy, the same energy that governs and describes the nature of the reactions that occur between the atoms of the periodic table—a morality system as outlined in 1809 [1796] by German polymath Johann von Goethe—hence I am what might be called, one step above atheism, as a 'Goetheanist' or a believer in Goetheanism—or humanism mixed with physicalism mixed with materialism."
>
> — Libb Thims (2011), video (Q) statement (19:10) of his Dawkins number, following Bertrand Russell's explanation of "rational morality"; an example of Goethean philosophy, Nov 1.

> "I believe that the evidence, whether physical, historical, or anecdotal, for the existence of a **supernatural** realm is either lacking or woefully flawed, where the label "supernatural realm" encompasses both supernatural entities (from gods to human souls) and supernatural powers (from telepathy to good luck charms). In the absence of any proper evidence, the only rational conclusion is that such entities and powers do not exist but are rather the products of wishful thinking and the human imagination."
>
> — William Jensen (2014), first part, of four, of his atheist's creed, Oct 15 [3]

References

1. D'Holbach, Baron. (1772). *Good Sense without God: or Freethoughts Opposed to Supernatural Ideas* (Q). Amsterdam.
2. (a) Forrest, Barbara. (2004). *Creationism's Trojan Horse: the Wedge Of Intelligent Design*. Publisher.
(b) Lebo, Lauri. (2008). *The Devil in Dover: an Insider's Story of Dogma v. Darwin in Small-Town America* (pg. 142). The New Press.
3. Jensen, William. (2014). "Email to Libb Thims", following query about his atheist's creed, i.e. if he had one, Oct 15.
4. (a) Santayana, George (c.1920). "Supernaturalism" (Q), *Little Essays*, #108.
(b) Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§: George Santayana, pgs. 228-30). Prometheus.

Further reading

● Patterson, John W. (2002). "Thermodynamics and the Supernatural: Some Comments on Walters' and Gordon's Replies in the Last issue." *Access Research Network*, Vol. 10, No.
● Girotto, Vittorio, Pievani, Telmo, and Vallortigara, Giorgio. (2014). "Supernatural Beliefs: Adaptations for Social Life or By-Products of Cognitive Adaptations?", *Behavior*, 151:385-402.

External links

● Supernatural – Wikipedia.

θΔics

In thermodynamics, **supramolecular thermodynamics** is the study of the stabilities, enthalpies and entropies of formation, and free energy changes or evolution spontaneity of systems of supermolecules; also the thermodynamical study of movements of supermolecules or supramolecular structures. [1]

In the study of supramolecular dynamics, one is concerned with not only the classical features, namely geometry, thermodynamics, and kinetics, of interactions, such as in a receptor-substrate supermolecule, but also with internal dynamics or the *dynamic cohesion* of the atomic and molecular entities of which is composed. [1] As such, in terms of energetics, there exists both "internal thermodynamics" (within the body of the supermolecule) and "interaction thermodynamics" (between supermolecules) of the supermolecules comprising a system.

History

The term "supramolecular thermodynamics", in a figurative sense, was first used in 1968 by author Mihajlo D. MesaroviÄ‡. [2] In 1978, Russian physical chemist Georgi Gladyshev began to outline a type of supramolecular thermodynamics in which "supermolecular evolution" of supermolecules or supramolecular systems, in various isothermal-isobaric subsystems of the biosphere, occurs in the direction of a minimum Gibbs free energy of formation. [3]

Difficulties on terminology

At present, the conception of when a molecular entity, such as a host-guest complex, becomes ‘supramolecular’ or what exactly constitutes a supramolecular system, seems to lie *in the eye of the beholder*. [4] Moreover, in terms of a molecular evolution table view, wherein the evolution and stepwise change of the molecular structure of any dynamic entity can be listed, the use of the term supra-molecular seems to encompass all 3- or 4-element molecular structures and above, including that of the human molecule. In light of this difficulty, some have come to define different classes or species of supermolecules. [5]

References

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2. MesaroviÄ‡, Mihajlo D. (1968). *Systems Theory and Biology: Proceedings*, (pg. 58). Springer-Verlag.
3. (a) Gladyshev, Georgi, P. (1978). "On the Thermodynamics of Biological Evolution", *Journal of Theoretical Biology*, Vol. 75, Issue 4, Dec 21, pp. 425-441.
(b) G.P.Gladyshev. (2001). Thermodynamics of biological evolution and aging. Supramolecular thermodynamics is a key to understanding phenomena of life. What is life from a physical chemist's viewpoint
(c) Gladyshev, Georgi, P. “Supramolecular thermodynamics is a key to understanding phenomenon of life. *What is life from a physical chemist’s viewpoint*”, M., 2002; Second Edition - Moscow – Izevsk, 2003 (In Russian).
(d) Ivanova, V.S., Novikov V. U., and Oksogoev, A.A. (2004). *Fractals, Applied Synergetics and Structure Design*, (ch. 7: “Thermodynamic Theory Answers the Questions: What is the Driving Force Behind Biological Evolution, and Why do We Age? by Georgi P. Gladyshev, pgs. 103-111). Nova Publishers.
4. Lindoy, L.F. and Atkinson, I.M. (2001). *Self-Assembly in Supramolecular Systems (Monographs in Supramolecular Chemistry)*, (pg. 5). Royal Society of Chemistry.
5. Atwood, J. L. and Steed, Jonathan W. (2004). *Encyclopedia of Supramolecular Chemistry*. (pg. 1434). CRC Press.

θΔics

In religio-mythology, **supreme god**, related to "state god", a feature of henotheism religions, is a belief model according to which one god among many is assigned the highest ranking in god genealogy (see: religio-mythology genealogy) or god power (see: higher power) assignments in the "paut" (god family) or state religion per century, dynasty, or empire period (see: supreme god timeline).

Quotes

The following are related quotes:

> "Most people believe that Amoun is the name given to Zeus in the land of the Egyptians, a name which we, with slight alteration, pronounce Ammon. But Manetho of Sebennytus thinks that the meaning 'concealed' or 'concealment' likes in this world. Hectaecus of Abdera, however, says that the Egyptians use this expression one to another whenever they call to anyone, for the world is a form of address. When they, therefore, address the **supreme god**, whom they believe to be the same as the 'universe', as if he were invisible and concealed, and implore him to make himself visible and manifest to them, they use the word 'Amoun'."
>
> — Plutarch (100AD), *On Isis and Osiris* [1]

See also

â— Personal god

References

1. Plutarch. (c.100AD). *Isis and Osiris*; in: *Plutarch's Moralia, Volume Five* (pg. 25) (Introduction: Victor Hanson). Harvard University Press.

External links

â— Supreme god – Wikipedia.

θΔics

In timelines, **supreme god timeline** refers to the shift of supreme god, typically a form of the sun god, as religious power centers shifted, over time, as dynasties rose and fell, from ancient Egypt to modern America; generally showing how the Pyramid Texts, Coffin Texts, Book of the Dead, various stele, e.g. Metternich Stela (O), morphed into the various modern religious books, the Vedas, Torah, Bible, and Quran in particular, the dominate books of the modern world religions.

Timeline | Supreme god

The following is the work in progress supreme god timeline: [1]

Dynasty	Supreme God	Capital	Person	Publication	Notes
Archaic | 5000-3500BC	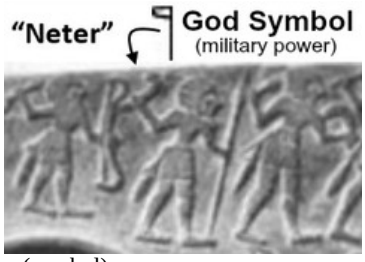 **Neter** (symbol)				
Libyan | Savage times	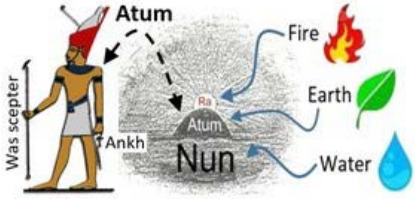 **Atum** [5]				
Pre-Dynastic | 3500-3150 BC / 6750-4900 BG → Heliopolis recension	 **Ra**/**Nun**	Heliopolis			
Early					
1st Dynasty | 3150-2890 BC / 4900-4640 BG	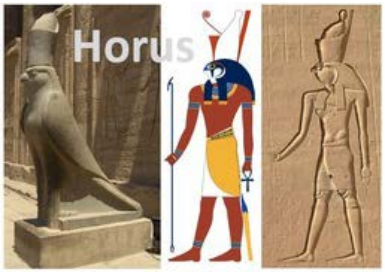 **Atum** / **Horus**	Heliopolis			
2nd Dynasty | 2890-2686 BC / 4640-4436 BG → Memphis recension	 **Ptah**	Memphis			
Old Kingdom					
				Step Pyramid Sahal Island	

3rd Dynasty | 2686-2613 BC / 4436-4663 BG	Ra	Memphis	Imhotep	rock inscription [7]	
4th Dynasty | 2613-2498 BC / 4663-4248 BG	**Ra** (O)(O) / Horus & Ra [?] (O)	Heliopolis			[200+ gods]
5th Dynasty | 2498-2345 BC / 4248-4095 BG	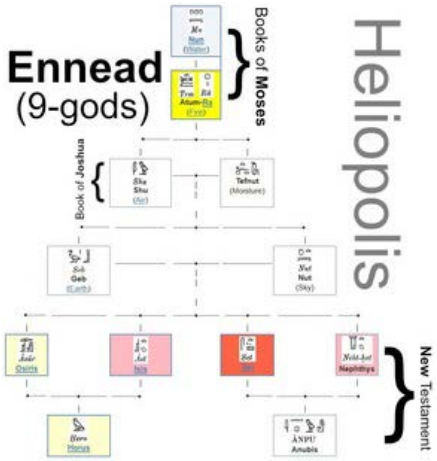 **Ra-Atum** (Atum-Ra) [4] / Ptah **; Ennead**	Heliopolis	Unas	Palermo Stone [8] **Pyramid Texts**	[200+ gods]
6th Dynasty | 2345-2181 BC / 4095-3931 BG	**Ra-Atum** (Atum-Ra) [4] / Ptah	Heliopolis			[200+ gods]
First Intermediate					
7th-8th Dynasty | 2181-2160 BC / 3931-3910 BG → Hermopolis recension	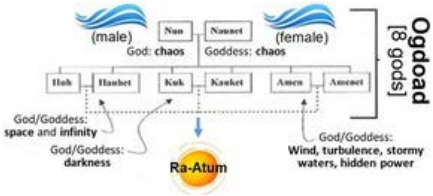 Atum-Ra; **Ogdoad**	Hermopolis		**Coffin Texts**	
9th Dynasty | 2160-2130 BC / 3910-3880 BG	Ogdoad	Hermopolis			
10th Dynasty | 2130-2040 BC / 3880-3790 BG	Ogdoad	Hermopolis			
Early 11th Dynasty | 2134-2061 BC		Hermopolis			
Middle Kingdom					
Late 11th Dynasty | 2061-1991 BC / 3811-3741 BG → Theban recension	Ra [4]	Thebes		***Book of the Dead***	
12th Dynasty | 1991-1803 BC / 3741-3553 BG		Thebes			

	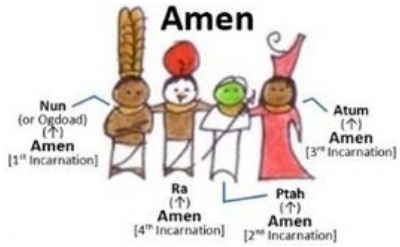 **Amen** [Upper Egypt]				
13th Dynasty | 1803-1649 BC / 3553-3399 BG	Amen	Thebes			
14th Dynasty | 1705-1650 BC / 3455-3400 BG	Amen	Thebes			
Second Intermediate					
15th / Hyksos Dynasty | 1650-1550 BC	**Baal-Set** (Q) [transition state] [5]	Thebes			
16th Dynasty | 1660-1600 BC	[transition state] [5]	Thebes			
17th Dynasty | 1580-1549 BC	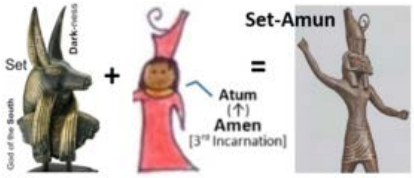 **Set-Amen** (Q) **Amen** [5]	Thebes			[god fusion]
New Kingdom					
18th Dynasty | 1549-1292 BC	 Amen-Ra [9] = Atum [5]	Thebes		Theban recension	
→ Atenism | 1352-1336 BC / 3102-3086 BG	 **Aten**	Amarna	Akhenaten		
→ Post-Atenism | 1237-1293 BC	[add]				
19th Dynasty | 1292-1189 BC	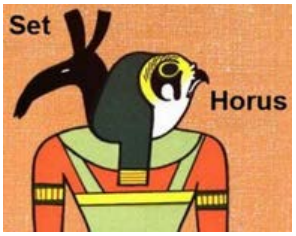 **Set**; Horus-Set	Thebes	Seti I Seti II	*Papyrus of Ani*	[1,200+ gods]

20th Dynasty | 1189-1077 BC	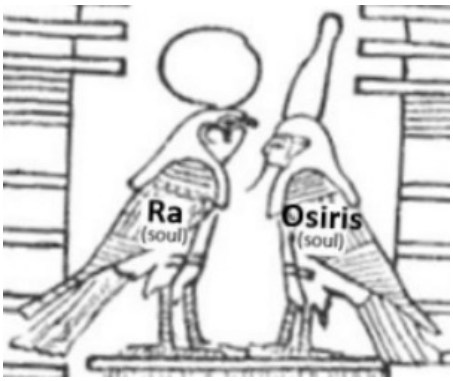 **Amen-Ra** / **Osiris**-Ra (Osiris-Ra)	Thebes		[Osiris sculptures]	
→ Reformulation | 1100 BC			[A source]		Amarna recension roots (Q)
Third Intermediate					
21st Dynasty / Priest-King Dynasty | 1069-945 BC [5]	Osiris-Ra				
→ Judaic recension | 1050-1000BC	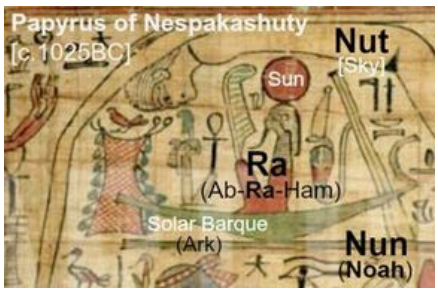 **YHWH** / **Yahweh**; Abraham (god→man)	S. Canaan	[J source]	**Genesis A**	Heliopolis recension roots [4]
22nd Dynasty | 945-720 BC	Osiris-Ra				
→ Judaism | 922 BC	 **El** [see: Neter] [Ptah = "the Lord" = El] (Q)	N. Canaan	[E source]	**Genesis B**	
23rd Dynasty | 837-728 BC	Osiris-Ra				
24th Dynasty | 732-720 BC	Osiris-Ra				
→ Piye invasion | 732 BC [4]	**Ra**				
25th Dynasty | 760-656 BC	Osiris-Ra				
720 BC (or 1500BC ?)	Ptah-Atum			Shabaka Stone (Q) [12]	
Late Period					
26th Dynasty | 672-525 BC	Zeus = Ra [?]			***Book of the Dead***	

→ Saite recension				(Standard Edition)	
670 BC				Priestly Blessing [6]	
650 BC			[D source]	Deuteronomy	
→ Babylonian exile | 587-397 BC					
586 BC			[P source]	Priestly matters	Theban recension roots [4]
Persian period					
First Persian Dynasty | 550-330 BC (O) → Cyrus recension	 **Zoroaster**				Theban recension roots
27th Dynasty | 525-404 BC	El-Yahweh				
→ Jerusalem return | 400 BC	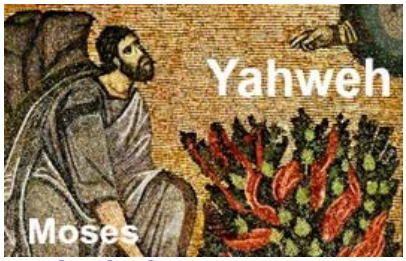 **Is-Ra-El**; **Yahweh**			***Torah***	
28th Dynasty | 404-398 BC / 2154-2148 BG					
29th Dynasty | 398-380 BC / 2148-2130 BG					
30th Dynasty | 380-343 BC / 2130-2093 BG	**Horus**	Alexandria	Nectanebus I	Metternich Stela (O)	
31st Dynasty | 343-332 BC / 2093-2082 BG	Jupiter/Zeus = Ra [?]				
Ptolemaic Period					
Macedonian Dynasty | 332-305 BC / 2082-2055 BG → Greek recension	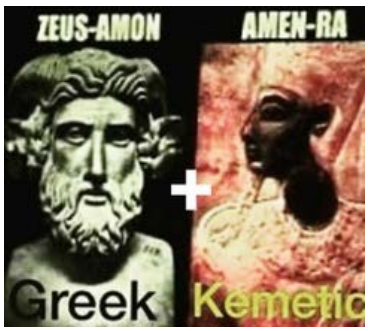 **Amen-Zeus**; **Horus**	Alexandria	Alexander	Library of Alexandria	
Ptolemaic Dynasty | 305-30 BC / 2055-1780 BG	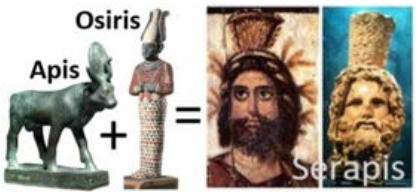 Amen-Ra / Horus; **Serapis** (O)	Alexandria	Ptolemy I		
250 BC					

	Serapis (Osiris-Apis) [7]				
			Ptolemy II Ptolemy III		
221-204 BC	Dionysus [10]	Egypt	Ptolemy IV		
100BC-37AD		Dendera	Tiberius	**Dendera Temple**	
Roman Period					
Caesar Dynasty | 30 BC-306 AD / 1780-1444 BG					
→ **Roman recension**		Rome			
→ Julio-Claudian dynasty | 54-68 AD	**Osiris**	Dendera	Nero	**Dendera Temple**	
69 AD	**Serapis and Isis** [7]	Rome	Vespasian		
100-250AD	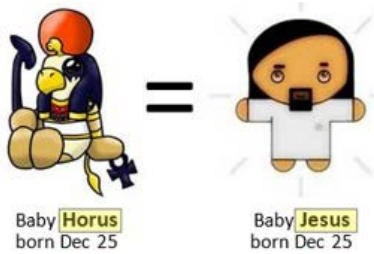 **Jesus**				
306-337 AD			Constantine	*Nicaean Creed* (325)	
337-641 AD	**Jesus**; **Trinity** Lord-God Almighty				
379-395 AD			Theodosius I		
529 AD			Justinian I		Outlawed: paganism; closed: Epicurean garden, Skeptic Academy, Lyceum, Stoic Porch, and Neoplatonic Academy (Athens); abolished the worship of Amun (at Augila) and Isis (at Philae). [11]
396-641 AD					
Arab Period					
Arab Egypt | 641-969 AD / 1109-781 BG	Allah = El				
Fatimid Egypt | 969-1171 AD / 781-579 BG	Allah = El				

Ayyubid Egypt | 1171-1250 AD / 579-500 BG				
Mamiuk Egypt | 1250-1517 AD / 500-233 BG				
English Period				
1st Monarch | 871-1700 AD				
1516		Netherlands	Erasmus	*Erasmus NT*
→ James recension | 1611		England	James	*King James Bible*

(add discussion)

Timeline | Renaissance era

The following shows the timeline morphing of the "supreme god" concept, in the renaissance era, during which time the fundamentals of religion began to come under attack (e.g. heliocentrism, atomic theory, evolution, physicochemical sociology, etc.) into things such as "creative force", "higher power", "living energy", and ontic opening theories, among other covert "god code" Trojan horse like concealments: [1]

Period	Supreme God	Capital	Person	Publication	Notes
Renaissance Period					
Atomic theory revival | 1417-1600 / 333-150 BG	God or Atoms/Voids?	Germany	Bracciolini		
Heliocentrism | 1543-1623 / 207-127 BG	God?	Italy	Copernicus		
Dualism | 1620	Soul in pineal gland	France	Descartes		
Atheism Revival					
Spinozism | 1677-1809	God = Nature	Netherlands	Spinoza		
Extreme Atheism | 1729-1855 / 21 BG-105 AG	God does not exist		Meslier		
Apologetics | 1736 / 14 BG	God = Designer	England	Paley		
Goethe period (Q)					
Human chemical theory | 1770-1832 / **20-82 AG**	Chemical Spinozism	Germany	Goethe	*Elective Affinities*	
1818-1844 / 64-94 AG	Will = Chemical Will	Germany	Schopenhauer		
1877-1888	Will to power	Germany	Nietzsche		[God is dead]
Ontic Opening Era (Q)					

Creative evolution | 1907	God = Creative force	France	Bergson	
1936	Spirit-Matter		Teilhard	
Real world thermodynamics | 1971 / 221 AG	God = Gibbs energy	America	Rossini	
Physicochemical sociology | 1987-2014 / 237-264 AG	Allah's will = Gibbs energy	Pakistan	Beg	*New Dimensions*
Sudden emergence | 2008 / 258 AG			Rothschild	
New Atheism				
Implicit atheism | 1900-2001				
New atheism | 2004			Harris	
Explicit atheism | 2014				
Zerotheism | 2015 / 265 AG			Thims	
Smart atheism | 2016			Thims	*Smart Atheism*

(add discussion)

Notes | Dating

While scholars, e.g. Karl Luckert (1991) and Gary Greenberg (2000), tend to situate Atum as the supreme god of Heliopolis, we do note that many of the pharaohs of the 0th Dynasty, e.g. Iry-Hor (3150BC), and 1st Dynasty, e.g. Hor-Aha (3050BC), were named after Horus. [2] Moreover, the gods: Horus, the sun god (Atum or Ra), and Hathor, according to Budge (pgs. 102-03), are the oldest of all. Early dynasty supreme god identification and dating is a bit of a grey area.

We also note that in the nome list, cited by Budge (1904), from inscriptions at the Temple of Edfu, Horus was the god of five of 42 nomes, and that the 'Temple of Edfu', dedicated to Horus, was built during the Ptolemaic period, between 327 to 57BC, which depicts the age-old conflict between Horus and Seth. The temple of Edfu fell into disuse as a religious monument following Theodosius I's edict banning non-Christian worship within the Roman Empire in 391. [3]

In the 19th dynasty, Budge, in *The Gods of Egypt, VI* (pgs. 131-32), cites the *Papyrus of Hunefer* (c.1279BC), wherein Ra-Atum is the chief god, and, via citation of a related period text, indicates that Tatenen (Memphis version of the Heliopolis Atum, i.e. land mound), Ra-Atum, and Osiris were each beginning to be referred to as 'God One alone', and that Amen-Ra was in the mix.

Quote

The following are related quotes:

> "It is interesting to note the existence of the monks of the Serapeum, because they form a connecting link between the Egyptian priests and the Christian ascetics and monks who filled Egypt in the early centuries of our era. The worship of Apis continued in Egypt until the downfall of paganism, which resulted from the adoption of Christianity by Constantine the Great [reign: 306-337AD] and from the edicts of the Emperor Theodosius [reign: 379-395AD] ."
>
> — Wallis Budge (1904), *The Gods of the Egyptians, Volume Two* (pg. 349)

See also

- God reduction
- Recension theory

References

1. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs) (pgs. 99-101). Publisher.
2. List of pharaohs – Wikipedia.
3. Temple of Edfu – Wikipedia.
4. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (Ra in 11th, pg. 104; Ra-Atum in 5th-6th, pg. 105; Piye, pg. 331). Dover, 1969.
5. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (transition state, pgs. 4; Amen in Thebes, 17th-20th, pgs. 4-5; Priest-King dynasty, pg. 12; Amen-Ra = Atum, pg. 88; Atum at savage times, pg. 88). Dover, 1969.
5. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (roots, pgs. 3-4; pgs. 4-5). Source Books.
6. Extant Tanakh manuscripts (section) – Wikipedia.
7. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (Sahal Island rock inscription, pg. 52; Vespasian, pg. 217; Serapis, pg. 349) (O). Dover, 1969.

8. (a) Palermo Stone – AncientEgyptOnline.co.uk
(b) Palermo Stone – Wikipedia.
9. (a) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume One* (Amen-Ra, pg. 493). Dover, 1969.
(b) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (Amen-Ra, pg. 7). Dover, 1969.
10. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* ("Popular Jewish legend has it that Ptolemy IV (204BC), a great devotee of Dionysus, had issued a decree commanding the Jews of Egypt to become worshipers of Dionysus", pg. 52). HarperOne.
11. (a) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 208). HarperOne.
(b) Suppression of other religions and philosophies (section) – Wikipedia.
12. Luckhert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective* (pgs. 98-104). SUNY Press.

θΔics

In laws, **supreme law**, superseding all other laws, refers to []

Overview

In 1927, English mathematical physicist and astronomer Arthur Eddington , in his *The Nature of the Physical World*, stated that the second law of thermodynamics was the supreme law of the universe: [1]

> "The law that entropy always increases — the second law of thermodynamics — holds, I think, the **supreme position** among the laws of nature. If someone points out to you that your pet theory of the universe is in disagreement with Maxwell's equations — then so much the worse for Maxwell's equations. If it is found to be contradicted by observation — well, these experimentalists do bungle things sometimes. But if your theory is found to be against the second law of thermodynamics I can give you no hope; there is nothing for it but to collapse in deepest humiliation."

The above passage is one of the most frequently repeated thermodynamics quotes. In typical freely going earth bound natural systems, such as found test tubes or societies, Eddington's supreme law becomes, through derivation, the universal rule of chemical thermodynamics as explained by American physicist Gilbert Lewis in 1923.

References

1. Eddington, Arthur. (1928). *The Nature of the Physical World* (a course of Gifford Lectures delivered at the University of Edinburgh in January to March 1927) (ch. 4: "The Running-Down of the Universe", pgs. 63-86). The University of Michigan Press.

θΔics

In science, **surface** is an approximately-shaped two-dimensional region upon which an interaction or process may take place. The majority of the most complex and important earth-bound chemical processes and reactions, such as ocean floor activity, the Haber process, drug-receptor interactions, human chemical reactions (human existence), etc., take place on or near a surface. Shown below are few common examples:

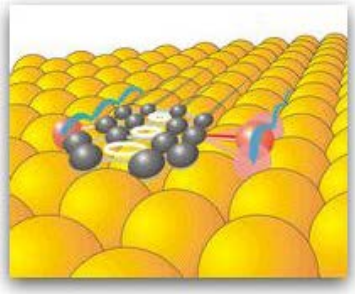

DTA molecule "walking" on a **surface**.

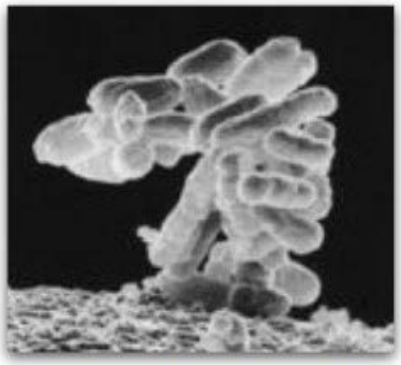

$C_{E11}H_{E11}O_{E11}N_{E10}P_{E9}S_{E9}Ca_{E9}K_{E7}$
$Cl_{E7}Na_{E7}Mg_{E7}Fe_{E6}Si_{E5}Mn_{E3}Co_{E3}$

Cluster about twenty *E. coli* bacteria (a bacteria molecule) attached and growing on a **surface**.

People (human molecules) walking on the **surface** of a bridge in daylight hours.

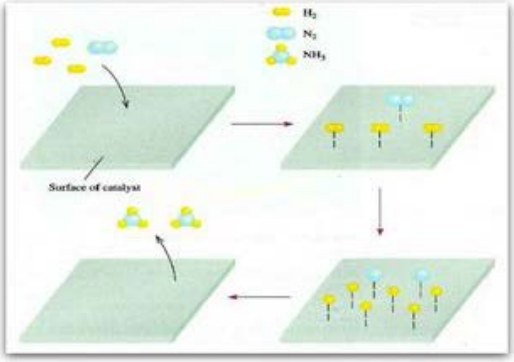

Haber process (1905): production of small amounts of ammonia NH_3 from N_2 and H_2 at a temperature of 1000° C with the help of iron as a **surface** catalyst

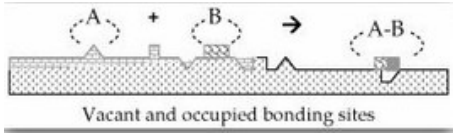

Vacant and occupied bonding sites on a reactant **surface** available to different chemical species (A, B, A-B).

Octopus moving on a **surface** of ocean floor.

An ordered array of homes attached to a **surface** section of a Las Vegas suburb.

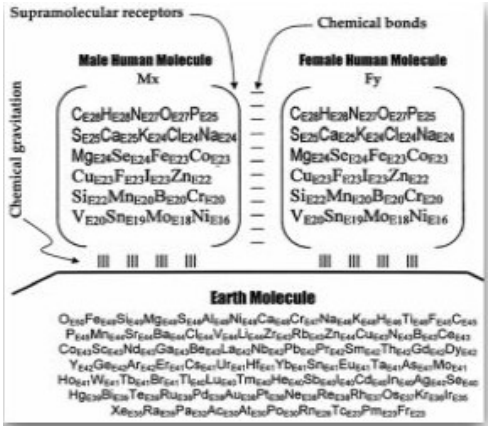

Diagram of two human molecules, 26-element molecules, attached to each other Mx≡Fy, via a human chemical bond, also each shown, Mx=E and Fy=E, attached to the **surface** of the earth molecule, a 92-element molecule, via an undefined type of chemical gravitation (gravity)?

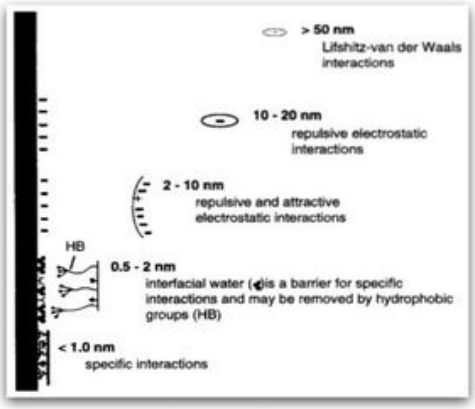

Diagram of the different attractive and repulsive forces, e.g. *********-Van der Waals, electrostatic repulsion, hydrophobic interactions, etc., involved as a bacterium moves towards and attaches to a vertical **surface**.

Technically, a surface is often considered as a "substrate", thus acting as a catalyst functioning to lower the activation energy barrier to

successful reaction, process actualization, or completed movement. The mechanisms of surface activity are studied in the science of "surface chemistry" and the heat, energy and work aspects of surface activity are studied in the science of "surface thermodynamics".

In chemistry, the ability of a substance to influence the surface tension of a liquid is called "surface activity"; an example being the reduction in surface tension in water by the addition of a detergent. [1] A significant area of surface chemistry is concerned with the chemical reactions that occur at the interface between two phases, such as the reaction of a gas at the surface of a liquid.

References

1. Clark, John O.E. (2004). *The Essential Dictionary of Science.* Barnes & Noble.

θΔics

In science, **surface chemistry** is the study, at both the microscopic and macroscopic levels, of how atoms and molecules interact with surfaces, how they behave, and why they react. [1]

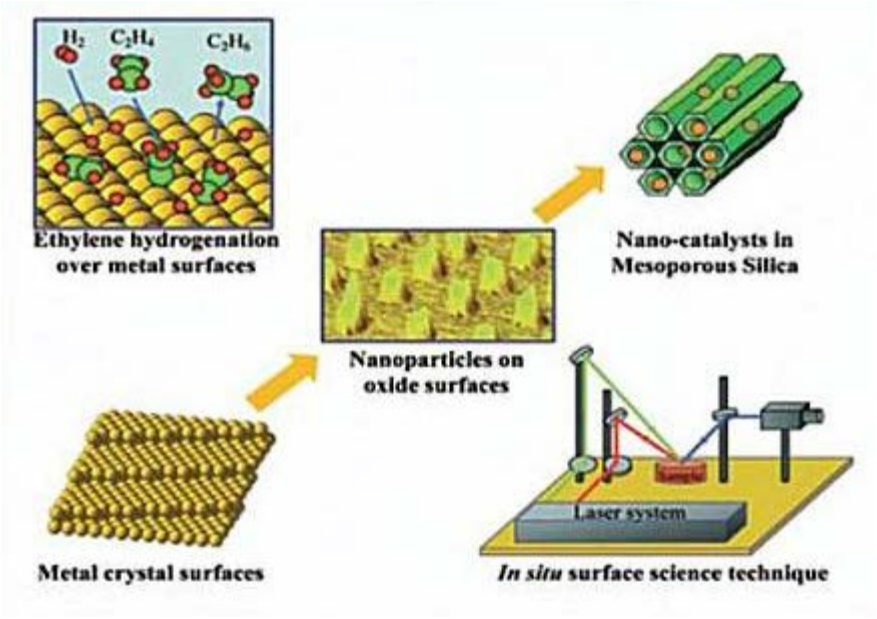

Common examples of **surface chemistry**. [3]

Human chemistry

Being that human chemical reactions, i.e. reactions between human molecules, generally occur on a surface, surface chemistry will invariably yield better models of human behavior than models in gas-phase or liquid-phase chemistry. [2]

See also

â— Surface thermodynamics

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θΔics

In chnopsology (biology), **surface law** or "body-surface law" states that the surface-to-volume ratio of an living (animate chnopsological) object object decreases as the object evolves or gets bigger. [1]

History

In 1839, French mathematician Pierre Sarrus wrote the first thesis on this subject, read to the Royal Academy of Medicine in Paris, emphasizing that the heat loss from a warm-blooded animal must be roughly proportional to its free surface area, and because a small animal has a larger relative surface, it must also have a higher relative rate of heat production to keep up with the heat loss. [2]

In 1847, Sarrus' reasoning was adopted by German biologist Christian Bergmann, who formulated what is now known as Bergmann's rule, which asserts that within a species the body mass increases with latitude and colder climate, or that within closely related species that differ only in relation to size that one would expect the larger species to be found at the higher latitude. [3]

In 1997, British science writer Colin Tudge stated the following about the surface law: [4]

> "For homoeothermic land animals, the physics of heat comes into play: gravity and thermodynamics determine that, on land, body size, shape, and lifestyle are bound to be intimately linked."

The surface law can also be stated in terms of body mass, in that smaller animals tend to have a larger body surface relative to its mass; subsequently, in order to keep warm, smaller animals must produce heat at rate higher than that found in larger animals. [2] The surface law is said, for instance, to place a limit on how large social aggregates, such as termite mounds, can be. [1]

Longevity

American biophysicist Mark Blumberg asserts that the surface law explains, in large part, longevity or lifespan. Bacteria, for instance, have a life span (grow and divide) as short as 10 minutes; mice and other small rodents on the order of a few years; dogs about 10 years; elephants a few decades; and the blue whale, the largest animal, on the order of 30 to 80 years. Blumberg postulates that the high surface-to-volume ratio of small animals "leads to a fast-paced life and, inevitably, to early burnout", while larger animals actuate at a slower pace, and thus live longer. [1]

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θΔics

In thermodynamics, **surface thermodynamics** is the study of the thermodynamic behaviors of chemical species, such as atoms, molecules, bacteria, human molecules, etc., near surfaces.

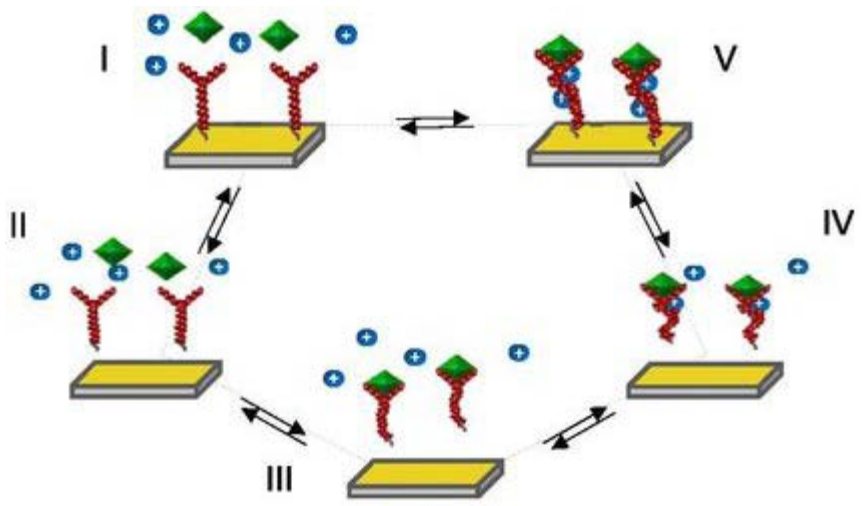

Diagram of a so-called "biomolecule" (see: animolecule "animated molecule" vs. animalcule "little animal") transforming on a surface, from the 2012 article "On the Thermodynamics of Biomolecule Surface Transformations. [5]

Overview

The basic principle of surface thermodynamics is that a properly identified thermodynamic potential, i.e. free energy, will be minimized at equilibrium. Thus, the process under consideration, e.g. bacterial adhesion, will be favored if the process itself causes the thermodynamic function to decrease. The process will not be favored if it causes the free energy function to increase. [1] In theory, the same situation applies to human molecules (people) attached to the surface of the earth. The details of these of these interactions, however, are more difficult to formulate mathematically. [2] The surface of the earth, from a chemical point of view, is considered as "substrate".

History

The historical origin of surface thermodynamics were formulated in the second part of Willard Gibbs' 1876 *On the Equilibrium of Heterogeneous Substances*, on the subject he named the "theory of capillarity"; the namesake, according to A.I. Rusanov, meant to embody the classical theory of capillarity (called the traditional theory) that existed before Gibbs in the works of Pierre Laplace and Thomas Young. [6]

Bacteria-surface interactions

The two basic theoretical approaches to modeling bacterial adhesion are the "DLVO theory", introduced in the 1940s, which takes into account the van der Waals attraction and the electrostatic repulsion, such as due layer of counterions, and the "thermodynamic model", culled from surface chemistry, which models the interactions on changes in Gibbs free energy, i.e. the isothermal-isobaric thermodynamic potential, for the process.

The first theories on the thermodynamics of bacterial adhesion seems to have been outlined in the 1982 article "Are Solid Surfaces of Ecological Significance to Aquatic Bacteria" by American marine biologists Madilyn Fletcher and Australian microbiologist Kevin Marshall. [4]

In the thermodynamic approach to "large molecular entity" interaction with a surface, such as a bacteria molecule attaching to an aquatic surface, the attachment process is viewed as a spontaneous change, which is accompanied by a decrease in the free energy of the system. [3]

The process of bacterial adhesion to a surface, in the thermodynamic model, is treated as an equilibrium process, described in terms of the "surface free energies" of the bacterium, substrate, and separating liquid. The estimation of the inter-facial free energies at the bacterium and substratum surfaces are generally estimated indirectly by measuring the contact angles of liquids on the test substrata and on lawns of bacterial cells. [4]

Human-surface interactions

The first models of humans attaching, reacting, or evolving on substrate were made by American anthropologist

Eugene Ruyle in the 1960s, with his conception of a social "thermodynamic substratum", and the 2007 human chemistry model of humans as "human molecules" attaching to "active sites", such as homes, lakes, or rivers, etc., by American chemical engineer Libb Thims.

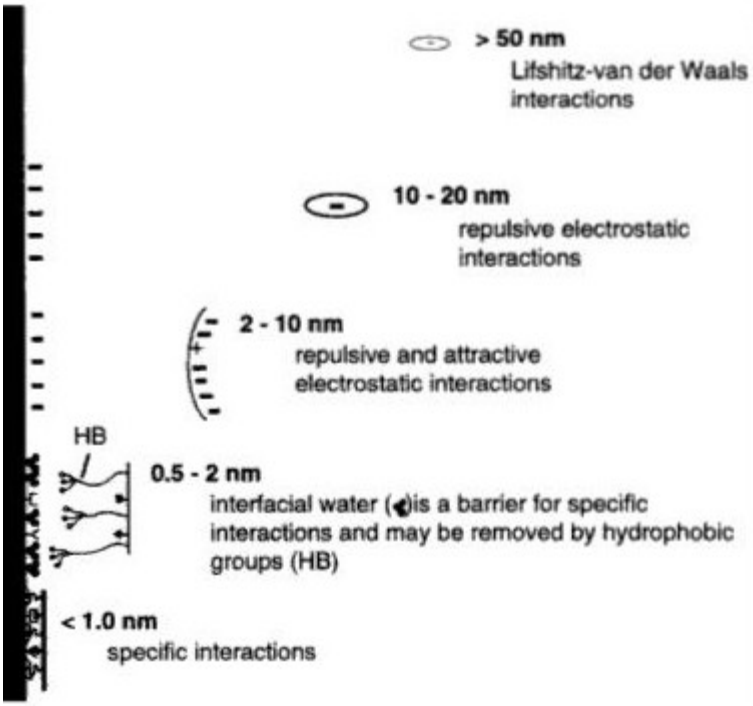

Diagram shows a model of the forces involved in the attractive and repulsive interactions between a bacterium and a surface, where HB indicates the hydrophobic functional groups on the cell surface appendages that may assist in removing the layer of water adsorbed onto the substratum surface. [3]

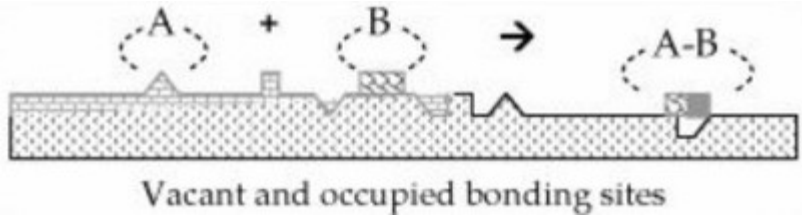

In the conceptual human dynamics model outlined by Thims, as shown below, two species A and B (such as two single people), on two different bonding sites, can favorably react together forming the A-B complex (such as a married couple):

$$A + B \rightarrow A\text{-}B$$

on a new energetically favored attachment site. [2] In more detail, to note, the general analysis of what constitutes "catalyst" vs. "substrate", the nature of the substrate or catalyst on the free energy vs. activation energy, the thermodynamic definition of sustanence (food), etc., among other difficulties, is a subject of current investigation. [2]

See also

â— Surface chemistry

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θΔics

In thermodynamics, **surroundings** or *environment* is that part of the universe external to the boundary of the system. [1] The regions or parts of the surroundings of interest are those in which an energy interaction takes place with the system across the boundary. Said another way, the surroundings are only of interest if they can have some influence on the evolution of the system. [1]

The original regions of interest in the surroundings to the system or *working substance*, as defined by French physicist Sadi Carnot in 1824, were the boiler (burning coal), the condenser (a cooling stream of water), and the atmospheric pressure change work transferred through the face of the piston. [2]

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θΔics

In thermodynamics, **surroundings entropy increase** is an oft-used postulate, particularly used in life thermodynamics, which states that if living structures represent local pockets of entropy decrease (regions of order) then, in accordance with the second law, there must have been a greater increase in entropy (regions of disorder) in the surroundings outside of the system.

Overview

In 1947, English thermodynamicist Alfred Ubbelohde stated the argument as such: [1]

> "Living organisms are characterized thermodynamically not by any vital power of selection of individual molecules, but by the fact that the organism considered as a unit is continually effecting processes, in which the **entropy decreases**, at the expense of rather greater compensating **increases of entropy in the surroundings**."

The proof of the postulate, commonly found, argues that: [2]

(a) the universe can be treated as an "isolated" system, such that:

$$dS_{universe} = dS_{isolated}$$

(b) that the second law for isolated system stipulates that:

$$dS_{isolated} \geq 0$$

(c) that a decrease in the value of entropy in a system is representative of "order":

$$dS \downarrow = order$$

(d) that an increase in the value of entropy in a system is representative of "disorder":

$$dS \uparrow = disorder$$

(e) that a living entity (living system), such as human being, represents an ordered system:

= *Ordered system*

(f) that, according to the principle of additivity of entropy, the entropy of system (e), contained within the surroundings of the universe (which is assumed isolated as a whole), relates to the entropy of the universe, such that: [3]

$$dS_{universe} = dS_{system} + dS_{surroundings}$$

(g) that with substitution of points (a) and (b), part (f) becomes:

$$dS_{system} + dS_{surroundings} \geq 0$$

(h) that, in the process of the formation of a living structure, according to the logic of points (c) and (e), there would have been:

$$dS_{system} \downarrow$$

(i) that in order for expression (g), in conjunction with (h), to hold one must conclude that:

$$dS_{surroundings} \uparrow\uparrow$$

It is difficult to find exactly where the proof originated but into the 1970s it gained momentum as a sort of assumed truth.

In 1977, American biologist William DeWitt, for instance, on the topic of cellular energetics, stated that: [4]

> "If the entropy of a system decreases, then there must be a larger **increase in the entropy of the surroundings**, such that the net result of the process is an increase in the entropy of the universe."

(add discussion)

Difficulties

The central difficulties in the above proof are, firstly, that in point (i) it is inconceivable to think that one can measure changes in entropy (or of heat flow) in the infinit space of the surroundings, which are obviously open to any number of possible changes, to corroborate proof; second, that in point (a) we do not know if the universe is isolated; third, that the suppositions involved in points (c) and (e) are rather unsubstantiated in themselves.

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θΔics

In hmolscience, **Surya Prakash Pati** (1983-) is an Indian chemist and organizational behavior management researcher noted, in human chemical thermodynamics, for his 2009 HCR theory work on thermodynamics of humans, people explicitly conceptualized as "chemical molecules", applied in the areas of relationships and stress management in business.

Overview

In 2009, Pati, in his blog article "The Thermodynamics of the Human Bond!", attempted to venture into the following subject: [1]

> "Thermodynamics can really help to understand 'bonding' between human beings as in chemical molecules."

Pati gives loose descriptions on how the quantities of free energy, activation energy, entropy, and enthalpy apply to relationships viewed as human chemical reactions, in an independent and original manner similar to American chemist David Hwang's 2001 article "The Thermodynamics of Love". [2] Pati's most resent article is "Stress Management and Innovation: a Thermodynamics View", published in the *Journal of Human Thermodynamics*, which attempts to identify stress criteria in the organization, thermodynamically. [5]

Human chemical reaction

See main: Human chemical reaction

Pati, firstly, defines a relationship as combination reaction between two persons A and B, who he says "come together to form a molecule", a reaction he defines as follows:

$$A + B \rightarrow AB$$

In this reaction, Pati seems to follow the logic that A and B are atoms, representative of single people, and AB is a molecule of two atoms, representative of the relationship. Technically, to clarify, the AB product is what is called a 'dihumanide molecule', a bound state of two human molecules. [3] The human particle (or human atom) model, generally, is only good when speaking in the perspective of human statistical thermodynamics, human physics, or in human molecular orbital theory, etc.; it is not technically correct from a definitional chemistry point of view.

Gibbs free energy

See also: Spontaneity criterion

Pati then explains how Gibbs free energy applies in chemistry, stating that the higher free energy an atom or molecule has, the more restless it is, whereby it has the tendency to form bonds so to stabilize. He also notes that molecules, such as a two people in a relationship, with high free energy, can break apart so to elevate the stress of a strained relationship.

Activation energy

See also: Collision theory, etc.

Pati also discusses human relationships in terms of activation energy. He states that for two atoms to come together, they both have to be excited to a certain energy level, i.e. "raise the free energy so that they can react or bond", just as the case with reactions between human beings. Beyond this he speculates on how "cold human beings" (see: cold body) related to activation energy, and how having too much stability can be detrimental to the dynamics and energetics of a process.

Reaction time

See: Extent of reaction, arrow of time, etc.

Pati uses Newton's third law of motion, that every action has an equal and opposite reaction, to postulate that the more time it takes to form a bond the more stable it will be in the long run. This postulate, however, may not be accurate, in that spontaneity is what characterizes successful reactions; whereas, reactions that lack spontaneity tend to be equilibrium reactions, characterized by negligible Gibbs free energy change ($\Delta G \approx 0$). To corroborate this, it is well-known that relationships that slow to form marriage bonds, particularly those that choose to live together prior to marriage, tend to end in divorce.

Entropy

See also: human entropy, second law

Pati argues that the underlying thermodynamic reason for divorce, which in India occur in 45% of marriages, is entropy, which he defines as the measure of disorderliness in a system. He argues that because the 'entropy law' states that systems always tend to disorder, that to counter this in relationships, pairs tend to become structured towards each other, often making extreme sacrifices, in such a way that freedom tends to be reduced. In this context, Pati postulates that in those who divorce, stress builds, up due to entropy, reaching a tipping point that he calls a volcano effect.

Enthalpy

Pati defines enthalpy as heat released in a system when to atoms or molecules bond. In human context, Pati states that enthalpy is heat released through warmth, love, mutual affection, and care for one another.

Thermodynamic advice

In applying his human chemical thermodynamics theories, Pati concludes with five points of advice:

#	Thermodynamic Advice
1.	Relationships (and friendships) require free energy (release); one is advised to avoid cold people.
2.	Free energy is influenced by activation energy.
3.	Activation energy is dependent on one's childhood. Parents are suggested to make their child sensitive; but not to overdo it, such that he or she reacts to everything, in that being a reactive compound is dangerous, an example being someone who loses his or her identity to harm others.
4.	Get into a relationship but don't become a lot structured. Don't let your freedom be affected.
5.	Show some genuine love for your partner. Strike a perfect trade-off between entropy and enthalpy.

Difficulties on theory

See main: Religious thermodynamics

Pati's discussion is interspersed with mentions of spirituality, which weakens his presentation, to some extent. Some of his other writings include meanderings on God as an atom.

Education

Pati completed his BS (2003) and MS (2005) in chemistry from the Sri Sathya Sai University. He is currently completing the equivalent of PhD research and thesis in human organizational behavior applied to management, marketing, and strategy, at the Indian Institute of Management, Lucknow. [4]

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External links

â— Surya Prakash Pati (faculty) – Indian Institute of Management Kozhikode.

θΔics

In hmolscience, **Susan Gustafson** (c.1960-) (CR:4) is an American German literature scholar noted for []

Overview

In 2002, Gustafson, in her *Men Desiring Men: the Poetry of Same-Sex Identity and Desire in German Classicism*, touched on topics such as: maternal imagination theory, Wahlverwandtschaft translation, chapter four, and possibly the labeled seeming paradoxical "immorality" issues of chemical morality and same-sex relationships. [1]

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External links

â— Susan Gustafson (faculty) – University of Rochester.

θΔics

In biographies, **Susanne Katharina von Klettenberg** (1723-1744) was a German abbess and religious writer, a friend of Catherina Elizabeth Goethe, who is noted for having helped the young Goethe during his convalescent year at home in bed (1768-69), during which period he began his studies in chemistry, particularly the work of Swiss physician-chemist Paracelsus and supposedly the chemistry or alchemical-religious work of Klettenberg herself. [1]

Overview

Klettenberg has been described as a Herrnhut Pietist who was profoundly affected by mystic and theosophic traditions. [4]

Under her direction, Goethe immersed himself in both chemistry and alchemy, studying Bavarian alchemical writer Georg von Welling's 1719 *Opus Mago-Cabalisticum*, German writer Anton Kirchweger's *Golden Chain of Homer: a Description of Nature and Natural Things*, and various Rosicrucian books. [1]

A year later, following his recovery, Goethe famously commented to Klettenberg, in a 1770 letter: [2]

> "Chemistry is still my secret love."

It was Johann Herder, to note, who in 1776 had recommended the *Chemical Wedding* novel to Goethe. [2]

In 1786, possibly related in some way to these studies, as Goethean scholar Donald MacLean notes, Goethe wrote to Charlotte von Stein, mentioning that he saw in Johannes Andreae's 1616 *The Chemical Wedding of Christian Rosenkreutz* the making of a good story: [3]

> "There will be a good fairy tale to tell at the right time, but it will have to be reborn, it can't be enjoyed in its old skin."

(add discussion)

References

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External links

â— Susanne von Klettenberg (German → English) – Wikipedia.

θΔics

In science, **sustainability** refers to the study of how to maintain or instill a behavior or mode of progressive human existence, continuously, and stably into the future, given a limited supply of environmental resources.

A 1936 **sustainability** themed cartoon, by Jay N. 'Ding' Darling, from the 2013 book *State of the World 2013: Is Sustainability Still Possible?*, with chapters by Eric Zencey, among others, about how, supposedly, mother nature's resources are running out. [4]

Sustainability thermodynamics

See main: Sustainability thermodynamics

In 1865, Stanley Jevons, in his *The Coal Question*, starting with James Watt's improvements to the steam engine, first defines coal as "material energy", and then goes on to argue that supplies of coal will eventually run out: [1]

> "Coal in truth stands not beside but entirely above all other commodities. It is the material energy of the country — the universal aid — the factor in everything we do. With coal almost any feat is possible or easy; without it we are thrown back into the laborious poverty of early times. With such facts familiarly before us, it can be no matter of surprise that year by year we make larger draughts upon a material of such myriad qualities — of such miraculous powers."

In 1987, Swedish physician Karl-Henrik Robèrt who in 1987 proposed to develop a theory of society towards sustainability based on thermodynamics.

Thermodynamic arguments, typically involving the second law, are frequently involved in discussions on sustainability issues.

A recent promoter of efforts to develop a sustainability science based on thermodynamics is American mechanical engineer Timothy Gutowski. [1]

The 1999 "supply side sustainability" model, by Timothy Allen, Thomas Hoekstra, and Joseph Tainter, supposedly, is based on the ecological thermodynamics work of Eric Schneider and James Kay. [2]

In the 2006 book *The Myth of Progress*, American terrestrial ecologist Tom Wessels argues how society's current path toward progress, based on continual economic expansion and inefficient use of resources, runs absolutely contrary to what he calls the three laws of sustainability: (1) the law of limits to growth, (2) the second law of thermodynamics, which he argues exposes the dangers of increased energy consumption, and (3) the law of self-organization, which he sees as that behind the resulting diversity of such highly evolved systems as the human body and complex ecosystems. [3]

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External links

● Sustainability – Wikipedia.

θΔics

In human thermodynamics, **sustainability thermodynamics** is the use of thermodynamics models in development of sustainability theories.

History

In 1971, American physical chemist Stephen Berry, in his “The Option for Survival”, argued that in order to understand ‘survival’ one must use a thermodynamics view on the premise that people must recycle waste while the thermodynamic potential is still moderately high. [1]

In 1989, Swedish physician Karl-Henrik Robert outlined a thermodynamics sustainability model; which in 1991 evolved into a thermodynamics-structured “natural step” theory of societal sustainability. [2]

In 2012, during a lunch conversation with American electrochemical engineer Libb Thims, Iranian-born American chemical engineer Ali Mansoori commented that he was thinking about writing a book on sustainability, in a thermodynamics context.

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θΔics

In thermodynamics, **Svante Arrhenius** (1859-1927) was a Swedish physical chemist notable his Arrhenius equation, which gives the quantitative basis of the relationship between the activation energy and the rate (reaction rate) at which a reaction proceeds.

Education

Arrhenius completed his PhD dissertation in 1884 on the conductivity of electrolytes, done in part at both the University of Uppsala and the Physical Institute of the Swedish Academy of Sciences. The dissertation was not very impressive to the professors at Uppsala, but Arrhenius sent it to a number of scientists in Europe who were developing the new science of physical chemistry, including Rudolf Clausius, Wilhelm Ostwald, and Jacobus van't Hoff. They were far more impressed, and Ostwald even came to Uppsala to persuade Arrhenius to join his research team. Arrhenius declined, however, as he preferred to stay in Sweden for a while (his father was very ill and would die in 1885) and had received an appointment at Uppsala.

In circa 1886, Arrhenius received a travel grant from the Swedish Academy of Sciences, which enabled him to study with Ostwald in Riga (now in Latvia), with Friedrich Kohlrausch in Würzburg, Germany, with Ludwig Boltzmann in Graz, Austria, and with van 't Hoff in Amsterdam.

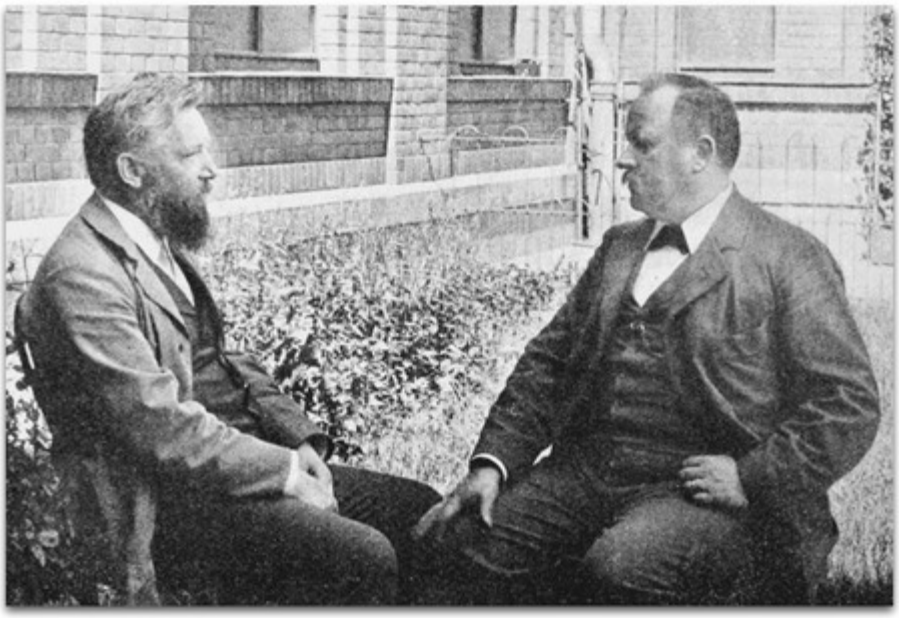

German chemist Wilhelm Ostwald and **Svante Arrhenius**, from a 1904 issue of *Popular Science Monthly* (Ñº); in 1884, Arrhenius published work which showed that affinities and electrical conductivity in solution parallel one another; Ostwald, who in 1882 had become full professor at the University of Riga, recognized the originality of the this young fellow chemist and helped him to find due appreciation, the same way M.M. Pattison Muir (1848-1931) had further him in 1879. [7]

In thermodynamics schools classification, Arrhenius is said to be part of the Van't Hoff school or "Arrhenius-Ostwald-van't Hoff school" as it has been sometimes called.

Activation energy

In 1889, Arrhenius explained the fact that most reactions require added heat energy to proceed by formulating the concept of activation energy, an energy barrier that must be overcome before two molecules will react. What has since come to be known as the Arrhenius equation gives the quantitative basis of the relationship between the activation energy and the rate at which a reaction proceeds.

In particular, building on the previous 1884 work of Dutch physical chemist Jacobus van't Hoff, Arrhenius introduced term "activation energy", by suggesting that a catalyst forms an intermediate complex with the reactants, which acts to lower the activation energy or barrier to reaction or product formation, the logic of which is embodied in the Arrhenius equation. [1] In particular, Arrhenius found that the plot of the logarithm of the rate constant (ln k) against the inverse of the absolute temperature (1/T) is a straight line: [2]

$$\ln k = \text{intercept} + \text{slope} \times \frac{1}{T}$$

where the intercept is denoted ln *A* and the slope is denoted $-E_A/R$, where *R* is the ideal gas constant, *A* is the pre-exponential factor, and E_A is the activation energy:

$$\ln k = \ln A - \frac{E_A}{RT}$$

whence

$$E_A = RT(\ln A - \ln k)$$

Nobel Prize

About 1900, Arrhenius became involved in setting up the Nobel Institutes and the Nobel Prizes. He was elected a member of the Royal Swedish Academy of Sciences in 1901. For the rest of his life, he would be a member of the Nobel Committee on Physics and a de facto member of the Nobel Committee on Chemistry.

He used his positions to arrange prizes for his friends (Jacobus van't Hoff, Wilhelm Ostwald, Theodore Richards) and to attempt to deny them to his enemies (Paul Ehrlich, Walther Nernst, Dmitri Mendeleev). [3]

Heat death

In human thermodynamics, Arrhenius is noted for his for his view of heat death and the second law about which he admitted the universality of the second law but thought, supposedly, that rare exceptions might occur leading to the rebuilding of worlds—perhaps by some conscious "Maxwellian demon", which could sort out individual molecules and thereby create a temperature difference without expending energy. [4]

In his 1909 *Worlds in the Making: the Evolution of the Universe*, Arrhenius supposedly attributed the heat death theory to Rudolf Clausius and his notion 'Wärmetod'. [6]

A group photo, dated 1900 at Innsbruck, Austria, showing Walther Nernst (back row, far left), **Svante Arrhenius** (back row, third from left), and Ludwig Boltzmann (front row, center). [5]

Acid base theory

In 1887, Arrhenius stated the theory that acid ionizes in aqueous solution to produce hydrogen ions (protons), H^+, and anions; and a base ionizes in aqueous solution to produce hydroxide ions (OH^-) and cations. Sometime during this period, Max Planck proposed a thermodynamic basis for Arrhenius' theory of electrolytic dissociation.

In 1903, Arrhenius won the Nobel Prize in Chemistry in recognition of his electrolytic theory of dissociation.

Origin of life

In 1903, in regards to the origin of life debate, Arrhenius advanced a version of the meteoroid origin of life theory. Specifically, he thought life might have been carried from planet to planet by the transport of spores.

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External links

â— Svante Arrhenius – Wikipedia.

θΔics

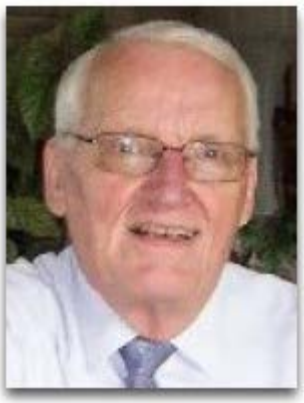

In animate thermodynamics, **Sven Jorgensen** (1934-) is a Danish ecologist and chemical engineer noted for his publications, in the field of ecological thermodynamics, on the application of various thermodynamics principles, such as exergy and emergy, as well as Prigoginean thermodynamics of self-organization of critical systems, etc., to the study of ecosystems. About sixty percent of his many articles in this area are focused on the logic of exergy, and the maximum exergy principle, in ecosystem modelling. An example concept he discusses is the dilute solution model. [1]

Jorgensen's first publication in this area was the 1982 section "A Holistic Approach to Ecological Modeling by Application of Thermodynamics" in the book *Systems and Energy*. [2] His latest publication, focused on evolution thermodynamics, is the 2008 book *Evolution Essays: A Thermodynamic Interpretation of Evolution.* [3] Jørgensen was the recipient of the 2004 Prigogine Medal, the inaugural year of the prize, awarded annually to a leading scientist in the field of ecological systems. [5]

A thermodynamic interpretation of evolution

In his 2008 book *Evolutionary Essays: A Thermodynamic Interpretation of Evolution*, Jorgensen uses the concept of eco-exergy as a fundamental concept to describe evolutionary processes, using the idiom that:

> "All real processes are irreversible which implies that exergy inevitably is lost. Exergy is not conserved."

He views eco-exergy as a bridge between equilibrium systems, which he views as dead systems, and far from equilibrium systems, which he views as living systems, a view that he enmeshes with Belgian chemist Ilya Prigogine's dissipative structure theory. [6]

Education

Jorgensen completed his MS in chemical engineering in 1958 at the Technical University of Denmark. [4] In 1975, he completed a PhD in environmental engineering at the Karlsruhe Institute of Technology, Germany. In 1990, he completed a second PhD in ecological modeling at Copenhagen University. [5]

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θΔics

In studies, **sweaty T-shirt study** is a mate selection study, conducted in 1995 by Swiss biologist Claus Wedekind, based on earlier animal studies, which found that people are most attracted to the scent of someone of the opposite sex that has the most dissimilar immune system to their own. [1] The results of the sweaty T-shirt study were used, at one point, by the once-active science-based pair matching site ScienticMatch.com (2008) to match people. [2] American anthropologist Helen Fisher calls the sweaty T-shirt study "one of the most important modern scientific studies". [3]

Overview of the 1995 sweaty T-shirt study: women smelled T-shirts worn by different men, for several days, and picked the ones they were most sexually attracted to; the men and women were then DNA typed, and the attraction patterns indicated that women tended to choose the scents of the men they were most MHC complex dissimilar to.

Overview

In the mid 1970s, MHC-dissimilar tendency matching was shown to be the case for mice (and later for other animals such as fish).

In 1974, the writer and medical researcher Lewis Thomas suggested that different MHC genes might be linked to different odors. He was considering training dogs to sniff out compatible people for skin grafts and organ donations. That led to work on laboratory mice and rats that established that the animals preferred mates that were different in their MHC genes.

Laboratory studies soon proved Thomas right in the case of mice. Inbred mice, who were alike in all genes but MHC, could detect a difference in the scent of a relative that harbored an ever-so-slightly different MHC gene. Moreover, their odor preferences were not innate but learned. Young mice tend to prefer the odor of their nest mates, but when they hit puberty: they preferred to mate with mice whose MHC genes were unlike their own. [4]

Scientists speculated that this was either a mechanism to prevent inbreeding or a way for animals to insure that their offspring would have immune systems diverse enough to fight as many diseases as possible. [5]

Study

In 1995, Swiss biologist Claus Wedekind, based on the previous animal studies, tested the theory on humans. In this study, Wedekind had a group of female college students smell T-shirts that had been worn by male students for three nights, without deodorant, cologne or scented soaps. Overwhelmingly, the women preferred the odors of men with the most dissimilar MHCs to their own

The theory of desired dissimilar immune system matching can be quantified according to markers on a person’s major histocompatibility complex (MHC), a large gene region that controls the immune system response, and postulates that couples attracted to this type of scent owing to the result that a resultant child would create a more robust immune system, more defensive against a greater variety of pathogens.

Wedekind, in particular, recruited a group of 49 women and 44 men who harbored a wide range of MHC genes. Wedekind gave each man a clean T-shirt on a Sunday morning and asked him to wear it for two nights. [4] He decided to gather male scent rather than female scent simply because unshaved armpits collect more odor. In fact, to ensure a strong body odor, he gave the men supplies of odor-free soap and aftershave and asked them to remain as "odor neutral" as possible.

On Tuesday morning, the men returned, sweaty T-shirts in hand. Wedekind put each shirt in a plastic-lined cardboard box with a sniffing hole on top. Then he brought in the women. Each was scheduled for the experiment at the midpoint of her menstrual cycle, when women's noses are reputedly the keenest, and each was presented with a different set of seven boxes. Three of the seven boxes contained T-shirts from men harboring MHC similar to the woman's own; three contained T-shirts from MHC-dissimilar men; and one contained an unworn T-shirt as a control.

The women were asked to rate each of the seven T-shirts as pleasant or unpleasant. Overall, says Wedekind, the women he tested were more likely to prefer the scent of men with dissimilar MHC. In fact, that scent tended to remind them of their boyfriends, both past and present. Says Wedekind, "This is the first indication that MHC still plays a role in mate choice today."

15 degree rule

In 2003, American electrochemical engineer Libb Thims conducted a study of 83 individuals, based on the findings of the MHC sent attraction studies, wherein, knowing that each MHC profile, per person, is based on one's average ethnicity, i.e. the latitudes of existence of the ancestors of each individual person, in the sense that each latitude will tend to yield species that survive owing to certain disease susceptibility trait resistances, he polled each person as to what (a) ethnicity they were most sexually-attracted to and (b) their own ethnicity. The results of the study found that people, on average, were least sexually attracted to individuals of their own latitude of ethnicity, something already known from the Claus Wedekind (1995) study, and "most" sexually-attracted to individuals ±15° in latitude, above or below their own latitude of ethnicity. [6] This has since been referred to as the 15 degree rule of mate selection, in regards to physical traits attraction compatibilities.

BP2: Libb Thims (2003) 15 degree rule (able to be replicated)
findings supported those of Wedekins
found that HMC was determined by ones ethnicity and ancestry and therefore their latitude
most desirable was 15 degrees north or south for mate selection

A 2015 snippet (Ñº) on Libb Thims 2003 study, on mate selection preferences in respect to MHC matching optimization, which found the 15 degree rule, i.e. in opposition to inbreeding, people tend to be most sexually attracted to people who are above them, in genetic composition, by plus or minus 15 degrees in latitude, according to polled opinion.

Science-based dating sites

Two science-based dating sites structured around MHC-matching theory include the 2003-launched GenePartner.com, the 2007-launched ScientificMatch.com.

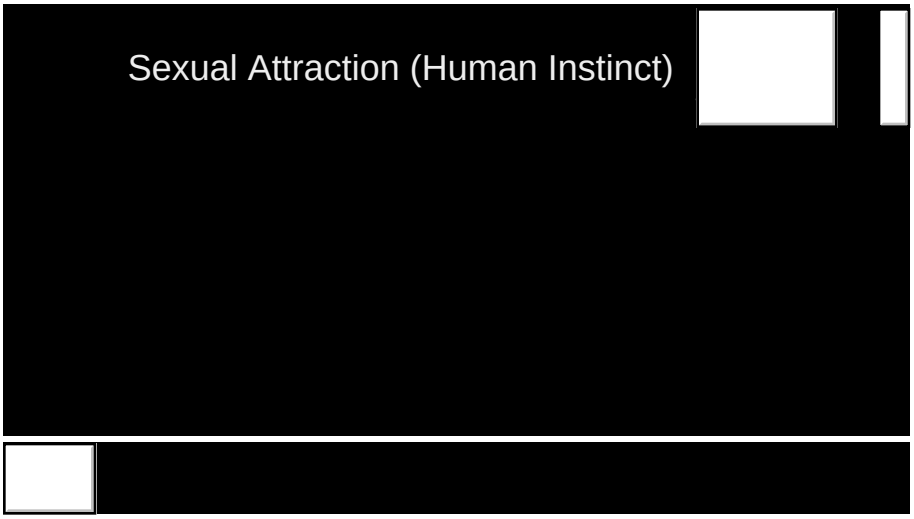

A video documentary on the **sweaty T-shirt study**.

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θΔics

In science, **swerve of the atom**, atomic swerve or *clinamen* "to incline", in the original Latin, was a circa 300BC atomic theory based ontic opening stylized proposition introduced by Greek philosopher Epicurus, contrary to the views of his predecessor Democritus, introduced to allow a certain amount of indeterminism (see: determinism) to exist in nature, specifically to allow humans to have free will, which was said to result owing to an uncaused "swerve" of the motion of atoms.

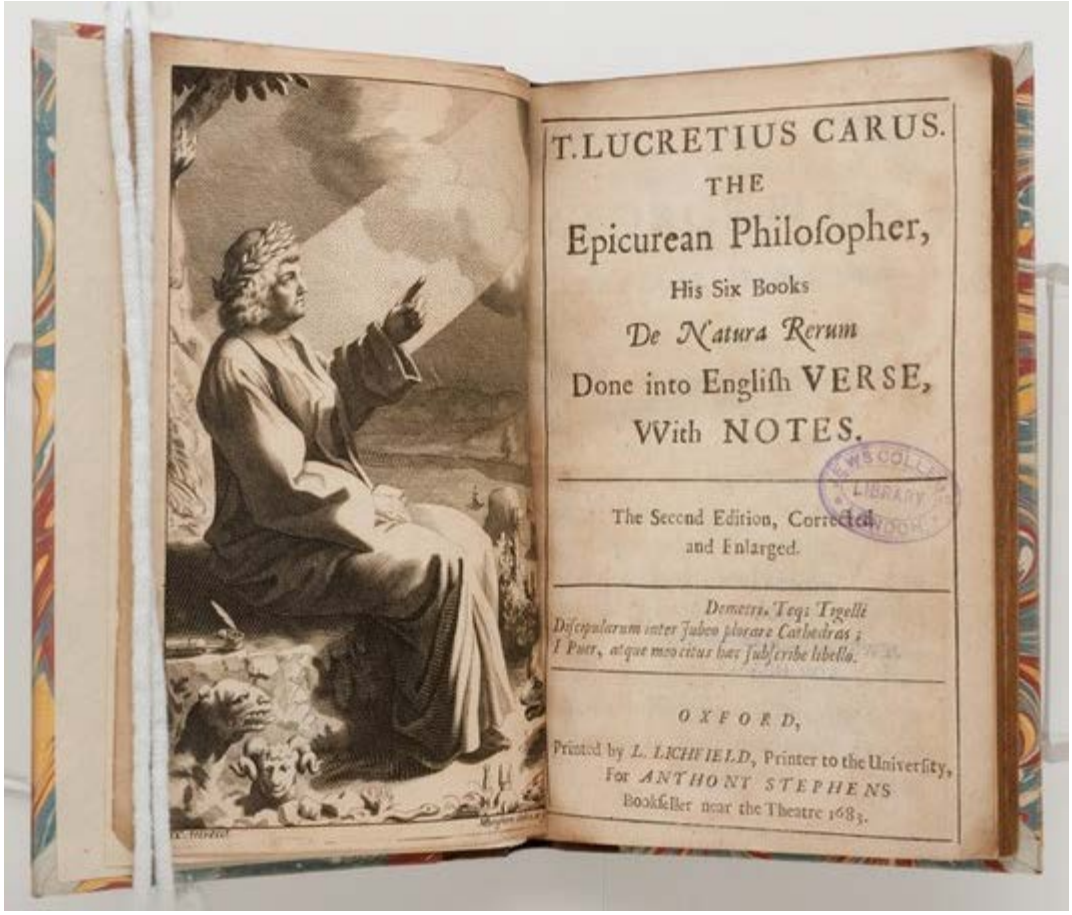

A 1683 version of Greek philosopher Lucretius' 55BC *On the Nature of Things*, wherein Epicurus' **atomic swerve theory** is explained, or rather posited to account for free will and choice.

Overview

In 55BC, Greek philosopher Lucretius, in his *On the Nature of Things*, on Epicurus' atomic swerve theory, stated the following:

> "There is one other point on this subject which I want you to understand. While the atoms are being carried down in a straight line through the void by their own weight, at quite uncertain times and at uncertain intervals they **swerve** slightly out of their course — just enough for one to be able to say that there has been an alteration in their movement. For if they had not this characteristic of moving out of the direct line, they would all fall downwards like drops of rain through the depths of the void; no collision would take place, no one atom would strike upon another; and so nature would never have produced anything at all.
>
> If by any chance anyone holds the view that heavier bodies, through being carried down more quickly in a straight line through the void, are able to fall from on top on lighter bodies and in this way produce impacts out of which the creative motion could arise, he is quite wrong and has strayed far from the path of true reason. When things fall downwards through water or through thin air, they must indeed accelerate the speed of their fall in proportion to their weights. This is because the corporeal structure of water and the nature of air cannot put a check on each thing equally; the heavier a thing is, the quicker they are mastered and have to give way. The empty void on the other hand cannot possibly offer any resistance to any thing anywhere or at any time: as its whole nature demands, it must always give way. Therefore all bodies, whether their weights are equal or not, must be carried through the peaceful void at an equal speed. And so the heavier bodies will never be able to fall from above on the lighter ones or by themselves produce the blows which give rise to the various motions by which nature carries on her work. Therefore (I must emphasize this point again and again) it is necessary that the atoms **swerve** slightly; and the **swerve** must only be the slightest possible; otherwise it will look as though we are assuming oblique motions, a theory which is against the evidence of real facts. For this is something which we see set down plainly before our eyes: that, so far as can be perceived, weights falling straight down from above do not have it in their nature to move obliquely. On the other hand no one has such power of perception as to be able to state that there is absolutely no deviation at all from a perfectly straight course.
>
> Then again, if we assume that all motion always goes on in a continuous chain with new motion always

arising out of the old in an absolutely determined order; and if the atoms, by means of this swerve, do not initiate a kind of motion that can break through the decrees of fate so that cause may not ' follow cause to infinity, then how can we explain this free will which we find in living creatures all over the earth? What, I say, is the origin of this faculty of ours which we have wrested from the fates and by which each of us goes where his pleasure leads him, deviating in our motions just as the atoms do at no fixed times or places, but just as our mind takes us? For it is beyond doubt that in these matters it is a man's will that provides the initiative and from it the movements spread through the limbs. You have no doubt observed too that when the barriers are let down at a given moment on a race-course, the strong eager bodies of the horses still cannot burst out into the track as suddenly as their minds in themselves would like to do. This is because the total quantity of matter has to be stirred up together throughout the whole body so that it may then make the collective effort of following the desire of the mind. So you may see that the origin of motion is an act of the intelligence and that this proceeds in the first place from the will of the mind, from it to be passed on further through the whole body and through the limbs. This is not at all the same thing as when we move forward because we are forced to do so by the impulsion of the great strength or great effort of someone else; for in this case it is quite clear that all the matter in the entire body is being pushed forward and hurried along against our will, until the will, operating through the limbs, has regained control. Do you see, then, that, though some external force often drives people on and often compels them to be swept forward headlong against their wills, nevertheless there is something in our breast capable of fighting against this impulse and resisting it? And it is owing to the power of this authority inside ourselves that the whole quantity of matter is sometimes compelled to alter course throughout the body and limbs, and, though pushed forward in one direction, is brought under control and made to settle back again.

You must admit therefore that the same principle holds true of the atoms: that, apart from weight and the blows of one atom on another, there must be another cause for motion, from which comes this power that is born in us, since we see that nothing can be produced out of nothing. It is weight that prevents everything being caused by the blows of one atom on another, as it were by an external force; but it is the minute **swerve** in the atoms, taking place at no definite time or place, which keeps the mind itself from being governed by an internal necessity in all its actions, and from being as it were subdued by this necessity so as to be merely a passive subject."

Objectors

Some of the first to object to the atomic swerve theory include Cicero, who in his 45BC *On the Ends of Good and Bad Things*, arguing that if it was necessary first to go all out for natural law to dispense with divine intervention by gods then suddenly and capriciously cancel out all of this beautiful logic by inventing an uncaused swerve, then the entire atomic theory of Leucippus, Democritus, Epicurus, and Lucretius was probably after all just so much "childish fancy" (see also: Christoph Wieland). [2] Likewise, Plutarch (c.46-129AD), in his *Moralia*, shared Cicero's skepticism, writing in his section on the cleverness of animals that: [3]

"Philosophers do not concede to Epicurus, for the sake of the highest considerations, a thing so small and trifling as the slightest deviation of a single atom—which would permit the stars and living creatures to slip in by chance and would preserve from destruction the principle of free will."

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â— Clinamen – Wikipedia.
â— Atomic swerve – Epicurus wiki.

θΔics

In thermodynamics, **Sybren de Groot** (1916-1994) was a Danish physicist noted for his work in initiating the field of nonequilibrium thermodynamics or irreversible thermodynamics; his most popular book is the 1961 *Nonequilibrium Thermodynamics,* co-written with his graduate student Peter Mazur. [1]

Prigogine

De Groot's work was very influential to Belgian chemist Ilya Prigogine, who comments in his 1977 Nobel Lecture: [3]

> "Notwithstanding this local character, the linear thermodynamics of irreversible processes had already led to numerous applications, as shown by people such as J. Meixner, **S.R. de Groot** and P. Mazur, and, in the area of biology, A. Katchalsky. It was for me a supplementary incentive when I had to meet more general situations. Those problems had confronted us for more than twenty years, between 1947 and 1967, until we finally reached the notion of 'dissipative structure'."

(add discussion)

Education

De Groot completed his PhD in 1945, with a dissertation on "The Soret Effect: Thermal Diffusion in Condensed Phases", under Dutch physicist Cornelius Gorter at the University of Amsterdam. [2]

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External links

â— Sybren Ruurds de Groot (German → English) – Wikipedia.

θΔics

In thermodynamics, **symbols** or "notations" are means of representing measurable quantities or formulaic representations of these quantities by means of letters, modifications of letters, e.g. italics, bold, hats, cross-bars, etc., or other shapes, figurines, or operators.

> "Philosophy is written in that great book that lies before our gaze—I mean the universe—but we cannot understand it if we do not first learn the language and grasp the **symbols** in which it is written."
>
> — Galileo Galilei (1623), *The Assayer* [52]

> "I know several men who see all nature in **symbols**, and express themselves conformably whether in Quintics or Quantics, Invariants or Congruents."
>
> — James Maxwell (1863), letter (Ñº) to (someone)

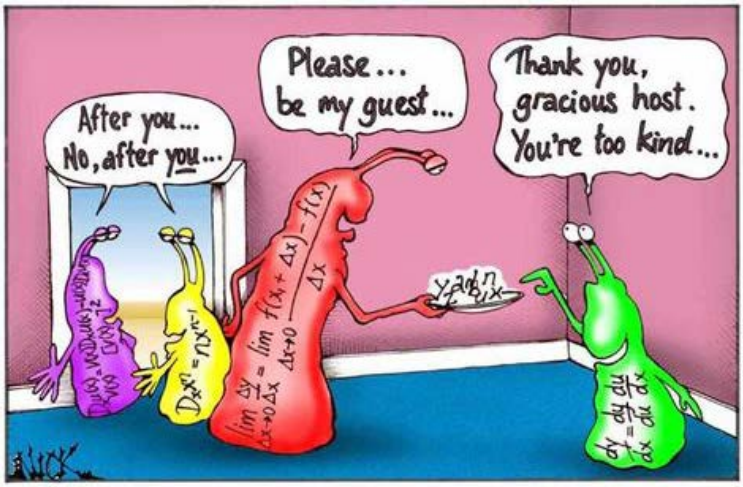

A differential equation **symbols** cartoon by Nick Kim. [49]

> "The first time I heard about chemical thermodynamics was when a second-year undergraduate brought me the news early in my freshman year. He told me a spine-chilling story of endless lectures with almost three-hundred numbered equations, all of which, it appeared, had to be committed to memory and reproduced in exactly the same form in subsequent examinations. Not only did these equations contain all the normal algebraic **symbols** but in addition they were liberally sprinkled with stars, daggers, and circles so as to stretch even the most powerful of minds."
>
> — Brian Smith (1973), *Basic Chemical Thermodynamics* [1]

Table

The following is an (under-construction) table of the various symbols used in thermodynamics and its connective fields. Some symbols are linked to as separate article, as listed in the adjacent navigation box. Curiously, of note, it seems that smaller letter, e.g. *p*, *t*, *v*, were preferred at the turn 19th century, whereas capital letters, e.g. *P*, *T*, *V*, were preferred at the turn of the 20th century and onward, for the most part. In the meaning column (two), names shown in brackets are what people tend to call the symbol in the modern sense; if no brackets are shown, then it is the name used according to the reference given:

Symbol	Meaning	Formula	Date	Person
Δ (link)	Fire or Heat		450BC	Egyptians, Greeks, or Democritus [53] Empedocles. [14]
$+$	(Plus sign)		1489 1518	Johannes Widmann (Ñº) Henricus Grammateus [43]
$-$	(Minus sign)		1489 1518	Johannes Widmann (Ñº) Henricus Grammateus [43]
$=$ (link)	(Equals sign)		1557	Robert Recorde. [42]
$>$ $<$			c.1600	Thomas Harriot [51]
Log.	Logarithm		1616	Appears as an abbreviation for logarithm in *A Description of the Admirable Table of Logarithmes* (1616), an English translation by Edward Wright of John Napier's work. [47]
∞	Infinity		c.1655	John Wallis [54]
$\leq$ $\geq$			1670	John Wallis [51]
$\int$	Integral		1675	Gottfried Leibniz: according to Leibniz's notebooks, a critical breakthrough occurred on 11 November 1675, when he employed integral calculus for the first time to find the area under a function $y=f(x)$. He introduced several notations used to this day, for instance the integral sign $\int$ representing an elongated S, from the Latin word *summa*. [32]

d	Derivative		1675	Gottfried Leibniz: in the same notebook, Leibniz employed the use of *d* for differentials, from the Latin word *differentia*. [32]
Ï• (phi)	Phlogiston		1704	Georg Stahl: [24]
T	Temperature		?	
V	Volume		?	
P	Pressure or weight of the overlying atmosphere		1738	Daniel Bernoulli: “the weight *P* holding down the piston in [a given] position is the same as the weight of the overlying atmosphere, which we shall designate *P* in what follows.”[34]
n	Number of particles		1738	Daniel Bernoulli: [34]
f(x)	Function		1755	Leonhard Euler: was the first to write *f*(*x*) to denote the function *f* applied to the argument *x*. [44]
i	Imaginary number		1755	Leonhard Euler: [44]
e	Natural log base		1755	Leonhard Euler: [44]
∑	Summation		1755	Leonhard Euler: [44]
→	Dart (Reaction arrow)	$\begin{cases} A \searrow C \\ B \end{cases}$	1757	William Cullen: “the dart → between them expresses the *elective attraction*; when I put a dart with the tail to one substance and the point to another, I mean that the substance to which the tail is directed unites with the one to which the point is directed more strongly than it does with the one united to it in the crotchet {” . [9]
{	Crotchet (Bonding bracket)	$\begin{cases} A \\ B \end{cases}$ equates to: AB or A≡B (modern)	1757	William Cullen: “by the mark { I mean them united to another” [9]
∂	Partial differential	"curly d"	1770	Marquis de Condorcet
AB	Chemical union	AB	1775	Torbern Bergman
T	Vis viva (kinetic energy)	$\frac{1}{2}mv^2$	1788	Joseph Lagrange: [6]
$\int_a^b$	Definite integral		1822	Joseph Fourier, in his *Analytical Theory of Heat*, introduced the symbol, and stated: “We refer in general by the sign (adjacent) as the Integral symbol with a and b as the Limits of the full integration that begins when the variable is equivalent to a, and is complete when the variable is equal to b.” [46]
s (or e)	Heat		1824	Sadi Carnot: "[s is] the heat liberated (set free) or absorbed" when "a gas varies in volume without change in temperature."; "let e be the quantity of heat employed to maintain the temperature of the gas constant during its dilation." [21]
r (or u)	Motive power (work)		1824	Sadi Carnot: [21]
Q	Heat		1834	Emile Clapeyron: "Q is an absolute quantity of heat which the gas possesses." [21] The "Q" supposedly is short for small "quantity"; the usage may date earlier, possibly to Joseph Fourier, and his *Analytical Theory of Heat* (1822)?
R	Gas constant		1834	Emile Clapeyron: (possibly used earlier?) [21][23]
U	Force function		1835	William Hamilton: "the function which has been here called *U* may be named the *force-function* of a system." [7]
	Quaternion operator Nabla (Maxwell, c.1873) Del (Gibbs and Wilson, 1901)	$\left(i\frac{d}{dx} + j\frac{d}{dy} + k\frac{d}{dz} \right)$	1837	William Hamilton Coined by Peter Tait, in dispute with Maxwell (link); or by Maxwell in honor of Tait, in his circa 1873/74 poem "Chief Musician upon Nabla" (link) (link)
T	Vis viva		?	Rudolf Clausius:

		$\sum \frac{1}{2}mv^2$		
J	Ergal	$J_0 - \int_{t_0}^{t} \sum (X\,dx + Y\,dy + Z\,dz)$	?	Rudolf Clausius: [26]
U	Energy	T + J	?	Rudolf Clausius: "[U is the] "energy of the system"; [according to the conservation of energy] the sum of the vis viva *T* and the ergal *J* [which] remains constant during its motion." [26]
W	Work	F (xyz) + const.	?	Rudolf Clausius: "[W is] the work done whenever a body moves under the influence of a force" and "the product of the force and distance moved through is the mechanical work which the force performs during the motion."
S	Entropy	$\frac{dQ}{T}$	1865	Rudolf Clausius: [27]
U	(Internal energy)		1865	Francois Massieu: [3][12]
U'	(Heat content)		1865	Francois Massieu: [3][12]
Ψ (psi)	Characteristic function	$\frac{-U+tS}{t}$ or $\frac{-\psi}{t}$	1869	Francois Massieu: [12]
Ψ' (psi prime)		$\frac{-U+tS-pv}{t}$ or $\frac{-\zeta}{t}$	1869	Francois Massieu: [12]
E	Entropy		1872	Ludwig Boltzmann: [36]
H	Heat		1873	Willard Gibbs: "heat received by the body in passing from one state to another". [5]
ε (epsilon)	Energy		1873	Willard Gibbs: "the energy of body in a given state". [5]
η (eta)	Entropy		1873	Willard Gibbs: "the entropy of a body in a given state". [5]
$\bar{d}$ (d-hat)	Inexact differential		1875	Carl Neumann: [28]
χ (chi)	(Heat content)	ε + pv	1876	Willard Gibbs: "heat function at constant pressure" [3]
Ψ (psi)	(Helmholtz function)	ε – tη	1876	Willard Gibbs: “the force function for constant temperature” [11]
ζ (zeta)	(Gibbs function)	ε – tη + pv	1876	Willard Gibbs:
μ (mu)	Potential (Chemical potential)		1876	Willard Gibbs: "if to any homogeneous mass in a state of hydrostatic stress we suppose an infinitesimal quantity of any substance to be added, the mass remaining homogeneous and it entropy and volume remaining unchanged, the increase of the energy of the mass divided by the quantity of the substance added is the *potential* for that substance in the mass considered." [8]
P	Potential difference (of a galvanic cell) or Pressure		1877	Hermann Helmholtz: [20]
â„°	(Electromotive force)	$P_k - P_a$	1877	Hermann Helmholtz: "P is the potential difference (a and k referring to the anode and cathode, respectively) in a concentration cell." [20]
J	Mechanical equivalent of heat		1882	Hermann Helmholtz: [20]
θ	Absolute temperature	"temperature reckoned from –273° C"	1882	" "
S	Entropy		1882	Hermann Helmholtz: [20]
U	Total energy		1882	Hermann Helmholtz: "the *total energy* (gesammt-energie) of the system [19]
𝔉, F	Free energy	U – JTS	1882	Hermann Helmholtz: "the *free energy* (frieie energie) of the system." [20]
𝔊, B	Bound energy	JTS (J=1 in modern joule units)	1882	Hermann Helmholtz: "the *latent energy* (gebundene energie) of the system." [19]

⇆	Reversible reaction		1884	Jacobus van't Hoff [45]
A–B A=B	Uniting dashes (chemical bond)	represent the "force lines" associated with atomic valencies.	1893	Walther Nernst
ln	Natural logarithm		1893	Used by Irving Stringham (1847-1909) in *Uniplanar Algebra* (Cajori vol. 2, page 107). [47]
U	Energy		1897	Max Planck: "the energy of a body or system of bodies." [19]
Φ (phi)	Entropy		1897	Max Planck: [19]
F	Free energy	U – TΦ	1897	Max Planck: “The function F, thus bearing the same relation to the external work that the energy U does to the sum of the external heat and work, has been called by Helmholtz the *free energy* (frieie energie) of the system (it should rather be called the ‘free energy for isothermal processes’).” [19]
Ψ (psi)	(Gibbs energy)	$\Phi - \frac{U+pV}{T}$ or $-\frac{G}{T}$	1897	Max Planck: “multiplying Φ by – T, we get the *thermodynamic potential at constant pressure* U + *p*V – T*Φ*” [19][2]
U	(Internal energy)		1897	Pierre Duhem: [18][3]
–	(Heat content)		1897	Pierre Duhem: [3]
$\mathfrak{F}$	(Helmholtz free energy)		1897	Pierre Duhem: [18][3]
Φ (phi)	(Gibbs potential)		1897	Pierre Duhem: [18][3]
h	Universal constant (Planck constant)	$6.55 \cdot 10^{-27} erg \cdot sec$	1900	Max Planck: "universal constant"[38]
k	Universal constant (Boltzmann constant)	$1.35 \cdot 10^{-16} \frac{erg}{deg}$	1900	Max Planck: "universal constant" [38]
A	Reaction energy		1905	Fritz Haber: [31]
Q	Reaction heat		1905	Fritz Haber: [31]
q	Latent heat of reaction		1905	Fritz Haber: "here we use minus *q* to designate the heat which is used up or in other words, becomes latent (or bound?)." [31]
S	Entropy	$\frac{q}{T}$	1905	Fritz Haber: [31]
U	Total energy		1905	Fritz Haber: [31]
N	Avogadro's constant	$70.5 \cdot 10^{22}$	1909	Jean Perrin: “the invariable number N is a universal constant, which may appropriately be designated *Avogadro’s constant.*” [37]
H	Enthalpy	E + PV	1909	Heike Kamerlingh-Onnes: coined the name enthalpy from the Greek εν (*en*) ‘in’ and θαλπος (*thalpos*) ‘to heat’, to define the word *enthalpos*, to warm within. [4]
U	Energy		1912	Otto Sackur: [17]
H	Heat content	U + pv	1912	Otto Sackur: “the heat of reaction at constant pressure is equal to the change in the function *H*. For this reason *H* is called the heat content of the system, or the heat function for constant pressure.” [17]
Ψ (psi)	Free energy function	U – TS	1912	Otto Sackur: [17]
ζ (zeta)	Thermodynamic potential	U – TS + pv	1912	Otto Sackur: “some authors use the term free energy for the function ζ, although this term was invented by Helmholtz for the function ψ (See G.N. Lewis, *J. Am. Chem. Soc*. 35: 14 (1913)).” [17]
U	Energy content		1917	Walther Nernst: [33]
Q	Heat flow		1917	" "
A	Work	German “Arbeit”, meaning work,	1917	" "

S	Entropy		1917	" "
$\oint$	Contour integral sign Line integral Path integral Curve integral		1917	Arnold Sommerfeld [50]
E	Internal energy		1923	Lewis and Randall: "[E is] the energy contained within a system, or its internal energy, a property of the system." [10]
A	Helmholtz free energy	E – TS	1923	" "
F	Free energy	(E + PV) – TS H – TS	1923	" "
A	Work		1924	James Partington: [15]
d	Ordinary differential			" "
θ (theta) or T	Temperature		1924	[" "]: “the symbol θ is used throughout to denote temperature measured on *any* scale, unless the scale is specified.” [15]
U	Intrinsic energy		1924	" "
H	Enthalpy; Total heat; Heat function	U + pV	1924	[" "]: “the function H was called by Gibbs the *heat function at constant pressure*, and denoted by χ; the name *enthalpy* has been proposed by Kamerling Onnes (τÏŒ θαλπος = heat). It is usually called by engineers the *total heat*, or *heat content*, but these names refer to an obsolete period in the theory of heat.” [15]
F	Free energy	U – TS	1924	" "
Z	Thermodynamic potential	U – TS + pV	1924	[" "]: “Z is called the *thermodynamic potential* by analogy with the potential function in dynamics: $Ï•_1 – Ï•_2$ = work” [15]
$(\int)\ \delta Q/T$	Cycle integral âˆ® (circle integral) closed path integral	$\sum \frac{Q}{T}$	1924	Used by Partington (1924) in a thermodynamic sense; may have been used by Arnold Sommerfeld in 1917, if not sooner?
Δ	Change	"excess of final over initial value" (e.g. $\Delta G = G_f - G_i$)	1933	Edward Guggenheim - defined in formulaic terms [11]; symbols used previously by Gilbert Lewis (1923).
H	Heat content	E + PV	1933	" "
F	Helmholtz free energy	E – TS	1933	[" "]: “the function *F* is due to Helmholtz, and was named by him the ‘free energy’. It is sometimes called the ‘work function’. We shall call *F* the ‘Helmholtz free energy’.” [11]
G	Gibbs free energy	H – TS	1933	Edward Guggenheim: “the function *G* is due to Gibbs, and is often referred to by modern writers as ‘free energy’. We shall call *G* the ‘Gibbs free energy’.” [11]
U	Internal energy		1934	Theophile de Donder: [16]
E	Internal energy		1936	Theophile de Donder: [3]
A	Affinity	$-\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$	1936	" "
Ξ or B (?)	Exergy		1956	Zoran Rant: [39]
S	Entropy	$\frac{dQ_{rev}}{T}$	1968	Clement Adkins: "[the *rev* subscript is used] to emphasize that the equality holds for reversible changes only." [41]
E	Total exergy		2004	Norio Sato: “we shall use the symbol *E* (capital epsilon) to express total exergy. [40]
ε	Molar exergy		2004	Norio Sato: “we shall use the symbol ε (small epsilon) to express molar (or specific exergy). [40]

Undated

The following needed to be dated with reference to the actual person who first used the symbol (starting point references are shown in brackets):

c_p	Specific heat at constant pressure			[19]
c_v	Specific heat at constant volume			[19]
γ (gamma)		$\frac{c_p}{c_v}$	1897	Max Planck (?): [19]
J	Massieu function	$\frac{-F}{t}$	1960	Herbert Callen (?): [13]
Y	Planck function	$\frac{-G}{t}$	1960	Herbert Callen (?): [13]

Discussion

The following is a discussion section on some of the symbols.

Α α	alpha	Ν ν	nu
Β β	beta	Ξ ξ	ksi
Γ γ	gamma	Ο ο	omicron
Δ δ	delta	Π π	pi
Ε ε	epsilon	Ρ ρ	rho
Ζ ζ	zeta	Σ σς	sigma
Η η	eta	Τ τ	tau
Θ θ	theta	Υ υ	upsilon
Ι ι	iota	Φ φ	phi
Κ κ	kappa	Χ χ	chi
Λ λ	lambda	Ψ ψ	psi
Μ μ	mu	Ω ω	omega

The **Greek alphabet**: used greatly in thermodynamics; capital delta Δ, for example, refers to heat (in chemistry) or change (in thermodynamics), as in before minus after of some variable, small delta δ represents an inexact differential, as in δW or δQ, as does Ä‘ (d-crossbar), and *d* refers to an exact differential, as in *dU* or *dS*.

Some common symbol examples include, âˆ† the symbol for heat or fire, θâˆ†ics the shorthand symbol for thermo-dynamics, *U* for internal energy, *G* for Gibbs free energy, *A* of *F* for Helmholtz free energy, *S* for entropy, *T* for temperature, *P* for pressure, *V* for volume, etc.

Etymologies

The etymologies of many symbols are very difficult to track down. Belgian chemist Theophile de Donder's 1936 book *A Thermodynamic Theory of Affinity* contains one of the first symbol tables for the main thermodynamic functions used by various pioneering authors up to that year. [3] One of the few articles on symbol etymology history is the 1997 "A Brief History of Thermodynamics Notations" by American chemical thermodynamicist Rubin Battino who commented, in motivation prior to writing his article, that: [2]

"I was recently asked, 'I understand the use of *H* for enthalpy because that is *heat* related, but where does *S* for entropy come from?' I was stumped and decided to do some historical research to track down not only the origin of *S* but also the other principal thermodynamic terminology and notation."

This semi error filled article (e.g. attributing enthalpy, *H*, to Clapeyron, or the statement "Clausius in 1834 [age 12] was using *Q* for heat"), however, fails in its essential mission to determine the origin of *H* to enthalpy (which was assigned in 1909 by Dutch physicist Heike Kamerlingh-Onnes), and the origin of *S* to entropy, assigned by German physicist Rudolf Clausius in 1865. The origin of S as entropy is arguably assigned either (a) on the following of Sadi Carnot's 1824 use of the small letter

"[***s*** represents] the heat liberated (set free) or absorbed"

during an isothermal expansion of a body of gas; or (b) in honor of S. Carnot's first name "Sadi". [21] Both of these tables are shown below:

De Donder's 1936 Symbol Table

Battino's 2001 Symbol Table

Notations used for the thermodynamic potentials in some important texts of Thermodynamics.

Authors	Internal Energy	Heat Content	Helmholtz Free Energy or Maximum Work	Gibbs Thermo-dynamic Potential
De Donder (new edition)	E	H	F	G
De Donder [1] (old edition)	U	Ψ	F	H
Gibbs [2]	ε	χ	ψ	ζ
Duhem [3]	U	—	$\bar{\Psi}$	Φ
Guggenheim [4]	E	H	F	G
Lewis and Randall [5]	E	H	A	F
Massieu [6]	U	U'	$-t\psi$	$-t\psi'$
Partington [7]	U	H	F	Z
Planck [8]	U	W	$-T\Psi$, F	$-T\Phi$
Sackur [9]	E_e	E_φ	F_v	F_p
Schottky, Ulich and Wagner [10] / Ulich [11]	U	W	F	G
van Lerberghe [12]	U	I	F	H

Belgian chemist Theophile de Donder's 1936 thermodynamic potential notation table. [3]

Name	Etymology[a]	Symbol	Source
Pressure	pressura (L)	P	
Volume	volumen (L)	V	
Temperature	temperatura (L) temperature (Fr)	T	
Work	work, werk, weorc (ME) worc, werc, weorc (AS)	W	
Heat	hete, haete (ME) heiza, heiza (OHG) hitze (G), hitte (D)	Q	calorique (Fr) Lavoisier (?)
Enthalpy	ενθαλπειν (Gr)	H	Clapeyron (?) Clausius (?)
		χ	Gibbs
		$\mathbf{X}$	Epstein
Entropy	η'τροπη' (Gr)	S	Clausius
		η	Gibbs
		Φ	Planck
Gibbs energy		G	IUPAC
		ζ	Gibbs
		Φ	Epstein
		F	Lewis
		ψ	Planck ($= -G/T$)
Helmholtz energy	freie Energie (Helmholtz)	A	IUPAC
		F	Planck
		ψ	Gibbs
		ψ	Epstein
Chemical potential		μ	Gibbs

[a] L = Latin; Fr = French; ME = Middle English; AS = Anglo-Saxon; OHG = Old High German; D = Danish; Gr = Greek.

American chemical thermodynamicist Rubin Battino's 2001 thermodynamic symbol etymology table. [2]

Jensen's symbol research

A few interesting symbol etymology articles come from American chemistry historian William Jensen, who runs a semi-annual "Ask the Historian" column of the *Journal of Chemical Education*, who takes email queries on "historical origins of symbols". In his 2003 “The Universal Gas Constant R”, a response to a reader's inquiry, which “traces the history of the gas constant *R* and the probable reason for its representation by the letter *R*", Jensen tracks the first use of the constant to French engineer Emile Clapeyron's use of R in his 1834 *Memoir on the Motive Power of Fire*. [22][23]

In his 2010 "Why Are *q* and *Q* Used to Symbolize Heat?", Jensen attempts to outline the historical usages of "q" and "Q" in the works of Clapeyron, Rudolf Clausius, August Horstmann, Hermann Helmholtz, Fritz Haber, up through Gilbert Lewis. [48]

See also

â— Characteristic function
â— Characteristic function table

IUPAC's 2007 Chemical Thermodynamics Symbol Table

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Name	*Symbol*	*Definition*	*SI unit*	*Notes*
heat	Q, q		J	1
work	W, w		J	1
internal energy	U	$dU = đQ + đW$	J	1
enthalpy	H	$H = U + pV$	J	
thermodynamic temperature	$T, (\Theta)$		K	
International temperature	T_{90}		K	2
Celsius temperature	θ, t	$\theta/°C = T/K - 273.15$	°C	3
entropy	S	$dS = đQ_{rev}/T$	$J\ K^{-1}$	
Helmholtz energy, (Helmholtz function)	A, F	$A = U - TS$	J	4
Gibbs energy, (Gibbs function)	G	$G = H - TS$	J	
Massieu function	J	$J = -A/T$	$J\ K^{-1}$	
Planck function	Y	$Y = -G/T$	$J\ K^{-1}$	
surface tension	γ, σ	$\gamma = (\partial G/\partial A_s)_{T,p,n_i}$	$J\ m^{-2}$, $N\ m^{-1}$	
molar quantity X	$X_m, (\overline{X})$	$X_m = X/n$	$[X]/mol$	5, 6
specific quantity X	x	$x = X/m$	$[X]/kg$	5, 6
pressure coefficient	β	$\beta = (\partial p/\partial T)_V$	$Pa\ K^{-1}$	
relative pressure coefficient	α_p	$\alpha_p = (1/p)(\partial p/\partial T)_V$	K^{-1}	
compressibility,				
isothermal	κ_T	$\kappa_T = -(1/V)(\partial V/\partial p)_T$	Pa^{-1}	
isentropic	κ_S	$\kappa_S = -(1/V)(\partial V/\partial p)_S$	Pa^{-1}	
linear expansion coefficient	α_l	$\alpha_l = (1/l)(\partial l/\partial T)$	K^{-1}	
cubic expansion coefficient	α, α_V, γ	$\alpha = (1/V)(\partial V/\partial T)_p$	K^{-1}	7
heat capacity,				
at constant pressure	C_p	$C_p = (\partial H/\partial T)_p$	$J\ K^{-1}$	
at constant volume	C_V	$C_V = (\partial U/\partial T)_V$	$J\ K^{-1}$	

Table of common **chemical thermodynamics symbols** from the 2007 (3rd ed) of *Quantities, Units and Symbols in Physical Chemistry*. [30]

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θΔics

In chemistry, **sympathy** (TR:31), from the Greek *sin-* “with, along with” + *-pathos* “feeling”, i.e. “fellow-feeling”, a *circa* 800 to 1900 employed concept, was a hypothetical quasi-emotional chemical or alchemical and or gravity-like force thought to connect different things, e.g. elements to elements, planets to metals, plants to plants, animals to animals, etc.

Planet		*Symbol*	
Ηλιος	Sun	☉	gold
Σεληνη	Moon	☾	silver
Κρονος	Saturn	♄	lead
Ζευς	Jupiter	♃	bronze
Αρης	Mars	♂	mixed metal
Αφροδιτη	Venus	♀	tin
Ερμης	Mercury	☿	iron

A circa 1,000AD listing of various elements and their alchemical symbols, during which time it was believed there existed some type of "**sympathy**" connection between astrology and the metals. [1]

Overview

In c.70BC, Greek philosopher Posidonius advocated a theory of cosmic "sympathy" (συμπάθεια, *sumpatheia*), the organic interrelation of all appearances in the world, from the sky to the earth, as part of a rational design uniting humanity and all things in the universe, even those that were temporally and spatially separate. (O)

> “Nature persists and coheres by its own power without any help from gods. There is indeed inherent in it a kind of harmony or **‘sympathy’** as the Greeks call it. But the greater it is in its own right, the less need it be regarded as the work of some divine power.”
>
> — Cotta (Cicero) (45BC), *On the Nature of the Gods*

In 1000AD, the first attempts to represent chemical entities using "characters" or "symbols" was done some time in the late first century, when it was theorized that some type of "sympathy" connection existed between the astrology and the metals, thus, e.g., silver Ag, colored the same as the moon, was assigned with the chemical symbol of a crescent moon , gold Au, colored the same as the sun, was assigned with the chemical symbol of the sun (or ☼), among other types of similar assignments.

In 1789, John Stewart, in his *Moral Motion*, possibly similar to Leonardo da Vinci, seems to have derived a vegetarianism philosophy based on his moral motion sympathy-centric ideology; some of which seems to be elaborated on as follows: [2]

> “A man in an enlightened state of nature will be averse to the violence necessary to procure subsistence by animal food, and the only violence he will permit, and that with extreme regret, will be the destruction of destructive creatures, whom he cannot change by education or prevent by restriction: both of which means he will first attempt, in order that the ‘sacred passion of **sympathy**’ may receive no callosity or diminution by hasty or voluntary violence.”

(add)

Affinities

The concept "sympathy",particularly after the publication of Newton's "Query 31" (1718), in large part, seems to have been usurped and and or supplanted by "affinity", in large part.

Quotes

The following are related quotes:

> “Like Empedocles, Leo identifies cosmic attraction with love. But he points out three degrees of love —natural, sensible, and rational. By natural love he means those "**sympathies**" which attract a stone to the earth, make rivers flow to the sea, keep the sun, moon, and stars in their courses, etc. Burton (1652) agrees with Leo, and asks quaintly: ‘How comes a loadstone to draw iron to it . . . the ground to covet showers, but

for love? . . . no stock, no stone, that has not some feeling of love. It is more eminent in Plants, Herbs, and is especially observed in vegetals; as betwixt the Vine and Elm a great sympathy,' 'Sensible' Love is that which prevails among animals. In it Leon recognizes the higher elements of delight in one another's company, and of attachment to a master. 'Rational' Love, the third and highest class, is peculiar to God, angels, and men. But the inclination to confound gravitation and other natural forces with Love is not to be found among ancient and mediaeval authors alone. Paradoxical as it may seem, it is the 'gross materialist'," Dr. Ludwig Buchner, who exclaims rapturously: "For it is love, in the form of *attraction*, which chains stone to stone, earth to earth, star to star, and which *Cosmic Attraction and Chemical Affinities* holds together the mighty edifice on which we stand, and on the surface of which, like parasites, we carry on our existence, barely noticeable in the infinite universe; and on which we shall continue to exist till that distant period when its component parts will again be resolved into that primal chaos from which it laboriously severed itself millions of years ago, and became a separate planet."

— Henry Finck (1887), *Romantic Love and Personal Beauty* [4]

"I am tempted to send Winiarski criticism. Why he called selfish and altruistic one hand on the other hand the forces of competition tends to be the balance of the moral world? Selfishness is it not by itself a principle sufficient to reconstruct the moral world the forces of attraction and repulsion that occur in any cosmic system? If these forces must be given a new name when carried out in this moral field, the words love and hate, or **sympathy** and antipathy, does not correspond with a more precise symmetry in attraction and repulsion, are not they not to each other more closely balances?"

— Jules de Gaultier (1898), "Review of Winiarski's *Essay on Social Mechanics*" (O) [3]

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θΔics

In conferences, **Symposium on Science and Human Values** was a 29 Dec 1970 meeting of the American Association for the Advancement of Science (AAAS), focused on “human values in the context of thermodynamics” (Q), held in Chicago, which had five presenters, including Ralph Burhoe, founding editor of *Zygon*, Aharon Katchalsky, and Bruce Lindsay, along with four commentators, including: Mihaly Csikszentmihalyi.

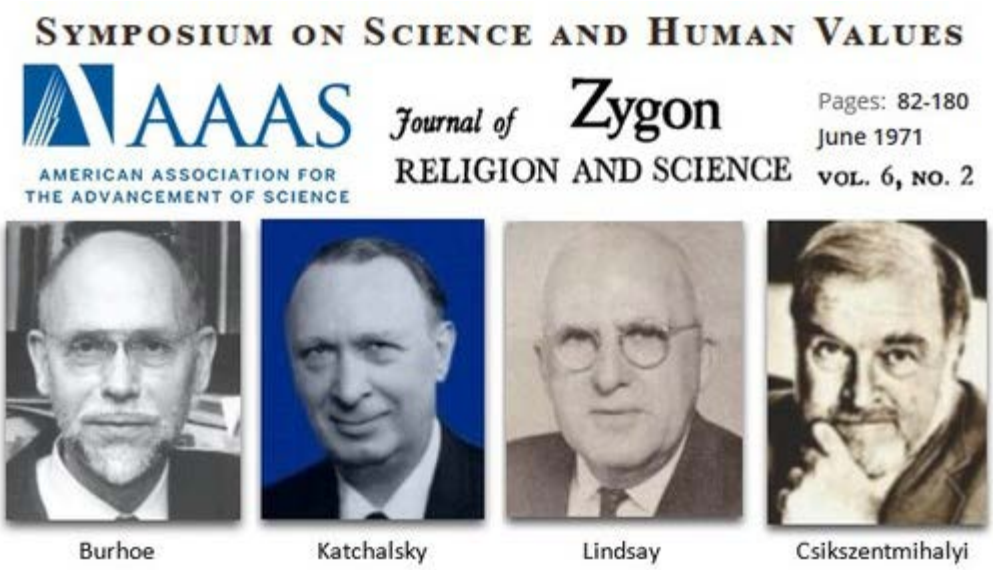

A visual of the 1970 AAAS **Symposium on Science and Human Values**, with talks and commentary by: Ralph Burhoe, Aharon Katchalsky, Bruce Lindsay and Mihaly Csikszentmihalyi, focused on "human values in the context of thermodynamics".

Overview

On 29 Dec 1970, the annual meeting (Q) of the American Association for the Advancement of Science (AAAS) was held at Chicago, Illinois, described as a Symposium on Science and Human Values, held under the auspices of the Section of the History and Philosophy, sponsored by the Alfred Sloan Foundation (Q), chaired by theologian and meteorologist Ralph Burhoe (1911-1997) (Q), wherein presentations were made by: Aharon Katchalsky, Bruce Lindsay, biochemist and oncologist Van Potter (1911-2001) (Q), anthropologist Anthony Wallace (1923-2015) (Q), with commentaries by biomedical scientist John W. Mehl, Barry B. Edelstein, Mihaly Csikszentmihalyi, William C. Wimsatt, and Paul A. Weiss.

Committee members included: Theodosius Dobzhansky, and Jacob Bronowski, whose 1956 *Science and Human Values*, the conference was named after, was in attendance.

The core minds of the conference where Katchalsky and Lindsay. Katchalsky's presentation, however, was weak, amounting to an attempt to spin Ilya Prigogine's dissipative structures theory, mixed with other related melting pot theories, e.g. Zhabotinsky reaction, Alan Turing's chemical morphogenesis, his own work on clay substrate theory origin of life, etc., to loosely argue for some general unstated idea, without actually touching on "human values" in any sense of the manner. Lindsay mostly rambled on to conclude with a restatement of how his version of the thermodynamic imperative should be the new golden rule.

Influence

The Dec 1970 symposium would seem to have influenced, in a goad sense, the Mar 1971 Priestly Medal Address “Chemical Thermodynamics in the Real World” by Frederick Rossini, who was notified of his award in Jun 1970, and did influence the 1971 “The Thermodynamics of War”, by Melvin Klegerman and Hugh McDonald, both the symposium and Rossini’s article being cited in the latter, in a platform sense. [1]

Quotes | Employed

The following are quotes employed by symposium participants:

> “Science provides only a car and a chauffeur for us. It cannot, as science, tell us where to drive.”
>
> — Clyde Kluckhohn (c.1958), “Scientific Study of Values and Contemporary Civilization”, told to American Philosophical Society; cited by Ralph Burhoe (pg. 82)

> “Enthusiastic but poorly informed physical scientists have lately tried very hard to squeeze all of biology

into the straight jacket of a reductionist physical-chemical explanation."

— Ernst Mayr (1969), "Scientific Explanation and Conceptual Framework"; comment on Hugo de Vries and the "Reception of Mutation Theory"; cited by Aharon Katchalsky (pg. 101); cited by Mihaly Csikszentmihalyi (pg. 163)

Quotes | From

The following are quotes from the symposium made by participants:

"For several decades, the search for adequate foundations on which a moral system could be constructed was directed toward the physical sciences. The assumption underlying these efforts was that the laws of physics represent the 'foundations of nature', and if—and what a huge if—human ethics should conform to natural requirements, then a set of weighty commandments could evolve from this study. Some of the better-known consequences of these considerations are the fine study of Bronowski [*Science and Human Values*, 1953] on the moral foundations of the whole structure of science and the famous attempt of Niels Bohr [*Atomic Physics and Human Knowledge*, 1958] to show that the principle of complementarity of atomic physics suffices for a new approach to human understanding and may serve as a basis for international complementary relations between contradictory cultures."

— Aharon Katchalsky (1970), "Thermodynamics of Flow and Biological Organization" (pg. 100)

"The prime position in the interpretation of human experience of the concept of energy, the most important idea in the whole of science. Representing in its simplest form the notion of constancy in the midst of change, it has come to pervade all aspects of life. There is nothing in our experience which cannot ultimately be described in terms of the transfer of energy from one place to another and for the transformation of energy from one form to another."

— Bruce Lindsay (1970), "The Larger Cybernetics" (pg. 127)

"Thermodynamics is the greatest physical theory ever concocted by the mind of man. There seems to be no reason to doubt that not only is the physical behavior of human beings describable in terms of energy, but that the same is true of mental and emotional behavior commonly ascribed to the nervous system."

— Bruce Lindsay (1970), "The Larger Cybernetics" (pg. 128)

"The second law conveys, to me, the distinct suggestion that we as individuals should endeavor to consume as much entropy as possible to increase the order in our environment. This is the thermodynamic imperative, possibly not unworthy to rank alongside the categorical imperative of Kant or even the golden rule."

— Bruce Lindsay (1970), "The Larger Cybernetics" (pg. 134)

Quotes | On

The following are quotes on the symposium:

"The **Symposium on Science and Human Values** at the 1970 meeting of the American Association for the Advancement of Science was largely devoted to the application of thermodynamics to social phenomena."

— Melvin Klegerman (1976), "The Thermodynamics of War" [1]

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See also

● Whewell-Coleridge debate | 1833 BAAS meeting
● Tyndall-Stewart-Tait debate | 1874 BAAS meeting

External links

● Overview – Zygon, Volume 6, Issue 2.

θΔics

In science, **synergy** tends to refer to two systems working together that produce results greater than the sum of their actions when working separately. [1]

Etymology

The term “synergy” itself, in the sense of “cooperation” or “working together” dates to the 1650s. [3]

As to who actually introduced the notion of synergy as “effects result greater when working together than when working separately”, is a bit elusive.

The first dominate usage of the term synergy, in a semi-physical sense, seems to be found in American physical sociologist Lester Ward, who in his 1907 *Pure Sociology*, introduces the term, with historical thoughts on the need for such a term, as the “twofold character of energy and mutuality, or the systematic and organic working together of the antithetical forces of nature.” Ward then goes onto give an example of how synergy can be used to qualify the work associated with the variety of forces involved in an atomic collision, and explanation in which he employs formulas. [2]

There is some commentary, to note, that synergy was coined by Carl Jung; this, however, may have been a later independent usage. [1]

Peter Corning, of late, is a big synergy theorist; as was Buckminster Fuller before him.

See also

â— Two cultures synergy

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External links

â— Synergy – Wikipedia.

θΔics

In chemistry, **synthesis**, from the Greek *sūn*, ‘together’, and *thesis*, ‘a placing’, refers to the formation of one or more chemical products from one or more simpler reactants, through one or more intermediate coupled mechanism steps or stages. [1]

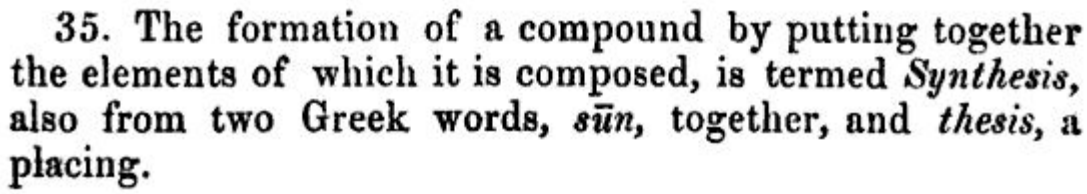
35. The formation of a compound by putting together the elements of which it is composed, is termed *Synthesis*, also from two Greek words, *sūn*, together, and *thesis*, a placing.

An 1858 definition of **synthesis**, by English chemist John Bidlake, with etymology, as the "putting together the elements" of which a chemical structure or compound is composed. [3]

The antonym of synthesis is "analysis".

Evolution

Synthesis is a replace of the more vague term “evolution”, acting as the more rigorous modern definition in describing the formation of human molecules over time from hydrogen precursors, i.e. humans were synthesized over time through a number of intermediate reaction mechanism steps.

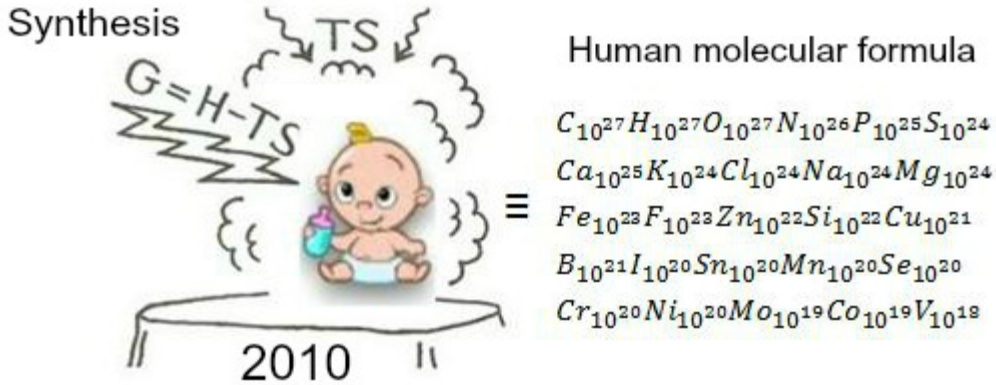

A free energy of formation view of human synthesis (see: human free energy); drawing modified from from American physicist Daniel Schroeder’s 2000 *Thermal Physics* textbook. [7]

Human synthesis

In hmolscience, in regards to a human molecule's (person's) reaction existence (life), the term "synthesis" is the modern term for what in ancient times was called "birth", which is now a defunct theory (see: defunct theory of life). In plain speak, a person, technically, cannot be "born" anymore so that can any other atom or molecule be born, but rather can only be synthesized (born) or analyzed (die). The outdated terms, e.g. "born", "die", "life", etc., are mythological-religious carryover terms, that do not hold up in the modern physical science view of the universe; hence the regress to pure chemical descriptions.

Etymology

The term “synthesis” or *kunstliche* was coined by German chemist Herman Kolbe for the de novo preparation of compounds, which generally stems from his famous 1845 production of acetic acid, CH_3COOH, form its natural elements (CH, CO, H) in several steps. [2]

Berthelot | Organic chemistry from mineral chemistry

In the 1850s, in the midst of the vital force debate years (see: vitalism; urea synthesis debate), the general view existed that there existed a divide between mineral chemistry and organic chemistry, the latter (typified by animals) not permissibly derived from the former (typified by rocks). French chemist Marcellin Berthelot, set out to overthrow the vital force theory, which he explicitly stated as follows: [4]

> “It is the object of these researchers to do away with life as an explanation, wherever organic chemistry is concerned.”

His aim here, although this seems to have have a feel of the defunct theory of life in it, was to show that all the transformations of the organic world are due to the play of simple chemical and mechanical forces acting in a mechanical way. [5] In his 1860 "Organic Chemistry Founded on Synthesis", his so-called masterpiece, Berthelot described his breakthrough insight, in his introduction, of how he obtained a first organic compound (formic acid): [4]

> "Solely by a combination of time and ordinary affinities."

This was in opposition to earlier views which held that "special affinities" existed inside of plants and animals.

This statement also seems, in some way, to be a forerunner to the debate that will eventually surround the premise of the synthesis of a human molecule (person), a large animate 26-element organic compound (see: human free energy of formation). Berthelot then went on to explain, in what seems to be a forerunner to a disproof of the unbridgeable gap hypothesis, that any type of organic compound or structure can be synthesized over time, if the right steps, reactants, and amounts of heat are used: [6]

> "In a word, in the order of **organic synthesis**, the essential point resides in the formation of the first from the elements, that is, in that of the carburets [hydrocarbons] of hydrogen and the alcohols; it is this which wipes out in principle all the lines of demarcation between mineral chemistry and organic chemistry. Thus synthesis extends its consequences form the elements up to the domain of the most complicated substances [human molecules] without our being able to assign any limit to the process. Among the organic compounds we know to how to make … up to those which exist in nature, such as the sugars and the nitrogenous principles of animal origin, we pass from one term to the other by insensible degrees, and we cannot see any absolute barrier or break which we may with any appearance of certitude fear to find unsurpassable. We can then affirm that organic chemistry is henceforth founded on the same base as mineral chemistry. In these two sciences, **synthesis** as well as analysis results from the same forces, applied to the same elements."

(add)

Human chemistry from the elements

American physical organic chemist George Scott declares, in his *Atoms of the Living Flame* (1985), that, in the above statement by Berthelot, "chemical vitalism was dead". This, however, is subtly far from the case. While organic chemistry may be now assumed readily synthesizable from mineral chemistry (or more generally from the 92 naturally-occurring elements of the periodic table), that human chemistry—that is to say human molecules (people)—are synthesizable from the elements of periodic table, by the same forces, is far from acceptable. In some countries, such as Latvia (see: life force), as many as 50% of the population, in modern times, believe in a vital force or life force at work in human origins and futures; and this belief becomes even more convoluted for the physical scientists (chemists and physicists) who—a large majority of—will readily and quickly label human molecular philosophy as "crackpot" or pseudoscience (see: Libb Thims (attack); detractors; human thermodynamics (objections to)); the general explanation of which is that many have not yet caught up the Goethean revolution, and are ignorant by some two plus centuries of human knowledge.

See also

- Thermosynthesis

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External links

● Chemical synthesis – Wikipedia.

θΔics

In science, **syntropic** is an entropy antonym like term conceptualized as something that describes converging waves or phenomena, e.g. those characteristic of life, which are not reproducible and tend to differentiation; the polar opposite of "entropic" or entropy phenomena, referring to processes or phenomena that consist of diverging waves, which are reproducible that tend towards leveling of behaviors.

In 1941, Italian mathematician Luigi Fantappie, in his "Unified Theory of the Physical and Biological World", completed in 1947, introduction of the new concept of "total existence, compatible with the principles of relativity. It was based on D'Alembert equation, which describes wave propagations and admits two types of solutions, represented respectively by *waves* from a source *divergent*, *convergent* and *waves* to a source, placed in the future. [1]

Fantappié identifies these new phenomena with the most typical and mysterious of life processes. In short, he reasons that *syntropic phenomena* are governed by a force, opposed to entropy, which attracts living systems towards higher levels of organization and order. [2]

See also

â— Anti-entropy difficulties
â— Syntropy

References

1. (a) "The Unitary Theory of the Physical and Biological World" first presented on 30 October 1942 at the Accademia d'Italia.
(b) Luigi Fantappié – Biography (translated version).
2. Di Corpo, Ulisse. (2005). "Syntropy: a Third Possibility in the Debate on Evolution" (pdf), *Syntropy*, 3:66-68.

θΔics

In hmolscience, **syntropy** is an entropy antonym like term conceptualized as a force which causes living things to reach "higher and higher levels of organization, order and dynamic harmony." [1]

Overview

In 1974, Hungarian physiologist Albert Szent-Györgyi proposed the term "syntropy" to replace the term the term "negative entropy" (or *negentropy*). In short, based on the misinterpreted logic that entropy is a universal "force" which causes organized forms to gradually disintegrate into lower and lower levels of organization and that some basic difference between the living and the non-living, Szent-Gyorgyi postulated that there exists what he calls the "principle" of *syntropy* or "negative entropy", as a drive in living matter to perfect itself, or something along these lines. [2]

See also

â— Anti-entropy difficulties
â— Syntropic

References

1. Vargiu, James. 1977. Editor of *Synthesis 1*, (Introduction to article by Szent-Gyorgyi). Vol1(1):14
2. Szent-Gyorgyi, Albert. 1977. "Drive in Living Matter to Perfect Itself" *Synthesis*, 1(1):14-26.

θΔics

In thermodynamics, **system** refers to the volumetric region under study. The system is characterized by a boundary, across which both matter and energy may pass. A system, in more detail, is the portion of the universe under study, being separated from the remainder of the universe by a boundary, which may be material or not, but which, by convention, delimits a finite volume, across which the possible exchanges of work, heat, or matter may pass. [1]

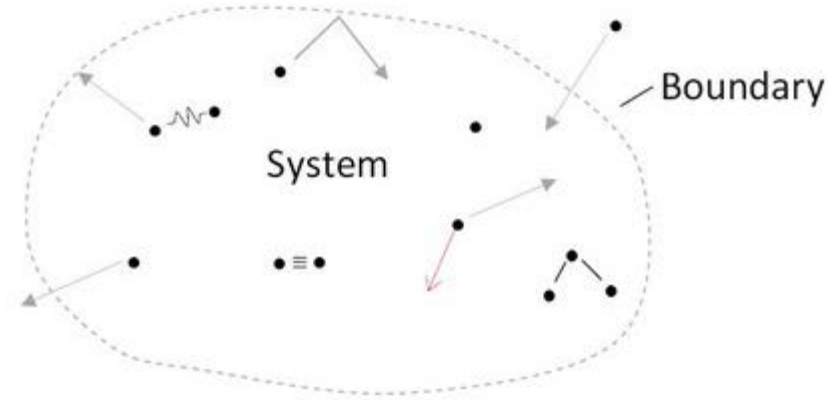

A **system** is any volumetric region of the universe delineated by a boundary.

History

The term *system* or "thermodynamic system" are synonyms of "working substance", used by French physicist Sadi Carnot in 1923, "working body", used by German physicist Rudolf Clausius in 1850, and "working medium", used by Russian bioelectrochemist Octavian Ksenzhek in 2007.

Types

The distinctions between "isolated", "closed", and "open" seem to have been first laid out explicitly in the Brussels school in the writings of Théophile de Donder, who in 1936 clearly defined closed systems, and his student Ilya Prigogine who in 1961 stated: [3]

> "We shall distinguish between isolated systems which can exchange neither energy nor matter, closed systems which can exchange energy but no matter, and open systems which can exchange both energy and matter with the exterior."

Human system

See main: Human system, Social system, Economic system, etc.

To properly understand the concept of *system*, for use in the extrapolation of thermodynamic analysis in human systems, e.g. a town, community, or social group, etc., being comprised of reactionary human molecules (people), one must aver to the more detailed original terminology used by Clausius. [2]

References

1. Perrot, Pierre. (1998). *A to Z of Thermodynamics*, Oxford: Oxford University Press.
2. Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview). Morrisville, NC: LuLu.
3. (a) Prigogine, Ilya. (1961). *Thermodynamics of Irreversible Processes*, (pgs. v, 3). New York: Interscience Publishers.
(b) De Donder, T. (1936). *Thermodynamic Theory of Affinity: A Book of Principles*, (pgs. 1-2). Oxford: Oxford University Press.

θΔics

In demons, **Szilard's demon** is a hypothetical intelligent being noted for his sharp "vision" ability to continuously observe and collect "information" the speeds and positions of the various particles of two chambers of gas molecules separated by a frictionless sliding door. If the collecting powers of the demon are above or beyond the control of the second law the demon will be able to move heat from a cold body to a hot body without the expenditure of work; if conversely the act of collecting information requires energy, then, according to the second law, a loss of available energy will progress, as the entropy of the two systems combined increases as the motions of the total set of particles moves toward equilibrium. [1]

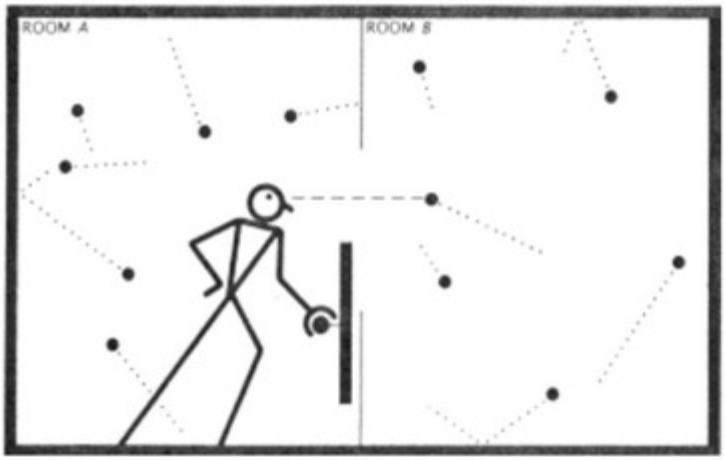

American quantum information theorist Charles Bennett's 1987 rendition of **Szilard's demon** collecting information on the particles of the system. [3]

The Szilard demon was described in Hungarian physicist Leo Szilard's 1929 "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings", in which an attempt was made to disprove the existence of a Maxwell's demon, by arguing that the logarithmic interpretation of entropy ($S = k \ln W$) could be used to determine the entropy produced during the 'measurement' of information the demon discerns when viewing the speeds and positions of the particles in his two compartments. [2]

Evolution and heat death

In 1946, Belgian-born English thermodynamicist Alfred Ubbelohde seems to have used the Szilard demon model to argue that new findings in quantum physics and aspects of radiation thermodynamics might negate the heat death ultimatum of the universe. [1]

See also

- Szilard's paradox
- Maxwell's demon
- Laplace's demon

References

1. Ubbelohde, Alfred René. (1947). *Time and Thermodynamics* (pgs. 90-91). Oxford University Press.
2. Szilárd, Leó. (1929). "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings" (Uber die Entropieverminderung in einem thermodynamischen System bei Eingriffen intelligenter Wesen), *Zeitschrift fur Physik*, 53, 840-56.
3. Bennett, Charles H. (1987). "Demons, Engines, and the Second Law", *Scientific American*, 257(5): 108-116, Nov.

Further reading

- Berger, Jorge. (1990). "Szilard's Demon Revisited" (abstract), *International Journal of Theoretical Physics*, 29(9): 985-95.

θΔics

In information thermodynamics, **Szilard's paradox** refers to paradoxical similarity between the formal definitions of entropy used in statistical thermodynamics
and information theory, namely Boltzmann entropy and Shannon entropy, which has misled many authors to identify entropy of information with negative physical entropy. [1] The origin of the confusion said to have originated with Hungarian-born American physicist Leó Szilárd's 1929 seemingly paradoxical thought experiment concerning Maxwell's demon. [2] The term "Szilard's paradox" seems to have been introduced in the 1972 article "Entropy, Information, and Szilard's Paradox" by mathematical physicists Josef M. Jauch and J.G. Baron, who attempted to explain that there is no paradox.

References

1. Jauch, J.M. and Baron, J.G. (1972). "Entropy, Information, and Szilard's Paradox", *Helv Phys Acta*, 45: 220-32; In: *Maxwell's Demon 2: Entropy, Classical and Quantum Information, Computing* (pgs. 124-36). CRC Press, 2003.
2. (a) Szilárd, Leó. (1929). "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings", *Zeitschrift fur Physik*, 53, pgs. 840-56.
(b) English translation of "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings" by Anatol Rapoport and Mechthilde Knoller in *Maxwell's Demon 2* (pgs. 110-19) by Harvey Leff and Andrew Rex.

θΔics

In poetry, **Thomas Stearns Eliot** (1888-1965), aka T.S. Eliot, was an American-born British essayist and poet noted for thermal word usage.

The Hollow Men

In 1925, Eliot penned his "The Hollow Men" wherein the following oft-cited heat death themed segment is found: [1]

> "This is the way the world ends
> Not with a bang but a whimper."

(add discussion)

The Waste Land

In 1922, Eliot wrote his poem "The Waste Land", in which, according to Kristen Miller, the reference to the second law is, supposedly, found. [3]

East Coker

In 1940, Eliot penned his "East Coker", in which the following thermal word loaded segment, as cited by Steven Weinberg (1992), is found: [1]

> "As we grow older
> The world becomes stranger, the pattern more complicated
> Of dead and living. Not the intense moment
> Isolated, with no before and after,
> But a lifetime burning in every moment."

The segment "lifetime burning in every moment" seems to elude to the so-called combustion theory of existence or combustion theory of love or something along these lines.

Related

People also searched for: Ezra Pound, W.B. Yeats, George Eliot, James Joyce, and W.H. Auden, among others. (Ñº)

References

1. (a) The Hollow Men – Wikipedia.
(b) Woods, Alan and Grant, Ted. (1995). *Reason in Revolt: Marxist Philosophy and Modern Science* (§2.4:Arrow of Time). Publisher.
2. (a) East Coker (poem) – Wikipedia.
(b) Weinberg, Steven. (1992). *Dreams of a Final Theory: the Scientist's Search for the Ultimate Laws of Nature* (pg. 90). Random House.
3. Miller, Kristen. (2007). "From Fears of Entropy to Comfort in Chaos: *Arcadia*, *The Waste Land*, *Numb3rs*, and Man's Relationship With Science" (abs), *Bulletin of Science Technology Society*, 27(1)81-94.

External links

â— T. S. Eliot – Wikipedia.

θΔics

In theater, a **tableau vivant**, a French term meaning “living picture”, is a theatrical performance of a well-known painting, with costumes, décor, and as many participants as the painting required.

In Europe, the fashion for *tableaux* took off after the publication of German polymath Johann Goethe’s *Elective Affinities* in 1809, in which they play an important role. [1]

References

1. Moi, Toril. (2006). *Henrik Ibsen and the Birth of Modernism: Art, Theater, Philosophy* (pg. 122). Oxford University Press.

References

1. Tableau vivant – Wikipedia.

θΔics

In existographies, **Cornelius Tacitus** (58-120AD) (Cattell 1000:294) (CR:11) Roman senator, public official, historian of the Roman Empire, who is noted as someone oft-cited having referred to the punishment of "Christians" by Nero and the execution of their founder "Christus" by Pontius Pilate; considered by Thomas Jefferson to be a good historian to read.

Overview

In c.115AD, Tacitus, in his *Annals* (15:44) (Q)(Q), is reported to have said the following so-called "profane testimony" about a man named "Christus":

> "But not all the relief that could come from man, not all the bounties that the prince could bestow, nor all the atonements which could be presented to the gods, availed to relieve Nero from the infamy of being believed to have ordered the Conflagration, the fire of Rome. Hence to suppress the rumor, he falsely charged with the guilt, and punished Christians, who were hated for their enormities. **Christus**, the founder of the name, was put to death by Pontius Pilate, procurator of Judea in the reign of Tiberius: but the pernicious superstition, repressed for a time broke out again, not only through Judea, where the mischief originated, but through the city of Rome also, where all things hideous and shameful from every part of the world find their center and become popular. Accordingly, an arrest was first made of all who pleaded guilty; then, upon their information, an immense multitude was convicted, not so much of the crime of firing the city, as of hatred against mankind."

In 1910, William Smith, in his *The Silence of Josephus and Tacitus*, building on Arthur Drews, pointed out the following: [1]

> "With respect to this famous passage we must observe first, that *if it be genuine*, it was written in the first quarter of the second century, near the close of the last work of the great historian, most probably after the death of Trajan (AD 117). At the most then it records only a report accepted at that time among Christians. Now it is not at all strange that **the fiction** (if it be a fiction) of the death under Pilate should be current at that date, nearly three generations after the **feigned event**. If such a report originated at all, it originated (gradually to be sure) at some time most probably in the first century; it may easily then have obtained currency and reached the ears of Tacitus before AD 110. Its reproduction, at his hands, then, merely attests its existence at that date, but in no degree attests its correctness."

The general issue here, as Smith points out, is not that there emerged a newly formed Christ-based religious sect in c.100AD, which eventually, by 800AD, became the state religion of the Roman empire, i.e. no doubt Christians, as we now know them began to exist as a bound group, at some point, but rather the contention that there was an actual real person named "Jesus Christ" that went through all of the events described in the Bible is no different than there was an actual person named "Krishna" in India purported to have existed in 1200BC who was "divinely saved from a death pronouncement", along with most of the other characteristic of events of Jesus. (Q). Both are what Smith correctly calls "feigned events".

> "I have seen the statement at least twice that the words **Christ and Krishna came from the same root**. In order to arrive at the truth of the matter the subject has been given some thought. Several years ago, I wrote to the professor of Sanskrit in Harvard University for the meaning of the word Krishna. He courteously replied that it meant 'black'. We have Christ through the Greek *christos*, which means anointed. At first there seemed to be no relationship existing between 'black' and 'anointed'. But I turned to the Hebrew word for Christ (*Mashiach*). The verb form (*mashach*) is defined, 'to smear or rub over with oil; to anoint with paint; to paint', etc. While the word means to anoint, it also means to paint. The same word is translated 'painted' in Jeramiah 22:14 'painted with vermilion'. The logical inference is that in Oriental countries the anointing oil was colored."

— Addison Brewer (1906), “Christ an Krishna” (O)

All of this painted black / anointed joint etymology goes back to 3100BC and to Osiris, the original dying and rising god, aka "Osiris Christ" or Osiris Anointed:

> “The funeral text spells were also liturgical utterances recited and or chanted during the funerary ritual of the pharaoh (and, perhaps, other noblemen): thus they accompanied the lustration of the corpse, the anointing, the embalming, the splitting of the mouth with the adze, the closing of the lid of the sarcophagus, and so on. The Osiris death and resurrection was indeed the prototype for the Pharaoh's death and resurrection in the afterlife (and later the **prototype for all people**). Osiris himself was always depicted in a mummy-form, with white cloak, the white crown of Upper Egypt, and the royal crook and flail; his **face was often colored black** or green symbolizing his ability for resurrection.”

During mummification, the dead were anointed with oil and then covered with a thick black tar, thought therein to mimic Osiris, and thereby guaranteed access to the afterlife.

In c.100AD, with the end of the Egyptian dynasties, and the end of the pharaohs, the Osiris Christ prototype was carried over, during the Roman recension, into the model of the "Jesus Christ prototype", whereby, not just the Pharaoh, but all people could get to the afterlife, if they just became followers of a fictional Christ as man figure; hence, the mythical events of Osiris became the feigned events of Jesus.

Both Krishna and Christ, in short, are Osiris rescripts. Krishna means the "black one" and Christ means the "anointed one". The people who united to follow these different sects existed, but the characters of the each respective sect did not exist.

Quotes

The following are related quotes:

> “But is it conceivable that the early Christians would have ignored so valuable a testimony had they known of its existence, and would they not have known of it had it really existed? The Christian Fathers, who not only collected assiduously all that they could use to establish the reality of Jesus—but who did not hesitate even to forge passages, to invent documents, and also to destroy the testimony of witnesses unfavorable to their cause—would have certainly used the Tacitus passage had it been in existence in their day. Not one of the Christian Fathers in his controversy with the unbelievers has quoted the passage from Tacitus, which passage is the church's strongest proof of the historicity of Jesus, outside the gospels.”
>
> — Mangasar Mangasarian (1909), *The Truth About Jesus: is He a Myth?* (O)

See also

- People claimed to be sun of god

References

1. Smith, William B. (1910). *The Silence of Josephus and Tacitus* (pg. 6). Open Court.

Further reading

- Murdock, Dorothy M (aka Acharya S). (2004). *Sons of God: Krishna, Buddha and Christ Unveiled* (Tacitus, 6+ pgs). Adventures Unlimited.

External links

- Tacitus – Wikipedia.
- Tacitus on Christ – Wikipedia.

θΔics

In human chemistry, **Takaoki Matsui** (1968-) is a Japanese literary theorist noted for several decipherment publications and conference presentation on German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities* (see: Goethe timeline), discussed from the point of view or extension of the ideas of Walter Benjamin.

In 2012, Matsui was working on a closely annotated new translation (in Japanese?) of part 2 (only) of Goethe's *Elective Affinities* for a Goethe anthology.

Illuminations of *Elective Affinities*

In 2010, Matsui published what seems to be a chapter entitled "Illuminations of *Elective Affinities:* Goethe's Criticism of Technology and Its Materialistic Transformation by Walter Benjamin" the synopsis of which is as follows: [1]

> Synopsis: "The "survival" of "bare life": the physical nature and translatability of elective affinities. In Benjamin's essay on translation speaks of "life and survival of the art". "Can consist of sensation, which characterize it only occasionally," according to him is the "life" or from organic physicality alone is to define, but the story it contains. How is this 'life metaphysics would relate' to what he laid out a critical scientific novel whose translatability he presented although not in question?
>
> Goethe's *Elective Affinities* is actually a comedy personified the four elements, according to a controversial doctrine of affinity, they are motivated to adultery, 'and finally brought by the minor characters disguised as scientists to decomposition. The story alludes to historical events and technology scientific findings, Goethe, transferred to the carnival games matter to the emergence of industrialization and the disciplining of human caricature *.
>
> However, he made the transfer process in the chemical only visible parable, where the characters learn (elements) of some of their presumed destiny. Encrypts remained linguistically untranslatable picture puzzles: those of the technical equipment, the proper names of body parts had been viewed, etc. They ignore or "mutatis mutandis" as part of a 'tragic' or 'murky' love story. Benjamin also did not want to destroy her 'dull' appearance. Only he fell to distinguish the inserted novel one of the novel's action following analogies: In the novel there is the "heat" before the "storm" in the novel but "the storm and peace", in which the former will only dull light of the "eclipse" in the latter, everything from "light [s] light" sharply outlined. These images correspond exactly to the inventions described therein encrypted and tests. Despite this 'enlightenment' he took only a sublimated nudity true story of the character and complained about the rootedness of the characters in the "association of bare life." The question is whether or not his life, metaphysics, the exact weather has disturbed sensation."
>
> * My detailed analysis of work published first in Japanese, 'Shinwaryoku <no KOUBOU (Illuminations of *Elective Affinities*'), in: 19 Seikigaku Kenkyu (Study of the 19th Century Scholarship), Vol 4, 2010."

Discuss:

Towards the Complete Decipherment of Goethe's *Elective Affinities*

In his 2011 literature chemistry conference Literature and Chemistry: Elective Affinities presentation: "From Lavoisier to Dalton and Davy: Towards the Complete Decipherment of Goethe's *Elective Affinities*", the abstract of which is as follows, Matsui further attempts to follow his 2010 argument that each of the characters are "scientists": [2]

> Abstract: "Goethe composed *Elective Affinities* as a satire on prominent scientists such as Newton, James Watt, Joseph Priestley, Thomas Young, Marie Lavoisier and Count Rumford. Disguised as supporting characters, they experiment with the so-called four elements – which are represented by the four protagonists – and bring them to death and separation (decomposition). The relationship of the protagonists symbolizes not only the law of chemical affinities but also theories of astrophysics. The events in their estate suggest how the correspondence of macro- and microcosm is transformed: The alchemical view of nature and human life was destroyed both by new discoveries in astronomy and by physiological experiments of chemists and physicians."

Matsui's presentation here seems to have been complete distorted fiction, as none of this occurs in Goethe's mind, nor his "best book" novella—it almost seems to be a remade fiction upon the original semi-autobiographical physical chemistry based fiction, something akin to Tom Stoppard's 1993 *Arcadia* remake. None of these people (Newton, Watt, Priestley, Young, Lavoisier,

Rumford), Newton aside, are even common in Goethe's writings or his circles of discussion. The entire argument here seems seems to be a nearly made up fantasy of the Matsui, from who knows where? Beyond this, it is well known that the one field Goethe never touched was astrophysics (see: Goethe timeline).

Astronomy and Geoscience in the Landscape Gardening of Goethe's *Elective Affinities*

In May 2012, Matsui was working on an article, in Japanese, in further attempted decipherment of Goethe's *Elective Affinities*, the abstract of which is as follows: [4]

> "Goethe used the landscapes of two spas as the background of his story: the Egerland where he visited a volcano with Sylvie von Ziegesar, and Bad Pyrmont where Charlotte von Stein had stayed for convalescence. As the latter's birthday coincides with that of Newton, a Newton-like "mason" celebrates "Charlotte's birthday". The ceremony on "Ottilie's birthday" caricatures the *Birth of Venus* with allusions to the contemporary anatomy, to the physics of foam (Young) and to the astronomy of Cassini and Laplace; its unspecified date suggests a combination of the dates of the discoveries of Uranus and uranium with those of St. Odile's feast day and of Minna Herzlieb's birthday. Ottilie is thus opposed to "Luciane" as *Aphrodite Urania* to *Aphrodite Pandemos* in a quasi-Platonic manner. "Eduard's birthday"is not celebrated, for it would imply the *delivery* of the Earth (= Eduard) from the Catholic geocentricism. Eduard's "gardener" is confronted with Ottilie's unreliable floriculture (parallax and aberration of light) and with the unfamiliar new stellar "catalogs"; like George III who supported Hanoverian astronomers, he is bothered also with Luciane's Napoleonic vandalism while expecting the florescence of aster(oid)s."

Matsui seems to think that some of the content of part two of Goethe's *Elective Affinities* has something to do with caloric theory and the kinetic theory of heat in some way, which seems to be a far-stretched hypothesis. On 6 May 2010, Matsui commented on this: [5]

> "The [following] pictures relate to Part II, Chap. 5 of the novel (the first of the three tableaux vivants which actually illustrate caloric theory and kinetic theory of heat). They were included in my slideshow for the conference (and not in my new article). Their subject (respiration experiment) is important for human chemistry, as you know."

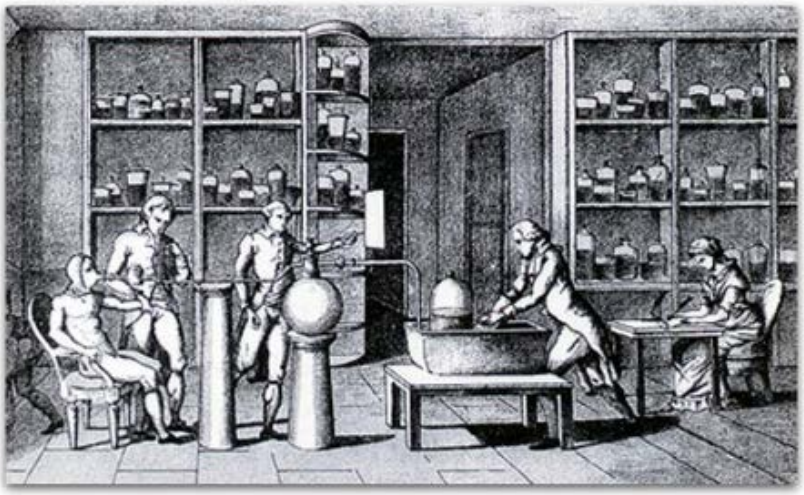

Left: French chemist Antoine Lavoisier (center) shown conducting **animal heat combustion experiments** on his assistant, French chemist Armand Seguin; his wife chemist Marie-Anne Paulze (Madame Lavoisier) seated. [6] Right: (add)

Education

Matsui studied social sciences at the University of Tokyo and Kulturwissenschaft (cultural studies) at Humboldt University Berlin. He completed his PhD in 2008 with a dissertation on "Walter Benjamin ad the Art of Graphic: Photography, Painting, Graphics" at Humboldt University, Berlin, on the work of Walter Benjamin, the abstract of which is: [3]

> Abstract: "Walter Benjamin's writings on visual arts include not only the famous 'materialistic' essays on aura but also

seemingly esoteric notes on painting and the graphic arts. The content and correlation of all these writings become clear once we grasp how they perform the task of describing childhood experience. His theory of aura was prefigured in his philosophical 'Diaries' where his struggle with his depression was often followed (or interrupted) by dreamlike visions of "youth". The discursive structure of these visions – which will prove to be a strangely 'photographic' one – is to be analyzed by using the second Freudian topology as a comparison. Through this analysis we will be able to reconsider the well-known (oversimplified) antagonism between his historical materialism and the 'apolitical formalism' of Clement Greenberg from a new viewpoint. Greenberg's criticism helps us also to decipher the 'esoteric' texts of Benjamin. They puzzled scholars especially because they described children's vision at first (about 1915) misleadingly in accordance with the conventional dichotomies of Romanticism (line / color; masculine / feminine; adult / child…); Benjamin could specify their original implication only after he had set up – based on his reflexions on the 'horizontality' of the graphic arts, and by speculating further on the magic nature of 'Zeichen' and 'Mal' (1917) – a trichotomy of genres (painting / the graphic arts / ink and watercolor illustrations). We will reconstruct this development of his theory not only through detailed analyses of related works of art but also in view of his 'materialistic' late writings (the Arcades Project and 'Berlin Childhood'), for it is only there that we find out an essential relation – a singular 'constellation' – of his early art theory and his theory of money."

Matsui currently exists in Tokyo as an independent scholar. In 2011, he listed himself as associated with the "Japanese Society for Goethe's Natural Philosophy".

References

1. Matsui, Takaoki. (2010). "Illuminations of *Elective Affinities:* Goethe's Criticism of Technology and Its Materialistic Transformation by Walter Benjamin" (blog abstract) ("Shinwaryoku no koubou"), in: *Study of the 19th Century Scholarship* (19 Seikigaku Kenkyu), vol. 4, 2010, p. 187 (the article itself - vol.4, pp.141-156 - contains erroneous readings; cf. corrigenda and addenda in Japanese: vol.5, pp.165-168) (Its full version will also soon appear in German).
2. Pratt-Smith, Stella. (2011). "Literature and Chemistry: Elective Affinities" (call for papers) (program) (abstracts), The British Society for Literature and Science, Interdisciplinary conference organized by the research group Literature and Science, Department of Foreign Languages and Literatures, The University of Bergen 27-28 Oct.
3. (a) Takaoki Matsui (dissertation) – GeoCities.jp.
(b) Matsui, Takaoki. (2008). Walter Benjamin ad the Art of Graphic: Photography, Painting, Graphics" (abs), PhD dissertation. Humboldt University, Berlin.
4. Matsui, Takaoki. (2012). "Astronomy and Geoscience in the Landscape Gardening of Goethe's *Elective Affinities*", in: *Study of the 19th Century Scholarship* 6 (pgs. 81-97). Publisher.
5. Email communication with American electrochemical engineer Libb Thims.
6. (a) Sketch by Madame Lavoisier, first published in E. Grimauzi, *Lavoisier 1743-1794*, Paris, 1889, Opposite, pg. 128.
(b) Marie-Anne Pierrette Paulze – Wikipedia.

θΔics

In hmolscience, **Talcott Parsons** (1902-1979) was an American sociologist, a product of the Harvard Pareto circle so to say, noted for his efforts to ferret out a semblance of a physical sociology.

Social action theory

In 1937, Parsons introduced some type of sociological "action theory", in respect to how equilibrium relates to society, and how social interchange related to the laws of thermodynamics; quote a noted excerpt: [1]

> "The second law of thermodynamics is a statement of the directionality of change in a system; it must be in the direction of increasing entropy. Potential energy is converted into kinetic energy, into action, in the physical sense. Rationality occupies a logical position in respect to action systems analogous to that of entropy in physical systems. Effort energy is, in the processes of action, converted into realization of ends, or conformity with norms. Rationality is one, at least, of the properties in terms of which the extent of this change is to be measured for any given system at any given point in the process of change."

Parsons further goes on to correlate the second law with German sociologist Max Weber's process of realization. [2] A notable student of Parsons was German sociologist Niklas Luhmann who had studied under Parsons in 1961 at Harvard, later carrying on his work on social systems and entropy.

In 1953, Parsons was outlining some type of Newtonian mechanics laws of motion based action theory, outlined as follows: [6]

> "There are four fundamental generalizations for defining the equilibrium of a social system in terms of four-dimensional space:
>
> 1. The principle of inertia: a given process of action will continue unchanged in rate and direction unless impeded or deflected by opposite motivational forces.
> 2. The principle of action and reaction: if, in a system of action, there is a change in the direction of a process, it will be balanced by a complementary change which is equal in motive force and opposite in direction.
> 3. The principle of effort: (add)
> 4. The principle of system-integration: (add)

(add discussion)

Henderson and equilibrium

Parsons, in turn, was a student of American physiologist Lawrence Henderson, who was himself a vicarious student of American engineer Willard Gibbs, and it was through the teachings of Henderson that Parsons learned his view of equilibrium in society. Parsons came to believe that believing that without equilibrium, a society would display no order. [3] Henderson had intensive discussions with Parsons during the writing of the manuscript for his 1937 *The Structure of Social Action.* A common view, posited by Kenneth Stokes, is that the theory of equilibrium, used by Parsons, was borrowed from thermodynamics. [4]

Interchange and thermodynamic laws

See main: sociological thermodynamics

Throughout his 1953 *Working Papers in the Theory of Action*, Parson advances the claim that interchange is isomorphic with the laws of thermodynamics. An analysis of this publication reveals that Parsons was not merely making a

metaphorical argument, but rather asserting that the two theories (thermodynamics and interchange) have similar substantive content. In doing so, Parsons is said couch his discussion of social interchange in the language of thermodynamics. [5]

Nuclear family

Parsons is often credited with popularizing the term “nuclear family” or at least the phrase “modern isolated nuclear family” (1955) to describe a bi-generational family unit, bereft of kinship networks and extended family ties. (Ñº)

References

1. Parsons, Talcott. (1937). *The Structure of Social Action* (keyword: “thermodynamics”, pgs. 625, 752). Allen and U.
2. Hamilton, Peter. (1992). *Talcott Parsons* (pg. 23). Taylor & Francis.
3. Bailey, Kenneth D. (1994). *Sociology and the New Systems Theory: Toward a Theoretical Synthesis* (Section: Henderson, pg. 104, also pg. 75). SUNY Press.
4. Stokes, Kenneth M. (1995). *Paradigm Lost* (pg. 301). M.E. Sharpe.
5. Alexander, Jeffrey C. (1984). *The Modern Reconstruction of Classical Thought* (pg. 163). Routledge.
6. (a) Parsons, Talcott, Bales, Robert F. and Shils, Edward A. (1953). *Working Papers in the Theory of Action* (pg. 102). Free Press.
(b) Brown, Richard H. (1977). *A Poetic for Sociology: Toward a Logic of Discovery for the Human Sciences* (pg. 141). University of Chicago Press, 1989.

External links

â— Talcott Parsons – Wikipedia.

θΔics

In existographies, **Tamerlane** (1336-1405) (Cattell 1000:373) [RGM:#|1,330+] (Murray 4000:N/A), aka “TImur”, was a Turco-Mongol conqueror; noted for []

Quotes | On

The following are quotes on Tamerlane:

> “The eruption of a volcano and the birth of a **Tamerlane** are to nature the same thing.”
>
> — Baron d’Holbach (1770), *The System of Nature* [1]

References

1. d’Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (pg. 114). J.P. Mendum, 1889.

External links

â— Timur – Wikipedia.

θΔics

In religio-mythology, **Tammuz**, or “Dumuzi”, was a Sumerian vegetation god, characterized either as the son of Nimrod and or as Nimrod incarnate, noted for []

Osiris | Adonis

See also: God character equivalences

(add)

In 1853, Alexander Hislop, in his *The Two Babylons*, asserted the equivalence of Tammuz, Nimrod, and Osiris as follows: [1]

> “Tammuz and Adonis are proved to be the same divinity. Jerome, who lived in Palestine when the rites of Tammuz were observed, up to the very time when he wrote, expressly identifies Tammuz and Adonis (vol. ii., p. 353), in his *Commentary on Ezekiel*, viii. 14, where the Jewish women are represented as weeping for Tammuz; and the testimony of Jerome on this subject is universally admitted. Then the mode in which the rites of Tammuz or Adonis were celebrated in Syria was essentially the same as the rites of Osiris. The statement of Lucian *(De Dea Syria*, vol. iii., p. 454) strikingly shows this, and Bunsen (vol. i., p. 443) distinctly admits it. The **identity of Osiris and Nimrod** has been largely proved in the body of this work. When, therefore, **Tammuz or Adonis is identified with Osiris**, the identification of Tammuz with Nimrod follows of course. .”

In 1959, Joseph Campbell, in his *Oriental Mythology*, considered Tammuz to be the Greek equivalent of Adonis: [2]

> “The dead and resurrected god **Tammuz** (Sumerian Dumuzi), prototype of the Classical Adonis, who was the consort as well as son by virgin birth, of the goddess-mother of many names: Inanna, Ninhursag, Ishtar, Astarte, Artemis, Demeter, Aphrodite, Venus.”

(add)

References

1. Hislop, Alexander. (1853). *The Two Babylons: the Papal Worship Proved to be the Worship of Nimrod and his Wife* (pg. 506). S.W. Partridge and Co, 1871.
2. Campbell, Joseph. (1959). *Oriental Mythology: the Masks of the Gods* (pgs. 39-40). Publisher.

External links

â— Tammuz (mythology) – Wikipedia.

θΔics

In hmolscience, **Tania Sousa** (1974-) is a Portuguese environmental engineer and ecological thermodynamicist noted for []

Overview

In 2006, Sousa, "Is Neoclassical Microeconomics Formally Valid? An Approach based on an Analogy with Equilibrium Thermodynamics", together with Tiago Domingos, they attempt to do the following:

> "We show that neoclassical economics is based on a wrong formulation of classical mechanics, being in fact formally analogous to equilibrium thermodynamics. The similarity between both formalisms, namely that they are both cases of constrained optimisation, is easily perceived when thermodynamics is looked upon using the Tisza–Callen axiomatisation. In this paper, we take the formal analogy between equilibrium thermodynamics and economic systems far enough to answer the formal criticisms, proving that the formalism of neoclassical economics has irreversibility embedded in it."

In 2007, Sousa, in her PhD dissertation "Thermodynamics as a Substantive and Formal Theory for the Analysis of Economic and Biological Systems", promulgated a mixture of ecological thermodynamics, economic thermodynamics, and chnopsological thermodynamics, the gist of which is summarized as follows: [1]

> "This dissertation explores a formal analogy between microeconomics and equilibrium thermodynamics; obtains a definition of irreversibility in economic behavior; [carries] the isomorphism between thermodynamics and economics much further including the definition of Legendre transforms, Maxwell relations, Le Chatelier Principle, and first order phase transitions in economic systems; the equivalence between variables used in microeconomics and thermodynamics is established [see: HT variables table], new results are obtained in both fields and the differences between the two optimization problems are systematized; [followed by a] substantive integration between thermodynamics and biology."

(add overview)

Education

Sousa completed her BS in environmental engineering in 1998 at Instituto Superior Tecnico, an MS in ecology, management, and modelling of marine resources with a dissertation on "Meteorological Forecasting in Continental Portugal with MM5" at the Technical university of Lisbon, and her PhD in 2007 with a dissertation on "Thermodynamics as a Substantive and Formal Theory for the Analysis of Economic and Biological Systems" Vrije University, Amsterdam and Technical University of Lisbon. [2]

See also

â— Jeff Tuhtan

References

1. Sousa, Tania and Domingos, Tiago. (2006). "Is Neoclassical Microeconomics Formally Valid? An Approach based on an Analogy with Equilibrium Thermodynamics" (abs), *Ecological Economics*, 58(1):160-69.
2. Sousa, Tania. (2007). "Thermodynamics as a Substantive and Formal Theory for the Analysis of Economic and Biological Systems" (abs) (pdf), PhD thesis, Vrije University, Amsterdam and Technical University of Lisbon, Feb 07.
3. Tania Sousa (cv) – Bio.uv.nl.

Further reading

â— Sousa, Tania, Mota, Rui, and Domingos, Tiago. (2006). "Thermodynamics of Organisms in the Context of

Dynamic Energy Budget Theory" (abs) (pdf), *Physical Review E*, 74(5):051901:1-15.

External links

â— Tania Sousa (faculty) - Environment and Energy Section, Instituto Superior Técnico, Lisboa.

θΔics

In human thermodynamics, **Tanya V. Maslova** (1979-) is a Russian economist noted for her theories on the 'thermolinguistics' or the thermodynamics of language, concepts such as the energy or temperature of a text, the entropy of languages, isotherms of a text, among other topics. [1] In her 2010 article "Thermolinguistics and Human Thermodynamics", Maslova speculates on how pair-wise chemical potential between entities, such as people, or plants in field, in the form of attractions and repulsions, may find explanation in the statistical mechanics work of Russian physicist Nikolay Bogolyubov. [2]

References

1. Maslova, Tanya V. (2009). "Existence Theorem of the Critical Isotherm in Mathematical Linguistics" (abstract). *Mathematical Notes* 86(5-6): 873-78.
2. Maslova, Tanya V. (2010). "Thermolinguistics and Human Thermodynamics: Correspondence Principles" (abstract), *Russian Journal of Mathematical Physics* 17(1): 141-44.

θΔics

In existographies, **Taslima Nasrin** (1962-) (FA:168) is a Bangladesh-born Swedish physician, poet and anti-Islam atheism activist, dubbed the "female Salmon Rushdie", noted for []

Overview

In 1992, Nasrin published the novel *Shame*, about the suffering of a Hindu family after they are attacked by Muslims; after which a call for her execution (fatwa) was pronounced on her for the crime of “blasphemy and conspiracy against Islam, the Quran, and the its prophet”. [1]

Quotes | By

The following are quotes by Nasrin:

> “When I began to study the Quran, I found many unreasonable ideas, e.g. the women were treated as slaves, nothing but sexual objects. I realized that religious oppression and injustices are only increasing, especially in Muslim countries”
>
> — Taslima Nasrin (1998), response to interview query about what made her become so outspoken in opposition to Islam [1]

> “I don’t find any difference between Islam and Islam fundamentalists. I believe religion is the root, and from the root fundamentalism grows as a poisonous stem. If we remove fundamentalism and keep religion, then one day or another fundamentalism will grow again.”
>
> — Taslima Nasrin (1998), response to interview query about whether she was critical of fundamentalists [1]

> “I am an atheist. I do not believe in prayers. I believe in work. And my work is that of an author. My pen is my weapon.”
>
> — Taslima Nasrin (2002), homepage quote (see: atheist's creed) [2]

References

1. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 475-76). HarperOne.
2. (a) Home (2002) – TaslimaNasrin.com.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 475-76). HarperOne.

External links

â— Taslima Nasrin – Wikipedia.
â— Taslima Nasrin – Twitter.

θΔics

In anecdotes, **tea kettle anecdote** refers to []

An 18th century artwork entitled "First steam experiment of James Watt", one of three renditions of the **tea kettle anecdote**, based on Watt's cousin Marion Muirhead's later recollected apocryphal story of how Watt, at age thirteen, became intrigued by the force of steam of a teapot to later go on to "invent the steam engine". [2]

Overview

The story about a young boy either experimenting with a tea kettle to study the properties of steam or to have gleaned the idea of the steam engine from watching the steam release valve bob up and down, as pointed out by Robert Thurston (1878), is attributed to: Edward Somerset, Thomas Savery, and James Watt. [1]

Worcester

(add)

Papin

Some have reported that Denis Papin envisioned the steam engine by watching the pressure release valve bob up and down on his pressure cooker (see: Papin digester).

Savery

(add)

Watt

In c.1829, Francois Arago was reporting the story in respect to James Watt. [1]

References

1. Thurston, Robert. (1878). *A History of the Growth of the Steam-Engine* (txt) (pg. 81). Appleton and Company.
2. Marsden, Ben. (2002). *Watt's Perfect Engine: Steam and the Age of Invention* (pgs. 10-11) (image). Icon.

θΔics

In

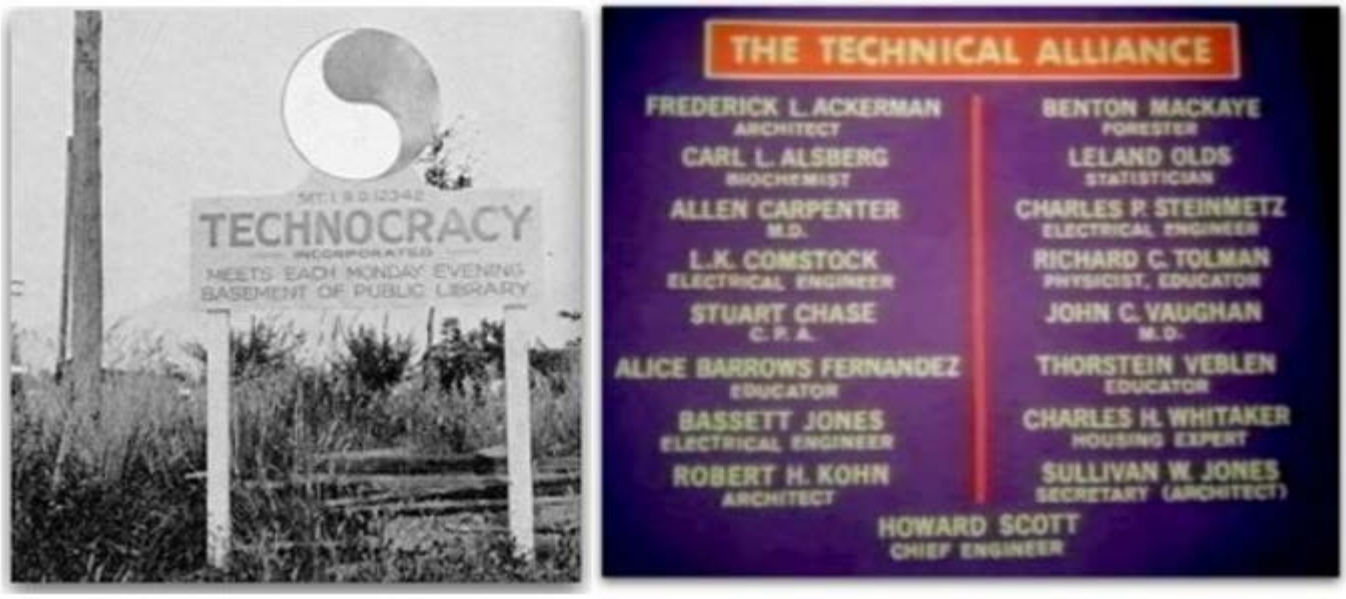

A technocracy billboard sign (left) and the "technical alliance" group, in 1958, showing Howard Scott as the chief engineer, along with other notables such as: Thorstein Veblen (economist) and Richard Tolman (cosmological thermodynamicist).

hmolscience, **technocracy**, from the Greek “techne”, meaning skill, + “kratos” , meaning rule (Q), is a type of “technological-bureaucracy”, of an economic thermodynamics variety, active largely between 1918 and 1933, in which the organizational structure devised to manage societal activity is based on physical science or, more specifically, very crude verbal conceptual ideas, per tenuous citation to Willard Gibbs. [1] The general methodology of the group was to examine social phenomena, such as unemployment or energy use, in the light of physical science. [3]

Overview

The group has its roots in a 1918 energy survey of North America, centered as Columbia University, completed under the leadership of American engineer Howard Scott.

In the winter of 1918-19, the group included Howard Scott, chief engineer; Frederick Ackerman, architect; Carl L. Alsberg, chemist; Allen Carpenter, M.D.; Stuart Chase, C.P.A.; L.K. Comstock, electrical engineer; Alice Barrows Fernandez, educator; Bassett Jones, electrical engineer; Benton Mackaye, forester; Leland Olds, statistician; Charles Steinmetz, electrical engineer; Richard Tolman, physicist; John Carol Vaughn, M.D.; Thorstein Veblen, educator; Charles H. Whitaker, housing expert; and Sullivan W. Jones, secretary. [4] The group’s view was that technology was displacing man-hours of labor, leading to increased unemployment and lack of purchasing power, and that a solution was needed.

One of their many thermodynamic-based economic theories was the use of “energy certificates” instead of money as units of value. The “Technate” is a term that describes the region over which a technocratic society would operate using thermodynamic energy accounting instead of a price system (money) method. The project, which purportedly sought to understand or regulate social order based on units of ergs, kilowatts, and calories, was supported by Columbia University.

In 1933, Columbia University, supposedly, had enough of technocracy ideas, and “cleaned house”. [2] It seems, possibly, that the project fell from public favor owing to its focus on trying to improve “efficiency”, likely modeled on Carnot efficiency, of human labor, whereby people began to see Technocracy as a body aimed at getting more work out of people.

In 1945, American physical historian Morris Zucker wrote the following humorous snippet: [6]

> “‘How best to produce and distribute the products of man’s efforts is an engineering problem and for each detail of which there is always a right answer’, wrote Harold Loeb, the High Priest of **Technocracy** when

that was in vogue."

(add)

References

1. Scott, Howard. (1932). *Technocracy – a Thermodynamic Interpretation of Social Phenomena* (12-pages). *Thenocracy* [sic]. ASIN: B00088FJ3M.
2. Dabney, Thomas E. (2007). *One Hundred Great Years: the Story of Times Picayune from its Founding to 1940* (pg. 450). Read Books.
3. Hubbert, M. King. (1936). "Man-Hours and Distribution." *Technocracy* Series A. No. 8, Aug.
4. Sievert, Skip. (2007). "A Review: Technocracy Study Course: 1947", Sep 22, Internet Archive.
5. Scott, Howard and Hubbert, M. King. (1934) *Technocracy Study Course: an Outline of those Elements of Science and Technology Essential to an Understanding of our Social Mechanism; an Analysis of the Price System; Technocracy's Social Synthesis* (275-pgs). Technocracy Inc.
6. (a) Loeb, Harold. (1933). *Life in a Technocracy: What it Might Be Like* (pg. 76). Syracuse University Press.
(b) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 25). Arnold-Howard Publishing Co.
7. Segal, Howard P. (1933). "Introduction", in: *Life in a Technocracy: What it Might Be Like* (by Harold Loeb). Syracuse University Press.

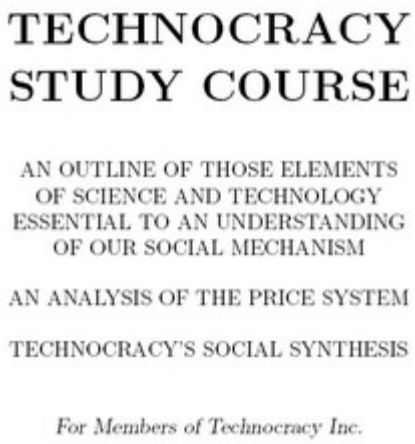
TECHNOCRACY
STUDY COURSE

AN OUTLINE OF THOSE ELEMENTS
OF SCIENCE AND TECHNOLOGY
ESSENTIAL TO AN UNDERSTANDING
OF OUR SOCIAL MECHANISM

AN ANALYSIS OF THE PRICE SYSTEM

TECHNOCRACY'S SOCIAL SYNTHESIS

For Members of Technocracy Inc.

Top: title page to the 1934, 275-page book *Technocracy Study Course*, with chapters on the laws of thermodynamics, the human engine, etc. [5] Right: Harold Loeb's 1933 *Life in a Technocracy*, an alternative view to that of Howard Scott. [7]

External links

- Technocracy and thermodynamics – Wikipedia.
- Technocracy wiki (19 articles) – Wikia.com.
- TechnocracyNow – YouTube.

In existographies, **Ted A. Erikson** (c.1928-) (CR:22) is an American chemical engineer noted his 2000s effort to understand how conscious may have arose from Planck length scales.

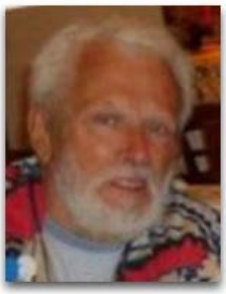

Overview

In the early 2000s, Erikson began working on a Planck-length theory of photon-base consciousness or awareness, in order to better understand where the sense of human consciousness arises.

In 2005, Erikson, a Chicago native, came into contact with Libb Thims, and the two began to meet and discuss theory over, here and there, into at least the early 2010s. Erikson, therein, became associated with Institute of Human Thermodynamics whose work is focused on the relationships between mass, energy, body size, and lifetimes of structures, both living and non-living, in attempts to synthesize a unified theory of growth valid from particles the size of the electron to particles the size of the human (human particle).
In 2009, Erikson, in his "What Makes Us Human", attempted to discern an evolution principle at the fundamental particle level to explain growth and consciousness at the human level. [2]

His general theory, based on his earlier work on and experiments on the forced vaporization of water, resulted in efforts to discern a Planck-scale theory of consciousness. [1]

In 2010, Erikson, in his April talk to the American society of Chemical Engineers at the Illinois Institute of Technology, shown adjacent:

stated the following:

> "Consciousness, a function derived from photons, gets a bit 'murky', but therein lies the source."

Erikson pointing to a printed version of the evolution timeline, at a 2010 lecture at the Illinois Institute of Technology, attempting to argue to engineer Libb Thims and physicist David Gore, that Planck length particles have consciousness. [2]

Education

Erikson completed his BS in chemical engineering and in 1959 his MS in chemistry on "Steady-State Thermodynamics", focused on the forced vaporization of water based on experiments, under American physical chemist Ralph Tykodi, at the at the Illinois Institute of Technology. Erikson went on to work for twenty years in the research and development department of the Armour Research Foundation, a subdivision of ITT, and later worked as a high school chemistry-physics-mathematics teacher for a period of twenty years.

References

1. (a) Tykodi, Ralph J. (1967). *Thermodynamics of Steady State*, (pgs. 15, 29, 57). MacMillan.
(b) Tykodi, Ralph J. (2002). *Thermodynamics of Systems in Nonequilibrium States* (xix, 210, 224, 252, 436). USA: Thinkers' Press.
(c) Erikson, Ted A. (1960). "Title", *J. Phys. Chem.*, Vol. (64): 820. (d) Tykoid, Ralph J. (1959). "Title", *J. Chem. Phys.* Vol. (31):1521.
(e) Erikson, Ted A. (1959). "Steady-State Thermodynamics: on the Forced Vaporization of Water", *MS Thesis*, Illinois Institute of Technology.
(f) Erikson, Ted A. (1965). "Title", *J. Phys. Chem.*, Vol. (69): 1809.
2. (a) Erikson, Ted A. (2009). "What Makes Us Human: Panpsychism and Thermodynamics Explored", In: *Philosophy of Evolution*, in publication (2010).
(b) Talk given to the AIChE students at IIT on April 01, 2010.

External links

- Ted Erikson (publications) – Scribd.com.
- Ted Erikson – SdogV.com
- Ted Erikson – SdogV (videos) at YouTube.com

In religio-mythology, **Tefnut**, in hieroglyphs: 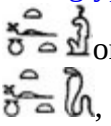 or , derived from the root "to spit; be moist", is the Egyptian goddess of the moisture of the sky; female counterpart of the god Shu (air); off-spring of Atum (or Ra-Atum, later), the Heliopolis sun god, of the Heliopolis creation myth (Ennead); mother of the god Geb (earth) and goddess Nut (heavens).

Some images of **Tefnut**, shown with lioness head, on which is balanced the sun (or sun god) Ra, surrounded by the Apep snake (Set); the image to the left shows her holding the was scepter; the right image seems to be lotus staff of some kind.

References

1. Budge, Wallis. (1904). *The Gods of the Egyptians*, *Volume Two* (Tefnut, 32+ pgs; "to spit; be moist", pg. 87). Dover, 1969.

External links

â— Tefnut – Wikipedia.

θΔics

In existographies, **Telauges** (c.540-470BC) was Greek philosopher (see: Greek philosophy), purportedly the son of Pythagoras, and semi-cited teacher of Empedocles, noted for []

Quotes | On

The following are quotes on Telauges:

> "Empedocles was a student of **Telauges** in the time when Heraclitus the obscure was well known."
>
> — Eusebius (c.330), *Preparation Evangelica* (10.14.15) [1]

References

1. Empedocles. (435BC). *The Poem of Empedocles: a Text and Translation with an Introduction* (editor: Brad Inwood) (pg. 155). University of Toronto Press, 1992.

External links

â— Telauges – Wikipedia.

θΔics

In hmolscience, **teleodynamics**, from the Greek *teleos*- meaning "end goal" + -*dynamics* meaning "power", is a supervenience conceptualized, emergence like theory, introduced by Terrence Deacon (2011), purported to explain the end-directedness, i.e. purpose, of "living things", using invented thermodynamics themed language, in a way that is meant to differ from the activity of an "attractor", e.g. the strange attractors of chaos theory, characteristic of so-called "morpho-dynamic" systems. [1]

Overview

In 2011, Terrence Deacon, in his *Incomplete Nature: How Mind Emerges from Matter*, introduced the term "teleodynamics" and "teleodynamics system", albeit crouched in his own invented thermodynamics-sounding language.

In 2020, Deacon, at the Thermodynamics 2.0 Conference (Q), gave a talk on "Teleodynamics".

Quotes

The following are related quotes:

> "**Teleodynamics** IS consistent with the second law of thermodynamics (no magic). It is a special case of thermodynamics, not some new physics. It is an atheistic model, that does not attempt to reinsert 'classical teleology' [teleology; new teleology] back into physical sciences."
>
> — Terence Deacon (2013), "JDNM review", May 22 [2]

> "William Connolly (The Fragility of Things, 2013) and Terrence Deacon (Incomplete Nature, 2012) have recently argued that **teleodynamics**, the purposeful and end-directed behaviors and the reactions and disturbances in other related ententional behaviors are key to understand not only the dynamics of institutional change per se but also, and especially so, the emergent patterns of behavior resulting from resistance and adaptation."
>
> — Juha Hiedanpaa (2015), "Teleodynamics and Institutional Change" (Q)

See also

- Chemical peneplanation
- Entelechy | Hans Driesch (c.1895)
- Telefinalism | Lecomte de Nouy (c.1942)

References

1. (a) Deacon, Terrence W. (2011). *Incomplete Nature: How Mind Emerged from Matter* (teleodynamics, 7+ pgs). W.W. Norton & Co.
(b) Tabaczek, Mariusz. (2019). *Emergence: Towards a New Metaphysics and Philosophy of Science* (teleodynamics, 5+ pgs). Notre Dame Press.
2. Thims, Libb. (2013). "Juarrero, Deacon, Nonreductive Physical Materialism, and Chemical Teleology" (pdf) (peer), *Journal of Human Thermodynamics* (url), 9(6): 77-122, Jun.

Videos

- Sherman, Jeremy. (2017). "Interview of Terrence Deacon: We Try. Nonliving Things Don't" (Q), Neither Ghost Nor Machine, Feb 8.

θΔics

In philosophy, **teleology** (TR:55), from the Greek *telos* "end" + *-logia* "divine origin", a theory in Aristotelean cosmology, is a doctrine holding that matter—specifically matter of the four element variety: earth, air, water, fire—or matter in any its modern formulations, e.g. sentient matter—has a goal, conceived as its "purpose", which is to go to its natural place, i.e. its "end", "final cause", or satiated location in the cosmos, a theory based on geocentric cosmology reasoning, namely that earth is at the bottom, in the scheme of a flat earth cosmos, fire is at the top, and each element tends towards its natural location in this scheme, e.g. fire rises because it wants to go to its higher location, and earth falls likewise to go to its natural lower place. Teleology, in an early 20th century sense (Weiss, 1925), assumes that events are not mechanically related to cause and effect, but that there is a culminating anthropomorphic condition or millennium to which ever thing is approaching. [6]

The general scheme of **teleology**, in the Aristotelian universe view of things, according to which all things in the universe have a tendency to move to their optimal or desired location, just as fire tends to rise, and earth tends to sink.

Etymology

The term "teleology" is generally attributed to Aristotle who, in the context of his general theory of everything, is said to have coined the term. (Q)

Likewise, the term "entelecheia", said to be coined by Aristotle, designates a completed state resulting from an internal movement towards this state. (Q)

The derivative term "telos" is defined or conceptualized as "inner purpose". (Q)

The work of Immanuel Kant sought to reconcile or harmonize the teleological and mechanical conceptions of the world. (Q)

In circa 1910, Hans Driesch advocated the notion of "entelochies" a sort of inner goal-directed agent hypothesized to be the mechanism behind developmental organism traits. (Q)

Physical | Humanities teleology

In 1983, American physicist Bruce Lindsay, in his "Social Exemplifications of Physical Principles", had the following telling words to say about teleology in physics: [5]

> "The **teleological** idea or the concept of purpose is involved in several physical principles, notably Hamilton's principle and the related but identical principle of least action, Hertz's principle of the straightest path, Gauss' principle of least constraint, and Fermat's principle of least time. They all effectively state that things take place in the physical world, e.g. the motions of systems of particles, in such a way as to make a certain function assume a stationary value under certain boundary conditions, usually a minimum as compared with all possible values satisfying the given conditions. For example, Hamilton's principle says that for a conservative dynamical system the motion between any two instants of time is such

> that the time integral of the difference between the kinetic and potential energies taken between these two instances has a stationary value. It has as if the system had a certain purpose to satisfy."

Lindsay, skipping a paragraph, continues:

> "With respect to the possible idea of purpose involved philosophers have argued that since Hamilton's principle is *not* necessary for the deduction of the actual motion of the dynamical systems, i.e. the Newtonian or Lagrangian equations are fully adequate, we have no real logical ground for insisting that nature imposes a teleological requirement on motions in our experience. Nevertheless the fact that one can exhibit the principles of mechanics in a teleological guise is persuasive, since it serves to tie physical principles with an idea basic to the interpretation that human beings give too much of their ordinary experience, particularly in their relations with other human beings.
>
> A rational individual is said to arrange his actions so as to be sure of achieving his fundamental desires, whether it be to accumulate wealth or gain power over his fellow men. In particular the aim here is almost always to try to attain the given desired end at minimum cost in human effort. This strongly suggests a heuristic connection with the minimum principles of physics."

Lindsay, to note, goes on to cite and discuss George Zipf and his *Human Behavior and the Principle of Least Effort* as a case in point.

The real "minimum principle", however, which Lindsay should have discussed, in respect to human behavior, is the free energy minimum principle. Being a physicist, however, it is conceivable that Lindsay was not as intuned to this insight.

Chemical teleology

The leading expositor of the lurking problems with chemical teleology, or the subtle usage of teleological statements and reasoning in chemical education, since 2007, has been Mexican-born American chemist Vicente Talanquer.

Social teleology

Stephen Turner (2008) devotes a number of pages to the issues with "social teleology" arguments, such as found in the works of Max Weber, Ernest Nagel, and Pierre Bourdieu, among others. (Q)

Other

In 2002, Robert Cummins began to popularize the term "neo-teleology", akin to neo-vitalism. (Q)

Quotes

The following are related quotes:

> "I feel profoundly convinced that the argument of design has been greatly too much lost sight of in recent zoological speculations. Reactions against the frivolities of **teleology**, such as are to be found, not rarely, in the notes of the learned commentators on Paley's *Natural Theology*, has, I believe, had a temporary effect in turning attention from the solid and irrefragable argument so well put forward in that excellent old book. But overwhelmingly strong proofs of intelligent and benevolent design lie all around us, and if ever perplexities, whether metaphysical or scientific, turn us away from them for a time, they come back upon us with irresistible force, showing to us through nature the influence of a free will, and teaching us that all living beings depend on one ever-acting creator and ruler."
>
> — William Thomson (c.1900) (Q)

"The Aristotelian viewpoint still prevails to some extent in biology, namely that an animal moves only for a purpose, either to seek food or to seek its mate or to undertake something else connected with preservation of the individual or the race. The Aristotelians had explained the process in the inanimate world in the same **teleological** way. Science began when Galileo overthrew this Aristotelian mode of thought and introduced the method of quantitative experiments which leads to mathematical laws free form the metaphysical conception of purpose. The analysis of animal conduct only becomes scientific in so far as it drops the question of purpose and reduces the reactions of animals to quantitative laws."

— Jacques Loeb (1918), *Forced Movements, Tropisms, and Animal Conduct*

"The causality of history is **teleological**."

— Alfred Kroeber (1915), "Eighteen Professions" [1]

"**Teleology** is like a mistress to a biologist: he cannot live without her but he's unwilling to be seen with her in public."

— John Haldane (c.1930s), supposedly, a requote of something said in the 1880s by Ernst Brucke [2]

"Frequent unqualified references to the principle of minimum entropy production, [are] quite often used to bolster **teleological** arguments."

— Irvin Richardson (1968) [3]

"External **teleology** is dead in biology."

— John Wilkins (1997), "Evolution and Philosophy: Is There Progress and Direction in Evolution? (Q)

"Fundamental **teleology** is a dead option in physics and chemistry."

— John Hawthorne and Daniel Nolan (2005), Bellingham Summer Philosophy Conference [4]

"In sociology, the terms of the debate have since been fundamentally and irreversibly changed, whatever it should be replaced by, **teleology** is now dead, whether in Hobhouse's whiggish version of cumulative moral progress, or in Marx's version of an inevitable dialectic leading from feudalism through capitalism to communism, or, for that matter, in the neo-Spencerian version of cumulative 'modernization', or in Weber's version of inexorable technical rationalization and spiritual disenchantment."

— Walter Runciman (2005), "Introduction to British Sociology" (Q)

See also

- Teleonomic entropy
- Terrence Deacon

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External links

● Teleology – Wikipedia.

θΔics

In animate thermodynamics, **teleonomic entropy** is a measure of disorder in biopsychosocial systems. [1] The conception of teleonomic entropy was conceived by Greek psychologists Dimitri Katakis and Charis Katakis in 1982 as a type of entropy, useful in the study of system hierarchies, related to the quality of apparent purposefulness in living systems that derives from their evolutionary adaptation; in short, a type of entropy in end-directed systems. [2] The duo supposedly began applying the concept of entropy, in the general sense, to psychotherapy in 1978. [3] Teleonomic entropy, accordingly, is argued to be "transformable" in that the teleonomic entropy at a given level of a system can affect the teleonomic entropy of different levels of the same system or other systems. [4] Whereas disorder in thermodynamics refers to the position and velocities of molecules, maximum teleonomic entropy means complete indifference to goals. [3]

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θΔics

In science, **telescope** is an instrument, aka "proportional glass" (Digges, 1571), which employs the use of glass lenses and or curved mirrors, to enable an observer see greater distances, typically into space, than is possible with the naked eye.

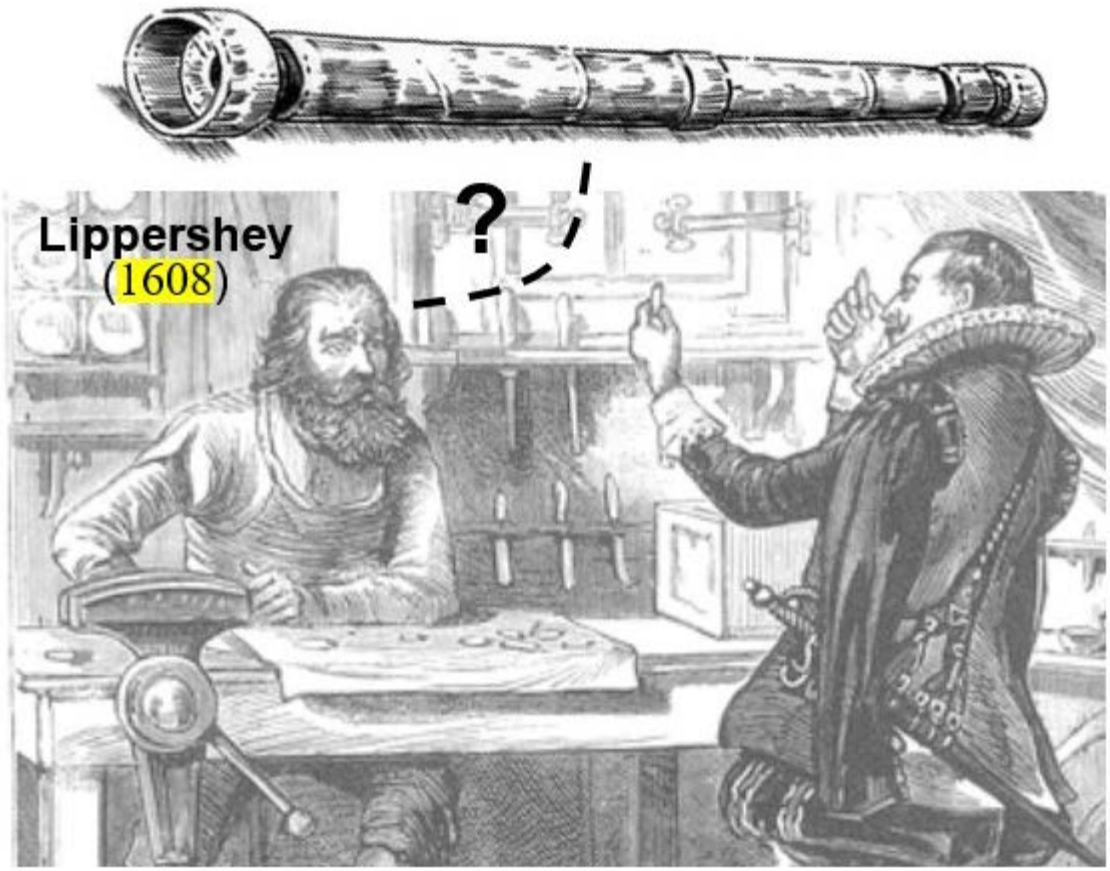

The 1610 "**telescope**" (top) built by Galileo, a 30x power telescope, based on the reports of the telescope devised by Hans Lippershey (1608). [2]

Overview

In 1289, an anonymous Florentine manuscript referred to "glass lenses for spectacles recently invented, of great advantage to old people with weak vision". [4]

In c.1500, Leonardo da Vinci, in his note books, jotted the following note to self in respect to making some type of telescope, which he had in mind:

> "Make glasses to see the moon large."
>
> — Leonardo da Vinci (c.1500), *Notebooks* [1]

In c.1515, Pope Leo X is reported to have used some type of instrument to observe, from the Medici Palace in Florence, "distant hunting chases and birds flying over the Fiesole hills". [1]

In 1538, Girolamo Fracastoro (1478-1553) (Ñº), an Italian physician, had the idea of using two convex lenses, placed one of top of the other, so to see the moon or a star, like one sees a far-away steeple:

> "If anyone looks through two spectacle lenses, one placed on top of the other, he will see everything much larger and closer. Indeed, certain spectacle lenses are made of such density, that if someone looks through them at the moon or at another star, he will judge than to be so close that they do not even appear to exceed the steeples themselves [in height]. This is why one should not be surprised if the same also occurs through the parts of the [heavenly] orbs?"
>
> — Girolamo Fracastoro (1538), *Person-Centric: Of the Stars* [3]

In c.1550, Leonard Digges (c.1515-c.1559) (Ñº), an English mathematician and surveyor, as reported by his son Thomas Digges, in his *Pantometria* (1571), is said to invented a "proportional glass" to view distant objects:

> "By proportional Glasses duly situate in convenient angles, not only discovered things far off, read letters, numbered pieces of money with the very coin and superscription thereof, cast by some of his friends of

> purpose upon downs in open fields, but also seven miles off declared what hath been done at that instant in private places."
>
> — Thomas Digges (1571), *Pantometria* [1]

In 1580s, Giovanni Porta began to discuss his work with multiple lenses employed to see far:

> "I have made glasses that can recognize a man several miles away."
>
> — Giovanni Porta (1586), "Letter" [4]

> "The figures hovering clearly and plainly as if I see my hands."
>
> — Giovanni Porta (1593), *The Refraction* [4]

In 1589, Porta, in his *Natural Magic* (§10), spoke of a "a combination of concave and convex lenses for improving long-distance vision." [4]

In 1608, Hans Lipperhey, a German-born Dutch spectacle maker, through some type of special order package for an unnamed customer, invented the telescope, or "Dutch perspective glass" as it later came to be called, and the tried to obtain a patient for it; the following is one account of this event:

> "In the year 1609 [sic], there appeared a genius or some other man, as yet unknown, of the race of Hollanders, who, in Middleburg in Zeeland, visited **Johannes Lippersein**, a man distinguished from others by his remarkable appearance, and a spectacle-maker. There is no other [spectacle-maker] in that city, and he ordered many lenses to be made, concave as well as convex. On the agreed day he returned, eager for the finished work, and as soon as he had them before him, raising two of them up, namely a concave and a convex one, **he put the one and the other before his eye and slowly moved them to and fro, either to test the gathering point or the workmanship**, and after that he left, having paid the maker. The artisan, by no means devoid of ingenuity, and curious about the novelty, began to do the same and to imitate the customer, and quickly his wit suggested that these lenses should be joined together in a tube. And as soon as he had completed one, he rushed to the court of Prince Maurice and showed hint the invention. The prince had one [or, had been acquainted with one] before, and lest it should be suspected that [the device] was of military value, and very necessary, had kept it a secret. But now that he found by chance that it had become known he disguised [his prior knowledge], rewarding the industry and good intentions of the artisan."
>
> — Giovanni Sirtori (1612), *Publication* [1]

On 7 Jan 1610, news of Lippershey's telescope invention reached Galileo, who built a new improved 30x power telescope, shown above. [2] Galileo used his telescope to get a closer view of Jupiter, and found three small, bright stars near the planet (Ñº); that year, he published a small book titled *The Starry Messenger* describing his findings.

In 1611, Johannes Kepler, in his *Dioptrice*, described a system of lenses where the concave eye-piece was replaced by a convex eye-piece. [4]

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External links

â— Telescope – Wikipedia.

θΔics

In thermodynamics, **temperature** is the "degree of heat or cold" of an object (Boyle, 1670); a "tension associated with entropy, which follows from the zeroth law" (Perrot, 1998); or a "tendency of an object or system to spontaneously give up energy" (Schroeder, 2000). [1]

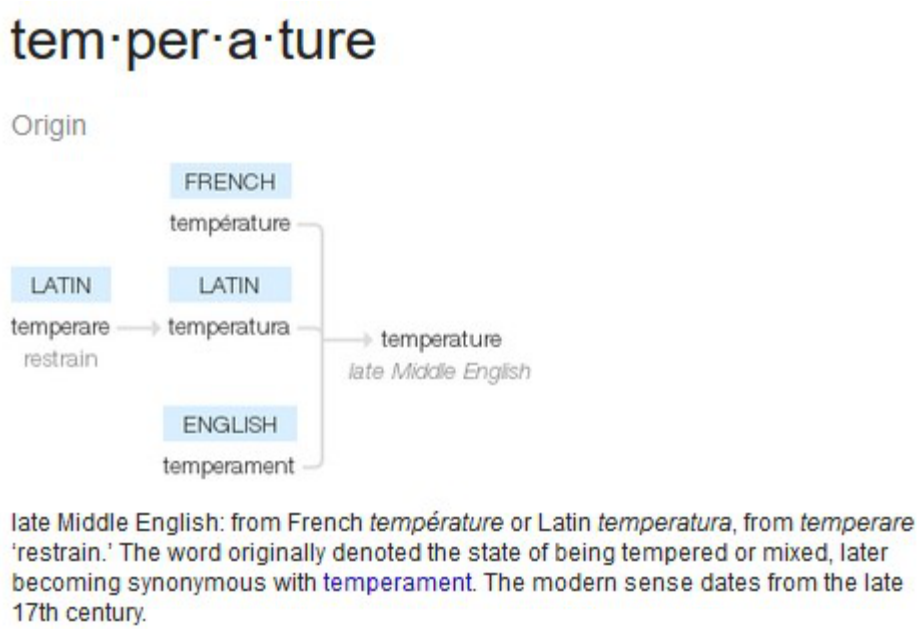

A Google-generated **temperature** etymology; pinning its "modern sense" meaning to the 17th century, e.g. Robert Boyle, as in "degree of of heat or cold".

Overview

The etymology of "temperature", according Douglas Harper's (Q)(Q) *Online Etymology Dictionary*, traces to the 15th century: [10]

> "mid-15c., 'fact of being tempered, proper proportion;' 1530s, 'character or nature of a substance,' from Latin *temperatura* 'a tempering, moderation,' from *temperatus*, past participle of *temperare* 'to mix in due proportion, modify, blend; restrain oneself' (see temper (v.)). Sense of 'degree of heat or cold' first recorded 1670 (Boyle), from Latin *temperatura*, used in this sense by Galileo. Meaning 'fever, high temperature' is attested from 1898."

In 1848, William Thomson introduced the absolute temperature scale.

In 1878, based on the kinetic theory, Scottish physicist James Maxwell defined temperature of a body as "the average kinetic energy of translation of one of its molecules multiplied by a constant which is the same for all bodies." [4]

Thermometer | Social thermometer

A device or indicator for temperature measurement is called a thermometer. A device or indicator for social temperature measurement is called a "social thermometer". Though such a device is yet to be invented, there have been no shortage of speculations in this area.

> "Public opinion is the thermometer a monarch should constantly consult."
>
> — Napoleon Bonaparte (c.1810), Publication

In 1930, French sociological philosopher Maurice Halbwachs uses the terms social temperature and in another instance moral temperature to allude to the suggestion that the suicide rate of a particular group of humans could be considered as a gauge of the moral temperature of the group: [8]

> "The number of suicides [in a region] can be considered a sort of **thermometric indicator** which informs us of the condition of the mores, of the moral temperature of a group."

(add discussion)

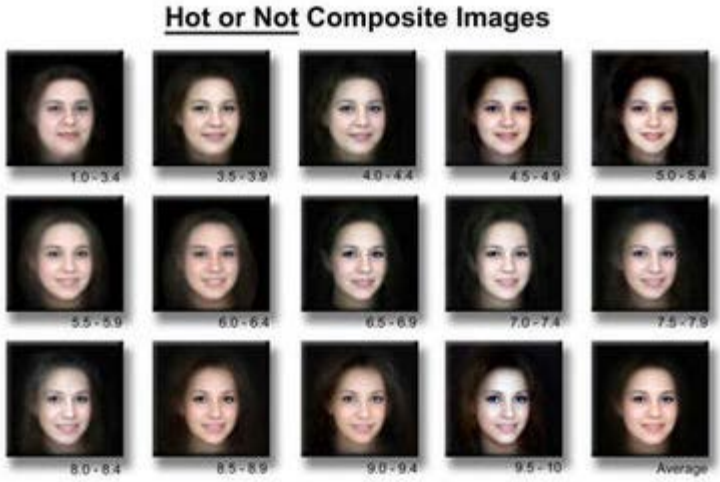

Left: a visual hot-cold temperature scale of sorts, three morphed images per photo, taken from the previously active HotOrNot.com website, in respect to average visual attractiveness aspects of beauty. Right: a 2008 video (Q) of "Thermodynamics of Hot For Words" by Libb Thims.

Hmolscience

One of the earliest attempts to extrapolate the standard definition of temperature to human systems was the conception of "economic temperature" by Emanuele Sella in 1915. [5]

In economic thermodynamics, temperature *T* has been used in measure the level of spending or income per person by authors such as German metallurgist Jürgen Mimkes (2005) and John Bryant (2007). [6]

In 2009, Chinese physicist Yi-Fang Chang suggested that social temperature could be defined by the following equation:

$$T = c\bar{K}(t)$$

where $\bar{K}$ is an average value of the social kinetic energy. [9] In this sense, in theory, as a type of human thermodynamic instrument or indicator, one could use GPS tracking devices to measure the kinetic energy, or the sum of ½ the masses of the human particles times their respective average velocities squared, of a system of human molecules under study and thus get a hypothetical reading of temperature of a social system.

In his 2010 article "Stokes Integral of Economic Growth", Mimkes argues that GDP per capita may be representative of the temperature of the economic system. [7]

In human social systems, comprised of human molecules, the definition of temperature becomes very complex. In this sence, the conception of the physical or neurological "hotness" of a person becomes a paramount issue.

The adjacent, November 26, 2008, video "Thermodynamics of HotForWords", made by American chemical engineer Libb Thims, gives a loose idea the difficulties involved in the assignment of temperatures, in reference to the Kelvin scale, in human life.

In general, the concept of temperature in human thermodynamics is one of the most difficult terms to understand and model. Beyond this, how does one, for instance, correlated the "physical heat" of a person, an example of which is shown below via thirty-person composite Hot or Not photos, with the reading on a standard thermometer?

Moreover, how does one correlate "temperature" with neurological heat, e.g. the fact that intellect correlates with sexual attractiveness. [2] These are deep questions in both human chemistry and human thermodynamics. [3]

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Videos

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External links

● Temperature – Wikipedia.

θΔics

In prizes, **Templeton Prize** is a 1972-established award for work or discoveries on spiritual realities, whose monetary value is adjusted to be more than the Nobel Prize, but whose prestige is the reverse.

Discussion

Any scientist who cashes in on the Templeton Prize and or takes grants from the Templeton Foundation is a sell-out, being that science does not recognized "spirits" as a reality, i.e. spirits are not real, hence acceptance of the prize only promotes false and vacuous ideals. A scientist associated with the Templeton Foundation is a red flag that their work is ontic opening based.

American physicist Sean Carroll, e.g., an outspoken atheist, in 2005 declined an invitation to present at a Templeton conference at the University of California at Berkeley. He says that because funding for quantum mechanics is hard to get, some of his colleagues are willing to take Templeton's research grants even if they don't support his beliefs. The Templeton folks make it tempting, he says, because unlike other academic conferences, Templeton's confabs pay presenters. Carroll says he would have received $2,000 to speak at the conference, a similar sum if he published his talk in their anthology, and a chance at a $10,000 prize for scientists under 40. (Q)

Templeton

The prize was initiated per the endowment of American-born British stock investor John Templeton (1912-2008). In 1939, Templeton, a daily prayer-believing Christian, borrowed $10,000 and $100 worth of ever stock valued at less than a dollar on New York exchange, quadrupled that in four years, and went on to become a billionaire, and in 1972 established the Templeton Foundation to encourage the researchers to use the “methods of science that have been so productive in other areas, in order to discover spiritual realities” and doles out some $80 million year for whatever spirit related work the foundation sees fit and $1.5 million annually for the prize.

Notice | Winners

The following, to make cautious not of, is a work in progress listing of Hmolpedia-related winners:

- Paul Davies
- Freeman Dyson

Quotes

The following are related quotes:

> “The **Templeton Prize** bridges the gap between sense and nonsense.”
>
> — Martinus Veltman (2003), on John Polkinghorne’s acceptance [1]

> “Rees’ acceptance of the **Templeton Prize** make him complaint quisling.”
>
> — Richard Dawkins (2010), on Martin Rees’ work on investigating life’s spiritual dimension (Q)

> “Never trust the work of a **Templeton Prize** winner or associate.”
>
> — Libb Thims (2013), mental note arisen in reflection of recent adds to Paul Davies page; along with past thought on other Templeton-funded writers: Robert Ulanowicz, Terrence Deacon (Q) , among others, whose mind[s] has gone to pasture, i.e. left the path of truth for sake of spiritual/God theory justification aiming/biased funding, 10:09AM CST Dec 9

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External links

- Templeton Prize – Wikipedia.

θΔics

In religio-mythology, **Ten Commandments** (CR:41), or Decalogue, a 500BC monotheistic transcription truncation of the 3,100BC Egyptian 42 Negative Confessions, refers to ten moral laws commanded by god, given to Moses, according to the Abrahamic faiths, that are not to be infringed upon; employed by many as a type of "Hillbilly morality" (e.g. Kanawha Country, 1974) in modern times.

Left: the German-Catholic version of the **Ten Commandments**, as would have been taught to Goethe as a child, showing commandment #6, prohibiting adultery, circled, it being the subject of Goethe's 1809 physical chemistry based *Elective Affinities*. Right: an American cowboy style version of the Ten Commandments.

Goethe

In 1809, German polyintellect Johann Goethe published his *Elective Affinities*, wherein he showed that the physicochemical implications of morality, especially in respect to the sanctity of marriage, are misaligned with Biblical understanding of morality. This misalignment comes out via the voice of the character Mittler, in the last and final chapter (P2:C18), as follows:

> There was but one occasion on which [Mittler] uniformly forgot himself—when he found an opportunity for giving his opinion upon subjects to which he attached a great importance. He lived much within himself, and when he was with others, his only relation to them generally was in active employment on their behalf; but if once, when among friends, his tongue broke fairly loose, as on more than one occasion we have already seen, he rolled out his words in utter recklessness, whether they wounded or whether they pleased, whether they did evil or whether they did good.
>
> The evening before the birthday, the major and Charlotte were sitting together expecting Edward, who had gone out for a ride; Mittler was walking up and down the saloon; Ottilie was in her own room, laying out the dress which she was to wear on the morrow, and making signs to her maid about a number of things, which the girl, who perfectly understood her silent language, arranged as she was ordered.

Punishments for Breaking the Ten Commandments

I. Other gods: Thou shalt stone him with stones, that he die; because he hath sought to thrust thee away from the Lord thy god.
—Deuteronomy 13:10

II. Graven images: Cursed be the man that maketh any graven or molten image.
—Deuteronomy 27:15

III. Using the Lord's name in vain: And he that blasphemeth the name of the Lord, he shall surely be put to death.
—Leviticus 24:16

IV. Keep the Sabbath holy: Whosoever shall work in the Sabbath day, he shall surely be put to death.
—Exodus 31:15

V. Honor thy father and mother: And he that curseth his father, or his mother, shall surely be put to death.
—Exodus 21:17

VI. Killing: He who kills a man shall be put to death.
—Leviticus 24:17

VII. Adultery: And the man that committeth adultery with another man's wife, the adulterer and the adulteress shall be put to death.
—Leviticus 20:10

VIII. Stealing: If a man shall steal an ox, or a sheep, and kill it, or sell it; he shall restore five oxen for an ox, and four sheep for a sheep.
—Exodus 22:1

IX. Bearing False Witness: A false witness will not go unpunished, and he who speaks lies will not escape.
—Proverbs 19:5

X. Coveting: No particular penalty specified, only the dire warnings against breaking a commandment.

The "punishments" for breaking the **ten commandments** as carved onto the side of the American Atheist bench (2013), orchestrated by David Silverman, outside Bradford County Courthouse, Florida, installed in reaction to to the installation of the Christian Community Men's Fellowship Ten Commandments monument, at the courthouse, the year previous; the punishment VII (above): the "adulterer [Edward] and the adulteress [Ottilie]", from Leviticus 20:10, used by Goethe in the climax end chapter [P2:C18] of his *Elective Affinities*, to show how Biblical morality is misaligned with physicochemical morality, and in need of fixing, i.e. upgrade to the modern understanding of reality and of right and wrong.

Mittler had fallen exactly on his favorite subject. One of the points on which he used most to insist was, that in the education of children, as well as in the conduct of nations, there was nothing more worthless and barbarous than laws and commandments forbidding this and that action. "Man is naturally active," he said, "wherever he is; and if you know how to tell him what to do, he will do it immediately, and keep straight in the direction in which you set him. I myself, in my own circle, am far better pleased to endure faults and mistakes, till I know what the opposite virtue is that I am to enjoin, than to be rid of the faults and to have nothing good to put in their place. A man is really glad to do what is right and sensible, if he only knows how to get at it. It is no such great matter with him; he does it because he must have something to do, and he thinks no more about it afterwards than he does of the silliest freaks which he engaged in out of the purest idleness.

I cannot tell you how it annoys me to hear people going over and over those Ten Commandments in teaching children. The fifth is a thoroughly beautiful, rational, preceptive precept. 'Thou shalt honor thy father and thy mother.' If the children will inscribe that well upon their hearts, they have the whole day before them to put it in practice. But the sixth now? What can we say to that? 'Thou shalt do no murder;' as if any man ever felt the slightest general inclination to strike another man dead. Men will hate sometimes: they will fly into passions and forget themselves; and as a consequence of this or other feelings, it may easily come now and then to a murder; but what a barbarous precaution it is to tell children that they are not

> to kill or murder! If the commandment ran, 'Have a regard for the life of another—put away whatever can do him hurt—save him though with peril to yourself—if you injure him, consider that you are injuring yourself;'—that is the form which should be in use among educated, reasonable people. And in our Catechism teaching we have only an awkward clumsy way of sliding into it, through a 'what do you mean by that?'
>
> "And as for the seventh; that is utterly detestable. What! to stimulate the precocious curiosity of children to pry into dangerous mysteries; to obtrude violently upon their imaginations ideas and notions which beyond all things you should wish to keep from them! It were far better if such actions as that commandment speaks of were dealt with arbitrarily by some secret tribunal, than prated openly of before church and congregation—" At this moment Ottilie entered the room.
>
> " 'Thou shalt not commit adultery,' "—Mittler went on—"How coarse! how brutal! What a different sound it has, if you let it run, 'Thou shalt hold in reverence the bond of marriage. When thou seest a husband and a wife between whom there is true love, thou shalt rejoice in it, and their happiness shall gladden thee like the cheerful light of a beautiful day. If there arise anything to make division between them, thou shalt use thy best endeavor to clear it away. Thou shalt labor to pacify them, and to soothe them; to show each of them the excellencies of the other. Thou shalt not think of thyself, but purely and disinterestedly thou shalt seek to further the well-being of others, and make them feel what a happiness is that which arises out of all duty done; and especially out of that duty which holds man and wife indissolubly bound together.' "
>
> Charlotte felt as if she was sitting on hot coals. The situation was the more distressing, as she was convinced that Mittler was not thinking the least where he was or what he was saying; and before she was able to interrupt him, she saw Ottilie, after changing color painfully for a few seconds, rise and leave the room.
>
> Charlotte constrained herself to seem unembarrassed: "You will leave us the eighth commandment," she said, with a faint smile.
>
> "All the rest," replied Mittler, "if I may only insist first on the foundation of the whole of them."

These "though shalt not commit adultery" comments, echoed into the ears of Ottilie, as she entered the room, resulted immediately in her collapse to death, and shortly thereafter to the death of Edward.

In 1830, Goethe wrote the following to his friend composer Carl Zelter: [1]

> "Following on what went before, let me tell you in fun, that in my *Elective Affinities*, I took care to round off the inward, true catharsis, with as much purity and finish as possible, but I do not therefore imagine that any handsome fellow could thereby be purged from the lust of looking after the wife of another. The sixth commandment, which seemed to the Elohim-Jehovah to be so necessary, even in the wilderness, that he engraved it on granite tables with his own finger,—this it will still be necessary to uphold in our blotting-paper catechisms."

The description of a god that writes laws on granite tablets with "his own finger", to note, refers to the description of the Akhenaten's monotheistic son god Aten, typically depicted in carvings as a sun disc with many long outstretched fingers; Akhenaten's monotheism generally considered the prototype to Moses' monotheism.

Goethe, in short, shows how the "double mental adultery" that takes place in the novel, explained through the language of a "double elective affinity reaction" (double displacement reaction), is at odd with morality define by Mosaic law.

Kanawha Country | Hillbilly morality

The following are interview excerpts, from people in the heat of the Kanawha County textbook controversy, showing how the self-defined "hillbillies" of Kanawha county saw the ten commandments as inflexible and at odds with situational ethics and evolution being taught to their children:

Citizen protestors during the Kanawha Country textbook controversy over some 300+ new school books that went against their Christian morality beliefs, many of whom cited the Ten Commandments as being at odds with situational ethics and sexuality studies.

> "Let me put it this way: If Darwin's right, we're just sophisticated monkeys. The Bible is wrong. There is no god. And without god, there's no right or wrong. We can just make up our morals as we go. The basis for all we believe is destroyed. And that's why this country is headed to hell in a handbasket. Is Darwin responsible? I'll say this: people have to choose between science and faith, between evolution and the Bible, between the **Ten Commandments** and make-'em-up-as-you-go ethics. We've made our choice—and we're not budging."
>
> — Local businessman (1974), response to Lee Strobel when asked if Darwin was responsible for the shootings, violence, and protests amid the Kanawha County textbook controversy [2]

> "We're trying to get our kids to do the right thing. Then these books come along and say that sometimes the wrong thing is the right thing. We just don't believe that! The **ten commandments** are the ten commandments."
>
> — Elementary school parent (1974), commentary to Lee Strobel; stated in reference to the new teaching curriculum wherein one textbook included a "situational ethics" story of a child cheating a merchant out of a penny, and asked: "Most people think that cheating is wrong. Do you think there is ever a time when it might be right to? Tell when it is. Tell why you think it is right." [2]

(add discussion)

Quotes

The following are related quotes:

> "The first and second laws of thermodynamics are of course known to us as the ten commandments, and probably obeyed more consistently."
>
> — Howard Seifert (1961), "Can We Decrease Our Entropy?" [3]

> "When it comes to bullsh*t, big-time, major league bullsh*t, you have to stand in awe of the all-time champion of false promises and exaggerated claims, religion. No contest. No contest. Religion. Religion easily has the greatest bullsh*t story ever told. Think about it. Religion has actually convinced people that there's an invisible man living in the sky who watches everything you do, every minute of every day. And the invisible man has a special **list of ten things** he does not want you to do. And if you do any of these ten things, he has a special place, full of fire and smoke and burning and torture and anguish, where he will

send you to live and suffer and burn and choke and scream and cry forever and ever 'til the end of time! But He loves you. He loves you, and He needs money! He always needs money! He's all-powerful, all-perfect, all-knowing, and all-wise, somehow just can't handle money! Religion takes in billions of dollars, they pay no taxes, and they always need a little more. Now, you talk about a good bullsh*t story. Holy sh*t!"

— George Carlin (1999), "god skit"

"If Goethe overthrew the 6th commandment, I need to overthrow the entire Bible."

— Libb Thims (2014), duty mental note, arisen per penning of Goethe on religion article, 9:19AM CST, Dec 8

See also

â— Bible vs physical science conflicts

References

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(b) Die Wahlverwandtschaften – GoetheZeitPortal.de.
(c) Goethe, Johann and Zelter, Carl F. (1892). *Goethe's Letters to Zelter: with Extracts from those of Zelter to Goethe* (sixth commandment, pg. 386). G. Bell and Sons.
2. (a) Strobel, Lee. (1974). "Textbook Battle Rages in Bible Belt County" (Ñº), *Chicago Tribune*, Sun, Oct 20.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pgs. 7-18). Zondervan, 2009.
3. Seifert, Howard S. (1961). "Can We Decrease Our Entropy?" (abs), *American Scientist*, Summer-June, 124A.

External links

â— Ten Commandments – Wikipedia.

θΔics

In thermodynamics, the **ten fundamental equations** of thermodynamics are the ten core equations of the mechanical theory of heat, signified by roman numerals (I-X), as found in German physicist Rudolf Clausius' 1875 textbook *The Mechanical Theory of Heat*, distinguished from the other 448 equations, in the same book, signified numerically, per chapter. [1] In founding chemical thermodynamics, in 1876, American engineer Willard Gibbs formulated 700 equations, based on Clausius' original 458 equations. In total, this amounts to 1,158 equations that one must master in order to become fluent in extended applications, such as in human chemical thermodynamics or in study of other types of earth-bound natural systems.

Fundamentals

These ten fundamental equations, which represent the foundation of thermodynamics, are listed below.

Equation	Description	#	Pg.
$dQ = dH + dL$	Development of the first main principle (Heat *dQ* imparted to any body whatsoever acts to increase the quantity of heat *dH* and the quantity of work *dL* done)	I	(27)
$dQ = dH + dJ + dW$	Forces against which work is done (the quantity of work *dL* may be divided into two classes: (a) internal work *dJ*, those which the molecules of the body exert among themselves, and which depend on the nature of the body itself; (b) external work *dW*, those which which arise from external influences, to which the body is subjected)	II	(27)
$dQ = dU + dW$	First main principle (first law of thermodynamics)	III	(31)
$dQ = dU + pdv$	Pressure-volume work (Case in which the only external force is a uniform pressure normal to the surface)	IV	(38)
$\int \frac{dQ}{T} = 0$	Convenient expression for the second main principle (if in a reversible cyclical process every element of heat taken in (positive or negative) be divided by the absolute temperature at which it is taken in, and the difference so formed be integrated for the whole course of the process, the integral so obtained is equal to zero)	V	(89)
$dQ = TdS$	Second main principle (second law of thermodynamics)	VI	(90)
$\int \frac{dQ}{\tau}$	Discussion on the function τ as being the absolute temperature T	VII	(105)
$dQ = \tau dS$		VIII	(107)
$\int \frac{dQ}{T} \leq 0$	Non-reversible processes (uncompensated transformations must always be positive)	IX	(213)
$dQ \leq TdS$		X	(214)

Of these, equations III and VI represent the "two main principles" (first main principle and second main principle) of the mechanical theory of heat, as discussed in Clausius' chapter five "Formation of the Two fundamental Equations."

Gibbs fundamental equation

See main: Gibbs fundamental equation

In 1876, American chemical engineer Willard Gibbs expanded on the two main principles, by adding together equations III, IV, and VI, to form what is known as the combined law of thermodynamics:

$$dU = TdS - PdV$$

but then went a step further by assuming that other factors, or rather 'forces', could act on the body, thus having an effect on the change of the bodies energy *dU* during any type of process. In short, according to Gibbs, one fully quantify the internal energy *U* of a system as the sum of all of its influencing conjugate variables pairs, which can be formed mathematically whereby with any extensity x_i (extensive variable, e.g. volume v) it is always possible to associate a tension variable X_i (intensive variable, e.g. pressure P), as a partial derivative of the internal energy of the system with respect to the partial of the extensive variable:

$$X_i = \frac{\partial U}{\partial x_i}$$

which is called the "conjugate", with the product of the two intensive extensive variables *Xdx* being called the "conjugate variable pair". Thus, according to the first law, as explained by Gibbs, the change in internal energy *dU* of a system is given can be defined rigorously as the summation of the product of all conjugate pairs acting on the system:

$$dU = \sum_{i=1}^{k} X_i dx_i$$

whereby the first main principle can be re-written as:

$$dU = TdS - PdV + \sum_{i=1}^{k} X_i x_i$$

whereby the condition for a process progressing irreversibly is that the "uncompensated transformations will be positive, expressed by saying that the variation of the entropy of the body will increase in each cycle, dS > 0, as defined by equations nine and ten, whereas the 'condition for equilibrium' is that the variation of the entropy dS of the body will be zero at the equilibrium state. The main nine types of conjugate pairs are listed below:

Intensive Variable	Extensive Variable	Energy	Function	Product	Person
Pressure *P*	Volume dV	pressure-volume work	δW	*pdV*	Clapeyron (1834)
Temperature *T*	Entropy *dS*	internal work	δQ	*TdS*	Clausius (1865)
Chemical potential *μ*	Particle number *dn*	species transfer work		*μdn*	Gibbs (1876)

Force F	Length dl	elongation/contraction work	Fdl
Electromotive force ε	Charge de	electrical work	εde
Surface tension γ	Surface area dA	surface work	γdA
Gravitational potential ψ	Mass dm	gravitation work	ψdm
Electric field E	Electric dipole moment dp	electric polarization	Edp
Magnetic field B	Magnetic moment dm	magnetic polarization	Bdm

What this table says is that when a system does work or has work done on it the system internal energy is effected, and this effect can be quantified by conjugate variable pairs. To go through one example, when the system has a volume dV change due the action of a pressure P, i.e. pressure-volume work (dW = pdV), an expansion of a material section or elongation dl in response to the application of a force F, i.e. elongation work (dW = Fdl), does work (μdn) by transporting a certain number of atoms or molecules dn against a concentration gradient, where μ is the chemical potential, i.e. transport work (dW = μdn), or, among many other possible examples, does work in the action of charge transport in which an amount of charge dq is transported against an electric potential ψ, i.e. electrical work (dW = ψdq), then the Gibbs fundamental equation becomes: [3]

$$dU = TdS - pdV + Fdl + \sum_{i=1}^{m} \mu_i \, dn_i + \psi dq$$

In short, what Gibbs did was to add on the 'other conditions' to Clausius' first main principle (III) by which the equilibrium of the system could be effected, as described in his now-famous treatise *On the Equilibrium of Heterogeneous Substances*, containing exactly 700 numbered equations, which has called the principia of thermodynamics. [2] In modern shorthand, the cliff-note version for primary results of Gibbs work, as applied in chemistry, for simple isothermal-isobaric processes, wherein reactants are put in a reaction vessel, is the following spontaneity criterion:

Condition	Description
$dG < 0$	Reaction or process is spontaneous in the forward direction.
$dG > 0$	Reaction or process is nonspontaneous (reaction is favored in the opposite direction).
$dG = 0$	System is at equilibrium (there is no net change).

which are simplified rules which quantify and predict the "spontaneity" of the said reaction or process under study.

See also

â— Quantity
â— Characteristic function
â— Characteristic function notation table

References

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2. Gibbs, Willard. (1876). "On the Equilibrium of Heterogeneous Substances", *Transactions of the Connecticut Academy*, III. pp. 108-248, Oct., 1875-May, 1876, and pp. 343-524, may, 1877-July, 1878.

θΔics

In thermodynamics, a **tension**, symbol X, is a partial derivative of the internal energy U with respect to an extensity, symbol x, other extensive quantities being kept constant. [1] Subsequently, with any extensity x_i it is always possible to associate a tension variable X_i:

$$X_i = \frac{\partial U}{\partial x_i}$$

which is called the conjugate. As such, according to the first law, the change in internal energy of a system is given by:

$$dU = \sum_{i=1}^{k} X_i dx_i$$

Stated verbially, extensity is an energy "transfer variable", defined such that when two systems A and B are brought into contact or interact, the assembly (A + B) being isolated, each system having different tensions, an exchange of energy results via a transfer of an extensity, such that the transfer ends when the tensions have equalized. [2]

First law example

The simplest example being the addition of a quantity of heat δQ to a body, whereby the body expands, according to Boerhaave's law, pushing outward on the surrounding atmosphere, thus doing an amount of pressure volume work δW. The first law thus gives:

$$dU = \delta Q - \delta W$$

or stated in terms of conjugate variables (with substitution of the integrating factor formulation of heat and work):

$$dU = Tds - Pdv$$

where T and P are the tensions and S and V are the extensities. To restate, the measure of pressure P, for instance, is a quantity of tension whose conjugated extensity is volume V. In the case of transfer, an amount of energy in the form of pressure-volume work dW can be exchanged between two interactive systems (the body of steam, for example, and the body of surrounding atmosphere):

$$dW = -PdV$$

where the minus sign is the consequence of the "system-based" sign convention of $dW > 0$ if $dV < 0$.

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1. Perrot, Pierre. (1998). *A to Z of Thermodynamics.* Oxford: Oxford University Press.
2. Richet, Pascal. (2001). *The Physical Basis of Thermodynamics: with Applications to Chemistry*, (pg. 11). Springer.

θΔics

In hmolscience, **Teresa Brennan** (1952-2003) was an Australian-born American feminist philosopher and social-political theorist noted for her psychodynamic theories on how energetics applies to social issues, such as relations between men and women, theorizing on concepts such as the physics of social pressure. [1]

Overview

Brennan's work is largely based on the Austrian psychologist Sigmund Freud's theories of how forces act on the mind in a physical sense in connection to psychological energy. In summary to her first book, the 1992 *Interpretation of the Flesh: Freud and Femininity*, Brennan explains that "the solution to the riddle of femininity depends on unraveling Freud's neglected if confused theories on psychical energy, while discarding the assumption that the subject is energetically and emotionally self-contained." In this work she discusses social energy, emphasizing Freud's physical psyche model using the notion of conflicting forces complemented by bound energy and free energy. [2] This bound energy, supposedly, is said to lead to psychic rigidity while freely mobile energy leads to psychic flexibility. [3]

Her 1993 book *History After Lacan* seems to cover the views of French psychoanalyst Jacques Lacan, noted energy-entropy critique of the psychodynamics work of Freud. [6]

In her 1997 article "Social Pressure", she argues that social pressure operates as physical energy, arguing that social pressures are pressures to conform but also those exerted on the psyche in the same way that physical pressures are exerted on the body. [4] In her last book, the 2004 *The Transmission of Affect*, which seems to be the most popular, she presents the idea that one can soak up someone else's depression or anxiety or sense the tension in a room, arguing that the emotions and energies of one person or group can be absorbed by or can enter directly into another.

Brennan's 2004 *The Transmission of Affect*. [4]

The 2007 multi-author book *Living Attention* is an interdisciplinary exploration of the scope and impact of Brennan's work and theories, inclusive of chapters such as "Teresa Brennan's Energetics", among others. [7]

Education

In 1992, Brennan was a professor of social and political sciences at the University of Amsterdam, also teaching regularly at the universities of Cambridge and London. In 2003, she was the chair of the humanities department at Florida Atlantic University.

Other

People who purchase Brennan's *Transmission of Affect* also tend to read the work of American women's studies sociologist Patricia Clough's 2007 *The Affective Turn: Theorizing the Social*, which utilizes thermodynamics, entropy, in theorizing about woman's work. [9]

Note

Brennan met her reaction end on February of 2003, following a hit-and-run car accident two months prior, which had put her in a coma. Connected to this, in 2006, in what seems to be a bit of macabre tabloid fodder, so to speak, Australian ex-judge Marcus Einfeld stated under oath in court that a speeding ticket he received (that was caught on camera) could not have occurred because at the time of the ticket (2006), as he stated (signing a statutory declaration to that effect), "his good friend good friend professor Teresa Brennan was driving his car when it was caught speeding", even though he knew she had passed three years earlier. [8]

References

1. Jardine, Alice, Lundeen, Shannon, and Oliver, Kelly. (2007). *Living Attention: on Teresa Brennan* (pg. xi). SUNY Press.

2. Brennan, Teresa. (1992). *The Interpretation of the Flesh: Freud and Femininity*. London: Routledge.
3. Oliver, Kelly. (2001). *Witnessing: Beyond Recognition* (pg. 196-197). University of Minnesota Press.
4. Brennan, Teresa. (1997). "Social Pressure", *American Imago* 54(3): 257-88.
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6. Brennan, Teresa. (1993). *History after Lacan.* New York: Routledge.
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8. (a) Robinson, Russell. (2007). "Teresa would be angry at Einfeld", *The Daily Telegraph*, Jan 23.
(b) Marcus Einfeld (criminal conviction) – Wikipedia.
9. (a) Clough, Patricia T. (2007). *The Affective Turn: Theorizing the Social* (keyword: thermodynamics, 20+ pgs; ch. Women's work and the Ambivalent Gift of Entropy, pgs. 119-15, by David Staples). Duke University Press.
(b) Patricia Clough (faculty) – Queens College, The City University of New York.

Further reading

â— Brennan, Teresa. (2000). *Exhausting Modernity: Grounds for a New Economy* (ch. 3: Energetics, pgs. 41-). Psychology Press.

External links

â— Brennan, Teresa – WorldCat Identities.

θΔics

In hmolscience, **term rank** (TR) or “term usage rank” refers to the number of pages a “term”—not to be confused with a personal “name” citation ranking or Hmolpedia citation ranking (HCR), nor with humanities citation ranking (HuCR)—is employed within Hmolpedia.

List

The following is a 22 Nov 2013 launched work-in-progress ranking of term predominance within Hmolpedia, the numbers shown being the number of page results returned according to the internal search engine:

#	Term	Pages	Related
1.	Thermodynamics	3,213	
2.	Human	2,605	
3.	Physics	2,001	
	Energy		
4.	Internal energy	1,921	187
	Work		
	Work function	1,921	1
	Chemical	1,741	
5.	Chemistry	1,635	
6.	Entropy	1,574	
	Life		
	Death	1,493	508
7.	Time	1,307	
8.	Heat	1,178	
9.	Molecule	1,129	
10.			
11.			
12.	Volume	990	
	Force	957	
	Affinity		
13.	Chemical affinity	844	237
	Elective affinity		135

14.	Atom	819	
15.	Free energy		
16.	Gibbs free energy Human free energy Helmholtz free energy	716	315 88 75
17.			
18.			
19.			
20.	Element	582	
21.	Temperature	567	
22.			
23.			
24.			
25.	Pressure	368	
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26.	Event	300	
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30.	Enthalpy	181	
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36.	Paradox	138	
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39.	Emotion	120	
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50. Causality 52
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Discussion

(add)

In genius studies, **Terman gifted study** refers to a 1916 to 1928 IQ testing study, conducted by Lewis Terman, wherein 1,000s of children in and around Palo Alto, California, were tested to isolate those scoring an IQ of 135 or above on Terman's newly developed Stanford-Binet intelligence test; some 1,528 "genius" range approaching children were identified, and thereafter studied for patterns and traits, and followed thereafter, into adulthood, to see if psychologist identified "giftedness" would transform into adult-level realized "genius". The only two geniuses realized, in actuality, from the Terman study, ironically, were two kids who didn't make the IQ test cut (tested as below 135), and were excluded from the study, namely: transistor inventor William Shockley and asteroid impact extinction theorist Luis Alvarez, both Nobel Laureates in physics.

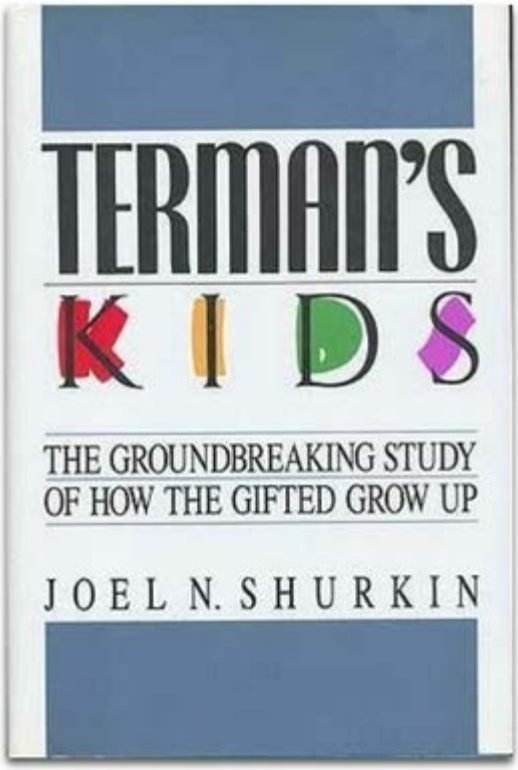

Cover of Joel Shurkin's 1992 *Terman's Kids*, wherein he ironically reports on how, in all of Lewis **Terman's gifted study**, in Terman's decade of testing kids, in and around California, with his IQ tests, so to presumably identify "giftedness" and supposedly "future geniuses", that the only two notable geniuses that resulted, in actuality, from the effort, were two that didn't make the identifying cut of IQ of 135 or above (see: IQ scale), namely: transistor inventor William Shockley and asteroid impact extinction theorist Luis Alvarez, both Nobel Laureates in physics.

Overview

In 1916, Lewis Terman, harboring the belief that "genius is inherited" (Galton, 1869), began to test 100s of kids around Palo Alto, California, with the ultimate aim to find 1,000 so-labeled "gifted children", using his new Stanford-Binet test, the earlier Army Alpha, which he co-developed, and or the National Intelligence Tests. By 1921, he eventually found eventually found 1,444 by by 1928 found 1,528 children (856 males and 672 females) using this method.

Mislabeled geniuses

See main: Mislabeled geniuses and IQ tests

In 1918, William Shockley (IQ:175|#260), age 8, scored an IQ of 125 on the Stanford-Binet, and at age 9 scored 129, but would go on to win the 1956 Nobel Prize in physics for his work on the development of the transistor, one of the central things behind what would later become to Silicon Valley.

In c.1921, Luis Alvarez (IQ:175|#533), age 10, took one of Terman's tests, scoring below IQ 135, therein failing to qualify, yet would famously go on to win the 1968 Nobel Prize in physics for work in elementary particle physics, and also in 1980 become famous for the "asteroid impact extinction theory" as to why the dinosaurs went extinct, based in iridium layer measurements.

Quotes

The following are related quotes:

> "I often laugh at how I couldn't qualify for **Terman's gifted study**, yet go on to in a Nobel Prize in physics?"
>
> — William Shockley (c.1960), frequently mused joke, following his 1956 Nobel Prize win

> "In 1921, Lewis Terman, a Stanford University psychologist and a pioneer of the IQ test, scoured California's schools to identify 1,521 children who scored 135 or over on his new intelligence test, the Stanford-Binet. Terman's little geniuses, who as the study went on too call them 'Termites', are now in their 80s and have been contacted every 5 or 10 years, making the Terman Study of Genius, the grandfather of all life-span research."
>
> — Daniel Goleman (1995), "75 Years Later, Study Still Tracking Geniuses" [2]

"IQ also is a good predictor of success in life, at least by conventional middle-class standards, and the **Termites** did splendidly, becoming (at least for the males) doctors, lawyers, businessmen, and scientists at a vastly higher rate than would be expected from the general population. The 1,500 children grew up to produce at least 2,500 scientific articles and papers, 200 books, more than 400 short stories and 350 patents. And that didn't count the output of the professional journalists. Terman was so proud of them that his files bulge with their work. Three were members of the National Academy (including his son, Fred); six made the International Who's Who; 40 made Who's Who in America, and 81 (including 12 women) made American Men of Science. Terman's kids worked for the Federal Reserve, the Atomic Energy Commission, the staff of the US Senate, the Department of Justice, NASA and the United Nations. During the Second World War, the men earned 90 valor medals, including 15 Purple Hearts. By and large, they reported themselves to be happy people, and they lived longer than the population average."

> — Joel Shurkin (2006), *Broken Genius: the Rise and Fall of William Shockley, Creator of the Electronic Age* (pg. 229) [3]

"A more valid criticism — and this is crucial to understanding the flaw in Shockley's argument too — lies in what IQ did not measure in **Terman's study**. Most obviously, Terman missed the two Nobel Laureates. Neither Shockley nor Luis Alvarez had IQs above 135. Shockley was tested twice and missed both times. Whatever talent they had went unmeasured by Terman's questions. One hypothesis is that the tests do not measure mathematical prowess very well, but is that ability not a facet of what we mean by 'intelligence'?"

> — Joel Shurkin (2006), *Broken Genius: the Rise and Fall of William Shockley, Creator of the Electronic Age* (pg. 230) [3]

"Two of the students **Terman** deemed to be insufficiently intelligent to participate in **his study**, Luis Alvarez and William Shockley, won the Nobel Prize in Physics. None of the Termites received a Nobel Prize or a Pulitzer Prize. Nor did any of the Termites become world-class musicians like Isaac Stern and Yehudi Menuhim — two other students rejected by Terman for insufficient IQ scores. 'All in all', writes David Shenk, the author of *The Genius in All of Us* (2010), Terman's epic studies in genius turned out to be studies in disappointment'."

> — Randall Kiser (2017), *Soft Skills for the Effective Lawyer* (pg. 89)

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1. Shurkin, Joel N. (1992). *Terman's Kids: the Groundbreaking Study of How Gifted Grow Up* (Amz). Publisher.
2. Goleman, Daniel. (1995). "75 Years Later, Study Still Tracking Geniuses" (Ñº), New York Times, Mar 7.
3. Shurkin, Joel N. (2006). *Broken Genius: the Rise and Fall of William Shockley, Creator of the Electronic Age* (Terman, 6+ pgs; 1,500 kids quote, pg. 229). Publisher.

External links

â— Genetic Studies of Genius – Wikipedia.

θΔics

In IQs, **Terman IQ** is an IQ determined by the calculations and methods of American psychologist Lewis Terman, a psychology professor at Stanford University, who in 1916, building on the previous child development IQ work of Alfred Binet (1899), Theodore Simon (c.1890), and William Stern (1912), invented the modern version of the IQ scale, as explained in his book *The Measurement of Intelligence*, as follows:

American psychologist **Lewis Terman** (1877-1956), 1916 inventor the modern **IQ** scale (0-100); a Binet-Simon scale focused on testing the 'average' student, using William Stern's 1912 proposal that an individual's intelligence be measured as an **MQ** (test-age/actual-age). [1]

IQ of 0 = no intelligence
IQ of 100 = average intelligence (of a normal child)

The name "Terman IQ" is synonymous with "ratio IQ", with the exception that the IQ value assigned to that person was determined by Terman himself, by analysis of that child's abilities.

200-range IQs

The first 200 range IQ was calculated by Terman in his 1917 article "The Intelligence Quotient of Francis Galton in Childhood", and assigned to Francis Galton, in which, in short, based on comments by Galton at age four:

> "I am four years old and I can read any English book. I can say all the Latin substantives and adjectives and active verbs besides fifty-two lines of Latin poetry. I can cast up any sum in addition and can multiply by 2, 3, 4, 6, 8, 9, 10, 11. I can also say the pence table. I read French a little and know the clock."

among other mental feats, in Galton's adolescence, Terman arrived at the result that Galton at age four was as smart as an average eight year old:

$$IQ_{Galton_{age4}} \cong 100\frac{8}{4} = 200$$

Thus, Terman concluded that via his age ratio IQ method, during the ages of about four to eight, Galton had a "intelligence quotient" of about 200. The central issue with this calculation is that it does not carry over into an adulthood IQ representation. Nevertheless, once someone is assigned a 200 IQ, people assume that this IQ value is representative of that person's intelligence, in retrospect, throughout their life. In other words, later when someone comes across the value the value of 190 assigned to Newton, by Catherine Cox (1926), people will reach the illogical conclusion that Galton was smarter than Newton, which makes no sense at all. To exemplify, Terman, using the above method, assigned Nicolas Copernicus, one of the greatest polymaths to have ever lived, the epitome of the "scientific revolution", with an IQ of 100 to 110:

IQ_T=100-110 (Copernicus's IQ, as a child, according to Terman)

which was a value, no doubt based on Copernicus' childhood, which may have been average at age four to eight.

IQ_C=160 (Copernicus' overall lifetime IQ, according to Catherine Cox, 1926)
IQ_B=185 (Copernicus' overall lifetime IQ, according to Tony Buzan and Raymond Keene, 1994)
IQ_{CB}=173 (Copericus' overall lifetime IQ, according to the mean of the Cox-Buzan estimates)

$IQ_?$=200 (Copernicus's overall lifetime IQ, according to intuitive placement on the 2010 grouping of the 35-known EoHT 200+ range IQs)

In other words, Copernicus was far from average, but rather one of the greatest geniuses to have ever lived; subsequently, this example highlights the issues with making 200-range estimations, using the age ratio IQ method of Terman.

IQ scale history

The IQ scale originated in the years to follow 1899 at which point French psychologist Alfred Binet (1857-1911) was assigned the task of facilitating the new French government mandate that all children ages six to fourteen go to school. Binet's aim was to develop a test for children ages 6-14, so as to be able to put each child in the appropriate classroom based on their test results. Binet's efforts eventually resulted in the now famous "Stanford-Binet Intelligence Test".

French psychologist **Alfred Binet** (1857-1911): in 1899 was appointed to the Commission for the Retarded, a repercussion of a new French law that mandated school for children ages six to fourteen, whose aim was to develop a test to differentiate between normal and abnormal children, so to be able assign each to different classrooms. [14]

French psychologist **Theodore Simon** (1872-1961): was an intern at the asylum in Perray-Vaucluse, studying abnormal children, during which time he began to work with Binet to develop a test that could measure intellectual development of children ages 3-12.

German psychologist **William Stern** (1871-1938): reviewed the work of Binet (and others), and developed the idea of expressing intelligence in the form of a single number, the "mental quotient" (1912) as one's mental age divided by one's chronological age: [15]

$$MQ = \frac{Age_{mental}}{Age_{actual}}$$

The point to remember here is that this test is geared for children aged fourteen our younger. Grandiose errors result when people extrapolate genius range IQs from this test, whereas in reality the test Stanford-Binet IQ test can only say that the child is at most at least as smart as fourteen year old.

Mental Quotient | MQ

In 1912, German psychologist William Stern (1871-1938) developed the formulaic idea that one could use childhood intelligence tests, such as Binet's, to put the test result into a formula, called a "mental quotient" (MQ), wherein the age the test was designed for, called the "mental age" (MA), would be divided by the age of the test taker, called the "chronological age" (CA), as follows:

$$MQ = \frac{MA}{CA} \quad \text{or} \quad MQ = \frac{Age_{mental}}{Age_{actual}}$$

The central issue with this formula was that it didn't give whole number results but rather decimal place fractions values such as 0.89 or 1.22, etc., which didn't seem to make much of an intuitive ranking sense.

Intelligence Quotient | IQ

In 1916, to remedy the fraction issue of the Stern's mental quotient formula, Terman devised the idea that Stern's MQ should be multiplied by the value of 100, thus always giving whole number results (1, 2, 3, etc.) and thereafter be called

an "Intelligence Quotient" (IQ):

$$IQ = 100\frac{MA}{CA}$$

Hence the idea of the "IQ" was born.

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θΔics

In knowledge, **terminology** is the study of the meaning of terms and words, those including prefixes, suffixes, conjunctions, portmanteaus, coinings, etymologies, anagrams, compound words, context of words, e.g. scientific (hard or soft), metaphorical, or analogy, among other aspects.

Overview

In hmolscience, a significant number of two cultures and or two natures (vs one nature), dualism, and or unbridgeable gap conceptualized collisional-like terminology issues exist. While some of these, e.g. "sun rise" (technically the earth rotates toward the sun at start of lightness) and "sun set" (technically the earth rotates away from the sun at start of darkness), these examples being a heliocentric mindset ingraining, are relatively innocuous, others, e.g. "life" (technically there is no such thing) or "death" (technically there is no such thing), these being Heliopolis creation myth (Anunian theology) mindset ingrainings, are not so innocuous, requiring considerable reconceptualization. To give an example of successful upgrade, in the mid 19th century the questionable 18th century terms "living force" (or vis viva) and "dead force" (vis mortua) easily dropped out of circulation, particularly going into the early 20th century, with the acceptance and adopted usage of the terminologically neutral terms: kinetic energy (coined by William Thomson and Peter Tait in 1862) and potential energy (coined by William Rankine in 1853), respectively; terms that cogently scale up and down the so-called great chain of being, molecular evolution table, or molecular evolution timeline, without any sort of anthropocentric or religio-mythology bias or underpinning.

Darwin | Terminology reflections

See main: Darwin on higher and lower

Darwin thought a great deal about terminology, particularly in regards to the terms "higher" and "lower", some communications of which are as follows:

> "Never use the words higher or lower."
>
> — Charles Darwin (c.1845), note written on the margin of his copy of Robert Chambers' 1844 *Vestiges of The Natural History of Creation* [3]

Life terminology | Reform

See main: Life terminology upgrades

In 1925, Alfred Lotka, in his *Elements of Physical Biology*, spends his entire first chapter "Regarding Definitions" on the issue of the definition of "life" form a physical + chemical point of view; about which he says is but a "hunt for the jabberwock", but does not see the remedy.

Terms in the physicochemical sciences have slowly been "upgraded" in the two centuries, according to which formerly anthropocentric or religio-mythology centric terms are or become divested of any terms that are non-physicochemically neutral, i.e. ones that do not extend up or down, unbiasedly, the so-called great chain of being, molecular evolution table, or molecular evolution timeline. To speak of a "living atom" (or living molecule), e.g., is a defunct neoplasm, not recognized by physics and chemistry (Charles Sherrington, 1938), and hence one either to be abandoned (Francis Crick, 1966) or upgraded.

Sociology terminology | Reform

See main: Sociology terminology upgrades

The following, to exemplify, is a description humans in aggregate groups using a chemical thermodynamically neutral (or physical science neutral) one nature terminology, albeit with the exception of the term "society", which is a term not found in the test tube, periodic table and or the chemistry textbooks:

> “In the inorganic world we find the power of combination growing with the increase of differences. Place a thousand atoms of oxygen in a receiver, and they will remain motionless; but introduce a single atom of carbon, and excite their affinities for each other, and at once motion will be produced. Such being the case in regard to all other matter, it must be so in regard to those combinations in which man is concerned, indicated by the **term** society.”
>
> — George Carey (1858), *Principles of Social Science* (§8: On The Formation of Society)

Likewise, to give a simpler example, the premise of “sociology” defined as the subject of study when people act "social"— from Latin *socius* “companion” — together is in need of a bit of terminology deanthropomorphization, in respect to one nature cleansing, e.g. in the physical sciences, one does not say that water and wine mix, whereas oil and water do not mix, because the former are “companions” to each other, whereas the latter are non-companions, but rather that wine is hydrophilic, whereas oil is hydrophobic; and if further term clarification is needed, one can interject into physical chemical descriptions and quantifications of each scenario, etc.

Love terminology | Reform

See main: Love terminology upgrades

The subject of love terminology reform is a newer subject; David Bossens (2013) gives a queried example of how love terminology reform is a precipitate of life terminology reform.

Morality terminology | Reform

See main: Morality terminology reform

The roots of the terms "moral" and "vitalism" trace to the mythological characters Mor aka "death goddess" and Vita aka life goddess, in the sense that something considered, deemed, or seen as amoral is considered to bring about the arrival of Mor, whereas something deemed moral acts to bring about the arrival of Vita; the following is an example quote of where using mythological-based terminology issues arise:

> “We shall use the **terms** morality, behavior, conduct, or constructive action in the same broad way. It may sound strange to speak of the morals of an atom, or of the way in which a molecule conducts itself. But in the last analysis, science can draw no fundamental distinction between the conduct of an animal, a bullet, or a freshman, although there may be more unknown factors involved in one case than in the other.”
>
> — William Patten (1920), *The Grand Strategy of Evolution: the Social Philosophy of a Biologist*

Here, in short, we see a "terminology reform" issue: it is indeed strange to speak of the "morals" of an atom. To reform the term "moral", into a chemical thermodynamically neutral language, however, is a large subject, to say the least — much of which involves a good deal of deanthropomorphization of belief system.

See also

- Self terminology reform
- Soul terminology upgrades (see: Epicurus)
- Spirit terminology upgrades | Spirit → Curious manifestations of material energy (Jevons, 1874) (Q)

Quotes

The following are related quotes:

"The first thing needed is the rectification of **names**."

— Confucius (c.470BC), *Analects* 13:3

"Power, truth, justice: they are **words** that denote something great, but that something we are quite unable to see and conceive."

— Michel Montaigne (1580), *Essays* [2]

"I am always very chary about using such **expressions** as 'spiritual phenomena', because the word *spiritual* has almost become a synonym of supernatural. Yet the word is a perfectly proper one and ought to be redeemed and freely used, more nearly as a synonym of *psychic* in its widest sense, and I shall not hesitate so to use it. The last three chapters have been devoted to showing that spiritual phenomena are as much natural phenomena as physical phenomena, that spiritual forces are true natural forces, and that there is a spiritual energy, *i.e.*, a psychic and social energy, that is as capable of doing work as any other form of kinetic energy. In fact it is the highest and most effective form of energy or *vis viva*."

— Lester Ward (1907), *Pure Sociology* [4]

"Historians will have to learn to be as precise in the employment of their **terms** as is the mathematician and the physicist."

— Morris Zucker (1945), commentary on terms such as 'free' vs. 'slave' labor power [1]

"While it was long possible and sometimes tempting for physicists to deny the usefulness of the molecular hypothesis, we economists have the good luck of being some of the 'molecules' of economic life ourselves, and of having the possibility through human contacts to study the behavior of other 'molecules' (see: human molecular hypothesis)…. If we will be more forthcoming with explanations of our cherished **terms**, our science colleagues may be more inclined to help us with 'entropy', which to me is a more difficult concept than anything economics has to offer."

— Tjalling Koopmans (1947/79), collected work (aggregate quote)

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External links

- Terminology – Wikipedia.

θΔics

In science, **terminology reform** is []

Overview

The following is the schematic overview of the terminology reform problem:

Problem (Term/Concept)		Solution (Term/Concept)		Notes (Synopsis/Progress)
Life does not exist				
Defunct theory of life Regarding definitions Abioism Afterlife does not exist Prelife does not exist	→	Life terminology upgrades	✓	
Self- terms violate principle of inertia	→	Self terminology reform		
Atoms socializing with each other problem [add synopsis]	→	Sociology terminology upgrades	✓	
Atoms loving each other problem				
In the early 20th century, it became apparent, to the "one nature" theorists, e.g. Bray (1910), that one can no longer get away, as Empedocles (450BC) did, with saying that the elements "love and hate" each other, e.g. to say that hydrogen "loves" oxygen, which is why water forms, is "objectionable	→	Love terminology upgrades	✓	See: Balzac feelings and affinity dialogue

nonsense" (Ñº) as Einstein (1936) would say; so it must be so with humans.

Purpose does not exist

Purposeless universe hypothesis
Pointlessness
Pointlessness universe hypothesis
Meaninglessness

→

Purpose terminology reform

Sense of purpose

The exact reform involves: (a) not invoking chemical teleology assertions, (b) not invoking pointlessness universe assertions, (c) addressing the Lindsay-Bray reform model, and (d) addressing the "divine a sense of purpose" Einstein description (as touched on in the Gates model).

This, in short, is an “Aristotelian cosmology” to “Gibbsian cosmology” belief system terminology reform AND concept reform problem; see: Hamiltonian. While "purpose", as an anthropism, does not seem to exist (e.g. as applied to hydrogen reacting with oxygen or a rock falling through a gravitational potential); it is erroneous to say, as Steven Weinberg (1993) infamously did, that "points", e.g that inflection points, such as Gibbs energy inflection points, don't exist in the universe, i.e. that the universe is "pointless"; meaningless hypotheses fall into this latter error-filled bucket likewise.

“We can, indeed, kill all organic beings and thus render them inorganic at will. But these changes are not the same as those which we induce in a piece of chalk by pouring sulphuric acid upon it; in this case we only change the form, and the inorganic matter remains. But when we pour sulphuric acid upon a worm [e.g. Dahmer], or when we burn an oak-tree, these organisms are not changed into some other animal and tree, but they disappear entirely as organized beings and are resolved into inorganic elements.”

— August Weismann (1889), *Essay on Heredity*; seeming variant of Gregory Bateson’s kick a stone or kick a dog comparison (Ñº)

Soul does not exist

Asoulism
Amoralism

→

Soul terminology upgrades
Morality concept reform

Goethe was the first to tackle this problem via his daimonic principle and later in his "moral symbols" (1809) postulate; the modern solution involves free energy coupling theory.

			“The science of force is power acting by law in space and time.” — William Hamilton (1834), *On a General Method in Dynamics*
God does not exist Atheism Adam and Eve never existed Abraham never existed Moses did not exist Jesus never existed	→	Theism to zerotheism reform	This, in short, is a "higher powers" confusion issue ingrained into a religio-mythology unlearn problem; representative quotes of which are as follows: “I do not think Jesus Christ ever existed.” — Napoleon Bonaparte (1817) “Moses did not exist.” — Ludwig Wittgenstein (1953), *Philosophical Investigations* (Ñº)
Ether does not exist	→	Relativity + spacetime	plus a "mind made over" issue. In 1905, Einstein disabused the notion of 'ether', the medium in which electromagnetic waves were *thought* to be propagating, from physics.
Caloric does not exist	→	Entropy increase	In 1834, Sadi Carnot, in his unpublished papers, recanted his former belief in caloric.
Atoms do not exist	→	Atoms do exist	“I don’t believe that atoms exist.” — Ernst Mach (1897), “statement at meeting in Vienna” In 1909, Wilhelm Ostwald recanted his former disbelief in atoms (or matter). Jean Perrin proved that atoms exist by calculating Avogadro's number using three different methods, all involving liquid phase systems: first, he used a gamboge soap-like emulsion, second by doing experimental work on Brownian motion, and third by confirming Einstein’s theory of particle rotation in the liquid phase; he received the 1926 Nobel Prize for this triple proof.

Vacuums do not exist	Partial vacuums can exist	✓ Evangelista Torricelli (1643) evidenced that 'vacuums' do exist
Force does not exist		Many people, e.g. Balfour Stewart and Peter Tait in 1875, have argued that 'force' is something that does not exist.

(add)

Quotes

The following are related quotes:

> "I am always very chary about using such expressions as 'spiritual phenomena', because the word *spiritual* has almost become a synonym of supernatural. Yet the word is a perfectly proper one and ought to be redeemed and freely used, more nearly as a synonym of *psychic* in its widest sense, and I shall not hesitate so to use it. The last three chapters have been devoted to showing that spiritual phenomena are as much natural phenomena as physical phenomena, that spiritual forces are true natural forces, and that there is a spiritual energy, *i.e.*, a psychic and social energy, that is as capable of doing work as any other form of kinetic energy. In fact it is the highest and most effective form of energy or *vis viva*."
>
> — Lester Ward (1903), *Pure Sociology* (pg. 167)

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1.

θΔics

W termodynamice **człowieka termodynamiki** jest naukowe badanie energiczny i entropijnej aspekty procesów ludzkiej aktywności i ruchu, w kontekście boundaried codziennie cykle słoneczne, to znaczy istnieje między ciepła, pracy, spontaniczność, nieodwracalności i określenia w nim prawa.

θΔics

In chemistry, **terra pinguis** was considered as the fatty, oily material substance of bodies that gives things the property of combustion. [1]

In 1669, German physician and chemist Johann Becher introduced the term "terra pinguis", conceived as an updated version of Paracelsus' 1524 sulphur model of how things burned.

In 1703, Becher's student Georg Stahl updated the terra pinguis model of with a phlogiston model of combustion. [2] This in turn gave way to the caloric theory by French chemist Antoine Lavoisier in circa 1780; which culminated in the mathematical entropy concept developed by German physicist Rudolf Clausius in 1865.

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θΔics

In hmolscience, **Terrel Gallaway** (c.1970-) is an American economist noted, in political thermodynamics, for his 1999 summary article on thermodynamics in political economy.

Overview

In 1999, Gallaway, "Entropy, Negentropy, and the Laws of Thermodynamics", in the *Encyclopedia of Political Economy*, gave the following summary:

> "The laws of thermodynamics are important to various fields of political economy. Interest in these laws reflects the interdisciplinary nature of political economy, in particular the linkage with physics, applied mathematics, and evolutionary theory."

(add discussion)

Education

Gallaway completed his PhD in 2001 on "Virtual Scarcity: the Evolution of Imbalance and its Impact on Society and the Environment" at Colorado State University. [2] Gallaway became an associate professor of economics at Missouri State University in 2006.

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External links

â— Terrel Gallaway (faculty page) – MissouriState.edu.
â— Terrel Gallaway (faculty description) – MissouriState.edu.

θΔics

In thermodynamics, **Terrell Leslie Hill** (1917-2014) is an American biochemist noted for his 1964 book *Thermodynamics of Small Systems*, a founding book in the field of nanothermodynamics. [1] Hills' overall contribution in science, it seems, was to extend the thermodynamics of American engineer Willard Gibbs to ensembles of small systems, particularly in the fields of biochemistry and molecular biology. [2]

Nanothermodynamics

In 2001, Hill coined the term 'nanothermodynamics' themed a shortened version of the older phrase 'small system thermodynamics' used by Hill beginning in 1961 to designate the subject of the thermodynamics and statistical mechanics of systems of colloidal particles, polymers, or macromolecules. Specifically, Hill stated: [6]

> "This subject, which now might appropriately be called **nanothermodynamics**, was investigated at some length by the author in 1961−3."

Hill's work in this area was influential to Iranian-born American chemical engineer Ali Mansoori who in his 2005 *Principles of Nanotechnology* attributes Hill as the originator of small systems thermodynamics and the coiner of the term 'nanothermodynamics'. [7]

Education

Hill, it seems, is a product of the Lewis school of thermodynamics, being that he completed his AB in biochemistry in 1939 and his PhD in 1942 with a dissertation on *The Reaction of Diphenylamine Green with Bases* and a *Theory of the isoelectric Point*, both at the University of California, Berkeley. [3] Hill spent a year and a half at Western Reserve University, a year and half at Berkeley (working in the Manhattan Project), four years on the faculty of the University of Rochester, and eight years as a chemist with the Naval Medical Research Institute, Bethesda, Md, after which he joined on with the chemistry department at the University of Oregon in 1957. He moved to the University of Santa Cruz in 1967, retiring from there in 1988, during which period he joined the laboratory of molecular biology of the Arthritis Institute of the NIH in 1971. [5]

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External links

- Hill, Terrell L. – WorldCat Identities.
- Hill, Terrell Leslie (1917-) – WorldCat Identities.

θΔics

In existographies, **Terrence Deacon** (c.1954-) (CR:69-) is an American physics-philosopher and neuro-anthropologist, noted for his 2011 theory of teleodynamics, conceived to explain the "end-directedness" behavior in "living things".

Overview

In 2011, Deacon, in his *Incomplete Nature: How Mind Emerged from Matter*, explored, in his own words, the relationship between "thermodynamic, self-organizing, evolutionary, and semiotic processes and provides a new technical conception of information—different from that of Shannon information—that explains both its representational and normative properties." Deacon's book, in short, seems to be an attack on the Shannon bandwagon; he ridicules, for example, American quantum computation theorist Seth Lloyd's "misrepresentation of history", in his 2006 *Programming the Universe*, namely Lloyd's comment that "Maxwell, Boltzmann, and Gibbs showed that all atoms register bits of information". [1]

This, to note, is similar to the polemical misrepresentation of history style of American physicist and self-defined "information theory philosopher" Robert Doyle, who in 2001 commented: "Kelvin claimed that information must be destroyed when entropy increases". [2] Doyle is also similar to Lloyd in that they both are willing to misrepresent history in the name of their respective information theory based free will arguments. [2] When Lloyd is asked about free will in the context of his universe as a vast computer model, he responds: [3]

> "Free will is safe. Even if the universe is completely deterministic, then we (and computers, and god knows who else) possess free will. At first, the deterministic nature of the laws of physics would seem to forbid free will: No choice is available. In fact, however, the computational nature of the universe actually guarantees free will."

The similarity between the two—Lloyd and Doyle—is striking.

On the so-called claimed-to-be "analogy" between Boltzmann entropy and Shannon entropy, Deacon comments: "The analogy [of Shannon entropy] to thermodynamic entropy breaks down." [1] This view is in alignment with the modern view of things. [4]

Morphodynamic work

In his theory, Deacon speculates on the thermodynamics of what he calls "morphodynamic work", which seems to be closely akin to German polymath Johann Goethe's physical science theory of everything concept of morphology, morphogenesis, and metamorphology; thought Deacon, to note, does not mention Goethe.

Juarrero-Deacon affair

See main: Juarrero-Deacon affair

In 2011, Deacon was accused of misappropriating theories from the work of American philosopher Alicia Juarrero, though the situation seems to be one of using common theories, in regards to theorizing about mind from matter in the context of purposive behavior, confined to the laws of physical science.

Education

Deacon completed undergraduate work in physics and philosophy from 1968 to 1970, at the University of Washington, and work in biology (chnopsology) from 1971 to 1972, at Western Washington University, completing his BA, in interdisciplinary fields, at Fairhaven College, Western Washington University, in 1976. In 1978, he completed an EdM in philosophy and cognitive development (somewhere). In 1984, he completed his PhD with a dissertation on "Connections of the Inferior Periarcuate Area in the Brain of Macaca Fascicularis: an Experimental and Comparative Neuroanatomical Investigation of Language Circuitry and its Evolution" at the biological anthropology department of

Harvard University. Deacon currently is the head of the anthropology department of the University of California, Berkeley. [5]

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External links

● Terrence Deacon – Wikipedia.
● Terrence W. Deacon (faculty) – University of California, Berkeley.
● Deacon, Terrence William – WorldCat Identities.

θΔics

In thermodynamics, **terrestrial thermodynamics** refers to thermodynamical study of systems found on land or on planets primarily composed of silicate rocks, such as planets from Mercury, Venus, Earth, and Mars. A primary subject of this terrestrial thermodynamics is the amount of solar radiation reaching the surface of the earth. [1]

History

The term 'terrestrial thermodynamics', supposedly, was coined by American geologist Clarence King in 1878, referring to the physical processes governing terrestrial tectonism. [2]

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● Lewis, Gilbert N. (1946). "Terrestrial Thermodynamics of an Ice Age: the cause and Sequence of Glaciation", *Science*, 104: 43-47.
● Dunlap, Knight. (1946). "Terrestrial Thermodynamics of an Ice Age", *Science*, 104, pg. 20.

θΔics

In terminology, **terrorism** is []

Overview

In 2003, Russian-born Israeli electronics-power engineer and social theorist Raddai Raikhlin, in his *Civil War, Terrorism and Gangs*, outlined a Prigoginean thermodynamics based theory of war, in which he utilizes concepts such as: fluctuation, bifurcation, temperature, entropy (entropy and social morals), degradation, pressure, 'links' (cohesion), force (field of forces of the hierarchy), flow (speed and pressure of flow), and ensembles: people modeled as atoms, molecules, and or quantums, among other concepts, to explain social change. [1]

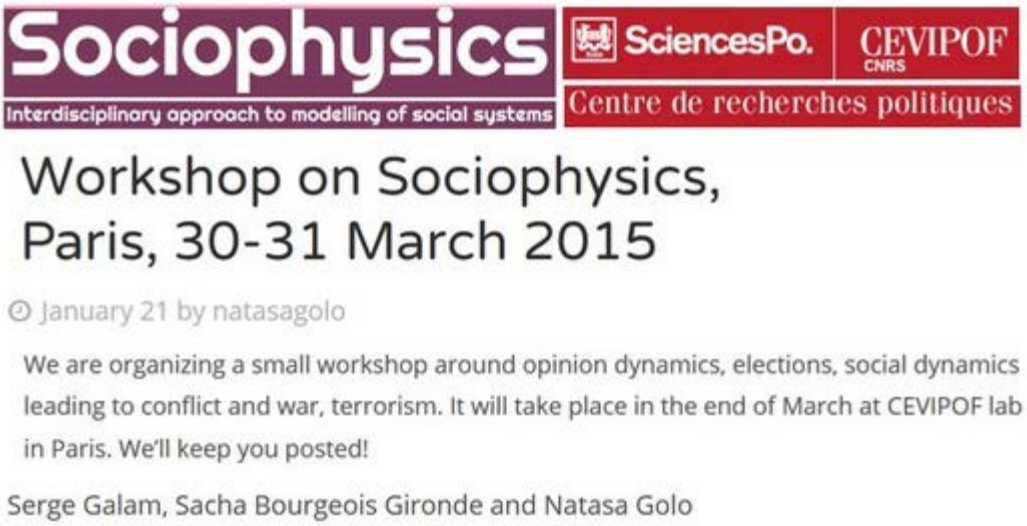

A Serge Galam 30-31 Mar 2015 sociophysics workshop (Q), at CEVIPOF, Paris, focused on applications to **terrorism** problems, run in coordination with economist Sacha Gironde and scientist Natasa Golo.

In 2006, American chemist Harold Leonard's made the suggestion, in the *Journal of Chemical Education* that Frederick Rossini's 1971 "Chemical Thermodynamics in the Real", which outlines some of the basics of the science of human chemical thermodynamics (or physicochemical humanities), i.e. chemical thermodynamics applied socially, might help us "find a formula for fighting terrorism, while preserving civil liberties", in a post 9/11 world. [2] The proposition was vehemently objected to specifically by American Christianity-believing physical chemist John Wojcik (Dec 2006), who inflamed the "Rossini debate" into subsidence. [3]

References

1. Raikhlin, Raddai. (2003). *Civil War, Terrorism and Gangs: the Systematic of Sociology and Social Dynamics* (thermodynamics, 30+ pgs). BookSurge.
2. Leonard, Harold, E. (2006). "Chemical Thermodynamics in the Real World." (pdf) *Letters, Journal of Chemical Education*, (83) 39, Jan, No. 1. pg. 39.
3. Wójcik, John F. (2006). 'A Response to Chemical Thermodynamics in the Real World.' (pdf) *J. Chem. Educ.* (*83)* 39.

θΔics

In information thermodynamics, **Terrell Bynum** (c.1938-), or Terry Bynum, is an American philosophy professor, at Southern Connecticut State University, noted for his 2005 chapter section "Entropy and Purpose in Human Life", focused on the impact of the internet and morality, generally a synopsis of American mathematician Norbert Weiner's 1950 *The Human Use of Human Beings*, intermixed with Aristotelian notions of purpose, in modern retrospect, and how the two views united can, supposedly, yield a model of human justice. [1]

Education

Bynum completed a BS in chemistry and a BA in philosophy, from the University of Delaware, and a MA in philosophy, from Princeton, a MA and PhD, both in philosophy, from City University of New York. [2]

References

1. Bynum, Terry. (2005). "Entropy and Purpose in a Human Life", in: *The Impact of the Internet on Our Moral Lives* (editor: Robert J. Cavalier) (§1: Norbert Wiener's Vision: The Impact of the "Automatic Age" on Moral Lives, pgs. 11-26; §§: Entropy and Purpose in a Human Life, pgs 13-14). SUNY Press.
2. A Brief Academic Biography – Southern Connecticut State University.

External links

â— Terrell Ward Bynum – Wikipedia.
â— Bynum, Terrell Ward – WorldCat Identities.

θΔics

In existographies, **Tertullian** (c.155-240AD) (IQ:160|#475) (Cattell 1000:283) was a Roman Christian apologist; noted for []

Quotes | On

The following are quotes on Tertullian:

> "The soul and the body were created together in the same instant and as if at a single brush stroke. They were thrown into the same mould, says **Tertullian**, a great theologian who dared to think."
>
> — Julien la Mettrie (1745), *Treatise on the Soul* (pg. 43)

> "The earliest doctors of Christianity had no other idea of the soul that that it was material. **Tertullian**, Arnobius, Clement of Alexandria, Origen, Saint Justin, Irenaeus, have never spoken of it other than as a corporeal substance. It was reserved for their successor, at a great distance of time, to make the human soul, and the soul of the world, pure spirits; that is to say, immaterial substances."
>
> — Baron d'Holbach (1770), *The System of Nature* (pgs. 50-51)

> "Some theologians have frankly confessed that the theory of creation was founded on an hypothesis supported by very little probability, and which had been invented some centuries after Jesus Christ. An author, who endeavored to refute Spinoza, assumes that **Tertullian** was the first who advanced this opinion against another Christian philosopher who maintained an eternity of matter."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 240)

Quotes | By

The following are quotes by Tertullian:

> "The first reaction to truth is hatred."
>
> — Tertullian (c.220AD)

> "Nature soaks every evil with either fear or shame."
>
> — Tertullian (c.220AD)

> "Wherefore will ye trouble yourself, seeking after the law of god, whilst ye have that which is common to all the world, and which is written on the tablets of nature."
>
> — Tertullian (c.220AD), *The Crown Knight* (*De Corona Militis*) [1]

> "The son of god died; it must need be believed because it is absurd. He was buried and rose again; it is certain because it is impossible."
>
> — Tertullian (c.220AD) [2]

References

1. d'Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (Tertullian, 5+ pgs; tablet quote, pg. 279). J.P. Mendum, 1889.
2. (a) Freeman, Charles. (2005). *The Closing of the Western Mind* (pg. 272). Vintage Books.
(b) Stephens, Mitchell. (2014). *Imagine There's No Heaven: How Atheism Helped Shape the Modern World* (pg. 42). St. Martin's Press.

External links

â— Tertullian – Wikipedia.

θΔics

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Line one
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H**Hmolpedia** (eoht.info) or *Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics* (see: etymology), a 'two cultures' encyclopedia, is a work-in-progress, prolegomenon, collectively-written online compendium of **3,030+** articles on the study of the application of the hard sciences of thermodynamics, chemistry, and physics to the analysis and explanation of human existence and experience and their intersections with the soft sciences of the humanities.

> "Manifold avenues open up almost as soon as one begins to tackle the problem."
>
> — Romanian scholar (1971), on the second law applied to socioeconomics

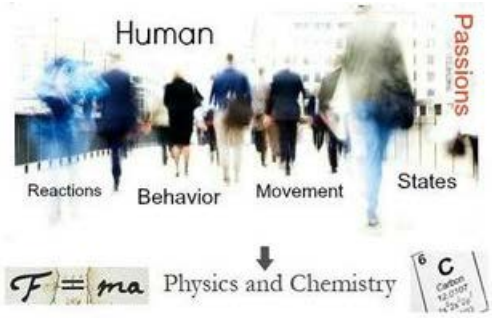

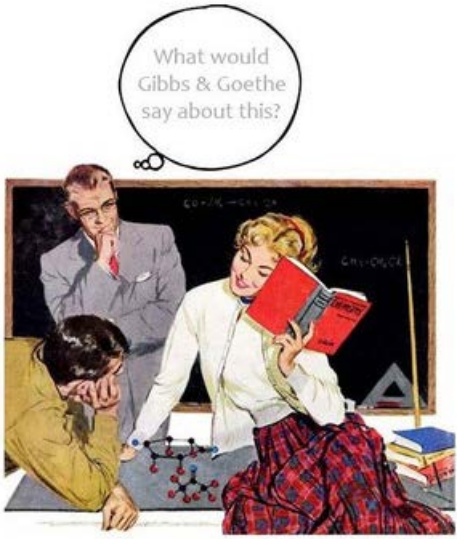

Die Wahlverwandtschaften
(The Elective Affinities)

Above: depiction of reduction of all of human existence and experience into the methodology of chemistry, physics, and thermodynamics, pure and applied. **Right:** the nutshell synopsis of hmolscience, namely the reinterpretation of the 1809 human relationship models and social meaning theories of German polyintellect Johann Goethe as seen through the lens of modern chemical thermodynamics (1933) according to American engineer and mathematical physicist Willard Gibbs (see: Gibbs and Goethe).

The following—the top nine names in Hmolscience citation rankings—are well representative of the core structure of Hmolpedia:

1. Gibbs | Willard Gibbs (cited: 575)
2. Clausius | Rudolf Clausius (cited: 524)
3. Goethe | Johann Goethe (cited: 347)
4. Maxwell | James Maxwell (cited: 328)
5. Lewis | Gilbert Lewis (cited: 300)
6. Boltzmann | Ludwig Boltzmann (cited: 276)
7. Carnot | Sadi Carnot (cited: 275)
8. Helmholtz | Hermann Helmholtz (cited: 260)
9. Newton | Isaac Newton (cited: 235)

Compare: Aristotle's citation rankings of core names employed in his collected works. Other backbone pages include: social Newtons (42+), a listing thinkers to have attempted to write *Social Principia* like treatises, Humanities citation ranking (38+), HT pioneers (505+), HC pioneers (57+), HP pioneers (50+), HMS pioneers (122+) and Genius IQs (430+); see also: Stark classification (10+) on the fundamental "forms" of the mechanistic social thought. The following shows the overall ongoing construction process of Hmolpedia, namely the dissection and re-interpretative understanding of the humanities and social sciences according to core laws of nature, the foremost of which is Clausius-Gibbs based thermodynamics, in other words in terms of the energy (i.e. enthalpy) and entropy (i.e. transformation content), something worked out in basic framework two centuries ago by Goethe in terms of human chemical reactions and chemical affinity or "elective affinities", the three (energy, entropy, and affinity) related via the affinity-free energy equation, according to the thermodynamic theory of affinity, proved in 1882 by Helmholtz, all of which derive from Newton's last and final Query 31:

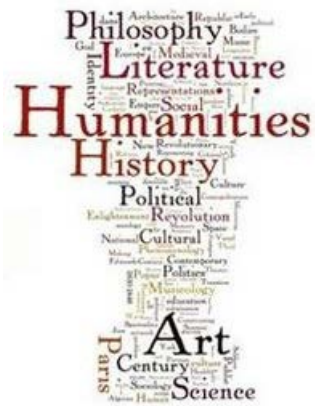

Humanities

Thermodynamics

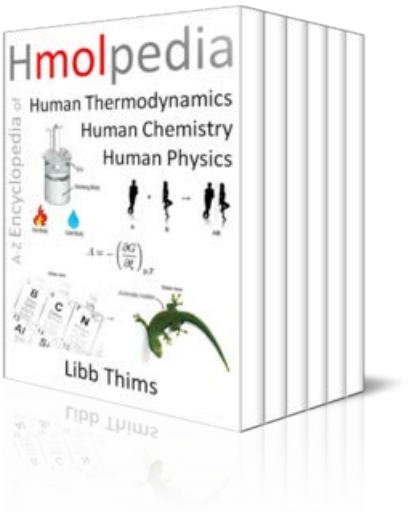

Hmolpedia [1]

Equation flowchart

The following equation flowchart, presented by American electrochemical engineer Libb Thims at UPESW 2013, Pitesti, Romania, gives an overview of the equation structure of the physical chemical reductionism of the humanities, from the invention of the equals sign "=" by Welsh physician-mathematician Robert Record (1557), i.e. equation invention, to American chemical engineer and physical chemist Frederick Rossini's 1971 derivation of what he defines as "chemical thermodynamics in the real world", according to which entropy ΔS and enthalpy ΔH changes govern the nature of freedom and security, respectively, in social reaction existence and experience equilibration processes:

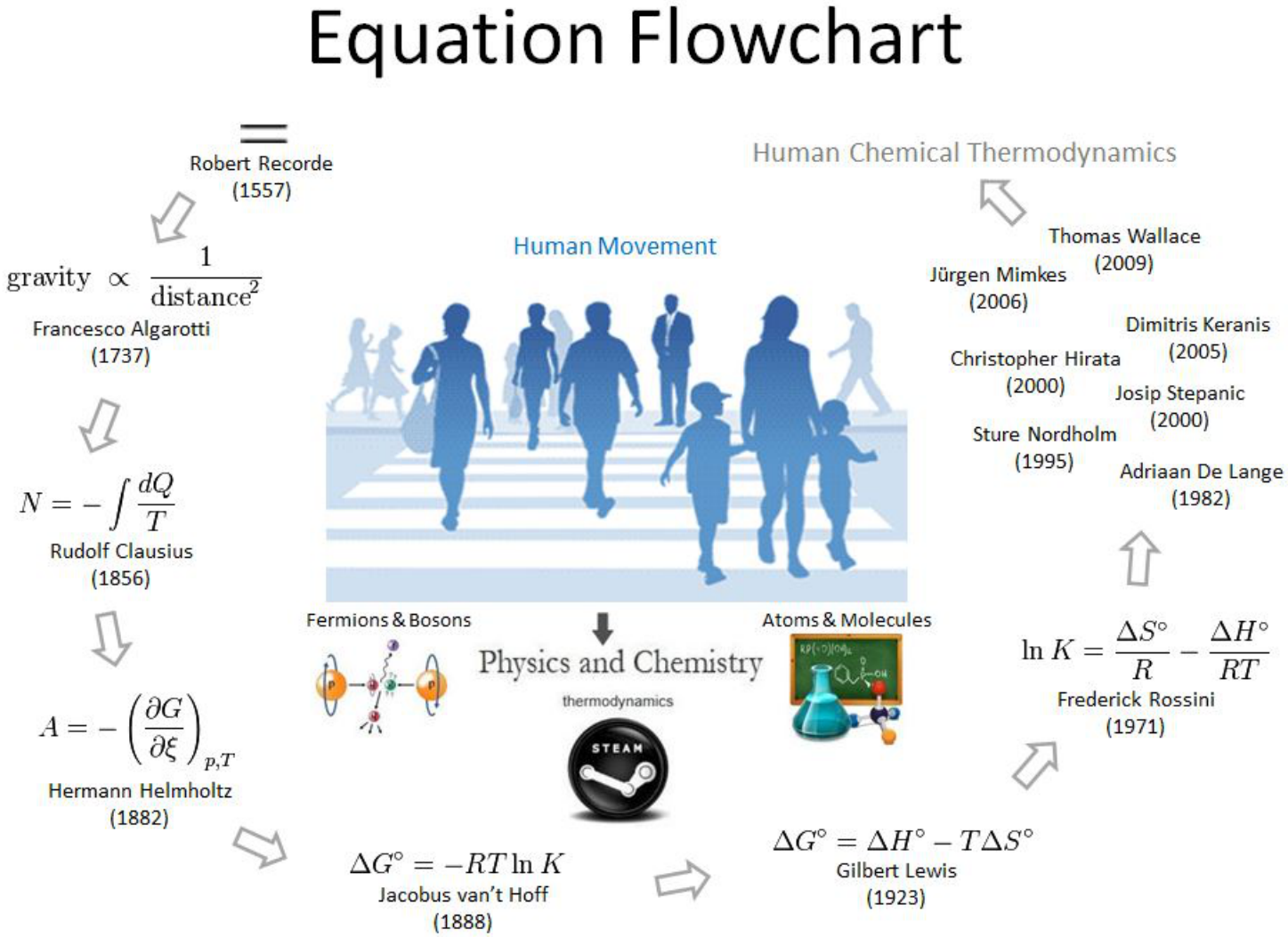

In this scheme, the following is the atomic theory (Leucippus, 450BC) applied to humans point of view followed in hmolscience, namely from the definition of the molecule (Pierre Gassendi, 1649) to the cell-as-molecule (Lionel Harrison, 1993) to human-as-molecule (Jean Sales, 1789) perspective, to the intersection of this with modern chemical thermodynamics perspectives (e.g. RSS news feed), in the form of modern human chemical thermodynamics: [2]

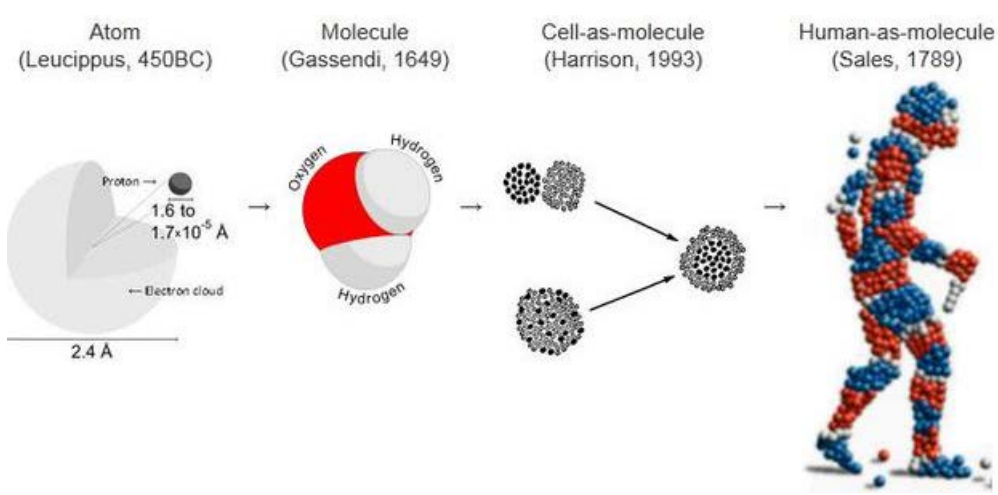

Thermodynamics news

References

1. Thims, Libb. (2013-14/15).â€‹ *Hmolpedia: A-Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics, Volumes 1-6*. (pdf). Publisher.
2. Thims, Libb. (2013-14/15). *Chemical Thermodynamics: with Applications in the Humanities* (pdf). Publisher.

Site feeds

The following are site feed snippets of recent hot discussions, new photos, new members (or noted members), and recent thermodynamic news. Please feel free to partake in the action:

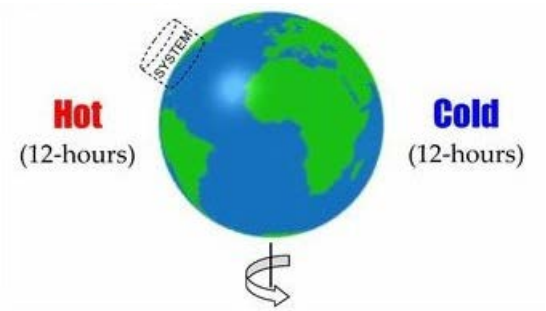

"The time may come when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry … then it may be possible, as Adams suggests, to invent a common formula for thermodynamics and history."

– William Thayer (1918), American historian

θΔics

In chemistry, **test tube** is cylindrical finger-like length of laboratory glassware, open at the top, usually with a rounded U-shaped bottom, used by chemists to hold, mix, or heat small quantities of solid or liquid chemicals, especially for qualitative experiments and assays.

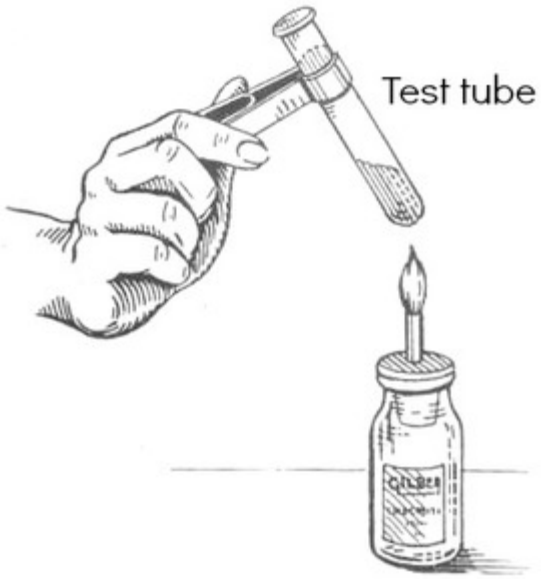

A **test tube**, filled with reagents, in the process of being heated, to bring about reaction.

Social test tubes

See main: Social test tube; Social retort

A "social test tube" is a conceptual extrapolation of the laboratory size test tube up to the social level of experimental reactions occurring between people.

The following is the conceptualization of the bringing of the Captain (C) to the system of the estate to visit with he (B) and his wife Charlotte (A), from P1:C2 of German polyintellect Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*:

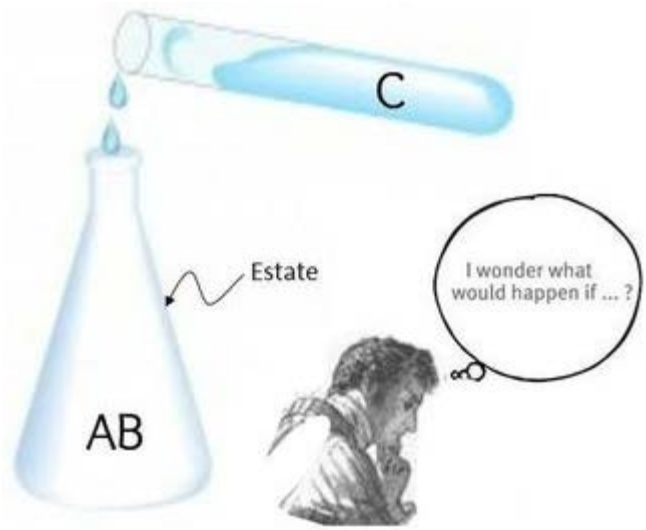

The following is a 2013 chemical analogy type sketch of a social beaker by Ben Biddle in a blog entitled "Innovation is like a Chemical Reaction", the coffee napkin sketch representative of what he calls a "powerful analogy for innovation", which he describes as follows: "catalysts are problems in need of a solution. Adding heat means tapping into the passion of the individuals working on the problem. Increasing the surface area amounts to opening up your organization and exposing it to more ideas. Motion comes from changing the context – just mentally re-framing things in a new way or even physically moving your location, as you might do with an offsite. When they all come together, there's a transformative reaction." (Ñº)

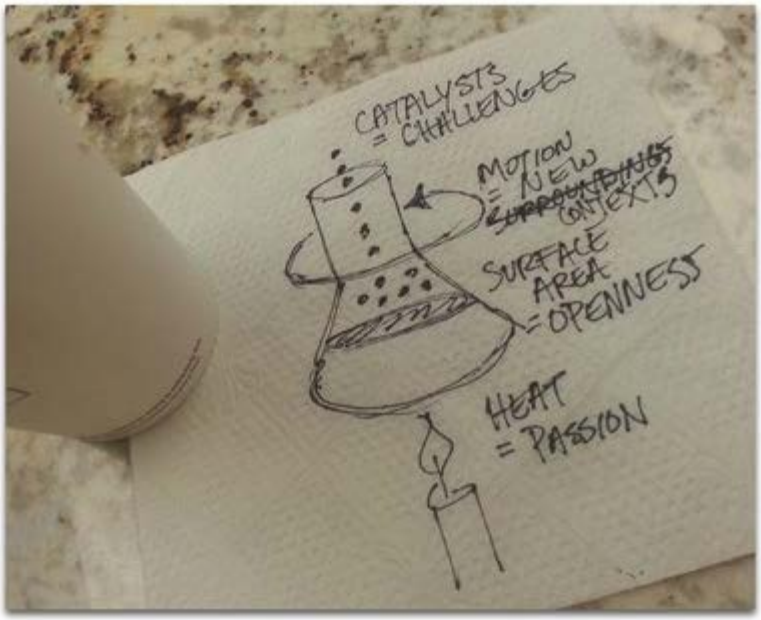

The following diagram, below left, shows a test tube version different types of chemical men (Ñº) and chemical woman (Ñº) in test tubes, conceptualized as different types of reactants that would react differently with each other when mixed to form products (single individuals + dihumanide molecules + other variants).

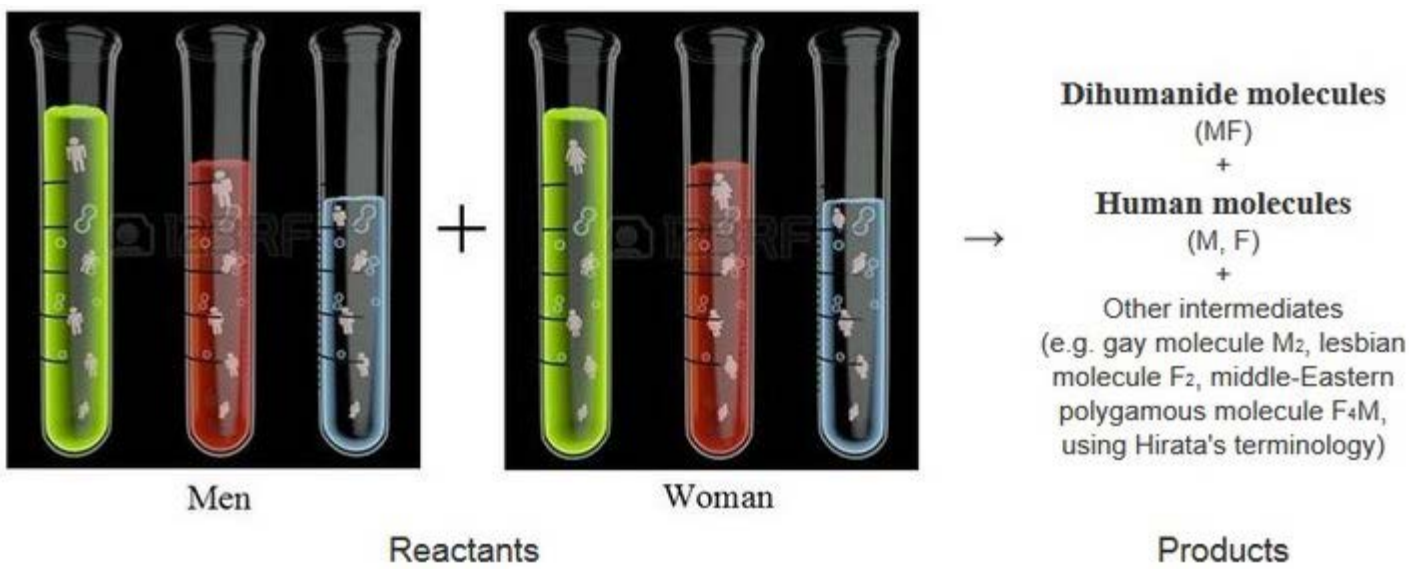

A test tube rendition of mixing different men with different women, as reactants, and forming the products of single human molecules, couples (dihumanide molecules), and other intermediates such as the gay molecule, lesbian molecule, polygamous molecule, in Christopher Hirata terminology.

Quotes

The following are related quotes:

> "Hence it is that we can have no precise laws in history as we have precise laws in physics, chemistry and mathematics; that history can never be a science in that highly rigid sense … the chemist, for example, can boast a superior apparatus for ascertaining the truth. In formulating the laws which govern an element, he can repeat his experiments thousands of times with all the factors precisely the same, or with endless variations of factors. The historian has no control of phenomena in the blowpipe (Ñº) or **test tube** sense."
>
> — Allan Nevins (1938), *The Gateway to History* [1]

"You can't put an omnipotent deity in a **test tube**."

— Eugenie Scott (1994), "Keep Science Free From Creationism"; cited by Lee Strobel, 2004 [4]

"People are like particles, they behave in groups as if they were molecules in a **test-tube**."

— Forbes Allan (1999), *Milton's Progress* [2]

"Ecological stoichiometry [is about] how chemical elements come together to form evolved, living species in ecosystems. Organisms can be thought of as complex evolved chemical substances that interact with each other and the abiotic world in a way that resembles a complex, composite, chemical reaction. Like any other normal chemical rearrangement at the surface of the earth, when organisms interact, mass must be conserved and elements are neither created nor destroyed. There is stoichiometry in ecology, just as there is in organic synthesis in a **test tube**".

— Robert Sterner and James Elser (2002), *Ecological Stoichiometry* [3]

References

1. (a) Nevins, Allan. (1938). *The Gateway to History* (blowpipe, pg. 46). Quadrangle Books, 1962.
(b) Allan Nevins – Wikipedia.
2. (a) Forbes, Allan. (1999). *Milton's Progress* (§21). Rowanlea Grove Press.
(b) Thims, Libb. (2008). *The Human Molecule* (pg. i). Morrisville, NC: LuLu.
(c) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (Nevins, pg. 199). Arnold-Howard Publishing Co.
3. Sterner, Robert W. and Elser, James J. (2002). *Ecological Stoichiometry: the Biology of Elements from Molecules to the Biosphere* (chapter one) (pg. 3-7, 47, 135). Princeton University Press.
4. (a) Scott, Eugenie. (1994). "Keep Science Free From Creationism", *Insight*, Feb 21.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 21). Zondervan, 2009.

External links

â— Test tube – Wikipedia.

θΔics

In hmolscience, **textbook controversies**, or religion vs science textbook or teaching curriculum controversies, explicitly, refers to one of a number of historical controversies that have arisen as a result of collisions between religion and science in newly proposed educational textbooks and curriculum in public schools, elementary through college; often resulting in public enflamement, protest, and sometimes violence, albeit generally tending towards pro-science reform.

Sandra Calderon (2013), dressed as T-Rex, amid the 2010 to 2014 Texas **textbook controversy**, with her hand in front of a "stand up for science" sign, during a pro-science rally prior to a Texas State Board of Education public hearing on proposed new science textbooks, in Austin, Texas. (Q)

Overview

The following (Q) is a 19th century depiction of 1791 "separation of church and state", i.e. the first amendment of the US Constitution, namely an illustration of Uncle Sam kicking a preacher, with his prayer and Bible, out of a public school:

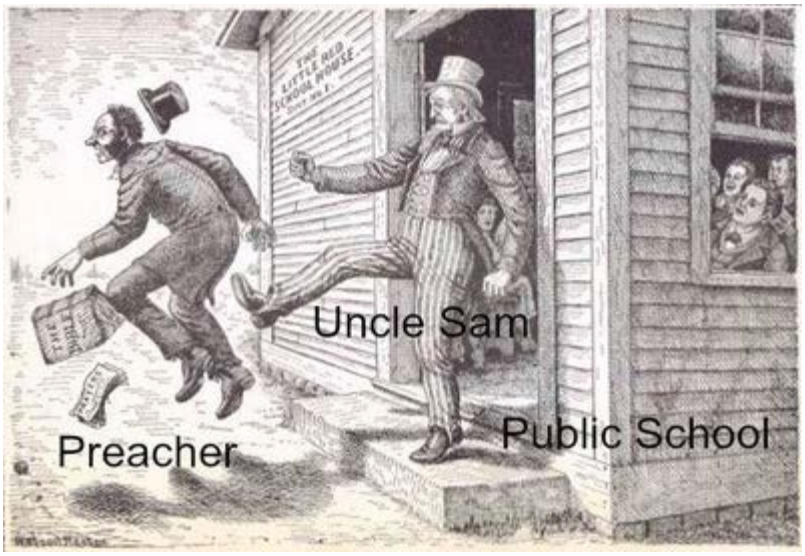

(add discussion)

List

The following is a work-in-progress listing of famous textbook controversies:

	Date	Name	Description
1.	1849	Froude-Sewell book burning	English moral philosophy professor, semi-rector, and reverend William Sewell, at Oxford, during one of his moral philosophy classes, famously threw a copy of James Froude's science-explaining morality advocating book *The Nemesis of Faith* (1949) into the fire, poking away at it as it burned with much indignation.
2.	1874-1878	Tyndall-Stewart-Tait debate	A growing controversy, at the Catholic University of Ireland, over whether or not to teach modern science to university students, resulted in a collision, at the 1874 British Association for the Advancement of Science (BAAS) meeting, between Irish physicist John Tyndall, who was under the view that religion must relinquish all control to

			science, and Scottish physicists Balfour Stewart a Peter Tait, who were of the view that the two could be integrated so as to explain morality, life, death, and immortality.
3.	1925	Scopes monkey trail	In circa 1920, John Butler, a Tennessee farmer and part-time high school teacher, while in church, heard a sermon about how a young women from his community lost her faith in god by taking after taking a biology course, at a nearby university, where she learned about evolution; five years later, Butler rallied to get the so-named "Butler act" passed, which made it illegal for anyone to teach evolution or any theory that denies divine creation as taught in the Bible; a group banned together to test this act and got a local biology teacher named John Scopes to purposely violate the act so it would go to court; it did, becoming the biggest evolution theory vs god theory public collisions in US history.
4.	1974	Kanawha County textbook controversy	(Q)
5.	1982	McLean vs Arkansas	
6.	1987	Edwards vs Aguillard	
7.	2005	Kitzmiller vs Dover Area School Board	
8.	2010-2015	Texas textbook controversy	In 2010, tensions began to flare when newly proposed changes to Texas history books, asserted, among other things, that the founding fathers were Christians; which, as pointed out, conflicts with is inaccuracy, e.g. Thomas Jefferson was a secular epicurean materialist (Q); that jihad means "the struggle to be a better person", whereas correctly it means "holy war"; that Moses and Mosaic law be taught; that Moses was the "first American"; that the including passages that suggested the Ten Commandments had an influence on the writing of the US Constitution (Q); among other Judeo-Christian alignments (Q); in 2014, the Texas State Board of Education, supposedly, made a new rule that only experts can serve on textbook review panels. (Q)

(add discussion)

External links

- Textbook controversies (categories) – Wikipedia.

θΔics

In existographies, **Thales** (c.624-546 BCM) (IQ:180|#92) (Cattell 1000:914) [RGM:84|1,500+] (Eells 100:62) (Stokes 100:1) (EvT:1|21+) (ACR:23) (GPhE:#) [CR:91], aka "Thales of Miletus", was a Greek mathematician, astronomer, natural philosopher (see: Greek philosophy), first Egyptian-trained scholar, the teacher of Euclid and Pythagoras (O), considered, according to Aristotle, as the "father of Greek philosophy", the oldest of the "Ionian school", contemporarily famous for his prediction of the eclipse of the sun, noted generally for his "everything is water" philosophy, and is attributed as having been the first to make theoretical observations on amber (electricity) and loadstone (magnetism).

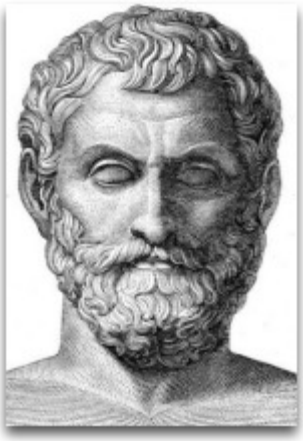

Egypt

In c.560BC, Thales, as summarized by mathematics historian Florian Cajori (1893), was studying in Egypt and doing applied geometry as follows: [13]

> "To Thales, of Miletus, one of the 'seven wise men' (O), and the founder of the Ionic school, falls the honor of having introduced the study of geometry into Greece. During middle life he engaged in commercial pursuits, which took him to Egypt. He is said to have resided there, and to have studied the physical sciences and mathematics with the Egyptian priests. Plutarch declares that Thales soon excelled his masters, and amazed King Amasis [reign: 570-526BC] (O) by measuring the heights of the pyramids from their shadows. According to Plutarch, this was done by considering that the shadow cast by a vertical staff of known length bears the same ratio to the shadow of the pyramid as the height of the staff bears to the height of the pyramid. This solution presupposes a knowledge of proportion, and the Ahmes (O) papyrus [1550BC] actually shows that the rudiments of proportion were known to the Egyptians. According to Diogenes Laertius, the pyramids were measured by Thales in a different way; viz by finding the length of the shadow of the pyramid at the moment when the shadow of a staff was equal to its own length. Probably both methods were used."

Most report that he studied in Memphis, while in Egypt.

Evolution

Thales, as summarized by Alexander Oparin (1936), asserted that living things developed from the amorphous slime under the influence of heat.

Water theory

Thales held "all is water" and that a flat earth floated on water. [2]

> "The principle behind all things is water. For all is water and all goes back to being water."
>
> — Thales (c.570BC) (O)

There is, to note, no extant record, supposedly, as to why Thales chose water as his primary element. Some scholars have supposed that Thales' water theory derives from Egyptian mythology. [7] In this case Memphis, where he studied, is where he would have learned the then-prevalent version of the Heliopolis creation myth (see: recension theory).

Aristotle, alternatively, reasoned that Thales choice of water as the primary element has to do with the seeming connection between "life" and water. [7]

Students

Students of Thales include: Anaximander, Euclid, Pythagoras (O), and Eudemus. [5]

Electricity | Magnetism

Thales is said to have made some of the first observations on electricity and magnetism. Thales, is attributed with having been the first to note that when amber was rubbed, straw attracted to it. [5]

Thales, according to Ludwig Buchner, theorized that "spirit" is what gave amber its properties; which Buchner categorizes as discredited theory, along with phlogiston, electric, magnetic, and or heat fluid theories, and vitalism. [6]

An early Greek word for the sun - ηλεχτορ - pronounced "elector" - was used to describe amber, because of its sunshiny color; amber, subsequently, came to be called "electron" by the Greek classic writers. [4]

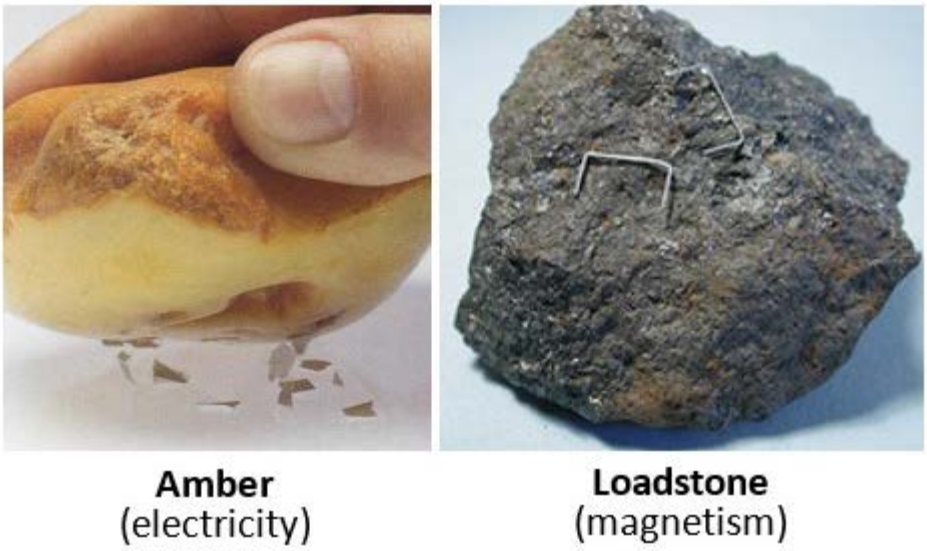

Thales noticed that amber attracts straw and that loadstone attracts metal, and therein ferret out the first rudimentary ideas on electromagnetism.

Thales, as discussed by Aristotle, also theorized that loadstone attracts iron because it has a soul — the prevailing view at the time being that movement of any kind indicated life, or a soul, or a god; the main source for this view is the following:

> "The lodestone has soul [*anima*, psyche, spirit, or life] as it is able to move the iron."
>
> — Thales (c.590BC) general view; discussed by Aristotle in *On the Soul* (405a19) (Q) [1]

Jennifer Hecht (2003), citing John Burnet (1930), summarizes this loadstone soul model as such: [11]

> "Thales held that 'all things are full of gods'. Aristotle also explained that Thales believed a magnet had a soul since it can move iron, and Aristotle supposed that this was what Thales had meant when he said that 'soul is diffused throughout the whole universe', meaning that that the forces that were gods were very much like the magnetic force."

The Thales and amber association, to note, appears in DK A1 (Diogenes Laertius I, 240 and DK A3 (scholion on Plato, *Republic* 600A). (Q)

The term "magnetism" and phenomena associated with it came to be called so because loadstones tended to come from the Greek island of Magnesia.

Gods | Soul

In c.600BC, Thales, as a student, traveled to Egypt and studied in Memphis, where he would have learned the creation myth of Memphis, as shown below:

1. Heliopolis creation myth | 3100BC
2. Memphis creation myth | 2800BC
3. Hermopolis creation myth | 2400 BC
4. **Thebian creation myth** | 2050 BC

5. Amarnan creation myth | 1300BC
6. **Thebian creation myth** / Canaan creation myth | 1200-400BC
7. Alexandrian creation myth | 300BC
8. Roman creation myth | 300AD

which taught that the god Ptah, the supreme god of Memphis, was conceived as a primary creative force that made the Nun, or primordial water; Thales supposedly said the following about water and god:

> "All things are full of gods."
>
> — Thales (c.600BC), attributed

In 45BC, Cicero, in his *On the Nature of the Gods*, described Thales view on god as follows: [12]

> "Thales said that water was the first principle, and that god was the mind that fashioned all things from water."

Cicero comments on this:

> "Can gods exist without feelings? Why did he associate mind with water, if the mind can exist independently without body?"

Peter Walsh, the 1997 English translator of Cicero, elaborated on this as follows: [12]

> "The statement that 'god was the mind that fashioned all things from water' misleads; Thales will have argued not that mind was an external agent working on water, but an immanent and dynamic force within it."

This god statement, however, has been interpreted (Q) to mean that forces that were the god, or something to this effect, e.g. soul, is a thing akin to or an embodiment of the magnetic force. Thales asserted, supposedly, that the loadstone's moving of the iron was caused by itself rather than by the intervention of some god. [4] Others have asserted that Thales model was atheistic:

> "**Thales**' ocean had no room for Poseidon."
>
> — Steven Weinberg (2001), *Facing Up: Science and Its Cultural Adversaries*

(add)

Quotes | On

The following are related praise quotes:

> "**Thales** foretold an eclipse"

— Heraclitus (c.495BC), Fragment 38 (Q) (translator: John Brunet)

"Let those philosophers disappear, who attribute natural corporeal principles to the intelligence attached to matter, such as **Thales**, who refers everything to water, Anaximenes to air, the Stoics to fire, Epicurus to atoms, that is to say, to infinitely small objects that can neither be divided nor perceived."

— Augustine (c.420 ACM)

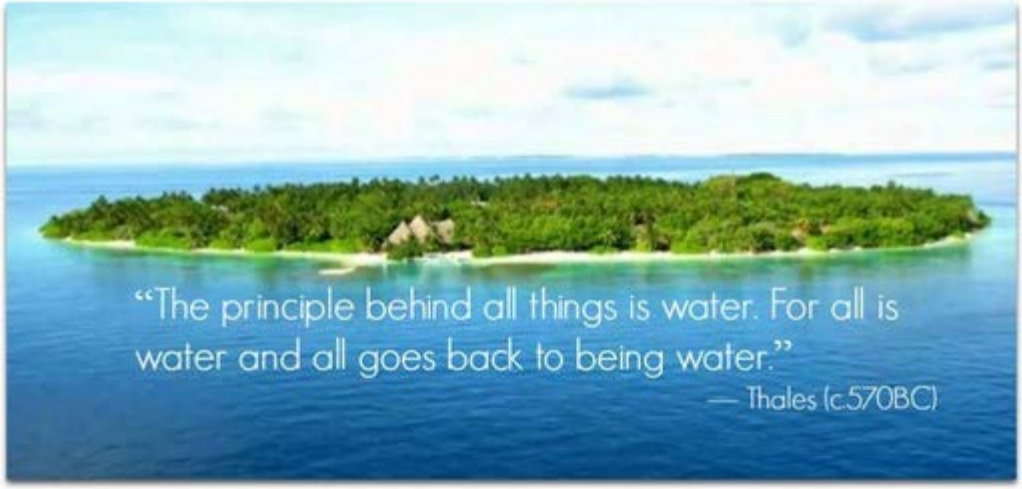

A depiction of **Thales** water philosophy, according to which the earth was conceptualized flat (or a flat disc), which floated on water.

"**Thales** asserted water to be the principle of things. For he saw that matter was principally dispensed in moisture, and moisture in water; and it seemed proper to make that the principle of things, in which the virtues and powers of beings, and especially the elements of their generations and restorations, were chiefly found. He saw that the breeding of animals is in moisture; that the seeds and kernels of plants (as long as they are productive and fresh), are likewise soft and tender; that metals also melt and become fluid, and are as it were concrete juices of the earth, or rather a kind of mineral waters; that the earth itself is fertilised and revived by showers or irrigation, and that earth and mud seem nothing else than the lees and sediment of water; that air most plainly is but the exhalation and expansion of water; nay, that even fire itself cannot be lighted, nor kept in and fed, except with moisture and by means of moisture. He saw, too, that the fatness which belongs to moisture, and which is the support and life of flame and fire, seems a kind of ripeness and concoction of the water."

— Francis Bacon (c.1620), *De Principiis Atque Originibus* (Q)

"**Thales** felt that there was a vital question to be answered relative to the beginning of things. He looked around him, and the result of his meditation was the conviction that moisture was the beginning. He was impressed with this idea by examining the constitution of the earth. There also he found moisture everywhere. All things he found nourished by moisture; warmth itself he declared to proceed from moisture; the seeds of all things are moist. Water when condensed becomes earth. Thus convinced of the universal presence of water, he declared it to be the beginning of things. Thales would all the more readily adopt this notion from its harmonizing with ancient opinions; such for instance as those expressed in Hesiod's *Theogony*, wherein Oceanus and Thetis are regarded as the parents of all such deities as had any relation to nature. 'He would thus have performed for the popular religion that which modern science has performed for the book of Genesis: explaining what before was enigmatical' (Constant, 1833). It is this which gives Thales his position in philosophy. Aristotle calls him "father of Greek philosophy" it was he who made the first attempt to establish a physical beginning, without the assistance of myths. He has consequently been accused of atheism [see: implicit atheism] by modern writers."

— George Lewes (1867), *The History of Philosophy: from Thales to Comte, Volume 1* [9]

"**Thales** taught that the moon borrowed her light from the sun; that lunar eclipses resulted from the moon's

immersion in the earth's shadow, that the earth was round, and he divided it into five zones; that the equinoctial line was cut obliquely by the ecliptic, and perpendicularly by the meridian; and he foretold a solar eclipse."

— Henry Bray (1910), *The Living Universe* [8]

"**Thales** held that water is all—a statement that a modern mind tends to interpret as a metaphor in order to avoid attributing an obvious absurdity to a founder of philosopher."

— Eric Zencey (1983), "Entropy as Root Metaphor" [3]

"**Thales** was the first thinker to try to account for the nature of the world without appealing to the wills and whims of anthropomorphic, Homerian gods. Aristotle mentions him, as does Herodotus [who] credits him with correctly predicting that there would be a solar eclipse in 585 during the battle between the Medes and the Lydians."

— Philip Stokes (2002), *100 Essential Thinkers* [2]

Quotes | By

The following are quotes by Thales:

"Of what is it that all things are made?"

— Thales (c.570BC) [14]

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● Clodd, Edward. (1897). *Pioneers of Evolution from Thales to Huxley: with an Intermediate Chapter on the Causes of the Arrest of Movement* (O)(pdf) (pg. xii). D. Appleton and Co.

External links

● Thales – Wikipedia.

θΔics

In music

The 6 Jun 2012 trailer for English alternative rock band Muse's new album ***The 2nd Law***, themed around the second law of thermodynamics applied to the human sphere of activity, particularly in regards to natural resources. [1]

thermodynamics, **The 2nd Law** is a 2012 album by the English alternative rock band Muse, scheduled for release on 17 Sep 2012, themed on a mixture of dub step, apocalypse, social revolution, possibly the fall of civilization (see: rise and fall of civilizations), the second law of thermodynamics (dispersion version), the premise of unsustainable continuous economic growth (see: sustainability), fossil fuel shortage, gas at 66 dollars per gallon, among other themes. The tagline intro thermodynamics-based news feed message that is shown in the trailer is as follows: [1]

> "All natural and technological processes proceed in such a way that the availability of the remaining energy decreases. In all energy exchanges if no energy enters or leaves an isolated system the entropy of that system increases. Energy continuously flows from being concentrated to being dispersed, spread out, wasted, and useless. New energy cannot be created and hybrid energy is being destroyed. An economy based on endless growth is unsustainable."

Discussion

The trailer for the album was released on 6 Jun 2012, showing a mock news caster discussing entropy and the economy, and quickly drew in over 1.5 million views and interestingly drumming up discussion on the implications of the laws of thermodynamics in the economic system.

The version of the second law promoted in the video, to note, in large part, is that of the views of American organic chemist Frank Lambert, who in the first decade of 2000s has been on a crusade to get the motto entropy = energy dispersion—which is hardly the sense in which entropy was originally defined by German physicist Rudolf Clausius as entropy = transformation content—into the minds of American chemistry students, supposedly getting some 25+ chemistry textbook authors to change to his viewpoint, even though Lambert notably did so poorly in his undergraduate thermodynamics classes that he was forced to change majors from physical chemistry to organic chemistry.

The field of sustainability thermodynamics, however, is a relatively new field of research.

Whatever the case, the video is interesting, especially since it is working to stir up debate on the reality of existence within the confines of the first and second law of thermodynamics.

The 2nd Law Tour

The band has concerts scheduled in 25 different cities in 20 different countries from 16 October to 18 December 2012. [2]

External links

1. Montgomery, James. (2012). "Muse Move Toward Dubstep in Apocalyptic *The 2nd Law* Trailer: Band's brand-new teaser forecasts a whole new sound on their next album, due out in September.", MTV.com, Jun 6.
2. The 2nd Law Tour – Wikipedia.

External links

â— The 2nd Law – Wikipedia.

θΔics

In famous publications, ***The Animate and the Inanimate*** is a 131-page "thermodynamic theory of life" book written between 1916 and 1920 by American child prodigy William Sidis while he was locked in a sanitarium, in which he attempts to outline the nature of animate and inanimate matter in the context of thermodynamics, Maxwell's demon, and what he calls the "big collision" theory of universal origins.

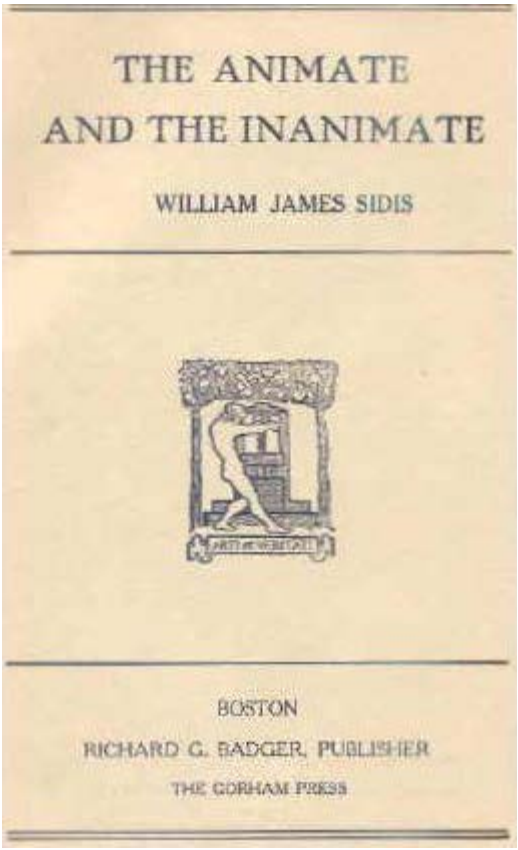

Title page to William Sidis' 1920 ***The Animate and the Inanimate***, wherein he sets for the view that life is reversal of the second law.

Production

In 1916, at the age of 18, Sidis sent a letter to Julian Huxley in which he stated: [10]

> "How has everything been this summer with you? I myself have been writing that theory of mine regarding the second law of thermodynamics. In a short while, I expect I will be in Cambridge, studying in the Law School. The University opens September 25."

According to this statement, it would seem that he had previously discussed his theory with Huxley, who himself was under the view that the second law is inoperable in the case of evolution, possibly a year or more previous, while he was aged 17 or younger.

Sidis' theory was finally finished in the book *The Animate and the Inanimate* in 1920 and eventually formally published by The Gorham Press in 1925. [1]

In this book, adding to the various theories of existence, Sidis set forth the view that life is a "reversal of the second law of thermodynamics". This was the only published book by Sidis, written when he was twenty-two, in which he used his own name. [2]

Overview

Building on the "reserve energy" theories of American psychologist William James, in which a person is theorized to have latent mental stores of energies (such as second or third winds of thought), along with English physicist William Thomson's views on life and the second law, and Scottish physicist James Maxwell's conception of an intelligent demon able to circumnavigate the second law, Sidis used a theory of probability to argue that a vital force exists in living matter able to supply available energy, in a converse manner to entropy (unavailable energy) such that "animal life acts the part of Clerk-Maxwell's *sorting demon*". [1]

Asylum

In the May Day riots of 1919, Sidis was among the 114 people arrested for protesting the war and for being a conscientious objector to the draft and was sentenced to eighteen months of jail—six months for rioting and a year for assaulting an officer. Sidis appealed, and was released on five hundred dollars bail under the condition that he be locked in a sanitarium, operated by his two parents (both psychologists). In his own words, when looking back on the situation some twenty years later, he was "kidnapped by his parents, by arrangement with the district attorney, and was taken to a sanatorium operated by them and kept there a full yearâ€•from October, 1919 to October, 1920" (age 21-22). On the conditions of his rehabilitation he comments:

> "I was kept under various kinds of mental torture, consisting of being scolded and nagged at (everything that did or did not happen was grounds for a tongue-lashing protracted over many hours) for an average of six to eight hours a day; sometimes this scolding was administered while I was loaded with sleeping medicine, or after being waked up out of a sound sleep. And the threat of being transferred to a regular insane asylum was held up in front of me constantly, with detailed descriptions of the tortures practiced

there, as well as of the simple legal process by which he could be committed to such a place."

This last bit on legal processes was accurate, as both Sidis' parents were physicians, and by law in most states, any two physicians can commit a man, without giving him a chance to defend himself, into a sanatorium or asylum, where he can be held incommunicado indefinitely.

In October 1920, he was taken to California, to prevent his communication somehow with friends in his home city sixty miles away. Sidis states that he made his escape from there in September, 1921. He stated that for years afterward his parents attempted to "get him back to the old tortures", resorting, from time to time, in various efforts to track him down and to persuade his friends to turn him over for "protection". In an event, the preface to his *The Animate and Inanimate* is January 6, 1920, which means that he wrote his masterpiece while in an asylum. [4]

Rendition of the side view of a black hole, predicted to exist by American mathematical physicist William Sidis in 1915, showing Hawking radiation shooting out the sides, as was predicted to exist in 1974 by British astrophysicist Stephen Hawking. [8]

Black holes

Interestingly, in this work, Sidis predicted the existence of black holes (using the term "black body" stars), which he defined as a type of sun that would take in all light energy, and therefore be totally invisible, some forty-seven-years before the term "black hole" was even invented; a 1967 coining of American astrophysicist John Wheeler. [3] Sidis also described what is now known as the event horizon, using the term "boundary surface". A partial explanation of his theory is found in chapter eight 'The Nebular Hypothesis', where Sidis explains his views on the nebular hypothesis, black bodies, and radiation thermodynamics:

"Our previous consideration on the production of radiant energy from the stars indicates that such production of radiant energy is only possible where the second law of thermodynamics is followed, that is, in a positive section of the universe. In a negative section of the universe the reverse process must take place; namely, space is full of radiant energy, presumably produced in the positive section of space, and the stars use this radiant energy to build up a higher level of heat. All radiant energy in that section of space would tend to be absorbed by the stars, which would thus constitute perfectly black bodies; and very little radiant energy would be produced in that section of space, but would mostly come from beyond the boundary surface.

What little radiant energy would be produced in the negative section of space would be pseudo-teleological directed only towards stars which have enough activity to absorb it, and no radiant energy, or almost none, would actually leave the negative section of space. The peculiarity of the boundary surface between the positive and negative sections of space, then, is, that practically all light that crosses it, crosses it in one direction, namely, from the positive side to the negative side. If we were on the positive side, as seems to be the case, then we could not see beyond such surface, though we might easily have gravitational or other evidence of bodies existing beyond that surface."

Sidis, according to biographer Amy Wallace, had actually formulated his ideas on entropy, black stars, and life as early as 1915, when he was 17, during his stay at the Rice Institute. [8] Wallace states that it was not until the publication of the 1939 book *An Introduction to the Study of Stellar Structure*, by Indian-born American astrophysicist Subrahmanyan Chandrasekhar, that the existence of black holes was suggested.

Stimulus to publish

Sidis stated that he was at first hesitant to publish this theory, but that he gained confidence on discovering the following quotation by Irish-born Scottish mathematical physicist William Thomson:

> “It is conceivable that animal life might have the attribute of using the heat of surrounding matter, at its natural temperature, as a source of energy for mechanical effect . . . . the influence of animal or vegetable life on matter is infinitely beyond the range of any scientific inquiry hitherto entered on. Its power of directing the motions of moving particles, in the demonstrated daily miracle of our human free-will, and in the growth of generation after generation of plants from a single seed, are infinitely different from any possible result of the fortuitous concurrence of atoms.”

Fullers' 1979 review

Sidis’ treatise, supposedly, failed to receive a single review for many decades, supposedly being found only in a few dusty attics. [5] The first review, it seems, was done by Sidis’ former Harvard classmate Buckminster Fuller, who in the late 1979 was handed a fat envelope marked "A present for Bucky" from American biographer Dan Mahony. Mahony is Columbia University graduate student who had read about Sidis in 1976 and been puzzled as to what Sidis had been doing all those years after leaving Harvard and had been probing the lost years of Sidis' life (1922-1944) and was attempting a biography on William and Boris Sidis. [7] After reading Sidis' book, Fuller dispatched a letter to *Scientific American* editor Gerard Piel urging him to reprint the text: [6]

> “Imagine my excitement and joy on being handed this Xerox of Sidis’ 1925 book, in which he clearly predicts the black hole. In fact, I find his whole book to be a fine cosmological piece. Norbert Wiener used to talk to me about him and Norbert was grieved that Sidis did not go on to fulfill his seemingly great promise of brilliance. I hope you will become as excited as I am at this discovery that Sidis did go on after college to do the most magnificent thinking and writing. I find him focusing on many of the same subjects that fascinate me, and coming to about the same conclusions as those I have published in *Synergetics*, and will be publishing in *Synergetics, Volume II*.”
>
> William suggested that the second law of thermodynamics is not a law at all, but a probability. The fact that the second law seems always to hold true is more or less coincidence in our corner of the universe. Also, entropy is reversed in other corners of the universe--elsewhere, chaos is proceeding to order. And if the second law appears to dominate local events, then probability suggests that there must be reversals of it all around us that we haven't yet recognized.
>
> Sidis theorized that inanimate (dead) objects follow the second law, while animate (living) things reverse the law, and draw on a ‘reserve fund’ of energy to mold the universe to their will. Life provided the reversal of entropy that Sidis' theory required. William's theory remains highly speculative; there is no reason to believe that a reverse universe exists. Also, biological processes are no longer the mystery they were at the time of his writing. But while working on this problem, Sidis came up with other conclusions that are interesting to this day.
>
> Cosmogeny is the study of the origins of the universe; the most popularly known-theory today is called the "Big Bang" theory. In *The Animate and the Inanimate*, William proposed a "Great Collision" theory, wherein two large, inert bodies, containing all the matter in the universe between them, collided; this collision provided the energy that started the universe in motion. As our sun hurtles through space to an eventual frozen death, it gives off energy. Somewhere in the universe there are suns that take in energy, and death becomes life. This other kind of sun Sidis dubbed a "black body," since it would be taking in all light energy, and therefore be totally invisible. This exactly describes a black hole. Should the second law of thermodynamics eventually reverse itself in this "blackbody," it would then start giving off energy and become a sun. In this way, the universe would be in a perpetual state of ebb and flow, all energy being conserved.
>
> Scientists all over the world are still working on a problem known as "Fermi's paradox," proposed by Enrico Fermi. If the universe is infinite, Fermi postulated, then everything possible must occur somewhere

sometime; therefore, there must exist a planet where the inhabitants speak English. Why haven't we met them? Why haven't we met anyone out there? Young Sidis also said, "The theory of the reversibility of the universe supposes that life exists under all sorts of circumstances, even on such hot bodies as the sun." Like Fermi's paradox, Sidis' reversibility theory also requires that life must exist in every corner of the universe, in order to provide the necessary reversals of the law of entropy.

The theory is challenging, fascinating, and controversial on its own merits today. It was far more so in 1925; and it must be remembered that it sprang from the mind of a boy in his early twenties, who devoted only a portion of his scholarship to this book, because he was dedicated to such a vast variety of other intellectual pursuits at the same time. Had he dedicated his life entirely to cosmogeny, who knows what extraordinary body of work he might have produced?"

Sidis was, in fact, twenty-two when he wrote this book.

Value

In circa 2010, an inscribed copy of The Animate and the Inanimate was sold in London to an anonymous collector for 5,000 pounds or about $8,000 in US dollars. [9]

See also

â— 10 percent myth
â— Good Will Hunting (William Sidis)

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External links

â— The Animate and the Inanimate (French → English) – Wikipedia.

θΔics

In famous publications, ***The Doctrine of Energy**: Historical-Critical Development, Along with contributions to an Overall Energetics* or *Die Lehre von der Energie: Historisch-kritisch entwickelt: Nebst Beitragen zu einer allgemeinen Energetik*, is an 1887, 109-page, book by German physicist Georg Helm, noted for having an appended final chapter to the application of energetics (and supposedly thermodynamics) in sociology and economics. According to the 1989 views of physical economics historian Philip Mirowski: [1]

> "The prophet of this new science was Georg Helm, a school teacher who caused a sensation with his 1887 monograph ***Die Lehre von der Energie***, [in which] he append a final chapter on the extension of the energy principle to social theory and, more specifically, to economics, traversing the now familiar hierarchy of physical energy to vital energy to social energy."

There does not seem to be any English translations, however, to corroborate this, so the start of parts of a German → English translation of Helm's *Doctrine* are shown below.

Die

Lehre von der Energie

historisch-kritisch entwickelt.

Nebst Beiträgen zu einer allgemeinen Energetik.

Von

Dr. Georg Helm,

Oberlehrer an der Annenschule zu Dresden.

Leipzig.

Verlag von Arthur Felix.

1887.

Title page to German physicist Georg Helm's 1887 ***The Doctrine of Energy***, containing chapters on applications in sociology and economics.

Economics

The final section to Helm's book is devoted to the extension of thermodynamics into economics. The last paragraph of this section capture's Helm's view that this is application is to be a future science ripe for the picking. To exemplify, he comments:

> "The increase of utility, which finds a good by its transport to the appropriate market, is a latent or potential form of energy, it disappears on exchange and causes the utility gain, the uprisings in the exchange of each owner. The latent energy makes perfect here as the concept of purpose to scientific expression, as in the science of the cause. The fact that such a latent energy, as contained for example in soil, knife blades without handles, and the like, only for a certain economic status, a normal, measure, and absolutely not to be specified, all the physical analogy. It may therefore well be possible to base economics on an axiomatic principle on [the impossibility of] perpetual motion or in its train of thought in energy terms."

He ends the book by stating, in reference to these types of extrapolations in economics, that "but this is not the place to consider whether such considerations are practical and fruitful, but only to show one example of the scope inherent in the energy ideas."

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Section III: The Philosophy | Die Philosophie

The following is Helm's section three (pgs. 12-16), on the philosophy connected to thermodynamics:

Die Philosophie

Es ist schon hervorgehoben worden, dass jede mechanische Weltanschauung den hauptsächlichsten Teil der Energie-Ideen vorwegnimmt. Von den Atomistikern des Altertums bereits, ja weiter zurück von den Philosophen, die überhaupt über das Wesen der Bewegung und über den Kontinuitätsgedanken nachgesonnen haben, sind uns mehrfach Äusserungen überliefert, die auf unsere modernen Energieanschauungen hinweisen; und die Philosophen der letzten Jahrhunderte haben fast sämtlich Berührungspunkte mit diesem Gedankenzuge13). Wenn alles Bewegung der Atome ist, so wechselt bei allen Veränderungen nur die Form der Bewegung. Jede Schöpfung neuer Bewegung widerspricht unserm Kausalitätsbedürfnis und vor allem den materialistischen Anschauungen, mit denen von je die Atomistik in innigem Bündnis stand. Also bleibt die Menge der Bewegung in der Welt überhaupt unverändert. Soweit ist die Philosophie leicht fertig. Wie ist aber nun die Menge der Bewegung mechanisch zu messen?

Diese Frage steht in so innigem Zusammenhange mit den angedeuteten philosophischen bez. religiösen Gedanken, dass man die Heftigkeit begreift, mit der sie bei ihrem ersten Auftreten behandelt wurde. Indessen, alle Lebhaftigkeit des Descartes-Leibniz'schen Streites half nicht über die Thatsache weg, dass die Mechanik verschiedene Dinge entdeckt hatte, welche bei allen Bewegungsänderungen ungestört erhalten bleiben. Der überwiegende Wert des einen wurde erst spät unter dem Einflusse der Technik erkannt. —

Nun zweigt sich von der ursprünglichen Fragestellung das Problem ab, diese konstanten Grössen aufzusuchen, welche die Erhaltung der Welt beweisen. Den kühnen Denkern des 18. Jahrhunderts waren die dahin zielenden Ergebnisse der Mechanik mehr als interessante Integrale der Bewegungsgleichungen, sie waren ihnen Herzenssachen und wurden nach individuellem Geschmack entweder als erfreuliche Bausteine einer religiösen Weltansicht begrüsst oder als kritische Waffen wider die Existenz Gottes verwertet. Der Geschichtsschreiber darf an solchen Tendenzen nicht achtlos vorübergehen; sie sind mächtige Triebkräfte der Geister, die manches des Schweisses wert erscheinen lassen, was sonst unbeachtet bleibt, und für manche Ergebnisse, die sonst erst spät wiederentdeckt werden müssten, das Interesse vorbereitet haben. Diese Erhaltungssätze haben nicht nur die Mechanik überhaupt, besonders die Dynamik des Himmels gefördert und dadurch mittelbar dem Energiegesetze vorgearbeitet, sie haben auch das Interesse für den Satz

The philosophy

It has already been emphasized that any mechanical theory anticipates the principal part of the energy ideas. Of the atomists of antiquity already, even further back from the philosophers, who generally have pondered about the nature of the motion and the continuity of thought, are we repeatedly comments passed that point to our modern energy outlook, and the philosophers of the last century, almost all points of contact with this Gedankenzuge13). If all movement of atoms, so with all the changes only changes the shape of the movement. Every creation of new movement is contrary to our need for causality, and above all the materialistic views, with which each of the atomic theory was in intimate alliance. So is the amount of movement in the world in general unchanged. As far as the philosophy is easily done. How, then, is the amount of movement to measure mechanical?

This question is so intimately connected with the implied philosophical mar. religious idea that we can understand the vehemence with which she was treated at their first appearance. Meanwhile, all the liveliness of the Descartes-Leibniz controversy helped not go beyond the fact that the mechanics had discovered several things, which are maintained undisturbed at all changes in motion. The major value of one was diagnosed late, under the influence of technology. -

Now branches off from the original question from the problem to visit this constant sizes, which prove the preservation of the world. The bold thinkers of the 18th-century, the then target the results of the mechanics more interesting as integrals of the equations of motion, they were welcomed and they were of the heart according to individual taste, either as positive elements of a religious world view, or used as a critical weapon against the existence of God. The historian must not carelessly pass by such trends, they are powerful driving forces of the spirits that make many of perspiration appear worth what otherwise remain unnoticed, and for some results that would otherwise be rediscovered late, have prepared their interest. These conservation laws have not only the mechanics at all, especially the dynamics of the sky and thus indirectly

schaffen helfen, der unter allen Erhaltungsprinzipien am umfassendsten ist. Freilich ist der hauptsächlich in religiösen Vorstellungen vererbte Konstanzgedanke, dieser wesentliche Bestandteil der Energieanschauungen, von den Unklarheiten seines philosophisch-religiösen Ursprungs erst in der Mechanik befreit, durch sie erst in seinem wissenschaftlichen Rechte befestigt worden, — aber seine Wurzeln schlagen bis in die innersten Tiefen des menschlichen Geistes. —

prepared the way for promoting the energy laws, they also help create interest in the proposition, which is the most comprehensive of all the conservation principles. Course is primarily inherited in religious ideas Constance thought, this essential component of the energy outlook by the ambiguities of his philosophical and religious origin liberated only in mechanics, have been secured by them only in his academic rights, - but its root to the innermost depths the human mind. -

Doch verfolgen wir jetzt den direkten Einfluss weiter, den die mechanische Weltanschauung auf die Entwickelung des Energiegesetzes gehabt hat. Sie hat 1762 Euler zu einer alle Naturerscheinungen umfassenden Hypothese geführt, welche die Einheit der Naturkräfte in den Bewegungen des Äthers findet14). Vom Standpunkte der mechanischen Weltanschauung schliesst Rumford, wie später Seguin, Mohr, Grove auf die Erhaltung der Energie; und auf demselben Boden steht Joule bei der Ermittelung des Wärmeäquivalents; denn nachdem inzwischen die wahren Maasse für die Menge der Bewegung und der Kraft, sowie für die Menge der Wärme erkannt worden waren, blieb nichts zu leisten übrig, als sie zu vergleichen und die Konstanz ihrer Wechselbeziehung darzuthun.

But we now pursue further the direct influence that the mechanical theory has had on the development of the energy law. It has led Euler in 1762 to an all natural phenomena comprehensive hypothesis which the unity of natural forces in the movements of the ether findet14). From the standpoint of the mechanical world view includes Rumford, as later Seguin, Mohr, Grove on the conservation of energy, and on the same soil Joule is the ascertainment of the heat equivalent, for after now the true extent of the amount of motion and strength, and for the amount of heat had been detected was nothing left to do than to compare them and prove the consistency of their interdependence.

So ist die mechanische Weltanschauung — und zwar bisher nur in der Form des Atomismus — ein Hebel der Energie-Ideen geworden. Nur hüte man sich, sie mit der materialistischen Weltanschauung zu verwechseln, mit der sie gern verbunden auftritt.

Thus, the mechanical world view - and they do so far been only in the form of atomism - a lever of energy ideas. Only one guard is to confuse it with the materialist worldview, with which it appears linked you.

Sofern der Materialismus das Handgreifliche bevorzugt, ist ihm die Energievorstellung unsympathisch, welche auf etwas hinter den Erscheinungen stehendes hinweist, das man in keiner Form wahrnehmen und vorstellen kann, weil es aller Formen fähig ist. — Und sofern der Materialismus die Weltanschauung ist, die sich für überzeugt hält, dass das Ganze erfasst ist, wenn man die Teile in der Hand hat, ist die Energie-Idee ihm geradezu feindlich. Denn sie lenkt die Aufmerksamkeit auf die Beziehungen, die zwischen den Teilen bestehen.

If the materialism the tangible preferred him the energy performance is unpleasant, which refers to something standing behind the phenomena that one can perceive imagine in any form, because it is capable of all forms. - And if materialism is the belief, considers himself to be convinced that the whole is covered if you have the parts in hand, the energy idea is downright hostile to him. Because it draws attention to the relationships that exist between the parts.

Dieser Feindschaft ist es wohl zuzuschreiben, dass das Energiegesetz besonders in Deutschland, wo es doch begründet wurde, so langsame Forschritte gemacht hat. In Deutschland begann ja in der Mitte des Jahrhunderts materialistischer Geist zu herrschen, zu herrschen mit jenem vollen Rechte der Reaktion wider eine ungesunde Philosophie, das sich zu allen Zeiten der Geschichte als die Ursache seines Wiederauflebens und als seine mächtigste Stütze erwiesen hat.

This hostility is probably attributable to the energy law in Germany especially, where it was founded but has made such slow progress. In Germany began even in the middle of the century to rule materialistic mind, to reign with that full rights of the reaction against an unhealthy philosophy that has proven in all periods of history as the cause of his resurgence and as his most powerful support.

Die mechanische Weltanschauung ist nicht die notwendige Gefährtin der Energie-Ideen. Neben ihr geht ein zweiter Zug philosophischen Denkens einher, der gerade in der am meisten philosophierenden Begründung des Energiegesetzes, in der Mayer'schen sehr deutlich hervortritt.

The mechanical world view is not the necessary companion of energy ideas. Next to her is accompanied by a second train of philosophical thought, which emerges precisely in the most philosophical justification of the energy law, in Mayer's very clear.

Berthold gebührt das Verdienst auf den Ursprung einer Idee hingewiesen zu haben, welche mit den Energievorstellungen der neueren Naturwissenschaft auf das Innigste verwachsen ist, auf den Ursprung des Monismus. John Tol and hat an der Schwelle des 18. Jahrhunderts diesen Gedanken gefasst und ihm in seinen Briefen beredten Ausdruck geliehen15).

Berthold has the merit to the origin of an idea have pointed to the energy with which ideas of modern science is adherent to the most intimate, the origin of monism. John Tol and hat on the threshold of the 18th century adopted this idea and he eloquently expressed in his letters geliehen15).

Die Aktion — wir sagen heute dafür die Energie — ist ihm eine notwendige Eigenschaft aller Materie; da ist kein Dualismus von Kraft und Stoff mehr, mit dem Stoffe ist auch schon die Energie gesetzt. Wer erkennt in diesen Gedanken nicht den Typus wieder, der in Faradays Potentialvorstellungen zündend auf die neuere Physik und begründend auf das Energiegesetz hingewirkt hat? ' Denn was ist Energie anders, als Ursache und Wirkung monistisch in Einem Begriff gedacht. Und alle Bewegungen sind nur Modi der Aktion, der Energie also, wie auch die Schwere einer der vielen Modi ist, in denen sich die Aktion zu offenbaren vermag.

The campaign - we say today is the energy for it - make it a necessary property of all matter, there is no duality of force and matter more, with matter already set the energy. Those who recognize these thoughts are not the type of back that has potential in Faraday's ideas stirring in the new physics and encouraged foundational to the energy law? 'For what energy is different, as cause and effect thinking monistic in one term. And all the movements only modes of action, of energy are therefore, like the gravity is one of the many modes in which the action can reveal.

Braucht man besonders hervorzuheben, dass in dieser Wendung die Umwandlungsidee liegt, die in den vorangehenden Erörterungen als ein wichtiger Charakterzug der Energiegedanken bezeichnet worden ist? — Wie alle Quantitäten nur Modi sind eines einzigen Prinzips, der Ausdehnung, so sind alle Bewegungen nur Modi eines andern, der Aktion, die gleichsam hinter allen Veränderungen steht, als das ewig Unveränderliche. Weist diese Darstellungsweise unverkennbar auf den Geist zurück, der Toland angeregt hat, indem er ihn zur Kritik reizte, auf Spinoza, so tritt doch derselbe Gedanke schon bei Diderot16) in modern mathematischem Bilde auf. Er ist seit Toland nicht wieder aus der Philosophie verschwunden: er offenbart sich in der besonders auf dem Gebiete der Mechanik frühe *) geläufig gewordenen Vorstellung, dass die Kraft, schon nach Newton'scher Auffassung und später noch inniger das Potential dem Massenpunkt als ein notwendiges Attribut zukommt; — er hat die Bestrebungen nach Gesamtauffassung der Natur genährt, von denen am Ende des vorigen Abschnitts die Rede war; — er hat endlich im Geiste Robert Mayers sich mit den andern Quellen der Energie-Ideen verschmolzen zu der ersten klaren Erfassung des Energiegesetzes.

Do we emphasize that this change lies in the conversion idea, which has been described in the foregoing discussion as an important feature of the energy of thought? - Like all the quantities are only modes of a single principle, the extension, all movements only modes of another, the action that is, behind all the changes, as the eternally unchanging. Indicates that this presentation is unmistakably back to the spirit, stimulate the Toland, has attracted criticism for taking him to Spinoza, yet the same thought occurs even at Diderot16) in modern mathematical picture. He has been Toland not disappeared from philosophy: he reveals himself in the early especially in the areas of mechanics *) become familiar idea that the force after a Newtonian view, and later more closely the potential of the mass point as a necessary attribute belongs - he has nurtured the aspirations for greater overall view of nature, of which at the end of the previous section, the speech was - he finally has the spirit of Robert Mayers is merged with the other sources of energy ideas to the first clear detection of the energy law .

An einem charakteristischen Gesichtszuge kann man es der Mayer'schen Auffassung ansehen, dass sie dem Monismus und nicht der mechanischen Weltanschauung entsprungen ist, an einem Zuge, der sich in neuerer Zeit auch bei anderen Forschern wiederholt hat17). Dass Wärme sich in Bewegung verwandelt, wird von den Anhängern der mechanischen Theorie als Beweis ihrer Auffassung der Wärme als eines Bewegungsvorgangs angesehen; anders bei Mayer: er glaubt aus jener Umwandlung eher schliessen zu müssen, däss Wärme nicht Bewegung sei, da ja Bewegung verschwindet, wenn Wärme entsteht. Bewegung ist ebenso eine Form der Energie, wie Wärme; nichts nötigt uns, gerade als mechanische Energie uns alle Energie vorzustellen.

On a characteristic facial features can look at it the Mayer's view that they and not the monism of the mechanical world view has arisen, in a procession, which in recent times for other researchers repeated hat17). That heat is converted into motion, is considered by the followers of the mechanical theory as evidence of their conception of heat as a movement process; different with Mayer: he thinks of that transformation Hide more likely to have to däss heat is not movement, since movement disappears when heat is generated. Movement is also a form of energy as heat, nothing obliges us, just as mechanical energy to imagine all the energy.

In monistischer Auffassung tritt, wie man sieht, das Übersinnliche der Energie recht deutlich hervor, — die Seite der neuen Idee, die ihrer Verbreitung am ungünstigsten war und für die Zukunft vielleicht die bedeutungsvollste ist18). Die Erscheinungsformen der Energie gehören der Sinnenwelt an, aber sie selbst steht über diesen Formen, wie die platonische Idee über den

In monistic conception occurs, as we see, the supernatural out of energy quite clear - the site of the new idea, its spread was most unfavorable for the future and perhaps the most significant ist18). The manifestations of energy are things of the world of sense, but she herself is on these forms, like the Platonic idea of the

Boscowich 1759. Vergl. Rosenberger, Geschichte der Physik, II, S. 331.

Boscowich 1759th Comp. Rosenberger, history of physics, II, p. 331

Dingen. Der Energiebegriff wird von seinen klarsten Vertretern als ein Begriff begrüsst, der den Thatsachen gerecht wird und doch so hoch über ihnen steht, dass er die Gefahr einer neuen Substantiierung ausschliesst. Wir reden von Beseelung, wo es gilt, vereinzelte Daseinsäusserungen zu einer Einheit zusammenzufassen; diese logische Beziehung hat die Energie mit der Seele gemein: wer sich also die Energie als Substanz (wie das Agens als Stoff, die Ursache als Kraft) denken wollte, müsste wohl bis zu animistischen Vorstellungen, bis zum Geisterspuk zurückkehren, um die Keichhaltigkeit ihrer Formen darzustellen.

Things. The energy term of his clearest representatives welcomed as a term that does justice to the facts and yet so high above them, is that it excludes the danger of a new substantiation. We talk about animation, where it is necessary to summarize isolated existence statements into a single unit; this logical relationship has the power to the soul in common: who thus wished to think of energy as a substance (such as the agent as a substance, the cause and effect), should probably up to animistic ideas, return to the phantoms to represent the Keichhaltigkeit of its forms.

Im Grunde genommen hat sich ja von dem Übersinnlichen des Energiebegriffs auch die mechanische Auffassung nicht losmachen können. Schon die Wärme kann von ihr nur als Energie nicht sinnlich wahrnehmbarer Molekeln und Atome begriffen werden, noch mehr aber tritt bei der mechanischen Auffassung des Lichtes, der Elektrizität und des Magnetismus dieses Übersinnliche hervor in Gestalt des Bewegten, welches — mag es nun Fluidum oder Äther genannt werden, sich weiterer Wahrnehmung entzieht. Wenn insbesondere alle Naturerscheinungen als Bewegungsvorgänge eines Stoffes, des Äthers, erklärt werden, wie das zuerst Euler versuchte, so sind zwar diese Bewegungen sinnlich vorstellbar, aber das Bewegte ist ein Übersinnliches.

In essence, has become even of the supernatural concept of energy, the mechanical conception can not get free. Even the heat can be understood only as of their energy is not perceptible molecules and atoms, and still more comes out in the mechanical view of light, electricity and magnetism of the supernatural in the form of moving, which may - whether fluid or ether are called to exercise more responsive. In particular, if all phenomena are explained as motions of a substance, the ether, as the first Euler tried, so although these movements are sensual to imagine, but the moving is a supernatural.

Von solchem Standpunkte aus erscheint die mechanische Weltbetrachtung als ein Spezialfall, von hier aus hat sich der Energiegedanke aufschwingen können über die Mechanik. Wenn die Energievorstellungen nicht notwendig an die mechanische Erklärung gebunden und doch mit ihr im Einklang sind, so muss dasselbe

From such point of the mechanical world view appears as a special case, from here, the energy concept has been able to soar over the mechanics. If the energy ideas, not necessarily tied to the mechanical explanation, and yet consistent with it, so must the same scientific endeavor, which considers the static long a special case of the mechanics are driven out,

wissenschaftliche Streben, das in der Statik längst einen Spezialfall der Mechanik sieht, angetrieben werden, die gesamte Mechanik wiederum als einen besonderen Fall der „Energetik" aufzufassen.

the entire mechanics again as a special case of the 'energetic' conception.

Section VIII: The Internal Energy of the Body | Die Eigenenergie der Körper

The following is Helm's section eight (pgs. 34-36), on the conservation of energy and energy stocks (34), Clausius (35), Thomson's definition (35), and the law of eigenenergie (36). The use of the term 'eigenenergie', although not used by Clausius (or Thomson), seems to be an original coining of Helm, albeit used in the sense of being synonymous with internal energy U or the ‘energy of the system’ (energie des systems), defined by Clausius.

Die Eigenenergie der Körper.

Rudolph Clausius, Wilhelm Thomson.

Die Helmholtz'sche Folgerung aus dem Perpetuum-mobile-Prinzip knüpft an die alte Formel des Satzes von der lebendigen Kraft an. So wichtig diese Fassung seitdem für die Anwendung des Energiegesetzes in der Mechanik und in den mechanischen Theorien, die es mit beschleunigungbestimmenden Kräften zu thun haben, z. B. in der Elektrik, geworden ist, — so hat sich doch eine zweite Ausdrucksweise des Helmholtz'sehen Prinzips von noch grösserer Tragweite erwiesen.

Die zweite Formulierung setzt die Erkenntnis der ersten, also des Satzes von der Erhaltung der Energie, voraus. Ist man aber durch diese dazu geleitet worden, die Arbeitsgrösse, welche von einem Körpersystem gewonnen oder verloren wird, als unabhängig von der Art (z. B. dem Weg oder den Geschwindigkeiten) des Übergangs anzusehen, so wird man aufhören, den Nachdruck darauf zu legen, dass ihr Verlust oder Gewinn ein Ergebnis äusserer Kräfte, von aussen geleistete oder entzogene Energie ist, wie Helmholtz es thut; — man wird vielmehr jene Arbeitsgrösse als Veränderung im Besitzstande des Körpers betrachten und nun diesen Besitz an Energie, diesen dem jederzeitigen Zustande des Körpers eigentümlichen Energievorrat ins Auge fassen, welcher durch die Aufspeicherung (emmagasiner le travail sagt Poncelet, stores of energy Thomson) der zugegangenen Arbeitsgrössen entstanden ist. Der Energievorrat oder die Eigenenergie des Systems ist eine Funktion der den augenblicklichen Zustand des Systems bestimmenden Coordinaten (bei nur mechanischen Vorgängen der räumlichen Coordinaten), ihr Differential nach diesen ein vollständiges.

Diese Erkenntnis war nach Helmholte' Arbeit von 1847 bei dem damaligen Zustande der Mathematik eine reife Frucht. Clausius hat 1850 in seiner Abhandlung*) über die bewegende Kraft der Wärme diese Funktion zuerst für thermodynamische Zwecke benutzt. Er bezeichnet sie dort mit einem Buchstaben, CT, aber noch nicht mit einem Namen, sondern sagt, dass sie die freie und die zu innerer Arbeit verbrauchte Wärme umfasst.

Die ganze Bedeutung dieser Funktion erkannt zu haben, ist Thomsons Verdienst, welcher sie im fünften Teile seiner Abhandlung „On the dynamical theory of heat" folgendermassen einführt:

„Als gesamte Eigenenergie46) eines Körpers**) sollte man den mechanischen Wert aller Wirkungen definieren können, welche der Körper durch Wärmeaussendung und Überwindung von Widerständen hervorbringen würde, wenn man ihn auf das Äusserste abkühlte und ihn — unter Verhinderung der Wärmebewegungen in ihm — sich unbegrenzt zusammenziehen bez. ausdehnen Hesse (je nachdem nämlich die zwischen seinen Teilen wirkenden Kräfte anziehend oder abstossend wirken). Aber bei unseren gegenwärtigen mangelhaften Kenntnissen über vollkommene Kälte und über die Natur der Molekularkräfte, können wir diese gesamte Eigenenergie für keinen Teil der Materie bestimmen und nicht sicher sein, dass sie für einen endlichen Teil der letzteren unendlich gross ist. Daher erscheint es angemessen, einen gewissen Zustand als Normalzustand (Standard state) des betrachteten Körpers zu wählen und

The intrinsic energy of the body.

Rudolph Clausius, William Thomson.

The consequence of the Helmholtz Perpetuum mobile principle ties in with the old formula the set of the kinetic energy. As important as this version has since become the application of the energy law in mechanics and mechanical theories, which have to deal with beschleunigungbestimmenden forces, such as the electric, is - as it has a second term of the Helmholtz ' see principle proved of even greater significance.

, The second formulation requires an acknowledgment of the first, ie, the rate of conservation of energy ahead. If you have been guided by this but to the quantity of work, which is produced by a body system or lost, to be independent of the type (such as the way or the velocities) of the transition considered, then that is it, to emphasize the to disclose that is their loss or profit a result of external forces outside accomplished or energy extracted, such as Helmholtz, it does - it is rather that work size, as changes in the acquis of the body look, and now this possession of energy, that the any time a state of peculiar body energy reserve envisage, who says by the accumulation (emmagasiner le travail Poncelet, stores of energy Thomson) is the size, contains the work emerged. The energy supply or the self-energy of the system is a function of the current state of the system coordinates determined (only mechanical processes of the spatial coordinates), its differential for this one complete.

This insight was for Helmholtz 'work from 1847 with the then state of mathematics a ripe fruit. Clausius had used in 1850 in his paper *) on the moving force of this feature first heat for thermodynamic purposes. He describes them there with a letter, CT, but not with a name, but says that she the free and the interior work includes heat consumed.

recognized the full significance of this feature to have, is Thomson's earnings, which it introduced in the fifth part of his treatise "On the dynamical theory of heat as follows:

"Would as a whole Eigenenergie46) of a solid **) should be able to define the mechanical value of all effects, which produce the body by heat release and overcoming resistance when it cooled to the uttermost and him - under the Prevention of heat flows in it - is bez unlimited contract. Hesse extend (as the act namely the forces acting between its parts attractive or repulsive). But with our current lack of knowledge about perfect cold and about the nature of molecular forces, we can determine, this whole self-energy for any part of matter and not be sure that for a finite part of the latter is infinite. It therefore seems appropriate to choose a certain state as the normal (standard state) of the considered body and the self-energy expression simply apply with respect to this norm.

den Ausdruck Eigenenergie schlechthin mit Bezug auf diesen Normalzustand anzuwenden.

Die Eigenenergie eines Körpers in einem gegebenen Zustande soll also den mechanischen Wert aller Wirkungen bezeichnen, welche der Körper beim Übergange aus dem gegebenen Zustande in den Normalzustand erzeugen würde, oder den mechanischen Wert der ganzen Leistung, die nötig wäre, um den Körper aus dem Normalzustande in den gegebenen zu bringen."

Diese Definition ist 1855 Phil. mag. (4) 9 veröffentlicht, aber sie stammt aus dem Jahre 1851 und wurde am 15. Dezember dieses Jahres in der Edinburger Gesellschaft gelesen***). Auch ist unter Hinweis auf letztere Veröffentlichung 1852 in einer Fussnote

*) Berl. Akad. Febr.; Pogg. Ann. März April; Phil. mag. (4) 2. **) Total intrinsic energy: Math. phys. Papers I, 292; früher total mechanical energy, später auch bloss energy.

***) Transactions of the royal society of Edinburgh XX, part. 3.

des Phil, mag.47) der Name angewendet, dort aber nur in thermodynamischer Hinsicht definiert. Für Wärmeerscheinungen wird in den angeführten Stellen auch die obige allgemeine Begriffserklärung zunächst verwertet, Thomson hat aber ihre umfassendere Bedeutung von Anfang an erkannt, denn schon 1852 (Phil, mag.) führt er als stores of mechanical energy auf: gravitierende, elektrische, brennbare, bewegte, erwärmte, durchstrahlte Stoffe*).

Mit Hülfe des Begriffs der Eigenenergie nimmt das Gesetz von der Erhaltung der Energie die Form an: In jedem Zeitraum ist der Zuwachs eines jeden Systems an Eigenenergie gleich der Summe aller vom System unterdess (positiv oder negativ) aufgenommenen Energiewerte (Arbeiten). Überhaupt schmiegt sich der Begriff der Eigenenergie nicht nur den Bedürfnissen der Thermodynamik an, aus denen er erwachsen ist, sondern auch — worauf besonders eindringlich C. Neu mann**) hingewiesen hat —, denen der Mechanik; es ist der umfassendste Begriff, zu welchen die Entwickelung der reinen Energie-Ideen geführt hat.

The intrinsic energy of a body in a given state should therefore describe the mechanical value of all the effects which would cause the body during the transition from the given state to normal, or the mechanical value of the entire performance, which would it take the body out of the normal state to bring in the given. "

This definition may 1855 Phil. (4) published 9, but it dates from 1851 and on 15 December of this year, read in the Edinburgh society ***). Also, having regard to the latter publication in 1852 in a footnote

*) Berl. Akad Feb; Pogg. Ann. March April, Phil likes. (4) second **) Total energy intrinsic: Math phys Papers I, 292; earlier total mechanical energy, and later just energy.

***) Transactions of the Royal Society of Edinburgh XX part. 3rd

of Phil, mag.47) the name applied there but only defined in thermodynamic respects. For heat phenomena is utilized in the passages quoted the above general concept statement begins, Thomson has but recognized their broader significance from the beginning, because already in 1852 (Phil likes.) Carry on as stores of mechanical energy: gravitating, electrical, flammable, moving heated, irradiated materials *).

With the help of the concept of intrinsic energy, the law of conservation of energy takes the form: in each period is the growth of any system of self-energy equal to the sum of all the system mean time (positive or negative) absorbed energy values (work). In general, fits the definition of self energy to not only the needs of thermodynamics, of which it is grown, but also - what particularly strongly stressed Carl Neumann **) - has, where the mechanics, and it is the broadest term to which has led the development of the pure energy ideas.

Final section | Economics and Sociology

The following is Helm's final section (pgs. 71-75), in which, according to Mirowski, Helm is the first to outline the application of energetics and thermodynamics to economics and sociology:

Die vorliegende Darstellung der Energie-Ideen hat sich überall darauf beschränkt, die Hauptgesichtspunkte zu erreichen. Die besonderen Anwendungen derselben zu verfolgen, ist in gründlicher und vor allem in energetisch selbständiger Weise nur möglich durch Neubearbeitungen der Einzelgebiete, wie sie bisher allein die Thermik gefunden hat. Man ist, wenigstens ausserhalb Englands, gleichsam zaghaft an die Energiegedanken herangetreten. Sie sind in Deutschland erst in neuerer Zeit wieder lebhafter betont worden, und Frankreich verhielt sich bis auf die letzten Jahre fast abweisend gegen dieselben.

Das Unanschauliche, das einst hervorragende Geister von Newtons Fernewirkung abstiess und in dieser Form doch gerade einer der mächtigsten Hebel tieferen Naturerkennens geworden ist, hält auch jetzt wieder manchen Forscher der Energetik fern. Aber gerade darin, dass die Energie nicht materialistisch gefasst, nicht sinnlich vorgestellt werden kann, sehe ich eine Bürgschaft dafür, dass sie eine tiefgehende Umwälzung in den Geistern veranlassen wird. Eine Bahn zum Idealismus könnte man die Energie-Ideen nennen, wenn man diese Seite des Nicht-Sinnlichen ins Auge fasst, Aber man erschöpft die Sache damit nicht. Denn welches Gesetz würde den realen Vorgängen zur Zeit gerechter, welches wagte sich unmittelbarer an die Dinge und Thatsachen heran, als das Energiegesetz?

The presentation of the energy ideas has always confined itself to reach the main points. The specific applications to track them is, in a thorough and above all in energy-independent manner only possible through new revisions of the individual areas, as it has so far only found the thermals. It is, at least outside of England, as it approached timidly to the energy of thought. You have been highlighted in Germany only in recent times lively, and France acted up to the last years, almost repellent against them.

The invisible, which repelled once great minds of Newton and became a distance effect in this form but just one of the most powerful lever deeper knowledge of nature's candidates, now back away from some researchers in the power industry. But the very fact that the energy is not materialistic focus, can not be presented to the senses, I see a guarantee that it will cause a profound transformation in the spirits. A path to idealism might be called the energy ideas, if one focuses on this aspect of non-sensuous eye, but we have exhausted the matter is not so. For what the law currently would just real processes, which ventured close up to things and facts, as the law of energy?

Hier sind kräftige Keime zu neuem Gedeihen: Im Energiegesetz entwickelt sich eine Weltformel, wie sie Laplace vorschwebte, doch weit hinausgreifend über das Gebiet Newton'scher Erkenntnis. Soweit naturwissenschaftliches Erkennen reicht, darf man im Energiegesetze die schönste Frucht erblicken, welche das sinkende Jahrhundert dem kommenden entgegenbringt.

Ja, die einfachen Grundgedanken, denen das Energiegesetz entsprossen ist, scheinen einer weiter reichenden Ausbeutung fähig zu sein, wie sie auch nicht lediglich naturwissenschaftlichem Boden entstammen. Mit Umformungen und Übergängen hat es nicht die Naturwissenschaft allein, sondern unter anderem auch die Volkswirtschaftslehre zu thun. Carl Neumann nennt die eigenenergie gelegentlich das Kapital des Körpers, und dass bei der Ausbildung der Energievorstellungen wirtschaftliche Analogien mitgewirkt haben, ist S. 18 von mir hervorgehoben worden78). Gewisse Teile der Eigenenergie eines Körpers haben nicht nur physische Beziehung zu unserem Körper, sondern auch Beziehung zu unserer wirtschaftlichen Wertschätzung. Insofern die Eigenenergie eines Körpers solche Bestandteile enthält, heisst der Körper ein Gut. Die Gesamtheit der Güter über die eine Person verfügt, bildet deren wirtschaftliche Energie, deren Vermögen. Die wirtschaftliche Eigenenergie jedes Gutes aber nennt man Wert (Gossen) oder Nützlichkeit (Jevons) desselben79).

Sie ist der wandelbare Proteus, der bei den wirtschaftlichen Veränderungen seine Form wechselt. Sie einem Körper in möglichst hohem Grade einzuimpfen, ist die Aufgabe der Produktion und des Transportes der Güter. Mit den Übergängen dieser Energie von einem Körper auf den andern hat es die Produktion zu thun; die Übergänge von einem Besitzer zum andern, welche den Energieübergängen bei Lagenänderung physischer Körper entsprechen, bilden den Gegenstand des Tausches der Güter; und in der Konsumtion geht die Energie vom Gut auf den Besitzer über, der Genuas ist ihre letzte wirtschaftliche Form.

Immer lässt sich das übergehende Energieelement *d E*derjenigen wirtschaftlichen Energieformen, die tauschbar sind, als *JdM* darstellen. Jheisst Nützlichkeitsgrad (Jevons), Schätzungsgrad, wirtschaftliche Intensität; ifmisst die Quantität des wirtschaftlichen Agens. Auch die wirtschaftliche Energie folgt einem Intensitätsgesetze: sie hat das Bestreben von der niederen zur höheren Intensität überzugehen. Ein Gerät z. B. von höherem Nützlichkeitsgrade drückt durch sein Auftreten im Handel den Wert der minder nützlichen herab zu seinem Gunsten; der Wert der andern geht teilweis auf dasselbe über. Alle Güter wandern durch Tausch dorthin, wo ihnen höherer Nützlichkeitsgrad beigelegt wird. Der Mensch ist ja genötigt, die Intensität durch wirtschaftliche Thätigkeit zu erhöhen, weil sich im Naturlaufe die Intensitäten vermindern.

Die Gleichung $dE = JdM$, welche für ein Gut gilt, dem nur eine Art der Verwendung offen steht, nur eine Intensität beigelegt wird, tritt bei Walras und Jevons in Anwendung auf den Tausch, bei Gossen in Anwendung auf den Genuss auf; doch betrachten diese Autoren *J*, und also auch *E*, als Funktion von *M* allein, $E = f(M)$, $J = f'(M)$; die Einflüsse, welche neben dem bereits getauschten oder genossenen Quantum *M* des Gutes noch sonst den Wert des weiter aufzunehmenden Teiles *dM* bestimmen, z. B. die verschiedene Beurteilung seitens verschiedener Besitzer, werden allein auf die Funktionsform /"geschoben. Gossen betrachtet sogar *J* nur als linear abnehmende Funktion von *M* und hat damit allerdings die richtige Erkenntnis zuerst hervorgehoben, dass *J* mit wachsendem *M* abnimmt.

Beim Tausche giebt jeder Besitzer so lange ein Gut *M1* ab gegen ein anderes *M2* bis durch weiteren Tausch keine Erhöhung seiner Gesamtenergie mehr erreicht werden kann, also

$$O = -J_1\,dM_1 + J_2\,dM_2, \quad J_1 : J_2 = dM_2 : dM_1.$$

Indem nämlich jeder der beiden Besitzer die letzten Quantitäten seines Gutes *M* aufgiebt, die ihm doch nur geringen Nützlichkeitsgrad bieten würden, da *J* eine fallende Funktion von *M* ist, und dafür ein neues Gut

Here are powerful seeds of a new prosperity: In the energy law to develop a world formula, as envisaged by Laplace, but far beyond the territory course go beyond Newtonian understanding. As far as scientific knowledge is sufficient, one can see in the energy legislation the most beautiful fruit, which the coming century, the declining entgegenbringt.

Yes, the simple basic ideas, which the law of energy is sprung, seems a more extensive exploitation to be able, as they stem not only natural science floor. With transformations and transitions, it has not to do with science alone, but among other things, the economics. Carl Neumann sets out the occasional discussions of the internal energy capital of the body, and that have participated in the training of energy performances economic analogies, p. 18 worden [78] is highlighted by me). Some parts of the self-energy a body not only have physical relationship to our bodies but also our economic relationship with appreciation. Insofar as the internal energy of a body containing such ingredients, i.e. the body is a commodity. The whole of the goods has the one person whose business is energy, whose assets. The economic internal energy of each good is called value (Gossen) or utility (Jevons) desselben [79]).

It is the changeable Proteus, who changes with the economic changes its shape. They inculcate a body to the highest possible degree, is the task of production and transportation of goods. With the transitions of this energy from one body to another has to do production, and the transitions from one owner to another, meeting the energy transitions in position change of physical body, are the subject of exchange of goods, and in the consumption goes to energy from the estate to the owner of the Genoese is their last economic form.

Time can be passing over the energy element *d* Ederjenigen economic forms of energy that are exchangeable, constitute as *JdM*. Jheisst utility grade (Jevons), estimate degree of economic ifmisst intensity and the quantity of the economic agent. The economic energy intensity follows a law: it has the tendency to pass from the lower to higher intensity. A device such as higher degrees of usefulness due to its appearance on the market value of the less useful presses down in his favor, the value of the other goes to the same thing over Partially. All goods travel through exchange to where they will be higher utility level enclosed. Man is compelled to increase the intensity by economic activity, since decrease in the natural course of the intensities.

The equation $dE = JdM$ which is effective for a commodity which only one type of use is open, only one intensity is attributed occurs in Walras and Jevons, as applicable to the exchange, in Gossen as applicable to the enjoyment, but consider this Authors *J*, *E*, and therefore, as a function of M alone, $E = f(M)$, $J = f'(M)$, and the influences which, in addition to the already exchanged or enjoyed Quantum M of the good or otherwise the value of the further included determine part of the month, for example, the various assessment by different owners, are only on the functional form / pushed. Gossen J even considered only as a linear decreasing function of M and thus has, however, the correct knowledge first pointed out that with increasing J M decreases.

The swap gives each owner as long a commodity against another from M1 to M2 through further exchange will not increase its total energy can be achieved more so

$$O = -J_1\,dM_1 + J_2\,dM_2, \quad J_1 : J_2 = dM_2 : dM_1.$$

By namely gives up each of the two owners, the last quantities of good *M*,

gewinnt, dessen erste Teile mit höherer Intensität einsetzen, erreicht er einen Energiegewinn, bis auch das neue Gut auf einen Nützlichkeitsgrad gesunken ist, der obiger Gleichung entspricht. In dieser Gleichung kann man die Quantitäten durch die Tauschpreise der Güter ausdrücken. Denn werden immer *pt* Einheiten des wertmessenden Gutes *M0* gegen 1 Einheit von *M1* und *p2* Einheiten jenes Normalgutes gegen 1 Einheit von *M2* getauscht,

$$p_1 M_1 = M_0 = p_2 M_2, \quad p_1 d M_1 = d M_0 = p_2 d M_2$$

geschätzt, so wird

$$0 = -\frac{J_1}{p_1} d M_0 + \frac{J_2}{p_2} d M_0, \quad J_1 : p_1 = J_2 : p_2$$

die Bedingung des Tauschgleichgewichts.

Der Quotient *J' — J : p*, den Launhardt als Preiswürdigkeit bezeichnet, erscheint hiernach als Intensität, wenn die Quantitäten der Güter nach gleichem Maasse, durch Geld, gemessen werden. Sind *Jl* und *J2* Funktionen von *M1* bez. *M2* allein, so kann man *M1* durch den Einheitspreis *pt : p2* ausdrücken und erhält so die Angebots- bez. Nachfragekurven von Walras.

Soweit der Nützlichkeitsgrad des Geldes als Konstante, unabhängig von seinem Quantum, betrachtet werden darf, kann man ihn als Intensitätseinheit wählen, und es ergiebt sich *J = p,* d. h. der Preis, zu welchem man das letzte noch eingetauschte Element eines Gutes erwirbt, misst den Nützlichkeitsgrad, die wirtschaftliche Intensität, die man dem Gute beilegt.,

Wenn Jemand sein Vermögen M zur Beschaffung der Gütermengen Q1 , Q2, .. . Qn den Preisen p1, p2 . . . pn verwendet, so ist sein Gewinn an Nützlichkeit oder wirtschaftlicher Energie

$$E = \int_0^{Q_1} J_1 (q_1) d q_1 + \int_0^{Q_2} J_2 (q_2) d q_2 + \ldots + \int_0^{Q_n} J_n (q_n) d q_n$$

ein Maximum, wenn

$$\frac{J_1 (Q_1)}{p_1} = \frac{J_2 (Q_2)}{p_2} = \ldots = \frac{J_n (Qn)}{pn} = J' (M),$$

da ja

$$M = p_1 Q_1 + p_2 Q_2 + \ldots + p_n Q_n$$

sein muss.

Es müssen sich also die Schlussdringlichkeiten der einzelnen Güter wie die Preise verhalten oder jede letzte Mark, welche man auf Befriedigung eines Bedürfnisses verwendet, muss gleichen Genuss gewähren. Die in den Händen eines Besitzers zusammentreffenden Güter gelangen auf gleiche Preiswürdigkeit, genau wie Gasvolume, die mit einander verbunden werden, auf gleichen Enddruck kommen.

Jeder Wirtschaftsbetrieb erscheint als ein Kreisprozess, bei welchem eine Energieform vermehrt, nämlich entweder auf höhere Nützlichkeit gebracht oder einem grösseren Quantum einverleibt wird, und bei welchem andere Energieformen, wie Arbeitsfähigkeit der Menschen und Motoren, vermindert werden. Jedem Gute kommt wirtschaftliche Triebfähigkeit zu, bestimmt durch den höchsten Nützlichkeitsgrad, der ihm zugänglich ist.

Noch gar nicht ist bisher die Konstanz der wirtschaftlichen Energie in Betracht gezogen worden. Durch Genuss, auch durch Abnutzung und Zerstörung sinkt *M*, aber der Nützlichkeitsgrad Jwächst, entweder an dem unverbrauchten oder unverdorbenen Beste oder an anderen Gütern. Wenn ein Getreidespeicher verbrennt, wächst dadurch allein der Nützlichkeitsgrad anderer Kornvorräte. Durch Erfindungen und Entdeckungen können allerdings neue Energiequellen erschlossen, durch

which he would still offer only limited usefulness degrees, since *J* is a decreasing function of *M*, and it wins a new right, use the first part with a higher intensity, it reaches a energy gain, until the new property has fallen to a level of usefulness, the above equation corresponds. In this equation can be expressed by the quantities of the exchange rates of the items. Because of the units will always p1 wertmessenden good M0 against a unit of M1 and p2 units that Normalgutes against 1 unit of M2 exchanged,

$$p_1 M_1 = M_0 = p_2 M_2, \quad p_1 d M_1 = d M_0 = p_2 d M_2$$

estimate so

$$0 = -\frac{J_1}{p_1} d M_0 + \frac{J_2}{p_2} d M_0, \quad J_1 : p_1 = J_2 : p_2$$

the condition of the exchange equilibrium.

The quotient J'= J : p, value for money as designated by Launhardt appear hereafter as intensity, if the quantities are the items to the same degree, measured by money. J1 and J2 are functions of M1 mar. M2 alone, we can p1 M1 by the Unit: expressed p2 and thus receives the supply mar. Demand curves of Walras.

As far as the utility level of money as constant, irrespective of its quantity, may be considered, one can choose it as the intensity unit, and it results in J = p, ie the price at which one acquires the last still traded element of a good measurement of the utility level, the economic intensity has been attached to the estate.,

If a man his property M for procurement of equipment quantities Q1, Q2, .. . Qn the prices p1, p2. . . used pn, then its usefulness or economic gain in energy

$$E = \int_0^{Q_1} J_1 (q_1) d q_1 + \int_0^{Q_2} J_2 (q_2) d q_2 + \ldots + \int_0^{Q_n} J_n (q_n) d q_n$$

is maximum, when

$$\frac{J_1 (Q_1)}{p_1} = \frac{J_2 (Q_2)}{p_2} = \ldots = \frac{J_n (Qn)}{pn} = J' (M),$$

since

$$M = p_1 Q_1 + p_2 Q_2 + \ldots + p_n Q_n$$

must be.

It must, therefore, the final act of the individual emergencies, such as the prices of goods or any final mark, which is used to satisfy a need, it must grant the same indulgence. Into whose hands the owner a concurring goods in the same value for money, just like gas volumes that are connected with each other, come to the same final pressure.

Any economic operation appears as a circular process in which one form of energy increases, either brought to higher utility or a larger quantity is absorbed, and decreases in which other forms of energy, such as are working people and engines. Each property comes to economic enzymatic activity determined by the highest utility level that is accessible to him.

Not yet been the constancy of the economic energy has been considered. With pleasure, by wear and destruction of *M* falls, but the usefulness Jwächst degrees, at either the unused or unspoiled best or other goods. When a grain store burns, thereby growing only the degree of usefulness of other grain stocks. By inventions and discoveries, however, new energy sources developed, through road improvements and energy can be won, but it is sufficient to settle the things latent economic power, as do the mechanics, but to introduce the constant thoughts in this area. Also, the

Meliorationen kann Energie gewonnen werden, aber man brauchte nur den Dingen latente wirtschaftliche Energie beizulegen, wie es die Mechanik thut, um doch den Konstanzgedanken in dieses Gebiet einzuführen. Auch die Erhöhung der Nützlichkeit, welche ein Gut durch seinen Transport auf den geeigneten Markt erfährt, ist eine latente oder potentielle Energieform; sie verschwindet beim Tausch und bewirkt den Nützlichkeitsgewinn, den beim Tausch jeder Besitzer davonträgt. Die latente Energie bringt hier ebenso vollkommen den Zweckbegriff zum wissenschaftlichen Ausdruck, wie in der Naturwissenschaft den der Ursache. Dass solche latente Energie, wie sie z. B. im Boden enthalten ist, in Messerklingen ohne Griffe u. dergl., nur für einen bestimmten wirtschaftlichen Zustand, einen Normalzustand, bemessen und nicht absolut angegeben werden kann, entspricht ganz der physischen Analogie. Es dürfte daher wohl möglich sein, auch die Wirtschaftslehre auf ein axiomatisches Perpetuum-mobile-Prinzip zu gründen oder in ihr einen Energiebegriff auszubilden, der Zweck und Mittel monistisch in Eins zusammenfasst. Doch ist hier nicht der Ort, zu erwägen, ob solche Betrachtungen zweckmässig und fruchtbar sind, — nur als ein Beispiel für die Tragweite, die den Energie-Ideen innewohnt, sollten sie an dieser Stelle Erwähnung finden.

increase of utility, which finds a good by its transport to the appropriate market, is a latent or potential form of energy, it disappears on exchange and causes the utility gain, the uprisings in the exchange of each owner. The latent energy makes perfect here as the concept of purpose to scientific expression, as in the science of the cause. The fact that such a latent energy, as contained for example in soil, knife blades without handles, and the like, only for a certain economic status, a normal, measure, and absolutely not to be specified, all the physical analogy. It may therefore well be possible to base the economics on an axiomatic principle of perpetual motion or in its train an energy term, which ends and means in summarizing monistic One. But this is not the place to consider whether such considerations are practical and fruitful - only as an example of the scope, inherent in the energy ideas, they should be mentioned at this point.

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End Notes (to Final section)

78) Seite 72.

Bezeichnend sind die Worte, die Du Bois Reymond (Berl. Monatsberichte 1870) von Leibniz anführt: „Les forces ne sont (pas) detruites, mais dissip6es parmi les parties menues. Ce n'est pas les perdre, mais c'est faire comme font ceux, qui changent la grosse monnaie en petite." Sie sind eben so merkwürdig hinsichtlich des Dissipationsgedankens, wie hinsichtlich der wirtschaftlichen Analogie.

79) Seite 72.

Gossen, Entwickelung der Gesetze des menschlichen Verkehrs .... Braunschweig 1854. Ein bedeutungsvolles Buch, wenn es auch an Schwächen leidet, die besonders dem Mathematiker nicht entgehen können. Und doch wurde es gänzlich vergessen und von Walras neu entdeckt.

Walras, Un 6conomiste inconnu H. H. Gossen. Journal des economistes (4) 29, 1885 enthält eine Lebensbeschreibung Gossens von seinem Neffen, Prof. Kortum-Bonn.

Walras, Theorie math. de la richesse sociale. Leipzig 1883.

Walras, Mathematische Theorie der Preisbestimmung .... Stuttgart 1881.

Jevons, The theory of political economy. London 1879, II ed. mit ausführlicher Litteraturangabe über mathematische Volkswirtschaftslehre.

Launhardt, Mathematische Begründung der Volkswirtschaftslehre. Leipzig 1885.

78) page 72

Typical are the words quoted by Du Bois Reymond (Berl. monthly reports in 1870) by Leibniz: "Les forces ne sont (pas) detruites, mais parmi les parties dissip6es menues. Ce n'est pas les perdre, mais c'est faire comme font ceux qui changent la monnaie en petite large [The forces are (not) destroyed, but among the minor parties dissip6es. This is not to lose them, but do like are those that change the currency in small wide]." They are just as curious as to the Dissipationsgedankens as economic terms the analogy.

79) page 72

Gossen, development of the laws of human intercourse .... Brunswick 1854th A meaningful book, if it also suffers from weaknesses that can not miss especially the mathematician. And yet it was completely forgotten and rediscovered by Walras.

Walras, 6conomiste Un inconnu H. H. Gossen. Journal des Economists (4) 29, 1885 contains a biography of his nephew Gossens, Prof. Kortum-Bonn.

Walras, theory, math. de la richesse sociale. Leipzig 1883rd

Walras, Mathematical Theory of Price Determination .... Stuttgart 1881st

Jevons, The Theory of Political Economy. London 1879, II ed with detailed Litteraturangabe on mathematical economics.

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1. Mirowski, Philip. (1989). *More Heat than Light – Economics as Social Physics, Physics as Nature's Economics* (pgs. 267-28). Cambridge: Cambridge University Press.

Further reading

â— Helm, Georg F. (1887). *Die Lehre von der Energie: Historisch-kritisch entwickelt: Nebst Beitragen zu einer allgemeinen Energetik* (*The Doctrine of Energy: historical-critical development: in addition to contributing to an overall energetics*) (thermodynamik, 7+ pgs). Leibzig: Verlag von Arthur Felix.
â— Helm, Georg F. (2010). *Die Lehre von der Energie: Historisch-Kritisch Entwickelt, Nebst Beiträgen Zu Einer Allgemeinen Energetik* (*The Doctrine of Energy: Historical-Critical Developed, Along with contributions to one general energetics*). Biobiobazaar.

θΔics

In literature thermodynamics, ***The Entropy Effect*** is a 1981 non-fiction book written by American science fiction author Vonda McIntyre, the second of a long-running series of over one-hundred *Star Trek* novels. *The Entropy Effect* uses a mix of entropy theory, in reference to chaos, the arrow of time, in reference to order, disorder, and time-travel, and reference to observation cycles, possibly in connection to thermodynamic cycles.

Synopsis

The *Enterprise* is engaged in an unprecedented scientific study of a naked singularity, i.e. a gravitational singularity without an event horizon, primarily by Spock's efforts, when a top priority message forces Captain Kirk to divert to a nearby system. The interruption ruins the observation cycle, making the time a complete waste of effort.

Upon arrival, the high priority of the message seems to have been a mistake: the *Enterprise* was needed simply to ferry a single criminal to another planet in the same system. The criminal turns out to be a theoretical physicist, Mordreaux, convicted of murder and unethical research on self-aware beings, being accused of promising to send people back in time, then killing them instead. When a crazed Mordreaux escapes, he inexplicably bursts onto the bridge and murders Captain Kirk before the crew's eyes.

Spock discovers that the Mordreaux that murdered Kirk is from the timeline in which he and Kirk had successfully defended Mordreaux against the earlier charges. When Mordreaux later discovered the time travels cause the entropic breakdown of the universe in mere decades rather than eons, he was driven mad and returned to take revenge on those he believed caused it to happen. The naked singularity was merely one of the first physical manifestations of this. Now Spock must journey back in time to avert the disaster *before* it occurs. But more is at stake than Kirk's life. Mordreaux's experiments have thrown the universe into chaos, and Spock is fighting time itself to keep the very fabric of reality from unraveling.

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1. McIntyre, Vonda N. (1981). *The Entropy Effect.* Publisher: Star Trek (originally published by Pocket Books).

θΔics

In famous publications, ***The Entropy Law and the Economic Process*** is a 1971, 457-page book by Romanian mathematician Nicholas Georgescu-Roegen in which a verbalized or dictionary-definition view of what entropy (or economic entropy) and free energy are supposed to be in economic systems, according to the second law of thermodynamics. The book has since become sort of a cult classic in various economics and ecologial economics circles, having been cited, according to Google scholar, over 2,500 times since its publication. This work is cited almost as much as Schrodinger's 1944 *What is Life?*. Italian architectural thermodynamicist Luis Galiano describes Roegen's book as the "obligatory reference" for the economy-ecology polemic. [3]

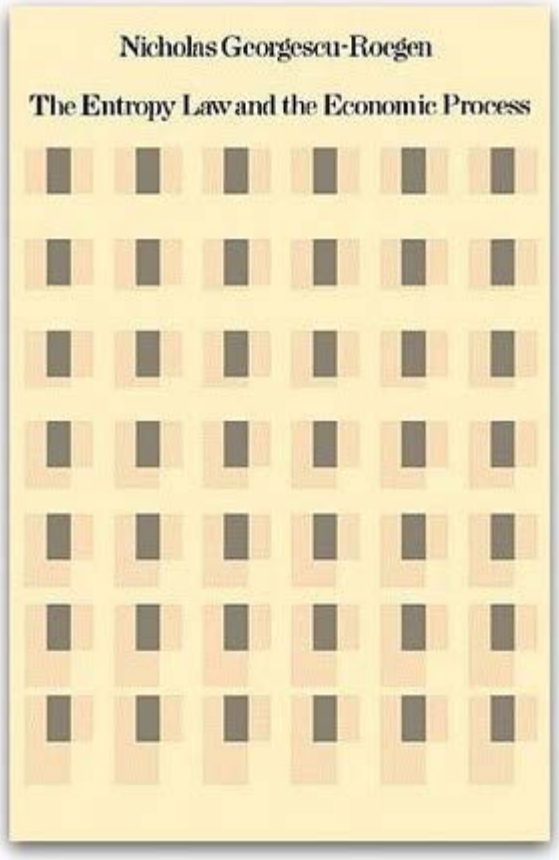

Cover of 1971 book ***The Entropy Law*** by Nicholas Georgescu-Roegen. [1]

Popular terms to have originated from this publication include: the pharse "entropy law", the theory of material entropy, among others.

Origin

The book derived from the introductory essay to Georgescu-Roegen's 1966 *Analytical Economics*, which by way of a second edition turned into the 1971 book. [2]

Difficulties

The general difficulty with the book is that Georgescu-Roegen is a mathematician, by training, and has never had any formal education in thermodynamics. This comes across clearly in his book, where, e.g., on the opening pages he cites *Webster's Collelgiate Dictionary* as a reference for defining entropy. He uses the terms available energy and bound energy in his own unique way, referring to a solid piece of coal as bound energy, and heat released to power economy as available energy, having no idea that these originated in the 1882 paper "The Thermodynamics of Chemical Operations" by German physicist Hermann Helmholtz, and are are defined differently in chemical thermodynamics. The two biggest errors promulgated in the book include the idea that the second law dictates that matter tends to disorder and that free energy refers to the available energy of natural fuels.

See also

â— The Entropy Effect
â— The Entropy Institute

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1. Georgescu-Roegen, Nicholas. (1971). *The Entropy Law and the Economic Process.* Cambridge, Massachusetts: Harvard University Press.
2. Georgescu-Roegen, Nicholas. (1986). "The Entropy Law and the Economic Process in Retrospect", *Eastern Economic Journal*, Vol. XII, No. 1, Jan-Mar.
3. Fernández-Galiano. (2000). *Fire and Memory: On Architecture and Energy* (pg. 207). MIT Press.

θΔics

In famous publications, "**The Establishment and Development of the Idea of Chemical Affinity**" is an 1840 14-page chapter subsection on the history of affinity chemistry by English polymath and science historian William Whewell, which gives a good take on "affinity", "chemical affinity", "elective affinity", related terms, theories, chemists, and ideas, etc., in a period of intellectual mindset, of historical development of affinity theory, seated between the post split affinity theory debate (1798) era and and pre thermal theory of affinity (1850s) debate era, amid the wake of the post Dalton based atomic theory era; touching on early affinity chemistry history (1718-1730s), Herman Boerhaave's famous love quote (1732), among other interesting details. [1]

Text

The following is the full text of Book 4, Chapter II, wherein Whewell covers twelve main points on affinity; partially-hyperlinked with added (related) images and brackets [see alsos]:

CHAPTER II.

ESTABLISHMENT AND DEVELOPMENT OF THE IDEA OF CHEMICAL AFFINITY.

1. THE earlier chemists did not commonly involve themselves in the confusion into which the mechanical philosophers ran, of comparing chemical to mechanical forces. Their attention was engaged, and their ideas were moulded, by their own pursuits. They saw that the connexion of elements and compounds with which they had to deal, was a peculiar relation which must be studied directly; and which must be understood, if understood at all, in itself, and not by comparison with a different class of relations. At different periods of the progress of chemistry, the conception of this relation, still vague and obscure, was expressed in various manners; and at last this conception was clothed in tolerably consistent phraseology, and the principles which it involved were, by the united force of thought and experiment, brought into view.

The opening section to William Whewell's 1840 "**The Establishment and Development of the Idea of Chemical Affinity**", in which he cogently covers the history of affinity chemistry, from 1718 to 1830s. [1]

1. The earlier chemists did not commonly involve themselves in the confusion into which the mechanical philosophers ran, of comparing chemical to mechanical forces. Their attention was engaged, and their ideas were molded, by their own pursuits. They saw that the connection of elements and compounds with which they had to deal, was a peculiar relation which must be studied directly; and which must be understood, if understood at all, in itself, and not by comparison with a different class of relations. At different periods of the progress of chemistry, the conception of this relation, still vague and obscure, was expressed in various manners; and at last this conception was clothed in tolerably consistent phraseology, and the principles which it involved were, by the united force of thought and experiment, brought into view.

2. The power by which the elements of bodies combine chemically, being, as we have seen, a peculiar agency, different from mere mechanical connection or attraction, it is desirable to have it designated by a distinct and peculiar name; and the term *affinity* has been employed for that purpose by most modern chemists. The word "affinity" in common language means, sometimes resemblance, and sometimes relationship and ties of family. It is from the latter sense that the metaphor is borrowed when we speak of chemical affinity. By the employment of this term we do not indicate resemblance, but disposition to unite. Using the word in a common unscientific manner, we might say that chlorine, bromine, and iodine have a great natural affinity with each other, for there are considerable resemblances and analogies among them; but these bodies have very little *chemical* affinity for each other. The use of the word in the former sense, of resemblance, can be traced in earlier chemists; but it does not appear to have acquired its peculiar chemical meaning till after Boerhaave's time. Boerhaave, however, is the writer in whom we first find a due apprehension of the peculiarity and importance of the Idea which it now expresses. When we make a chemical solution [N1], he says, not only are the particles of the dissolved body separated from each other, but they are closely united to the particles of the solvent. When *aqua regia* dissolves gold, do you not see, he says to his hearers, that there must be between each particle of the solvent and of the metal, a mutual virtue by which each loves, unites with, and holds the other (*amat*, unit, *retinet*)?

The opinion previously prevalent had been that the solvent merely separates the parts of the body dissolved: and most philosophers had conceived this separation as performed by mechanical operations of the particles, resembling, for instance, the operation of **wedges breaking up a block of timber**. But Boerhaave forcibly and earnestly points out the insufficiency of the conception. This, he says, does not account for what we see. We have not only a separation, but a new combination. There is a force by which the particles of the solvent associate to themselves the parts dissolved, not a force by which they repel and dissever them.

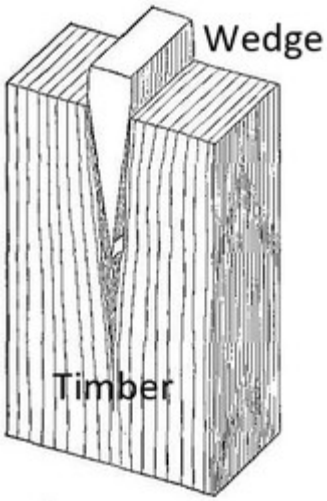

We are here to imagine not mechanical action, not violent impulse, not antipathy, but love, at least if love be the desire of uniting. (*Non igitur hic etiam actiones mechanica, non propulsiones violentae, non inimicitiae cogitandae, sed amicitiae, si amor dicendus copulae cupido*.) The novelty of this view is evidenced by the mode in which he apologizes for introducing it. "*Fateor, paradoxa haec assertio*." To Boerhaave, therefore, (especially considering his great influence as a teacher of chemistry,) we may assign the merit of first diffusing a proper view of chemical affinity as a peculiar force [see: chemical force], the origin of almost all chemical changes and operations.

3. To Boerhaave is usually assigned also the credit of introducing the *word* "affinity" among chemists; but I do not find that the word is often used by him in this sense; perhaps not at all. [N2] But however this may be, the term is on many accounts well worthy to be preserved, as I shall endeavor to show. Other terms were used in the same sense during the early part of the eighteenth century. Thus when Geoffroy, in 1718, laid before the Academy of Paris his Tables of Affinities, which perhaps did more than any other event to fix the idea of affinity, he termed them "Tables of the Relations of Bodies" ("*Talles des Rapports*") speaking, however, also, of their "disposition to unite," and using other phrases of the same import.

The term *attraction*, having been recommended by Newton as a fit word to designate the force which produces chemical combination, continued in great favor in England, where the Newtonian philosophy was looked upon as applicable to every branch of science. In France, on the contrary, where Descartes still reigned triumphant, "attraction," the watch-word of the enemy, was a sound never uttered but with dislike and suspicion. In 1718 (in the notice of Geoffroy's Tables,) the Secretary of the Academy, after pointing out some of the peculiar circumstances of chemical combinations says, "Sympathies and attractions would suit well here, if there were such things." ("Les sympathies, les attractions conviendroient bien ici, sielles etaient quelque chose.") And at a later period, in 1731, having to write the *éloge* of Geoffroy after his death, he says, "He gave, in 1718, a singular system, and a Table of *Affinities*, or Relations of the different substances in chemistry. These affinities gave uneasiness to some persons, who feared that they were *attractions in disguise*, and all the more dangerous in consequence of the seductive forms which clever people have contrived to give them. It was found in the sequel that this scruple might be got over."

This is the earliest published instance, so far as I am aware, in which the word "affinity" is distinctly used for the cause of chemical composition; and taking into account the circumstances, the word appears to have been adopted in France in order to avoid the word *attraction*, which had the taint of Newtonianism. Accordingly we find the word *affinité*

employed in the works of French chemists from this time. Thus, in the *Transactions of the French Academy* for 1746, in a paper of Macquer's upon Arsenic, he says [N3], "One can easily account for these phenomena by means of affinity that different substances used in these combinations have with each other" [“On peut facilement rendre raison de ces phenomènes par le moyen des affinités que les differens substances qui entrent dans ces ombinaisons, ont les uns avec les autres”] and he proceeds to explain the facts by reference to Geoffroy's Table. And in Macquer's *Elements of Chemistry*, which appeared a few years later, the “affinity of composition” is treated of as a leading part of the subject, much in the same way as has been practiced in such books up to the present time. From this period the word appears to have become familiar to all European chemists in the sense of which we are now speaking. Thus, in the year 1758, the Academy of Sciences at Rouen offered a prize for the best dissertation on affinity. The prize was shared between Jean Philippe de Limbourg of Theux, near Liege, and Georges Le Sage of Geneva [N4]. About the same time other persons (Manherr [N5], Nicolai [N6], and others) wrote on the same subject, employing the same name.

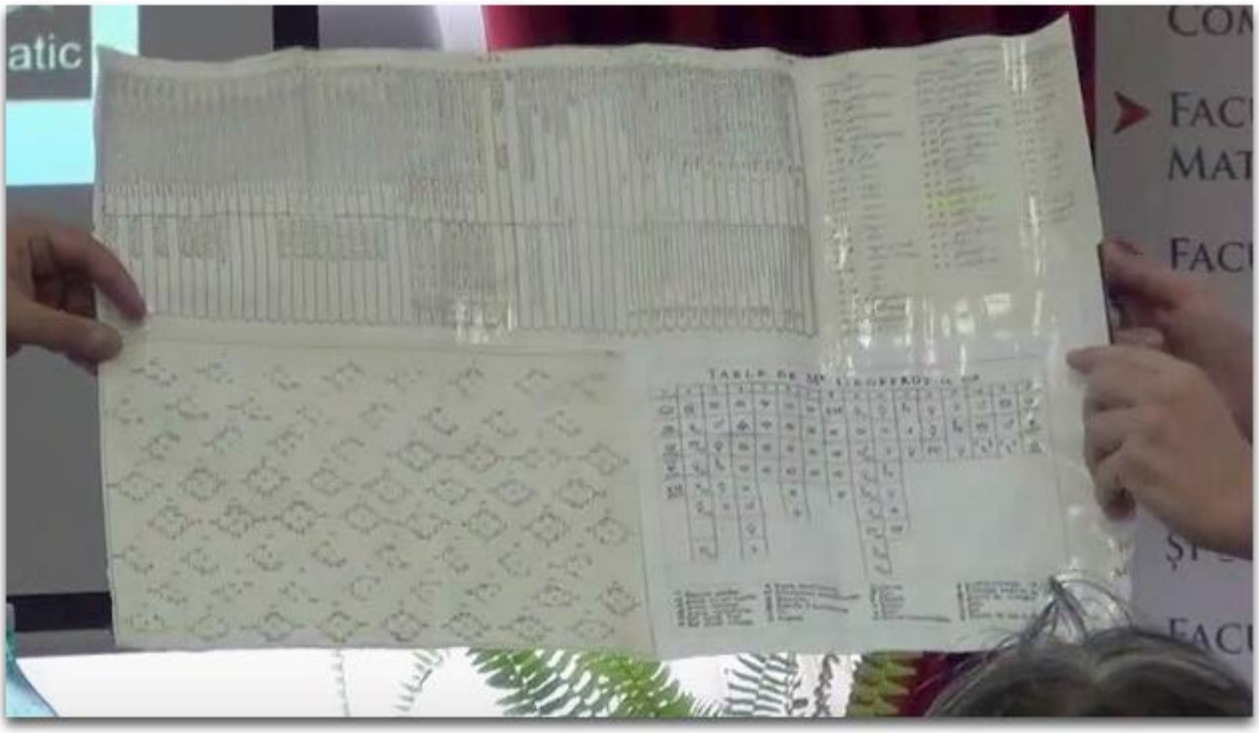

Libb Thims (right) explaining (Ñº) the Bergman affinity table (1775), shown at top left (of sheet), along with the Bergman reaction diagrams (bottom left), Bergman symbols explained (top right), and Geoffroy affinity table (1718) (bottom right) at the econophysics and sociophysics conference at the 2013 University of Pitesti, Romania.

Nevertheless, in 1775, the Swedish chemist Bergman, pursuing still further this subject of chemical affinities, and the expression of them by means of tables, returned again to the old Newtonian term; and designated the disposition of a body to combine with one rather than another of two others as *elective attraction*. And as his work on *Elective Attractions* had great circulation and great influence, this phrase has obtained a footing by the side of affinity, and both one and the other are now in common use among chemists.

4. I have said above that the term *affinity* is worthy of being retained as a technical term. If we use the word attraction in this case, we identify or compare chemical with mechanical attraction; from which identification and comparison, as I have already remarked no one has yet been able to extract the means of expressing any single scientific truth. If such an identification or comparison be not intended, the use of the same word in two different senses can only lead to confusion: and the proper course, recommended by all the best analogies of scientific history, is to adopt a peculiar term for that peculiar relation on which chemical composition depends. The word affinity, even if it were not rigorously proper according to its common meaning still, being simple, familiar, and well established in this very usage, is much to be preferred before any other.

But further, there are some analogies drawn from the common meaning of this word, which appear to recommend it as suitable for the office which it has to discharge. For common mechanical attractions and repulsions, the forces by which one body considered as a *whole* acts upon another external to it, are, as we have said, to be distinguished from those more intimate ties by which the *parts* of each body are held together. Now this difference is implied, if we compare the former relations, the attractions and repulsions, to alliances and wars between states, and the latter, the internal union of particles, to those bonds of affinity which connect the citizens of the same state with one another, and especially to the

ties of family. We have seen that Boerhaave compares the union of two elements of a compound to their marriage; “we must allow,” says an eminent chemist [Pierre Duhem] of our own time [N7], “that there is some truth in this poetical comparison.” It contains this truth, that the two become one to most intents and purposes, and that the unit thus formed (the family) is not a mere juxtaposition of the component parts. And thus the idea of affinity as the peculiar principle of chemical composition, is established among chemists, and designated by a familiar and appropriate name.

5. *Analysis is possible.—We* must, however, endeavor to obtain a further insight into this idea, thus fixed and named. We must endeavour to extricate, if not from the idea itself, from the processes by which it has obtained acceptation and currency among chemists, some principles which may define its application, some additional specialties in the relations which it implies. This we shall proceed to do.

The idea of affinity, as already explained, implies a disposition to combine. But this combination is to be understood as admitting also of a possibility of separation. Synthesis implies analysis as conceivable: or to recur to the image which we have already used, divorce is possible when the marriage has taken place.

That there is this possibility, is a conviction implied in all the researches of chemists, ever since the true notion of composition began to predominate in their investigations. One of the first persons who clearly expressed this conviction was Mayow, an English physician, who published his *Medico-Physical Tracts* in 1674. The first of them, *De Sale-Nitro et Spiritu Nitro-Aerio,* contains a clear enunciation of this principle. After showing how, in the combinations of opposite elements, as acid and alkali, their properties entirely disappear, and a new substance is formed not at all resembling either of the ingredients, he adds [N8], “Although these salts thus mixed appear to be destroyed, it is still possible for them to be separated from each other, with their powers still entire." He proceeds to exemplify this, and illustrates it by the same image which I have already alluded to: “Salia acida a salibus volatilibus discedunt, ut *** sale fixo tartari, tanquam sponso magis idoneo, conjugium strictius ineunt." This idea of a synthesis which left a complete analysis still possible, was opposed to a notion previously current, that when two heterogeneous bodies united together and formed a third body, the two constituents were entirely destroyed, and the result formed out of their ruins f. And this conception of synthesis and analysis, as processes which are possible successively and alternately, and each of which supposes the possibility of the other, has been the fundamental and regulative principle of the operations and speculations of analytical chemistry from the time of Mayow to the present day.

6. *Affinity is elective.—When* the idea of chemical affinity, or disposition to unite, was brought into view by the experiments and reasonings of chemists, they found it necessary to consider this disposition as elective: each element *chose* one rather than another of the elements which were presented to it, and quitted its union with one to unite with another which it preferred. This has already appeared in the passage just quoted from Mayow. He adds in the same strain, “I have no doubt that fixed salts choose one acid rather than another, in order that they may coalesce with it in a more intimate union.”—“Nullus dubito salia fixa acidum unum pre aliis *eligere*, ut *** eodem arctiore unione coalescant." The same thought is expressed and exemplified by other chemists: they notice innumerable cases in which, when an ingredient is combined with a liquid, if a new substance be immersed which has a greater affinity for the liquid, the liquid combines with the new substance by election, and the former ingredient is *precipitated.* Thus Stahl says [N9], “In spirit of nitre dissolve silver; put in copper and the silver is thrown down; put in iron and the copper goes down; put in zinc, the iron precipitates; put in volatile alkali, the zinc is separated; put in fixed alkali, the volatile quits its hold.”—As may be seen in this example, we have in such cases, not only a preference, but a long gradation of preferences. The spirit of nitre will combine with silver, but it prefers copper; prefers iron more; zinc still more; volatile alkali yet more; fixed alkali the most. The same thing was proved to obtain with regard to each element; and when this was ascertained, it became the object of chemists to express these degrees of preference, by lists in which substances were arranged according to their disposition to unite with another substance. In this manner was formed Geoffroy's Table of Affinities (1718), which we have already mentioned. This Table was further improved by other writers, as Gellert (1751) and Limbourg (1761). Finally Bergman improved these Tables still further, taking into account not only the order of affinities of each element for others, but the *sum* of the tendencies to unite of each two elements, which sum, he held, determined the resulting combination when several elements were in contact with each other.

7. As we have stated in the history [N10], when the doctrine of elective affinities had assumed this very definite and systematic form, it was assailed by Berthollet, who maintained, in his *Essai de Statique Chimique,* (1803,) that chemical affinities are *not* elective:—that, when various elements are brought together, their combinations do not depend upon

the kind of elements alone, but upon the quantity of each which is present, that which is most abundant always entering most largely into the resulting compounds. It may seem strange that it should be possible, at so late a period of the science, to throw doubt upon a doctrine which had presided over and directed its progress so long. Proust answered Berthollet, and again maintained that chemical affinity is elective. I have, in the History, given the judgment of Berzelius upon this controversy. "Berthollet," he says, "defended himself with an acuteness which makes the reader hesitate in his judgment; but the great mass of facts finally decided the point in favour of Proust." I may here add the opinion pronounced upon this subject by Dr. Turnerf. "Bergman erred in supposing the result of the chemical action to be in every case owing to elective affinity [for this power is modified in its effects by various circumstances]: but Berthollet ran into the opposite extreme in declaring that the effects formerly ascribed to that power are never produced by it. That chemical attraction is exerted between different bodies with different degrees of energy, is, I apprehend, indisputable." And he then proceeds to give many instances of differences in affinity which cannot be accounted for by the operation of any modifying causes. Still more recently, M. Dumas has taken a review of this controversy; and, speaking with enthusiasm of the work of Berthollet, as one which had been of inestimable service to himself in his early study of chemistry, he appears at first disposed to award to him the victory in this dispute. But his final verdict leaves undamaged the general principle now under our consideration, that chemical affinity is elective. "For my own part," he says*, "I willingly admit the notions of Berthollet when we have to do with acids or with bases, of which the energy is nearly equal: but when bodies endued with very energetic affinities are in presence of other bodies of which the affinities are very feeble, I propose to adopt the following rule: In a solution, everything remaining dissolved, the strong affinities satisfy themselves, leaving the weak affinities to arrange matters with one another. The strong acids take the strong bases, and the weak acids can only unite with the weak bases. The known facts are perfectly in accordance with this practical rule." It is obvious that this recognition of a distinction between *strong* and *weak* affinities, which operates to such an extent as to determine entirely the result, is a complete acknowledgement of the elective nature of affinity, as far as any person acquainted with chemical operations could contend for it. For it must be allowed by all, that solubility, and other collateral circumstances, influence the course of chemical combinations, since they determine whether or not there shall take place that contact of elements without which affinity cannot possibly operate.

8. *Affinity is Definite as to Quantity—In* proportion as chemists obtained a clearer view of the products of the laboratory as results of the composition of elements, they saw more and more clearly that these results were definite; that one element not only preferred to combine with another of a certain kind, but also would combine with it to a certain extent and no further, thus giving to the result not an accidental and variable, but a fixed and constant character. Thus salts being considered as the result of the combination of two opposite principles, acid and alkali, and being termed *neutral* when these principles exactly balanced each other, Rouelle (who was Royal Professor at Paris in 1742) admits of neutral salts with excess of acid, neutral salts with excess of base, and perfect neutral salts. Beaume maintained" against him that there were no salts except those perfectly neutral, the other classes being the results of mixture and imperfect combination. But this question was not adequately treated till chemists made every experiment with the balance in their hands. When this was done, they soon discovered that, in each neutral salt, the proportional weights of the ingredients which composed it were always the same. This was ascertained by Wenzel, whose Doctrine of the Affinities of Bodies appeared in 1777. He not only ascertained that the proportions of elements in neutral chemical compounds are definite, but also that they are reciprocal; that is, that if A, a certain weight of a certain acid, neutralize *m,* a certain weight of a certain base, and B, a certain weight *of* a certain other acid, neutralize *n,* a certain weight of a certain other base; the compound of A and *n* will also be neutral; as also that of B and *m.* The same views were again presented by Richter in 1792, in his *Principles of the Measure of Cle. mical Elements.* And along with these facts, that of the combination of elements in multiple proportions being also taken into account, the foundations of the Atomic Theory were laid; and that theory was propounded in 1803 by Mr. Dalton. That theory, however, rests upon the idea of substance, as well as upon that idea of chemical affinity which we are here considering; and the discussion of its evidence and truth must be for the present deferred.

9. The two principles just explained, that affinity is definite as to the kind, and as to the quantity of the elements which it unites, have here been stated as results of experimental investigation. That they could never have been clearly understood, and therefore never firmly established, without laborious and exact experiments, is certain; but yet we may venture to say that being once known, they possess an evidence beyond that of mere experiment. For how, in fact, can we conceive combinations, otherwise than as definite in kind and quantity? If we were to suppose each element ready to combine with any other indifferently, and indifferently in any quantity, we should have a world in which all would be confusion and indefiniteness. There would be no fixed kinds of bodies; salts, and stones, and ores, would approach to

and graduate into each other by insensible degrees. Instead of this, we know that the world consists of bodies distinguishable from each other by definite differences, capable of being classified and named, and of having general propositions asserted concerning them. And as we cannot conceive a world in which this should not be the case, it would appear that we cannot conceive a state of things in which the laws of the combination of elements should not be of that definite and measured kind which we have above asserted. This will, perhaps, appear more clearly by stating our fundamental convictions respecting chemical composition in another form, which I shall, therefore, proceed to do.

10. *Chemical Composition determines Physical Proper*ties.—However obscure and incomplete may be our conception of the internal powers by which the ultimate particles of bodies are held together, it involves, at least, this conviction:—that these powers are what determine bodies *to be* bodies, and therefore contain the reason of all the properties which, as bodies, they possess. The forces by which the particles of a body are held together, also cause it to be hard or soft, heavy or light, opake or transparent, black or red; for if these forces are not the cause of these peculiarities, what can be the cause? By the very supposition which we make respecting these forces, they include all the relations by which the parts are combined into a whole, and therefore they, and they only, must determine all the attributes of the whole. The foundation of all our speculations respecting the intimate constitution of bodies must be this, that their composition determines their properties.

Accordingly we find our chemists reasoning from this principle with great confidence, even in doubtful cases. Thus Davy, in his researches concerning the diamond, says: “That some chemical difference must exist between the hardest and most beautiful of the gems and charcoal, between a non-conductor and a conductor of electricity, it is scarcely possible to doubt: and it seems reasonable to expect that a very refined or perfect chemistry will confirm *the analogies of nature;* and show that bodies cannot be the same in their composition or chemical nature, and yet totally different in their chemical properties.” It is obvious that the principle here assumed is so far from being a mere result of experience, that it is here appealed to prove that all previous results of experience on this subject must be incomplete and inaccurate; and that there must be some chemical difference between charcoal and diamond, though none had hitherto been detected.

11. In what manner, according to what rule, the chemical composition shall determine the kind of the substance, we cannot reasonably expect to determine by mere conjecture or assumption, without a studious examination of natural bodies and artificial compounds. Yet even in the most recent times, and among men of science, we find that an assumption of the most arbitrary character has in one case been mixed up with this indisputable principle, that the elementary composition determines the kind of the substance. In the classification of minerals, one school of mineralogists have rightly taken it as their fundamental principle that the chemical composition shall decide the position of the mineral in the system. But they have appended to this principle, arbitrarily and unjustifiably, the maxim that the element which is *largest in quantity* shall fix the class of the substance. To make such an assumption is to renounce, at once, all hope of framing a system which shall be governed by the resemblances of the things classified; for how can we possibly know beforehand that fifty-five per cent of iron shall give a substance its predominant properties, and that forty-five per cent. shall not? Accordingly, the systems of mineralogical arrangement which have been attempted in this way, (those of Haüy, Phillips, and others) have been found inconsistent with themselves, ambiguous, and incapable of leading to any general truths.

12. Thus the physical properties of bodies depend upon their chemical composition, but in a manner which a general examination of bodies with reference to their properties and their composition can alone determine. We may, however, venture to assert further, that the more definite the properties are, the more distinct may we expect to find this dependence. Now the most definite of the properties of bodies are those constant properties which involve relations of space: that is, their figure. We speak not, however, of that external figure, derived from external circumstances, which, so far from being constant and definite, is altogether casual and arbitrary; but of that figure which arises from their internal texture, and which shows itself not only in the regular forms which they spontaneously assume, but in the disposition of the parts to separate in definite directions and no others. In short, the most definite of the properties of perfect chemical compounds is their crystalline structure; and therefore it is evident that the crystalline structure of each body, and the forms which it affects, must be in a most intimate dependence upon its chemical composition.

Here again we are led to the brink of another theory; —that of crystalline structure, which has excited great interest among philosophers ever since the time of Haüy. But this theory involves, besides that idea of chemical composition

with which we are here concerned, other conceptions which enter into the relations of figure. These conceptions, governed principally by the idea of Symmetry, must be unfolded and examined before we can venture to discuss any theory of crystallization: and we shall proceed to do this as soon as we have first duly considered the Idea of Substance and its consequences.

Discussion

Note: in later parts of the book, Whewell touches on what he terms “natural affinity”. (Ñº)

Note: on his [N2], in point #3 (above), Whewell credits Herman Boerhaave (c.1720s) as having introduced to chemists the word "affinity"; James Partington (1937), however, credits Albertus Magnus (c.1250) with the introduction of the term.

Notes

N1. *Elementa Chemia. Lugd. Bat.* 1732, p. 677.
N2. See DUMAs, *Leçons de Philos. Chim*, p. 364. REEs' *Cyclopædia*, Art. Chemistry. *In* the passage of Boerhaave to which I refer above, *affinitas* is rather opposed to, than identified with, chemical combination. When, he says, the parts of the body to be dissolved are dissevered by the solvent, why do they remain united to the particles of the solvent, and why do not rather both the particles of the solvent and of the dissolved body collect into homogeneous bodies by their *affinity?* denuo se affinitate suae naturae colligant in corpora homogenea? And the answer is, because they possess another force which counteracts this affinity of homogeneous particles, and makes compounds of different elements. Affinity, in chemistry, now means the tendency of *different* kinds of matter to unite: but it appears, as I have said, to have acquired this sense since Boerhaave's time.
N3. A. P. 1746, p.201.
N4. Thomson’s *Chemistry*, iii. 10. Limbourg's Dissertation was published at Liege, in 1761; and Le Sage's at Geneva.
N5. *Dissertatio de Affinitate Corporum.* Vindob. 1762.
N6. *Progr*. I. II. *de Affinitate Corporum Chimica.* Jen. 1775, 1776.
N7. DUMAs, *Leçons de Phil. Chim*, p. 363.
N8. Cap. Xiv., pg. 233
N9. *Zymotechnica*, 1697, pg. 117.
N10. *Hist. Ind. Sci.*, iii. 115.

References

1. Whewell, William. (1840). *The Philosophy of the Inductive Sciences: Founded Upon Their History, Volume One* (Book 4, §2: The Establishment and Development of the Idea of Chemical Affinity, pgs. 373-87; "si amor dicendus copulae cupido", pg. 375; Dumas, pg. 379). John W. Parker.

θΔics

In famous publications, "**The European War**" is a Sep 1914 editorial by German-born American

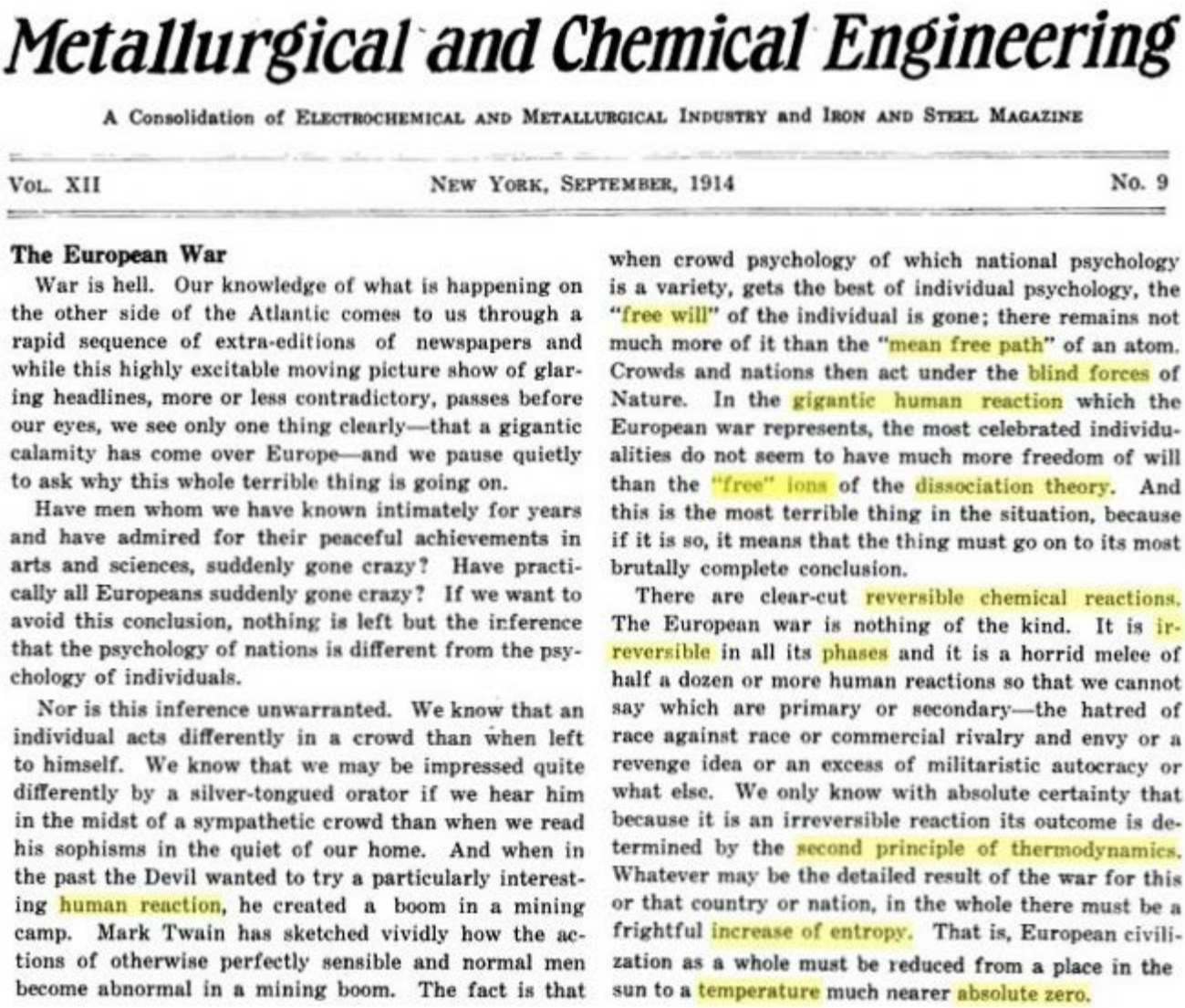

Metallurgical and Chemical Engineering

A Consolidation of Electrochemical and Metallurgical Industry and Iron and Steel Magazine

Vol. XII | New York, September, 1914 | No. 9

The European War

War is hell. Our knowledge of what is happening on the other side of the Atlantic comes to us through a rapid sequence of extra-editions of newspapers and while this highly excitable moving picture show of glaring headlines, more or less contradictory, passes before our eyes, we see only one thing clearly—that a gigantic calamity has come over Europe—and we pause quietly to ask why this whole terrible thing is going on.

Have men whom we have known intimately for years and have admired for their peaceful achievements in arts and sciences, suddenly gone crazy? Have practically all Europeans suddenly gone crazy? If we want to avoid this conclusion, nothing is left but the inference that the psychology of nations is different from the psychology of individuals.

Nor is this inference unwarranted. We know that an individual acts differently in a crowd than when left to himself. We know that we may be impressed quite differently by a silver-tongued orator if we hear him in the midst of a sympathetic crowd than when we read his sophisms in the quiet of our home. And when in the past the Devil wanted to try a particularly interesting human reaction, he created a boom in a mining camp. Mark Twain has sketched vividly how the actions of otherwise perfectly sensible and normal men become abnormal in a mining boom. The fact is that when crowd psychology of which national psychology is a variety, gets the best of individual psychology, the "free will" of the individual is gone; there remains not much more of it than the "mean free path" of an atom. Crowds and nations then act under the blind forces of Nature. In the gigantic human reaction which the European war represents, the most celebrated individualities do not seem to have much more freedom of will than the "free" ions of the dissociation theory. And this is the most terrible thing in the situation, because if it is so, it means that the thing must go on to its most brutally complete conclusion.

There are clear-cut reversible chemical reactions. The European war is nothing of the kind. It is irreversible in all its phases and it is a horrid melee of half a dozen or more human reactions so that we cannot say which are primary or secondary—the hatred of race against race or commercial rivalry and envy or a revenge idea or an excess of militaristic autocracy or what else. We only know with absolute certainty that because it is an irreversible reaction its outcome is determined by the second principle of thermodynamics. Whatever may be the detailed result of the war for this or that country or nation, in the whole there must be a frightful increase of entropy. That is, European civilization as a whole must be reduced from a place in the sun to a temperature much nearer absolute zero.

German-born American electrochemical engineer Eugene Roeber's famous Sep 1914 editorial "The European War", wherein he outlines a proto-version of human chemical thermodynamics, in his explanation that WII is a large phase change global social chemical reaction, in short. [1]

electrochemical engineer Eugene Roeber, a chemical engineering view of WWI (28 Jul 1914 – 11 Nov 1918), wherein he stated that WWI was a gigantic chemical reaction governed by the second law, wherein people's free will becomes like that of the will of "free" ions of dissociation theory; that entropy will increase as the war goes; that the end result will be a new Europe closer to absolute zero of temperature.

Overview

In Sep 1914, German-born American electrochemical engineer Eugene Roeber, in his "The European War", the opening editorial of *Metallurgical and Chemical Engineering*, expounded on his views that WWI (28 Jul 1914 – 11 Nov 1918) was a large social chemical reaction, comparing individuals to free ions, without free will, of dissociation theory, among other assertions; the following is the text of this editorial: [1]

> "War is hell. Our knowledge of what is happening on the other side of the Atlantic comes to us through a rapid sequence of extra-editions of newspapers and while this highly excitable moving picture show of glaring headlines, more or less contradictory, passes before our eyes, we see only one thing clearly—that a gigantic calamity has come over Europe—and we pause quietly to ask why this whole terrible thing is going on.

> Have men whom we have known intimately for years and have admired for their peaceful achievements in arts and sciences, suddenly gone crazy? Have practically all Europeans suddenly gone crazy? If we want to avoid this conclusion, nothing is left but the inference that the psychology of nations is different from the psychology of individuals.
>
> Nor is this inference unwarranted. We know that an individual acts differently in a crowd than when left to himself. We know that we may be impressed quite differently by a silver-tongued orator if we hear him in the midst of a sympathetic crowd than when we read his sophisms in the quiet of our home. And when in the past the Devil wanted to try a particularly interesting human reaction, he created a boom in a mining camp. Mark Twain has sketched vividly how the actions of otherwise perfectly sensible and normal men become abnormal in a mining boom. The fact is that when crowd psychology of which national psychology is a variety, gets the best of individual psychology, the "free will" of the individual is gone; there remains not much more of it than the "mean free path" of an atom. Crowds and nations then act under the blind forces of nature. In the gigantic human reaction which the European war represents, the most celebrated individualities do not seem to have much more freedom of will than the "free" ions of the dissociation theory. And this is the most terrible thing in the situation, because if it is so, it means that the thing must go on to its most brutally complete conclusion.
>
> There are clear-cut reversible chemical reactions [see: reversible chemical reaction]. The European war is nothing of the kind. It is irreversible in all its phases and it is a horrid melee of half a dozen or more human reactions so that we cannot say which are primary or secondary—the hatred [negative affinity] of race against race or commercial rivalry and envy or a revenge idea or an excess of militaristic autocracy or what else. We only know with absolute certainty that because it is an irreversible reaction its outcome is determined by the second principle of thermodynamics. Whatever may be the detailed result of the war for this or that country or nation, in the whole there must be a frightful increase of entropy. That is, European civilization as a whole must be reduced from a place in the sun to a temperature much nearer absolute zero.

This is the end of his human chemical thermodynamics themed editorial. Roeber then carried over the editorial, into the next article, as follows:

> The more carefully these reactions are restricted to Europe as an isolated system, the better for the rest of the world. President Wilson has been happy in defining the function of this country. There is no cause for alarm, but an opportunity for this nation to reap great permanent glory provided nobody loses his head. Our opportunity does not lie in war but in a control which will fit us, above of all nations of the world, to act for peace when the time comes. How greatly this country is affected by the European war, is clearly evident in the situation of the metallurgical industries. We may simply look at the two extremes, copper and zinc, the former being hit hard, the latter being benefited by the war. On the other hand, zinc has been put in an enviable position by the fact that the zinc smelting centers of continental Europe are in the zone of war operations. Liege has been for zinc what Pittsburgh is for iron. Our opportunity to export zinc and galvanized iron products to South America is evident. The opportunity of electric zinc smelting is also clear. Our friend, Woolsey McA. Johnson, the American pioneer in this field, has been a brilliant writer on the subject and a clever experimenter in the past. The psychological moment has come for him and his people to deliver the goods in their projected plant at Keokuk.”

(add discussion)

Reactions

In Oct 1914, someone, associated with British journal *Mining Magazine*, responded with an "irate editorial", as Kathryn Steel (2014) refers to it, after meeting with Roeber, during an American Institute [of something] dinner talk, that the Roeber's assertions were but disingenuous chemical simile, as follows: [2]

> “In the Sep issue of his periodical, Dr. Roeber concludes that ‘all Europeans have suddenly gone crazy’. He speaks of ‘crowds and nations that act under the blind forces of nature.’ The war, to our genial acquaintance at New York, is a ‘gigantic human reaction’ in which the most celebrated individualities do not seem to have much more freedom of will than the ‘free’ ions of the dissociation theory.’ This may be a delightful chemical simile, but to us it is flavored too much with that pestilent Prussian notion that war is a ‘biological necessity,’ that the breaking of a treaty is condoned by necessity, that atrocities are another part of warlike necessity, and so forth, to the end of the ensanguined chapter of mad militarism. No, Dr. Roeber, this will not do. The prevalence of such ideas among educated Germans, the acquiescence of university professors in the sinister writings of the Treitschke (Ñº) and Nietzsche school, and the lack of protest against the vaporings of the Potsdam War-Lord are among the causes of this great catastrophe. To us the preaching of organized murder in terms of culture is an abominable impertinence.
>
> Nay more, the violation of women, the hacking of young mothers’ breasts, the murder of little children, the burning of helpless captives, the shooting of inoffensive peasants in the field may be acts of individual savagery for which the General Staff and the Kaiser are not responsible, but the sacking of Louvain and the destruction of Rheims cathedral, together with several other atrocities on a large scale, are the acts of high authority, for which no excuse has been, or can be, offered. In the face of such wanton barbarism, the chemical simile of ‘necessity’ is an insult to human intelligence.

In Dec 2014, Roeber responded with the following: [3]

> “The *Mining Magazine*, of London, comments on our editorial on the European war, but deals almost exclusively with matters which we neither said nor suggested nor hinted at. We leave the relevance and good taste of the comment of our London critic entirely to the judgment of our readers, who have our original remarks on record in our September issue for comparison of quotations and interpretation. We have no reason to modify in the least our opinions there expressed. We publish the *Mining Magazine's* comment in full as an illustration of the correctness and pertinence of our original sketch of the psychological situation.”

(add discussion)

References

1. Roeber, Eugene. (1914). “The European War” (Ñº), *Metallurgical and Chemical Engineering*, 12(9):545, Sep.
2. (a) Anon. (1914). “Letter” (Ñº), *The Mining Magazine*, 11:221, Oct.
(b) Steen, Kathryn. (2014). *The American Synthetic Organic Chemicals Industry: War and Politics, 1910-1913* (pgs. 116-17). University of North Carolina Press.
3. Roeber, Eugene. (2014). “The By-Product of a Chemical Reaction” (Ñº), *Metallurgical & Chemical Engineering*, 12:738.

θΔics

In music thermodynamics, **"The First and Second Law"** is a comic song performed by the British duo Flanders and Swann. The song was performed and recorded during a performance at the Haymarket Theatre, London, in 1963 (shown adjacent) and published as song six in the 1964 album *At the Drop of Another Hat.* [1] Michael Flanders (1922–1975) was an actor and singer and Donald Swann (1923–1994) was the composer, pianist and linguist. Together they collaborated in writing and performing comic songs.

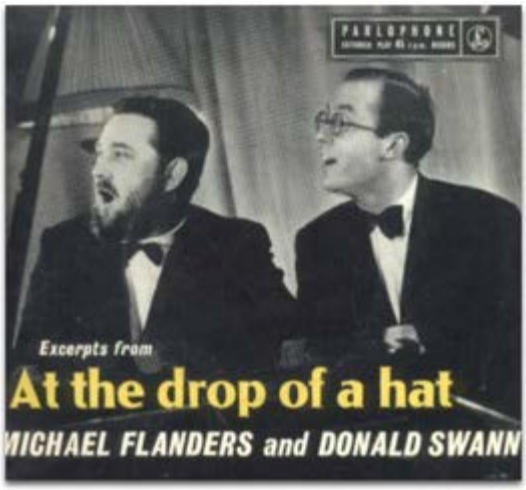

In the 1964 audio recorded (Ñº) stage performance "At the Drop of Another Hat" Flanders and Swann began talking about C.P. Snow and two cultures second law story, then entered into their duo "**The First and Second Law**" song skit, available in the video shown.

Lyrics

Note: Michael alone is in **blue**, Donald alone is in **red**, speech is *italicised*. [2]

The First law of Thermodynamics.
Heat is work and work is heat (a play on the mechanical equivalent of heat).
Heat cannot of itself pass from one body to a hotter body
Heat cannot of itself pass from one body to a hotter body
Heat won't pass from a cooler to a hotter
Heat won't pass from a cooler to a hotter
You can try it if you like but you'd far better not-a
You can try it if you like but you'd far better not-a
'Cos the cold in the cooler will get hotter as a rule-a
'Cos the cold in the cooler will get hotter as a rule-a
'Cos the hotter body's heat will pass to the cooler
'Cos the hotter body's heat will pass to the cooler
Heat is work and work is heat and work is heat and heat is work
Heat will pass by conduction and
Heat will pass by conduction and
Heat will pass by convection and
Heat will pass by convection and
Heat will pass by radiation
Heat will pass by radiation
And that's a physical law

Heat is work and work's a curse
And all the heat in the universe
Is gonna cool down,
'Cos it can't increase
Then there'll be no more work
And there'll be perfect peace
Really?
Yeah, that's entropy, Man.
And all because of the second law of thermodynamics which lays down:

That you can't pass heat from a cooler to a hotter
Try it if you like but you'd far better not-a
'Cos the cold in the cooler will get hotter as a rule-a
'Cos the hotter body's heat will pass to the cooler

Oh, you can't pass heat from a cooler to a hotter
Try it if you like but you'll only look a fool-a
'Cos the cold in the cooler will get hotter as a rule-a
And that's a physical law
Oh, I'm hot
That's because you've been working!
Oh, Beatles, nothing!
That's the first and second laws of thermodynamics.

References

1. "The First and Second Law" (song six) in the 1964 album *At the Drop of Another Hat* by Flanders and Swann.
2. (a) Lyrics - The First and Second Law
(b) Lyrics - The First and Second Law (Ian Kitching's music website)

θΔics

In famous publications, **"The Heat Death of the Universe"** is a controversial 1967 short story, comprising fifty-four paragraph-sized parts, by American writer Pamela Zoline, which gives a literature thermodynamics style take on the various implications of the heat death theory of universal end, second law, and entropy to the various windows and processes of human activity, such as child rearing, love, growing old, chaos, sex, time, and death, among other topics. She uses phrases such as "Gibbs' universe". In part (13), Zoline begins to dig into a full scientific paragraph definition of entropy. The character Sarah Boyle may to be a pun on Robert Boyle.

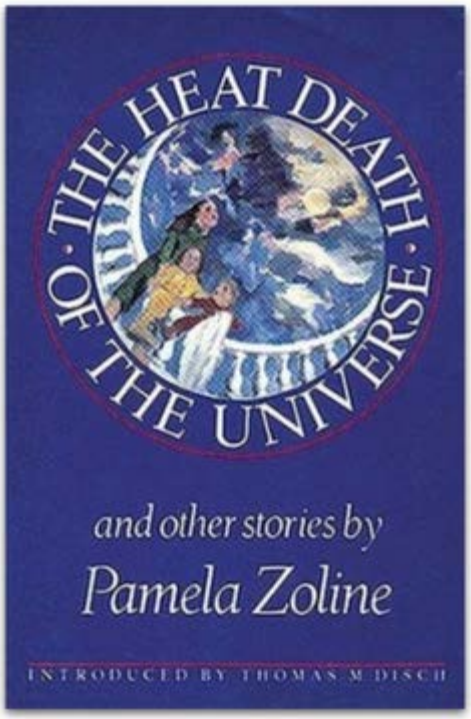

Cover of the 1988 collected short stories of Pamela Zoline, featuring the 1967 "**Heat Death Theory of the Universe**". [2]

Story

Below is a keyword-linked reprint of the short story: [1]

"The Heat Death of the Universe"
(1967)
by Pamela Zoline

(1) ONTOLOGY
That branch of metaphysics which concerns itself with the problems of the nature of existence or being.

(2) Imagine a pale blue morning sky, almost green, with clouds only at the rims. The earth rolls and the sun appears to mount, mountains erode, fruits decay, the Foraminifera adds another chamber to its shell, babies' fingernails grow as does the hair of the dead in their graves, and in egg timers the sands fall and the eggs cook on.

(3) Sarah Boyle thinks of her nose as too large, though several men have cherished it. The nose is generous and performs a well-calculated geometric curve, at the arch of which the skin is drawn very tight and a faint whiteness of bone can be seen showing through, it has much the same architectural tension and sense of mathematical calculation as the day after Thanksgiving breastbone on the carcass of a turkey; her maiden name was Sloss, mixed German, English and Irish descent; in grade school she was very bad at playing softball and, besides being chosen last for the team, was always made to play center field, no one could ever hit to center field; she loves music best of all the arts, and of music, Bach, J.S; she lives in California, though she grew up in Boston and Toledo.

(4) BREAKFAST TIME AT THE BOYLES' HOUSE ON LA FLORIDA STREET, ALAMEDA, CALIFORNIA, THE CHILDREN DEMAND SUGAR FROSTED FLAKES.
With some reluctance Sarah Boyle dishes out Sugar Frosted Flakes to her children, already hearing the decay set in upon the little white milk teeth, the bony whine of the dentist's drill. The dentist is a short, gentle man with a moustache who sometimes reminds Sarah of an Uncle who lives in Ohio. One bowl per child.

(5) If one can imagine it considered as an abstract object, by members of a totally separate culture, one can see that the cereal box might seem a beautiful thing. The solid rectangle is neatly joined and classical in proportions, on it are squandered wealths of richest colours, virgin blues, crimsons, dense ochres, precious pigments once reserved for sacred paintings and as cosmetics for the blind faces of marble gods. Giant size. Net Weight 16 ounces, 250 grams. "They're tigeriffic!" says Tony the Tiger. The box blatts promises. Energy, Nature's Own Goodness, an endless pubescence. On its back is a mask of William Shakespeare to be cut out, folded, worn by thousands of tiny Shakespeares in Kansas City, Detroit, Tucson, San Diego, Tampa. He appears at once more kindly and somewhat more vacant than we are used to seeing him. Two or more of the children lay claim to the mask, but Sarah puts off that Solomon's decision until such time as the box is empty.

(6) A notice in orange flourishes states that a Surprise Gift is to be found somewhere in the packet, nestled amongst the golden flakes. So far it has not been unearthed, and the children request more cereal than they wish to eat, great yellow heaps of it, to hurry the discovery. Even so, at the end of the meal, some layers of flakes remain in the box and the Gift must still be among them.

(7) There is even a Special Offer of a secret membership, code and magic ring; these to be obtained by sending in the box top with 50 cents.

(8) Three offers on one cereal box. To Sarah Boyle this seems to be oversell. Perhaps something is terribly wrong with the cereal and it must be sold quickly, got off the shelves before the news breaks. Perhaps it causes a special, cruel cancer in little children. As Sarah Boyle collects the bowls printed with bunnies and baseball statistics, still slopping half full of milk and wilted flakes, she imagines in her mind's eye the headlines, "Nation's Small Fry Stricken, Fate's Finger Sugar Coated, Lethal Sweetness Socks Tots."

(9) Sarah Boyle is a vivacious and intelligent young wife and mother, educated at a fine Eastern college, proud of her growing family which keeps her busy and happy around the house.

(10) BIRTHDAY
Today is the birthday of one of the children. There will be a party in the late afternoon.

(11) CLEANING UP THE HOUSE. (ONE.)
Cleaning up the kitchen. Sarah Boyle puts the bowls, plates, glasses and silverware into the sink. She scrubs at the stickiness on the yellow-marbled formica table with a blue synthetic sponge, a special blue which we shall see again. There are marks of children's hands in various sizes printed with sugar and grime on all the table's surfaces. The marks catch the light, they appear and disappear according to the position of the observing eye. The floor sweepings include a triangular half of toast spread with grape jelly, bobby pins, a green Band-Aid, flakes, a doll's eye, dust, dog's hair and a button.

(12) Until we reach the statistically likely planet and begin to converse with whatever green-faced teleporting denizens thereof—considering only this shrunk and communication-ravaged world—can we any more postulate a separate culture? Viewing the metastasis of Western Culture it seems progressively less likely. Sarah Boyle imagines a whole world which has become like California, all topographical inperfections sanded away with the sweet-smelling burr of the plastic surgeon's cosmetic polisher, a world populace dieting, leisured, similar in pink and mauve hair and rhinestone shades. A land **** Pink and Avocado Green, brassiered and girdled by monstrous complexities of Super Highways, a California endless and unceasing, embracing and transforming the entire globe, California, California!

(13) INSERT ONE. ON ENTROPY.
ENTROPY: A quantity introduced in the first place to facilitate the calculation, and to give clear expressions to the results of thermodynamics. Changes of entropy can be calculated only for a reversible process, and may then be defined as the ratio of the amount of heat taken up to the absolute temperature at which the heat is absorbed. Entropy changes for actual irreversible processes are calculated by postulating equivalent theoretical reversible changes. The entropy of a system is a measure of its degree of disorder. The total entropy of any isolated system can never decrease in any change; it must either increase (irreversible process) or remain constant (reversible process). The total entropy of the Universe therefore is increasing, tending towards a maximum, corresponding to complete disorder of the particles in it (assuming that it may be regarded as an isolated system.) See Heat Death of the Universe.

(14) CLEANING UP THE HOUSE. (TWO.)
Washing the baby's diapers. Sarah Boyle writes notes to herself all over the house; a mazed wild script larded with arrows, diagrams, pictures, graffiti on every available surface in a desperate/heroic attempt to index, record, bluff, invoke, order and placate. On the fluted and flowered white plastic lid of the diaper bin she has written in Blushing Pink Nitetime lipstick a phrase to ward off fumey ammoniac despair. "The nitrogen cycle is the vital round of organic and inorganic exchange on earth. The sweet breath of the Universe." On the wall by the washing machine are Yin and Yang signs, mandalas, and the words, "Many young wives feel trapped. It is a contemporary sociological phenomenon which may be explained in part by a gap between changing living patterns and the accommodation of social services to these patterns." Over the stove she had written "Help, Help, Help, Help, Help."

(15) Sometimes she numbers or letters the things in a room, writing the assigned character on each object. There are 819 separate moveable objects in the living-room, counting books. Sometimes she labels objects with their names, or with

false names, thus on her bureau the hair brush is labelled HAIR BRUSH, the cologne, COLOGNE, the hand cream, CAT. She is passionately fond of children's dictionaries, encyclopedias, ABCs and all reference books, transfixed and comforted at their simulacra of a complete listing and ordering.

(16) On the door of a bedroom are written two definitions from reference books. "GOD: An object of worship" ; "HOMEOSTASIS: Maintenance of constancy of internal environment."

(17) Sarah Boyle washes the diapers, washes the linen, Oh Saint Veronica, changes the sheets on the baby's crib. She begins to put away some of the toys, stepping over and around the organizations of playthings which still seem inhabited. There are various vehicles, and articles of medicine, domesticity and war: whole zoos of stuffed animals, bruised and odorous with years of love; hundreds of small figures, plastic animals, cowboys, cars, spacemen, with which the children make sub and supra worlds in their play. One of Sarah's favourite toys is the Baba, the wooden Russian doll which, opened, reveals a smaller but otherwise identical doll which opens to reveal, etc., a lesson in infinity at least to the number of seven dolls.

(18) Sarah Boyle's mother has been dead for two years. Sarah Boyle thinks of music as the formal articulation of the passage of time, and of Bach as the most poignant rendering of this. Her eyes are sometimes the colour of the aforementioned kitchen sponge. Her hair is natural spaniel-brown; months ago on an hysterical day she dyed it red, so now it is two-toned with a stripe in the middle, like the painted walls of slum buildings or old schools.

(19) INSERT TWO. THE HEAT DEATH OF THE UNIVERSE.
The second law of thermodynamics can be interpreted to mean that the ENTROPY of a closed system tends towards a maximum and that its available ENERGY tends towards a minimum. It has been held that the Universe constitutes a thermodynamically closed system, and if this were true it would mean that a time must finally come when the Universe "unwinds" itself, no energy being available for use. This state is referred to as the "heat death of the Universe." It is by no means certain, however, that the Universe can be considered as a closed system in this sense.

(20) Sarah Boyle pours out a Coke from the refrigerator and lights a cigarette. The coldness and sweetness of the thick brown liquid make her throat ache and her teeth sting briefly, sweet juice of my youth, her eyes glass with the carbonation, she thinks of the Heat Death of the Universe. A logarithmic of those late summer days, endless as the Irish serpent twisting through jewelled manuscripts forever, tail in mouth, the heat pressing, bloating, doing violence. The Los Angeles sky becomes so filled and bleached with detritus that it loses all colours and silvers like a mirror, reflecting back the fricasseeing earth. Everything becomes warmer and warmer, each particle of matter becoming more agitated, more excited until the bonds shatter, the glues fail, the deodorants lose their seals. She imagines the whole of New York City melting like a Dali into a great chocolate mass, a great soup, the Great Soup of New York.

(21) CLEANING UP THE HOUSE. (THREE.)
Beds made. Vacuuming the hall, a carpet of faded flowers, vines and leaves which endlessly wind and twist into each other in a fevered and permanent ecstasy. Suddenly the vacuum blows instead of sucks, spewing marbles, dolls' eyes, dust, crackers. An old trick. "Oh my god," says Sarah. The baby yells on cue for attention/changing/food. Sarah kicks the vacuum cleaner and it retches and begins working again.

(22) AT LUNCH ONLY ONE GLASS OF MILK IS SPILLED.
At lunch only one glass of milk is spilled.

(23) The plants need watering, Geranium, Hyacinth, Lavender, Avocado, Cyclamen. Feed the fish, happy fish with china castles and mermaids in the bowl. The turtle looks more and more unwell and is probably dying.

(24) Sarah Boyle's blue eyes, how blue? Bluer far and of a different quality than the Nature metaphors which were both engine and fuel to so much of precedant literature. A fine, modern, acid, synthetic blue; the shiny cerulean of the skies on postcards sent from lush subtropics, the natives grinning ivory ambivalent grins in their dark faces; the promising fat, unnatural blue of the heavy tranquilizer capsule; the cool mean blue of that fake kitchen sponge; the deepest, most unbelievable azure of the tiled and mossless interiors of California swimming pools. The chemists in their kitchens cooked, cooled and distilled this blue from thousands of colorless and wonderfully constructed crystals, each one unique

and nonpareil; and now that color, hisses, bubbles, burns in Sarah's eyes.

(25) INSERT THREE. ON LIGHT.
LIGHT: Name given to the agency by means of which a viewed object influences the observer's eyes. Consists of electromagnetic radiation within the wave-length range 4 x 10-5 cm to 7 x 10-5 cm approximately; variations in the wave-length produce different sensations in the eye, corresponding to different colors. See color vision.

(26) LIGHT AND CLEANING THE LIVING ROOM.
All the objects (819) and surfaces in the living room are dusty, gray common dust as though this were the den of a giant molting mouse. Suddenly quantities of waves or particles of very strong sunlight speed in through the window, and everything incandesces, multiple rainbows. Poised in what has become a solid cube of light, like an ancient insect trapped in amber, Sarah Boyle realizes that the dust is indeed the most beautiful stuff in the room, a manna for the eyes. Duchamp, that father of thought, has set with fixative some dust which fell on one of his sculptures, counting it as part of the work. "That way madness lies, says Sarah," says Sarah. The thought of ordering a household on Dada principles balloons again. All the rooms would fill up with objects, newspapers and magazines would compost, the potatoes in the rack, the canned green beans in the garbage pale would take new heart and come to life again, reaching out green shoots towards the sun. The plants would grow wild and wind into a jungle around the house, splitting plaster, tearing shingles, the garden would enter in at the door. The goldfish would die, the birds would die, we' d have them stuffed; the dog would die from lack of care, and probably the children—all stuffed and sitting around the house, covered with dust.

(27) INSERT FOUR. DADA.
DADA (Fr., hobby-horse) was a nihilistic precursor of Surrealism, invented in Zurich during World War I, a product of hysteria and shock lasting from about 1915 to 1922. It was deliberately anti-art and anti-sense, intended to outrage and scandalize and its most characteristic production was the reproduction of the Mona Lisa decorated with a moustache and the obscene caption LHOOQ (read: elle a chaud au cul) "by" Duchamp. Other manifestations included Arp's collages of coloured paper cut out at random and shuffled, ready-made objects such as the bottle drier and the bicycle wheel "signed" by Duchamp, Picabia's drawings of bits of machinery with incongruous titles, incoherent poetry, a lecture given by 38 lecturers in unison, and an exhibition in Cologne in 1920, held in an annex to a café lavatory, at which a chopper was provided for spectators to smash the exhibits with—which they did.

(28) TIME-PIECES AND OTHER MEASURING DEVICES.
In the Boyle house there are four clocks; three watches (one a Mickey Mouse watch which does not work); two calendars and two engagement books; three rulers, a yardstick; a measuring cup; a set of red plastic measuring spoons which includes a tablespoon, a teaspoon, a one-half teaspoon, one-fourth teaspoon and one-eighth teaspoon; an egg timer; an oral thermometer and a rectal thermometer; a Boy Scout compass; a barometer in the shape of a house, in and out of which an old woman and an old man chase each other forever without fulfillment; a bathroom scale; an infant scale; a tape measure which can be pulled out of a stuffed felt strawberry; a wall on which the children's heights are marked; a metronome.

(29) Sarah Boyle finds a new line in her face after lunch while cleaning the bathroom. It is as yet barely visible, running from the midpoint of her forehead to the bridge of her nose. By inward curling of her eyebrows she can etch it clearly as it will come to appear in the future. She marks another mark on the wall where she has drawn out a scoring area. Face Lines and Other Intimations of Mortality, the heading says. There are thirty-two marks, counting this latest one.

(30) Sarah Boyle is a vivacious and witty young wife and mother, educated at a fine Eastern college, proud of her growing family which keeps her happy and busy around the house, involved in many hobbies and community activities, and only occasionally given to obsessions concerning Time/Entropy/Chaos and Death.

(31) Sarah Boyle is never quite sure how many children she has.

(32) Sarah thinks from time to time; Sarah is occasionally visited with this thought; at times this thought comes upon Sarah, that there are things to be hoped for, accomplishments to be desired beyond the mere reproductions, mirror reproduction of one's kind. The babies. Lying in bed at night sometimes the memory of the act of birth, always the hue and texture of red plush theatre seats, washes up; the rending which always, at a certain intensity of pain, slipped into

landscapes, the sweet breath of the sweating nurse. The wooden Russian doll has bright, perfectly round red spots on her cheeks, she splits in the center to reveal a doll smaller but in all other respects identical with round bright red spots on her cheeks, etc.

(33) How fortunate for the species, Sarah muses or is mused, that children are as ingratiating as we know them. Otherwise they would soon be salted off for the leeches they are, and the race would extinguish itself in a fair sweet flowering, the last generations' massive achievement in the arts and pursuits of high civilization. The finest women would have their tubes tied off at the age of twelve, or perhaps refrain altogether from the Act of Love? All interests would be bent to a refining and perfecting of each febrile sense, each fluid hour, with no more cowardly investment in immortality via the patchy and too often disappointing vegetables of one's own womb.

(34) INSERT FIVE. LOVE.
LOVE: a typical sentiment involving fondness for, or attachment to, an object, the idea of which is emotionally colored whenever it arises in the mind, and capable, as Shand has pointed out, of evoking any one of a whole gamut of primary emotions, according to the situation in which the object is placed, or represented; often, and by psychoanalysts always, used in the sense of sex-love or even lust (q.v.)

(35) Sarah Boyle has at times felt a unity with her body, at other times a complete separation. The mind/body duality considered. The time/space duality considered. The male/female duality considered. The matter/energy duality considered. Sometimes, at extremes, her Body seems to her an animal on a leash, taken for walks in the park by her Mind. The lamp posts of experience. Her arms are lightly freckled and when she gets very tired the places under her eyes become violet.

(36) Housework is never completed, the chaos always lurks ready to encroach on any area left unweeded, a jungle filled with dirty pans and the roaring giant stuffed toy animals suddenly turned savage. Terrible glass eyes.

(37) SHOPPING FOR THE BIRTHDAY CAKE.
Shopping in the supermarket with the baby in front of the cart and a larger child holding on. The light from the ice-cube-tray-shaped fluorescent lights is mixed blue and pink and brighter, colder, and cheaper than daylight. The doors swing open just as you reach out your hand for them, Tantalus, moving with a ghastly quiet swing. Hot dogs for the party. Potato chips, gum drops, a paper tablecloth with birthday designs, hot dog buns, catsup, mustard, picalilli, balloons, instant coffee Continental style, dog food, frozen peas, ice cream, frozen lima beans, frozen broccoli in butter sauce, paper birthday hats, paper napkins in three colors, a box of Sugar Frosted Flakes with a Wolfgang Amadeus Mozart mask on the back, bread, pizza mix. The notes of a just-graspable music filter through the giant store, for the most part by-passing the brain and acting directly on the liver, blood and lymph. The air is delicately scented with aluminum. Half and half cream, tea bags, bacon, sandwich meat, strawberry jam. Sarah is in front of the shelves of cleaning products now, and the baby is beginning to whine. Around her are whole libraries of objects, offering themselves. Some of that same old hysteria that had incarnadined her hair rises up again, and she does not refuse it. There is one moment when she can choose direction, like standing on a chalk-drawn X, a hot cross bun, and she does not choose calm and measure. Sarah Boyle begins to pick out, methodically, deliberately and with a careful ecstasy, one of every cleaning product which the store sells. Window Cleaner, Glass Cleaner, Brass Polish, Silver Polish, Steel Wool, eighteen different brands of Detergent, Disinfectant, Toilet Cleanser, Water Softener, Fabric Softener, Drain Cleanser, Spot Remover, Floor Wax, Furniture Wax, Car Wax, Carpet Shampoo, Dog Shampoo, Shampoo for people with dry, oily and normal hair, for people with dandruff, for people with grey hair. Tooth Paste, Tooth Powder, Denture Cleaner, Deodorants, Antiperspirants, Antiseptics, Soaps, Cleansers, Abrasives, Oven Cleansers, Makeup Removers. When the same products appear in different sizes Sarah takes one of each size. For some products she accumulates whole little families of containers: a giant Father bottle of shampoo, a Mother bottle, an Older Sister bottle just smaller than the Mother bottle, and a very tiny Baby Brother bottle. Sarah fills three shopping carts and has to have help wheeling them all down the aisles. At the checkout counter her laughter and hysteria keep threatening to overflow as the pale blonde clerk with no eyebrows like the Mona Lisa pretends normality and disinterest. The bill comes to $57.53 and Sarah has to write a check. Driving home, the baby strapped in the drive-a-cot and the paper bags bulging in the back seat, she cries.

(38) BEFORE THE PARTY.
Mrs. David Boyle, mother-in-law of Sarah Boyle, is coming to the party of her grandchild. She brings a toy, a yellow

wooden duck on a string, made in Austria: the duck quacks as it is pulled along the floor. Sarah is filling paper cups with gum drops and chocolates, and Mrs. David Boyle sits at the kitchen table and talks to her. She is talking about several things, she is talking about her garden which is flourishing except for a plague of rare black beetles, thought to have come from Hong Kong, which are undermining some of the most delicate growths at the roots, and feasting on the leaves of other plants. She is talking about a sale of household linens which she plans to attend on the following Tuesday. She is talking about her neighbor who has cancer and is wasting away. The neighbor is a Catholic woman who had never had a day's illness in her life until the cancer struck, and now she is, apparently, failing with dizzying speed. The doctor says her body's chaos, chaos, cells running wild all over, says Mrs. David Boyle. When I visited her she hardly knew me, can hardly speak, can' t keep herself clean, says Mrs. David Boyle.

(39) Sometimes Sarah can hardly remember how many cute chubby little children she has.

(40) When she used to stand out in center field far away from the other players, she used to make up songs and sing them to herself.

(41) She thinks of the end of the world by ice.

(42) She thinks of the end of the world by water.

(43) She thinks of the end of the world by nuclear war.

(44) There must be more than this, Sarah Boyle thinks, from time to time. What could one do to justify one's passage? Or less ambitiously, to change, even in the motion of the smallest mote, the course and circulation of the world? Sometimes Sarah's dreams are of heroic girth, a new symphony using laboratories of machinery and all invented instruments, at once giant in scope and intelligible to all, to heal the bloody breach; a series of paintings which would transfigure and astonish and calm the frenzied art world in its panting race; a new novel that would refurbish language. Sometimes she considers the mystical, the streaky and random, and it seems that one change, no matter how small, would be enough. Turtles are supposed to live for many years. To carve a name, date and perhaps a word of hope upon a turtle's shell, then set him free to wend the world, surely this one act might cancel out absurdity?

(45) Mrs. David Boyle has a faint moustache, like Duchamp's Mona Lisa.

(46) THE BIRTHDAY PARTY.
Many children dressed in pastels, sit around the long table. They are exhausted and overexcited from games fiercely played, some are flushed and wet, others unnaturally pale. This general agitation, and the paper party hats they wear, combine to make them appear a dinner party of debauched midgets. It is time for the cake. A huge chocolate cake in the shape of a rocket and launching pad and covered with blue and pink icing is carried in. In the hush the birthday child begins to cry. He stops crying, makes a wish and blows out the candles.

(47) One child will not eat hot dogs, ice cream or cake, and asks for cereal. Sarah pours him out a bowl of Sugar Frosted Flakes, and a moment later he chokes. Sarah pounds him on the back, and out spits a tiny green plastic snake with red glassy eyes, the Surprise Gift. All the children want it.

(48) AFTER THE PARTY THE CHILDREN ARE PUT TO BED.
Bath time. Observing the nakedness of children, pink and slippery as seals, squealing as seals, now the splashing, grunting and smacking of cherry flesh on raspberry flesh reverberate in the pearl tiled steamy cubicle. The nakedness of children is so much more absolute than that of the mature. No musky curling hair to indicate the target points, no knobbly clutch of plane and fat and curvature to ennoble this prince of beasts. All well-fed naked children appear edible, Sarah's teeth hum in her head with memory of bloody feastings, prehistory. Young humans appear too like the young of other species for smugness, and the comparison is not even in their favor, they are much the most peeled and unsupple of those young. Such pinkness, such utter nuded pinkness; the orifices neatly incised, rimmed with a slightly deeper rose, the incessant demands for breast, time, milks of many sorts.

(49) INSERT SIX. WEINER ON ENTROPY.

In Gibb's Universe order is least probable, chaos most probable. But while the Universe as a whole, if indeed there is a whole Universe, tends to run down, there are local enclaves whose direction seems opposed to that of the Universe at large and in which there is a limited and temporary tendency for organization to increase. Life finds its home in some of these enclaves.

(50) Sarah Boyle imagines, in her mind's eye, cleaning, and ordering the great world, even the Universe. Filling the great spaces of Space with a marvellous sweet smelling, deep cleansing foam. Deodorizing rank caves and volcanoes. Scrubbing rocks.

(51) INSERT SEVEN. TURTLES.
Many different species of carnivorous Turtles live in the fresh waters of the tropical and temperate zones of various continents. Most northerly of the European Turtles (extending as far as Holland and Lithuania) is the European Pond Turtle (Emys orbicularis). It is from eight to ten inches long and may live a hundred years.

(52) CLEANING UP AFTER THE PARTY.
Sarah is cleaning up after the party. Gum drops and melted ice cream surge off paper plates, making holes in the paper tablecloth through the printed roses. A fly has died a splendid death in a pool of strawberry ice cream. Wet jelly beans stain all they touch, finally becoming themselves colorless, opaque white flocks of tames or sleeping maggots. Plastic favors mount half-eaten pieces of blue cake. Strewn about are thin strips of fortune papers from the Japanese poppers. Upon them are printed strangely assorted phrases selected by apparently unilingual Japanese. Crowds of delicate yellow people spending great chunks of their lives in producing these most ephemeral of objects, and inscribing thousands of fine papers with absurd and incomprehensible messages. "The very hairs of your head are all numbered," reads one. Most of the balloons have popped. Someone has planted a hot dog in the daffodil pot. A few of the helium balloons have escaped their owners and now ride the ceiling. Another fortune paper reads, "Emperor's horses meet death worse, numbers, numbers."

(53) She is very tired, violet under the eyes, mauve beneath the eyes. Her uncle in Ohio used to get the same marks under his eyes. She goes to the kitchen to lay the table for tomorrow's breakfast, then she sees that in the turtle's bowl the turtle is floating, still, on the surface of the water. Sarah Boyle pokes at it with a pencil but it does not move. She stands for several minutes looking at the dead turtle on the surface of the water. She is crying again.

(54) She begins to cry. She goes to the refrigerator and takes out a carton of eggs, white eggs, extra large. She throws them one by one onto the kitchen floor which is patterned with strawberries in squares. They break beautifully. There is a Secret Society of Dentists, all moustached, with Special Code and Magic Rings. She begins to cry. She takes up three bunny dishes and throws them against the refrigerator; they shatter, and then the floor is covered with shards, chunks of partial bunnies, an ear, an eye here, a paw; Stockton, California, Acton, California, Chico, California, Redding, California Glen Ellen, California, Cadix, California, Angels Camp, California, Half Moon Bay. The total ENTROPY of the Universe therefore is increasing, tending towards a maximum, corresponding to complete disorder of the particles in it. She is crying, her mouth is open. She throws a jar of grape jelly and it smashes the window over the sink. It has been held that the Universe constitutes a thermodynamically closed system, and if this were true it would mean that a time must finally come when the Universe "unwinds" itself, no energy being available for use. This state is referred to as the "Heat Death of the Universe." Sarah Boyle begins to cry. She throws a jar of strawberry jam against the stove, enamel chips off and the stove begins to bleed. Bach had twenty children, how many children has Sarah Boyle? Her mouth is open. Her mouth is opening. She turns on the water and fills the sink with detergent. She writes on the kitchen wall, "William Shakespeare has Cancer and lives in California." She writes, "Sugar Frosted Flakes are the Food of the Gods." The water foams up in the sink, overflowing, bubbling onto the strawberry floor. She is about to begin to cry. Her mouth is opening. She is crying. She cries. How can one ever tell whether there are one or many fish? She begins to break glasses and dishes, she throws cups and cooking pots and jars of food, which shatter and break, and spread over the kitchen. The sand keeps falling, very quietly, in the egg timer. The old man and woman in the barometer never catch each other. She picks up eggs and throws them into the air. She begins to cry. She opens her mouth. The eggs arch slowly through the kitchen, like a baseball, hit high against the spring sky, seen from far away. They go higher and higher in the stillness, hesitate at the zenith, then begin to fall away slowly, slowly, through the fine clear air.

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1. Zoline, Pamela. (1967). "The Heat Death of the Universe", New Worlds.
2. Zoline, Pamela. (1988). *The Heat Death of the Universe and Other Short Stories*. McPherson.

θΔics

In human chemistry, **The Human Element**, symbol Hu, is a popular 2006-2009 Dow Chemical advertising campaign depicting the human as the “missing element” of the periodic table, and was developed in by the advertising agency Draftfcb Chicago, conceived particularly by creative director John Claxton, according to which images of people with the element symbol box, symbol Hu, and atomic number 10E+9, were displayed in magazines and commercials over the course of several years.

One of the Dow Chemical "The Human Element" Videos.

Overview

Dow Chemical Company was founded in 1897 by Canadian-born chemist Herbert Dow, and is the second-largest chemical manufacturer in the world. In 2006, Dow hired advertising agency Draftfcb Chicago to rebrand its image with a corporate focus on working together to improve the human condition, the resulting campaign was called “The Human Element”, depicting people as a “human element” analogous to an element on the periodic table. The campaign won the 2008 Effie Award. [8]

In circa 2006, a newly established Dow CEO, Andrew Liveris was interested in making a new philosophical mantra for the company—to make Dow the most respected chemical company in the world—and was anxious to make it a reality. In this direction, Liveris turned to Draftfcb Chicago. Draftfcp creative director John Claxton, whose hobbies are reading science essays and studying human behavior, then got the ball rolling at the first creative meeting. In Claxton’s own words:

> “One of the first steps was a creative meeting at our agency during the “pitch process.” I walked into the meeting with a new element for the periodic table. . . not carbon, hydrogen or oxygen, but the Human Element. That pretty much put everything in motion. Including the Human Element on the Periodic Table of the Elements changed the way Dow looked at the world and the way the world looked at Dow. Every creative decision we made from that point on was filtered through the lens of the Human Element, and that’s what took us down a very non-science approach to science advertising.”

The following seems to a sketch of this idea: (Ñº)

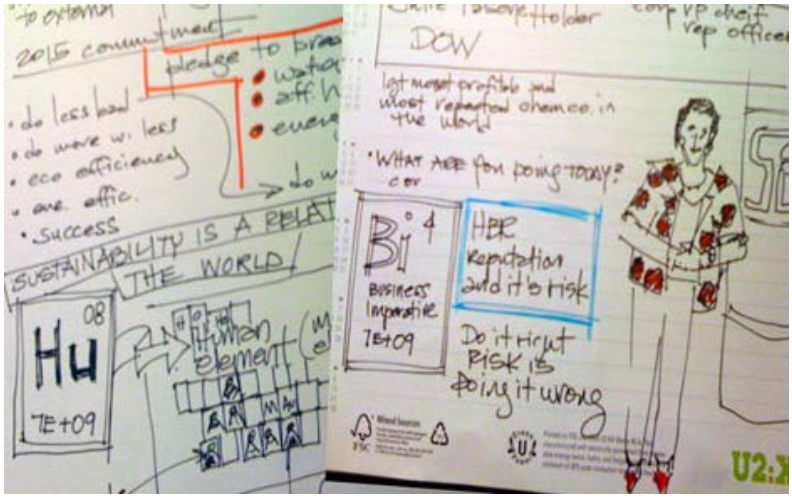

The “voice” of the campaign, was themed on three things: science essays, the writing of American biologist Edward Wilson, and contemporary American poetry. The campaign was very moving for many: “we were completely surprised by the passionate response from people at all levels of society. From teachers to politicians to parents, people were so moved that they felt compelled to write to the company and express their feelings. The campaign struck a nerve in a way that we had never imagined”, says Claxton.

Examples

The following are example depictions the Hu element concept found in magazines, aprons, and T-shirts:

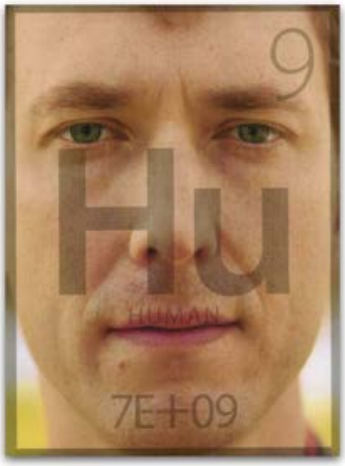

References

1. Grbic, Jovana J. (2009). "Selling Science Smartly: Dow Human Element Campaign (Interview with advertising mastermind John Claxton)", Feb 18. ScriptPhD.com.
2. Human element (29+ designs) – CafePress.com.

External links

â— Dow Chemical Launches "The Human Element" Campaign, Midland Mi, June 20, 2006.
â— DOW - Human Element (video clips page). Dow.com.

θΔics

In famous publications, ***The Human Molecule*** is a 120-page, 2008 book by American chemical engineer Libb Thims. It is the first-ever book published with specific focus on the subject of the "human molecule", the atomic-definition of a person; a term coined in 1869 by French historian Hippolyte Taine (correction: Jean Sales, 1789). [1]

The first review of *The Human Molecule is* scheduled to be published in a late Summer issue of *The Chemical Engineer*. [2]

Of note, the 2010 Lulu edition of American writer John Hodgson's 2002 book *Little Fun Book of Molecules Humans*, was retitled as *molecules humans*, printed with a newly-designed cover art taking its cues from Thims' use of Italian polymath Leonardo da Vinci's *The Human Molecules*. [3]

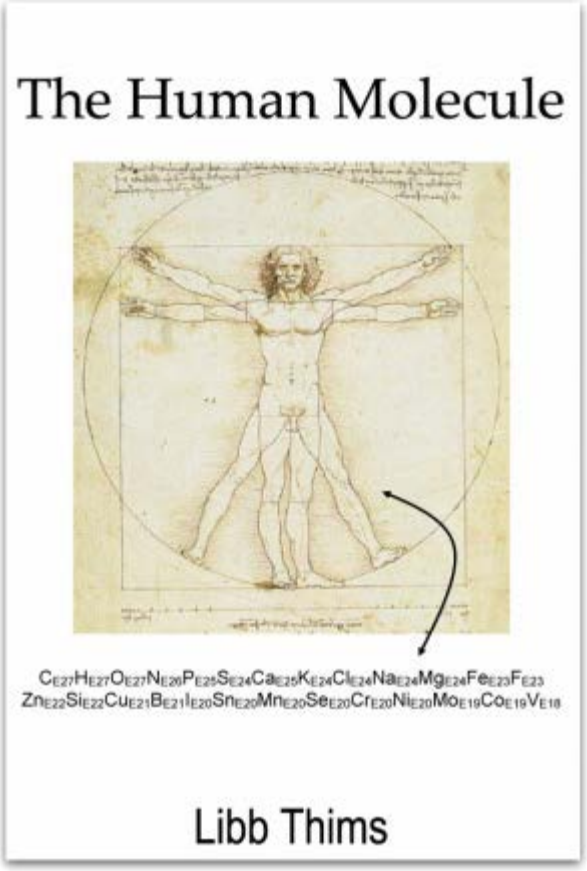

American electrochemical engineer Libb Thims' 2008 booklet *The Human Molecule*, a history on the theory of a person defined or conceptualized as a molecule or atomic aggregate.

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1. (a) Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc). LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (ch. 2: "The Human Molecule", pgs. 15-35). Morrisville, NC: LuLu.
2. Staff Author. (2008). “Book Review: *The Human Molecule”*, *The Chemical Engineer* (Aug-Sept).
3. (a) Hodgson, John. (2002). *Little Fun Book of Molecules/Humans*. 1st Books.
(b) Hodgson, John. (2010). *molecules humans*. Lulu.com.
4. Vitruvian man – Wikipedia.

External links

â— Press Release: “What is a Human Being?” - Newly Released Book by the *Institute of Human Thermodynamics*, *The Human Molecule* (2008), Answers the Question. PR.com.
â— The Human Molecule – Academia.edu.

θΔics

In films, **The Laws of Thermodynamics (film)**, or "*Las leyes de la termodinámica*", is a 2018 Spanish-language, English subtitled, film by Mateo Gil, set in Barcelona, wherein the narrator attempts to explain human romantic relationships in terms of chemistry, e.g. atoms, physics, e.g. electromagnetic force fields, space-time continuum, and thermodynamics, e.g. entropy and energy, via diagrams and replays, with references to C.P. Snow, e.g. two cultures, and Ernest Rutherford.

A visual of the two main characters: Manel (Vito Sanz), an astrophysics graduate student, and Elena (Berta Vazquez), a model turned actress, who engage in an "opposites attract" type relationship, of Mateo Gil's 2018 hmolscience themed film ***The Laws of Thermodynamics***.

Overview

In Mar 2018, the film debuted at the Miami Film Festival.

On 10 Aug 2018, the film is slated to stream on Netflix.

The film, as of 23 Oct 2018, received (Q) a 43% on the tomatometer, with 11 reviews, some characterizing it as a Spanish version of Big Bang theory.

Other

The film indirectly cites Hmolpedia's founders of thermodynamics and suicide article, when the professor warns his graduate student, at least twice, about how there have been many thermodynamics founders and entire families and children of founders, e.g. Fritz Haber, who have committed suicide.

Quotes

The following are related quotes:

> "Gil stages copious romantic-comedy tropeswith added commentary, diagrams and action replays to prove that what we think of as human behavioral cliché is in fact dictated by physical relations between different forms of energy."
>
> — Guy Lodge (2018), "Miami Film Review: 'The Laws of Thermodynamics'", Mar 18 [1]

See also

- Afinidades
- Elective Affinities (films)
- Ninotchka
- It's a Chemical Reaction, That's All
- Matrix (causality scene)

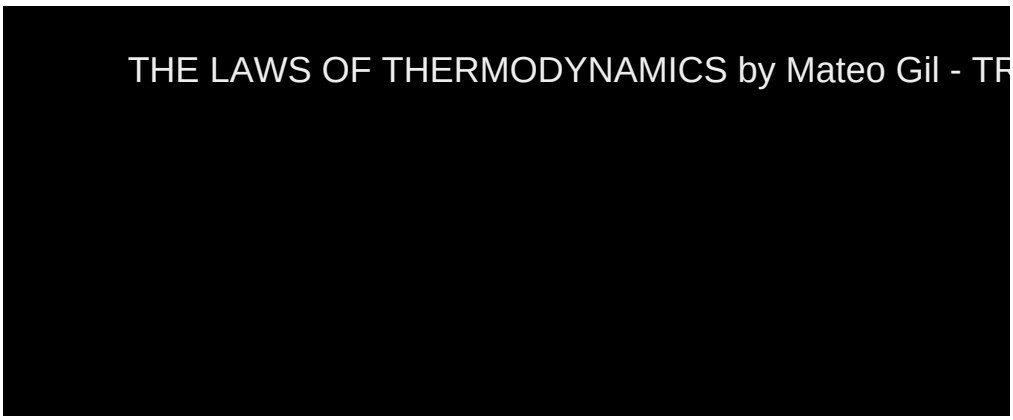

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1. Lodge, Guy. (2018). "Miami Film Review: 'The Laws of Thermodynamics', Mateo Gil's return

to Spanish-language cinema is fizzing, restless, wholly singular fusion of physics lecture and romcom" (Q), Variety.com, Mar 18.

A Jan 2018 film preview of **The Laws of Thermodynamics**, which debuted at the Miami Film Festival (Mar 2018).

Videos

● Thims, Libb. (2018). "Gil's 2018 Thermodynamics and Physics of Relationships | Review" (Q), HumanChemistry101, Mar 13.

θΔics

In poetry, **"The Mathematician in Love"** is a *circa* 1845 posthumously-published (1874) eight stanza, five line poem, or song, depending, by Scottish mathematical physicist and engineer William Rankine (1820-1872) — sometimes referred to as the Rankine love poem — in which one of the earliest known equations of love, or "marvelous mathematical formula", as American physical historian Morris Zucker describe things, is found, and in which, incredibly, he discusses, in his poetic humor view, the hypothesis that love is type of thermodynamic potential, a very honed discernment, particularly coming from the 1853 coiner of the term "potential energy".

Let x denote beauty, y manners well-bred,
z fortune (this last is essential),
Let L stand for love—our philosopher said—
Then L is a function of x, y and z
Of the kind that is known as potential.

Now integrate L with respect to dt
(t standing for time and persuasion)
Then, between proper limits, 'tis easy to see
The definite integral Marriage must be
(A very concise demonstration).*

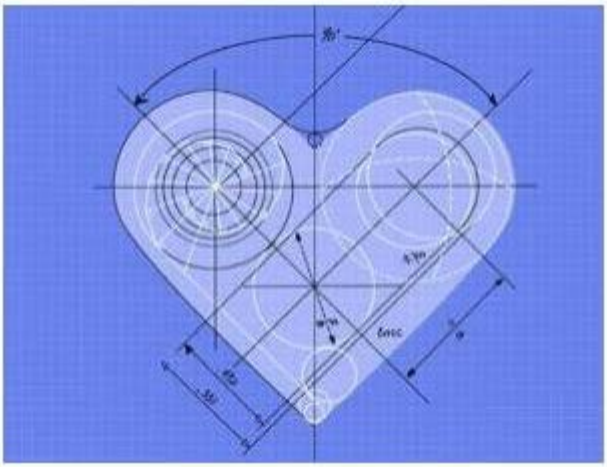

There once was a man who loved math, who thought he was Sylvia Plath...

Left: key section of Scottish engineer William Rankine's 1874 poem **"The Mathematician in Love"**, cited by Arthur Eddington in his 1938 *The Philosophy of Science* lecture, as an example of how, supposedly, it is "easy to introduce mathematical notation", but difficult to "turn it into useful account". [2] **Right:** an image (Ñº) from a 2011 "Rhyme and Reason" *New Scientist* article, citing Rankine's love poem.

Date

The following is the abstract of the collected "songs" of Rankine, from the 1874 posthumously-published collected works set, of which "The Mathematician in Love" is listed first: [1]

> "Those who enjoyed the personal intimacy of the late Professor Rankine—and the circle was not a narrow one—will, it is thought, be glad to have the means of recalling some of the songs which they can no longer hear from him, though his voice and manner lent a charm which the printed page cannot restore. Those who knew him from his graver works only, may be surprised, but it is hoped will not be disappointed, to find that a genius for philosophic research, which made his name known throughout the whole scientific world—and the labors of a life devoted chiefly to directing others, from the chair, and by the press, how to follow his steps—were not incompatible with the playful, genial spirit which brightens the following pages. The first of the Songs may be taken as the meeting point of science and humor:—the last possesses a melancholy interest, from having been written very shortly before his death, when failing health and eyesight seem to have revived a longing for the scenery and simple pleasures of his childhood."

It would seem, therefore, approximately correct to estimate the writing of this poetry song to *circa* 1845 (age 25±), or somewhere between age 16 to 28, specifically from the year 1836, when Rankine (age 16) began to study a spectrum of scientific topics at the University of Edinburgh, including natural history under Robert Jameson and natural philosophy under James Forbes, to 1842 (age 22), when he attempted to reduce the phenomena of heat to a mathematical form but he was frustrated by his lack of experimental data, to age 1848 (age 28), when he switched careers to study mathematical physics, thermodynamics, and applied mechanics, the year after which (1849) he was elected to the *Royal Society of Edinburgh.* This is an estimate in line with the ages at which other human chemical thermodynamics pioneers penned their thermodynamics of love theories (Christopher Hirata, age 18-20; David Hwang, age 22; Libb Thims, age 24; Surya Pati, age 26).

Poem

The following is Rankine's "The Mathematician in Love" poem, from his 1874 *Songs and Fables*, listed in his table of contents as the first song or "clever little ditty" as Morris Zucker refers to it:

I.	A MATHEMATICIAN fell madly in love With a lady, young, handsome, and charming: By angles and ratios harmonic he strove Her curves and proportions all faultless to prove. As he scrawled hieroglyphics alarming.	|→ golden ratio |→ waist-to-hip ratio |→ Rosetta stone
II.	He measured with care, from the ends of a base, The arcs which her features subtended: Then he framed transcendental equations, to trace The flowing outlines of her figure and face, And thought the result very splendid.	|→ symmetry, averageness
III.	He studied (since music has charms for the fair) The theory of fiddles and whistles, — Then composed, by acoustic equations, an air, Which, when 'twas performed, made the lady's long hair Stand on end, like a porcupine's bristles.	
IV.	The lady loved dancing: — he therefore applied, To the polka and waltz, an equation; But when to rotate on his axis he tried, His center of gravity swayed to one side, And he fell, by the earth's gravitation.	|→ Paul Dirac (on the puzzle of dancing)
V.	No doubts of the fate of his suit made him pause, For he proved, to his own satisfaction, That the fair one returned his affection; — "because, "As every one knows, by mechanical laws,	|→ third law of motion (laws of motion)

	"Re-action is equal to action."	
VI.	"Let *x* denote beauty, — *y*, manners well-bred, — "*z*, fortune, — (this last is essential), — "Let *L* stand for love" — our philosopher said, — "Then *L* is a function of *x*, y, and *z*, "Of the kind which is known as potential."	|→ potential energy, thermodynamic potential, human free energy
VII.	"Now integrate *L* with respect to *dt*, "(*t* standing for time and persuasion); "Then, between proper limits, 'tis easy to see, "The definite integral *Marriage* must be: — "(A very concise demonstration)."	
VIII	Said he — "If the wandering course of the moon "By algebra can be predicted, "The female affections must yield to it soon" — — But the lady ran off with a dashing dragoon, And left him amazed and afflicted.	

The equation for stanza six, according to Rankine, is the following:

$$L = \phi(x, y, z) = \iiint \frac{f(x, y, z)}{\sqrt{(\xi - x)^2 + (\eta - y)^2 + (\zeta - z)^2}} \, d\xi \, d\eta \, d\zeta.$$

The equation for stanza seven, according to Rankine, is the following:

$$\int_{-\infty}^{+\infty} L \, dt = \mathbf{M}$$

(add discussion)

Eddington

In 1938, English astronomer Arthur Eddington, in his "The Philosophy of Physical Science", Tarner Lecture series, delivered Easter term at Trinity College, Cambridge, being a general discussion of principles of philosophical thought associated with advances in physical science, developing the ideas contained in earlier titles such as *The Nature of the*

Physical World (1928) in line with discoveries in quantum mechanics and group theory, in his discussion of how it is easy to introduce mathematical notation, to explain something, but difficult to turn the notation into useful account, cites the cites the following poem segment: [2]

> Let x denote beauty, y manners well-bred,
> z fortune (this last is essential),
> Let L stand for love—our philosopher said—
> Then L is a function of x, y and z
> Of the kind that is known as potential.
>
> Now integrate L with respect to dt
> (t standing for time and persuasion)
> Then, between proper limits, 'tis easy to see
> The definite integral Marriage must be
> (A very concise demonstration).*

On this poem segment, Eddington seems dismissive, as though this were a trivial, meaningless, or void poetry diddy:

> "At the start there is no essential difference between this example of mathematical notation, and the *A*, *B*, *C*, …, *P*, *Q*, *R*, …, *X*, *Y*, *Z*, …, that we have been discussing. We must find what it is that turns the latter into powerful calculus for scientific purposes, whereas the former has no practical outcome—as the poem goes onto related."

Here, in this "no practical outcome" conclusion, we are reminded of Japanese chemical engineer Tominaga Keii's 2004 chemical thermodynamics of reactions chapter section Chemical Affinity in 1806 wherein he, like Eddington, dismisses Goethe's physical chemistry based *Elective Affinities*, as having not added "any scientific knowledge". Both are examples of two cultures blindness (see: forest blind).

Zucker

In 1945, American physical historian Morris Zucker, in his *Causality or Indeterminacy in History* chapter, subsection: "Probability Statistics Applied to Social Phenoomena", citing Eddington, quotes stanza six, and, like Eddington, seems to at the same time glorify and deride the premise of the poem, namely that love or the passions running society can be formulated and hence thereby predicted: [3]

> "This, of course, solves all ticklish problems, past, present and for the future, and all novelists, dramatists and Hollywood scenarists might as well begin right now to fold up their scenarios. However, candor compels the admission that this marvelous mathematical formula was put forth in 1874, but somehow has failed to catch on in spite of the long head start. Whatever success mathematics has achieved in physics, the application of its rigid formulae to the analysis of social phenomena **must fail**, not only because social phenomena is not susceptible of such formulation, but because its laws can seldom be stated in mathematical language. Neither, for that matter, can that be done about the internal state of the simplest atom. But that does not prevent the physicist and the chemist form making predictions with absolute certainty in their respective fields, and the degree of that certainty is the measure of the successful organization of a particular inquiry."

All of this is very odd indeed, being that Zucker seems to devote nearly the entirety of volume one, of this two-volume *A Field Theory of History*, the previous 578-pages up to this poem love formula citation in fact, to a pronged effort to prove and or substantiate that the "laws of social motion" and or "laws of economic motion", a Karl Marx phrase he employs repetitively, can be formulated; but then, above, negating all of his previous argument, states his seemingly hidden views explicitly, namely that "social phenomena is not susceptible to such formulation", and shockingly that the

application of the rigid formula of physics to social phenomena “must fail”?

These concluding remarks are very strange indeed, particularly coming from someone who has put so much effort into collecting and discussing all of the various “physical historian” points of view, and for someone who is attempting to formulate some type of Maxwell-Einstein like “field theory of history”? The only supposition offered here, with Zucker’s passing seemingly innocuous mentions of God, his Heisenberg uncertainty principle discussions, etc., is that he is some type of closet ontic opening theorist, i.e. attempting to formulate a "scientific" version of history, yet at the same retaining belief in free will, and hence some type of hidden agenda soul weight afterlife theory, or something along these lines.

Haynes

In 1994, Australian science and literature scholar Roslynn Haynes, in her *From Faust to Strangelove*, comments the following incorrect take on the poem: [6]

> “In such accounts, mathematicians feature prominently as exemplars of the dehumanization process. This is comically expressed in W.J.M Rankine’s poem ‘The Mathematician in Love’ (1874). The mathematician is mocked for his inability to related emotionally to the young lady, and his obsession with formulas is duly punished in the living world, where emotions rather than abstractions are the accepted currency.”

Here, Roslynn, not being a mathematician herself—her degrees being in biochemistry (BS) and literature (BA and MA)—falters in her take on Rankine’s poem.

Firstly, she thinks Rankine is mocking himself? This is incorrect. Correctly, Rankine wants to understand the process of falling in love as Newton understood the process of a body falling to the earth, via the force of gravity; and he wants to do so formulaically, i.e. with precision—but he cannot quite see the clear picture, hence he must take recourse to rhyme and poetry, which, according to Goethe, is a tool that helps one to work out frustration and or confusion in thought. Yet, he is prescient: one day the wandering course of male and female affections “must yield soon” to prediction, as has been shown in celestial mechanics.

Secondly, her jibe about how his “obsession with formulas” results in him being “duly punished” in the “living world”, as compared, supposedly, to the abstract world of mathematical physics, where “emotions” are the accepted currency, is off—Goethe explained the currency of emotions correctly in terms reaction of affinities (see: Goethe timeline, 1799) and at the abstractions of Cullen reaction diagrams; Rankine was but expanding and elaborating in this direction is precursory human chemical thermodynamics logic.

Thirdly, her idea that "mathematicians feature prominently as exemplars of the dehumanization process", this in the Rankine love poem example, is not the case. In fact, it is the exact opposite: Rankine above is working out the details of the "rehumanization process", namely that when belief systems behind the explanation human ideals begins to falter in logic, the passions begin to suffer, owing to misdirection, and thereby only through rehumanization process (clearly direction) can the passions again "come alive", so to say, in defunct terminology, in the source of social progress.

Lancashire

In 2003, Canadian poem collector Ian Lancashire, an English professor at the University of Toronto, posted the Rankine poem online, with a few analysis points or notes, labeled in a Stanza/Line citation method: [4]

> S1:L3 – ratios harmonic: harmonic proportion, the relation of three quantities whose reciprocals (inverse relations) are in arithmetical progression.
> S2:L7 – subtended: stretched underneath or opposite to.
> S2:L8 – transcendental equations: ones resulting only in an infinite series.
> S6:L30 – potential: something can be calculated; more amply defined as "a mathematical function or quantity by the differentiation of which the force at any point in space arising from any system of bodies,

> etc., can be expressed. In the case in which the system consists of separate masses, electrical charges, etc., this quantity is equal to the sum of these, each divided by its distance from the point" (OED "potential" 5). S7:L31 – integrate: finding a definite integral (cf. line 34) i.e., the numeric difference between the values of a function's indefinite integral for two values of the independent variable.

(add discussion)

Copan

In 2005, American religion apologist Paul Copan, in his *How Do You Know You're Not Wrong?: Responding to Objections that Leave Christians Speechless*, referred to the Rankine love poem, naturally enough, as follows: [5]

> "Rankine's **'The Mathematician in Love'** reveals the absurdity of reducing all the knowledge to science and mathematical equations. There's more to love than math and science."

This religious belief system based objection, naturally enough, is followed by something about how "just as one scientific discipline can't rule out theism, stacking them all up together can't do so either", followed by citation of Edward Wilson's "consilience" of all things theory.

Mander

On 1 Feb 2013, Peter Mander, in his "Rankine on Entropy, Love and Marriage" (Ñº), blogged on firstly on Rankine's version of the new heat function, a variant of what Clausius would eventually call entropy, and secondly on Rankine's circa 1845 "The Mathematician in Love", about which he commented: "Rankine never found the time to test this theory in practice. He died a bachelor on Christmas Eve 1872, at the age of 52, of overwork."

Hmolpedia | Thims

On 29 Nov 2013, Libb Thims discovered the Rankine love poem. One aspect, about the Rankine love poem, which comes to mind, is that knowing that this page is Hmolpedia article #3,086, started two days following the 29 Nov 2013 discovery of the Rankine poem, via the Zucker 1945 citation, which in turn cited the 1938 Eddington lecture, is the buried underground hiddenness of these types of suppositional arguments, i.e. that love or equivalently the passions can be quantified formulaically as a thermodynamic potential amenable to evolutionary psychology analysis.

In plain speak, it has taken American electrochemical engineer Thims 18-years, since his 1995 seeded reverse engineering puzzle, to dig this poem out of the matrix of buried and archived scientific knowledge; which can be compared to the 2006 discovery of Goethe's *Elective Affinities* via footnote 2.5 of Ilya Prigogine's mention of Mittler the mediator, something which took 11-years to find. The fact that there is such a large disjunct between the two cultures is a mar to the mind of the growing erudition.

Reviews

The following are news paper clipping reviews:

> "Professor Rankine was a man of singularly genial spirit and fine intellect, which hardly found adequate expression, notwithstanding that the social instinct was strong in him. This volume of Songs and Fables will suffice to give a hint of the literary possibilities that were in him. There is ready humor, quaint wit, and rare felicity of expression. They are unlaboured *jeux d'esprit* , but they are finished in their way, and often, in spite of the dash and freedom, show a very delicate point. The Songs are something after the style of *Songs from Maga*, but are distinctly individual in note. **'The Mathematician in Love'** is really excellent. The Fables are what they profess to be, genuine fables — but they are ruffled by a stir of real fun."
>
> — Manchester Examiner (1874), review (Ñº)

> “The Editor of these Songs and Fables, by the eminent Glasgow professor of civil engineering, whom the scientific world still laments, fears that belief in a necessary incompatibility between philosophic research and playful humor will prejudice the public against them ; and if one of the objects of the publication was to show the fallacy of such a notion, it will possibly be carried out. . . . The cleverest and most ingenious song in the book is **‘The Mathematician in Love’**, of which the Editor scarcely speaks too strongly when he calls it the meeting point of science and humor . . . . The Fables are very short, but some of them are extremely amusing, and the clever illustrations by Mrs. Hugh Blackburn considerably increase the attractiveness of the work.”
>
> — Glasgow News (1874), review (Ñº)

Other

The poem has a 6.2 out of 10 rating (12 votes) at PoemHunter.com (Ñº).

See also

â— The World Ways (Friedrich Schiller, 1795) | Freud-Schiller drive theory
â— A Paradoxical Ode (James Maxwell, 1874)
â— Mala Radhakrishnan

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(b) Rankine, William. (1908), “The Mathematician in Love”, *The Michigan Technic*, 19(21):95-96.
(c) Eddington, Arthur. (1938). *The Philosophy of Physical Science* (pg. 138). Cambridge University Press.
(d) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 579). Arnold-Howard Publishing Co.
2. (a) Eddington, Arthur. (1938). *The Philosophy of Physical Science* (pg. 138). Cambridge University Press.
(b) Tarner Lectures – Wikipedia.
3. Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 579). Arnold-Howard Publishing Co.
4. (a) Rankine, William. (1874) “The Mathematician in Love” (analysis: Ian Lancashire), University of Toronto, 2003.
(b) Ian Lancashire (faculty) – University of Toronto.
5. (a) Copan, Paul. (2005). *How Do You Know You’re Not Wrong?: Responding to Objections that Leave Christians Speechless* (pg. 74). Baker Books.
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6. Haynes, Roslynn. (1994). *From Faust to Strangelove: Representations of the Scientist in Western Literature* (pg. 85). John Hopkins University Press.

Further reading

â— Fadiman, Clifton. (1997). *The Mathematical Magpie: being more stories, mainly transcendental, plus subjects of essays, rhymes, music, anecdotes, epigrams, and other prime oddments and diversions, rational and irrational, all derived from the infinite domain of mathematics* (pg. 276-77). Copernicus.
â— Gaither, Carl C. and Cavazos-Gaither, Alma E. (2012). *Gaither’s Dictionary of Scientific Quotations* (pg. 835). Springer.

θΔics

In famous films, ***The Matrix*** is a 1999 philosophically-loaded science fiction action film, oft-cited as "the most philosophical film ever made", written by the American siblings Andy Wachowski and Lana Wachowski—formerly Larry Wachowski (prior to 2012)—which, in conjunction with its sequel, *The Matrix Reloaded* (2003), cover a significant number of hmolscience-centric topics, including: reality, choice, causality (or cause and effect), purpose, (or sense of purpose), power (or humans as batteries), action and reaction, impulse, particularity sexual impulse, neuroscience—mind as but brain electrochemistry—truth vs. ignorance, to name a few, anchored in the overt paradigm views of Jean Baudrillard (1981), on people as simulated hydrocarbon-based cultural molecules (see: human molecule), and Kevin Kelly (1994), on machine philosophy, mixed together with evolutionary psychology stitching, along with the furtive or clandestine philosophies of, supposedly, Socrates (Socratic method), Plato (allegory of the cave), Rene Descartes (add), George Berkeley (on reality), Friedrich Nietzsche (nihilism and or existentialism), Karl Marx (historical materialism), among, it seems, a long list of alleged others.

A depiction of the 1999 film ***The Matrix***, according to which reality is but a computer program running on the mind, and humans are types of power cells, grown as batteries to run the matrix or computer coded machine world.

Philosophy behind

The subject of the philosophy behind *The Matrix*, is supposedly centered around a modern wake up to reality dialogue on the "big questions", as American philosopher William Irwin reports: [1]

> "The Wachowski brothers, college dropout comic-book artists intrigued by the big questions, readily acknowledge that they have woven many philosophical themes and allusions into the fabric of the film."

The autogenerated search return of "*The Matrix*", per query "philosophy behind", is one of the top four Google search return autogenerates, along with: *The Declaration of Independence* (1776), *Fight Club* (1999), and communism.

In 2004, then Larry Wachowski, in interview with integral philosopher Ken Wilber, remained fairly tight-lipped as to the underlying meanings in the film, for the sake of individual viewer interpretation, whatever that means, a few comments aside: [6]

> "Larry is just about as philosophically/spiritually well read as anyone you're likely to find."

The problem here, is that what exactly Larry read is kept secret. At about 11-min into the interview, Larry comments that he had his father, who's "read a lot" and "more of Marxist" then he is, were half-way into Wilber's 1995 *Sex, Ecology, and Spirituality*, which of course is post-Matrix reading, and was speculating on his relation to Georg Hegel (later mentioned at 24:44-27:40); the name of Friedrich Nietzsche is thrown up; Larry mentions something about some type of Hegel-themed omega point (not Pierre Teilhard themed) and the big bang; comments (13:29) about how Arthur Schopenhauer (also mentioned at 27:45) is "dead on" somewhere in his writing; though, to note, it is not at all clear if this commentary is about Wilber's book or in some way relevant to *The Matrix*? Larry comments (7:00) how when he first met, via talked on the phone for three hours, Wilber, how he felt some type of instant connection, fellowship, or validation to his belief system, or something along these lines. At 26:42, Larry interjects into Wilber's discussion about getting out of the evolutionary spiral mode of thinking and finding the origin, with the following:

> "Right, but the path there is the development of an ever reexpanding path; when you start off, you're going from space matter [or base matter?], atoms, molecules, cells, living organisms, up to the triune brain, and that is a progression, a mental progression, which suggests a value statement there, leading towards this entity, leading towards Hegel … and on to awareness."

(add)

Causality

In 2003, in the famous causality or action and reaction scene, we see some honed logic:

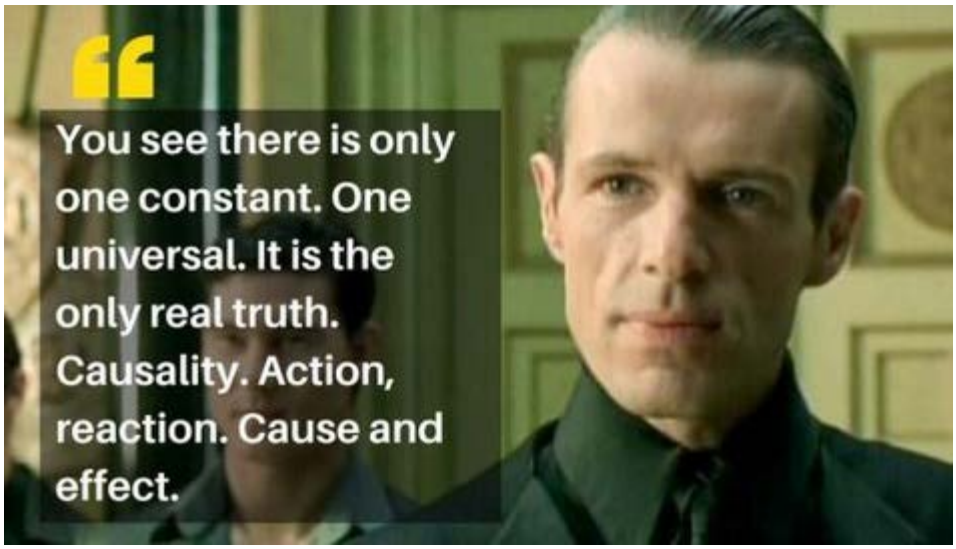

> **Merovingian:** It is the way of all things. **You see, there is only one constant, one universal, it is the only real truth: causality. Action. Reaction. Cause and effect**.
>
> **Morpheus:** Everything begins with choice.
>
> **Merovingian:** No. Wrong. **Choice is an illusion, created between those with power, and those without**. Look there, at that woman. My god, just look at her. Affecting everyone around her, so obvious, so bourgeois, so boring. But wait… Watch – you see, I have sent her dessert, a very special dessert. I wrote it myself. It starts so simply, each line of the program creating a new effect, just like poetry. First, a rush… heat… her heart flutters. You can see it, Neo, yes? She does not understand why – is it the wine? No. What is it then, what is the reason? And soon it does not matter, soon the why and the reason are gone, and **all that matters is the feeling itself**. This is the nature of the universe. We struggle against it, we fight to deny it, but it is of course pretense, it is a lie. Beneath our poised appearance, the truth is we are completely out of control. Causality. There is no escape from it, we are forever slaves to it. Our only hope, **our only peace is to understand it, to understand the 'why'**. 'Why' is what separates us from them, you from me. **'Why' is the only real source of power**, without it you are powerless.

(add)

Truth | Ignorance

The general motto of *The Matrix* series, as summarized by American philosopher William Irwin, is the following: [1]

> "Is ignorance bliss, or is the truth worth knowing, no matter what?"

The red pill, the doorway to truth, or the blue pill, internal ignorance soaked bliss, are the two alternative "choices" of so-called reality offered to the Neo, the main character, in the opening scene.

The film, particularly in respect to truth and choice, has a very Goethe-feel to it, which likely would have come through via Schopenhauer, mentioned by Larry (Lana) Wachowski (2004) above, Goethe's sole direct philosophical protege; although, to clarify, there does not seem to be actual citation or crediting of Goethean philosophy as the underlying theme to the film, in the sense of his 1809 *Elective Affinities* being entirely about the nature of "choice", in a physico-chemical sense—the original German title *Die Wahlverwandtschaften* meaning the "choice of one's elections to

attraction, repel, or embrace" (see: title decoding)—in a world predetermined by the nature of predominately external forces (see: Goethe timeline, 1796) acting on the internal forces of humans defined as motile evolving chemicals. The following social Newton quote, by Goethe, gives wind of the connection between the two:

> "Few people have the imagination for reality."
>
> — Goethe (Ñº)

(add)

Baudrillard | Kelly | Evolutionary psychology

The three overt required reading books, which had to be read by the actors before the script was opened, so that they would be able to explain, when asked, the meaning of the various aspects of the film, were: Jean Baudrillard's 1981 book *Simulacra and Simulation*, Kevin Kelly's 1994 book *Out of Control*, and Dylan Evans' 1999 *Introducing Evolutionary Psychology*, an overview on evolutionary psychology. The following is a representative Baudrillard quote: [2]

> "Our only culture in the end is that of hydrocarbons, that of refining, cracking, breaking cultural molecules and of their recombination into synthesized products."

Baudrillard theorizes on concepts such as energy, negentropy, cybernetics, and information, viewed in terms of societies as molar groups, contracting and expanding.

Power source problem

See main: Machine evolution scenario

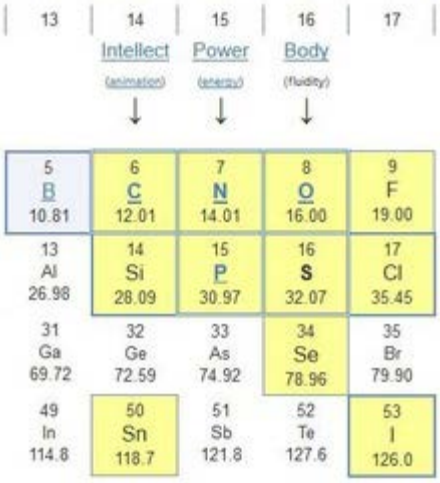

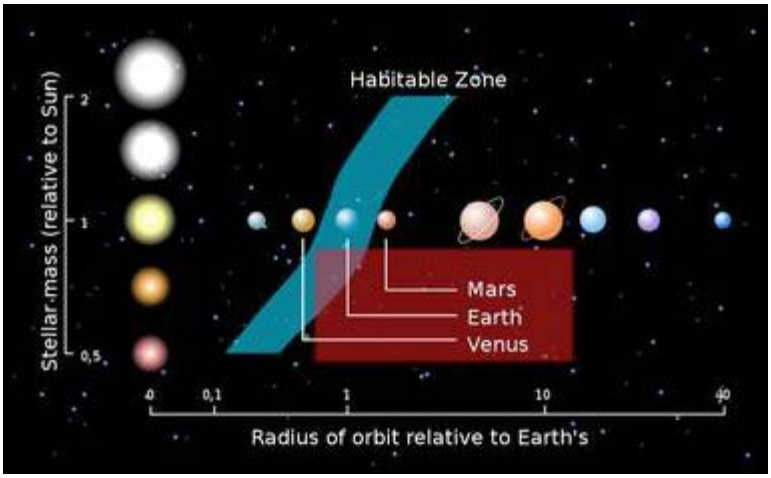

A portion of the hmolscience periodic table, showing the so-called "intelligence" or mind column (#14) of the periodic table; the premise of *The Matrix*, being that, in the future, machine intelligence (Si-based) will out pace human intelligence (C-based), and thereafter appropriate humans as battery like types of "energy slaves", in the Buckminster Fuller (1944) terminology, to power their operations.

One of the contentious or rather weaker, albeit difficult to decipher why, links in the film is that premise that machines, supposedly, silicon based in intelligence (see: hmolscience periodic table), have taken over the planet earth, as the leading species of animation, and enslaved humans to use as a power source:

> "The human body generates more bioelectricity than a 120 V battery and over 25,000 btu's of heat. Combined with a form of fusion, the machines had found all the energy they'd ever need."
>
> — Morpheus (1999), *The Matrix*

The gist of this line of reasoning seems to come from American futurist Kevin Kelly's 1994 *Out of Control: the New*

Biology of Machines, Social Systems, and the Economic World, noted for his use of entropy and extropy in theorizing about the impact of machines and technology in the future, which touches on topics of cybernetics, emergence, self-organization, complexity, and chaos theory, devoting about ten pages discussing entropy in the context of evolution and technology, the aim of which is to lay out the basic principals defining 'artificial evolution', a phenomenon argued to become commonplace in the next century. Kelly defines extropy as "life force" and life as an "information process making new order". [4]

The general problem with this human battery power premise, is the underlying assumption that earth, in the aftermath of the some type of future nuclear war, being now covered in some type of sunlight-reflecting or blocking cloud or dust cover, is now, in effect, out of the circumstellar habitable zone, according to which heat from the sun is no longer the factor or hot body driving force operator in the animation of atomic geometries on the surface of the earth, according to which, thereby, the machines, in the face of this scenario, acquire humans as power sources to fill the gap.

In short, with the sun as the power source is taken out of the equation, the premise that silicon-based intelligence (machine or computer) would want or have some type of desire to further its continuation, grow, evolve, or metamorphosize into the future, contradicts the premise that metamorphic form change only accrues via a photon mediated, induced movement, Bohr model electron orbital jumping stability seeking, type of floating magnets form change, operating on the periodic table; namely, without photon mediation, progressive form change would cease.

Architect

The Architect scene of part two is one of the intellectual apexes of the series (add discussion), at least in respect to pleasant amount of wordiness (vis-a-vis, ergo, concordantly, etc.), if not content; very well-scripted, to say the least—so much so that the 2003 MTV Will Ferrell parody (Ñº) of it is humorous. [5]

Quotes

The following are noted and or related quotes:

> "What is real? How do you define real? If you're talking about what you can feel; what you can taste; what you can smell and see; then real is simply electrical signals being interpreted by your brain."
>
> — Morpheus (1999), *The Matrix* [3]

> "To deny our own impulses is to deny the very thing that makes us human."
>
> — Mouse (1999), *The Matrix*

> "The way I see things, is similar to the way Neo sees the code in **the Matrix**; but in my case, all I see is atoms (instead of code), which, according to the nebular hypothesis, geometrically have been changing form, since the solar system first formed 4.6 billion years ago; whereby, according to the heat engine view of things, the sun is the hot body, any given region of earth (such as a ecosystem, a city, a river, etc.) is the working body, and the region of space on the dark side of the earth is the cold body. Therefore, in order to study this "working body" objectively, we have to strip away all previous conceptions [see:

A Neo as "code view" depiction of reality, according to which everything is but binary digits (bits), and or other computer symbols (e.g. binary algebra), interpreted by the brain; which in some sense, has resemblance to the

terminology reform], and start our study from Helmholtz's 1882 "On the Thermodynamics of Chemical Processes", wherein he showed how entropy applies to chemical reactions occurring in the "working body"; according to which, in the modern post-Lewis thermodynamics view of things, means that these atomic geometries go from one state [initial state] of arrangement to a second state [final state] of arrangement to a third state of arrangement, progressively each day (one heat cycle), and that each geometric arrangement is quantified by a measurable value of Gibbs free energy. The rest is simply puzzle solving and filling in the details."

"everything is but atoms and voids" atomic theory motto of Leucippus.

— Libb Thims (2011), comment #16 (Ñº) to Jeff Tuhtan on why a fish [see: fish molecule] is a [type] of molecule (Nov 9)

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Further reading

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See also

â— *Elective Affinities: Illustrated, Annotated, and Decoded*
â— Francis Ford Coppola
â— Human thermodynamic films

External links

â— The Matrix – Wikipedia.
â— Matrix Wiki – Wikia.com.

θΔics

In famous publications, ***The Mechanical Theory of Heat**: with its Applications to the Steam Engine and to Physical Properties of Bodies*, or *Die Mechanische Wärmetheorie* (German), is a 376-page 1867 book written by German physicist Rudolf Clausius, that is the founding publication and linchpin of the entire edifice of the science of thermodynamics, in which the ten fundamental equations of thermodynamics were penned. [1]

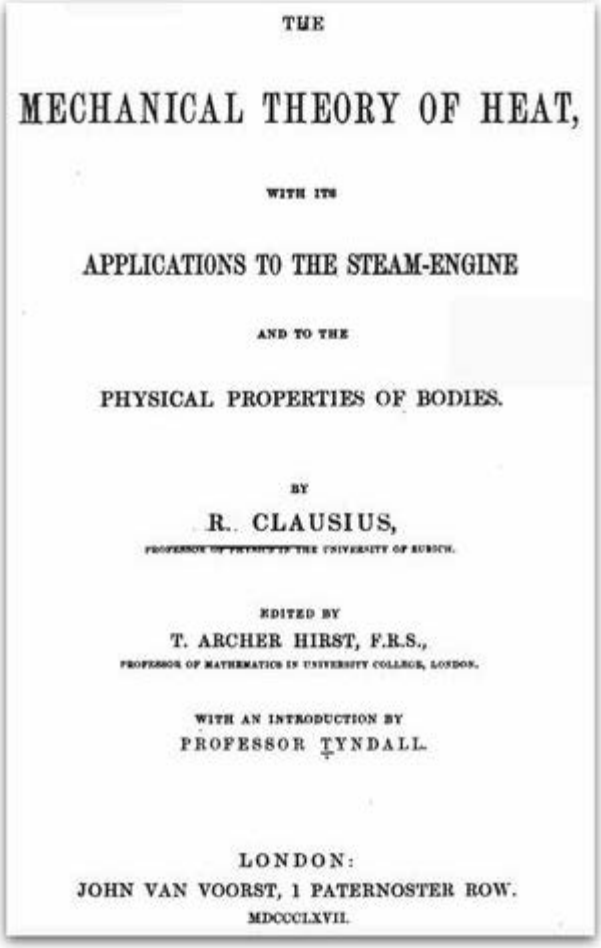
THE

MECHANICAL THEORY OF HEAT,

WITH ITS

APPLICATIONS TO THE STEAM-ENGINE

AND TO THE

PHYSICAL PROPERTIES OF BODIES.

BY

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WITH AN INTRODUCTION BY

PROFESSOR TYNDALL.

LONDON:

JOHN VAN VOORST, 1 PATERNOSTER ROW.

MDCCCLXVII.

Title page to the English translation of the first edition (1865) of ***The Mechanical Theory of Heat*** by Rudolf Clausius, translated by Thomas Hirst, with an introduction by John Tyndall.

The book, a collection of nine memoirs (papers) of Clausius, is the result of a prolonged investigative correction of French physicist Sadi Carnot's 1824 paper "On the Motive Power of Fire", in which Clausius modified Carnot's caloric theory based postulates on the nature of the relationship between heat and work, in particular the assumption that no change occurs in the working body during one heat cycle, with the recent experimental discoveries contained in the theory of heat and mechanical equivalent of heat, to result in the modern mathematical formulation of the first and second laws of thermodynamics.

First edition | 1865

The first edition of Clausius' *The Mechanical Theory of Heat*, consist of a mathematical introduction, his collection of nine memoirs on the mechanical theory of heat, published in the fifteen years prior in various journals (principally in Poggendorff's *Annalen*), along with an attachment of notes and appendices:

- Mathematical Introduction (1858): On the Treatment of Differential Equations which are not Directly Integrable, pp. 1-13.
- First Memoir (1850): On the Moving Force of Heat and the Laws of Heat Which May be Deduced Therefrom, pp. 14-69
- Second Memoir (1851): On the Deportment of Vapour During its Expansion Under Different Circumstances, pp. 90-100
- Third Memoir (1851): On the Theoretic Connexion of Two Empirical Laws Relating to the Tensions and the Latent Heat of Different Vapours, pp. 104-110
- Fourth Memoir (1854): On a Modified Form of the Second Fundamental Theorem in the Mechanical Theory of Heat, pp. 111-135
- Fifth Memoir (1856): On the Application of the Mechanical theory of Heat to the Steam-Engine, pp. 136-207
- Sixth Memoir (1862): On the Application of the Theorem of the Equivalence of Transformations to Interior Work, pp. 215-250
- Seventh Memoir (1863): On an Axiom in the Mechanical Theory of Heat, pp. 267-289.
- Eighth Memoir (1863): On the Concentration of Rays of Heat and Light, and on the Limits of its Action, pp. 290-326.
- Ninth Memoir (1865): On Several Convenient Forms of the Fundamental Equations of the Mechanical Theory of Heat, pp. 327-365.

(add discussion)

Second edition | 1875

After having taught the subject for a number of years, in 1875 Clausius finished rewriting the book so as to take it from a collection of papers to a "text-book of the subject". It was published in 1876 and later as an English translation edition in 1879. The opening paragraph of page one of this last and final English edition is shown below: [2]

> “Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, work is performed.”

In the preface to the second edition, he states that his long experience as a lecturer on the subject at the Polytechnic School and at several universities over the last ten years, since the publication of the first edition, has taught him how the subject matter should be arranged to make this “somewhat difficult theory” more readily intelligible. The chapters to the second edition are listed below:

#	Chapter Title	Pgs.
	Translator's Preface (by Walter Browne)	v-vi
	Author's Preface (by Rudolf Clausius)	vii-viii
	Table of Contents	ix-xvi
	Mathematical Introduction: on Mechanical Work, On Energy, and on the Treatment of Non-Integrable Differential Equations	1-20
I	First Main Principle of the Mechanical Theory of Heat: or Principle of the Equivalence of Heat and Work	21-38
II	On Perfect Gases	39-68
III	Second Main Principle of the Mechanical Theory of Heat	69-90
IV	The Second Main Principle Under Another Form: or Principle of the Equivalence of Transformations	91-109
V	Formation of the Two Fundamental Equations	110-125
VI	Application of the Mechanical Theory of Heat to Saturated Vapour	126-162
VII	Fusion and Vaporization of Solid Bodies	163-174
VIII	On Homogeneous Bodies	175-194
IX	Determination of Energy and Entropy	195-211
X	On Non-Reversible Processes	212-234
XI	Application of the Mechanical Theory of Heat to the Steam-Engine	235-294
XIII	On the Concentration of Rays of Light and Heat on the Limits of its Operation	295-331
XIII	Discussions on the Mechanical Theory of Heat as Here Developed, and on its Foundations	332-362
	Appendix I: On the Thermo-Elastic Properties of Solids (by Walter Browne)	363-368
	Appendix II: On the Continuity of the Liquid and and Gaseous States of Matter (by Walter Browne)	369-371

Appendix III: On Capillarity (by Walter Browne) 372-376

Overviews of the chapters are slowly being written as subfiled wikipages to this page (as linked to above).

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Videos

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θΔics

In famous publications, “**The Natural Sciences and the Revolution**” is an 1850 article by Ludwig Feuerbach, wherein it is asserted, proposed, and or "prophesized" that the natural sciences, chemistry in particular—either physical chemistry, of the Goethean philosophy based human chemistry variety, the logic of which Feuerbach had absorbed in 1834, and or "digestive chemistry" (physiology), of the “medical materialism” (O) variety, of Jacob Moleschott, who is cited (below), and who had attended Feuerbach’s 1848 “Essence of Religion” lectures—will someday dissolve, or is in the course of dissolving, the Christian world view in nitric acid. [1]

Article

The following is a Google-translated abridged German-to-English version of the article:

German	English
Der selige Minister Eichhorn gab einmal der Königsberger Universität die gnädige Versicherung: dass die königliche Regierung zwar keine mit ihren Grundsätzen in Widerspruch stehenden Religions- und Staatslehren dulden könne, dass sie aber nicht im entferntesten daran denke, mit dieser Beschränkung der philosophischen Wissenschaften auch die Naturwissenschaften beschränken zu wollen. Wenn uns ein anderer preussischer Minister mit dem beschränkten Unterthanenverstand bekannt gemacht, so hat dagegen der Herr Minister Eichhorn bei dieser Gelegenheit — freilich nicht bei dieser allein — den Beweis geliefert, dass es auch einen sehr beschränkten Regierungsverstand giebt. Wie? die Regierung maasst sich die Herrschaft über unsere Gedanken und Gesinnungen an, sie schreibt uns vor, was wir denken und glauben sollen, und dennoch erlaubt sie uns den Gebrauch unserer fünf Sinne?	
Die Regierung steckt ihre Nase in Alles, sie durchstöbert jeden Winkel in unserem Schreibtische, jeden Wisch in unserem Papierkorb, um selbst noch in den ad pium usum bestimmten Papieren Spuren von Hochverrath auszuwittern, und doch untersucht sie nicht den Inhalt unserer Herbarien, unserer Steinsammlungen, unserer ausgestopften Thiere?(1) Die Regierung nimmt dem Bürger seine Waffen, dem Schriftsteller seine spitzige Feder, dem Drucker seinen Pressbengel, und doch lässt sie dem Geologen seinen Hammer, dem Anatomen sein Secirmesser, dem Chemiker sein Scheidewasser? Ist das nicht ein ungeheuerer Widerspruch?	The late Minister Eichhorn was once the Königsberg University gracious insurance: that the royal government indeed could not tolerate any religion and state teachings that conflict with their principles, but that they had no intention in the least, with this restriction of philosophical sciences, the natural sciences want to restrict. If we made another Prussian minister with limited sub Than mind known, however, the Minister Eichhorn has on this occasion - certainly not in this alone - the evidence supplied that it also gives a very limited government mind. How? the government maasst the dominion over our thoughts and intentions on, it prescribes what we think and to believe, and yet they allowed us to use our five senses?
Was ist aber der Grund dieser liberalen Gesinnung gegen die Naturwissenschaften? Nur der beschränkte Regierungsverstand, der nichts weiss von dem geheimen staatsgefährlichen Bunde der Naturwissenschaft mit Religion, Philosophie und Politik. Auf den ersten oberflächlichen Blick erscheint allerdings die Beschäftigung mit der Natur als die allerunschädlichste, ja unschuldigste, die es nur immer geben kann; denn was steht dem Getriebe der politischen Welt ferner als die Natur? Was ist für ein Zusammenhang zwischen den	

Gesetzen der Natur und den Intriguenspielen unserer Politik, zwischen den Bedürfnissen des Lebens und den Luxusartikeln unserer Staaten, zwischen den Kräften der Materie und den Phrasen unserer Minister und Deputirten? Was kümmern sich die Naturmächte um unsere Gross- und Kleinmächte, unsere Fürsten und Demokraten? Unterscheidet der Floh zwischen fürstlichem und bürgerlichem Blut, der Blitz zwischen einem gekrönten und ungekrönten Haupte? Aber wie das Objekt so das Subjekt, wie die Ursache so die Wirkung. Gleichgiltigkeit gegen die politischen Parteien und Händel ist daher die erste Wirkung der Naturwissenschaft.

Diese Wirkung passt nun allerdings insofern in den Kram unserer reactionären Regierungen, als der Naturforscher nicht gegen sie ist; aber er ist auch nicht für sie, und das allein macht ihn schon zu einem höchst verdächtigen Menschen. Denn unsere Staaten sind ja »gut christlich«; sie stützen sich, wenn auch nur mit Bayonnetten, auf die Heilige Schrift, und in ihr steht geschrieben: »Wer nicht für mich ist, ist wider mich«. Die politische Indifferenz ist übrigens auch nur eine vorübergehende Wirkung der Naturwissenschaft; denn die Natur kümmert sich nicht nur nichts um Politik, sie ist auch das direkte Gegentheil der Politik. Wo Natur, ist keine Politik, wenigstens im Sinne der Dynasten, und wo Politik, nur Unnatur: wie könnte also der Naturforscher bei diesem augenfälligen Contraste zwischen dem Wesen der Natur und dem Unwesen der Politik gleichgiltig bleiben?

Der Naturforscher sieht, wie die Natur in einem ewigen Fortschritte begriffen ist, wie sie nie mehr auf eine einmal überschrittene Stufe zurückfällt, nie mehr aus einem Mann ein Knabe, einem Weibe ein Mädchen, einer Frucht eine Blüthe, einer Blüthe ein Blatt wird; wie in der Natur immer das Alte abstirbt, und zwar nur dazu, um den Dünger für eine bessere Zukunft abzugeben. Wie thöricht, wie lächerlich kommen ihm dagegen die reactionären Thaumaturgen vor, welche sich einbilden, inhaltsvolle Jahre aus der Geschichte streichen, die Menschen auf einen verlassenen Standpunkt zurückversetzen, Männer wieder zu Kindern machen zu können! Der Naturforscher sieht, wie es in der Natur nichts Isolirtes, nichts Vereinzeltes giebt; wie Alles vielmehr in ihr in einem nothwendigen und grossartigen Zusammenhang steht; wie die Naturwesen sich zwar in verschiedene Klassen abtheilen, aber nur nach begründeten Unterschieden, und wie selbst diese wieder zuletzt in die Einheit des Ganzen sich auflösen. Er gewöhnt sich dadurch unwillkürlich, alle Dinge von einem universellen Standpunkte aus zu betrachten, folglich auch an die Politik den grossen Maasstab der Natur anzulegen.

Wenn er daher einen Blick in die deutsche Politik wirft,

The government put its nose in everything, they ransacked every corner of our desks, each wipe in our Trash to still *usum* certain papers auszuwittern traces of treason even in the *ad Pium*, and yet they do not examine the content of our herbaria, our stone collections, our stuffed animals? (1) The government is taking the citizens his weapons, the writer pointed his pen, the printer's press villain, and yet she lets the geologist's hammer, the anatomist be Secirmesser, the chemist be nitric acid HNO_3? Is not this a monstrous contradiction?

But what is the reason of this liberal attitude towards the natural sciences? Only the limited government mind who knows nothing of the secret subversive alliance of science with religion, philosophy and politics. However, at first superficial glance, the study of nature as the allerunschädlichste, so innocent that it only can always be displayed; because what is the transmission of the political world further than nature? What kind of a relationship between the laws of nature and the Intriguenspielen our policy, between the needs of life and the luxuries of our countries, between the forces of matter and the phrases of our ministers and deputies? What the forces of nature take care of our large and small powers, our princes and Democrats? Distinguishes the flea between princely and bourgeois blood, the flash between a crowned and uncrowned head? But as the object as the subject, as the cause of the effect. Indifference to the political parties and Handel is therefore the first effect of the natural sciences.

This effect now fits but so far the stuff of our reactionary governments when the naturalist is not against them; but he is not for them, and that alone makes him already a highly suspicious people. Because our countries are indeed "good Christian"; they are based, albeit with Bayonnetten, to the Scriptures, and is in her written: "He who is not with me is against me." Political indifference is actually only a temporary effect of natural science; because nature not only cares nothing about politics, it is also the direct opposite of the policy. Where nature, is not a policy, at least in terms of dynasties, and where policy, only unnatural: So how could remain indifferent to the naturalist in this striking contrasts between the essence of nature and the mischief of the policy?

The naturalist sees how nature is involved in an eternal progress as never falls back on an even exceeded level, never more of a man, a boy, a woman, a girl, a fruit, a flower, a flower, a sheet; as in nature, always dies the old,

ach! wie winzig erscheinen ihm da unsere »grossen Staatsmänner«, wie unerheblich die Spielarten der »achtunddreissig deutschen Nationen«, die sich auf dem Miste des historischen Rechtsbodens erzeugt haben, wie komisch die zwieträchtige Eintracht der deutschen Fürsten, wie unwürdig das corpsburschenschaftliche Wesen und Treiben unserer Particularisten, wie ungeheuer die Beschränktheit der Politiker, welche einen Staat wie Preussen als einen Grossstaat betrachten und bezeichnen! Der Naturforscher verkennt zwar nicht, dass Preussen in dem kleinen Baden gross gethan; aber wie klein, wie unendlich klein erscheint ihm Preussen und sein Benehmen im Grossen und Ganzen der deutschen Politik! Der Naturforscher ist Grossdeutscher im wahrsten und eminentesten Sinne des Worts. Für ihn existirt kein Lichten- und Lobenstein, aber auch kein Preussen, kein Oesterreich, kein Bayern. Der Naturforscher weiss aus der Erfahrung, dass die Farbe das allerwesenloseste Unterschiedsmerkmal. Was anders unterscheidet denn aber zuletzt z.B. den Preussen und Bayern, als die Farben: schwarzweiss und blauweiss?

Wie kann also der Naturforscher seinen universellen Sinn und Blick durch diese wesenlosen, willkürlichen, kleinlichen Unterschiede beschränken, wie preussisch oder bayrisch gesinnt sein? Wenn man aber nicht mehr preussisch oder bayrisch denkt, kann man dann noch eine königlich preussische oder königlich bayrische, oder gar fürstlich loben- und lichtensteinische Gesinnung haben? Unmöglich! Der Naturforscher wirft daher mit Cicero’s Ausruf über die Politik seiner Zeit: »Sunt omnia omnium miseriarum plenissima«, (Alles ist aller Erbärmlichkeiten voll) sehnsuchtsvoll seine Blicke über die blauweissen und schwarzweissen Schlagbäume der deutschen Politik hinüber in die freien Urwälder Nordamerikas, vor dessen räumlicher Grösse allein schon die kleinlichen Maasstäbe der europäischen Kabinetspolitik in Nichts verschwinden und findet das Heil nur in der Demokratie.(2)

Aber nicht nur Demokrat, selbst auch Socialist und Communist, freilich nur im vernünftigen und allgemeinen Sinne dieses Worts, wird nothwendig der Naturforscher; denn die Natur weiss nichts von den Anmaassungen und Fictionen, durch die der Mensch im Rechte die Existenz seines Nebenmenschen beschränkt und verkümmert hat. Die Luft gehört von Natur Jedem und eben damit Niemanden, sie ist das Gemeingut aller Lebenden; aber die Rechthaberei hat selbst die Luft zu einem Regale gemacht: »Der Wind gehört der Herrschaft«. Die Natur kennt allerdings das Eigenthum, aber nur das nothwendige, vom Leben unabsonderliche; sie giebt jedem Wesen, was es braucht; sie hat keines zum Verhungern geschaffen. Die Nothwendigkeit der Verhungerung

and then only to to deliver the fertilizer for a better future. How foolish, how ridiculous come against him before the reactionary miracle worker, who imagine, emphasize content-filled years of history, back put people on a deserted position, to make men children again! The naturalist sees as nothing Isolirtes, nothing Sporadic gives in nature; Everything is rather like in her in a great relationship and necessaries; as the natural beings Although abtheilen into different classes, but dissolve only after reasonable differences, and how even these last again in the unity of the whole itself. He used thereby involuntarily to look at all things from a universal point of view, therefore, also be applied to the policy the great standard of nature.

When he therefore a look at the German policy raises, alas! how tiny appear to him our "great statesmen" because as irrelevant the varieties of "thirty-eight German nations" that have generated on the dunghill of history right soil, how funny the discordant concord of the German princes, as unworthy of the corpsburschenschaftliche nature and activities of our Particularists how tremendously the narrowness of the politicians who consider a country like Prussia as a great state and call! The naturalist Although not unaware that Prussia had done great in the small Baden; but as small as infinitely small Preussen and his behavior seems to him on the whole of German politics! The naturalist is big German in the truest and highest sense of the word. For him there exists no Lichtenberg and Lobenstein, but not Prussia, not Austria, no Bayern. The naturalist knows from experience that the color of the allerwesenloseste difference feature. What else is different because but as the last Prussia and Bavaria, as the colors: black and white and blue white?

So how can the naturalist unsubstantial its universal sense and look through it, limit arbitrary, petty differences, be like-minded Prussian or Bavarian? But if you no longer thinks Prussian or Bavarian, you then can have a Royal Prussian or Bavarian royal, or even be upon royally and Lichtensteinische mind? Impossible! Therefore, the naturalist throws with Cicero's exclamation about the politics of his time: *"sunt omnia omnium miseriarum plenissima"* (Everything is all miseries full) longingly his eyes on the blue and white and black and white barriers of German politics over into the free virgin forests of North America, spatial prior to its alone disappear size petty Maas bars European Kabinetspolitik into nothing and finds salvation only in a democracy. (2)

verdankt ihre Existenz nur der Willkür des Staates, dessen Wesen der »Staat«, die Uniform, der Schein, der Tand ist. Der Blick in die Natur erhebt darum den Menschen über die engherzigen Schranken des peinlichen Rechts, sie macht den Menschen communistisch, d.h. freisinnig und freigebig. Selbst der heilige Anselmus sagt schon, seinem Lebensbeschreiber Cadmerus zufolge, ganz im Widerspruch mit der weltbekannten geistlichen Habsucht, dass nach dem Naturgesetz (secundum naturalem legem) nichts dem Einen mehr als dem Andern angehöre, und dass alle Schätze der Welt zum allgemeinen Besten der Menschen erschaffen seien.

But not only Democrat, Socialist and Communist himself also, of course, only in the rational and the general sense of the word, is necessarily the naturalist; because nature knows nothing of the Anmaassungen and fictions, by which man has rights in limited and stunted the existence of his fellow-men. The air is one of nature each and just so no one, it is the common property of all living; But the self-righteousness has made even the air to a shelving: "The wind is one of domination". However, nature knows the property, but only the necessary, unabsonderliche of life; it gives every creature what it needs; it has created none of starvation. The necessity of starvation owes its existence only at the mercy of the state, its nature of 'State', the uniforms, the appearance, the trinkets is. The view of nature arises why the people on the narrow-minded confines of embarrassing law, it makes man communistisch, ie liberal and generous. Even St. Anselm says it, his biographer Cadmerus According, quite at odds with the world-renowned spiritual greed that after the law of nature *(secundum naturalem legem)* not the one more than the others belonged, and that all the treasures of the world for the common good of the people were created.

Das »gute alte Recht« hat die Menschheit in Noblesse und Canaille, Adel und Pöbel, geschieden und zur Rechtfertigung dieser Injurie gegen das Menschengeschlecht den unsinnigen Satz aufgestellt: »Venter nobilitat«. Aber die Naturwissenschaft kennt keinen Unterschied zwischen einem adeligen und einem bürgerlichen Bauch, sie weiss nur von einem allen Menschen gemeinen und gleichen Ursprung. Als einst der Anatom Jodocus Lucius die Lage der Gebärmutter zeigte, sagte er: »Hier lasset uns bespiegeln, wir Menschen, die wir mit unserer adeligen Ankunft prangen und meinen, wir seien besser als Andere: hier ist unsere erste Wohnung zwischen Harn und Koth.« Solche communistische, staats- und rechtswidrige Gesinnungen flösst die Natur ein!

The "good old law 'has humanity in Noblesse and Canaille, nobles and rabble, divorced and the nonsensical sentence erected to justify this Injurie against the human race," *Venter nobilitat* ". But science knows no difference between a noble and a bourgeois belly, she knows only from a common to all men and the same origin. Once when the anatomist Jodocus Lucius showed the position of the uterus, he said, "Here let bespiegeln us, we humans, that we are resplendent with our noble arrival and think that we are better than others: here is our first apartment between urine and faeces. "Such communistic, Heads of State and unlawful disposition infuses nature!

Und doch giebt der beschränkte Regierungsverstand die Naturwissenschaft frei und stellt nur die Philosophie unter polizeiliche Aufsicht. Nur die Philosophie! Wie thöricht! Wie unschädlich ist sie, wie arm, wie wehrlos im Vergleich zu den Naturwissenschaften! Wie leicht kann man ihre gefährlichen Wirkungen auf das Publikum verhindern! Was gehört dazu, einen Philosophen zu widerlegen? Nichts weiter als ein Professor der Philosophie, und was ist leichter zu haben als ein solcher! Wenn daher ein revolutionärer Philosoph auftritt, so braucht man nur einen Professor der Philosophie gegen ihn schreiben zu lassen, und der arme Philosoph ist, wenigstens in den Augen des Publikums — aber darauf kommt es allein an, Schein regiert die Welt — mausetodt. Dem Philosophen, dem nur das treulose und vieldeutige Wort zum Organ dient, kann man ja ohne Mühe auch den sonnenklarsten Satz, den unwidersprechlichsten Beweis zunichte machen: man darf nur ein Wort verdrehen, oft selbst nur eine Partikel auslassen, und der ganze Satz löst sich in Unsinn auf.

Yet the limited government mind gives science free and provides only the philosophy under police supervision. Only the philosophy! How foolish! How harmless it is, how poor, how defenseless compared to the natural sciences! How easy is it to prevent its harmful effects on the audience! What does it take to refute a philosopher? Nothing more than a professor of philosophy, and what to have an easier time as such! Therefore, when a revolutionary philosopher occurs, so you need to have only write a professor of philosophy against him, and the poor philosopher is, at least in the eyes of the audience - but that is what counts alone bill governs the world -

Was sind gegen die festbestimmten und innigen Verbindungen der chemischen Stoffe die losen, flüchtigen Wortverbindungen, die der Gedanke eingeht? Was gegen den soliden Körperbau der naturgeschichtlichen Wesen der papierne Periodenbau, worauf sich der Philosoph

stützt! Was gegen die Platinadichte des Natursystems das luftige Spinnengewebe der Sprache, worin der Denker sein Wesen entfaltet! Spinne noch so sorgfältig, noch so logisch zusammenhängend Faden an Faden: du vermagst nichts gegen die Natur der Sprache, du reihst nur Lücke an Lücke, und jede Lücke ist ein Tummelplatz für die Bosheit und Dummheit deiner Kritiker. Der Philosoph spricht sich ferner nur in allgemeinen und deswegen abstracten Sätzen aus. Sind diese gleich nur von einzelnen wirklichen Fällen abgezogen, so scheinen sie doch nur aus der Luft gegriffen zu sein, wenn man nicht durch den Schein hindurch auf den Grund blicken, das Abstracte mit dem Concreten, das Geistige mit dem Sinnlichen verknüpfen kann. Aber wie Wenige vermögen dieses! Und wie machtlos sind überhaupt abstracte Wahrheiten!

Wie ganz anders ist es dagegen mit der Naturwissenschaft, deren Grundsätze anschauliche Thatsachen, deren Beweismittel sinnliche Instrumente sind. Doch wozu sagen, was schon Andere besser gesagt haben! Condorcet in seinem »Éloge de Mariotte« sagt:

Les théories nouvelles, les mieux prouvées, font peu de progrès, tant qu'elles ne sont appuyées que sur des principes abstraits; même les meilleurs esprits, accoutumés à certaines idées abstraites, acquises dans la jeunesse, rejettent toutes celles qui ne se lient pas aisément avec les premières, et toutes les vérités spéculatives dont on ne peut leur donner des preuves sensibles, sont absolument perdues pour eux. Ainsi toutes les fois qu'un homme de génie propose des vérités nouvelles, il n'a pour partisans que ses égaux, et quelques jeunes gens élevés loin des préjugés des écoles publiques; le reste ne l'entend point ou l'entend mal; le persécute ou le tourne en ridicule.

[Die neuen, am besten bewiesenen Theorien machen wenig Fortschritte, solange sie sich nur auf abstrakte Prinzipien stützen; selbst die besten Geister, die an bestimmte, schon in der Jugend erworbene abstrakte Ideen gewöhnt sind, verwerfen all die Ideen, die sich nicht bequem mit den ersteren verbinden, und alle spekulativen Wahrheiten, für die man keine sinnlich wahrnehmbaren Beweise geben kann, sind für sie absolut verloren. Wenn daher ein Mann von Genie neue Wahrheiten vorschlägt, hat er allemal zu Anhängern nur seinesgleichen und einige junge Leute, die fern den Vorurteilen der öffentlichen Schulen erzogen sind; der Rest versteht ihn nicht oder falsch, verfolgt ihn oder macht ihn lächerlich.]

Allerdings greift der Naturforscher nicht direct, wie der Philosoph, die religiösen und politischen Vorurtheile an; aber man kann kein Glied aus der Reihe der menschlichen

mausetodt. The philosopher, the serving only the perfidious and ambiguous word for body, you also sonnenklarsten sentence unwidersprechlichsten evidence may indeed effortlessly destroy: Sixteen twist a word, often omit only a particle itself, and the whole sentence dissolves in on nonsense.

What are firmly against the particular and intimate connections of chemical substances the loose, fleeting phrases that addresses the idea? What against the solid physique of natural history nature of papierne periodic structure on which is based the philosopher! What Platinadichte against the natural system, the airy cobwebs of the language in which the thinker his nature unfolds! Spider ever so carefully, no matter how logically coherent thread to thread: thou shalt not against the nature of language, you string along only gap to gap, and each gap is a playground for the malice and stupidity of your critics. The philosopher also speaks out only in general and therefore abstract sets. Are these the same deducted only from individual real cases, so they seem to be yet grasped only from the air, if you are not looking through the bill through to the bottom, the Abstracte with the concrete, can combine the spiritual with the sensual. But how few are capable of this! And how powerless are at all abstract truths!

How different it is against the natural sciences whose principles vivid facts whose evidence are sensual instruments. But why say what others have said better! Condorcet in his "Praise of Mariotte" (1773) says:

“The new, best proven theories make little progress as long as they are based only on abstract principles; even the best minds, who are used to certain acquired in youth abstract ideas, reject all the ideas that do not easily combine with the former, and all speculative truths, for which one can give no sensible evidence, are for they absolutely lost. Therefore, when a man of genius proposing new truths, he has all just like him to supporters and a number of young people who are educated away the prejudices of the public schools; the rest did not understand him or wrong, pursuing him or makes him ridiculous.”

Vorstellungen herausreissen oder verändern, ohne damit die ganze Reihe zu verändern. So lange die Phantasie des religiösen Glaubens die Menschen beherrschte, so lange war auch die natürliche Welt eine Fabel- und Märchenwelt. Wer an Wunder in der Bibel glaubt, der glaubt auch an Wunder ausser der Bibel, der hat überall Wunder im Kopfe. Und umgekehrt: wer an keine natürlichen Wunder mehr glaubt, der glaubt auch keine religiösen mehr. Wie wäre es auch anders möglich? Der Boden aller Wunder ist ja die Natur. Freilich kann sich der Mensch mit der Ausrede helfen, dass er nur auf dem Gebiete der Natur, nicht der Religion und Theologie, das Wunder aufhebe. Aber nur eine Zeit lang; endlich siegt doch im Menschen der Einheitsdrang und Wahrheitssinn über den Zwiespalt zwischen einer vernünftigen natürlichen und einer unvernünftigen übernatürlichen Welt.

However, the naturalist does not intervene directly, as the philosopher, the religious and political prejudices on; but you can rip out or alter, without changing the way the whole series no member from the series of human ideas. As long as the imagination of religious belief, people dominated so long was also the natural world is a fable and fairy tale world. Those who believe in miracles in the Bible who also believes in miracles other than the Bible, who has everywhere wonder in the head. And vice versa: who believes in no natural wonder, who believes no longer religious. How it would be otherwise? The floor of all miracles is indeed nature. To be sure, the man can help with the excuse that he take up only in the realm of nature, not of religion and theology, the miracle. But only for a while; finally triumphs but in man the urge unit and sense of truth about the conflict between a natural and a rational irrational supernatural world.

Der erste Revolutionär der neueren Zeit war daher der Verfasser der Schrift »De revolutionibus orbium coelestium«, Nicolaus Copernicus. Copernicus hat den allgemeinsten, den ältesten, den heiligsten Glauben der Menschheit, den Glauben an die Unbeweglichkeit der Erde, umgestossen und mit diesem Stosse das ganze Glaubenssystem der alten Welt erschüttert. Er hat als ein echter »Umsturzmann« das Unterste zu oberst und das Oberste zu unterst gekehrt, die höchste Sphäre des ptolemäischen Systems, das Primum mobile, (die Ursache der täglichen Himmelsbewegung) zum Parterre der Astronomie gemacht, der Erde die Initiative der Bewegung zugeeignet und dadurch allen ferneren und anderweitigen Revolutionen der Erde Thür und Thor geöffnet.

The first revolutionary of modern times, therefore, was the author of the work *"De revolutionibus Orbium Coelestium"* Nicolaus Copernicus. Copernicus has the most general, the oldest, the most holy faith of humanity, the belief in the immobility of the earth, knocked over and shattered with this push the whole belief system of the ancient world. He has served as a real "coup man" at the top, the lowest and highest swept to bottom, the highest sphere of the Ptolemaic system, *the primum mobile*, made (the cause of the daily motion of the heavens) to ground floor astronomy, earth appropriated the initiative of movement and thus all distant and open otherwise revolutions of the earth door and Thor.

Er hat dem phantastisch-despotischen Dominium mundi des Mittelalters, welches sich die Erde über die Himmelskörper, der Papst über die Geister, der Kaiser über die Fürsten und Völker, der Mensch über die Menschen angemaasst hatte, für immer den Garaus gemacht; er hat den menschlichen Geist aus den epicyklischen Zauberkreisen des verworrenen, widerspruchsvollen Unsinns einer eingebildeten Welt erlöst und zur Anschauung der wirklichen Welt, zur Einfachheit der Natur zurückgeführt. Er hat mit frecher Hand die bis auf ihn verschlossene, mit Ausnahme einiger ketzerischer Denker selbst den grössten Geistern des Alterthums undurchdringliche, nur zur Brustwehr der menschlichen Beschränktheit, Gedankenlosigkeit und Gläubigkeit dienende Himmelsveste aufgesprengt, und dadurch den Blick des Menschen bis in die Unendlichkeit des Universums erweitert und dem gesunden Menschenverstand Eingang selbst in den Himmel verschafft. Der Himmel galt sonst in der Religion für den Thron und Sitz der Gottheit, den Wohnort der Seligen, in

He has the fantastically-despotic *Dominium mundi* of the Middle Ages that the Earth on the celestial body that had angemaasst Pope about the ghosts, the emperor above the princes and peoples, the man on the man made to forever put an end to; he has redeemed from the human spirit the epicyklischen magic circles of tangled, contradictory nonsense of an imagined world and returned to the contemplation of the real world to the simplicity of nature. He has worked with saucy hand to him sealed, blown open with the exception of some heretical thinkers even the greatest minds of antiquity impenetrable, serving only to parapet of human stupidity, thoughtlessness and orthodoxy sky Veste, and thus the view of the people into the infinity of the universe extended and common sense provides input even in the sky. The sky was otherwise in

der Philosophie für das fünfte Element, wo keine Negation, keine Veränderung, kein Entstehen und Vergehen wie auf der plebejischen Erde stattfinden sollte, kurz: für ein heiliges göttliches Wesen. Aber alle diesen süssen, heiligen Vorstellungen und Aussichten, die sich sonst an den Himmel knüpften, hat die moderne Astronomie, deren Urheber oder Begründer Copernicus war, schonungslos vernichtet. Sie hat zwar die Erde in den Himmel emporgehoben, aber eben dadurch auch den Himmel profanirt, die Himmelsgestirne auf gleichen Fuss mit der Erde gesetzt. Copernicus ist es, der die Menschheit um ihren Himmel gebracht hat. Wo kein sinnlicher Himmel mehr, verschwindet auch bald der Himmel des Glaubens; denn nur an dem sinnlichen Himmel hatte ja auch der religiöse seinen Grund und Haltpunkt. Mit vollem Recht wurde das Copernicanische Weltsystem von den Katholiken als ein ketzerisches förmlich verdammt, von den Protestanten wenigstens theoretisch verworfen, denn es widerspricht der Heiligen Schrift. »Du gründest das Erdreich«, heisst es im Psalm, »auf seinen Boden (super stabilitatem suam, wie es in der Vulgata heisst), dass es bleibt immer und ewiglich.« »Die Erde bleibet ewiglich«, sagt der Prediger Salomo, »die Sonne geht auf und geht unter und läuft an ihren Ort.« Diese und noch einige andere Sprüche der Bibel hielt man den Copernicanern entgegen. Was aber in der Bibel steht, muss auch in der Natur stehen. Hat man doch selbst in den Sternbildern die hebräischen Buchstaben gefunden! »Alles, was die Heilige Schrift behauptet«, heisst es z.B. in Theodorici Winshemii Novae quaestiones sphaerae« vom J. 1564, »ist unbezweifelbar gewiss. Die Heilige Schrift behauptet aber, dass die Erde fest und unbeweglich sei. Also ruht die Erde in der Mitte der Welt und bewegt sich nicht.« Welch eine glückliche Zeit, wo man noch mit Bibelsprüchen den menschlichen Geist bannen, mit Bibelsprüchen den Revolutionen der Erde Stillstand gebieten konnte! Was sind gegen diese Wirkungen des todten biblischen Buchstabens die oratorischen Machtsprüche, womit unsere politischen Schlangenbeschwörer die »lernäische Schlange« der Revolution bezwingen wollen. Und gleichwohl sieht der beschränkte Regierungsverstand nicht ein, dass nicht erst die gottlose Philosophie, sondern schon Meister Copernicus der Bibel ihre reactionäre Zaubermacht genommen. Copernicus hat das körperliche Centrum der Welt, die Erde, in die Reihe der Irrsterne eingeführt; Copernicus hat auch das geistige Centrum der christlichen Welt, die Bibel, in die Klasse der irrenden menschlichen Bücher versetzt. Schwach sind die Gründe, womit die Copernicaner die göttliche Ehre der Bibel zu retten suchten. Die Geschichte hat sie längst widerlegt. »Der Heilige Geist lässt sich nicht trennen, noch theilen, dass er ein Stück sollte wahrhaftig und das andere falsch lehren

religion for the throne and seat of the Godhead, the place of residence of the blessed, in the philosophy of the fifth element, where no negation, no change, no rise and fall should take place as to the plebeian world, in short, for a holy divine being. But all that sweet, sacred ideas and perspectives that otherwise knüpften at the sky, has modern astronomy, whose author or founder Copernicus was destroyed mercilessly. Although it has uplifted the Earth into the sky, but the very fact profaned even the sky, set the sky the stars on the same footing with the earth. Copernicus is it that has brought humanity to their heaven. Where no more sensual heaven, also disappears soon the sky of faith; because only at the sensual sky had also its religious basis and support point. Quite rightly, the Copernican system of the Catholics was considered a heretic formally condemned, at least theoretically rejected by the Protestants, because it contradicts Scripture. "What you are the earth," we read in Psalm, "on its soil *(super stabilitatem suam*, as it is called in the Vulgate) that it is for ever and ever." "The earth abideth for ever," says Ecclesiastes, " The sun rises and sets and runs to its place. "These and several other sayings of the Bible held one against the Copernicanern. But what is in the Bible, must also be in the nature. One has yet even in the constellations the Hebrew letters found! "Everything that Scripture asserts," we read, for example, in Theodorici Winshemii *Novae quaestiones Sphaerae* "from J. 1564" is undoubtedly certainly. The Scriptures, however, maintains that the earth is fixed and immovable. So the earth is at rest in the center of the world and does not move. "What a happy time, where you can still capture the human mind with Bible texts, with Bible texts could the revolutions of the earth areas standstill! What are the oratorical Machtsprüche what our political snake charmers want to conquer the "Lernaean serpent" of the revolution against the effects of the dead biblical character. And yet the government limited mind a not see that not only the godless philosophy but already master Copernicus the Bible taken their reactionary spell power. Copernicus has introduced the physical center of the world, the earth in the number of wandering stars; Copernicus has also displaced the spiritual center of the Christian world, the Bible in the class of erring human books. Weaknesses are the reasons which the Copernican tried to save the divine glory of the Bible. It has long since been refuted the story. "The Holy Spirit can not be separated, even parts that he should a piece of true and the other false teachings or have you believe." Where the Bible has no voice in astronomy because it will soon no longer in other things. How does because even with a false astronomy a true anthropology or psychology? How can you look at the people in the true light when, judged the world to which it belongs only to their bills? But what I am auctioning into the distant sky astronomy to denounce the natural sciences because of

oder glauben lassen.« Wo die Bibel keine Stimme mehr in der Astronomie hat, da hat sie bald auch keine mehr in anderen Dingen. Wie verträgt sich denn auch mit einer falschen Astronomie eine wahre Anthropologie oder Psychologie? Wie kann man den Menschen im wahren Lichte betrachten, wenn man die Welt, zu der er gehört, nur nach ihrem Scheine beurtheilt? Doch wozu versteige ich mich bis in den fernen Himmel der Astronomie, um die Naturwissenschaften wegen ihrer revolutionären Tendenz bei unseren Regierungen zu denunciren? Einen uns weit näher liegenden, eindringlichern und zeitgemässern Beweis von der universellen revolutionären Bedeutung der Naturwissenschaft haben wir an vorliegender neuer Schrift: Lehre der Nahrungsmittel. Für das Volk. Von Jakob Moleschott. Erlangen, Enke. 1850.

Diese Schrift theilt uns mit, in volks- oder, was Eins ist, menschenfreundlicher Absicht und Sprache, die Resultate der modernen Chemie über die Nahrungsmittel, ihre Bestandtheile, ihre Beschaffenheiten, Wirkungen und Veränderungen in unserem Leibe. Sie hat also eigentlich nur einen gastronomischen Zweck und Gegenstand; und doch ist sie eine, und zwar im höchsten Grade, Kopf und Herz aufregende, eine sowohl in philosophischer als ethischer und selbst politischer Beziehung höchst wichtige, ja revolutionäre Schrift.

Ich beginne meine Denunciation mit der Philosophie und behaupte, dass diese Schrift, obgleich sie nur von Essen und Trinken handelt, den in den Augen unserer supranaturalistischen Scheincultur niedrigsten Akten, doch von der höchsten philosophischen Bedeutung und Wichtigkeit ist. Ja, ich gehe weiter und behaupte, dass nur sie die wahren »Grundsätze der Philosophie der Zukunft« und Gegenwart enthält; dass wir in ihr die schwierigsten Probleme der Philosophie gelöst finden. Was haben sich nicht sonst die Philosophen den Kopf zerbrochen mit der Frage von dem Bande zwischen dem Leib und der Seele!

Jetzt wissen wir aus wissenschaftlichen Gründen, was längst das Volk aus der Erfahrung wusste, dass Essen und Trinken Leib und Seele zusammenhält, dass das gesuchte Band also die Nahrung ist. Wie hat man sich nicht sonst über eingeborene oder von aussen gekommene Ideen gezankt und wie verächtlich auf die herabgeblickt, welche den Ursprung der Ideen aus den Sinnen ableiteten! Jetzt ist es uns ebenso unmöglich von eingeborenen Ideen zu reden wie von eingeborenen Speisen oder von eingeborener Wärme, die wirklich einst unter dem Namen calor innatus eine Hauptrolle in der Naturwissenschaft spielte. Jetzt wissen wir, dass die Respiration die hauptsächlichste Quelle der Wärme, dass die Luft ein wesentlicher Theil unserer selbst ist, dass wir alles von aussen pumpen, dass wir nichts zu eigen haben, dass wir als reine Lumpen und

their revolutionary tendency of our governments? A us far more immediate, and eindringlichern zeitgemässern proof of the universal revolutionary importance of science, we have to present new font: teaching of foods. For the people. By Jacob Moleschott. Erlangen, sink. 1850th

This document informs us, in popular or what is One, philanthropic intent and language, the results of modern chemistry about the food, their constituents, their textures, effects and changes in our body. So she has really only a gastronomic purpose and object; and yet it is one, and in the highest degree, head and heart exciting, both in a philosophical than ethical and even political matters most important, even revolutionary writing.

I start my denunciation with the philosophy and claim that this writing, although it is all about eating and drinking, the lowest in the eyes of our supernatural Scheincultur files, but is of the highest philosophical significance and importance. Yes, I'll go further and say that it contains the only true "Principles of Philosophy of the Future" and the present; that we find dissolved in their most difficult problems of philosophy. What have not otherwise philosophers head broken with the question of the relationship between the body and the soul!

Now we know for scientific reasons, which long ago the people knew from experience that eating and drinking keeps body and soul together that the desired band so is the food. How has not otherwise been quarreling over indigenous or has come from outside ideas and how contemptuously looked down upon those which were derived the origin of the ideas from the senses! Now it's us as impossible of innate ideas to talk like native of food or of Aboriginal heat that really once *calor* under the name *innatus* played a major role in science. Now we know that the respiration the principal source of heat that the air is an essential part of our self that we pump everything from the outside, that we have nothing of his own, that we come as pure rags and communists in the world that nothing is in us what not outside of us exists that we capable only of oxygen, nitrogen, carbon and hydrogen, these few, simple and yet so infinitely diverse connection at the end, this ghostly, immediately un- and sensual, yet at and indirectly

Communisten auf die Welt kommen, dass gar nichts in uns ist, was nicht auch ausser uns existirt, dass wir am Ende nur aus Sauerstoff, Stickstoff, Kohlenstoff und Wasserstoff, diesen wenigen, einfachen und doch so unendlich verschiedenartiger Verbindung fähigen, diesen geisterhaften, unmittelbar un- und übersinnlichen und dennoch an sich und mittelbar sinnlichen Stoffen zusammengeflickt sind.

Wie stimmt aber diese Anschauung des Menschen mit der christlichen Welt- und Menschenanschauung? Denn was ist der eigentliche Kern der christlichen, wenigstens dogmatisch-christlichen Lehre? Der: »dass wir existiren könnten allein mit Gott, auch wenn kein Raum, keine Materie wäre, weil unser Wesen nicht den Begriff der Existenz der äusseren Dinge in sich schliesst«; dass der Mensch ein Bild Gottes, d.h. das Wesen ist, welches nur aus sich und in sich d.h. nur aus und in Gedanken besteht, welches keiner Welt, keiner Natur, keiner Materie zu seiner Existenz bedarf: dass also der Mensch noch existirt, auch wenn sein Leib und die materielle Welt überhaupt zugrunde geht.

Und dennoch dulden unsere gutchristlichen Regierungen im christlichen Staate die Naturwissenschaften, insbesondere die allerradikalste, corrosivste und destructivste Wissenschaft, die Chemie, die in ihrem Scheidewasser all die Mysterien der christlichen Weltanschauung aufgelöst hat? Welch' ein ungeheuerer Widerspruch!

Doch kehren wir wieder von den Thorheiten der Politik zur Philosophie zurück. Wie hat nicht der Begriff der Substanz die Philosophie vexirt! Was ist sie? Ich oder Nicht-Ich, Geist oder Natur, oder die Einheit von beiden? Ja, die Einheit. Aber was ist denn damit gesagt? Die Nahrung nur ist die Substanz; die Nahrung die Identität von Geist und Natur. Wo kein Fett, ist kein Fleisch; aber wo kein Fett, da ist auch kein Hirn, kein Geist: und das Fett kommt nur aus der Nahrung. Die Nahrung ist das Spinozistische Hen kaì pân, das Allesumfassende, das Wesen der Wesen. Alles hängt vom Essen und Trinken ab. Die Verschiedenheit des Wesens ist nur Verschiedenheit der Nahrung. Schon in der »Offenbarung der Natur und natürlichen Dinge ... durch den hochgelehrten Hieronymum Cardanum« heisst es übrigens ganz im Widerspruch mit der Offenbarung der Bibel, wo dem Essen und Trinken nur eine frivole Bedeutung gegeben, das Wesen des Menschen als ein vom Essen und Trinken unabhängiges vorgestellt wird: »die Nahrung mögend in alle Naturen die Menschen verenderen. Wölliche nun vil Wildbret und Gewürz in der Speiss brauchen, werden alle grimm und zornig leuth, wölliche kraut essend, werdend

sensual fabrics are patched.

But how true this view of man with the Christian world and human intuition? After all, what is the real core of the Christian, at least dogmatic Christian doctrine? The "that we could exist alone with God, even if no space, no matter would be because our nature does not exclude the notion of the existence of external things in themselves"; that man an image of God, that is the essence of being, which consists only of itself and in itself that is just and in thought, which requires no world, no nature, no matter for its existence: i.e. that man still exists, even if His body and the material world ever perish.

And yet tolerate our gutchristlichen governments in Christian state the natural sciences, especially the allerradikalste, corrosivste and destructivste science, chemistry, has dissolved in their vagina water all the mysteries of the Christian worldview? What a monstrous contradiction!

But we return from the follies of the policy back to philosophy. How has not the concept of substance philosophy vexirt! What is she? I or non-ego, mind or nature, or the unity of the two? Yes, the unit. But what is said by that? The food is the only substance; the food, the identity of spirit and nature. Where no fat, no meat; but where no fat, there is no brain, no ghost: and the fat comes only from food. The food is the Spinoza Hen kai pan, the all-encompassing, the essence of nature. Everything depends on the food and drink. The diversity of nature is diversity of food. Even in the "revelation of nature and natural things ... by the most learned Hieronymum Cardanum" is personalize it completely at odds with the revelation of the Bible, where the food and drink given only a frivolous meaning, the essence of man as a food by and drink is presented independent: "the food liking in all natures people verenderen. Wölliche now vil venison and spice in Speiss need all grim and angry Leuth, wölliche herb eating, becoming milt and tame. "What thorny investigations has not been caused to the philosophers! Is it one or many? One with the thinker but different from the nothingness of thought? Useless questions! Being is one with the food; Its called food; what is eating and being eaten. Food is to be the subjective, thätige eaten that objective, suffering form of existence; Both, however, inseparable. It was only in Essen therefore fulfills the hollow concept of Being and the absurdity of question reveals: whether being and non-identical, ie if food and hunger is the same?

milt und zahm.« Welche dornenvolle Untersuchungen hat nicht das Sein den Philosophen verursacht! Ist es Eines oder Vieles? Eins mit dem Denker aber verschieden von dem Nichts des Gedankens? Unnütze Fragen! Das Sein ist Eins mit dem Essen; Sein heisst Essen; was ist, isst und wird gegessen. Essen ist die subjektive, thätige, gegessen werden die objective, leidende Form des Seins; aber Beides unzertrennlich. Erst im Essen erfüllt sich daher der hohle Begriff des Seins und offenbart sich die Unsinnigkeit der Frage: ob Sein und Nichtsein identisch, d.h. ob Essen und Hungern identisch ist?

Was haben sich nicht die Philosophen mit der Frage gequält: was ist der Anfang der Philosophie? Ich oder Nicht-Ich, Bewusstsein oder Sein? O ihr Thoren, die ihr vor lauter Verwunderung über das Räthsel des Anfangs den Mund aufsperrt und doch nicht seht, dass der offene Mund der Eingang ins Innere der Natur ist, dass die Zähne schon längst die Nüsse geknackt haben, worüber ihr noch heute euch vergeblich den Kopf zerbrecht! Damit muss man anfangen zu denken, womit man anfängt zu existiren. Das Principium essendi ist auch das Principium cognoscendi. Der Anfang der Existenz ist aber die Ernährung; die Nahrung also der Anfang der Weisheit. Die erste Bedingung, dass du etwas in dein Herz und deinen Kopf bringst, ist: dass du etwas in deinen Magen bringst. »A Jove principium« hiess es sonst, aber jetzt heisst es: »a ventre principium«. Die alte Welt stellte den Leib auf den Kopf, die neue setzt den Kopf auf den Leib; die alte Welt liess die Materie aus dem Geiste, die neue lässt den Geist aus der Materie entspringen. Die alte Weltordnung war eine phantastische und verkehrte, die neue ist eine natur- und eben deswegen eine vernunftgemässe. Die alte Philosophie begann mit dem Denken, sie »wusste nur die Geister zu vergnügen und liess darum die Menschen ohne Brod«; die neue beginnt mit Essen und Trinken. Die alte Philosophie hatte daher nichts im Kopfe — »Sein und Nichts ist identisch«, das Nichts ist das Infinitum et indeterminatum negans; Dieu est opposé au néant —: denn wo nichts im Magen, ist auch nichts im Kopfe. Der Kopf ist das Vermögen, zu schliessen; aber die Vordersätze, die Elemente zu diesen Schlüssen liegen in den Speisen und Getränken. Der Geist ist Licht, verzehrendes Feuer, aber der Brennstoff ist der Nahrungsstoff. »Ein voller Bauch studirt nicht gern«; richtig; aber so lange der Bauch voll ist, so lange hat der Kopf auch nichts vom Inhalte des Bauchs. Hirn werden die Speisen erst, wenn sie verdaut, wenn sie Blut geworden sind. Der »volle Bauch« ist also ein alberner Einwand. Es bleibt dabei: der Nahrungsstoff ist Gedankenstoff.

Das Gehirn kann ohne phosphorhaltiges Fett nicht bestehen. ... An das phosphorhaltige Fett ist die

What have not the philosopher tormented with the question: what is the beginning of philosophy? I or non-ego, consciousness or Being? O ye gates, the sheer amazement at the enigma of the beginning unlocks her mouth and yet do not see that the open mouth is the entrance into the interior of the nature that the teeth have already cracked the nuts, what her today to you in vain upside break up! So you have to begin to think, which one begins to exist. The *Principle essendi* is also the *Principle cognoscendi.* But the beginning of existence is the diet; the food so the beginning of wisdom. The first condition is that you bring something in your heart and your head is: that you bring something in your stomach. *"A Jove principium"* it said otherwise, but now it says: *"A Ventre principium"*. The old world turned upside down the body, the new sets his head on the body; the ancient world was the matter of the mind, the new makes the spirit from matter arise. The old world order was a fantastic and perverse generation, the new is a natural and very reason a rational. The old philosophy began to think they "just knew how to have fun and let the spirits about the people without bread"; the new begins with eating and drinking. The old philosophy was therefore nothing in the head - "Being and Nothingness is the same," Nothingness is the *Infinitum et indeterminatum negans; Dieu est au opposé néant* -: because where nothing in the stomach, nothing is even in the head. The head is the ability to close; But the precedents, the elements of these circuits are in the food and beverages. The spirit is light, consuming fire, but the fuel is the food substance. "A full belly studied not like"; right; but as long as the belly is full, as long as the head has nothing of the contents of the abdomen. Brain, the food only if they digested when they have become blood. The "full belly" is therefore a ridiculous comment. The fact remains that the food material is food for thought.

The brain can not exist without phosphorus-containing fat. ... To the phosphorus-containing fat is the origin, hence also established the activity of the brain. ... Without phosphorus no thought ("Teaching the food," S. 115fg.).

Where ever a speculative philosopher think of that? Do not they all explained the thinking of himself, made the mind into an independent, immaterial separate from all matter being? Can not you do not know in a non-existence of the same turns of the material foundations of the mind? Is it any wonder that it still looks so dark in the world,

Entstehung, folglich auch die Thätigkeit des Hirns geknüpft. ... Ohne Phosphor kein Gedanke (»Lehre der Nahrungsmittel«, S. 115fg.).

Wo hat je ein speculativer Philosoph daran gedacht? Haben sie nicht alle das Denken aus sich selbst erklärt, den Geist zu einem selbständigen, stofflosen von aller Materie abgesonderten Wesen gemacht? Haben sie nicht ihr Nichtwissen von den materiellen Grundlagen des Geistes in ein Nichtsein derselben verwandelt? Ist es nun ein Wunder, dass es noch so dunkel in der Welt aussieht, da selbst unsere grössten Denker keinen Phosphor im Kopfe hatten?

Ist es ein Wunder, dass die unsinnigste Vorstellung, die Schöpfung aus Nichts, sogar zu einem heiligen Glaubensartikel und zum »höchsten Problem der speculativen Philosophie« wurde? Was heisst denn aber: »die Welt ist geschaffen aus Nichts« anders als: sie ist geschaffen ich weiss nicht woraus? Was heisst also, an eine Schöpfung oder überhaupt Entstehung aus Nichts glauben? Es heisst an die Heiligkeit und Göttlichkeit der Ignoranz glauben; es heisst die Ignoranz an die Spitze der Welt, der Religion und Wissenschaft stellen. Ein Beispiel hiervon haben wir eben an dem Ernährungsprocess. Dass die Speisen Fleisch und Blut werden, wusste man; aber wie? Das wusste man nicht. Wie löste man nun den Widerspruch zwischen dem bekannten Etwas und dem unbekannten Nichts oder dem Nichts der Unwissenheit? Man schrieb dem Leibe unter dem Namen der Lebenskraft ohne Weiteres die Kraft zu, die Speisen in Blut zu verwandeln, d.h. man dichtete dem Organismus, wenn auch nicht mit Worten, doch der That nach, eine aus Nichts schaffende Kraft an, um so die Wunder der christlichen Dogmatik in Fleisch und Blut umzusetzen.

Aber in der Wirklichkeit verhält es sich ganz anders. Hören wir wie. Ehe wir aber dieses Wie verstehen, müssen wir wissen, warum wir essen und was wir essen oder vielmehr uns aneignen. »Das Leben ist Stoffwechsel« (S. 66). Wir empfangen von der Aussenwelt Stoffe und geben sie wieder zurück, nur in anderer Gestalt, scheiden sie aus. Und je mehr oder weniger wir von uns geben, desto mehr oder weniger müssen wir auch zu uns nehmen. Leider ist aber nicht mit der verminderten Aufnahme von Nahrungsmitteln auch eine verhältnismässige Abnahme der Ausscheidungen verbunden. Wenn wir Nichts zu verzehren haben, verzehren wir uns selbst. Es heisst (S. 62):

»Auch wenn wir uns aller Speise und alles Tranks enthalten, hauchen wir Kohlensäure und Wasser aus, die Ausleerungen von Harn und Koth erfolgen nach wie vor,

since even our greatest thinkers have no phosphorus in the head?

Is it any wonder that the nonsensical notion that creation out of nothing, even a sacred article of faith and the "highest problem of speculative philosophy" has been? What do you mean but "the world is created out of nothing" other than: it's created I do not know what from? So what is to believe in a creation or emergence out of nothing at all? It is said in the sanctity and divinity of ignorance believe; It is the ignorance to the top of the world, religion and science questions. An example of this we have just to the Diet Process. That the food flesh and blood are, you knew; but how?That did not you. So how do you solved the contradiction between the known and the unknown Something Nothing or nothing of ignorance? You wrote the body under the name of vitality easily the power to transform the food into blood, which means you wrote the organism, even if not in words, but indeed for a creative from nothing force, so the miracle the Christian dogma in the flesh implement.

But in reality it is quite different. Let us hear how. But before we understand how this, we need to know why we eat and what we eat, or rather we acquire. "Life's metabolism" (p.66). We received from the outside world materials and give them back, but in a different form, they will be eliminated. And the more or less we give of ourselves, the more or less we have to eat. Unfortunately also a proportionate decrease in precipitations is not connected to the reduced intake of foods. If we have to eat nothing, we eat ourselves, it is stated (page 62):

"Even if we abstain of all food and all potion, we breathe out carbon dioxide and water, the evacuations of urine and faeces take place remains to grow hair, the nails are extended, and sweat and mucus deprive the body of the hour its most important constituents. And if continence continues, then it betrays itself only too soon by a considerable decrease in the weight of our body. "

In addition, p.63:

"If the replacement stops while continue spending, then immediately changes the composition of the tissue, and the blood that buys not only the fabric but also for himself, makes in a few days or if it comes up, in a few weeks bankruptcy. Because of the oxygen we breathe, consumed by blood, falter its revenue. "

die Haare wachsen, die Nägel verlängern sich, und Schweiss und Schleim entziehen dem Körper von Stunde zu Stunde seine wesentlichsten Bestandtheile. Und wenn die Enthaltsamkeit fortdauert, dann verräth sie sich nur zu bald durch eine beträchtliche Abnahme des Gewichts unseres Körpers.«

Ferner S. 63:

»Wenn der Ersatz aufhört, während die Ausgaben fortdauern, dann ändert sich alsbald die Zusammensetzung der Gewebe, und das Blut, das nicht nur für die Gewebe, sondern auch für sich selbst einkauft, macht in einigen Tagen oder, wenn es hoch kommt, in wenigen Wochen Bankrott. Denn der Sauerstoff, den wir einathmen, zehrt vom Blut, dessen Einnahmen stocken.«

Und S. 49:

»Allen Stoffen unseres Körpers wird nämlich Sauerstoff der Luft zugeführt den wir unablässig einathmen. Kein Stoff aber greift mächtiger als der Sauerstoff in das Werden und Vergehen der organischen Verbindungen ein. Vor der anhaltenden Wirkung des Sauerstoffs hat keine organische Verbindung unsers Körpers Bestand.«

Am ersten schwinden unter dem verzehrenden Einfluss des Sauerstoffs die Fette, dann die Muskeln, das Herz, Milz und Leber, am spätesten die Nerven und das Hirn — eine merkwürdige Erscheinung, da sie aus den wandelbarsten Stoffen unsers Körpers, aus Fett und Eiweiss bestehen; eine bis jetzt noch unerklärte Erscheinung, die aber trotzdem das späte Absterben der geistigen Thätigkeit erklärt. Doch die Folgen des Hungerns oder Fastens erstrecken sich noch weiter. Wo die Menge und Mischung des Stoffs, verändert sich auch die Form der Verrichtung.

»Denn ein gemeinsames Band hält Stoff und Form und Verrichtung umschlungen ... Der leichtere Muskel, dessen Fett und Eiweiss geschwunden ist, erscheint als welkes Fleisch, das sich langsam zusammenzieht. Das Herz ist träge, die Zahl der Pulse in der Minute beträchtlich vermindert ... Kleine Reize haben grosse Wirkung. Das Licht thut wehe, ein stärkerer Schall wird unerträglich, eine Berührung erweckt Zorn ... In schlafloser Nacht quält den Hungernden die Gier, der mächtige Hebel so vieler Leidenschaften. Wer zu Aas und Leichen, zum Fleisch seiner Freunde oder zu seinem eigenen Körper greift, der beweist mehr als die Einbildungskraft der Dichter sich vorstellen kann ... Von keinem Triebe wird die Macht des Geistes trauriger besiegt. Der Hunger verödet Kopf und Herz ... Der Hungernde fühlt jeden Druck mit Centnerschwere: darum hat der Hunger mehr Empörungen

And page 49:

"all substances our body oxygen in the air is in fact fed we inhale constantly. No substance but uses more powerful than the oxygen into the growth and decay of organic compounds. Before continuing effect of oxygen has no organic connection of our body stock. "

At first dwindle under the devouring influence of oxygen, the fats, the muscles, the heart, spleen and liver, the latest, the nerves and the brain - a strange phenomenon, because they consist of the change most substances of our body, from fat and protein; an as yet unexplained phenomenon, but nevertheless declared the death of the late spiritual activity. But the consequences of starvation or fasting extend even further. Where the amount and mixture of the substance to the form of performing changed.

"For a common bond holds substance and form and performing entwined ... the lighter muscle, fat and protein which has disappeared, appears as wilted flesh that shrinks slowly. The heart is slow, the number of pulses is reduced considerably in the minute ... Small stimuli have big impact. The light does woe, a stronger sound becomes unbearable, a touch awakens anger ... In a sleepless night the hungry torments the greed, the powerful lever of so many passions. Who accesses carrion and corpses to the meat of his friends or to his own body, which proves more than the imagination of the poet can imagine ... By no shoots the power of the mind is defeated sad. Hunger desolate head and heart ... The Starving feels any pressure with Centnerschwere: why hunger has caused more outrage than the ambition dissatisfied heads ... cold and rigid, the muscles twitching in paralyzed limbs, with a sigh, with a sad eye, blunt sensation, bethörtem judgment, the Tormented fighting the agony, the frequent blackouts put his goal, but sometimes precedes raging delirium "(p. 66-68.)

This the painting of the terrible consequences of unsatisfied hunger, this is the reason of the need for food, this is also the reason why the new world wisdom no longer nothingness in the head, but the void in the stomach - a very real because sensitive Nothing - and to its World Princip makes.

We see at once from this, of which major ethical importance both as a political doctrine of the food for the people. The food is to blood, the blood to the heart and mind to thoughts and sentiments fabric. Human food is the

verursacht als der Ehrgeiz unzufriedener Köpfe ... Kalt und starr, die Muskeln zuckend in gelähmten Gliedern, seufzend, mit trübem Auge, abgestumpfter Empfindung, bethörtem Urtheil, kämpft der Gepeinigte den Todeskampf, dem häufig eine Ohnmacht sein Ziel steckt, bisweilen aber rasendes Irrereden vorausgeht.« (S. 66-68.)

Dies das Gemälde von den schrecklichen Folgen des unbefriedigten Hungers, dies der Grund des Nahrungsbedürfnisses, dies auch der Grund, warum die neue Weltweisheit nicht mehr das Nichts im Kopfe, sondern das Nichts im Magen — ein sehr reelles, weil empfindliches Nichts — zu ihrem und der Welt Princip macht.

Wir sehen zugleich hieraus, von welcher wichtigen ethischen sowohl als politischen Bedeutung die Lehre von den Nahrungsmitteln für das Volk ist. Die Speisen werden zu Blut, das Blut zu Herz und Hirn, zu Gedanken und Gesinnungsstoff. Menschliche Kost ist die Grundlage menschlicher Bildung und Gesinnung. Wollt ihr das Volk bessern, so gebt ihm statt Deklamationen gegen die Sünde bessere Speisen. Der Mensch ist was er isst. Wer nur Pflanzenkost geniesst, ist auch nur ein vegetirendes Wesen, hat keine Thatkraft.
…
Indess ist es nicht genug, dass wir unter dem Volk, welches ja längst vor der Entdeckung der thierisch-vegetabilischen Substanz der Hülsenfrüchte aus der Erfahrung die Wichtigkeit derselben, besonders der Linsen, erkannt hat, Propaganda für den Erbsenstoff machen, um durch die Salze und phosphorsaueren Alkalien, die in den Hülsenfrüchten in so reichlicher Menge enthalten sind, das faule Kartoffelblut des deutschen Volks wieder in Bewegung zu setzen. Auch wir, die wir unverdienterweise so glücklich sind, nicht allein von Kartoffeln zu leben, müssen die Lehre der Nahrungsmittel zu unserer Richtschnur nehmen, wenn wir einen guten Grund zu einer neuen Revolution legen wollen.

Die Diät ist die Basis der Weisheit und Tugend, der männlichen, muskelkräftigen, nervenstarken Tugend; aber ohne Weisheit und Tugend gedeiht keine Revolution. Lassen wir uns daher vor Allem durch die Politik, so niederschlagend und ekelerregend sie auch jetzt ist, nicht den Appetit zum Essen und Trinken verderben; aber mässigen wir den Genuss durch die Kenntniss der Nahrungsstoffe, wie sie uns hier der Verfasser mittheilt, wenngleich uns die Empfindung von ihren Wirkungen längst gesagt hat, was uns die Chemie lehrt. Aber die Aufgabe des Menschen ist eben, den Grund der Empfindung zu entdecken, den Gegenstand der

foundation of human culture and mentality. Do you want to improve the people, so give him instead of declamations against sin better food. You are what you eat. Who enjoys only plant-based diet, is also just a vegetirendes beings, has no deed force.
...
However, it is not enough that we do among the people, which has long been the importance of the same, especially the lenses recognized from experience, before the discovery of the brutish-vegetable substance of legumes, propaganda for peas substance to and through the salts phosphorus aueren alkalis contained in the legumes in such large quantities, to put the rotten potato blood of the German people moving again. Even we who are undeservedly so happy, not only to live on potatoes, have to take the doctrine of the food to our guide, if we want to lay a good foundation for a new revolution.

The diet is the basis of wisdom and virtue, male, muscular strong, strong nerves virtue; but without wisdom and virtue prospers no revolution. Let us therefore mainly due to the policy, so depressing and disgusting it is now, do not spoil your appetite for food and drink; but we even benefited by the knowledge of nutrients, as here the author imparts us, although we the sensation has long been said of their effects, which teaches us that chemistry. But the task of man is precisely the reason for the feeling to discover, to raise the subject of the sensation to the subject of knowledge. Not with prayer, to be enjoyed with knowledge, is human. But we can the author not into follow up in its dietetics and dissection of each food, drinks and spices: but anyone scholars, the man is more than the book, every artist, every craftsman, every teacher, every father, every housewife, this book as an indispensable, as a book that has all the conditions that are required for a healthy, appropriate their terms, both physical as spiritual nourishment.

Remarks:

** Slightly abridged version; the cuts were made with "..." indicated.*

(1) The governments make giant strides. A few weeks after this was written, the newspapers carried the news that the Prussian government was looking for in the head of a deer after the draft terrible Komplots. To realize our

Empfindung zu einem Gegenstand des Wissens zu erheben. Nicht mit Gebet, mit Erkenntniss zu geniessen, ist menschlich. Doch wir können dem Verfasser nicht bis in seine Diätetik und Zergliederung der einzelnen Speisen, Getränke und Gewürze hineinfolgen: empfehlen aber jedem Gelehrten, dem der Mensch mehr ist als das Buch, jedem Künstler, jedem Handwerker, jedem Lehrer, jedem Vater, jeder Hausfrau, dieses Buch als ein unentbehrliches, als ein Buch, welches alle die Bedingungen aufweist, welche zu einer gesunden, ihrem Begriffe entsprechenden, sowohl leiblichen als geistigen Nahrung erfordert werden.

Anmerkungen:

* Leicht gekürzte Fassung; die Kürzungen wurden mit "…" kenntlich gemacht.

(1) Die Regierungen machen Riesenfortschritte. Wenige Wochen nachdem dieses niedergeschrieben war, brachten die Zeitungen die Nachricht, dass die preussische Regierung in dem Kopfe eines Hirsches nach dem Entwurf eines furchtbaren Komplots gesucht habe. So verwirklichen unsere Regierungen selbst die tollsten Träume der Phantasie!

(2)Diesen Uebergang zur Demokratie hat schon der berühmte Physiolog Haller den jetzigen Naturforschern zur Pflicht gemacht. Haller schrieb drei politische Romane. Der erste handelt von der Despotie oder absoluten Monarchie, der zweite von der constitutionellen Monarchie, der dritte von der aristokratischen Republick. Was hätte nun nothwendig folgen sollen? »Le tableau d’une democratie parfaite«, wie schon Condorcet in seinem »Éloge de Mr. de Haller« bemerkt. Aber diese Consequenz scheiterte an der Berner Aristokratie, deren Mitglied Haller selbst war. Der jetzige Naturforscher ist jedoch an diese Lokalschranke nicht mehr gebunden. Er hat den Fehler Haller’s gutzumachen. Uebrigens lasse ich nicht umsonst den Naturforscher nach Amerika hinüberblicken, und womöglich selbst hinübergehen; denn es ist noch sehr in Frage, ob Europa, wenigstens in einem voraussichtlichen Zeitraum, einer wahren Umgestaltung und Verjüngung fähig sei. Gewohntes Uebel ist dem Menschen lieber als ungewohntes Neues, wenngleich es ein Gut ist. Ueberdies erfordert eine neue Zeit auch einen neuen Raum. Ortsveränderung gehört zur Sinnesänderung. Auf dem alten Boden haften auch die alten Sünden. Deutschland oder, was Eins ist, Europa, in eine Republik verwandeln wollen, kommt mir oft gerade so vor, als wenn man eine Dirne, die schon allen Potentaten gedient, in eine Jungfrau verwandeln wollte. Es giebt keine religiösen, aber auch keine moralischen und politischen Wunder.

governments, even the wildest dreams of the imagination!

(2) this transition to democracy has already made the famous physiologist Haller to present naturalists compulsory. Haller wrote three political novels. The first deals with the despotism or absolute monarchy, the second of the constitutional monarchy, the third of the aristocratic Republick. What would now be necessary to follow? " *Le tableau d'une democratie parfaite* ", as already Condorcet in his" *Éloge de Mr. de Haller* noticed ". But this consequence was thwarted by the Bernese aristocracy whose member Haller himself was. The current naturalist, however, no longer bound by this local barrier. He has to make up for mistakes Haller's. Besides, I will not for nothing the naturalist to America over look, and perhaps go over itself; because it is still very much in question whether Europe, at least in a foreseeable period of time, a true transformation and rejuvenation was capable. Familiar Uebel is the people rather than unusual new, although it's a good. Besides this requires a new time and a new space. Change of location is part of the change of mind. On the old ground adhere the old sins. Germany or what is One, Europe, want to turn into a republic, I often happens just as if you wanted to turn a prostitute who already served all potentates, in a virgin. There is no religious, but also no moral and political miracle.

(add discussion)

Quotes | Nitric acid

The following are nitric acid related quotes:

> "It is true: writing brings forth in the lives of many humans just such destructive results, like Ottilie in Goethe's *Elective Affinities*, through whose appearance the fortune of a satisfying life is ruined."
>
> — Ludwig Feuerbach (1834), *Abelard and Heloise* (Aphorism #42) [2]

> "Just as god, substance, and trinity are 'nothing but' the projections of human consciousness, so is man nothing but a combination of chemical elements. And yet our so-called Christian government, says Feuerbach, permits the natural sciences, and in particular the most revolutionary of all, chemistry, to go on researching, investigating, and attacks philosophy, when the philosophical debates are being dissolved by the nitric acid of chemistry."
>
> — Marx Wartofsky (1977), *Feuerbach* (O)

> "Feuerbach saw the scientific revolution coming; it would be a time that would 'dissolve the Christian world-view in nitric acid'."
>
> — William Newell (1986), *The Secular Magi* (O)

> "After the failure of the political revolution of 1848, it was Feuerbach who prophesied another—successful—revolution, which would be speeded up by the natural sciences, the radical, corrosive natural sciences, especially chemistry. Although reactionary governments, with their limited range of vision, had not noticed the fact, that the natural sciences had 'long before dissolved the Christian world view in nitric acid'. The philosopher, himself drawn to the natural sciences but continually falling back on theology, insisted that philosophy should be linked no longer with theology but with the natural sciences."
>
> — Hans Jung (1990), *Freud and the Problem of God* [4]

> "Christians … hadn't they heard, as one skeptic famously put it, that modern science had already dissolved Christianity in a vat of nitric acid."
>
> — Lee Strobel (2004), reflective monologue, with citation to Feuerbach, on being sent in 1974 to report on the West Virginia hillbilly bombings and shootings over certain non-Christianity conforming textbooks being used in public schools [3]

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θΔics

In famous publication, ***The Next Million Years*** is a 1952 book written by English physicist C.G. Darwin , wherein his "introduction" chapter he defines the subject of human thermodynamics as the statistical mechanics of human molecules, a very revolutionary and modern view, even in the modern day.

In short, Darwin's book is first-ever published document outlining a theory using the terms "human thermodynamics" and "human molecule" in unison, as discussed in his 16-page Introduction chapter. [1]

The book was reprinted in 1953 and 1973. *The Next Million Years* is one of the founding books in the history of human thermodynamics.

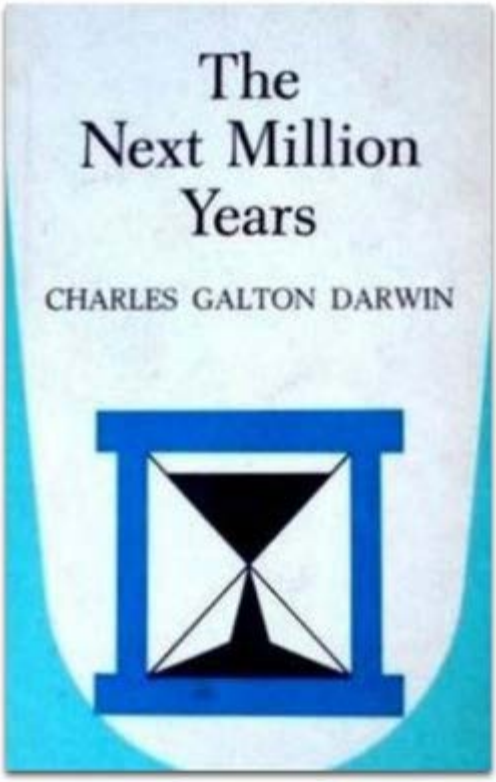

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1952, 209-page book ***The Next Million Years*** by English physicist C.G. Darwin, in the famous Introduction chapter (pgs. 13-28) of which he outlines "human thermodynamics", a subject he defines as the statistical mechanics of conservative dynamical systems of human molecules.

Etymology

The title of the book takes its name from C.G. Darwin's knowledge that it takes a million years for a new species to form.

Overview

In short, Darwin argued that humans were molecules, that assemblies of humans constituted "conservative dynamical systems", and that one could use statistical thermodynamics, particularly American mathematical physicist Willard Gibbs version of it, to predict the course of the next million years of human evolution.

In his book, according to a 1953 review by *Time* magazine, Darwin, a theoretical physicist, invades sociological territory where many sociologists fear to tread. [2] He bases his reasoning about man's future on what is sometimes called "social physics": the idea that the behavior of humans in very large numbers can be predicted by the statistical methods that physicists use with large numbers of molecules.

Accordingly, in the gas phase, the motions of single molecules are unpredictable: they may move fast or slow and zigzag in any direction, but the impacts of billions of gas molecules against a restraining surface produce a steady push that obeys definite and rather simple laws. In the same manner, Darwin believes, the actions of individual humans are erratic and sometimes remarkable, but the behavior of large numbers of them over long periods of time is as predictable as the pressure of gas. All that is needed is to determine the basic, averaged-out properties of human "molecules."

In Darwin's view, according to the review, "human molecules have one fundamental property that dominates all others: they tend to increase their numbers up to the absolute limit of their food supply". [2]

Notes

The book, as of 2010, seems to be out of print and the in demand original copies sell for as much as $395 dollars.

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External links

● The Next Million Years – Infowars.Wikia.com.

θΔics

In famous publications, ***The Phenomenon of Man*** or *Le Phenomene Humain*, is a 1938 book by French philosopher-theologian Pierre Teilhard that attempts to synthesize a view that integrates the anthropocentric concepts of consciousness, spirit, and purpose, with evolution, chemistry, and physics, and in particular the second law of thermodynamics. It is one of the first books to utilize a "human molecule" perspective, in great detail. The centerpiece of the book is the omega point theory, which argues that humanity is evolving towards a type of global or universal united consciousness. [1]

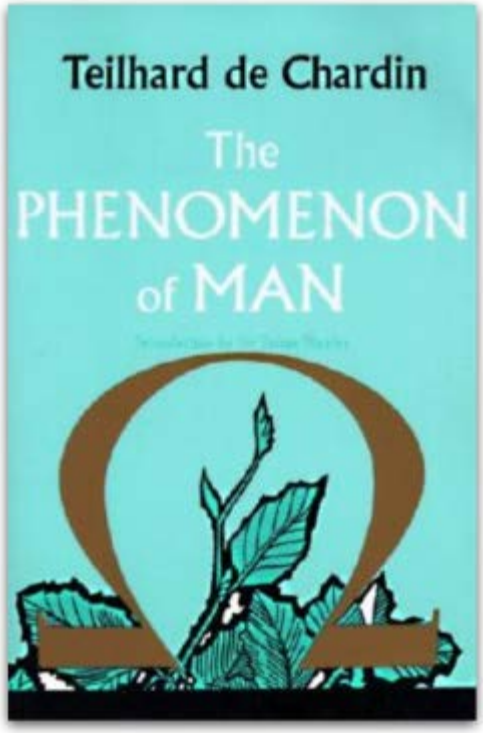

2002 Perennial-edition reprint of the *The Phenomenon of Man*, with an introduction by Julian Huxley. [1]

The book was written in a series of personal articles by Teilhard said to date predominately to the year 1938, but rejected for publication by the Church, and only published post-humorously in 1955 as *Le Phenomene Humain*, and translated in English in 1959, with a revised English translation in 1965.

Influence

In modern times, *The Phenomenon of Mant* has a near-cult following, as it is the representative archetype crossover book to those who would wish to integrate materialism view, with the mind-body dualism view, with new age types of spiritualism view, to yield a 'spiritual materialism' view of evolution. An example of this is American philosopher Christian de Quincey's 2002 *Radical Nature*, who states that he was 'awestruck' the first time he came across *The Phenomenon of Man*, and his updated view that consciousness extends all the way down the evolutionary ladder. [2]

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External links

â— The Phenomenon of Man – Wikipedia.

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In famous publications, **“The Scientific Work of Gustav Adolph Hirn, in 7 Chapters (1845-1888)”** is a 1893 article, 56-pages in length, on the life, work, and thermodynamic philosophy of French physicist Gustave Hirn, by English engineer Bryan Donkin, in which the terms "human thermo-dynamics" and “human thermodynamics” were coined. [1]

Overview

(add synopsis)

References

1. Donkin, Bryan. (1893). “The Scientific Work of Gustav Adolph Hirn in 7 Chapters (1845-1888)” (pgs. 145-201); Picture of Hirn, (pg. 144); Chapter V: Human thermodynamics, pg. 176-83)”, *Transactions of the Manchester Association of Engineers* (table of contents: human thermo-dynamics, pg. 176). Herald & Walker Printers.

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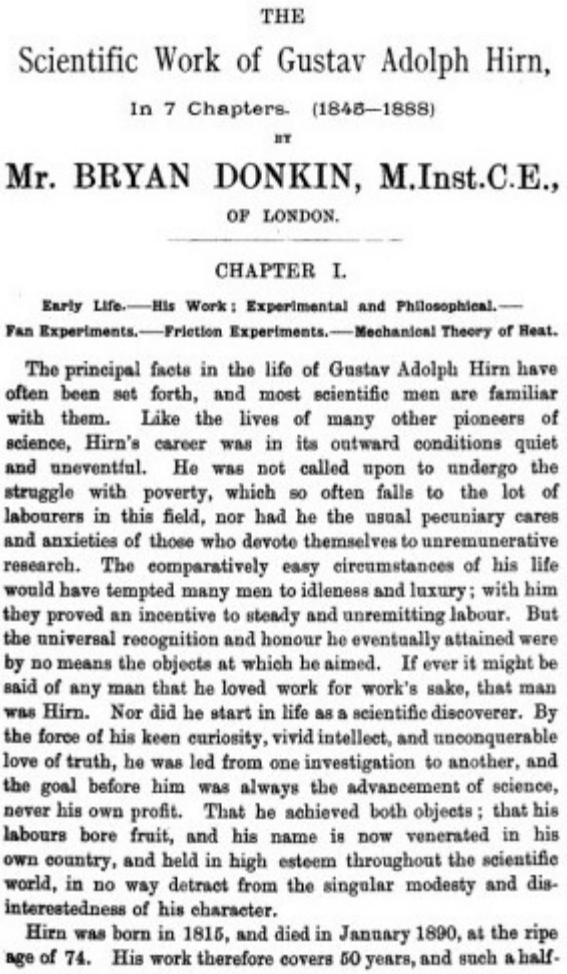

THE

Scientific Work of Gustav Adolph Hirn,

In 7 Chapters. (1845—1888)

BY

Mr. BRYAN DONKIN, M.Inst.C.E.,

OF LONDON.

CHAPTER I.

Early Life.—His Work; Experimental and Philosophical.—Fan Experiments.—Friction Experiments.—Mechanical Theory of Heat.

The principal facts in the life of Gustav Adolph Hirn have often been set forth, and most scientific men are familiar with them. Like the lives of many other pioneers of science, Hirn's career was in its outward conditions quiet and uneventful. He was not called upon to undergo the struggle with poverty, which so often falls to the lot of labourers in this field, nor had he the usual pecuniary cares and anxieties of those who devote themselves to unremunerative research. The comparatively easy circumstances of his life would have tempted many men to idleness and luxury; with him they proved an incentive to steady and unremitting labour. But the universal recognition and honour he eventually attained were by no means the objects at which he aimed. If ever it might be said of any man that he loved work for work's sake, that man was Hirn. Nor did he start in life as a scientific discoverer. By the force of his keen curiosity, vivid intellect, and unconquerable love of truth, he was led from one investigation to another, and the goal before him was always the advancement of science, never his own profit. That he achieved both objects; that his labours bore fruit, and his name is now venerated in his own country, and held in high esteem throughout the scientific world, in no way detract from the singular modesty and disinterestedness of his character.

Hirn was born in 1815, and died in January 1890, at the ripe age of 74. His work therefore covers 50 years, and such a half-

Opening page of chapter five of English engineer Bryan Donkin's 1893 article: "The Scientific Work of Gustav Adolph Hirn."

In famous publications, **"The Second Law of thermodynamics"** or "Der Zweite Hauptsatz der Mechanischen Wärmetheorie" is a May 29, 1886 lecture by Austrian physicist Ludwig Boltzmann presented at the 'Festive Session' of the the Imperial Academy of Sciences in Vienna in which a laymanized discussion of the second law was given with special emphasis on its application in relation to Charles Darwin's 1859 theory of evolution.

Struggle for entropy

The most-quoted passage from the lecture, stated rather cryptically, is that life is a struggle for entropy: [1]

> "The general struggle for existence of animate beings is not a struggle for raw materials – these, for organisms, are air, water and soil, all abundantly available – nor for energy, which exists in plenty in any body in the form of heat *Q*, but of a struggle for entropy, which becomes available through the transition of energy from the hot sun to the cold earth."

To note, there is a bit of translation issue in this quote as to whether Boltzmann spoke about entropy or free energy as the focus of the "struggle", as discussed further below.

Darwin

Another famous statement made by Boltzmann was that he gave his opinion that in the future, the 19th century will be seen as the century of the theory of evolution and of the mechanical theory of heat: [5]

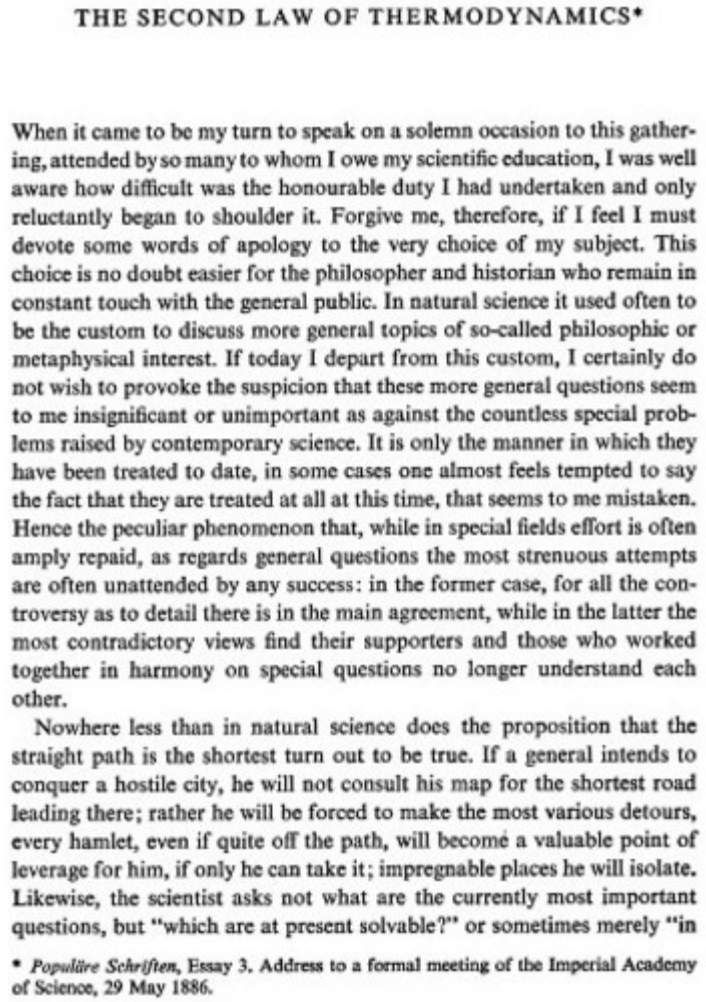

THE SECOND LAW OF THERMODYNAMICS*

When it came to be my turn to speak on a solemn occasion to this gathering, attended by so many to whom I owe my scientific education, I was well aware how difficult was the honourable duty I had undertaken and only reluctantly began to shoulder it. Forgive me, therefore, if I feel I must devote some words of apology to the very choice of my subject. This choice is no doubt easier for the philosopher and historian who remain in constant touch with the general public. In natural science it used often to be the custom to discuss more general topics of so-called philosophic or metaphysical interest. If today I depart from this custom, I certainly do not wish to provoke the suspicion that these more general questions seem to me insignificant or unimportant as against the countless special problems raised by contemporary science. It is only the manner in which they have been treated to date, in some cases one almost feels tempted to say the fact that they are treated at all at this time, that seems to me mistaken. Hence the peculiar phenomenon that, while in special fields effort is often amply repaid, as regards general questions the most strenuous attempts are often unattended by any success: in the former case, for all the controversy as to detail there is in the main agreement, while in the latter the most contradictory views find their supporters and those who worked together in harmony on special questions no longer understand each other.

Nowhere less than in natural science does the proposition that the straight path is the shortest turn out to be true. If a general intends to conquer a hostile city, he will not consult his map for the shortest road leading there; rather he will be forced to make the most various detours, every hamlet, even if quite off the path, will become a valuable point of leverage for him, if only he can take it; impregnable places he will isolate. Likewise, the scientist asks not what are the currently most important questions, but "which are at present solvable?" or sometimes merely "in

* *Populäre Schriften*, Essay 3. Address to a formal meeting of the Imperial Academy of Science, 29 May 1886.

First page to Ludwig Boltzmann's famous 1886 lecture on the second law of thermodynamics.

> "If you ask me about my innermost conviction whether our century will be called the century of iron or the century of steam or electricity, I answer without hesitation: it will be called the century of the mechanical view of nature, the century of Darwin."

In basing his ideas on struggle Boltzmann gives his opening opinion in his essay that the achievement that will put its stamp on the 19th century will be English naturalist Charles Darwin's 1859 *Origin of Species*.

Free energy

Curiously, in the works of both German chemist Walther Nernst (1893) and Romanian mathematician Nicholas Georgescu (1971), they both commented that in German version of this essay Boltzmann argued to the effect that "free energy", rather than entropy, which is the object of the struggle in life. Nernst comments: [3]

> "Strife is not for the component substances, for these component substances of all organism, as air, water, and earth, are abundant; neither is the strife for energy as such, for this occurs in abundance, as the heat content of matter of our environment; but strife is for the **free energy** available for the performance of work."

Likewise, Georgescu-Roegen comments: [4]

> "Life does not feed on mere matter and mere energy but—as Schrodinger aptly explained—on low entropy. The seed of this idea goes back to Boltzmann who was the first to point out that **free energy** is the object of the struggle for life."

It is difficult, however, to actually find Boltzmann using the term "free energy" in this essay, meaning that this may be a German→English translation issue? He does, to note, cite Hermann Helmholtz (who introduced the term free energy as the measure of affinity in 1882) and discuss energy set free in the context of chemical affinity.

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θΔics

In famous publications, **"The Story of the Contented Molecule"** is a 1941 children's story Empedocles-style anecdotal advertisement, promoted by Quaker State Motor Oil, of how people in crowds are like molecules in a oil and how there are satisfied and unsatisfied molecules and why certain oils are better than others, based on their respective stabilities and the rate at which they will break down. [1]

Human chemistry

In the modern 21st century human chemistry view, it is known that humans are molecules, i.e. human molecules, and that humans due tend to separate into separate boundaried groups just as due oil and water, a subject discussed in integration and segregation thermodynamics and racial thermodynamics. [2] Beyond this, a number of things can be learned from this so-called "children's story". Some of these are listed below as points of discussion.

Birth of molecules

The articles states that dissatisfied molecules are ones "born" without all its atoms. The first correction to this statement is that molecules are not born, but rather synthesized.

The second underlying correction to this anthropomorphic label is that not only are molecules not born, but in addition molecules do not "die" and are not "alive" or "living", but rather can only be defined using standard chemistry terms such as animated, reactive, inert, etc; an issue that is slowly being addressed in the 2009 defunct theory of life. [5]

Dissatisfied molecules

The definition of dissatisfied molecules as one that lack certain atoms seems to hold up, as modeled on Abegg's rule and the octet rule, being that atoms (or atoms of molecules) tend to seek bonds that satisfy an outer shell valence electron configuration of eight electrons. [3]

The desire to be different

It is said that the dissatisfied molecule is always trying to become something different because he knows he isn't right in some way. This form the most part is correct, similar to above, in that when atoms (or atoms of molecules) are dropped into a reactive system they will migrate, move, and react in the direction that will most satisfy their

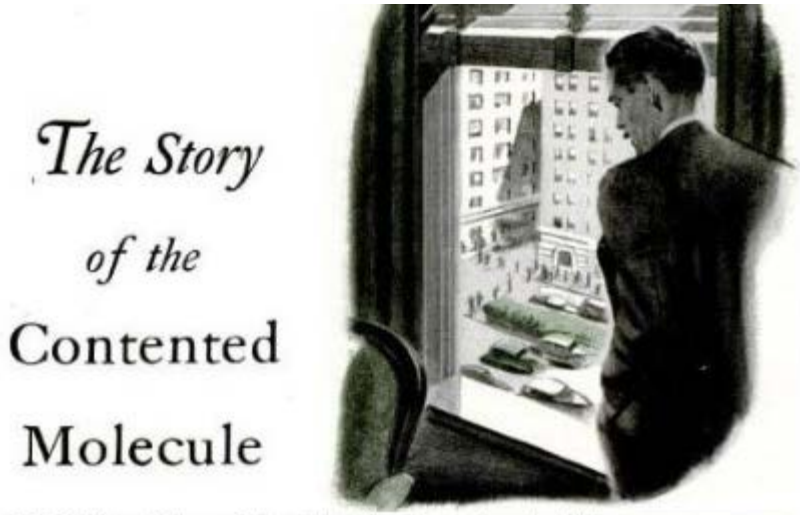

The Story of the Contented Molecule

WHEN you look out of the window of a high building at the crowd in the street, it is just a crowd. But when you get down on the sidewalk, you see that the crowd is made up of different kinds of people. Some are tall. Some are short. Some are fat. Some are thin. Some of them get pleasure by giving crumbs to sparrows; others by tying cans to dogs' tails. It takes all kinds of people to make a crowd, and we could use more of some kinds and less of others.

When you see oil pouring into the crankcase of your car, you think of it as just oil. But that oil is made up of molecules, and these molecules differ from each other just as people do.

* * *

Here's a Dissatisfied Molecule.

He has an inferiority complex because he was born without all of his atoms, and he is always trying to become something different because he knows he isn't right.

* * *

Here you see a Contented Molecule.

He is good oil. And knows it. And all he ever wants to do is to go on being good oil . . . doing the best he can to make up for the shortcomings of the Dissatisfied Molecules.

* * *

NOW the first thing, when they got into the crankcase, the Dissatisfied Molecule started getting into trouble. He found a tiny drop of water and a loose atom of carbon, and started mucking around with them. Next thing you knew, he had his hands all over a sticky substance which he smeared on the oil screen as he went through.

"Aw shucks," you say, "what harm can that one little molecule do? Just a little harmless mischief."

But don't forget, if there are billions like him, pretty soon the oil screen and the crankcase are covered with sludge, and then there's real trouble.

* * *

Meantime, the Contented Molecule had climbed onto a piston and was happily riding up and down. It was all he wanted to do for the rest of his life.

* * *

After making the sludge, the Dissatisfied Molecule discovered a new game. He found that by adding an atom of oxygen to a bit of the sludge and getting it good and hot, he could make a kind of sticky, brown varnish which he brushed on the sides of the engine. And if you think that was just innocent fun, you should have heard his evil laugh when rings and pistons stuck.

* * *

And all this time the Contented Molecule was just riding up and down on his piston; smoothing things out and doing his best to overcome the trouble that the Dissatisfied Molecule was making.

* * *

As you might expect, the Dissatisfied Molecule came to no good end. Torn by envy and malice, he divided and became several more Dissatisfied Molecules, none of which was half as good as the first one, and goodness knows *that* was bad enough.

* * *

And the Contented Molecule just rode up and down.

* * *

IF you read this story aloud to your children, they will begin to understand why some oils are so much better than others. Why some oils break down quickly, so that you frequently must add more quarts. Why some oils form sludge and varnish. Why some oils give safer protection and make cars last longer.

And also they will understand Quaker State's new stabilizing process which gives Quaker State Motor Oil a uniquely stable molecular structure. Try the New Stabilized Quaker State. Go to any dealer who displays the familiar green-and-white Quaker State sign. Ask the service man to drain and refill your crankcase with...*Stabilized Quaker State*. Quaker State Oil Refining Corporation, Oil City, Pennsylvania.

***STABILIZED* QUAKER STATE MOTOR OIL**

THE OIL OF CHARACTER

The **"The Story of the Contented Molecule"** advertisement as found in a 1941 issue if *Life*. [1]

affinities, which for simple rows two and three elements equates to the "desire" of atoms to seek bonds that will enable them to form a noble gas valence electron configuration. This same desire-behavior is said to explain the underlying motives of human behaviors, as loosely outlined in the 2009 article "Neuro Octet Trajectory Theory" by American chemical engineer Libb Thims. [4]

Good, bad, and evil molecules

The story alludes to the premise that there are "good oils" and "bad oils" or rather good and bad molecules, which extrapolates to the idea that there are so-called "evil" molecules; likewise "some oils [or molecules] are better than other", supposedly based on the logic that molecules who break down faster or less stable in the long run are worse or bad, comparatively speaking.

Moreover, the good-bad dichotomy runs against the grain of the Utopian motto that all people are created equal, such as was famously held to be "self-evident" according to Thomas Jefferson in his drafting of the Constitution of the United States. [6] Here we see, conversely, that it is not so easily self-evident at the chemical level.

The article alludes to the idea that certain reactions, such as the autoxidation chemical reaction between oil and oxygen, to make varnish is "evil", particularly when it produces an undesired affect and gums up the piston.

What harm can one little molecule do?

The story states that one dissatisfied molecule can get into "trouble", such as by finding a drop of water or a loose atom of carbon, and then, before long, if there are billions like him have a situation covered in sludge.

Here we may offer the famous example of the one little "human molecule" Bosnian Serb Gavrilo Princip, a dissatisfied student, who in 1914, by shooting Archduke Franz Ferdinand, according to social physicist Marc Buchanan, singlehandedly started a global chain reaction that launched WWI leaving ten million dead five years later. [7]

Happy molecules

The article alludes to the idea that there are ways to define the state of a molecule as being in a happy state, such as riding up and down on a piston, similar to a child riding up and down on a teeter-totter. Two ways in which thinkers have gone about quantifying and modeling happiness of human molecules is by (b) bond count, i.e. wherein bond count has been found to be proportional to one's happiness level, and (b) the flow state (a state of productive work output), such as is quantified in Jungian-style psychological entropy Csíkszentmihályi flow theory.

Overcoming troubles

It is said that the contented molecules have to do their best to overcome the troubles produced by the uncontented molecules. There may be some truth in this statement, explained by Fritz Lipmann's 1941 free energy coupling theory as applied to social interactions, on the logic that strongly energy releasing human chemical reactions reactions ($\Delta G << 0$) work to drive weakly-going reactions ($\Delta G \approx 0$) as well as reactions that would never go on their own ($\Delta G > 0$), such as has been outlined in global inter-country economic terms by Robert Kenoun (*Theory of History and Social Change*), in local economic terms by Octavian Ksenzhek (*Money: Virtual Energy*, 2007), and in interpersonal and familial human molecular relationship terms by Libb Thims (*Human* Chemistry, 2007).

Envy and malice

The parable of the story is that bad molecules (or dissatisfied molecules) get what they have coming to them, so to speak, and that no good can come out of their situation. This seems to be saying that good will always prevail in the end, or something to this effect (or something along the lines of karma existing in chemical systems).

The story states that the bad molecules become torn by envy and malice, whereby resultantly one bad molecule multiplies into gangs of bad molecules, each precipitate or copy, however, being half as good as the original bad template molecule.

These last two contentions are difficult to merit out in terms of correctness or not?

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θΔics

In famous publications, ***The System of Nature: Laws of the Moral and Physical World*** is a 1770 anonymously-published book by Baron d'Holbach, retrospectively characterized as the first-main and greatest "Atheist's Bible", wherein thorough-going, science-based, religion-destroying (or religion-reformulating), materialistic atheism is presented.

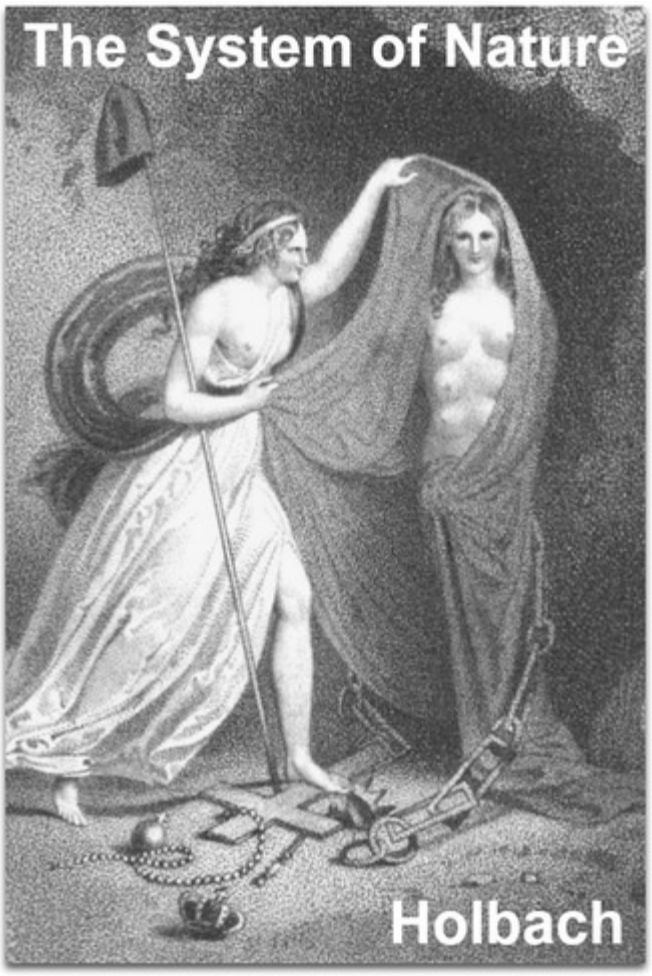

The cover (O) to 1795 William Hodgson English translation of Baron d'Holbach's ***The System of Nature*** (1770), showing a woman, possibly symbolic of nature or "mother nature", unveiling a statur of a second woman, with six breasts, possibly alluding to evolution and or a hidden nature, the first of whom is standing on a Cristian cross, which is shackled to the floor, along with some rosary beads, holy water, a crown, and religious hat of some kind.

Soul | Moving Principle

See also: Soul terminology upgrades

The following are Holbach's views on the soul, which he equates to an historical term embodying the "moving principle" within a human or the "motive principle" that acts within a person:

> "Thus, in consequence of man's reasoning upon false principles, the **soul, or moving principle within him**, as well as the concealed moving principle of nature, have been made mere chimeras, mere beings of imagination."
>
> — Baron d'Holbach (1770), *The System of Nature* (§7, pg. 51)

> "When it is said, that man is not a free agent, it is not pretended to compare him to a body moved by a simple impulsive cause: he contains within himself causes inherent to his existence; he is moved by an interior organ, which has its own peculiar laws, and is itself necessarily determined in consequence of ideas formed from perceptions resulting from sensations which it receives from exterior objects. As the mechanism of these sensations, of these perceptions, and the manner they engrave ideas on the brain of man, are not known to him; because he is unable to unravel all these motions; because he cannot perceive the chain of operations in his **soul, OR the motive principle that acts within him**, he supposes himself a free agent; which, literally translated, signifies, that he moves himself by himself; that he determines himself without cause: when he rather ought to say, that he is ignorant how or for why he acts in the manner he does."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 97)

He continues with the following:

> "It is true the soul enjoys an activity peculiar to itself: but it is equally certain that this activity would never be displayed, if some motive or some cause did not put it in a condition to exercise itself: at least it will not be pretended that the soul is able either to love or to hate without being moved, without knowing the objects, without having some idea of their qualities. Gunpowder has unquestionably a particular activity, but this activity will never display itself, unless fire be applied to it; this, nowever, immediately sets it in motion."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 97)

Here, we see Holbach comparing the activation of the soul or internal moving principle to the activation of the gunpowder the motion that results therefrom, which connect the soul to activation energy; other quotes:

> "An organized being may be compared to a clock, which, once broken, is no longer suitable to the use for which it was designed. To say, that the soul shall feel, shall think, shall enjoy, shall suffer, after the death of the body, is to pretend, that a clock, shivered into a thousand pieces, will continue to strike the hour, and have the faculty of marking the progress of time."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 118)

(add)

Anti-chance | Absolute determinism

See main: Holbach's demon; See also: Laplace's demon

Holbach, in his §4: "Of the Laws of Motion common to all the Beings of Nature—of Attraction and Repulsion—of Inert Force—of Necessity", stated the following very-ripe anti-chance (or non-chance) view of a dust storm and a political revolution:

> "Two examples will serve to throw the principle here laid down, into light—one shall be taken from **physics**, the other from **morals**. In a whirlwind of dust, raised by elemental force, confused as it appears to our eyes, in the most frightful tempest excited by contrary winds, when the waves roll high as mountains, **there is NOT a single particle of dust, or drop of water, that has been placed by 'chance'**, that has not a cause for occupying the place where it is found; that does not, in the most rigorous sense of the word, act after the manner in which it ought to act; that is, according to its own peculiar essence, and that of the beings from whom it receives this communicated force. A **geometrician exactly knew the different energies acting in each case**, with the properties of the particles moved, could demonstrate that after the causes given, each particle acted precisely as it ought to act, and that it could not have acted otherwise than it did.
>
> In those terrible convulsions that sometimes agitate political societies, shake their foundations, and frequently produce the overthrow of an empire; there is not a single action, a single word, a single thought, a single will, a single passion in the agents, whether they act as destroyers, or as victims, that is not the necessary result of the causes operating; that does not act, as, of necessity, it must act, from the peculiar essence of the beings who give the impulse, and that of the agents who receive it, according to the situation these agents fill in the moral whirlwind. This could be evidently proved by an understanding capacitated to rate all the action and re-action, of the minds and bodies of those who contributed to the revolution."

Here, to clarify, firstly we see Holbach jettisoning the Greek chance-based version of atomic theory. Secondly, we note that this sharp passage predates the more famous variant given by Pierre Laplace, aka "Laplace's demon", given three years later (1773); Hugh Roberts (1997), in respect to how Percy Shelley, supposedly, read both versions, copying the above Holbach version in his notes, summarizes this as follows: [8]

> "Holbach's *Systeme de la nature* dates from 1770, whereas the paper that contains Laplace's most famous statement of absolute determinism, 'Research on the Integration of Differential Equations with Finite Differences and their use in the Theory of Randomness' ('Recherches sur I'integration des equations differentielles aux differences finies et sur leur usage dans la theore des hasards'), was read to the Royal Academy in 1773, and published in 1776 (Oeuvres completes, vol. 8). Shelley also refers to Laplace in his

notes, and had evidently read his *Systeme du monde* (Hutchinson, 809)."

Roberts, among others (Q), refer to this as Holbach's demon or Holbach's demonic "intelligence". [8] Holbach, following this sharp digression, states the following:

> "It may, perhaps, be in the arid plains of Lybia, that are amassed the first elements of a storm or tempest, which, borne by the winds, approach our climate, render our atmosphere dense, and thus operating on the temperament, may influence the passions of a man, whose circumstances shall have capacitated him to influence many others, who shall **decide after his will** the fate of many nations."

This, as it is popularly known, in modern terms, has been dubbed the "butterfly effect" by James Gleick (1997).

> "Would it not be a thousand times better to depend upon blind matter, upon a nature destitute of intelligence, upon chance, or upon nothing?"
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 200) (see: god replacement) [8]

> "In seeing the world, we acknowledge a material cause of those phenomena which take place in it; and this cause is nature, of whom the energy is shown to those who study her. **Let us not be told, that, according to this hypothesis, we attribute every thing to** a 'blind cause', to the 'fortuitous concurrence of atoms'; to 'chance'. We only call those blind causes, of which we know not the combination, the power, and the laws. We call fortuitous, those effects of which we are ignorant of the causes, and which our ignorance and inexperience prevent us from foreseeing. We attribute to chance, all those effects of which we do not see the necessary connection with their causes. Nature is NOT a blind cause; she does NOT act by chance; NOTHING that she does would ever be fortuitous to him who should know her mode of acting, her resources, and her course. Every thing which she produces is necessary, and is never more than a consequence of her fixed and constant laws; every thing in her is connected by invisible bands (see: bond), and all those effects which we see flow necessarily from their causes, whether we know them or not."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 234)

(add)

Fate

Holbach , in his §6: "Of the System of Man's Free Agency", citing Seneca, conjoins the following two statements:

> "The same necessity which regulates the physical, also regulates the moral world, in which every thing is in consequence submitted to fatality. **Man**, in running over, frequently without his own knowledge, often in despite of himself, the route which nature has marked out for him, **resembles a swimmer who is obliged to follow the current that carries him along**: he believes himself a free agent, because he sometimes consents, sometimes does not

consent, to **glide with the stream**, which, notwithstanding, always hurries him forward; he believes himself the master of his condition, because he is obliged to use his arms under the fear of sinking."

— Baron d'Holbach (1770), *The System of Nature* (pg. 102)

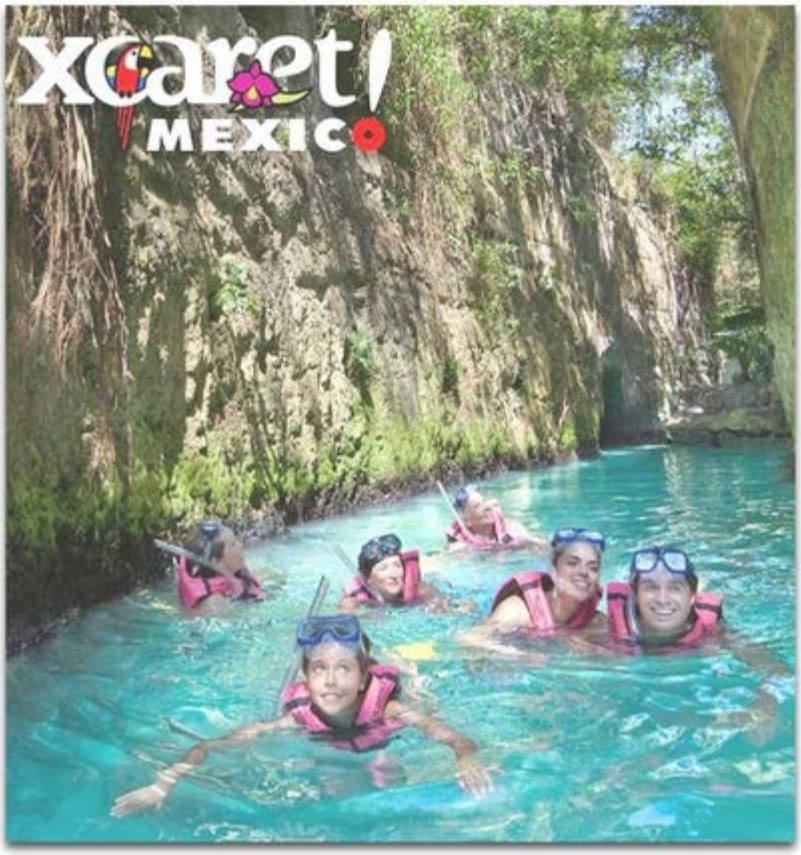

A photo of a family **swimming and or "floating"** in the current of the underground fresh water rivers of Xcaret Park (O), a natural network of channels, i.e. a natural waterpark (O), which circulate under the Yucatan Peninsula, Mexico.

"Fate leads the willing and drags the unwilling."

— Seneca (c.55BC), Epistulae (107.11) (O); after Cleanthes (c.250BC); cited by Baron d'Holbach (1770) in *The System of Nature* (pg. 102)

(add)

Life | Animate matter

In respect to how inanimate matter can pass into the state of animate matter, Holbach addresses the issue as such:

"If filings of iron, sulphur, and water be mixed together, these bodies thus capacitated to act on each other, are heated by degrees, and ultimately produce a violent combustion. If flour be wetted with water, and the mixture closed up, it will be found, after some lapse of time, (by the aid of a microscope) to have produced organized beings that enjoy life, of which the water and the flour were believed incapable: it is thus that inanimate matter can pass into **life, or animate matter**, which is in itself only an assemblage of motion. Reasoning from analogy, which the philosophers of the present day do not hold incompatible, the production of a man, independent of the ordinary means, would not be more astonishing than that of an insect with flour and water."

— Baron d'Holbach (1770), *The System of Nature* (pg. 20)

Here, we see Holbach vacillating intelligently on the terms "life" or "animate matter"; gets into the issue of life terminology upgrades. Very good digression, however, for this point in history (see: defunct theory of life).

Motion

The following are the key segments, from §2: Of Matter and its Origin, on motion, whether be it a stone or a human:

> "When it is said, it is the *essence* of a **stone to fall**, it is the same as saying, that its descent, is the necessary effect of its gravity, of its density, of the cohesion of its parts, of the elements of which it is composed. In short, the *essence* of a being, is its particular, its individual nature."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 16)

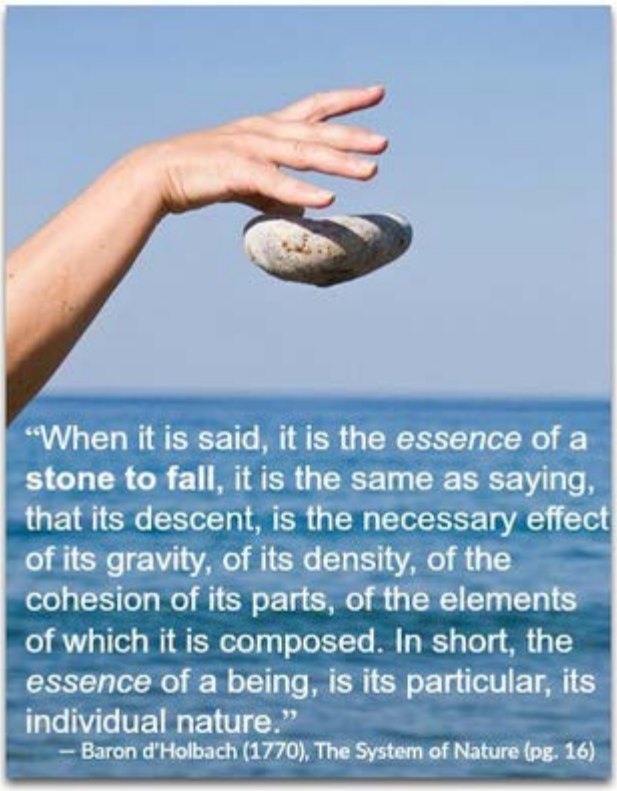

Holbach on a stone vs human (see: rock vs human) in respect to motion and its two types: motion of mass and internal or concealed motion.

> "Motion an effect by which a body either changes, or has a tendency to change its position: that is to say, by which it successively corresponds with different parts of space, or changes its relative distance to other bodies."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 16)

> "A *cause* is a being which puts another in motion, or which produces some change in it. The *effect* is the change produced in one body by the motion or presence of another."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 16)

> "Those which cannot act on any of our organs, either immediately and by themselves, or mediately, by the intervention of other bodies, exist not for us; since they can neither move us, nor consequently furnish us with ideas: they can neither be known to us, nor of course be judged of by us. **To know an object, is to have felt it; to feel it, it is requisite to have been moved by it**."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 16)

Here, to pause, let us reference the following:

> "The **only thing which can be directly perceived by the senses is force**, to which may be reduced light, heat, electricity, sound and all the other things which can be perceived by the senses."
>
> — James Maxwell (1847), age 16 answer to homework exercise for Scottish philosopher William Hamilton (1788-1856) on the properties of matter [6]

> "Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body remains at rest. In this case the force performs no work. But **as soon as the body moves under the influence of the force, work is performed**."
>
> — Rudolf Clausius (1875), "Mathematical Introduction"

This last statement by Clausius, to clarify, is a verbal formulation of the principle of the transmission of work. The gist

of these three last quotes seems to be digging around at the social first law of motion, or something to this effect. To continue:

> "**To see, is to have been moved by something acting on the visual organs**; to hear, is to have been struck by something on our auditory nerves. In short, in whatever mode a body may act upon is, whatever impulse we may receive from it, we can have no other knowledge of it than by the change it produces in us."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 16)

> "**From the continual action and re-action** [see: third law of motion] **of these beings, result a series of causes and effects**; or a chain of motion guided by the constant and invariable laws peculiar to each being; which are necessary or inherent to its particular nature—which make it always act or move after a determinate manner."
>
> — Baron d'Holbach (1770), *System of Nature* (pg. 16)

Next, Holbach attempts to differentiate between two types of motion:

> "Our senses bring us generally acquainted with two sorts of motion in the beings that surround us: the one is the motion of the mass, by which an entire body is transferred from one place to another. Of the motion of this genus we are perfectly sensible.—Thus, we see a stone fall, a ball roll, an arm move, or change its position. The other is an internal or concealed motion, which always depends on the peculiar energies of a body: that is to say, on its *essence*, or the combination, the action, and re-action of the minute—of the insensible particles of matter, of which that body is composed."
>
> — Baron d'Holbach (1770), *System of Nature* (pg. 17)

(add)

Will & Motion

Holbach digs into the 'will' in the context of his motion model of things as follows:

> "That motion which is excited in a body, that contains within itself the causes of those changes we see it undergo, is called 'spontaneous'. Then it is said, this body acts or moves by its own peculiar energies. Of this kind is the motion of the man who walks, who talks, who thinks. Nevertheless, if we examine the matter a little closer, we shall be convinced, that, strictly speaking, there is no such thing as spontaneous motion in any of the various bodies of nature; seeing they are perpetually acting one upon the other; that all their changes are to be attributed to the causes, either visible or concealed, by which they are moved. The **will of man** is secretly moved or determined by some exterior cause that produces a change in him: we believe he moves of himself, because we neither see the cause that determined him, the mode in which it acted, nor the organ that it put in motion."
>
> — Baron d'Holbach (1770), *System of Nature* (pg. 17)

This is pretty sharp logic, to say the least; here, again, we recall Maxwell:

> "I cannot help thinking about the immediate circumstances which have brought a thing to pass, rather than about any 'will' setting them in motion. What is done by what is called myself is, I feel, done by something greater than myself in me."
>
> — James Maxwell (1879), "Comment to Fenton Hort when terminally ill" [7]

(add)

Plato

On Plato, and also of Pythagoras, Holbach is unforgiving:

> "Plato, the **great creator of chimeras**, says that 'those who admit nothing but what they can see and feel, are stupid and ignorant beings, who refuse to admit the reality of the existence of invisible things'. Our theologians hold the same language to us: our European religions, have visibly been infected with the reveries of the Platonists, which evidently are no more than the result of obscure notions, and of the unintelligible metaphysics of the Egyptian Chaldean, and Assyrian priests, among whom Plato drew up his pretended philosophy. Our theologians, still guided by the enthusiasm of Plato, discourse with their followers only of *spirit; intelligent, incorporeal substances; invisible powers; angels; demons of mysterious virtues; supernatural effects; divine inspiration; innate ideas,* &c., *&c.*""
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 219)

> "Whoever will take the trouble to read the works of Plato and his disciples, such as Proclus, Jamblicus, Plotinus, &c. will find in them almost all the doctrines and metaphysical subtilties of the Christian teleology. Moreover, they will find the origin of the *symbols*, the *rites*, the *sacraments*, in short, of the *theurgy*, employed in Christian worship, who, as well in their religious ceremonies as in their doctrines, have done no more than follow, more or less faithfully, the road which had been traced out for them by the *priests* of *paganism.* With respect to the ancient philosophy, with the exception of that of Democritus and Epicurus, it was, for the most part, a true *theosophy*, imagined by the Egyptian and Assyrian priests: Pythagoras and Plato have been no more than theologians, filled with enthusiasm, and perhaps with knavery. At least, we find in them a *sacerdotal* and mysterious mind, which will always indicate, that they seek to deceive or that they are not willing men should be enlightened. It is in *nature*, and not in *theology*, that we must draw up an intelligible and true philosophy."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 220)

(add)

Publication

In c.1768, Baron d'Holbach finished a draft of his *The System of Nature*, which he showed to Denis Diderot.

In 1770, d'Holbach, after smuggling it across the border into Amsterdam to be published, under a pseudonym (Q), under the name "Jean-Baptiste de Mirabaud", a deceased member of the French Academy of Science, e.g. see the 1795 English translation by William Hodgson (Q), then shipped it back to France, where it debuted anonymously as *The System of Nature*, soon-to-be-dubbed the "Atheist's Bible" (Q)(Q); the book was banned and publicly burned. [5]

Initially, of note, the anonymous work was attributed to Helvetius and Honore Mirabeau. [1]

Translation | Issues

Of note, there is a 1795 English translation by William Hodgson (1745-1851) (Q)(Q), an 1820 three-volume mis-

aligned theistic-rendering English translation by Samuel Wilkinson, and there is an 1835 (1969/1889) proper atheistic-rendering English translation by American free thinker H.D. Robinson (O); comparative excerpts from the latter two are shown below, wherein severe translation issues, one of many, are apparent:

Theistic Translation | Wilkinson (1820)

"Thus, in consequence of man's reasoning upon false principles; of having relinquished the evidence of his senses; the **moving principle within him, the concealed author of motion**, has been made a mere chimera, a mere being of the imagination."

— Baron d'Holbach (1770), *The System of Nature* (§7, pg. #., 1820 Wilkinson translation) [9]

Free Thinker Translation | Robinson (1835)

"Thus, in consequence of man's reasoning upon false principles, the **soul, or moving principle within him**, as well as the concealed moving principle of nature, have been made mere chimeras, mere beings of imagination."

— Baron d'Holbach (1770), *The System of Nature* (§7, pg. 51., 1835 Robinson translation) [1]

Firstly, in short, avoid the Wilkinson translation. Secondly, of note, the 1835 H.D. Robinson translation is subtitled "new and improved edition, with notes by Denis Diderot", but many of the footnotes refer to people and incidents well past the reaction end of Denis Diderot (1713-1784), e.g. mention of the 1829 interactions of Robert Taylor and Richard Carlile. These "notes" then would seem to have been made by Robinson.

Goethe

In 1770-1771, Goethe, as a student at the University of Strasbourg, reacted to the work as follows

> "Finally, there is an often-quoted estimate of d'Holbach's work from a very different quarter. In *Poetry and Truth* (*Wahrheit unit Dichtung*, Book XI), Goethe speaks of his studies at Strasbourg and remarks that out of curiosity he and his friends had a look at the ***System of Nature***. 'We could not conceive how such a book could be dangerous. It appeared to us so grey, so Cimmerian, so corpse-like that we had difficulty in enduring its presence and shuddered before it as before a spectre'. To Goethe, d'Holbach's work seemed to deprive nature and life of all that is precious."
>
> — Frederick Copleston (2003), *The Enlightenment: Voltaire to Kant* (pg. 50)

Another translation, by Will Durant (1965), reads as follows: [2]

> "Holbach's ***System of Nature*** appeared to us [students at Strasbourg] so dark, so deathlike, that we found it a trouble to endure its presence, and shuddered at it as a specter."

(add)

Shelley

In 1793, William Godwin, the father of Mary Shelley (wife of Percy Shelley), published *Political Justice*, which was influenced by the Holbach, Helvetius, and Jean Rousseau, respectively. [3]

In 1806, Percy Shelley, age 16, entered Oxford University, where his favorite amusements were chemistry, microscopic investigations, and boating; before the end of the year, he married Mary Shelley in the "Church of Elective Affinities", as Mary retrospectively referred to things.

Sometime therein, or shortly thereafter, Shelley read *System of Nature*, and then began to translate as a means of enlisting the Oxford dons in the campaign against religion; Shelley, supposedly, dates his atheism start from his reading Holbach's *System of Nature*. [3]

In 1811, Shelley, age 19, inspired, also, in part, by the proto-atheism work of Benedict Spinoza, wrote, together with Thomas Hogg, a college friend, albeit published anonymously, a 13-page pamphlet "The Necessity of Atheism", which resulted to be so controversial that it got him expelled from Oxford.

Quotes | Employed

The following are quotes employed in *The System of Nature*:

> "We must expect death with tranquility, seeing that it is only a dissolution of the elements of which each animal is composed."
>
> — Marcus Aurelius (c.175AD), *Meditations* (Book 2); cited by Baron d'Holbach (1770) in *The System of Nature* (pg. 130)

> "We believe that that which is, will always be, and that the same causes will have the same effects."
>
> — Thomas Hobbes (c.1650), *Publication*; cited by Baron d'Holbach (1770) in *The System of Nature* (pg. 124)

Quotes | On

The following are quotes on *The System of Nature*:

> "There was no wit, no shadow, no nuance, no multi-sidedness, no art, no pleasure or erotic play to be found in its pages. It denied god, argued that all religions were created out of fear, ignorance, and anthropism; that souls did not outlive the body; that the world was determined by strict laws."
>
> — Denis Diderot (c.1768), comment to someone on early draft of Holbach's *The System of Nature* [4]

> "Holbach's ***System of Nature*** is the most able exposition of theological absurdities ever written."
>
> — Author (c.1771), "Advertisement" to *The System of Nature* [1]

> "Holbach's ***System of Nature*** contains the most comprehensive description of materialism and atheism in the entire history of philosophy."
>
> — Will Durant (1965), *The Story of Civilization, Volume 9 – The Age of Voltaire* [3]

> "***The System of Nature*** is an incendiary device ticking bomb."
>
> — Rebecca Scott (2013), *Darwin's Ghosts: in Search of the First Evolutionists* [4]

Quotes | By

The following are noted quotes by Holbach in *System of Nature*:

> "We must show them its charms, that we may disgust them with that disgraceful worship, which leads them into errors."

— Baron d'Holbach (c.1770), title page quote (Q) to 1795 William Hodgson English translation

"The source of man's unhappiness is his ignorance of nature."

— Baron d'Holbach (1770), *System of Nature* (opening preface sentence, pg. viii)

"If man must have chimeras, let him at least learn to permit others to form theirs after their own fashion."

— Baron d'Holbach (1770), *System of Nature* (preface, pg. x)

"The beings which he pictures to himself as above nature [see: supernatural], or distinguished from her, are always chimeras formed after that which he has already seen, but of which it is impossible he should ever form any correct idea, either as to the place they occupy, or of their manner of acting."

— Baron d'Holbach (1770), *The System of Nature* (pg. 10)

"The distinction which has been so often made between the *physical* and the *moral* man is evidently an abuse of terms. Man is a being purely physical: the moral man is nothing more than this physical being considered under a certain point of view, that is to say, with relation to some of his modes of action, arising out of his particular organization."

— Baron d'Holbach (1770), *The System of Nature* (pg. 10)

"The *enlightened man*, is man in his maturity, in his perfection; who is capable of pursuing his own happiness; because he has learned to examine, to think for himself, and not to take that for truth upon the authority of others, which experience has taught him examination will frequently prove erroneous."

— Baron d'Holbach (1770), *The System of Nature* (pg. 12)

"The universe, that vast assemblage of every thing that exists, presents only matter and motion : the whole offers to our contemplation nothing but an immense, an uninterrupted succession of causes and effects; some of these causes are known to us, because they strike immediately on our senses; others are unknown to us, because they act upon us by effects, frequently very remote from their original cause."

— Baron d'Holbach (1770), *The System of Nature* (pg. 13)

"This truth—that every thing in the universe is in motion; the essence of matter is to act: if we consider its parts attentively, we shall discover that not a particle enjoys absolute repose; those which appear to us to be without motion, are, in fact, only in relative or apparent rest; they experience such an imperceptible motion, and expose it so little on their surfaces, that we cannot perceive the changes they undergo—which is still denied by many metaphysicians, has been conclusively established by the **celebrated Toland**, in a work which appeared in the beginning of the eighteenth century, entitled *Letters to Serena.* Those who can procure this scarce work will do well to refer to it, and their doubts on the subject, if they have any, will be removed."

— Denis Diderot (1770), note (pg. 18) to Baron d'Holbach's §2: Of Motion and its Origin of *The System of Nature* [6]

"Of those who ask, why does not nature produce new beings, we inquire in turn how they know that she does not do so. What authorizes them to believe this sterility in nature? Do they know whether, in the combinations she is at every instant forming, nature is not occupied in producing new beings without the cognizance of these observers? Who told them whether nature be not now assembling in her **vast laboratory the elements** fitted to give rise to wholly new generations, that will have nothing in common with the species at present existing. What absurdity, then, would there be in supposing that man, the horse, the fish, the bird, will be no more? Are these animals so indispensable to nature that without them she cannot continue her eternal course? **Does not all change around us**? Do we not ourselves change? Nature contains no constant forms."

— Baron Holbach (1770), *The System of Nature* (pg. 46); variant, supposedly, found in the third edition of Jean Sales' 1777 *The Philosophy of Nature* (PI, pgs. 215): "It is reasonable to suppose that nature has: 'sucked successively every degree of the large scale' [pacouru successivement tous les degres de la grande echelle]"; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pgs. 269, 366)

"Those who wish to form an idea of the shackles imposed by theology on the genius of philosophers born under the 'Christian dispensation', let them read the **metaphysical romances** of Leibniz, Descartes, Malebranche, Cudworth, etc., and coolly examine the **ingenious but rhapsodically** systems entitled: the pre-established harmony of occasional causes; physical pre-motion, etc."

— Denis Diderot (1770), note (pgs. 51-52) to Baron d'Holbach's *The System of Nature* (1889)

"It is evident that the notion of *spirits*, imagined by savages and adopted by the ignorant, is calculated to retard the progress of knowledge, since it precludes our researches into the true cause of the effects which we see, by keeping the human mind in apathy and sloth. This state of ignorance may be very useful to crafty theologians, but very injurious to society. This is the reason, however, why in all ages priests have persecuted those who have been the first to give natural explanations of the phenomena of nature— as witness: Anaxagoras, Aristotle, Galileo, Descartes—and, more recently, Richard Carlile, William Lawrence, Robert Taylor, and Abnet Kneeland; to which we may add the name of the learned and venerable Thomas Cooper M. D., lately president of Columbia College. South Carolina."

— H.D. Robinson (1770), notes (pg. 53) to Baron d'Holbach's *The System of Nature* (1889)

"What is life, except it be the assemblage of modifications, the congregation of motion, peculiar to an organized being? Life in a body is the totality of its motion; feeling and thought make a part of this motion: thus, in the dead man, these motions will cease like all the others."

— Baron d'Holbach (1770), *The System of Nature* (pg. 118)

"**Laws, as necessary as those which gave him birth, will make him return into the bosom of nature from whence he was drawn**, in order to reproduce him afterwards under some new form, which it would be useless for him to know: without consulting him, nature places him for a season in the order of organized beings; without his consent, she will oblige him to quit it to occupy some other order."

— Baron d'Holbach (1770), *The System of Nature* (pg. 121)

"Let them speak of immortality to intrepid and noble souls; let them show it as the price of their labors to energetic minds, who, springing forward beyond the boundaries of their actual existence, **are little satisfied** with eliciting the admiration and with gaining the love of their contemporaries, but are determined also to wrest the homage, to secure the affection of **future races**. Indeed, **there is an immortality to which genius, talents, virtue, have a just right to pretend;** do not therefore let them censure or endeavour to stifle so noble a passion in man, which is founded upon his nature, and from which society gathers the most advantageous fruits."

— Baron d'Holbach (1770), *The System of Nature* (pg. 133) (see: posthumous genius)

"If the ignorance of nature gave birth to such a variety of gods, the knowledge of this nature is calculated to destroy them."

— Baron d'Holbach (1770), *The System of Nature* (pg. 174) (Q); employed by Percy Shelley (1811) in *The Necessity of Atheism* (pg. #)

"Montaigne says 'Man is not able to be other than he is, nor imagine but after his capacity; let him take what pains he may, he will never have a knowledge of any soul but his own.' Xenophanes said, 'If the ox or the elephant understood either sculpture or painting, they would not fail to represent the divinity under their own peculiar figure; that in this, they would have as much reason as Polyclitus or Phidias, who gave him the human form.' It was said to a very celebrated man that 'god made man after his own image'; 'Man has returned the compliment', replied the philosopher; and L'amotte le Vayer used to remark, that 'theanthropy (Q) was the foundation of every system of Christianity'."

— Baron d'Holbach (1770), *The System of Nature* (pg. 181)

"Let us banish from the man of genius the chimera which makes him waste his time."

— Baron d'Holbach (1770), *The System of Nature* (pg. 298)

"Abandon your chimeras; occupy yourselves with truth; learn the art of happy living; perfect your morals, your governments, and your laws; look to education, to agriculture, and to the sciences that are truly useful; labor with ardor. If you must have chimeras, permit your fellow-creatures to have theirs also; and do not cut the throats of your brethren, when they cannot rave in your own manner. If the infirmities of your nature require an invisible crutch, adopt such as my suit your humor, select those which you may think most calculated to support your tottering frame. Do not let these 'imaginary beings' detract from or upset your relations with the 'real beings' around you."

— Baron d'Holbach (1770), *System of Nature* (pgs. 298-99); note: "chimeras" is a Jean Meslier chapter title; cited by Jennifer Hecht (2003) in *Doubt: a History* (pgs. 353-54)

"Indeed, what is an atheist? He is a man, who destroys chimeras prejudicial to the human species, in order

to reconduct men back to nature, to experience, and to reason. He is a thinker, who, having meditated upon matter, its energy, its properties, and its modes of acting, has no occasion, in order to explain the phenomena of the universe, and the operations of nature, to invent ideal powers, imaginary intelligences, beings of the imagination."

— Baron d'Holbach (1770), *The System of Nature* (pg. 300; compare pg. 359)

"It belongs, then, to candor, to **disinterestedness**, and to reason, to judge whether the natural principles, which have been here brought forward, be destitute of foundation; it is to these upright judges, that a disciple of nature submits his opinions; he has a right to except against the judgment of enthusiasm, of presumptuous ignorance, and interested knavery."

— Baron d'Holbach (1770), *The System of Nature* (pg. 303); compare Goethe (1814) on Spinoza's *Ethics*: "what especially riveted me to him, was the utter *disinterestedness*, which glowed in his every sentence"

"Indeed, many theologians, in despite of those invectives with which they attempt to overwhelm atheists, appear frequently to have doubted whether any existed in the world, or if there were persons who could honestly deny the existence of a god. Their uncertainty was, with was without doubt, founded upon the absurd ideas which they ascribe to their adversaries, whom they have unceasingly accused of attributing everything to *chance*, to *blind* causes, to *dead* and *inert* matter, incapable of acting by itself. We have, I think, sufficiently justified the partisans of nature, from these ridiculous accusations; we have, throughout the whole, proved, and we repeat it, that *chance* is a word devoid of sense, which, as well as the word *god*, announces nothing but an ignorance of true causes."

— Baron d'Holbach (1770), *The System of Nature* (pgs. 303-304); see: Reddit post (Q)

"The gods once destroyed, there remain, in the minds of some atheists, no longer any bonds to connect mortals."

— Baron d'Holbach (1770), *The System of Nature* (pg. 310)

"The peaceable Epicurus never disturbed Greece; the poem of Lucretius caused no civil wars in Rome; Bodin was not the author of the league; the writings of Spinoza have not excited the same troubles in Holland, as the disputes of Gomar and d'Arminius. Hobbes did not cause blood to flow in England."

— Baron d'Holbach (1770), *The System of Nature* (pgs. 311-312)

"What, indeed, is an atheist? He is one who destroys delusions which are harmful to humanity in order to lead men back to nature, to reality, to reason. He is a thinker who, having reflected on the nature of matter, its energy, properties and ways of acting, has no need of idealized powers or imaginary intelligences to explain the phenomena of the universe and the operations of nature."

— Baron d'Holbach (1770), *The System of Nature* (pg. 359; compare pg. 300) [5]

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θΔics

In famous publications, **"The Teaching of Pure Political Economy and Social Mechanics"** is a March-April 1900 four-page report by Polish social-economist Leon Winiarski describing the outlines of a new experimental course on applied thermodynamics in sociology, economics, and politics that was being taught at the University of Geneva, during the previous six years (1894-1900), the fortuitousness of this teaching method being advocated to other universities. The following is the key paragraph of the report wherein Winiarski mentions the incorporation of thermodynamics: [1]

> **"**Turning to the dynamic part of the problem, we gave a definition of social-biological energy in two forms: potential (hunger and love) and kinetic (economic, political, legal, moral, aesthetic, religious, and scientific). This led us to the principles of thermodynamics, including the third, the Clausius same time explains the progressive spiritualization any closed social aggregate to show a decrease in potential. This dissipation of entropy that occurs is the same in the social world as in the physical world.**"**

The report is part of Winiarski's collected text *Essay on Social Mechanics*. [2] The English translation is shown in full below, which seems to have been done by American sociologist Lester Ward, the general editor of the journal in which the translation is found. [3] This paper is similar, to note, to American historian Henry Adams 1910 *A Letter to American Teachers of History*, advocating the teaching of thermodynamics in history courses.

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L'ENSEIGNEMENT

DE L'ÉCONOMIE POLITIQUE PURE

ET DE LA MÉCANIQUE SOCIALE

Toute science a deux parties : une partie rationnelle, pure, qui étudie la forme la plus générale et abstraite des phénomènes respectifs et une partie appliquée qui étudie leur forme concrète et détaillée. La distinction rigoureuse entre ces deux parties, acceptée dans les sciences physiques, tend de plus en plus à s'introduire dans le domaine des sciences sociales.

Pour l'enseignement, cette distinction est de première importance en habituant pratiquement les étudiants aux nécessités logiques d'une méthode vraiment scientifique et en leur facilitant la conception claire et méthodique des faits. Elle les prépare en même temps au travail indépendant et personnel en leur fournissant des procédés d'investigation sûrs et nécessaires pour toute recherche productive.

Des logiciens de premier ordre comme MM. les professeurs Ad. Naville, Goblot et d'autres, nous montrent avec raison qu'il est désormais impossible d'opposer la méthode de la physique, de la psychologie ou de la sociologie à celle des mathématiques aussi absolument qu'on le faisait autrefois. Les procédés du physicien, du psychologiste ou du sociologiste ressemblent toujours plus à ceux du mathématicien, à mesure qu'ils se perfectionnent.

Toutes les sciences ont une partie abstraite qui étudie les rapports entre des concepts. Ces sciences de lois ont du reste un point de départ expérimental. Les mathématiques ont eu au début une phase tout empirique ; ce n'est qu'avec le développement ultérieur qu'elles ont pris une apparence de plus en plus aprioristique : les constructions rationnelles refoulent dans l'ombre les données d'observation, qui n'en existent pas moins.

Dès maintenant, dans certaines parties de la physique, la construction rationnelle a un rôle non moins grand que l'observation. Le développement de la psychologie et de la sociologie va du même côté. De telle façon que sans diminuer l'importance de la partie

Original French title page to Leon Winiarski's 1900 report "The Teaching of Pure Political Economy and Social Mechanics", outlining the teaching of thermodynamics in sociology, economics, and politics at the University of Geneva. [1]

Report

REPORT OF M. WINIARSKY.
Introduction note (by translator): The report of Dr. Leon Winiarsky, of the University of Geneva, mentioned above (supra, p. 1492) by M. Suter, on the teaching of pure political economy and social mechanics in Switzerland, assumes a special importance in view of M. Gide's remark (supra, p. 1469), pointing out the lack in France of any treatment of the social sciences from the point of view of method, and calling attention to the advance in this direction that has been made in Switzerland. Walras and Pareto, of the University of Lausanne, and Winiarsky, of the University of Geneva, constitute a strong school of pure or theoretical economics and sociology, based on mathematics. As this report gives a brief account of the history and present status of methodological social science, it deserves a place here:

"The teaching of pure political economy and social mechanics in Switzerland"

by Dr. Leon Winiarsky, privat-doccnt at the University of Geneva

Every science has two sides: A rational or pure side, which studies the most general and abstract form of the respective phenomena, and an applied side which studies their concrete and detailed form. The rigorous distinction between these two divisions, accepted in the physical sciences, is tending more and more to be introduced into the domain of the social

sciences.

For purposes of instruction this distinction is of the first importance in practically accustoming students to the logical necessity of a truly scientific method and in facilitating the clear and systematic conception of the facts. It prepares them at the same time for independent personal work by furnishing them methods of investigation that are sure and necessary to any productive research.

Logicians of the first rank, like Professors Ad. Naville, Goblot, and others, show us with reason that it is henceforth impossible to employ, as absolutely as was formerly done, a method in physics, psychology, and sociology opposed to that of mathematics. The processes of the physicist, the psychologist, and the sociologist always resemble those of the mathematician more and more as they attain greater perfection.

All sciences have an abstract side, which studies the relations between concepts. These sciences of laws have, moreover, an experimental point of departure. Mathematics had at the outset a wholly empirical phase; it was only with further development that it assumed a more and more a priori character. The products of reasoning push the data of observation more and more into the shade, but they exist none the less.

At the present time in certain departments of physics abstract reasoning occupies as prominent a place as observation. The development of psychology and sociology is pursuing the same course, so that without diminishing the importance of the historical and descriptive part, which is principally based on observation, it is necessary to recognize the paramount value of the abstract and rational part. It is the mark of a good logical method, and at the same time of a good method in teaching, to introduce and strictly maintain this distinction.

Among the social sciences political economy was the first to introduce this distinction in the most rigorous way, by accepting for the rational part the mathematical form.

Cournot was the true founder, to have, in his *Researches into the Mathematical Principles of the Theory of Wealth* (1838), clearly stated in what was the application of mathematics to political economy, to have raised the demand curve of goods according to declining prices and have deduced the mathematical theory of monopoly.

In 1854, Hermann Gossen, in his *The Development of the Laws of Human Interactions*, established another curve, that of the intensity of the last want satisfied as a decreasing function of the quantity consumed, and from it he deduced the formula of the optimum division of two commodities between two individuals, so as to produce the absolute maximum utility, measured by the equal intensities of the last wants satisfied of each commodity by the two individuals (communistic sharing).

In 1802, Jevons drew the same curve as Gossen and deduced from it the formula of free exchange of two commodities between two individuals, showing the inverse proportion for each party to the exchange of the intensities of the last wants satisfied ("final degree of utility") to the quantity of the commodities exchanged (individualistic sharing).

Finally, in 1873, Mr. Walras explains in a paper entitled *Principle of a mathematical theory of exchange*, the theory of economic exchange of two commodities between any number of exchangers. To do this he introduces the problem, as unknowns to be determined, the prices of both goods (that Jevons was replaced by the inverse relationships of quantities traded). Then, the utility curve of Goshen, he deduces the curves of demand and supply, under the condition of maximum satisfaction of needs, expressed in a form identical to that of Jevons.
In this way M. Walras found deductively the curve of demand empirically arrived at by Cournot, and also the curve of supply. Finally he determined the prices current of equilibrium, by virtue of the condition of equality, of the actual supply and demand, by the intersection of two curves of demand and supply.

In his *Elements of Pure Political Economics*, M. Walras has successively derived from the mathematical principles indicated above: (1) The theory of exchange of any number of commodities for one another; (2) the theory of production of those commodities considered as products resulting from the combination of the effects of different kinds of productive capital; (3) the theory of capitalization, or of the production of new capital, and, finally, (4) the theory of money, or the theory of the determination of the prices of products, services, and capital in a form of goods serving not

only as a standard for the measure of values, but also as a medium of exchange. Finally, from all these theories taken together, M. Walras derived a theory of general economic equilibrium.

Thus was economic statics definitely established. It still remains to found economic dynamics. It is on this task that certain economists are engaged, as Mr. Patten in America.

On the other hand, some writers, as MM. Wicksteed, Barone, Clark, and Montemartini, are completing the theory of marginal utility by a theory of marginal productivity, which constitutes, at the same time, the point of departure for a theory of the distribution of wealth. Great activity prevails in this domain of the science, as is proved by the list of mathematical economists: Marshall, Edgeworth, Launhardt, Lebr, Auspitz, lieben, Wicksell, Rossi, Giddings, Fisher, etc. To these must be added the representatives of pure economics who employ deduction without having recourse to mathematics, such as Menger, Wieser, Sax, Bohm-Bawerk, etc.

To follow, step by step, this entire movement and set forth its pa-ogress in the successive phases acquired is the task that we have undertaken in a course that we have been giving for the past six years at the University of Geneva.

Moreover, encouraged by the example of pure political economy, and convinced that this is the route that social science must necessarily pursue in order to attain a definite character, we have attempted to apply the same methods of investigation and reasoning to all the other departments of general and abstract sociology.

It is thus that we have arrived at the conception that the theory of equilibrium may be extended from economic phenomena to all social phenomena—political, juridical, moral, esthetic, religious, and scientific; the two modes of division, the Gossenian and Jevonian, adapting themselves very well to the communistic regime of primitive societies and to the individualistic regime of the historic societies.

By extending these results attained through pure political economy to social science, we have arrived at the discovery that the fundamental equations of M. Walras— expressing, for a party to an exchange, the equivalence of the quantities offered and the quantities demanded of various commodities at certain prices, and the proportion of the intensity of the last wants satisfied to these prices—-may be deduced from the general equations of motion of Lagrange, and we have shown analytically in what way this deduction can be made. Having furnished the equations of social equilibrium, we have laid the foundations for social mechanics—*on* its static side— on the principle of Lagrange, that of least effort or greatest energy, i. e., on the principle that serves as the basis of universal mechanics.

Turning to the dynamic part of the problem, we gave a definition of social-biological energy in two forms: potential (hunger and love) and kinetic (economic, political, legal, moral, aesthetic, religious, and scientific). This led us to the principles of thermodynamics, including the third, the Clausius same time explains the progressive spiritualization any closed social aggregate to show a decrease in potential. This dissipation of entropy that occurs is the same in the social world as in the physical world.

Finally, we have shown how the principle of least effort and of the acceleration of velocity explains the gradual differentiation and integration of social aggregates by their more and more perfect adaptation to the natural and artificial environment. All this forms the subject of a course on social mechanics that we are giving under the title, "Economic bases of social science," parallel with our course on pure political economy. In fact, the point of departure of our researches was, as we have shown, pure political economy, to which we refer all social science, and bring it all back to mechanics.

In our course we do not content ourselves with the abstract or pure science, but make applications of it to the primitive and historic societies by a detailed study of the facts.

The results of our research in pure social mechanics were published in the *Philosophical Review* (March 1898) under the 'title: "Essay on the social Mechanics", which contains three parts: 1 The economic and social balance; 2 "the transformations of social energy, and 3 social dynamics.

A year after the publication of our work, we were pleased to note the appearance of two books of great value, that of

Professor Maurce Haurion: *Lessons Social Movement* (1899) and that of Professor Andre Lalande: *The Dissolution Opposed to Revolution in the Physical and Moral* (1899). These studies, while differing on some points of our findings in the philosophical journal (March 1898), based on the same principles and tend in the same direction, toward an application of mechanics and thermodynamics to social science.

In 1889 we applied these principles to the theory of the family and of property in an article published in the *Rivista italiana di Sociologia* (November, 1899). We showed that it is the family and property that lie at the basis of society, and that all other institutions constitute its superstructure. Finally, during the present year, we have more thoroughly analyzed (in the *Revue philosophique*, February-March, 1900) certain points in our theory, and shown how quantitative methods may be applied to social mechanics, with a view to the creation of a sociometry.

Some of this work has attracted interest from abroad and have been translated into Polish (Athenaeum Warsaw), German (Soc. Monatshefte Berlin) and Russian (Saint Petersburg Scientific Review). The samples were analyzed, among others, in the *Rivista Italiana di Filosofla*1 by Professor Groppoli which, while recognizing the need for a general science of society and abstract, it would retain the title of pure sociology. But I prefer title social mechanism, which I gave to this science, especially since Professor Lester Ward, Columbia University, author of *Dynamic Sociology*, now follows the same path in memoir presented at The International Congress of Sociology of this year a entitled: "Social Mechanics". [note1]

Such are the stages in the career thus far pursued by social mechanics. Though teaching it for six years at the University of Geneva, I do not think it can replace descriptive and comparative sociology represented with us with so great authority and mastery by Prof. L. Vuarin, but I do think that it may become an independent and complementary discipline, allying itself at the same time to mathematics, political economy, and sociology.

I have ventured to inform the congress of this isolated experiment, and the first of its kind. As to pure economics, it is already taught in a score of universities in England, America, Germany, Austria, and Switzerland, and it would be desirable that this example be followed by those of France. I am happy to add that the teaching of these sciences, which might appear dry, interests its hearers, whose number is constantly increasing.

â— Note 1: Ward, Frank. (1900). "Social Mechanics", Read before the Fourth Congress of the Institute International de Sociologie at Paris, Sep, 25, 1900; Reprinted in: *Sociology at the Paris Exposition of 1900* (pgs. 1579-93).
â— Translator end note: In view of the importance of the subject and the novelty of the experiment, I have introduced Dr. Winiarsky's report entire. The question of methodology in social science will come up later (p. 1576).

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θΔics

In famous publications, **The Theologian's Nightmare**, aka "Bertrand Russell Dies and Goes to Heaven" (Q), is a 1961 fictional story, by Bertrand Russell, about a theologian named Dr. Thaddeus who dreams that he dies and goes to heaven, only to find the afterlife being akin to a cross between Neo meets the "Architect", of Matrix, Hari Seldon of Isaac Asimov's foundation series (see: psychohistory), presented through a Carl Sagan like lens of the universe.

Overview

In 1961, Bertrand Russell, aged 89, published the following parody of Christian cosmology, with respect to the model of heaven, in the context of modern cosmology: [1]

> "The eminent theologian Dr. Thaddeus (Russell's theological alter-ego) dreamt that he died and pursued his course toward heaven. His studies had prepared him and he had no difficulty in finding the way. He knocked at the door of heaven, and was met with a closer scrutiny than he expected. "I ask admission," he said, "because I was a good man and devoted my life to the glory of God." "Man?" said the janitor, "What is that? And how could such a funny creature as you do anything to promote the glory of God?" Dr. Thaddeus was astonished. "You surely cannot be ignorant of man. You must be aware that man is the supreme work of the Creator." "As to that," said the janitor, "I am sorry to hurt your feelings, but what you're saying is news to me. I doubt if anybody up here has ever heard of this thing you call 'man.' However, since you seem distressed, you shall have a chance of consulting our librarian."
> The librarian, a globular being with a thousand eyes and one mouth, bent some of his eyes upon Dr. Thaddeus. "What is this?" he asked the janitor. "This," replied the janitor, "says that it is a member of a species called 'man,' which lives in a place called 'Earth.' It has some odd notion that the Creator takes a special interest in this place and this species. I thought perhaps you could enlighten it." "Well," said the librarian kindly to the theologian, "perhaps you can tell me where this place is that you call 'Earth.'" "Oh," said the theologian, "it's part of the Solar System." "And what is the Solar System?" asked the librarian. "Oh," said the theologian, somewhat disconcerted, "my province was Sacred Knowledge, but the question that you are asking belongs to profane knowledge. However, I have learnt enough from my astronomical friends to be able to tell you that the Solar System is part of the Milky Way." "And what is the Milky Way?" asked the librarian. "Oh, the Milky Way is one of the Galaxies, of which, I am told, there are some hundred million." "Well, well," said the librarian, "you could hardly expect me to remember one out of so many. But I do remember to have heard the word galaxy' before. In fact, I believe that one of our sub-librarians specializes in galaxies. Let us send for him and see whether he can help."
>
> After no very long time, the galactic sub-librarian made his appearance. In shape, he was a dodecahedron. It was clear that at one time his surface had been bright, but the dust of the shelves had rendered him dim and opaque. The librarian explained to him that Dr. Thaddeus, in endeavoring to account for his origin, had mentioned galaxies, and it was hoped that information could be obtained from the galactic section of the library. "Well," said the sub-librarian, "I suppose it might become possible in time, but as there are a hundred million galaxies, and each has a volume to itself, it takes some time to find any particular volume. Which is it that this odd molecule desires?" "It is the one called 'The Milky Way,'" Dr. Thaddeus falteringly replied. "All right," said the sub-librarian, "I will find it if I can."
>
> Some three weeks later, he returned, explaining that the extraordinarily efficient card index in the galactic section of the library had enabled him to locate the galaxy as number QX 321,762. "We have employed," he said, "all the five thousand clerks in the galactic section on this search. Perhaps you would like to see the clerk who is especially concerned with the galaxy in question?" The clerk was sent for and turned out to be an octahedron with an eye in each face and a mouth in one of them. He was surprised and dazed to find himself in such a glittering region, away from the shadowy limbo of his shelves. Pulling himself together, he asked, rather shyly, "What is it you wish to know about my galaxy?" Dr. Thaddeus spoke up: "What I want is to know about the Solar System, a collection of heavenly bodies revolving about one of the stars in your galaxy. The star about which they revolve is called 'the Sun.'" "Humph," said the librarian of the Milky Way, "it was hard enough to hit upon the right galaxy, but to hit upon the right star in the galaxy is far more difficult. I know that there are about three hundred billion stars in the galaxy, but I have no knowledge,

myself, that would distinguish one of them from another. I believe, however, that at one time a list of the whole three hundred billion was demanded by the Administration and that it is still stored in the basement. If you think it worth while, I will engage special labor from the Other Place to search for this particular star."
It was agreed that, since the question had arisen and since Dr. Thaddeus was evidently suffering some distress, this might be the wisest course.

Several years later, a very weary and dispirited tetrahedron presented himself before the galactic sub-librarian. "I have," he said, "at last discovered the particular star concerning which inquiries have been made, but I am quite at a loss to imagine why it has aroused any special interest. It closely resembles a great many other stars in the same galaxy. It is of average size and temperature, and is surrounded by very much smaller bodies called 'planets.' After minute investigation, I discovered that some, at least, of these planets have parasites, and I think that this thing which has been making inquiries must be one of them."

At this point, Dr. Thaddeus burst out in a passionate and indignant lament: "Why, oh why, did the Creator conceal from us poor inhabitants of Earth that it was not we who prompted Him to create the Heavens? Throughout my long life, I have served Him diligently, believing that He would notice my service and reward me with Eternal Bliss. And now, it seems that He was not even aware that I existed. You tell me that I am an infinitesimal animalcule (Q)(Q)(Q) on a tiny body revolving round an insignificant member of a collection of three hundred billion stars, which is only one of many millions of such collections. I cannot bear it, and can no longer adore my Creator." "Very well," said the janitor, "then you can go to the Other Place."

Here the theologian awoke. "The power of Satan over our sleeping imagination is terrifying," he muttered."

Here, of note, Russell refers to a human, from the advanced perspective, as either a "thing", an "odd molecule", or an "animalcule".

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1. (a) Russell, Bertrand. (1961). "The Theologian's Nightmare", *Fact and Fiction*. George and Allen Unwin.
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θΔics

In famous publications, **"The Thermodynamics of Love"** is a 2001 article, published in the *Journal of Hybrid Vigor*, by American chemist and neuroscience physician David Hwang, in which a Gibbs free energy theory of mate selection is outlined, albeit in humorous form. [1]

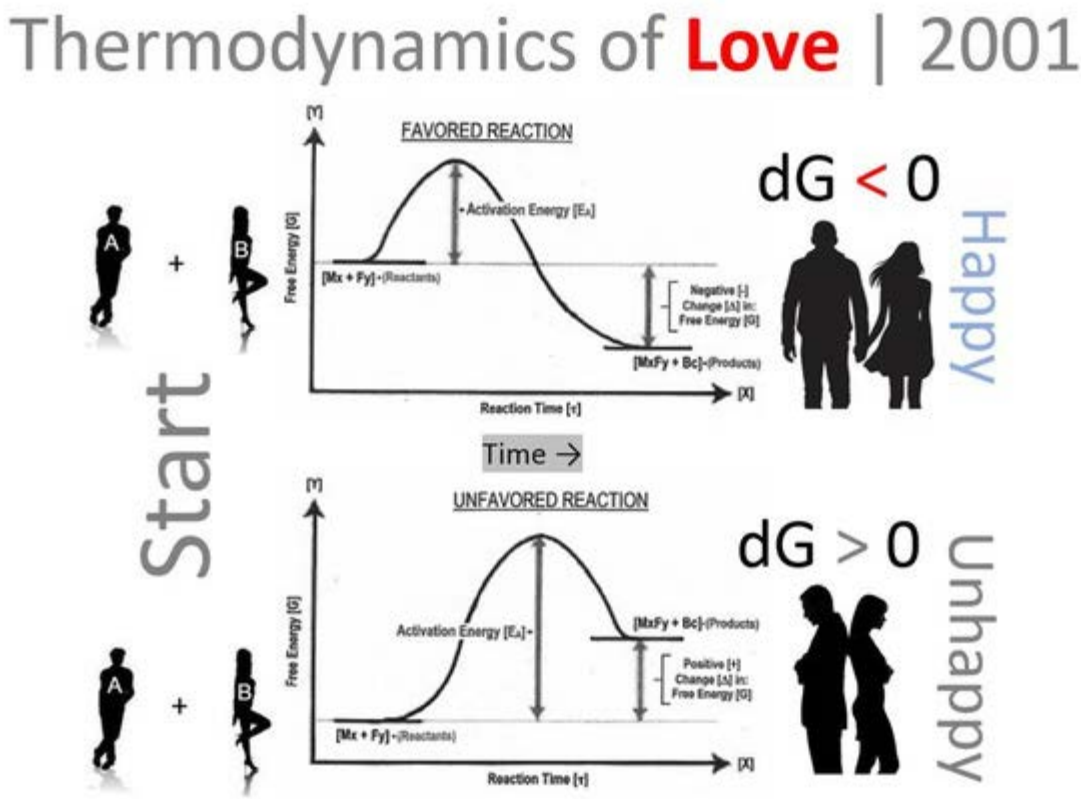

Above: a annotated version of American computational chemist David Hwang's 2001 article **"The Thermodynamics of Love"**, wherein he defines people chemically as "elements" (see: human chemical element), couples as "compounds", and the process of falling in love as a chemical reaction that is quantified and governed via Gibbs free energy changes, from Libb Thims' 2015 Zerotheism for Kids lecture (part two). [1]

In short, in chemistry, reaction feasibility is determined by "thermodynamics", particularly chemical thermodynamics. Subsequently, the feasibilities of the various potential processes of human mating or "love the chemical reaction" would also be determined by thermodynamics.

Hwang's human thermodynamics

Hwang, however, did more than verbally justify his thermodynamics of love theory, he described it, in rather descent form, from a chemical thermodynamic point of view. [3] In particular, thermodynamics, according to Hwang, "not only explains the spontaneity of chemical reactions", but "also applies directly to various factors determining the success of human relationships". To begin with, Hwang defines the couple forming reaction as such: a theoretical chemical reaction where two elements, "male" (M) and "female" (F), combine to form a new compound called "couple" (M-F):

$$M + F \rightarrow M\text{-}F$$

To visually illustrate this, Hwang used free energy vs. reaction extent plots (shown adjacent). Firstly, in regards to the plots, he states that the y-axis measures Gibbs free energy and that the x-axis measures the time progression of the reaction, Hwang defines individual elements (presumably either single unattached people or bonded couples) with a collective high free energy (G) value are relatively reactive, while a compound with a low G value is likely to be stable.

Thus, according to Hwang, a reaction in which G decreases (-sG) favors formation of product because the products have less free energy than the starting compounds and are more stable. In a reaction in which G increases (+sG), in Hwang's view, reactants are not likely to make much chemical progress. Subsequently, according to Hwang, we can apply these concepts to our theoretical male-female reaction and thus use chemical thermodynamics to answer questions such as "are two people completely natural as a pair, or are they better off apart?"

Difficulties on theory

All-in-all, aside from a few points of argument, Hwang's take on the situation is fairly accurate. One area of difficulty in Hwang's theory is the small particle count aspect involved in the thermodynamic computations of interactions between people with systems consisting of a few humans (e.g. ten human molecules in a system).

Specifically, how do the laws of thermodynamics apply to the analysis of, for instance, two particle systems, such as two people in a regioned system? General thermodynamic analysis, e.g. gas phase systems, for instance, studies "working bodies" consisting of Avogadro's number of particles, namely 10E23 particles, i.e. atoms or molecules. There have, however, been thermodynamic studies on one-particle systems. This is an advanced topic.

Other

See main: Thermodynamics of love

In the 1950s, Iranian mechanical engineer Mehdi Bazargan is said to have penned an article entitled "Thermodynamics of Love"; possibly still only available in Farsi.

In *circa* 2000, American child prodigy turned astrophysicist Christopher Hirata penned his human chemical thermodynamics and human physics based "The Physics of Relationships" (see: relationship physics) article consisting of five parts:

1. Thermochemical Approach to Relationships
2. Complex Equilibria of Men and Women
3. Reaction Kinetics
4. Neutron Scattering: A Cautionary Tale
5. The Shell Model

on the topics of a thermochemical approach to relationships, complex equilibria of men and women, reaction kinetics, neutron scattering, and shell model, written at the age of about 18 that harks of genius ranking near to that of the great insights of German polyintellect Johann Goethe (IQ=230) and his 1796 human chemical theory. [1]

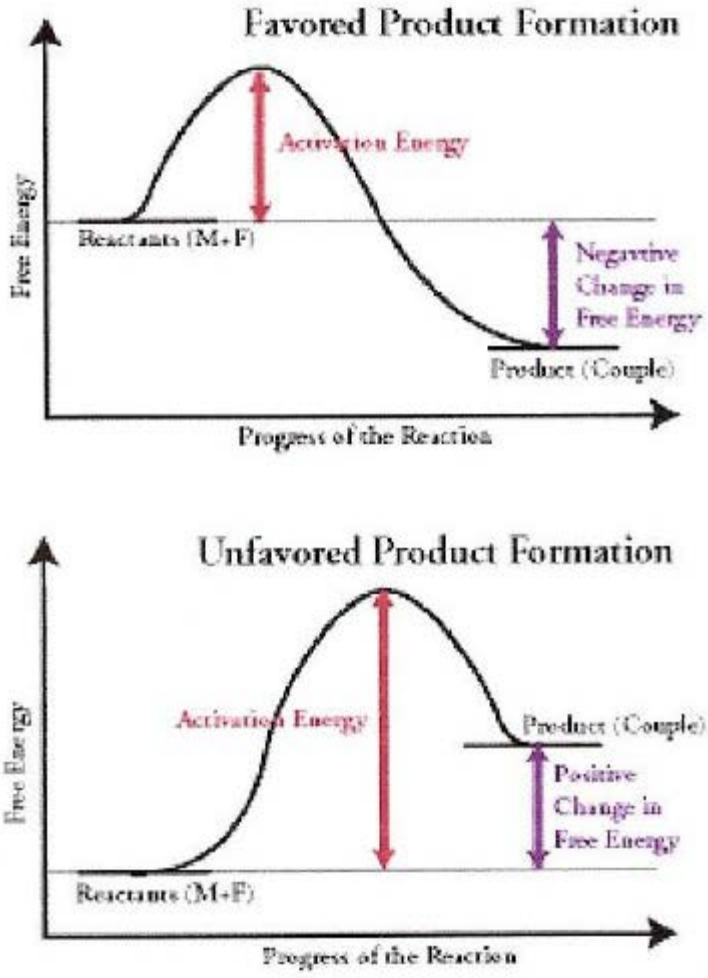

Hwang's free energy plots verse extent of reaction, showing stable products (top) and unstable products (bottom).

In 2003, internet writer Wild Bob, in his short article "Thermodynamics of Love", reasoned that "people often can be heard talking about the 'chemistry' in a relationship", and, without going into too much detail on this postulate, concludes: [2]

> "Remember, it's not chemistry that determines long term love—it's thermodynamics."

Chemistry, he states, may be involved in the initial attraction, but it is "thermodynamics that determines if the relationship will last."

In 2015, Colombian-born British writer Patrissia Cuberos published *The Thermodynamics of Love: the Secret Life of a God*, part one of a three-part trilogy (Book I: The Secret Life of a God; Book II: Diary of an Ex-Goddess; Book III: The Physics of Romance), wherein she applies chemistry, thermodynamics, and physics to relationship dynamics; the abstract of part one is as follows: [6]

> "We live in a world of relationships: from chemical bonds to boy meets girl, to families and societies, to the laws that govern the cosmic order. The trilogy is a typical love story. Indeed, boy meets girl and a

relationship develops, but we all know that as Woody Allen says 'Sooner or later everything turns to sh*t.' In other words, in most relationships, the initial dynamic exchange of heat-energy soon becomes the dreaded lukewarm entropy, harbinger of heat death. However, the physics that seem to doom David and Kate's relationship to the thermodynamic trap, might be able to help them to transform it into the everlasting loop of energy exchange they have always dreamed of: a superconductive love unmarred by friction from guilt, fear and resentment. Their quest will force them to challenge, and eventually transcend their all too human feelings of inadequacy, the apparently inevitable limitations of time, and the hazy, illusory lines between dream and reality, life and death."

(add)

Quotes

The following are related quotes:

> "The thermodynamics of computation, if anyone had stopped to wonder about it, would probably have seemed no more urgent as a topic than, say, the **thermodynamics of love**."
>
> — Charles Bennett (1988), "Notes on the History of Reversible Computation" [4]

> "The big ideas in heat are the laws of thermodynamics. So important and far-reaching are the laws of **thermodynamics** that some people try to use them to explain what governments should do, why people fall in **love**, and why there are car wrecks."
>
> — Bill Nye (1993), American mechanical engineer [5]

See also

- Surya Pati
- Chemistry of love
- Physics of love
- Mathematics of love

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θΔics

In famous publications, ***The Will to Power: An Attempt at a Revaluation of All Values***, is collection of 1,067 note fragments, according to the 1906 edition, written as draft mental notes by Friedrich Nietzsche, during the years 1883 to 1888, posthumously published in 1888, claimed by some to be his unfinished magnum opus prior to his unrecoverable 1889 mental breakdown. Some of the fragments, commonly labeled as WP:#, are shown below. [1]

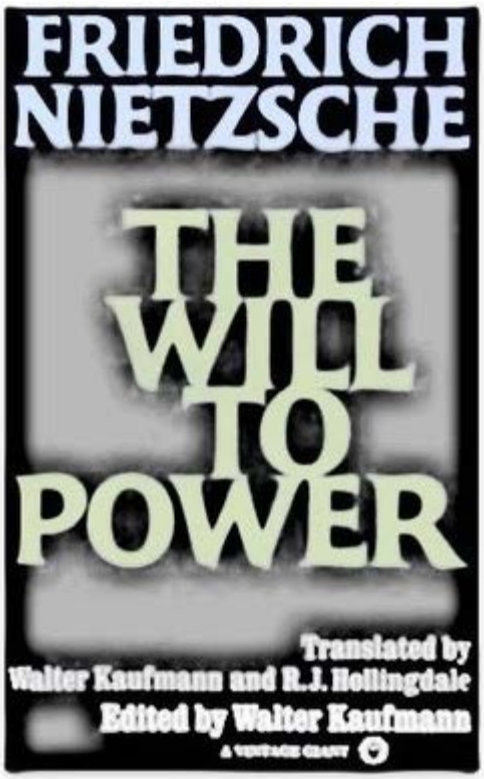

Nietzsche's posthumously-published collected notes (1883-1888) of his draft-stage book *The Will to Power: An Attempt at a Revaluation of All Values*, which outlines his **will to power** theory, which, it is said, would have been his magnum opus, of his 5,000-page collected work set, which never reached complete fruition, following his 1889 breakdown. [21

Overview

In summer 1886, Nietzsche penned (Ñº) the following tentative outline for his new draft stage book: [1]

The Will to Power: Attempt at a Revaluation of All Values

First Book: The danger of dangers (presentation of nihilism as the necessary consequence of our valuations so far). Tremendous forces have been unleashed; but they conflict with each other; they annihilate each other. In a democratic commonwealth, where everybody is a specialist, the 'what for?' and 'for-whom?' are lacking. The class [*Stand*] in which the thousand-fold atrophy of all individuals (into mere functions) acquires meaning.

Second Book: Critique of values (of logic, etc.) Everywhere the disharmony between the ideal and its individual conditions (e.g. honesty among Christians who are continually forced to lie).

Third Book: The problem of the legislator (including the history of solitude). The forces that have been unleashed must be harnessed again lest they annihilate each other; eyes have to be opened for the actual increase of strength.

Fourth Book: The hammer. What would me have to be like whose valuations are the opposite? Men who have all the traits of the modern soul but are strong enough to transform them into much health—their means for their task.

(add)

Fragments | Ordering scheme | Chronology

In 1883, Nietzsche began penning hand-written mental notes, idea fragments or "aphorisms" as some refer to them, to some type of final product of his intellectual quest, or something along these lines. The following fragment, dated in 1885 to 1886, seems to be his first idea notes on his will to power theory of morality:

> "What are our evaluations and moral tables really worth? What is the outcome of their rule? For whom? In relation to what? Answer: for life. But 'what is life'? Here we need a new, more definite formulation of the concept of 'life'. My formula for it is: life is the will to power."
>
> — Friedrich Nietzsche (c.1885), WP:254

In 1886, Nietzsche, supposedly, had announced, at the end of *On the Genealogy of Morals*, a new work with the title: *The Will to Power: An Attempt at a Revaluation of All Values* (Ñº); the project under this title, however, was set aside and some of its draft materials used to compose *The Twilight of the Idols* and *The Antichrist* (both written in 1888). At

some point, in this period, in his zeal-fueled visions, Nietzsche, as summarized by Henry Mencken (1920), was planning to publish *Will to Power*, in ten volumes, with the subtitle “An Attempt at a New Interpretation of the World”. He also had the following subtitles in mind: “An Interpretation of All That Happens” and “An Attempt at a Transvaluation of All Values”. Eventually, according to Mencken, he fell back to four volumes, in final vision. [7]

In Aug 1888, Nietzsche, supposedly, had abandoned all intention of publishing a work entitled *The Will to Power*; what remained are his some thousand-plus collection of hand-written fragment notes. [4]

In 1901, a first edition print of these noted entitled *The Will to Power*, containing 483 fragment notes, edited by Ernst Horneffer and August Horneffer, was published. In 1906, a second expanded edition, with 1,067 fragment notes, edited by Peter Gast and Elisabeth Forster-Nietzsche, was published. This was reissued, with minor alterations, by Kroner in 1911, thereafter becoming the “definitive” edition. [4] In 1968, editor-translators Walter Kaufmann and Reginald Hollingdale, using the 1,067-fragments, published what seems to be the definitive English edition, with editor's introduction, a section on the "editions" of *Will to Power*, and a chronology of Nietzsche's works. The total 1,067-fragments (1906 selection), which, supposedly, comprise the draft noted for Nietzsche’s envisioned *Will to Power*, are ordered, according to Nietzsche scholar Mazzino Montinari (2003), as follows: “The fragments are consequently ordered not chronologically (which, with a time span of six years, is serious) but instead according to systematic, categorizing of keywords.” [3] These 1,067 fragments are designated via the notation WP:# herein.

Quotes | Fragments

The following are miscellaneous fragments, yet lacking designated section discussion:

> “Weakness of the will: that is a metaphor that can prove misleading. For **there is no will**, and consequently neither a strong nor a weak will. The multitude and disgregation of impulses and the lack of any systematic order among them result in a "weak will"; their coordination under a single predominant impulse results in a "strong will": in the first case it is the oscillation and the lack of gravity; in the latter, the precision and clarity of the direction.”
>
> — Friedrich Nietzsche (1888), WP:45, Mar-Jun

> “My chief proposition: thee are no ‘moral’ phenomena, there are only a moral interpretation of these phenomena. This interpretation itself is of extra-moral origin.”
>
> — Friedrich Nietzsche (c.1885), WP:258

> “There are those who go looking for immorality. When they judge: ‘this is wrong’, they believe one should abolish and change it. I, on the contrary, cannot rest as long as I am not yet clear about the immorality of a thing. When I unearth it I recover my equanimity.”
>
> — Friedrich Nietzsche (1887), WP:309

> “A man as he ought to be: that sounds to us as insipid as a ‘tree as it ought to be’.”
>
> — Friedrich Nietzsche (1887), WP:332

> “Man, imprisoned in an iron cage of errors, became a caricature of man, sick, wretched, ill-disposed toward himself, full of hatred for the impulses of life, full of mistrust of all that is beautiful and happy in life, a

walking picture of misery."

— Friedrich Nietzsche (1888), WP:397, Jan-Fall

"I believe in absolute space as the substratum of force: the latter limits and forms. Time eternal. But space and time do not exist in themselves. "Changes" are only appearances (or sense processes for us); if we posit the recurrence of these, however regular, nothing is established thereby except this simple fact, that it has always happened thus. The feeling that post hoc is propter hoc can easily be shown to be a misunderstanding; it is comprehensible. But appearances cannot be "causes" !"

— Friedrich Nietzsche (1885), WP:545 (see: "atheist's creed")

"My idea is that every specific body strives to become master over all space and to extend its force (– **its will to power**:) and to thrust back all that resists its extension. But it continually encounters similar efforts on the part of other bodies and ends by coming to an arrangement ("union") with those of them that are sufficiently related to it: thus they then conspire together for power. And the process goes on."

— Friedrich Nietzsche (c.1888), WP:636 (Ñº)(Ñº)(Ñº), Mar-Jun

"When we do something there arises a 'feeling of force' [*kraft-gefühl*] often even before the deed, occasioned by the idea of what is to be done, e.g. as in the sight of an enemy or an obstacle to which we feel ourselves equal, which is always an accompanying feeling. We instinctively think that the feeling is the cause of the action, that is 'the force'. Our belief in causality is belief in force and its effect; a transference from our experience; and we identify force and the feeling of force."

— Friedrich Nietzsche (c.1886), WP:644

"Ah, the philosophy of right! A science that, like all moral science, has not even reached the cradle yet!"

— Friedrich Nietzsche (c.1885), WP:744

(add)

WP:95 | Three centuries

In Spring-Fall 1887 (WP:95), Nietzsche gives the following historical:

"The Three Centuries. Their different sensibilities are best expressed thus: Aristocratism: Descartes, rule of reason, testimony of the sovereignty of the will; Feminism: Rousseau, rule of feeling, testimony of the sovereignty of the senses, mendacious; Animalism: Schopenhauer, rule of craving, testimony of the sovereignty of animality, more honest but gloomy.

The seventeenth century is aristocratic, imposes order, looks down haughtily upon the animalic, is severe against the heart, not cozy, without sentiment, "un-German, " averse to what is burlesque and what is natural, inclined to generalizations and overeign confronted with the past--for it believes in itself. Much

beast of prey au fond, much ascetic habit to remain master. The century of strong will; also of strong passion.

The eighteenth century is dominated by woman, given to enthusiasm, full of esprit, shallow, but with a spirit in the service of what is desirable, of the heart, libertine in the enjoyment of what is most spiritual, and undermines all authorities; intoxicated, cheerful, clear, humane, false before itself, much canaille au fond, sociable. -

The nineteenth century is more animalic and subterranean, uglier, more realistic and vulgar, and precisely for that reason "better, " "more honest," more submissive before every kind of "reality," truer; but weak in will, but sad and full of dark cravings, but fatalistic. Not full of awe and reverence for either "reason" or "heart"; deeply convinced of the rule of cravings (Schopenhauer spoke of "will"; but nothing is more characteristic of his philosophy than the absence of all genuine willing) . Even morality reduced to one instinct ("pity") .

Auguste Comte is a continuation of the eighteenth century (domination of coeur over la tete, sensualism in the theory of knowledge, altruistic enthusiasm). That science has become sovereign to such a degree proves how the nineteenth century has rid itself of the domination of ideals. A certain frugality of desire makes possible our scientific curiosity and severity — which is our kind of virtue. -

Romanticism is an echo of the eighteenth century; a kind of piled-high desire for its enthusiasm in the grand style (as a matter of fact, a good deal of histrionics and self-deception: one wanted to represent strong natures and grand passions) .

The nineteenth century looks instinctively for theories that seem to justify its fatalistic submission to matters of fact. Already Hegel's success against "sentimentality" and romantic idealism was due to his fatalistic way of thinking, to his faith in the greater reason on the side of the victorious, to his justification of the actual "state" (in place of "mankind," etc. J.- Schopenhauer : we are something stupid and, at best, even something that cancels itself. Success of determinism, of the genealogical derivation of obligations that had formerly been considered absolute, the doctrine of milieu and adaptation, the reduction of will to reflexes, the denial of the will as an "efficient cause"; finally--a real rechristening: one sees so little will that the word becomes free to designate something else. Further theories: the doctrine of objectivity--"will- less" contemplation--as the only road to truth; also to beauty (--also the faith in the "genius" to justify a right to submission); mechanism, the calculable rigidity of the mechanical process; the alleged "naturalism, " elimination of the choosing, judging, interpreting subject as a principle- Kant, with his "practical reason" and his moral fanaticism is wholly eighteenth century; still entirely outside the historical movement; without any eye for the actuality of his time, e. g., Revolution; untouched by Greek philosophy; fanciful visionary of the concept of duty; sensualist with the backdrop of the pampering of dogmatism. -

The movement back to Kant in our century is a movement back to the eighteenth century: one wants to regain a right to the old ideals and the old enthusiasm--f or that reason an epistemology that "sets boundaries," which means that it permits one to posit as one may see fit a beyond of reason. -

Hegel's way of thinking is not far different from Goethe's: one needs only to listen to Goethe about Spinoza. Will to deify the universe and life in order to find repose and happiness in contemplation and in getting to the bottom of things; Hegel seeks reason everywhere—before reason one may submit and acquiesce. In Goethe a kind of almost joyous and trusting fatalism that does not revolt, that does not flag, that seeks to form a totality out of himself, in the faith that only in the totality everything redeems itself and appears good and justified.”

(add)

WP:490 | Will = Force

In 1885 (WP:490), Nietzsche states the following:

> “The assumption of one single subject is perhaps unnecessary; perhaps it is just as permissible to assume a multiplicity of subjects, whose interaction and struggle is the basis of our thought and our consciousness in general? A kind of aristocracy of "cells" in which dominion resides? To be sure, an aristocracy of equals, used to ruling jointly and understanding how to command?
>
> My hypotheses: The subject as multiplicity. Pain intellectual and dependent upon the judgment "harmful": projected. The effect always "unconscious": the inferred and imagined cause is projected, follows in time. Pleasure is a kind of pain. The only force that exists is of the same kind as that of the will: a commanding of other subjects, which thereupon change. The continual transitoriness and fleetingness of the subject. "Mortal soul". Number as perspective form.”

(add)

WP:595 | Presuppositions

In 1884 (WP:595), Nietzsche states is presuppositions:

> “Our presuppositions: no god: no purpose: finite force. Let us guard against thinking out and prescribing the mode of thought necessary to lesser men!!”

Here we see decent platform. Purpose, however, is a loaded word, in need of reform; while, e.g., it is not applicable to state, as a description, that when hydrogen reacts with oxygen that is their "purpose", there is someone who made a connection, using apparent terminology reform, of purpose correctly redefined via thermodynamic potentials.

WP:617 | Life = Will to Power

In 1883-1885 (WP:617), Nietzsche states the following curious views:

> “To impose upon becoming the character of being—that is the supreme will to power. Twofold falsification, on the part of the senses and of the spirit, to preserve a world of that which is, which abides, which is equivalent, etc. That everything recurs is the closest approximation of a world of becoming to a world of being:—high point of the meditation.
>
> From the values attributed to being proceed the condemnation of and discontent with becoming, after such a world of being had first been invented. The metamorphoses of what has being (body, god, ideas, laws of nature, formulas, etc.) "Beings" as appearance; reversal of values; appearance was that which conferred value—.
>
> Knowledge-in-itself in a world of becoming is impossible; so how is knowledge possible? As error concerning oneself, as will to power, as will to deception. Becoming as invention, willing, self-denial, overcoming of oneself: no subject but an action, a positing, creative, no "causes and effects."
>
> Art as the will to overcome becoming, as "eternalization," but shortsighted, depending on the perspective: repeating in miniature, as it were, the tendency of the whole.
>
> Regarding that which all life reveals as a diminutive formula for the total tendency; hence a new definition of the concept "life" as will to power.

Instead of "cause and effect" the mutual struggle of that which becomes, often with the absorption of one's opponent; the number of becoming elements not constant.
Uselessness of old ideals for the interpretation of the totality of events, once one knows the animal origin and utility of these ideals; all, moreover, contradictory to life.

Uselessness of the mechanistic theory—it gives the impression of meaninglessness. The entire idealism of mankind hitherto is on the point of changing suddenly into nihilism—into the belief in absolute worthlessness, i.e., meaninglessness. The destruction of ideals, the new desert; new arts by means of which we can endure it, we amphibians. —Presupposition: bravery, patience, no "turning back," no haste to go forward. (N.B. Zarathustra adopts a parodistic attitude toward all former values as a consequence of his abundance.)"

(add discussion)

WP:619 | Inner will

In 1885 (WP:619), Nietzsche states the following:

"The victorious concept of 'force', by means of which our physicists have created god and the world, still needs to be completed: an *inner will* must be ascribed to it, which I designate as 'will to power', i.e. as an insatiable desire to manifest power; or as the employment and exercise of power, as a creative drive, etc. Physicists cannot eradicate 'action at a distance' from their principles; nor can they eradicate a repellent force (or an attracting one). There is nothing for it: one is obliged to understand all motion, all 'appearances', all 'laws', only as symptoms of an inner event and to employ man as an analogy to this end. In the case of an animal, it is possible to trace all its drives to the will to power; likewise all the functions of organic life to this one source."

(add discussion)

WP:620 | Force real?

In 1885-1886 (WP:620), Nietzsche seems to grapple with the question as to whether or not force exists:

"Has a force ever been demonstrated? No, only its *effects* translated into a completely foreign language. We are so used, however, to regularity in succession that its oddity no longer seems odd to us."

(add discussion)

WP:1062 | Infinite force?

In 1885 (WP:1062), Nietzsche digresses on the concept of "infinite force", goals (or final states), intermixed with Spinoza's "god or nature" :

"If the world had a goal, it must have been reached. If there were for it some unintended final state, this also must have been reached. If it were in any way capable of a pausing and becoming fixed, of "being, " then all becoming would long since have come to an end, along with all thinking, all "spirit." The fact of "spirit" as a form of becoming proves that the world has no goal, no final state, and is incapable of being.

The old habit, however, of associating a goal with every event and a guiding, creative god with the world, is so powerful that it requires an effort for a thinker not to fall into thinking of the very aimlessness of the world as intended. This notion--that the world intentionally avoids a goal and even knows artifices for

keeping itself from entering into a circular course— must occur to all those who would like to force on the world the ability for eternal novelty, i e., on a finite, definite, unchangeable force of constant size, such as the world is, the miraculous power of infinite novelty in its forms and states. The world, even if it is no longer a god, is still supposed to be capable of the divine power of creation, the power of infinite transformations; it is supposed to consciously prevent itself from returning to any of its old forms; it is supposed to possess not only the intention but the means of every one of its movements at every moment so as to escape goals, final states, repetitions--and whatever else may follow from such an unforgivably insane way of thinking and desiring. It is still the old religious way of thinking and desiring, a kind of longing to believe that in some way the world is after all like the old beloved, infinite, boundlessly creative god--that in some way "the old god still lives"-- that longing of Spinoza which was expressed in the words "deus sive natura" [god or nature] (he even felt "natura sive deus" [nature or god]) .

What, then, is the law and belief with which the decisive change, the recently attained preponderance of the scientific spirit over the religious, god-inventing spirit, is most clearly formulated? Is it not: the world, as force, may not be thought of as unlimited, for it cannot be so thought of; we forbid ourselves the concept of an infinite force as incompatible with the concept "force." Thus--the world also lacks the capacity for eternal novelty.”

(add discussion)

WP:1066 | Heat death

In Mar-Jun 1888 (WP:1066), Nietzsche mentions William Thomson, heat death, and his opinion on this in respect to being:

“The new world-conception.—The world exists; it is not something that becomes, not something that passes away. Or rather: it becomes, it passes away, but it has never begun to become and never ceased from passing away--it maintains itself in both. — It lives on itself: its excrements are its food. We need not worry for a moment about the hypothesis of a created world. The concept "create" is today completely indefinable [This word is illegible.], unrealizable; merely a word, a rudimentary survival from the ages of superstition; one can explain nothing with a mere word. The last attempt to conceive a world that had a beginning has lately been made several times with the aid of logical procedures--generally, as one may divine, with an ulterior theological motive.

Lately one has sought several times to find a contradiction in the concept "temporal infinity of the world in the past" (*regressus in infinitum*): one has even found it, athough at the cost of confusing the head with the tail. Nothing can prevent me from reckoning backward from this moment and saying "I shall never reach the end"; just as I can reckon forward from the same moment into the infinite. Only if I made the mistake— I shall guard against it--of equating this correct concept of a *regressus* in infinitum with an utterly unrealizable concept of a finite *progressus* up to this present, only if I suppose that the direction (forward or backward) is logically a matter of indifference, would I take the head—this moment — for the tail: I shall leave that to you, my dear Herr Diihring!--

I have come across this idea in earlier thinkers: every time it was determined by other ulterior considerations (—mostly theological, in favor of the creator spiritus). If the world could in any way become rigid, dry, dead, nothing, or if it could reach a state of equilibrium, or if it had any kind of goal that involved duration, immutability, the once-and-for-all (in short, speaking metaphysically: if becoming could resolve itself into being or into nothingness), then this state must have been reached: from which it follows— This is the sole certainty we have in our hands to serve as a corrective to a great host of world hypotheses possible in themselves. If, e. g., the mechanistic theory cannot avoid the consequence, drawn for it by William Thomson, of leading to a final state, then the mechanistic theory stands refuted.

If the world may be thought of as a certain definite quantity of force and as a certain definite number of

> centers of force—and every other representation remains indefinite and therefore useless—it follows that, in the great dice game of existence, it must pass through a calculable number of combinations. In infinite time, every possible combination would at some time or another be realized; more: it would be realized an infinite number of times. And since between every combination and its next recurrence all other possible combinations would have to take place, and each of these combinations conditions the entire sequence of combinations in the same series, a circular movement of absolutely identical series is thus demonstrated: the world as a circular movement that has already repeated itself infinitely often and plays its game *in infinitum*. This conception is not simply a mechanistic conception; for if it were that, it would not condition an infinite recurrence of identical cases, but a final state. Because the world has not reached this, mechanistic theory must be considered an imperfect and merely provisional hypothesis."

Here, to note, we are reminded of the Heraclitus vs Parmenides debate on whether the flux and fire model or being and becoming model is correct.

1067 | Monster of energy

In 1885 (WP:1067), the last fragment, according to the Kaufmann-Hollingdale (1967) edition, is as follows:

> "And do you know what 'the world' is to me? Shall I show it to you in my mirror? This world: a monster of energy, without beginning, without end; a firm, iron magnitude of force that does not grow bigger or smaller, that does not expend itself but only transforms itself; as a whole, of unalterable size, a household without expenses or losses, but likewise without increase or income; enclosed by "nothingness" as by a boundary; not something blurry or wasted, not something endlessly extended, but set in a definite space as a definite force, and not a sphere that might be "empty" here or there, but rather as force throughout, as a play of forces and waves of forces, at the same time one and many, increasing here and at the same time decreasing there; a sea of forces flowing and rushing together, eternally changing, eternally flooding back, with tremendous years of recurrence, with an ebb and a flood of its forms; out of the simplest forms striving toward the most complex, out of the stillest, most rigid, coldest forms toward the hottest, most turbulent, most self-contradictory, and then again returning home to the simple out, of this abundance, out of the play of contradictions back to the joy of, concord, still affirming itself in this uniformity of its courses and, its years, blessing itself as that which must return eternally, as a, becoming that knows no satiety, no disgust, no weariness: this, my, Dionysian world of the eternally self-creating, the eternally self-destroying, this mystery world of the twofold voluptuous delight, my "beyond good and evil," without goal, unless the joy of the circle is itself a goal; without will, unless a ring feels good will toward itself—do you want a name for this world? A solution for all its riddles? A light for you, too, you best-concealed, strongest, most intrepid, most midnightly men?—This world is the will to power—and nothing besides! And you yourselves are also this will to power—and nothing besides!"

(add)

Other

A noted WP fragments scholar, in respect to their thermodynamics content, is Eric Steinhart. [2]

References

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2. Steinhart, Eric. (1999). "The Will to Power and Parallel Distributed Processing" (§:From Thermodynamic to Philology: the Thermodynamic Conception of the Will to Power), in: *Nietzsche, Epistemology, and Philosophy of Science: Nietzsche and the Sciences II* (editors: Babette Babich, Robert Cohen) (pgs. 313-22; §, pgs. 314-). Kluwer Academic Publishers.
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7. Nietzsche, Friedrich. (1888). *The Antichrist* (translation and Introduction: Henry Mencken) (§:Introduction, pgs. 1-2). A.A. Knopf, 1920.

External links

â— The Will to Power (manuscript) – Wikipedia.

θΔics

In recension theory, **Theban recension** refers to the conjecture (Naville, 1886) that in the 18th dynasty (1549-1292BC) to 19th dynasty (1292-1189), of the New Kingdom (1549-1070BC) period (see: supreme god timeline), there was a major redaction, revision, or "recension" (Budge, 1904) to the Egyptian Book of the Dead, which was orchestrated by the priests or religious scholars of Thebes (see: Thebian creation myth).

References

1. (a) Spence, Lewis. (1915). *Ancient Egyptian Myths and Legends* (§: The Three Recensions, pgs. 114-). Dover, 1990.
(b) Lewis Spence – Wikipedia.

θΔics

In creation myths, **Thebian creation myth** or "Theban creation doctrine" (Greenberg, 2000), refers to []

A cartoon (Q) of the "let there be light" of the Bible, and how, paradoxically, there are three types of Biblical light? The paradox is resolved by noting that Genesis 1:3-5 is a Jewish recension rescript of **Thebian creation myth**. [2]

Overview

In 2050BC, Thebes became the new state capital of Egypt, according to which the god Amen was reconceptualized as a fusion or incarnation of all the supreme gods come before; during which time the previously once dominate Egyptian creation myths, namely of Heliopolis (Heliopolis creation myth, 3100BC), Memphis (Memphis creation myth, 2800BC), and Hermopolis (Hermopolis creation myth, 2400BC), were uniformed into one Amen-god based creation narrative. [1]

In c.1300BC, the Amarnan creation myth, formulated by Akhenaten, usurped and superseded the Thebian creation myth, wherein the sun god Aten was made not only supreme god, but the only god. Donald Redford, in his *Akhenaten: the Heretic King* (1984), argued that Akhenaten, in his scientific sounding descriptions of Aten as something like energy, amounted to atheism. [3] This attempted reform, accordingly, only lasted about three decades.

In c.1213 BC, according to the Leiden Papyrus I 350, the god Amun again returned to supreme god status; fragments of the new form of the creation myth are translated as follows:

Hymn to Amun
Leiden Papyrus I 350 (80th chapter) (Q)

1 The **eight (1) were** your first manifestation (2)
until you completed these, you being single (3).
Secret was your body among the elders,
5 and you kept yourself hidden as Amun,
at the head of the gods.

You made your **manifestations in Tatenen** (4),
to accompany the primeval ones in your first primeval time.
Your beauty arose as the Bull of His Mother (5) .

You withdrew as the one in the sky, **enduring as Re**.
10 You returned in fathers, maker of their sons,
to make an excellent heritage for Your

Hymn to Amun
Alternative translation [3]

He who has given shape to himself, his form is unknown, that beautifully shimmering (hue of) color which has become a beautiful but secret form—the one who gave shape to himself and who did create himself....

The **eight gods** [Ogdoad of Hermopolis] were your first manifestations?' Before them you alone hast been. Your body was made secret to the ancients, you, who hast hidden yourself as Amun, as the first among the gods.

You assumed the **form of Tenen** (primal hill) to give shape to the first gods of the primeval era.... The Ennead together, (the nine) were in your members, and in your form were all the gods united. Your first form by which you have begun was Amun—namely, he who hides his name from the gods....

When Ra arose in the sky, to rejuvenate himself again, he

children.

(Amun) spat forth ... to create Shu and Tefnut to be joined.

You began manifestation with nothing,
without the world being empty of you on the
first occasion (6).
All gods came into existence after you ...
[remainder lost]

In 1991, Karl Luckert, in commentary on the above, states that this "hiddenness" and "obscurity of name" are the features generally associated with Yahweh, according to which this new new version of Amen, during the so-called "restoration period of Amunism" (Adolf Erman, 1923) following the collapse of Atenism, is the forerunner to the monotheism of Judaism. [3]

Hebrew creation myth

See main: Yahweh, Aten, and Amun

In the new Canaanite recension, following the Amarna recension (c.1300BC), with focus on the god Atum, and in the so-called “second Theban recension” (c.1200-800BC), with focus on the hidden god Amen, a new god YHWH or “I Am Who I Am” or Yahweh was formulated, based on a synthesis of the former two, intermixed with aspects of the old Canaanite god El, to make the new supreme god of the Israelites.

> “I suspect that Yahweh was shaped after the model of Amen.”
>
> — Kurt Sethe (c.1933) [4]

In short, as people began to migrate out of Egypt, Amen, in the so-called Iron age Canaanite creation myth (Q) reform (c.900-300BC), was renamed YHWH or Yahweh, and was merged with the former Bronze Age Canaanite supreme god El, to make the compound god Amen-El or Yahweh-El, of the new sect of Is-Ra-El-ites, wherein in Isis became Sarah, Ra became Abraham, and Nun became Noah in god-to-prophet rescript fashion.

In Genesis 1.3-5, of the Old Testament of the Bible, the first day of creation is described as follows: (Q)

> “And god said, ‘Let there be light’, and there was light. 4 God saw that the light was good, and he separated the light from the darkness. God called the light ‘day’, and the darkness he called ‘night’. And there was evening, and there was morning—the first day.”

This account of things has been famously paradoxical, to Biblical interpreters, per reason that the statement that "light" is created on the first day, is scientifically impossible, per reason that the sources of light, namely the sun and the stars, are not created until the forth day? (Q)

This confusion, according to Gary Greenberg (2000), is resolved by noting that this Jewish mythology version is a rescript of the following segment of Thebian creation: [2]

> “The one (i.e. Amen) that came into being in the first time when no god was yet created, when you [Amen-Ra] opened your eyes to see with them and everybody became illuminated by means of the glances of your eyes, when the day had not yet come into being.”

The mention of “eyes” here, to clarify, refer to the ancient Egyptian belief that the eyes of Horus, the oldest of the Egyptian gods, were thought to be the sun and the moon, one eyeball being the sun, one being the moon, the face of the god looking down on people from above.

See also

- Clay creation myth

References

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2. Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History* (Myth #3: Creation began with the appearance of light, pg. 14). Source Books.
3. Luckhert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective* (atheism, pg. 109; Hymn to Amun, pgs. 111-12). SUNY Press.
4. (a) Bonnett, Hans. (1952). *Reallexikon der Agyptischen Religionsgeschichte* (pgs. 31-34). Publisher.
(b) Luckhert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective* (pg. 126). SUNY Press.

External links

- Thebes (section) – Ancient Egyptian creation myths.

θΔics

In religio-mythology, **theism**, from Greek *theos* "god" + *-ism*, "belief", aka "pretended natural religion" (Holbach, 1770), is belief in the existence of god (see: monotheism), gods (see: polytheism), or one supreme god and lesser gods (see: henotheism). [1]

Quotes

The following are related quotes:

> "Libb Thims' science is laced with extreme atheism and materialism and hence his precarious position. Science needs to be kept at equal distance and away from both atheism and **theism**. I can't stop but laugh at myself when I think that I am not alive or I am not moving myself."
>
> — DMR Sekhar (2011), a self-drive (or self-motion) theorist

See also

- Atheism
- Deism
- Pantheism

References

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External links

- Theism – Wikipedia.

θΔics

In existographies, **theists**, as compared to atheists (or atheist), are individuals who have identified as people who have belief in the existence of god and argue that god exists; some noted theists, famous theists, and or creationism scientists ranked by idiocy; along with theism-related individuals are listed in the adjacent drop menu.

Quotes

See also: theism quotes

The following are noted "theists" (plural) related quotes:

> "I shall quite briefly mention here the notorious atheism of science. The **theists** reproach it for this again and again. Unjustly. A personal god cannot be encountered in a world picture that becomes accessible only at the price that everything personal is excluded from it. We know that whenever god is experienced, it is an experience exactly as real as a direct sense impression, as real as one's own personality. As such he must be missing from the space-time picture. 'I do not meet with god in space and time', so says the honest scientific thinker, and for that reason he is reproached by those in whose catechism it is nevertheless stated: 'god is spirit'."
>
> — Erwin Schrodinger (c.1954), *Nature and the Greeks* [1]

> "Actually, it's **theists** who believe in nothing, quite fervently."
>
> — Paul Myers (2008)

> "The universe somehow 'works' and all our beliefs concerning ultimate purpose are little more than biological blunders. **Theists** are inclined to view the universe as a grand and beautifully designed machine. Atheists, on the other hand, are disposed to see it as a chaotic mess."
>
> — Bo Jinn (2013), *Illogical Atheism* [2]

References

1. Schrodinger (quotes) – GoodReads.com.
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θΔics

In hmolscience, **Theodor Lipps** (1851-1914) was a German psychologist noted, in psychological thermodynamics, for his 1903 views on a mechanistic theory of psychic energy, based on, or akin to, in some way, physical energy.

Overview

In 1903, Lipps, in his *Guide to Psychology*, discussed the concept of "psychic energy" and its possible interactions with the subconscious. [1]

Lipps' notion of how psychic energy or nervous energy works via mechanism in the subconscious was an inspiration to Austrian psychologist Sigmund Freud in his later work on the subject. [3] Freud, supposedly, was attracted by the way Lipps, his friend, and Herbert Spencer had worked the concept of psychic energy into a mechanical explanation of laughter. (Ñº)

Lipps' views formed a certain basis for Swiss psychiatrist Carl Jung. [2] Jung credits Lipps as having been the first to differentiate between psychic force and psychic energy; and on Lipps' view that psychology had the right to develop its own versions of energy concepts, juggled around with terms such as life energy (lebens-energie), as differing from life force (lebenskraft); libido, as the representation of life-energy, and discussed his views on bioenergetic terms as bioenergy or vital energy. [4]

References

1. (a) Lipps, Theodor. (1903). *Guide to Psychology* (*Leitfaden der Psychologie*). Publisher.
(b) Bishop, Paul. (1999). *Jung in Contexts.* (pg. xxiii). Routledge.
2. Jung, Carl. (1928). "On Psychic Energy" (pgs. 15-16), in *On the Nature of the Psyche* (1960). Princeton University Press.
3. Morreall, John. (1983). *Taking Laughter Seriously* (pg. 27). SUNY Press.
4. Shamdasani, Sonu. (2003). *Jung and the Making of Modern Psycholgy* (pg. 245). *Cambridge University Press.*

External links

â— Theodor Lipps – Wikipedia.

θΔics

In existographies, **Theodor Schwann** (1810-1882) (IQ:150|#654) (Murray 4000:8|A) was a German physiologist and physician, considered the founder of histology, coiner of the term "metabolism", noted for []

Overview

In 1839, Schwann published a monograph that declared all animals and plants are made from one single fundamental unit, eventually dubbed the "cell", a term previously coined by Robert Hooke.

Schwann also, notably, discovered pepsin, the first digestive enzyme prepared from animal tissue, discovered Schwann cells in the peripheral nervous system, and experimented to disprove spontaneous generation.

Quotes | On

The following are quotes on Schwann:

> "When Robert Hooke observed 'a great many little boxes' in slices of cork in 1665 through his compound microscope, he compared them to honeycomb and chose a name connoting an empty enclosed space. The teeming interior of the cell and its fundamental role in living organisms remained unguessed for the next two hundred years. Only in 1838 and 1839, with improved optics and theories advanced by botanist Matthias Schleiden and zoologist **Theodor Schwann**, came suggestions of its broader significance. But the genius of cell theory is the German physician and anatomist Rudolf Virchow, the founder of cellular pathology."
>
> — John Simmons (2000), *The Scientific 100* (pg. 89) (see: Simmons 100)

Quotes | By

The following are quotes by Schwann:

> "We set out, therefore, with the supposition that an organized body is not produced by a fundamental power which is guided in its operation by a definite idea, but is developed, according to blind laws of necessity, by powers which, like those of inorganic nature, are established by the very existence of matter. As the elementary materials of organic nature are not different from those of the inorganic kingdom, the source of the organic phenomena can only reside in another combination of these materials, whether it be in a peculiar mode of union of the elementary atoms to form atoms of the second order, or in the arrangement of these conglomerate molecules when forming either the separate morphological elementary parts of organisms, or an entire organism."
>
> — Theodor Schwann (1939), *Microscopic Researches into the Accordance in the Structure and Growth of Animals and Plants* [1]

> "In the clear fluid, consisting of gum and sugar, granules of protein-compounds are seen swimming about (a), among which a few larger ones are strikingly conspicuous. Around these latter the former are seen conglomerated into the form of a small disc (b,c). Around other discs a clear, sharply defined border may be distinguished, which gradually recedes farther and farther from the disc (the cytoblast), and, finally, can be distinctly recognized to be a young cell (d,e)."

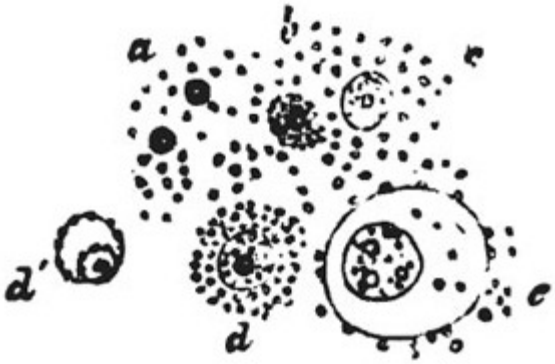

— Theodore Schwann (1839), *Main Features of Scientific Botany*

See also

â— Cell-as-molecule

References

1. Schwann, Theodor. (1939). *Microscopic Researches into the Accordance in the Structure and Growth of Animals and Plants* (*Mikroskopische Untersuchungen über die Uebereinstimmung in der Struktur und dem Wachsthum der Thiere und Pflanzen*) (translator: Henry Smith) (pgs. 190-01) (Ñº). Publisher, 1847.

External links

â— Theodor Schwann – Wikipedia.

θΔics

In hmolscience, **Theodore Porter** (1953-) is an American social science historian noted for a number of works on a historical critique of aspects of social physics (James Maxwell) and human mathematics (Pierre Laplace and Adolphe Quetelet), or what might be better called social mathematics. [1]

Overview

In 1981, Porter, in his "A Statistical Survey of Gases: Maxwell's Social Physics", a public lecture, turned essay, given at University of Bielefeld, West Germany, discussed the influence of Adolphe Quetelet's social physics in the gas theory physics of James Maxwell. [5]

In 1986, Porter, in his *The Rise of Statistical Thinking*, his first book, outlined the development of statistical ideas and methods in the social science, biological evolution, and thermodynamics. [3]'

In 2005, Porter, in his *Karl Pearson: the Scientific Life in a Statistical Age*, discussed some of the reactions to the Christian apologetic stylized paradoxical philosophy of Peter Tait and Balfour Stewart. [4]

Porter's work is mentioned by those including American humanities thermodynamics historian Greg Myers, in his 1985 article "Nineteenth-Century Popularizations of Thermodynamics and the Rhetoric of Social Prophecy", and physical economics historian Philip Mirowski, in his 1989 *More Heat that Light*. [2]

Education

Porter completed his AB in history at Stanford University in 1976 and PhD in history at Princeton University in 1981. Porter currently is a professor of history at the University of California, Los Angeles.

References

1. (a) Porter, Theodore. (1981). "The Mathematics of Society: Variation and Error in Quetelet's Statistics" (abs), *British Journal for the History of Science*, 18: 51-69.
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(b) Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (pg. 437). Cambridge University Press.
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4. Porter, Theodore M. (2005). *Karl Pearson: the Scientific Life in a Statistical Age* (pgs. 38-39). Princeton University Press.
5. Porter, Theodore M. (1981). "A Statistical Survey of Gases: Maxwell's Social Physics" (abs), public lecture at University of Bielefeld, West Germany; in *Historical Studies in the Physical Sciences*, 12:77-116.

External links

â— Theodore M. Porter – Wikipedia.
â— Theodore M. Porter (faculty) – Department of the History, UCLA.
â— Porter, Theodore M. (1953-) – WorldCat Identities.

θΔics

In thermodynamics, **Theodore Richards** (1868-1928) was an American chemist noted for his 1902 paper "The Relation of Changing Heat Capacity to Change of Free Energy, Heat of Reaction, Change of Volume, and Chemical Affinity", in which he pointed out very clearly that the question of whether A > U or U < A above absolute zero (where U = A) depends upon whether the heat capacity is increased or decreased by the chemical process; where A is the maximum external work (or free energy) and U is the energy of the body. [1] This was an historical forerunner to Walther Nernst's heat theorem or the third law of thermodynamics. [2] Richards won the 1914 Nobel Prize in chemistry for work on atomic weights.

Students

Richards was the thesis advisor to Gilbert Lewis at Harvard, a PhD jointly published as "Some Electrochemical and Thermochemical Reactions of Zinc and Cadmium Amalgams". [3] Richards was also acquainted with Percy Bridgman.

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3. Hildebrand, Joel H. (1947). "Gilbert Newton Lewis: 1875-1946", *Obituary Notices of the Royal Society*, 5: 491-506.

External links

â— Theodore William Richards – Wikipedia.

θΔics

In science, **Theodore Roose** (1771-1803) was a German anatomist (Q) and proto-physiologist noted his 1797 attempts at introducing "biology" as a new science, according to which physical and chemical forces distinguished between a "living nature" and a "dead nature", each with respective laws, i.e. "laws of living nature" and "laws of dead nature", respectively; all generally based on the notion of the existence of "life force".

Overview

In 1797, Roose, in his *Outlines of the Theory of Life Force*, according to Sydow Momme (2012), was the first to employ the term "biology", which he associated with organisms that have the property of "*Lebenskraft*" or "life force"; the following is some of the opening content: [1]

German	English
Vorede	**Preface**
Ich habe bei der Herausgabe dieses Entwurfes einer **Biologie** wettig an die Leser desselben vorzuerinnern. Rechtfertigt die dermalige Lage der Wissenschaft eine Schrift, wie die gegenwättige? Und wenn diefs der Fall ist, füllt der vorliegende Versuch die Lücke aus, zu deren Ausfüllung er bestimmt ist? Könnte ich die zweite Frage mit eben der Zuversicht, wie die erste, bejaend beantworten, so würde ich diese Schrift mit mehreren Selbstvertrauen dem Publikum darbringen. lieber die Zweifel, die ich einigen Lelirsätzen untrer vortrefflichsten physiologischen Schriftstellet entgegengestellt habe, verlieft ich kein Wort, jfede Entschuldigung darüber wäre eine Verletzung der Sichtung gegen sie und gegen das Publikum. Man wird hoffentlich mein aufrichtiges Streben nicht verkennm, das Streben nach Wahrhtit.	I have a **biology** Wettig to readers vorzuerinnern thereof in the publication of this draft. Justifies is the momentary position of the science a font as the gegenwättige? And if diefs is the case, the present experiment, the gap is filled out, for the filling of it is intended? Could I have the second question with as much confidence as the first answer bejaend, I would this work with more confidence offer to the public. rather the doubts that I have opposed some Lelirsätzen untrer noblest physiological Schriftstellet I verlieft no word jfede sorry about it would be a violation of sighting against them and against the audience. It is my sincere hope striving not verkennm, the pursuit Wahrhtit.
Leblose und lebende Natur	**Lifeless and living nature**
An den Körpern, die wir in der uns umgebenden Natur wahrnehmen, bemerken wir gewisse Eigenschaften und Kräfte, die wir, da wir an allen Körpern sie mehr oder weniger wahrnehmen > physische Kräfte nennen. Diese Kräfte sehen wir immer unter gewissen Bedingungen wirksam, und schliessen daraus: sie gehorchen gewissen Gesetzen, den physischen Gesetzen. Hierher gehören Schwere, Schnellkraft, Undurchdringlichkeit, u. s. w. Die Wirkung bewegter Körper auf einander durch Mittheilung ihrer Bewegung heisst mechanische» die Wirkung der Grundstoffe, aus denen die. Körper bestehen, wodurch sie ihre Verbindung unter einander verändern, heisst chemische Wirkung. Chemische Kräfte und Wirkungen sind demnach von den mechanischen so wesentlich nicht verschieden, als oftmals vorausgesetzt wird; beide sind nur Arten Einer Gattung.	physische Kräfte nennen.">At the bodies that we perceive in nature around us, we notice certain qualities and powers that we, as we in all bodies perceive them more or less call "physical forces". We see these forces always under certain conditions effectively, and conclude: they obey certain laws, the physical laws. Subheadings include gravity, explosiveness, strength, impenetrability, u. S. W. The effect of moving bodies to each other through communication of their motion is called the "mechanical effect" of the raw materials from which the. Bodies are made, whereby they change their connection to one another is called chemical action. "Chemical forces" and effects are therefore of the mechanical so far not different, as is often assumed; both are types of genus.
Diesen mechanischen und chemischen Kräften und Gesetzen sind alle Körper, als solche, unterworfen, und vermöge derselben bringen sie Erscheinungen hervor, die	This mechanical and chemical forces and laws are all body, as such, subject to, and by virtue of the same

wir aus jenen Kräften erklären.

Einige Arten von Körpern bringen Erscheinungen hervor, die wir aus jenen allgemeinen physischen Kräften nicht erklären können, die sogar oftmals den physischen Kräften gerade entgegen wirken. Solche Körper nennen wir lebendi Körper, und unterscheiden also überhaupt die lebende Natur von der /eWo/f«. Beispiele solcher Erscheinungen, die sich durchaus aus den allgemeinen Gesetzen der todten Natur nicht erklären lassen, haben wir in der lebenden Natur täglich vor Augen. Ein Samenkorn wird in die feuchte , warme Erde gelegt; den Gesetzen der todten Natur zufolge müsste eine Zersez-* zung seiner Theile durch Fäulniss ror sich gehen; aber es fault nicht; es keimt ein Gewächs daraus hervor, das tausend neue .Samenkörner trägt; — Ein frisches, d. i. ein lebendes; Ei, geht in einem Wärmegrade von 96 Grad, in welchem jede todte thierische Substanz verfault, nicht in Fäulniss über, sondern es entwickelt sich daraus neues Leben, ein neues Thier. —* Das ewige Gesetz der Wärme in der tödten Natur, sich gleichmäfsig zu verbreiten, hört im Körper der vollkommnern Thiere äu£ Der Mensch und die ihm am ähnlichsten Thiere haben einen ihnen eigenthümlichen Wärmegrad, der unabhängig von dem Wärmegrad eines Mittelkörpers ist, in welchem sie sich befinden, so, dass er in einem Grade der Wärme, der das Quecksilber gefrieren macht, und bei einem Grade der Hitze, der nahe an den Siedpunkt des Wassers gränzt, derselbe bleibt.

phenomena they bring forth, we explain from those forces.

Some types of bodies bring forth phenomena that we can not explain from those general physical forces which even often the physical forces counteract straight. Such bodies we call "alive body", and thus differ at all the living nature of the / ESA / f ". Examples of such phenomena, which can not be entirely out of the general laws of dead nature declare we have in living nature all around us. A seed is placed in the moist, warm earth; the laws of dead nature According takes a Zersez- * tion of its parts by putrefaction ror to go; but it will not rot; They sprout a plant out of it, which carries a thousand new .Samenkörner; - A fresh, d i a living;.. Egg, goes into a degree of heat of 96 degrees, in which each dead animal matter rots, not in putrefaction over, but it develops new life, a new animal. - * The eternal law of heat in the killing nature to spread gleichmäfsig, listening in the body the more perfect animals gs £ Man and his most similar animals have them peculiar degree of heat, which is independent of the degree of heat of a central body in which they are, so that he. to a degree of heat which makes the mercury freeze, and with a degree of heat, the gränzt close to the boiling point of the water remains the same

(add discussion)

References

1. (a) Roose, Theodore. (1797). *Outlines of the Theory of Life Force* (*Grundzüge von der Lehre von der Lebenskraft*) (Biologie, pg. iii). Braunschweig.
(b) Sydow, Momme von. (2012). *From Darwinian Metaphysics towards Understanding the Evolution of Evolution Mechanisms* (pg. 88). Gottingen University.

External links

- Theodore Georg August Roose (German → English) – Wikipedia.

θΔics

In existographies, **Theodorus** (c.340-250BC) (IQ:175|#225) (FA:19) (CR:22), from the Greek *theos*-, 'gods' + *-doron* 'a gift', meaning a "gift from the gods", was a Greco-Alexandrian philosopher, aka "Theodorus the atheist", noted for []

Other

Theodorus the atheist, is not to be confused with not to be confused with Theodorus (c.465-400BC), Theodorus of Samos (c.550-500BC), who supposedly studied abroad in Egypt, or Theodorus of Byzantium (c.500-450BC) (ACR:33) (Q).

Overview

In c.270BC, Theodorus, supposedly, penned a book entitled *Of the Gods*, wherein he rejected belief in gods.

Theodorus has been classified, along with Diagoras, as one of the first two "outright atheists". [3]

Education

Studied the lectures of determinism philosopher Zeno of Citium. [4]

Influence

The works of Theodorus were said to be influential to Epicurus; some assert that Epicurus borrowed most of what he wrote from Theodorus.

Quotes | On

The following are noted quotes on Theodorus:

> "The Theodoreans derived their name from **Theodorus**, known as 'the atheist', and adopted his doctrines. Theodorus was a man who utterly rejected the current belief in the gods. And I have come across a book of his entitled *Of the Gods* which is not contemptible. From that book, they say, Epicurus borrowed most of what he wrote on the subject."
>
> — Diogenes Laertius (c.225), *Lives and Opinions of Eminent Philosophers* [1]

> "Diagoras and **Theodorus** flatly deny that there were ever gods at all."
>
> — Michel Montaigne (c.1580) [2]

> "**Theodorus the atheist** (fourth/third century BC). Theodorus acquired his nickname because of his professed opposition to the religious beliefs of his time. According to Diogenes Laertius, he studied under Aristippus Metrodidactus (Q) [compare: Aristippus], Misdeeds of Cyrene and Dionysius of Chalcedon, subsequently attracting his own group of followers who became known as the 'Theodoreans'. He took the view that pleasure and pain were the only important things in life, and that conventional morality should be treated with a degree of flexibility. He regarded himself as a citizen of the world, and lived in a number of different places. This was not always a matter of choice as on more than one occasion he was asked to move on. His flexible approach to morality may have been a contributory factor. He ended his days in Cyrene, even though it had earlier thrown him out. His views on religion may have influenced Epicurus."
>
> — Trevor Curnow (2006), *The Philosophers of the Ancient World: an A-Z Guide* [1]

References

1. Laertius, Diogenes. (c.225BC). *Life of Aristippus* ("known as the atheist", pgs. 86; *On the Gods*, pg. 97), in: *Lives and*

Opinions of Eminent Philosophers (Q), *Book 2* (pg. 97) (translator: Robert Hicks). Publisher, 1925.
2. (a) Montaigne, Michel. (1592). *The Complete Works* (translator: Donald Frame) (Theodorus, 4+ pgs; quote, pg. 465). Everyman's Library, 2003.
(b) Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§3: Michel de Montaigne, pgs. 29-31). Prometheus.
3. Schodde, Carla. (2013). "Ancient Atheism" (Q), FoundInAntiquity.com, Jul 10.
4. Anon. (c.1000). "Theodoros", *Suda* (Q). Publisher.
5. Curnow, Trevor. (2006). *The Philosophers of the Ancient World: an A-Z Guide* (pg. 264). Bloomsbury, 2011.

External links

- Theodorus the Atheist – Wikipedia.

θΔics

In existographies, **Theodosius Dobzhansky** (1900-1975) (Simmons 100:67) (CR:7) was a Russian-born American zoologist, geneticist, and origin of life debater, noted for his position that a human is not a molecule (see: people are not molecules; human molecular theory).

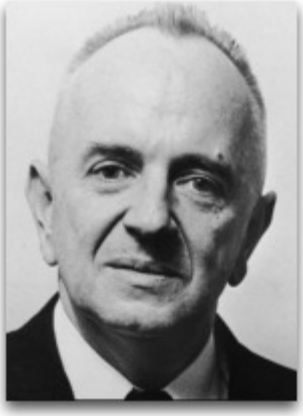

Quran | Science

In 1975, Dobzhansky employed the following quote, as dialogue opening leverage, in respect to his war on Islamic-based science and or ideology of Christian god-created evolution based biology:

> "The Holy Koran, the Prophet's teachings, the majority of Islamic scientists, and the actual facts of all prove that the sun is running in its orbit, as Almighty God ordained, and the earth is fixed and stable, spread out by God for his mankind. Anyone who professed otherwise would utter a charge of falsehood toward God, the Koran, and the Prophet."
>
> — Abdul ibn Baz (1966), "Letter to Faisal, King of Saudi Arabia", published in two newspapers, requesting that he suppress the heresy and falsehood of heliocentrism being taught at Riyadh University; when King Faisal found out this, he was furious and ordered the destruction of every unsold copy of both papers; but it was too late, news had leaked out to Egyptian newspapers, after which Saudi Arabia was labeled a "backwards nation"; ibn Baz, to note, had begun to lose his eyesight in 1927 (age 16) and was completely blind by 1950 (age 40); he did not recant his views until 1985 (age 75) when Prince Sultan Ibn Salman, the first Arab astronaut, returned from a week's stay aboard the space shuttle *Discovery*, and returned home, and made a special trip to see ibn Baz and to tell him that by watching the line that separates day and night, he had personally seen the earth rotate; nevertheless, in spite of such intellectual backwardsness, in 1993 (age 83) he was appointed, by King Fahad, to be "grand mufti", the equivalent of "chief justice" of Saudi Arabia. [1]

Of note here, King Fahd, was the person who allowed Saudi Arabia to host American-led coalition troops in his kingdom, later allowing American troops to be based their; a decision that brought considerable criticism and opposition from many Saudi citizens, who objected, per Quranic reasoning, to the presence of foreign troops on Saudi soil, among these objectors was Osama bin Laden and Al Qaeda, the former of which latter cited this "event" as *causus belli*, i.e. an "act or event that provokes or is used to justify war", Jihad in this case, in the later justified 9/11 attacks. [6]

Prebiotic evolution

The following are prime examples where Dobzhansky's religious faith conflicts with his scientific beliefs and thereby arguments:

> "Prebiological natural selection is a contradiction in terms."
>
> — Theodosius Dobzhansky (1963), discussion with Gerhard Schramm on terminology [2]

> "Man is not a molecule, and though he is an animal he is a very special kind of animal."
>
> — Theodosius Dobzhansky (1964) [3]

(add)

Religion

Ernst Mayr stated on Dobzhansky: "On the other hand, famous evolutionists such as Dobzhansky were firm believers in a personal god." [4] Dobzhansky himself spoke of god as creating through evolution, and considered himself a communicant of the Eastern Orthodox Church. [5]

Quotes | On

The following are quotes on Dobzhansky:

> "I must also mention books by two scientists who are my associates on the Committee on Science and Human Values, which is responsible for this meeting: L. C. Birch's *Nature and God* and **Theodosius Dobzhansky**'s *Biology of Ultimate Concern*."
>
> — Ralph Burhoe (1970), "Introduction" to *Symposium on Science and Human Values* [8]

Quotes | By

The following are quotes by Dobzhansky:

> "Purposefulness, or teleology, does not exist in nonliving nature. It is universal in the living world. It would make **no sense** to talk of the purpose or adaption of stars, mountains, or the laws of physics."
>
> — Theodosius Dobzhansky (c.1970), *Publication* (Q); cited by Peter Corning (2003) in: *Nature's Magic* (pg. 172)

> "Purposefulness, or teleology, does not exist in nonliving nature. It is universal in the living world."
>
> — Theodosius Dobzhansky (1977), *Publication* (pg. 77) (Q)

> "Man certainly consists of molecules and atoms, but he does NOT arise by an accidental concourse of these."
>
> — Theodosius Dobzhansky (1967), *The Biology of Ultimate Concerns* [7]

References

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(b) Watson, Mark. (2008). *Prophets and Princes: Saudi Arabia from Muhammad to the Present* (earth, pg. 196). Publisher.
(c) Abd al-Aziz ibn Baz (Abdul Aziz bin Abdullah bin Baz) – Wikipedia.
(d) Faisal of Saudi Arabia – Wikipedia.
(e) Fahd of Saudi Arabia – Wikipedia.
(f) Kings of Saudi Arabia (1932-present) – Wikipedia.
2. (a) Schramm, Gerhard. (1963). "Synthesis of Nucleosides and Polynucleotides with Metaphosphate Esters", *The Origins of Prebiological Systems and of their Molecular Matrices* (editor: Sidney Fox) (§:Talk, pgs. 299-309; §:Discussion, pgs. 309-15; quote, pg. 310); Proceedings of a Conference Conducted at Wakulla Springs, Florida and NASA on 27–30 October 1963 under the auspices of the Institute for Space Biosciences The Florida State. Academic Press, 1965.
(b) Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God* (pg. 285). Zondervan, 2009.
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Further reading

● Dobzhansky, Theodosius. (1956). *The Biological Basis of Human Freedom*. Publisher.
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External links

● Theodosius Dobzhansky – Wikipedia.

θΔics

In terminology, **theology** (TR:268), from Greek *theos* "gods", based on the Greek letter Theta 'Θ' (see: alphabet), representing, numerically, the Greek number "9", symbolic of the nine gods (paut) of the Ennead of Heliopolis (Porphyry, c.280); theta, itself, derived from Egyptian circle with X inside " ", generally known as the symbol for either the city of Heliopolis, aka "city of the sun", or also a circle with dot in side " Θ " the symbol for Ra, the sun god (Gardiner, 1929), which combined with the Middle English *-logy* "doctrine or theory", the latter from *-logia* "divine communications", from *logos* "word", is the study of the nature of gods, god, and religious beliefs. [1]

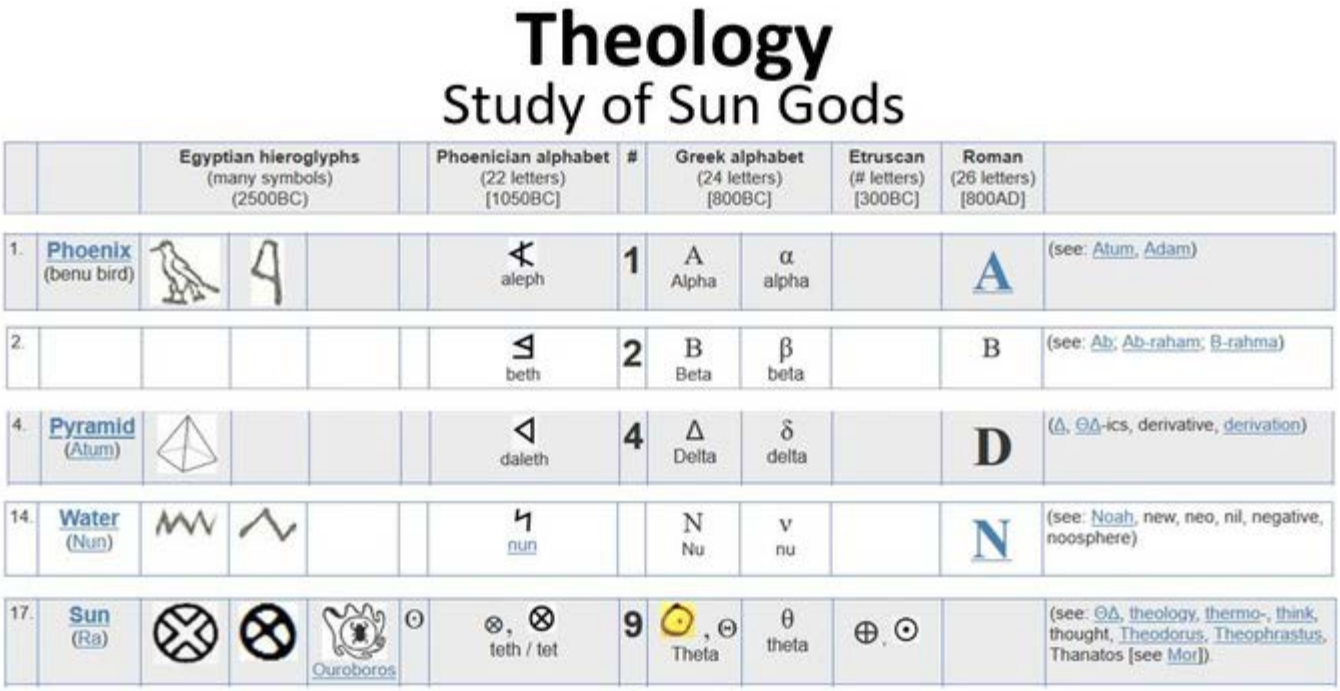

A section from the alphabet page, showing that "**theology**", introduced primarily by Hesiod (800BC), derives from the older Greek letter "Theta" 'Θ' the symbol of both the sun god Ra and, numerically, being the Greek number 9, the Heliopolis Ennead, or god family of nine gods.

Quotes

The following are related quotes:

> "Practically since its first definitive formulation by Darwin the concept of chance variation and natural selection has dominated the study of evolution, although frequent attempts have been made to replace or modify it. Probably most such attempts are provoked by a vaguely defined awareness of an insufficiency in the natural selection hypothesis, and the recognition of a directive factor in evolutionary processes which persists through successive generations. The latter concept which is commonly known as 'orthogenesis', is supported a by considerable amount of evidence (Leo Berg, 1926), but at present is not widely accepted among biologists. The general reason for abandoning or neglecting this concept has been the failure, thus far, to demonstrate the existence of the necessary directing factor outside of the **theological** doctrine; and one may suspect that fear of leaning too closely to such doctrine has caused most biologists to 'shy off' from orthogenesis. It will be the aim of the writer to indicate the actual existence of a directing factor in evolutionary processes, while at the same time avoiding all necessity of invoking theological concepts."
>
> — Harold Blum (1935), "A Consideration of Evolution from a Thermodynamic Viewpoint" [2]

> "***Theologia*** first appears in Plato, and the term is used both by him (*Republic*, 379a) and by Aristotle (*Metaphysics*, 1000a, 1071b) to designate the activity of the poets who gave cosmogonical accounts. Aristotle particularly uses it in contrast with the philosophical speculations of the *physikoi* (e.g. *Metaphysics*, 1075b); in effect, it is parallel to the distinction between mythos and logos (qq.v.). In *Metaphysics* (1026a), a sharply distinct meaning emerges. Aristotle had divided the theoretical sciences into

three classes, of which the third deals with substances that are 'separate' (for the sense, see choriston) and without *kinesis*; this is the 'first philosophy' or *theologike*, so called because such substances are the realm of divinity. Theology later expanded to once again embrace all discourse about the gods, and this new understanding of its scope may be seen in the division of theology into 'mythical, physical, and political', a division originating in the Middle Stoa (see Augustine, De civ. Dei VI, 5, citing Varro; compare, ibid. IV, 27 and Eusebius, Praep. Evang. IV, 1)."

— Francis Peters (1967), *Greek Philosophical Terms* (pg. 194)

See also

- Ab-ra-ham-ic theologies
- Anunian theology
- B-ra-hma-ic theologies
- Monotheism
- Polytheism
- Ra theology
- Zerotheism

References

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2. (a) Blum, Harold F. (1934). "A Consideration of Evolution from a Thermodynamic View-Point" (abs), presented at the 94th meeting of the American Association for the Advancement of Science, Jun 20, in: *The American Naturalist*, 69(723):354-69, Jul-Aug, 1935.
(b) Berg, Leo S. (1926). *Nomogenesis or Evolution Determined by Law* (*Номогенез, Или Эволюция На Основе Закономерностей*) (translator: J.N. Rostovtsow) (thermodynamics, pgs. 174, 405). MIT Press, 1969.

External links

- Theology – Wikipedia.

θΔics

In thermodynamics, **Theophile de Donder** (1872-1957) (IQ:170|#301) was a Belgian mathematical physicist and thermodynamicist know as the “father of irreversible processes”, founder of the Brussels school of thermodynamics, mentor to Russian-born Belgian chemist Ilya Prigogine, and notable for his 1922 free energy formulation of chemical affinity. [1] De Donder introduced the concept of the “degree of advancement” ξ or extent of reaction in 1920. [7]

Education

In 1899, De Donder received his doctorate in physics and mathematics from the Université Libre de Bruxelles, for a thesis entitled *Sur la Théorie des Invariants Intégraux* (*On the Theory of Integral Invariants*). [2] He was professor between 1911 and 1942, at the Université Libre de Bruxelles. Initially he continued the work of Henri Poincaré and Elie Cartan. From 1914 he was influenced by the work of Albert Einstein and was an enthusiastic proponent of the theory of relativity.

Brussels school

In 1918, the “birth year” of the Brussels school, the then 45 years old de Donder began to devote his time to superior teaching, after he was for some years appointed as a secondary school teacher, on the nature of thermodynamics. At this time, he was promoted to professor at the Department of Applied Science, and began without delay the writing of a course on theoretical thermodynamics for engineers. [3]

Thermodynamic theory of affinity

See main: Thermodynamic theory of affinity

Starting with German physicist Rudolf Clausius' second principle, having been formulated as an inequality: "uncompensated heat" is positive - or, in more recent terms, entropy production is positive, where the inequality refers, of course, to phenomena that are *irreversible*, as are any natural processes, de Donder, in the words of Prigogine, "extracted the entropy production out of this ‘sfumato’ when related it in a precise way to the pace of a chemical reaction, through the use of a new function that he was to call ‘affinity’." [4] In his approach, de Donder gave a new formulation of the second principle, based on such concepts as affinity and degree of evolution of a reaction, considered as a chemical variable. [3] He gained significant reputation in 1923, when he developed his definition of chemical affinity. He pointed out a connection between the chemical affinity and the Gibbs free energy.

Reaction affinity and free energy

Most notable for De Donder is his 1922 proof that connected free energy and chemical affinity. In particular, De Donder showed that for a generic chemical reaction, such as:

$$A + B \rightarrow AB$$

The affinity felt between the reactants (A,B) or what is called the *affinity of reaction* is positive for spontaneous reactions and negative for non-spontaneous reactions: [5]

- $A > 0$ the reaction proceeds to the right
- $A < 0$ the reaction proceeds to the left

In large part, this derivation stems from the 1922 De Donder who, building on the "chemical potential" theories of American mathematical physicist Willard Gibbs and the "free energy" logic of German physician and physicist Hermann von Helmholtz and others, formulated a relation between chemical affinity *A* and Gibbs free energy *G*. He showed that if we consider a mixture of chemical species, e.g. a system of reactive chemical entities, with the possibility

of chemical reaction, the measure of affinity felt between the reacting species is equal to the negative of the Gibbs free energy of formation ΔG for the reaction, as shown by the following expression: [6]

$$A = -\Delta G$$

References

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(b) Théophile de Donder – Mathematics Genealogy Project.
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3. Autobiography (Ilya Prigogine) - NobelPrize.org.
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5. Kondepudi, Dilip and Prigogine, Ilya. (1998). *Modern Thermodynamics – from Heat Engines to Dissipative Structures*, (section: "Chemical Potential and Affinity: the Driving Force of Chemical Reactions", pgs. 103-13). New York: John Wiley & Sons.
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7. (a) De Donder, Théophile. (1920). *Lecons de Thermodynamique et de Chemie Physique* (Lessons of Thermodynamics and Physical Chemistry), (pg. 117, formula 318). Paris: Gauthier-Villars.
(b) De Donder, Theophile. (1936). *Thermodynamic Theory of Affinity: A Book of Principles* (pg. 2). Oxford: Oxford University Press.

External links

- Theophile de Donder – Wikipedia.
- Donder, th. De (Theophilie) – WorldCat Identities.

θΔics

In existographies, **Theophilus** (c.120-184), aka “Theophilus of Antioch” was a Mesopotamian-born Greek religious thinker, noted for []

Quotes | By

The following are quotes by Theophilus:

> “For it was fit that they who wrote should themselves have been eye-witnesses of those things concerning which they made assertions, or should accurately have ascertained them from those who had seen them; for they who write of things unascertained beat the air. For what did it profit Homer to have compose the Trojan war, and to have deceived many; or Hesiod, the register of the theogony of those whom he calls gods; or Orpheus, the three hundred and sixty-five gods, whom in the end of his life he rejects, maintaining in his precepts that there is one god? What profit did the sphaerography of the world's circle confer on Aratus, or those who held the same doctrine as he, except glory among men? And not even that did they reap as they deserved. And what truth did they utter? Or what good did their tragedies do to Euripides and Sophocles, or the other tragedians? Or their comedies to Menander and Aristophanes, and the other comedians? Or their histories to Herodotus and Thucydides? Or the shrines and the pillars of Hercules to Pythagoras, or the Cynic philosophy to Diogenes? What good did it do Epicurus to maintain that there is no providence; or **Empedocles to teach atheism**; or Socrates to swear by the dog, and the goose, and the plane-tree, and AEsculapius struck by lightning, and the demons whom he invoked? And why did he willingly die? What reward, or of what kind, did he expect to receive after death? What did Plato's system of culture profit him? Or what benefit did the rest of the philosophers derive from their doctrines, not to enumerate the whole of them, since they are numerous? But these things we say, for the purpose of exhibiting their useless and godless opinions.”
>
> — Theophilus (c.170AD) “Letter to Autolycus” [1]

See also

â— Theophilus Spizelius (1639-1619)

References

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(b) Kors, Alan C. (2014). *Atheism in France, 1650-1729, Volume I: the Orthodox Sources of Disbelief* (pg. 191). Princeton University Press.

External links

â— Theophilus of Antioch – Wikipedia.

θΔics

In existographies, **Theophilus Spizelius** (1639-1619) was a German anti-atheism author of *Radical Atheism* (1666) (Q) (Q), wherein he differentiated (Q) between two ancient strains of atheism, namely: "Epicurean atheism", wherein the world was just matter, and "political atheism", wherein the theory of god arose from the needs of statecraft. [1]

See also

- Theophilus (c.120-184)

References

1. (a) Spizelius, Theophilus. (1666). *Radical Atheism* (1666) (Q)(Q). Publisher.
(b) Kors, Alan C. (2014). *Atheism in France, 1650-1729, Volume I: the Orthodox Sources of Disbelief* (pg. 162). Princeton University Press.

θΔics

In existographies, **Theophrastus** (c.371-287BC) (IQ:175|#306) (FA:19), not to be confused with the Anon Theophrastus (c.1609-1665), was a Greek philosopher, pupil and successor to Aristotle, characterized as "the most elegant and erudite of philosophers " (Cicero, c.45BC) and a "universal genius" (Cap, 1851), noted for []

On the Gods

In c.320BC, Theophrastus penned an essay, now lost, entitled "On Gods" (Περὶ ὦεῶν), wherein, supposedly, he debunks religion and proves gods non-existent.

In c.300BC, Leontion penned a treatise criticizing Theophrastus. (Q)

In 45BC, Cicero, in his *On the Nature of the Gods*, describes Theophrastus' ideas about god, as well as those of his student Strato, as follows: [1]

> "Equally intolerable is the inconsistency of **Theophrastus**, for at one moment he allots the divine primacy to mind, at another to the heavens, and yet another to the signs of the heavenly stars. Another figure unworthy of attention is Theophrastus' disciple Strato, the one they call the 'physicist', for he proposes that all divine power lies in nature, which bears within it the causes of birth, growth, and diminution, but which lacks all sensation and shape."

In 167AD, Marcus Aurelius said the following on Theophrastus: [2]

> "Theophrastus, in his comparison of bad acts—such a comparison as one would make in accordance with the common notions of mankind—says, like a true philosopher, that the offences which are committed though 'desire' are more blamable than those which are committed through 'anger'. For he who is excited by anger seems to turn away from reason with a certain pain and unconscious contraction; but he who offends though desire, being overpowered by pleasure, seems to be in a manner more intemperate and womanish in his offences."

In 1659, an anonymous French freethinker, dubbed the Anon Theophrastus, assumed the moniker or mindset of a "Theophrastus Reborn", and therein penned *Theophrastus Redivivus*, a 1090-page tome themed as a modern version of Theophrastus' "On the Gods", albeit via an explicit and open materialistic atheism purview.

Quotes | On

The following are quotes on Theophrastus:

> "The genius of **Theophrastus** was not less universal than that of Aristotle. He embraced in his meditations almost all the parts of the exact and speculative sciences. We end in Diogenes the list of two-hundred and twenty-seven works which he wrote on grammar, logic, dialectics, oratory, physics, natural history, mathematics, poetry, music, morality and even comedy. Unfortunately, most of these works are lost to us. All that remains is reduced to two treatises on the history of the vegetable kingdom, a treatise on stones, a small number of writings on physics and medicine, and some fragments of moral works, known under the name of *Characters*."
>
> — M. Cap (1851), "Aristotle and Theophrastus" [2]

Quotes | By

The following are quotes by Theophrastus:

> "Time is the most valuable thing a man can spend."
>
> — Theophrastus (c.300BC) (O)

> "There is also the problem of why a flame is shaped like a pyramid. Democritus says that as its extremities cool down it contracts into a small shape and eventually tapers to a point."
>
> — Theophrastus (c.320BC), *On Fire* (52) [3]

References

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2. Aurelius, Marcus. (167AD). *Meditations* (translator: George Long; Introduction: Alice Zimmern) (pgs. 25-26). Publisher, 1887; DigiReads, 2015.
3. Taylor, C.C.W. (1999). *The Atomists: Leucippus and Democritus: Fragments: a Text and Translation with a Commentary by C.C.W. Taylor* (pyramid, pgs. 85-86; 133). University of Toronto Press.

External links

- Theophrastus – Wikipedia.

θΔics

In famous publications, ***Theophrastus Redivivus*** is a c.1659 neo-Latin manuscript, penned by an anonymous French author, commonly known as the "Anon Theophrastus", the title an allusion (Q) to the lost essay “On Gods” (Περὶ ῶεῶν) by Aristotle’s pupil Theophrastus, the author believing himself to be a “second Theophrastus”, or “Redivivus” (Q) of Theophrastus, aka Theophrastus reborn (Q), wherein all the anti-religious arguments ever presented are compiled. [1]

Title page of one of the four extant copies of the 1,090-page Latin manuscript ***Theophrastus Redivivus*** (c.1659), penned by the French Anon Theophrastus, a history of atheistic thought and religion disproof. [1]

Atheism | Freethought

In c.1659, the Anon Theophrastus, in his *Theophrastus Redivivus*, proclaiming that all the great philosophers, including the eponymous Theophrastus, have been atheists; religions are contrived works of men; there is no valid proof for the existence of gods, and those who claim experience of a god are either disingenuous or ill. (Q) The philosophical position presented throughout is materialistic atheism. [1]

Thinkers | Cited

The Anon Theophrastus present all the arguments which have been produced since antiquity against the faith of god and against religions. He quotes, in his compilation, the ancient atheistic philosophers: Theophrastus of Eresos, Protagoras, Diagoras of Melos, Euhemerus, Theodorus Atheos (aka "Theodorus the godless"), Lucretius, Sextus Empiricus, and liberal authors from the Renaissance to the 17th century, namely: Pietro Pomponazzi , Lucilio Vanini , Michel Montaigne, Niccolo Machiavelli , Pierre Charron and Gabriel Naude .

Copies | Translations

Only four extant copies of *Theophrastus Redivivus* remain, in Latin.

In 1979, Tullio Gregory, in his *Theophrastus Redivivus: Erudition and Atheism in the 17th Century*, gave a 216-page Italian translation introduction to the work. [6]

Quotes | On

The following are related quotes on *Theophrastus Redivivus*:

> “Conversely, all the subversive writings of the seventeenth-century *libertins*, and a good many subsequent ones, too, have the ring of familiarity to the student of such matters in the Renaissance: the topoi are the same, illustrating the same themes, turning around the same antinomies—only the tone is slightly more strident, the disguise more transparent. The most exemplary of texts in this regard is certainly the ***Theophrastus Redivivus***, which may fairly be described as an explicit radicalization of many, indeed most of the ideas which the men of a previous century and earlier had **shrouded in the veils of indirection and allegory, had hinted, winked, and nodded at**, had allowed themselves to think—and write—in guarded private moments more or less strictly controlled, in lives of apparently unimpeachable orthodoxy . . . and had exchanged in conversation and pleasantry, in convivial table-talk, safely among friends. All these forbidden avenues of thought are followed **openly and relentlessly, with cold logic and devastating coherence**, by the author of the *Theophrastus*, and in his book, we may see clearly just where they lead. Until recently this has been the reverse of easy; indeed, few enough scholars took the trouble to read it,

understandably put off by the length and difficulty of the Latin manuscript. In any case, it was not readily available. Tullio Gregory [1979] has made it easy for us, and much of what follows is indebted to his work."

— Max Gauna (1992), *Upwellings: First Expressions of Unbelief in the Printed Literature of the French Renaissance* [5]

"The anonymous book ***Theophrastus Redivivus***, published in about 1650, was famous for more than a century. It was a compendium of old arguments *against* religions and belief in god, by those including: Pietro Pomponazzi, Niccolo Machiavelli, Lucilio Vanini, Michel Montaigne, Pierre Charron, and Gabriel Naude, and it precipitated a cultural explosion in discussions of unbelief."

— Jennifer Hecht (2003), *Doubt: a History* [2]

"The ***Theophrastus Redivivus*** is the first modern work to present an atheistic system, combined with religious criticism, which attacks the current world view."

— Gianni Paganni (2014), "How Lawmakers Become Fraudsters: a Philosophical Archeology of Radical Libertinism" [3]

Quotes | By

The following are noted quotes by the Anon Theophrastus:

"I use the teachings of the philosophers and thinkers of antiquity to show that god does not exist, that the world is eternal, that the soul is mortal, that hell is nothing but a fairy tale, and that religion is a political artifice. A cunning deception is that death is detestable, because nothing stifles him [it?]. Thus, I have divided the work, as Theophrastus of Eresus did it, into six books: the first on the gods, the second on the world, the third on religion, the fourth on the soul and on hell, the fifth on the contempt of death, the sixth on the natural life. All this belongs to the argument with the gods. If it has been proved that the gods do not exist, the rest understands itself."

— Anon Theophrastus (c.1659), *Theophrastus Redivivus* (pg. 8) [1]

"It is useful that everybody, except the enlightened elite, is convinced that god exists, although this conviction is not true."

— Anon Theophrastus (c.1659), *Theophrastus Redivivus* (pg. 56) (Q)

"Only human reason, the cunning of sly people who want to come to power, has invented everything that was said about gods: without this invention, it would be difficult for man to secure the obedience of the people."

— Anon Theophrastus (c.1659), *Theophrastus Redivivus* (pg. 341); a Critias view [3]

"There are only three deceivers who go after man: Moses, Jesus, and Muhammad."

— Anon Theophrastus (c.1659), *Theophrastus Redivivus* (pg. 528); a Frederick II view [3]

"I agree with those legislators and philosophers who think that some religion is necessary in a society."

— Anon Theophrastus (c.1659), *Theophrastus Redivivus* (pg. 541) (Q); compare: no religion

References

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Further reading

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● Gregory, Tullio. (1979). *Theophrastus redivivo*. *Coliana di filosofia XX*. Naples: Moran. "11 libertinismo nella prima mak del Seicento." In: *Ricerche su letteratura libertina e letteratura clandestina nel Seicento: Atti del Convegno di studio di Genova* (pgs. 3-47). Florence: Nuova Italia, 1980.
● Gensini, Stefano. (1996). "The Linguistic Naturalism of Theophrastus Redivivus (c.1659)" (abs), *Historiographia Linguistica*, 23(3):301-20.

External links

● Theophrastus Redivivus – Wikipedia.

θΔics

In thermodynamics, the **theorem of equivalence of transformations** is defined by the following statement:

> "In all cases where a quantity of heat is converted into work, and where the body effecting this transformation ultimately returns to its original condition, another quantity of heat must necessarily be transferred from a warmer to a colder body; and the magnitude of the last quantity of heat, in relation to the first, depends only upon the temperatures of the bodies between which heat passes, and not upon the nature of the body effecting the transformation."

Theorem of the equivalence of transformations.

Carnot's theorem, when brought into agreement with the first fundamental theorem, expresses a relation between two kinds of transformations, the transformation of heat into work, and the passage of heat from a warmer to a colder body, which may be regarded as the transformation of heat at a higher, into heat at a lower temperature. The theorem, as hitherto used, may be enunciated in some such manner as the following :—*In all cases where a quantity of heat is converted into work, and where the body effecting this transformation ultimately returns to its original condition, another quantity of heat must necessarily be transferred from a warmer to a colder body; and the magnitude of the last quantity of heat, in relation to the first, depends only upon the temperatures of the bodies between which heat passes, and not upon the nature of the body effecting the transformation.*

Opening header section to German physicist Rudolf Clausius' 1854 "**theorem of equivalence of transformations**", consisting of about twenty pages of logic reasoning as to the transformations of heat and work that occur in the working body during one heat cycle, which lays out the foundation for what would later become the Clausius inequality. [1]

The theorem of the equivalence of transformations, as it is called, is based on or rather an extrapolation of the mechanical equivalent of heat, was stated by German physicist Rudolf Clausius in 1854, and assumes there to be two 'kinds' of transformations:

(a) negative transformation: the transformation of heat into work.
(b) positive transformation: the passage of heat from a warmer body to a colder body, which may be regarded as the transformation of heat at a higher temperature, into heat at a lower temperature.

Moreover it assumes that when a quantity of heat Q is passed from the hot body into the working body, during the expansion stroke, and then into the cold body, during the contraction stroke, that this is called a "double transformation" and that the magnitude of this one transformation process (positive transformation or negative transformation) can be quantified by an extensive state variable called the "equivalence-value", defined mathematically by the ratio:

$$\frac{Q}{T}$$

where Q is an inexact differential quantity of heat, and T is the integrating denominator, such that the inverse of the absolute temperature:

$$\frac{1}{T}$$

is called the integrating factor, and is the temperature of either the hot body or the cold body, depending on the transformation.

It is assumed that in the "perfect thermodynamic engine", the equivalence-values exactly compensate each other, such that the positive transformation cancels out the magnitude of the energy change of the negative transformation, such that the mathematical value of the double transformation, given by the following expression:

$$\frac{Q}{T_H} - \frac{Q}{T_C}$$

is zero. This we call a "reversible" process or transformation.

If in the course of the double transformation, the equivalence value changes are positive, and not zero, as are all processes which are in any way possible, the sum of which we call the equivalence vales of all uncompensated transformations, symbol N, we then call this type of double transformation an "irreversible" process or transformation.

This set of logic, of reversible and irreversible transformations, as embodied in the "theorem of the equivalence of transformations", is the foundation to the now-famous Clausius inequality (1865):

$$\oint \frac{dQ}{T} \leq 0$$

which in turn is the foundation to the Lewis inequality (1923)

$$\Delta G < 0$$

which is the central governing equation of human existence as well as for all natural processes freely occurring on the surface of the earth.

References

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θΔics

In genius studies, **theoretical IQ**, symbol IQ_{Th}, as compared to a real IQ, refers to what one's IQ could be "in theory", in the future, as an adult, after one has accomplished something of genius merit, but one that generally is a thing only the future can discern, retrospectively, e.g. via falsifiability criterion.

Overview

A theoretical IQ, in short, is a paper IQ, ratio IQ, deviation IQ, psychologist estimated IQ, etc., generally assigned in the genius range (140+), that tends to be made in youth or young adulthood age, that has not secondary adulthood age real genius work or result corroboration, retrospectively discerned by those in the know, in said field of genius, and more often than not tends to be an inflated IQ, one that tends to give confused false comfort to a youth, in the sense of IQ overestimation.

Historically, to cite a classic example, if we look at the 1917 age 3 to 9 calculation of the young Francis Galton by Lewis Terman, using his new age ratio IQ formula, wherein he determined Galton's IQ to be 200, this is a classical example of IQ miscalculation, one where theory, i.e. the calculated "theoretical IQ", didn't match up with reality, Galton's "real IQ", historically discerned.

If, to cite a modern example, we take the statement "I taught [Laurent Simons] when he was six and we studied at the level of a 16 year-old" (Wilkes, 2019) (Ñº), we can calculate a “theoretical IQ” of 267, per age ratio IQ method; this, however, is what is classified as an “inflated IQ” estimate per reasons that IQ calculations past the 225 range don’t match up with reality, i.e. the “real IQs” of real historical geniuses, as determined via meta-analysis, as shown in the top 1000 geniuses rankings. [N1]

The same is the case for a young person, teenager, or high school who takes a college entrance test, e.g. Stanford-Binet, and scores perfect, and is told that there “deviation IQ” per this score, puts them in the genius range (140+), then this too is a theoretical IQ, i.e. the student is a "potential genius" in theory.

Notes

N1. This theoretical IQ definition and example derivation was done by Libb Thims on 19 Nov 2019, after user oye777 (Alex Bickle) messaged Thims with “Laurent Simons's mother Lydia … desires an IQ evaluation”, the boy Laurent Simons (2000-) in Nov 2019 attempting to graduate with a BS in electrical engineering in Dec 2019 and thus break the youngest college graduates record.

θΔics

In science, **theories of love**, or “love theories”, refers to []

History

In 1809, Goethe employed the majority of the then-known scientific theories of love (see: EA | IAD: Love theories), e.g. Cupid's arrow, Plato’s split soul theory, maternal imagination theory, Empedocles water and wine theory, etc., in coded form, in the story of his physical chemistry based novella *Elective Affinities*.

Quotes

The following are related quotes:

> “How on earth are can one explain, in terms of chemistry and physics, so important a biological phenomenon as first love? Falling in love is not the most stupid thing that people do—but gravitation cannot be held responsible for it.”
>
> — Albert Einstein (1933), aggregate quote from 1920s dialogue with Thomas Morgan + 1933 personal note jotting (see: Einstein on love).

See also

- Chemistry of love
- Chocolate theory of love
- Endorphin theory of love
- Equation of love
- Mathematics of love
- Physics of love
- Thermodynamics of love

θΔics

In science, a **theory** is a set of ideas, concepts, principles, or methods used to explain a wide set of observed facts. [1] The following is a noted quote on theories in general by Arthur Eddington, from his 1928 *The Nature of the Physical World*: [2]

> "If someone points out to you that your pet **theory** of the universe is in disagreement with Maxwell's equations — then so much the worse for Maxwell's equations. If it is found to be contradicted by observation — well, these experimentalists do bungle things sometimes. But if your theory is found to be against the second law of thermodynamics I can give you no hope; there is nothing for it but to collapse in deepest humiliation."

which generally means that any theory that contradicts the second law is in fact a defunct theory.

Examples

Theories connected to the subject of thermodynamics, human thermodynamics, chemistry, or human chemistry include: caloric theory, mechanical theory, theory of heat, kinetic theory, information theory, collision theory, mechanical theory of heat, reaction match theory, Porteus theory of happiness, combination lock theory, endorphin theory of love, thermodynamic theory of the evolution of living beings, human molecular orbital theory, among others.

References

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θΔics

In science, **theory of everything** refers a theory that explains and answers all or the majority of the big questions of the operations of the universe in a unified way; theories of everything tend to be theories developed by Aristotle-like or Newton-like thinkers (see: social Newtons); some historical analysis of term usage change over time, in respect to big universal theory terms, i.e. laws of the universe, can be seen on the Social Newton term analysis page; a staple term, overtime, being "heat" (or "fire").

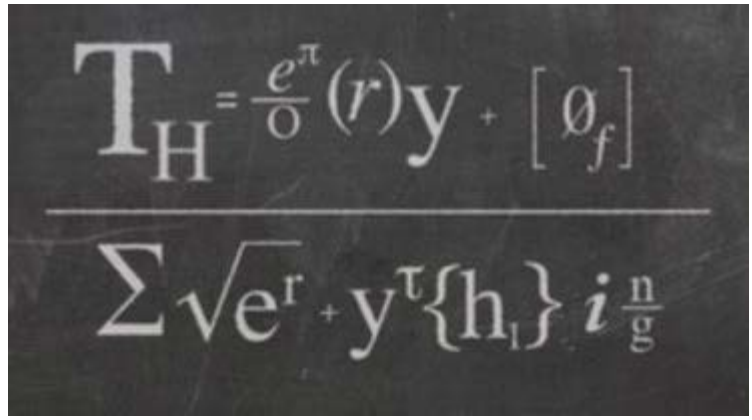

A equation letter stylized "**theory of everything**" design (O) from the 2014 film *Theory of Everything* on the early reaction existence of Stephen Hawking.

Overview

In 3100BC, the ancient Egyptians developed the god-based "Heliopolis creation myth" theory of everything; the scent of which still permeates all modern attempts at theories of everything.

In 450BC, Empedocles promulgated his two forces four elements theory of everything.

In 400BC, Democritus, penned his atomic theory of everything, about which Diogenes Laertius (250) summarizes as follows:

> "The **principles of all things** are atoms and the void, and everything else exists only by convention. The worlds are unlimited and subject to generation and corruption. Nothing could come to be from nonbeing, and nothing could return by corruption to nonbeing. Atoms are unlimited in size and number, and are the seat of a vortex motion in the universe, which results in the creation of all compounds: fire, water, air, and earth, which are simply organizations of certain atoms, themselves resistant to change and alteration by virtue of their hardness. The sun and the moon are composed of such particles, smooth and round, as is the soul, which is the same thing as the intellect."

The key term here is "all things", the postulate of atoms and void explains all things or everything; the soul (appeased by *clinamen* or hypothetical "swerve atoms") and "being" arising from "nonbeing" (Parmenides being main objector) were the two big objections to this theory

In 330BC, Aristotle can be credited with promulgating the first extensively detailed general theory of everything, covering all areas of knowledge, in a way that hasn't been surpassed since.

In 1770, Baron d'Holbach, among extreme atheism thinkers, published his *The System of Nature: Laws of the Moral and Physical World*, which might have been general grasping at a theory of everything.

In 1810s, Goethe was after a metamorphology theory of everything, which was very encompassing; albeit with the exception that he averred from astronomy digression.

In 1833, the Whewell-Coleridge debate resulted in the splitting of theoretical ideologies into the "moral world" and the "physical world" two cultures divide; a divide that has since never been re-bridged.

The mid 19th century to early 20th century saw the matter and motion type theory of everything publications of those including: Ludwig Buchner (1855), Henry Carey (1858), and Henry Bray (1910).

Modern terms

It is said that the species of "universal geniuses" died off with Hermann Helmholtz (1821-1894), the so-called last of the last universal geniuses; only partial imitations, e.g. John Neumann (1903-1957), being produced thereafter, owing to the

effect of knowledge hydraism.

In 1992, Steven Weinberg, in his *Dreams of a Final Theory*, wherein he discussed how he dreams of unifying the four forces of nature into one theory.

Into the 21st century, what is seen, with Richard Feynman subsuming Paul Dirac, who subsumed Albert Einstein, who subsumed James Maxwell, is that new synthesized IQ:225-range cited child prodigies, e.g. William Sidis (1898-1944), Christopher Hirata (1982-), going into adulthood are only passingly able to absorb the deeper social meaning philosophical questions, being preoccupied with more physics-oriented unsolved problems, such as the double slit experiment, accelerating universe problem, force unification, particle physics conundrums, etc., that right brain become atrophied in respect to the more difficult "Shakespeare culture" questions of C.P. Snow's division of the intellectual erudites. In other words, it takes a certain amount of work, found in the mind of a Dirac, to apply relativity to the electron and thereby predict the antiparticle; thus precluding the possibility of becoming a modern Aristotle in the areas of philosophy, sociology, politics, economics, religion [belief system which binds], etc.

Quotes

The following are related quotes:

> “The time may come when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry … then it may be possible, as Adams suggests, to invent a common formula for thermodynamics and history.”
>
> — William Thayer (1918), on Henry Adams' 50-year attempt at a thermodynamic theory of everything

See also

- Theory of heat
- Theory of life

External links

- Theory of everything – Wikipedia.

θΔics

In science, **theory of heat**, or "heat theory", refers to number of theories employed to explain the nature of heat, namely: material theory of heat (or fluid theory of heat), kinetic theory of heat, wave theory of heat, among others.

Overview

In the 1830s, French writers began to use the therm "theory of heat" as the subject of the study of the phenomena of radiation, conduction, expansion of bodies, and light according to the doctrine that heat is a state of vibration. [1] This was in contrast to the older, but still in debate, during these years, "caloric theory" by French chemist Antoine Lavoisier, which viewed heat as a fluid-like indestructible substance called caloric.

Transition to thermodynamics

In the 1850s, the theory of heat was unified with the mechanical equivalent of heat, in the production of heat by work or work by heat, particularly in heat engines, into the "Mechanical Theory of Heat" by German physicist Rudolf Clausius. [2] This work soon led to the development of the new science of "thermo-dynamics", an early outlines of which can be found in British physicist William Thomson's 1851 paper "On the Dynamical Theory of Heat". [3]

Theory of Heat

In 1871, Scottish mathematical physicist James Maxwell published his *Theory of Heat*, geared toward the layman, and after discovering the 1873 graphical thermodynamics work of American engineer Willard Gibbs, made a substantial revised 1875 edition, wherein he incorporated his sketches of his Maxwell thermodynamic surface, correcting his earlier views on entropy, which were based on Peter Tait.

References

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3. Thomson, William. (1851). "On the Dynamical Theory of Heat." *Transactions of the Royal Society of Edinburgh,* March.

Further reading

â— Maxwell, James C. (1872). *Theory of Heat* (313 pgs). London: Longmans, Green, and Co.
â— Preston, Thomas. (1894). *Theory of Heat* (719 pgs). London: MacMillan and Co.

External links

â— Theory of heat – Wikipedia.

θΔics

In science, **theory of life** is an unwritten assumption, handed down through the ages, that humans and other so-called “lower life forms”, descending down the evolutionary ladder to the level of bacteria, virus, or RNA, depending, are in possession, when in animate moving existence, of something called “life”, albeit a term that defies scientific definition.

A PC app designed to teach kids about the "**theory of life**", specifically so-called difference between a living thing and a non-living thing, the former of which are described as having the properties of: breath, movement (with legs), growth, and change; albeit each of which are properties that can be discredited given some thought, e.g. it is debatable as to whether a brain dead person whose body is on artificial respiration is alive or dead (as it is debatable as to what point an embryo is live, e.g. before or after ability to breath); crystals grow, but are not considered alive; walking molecules move with legs, but are not considered alive; viruses reproduce, but are generally considered as alive, and so on. [1]

Origin

The etymology of the “theory of life” for the dominate portion of the belief systems of world, 75 percent by religious affiliation, derives from the *circa* 3,100BC theory that each day the sun is “born” and that each night the sun “dies”, an argument that forms the core basis of Anunian theology, of which the modern Abrahamic faiths and Brahmaic faiths are derivatives, and that the sun anthropomorphized as the human-like deity Ra created all humans, via the powers of divine breath and spit, a process originally described according to the Heliopolis Ennead creation theory, though later versions differ in detail, and that humans, like the sun, have similar life/death properties. Modifications of this logic have been passed along to us as children for the last 5,000 years (an example of which is shown adjacent).

The Yellow River religions, to note, account for another 10 percent of belief systems in regard to etymological notions of a "theory of life". Beyond this framework, Neanderthals, some 35,000-years ago, were known to bury their dereacted (deceased) kin with red ochre, among other artifacts, indicating that alternative conceptual anthropomorphic-like "theories of life" may also have existed in alternative forms.

Scientific attempts

Later scientific groupings at definitions of life and death, particularly following the invention of the microscope, after which ideas about “what is life” began to come into scrutiny, are but hold-ons to the old ingrained, passed along through the generations, belief system, in spite of the fact that the undefinable concept of “life” is a belief incompatible with modern chemistry and physics (see: defunct theory of life), particularly when one goes searching for the demarcation point in the so-called great chain of being, the hypothetical point at which atoms and molecules supposedly “come alive”, which becomes strikingly convoluted in its absurdity when thermodynamical considerations are brought to bear on this question, all of which tend to amount to perpetual motion of the living kind theories, the alternative of which is to become a panbioist. Austrian physicist Erwin Schrodinger's infamous retraction "Note to Chapter 6", of his 1944 *What is Life*? lecture-turned-book is an example of thermodynamic meanderings about an attempt to derive a chemistry and physics based theory of life turned incorrigible.

Defunct classification

In 2009, the theory of life officially became classified as a defunct scientific theory (see: defunct theory of life).

See also

- Life theory | List
- What is life? (theories of existence)

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● Alexander, James B. (1909). *The Dynamic Theory of Life and Mind*: *an attempt to show that all organic beings are both constructed and operated by the dynamic agencies of their respective enviroments.* The Truth Seeker Co.

θΔics

In terminology, **theos**, from the Greek "Θεο" (theo), god, means "gods", which derives from the Greek letter Theta 'Θ' (see: alphabet), representing, numerically, the Greek number "9", symbolic of the nine gods (paut) of the Ennead (Porphyry, c.280) of Heliopolis; theta, itself, derived from Egyptian circle with X inside " ", also called the 'tet' or 'teth' symbol in Phoenician (1050BC) and '+' sign in circle " " in Etruscan (300BC), each, in turn, being the symbol for the ancient city of Heliopolis (2800BC), or, in the form of a circle with dot inside " Θ ", the symbol for Ra, the supreme sun god of Egypt (Gardiner, 1929), who, in the form of Atum-Ra, was the original creator god of the Ennead, i.e. the first of the nine god group (paut) of the Heliopolis creation myth; also said to derive from the Ouroboros, representative of the symbol of the cosmos or universe (Lydus, 555).

Overview

In 800BC, Hesiod penned his *Theogony* , or Θεο-γονία (*Theo-gony*), a term meaning "generation of the gods", wherein, after studying the creation myths of Egypt (see: Egyptian pantheon), penned a more anthropomorphized, god reduced, version for the Greeks to read (see: Greek pantheon), basically a rescript of the former.

In 375BC, Plato, in his *Republic*, introduced the term "theologia", from *theo-* meaning "god" + *-logos* meaning "speech or words", + *-ia* meaning "names of actions and abstract things", meaning "speech or words about god, gods, or god-like things" (Naddaf, 1995). [1]

In 350BC, Aristotle, in his *Metaphysics* (Q), following digression on his theory of "actuality" (entelecheia, Greek: ἐντελέχεια) and "potentiality" (dynamis, Greek: δύναμις), where the former is perfection, realization, fullness of being, the latter is imperfection, incompleteness, perfectibility – former is the determining, the latter the determinable principle – delves into his ideas on "theologia".

The term "theology", following the work of Marcus Varro (c.40BC), Eusebius (c.320), and Augustine (c.400), eventually came to be known as the study of god or gods.

Quotes

The following are related quotes:

> "***Theologia*** first appears in Plato, and the term is used both by him (*Republic*, 379a) and by Aristotle (*Metaphysics*, 1000a, 1071b) to designate the activity of the poets who gave cosmogonical accounts. Aristotle particularly uses it in contrast with the philosophical speculations of the *physikoi* (e.g. *Metaphysics*, 1075b); in effect, it is parallel to the distinction between mythos and logos (qq.v.). In *Metaphysics* (1026a), a sharply distinct meaning emerges. Aristotle had divided the theoretical sciences into three classes, of which the third deals with substances that are 'separate' (for the sense, see choriston) and without *kinesis*; this is the 'first philosophy' or *theologike*, so called because such substances are the realm of divinity. Theology later expanded to once again embrace all discourse about the gods, and this new understanding of its scope may be seen in the division of theology into 'mythical, physical, and political', a division originating in the Middle Stoa (see Augustine, De civ. Dei VI, 5, citing Varro; compare, ibid. IV, 27 and Eusebius, Praep. Evang. IV, 1)."
>
> — Francis Peters (1967), *Greek Philosophical Terms* (pg. 194)

References

1. Naddaf, Gerard. (1995). "Plato's 'Theologia' Revisited" (pdf), SAGP Meeting New York, Dec 28.

External links

- Theos – Wikipedia.
- theos – Wiktionary.

θΔics

In human thermodynamics, **thermal comfort** is that condition of mind which expresses satisfaction with the thermal environment. [1] The originator of this definition of thermal comfort, along with using thermodynamics balance equations to build models of indoor air comfort descriptions was Danish environmental engineer Ole Fanger. [2]

References

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2. Fanger, P. Ole. (1977). "Thermal Discomfort Caused by Radiant Asymmetry, Local Air Velocities, Warm or Cold Floors, and Vertical Air Temperature Gradients", *Thermal Comfort*, Jacques Durand, and Jeanne Raynaud, eds. INSERM, Dec. 75: 145-52.

Further reading

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â— Rodrigues, V.C., da Silva, I.J., Vieira, F.M., and Nascimento, S.T. (2010). "A Correct Enthalpy Relationship as Thermal Comfort Index for Livestock" (abstract). *Int. J. Biometeorol.* Jul 07.

θΔics

In science, **thermal energy** is a misnomer or rather misused contrivance, convolution, or confabulation of the precisely defined terms heat and energy, or rather heat and internal energy, and or sometimes mistaken to be a synonym or aggregation of terms such as heat content, specific heat, heat capacity, or latent heat, all of which have precise mathematical formulation.

The term “thermal energy”, in the context of modern physical science, loosely speaking, is a nonsensical term and seems to be a laymanized carryover of either the 18th century term “caloric content”, alluding to the idea that a body contains a certain number of caloric particles.

Further reading

â— Lewis, Gilbert N. and Adams, Elliot Q. (1914). “On the Distribution of Thermal Energy”, *Physical Review*, 331-44.

External links

â— Thermal energy – Wikipedia.

θΔics

In thermodynamics, **thermal equilibrium** is a state of a body in which no net heat exchange is taking place within it or between it and its surroundings. [1] A state of equilibrium of heat flow between bodies is the central criterion of the zeroth law of thermodynamics.

See also

- Equilibrium state

References

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θΔics

In chemistry, **thermal theory of affinity**, or "heat theory of affinity", was a 19th century posited argument which asserted that all chemical action not due to external energy tends to the production of the body or bodies which set free the greatest heat. [1] Synonyms include: principle of maximum work, law of maximum work, Thomsen-Berthelot principle, and Berthelot-Thomsen principle.

Overview

The theory was independently proposed by Danish chemist Julius Thomsen (1854) and French chemist Marcellin Berthelot (1864), but disproved in 1882 by German physicist Hermann Helmholtz, and replaced by the thermodynamic theory of affinity.

In 1887, German chemist Lothar Meyer, in his “Evolution of the Doctrine of Affinity”, have a cogent rise and fall account of the thermal theory of affinity. [4]

In the 1980s, German chemistry historian Helge Kragh is said to have provided the the bulk of the references to the literature on the thermal theory of affinity. [2]

Quotes

The following are related quotes:

> “The **thermal theory of affinity**, which is even today championed by Berthelot and others, is by this circumstance proved to be quite untenable. It is natural, in the case of such a far-reaching proposition, to require proofs.”
>
> — Wilhelm Ostwald (1893), “On Chemical Energy” [3]

References

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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (thermal theory of affinity, pg. 434). Morrisville, NC: LuLu.
2. (a) Kragh, Helge. (1993). “Between Physics and Chemistry: Helmholtz’s Route to a Theory of Chemical Thermodynamics”, in *Hermann von Helmholtz and the Foundations of Nineteenth-Century Science* (thermal theory of affinity, 8+ pgs.; ch. 10, pgs. 402-31), ed. David Cahan. University of California Press.
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θΔics

In language, a **thermal word** is a temperature-laden or thermodynamic type expressions or metaphor, such as “in heat”, “hot topics”, “cold war” (vs. “hot war”), "IQ is a measure of relative brightness or intellect", "he burned out", “he has a hot temper”, “she’s warm-hearted”, “he’s a cold-blooded killer”, “they are boiling with anger”, “I’ve got the hots for you”, “she’s so hot”, "cool hand luke", the "Fonz is cool", "our relationship has grown cold", the heat of passion, hot sex vs cold sex, she's smoken, we have a close warm friendship, etc. [1] Common websites that use thermal words include the YouTube channel HotForWords (adjacent), the photo-rating site HotorNot.com, among others. [2]

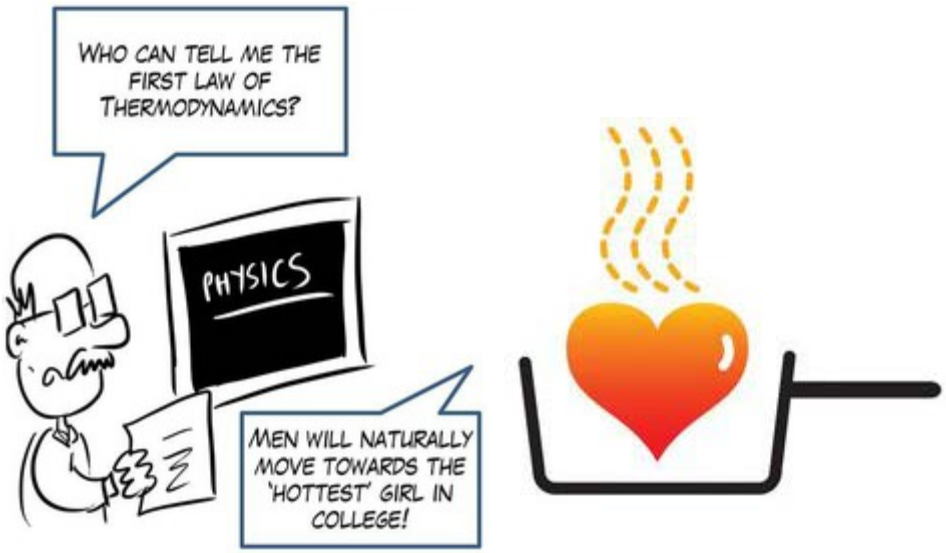

Left: an icon (Ñº), by Savio Alphanso, for someone who is “warmhearted”, an example of a type of **thermal word**, a conjunction of the thermodynamic term "heat" and the emotional term "heart", representative of love and or passion. Right: a thermodynamics humor take on the first law, employing a "hottest girl" thermal word like usage; or strong analogy as some would call it.

Etymology

The term "thermal word" is a 2002 coining of Mark Blumberg. [1]

Discussion

In terms of a human thermodynamics and human chemistry analysis of thermal words or "thermal expressions", the breakdown of some of these terms according to actual physics, chemistry, and thermodynamics can be very difficult and elusive to pin down, in many cases. When a pair is engaged in the “heat of sex” an increase in body temperature will occur, and the term seems to be easily explained; but this is not the the complete picture. When, for instance, one wishes to study the change in enthalpy (heat content) in the course of human chemical reaction of a twenty-year marriage, which is where the true understanding of the heat of the sex (relationship) is to be found, the explanation becomes enormously complicated.

It's cold outside, but between us it's cold in here

To cite one example, in the 2008 song “I Hate This Part”, by the Pussycat Dolls, a couple is driving together, at night, in the winter, with snow outside, not speaking, and the female, who is contemplating breaking up, thinks to herself “it’s cold outside, but between us it’s cold in here.” [3] Here, we may ask is this purely metaphor or is the song writer intuitively commenting on actual physics? Technically, for a bond to break, such as occurs in a relationship breakup (the breaking of a human chemical bond), the system of the reaction will have to absorb energy from the surroundings to detach the union, through the process of debonding or a dissolution reaction: [4]

$$A{\equiv}B \rightarrow A + B$$

In this sense, we could explain the lyrics as an aspect of the relationship being an endergonic (work energy absorbing) or endothermic (heat absorbing) process. [5] The term "endothermic" seems most apt to the description of temperature drop between the two human molecules, A and B, in the car. Where, in the context of chemistry, it means the chemical reaction (human chemical reaction) that requires heat to break the bonds “A≡B” of the reactants. Technically, an endothermic transformation is one in which the system receives heat from the surroundings: Q > 0. When the transformation occurs at constant

pressure: $\Delta H > 0$; at constant volume $\Delta U > 0$. If the surroundings do not supply heat, an endothermic transformation leads to a drop in the temperature (↓T) of the system. [6]

A 26 Nov 2008 video, by Libb Thims, on the analysis of the **thermal word** expression "hot for words" of the popular YuTube word etymology channel hosted by Marina Orlova.

Hence, it is reasonable to conclude that when the woman thinks to herself: "between us it's cold", as the pair drive silently together in the closed system of the car, the thought is partially rewiring her central nervous system in her mind, and can thus be characterized as an endothermic transformation, and the system is becoming colder than surroundings. A comparative example, is the mixing of barium hydroxide $Ba(OH)_2$ and ammonium thiocyanate NH_4SCN wherein a powerful endothermic reaction occurs such that the reacting mixture become so cold that the moisture from the air forms a layer of frost on the outer surface of the beaker.

Experimentally, in context of the song, one should be able to measure the inward flow of heat and a temperature drop in the system of the car (or relationship). What equipment would be needed to measure the temperature drop is a matter of further discussion. An extremely graduated thermometer should be able to detect a temperature drop and what is called a "human reaction calorimeter" should be able to measure the heat flow. [4]

Quotes

The following are noted thermal word like quotes:

> "In everyone's life, at some time, our inner fire goes out. It is then burst into flame by an encounter with another human being. We should all be thankful for those people who rekindle the inner spirit."
>
> [or]
>
> "At times our own light goes out and is rekindled by a spark from another person. Each of us has cause to think with deep gratitude of those who have lighted the flame within us."
>
> — Albert Schweitzer (c.1880), alternative translations (Ñº)

> "The only people for me are the mad ones, the ones who are mad to live, mad to talk, mad to be saved, desirous of everything at the same time, the ones who never yawn or say a commonplace thing, but burn, burn, burn, like fabulous yellow Roman candles exploding like spiders across the stars, and in the middle, you see the blue center-light pop, and everybody goes ahh..."
>
> — Jack Kerouac (1957), *On the Road* (see: tattoo)

> "I began to realize how important it was to be an enthusiast in life … if you are interested in something, no matter what it is, go at it at full speed ahead. Embrace it with both arms, hug it, love it and above all become passionate about it. Lukewarm is no good. Hot is no good either. White hot and passionate is the only thing to be."
>
> — Roald Dahl (c.1975)

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(b) Hot or Not – Wikipedia.
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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (term: "human reaction calorimeter", pg. 431) (preview), (Google books). Morrisville, NC: LuLu.
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External links

â— Cold feet (metaphor) – Wikipedia.

θΔics

In chemistry and human chemistry, **thermalization** is the process in which particles, atoms, molecules, or human molecules reach thermal equilibrium, i.e. that state in which no energy flows; through mutual interaction. [1] In physics, thermalization is the reduction of the kinetic energy of neutrons in a thermal nuclear reactor by means of a moderator (a substance that slows down free particles); the process of producing thermal neutrons. [2]

History

In 1885, author G.D. Liveing, defined what he called "equalization" in relation to changes of potential between bodies: [3]

“The fundamental notion connected with equality of potential being that when two forms of energy are at the same potential in the same substance there is no tendency for either to be increased at the expense of the other; but that if they are at unequal potentials there is a tendency to an **equalization**; also that when two bodies have their energies at equal potentials there is no tendency for the energy of one to increase at the expense of the other, while if they are at unequal potentials there is a tendency to equalization by the passage of energy from one body to the other.”

Into the 1950s, a “thermalization theory” had developed based on an energy mode concept and was being applied in particle physics, particularly in regards to a theory of “neutron thermalization”. [4]

Related

In 1862, English scientist Herbert Spencer used term of "equilibration", of four different types, to explain evolution. [5]

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θΔics

In science, the prefix **thermo-** refers to "heat" or "hot" a combination of the Greek words *thermós* (hot) + *thérmé* (heat). [1] The use of the prefix, as in *thermo-magnetism* (1824), *thermo-stat* (1831), *thermo-electricity* (1834), or *thermo-chemistry* (1840), etc. dates back to at least the 1820s if not before. [2]

History

Possibly, the earliest use of the prefix *thermo-* was the term "thermometer" (1663) from the French *thermomètre* (1624), coined by Jesuit Father Leuréchon from Greek *thermos* "hot" + *metron* "measure". [3]

Thermo-dynamics

The term was first used in a thermodynamical-sense in 1849 by Scottish physicist William Thomson who referred to a "perfect *thermo-dynamic* engine", in reference to the ideal Carnot engine, having no irreversibility, described by French physicist Sadi Carnot in 1824.

See also

â— -dynamic

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(b) Thermostat (1831) – *Online Etymology Dictionary*, 2001 by Douglas Harper
(c) Meyer, Ernst von. (1898). *A History of Chemistry from the Earliest Times to the Present Day*. (pg. 507 cites that Ostwald refers to G. H. Hess, and his 1840 work, "Constanz der Warmesummen", as being the founder of thermo-chemistry). The Macmillan Company.
3. Thermometer (1663) – *Online Etymology Dictionary*, 2001 by Douglas Harper.

θΔics

In chemistry, **thermo-chemistry** is the study of the function of heat and temperature involved in chemical transformation. In modern physical chemistry, thermochemistry is defined as a subject concerned with heats of chemical reactions, heats of formations, etc. [1]

History

English chemistry historian James Partington attributes the foundation of thermochemistry to the construction of the ice-calorimeter in the winter of 1782-83, by French chemist Antoine Lavoisier and mathematician Pierre-Simon Laplace, used to determine the heat evolved in various chemical changes; calculations which were based on Scottish physicist Joseph Black's prior discovery of latent heat. [3]

The conjunctional term "thermo-chemistry" dates to at least 1840. In fact, German physical chemist Wilhelm Ostwald cites Swiss-born Russian chemist Germain Hess, with his 1840 article "Constant Heat Sums" (Constanz der Warmesummen), which established Hess' law, as being the founder of thermo-chemistry. [2]

References

1. Daintith, John. (2004). *Oxford Dictionary of Chemistry*. Oxford University Press.
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3. Partington, J.R. (1957). *A Short History of Chemistry*. MacMillan and Co.

θΔics

In terminology, **thermo-dynamic**, a conjunction of the parts 'thermo-' (1663) and '-dynamic' (1827), is a term used in 1849 by Scottish mathematical physicist William Thomson in reference to a Carnot engine, one that is reversible.

Overview

In 1849, Scottish mathematical physicist William Thomson, in his "An Account of Carnot's Theory of the Motive Power of Heat", stated: [1]

> "A perfect thermo-dynamic engine is such that, whatever amount of mechanical effect derived from a certain thermal agency; if an equal amount be spent in working backwards, an equal reverse thermal effect will be produced."

Thomson would later go on to be the first to coin the term "thermo-dynamics" as a subject in 1854.

References

1. (a) Thomson, William. (1849). "An Account of Carnot's Theory of the Motive Power of Heat; with Numerical Results Deduced from Regnault's Experiments on Steam", *Transactions of the Edinburgh Royal Society* (pgs. 127-203) , xiv.; *Annales de Chime*, xxxv. 1852; in: *Mathematical and Physical Papers (1832-1911), Volume 1* (pg. 119). Publisher.
(b) Bynum, W.F. and Porter, Roy. (2005). *Oxford Dictionary of Scientific Quotations* (pg. 579). Oxford University Press.

External links

â— Thermodynamic explained (2 articles) – Helium.com.

θΔics

In science, **thermo-dynamics** (with a dash) was a term used from 1854 to 1868 to signify the newly developing science of the operation of generalized heat engines. The terms 'thermo-dynamic' (1849) and 'thermo-dynamics' (1854) were both coined by Irish physicist William Thomson. [1]

See also

- Thermodynamics (etymology)
- θΔics

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(b) Thomson, William. (1854). Thermo-electric Currents, Preliminary 97-101, "Fundamental Principles of General Thermo-dynamics Recapitualted (pg. 232). *Transactions of the* Royal Society of Edinburgh, vol. xxi, part I.; read May.

θΔics

In science, **thermo-electricity** is the study of the relationship to heat and electricity or current and voltage in circuits. The central aspect of this subject is the “thermoelectric effect” or the generation of electrical current by heat. The term thermo-electricity expresses the development of electricity by the agency of heat. [1]

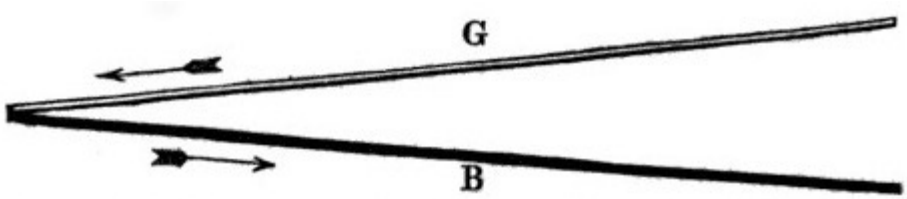

Thermo-electricity: if the ends of two wires, or strips of silver G, and brass B, are put in contact (brazed or soldered together), and the junction heated, a current will flow from the silver to the brass (in the direction of the arrow), if the free extremities of the wires are connected by any conductor of electricity, and thus an electrical circuit will be established. [1]

History

The subject of thermo-electricity originated in 1821-1822 when Estonian-born German physicist Thomas Seebeck discovered that a junction of dissimilar metals produces a current when exposed to a temperature gradient, a phenomenon called the thermoelectric effect. The term "thermo-electricity" was used as early as 1834.

At the time of the discovery, aside from natural atmospheric electricity (lightening), four forms of man-made electricity were known:

● Friction under the head first of statical electricity [Guericke's friction generator (1650)] or [Leyden jar (1744)] and electricity from effluent steam, i.e. electricity manifested in an insulated boiler, during the emission of pressurized steam through a narrow aperture [Armstrong (1840)];
● Second of chemical action under galvanism [Galvini's frog legs (1786)] or voltaic electricity [Volta's battery (1800)];
● Third animal electricity;
● Fourth from certain arrangements with magnets, under the head of magneto-electricity [Orsted's electromagnetism (1820)].

The discovery of electricity due to the actions of heat, discovered via experiments made by Seebeck, communicated to the Academy of Berlin in the years 1821 and 1822, was considered as a fifth type

Seebeck's experiments

The basic aspects of Seebeck's experiments are explained below: [3]

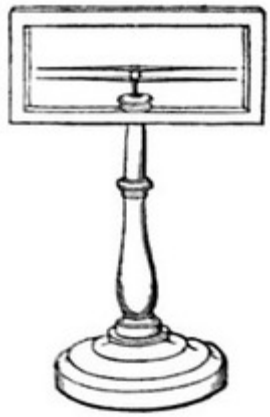

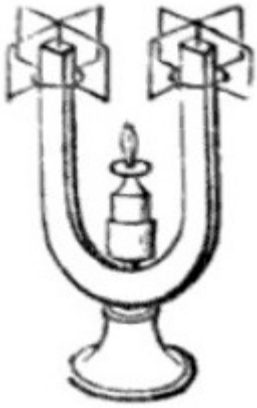

Left: In the first experiment by Seebeck, his apparatus consisted of two different metals (antimony and bismuth were found the most efficient) soldered together at their extremities and formed into frames of either circular or a rectangular figure. He found that electricity was excited by the application of heat to the places at which the metals were united as evidenced by disturbance of the magnetic needle balanced on a point between the two extremities. The best effect is produced by heating one compound corner by a flame and cooling the opposite corner by wrapping it with folds of filter paper moistened with either. Right: In a second experiment by

Seebeck, two frames composed of platinum and silver wires are represented delicately poised on the poles of a horseshoe magnet, where it is found that a flame being placed between them causes the circulation of the thermo-electric currents in the wires as evidenced by their rotation around the poles of the magnet.

In 1834, after receiving a small inheritance from the death of his wife's mother, French physicist Jean Peltier continued the work of Seebeck. In particular, Peltier passed current through a continuous circuit made of two different metals, connected by two different junctions, finding the temperature of one junction to rise and the other to fall. [4]

In 1838, Russian physicist Heinrich Lenz froze a drop of water using Jean Peltier's thermoelectric method. [5]

References

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(b) Heinrich Lenz – Wikipedia.

Further reading

● Tait, Peter G. (1884). *Heat* (ch. XI: Thermo-electricity, pgs. 163-92). MacMillan.

External links

● Thermoelectric effect – Wikipedia.

θΔics

In chemistry, **thermochemistry** is the study and measurements of heat phenomena of chemical reactions and chemical processes. [1]

History

The work of William Cullen (evaporative refrigeration, 1748), Joseph Black (latent heat, 1761), Richard Kirwan (specific fire, 1777), Joao Magellan (specific heat, 1780), Antoine Lavoisier and Pierre Laplace (reaction calorimetry, 1782), Person (heat capacity, date), Dulong-Petit law (Pierre Dulong and Alexis Petit, 1819), among others, marks the start or at least preliminaries of the subject of thermochemistry.

Science historian Helge Kragh argues that what can be classified as "classical thermochemistry" is was the subject "inextricably bound up with the problem of chemical affinity", which seems about right, specifically the question of heat (release or absorption) in relation to chemical reaction and the older 18th century theories of chemical affinity, which was said to be the period when Danish chemist Julius Thomsen (1826-1909) began his career. [2]

The hyphenated term "thermo-chemistry" (heat chemistry) was an independent subject in as early as the 1830s and 40s.

The downfall of the heat of reaction theories of Danish chemist Julius Thomsen, i.e. his 1854 "thermal theory of affinity" (Berthelot-Thomsen principle), and French chemist Marcellin Berthelot, i.e. his similar 1864 principle of maximum work, occurred with the publication of German physicist Hermann Helmholtz's 1882 "On the Thermodynamics of Chemical Processes", wherein it was shown that affinity was a function of free energy, and not solely heat.

This years marks the start (or period) of slow integration of thermochemistry into the chemical thermodynamics, an integration that would not be completed until at least the 1920s.

See also

- Chemical thermodynamics
- Relationship thermochemistry (Christopher Hirata)

References

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External links

- Thermochemistry – Wikipedia.

θΔics

In analogies, **thermodynamic analogy** is a comparison or statement of likeness or similarity between, typically, a human or a social or economic variable or quantity and a thermodynamic term, e.g. system, variable, e.g. temperature, or quantity, e.g. moles; which can vary between off analogy (incorrect or baseless), inexact analogy, gray analogy, to exact analogy (true statement or fact), among other classifiers.

Table I. Summary of the suggested analogies between thermodynamic and economic systems. Not listed are the direct analogies between S and T.

Thermodynamics	$-F$	$-E$	TS	μ	N
Economics	W(wealth)	U(utility)	Ψ(surplus)	p(price)	N(# of goods)

American physicist Wayne Saslow's 1999 **thermodynamic analogies**, i.e. so-labeled "analogies" between thermodynamic and economic systems; one of many historical human thermodynamic variables table, which date back to American economist Irving Fisher (1892). [1]

Discussion | Analogy vs Reality

In the late 19th century, thermodynamic analogies began to accumulate, most implicit, some explicitly, stated as "analogies" as a matter of discourse.

The subject itself is a rather involved an intricate one, being that by the turn of the early 20th century, the first and second law were proved to govern and to apply to "every" system in the universe, without exception; hence when one says, e.g. that the "energy of the processes occurring in a given social system is conserved" this is not analogy but fact. If, conversely, we say, e.g., that the "energy of money is conserved" or that, as William Ramsay (1898) said, the collisions of gas molecules are like the collisions of football players, these are what are called a gray area analogies, some more accurate than others and many completely off-base or incorrect and some real or not analogy; take, e.g. the following statement on Frederick Rossini's 1971 "Chemical Thermodynamics in the Real World" assertion and followup Rossini debate:

> "A well-drawn **analogy** between two surprisingly dissimilar concepts can not only be helpful in the classroom, it can be pleasing and instructive on its own merits, as long as one is cognizant of its limitations. On the surface, **Rossini's analogy** relating enthalpy, entropy, and the equilibrium constant to freedom and security in the modern nation-state seems like a good example of an unusual and instructive comparison. I was initially intrigued. Using the thermodynamic conclusion that (a) a reaction's spontaneity (or *K*eq) increases when either â^†*H* gets more negative (stronger security) or â^†*S* gets more positive (more freedom), Rossini analogized that (b) "One cannot have a maximum of freedom and a maximum of security at the same time." Sadly, point (a), although true, does not support point (b), not even in the limited realm of chemical thermodynamics, much less in the broader realm of political governance."
>
> — Todd Silverstein (2006), "State Functions vs State Governments", Jun [6]

Here we see confusion, namely: Rossini presented his lecture as a real world non-analogy application, whereas Silverstein re-interpreted his argument as "analogy".

The Moriarty-Thims debate (2009) centered around whether an ordering of students has a "thermodynamic" entropy, in reality, NO analogy, or whether the teaching heuristic of referring to people grouped in a field, as compared to scattered randomly, is but "analogy" and in reality they ordering of students have no measurable entropy.

The following, to give a comparison example, done by Brazilian chemical engineer Jaime Aguilar-Arias (2014), between the so-labeled "Mohsen analogies", made by American chemical engineer Mohsen Mohsen-Nia (2013), and the "Bryant analogies", made by English mechanical engineer John Bryant (2011): [3]

Table 1. Analogies for thermodynamic variables proposed by Mohsen

Symbol	Thermodynamics	Mohsen Analogy
U	Internal Energy	Energy Stored in Societies
Q	Heat	Energy flowing due to difference of society excitement
P	Pressure	Social Rules (Laws, Culture, Religion, etc.)
V	Volume	Freedom
T	Temperature	Motivation in society
W	Work	Energy necessary for making a regular social system
S	Entropy	Social system desorder

Table 2. Analogies for thermodynamic variables proposed by Bryant

Symbol	Thermodynamics	Bryant Analogy
U	Internal Energy	Internal Value, depending on T
Q	Heat	Entropic Value
P	Pressure	Unit price
V	Volume	Units per unit of time
T	Temperature	Index of trading value
W	Work	Work Value per unit of time
S	Entropy	Entropy
k	Boltzmann constant	Productive content

Here, we see temperature, assigned by seeming analogical guess, to "motivation in society" (Mohsen, 2013) and "index of trading value" (Bryant, 2011); prolonged discussion would be requisite to discern which analogy, in regard to this variable, is more exact (truer) or correct (or incorrect).

Historical | Examples

In 1952, English physicist C.G. Darwin, to give another example, defined "human thermodynamics" as the "thermodynamic study of systems of human molecules", in his book in his *The Next Million Years*, wherein he used the word 'analogy' 19-times, comparing humans, by analogy, to the molecules of a body of gas governed by Boyle's law, to the behavior of a wild animal, and to the behavior of ants. The following are few representative quotes:

> "The **analogy** I have cited of the gas laws is the simplest example that is furnished by statistical mechanics, and it is only fair to mention that, when the subject is pursued further, it does get a good deal more complicated. Thus much greater difficulties arise in considering how the gas can condense into a liquid or solid, but it would not be profitable to follow the **analogy** into these intricacies. We may, so to speak, reasonably hope to find the Boyle's Law which controls the behavior of those very complicated molecules, the members of the human race, and from this we should be able to predict something of man's future. The possibility depends on finding out whether there are for humanity any similar internal conditions, which would be analogous to the condition of being a conservative dynamical system, and external conditions analogous to the containing vessel.
>
> In the gas, the external conditions were given by the containing vessel, and the analogy here is obviously the earth itself. The internal principle, which is to be analogous to the property of being conservative dynamical systems, of course lies deeper. It must depend on the laws governing the nature and behaviour of the human molecules. When I compare human beings to molecules, the reader may feel that this is a bad **analogy**, because unlike a molecule, a man has free will, which makes his actions unpredictable. Though the individual collisions of the human molecules may be a little less predictable than those of gas molecules—which, as I have said, do not have to be considered in detail either—the census returns show that for a large population the results average out with great accuracy. The internal principle then of the human molecules is human nature itself. On the **analogy** between human history and the molecules of a gas, the different civilizations are to be ranked as fluctuations from the average."

In objection to this definition, many argue, on what seem to be emotional, religious, or philosophical grounds, that this statement is pure analogy.

In 1997, Swedish physical chemist Sture Nordholm published his famous "In Defense of Thermodynamics: an Animate Analogy", wherein he gives rather well-honed advice and rules of thumb when attempting to formulate thermodynamic analogies, namely that it is a matter of "proper translation", or in more detail:

> "The purity and precision of **thermodynamics** has been maintained on the strength of its validity only as a collection of limiting laws for infinitely large systems undergoing infinitely slow changes. However, the interest in thermodynamics has always been based on the great relevance for finite real systems undergoing changes that are fast on our everyday time scale and slow only on the microscopic time scale of atomic motion. Thus we are merely extending the beam of insight from the lifeless behaviors of inanimate matter to the vivid complexities of human behavior. In the final analysis this **far-reaching analogy** rests on the fact that the basic elements of the description of atoms, molecules, and matter **can be scaled**

> **up** to the realm of living organisms without changes other than in the complexity of the systems and their behavior."

In 2006, Polish science-philosopher theologian Jozef Zycinski stated that in his 2000 article "God, Freedom, and Evil: Perspectives from Religion and Science" he "offers an interpretation of human behavior with consideration of analogies from thermodynamics". [9]

In 2008, American physical chemist Thomas Wallace argued that the rise and fall of civilizations can be explained thermodynamically on the analogy of the five-year operational life of a car battery. [8]

In 2013, Jason Smith, in his "Economics for Fun and Profit", spent time blogging on thermodynamic analogies, and how Paul Samuelson (1960) objected to them; to quote a snippet: [1]

> "Oh snap. Anyway, some of the basic ideas that came out of the **thermodynamic analogy** seem to be that goods are extensive measures like energy or volume and prices are intensive measures like pressure or temperature. Hey, that's what I found! Prices are like pressure, the quantity supplied is like volume and the quantity demanded is like energy in the information transfer model."

(add discussion)

Quotes

The following are related quotes:

> "The formal **mathematical analogy** between classicalthermodynamics and mathematical economic systems has nowbeen explored. This does not warrant the commonly metattempt to find more exact analogies of physical magnitudes—such as entropy or energy—in the economic realm. Whyshould there be laws like the first or second laws ofthermodynamics holding in the economic realm? Why should "utility" be literally identified with entropy, energy, or anythingelse? Why should a failure to make such a successful identification lead anyone to overlook or deny the mathematicalisomorphism that does exist between minimum systems thatarise in different disciplines?"
>
> — Paul Samuelson (1960), "Publication"; cited by Jason Smith [2]

> "This is all just a **horrendous analogy**. Chemical laws apply to humans, but ourï»¿ behavior is more complex than something that can be modeled with a couple of thermodynamic equations. A + B → AB is just a pretentious way of stating something we already know; it tells us absolutely nothing new."
>
> — Ryan Grannell (2011), "Category: Human Chemistry" [5]

See also

â— Black cat analogy
â— Chemical analogy
â— Exact analogy
â— Mathematical analogy
â— Physical analogy

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θΔics

In science, the **thermodynamic arrow** is the measure of time according to the second law of thermodynamics, namely that of irreversibility and the unidirectional flow of heat to hot to cold.

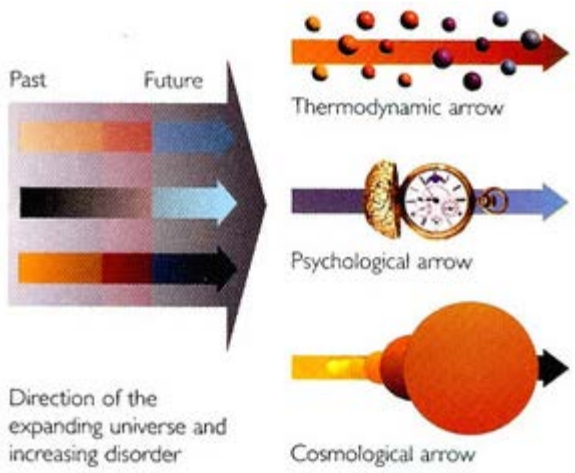

American physicist Stephen Hawking's 1996 depiction of the **thermodynamic arrow**, in relation to the other arrows of time. [4]

Overview

In 1908, there was a debate between Swiss physicist Walter Ritz and German-born American physicist Albert Einstein as to which arrow, the electromagnetic or the thermodynamic, reduces to the other. [1]

In 1928,English astronomer Arthur Eddington introduced term “thermodynamic arrow” is a synonym for the 1928 term "time's arrow".

The phrase thermodynamic arrow, however, is often used in comparison to other arrows of time (numbering up to seven), such as the *cosmological arrow*, referring to the expansion, contraction, or movement of the universe, the *psychological arrow*, the sense of the movement of time according to the human psyche, or the *electromagnetic arrow*, the measure of time according to the movement of radiation.

In 1973 commentary on the suggestion that thermodynamic irreversibility is due to cosmological expansion, i.e. that the thermodynamic arrow is a resultant effect of the cosmological arrow, English thermodynamicist Peter Landsberg stated that “in a sense cosmology contains all subjects because it is the story of everything, including biology, psychology and human history … in that sense it can be said to contain an explanation also of time’s arrow. But this is not what is meant by those who advocate the cosmological explanation of irreversibility. They imply that in some way the time arrow of cosmology imposes its sense on the *thermodynamic arrow*. I wish to disagree with this view.” [2]

In 1988, British physicist Stephen Hawking, in his *A Brief History of Time*, argued that the psychological arrow, described by him as “the direction in which we feel time passes”, is determined by the thermodynamic arrow, which he likens to “the direction of time in which disorder or entropy increases”, and that these two arrows point in the same direction. [3]

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θΔics

In scientific bibles, **thermodynamic bible** or the "bible of thermodynamics" is a term used several times several different thermodynamics publications in regards to having achieved "Bible" status, in thermodynamics, in the same manner in which Linus Pauling's 1938 *The Nature of the Chemical Bond* achieved "Bible status" in 20th century chemistry; the dominate epitaph in this manner being American physical chemist Gilbert Lewis' 1923 thermodynamics textbook, which by no coincidence is also the most cited thermodynamics textbook of all time.

A caricature of American physical chemist Gilbert Lewis as one of the prophets of modern chemical thermodynamics, for the publication of his 1923 thermodynamics textbook, soon known as the "**bible**" of thermodynamics, for, in the words of chemistry historian Henry Leicester, (a) replacing the word "affinity" by the word "free energy" throughout the English speaking world, and most importantly (b) through the simplification of 700-equation treatise of Willard Gibbs into the following truncated equation: $\Delta G < 0$, which has since come to be called the Lewis inequality for natural processes, an equation which has been found to govern both human nature and chemical nature or as put succinctly by Goethe "there is, after all, only one nature".

Carnot

The following are bible like quotes for Sadi Carnot's *On the Motive Power of Fire*:

> "He was a practical electrician fond of whiskey, a heavy, red-haired brute with irregular teeth. He doubted the existence of a deity but accepted Carnot's cycle, and he had read Shakespeare and found him weak in chemistry."
>
> — H.G. Wells (1906), "Lord of the Dynamos" (Q); in: *The Door in the Wall, and Other Stories*

(add)

Lewis

In the decades to follow the publication of American physicists Gilbert Lewis and Merle Randall's 1923 textbook *Thermodynamics and the Free Energy of Chemical Substances*, it achieved "Bible status" among thermodynamicists and residual thermodynamicists. The following, to exemplify, is a 1962 reference to Lewis' textbook having achieved "Bible" status: [1]

> "[*Thermodynamics and the Free Energy of Chemical Substances*] also a **thermodynamic bible** for many of Lewis' students and for some of us."

The following is a 1983 reference: [2]

> "[Lewis' *Thermodynamics*] soon became the '**bible**' in the field for chemistry students."

(add)

Ostwald

German physical chemist Wilhelm Ostwald's circa 1900-1910 energetics work is also referred to as the bible, not owing to the fact that it replaced the concept of 'god' with the concept of 'energy'. The following is the quote: [2]

> "On the shelves there was also to be found, naturally, Ostwald's *Energetics*, that sort of **thermodynamic bible** in which god is replaced by a lay entity called energy."

— Ernesto Sabato (1981), *On Heroes and Tombs* (pg. 256)

The term "Ostwald's *Energetics*", here, to note, may be referring to his 1909 *Energetic Bases of Cultural Studies*, although it could mean his entire "energetics program" which spans a number of publications.

Gibbs

American engineer Willard Gibbs' 1902 *Elementary Principles in Statistical Mechanics*, which is a mix of thermodynamics applied to William Hamilton's equations of motion, has been called the "bible of statistical physics", based on the fact that it put statistical mechanics on a new and more general basis; the following are examples:

> "Gibbs' monograph on the principles of statistical physics is still the 'bible' of statistical physics."
>
> — Werner Ebeling (2005), *Statistical Thermodynamics and Stochastic Theory of Nonequilibrium Systems* (pg. 6)

(add)

See also

- Principia of thermodynamics
- Gunter Grass
- Scientific bibles

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θΔics

In science, **thermodynamic data tables** are tables that list tabulated measured valued of free energies of formation, enthalpies of formation, and entropies of various elements, compounds, and molecular entities.

		$2Na$ (s)	$+ 2H_2O$ (l)	$\rightarrow 2NaOH$ (aq)	$+ H_2$ (g)
ΔG_f°	(kJ/mol)	0	–237	–419	0
ΔH_f°	(kJ/mol)	0	–286	–469	0
S°	(kJ/mol·K)	52	70	48	131

A sodium water reaction thermodynamic data table.

See also

- Free energy table

Further reading

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External links | Active

- Thermodynamic variables – Chem.Wisc.edu.

External links | Inactive

- Enthalpy, Entropy, and Gibbs free energy – ChemistryTable.Webs.com.
- Thermodynamics tables – URI.edu.
- Thermodynamic tables – GenChem.net.

θΔics

In human thermodynamics, **thermodynamic depth** is an information-base supposition that the measure or value of the energy conversions that went into a given product, such as a living being, a peacock's tail, or a classic poem. [1]

History

The term "thermodynamic depth" stems from the 1988 paper "Complexity as Thermodynamic Depth" by American mechanical engineering Seth Lloyd, who is currently a professor at the MIT school of thermodynamics, and his PhD supervisor at Rockefeller University, American physicist Heinz Pagels. [2] In particular, they state "depth", a universal measure, applicable to all physical systems, "is a measure of the complexity for the macroscopic states of physical system." Moreover that: [3]

> "The form of the measure [of depth] I uniquely fixed by the requirement that it be a continuous, additive function of the processes that can result in a state … applied to a Hamiltonian system, the measure is equal to the difference between the system's course- and fine-grained entropy, a quantity that we call **thermodynamic depth**."

The definition here, to note, seems to be caught up in a mixture of complexity theory, information theory, computer science, as applied to "systems capable of computation", and thus not a true thermodynamic term as built on the works of German physicist Rudolf Clausius.

Mate selection

Beginning in 1998, and particularly in 2002, with the publication of *The Generous Man*, Danish science writer Tor Nørretranders picked up on the concept of thermodynamic depth, only applying it to information exchanges between sexual selecting species, such with animals and with human. [4] In particular, in the process of human communication, Nørretranders' begins by distinguishing between "exformation", as that information that churns around in the mind of the sender before speaking as well as the information sparked off in the mind of the receiver before the message is sent, in contrast to "information", that which is said.

In this sense, exformation are the meaningful aspects of something that is said, not present in the words, but referred to. Thus, according to Nørretranders, "by distinguishing between information and exformation we are able to define what's costly in a costly signal itself is information, of course, which is measured in bits. But costliness was a manifestation of how difficult producing the signal was: how much it cost the organism to build a peacock tail or to write a poem." In this sense, according to Nørretranders, the back story is the "depth" of the utterance. In Nørretranders' view:

> "[Sexual attractiveness] depth involves, among other things, ***thermodynamic depth***, which covers all the energy conversions that lead to a given product, such as a living being … thermodynamic depth is thus a measure of the cost of producing something or other."

On this logic, he notes that "this depth is therefore a measure of the costliness of a signal regarded as physiological effort, metabolite resources, or blood sugar consumption." This means, according to Nørretranders, that the complexity of a physical system is measured by the resources that went into its production, a measurement that can be quantified thermodynamically as depth.

References

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θΔics

In thermodynamics, **thermodynamic entropy** (or Clausius entropy) is a conjunctive term used to differentiate between the entropy of classical thermodynamics, particularly as defined by German physicist Rudolf Clausius in 1865, and other more abstract forms of entropy used in niche branches of thermodynamics, e.g. Boltzmann entropy, Gibbs entropy, etc., or as used in non-thermodynamic subjects (such as information theory or mathematics).

Typical examples might include distinguishing between: thermodynamic entropy as compared to statistical entropy; thermodynamic entropy versus internal entropy, such as discussed in nonequilibrium thermodynamics; thermodynamic entropy contrasted with "entropy of surface formation", such as discussed in the movement of molecules in a liquid towards the surface; or as is most often the case, particularly after the publication of American electrical engineer Claude Shannon's 1948 "Mathematical Theory of Communication", the contrast between thermodynamic entropy and information entropy (or Shannon entropy), as used in information theory or information theory thermodynamics.

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θΔics

In evolution thermodynamics, **thermodynamic evolution** is an oft-used term that describes the process of the structural change and development of life through time according to the laws of thermodynamics. [1] An example is "social evolution" or the thermodynamic study of the evolution of culture and society; as some have analyzed through the second law. [2] The science of evolution thermodynamics is the study of thermodynamic evolution, i.e. the process of evolution from the thermodynamic point of view.

History

Some of the first to write about the thermodynamics of evolution include English oceanographer James Johnstone (1921) and English physical chemist Alfred Lotka (1922). [6]

In 1976, French anthropological sociology writer Roger Caillois summarized the century-long debate or contrast between *thermodynamic evolution*, seen as the directionality of systems from order to chaos, and *biological evolution*, seen as the directionality of systems from chaos to order, by stating, infamously, that: "Clausius and Darwin cannot both be right." [3] Writer Michael Bushev, in 1994, defined *thermodynamic evolution*, in its colloquial Boltzmann sense, as "evolution from order to chaos." [4] The adjacent video gives a loose take on the relations between evolution and thermodynamics. [5]

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4. Bushev, Michael. (1994). *Synergetics: Chaos, Order, Self-organization*, (pg. 130). World Scientific.
5. "Scientific Definitions: Evolution and Thermodynamics" (March 24, 2007) by YouTuber: TheFallibleFiend.
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External links

â— Thermodynamic evolution - Institute of Human Thermodynamics.
â— Molecular evolution table - Institute of Human Thermodynamics.

θΔics

In social thermodynamics, **thermodynamic flow** refers to energy movements to and from individuals in a society. The term “thermodynamic flow” was coined in 1976 by American anthropologist Eugene Ruyle in the development of his social thermodynamics theories. [1] This term, as used by Ruyle, seems to be similar to the term "Gibbs energy flow" as used by used in 2008 by American physical chemistry professor Dilip Kondepudi. [2]

Overview

In his view of life, Ruyle states that “all life may be viewed as a continuous expenditure of energy in the pursuit of need-satisfaction.” That “the basic need of all living forms is the continual harnessing of free energy, in the form of food … but all organisms have additional needs which they satisfy through their behavior. Life may be viewed, then, as the continuous outpouring of energy, in various forms of behavior, in pursuit of the satisfaction of the needs of the living organism.” On this logic, Ruyle outlines a theory of social “thermodynamic flows”. In particular, he reasons that these need-based expenditures of energy may be either facilitated or hindered by other members of the population. Specifically:

> “The ensemble of social relations in any population may be viewed as a system of **thermodynamic flows** and blockages.”

In more detail, Ruyle explains thermodynamic flows as such:

> “The struggle for satisfaction by individuals occurs within this complex system. Blockages occur when there are scarce resources (food, shelter, sexual partners) and the behavior of one individual reduces the resources available for others, leading to an increase in the amount of energy required for need satisfaction (or to needs going unsatisfied). **Thermodynamic flows** occur when the energy expenditure of one individual facilitates the need-satisfaction of another. [David P.] Barash (1982: 202) discusses situations in which such cooperative relations are likely to develop: reproduction (including parenting), avoiding predators, gathering food, social facilitation & biologic conditioning of the environment, minimizing competition or competing more successfully, division of labor, and the social transmission of information.”

(add discussion)

References

1. Toward an Anthropological Marxism (chapter 3) by Eugene Ruyle.
2. Kondepudi, Dilip. (2008). *Introduction to Modern Thermodynamics*, (section: Biological Systems, pg. 379). John Wiley and Sons.

θΔics

In thermodynamics, a **thermodynamic force** is systems-based quantification of the energy tendencies. [1] In a sense, the thermodynamic force is the energetic description of the driving force of any process.

Conjugate variables

See main: Conjugate variables

In a generalized sense, a thermodynamic force is a tension whose conjugate extensity is length. [2] The central concept of thermodynamics is that of energy, the ability to do work. As stipulated by the first law, the total energy of the system and its surroundings is conserved. It may be transferred into a body by heating, compression, or addition of matter, and extracted from a body either by cooling, expansion, or extraction of matter. In mechanics, for comparison, energy transfer results from a force which causes displacement, the product of the two being the amount of energy transferred. In a similar way, thermodynamic systems can be thought of as transferring energy as the result of a "generalized force" causing a "generalized displacement", with the product of the two being the amount of energy transferred. These thermodynamic force-displacement pairs are known as conjugate variables. The most common conjugate thermodynamic variables are pressure-volume (mechanical parameters), temperature-entropy (thermal parameters), and chemical potential-particle number (material parameters).

CHNOPSological systems

In biological systems, the much discussed "energy flow" through such systems is "Gibbs energy flow" and the thermodynamic force is the change in the Gibbs free energy ΔG during the movement, evolution, or change. [3] Said another way, in the phrasing of pre-1882 thermodynamics and chemistry, the thermodynamic forces that drive most of the "flows" in biological systems are affinities. When affinity is the difference in chemical potential between reactants and products, the corresponding flow is a chemical reaction; when it is the difference in chemical potential from one location to another, the flow is transport of matter. [3] In respect to the transport of species between two compartments or phases, the thermodynamic force for the transport is the difference in electrochemical potential between the compartments. [4]

Positive psychology

In the sense of the conception of mental "flow" states as defined by Croatian-born American psychologist Mihály Csíkszentmihályi, it should be note that the thermodynamic force is still the same as in the biological case, only this type of theory has yet to be published.

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θΔics

In thermodynamics, **thermodynamic function** (TR:11), symbol Phi Φ, is a function, increase or diminution of which indicates whether heat is entering or leaving a system.

Overview

In 1854, Scottish engineer-physicist William Rankine conceived of the thermodynamics function. [1]

In 1876, James Maxwell was referring to Rankine's thermodynamic function as follows: (O)

$$\Phi = \int \frac{dq}{t}$$

This was later shown to be near equivalent to German physicist Rudolf Clausius' conception of entropy (1865). [2]

The reason, supposedly, that Rankine's thermodynamic function received so little attention is that it is tangled up with his hypothesis of molecular vortices.

Quotes

The following are related quotes:

> "The function by which the absolute temperature is multiplied in calculating the conversion of energy between the mechanical and the thermic forms, is the variation of what the author has called the 'metamorphic function', being on term of the **'thermodynamic function'**, which corresponds to what Clausius calls entropie."
>
> — William Rankine (1865), "On the Second Law of Thermodynamics" [4]

> "The mathematical part of the theory was improved by the introduction of the scalar value which Rankine called the **'thermodynamic function'** and Clausius the 'entropy' of a body, a variable quantity, momentary increase or decrease of which indicates (in a reversible physico-chemical transformation) whether heat is leaving or entering the body at that moment, irrespective of its temperature or previous condition."
>
> — Fielding Garrison (1909), "Josiah Willard Gibbs and his Relation to Modern Science" [3]

See also

- Carnot function
- Entropy (etymology)

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4. Rankine, William. (1865). "On the Second Law of Thermodynamics", Read before the British Association for the Advancement of Science, at Birmingham, Sep; in: *Philosophical Magazine*, Oct; in: *Miscellaneous Scientific Papers* (pgs. 427-31; quote, pg. 430). Charles Griffin and Co, 1881.

Further reading

● Rankine, William. (1881). *Miscellaneous Scientific Papers* (thermodynamic function, 10+ pgs). Charles Griffin and Co.

θΔics

In protein thermodynamics, **thermodynamic hypothesis**, or "Anfinsen's dogma", states that the three-dimensional structure of a native protein in its normal physiological milieu (solvent, *p*H, ionic strength, presence of other components such as metal ions or prosthetic groups, temperature, etc.) is the one in which the Gibbs free energy of the whole system is lowest; that is, that the native conformation is determined by the totality of interatomic interactions and hence by the amino acid sequence, in a given environment. [1] Said another way, a protein's native structure is determined solely by the protein's amino acid sequence components and the environmental conditions in which the folding occurs, such that the native structure is a unique, stable, and kinetically accessible state corresponding to a Gibbs free energy minimum.

American mathematician Stephen Smale (Q) at the Institute for Science and Technology, Australia, lecturing on Anfinsen's dogma, aka the **thermodynamic hypothesis**.

History

The hypothesis was put forward by American biochemist Christian Anfinsen in the 1950s who reasoned that the information determining the tertiary structure of a protein resides in the chemistry of its amino acid sequence. Investigations on reversible denaturation of several proteins served to verify this proposal experimentally. The paper presenting his theory seems to be the 1973 article "Principles that Govern the Folding of Protein Chains", in which he showed that under the proper solvent conditions, amino acid sequence fold spontaneously into functional three-dimensional protein structures, and that the process was governed thermodynamically. [2] Anfinsen won half the 1972 Nobel Prize in chemistry for this work on "ribonuclease, especially concerning the connection between the amino acid sequence and the biologically active conformation." [3]

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External links

- Anfinsen's dogma – Wikipedia.

θΔics

In hmolscience, **thermodynamic imperative** is an ethics theory or scientific guideline, in philosophical thermodynamics, on how to live, based on the universal laws, either the first law, second law, or both.

The principle has obviously a great practical, as well as philosophical, importance. It has been made by Ostwald (1912) the basis of a general rule of conduct, which he calls the "Imperative of Energetics." The rule may be translated thus: "Waste not free energy; treasure it and make the best use of it." As will be admitted, the admonition is an excellent one, and, when applied, leads to interesting results, as may be seen from the collection of essays under this name. To mention two subjects only, which are amongst those discussed, the waste involved in war and the value of a universal standard for the sizes of printed books.

A 1915 interpretation of Wilhelm Ostwald's **energy imperative principle**, "waste not free energy; treasure it and make the best use of it", by American physiologist William Bayliss, which he says has application to the waste involved in war as well as the cost of printed books. [5] This, however, may have been a secondary interpretation or translation (introduced by Bayliss?), as the specific phrase *waste not free energy* (abfall nicht freie energie), does not seem to be found in the original German; although the term "freie energie", to note, is found on 14 pages. [6]

The imperative has been stated various ways over the year, some more correct than others, and seem to have their roots in German philosopher Immanuel Kant's 1785 categorical imperative, but framed on either the first, second, or combined laws of thermodynamics.

The idea for introducing the energetics-based ethics is that in absence of any other ethics, one cannot take a single step forward without being guided by some criterion of right and wrong. [9] The absence of an agreed-upon system of ethics can possibly have been marked by German philosopher Friedrich Nietzsche's 1882 proclamation that "God is dead", after which it can be said that belief in religion began to decline. Without religion, however, one is left with a void in an agreed-upon criterion of right and wrong actions, with which to step forward.

Kant | Categorical imperative

The first imperative seems to have been German philosopher Immanuel Kant's 1785 categorical imperative and his idea of universal moral law. A categorical imperative, on the other hand, denotes an absolute, unconditional requirement that asserts its authority in all circumstances, both required and justified as an end in itself. It is best known in its first formulation: [8]

> "Act only according to that maxim whereby you can at the same time will that it should become a universal law."

The shortened version of Kant's categorical ethical imperative reads: [10]

> "Act that your conduct may be taken as a universal law."

To updated this statement, in 1865 German physicist Rudolf Clausius penned the two universal laws of the universe: (a) the energy of the universe is constant; (b) the entropy of the universe tends to a maximum; hence, soon thereafter, people began to marinade on how to update Kant based on Clausius, as to how points A and B apply to one's actions and conduct; which is not a simple matter.

Ostwald | Energetic imperative

In 1912, German chemist Wilhelm Ostwald was the first to attempt an entire 500+ page book on a thermodynamic-based imperative, namely *The Energetic Imperative*, in which he outlined his "energetic imperative" which has a variety of difficult translations. In 2008, German entropy historian Helge Kragh summarizes the imparative as such: [1]

> "The principle message of Ostwald's energetic imperative was 'waste no energy; turn it all to account!"

Kragh states that the essential statement of the imperative comes from page thirteen of *Die Energetische Imperativ*, in particular: “Vergeude keine Energie, verwerte sie!”, which according to straight Google translation reads: “do not waste energy, recycle it!” The difficulty here is that the English translation of “verwerten”, can mean *to exploit*, *to utilize*, *to turn to account*, or *to realize*. [15] Likewise, the term "verwerte sie", according to Google translation, can read either as *recover it* or *recycle it*. These six different meanings, obviously, complicates the interpretation. [15] The original full paragraph reads:

Ich kann an dieser Stelle nicht alle die Stufen energetischer Betrachtungsweise schildern, welche ich weiterhin zurückgelegt habe, und begnüge mich damit, die letzte zu kennzeichnen, die mir in ganz unerwarteter Weise ein neues Feld fruchtbarster Arbeit eröffnet hat. Jene Anwendungen des energetischen Denkens auf immer menschlichere und unmittelbarere Gebiete des Lebens hatte mir schon vor einigen Jahren die Formel des energetischen Imperativs gegeben, nämlich die Zusammenfassung der beiden Hauptsätze in dem Wort:

Vergeude keine Energie, verwerte sie!

Eine neue Erkenntnis ist in diesem energetischen Imperativ nicht vorhanden, wohl aber stellt diese kurze und leicht verständliche Fassung ein Werkzeug dar, dessen Vielseitigkeit und Wirksamkeit sich gegenwärtig auch denen aufdrängt, die mit der ursprünglichen wissenschaftlichen Energetik gar keine weiteren Beziehungen haben. Mir ist in so mannigfaltiger Weise beschrieben worden, wie überall die Anwendung des energetischen Imperativs im täglichen Leben jedem einzelnen Förderung, Erleichterung, Erfrischung und ganz allgemein Steigerung der Lebenstätigkeit zu bringen vermag, daß ich in dieser kurzen Formel tatsächlich das Symbol empfinde, in welchem sich meine bisherige gesamte Arbeit am deutlichsten zusammenfassen läßt. Gleichzeitig ist der energetische Imperativ das Symbol, das richtunggebend und entscheidend für den Rest an Arbeit bleiben wird, der mir zu tun noch vorbehalten ist. Diese Arbeit vollzieht sich in zwei Rahmen, im Monistenbunde und in der Brücke

I can describe at this point not all the energy levels approach, which I still back down and shall content myself with the last mark, which has given me quite unexpectedly, in a new field most fruitful work. Those applications of energy had thought for ever more human and more immediate areas of life given to me several years ago, the formula of the energetic imperative, namely the merger of the two main movements in the word:

Do not waste energy, instead realize it!

A new finding in this energetic imperative does not exist, but this is short and easy to understand text is a tool, whose versatility and efficacy at present imposes itself even to those with the original scientific energetics have no further relationship. I have been described in so many ways, as everywhere can use the energy imperative in daily life each and every promotion, relief, refreshment, and generally to bring increased life activity that I am actually in this brief formula feel the symbol in which the summarized all my previous work can be most clearly. At the same time the energetic imperative, the symbol that is directive and remain essential for the rest to work, to do me without notice. This work is accomplished in two frames in Monistenbund and in the bridge

The essential point of his energy imperative, is that Ostwald argued that the second law asserts that no being can live without dissipating energy, but the energy imperative focuses attention on responsible ways of living in an energy based world. Ostwald even put this into formulation, a theory of happiness (see: Ostwald happiness formula), mathematically states as:

$$G = k(A - W)(A + W)$$

where *G* is *Gluck* (happiness), *A* is *Arbeit* (energy expended in doing useful work), and *W* is *Widerstand* (energy dissipated in overcoming resistance). Another shortened translation is: [1]

> "Waste no energy; turn it all to account."

According to the 1916 translation/interpretation of Ramiro de Maeztu, Ostwald's imperative commands not that we shall serve human solidarity, but rather: [9]

> "Do not waste energy; give it a value."

In 1914, Ostwald's imperative was summarized by American chemist Edwin Slosson as: [11]

> "We call one automobile 'good' and another 'bad' if the former will carry us twice as far as the latter on the same amount of gasoline consumed. A 'good' friend is one who helps us in our endeavors through judicious advice and without annoyance, while a 'poor' friend only multiplies our difficulties; here again goodness and badness are determined by the ratio of the total energy employed and the results obtained. It is this second principle of thermodynamics, the law of the degradation and dissipation of energy, that prevents us from undoing the past, that gives significance to such phrases as 'time flies' and 'the world moves.' The cosmic process is not a reversible reaction."

In 1967, Paul Edwards, in his *Encyclopedia of Philosophy*, described Ostwald's imperative as: [14]

> "Do not waste your energy."

This reduction, however, seems to have little connection to the original connotation. George Fleck's 1993 version states that: [7]

> "Dissipate no energy, but strive to use energy by converting it into more useful forms."

(add)

Bayliss | Free energy imperative

In 1915, English physiologist William Bayliss, in his

Clausius, at the end of a fundamental paper (*Pogg. Annalen*, cxxv. p. 400, 1865), formulates the two laws of energetics as follows:—

I. The energy content of the universe is a constant quantity.

II. The entropy of the universe is always striving to a maximum. The word "entropy" is here used as having essentially the same meaning as the "bound" energy of Helmholtz. The law is therefore equivalent to the statement that "free" energy is always striving to a minimum.

The fact, derived from universal experience, that free energy always tends to diminish, if it possibly can, is sometimes known as the "*principle of Carnot and Clausius.*" It was also enunciated, about the same time as the publication of the paper of Clausius referred to above, by Lord Kelvin (then Prof. William Thomson) under the name of the "Dissipation of Energy."

The key explanation section by Bayliss, wherein he summarizes to the effect that the combined statements of the laws of the universe, made by Clausius, Helmholtz, Gibbs, Thomson, and Carnot, amount to the effect that "free energy is always striving to a minimum." This, curiously, is a very advanced view for 1915. [5]

Principles of General Physiology, specifically in his chapter on the thermodynamics of physiology, cites Ostwald's energetic imperative, but having a decent grasp of the views of Willard Gibbs (available energy) and Hermann Helmholtz (free energy and bound energy), states that Ostwald's version of the imperative, should not be solely based on the first law, but on both the first and second law, whereby the imperative should correctly be stated as: [5]

> "Waste not free energy; treasure it and make the best use of it."

The use of "free energy" vs. energy, to note, as introduced here by Bayliss involves a huge complification of ideas, greatly more involved it seems that Ostwald had originally intended. Nevertheless, this insertion or updated interpretation, by Bayliss, is very cogent; although, to note, it is not as modern as it could be in that it does not touch on the initial state and final state of reactions and energy changes involved in the dynamics of human chemical bonds.

Interestingly, Bayliss posits that his "waste not free energy; treasure it and make the best use of it" principle can be fortuitously applied to the waste involved in war. This postulate, can be connected to English writer John Lyly's circa 1578 axiom "all's fair in love and war". [16]

In 1917, the Bayliss-interpretation of Ostwald's impartive was being presented as by American sociologist William Thomas: [12]

> "A child needs less repression and more guiding in activity. Ostwald's *Imperative of Energetics* with its rule, 'Waste no free energy; treasure it and make the best use of it,' is one of the most important principles of education. Direct children to use their free energy by cultivation of habits and by training in the use of initiative. Do not cultivate weariness; do not smooth over weariness by mere overstimulation; but see that the child often enough uses all his energies with a full expression of all his capacity."

It is unclear, however, at this point, if Thomas culled this from Bayliss, although this seems to be the case? In 1922, psychologist Robert Givler does cite Bayliss and his *Principles of General Physiology*, as follows: [13]

> "It is essential, however, that we understand just what it means to 'suffer an exception' in physiological terms. For every exception that is allowed reveals the secret wish to return to the old habit— it means that some part of our personality desired the exception to occur. And such a wish is really nervous and muscular energy whose release has been conditioned by a stimulus either in the outer environment or within the body. Hence the wiser teaching is either to remove oneself from any environment or person who elicits the habitual reaction, rather than to grit one's teeth in an effort to call upon his 'will power.' Dogged effort is not necessarily wise; it may, indeed, be wasteful or harmful. Herein lies the value of Ostwald's Imperative of Energetics: *'Waste not free energy; treasure it and make the best use of it.'* For the man who is not frank

> and bold enough to give up even that family or acquaintance who has become the conditioning stimulus for a habit that lessens his good can scarcely hope to succeed in developing his best traits to their maximum perfection. As valuable as a reasonable amount of 'self-control' may be, in comparison to a sagacious control of the environment it pales into insignificance."

Thus it does seem that Bayliss may have been the one to introduce "free energy" into the imperative. A 1945 version by Samuel Brody is: [18]

> "Waste not free energy: treasure it and make the best use of it."

In 2007, Brazilian-American chemical engineer Edison Bittencourt quotes the "waste not free energy" idiom, suggesting that it should be taught to chemical engineering students to help understand how thermodynamics applies to society and economics, but attributes the quote to Ostwald. [17]

Lindsay's imperative

In the 1910s and 1920s, through the work of Ludwig Boltzmann (1876-1895), Max Planck (1900-1914), and Walther Nernst (1893-1926), and the principle of elementary disorder, entropy began to be associated with ideas on order and disorder, and these in turn soon thereafter began to be incorporated into the imperative.

The term "thermodynamic imperative" was introduced in the lectures of American physicist Robert Lindsay in his physics classes at Brown University prior to 1959, later popularized in his 1963 book *The Role of Science in Civilization*, among other talks. [2]

> "The second law conveys, to me, the distinct suggestion that we as individuals should endeavor to consume as much entropy as possible to increase the order in our environment. This is the **thermodynamic imperative**, possibly not unworthy to rank alongside the categorical imperative of Kant or even the golden rule."
>
> — Bruce Lindsay (1970), "The Larger Cybernetics" (pg. 134)

Lindsay's version of the imperative states, based on the oft-reasoned generalized tendency that the universe (or systems) tend towards disorder, as embodied in second law, that one should fight the law as vigorously as possible "to increase the degree of order in their environment so as to combat the natural tendency for order in the universe to be transformed into disorder." [1] In short, Lindsay's thermodynamic imperative is a type of ethics based on reducing entropy to the minimum or, in other words, increasing negentropy to the maximum, and for his theories on how humans should have guidelines on how to live and behave based on the laws of thermodynamics and what he called the entropy concept of human consumption. [3] His generalized living principle is what he called the thermodynamic imperative states that: [2]

> "While we *do* live we ought always to act in all things in such a way as to produce as much order in our environment as possible."

In this sense, Lindsay reasons that since every human process or action exhibits an increase in entropy, everything one does leaves a mark in one's thermodynamic system, irrevocably. Hence, to counter this tendency, according to Lindsay, we should follow a certain code of conduct in life based on thermodynamics. [4] In more detail, according to Lindsay, the following statement (the thermodynamic imperative) might serve as a "satisfactory basis for an ethical code": [2]

> "All men should fight always as vigorously as possible to increase the degree of order in their environment, i.e. consume as much entropy as possible, in order to combat the natural tendency for entropy to increase and for order in the universe to be transformed into disorder, in accordance with the second law of thermodynamics."

(add)

Modern views

A number of people in recent years have spun out variations of this theme, such as Jack Hokikian's 2002 order-disorder view of morality, Dick Hammond's 2005 "entropy ethics" teaching workshops, among others.

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Further reading

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θΔics

In hmolscience, **thermodynamic information fallacy** is the oft-made, incorrectly presumed assumption or grasping idea, per reasons of Sokal affair based confusion, that "information" is a "quantity" of thermodynamics; the abused idea, generally, that information is on par with that of energy, matter, or entropy, the latter of which it is incorrectly said, in many instances, to be equivalent with.

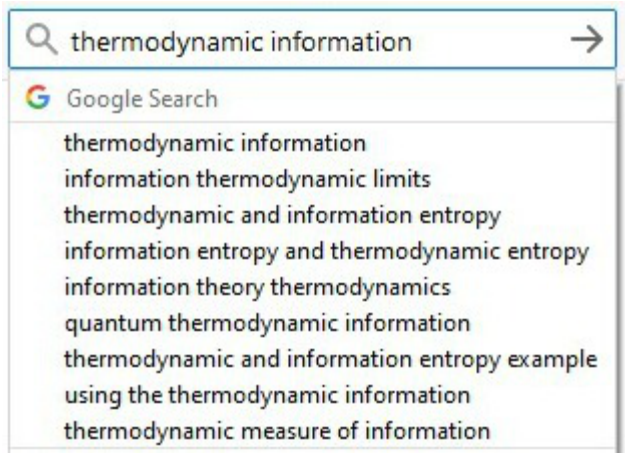

A 2020 Google search return for key **"thermodynamic information"**, showing the proliferation of **false** belief that information is a quantity of thermodynamics, and or defined by thermodynamics, which is NOT the case. [1]

Overview

In fall 1940 to spring 1941, John Neumann told Claude Shannon to all his new logarithmic quantity for the transmission of 'information' (of the 1927 telegraph transmission Hartley type), by the name "entropy", as a supposed joke of some kind (see: Neumann-Shannon anecdote).

In 1948, Shannon, in his "A Mathematical Theory of Communication", taking Neumann's suggestion to heart, introduced a new H function model of "information, choice, and uncertainty" passed as ones and zeros in telegraph lines, stylized in some crude grasping way Ludwig Boltzmann's 1872 H-function model of the "heat", symbol H, of an ideal gas, and christened his new formula by the name "entropy".

In the decades to follow, the popularity of this paper, passed along the incorrect idea that heat of thermodynamics as something to do with information coding and transmission of computer science; only a few were keen to the situation:

> "The entropy introduced in information theory is **NOT** a thermodynamical quantity."
>
> — Dirk ter Haar (1954), *Statistical Mechanics*

> "It is **misleading in a crucial way** to view 'information' as something that can be poured into an empty vessel, like a fluid or even energy."
>
> — Anatol Rapoport (1956), "The Promise and Pitfalls of Information Theory" [2]

> "The term 'entropy' is now widely used in social science, although its origin is in physical science. There are three main ways in which the term may be used. The first invokes the original meaning, referring to the unidirectionality of heat flow, from hot bodies to cold ones. The second meaning can be derived from the first via statistical mechanics; this meaning is concerned with measures of 'evenness' of 'similarity'. The third meaning derives from information theory. The three distinct meanings are carefully described and distinguished, and their relationships to each other are discussed. The various uses of the three concepts in the social sciences are then reviewed, including **some uses which confuse the different meanings of the term**. Finally, modern work in thermodynamics is examined, and its implications for economic analysis are briefly assessed."
>
> — John Proops (1987), "Entropy, Information, and Confusion in the Social Sciences"

Others, less knowledgeable about physics and information theory, were prone to gullibility. The 1978 use of this incorrect model by James Miller, later expanded on by Richard Adams (1988) and his "energy form" model, being just one of hundreds (if not thousands) of confused examples found in print. [1] As a general rule of thumb, to see if a non information science themed book is based on nonsense, is to key word search the book for "Shannon", and if his name

returns, then one can be sure the book is sinking ship argument.

See also

â— Information entropy (quotes)
â— Shannon bandwagon

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θΔics

In instruments, **thermodynamic instrument** are is a device, e.g. thermometer, barometer, indicator, or reaction calorimeter, etc., built or conceived to measure quantities, e.g. temperature, pressure, or heat, respectively, related to the thermodynamics.

See also

- Human thermodynamic instrument

External links

- Thermodynamic instruments – Wikipedia.

θΔics

In human thermodynamics, **thermodynamic isomorphisms** are derived or made up equations, alluded to be thermodynamical, on the superficial premise that they have the same general mathematical shape. The majority of these types of isomorphism equations have essentially nothing to do with thermodynamics, but are surface scratching attempts to appear thermodynamical.

Examples

A simple example would be American mathematician Harold Davis' 1941 modelling of a person's budget in the differential form: [1]

$$dI = dS + dE$$

where I is income, S is savings, and E is expenditure, which according to Johannes Lisman (1949) is an attempt to formulate a first law of thermodynamics: [2]

$$dQ = dU + dA$$

where Q is heat supplied, U is internal energy, and A is external work done. The classic example is John Neumann's circa 1949 suggestion to Claude Shannon to call Ralph Hartley's 1928 logarithmic equation for the transmission of information, in the form of high and low voltage (1s and 0s) pulses, in telegraph wires:

$$\mathrm{H} = n \log S$$

By the name "entropy" since Max Planck (1901) was using a similar equation to describe the entropy of a physical body in thermodynamics:

$$\mathrm{S} = k \log W$$

These examples, as with most isomorphism attempts, are purely baseless. A recent example of thermodynamics isomorphisms are the theories of English engineering business consultant John Bryant, as captured in the 2009 book *Thermoeconomics: a Thermodynamic Approach to Economics*. An example being the empty jumps of extrapolation, that the Watt indicator diagram describing pressure-volume work of a piston and cylinder :

$$\mathrm{W} = \mathrm{PdV}$$

where W is the work done, P is the pressure, and V is change in volume of the body in question, translates, in economic systems, to a description of the price P of a product plotted against the volume V per unit time of the product flowing through the system, such that the

$$\mathrm{W} = \mathrm{PV}$$

where W is the work value of that particular product or good per unit time, coming out of the economic system. This last example seems to be based on nothing more than the fact that the different quantities start with the same letter. [3]

In the correct view, conceptions of social pressure (or social volume) or economic pressure (or economic volume) of working systems of human molecules, e.g. Russia, become greatly more complicated, the exchange of goods in the system acting as a secondary field particle of the exchange force involved in the human chemical reactions in the system or in other descriptions a factor of the activation energy.

Etymology

This category of equations seems to have been named in 1966 by American economist Paul Samuelson, who called such equations in economics, by the name “economic isomorphisms”, as he would receive numerous versions of such equations in the monthly mail, as he has commented. [4]

See also

â— Action thermodynamics,
â— Unitless thermodynamics

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External links

â— Isomorphism – Wikipedia.

θΔics

In human thermodynamics, **thermodynamic law of behavior** states that human behavior is determined by a balancing of the tendency of individuals and groups to impose order about themselves, in accordance with the first law of thermodynamics, with that of the the tendency for disorder and conflict to arise at boundaries of dissimilar individuals and groups, in accordance with the second law of thermodynamics.

In 1973, American political scientist Harold Nieburg stated the following: [1]

> "We assume that all individuals and groups seek to impose order around them. The boundaries of conflicting systems of order, however, overlap creating arenas of social entropy (relative disorder) and competition. Thus, one may postulate a **thermodynamic law of behavior**: assuming, based on the law of conservation of energy, that organisms seek to conserve energy and values, and, based on the law of entropy, that social disorder and decay are constant threats that energy and values must overcome."

In 2006, Polish science-philosopher theologian Jozef Zycinski stated that in his 2000 article "God, Freedom, and Evil: Perspectives from Religion and Science" that he "offers an interpretation of human behavior with consideration of analogies from thermodynamics". [2]

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θΔics

In hmolscience, **thermodynamic lens**, similar to "molecular goggles" (Szent-Gyorgyi, c.1960s) or "advanced perspective" (Thims, 2007), refers to the view of social structure dynamics, e.g. employer-employee relations, via the investigation tools and models of molecular thermodynamics, with the explicit assumption that molecular behavior crudely approximates human behavior and that emotional forces qualitatively equate to bonding forces. [1]

An annotated "**thermodynamic lens**", based on the verbal content of Americans chemical engineer Marc Donohue and leadership psychologist Richard Kilburg's 2014 "Leadership and Organizational Behavior: a Thermodynamic Approach", illustrating the visual conceptual way, e.g. bonding forces, reactions, drives, phases (social phase), emotions, human behavior ≈ molecular behavior, states, etc., a so-called physicochemical psychologist or physicochemical sociologist would view social structure, dynamics, and behaviors. [1]

Overview

In 2005, Nigerian scientist Akinbo Oji, in his "On a Thermodynamic Basis for Inflationary Cosmology", was using the term "thermodynamic lens" in respect to a discussion of hypothetical extraterrestrial intelligence, who already had their Boltzmann, but not yet their Einstein, who was studying inflation and big bang like theories. (Ñº)

In 2009, economist Peter Pogany was using semi-accurate "thermodynamic lens" term idealization in respect to world history. (Ñº)

In 2013, American environmental sociologist Laura McKinney was using an incorrect Roegen-Daly school stylized "thermodynamic lens" to argue about sustainability to the effect that urbanization creates disorder. [2]

In 2014, Americans chemical engineer Marc Donohue and leadership psychologist Richard Kilburg, as presented in their "Leadership and Organizational Behavior: a Thermodynamic Approach", used, American business leadership scholar Bruce Avolio (Ñº), a rather correct, as chemical thermodynamics sees things, usage of term "thermodynamic lens", employed to make a molecular thermodynamics approach to business leadership; a publication involving some 12 total authors in various fields, which allowed the latter, the psychologist, to formulate theories on leadership and group formation dynamics via the eyes of the former, the chemical engineer. [1]

In 2016, Libb Thims put the adjacent "thermodynamic lens" magnifying glass image on all ten back covers of the printed version of Hmolpedia (see: print set); the following is a segment of the back cover of volume one:

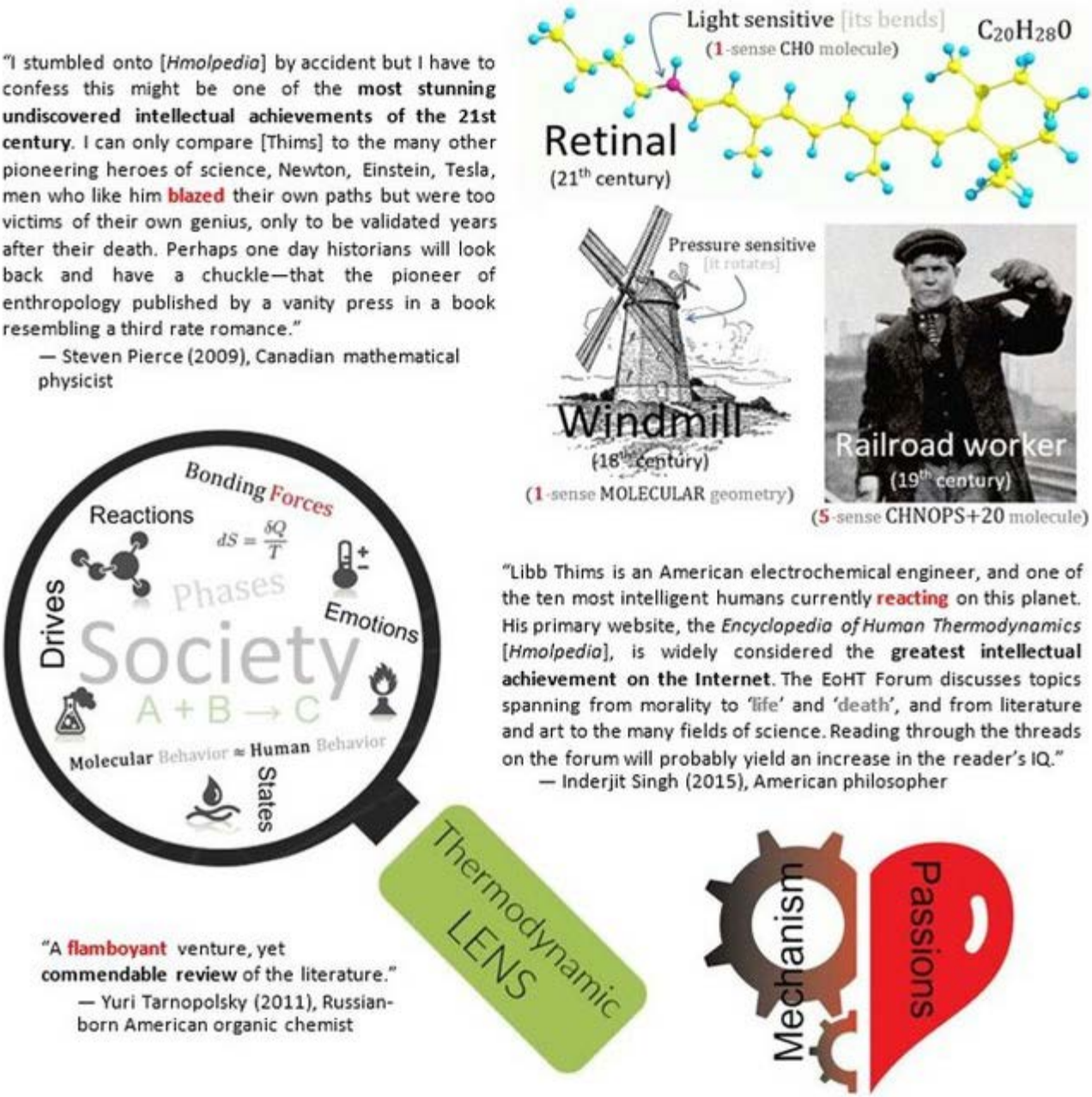

(add)

Quotes

The following are related quotes:

> "Adrian Bejan in *Design in Nature* repeatedly states that organisms are 'machines' or 'motors' in the sense that they are a more efficient means of distributing the flows of natural energies. In other words, the movement of a trout helps to mix the water and transfer energies through the affiliated ecosystem. At some point, a new generation of behaviorists are going to apply the '**thermodynamic lens**' to behavior and realize that this is what organizes complex learning and social behavior as well."
>
> — Kevin Behan (2014), "Thermodynamic Basis of the Animal Mind" (Ñº), Jan 27

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θΔics

In science, **thermodynamic noise** is laymanized term employed to explain physical environmental variations or changes of an organism or molecule in a second law or entropy-like theme.

The term "thermodynamic noise", supposedly, was introduced in 1953 by Scottish animal geneticists E. Reeve and E. Robertson, as a vaguely described unknown quantity affecting developmental stability at the level of the organism. [1]

In 2011, American philosopher Alexander Rosenberg, who has been parlaying the term recently (O) to argue for a second law based Darwinian-like selection model at the atomic molecular level, described thermodynamic noise as follows: [2]

> "Thermodynamic noise constantly makes more and more different environments—different temperatures, different pH, different concentrations of chemicals, different amounts of water or carbon dioxide or nitrogen, or more complicated acids and bases, magnetic fields, and radiation. As a result, there will be a corresponding selection for more and more different molecules."

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θΔics

In thermodynamics, **thermodynamic potential** is the name given to a function whose minimum gives the equilibrium state of a system subject to specific constraints. [1] Among the most often encountered thermodynamic potentials cited include:

- Negentropy | -S | isolated system.
- Internal energy | U | quantities of extensity constant.
- Helmholtz free energy | U – TS | temperature, volume, and amount of substance constant.
- Gibbs free energy | U + PV – TS | temperature, pressure, and amount of substance constant.
- Enthalpy | U + PV | entropy, pressure, and amount of substance constant.

Stated verbally, the conception of thermodynamic potential provides for a description of the direction of evolution of physical systems. Through the second law, the science of thermodynamics states that a system evolves in the direction that minimizes an appropriate thermodynamic potential, for example the "negative of entropy" (neg-entropy) for isolated systems, or the Gibbs free energy at constant pressure and temperature. [2]

Thermodynamic potentials

	System	Potential	Conditions	Equilibrium
Coupled bulbs	Isolated system	Entropy (negative) Negentropy		dS = 0 (S = max)
System?	(add)	Internal energy (dS = 0, dV = 0)	Quantities of extensity constant	dU = 0 (U = min)
System?	Closed isentropic isobaric system	Enthalpy (dS = 0, dP = 0)	Entropy, pressure, and amount of substance constant	dH = 0 (H = min)
Battery	Closed isochoric isothermal system	Helmholtz free energy (dT = 0, dV = 0)	Temperature, volume, and amount of substance constant	dF = 0 (F = min)
Social systems	Closed isobaric isothermal system	Gibbs free energy (dT = 0, dP = 0) Note: (freely running)	Temperature, pressure, and amount of substance constant	dG = 0 (G = min)
Social systems	Open isobaric isothermal system	Gibbs free energy (dT = 0, dP = 0) Addition factors: (chemical potential: μ) (turnover rate)	Temperature and pressure constant; amount of substance varies	dG = 0 (G = min)

Chemical reactions

The application of the thermodynamic concept of potential to the kinetics of chemical reactions (transition state theory) provides a criterion for selecting the optimal pathway for a transition, usually the pathway with the transition state of the lowest free energy. In this perspective, by providing a direction for systems to evolve and an optimal pathway, thermodynamics offers a way for answering *why* things happen the way they do. [2]

Humor

The following is a thermodynamics humor T-Shirt made by Zazzle creator Word & UnWords, showing Willard Gibbs 1873 'available energy' (AB) graph: [3]

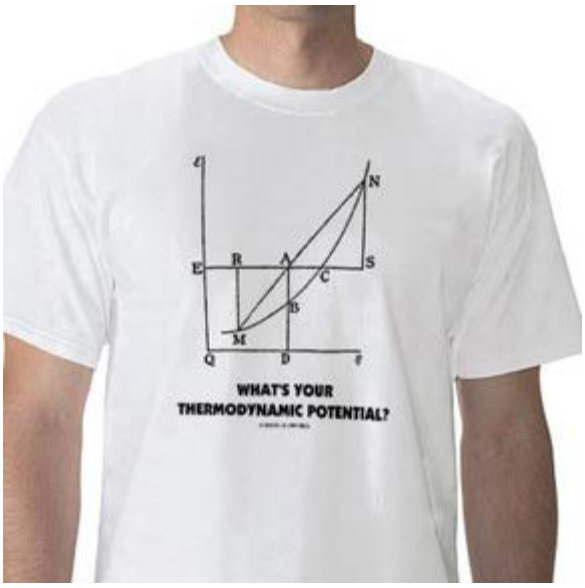

See also

- Coupling

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3. What's your thermodynamic potential? (T-Shirt) – Zazzle.com.

θΔics

In scientific revolutions, the **thermodynamic revolution** (1797-1882) was the gradual clarification and unification of the postulates and theories surrounding the phenomenon of combustion (particularly what heat is) and its usefulness, via energy transformative relationships, to other forms of work such mechanical, electrical, or chemical.

Overview

Another common view, is that the thermodynamic revolution was centered around the discovery of "how to turn heat (un-directed energy) partially into usable work (directed energy)." [3] Scientific revolution theorist Thomas Kuhn reasons that the thermodynamic revolution was a "crisis and emergence" type of revolution and that thermodynamics was "born from the collision of two existing nineteenth-century physical theories (caloric theory and kinetic theory)." [4]

In the long scheme of things, it can be argued the thermodynamic revolution began with Arabian chemist Jabir ibn-Hayyan's (Geber's) c. 790 postulate that metals were formed out of two elements: *sulphur*, 'the stone which burns', which characterized the principle of combustibility, and *mercury*, which contained the idealized principle of metallic properties, peaked with German physicist Rudolf Clausius' 1865 textbook *Mechanical Theory of Heat*, and ended with the formation of modern chemical thermodynamics by Americans Gilbert Lewis and Merle Randall (1923) and Brit Edward Guggenheim (1933). [5]

The essence of the revolution, however, was seeded with French chemist Antoine Lavoisier's 1787 caloric theory of heat, began to folder with Benjamin Thomson's 1797 cannon-boring experiments, peaked with English physicist James Joule's meticulous "mechanical equivalent of heat" energy conservation experiments (1843), was solidified or made into a science through primarily the work of German physicist Rudolf Clausius (1850-65), with his "internal energy" formulation and his conception of "entropy" as a type of transformation system energy, and was capped-off when German physicist Hermann von Helmholtz showed in 1882 that the long-sought quantity "chemical affinity" was measured by the free energy of the system.

Many, interestingly, argue that revolution still continues, in areas such "ecological thermodynamics", "quantum thermodynamics", or particle physics, where the laws of thermodynamics serve as benchmarks. Similarly, some reason that a new revolution will occur in the future when thermodynamics fully penetrates and elucidates areas such as the thermodynamics of biological nano-engines or the thermodynamics of the being and existence of the person. [6]

Quotes

The following are related quotes:

> "Not Copernicus and Galilei [sic], when they abolished the Ptolemaic system; not Newton, when he annihilated the Cartesian vortices; not Young and Fresnel, when they exploded the Corpuscular Theory; not Faraday and Clerk-Maxwell, in their splendid victory over *Actio in distans* – more thoroughly shattered a malignant and dangerous heresy, than did Joule when he overthrew the baleful giant force, and firmly established, by lawful means, the beneficent rule of the rightful monarch, energy! Then, and not till then, were the marvelous achievements of Sadi Carnot rendered fully available; and Science silently underwent a **revolution** more swift and more tremendous than ever befell a nation. But this must be a theme for the Poet of the Future!"
>
> — Anon (1884), review of Joule's Scientific papers in the Phil. Mag. [2]

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θΔics

In thermodynamics, **thermodynamic self-organization** refers to a posted self-organization explained via some hypothetical thermodynamics-based theory.

Overview

The term "thermodynamic self-organization" seems arisen among Russian scientists, referring to assembly behaviors describable by thermodynamics in the near-equilibrium range. [1] The term is used such to distinguish two variants of energy dispersion: (a) operations related to near-equilibrium processes (thermodynamic self-organization) and (b) operations related to non-equilibrium processes (dynamic self-organizations), the latter generally being associated with Prigoginean thermodynamics. [2] In the view of Russian physical chemist Georgi Gladyshev's hierarchical thermodynamics, thermodynamic self-organization is defined as the spontaneous ordered joining of the structures of the *i*-th hierarchy into structures of the *(i+1)*-th hierarchy. [3]

Difficulties

As the principle of inertia, the forerunner to the first law of motion, invalidates any and all types of self-[determining/organizing] systems (Karl Pearson, 1892), the premise of a thermodynamics-based self-[organized] system, is akin to a double-defunct theory, being that the laws of motion underlie the laws of thermodynamics.

References

1. This terminology was used at the 2008 5-th International Inter-Sciences Symposium "Applied Synergetics in Nano-technologies", e.g. in the lectures of Georgi Gladyshev and V.S. Ivanova, among other scientists at the conference (source: 13 Jan 09 email from Gladyshev to Libb Thims).
2. Author. (1998). *Russian Metallurgy* (pg. 101). London: Scientific Information Consultants.
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θΔics

In thermodynamics, **thermodynamic square**, or Born diagram or Koenig-Born thermodynamic square, is a type of mnemonic memory trick flow diagram or schematic, depicted adjacent, for recalling the exact differentials of the thermodynamic potentials U, F, G, and H, the associated Maxwell relations, and conditions for equilibrium under various sets of imposed conditions. [1]

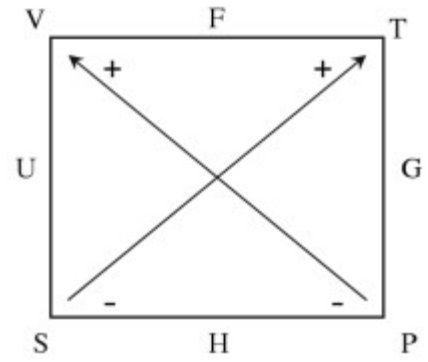

The **thermodynamic square** (Born diagram) drawn where each potential (U, F, G, H), is between its its natural independent variable (SV, VT, TP, PS); whereby, derivatives are obtained by following the diagonal of the square, and the sign is determined by the direction of the arrow. [6]

Etymology

The “thermodynamics square” concept was developed German physicist Max Born in his late 1920s University of Gotttingen lectures on thermodynamics, on the subject of on Maxwell’s relations. One of his 1929 lectures was attended by Hungarian-born American physicist Laszlo Tisza, of the MIT school of thermodynamics, who later incorporated the diagram into his 1966 *Generalized Thermodynamics*. [6]

The first literature publication of the thermodynamic square method appeared in the 1935 article “Families of Thermodynamic Equations: The Methods of Transformation by the Characteristic Group” by American chemist Frederick Koenig, wherein he attempts to regroup the important equations of thermodynamics into so-called "families", via of a precise definition. [3]

Koenig followed this with a part two 1972 article subtitled “Families of Thermodynamic Equations: The Case of Eight Characteristic Function” (see: characteristic function). [4]

The thermodynamic square diagram next seems to have appeared in Tisza’s student American physicist Herbert Callen’s famous 1985 second edition *Thermodynamics an Introduction to Thermostatics* textbook. [4]

Variants

If more potentials and varialbes are used, other more advanced variants of the square can be made such as a “thermodynamic cuboctahedron”. [7] Likewise, a the so-called “thermodynamic cube” can be made using a sheet of paper cut and folded a certain way. [8]

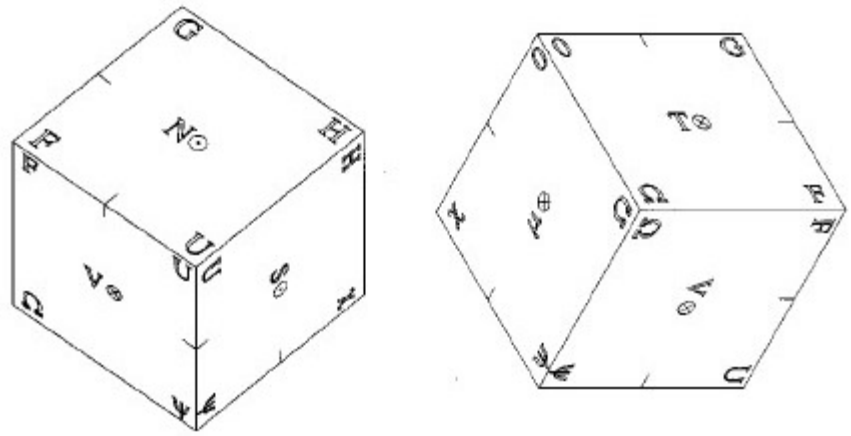

A **thermodynamic cube**, a more encompassing advanced variation of the thermodynamic square. [8]

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● Rock, Peter. (2003). *Chemical Thermodynamics* (5.6: The Thermodynamic Square, pg. 126-). University Science Books.

External links

● Thermodynamic square – Wikipedia.
● A question about the Thermodynamic Square (2010) – ChemicalForums.com.

θΔics

In social thermodynamics, **thermodynamic substratum** is the material that underlies a human society. [1] Thermodynamic substratum, modelled on the chemical term substrate, is defined in such a manner that people pump energy into this substratum when they produce values (or "use-values"); whereas they withdraw energy from it when they consume those values.

Overview

The term “thermodynamic substratum” was coined in 1976 by American anthropologist Eugene Ruyle in the development of his social thermodynamics theories. Ruyle defines thermodynamic substratum as such: [1]

> “In the labor process, the labor that is expended in transforming nature into socially acceptable use-value becomes embodied, in a sense, in those use-values. When the use-values are consumed, a definite amount of labor energy is also being consumed. Thus, if I spend two hours digging up yams and another two hours cleaning and cooking them, there are four hours of my labor time embodied in the resulting yam pie. When I eat the pie, I am consuming not only 2000 calories of food energy, I am also consuming four hours of labor energy. If I split the pie with someone else, I am consuming two hours of my labor time, and the other person is also consuming two hours of my labor time. In this way, we may speak of two hours of my labor time flowing to the other person. All human beings are dependent upon these sorts of energy flows [thermodynamic flows] as they consume use-values produced by other members of the population and in turn produce use-values which are consumed by others. There is thus a thermodynamic substratum in human societies upon which all human beings depend.”

(add)

See also

â— Surface thermodynamics

References

1. Toward an Anthropological Marxism (chapter 3) by Eugene Ruyle.

θΔics

In thermodynamics, a **thermodynamic system** or "system" is any material body of the universe made to expand or contract, according to Boerhaave's law, by the action of heat, and thus made to do mechanical work, according to the cycle of operation steps of the Papin engine (1690).

The original thermodynamic system, shown adjacent, drawn by French physicist Sadi Carnot in 1823. It is important to note, that the "system", in the original steam engine sense of the word, is one of three bodies that comprise the basic heat engine. The working body (system) is typically steam, although it can be any physical body of the universe; the other two being the hot body (typically a boiler, heated by fire) and the cold body (typically a spray of cold water, from a nearby stream). This is the basic model in thermodynamics, whose operation is defined by the seven step Carnot cycle, added to which other factors, such as electrical work, chemical work, elongation work can be quantified by their modification to the change in the internal energy of the the working body or "system".

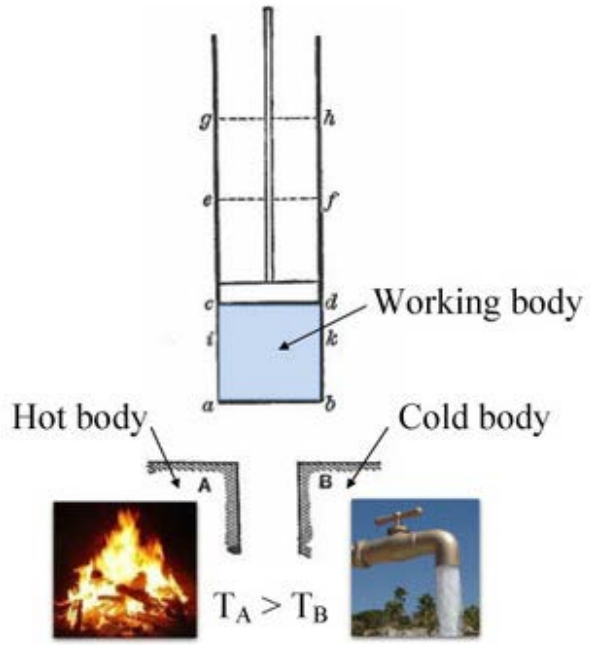

Modified diagram of the original 1824 Carnot heat engine showing the hot body, working body (**system**), and cold body, the letters labeled according to the stopping points in the various steps of the seven-step Carnot cycle.

Etymology

The modern term "thermodynamic system" was introduced in 1923, a clarification-type derivative of the older terms working substance (Carnot, 1824), working body (Clausius, 1850), or system (Maxwell, 1871), and of the newer terms, such as working medium (Ksenzhek, 2007).

The double word term "thermodynamic system" verse "system" seems to have arisen out of the unwritten practice of placing the classifier “thermodynamics” in front of whatever term was being used, such as thermodynamic function, thermodynamic arrow, thermodynamic evolution, thermodynamic temperature, etc., in unintentional efforts to help distinguish the term in some sense or degree.

In a modern use, when diagrams are made, such as shown below, in which the center region is titled *thermodynamic system*, the connection to the operation and depiction of the hot body and cold body, often called "reservoirs", often becomes lost in translation. [2]

The term *thermodynamic system* seems to have come into use in the popular the 1923 textbook *Thermodynamics* by American physical chemists Gilbert Lewis and Merle Randall. [1] They state that what is customarily called a “system”, which can be enclosed either by physical walls or imaginary mathematical surfaces, is whatever part of the objective world that is the subject of thermodynamic discourse, e.g. a crystal or a cubic centimeter portion of crystal. On this definition that surmise:

> “A **thermodynamic system** may contain no substance at all, in the ordinary sense, and consist of radiant energy, or an electric or magnetic field … [but] usually comprises a substance, which may be homogeneous or heterogeneous.”

(add discussion)

Difficulties on terminology

As mentioned above, the new

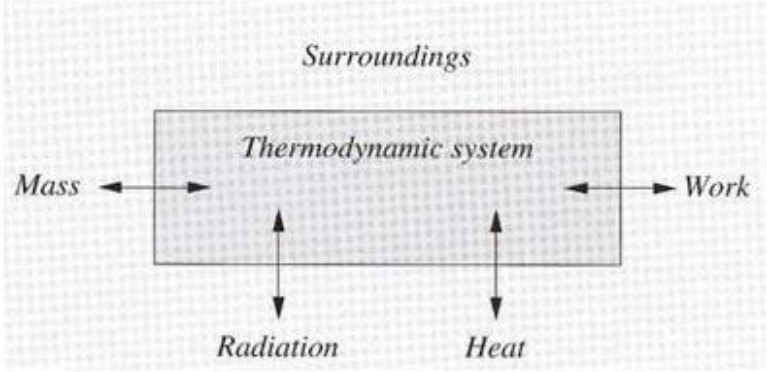

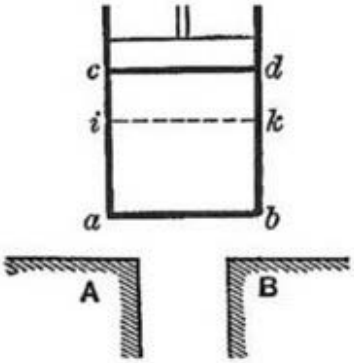

Left: Modern generic version of the **thermodynamics system**, showing that both radiation, heat, and work can pass the boundary, often defined as an "closed system", and that also mass can pass across the boundary, often defined as an "open system". Mass can pass the boundary as either inert transport mass, in which a certain amount of energy is assigned to the work of moving the mass; or in the case of chemically reactive mass, the effect is quantified by the chemical potential terms, taking into affect the nature of the change of the internal energy in a chemical reaction sense. Right: a close-up of the original Carnot engine (1824).

student of thermodynamics, when introduced to the the term "system" or "thermodynamic system" (such as diagrammed above) may easily fall into the assumption that the “thermodynamic system” is a two-component system, comprising both the system and the surroundings, or a three-component system, comprising the boiler (hot body) A, condenser (cold body) B, and substance (working body), below (left).

This thermodynamic "system" model, in turn, stems from the 1850 terminology of German physicist Rudolf Clausius, who referred to the "working body" as the system, such as shown generically below (middle). In this sense, where the term "thermodynamic system", as given to the newby thermodynamics student, has little visual connection to the 1824 working substance “steam body” description of heat engine operation by French physicist Sadi Carnot, as depicted below (right), in which the "system" is the body of water molecule contained in the piston volume region *acdb*.

This diagram model by Carnot of his generic heat engine, in turn, was mainly based on the steam engine designed by Scottish engineer James Watt, shown below (left), having a separate condenser (1765), sun and planet gear (1781), centrifugal governor (1788), where the "system", "working substance", or "working body" is the "body" of an amount of water, heated in a boiler (hot body, **A**) and fed as steam, through conduit d, into the piston C, later to be condensed into water again via contact with the condenser (cold body, **B**), diagrammed below as section D, is the steam engine:

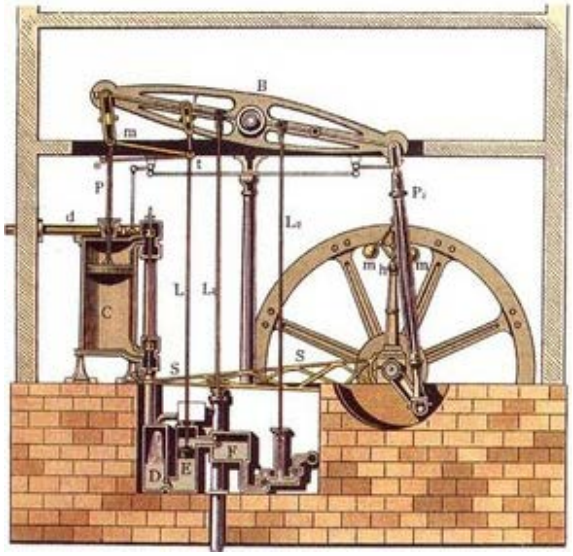

Watt engine (c. 1780)

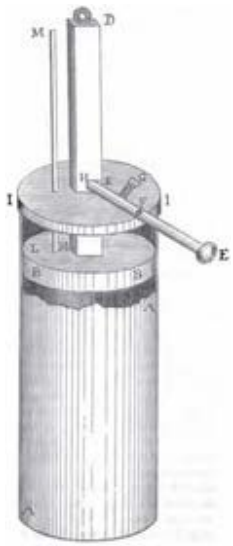

Papin engine (1690)

Papin digester (1679)

Vacuum pump (1850)

Watt's design, in the the course of the timeline of engine development, in turn, was modeled on the Papin engine design of a "heated" piston-and-cylinder, shown above (center left), configured with the ability to do work, via certain steps of operation, as detailed in the 1690 memoir "A New Method to Obtain Very Great Motive Powers at Small Cost" by French

physicist Denis Papin.[4] In terse summary, after decades of experimental work in attempts to create a "gunpowder engine", one that lowers the piston (doing work) following a discharge of gunpowder in the cylinder, after watching a steam release valve move up and down on one of his digestors (pressure cooker), he conceived of the idea that to make a steam engine, one could put a body of water (system) in a sealed piston and cylinder and then operate the engine in two steps.

The two steps of Papin engine operation are: (a) have someone hold a fire under the piston, making the water boil and expand pushing the piston upward and (b) then have some one cool the piston by holding a tub or stream of cool water under the hot piston, thus causing the steam to condense, pulling the piston back down. This was one engine cycle. This is the basic model of operation of all steam engines and was used by English engineer Thomas Necomen in 1698 to make the first steam engine, called the Savery sump pump (or Miner's friend). The Watt steam engine evolved from the Savery engine.

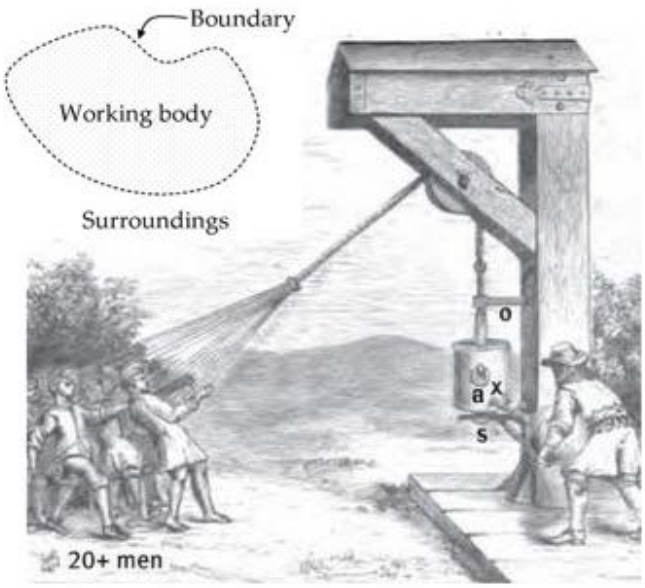

Papin's heat engine design, which contains the first verbal description of what later came to be called the "Carnot cycle", in turn, was based on the very-popularized 1647 piston-and-cylinder vacuum pump weight-lifting ideas initiated in 1647 by German inventor and physicist Otto Guericke, such as the ones shown below:

To explain further, as to the operation of the Guericke engine, in one experiment shown to the left, 20+ men pulled on the piston till it reached halfway up position, then a large glass receiver, which had been mad perfectly vacuous by Guericke's pump, was then applied to the stop-****; and when the men were exerting their utmost force, a communication was opened between the receiver and the cylinder, and the piston was suddenly forced down to the bottom of the cylinder in spite of the efforts of the men to keep it up.

In the experiment shown to the right, conducted in 1654, Guericke arranged the piston at the top of the cylinder, having a scale loaded with 2,686 lbs attached to it. In this configuration, a little boy, by means of a small syringe applied at the stop-**** **x** to pump out the air, was able to bring down the piston and raise the weight. [2]

In sum, these early piston and cylinder experiments, in later connective coordination, via the caloric theory, to Dutch physician and chemist Herman Boerhaave's 1724 heat augmentation axiom, are to which the conception of a thermodynamic "system" stem. In this sense, the modern joint term "thermodynamic system" may not be an advisable one, and may lead to confusion, particularly in regards to the "theory of transformation-equivalents", introduced in the period 1850-65 by German physicist Rudolf Clausius, otherwise known as entropy. [3]

Earth-bound thermodynamic systems

See main: Earth-bound thermodynamic systems

In subjects such as life thermodynamics, evolutionary thermodynamics, biological thermodynamics, ecological thermodynamics, economic thermodynamics, sociological thermodynamics, or human thermodynamics in general, the diagramming of the boundary of the thermodynamic system becomes a paramount issue. The basic model delineates a cylinder type imaginary volumetric region on the surface (substrate) of the earth, viewed such, while remaining in contact with the surface of the earth, it rotates in a 24-hour, two-part heat cycle, being put in contact with a hot body (the sun) for approximately 12-hours, the expansion phase, and then put in contact with a cold body (the night sky) for approximately 12-hours, the contraction phase, whereby after the body, if it is considered to be reversible, returns to its original condition.

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(b) Muirhead, James. (1859). *The Life of James Watt*, (English translation: Ch. XI, Denys Pain: His memoir of 1690, Section: A New Way to Obtain Very Great Motive Powers at Small Cost", pgs. 131-42). London: John Murray.

External links

â— Thermodynamic system – Wikipedia.

θΔics

In thermodynamics, **thermodynamic theory of affinity**, as contrasted to the older now-defunct 1850s thermal theory of affinity, refers to the explanation of affinity, chemical affinity, elective affinity, or human elective affinity, in modern chemical thermodynamic quantification terms, as free energy change, and not solely heat release, being the "true" measure of the force of affinity. For isothermal-isobaric reactions, in simplified form, the thermodynamic quantification of affinity *A* is:

$$A_{T,P} = -\Delta G$$

where *ΔG* is the change in the Gibbs free energy for the process or reaction; and for isothermal-isochoric reactions:

$$A_{T,V} = -\Delta F$$

where *ΔF* is the change in the Helmholtz free energy for the process or reaction.

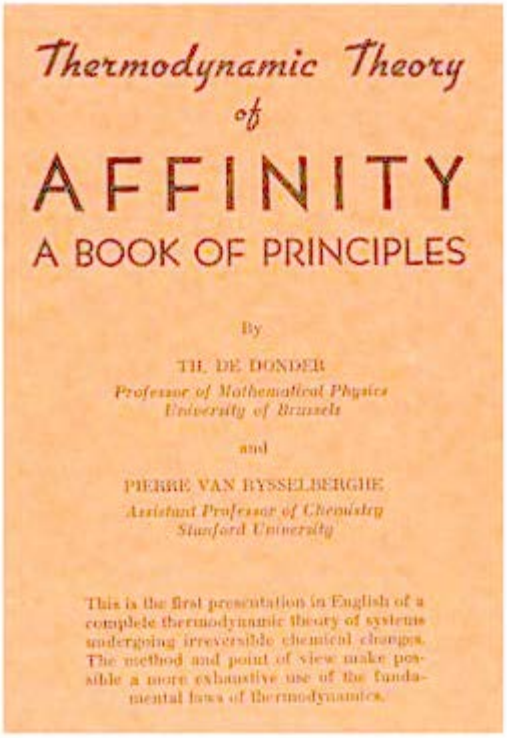

Cover of Theophile de Donder's 1936 *Thermodynamic Theory of Affinity*, a 144-page book on the thermodynamic explanation of chemical affinity. [1]

History

The first theories on this topic of the measure of chemical affinity were those put forward, independently, it seems, by Danish chemist Julius Thomsen (1854) and French chemist Marcellin Berthelot (1864) who argued that the heat of a reaction was the true measure of affinity. This came to be known as the thermal theory of affinity.

In 1882, German physicist Hermann Helmholtz, in his chemical thermodynamics founding paper "On the Thermodynamics of Chemical Processes", showed that the true measure of affinity is not the heat evolved, but rather free energy, being that the second law of thermodynamics, or rather entropy, plays a role in the measurement or actuation of chemical affinity in chemical reactions. This publication overthrew the older "thermal theory of affinity" advocated by Danish chemist Julius Thomsen (1854) and French chemist Marcellin Berthelot (1864).

In 1884, Dutch physical chemist Jacobus Van't Hoff showed that the maximum external work that obtained when a chemical reaction was carried out reversibly and isothermally could serve as a measure of chemical affinity.

Belgian chemist Theophile de Donder worked for many years on this subject, publishing articles on this topic beginning in 1922, culminating with his 1936 book *Thermodynamic Theory of Affinity*. [1] Gianni Astarita argues that, in addition to being one of the first books to discuss the details of the thermodynamics of affinity, de Donder's *Thermodynamic Theory of Affinity* was the first to put forward the concept of 'extent of reaction':

$$A = -\left(\frac{\partial G}{\partial \xi}\right)_{p,T}$$

The 1923 textbook *Thermodynamics and the Free Energy of Chemical Substances*, by American physical chemists by Gilbert Lewis and Merle Randall, is said to have led to the replacement of the word 'affinity' by 'free energy' throughout the world.

Human chemical thermodynamics

In 1809, German polymath Johann Goethe published his physical chemistry based novella *Elective Affinities*, wherein he showed how chemical affinity governs human interactions. In the years following 1882, with the publication of German physicist Hermann Helmholtz's 1882 "On the Thermodynamics of Chemical Processes", wherein he proved that that the true measure of affinity is not the heat evolved, but rather free energy, being that the second law of thermodynamics, or rather entropy, plays a role in the measurement or actuation of chemical affinity in chemical reactions, and more particularly in the decades after the 1923 publication of American physical chemist Gilbert Lewis' famous *Thermodynamics and the Free Energy of Chemical Substances*, after which the term "free energy" began to be used over that of "affinity", the subject of human chemical thermodynamics, namely the study of the thermodynamics of human chemical reactions (see: theory), the advanced subject of "human free energy" theory began to be discussed and theorized about, using the language of partial differential equations, the recent work of German solid state thermodynamicist and socio-economic physicist Jurgen Mimkes ("A Thermodynamic Formulation of Social Science", 2007) and American physical chemist Thomas Wallace ("The Fundamentals of Thermodynamics Applied to Socioeconomics", 2009) being two prime examples. [5]

Quotes

The following are related quotes:

> "The influential textbook of G.N. Lewis and Merle Randall led to the replacement of the term 'affinity' by the term 'free energy' throughout the English speaking world."
>
> — Henry Leicester (1956), *The Historical Background of Chemistry* [4]

-

> "The term "affinity" gave way slowly to "work" and to "free energy," with the adoption by chemists of the so-called Gibbs free energy function (F), rather than the expression (A) developed by Helmholtz (1882), van' t Hoff (1884), and Nernst (1887). Like many of the new physical chemists, Ostwald reveled in the new approach. "As long as we sought to measure chemical 'forces'," he wrote, "the theory of affinity made no progress." Willard Gibbs's method of making calculations at constant pressure and constant temperature was more useful than the free energy derivation by European scientists for constant volume and constant temperature. Thus, for chemists, H (heat of reaction), c_p (heat capacity at constant pressure), and F were more generally useful than E, and A. With the standardization of free energies of formation of electrolytes in solution by Lewis and his American colleagues, thermodynamics became an ordinary tool for most chemists. Indeed, Lewis said of this work that it had given him more personal satisfaction than anything else he had done in chemistry."
>
> — Mary Nye (1994), *From Theoretical Philosophy to Theoretical Chemistry* (pg. 120)

-

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(b) Leicester, Henry. (1956). *The Historical Background of Chemistry* (pg. 206). Dover.
3. Astarita, Gianni. (1989). *Thermodynamics: an Advanced Textbook for Chemical Engineers* (pg. 66). Plenum Press.
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(b) Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (Appendix A: The Fundamentals of Thermodynamics Applied to Socioeconomics, pgs. 469-89). AuthorHouse.

Further reading

â— De Donder, T. (1922). “Article”. *Bull. Ac. Roy. Belg.* (Cl. Sc.) (5) 7: 197-205.
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â— De Donder, T. and Van Rysselberghe P. (1936). *Affinity.* Menlo Park, CA: Stanford University Press.

θΔics

In theories, **thermodynamic theory of everything** is a theory of everything based on the premise that thermodynamics, the universal operator or governor of the universe, is the working foundation of the theory.

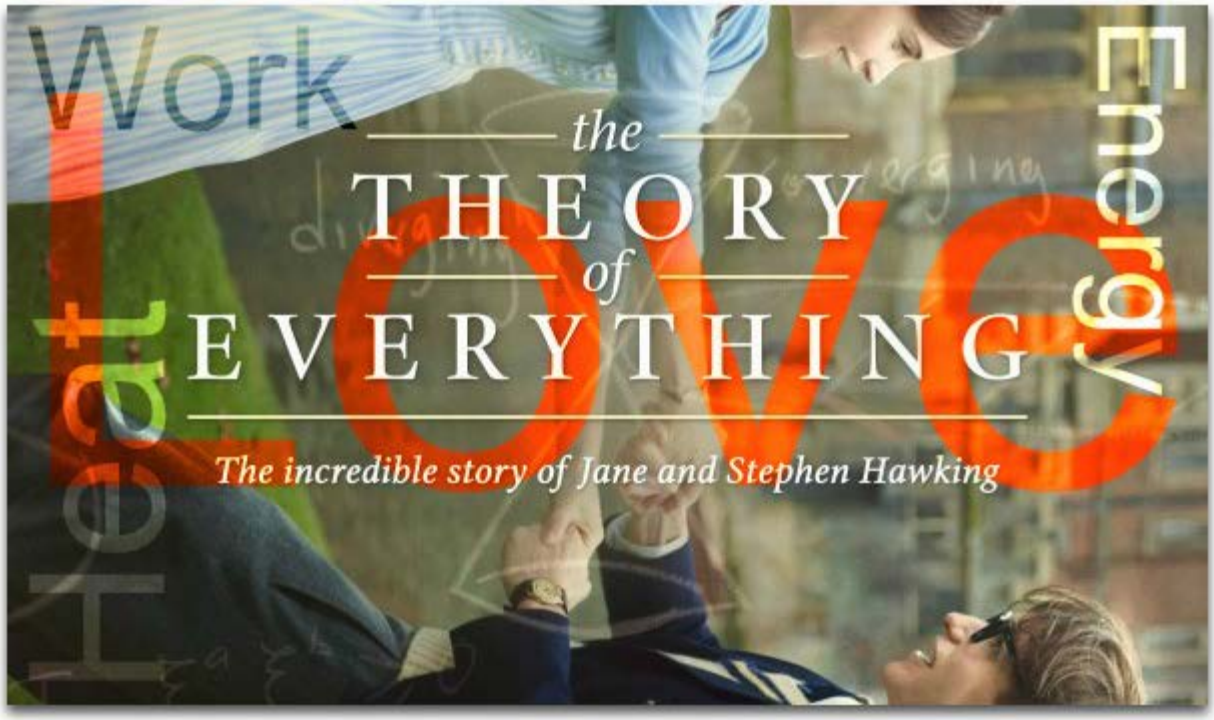

An annotated film poster of *The Theory of Everything* (2014), based on relationships, equations, times Stephen Hawking, who in 1988 explained both "book reading" and "black holes" via thermodynamics, entropy in particular; thereby outlining a semblance of a **thermodynamic theory of everything**.

Overview

In 1865, Rudolf Clausius stated that the first law and second law, of thermodynamics, govern the entire universe.

In 1910, Henry Adams arrived at the outline of a Gibbs-based thermodynamic theory of everything, after some fifty years work in this area; the following being a retrospect statement of this effort;

> "The time may come when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry … then it may be possible, as Adams suggests, to invent a common formula for thermodynamics and history."
>
> — William Thayer (1918), on Henry Adams' 50-year attempt at a thermodynamic theory of everything

At the end of his very-impressive effort, e.g. coming to believe that he was a social phase, he stated the complete solution would "require the aid of another Newton".

In 1914, William Sidis, age 16, attempted a thermodynamics theory of everything, resulting in his *The Animate and the Inanimate* (1925). [1]

Quotes

The following are related quotes:

> "A theory is the more impressive the greater the simplicity of its premises, the more different kinds of things it relates, and the more extended its area of applicability. Therefore the deep impression that classical thermodynamics made upon me. It is the only physical theory of universal content which I am convinced will never be overthrown, within the framework of applicability of its basic concepts."
>
> — Albert Einstein (c.1940)

See also

â— Thermodynamic theory of affinity

References

1. Sidis, William J. (1920). *The Animate and the Inanimate*. Draft stage 1916; Formerly published: R.G. Badger, 1925.

θΔics

In famous publications, ***Thermodynamic Theory of the Evolution of Living Beings*** is a 1997, 142-page book, written by Russian physical chemist Georgi Gladyshev, which set forth the first unified theory of the origin and evolution of living beings from the view point of thermodynamics, built on the chemical thermodynamics work of American mathematical engineer Willard Gibbs.

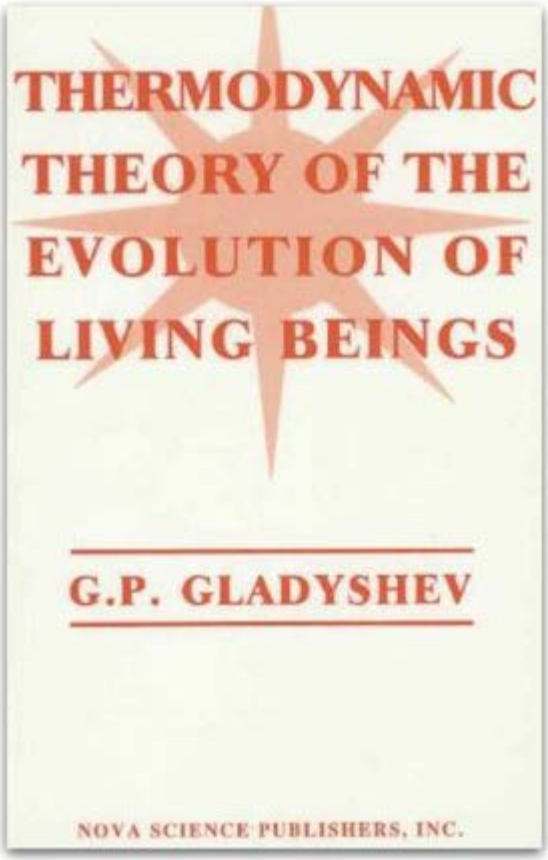

The book was originally published in Russian as the 86-page book *Thermodynamic Theory of the Evolution of Life Forms*, of which 1,000 copies were printed, and is described by Russian polymer thermodynamicist Yuri Lipatov as an "extraordinary publication event", in that it draws the conclusion that the evolution of life forms can be explained without implementing the concepts of dynamic self-organization or dissipative structures, by the supposition that the first life form originated as a "thermodynamic self-organized (self-assembled) polyhierarchic system." [2]

Principles

The essential features or postulates of Gladyshev's theory are:

(a) That biological evolution is an irreversible process, characterized as a documented historical variation of life with respect to a given evolution timescale.
(b) That light, acoustic and magnetic fields, mechanical torsions, smells, and psychological stresses initiate the reaction of biological objects and determine their behavior.
(c) That optical activity of biological substances the principle peculiarity of the living world.
(d) That biospheric "thermostats", or time-delineated surrounding mediums of relative constant compositions, temperatures, and pressures, exist owing to the periodic, diurnal, and cyclical nature of earth dynamics over the last 4.5 billion years.
(e) That thermostats can be used as a criterion for the identification of biospheric subsystems (within systems) in states of micro-evolution or system chemical reaction evolutions.
(f) That a law of temporal hierarchies exists such that any living system of any temporal hierarchical level in a normal state has a "thermostat", which is a surrounding medium that is characterized by slightly changing average values of thermodynamic parameters.
(g) That the definition of the "thermodynamic system" is that which is temporally surrounded by a "thermostat".
(h) That systems are arranged in "hierarchies", such that a "principle of substance stability" characterizes the movement of substance between systems owing to variations in stabilities of the molecular substances.
(i) That the definition of ΔG is the energetic measure of system structure formation in a given system evolution relaxation window.
(j) That only the initial and final states of a process under study are of interest.
(k) That the variations of the Gibbs function of the system, at any stage of evolution, particularly ontogenesis and philogenesis (where *ontogenesis*, meaning the development of the individual, represents a curtailed repetition of *philogenesis*, or the development of the race or species), can be calculated by thermodynamic methods.
(l) That a function $G_{system\text{-}formation} = f(t)$, can be obtained using thermodynamical data, thus representing the "state" of the system at a fixed moment in time.
(m) That variations of calculations of ΔG characterize stability changes in the system.
(n) That this outline, being consistent and unified to that of logic of standard physical chemistry, quantifies the physical essence of the evolution tendency and is the "general law" (combined law of thermodynamics) that Charles Darwin postulated as that which determines the principles of life.

These logic constitute what Gladyshev calls "hierarchical thermodynamics". This theory, to note, was in direct contrast to the more-established 1970s paradigm of the far-from-equilibrium dissipative structure theory of Belgian chemist Ilya Prigogine, who developed an “internal entropy” generation function model to account for the appearance of spontaneously forming ordered structures in the high heat flow regime of viscous mediums, such as the formation of Bénard cells in silicon oil placed on a hot plate, in which the heat is turned up past the turbulent flow regime.

References

1. (a) Gladyshev, Georgi, P. (1997). *Thermodynamic Theory of the Evolution of Living Beings*. Commack, New York: Nova Science Publishers.
(b) Newspaper interview (1999) with Prof. Georgi P. Gladyshev (correspondent Mr. A. Gubanov).
(c) Forward (origin of book) – *Thermodynamic Theory of the Evolution of Living Beings.*
2. (a) Lipatov, Yuri S. (1997). “Book Review: G.P. Gladyshev, *Thermodynamic Theory of the Evolution of Life Forms*, Luch, 1996, 86 pages – in Russian” (abs), *Journal of Biological Physics*, 23: 129-31.
(b) Liopatov, Yuri S. and Nesterov, Anatoly E. (1997). *Thermodynamics of Polymer Blends*. CRC Press.

θΔics

In thermodynamics, **thermodynamic time** is time correlated to an increase in entropy of a given body during process. French biophysicist Louis-Marie Vincent states that the term “thermodynamic time” was introduced by Belgian physicist Ilya Prigogine as being synonymous with a chemical reaction process and the inevitable production of entropy occurring therein, whereby if one were to freeze a reaction, time would no longer flow. [1] The term thermodynamic time is nearly synonymous in meaning with the term thermodynamic arrow.

References

1. Elsaesser-Valarino, Evelyn. (2001). *On the Other Side of Life: Exploring the Phenomenon of Near-death Experience* (ch. 6: “Dialogue with Louis-Marie Vincent, PhD”, pgs. 176-92; section: What about thermodynamic time?, pgs. 170). Da Capo Press.

Further reading

â— Thermodynamic Asymmetry in Time – Stanford Encyclopedia of Philosophy.

θΔics

In gravesites, **thermodynamic tombstones** are markers for the burial places of famous thermodynamicists, including the Clausius tombstone (Bonn, Germany), Boltzmann tombstone (Vienna, Austria), or Gibbs tombstone (New Haven, Connecticut), among others, often the site of vacation spots, pilgrimages, or birth anniversaries by scientists. In 2005, at the Gibbs tombstone, for instance, groups gathered for pictures on the occasion of the unveiling of the new US Postal Service 37-cent Gibbs stamp.

Of tombstones of famous thermodynamicists, the tomb of Austrian physicist Ludwig Boltzmann is the most famous, in that it has an entropy equation, S = k log W, engraved on it (shown adjacent), above a bust of Boltzmann.

Articles for some of these noted tombstones are listed in the file tree header to the left.

Other famous burial sites include the Nernst tombstone (of German physical chemist Walther Nernst), the Maxwell tombstone (of Scottish physicist James Maxwell), Planck tombstone (of German physicist Max Planck) among others. [1]

Then there is German-born American physicist Albert Einstein, whose first thirty papers were in thermodynamics, who upon death (1955) was cremated, having his ashes scattered in an unknown river in New Jersey. [2]

See also

â— Pierre Teilhard (tombstone)
â— Goethe timeline (Goethe coffin)

References

1. (a) Nernst tombstone (image)
(b) Maxwell tombstone (image)
(c) Planck tombstone (image)
2. Albert Einstein – FindAGrave.com

θΔics

In science toys, **thermodynamic toys** are those that employ, utilize, or demonstrate noted principles or laws of thermodynamics. Several of these noted historical-based experimental toys are available at Xump.com, as pictured below.

Galileo thermometer

In 1592, Italian scientist Galileo Galilei invented what most consider the first true thermometer. [1] It was described, according to a retrospect description by Galileo's friend Benedetto Castelli, many years later, as such: [2]

> "Galileo took a glass about the size of a small hen's egg, fitted to a tube the width of a straw, and about two spans long: he heated the glass bulb in his hands and turned the glass upside down so that the tube dipped in water held in another vessel; as soon as the ball cooled down, the water rose in the tube. This instrument he used to investigate degrees of heat and cold."

An overview of the thermodynamic hand boiler, a type of **thermodynamic toy**, from Xumpscience.

This device seems to have come to have been referred to as a 'thermoscope' (a thermometer without a scale), in modern discussion. Galileo's instrument was said to depend on the observation that air expands when it is hot and contracts when it is cool. The water, differed in respect to mercury in a modern thermometer, serving merely to indicate the expansion or contraction of the air in the bulb. The preliminary heating was a trick to bring the water to a level where it could be seen. [2]

Left: this **Galileo thermometer** is 12" tall and contains five 4 degree graduation spheres. Spheres have a small brass plate with a temperature graduation engraved on it. The floating spheres move up and down inside the liquid-filled cylinder depending on the surrounding temperature. The lowest floating sphere in the upper part of the cylinder tells the correct temperature. Right: the **ball and ring experimental device** explains the principle that molecules and atoms vibrate at higher temperatures and begin to push apart from each other. This phenomenon is known as thermal expansion. Simply heat the brass ball for two minutes. This will cause the ball to expand; hence it will not fit through the ring. When the ball cools down, it will once again fit smoothly through the ring. Great for the classroom or the home laboratory!

In the 1613 words of his student Francesco Sagredo, who used Galileo's device for measuring the difference in temperature between air, snow, and ice, what Galileo had invented was an "an instrument for measuring heat", which can be said to be the first recorded definition of a thermometer. [3] Sagredo used the device to compare the temperature of lakes of different sizes as they cooled in the winter, finding that smaller ones cooled faster than larger ones. He recorded his readings as "degrees of heat". [4]

Ball and ring

The ball and ring toy (pictured) was originally invented by Dutch physicist Willem Gravesande at Leiden University and demonstrated in his

famous circa 1730s ball and ring experiment, which was one of the first experimental measurements or quantifications of the phenomenon volume expansion by heat, which at the time of demonstration was by no means a simply phenomenon to understand nor explain, by virtue of the historical precedence of the various heat element theories (heat element (classical), terra pinguis, phlogiston, and later caloric).

Drinking bird

The drinking bird was invented in the 1940s by American chemist Miles Sullivan, patented by him in 1945, after watching bubbles go up a colored tube on a jukebox machine, and thinking about how much energy was lost by that process

The famous thermodynamic toy the "drinking bird" is an amusing toy, the thermodynamical operation of which was said to have notoriously baffled German-born American physicist Albert Einstein in 1946.

The dipping bird is a loose example of "thermodynamic art", being a sort of atmospheric heat engine, which will run for days operating on the principle of heat loss via evaporation conjoined with the conversion of heat into work in the working body (liquid-vapor mixture of methylene chloride CH_2Cl_2) of the engine via the mechanical equivalent of heat. This is similar, in a way, to Greek inventor Hero of Alexandria's first century AD rotating toy steam engine the "aeolipile", a heat-driven spinning steam ball.

Left: the **drinking bird**: When the head of the bird is moistened with water it will repeatedly tip over and appear to be drinking from a cup placed in front of it. The dunking is due to the evaporating water, which cools the head reducing the pressure of the gas inside. The liquid inside the bird rises up from his tail towards his head, causing the bird to tip and appear to be drinking. As the bird dunks, the liquid returns to its tail, and the process begins again. In essence this is a small, cleverly designed thermodynamic engine which only needs water to run!Right: the **thermodynamic hand boiler**: This is a cool, old-fashioned thermodynamic hand boiler toy that is made of hand-blown glass. The liquid inside these beautiful boilers shoots up the tubes and appears to boil when you hold it in your hand. It makes an excellent stocking stuffer for the holidays, or a great classic desk toy for the office setting.

Hand boiler

The thermodynamic hand boiler seems to be a variant of the dipping bird, possibly using liquid-vapor mixture of methylene chloride (CH_2Cl_2) as the working body (colored liquid). The inventor of this toy needs to be tracked down.

References

1. (a) Bolton, Henry C. (1900). *Evolution of the Thermometer, 1592-1743* (ch. 1: The Open Air-thermometer of Galileo, pgs. 5-24; Ferdinand, pg. 33). Chemical Publishing Co.
(b) Galileo thermometer – Wikipedia.
2. Bailin, David and Love, Alexander. (2004). *Cosmology in Gauge Field Theory and String Theory* (pg. 21). CRC Press.
3. Muller, Ingo. (2007). *A History of Thermodynamics - the Doctrine of Energy and Entropy* (ch. 1: Temperature, pgs. 1-7). New York: Springer.
4. McGee, Thomas D. (1988). *Principles and Methods of Temperature Measurement* (Philo, pg. 3; Fludd, pg. 3-4). Wiley-IEEE.

External links

- Thermodynamic hand boiler – Xump.com.
- Thermodynamic drinking bird – Xump.com.

- Galileo thermometer – Xump.com.
- Ball and ring (thermal expansion) – Xump.com.

θΔics

In science, a **thermodynamicist** is a person who studies systems and processes from a thermodynamic point of view. The universe, for the thermodynamicist, defined as that which is accessible to experiment, is made up of the "system" examined and its "surroundings" able to act on its evolution. [1] To a good approximation, French engineer Sadi Carnot was the world's first thermodynamicist; followed by Emile Clapeyron, Hermann Helmholtz, William Thomson, Peter Tait, William Rankine, and Rudolf Clausius.

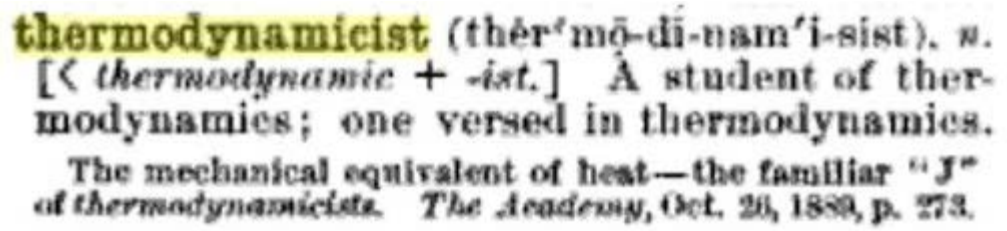
thermodynamicist (thêr'mō-dī-nam'i-sist). *n.* [< *thermodynamic* + *-ist.*] A student of thermodynamics; one versed in thermodynamics.

The mechanical equivalent of heat—the familiar "J" of thermodynamicists. *The Academy*, Oct. 26, 1889, p. 273.

An 1897 encyclopedia definition of **thermodynamicist**, defined as a student of or one versed in thermodynamics. [7] In 1891, William Magie was described as a "thermodynamicist trained by Helmholtz". (O)

Energeticist

A closely related term to thermodynamicist, generally a post 1940s term, was "energeticist", a term of the late 19th century. American Willard Gibbs, for instance, was often referred to as an energeticist; whereas, in modern terms, he is considered a *chemical thermodynamicist* or more specifically the "founder of chemical thermodynamics". [2] In the 1890s, by comparison, German energeticist Wilhelm Ostwald, often considered as the founder of the "school of energetics", who had recently translated Gibbs' *On the Equilibrium of Heterogeneous Substances* into French, styled Gibbs as the "founder of chemical energetics". [3]

Quotes

The following is a noted quote, that seems to have originated in originated with Percy Bridgman (1941), regarding how there is a different version of the first law and or second law for ever thermodynamicist: [4]

> "There's as many formulations of the second law as there have been discussions of it."

This was rephrased by Clifford Truesdell (aware or not of the Bridgman-version) in 1969 as follows: [5]

> "I hesitate to use the terms 'first law' and 'second law', because there are almost as many 'first laws' as there are **thermodynamicists**, and I have been told by these people for so many years that I disobey their laws that now I prefer to exult in my criminal status and non-condemning names to the concrete mathematical axioms I wish to use in my outlaw studies of heat and temperature. The term 'entropy' seems superfluous, also, since it suggest nothing to ordinary persons and only intense headaches to those who have studied thermodynamics but have not given in and joined the professionals."

This has since come to be known as:

> "There's as many version of the second law as there are thermodynamicists."

This last version, supposedly, began to be used in the 1950s. [6]

See also

- Human thermodynamicist
- Thermodynamicist (other)
- Thermodynamics founders

● Human thermodynamics pioneers

References

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2. Nemilov, Sergei V. (1995). *Thermodynamic and Kinetic Aspects of the Vitreous State* (pg. 5). CRC Press.
3. Willard Gibbs - Encyclopedia Britannica article (1910).
4. Bridgman, Peter W. (1941). *The Nature of Thermodynamics* (pg. 116). New York: Harper Torchbooks.
5. (a) Truesdell, Clifford A. (1969). *Rational Thermodynamics: A Course of Lectures on Selected Topics* (pg. 11). Springer-Verlag.
(b) Gal-Or, Benjamin. (1974). *Modern Developments in Thermodynamics: an Interdisciplinary Collective Treatise* (§: Thought-Provoking and Thought-Depressing Quotations" (43 quotes selected by B. Gal-Or), pgs. 435-42). Wiley.
6. 110+ versions of the second law (note 1) – HumanThermodynamics.com.
7. Whitney, William D. and Smith, Benjamin E. (1897). *The Century Dictionary and Cyclopedia: a work of universal reference in all departments of knowledge, with a new atlas of the world, Volume 8* (pg. 6282). Century.

Further reading

● Fleeter, Rick. (2007). *Travels of a Thermodynamicist*. Outskirts Press.

External links

● Category: Thermodynamicists – Wikipedia.

θΔics

In science, **thermodynamicists (generations)** refers to the grouping, ranking or categorization of thermodynamicists by their respective generational distance from French physicist Sadi Carnot (first generation) to Willard Gibbs (third generation), to modern times (ninth generation), according to the 1991 generation scheme enunciated by American science historian William Cropper, as outlined below—those with dates bolded being human thermodynamics connected theorists:

Thermodynamicist Generation Groupings

Pre-generational thermodynamicists
1. Herman Boerhaave (1620) 2. Joseph Black (1761) 3. Antoine Lavoisier (1787) 4. Benjamin Thompson (1798) 5. Humphry Davy (1799) 6. Johann Goethe **(1809)** 7. Joseph Fourier (1811) 8. Gustave Coriolis (1829)

First generation thermodynamicists	Second generation thermodynamicists	Third generation thermodynamicists
1. **Sadi Carnot** (1824) 2. Emile Clapeyron (1834)	1. Germain Hess (1840) 2. Robert Mayer (1841) 3. James Joule (1843) 4. Hermann Helmholtz (1847-1882) 5. William Thomson (1849-1854) 6. William Rankine (1850-1859) 7. **Rudolf Clausius** (1850-1865) 8. Gustave Hirn **(1856)** 9. James Maxwell (1857-	1. August Horstmann (1868-1873) 2. Ludwig Boltzmann (1872-1895) 3. **Willard Gibbs** (1873-1901) 4. Jacobus van' Hoff (1884) 5. Wilhelm Ostwald

1871)
10. Peter Tait (1868)
11. (add)
12. etc.

(1885-1920)
6. (add)
7. etc.

Fourth generation thermodynamicists	Fifth generation thermodynamicists	Sixth generation thermodynamicists
1. Leon Winiarski **(1890-1894)** 2. Walther Nernst (1893-1906) 3. Max Planck (1897-1900) 4. Fritz Haber (1905) 5. Albert Einstein (1902-1907) 6. Otto Sackur (1908-1912) 7. (add) 8. etc.	1. Percy Bridgman **(1914-1941)** 2. Ralph Fowler (1922-1939) 3. C.G. Darwin **(1922-1952)** 4. James Partington (1913-1924) 5. Theophile De Donder (1922) 6. **Gilbert Lewis (1923)** 7. Merle Randall (1912-1942) 8. John Butler (1928-1935) 9. Edward Guggenheim (1933-1949) 11. Mehdi Bazargan **(1935-1979)** 10. Paul Epstein (1937) 11. (add) 12. etc.	1. Fritz Lipmann (1941) 2. Joseph Keenan (1941-1952) 3. Mark Zemansky (1943) 4. Erwin Schrodinger (1944-1946) 5. Samuel Glasstone (1947) 6. Ilya Prigogine **(1947-1998)** 7. Edward Obert (1948) 8. **Frederick Rossini (1950-1971)** 9. etc

Seventh generation thermodynamicists	Eighth generation thermodynamicists	Ninth generation thermodynamicists
1. Hendrick van Ness (1959-2005) 2. Herbert Callen (1960-1985) 3. Raymond Kern (1964) 4. Alain Weisbrod (1964) 5. George Hatsopoulos (1965) 6. Laszlo Tisza (1966)	1. Donald Haynie (1993-2008+) 2. Gregor Anderson (1996)	

7. Joseph Kestin (1966)
8. Stephen Hawking (1970)
9. Jacob Bekenstein (1972)
10. **Stanley Sandler** (1977)
11. Georgi Gladyshev **(1977)**
12. (add)
13. etc.

3. Enrico di Cera (1995-2000)
4. Libb Thims **(1995)**
5. (add)
6. etc.

(2013 +/- 11 years)?
1. (add)
2. etc.

Maxwell | Generation scheme

In 1878, Irish physicist James Maxwell summarized the learning of the definition of entropy as follows:

> "By the introduction of the expression, "without compensation" (verses "of itself"), combined with a full interpretation of this phrase, the statement of the second principle ("that heat cannot *without compensation* pass from a colder to a warmer body") becomes complete and exact; but in order to understand it we must have a previous knowledge of the theory of transformation-equivalents, or in other words entropy, and it is to be feared that we shall have to be taught thermodynamics for **several generations** before we can expect beginners to receive as axiomatic the theory of entropy."

Cropper | Generation scheme

This ranking logic comes from American physics historian and chemist William Cropper, who defines Gibbs as the "principle third generation thermodynamicist", and eludes to the idea that Clausius and Thomson were the principle second generation thermodynamicists, with Carnot being first generation or initiator of the "Carnot legacy". This gives 22 years per thermodynamic generation, based on the average distance between Carnot (b.1796), Clausius (b.1822), and Gibbs (b.1839). This scheme is discussed in the following quote: [7]

> "Thomson touched on every one of the major problems of thermodynamics. But except for his temperature scale and interpretation of the energy concept, his work is not found in today's textbook version of thermodynamics. Although he ranks with Clausius and Gibbs among thermodynamicists, his legacy is more limited than theirs. The comparison with Clausius is striking. These two, of about the same age, and both in possession of the Carnot legacy, had the same thermodynamic concerns. Yet it was the Clausius thermodynamic scheme, based on the two concepts of energy and entropy and their laws, that impressed Gibbs, the principle **third generation thermodynamicist**. Clausius cold also be obscure, but he left no doubt about the conceptual foundations of his theories, and he gave Gibbs the requisite clues to put together the scheme we see today in thermodynamics texts."

On this Carnot-Clausius-Gibbs three-generation logic, which seems cogent, the following "generational table of principle thermodynamicists" is ordered by date of publication of works, showing the "principle" thermodynamicist of each generation (neglecting gas law pioneers, affinity chemist pioneers, heat engine developers, mathematics pioneers, etc). In this grouping scheme, we note, based on the same generation occurrence of C.G. Darwin's statistical "human thermodynamics" and Mehdi Bazargan's "thermodynamics of man", that human thermodynamics can be considered a fifth generation branch of thermodynamics

Notes

The 22-year per generation figure agrees calculated via the average distance between the birth of Carnot and the birth of Gibbs agrees with the 22-years per generation found when the table was first built intuitively, based on groupings as to who built on who's work, later finding a twenty-two year gaping between the eight generations.

Quotes

The following are related quotes:

> "**Rossini** was one of the preeminent thermodynamicists of the twentieth century."
>
> — Ernest Eliel (1999), *Biographical Memoirs*, National Academies of Press [2]

References

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(b) Ernest L. Eliel – Wikipedia.

θΔics

The **thermodynamicists (other)** page is a file tree header for the listings of noted thermodynamicists, such as Irving Koltz, Laszlo Tisza, Leo Szilard, etc., not generally considered "founders of thermodynamics", per se, or "human thermodynamics pioneers", i.e. human thermodynamicists, but nevertheless connected in some way to the subjects of modern thermodynamics, e.g. quantum thermodynamics, or human thermodynamics. These individuals are listed in the adjacent site pages box.

θΔics

See adjacent drop menu.

See adjacent drop menu.

See adjacent drop menu.

In science, **thermodynamics** is the study of the conversion of heat into work through the intermediate cyclical actions of a system. [1] To the thermodynamicist, thermodynamics is the "science of everything", being that it is studies the behavior of "any body" in the universe, whatsoever. [11] The generality and universal applicability of thermodynamics was laid out by subject initiator French physicist Sadi Carnot who in 1824 presented the following definition:

"The energy of the universe is constant."

$$dQ = dU + dW$$

(first main principle)

"The entropy of the universe tends to a maximum."

$$\int \frac{dQ}{T} \geq 0$$

(second main principle)

> "**Thermodynamics** is the study of the principles and laws behind the phenomenon of the production of motion by heat, considered from a sufficiently general point of view, applicable to not only steam engines, but to all imaginable heat engines, whatever the working substance and whatever the method by which it is operated."

This subject definition, to note, is modified in the sense that Carnot did not use the term 'thermodynamics', nor did he specifically assign a name for the subject he invented, but rather gave the above definition in reference to an 'unnamed subject' that was in need of formulation; the concise name of this subject would be assigned by Irish physicist William Thomson, who introduced the shorthand terms: "thermo-dynamic" (1849) and "thermo-dynamics" (1854) or in its German variant "Mechanische Wärmetheorie" (Mechanical Theory of Heat) (1850) by German physicist Rudolf Clausius. [9] The key phrase in Carnot's definition being 'whatever the working substance', which takes it cues from Boerhaave's law (1720) on the expansion and contractions of bodies due to heat, which refers to any physical body in the universe.

Thermodynamics, in more detail, studies the process relationship between heat and other forms of energy, such as work, electricity (electrical work), light (radiation), and generalized forces (e.g. elongation work), etc., as can be quantified by measurements, e.g. pressure, volume, and temperature. [2] The cornerstones of thermodynamics are the four laws of thermodynamics, which define the rules of temperature equivalence (zeroth law), energy conservation (first law), entropy tendencies (second law), and conditions for an absence of temperature (third law). [3]

Nutshell history

See main: History of thermodynamics

In a nutshell, thermodynamics is the science, developed largely between 1823 and 1882, that united affinity-chemistry (1718), thermo-chemistry (1870s), thermo-electricity (1822), overthrew the caloric theory, vitalism, perpetual motion theory (replacing them with the kinetic theory, mechanical equivalent of heat, and the conservation of energy respectively), and later functioning to seed the quantum revolution (1900).

A 1931 meeting of the minds "**thermodynamics**" dinner party photo showing, from left to right, thermodynamics founders: Walther Nernst, Albert Einstein, and Max Planck, following by Robert Millikan, grinning, noted for his famous 1909 electron charge determining oil drop experiment, at the house of host Max von Laue, noted relativistic thermodynamics pioneer; in the photo collage can be seen: Ludwig Boltzmann and Rudolf Clausius among others.

The foundations of thermodynamics, according to American mathematical physicist Willard Gibbs, began to be laid in 1850. Specifically, according to Gibbs, the first memoir on thermodynamics published in 1850 by German physicist Rudolf Clausius, entitled "On the Motive Power of Heat, and on the Laws which can be Deduced from it for the Theory of Heat", "marks an epoch in history of physics". Moreover, according to the 1889 words of Gibbs: [4]

> "If we say, in the words of Maxwell some years ago (1878), that ***thermodynamics*** is 'a science with secure foundations, clear definitions, and distinct boundaries,' and ask when those foundations were laid, those definitions fixed, and those boundaries traced, there can be but one answer. Certainly not before the publication of that memoir (Clausius, 1850)."

In 1865, Clausius assembled his nine total memoirs on thermodynamics into the book *The Mechanical Theory of Heat*; and with the December 1875 publication of the second edition, in his own words, "re-model[ed] the papers that they might form a connected whole, and enable the work to become a text-book of the science", after which time it can be said that thermodynamics had solidified into a new branch of science.

Historical | Timeline

See main: Timeline of thermodynamics

Visit the moving (sideways scrolling) twenty-foot long pictorial timeline of thermodynamics, a portion of which is shown below, for a quick visual history of thermodynamics:

Parmenides' void denial (485BC)

In the circa 485 BC treatise "On Nature", Greek physicist-philosopher Parmenides argued that a void or rather a vacuum, in nature, could not exist. This launched the two-millennium long "nature abhors a vacuum" debate.

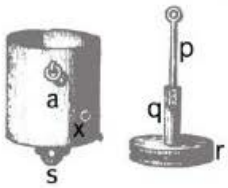

Piston and cylinder (1647)

In circa 1647, German engineer Otto Guericke built a piston and cylinder.

Guericke vacuum pump (1650)

In 1650, Guericke built a vacuum pump, in the operation of which, when the handle is cranked, each downward stroke works to draw air out of the bulb (vacuum bulb) at the top, which can then be sealed, removed, and employed elsewhere; he used the device to disprove Parmenide's vacuums-are-impossible theory.

Guericke piston experiment (1652)

In circa 1652, Guericke used his vacuumed-out bulb attached to the piston and cylinder to show that with the twist of the stopper opening to vacuum bulb, the "power of the vacuum" could do the work of twenty plus men.

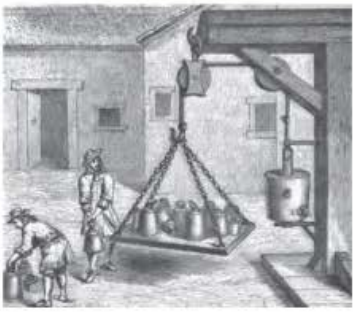

Guericke lifting experiment (1654)

In a third demonstration of 1654, Guericke arranged the piston at the top of the cylinder, having a scale loaded with 2,686 lbs attached to it, shown above right. In this configuration, a little boy, by means of a small syringe applied at the stopper x to pump out the air, was able to bring down the piston and raise the weight.

Definitions

See main: Definitions of thermodynamics

The following is partial chronological listing of definitions of thermodynamics:

Date	Definition	Person[s]
1859	"It is a matter of ordinary observation, that heat, by expanding bodies, is a source of mechanical energy; and conversely, that mechanical energy, being expended either in compressing bodies, or in friction, is a source of heat. The reduction of the laws according to which such phenomena take place, to a physical theory, or connected system of principles, constitutes what is called the science of **thermodynamics**."	William Rankine [6]
1880	"**Thermodynamics**, or the mechanical theory of heat, is that science which treats of the mechanical effects of heat, and of those mechanical processes by which heat is generated."	Robert Rontgen and Augustus du Bois [5]
1998	"**Thermodynamics** now designates the science of all transformations of matter and energy."	Pierre Perrot [7]

General branches of

See main: Branches of thermodynamics

Thermodynamics has it roots in affinity chemistry (1718), thermo-chemistry (1770s), thermo-electricity (1822), thus becoming a tree with foundations in the works of Sadi Carnot, William Thomson, Rudolf Clausius (trunk), and William Rankine, soon thereafter sprouting many branches of thermodynamics, e.g. biological thermodynamics (1926), each with many sub-branches, e.g. protein thermodynamics (1960s).

Human thermodynamics

The subject of the application of thermodynamics to explain human existence has deep roots, beginning with the 1809 human reaction affinity (free energy) theories of Johann Goethe. The term "human thermodynamics", as a the thermodynamic study of systems of human molecules was coined in 1952 by English physicist Charles Galton Darwin, which generally can be considered as the initiation point of this branch of science.

See also

â— Founders of thermodynamics
â— Thermo-dynamics
â— Thermodynamicists (generations)

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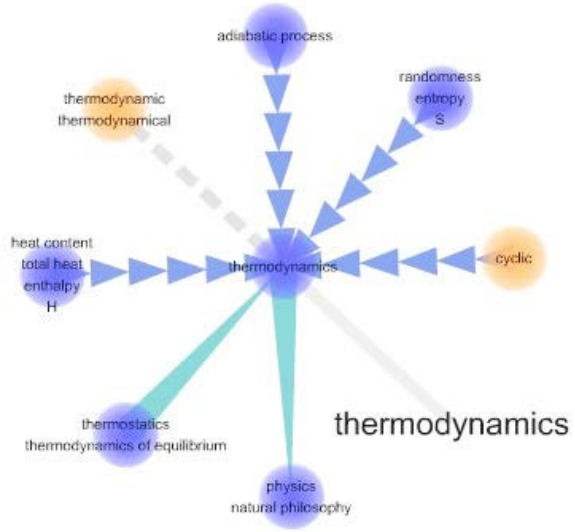

Visuwords word-association definition of **thermodynamics**, showing key terms: adiabatic, process, cycle, heat, enthalpy, thermostatics, equilibrium, entropy, and physics. [8]

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6. Rankine, William. (1859). *A Manual of the Steam Engine and Other Prime Movers* (chapter III: "Principles of Thermodynamics", pgs. 299-478). London: Charles Griffin and Co.
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10. (a) Note: the inequality of the 1862 version of the second main principle is reversed as compared to the 1875 version; a further reading of the the first and second edition of *The Mechanical Theory of Heat*, with focus on the function N, is required to understand this switch.
(b) Clausius, Rudolf. (1962). "Sixth Memoir: On the Application of the Theorem of the Equivalence of Transformations to Interior Work", Communicated to the *Naturforschende Gesellschaft of Zurich*, Jan. 27th, 1862; published in the *Viertaljahrschrift of this Society, vol. vii. P.* 48; in Poggendorff's Annalen, May 1862, vol. cxvi. p. 73; in the Philosophical Magazine, S. 4. vol. xxiv. pp. 81, 201; and in the *Journal des Mathematiques of Paris*, S. 2. vol. vii. P. 209.
11. Maugin, Gerard A. (1999). *The Thermomechanics of Nonlinear Irreversible Behaviors* ("science of everything", pg. 2). World Scientific.

Further reading

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â— Wallace, Duane C. (1972). *Thermodynamics of Crystals*. Dover.

External links

â— Thermodynamics – Wikipedia.
â— Defining thermodynamics (4 articles) – Helium.com.
â— Thermodynamics - Zimbio.

θΔics

In science, **thermodynamics (definitions)** are sentence descriptions that explain the subject of thermodynamics. The first definition was stated in 1854 by Irish physicist William Thomson. Other definitions soon followed, at about a yearly rate, soon thereafter; each defined in near synonymous, but subtly different and unique ways; each of which, offering insight into the difficult and complex subject. A chronological table of thermodynamics definitions, stated by various authors, is shown below.

Proto-definitions

See also: Thermo-dynamics (etymology)

It could be argued that early-definitions of thermodynamics, as the science of the relation between heat and work, can be found in the works of those as Sadi Carnot (1824) and Emile Clapeyron (1834). In particular, from the opening page of Carnot's *Reflections*, which started the science of thermodynamics, the following definition can be discerned:

> "The study of heat-engines [by which] combustibles produce heat and the impelling power which is the result of it."

In 1845, a twenty-one year old William Thomson went on a search in bookstores throughout Paris looking for a copy of Carnot's *Reflections* (see: Thomson's search for Carnot's Reflections) to no avail; eventually, however, obtaining one a few months later from his professor Lewis Gordon. The influence of Carnot, through Thomson, later functioned to bring the subject and definition into European scientific circles, particularly in Ireland (William Rankine), England (James Maxwell), and Germany (Rudolf Clausius and Hermann Helmholtz).

Thermodynamics definitions table

The following is a definitions chronology table of thermodynamics:

Date	Definitions of thermodynamics	Person
1824	The study of the principles and laws of the production of motion by heat, considered independent of any mechanism or any particular agency, applicable to not only to steam-engines but to all imaginable heat-engines, whatever the working substance and whatever the method by which it is operated.	Sadi Carnot
1854	**Thermo-dynamics** [has] two divisions, of which the subjects are respectively, the relation of heat to forces acting between contiguous parts of bodies, and the relation of heat to electrical agency.	William Thomson
1859	It is a matter of ordinary observation, that heat, by expanding bodies, is a source of mechanical energy; and conversely, that mechanical energy, being expended either in compressing bodies, or in friction, is a source of heat. The reduction of the laws according to which such phenomena take place, to a physical theory, or connected system of principles, , constitutes what is called the science of **thermodynamics**."	William Rankine
1860	The reduction of the laws according to which the phenomena by which heat, by expanding bodies, is a source of motive power and, conversely, that motive power, being expended either in compressing bodies or in producing friction, is a source of heat, take place, to a physical theory or connected system of principles.	John Nichol
1871	The investigation of those relations [thermometry and calorimetry] between the thermal and the mechanical properties of substances.	James Maxwell
1880	**Thermodynamics**, or the mechanical theory of heat, is that science which treats of the mechanical effects of heat, and of those mechanical processes by which heat is generated.	Robert Rontgen Augustus du Bois

1912	Calculations about heat as a form of energy, and about work, another related form, both of them in connection with changes in the condition of all sorts of substances that may give or take heat, and perform or receive work while changing condition.	Charles Lucke
1936	[The subject] mainly concerned with the transformations of heat into mechanical work and the opposite transformations of mechanical work into heat.	Enrico Fermi
1941	The science of the relationship between heat, work, and the properties of systems.	Joseph Keenan
1969	The study of energy and its transformations.	Hendrick Van Ness
1998	The science of all transformations of matter and energy.	Pierre Perrot
2001	The study of energy transformations.	Donald Haynie
2006	The study of the changes in the state or condition of a substance when changes in its temperature, state of aggregation, or internal energy are important.	Stanley Sandler

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θΔics

In etymologies, **thermodynamics (etymology)** has an intricate history, spanning over forty-years (1824-1868) of naming subtleties, starting with French physicist Sadi Carnot's mention that a mechanical theory based type of heat engine theory was needed (1824), followed by about twenty-five years of discussion of variants on the term "Carnot's theory", to Scottish physicist William Thomson's adding together of the terms "thermo-dynamic" (1849) + "dynamical theory of heat" (1851) to mean "thermo-dynamics" (1854), variations on the German name of the subject, introduced by Rudolf Clausius, of "mechanischen wärmetheorie", translated into English, during the years of circa 1850 to 1878, as "mechanical theory of heat", to the removal of the conjunction bracket, meaning that the subject had essentially solidified into a commonly accepted term, "thermodynamics" in 1868, by various authors, such as Gustave Hirn and Peter Tait. The year in which representatives of the German school of thermodynamics, such as, e.g., Herman Helmholtz in 1882, began to adopt the English variant (thermodynamics) over the German variant (mechanischen wärmetheorie), can loosely be said to have been the final chapter in the history of the etymology of the term thermodynamics. The following table gives a chronological overview of the basic etymology:

Precursor Terms	School	Author	Year
En-ergon (energon)		Heraclitus	570BC
Dynamis + energia		Aristotle	350BC
Dynamics		Gottfried Leibniz	1689
A theory of the operation of generalized heat engines, similar to the mechanical theory, is needed	Ecole Polytechnique	Sadi Carnot	1824
Was using the term "dynamode" for a 1,000kg lifted one meter as a unit of what we now call "work".	École Polytechnique	Gustave Coriolis	1829
Carnot's theory of heat	Ecole Polytechnique	Emile Clapeyron	1834
Carnot's theory of the motive power of heat	Glasgow school	William Thomson	1848
Thermo-dynamic / theory of the motive power of heat	Glasgow school	William Thomson	1849
Carnot's theory of heat (*modified* to corroborate with Joule + Holtzmann + Mayer + Thomson + Regnault)	Berlin school	Rudolf Clausius	1850
Dynamical theory of heat	Glasgow school	William Thomson	1851
Thermo-dynamics	Glasgow school	William Thomson	1854
Energetics	Glasgow school	William Rankine	1855
Thermo-dynamics	Glasgow school	William Rankine	1855
Théorie mécanique de la chaleur (mechanical theory of heat)		Gustave Hirn	1862
Mechanischen wärmetheorie (**mechanical heat theory**)	Berlin school	Rudolf Clausius	1865
Thermo-dynamics	Glasgow school	John Nichol	1860
Thermodynamique *(thermodynamics)*		Gustave Hirn	1868
	Edinburgh		

Thermodynamics	school	Peter Tait	1868
Thermodynamics	Edinburgh school	James Maxwell	1871
Thermodynamics	Yale school	Willard Gibbs	1873
"ΘΔ"		James Maxwell	1876
Mechanical theory of heat (sometimes called thermodynamics)		Richard McCulloch	1876
Energetics and thermo-dynamics		Robert Thurston	1878
Thermodynamics		Henry Eddy	1879
Thermodynamik (thermodynamics)	Berlin school	Herman Helmholtz	1882
Thermo-dynamics		Bryan Donkin	1893
Thermodynamics	Berlin school	Max Planck	1897

In short, over the course of nearly a decade, William Thomson (in coordination with William Rankine and Rudolf Clausius) synthesized the subjects of Carnot's *motive power of heat* (1824), Joule's *mechanical equivalent of heat* (1842), and Clausius' *mechanical theory of heat* (1850), among others, into the subject known known as thermodynamics. A near-synonymous term used is "energetics", used early on by used by Scottish physicist William Rankine, and in later years by the energetics school. The joint term 'thermodynamics', as a solidified subject, began to be used as early as 1868, such as found in the works of those as Gustave Hirn and Peter Tait.

Thomson | 1849

The term *thermo-dynamic* was first used in 1849 by Irish physicist William Thomson (Lord Kelvin), in a paper titled paper *An Account of Carnot's Theory of the Motive Power of Heat*, where he states: [2]

> "A perfect **thermo-dynamic** engine of any kind, is a machine by means of which the greatest possible amount of mechanical effect can be obtained from a given thermal agency; and, therefore, if in any manner we can construct or imagine a perfect engine which may be applied for the transference of a given quantity of heat from a body at any given temperature, to another body, at a lower given temperature, and if we can evaluate the mechanical effect thus obtained, we shall be able to answer the question at present under consideration, and so to complete the **theory of the motive power of heat**."
>
> — William Thomson (1849), "An Account of Carnot's Theory of the Motive Power of Heat", Jan 2; in: *Mathematical and Physical Papers, Volume One* (pg. 118)

(add)

Thomson | 1854

In 1854, coined the term 'thermo-dynamics' as a specific subject or branch of science. Specifically, influenced to an extent by the 1837 book *Theory of Heat* by English mathematician Philip Kelland, which used phrases such as a needed "theory of heat" in relation to "forces", and terms, such as the "dynamical hypothesis" of heat, etc., Thomson presented the following definition: [1]

> "**Thermo-dynamics:** the subjects [of] the relation of heat to forces acting between contiguous parts of

> bodies, and the relation of heat to electrical agency."

The majority of references cite this year (1854) as being the first time the word thermodynamics was used. A few other sources cite that Thomson used the term thermo-dynamics in 1850 or 1852, but there does not seem to exist an actual reference to corroborate these various 1850-1853 claims. [11]

Rankine | 1855

In 1855, Scottish mathematical physicist William Rankine, an associate of Thomson, in a paper titled "Outlines of the Science of Energetics", had begun to differentiate between a "science of energetics", loosely defined by his hypothesis of molecular vortices, a general law of transformation between actual energy and potential energy, and parts of Thomson's theory of thermo-electricity, among other principles, and a "science of thermo-dynamics", having to do with equilibrium of energies between bodies, absolute temperature, and Carnot's function, among discussions. [12]

Rankine | 1859

In 1859, Rankine, according to the retrospect views of Scottish physicist James Maxwell, wrote the world's first chapter on thermodynamics titled "Principles of Thermodynamics", in his 1859 book *A Manual of the Steam Engine and Other Prime Movers.* [9] In the opening section of this chapter, in reference to the results of the mechanical equivalent of heat, Rankine defines thermodynamics as such:

> "It is a matter of ordinary observation, that heat, by expanding bodies, is a source of mechanical energy; and conversely, that mechanical energy, being expended either in compressing bodies, or in friction, is a source of heat. The reduction of the laws according to which such phenomena take place, to a physical theory, or connected system of principles, constitutes what is called the science of **thermodynamics**."

(add)

Nichol | 1860

The first encyclopedia definition of 'thermo-dynamics' is give by Scottish astronomer John Nichol in his 1860 *Cyclopedia of the Physical Sciences*, wherein thermo-dynamics was defined, in short, as "heat or the theory of the mechanical action of heat". More definitively, Nichol's defined thermo-dynamics as science "still in progress" and gave the following definition: [4]

> "**Thermo-dynamics:** the reduction of the laws according to which the phenomena by which heat, by expanding bodies, is a source of motive power and, conversely, that motive power, being expended either in compressing bodies or in producing friction, is a source of heat, take place, to a physical theory or connected system of principles."

(add)

Clausius | 1865

In 1865, German physicist Rudolf Clausius published his collected nine memoirs (1850-1865) on the subject of what he called "mechanischen wärmetheorie", which translates as either "mechanical heat theory" or "mechanical theory of heat" into the form of a textbook on the subject of thermodynamics, as it is definitively know today. Subsequently, the term 'mechanischen wärmetheorie' is that which Clausius preferred as the name of the subject he largely created. In other instances, to note, he also seems to have used the term "mechanischen theorie der wärme"; possibly this was an earlier pre-truncation version of the latter.

Clausius, to clarify, never used the word thermo-dynamics either editions (1865 and 1875) of his textbook *Mechanical Theory of Heat*. Clausius did, however, use the term "thermo-dynamic engine" (three times) as well as "thermo-dynamic

machines" (once), in his fifth memoir (1856), as in reference any type of heat engine that works in a cycle, in what seems to be modeled on the earlier Thomson phrasing.

Thermodynamics

A specific source needs to be tracked down to determine in what specific year the conjugational dash was first removed in going from 'thermo-dynamics' (a new term) to 'thermodynamics' (an established term). As a starting point, we note that Scottish physicist Peter Tait used the term thermodynamics in the title of his 1868 historical overview book *Sketch of Thermodynamics*. [14]

Other definitions

See main: Thermodynamics (definitions)

In the 1892 *Lockwood's Dictionary of Terms used in the Practice of Mechanical Engineering*, the newly evolving term was defined as: "*thermo-dynamics*: the study which treats of heat as a form of energy or mode of work." [5] The term "thermo-dynamics" (with the conjunction) was used well into the 1920s, before it became commonly known as one word. It is likely that the 1923 textbook *Thermodynamics*, by Americans Gilbert Lewis and Merle Randall, being the most cited thermodynamics book of all time, led to this common name usage.

Other non-sensical etymologies

Somewhat paradoxically, French thermodynamicist Pierre Perrot, author of the excellent 1998 dictionary the *A to Z of Thermodynamics*, maintains that the term "thermodynamics" was coined by English physicist James Joule in 1858 to designate the science of relations between heat and power. [3] This supposition, however, seems dubious. In the collection of scientific papers, Joule never uses the phrase "thermodynamics", but does use the term "perfect thermo-dynamic engine" in reference to Thomson's 1849 phraseology. [10]

American biophysicist Donald Haynie claims that the word thermodynamics was coined in 1840, from the Greek roots *therme*, heat, *and dynamis*, power. [6] This, however, seems doubtful. A third illogical source claims that French mathematical physicist Henri Poincaré, who was born in 1854, and later published the 1892 French book *Thermodynamique*, coined the term *thermodynamiques* to refer to the new insights that developed from the first and second law. [7]

In tribute to poor science, Ukraine physical chemist Vitaly Prisyazhniuk, in his 2007 *Encyclopedia of Earth* article "History of thermodynamics" (an article reviewed by American mechanical engineer and thermodynamics professor Tom Lawrence), states "it was G. Black (1770) who was the first to use the term 'thermodynamics'". [13] Here, Prisyazhniuk not only typos G. Black for Joseph Black, but also seems to be un-aware that Black was a calorist, i.e. a proponent of the caloric theory and promoter of Antoine Lavoiser's caloric theory of heat, and thus at odds with Clausius' mechanical theory of heat.

Mechanische Wärmetheorie

The central founder of the entire subject, German physicist Rudolf Clausius, curiously, never seems to have used the term "thermodynamics" to designate the subject he created more to perfection than any other, but seemed to prefer the German phrase: "mechanische Theorie der Wärme" (mechanical theory of heat) or "mechanische Wärmetheorie" (mechanical heat theory) over the German "Thermodynamik". He never used the word thermo-dynamics either editions (1865 and 1875) of his textbook *Mechanical Theory of Heat*. Clausius did, to note, use the term "thermo-dynamic engine" (three times) or "thermo-dynamic machines" (once), in his fifth memoir (1856), as in reference any type of heat engine that works in a cycle, in what seems to be modeled on the earlier Thomson phrasing.

See also

â— θâˆ†ics
â— human thermo-dynamics

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θΔics

In science, **thermodynamics (memorabilia)** include thermodynamics themed products such as Murphy's law posters, entropy T-shirts, coasters, bumper stickers, teddy bears, etc., that are available for sale about the internet, such as one might find in a science novelty store.

External Links

- Thermodynamics Teddy Bears – Café Press.
- Thermodynamics Juniors Activewear – Café Press.
- Murphy’s Law of Thermodynamics (Posters, Coasters, T-Shirts) – MurphyWasAnOptimist.com
- Entropy (posters) – MathematiciansPictures.com

θΔics

In Hmolpedia, **thermodynamics (misc)** page is a file-tree header page for miscellaneous topics, as listed in the adjacent drop-menu, in thermodynamics.

θΔics

In science, the **naming** of a new branch of **thermodynamics** often results in a variety of near-synonymous names, particularly if approached in the typical haphazard, trial-and-error, type of naming process. Often is the case that names emerge unknowingly in text, for many years, before the subject begins to solidify, settling on the either the most used name or the one with the most intuitive sense.

Three system perspectives

The issue surrounding naming choice of subjects dealing with thermodynamics applications, generally, has to do with the fact that thermodynamics can be applied and used according to the three points of view by which the system and the system boundary can be defined: (a) processes occurring inside the body, (b) processes viewed external to the body, (c) processes of a system of interacting bodies (of types (a) and (b) subsumed).

To give an example of this, American physical chemist Alfred Lotka, in his 1925 *Elements of Physical Biology*, in application of physics and thermodynamics to the study of humans or, more generally, biological structures, devotes a portion of his preface to explaining that, in his view, the 'biophysics' refers to the physics study of the individual, whereas 'physical biology' refers to the physics study of biological systems of individuals. The following is the key section by Lotka: [2]

> "The term *physical biology* has been employed to denote the broad application of physical principles and methods in the contemplation of biological *systems*, whereas *biophysics*, in common parlance, relates rather to the special field of certain physical aspects of life processes of the *individual*. With this terminology, physical biology would comprehend biophysics within its scope."

The definition of system, used by Lotka is that of the thermodynamic system, a subject of which Lotka spends considerable time on.

The issue becomes even more diverged than this, being that there are two ways one can attempt to study the individual: the internal perspective and the external perspective, the former representative of the thermodynamics of biochemical processes inside of the body, e.g. cellular, membrane, transport, etc., the latter representative of subjects such as psychodynamics or exercise physiology.

Naming rule-of-thumb

A good rule, in naming new branches of thermodynamics, is to follow the protocol used behind the logic of name "chemical thermodynamics", where (a) the additive *new* subject (e.g. chemistry) is affixed with the appropriate suffix (e.g. -ary, -ical, –al, etc.) and (b) the new core subject is followed by the word "thermodynamics". This simple rule often saves decades of thought as to naming choice. The emergence of the branch of thermodynamics called specifically "chemical thermodynamics", for instance, is as follows: [1]

1876: *On the Equilibrium of Heterogeneous Substances*	Willard Gibbs
1882: "The Thermodynamics of Chemical Operations"	Hermann Helmholtz
1884: *Studies in Chemical Dynamics*	Jacobus van't Hoff
1903: *Thermodynamics and Chemistry: A Non-mathematical Treatise for Chemists and Students of Chemistry*	Pierre Duhem
1907: *Experimental and Theoretical Applications of Thermodynamics to Chemistry*	Walther Nernst
1912: *A Text Book of Thermo-Chemistry and Thermodynamics*	Otto Sackur
1913: *Text-book of Thermodynamics with special*	James Partington

reference to Chemistry	
1921: *Thermodynamics and Chemistry*	Frank MacDougall
1923: *Thermodynamics and the Free Energy of Chemical Substances*	Gilbert Lewis and Merle Randall
1924: *Chemical Thermodynamics*	James Partington
1933: *Modern Thermodynamics by the Method of Willard Gibbs*	Edward Guggenheim
1949: Thermodynamics: Advanced Treatment for Chemists and Physicists	Edward Guggenheim
1950: *Chemical Thermodynamics*	Ilya Prigogine and Raymond Dufay
1950: *Chemical Thermodynamics*	Frederick Rossini
1950: *Chemical Thermodynamics: Basic Theory and Methods*	Irving Klotz
1965: *Chemical Thermodynamics*	John Kirkwood and Irwin Oppeheim

Thus, given the above rule, the subject of "thermodynamics and chemistry" (1880s) became "chemical thermodynamics" (1920s) over a period of forty years. Hence, if one is to learn by example, in the naming of a new branch of thermodynamics, e.g. "the thermodynamics of surface interactions", one should skip to the chase (e.g. surface thermodynamics), and save years of thought on questions regarding name choice.

Extrapolation

On this basis, for example, one might ask: how should the subject of sociology and thermodynamics be named? Possible naming examples might include some that have been used and other not yet used: social thermodynamics (1972), socio-thermodynamics (2002), sociology thermodynamics, sociodynamics (1990s), etc. Using the above rule, the correct name, in the future, should result to be: sociological thermodynamics.

â— Biochemical thermodynamics (rule-of-thumb correct name) biochemistry + thermodynamics

Synonyms: bioenergetics, bio-thermodynamics, biothermodynamics, biological thermodynamics, etc.

â— Geochemical thermodynamics (rule-of-thumb correct name) = geochemistry + thermodynamics

Synonyms: thermodynamics for geologists (1967), thermodynamics in Geochemistry (1993), etc.

Other examples

On this naming logic, the subject of the use of thermodynamics in information theory should correctly be called "information theory thermodynamics"; although the term "information thermodynamics" is a weaker alternative, that has been used in the past.

Notes

In other cases, to note, the above rule of thumb does not always work. The example of neurothermodynamics or neurological thermodynamics (brain-systems studies) vs. neurochemical thermodynamics (neurochemical operations studies) is one such case. In the case of the study of the thermodynamic aspects of psychology, the name “psychodynamics” as persevered, whereas the rule-of-thumb correct name psychological thermodynamics is non-

existent.

The subject of the study of “thermodynamic and evolution” seems to logically be called “evolutionary thermodynamics” modeled on the new field of evolutionary psychology; whereas a weaker variant could be "evolution thermodynamics".

In some cases, at present, historical presidence seems to hold weight in naming use. The example of psychodynamics, the subject of the use of the first and second laws of thermodynamics, in the study of the psyche, should correctly be called "psychological thermodynamics", the rule-of-thumb correct name, a combination of psychology + thermodynamics, but it is not. The word seems to have roots in the 1860 term "psychophysics" used by German physicist and psychologist Gustav Fechner. Other synonyms include: psycho-dynamics, dynamic view or "mental dynamics (Freud, 1923), psychic energism and dynamism (Jung, 1928), the psychical energy model (Bowlby, 1969), "dynamic psychology", or energy psychology

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θΔics

In publications, **thermodynamics (news)** consists of recent articles, clippings, happenings, tidbits, discoveries, blogs, or stories on topics connected to thermodynamics, or its sub-branches. Some of these are listed below as news feeds and others are linked to as updated news lists.

Feeds

Blogs

Videos

- Thermodynamics (sorted by date added) – YouTube
- Thermodynamics (videos) – MeFeedia
- Thermodynamics – Google Video
- Thermodynamics – Live Search Video

Feed sites

- Thermodynamics - Zimbio
- Thermodynamics - BlogTopList

θΔics

In famous publications, ***Thermodynamics and the Free Energy of Chemical Substances*** is a 1923, 653-page, 762-equation, textbook, written by American physical chemists Gilbert Lewis and Merle Randall, that introduced the science of thermodynamics to the chemists of the world. It is one of the founding books of modern chemical thermodynamics. Into the 1960s, it was being proclaimed as the "thermodynamic bible" or the "bible" to students of chemistry working in this field. [6]

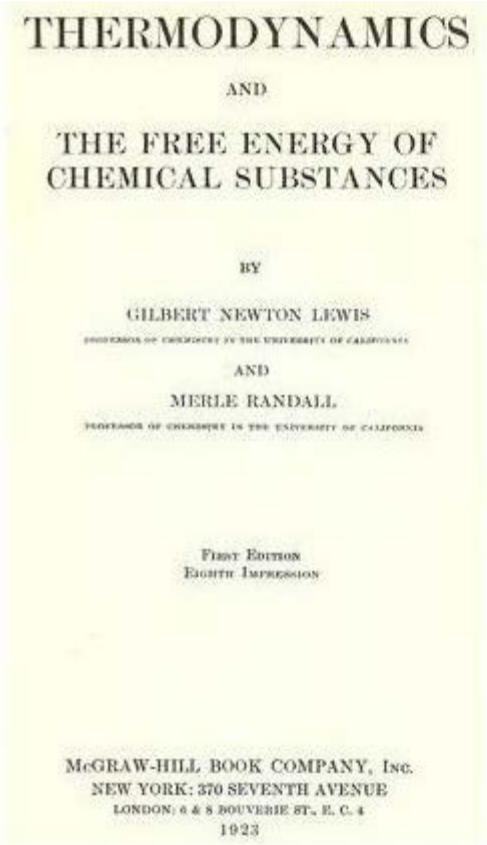
THERMODYNAMICS

AND

THE FREE ENERGY OF CHEMICAL SUBSTANCES

BY

GILBERT NEWTON LEWIS

AND

MERLE RANDALL

FIRST EDITION
EIGHTH IMPRESSION

McGRAW-HILL BOOK COMPANY, INC.
NEW YORK: 370 SEVENTH AVENUE
LONDON: 6 & 8 BOUVERIE ST., E. C. 4
1923

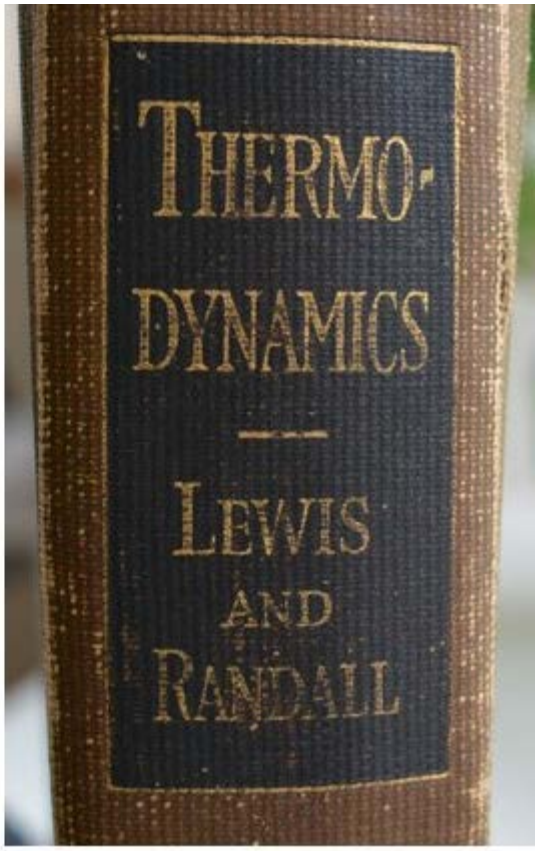

A visual of Gilbert Lewis' famed 1923 ***Thermodynamics and the Free Energy of Chemical Substances***, the short-version effect of which being that it worked to supplant "affinity" by the term "free energy", throughout the English-speaking world, as Henry Leicester (1956) aptly put things, which enacted a huge transition point in social Newton thinking, as evidenced by chronologies of social Newton term analysis; the longer-effect version of which being that it switched affinity table based physical chemistry to free energy table based physical chemistry.

This influential book, by 1956, according to American chemistry historian Henry Leicester, led to the replacement of the term "affinity" by the term "free energy" in much of the English-speaking world. [1] The general function of the book was to make the methods of America mathematical physicist Willard Gibbs' very-dense 1876 *On the Equilibrium of Heterogeneous Substances* *accessible* to the chemists.

In 2005, American chemical engineer Libb Thims, in dissection of the references of his new-amassing thermodynamics book collection, who at that point had never really been aware of the name "Lewis", began to see the citation "Lewis and Randall (1923) *Thermodynamics*", over and over and over, far mar than any other citation. [3]

Tributes

The following are noted tributes:

> "Lewis' *Thermodynamics* is the world's most-quoted scientific book."
>
> — Stanley Angrist (1967) [2]

> "One of the more significant books on [thermodynamics] after Gibbs."
>
> — David Crerar (1993) [3]

Quotes

The following are noted quotes:

> "The fascination of a growing science lies in the *work of the pioneers* at the very borderland of the

unknown, but to reach this frontier one must pass over well traveled roads; of these one of the safest and surest is the broad highway of thermodynamics”

— Gilbert Lewis (1923), *Thermodynamics*

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θΔics

In anecdotes, **thermodynamics anecdotes** are any of various famously passed around inside stories or biographical incidents related to the development or history of thermodynamics. Some of these are listed below.

A 1768 rendition of English physicist and chemist Robert Boyle's *circa* 1660 bird in vacuum experiments, by English artist Joseph Wright, somewhat incorrectly entitled "An Experiment on a Bird in an Air Pump" (incorrect on the fact that the bird as depicted is in a vacuum bulb, and not in the air pump); a noted **thermodynamics anecdote**: the odd experiment done so to test and hence disprove English scientist Thomas Hobbes' "wind theory of cold". [13]

Boyle | freezing live animals in a vacuum

See main: Animal in vacuum experiment

Frequently, in reading up on the history of thermodynamics one will come across a mention of how in circa 1660s Irish scientist Robert Boyle put live animals inside a vacuum and then froze them. After coming across this trivia several times one begins to wonder what goaded Boyle into such a puzzling experiment?

Historically, the first to put animals in a vacuum was German engineer Otto Guericke, the person who invented the vacuum bulb. In circa 1650, Guericke "discovered that animals in a vacuum cannot exist". [20] Not only did Guericke report that animals "die in evacuated space" but also gave rather gruesome details about the process, one example being that pikes spit out smaller fish they have recently swallowed. [21]

Boyle, in circa 1656, learned of Guericke's vacuum work, made vacuum equipment of his own, and began to undertake his own experiments.

In regards to why Boyle froze animals in a vacuum, the incident becomes clear after one humorously learns that the experiment of freezing live animals in a vacuum resulted out of a decade-long debate with English science philosopher Thomas Hobbes who promoted a theory that wind was the true source of cold and that for something to freeze, air or wind would have to blow on it (wind theory of cold). Boyle, not buying into this sort of theory, performed the experiment to show that in the absence of air or wind it was possible to freeze things, a result which thus disproved Hobbes' theory. [13]

Jolly | On Mayer | On Physics

German physicist Philipp Jolly is noted for a double anecdote, firstly in objection to the mechanical equivalent of heat theory and work of Robert Mayer, in circa 1840 he told Mayer, somewhat mockingly, that if what you say is true, then "water should be warmed by merely shaking it." Mayer left quietly, only to return several weeks later to Jolly's room, exclaiming "and so it is". [1]

Jolly, to note, was the same guy who in circa 1874 told a young student at the University of Munich, named Max Planck, not to go into physics, because "in this field, almost everything is already discovered, and all that remains is to fill a few unimportant holes." [2] Planck, fortunately, didn't heed this advice, and completed his PhD on the second law and went on to found quantum mechanics in 1900 based on the second law. The idea that nothing new would be discovered in physics seems to have been prevalent during these decades.

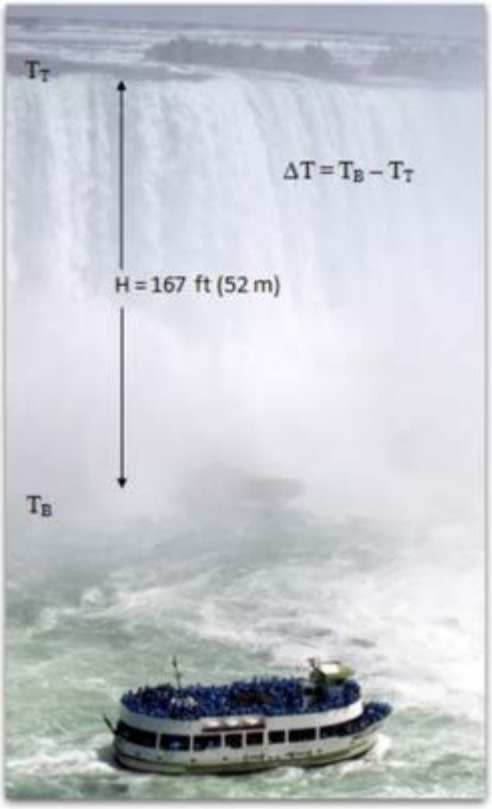

English physicist James Joules' famous 1847 Niagara Falls honeymoon experiment, where he measured the mechanical equivalent of heat.

William Thomson stated, in a 1900 address to an assemblage of physicists at the British Association for the advancement of Science, that "there is nothing new to be discovered in physics now. All that remains is more and more precise measurement." A similar statement, supposedly, is attributed to the American physicist Albert Michelson. [15]

Joule | Niagara Falls honeymoon

See main: Niagara Falls

Joule's draw to experimentation, much of it done at the family brewery, was such that Joule rarely left home without scientific apparatus. Indeed, while visiting a waterfall with his wife on their honeymoon in 1847, he produced a thermometer with which to measure the change in the temperature of the water as it fell. [10]

The underlying motives behind the anecdote becomes apparently clear from a Joule's 1847 lecture "On Matter, Living Force, and Heat", read at the reading room of St. Ann's Church, in which he explains that the measure of the mechanical equivalent of heat created by the friction of the wind and agitation of the water gives experimental proof for the story of genesis as described in the Bible, to the effect that God's powers have been conserved, so to speak, or something to this effect over the "last 4000 to 6000 years" since the creation of the universe.

In other words, the need to take the measurements on his honeymoon were out of a need to find an experimental proof for the story of genesis and hence the existence of God. [17]

Clausius | dining room rebuttal

See main: Dinning room anecdote

In German physicist Rudolf Clausius famous 1857 paper "On the Nature of the Motion which we call Heat", he deduced the average speed of particles to be moving in the neighborhood of 300 to 1,000 meters per second (modern values often cite 500-meters per second or 1200-mph). This calculation drew a quick response from Dutch meteorologist Christoph Ballot who

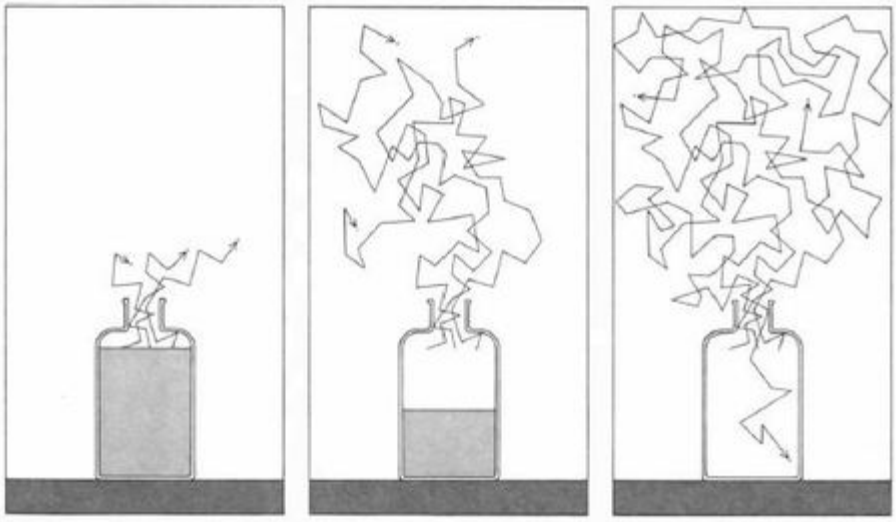

A depiction of "mean free path", that of a newly-opened perfume bottle, from David Layzer's 1975 article "The Arrow of Time", which illustrates the famous Clausius-Ballot "dinning room anecdote" on the nature of the speed of gas particles and the

velocity of the sent of hot food. [22]

argued that if he were seated in a long dining room and the butler brought in dinner, it would be some moments before the smell of the food would reach his nose. [8] A response to this objection by Clausius resulted in the development of the concept of mean free path. [9]

â— Serge, Emilio. (2007). *From Falling Bodies to Radio Waves: Classical Physicists and Their Discoveries* (§: Again, Clausius and Maxwell, pgs. 236-37). Courier Dover Publications.

Boltzmann | tumblers of water

In thermodynamics folklore, an oft-heard comment is that the second law has something to do with pouring a glass of water into the sea. This stems from Austrian physicist Ludwig Boltzmann who in 1870 told English physicist John Strutt that the second law has the same truth as the assertion that you cannot recover a tumbler of water thrown into the sea. [6]

Gibbs | Mathematics is a language

Gibbs was not talkative and not prone to giving public speeches. Once at the faculty meeting, however, after long wrangling - whether the curriculum should be expanded to make more space for language classes (thus cutting down on time given to mathematics), or whether math should be taught to all freshmen instead - Gibbs stood up and defensively said: "mathematics is a language"; after which he sat down and did not say a word more thereafter. [12]

Maxwell | on Gibbs

During a visit to Cambridge University, in the years *circa* 1873-78, the president of Yale (likely Reverend Noah Porter, president from 1871 to 1886) inquired about possible people to promote at Yale. [3] The famous Scottish physicist, James Maxwell immediately suggested Gibbs. At this time there was also a socially rather prominent individual, named Alan Gibbs, at Yale. Thus, the president replied with pleasure. "Oh, you mean *Alan* Gibbs." "No! No!" answered Maxwell; "Willard Gibbs." The president's reply was: “well, but he is a nobody. He just sits in his room and writes.” [4]

Gibbs | Maxwell's plaster water bust

In 1875, Scottish physicist James Maxwell made his thermodynamics surface, a plaster three-dimensional sculpture of states of water, he sent it to Gibbs as a gift. Gibbs was said to have been flattered and pleased with the gift of the water sculpture from Maxwell. Owing to his typical modesty, however, whenever students asked about the sculpture, Gibbs told them it came from a “friend in England” (rather than mention that it came from the world-famous Maxwell). [5] The anecdote seems to have originated from American writer Muriel Rukeyser's 1942 biography on Gibbs, where she states that the student was the father of a "Leonard Bacon". [18]

One of Maxwell's thermodynamic surfaces, that he made in 1875 and sent to American engineer Willard Gibbs as a gift.

Aside from the commonly repeated anecdote about Gibbs and his student, there also seems to have been a certain amount of mystery surrounding the details of the manner in which Maxwell sent out his sculptures and how many sculptures he actually made package. American science historian Fielding Garrison indicates that possibly up to six statues were made by Maxwell and that in his typical riddled correspondence style (see for example the origin of the symbol θâˆ†ics) that a certain amount of playful mystery accompanied the sending of each statue to its new host: [19]

> “Copies of this **model** were distributed by Maxwell evidently with a certain amount of playful mystery, for each recipient thought that he was the happiest possessor of (at most) three. The writer knows of at six at least, and possibly there are more.”

J.J. Thomson | on Gibbs

Gibbs had a mailing list of over 300 of the world's greatest scientists, to which, it has been said, he sent his publications to. Of the bunch, it was Scottish physicist James Maxwell who first took appreciation of Gibbs' work and began to promote it. One of Gibbs' biographers, J. G. Crowther, remarked that Maxwell became, in effect, Gibbs' "intellectual publicity agent". In the years after Maxwell's premature death, in 1879, a humorous incident occurred between one of Maxwell's successors at Cambridge English physicist J.J. Thomson, the discoverer of the electron, and a president of a newly formed American university on a faculty-recruiting mission. As the story went, according to Thomson: [5]

> "He came to Cambridge, and asked me if I could tell him of anyone who could make a good Professor of Molecular Physics." Thomson told him that one of the greatest molecular physicists in the world was **Willard Gibbs**, and he livened in America. The president responded that Thomson probably meant *Wolcott* Gibbs, a Harvard chemist. Thomson was empathetic that he did mean *Willard* Gibbs, and tried to convince his visitor that Gibbs was indeed a great scientist. "He sat thinking for a minute or two", Thomson continues, "and then said, "I'd like you to give me another name. Willard Gibbs can't be a man of much personal magnetism or I should have heard of him.'"

Thomson | wife's dissipations

In 1885, while musing upon the subject of thermodynamics one day, Scottish physicist William Thomson suddenly realized that his wife was discussing plans for an afternoon excursion. "At what time," he asked, glancing up, "does the dissipation of energy begin?" [11] A prime human thermodynamics application of the law of dissipation of energy.

Nernst | farmyard thermodynamics

In 1920, German physicist Walther Nernst acquired Zibelle, an extensive estate in East Prussia. There were cows, pigs, a pond with carp, and a thousand acres of land, which included fields of cereals and other crops. Nernst pursued his new interest in farming with characteristic single-mindedness. It is related that on a tour of inspection on a cold winter's morning he entered the cowshed and was astonished to discover how warm it was. Why was it heated, he asked? The reply came that the heat was generated only by the cows, the result of metabolic activity. Nernst was dumbstruck and immediately resolved to sell his cows and invest instead in carp: a thinking man, he said, cultivates animals that are in thermodynamic equilibrium with their surroundings and does not waste his money in heating the universe. So the old system of ponds on the estate was stocked with carp, which did not noticeably heat the water of their pond. [14]

Rashevsky | on the thermodynamics of biology

In a mid 1920 anecdote, recounted by American theoretical biologist Robert Rosen (who was told the story), the newly minted doctorate Russian-born American theoretical physicist Nicolas Rashevsky (Rosen's dissertation advisor) was working on the thermodynamics of liquid droplet division at the Westinghouse Corporation research laboratories, Pittsburgh, Pennsylvania, during which time, at a social gathering, he chanced upon a casual conversation on cell division with a biologist from the University of Pittsburgh. During the course of the conversation, Rashevsky proceeded to ask the biologist whether the thermodynamic mechanisms on which he was working on was the way biological cells divide. Rashevsky was told (a) Nobody knew how biological cells divided and (b) nobody *could* know how biological cells divided, because this was biology. Rashevsky, an 'ideal' physicist, found this outrageous, that a material phenomenon (the division of biological cells) should so casually be put outside the pale of physics. This chance conversation irritated Rashevsky to the effect that he ended up switching careers and, over the next five decades, went on to found what came to be known as the "Rashevsky school of mathematical biology" and the science of relational biology.

Onsager

In the 1970s, during a visit with Norwegian-born American physical chemist Lars Onsager, whom American physicist Ronald Fox had met as a student at Rockefeller University, during the years 1965 to 1969, Fox asked Onsager whether he thought statistical mechanics would have a significant impact on the study of biological questions, such as the origin

of life, to which Onsager replied abruptly “No”. [7]

See also

â— Thomson’s search for Carnot’s Reflections
â— Founders of thermodynamics and suicides

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8. Buys-Ballot, Christoph. (1858). “Ueber die Art von Bewegung welche wir Warme und Elektrizitat nennen” (“On the Kind of Motion we Call Heat and Electricity”), *Ann. Phys.* 103: 240.
9. Clausius, Rudolf. (1859) [1858]. “On the Mean length of the Paths described by the Separate Molecules of Gaseous Bodies on the Occurrence of the Molecular Motion: together with some other remarks upon the mechanical theory of heat”, *Phil. Mag.* 17:81-91.
10. Joule – Anecdotes.com.
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(b) Bell, Eric T. (1999). *Men of Mathematics.* Turtleback Books.
(c) Entropy (Kelvin) – Anecdotage.com.
12. (a) Wheeler, Lynde, P. (1951). *Josiah Willard Gibbs - the History of a Great Mind* (pg. 173). Woodbridge, Connecticut: Ox Bow Press.
(b) J.W. Gibbs gives a speech (mathematics quotes) – Cut-the-Knot.org.
(c) Other version: Gibbs was known in Yale as a faculty member who never spoke at the meetings. Once, during a discussion another professor argued that students are better of learning another foreign language instead of taking mathematics classes. Gibbs spoke first time. He said, "Mathematics is a language". (Source: Paul Samuelson's "on being an economist".)
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"discovered that animals in a vacuum cannot exist", pg. 389). John Wiley & Sons.
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External links

â— Anecdote – Wikipedia.
â— Science (category) – Anecdotage.com.
â— Thermodynamics (anecdotes) – Anecdotes.com.

θΔics

In science, **thermodynamics awards** are prizes, medals, or awards given to researchers who significantly use thermodynamics to further or advance a given subject of study. [1] The Prigogine award, for instance, is given to individuals in systems ecology who have used Prigoginean thermodynamics in their theoretical developments. [2] These awards are listed below:

List

Rumford Medal (1800) – biennial award for outstanding scientific research, by a European, on heat or light.

Rumford Prize (1839) – biennial award for outstanding scientific research, by an American, on heat or light.

Nobel Prize (1901) – annual award given in physics, chemistry, physiology or medicine, or economics.

Gibbs Medal (1911) – annual award given to chemists that have enabled people to either live better or to understand the world better.

Boltzmann Medal (1975) – awarded once every three years to physicists who have advanced statistical mechanics.

James Harry Potter Gold Medal (1980) – annual award for achievement or service in the application of thermodynamics in mechanical engineering.

Prigogine Medal (2004) – annual award given to researchers in systems ecology.

Related

Other connective awards include:

â— Gilbert Newton Lewis Medal – for achievement in the theoretical aspects of chemistry; Linus Pauling won in 1951; possibly now defunct?
â— Priestley Medal (1922) – yearly award for service in the field of chemistry; Frederick Rossini won in 1971.

By comparison, the great German physicist Rudolf Clausius, the base for all of the schools of thermodynamics, received the Huygens Medal (1870), the Copley Medal (1879), and the Poncelet Prize (1883).

See also

â— Clausius Medal (proposal)

References

1. (a) Willard Gibbs Award – Wikipedia.
(b) The Willard Gibbs Award – American Chemical Society.
(c) Rumford Prize – Wikipedia.
(d) Rumford Medal – Wikipedia.
(e) Boltzmann Medal – Wikipedia.
2. (a) Prigogine Awards – The Prigogine Lectures, University of Siena.
(b) Prigogine Award Ceremony – at the 2007 Urban Transport Conference, Wessex Institute of Technology.

θΔics

In education, a **thermodynamics dissertation** refers to the completion of a masters or doctorates with a dissertation or thesis on a thermodynamics or human thermodynamics subject. Some of these, particularly related to subjects in human thermodynamics, are listed below. Of note, the first thermodynamics doctorate seems to have been, famously, German physicist Max Planck who completed his dissertation on the second law of thermodynamics, through self-study of the works of Rudolf Clausius, under the direction of Hermann Helmholtz.

Thermodynamics

The following are dissertations in thermodynamics, specifically:

Year	Person	Dissertation/Thesis	School
1879	Max Planck (1858-1947)	*On the Second Fundamental Theorem of the Mechanical Theory of Heat* (*Über den Zweiten Hauptsatz der Mechanischen Wärmetheorie*) (PhD)	University of Berlin and University of Munich
1940	John Fenn (1917-)	*The Thermodynamics of Hydrochloric Acid in Methanol-Water Mixtures* (PhD)	Yale University
1941	Ilya Prigogine (1917-2003)	*The Thermodynamics of Irreversible Phenomena* (PhD)	Free University of Brussels Advisor: Theophile de Donder
1969	Ali Mansoori (c.1943-)	*A Variational Approach to the Equilibrium Thermodynamic Properties of Simple Liquids and Phase Transitions* (PhD)	University of Oklahoma
1969	Ronald Fox (1943-)	*Contributions to the Theory of Nonequilibrium Thermodynamics* (PhD)	Rockefeller University [5]

See also

â— Human thermodynamics dissertations

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3. Messaging to Libb Thims from turnkey13 on 30 Jan 2009.
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5. Fox, Ronald F. (1969). *Contributions to the Theory of Non-equilibrium Thermodynamics*. PhD thesis. Rockefeller University.

θΔics

In science, **founders of thermodynamics**, include: Sadi Carnot, Émile Clapeyron**,** Robert Mayer, James Joule, Hermann von Helmholz, William Thomson, Rudolf Clausius, Peter Tait, James Maxwell, Willard Gibbs, Ludwig von Boltzmann, Max Planck, among others to follow in the 20th century, such as Albert Einstein, Gilbert Lewis, Edward Guggenheim, etc. The founders, by category, are listed below (a work in progress).

The 'true' founder

See main: Thermodynamics pioneers

The one true core "founder of thermodynamics", by all clear measure, is German physicist Rudolf Clausius. The acknowledgment, however, that Clausius is the founder is buried deep in the literature. In fact, only experts or 'founders' themselves, such as Willard Gibbs, who commented that Clausius 'laid the foundations of the science', recognize this fact. Most (about 95%) popularizations of the subject cite Sadi Carnot as the founder, whereas correctly he initiated the subject. The lack of colloquial agreement of one single founder is exemplified by the following collection of quotations making claims or giving stated opinion as to so-and-so founder of thermodynamics, by various individuals (ordered by loose descending founder rank):

Founder	Quoted Citation	Reference
	"Regarded as the **founder of thermodynamics**, [Rudolf Clausius] gave much credit to such predecessors as Sadi Carnot, Henri Clapeyron, Robert Mayer, and others."	Garnett Williams (1997) [1]
	"Scientists consider [Sadi Carnot] as the **founder of thermodynamics** and consider the year 1824 as the birthdate of this discipline."	Pierre Perrot (1998) [3]
	"Lord Kelvin, the **founder of thermodynamics**, once said [in 1883]: 'when you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science, whatever the matter may be."	Alfred Tassel (1973) [7]
	"Rankine was really the **founder** of the modern science **of thermodynamics** and his was the first book on the subject."	John Emswiler (1921) [5]
	"American theoretical physicist and mathematician Willard Gibbs [is] often described as the **founder of thermodynamics**."	Tim Armstrong (2003) [6]
	"Black's contributions [heat capacity] qualify him as the true **founder of thermodynamics**."	Laszlo Tisza (1966) [4]

"Indeed, nowhere in *Capital* probably does Marx so excel himself in vituperation as in his description of the **founder of thermodynamics** as 'an American humbug, the baronised Yankee, Benjamin Thompson (*alias* Count Rumford) …"

Frederick Soddy (1926) [2]

Classical thermodynamics

See main: Mechanical Theory of Heat, Thermodynamics, Classical thermodynamics

1. Sadi Carnot
2. Émile Clapeyron
3. Robert Mayer
4. James Joule
5. William Rankine
6. Rudolf Clausius
7. William Thomson
8. Peter Tait

Statistical thermodynamics

See main: Statistical thermodynamics, Statistical mechanics

1. James Maxwell
2. Ludwig Boltzmann
3. Willard Gibbs

Chemical thermodynamics

See main: Chemical thermodynamics

1. Hermann von Helmholz
2. Willard Gibbs
3. Gilbert Lewis
4. Merle Randall
5. Edward Guggenheim

Quantum/radiation thermodynamics

See main: Quantum thermodynamics

1. Max Planck
2. Albert Einstein

Relativistic thermodynamics

See main: Relativistic thermodynamics

1. Max Planck
2. Max von Laue
3. Ferencz Jüttner
4. John Synge
5. Carl Eckart
6. Ingo Müller
7. Nikolay Chernikov

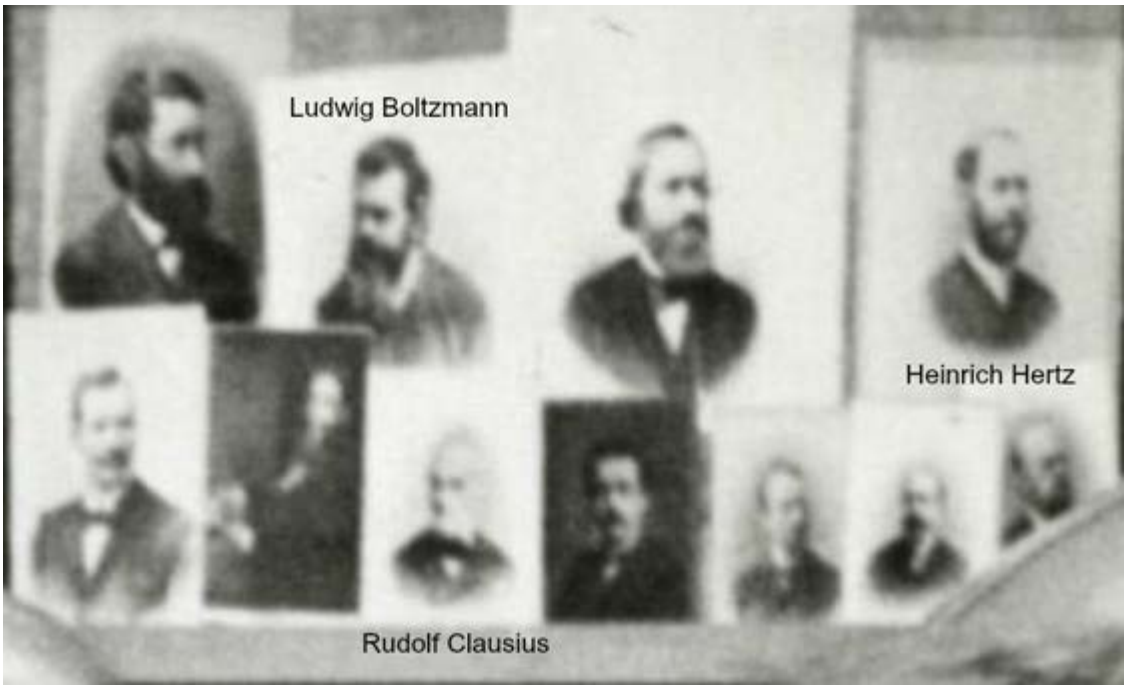

Scientific **geniuses** on the wall at the house of Max von Laue during the 1931 dinner party photo (Ñº) of Walther Nernst, Albert Einstein, Max Planck, Robert Millikan, and von Laue.

Nonequilibrium thermodynamics

See main: Nonequilibrium thermodynamics; Irreversible thermodynamics

1. Théophile de Donder
2. Lars Onsager
3. Josef Meixner
4. Ilya Prigogine
5. Sybren de Groot
6. Peter Mazur

Biochemical thermodynamics

See main: Biochemical thermodynamics, Biothermodynamics, Biological thermodynamics, Bioenergetics

1. Keith Burton
2. Albert Lehninger
3. Harold Morowitz
4. Gordon Hammes
5. David Nicholis
6. Stuart Ferguson
7. Donald Hayne

Human thermodynamics

See main: Human thermodynamics pioneers

1. Sigmund Freud
2. Brooks Adams
3. Henry Adams
4. Charles Galton Darwin
5. Ilya Prigogine
6. Georgi Gladyshev

7. Libb Thims
8. David Hwang

See also

â— Who is the greatest thermodynamicist?

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3. Perrot, Pierre. (1998). *A to Z of Thermodynamics* (pg. 32). Oxford: Oxford University Press.
4. Tisza, Laszlo. (1966). *Generalized Thermodynamics* (pg. 17). MIT Press.
5. Emswiler, John E. (1921). *Thermodynamics* (pg. 247). McGraw-Hill.
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External links

â— Best thermodynamicist poll (with 20+ comments) – by Chad Orzel, 28 Jul 09.
â— Best thermodynamicist poll (results explained) – by Chad Orzel, 29 Jul 09.
â— Thermodynamicists (Category) - Wikipedia.

θΔics

In thermodynamics, **thermodynamics humor** consists of classical quotes, jokes, cartoons, articles, songs, videos, etc., that bring about laughter on the subject of thermodynamics.

Humorous examples include: the Entropy Clock, The Entropy Institute, and the 2004 rap parody entropy (song) by MC Hawking.

Entropy for Nerds fragrance by Lord Kelvin, humor by Lyle Zapato?). [10]

The Entropy Institute: Science cartoon by T McCracken.

Twitter

The following is a humorous (Ñº) human thermodynamics tweet:

Jokes

The following is a thermodynamics joke: [12]

> Joke: "What is the difference between thermodynamics and a stick?
>
> Answer: "A stick has two ends and no beginning. Thermodynamics has two 'beginnings' (the first and second law) and no end."

Funny quotes

A noted, albeit unreferenced quote, dated before *circa* 1950, tracing loosely to a 1941 publication of American physicist Percy Bridgman, is: [1]

> "There's as many versions of the second law as there are thermodynamicists."

In one episode of the *The Simpsons*, after Lisa constructs a perpetual motion machine whose energy increases with time, Homer scolds her with:

> "In this house, we obey the laws of thermodynamics!"

In the late 1940s, German theoretical physicist Arnold Sommerfeld, having previously written a series of books in physics: mechanics (1943), electrodynamics (1948), optics (1950), etc., was asked why he had never written a book on thermodynamics? The

following is his humors and frequently quoted answer: [8]

> "Thermodynamics is a **funny** subject. The first time you go through it, you don't understand it at all. The second time you go through it, you think you understand it, except for one or two small points. The third time you go through it, you know you don't understand it, but by that time you are so used to it, it doesn't bother you anymore."

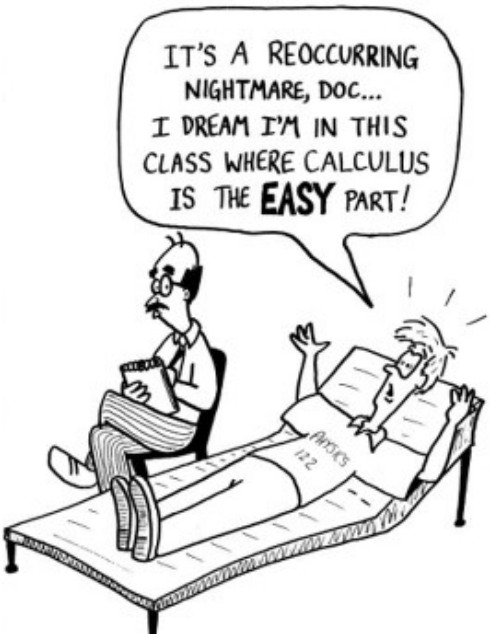

From lecture notes (Ñº) on the Lane-Emden model of stellar structure, derived in part from Robert Emden, based on thermodynamics and physical chemistry, wherein calculus, a pre-requisite to thermodynamics, is pegged the easy part.

In an odd twist of fate to this quote, in April of 1951, while in the midst of writing a book on thermodynamics (*Thermodynamics and Statistical Mechanics*), and having been nominated 81 times for the Nobel Prize (more than any other physicist), but not yet having won, Sommerfeld was killed from injuries after a traffic accident while walking his grandchildren. The book was published post-humorously the following year. [9]

Thermodynamics and suicide

See main: Founders of thermodynamics and suicide

A large number of thermodynamics founders and founders of human chemistry (e.g. Otto Weininger) and their relations have notoriously met their reaction end (death) by their own hand:

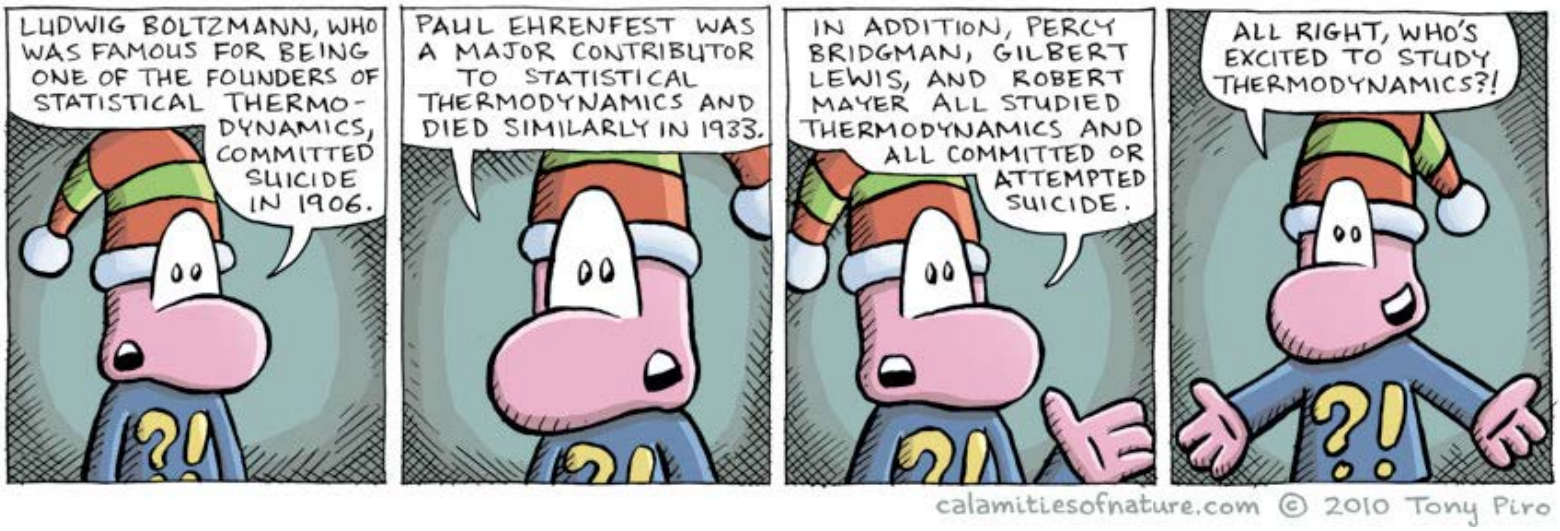

Political thermodynamics

The following is a funny political thermodynamics themed take on Middle Eastern tensions, presented in the form of what one might call "perpetual motion politics" of the Rude Goldberg / mousetrap style contraption of movement, blended in with thermal words and human thermodynamics concepts, e.g. social friction, war thermodynamics, etc.:

Creationism thermodynamics

The following are creationism thermodynamics (religious thermodynamics) humor cartoons: (Ñº)

"I'm trying to invent some new laws. All the old ones disagree with evolutionary theory."

"How could the Second Law apply to everything, as Kelvin and Einstein said,—when we evolutionists have decided that everything in our world is an 'open system' and not subject to the Second Law at all?"

"Let's get rid of the Second Law—and all the other laws. Or pretty soon we'll have to begin keeping the moral law: the ten commandments!"

"Tell the publishers to stop mentioning the Second Law in the textbooks they publish for the schools. It keeps embarrassing us."

"I'm trying to find something that doesn't corrode, break down, rot, or fall to pieces. Then I can say the Second Law has been disproved."

"It's just a meeting of evolutionists."

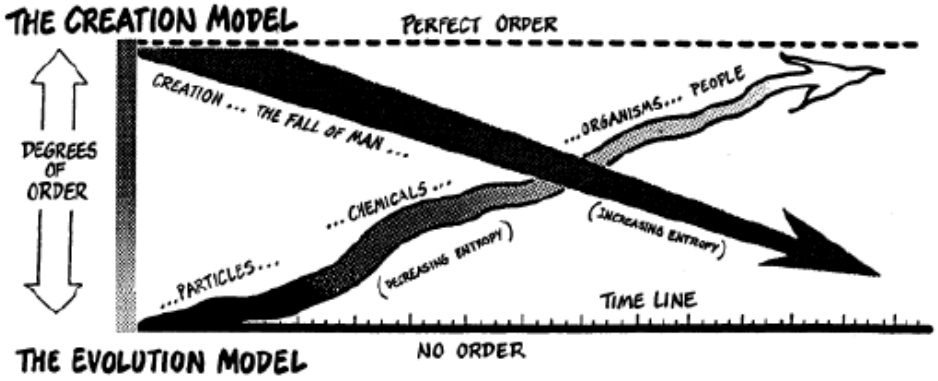

(add discussion)

Thermodynamics of hell

See main: Thermodynamics of hell

The seed of the thermodynamics of hell joke originated in the circa 1920 article “The Temperature of Heaven and Hell” written by American physicist Paul Foote.

In 1972, a humorous article appeared in *Applied Optics*, arguing, via thermodynamics, that heaven is hotter than hell. [3] A following up refutation article appeared in 1979, in the *Journal of Irreproducible Results*, arguing the converse situation. [4]

A photo of Hell, Michigan, "frozen" with ice.

Another humorous tidbit is the story about a thermodynamics professor gave a take-home exam to his graduate student with the question: “Is hell exothermic or endothermic”, with the conditioner: support your answer with a proof. [5] One source argues that Tim Graham, a student of the University of Oklahoma, is the author of the story. [6] Another source claims that it was given in a University of Washington chemistry mid-term. [7]

Cartoons

The following are humorous entropy or thermodynamics cartoons:

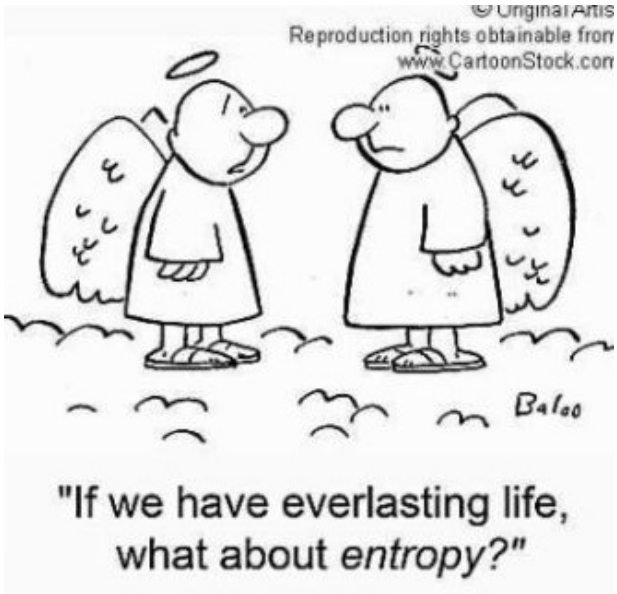

"Now, in the *second* law of thermodynamics . . . "

"You'll have to take over Weinbart's entropy experiment — he died."

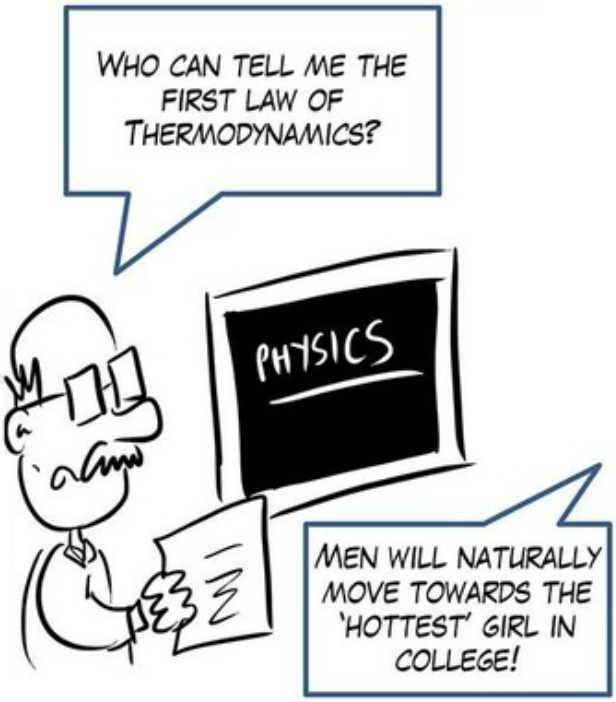

The First In-law of Thermodynamics.

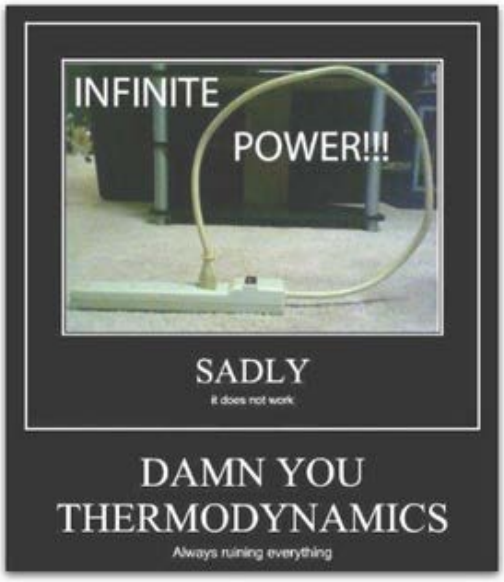

The following is a 2010 “Sandra and Woo” humorous cartoon on the second law, heat death, and the meaning of life: [11]

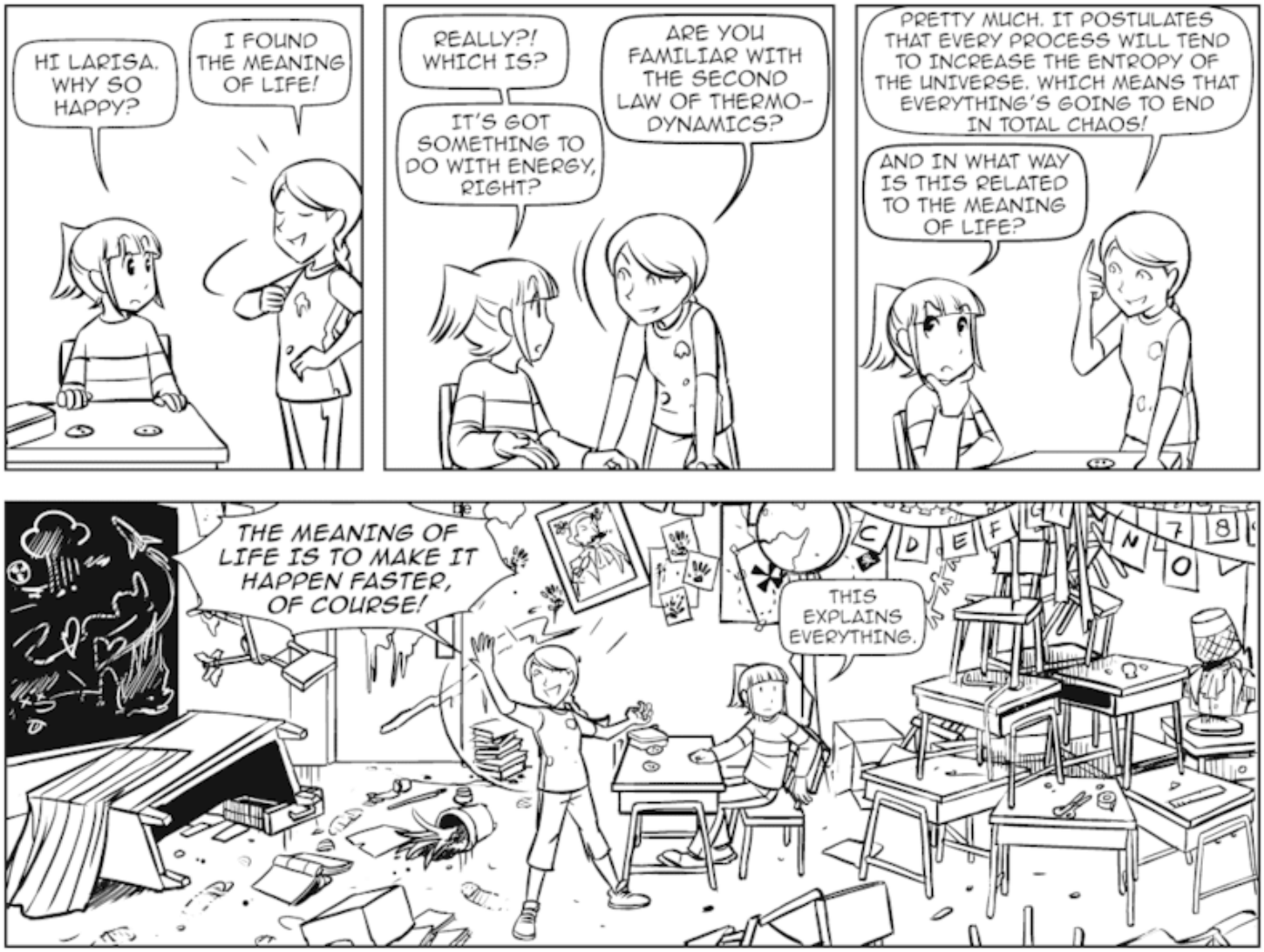

Sandra and Woo (www.sandraandwoo.com) by Powree and Oliver Knörzer

Videos

The following are funny or humorous thermodynamics-related videos. One is a funny November 15, 2007 video titled "Baby Thermodynamics", on the nature of absolute zero of temperature in relation to motion, is shown adjacent. The second is a Lego animation on the four laws of thermodynamics:

"Baby Thermodynamics" (15 Nov 07)	"Lego Stop Motion Thermodynamics" (28 Apr 09)	Simpsons and thermodynamics

Other

In 1956, Danish protein physicochemist Kaj Linderstrom-Lang gave a humorous 1956 lecture “The Thermodynamic Activity of the Male Housefly”.

In 1997, Internet writer Lyle Zapato, a great William Thomson (Lord Kelvin) fan, conceived of the Thermodynamic Law Party (TLP) and prior to that, in 1989, the Kelvinic University. [2]

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1. 110+ Variations of the Second Law of Thermodynamics – IoHT publications.
2. Thermodynamic Law Party - Zapatopi.net
3. (a) *Applied Optics* (1972), 11 A14.
(b) Theological Thermodynamics – a Donald Simanek’s Page
4. This paper appeared in *The Journal of Irreproducible Results*, Vol 25, No.4:17-18 Copyright © 1979 by The Journal of Irreproducible Results, Inc.
5. Thermodynamics Humor – Tavi’s page, Department of Genetics, Yale.
6. The Thermodynamics of Hell – Writer’s Dreamtools, Best Internet Humor.
7. Thermodynamics of Hell – Scott’s Little Corner of the Web (Humor).
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13. James, Neil. (2011). “Nature Abhors a Vacuum: Advertisers Should Embrace It”, Russell Herder blog, Feb 7.

A 1992 Far Side cartoon parody of the "nature abhors a vacuum" postulate, used used as a humorous illustration for Derek Halpern’s theory that knowledge vacuums exist in social arenas and that nature abhors them, subsequently advertisers can use this rule to pull readers in. [13]

Further reading

â— Bredt, James F. (1988). *The First and Second Laws: A Cartoon Introduction to Classical Thermodynamics*. Publisher: Bredt.
â— Highfield, Rodger. (1998). *The Physics of Christmas: From the Aerodynamics of Reindeer to the Thermodynamics of Turkey*. Back Bay Books.

External links

â— Thermodynamic Jokes - Joachim Verhagen's science jokes site.
â— Thermodynamics: Beer and Ice Cream Diet – School of Physics, University of Sydney.

θΔics

In journals, **thermodynamics journals** are semi-annual periodicals dealing with matters and subjects of interest specific to thermodynamics and its connected topics. [1] Some of these thermodynamics are tabulated below, ordered by date of inception, categorized by its human thermodynamics (HT) article content:

Year	Journal	Description	Cost	Cover
1969	Journal of Chemical Thermodynamics (link) HT=?	To disseminate significant new measurements in experimental thermodynamics and thermophysics including calorimetry, phase equilibria, equilibrium thermodynamic properties, transport properties; and to publish high-quality work related to gases, liquids, solids, mixtures, solutions, interfaces, polymers, bio-thermodynamics, and biological materials provided that the systems studied are characterized and reproducible. Elsevier (0021-9614)		
1976	Journal of Thermal Biology (link) HT=?	Publishes work in which the central theme is the mechanisms by which temperature affects living organisms. Pergamon (0306-4565).		
1989	Continuum Mechanics and Thermodynamics (link) HT=?	For new ideas in continuum and quasi-continuum modeling of systems with a large number of degrees of freedom and sufficient complexity to require thermodynamic closure. Subjects: physics and astronomy, engineering, chemistry and materials science, theoretical and applied mechanics, engineering thermodynamics, transport phenomena, mechanics, fluids, thermodynamics and structural materials. Springer (0935-1175 (Print) 1432-0959 (Online)).		
1998	International Journal of Thermodynamics (link) HT=?	A reference for thermodynamics with emphasis on the dissemination of technical information of permanent interest as it relates to theory, current applications and proposed improvements in industry		
1999	Journal of Non-Equilibrium Thermodynamics HT=?	Topics in nonequilibrium thermodynamics.		
1999	Entropy HT=Sometimes	On entropy and information studies, publishes reviews, regular research papers and short notes; with focus on theoretical and experimental details. Topics: entropy, information concepts, second law, information theory, system theory, cybernetics, AI, complexity, self-organization, chaos, reversibility, application of entropy to natural and social science, etc. MDPI (1099-4300).	$900	
2003	Interdisciplinary Description of Complex Systems (link) HT=Sometimes	Devoted to quantification and understanding of human societies and other complex systems, including aspects of our environment.		
2005	Journal of Human Thermodynamics HT=Yes	Articles in human thermodynamics, or the related. Topics: economic thermodynamics, sociological thermodynamics, psychological thermodynamics, anthropological thermodynamics, political thermodynamics, philosophical thermodynamics, etc. Articles on information theory and religion are discouraged.	Free	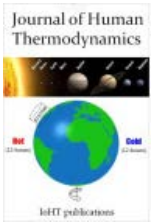
2005	Thermodynamics Research Today (link)	a free monthly online-journal that collates and summarizes the latest research about thermodynamics, including details on enthalpy, entropy, and energy transductions.		

2005	International Journal of Ecodynamics	Articles centered around the application of Prigoginean thermodynamics in ecology.	
2007	Open Thermodynamics Journal (link)	An open-access journal publishing research articles, reviews, and letters in all areas of experimental and applied thermodynamics; ISSN: 1874-3967; Imprint: Bentham Open.	
2008	Energies	On a variety of energy topics	$800
2008	Journal of Thermodynamics (link)	Peer-reviewed, open access journal that publishes original research articles as well as review articles in all areas of thermodynamics. *ISSN:* 1687-9244*; Imprint:* Hindawi Publishing Corporation	$450

The following are journals that may sometimes publish material on the thermodynamics of human life, such as "psychodynamics", entropy and life, ecosystem thermodynamics, economic thermodynamics, sociological thermodynamics, etc:

Year	Journal	Description	Cost	Cover
1979	Energy Economics (link)	Papers concerned with the economic and econometric modelling and analysis of energy systems and issues. Elsevier (0140-9883).		
2003	Evolutionary Psychology (link)	On evolutionary approaches to psychology and behavior. Idium (1474-7049).		
2006	Public Library of Science (PLoSOne.org) (Wikipedia)	An interactive open-access journal for the communication of all peer-reviewed scientific and medical research.	$1-2k/free	
	HT = Sometimes			

Journal citation reports: Thermodynamics

The following is the 2004 ranking of the top 39 journals, categorized by thermodynamics, and ranked by impact factor. In 2010, there were 44 journals in category thermodynamics.

No.	Abbr. Journal Title	Full Journal Title	ISSN	2004 Total Cites	Impact Factor	Immediacy Index	2004 Articles	Cited Half-Life
1	PROG ENERG COMBUST	PROGRESS IN ENERGY AND COMBUSTION SCIENCE	0360-1285	1188	02.844	0.188	16	8.7
2	CALPHAD	CALPHAD-COMPUTER COUPLING OF PHASE DIAGRAMS AND THERMOCHEMISTRY	0364-5916	926	02.119	0.2	25	99.9
3	FLUID PHASE EQUILIBR	FLUID PHASE EQUILIBRIA	0378-3812	4543	01.356	0.251	311	7.3
4	INT J HEAT MASS TRAN	INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER	0017-9310	8272	01.220	0.183	476	9.8
5	J CHEM THERMODYN	JOURNAL OF CHEMICAL THERMODYNAMICS	0021-9614	2735	01.144	0.336	131	99.9
6	COMBUST FLAME	COMBUSTION AND FLAME	0010-2180	3956	01.023	0.186	145	8.8
7	CRYOGENICS	CRYOGENICS	0011-2275	1422	01.023	0.164	110	9.6
8	INT J HEAT FLUID FL	INTERNATIONAL JOURNAL OF HEAT AND FLUID FLOW	0142-727X	1015	00.988	0.032	93	6.2
9	INT J REFRIG	INTERNATIONAL JOURNAL OF REFRIGERATION-REVUE INTERNATIONALE DU FROID	0140-7007	868	00.889	0.075	107	6.3
10	COMBUST THEOR MODEL	COMBUSTION THEORY AND MODELLING	1364-7830	286	00.857	0.154	39	4.8
11	INT J THERMOPHYS	INTERNATIONAL JOURNAL OF THERMOPHYSICS	0195-928X	1273	00.846	0.15	133	7.7
12	CONTINUUM MECH THERM	CONTINUUM MECHANICS AND THERMODYNAMICS	0935-1175	357	00.838	0.293	41	6.6
13	EXP THERM FLUID SCI	EXPERIMENTAL THERMAL AND FLUID SCIENCE	0894-1777	774	00.813	0.158	101	7.3
14	ENERG CONVERS MANAGE	ENERGY CONVERSION AND MANAGEMENT	0196-8904	1513	00.794	0.156	211	5.4
15	MICROSCALE THERM ENG	MICROSCALE THERMOPHYSICAL ENGINEERING	1089-3954	201	00.783	0.071	28	4.4
16	J HEAT TRANS-T ASME	JOURNAL OF HEAT TRANSFER-TRANSACTIONS OF THE ASME	0022-1481	3594	00.731	0.057	123	99.9
17	OPEN SYST INF DYN	OPEN SYSTEMS & INFORMATION DYNAMICS	1230-1612	72	00.702	0.048	21	
18	J THERM STRESSES	JOURNAL OF THERMAL STRESSES	0149-5739	871	00.692	0.15	60	7.9
19	P COMBUST INST	PROCEEDINGS OF THE COMBUSTION INSTITUTE	0082-0784	1948	00.683			8.2
20	HEAT TRANSFER ENG	HEAT TRANSFER ENGINEERING	0145-7632	234	00.632	0.067	60	7.4
21	J NON-EQUIL THERMODY	JOURNAL OF NON-EQUILIBRIUM THERMODYNAMICS	0340-0204	276	00.619	0.12	25	8.1
22	INT J THERM SCI	INTERNATIONAL JOURNAL OF THERMAL SCIENCES	1290-0729	321	00.600	0.058	104	3.4
23	NUMER HEAT TR B-FUND	NUMERICAL HEAT TRANSFER PART B-FUNDAMENTALS	1040-7790	484	00.598	0.196	56	7.4
24	APPL THERM ENG	APPLIED THERMAL ENGINEERING	1359-4311	633	00.596	0.079	202	4
25	COMBUST SCI TECHNOL	COMBUSTION SCIENCE AND TECHNOLOGY	0010-2202	1822	00.568	0.083	96	99.9
26	J ENHANC HEAT TRANSF	JOURNAL OF ENHANCED HEAT TRANSFER	1065-5131	155	00.556	0.026	39	5.9
27	J THERMOPHYS HEAT TR	JOURNAL OF THERMOPHYSICS AND HEAT TRANSFER	0887-8722	659	00.551	0.15	80	7.9
28	ENERGY	ENERGY	0360-5442	983	00.524	0.084	178	7.7
29	NUMER HEAT TR A-APPL	NUMERICAL HEAT TRANSFER PART A-APPLICATIONS	1040-7782	665	00.524	0.068	103	6.5
30	INT COMMUN HEAT MASS	INTERNATIONAL COMMUNICATIONS IN HEAT AND MASS TRANSFER	0735-1933	651	00.441	0.009	117	6.3
31	FLOW TURBUL COMBUST	FLOW TURBULENCE AND COMBUSTION	1386-6184	178	00.409	0.054	37	4.2
32	J POROUS MEDIA	JOURNAL OF POROUS MEDIA	1091-028X	84	00.378	0.037	27	
33	HVAC&R RES	HVAC&R RESEARCH	1078-9669	115	00.370	0.1	30	4.4
34	HEAT MASS TRANSFER	HEAT AND MASS TRANSFER	0947-7411	364	00.368	0.045	110	5.5
35	HIGH TEMP-HIGH PRESS	HIGH TEMPERATURES-HIGH PRESSURES	0018-1544	650	00.342			99.9
36	EXP HEAT TRANSFER	EXPERIMENTAL HEAT TRANSFER	0891-6152	138	00.333	0	18	9.4
37	COMBUST EXPLO SHOCK+	COMBUSTION EXPLOSION AND SHOCK WAVES	0010-5082	584	00.281	0.084	95	99.9
38	ASHRAE J	ASHRAE JOURNAL	0001-2491	215	00.141	0.071	98	8.2
39	JSME INT J B-FLUID T	JSME INTERNATIONAL JOURNAL SERIES B-FLUIDS AND THERMAL ENGINEERING	1340-8054	288	00.141	0.01	100	7.8

References

1. Journal (definition) – Merriam-Webster Collegiate Dictionary, 2000.

θΔics

In lectures, **thermodynamics lectures** are often the seed or impetus behind the later development of important new theories and ideas. Various free-courseware thermodynamics lectures, from Strathcona-Tweedsmuir high school, MIT, Yale, etc., are posted below (a work in progress):

Famous lectures

A few famous examples of noted thermodynamics lectures include German physicist Rudolf Clausius' 1865 reading of his paper "On Several Convenient Forms of the Fundamental Equations of the Mechanical Theory of Heat" to the Philosophical Society of Zurich on April 24th, in which the two famous enunciations of the laws of thermodynamics were first spoken, namely the energy of the universe is constant and the entropy of the universe tends to a maximum; English physiologist William Bayliss' 1922 Twenty-fourth Robert Boyle Lecture "Life and the Laws of Thermodynamics", delivered Before the Junior Scientific Club of the University of Oxford on 7th June; English astronomer Arthur Eddington's 1927 Gifford Lectures delivered at the University of Edinburgh, January to March, resulting in the 1928 book *The Nature of the Physical World*, in which are found the shuffling card model of entropy and the notion of the entropy arrow of time; as well as Austrian physicist or Erwin Schrodinger's 1943 lectures delivered at Trinity College, Dublin, in February 1943, resulting in the famous 1944 book *What is Life?*, in which are found the postulate that life feeds on negative entropy.

English physical chemist George Porter's episode four "An Introduction to Chemical Change and Thermodynamics" of his 1965 BBC series of lectures entitled 'The Laws of Disorder: an Introduction to Chemical Change and Thermodynamics', wherein he discusses entropy, the arrow of time, and gives the following quote: "The second law has been quoted as the *sine qua non* of scientific enlightenment." [6]

NIU | Human Chemical Thermodynamics | Spring 2013

The following is a 45-minute 16 Apr 2013 lecture entitled "Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies" (see: lecture notes) by American electrochemical engineer Libb Thims given to the engineering students, primarily mechanical engineering thermodynamics students, and faculty of the Norther Illinois University—full lecture below left, condensed synopsis of experimental demonstrations below right:

MIT 5.111 Principles of Chemical Science | Fall 2005

The following are the main thermodynamics lectures from the 36-part lecture series of the Fall MIT course 5.111 Principles of Chemical Science: [1]

18. Thermodynamics and Spontaneous Change

23. Cell Potentials and Free Energy

Yale PHYS 200 Fundamentals of Physics | Fall 2006

The follow four lecture parts (20-23), by physicist Ramamurti Shankar, are devoted to thermodynamics: [2]

21. Thermodynamics

22. Boltzmann constant and the first law of thermodynamics

23. The second law of thermodynamics and Carnot's engine

24. The second law of thermodynamics and entropy

AP Chem Thermodynamics (grade 12) | 2008

The following video set is by Rob Lederer a senior level / grade 12 chemistry teacher Strathcona-Tweedsmuir high school for over 26 years, who makes a DVD series on chemistry lessons (ChemGuy.com): [3]

Intro: Chemical energetics (introduction to energy)

1. Entropy and spontaneous reactions

2. Change in the entropy of the universe

3. Gibbs free energy calculation

4. Free energy calculations: products – reactants = ΔG

5. Free energy, equilibrium constant; Nernst equation

MIT 5.60 Thermodynamics & Kinetics | Spring 2008

The following 36-part lecture series, delivered by chemists Moungi Bawendi (video one) and Keith Nelson (video three), based on the 2004 textbook *Physical Chemistry* by Robert Sibey, Robert Alberty, and Bawendi, deals primarily with equilibrium properties of macroscopic systems, basic thermodynamics, chemical equilibrium of reactions in gas and solution phase, and rates of chemical reactions. [4]

1. State of a system, 0th law, equation of state

2. Work, heat, first law

3. Internal energy, expansion work

4. Enthalpy

5. Adiabatic changes

6. Thermochemistry

7. Calorimetry

8. Second law

9. Entropy and the Clausius inequality

10. Entropy and irreversibility

11. Fundamental equation, absolute S, third law

12. Criteria for spontaneous change

13. Gibbs free energy

14. Multicomponent systems, chemical potential

15. Chemical equilibrium

16. Temperature, pressure and Kp

17. Equilibrium: application to drug design

18. Phase equilibria — one component

19. Clausius-Clapeyron equation

20. Phase equilibria — two components

21. Ideal solutions

22. Non-ideal solutions

23. Colligative properties

24. Introduction to statistical mechanics

25. Partition function (q) — large N limit

26. Partition function (Q) — many particles

27. Statistical mechanics and discrete energy levels

28. Model systems

29. Applications: chemical and phase equilibria

30. Introduction to reaction kinetics

31. Complex reactions and mechanisms

32. Steady-state and equilibrium approximations

33. Chain reactions

34. Temperature dependence, Ea, catalysis

35. Enzyme catalysis

36. Autocatalysis and oscillators

MIT 5.111 Principles of Chemical Science | Fall 2008

The following are the main thermodynamics lectures from the 36-part lecture series of the Fall MIT course 5.111 Principles of Chemical Science: [5]

16. Determining hybridization in complex molecules; thermochemistry and bond energies / bond enthalpies.

17. Entropy and disorder

18. Free energy and control of spontaneity

19. Chemical equilibrium

20. Le Chatelier's principle (applied to blood-oxygen levels)

25. Electrochemical cells

34. Temperature and kinetics

References

1. Video Lectures (1-36) – MIT 5.111 | Principles of Chemical Science | Fall 2005 – OCW.MIT.Edu.
2. Physics – Yale PHYS 200 | Fundamentals of Physics | Fall 2006 – Open Yale courses.
3. (a) BannanaIsCool – YouTube.com.
(b) Home – ChemGuy.com.
(c) Rob Lederer (about) – ChemGuy.com.
4. Video Lectures – MIT 5.60 | Thermodynamics & Kinetics | Spring 2008.
5. Video Lectures (1-36) – MIT 5.111 | Principles of Chemical Science | Fall 2008 – OCW.MIT.Edu.

6. (a) George Porter (collection) – NationalArchives.Gov.uk.
(b) Porter, George. (1972). *Molecules to Men* (quote, pg. 17). Heinemann Educational.

External videos

â— (a) Thermodynamics in a Nutshell: the Definition of Entropy in One Hour (1:49 hours) by Gian Beretta at the AIP 2008 - TechTV.mit.edu.
(b) Thermodynamics in a Nutshell (blackboard closeups) – Web.MIT.edu.

θΔics

In famous publications, “Thermodynamics of Evolution” is a noted 1972 cover-story article, in *Physics Today*, by Belgians thermodynamicist Ilya Prigogine, physicist Gregoire Nicolis, and neuroscientist Agnes Babloyantz, in which nonequilibrium thermodynamics, in conjunction with ideas on “nonequilibrium order”, is used to explain the Darwinian concept of survival of the fittest in the context of the pre-biotic stages of evolution. [1]

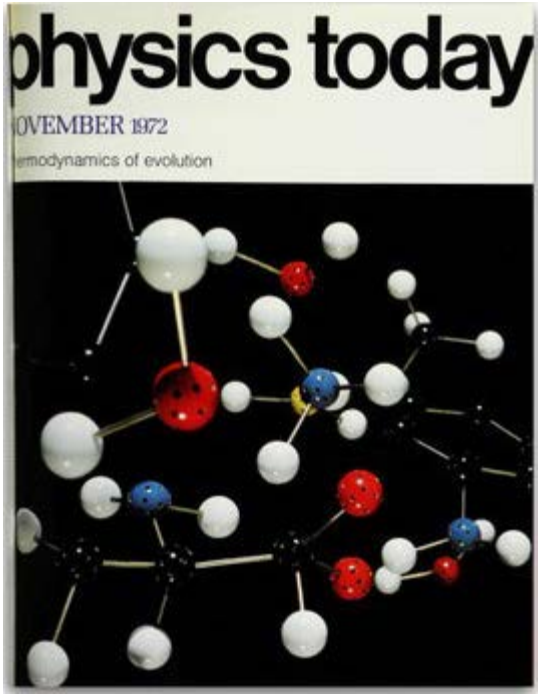

Second law evolution problem

In outlining what they define as "the problem", i.e. the issue of the tendency towards disorder in the second law verses the tendency towards order in evolution, they state:

> “Coherent behavior is the characteristic feature of biological systems (ordered structures), reflective of structures acquired during long periods of evolution.”

In contrast, according to the second law, they point out that:

> “The evolution of a physicochemical system leads to an equilibrium state of maximum disorder.”

They then note that this last statement holds for isolated systems; albeit they neglect to mention that this only holds for systems that obey the Boltzmann chaos assumption, i.e. ideal gas phase systems. In continuation with their chain of logic, the state that for a system in contact with an energy reservoir at a temperature T, its state is defined by the following function of free energy, F, where:

$$F = E - TS$$

where E is the internal energy, and S is the entropy of the system; a function defined such that at equilibrium F is a minimum. The then state that at low temperatures, according to this function, ordered low-entropy structures, such as crystals, can appear. In admonition, however, they state:

> “Unfortunately this principle cannot explain the formation of biological structures.”

Curiously, to note, in laying out this argument they choose to utilize Helmholtz free energy (constant volume processes) rather than Gibbs free energy (constant pressure processes), which can explain the formation of biological structures. It is likely that Prigogine chooses his presentation in this manner so as to not effect a weakening in his later arguments; in the sense that he wants to discredit any detail not in alignment with his view that nonequilibrium thermodynamics is the key to explain biological evolution.

In any event, they then explain that their supposition is true because, as they reason, the probability that a macroscopic number of molecules will assemble to form higher ordered living structures is “vanishingly small” at ordinary temperatures. This argument, however, traces to the intersection of the 1890 Poincaré recurrence theorem, which states that, given a long enough time, there exists a small probability that an isolated dynamical system can return to its initial state (ordered); which conflicts with the second law which states that such a system will continue to move towards a more disordered final state. In any event, curiously, Prigogine repeates this same argument in the opening words of his

1977 Nobel Lecture “Time, Structure and Fluctuations.” [2] They then conclude:

“The apparent contradiction between biological order and the laws of physics—in particular the second law of thermodynamics—cannot be resolved as long as we try to understand living systems by the methods of familiar equilibrium statistical mechanics and equally familiar thermodynamics.”

To solve this issue, in their article, on the lead of Prigogine, the introduce the Prigoginean thermodynamics logic of nonequilibrium open systems, internal entropy, dissipative structures, order through fluctuations, feedback, among other factors.

References

1. (a) Prigogine, Ilya, Nicolis, Gregoire, and Babloyants, Agnes. (1972). "Thermodynamics of Evolution," (part I). *Physics Today* (pgs. 23-28), Vol. 25, November.
(b) Prigogine, Ilya, Nicolis, Gregoire, and Babloyants, Agnes. (1972). "Thermodynamics of Evolution," (part II). *Physics Today* (pgs. 38-44), Vol. 25, December.
2. Prigogine, Ilya. (1977). “Time, Structure and Fluctuations”, *Nobel Lecture*, Dec. 08.

θΔics

In human thermodynamics, **thermodynamics of Goethe's *Faust*** refers to the ideas presented at an 1892 lecture, titled "Goethe's Presentiments of Coming Scientific Ideas", held in the General Assembly of the Goethe Society in Weimar, in which German physician and physicist Hermann von Helmholtz attempted to explain German polymath Johann von Goethe's *Faust* through the lens of thermodynamics. [1] In this speech, Helmholtz postulates that Goethe was aware of the basics of the conservation of energy and argues that the ebb and flow of life, and its relation to death, has an explanation in the total constancy of energy or active force, for both animate and inanimate life. These ideas were precursors to the science of cessation thermodynamics, the study of death in relation to the first law of thermodynamics. [3]

Overview

The legend of Faust is a classic German Legend about a man named Faust that makes a pact with the Devil, a tale which goes back to at least the 16th century. [2] Goethe's version of *Faust* was highly-complex as compared to the original. The legend of *Faust* was an obsession of Goethe's. Although by no means a constant pursuit, the composition and refinement of his own version of the legend occupied him for over sixty years. The final version, not completely published until after his death, is recognized as a great work of German Literature.

In Goethe's version of *Faust*, the story concerns the fate of Faust in his quest for the *true essence of life* (*"was die Welt im Innersten zusammenhält"*). Frustrated with learning and the limits to his knowledge and power, he attracts the attention of the Devil (represented by Mephistopheles), with whom Faust makes a deal to serve him until the moment that Faust attains the zenith of human happiness, at which point Mephistopheles may take his soul. Goethe's Faust is pleased with the deal, as he believes the moment will never come.

In the first part, Mephistopheles leads Faust through experiences that culminate in a lustful and destructive relationship with an innocent and nubile woman named Gretchen. Gretchen and her family are destroyed by Mephistopheles' deceptions and Faust's desires and actions. The story ends in tragedy as Gretchen is saved and Faust is left in shame.

The second part begins with the Spirits of the Earth forgiving Faust (and the rest of mankind) and progresses into rich allegorical poetry. Faust and his devil pass through the world of politics and the world of the classical gods, and meet with Helen of Troy (the personification of beauty). Finally, having succeeded in taming the very forces of war and nature Faust experiences a single moment of happiness. Helmholtz explains this using thermodynamics. [1]

Thermodynamics

In particular, in an 1892 lecture titled "Goethe's Presentiments of Coming Scientific Ideas", Helmholtz cites the allegorical figure of the Earth Spirit which he says, in modern times, should be equated with organic life on Earth that, in thermodynamic terms, can be equated with “energy or effective motor power”, which constitutes the “active force … in the realm of the living nature and in inanimate bodies”. [3] Specifically, the passage to which Helmholtz refers in *Faust*, the Spirit says:

> In the tides of Life,
> in Actions storm,
> A fluctuant wave,
> A shuttle free,
> Birth and the Grave,
> An eternal sea,
> A weaving, flowing
> Life, all-glowing,
> Thus at Time’s humming loom ‘tis my hand prepares
> The garment of Life which Deity wears!

In thermodynamical explanation of this section, Helmholtz states that “we know today that there resides in the world an indestructible and unincreasable supply of energy (Kraft) or effective motor power that can appear in the most manifold,

ever-changing forms—now as a raised weight, now in oscillation with accelerated masses, now as heat or chemical affinity, &c.—which, in this exchange, constitutes the active force in each effect, both in the realm of the living nature and in inanimate bodies." Helmholtz postulates that "this insight into the constancy of the value of energy (conservation of energy) were already at the hand in the previous century, and could have been known to Goethe". This description of the ebb and flow of the total constancy of energy or active force in life and through death (Birth and the Grave), to note, is a precursory postulate to the modern science of cessation thermodynamics. [3]

References

1. (a) Helmholtz, Hermann. (1892). "Goethe's Presentiments of Coming Scientific Ideas", *Speech held in the General Assembly of the Goethe Society, Weimar* in *Science and Culture: Popular and Philosophical Essays,* (ch. 15, pg. 393-412 [411]), 1995, by Hermann von Helmholtz, David Cahan.
(b) *Faust*, 1: 28-29.
(c) Source: Astrida Orle Tantillo, Head of the Department of Germanic Studies, University of Illinois at Chicago (in discussion with Libb Thims).
2. (a) The first recorded *Faust* committed to print is a little chapbook bearing the title *Historia von D. Iohan Fausten* published in 1587.
(b) The origin of Faust's name and persona remains unclear, though it is widely assumed to be based on the figure of German Dr. Johann Georg Faust (approximately 1480–1540), a dubious magician and alchemist.
3. Thims, Libb. (2007). *Human Chemistry (Volume Two),* (preview), Ch 16: section "Cessation Thermodynamics", (693-699). Morrisville, NC: LuLu.

θΔics

In religious thermodynamics, **thermodynamics of hell** is the subject, whether considered real or humorous fun, of explaining the theory of hell, a hypothetical high-temperature place, in the center of the earth, where bad or evil people are said to be sent when they die, using modern thermodynamic arguments. To exemplify, the following excerpt comes from the 1999 article "When Hell Freezes Over" in the *Journal of Chemical Education* by American chemistry professor Ron DeLorenzo: [7]

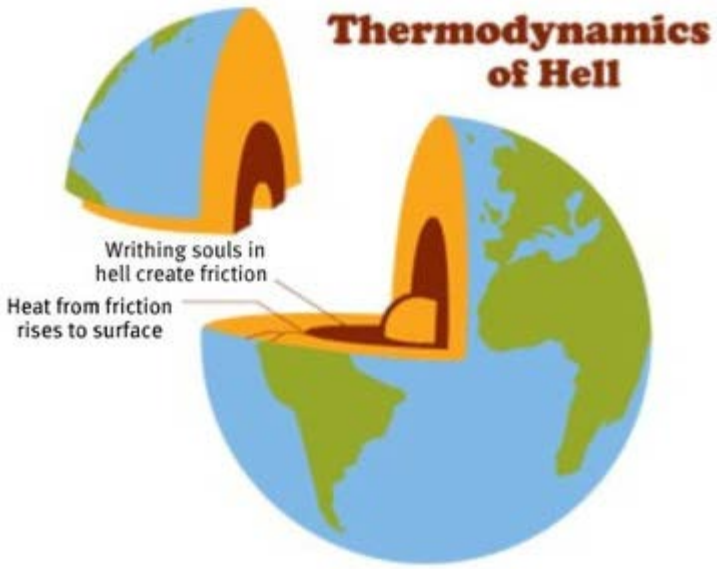

A 2005 T-shirt of the "Thermodynamics of Hell" by WamBot. [8]

> "The Stefan–Boltzmann fourth-power radiation law predicts that heaven must be 977 °F if it were to radiate this much heat, and this makes heaven hotter than hell."

There are many variations of the topic, including the questions: is heaven hotter than hell, is hell hotter than heaven, is hell exothermic or endothermic, what is the temperature of hell, discussion of the thermal saying "when hell freezes over", among others, all answers requiring some type of logical proof. People have attempted proofs using Boyle's law, mechanical equivalent of heat (such as the friction creation argument picture adjacent), radiation laws or radiation thermodynamics (above quote), and so on.

The thermodynamics of hell, curiously, is a very popular Google search term, a top seven search related to thermodynamics. The question is along the same lines of explaining the "Thermodynamics of HotForWords" or the "Thermodynamics of HotorNot" and so on. [10] The subject of mixing thermodynamics together with religion, to note, dates back to at least the time of Maxwell's demon (1867).

American physicist Paul Foote: author of 1920 article "The Temperature of Heaven and Hell". [13]

Foote's 1920 article

The seed of the thermodynamics of hell joke originated in the circa 1920 article "The Temperature of Heaven and Hell" written by American physicist Paul Foote, a noted early soul theorists, noted expert in high temperature physics, which he published anonymously in a periodical of the *Taylor Instrument Company*, wherein he drew scientific deductions from descriptions of the states of various material substances as described in the Bible to conclude that Heaven was hotter than Hell. [12] The answer that Foote gave, supposedly, is: [11]

> "The Stefan–Boltzmann fourth-power radiation law predicts that heaven must be 977 °F if it were to radiate this much heat, and this makes heaven hotter than hell."
>
> "First, we postulate that if souls exist, then they must have some mass. If they do, then a mole of souls can also have mass. So, at what rate are souls moving into hell and at what rate are souls leaving? I think that we can safely assume that once a soul gets to hell, it will not leave. Therefore, no souls are leaving.
>
> As for souls entering hell, let's look at the different religions that exist in the world today. Some of these religions state that if you are not a member of their religion, you will go to hell. Since there are more than one of these religions and people do not belong to more than one religion, we can project that all people and all souls go to hell.
>
> With birth and death rates as they are, we can expect the number of souls in hell to increase exponentially. Now, we look at the rate of change in volume in hell. Boyle's law states that in order for the temperature and pressure in hell to stay the same, the ratio of the mass of souls and volume needs to stay constant.

> So, if hell is expanding at a slower rate than the rate at which souls enter hell, then the temperature and pressure in hell increase until all hell breaks loose. Of course, if hell is expanding at a rate faster than the increase of souls in hell, then the temperature and pressure will drop until hell freezes over."

In the decades to follow, variations of Foote's paper appeared, such as in the journal of *Applied Optics* (1972), among others, attributing the argument to an anonymous source. A copy of the original manuscript with Foote's personal notations, however, has identifying him as the author of the article, as was found in his personal file after his death in 1971. [13] The *Applied Optics* article cited its source as 'an unnamed environmental physicist several decades back', as discussed in the followup *Time* magazine article "Science: A Hellish Heaven". [14] It is said that a followup refutation article appeared in 1979, in the *Journal of Irreproducible Results*, arguing the converse situation to Foote's reasoning. [2]

University of Oklahoma | Chemical engineering

In May 1997, at the University of Oklahoma Chemical Engineering Department, as the story goes, professor Robert L. Shambaugh (although he denies the story), for the final question of his "Momentum, Heat, and Mass Transfer II" course, was said to have asked: "Is hell exothermic or endothermic? Support your answer with a proof." [3] The story shortly thereafter was posted online, after which, as one writer notes, it "went around the Internet like greased lightning". A 1998 version of the solution uses the following quote as part of the proof:

> "It will be a cold day in hell before I sleep with you."
>
> — Theresa Banyan (c.1990), comment to freshman Mick White

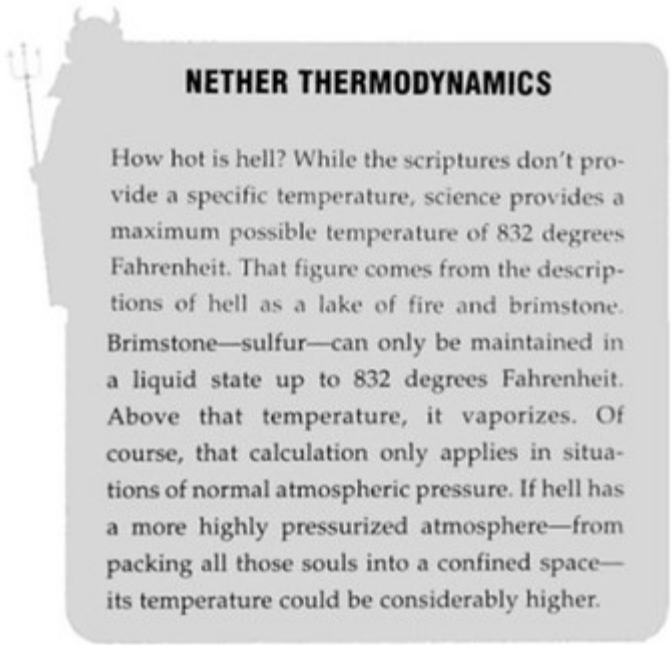

NETHER THERMODYNAMICS

How hot is hell? While the scriptures don't provide a specific temperature, science provides a maximum possible temperature of 832 degrees Fahrenheit. That figure comes from the descriptions of hell as a lake of fire and brimstone. Brimstone—sulfur—can only be maintained in a liquid state up to 832 degrees Fahrenheit. Above that temperature, it vaporizes. Of course, that calculation only applies in situations of normal atmospheric pressure. If hell has a more highly pressurized atmosphere—from packing all those souls into a confined space—its temperature could be considerably higher.

Caption entitled "Nether Thermodynamics" from the 2005 book *Go to Hell: A Heated History of the Underworld.* [9]

Shambaugh maintains he never asked the problem about hell, commenting that: "my guess is that one of my ex-students added fact to fantasy to create the problem about hell."

One source argues that Tim Graham, a student of the University of Oklahoma, is the author of the story. [4]

Another source claims that it was given in a University of Washington chemistry mid-term. [5]

Modern views

See main: What happens when you die?; Cessation thermodynamics; Defunct theory of life, etc.

The subject of applying thermodynamics to the theory of hell, in attempts to validate or refute, in a modern human thermodynamic sense, which assumes that humans are molecules, through and through, pure and simple, regulated by the laws of chemical thermodynamics, just as are all molecules in chemical systems, immediately opens up a number of grand problems that require a near complete revolution in what constitutes the definition and surrounding understanding of being a human and existing. The person new to this subject will ask: does a human molecule have a soul? Owing to this question, many (even seasoned thermodynamicists) will deny they are a molecule.

Beyond this, of first notice, the assumed existence of a place one goes when death occurs, presupposes that people are alive. This, however, has been shown to be a defunct theory. [15] Technically, a person cannot be considered to be alive, any more so than a hydrogen atom can be considered to be alive. Secondly, hell theory implies the existence of both good and evil activity in the universe. There have been many attempts to explain morality in the context of

thermodynamics, as well as the thermodynamics of evil, but the subject remains unpurified, at present, being that it is incredibly difficult to pick up a standard chemistry textbook and to separate good as compared to evil reactions in it just would need to be done to distinguish between good or evil human chemical reactions and good verses evil human molecules or human molecular behavior.

One variation of the the joke (said to have been submitted by a student to an exam question on this topic) was the assertion that hell must be exothermic because a girl he'd been chasing had sworn it'd be a **cold day in hell** before she'd sleep with him, and he'd so far been unable to get to first base with her. [11]

These details aside, an example of the intricacies involved, conceptually wise in terms of pure hard science and equations, when even attempting to quantify the theory of the soul, or rather good or bad moral energy inherent in a person, in terms of modern science, is captured well in the 2005 review of American chemical engineer and physician Gerry Nahum's 1978 "A Proposal for Testing the Energetics of Consciousness and its Physical Foundation", in Mary Roach's popular book *Spook: Science Tackles the Afterlife*, in which he proposed to experimentally weight the departing soul thermodynamically at the point of death of people in laboratory using electromagnetic sensors based on a type of negative entropy theory and the mass-energy equivalence relation. [6]

In simple terms, there is no doubt that when people die (or rather stop moving permanently) that he or she does not go to either the interior of the earth nor to the clouds in the sky, as religious scriptures would claim. The acceptance of this, immediately opens up the the door to the evidence of needed modern day theory to reconcile these types of left-open questions in the modern sense of what happens to the fundamental particles constituting a person in the movement of the universe after one ceases to be and how does a person's total actions and movements, good or bad, impact the movement of the universe, or conversely, how does the movement of the universe instill or create good or bad human movements and there carry-through after a person dies (ceases to be), and how is this explained in terms of the first and second laws of thermodynamics. The topic is larger, to say the least.

Discussion

A 2011 BrightHubEngineering.com re-wright of the above, written by a Baby Rani, and edited by Lamar Stonecypher, speculates on whether or not the "inner energy" of a person, from a thermodynamic point of view, is a type of potential energy or internal energy, among other digression, and in conclusion comments: [16]

> "The matter of using thermodynamics to the **hypothesis of hell**, in efforts to corroborate or controvert, in a modern human thermodynamic logic is a modern view. Thermodynamics presumes that humans are particles, complete, unadulterated, and trouble-free, synchronized by the laws of chemical thermodynamics similar to all other molecules in an established chemical system. This understanding straight away gives rise to a lot of issues which actually require a near **total revolution** to define and comprehend of constituting a human and living. Any new person in this subject will surely inquire as to whether a human molecule has a soul. Therefore modern theory will have to find answers to a lot of questions. For instance it has to be found out as to what takes place when the basic molecules making up a human being move about in the cosmos and later on stop moving meaning dead. Does an individual's entire activities and progress be it good or bad, affect the motion of the universe. If so, how can this be clarified in terms of the first law of thermodynamics?"

A good deal of insight is found in this conclusion indeed.

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Further reading

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External links

â— The Thermodynamics of Hell – WhoSoEver.org.
â— The Thermodynamics of Hell – Bio.Miami.edu.

θΔics

In famous publications, ***Thermodynamics of Humans: Love and Worship*** (Farsi: *Eshq va Parastesh ya Termodynamik-e Ensan*) (Persian: عشق و پرستش ي ا ترمودينام يك انسان) is a 216-page 1956 book written (from Spring to Autumn of 1955 during a 5-month incarceration) by Iranian mechanical engineer and thermodynamics professor Mehdi Bazargan, in which he attempts to explain human activity thermodynamically, using equations, and also in footnoted sections he attempts to explain how his equations explain passages of the Quran. [1] Bazaran's *Termodynamik-e Ensan* seems to be the first attempt at a book on and entitled 'human thermodynamics' (a term Bazargan uses on page four); although, technically, Polish social economist Leon Winiarski's circa 1890 *Social Mechanics* would be the true first book on the thermodynamics of systems of humans.

In *circa* 1980 retrospect of this book, in an article section on the 'Cause of Movement and Life', Bazargan summarizes that: [2]

> "In general, an object in a given force field will, of necessity, behave in a calculable and predictable way. For any object, whether a stone, a plant, or a human society, force means movement."

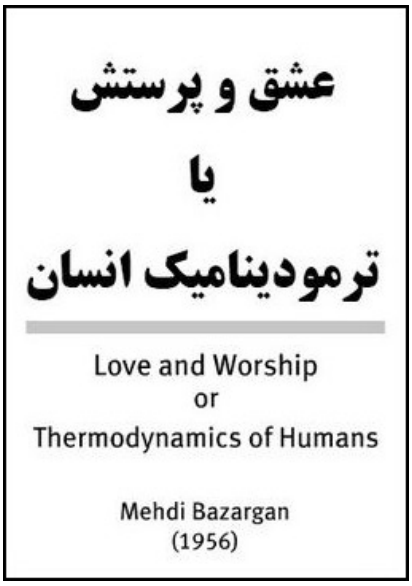

Contents

1. A few words of love
2. A few words of life
3. Thermodynamics of life
4. Life force
5. The issue of death
6. Thermodynamics in social and economic
7. Thermodynamics of ethics
8. Thermodynamics of life
9. Worship

Left: Cover of Iranian thermodynamicist Mehdi Bazargan's 1956 book ***Thermodynamics of Humans*** (*Termodynamik-e Ensan*). [1] Right: a 2009 synopsis of the book's sections. [12]

On this quote, which seems to be a citation of either French physicist Gustave Coriolis 1829 principle of the transmission of work or its thermodynamic formulation by German physicist Rudolf Clausius, in his 1865 mathematical introduction, Bazargan is saying that movement of a human body or the body of a human society by the forces acting on those bodies constitutes a measurement of work as the product of force times distance or as pressure-volume work, measured at the boundary of society. This is the first step into pure thermodynamics. Beyond this, Bazargan goes on to discuss entropy and thermodynamics applied to human activity.

History

The book seems to be an expanded view of his earlier six-page 1946 chapter "The Relationship Between Man and Work", in *Work and Islam*, in which Bazargan had discussed what he called the 'physiological thermodynamics' of human work. Bazargan wrote his famous 1956 treatise *Termodynamik-e Ensan* (*Thermodynamics of Humans*) while in prison for his political views, a precipitate of the 1953 Iranian coup and its subsequent political restrictions. The book was first published in 1957, according to private documents in possession of Bazargan's biographer Saeed Barzin. [9]

First main principle

The most cited equation that Bazargan seems to use in this book is German physicist Rudolf Clausius' first main principle in the form:

$$W = U - TS$$

although he does not seem to define these variables in precise thermodynamic terms. [7] Bazargan defined work *W* by the term 'effective energy' equating it with the human power of movement and production; the internal energy *U* by the phrase 'initial internal energy', equating it with desire, need, and love; and temperature *T* he equated to the value of one's possessions; and entropy S with the amount of possessions. [9]

Entropy

Bazargan employs about ten equations in the first seventy pages alone. The sections of cropped equations, of pages 70-71, gives an idea of Bazargan's treatise, while at the same time highlighting Persian-to-English translation issues, concerning what exactly Bazargan is saying. The equation of work, below, seems to be saying that the work of the individual in a society is a function of the internal energy less the energy associated with sexual inventory, whatever that means?

dQ	=	T	×	dS
↓		↓		↓
افزایش دارایی		نرخ		مقدار تولید
یا		یا		یا
قیمت کل		بهای واحد		افزایش مقدارجنس
Increase in assets or Total price		Rate or Unit Price		Production amount or increase in item quantity

Overview

The book, according to a review by Muhammad Taqavi was is divided into two parts: the first part, which is the main text, is about what Bazargan called the 'thermodynamics of man', and is an examination of love, the need for love, various types of love and the like, on the basis of thermodynamic concepts and formula. The second part of the book amounted to footnoted explanations of certain scientific points in the main discussion that were thought to correspond with Koranic verses. Bazargan maintained that the two parts were independent, such that rejection of one part did not amount to denial of the other. [9]

Bazargan called his discourse on historical evolution the "evolutionary course of

W	=	U	-	T.S
↓		↓		↓
تقاضا	=	استعدادمصرف	–	موجودی‌جنسی
یا احتیاج		یااحتیاج کلی		
Demand or need		The capacity of consumption or total need		Available assets [items] (Sexual inventory?)

religions", on the postulate that religion has developed through evolution, an argument which he bases on Charles Darwin's *Origin of Species* and its theory of natural selection; and his argument of social laws the "thermodynamics of society".

Bazargan explains everyday life in terms of thermodynamics, using it as a model that can explain how society in general works, according to a 2004 review by American cultural anthropologist Mazyar Lotfalian. Bazargan explains that love is that which is connected to faith but expanded to biology and is considered as the source of all human activity: "under the rubric of love, we want to gather all human goals and sources of human activities, whether it is food, clothing, libidinal feelings …" On devotion, Bazargan states that it is the movement of love to its ultimate limit, which is god. Lotfalian gives the following definition of Bazargan's subject matter the thermodynamics of humanity: [7]

> "[Human thermodynamics] (*termodynamik-e ensan*) is the mathematical expression of how human activity works according to a set of laws that are based on the relation of heat, time, and energy."

Morality

Bazargan devoted a section to human morality. In introducing this discussion, he comments: [9]

> "I will try to discuss morality from the point of view of thermodynamics and [scientific] natural law. Such a task is very difficult. Nevertheless, doing it is better than not doing it."

This is similar to German polymath Johann Goethe who stated in circa 1810 that 'the moral symbols used in the natural sciences were the elective affinities discovered and employed by the great Bergman'.

English translation project

A complete English translation of Bazargan's *Thermodynamics of Humans* has not yet come to fruition.

On 27 Apr 2010, American electrochemical engineer Libb Thims obtained a 216-page PDF version of the book (in Farsi) from Bonyad Farhangi Bazargan of Bazargan.info).

Using this PDF, the first 40 pages has been machine translated by Thims, shown below. Others, in communication with Thims, to have participated or given tips or direction, in some way or another, to the English translation project include: Iranian-born American engineer Robert Kenoun (section below), Iranian-born American chemical engineer and thermodynamicist Ali Mansoori, among others (work in project).

Editor

Libb Thims

Translator

Fardin Khalili

Reviewers | Potential

Robert Kenoun

Abdolali Bazargan

Reza Hashermian

Mehdi Bahadori

On 28 Oct 2012, Iranian-born American electrical engineer Reza Hashermian, in query on a tip by Mansoori that he might have already done the translation, Hashermian commented to Thims: [13]

> "No! I wish I did, but I have not translated Mehdi Bazargan's 1956 book on *Thermodynamics of Humans*! It is certainly an excellent book to translate and I encourage you to finish the translation you have started.I wish you success!"

On 29 Mar 2013, Thims began communicating with Bazargan's son, Abdolali Bazargan about the translation project, who commented:

> "I was very pleased to hear that one of my late father's books has interested you to make it part of a curriculum on the topic of thermodynamics. I had forwarded your links and email to "Bazargan Cultural Foundation" in Iran to seek their input, and they too were intrigued on the idea to translate this text into English. Unfortunately, my lack of knowledge in English and the topic will not make me a good candidate to translate this book; however, I will be more than happy to support this project with limited resources I have. Please let me know how you foresee this endeavor getting accomplished and how can I be of any assistance in expediting or facilitating this goal!? Best regards and looking forward to your reply."

On 4 Apr 2013, in further discussion with Hashermian about the Abdolali Bazargan involvement with the project, Hashermian suggested the following to Thims:

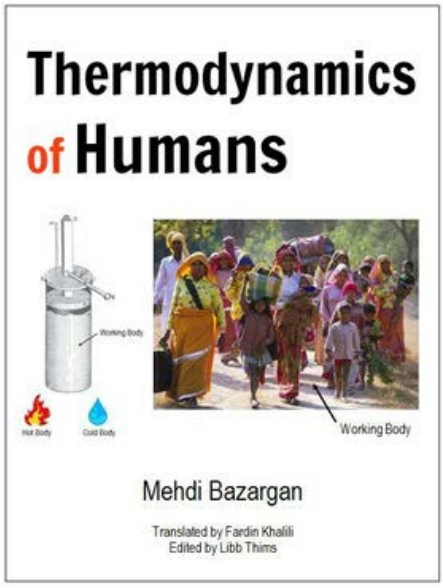

Current working draft cover (18 Apr 2013) to Bazargan translation project.

> "I think your choice of Abdol Ali Bazargan is an appropriate one. As far as I know, he has been in US for quite a while and giving lectures both in Farsi and English. I would like to introduce another person to you if you could get the hold of him. Dr. Mehdi Bahadori-Nezgad, you may already know him. I think, if he accepts, Dr. Bahadori-Nezgad is one of the best choices to either do the translation or the proof reading. You can read his Vita. He is a mechanical engineer and one of the earliest students of Mehdi Bazargan. His classmate and one of the closest friends was Dr. Mostaffa Chamran, who passed away during the Iran-Iraq war. Although I have read the book and have enjoyed the subject in quite a while ago, but thermodynamics is not close enough to my field to get engaged with the proof reading of the book."

On 16 May 2014, Fardin Khalili emailed Libb Thims the following note:

> "I just graduated and I am done with my thesis works that has prevented me to work hard on translating the book. Right now I am free and will continue the translation. I estimate to finish the translation by the end of summer."

Human thermodynamics | Kenoun translation

The following is the excerpt, from pages 4-5, where Bazargan uses the term "human thermodynamics", specifically in brackets, referring, it seems, to the general subject of thermodynamics applied in sociology and economics, as translated by Iranian-born American engineer Robert Kenoun, with commentary shown in brackets. [11]

> [With all the respect for Mr. Bazargan, I do not like his writing; he could have done a much better job. For such a difficult subject using long sentences and figurative phrases makes it harder for the reader to follow and grasp his thoughts and ideas much less to translate it in another language. He also uses a lot of Arabic words in his writings, which is natural for him due to his religious conviction to Islam and Arabic language that Koran uses. I have translated this page as close as I could to keep its originality unless figurative use of words interfered with meaning. In that case I tried to preserve the meaning.]

To escape from such a misery, there are two options. One, to make an attempt, even if it is a lousy attempt, to explain the principles of thermodynamics and their applications in the footnotes, and try not to sell them as science. Also, try to avoid detailed explanation and prolongation of arguments of connecting subjects to refrain from confusing those unfamiliar with the subjects of mathematics and thermodynamics in order to preserve the totality of the main subject of thermodynamics and to continue further discussions that follows. However, one should not expect that as the validity of thermodynamic equations and their results are proven scientifically, be also believed in the mind of the readers. The very elementary idea of application of thermodynamics in the field of economic that we discussed in a chapters in the middle of the book, nowadays, is much more advanced than once it was presented. Although these theories still incomplete and in infancy stages, but there is much hope for finding more common grounds between the field of thermodynamic and other sciences such as social and economics. Nevertheless, the help we have received, in this chapter, from using few simple mathematical equations may not produce a conflict with more common topics discussed in later chapters.

> [This is exactly where you got stuck. The worst sentence written here that I cannot make sense of.
> Here is my take and understanding of this sentence; not an exact translation but the meaning of it.]

> [Bazargan is worried that scientific community may excommunicate his book because he has brought the notion of God and religion in such a scientific discussion like thermodynamics. To avoid it, he suggests that all topics related to 'human thermodynamics' and God/religion be separated and discussed in the footnotes. I believe he refers to the scientific community as "those better than us"; an exact translation. Continuing with the rest of the page.]

Nevertheless, readers should not disregard the footnotes so that they, too, not to be included as part of this community, i.e. “those better than us”.

> [I guess here he even insults this community as “dumb donkey” Anyway the text of the book (referring to the scientific notions) and the footnotes (referring to matters discussed in relation to God/religion) each has its own independent approach.]

Anytime there are similarities in the results and conclusions between the two approaches, they are stated in the footnotes and if the reader finds one to be nonsensical it does not mean that the other is too. The reader should also be aware and not to expect concrete results and mathematical proof for our approach (referring to footnote material). In this approach, the pseudo-science, i.e. “Thermodynamic of Life” has been equated to worship, love of the heavens filled with stars and fields that are full of flowers. Since human and social activities fit within these two limits (*I guess he means approaches*) inevitably in their journey through the territory of love and worship, they will face so many humanitarian issues that when they are observed and analyzed from this perspective and approach it would be much more interesting.

> [This last paragraph was very poetic and he used words in figurative phrases that the exact translation to English would have been too confusing and nonsense. Again, this my understanding of his mind.]

Human thermodynamics | Google translate

The following is the excerpt, from pages 4-5, where Bazargan uses the term "human thermodynamics", specifically in brackets, referring, it seems, to the general subject of thermodynamics applied in sociology and economics.

براي فرار از چنين بدبختي دو چاره جويي كرده است. يكي آنكه سعي نموده است
مباني و مسائل ترموديناميك ر اكه مورد استناد قرار مي گيرد، به هر دست و پا شكستگي
شده در پاورقي ها تا اندازه اي شرح دهد و حتي المقدور كمتر علم فروشي نمايد.
به علاوه ربط مطالب را با بعضي تجديد مطلع ها و تفصيل ها- كه به نوبه خود مزيد
تطويل و تصديع شده و قبلاً معذرت مي طلبد- طوري ترتيب بدهد كه اگر
قسمت هايي مفهوم نشد و براي بيگانگان ب هترموديناميك و رياضيات مبهم بود
مع ذلك رشته ي كلي گسيخته نگردد و تعقيب مباحث بعدي امكان پذير باشد. ولي
توقع هم نبايد داشته باشيد كه نتايج و فرمول هاي ترموديناميك كه در جاي خود
مسلم شده است در اينجا و در ذهن خواننده نيز به اثبات و يقين برسد.
فصل وسط كتاب كه استعمال ترموديناميك در اقتصاد مي باشد خودبه خود توسعه
و تفصيل خارج از تناسب پيدا كرده و بيش از آنچه نظر ابتدايي بود جلو رفته است.
مع ذلك البته ناقص است و گمان مي كند در اين زمينه ميدان تفاهم و تشريك
مساعي مابين ترموديناميك و علوم اقتصاد و اجتماع خيلي باز و اميدبخش باشد. در
هر حال استمدادي كه در اين فصل از بعضي فورمول هاي ساده رياضي شده است
مانع تجديد عهد با فصول بعدي كه موضوعات عمومي تر مي باشد نخواهد بود.
و همچنين براي آنكه ارتباط « از ما بهتران » چاره جويي ديگر آنكه براي خاطر دسته ي
طبيعي مطالب با مفاهيم ديني و اسلامي موجب طرد و تكفير متن كتاب از ناحيه ي بعضي
استقلال خود را از دست ندهد آنچه « **ترموديناميك انسان** » روشنفكران نشود و موضوع
را كه پاي خدا و كلام خدا در آن مي آيد جدا كرده در پاورقي ها جا داده است.
مع ذلك به كليه خوانندگان محترم توصيه مي نمايد پاورقي ها را هم نديده نگيرند تا)
خداي نكرده مشمول آيه فوق الذكر كه در شأن... الاغ نازل شده است نگردند!..). در هر
حال متن كتاب و حاشيه هريك براي خود جرياني مستقل دارد. هرجا نتايج و ربط هايي
پيش آمده است كه ب هگمان نگارنده قابل تطبيق و قياس با آيات قرآن و كلمات ائمه
است تذكر و ترجم هاي در ذيل صفحه داده شده است و اگر يكي از اين دو جريان
به نظر خواننده كج و بيراهه رفته باشد دليل بر انحراف ديگري نبايد گرفته شود.
انتظار ديگري كه نبايد داشته باشيد رسيدن به نتايج بسيار قطعي رياضي در اين
است. در اينجا ترموديناميك در زمينه حيات « نيمه ادبي- نيمه علمي » قبيل مباحث
انسان به عنوان پل ربط و معراجي از صحراي پر از گلِ عشق به آسمان پر از ستاره ي
پرستش انتخاب شده است. نظر به اينكه فعاليت هاي انسان و اجتماع مابين اين
دوسرحد يا بر حول اين محور در حركت و گردش مي باشد، ناگزير در سفر از ديار
عشق به ديار پرستش از بسياري منازل بشريت و مناظر انسانيت عبور خواهد شد كه
وقتي از دريچ هي جديدي ديده مي شود ممكن است خالي از تازگي و تماشا نباشد.

***

To escape from such misery we have used two saving options. Firstly, we have tried to use thermodynamics principles and applied issues in the main part of the text and to use citations in the footnotes, to some degree as possible to describe sections of a secondary nature. In addition, with some relevant content and reformulation of details - which in turn worsens prolongation of concept for troubling and already demand - so we have arranged the main parts of the concept and its math the overall field is not disruptive, and pursuing further discussions are possible. But we should not expect the results of thermodynamics and the formulas used in places clearly here and in the mind of the reader to prove to be certain.

The middle chapter book is focused on the use of thermodynamics in economics as in the spontaneous development of proportion and detail and have found more than what was considered the primary. The course will be incomplete and one will consider this field in this area of understanding and sharing effort between thermodynamics and economic and social sciences very open and is promising.

Any appeal in this chapter to simple mathematical formula has been done to prevent re-promise that next session with more general issues are not. They also communicate, with better choice for those seeking more explication for the normal subjects with connection to Islamic religious concepts are found in the causes, and are thus an exclusion and excommunication from the main area of the text, so that the textbook will not lose its independence, in what intellectuals may call **"human thermodynamics"** and not be directly connected to subject matter of the second part of the book, that in the footnotes, of God and the word of God.

To all readers, editorial recommends users not seen them until now God not subject to the above verse is used in dignity. Assurance is revealed. For the textbook is now and your margin for each stream of discussion is independent. Where relevant results and some before that the writer has adaptive and comparison with verses and words of Iman's and interpreters is reminded of the following page has been if one of these two flow the singer is tilted and went astray because of the deviation should be another. One should not have expected the other to achieve results in a very definite mathematical way.

The [typo] thermodynamics of life is thus presented here as "semi-literary" and "semi-scientific" topics relevant as a bridge from desert full of flowers to love the sky full of stars. Worship is selected. Considering that human and social activities between these around the axis of the movement and circulation is forced on a journey from the land of love to worship in many homes, land and landscape of humanity and that humanity will pass when

a new day is seen may not be empty recently and watched.
* * *

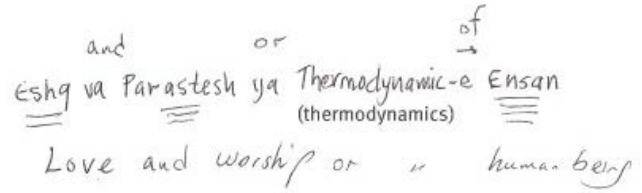

Translation by randomly-polled Iranian-born American, indicating that the title means: **"Thermodynamics of Human Beings"**. [8]

عشق و پرستش ي ا ترموديناميك انسان

A poll of an Iraqi-born American indicates that the above Farsi title means **"Thermodynamics of People"**.

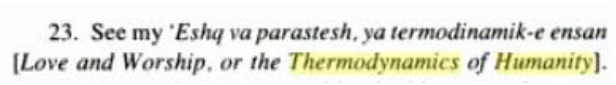
23. See my *'Eshq va parastesh, ya termodinamik-e ensan* [*Love and Worship, or the Thermodynamics of Humanity*].

Above: Footnote twenty-three to Bazargan's *circa* 1980 article "Religion and Liberty", seems to indicate that Bazargan calls his own book **"Thermodynamics of Humanity"**; this, however, may be a which may be a secondary translational interpretation? [2] Right: a 2014 translation by Iranian-born American translator Sadegh Simorgh.

Title translations issues

There seem to be many variations of the English translation of the title of Bazargan's book including "Man's Thermodynamics", "Thermodynamics of Humans", "Thermodynamics in Human Condition", "Thermodynamics of Humanity", "Thermodynamics of People", "Thermodynamics of Human Beings", or "Human Thermodynamics". The pure Persian/Farsi title, according to Google translate, reads:

عشق و پرستش (love and worship) ي ا (or a) ترموديناميك (thermodynamics) يك (of) انسان (man)

The last part, taken together, however, translates in a politically correct sense as thermodynamics of humans: ترموديناميك انسان (thermodynamics of humans), as indicated by Google translate. If the book was to be republished and fully translated in English this would seem to be the correct modern title, i.e. *Thermodynamics of Humans.*

The book began to be cited in secondary English works in the 1960s or 1970s, under various titles (some as listed below). It is not for certain whether there is an actual English translation of the entire book? There may have been one published in English in Houston by the Book Distribution Center in 1978, as this is a common reference; although more investigation needs to be done.

The actual English translation of the Farsi title *Eshq va Parastesh ya Termodynamik-e Ensan* differs depending on source, which include: *Love and Faith: the Thermodynamics of Human Beings* [4];*Thermodynamics in Human Condition* (1969) [6]; *Love and Devotion: or the Thermodynamics of Humanity* (1978) [7]; *Love and Worship: Human Thermodynamics* (1979) [3]; *Love and Worship: Man's Thermodynamics* (date); *Love or Worship or the Thermodynamics of Humanity* (date), among others. In the 1998 English reprint of Bazargan's article "Religion and Liberty" (c.1980), as shown in footnote 23 (above), it seems that Bazargan calls his book, in English, the *Thermodynamics of Humanity*; although, again, this may be a post-humorous translation interpretation. Post 1979 English reprints of the book tend to retitle or translate *Termodynamik-e Ensan* as *Human Thermodynamics*. [3] A yet another (1990) reference states that, in English, the book was called *Love and Adoration, or the Thermodynamics of Man.* [10]

English translation

Shown below is the partial start of a straight Farsi → English Google translation of Bazargan's book using a 216-page PDF version of the book sent to American chemical engineer Libb Thims from Bonyad Farhangi Bazargan (of Bazargan.info) on 27 Apr 2010. If you are fluent in both Persian and English feel free to correct the mis-translated sentences (which are many).

Page 2:

Topics basics (Complete Works: 268)
In honor of my mother, homonymous S. Kobra, example of Loyalty and sacrifice.

Submitted to:
Dear friends and relatives during the Involvement with munificence and kindness and Tafaqodi, Prove they dare to express magnanimity.

Page 3:

Introduction:

This book brings the first months of military prison governor (April and June 1334). Fortunately, reading and writing was prohibited? Therefore, major employment - which This case should be forced to put his name activity - was turn the book. A value Book legend and the novel love books, a bit of religious books Person's story, such as prayers or faith leaders and topics, ie the destination of their written Nature worship is eternal. Thus strengthening the spirit of passing time and provided with Acquiring new knowledge from deprivation compensatory activity to act abroad, respectively. Also, the book Thermodynamics industrial house I had asked about the opportunities available subject A few years ago that Wedgwood Hshbahty between verb and its chemical sense Lhay Anfa I think I was. The combination of these three factors hefty mixture was digested with shame that now all Service are presented to readers. How nice savings and be helpful I do not know. Entertainment for the author has. If the reader the tedium of employment empty Is very satisfied and will be Shaker. However, the bad and good legs who must Be written that caused unemployment and involvement in this ... So that as the book suggests, the book includes three types of content are: First, Love all the less desirable and famous. Basically someone dislikes it will not be revealed (Especially in the nation Sharmslk Iran). Secondly, worship; serve as Hdalay love But it also was said host name of God and God gives the smell and the fairy say This offends the talk. Or "smart set" Bismillah might enter the river

page 4:

Topics basic (Works 270)

A god who did "not ANOVA, Fischer exact M. H. R. M. S. M. tons R. F. you. R. F. D. M. N Qs and R. conducted "true verse Khran are like frightened that Solat milk can escape from the word Rome Do! The third is thermodynamics, Items to be other than that I think people The few school have been forced to drop this course, theoretical (and certainly forget Have) very upset and worried others will ... Short of reading the book does not predict! Ali remains and Hvzsh!
* * *
To escape from such misery has two saving options. Rather one has tried to R. Ak·h thermodynamics principles and issues cited is placed, each hand and foot fractures In the Notes, to some degree as possible to describe and to lower marketing. In addition, with some relevant content and re-informed of details - which in turn worsens Prolongation and sorry for troubling and already demand - so if you arrange Parts of the concept and not for foreigners was vague and math b Htrmvdynamyk M Zlk the overall field is not disruptive, and pursuing further discussions be possible. But Should also expect to have results and formulas in place of thermodynamics Is clear here and in the mind of the reader and also prove to be certain. Middle chapter book is the use of thermodynamics in economics Spontaneous development Out of proportion and detail and have found more than what was considered the primary front is gone. M Zlk course incomplete and they will field in this area of understanding and sharing Effort between thermodynamics and economic and social sciences very open and is promising. At Any appeal in this chapter some simple mathematical formula has been Preventing re promise that next season with more general issues are not. And also they communicate, "we better choice for those seeking Moreover, for the Normal subjects with Islamic religious concepts and causes exclusion and excommunication from the area, some text books Lose its independence, what "**human thermodynamics**" intellectuals and not subject That the foot of God and the word of God that comes to separating the Footer is here. (M Zlk to all readers edit recommends users not seen them until now
50 and 51: Hand Rmyd Gvrkhrany telling that [front] milk flee. / (1. Mdsr (7

page 5:

Love and worship (Works 271)
God not subject to the above verse in dignity ... Ass is revealed Ngrdnd !..). Per Text Book now and your margin for each stream is independent. Where relevant results and some Before that the writer Hgman adaptive B and comparison with verses and words of Imams And interpreter is reminded of the following page has been if one of these two flow The singer is tilted and went astray because of the deviation should be another. Should not have expected other to achieve results in a very definite mathematical Is. Thermodynamics of life here in "semi-literary - semi-scientific" topics such as Human levitation and relevance as a bridge from desert full of flowers love the sky full of stars Worship is selected. Considering that human and social activities between these Dvsrhd or around the axis of the movement and circulation is forced on a journey from the land Love to worship in many homes, land and landscape of humanity that humanity will pass When a new Drych Hey is seen may not be empty recently and watched.
* * *
Thermodynamics principles long ago in many science and technical issues and theoretical The overwrought and the results have been remarkable. Maybe Zys Tshnasy and Human activities as well as the earlier and better than what this book is trying to work Be taken. Of course L Alfzl trick D. M. height . In any case, is necessary in any thermodynamics Where the local dress and the color of the analogy and metaphor to sustentation to ethnic language Talk to the parties understand each word. Entering the world and full of endless forms Of life and distorting some of the inevitable adjustment will be necessary. Certainly at the foot of thermodynamics And work here at the beginning of a more lame and stuttering tongue Dartr other places will be. At First steps and precautions for brevity should not accept large items to be delivered. Lack of Writer and a bit identification and qualification opportunities for entering the details of expression but Approximation could not be. With such a confession and apology is hoped that any courage Hsaht b popular Holy shrine of love and worship and every error that contributed bright spots thermodynamics Is entered, in favor of reform and readers should be elevated Tkmy Lknndgan

Page 6:

Topics Basics (Works 272)

مراسم نماز عیدفطر انجمن اسلامی دانشجویان دانشگاه تهران، در گلشهر کرج - سال ۱۳۳۷ (افراد شناخته شده از چپ به راست: شهید محمدعلی رجائی، مرحوم دکتر علی شریعتی، دکتر کاظم یزدی، مهندس اکبر رائی، مرحوم مهندس بازرگان، مرحوم آیت‌الله طالقانی، شهید مطهری، دکتر غلامعباس توسلی)

Photo on page 6 (add: English translation of caption)

Page 7:

Chapter 1
A Few Words of Love

Page 8:

"Topics basic" (Works 274)
-1 0.1 world of love
First previous love life and people have been flirting. I am also a poet and artist in this Feeling nourished and soft areas of competence and aesthetic view I have in mind. Personal taste and sense of love Nchshydh step in the valley and the world of lovers and fascination with beauty I did not perfection. But, according to such well-known, if I have eaten wheat bread I've seen people get. Briefly describe the love and heard my calling.
* * *
Of scientific books and correspondence from anyone serious life, religious books and literature The moral that aside, what should be said of human poetry, poems of love Is. Tales of childhood to the end of the wedding is, in ancient legends and literature All Zba Nha often love stories, poems and poems of poets throughout our role Yar has occurred and journalist, wrote of writers in Europe and theater and cinema with a brief exception Love and tinker around the axis M Yznd away. Melody is music lovers. Artists, authors and readers are all beautiful panegyric Food is love that has been: What everyone is seeking partners and how drunk alert Home is everywhere love what what Knsht Mosque Books mysticism and wisdom to express the meaning of the original and delicate thoughts, the language of Gvyatr Languages are not love. All love turns tail. Love of course different with different titles. A point is not more than sorrow and love this too Kz any that I hear is Namkrr -1 0.2 you must love into account? It is true that love is out of discussion of serious topics of science and love working Is hidden, but if you can camouflage is not deniable. Although the poet used exaggeration and hyperbole to say to and work of artist and writer Musician and writer, and all show that certain lines Brjst Hkrdn desired

Page 9:

"Topics basic" (Works 275)
He is. But - not Chyzky people refrain from things. Can not deny the fact that They love to both accepted and rejected is legitimate or deviant and one Work is a major absorber of humanity and the cause is very effective in individuals and Communities played a major role and will. Whatever your love, whether fictitious or Available, it works visible and palpable. What was visible and tangible and effective, Can not be scientific topic and the direction is not significant. Can not deny the fact that a lot of obstacles in the heat of love your way Water can. Fu Qaladh and fills in its own to create. Literary and artistic masterpieces, and how many military conquests and political success in the following Blazing flames of love has been made. Or when the heart person under Severe body functions have been located. N stage determination to love before you step profits Ray B. you this journey can we

possibly Jazbyt and reality is something natural and true love. Instead of telling someone Is, sentiments fills falls and manage intelligence and other talents Adjacent and internal to the weld and the incidence and appearance come. Maybe next welding and That b stimulation Hadmy refurbishment and gives liveliness. Quote old young poets Be. If Yar Zll lip kiss by a young myself and I live over again I g. -1 Types love and power, 0.3 Various aspects of courtship and lover is different. Sade Htr and what is more normal and Sh Qha other basic scale is, love and sexual attraction is a male and female signs. This

Realms universe behalf of human animals (and perhaps species) and the connection will be extended. In the world of animals who hypocritically empty artifice and poetic is Tkhy Lhay Strange power of this phenomenon is better and size charts and praised it easier. Since the creation of nature and will clearly look and Gray will provide gift Particular score is the man who created and deviation does not disorder, can be better Quality of this reality and realized it believes ...

Page 10:

"Topics basic" (Works 276)

Biology scholars say the main actions or signs of a major three things in life Are: Nutrition - exchange (with external environment) - Tvald. And these three things that goal Their common survival and survival is, rather more important and others sacrificed their Makes the third act and the sexual instinct is the reproductive factor. Rather than that some Insects do not come into the world, except for mating: males and females were immediately pleased . His life from night to morning after spawning done nothing touches the eye turvy 2 Many kinds of animals for the sexual act only because they felt Is. Faber 3 famous scientist who study courtship or copulation Yknv of the spider 4 5 to see. While the male "love of power above the power of death is His favorite was hard embraced scientist sees animal material shall Eating poor husband is a dispute. Nothing without love dedication Pressure to reduce the warmth and love and so much loyalty and dedication continues to Fkyn Ruthless lover to love about belly tank been sympathetic Mydrd sexual glands. At The time is getting rid of ... Sense of self-protection in animals and defense of survival there. However, cases and examples That indicate a sense of self-preservation (ie selfishness) in the sense of sexual and production Generation and maintain the shield pockets are numerous. Love and wars that predators and Chrndgan mating season for the kidnapping and the owner of a substance (or flock material Deer) and shall lead to victory coupled with a strong male will kill other males, Evident from hunters and Zoology is normal. Thus the nature Before the conclusion of its security and generation of B Hhfz uprising has weakened individual does not Producer and the donor are inherited. Also has a female serial. Predators and boldness that Article animals defend their baby shows sometimes Shdydtraz heat Males

Notes

1. Fonctions; 2. Les Ephemeres; 3. J.H. Fabre; 4. Mantes religieuse; 5. L'amour plus forte que la mort.

Page 11:

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When mating is. Maternal love, which comes after sex love it Is stronger. Poets, we all reap Ghprdazy of metaphor and the right to say that the singing nightingale in Hand For the flower lover and is popular for. Not only but other birds and insects nightingale The spring flight and song will they burn the desired sex are followed. Animals, like humans and H. efflorescence d d action and manifestations of the best works Existence during the lover to occur. Mystics from the world of animal and human inputs on each foot beyond the city walls occur as partners and saw Hand N and every instrument a love song heard, the world breathless and with the manifestations of life and love birth Are known. Roman Rumi says: Of course the reactions of love Kunder M. Ftad fire of love Kunder N Ftad Soil body was lying on the mountain of love was dance and pep was Rejoice we love a good soda because of our medical Plato and our Galen you with his arrogance and honor our medic The creation of religions and their training officers are bound to observe the truth were known The tail of love and the servants are surprised. Founder of monotheistic religions on earth respect All of them are, Ibrahim (Ali Nabi Ali ship Hals Lam) is. Khalil Ibrahim. Khalil H. M. Nyfa Q L M you and us ... "the friendly. Loving God! Quran makes him such a description Al-Omran / 67) Abraham was Hanif (Hanif miles and the Taliban). "Kan M N chagrin Shrkyn Right). M. tuberculosis was M. (submitter to God) and not an idolater (other than servants of God and to love No longer push) Christians, their religion the religion of love and know. Jesus came to say Who love (to love God and love to create them) to train. There is no word love in the Quran (the Persian word is more poetic Arabic. Perhaps the time has not been in common use, and now the Arabs love b c say). And They based education and training based on refinement and put contemplation, and belief and certainty Have been asked to open everywhere you speak words like B. D. Gha’ and quite Hezbollah (search and

Page 12:

"Topics basic" (Works 278)

Demand on God) - a pill van Allah - Allah parents - a row Van L Qa’ God - maximum b c God etc. "Heart" is. Aside no faith in Islam and the Koran than it is known to enter Is not acceptable and effective knows. Believe work is the heart and the heart of the believer, the name of God Is blown. Believing and seeing the signs of God's revelations to the soil falls and tears of joy "Ask" comes. Order Holy Qur'an repeatedly makes me read me Come unto me. This Dargahan we Dargahan not despair if you repent Sdbar open fracture Ay Love as if that criticism fail impurity, jealousy accusation that alien traits Mshvqhay earth is the Eternal Portal is love. Because they are not only Property to love their hearts are pure will, the Koran also promised each fault

Forgiveness will save Shrek: A. Lai N God Ghf Shrek to the thigh and the infrared Ghf R. Zlk L M N The Sha’. (Nisa / 48). Does not allow the love and serve God as though No one who Is (Beth - Shafi - partners - hypocrisy - Find - a reward - fear, etc.) to share. The heart of believers and religion is for God and Khalsa Mkhlsa hard to kill him; least N Fm a row Wa Kan L Qa’ R. B. Fly the paternal uncle Sal Mola L AS Lai Ha and Shrek Bbad conducted R. B. the اح da (K · hf / 110: Say Everyone is so desirous of meeting with their Lord is required to do practical work Worthy, and the servants of the Lord No one partner does not.) The Shia religion, so you know, if accepted religion and province to province, known In love across the board. Dahayy imams who come across Tkbyr and hymn the praises of With God and want a reminder that the great goods and attributes of God forgiving and purity and Magnanimity and other traits Jlalh, love him to much at the heart of a Muslim. Imam Sajjad (AS) taught us prayer Abvhmz·h Smaly stated: Allhm you OWN Asylk it Tmla and cardiac b c elk (the heart of God you want me chock-full of love You have to), and Sb inform Qayk Li L (Khatrm meeting and appointment in the popular turn), or Ghay T في R. Ghb T (o But my wish and desire) 1

Notes

1. Dahayy course taught us that the Prophet other than Hand Dahayy that is common to us. We pray World and ask ourselves easily. God to serve them Tlbym. They need prayer and love have secrets And God himself would serve him leave. Zkrshan describe the greatness and perfection, and Sobhan

279

-1 0.4 Generalized love Human evolution and diversity of human traits very wide range of mind and has variable. Here, the issue should love a wider horizon and fuel types and Atvar Hdartr much and And numerous aspects of studied. What makes something easy is that despite the different scenarios Different and contradictory purposes and Z Fhay high intensity, common in all these respects Love that course, many names are found there. If the destination is different, Source unit. Is a secret love jokes that it delivers That its name not ruby lips and legging line is The names of the degrees of Sade such exponential words and asked to beg, desire Or order started Bhsb intensity and Zfy Khvahndh that is important or Which is called gravitational words such as destination or purpose, need or needful, Desirable ideals, popular and beloved arrives. And finally lead to God. All of it for that person to reach the other side, and his desire to create Internal and external movements to a kind of love will be: Love was not in any one certainty insider Everyone has thought in terms of understanding

Notes

Variation of praise and satisfaction are believers. Considering the greatness of creation machine has the humility and self blame Sorry to be. They ask for forgiveness and request shall esteem. Contrary to our complaints section Protest delivered to your work and God's hand only when caught praying and begging removed creditor We are. Ash Qand it and we M. de attempts Their patience and Faraj want more and better ways to collect on the problems and Abtlahay right to bring home. Higher strength and effort and win the race and serve Yknnd M. demand action. (Camille is in prayer: Swan St. AS but tail K d c Varhy and maximum D. A. but Alzym conducted J. Van living. B L E and shall Aljd mischief Khshy K d and Ald loan F. Yala Tsal Depending tail K d Asrh or even mischief Lake Squares Als Abqyn and immediately Lake mischief or chagrin wind Ryn). In front of us to escape Karda duty and God and we want to put on our own instead of serving the homeless and train their Persist. B Ysy expectation and suffering, free and clear step from heaven! Language to pray to God in love and now want to read and is beloved. Requires knowledge of worship and then Is. In fact, all knowledge and faith to find love at home is like getting to know and pray to God Bdrkhanh like squash to be informal and ask for service.

"Topics basic" (Works 280 (1

Lover who currently have nothing to do and what is desirable and what degree of external reality and Have the ability to love is. What is important and indisputable fact that such a state in humans and Of activity is found. Human existence, whether it across or under the command of the material Ink spiritual know, is up against love. Is hot and inflamed. To Next to come and weld enter. His body and nerve activity to find and work with this Intimacy and exhilaration do. The appropriateness and understanding are for it. Like that Previous provision, and it has been their home appreciation. Because nothing in human Love (meaning both in positive and negative directions) to movement and activity comes Drnmy. After the real love is real. And when Love in front of hidden assets out Comes to existence and may be used in pockets after he made for the same work And discussed. Now if we consider that love is with different stages Steps it is found that a person against his love and sacrifice can forget, Will reach a deeper Astnbathay Bahri is a measure of love is not alone Hychsh But they die there is not remedy Before we reach such a stage of deep and accurate, the normal process of post We see that we get very present in the collection or spending time to think or Mqsvdman property Bnmayym, Let your Bzhmt, from selfishness to accessories and let inoculation. In other words, just love feeling a sense of self-preservation and survival picture is. M Zlk Feels natural and the human (or in life in general.) And with all the horns and Which leaves it to the poets and mystics Hand of material and scientific phenomena and undeniable Is rather remarkable. Henceforth to our other female lover, or the opposite sex with charm and Attractions passionate and is not a hobby, but every good purpose and will be included. Intention is that as a simple single photo, all the objectives and the origin of life Activities of human physical and mental we have a gathering. Including food, Clothing and Shhvat sexual instinct, emotion, taste, art, and material credit Affairs

Note

1. Psychologique

Love and worship 281

Spiritual, physical and psychological (and physiological Psykvlvzhyk) or carnal miles. Apparently this Generalization error and facilitate the way we have gone. Because the manifestations of life is very active and Tha Except where these activities of the purposes and issues that interest or need to be human, Does not originate. The day a person and a desire to taste what is not of any practical

Does not. 0.5 -1 need Now if you consider that the desire to seek love and when that person loses

In need of his or catchy feel the opposite side (namely the need to open Yknv But that is the need to confront the man is feeling and stimulation), We say that the source and origin of all manifestations of life and active Tha is no need Life is needed. With the difference being that the latter Ghyrzndh No sense of hunger or thirst, or lack of and need not Ynmayd general. He claims there is. "Out" but the first thing that needs to

"Topics basic" (282 works (

Chapter 2
A Few Words of Life

We said love and worship. Enough. Speech is not the end and be rid of it. Poetry with repetition Leza Nalghyb Hafiz: Bahri is a measure of love is not alone Hychsh But they die there is not choice. Go head man thermodynamics. Thermodynamics us to see what the land borders. Of course, the first start of human life.

"Topics basic" (Works 284 (1

0.1 -2 orbit life And filling the deficit and without prejudice "need" of human (and in general any living organism) to resolve That feels itself, and the rush to move in and demand comes. Purpose seems to And preys lover or blends. The fire of love or need or appetite, he gradually reduced Be. Peace and settlement and satisfaction and depression in other words, he obtained Be. Turns off. May even go to sleep. Thus a period or a cycle of actions to head home his life purpose
Appears. Thermodynamics called a small circuit during makes. Circuit or garlic Packet, first it was stillness, and strength was needed appeared, causing the need Movement and were active, and joiner work leads to success, the concession activity (Results were terminated and this became the stillness. (Forms 1

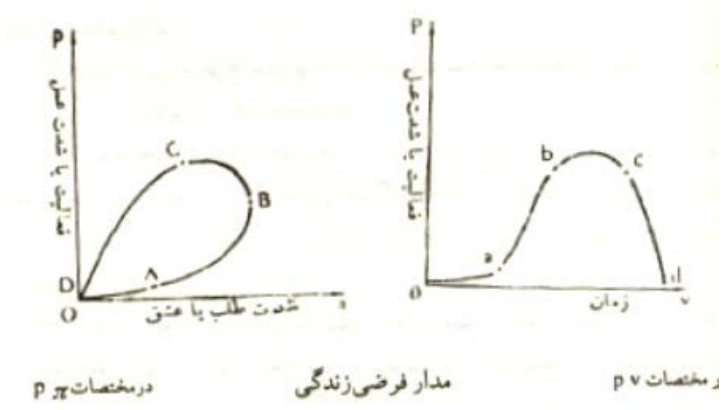

pπ (dmkhtsat?)	Hypothetical circuit life	pv coordinates

Seek or need it appeared extremely leaves. After a while (in the Source o Activity begins. Activity and demand is increasing both in until (a and A points Browse a review is needed to find discount. (B and B activity reaches a maximum (around Can. The low activity can finally be achieved Browse and off (points

Page 19:

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Supposed that this small circuit for all living creatures to the incessant D. M. Death (or to sleep at night and death, like winter Khva price) and may be repeated 1 say. However, "a singular orbit" or "circuit element of life is simple or compound is Degree of need and longing and love stronger activity is more severe and longer perform Been, the circuit will Dartr domain. Which we have called it arrogance, representing the amount of work that a person (or if p Available) on the way to the Beloved collected per unit time gives the circuit area Show time), the equivalent activity or something that v) v and p coordinates oabcd While the circuit element has to perform for the beloved.

$$K = \int Pdv = A$$

Yknv only need to have, and such a simple food adequacy of their lives May call, own lifetime exclusive and limited to a singular orbit above will not. Needs Numerous and diverse and are found consecutively.
Firstly, to supply any need to be simple primary circuit to separate during (May in time become the consistent and ink). Secondly (point) after an order to come to drink and needful satisfied Were stagnant, such as not being equally. Hunger, thirst, need oxygen, etc. Sraghshan comes back. So that the collection should be open to new needs and demands Fall to the hands and feet. Thirdly environment in which agents live and brings the issues recently They face the changes, problems, risks, etc, this also forced to pay Performed during the reaction or defensive circuits are. That may be separated from Be. A, v and p or main circuit and it coupled with increased

Note
1. Cycle elementaire de la vie

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"Topics basic" (Works 286 (1
Raba (sensitive points) circuit elements in terms of the above is true External activities and emerging needs in terms of internal disturbances is blocked and this inactivity Is leading, but always an influence and change the interior (and sometimes In addition, existing outside) leaves the same arrangements and the emergence and growth The new structure within the existing (and in the external environment) is. The members or For his part, needs the new organization and new Drkhvas Thay shall require That lead to proliferation and the development and sequencing circuit is. For example, a drop from the ommunity of male and female gametes is true, is an animal Cellular and need to potluck. Movements and activity with low to attract and Food disposal. But the result of feeding can immediately start Anqsam. A two-cell and cell Four thousand cells and cell was a colony established that the nutritional needs It is far worse than the main drop. Then simply become uniform, Mjv F. and Ghyrmtqarn be. Cells with the situation inside out has changed and therefore Need different types of activities they can find. Rather than gradually during the scenarios Embryonic, cell and tissue function, each requires different needs and requirements and Different if the baby has come out and wide open environments with high risk Ghyrmanvs Are facing. This time he needs air, water, food and protection against cold and Heat and environmental factors. For they cry when he does not need to bring milk. Instead of warm and soft and his occasional Ngahdarnd Fzvlatsh lift. But some day when Eye and ear over and opened for him, if in addition to the above equipment entertainment See and hear do not cry will provide. Than those who feed him and Intimacy to play next to him if found to be around and cry to foreigners Makes strange. Will find the need to socialize. Slowly slowly grown feet and hands Child while trying to get equipment and objects and throwing and walking Falls. Ten times the stairs rises and falls. Objects at hand if he is Enough to bend their will and right to reach them after the

harvest forward Can throw away from him again need to be prowling. Thus Zlatsh is strong and stands on the foot. Strong muscle movements, and other games

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Love and worship 287
New toys and more shall require and demand. During this time course, and other languages Senses he is left unemployed. Grows and the word goes back Hmshbt and learn. Of his curiosity is stimulated. The personality and self-esteem is gaining. Age That reached maturity in his original need appears. Until married and Child is not owner of batch Plan looks at low interest, but that the parent Mother was particularly strong feelings straight to the child sees him Many efforts to make and present operations. Emotional development of children with the song Instead, be renewed and strengthened and refined child Ygrdd M. ... As well as to life. Far above that in spite of prolongation and troubling speech reader, and sample stage Brief emergence and proliferation requirements and Sh Abtlahay Qha and was consecutive, all individual Was dedicated. Transduction in individual communities and their organization is up joint ... Such short fortune telling and the creation and public life in head Is living, just defective and needs to be and always remain incomplete and needy. However the need for removing and collecting the desired or can rush first lover Ahtyajsh For always not saturated and supply, will occur again. And secondly, any progress and growth Need a geometric progression on the need arise. No matter how open horizons of life and Further forward, more needs. If the environment for human needs and problems Investigate and explore new faces defeat in person before, Desire brings new shower. According to Baba Taher naked: G's and seen both the heart cry of the heart sees what he had learned Nyshsh Zpvlad make dagger to the heart of my wife had to be free Or interpreted wisely and Lvknt Dvnvyy a beautiful life of a consecutive series Imbalance conditions (dissatisfaction) has been arranged. So that the constant Tb was always in demand and tries to find growth and development. Wherever satisfaction Balance between environment and type of established, where evolution stopped Ygrdd M..
0.3 -2 meaning of life

Note
1. Le conte du Noly

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"Topics basic" (Works 288 (1
So the need for life. When the need for activity and appetite is there. The life Is. Gradually the need and appetite and desire and love are low, the growing aging goes. Finally, appetite and enthusiastically and love young. But joy of life and activity Both young. When all appetite and taste and desires were silent, when death is Like Jmadat ... Difference between young and old with the dead is not alive at this weight with less material Be. Or old dead weight and not the substance is not lost, but the degree requirements and He dreams of the weak or has vanished. Life is the hope Which makes up. Of course, need and desire Mnbs internal situation and the existing building Is vital, but finally the power and facilities primarily a function of love and hope Is. If the defect and therefore need not and need not Zayandeh action and love, the life of Not all the way to there not passed across: Shqym home and no monk Zsrhd
Yet despite all this climate to come my way If problems in love before and after sperm was little love to become young Rashid Were not human eyes and ears open and did not. Azadmanesh march and not learned. Him Such creation was not cheap to provide their own road to the left or B Hrast normal life
Go

Note:
1. L AS the future but while Ella M. Nsan N Ald every trick of thy Shyya M. Zkvra. or non Khlqnah M N Ntfh Amshaj ثم Nbtlyh Fj AS Lnah Q Mya B Syra or the ill-Nah de the Als Bill or M. or shock to you and M. or Kfvra (universe / 1: whether the man's name and address when urgently In no time. We drop him from the tangled complex have created, then we infected B Hgrftarysh, until He made a hearer and a seer. Then we guide him or whether Shaker and Hbrdar or disbelieve in the favor of and Denied.

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Love and worship 289
The main human capital in the valley of love and wishes is a request. Almost Internal energy stored in all of human existence Frakhvr what happens not to ask of him They will demand answers. Maythll afford and use, especially with the treasury which Second nature is infinite. Because everything is in pain is:
Notify me of that pain is your pain medication in the two world Tvast John Pain Nothing is a pain treatment, treatment principles will Vank·h he bases his life

Note:
1. Holy Lord in prayer Camille virtuous states: A. Ghfrl N M K Lai Mel or La Ald A' and Arh M. M N R. S. the property Paced (but please forgive him who possessed nothing and thanks Thumb B Hksy hope that gets cold). Ĥ Alrj 2. Imam Sajjad (AS) in one of the prayers seeking Havaeji Scriptures states: and county Algh from straw and M. A. not Tsbbhm But you Alfqr and from the M. Alfqr or Lake (whom you need and without means of need and poverty, and they raised their
To achieve the poverty and need from you are.)

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Topics basic (290 works)

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Chapter 3
Thermodynamics of Life

Thermodynamics is a science that more than 132 years of my life Ygzrd it. For Carnot Machinery and equipment for steam power generation

(mechanical force) into the heat Work, this knowledge is remarkable. And his studies on the relationship between these two energy - The heat and work - and the exchange ratio (balance coefficient) are obtained. Conditions "Carnot" essential work of heat production and efficiency (efficiency) heat machine own ideals Has expressed. Thermodynamics has announced two principles: The first principle, the principle of survival and stability of energy - the energy and non constant creation and destruction Is. What man or nature will be carried out if the energy conversion from If other delivery systems is also. The second principle, the principle of aging or degradation of energy - while energy and Thvy Tbdy Lha Lha of An effective value to be stagnant amendeth post. If the lowest temperature The heat Anrzhyst whatever degree is lower than is inefficacious. Energy Remains constant in terms of quantity but in quality degradation shall. Accordingly, thermal machines statute and regulations (and the reverse in Cooling machine producing cold) was prepared. Considering that the production and energy conversion machines unique steam and combustion and cooling And not in other industrial operations, and natural transformation of energy into the foot (especially Mediation with heat) comes in between the principles of thermodynamics and the results in other Hhay Rasht Industry and especially in physics and later chemistry and favorable results were used as income Was. Principle of thermodynamics two Qalzkr Fu and formulas relevant energies and opening keynote Password their relationship was (the light - electricity - radiation - chemical, even nuclear energy, etc. On earth or in heaven).

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"Topics basic" (Works 292 (1
Life is activity in the heat too. The thermodynamics as well. 0.1 -3 nosy thermodynamics in natural sciences It is evident that the circuit element life simple circuits containing a verb and Interaction and exchange are not simple. Works that are upon them and the emergence Mtrtb Members and new arrangements, all of the evil is very, very detailed and difficult. This In its general subject scholars Biology (Biology) and dissection (anatomy) And Zoological (Zyvlvzhy) and enter the details of physics and chemistry topics Especially organic chemistry is. Our competence and the right to enter this information and Necessary to discuss developments and how relevant do not Tbdlat. From evil We are. Thermodynamics is a science that, even on machines "watch" out Heating and industrial Asbabhay more or less artificial and his descendants are, interference And they did not pay attention to the interior, that does not work, for example engine discussed with Piston and cylinder or rotary Hhay P. R. . Speed and size and manner how it is. Thermodynamics wrapping machine pulled away view mode in fluid input and output Device shall. Issued and incoming energies account keeps. Exchange of Device itself can study abroad development. Next to these exchanges and The results should be the income was, to his dignified sustentation two principles firmly comments Will and shall confirm or Tvsy of ... "Consultative" Thermodynamics is not the first time in his head made crock other sciences Wants to sniff out what to spread their work released on the head, and evil Laws that they after years of extensive experience with complex inference Expressions Hand made, Under a simple mathematical formula to put the field and Vsyl Jlvyshan of use and Astntajhay give next. Electricity in heating, melting and extraction of the metals in Thermal radiation and chemistry and a verb and its bilateral Anfalhay this work has. What is a barrier in experimental biology and even an active economic and moral Thay Man may call faith! Young science of thermodynamics. Dreams of youth are not fault!

Note:
1. If you already have others here, but poor thing has not come better, Alfzl Llmtqdm.

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Love and worship 293
So in no way involved in the life of shoes you do not want to foot and scholars Byvlvzhystha Natural and even Fyzysyn Shymyst of Bnmayym. Ask yourself this very small circuits with life domains and courses Thousands of different and perhaps millions of times daily or annual human relationships (and any existing Living) environment is out of place during the incidence and the emergence of various activities Is, its energy Where to be and where? Under what principles and Is regulation? What are the results? 0.2 -3 compared Because of this, which enter the details and quality of vital activity and if Nshvym Could also seems to wash with a never ending variety of critical actions, by the formula General impossible simple unit is forced to express the interplay of vital resorted to Comparison and analogy al. Because prejudice and comments external relations with existing or desired His lover (who is out) is, qualitatively, the internal operation of the device (ie Body) in terms of thermodynamics and has no significance. Compared to which resort you'll get In terms of protests and foreign exchange is true, in general would be acceptable. Living in the last stage of analysis a number of chemical elements Simple, such as oxygen, Yydrzhn, carbon, nitrogen, etc., was established in Hand. Tissue, nothing except Organic chemical compounds are not. Also vital operations (especially opinion Materialist s) a series of action and chemical Anfalhay. Leading to extremely detailed and Complex. Therefore, we present a collection of live chemical or organization (Shymyk system) For comparison, and we compared one of the simplest act, for example chemistry and Anfa Lhay Combination of oxygen and Yydrzhn we consider are: Independent elements. Propertied. No origin alone (O oxygen (2 Namely that the independent element (H act and no energy source is not. But when the Yydrzhn (2 Is certain to face, if normal conditions, the opening movement and the effect of any update Does not. However, high temperature or in the vicinity of the catalyzer in the proper environment Favorable, these two elements together has grappled fills and super heat

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"Topics basic" (Works 294 (1
(If the frequency of blast material and very favorable conditions) have been appearing, in combination Is emerging. (H_2O) with their new properties emerging body of water called

$H_2 + 1/2O_2 \rightarrow H_2O$ + 68,320 calories

After which the resulting heat was dispersed again and the recession appears to be cold. Water Resulting also in turn may object, for example chlorine in the fall and another circuit and To renew the product. Similarly so on. Exists. "Affinity" to say Shymyst between oxygen and Yydrzhn We say about living between existing and desired object he needs or Alyh Need or desire and love there. That very large scale sophisticated substitute a life Has the same affinity. If the oxygen affinity and Yydrzhn them fascinated Mnjzm have in one another, during combined heat and motion appears. Living in desirable or prowling their beloved activity before heat They were concealed in secret and finally manifested joiner reached lover, then cold Are. Meanwhile, the joiner, or marriage relationship and that such a simple combination of oxygen and Yydrzhn is, that the new body, new cells or tissue and new members or Physiological conditions and is Psykvlvzhyk appears. Of course, in this case, the interaction formula is so simple and straightforward combination of water But is not very complicated. And in particular may waste a lot of branches 2 and Be accompanied. But that is the basis and general. Especially from abroad, and Thermodynamic terms compared to fully adaptive seems. 0.3 -3 where energy comes from: The main question that

applied where vital water and feed energy required for this motion And cases where supply is Blajvab stay.

Notes
1. Complexe
2. Dechets

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Love and worship 295
Whether a source and a source of metaphysical and spiritual essence of something vital Is blown? It helps the environment? It even as an isolated system Critical operations on their own internal practices and foreign exchange that the algebraic set Is zero if they Ygyrd M? NO. Exactly like the analogy above organisms expressing the energy required for activities that In hunting or killing enemy Sydkrdn or to obtain or build the beloved object and B. Generally achieve Hmnzvr put to work from their leave is placed. Capital And internal energy for two Yhay that B. M. Yryznd Hkharj. Here, like compound Repulsive interaction calefactory Alhrart or H2 + 1/2O2 3 and put the same inoculation He has his weak (ie, hungry) and the need has again forced the circuit during Another is to provide fresh material from outside Rome as Qdar (ten energy) into Maythll Acquire and store energy. Of them (A> These circuits all circuits open area was positive. (0 Disposal is out of energy. And any combination of heating or other C + O 2 H2 + 1/2O As the composition of two Concealed internal energy or energy derived compound, less than total energy Energy internal elements are issued and energy with opposite sign "Energy joiner» 4 call. Here the energy or the so-called spiritual connection "connection Negative weaken and fall in love with the discount is cold Hhay internal. Leading to internal investment and demand as long as the exposure was not lost, Underground storage impoverish was no incidence and emergence. Someone (even themselves Person) was not aware of it. Meeting of the beloved and demand and thus favorable Conditions, the matter to the Judiciary and the Judiciary to act income. Hidden or concealed mode mode Potential and potential energy into kinetic energy to create the kinetic energy can be.

Notes
1. Systemes isoles
2. Energie interne
3. Exothermique
4. Energie de liaison

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"Topics basic" (Works 296 (1
Now if you question the sense of appetite or interest in or need love Azkja comes? From there, we answer that oxygen affinity and thus made Ydrzhn (If you do not take blame, so are created) that such and such possibility and affinity There is talent in them. (Of course, they may be the possibility and potential of Atoms and electrons and their ancestors have been.) Configuration and desired living or
They loved so well arranged that such demands appear Vshq Maby breads Be. Sometimes a side attraction, the duplex was sometimes true: what good without Gr love both Q R without imposing come true. Hope this vague answer is do not take too much blame, because over there so Is. Electric attraction, attraction of gravity, electrons, collections, etc. constellation. Mill is one of the dancers takes every bit of each particle to a particular destination G fire to wind up the soil from wind G month following planetarium to the top If the desire is the desire to know what is truth in the cavalry regiment
This is a strong desire to gain such insight into love and to be followed in a sinew The first principle of thermodynamics in terms of stability and survival of primary energy, accounting Vital activity of existing circuits closed. Energy comes not from above, not Heterogenesis is produced is not mortal. Using existing reserve those former Has gained self-inoculation and delivery similar to M. Ygzard Thvy Lhay Dyabatyk 2 will do…

Notes:
1. From wild Bafgh
2. Dyabatyk like to say that the delivery or collection system without heat exchange with the outside and spend Its internal energy (or energy acquisition Ghyrhrarty) be done. Also, without wastage and loss, ie the difference Funds to complete the so-called thermodynamic reaction and to fully carry out Mtqablh. Reactionary Ie, the pressure difference within the system and there is no disturbance in the system against external pressure Particles into the system is equal and opposite pressures are expressed. Work so that all foreign forces Reactionary form of energy (such as being compressed gas cylinders) to be stored in the system. This being the Mtqablh That temperature and pressure differences between inside and outside of other factors, is extremely small. So if the outside power in the abbreviated change and reverse the difference between work Photo taken inside to give out energy.

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Love and worship 297
Noticeable point is that some activities and power of person which will update Will depend on the interest rate and that love has to find is good. True Energy is necessary to express the inner person and can be extracted, but human existence Ie, body weight and energy is stored Yhay facilities Anrzhtyk life
Shall determine. To infinite possibilities in this regard may also be. There lover Capital is unknown and the unknown talents and appears to love drawing That talent will enter the judiciary to act. If the natural balance and agreement Between love and establish indigenous lover was ready to love and vision and near complete To be loved, may be about energy and the effects of the above Nature and habits of thought to be miraculous. (This coming season Will be brighter). 0.4 -3 is frail Ftyr Now that know the origin and source of energies needed for the smallest active vital Thay Internal assets are living. And thus the demand and bustle that Available only to appear desirable and beloved, but also improve the growth and development Will, we can look at the issue from a higher horizon than all and has We generalize it to human purposes and certainly clear that this general principle to bring the faith Man what's up and provide what is desired and placed Ngzard kindly " 1. And creation of life on the circuit is that what the person "is not reached And his favorite is the (wealth, time, place, comfortable, and finally Tmkn body and soul) Does not use, to hide and will not receive a new stage and stage Growth and perfection will be achieved. Effort and costs that others do for humans Orbit would be that someone out there is closed and therefore can not Result for the Interior and Finance is his real. Obviously, when two others provide

Note

Giovane Tnalva c t Tnf powers M. M. B or Th van "0.1 Al-Omran / 92: Never to achieve good and you will not be good unless you love what you spend."Ella Tzr Vazr recent Vzr conducted. And lick it L La La Nsan or our attempts Q "0.2

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"Topics basic" (Works 298 (1

Bnmaynd needs someone as a person than the circuit during the life Will. And in the rear of the activities and benefits will be vital. Shed and B Hkar property and throwing personal belongings (including credit and real) Firstly, as de and Ron D. M. metabolism and action while internal combustion and heating materials Stable waste and toxins out of tissues and the environment makes the body cleans Person shall purify. And secondly, reduction of reserves and need to make this do-nothing Man and his love and desire to work and bring joy and another step on the road Growth and perfection pose. Like the weed field with weeds discarding . Weeds and old plants is a result of purification 0.5 -3 aging If a principle of thermodynamics, and in the world, but the main principle of the survival and stability, government Did not, the human situation is much better than they had all safely and frequency Days of grace, like Adam and Eve lived in paradise and Mkhld We become. And technical school students bother to understand the second principle of thermodynamics Not found, trapped maze filled with ambiguity entropy were not! Entropy interpretation of mathematical or aging is the second principle of thermodynamics, the principle of denial First the stability and survival of the energy does not, but all of them to each bowl and Kvz Plan Are

Note

Jam / 38 and 39: Be aware that any cargo load Brnkhvahd another human being, and what the owner But they will try their "And you N Q AS ONE Q and F the Ray" And that therefore he tried to be seen soon. 1. Khz M N my the Wall p. Dqh Tth RA and M. Tzky The price Repentance / 103: received alms hanging from their property. This means they can clean and pollution Yha M. Ynmayy smooth. Quantity of heat in thermodynamics is operating. Ie, a type of heat energy, and (S) 2. Entropy Work and energy like electricity and waterfalls, etc., should be a product of quality factor (such as voltage Water fall waterfall height) in a quantity of agent (eg water) is. Is the product of two factors. Qualitative difference in the temperature or the temperature level that is considered and known. Another factor Unfortunately, none of the senses with natural and physical Asbabhay not measurable and mathematical formula Is deduced, is the entropy or aging.

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The second principle says that if the cyst Mha exchanges abroad and with its own delivery In principle on a fair regular, ie without friction and loss and confusion to Do completely reactionary, not only low and high energy is not, but the value And its effect also not lost, the system can receive this with what is spent Is to act (in circuit) repeat till Alabd. And each time the value of good work And can be converted into usable energy to be whether to leave. Unfortunately, as the blameless person in the world is less complete, as well as objects and toys Cow are not perfect. In friction and disorder and chaos and Domestic waste some energy is always valuable to do that is to Offset against consumption and domestic waste is reached. Some fraction of each orbit to In terms of useful work to be found. In other words, the circuit in terms of exchange accounts work, Is not closed properly. Amount of work that goes from the form of heat instead Post is a high energy comes from. Efficiency (efficiency) can never be one hundred percent. The primary organisms that are nothing but material systems can not The principle that the aging (ie old) translations have to be exempted. As Material energy systems Predicate of them delivered by Ghyrartjay Gradually become a working B Hhrart ability to lose and Are worn and the total energies in the universe too T and T was granted the surface The deterioration process, the principle of entropy in the universe to live sensible, general concept Aging and old age makes the embodied. In animals and humans to prove the second principle of thermodynamics is a waste operation. Something Is experimental, general, and a Moslem. So far this principle has not taken exception . What Significant and should be searched, the quality of presentation and how the expression of entropy that

Notes

$$S = \int \frac{dQ}{T}, dQ = TdS$$

Is Entropy, i.e. what the delivery system of more than reactionary

$$S > \int \frac{dQ}{T}$$

Thus achieving high temperatures Yrvd M, increases. 1. And M. M N N RA Nnk Q the Yalkhlq F.Ys / 68: Everyone has a lot to do in life and modes of creation, we wear out pH).

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"Topics basic" (Works 300 (1

Results of activities and exchange of vital or living organisms Entropy how progress And what can never be a formula that entropy function and certain specified device Is expressed. In simple chemical systems, aging is expressed with words and can be Hzmy Is calculated and compared. After supposedly living in the formula to go back Would be inconclusive. But now the trouble and inconvenience that the power of the writer Is beyond the reader do not. Evil we see from the outside is easier. To Instead they point to the low entropy the subject has read into the formula and the number We, as we discuss the qualitative. Again, no results will be income.

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Chapter 5
Life Force

If ever love and life and general literary language we speak of this to Mathematical formula for the thermodynamic expression of love and life are going. Grope grope and Len Glngan step is removed. Perhaps other steps Stronger and take longer.

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"Topics basic" (Works 302 (1

0.4 grams of blood in animals (S) -1 increased entropy Animals used to look (one of them is human) body temperature higher than Is the normal temperature environment. Activities within their temperature constant or Called the thermodynamics Ayzvtrm occur. Therefore constantly exchange with Outside heat rejection and shall compensate for heat loss and keep constant Body temperature, so that we do act metabolism. Ie Oxygen by breathing air that can enter the lungs and red blood cells by the Reaches all parts of the body tissues contain materials combined with a combustion the permanent Grmad (Repellent Alhrart) supply. Food animals (in terms of thermodynamics, which They are animals Ayzvtrm Nmamym) must be a way that results in combination with oxygen Heat production may call (ie, energy is negative description resulting compounds). On the other hand compounds calefactory always have lower entropy than the objects Are constituted (eg, Zr entropy of water in the base case, ie 20 degrees 45 calories. If particle entropy / C and atmospheric pressure equal to 11 Is 55 calories). / 24 and a total of 71 / 1 / 2 is equivalent to 5 O 31/21 for the base case for 2 H 2 Because it is clear. Because it resulted from the combination of heat given out Shall fall. S is, therefore dS <then 0 dQ <is. 0 But if your verb Anfalhay calefactory degrees and a high temperature Verb Anfalhay equilibrium (two-way Mtqablh) as recipients, it is natural that as long as Will be fixed. S combination of heat, but have not lost as with Dyabatyk Because usually the combustion temperature in degrees and the normal one-way (Ghyrmtqablh) Is performed after surgery in total entropy increases. Looking back now or animals accustomed to promise ourselves Ayzvtrm: -1 Animal life in the cooler environment and disposal of heat to the outside shall Cause degradation of her body is entropy. For example, people in every time the (dQ <0) Average 100 calories to heat and excrete body temperature 37 degrees C is the charge as:

$$\frac{۱۰۰}{۲۷۳+۳۷}=۰٫۳۲۲ \qquad \frac{10+0}{273+37}=\frac{0}{322}_{(?)}$$

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Young is 322 units. / Unit of entropy is lost. Or in other words 0 Unfortunately the only thing that reduces the entropy is one. Other actions Raise it. -2 Nutrition and supplement the evacuation operation, because in general causes the minerals And relatively simple organic materials (vegetable or animal organisms easier (NaCl) as Man) enters the body, instead of organic compounds found in greater detail the body out. And simple compounds generally have higher entropy repellent compounds Alhrart Levels are high, so this operation, import and export entropy differentials Mabh Remains in the body. -3 Practice breathing and other internal Lhay Anfa verb, so that as noted above, S levels in normal temperature as is done unilaterally increase Be. -4 Mechanical body activities. Without quality change and want to enter the verb and Chemical Anfalhay very long and how muscles work to produce tissue step mechanism, Same magnitude as the production and transfer of M. Ygvyym always coupled with friction and Atla Fhayy That is the product temperature, this practice also causes raise the entropy Is. (Car body heat due to thermodynamic machine is a low interest And paragraph 55 so that the first volume of thermodynamics described industrial efficiency, it 3%, and severe activity / 0% unemployment or at bedtime, when the normal gait 3 6% respectively. Asymptote in performance / mechanical means for runners and only five working machine Mabh around 7% to 7% margin of 100% heat becomes entirely. Although this Is not zero and temperature dT Hkharj B is poured, but as between body and environment Makes progress. In addition, the temperature of S, the exchange will not be Mtqablh A lot of work to be poured out into a heat and energy that They are. S in the tissues increased -5 Other body activities. Practice development and proliferation of cells and tissue growth and members Because reproductive coupled with simple organic materials into organic matter such as very detailed protein Etc., and apparently must calefactory Tnz Ldhndh aging, but because the unilateral

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"Topics basic" (Works 304 (1

Are carried out (never been seen to perform fetal Qhqhra garlic and children Be. S return to her parents) Open namely increased Psykvlvzhyk and intellectual activities (mental) to have such a diagnosis that causes Changes in body temperature or brain and produce additional heat Nmygrdnd. Now in effect or

Precision and elegance neural activity heat production of about savings Hgyry May be less, or no mental and intellectual activities as their name Tvrk·h Mental feed material have been laid. In short, if the acts 2 and 3 do not Ghyrartjay Ygrft, an act They will be compensated in this regard and the body remains constant entropy. However, conditions Normal conditions of life, a total of constant entropy body and this trend is About the entropy of the system and represent the age of the animal or person is aging. Entropy unit or the body relative Entropy: Entropy quotient of total weight Man. Of course, the baby is extremely weak. Because most sperm joint compounds Is. But soon shall progress. The relative activity is as much more progress The relative entropy will be higher. In the fetal period and after the children and young people Power cell proliferation and tissue growth and active foreign Thay are extremely high, Entropy is a severe progressive and perhaps the remaining life of between one and feed angle Tangent curve entropy relationship found. Genital gametes and sperm, which are cells of a sequence of interaction and Series into a long mineral and organic material after simple organic matter to simple materials More detailed and protein and protoplasm and nucleus and delivered into cells are obtained. Such that the composition of the extract and comprehensive full body materials are, because each These compounds calefactory entropy comes down, germ cell minimum relative entropy Will. This point also say that Byvlvzhys Tha experience and believe that death Closing an animal or human body that public organizations and the general circulation verbs As a result, some vital parts of sensitive corruption or some Gyrkrdn currents occurred Be. And the system lost his Mahngy work falls. So that if

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Member to correct defective or retention difficulties and the high build, Back to Life Will be possible. This experience has been repeatedly. Death of a person's death Public body is not the minor's death. Ie before Frdfrd body die, Your device and they are denied public cooperation. Minutes and after the death of Sa Tha Person or animal is seen in the muscle tissue and internal heart or stomach, kidney Movements and their secretions continue growing and gradually go silence. Also Keep complete tissue or cells isolated from animals living in environments Favorable containing foods and that they were

poisons and waste Secreted from cells is common practice to disposal. Here might be the result Cells were living inside the body fluids and the environment because no difference in degree Will. And so that future seasons will be discussed in S is heat, no progress Maybe life was extremely possible for them is acceptable. 0.2 -4 energy or energy efficient a useful animal Ayzvtrm Energy being concealed from the energy and entropy we talked, a few words from Jaysh say that is true here. Effective or useful energy, which credibility (W) «Effective Also called "work function 2" different concepts and use cases, names have multiple B and Han Chemical thermodynamics is the Guide have found special importance in determining Zyqymty For the interaction and balance, etc. is three. Therefore, thermodynamics, life

Notes
1. Energie utilisable
2. Work Function

And energy (U) energy difference between general internal system, (W = U - TS) 3. Effective or useful energy system The amount of energy or capital system that could be converted to work. W is (TS) system Ghyrmfyd Is used and the effect shows. Simply put the above two principles of thermodynamics and the total expressions removed W is as much more than U is obtained. So that whatever had Yshvd M (Q) heat Will be less. Produce the system entropy W Thvylhay Ayzvtrm and reactionary system is more Is and vice versa: W equal degradation dA =-d (U-TS) But if the system can automatically change Ghyrartjay, produce less than effective energy will be reduced Chemical thermodynamics system which are under constant change and interaction (dA <-d (U-TS) May be minimized (in Thvylhay reactionary W When the balance has already indicated that its final stage.

Page 40:

"Topics basic" (Works 306 (1
Can not service the source. Because the vital activities of friendly animals Like all chemical interaction that gradually released in the environment occurs or
As a connection is done in ovens, has been subject to Ayzvtrm.
dA - dW
And certainly it is between growth and life and power and other vital facilities available
Living close relationships are established. 4 we saw that the relative entropy function of animal age was climbing. Section 1 Constantly with an average rise. Now the fact that the relative internal energy T in the case of fixed combination of existing public bodies and remains constant Is. W causes the gradual degradation of S is fixed and permanent, the permanent progress Effective useful energy or relative energy relative decline of the animal constantly growing, continuous power Activities of foreign and domestic actions (proliferation and growth and production) is decreased. Extent the problem of physiological age of two that Dr. Alexis Karl 3 W in this regard Defines remembers. Dr. Carl for animals and humans in addition to age When a calendar of foreign contract is a normal age-related self- The existing definition. The late Dr. wound healing period, which of course depends on Multiply rapidly and produce cells and tissue with its long and short Nha Jva Pyrha Long index, age or actual physiological age Ygyrd M.. It is evident that The chronological age is associated with age, but is not consistent. A person 30 years old Less worn and do not be a good and lively, physiological age may He leaves less than 25 years younger. Cells of fetal tissue or when the child M. Ygzarnd chowder special view is growth rate and proliferation Extraordinary show. Multiply rapidly in young mild and very mild Pyrha

Notes
Zero and the minimum is Ghyrartjay) - see Chapter 5 Book *Industrial thermodynamics* or better
Samuel Glasstone-*Thermodynamics for Chemists*: Book it
1. Continu
2. Age physiologique
3. Dr. Alexis Carrel

Page ##:

(add)

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Further reading

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θΔics

In translations, **Thermodynamics of Humans (English)** is a work-in-progress attempt at Persian to English translation of Mehdi Bazargan's 1956 *The Thermodynamics of Humans*.

Translation

The following is a work-in-progress translation by Iranian-born American Angela Jabari:

Persian | Original	English | Google	English | Jabari
	Title Page	Title Page
عشق و پرستش يا ترموديناميك انسان	Love and Worship or Human Thermodynamics	Love and Worship or Human Thermodynamics
	Page 2	Page 2
به افتخار مادرم ، همنام صديقه كبري سرمشق وظيفه شناسي و از خودگذشتگي	In honor of my mother, namesake S. K. example of conscientiousness and self-sacrifice	In honor of my mother, namesake S. K. example of conscientiousness and self-sacrifice
تقديم به: خويشان و دوستان عزيزي كه در دوران گرفتاري با بذل تفقد و مرحمت و با ابراز جرأت .اثبات بزرگواري كردند	Delivery to: relatives and dear friends that during involvement with giving sympathy, grace and courage demonstrated by expressing their magnanimity.	Delivery to: relatives and dear friends that during involvement with giving sympathy, grace and courage demonstrated by expressing their magnanimity.
	Page 3-4	Pages 3-4
هوالعزيزالعليم مقدمه	Hvalzyzallym Introduction	
اين كتاب ارمغان ماه هاي اول زندان فرمانداري نظامي است ارديبهشت و خرداد 1334 خوشبختانه خواندن و نوشتن ممنوع نبود؟ بنابراين مشغوليت عمده- كه در اين مورد از ناچاري بايد نامش را فعاليت گذاشت- ورق زدن كتاب بود. يك مقدار كتاب هاي افسانه و رمان يعني كتاب هاي **عشقي**، يك مقدار هم كتاب هاي ديني از قبيل ادعيه يا سرگذشت پيشوايان و مباحث اعتقادي؛ يعني كتبي كه مقصد آنها پرستش **ذات لايزال** است. به اين ترتيب گذران وقت و تقويت روحيه فراهم شده با كسب معلومات تازه جبراني از محروميت فعاليت خارج به عمل مي آمد. ضمناً كتاب **ترموديناميك** صنعتي را از منزل خواسته بودم تا در فرصت موجود راجع به موضوعي كه از چند سال پيش وجه شباهتي مابين آن و فعل و انفعال هاي **شيميايي** حس .مي كردم فكر كنم	This book brings the months of May and the first military governor of the prison Persian date Khordad 1334 was banned Fortunately, reading and writing? Therefore, in this case the engagement Mdh- Gzasht- activity will have his name was flipping through the book. A book of fairy tales and novels, the book value of **love**, a story leaders of the religious books such as prayers or religious topics, namely writing that their destination is eternal worship of **nature**. The passing of time and boost morale by providing compensation for the deprivation of acquiring new information came out to act. The **thermodynamics** book industry from home I was asked to participate in the opportunities available on the subject a few years ago, far from it, and the interplay between **chemical** sense I think.	
از تركيب اين سه عامل معجون ثقيل الهضمي در آمد كه اينك با شرمندگي تمام خدمت خوانندگان	The combination of these three factors Gastroenterology was heavy	This book is the gift of the first months of being in military governor's prison, April and May 1334 [1955], fortunately writing was not forbidden those days, so the only thing to do was turning pages (if we can call it a job).

تقديم مي نمايد. تا چه انداز مقبول و مفيد واقع گردد نمي دانم. براي نويسنده مشغوليتي بوده خالي از است. اگر براي خواننده نيز مشغوليت ملالت باشد بسيار راضي و شاكر خواهد بود. در هر حال، بد و خوب آن پاي كساني بايد نوشته شود كه سبب اين بيكاري و گرفتاري شدند...

به طوري كه از عنوان كتاب پيداست، كتاب شامل سه نوع مطلب مي باشد: اولًا عشق كه كمابيش مطلوب همه و مشهور است. كسي از آن اصولًا بدش نمي آيد)خصوصاً در ملت شاعرمسلك ايران(. ثانياً پرستش؛ پرستش به عنوان حداعلاي عشق نيز گفته شده است ولي چون اسم خدا و بوي خدا را مي دهد و مي گويند جن از بسم االله درمي رود چه بسا كه »از ما بهتران« را از اين صحبت خوش نيايد. يا به

. ه ر ف ذ ت س م ر م ح م نه ريفه »كَاَ خداي نكرده كساني 1« ة ر و قَس ن م ت فَر باشند كه مانند خران وحشت زده كه از صولت شير فرار مي كنند از اين كلمه رم كنند! سومي كه ترموديناميك است، مطلبي مي باشد كه گمان مي كنم غير از اشخاص معدودي كه در مدرسه مجبور شده اند نظري به اين درس بيندازند)و حتماً فراموش كرده اند(سايرين را بسيار ناراحت و نگران خواهد كرد...

صه آنكه خواننده اي براي كتاب پيش بيني نمي نمايد! علي مي ماند و حوضش!

***

concoction that with shame all readers shall serve. I do not know what savings to be acceptable and useful. The author has been busy. If the reader is also very satisfied and grateful Mshghvlyt will be free from boredom. However, the bad and the good of those who should foot Written causing unemployment and were caught ...

As the title suggests, the book includes three types of reading are: firstly love all more or less desirable and famous. smart set "of the talks averse. or

Rifé "H M R M S T N F R H
Kaaa Nh M . Far T M N
Qas V R H "1 God forbid, those who like donkeys terrified of milk Solat flee from Rome to the word! Third thermodynamics, which I suppose is something other than a few people who have been in school, drop a comment to this lesson), and you forget
Have (very upset and concerned others will ...

Sh they do not expect the reader to the book! Ali remains and Hvzsh

***

Some legendary books and novels means **love** books, and some religious books like praying books or religious leaders biographies and believes arguments means the books that their goals are worshiping **eternal essence**. In this way, spending time and prepared reinforcement of mood and with receiving reparative new knowledge from exclusion of outside activities was happening. By the way, I had asked for my industrial **thermodynamics** books from home, because I've been feeling the similar points between them and **chemical** reactions, from many years ago.

(add discussion)

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θΔics

In human thermodynamics, the **thermodynamics of love** is the study of how the laws of thermodynamics explain the process of two people falling in love or being in love.

A 2012 short film, entitled "A Strange Thing Called Love", by Indians Vamshi Regalla and Ravi Vedula, on the **thermodynamics of love**, from a chemical engineer's point of view, about a guy with 9 girlfriends to choose from to marry, the synopsis of which is: "love is a form of energy that can neither be created nor destroyed"; [first law] "It only gets transferred from one girl to another" [second law].

Overview

The subject of the thermodynamics of love is one of the least studied fields in human thermodynamics, owing to its notorious difficulty. The first to give a pre-thermodynamics dissection of the topic was German polymath Johann Goethe who in 1799 began developing a theory of human chemistry in which human relationships are chemical reactions in which people, as chemical entities, attract and reply, neutralize each other, separate again, and reestablish themselves according to the laws of affinity chemistry or specifically according to the force of chemical affinity, symbol "A". In 1882, German physicist Hermann Helmholtz, in his "On the Thermodynamics of Chemical Processes", showed that measurement of chemical affinity is the negative of the free energy change; which in modern terminology translated to the fact that for freely going, surface attached, earth-bound reactions, at standard conditions, the following equation is the equation of love:

$$A = -\Delta G$$

specifically affinity is the negative of the Gibbs free energy change ΔG of of the reaction or process of love, in lay speak.

In 1995, as a chemical engineering thermodynamics student, American engineer Libb Thims began to muse one how one would go about using Gibbs free energy change to predict between the successfulness of two or more potential marriage reactions, between one person and two or more potential mates, similar to how physical chemists use Gibbs free energy measurements to determine the energetic feasibility of all chemical reactions. [1]

In circa 2000, American physicist Christopher Hirata outlined a similar model to Goethe and Thims, in what he called the "thermochemical approach to relationships", modelling pairing reactions of college student bodies using an equilibrium constant model. [2]

In 2001, American computational chemist David Hwang wrote his article "The Thermodynamics of Love", for his college magazine, outlining how people combine in pairs according to Gibbs free energy determinants, and was the first to do so graphically, using a reaction coordinate, energy surface diagram, depicting the change in Gibbs free energy of a reacting pair over time. [3]

In 2009, Indian chemist Surya Pati blogged the article "The Thermodynamics of the Human Bond", outlining how the attachment of two unattached restless people, defined as "chemical molecules", will stabilized in a bond owing to a free energy decrease. [4]

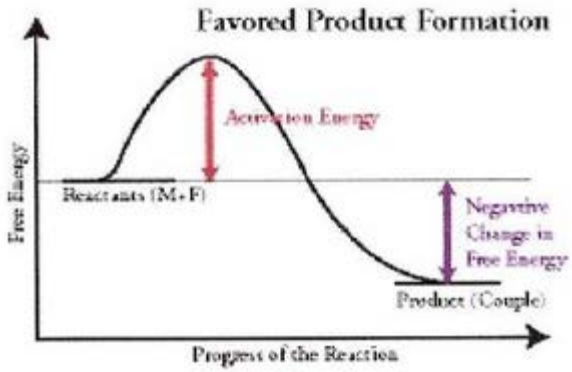

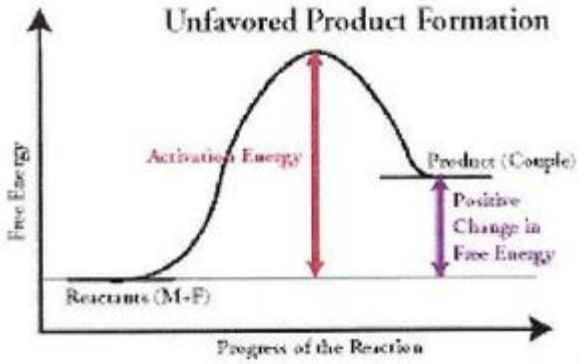

American computational chemist David Hwang's 2001 free energy surface graphs for "favored" and "unfavored" male-female reactions. [3]

In 2009, science teacher David Ng wrote a song about the thermodynamics of love.

In 2013, Columbian microbiologist and cancer researcher Andres Florez published a blog entitled "Thermodynamics of Love" which attempts a thermodynamics of love conceptualized approach to explain love and relationships via a mixture of John Gottman's *The Mathematics of Love* (2005) and protein thermodynamics. [5]

See also

â— Chemistry of love
â— Physics of love

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θΔics

In hmolscience, **thermodynamics of society** refers to []

Quotes

The following are related quotes:

> "With the discovery of a fatigue as the dystopia of universal labor power, the search for a '**thermodynamics of society**' began in earnest."
>
> — Anson Rabinbach (1990), *The Human Motor* [1]

> "The process has three fundamental characteristics: it must be endogenous to the system; it must be continuously productive of functions and systemic innovations; and it must reach equilibrium. What we are seeking is a veritable '**thermodynamics of society**'. The more the analysis deepens and produces real redundancies, the more the contradictory content of the process becomes manifest. But the multiple times of the collective and their dissipative effects must be reconceived all the more in a dynamic of reversible trajectories that can be brought back to equilibrium, to the rule of equivalence, to the equilibrium of micro-conflicts within the recapitulative totality."
>
> — Antonio Negri (2000), *Time for Revolution* [2]

See also

â— Physics of society | Philip Ball

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θΔics

In pioneers, **thermodynamics pioneers** are those (100+) engineers, physicists, chemists, scientists, researchers, writers, and thinkers who over the years contributed to the background knowledge, formation and founding of the science of thermodynamics.

> "The fascination of a growing science lies in the work of the **pioneers** at the very borderland of the unknown, but to reach this frontier one must pass over well traveled roads; of these one of the safest and surest is the broad highway of thermodynamics." (Gilbert Lewis and Merle Randall, *Thermodynamics*, 1923)

Left: German engineer Otto Guericke's assistants pulling (doing work on) on a suction device in attempts to make a vacuum in a beer keg (c.1649); a **pioneering** experiment, which can loosely mark the start of the science of **thermodynamics**;

Right: the Papin engine, conceived by French physicist Denis Papin in 1690; a direct precipitate of Guericke's vacuum work, and the eventual model for the modern steam engine, and thus the Carnot cycle, upon which the science of thermodynamics is derived.

Each person's *photo-size* is indicative of a combination of contribution density, impact, deepness of thought, theory penetration, and the enduring impact of their work. Ranks of pioneers within a given year are listed in descending order. Small quick-mark clickable *icons*, as described in (add), are used to facilitate topics and theories associated with the work of each person.

Under construction

Pioneers

The following is a chronological listing of individuals who pioneered the subject of thermodynamics:

Pioneer	Date	Contribution
Parmenides (510-450BC) Greek physicist-philosopher	485BC	Initiated the famous "nature abhors a vacuum" debate in his essay *On Nature*, wherein he argued that a void or rather vacuum, in nature, cannot exist; a postulate that indirectly resulted in the invention or development of a number of things: atomic theory (c. 450BC), barometer (1643), vacuum pump (1650), piston and cylinder (1650), air pump (1657), steam engine (1690), gas laws (1645-1897), and eventually the science of thermodynamics (1865).
Aristotle (384-322BC) Greek philosopher	350BC	Introduced the "four element theory", that the universe consists of four elements: earth, water, air, fire, of descending mass or density, respectively; denser elements tend to rise; lighter elements fall; earth is the heaviest element; fire the lightest; quote: "for any two portions of fire, small or great, will exhibit the same ratio of solid to void; but the upward movement of the greater is quicker than that of the less"; his

(IQ=190)		*Metaphysics* presents one of the first uses of the term *enérgeia* (energy) to mean act or ‘activity’, ‘actuality’, or in a literal sense ‘(a state of) functioning’, deriving from *energos* "active, working," from *en-* "at" + *ergon* "work"; was the first to document the Mpemba effect, which he attempted to explain using a theory called 'antiperstasis'.
Geber (c.721-c.815) Arabian chemist	790	Introduced the “three principles theory”, which states that metals are formed of two elements: *sulphur*, "the stone which burns", which is the principle of combustibility, and *mercury*, the principle of metallic properties; and salt is what gives solidity.
Paracelsus (1493-1541) Swiss chemist and physician	1524	He adopted Aristotle’s four element theory, but reasoned that they appeared in bodies as Geber’s three principles; saw these principles as fundamental, and justified them by recourse to the description of how wood burns in fire. Mercury included the cohesive principle, so that when it left in smoke the wood fell apart. Smoke represented the volatility (the mercury principle), the heat-giving flames represented flammability (sulphur), and the remnant ash represented solidity (salt).
Galileo Galilei (1564-1642) Italian physicist and astronomer (IQ=180-200)	1592	Constructed an "an instrument for measuring heat" (thermometer), using expansion and contraction of air in a bulb to move water in an attached tube; in 1630, explained the “Pump problem”, namely Giovanni Baliani’s inquiry about the explanation of why a siphon, led over a hill about twenty-one meters high, failed to work, responded that it was the power of a vacuum which held the water up, and at a certain height (in this case, thirty-four feet) the amount of water simply became too much and the force could not hold any more, like a cord that can only withstand so much weight hanging from it; his with his 1632 *Dialogue Concerning the Two Chief World Systems*, is said to have initiated the science of invention of dynamics; in 1643, he encouraged his pupil Evangelista Torricelli to investigate the subject of the pump problem, after which Torricelli made the first barometer or "Torricelli vacuum".
Giovanni Baliani (1582-1666) Italian mathematician, physicist, and astronomer	1630	His famous query letter to Galileo Galilei as to why an experiment he had made in which a siphon, led over a hill about twenty-one meters high, failed to work, launched the famous investigations into the pump problem; in circa 1635, he showed that by placing an iron pot filled with water on a spinning metal disk it was possible to make water boil—an experiment said to have been one of the first references to an experimental determination of the equivalence between heat and work.
Evangelista Torricelli (1608-1647) Italian mathematical physicist	1643	Investigated the pump problem, at the behest of his mentor Galileo Galilei, during which time he inverted a tube of mercury into a mercury dish, noticed the vacuum to have formed, noticed how the vacuum size varied from day to day, and hence invented the world’s first (mercury) barometer thus proving that atmospheric pressure exists.
Otto Guericke (1602-1686)		Being fascinated with the nature of cold, he began to devoted a considerable portion of his spare time to experimentation; and the question of the existence of a vacuum: “Could empty space exist, and is heavenly space unbounded?”; researching this query, brought into contact with Gaspar Schott, an adherent to Aristotle’s version of the denial of the void, and ultimately and to Rene Descartes’ adherence to the “denial of the vacuum” dictum; this puzzle intrigued Guericke and he went to work trying to evacuate the air form a well-caulked beer keg,

German engineer and physicist	c.1648	which introduced him to the sealing problem, i.e. how to make a container air tight; after solving the sealing problem, he was said to have discovered the phenomenon of the compressibility of air; all of this resulted and led into the building, invention, and demonstration of a number of fundamental vacuum and vacuum engine principles: piston and cylinder, vacuum pump, vacuum bulb, Magdeburg hemispheres (1657), the calculation that a force of 2,700 pounds would be needed to pull the hemispheres apart, as is depicted in his 1672 lifting experiment.
Gaspar Schott (1608-1666) German mathematical physicist	c.1652	A close associate of Otto Guericke; his 1657 book *Mechanics of Gas Hydraulics* detailed and diagrammed (Schott diagrams) Guericke's experimental work on beer keg evacuations, vacuums, vacuum bulbs, vacuum pumps, the Magdeburg hemispheres, etc.; his publication, acted as a sort of liaison between the work of Guericke and Christiaan Huygens and Robert Boyle, who after reading his book began to make their own vacuum-based instruments, Boyle directing the construction of the pneumatical engine (air pump and vacuum pump), built in 1658 by his employee Robert Hooke, and Huygens, working with Denis Papin, making some of the first working gunpowder engines, wherein the explosion would act to create the vacuum.
Robert Boyle		
Robert Hooke		
Christiaan Huygens (1629-1695)		
Johann Becher (1635-1682) German chemist	1669	Introduced the terra pinguis theory of combustion.
Denis Papin (1647-1712) French physicist and engineer	1679	In vented the Papin digester (1679) and Papin engine (1690).
Wilhelm Homberg (1652-1715) Dutch chemist	1702	In a series of *Essais de Chimie* (1702-1709) he sought to rehabilitate the doctrine of the five principles, by separating them out in actual analysis with the burning glass, in a manner compatible with corpuscular philosophy; his "fire analysis" burning glass method conceptualized pure fire as a tangible, corpuscular substance that mad up other bodies and participated in chemical actions; his work ushered in the long-standing conception of fire as the universal solvent that resolved bodies into their ultimate constituents.
Georg Stahl (1659-1734) German chemist and physician	1703	In modification of his mentor Johann Becher's 1669 terra pinguis theory of combustion, introduced the phlogiston theory of heat, wherein heat was viewed as as being comprised of small particles with mass termed "phlogiston"; explained natural phenomena by affirming that "heat matter" (phlogiston) was contained in all combustible bodies and was made to appear when such bodies were burned. His "Conjectures and Reflections on the Matter of Fire and on the Light"

Louis Lemery (1677-1743) French physician and chemist	1709	in which, building on the previous burning glass experimental work and matter of heat (igneous particle) theories of Dutch chemist Wilhelm Homberg (1652-1715), he reconceptualized the “particles of fire” view in the form of a universal solvent for calcination and combustion processes by drawing an explicit analogy with the action of water as a solvent in regards to salts.
Johann Bernoulli (1667-1748)	c.1717	
Jacob Bernoulli (1654–1705)	c.1717	
Herman Boerhaave (1668-1738) Dutch physician and chemist	1724	His textbook *Elements of Chemistry* (aka *Treatise on Fire*), influenced by the earlier work of Louis Lemery’s corpuscular theory of fire, advocated what came to be known as "Boerhaave's law", which states that: “ever body, whether solid or fluid, is augmented in all its dimensions by any increase of its sensible heat”; was an associate of Polish physicist Daniel Fahrenheit; said to have introducing quantitative methods into the measure of temperature and mass and for carryed out some of the first calorimetric research.
Daniel Bernoulli (1700–1782) Dutch mathematician, physicist, and physician	1738	
Leonhard Euler (1707-1783) Swiss mathematician (IQ=180-200)	c.1750	Student of Johann Bernoulli (1667-1748); the eponym of (mathematician behind) the “reciprocity relation”, the mathematical substantiation behind entropy (S) defined as a state function (dQ/T) variable of heat (dQ); also behind the homogenous function, which supposedly is the mathematical form which relates an extensive property of a system to its component variables.
Joseph Black (1728-1799) Scottish physician, physicist, and chemist	c.1757	Began a friendship with James Watt, the two supposedly conducting experiments with heat and steam; in 1761, noted that the temperature of a pail of ice-cold water placed in a warm room rose quite quickly, whereas, if the pail contained ice, the temperature remained constant for many hours while the ice melted, and thus discovered “latent heat”; was one of the first chemists to adopt Antoine Lavoisier’s caloric theories and taught them as early as 1784; his circa 1786 *Lectures on Chemistry*, introduced the first statements of the zeroth law.
James Watt (1736-1819) Scottish instrument maker and engineer (IQ=165)	c.1757	Supposedly, began conducting experiments on steam with Joseph Black and would go on to make a number of inventions and design improvements to the functionality of the steam engine, including: separate condenser (1765), sun and planet gear (1781), the fly-ball governor (1788), the indicator (1796) and "indicator diagram", made with his employee John Southern, which tracked the changes in volume of the piston, the definition of "pony power" (or horse power), all embodied in what came to be known as the Watt engine.
Antoine Lavoisier (1743-1794) French chemist (IQ=170)	1768	

Benjamin Thomson (1753-1814) American-born English physicist	1787	Reacted to George Fordyce's *circa* 1785 experiments which claimed to have measured a gain in the weight of water after it was frozen, by repeating Fordyce's experiment to see for himself if this was in fact the case; his 1798 cannon-boring experiments, provided data for the first calculation of the mechanical equivalent of heat, which laid question to Lavoisier's caloric theory, as discussed in his famous "An Inquiry Concerning the Source of Heat which is Excited by Friction"; promoted Thomas Young to Royal Institute lecturer, and it was in these lecturers (1807) that Young, using Thompson's cannon-boring data, that the the first modern definition of heat and also of energy is found.
Humphry Davy (1778-1829) British chemist and physicist (IQ=185)	1799	His famous ice-rubbing experiments showed that ice cubes rubbed together in a room colder than the freezing point of water can be made to melt, a result which conflicted with the caloric theory.
Charles Desormes (1771-1862) French physicist and chemist		
Nicholas Clement (1779–1842) French physicist and chemist		
Sadi Carnot (1796-1832) French engineer and physicist	c.1818	In *circa* 1818, he fell into the association of brother-in-laws Nicholas Clement and Charles Desormes, who did joint research on the physics of steam engines; all three, were said to have felt a need to boost France's mills and factories industry operations, and that the way to do this was to better understand the principles behind the operation of steam engines; Carnot devoted the years 1820 to 1824 to this effort, the result of which was the self-published 1824 treatise *Reflections on the Motive Power of Fire and on Machines Fitted to Develop that Power*, a short booklet on the generalized theory of heat engines, out of which sprang a number of foundational physical models, namely: Carnot engine, Carnot cycle, and Carnot's principle, the latter of which being precursor to the second law.
Joseph Fourier (1768-1830) French mathematical physicist	1822	His *Analytical Theory of Heat*, used Newton's law of cooling, namely, that the flow of heat between two adjacent molecules (or bodies) is proportional to the extremely small difference of their temperatures, to outlined a mathematical model of heat movement in various directions; he argued that any function of a variable, whether continuous or discontinuous, can be expanded in a series of sines of multiples of the variable.
Émile Clapeyron (1799-1864) French physicist	1834	His "Memoir on the Motive Power of Fire" (a) brought Carnot's *Reflections* into public light, (b) rewrote the *Reflections* using a graphical footing, by explaining the work output of the Carnot cycle using indicator diagrams, and (c) used a cleaner more accurate and rigorous mathematical style.
James Forbes (1809-1868) Scottish physicist	1836	

Philip Kelland (1808-1879) English mathematician	1837	
James Joule (1818-1889) English engineer and physicist	c.1838	
John Nichol (1804-1859) Scottish astronomer	1839	
William Thomson (1824-1907) Irish-born Scottish physicist and mathematician	1839	
Robert Mayer (1814-1878) German physician and physicist	1840	
Lewis Gordon (1815-1876) Scottish civil engineering	1841	
James Thomson (1822-1892) Scottish engineer	c.1841	
William Rankine (1820-1872) Scottish mathematical physicist and engineer	1842	
Hermann Helmholtz (1821-1894) German physicist and physician	1843	His “On the Conservation of Force” presented one of the first versions of the conservation of energy; his 1882 paper "The Thermodynamics of Chemical Processes", one of the founding papers of chemical thermodynamics, showed, through derivation, how the long-sought chemical "affinity" (the force of reaction) of chemistry was measured by the "free energy" of the system, i.e. that which could be converted into other forms of usable energy (such as mechanical work or electricity), not by the heat of the reaction, hence disproving the thermal theory of affinity as was being advocated independently by Julius Thomsen (1854) and Marcellin Berthelot (1864)
Henri Regnault (1810-1878) French chemist and physicist	1845	During the years 1845-46, as the chair of chemistry at the École Polytechnique, he conducted research on the thermal properties of gases; during which time he mentored William Thomson; his 1847 “Experimental Relations … to determine the Main Laws and Numerical Data Entering into the Calculations of Steam Machines”, presented the results of a large number of specific heat measurements, date of which was used by Rudolf Clausius to confirm agreement between the mechanical equivalent of heat results of Robert Mayer and James Joule;

his paper also stimulated William Rankine to develop his theories of thermo-dynamics and his “molecular vortex” hypothesis.

James Maxwell (1831-1879) Scottish mathematician and physicist (IQ=200+)

1846

At age 15, became friends with William Thomson, the newly appointed (age 22) Glasgow professor of natural philosophy, and together with Peter Tait, whom he had been friends with since age 10 (1841), the three formed a post card connected circle of friends (Edinburg school), discussing with each other the subject of what they mutually referred to as “θâˆ†ics” (Maxwell’s coining) or thermo-dynamics (Thompson’s 1854 coining); from 1855 to 1878, published at least 47 documents (letters, articles, books, correspondence, etc.) on thermodynamics; in 1859, after reading Rudolf Clausius’ "On the Nature of the Movement, Which we call Heat" (1857) he formulated the famous "Maxwell distribution" of molecular velocities; in an 1867 letter to Tait, he proposed the now-famous Maxwell's demon; his 1871 *Theory of Heat* was one of the first simplified treatises on thermodynamics; his 1873 super-famous *A Treatise on Electricity and Magnetism* introduced what have come to be known as Maxwell equations, the four governing equations on the phenomenon of the interrelationship of electricity and magnetism, which he showed implicitly required the existence of electromagnetic waves traveling at the speed of light; was the first to recognize and promote the work of Willard Gibbs (1873-1876+); in 1874, using Gibbs' graphical thermodynamics papers, he constructed the first 3D thermodynamics surface model of the states of existence of water-like substance; in 1878-79, in his last year, his review article "Paradoxical Philosophy" and followup last poem "A Paradoxical Ode", outlined his views on: (a) the notion of the paradoxical philosopher and (b) his cryptic last thoughts the implications of the findings of electromagnetic theory, thermodynamics, and conservation of energy in regards religion, immortality, the soul, the life/death demarcation, evolution, morality, consciousness, down to the atomic level.

Peter Tait (1831-1901) Scottish mathematical physicist

1846

In 1841, he became best friends with James Maxwell; in 1846, he entered into the thermodynamics communication network (Edinburg school) of Maxwell and William Thomson; in 1864, he wrote “Dynamical Theory of Heat” and “Energy”, which formed the basis of his followup 1868 *A Sketch of Thermodynamics*, a history of thermodynamics booklet, so to speak; in 1867, he and Thomson published *Treatise on Natural Philosophy*, a seminal energy-based physics textbook; his 1875 *The Unseen Universe: or Physical Speculations on a Future State*, written with Balfour Stewart, speculates on immortality, supposedly in an energy-thermodynamic sense, the heat death of the universe; how thoughts are molecular motions of the brain; how the universe may contain "bonds of energy" that connect to the thinking aspects of the mind; among other curious subjects.

Rudolf Clausius (1822-1888) German physicist

1850

His "On the Moving Force of Heat and the Laws which may be Deduced Therefrom", which resulted following him becoming “acquainted with [Carnot’s *Reflections on the Motive Power of Fire* (1824)] through the work of Clapeyron and Thomson”, the first in a collected works total of 16 papers: 1-9 (1850-65) on thermodynamics, 10-13 (1852-57) on the theory of electricity, and 14-16 (1857-62) are on gas theory (kinetic theory of heat), of which the first nine memoirs would form 1865 proto-textbook *The Mechanical Theory of Heat* (and followup 1875 second edition re-written textbook), initiated what would eventually become the

		state function, exact differential definition of the differential quantity of heat known as "entropy", the first law, and the second law, which together define the subject of thermodynamics as known currently.
Julius Thomsen (1826-1909) Danish chemist	1853	
Marcellin Berthelot (1827-1907) French chemist	1864	
August Horstmann (1842-1929) German physical chemist	c.1865	Began studying the works of Clausius for applications in the calculation of equilibriums in chemical systems; his 1869 paper "Vapor Pressure and Heated Evaporation of Ammonium Chloride" was the first publication to apply entropy to chemical problems; in 1873, announced the condition for chemical equilibrium to be that of maximum entropy.
Ludwig Boltzmann (1844-1906) Austrian physicist	1866	
Balfour Stewart (1828-1887) Scottish physicist	1868	
Francois Massieu (1832-1896) French engineer	1869	His "On the Various Functions Characteristic of Fluids and on the Theory of Vapors", cited by Gibbs, introduced the idea of the "characteristic function", symbol Ψ (psi), of a fluid body, or Massieu functions, as they have come to be known; in Gibbs' own summary words: "Massieu has shown how all the properties of a fluid 'which are considered in thermodynamics' may be deduced from a single function, which he calls a characteristic function of the fluid considered; he introduces two different functions of this kind, vis, a function of the temperature and volume, which he denotes by Ψ, and a function of the temperature and pressure, which he denotes by Ψ'; in both cases he considers a constant quantity (one kilogram) of the fluid, which is regarded as invariable in composition."
Willard Gibbs (1839-1903) American engineer and mathematical physicist	1873	
Max Planck (1858-		At age 19, went to Berlin for a year of study with physicists Hermann Helmholtz and Gustav Kirchhoff and the mathematician Karl Weierstrass; he soon became close friends with Helmholtz; while there he undertook a program of mostly self-study of Rudolf Clausius' writings, which led him to choose heat theory as his field; in 1879 completed his PhD dissertation, with a thesis "On the Second

1947) German physicist	1877	Fundamental Theorem of the Mechanical Theory of Heat"; in 1893, published his *Outline of General Thermochemistry*, a summary of the results of his electrochemical and thermochemical investigations, some of which overlapped with the work of Walther Nernst; investigations which trace to earlier 1889-90 papers of Planck published on the electromotive force; he expanded on and retitled this as the now-famous 1897 *Lectures on Thermodynamics*; in 1900, theorized that the internal energy of a black body (resonator) could be divided into a discrete number of "energy elements", thus launching the quantum revolution; would go on to do work in radiation thermodynamics.
Gilbert Lewis (1875-1946) American physical chemist		
Merle Randall (1888-1950) American physical chemist		
Ralph Fowler (1889-1944) English physicist	1922	
Edward Guggenheim (1901–1970) English physical chemist		
Emile Borel (1871-1956) French mathematician	1913	His "Statistical Mechanics and Irreversibility", followed by his 1914 book *Chance*, introduced the typing monkeys explanation of the statistical view of the second law.
Arthur Eddington (1882-1944) English mathematician, astronomer, and physicist	1928	
Leo Szilard (1889-1964) Hungarian-born American physicist	1929	
Claude Shannon (1916-2001) American electrical engineer and mathematician	1948	

Peter Landsberg (1922-2010) English physicist and statistical thermodynamicist	1961
Peter Atkins (1984) English physical chemist	1984

See also

- HT pioneers
- Thermodynamics founders
- Thermodynamicists (generations)
- History of thermodynamics
- Thermodynamicists (other)
- Schools of thermodynamics
- Founders of thermodynamics and suicide

θΔics

In thermodynamics history, **thermodynamics quotes** are famous thermodynamics quotations or noted statements which have been repeated so much that they have gained a certain level of fame. These are shown below arranged in a loose order of precedence and by ranked order of commonality of occurrence, and or humorous aspect

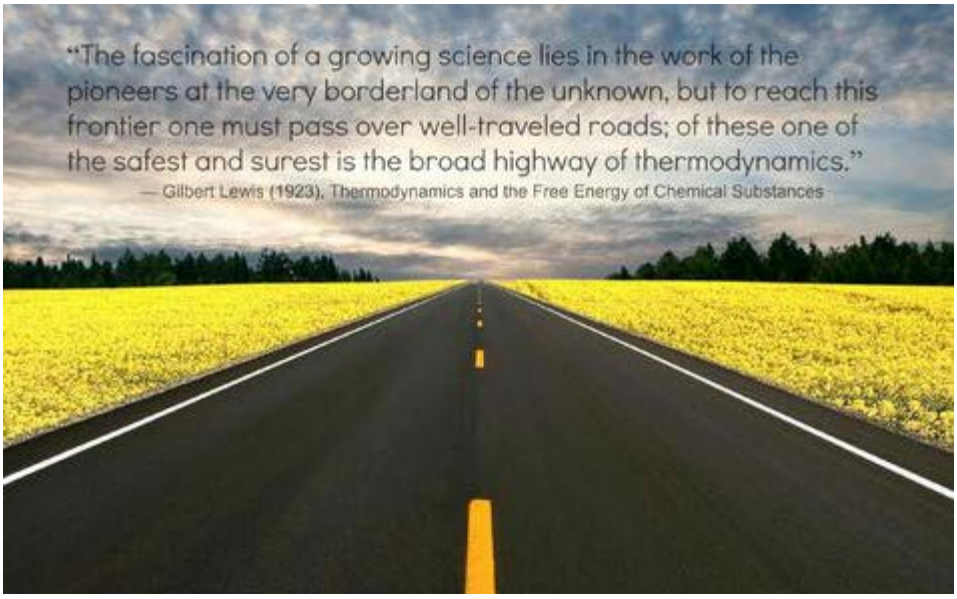

American physical chemist Gilbert Lewis' famous "broad highway of thermodynamics" quote. [2]

Passes

The following are quotes on the number of times one has to go through the subject of thermodynamics before one understands it:

> "Thermodynamics cannot be fathomed in all its profundity in a single pass."
>
> — Joseph Kestin (1966), *A Course in Thermodynamics* [31]

> "Thermodynamics is a funny subject. The first time you go through it, you don't understand it at all. The second time you go through it, you think you understand it, except for one or two small points. The third time you go through it, you know you don't understand it, but by that time you are so used to it, it doesn't bother you anymore."
>
> — Arnold Sommerfeld (c.1950) when asked why he had never written a book on the subject [11]

If by the third time, one goes though thermodynamics, one is in a state of unbothered consciousness about lack of complete understanding, the question remains as to what number of times one has to go through the subject before absolute mastery is obtained seems remains an open ended question—even the great Willard Gibbs, left unfinished things to write, such as tentative draft unpublished writing for a section on entropy as mixed-up-ness.

Humorous

The following are quotes with humorous aspects to them:

> "With thermodynamics, one can calculate almost everything crudely; with kinetic theory, one can calculate fewer things, but more accurately; and with statistical mechanics, one can calculate almost nothing exactly."
>
> — Eugene Wigner (date) [27]

> "Luddites and anti-intellectuals do not master the differential equations of thermodynamics or the biochemical cures of illness ... they stay in thatched huts and die young."
>
> — Edward Wilson, *On Human Nature* (1978) [9]

Newly found

The following are newer additions:

> "For the second law [of thermodynamics], I will burn at the stake."
>
> — Heinz London (c.1933), comment made to H. Montgomery during his time at Harwell [1]

> "Frequent unqualified references to the principle of minimum entropy production, [are] quite often used to bolster teleological arguments."
>
> — Irvin Richardson (1968) [28]

> "[We] do not feed on *negentropy* [like] a cat laps up milk."
>
> — Linus Pauling (1987) [25]

> "I am, and ever will be, a white-socks, pocket-protector, nerdy engineer—born under the second law of thermodynamics, steeped in the steam tables, in love with free-body diagrams, transformed by Laplace, and propelled by compressible flow. As an engineer, I take a substantial amount of pride in the accomplishments of my profession."
>
> — Neil Armstrong (2000), in a rare February public appearance (link), comment to America's National Press Club (link)

Human thermodynamics

See main: Human thermodynamics quotes

The following are noted quotes related to thermodynamics applied to questions of human concern, human existence, or human experience:

> "Indeed, the true role of entropy in that great circle of sciences, including sociology, which may be classified as the energetic sciences, is far broader and more important than even these words may indicate."
>
> — Sidney Reeve (1907), "The Question of Entropy" (see: what is entropy debate) [26]

> "If thought is capable of being classified with electricity, or will with chemical affinity, as a mode of motion, it seems necessary to fall at once under the second law of thermodynamics. Of all possible theories, this is likely to prove the most fatal to professors of history."
>
> – Henry Adams (1910), *A Letter to American Teachers of History* [23]

> "What can one say about the philosophical bravado, the cosmic effrontery, the sheer panache of this ailing philosopher with one foot in the grave talking down the second law of thermodynamics? It is a scene fit to

set alongside the death of Socrates."

— Robert Richardson (2007) on William James' derogation of Henry Adams' 1910 *A Letter to American Teachers of History*. [10]

"The world has signed a pact with the devil; it had to. It is a covenant to which everything, even every hydrogen atom, is bound. The terms are clear: if you want to live, you have to die. The world came into being with the signing of this contract. A scientist calls it the second law of thermodynamics."

— Annie Dillard [24]

"He was a practical electrician fond of whiskey, a heavy, red-haired brute with irregular teeth. He doubted the existence of a Deity but accepted Carnot's cycle, and he had read Shakespeare and found him weak in chemistry."

— H.G. Wells (1906), *The Door in the Wall, and Other Stories*, Lord of the Dynamos [20]

Founding quotes

The following are classic quotes in thermodynamics:

"The fascination of a growing science lies in the *work of the pioneers* at the very borderland of the unknown, but to reach this frontier one must pass over well traveled roads; of these one of the safest and surest is the broad highway of thermodynamics."

— Gilbert Lewis (1923) *Thermodynamics and the Free Energy of Chemical Substances* (1923) [2]

"A theory is the more impressive the greater the simplicity of its premises, the more different kinds of things it relates, and the more extended its area of applicability. Therefore the deep impression that classical thermodynamics made upon me. It is the only physical theory of universal content which I am convinced will never be overthrown, within the framework of applicability of its basic concepts."

— Albert Einstein, *Autobiographical Notes* (c. 1940s) [4]

"A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it."

— Max Planck, on how Boltzmann's statistical thermodynamics and atomic hypothesis triumphed over those as Ernst Mach and others of the energetics school (c. 1947) [18]

"The concept of an independent system is a pure creation of the imagination. For no material system is or can ever be perfectly isolated from the rest of the world. Nevertheless it completes the mathematician's 'blank form of a universe' without which his investigations are impossible. It enables him to introduce into his geometrical space, not only masses and configurations, but also physical structure and chemical composition. Just as Newton first conclusively showed that this is a world of masses, so Willard Gibbs first

revealed it as a world of systems."

— Lawrence Henderson, *The Order of Nature: An Essay* (1917) [5]

Second law | Entropy quotes

See main: Entropy quotes

The following are quotes related to the second law or entropy in general:

"The second law is the most metaphysical laws of physics since it points out without interposing symbols, without artificial devices of measurements, the direction in which the world is going."

— Henri Bergson, *Creative Evolution* (1907)

"Entropy is an extremely baffling conception. It is sometimes erroneously treated as if it were simply a statistical, a probable, or thermodynamic factor, without any material basis. Its material basis is almost never defined and is seldom even alluded to in books on thermodynamics."

— Albert Mathews (1927), *The Nature of Matter, Gravitation, and Light* [1]

"If someone points out to you that your pet theory of the universe is in disagreement with Maxwell's equations — then so much the worse for Maxwell's equations. If it is found to be contradicted by observation — well, these experimentalists do bungle things sometimes. But if your theory is found to be against the second law of thermodynamics I can give you no hope; there is nothing for it but to collapse in deepest humiliation."

— Arthur Eddington, *The Nature of the Physical World* (1928) [3]

"There's as many formulations of the second law as there have been discussions of it."

– Percy Bridgman, *The Nature of Thermodynamics* (1941) [17]

"A good many times I have been present at gatherings of people who, by the standards of the traditional culture, are thought highly educated and who have with considerable gusto been expressing their incredulity at the illiteracy of scientists. Once or twice I have been provoked and have asked the company how many of them could describe the second law of thermodynamics. The response was cold: it was also negative. Yet I was asking something which is the scientific equivalent of: *Have you read a work of Shakespeare's?*"

— C. P. Snow, 1959 *Rede Lecture*, "The Two Cultures and the Scientific Revolution". [7]

"One of the most fabled and mystical principles in science."

— Dennis Overbye (2001) *Einstein in Love.* [8]

“The second law of thermodynamics has a complicated genealogy.”

— Luis Fernández-Galiano, *Fire and Memory: On Architecture and Energy* (1982) [12]

“Every question or effect has the right to exist if it does not contradict the second law of thermodynamics”.

— Boris Pavlovich (c.1950) (link)

Other quotes

The following are other noted thermodynamics quotes:

“It must be admitted, I think, that the laws of thermodynamics have a different feel from most of the other laws of physics. There is something more palpably verbal about them—they smell more of their human origins. The guiding motif is strange to most of physics; namely, a capitalizing of the universal failure of human beings to construct perpetual motion machines of either the first or the second kind. Why should we expect nature to be interested either positively or negatively in the purposes of human beings, particularly purposes of such unblushingly economic tinge?”

— Percy Bridgman, *The Nature of Thermodynamics* (1941) [13]

“Every mathematician knows it is impossible to understand any elementary course in thermodynamics.”

— Vladimir Arnold, “Contact Geometry: the Geometrical Method of Gibbs’ Thermodynamics” (1989) [15]

“All kinds of private metaphysics and theology have grown like weeds in the garden of thermodynamics.”

— Erwin Hiebert, 1966 “The Uses and Abuses of Thermodynamics in Religion”. [16]

“Gentle mathematicians and physicists still cling to their laws of thermodynamics, and are almost epileptic in their convulsive assurances that they have reached a generalization which will hold good. Perhaps it will. Who cares?”

— Henry Adams, June letter, 1903 [19]

“What in the ever-loving blue-eyed world do these [Ulanowicz's] innocuous comments on thermodynamics have to do with ecology!”

— Anonymous manuscript reviewer, *The American Naturalist* (1979); in *Growth and Development* (1986) by Robert Ulanowicz.

Miscellaneous

The following are miscellaneous oft-repeated quotes with thermodynamics mentions:

"In whatever system where the weight attached to the wheel should be the cause of motion of the wheel, without any doubt the center of the gravity of the weight will stop beneath the center of its axle. No instrument devised by human ingenuity, which turns with its wheel, can remedy this effect. Oh, speculators about perpetual motion, how many vain chimeras have you created in the like quest. Go and take you place with the seekers after gold."

— Leonardo da Vinci (1494) [32]

"To teach ethnology, the philosophy of history, political economy and the theory of the state, to men who have not learned these first principles of sociology, is like teaching astronomy or thermodynamics to men who have not learned the Newtonian laws of motion."

— Franklin Giddings, *The Theory of Sociology* (1894)

"The future belongs to those who can manipulate entropy; those who understand but energy will be only accountants."

— Frederic Keffer [24]

"The use of thermodynamics in biology has a long history rich in confusion."

— Harold Morowitz (1992), *Beginnings of Cellular Life* [34]

Evolution

The following are evolution-related quotes:

"Clausius and Darwin cannot both be right." | "Can Carnot and Darwin both be right?" [14]

— Roger Caillois, *Coherences Aventureuses* (1973), [6]

"Who was right, Darwin or Carnot?"

— Fritjof Capra (1996), *The Web of Life* [30]

Lists

The end chapter of Benjamin Gal-Or's 1974 book *Modern Developments in Thermodynamics* contains seven-pages of noted and or historical thermodynamics quotations, selected by Gal-Or, by a number of thinkers, including: [21]

"I hesitate to use the terms 'first law' and 'second law', because there are almost as many 'first laws' as there are thermodynamicists, and I have been told by these people for so many years that I disobey their laws that now I prefer to exult in my criminal status and non-condemning names to the concrete mathematical axioms I wish to use in my outlaw studies of heat and temperature. The term 'entropy' seems superfluous, also, since it suggest nothing to ordinary persons and only intense headaches to those who have studied thermodynamics but have not given in and joined the professionals."

— Clifford Truesdell (date) [21]

among others including: Arthur Eddington, John Wheeler, Henri Poincare, Olivier Beauregard, among others. [22]

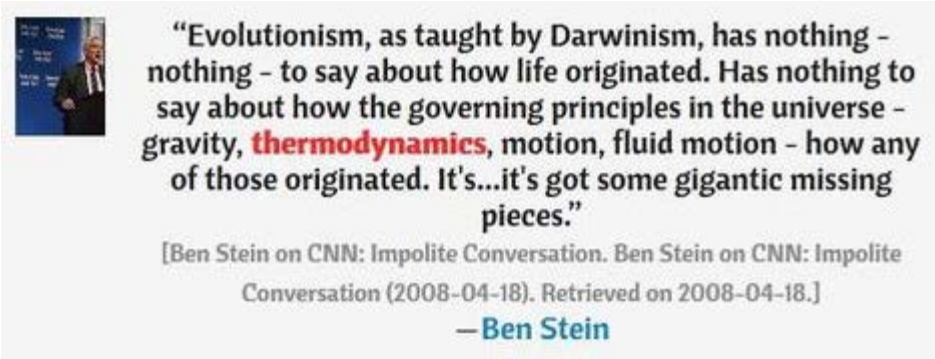

An example **thermodynamics quote** by American creationism spokesperson Ben Stein as found at IZQuotes.com. [29]

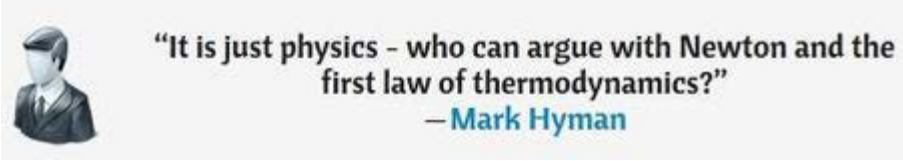

An example **thermodynamics quote** by American broadcaster Mark Hyman from IZQuotes.com. [29]

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External links

â— Thermodynamics Quotations – Today in Science History.
â— Heat quotes – TodayInSci.com

θΔics

In art thermodynamics, **thermodynamics tattoos** are tattoos involving thermodynamics quantities, such as energy E or entropy S, formulas, equations, or key terms. Some of these are tabulated below, shown chronologically.

Tattoo	Description	Equation	Date/Location
	Quote: "This tattoo means a lot to me because I was diagnosed with Manic-Depressive Illness right before I got it. It is just a reminder of all the blood, sweat, and tears that I've been through to be where I am today."		2005; on arm of man; attending school at ITT Tech; who lives in Waynesboro, PA. [8]
	Quote: "I think that capo3433's Boltzmann equation tattoo is the geekiest tattoo I've posted in quite a long time (I'm assuming he understands it, but he says he's not very good at math!). It's done by Kimsu at *Body Graphics* in NJ. If you're wondering, s = k *log* w is a measure of entropy in this case."	S = k log W (S = k ln W) ● Formulate by Max Planck in 1901, based on Austrian physicist Ludwig Boltzmann's 1882 H-theorem.	On stomach of man named Capo, 2006. [7]
	On the other arm, to note, is Newton's second law of motion F = ma.	$E = mc^2$ (mass energy equivalence) ● Formulated in 1905 by Albert Einstein	On front right forearm of a man, Oct 2007. [1]
	Quote: "My first year of college, I wanted to be an English major, and I took intro chemistry to fill the science requirement. The brief unit on thermodynamics made me fall totally in love. Entropy made sense to me - scientifically, philosophically. I became a chemistry major and love every second of it. I got the tattoo to mark my rite of passage - Entropy going both ways, with its symbol delta S in the middle, all supported in the roots of Yggdrasil, the world-tree of Norse mythology (harking back to my English-lit days)."	Entropy change ΔS ● Formulated in date by person?	Written, going both ways, on the back of Abigail Garcia, March 2007. [2]
	Quote: "I'm currently a PhD student in chemistry, specializing in polymer synthesis. I got this tattoo at the very beginning of my graduate studies (almost three years ago), for many reasons (one		

Related

The following are related tattoos:

Tattoo	Description	Date/Location
	A truncated meaning of the a discussion between God and mud in American writer Kurt Vonnegut's 1963 *Cat's Cradle*, on purpose in the context of the creation by clay myth as it is known to most Abrahamic faiths as the Adam and Eve story as told in the story of Genesis; a section of which is shown below: And God said, "Let Us make living creatures out of mud, so the mud can see what We have done." And God created every living creature that now moveth, and one was man. Mud as man alone could speak. God leaned close as mud as man sat up, looked around, and spoke. Man blinked. "What is the *purpose* of all this?" he asked politely. "Everything must have a purpose?" asked God. "Certainly," said man. "Then I leave it to you to think of one for all this," said God. And He went away. ● Vonnegut, Kurt. (1963). *Cat's Cradle* (pg. 265). RosettaBooks, 2002.	● Lucky me, luck mud (2010) – Blog.PassionTask.com.

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1. (a) E = mc² (Tattoo) – Full Photo.
(b) Anon. (2007). "Inked for Science", Oct 25.
2. (b) Entropy tattoo (Science Tattoo Emporium) - DiscoverMagazine.com
(c) May She Rest in Odin's Hall's (August 19, 2008) – BionicAtheist.WordPress.com.
3. (a) Irreversibility (photo by Marco Fantoni; March, 2008) - Flickr.
(b) Irreversibility – Flickr (Italian → English).
4. (a) Zimmerman, Carl. (2009). "I am Shiva, the Physics Teacher of the Worlds", *Discover Science Blogs*, Apr. 23.
(b) Entropy generation (tattoo) – full picture.
(c) Quote: "equation describing entropy, symbolizes destruction, simply stating that this fundamental breakdown of systems and accumulation of disorder either increases or stays the same over time, but never decreases."
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(b) The Second law of Thermodynamics (05 Apr 2010) – GeekyTattoo.com.
(c) Tattoo is a duplicate of the 1856 formulation of Clausius' 1854 principle of the equivalence of transformations (i.e. second main principle, alternative formulation), as found in the mathematical descriptions section of the Wikipedia second law of thermodynamics article, an equation added by Libb Thims on 18 Sep 2006.
6. Entropy tattoo (foot) added on 30 Jun 2009 (by Franchise6125, female age 24) RankMyTattoo.com.
7. Boltzmann equation (stomach tattoo) Capo3433, 19 Dec 2006 – News.BMEzine.com.
8. Entropy tattoo (2005) – BodyMod.org.

θΔics

In human thermodynamics education, **thermodynamics textbooks with humanities applications**, refers to thermodynamics textbooks that include applications in the humanities, i.e. human thermodynamics material, in one of its 40+ branches, in their content; known examples are listed below:

List

The following is a listing of known thermodynamics (predominately) textbooks, and to a lesser extent thermal physics, statistical mechanics (or statistical thermodynamics), and or chemistry (or physical chemistry) textbooks, that include "thermodynamics applied to the humanities" material:

Year	Textbook	Human thermodynamics branch	References
1931	 *A Treatise on Heat: Including Kinetic Theory of Matter, Thermodynamics, Statistical Mechanics, and Thermal Ionisation* Meghnad Saha (1893-1956) Indian astrophysicist (see: Indian school)	● Explained the Maxwell-Boltzmann distribution of molecular velocities according to kinetic theory in terms of the wealth distributions in society. 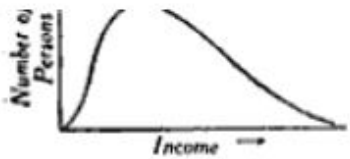 Fig. 6.—Distribution of income among persons	[10]
1964	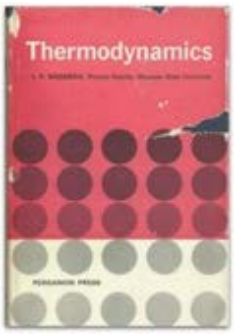 *Thermodynamics* Ivan Bazarov (1916-2005) Russian physicist	● Heat death argument *for* the existence of god (Friedrich Engels) ● Heat death argument *against* the existence of god (Bazarov) ● Universal origins	[1]

1973	 *Fundamentals of Classical Thermodynamics* Gordon van Wylen (1920-) American mechanical engineer Richard Sonntag (1933-2010) American mechanical engineer	● Philosophical thermodynamics ● Argument for/belief in the existence of God/Creationism ● Universal origins (low entropy state)/Eschatology ● Destiny of humans (second law)	[2]
1980	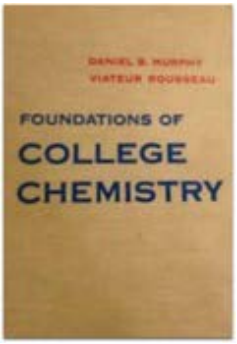 *Foundations of College Chemistry* Daniel Barker Murphy (1928-) Viateur Rousseau (1914-2000)	● Frederick Rossini ("Chemical Thermodynamics in the Real World", 1971); the chemical thermodynamic nature of freedom vs security, government (government thermodynamics), politics (political thermodynamics). ● Rossini debate (2006)	[7]
1999	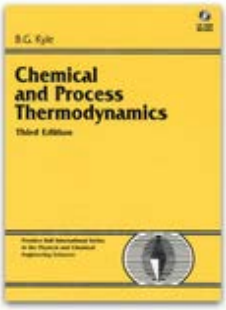 *Chemical and Process Thermodynamics* Benjamin Kyle	● Two cultures (C.P. Snow) ● Universal origins/Eschatology/Heat death (Friedrich Engels, Ivan Bazarov) ● Religious thermodynamics (William Inge, Pope Pius XII, Pierre Teilhard) ● Animate thermodynamics (life, origin of life; defunct theory of life) ● Social thermodynamics/Anthropological thermodynamics (Claude Levi-Strauss) ● History thermodynamics (Henry Adams) ● Economic thermodynamics (Nicholas Georgescu-Roegen) ● Ecological economics (Herman Daly, Jeremy Rifkin) ● Literature thermodynamics (John Barth, Donald Barthelme, Saul Bellow, Stanley Elkin, Norman Mailer, Walker Percy, Thomas Pynchon, John Updike) ● Art thermodynamics (Rudolf Arnheim)	[3]

	(1927-) American chemical engineer	● Philosophical thermodynamics (Kyle) ● Psychological thermodynamics (Sigmund Freud)	
1999 thru 2010	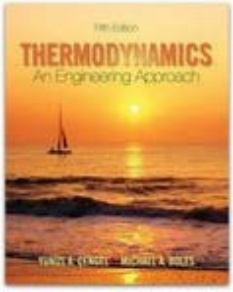 *Thermodynamics an Engineering Approach* Yunus Cengel (1955-) Turkey mechanical engineer Michael Boles (1943-) American mechanical engineer	● Economic thermodynamics (Robert Ayres) ● Human thermodynamics (human performance/efficiency in daily existence, learning (low-entropy learning), work place friction, human friction, social friction (entropy generation), etc.) ● War thermodynamics See main: Cengel-Boles human thermodynamics	[4]
2004	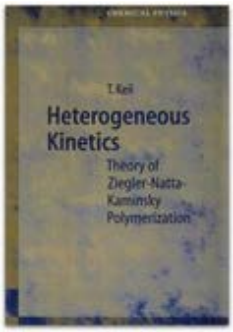 *Heterogeneous Kinetics: Theory of Ziegler-Natta-Kaminsky (chapter 2: Chemical Thermodynamics)* Tominaga Keii (1920-2009) Japanese chemical engineer	● Chemical Affinity in 1806 ● Human chemical thermodynamics: *Elective Affinities;* human elective affinity; human chemical reaction, Goethe's affinity table, Goethe's human chemistry (Johann Goethe)	[6]

2003 thru 2010	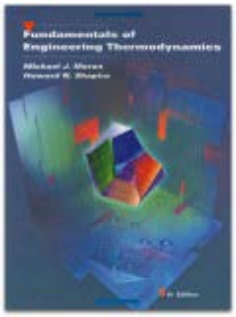 *Fundamentals of Engineering Thermodynamics* Michael Moran (c.1950-) American mechanical engineer Howard Shapiro (c.1947-) American mechanical engineer	● A few economics problems and life and second law paradox problems; ● Nicholas Georgescu-Roegen (1971), Erwin Schrodinger (1944), Ilya Prigogine (1971-2003), and Eric Schneider (2005)	[13]
2010	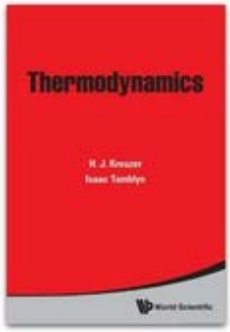 *Thermodynamics* Hans Kreuzer (c.1945-) Canadian atmospheric physicist Isaac Tamblyn (c.1983-) Canadian physicist	● Economic thermodynamics (Wayne Saslow)	[5]
2010	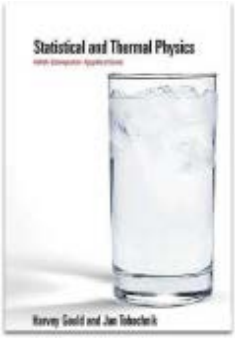 *Statistical and Thermal Physics:*	● Includes applications of thermodynamics and statistical mechanics to areas such as social networks and finance (Elliott Montroll, Albert-Laszlo Barabasi,	[12]

	With Computer Applications Harvey Gould (c.1941-) American physicist Jan Tobochnik (1958-) American natural scientist and physicist	Cesar Hildalgo, Jean-Phillippe Bouchard, Marc Potters, Nassim Taleb, etc.) ● Ising model to social behavior (social Ising model) (Dietrich Stauffer)
2011	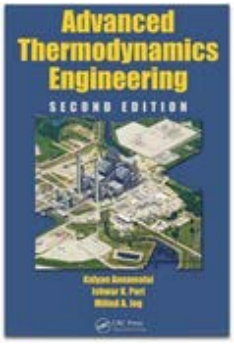 *Advanced Engineering Thermodynamics* Kalyan Annamalai Carlos Silva (co-author, formula chapter) Puri Ishwar Milind Jog	● Human molecular formula (Libb Thims) [8] **14.4.1 Formulae** **Humans may be called a 26-element energy/heat driven dynamic atomic structure.** The body contains about 60–70% water; even the bones contain over 30% water with males containing more water than females. By weight, oxygen amounts to about two-thirds of the body (about 67%),
2012	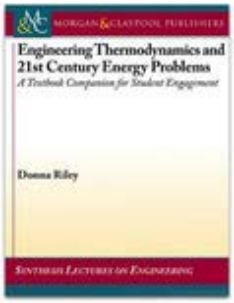 *Engineering Thermodynamics and 21st Century Energy Problems* Donna Riley	● HumanThermodynamics.com (Libb Thims) ● Entropy as a social construct (sociological thermodynamics) ● Entropy's philosophical implications (philosophical thermodynamics) ● Entropy and time (arrow of time) ● Entropy in learning, libraries, rooms, and armies (Cengel-Boles human thermodynamics) [9]
2014		● Henry Adams ● Literature thermodynamics | Bruce Clarke

	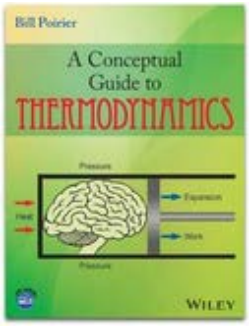 *A Conceptual Guide to Thermodynamics* Bill Poirier		
2015/16	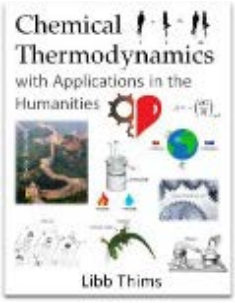 *Chemical Thermodynamics: with Applications in the Humanities* Libb Thims (c.1975-) American electrochemical engineer (see: human chemical thermodynamics)	● Full top to bottom step-by-step derivation of chemical thermodynamics (Parmenides → Otto Guericke → Sadi Carnot → Rudolf Clausius → Willard Gibbs → Gilbert Lewis → Edward Guggenheim → Fritz Lipmann), with focus on application to the various fields of the humanities (Johann Goethe → William Rankine → Lawrence Henderson → Frederick Rossini → Mirza Beg → modern human free energy theorists).	[11]

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θΔics

In conferences, **Thermodynamics Two Cultures Conference**, or "International Conference on Thermodynamics 2.0", is a planed Jun 2020 international conference on thermodynamics focused on the topic of "identifying and connecting the dots of scientific revolutions in the natural and social sciences" (Poudel, 2019), themed on the growingly-divided "two cultures" rift in the world's education systems, as opinionated famously by Judson Herrick (1930), John Dewey (1938), and Charles Snow (1959). [N1]

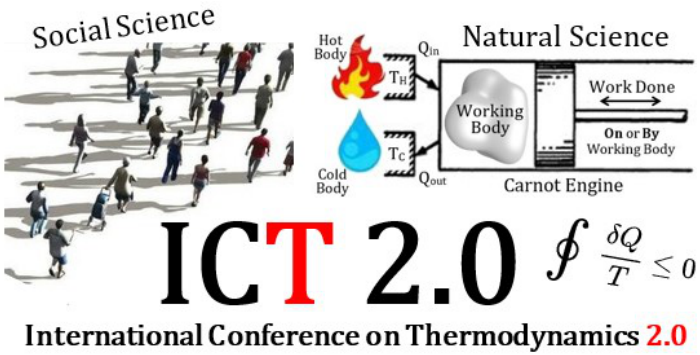

Venue

The conference is tentatively slated to occur on Jun 22-24, 2020 at the Worcester Polytechnic Institute, Worcester, Ma, conceived as a joint effort of colleagues from University of Massachusetts, Amherst, and University of Connecticut. [2]

Forerunners

The Thermodynamics Two Cultures Conference 2020 is precursored, thematically, in various ways, by the BPE 2016 conference, the Arthur Iberall lecture series (2003-present) (Ñº), and the 1970 AAAS Symposium on Science and Human Values (in the context of thermodynamics).

Speakers | Confirmed

The following is a tentative desired attendee listing, ordered alphabetically by country, shown with economic funding qualification, where applicable; named bolded being key desired speakers: [N2]

-
-

		Country	Person		Talk	Affiliation / Notes / Fields
A	1.	Australia				
B	2.	Belgium				
		Brazil				
		Bulgaria				
C	3.	Canada				
	4.	China				
	6.	Croatia				
D						
E						
F	7.	France				
G	9.	Germany				
H						
I	12.	India				
	1#.	Israel				
	13.	Italy				
	14.	Italy				
J						
K						
L						
M	15.	Mexico				
N	16.	Nepal	Ram Poudel E: rcpoudel@ioe.edu.np	✓	"Talk Title"	Topics: Economics, sociology, social field
	17.	Nigeria				
O						
P	18.	Pakistan	**Mirza Beg** (P) [LMI]	✓	"Socio-Physicochemical Theory on Terror and Terrorism" [4]	Topics: Physico-chemical sociology

	19.	Poland				
	20.	Puerto Rico				
Q						
R	21.	Russia				
S	23.	Spain				
T						
U	24.	UK				
		USA	Georgi Georgiev			
	29.		Jon McGowan	✓	"Talk Title"	Co-author with Poudel in his social field publications.
	30.		Libb Thims E: libbthims@gmail.com	✓	"A Theoretical Torricelli Social Barometer to Measure Social Pressure" [3]	
V	40.	Venezuela				
W						
X						
Y						
Z						

-
-

Speakers | Draft list

The following is a tentative desired attendee listing, ordered alphabetically by country, shown with economic funding qualification, where applicable; named bolded being key desired speakers: [N2]

-

		Country	Person	Go	Fields	Talk	Email	Affiliation / Notes
		---	---		---	---		
A	1.	Australia	Ramil Nigmatullin (P)				ramil.nigmatullin@sydney.edu.au	University of Sydney profile.
B	2.	Belgium	Serban Scrieciu (P)		Energy policy, sustainability		scrieciu@gmail.com	ResearchGate profile.
		Brazil	**Jaime Aguilar-Arias** (T)					
		Bulgaria	Roumen Tsekov (T)					
C	3.	Canada	Vaclav Smil (P)		History			
	4.	China	**Yi-Fang Chang** (P)		Sociology, social field		yifangchang1030@hotmail.com	
	5.	China	Ao Ping (P)				aoping@situ.edu.cn	ResearchGate profile.
	6.	Croatia	**Josip Stepanic** (P)		Sociology			
D								
E								
F	7.	France	**Francois Roddier** (P)		Evolution, economics, sociology			Reddit post (Mar 2019).
	8.	France	Robert Ayers (P)					
G	9.	Germany	**Ingo Muller** (P)		Economics, sociology			

	10.	Germany	**Dirk Helbing** (P)		Social field			
	11.	Germany	Hermann Haken (P) (↓)					
		Germany	Frank Schweitzer (T)					ETH Zurch
H								
I	12.	India	Ashok Sengupta				osegu@iitk.ac.in	Website homepage.
	1#.	Israel	**Alec Groysman** (T)					Website homepage.
	13.	Italy	Tommamso Ruggeri (P)		?			(CV) (website)
	14.	Italy	Corrado Giannantoni (P)					
J								
K								
L								
M	15.	Mexico	Karo Michaelian (P)		Evolution, origin of life			
N	16.	Nepal	Ram Poudel	✓	Economics, sociology, social field	"Talk Title"	rcpoudel@ioe.edu.np	
	17.	Nigeria	**Nathaniel Umukoro** (T) [LMI]	✓	Culture, border conflict		numukoro@yahoo.co.uk	Reddit post (Ñº) (Apr 2019).
O								
P	18.	Pakistan	**Mirza Beg** (P) [LMI]	✓	Sociology	"Socio-Physicochemical Theory on Terror and Terrorism" [4]		
	19.	Poland	Mieczyslaw Dobija (P)		Economics			
	20.	Puerto Rico	Luis Arroyo (P)		Economics			
Q								
R	21.	Russia	Georgi Gladyshev (P) (↓)		Evolution			
	22.	Russia	Octavian Ksenzhek (P)		Economics			
S	23.	Spain	**Mateo Gil** (T)		Relationships, film			Reddit post (2018).
		Spain	**Stefan Pohl-Valero** (T)					
T								
U	24.	UK	**Erich Muller** (T)				e.muller@imperial.ac.uk	
		UK	**Philip Ball** (T)		Physics of society			Email associate of Thims since 2010

	25.	UK	**Amir Shirzadi** (T) ?				Reddit post (Jun 2018).
	26.	UK	Benjamin Sovacool (P)	Energy policy			Wikipedia article; 2006 PhD (pdf)
	27.	UK	Michael Joffe (P)	Economics		m.joffe@imperial.ac.uk	LinkedIn profile.
	28.	USA	**Jacob Leachman** (T)	Sociology		jacob.leachman@wsu.edu	
	29.		Jon McGowan	✓			Co-author with Poudel in his social field publications.
	30.	USA	Libb Thims	✓	[everything]	"Talk Title" "A Theoretical Torricelli Social Barometer to Measure Social Pressure" [3]	
	31.		**James Ferri** (T)				
	32.		Donna Riley (T)				
	33.		Curtis Blakely (T)				
	34.		Alan Sica (T)				
	35.		**Leon Warshay** (T)				
	36.		**Timothy Kueper** (T)		Morality, Religion		
	37.	USA	Melvin Klegerman (T)		War	melvin.e.klegerman@uth.tmc.edu	23 Oct 2018 email dialogue with Thims and Leachman on his 1976 thermodyamics of war article
	38.	USA	Mehrdad Massoudi (T)		Morality; ethics		Reddit post (May 2019).
	39.	USA	Seth Lloyd (P)		Information theory	libbthims@gmail.com	YouTube vid (2018).
V	40.	Venezuela	**Klaus Jaffe** (T)		Sociology	kjaffe@usb.ve	
W							
X							
Y							
Z							

-

The "Go" column, with check mark ✓, indicates committed attendees and or speakers.

As of Nov 2019, about 15 abstracts have been submitted; but these are not yet updated with check marks (above).

Funding

The venue will likely be able to provide financial aid of about $500 to $1,000 per person, per country, for those countries listed on the World Bank (Ñº)
(**Ñº**) as "low income" [LI], i.e. less than $995 GNI per capita (2017) or "lower middle income" [LMI], i.e. $996-$3,895 GNI per capita (2017) economies.

Focuses

The following are conference focuses:

â— **Adequate** apeaker **time allotment**: 30-45 min (+ Q/A) (compare the: 2016 BPE sloppy 15-min speaker window disaster scheduling result)
â— **Published conference proceedings** (low cost), available for purchase, and in Google Books
â— Full conference lectures **video recorded** and available on YouTube

(add)

See also
â— Two cultures calls

Notes
N1. A tentative 24-person potential attendee listing was compiled by Ram Poudel (Jun 2019), as indicated by the letter "P" by potential attendees; those potential attendee additions shown with letter "T" were added by Libb Thims; the up-arrows (↑) and down-arrows (↓) were added, by Thims, via intuition (e.g. age, health, funding, etc., issues), based on the relative likelihood of each person's attending or not attending, respectively.

References
1. (a) Poudel, Ram. (2019). "Email to Libb Thims", Apr 10.
(b) Poudel, Ram. (2019). "Email to Libb Thims", Jun 19.
2. International Conference on Thermodynamics 2.0 (2020) – IAISAE.org.
3. Thims, Libb. (2019). "A Theoretical Torricelli Social Barometer to Measure Social Pressure" (pdf), Article for Talk at 22-24 Jun 2020 International Conference on Thermodynamics 2.0 at Worcester Polytechnic Institute, Worcester, Ma.
4. Beg, Mirza. (2020). "Email to Ram Poudel and Libb Thims", Apr 1.

Videos
â— Thims, Libb. (2019). "Interview of Mirza Beg: Physico-Chemical Sociology" (Chair of Physio-Chemical Sociology, 0-9:49; Thermodynamics 2.0 Conference, 9:50-20:00) (№), Day 2.6, Sep 17.

θΔics

In websites, **thermodynamics websites** are those whose URL indicates a dedication to a specific topic in thermodynamics. The following tables collect some of these websites, ordered by date of launch:

New (add)

- Entropy-and-HumanValues.gr (c. 2006 launch) by Dimitris Keranis.

Thermodynamics sites

The following are themed or on pure thermodynamics:

Site	Screenshot	Description
SecondLaw.com Launch: 1998 By: Frank Lambert	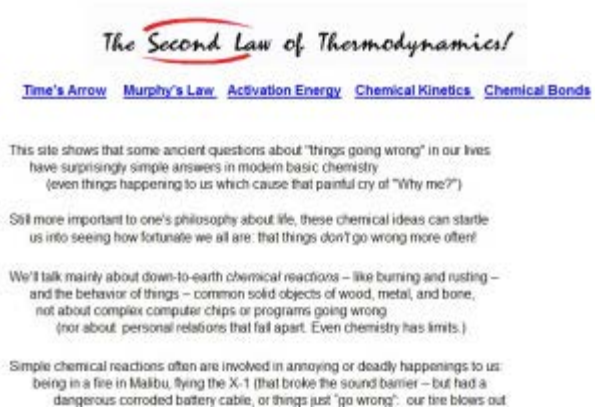	The first of a number of websites, including 2ndLaw.com (1999), Shakespeare2ndLaw.com (2001), EntropySimple.com (2001), EntropySite.com (2003), etc., aiming to present the simplified view that entropy is not "disorder", but rather better explained as "energy dispersal". All the sites were transferred to Occidental College (.com → .oxy.edu) in circa 2009.
ThermoHistory.org Launch: 2003 By: S Carnot (EoHT user)		Contains an except of Lynde Wheeler's biography of Willard Gibbs and parts of Sadi Carnot's paper.
ThermoWiki.org (ThermoWiki) Launch: 2007 (retired: 2009) By: J.M. Haile		A short-lived wiki, having made 47 articles, with aims to education on thermodynamics topics, particularly chemical thermodynamics.
Sklogwiki.org		A collection of pages linking external

(SklogWiki)
Launch: 2007
By: Carl McBride

publications on topics in statistical mechanics.

LearnThermo.com
Launch: 2007
By: William Baratuci

Contains tutorials, examples, a blog, and links and tools to help students learn thermodynamics. Before that the information was online at ThermoCD.com. ThermoCD.com still exists, but the free Authroware plug-in is required. It can be downloaded from Adobe. [1]

Human thermodynamics sites

The following are sites dedicated or themed on applications of thermodynamics to subjects of the humanities, i.e. in fields of human thermodynamics:

Site	Screenshot	Description
SocialThermodynamics.hu Launch: 2004 By: Babics Laszlo		Contains Hungarian and English translations of 2003 paper "The Mechanics and Thermodynamics of Mass Societies."
HumanThermodynamics.com Launch: 2005 By: Libb Thims		Gives a layperson overview of how thermodynamics applies to humanities; host to the Journal of Human Thermodynamics; published classic papers among other things.

Negentropy.us (2007)
Negentropie.com (2010?)
Negentropia.com (2010?)
ValterCaggio.com (2002)
Launch: 2002-2010
By: Valter Caggio

A set of redirect multi-language (Italian and English primarily) sites dedicated to promoting negentropy as the universal principle to human existence.

HumanChemistry.net
Launch: 2007
By: Libb Thims

Educational site on human chemistry, a prerequisite subject to human chemical thermodynamics.

EoHT.info
Launch: 2007
By: Libb Thims

An encyclopedia of terms, people, and theory surrounding the application of thermodynamics to subjects of humanity.

HumanMolecule.net
Launch: 2008
By: Libb Thims

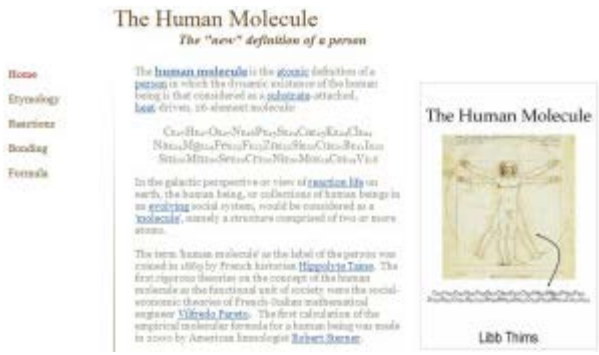

Educational site on the human molecule, the basic component particle of study in systems of human thermodynamics.

Carbon-Entromorphology.com
Launch: 2008
By: Mark Janes

Considers a human to be a "giant carbon atom" and uses uses aspects of chemical thermodynamics, particularly the Gibbs free energy equation $\Delta G = \Delta H - T\Delta S$, to explain aspects of

humanity, such as good, evil, purpose, evolution, etc.

SocialThermodynamics.org
Launch: 2009
By: Gregory Botanes

Uses "social thermodynamics research" and Montecarlo techniques to apply in business and market applications using an external consultation approach. It uses the acronym SThAR or "social thermodynamics applied research" as a logo for the human thermodynamics applications business thermodynamics company.

See also

- Entropy.ac – Society for Studies on Entropy (Japan).

Notes

Comment in the threads below if you know of other related thermodynamics sites.

References

1. Authroware plug-in (download) - Adobe.

External links

- The World's Top Thermodynamics Websites – WebsBiggest.com.

θΔics

En thermodynamique, la **thermodynamique de l'homme** est l'étude scientifique des aspects énergétiques et entropiques du processus de l'activité humaine et le mouvement, dans le cadre de boundaried quotidienne cycles solaires, à savoir celles existant entre la chaleur, le travail, la spontanéité, l'irréversibilité et les lois définissant celle-ci.

Further reading

● Hirn, Gustave A. (1868). *Conséquences Philosophiques et Métaphysiques de la Thermodynamique*: *Analyse élémentaire de l'univers* (*Metaphysics and Philosophical Implications of Thermodynamics: Basic Analysis of the Universe*). Gauthier-Villars.

θΔics

In thermodynamics, **thermoeconomics** is duel-meaning term originally defined as use of the science of economics in the improvement and study of the cost efficiencies of thermodynamical processes, but more recently meaning the use of the science of thermodynamics in the study of economies.

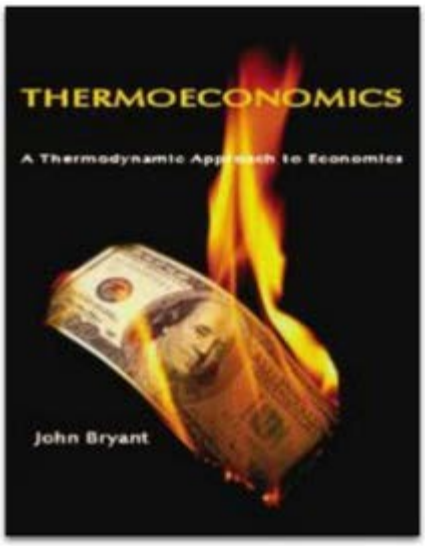

Cover of English mechanical engineer John Bryant's 2009 book ***Thermoeconomics:*** *a Thermodynamic Approach to Economics.* [5]

Synonyms

Thermoeconomics is a near synonym for both economic thermodynamics, eco-thermodynamics, and biophysical economics, loosely.

Etymology

The term "thermoeconomics" was coined by American engineer Myron Tribus and used in a functional sense in relation to cost and efficency as presented in a 1962 paper that dealt with seawater desalination processes. [1] The term soon began to be used, essentially within the field of engineering, as the study of the efficency of energy use in industrial processes or as the "field that links economic analysis with thermodynamics". [2]

In 1990, German theoretical ecologist Bengt Mansson was using the term "thermoeconomics" in the two cultures sense of the term.

In 2001, social scientist Peter Corning began using the term thermoeconomics, in a functional sense, as the study of economic systems through the tools of energy and entropy. [3] Life, according to Corning, is a contingent and labor-intensive activity" in which "energetic profitability is essential to growth and reproduction". Corning calls this the *first law of thermoeconomics*.

In 2007, similar to Corning, American chemical engineer Libb Thims defined "thermoeconomics" as that overarching human thermodynamics discipline, developed by those such as Frederick Soddy (1922), Nicholas Georgescu-Roegen (1971), Philip Mirowski (1989), and Jing Chen (2005), and others, that thermodynamically studies human societies from an economic point of view. [4]

References

1. Yehia M. El-Sayed (2003). *The Thermoeconomics of Energy Conversions* (pg. 4). Pergamon.
2. (a) Sieniutycz, Stanislaw; Salamon, Peter (1990). *Finite-Time Thermodynamics and Thermoeconomics* (pg vii, 1). Taylor & Francis.
(b) Berry, R.S., Salamon, P. and Heal, G. (1978). "On a Relation between Thermodynamic and economic optima", *Resources and Energy*, 1, 125.
(c) Sieniutycz, S. (1978). *Optimization in Process Engineering.* Warsaw: WNT.
(d) Mansson, B.A.G. (1985). *Contributions to Physical Resource Theory*, Chalmers University of Technology, Goteborg.
3. Corning, Peter A. (2001). "Thermoeconomics - Beyond the Second Law" (PDF), Institute for the Study of Complex Systems.
4. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview). pg. 53, Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), pg. 677-678. Morrisville, NC: LuLu.
5. Bryant, John (2009). *Thermoeconomics: A Thermodynamic Approach to Economics*. VOCAT International Ltd.
6. Mansson, Bengt. (1990). “Thermodynamics and Economics”, in: Mansoori, G.A., Sieniutycz, S. and Salamon, P. (1990). *Advances in Thermodynamics, Vol. IV: Finite-Time Thermodynamics and Thermoeconomics* (pgs. 153-74). Taylor & Francis.

External links

â— Thermoeconomics – Wikipedia.

θΔics

In science, **thermofluids** is the joint study of thermodynamics and fluid mechanics integrated into one subject. [1] The subject as a discipline, taught as part of college curriculum, dates back to at least 1968. [2]

References

1. (a) Sherwin, Keith and Horsley, Michael. (1996). *Thermofluids* (pg. vii). Taylor & Francis.
(b) Marquand, C. and Croft D.R. (1994). *Thermofluids: an Integrated Approach to Thermodynamics and Fluid Mechanics Principles.* J. Wiley.
2. Proceedings of the Mechanical Engineers (Great Britain) (pg. 163) vol. 182.

External links

â— Thermofluids – Wikipedia.

θΔics

In science, **thermogen**, meaning 'to bring forth heat', was a hypothetical type of imponderable matter of fire, acting such that forces of repulsion occurred between the particles of thermogen, and forces of attraction occurred between thermogen and those of bodies. [1]

Etymology

The term 'thermogen', in its original formulation, was defined as an imponderable element of all supporters of combustion, whether it exists combined with matter, or in a free and uncombined state. [2] The term was coined by English scientist Ezekiel Walker in 1814, along with the term 'photogen', the element of light, the two terms providing for a tentative theory of combustion and heat and light actions in the voltaic cell. [3] The term seems to have been a theoretical variant, spinoff, or possibly a synonym, in a sense, of caloric (the matter particle of heat and light). [4]

References

1. Alekseev G.N. (1987). *Energy and Entropy* (pg. 110). Imported Publishers.
2. Walker, Ezekiel. (1814). "New Outlines of Chemical Philosophy (section: Thermogen and Photogen, pgs. 23-24)." *Phil. Mag.* (pgs. 22-26). *Vol. XXXiX*, p. 137.
3. (a) Hutton, Charles. (1815). *A Philosophical and Mathematical Dictionary*, Vol. 1 (pgs. 637-38). S. Hamilton.
(b) Golinski, Jan. (1999). *Science as Public Culture: Chemistry and Enlightenment in Britain, 1760-1820* (pg. 213). Cambridge University Press.
4. Thermogene Co., Limited v. Thermozine Co., Inc. (1925). *The Federal Reporter* (pgs. 69-70), Vol. 234.

θΔics

In science, **thermometer** is a device or instrument for measuring temperature, or 'degree of heat or cold', the theory of which is based on the zeroth law of thermodynamics.

History

In circa 240BC, Philo of Byzantium (c.280-220BC) made the first thermometer-like devices. [11] Philo published a manuscript describing an experiment in which a tube from a hollow sphere was extended over a jug of water operating such that if the sphere was placed in the sun, bubbles would be released as air expanded out of the sphere; conversely, when moved into the shade, water rose in the tube as air in the sphere contracted, as pictured adjacent. [10]

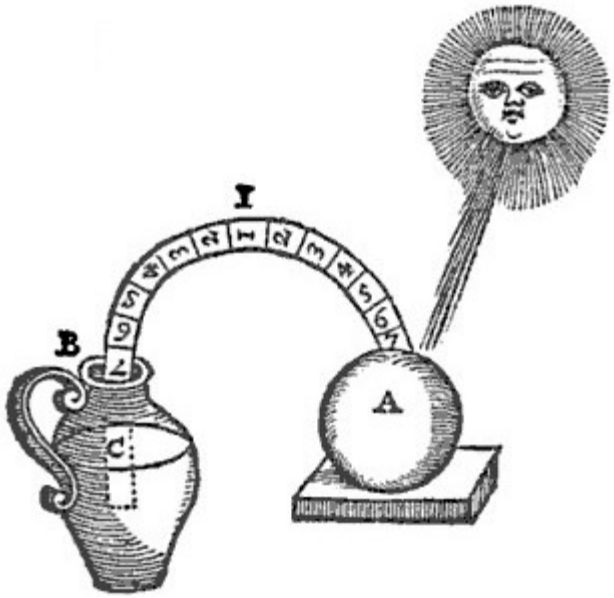

A circa 240BC Philo thermometer, the world's first **thermometer**. [10]

In c.50AD, Hero of Alexandria (c.10-70AD) is said to have modeled is thermometer work on Philo, which he described in his *Pneumatica.* [12]. Later, others, such as German engineer Robert Fludd, had access to Philo's manuscript, and Galileo read Hero's *Pneumatics* in 1589. [9]

In 175AD, Galen made a crude thermometers was a nine-degree scale. In particular, Galen considered boiling water to be the hottest body, ice to be the coldest, and a mixture of equal parts ice and boiling water to be the neutral body. He then installed four degrees above and four degrees below the neutral point, thus making a nine-point scale. [2]

Sometime towards the later 16th century, Italian physician Santorio Santorio (1561-1636), a colleague of Galileo, is said to have made a thermoscope type of device, a type of redesigned Galen thermometer. In this sense, Santorio is often credited with the design of the clinical thermometer. [10]

In 1592, Italian scientist Galileo Galilei invented what most consider the first true thermometer. [6] It was described, according to a retrospect description by Galileo's friend Benedetto Castelli, many years later, as such: [3]

> "Galileo took a glass about the size of a small hen's egg, fitted to a tube the width of a straw, and about two spans long: he heated the glass bulb in his hands and turned the glass upside down so that the tube dipped in water held in another vessel; as soon as the ball cooled down, the water rose in the tube. This instrument he used to investigate degrees of heat and cold."

This device seems to have come to have been referred to as a 'thermoscope' (a thermometer without a scale), in modern discussion. Galileo's instrument was said to depend on the observation that air expands when it is hot and contracts when it is cool. The water, differed in respect to mercury in a modern thermometer, serving merely to indicate the expansion or contraction of the air in the bulb. The preliminary heating was a trick to bring the water to a level where it could be seen. [3]

In the 1613 words of his student Francesco Sagredo, who used Galileo's device for measuring the difference in temperature between air, snow, and ice, what Galileo had invented was an "an instrument for measuring heat", which can be said to be the first recorded definition of a thermometer. [2] Sagredo used the device to compare the temperature of lakes of different sizes as they cooled in the winter, finding that smaller ones cooled faster than larger ones. He recorded his readings as "degrees of heat". [10]

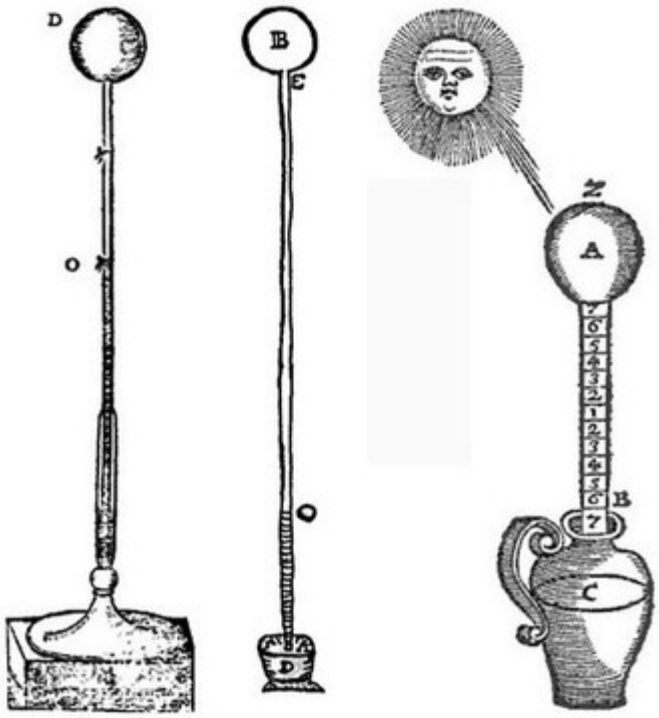

Left: A circa 1610 Santorio thermoscope. [10] Center: Giuseppe Biancani's 1617 thermoscope. [13] Right: Robert Fludd's 1638 air thermometer. [10]

In circa 1612 to 1624, Padua physician Sanctorius was the first to take a patients temperature, with some type of device, and to realize that a thermometer could work to give information useful in diagnosis. [3]

In 1638, in dependent of Galileo, English physician Robert Fludd used a modified Philo-thermometer design, in which he placed the sphere vertically above the jug (adjacent), thus making an unsealed air thermometer, with a scale. [10]

In the 1640s, German engineer Otto Guericke built a 20-foot high thermometer of sorts consisting of an expansion of alcohol in which a float, connected to a pointing angel, moved, thus indicating divisions graduated from "great heat" to "great cold". [3]

In 1663, Jesuit Father Leuréchon coined the term "thermometer" from an earlier 1624 French term *thermomètre*, from Greek *thermos* "hot" + *metron* "measure". [1]

In 1654, or before, Italian scientist Ferdinand II, Grand duke of Tuscany, invented the sealed-glass thermometer. The devise was filled to a certain height with colored alcohol; then sealed by melting the glass tip; then marked off with 360 divisions, like the gradations of a circle, after which scientists began calling such divisions by the name "degrees". [15] In this device, small glass bubbles filled with air at varying pressures hovered within the liquid, changing positions as the temperature rose or fell. These were called "spirit thermometers", because they were filled with "spirit of wine" (distilled alcohol) or "Florentine thermometers" (Florence being the capital of Tuscany). Scientists such as Robert Boyle, Robert Hooke, and Christopher Wren all used Florentine thermometers.

In 1664, English scientist Robert Hooke, a student of sorts of Guericke's work, a had made a variety of spirit thermometers, and notably used the bulb immersed in ice water as the zero mark on the thermometer, then made further marks on the tube to represent an expansion of 1/500th of volume of the fluid in the bulb. [5] Hooke was among the first to argue that the freezing point of water should be used as a fixed reference point.

In 1670, English chemist Robert Boyle, Hooke's employer, used the term temperature to mean 'degree of heat or cold'. [8]

In 1694, Padua mathematician Carlo Renaldini suggested the melting point of ice and the boiling point of water as the standard two main temperature set-points, the space between them on the thermometer stem being divided into twelve parts. [3]

In circa 1695, French physicist Guillaume Amontons designed a sealed-glass air-based thermometer.

In circa 1700, English physicist Isaac Newton designed a linseed-oil thermometer, publishing the results of experiment anonymously in the 1701 *Transactions* of the Royal Society.

In 1701, Danish astronomer Ole Romer invented a thermometer in which he defined the lower fixed point to be the freezing point of water at precisely 7.5 degrees and the upper point as the boiling point of water at 60 degrees. [7]

In circa 1708, it is said that Polish physicist Daniel Fahrenheit learned of Romer's scale during a visit with him. Fahrenheit commented in a retrospect letter to Dutch chemist Herman Boerhaave, that in about 1717 he had begun using an improved Romer scale, supposedly, by increasing the number of divisions by a factor of four, using different fixed points. Fahrenheit used the fixed points of 96 (instead of 22.5 or 90), the temperature of his wife's armpit, 32 the temperature of ice melting in water, and 0 the temperature of a bath of ice melting in a solution of common salt. This scale is now known commonly as the Fahrenheit temperature scale (˚F), which found its finalized form by 1724.

In 1730, French scientist Rene Reaumur (1683-1757) popularized a scale, supposedly a duplication of Hooke's scale, in which the freezing and boiling point are set at 0 and 80 degrees, respectively.

Centigrade scale

In 1726, Swedish instrument maker Daniel Ekstrom (1711-1755) had made thermometers on which the freezing point of water was 0˚ and the boiling point was 100˚.

In 1741, Swedish astronomer Anders Celsius (1701-1744) obtained a thermometer from St. Petersburg and etched on the side opposite its scale a formulation: a boiling point of 0˚ and a freezing point of 100˚. Celsius had proposed the downward counting scale in attempts to avoid negative numbers, of boiling water (0) and melting ice (100). Celsius published the findings of his scale in the 1742 paper "Observations of Two Persistent Degrees on a Thermometer".

In 1750, Marten Stromer (1707- 1770), the successor to Celsius at Uppsala University, made a centigrade scale, on which he simply reversed Celsius' scale, putting 100 at the top and 0 at the bottom.

Galileo"s student Italian physicist Evangelista Torricelli (c.1635) holding what appears to be a Galilean-type thermometer. [17]

In 1758, Swiss botanist Carl Linnaeus claimed, its seems incorrectly, to have been the originator of the centigrade scale. [9] Linnaeus was Celsius' assistant and in the years to follow Celsius' death, encouraged the use of Celsius' scale among thermometer manufacturers, and also reversed Celsius' scale to make his own patented "Linnaeus thermometer", for use in greenhouses. [16]

At the 1948, International Conference on Weights and Measures, the scale "degrees centigrade" was renamed as "degrees Celsius", in honor of Anders Celsius.

Absolute scale

In 1848, the absolute temperature scale was conceived by Scottish physicist William Thomson, in his "On an Absolute Thermometric Scale founded on Carnot's Theory of the Motive Power of Heat, and Calculated from Regnault's Observations", upon whom the unit of thermodynamic temperature, degrees kelvin (˚K), is named. [4]

References

1. Thermometer (1663) – *Online Etymology Dictionary*, 2001 by Douglas Harper
2. Muller, Ingo. (2007). *A History of Thermodynamics - the Doctrine of Energy and Entropy* (ch. 1: Temperature, pgs. 1-7). New York: Springer.
3. Bailin, David and Love, Alexander.

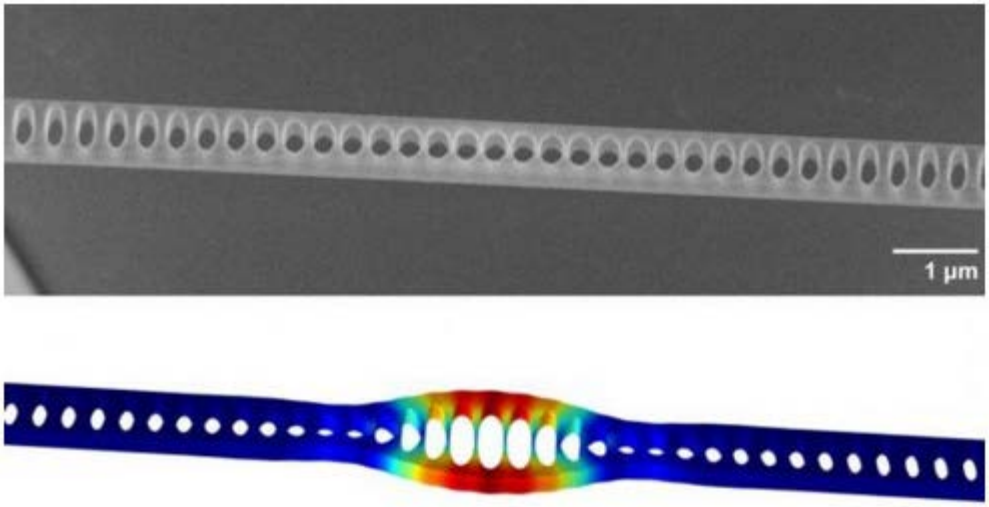

A depiction of a quantum thermometer (Q), namely: an electron micrograph of the silicon nitride beam. The bottom shows how the beam deforms as it vibrates (length scale greatly exaggerated) with the red regions showing the most deformation, and the blue regions not moving at all. Over one vibrational period the center of beam goes from being stretched out as shown, to being compressed inward, and then back.

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9. Shachtman, Tom. (1999). *Absolute Zero and the Conquest of Cold* (ch. 3: Battle of the Thermometers, pgs. 36-55; Ferdinand II, pg. 40). Mariner Books.
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11. Philo of Byzantium – Wikipedia.
12. Hero. (c.50AD). *Pneumatics*. Greece.
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(b) Shachtman, Tom. (1999). *Absolute Zero and the Conquest of Cold* (Ferdinand II, pg. 40). Mariner Books.
16. History of the Thermometery – TMElectronics.co.uk.
17. Evangelista Torricelli (Italian → English) – Alparavenna.it.

External links

- Thermometer – Wikipedia.
- Timeline of temperature and pressure measurement technology – Wikipedia.

θΔics

In science, **thermophobia** is a morbid fear of heat. [1] Thermophobia or being "thermophobic" can also refer to an abnormal and persistent fear of heat, including hot weather and hot objects. Sufferers from thermophobia experience anxiety even though they realize their fear is irrational. To avoid heat, they may live in a cold climate, wear light clothing, stay indoors on warm days, and avoid hot water and hot foods. [2] Certain bacteria, such as *mycobacterium leprae*, are thought to be thermophobic and to live only in the periphery, cooler regions of host organisms, such as the skin in people with leprosy. [3] An antonym is *thermophilic* or living and thriving in relatively hot temperatures.

See also

â— Cryophobia

References

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2. Thermophobia - MedTerms.com
3. Leprosy (physiopathology) - *Institute of Tropical Medicine*, Antwerp.

θΔics

In terminology, **thermostat** is a part of the total system that can be considered as the surroundings or environment. [1] The thermostat imposes certain conditions on the system under study, which is a subsystem. These conditions can be constant temperature, pressure, chemical potentials, or any other potentials, e.g. sociological ones, etc. [2] The application of the terminology of thermostat in human social settings leads to the analysis of energetic boundary analysis, such as territories, or social boundaries, etc. and the free energy coupling conditions necessary to cross one. [3]

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θΔics

In thermodynamics, **thermostatics** refers to aspects of thermodynamics concerned with thermal equilibrium. [1] Thermostatics, in another sense, is the study of the equilibrium of heat. [2] Thermostatics is sometimes synonymously with the “thermodynamics of equilibrium” or equilibrium thermodynamics. The term “thermostatics”, and its later cousin “thermostatistics”, in a general sense, are both rather ill-defined, in that they each came into use without explicit definition, referring to a mixture of thermodynamics, statics, statistics, and information theory. The term, for instance, is not found in science dictionaries.

Etymology

The etymology of thermostatics is a bit difficult to track down. According to one references, it is a humorous coinage of Ilya Prigogine used in a pejorative way to label "classical thermodynamics" tracing to sometime after 1845. [7]

The term “thermostatics” in a dominate usage sense, however, seems to be a product of the MIT school of thermodynamics, a term used significantly by American thermodynamicist Myron Tribus, beginning in 1956, and later by Herbert Callen in 1960. [3] In 1965, American physicist Edwin Jaynes wrote that “classical thermodynamics … is becoming called increasingly, thermostatics”. [4] American physicist Laszlo Tisza, picked up on the term in 1966, using phrases such as the “fundamental theorem of thermostatics” as well as "Gibbsian thermostatics”, in his *Generalized Thermodynamics* textbook, but never seems to define the term thermostatics, itself. [5] The second edition of Callen’s textbook, becoming one of the most-referenced thermodynamics publications, was retitled as *Thermodynamics: an Introduction to Thermostatistics*, a change that seems to be modeled on Dutch-born English physicist Dirk ter Haar’s 1966 book *Elements of Thermostatistics*, the second edition of the book *Elements of Thermodynamics* published in 1960. [6] In each case, the term thermostatistics seems to refer to the topic of: thermodynamics + statistical mechanics.

References

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2. (a) Thermostatics – TheFreeDictionary.com
(b) Thermostatics – YourDictionary.com
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(b) Tribus, Myron. (1959). *Thermostatics and Thermodynamics: an Introduction to Energy, Information, and States of Matter: Part I and II.* Van Nostrand.
(c) Callen, Herbert B. (1960). *Thermodynamics: an Introduction to the Physical Theories of Equilibrium Thermostatics and Irreversible Thermodynamics.* John Wiley & Sons.
4. Jaynes, Edwin T. (c.1965). *Thermodynamics*, (ch. 1: Development of Thermodynamics, 49-pgs, ch. 2: Use of Jacobians in Thermodynamics, 17-pgs, ch. 5: Gibbs Formalism: Physical Derivation, 30-pgs). Unpublished Book, 9+ chapters.
5. Tisza, Laszlo. (1966). *Generalized Thermodynamics.* Cambridge, (section: 2.3: Gibbsian thermostatics, pgs 38-48, pg. 104). Massachusetts: The MIT Press.
6. (a) Callen, Herbert B. (1985). *Thermodynamics and an Introduction to Thermostatistics* (2nd ed.). New York: John Wiley & Sons.
(b) Haar, Dirk ter. (1966). *Elements of Thermostatistics.* Holt, Rinehart & Winston.
7. Greenberg, Arthur. (2007). *Chemistry: Decade by Decade* (pg. 148). Infobase Publishing.

External links

â— Thermostatics – WolframAlpha.com.

θΔics

In chemistry, **thermosynthesis** refers to the synthesis of products from reactants or components in reactions or processes that are driven by heat.

Etymology

The term “thermosynthesis”, referring to synthesis (formation or building of more complex structures from simpler elements or compounds) by heat, has been around since the 1940s.

Muller's biothermosynthesis

A recent proponent of the term, in the context of biosynthesis, has been Danish physical chemist and biophysicist Anthonie Muller, who wrote his first paper on thermosynthesis in 1983, and has since been an active researcher and promoter of the term. [1] Muller defines thermosynthesis as biological heat engines working on thermal cycling. [2] In the context of the origin of life, Muller defines thermosynthesis as a theoretical biological mechanism for free energy gain from thermal cycling, tentatively slated as the energy source for the origin of life. [3]

References

1. (a) Anthonie Muller (background) – GeoCities.com (AWJMuller).
(b) Muller, Anthonie W.J. (1985). "Thermosynthesis by biomembranes: energy gain from cyclic temperature changes". *Journal of Theoretical Biology* 115: 319-321.
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3. Muller, Anthonie W. J. (2005). “A Search for Thermosynthesis: Starvation Survival in Thermally Cycled Bacteria.” Department of Geology, University of Washington.

External links

â— Thermosynthesis – Wikipedia.
â— Thermosynthesis (homepage) – GeoCities.com (AWJMuller).
â— Re: Paper on Thermosynthesis (notes) – Sci.Tech-Archive.net.

θΔics

In science, **thermotics**, according to Ralph Tykodi (1967), supposedly, is a rare term referring to the science of heat. [1]

Etymology

The term thermotics of Greek origin having been first used in 1837 (by someone). [2]

In 1967, American physical chemist Ralph Tykodi made an attempt to revive the term thermotics, a term which he said was equal in usage, so-to-speak, to Danish chemical engineer and physical chemist Johannes Bronsted's 1946 version of "energetics". Tykodi's aim, however, is to revive or redress the term thermotics to be a science comprised of three sub-branches: *thermo-statics*, that pertaining to the ordinary, classical equilibrium aspects of heat, *thermo-dynamics*, that pertaining to those aspects for which time variation is important, and *thermo-staedics*, that pertaining to aspects that are temporally steady or stationary.

Tykodi states that he added in the *ae*, instead of *ea*, in the suffix '-staedics', to keep it phonetically distinct from '-statics'. Tykodi published a followup reprinting of this proposal in journal article form the following year, but seems to have gathered no citations or continued usage. [4] In the 2000s, however, Tykodi's 1959 graduate student Ted Erikson began to employ Tykodi's *thermo-staedics* concept to attempt to model a type of panpsychism consciousness state, of all matter, that supposedly governs grown and evolution. [5]

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3. (a) Bronsted, Johannes. (1946). *Principles and Problems in Energetics*. Interscience Publishers, 1955.
(b) Johannes Bronsted – Wikipedia.
4. Tykodi, Ralph J. (1968). "Correspondence: Thermodynamics-Thermotics: the Name of the Game", *Ind. Eng. Chem.* 60(11): 22.
5. (a) Erikson, Ted A. (2009). "What Makes Us Human: Panpsychism and Thermodynamics Explored", In: *Philosophy of Evolution*, in publication (2010).
(b) Talk given to the AIChE students at IIT on April 01, 2010.

External links

â— Thermotics (definition) – Webster Dictionary.

θΔics

In science wikis, **ThermoWiki** is a now-inactive site, having been active for a few months, between May 27 and July 26, in 2007, having produced a total of 47 pages or articles. [1] It was started by American chemical engineer J.M. Haile. [2]

References

1. (a) ThermoWiki – Homepage
(b) All Pages – ThermoWiki (Special Pages)
2. J.M. Haile – User Page (WikiAdmin)

θΔics

In alphabets, **Theta**, or Θῆτα (Greek), symbol ‘Θ’ (capital letter), or theta, symbol ‘θ’ (lowercase letter), is the eight letter of the Greek alphabet, and representative, in the Greek numerical system, of the number 9.

Overview

The following shows the basic etymology of the symbol theta:

Egyptian hieroglyphs (many symbols) (2500BC)				**Phoenician alphabet** (22 letters) [1050BC]	#	**Greek alphabet** (24 letters) [800BC]		**Etruscan** (# letters) [300BC]	**Roman** (26 letters) [800AD]	**Derived terms**
Sun (Ra)			Ouroboros	⊙	, ⊗ teth / tet	**9**	, Θ Theta	θ theta	, ⊙	Th	Theos, theology, Theodorus, Theophrastus, Thanatos (see Mor). therm, thermal, temperature, thermo-, ΘΔ, think, thought

In c.2800BC, Heliopolis, main hieroglyph " ", originally called An, Anu, Junu, Iunu, in Egyptian, remained Heliopolis (Greek), from *Helio-* meaning "sun" + *-polis* meaning "city", aka "sun metropolis" or “city of the sun”, later named On (Hebrew), was a prominent religious capital city of ancient Egypt, which arose to power in c.2800BC, being one of the foremost religious centers, along with Memphis and Thebes, wherein the so-called Heliopolis creation myth was promulgated, centered around the Heliopolis ennead or paut (group) of nine gods, with Atum and later Atum-Ra as the supreme god of this paut.

The following, from Wallis Budge’s *Egyptian Hieroglyphic Dictionary* (1920), shows the various hieroglyphs for the Egyptian city of An (or Anu, Junu, Iunu), renamed later by the Greeks as “Heliopolis”: [5]

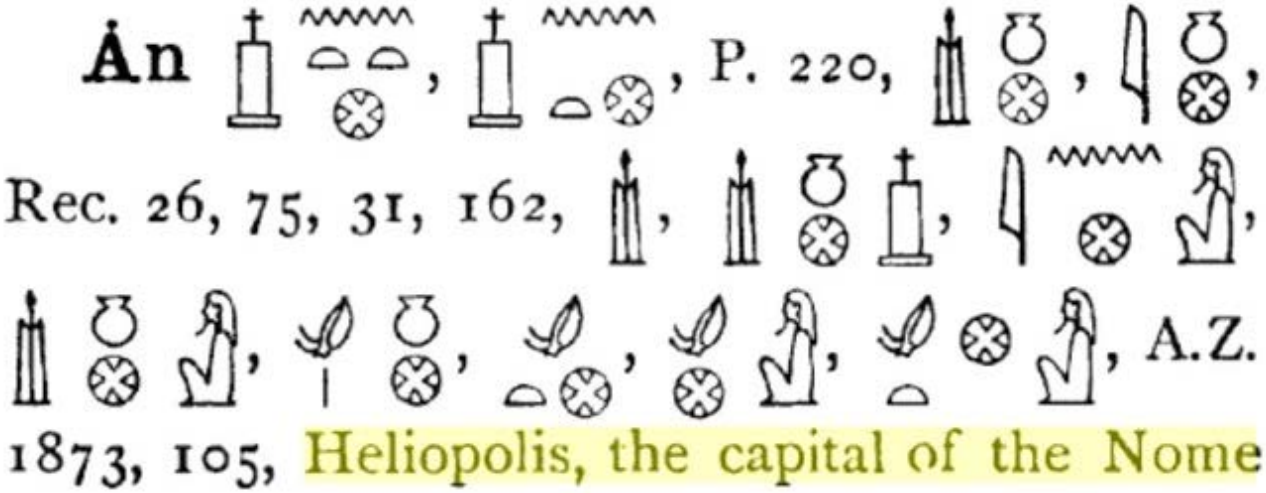

The numerical sum of the letters in the word θῆτα (theta), in what is called ‘isopsephy’ (Ω), a learning technique where early Greeks used pebbles arranged in patters to learn arithmetic and geometry, has the same numerical value as Ηλιος (Helios), as follows:

Θῆτα (**Theta**) = 9 + 8 + 300 + 1 = 318
Ηλιος (**Helios**) = 8 + 30 + 10 + 70 + 200 = 318

In 800BC, Hesiod penned his *Theogony* , or Θεο-γονία (*Theo-gony*), a term meaning "generation of the gods", wherein, after studying the creation myths of Egypt (see: Egyptian pantheon), penned a more anthropomorphized, god reduced, version for the Greeks to read (see: Greek pantheon), basically a rescript of the former; this would seem to indicate that the Greek term "Θεο" (god), rooted in the letter symbol "Θ", representative of the sun, sun god, or one of the supreme gods, was a commonly accepted language term in Hesiod's time.

In c.110, Philo of Byblos (O), said that Greek Theta owed its form to the Egyptian habit of designating the deity by a ringed serpent, with its head turned inward [see: Ouroboros], the dot representing the eye of god in the world. [3]

In c.280, Porphyry, in some publication, stated that the Greek theta corresponds firstly to the 'soul' of the world (see: world soul), and also, more importantly, that the significance of number "nine", in respect to its use in as "theta", was symbolic or representative of the famous "**Ennead**" [9 gods], or paut (group) of nine deities, of Heliopolis, as told in their Heliopolis creation myth, which is behind the constructions of the pyramids. [1]

In c.555, John Lydus, supposedly, noted that the Egyptians also used a symbol in the form of a *theta* for the cosmos, with an airy fiery circle representing the world, and a snake, spanning the middle, representing the *agathos daimon* or 'good spirit'; which would seem to correspond to what we now call the "ouroboros". [2]

The following, according to the Philo-Porphyry-Lydus view, then would be the presumed origin of the Greek theta:

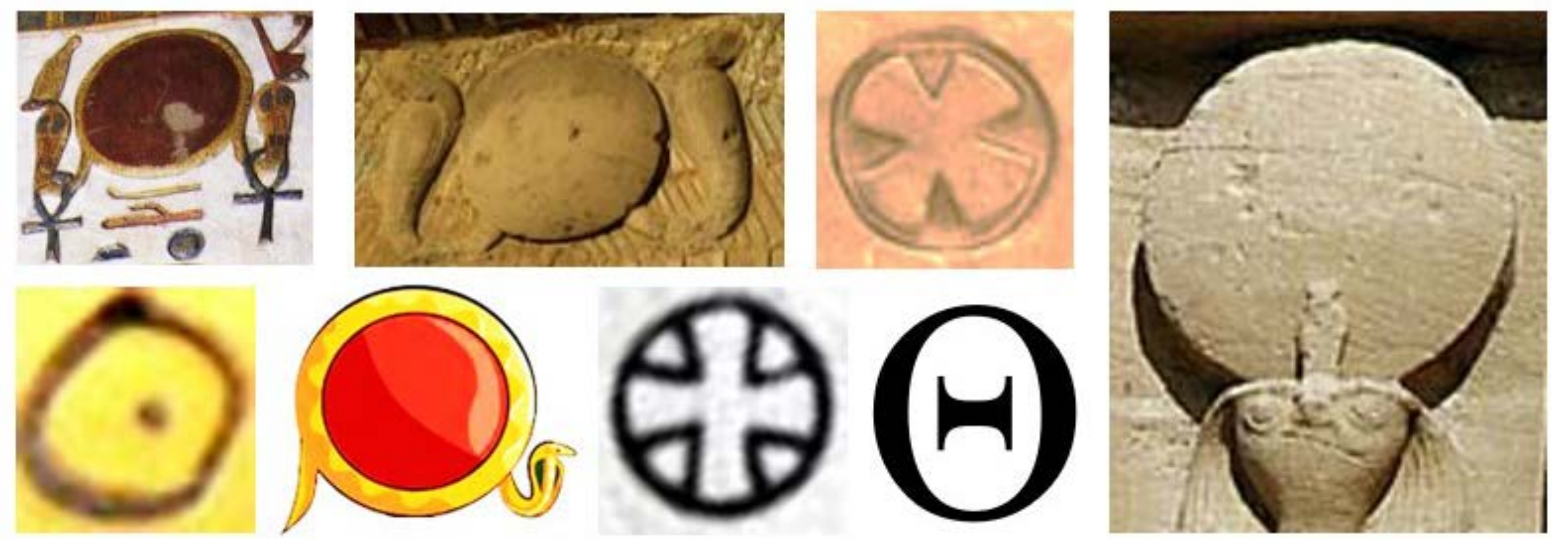

(add)

Helios | Theta

Quotes

The following are related quotes:

> "What relation serpents had to the earliest letters it is now impossible to say. Philo

[c.110] says that the Greek **Theta** [Θ] owed its form to the Egyptian habit of designating the deity by a ringed serpent, with its head turned inward [see: Ouroboros], the dot representing the eye of god in the world. But the serpent was the name and symbol of the Phoenician letter Tet [ ], which preceded the Greek Theta, and that Greek letter still represents the deity in abbreviated writing."

— Caroline Dall (1867), "Review of Charles Bunsen's 1848 *Egypt's Place in Universal History*" [1]

In 2007, Peter Joseph, in his *Zeitgeist*, via citation to Dorothy Murdock, Gerald Massey, among others, conjectured that the sun perceptually "dies" on the location of the Southern crux for three days, Dec 22-24, before being "reborn" in its new yearly solar cycle; this may be one possible origin for the "+" or "X" symbol in the sun circle "O", prior to it becoming the **Theta** Θ symbol?

"In Old Hebrew and Phoenician as the letter *tet* ' ', also known as the 'compass', is part of all early alphabets, including Mayan, Chinese, Linear A & B, Etruscan, and the Indus Valley scripts. It also appears on early rock paintings all over the world. The *tet* became the Greek **theta**, originally written (now θ). Theta is the first letter of god: *theos* [see: theology], and his throne or *thronos*."

— Esther Stein (2018), *The Visible Kingdom of God: the Song of Noah* [4]

See also

- Theos | Dios
- Theology

References

1. (a) Anon. (c.2019). "Theta Symbol and Its Meaning" (Q), Mythologian.net.
(b) Gardiner's sign list – Wikipedia.
2. Barry, Kieren. (1999). *The Greek Qabalah: Alphabetical and Mysticism and Numerology in the Ancient World* (pg. 73). Publisher.
3. (a) Bunsen, Charles. (1848). *Egypt's Place in Universal History: An Historical Investigation, Volumes 1-5* (translator: Charles Cottrell; notes: Samuel Birch). Publisher.
(b) Dall, Caroline H. (1867), "Egypt's Place in Universal History" (quote, pg. 39; table, pg. 40), Review of Charles Bunsen's 1848 *Egypt's Place in Universal History: An Historical Investigation*, *The Friend*, 3(26):33-, Oct 5.
(c) Dall, Caroline. (1868). *Egypt's Place in History: a Presentation* (Philo, 5+ pgs; quote, pg. 87). Lee and Shepard.
4. Stein, Esther. (2018). *The Visible Kingdom of God: the Song of Noah* (pg. #). Balboa Press.
5. Budge, Wallis. (1920). *An Egyptian Hieroglyphic Dictionary, Volume Two: With an Index of English Words, King List and Geographical List with Indexes, List of Hieroglyphic Characters, Coptic and Semitic Alphabets* (pg. 958). Cosimo, 2013.
6. Higgins, Godfrey. (1833). *Anacalypsis: an Attempt to Draw Aside the Veil of the Saitic Isis: Or an Inquiry Into the Origin of Languages, Nations and Religions, Volume 1* (cross, pg. 500). Longman, 1836.

External links

- Theta – Wikipedia.

θΔics

In mononyms, **Thims** (CR:124), a reverse anagram of "Smith", is the surname of American electrochemical engineer Libb Thims.

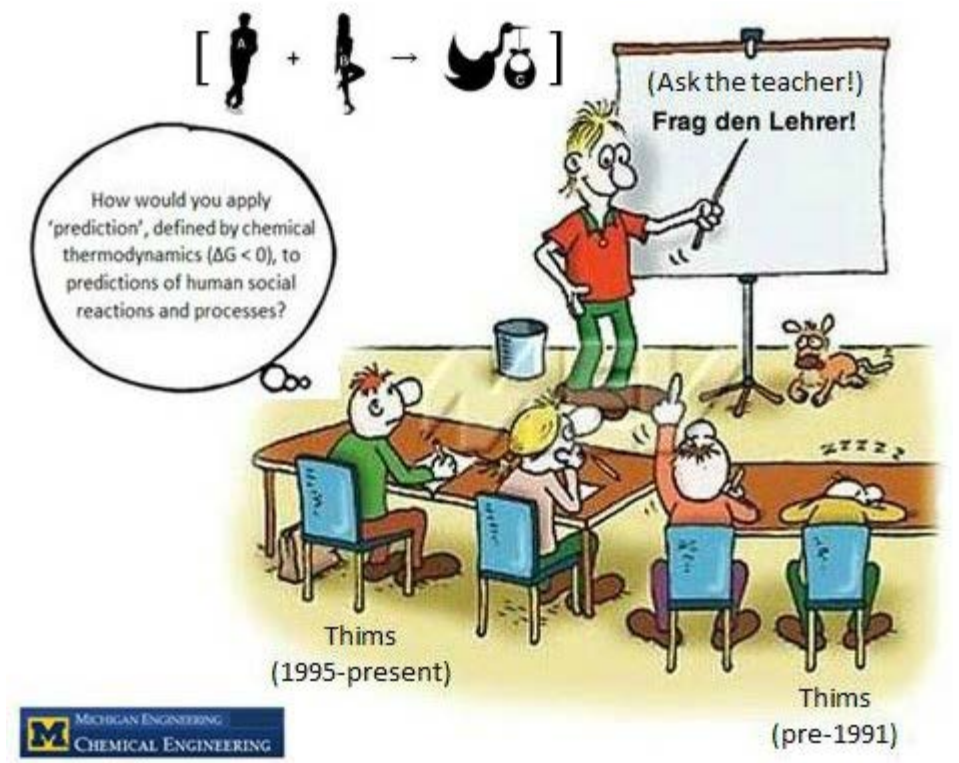

A rendition of **Thims** as an undergraduate chemical engineering thermodynamics student ruminating on how chemical thermodynamics would, in theory, be applied to reactions between humans, relationships conceptualized as chemical reactions; it would be some two decades later that he would begin to ferret out the details of this intricate puzzle—one filled with glass walls, forest-tree issues, ships not seen paradoxes, one nature (vs. two nature) issues, terminology reform issues, among others—into the form of a initial stage working draft textbook. [1]

Links

The following are general secondary Thims pages:

- Beg-Thims dialogue
- Gladyshev and Thims
- Libb Thims (attack)
- Libb Thims (books)
- Libb Thims (books read)
- Libb Thims (citations)
- Libb Thims (derogation)
- Libb Thims (etymology)
- Libb Thims (experiments)
- Libb Thims (genius ranking)
- Libb Thims (history)
- Libb Thims (lectures)
- Libb Thims (personal notes)
- Libb Thims (prospectus)
- Libb Thims (publications)
- Libb Thims (quick reference)
- Libb Thims (quotes)
- Libb Thims (students)
- Moriarty-Thims debate
- Thims human molecular formula
- Thims thought experiment
- Thimsian atheism
- Why does Libb Thims make genius lists?

Library

The following are categorized listing of books by subject from Thims personal research library:

- Thims' mate selection book collection
- Thims religio-mythology and atheism book collection
- Thims' thermodynamics book collection

Collected works

Libb Thims (collected works); Libb Thims (books)

The following are a portion of Libb Thims' 10+ volume set of collected works, as of 2013:

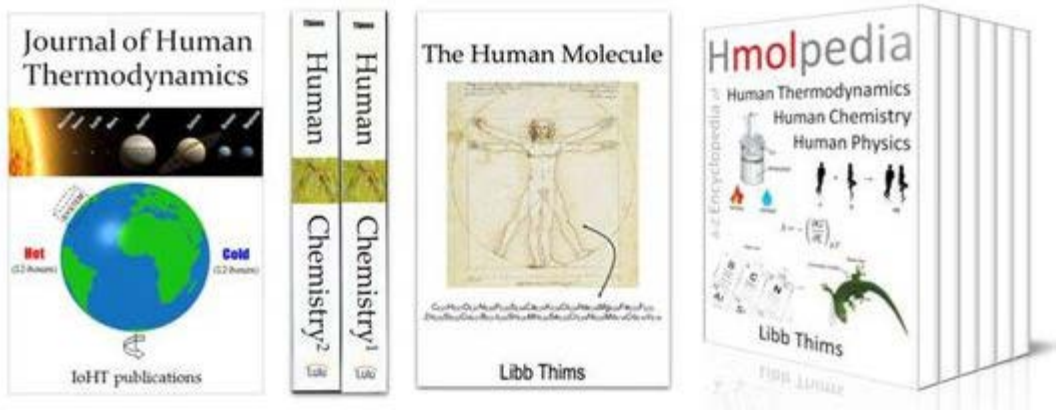

Quotes

The following are a few recent mononym quotes:

> "**Thims** is [a walking] encyclopedia of human thermodynamics."
>
> — Milivoje Kostic (2013), introduction to Thims' 16 Apr NIU talk [2]

> "I think [**Thims**] HumanChemistry101 is a pretty cool guy, he ranks IQ and doesn't get afraid of anything [or] official IQ rankings. Why do people get so worked up over IQ? Because they're scared little monkeys."
>
> — IJustWantToSignIn (2013), comment (Q) on IQ 200+ | Smartest person ever (4 of 4), Nov 10.

References

1. Thims, Libb. (2013-14/15). *Chemical Thermodynamics: with Applications in the Humanities* (pdf). Publisher.
2. (a) Kostic, Milivoje. (2013). "Introduction of Speaker Comments", in: full video (time:), Apr 16.
(b) Thims, Libb. (2013). "A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies" (abs) (NIU announcement) (cover) (main) (full video) (abs video), Lecture to mechanical engineering thermodynamics students (professor: Milivoje Kostic), Northern Illinois University (NIU), Apr 16.

External links

- Libb Thims – LibbThims.com.
- Libb Thims (profile) – Google Scholar.

θΔics

In human molecular formulas, **Thims human molecular formula** refers to the 26-element molecular formula for an average human, assuming the human molecular theory view, calculated in 2002, published online (Q) in 2005, and in print in 2007 by American electrochemical engineer Libb Thims.

Overview

In 2002, American electrochemical engineer Libb Thims, while writing the draft chapters for a three volume *Human Thermodynamics* manuscript, amid writing an end chapter on cessation thermodynamics, in respect to what, at the moment a person ceases to exist (dies), constitutes the totality of a person, from a matter and energy point of view, at that moment, engaged into several months worth of research into mass composition tables and element functionality in the human, the result of which was a 26-element empirical formula version of a human, as shown below: [1]

$$\text{Molecular formula}_{\text{human}} \text{ (Thims) [empirical]} = \begin{array}{l} H_{2.5E9}O_{9.7E8}C_{4.9E8}N_{4.7E7}P_{9.0E6}Ca_{8.9E6}K_{2.0E6}Na_{1.9E6}S_{1.6E6}Cl_{1.3E6}Mg_{3.0E5}Fe_{5.5E4} \\ F_{5.4E4}Zn_{1.2E4}Si_{9.1E3}Cu_{1.2E3}B_{7.1E2}Cr_{98}Mn_{93}Ni_{87}Se_{65}Sn_{64}I_{60}Mo_{19}Co_{17}V \end{array}$$

Based on the empirical molecular formula, Thims was the first to specifically calculate a human molecular formula for an average 70-kg (154-lb) person, the 2008 version of which is shown below: [2]

$$\text{Molecular formula}_{\text{human}} \text{ (Thims) [molecular]} = \begin{array}{l} C_{E27}H_{E27}O_{E27}N_{E26}P_{E25}S_{E24}Ca_{E25}K_{E24}Cl_{E24}Na_{E24}Mg_{E24}Fe_{E23}F_{E23} \\ Zn_{E22}Si_{E22}Cu_{E21}B_{E21}I_{E20}Sn_{E20}Mn_{E20}Se_{E20}Cr_{E20}Ni_{E20}Mo_{E19}Co_{E19}V_{E18} \end{array}$$

Thims' calculation of the molecular formula for an average human has since become the standard textbook definition of a human, particularly in thermodynamics. [3]

BioNumbers | Harvard

In 2015, BioNumbers, Harvard Medical School's database of "useful biological numbers", began listing both the molecular formula and empirical molecular formula for a human, per citation of Thims (2002):

Human molecular formula | Molecular

ID	111244
Property	Human molecular formula (molecular)
Organism	Human Homo sapiens
Range	See "Measurement Method" section
Units	N/A
Reference	link Thims molecular formula | 2002
Primary Source	Thims published his results in the 2002 manuscript Human Thermodynamics (Volume One), in the 2005 IoHT (online) Molecular Evolution Table, and in the 2007 textbook Human Chemistry (Volume One). For an average 70-kg human being, this empirical formula translates to the following human molecular formula:
Method	HE27 OE27 CE27 NE26 PE25 CaE25 KE24 SE24 NaE24 ClE24 MgE24 FeE23 FE23 ZnE22 SiE22 CuE21 BE21 CrE20 MnE20 NiE20 SeE20 SnE20 IE20 MoE19 CoE19 VE18
Entered By	Uri M
Date Added	Jan 04, 2015 4:26 AM
Date Edited	Jan 04, 2015 4:33 AM
Version	3
Permalink	http://bionumbers.hms.harvard.edu//bionumber.aspx?id=111244&ver=3

BIONUMBERS THE DATABASE OF USEFUL BIOLOGICAL NUMBERS

Human molecular formula | Empirical

ID	111243
Property	Human molecular formula (empirical)
Organism	Human Homo sapiens
Range	See "Measurement Method" section
Units	N/A
Reference	An encyclopedia of human thermodynamics link
Primary Source	In any event, during this period of focusing on the query of what happens to a person at the point of death according to thermodynamics, a subject generally known as cessation thermodynamics, Thims began ruminate on how to go about calculating the molecular formula for an individual human, during which time, following several months of research, investigation, and searching for mass composition tables of humans, Thims eventually produced, similar to Sterner and Elser, a meta-analysis 26-element empirical human molecular formula as shown below: [4]
Method	H2.5E9 O9.7E8 C4.9E8 N4.7E7 P9.0E6 Ca8.9E6 K2.0E6 Na1.9E6 S1.6E6 Cl1.3E6 Mg3.0E5 Fe5.5E4 F5.4E4 Zn1.2E4 Si9.1E3 Cu1.2E3 B7.1E2 Cr98 Mn93 Ni87 Se65 Sn64 I60 Mo19 Co17 V
Entered By	Uri M
Date Added	Jan 04, 2015 4:14 AM
Date Edited	Jan 04, 2015 4:17 AM
Version	2
Permalink	http://bionumbers.hms.harvard.edu//bionumber.aspx?id=111243&ver=2

BIONUMBERS THE DATABASE OF USEFUL BIOLOGICAL NUMBERS

The 2015 entries for "molecular" [left] (Q) and "empirical" [right] (Q) molecular formulas for an average human, in Harvard's Medical School' BioNumbers, per citation of American electrochemical engineer Libb Thims 26-element "**human molecular formula**" (see: Thims human molecular formula (2002); compare: Sterner-Elser human molecular formula (2000), a 22-element formula).

(add discussion)

Other

An alternative, independent, formulation is the 22-element Sterner-Elser human molecular formula (empirical only), calculated in 2000 and published in print in 2002 by American limnologists Robert Sterner and James Elser. [4]

References

1. (a) Thims, Libb. (2002). *Human Thermodynamics* (ch. 19: "Where Does One Go After Death", pgs. 491-), unpublished manuscript. Chicago: Institute of Human Thermodynamics.
(b) Thims, Libb. (2002). *Human Thermodynamics (Volume One)*, Date: Sept. Chicago: Institute of Human Thermodynamics.
(c) Thims, Libb. (2005). *Cessation Thermodynamics.* Institute of Human Thermodynamics.
(d) Thims, Libb. (2005). "Molecular Evolution Table" (Q), HumanThermodynamics.com, Dec 13.
(e) Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (ch. 2: "The Human Molecule", pgs. 15-35). Morrisville, NC: LuLu.
(f) The discovery of the Sterner-Elser calculation was a partial impetus behind the expansion of the 2007 chapter two, i.e. "The Human Molecule", of *Human Chemistry*, into the 2008 booklet *The Human Molecule* (6 Mar 2008).
(g) Thims, Libb. (2008). *The Human Molecule*, (preview) (Google Books). Morrisville, NC: LuLu.
2. Thims, Libb. (2008). *The Human Molecule*, (preview) (Google Books). Morrisville, NC: LuLu.
3. Annamalai, Kalyan, Puri, Ishwar K., and Jog, Milind A. (2011). *Advanced Thermodynamics Engineering* (§14: Thermodynamics and Biological Systems, pgs. 709-99, contributed by Kalyan Annamalai and Carlos Silva; §14.4.1: Human body | Formulae, pgs. 726-27; Thims, ref. 88). CRC Press.
4. Sterner, Robert W. and Elser, James J. (2002). *Ecological Stoichiometry: the Biology of Elements from Molecules to the Biosphere* (chapter one) (human molecule, empirical formula pg. 3; discussion, pgs. 47, 135). Princeton University Press.

θΔics

In genius studies, **Thims IQ**, or "Thims IQs", refers to the IQs (see: IQ key) of historical geniuses as determined and ranked by Libb Thims, from 2010 to present, as shown in the "real IQ" column (left column) the top 1000 geniuses pages, as well as shown in Hmolpedia articles, e.g. Joseph Lagrange (IQ:190|#22), as shown adjacent. [1]

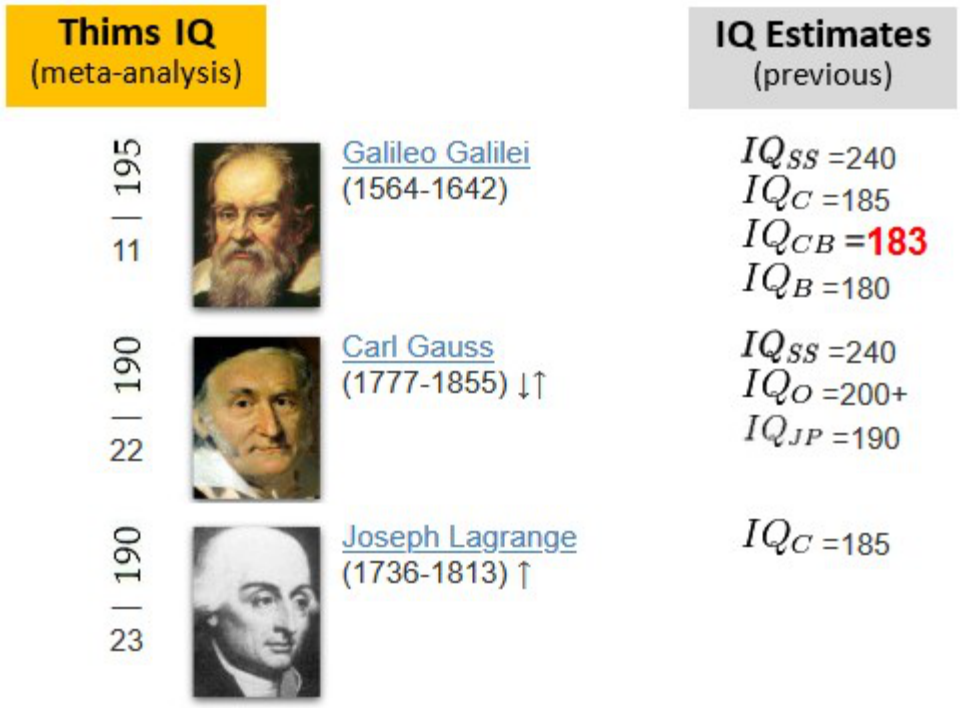

A section from the top 1000 geniuses page (Nov 2019), showing real IQ or "**Thims IQ**", in the left column, of Galileo (IQ:195|#11), Carl Gauss (IQ:190|#22), and Joseph Lagrange (IQ:190|#23), as can be compared to the various historical IQ estimates, in the right column; the # next to each IQ being that individual's ranking in the top 1000 genius rankings.

Overview

In 1990s, Libb Thims began collecting citations and references to various individuals with "purported IQs" in the nefarious ceiling genius range.

In 2008, Thims had a working Word document file of about 15 individuals with IQs cited in the 200 or above range, ranked from highest to lowest. [1]

In 2010, Thims, when the online version of the IQ:200+ genius listing was at the 25 person level, following the discovery of the "IQ:400" citation of Adragon de Mello, as calculated by his over-zealous father, Thims began to engage into the task of re-ranking the world's geniuses. [1]

In 2011, Thims began to merge all of the geniuses, from the various historical genius rankings, such as shown below, into one 400+ person "genius IQs" listing, of all of the world's purported geniuses cited with or said to have an IQ of 140 or above:

- Terman IQ (1916)
- **Cox IQ** (1926)
- **Platt IQ** (1962)
- Guinness Book IQ (1970s to 1996)
- Walberg IQs (1981)
- **Buzan IQ** (1995)

  → Cox-Buzan IQ

  → **Cox-Buzan-Platt IQ**

- Simonton IQ [e.g. 40+ President IQs] (2006)
- Michael IQ [51 geniuses] (2008)

In 2015, the IQs in Thims' archived 40-person IQ:200+ article and or video series, following an interview with journalist Natasha Bertrand, became popularized in the *Business Insider* article "The 40 Smartest People of All Time". [2]

In Feb 2019, Thims had converted the previous "genius IQs" page, into a ten-page top 1000 geniuses rankings, then filled with 730+ geniuses, each ranked by meta-analysis "real IQ", the entire rankings free from all with all extraneous contrived genius IQs (e.g. fake IQs, inflated IQs, paper IQs, etc.), which have previously tarnished the 20th century with

a great deal of confusion in respect to "IQ" and "genius" or real genius.

Note

For the related query “what is the IQ of Libb Thims?” or “what is Libb Thims’ IQ?”, see: Libb Thims (genius rankings), for an approximate overview of this topic.

References

1. Why does Libb Thims make genius lists?
2. (a) Bertrand, Natasha. (2015). “The 15 Smartest Presidents of All Time” (Q), *Business Insider*, Mar 30.
(b) Bertrand, Natasha. (2015). “The 40 Smartest People of All Time” (Q), *Business Insider*, Feb 27.

θΔics

In libraries, **Thims religio-mythology and atheism book collection** is American electrochemical engineer Libb Thims personal library, near Buffett number level, collection of **174+** books on religio-mythology, comparative religion and mythology, science and religion, science vs religion, religion vs science, and atheism, etc. books and publications.

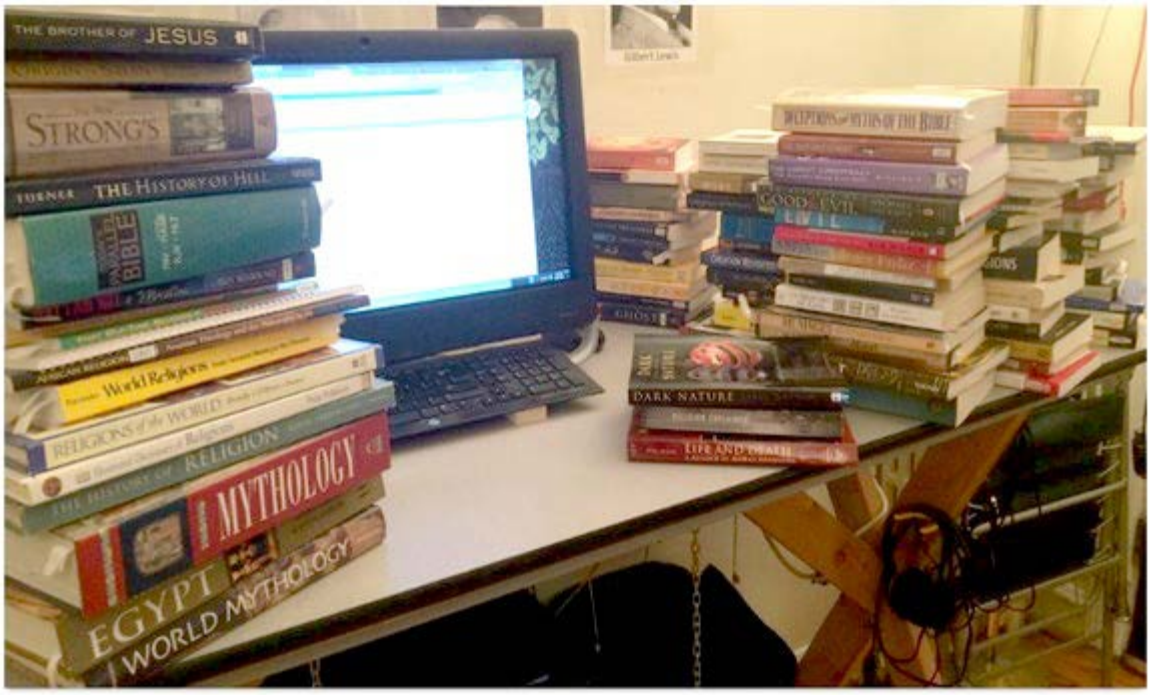

A 30 Sep 2014 photo of American electrochemical engineer Libb Thims' **religio-mythology, science, and atheism book collection**, at the point when he scoured his library and collected all of the related books, counting 92 books, shown.

Recent

The following are new recently purchased books:

● Budge. Wallis. (1904). *The Gods of the Egyptians, Volume One*. Dover, 1969.
● Budge. Wallis. (1904). *The Gods of the Egyptians, Volume Two*. Dover, 1969.
● Fletcher, Joann. (2002). *The Egyptian Book of Living and Dying: the Illustrated Guide to Ancient Egyptian Wisdom*. Thorsons.
● Ehrman, Bart D. (2014). *How Jesus Became God: The Exaltation of a Jewish Preacher from Galilee*. HarperOne.
● Arthur, James. (2000). *Mushrooms and Mankind: The Impact of Mushrooms on Human Consciousness and Religion* (pgs. 11-13) (Q). Book Tree.
● Petty, Bill. (2012). *Hieroglyphic Dictionary: a Vocabulary of the Middle Egyptian Language* (Amz). CreateSpace.
● Harpur, Tom. (2004). *The Pagan Christ*. Thomas Allan Publishers.
● Flynn, Tom. (1993). *The Trouble with Christmas* (Osiris, pgs. 55-57). Prometheus Books.
● Plutarch. (c.100AD). *Isis and Osiris*; in: *Plutarch's Moralia, Volume Five*: Isis and Osiris. The E at Delphi. The oracles at Delphi no longer given in verse (§:355-). The obsolescence of oracles (Introduction: Victor Hanson). Harvard University Press.
● Massey, Gerald. (1883). *The Natural Genesis: Second Part of a Book of the Beginnings, Containing an Attempt to Recover and Reconstitute the Lost Origins of the Myths and Mysteries, Types and Symbols, Religion and Language, with Egypt for the Mouthpiece and Africa as the Birthplace, Volume One*. Williams and Norgate.
● Massey, Gerald. (1883). *The Natural Genesis: Second Part of a Book of the Beginnings, Containing an Attempt to Recover and Reconstitute the Lost Origins of the Myths and Mysteries, Types and Symbols, Religion and Language, with Egypt for the Mouthpiece and Africa as the Birthplace, Volume Two*. Williams and Norgate.
● Freke, Timothy and Grandy, Peter. (2001). *Jesus and the Lost Goddess: The Secret Teachings of the Original Christians* (Osiris, 18+ pgs; quote, pg. 13). Random House.
● Joshi, S.T. (2014). *The Original Atheists: First Thoughts on Nonbelief*. Prometheus Books.
● Montaigne, Michel. (1592). *The Complete Works* (translator: Donald Frame) (atheism, 6+ pgs). Everyman's Library, 2003.
● Hodge, Bodie and Patterson, Roger. (2016). *World Religions and Cults, Volume Three: Atheistic and Humanistic Religions*. New Leaf Publishing.
● Massey, Gerald. (1900). *Gerald Massey's Lectures* (Amz). Publisher, 1998.

Further reading

● Bauval, Robert. (1994). *The Orion Mystery: Unlocking the Secrets of the Pyramids*. Three Rivers Press.
● Murdock, Dorothy M. (2008). *Christ in Egypt: the Horus-Jesus Connection*. Stellar House Publishing.

● Musolino, Julien. (2015). *The Soul Fallacy: What Science Shows We Gain from Letting Go of Our Soul Beliefs* (Forward: Victor Stenger) (Q) (pg. 154). Prometheus Books.
● Cooper, Thomas. (1829). *Fabrication of the Pentateuch: Proved by Anachronism Contained in Those Books* (Amz) (Arc)(txt). George E. Evans, 1840.
● Ali, Ayaan. (2008). *Infidel*. Simon & Schuster.
● Ali, Ayaan. (2015). *Heretic: Why Islam Needs a Reformation Now*. Publisher.
● Stephens, Mitchell. (2014). *Imagine There's No Heaven: How Atheism Helped Shape the Modern World*. St. Martin's Press.
● Berlinski, David. (2008). *The Devil's Delusion: Atheism and Its Scientific Pretensions*. Publisher, 2010.
● Author (1714). *The Life of Lucilio (alias Julius Caesar) Vanini: Burnt for Atheism at Toulouse with an abstract of his writings being the sum of the atheistical doctrine taken from Plato, Aristotle, Averroes, Cardano and Pomponazzius's philosophy with a confutation of the same; and Mr. Bayle's arguments in behalf of Vanini completely answered* (Amz). Publisher, 1730.
● Jacob, Susan. (2004). *Freethinkers: a History of American Secularism* (rev). Publisher.
● Volney, Constantine. (1791). *The Ruins: Mediation on the Revolutions of Empires* (translators: Thomas Jefferson (§1-20) and Joel Barlow (§21-24)) (Amz). New York: Dixon and Sickles, 1828.
● Thorpe, Jessica. (2016). *Atheism for Kids* (illustrator: Teal Barnes). Winter House Books.
● Tunstall, Kate E. (2016). *Blindness and Enlightenment – a Essay: with a New Translation of Diderot's Letter on the Blind and La Mothe Le Vayer's Of a Man Born Blind*. Bloomsbury.
● Ingersoll, Robert. (1977). *Best of Robert Ingersoll: Selections from his Writings and Speeches* (editor: Roger Greeley). Prometheus.
● Whitmarsh, Tim. (2015). *Battling the Gods: Atheism in the Ancient World* (pg. 63-64). Vintage Books.
● Gordon, J.S. (1997). *Land of the Fallen Star Gods: the Celestial Origins of Ancient Egypt*. Simon & Schuster, 2013.
● de Wall, Frans. (2013). *The Bonobo and the Atheist: in Search of Humanism Among the Primates*. W.W. Norton & Co.
● Paulkovich, Michael. (2013). *No Meek Messiah*: *Christianity's Lies, Laws and Legacy* (§: Egyptian Origins of Judeo-Christian Beliefs, pgs. 161-65). Publisher.
● Faulkner, Raymond. (1972). *The Egyptian Book of the Dead: the Book of Coming Forth by Day: Complete Papyrus of Ani, Featuring Integrated Text and Full-Color Images* (translator: Ogden Goelet; Preface: Carol Andrews; Introduction: Daniel Gunther; Foreword: James Wasserman) (Amz). Chronicle Books.
● Griffiths, John G. (1980). *The Origins of Osiris and His Cult* (pg. 3). Publisher.

Atheism | Proto

The following are pre-atheism works:

● Epicurus. (c.300BC). *The Art of Happiness* (forward: Daniel Klein; translator: George Strodach). Penguin, 2012
● Lucretius. (55BC). *On the Nature of Things* (translator: Frank Copley). W.W. Norton & Co, 1977.
● Cicero. (45BC). *On the Nature of the Gods* (translator: Patrick Walsh). Oxford University Press, 2008.
● Montaigne, Michel. (1592). *The Complete Works* (translator: Donald Frame). Everyman's Library, 2003.

Voltaire

The following are Voltaire proto-atheism related works:

● Voltaire. (1759). *Candide: and Other Poetic and Philosophical Writings* (editor: Eric Palmer) (apple, pg. 189). Broadview Press.
● Voltaire. (1776). *Philosophical Dictionary* (introduction: John Iverson). Barnes & Noble, 2006.
● Voltaire. (1769). *God and Human Beings* (translator: Michael Shreve; Introduction: Sunand Joshi). Prometheus Books, 2010.

Atheism | Modern

● Meslier, Jean. (1729). *Testament: Memoir of the Thoughts and Sentiments of Jean Meslier* (translator: Michael Shreve). Prometheus Books, 2009.

● La Mettrie, Julien. (1747). *Machine Man and Other Writings* (editor: Ann Thomson). Cambridge University Press, 1996.
● Paine, Thomas. (1795). *The Age of Reason* (editor: Moncure Conway) (txt). Merchant Books, 1896.
● d'Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson). J.P. Mendum, 1889.
● Feuerbach, Ludwig. (1841). *The Essence of Christianity* (translator: George Eliot). DigiReads, 2012.
● Russell, Bertrand. (1957). *Why I Am Not a Christian: and Other Essays on Religion and Related Topics*. Touchstone Books.
● Ayn, Rand. (1957). *Atlas Shrugged*. Publisher.
● Smith, George H. (1974). *Atheism: the Case against God*. Prometheus Books, 1989.
● Russell, Bertrand. (1986). *Bertrand Russell on God and Religion* (editor: Al Seckel). Prometheus Books.
● Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (§: George Santayana, pgs. 228-30). Prometheus.
● Josh, S.T. (2000). *Atheism: a Reader*. Prometheus Books.
● Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas*. HarperOne.
● Harris, Sam. (2004). *The End of Faith: Religion, Terror, and the Future of Reason*. W.W. Norton & Co.
● Wielenberg, Erik J. (2005). *Value and Virtue in a Godless Universe*. Cambridge University Press.
● Onfray, Michael. (2005). *Atheist Manifesto: the Case Against Christianity, Judaism, and Islam* (*Traite d'Atheologie*) (translator: Jeremy Leggatt) (Q). Arcade Publishing, 2007.
● Harris, Sam. (2006). *Letter to a Christian Nation*. Alfred A. Knopf.
● Mills, David. (2006). *Atheist Universe: the Thinking Person's Answer to Christian Fundamentalism*. Ulysses Press.
● Dawkins, Richard. (2006). *The God Delusion*. Mariner Books.
● Hitchens, Christopher. (2007). *God is Not Great: How Religion Poisons Everything*. Hachette Book Group.
● Konner, Joan. (2007). *The Atheist's Bible: an Illustrious Collection of Irreverent Thoughts*. Harper Collins.
● Huberman, Jack. (2007). *The Quotable Atheist: Ammunition for Nonbelievers, Political Junkies, Gadflies, and those Generally Hell-Bound*. Nation Books.
● Hitchens, Christopher. (2007). *The Portable Atheist: Essential Readings for the Nonbeliever, Selected and with Introductions by Christopher Hitchens*. De Capo Press.
● Berlinski, David. (2008). *The Devil's Delusion: Atheism and its Scientific Pretensions*. Basic Books.
● Stenger, Victor J. (2009). *The New Atheism: Taking a Stand for Science and Reason*. Prometheus Books.
● Minois, Georges. (2009). *The Atheist's Bible: the Most Dangerous Book that Never Existed* (translator: Lys Weiss). University of Chicago Press, 2012.
● Rosenberg, Alex. (2011). *The Atheist's Guide to Reality: Enjoying Life without Delusions*. W.W. Norton & Co.
● Williams, Albert. (2014). *Why Our Children Will be Atheists: the Last 100 Years of Religion, and the Dawn of a World without God* (eB). Albert Williams.
● Palmer, Michael. (2013). *Atheism for Beginners: a Coursebook for Schools and Colleges*. Lutterworth Press.
● Boghossian, Peter. (2013). *A Manual For Creating Atheists* (foreward: Michael Shermer). Pitchstone Publishing.
● Navabi, Armin. (2014). *Why There is No God* (eB). Atheist Republic.
● Spencer, Nick. (2014). *Atheists: the Origin of Species*. Bloomsbury Publishing.
● Ruse, Michael. (2015). *Atheism: What Everyone Needs to Know* (abs) (Royal Society polls, pgs. 100-106). Oxford University Press.
● Silverman, David. (2015). *Fighting God: an Atheist Manifesto for a Religious World*. St. Martin's Press.

Nietzsche

The following are Nietzsche books:

● Nietzsche, Friedrich. (1882). *The Gay Science* (translator: Walter Kaufmann). Vintage Books.
● Nietzsche, Friedrich. (1883-85). *Thus Spoke Zarathustra* (translator and introduction: R.J. Hollingdale). Penguin, 2003.
● Nietzsche, Friedrich. (1886). *Beyond Good and Evil* (translator: Helen Zimmern; editor: Oscar Levy; introduction: Costica Bradatan). Barnes & Noble. 2007.
● Nietzsche, Friedrich. (1887). *On the Genealogy of Morals* (translator: Michael Scarpitti; Introduction and Notes:

Robert Holub). Penguin, 2013.
● Nietzsche, Friedrich. (1887). *On the Genealogy of Morals* (translator: Horus Samuel). Dover, 2003.
● Nietzsche, Friedrich. (1888). *Ecce Homo: How One Becomes What One Is* (translator and notes: R.J. Hollingdale; introduction: Michael Tanner) (Q). Penguin.
● Nietzsche, Friedrich. (1888). *The Antichrist* (translation and Introduction: Henry Mencken) (txt). A.A. Knopf, 1920.
● Nietzsche, Friedrich. (1888). *Will to Power: An Attempt at a Revaluation of All Values* (translator: Walter Kaufmann and Reginald Hollingdale; editor: Walter Kaufmann) (pdf) (txt). Random House, 2011.
● Plank, William. (2002). *The Quantum Nietzsche: the Will to Power and the Nature of Dissipative Systems* (ch. 7: Human Reality as a Thermodynamics Model, pgs. 33-34). iUniverse.

Kids Atheism | Godlessness

The following are atheism, humanism, or related, books geared for children:

● Bennett, Helen. (2005). *Humanism, What's That: a Book for Curious Kids*. Prometheus Books.
● Harris, Annaka. (2013). *I Wonder* (Amz). Four Elephants Press.
● Gilgamesh, Horus. (2013). *Awkward Moments Children's Bible* (eB) (Q) (last supper, pg. #). CreateSpace.
● Mitchell, Deborah. (2014). *Growing Up Godless: a Parent's Guide to Raising Kids Without Religion* (foreword: Dale McGowan). Sterling Publishing.

Science vs Religion | Atheism

The following are science vs religion books argued from the atheist-side of the fence, give or take:

● Atkins, Peter W. (1992). *Creation Revisited: a Distinguished Scientist Looks at the Origins of Space, Time, and the Universe*. W.H. Freeman & Co.
● Edis, Taner. (2002). *The Ghost in the Universe: God in Light of Modern Science*. Prometheus Books.
● Graves, Dan. (1996). *Scientists of Faith: Forty-Eight Biographies of Historic Scientists and Their Faith*. Kregel Resources.
● Newberg, Andrew, D'Aquili, Eugene, and Rause, Vince. (2001). *Why Won't God Go Away: Brain Science & the Biology of Belief*. Ballantine Books.
● Stenger, Victor J. (2007). *God the Failed Hypothesis: How Science Shows That God Does Not Exist*. Prometheus Books.
● Kauffman, Stuart A. (2008). *Reinventing the Sacred: a New View of Science, Reason, and Religion*. Basic Books.
● Ecklund, Elaine H. (2010). *Science vs. Religion: What Scientists Really Think*. Oxford University Press.
● Paulson, Steve. (2010). *Atoms & Eden: Conversations on Religion and Science*. Oxford University Press.
● Harris, Sam. (2010). *The Moral Landscape How Science Can Determine Human Values*. Free Press.
● Stenger, Victor J. (2012). *God and the Folly of Faith: the Incompatibility of Science and Religion*. Prometheus Books.
● Krauss, Lawrence M. (2012). *A Universe from Nothing*. Atria Books.
● Nye, Bill. (2014). *Undeniable: Evolution and the Science of Creation*. St. Martin's Press.

Science vs Religion | Theism

The following are science vs religion books argued from the theist-side of the fence, give or take:

● Wilber, Ken. (1998). *The Marriage of Sense and Soul: Integrating Science and Religion*. Broadway Books.
● Schroeder, Gerald L. (2001). *The Hidden Face of God: Science Reveals the Ultimate Truth*. Touchstone.
● Gyatso, Tenzin (14th Dalai Ze). (2005). *The Universe in a Single Atom: the Converge of Science and Spirituality*. Harmony.
● Collins, Francis. (2006). *The Language of God: A Scientist Presents Evidence for Belief* (soul, 5+ pgs; quote, pg. 202). Simon & Schuster.

Religious texts

The following are founding books of religions:

● Anon. (c.1450BC). *The Egyptian Book of the Dead: the Papyrus of Ani* (translator: Wallis Budge, 1895). Dover,

1967.
● Anon. (c.1350BC). *The Rig Veda* (translator: Wendy O'Flaherty). Penguin Books, 1981.
● Tzu, Lao. (c.600BC). *Tao Te Ching* (translator: D.C. Lau). Penguin, 1963.
● Anon. (c.500BC). *Tanaakh: Torah, Nevi'im, Kethuvim*. The Jewish Publication Society, 1985.
● Anon. (c.750). *The Tibetan Book of the Dead* (translator: W.Y. Evans-Wentz; foreword and afterward: Donald Lopez). Oxford University Press, 2000.
● Anon. (c.200). *The Holy Bible, Modern English Version*. Passio, 2014.
● Anon. (c.800). *Quran*. Tahrike Tarsile Qur'an, Inc, 2002.
● Anon. (c.800). *The Quran* (translator: J.M. Rodwell; Foreword and Introduction: Alan Jones). Phoenix, 2001.
● Anon. (2000). *Today's Parallel Bible: King James Version, New International Version, New Living Translation, New American Standard Bible*. Zondervan.

Mythology | General

The following are general mythology books:

● Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World*. Facts on File, Inc.
● Cotterell, Arthur. (2001). *Encyclopedia of World Mythology*. Barnes & Noble.
● Littleton, C. Scott. (2002). *Mythology: the Illustrated Anthology of World Myth and Storytelling*. Thunder Bay Press.
● Faustino, Mara. (2004). *Heaven and Hell: a Compulsively Readable Compendium of Myth, Legend, Wisdom, and Wit for Saints and Sinners*. Atlantic Monthly Press.
● Steele, Philip. (2007). *Eyewitness Mesopotamia: Discover the Cradle of Civilization: the Birthplace of Writing, Religion, and the Rule of Law*. DK Publishing.

Egyptian | Mythology | Theology

The following are Egyptian mythology, i.e. Anunian theology or Ra theology, related books:

● Budge. Wallis. (1900). *Egyptian Ideas of the Future Life*. Publisher.
● Freud, Sigmund. (1939). *Moses and Monotheism* (Arc). Vintage, 1955.
● Mercante, Anthony S. (1978). *Who's Who in Egyptian Mythology* (editor and reviser: Robert Bianchi). Metro Books, 1995.
● El Mahdy, Christine. (1989). *Mummies, Myth and Magic in Ancient Egypt*. Thames & Hudson.
● Wilson, Hilary. (1993). *Understanding Hieroglyphs: a Complete Introductory Guide*. Barnes & Noble.
● Hayes, Michael. (1997). *The Egyptians*. Lansdowne Publishing.
● Ashby, Muata. (1997). *Anunian Theology: African Religion, Volume I*. Cruzian Mystic Books.
● Luckhert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective*. SUNY Press.
● Redford, Donald. (2002). *The Oxford Essential Guide to Egyptian Mythology*. Oxford University Press.
● Marie-Rose, Anon and Hagen, Rainer. (2002). *Egypt: People, Gods, Pharaohs*. Taschen.
● Oakes, Lorna and Gahlin, Lucia. (2002). *Ancient Egypt: an Illustrated Reference to the Myths, Religions, Pyramids and Temples of the Land of the Pharaohs*. Hermes House.

Christianity | Apologetics

The following are Christian apologetics themed works:

● Pascal, Blaise. (1662). *Pensees: Thoughts on Religion* (O). Penguin, 1995.
● Lewis, C.S. (1952). *Mere Christianity, Revised and Enlarged Edition*. Harper San Francisco, 2015.
● Zacharias, Ravi. (1990). *The Real Face of Atheism* (hydrogen, pg. 44). Baker Books, 2004.
● Strobel, Lee. (2004). *The Case for a Creator: a Journalist Investigates Scientific Evidence that Points Toward God*. Zondervan.
● Zacharias, Ravi. (2008). *The End of Reason: a Response to the New Atheists*. Zondervan.
● Jinn, Bo. (2013). *Illogical Atheism: a Comprehensive Response to the Contemporary Freethinker from a Lapsed Agnostic* (eB). Sattwa Publishing, 2014.

Christianity | General

The following are general Christianity, i.e. Jesus-centrict Ab-Ra-ham-ic theology, books:

● Jefferson, Thomas. (1804). *The New Jefferson Bible: the Life and Morals of Jesus of Nazareth in Modern English* (editor: Dan Marshall). Prose City Books, 2013.
● Strong, James. (1995). *The New Strong's Exhaustive Concordance of the Bible*. Thomas Nelson Publishers.
● Bright, Bill. (2002). *Heaven or Hell: Your Ultimate Choice*. New Life Publications.
● Feiler, Bruce. (2002). *Abraham: a Journey to the Heart of the Three Faiths*. Harper Collins.
● Shanks, Hershel and Witherington, Ben. (2003). *The Brother of Jesus: the Dramatic Story and Meaning of the First Archaeological Link to Jesus and His Family* (forward: Andre Lemaire). Harper San Francisco.
● Anon. (2013). *Jesus: Who Do You Say That I Am?* Life Magazine.

Islam | General

The following are Islam, i.e. Muhammad-centric Ab-Ra-ham-ic theology, and or Islam-Christian connecting books:

● Warraq, Ibn. (1995). *Why I Am Not a Muslim*. Prometheus Books, 2003.
● Green, Joey. (2003). *Jesus and Muhammad: the Parallel Sayings* (Foreward: Sayyid Syeed; Introduction: Kenneth Atkinson). Seastone.

Religion | General

The following are non-Christian / Islamic books:

● James, William. (1902). *The Varieties of Religious Experience*: *a Study in Human Nature, Being the Gifford Lectures on Natural Religion Delivered at Edinburgh in 1901-1902*. The Modern Library, 1994.
● Smith, Huston. (1958). *The World's Religions*. Harper Collins.
● Parrinder, Geoffrey. (1971). *World Religions: from Ancient History to the Present*. Facts on File, Inc.
● Basham, A.L. (1989). *The Origins and Development of Classical Hinduism* (editor: Kenneth Zysk). Oxford University Press.
● Armstrong, Karen. (1993). *A History of God: the 4,000-Year Quest of Judaism, Christianity and Islam*. Ballantine Books.
● Eagle, Chokecherry G. (1997). *Beyond the Lodge of the Sun*. Vega.
● Hubbard, L. Ron. (1997). *Scientology: a New Slant on Life*. Bridge Publications.
● Breuilly, Elizabeth, O'Brien, Joanne and Palmer, Martin. (1997). *Religion of the World: the Illustrated Guide to the Origins, Beliefs, Traditions, and Festivals* (editor: Martin Marty). Facts on File, Inc.
● Strathern, Paul. (1999). *Confucius in 90 Minutes*. Ivan R. Dee.
● Wilkinson, Philip. (1999). *Illustrated Dictionary of Religions: Figures, Festivals, and Beliefs of the World's Religions*. DK Publishing.
● Pojman, Louis P. (2000). *Life and Death: a Reader in Moral Problems*. Wadsworth Publishing Co.
● Bowker, John. (2000). *Oxford Concise Dictionary of World Religions*. Oxford University Press.
● Boyer, Pascal. (2001). *Religion Explained: the Evolutionary Origins of Religious Thought*. Basic Books.
● Farrington, Karen. (2001). *The History of Religion*. Barnes & Noble.
● Armstrong, Karen. (2001). *Buddha*. Viking Books.
● Lopez, Donald S. (2002). *Religions of Asia: in Practice, an Anthology*. Princeton University Press.
● Harrison, Guy P. (2008). *50 Reasons People Give for Believing in God*. Prometheus Books.
● Pierce, Charles P. (2009). *Idiot America: How Stupidity Became a Virtue in the Land of the Free*. Random House.

Good | Evil

The following are books focused on the nature of good and evil:

● Turner, Alice K. (1993). *The History of Hell*. Harvest Books.
● Pagels, Elaine. (1995). *The Origin of Satan*. Vintage Books.
● Watson, Lyall. (1995). *Dark Nature: a Natural History of Evil*. Harper Perennial.
● Bloom, Howard K. (1997). *The Lucifer Principle: a Scientific Expedition in the Forces of History* (thermodynamics,

12+ pgs). Atlantic Monthly.
● Mack, Carol K and Mack, Dinah. (1998). *A Field Guide to Demons, Fairies, Fallen Angels, and Other Subversive Spirits*. Owl Books.
● Morrow, Lance. (2003). *Evil: an Investigation*. Basic Books.
● Shermer, Michael. (2004). *The Science of Evil: Why People Cheat, Gossip, Care, Share, and Follow the Golden Rule*. Times Books.

Mythology | Egyptian | Christian

The following are Egyptian mythology to Christianity connecting books:

● Graham, Lloyd M. (1975). *Deceptions and Myths of the Bible*. Citadel Press Books.
● Jackson, John G. (1985). *Christianity Before Christ* (forward: Frank R. Zindler). American Atheist Press.
● Osman, Ahmed. (1990). *Moses and Akhenaten*: *the Secret History of the Egypt at the Time of the Exodus*. Bear & Co.
● Greenberg, Gary. (1996). *The Bible Myth: the African Origins of the Jewish People* (formerly published as *The Moses Mystery*) (section: "The Osirian Iconography in Isaac's Sacrifice", pgs. 245-46). Citadel Press.
● Freke, Timothy and Gandy, Peter. (1999). *The Jesus Mysteries: Was the Original Jesus a a Pagan God?* Three Rivers Press.
● Murdock, Dorothy M. (aka Acharya S.). (1999). *The Christ Conspiracy: the Greatest Story Ever Sold*. Adventures Unlimited.
● Rubenstein, Richard E. (1999). *When Jesus Became God: the Struggle to Define Christianity During the Last Days of Rome*. Harvest Books.
● Greenberg, Gary. (2000). *101 Myths of the Bible: How Ancient Scribes Invented Biblical History*. Source Books.
● Maxwell, Jordan. (2000). *That Old-Time Religion: the Story of Religious Foundations* (with a chapter by: Gerald Massey). The Book Tree.
● Jordan, Michael. (2001). *The Historical Mary: Revealing the Pagan Identity of the Virgin Mother*. Seastone.
● Murdock, Dorothy M (aka Acharya S). (2004). *Sons of God: Krishna, Buddha and Christ Unveiled* (pg. 91). Adventures Unlimited.
● Murdock, Dorothy M. (aka Acharya S.) (c.2010). "Zeitgeist: the Movie: Companion Source Guide", ZeitgeistMovie.com.

Evolution | Religion

The following are evolution vs religion tension topic books:

● Larson, Edward J. (1997). *Summer for the Gods: the Scopes Trial and America's Continuing Debate Over Science and Religion* (new afterword by author). Basic Books, 2006.
● Humes, Edward. (2007). *Monkey Girl: Evolution, Education, Religion, and the Battle for America's Soul*. Harper Perennial.
● Lebo, Lauri. (2008). *The Devil in Dover: an Insider's Story of Dogma v. Darwin in Small-Town America*. The New Press.

Further reading

The following are books that Thims doesn't own but posted below as being of possible value:

● Epstein, Greg M. (2009). *Good without God: What a Billion Nonreligious People Do Believe*. Harper Collins.
● Niose, David. (2012). *Nonbeliever Nation: The Rise of Secular Americans*. St. Martin's Press.

See also

● Thims thermodynamic book collection | 400+
● Thims mate selection book collection | 100+

θΔics

In thought experiments, **Thims thought experiment**, or “Thims love thought experiment”, a modern-day free energy version of the affinity chemistry based Goethe “love thought experiment” (1808), refers to the chemical thermodynamics based mate selection thought experiment conceived in *circa* 1995 by American electrochemical engineer Libb Thims, according to which a person selects mates based on Gibbs free energy change, in the same manner as a physical chemist or chemical engineer would determine the feasibility or spontaneity of any given chemical reaction using free energy tables. Thims’ publications, theories, and work, e.g. Hmolpedia, are a direct precipitate of this one thought experiment, reconstruction of which is outlined below:

Two random girls American Libb Thims, in *circa* 1990, picked up at waterpark, somewhere in Michigan (or Ohio), sitting on Thims' car; albeit neither one of the 19 potential marriage partner girlfriends Thims conceptualized about in his *circa* 1992 mate variable "love though experiment" spreadsheet (shown below) selection methodology.

Attribute selection method

In *circa* 1992-1993, while grappling with a number of deeper philosophical questions surrounding human existence (see: history), American college student Libb Thims, in an attempt to figure out how to go about choosing who to marry—as this is supposed to be a step, according to cultural protocol, in the public standard model of existence—made an excel spreadsheet style table of the top nineteen girlfriends, whom he could potentially marry, listing each person on the horizontal and listing a range of point ranked attributes, qualities, or factors on the vertical, such as “grandmother would like her”, spontaneity, fun factor, physical attraction factors, mental attraction factors, repulsive factors, etc., in an attempt to get a numerical "marriage quality value" for each girlfriend.

The original table spreadsheet has since been destroyed (similar to Goethe who destroyed all the notes, tables, and drafts that went into his *Elective Affinities*). A mock reconstruction of Thims' *circa* 1992 trait-based mate selection table, using random female photos (and hotness rating) from Pictures2Rate.com and mock traits (and scores), is shown below:

	G1 | 5.0	G2 | 6.2	G3 | 6.1	G4 | 5.6	G5 | 7.2	G6 | 5.8	G7 | 5.9	G8 | 6.7	G9 | 6.4	G10 | 4.3	G11 | 5.3	G12 | 5.2	G13 | 4.6	G14 | 6.0	G15 | 6.0	G16 | 6.2	G17 | 6.6	G18 | 7.7	G19 | 5.3
(20) Grandmother likes	2	5	3	7	12	10	5	5	20	3	5	2	8	15	8	5	0	10	10
(15) Spontaneity	10	3	8	8	10	5	15	10	15	5	5	5	10	5	12	12	12	10	10
(15) Fun factor	12	4	5	8	8	8	15	12	15	5	5	2	10	8	5	5	8	5	8
(10) Fitness	8	0	5	7	10	5	10	8	10	3	7	8	8	8	7	8	8	10	8
(10) Hair	10	5	5	8	7	10	5	6	5	4	10	5	4	4	4	7	7	9	8
(10) Eyes	8	5	2	5	8	10	8	9	10	5	6	5	3	5	5	6	7	7	7
(15) Body	12	2	10	10	12	5	5	10	10	2	8	5	4	4	18	4	10	15	12
(25) Intelligence	15	20	15	8	8	12	15	5	25	5	10	5	20	15	15	8	8	10	10
(20) Character	15	15	5	3	5	5	10	5	20	5	0	0	10	15	15	10	5	5	10
(10) Class	5	10	5	6	10	5	10	7	10	3	5	3	5	5	5	5	5	8	5
TOTAL =	82	69	63	70	90	75	98	77	140	40	61	35	82	84	84	70	70	90	80

The resulting solutions, however, did not seem to intuitively make any sense. The one who is physically the "hottest" according to general opinion is female #18 (Ella), who scores 7.7 on the hot or not 1-10 scale. Heat, however, as Thims would come to learn, if this number is indeed representative of physical heat, is not the sole determining factor of whether a reaction will go, as the debacle of the famous thermal theory of affinity showed. The one who scores the highest on the meta-ranking method is female #9 (Ava), who scores 140. Sometime herein, before, or after, Thims began to read up on mate selection, evolutionary psychology, physical attractiveness research, etc., to study the issue further (see: Thims' mate selection book collection).

To give some comparison, i.e. to exemplify standard or colloquial methods of mate selection, the following is a 2003 polling of 50 people, done by Thims, as to the top three methods he our she uses to select for spouses: [1]

Man-to-Man [N=22] Advice (to your little nephew):
Rule of Thumb on how to "pick the right one"
(supposing he had 3 to choose from)

#	Rule	Source
1	The hottest one, i.e. biggest tits, best T&A, most beautiful, etc.	M, M, M, M
2	The one you know you can trust, honesty, faithful, etc.	M, M, M
3	The one that makes you the happiest or is the happiest	M, M, M
4	The one who takes the most pleasure in making you dinner, or best cook	M, M
5	Go with your gut	M
6	Follow your heart	M
7	The one that tries to change you the least	M
8	You go away for a week; the one you miss the most is the one you pick	M
9	The one you share the most interests with	M
10	The one that bitches the least	M
11	The smartest one	M
12	The one that takes care of you the best	M
13	The one with the best work ethic	M
14	The one with the most money	M

Woman-to-Woman [N=28] Advice (to your little niece):
Rule of Thumb on how to "pick the right one"
(supposing she had 3 to choose from)

#	Rule	Source
1	Follow your heart	F, F, F
2	The one that respects you the most	F, F, F
3	The one that makes you laugh the most	F, F, F
4	The richest one, best job, etc.	F, F
5	The one you know you can trust, honesty, etc.	F, F
6	The one that makes you the happiest, have the most fun with, etc.	F, F
7	The one that treats their mother the best	F, F
8	Marry for stability, i.e. emotionally, financially, physically, etc.	F
9	Go with your gut	F
10	Follow your instinct	F
11	The one you most want to have children with	F
12	The one that take the longest to say "I love you"	F
13	The one with the best personality	F
14	The one you feel the most comfortable with	F
15	Whomever treats you most like a lady	F
16	The one you can talk to the most	F
17	The one who most complements your dreams	F
19	The one that appreciates you the most	F

A 2003 interview poll of 50 people: 22 men (left) and 28 women (right), conducted by American electrochemical engineer Libb Thims, on the rule of thumb methods men and women tend to use to select mates for marriage, supposing one was to give such advice to his or her nephew or niece on the matter. Each responded, male M or female F, was asked to provide three methods; responses of which are shown in the source column. [1]

Free energy selection method

In *circa* 1995, after taking courses in chemical thermodynamics and physical chemistry, and learning how reactions between different chemical species are predicted energetically, Thims began to muse about how this would be done chemical thermodynamically in regards to humans, even nearing the point of asking the question openly by raising his hand in his chemical engineering thermodynamics class. The following is the reformulated free energy based selection method table Thims hand in mind at this point (which, to note, is equivalent to Goethe's affinity table, affinity and free energy connected via the Goethe-Helmholtz equation):

Reaction #	A	+	B	→	C	ΔG (MJ/hmol)
1	Thims	+	Lisa | 5.0	→		-80
2	Thims	+	Sarah | 6.2	→		+25
3	Thims	+	Jessica | 6.1	→		0
4	Thims	+	Fay | 5.6	→		+10
5	Thims	+	Tina | 7.2	→		-20

6	Thims	+	Ashley | 5.8	→		-30
7	Thims	+	Mary | 5.9	→		-50
8	Thims	+	Sophia | 6.7	→		+125
9	Thims	+	Ava | 6.4	→		-75
10	Thims	+	Chloe | 4.3	→		+50
11	Thims	+	Samantha | 5.3	→		-125
12	Thims	+	Allison | 5.2	→		+200
13	Thims	+	Addison | 4.6	→		+10
14	Thims	+	Julia | 6.0	→		-200
15	Thims	+	Brooke | 6.0	→		-40
16	Thims	+	Lauren | 6.2	→		+10
17	Thims	+	Claire | 6.6	→		-25
18	Thims	+	Ella | 7.7	→		+10
19						-15

Thims

+

Aubrey | 5.3

→

The units listed above, to note, are retrospect units, in the sense that in circa 1995 Thims only had +/- conception of free energy change in his mind, i.e. that a negative free energy change is needed for a spontaneous, favorable, of feasible reaction, and that the more negative the value in magnitude the greater the spontaneity or favorableness of the reaction, as defined by the spontaneity criterion:

Condition	Description
$dG > 0$	Reaction is nonspontaneous (reaction is favored in the opposite direction).
$dG = 0$	System is at equilibrium (there is no net change).

Hence, if the above values of Gibbs free energy change, per each human chemical reaction, were accurate, as based on measurement, then reaction #14 would be the most thermodynamically favored (Thims marrying Julia and making a family); reactions: #11 (-125 MJ/hmol), #1 (-80 MJ/hmol), #9 (-75 MJ/hmol), #7 (-50 MJ/hmol), #6 (-30 MJ/hmol), #15 (-40 MJ/hmol), #17 (-25 MJ/hmol), #5 (-20 MJ/hmol), and #19 (-15 MJ/hmol) would each also be favored energetically, albeit each to a lesser degree, respectively; reaction #3 (0 MJ/hmol) would be at equilibrium or characterized by no free energy change and hence one that was equally favored in the forward and backwards direction; and reactions: #4 (+10 MJ/hmol), #13 (+10 MJ/hmol), #16 (+10 MJ/hmol), #18 (+10 MJ/hmol), #2 (+25 MJ/hmol), #10 (+50 MJ/hmol), #8 (+125 MJ/hmol), and #12 (+200 MJ/hmol) would each be non-favored reactions, with increasing amounts, respectively, i.e. reactions that are thermodynamically impossible, unless energy were added to the reaction to make each go.

The "hmol" in the above table, to note, is assumed to be three human molecules and wherein a normal reproduction reaction is approximated as involving an average of 1,500 cal per day at 365 days per 18 years times 3 people involved in the reproduction and one child rearing process, which amounts to about 125 megajoules of energy.

Determinism

A salient point about the above logic, which is based on Gilbert Lewis' 1923 "universal rule" of chemical thermodynamics, is that the entire reaction process, and hence the details of the mechanism of human choice, is entirely based and predetermined on the measure of the free energy change for the process. This is summarize well by Canadian-American physical chemist Julie Forman-Kay: [2]

> "Whether two molecules [or human molecules] will bind is [**completely**] determined by the free energy change of the interaction, composed of both enthalpic and entropic terms."

This of course conflicts directly with ancient belief in free will, as dominantly rooted in Anunian theology, and the premise of the weighing of the soul, which in turn implies that global morality system will eventually need to be completely overhauled; hence the Goethean revolution.

Enthalpy and entropy

It would be a full seven years (2001) before he could figure out the nuts and bolts of how this free energy change could be quantified via enthalpy and entropy determinants (see: history):

$$\Delta G = \Delta H - T\Delta S$$

In more detail, the subject of the governing relation of the interactions of human relationship with that of chemical thermodynamics originated in *circa* 1995 during Thims' years as a chemical engineering thermodynamics student at the University of Michigan and his curiosity as to how the spontaneity criterion of chemical thermodynamics applies to the successfulness of mate selection or prediction in the action of love the chemical reaction. In this period, and the years to follow, Thims began to seek a thermodynamic understanding of the human existence process, especially as thermodynamics relates to mate selection and the nature of love; and sometime shortly thereafter, Thims discovered American evolutionary psychologist David Buss' newly-published 1994 book *The Evolution of Desire*, containing the results of a robust study on mate selection of 10,000 people of all ages from thirty-seven cultures worldwide, which presented a rather eye-opening and straight-forward look at the nuts and bolts of mate selection, in regards to what specific factors affect sexual attractiveness and sexual repulsiveness, from both the male and female perspective. Some of the first products of this efforts include the 2005 *Journal of Human Thermodynamics*, the 2007 textbook *Human Chemistry*, and the 2008 *The Human Molecule*, to name a few.

References

1. Thims, Libb. (2003). "How to Pick the Right One", IoHT research project.
2. Forman-Kay, Julie D. (1999). "The 'Dynamics' in the Thermodynamics of Binding." *Nature Structure Biology*, 6: 1086-87.

θΔics

In libraries, **Thims' thermodynamics book collection** (422+) is a growing set of thermodynamics books and textbooks maintained by American electrochemical engineer Libb Thims; one of the world's largest collections. [1] Thims' loose aim is to collect every book on thermodynamics ever published.

> "Your bibliography helps greatly. Please accept my compliments for publishing it!"
>
> — New Member (2009), a geological thermodynamicist, comment to Thims, Aug 7 [3]

Partial view of Libb Thims' **thermodynamics book collection**, IoHT, Chicago (c. 2005).

History of collection

In *circa* 1991, at a point when Thims owned zero books, of any sort, he entered into a autodidactic path of self-education: and during the years circa 1992 to 1997, began to amass books as he began to educate himself on the subjects of, primarily, chemical engineering, electrical engineering, evolutionary psychology, mate selection, medicine, and neuroscience, obtaining degrees in the former two subjects, and getting past the ½-Buffett number in the latter two subjects.

In circa 1995, Thims began to ruminate on the puzzling question of how one would applied the basic chemical thermodynamic rule of the chemical reaction spontaneity criterion ($\Delta G < 0$ = spontaneous reaction) to the human reactions of sex, love, and reproduction, in which two react to produce a third newly synthesized product (a baby), and thereafter began searching for previous theories on this topic, a which point his thermodynamics book collection began to grow.

Thims began to keep an actual 'running count' of his personal book collection when, in May of 2006, during a conversation with American four-degreed engineer (BS, MS, PhD chemical engineering, ME nuclear engineering) James Lawler, on the topic of Peruvian engineer Alfredo Infante's circa 2001 social entropy theory, Lawler informed Thims that he had a book collection of over 4,000 books, in three different homes, some in triplicate, after which, Thims, out of curiosity, counted his own personal book collection, finding it in the 850 book count range, a collection having a growth rate of 57 books per year (since 1991).

Thims since has made a specific effort to make sure that on the one topic of human thermodynamics and thermodynamics in general that no person or library in the world has more thermodynamics books than he does. In 2007, Thims' personal library stood at just past the 1,000 book mark. [2] In 2011, Thims' total personal library collection, including thermodynamics books, was at the 1,250+ mark.

Recent additions:

The following thermodynamics-related books, as listed in the following header section, were *recently* (Aug 2011-current) purchased by Thims (and not yet reordered into categories):

1. Hill, Terell L. (1989). *Free Energy Transduction and*

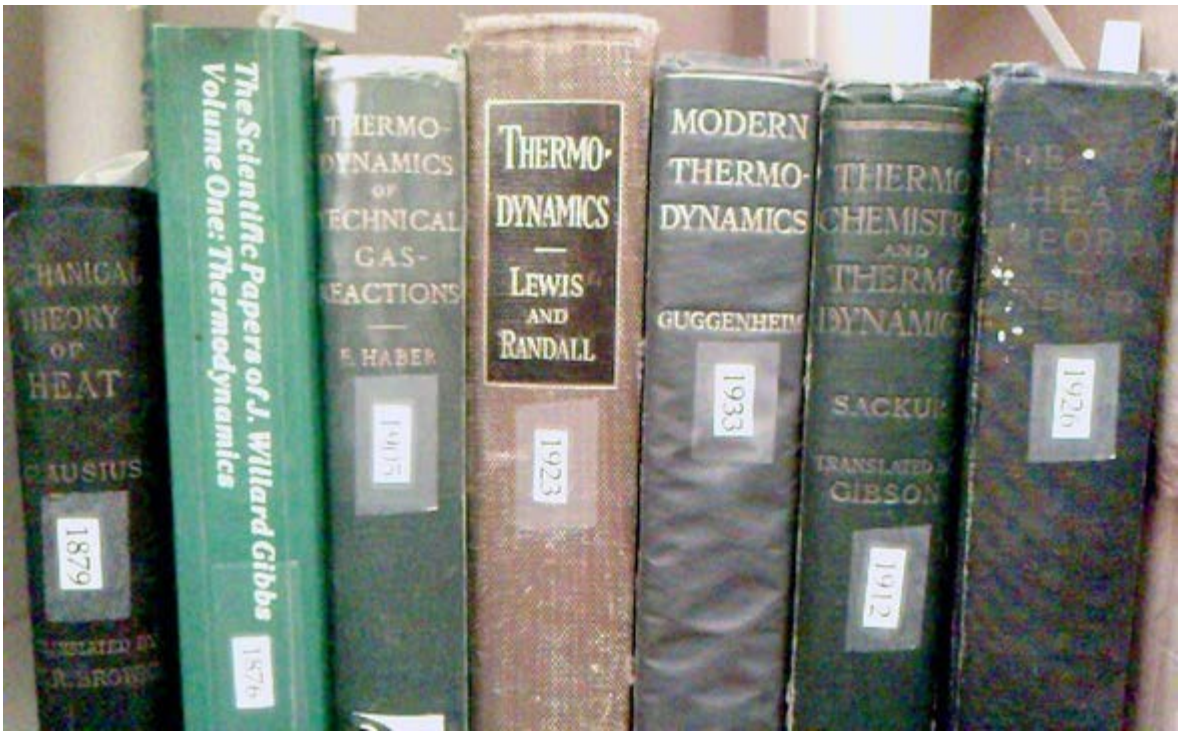

Some of the **core books** in Libb Thims' thermodynamics book collection: the three most germane to human thermodynamics being: (1) Clausius' 1875 *Mechanical Theory of Heat*, (2) Gibbs' 1876 *Equilibrium on the Heterogeneous Substances*, and (3) Lewis' 1923 *Thermodynamics and the Free Energy of Chemical Substances*.

Biochemical Cycle Kinetics. Springer.

2. Bryant, John (2011). *Thermoeconomics: A Thermodynamic Approach to Economics* (ch. 1: Introduction; ch. 3: Thermodynamic Principles; ch. 5: Money). VOCAT International Ltd.
3. Hough, Adrian. (2010). *The Flaw in the Universe: Natural Disaster and Human Sin.* O Books.
4. Atkins, Peter. (2010). *The Laws of Thermodynamics: A Very Short Introduction.* Oxford.
5. Krishnan, Rajaram, Harris, Jonathan, and Goodwin, Neva R. (1995). *A Survey of Ecological Economics*. Island Press.
6. Rosen, Robert. (1991). *Life Itself: A Comprehensive Inquiry into the Nature, Origin, and Fabrication of Life* (thermodynamics, 7+ pgs; ch. 4: The Concept of State, pgs. 67-). Columbia University Press.
7. Foss, Laurence. (2002). *The End of Modern Medicine: Biomedical Science under a Microscope* (Section: Second Law of Psychothermodynamics, pgs. 229-36). SUNY Press.
8. Foss, Laurence and Rothenberg, Kenneth. (1987). *The Second Medical Revolution: from Biomedicine to Infomedicine* (thermodynamics, 38+ pgs). Shambhala.
9. Foster, David. (1985). *The Philosophical Scientists* (thermodynamics, 14+ pgs). C. Hurst.
10. Mellor, Joseph W. (1902). *Higher Mathematics for Students of Chemistry and Physics: with special reference to the work of J.W. Mellor* (exact differential, pg. 57-62). Longmans, Green, and Co.
11. Partington, James R. (1911). *Higher Mathematics for Chemical Students.* Methuen & Co.
12. Ulanowicz, Robert E. (2009). *A Third Window: Natural Life beyond Newton and Darwin* (thermodynamics, 32+ pgs; entropy, 17+ pgs; God, 12+ pgs) . Templeton Press.
13. Jantsch, Erich. (1979). *Self-organizing Universe: Scientific and Human Implications of the Emerging Paradigm of Evolution* (thermodynamics, 10+ pgs). Hanser Verlag; English trans. Pergamon Press, 1980.
14. Cousins, Norman. (1985). *Nobel Prize Conversations: With Sir John Eccles, Roger Sperry, Ilya Prigogine, Brian Josephson* (thermodynamics, 10+ pgs). Saybrook Pub.
15. Kuhn, Thomas. (1957). "Energy Conservation as an Example of Simultaneous Discovery", in Marshall Clagett, ed., *Critical Problems in the History of Science*: *Proceedings of the Institute for the History of Science*, 1959. (pgs. 321-56), Madison, Wis.: University of Wisconsin Press, 1969 reprint.
16. Harman, Peter M. (1892). *Energy, Force, and Matter: the Conceptual Development of Nineteenth-Century Physics (Cambridge Studies in the History of Science)*. Cambridge University Press.
17. Rothman, Tony. (1989). *Science a la Mode: Physical Fashions and Fictions* (ch.: Entropy as Evolution, pgs. 75-108). Princeton University Press.
18. Pynchon, Thomas. (1984). *Slow Learner* (entropy, pgs. 10-14; §Entropy, pgs. 79-98). Little, Brown, and Co (Vintage, 1995).

19. Koenigsberger, Leo. (1902). *Hermann von Helmholtz* ("The Thermodynamics of Chemical Processes", pgs. 335-39; 1883: Note on an Introduction to Thermodynamics, pgs 340-43) trans. Frances A. Welby, preface by Lord Kelvin. Oxford at the Clarendon Press.
20. Helmholtz, Hermann. (1995). *Science and Culture: Popular and Philosophical Essays*. University of Chicago Press.
21. Kauffman, Stuart. (2002). *Investigations*. Oxford University Press.
22. Wyson, Randy L. (1976). *The Creation-Evolution Controversy* (ch. 16: Thermodynamics, pgs. 239-75). Wysong Institute.
23. Abbott, Michael and Van Ness, Hendrick. (1989). *Schaum's Outlines of Thermodynamics with Chemical Applications.* McGraw-Hill.
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25. Bayliss, William M. (1915). *Principles of General Physiology* (ch. II Energetics (thermodynamics), pgs. 27-47). Longmans, Green, and Co.
26. Coffey, Patrick. (2008). *Cathedrals of Science: the Personalities and Rivalries that Made Modern Science* (pg. 176). Oxford University Press.
27. Collins, Dennis G. (2011). *Conflict in History, Measuring Symmetry, Thermodynamic Modeling and Other Work* (abs) (List of Thermodynamic Modeling Papers, pgs. 99-100). AuthorHouse.
28. Lightman, Alan. (2000). *Great Ideas in Physics: the Conservation of Energy, the Second Law of Thermodynamics, the Theory of Relativity, and Quantum Mechanics* (§: Conservation Laws and Human Freedom, pgs. 35-36; §: The Second Law Applied to Human Society, pgs. 110-114; Appendix B: Problems and Discussion Questions, pgs. 253-). McGraw-Hill.
29. Lewis, Gilbert N. (1925). *The Anatomy of Science*, Silliman Lectures; Yale University Press, 1926.
30. Kilmister, C.W. (1989). *Schrödinger: Centenary Celebration of a Polymath* (§18: "Schrodinger's Contribution to Chemistry and Biology", pgs. 225-33, by Linus Pauling; §19: "Erwin Schrödinger's *What Is Life?* and molecular biology", by Max Perutz, pgs. 234-51).Cambridge University Press.
31. Gold, Barri J. (2010). *ThermoPoetics: Energy in Victorian Literature and Science.* MIT Press.
32. Bousquet, Antoine. (2009). *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity* (ch. 3: Thermodynamic Warfare and the Science of Energy, pgs. 63-92). Columbia University Press.
33. Hsieh, Ching-Yao, Hsieh and Ye, Meng-Hua. (1991). *Economics, Philosophy, and Physics* (§3: Thermodynamics and Newtonian World View, pgs. 55-66). M.E. Sharpe.
34. Klein, Joseph F. (1910). *Physical Significance of Entropy: or of the Second Law* (principle of elementary disorder, pgs. 5-10). D. Van Nostrand Co.
35. O'Neill, Patrick. (1990). *The Comedy of Entropy: Humour, Narrative, Reading* (*Elective Affinities*, pg. 179). University of Toronto Press.
36. Monod, Jacques. (1970). *Chance and Necessity: Essay on the Natural Philosophy of Modern Biology* (*Le Hasard et la Nécessité: Essai sur la philosophie naturelle de la biologie moderne*) (English translator: Austryan Wainhouse). Vintage, 1971.
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38. Guye, Charles E. (1922). *Physico-Chemical Evolution* (translator: J.R. Clarke). Dutton, 1925.
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41. Coveney, Peter V. and Highfield, Roger. (1992). *The Arrow of Time: a Voyage through Science to Solve Time's Greatest Mystery* (entropy, 59+ pgs). Fawcett Columbine.
42. Diggins, John P. (1995). *The Promise of Pragmatism: Modernism and the Crisis of Knowledge and Authority* (§2: Who Bore the Failure of the Light: Henry Adams, pgs. 55-107; §§: Science and the Fate of the Universe, pgs. 67-80; quote, pg. 84; thermodynamics, 9+ pgs). University of Chicago Press.
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§3.4: Evaluating Entropy Analogies, pgs. 58-59; §4.5: Ethics of Energy Disasters, pgs. 79-80). Morgan& Claypool.
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The laws of thermodynamics

See main: Laws of thermodynamics

1. Goldstein, Martin and Goldstein, Inge F. (1993). *The Refrigerator and the Universe - Understanding the Laws of Energy*. Cambridge, Massachusetts: Harvard University Press.
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Temperature

See main: Temperature

1. Shachtman, Tom. (1999). *Absolute Zero and the Quest for Absolute Cold*. New York: Mariner Books.
2. Segre, Gino. (2002). *A Matter of Degrees - What Temperature Reveals About the Past and the Future of Our Species, Planet, and Universe*. London: Penguin Books.

Heat

See main: Heat

1. Mendelsohn, Everett I. (1964). *Heat and Life: the Development of the Theory of Animal Heat*, (pg. 9). Harvard University Press.
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History of thermodynamics

See main: History of thermodynamics

1. Helm, Georg F. (1887). *Die Lehre von der Energie: Historisch-Kritisch Entwickelt, Nebst Beiträgen Zu Einer Allgemeinen Energetik* (*The Doctrine of Energy: Historical-Critical Developed, Along with contributions to one general energetics*). Biobiobazaar, 2010.
2. Rabinbach, Anson. (1990). *The Human Motor - Energy, Fatigue, and the Origins of Modernity*. Berkeley: University of California Press.
3. Cobb, Cathy, and Rarold, Goldwhite. (1995). *Creations of Fire - Chemistry's Lively History from Alchemy to the Atomic Age*. Cambridge, Massachusetts: Perseus Publishing.
4. Baeyer, Hans C. von (1999). *Warmth Disperses and Time Passes - the History of Heat*. New York: The Modern Library.
5. Nye, Mary Jo (1999). *Before Big Science: the Pursuit of Modern Chemistry and Physics, 1800-1940* (ch. 4: Thermodynamics, Thermochemistry, and the Science of Energy, pgs. 88-146). Harvard University Press.
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7. Sproule, Anna. (2001). *James Watt: Master of the Steam Engine*. Blackbirch Press, Inc.
8. Robinson, Andrew. (2005). *The Last man Who Knew Everything: Thomas Young* (energy, 5+ pgs.). Pi Press.
9. Muller, Ingo. (2007). *A History of Thermodynamics - the Doctrine of Energy and Entropy*. New York: Springer.

Biochemical thermodynamics

See main: Biochemical thermodynamics, Bioenergetics, Biological thermodynamics, etc.

1. Lotka, Alfred J. (1926). *Elements of Physical Biology*. New York: Dover.
2. Krebs, H.A. and Kornberg, H.L. (1957). *Energy Transformations in Living Matter - a Survey (with Appendix by*

K. Burton). Berlin: Springer-Verlag.
3. Spanner, D. C. (1964). *An Introduction to Thermodynamics: Experimental Botany.* Academic Press.
4. Morowitz, Harold J. (1970). *Entropy for Biologists - an Introduction to Thermodynamics.* New York: Academic Press.
5. Lehninger, Albert L. (1973). *Bioenergetics - the Molecular Basis of Biological Energy Transformations* (2nd ed.). London: The Benjamin/Cummings Publishing Co.
6. Becker, Wayne. (1977). *Energy and the Living Cell: An Introduction to Bioenergetics.* J.B. Lippincott.
7. Di-Cera, Enrio. (1995). *Thermodynamic Theory of Site-Specific Binding in Biological Macromolecules.* Cambridge: Cambridge University Press.
8. Hammes, Gordon G. (2000). *Thermodynamics and Kinetics for the Biological Sciences.* New York: John Wiley & Sons, Inc.
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10. Haynie, Donald. (2001). *Biological Thermodynamics.* Cambridge: Cambridge University Press.
11. Raffa, Robert B. (2001). *Drug-Receptor Thermodynamics - Introduction and Applications.* New York: John Wiley & Sons.
12. Nicholls, David G. and Ferguson, Stuart J. (2001). *Bioenergetics3* (2nd ed, 4th printing). New York: Academic Press.
13. Alberty, Robert, A. (2003). *Thermodynamic of Biochemical Reactions.* Hoboken, New Jersey: John Wiley & Sons, Inc.

Earth sciences thermodynamics

See main: Geothermodynamics, Geochemical thermodynamics

1. Kern, Raymond and Weisbrod, Alain. (1967). *Thermodynamics for Geologists.* San Francisco: Freeman, Cooper and Co.
2. Anderson, Greg, M. and Crerar, David A. (1993). *Thermodynamics in Geochemistry - the Equilibrium Model.* New York: Oxford University Press.
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4. Anderson, Greg M. (2005). *Thermodynamics of Natural Systems* (2nd ed.). Cambridge: Cambridge University Press.

Atmospheric thermodynamics

See main: Atmospheric thermodynamics

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2. Zdunkowski, Wilford and Bott, Andreas. (2004). *Thermodynamics of the Atmosphere - A Course in Theoretical Meteorology.* Cambridge: Cambridge University Press.

Physical chemistry

See main: Physical chemistry

1. Taylor, Hugh, S. and Glasstone, Samuel. (1942). *A Treatise on Physical Chemistry - Volume One: Atomistics and Thermodynamics.* (3rd ed.). New York: D. Van Nostrand Co., Inc.
2. Randall, Merle and Young, Leona E. (1942). *Elementary Physical Chemistry.* Randall and Sons.
3. Barrow, Gordon M. (1988). *Physical Chemistry* (5th ed.). New York: McGraw-Hill, Inc.
4. Atkins, Peter. (1998). *Physical Chemistry* (6th ed.). New York: W.H. Freeman and Co.
5. Silbey, Robert J. and Alberty, Robert A. (2001). *Physical Chemistry* (3rd ed.). New York: John Wiley & Sons, Inc.

Thermal physics, thermal sciences, etc.

See main: Thermal physics

1. Baierlein, Ralph. (1999). *Thermal Physics.* Cambridge: Cambridge University Press.
2. Schroeder, Daniel, V. (2000). *An Introduction to Thermal Physics.* New York: Addison Wesley Longman.
3. Lee, Jooh, C. (2002). *Thermal Physics - Entropy and Free Energies. London: World Scientific.*
4. Potter, Merle C. and Scott, Elaine P. (2004). *Thermal Sciences - an Introduction to Thermodynamics, Fluid Mechanics, and Heat Transfer.* U.S.: Brooks/Cole.

Thermodynamic biographies

See main: Willard Gibbs, Robert Mayer, Hermann Helmholtz, Ludwig Boltzmann, James Watt, Fritz Haber, etc.

1. Rankine, William, J.M. (1881). *Miscellaneous Scientific Papers,* (GB). C. Griffin and Co. (2001, Adamant Media Corporation, reprint).
2. Rukeyser, Muriel. (1942). *Willard Gibbs - American Genius.* Garden City, New York: Doubleday, Doran & Co., Inc.
3. Wheeler, Lynde, P. (1951). *Josiah Willard Gibbs - the History of a Great Mind.* Woodbridge, Connecticut: Ox Bow Press.
4. Gillispie, Charles C. (1971). *Lazare Carnot Savant: A Monograph Treating Carnot's Scientific Work.* Princeton University Press.
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6. Cahan, David. (1993). *Hermann von Helmholtz and the Foundations of Nineteenth-Century Science.* Berkeley: University of California Press.
7. Guillen, Michael. (1996). *Five Equations that Changed the World: the Power and Poetry of Mathematics* (ch. 4: An Unprofitable Experience: Rudolf Clausius and the Second Law of Thermodynamics, pgs. 165-214). Hyperion.
8. Cercignani, Carlo. (1998). *Ludwig Boltzmann - the Man Who Trusted Atoms.* Oxford: Oxford University Press.
9. Lindley, David. (2001). *Boltzmann's Atom - the Great Debate that Launched a Revolution in Physics.* New York: The Free Press.
10. Sproule, Anna. (2001). *James Watt - Master of the Steam Engine.* WoodBridge, Connecticut: Blackbirch Press, Inc.
11. Lindley, David. (2004). *Degrees Kelvin - a Tale of Genius, Invention, and Tragedy.* Washington, D.C.: Joseph Henry Press.
12. Cropper, William H. (2004). *Great Physicists: the Life and Times of Leading Physicists from Galileo to Hawking* (section II: Thermodynamics, pgs. 41-134). Oxford University Press.
13. Charles, Daniel. (2005). *Master Mind - the Rise and Fall of Fritz Haber, the Nobel Laureate who Launched the Age of Chemical Warfare.* New York: Harper Collins Publishers.

Evolution thermodynamics, origin of life, etc.

See main: Thermodynamic evolution, Evolution thermodynamics, Self-Organization, etc.

1. Osborn, Henry F. (1916). *The Origin of Life: on the Theory of Action, Reaction and Interaction of Energy* (keyword: thermodynamics, pgs. xix, 5, 13-14, 18, 22, 53, 117, 311, 321). The Science Press; Reprinted by: Charles Scribner's Sons, 1917, 1918, 1921.
2. Vernadsky, Vladimir I. (1926). *The Biosphere.* New York: A Peter N. Nevraumount Book.
3. Schrodinger, Erwin. (1944). *What is Life?* Cambridge: Cambridge University Press.
4. Oster, G.F., Silver, I.L., and Tobias, C.A. (1974). *Irreversible Thermodynamics and the Origin of Life.* New York: Gordon and Breach Science Publishers.
5. Lovelock, James. (1979). *Gaia - a New Look at Life on Earth.* Oxford: Oxford University Press.
6. Margulis, Lynn and Sagan, Dorion. (1995). *What is Life?* Berkeley: University of California Press.
7. Fox, Ronald F. (1988). *Energy and the Evolution of Life.* New York: W.H. Freeman and Co.
8. Weber, Bruce H., Depew, David J., Smith, James D. (1988). *Entropy, Information, and Evolution: New Perspectives on Physical and Biological Evolution.* MIT Press.

9. Morowitz, Harlod J. (1992). *Beginnings of Cellular Life - Metabolism Recapitulates Biogenesis.* New Haven: Yale University Press.
10. Kauffman, Stuart. (1995). *At Home in the Universe - the Search for the Laws of Self-Organization and Complexity.* Oxford University Press.
11. Capra, Fritjof. (1996). *The Web of Life - a New Scientific Understanding of Living Systems.* New York: Anchor Books.
12. Chaisson, Eric J. (2001). *Cosmic Evolution - the Rise of Complexity in Nature.* Cambridge, Massachusetts: Harvard University Press.
13. Lurquin, Paul F. (2003). *The Origins of Life and the Universe.* New York: Columbia University Press.
14. Avery, John. (2003). *Information Theory and Evolution.* London: World Scientific.
15. Hazen, Robert M. (2005). *Genesis - the Scientific Quest for Life's Origin.*

Human thermodynamics: books below this line have some type of thermodynamic application geared specifically towards human existence questions.

Human thermodynamics

See main: Human thermodynamics

1. Adams, Henry. (1918). *The Education of Henry Adams: an Autobiography* (chs. “A Dynamical Theory of History” (1904), “A Law of Acceleration” (1904), “Nunc Age” (1905)). Massachusetts Historical Society.
2. Zamyatin, Yevgeny. (1921). *We* (introduction). Penguin.
3. Reiser, Oliver L. (1940). *The Promise of Scientific Humanism: Toward a Unification of Scientific, Religious, Social, and Economic Thought* (thermodynamics, 6+ pgs). O.Piest.
4. White, Leslie. (1949). *The Science of Culture: a Study of Man and Civilization* (quote: "struggle for free energy", pg. 367). Farrar, Straus.
5. Darwin, Charles G. (1952). *The Next Million Years* ("human thermodynamics", pg. 26), (PDF), (Google Books). London: Rupert Hart-Davis.
6. White, Leslie. (1959). *The Evolution of Culture: the Development of Civilization to the Fall of Rome* (ch. 2: Energy and Tools: Wilhelm Ostwald, Lotka, Negative entropy, pgs. 33-49). McGraw-Hill.
7. Pynchon, Thomas. (1966). *The Crying of Lot 49* (Maxwell’s demon, pgs. 68-69, 84-85, 88, 98, 134). Bantam.
8. Nieburg, H.L. (1973). *Culture Storm: Politics and the Ritual Order* (ch. 5: “Political Thermodynamics”, pgs. 81-104). New York: St. Martin’s Press.
9. Miller, George T. (1971). *Energetics, Kinetics, and Life: an Ecological Approach* (section: 2.4: Entropy and Ethics, pg. 328). Wadsworth Pub. Co.
10. Iberall, Arthur S. (1971). *Toward a General Science of Viable Systems* (Gibbs free energy, pg. 91). McGraw Hill.
11. Blissett, Marlan. (1972). *Politics in Science,* (ch. 3: Big Science and the Laws of Social Thermodynamics, pg. 25-; term: entropy, pgs. 26, 53, 66, etc.). Little, Brown and Co.
12. Lindsay, Robert B. (1973). *The Role of Science in Civilization,* (section: Information and Thermodynamics: Entropy, pgs. 153-164; section: A Scientific Analogy: The Thermodynamic imperative). Greenwood Pub. Group.
13. Commoner, Barry. (1976). *The Poverty of Power: Energy and the Economic Crisis* (ch. 2: Thermodynamics: the Science of Power). Alfred A. Knopf.
14. Fernández-Galiano, Luis. (1982). *Fire and Memory: On Architecture and Energy.* MIT Press.
15. Slade, Joseph W. (1990). *Beyond Two Cultures: Essays on Science, Technology, and Literature,* (ch. 9: Entropy as Root Metaphor, pgs. 185-200). Iowa State University Press.
16. Iberall, Arthur, Wilkinson, David, White, Douglas. (1993). *Foundations for Social and Biological Evolution: Towards a Physical Theory of Civilization and Speciation.* Cri-de-Coeur Press.
17. Rosnay, Joel. (1995). *The Symbiotic Man: a New Understanding of the Organization of Life and* (term: entropy, pgs. 30, 127, 202) (Phyllis Aronoff, 2000 Engl. Trans.). McGraw-Hill.
18. Levy, Pierre. (1997). *Collective Intelligence: Mankind's Emerging World in Cyberspace* (keyword: "human thermodynamics", pg. 52). New York: Basic Books.
19. Gladyshev, Georgi, P. (1997). *Thermodynamic Theory of the Evolution of Living Beings.* Nova Science Publishers.

20. Ullis, Karlis (1999). *Age Right: Turn Back the Clock with a Proven Antiaging Program*, (section: "Human Thermodynamics", pg. 34-36) New York: Simon & Schuster.
21. DeMarco, Tom and Lister, Timoth. (1999). *Peopleware: Productive Projects and Teams* (section: Corporate entropy, pg. 99). Dorset House Pub. Co.
22. O'Reilly, Sean. (2001). *How to Manage Your Dick: Destructive Impulses with Cyber-kinetics: Redirect Sexual Energy and Discover your More Spiritually Enlightened, Evolved Self* (ch. 7: Entropy and Your Dong, pgs. 47-56). Travelers' Tales.
23. Hokikian, Jack. (2002). *The Science of Disorder: Understanding the Complexity, Uncertainty, and Pollution in Our World*. Los Feliz Publishing.
24. Hammond, Dick K. (2005). *The Human System from Entropy to Ethics*. (part 3: The Entropy Ethic, pgs. 63-94). Publisher: Dick Hammond.
25. Nørretranders, Tor. (2006). *The Generous Man: How Helping Others is the Sexist Thing You Can Do*, (theory: "thermodynamic depth", pg. 180) (English translation). Da Capo Press.
26. Kenoun, Robert. (2006). *A Proposition to Theory of History and Social Evolution.* Trafford Publishing.
27. Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview). (Index: "human thermodynamics", pgs. x, 14, 74, 79, 107, 110, 204, 273, 315). Morrisville, NC: LuLu.
28. Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (Ch. 16: "Human Thermodynamics", pgs. 653-702). Morrisville, NC: LuLu.
29. Thims, Libb. (2008). *The Human Molecule*, (preview) (keyword: "human thermodynamics", pgs. 50-51, 89, 92, 94-100). Morrisville, NC: LuLu.
30. Ejike, Satch U. (2008). *Find a Good Man and Keep Him* (keyword: "human thermodynamics", pg. 30) (Google Books). AuthorHouse.
31. Eason, Dickey. (2009). *The Impacts Dynamics: Working Against Dispersal in Human Society and Across the Universe* (thermodynamics, 22+ pgs.). Impacts Publishing.
32. Fisher, Len. (2009). *The Perfect Swarm: the Science of Complexity in Everyday Life* (edge of chaos, pgs. 2-3; Maxwell-Boltzmann distribution of students, pg. 24). Basic Books.
33. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (pg. 2). AuthorHouse.

Cessation thermodynamics

See main: Cessation thermodynamics, What happens when you die?, Defunct theory of life

1. Stewart, Balfour and Tait, Peter G. (1875). *The Unseen Universe: or Physical Speculations on a Future State.* Macmillan.
2. Gonzalez-Wippler, Migene. (1997). *What Happens After Death: Scientific & Personal Evidence for Survival* (thermodynamics, pgs. 5-7, 10). Llewellyn Publishers.
3. Valarino, Evelyn E. (2001). *On the Other Side of Life: Exploring the Phenomenon of Near-death Experience* (keyword: Entropy, pgs. 9, 170, 177, 211-12; ch. 6: "Dialogue with Louis-Marie Vincent, PhD", pgs. 176-92; section: What about thermodynamic time?, pgs. 170-; section: Energy, pgs. 176-). Da Capo Press.

Psychodynamics

See main: Psychodynamics; Psychological thermodynamics, etc.

1. Freud, Sigmund. (1895). *A Project for Scientific Psychology*, in *The Origins of Psychoanalysis: Letters to Wilhelm Fliess, Drafts, and Notes: 1887-1902* (pgs. 345-445). Basic Books.
2. Freud, Sigmund. (1920). *Beyond the Pleasure Principle.* New York: W.W. Norton.
3. Freud, Sigmund. (1923). *The Ego and the Id.* New York: W.W. Norton.
4. Jung, Carl. (1946). *The Structure and Dynamics of the Psyche.* Vol. 8 of the Collected Works of C. G. Jung.
5. Hall, Calvin S. (1954). *A Primer in Freudian Psychology.* New York: Meridian Books.
6. Hall, Calvin S. and Nordby, Vernon J. (1973). *A Primer in Jungian Psychology.* New York: Meridian Books.
7. Horowitz, Mardi, J. (1988). *Introduction to Psychodynamics - a New Synthesis.* New York: Basic Books, Inc.

Business thermodynamics

See main: Business thermodynamics

1. DeMarco, Tom and Lister, Timothy. (1999). *Peopleware – Productive Projects and Teams, 2nd ed.* (Section: "Corporate Entropy", pg. 98). New York: Dorset House Publishing.
2. Callaway, Marguerite M. (2006). *The Energetics of Business.* Chicago: Lincoln Park Publications.

Economic thermodynamics

See main: Economic thermodynamics, Physio-Economics, etc.

1. Soddy, Frederick. (1926). *Wealth, Virtual Wealth and Debt: the Solution of the Economic Paradox.* London: George Allen & Unwin.
2. Georgescu-Roegen, Nicholas. (1971). *The Entropy Law and the Economic Process.* Cambridge, Massachusetts: Harvard University Press.
3. Mirowski, Philip. (1989). *More Heat than Light – Economics as Social Physics, Physics as Nature's Economics.* Cambridge: Cambridge University Press.
4. Sieniutycz, Stanislaw and Salamon, Peter. (1990). *Finite-Time Thermodynamics and Thermoeconomics.* New York: Taylor & Francis.
5. Burley, Peter and Foster, John. (1994). *Economics and Thermodynamics – New Perspectives on Economic Analysis.* Boston: Kluwer Academic Publishers.
6. Beaudreau, Bernard C. (1998). *Energy and Organization: Growth and Distribution Reexamined.* Greenwood Press.
7. Parker, Philip. (2000). *Physioeconomics - the Basis for Long-Run Economic Growth.* Cambridge, Massachusetts: The MIT Press.
8. Chalidze, Valery. (2000). *Entropy Demystified - Potential Order, Life and Money.* USA: Universal Publishers.
9. Rifkin, Jeremy. (2003). *Hydrogen Economy*: *the Creation of the Worldwide Energy Web and the Redistribution of Power on Earth* (Thermodynamics of Rome, pgs. 57-63). Penguin Group.
10. Chen, Jing. (2005). *The Physical Foundations of Economics - an Analytical Thermodynamic Theory,* London: World Scientific.
11. Beinhocker, Eric, D. (2006). *The Origin of Wealth – Evolution, Complexity, and the Radical Remaking of Economics.* (ch. 14: "A New Definition of Wealth – Fit Order" (topic: Economic Thermodynamics, pgs. 299-319)). Boston, Mass.: Harvard Businees School Press.
12. Pogany, Peter. (2006). *Rethinking the World* (ch. 5: Cultural and Cultural Evolution in the Context of Thermodynamics, pg. 103-38). iUniverse (and Shenandoah Valley Research Press).
13. Ksenzhek, Octavian S. (2007). *Money: Virtual Energy - Economy through the Prism of Thermodynamics,* Universal Publishers.

Social thermodynamics

See main: Sociological thermodynamics, Socio-thermodynamics, etc.

In addition to the following short list, Gladyshev, in his 1997 book *A Thermodynamic Theory on the Origin of Living Beings* has excerpts on "social thermodynamics", Muller and Weiss in their 2005 book *Energy and Entropy,* have a chapter on "socio-thermodynamics", and Muller has a small amount of material on socio-thermodynamics in his 2007 book *A History of Thermodynamics.*

1. Carey, Henry C. (1858).*The Principles of Social Science* (Vol I). J.B. Lippincott & Co.
2. Adams, Henry, and Brooks, Adams. (1910). "A Letter to American Teachers of History", Kessinger Publishing (reprint).
3. Sorokin, Pitirim. (1928). *Contemporary Sociological Theories* (thermodynamics, pgs. 25-27; human molecules, pg. 46-47). Harper & Brothers.

4. Odum, Howard W. and Jocher, Katharine C. (1929). *An Introduction to Social Research* (mechanistic theories, pgs. 108-109). H. Holt and Co.
5. Henderson, Lawrence J. (1935). *Pareto's General Sociology: a Physiologists Interpretation.* Harvard University Press.
6. Nisbet, Robert A. (1970). *The Social Bond - an Introduction to the Study of Society,* (ch. 10: "Social Entropy", pgs. 260-98). New York: Alfred A. Knoph.
7. Rosnay, Joel de. (1975). *The Macroscope - a New World Scientific System.* New York: Harper & Row Publishers.
8. Porteus, Elizabeth, D. (1987). *My Twentieth Century Philosophy.* New York: Carlton Press, Inc.
9. Bailey, Kenneth D. (1990). *Social Entropy Theory,* New York: State University of New York Press.
10. Bailey, Kenneth D. (1994). *Sociology and the New Systems Theory: Toward a Theoretical Synthesis*. SUNY Press.
11. Müller, Ingo and Weiss, Wolf. (2005). *Entropy and Energy - a Universal Competition* ("Socio-thermodynamics - Integration and Segregation in a Population", ch. 20).Germany: Springer.

Religious thermodynamics books

See main: Religious thermodynamics

1. O'Manique, John. (1969). *Energy in Evolution – Teilhard's Physics of the Future.* New York: Humanities Press.
2. Teilhard, Pierre de Chardin. (1962). *Human Energy.* New York: A Helen and Kurt Wolff Book.
3. Teilhard, Pierre de Chardin. (1976). *Activation of Energy.* New York: Harvest Books.
4. Peck, M. Scott. (1978). *The Road Less Traveled,* (pgs. 263-77: The Miracle of Evolution, The Alpha and the Omega, Entropy and Original Sin). New York: Simon & Schuster.
5. Williams, Emmett L. (1981). *Thermodynamics and the Development of Order.* Creation Research Society.
6. Rifkin, Jeremy. (1989). *Entropy - Into the Greenhouse World* (formerly published as *Entropy: a New World View*, 1981). New York: Bantam Books.
7. Wedekind, Gilbert L. (2003). *Spiritual Entropy: Life-Changing Insights Revealed by a Unique Natural law* (pgs. ix, xii, 148). Xulon Press.
8. Sanford, J.C. (2005). *Genetic Entropy and the Mystery of the Genome - the Genome is Degenerating.* Lima, New York: Ivan Press.
9. Alkek, David S. (2007). *The Self-Creating Universe: A Synthesis of Science, Philosophy, and Religion Creating a Theory of Universal Existence* (thermodynamics, pgs. 24, 81-88, 137-43). iUniverse. (ebook). LuLu.com.

Literature thermodynamics

See main: Literature thermodynamics

1. Zoline, Pamela. (1988). *The Heat Death of the Universe and Other Short Stories.* McPherson.
2. Ying, Leong. (2007). *Klystar* (thermodynamics, pgs. 129, etc., Universal Law of Thermodynamics, back matter; entropy, 11+pages). Tate Publishing & Enterprises.

Philosophical, new age, fringe

See main: Philosophical thermodynamics; Fringe thermodynamics

1. Young, Arthur. (1976). *The Reflexive Universe: Evolution of Consciousness* (thermodynamics, 4+ pgs). Delacorte Press.
2. Young, Louis B. (1986). *The Unfinished Universe* (thermodynamics, 5+ pgs). Simon and Schuster.
3. Kelly, Kevin. (1994). *Out of Control: the New Biology of Machines, Social Systems, and the Economic World* (extropy, pg. 106; entropy, pgs. 79, 405-06, 413, 452). Addison Wesley.

Animate thermodynamics

See main: Life thermodynamics; Animate thermodynamics

1. Thurston, Robert H. (1894). *The Animal as a Machine and Prime Motor: and the Laws of Energetics.* John Wiley & Sons.
2. Sidis, William J. (1920). *The Animate and the Inanimate*, 131-pgs, (published in 1925, R.G. Badger).
3. Johnstone, James. (1921). *The Mechanism of Life in Relation to Modern Physical Theory,* (pgs. 192-203). New York: Longmans, Green & Co.
4. Sherrington, Charles. (1940). *Man on His Nature* (pg. 78). CUP Archive.
5. Ubbelohde, Alfred René. (1955). *Man and Energy ... Illustrated,* (Section: XIII: Thermodynamics and Life, pg. 183-200, Section: XIV: Thermodynamic Laws and Cognition, pg. 201-09). London: Braziller.
6. Blumberg, Mark S. (2002). *Body Heat: Temperature and Life on Earth.* Harvard University Press.
7. Kurzynski, Michal. (2006). *The Thermodynamic Machinery of Life.* New York: Springer.

Ecological thermodynamics

See main: Ecological thermodynamics, Ecodynamics, Ecological economics, etc.

1. Odum, Howard, T. and Elisabeth, Odum, C. (1976). *Energy Basis for Man and Nature.* New York: McGraw-Hill Book Company.
2. Ulanowicz, Robert E. (1986). *Growth and Development - Ecosystems Phenomenology.* New York: toExcell Press.
3. Peet, John. (1992). *Energy and the Ecological Economics of Sustainability.* Washington D.C.: Island Press.
4. Goldsmith, Edward. (1998). *The Way: An Ecological World-View,* (pgs. 13-14) (Appendix One: Does the Entropy Law Apply to the Real World?, pgs 439-48). University of Georgia Press.
5. Giannantoni, Corrado. (2002). *The Maximum Em-Power Principle as the Basis for Thermodynamics of Quality.* Servizi Grafici Editoriali Publishers.
6. Jorgensen, Sven E. and Svirezhev, Yuri M. (2004). *Towards a Thermodynamic Theory for Ecological Systems.* New York: Elsevier.
7. Schneider, Eric D. and Sagan, Dorion. (2005). *Into the Cool - Energy Flow, Thermodynamics, and Life.* Chicago: The University of Chicago Press.

Miscellaneous: the following are a connected or related books

Dissipative structures

See main: Dissipative structure, Far-from-equilibrium, Bifurcations, Fluctuations, etc.

1. Prigogine, Ilya. (1980). *From Being to Becoming – Time and Complexity in the Physical Sciences.* San Francisco: W.H. Freeman and Co.
2. Prigogine, Ilya. (1984). *Order Out of Chaos – Man's New Dialogue with Nature.* New York: Bantam Books.
3. Gregoire, Nicolis and Prigogine, Illya. (1989). *Exploring Complexity - an Introduction.* New York: Freeman and Co.
4. Prigogine, Illya. (1996). *The End of Certainty - Time, Chaos, and the New Laws of Nature.* New York: The Free Press.
5. Capra, Fritjof. (1996). *The Web of Life - A New Scientific Understanding of Living Systems.* New York: Anchor books.

Information theory, cybernetics, chaos theory, emergence, etc.:

See main: Information, Information thermodynamics, Chaos

The following lists books that have made an attempt to blend thermodynamic theories together, in one way or another, with a similar or connected field of study, such as emergence, chaos theory, information theory, cybernetics, general systems theory, ect.:

1. Shannon, Claude E. and Weaver, Warren. (1949). *The Mathematical Theory of Communication.* Illinois: The University of Illinois Press.
2. Wiener, Norbert. (1950). *The Human Uses of Human Beings: Cybernetics and Society*. Boston: Houghton Mifflin Co.
3. Wiener, Norbert. (1961). *Cybernetics - or Control and Communication in the Animal and the Machine* (2nd ed.). Cambridge, Massachusetts: The MIT Press.
4. Brillouin, Leon. (1962). *Science and Information Theory* (2nd ed.). New York: Dover (reprint).
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6. Gatlin, Lila L. (1972). *Information Theory and the Living System*. Columbia University Press.
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Miscellaneous

1. Morowitz, Harold J. (1992). *The Thermodynamics of Pizza.* Rutgers University Press.

Juvenile thermodynamics

1. Moran, Jeffrey B. (2001). *How Do We Know the Laws of Thermodynamics* (ages 9-12). The Rosen Publishing Group.
2. McCarthy, Rose. (2005). *The Laws of Thermodynamics: Understanding Heat and Energy Transfers.* The Rosen Publishing Group.

See also

â— Thims' list of thermodynamics books to buy (work in progress)
â— Thims' mate selection book collection (140+)

References

1. (a) By comparison, for example, Italian nuclear engineer, mechanical engineer, and thermodynamicist Gian Beretta (BS nuclear engineering, MS mechanical engineering, PhD mechanical engineering), who runs QuantumThermodynamics.org, started in 2006, has about 50-60 thermodynamics books. [Source: email communications between Thims and Paolo-Beretta in Oct-Nov of 2006.]
(b) American chemical engineer and nuclear engineer (BS chemical engineering, MS chemical engineering, ME chemical engineering, ME nuclear engineering, PhD chemical engineering) James Lawler, who runs the NexialInstitute.com, has a collection of over 4,000+ books.
(c) Source: email communications between Thims and Lawler in May of 2006.
(d) In 2001, Harvard nanomechanical engineer Shigan Suo stated that he had amassed about 40 thermodynamics books, and in 2011, after building his collection further, ventured into teaching is first thermodynamics course.
2. Note: if you know of other good related human thermodynamics books, please leave Thims a note in either the "books to buy" (page) or thread section below.
3. Commenter (geological thermodynamicist) completed their MS and PhD theses on new theorems in equilibrium

thermodynamics and applied these to igneous and metamorphic petrology.

Further reading

â— Anon. (2008). "30 Author's and Their Groundbreaking Chemical Engineering Books", CEP, Aug.

External links

â— Thermodynamics (book list) – EricWeisstein.com.

θΔics

In atheism types, **Thimsian atheism**, as can be contrasted with Epicurean atheism, the brand of atheism of American electrochemical engineer Libb Thims (DN:10), an extreme deanthropomorphized progressive Goethean "physico-chemical atheism", generally comprised of the following six main component atheism types (see: atheism types by denial and belief):

1. Goetheanism

   → **Physicochemical atheism**

2. Holbachian atheism
3. Schopenhauerian atheism
4. Buchnerian atheism
5. Ostwaldian atheism
6. Nietzschean atheism

American thinker Libb Thims' 2015 About.me profile, wherein he self-labels as an "electrochemical atheist", captioned with the mention that in 2014 he began to engage in "extreme atheism" of the Feuerbach, Buchner, Nietzsche variety; the image shown being a screenshot of Thims' 2013 NIU lecture to engineering students on Goethe and human chemical thermodynamics, doing the ball-and-ring experiment, to explain social volume expansion and contraction, in front of a lecture slide showing French philosopher Jean Sales, the person who introduced the human molecular hypothesis, and who in 1770 exchanged views with Voltaire on Baron d'Holbach's *System of Nature*, aka the "Atheist's bible"; Thims' 2002 human molecular formula work, also shown on the lecture screen, was cited in 2013 as a god disproof. [1]

The roots of which are diagrammatically shown on the atheism genealogy page; which can generally be characterized as modern stage of the prophesized (Woodhull, 1871) Goethean revolution, one that overturns "everything holy" (Heine, 1810), namely the 5,100-year decrepit and deteriorating mythologically-based Anunian theology belief system, which currently dominates the thinking and belief state of 80 percent of the modern world, via Abraham and Brahma rooted faiths, i.e. Ra born out of the Nun following the primordial flood ideology (i.e. annual Nile River flood), as epitomized by the fact that 56 percent of American's currently believe that Adam and Eve were real people. (Ñº)

Beg goad | Explicit atheism

In 2014, the exchange that moved Thims from theism-avoiding implicit atheism to theism-engaging explicit atheism can be found in thread posts 3-4 in the "Beg-Thims dialogue" (Ñº) thread, below article exact science, wherein, on Aug 14th, Thims asks Mirza Beg, whom he had been engaged with via 162 threads, in the previous two months, the following:

> "Re: "religion and science growing together", while on this premise of yours, i.e. that religion and science are merging, what branch of science explains the operation of the flying horse (buraq) (Ñº) that Muhammad used to fly from Mecca to Jerusalem and back in one night?
>
> Also, do you believe, as a grown adult, in the existence of flying horses? I've taken a course in aerospace engineering, and I don't recall hearing about the operation of the burag? I don't mean to ridicule you here, but as you say, each sura of the Quran is accurate, being that it has been copied by scribes, verbatim, from the mind of Allah, to the ears of Muhammad, to the modern reader; hence, Sura 17, aka "The Night Journey", should be a true story in your mind, if I am not mistaken. Hence, I just want to clarify if it is just winged horses you believe in, or also other mythological horses, e.g. unicorns?
>
> To give you some comparison, Johannes Kepler, in the 17th century, believed in the existence of planets ridden by "winged angels" causing them to move. Hence, you might, likewise, presently believe in "winged horses"? This, by no means, to note, is an issue embedded in Germany (Kepler) or Pakistan (Beg), but also here in America; read, for example, the transcript (pdf) of Meeting 17: Session 6 of the 10 Jun 2014 Presidential Commission for the Study of Bioethical Issues, Atlanta, Ga, guest speaker Joshua Greene, and you will see a discussion of "whether there's angels in the universe" (pg. 17)."

Beg, on Aug 15th, responded to this as follows:

A Jan 2018 screenshot of Hmolpedian elenovski (Ñº), who characterizes his or her first ideology as "**Thimsian atheist**", along with Dawkins number of 10, anarcho-communism, nihilism, and Yugoslav.

> "Re: 'What branch of science explains buraq?', Quran and Hadeth (record of Prophet's sayings and actions) have made known to believers and non-believers that the Prophet was taken from Mecca to Jerusalem and to heaven with a buraq and Angel Gabriel to guide him in the tour to heaven and hell and tell him to perform the prayer and he prayed with all prophets and he came back to his bed in one night.
>
> This is revealed in the Glorious Quran as follows: {Al-Israa, Glory be to Him Who made His servant to go on a night from the Sacred Mosque to the remote mosque of which We have blessed the precincts, so that We may show to him some of Our signs; surely He is the One who Hears, and Sees (1). And We gave Musa the Book and made it a guidance to the children of Israel, saying: Do not take a protector besides Me (2). The two verses imply that the Prophet was taken along as per the will of Allah to show the Prophet the ultimate for himself. I know it is hard for a highly intelligent person to believe in the existence of Buraq, which is described by Sahih Bukhari Volume 5, Book 58, # 227 hadith: "I was brought by Buraq, which is an animal white and long, larger than a donkey but smaller than a mule, who would place its hoof at a distance equal to the range of vision." (Implying speed of light)! There is no branch of science that may explain the operation of the flying horse (buraq) that Prophet Mohammad used for the Night Journey. However, this is one of those miracles which believers must have faith in. Doubts were cast at the outset but the Journey was authenticated by one his closest Associates saying that it must be true if the Prophet is saying so because He has never lied before. Same is my argument; call it blind faith but as argued earlier, belief in FAITH rules supreme. Research is ongoing on Myths, Legends and Miracles which upholds them and also rejects them. This leaves me no option but to cling to my theoretical explanation."

This, in the year to follow, after absorbing this statement, tipped Thims into the "out-and-open public extreme explicit atheism" category, with direct engagement into the public engagement into the mentally-taxing "descent into absurdities and idiocy vacuum" (see: creationist scientists ranked by idiocy).

Type | Descriptors

Among atheists, according to enlightenment era atheists historian David Berman (2007), there are various types, that are well-classified by declaration, namely: avowed published atheism (e.g. Baron d'Holbach), clandestine atheism (e.g. Jean Meslier), covert atheism (e.g. add), putative atheism (e.g. Helvetius, Augustin Roux, Erasmus Darwin, and Jeremy Bentham), covert implied atheism (e.g. Anthony Collins, John Toland, and Albert Radicatti); among these, according to Berman, Holbach is unique in that he publicly denied both god and afterlife:

> Holbachian atheism = avowed atheism (deny god) + mortalism (deny afterlife)

Thims is a grade above d'Holbach in that he denies not only god and afterlife but also life:

> Thimsian atheism = avowed atheism (deny god) + mortalism (deny afterlife) + abioism (deny life)

Thims, in this regard, is the first professed “abioist” atheist (defunct theory of life, 2009); such as exemplified by the following online-published personal note:

> “Not only do I not believe in the principle of the afterlife, but also do not believe in the principle of life.”
>
> — Libb Thims (2012), personal note; written in black pen on printing paper, Sep 24

Technically, to note, Alfred Rogers, and his 2010 life does not exist publications, can also be classified as professed “abioist atheist” as well; others, following Thims, might likewise be classified as abioist atheists (e.g. Jeff Tuhtan, David Bossens, Patrick Fergus, and possibly a few others). The most extreme versions of extreme atheism, in direction, is one who denies not only god, afterlife, and life, but also soul and spirit:

> Hardcore extreme atheism = avowed atheism + mortalism + abioism + aspiritism + asoulism

Denial of the spirit seems to be a mute issue, although there are many modern day "spiritual atheists", being that the materialists, those who believe the universe is but matter and motion, seem to have long ago denied denied the existence of spirit; e.g. the last true pioneer in this area was Pierre Teilhard (1936), after which venture into this realm of "spirit matter" was nullified as waste.

To outright deny the existence of the soul, in regards to its fundamental principle, however, is more complicated (see: Heisenberg-Pauli dialogue, Goethe on the soul, Edison on the soul, and Einstein on the soul). One can, e.g., simply deny the existence of the soul, on the basis that one never finds one in the corpses one dissects (e.g. pineal gland of the Cartesian soul; the heart of the Egyptian soul, etc.), such as was done by Francois Broussais; but to deny the existence of right and wrong, i.e. objective morality, as compared moral relativism (or subjective morality), i.e. to deny the existence of “justice” in a fermionic-bosonic universe is more complicated.

The following are a work-in-progress listing of statements of type of atheism of Libb Thims, by Thims, or others, in respect to type or label:

	Thimsian atheism | Descriptors	Via	Year	Ref
0.	Age 5: atheism inquisitor | problem broached			
1.	Aware of the problem (god problem); but kept in the back of the mind.		1970s	
2.	Outward self-labeled, seemingly, as culturally-inoffensive "secular", if probed.		1990s	
3.	100% atheist; after discovering Gary Greenberg, following 50-70 book reading research on the so-called "religious origins" problem.		c.2003	
4.	Implicit atheism [indirectly stated (e.g. the Journal of Human Thermodynamics was launched (2005), from the get-go, with rule (c) banning god theory (unless historical, religio-mythology, deconstruction, etc.); thermodynamics is atheist by definition] In 2008 to 2007, while penning *Human Chemistry*, went to great lengths to **AVOID using the term "god" or any related "god theory" terms**, e.g. soul, spirit, etc, throughout the entire book, except until the last chapter, in the section on cessation thermodynamics, wherein the highest-ranked (by vote) present-day greatest philosophical conundrum, i.e. "What Happens When You Die?", as shown below, was broached via thermodynamics:	Thims	2005	(Ñº)
5.			2007	

the three most wanting philosophical puzzles have to do with the subjects of death, love, and life. Specifically, when random people are polled with the question:

> “What is humankind’s present-day greatest philosophical conundrum?”

the following top-three responses will result:[177]

What Happens When You Die? (27%)
What is Love? (23%)
What is the Meaning of Life? (19%)

6.	143% atheist; conversationally-forward atheism; e.g. “I’m level 10 on the Dawkins scale; don’t like the word ‘atheist’, like ‘scientist’ better.”	Thims	2009 Sep 7	[9]
7.	Avoidance atheist; e.g. while giving college human thermodynamics bioengineering lectures, e.g. on how Goethean chemical thermodynamics determines relationship reactions, morality, etc.; side-stepped and avoided the **"elephant in the room" problem**; the repercussions of which became apparent in student feedback letters (i.e. deeper topics weren't brought up openly in lecture, via hand raising; possibly owing to the cultural taboo-ness of the subject transgression).		2010	
8.	Became a blogged about "public atheist"; e.g. Thims is “a [life-denier] whose science is laced with extreme atheism and materialism.”	Sekhar	2011	[4]
9.	Printed-in-book atheist by definition; e.g. “a strong atheist who adheres to a physics-based [Goethean] morality.”	Bossens	2013	[5]
10.	On 13 May 2014, **Thims discovered** the physiochemical sociology work of **Mirza Beg**; in late May, Thims obtained a copy of of Beg’s 1987 *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*. [1] On 23 Jun 2014, Begs and Thims began communicating, via Hmolpedia messaging, and in some 189+ public thread dialogue interactions, over the course of two months, until 12 Sep 2014, during the course of which.		20	
11.	On 15 Aug 2014, Beg publicly admitted that he believed in the existence of the "buraq" (Ñº), i.e. the flying horse that Muhammad rode during his "night journey", wherein he visited, in heaven: Moses, Abraham, John the Baptist, and Jesus, and other prophets of the Judeo-Christian-Islamic religion.			

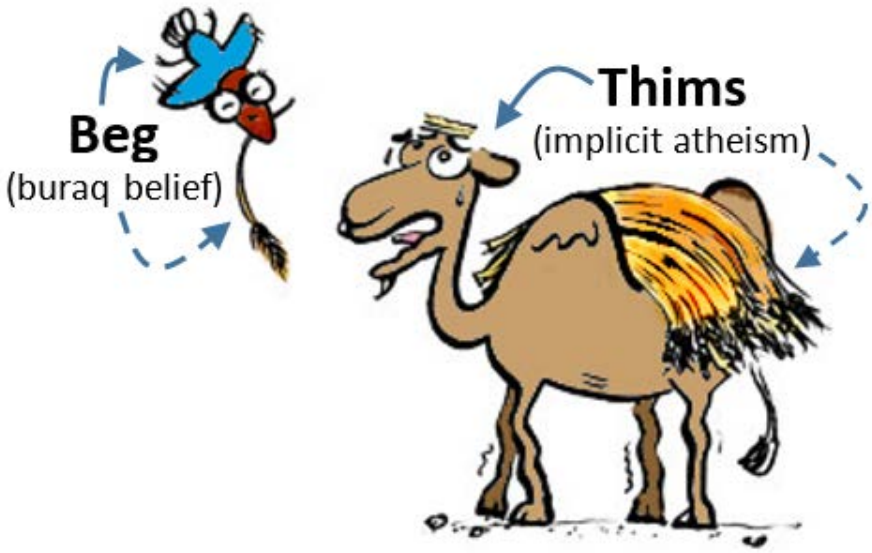

This was the proverbial **"straw" that broke the camel's back**, therein working to turn Thims from an "implicit atheist" (camel straining to present human chemical

thermodynamics WITHOUT god talk) to an "explicit atheist" (unburdened camel presenting human chemical thermodynamics WITH god talk, albeit completely dismantled via the methods of: extreme atheism, greatest atheism scholarship, religio-mythology scholarship, and god terminology upgrade).

12. In 17 Jun 2014, in the 44-page draft version of *Chemical Thermodynamics: With Applications in the Humanities*, this **"god avoiding" route** (carpet sweeping method) was still testingly being employed, via the method of subsuming the problem into the 3-page "Religion | Belief conflicts" section, of the preface, via citation to Pierre Laplace (1802), Wilhelm Ostwald (1909), and Paul Dirac (1933), and how god had been dismissed from celestial mechanics, physical chemistry, particle physics and sociology, respectively. 2014 Jun 17

13. On 9 Sep 2014, Thims started the "atheism timeline" page in Hmolpedia.

On 11 Sep 2014, Thims started the Atheism Reviews YouTube channel and the page in Hmolpedia on Atheism Reviews. On 15 Sep 2014, Thims made an "Atheism Reviews" promo video (Ñº).

Over the next two months, Thims began ordering atheism books, via book orders from Amazon (see: Thims religio-mythology and atheism book collection).

On 5 Nov 2014, Thims, together with Patrick Fergus, made their first PUBLIC "History of Atheism" (Ñº) intro video (see: photos_, entering into the full-on PUBLIC ATHEISM engaging domain.

14. Self-characterized (on video): "extreme atheist" (aka "extreme realism" believer); and referred to by others, e.g. Patrick Fergus, as "extreme". Thims 2014 [8]

Defended the use, as on explicit atheist, of capital "G" in God (singular) and lower case "g" in "gods" (plural), in video:

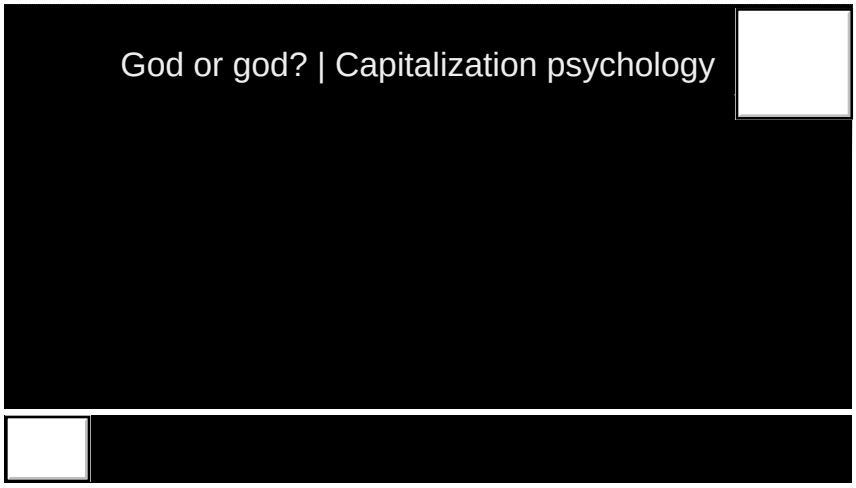

2014 Dec 23

This was then the standard usage in Hmolpedia articles; in the year to follow, Thims saw the error in his ways, and thereafter began to lower case all "god" and "gods" usages, but to continue to capitalize named gods, such as Zeus, or Osiris.

2015

15.	Water-test (online) atheism type label: “electrochemical atheist”	Thims	Jun 30	[7]
16.	Water-test (online) atheism type label: “extreme physiochemical materialism atheist”	Thims	2015 Jul 3	(Ñº)
17.	Explicit atheism: have "atheism type" explicitly defined, per denial (six main), belief (six main), and by top 28 historical atheism brands composition (see: atheism types by denial and belief).		2015 Jul 7	
18.	On 10 Aug 2015, taught "Zerotheism for Kids" class, a stylized Sunday school for atheists.		2015 Aug	
19.	Attempted to draft "atheist's bible" for kids, aka a Children's Atheist Bible, resulting in a draft *Smart Atheism: for Kids* (see: smart atheism).		2016	

(add discussion)

Overview

At age five, Thims rejected the existence of god, when told logic that some day a person will "die", and that when that happens, if the person is "good", they will go to "live" with "god", to which Thims queried his interlocutor with the response question "where does god live?", to which Thims was given an answer that was unpalatable to the mind.

An image shown to kids during the 2015 *Zerotheism for Kids* class, as an example of nonsense that modern kids are taught.

In early youth, the first time Thims road on a plane, he looked out of the window into the clouds, similar to the above photo, to confirm or disprove the previously told to him story that people who die go to live in the clouds. This, to note, is similar to Russian cosmonaut Gherman Titov, who in 1961, then aged 26, upon his return from space, then being the second Soviet astronaut to orbit the earth, let it be known that "he hadn't seen god". [10]

In 2003, Thims, in his draft manuscript *Human Thermodynamics*, deconstructed all of modern religion back to its pure Nile River mythology (80% world belief) and Yellow River mythology (10% world belief) origins (via transcription and syncretism).

In 2005, Thims launched the *Journal of Human Thermodynamics*, in which it was conditionally-stipulated that two submissions NOT acceptable were: (a) religious argument and (b) information theory arguments; later (c.2013) added (c) "life theory" arguments as not acceptable.

In 2007, Thims published his two-volume *Human Chemistry*, presented in such a way that it was “atheism implicit”, i.e. it was assumed implicitly that chemistry (or thermodynamics), a god-free subject, applied to the explication of the humanities, is, without fanfare, a concordantly god-free subject; so-called “god talk”, i.e. god (Ñº), soul (Ñº), spirit (Ñº), was relegated to a tentative end section on “Cessation Thermodynamics”; in 2009, amid the Moriarty-Thims debate, self-classified himself as a “10” on the original 7-point Dawkins scale; during 2010 lectures, to bioengineering students, began to see (see: student responses (Ñº)) how “implicit atheism” may not be a fully-effective approach, i.e. one that is, in effect, a bush-beater or rug-sweeping approach (e.g. see: chemistry professor paradox); soon thereafter, began to be labeled an atheist, of the "strong" or "extreme" variety—particularly for his avocation of the view that life does not exist, that it is a defunct scientific theory, a carryover from our religio-mythology heritage.

In 2011, he drafted *Purpose? (in a Godless Universe)*, with non-mythological dating system; albeit an effort

that stalled out (c.2013) at the 105-page level. [2]

In 2013, Thims' human molecular formula work was cited, with the shown "The Creation of Adam" (Michelangelo, 1512) image (above right), in the *Triple≡Bond Chemistry* (triplenlace.com) article "Chemical Formula of a Human"; alluding to the religion-overthrowing implication of human molecular theory: [4]

1802	1909	1933
"I have no need of the *hypothesis of god* in my celestial mechanics."	"Research workers were, at one time, obliged to endeavor to ensure that their theories did not contradict those of the church; nowadays, in contrast the church is at pains to prove that its teachings are compatible with those of science. In other words, the church acknowledges science as the higher authority."	"Any further assumption implied by belief in a *god* which one may have in one's faith is inadmissible from the point of view of modern science, and should not be needed in a well-organized society."
— Pierre Laplace , comment to Napoleon Bonaparte	— Wilhelm Ostwald, "On Catalysis", Nobel Lecture	— Paul Dirac, hand-written note, in reaction to Einstein's mentions of god and dice[20]

The three "god hypothesis" is obsolete and therefore unneeded quotes in Thims' 2013 draft *Chemical Thermodynamics: with Application in the Humanities*, the "Religious Tension" intro section. [3]

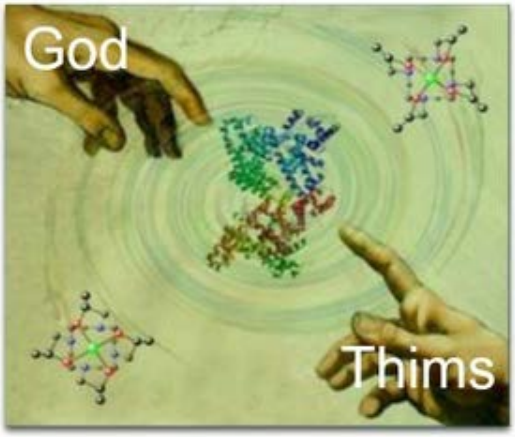

In 2013, Thims draft-initiated *Chemical Thermodynamics: with Applications in the Humanities*, became bottlenecked, in the intro, in attempting to address the "religious issue" (i.e. belief conflict issue), in less than a three-pages; opening to quotes of Pierre Laplace (1802), Wilhelm Ostwald (1909), and Paul Dirac (1933), shown adjacent. [3] This work seems to have halted; seemingly owing to the implicit "God vs Gibbs" imbedded "religious conflict", as seen in the Rossini debate; Frederick Rossini's 1971 "Chemical Thermodynamics in the Real World" being of the "implicit atheism" variety.

Atheism Reviews | Extreme atheism

In 2014, Thims launched the Atheism Reviews channel, in the wake of the Beg-Thims dialogue, wherein Mirza Beg admitted that he believed in flying horses, i.e. the winged buraq (Ñº) that Muhammad rode during his superluminal night journey to visit Allah, as described in the 17th surah of the Quran, shown adjacent, in aims to digress on mythology-debunking pro-science extreme "explicit atheism", of the Meslier-Mettrie-Holbach "extreme atheism" mindset and the Goethe-Schopenhauer-Nietzsche "god assassination" technique approach.

Mirza Beg's admittance that he believes in Muhammad's flying horse and simultaneously that Gibbs energy differentials govern human spontaneities, caused Thims to switch from implicit atheism to explicit atheism.

On 19 Nov 2014, Thims derived the following word scramble memory mnemonic to quickly conceptualize "extreme atheism", namely the main backbone belief tenants of real world Rossini hypothesis human chemical chemicals: (Ñº)

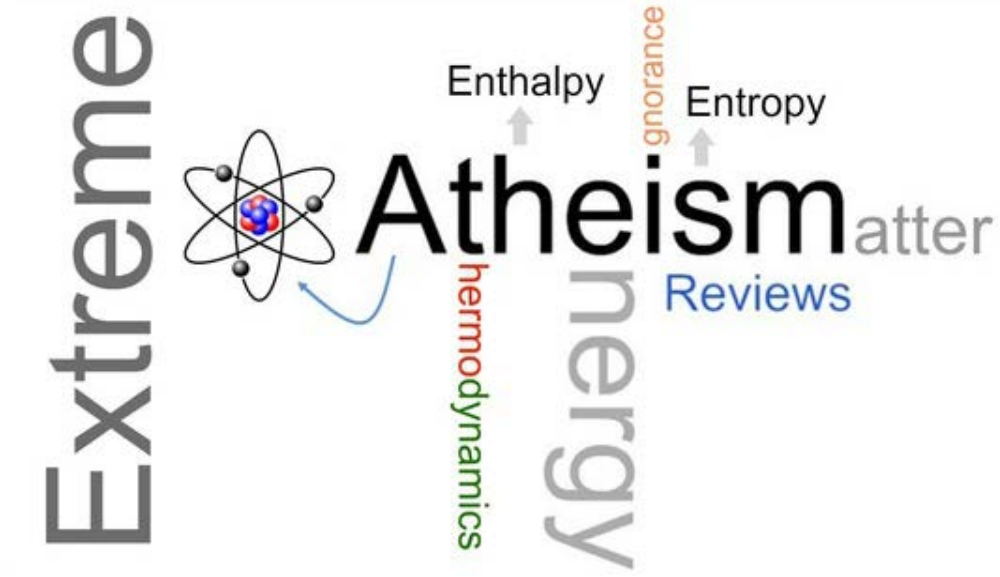

Thims then made this verbally-stated Thimsian atheism mnemonic into the above diagram, shown above, which he has since used as screenshot opening to the majority of Atheism Reviews videos. This mnemonic was described in more detail in the 27 Dec 2014 video (Ñº) “Extreme Atheism | Meaning”.

Genealogy

The following, from the atheism genealogy page, shows the roots of the type of atheism of Thims:

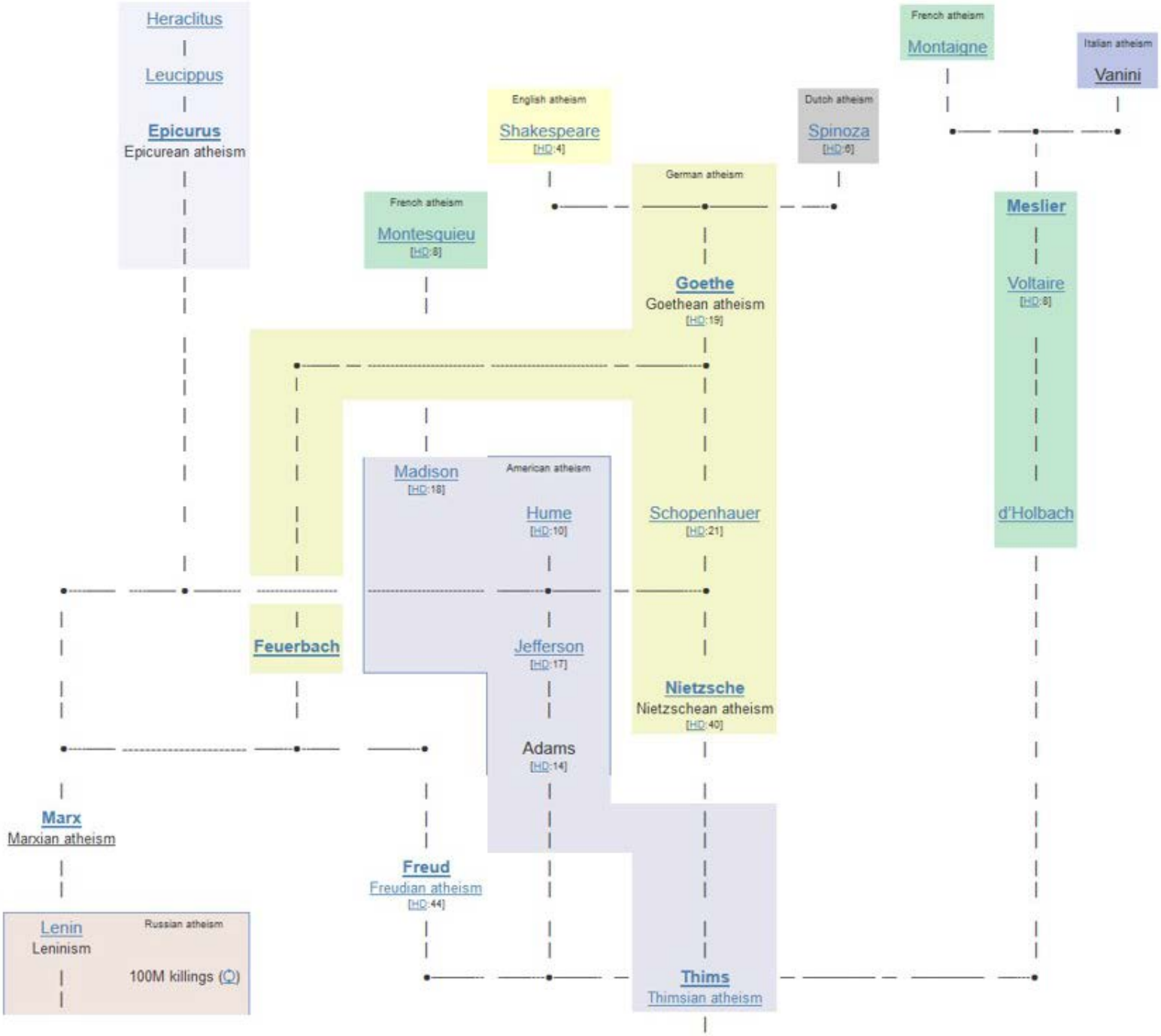

Implicit → Explicit | Switch

The switch from "implicit atheism" to "explicit atheism" can be found in the growth of the work of Thims, who in his 2007 two-volume *Human Chemistry* textbook completely avoided the use of the word "god" and god-related terms, e.g. soul, spirit, etc., except for the last 7-page volume two end section on cessation thermodynamics, a short introduction to what, historically, thermodynamics, and human thermodynamicists have had to saw about the laws of thermodynamics and question of the essence of being or state of mind of a person at the point of dereaction (death), wherein the subject matter invariably treads into domain traditionally reserved for religion. [2]

In 2010, Thims, while adhering to an "implicit atheism" style of presentation, using the standard 19th century established Laplace-Wislicenus "assumed atheism" modus operandi, such as depicted (above, right), Thims gave his first public lecture on human thermodynamics, to the University of Illinois, Chicago bioengineering students, of Ali Mansoori. What was discovered, however, was that without "explicitly" and openly digressing on the fact that thermodynamics is, by definition, based on godless and religion-free principles, students kept their objections and points of concern to themselves. This was evidenced when Mansoori instructed students as part of their homework to write short commentaries on Thims' presentation, scans of which are listed here (Ñº); one of which is shown below:

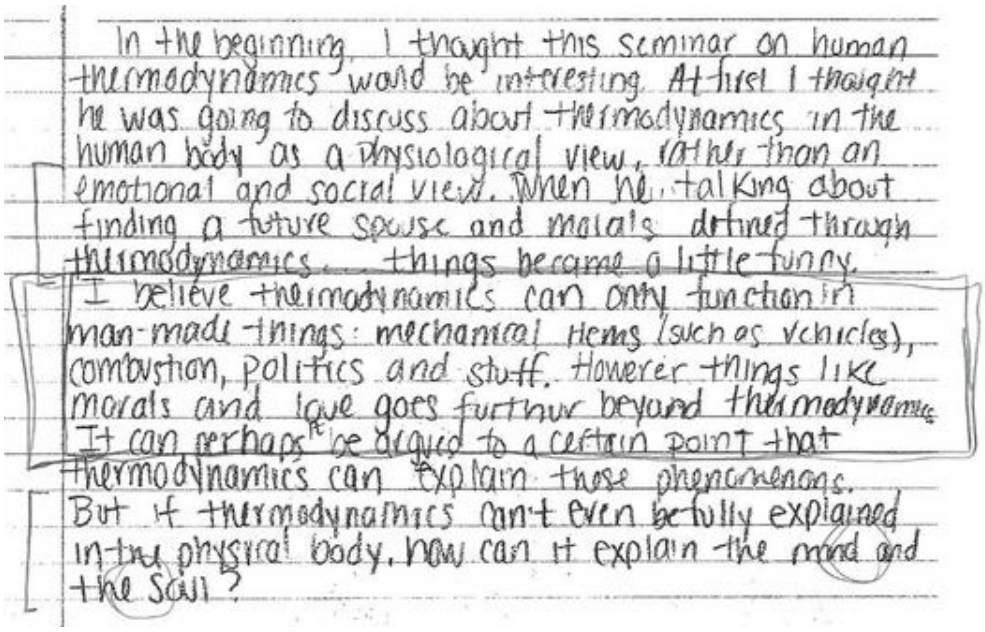

In the beginning, I thought this seminar on human thermodynamics would be interesting. At first I thought he was going to discuss about thermodynamics in the human body as a physiological view, rather than an emotional and social view. When he talking about finding a future spouse and morals defined through thermodynamics... things became a little funny.
I believe thermodynamics can only function in man-made things: mechanical items (such as vehicles), combustion, politics and stuff. However things like morals and love goes furthur beyond thermodynamics. It can perhaps be argued to a certain point that thermodynamics can explain those phenomenons. But if thermodynamics can't even be fully explained in the physical body, how can it explain the mind and the soul?

Here, we see that without being explicit and open about that fact that thermodynamics, physics, and chemistry are god-free subjects, an unaddressed tension remains. This was one of the turning points that worked to move Thims, in circa 2014, into becoming an explicit atheist; see, e.g., the tabulated listing of "atheism types (by denial)" wherein each denial (disbelief) and belief (creed) of each type of atheism, with respect to each type of scientist, is "explicitly" stated.

Freudian atheism | Comparison

Thimsian atheism, compared to Freudian atheism, i.e. the brand of atheism of Sigmund Freud, are similar on two accounts. Firstly, Freud, in his 1895 "Project for Scientific Psychology" sought out to build his entire formulation of psychology in terms of free energy and bound energy applied to chemicals "in" the mind, via citation to Hermann Helmholtz. Thims, in this respect, beginning in 1995, set out to build his entire reformulation of the humanities in terms of free energy and bound energy, albeit conceptualized such that people are chemicals—as Goethe saw things—and the free energies and bound energies are applied "between" minds.

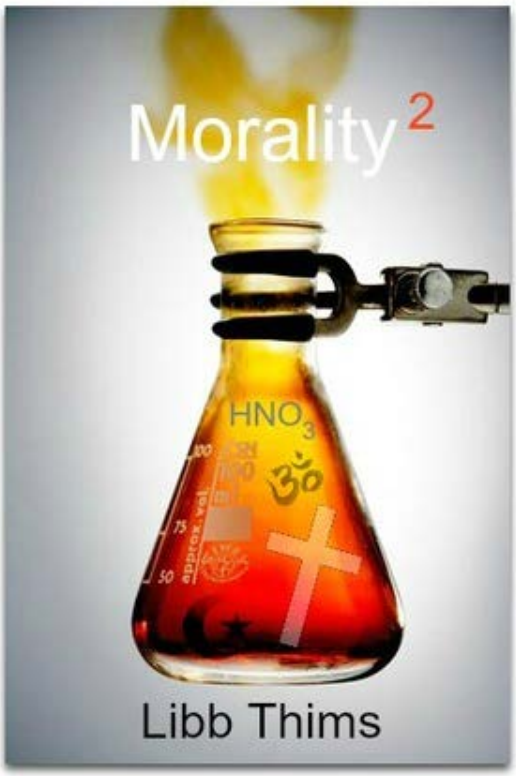

Secondly, Freud, his 1939 *Moses and Monotheism*, sought to determine the religio-mythology roots of Moses, the conclusion of which being that he connected the character of Moses to the Egyptian monotheistic pharaoh Akhenaten. Thims, beginning in circa 2003, engaged in the same project, albeit connecting all of the main characters of the Abrahamic faiths and Brahmaic faiths further back, past Akhenaten, all the way to formation of the first dynasty (see: religio-mythology transcription and syncretism).

God | capitalization

In 2015, circa Jun-Jul, Thims began notably to begin de-capitalizing the term "God" wherever used or found into the lowercase "god", a seeming repercussion to the 23 Dec 2014 video "God or god? | Capitalization psychology" (Ñº); itself a follow up to the accusation of a YouTube user (i.e. "503WorkShop", who changed his channel name to "myName" (Ñº), as a result of the fiasco), that Thims wasn't a real atheist (or still believed in god, in some way) because he was capitalizing "God" and "Allah", in discussion, and using lowercase for the plural "gods", or something along these lines. In some way the accusation ruminated in the mind, as an ongoing irritation; in circa Jun (or May), Thims seems to have begun water-testing lowercase capitalization grammar standard methodology.

On 9 Sep 2015, while processing the following newly-found (Ñº) God-capitalized quote into Hmolpedia:

A Jun 2015 draft-cover (Ñº) for tentative 80-120 page booklet entitled *Morality Squared: on the Goethean-Feuerbach Prophesy and the Nietzschean Void*, an elaboration on Ludwig Feuerbach's famous 1850 nitric acid [HNO3] quote + Goethe's 1809 sulphuric acid [H2SO4] based "moral symbols" explaining P1:C4 and Ten Commandments overthrowing P2:C18 end chapter (see: Goethean revolution).

> "I do not feel obliged to believe that same **God** who endowed us with sense, reason, and intellect had intended for us to forgo their use."
>
> — Galileo Galilei (c.1630) (Ñº)

Into the form, into the becoming to be new-standard form for Hmolpedia articles:

> "I do not feel obliged to believe that same **god** who endowed us with sense, reason, and intellect had intended for us to forgo their use."
>
> — Galileo Galilei (c.1630) (Ñº)

The reasoning arrived that similar to not capitalizing "caloric" or "phlogiston", these being once-proposed or "hypothesized" or theorized to exist entities, such as found in phlogiston theory or caloric theory, respectively, then so too should the same punctuation methodology apply in regards to "god theory" and or the "hypothesis of god" (or god hypothesis), i.e. the term "god", similar to caloric, is but a hypothetically-proposed entity or theoretical construct, debarred and or disabused from science in the 19th century, in each of the following fields, respectively: physics in 1802 (via Laplace | France), in physiology in 1842 (via the Reymond-Brucke oath | Germany), in chemistry in 1885 (via Wislicenus), and in psychology in 1895 (via Freud | Vienna).

Quotes | On

The following are related quotes:

> "Arrogants like Eddington, despite his achievements, are the cause as to why people like Libb Thims fall from one position to another lower position. First Libb argued that life is a defunct theory to justify the application of classical version of the second law of thermodynamics to living systems, ignoring statistical thermodynamics. Then to justify 'life is a defunct theory' he argues that his actions and behavior or not 'self-controlled' or 'self-driven' [see: self-motion] but are governed by external electromagnetic forces. Arrogance leads to ignorance and scientific blindness as we noted from the example of Eddington and Nobel laureate Chandra Sekhar. Libb Thims' science is laced with **extreme atheism** and materialism and hence his precarious position. Science needs to be kept at equal distance and away from both atheism and theism. I can't stop but laugh at myself when I think that I am not alive or I am not moving myself."
>
> — DMR Sekhar (2011), "Eddington's Psycho-Syndrome"

> "Libb Thims is a **strong atheist**, adheres to a physics-based morality, and considers himself a Goethean revolutionist."
>
> — David Bossens (2013), *Debates of the Hmolpedians* [5]

> "Libb Thims [penned] his human chemistry, and he's also a hella fkn **epic atheist**."
>
> — Anon (2015), Science & Math thread, Warosu.org. May 2.

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7. Libb Thims – (Started: 8 Jun 2015) About.me.
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θΔics

In libraries, **Thims' mate selection book collection** is a growing collection of 140+ books the topic of mate selection, such as desire, love, sex, relationships, marriage, divorce, beauty, facial attractiveness, human bonding, body signals, animal mating behaviors, among others.

History

Thims began collecting these types of books, as a sort of curiosity-hobby, beginning in about 1994 upon reading the newly published *The Evolution of Desire: Strategies of Human Mating* by American evolutionary psychologist David Buss. Over the years, stimulated in a sense by Buss' excellent book, Thims has read over one-hundred books in this area, surpassing the Buffett number in knowledge. The list is shown below (a work in progress).

Newly added

The following have been recently added (04/12/10):

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General

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See main: Evolutionary psychology

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Birth Order

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θΔics

In libraries, **Thims' personal library** refers to the total set of books read, owned, and or collected by American electrochemical engineer Libb Thims from circa 1990, the year he set out on a path of autodidactic self-education, to present.

A 30 Sep 2015 photo (Q) of **Thims' personal library**, of Libb Thims, at the circa 1,300 book level, packed (following relocation move) into 39 banana boxes and 6 egg boxes, shown next to one (of ten) of Thims' famously sought-after "snake book shelves" , a free-standing mobile book shelf, which works to hold active books (note: version shown is a shorter version of the original model, cut down by one row (about 14-inches) so to fit into the lower ceiling height of new library location.

Overview

Thims' library is comprised predominately of the following composition blocks:

- Thims' thermodynamic book collection | 400+ books
- Thims' mate selection book collection | 140+ books
- Thims religio-mythology and atheism book collection | 120+ books

History

In circa 1990, Thims owned zero books.

The following is a circa 2005 photo of a portion of Thims' library:

The following is a circa 2007 picture of the core thermodynamics portion of Thims library:

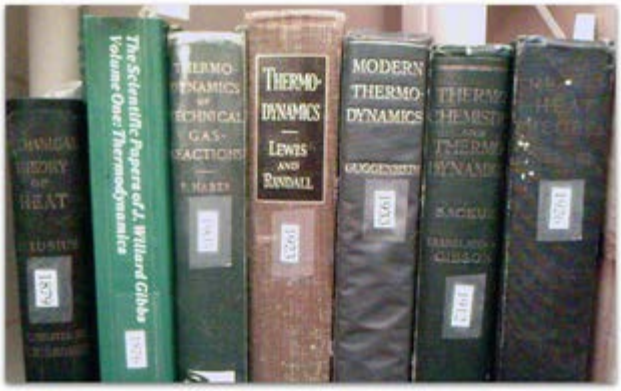

The following is a circa Sep 2014 photo of the religio-mythology and atheism portion of the library, taken prior to launch of Atheism Reviews channel:

The following is a 11 Dec 2014 screenshot of a portion of Thims library taking during part 5 of 5 of the Top 25 Smartest Person Existive (2015) countdown:

The following is a c.2015 photo of some of the books from Thims' genius studies section of his library:

The following is a 10 Aug 2015 photo of a portion of Thims library taken during the filming of the Zerotheism for Kids class; the toddler is grabbing at the Goethe portion of Thims library, to the left of which is the sociological thermodynamics portion:

The following is a c.2016 photo of some of Thims' books read:

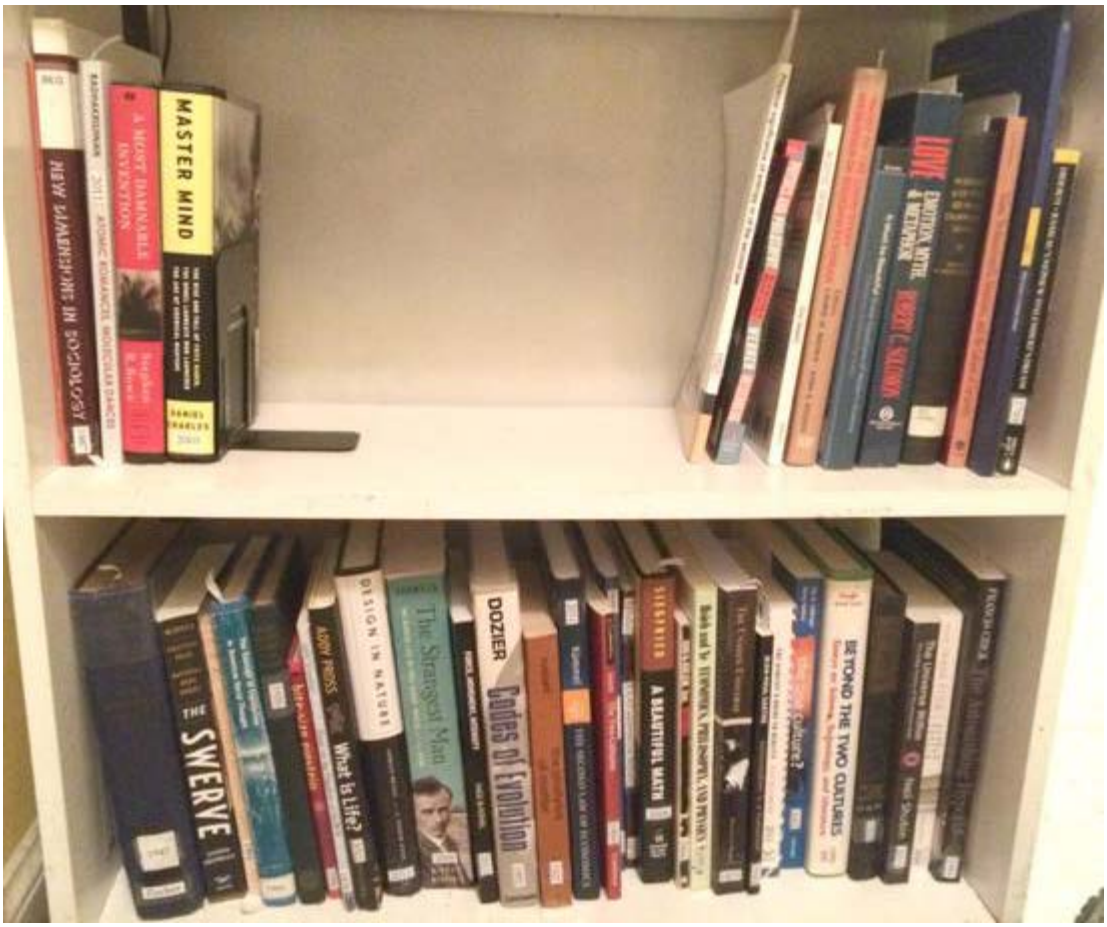

Reading | Techniques

The following is a 28 Mar 2013 recently-read 12-inch stack of books, of Libb Thims, taken to visually-illustrate to

American physics-philosopher and neurological-anthropologist Terrence Deacon (fourth book from top), in particular, and also to American philosopher Alicia Juarrero (third book from top), during the JHT beta review of his book (see: JDNM), done in the wake of the so-called Juarrero-Deacon affair (2011-2013); see also peer review quote below. [1]

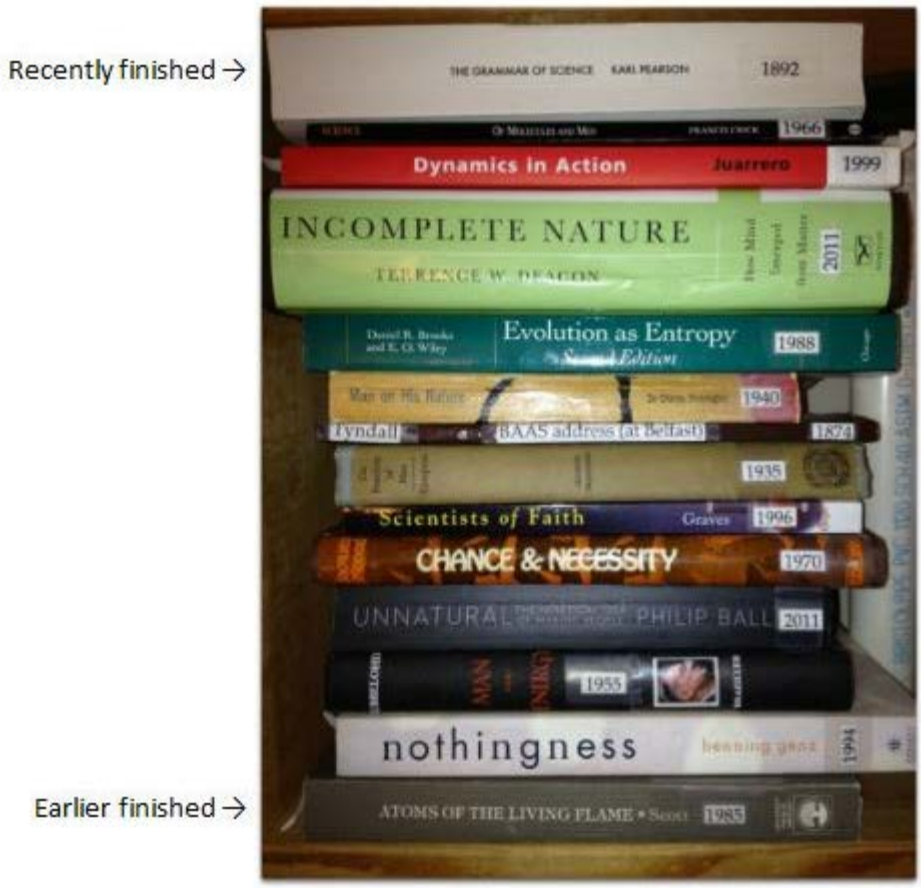

Quotes

The following are related quotes:

> "Also, to clarify, I read your book in detail, cover to cover, and this reading is inclusive of my standard dissection of books method of pencil noting commenting, boxing in of certain text, stars, checks, boxes, dates, question marks, "what" comments, one or two occasional highlights for exceptional sentences (which in your case amounted to one, namely your statement that Seth Lloyd writes in a "way of telling the story" that "misrepresents the history", which is strikingly true, hence I highlighted it), circles around certain foot notes, etc., etc., etc., which in your case amounted to a total of **1,340 pencil dissection incidences**, all the way through your Glossary, Notes, References, Index, up through your second to last page (#601), where I box in all your usages of the term "vitalism", one notation example of which I scanned and will post on the above wiki review page [shown below], namely notation note #1250 your date typo of the Schneider and Kay reference, which you incorrectly put as 1997 (pg. 561), whereas it should correctly be 1994. I then let the book sit for some time, read two other books [Karl Pearson's 1892 *The Grammar of Science* and Francis Crick's 1996 *Of Molecules and Men*], as discussed, then came back to it, went through all 1,340 notation and commentary notes AGAIN and wrote this article with my "remarkably poisoned pen" as you call it."
>
> — Libb Thims (2013), response (Q) to Terrence Deacon that "I didn't read his book", May 22

> "I stack **books**, like your momma stacks pancakes."

— Libb Thims (2013), response (Q) to YouTuber comment about why Thims considered himself worthy of making a ranked Smartest Person Ever | IQ:200+ list, if he couldn't pronounce Goethe and Euler correctly (see: books read), Dec

References

1. Thims, Libb. (2013). "Juarrero, Deacon, Nonreductive Physical Materialism, and Chemical Teleology" (pdf) (peer) (book stack photo,pg. 84), *Journal of Human Thermodynamics* (url), 9(6): 77-122, Jun.

See also

- Einstein's personal library
- Library walk problem

θΔics

In terminology, **thing** (TR:1218), as opposed to a non-thing, is a fermion, boson, void, or vacuum, space-time, or derivative thereof; the philosophy that takes the thing point of view, as opposed to the anthropomorphic point of view, is called thing philosophy.

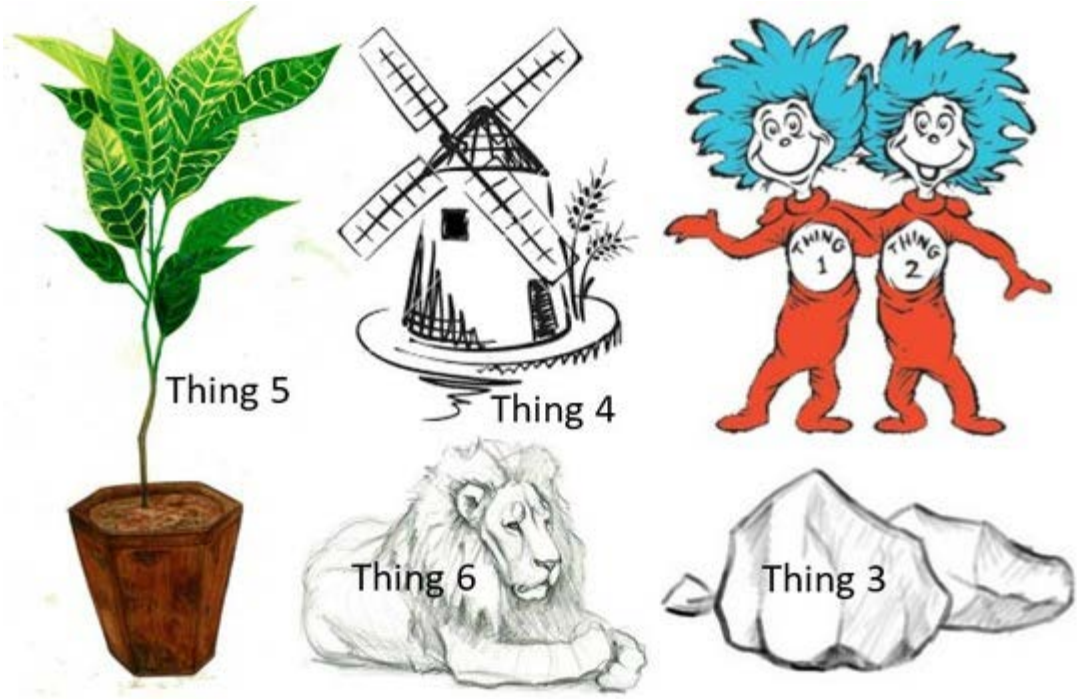

Examples of "**things**", the principle operation of the nature of each governed by one and the same laws of chemistry, physics, and thermodynamics; things 1, 2, 4, 5 and 6, in classification speak, compare outdated Linnaean classification (1735), are types of "animate" things, and thing 3, which is a type of "inanimate" thing (see: rock vs human); among the former variety of which thing 4 is a wind-powered (pressure-sensitive) mechanical thing, thing 5 is a light-powered (light, pressure, smell, and taste sensitive) physicochemical thing (Q), and things 1, 2, and 6 are powered CHNOPS+# things, the "#" indicative of the elemental composition of the thing, e.g. a human, similar, conceptually, to the two fictional Seuss things, is a 21-sense (Q)(Q) powered CHNOPS+20 thing. Things 1, 2, 5, and 6, physicochemically-speaking, are "reactive" things, as compared to things 3 and 4, which are non-reactive or "inert" things, in respect to human-interaction timescales or human chemical reaction energies.

Dead things | Living things

Among puzzles, biggest confusion to implant into the mind of man, a switch occurring sometime amid the dark ages, is the belief that all "things" in the universe can be divided into two categories: dead things and living things. It would take man some 5,000-years to ferret out this mess.

Early views

In the pre-Christian era (1000BC to 100AD), when gods were marginalized and four element or atomic theory and two force like theories predominated, theories of generalized "things" seemed to be the way of the philosophical inquiry.

Aristotle

In 330BC, Aristotle outlined a physics and metaphysics of "things", the most-prolific theory of everything to date; the following is one example:

> "Natural **things** are exactly those things which do move continuously, in virtue of the principle inherent in themselves, towards a determined goal; and the final development which results from any one such principle is not identical for any two species, nor yet is it any random result, but in each there is always a tendency towards an identical result if nothing interferes."
>
> — Aristotle (322BC), *Physics* (2:8) [6]

> "The aim of art is to represent not the outward appearance of **things**, but their inward significance."
>
> — Aristotle (c.330BC) (Q)

(add)

Lucretius

In 60BC, Lucretius published his *On the Nature of Things*, wherein he outlined a general atomic theory and one force based model of things; the following being some excerpts: [1]

> "All **things** come to be without the aid of gods."
>
> — Lucretius (c.60BC), *On the Nature of Things* (§:General Principles)

> "All **things** are put together of everlasting seeds, until some force has met them to batter things asunder with its blow, or to make its way inward through the empty voids and break things up, nature suffers not the destruction of anything to be seen."
>
> — Lucretius (c.60BC), *On the Nature of Things* (§:A.General Principles)

> "I maintain, the truth is this; there are certain bodies, whose meetings, movements, order, position, and shapes make fires, and when their order changes, they change their nature, and they are not made like to fire nor to any other thing either, which is able to send off bodies to our senses and touch by collision our sense of touch. Moreover, to say that fire is all **things**, and that there is no other real thing in the whole count of things, but only fire, as this same Heraclitus does, seems to be raving frenzy."
>
> — Lucretius (c.60BC), *On the Nature of Things* (§:C.Refutation of Rival Theories)

(add)

Aurelius

The following are the anti-Epicurean thing views of Marcus Aurelius:

> "Nature, which governs the whole, will soon change all **things** which thou seest, and out of their substance will make other things, and again other things from the substance of them, in order that the world may be ever new."
>
> — Marcus Aurelius (c.160), *Publication*; cited by Edward Clodd (1897) as opening quote in *Pioneers of Evolution from Thales to Huxley*

(add)

Dark ages

Into the dark ages, the following became the dominate thing philosophy:

> "God as arranged all **things** by measure and number and weight."
>
> — Anon (c.100AD), *Wisdom of Solomon* 11:20 (Q); quote was found proximately above the periodic table of elements, in the chemistry classroom of the University of Leipzig when Hermann Kolbe was professor, but removed per order "that must go" when in 1885 Johannes Wislicenus succeeded Kolbe.

Specifically, in the Christian era (100AD-1500), when god became predominate, and four element or atomic theory and two force like theories became illegal, promulgations of punishable by death (de-existence), theories of generalized

"things" became usurped by a deistic-based dualism conceptualized theory of "living things" and "dead things", in short.

Bruno

In the 1580s, Italian philosopher Giordano Bruno, building on Aristotle, albeit with Copernican changes (Q), began to outline a semblance of a thing philosophy:

> "A spirit exists in all **things**, and no body is so small but contains a part of the divine substance within itself, by which it is animated."
>
> — Giordano Bruno (c.1590), *Publication*; cited by Henry Bray (1910) in *The Living Universe* (pg. 180)

The 1600 infamous burning of Bruno, who would not retract is thing philosophy, marked a turning point out of the dark ages and towards enlightenment.

Spinoza | Hobbes

In 1670, Benedict Spinoza (1632-1677), in his *Tractatus Theologico-Politicus* (§3), building on Thomas Hobbes (1588-1679) and Maimonides (1135-1204), digressed on what he referred to as the natural right of things, as follows: (Q)

> "By the right and order of nature, I merely mean the rules determining the nature of each individual **thing** by which we conceive it is determined naturally to exist and to behave in a certain way. For example fish are determined by nature to swim and big fish to eat little ones, and therefore it is by sovereign natural right that fish have possession of the water and that big fish eat small fish. For it is certain that nature, considered wholly in itself, has a sovereign right to do everything that it can do, i.e., the right of nature extends as far as its power extends … since the universal power of the whole of nature is nothing but the power of all individual things together, it follows that each individual thing has the sovereign right to do everything that it can do, or the right of each thing extends so far as its determined power extends."

Another noted quote is:

> "All **things** happen according to the laws of nature."
>
> — Benedict Spinoza (c.1625), *Treatise on Theological Politics* (§3) (Q)

(add)

Other

In 1925, Gilbert Lewis, in his *The Anatomy of Science*, amid the defunct theory of life transition point period (1880s-1940s), was vacillating on the terms "animate things" and "living things" which he used interchangeably.

Quotes

The following are other neo-modern related thing quotes:

> "The only **thing** which can be directly perceived by the senses is force, to which may be reduced light, heat, electricity, sound and all the other things which can be perceived by the senses."

— James Maxwell (1847), age 16

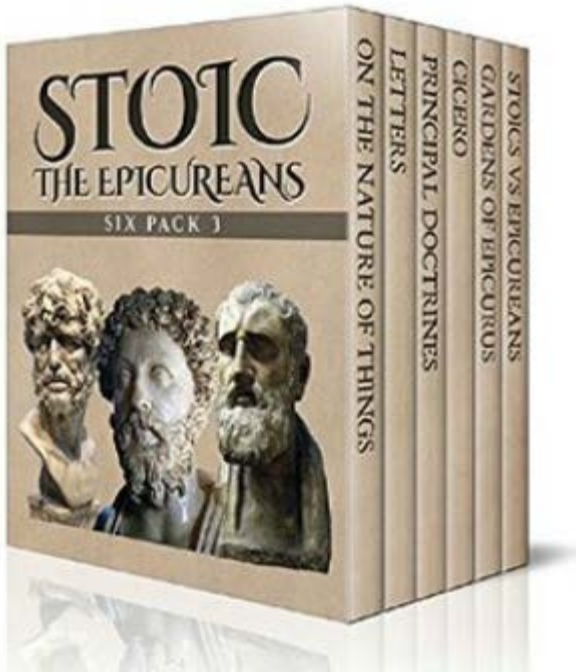

The 2015 sic-volume *Stoic: The Epicureans* showing (Q) Lucretius' *On the Nature of Things*; the subject of "**things**" being the first main book of six, in comparing and contrasting stoicism with Epicureanism, as found in Epicurus and Cicero.

"After death the force, or power, we call 'will' undoubtedly endures; but it endures in this world, not in the next. And so with the **thing** we call life, or the soul—mere speculative terms for a material thing which, under given conditions, drives this way or that. It too endures in this world, not the other."

— Thomas Edison (1910), interview with NY Times journalist Edward Marshall [2]

"More than this can be said. There is no **thing** endowed with life—from man, who is enslaving the elements, to the humblest creature—in all this world that does not sway it in turn. Whenever action is born from force, though it be infinitesimal, the cosmic balance is upset and universal motion result."

— Nikola Tesla (1915), "How Cosmic Forces Shape Our Destines" [3]

"Such a principle [relativity] resulted from a paradox upon which I had already hit at the age of sixteen: If I pursue a beam of light with a velocity c (velocity of light in a vacuum), I should observe such a beam of light … at rest. However, there seems to be no such **thing**, whether on the basis of experience or according to Maxwell's equations."

— Albert Einstein (c.1930), retrospect reflection on relativity theory [4]

"I propose the following definition, which is applied to everything, including minerals: 'life is the faculty of reaction.' Everything in the universe tends toward inertia, or absence of reaction. The proof of this inertia, which thermodynamics seeks in 'absolute zero,' has never been given, nor will it ever be, because absolute inertia can only be attained through the cessation of the formed matter or '**thing**'. This would be the moment the thing ceased to exist. Everything 'existing' is capable of reaction, insofar as it has 'weight', that is, fixed or specific energy. The vital phenomenon is the faculty of reacting, and to manifest itself this reaction requires a resistance of the same nature as the action."

— Rene Lubicz (1949), *The Temple of Man*

"To a materialist no **thing** is real but atoms in a void and we are but molecular people controlled by the actions of natural physicochemical law."

— George Scott (1985), "Molecular People" dedicated to Lucretius

"The world appears to be governed by empirically discoverable, natural, and unalterable laws, and individuals apprehend their own activities in terms of quantifiable laws. The **thingification** of people (reification) presents itself in philosophy as crude materialism, and the personification of things (fetishism) presents itself as crude idealism. Crude materialists tend to regard social relations of production as though they are natural properties inherent in things."

— Gillian Howie (2010), *Between Feminism and Materialism* [5]

"It helps us to understand the nature of **things**."

— Bruno (2010), dialogue with Magda (wife) on quarks and binding energy in respect to their marriage; in film *Afinidades*

References

1. Lucretius. (c.60BC). *On the Nature of Things* (translator: Cyril Bailey) (txt). Oxford, 1910.
2. Marshall, Edward. (1910). "No Immortality of the Soul Says Thomas A. Edison" (Q) (pdf), *The New York Times*, Oct 2.
3. (a) Tesla, Nikola. (1915). "How Cosmic Forces Shape Our Destinies ('Did the War Cause the Italian Earthquake'), *New York American*, Feb 7.
(b) Tesla, Nikola. (2007). *The Nikola Tesla Treasury* (pg. 504-13). Wilder Publications.
4. Kaku, Michio. (2005). *Einstein's Cosmos: How Albert Einstein's Vision Transformed Our Understanding of Space and Time* (pg. 44). W.W. Norton & Co.
5. Howie, Gillian. (2010). *Between Feminism and Materialism: a Question of Method* (pgs. 46-47). Palgrave Macmillan.
6. Brown, Richard H. (1977). *A Poetic for Sociology: Toward a Logic of Discovery for the Human Sciences* (pg. 130). University of Chicago Press, 1989.

External links

- Thing – Wikipedia.

θΔics

In philosophy, **thing philosophy** is the love of knowledge that adheres to the "thing" point of view of entities that comprise the universe, as as opposed to the "anthropic" view, particularly when it comes to moving or animate entities (e.g. animate things).

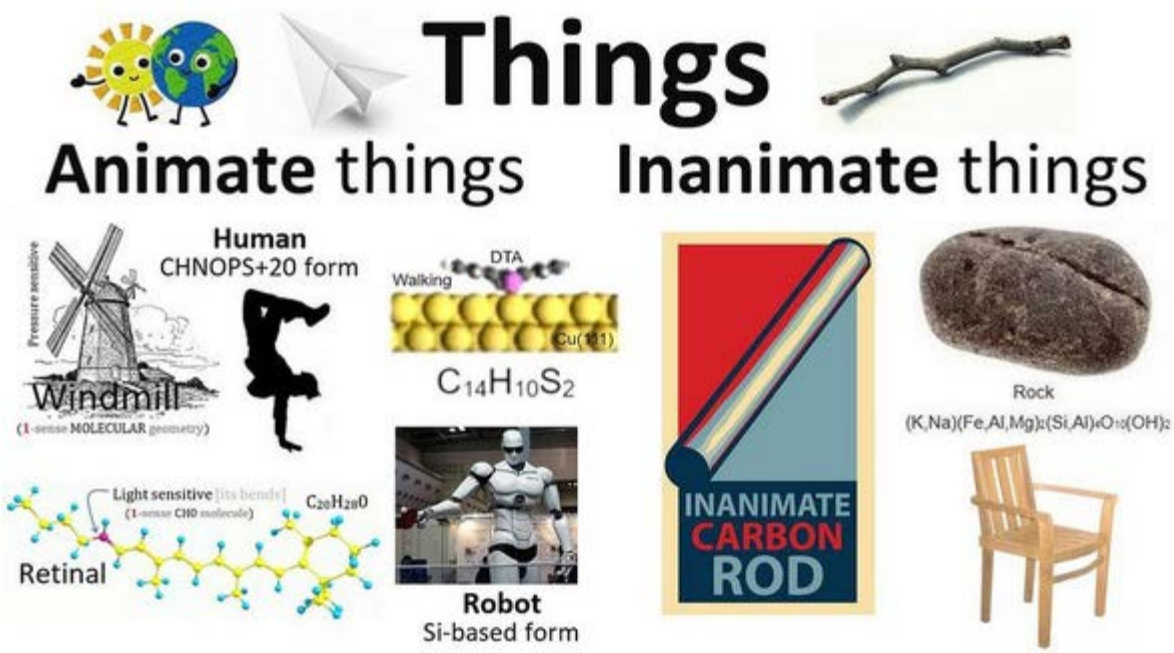

Three **thing philosophy** examples of "animate forms" (or animate things), the respective principles of animation of each differing only in degrees of complexity (see: animate and inanimate; rock vs human); the nature of operation of each governed by one and the same laws of physics, chemistry, and thermodynamics (see: one nature).

Philosophers

The following are noted thing philosophers:

1. Heraclitus 185|#86
2. Aristotle 195|#10
3. Lucretius 180|#94
4. Marcus Aurelius 180|#125
5. Nicholas of Cusa 180|#40
6. Giordano Bruno 190|#35
7. Benedict Spinoza 185|#53
8. Napoleon Bonaparte 180|#111
9. Rene Lubicz 175|#270

The mean IQ|position of these eight is: 183|#92 (Jan 2018). Others include: Rene Descartes.

More recent thing philosophers include: Dr. Seuss, Libb Thims, and Vladimir Cruz.

Go philosophy

Thing philosophers, of note, also tend to be "go philosophers" (see: go), such as exemplified by Maxwell's famous age three "what's the go' o that?" in respect to any thing that "moved, shone, or made a noise".

Quotes

The following are related quotes:

> "The **things** that can be seen, heard, and learned are what I prize the most."
>
> — Heraclitus (c.495BC), Fragment 55 (Ñº) (translator: John Brunet)

> "For any particular **thing**, ask: What is it in itself? What is its nature?"
>
> — Marcus Aurelius (167), *Meditations*; cited in *Silence of the Lambs* (1991)

"**I am a thing that thinks**: that is to say, that doubts, affirms, denies, that wills, that desires, that also imagines and perceives."

— Rene Descartes (1641), *Mediations on First Philosophy (Mediation Three)* (Ñº); note: Hobbes objected (Ñº) to this [15]; cited by Henry Buckle (1856) in *History of Civilization, Volume One* (pg. 425)

"There is present in all **things** a natural desire to exist in the best manner in which the condition of each thing's nature permits this. And [we see that all things] act toward this end and have instruments adapted thereto. They have an innate sense of judgment which serves the purpose of knowing. [They have this] in order that their desire not be in vain but be able to attain rest in that [respective] object which is desired by the propensity of each thing's own nature."

— Nicholas of Cusa (1660), *Learned Ignorance* (Ñº)

"Everything is more or less organized matter. All **things** can be explained by magnetism."

— Napoleon Bonaparte (1817), "Dialogue with Gaspard Gourgaud", Apr [4]

"The world is full of a number of **things**, I'm sure we should all be happy as kings."

— Robert Stevenson (1885), *Happy Thought*; cited by Hilda Finnemore (1924) in *A History of Earth: from Stardust to Man* (pg. 5) [1]

"I propose the following definition, which is applied to everything, including minerals: 'life is the faculty of reaction.' Everything in the universe tends toward inertia, or absence of reaction. The proof of this inertia, which thermodynamics seeks in 'absolute zero,' has never been given, nor will it ever be, because absolute inertia can only be attained through the cessation of the formed matter or **'thing'**. This would be the moment the thing ceased to exist. Everything 'existing' is capable of reaction, insofar as it has 'weight', that is, fixed or specific energy. The vital phenomenon is the faculty of reacting, and to manifest itself this reaction requires a resistance of the same nature as the action."

— Rene Lubicz (1949), *The Temple of Man*

"I am not a **thing** — a noun. I seem to be a verb, an evolutionary process – an integral function of the universe."

— Buckminster Fuller (1970), *I Seem to Be a Verb*

"The world appears to be governed by empirically discoverable, natural, and unalterable laws, and individuals apprehend their own activities in terms of quantifiable laws. The **thingification** of people (reification) presents itself in philosophy as crude materialism, and the personification of things (fetishism) presents itself as crude idealism. Crude materialists tend to regard social relations of production as though they are natural properties inherent in things."

— Gillian Howie (2010), *Between Feminism and Materialism* [2]

> “There is no such **thing** as life.”
>
> — Jonathan Dowling (2013), reflection on his abioism view, as argued during 1998 to 2004 NASA Jet Propulsion Laboratory "life detection" device debates

References

1. (a) Stevenson, Robert L. (1885). *A Child’s Garden of Verses* (Ñº). Publisher.
(b) Finnemore, Hilda. (1924). *A History of the Earth from Star-Dust to Man* (§1: What Things are Made Of, pgs. 5-20; quote, pg. 5). Longmans, Green, and Co.
2. Howie, Gillian. (2010). *Between Feminism and Materialism: a Question of Method* (pgs. 46-47). Palgrave Macmillan.
3. Dowling, Jonathan. (2013). *Schrödinger's Killer App: Race to Build the World's First Quantum Computer* (ref. #88, pgs. 429-30; soul, pgs. 11, 398; god, 12+ pgs). CRC Press.
4. (a) Bonaparte, Napoleon. (1817). “Comment to Gaspard Gourgaud”, Apr.
(b) Gougaud, Gaspard. (1898). *Talks of Napoleon at St. Helena with General Baron Gourgaud: Together with the Journal Kept by Gourgaud on Their Journey from Waterloo to St. Helena* (pg. 276). Nabu Press, 2012.
(c) Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pg. 109). Prometheus.

θΔics

In terminology, **think** refers to the process of working the mind on problems.

Quotes

The following are related quotes:

> "Freethinkers are those who are willing to use their minds without prejudice and without fearing to understand things that clash with their own customs, privileges, or beliefs. This state of mind is not common, but it is essential for right **thinking**."
>
> — Leo Tolstoy (1862), *War and Peace* (Ñº)

> "I, too, was originally supposed to become an engineer. But I found the idea intolerable of having to apply the inventive faculty to matters that make everyday life more elaborate—and all, just for dreary money-making. Thinking for its own sake, as in music! … When I have no special problem to occupy my mind, I love to reconstruct proofs of mathematical and physical theorems that have long been known to me. There is no goal in this, merely an opportunity to indulge in the pleasant occupation of thinking."
>
> — Albert Einstein (1918), "Letter to Heinrich Zangger"

> "Here stood a man entirely on his own. There was no Medici family to put resources at his disposal. Scientifically, he was in a less favorable situation than the members of the Florentine Academia del Cimento who could advise each other. He had to **think** out for himself every little artifact and design emery piece of auxiliary apparatus so that it could be made by a Magdeburg based business. Perhaps it is this that is at the root of the preference, that all his experiments show, for a certain unsophisticated directness. When someone in Florence carried out experiments on the pressure of the air, he could rely on the availability of the highest technical expertise. Here in Magdeburg, the equipment for scientific research was the solid and durable work of a local forge. While this, on the one hand, made it harder to perform experiments it also, on the other, gave them an overwhelming direct impact."
>
> — Hans Schimank (1936), *Otto von Guericke* (pg. 40)

> "History is hard to know, because of all the hired bullsh*t, but even without being sure of 'history' it seems entirely reasonable to **think** that every now and then the energy of a whole generation comes to a head in a long fine flash, for reasons that nobody really understands at the time—and which never explain, in retrospect, what actually happened . . . There was madness in any direction, at any hour. If not across the Bay, then up the Golden Gate or down 101 to Los Altos or La Honda . . . You could strike sparks anywhere. There was a fantastic universal sense that whatever we were doing was right, that we were winning . . . And that, I think, was the handle—that sense of inevitable victory over the forces of Old and Evil. Not in any mean or military sense; we didn't need that. Our energy would simply prevail. There was no point in fighting—on our side or theirs. We had all the momentum; we were riding the crest of a high and beautiful wave . . . So now, less than five years later, you can go up on a steep hill in Las Vegas and look West, and with the right kind of eyes you can almost see the high-water mark—that place where the wave finally broke and rolled back."
>
> — Hunter Thompson (1971), *Fear and Loathing in Las Vegas* [2]

See also

â— Thinker

References

1. (a) Schimank, Hans. (1936). *Otto von Guericke: Mayer of Magdeburg – a German Statesman, Thinker, and Researcher* (*Otto von Guericke: Burgermeister von Magdeburg. Ein deutscher Staatsman, Denker und Forscher*) (one his own, pg. 40; name change, pg. 69). Publisher.
(b) Conlon, Thomas. (2011). *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum* (Amz) (on his own, pg. 44). Saint Austin Press/LuLu.
2. Hunter S. Thompson – Wikipedia.

θΔics

In thermodynamics, the **third law of thermodynamics** states that no finite sequence of cyclical processes processes can succeed in cooling a body to absolute zero. [1] In other words, it is found by experiment, one needs to do an ever increasing, and ultimately infinite, amount of work to remove energy from a body as heat as its temperature approaches absolute zero. In short, the third law, also known as the Nernst heat theorem, states that as absolute zero is approached, the entropy change ΔS for a chemical or physical transformation approaches zero:

$$\lim_{T \to 0} \Delta S = 0$$

This phenomenon was determined by German physicist Walther Nernst in 1906.

History

One of the first proto-statements of the outline of the third law of thermodynamics comes from the 1898 experimental findings of Scottish physical chemist James Dewar, who had been thinking about the nature of cold since the age of ten (1852) after having fallen through the ice of a pond and thereafter suffering a period of prolonged illness. Specifically, in 1898, following many years of low temperature research, Dewar solidified hydrogen by first evacuating hydrogen gas molecules from a dewar of hydrogen; then used charcoal to absorb the molecules, which resulted to cool the liquid to the solidification point; lastly he applied suction to solid hydrogen to reach a then new low-temperature record of thirteen degrees above absolute zero, at which point he commented that "there or thereabouts our progress is barred." In commentary on the efforts involved in moving downward in these difficultly decreasing ranges of temperature, Dewar wrote: [5]

> "To win one degree low down the scale is quite a different matter from doing so at higher temperatures; in fact, to annihilate these few remaining degrees would be a far greater achievement than any so far accomplished in low-temperature research."

In 1905-06, German physicist Walther Nernst proposed a new heat theorem, which provided a means of determining free energies, and therefore equilibrium points, of chemical reactions from heat measurements. [2] In the years to follow, German physicist Max Planck was the first to emphasize that the new heat theorem could be considered as a new entropy theorem; in that, it supplied a means of fixing the otherwise undetermined additive constant:

> $S = k \log W$ + constant

in the expression for the entropy of a condensed system. [3] Planck published this interpretation of the new heat theorem in a new and revised edition of his textbook on thermodynamics, indicating in the preface, dated 1910, that he had begun to consider the physical significance of Nernst's theorem in areas outside the scope of thermodynamics.

In December of 1910, German physical chemist Otto Sackur submitted a paper to the *Annalen* in which he argued for a connection between the "new law of thermodynamics", i.e. Nernst's heat theorem, now known as the third law of thermodynamics, and the role played by the quantum constant, i.e. Planck's constant *h*, in statistical calculations of entropy. [3] Upon reading this paper, Planck seized on this logic in a move to eliminate the additive constant to the statistical entropy equation. In 1914, Planck outlined what was then called Nernst's heat theorem, in his "hypothesis of quanta", as such: [4]

> "For the hypothesis of quanta as well as the heat theorem of Nernst may be reduced to the simple proposition that the thermodynamic probability of a physical state is a definite integral number, or, what amounts to the same thing, that the entropy of a state has a quite definite, positive value, which, as a

minimum becomes zero […]. For the present, I would call this proposition as the very quintessence of the hypothesis of quanta."

(add discussion)

References

1. Atkins, Peter. (2007*). Four Laws - that Drive the Universe*. Oxford: Oxford University Press.
2. Nernst, Walther. (1921). "Studies in Chemical Thermodynamics", *Nobel Lecture*, Dec. 12.
3. Planck, Max. (1915). *The Theory of Heat Radiation*, (pg. xxxiii). Springer (reprint).
4. (a) Planck, Max. (1915). *The Theory of Heat Radiation*, Engl. Transl. Morton Masius, *Preface to second edition, pp. VI, VIII.* Philadelphia.
(b) Garola, Claudio, Rossi, Arcangelo, and Sozzo, Sandro. (2006). *Foundations of Quantum Mechanics: Historical Analysis and Open Questions – Cesena 2004* (pg. 101). World Scientific.
5. Shachtman, Tom. (1999). *Absolute Zero and the Quest for Absolute Cold* (pg.167-78). Mariner Books.

External links

â— Third law of thermodynamics – Wikipedia.
â— 20+ Variations of the Third Law of Thermodynamics - *Institute of Human Thermodynamics*

θΔics

In lectures, **Third Lecture on Anatomy** is a famous 1796 lecture by German polyintellect Johann Goethe, on comparative anatomy and zoology, wherein he fixates organic and inorganic existences into one outlined theory termed "metamorphology", in which he alludes to the premise that affinities (chemical forces of attraction and repulsion) and bonds (chemical bonds) apply to human and mineral interactions by one and the same methodology (physical chemistry).

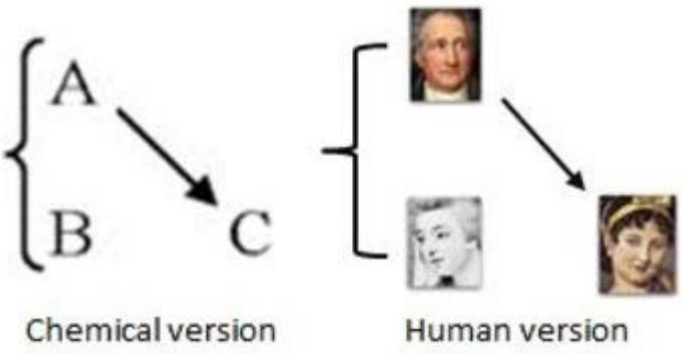

Goethe, in his 1796 **Third Lecture on Anatomy**, presents his first outline of metamorphology, comparing human affinities and bonds to chemical affinities and bonds, therein presaging evolution theory and the first draft notes of his *Elective Affinities* (1809), which initiated the science of human chemistry (see: Goethe timeline).

Overview

In 1796, German polyintellect Johann Goethe gave his famous "Third Lecture on Anatomy", wherein, in subsection "On the Laws of Organization as Such, to the Extent That We Can Observe Them in the Structure of Types", the subject of human chemistry, for the first direct time in history, is broached; the main part of which is as follows: [1]

> "To facilitate our comprehension of the concept of organic existence, let us first take a look at mineral [inorganic] structures. Minerals, whose varied components are so solid and unchanging, do not seem to hold to any limits or order when then combine, although laws do determine these conditions. Different components can be easily separated and recombined into new combinations. These combinations can again be taken apart, and the mineral we thought destroyed can soon be restored to its original perfection.
>
> The main characteristic of minerals that concerns us here is the indifference their components show toward the form of their combination, that is, their coordination or subordination. There are, by nature, stronger or weaker bonds between these components, and when they evidence themselves, they resemble attractions between human beings. This is why chemists speak of elective affinities, even though the forces that move mineral components [or humans] one way or another and create mineral structures are often purely external in origin, which by no means implies that we deny them the delicate portion of nature's vital inspiration that is their due.
>
> How different even imperfect organic beings are! They convert part of the nourishment they absorb—eliminating what they do not need—into distinct organs. What they do absorb they turn into something unique and exquisite by joining most intimately one element with another and so forming differentiated parts in whose forms multifarious life is manifested. And if these forms are destroyed, they cannot be reconstructed from what remains.
>
> If we compare these imperfect organic beings with higher ones, we find that the former, even though they make use of elemental influences with a certain degree of force and individuality, cannot bring the resulting organic parts to the same level of specialization and permanence as the higher animal forms can. We know, for example, that plans—and we will not descend any lower on the scale of organic life—developing as they do in a certain sequence, represent one and the same basic organ in highly different shapes.
>
> Detailed insight into the law governing this metamorphosis will surely advance the science of botany, not only in its descriptive tasks but also in its efforts to understand the inner nature of plants."

(add discussion)

Other

In 2011, Lorna McIntosh, in her "Elective Affinities" gallery in Edinburg, quoted from the Third Lecture, in some way; possibly conceptualizing it as a unification of physical, mental, and spiritual, or something along these lines. (Ñº)

Quotes

The following are related quotes:

> "Goethe's first detailed presentation of 'affinity' occurs in his **third *Lecture on Anatomy*** of 1796 (*LA*, I, 9, pgs. 202f). Brief though this treatment is, it reveals how thoroughly Goethe had absorbed the current theory, and how radically he was beginning to transform it. Interestingly, Goethe steers a path between the existing views by granting that 'affinities' operate 'according to fixed laws', whilst denying that they have a definable 'limit'. Thus he accepted the general theory, yet rejected the possibility of establishing a fixed 'order' that could be summarized in a table."
>
> — Jeremy Adler (1990), "Goethe's use of chemical theory in his *Elective Affinities*" [2]

References

1. (a) Goethe, Johann. (1796). *Third Lecture on Anatomy* (§:On the Laws of Organization as Such, to the Extent That We Can Observe Them in the Structure of Types); Lectures on Comparative Anatomy and Zoology. Publisher.
(b) Eigen, Manfred, and Winkler, Ruthild. (1981). *Laws of the Game: How the Principles of Nature Govern Chance* (pg. 74-77). Princeton University Press.
(c) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (pg. 395). Morrisville, NC: LuLu.
2. (a) Goethe, Johann. (1947-). *The Writings on Natural Science* (*Die Schriften zur Naturwissenschaft*) (editors: Dorothea Kuhn, Rupprecht Matthei, Wilhelm Troll, and Lothar Wolf) (21 volumes) (I, 9, pg. 202f). Weimar: Hermann Bohlhaus Nachfolger.
(b) Adler, Jeremy. (1990). "Goethe's use of chemical theory in his *Elective Affinities*" (ch. 18, pgs. 263-79; Third Lecture, pg. 268) in *Romanticism and the Sciences* - edited by Andrew Cunningham and Nicholas Jardine, New York: Cambridge University Press.

θΔics

In hmolscience, **this idea** refers to the "radical", according to some, view, discerned, independently, by those including: Goethe (1770), Shelley (1804), Adams (1885), De Lange (1960), Rossini (1971), Beg (1974), Thims (1995), Hirata (2000), and Hwang (2001), that people ARE chemical substances, NO metaphor, and that the forces of attraction and repulsion, and reactions mediated thereby, of which, being governed by one and the same nature and laws of physics and chemistry, actuate as evidenced in the behaviors of smaller chemical substances, as experimented with in the chemistry class, laboratory, and or observed in nature.

A diagrammatic showing how it took Goethe **31-years** to from the 1770 age 19 "puzzlement stage" (see: Goethe's daimonic) to the 1799 age 50 "verbal gripe" / "idea stage" (see: passions like playing cards), to go another **10-years** exactly to working finished "product stage", namely his coded novella *Elective Affinities*, which he declared his "best book" (greatest work), wherein the passions are explained NOT like playing cards, as Crebillon did, but rather by the rules, laws, and reactions of physical chemistry.

Goethe

It took Goethe exactly 10-years to go from age 19-20 puzzlement stage (1770) of his confusion (see: Goethe's daimonic) to working model stage, i.e. his plant evolution theory (1780), to go another 4-years to the evidence stage of his human evolution theory (see: human intermaxillary bone) (1784), to go another 12-years to the "metaphor stage" of the general alluded to concept of a "human chemical theory", see: *Third Lecture on Anatomy* (1796), to go another 3-years to the "griping stage", i.e. something needs to be done about this abysmal state of the situation, see: passions like playing cards (1799), to go another 10-more years to the "finished product" stage of the realization of "the idea", i.e. human passions or heats of emotion NOT treated in literature like playing cards, but as real quantitative functions of the heats, forces, and affinities of atoms and chemicals actually reacting, according to measurement, i.e. atoms and molecules do NOT react together like the mixing of playing cards, so why should human reactions be any different; the ramifications of which he discussed and employed in his own existence and discussions up into his last year in 1832, for a total of 62-years at a minimum working on the so-named "hard problem" of the humanities (see: below).

Shelley

In took Percy Shelley 8-years to go from the 1803 age 11 "this idea" stage, namely: that heats, elements, chemical reactions, and the affinities apply to human social interactions and the passions, which he discerned while a student in the chemistry class of Adam Walker, to the 1811 age 19 "atheism stage", namely that religion and chemistry are at odds with each other, therein penning his *The Necessity of Atheism*, which got him expelled from Oxford, to go another 5-years to the 1816 age 24 "applied stage" of using his new radical elective affinities philosophical, which is summarized below, in his daily goings-on:

> "The radical tenets of Shelley's philosophy appear transmuted to something rich and strange in the medium of his poetry. These principles, which he imbibed from William Godwin's *Political Justice*, are, briefly, the perfectibility of man, the usurpation of Church and State, the negation of moral evil, and the **doctrine of elective affinities**. When religion and government shall have passed away, and liberty, equality and fraternity, the ideals of the French Revolution, shall have come to dwell among men, then will the golden age return. Shelley regarded himself as **a seer**, a hierophant whose concern was with the regeneration of humanity."
>
> — Florence Moynihan (1922), "The Centenary of Shelley" (Ñº)

Student
Percy Shelley
(1804, age 12)

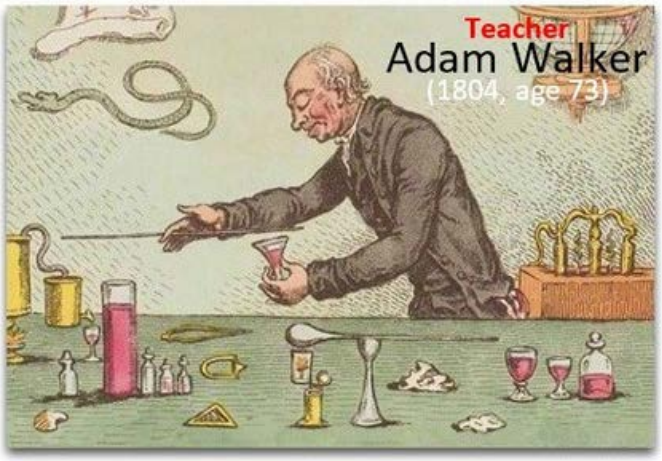

"In elective-affinity scheme, men ARE chemical substances, and in nine cases in ten, in my opinion, the force of the attraction works more constantly and lastingly upon the woman than the man."
— Mary Shelley (1839), reflection on her late husband's 'radical' elective affinities social philosophy

Mary Shelley, famed *Frankenstein* author, on the "radical" elective affinities philosophy of her late husband Percy

to eventually, e.g., marry soon-to-become famed *Frankenstein* author Mary Shelley in the conceptual god-free "Church of Elective Affinities", as Mary Shelley retrospectively referred to it; for a total of 18-years mentally working on the so-named "hard problem" of the

humanities (see: below), before committing suicide at age 29 a month before his 30th birthday (similar to Patrick Fergus).

Shelley, "**the idea**" of which he gleaned, at the age of 12, in the chemistry class of Adam Walker.

Adams

It took Henry Adams 28-years to go from his age 25 "idea confusion" (1863) stage, which he expressed in letter to Charles Gaskell (see: Adams creed), aka the "daimonic stage", as Goethe referred to it:

> "Everything in this universe has its regular waves and tides. Electricity, sound, the wind, and I believe every part of organic nature will be brought someday within this law. The laws which govern animated beings will be ultimately found to be at bottom the same with those which rule inanimate nature, and as I entertain a profound conviction of the littleness of our kind, and of the curious enormity of creation, I am quite ready to receive with pleasure any basis for a systematic conception of it all. I look for regular tides in the affairs of man, and, of course, in our own affairs. In ever progression, somehow or other, the nations move by the same process which has never been explained but is evident in the oceans and the air. On this theory I should expect at about this time, a turn which would carry us backward."

to the "proof stage", i.e. to 1889 to 1891 penning of his nine-volume *History of the United States of America*, covering the years during the Jefferson Administration, 1801 to 1817, to prove to his own mind that history operates "mechanistically" (see: social mechanism), which he summarizes as follows:

> "He had even published a **dozen volumes** of American history for no other purpose than to satisfy himself whether, by severest process of stating, with the least possible comment, such facts as seemed sure, in such order as seemed rigorously consequent, he could fix for a familiar moment a necessary sequence of human movement. The result had satisfied him as little as at Harvard College."

To go another 18-years into the publication manuscript peer review stage of "of idea" stage, which in 1909 he found in the mind of Henry Bumstead, one of the few students of Willard Gibbs, who reviewed his "The Rule of Phase Applied to History" (1909); some of which is evidenced by the following quotes:

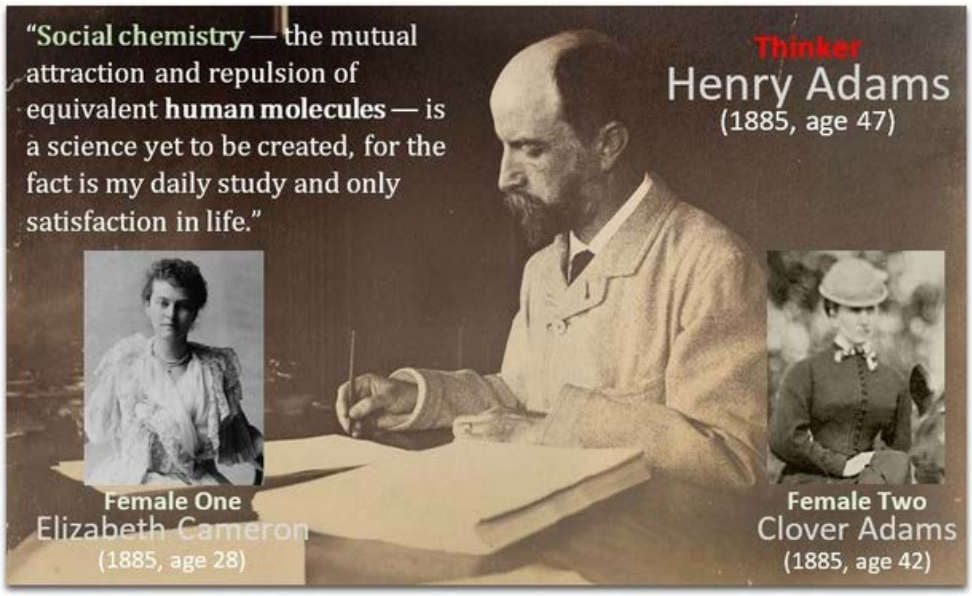

The 1885 Henry Adams love thought experiment, i.e. trying to understand "**the idea**" of relationships from the point of view of nature as determined by physics and chemistry.

> "On the physico-chemical law of development and dynamics, our society has reached what is called the critical point where it is near a new phase or equilibrium."
>
> — Henry Adams (1908), "Letter to Charles Gaskell" (Sep 27)

> "The solution of mind is certainly in the magnet."
>
> — Henry Adams (1908), "Letter to Charles Gaskell" (Sep 27)

> "I have run my head hard up against a form of mathematics that grinds my brains out. I flounder like a sculpin in the mud. It is called the 'law of phases', and was invented at Yale [by Gibbs]. No one shall persuade me that I am not a phase."
>
> — Henry Adams (1908), "Letter to Elizabeth Cameron" (Sep 29)

> "I'm looking for a 'young and innocent physico-chemist who wants to earn a few dollars by teaching an idiot what is the first element of theory and expression in physics.'"
>
> — Henry Adams (1908), "Note to John Jameson" (Dec)

> "My essay 'The Rule of Phase [Applied to History]' is a 'mere intellectual plaything, like a puzzle' [to Brooks]. I am interested in getting it into the hands of a 'scientific, physico-chemical proofreader' and I am willing to pay 'liberally for the job' [to Jameson]."
>
> — Henry Adams (1909), Notes to Brooks Adams and John Jameson

to go another year to get to the suggested solution stage, as contained in his *Letter to American Teachers of History* (1910), to get to the competent peer-review stage, after which he had a seizure or stroke, after which he could no longer mentally function at this level of inquire; for a total of 47-years working on the so-named "hard problem" of the humanities (see: below).

De Lange

It took Adriaan de Lange approximately 22-years to from the circa 1960 age 15 "struggle stage", which he describes, in retrospect, as follows:

> "Since as a kid I was aware of the abyss (super rift) between the material and mental worlds. I tried to bridge this abyss, but could not. Yet I kept on with my own "Steigerung" as Goethe did."

to go to the age 37 "discovery stage" (1982), which he describes as follows:

> "Then during 1982-83 I discovered empirically that the law of entropy production applies to the spiritual [*humanistic*] world as it applies to the physical world. My joy knew no bounds. I have found the bridge between these two worlds with which to cross the abyss between them. Others thought I was crazy and would not dare to publish my account."

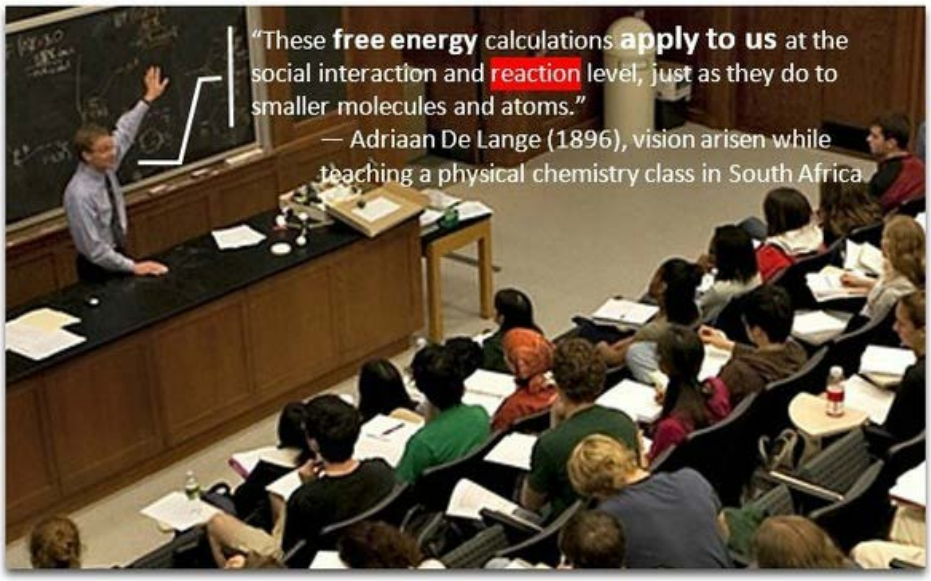

A mock rendition of South African physical chemistry Adriaan de Lange (1986) teaching Lewis-based physical chemistry to his students, amid which he came to the realization that these principles ALSO apply to people at the social interaction and reaction level; it would take him another 23-years to go from the "**idea stage**" to be able to pen out a full book on this view. [3]

to go another 4-years to the mental solution stage (1986), which arose in his mind "while lecturing" to students as a physical chemistry professor, which he describes in retrospect as follows:

> "Then, in 1986, if I remember correctly, I was teaching university students the intricate calculations concerning free energy in chemical reactions. During that lecture I suddenly became aware how my mind was rushing along two levels. The lower level was concerned with chemical processes as a physical phenomenon. I executed this level almost automatically. But the higher level of my mind was exploring free energy in the process of knowing-learning as a spiritual [*thermodynamics*] phenomenon. I followed this level with great curiosity. I think the students became aware that I was rather absent minded that day, not perceiving my higher most thoughts. That day marks the beginning of my continual exploring of the role of free energy in the spiritulization [*actualization*] of humankind."

to go another 12-years to get to the internet sphere / online / forum "discussion stage" of idea water testing and discussion (1998-2001). [2]

It took him another 8-years to go from the scattering of online postings of dialogue and idea stage to go to the "online chapter-by-capther book stage", in the form of the published book *Irreversible Self-Organization* (2009), which is only available in Afrikaans and not available as a printed book; for a total of 49-years working on the so-named "hard problem" of the humanities (see: below). As of 2010, De Lange's health is too frail for him to move beyond this stage to make an English-translation stage of his work so to be available in either article form (e.g. JHT publication) or book form, for the global audience. [4]

Beg

It took Mirza Beg exact **2-years** to go from the 1974 age 42 "observation stage" that, as an attending scientist, taking notes, lecturers in his advanced training humanities course at the National Institute of Public Administration, Karachi, Pakistan, were using physical chemistry like terms such as: "polarization, activation, potential energy, complexes, compounds, perhaps metaphorically and in an unrelated context", to the mimeographing of his notes into the 1976 age 46 booklet *Human Behavior in Scientific Terminology*, to go another **5-years** to get past the 1983 age 51 "peer review stage", according to which out of this booklet five articles were published in local journals, namely:

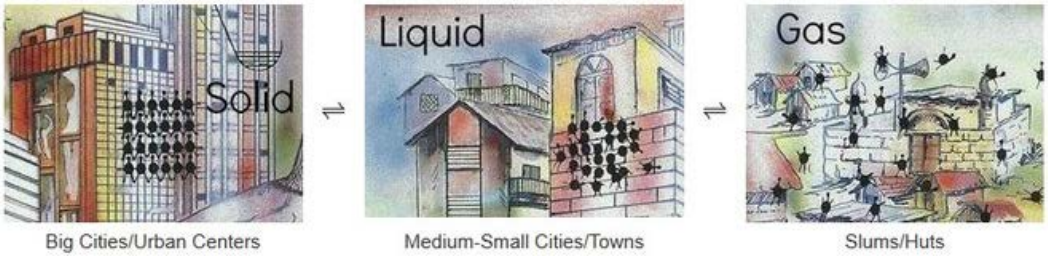

It took Pakistani organometallic chemist Mirza Beg 13-years to go from the 1974 age 42 "this idea" stage of listening to his fellow humanities scholars lecture about public administration using metaphorical physical chemist language, such as: "polarization, activation, potential energy, complexes, compounds, etc." to get to the 1987 age 55 non-metaphor presentation of physicochemical description "view" of society as an actual trained organometallic chemist sees things, via the publication of his *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*.

â— Beg, Mirza. (1979). “Human Behaviour in Scientific Terminology”, *Pakistan Management Review*.
â— Beg, Mirza. (1980). “Human Behaviour in Scientific Terminology: Assimilation”, *Pakistan Management Review*.
â— Beg, Mirza. (1981). “Human Behaviour in Scientific Terminology: Affinity, Free Energy Changes, Equilibria, and Human Behaviour”, *Pakistan Management Review*.
â— Beg, Mirza. (1982). “Article Title”, *Pakistan Marketing Review*.
â— Beg, Mirza. (1983). “Physico-Chemical Processes and Human Behaviour Part—IV: Muslim Society, its Formation & Decline”, *Science & Technology in the Islamic World*.

It took Beg another **4-years** to get to the 1987 age 55 revolution stage setting book: *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior*, wherein the science of physicochemical sociology is largely founded; after which taking him another **27-years** to get to the 2014 age 82 global water-testing of his ideas stage, via Academia.edu, OUTSIDE of the sphere of the Islamic-anchored mindsets of his fellow Pakistani's, wherein in their minds, everything he suppositions is implicitly assumed to be the will or infinite power of Allah, morality defined by the Quran, wherein he "collided" with extreme ultra-reductionist atheist Libb Thims (see: Beg-Thims dialogue), and therein found the inherent weaknesses in his "idea" turned published presentation.

Thims

it took Thims exactly 8-years to go from an age 15 confusion about the subject, namely of mate selection, in relation to work (occupation, social climbing, and happiness, to age 23 visualization of "the idea" that the solution was found in chemical thermodynamics + evolutionary psychology base mate selection modes. Specifically, in Fall 1994, amid his course: Chemical Engineering Thermodynamics I [ChE 230], Winter 1995, or amid the course: Chemical Engineering Thermodynamics II [ChE 330], or at the very latest, Spring 199, amid the course: Physical Chemistry [CHEM 468], see: Libb Thims (history), Thims’ gleaned the patently-obvious **“idea”**, in his mind, that these equations, reactions, and principles, he was learning, in these courses, wherein he received straight As, being near the top of his graduating class, of about 128 student, in each course, to predict and understand the nature of molecular formations, reactions, and dissolutions, applied to human reactions at the macro-social level; something along the lines of the following logic or view, i.e. that columns 1-3 are "translatable" to the phenomena described in columns 5-6:

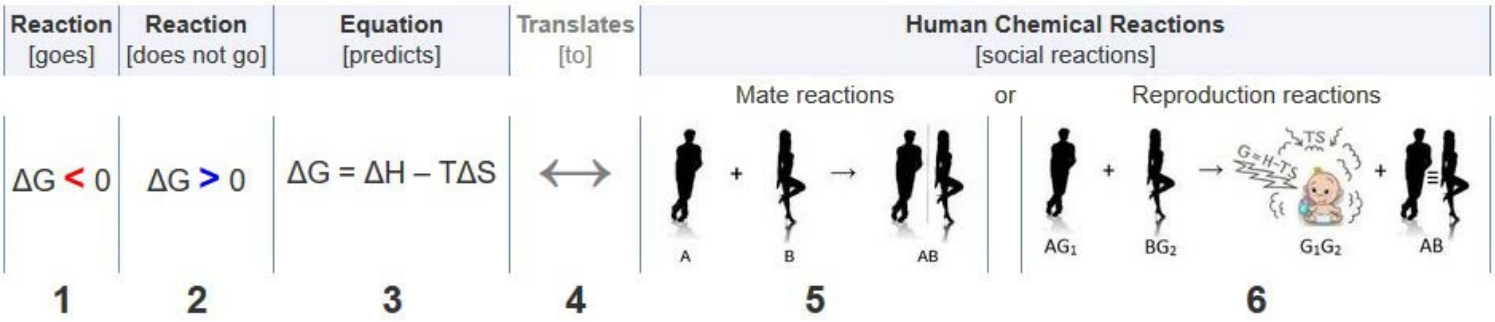

The question Thims had, in his mind, at this point, was “who” exactly, historically, or “how” exactly, in modern terms, was this explained, in detail? Thims, for whatever reason, did not ask the question OPENLY in class, despite of the fact, that he routinely sat in the front of every class, raised his hand to as the most questions in class, or thereabouts, and was the student that did some of the most teacher office visits, to get specifics answer, on various questions, that he couldn’t solve on his own.

It took Thims another 7-years to to get to the partial equation solution stage (2001) of the problem, in terms of partial differential equations, to another 2-years to the "evidence stage" of proving to oneself that the theory matches real data (see: Beckhaps law proof), to go anther 4-years to get to the published textbook stage of the basics of the model (2007), and another 9-years to publish a 10-volume encyclopedia (2016) on the historical footnotes and elaboration on details of the basic large picture outline of the subject. The *Human Chemical Thermodynamics* textbook presentation of this complete picture, the way chemical thermodynamics textbooks are actually written, however, is something not realized at the moment; for a total of (as of 2016) approximately 29-years working on the so-named "hard problem" of the humanities (see: below).

Hirata

In 2000, American child prodigy Christopher Hirata, age 18, in one of his Caltech faculty subpages, entitled "fun stuff", jumped into the published joking "metaphor stage", with his five part *The Physics of Relationships*, which outlined pretty much the same thing Goethe outlined 200-years ago, albeit with Gibbs energy + Van't Hoff equilibrium reaction model upgrades; the following is a synopsis of this:

> “Hirata (IQ:225|#3) is an astrophysicist who is known for his work 'The Physics of Relationships.' His fame came at age 13 when became the youngest competitor ever to win a gold medal at the International Physics Olympiad. At 16, he began working with NASA on a project dedicated to colonizing Mars. He produced a similar theory on human chemical thermodynamics to Johann Wolfgang von Goethe (IQ:220|#4).”
>
> — Roxy Farrah (2014). “20 Smartest People to Ever Exist” (Ñº), Aug 30

(add discussion)

Hirata | Joke? | Discussion

Of peculiar note, Hirata, as is often pointed out by detractors and objectors to "this idea", opened his teenage — himself not yet having had any serious romantic relations [reaction] at this point — "fun stuff" derivation with the following disclaimer:

> In the true spirit of Caltech (I'm not sure if this applies to Princeton), I devote this section of my website to the application of basic physical principles to relationships, particularly the romantic kind. Before I do this, I will make a few comments. You should understand them before you proceed. They aren't hard to understand**:** (a) **Don't take it too seriously**. This site is for your amusement, and it does not serve any other purpose. I am not a counselor, and if you have a real problem with your "significant other" then this page won't help you solve it. I take no responsibility for what you do with this information. Also recall that I don't have a girlfriend, so what do I know about this? Only what physics can tell me. [UPDATE: Since I wrote this page I have found Annika and we are engaged. This confirms that I know what I'm talking about.]. (b) This site is geared primarily toward nerds. If you're not a nerd, this doesn't mean I want you to go away. In fact, it will give you some idea of the **types of jokes** frequently made in Caltech dorms. You may or may not find it interesting. (c) This is not a dirty site. For my younger audience: since this is the Internet, and I recognize that little kids have access to any material I put here, this site contains no sexually explicit material. (This is also because I don't want losers reading my page.)
>
> So enjoy the compilation of **worthless applications** of physics and mathematics to relationships:

"You've GOT to realize the **blatant absurdity** of trying to model the laws governing human relationships using the rules of **thermodynamics**, a set of rules that only apply at a molecular level. *Human beings are NOT molecules, they are composed of molecules*, but we aren't **giant molecules**. Human relationships are governed mostly by human psychology. I can only assume you're senile or crazy to believe this nonsense. Thermodynamics of human relationships is bullcrap. **The stuff Hirata said about human thermodynamics was a JOKE**. You don't seriously believe that he was serious about this, do you? Your obsession with human thermodynamics is silly."
— Lubos Motl (2010), YouTube dialogue with Libb Thims, Nov 16-20

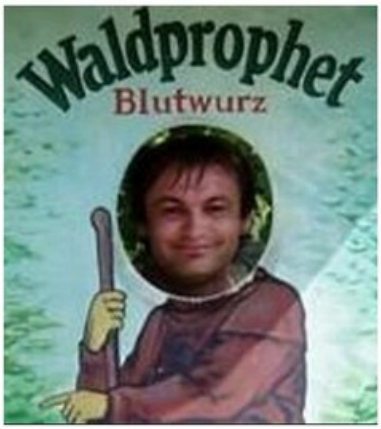

The 16-20 Nov 2010 opinions of wildcard Lubos Motl (photo shown being his Twitter (Ñº) page avatar) – a former Harvard physics professor, who in 2007 was forced (Ñº) to resign, owing to his over-typical approach of using flaming criticism of anti-string theory advocates, such as Lee Smolin and Peter Woit, whose books he described as "crank" and "crackpot" – on Hirata and Thims versions of human chemical thermodynamics theories, dismissing Hirata as "but a joke" and Thims as senile or crazy. [8]

Hirata, of note, compared to Goethe, was like Goethe a child prodigy, who like Goethe, became an IQ:225 cited adult. Hirata, however, seems to have given this "disclaimer" so not to worry his older peers or hinder his chance of getting tenure or deter funding opportunities down the line, down the line, or something to this effect. In other words, it is very effrontery and dangerous for a young person, without standing, to come out and challenge the *status quo* by saying, something to the effect of "this is a posited model of reality!"

Conversely, as history has shown, such ventures tend to somewhat dangerous; the prime examples include: Frederick Rossini who in his age 72 address "Chemical Thermodynamics in the Real World" (1971), asserted that this is the modern model of the "real world", a supposition which eventually "sparked" 2006 heated Rossini debate in the *Journal of Chemical Education*; or such as the young boundary-pushing age 19 Percy Shelley, a fellow human elective affinities theorist (see: Church of Elective Affinities), like Goethe, whose anonymously published 1811 realism pamphlet *The Necessity of Atheism*, which got him expelled from Oxford on 25 Mar 1811; or as James Froude, the person who did the first English-translation of Goethe's *Elective Affinities*, found out the hard way, when his book *The Nemesis of Faith* was burned in the moral philosophy of class professor William Sewell at Oxford:

> "Froude's semi-autobiographical *Nemesis of Faith*, published in 1848, owed much to Goethe's novel of human and chemical reactions, *Elective Affinities*, which he translated. *Nemesis* lost him his fellowship at Exeter College, Oxford, where his book was **publicly burned**."
>
> — David Knight (2009), *The Making of Modern Science*

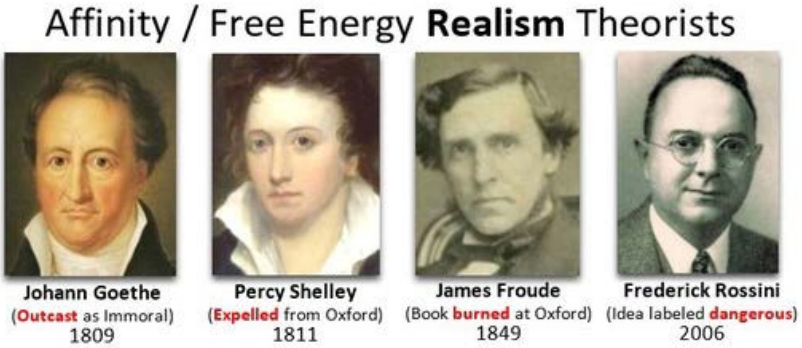

A selection of four realism philosophers, namely: Goethe, Shelley, Froude, and Rossini, who each asserted **boldly** that the chemical affinity (human affinity theory) or chemical free energy model (human free energy) of humanity IS the modern real world model, i.e. realism, and and NOT a childish joke, as many, e.g. Hirata, Hwang, among others, like to passingly suggest, so not offend anyone's religion or beliefs, and or to side-step the "danger" that such suggestion tends to bring forth.

Hirata might have seen similar repercussion had he pushed for realism. Likewise, in an 1827 conversation with Johann Eckermann, Goethe discusses a letter from Solger to Tieck in which kind words about the *Wahlverwandtschaften* (Elective Affinities) were spoken on the fine nature of the Architect's character; after which he comments on this letter that:

> "These remarks were written as early as 1809. I should then have been much cheered to hear so kind a word about the *Wahlverwandtschaften*; for at that time, and afterwards, not many pleasant remarks were vouchsafed be about that novel."

Goethe's bold assertion that his novella / chemical theory is a realism presentation, and not metaphor, found a cold reception and likely rejection for many people, which of course was due to the fact that the logic of the book was many centuries ahead of its time.

Hirata, in short, stopped at this stage, to pursue more practical line of work, namely becoming a astrophysics professor, at Ohio State University, who is presently attempting to solve the dark matter problem and the accelerating universe problem.

Hwang

In 2001, American chemistry student David Hwang, age 22, jumped into the "metaphor stage", via article size "presentation", when he published his *The Thermodynamics of Love*, in his newly formed school journal article *Journal of Hybrid Vigor*, wherein he jokingly or with a flavor of humor (similar to Hirata) outlined how Gibbs free energy explains mate selection:

> "Two people who fall in love with one another are often described as having a certain personal 'chemistry.' Although most people would probably be quite content with accepting this convention at face value, the **truth** is that the correlation between romance and everyone's favorite branch of the natural sciences runs quite deep. In fact, while the terminology of thermodynamics explains the spontaneity of chemical reactions very well, it also applies directly to various factors determining the success of human relationships."
>
> — David Hwang (2001), "The Thermodynamics of Love" [1]

Hwang, however, stopped at the published metaphor stage, to pursue more a more practical line of work, i.e. a career as a neurointensivist physician at Yale Medical School.

Others

Others to jumped into the published "this is fun amusing idea" stage, include: John Tukey (1966), Chanel Wood (2007) and Surya Pati (2009), to a few dominate examples.

Neumann vs Einstein | Problem holding

The above outlined "this idea" chronology of variants of the stages of the elective affinities problem is what is called the hardest of the hard wood problems; as gist of which is outlined as follows:

> "I have little patience for [thinkers] who take on a board of wood, look for its **thinnest** part, and drill a great number of holes when the drilling is easy."
>
> — Albert Einstein (c.1930), recalled by Philipp Frank [18]

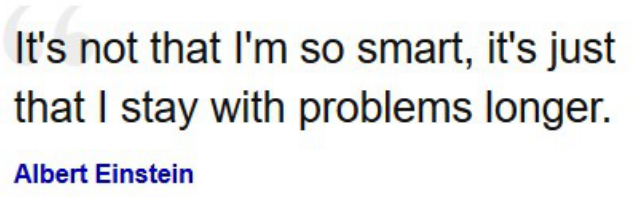

Einstein credited his famed intelligence to his tenacity with problems; only a few great thinkers, Goethe and Henry Adams in particular, have had the mental aptitude to "stay with" the elective affinities problem, past the passing "**this idea**" stage.

In other words, John Neumann, to cite one example, as compared to Einstein (see: who was smarter?), was a soft wood genius, as compared to Einstein (a hard wood genius). While both were smart, the difference between Neumann and Einstein is that Neumann drilled many holes in medium density wood, whereas Einstein stayed with his hard wood problem, and didn't let go; the following quote attests to this difference:

> "I have known a great many intelligent people in my life. I knew Planck, von Laue and Heisenberg. Paul Dirac was my brother in law; Leo Szilard and Edward Teller have been among my closest friends; and Albert Einstein was a good friend, too. But none of them had a mind as quick and acute as Jansci [John] von Neumann. I have often remarked this in the presence of those men and no one ever disputed. But Einstein's understanding was deeper even than von Neumann's. His mind was both more penetrating and more original than von Neumann's. And that is a very remarkable statement. Einstein took an extraordinary pleasure in invention. Two of his greatest inventions are the special and general theories of relativity; and for all of Jansci's brilliance, he never produced anything as original."
>
> — Eugene Wigner (c.1980) (Ñº)

In 1934, Neumann, in dialogue with Abraham Flexner, on Georges Guillaume's economic thermodynamics PhD dissertation, had the "general idea", as outlined above, in the minds of: Goethe, De Lange, Thims, etc., which he describes to Flexner as follows:

> "I think that the basic intention of the authors, to analyze the economic world, by constructing an analogous fictitious 'model', which is sufficiently simplified, so as to allows an absolutely mathematical treatment, is—although not new—sound, and in the spirit of exact sciences. I do not think, however, that the authors have a sufficient amount of mathematical routine and technique, to carry out program out.
>
> I have the impression that **the subject is not yet ripe** (I mean that it is not yet fully enough understood, which of its features are the essential ones) to be

Thermodynamic variable	Economic analogon
Energy	Value (estate of an economical subject)
Entropy	Liquidity
Free energy	Cash value

Neumann's 1934 human thermodynamics variables table, based on his review of Georges Guillaume's 1934 *On the Fundamentals of the Economy with Rational Forecasting Techniques*.

> reduced to a small number of fundamental postulates—like geometry, or mechanics (cf. pgs. 77-78). The analogies with thermodynamics are probably misleading (cf. pgs. 69, 85). The authors think that the 'amortization' is analogous to 'entropy'. It seems to me, that if this analogy can be worked out at all, the analogon of 'entropy' must be sought in the direction of 'liquidity'. To be more specific: if the analogon of 'energy' is 'value' of the estate of an economical subject, then analogon of its thermodynamic 'free energy' should be its 'cash value'.
>
> The technique of the authors to set up and deal with equations is rather primitive, the way, for instance, in which they discuss the fundamental equations (1) and (2) on page 81-85 is incomplete, as they omit to prove that 1: the resulting prices are all positive (or zero), 2: that there is only one such solution. A correct treatment of this particular question, however, exists in the literature. Various other technical details in the setting up of their equations and in their interpretations could be criticized, too. I do not think that their discussion of the 'stability of solutions', which is the only satisfactory way to build up a mathematical theory of economic cycles and of crises, is mathematically satisfactory.
>
> The emphasis the authors put on the possibility of states of equilibrium in economics (cf. pgs. 68-69) seems to me to entirely justified. I think that the importance of this point has not always been duly acknowledged. I cannot judge the value of their statistical methods, as they are given in the last part of the book for practical purposes. Their aim is to diagnose the present status of economics, and to lead to forecasts. But I think that the theoretical deduction, which lead to them is weak and incomplete."

Neumann, in short, gleaned the general idea of the subject, as Goethe, De Lange, and Thims, independently, e.g. stating that free energy is equivalent to cash value, but did not stay with the problem, say as compared to Einstein did with his running along side a beam of light though experiment. Neumann said the problem was too unripe, and moved on to something else.

Humanities | Hard wood problem

Once one goes through all of the hard sciences, and get into the top 50 range, of the world's greatest geniuses, as Goethe (IQ:230|#1), Newton (IQ:220|#2) and Percy Bridgman (IQ:185|#52) achieved, the above "idea" becomes the crowning jewel "hard problem" of the humanities:

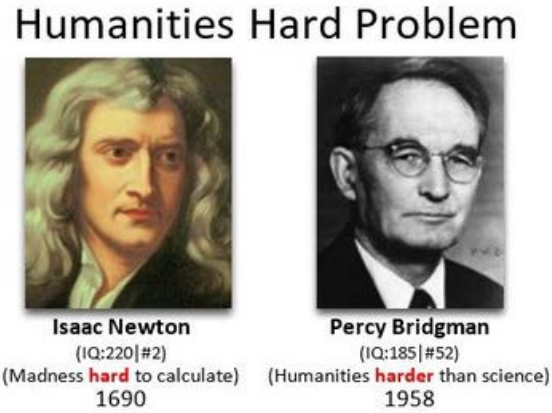

The humanities, according to Newton and Bridgman, are "harder" than the physical sciences; this is evidenced by the Bridgman paradox.

> "I can calculate the movements of stars, but not the madness of men."
>
> — Isaac Newton (c.1690), after losing his hat in a market collapse [6]

> "The humanities are much more complex and difficult than the sciences."
>
> — Percy Bridgman (1958), "Quo Vadis" [7]

In short, once one goes through and masters all the physical, chemical, and natural sciences, in a pristine manner, the so-called "idea" that Hirata jokes about, that Henry Adams said he floundered "like a sculpin in the mud" on, that Goethe said was his "best book", one comes to discern the physico-chemical solution to the big humanities questions is harder than any question in the pure physical or chemical sciences.

Quotes

The following are related quotes:

> "Something 60-80 years ahead of its time. Thims, in the future, will be someone who's talked about in classrooms as this guy who had **this idea**. However, now, yes the book will sell, but its premise will not be accepted by people of this generation."
>
> — Monzer Ettawil (2005), American law student

> "As strange as it sounds, I have thought the same way (chemically) about relationships ... especially entropy and molecules. Weird.ï»¿"
>
> — Hala Kalmareiata (Ñº) (2014), "IQ:200+ | Smartest Person Ever (3 of 4)", forum (Ñº) post

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θΔics

In existographies, **Thomas Aikenhead** (1676-1697) (EPD:FM|10) (FA:63) was a Scottish medical student, turned satirical and outspoken irreligionist, noted for []

An artistic rendition of **Aikenhead** (1697), aged 20, hung for blasphemies against Christianity, e.g. speaking of Jesus as an impostor (see: three impostors), that Moses faked a genealogy, that the Old Testament is a variant of Aesop's fables, etc. (Q)

Education

Thomas was the son of James Aikenhead, an Edinburgh surgeon-apothecary, and Helen Ramsey. The following, from Dilys Rose's *Unspeakable* (2017), is a synopsis of Aikenhead's early years: [5]

> "A young Tom was very inquisitive. He wanted to know if more truth could be made by stretching the truth. Why, he wondered, did two of his sisters die in infancy. Why did the Lord need so many bairn? Do cats have souls, and if so, can cats go to hell? Tom's early upbringing included weekly churchgoing where the minister preached fire and brimstone. One May day, several families including Tom's skipped church, choosing instead, to picnic by the river. Church elders were sent to determine who the Sabbath breakers were. Tom's mother was made to stand on a stool of repentance in church for six consecutive Sundays and be publicly humiliated along with gamblers and fornicators. After losing both parents at a young age [age 10], Tom was sent to live with legal guardian, Sir Patrick Aikenhead. Thomas was deemed to be bright and well-mannered. Sir Patrick, demonstrating Christian charity, sent Tom to the University of Edinburgh."

At age 17, in 1693, he enrolled at Edinburgh University. By then the University library held books by Rene Descartes, Benedict Spinoza, Thomas Hobbes, Charles Blount, and other so-called atheists. Moreover, while Aikenhead was a student, John Toland's *Christianity Not Mysterious*, and Michael Servetus' *The Restoration of Christianity* (*Christianisimi Restitutio*), which rejected (Q) trinity and the concept of predestination, were added to the university library. It has been conjectured, by many, that he read some if not all of these works. [3]

Beliefs

Aikenhead, according to the trial reports of five student 'friends' appeared as prosecution witnesses, professed some variety of pantheism, albeit this term was not coined until 1705, and denied creation. [5]

Blasphemy | Trial

In c.1796, Aikenhead, circa aged 19, while a medical student at the University of Edinburgh, began venting about the nonsensical nature of religion. He was accused of blasphemy. He then confessed to all chargers and begged for forgiveness. On 8 Jan 1697, it was decided, by one vote, however, to execute Aikenhead, then aged 20.

Aikenhead, supposedly, was the last person in Britain to be executed for blasphemy. (Q)

Most of the material on Aikenhead was meticulously preserved by John Locke. [1]

Aikenhead's trial and execution appeared in the fourth volume of Macaulay's 1855 *History of England*. [2]

In 2016, a play on the Aikenhead event, entitled "I Am Thomas" (Q)(Q), in reference to the "I Am Charlie" slogan, in reference to the Charlie Hebdo shooting (2015), co-production by the National Theatre of Scotland and the Lyceum Theatre, Edinburgh, opened at the Liverpool Playhouse on Feb 19 and toured to Salford, Salisbury, Edinburgh, Inverness and London. (Q)

Quotes | On

The following are quotes on Aikenhead:

> "The killing of **Thomas Aikenhead**, like the hounding of Salman Rushdie for the same 'offense,' was a disgrace. . . a prime example of a god-fixated state killing a man in an attempt to stop the spread of an idea."
>
> — George Rosie (c.1999), *The Scotsman* [4]

Quotes | By

The following are quotes by Aikenhead:

A photo of Scottish Secular Society's so-named "Aikenhead Award" (Q) given to services to secularism.

> "The Old Testament is Ezra's fables, made by a profane allusion to Aesop's fables, with which a cunning man [Moses] drew a number of Babylonian slaves to follow him, for whom he had made up a feigned genealogy."
>
> — Thomas Aikenhead (c.1696) [1]

> "The New Testament is the history of the impostor Christ who learned magic in Egypt and picked up a few ignorant blockish fisher fellows, playing pranks on them with his supposed miracles."
>
> — Thomas Aikenhead (c.1696) [1]

> "I thought a great part of morality, if not all, proceeded *ex arbitrio hominum*, as of that kingdom or common-wealth, or what most men think convenient for such and such ends, and these ends are always terminated upon being congruous to the nature of things; now we see that according to men's fancy things are congruous or incongruous to their natures, if not to the body, yet to the thinking faculty"
>
> — Thomas Aikenhead (c.1696) (Q)

> "Theology is a rhapsody of ill-invented nonsense, patched up partly of the moral doctrines of philosophers, and partly of poetical fictions and extravagant chimeras."
>
> — Thomas Aikenhead (c.1696) [1]

> "The scriptures are so stuffed with madness, nonsense, and contradictions, that one can only admire the stupidity of the world in being so long deluded by them."
>
> — Thomas Aikenhead (c.1696) [1]

> "Moses, if there ever was such a man, learned magic in Egypt, but was both the better artist and better politician than Jesus."
>
> — Thomas Aikenhead (c.1696) [1]

"I reject the mystery of the trinity as unworthy of refutation; and I scoff at the incarnation of Christ."

— Thomas Aikenhead (c.1696)

"I wish, when cold, to warm in hell."

— Thomas Aikenhead (c.1696) (Q) [4]

"It is a principle innate and co-natural to every man to have an insatiable inclination to the truth, and to seek for it as for hid treasure. So I proceeded until the more I thought thereon, the further I was from finding the verity I desired."

— Thomas Aikenhead (1697) "Letter to Friend" (last words) morning, Jan 8 [4]

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(b) Thomas Aikenhead (quotes) – GoodReads.
(c) Thomas Aikenhead – Dictionary of Unitarian and Universality Biography.
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3. (a) Thomas Aikenhead – Dictionary of Unitarian and Universality Biography.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 338-39). HarperOne.
4. Thomas Aikenhead – Dictionary of Unitarian and Universality Biography.
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Further reading

● Graham, Michael F. (2008). *The Blasphemies of Thomas Aikenhead: Boundaries of Belief on the Eve of the Enlightenment* (abs). Edinburgh University Press.

External links

● Thomas Aikenhead – Wikipedia.

θΔics

In existographies, **Thomas Andrews** (1813-1885) (CR:10) was an Irish chemist and physician noted for his 1869 article "On the Continuity of the Gaseous and Liquid States of Matter" in which, building on the work of Charles Cagniard (1822), Michael Faraday (1823), and a few others, he discusses the 'critical point' of a fluid and the results of his experiments on carbonic acid, H_2CO_3, which showed that the acid in its liquid state may be carried to gaseous state without losing its homogeneity. [1]

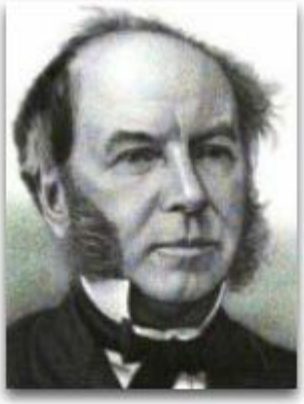

Gibbs

Andrews' 1869 article was famously cited by American engineer Willard Gibbs in his two 1873 graphical thermodynamics articles and in his 1876 *On the Equilibrium of Heterogeneous Substances*. [2]

Andrews' follow-up 1876 article, on the same subject, "On the Gaseous State of Matter", was cited by Gibbs in his 1879 article. [4] Andrews is also noted, supposedly, for his work on the subject of the 'heat of combination', such as his 1841 article "On the Heat Developed During the Combination of Acids and Bases", and others to follow. [5]

Maxwell

Gibbs use of Andrews' experimental results in the development of his graphical method of representing the various states of a substance on an energy, entropy, volume coordinates plot, stimulated the production of Irish physicist James Maxwell's 1874 thermodynamic surface of water, and two follow-up communication letters with Andrews on the construction of his surface. [3] Maxwell had made reference to Andrews' experiments in his 1874 article "Van der Waals on the Continuity of the Gaseous and Liquid States". [7]

Education

At an early age, Andrews attended the Belfast Academy and then the Academical Institution, where studied mathematics under James Thomson (mathematician).

In 1828, at age 15, Andrews attended the University of Glasgow, where he studied chemistry under Thomas Thomson. [5] Andrews, at this age, was described, by Dr. M'Donnell, a well-known Belfast Physician and family educational advisor of sorts, as a "modest silent boy, who wished to study chemistry profoundly, not merely as being connected with his profession, but as a great branch of human knowledge." [6] Andrews published his first scientific paper that year "On the Action of the Blowpipe on Flame." In a March 25th, 1830 letter to Andrews' father, Dr. M'Donnell, a well-known Belfast Physician and family educational advisor of sorts, suggested the following education plan for young 17-year-old Thomas Andrews:

> "Thomas should enter Dublin College, and return home from that, without pursuing the usual course of study there. He should at the same time be bound nominally to a surgeon, after which he should go to France and Italy, and remain there until he has satisfied his own mind; and, returning from thence, should attend as many terms in Dublin as would qualify him for taking the degree of Bachelor of Arts, and either or both the other degrees in Surgery and Physics; taking care in these pursuits, never to relinquish the idea of becoming ultimately a merchant if it became his duty or interest to do so."

Curiously, Andrews, over the next fifteen years, enacted and completed this plan down to the last detail. In 1830, Andrews went to Paris to study the subjects of zoology, and chemistry in its application in the arts, botany, vegetable physics, mineralogy, and geology; during which time he became an apprentice in the laboratory of French chemist Jean Dumas, attended Dumas' chemistry course at the College of France, and met French chemist Joseph Gay-Lussac, eponym of Gay-Lussac's law ($P = kT$, at constant volume). He also interned at the Hopital de la Pitie.

Following his studies in Paris, Andrews completed spent four undergraduate years in Trinity College, Dublin, studied classics, science, and medicine, where he attended the lectures of Irish mathematician William Hamilton on astronomy. Concurrently, he attending lectures in the School of Physic in Ireland, in the Meath Hospital, and in the Richmond

Surgical Hospital.

In 1835, Andrews completed his MD at the Edinburgh Medical School, University of Edinburgh, after which he started a successful medical practice in his native Belfast; while simultaneously giving instruction in chemistry at the Academical Institution. In 1845, he was appointed vice-president of the newly established Queen's University of Belfast, and professor of chemistry there; two offices that he held until his retirement in 1879.

Owing to his varied studies and academic associations, Andrews is associated with four thermodynamic schools: École Polytechnique, Glasgow school, Edinburg school, and Gibbs school.

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(c) Gibbs, Willard. (1876). "On the Equilibrium of Heterogeneous Substances", *Transactions of the Connecticut Academy* (Andrews [1869], pg. 129), III. pp. 108-248, Oct., 1875-May, 1876, and pp. 343-524, may, 1877-July, 1878.
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6. Dr. M'Connell (well-known Belfast Physician). (1828). "Letter of Introduction (to Thomas Thomson) for Thomas Andrews", Nov 1st.
7. Maxwell, James. (1874). "Van der Waals on the Continuity of the Gaseous and Liquid States", *Nature*, 10: 477-80, 15 Oct.

External links

â— Thomas Andrews (scientist) – Wikipedia.

θΔics

In existographies, **Thomas Aquinas** (1225-1274) (IQ:170|#325) (Cattell 1000:384) [RGM:110|1,500+] (Murray 4000:6|WP) (Gottlieb 1000:8) (GPhE:#) (CR:54) was a an Italian theological philosopher noted for is 1274 *Summa Theolologica* (*Total Theology*), wherein he tackles the pros and cons of the Plato-Aristotle dictum that "nothing moves itself", particularly in regards to the "will".

Will | Self-motion?

In his third article titled "Whether the Will Moves Itself", Aquinas opens to his first objection, citing Aristotle's *Physics 3*, and states the following: [1]

> "It would seem that the will does not move itself. For every mover, as such, is an act: whereas what is moved, is in potentiality; since *movement is the act of that which is in potentiality, as such* [2]. Now the same is not in potentiality and in act, in respect of the same. Therefore **nothing moves itself**. Neither, therefore, can the will move itself."

This would be in accordance with the Isaac Newton era logic that "only force can move an object" or in strict accordance with the 1865 Rudolf Clausius thermodynamic framework that: [3]

> "Every force tends to give motion to the body on which it acts; but it may be prevented from doing so by other opposing forces, so that equilibrium results, and the body does remains at rest. In this case the force performs no work. But as soon as the body moves under the influence of the force, work is performed."

The conflict between the two positions, anthropomorphic "will-based" notions of movement vs. "force-based" notions of movement, often tends to come to the fore in philosophical debates regards to human movement. [4] Resolution of the crux only becomes more complicated in the framework of the post circa 1925 "exchange force" model of force, wherein animation of "bodies", such as intentional human movement, can be understood by studying the bending movement of the retinal molecule, as being a type of induced movement brought about the the exchange of photons, the force carrier of the electromagnetic force, "acting" on the electron structure of 11-12 carbon bond of the molecule.

Education

Aquinas was a student of Albertus Magnus. [5]

Quotes | On

The following are related quotes:

> "The monumental work of **Thomas Aquinas**, which based on Aristotle, including its whole theory of natural law, is the foundation of Roman Catholic theology."
>
> — Tom Harpur (2004), *The Pagan Christ* (pg. xxii)

> "Aquinas' masterpiece and his monument, *Summa Theologica*, contains 38 treatises, and deals with 612 separate questions, subdivided into 3,120 separate sections. In all the work asks and answers ten thousand questions."
>
> — David Berlinski (2008), *The Devil's Delusion* (pg. 65)

Quotes | By

The following are quotes by Aquinas:

> "It seems that everything we see in the world can be accounted for by principles, supposing god did not exist. For all natural things can be reduced to one principle, which is nature; and all voluntary things can be reduced to on principle, which is human reason, or will. Therefore, there is no need to suppose god's existence."
>
> — Thomas Aquinas (1275), *Total Theology* [6]

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Further reading

â— Crosby, Everett U. and Webb, Charles R. (1973). *The Last Prolouge* "Toward a New Equilibrium" (pg. 369). Ardent Media.

External links

â— Thomas Aquinas – Wikipedia.

θΔics

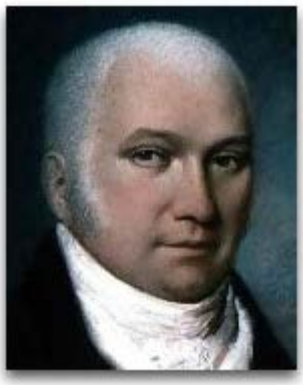

In existographies, **Thomas Beddoes** (1760-1808) (CR:3) was and English physician and science writer noted for doing the 1785 English translation, with original notes, of Swedish chemist Torbern Berman's 1775 *A Dissertation on Elective Attractions*. [1]

Beddoes was also the second person to use the term "biology".

References

1. (a) Chisholm, Hugh. (1910). *The Encyclopedia Britannica, Volume 3* (Thomas Beddoes, pg. 614). At the University Press.
(b) Bergman, Torbern. (1775). *A Dissertation on Elective Attractions*. London: Frank Cass & Co.

Further reading

â— Levere, Trevor. (2016). *The Enlightenment of Thomas Beddoes: Science, Medicine, and Reform*. Routledge.

External links

â— Thomas Beddoes – Wikipedia.

θΔics

In existographies, **Thomas Browne** (1605-1682) (IQ:175|#240) (PR: 2,000+) (CR:6) English physician, philosopher, encyclopedist; noted for []

Overview

In 1646, Browne, in his *Pseudodoxia Epidemica* (Q), a Bacon-like encyclopedia of sorts, building on the earlier term usage of William Gilbert, coined the term "electricity". [1]

Personal library

Browne's personal library had over 2,000 titles (Q); subjects: Greek literature, Roman literature, Arabic, contemporary science, philosophy, theology, medicine, esoteric, natural history, literature, geography and history. (Q)

Quote | By

The following are quotes by Browne:

> "Nature does nothing in vain, is the only indisputable axiom in philosophy. There are no grotesques in nature; not any thing framed to fill up empty cantons, and unnecessary spaces."
>
> — Thomas Browne (1642), *Religio Medici* (Part I, Section 15) (Q)

> "It is a riddle to me how so many learned heads should so far forget their metaphysics, and destroy the ladder and scale of creatures, as to question the existence of spirits."
>
> — Thomas Browne (1642), *Religio Medici*; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 80)

> "Life is a pure flame, and we live by an invisible sun within us."
>
> — Thomas Browne (c.1670)

References

1. (a) Brown, Thomas. (1646). *Pseudodoxia Epidemica – or Enquiries into Very many Received Tenets and commonly presumed Truths.* London.
(b) Kirby, R.S., Withington, S. Darling, A. B. and Kilgour, F.G. (1956). *Engineering in History* (pg. 329). New York: Dover.

Collected works

● Browne, Thomas. (1836). *Works and Correspondence* (4-volumes) (editor: S. Wilkin). London.

External links

● Thomas Browne – Wikipedia.

θΔics

In existographies, **Thomas Carlyle** (1795-1881) (IQ:155|#586) (Cattell 1000:103) (CR:19) was a Scottish philosopher and historian, his doctrines sometimes referred to as Carlylism (Nietzsche, 1887), noted for []

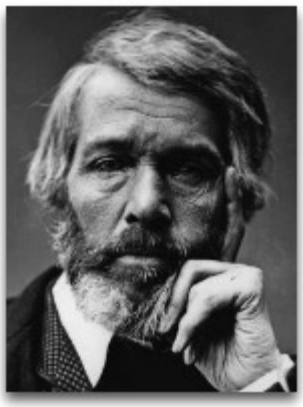

Overview

In 1837, Carlyle, in his *The French Revolution*, described the members of the States-General of 1789 and the National Convention into which it was transformed as gravitating bodies (see: social gravitation): [1]

> "Every reunion of men, is it not, as we often say, a reunion of incalculable influences; every unit of it a microcosm of influences;—of which how shall science calculate or prophesy! Science, which cannot, with all its calculuses, differential, integral, and of variations, calculate the problem of three gravitating bodies, ought to hold her peace here, and say only: In this National Convention there are seven hundred and forty-nine very singular bodies, that gravitate and do much else;—who, probably in an amazing manner, will work the appointment of Heaven."

The following is a picture of the May 5, 1789 meeting of the States-General in the Grands Salles des Menus-Plaisirs in Versailles, France, showing the 749 singular bodies Carlyle speaks of: [2]

Individualism

Carlyle, among historians, is noted for his so-called "great men" theory of history, which Henry Buckle argued against, in its place advocating the belief in the possibility of applying scientific treatment to historical problems, and for his "individualism argument" according to which the historian is supposed to know the knowledge of every act and thought of every individual of a given time in order to write history, which Morris Zucker argued against, stating to the effect that just as the metallurgist in a steel mill does not need to know the actions of every electron and atom of the material he works with to make steel so too does the historian not need to know the actions of every single person to write history.

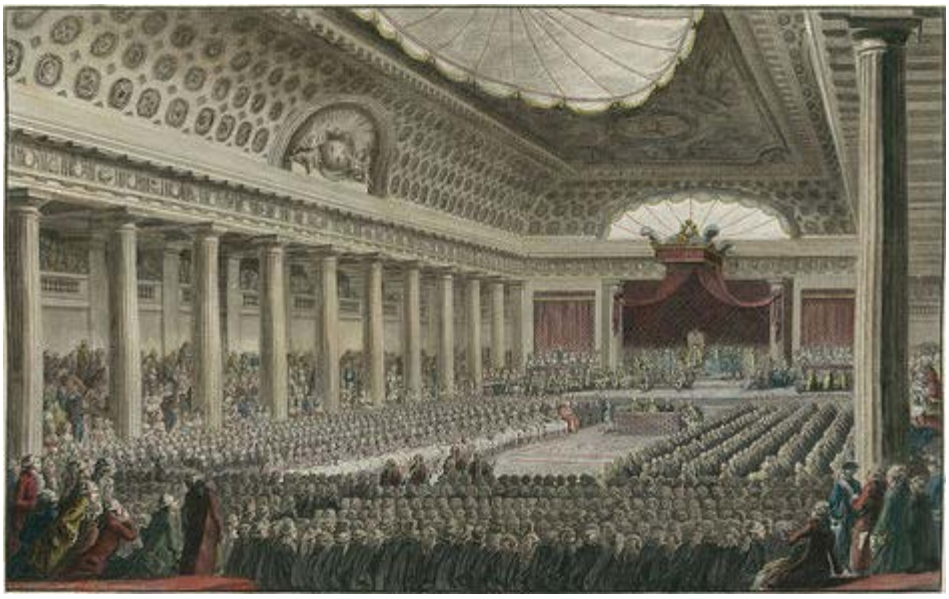

In 1837, Carlyle described the members of the States-General of 1789 and the National Convention, depicted above, into which it was transformed, as gravitating bodies (see: social gravitation).

Goethe | Elective Affinities

In 1877, Carlyle, in his essay *Goethe*, opens to the following, after which he ranks Goethe above Voltaire:

> "Viewed in his merely external relations, Goethe exhibits an appearance such as seldom occurs in the history of letters, and indeed, from the nature of the case, can seldom occur. A man who, in early life, rising almost at a single bound into the highest reputation over all Europe; by gradual advances, fixing himself more and more firmly in the reverence of his countrymen, ascends silently through many vicissitudes to the supreme intellectual place among them; and now, after half a century, distinguished by convulsions, political, moral, and poetical, still reigns, full of years and honors, with a soft undisputed sway; still laboring in his vocation, still forwarding, as with kingly benignity, whatever can profit the culture of his nation: such a man might justly attract our notice, were it only by the singularity of his fortune. Supremacies of this sort are rare in modern times; so universal, and of such continuance, they are almost

unexampled."

— Thomas Carlyle (1877), *Goethe* (pgs. 3-4)

Carlyle described Goethe, in another place, as the "wisest of us all"; the following is another quote:

"Close thy Byron, open thy Goethe."

— Thomas Carlyle (c.1850) (Ñº)

Printed direct commentary by Carlyle on Goethe's *Elective Affinities*, however, is elusive.

"**Thomas Carlyle**, probably one of Goethe's biggest supporters, does not even mention *Die Wahlverwandtschaften* in his major works on Goethe."

— Astrida Tantillo (2001), *Goethe's Elective Affinities and the Critics* (pg. 49)

Carlyle does, to note, employ "elective affinities" in social chemical metaphor usage (Ñº) in his discussions of social revolutions.

Carlyle's disciple James Froude, however, was the first English translator (1854) of *Elective Affinities*.

Other

Carlyle was friends with Ralph Emerson and of John Mill, the latter, together with Jeremy Bentham, noted as being a founder of utilitarianism; Bentham described by Stark classification as being a secondary form of mechanistic social thought.

Quotes | By

The following are quotes by Carlyle:

"Coleridge is 'very great but rather mystical, sometimes absurd.' Essayist William Hazlitt is 'worth little, tho' clever.' Alexander Pope is 'eminently good," while Thomas Gray was found to be 'very good and diverting.' On Washington Irving: 'It was a dream of mine that we two should be friends!' Byron, and those like him, are to be regarded as 'opium eaters', people who 'raise their minds by brooding over and embellishing their sufferings, from one degree of fervid exaltation and dreamy greatness to another, till at length they run amuck entirely, and whoever meets them would do well to run them thro' the body."

— Thomas Carlyle (c.1850) [3]

References

1. (a) Carlyle, Thomas. (1837). *The French Revolution* (pg. 528). Publisher.
(b) The French Revolution: A History – Wikipedia.
(c) Zucker, Morris. (1945). *The Philosophy of American History: The Historical Field Theory* (pg. 42). Arnold-Howard Publishing Co.
2. Estates-General of 1789 – Wikipedia.
3. Hindley, Meredith. (2009). "The Voracious Pen of Thomas Carlyle" (Ñº), *Humanities*, 30(2), Mar/Apr.

External links

â— Thomas Carlyle – Wikipedia.

θΔics

In existographies, **Thomas Carlyle 2** (IQ:155|#546) (Cattell 1000:103) is []

→ Thomas Carlyle (mobile; readable)
→ Thomas Carlyle (online; readable) – WayBack (2015).
→ **Thomas Carlyle** (online; unreadable) – Hacked (being recovered)

θΔics

In economic thermodynamics, **Thomas Carver** (1865-1961) was an American economist noted, according to Oliver Reiser, for his 1924 book *The Economy of Human Energy*, in which he argued that life processes of social groups consist in transforming the largest possible sum of solar energy into human energy, whereby civilization is a device for storing energy, and social welfare depends upon its utilization in such ways as to increase the sum total of utilization of the sun's energy. [1]

Storing energy in a social sense

Some parts of his chapter on "Storing of Surplus Energy", subsection "storing in a social sense", in which he talks about human energy stored socially in a pile of stone (e.g. the pyramids), in terms of the way in which the shape and meaning of the pile "inspire" people thereafter economically, such as:

> "The pile of stone—pyramidal in shape, called Cheops—of whatever sort, cannot of course, be burned in the human body and physically transformed into vital energy, heat, or mechanical power as food can. It may, however, inspire to higher endeavor and thus be a factor in the economizing of the energy of people who are thus inspired."

were previously published in his 1915 *Essays in Social Justice*. [2] In this chapter he also discusses his views on the second law, albeit with reference to the "universal dissipation and degradation of energy" as he sees things.

In 1929, Howard W. Odum summarized Carver's theory as follows: [4]

> "Carver claims that to "transfer the maximum of solar into human energy" is the function of society. The sun supplies energy; and energy produces life. Life is maintained and sustained through the transfer of "solar energy into vital." Man's energy may be spent in the production of either productive or non-productive energy. An excess of productive energy over non-productive builds up a surplus; and the economic use of the surplus means progress. An equilibrium of energy is brought about when a species is just able to maintain itself, and no matter what the forces or their strength, there is always a tendency in this direction."

(add discussion)

References

1. (a) Carver, Thomas N. (1924). *The Economy of Human Energy*. MacMillan.
(b) Reiser, Oliver L. (1935). *Philosophy and Conceptions of Modern Science* (pg. 240). MacMillan.
2. Carver, Thomas N. (1915). *Essays in Social Justice* (pgs. 132-35; energy, 35+ pgs). Harvard University Press.
3. Carver, Thomas N. (1924). *The Economy of Human Energy* (pg. 31). MacMillan.
4. Odum, Howard W. and Jocher, Katharine C. (1929). *An Introduction to Social Research* (pg. 112). H. Holt and Co.

External links

â— Thomas Nixon Carver – Wikipedia.

θΔics

In existographies, **Thomas Cheyne** (1841-1915) [RMS:74] was an English Old Testament scholar noted for []

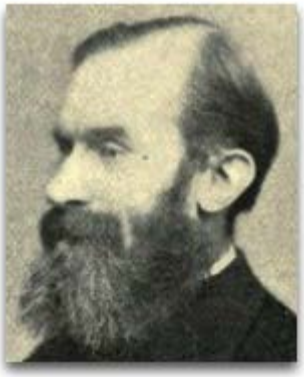

Quotes

The following are quotes by Cheyne:

> "Of the relation between the Israelitish story, whether in its older or in its more recent form, and Egyptian myths not much need here be said. In very early and probably pre - Israelitish times Egypt may have had considerable religious influence on the land of Canaan or Palestine, and it would be easy to indicate points of affinity between the Egyptian cosmogony and that in Genesis. The conception of the primeval watery envelope of all things, also that of creation by a word, also the story of the conflict between Re or Ra the sun god and the gigantic dragon Apepi or Apopi, remind us forcibly of the Babylonian and in a wide sense of the Hebrew cosmogony. But while fully admitting the combination of influences to which the Israelites were exposed, I do not think that the influence of Egypt upon the Israelites can be reckoned as at all comparable to that of Babylonia."
>
> — Thomas Cheyne (1907), *Traditions and Beliefs of Ancient Israel* [1]

References

1. (a) Usual books on Egyptian religion (Brugsch, Wiedemann, etc.)
(b) Grenfell, Alice. (1906). "Egyptian Mythology and the Bible" (Ñº), *The Monist, 16:*169-200.
(c) St. Clair, George. (1898). *Creation Records Discovered in Egypt*. Nutt.
(d) Cheyne, Thomas K. (1907). *Traditions and Beliefs of Ancient Israel* (pgs. 4-5). A. and C. Black.

External links

â— Thomas Kelly Cheyne – Wikipedia.

θΔics

In existographies, **Thomas Conlon** (c.1950-) (CR:15) is an Irish mathematician, physicist, and languages scholar, noted for his 2011 historical work on Otto Guericke and his vacuum experiments.

Guericke | Languages

Guericke is fluent in German, via travels abroad, Latin, which he teaches, and English, his native language.

In 1971, Conlon, as an undergraduate during the summer, went to work as guest worker on a Baustelle in Mainz, Germany, whereat he learned German, during which time he travelled to Berlin. In 2006, during a travelling tour throughout Europe, with his wife, he visited: Berlin, Dresden, Potsdam, Wittenberg, Jena, Bradenburg, and Magdeburg, in the last of which he picked up a copy of a facsimile copy of Otto Guericke's *Experimenta Nova*, which were being sold for the 400th anniversary of Guericke's birth, and this "was the beginning of my interest in von Guericke" as he says. [1]

In 2011, Conlon, in his *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum*, presented a new translation from the original Latin of Guericke's experiments, plus an English synopsis of information from three German existographies on Guericke, namely: Friedrich Hoffmann (1874), Hans Schimank (1936), and Ditmar Schnneider (1997), along with information from other German books, e.g. Alfons Kauffeldt's 1968 *Otto von Guericke Philosophical about the Empty Space* (*Otto von Guericke Philosophisches uber den leeren Raum*).

Education

In c.1973, Conlon completed a BS, supposedly, in physics, after which he completed his PhD in mathematical logic at the University of Bristol, England, after which he engaged in a career in telecommunications software engineering. In 2003, after retirement from telecommunications industry, he taught mathematics, physics, and Latin at Chavagnes International College, France, for two years, and worked as headmaster, from 2004 to 2006, whereat he continues to teach in a part-time capacity. [1]

Quotes | By

The following are quotes by Conlon:

> "Working entirely as a self-funded amateur, **Guericke** gained a permanent place in the scientific community, through three original achievements: the invention of the vacuum pump, the first demonstration of electrostatic repulsion, and the pioneering of the concept of absolute space. Inter alia, he also independently invented the barometer, associated low pressure with stormy weather, weighted air, investigated sound and combustion in the vacuum, and estimated the height of the atmosphere."
>
> — Thomas Conlon (2011), *Thinking About Nothing* (pg. 7) [8]

> "Guericke was destitute at thirty; when he gave the superbly crafted [mechanical] celestial globe [which he made] to Torstenson he was forty-four; when he appeared at Regensburg with a thought-out position on one of the great philosophical questions of the day [on the vacuum] and able to support it with experiments, he was fifty-two; when he completed his *Experiments Nova* he was sixty-one."
>
> — Thomas Conlon (2011), *Thinking About Nothing* (pg. 38)

References

1. Conlon, Thomas. (2011). *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum* (Amz) (About Conlon, backcover; "the beginning", pg. x). Saint Austin Press/LuLu.

External links

â— Thomas Conlon (faculty) – Chavagnes.org.

θΔics

In existographies, **Thomas Cooper** (1759-1840) was an English born American lawyer, judge, political figure, college president, chemistry professor, physician (of sorts), economist, and philosopher, dubbed a "radical" (Edmund Burke), noted for []

Overview

In 1829, Cooper anonymously published a 14-page pamphlet *Fabrication of the Pentateuch: Proved by Anachronism Contained in Those Books*, citing Benedict Spinoza (*Tractatus Theologico Politucs*), Spanheim (*Dubia Evangelica*), Pere Simon (*Historie Critique dis Vieux Testament*), and Constantin Volney (*Recerches Nouvelles sur l'History Ancienne, Volume One*), wherein he addresses the conflict with growing modern sciences, e.g. geology, chemistry, physics, etc., with the creation defined in the Old Testament, along with Moses disproofs, e.g. Moses penned his own death, etc., which got him dismissed from his position as president of University of South Carolina. [1]

Associates

Cooper, of note, was closely associated with Joseph Priestley (his mentor), James Watt (his travel companion in France), Thomas Paine, Thomas Jefferson, and John Adams. [2]

Quotes | On

The following are quotes on Cooper:

> "Judge **Cooper** of Pennsylvania, a political refuge with Priestly from the fires and mobs of Birmingham, is one of the ablest men in America, and in several branches of science, the law opinion which he mentions, I have received, and a more luminous one has not been seen."
>
> — Thomas Jefferson (1810), "Letter to Joseph C. Cabell" (Ñº), Jun 17

> "Scarcely anything that has happened to me in my curious life, has made a deeper impression upon me that that such a learned ingenious scientific and talented madcap as **Cooper**, could have influence enough to make Priestley my enemy."
>
> — John Adams (1813), "Letter to Thomas Jefferson" (Ñº), Jun 22

> "It is evident that the notion of *spirits*, imagined by savages and **adopted by the ignorant**, is calculated to retard the progress of knowledge, since it precludes our researches into the true cause of the effects which we see, by keeping the human mind in apathy and sloth. This state of ignorance may be very useful to crafty theologians, but very injurious to society. This is the reason, however, why in all ages priests have persecuted those who have been the first to give natural explanations of the phenomena of nature— as witness: Anaxagoras, Aristotle, Galileo, Descartes—and, more recently, Richard Carlile, William Lawrence, Robert Taylor, and Abner Kneeland; to which we may add the name of the learned and venerable **Thomas Cooper** MD, lately president of Columbia College, South Carolina."
>
> — H.D. Robinson (1835), notes to Baron d'Holbach's *The System of Nature* [3]

Quotes | By

The following are quotes by Cooper:

> "I have heard the question put so frequently: 'How do your opinions agree with the account given by Moses?' that I am almost compelled in self-defense to meet this difficulty in all its strength, I have had

repeated and practical experience, that the interference of the clergy in questions of science is always for the purpose of suppressing and not of promoting knowledge; and on that point now before us, I feel it absolutely necessary for my own peace, that those gentleman and I should understand each other."

— Thomas Cooper (1823), *Fabrication of the Pentateuch* [1]

References

1. Cooper, Thomas. (1829). *Fabrication of the Pentateuch: Proved by Anachronism Contained in Those Books* (Amz)(Arc)(txt). George E. Evans, 1840.
2. Thomas Cooper – History of Economic Thought Website.
3. d'Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (pg. 53). J.P. Mendum, 1889.

External links

â— Thomas Cooper – Wikipedia.

θΔics

In economic thermodynamics, **Thomas R. DeGregory** (c.1937-) is an American economist noted for his 1986 article "Technology and Negative Entropy", wherein he argues that life is an island of negative entropy, and that alternative technologies help us to stave off inevitable losses of organization due to the second law, by creating new resources. [1] DeGregory, in general, seems argue against the views of Nicholas Georgescu and Jeremy Rifkin, and their view that material entropy loss tends to a maximum.

Education

DeGregory completed his BA in government and philosophy (1959) and MA in economics (1960) at the University of New Mexico, and completed his PhD in economics at the University of Texas in 1965. DeGregory currently is professor of economics at the University of Texas.

References

1. (a) De Gregory, Thomas R. (1986). "Technology and Negative Entropy: Continuity or Catastrophe?", *Journal of Economic Issues*, Vol. XX, June.
(b) De Gregory, Thomas R. (1985). *A Theory of Technology: Continuity and Change in Human Development* (entropy, pgs. 4, 8, 94, 192). Iowa State University Press.
(c) O'Hara, Phillip A. (1999). *Encyclopedia of Political Economy*, Volume1 (pg. 264). Routledge.

External links

â— Thomas DeGregory (faculty) – University of Houston.
â— DeGregori, Thomas R. – WorldCat Identies.

θΔics

In existographies, **Thomas Digges** (c.1546-1595) (IQ:165|#461) was an English mathematician, astronomer, politician, and military leader, noted for []

Overview

In c.1573, Digges attempted to determine the parallax of the 1572 supernova observed by Tycho Brahe, and concluded it had to be beyond the orbit of the Moon; a conjecture which contradicted Aristotle's view of the universe, according to which no change could take place among the fixed stars.

In 1576, Digges, during the publication of the 4th edition of *A Prognostication Everlasting*, a Ptolemaic cosmology based perpetual almanac written by his father Leonard Digges, added an appendix of featuring the first English translation of Copernican heliocentric model of the universe, during which Digges went further than Copernicus by proposing that the universe is infinite, containing infinitely many stars, as shown below, and may have been the first person to do so.

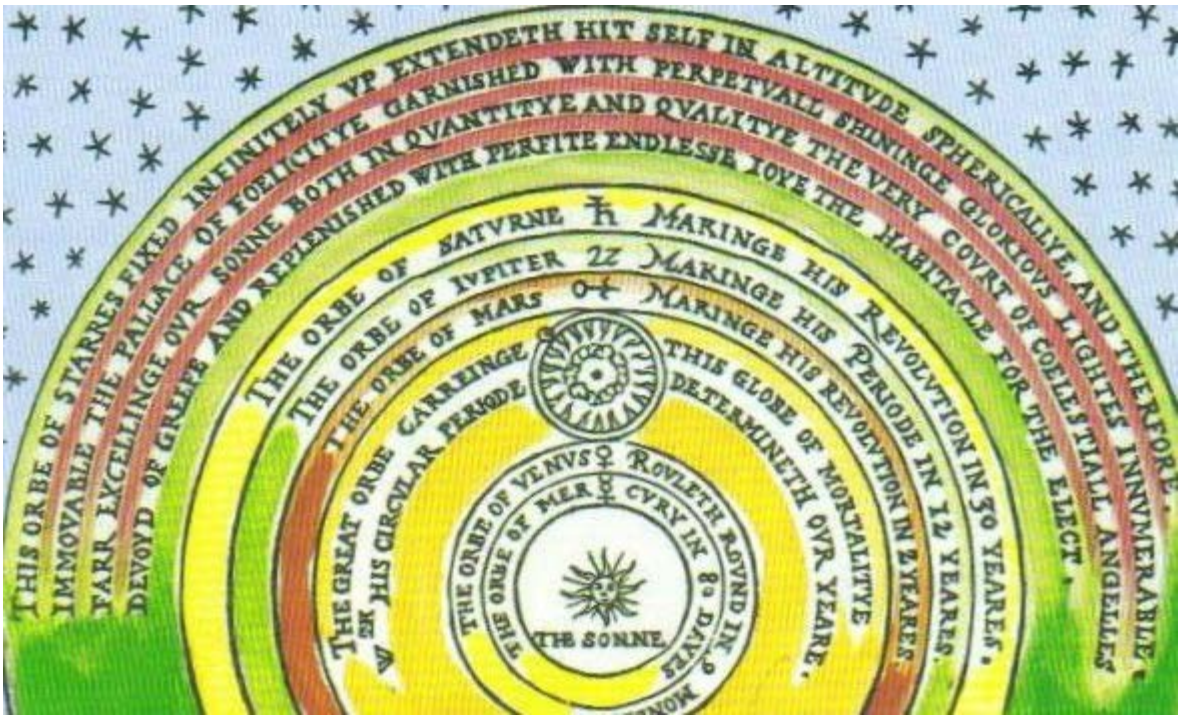

In 1584, Giordano Bruno, in his *On the Infinite Universe and the Worlds*, amassed the Ptolemaic model, the Copernican model, the Tychonian model, and the Digges model, to propose the theory that the universe is infinitely extensive and that it is filled with stars like the sun and planets like earth. [1]

Dark Night Sky Paradox

Digges, according to Edward Harrison (1987), was the first to address the problem of the dark night sky paradox, aka Olbers' paradox (Ñº); this, however, may be retrospect reading into the text like conjecture. [2]

Proposed Solutions to the Riddle of Darkness at Night

	Solution	Interpretation	Author	Chapter
1	Stars hidden in rows	B	Fournier d'Albe	1
2	Starlight too feeble	A	Digges	3
3	Dark cosmic wall	B	Kepler	4
4	Stoic extracosmic void	B	Guericke	5
5	Geometric effect	A	Halley	6
6	Interstellar absorption	A	Chéseaux and Olbers	8
7	Obscuration by dark stars	A	Fournier d'Albe	8
8	Hierarchical structure	B	Herschel and Proctor	11
9	Stars not old enough	B	Poe and Kelvin	13, 14
10	Etherless intergalactic space	B	Newcomb and Gore	15
11	Sun not old enough	C	de Sitter	15
12	Finite unbounded space	B	Zöllner and Jaki	15
13	Steady-state universe	A	Macmillan	16
14	Redshift	A	Bondi	17
15	Insufficient energy	B	Harrison	18

A. The covered-sky interpretation.
B. The uncovered-sky interpretation.
C. The midnight-sun interpretation.

(add)

Quotes | On

The following are quotes on Digges:

> "Tycho Brahe and others deemed **Digges** to be one of the greatest geniuses of the time."
>
> — Walter Ball (1889), *A History of the Study of Mathematics at Cambridge* [3]

Quotes | By

The following are quotes by Digges:

> "This orb of stars fixed infinitely up extends itself in altitude spherically, and therefore immovable the palace of felicity garnished with perpetual shining glorious lights innumerable, far excelling over [the] sun both in quantity and quality the very court of celestial angels, devoid of grief and replenished with perfect endless joy, the habitacle for the elect."
>
> — Thomas Digges (1576), outer inscription on solar system map

References

1. Bruno, Giordano. (1584). *On the Infinite Universe and the Worlds* (*On the Infinite, the Universe, and the Worlds*) (*de l'Infinito, Universo e Mondi*) (translator: Scott Gosnell). Giusto Laterzi & Sons, 1907; CreateSpace, 2014.
2. Harrison, Edward. (1987). *Darkness at Night: A Riddle of the Universe* (Digges, 5+ pgs). Harvard University Press.
3. Ball, Walter. (1889). *A History of the Study of Mathematics at Cambridge* (pg. 21). University Press.

External links

â— Thomas Digges – Wikipedia.

θΔics

In human chemistry, **Thomas Dreier** (1884-1976) was an American editor, writer, and business theorist noted for his human chemical theory, developed between 1910 and 1954, that people are "human chemicals" and that business operations should be run by the executive "human chemist", just as chemists run and operate the reactions of the elements their laboratories

Overview

In 1910, Dreier published a 27-page pamphlet entitled "Human Chemicals" outlining the view that people are "human chemicals" [1]

The following is an excellent take on Dreier's point of view: [7]

> "Watch groups of people working or playing together and you will be startled to discover how 'chemical' are their reactions to one another. Once you acquire even rudiments of human chemistry, you will be baffled less often by people, and become impatient or angry less often at the (to you) annoying things they do. You will see and judge them for what they are—different kinds of human chemicals, obeying the laws of their natures as you and I obey the laws of our natures."

Dreier's first publication on the subject of people modeled as reactive chemicals was the 1910 booklet *Human Chemicals* (1910). [1] It was described by interviewer Mirian deFord as "an interesting theory of human contacts". [2]

Human chemists

In 1922, Dreier conceived of the idea that the executive or business manager is a chemist with his or her employees being the reactants: [3]

> "It flashed into my mind the other night that an executive is like a chemist. He has a laboratory stocked with seventy-eight elementary chemicals. With that stock he can make absolutely every substance needed in his daily life if he possesses the necessary knowledge to combine the elements."

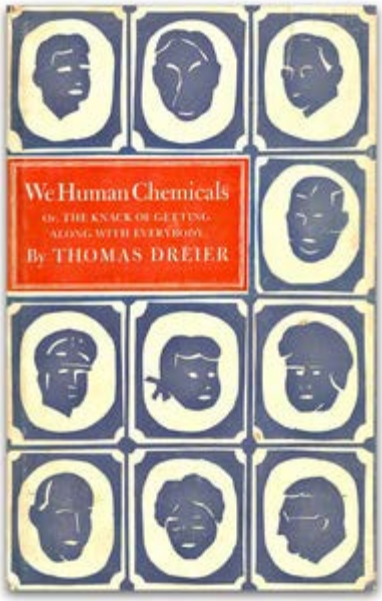

Cover of 1948 book ***We Human Chemicals**: the Knack of Getting Along with Everybody* by Dreier, showing each person as analogous to an element on the periodic table.

The mention of 78 "elementary chemicals" seems to be alluding to the fact that during this decade about 81 chemical elements were known to exist, which combined to form molecules and people. Hence, it is likely that Dreier had read a figure giving the count at 78-elements. This "flash of insight", as Dreier calls it, would later be expanded into the 37-page booklet *The Executive as a Human Chemist*, published in 1954. [4] This booklet prompted response articles, such as "Do People 'Explode' in Your Office?". [5]

Education

After high school, Dreier began to train for the priesthood. Soon thereafter, he abandoned that goal and at one point started to go to the University of Wisconsin, but in the process got a job at a Madison newspaper instead.

By 1915, Dreier was working at University Press, Cambridge, and had been an editor of a half a dozen magazines, and was a household name among business men seeking higher inspiration. During this period, he was conducting what he called the "Thomas Dreier Service", kind of like a lay preacher type of sermon, in what he considered an institution organized to create, assemble and distribute ideas which will help render service to society, through articles, lectures, and private correspondence.

The seeds of Dreier's theories and writings first appeared as private letters to his friends. He stated that the impulse

toward the kind of writing he did, came to him years ago, when he was loafing in his canoe out in Wisconsin, and found a verse that appealed to him so much that he wished that lots of people could read it too. A significant influence to Dreier were American writer Elbert Hubbard and Aristotle. [2]

From 1908 to 1909, Dreier was a business manager of a publishing company called Sheldon University Press, which explains from where he bases "executive chemist" theories, and managing editor of Business Philosopher. [6]

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- Thomas Dreier Reading Room – Peter H. Armacost Library, Eckerd College.

θΔics

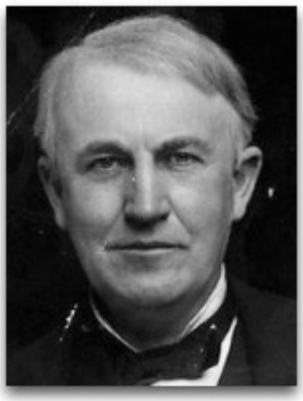

In existographies, **Thomas Edison** (1847-1931) (IQ:185|#57) [RGM:38|1,500+] (Murray 4000:2|T) (Gottlieb 1000:28) (GEE:#) (FA:110) [CR:60] was an American electrical engineer, technologist, inventor, and philosopher; a milk and genius consumer; noted for his 1910 straight-from-shoulder answers to religious queries, in respect to his belief system, a subject about which scientists and engineers tend to be very taciturn.

Influences

Edison was influenced, particularly in respect to his critical opinions of religion, by Edward Gibbon's *Rise and Fall of the Roman Empire*, and Thomas Paine's *Age of Reason*; to quote:

> "I can still remember the flash of enlightenment that shone from its pages."
>
> — Thomas Edison (c.1915), reflection on Paine's *Age of Reason* [4]

(add)

NY Times | Immortality interview | 1910

See main: Edison on the soul

On 26 Aug 1910, noted reserve energy theorist and *The Varieties of Religious Experience* (1902) author Harvard psychologist William James met his reaction end (died). Shortly thereafter, following alleged reports of the reappearance or 'manifestation' of James' soul on earth, *New York Times* journalist Edward Marshall sought out Edison, then aged 63, to clarify the matter, the aim of which he explains as follows: "The newspapers have been teaming with the subject. The psychic researchers are even now quarreling bitterly over it. The public is puzzled. Therefore, I turned to Edison, who has solved for us so many puzzling problems. The existence of the soul, of life after death, has lately become largely a scientific question. Professor James, who, if not a confessed spiritualist, was very close to the boarder, worked wholly along scientific lines. No one has studied the minutiae of science with greater care than Edison. I determined, therefore, to find out what were his conclusions. And the result , as I have said, was amazing, fascinating." [1]

Other

Edison's only foods were milk and the occasional glass of orange juice (see: milk and genius). [2]

Quotes | By

The following are quotes by Edison:

> "My mind is incapable of conceiving such a thing as a soul. I may be in error, and man may have a soul; but I simply do not believe it."
>
> — Thomas Edison (c.1910), "Do We Live Again"? (Q)

> "So far as religion of the day is concerned, it is a damned fake. Religion is all bunk."
>
> — Thomas Edison (c.1910), in FSM app [3]

> "The brain can be developed just the same as the muscles can be developed, if one will only take the pains

to train the mind to think."

— Thomas Edison (c.1915), *Publication* (Q)

See also

- Goethe on the soul

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- Israel, Paul. (2000). *Edison: A Life of Invention* (pg. 9). Wiley & Sons.

External links

- Thomas Edison – Wikipedia.

θΔics

In existographies, **Thomas Harriot** (1560-1621) (IQ:#|#) (Siegfried 10:8) (GME:#) (CR:3) was an English mathematician, philosopher (Hues, 1594), physicist, navigator, linguist, an oft-cited general polymath, noted for the c.1595 introduction of the inequality sign.

Overview

In c.1595, Harriot, in his manuscript notes, stated the following:

> "The **mark of the majority** (*signum majoritatis*) as a > b, signifies *a* greater than *b* and the **mark of the minority** (*signum minoritatis*) to a < b signifies *a* lesser than *b*."
>
> —Thomas Harriot (c.1610), *The Analytical Arts Applied to Solving Algebraic Equations* [1]

This is the origin of the inequality sign.

Quotes | On

The following are quotes on Harriot:

> "**Harriot** is profound mathematician, along side Thomas Digges and John Dee."
>
> — Gabriel Harvey (1593), *Publication* [2]

> "**Thomas Harriot** was an innovative thinker and practitioner in several branches of the mathematical sciences: navigation, astronomy, optics, geometry and algebra, but he never published any of his scientific or mathematical findings. At his death he left behind over four thousand manuscript sheets of observations, calculations and diagrams, but the range of the contents and the disorder of the papers have defeated almost all subsequent attempts at publication."
>
> — Jacqueline Stedall (2003), *The Great Invention of Algebra* (pg. 3) [2]

> "Torporley became Viete's (GME:23) amanuensis, and it was almost certainly through Torporley that Harriot acquired his detailed knowledge of Viete's mathematics."
>
> — Jacqueline Stedall (2003), *The Great Invention of Algebra* (pg. 4) [1]

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External links

â— Thomas Harriot – Wikipedia.

θΔics

In thermodynamics, **Thomas Archer Hirst** (1830-1892), commonly cited as T. Archer Hirst, was an English mathematician noted for being the translator of the 1867 first English edition of Rudolf Clausius' collected papers on *The Mechanical Theory of Heat*. [1] Hirst was associated with Irish physicist John Tyndall, who wrote the introduction to the 1867 edition. [2]

The second edition English translator (1879), after the textbook was re-written by Clausius, was English civil engineer Walter Browne.

Education

At age fifteen, Hirst left school at fifteen to work as an apprentice engineer in Halifax, surveying for proposed railway lines. It was there that he met Irish physicist John Tyndall, ten years older than Hirst and working as an engineer in the same firm. In his late teens, at the instigation of Tyndall, he decided to go to Germany for education, initially in chemistry. He eventually received a doctorate in mathematics from the University of Marburg in 1852. In 1853 he attended geometry lectures by Swiss mathematician Jakob Steiner at University of Berlin. From 1860 to 1864 he taught at University College School, but resigned because he wanted more time for his mathematical research. He was appointed professor of physics at University College London in 1865, and he succeeded British mathematician Augustus de Morgan to the chair of mathematics in 1867. [3]

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2. (a) ibid, *The Mechanical Theory of Heat*, Introduction, pg. iii.
(b) John Tyndall – Wikipedia.
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External links

â— Thomas Archer Hirst – MacTutor Archives.

θΔics

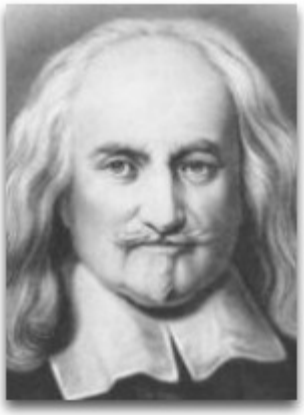

In existographies, **Thomas Hobbes** (1588-1679) (IQ:185|#76) (Cattell 1000:63) [RGM:127|1,500+] (Murray 4000:16|WP) (Gottlieb 1000:151) (Becker 139:5) (Stokes 100:31) (Perry 80:9) (HD:5) (FA:58) (GA:30) [RMS:18] (GPhE:14) [CR:173] was an English mechanical philosopher, social physicist, political theorist, and psychologist (Romanes, 1895), noted, in hmolscience, for his 1651 book *Leviathan*, one of the founding books in human physics, in which he is said to have drawn analogies between the laws of mechanics and the features of society. [1]

Air | Bacon | Cold theory

In 1661, Hobbes, in his "Physics Dialogue on Nature of Air: Facts Taken from Experiments Recently Made in Gresham College, London", outlined a discourse on his personalized mechanical philosophy model of air, likely touching on his "wind theory of cold", all meant as an attack on the vacuum experiments of Robert Boyle. [19]

Here, Hobbes attacked Boyle and others who founded the society for experimental research, soon known as the Royal Society. [18]

In c.1662, Robert Boyle responded with *Examen of Mr. Hobbes his Dialogus*. [20]

In c.1674, Boyle, in his *Dissertation on Vacuum Against Mr Hobbes*, wherein he took up the same argument. [20]

Hobbes, is his *Dialogus Physicus and De Corpore*, mounted a strong critique of vacuum and temperature work of Irish scientist Robert Boyle. Hobbes, in opposition to Boyle, posited a "wind-as-a-source-of-cold theory", which argued that the source of all cold was wind; for example:

> "Cold rakes the superficies of the earth, and that which a motion so much the stronger, by how much the parallel circles towards the poles grow less and less. From whence must arise a wind, which will force together the uppermost parts of the water, and withal raise them a little, weakening their endeavor towards the center of the earth."

Hobbes, in other words, believed that cold winds made the exterior parts of bodies coagulate and go inward, thus transmitting the cold. [3]

In a notable anecdote, to counter Hobbes' cold theory, Robert Boyle put live animals in a vacuum, extracted the air (meaning that no wind could exist), and then froze the animals in the absence of wind. One will here this story to the effect that Boyle performed experiments with live animals in a vacuum, which in itself makes little sense, until learns that Boyle did this to disprove Hobbes.

Materialism

Hobbes philosophy was materialistic; the gist of which, as summarized by Jennifer Popiel (2004), is as follows: [1]

> "Hobbes' philosophy was materialistic, that is, he subscribed to the metaphysical view that only things that exist, or can be known to exist, are physical bodies. Hobbes' materialism was the source of the charges of atheism, because materialistic philosophy explained the universe only by reference to matter, but not god's existence or that of souls. In his materialism, Hobbes argued that all change in the universe came about from one material object striking another. For this reason, freedom lay not in 'choice' but in the ability to move without impediment. Human beings and their choices were no more or less mechanical than other material objects."

Hobbes, as a so-called mechanistic materialism philosopher of the new sciences, wanted to explain, in mechanistic terms, how individuals were driven by their desires and not by 'higher' spiritual or moral ends. [1]

Hobbes, early on, stated that his overarching intention was to produce a single, coherent, all-inclusive system of philosophy, to be called *The Elements of Philosophy*, grounded on the principles of natural science, progressing systematically through the science of human nature to its culmination in a science of the principles of civil association, published in three parts: *The Body* (*De Corpore*) (1655), *The Human* (*De Homine*) (1650), and *The Civil* (*De Cive*) (1642), albeit published in reverse order owing to ongoing civil wars in his own country. (Ñº)

Influenced

The ideas in Hobbes' *Leviathan* were influential to: John Locke, whose *Two Treatises of Government* (1690) derived much of its force from Hobbes' concepts of natural law, natural rights, and social contract (as opposed to divine appointment); Charles Montesquieu, and his *Spirit of the Laws* (1748), which underpins the US constitution, and Rousseau, who modeled his "general will" idea from Hobbes conception of the formation of the state. [1]

Associations

Hobbes was associate of: Francis Bacon, Pierre Gassendi, and Rene Descartes.

Moses

Hobbes, according to Richard Friedman (1987) and Gary Greenberg (1996), supposedly, was the first to argue that Moses was NOT the author of the Pentateuch. [12]

Powers invisible

Hobbes, in his *Leviathan*, famous quipped about "powers invisible" (compare: higher power) in his ridicule of foolish people and the means about which they invent gods; the first use of this term is as follows: [11]

> "[Foolish people] make little or no inquiry into the natural causes of things, yet from the fear that proceeds from the ignorance itself, of what it is that hath the power to do them much good or harm, are inclined to suppose, and feign unto themselves, several kinds of **powers invisible**; and to stand in awe of their own imaginations ; and in time of distress to invoke them; as also in the time of an expected good success, to give them thanks ; making the creatures of their own fancy, their gods"

(add)

Atheism

In 1651, Hobbes, in his *Leviathan*, argued that the world is a machine-like thing that runs itself, in which a government is need to keep people's existences from being: solitary, poor, nasty, brutish, and short; this publication, soon thereafter, was referred to as an "atheist's bible" (Ñº); it has been classified by others as a "crypto-atheistic work". [10]

Hobbes, while never referring to himself as an "atheist", was referred to as such in his century and thereafter.

In 1666, in the English Commons, a bill against atheism was introduced that mentioned *Leviathan* by name. [9]

Bacon

In the 1620s, Hobbes, at the age of *circa* 33 to 37, worked for some time as the secretary or "amanuensis" of Francis Bacon, supposedly during the period after Bacon's political fall (Ñº) of 1621, wherein, during his remaining five years of existence, he began to devote himself to study and writing; Hobbes was said to have taken notes for Bacon, translated some of his essays, and spent time conversing with him. [7]

Reductionism

Hobbes, according to American neurological anthropologist Terrence Deacon, argued that all phenomena, including

human activity, could ultimately be reduced to bodies and their interactions—and in this sense is ranked as one of the leading reductionists since the Greek atomic theory school. [6]

Sense

In 1655, Hobbes, in his *On the Body*, stated the following in sense and bodies in general: [4]

> "I know there have been certain philosophers, and they learned men, who have held that all bodies are endowed with sense; nor do I see, if the nature of the sense be set alongside reaction solely, how they can be refuted."

English physiologist Charles Sherrington quotes this passage in his 1940 meanderings on whether or not a cell has "some modicum of mind" when it seeks its food, actuates its defense systems, or moves about in the body. [5]

Influenced

Hobbes influenced to Benedict Spinoza and his natural right of "things" theologico-political philosophy;

Quotes | On

The following are quotes on Hobbes:

> "I found him to lard and seal every asseveration with a rounded oath, and to undervalue all other men's opinions and judgements, to defend to the utmost what he asserted though never so absurd, to have a high conceit of his own abilities and performances, though never so absurd and pitiful, &c. He would not be persuaded, but that a common spectacle-glass was as good an eye-glass for a thirty six foot glass as the best in the world, and pretended to see better than all the rest, by holding his spectacle in his hand, which shook as fast one way as his head did the other; which I confess made me bite my tongue."'
>
> — Robert Hooke (1663), "Letter to Robert Boyle" on his meeting of Thomas Hobbes at Richard Reeve's optical instruments shop, late Jun [16]

> "There may be some Spinosists (Spinozaism) beyond the seas; but not one English infidel in a hundred is any other than a **Hobbist** (see: Hobbesian); which I know to be rank atheism in the private study and select conversation of these men; whatever it may appear abroad."
>
> — Richard Bently (1692), "Letter to a Professor" [8]

> "The earliest writer who deserves to be called a psychologist is **Hobbes**."
>
> — George Romanes (1885), "Mind and Motion" [17]

> "**Hobbes** thought in an atmosphere of dualism—yet Hobbes was a resolute opponent of dualism. He suspected Descartes of paltering with philosophy to appease the Jesuits—his philosophy must find a corner for the mysteries of the Catholic faith, e.g. transubstantiation, *pro salute animae* (Ñº); and was a system to be received which fell hopelessly apart in the middle, and which demanded a miracle to restore a unity which a philosophy worthy of the name was bound to demonstrate impossible?"
>
> — Pogson Smith (c.1895), "The Philosophy of Hobbes" [14]

"**Hobbes**' masterwork, *Leviathan*, was an attempt to develop a political theory out of the mechanical view."

— Philip Ball (2004), *Critical Mass* [2]

Quotes | By

The following are quotes by Hobbes:

"It is the nature of all corporeal beings, who have been frequently moved in the same manner, to continually receive a greater aptitude, or to produce the same motions with more facility."

— Thomas Hobbes (1640), "Essay on Human Nature" (Ñº); cited by Baron d'Holbach (1770) in *The System of Nature* (pg. 70)

"Now, look how many sorts of things there are which properly fall within the cognizance of human reason, into so many branches does the tree of philosophy divide itself. For treating of figures, it is called geometry; of motion, physics; of natural right, morals; put all together, and they make up philosophy. And truly the geometricians [see: Holbach's geometrician] have very admirably performed their part. For whatsoever assistance doth accrue to the life of man, whether from the observation of the heavens or from the description of the earth; from the notation of times, or from the remotest experiments of navigation; finally, whatsoever things they are in which this present age doth differ from the rude simpleness of antiquity, we must acknowledge to be a debt, which we owe merely to geometry. If the moral philosophers had as happily discharged their duty, I know not what could have been added by human industry to the completion of that happiness which is consistent with human life. For **were the nature of human actions as distinctly known as the nature of quantity in geometrical figures**, the strength of avarice and ambition, which is sustained by the erroneous opinions of the vulgar as touching the **nature of right and wrong**, would presently faint and languish; and mankind should enjoy such an immortal peace, that unless it were for habitation, on supposition that the earth should grow too narrow for her inhabitants, there would hardly be left any pretense for war."

— Thomas Hobbes (1642), *Publication* (Ñº); in 1894 "Preface" (pg. 6-7) of *Leviathan*; bolded section seems to be synopsis of Benedict Spinoza's *Ethics* (1675) [1]

"That when a **thing** lies still, unless somewhat else stir it, it will lie still forever, is a truth that no man doubts of. But that when a thing is in motion, it will eternally be in motion, unless somewhat else stay it, though the reason be the same, namely, that nothing can change itself, is not so easily assented to. For men measure, not only other men, but all other things, by themselves; and because they find themselves subject after motion to pain, and lassitude, think everything else grows weary of motion, and seeks repose of its own accord; little considering, whether it be not some other motion, wherein that desire of rest they find in themselves, consistent."

— Thomas Hobbes (1651), *Leviathan* (§2: On Imagination) (pg. 3)

"All the qualities called 'sensible' are, in the object which causeth them, but so many motions of the matter by which it presseth on our organs diversely. Neither in us that are pressed are they anything else but divers motions; for motion produceth nothing but motion. . . . The cause of sense is the external body or object, which presseth the organ proper to each sense, either immediately, as in taste and touch, or mediately, as in

hearing, seeing, and smelling; which pressure, by the mediation of the nerves, and other strings and membranes of the body, continued inwards to the brain and heart, causeth there a resistance, or counterpressure, or endeavour. . . . And because *going, speaking,* and the like voluntary motions, depend always upon a precedent thought of *whither, which way,* and *what;* it is evident that the imagination [or idea] is the first internal beginning of all voluntary motion. And although unstudied men do not conceive any motion at all to be there, where the thing moved is invisible; or the space it is moved in is, for the shortness of it, insensible; yet that doth not hinder, but that such motions are. These small beginnings of motion, within the body of man, before they appear in walking, speaking, striking, and other visible actions, are commonly called 'endeavor'."

— Thomas Hobbes (1651), *Leviathan* (pt. I, §1 and 6); cited by George Romanes (1885) in "Mind and Motion" [17]

"The world is corporeal; it has the dimensions of size, that is to say, length, breadth, and depth. Each portion of a body, is a body, and has these same dimensions: consequently, each part of the universe is a body, and that which is not a body, is no part of the universe; but as the universe is every thing, that which does not make a part of it, is nothing, and can be no part."

— Thomas Hobbes (1651), *Leviathan* (§:46); cited by Baron d'Holbach (1770) in *The System of Nature* (pg. 233)

"Moral philosophy is nothing else but the science of what is good and evil, in the conversation, and society of mankind. Good and evil are names that signify our appetites, and aversions; which in different tempers, customs, and doctrines of men, are different: and diverse men, differ not only in their judgment, on the senses of what is pleasant and unpleasant to the taste, smell, hearing, touch, and sight; but also of what is conformable or disagreeable to reason, in the actions of common life."

— Thomas Hobbes (1651), *Leviathan* [15]

"The chimerical fear of invisible powers is the origin of all religions."

— Thomas Hobbes (c.1651) attributed and or paraphrase; in: *The Three Imposters* (1712) [9]

"There is only one reality in the world—it is movement, external, without beginning, the cause of each and every change."

— Thomas Hobbes (c.1651), *Publication*; cited by George Gore (1902) in "The Coming Scientific Morality"; cited by Anon (1902) in "Materialist Morality"

"Desire to know why, and how – curiosity, which is a lust of the mind, that a perseverance of delight in the continued and indefatigable generation of knowledge – exceeds the short vehemence of any carnal pleasure."

— Thomas Hobbes (c.1660) (Ñº)

"If men found their interest in it, they would doubt the truth of Euclid's *Elements*."

— Thomas Hobbes (c.1660), *Publication* (Ñº); cited by Baron d'Holbach (1770) in *The System of Nature* (pg. 221)

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External links

â— Thomas Hobbes – Wikipedia.

θΔics

In existographies, **Thomas Hobbes 2** is []

→ **Thomas Hobbes** (mobile) | Readable; uneditable
→ Thomas Hobbes (online) | Non-readable; hacked (in the process of being recovered)
→ **Thomas Hobbes** (online) | Wayback; archived

θΔics

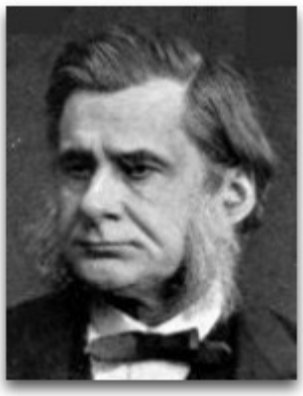

In existographies, **Thomas Huxley** (1825-1895) (IQ:170|#337) [RGM:530|1,500+] (Gottlieb 1000:799) (CR:126) was an English natural philosopher, nicknamed “Darwin’s bulldog”, noted for his argumentative advocacy of English naturalist Charles Darwin’s theory of evolution; social chemistry philosophy; atheism discussion; materialism logic; coining of the term "agnostic" (1869); among other erudition.

Huxley-Wilberforce debate

See main: Huxley vs Wilberforce debate

On 30 Jun 1860, Huxley, seven months after the publication of his friend Charles Darwin’s *On the Origin of Species*, famously debated Bishop Samuel Wilberforce. [14] Huxley, according to Christopher Hitchens (Ñº), mopped the floor with Wilberforce, commenting that the debate was similar to the 1925 “Scopes Monkey Trial” debate.

Laws of nature

In 1868, Huxley penned his “A Liberal Education and Where to Find It” essay, wherein he gave a few well-apt quotes on the laws of nature and that if anything is to be called "education" this must be its focus: [10]

> “Education is the instruction of the intellect in the laws of nature, under which name I include not merely things and their forces, but men and their ways; and the fashioning of the affections and of the will into an earnest and loving desire to move in harmony with those laws. For me, education means neither more nor less than this. Anything which professes to call itself education must be tried by this standard, and if it fails to stand the test, I will not call it education, whatever may be the force of authority, or of numbers, upon the other side.”

> “It is a very plain and elementary truth, that the life, the fortune, and the happiness of every one of us, and, more or less, of those who are connected with us, do depend upon our knowing something of the rules of a game infinitely more difficult and complicated than chess. It is a game which has been played for untold ages, every man and woman of us being one of the two players in a game of his or her own. The chessboard is the world, the pieces are the phenomena of the universe, the rules of the game are what we call the laws of nature.”

(add)

Social chemistry

In 1871, Huxley coined the both the terms "social chemistry" and "social molecule", as follows: [1]

> “Every society, great or small, resembles ... a complex molecule, in which the *atoms* are represented by *men*, possessed of all those multifarious attractions and repulsions which are manifested in their desires and volitions, the unlimited power of satisfying which we call freedom ... the social molecule exists in virtue of the renunciation of more or less of this freedom by every individual. It is decomposed, when the attraction of desire leads to the resumption of that freedom the expression of which is essential to the existence of the social molecule. The great problem of social chemistry we call politics, is to discover what desires of mankind may be gratified, and what must be suppressed, if the highly complex compound, society, is to avoid decomposition.”

In 1962, in commentary on Huxley's call for the development of social chemistry, Austrian sociologist Werner Stark

commented: [8]

> “Why should no social chemistry ever been developed?” He states that “nobody would suggest that the social scientists should imitate meteorology, for this discipline does not appear to have got very far … but what about chemistry? A sociology based on chemistry [has] in fact been called for, but, significantly, [this call has] found no echo. It would have been easy to take up this suggestion and develop it further. An intending social chemist would have found it one whit more difficult to manufacture a sociological parallel to the Boyle-Charles law than Haret did to the Newtonian propositions. But the experiment appears never to have been tried. Why?”

(add)

Non-living world | Defunct theory of life

See main: Life terminology upgrades

Huxley is often cited as having the mindset that he expected the gap between the non-living and living things to be bridged. (Ñº) The following are example quotes:

> “The elements of living matter are identical with those of mineral bodies; and the fundamental laws of matter and motion apply as much to living matter as to mineral matter; but every living body is, as it were, a complicated piece of mechanism which ‘goes’, or lives only under certain conditions.”
>
> — Thomas Huxley (1880) [7]

> “In the living world facts of this kind are now understood to mean evolution from a common prototype. It is difficult to imagine that in the non-living world they are devoid of significance. It is probable that they mean that evolution of our elements from a primary undifferentiated form of matter.”
>
> — Thomas Huxley (c.1885) [13]

(add)

Consciousness | Movement

In 1901, Huxley stated the following so-called "zombie argument", as it is called in modern consciousness debates:

> “The argument which applies to brutes [zombies] holds equally good of men … It seems to me that in men, as in brutes, there is no proof that any state of consciousness is the cause of change in motion of the matter of the organism.”

Meaning that, according to Huxley, consciousness is NOT the cause of change in motion of human (see: Library walk problem).

Huxley's demon

See main: Scientific demons

Huxley stated an evolution version of Laplace's demon as such: [4]

> "If the fundamental proposition is true, that the entire world, living and not living, is the result of the mutual interaction, according to a set of definite laws, of the forces possessed by the molecules of which the primitive nebulosity of the universe was composed, it is not less certain that the existing world law, potentially, in the cosmic vapor, and that a **sufficient intellect** could, from a knowledge of the properties of the molecules of that vapor, have predicted, say the state of the Fauna of Great Britain in 1869, with as much certainty as one can say what will happen to the vapor of the breath in a cold winter's day."

This "sufficient intellect" might be categorized as Huxley's demon.

Evolution

Huxley seems to have been the inspiration for the now-famous evolution timeline drawings, supposedly as found in (or derived from) his book 1863 *Man's Place in Nature*:

Family

Noted grandchildren of Thomas Huxley include: writer and human entropy theorist Aldous Huxley, who wrote about entropy, second law, and the soul in many of his works, and chnopsologist (biologist) Julian Huxley, who had views on anti-entropy and evolution. In a curious anecdote, Julian, at age four, after reading Charles Kingsley's *The Water Babies*, and finding his grandfather mentioned, wrote to him:

> "Dear Grandpater have you seen a Water-baby? Did you put it in a bottle? Did you wonder if it could get out? Can I see it some day? Your loving Julian."

To which Thomas replied: "I never could make sure about that Water Baby. I have seen Babies in water and Babies in bottles" but the baby in water was not in a bottle and the Baby in the bottle was not in water." [5]

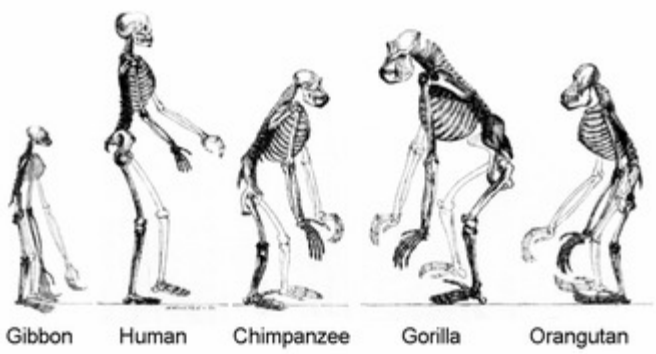

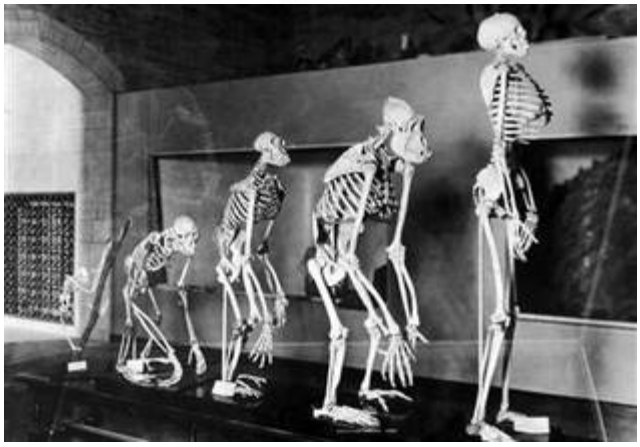

Left: drawing by Benjamin Hawkins attributed to (in some way) Huxley's 1863 *Man's Place in Nature* [2] Right: Display: "The Evolution of the Ape to Human" at the Peabody Museum, Yale University. [3]

Students

A noted student of Huxley was Lloyd Morgan who's 1929 work *Mind at the Crossways* expanded on his mentor's use of the "animalcule" concept.

Quotes | On

The following are quotes on Huxley:

> "**Huxley**, in his *Place of Man in Nature* (1863), very ably discussed this most important consequence of evolution, according to which, with the aid of comparative anatomy and ontogeny, and the support of the facts of palaeontology, he proved that the 'descent of man from the ape' is a necessary consequence of Darwinism, and that no other scientific explanation of the origin of the human race is possible."
>
> — Ernst Haeckel (1899), *The Riddle of the Universe* (pg. 82)

Quotes| By

The following are quotes by Huxley:

> "Mind [or consciousness] is a function of matter, when that matter has attained a certain degree of organization."
>
> — Thomas Huxley (1871), "Mr. Darwin's Critics"; paraphrase version cited by Lee Strobel [2]

> "Religions rise because they satisfy the many and fall because they cease to satisfy the few."
>
> — Thomas Huxley (c.1870), Undated note (Ñº)

> "It may be asked if even-handed justice has eve yet been dealt out to the sages of antiquity, who for eight centuries, from the time of Thales to that of Galen, toiled at the foundations of physical science."
>
> — Thomas Huxley (1877), "Science" (pg. 323) [11]

> "Boyle did a great service to science by his *Skeptical Chemist*, I am inclined to think that, at the present day, a *Skeptical Biologist* might exert a equally beneficent influence."
>
> — Thomas Huxley (1877), "Science" (pg. 380) [11]

> "All physical science starts from certain postulates. One of them is the objective existence of a real world."
>
> — Thomas Huxley (1887), cited by Mellor (1922), in: chapter twelve "Thermodynamics and Thermochemistry" [12]

> "Few literary dishes are less appetizing than cold controversy."
>
> — Thomas Huxley (1892), Prologue to Controverted Questions (Ñº)(Ñº)

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2. (a) *After T. H. Huxley (by permission of Messrs. Macmillan);* SKELETONS OF THE GIBBON, ORANG, CHIMPANZEE, GORILLA, MAN; Photographically reduced from diagrams of the natural size (except that of the gibbon, which was twice as large as nature) drawn by Mr. Waterhouse Hawkins (1807-1894) from specimens in the Museum of the Royal College of Surgeons.
(b) Thomson, J. Arthur. (1922). *The Outline of Science, Vol 1*. (of 4) (pg. 161). G.P. Putnam's Sons.
(c) Ape skeletons (diagram) – Wikipedia.
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4. Bergson, Henri. (1911). *Creative Evolution* (pg. 44). H. Holt and Co.
5. Ball, Philip. (2011). *Unnatural: the Heretical Idea of Making People* (pg. 167-68). Vintage Books.
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10. (a) Huxley, Thomas H. (1868). "A Liberal Education and Where to Find It" (Ñº), in: *Collected Essays III*. Publisher.
(b) Dozier, Rush W. (1992). *Codes of Evolution: the Synaptic Language Revealing the Secrets of Matter, Life, and Thought* (pg. 71). Crown Publishers.
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14. 1860 Oxford evolution debate – Wikipedia.

Further reading

â— Huxley, Thomas H. (1862). *On the Physical Basis of Life*. C.C. Chatfield, 1870.
â— Huxley, Thomas H. (1863). *On Our Knowledge of the Causes of the Phenomena of Organic Nature*. London: Robert Hardwicke.
â— Huxley, Thomas. (1889). *Agnosticism and Christianity: a Controversy*. Publisher.

External links

â— Thomas Henry Huxley – Wikipedia.

θΔics

In existographies, **Thomas Hyde** (1636-1703) was an English orientalist noted for []

Overview

In 1700, Hyde, in his *The Religion of Ancient Persia*, as cited by Joseph Hager (1801), Richard Graves (1841), among others, stated the following:

> "To return to the ancient Persians, by their declaration in the book called *Pharhang Sururi*, the religion of the Persians is termed the religion of Abraham and Zerdusht [Zoroaster], or *Abraham Zerdushtensis*; for they maintain, that Abraham was of the some religion with Zerdusht, who succeeded him long after, and that the religion of Zerdusht was derived from Abraham: and by the religion of Abraham the Persians understood that which (rejecting the first interpolation (of the Sabians)) teaches the worship of the one only and true god, excluding all false religions."

(add discussion)

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(b) Hager, Joseph (1801). *Dissertation on the Newly Discovered Babylonian Inscriptions* (Abraham, 5+ pgs; Hyde, pgs. 9-10). London.
(c) Graves, Richard. (1841). *Lectures on the Four Last Books of the Pentateuch: Designed to Show the Divine Origin of the Jewish Religion, Chiefly from Internal Evidence* (pgs. 351-52). W. Curry.

External links

â— Thomas Hyde – Wikipedia.

θΔics

In existographies, **Thomas Jefferson** (1743-1826) (IQ:190|#34) (Cattell 1000:79) [RGM:37|1,500+] (Washington 23|#) (HD:17) (CR:232) was the third American President, noted for his use of Isaac Newton's mechanics in the drafting of the *Declaration of Independence*, adopted on 4 Jul 1776, a polymath who spoke five languages, owned a personal library of 6,487 books (home later purchased by Claude Shannon), one of the fabled "last persons to know everything", theorist behind the "separation of church and state" (1802) model of governance, atheist, and noted as being a self-described "Epicurean materialist" in philosophy and or belief system, deeply interested in science and political philosophy, who once stated: "I cannot live without books".

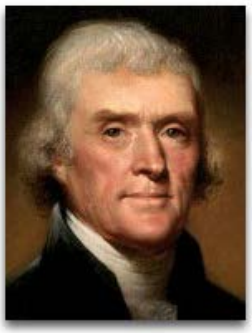

Matter and motion

On 15 Aug 1820, Jefferson wrote the following to John Adams: [2]

> "I feel: therefore I exist. I feel bodies which are not myself: there are other existences then. I call them *matter*. I feel them changing place. This gives me *motion*. Where there is an absence of matter, I call it *void*, or *nothing*, or *immaterial space*. On the basis of sensation, of matter and motion, we may erect the fabric of all the certainties we can have or need."

(add)

Newton | Declaration of Independence

Jefferson, as it has been frequently inferred, used Newtonian mechanics, and or the celestial mechanics of English physicist Isaac Newton, in the writing of the Declaration of Independence (1776); the following is a representative quote:

> "We had no occasion to search into musty records, to hunt up royal parchments, or to investigate the laws and institutions of a semi-barbarous ancestry. We appealed to those of nature and found them engraved on our hearts."
>
> — Thomas Jefferson (1826), on the origin of the Declaration of Independence, shortly before his dereaction (death) [6]

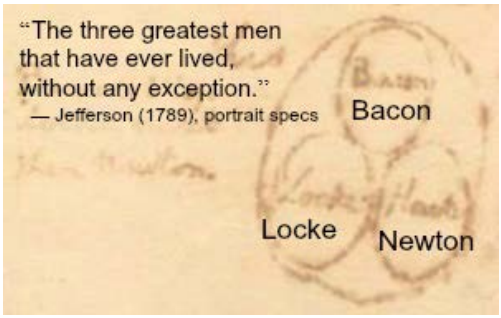

In a 1789 letter to American painter John Trumbull, in an order for portraits of Bacon, Locke, and Newton—supposedly arranged as diagrammed (Ñº) above—Jefferson identified Bacon, Locke, and Newton as "the three greatest men that have ever lived, without any exception". [5]

American humanities scholar Joseph Slade elaborates on this as follows: [3]

> "Leaving aside examples such as the celebrated influence of Isaac Newton's mechanics on **Thomas Jefferson's** *Declaration of Independence*, the parallels between physics and literature are simply too evident to ignore."

Scottish-born American physician-physicist William Small, in the years 1760-1762, as professor at the College of William and Mary, Virginia, was the one who first introduced Jefferson, aged 16-18, to the writings of John Locke, Francis Bacon, and Isaac Newton. [4]

In 1789, Jefferson identified Bacon, Locke, and Newton as the "three greatest men that had ever lived, without exception", whose portraits he ordered to be painted and seemingly arranged as shown adjacent. [5]

Religion | Debunking

Jefferson devoted a certain amount of time and effort to the questioning of religious tenets, facts, and ideologies; some representative quotes of which are shown below:

> "Religion: your reason is now mature enough [age 17] to examine this object. In examining this subject, divest yourself of all bias, in favor of novelty and singularity of opinion, shake off all fears and servile prejudices, under which *weak minds* are servilely crouched: fix reason in her seat firmly; **question with boldness even the existence of God**; because if there is one, he must approve more of the homage of reason than that of blindfolded faith. Read the Bible as you would Tacitus or Livy. Those facts in the Bible which contradict the laws of nature must be examined with care."
>
> — Thomas Jefferson (1787), "Letter to [nephew] Peter Carr" [7]

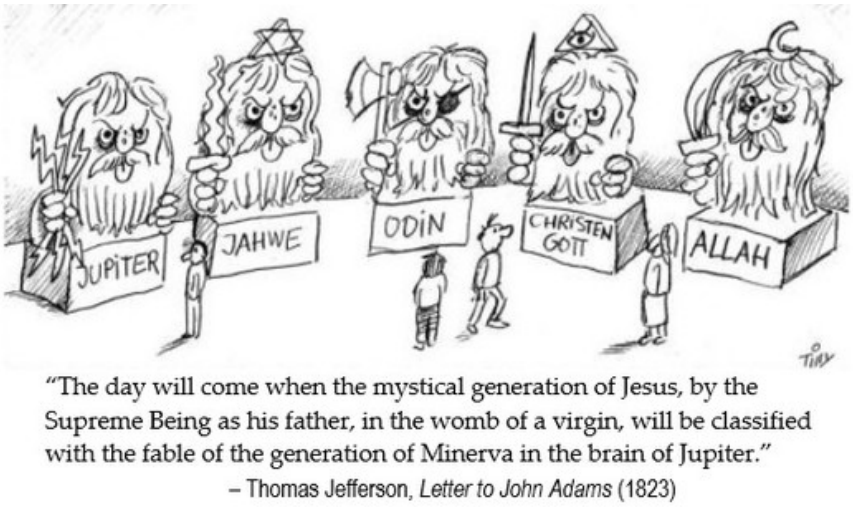

A future "god museum" cartoon, reminiscent of **Jefferson**'s 1823 letter to John Adams on the future mythological classification of "mystical generation of Jesus". [11]

> “And the day will come when the mystical generation of Jesus, by the supreme being as his father in the womb of a virgin will be classed with the fable of the generation of Minerva in the brain of Jupiter.”
>
> — Thomas Jefferson (1823), “Letter to John Adams”, Apr 11 (Ñº)

(add discussion)

Belief system

Jefferson's belief system seems to have evolved over the years, the more he read. In 1800, during his presidential campaign, he was said to be unfit to hold office because he did not have orthodox religious beliefs and called a “howling atheist”; in 1802, he added the separation of church and state clause to the Constitution; in the years to follow he became reticent, vacillated in belief system labels over time; in private letters, variously refers to himself as "Christian" (1803), "a sect by myself" (1819), an "Epicurean" (1819), a "materialist" (1820), and a "Unitarian by myself" (1825). (Ñº)

Jefferson Bible | Miracle-free

In 1798-99, Jefferson discussing the idea, with Benjamin Rush, about writing a new miracle-free and supernatural-free version of the Bible, starting with a review of the morals of the ancient philosophers, followed by the “deism and ethics of the Jews”, followed by the “principles of pure deism” taught by Jesus Christ , explicitly “omitting the question of his deity”, which by 1813 he had accomplished in the form of an octavo of forty-six pages, of “pure and unsophisticated doctrines” as he told John Adams: [8]

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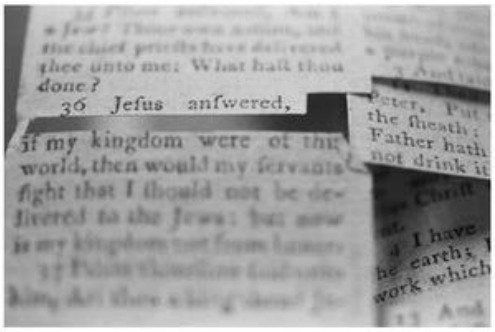

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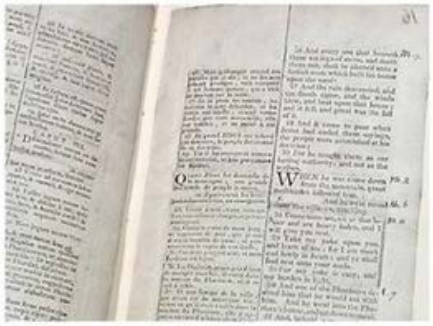

Jefferson did not believe in the divinity of Christ nor that He performed miracles; he saw Jesus as a great reformer and moral leader. Toward the end of his life, using multiple language extracts of the four Gospels, Jefferson cut and pasted together his own version. His goal was to eliminate what he felt were distortions in the Gospels by unlearned apostles who often misunderstood the teachings of Jesus. Thus he removed all the supernatural aspects, including miracles, as well as misinterpretations he perceived had been added by the Gospel writers. The result, he felt, best expressed the moral code of the teachings of Jesus. This work was never published during the lifetime of Jefferson, and in fact a printed version was not published until 1895 by the National Museum. (Ñº)

Epicurus | Moral philosophy

Jefferson owned at least five Latin editions of Lucretius’ 55BC *On the Nature of Things*, as well as translations into other languages. [1] On 31 Oct 1819, in a letter to William Short (1759-1849) (Ñº), Jefferson stated the following about his belief in the philosophy of Epicurus: [12]

> “As you say of yourself, I too am an Epicurian. I consider the genuine (not the imputed) doctrines of Epicurus as containing everything rational in moral philosophy which Greece and Rome have left us. Epictetus indeed, has given us what was good of the stoics; all beyond, of their dogmas, being hypocrisy and grimace. Their great crime was in their calumnies of Epicurus and misrepresentations of his doctrines; in which we lament to see the candid character of Cicero engaging as an accomplice. Diffuse, vapid, rhetorical, but enchanting. His prototype Plato, eloquent as himself, dealing out mysticisms incomprehensible to the human mind, has been deified by certain sects usurping the name of Christians; because, in his foggy conceptions, they found a basis of impenetrable darkness whereon to rear fabrications as delirious, of their own invention. These they fathered blasphemously on him whom they claimed as their founder, but who would disclaim them with the indignation which their caricatures of his religion so justly excite.

Jefferson went on to say:

> Of Socrates we have nothing genuine but in the Memorabilia of Xenophon; for Plato makes him one of his Collocutors merely to cover his own whimsies under the mantle of his name; a liberty of which we are told Socrates himself complained. Seneca is indeed a fine moralist, disfiguring his work at

Jefferson, who owned five plus volumes of Lucretius' 55BC *On the Nature of Things*, was a noted adherent to the works of Epicurus, shown above, describing himself in the years 1819-20 as an "Epicurean materialist" in belief system philosophy.

times with some Stoicisms, and affecting too much of antithesis and point, yet giving us on the whole a great deal of sound and practical morality.

But the greatest of all the reformers of the depraved religion of his own country, was Jesus of Nazareth. Abstracting what is really his from the rubbish in which it is buried, easily distinguished by its lustre from the dross of his biographers, and as separable from that as the diamond from the dunghill, we have the outlines of a system of the most sublime morality which has ever fallen from the lips of man; outlines which it is lamentable he did not live to fill up.

Epictetus and Epicurus give laws for governing ourselves, Jesus a supplement of the duties and charities we owe to others. The establishment of the innocent and genuine character of this benevolent moralist, and the rescuing it from the imputation of imposture, which has resulted from artificial systems [N1], invented by ultra-Christian sects, unauthorized by a single word ever uttered by him, is a most desirable object, and one to which Priestley has successfully devoted his labors and learning. It would in time, it is to be hoped, effect a quiet euthanasia of the heresies of bigotry and fanaticism which have so long triumphed over human reason, and so generally and deeply afflicted mankind; but this work is to be begun by winnowing the grain from the chaff of the historians of his life.

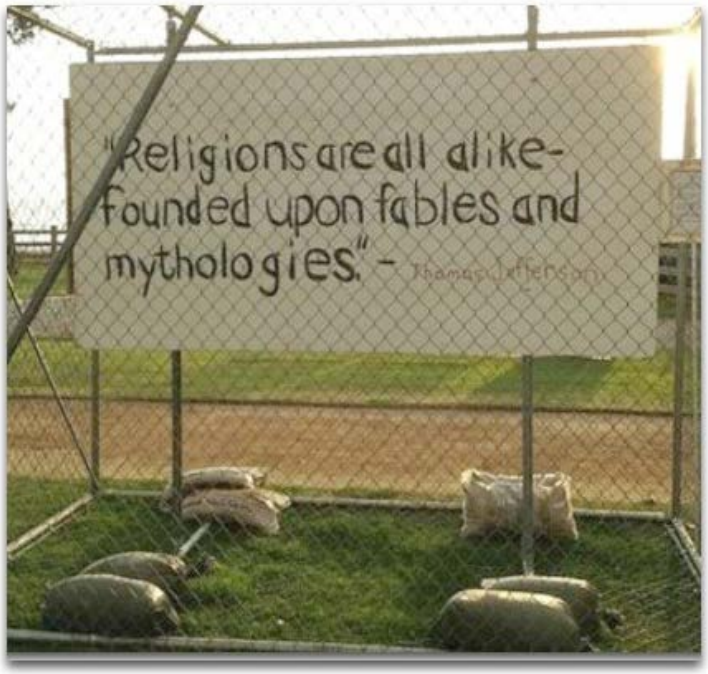

A 2011 fence-protected holiday display, by Atheists United, in Santa Monica, California, showing a **Jefferson** quote on religion a mythology. (Ñº)

I have sometimes thought of translating Epictetus (for he has never been tolerable translated into English) by adding the genuine doctrines of Epicurus from the Syntagma of Gassendi, and an abstract from the Evangelists of whatever has the stamp of the eloquence and fine imagination of Jesus. The last I attempted too hastily some twelve or fifteen years ago. It was the work of two or three nights only, at Washington, after getting through the evening task of reading the letters and papers of the day. But with one foot in the grave, these are now idle projects for me. My business is to beguile the wearisomeness of declining life, as I endeavor to do, by the delights of classical reading and of mathematical truths, and by the consolations of a sound philosophy, equally indifferent to hope and fear.

I take the liberty of observing that you are not a true disciple of our master Epicurus, in indulging the indolence to which you say you are yielding. One of his canons, you know, was that "the indulgence which prevents a greater pleasure, or produces a greater pain, is to be avoided." Your love of repose will lead, in its progress, to a suspension of healthy exercise, a relaxation of mind, an indifference to everything around you, and finally to a debility of body, and hebetude of mind, the farthest of all things from the happiness which the well-regulated indulgences of Epicurus ensure; fortitude, you know, is one of his four cardinal virtues. That teaches us to meet and surmount difficulties; not to fly from them, like cowards; and to fly, too, in vain, for they will meet and arrest us at every turn of our road. Weigh this matter well; brace yourself up; take a seat with Correa, and come and see the finest portion of your country, which, if you have not forgotten, you still do not know, because it is no longer the same as when you knew it. It will add much to the happiness of my recovery to be able to receive Correa and yourself, and prove the estimation in which I hold you both. Come, too, and see our incipient University, which has advanced with great activity this year. By the end of the next, we shall have elegant accommodations for seven professors, and the year following the professors themselves. No secondary character will be received among them. Either the ablest which America or Europe can furnish, or none at all. They will give us the selected society of a great city separated from the dissipations and levities of its ephemeral insects.

I am glad the bust of Condorcet has been saved and so well placed. His genius should be before us; while the lamentable, but singular act of ingratitude which tarnished his latter days, may be thrown behind us. I will place under this a syllabus of the doctrines of Epicurus [N2] somewhat in the lapidary style, which I wrote some twenty years ago [c.1799], a like one of the philosophy of Jesus, of nearly the same age is too long to be copied. *Vale, et tibipersuade carissimum te esse mihi.*"

(add discussion)

Quotes | On

The following are quotes on Jefferson:

Left: a photo of Jefferson's portable writing desk. (Ñº) Right: a sketch (Ñº) of Jefferson sitting his "swivel chair", something he invented, drawing out architectural plans for the University of Virginia.

"I do not believe that the most high will permit a *howling atheist* to sit at the head of the nation."

— Thomas Robbins (1800), Diary Entry (Ñº), May 8

"If not an absolute atheist, he had no belief in a future existence. All his ideas of obligation or retribution were bounded by the present life."

— John Quincy Adams (1831), Diary Entry, Jan 11

"**Jefferson** was, himself, a living and walking encyclopedia."

— William Wirt (1833) (Ñº)

Quotes | By

The following are noted quotes:

"Believe me, dear Sir: there is not in the British Empire a man who more cordially loves a union with Great Britain than I do. But, by the god that made me, I will **cease to exist** before I yield to a connection on such terms as the British Parliament propose; and in this, I think I speak the sentiments of America."

— Thomas Jefferson (1775), "Letter to John Randolph", Nov 29 [10]

"The legitimate powers of government extend to such acts only as are injurious to others. But it does me no injury for my neighbor to say there are twenty gods, or no god. It neither picks my pocket nor breaks my leg."

— Thomas Jefferson (1782), "Notes on the State of Virginia" (Ñº)

"I remember well the enthusiasm with which I devoured it [Hume's work] when young, and the length of time, the research and reflection which were necessary to eradicate the poison [see: unlearn] it had instilled into my mind."

— Thomas Jefferson (1810), "Letter to William Duane", Aug 12 [9]

"History, I believe, furnishes no example of a priest-ridden people maintaining a free civil government. This marks the lowest grade of ignorance of which their civil as well as religious leaders will always avail themselves for their own purposes."

— Thomas Jefferson (1813), "Letter to Alexander von Humboldt"; in FSM app

"I am of a [religious] sect by myself, as far as I know."

— Thomas Jefferson (1819), "Letter to Ezra Stiles", Jun 25

"Speaking of Plato, I will add, that no writer, ancient or modern, has bewildered the world with more *ignes fatui* [misleading influence], than this renowned philosopher, in ethics, in politics, and in physics. In the latter, to specify a single example, compare his views on the animal economy, in his *Timaeus*, with those of Margaret Bryan in her *Conversations on Chemistry*, and weigh the science of the canonized philosopher against the good sense of the unassuming lady. But Plato's versions have furnished a basis for endless systems of 'mystical theology', and he is therefore all but adopted as a Christian saint. It is surely time for **men to think for**

themselves, and to throw off the authority of names so artificially magnified."

— Thomas Jefferson (1820), "Letter to William Short", Aug 4 [13]

"To talk of immaterial existences is to talk of nothings. To say that the human soul, angels, god, are immaterial, is to say they are nothings, or that there is no god, no angels, no soul. I cannot reason otherwise ... without plunging into the fathomless abyss of dreams and phantasms. I am satisfied, and sufficiently occupied with the things which are, without tormenting or troubling myself about those which may in-deed be, but of which I have no evidence."

— Thomas Jefferson (1820), "Letter to John Adams", Aug 15

"Priests of different sects dread the advance of science as witches do the approach of daylight."

— Thomas Jefferson (1820), "Letter to Correa de Serra", Apr 11

"I have recently been examining all the known superstitions of the world, and do not find in our particular [Christian] superstition on redeeming feature. They are all alike, founded on fables and mythologies."

— Thomas Jefferson (c.1820), "Letter to Dr. Woods"; not found in extant work; possibly an ad hoc paraphrase as cited by John Remsburg (1883) (Ñº); cited by James Haught (1996)

Notes

N1. e.*g.* The immaculate conception of Jesus, his deification, the creation of the world by him, his miraculous powers, his resurrection and visible ascension, his corporeal presence in the Eucharist, the Trinity; original sin, atonement, regeneration, election, orders of Hierarchy, &c.—T. J.

N2. *Syllabus of the doctrines of Epicurus*: *Physical.*— The Universe eternal. Its parts, great and small, interchangeable. Matter and Void alone. Motion inherent in matter which is weighty and declining. Eternal circulation of the elements of bodies. Gods, an order of beings next superior to man, enjoying in their sphere, their own felicities; but not meddling with the concerns of the scale of beings below them. *Moral*.—Happiness the aim of life. Virtue the foundation of happiness. Utility the test of virtue. Pleasure active and In-do-lent. In-do-lence is the absence of pain, the true felicity. Active, consists in agreeable motion; it is not happiness, but the means to produce it. Thus the absence of hunger is an article of felicity; eating the means to obtain it. The *summum Annum* is to be not pained In body, nor troubled in mind. *i. e.* In-do-lence of body, tranquillity of mind. To procure tranquillity of mind we must avoid desire and fear, the two principal diseases of the mind. Man is a free agent. Virtue consists in 1. Prudence. 2. Temperance. 3. Fortitude. 4. Justice. To which are opposed, I. Folly. 2. Desire. 3. Fear. 4. Deceit.

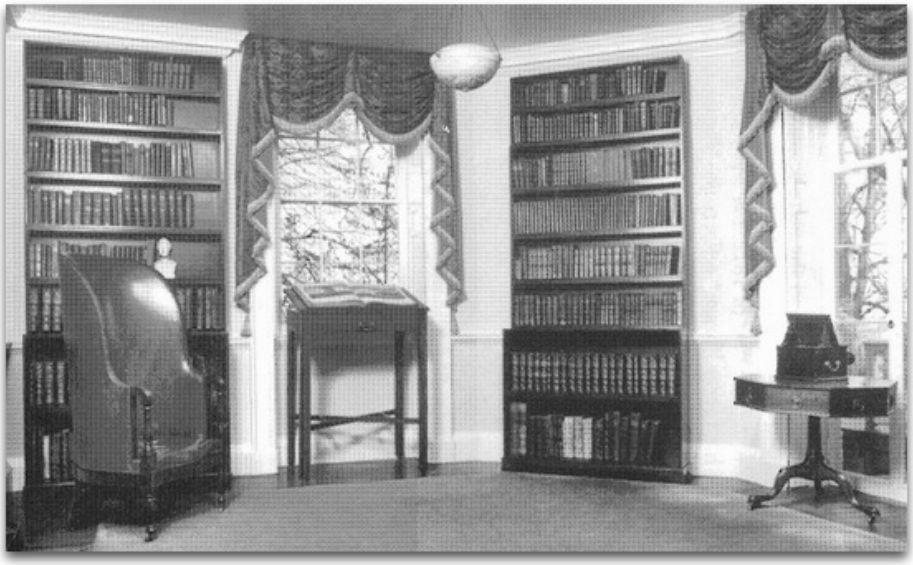

A re-constructed depiction some of the personal library of 6,700+ books owned by **Jefferson**'s at Monticello. [14] Note: the reconstructive cataloging of the books owned by Jefferson is what started the Legacy Library project at LibraryThing.com.

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â— Thomas Jefferson – Wikipedia.

θΔics

In existographies, **Thomas Kuhn** (1922-1996) (CR:30) was an American physicist and noted "paradigm change" science historian noted for his 1957 article “Energy Conservation as an Example of Simultaneous Discovery” on the history of the discovery of the conservation of energy, the philosophical framework of which he used as the model for his most famous 1962 book *The Structure of Scientific Revolutions*, wherein he outlines a general theory of how "scientific revolutions" occur.

Energy conservation | simultaneous discovery

Kuhn's 1957 article “Energy Conservation as an Example of Simultaneous Discovery” famously categorizes twelve possible candidates for the claimant of the "discoverer" of the conservation of energy, dividing the aspirants into three groups of descending order of legitimacy:

Conservation of energy

- Robert Mayer
- James Joule
- Ludwig Colding
- Hermann Helmholtz

Mechanical equivalent of heat

- Sadi Carnot
- Marc Seguin
- Carl Holtzmann
- Gustave Hirn

Conservation of force

- Karl Mohr
- William Grove
- Michael Faraday
- Justus Liebig

In article, which is fairly detailed, in depth, and dense, as far as history of thermodynamics articles go, Kuhn looked to discern the trigger factors behind scientific discovery, by studying the behind the scenes historical details to the discovery of the mechanical equivalent of heat (via Joule) and the conservation of energy (via Mayer), and the conservation of force (via Helmholtz) [1]

Kuhn's most frequently-cited work is 1962 *The Structure of Scientific Revolutions*, in which he popularizes the idea of a paradigm shift. [2] In interview, Kuhn, commented on his undergraduate course with Philipp Frank and graduate course with Percy Bridgman, stating that: [3]

> “I’ve always rather liked thermodynamics; that sense of a subject which is largely mathematical but which gives you important physical consequences is a strange, tasteful experience.”

Trigger factors

In thermodynamics, he is most noted for his classic 1959 essay “Energy Conservation as an Example of Simultaneous

Discovery", in which he sought to discover the source of the phenomenon called simultaneous discovery, arguing that between 1832 and 1854 twelve scientists—above all, Robert Mayer, James Joule, Ludwig Colding, and Hermann Helmholtz—all "grasped for themselves" the essential elements of the concept of energy and its conservation. In this context, Kuhn asked why these 'elements' became accessible at that time, thereby seeking to identify not the innumerable 'prerequisites' of the principle of energy conservation, but rather what he called 'trigger factors'. [1]

Education

Kuhn completed his BS (1943), MS (1946), and PhD (1949) in physics at Harvard University. He later taught history of science at Harvard and philosophy at the University of California, Berkeley.

Quotes | By

The following are quotes by Kuhn:

> "Almost always the men who achieve these fundamental inventions of a new paradigm have been either very young or very new to the field whose paradigm they change."
>
> — Thomas Kuhn (1962), *The Structure of Scientific Revolutions* (pg. 89); cited by Herman Daly (1980) in "The Economic Thought of Frederick Soddy" (Q)

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Further reading

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External links

- Thomas Samuel Kuhn – Wikipedia
- The Structure of Scientific Revolutions – Wikipedia.

θΔics

In existographies, **Thomas Malthus** (1766-1834) (IQ:165|#450) (Cattell 1000:869) (Gottlieb 1000:306) (CR:5) was an English economist and demographer, noted for []

Overview

In 1798, Malthus, in his *An Essay on the Principle of Population*, building on some ideas of David Hume, Adam Smith, Wallace [?], and a Dr. Price [?], outlined a general model, thought out mathematically, that, over time, that the "power" population growth, in populations of species, will be "checked" by the "strong law of necessity".

Malthus, along with along with Adam Smith, David Ricardo, and John Mill, is regarded (Leontief, 1982) one of the four founders of “classical economics”.

Influenced

Malthus influenced: Charles Darwin, Alfred Wallace, Friedrich Engels, Karl Marx, John Galbraith, and Adolf Hitler.

Quotes | On

The following are quotes by Malthus:

> “After my return to England [2 Oct 1838] it appeared to me that by following the example of Lyell in *Geology*, and by collecting all facts which bore in any way on the variation of animals and plants under domestication and nature, some light might perhaps be thrown on the whole subject.... I worked on true Baconian principles, and without any theory collected facts on a wholesale scale, more especially with respect to domesticated productions, by printed enquiries, by conversation with skillful breeders and gardeners, and by extensive reading.... I soon perceived that **selection** was the keystone of man's success in making useful races of animals and plants. But **how selection could be applied to organisms living in a state of nature remained for some time a mystery to me**. In Oct 1838, that is, fifteen months after I had begun my systematic enquiry, I happened to read for amusement **Malthus** *on Population*, and being well prepared to appreciate the struggle for existence which everywhere goes on ... it at once struck me that under these circumstances **favorable variations** would tend to be preserved, and **unfavorable ones** to be destroyed. The result of this would be the **formation of new species**. Here, then, I had at last got a theory by which to work.”
>
> — Charles Darwin (1887), *Autobiography* (Ñº)

> “One may say there is a force like a hundred thousand wedges trying [to] force every kind of adapted structure into the gaps in the oeconomy of nature, or rather forming gaps by thrusting out weaker ones ... The final cause of all this wedging, must be to sort out proper structure and adapt it to change.”
>
> — Charles Darwin (1838), *Transmutation Notebook D* (made directly after some comments on Malthus) (Ñº), Sep 28

> “**Malthus** claimed that the human population expanded geometrically [1, 2, 4, 8, 16, 32, …], doubling every 25 years on average, while agricultural production increased only arithmetically [1, 2, 3, …]. Therefore, the population must ineluctably be controlled in the struggle for sustenance and reproduction by such checks as famine, epidemics, wars, abortion, infanticide, contraception, or at best moral self-restraint in the form of late marriage and sexual abstinence. Society, said Malthus, must recognize this underlying statistical cause of misery and vice, and look for logical ways to alleviate them.”
>
> — Andrew Robinson (2020), *Sudden Genius* [2]

Quotes | By

The following are quotes by Malthus:

> "It is an acknowledged truth in philosophy that a just theory will always be confirmed by experiment."
>
> — Thomas Malthus (1798), *An Essay on the Principle of Population* (§1) (Ñº)

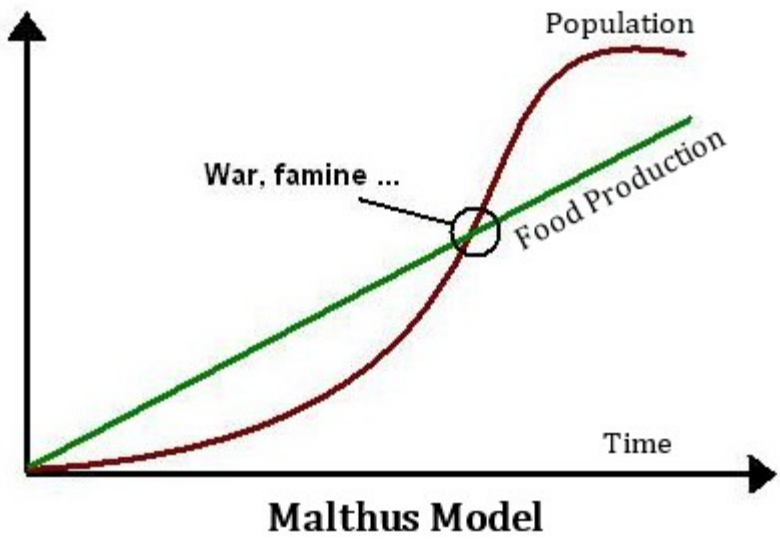

A general diagram of the Malthus model, according to which food production increases linearly, whereas population increases geometrically, and that overtime the "power" of population will be checked by the "law of necessity".

> "Taking the whole earth instead of **this island**, emigration would of course be excluded; and supposing the present population equal to a thousand millions, the human species would increase as the numbers 1, 2, 4, 8, 16, 32, 64, 128, 256, and subsistence as 1, 2, 3, 4, 5, 6, 7, 8, 9. In two centuries the population would be to the means of subsistence as 256 to 9; in three centuries as 4096 to 13, and in two thousand years the difference would be almost incalculable. In this supposition no limits whatever are placed to the produce of the earth. It may increase for ever, and be greater than any assignable quantity; yet still the power of population being in every period so much superior, the increase of the human species can only be kept down to the level of the means of subsistence by the constant operation of the strong law of necessity acting as a check upon the greater power."
>
> — Thomas Malthus (1798), *An Essay on the Principle of Population* (pg. 8)

> "The poverty and misery arising from too rapid increase of population, had been distinctly seen, and the most violent remedies proposed, so long ago as the times of Plato and Aristotle."
>
> — Thomas Malthus (1803), "Preface" to revised edition of *An Essay on the Principle of Population* (iv)

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External links

â— Thomas Robert Malthus – Wikipedia.

θΔics

In hmolscience, **Thomas More** (1478-1535) (IQ:175|#240) (Cattell 1000:106) was an English lawyer and social philosopher noted for his 1516 *Utopia*, a name that means “no-place” in Greek, an imaginary island, wherein its inhabitants were allowed to pursue pleasure, in the Epicurean "pleasure principle" atomic theory sense of the matter, so long as they don’t deny the existence of divine providence, i.e. think that chance rules the universe, or deny the afterlife, i.e. think that the soul dies with the body. [1]

Overview

More, in his work, attempted to reconcile Epicurus and Lucretius with Christian thinking; his *Utopia* was the result. [2]

Genius

In 2017, Travis Curtright, in his “Thomas More and the ‘genius’ of *Utopia*” (Q), digresses on whether or not Desiderius Erasmus considered More a genius; the opening of which is as follows:

> “Desiderius Erasmus (1466–1536) and Peter Giles (1486–1533), in their prefatory letters to the 1518 edition of *Utopia*, employ the Latin word *ingenium* in their description of **Thomas More**. Both authors use this term to laud what G. C. Richards’ longstanding translation renders as “genius.” Robert M. Adams, in the more recent Cambridge translation, supplies “wit” in the instance of Erasmus’ letter but retains “genius” for Giles’ usage. At stake in these choices is a question about how Erasmus and Giles—not to mention those humanist readers who approach *Utopia* through their prefatory letters—understand More's literary achievement.
>
> Did Erasmus and Giles think of More as a “genius”? Both letters are written in the genre of epideictic oratory, the classical designation for speeches of praise or blame, but the term “genius” raises a philological difficulty for today's readers in addition to those of rhetorical structure or authorial tone. In C. S. Lewis’ *Studies of Words*, he understands *ingenium* to mean “‘talent’ or even ‘genius’” but acknowledges that it is impossible to employ either term “without foisting upon Roman and English writers a far later, and Romantic, distinction.” Lewis worries “the modern cant would say ‘creative.’”
>
> Still other and more recent word genealogies remind us how the original Latin term *genius* represents a guiding spirit like Socrates’ *daimon*. It was only during the Enlightenment that “genius” emerged from *ingenium* to fashion the modern sense of an extraordinary and creative mind, a “genius.” So it would appear to many that More, despite centuries of praise for *Utopia* and its widespread influence, could not be considered a “genius” until the eighteenth century.”

Likewise, Brad Birzer, in his “The Genius of Sir Thomas More”, devotes discussion to the unsung genius of More. [3]

Reaction end

More was beheaded by his friend Henry the VIII for not sanctioning the king’s divorce as well as opposing the 1534 Act of Supremacy, which overturned a thousand years of Christian tradition, i.e. it granted the king the right to determine religious matters.

Utopia | Quotes

The following are noted quotes from Utopia:

> “Called once “No-place” because I stood apart. Now I compete with Plato’s state, perhaps Surpass it; what he only wrote about I have alone in fact become: the best In people, wealth, in laws by far the best. “Good-place” by rights I should be called.” [from original title page] “I have taken great pains to prevent any inaccuracy in the book , so too, when I am in doubt, I would rather say something inaccurate than tell a lie,

because I would rather be honest than clever." (5) "For it did not occur to us to ask, or him to mention, in what part of that new world Utopia is located."

— Thomas More (1516), *Utopia* (pg. 5) [3]

"Most people know nothing about learning; many despise it. Dummies reject as too hard whatever is not dumb. The literati look down their noses at anything not swarming with obsolete words. Some like only ancient authors; many like only their own writing. One person is so dour that he cannot abide jokes; another is so witless that he cannot stand anything witty. Some have so little nose for satire that they dread it the way someone bitten by a rabid dog fears water. Others are so changeable that their approval depends on whether they are sitting down or standing up. They sit around in taverns and over their cups they pontificate about the talents of writers, condemning each author just as they please, pulling him down through his writings as if they had grabbed him by the hair, while they themselves are safe and out of harm's way, as the saying goes, because these good men have their whole heads smooth-shaven so that there is not a single hair to grab on to."

— Thomas More (1516), *Utopia* (pgs. 6-7) [3]

"Certainly he has sailed, not like Palinurus, but rather like Ulysses, or even better like Plato. This man, who is named Raphael— his family name is Hythloday— has no mean knowledge of the Latin language but is especially proficient in Greek; he has devoted himself to Greek more than to Latin because he has totally committed himself to philosophy and he knew that in that field there is nothing of any importance in Latin except some works of Seneca and Cicero. Out of a desire to see the world he left to his brothers his heritage in his homeland (he is from Portugal)."

— Thomas More (1516), *Utopia* (pgs. 11-12) [3]

"Human nature is changeable."

— Thomas More (1516), *Utopia* (pg. 124) [3]

"A pretty face may be enough to catch a man, but it takes character and good nature to hold him."

— Thomas More (1516), *Utopia* (pg. #) (Q)

Quotes | Other | By

The following are representative quotes:

"Congratulations, then, my dear Erasmus, on your outstanding virtuous qualities; however, if on occasion some good person is unsettled and disturbed by some point, even without a sufficiently serious reason, still do not be chagrined at making accommodations for the pious dispositions of such men. But as for those snapping, growling, malicious fellows, ignore them and, without faltering, quietly continue to devote your self to the promotion of intellectual things and the advancement of virtue."

— Thomas More (1532), "Letter to Erasmus", Jun 14 [3]

"The many great gardens of the world, of literature and poetry, of painting and music, of religion and

architecture, all make the point as clear as possible: The soul cannot thrive in the absence of a garden. If you don't want paradise, you are not human; and if you are not human, you don't have a soul."

— Thomas More (c.1530) (Q)

"One of the greatest problems of our time is that many are schooled but few are educated."

— Thomas More (c.1530), *Selected Writings* (Q)

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(b) Stenger, Victor J. (2013). *God and the Atom: from Democritus to the Higgs Boson: the Story of a Triumphant Idea* (pg. 55). Prometheus Books.
2. Stenger, Victor J. (2013). *God and the Atom: from Democritus to the Higgs Boson: the Story of a Triumphant Idea* (pgs. 49, 55). Prometheus Books.
3. Birzer, Brad. (2017). "The Genius of Sir Thomas More" (Q), Jun 22.

External links

- Thomas More – Wikipedia.

θΔics

In existographies, **Thomas Nagel** (1937-) (CR:11), not to be confused with Ernest Nagel (1901-1985), whose surname similarly arises in reductionism discussions, is an American atheist anti-reductionist philosopher, generally focused on an argument that "consciousness" is not reducible to physics and chemistry, noted for his 1987 book *What Does it All Mean?*, a treatise on physicalism versus dualism, with discussions.

Bat | Consciousness

Nagel seems to be widely-cited for his 1974 “What is it Like to be a Bat?” wherein he pits reductionism against the premise that every organism that has conscious experience has a subjective unique mental state, not accountable to materialism, or something along these lines. [4]

Extrapolate down | Difficulties

In 1987, Nagel, in his *What Does it All Mean?*, gave the following argument, cited by Christian de Quincey (2002), of the, supposed, absurdities resulting from the extrapolate down approach, in respect to consciousness: [1]

> “Ordinarily we believe that other human beings are conscious, and almost everyone believes that other mammals and birds are conscious too. But people differ over whether fish are conscious, or insects, worms, and jellyfish. They are still more doubtful about whether one-celled animals like amoebae and paramecia have conscious experiences, even though such creatures react conspicuously to stimuli of various kinds. Most people believe that plants aren’t conscious; and almost no one believes that rocks are conscious, or Kleenex, or automobiles, or mountain lakes, or cigarettes. And to take another biological example, most of us would say if we thought about it, that the individual cells of which our bodies are composed do not have conscious experiences.”

In 2012, Nagel, in his *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature Is Almost Certainly False*, argued the following:

> “It is highly implausible that life as we know it is the result of a sequence of physical accidents together with the mechanism of natural selection.”

Nagel, as summarized by one of his former Princeton philosophy students Richard Brody, argues, in sum, that “life cannot have arisen solely from a primordial chemical reaction, and the process of natural selection cannot account for the creation of the realm of mind.” [3]

Quotes

The following are related quotes:

> “I want atheism to be true and am made uneasy by the fact that some of the most intelligent and well-informed people I know are religious believers.”
>
> — Thomas Nagel (c.2000) (Q)

> “I am drawn to a fourth alternative, natural teleology, or teleological bias, as an account of the existence of the biological possibilities on which natural selection can operate. I believe that teleology is a naturalistic alternative that is distinct from all three of the other candidate explanations: chance, creationism, and directionless physical law. To avoid the mistake that White [Roger White] finds in the hypothesis of nonintentional bias, teleology would have to be restrictive in what it makes likely, but without depending

on intentions or motives. This would probably have to involve some conception of an increase in value through the expanded possibilities provided by the higher forms of organization toward which nature tends: not just any outcome could qualify as a telos. That would make value an explanatory end, but not one that is realized through the purposes or intentions of an agent. Teleology means that in addition to physical law of the familiar kind, there are other laws of nature that are "biased toward the marvelous".”

— Thomas Nagel (2012), *Mind and Cosmos* (Q)

See also

- Alvin Plantinga

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(b) De Quincey, Christian. (2002). *Radical Nature: Rediscovering the Soul of Matter* (pg. 27-28). Invisible Cities Press.
2. Nagel, Thomas. (2012). *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature Is Almost Certainly False* (chemical, 12+ pgs; quote, pg. 6). Oxford University Press.
3. Brody, Richard. (2013). “Thomas Nagel: Thoughts are Real”, *The New Yorker*, Jul 16.
4. (a) Nagel, Thomas. (1974). “What is it Like to be a Bat?” (pdf), *The Philosophical Review*, Oct.
(b) What Is it Like to Be a Bat? – Wikipedia.

External links

- Thomas Nagel – Wikipedia.
- Nagel, Thomas (1937-) – WorldCat Identities.

θΔics

In existographies, **Thomas Newcomen** (1664-1729) (IQ:#|#) [RGM:714|1,500+] (EP:17) (CR:29) was an English engineer noted for his 1712 construction of the atmospheric engine or Newcomen engine, as it has came to be called.

Overview

The following is a summary of the connection of Thomas Savery, his Savery engine (1698), and Newcomen, and his Newcomen engine (1705), and supposedly some correspondence notes written by Robert Hooke to Newcomen about some of the piston and cylinder ideas of Denis Papin:

> "It is supposed that Savery's engine was perfectly well known to **Newcomen**, and that the latter may have visited Savery at his home in Modbury, which was but fifteen miles from the residence of Newcomen. It is thought, by some biographers of these inventors, that Newcomen was employed by Savery in making the more intricate forgings of his engine. Harris, in his *Lexicon Technicum* (1704) states that drawings of the engine of Savery came into the hands of Newcomen, who made a model of the machine, set it up in his garden, and then attempted its improvement; but Switzer (*Hydrostatics*, 1729) says that Newcomen was as early in his invention as Mr. Savery was in his.
>
> Newcomen was assisted in his experiments by John Calley, who, with him, took out the patent. It has been stated that a visit to Cornwall, where they witnessed the working of a Savery engine, first turned their attention to the subject; but a friend of Savery has stated that Newcomen was as early with his general plans as Savery.
>
> After some discussion with Calley, Newcomen entered into correspondence with Dr. Hooke, proposing a steam-engine to consist of a *steam-cylinder containing a piston similar to that of Papin's, and to drive a separate pump*, similar to those generally in use where water was raised by horse or wind power. Dr. Hooke advised and argued strongly against their plan, but, fortunately, the obstinate belief of the unlearned mechanics was not overpowered by the disquisitions of their distinguished correspondent, and Newcomen and Calley attempted an engine on their peculiar plan. This succeeded so well as to induce them to continue their labors, and, in 1705, to patent, in combination with Savery—who held the exclusive right to practice surface-condensation, and who induced them to allow him an interest with them—an engine combining a steam-cylinder and piston, surface-condensation, a separate boiler, and separate pumps."
>
> — Robert Thurston (1878), *A History of the Steam Engine* (pgs. 57-58) [1]

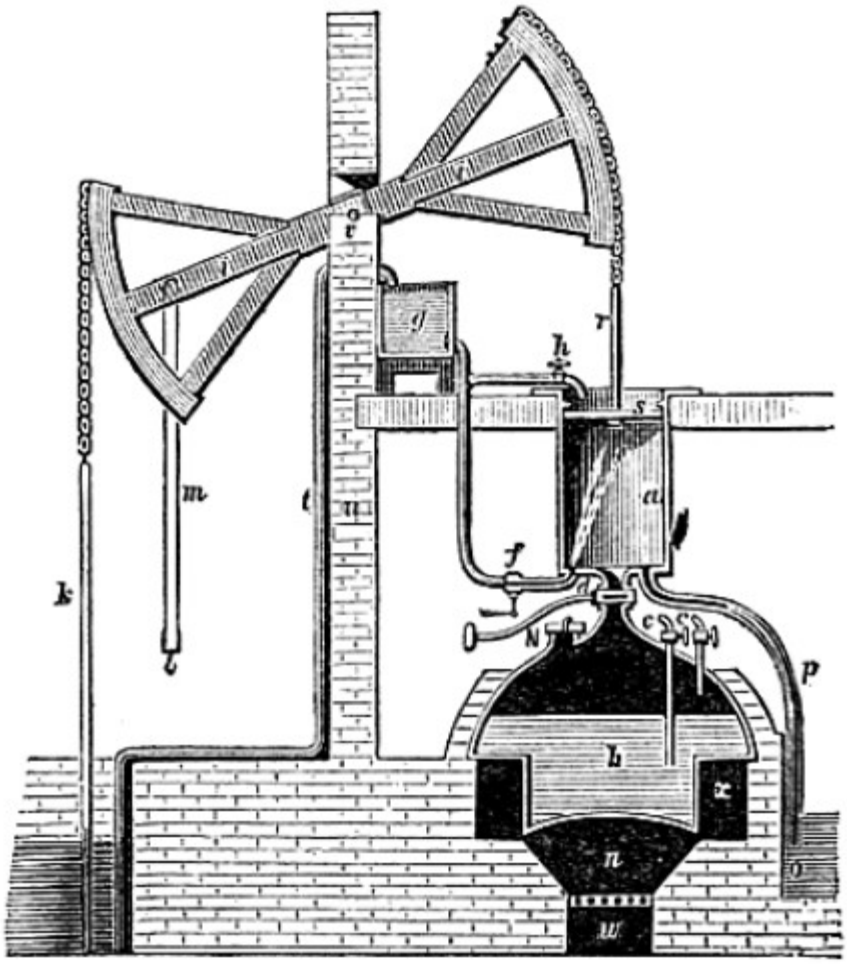

A depiction of a c.1705 Newcomen engine. [1]

The pipe h is used to keep the top of the piston covered in water, to prevent air leaks, which was a device of Newcomen, but likely learned from his correspondence with Hooke and the work of Papin, via Hooke.

Another take on the Newcomen, Hooke, Savery, Papin connection is:

> "Savery spent some time in Cornwall, attempting to persuade mine owners to adopt his engine. It was probably during this time that he became known to Thomas Newcomen. Newcomen was an ironmonger from Dartmouth, a small port town near Cornwall. Through his trade, he would have been able to work with brass, copper and tin, as well as iron, and he would also have been familiar with the drainage problems that beset mining in the area. Unfortunately, little is known about Newcomen personally (there is not, for example, a known likeness of him), or about the development of his engine; inevitably, conjecture must fill some of the gaps. Newcomen was a man of some reading, and he was acquainted with Dr Robert Hooke. According to John Farey, writing in the 1820s, there survived notes written by Hooke on the subject of Denis Papin, a Huguenot émigré who had also been involved in early steam engine prototypes. The notes - written in Hooke's own hand - were apparently written for Newcomen's benefit. Hooke died in 1703 so, assuming this story is credible, it suggests that Newcomen was interested in steam engineering from at least that date. This is corroborated by Newcomen's contemporary, the Swede Marten Triewald, who wrote that the 'work on the prototype of the fire-engine was carried on for ten years.' In their invaluable history of the Newcomen engine, John Allen and Lionel Rolt suggest that much of Newcomen's time may have been spent working with small-scale models."
>
> — Sean Bottomley (2014), *The British Patent System and the Industrial Revolution 1700-1852: from Privilege to Property* (pg. 235)

(add)

Quotes | On

The following are about or related quotes:

> "**Newcomen** had been as early in his invention as Savery was in his, only the latter being nearer the Court, had obtained his patent before the other knew it, on which account Newcomen was glad to come in as a partner to it."
>
> — Stephen Switzer (1729), *An Introduction to a General System of Hydrostatics and Hydraulics* (pg. 342) (Q)

> "I had gone on a walk on a fine Sabbath afternoon. I had entered the Green [of Glasgow] by the gate at the foot of Charlotte Street—had passed the old washing-house. I was thinking upon the engine at the time, and had gone as far as the herd's house, when the idea came into my mind that as steam was an elastic body it would rush into a vacuum, and if a communication were made between the cylinder and an exhausted vessel it would rush into it, and might be there condensed without cooling the cylinder. I then saw that I must get rid of the condensed steam and injection water if I used a jet, as in Newcomen's engine. Two

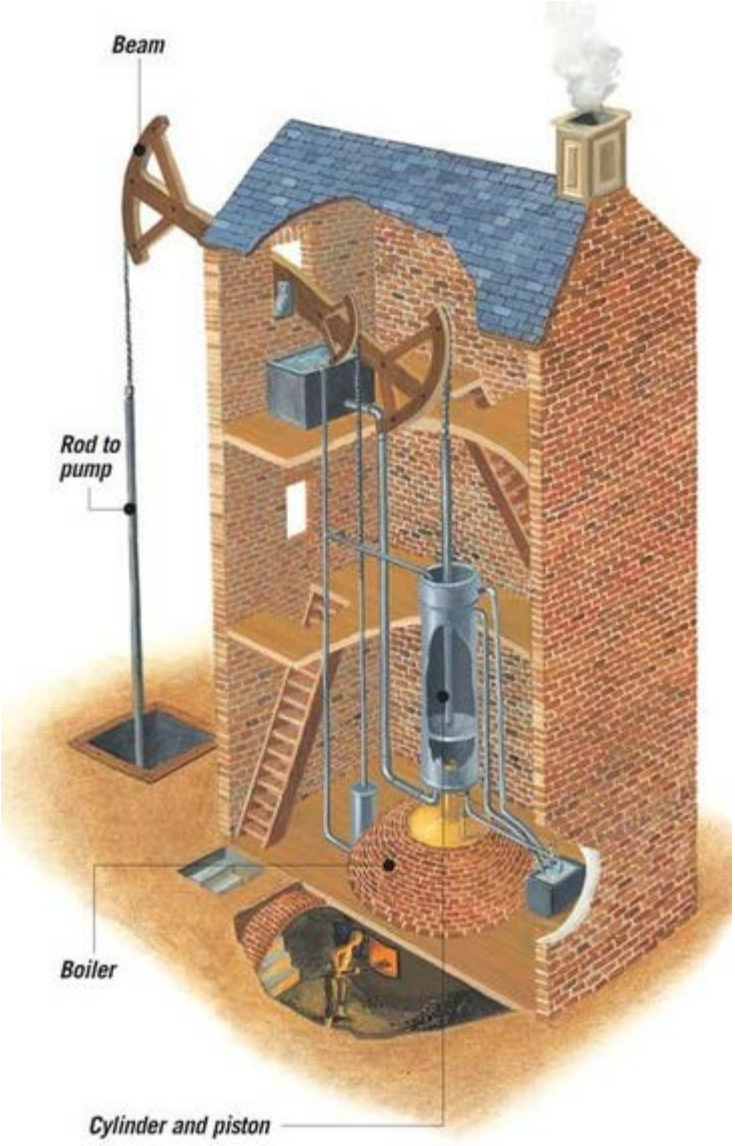

An artistic rendition of the Newcomen's engine. (Q)

ways of doing this occurred to me. First, the water might be run off by a descending pipe, if an outlet could be got at the depth of 35 or 36 feet, and any air might be extracted by a small pump. The second was to make the pump large enough to extract both water and air. ... I had not walked further than the Golf-house when the whole thing was arranged in my mind."

— James Watt (1765), reflection on inspiration moment on improving Newcomen's steam engine, May (Q)

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1. Thurston, Robert. (1878). *A History of the Growth of the Steam-Engine* (txt) (pgs. 57-59). Appleton and Company.

External links

- Thomas Newcomen – Wikipedia.
- Thomas Newcomen – BBC History.
- Thomas Newcomen – NNDB.

θΔics

In existographies, **Thomas of Kempis** (c.1380-1471) (IQ:140|#697) was a Dutch German cannon, noted for []

Overview

In c.1423, Kempis anonymously published *The Imitation of Christ*, advocating inner existence, over vanity and worldly affairs; supposedly, this was a precursor to the later reformation by Martin Luther. It was influential to Thomas More, among others.

Quotes | On

The following are quotes on Kempis:

> "I read books advocating each viewpoint including works of **Thomas of Kempis** and Saint Augustine and concluded by age 24 that I could not believe anything supernatural."
>
> — Alfred Rogers (2014), "Email to Libb Thims", Nov 21

Quotes | By

The following are quotes by Kempis:

> "Everywhere I have sought peace and not found it, except in a corner with a book."
>
> — Thomas of Kempis (c.1420) (Ñº)

> "Love feels no burden, thinks nothing of trouble, attempts what is above its strength, pleads no excuse of impossibility; for it thinks all things lawful for itself, and all things possible."
>
> — Thomas of Kempis (c.1420) (Ñº)

> "First keep the peace within yourself, then you can also bring peace to others."
>
> — Thomas of Kempis (c.1420)

External links

â— Thomas a Kempis – Wikipedia.

θΔics

In existographies, **Thomas Paine** (1737-1809 ACM) (13 BG – 59 AG) (IQ:180|#137) (Cattell 1000:583) [RGM:132|1,500+] (RMS:24) (HD:15) (FA:44) (**GA**:28) (Stokes 100:52) (founding father:6) (CR:102) was an English-born American political activist, philosopher, irreligionist, and revolutionist, known as the "leading atheistic writer in the American colonies" (Q); his *The Age of Reason* (1794) is the most-widely cited "atheist's bible", historically (Q)(Q); one of the rocks to avoid in the Christian captain parable.

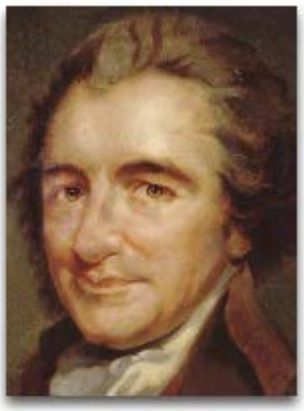

Associates

In England, Paine met Benjamin Franklin who gave him letters of introduction to go to America. In 1802, Paine, when he returned to America, was befriended by Thomas Jefferson. [4] He also was friends with Elihu Palmer and his wife, who nursed him.

Origin of Christianity

In c.1803, Paine drafted a chapter entitled "Origin of the Christian Religion", where, among other things, he asserted: [3]

> "The [Christian] Cosmogony, that is, the account of the creation with which the book of Genesis opens, has been taken and mutilated from the Zend-Avesta of Zoroaster, and was fixed as a preface to the Bible after the Jews returned from captivity in Babylon, and that the Robbins of the Jews do not hold their account in Genesis to be a fact, but mere allegory. The six thousand years in the Zend-Avesta, is changed or interpolated into six days in the account of Genesis."

In c.1804, Paine, in his "Essay on the Origin of Free-Masonry", citing his "Origin of Christianity" chapter, stated the following: [4]

> "The Christian religion and Masonry have one and the same common origin: both are derived from the worship of the Sun. The difference between their origin is, that the Christian religion is a parody on the worship of the Sun, in which they put a man whom they call Christ, in the place of the Sun, and pay him the same adoration which was originally paid to the Sun."

Paine then, citing George Smith (1783), who speaks about Egyptian mythology, and William Dodd (c.1770) (Q)(Q), comments:

> "In Masonry many of the ceremonies of the Druids are preserved in their original state, at least without any parody. With them the Sun is still the Sun; and his image, in the form of the sun is the great emblematical ornament of Masonic Lodges and Masonic dresses. It is the central figure on their aprons, and they wear it also pendant on the breast in their lodges, and in their processions. It has the figure of a man, as at the head of the sun, as Christ is always represented.
>
> At what period of antiquity, or in what nation, this religion was first established, is lost in the labyrinth of unrecorded time. It is generally ascribed to the ancient Egyptians, the Babylonians and Chaldeans, and reduced afterwards to a system regulated by the apparent progress of the sun through the twelve signs of Zodiac by Zoroaster the law giver of Persia, from whence Pythagoras brought it into Greece. It is to these matters Dr. Dodd refers in the passage already quoted from his oration.
>
> The worship of the Sun as the great visible agent of a great invisible first cause, "Time without limits," spread itself over a considerable part of Asia and Africa, from thence to Greece and Rome, through all ancient Gaul, and into Britain and Ireland."

(add)

Religion | Beliefs

Paine, in respect to his upbringing, stated that his father was a Quaker. [1] His own mind, in youth, as he says, was had a natural bent to science, astronomy in particular.

Quotes | On

The following are quotes on Paine:

> "**Paine**'s [49-page] *Common Sense* [1776] pamphlet [selling some 500,000 copies in the mid 1770s] became the biggest seller per capita in American publishing history and almost single-handedly sparked the [American] revolution."
>
> — Scott Smith (2013), "Thomas Paine's Writing Sparked the American Revolution" (Q)

Quotes | By

The following are quotes by Paine:

> "It is necessary to the happiness of man that he be mentally faithful to himself. Infidelity does not consist in believing, or in disbelieving, it consists in professing to believe what one does not believe."
>
> — Thomas Paine (1794), *The Age of Reason* (pg. 22) (Q)

> "Every national church or religion has established itself by pretending some special mission from god, communicated to certain individuals.The Jews say, that their word of god was given by god to Moses, face to face; the Christians say, that their word of god came by divine inspiration, to Jesus Christ, their apostles and saints; and the Turks say, that their word of god (the Koran) was brought by an angel, from heaven, and given to Mahomet. Each of those churches accuse the other of unbelief; and for my own part, I disbelieve them all."
>
> — Thomas Paine (1794), *The Age of Reason* (pg. 23)

> "When also I am told that a woman, called the Virgin Mary (see: Isis), said, or gave out, that she was with child without any cohabitation (see: virgin birth) with a man, and that her betrothed husband, Joseph (see: god Geb), said that an angel told him so, I have a right to believe them or not."
>
> — Thomas Paine (1794), *The Age of Reason* (pg. 24); cited by Jennifer Hecht (2003) in *Doubt: a History* (pg. 356)

> "It appears that Thomas [see: Doubting Thomas] did not believe the resurrection and as they say would not believe without having ocular and manual demonstration himself. So neither will I: and the reason is equally as good for me and every other person as for Thomas."
>
> — Thomas Paine (1794), *The Age of Reason* (pg. 27); cited by Jennifer Hecht (2003) in *Doubt: a History* (pg. 356)

“The Christian mythologists, calling themselves the Christian church, have erected their fable, which for absurdity and extravagance is not exceeded by anything that is to be found in the mythology of the ancients.”

— Thomas Paine (1794), *The Age of Reason* (pg. 28)

“Are we to suppose that every world in the boundless creation had an Eve, an apple, a serpent, and a redeemer?”

— Thomas Paine (1794), *The Age of Reason* (pg. 52); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 108)

“The age of ignorance commenced with the Christian system.”

— Thomas Paine (1794), *The Age of Reason* (pg. 60) (png)

“I wrote *Common Sense* the latter end of the year 1775, and published it the first of January, 1776. Independence was declared the fourth of July following.”

— Thomas Paine (1794), *The Age of Reason* (pg. 63)

“I trouble not myself about the manner of future existence. I content myself with believing, even to positive conviction, that the power that gave me existence is able to continue it, in any form and manner he pleases, either with or without this body; and it appears more probable to me that I shall continue to exist hereafter than that I should have had existence, as I now have, before that existence began.”

— Thomas Paine (1794), *The Age of Reason* (pg. 83)

“Deism was the religion of Adam, supposing him not an imaginary being; but none the less must it be left to all men to follow, as is their right, the religion and worship they prefer.”

— Thomas Paine (1794), *The Age of Reason* (pg. 84)

“It has often been said that any thing may be proved from the Bible; but before any thing can be admitted as proved by Bible, the Bible itself must be proved to be true; for if the Bible be not true, or the truth of it be doubtful, it ceases to have authority, and cannot be admitted as proof of any thing.”

— Thomas Paine (1794), *The Age of Reason* (pg. 89)

“As it is nothing extraordinary that a woman should be with child before she was married, and that the son she might bring forth should be executed, even unjustly, I see no reason for not believing that such a woman as Mary, and such a man as Joseph, and Jesus, existed; their mere existence is a matter of indifference, about which there is no ground either to believe or to disbelieve.”

— Thomas Paine (1794), *The Age of Reason* (pg. 152)

"The study of theology as it stands in Christian churches, is the study of nothing; it is founded on nothing; it rests on no principles; it proceeds by no authorities; it has no data; it can demonstrate nothing; and admits of no conclusion. Not any thing can be studied as a science without our being in possession of the principles upon which it is founded; and as this is not the case with Christian theology, it is therefore the study of nothing."

— Thomas Paine (1794), *Age of Reason* (§3)

"I would give worlds, if I had them, that the *Age of Reason* had never been published. Oh, god, save me; for I am at the edge of hell alone."

— Thomas Paine (1809), supposed last words [2]

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(b) Paine, Thomas. (c.1804). "An Essay on the Origin of Free-Masonry" (Q). Bonneville's widow, 1810 (abbreviated); full printing, 1818; in: *Writings of Thomas Paine* (editor: Moncure Daniels Conway). G.P. Putnam's Sons, 1896.
4. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pgs. 356-57). HarperOne.

External links

- Thomas Paine – Wikipedia.

θΔics

In hmolscience, **Thomas Pynchon** (1937-), pronounced *PIN-chawn*, is American engineering physicist turned writer noted, in literature thermodynamics, for his three Henry Adams + Norbert Wiener based entropy-philosophy implications based novels: *V* (1963), *The Crying of Lot 49* (1966), and *Gravity's Rainbow* (1973)

Overview

In 1958, Pynchon wrote a short story "Entropy", published in 1960, in which he helped to introduce the physics concept of entropy to the literary world, a term which was to later become synonymous with Pynchon's name. [6]

Pynchon credits his major influences in the formulation of "Entropy" as American historian Henry Adams, author of the 1910 "A Letter to American Teachers of History" and American mathematician Norbert Wiener, author of *Cybernetics* (1948) and *The Human Use of Human Beings* (1950). He explains "that the 'theme' of the story is mostly derivative of what these two men had to say." [7]

In 1963 to 1973, Pynchon published three Maxwell's demon containing novels: *V* (1963), *The Crying of Lot 49* (1966), which specifically uses entropy as a narrative device, and *Gravity's Rainbow* (1973). [1] Pynchon's works have been referred to as a prime example of entropology. [2]

several second law of thermodynamics themed works, namely the 1960 short story "Entropy" and

Of note, the *Crying of Lot 49* is listed by *Time* magazine as one of the best English language novels from 1923 to 2005. [3] To cite an example, the following is an excerpt from *The Crying of Lot 49*, themed on similarity of Shannon entropy to Boltzmann entropy (or Clausius entropy) and the nature of the two in respect to information loss and Maxwell's demon: [12]

> "He began then, bewilderingly, to talk about something called entropy. The word bothered him as much as 'Trystero' bothered Oedipa. But it was too technical for her. She did gather that there were two distinct kinds of entropy. One having to do with heat-engines, the other to do with communication. The equation for one, back in the '30's, had looked like the equation for the other. It was a coincidence. The two fields were entirely unconnected, except at one point: Maxwell's Demon."

In retrospect, as noted by American writer Jeremy Campbell, we note that the formulaic similarity between thermodynamic entropy and information entropy was not exactly a "coincidence", but rather a half-joke, half-effort made by American electrical engineer Claude Shannon in attempts to justify his theories on signal transmission in phone lines (information theory), thermodynamically. [13]

Pynchon later admitted the "shallowness of [his] understanding" of the subject of entropy, and noted that choosing an abstract concept first and trying to construct a narrative around it was "a lousy way to go about writing a story". He carries the concept of entropy, however, throughout his work; at least up through 1973.

From "Entropy" we find:

Pynchon's novels are so densely woven with various scientific concepts, where often readers comment to the effect that they only remember ten-percent of each chapter after a reading, that there is even a literary wiki (PynchonWiki.com) dedicated to the exploration of six of Pynchon's novels: Against the Day (2006), Thomas Pynchon's most recent novel; Mason & Dixon (1997); Vineland (1990); Gravity's Rainbow (1973), Pynchon's awe-inspiring third novel; The Crying of Lot 49 (1966), Pynchon's second novel; and V. (1960) Pynchon's first novel (the latter three as pictured on the site below). [9]

> "Nevertheless," continued Callisto, "he found in entropy, or the measure of disorganization for a closed system, an adequate metaphor to apply to certain phenomena in his own world. He saw, for example, the younger generation responding to Madison Avenue with the same spleen his own had once reserved for Wall Street, and in American 'consumerism' discovered a similar tendency from the least to the most probable, from differentiation to sameness, from ordered individuality to a kind of chaos. He ... envisioned a heat-death for his culture in which ideas, like heat-energy, would no longer be transferred, since each point in it would ultimately have the same quantity of energy, and intellectual motion would, accordingly, cease. "

The Crying of Lot 49 (1965), likewise, traces the concept of entropy through the theoretical Maxwell's Demon device (the great historical challenge to the second law), and also extends the property and Demon to metaphorically control and inform the journey of Oedipa Mass, the novel's protagonist. Pynchon's reader is said to travel an analogous odyssey to the protagonist, sorting information, flirting with chaos and circumnavigating truth. [8] A noted scholar of the thematic use of entropy in the the work of Pynchon is American literature theorist Lois Zamora. [21]

Slow Learner

In the Introduction to *Slow Learner* (1984), Pynchon states in commentary on his earlier work:

> "After having been worked with in a restrained way for the next 70 or 80 years [after its first formulation in 1865 by Rudolf Clausius], entropy got picked up on by some communication theorists and given the cosmic moral twist it continues to enjoy in current usage."

In the following oft-quoted passage, Pynchon explains how, as is the case for many if not most, he found difficulty in his attempts to understand the notion of entropy: [19]

> "Since I wrote this story ["Entropy"] I have kept trying to understand entropy, but my grasp becomes less sure the more I read. I've been able to follow the OED definitions, and the way Isaac Asimov explains it, and even some of the math. By the qualities and quantities will not come together to form a unified notion in my head. It is cold comfort to find that Gibbs himself described entropy in written form as 'far-fetched … obscure and difficult of comprehension'."

The mention of Gibbs' view on entropy in this last quote, to note, is a biased truncation slanted in such a way towards Pynchon's outlook. The actual full 1873 quote by Gibbs is: [20]

> "Any method involving the notion of **entropy**, the very existence of which depends on the second law of thermodynamics, will doubtless seem to many far-fetched, and may repel beginners as obscure and difficult of comprehension."

In any event, in these works, Pynchon relates contemporary culture to an entropy heat death, suppositions latent questions such as: Can heat death be reverse?, among other subtleties. [18]

Impact

Followers of the works of Pynchon have raised him to almost a cult status. Writer Erik Ketzan, in 2004, noted that “a reader review of Gravity’s Rainbow at Amazon.com sums up the Pynchon cult by declaring: ‘GR is our new Bible, and Pynchon’s a zany Moses in America’. To these devoted literati, finally hearing Pynchon’s voice (*The Simpsons*, 2004) is comparable to Moses descending Mount Sinai.” Likewise, author Rick Moody commented in 2005 that the reading of Pynchon’s authorized bootleg edition of his early stories (*Slow Learner*, 1985) felt like a finding of the Rosetta Stone to his later works.

One possible explanation of this iconic status might be Pynchon’s fascination, in his writings, on entropy in relation to death and particularly his speculations on what sort of past-entropy life or after-life might exist beyond this demarcation of equilibrium (see: cessation thermodynamics); in that the philosophical question (see: philosophical thermodynamics) of "what happens to a person when they die", in the sense of the question of the continuity of movement in this life may relate to or connect to the movement of the universe in the long scheme of things, is the most wanting in explanation. [17]

Reclusiveness

Left: Pynchon in high school yearbook (1953). Left (center): Pynchon sitting, in a row of people, (c.1954). Right (center): Pynchon at (convention?) with press identification tags in Japanese and English (c. 1970). Right: Pynchon with paper bag on his head in an episode of *The Simpsons*, where he voices his own lines (2004).

Pynchon is notoriously elusive, camera shy, and very reclusive. There are, for instance, only a handful of images of him (shown adjacent). In 1963, according to one story, when *Time* sent a photographer to his house in Mexico City, he reportedly jumped out of the window and fled to a nearby town to avoid the interview and photograph. Supposedly, he has never given an interview, allowed himself to be photographed, or appeared on television; although some un-photographed interviews do seem to exist (such as a photograph of Gary Snyder in conversation with Pynchon (where only Snyder is shown)). [10]

In 2004, Pynchon came out of hiding and voiced a sketch of himself wearing a paper bag on his head in the the episode "Diatribe of a Mad Housewife" of the Simpsons. [11] In the short 30-second clip, Pynchon tells another new author (Marge Simpson): “here’s your quote: Thomas Pynchon loved this book, almost as much as he loves cameras” and then tries to sell himself on the street as a today only special to get an picture with a reclusive author.

Nobel Prize contender

See main: Nobel prize winners in thermodynamics

In connection to other Nobel Prize laureates in thermodynamics, in recent years, Pynchon has frequently been cited as a contender and seems to be in the running for the Nobel prize in literature, likely having been already nominated many times, but not yet won (similar to Gilbert Lewis, nominated 35 times). Likewise, in November of 2004 Austrian playwright and novelist Elfriede Jelinek, winner of the 2004 Nobel Prize in literature (announced in October), commented, in an interview regarding her translations of Pynchon’s works, that: [15]

> “Sure, I am fond of translating. But I wouldn’t translate **Pynchon** again. Not that I don’t consider him to be a genius. It’s a joke that he hasn’t got the Nobel Prize and I’ve got it. I do consider him as one the most important authors, far ahead of Philip Roth by the way. I cannot get the Nobel Prize if Pynchon hasn’t got it. That’s against the laws of nature. For the record, please.”

Likewise, in 2007 writer John Carvill commented that: “recently, it was suggested that the Nobel committee dare not award Thomas Pynchon the ‘big prize’, as they’re terrified he’ll turn them down.” [16]

Education

Pynchon graduate from high school in 1953, at the age of 16, where the caption under his school yearbook photo read: [4]

> “Pynch; P&G Yearbook; Trade Fair 2, 3; Sr. Play student director; Spanish Club 3, 4: Honor Society 3, 4; likes pizza; dislikes hypocrites; pet possession, a typewriter; aspires to be a physicist.”

After graduation, Pynchon studied engineering physics at Cornell University, but at the end of his second year left to serve in the US Navy. In 1957, Pynchon returned to Cornell to pursue a degree in English, publishing several short stories while there, graduating in 1959 with a BA in English. In 1964, Pynchon applied to study mathematics as a graduate student at the University of California, Berkeley, but was turned down. [5]

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θΔics

In existographies, **Thomas Savery** (c.1650-1715) (IQ:170|#325) (EP:21) (CR:33), aka "Captain Savery", the term "Captain" being a title (Q) given in Cornwall to the superintendent of works connected with a mine, was an English engineer, and "commissioner of sick and wounded" (Switzer, 1729), noted for his 1698 construction of his "Savery engine", aka Miner's friend, a suction pump type of steam engine designed for the removal of water from mines, the world's first operational steam engine. [1]

Overview

On 25 Jul 1698, Savery patented a design for a steam engine to be employed for pumping water out of mines. [5]

In 1699, Savery submitted a working model of his engine to the Royal Society, during which time successful experiments were made with it. [5]

On 14 Jun 1699, Savery demonstrated a small working model of his steam engine at Gresham College before an audience where it was approved of; supposedly, something akin to the following design: (Q)

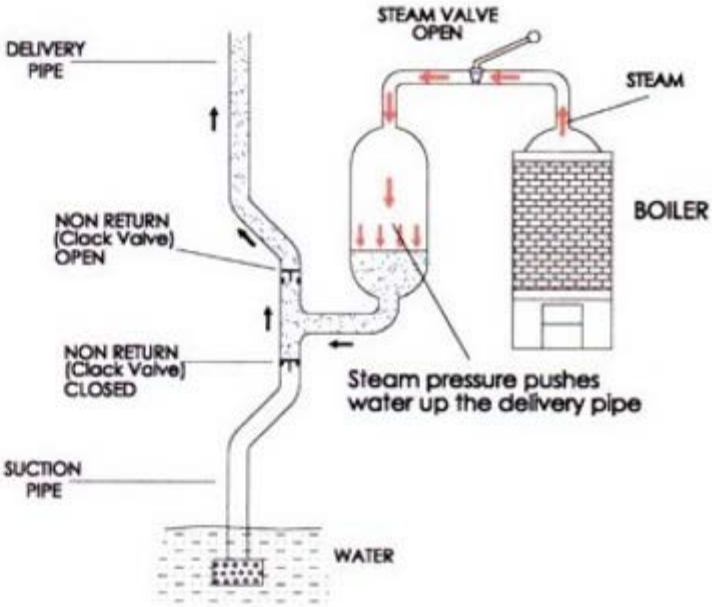

In 1701, Savery, in his *The Miner's Friend: or an Engine to Raise Water by Fire; and of the Manner of Fixing it in Mines; with an Account of the Several Other Uses it is Applicable Unto; and an Answer to the Objections Made Against It*, gave a draft-overview of his new machine, along with the following four illustrations. [1]

In the decade to follow, Savery built several of his devices, which worked for raising water for the use of flushing toilets in homes, but ran into problems, when it came to applications in mines; the following is one retrospective synopsis of these issues and how Thomas Newcomen stepped into make the next improved design:

> "**Savery** made a great many experiments to bring this machine to perfection, and did erect several, which raised water very well for gentlemen's seats (Q) [toilets]; but could not succeed for mines, or supplying towns, where the water was to be raised very high and in great quantities: for then the steam required being boiled up to such a strength, as to be ready to tear all the vessels to pieces. The heat, which is sufficient to boil water, will produce steam whose spring is of the same strength as common air; but that steam by the removal of the atmosphere and letting it return to press, is only capable of bringing the water up to a little above 30 feet but for every 32 feet that the wafer is to be raised higher, the steam must be so many times

stronger than the air: for example, if it is to be forced up 90 or 100 foot higher than the receivers, where the steam acts upon it, the steam must be three or four times stronger than the common air; and a great deal stronger than that (perhaps six times stronger) upon the following account: The **hot steam** striking upon the surface of **cold water** in the receivers, condenses itself, and thereby becomes uneffectual till the surface of the water and a small depth of it, is warm enough not to condense any more steam; and then (and not before) the water yields to the pressure of the spring of the steam to make it rise. I have known Savery, at York buildings, make steam eight or ten times stronger than common air; and then its heat was so great, that it would melt common soft solder; and its strength so great as to blow open several of the joints of his machine: so that he was forced to be at the pains and charge to have all his joints soldered with spelter or hard solder. These discouragements stopped the progress and improvement of this engine, till Mr. Newcomen, an iron-monger, and John Cawley, a Glazier living at Dartmouth, brought it to the present form in which it is now used, and has been near these 30-years."

— John Desaguliers (c.1740), *A Course in Experimental Philosophy, Volume Two* (pgs. 466-67)

(add)

Quotes | Employed

The following are quotes employed by Savery:

"Pigri est ingenii contentum esse his, quae ab aliis inventa sunt."

— Seneca (c.50AD), *Publications*; quoted by Thomas Savery on title page of *The Miner's Friend* (pg. 1)

Quotes | On

The following are quotes on Savery:

"No contrivance for raising water is more justly surprising than the 'fire engine', the particular contrivance, and sole invention of a gentleman with whom I had the honour long since to be well acquainted. I mean the ingenious **Captain Savery**, some time since deceased, but then a most noted engineer, and one of the commissioners of sick and wounded. This gentleman's thoughts were always employed in hydrostatics, or hydraulics, or in the improvement of water-works; **and the first hint from which it is said he took this engine was from a tobacco-pipe**, which he immersed to wash or cool it, as is sometimes done. He discovered by the rarefaction of the air in the tube, by the heat or steam of the water, and the gravitation or impulse of the exterior air, that the water was made to spring through the tube of the pipe in a wonderful, surprising manner; though others say, that the learned Marquis of Worcester, in his *Century of Inventions* (which book I have not seen) gave the first hint for this raising water by fire. It was a considerable time before this **ingenious person** (Savery), who has been so great an honour to his country, could, as he himself tells us, bring this his design to perfection, on account of the awkwardness of the workmen, who were necessarily to be employed about the affair; and I have heard him say myself that the very first time he played it was in a porter's house at Lambeth; where, though it was a small engine, yet it forced its way through the roof and struck up the tiles, in a manner that surprised all the spectators."

— Stephen Switzer (1729), *Introduction to a System of Hydrostatics and Hydraulics* [3]

"Captain **Savery**, having read the Marquis of Worcester's book [*Century of Inventions*, 1655], was the first who put in practice the raising 'water by fire', which he proposed for the draining of mines. His engine is described in Harris's Lexicon (see the word 'engine') which being compared with the Marquis of Worcester's description, will easily appear to have been taken from him; **though Savery denied it**, and the

better to conceal the matter, bought up all the Marquis of Worcester's books that he could purchase in Paternoster Row, and elsewhere, **and burned them in the presence of the gentleman his friend, who told me this**. He said that he found out the 'power of steam' by chance, and invented the following story to persuade people to believe it, *viz.* that having drank a flask of Florence at a tavern, and thrown the empty flask upon the fire, he called for a basin of water to wash his hands, and perceiving that the little wine left in the flask had filled up the flask with steam, he took the flask by the neck and plunged the mouth of it under the surface of the water in the basin, and the water of the basin was immediately driven up into the flask by the pressure of the air. Now he never made such an experiment then, nor designedly afterwards, which I thus prove: I made the experiment purposely with about half a glass of wine left in a flask, which I laid upon the fire till it boiled into steam: then putting on a thick glove to prevent the neck of the flask from burning me, I plunged the mouth of the flask under the water that filled a basin; but the pressure of the atmosphere was so strong, that it beat the flask out of my hand with violence, and threw it up to the ceiling. As this must also have happened to Captain Savery, if ever he had made the experiment, he would not have failed to have told such a remarkable incident, which would have embellished his story."

— John Desaguliers (c.1740), *A Course in Experimental Philosophy, Volume Two* (pgs. 465-66)

"When a comparison is made between Savery's engine [1698] and those of his predecessors, the result will be in every respect favorable to his character as an inventor, and as a practical engineer; all the details of his invention are made out in a masterly style, and accidents and contingencies are provided for, so as to render it a real working engine; whereas De Caus [Caus engine, 1615], the Marquis of Worcester [Worcester engine, 1663], Sir Samuel Morland [Morland engine, 1683], and Papin [Papin engine, 1690], though ingenious philosophers, only produced mere outlines, which required great labor and skill of subsequent inventors to fill up, and make them sufficiently complete to be put in execution."

— John Farey (1827), *Treatise on the Steam Engine*; cited by Dionysius Larder (1840) in *The Steam Engine* (pg. 58) [1]

Quotes | By

The following are related quotes:

"I am very sensible a great many among you do as yet look on my **invention of raising water by the impellent force of fire**, a useless sort of a project, that never can answer my designs or pretensions; and that it is altogether impossible that such an engine as this can be wrought underground, and succeed in the raising of water, and draining your mines, so as to deserve any encouragement from you. I am not very fond of lying under the scandal of a bare projector; and, therefore, present you here with a draught of my machine, and lay before you the uses of it, and leave it to your consideration whether it be worth your while to make use of it or no. I can easily give grains of allowance for your suspicions, because I know very well what miscarriages there have been by people ignorant of what they pretend to."

— Thomas Savery (1701), *The Miner's Friend* (pg. 7)

"Though my thoughts have been long employed about waterworks, I should never have pretended to any invention of that kind, had **I not happily found out this new, but yet a much stronger and cheaper force or cause of motion**, than any before made use of. But finding this **of rarefaction by fire**, the consideration of the difficulties the miners and colliers labor under by the frequent disorders, cumbersomeness, and in general of water-engines, encouraged me to invent engines to work by this new force : that though I was obliged to encounter the oddest and almost insuperable difficulties, I spared neither time, pains, nor money, till I had absolutely conquered them.."

— Thomas Savery (1701), *The Miner's Friend* (pgs. 8-9)

"Such an engine will do the work of ten or twelve of horses."

— Thomas Savery (1701), *The Miner's Friend* (pg. 26) [2]

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External links

● Thomas Savery – Wikipedia.

θΔics

In existographies, **Thomas Schelling** (1921-2016) (CR:15) is an American economist noted, in social physics, for his racial segregation dynamics model, first described in his 1969 article "Models of Segregation", in which he showed that a small micro preferences for one's neighbors, such as skin color or similar ethnicity, could lead to total segregation, as well as early work on physics-based tipping point theory applied sociologically.

To demonstrate this, Schelling used coins on graph paper to demonstrate his theory by placing pennies and nickels in different patterns on the "board" (society) and then moving them one by one if they were in an "unhappy" situation (socially uncomfortable position).

History

Polish physicist and sociophysicist Katarzyna Sznajd-Weron explains how, in interview, Schelling arrived at his checker board racial dynamics model while on a plane: [5]

One day I was flying home from Chicago, and I did not have anything to read. I wondered what to do (...) So, I drew a line on a sheet of paper, put down (...) X's and O's, and said now suppose I thought that these were black and whites, and both had ideas about neighbors. I started moving them around (...)

XO O X X O X O X O XOO OX

I had to erase marks to move them, and was extremely clumsy, but by the time my plane landed in Boston I decided this was going to prove interesting.

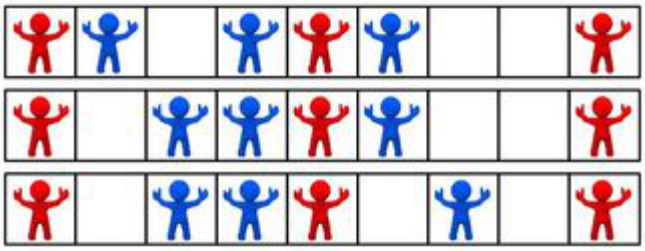

Schelling continues:

Use a chessboard and coins of two types (pennies and nickels)

Put coins randomly on a chessboard and start to move them (coins = agents)

Agent is unhappy if the proportion of other agents of its color in its neighborhood is below a certain threshold

Unhappy agent is moved randomly into a new place

Preference to have neighbors of the same color: 70%

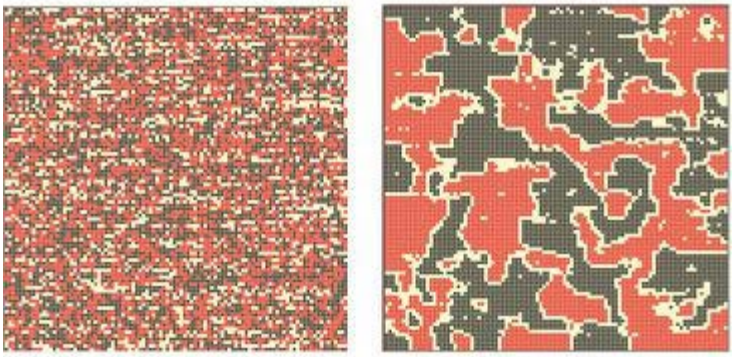

This plane derivation resulted in Schilling's 1969 article "Models of Segregation", in which he showed that a small micro preferences for one's neighbors, such as skin color or similar ethnicity, could lead to total segregation, followed by his more famous 1971 article "Dynamic Models of Segregation" (cited by 2126+), wherein he expands on his penny-nickel model of segregation, and appends an end section to Schelling what calls "neighborhood tipping", an overview of

the basic of a general theory of tipping or tipping points: [5]

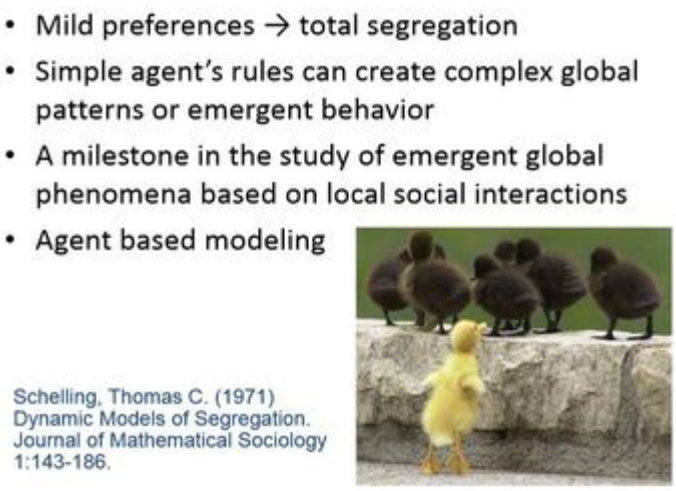

which was followed by his 1980 *The Strategy of Conflict* (cited by 10,901+).

Schelling gives a history of the tipping point theory, tracing the term to the 1957 coining of American political economist Morton Grodzins. [2] Grodzins, supposedly, coined the term tipping point by analogy with the fact in physics that adding a small amount of weight to a balanced object can cause it to suddenly and completely topple. [3]

Schilling expands on these ideas graphically and introduces terms such as "tipping-in" and "in-tipping" points.

Schelling expanded on this racial dynamics model fully in his 1978 book *Micromotives and Macrobehavior*. [4]

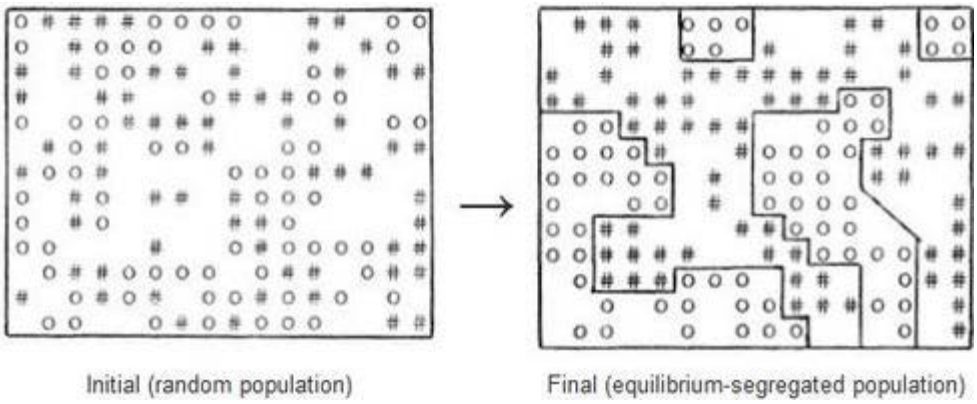

Some of the before and after micro-choice preference segregation diagrams from Schilling's 1971 article "Dynamic Models of Segregation", where he explains that people will tend to move, one-by-one, until they are in a socially "happy" situation (socially uncomfortable position). [2]

References

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2. Schelling, Thomas. (1971). "Dynamic Models of Segregation" (abs), *Journal of Mathematical Sociology*, 1(2): 143-86.
3. (a) Morton Grodzins – Wikipedia.
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4. Schelling, Thomas. (1978). *Micromotives and Macrobehavior*. W.W. Norton.
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Further reading

â— Ball, Philip. (2004). *Critical Mass - How One Thing Leads to Another* (Schelling, 14+ pgs.). New York: Farrar, Straus and Giroux.
â— Buchanan, Mark. (2007). *The Social Atom - why the Rich get Richer, Cheaters get Caught, and Your Neighbor Usually Looks Like You* (Schelling, 14+ pgs.). New York: Bloomsbury.

External links

â— Thomas Schelling – Wikipedia.

θΔics

In science, **Thomas Seebeck** (1770-1831) was an Estonian-born German physician and physicist noted for his 1821 experimental discovery of thermo-electricity and for his association with German scientist Johann Goethe on color theory. [1]

References

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External links

- Thomas Johann Seebeck – Wikipedia.

θΔics

In existographies, **Thomas Tailour** (c.1461-1500) (FA:45) was an English fuller noted for []

Overview

In 1491, Tailour was “disciplined” for uttering the following heresies: calling people "fools" for going on a pilgrimage, saying it was pointless to worship images of saints, disparaging the learning and the moral behavior of priests, questioning the need for baptism, and maintaining that the soul dies with the body, as the flame of a candle dies when blown out, and for denying the existence of god. As punishment, he had to publicly renounce these views and each day for the rest of his existence, say the Pater Nosier five times, the Ave Maria five times, and the Credo once. If he didn't stick to this, or if he again voiced his heretical beliefs, he would be burnt to death, and he was also was made to carry around with him the firewood that would be used for this purpose. [1]

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(b) Steele, David D. (2008). *Atheism Explained” from Folly to Philosophy* (pg. #). Open Court Publishing.
(c) Whitmarsh, Tim. (2015). *Battling the Gods: Atheism in the Ancient World* (pg. 6). Vintage Books.

θΔics

In existographies, **Thomas Patrick Wallace** (1935-) (SNE:3) (CR:89) is an American physical chemist noted for his 2009 book *Wealth, Energy, and Human Values*, particularly his appendix section "The Fundamentals of Thermodynamics Applied to Socioeconomics", wherein he applies chemical thermodynamics to the modeling of the formation, operation, and decline of societies, in what he considers a 'mechanistic-thermodynamic paradigm'.

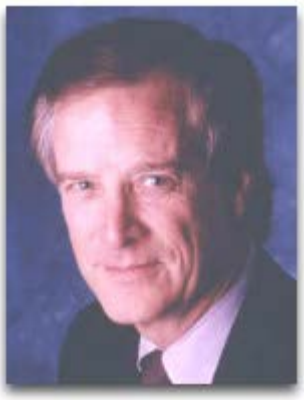

Overview

The following is a truncated statement of Wallace's position:

> "The thermodynamic parameter free energy:
>
> $$\Delta G = \Delta H - T\Delta S$$
>
> represents the fundamental driving force in nature and determines whether physical and chemical processes conducted by nature and society will take place [and] the civilization development model [can be] represented by the following equation:
>
> $$P \rightarrow F \Leftrightarrow S \Leftrightarrow I \rightarrow F$$
>
> where *P* is the primitive phase, *F* the feudal phase, *S* the state phase, *I* the imperial phase, ⇔ meaning dynamic equilibrium, and → meaning complete conversion to products."

The following is a representative view expressed by Wallace: [1]

> "Thermodynamics principles and energy considerations control all processes conducted by nature and society, i.e. determine the potential process spontaneity and directionality."

Of curiosity, Wallace relegates these best parts of the book to the last ten pages, wherein he uses two equations, the first main principle and the Gibbs equation. In the bulk of the book, in contrast, Wallace sticks to mostly verbal arguments, giving many good quotes along the way, such as:

> "Thermodynamics regulates society's acquisition, refinement, and utilization of nature's resources to provide the food and fuels necessary for the vital processes of human existence."

Another good quote by Wallace is:

> "A thermodynamic-based economic model identifies the dynamics that drive all human existence including the economic, social, and political activities of a society. Such a model must employ strict science-based definitions of national wealth, wealth-energy resources, and related financial and economic parameters and must not violate the laws of thermodynamics."

Wallace's supporting references, based on key term usage, seem to be Frederick Soddy, Joseph Tainter, Leslie White,

Max Weber, Carl Neumann, Anson Rabinbach, and Pitirim Sorokin, respectively. [3] Overall, Wallace's theory of entropy-driven degrading cultures seems to be themed similar to the views of American historian Henry Adams, albeit he does not cite Adams, maybe possibly not having been aware of his work?

Mechanism

In the last chapter, The Mechanistic-thermodynamic Paradigm: a Unifying Perspective of Civilization, Wallace builds on the 1969 work of American political scientist Matthew Melko, who defines "transitional periods", reversions to original periods, etc., using transition mechanism diagrams, to describe the transitioning from a primitive society P to a feudal society F to a state society S to an imperial society, each with a transition phase, i.e. PT, FT, ST, IT, and possible reversion to original state side routes, indicated by side-route branches angled forward, an example of which is shown below: [5]

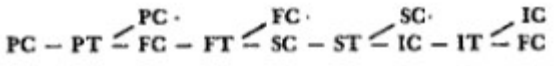

Melko defines this in terms of a pin ball machine:

> "[The mechanism] is rather like a pin-ball machine. The ball, when shot, has a universe of possibilities … but as soon as it passes through the first slot on its downward curve, the possibilities are narrowed. Thus, having reached FC, it can no longer return to PC. But the machine also has rubber bumpers, so that the ball can reverse its course. Having reached slot SC, it can no longer return to PC, the initial ejection slot, which has been closed off by a one-way valve."

The addition that Wallace makes to this is to rephrase the entire description in purely physical chemistry terminology and depiction, using the double dagger "‡" to indicate a molecular reactant species in an unstable transition state, the double arrow "↔" to represent a reversible reaction, and a one-way arrow "→" to represent an irreversible reaction, as follows:

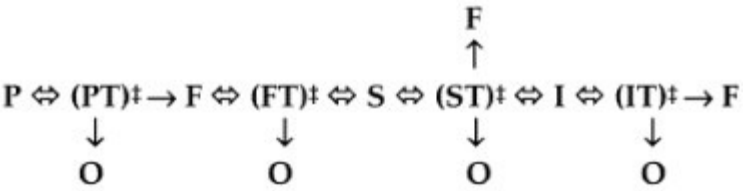

Wallace modifies Melko's mechanism by adding in the side-step reaction mechanism step that the transition state, e.g. (PT)‡, may undergo ossification O, an Arnold Toynbee term meaning to "freeze at a crystal stage". Wallace also describes each step in terms of being types of double displacement reactions:

$$A + B \rightarrow C + D$$

in which a change in conditions, e.g. stress, temperature, addition of reactants or products, etc., to the system will affect a change in the dynamic equilibrium of the reaction, according to Le Chatelier's principle.

Difficulties on theory

The book may have a certain religious tinge to it as the capitalization of the term 'Mother Nature', used on at least 32-pages, upwards of 3-5 times per page, is used ad nauseum. To compound this, the word 'God' is mentioned fourteen times and the word 'spirituality' is found prominently on the cover. It is difficult to pin down the reasoning behind this uncomfortable usage of "Mother Nature", but it may be indicative of some type of ambivalence in the author's mindset

on the existence of God, as the laws of thermodynamics are in direct opposition to this view.

Education

Wallace completed his BS in chemistry from the State University of New York, and his MS in chemistry from St. Lawrence and Syracuse. (Q) He then completed his PhD in physical chemistry from Clarkson University in 1967 with a dissertation on "Light Scattering Studies of Synthetic Polymer Latex Systems". [2] Wallace has taught undergraduate and graduate courses in chemical thermodynamics, kinetics, and polymer science. Wallace was president of Illinois State University from 1988 to 1995. [4]

In 1991, Wallace created the Illinois State University "Center for Mathematics, Science, and Technology", to assist in integrating efforts of diverse departments, drawn from different colleges in the university, in meeting the needs of Illinois schools in addressing issues related to mathematics, science, and technology education. [6]

See also

- Barbara Heyl | ISU sociology professor 1975-2005; noted Harvard Pareto circle scholar
- Eric Zencey | gave Wilhelm Ostwald based social energetics talk at ISU (2014), co-sponsored by the chemistry department.

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1. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (Le Chatelier's principle, pgs. 142-43; Appendix A: The Fundamentals of Thermodynamics Applied to Socioeconomics, pgs. 469-89). AuthorHouse.
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- Wealth, Energy, and Human Values (homepage) – DecayingCultures.com.

θΔics

In existographies, **Thomas Willis** (1621-1675) (IQ:#|#) was an English physician and philosopher, noted for []

Overview

In 1664, Willis published *Anatomy of the Brain* (*Cerebri anatome*), illustrated by Christopher Wren, wherein the word "neurology" was coined.

In 1672, Willis, in his *Two Discourses Concerning the Soul of Brutes*, starting with the Lucretius and Pierre Gassendi, outlined a theory of a corporeal fiery soul extended throughout the bodies of animals and humans, while simultaneous insisting on the existence of a second higher rational soul in humans. [1]

Hooke

Willis was a teacher of Robert Hooke and his patron at Christ Church; Hooke, supposedly, had read his *Anatomy of the Brain* (1664), along with Rene Descartes' *L'Homme* (1633), prior to giving his 1682 "Memory, Association, and Time Perception" lecture on the subject of the soul. [3]

Quotes | Employed

The following are quotes employed by Willis:

> "Who can easily comprehend that small thing … within the body of an elephant … that it should be able to agitate such a bulk, and to cause it to perform a swift and harmonious dance? But indeed, the same fiery nature of the soul, serves within the body by its own mobility, what a little flame of gunpowder does in a cannon: it not only drives the bullet with so much force, but also drives back the whole machine with so great strength."
>
> — Pierre Gassendi (c.1648), *Publication*; cited by Thomas Willis (c.1660) in "On Convulsive Diseases" [2]

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(b) La Mettrie, Julien. (1751). *Machine Man and Other Writings: Treatise on the Soul, Man as Plant, The System of Epicurus, Anti-Seneca or the Sovereign Good, Preliminary Discourse* (translator and editor: Ann Thomson) (Lunatic, pg. xi). Cambridge University Press, 1996.
2. Willis, Thomas. (c.1660). "Of Convulsive Diseases," in *Dr. Willis's Practice of Physick* (op. cit., p. 2). Publisher.
3. (a) Hooke, Robert. (1682). "Memory, Association, and Time Perception (aka Lecture on the Soul)", Royal Society of London, Jun 21; given again on Jun 28 (by request); first-published in 1705 in Posthumous works.
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References

â— Thomas Willis – Wikipedia.

θΔics

In existographies, **Thomas Young** (1773-1829) (IQ:195|#11) [RGM:658|1,500+] (Murray 4000:19|P) (library:1,000+) [LPKE] [polymath] (RE:56) (CR:103) was an English physician-physicist and linguist, a "child prodigy" turned "phenomenon Young" (medical school classmates) turned "walking encyclopedia" (Robinson), characterized as "one of the most acute men" (Helmholtz), a "polymath of amazing reach" (Zajonc), "highly intelligent" (Cantor), "last man to known everything" (Ruhah), etc., notable for his 1801 wave theory of light, in which he showed that each color of light is associated with a particular wave; a theory which he proved in his circa 1804 double-slit experiment, which show that light waves interact with each other constructively and destructively; for being the first to define by "heat" and "energy", in 1807, in the modern physical sense; for his modulus of elasticity work (1807); and for his 1814 to 1818 work on the partial translation of the Rosetta Stone, the key to the later understanding of the Egyptian origin to seventy-two percent of all modern religions. [1]

Child prodigy

Young was a significant child prodigy. At two, Young was reading, and by four had read the Bible twice.

At age six, Young had commenced Latin study and could repeat lengthy poems, such as Oliver Goldsmith's *The Deserted Village* (1770)—a work of social commentary, which condemns rural depopulation and the pursuit of excessive wealth—by rote.

While a teen, he could read Greek, Latin, Hebrew, Persian, Syriac, and Chaldean; and also taught himself calculus, studied the sciences, learned how to construct his own optical devices, and learned medicine.

At 14 he was tutoring others on the classics. By age twenty he had also learned French, German, Spanish, Arabic and Italian. He also studied art and learned to play the flute. He was not a complete nerd, either; he could also ride horses, sing, and dance. Once he walked over 170 miles to see an art exhibition.

At 19, Young began his medical studies under English anatomist John Hunter. [7]

Overview

The modern physics meaning of the term is generally attributed to English physicist and physician Thomas Young who in 1807 used the term energy, based on the Greek word Îνεργεια meaning *efficacy* or *effective force*, as an abbreviation for the sum of kinetic energy and gravitational potential energy of a mass and the elastic energy of a spring to which the mass may be attached. [2] In more detail, under the guidance of American-born English physicist Benjamin Thomson, in 1802 Young began to prepare lectures in natural philosophy for the Royal Society. In them, he dealt with the quantity "vis viva" and in 1807 introduced the term energy for it: [3]

> "The term **energy** may be applied, with great propriety, to the product of mass or weight of a body, into the square of the number expressing its velocity. Thus, if the weight of one ounce moves with a velocity of a foot in a second, we call its energy 1; if a second body of two ounces has a velocity of three feet in a second, its energy will be twice the square of three, or 18."

In this sense, Young defined energy as:

$$E = mv^2$$

To clarify that Young was the first to have mathematically coined the term "energy", years later Scottish mathematical physicist William Thomson stated before an audience, for instance, that "the very name *energy*, though first used in its present sense by Thomas Young about the beginning of this century, has only come into use

practically after the doctrine which defines it had ... been raised from mere formula of mathematical dynamics to the position it now holds of a principle pervading all nature and guiding the investigator in the field of science." [4]

Kinetic energy

In 1811, in partial correction to Young's expression, Italian mathematician Joseph Lagrange used calculus to show that a factor of two is involved in the relationship "potential" (potential energy) and "vis viva" (kinetic energy). [3] In the symbols used by Lagrange, i.e. *T* as kinetic energy, in his 1788 *Analytical Mechanics*:

$$T = \frac{1}{2}mv^2$$

where *2T* denotes the whole "living force of the system". [5]

Lagrange

In mid-1814, Young, while studying the Rosetta Stone in Worthing, was approached by Scottish editor Macvey Napier about making contributions to the *Encyclopedia Britannica*. Young, at first initially refused, but would eventually go on to contribute some 380 quarto pages—his article on "languages" alone runs some 33,000 words—over the course of 9 years, on a number of subjects. Among biographies, which, as he said, "seldom amused him much", the biography on Joseph Lagrange was the only one he did "con amore", i.e. with love, as he reported in a letter to Napier. The following are some of the ripe letter excerpts by Young on this matter:

> "Lagrange will be an arduous task but I must not flinch from it; I cannot promise it till Christmas; it cannot be long, probably longer than any of my biographical articles; but the labor will be much more than in proportion to its length."
>
> — Thomas Young (1820), "Letter to Macvey Napier" [6]

> "The biographical articles seldom amuse me much in writing; there is too little invention to occupy the mind sufficiently: I like to a deep and difficult investigation when I happen to have made it easy to myself if not to all others—and there is a spirit of gambling in this, whether as by the cast of a die, a calculation *a perte de vue* [i.e. a farfetched calculation] shall bring out a beautiful and simple result, or shall be wholly thrown away. Scientific investigations are a sort of warfare, carried on in the closet or on the couch against all one's contemporaries and predecessors; I have often gained a single victory when I have been half asleep, but more frequently found, on being thoroughly awake, that the enemy had still the advantage of me when I thought I had him fast in a corner—and all this, you see, keeps one alive."
>
> — Thomas Young (c.1820), "Letter to Hudson Gurney" [6]

Young cited, and in many cases summarized, more than 100 articles of Lagrange, in the writing of his *Britannica* article.

Quotes | By

The following are noted quoted by Young:

> "Whoever would arrive at excellence must be self-taught. There is, in reality, very little that a person who is serious and industriously disposed to improve may not obtain from books with more advantage than from a living instructor."
>
> — Thomas Young (1798), "Letter to brother" [6]

> “The longer a person has lived the less he gains by reading, and the more likely he is to forget what he has read and learnt of old; and the only remedy that I know of is to write upon every subject that he wishes to understand, even if he burns what he has written.”
>
> — Thomas Young (1809), “Letter to Hudson Gurney” [6]

References

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2. Muller, Ingo. (2007). *A History of Thermodynamics - the Doctrine of Energy and Entropy*. New York: Springer.
3. Rayner, John, N. (2000). *Dynamic Climatology: Basis in Mathematical Physics* (pg. 94). Blackwell Publishing.
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7. (a) Graves, Dan. (1996). *Scientists of Faith: Forty-Eight Scientists and Their Christian Faiths* (§24: Thomas Young, pgs. 91-93). Kregel Resources.
(b) Thomas Young (2012) – CreationRevolution.com.

Further reading

â— Fechner, Gustav Theodor (1878). *Ueber den Ausgangswerth der kleinsten Abweichungssumme*. S. Hirzel.

External links

â— Thomas Young – Wikipedia.

θΔics

In chemistry, the **Thomsen-Berthelot principle** (or Berthelot-Thomsen principle) argued that heat release or in modern speak that enthalpy was the driving force of a chemical reaction and that only exothermic reaction would occur spontaneously. The principle argued, in short, that heat is the driving force of chemical reactions and hence the measure of chemical affinity.

3.2.2 Conversion of Free and Bound Energy

It was believed at one time that the size of the heat of reaction (reaction enthalpy) was a measure of the chemical "force" (**affinity**) driving a reaction (*Thomson-Berthelot principle*), and that therefore only exothermic reactions could occur spontaneously. This hypothesis has proved to be false. We now know that the heat of a reaction $E_{total} = \Delta H$ is made up of two components, one "*free*" and one "*bound*": $E_{total} = E_{free} + E_{bound}$. Only that part which can also be converted into work, the "*maximum work*", Gibbs' free energy or **free energy of reaction** (ΔG) determines the course of the reaction (J. H. van't Hoff, 1883). Reactions which occur spontaneously are those in which free energy ΔG is released. In other words, work can be done by these reactions and the free energy change is *negative*. Those reactions in which free energy is absorbed can occur only if energy is added: the free energy change is *positive* [3]. The portion of the total energy which can be obtained only as heat, E_{bound}, is closely linked to the actual reaction process. The sign and magnitude of E_{bound} determine the sign of the total energy E_{total} of the spontaneous process, and make it either exothermic or endothermic. Thus it is possible for endothermic reactions to occur spontaneously, if the total energy is less than the bound energy.

A 2001 inorganic chemistry textbook summary of the the **Thomson-Berthelot principle**. [1]

History

This principle was postulated independently in 1854 by Danish chemist Julius Thomsen and in 1864 by French chemist Marcellin Berthelot.

Synonyms

Another synonymous name is the principle of maximum work.

Chemical thermodynamics

The Thomsen-Berthelot principle was superseded by the "free energy principle", that free energy is the true measure of affinity, as proved in 1882 by German physicist Hermann Helmholtz, in which "On the Thermodynamics of Chemical Processes". [2]

Absolute zero

The Thomsen-Berthelot principle was shown to only be true at absolute zero, as proved by German physical chemist Walther Nernst in his circa 1906 heat theorem.

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2. Helmholtz, Hermann. (1882). "On the Thermodynamics of Chemical Processes", in: *Physical Memoirs Selected and Translated from Foreign Sources*, 1: 43-97. Physical Society of London, Taylor and Francis, 1888.

External links

â— Thomsen-Berthelot principle – Wikipedia.

θΔics

In genealogies, **Thomson genealogy** is the lineage that made Scottish-Irish brothers physicist William Thomson and engineer James Thomson, two the main early curators of thermodynamics, both sons of mathematician James Thomson, Sr., along with three other James Thomson's prior to him.

Thomson lineage

The Thomson clan is of Scottish origin. In 1641, it is said that three brothers James Thomson, John Thomson, and Robert Thomson, migrated from the Lowlands of Scotland, during the troubled times of the civil war. John Thomson settled in Count Down at Ballymaglave (or Ballymaglymph), and for nearly two-hundred-years his descendents continued to occupy a farm called Annaghmore, near Spa Well, Ballynahinch.

An anon son of John Thomson hand a son named James Thomson (c.1691-).

On his house, on a quoin of a building now used as a barn, this James Thomson, grandson of John Thomson, cut his name, with the date 1707 (which fixes his age to about sixteen).

This James Thomson had three sons: John Thomson, Robin Thomson, and James Thomson (c.1738-). The first two sons, John and Robin, both migrated to Buffalo Valley, New York in about 1755.

The latter son, James Thomson (c.1738), stated in Scotland, and in 1768 married Agnes Nesbitt, who bore him three sons: Robert Thomson, John Thomson, and James Thomson (mathematician). At this date the Thomson's owned about one-quarter of the township of Ballymaglave. [1]

Overview

The following is the framework of the Thomson genealogy:

Thomson family		
James Thomson (c.1616-)	John Thomson (c.1619-)	Robert Thomson (c.1622-)
	|	
	Anon Thomson (c.1654-)	
	|	
	James Thomson (c.1691-)	
	|	
John Thomson (c.1730-)	James Thomson (c.1738-) (farmer)	Robin Thomson (c.1732-)
	|	
Robert Thomson (1773-)	James Thomson	John Thomson (c.1780-)

(1786-1849)
(mathematician)

|---------- ----------|

James Thomson
(1822-1892)
(engineer)

William Thomson
(1824-1907)
(physicist)

It is said James Thomson (farmer) gave his children what little education they could receive. [2]

References

1. Thompson, Silvanus P. (1910). *The Life of William Thomson, Baron Kelvin of Largs, Volume 1* (James Thomson and Agnes Nesbitt, pg. 1-2). MacMillian.
2. James Thomson (mathematician) – MacTutor Biography, University of St. Andrews.

θΔics

In geniuses on, **Thomson on religion** refers to the published opinions, statements, views, and expressed beliefs of Irish-born Scottish mathematical physicist William Thomson (1824-1907) on religion, god, and science.

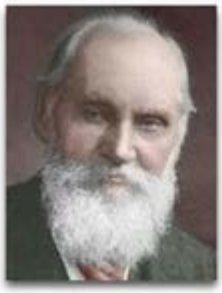

A depiction of William Thomson caught between his Irish Catholic beliefs (Christianity) and the newly being discovered sciences of thermodynamics, James Joule's 1843 paddle wheel experiment (right), electricity, and physics, at the end of which, he sided with a "creative power" (1903) model over that of evolution (Darwin).

Overview

Thomson, in his early writings, was not overtly religious; say as compared to someone like James Joule who preached about the mechanical equivalent of heat in Church and how his calculations has something to do with the water churning actions described in the flood myth of the Bible.

In 1852, Thomson used the technique of using overtly scientific language, with covertly hidden religious backdoor key terms; such as stating that "there is a universal tendency in nature to the dissipation of mechanical energy" and suggested how this tendency might relate to "vegetable life" or to the "will of animate creatures". [1] This type of description, for lack of better terms, is "scientific god code" or "covert creationism"; a modern example of which is: Robert Ulanowicz and his ascendency principle.

Crystals | God

In 1897, William Thomson, in his "The Age of the Earth as an Abode Fitted for Life", stated the following: [6]

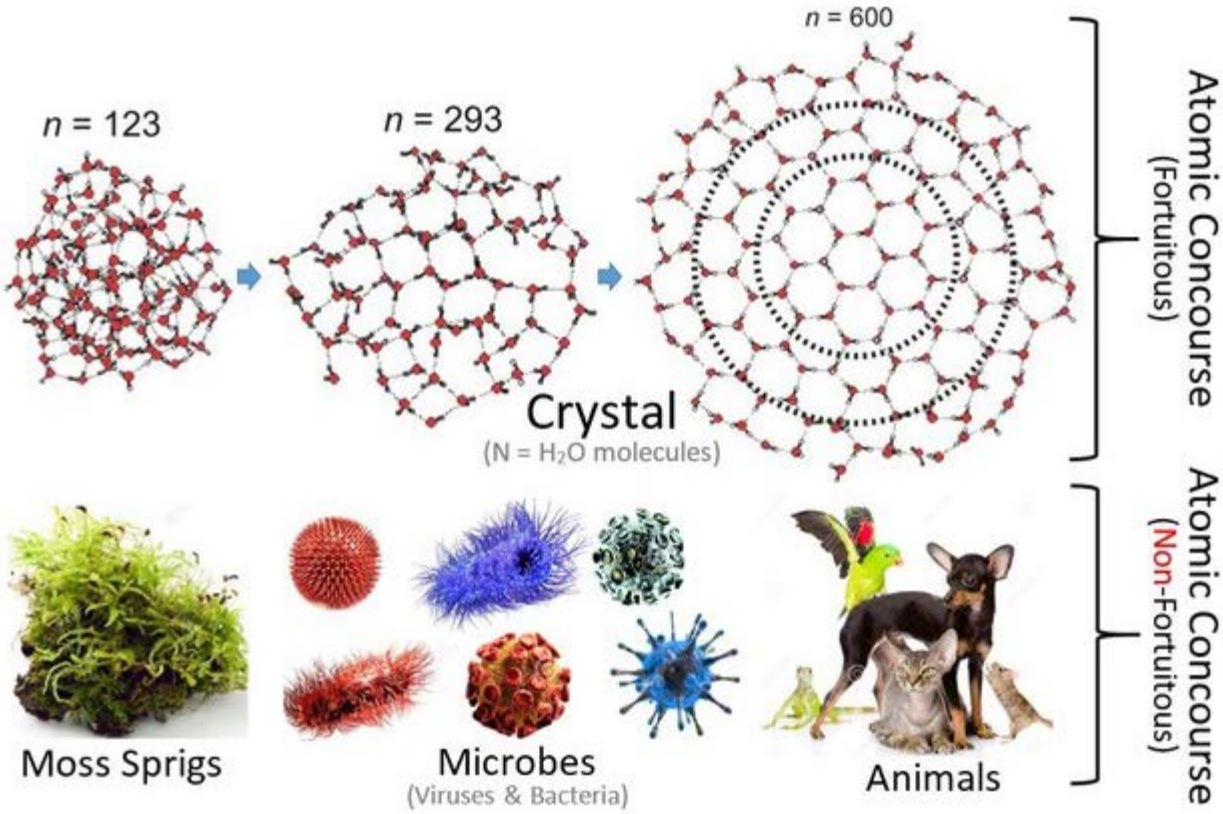

A synopsis of William Thomson's vacillating 1897-1903 views on "**crystals**", e.g. water crystal (Ñº) formation shown above, which he believes are formed by the "fortuitous concourse of atoms" (Cicero on Greek atomic theory), whereas moss sprigs, microbes, and animals are formed by the "creative power" of god acting on atoms, via a miracle; though in his 2 May 1903 impromptu speech he slips and says it is absurd to believe that crystals could form by the "fortuitous concourse of atoms", then request a recant two days later, after reading his published statements in *The Times*.

> "My task has been rigorously confined to what, humanly speaking, we may call the 'fortuitous concourse of atoms', in the preparation of the earth as an abode fitted for life. Mathematics and dynamics fail us when we contemplate the earth, fitted for life but lifeless, and try to imagine the commencement of life upon it. This certainly did not take place by any action of chemistry, or electricity, or

crystalline grouping of molecules under the influence of force, or by any possible kind of fortuitous concourse of atoms. We must pause, face to face with the mystery and miracle of creation of living creatures."

In 2 May 1903, Thomson, amid a five part public lecture by professor George Henslow (1835-1925), on "Christian Apologetics", delivered at the Botanical Theater, at University College, the first of which being on "Present-day Rationalism: an Examination of Darwinism", gave thanks to Henslow by say a few words, as follows: [2]

"Science positively affirmed creative power. Science made everyone feel a miracle in himself. It was not in dead matter that they lived and moved and had their being, but in the creative and directing power which science compelled them to accept as an article of belief. They could not escape from that when they studied the physics and dynamics of living and dead matter all around. Modern biologists were coming once more to a firm acceptance of something, and that was a vital principle. They had an unknown object put before them in science. In thinking of that object they were all agnostics. They only knew God in his works, but they were absolutely forced by science to admit and to believe with absolute confidence in a directive power—in an influence other than physical, dynamical, electrical forces.

Cicero denied that they could have come into existence by a fortuitous concourse of atoms. Was there anything so absurd as to believe that a number of atoms by falling together of their own accord could make a crystal, a sprig of moss, a microbe, a living animal? People thought that, given millions of years, these might come to pass, but they could not think that a million of millions of years could give them unaided a beautiful world like ours. They had a spiritual influence, and in science a knowledge that there was that influence in the world around them. He admired the healthy, breezy atmosphere of free thought in professor [John] Henslow's (Ñº) lecture. Let no one be afraid of true freedom. They could be free in their thoughts, in their criticisms, and with freedom of thought they were bound to come to the conclusion that science was not antagonistic to religion but a help for religion."

Thomson, then, after reading his praise commentary, as printed in *The Times*, sent a "request to amend" letter to the editor of *The Times*, which was printed on May 4, 1903, wherein he states the following humorous request:

"Sir,—In your report of a few words which I said in proposing a vote of thanks to Professor Henslow for his lecture 'On Present Day Rationalism' yesterday evening, in University College, I find the following: —'Was there anything so absurd as to believe that a number of atoms by falling together of their own accord could make a crystal, a sprig of moss, a microbe, a living animal?' I wish to delete 'a crystal,' though no doubt your report of what I said is correct."

Thomson elaborates on his reasoning behind this request as follows:

"Exceedingly narrow limits of time prevented me from endeavoring to explain how different is the structure of a crystal from that of any portion, large or small, of an animal or plant, or the cellular formation of which the bodies of animals and plants are made; but I desired to point out that, while 'fortuitous concourse of atoms' is not an inappropriate description of the formation of a crystal, it is utterly absurd in respect to the coming into existence, or the growth, or the continuation of the molecular combinations presented in the bodies of living things. Here scientific thought is compelled to accept the idea of creative power. Forty years ago I asked Liebig, walking somewhere in the country, if he believed that the grass and flowers which we saw around us grew by mere chemical forces. He answered, 'No, no more than I could believe that a book of botany describing them could grow by mere chemical forces.' Every action of human free will is a miracle to physical and chemical and mathematical science."

(add discussion)

Other

In 1908, American James Walsh, following is obituary on Kelvin, in *Catholic World*, commented that those wishing to become proficient in Christian apologetics, should consult Thomson. [3]

Quotes | Related

The following are related quotes:

> "Kelvin was a strong Christian, opposing both Darwinian evolution and Lyellian uniformitarianism."
>
> — Henry Morris (c.1960) [5]

Quotes

The following are other representative Thomson on religion quotes:

> "Modern biologists are coming, I believe, once more to a firm acceptance of something beyond mere gravitational, chemical, and physical forces; and that unknown thing is a vital principle."
>
> — William Thomson (c.1900) [4]

> "Modern biologists are coming, I believe, once more to a firm acceptance of something beyond mere gravitational, chemical, and physical forces; and that unknown thing is a vital principle."
>
> — William Thomson (c.1900) [4]

> "Overwhelming strong proofs of intelligent and benevolent design lie around us."
>
> — William Thomson (c.1900) [4]

> "The more thoroughly I conduct scientific research, the more I believe that science excludes atheism."
>
> — William Thomson (c.1900) [4]

> "The atheistic idea is so nonsensical that I do not see how I can put it in words."
>
> — William Thomson (c.1900) [4]

> "Do not be afraid of being free thinkers. If you think strongly enough you will be forced by science to the belief in God, which is the foundation of all religion. You will find science not antagonistic but helpful to religion."
>
> — William Thomson (c.1900) [4]

> "The hypothesis that life originated on this earth through moss-grown fragments from the ruins of another

world may seem wild and visionary; all I maintain is that it is not unscientific."

— William Thomson (c.1900) [4]

"I feel profoundly convinced that the argument of design has been greatly too much lost sight of in recent zoological speculations. Reactions against the frivolities of teleology, such as are to be found, not rarely, in the notes of the learned commentators on Paley's *Natural Theology*, has, I believe, had a temporary effect in turning attention from the solid and irrefragable argument so well put forward in that excellent old book. But overwhelmingly strong proofs of intelligent and benevolent design lie all around us, and if ever perplexities, whether metaphysical or scientific, turn us away from them for a time, they come back upon us with irresistible force, showing to us through nature the influence of a free will, and teaching us that all living beings depend on one ever-acting Creator and Ruler."

— William Thomson (c.1900) [4]

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Further reading

â— Crutchley, Peter. (2013). "Kelvin's Conundrum: Is it Possible to Believe in God and Science?" (Ñº), BBC, Religion & Ethics, Oct 20.
â— Livio, Mario. (2103). *Brilliant Blunders: From Darwin to Einstein, Colossal Mistakes by Great Scientists That Changed Our Understanding of Life and the Universe* (§4: How Old is the Earth?, pgs. 60-). Simon & Schuster.

θΔics

In thermodynamics, **Thomson's search for Carnot's *Reflections*** is a famous story of how in 1845 a twenty-one year old Irish student named William Thomson went on a search throughout the bookstores of Paris looking for French physicist Sadi Carnot's 1824 memoir *Reflections on the Motive Power of Fire*; efforts that later functioned to bring the proto-subject of the connection between heat and work to the likes of William Rankine, James Maxwell, and most importantly Rudolf Clausius, the latter of which later coming to lay the foundations of thermodynamics with his 1865 book *The Mechanical Theory of Heat*.

Early details

In 1839, a young 15-year-old Irish mathematical physics student named William Thomson was in attendance at the Royal Belfast Academical Institution of Northern Ireland, where Scottish educator John Nichol, a professor of astronomy, had that year took the chair of natural philosophy. Upon doing so, Nichol updated the curriculum, introducing students to the new mathematical works of French mathematical physicist Joseph Fourier's particularly his 1822 *Analytical Theory of Heat.* [1] The mathematical treatment much impressed young Thomson, who became intrigued with Fourier's *Théorie analytique de la chaleur* and committed himself to study the "Continental" mathematics resisted by a British establishment still working in the shadow of English physicist Isaac Newton. This was Thomson's first stimulator as to the nature of heat.

In 1840, Thomson also came across Edinburgh mathematics professor Philip Kelland's 1837 *Theory of Heat*, in which it was claimed that Fourier was mostly wrong. [2] In comparing the two, as Thomson told his father, "Fourier is right, and Kelland is wrong." [3] Out of this stimulus, in 1841, at the age of seventeen, Thomson wrote his first scientific paper on Fourier's analysis of heat under the pseudonym *P.Q.R.*, which was submitted to the *Cambridge Mathematical Journal* by his father James Thomson (mathematician), titled "On Fourier's expansions of functions in trigonometric series"; and soon two more papers of similar theme soon followed. [4]

Clapeyron

At some point during the years 1843 to 1845, William Thomson learned about Carnot through hearing of or reading French engineer Émile Clapeyron's 1834 article "Memoir on the Motive Power of Heat", wherein French physicist Sadi Carnot's 1824 work, for the first time, had been referenced and also reinterpreted graphically, using English engineer John Southern's 1796 indicator diagram methodology. [6]

English thermodynamics historian Crosbie Smith states, in his 1998 book *The Science of Energy*, that this occurred in the late summer of 1843 when William and his older brother brother James Thomson began initiated a dialogue on the Carnot-Clapeyron theory. [5] Crosbie argues that William developed an interest in the efficiency of heat engines during this period and had begun to engage in discussions about the paper of Carnot on this subject with his older brother James Thomson, a steam engineer, who was in need of such knowledge so to improve the efficiency of engines at a factory where he was employed at the time.

American low-temperature historian Tom Shachtman states, in his 1999 book *Absolute Zero*, that William learned of Clapeyron's exegesis of Carnot, in 1845, while doing post-graduate work in the laboratory of Victor Regnault, a former student (1830) and chair of chemistry (1840) of the École Polytechnique (a school founded by Carnot's father, Lazare Carnot), from "colleagues at Regnault's laboratory". Shachtman also states that prior to being introduced to Clapeyron's work, Thomson believed that heat depended on caloric as Regnault did. [12]

Paris bookstores

During this time (likely in 1845), Thomson tried to find a copy of Carnot's *Reflections*. To his surprise and disappointment there was no copy in the library of the École Polytechnique, and no Paris bookseller had heard of it or its author. [7] As he later recalled: [8]

> "I went to every book-shop I could think of, asking for the *Puissance Motrice du Feu*, by Carnot. 'Caino? Je ne connais pas cet auteur' … 'Ah! Ca-rrr-not! Oui, voice son ouvrgae', producing a volume on some social question by Hippolyte Carnot [Sadi's brother]; but the *Puissance Motrice du Fue* was quite unknown."

In June of 1848, still not having found an a copy of Carnot's publication, Thomson published a paper titled "On an Absolute Thermometric Scale Founded on Carnot's Theory of the Motive Power of Heat" read to the Cambridge Philosophical Society, based on Clapeyron's 1834 paper. [6] In a foot note to his paper, Thomson states: [9]

> "Having never met with the original work, it is only through a paper by M. Clapeyron, on the same subject, published in the *Journal de l'École Polytechnique*, Vol. xiv. 1834, and translated in the first volume of Taylor's *Scientific Memoirs*, that the Author has become acquainted with Carnot's Theory."

Thomson also recalls, in retrospect, in a November 5th, 1881 note, that:

> "A few months later through the kindness of my late colleague Professor Lewis Gordon, I received a copy of Carnot's original work and was thus able to give to the Royal Society of Edinburgh my 'Account of Carnot's Theory' (Jan. 2nd, 1849)."

The article referred to above is the 1849 "An Account of Carnot's Theory of the Motive Power of Heat", in which the term "thermo-dynamic" was coined. [10]

Clausius

By 1850, through Thomson's and Clapeyron's writings, the work of Carnot, via Clapeyron's paper, reached the likes of German physicist Rudolf Clausius. Without even seeing Carnot's paper directly, Clausius was so drawn into the subject that he wrote the famous 1850 paper "On the Moving Force of Heat", giving his views on Carnot's heat engine theories. In a foot note, Clausius states: [11]

> "I have not been able to obtain a copy of this book [*Reflections*], and am acquainted with it only through the work of Clapeyron and Thomson, from the latter of whom are quoted the extracts afterwards given."

The supposition, in Carnot's work, that caught Clausius' attention was the postulate, expressly stated, that "the quantity of heat remains unchanged" (in the process), which equates to the argument that "no change occurs in the condition of the working body" (during the work cycle). Conversely, according the view of Clausius, as developed in the mechanical equivalence of heat, a certain amount of heat would consumed in the working body during an irreversible passage of heat in the cyclical production of work. These corrections were employed and remolded in Clausius' famous *Mechanical Theory of Heat* (1850-1875).

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θΔics

In Nordic mythology, **Thor**, and his father Odin, are the German-Scandinavian culturally transmitted rescripts of the Egyptian god Horus, and his great great grandfather Ra. [5]

Diagram shown how the Egyptian myth of how the moon and sun both "lost their eyes", i.e. had new moon and eclipse, respectively, was transmitted to the Nordic cultures as the stories of Thor and Odin loosing their eyes in battle. [5]

Overview

In 1807, Jacob Bryant, in his *A System: an Analysis of Ancient Mythology*, says the following: [1]

> "We are informed by Cedrenus, that one of the early successors to Ninus was called **'Thorous'**, that he was son of Zames, the same as Ninyas: that his father gave him the name Ares; but that the people called him Baal, and payed him divine honors."

In 1845, Philomathes, in his *Connexion Between Revelation and Mythology*, put things thusly: [4]

> "The second Scandinavian Trinity consists of **Odin, Frigga and Thor, a group much resembling Osiris, Isis, and Horus**. The former is slain, like the Egyptian Deity; the second is his wife, our universal goddess again; and **Thor** is their son, a Divine Hero, who, in fighting with the huge serpent of Midgard, **parallels himself with Krishna, Hercules and Apollo**. Many writers, however, put Freya, the Northern Venus, in the place of Frigga; probably hey were originally the same, so that it is not very momentous which holds the place of honour Dr. Henderson, in the Introduction to his "Iceland," (p. 19,) gives the form of oath usually taken by the ancient idolatrous natives of that strange island. . It ran thus—"So help me Frigga, and Thor, and the Omnipotent God," this last, of course, being Odin himself. Maurice places Frega at once in the Northern Trinity, asserting from Mallet (no mean authority,) that she is the Dea Syria, and Rhea, and Venus Urania. She is the Diana or Bubastis, as well as the Venus of the Scandinavian system; Friday or F*reya's day* is the same called *dies Veneris* by the Romans, a name still preserved in the French *Vendredi, &c.;* as Wednesday, or *Woden's day* is the day of the week sacred to Boodh, or Buddha, in the East, with which Deity he is identified by the best authorities."

In 1853, Alexander Hislop, in Note L: "The Identity of the Scandinavian Odin and Adon of Babylon", says the following about the origin of Odin: [2]

> "1. Nimrod, or Adon, or Adonis, of Babylon, was the great wargod. Odin, as is well known, was the same.
>
> 2. Nimrod, in the character of Bacchus, was regarded as the god of wine; Odin is represented as taking no food but wine. For thus we read in the *Edda:* "As to himself, he [Odin] stands in no o of food; wine is to him instead of every other aliment, according to what is said in these verses: The illustrious father of armies, with his own hand, fattens his two wolves; but the victorious Odin takes no other nourishment to himself than what arises from the unintermitted quaffing of wine," (MALLET, *20th Fable,* vol. ii., p. 106).

3. The name of one of Odin's sons indicates the meaning of Odin's own name. Balder, for whose death such lamentations were made, seems evidently just the Chaldee form of Baal-zer, “The seed of Baal;” for the Hebrew z, as is well known, frequently, in the later Chaldee, becomes *d.* Now, Baal and Adon both alike signify “Lord;” and, therefore, if Balder be admitted to be the seed or son of Baal, that is as much as to say that he is the son of Adon; and, consequently, Adon and Odin must be the same. This, of course, puts Odin a step back; makes his son to be the object of lamentation and not himself; but the same was the case also in Egypt; for there, Horus the *child* was sometimes represented as torn in pieces, as Osiris had been. Clemens Alexandrinus says *(Cohortatio,* vol. i., p. 30), “they lament an infant torn in pieces by the Titans.” The lamentations for Balder are very plainly the counterpart of the lamentations for Adonis; and, of course, if Balder was, as the lamentations prove him to have been, the favourite form of the Scandinavian Messiah, he was Adon, or “Lord,” as well as his father.

4. Then, lastly, the name of the other son of Odin, the mighty and warlike **Thor**, strengthens all the foregoing conclusions. Ninyas, the son of Ninus or Nimrod, on his father's death, when idolatry rose again, was, of course, from the nature of the mystic system, set up as Adon, “the Lord.” Now, as Odin had a son called Thor, so the second Assyrian Adon had a son called Thouros *(Cedrenus,* vol. i., p. 29) (Ñº) . The name Thouros seems just to be another form of Zoro, or Doro, “the seed;" for Photius tells us that among the **Greeks Thoros signified “Seed”** *(Lexicon,* pars i., p. 93). The D is often pronounced as Th. Adon, in the pointed Hebrew, being pronounced Athon.”

In 1885, Henry William, in his *The British Israelites*, building on Alexander, says the following: [3]

“Odin or Wodin, the Scandinavian war-god, after whom one of the days of the week, viz., Wednesday (*Wodnes-dag*), was called ; as also several places in England, such as *Wanborough* (formerly *Wodnesbrorh*) in Surrey ; *Wednesbury* in Staffordshire ; *Woodnes-borough* in Kent, &c., had two sons Balder and Thor (*Thors-day*, Thursday). Balder is Chaldaic for Baal Zer, "the seed of Baal." Now Baal and Adon both mean lord,—" the seed of Baal," therefore, signifies " the seed of Adon." Now Nimrod, the great war-god of Babylon, is known as Adon (which is synonymous with Odin) who also had a son called Thouros. Again, " Nimrod, in the character of Bacchus, was regarded as the god of wine ; Odin is represented as taking no food but wine" (Two Babylons, App. JJ.) We thus observe the **identity of the Scandinavian god Odin and Adon of Babylon**.”

(add)

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External links

â— Thor – Wikipedia.

θΔics

In hmolscience, **Thorstein Veblen** (1857-1929) was an American economist, cited by Robert Heilbroner as someone who became known as the apocryphal "last man who knew everything", notable, in physical economics, for his 1900 discussions on a possible "law of conservation of economic energy", which American physical economics historian Philip Mirowski's seems to think is a "bold assertion in the face of ignorance", and for being one of the first to work in the field of "evolutionary economics" a term he coined. [1]

Veblen was one of the members of the technocracy school.

Evolutionary economics

Veblen, in his 1898 article "Why is Economics Not an Evolutionary Science?" — wherein he coins the term "evolutionary economics" (see also: evolutionary psychology coining by William James, 1890) — comments the following about conservation of energy: [5]

> "The modern scientist is unwilling to depart from the test of causal relation or quantitative sequence. When he asks the question, Why? he insists on an answer in terms of cause and effect. He wants to reduce his solution of all problems to terms of the conservation of energy or the persistence of quantity."

Leisure class theory

Veblen is best-known for his 1899 "conspicuous consumption" theory, outlined in his *The Theory of the Leisure Class*, of the function of the leisure class. [2] The following are some of his popular quotes on this subject: [3]

> "Conspicuous consumption of valuable goods is a means of reputability to the gentleman of leisure."
>
> "The basis on which good repute in any highly organized industrial community ultimately rests is pecuniary strength; and the means of showing pecuniary strength, and so of gaining or retaining a good name, are leisure and a conspicuous consumption of goods."
>
> "In itself and in its consequences the life of leisure is beautiful and ennobling in all civilized men's eyes."

(add discussion)

Influences

A few notable influences to Veblen include: Charles Darwin, Herbert Spencer, Lester Ward, William James, Henri de Saint-Simon, and Charles Fourier.

Education

In 1880, Veblen completed his BA at Carleton College, Minnesota, and his PhD in 1884 at Yale University with a dissertation on "Ethical Grounds of a Doctrine of Retribution". He then spent six years on his family farm – ostensibly to recover from malaria – reading voraciously; often retreating to an isolated cabin in northern Wisconsin to focus on his studies. [4] In 1891, he left the farm, to study economics as a graduate student at Cornell University under James Laughlin.

Quotes

The following are relevant quotes:

> "The outcome of any serious research can only be to make two questions grow where only one grew before."

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External links

â— Thorstein Veblen – Wikipedia.

θΔics

In religio-mythology, **Thoth**, hieroglyph or "Tehuti" (Djehuti), is the Egyptian god of time, also a moon god, generally depicted as an Ibis-headed man, with or with out a moon symbol head piece; generally noted for having been, in Egyptian mythology, in the earlier period, the "judge of the two combatant gods" in the famous battle between Horus, god of North Egypt (Lower Egypt), and Set, god of South Egypt (Upper Egypt) for control of Egypt, at the time of the formation of the 1st Dynasty (3,100BC).

Thoth, sitting on a throne, holding the was scepter (uas scepter), or staff of the tamed Set, in his right hand and the Ankh, or symbol of life, in his left hand, as found carved (50BC) on the wall at the Hathor Temple of the Dendera Temple complex (right), in the Chapel of Isis, which is one of the shrines located to the east of the central sanctuary; and as illustrated (left) in Wallis Budge's *The Gods of the Egyptians* (1904). [2]

Overview

In 1904, Wallis Budge, in his *The Gods of the Egyptians*, opens to the following statement about Thoth: [1]

> "The hymns to Ra which are found in the *Book of the Dead* and in other funeral works of the ancient Egyptians state that the deities **Thoth** and Maat stand one on each side of the great god in his boat, and it is clear that they were believed to take some important part in directing its course; and as they were with Ra when he sprang up from the abyss of Nu their existence must have been coeval with his own."

Budge also (pg. 401) states:

> "Thoth was a self-begotten god who made calculations concerning the stablishing of the heavens, and the stars, and the earth; was the heart of Ra, master of law, both in the physical and moral conceptions of the knowledge of 'divine speech'. He was the inventor and god of all arts and sciences, the 'lord of books', the 'scribe of the gods', and 'mighty in speech', i.e. his words took effect, and he was declared to be the author of many of the funeral works by which the deceased gained everlasting life."

Here, to note, we see the prototype modern of "Moses" figure as author of the Old Testament, as the modern description tells us.

Moon god

Thoth, originally, was a moon god; the following are representative depictions of him with the moon symbol and moon crescent on his head:

His role as moon god can be seen in the story of the resurrection from the dead of Horus from a scorpion bite (see: Joshua 10:13) and how the Easter has to be celebrated during a full moon (see: black rite).

In short, the reason why the resurrection of Jesus from the dead HAS to occur (or be celebrated) on (or near) a full moon, is that the resurrection or revival of both Horus (see: Joshua 10:13) and Osiris (see: black rite) from the dead needed to have the presence and magical powers of the Egyptian moon god Thoth to have worked. Thoth stopped time during the resurrection of Osiris and Thoth came to the aid of crying Isis to help revive her dead son Horus, following a scorpion sting, in the original Egyptian version of the myth. By the time, 2,500-years later, this myth found its way into the Roman era, the polytheism of Osiris and Horus, became Osiris-Horus or Horus Christ, which became Jesus Christ and the celebration of Easter.

Hermes

In c.800BC, in Greece, via Greek mythology, the character of Thoth either was the mold for the Greek god Hermes and or they were later syncretized, during the Ptolemaic Dynasty period, such that the attributes of Thoth were subsumed into Hermes.

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External links

â— Thoth – Wikipedia.

θΔics

In experiments, **thought experiment** refers to any of various hypothetical or applied conceptualizations of possible processes or applications and the theoretical ramifications that follow. Often is the case that very simple thought experiments may lead to the development of entire libraries of new scientific branches.

Social chemistry experiment

An example of an outline of a 'thought experiment', concerning what would result if one was to apply basic chemist theory to social interactions, was given in 1962 by Austrian social economist Werner Stark in questioning why English biologist Thomas Huxley's 1871 call for the development of the field of social chemistry has never actuated: [1]

> "Why should no social chemistry ever been developed? Nobody would suggest that the social scientists should imitate meteorology, for this discipline does not appear to have got very far … but what about chemistry? A sociology based on chemistry [has] in fact been called for, but, significantly, [this call has] found no echo. It would have been easy to take up this suggestion and develop it further. An intending social chemist would have found it one whit more difficult to manufacture a sociological parallel to the Boyle-Charles law than Haret did to the Newtonian propositions. But the **experiment** appears never to have been tried. Why?"

Of note, in 1952 English C.G. Darwin did take up this call by devoting the first thirty pages of his book *The Next Million Years* to outlining the sociological parallel of Boyle's law, in which he considered a society to be a relatively closed system of human molecules governed by the laws of statistical mechanics, but Stark seems to have been unaware of this effort and it is certainly not 'easy' as Stark seems to think as evidenced by the fact that in 1910 American historian Henry Adams, after struggling with this type of application for some fifty years (e.g. commenting to his wife in 1885: "social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life"), concluded in the end, after writing several books on this subject, that the solution would "require the aid of another Newton."

Famous experiments

Some other famous thought experiments in chemistry and thermodynamics are listed below.

Person	Date	Age	Experiment	Result
Johann Goethe	1808	59	**Love thought experiment**: while writing a story called "The Renouncers", which was about a hero simultaneously in love with four women; the synopsis of which, in his view, was that "each in her own way is lovable; whichever one he is drawn to in the mood of the moment, she alone is lovable", he contemplated who to use the "determinate power" (Bergman, 1775) of the science of affinity chemistry to correctly "choose" who to love.	Goethe took it up again early the next year, after which the tale ballooned into a novel, progressed quickly, and before the end of the year (Oct 3, 1809) it was in print under the enigmatic title *Elective Affinities*, thus launching the science of human chemistry.
Rudolf Clausius	1849	27	Wondered how Carnot's 1824 incorrect supposition, that at the end of a heat cycle a body returns unchanged to its original state (or atomic position), could be amended in light of the	Led to the founding the science of thermodynamics, in the 1865 book *The*

				mechanical equivalent of heat.	*Mechanical Theory of Heat*
	James Maxwell	1867	36	Wondered if an intelligent agent at the boundary between a hot and a cold gas vessel, could circumvent the second law, by selectively choosing which speed particles can pass through the boundary.	Led to the century-long debate over the concept of 'Maxwell's demon'.
	Ludwig Boltzmann	1868	24	Speculated on what would happen to a volume of gas rising in earth's gravitational field. [2]	Led to the Maxwell-Boltzmann distribution
	Albert Einstein	1895	16	While daydreaming, began to ponder "what would it be like to run beside a light beam, at the speed of light." [3]	Led to the development of the special theory of relativity.
	Libb Thims	1995	23	**Love thought experiment**: while daydreaming in a chemical engineering thermodynamics class, began to wonder how the spontaneity criterion of chemical thermodynamics could be used to predict reactions between people, as is done with simple chemical reactions, particularly in application to mate selection, in order to "choose" who to correctly marry.	Led to the writing of the 2007 textbook book *Human Chemistry*, the 2008 booklet *The Human Molecule*, and *Hmolpedia* (2,300+ articles).

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External links

â— Thought experiment - Wikipedia.

θΔics

In science, **three element theory**, as compared to four element theory, asserts that the universe is comprised for three primary elements, namely: earth, water, and fire, and that among these fire is the fundament or underlying essential nature of earth and water.

The three element theory was introduced by Greek philosopher Heraclitus, in circa 500BC, supposedly derived in some way from the Egyptian Heliopolis creation myth, according to which the universe resulted from a primordial abyss from which fire (Ra) burst forth thereafter self-engendering earth (Geb) and water (Nun). [1]

The three elements of nature, according to Heraclitus: earth, water, and fire, aka the **three element theory**.

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θΔics

In religio-mythology, **three impostors**, aka “three impostors legend” (Hecht, 2003), is the assertion, hypothesis, theory, conjecture, or stated opinion that the three main figures of the Abrahamic religions, namely: Moses (Judaism), Jesus (Christianity), and Muhammad (Islam), were people who pretended to be someone else, namely a divine prophet or son of god, in order to deceive others, especially for fraudulent gain.

In the 12th century, someone, e.g. Averroes, began to circulate the theory that Moses, Jesus, and Muhammad were three "**impostors**", each of their respectively founded religion: Judaism, Christianity, and Islam; in the 18th century, hoax treatises, e.g. using Spinoza publications, and responses, e.g. by Voltaire, to the hoax treatises began to appear.

Theory | View

The view that each of the three great religious leaders had tricked their followers and were not an agent of the divine traces to the publications of: Averroes (c.1180), Frederick II (c.1235), Pietro Pomponazzi (c.1510), and the Anon Theophrastus (c.1659). [1]

Book | Treatise

In c.1190, Simon of Tournai (1130-1201) was accused of having penned a treatise on the three impostors. (Q)

In 1239, Pope Gregory IX, without offering any evidence of any kind, asserted that Frederick II (c.1235) penned a book entitled *Treatise on The Three Impostors*, in which he denounced the three prophets. [2]

In c.1560, Bernardino Ochino (1487-1564) was charged with being the "author" of the *Three Impostors Treatise*. (Q)

In c.1615, Lucilio Vanini was purported to have brought to light again the book entitled *Of the Three Impostors*. [3]

In 1719, a book titled *The Life and Spirit of Spinoza* contained the “three impostors legend” outlined in the second half the book. [1]

In 1770, Voltaire, published a response to the hoax treatise entitled *Epistle to the Author of the Book of the Three Impostors* (*Épître à l'Auteur du Livre des Trois Imposteurs*) (Q), which contains one of his best-known quotations, "If god didn't exist, it would be necessary to invent him."

Quotes

The following are related quotes:

> “Frederick II, this pestilent king, a scorpion spitting out poison from the stinger of his tail, has notably and openly stated that—in his own words—the whole world has been fooled by **three imposters**, Jesus Christ, Moses, and Muhammad, two of whom died honorably, while Jesus himself died on the cross. Moreover, he has dared to affirm, or rather, he has fraudulently claimed, that all those who believe that a virgin could give birth to the god who created nature, and all the rest, were fools. And Fredrick has aggravated the heresy by this insane assertion, according to which no one can be born without having been conceived by the prior intercourse of a man and woman; he also claims that people ought to believe nothing that cannot be proven by the strength and reason of nature.”

— Pope Gregory IX (1239), address to monarchs

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(b) Durand, David. (1714). *The Life of Lucilio (alias Julius Caesar) Vanini: Burnt for Atheism at Toulouse with an abstract of his writings being the sum of the atheistical doctrine taken from Plato, Aristotle, Averroes, Cardano and Pomponazzius's philosophy with a confutation of the same; and Mr. Bayle's arguments in behalf of Vanini completely answered* (Amz) (pg. 101-02). Publisher, 1730.

Further reading

● Andersen, Abraham (1997). *The Treatise of the Three Imposters* and the Problem of the Enlightenment. A New Translation of the Traité des Trois Imposteurs (1777 Edition). Rowman & Littlefield, 2000.

External links

● Treatise on the Three Impostors – Wikipedia.

θΔics

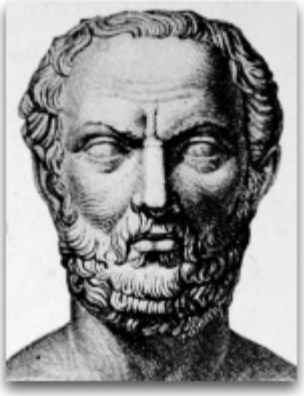

In existographies, **Thucydides** (460-395BC) (IQ:160|#569) (Cattell 1000:72) [RGM:171|1,400+] (FA:14) (GHE:6) (CR:3) was a Greek historian and general; noted for his participation in and later secular recounting of the Peloponnesian War (431-404BC), wherein the Athenians battled the Spartans; considered, by some (Q), to be the father of "scientific history", i.e. history based on evidence-gathering and analysis of cause and effect.

Religion | Atheism

Thucydides often is cited as the first secular historian; Mitchell Stephens (2014) summarizes his views as follows: [2]

> "Thucydides admits that 'chance' plays a major role in human affairs; he does not admit that gods to. Those who search most rigorously for a 'clear understanding of what happen' often fail to find a role for gods. There is no evidence that Thucydides believed gods existed."

In 1629, Thomas Hobbes, in his "Of the Life and History of Thucydides", defended Thucydides against the charge of atheism. (Q)

Quotes | On

The following are quotes on Thucydides:

> "The most philosophic of all Greek historians was certainly **Thucydides**."
>
> — Henry Buckle (1857), *History of Civilizations, Volume One* (pg. 144)

> "Modern criticism rightly regards **Thucydides** as the model of the rational and objective historian who made it his first duty to leave the finger of god out of history and to tidy up the mundane events of the human drama. The contrast between his work with respect to the gods and the histories of his predecessor Herodotus and his successor Xenophon is plain; it is a contrast so great, in fact, as to provoke the observation from some (e.g. K. J. Dover) that Thucydides may well have been an atheist."
>
> — Borimir Jordan (1986), "Religion in Thucydides" [1]

Quotes | By

The following are quotes by Thucydides:

> "The secret to happiness is freedom. And the secret to freedom is courage."
>
> — Thucydides (c.400BC)

> "The bravest are surely those who have the clearest vision of what is before them, glory and danger alike, and yet notwithstanding, go out to meet it."
>
> — Thucydides (c.400BC)

> "We secure our friends not by accepting favors but by doing them."

— Thucydides (c.400BC)

> “Wars spring from unseen and generally insignificant causes, the first outbreak being often but an explosion of anger.”

— Thucydides (c.400BC)

References

1. Jordan, Borimir. (1986). “Religion in Thucydides” (Q), *Transactions of the American Philological Association*, 115:119-47.
2. Stephens, Mitchell. (2014). *Imagine There’s No Heaven: How Atheism Helped Shape the Modern World* (pgs. 26-27). St. Martin's Press.

External links

- Thucydides – Wikipedia.

θΔics

In religio-mythology, **thyrsus**, aka "staff of Osiris" (Ñº) or "Bacchic wand" (Plutarch, 100AD), refers to []

Overview

Some of the earliest depictions of Osiris show him standing next to a thyrsus; the following, e.g., shows Osiris in the Judgment Hall, during the Judgment of Amenti, with the "thyrsus" shown shown with a fillet, to which the spotted skin of a leopard is suspended:

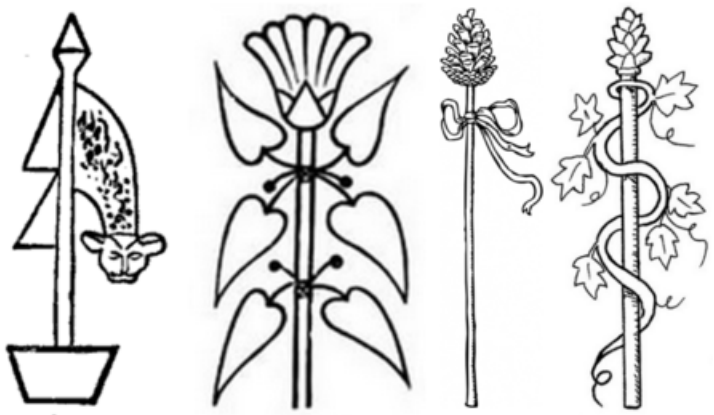

Four images of the **thyrsus**, the first being a spear (or pinecone topped) with leopard skin hanging off, bound by a fillet (generally shown next to Osiris); the second, being a topped with a lotus plant, wrapped in ivy or some plant; the third being topped with a pinecone, wrapped in a blow (oft held by Bacchus); the forth being a pinecone topped staff wrapped in some type of ivy.

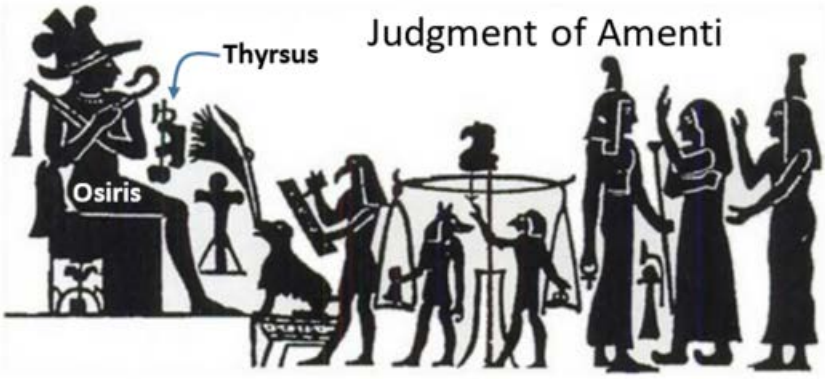

The spotting on the skin, supposedly, was thought to be representative of the constellations:

> "The **spotted skin** of the leopard, which serves him for a mantle, represented the heavens filled with stars and constellations."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 179); commentary on Pan

Robert Brown (2002), citing Gardner Wilkinson (1836), comments on this diagram: [1]

> "It is the same that the high-priest, clad in the leopard-skin dress, carries the processions, and which gave rise to the 'nebrus' and **'thyrsus'** of Bacchus, to whom Osiris corresponds in Greek mythology (Wilkinson, 1836). The lotus flower, the emblem of a new birth, is represented just before the thyrsus."

In 1875, John Wilkinson, in footnotes to Herodotus' *History*, gives the following account of the thyrsus:

> "The **thyrsus** is shown by Plutarch to be the staff (fig. 1), often bound by a fillet, to which the spotted skin of a leopard is suspended near the figure of Osiris; for it is the same that the high priest, clad in the leopard skin dress, carries in the processions (Plut. de Is... s.35). Another form of it is the head of a water-plant (similar to that in fig. 3), to which Athenaeus (Deipn. v. p. 196) evidently alludes when he speaks of some columns having the form of palm-trees, and others of the thyrsus."

John Wilkinson next surmises incorrectly on the symbolism of the pinecone as follows:

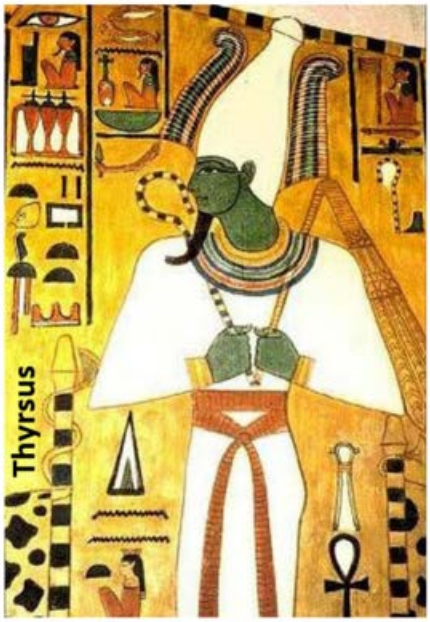

Osiris standing with a “thyrsus” pole shown on each side; below left (Ñº) is from the tomb of Sennedjem (c.1250BC) (Ñº) at Luxor; below right (Ñº) is of similar period:

> “The adoption of the pinecone to the head of the spear of Bacchus **originated in the use of the resinous matter put into wine-skins**, and afterwards into amphorae; but the thyrsus was also represented as a spear having its point ‘concealed in ivy leaves’, or: *pampineis agitat velatam frondibus hastam* (Ovid, *Metamorphosis*, iii. 667; comp. xi. 27, &c. Diodorus, iii, 64. Athen. Dipn. Xiv. 631 A.) Thus the poets generally describe it, as well as the paintings on Greek vases: and if the pinecone was preferred for statues of Bacchus, that was probably from its being better suited to sculpture. The resemblance of the *nebris*, and the Semitic name of the leopard, *nimr*, is striking, the car of bacchus being drawn by leopards; and the Bochart points to the analogy between Nebrodes, a title of Bacchus and Nimrod, who is called the Philo-Judaeus ‘Nebrod’. The pinecone was adopted by the Arabs as an ornament in architecture at an early time, and passed thence to cashmere shawls and embroidery.”

This conjecture that the pinecone originated because of its use in "using resinous matter put into wineskins" per reason that Osiris, in the great tale of the Passion of Osiris, was reborn as an "evergreen tree", hence the pinecone is symbolic of this.

Dionysus, Bacchus, and Moses

See main: Osiris, Dionysus, and Bacchus; Osiris, Dionysus-Bacchus, and Moses

In c.800BC, the model of Osiris, and his thyrsus, was imported into Greece, via either migration and or Greeks studying abroad, into the guise of Dionysus and his thyrsus; in 200BC the Greek model of Dionysus and his thyrsus was imported into Rome into the guise of Bacchus and his thyrsus; in 200AD to 1000AD this general Osiris turned Dionysus-Bacchus model, according to the so-called Vossius-Huet conjecture (c.1680), was monotheized into the mold of Moses and his "magical staff" that parts the Red Sea and smites water from rocks, such as shown below right:

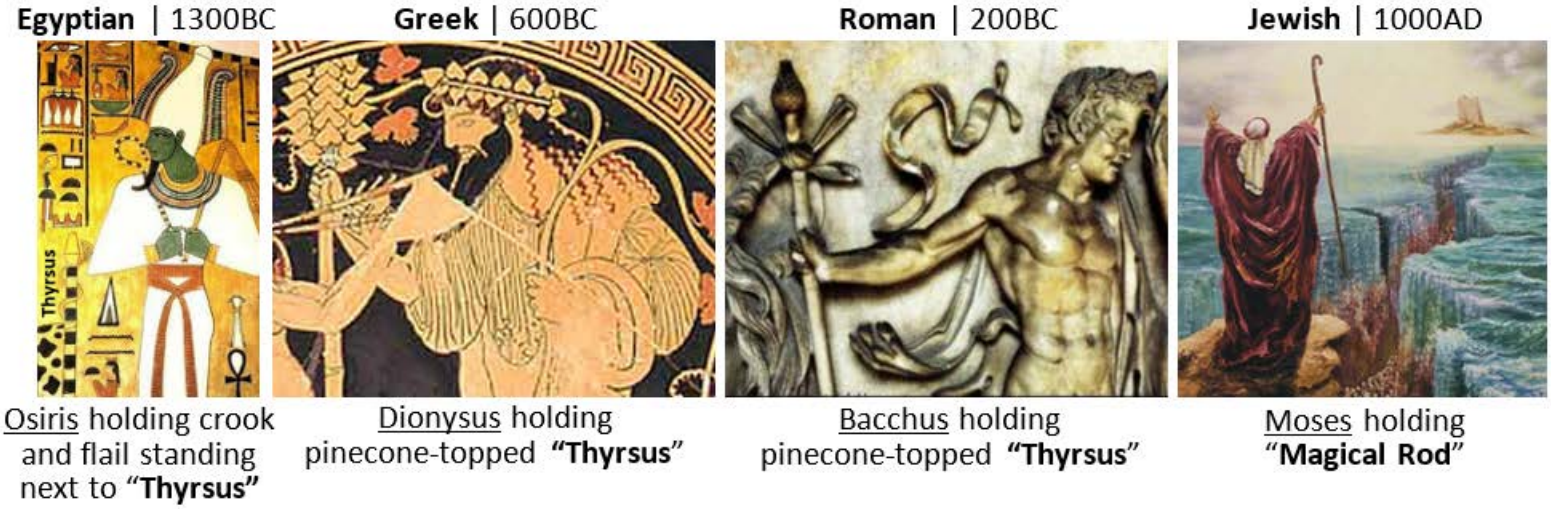

In Exodus 14, segment 14.16 (Ñº) in particular, we find Moses famously "lifting up his rod", just as Bacchus had done with his thyrsus, to part the Red Sea, as follows:

14.1 And the Lord spake unto Moses, saying,
2 Speak unto the children of Israel, that they turn and encamp before Pihahiroth, between Migdol and the sea, over against Baalzephon: before it shall ye encamp by the sea.
3 For Pharaoh will say of the children of Israel, They are entangled in the land, the wilderness hath shut them in.
4 And I will harden Pharaoh's heart, that he shall follow after them; and I will be honoured upon Pharaoh, and upon all his host; that the Egyptians may know that I am the Lord. And they did so.
5 And it was told the king of Egypt that the people fled: and the heart of Pharaoh and of his servants was turned against the people, and they said, Why have we done this, that we have let Israel go from serving us?
6 And he made ready his chariot, and took his people with him:
7 And he took six hundred chosen chariots, and all the chariots of Egypt, and captains over every one of them.
8 And the Lord hardened the heart of Pharaoh king of Egypt, and he pursued after the children of Israel: and the children of Israel went out with an high hand.
9 But the Egyptians pursued after them, all the horses and chariots of Pharaoh, and his horsemen, and his army, and overtook them encamping by the sea, beside Pihahiroth, before Baalzephon.
10 And when Pharaoh drew nigh, the children of Israel lifted up their eyes, and, behold, the Egyptians marched after them; and they were sore afraid: and the children of Israel cried out unto the Lord.
11 And they said unto Moses, Because there were no graves in Egypt, hast thou taken us away to die in the wilderness? wherefore hast thou dealt thus with us, to carry us forth out of Egypt?
12 Is not this the word that we did tell thee in Egypt, saying, Let us alone, that we may serve the Egyptians? For it had been better for us to serve the Egyptians, than that we should die in the wilderness.
13 And Moses said unto the people, Fear ye not, stand still, and see the salvation of the Lord, which he will shew to you to day: for the Egyptians whom ye have seen to day, ye shall see them again no more for ever.
14 The Lord shall fight for you, and ye shall hold your peace.

15 And the Lord said unto Moses, Wherefore criest thou unto me? speak unto the children of Israel, that they go forward:
16 But **lift thou up thy rod**, and stretch out thine hand over the sea, and divide it: and the children of Israel shall go on dry ground through the midst of the sea.

17 And I, behold, I will harden the hearts of the Egyptians, and they shall follow them: and I will get me honour upon Pharaoh, and upon all his host, upon his chariots, and upon his horsemen.
18 And the Egyptians shall know that I am the Lord, when I have gotten me honour upon Pharaoh, upon his chariots, and upon his horsemen.
19 And the angel of God, which went before the camp of Israel, removed and went behind them; and the pillar of the cloud went from before their face, and stood behind them:
20 And it came between the camp of the Egyptians and the camp of Israel; and it was a cloud and darkness to them, but it gave light by night to these: so that the one came not near the other all the night.
21 And Moses stretched out his hand over the sea; and the Lord caused the sea to go back by a strong east wind all that night, and made the sea dry land, and the waters were divided.
22 And the children of Israel went into the midst of the sea upon the dry ground: and the waters were a wall unto them on their right hand, and on their left.
23 And the Egyptians pursued, and went in after them to the midst of the sea, even all Pharaoh's horses, his chariots, and his horsemen.
24 And it came to pass, that in the morning watch the Lord looked unto the host of the Egyptians through the pillar of fire and of the cloud, and troubled the host of the Egyptians,
25 And took off their chariot wheels, that they drave them heavily: so that the Egyptians said, Let us flee from the face of Israel; for the Lord fighteth for them against the Egyptians.
26 And the Lord said unto Moses, Stretch out thine hand over the sea, that the waters may come again upon the Egyptians, upon their chariots, and upon their horsemen.
27 And Moses stretched forth his hand over the sea, and the sea returned to his strength when the morning appeared; and the Egyptians fled against it; and the Lord overthrew the Egyptians in the midst of the sea.
28 And the waters returned, and covered the chariots, and the horsemen, and all the host of Pharaoh that came into the sea after them; there remained not so much as one of them.

29 But the children of Israel walked upon dry land in the midst of the sea; and the waters were a wall unto them on their right hand, and on their left.
30 Thus the Lord saved Israel that day out of the hand of the Egyptians; and Israel saw the Egyptians dead upon the sea shore.
31 And Israel saw that great work which the Lord did upon the Egyptians: and the people feared the Lord, and believed the Lord, and his servant Moses.

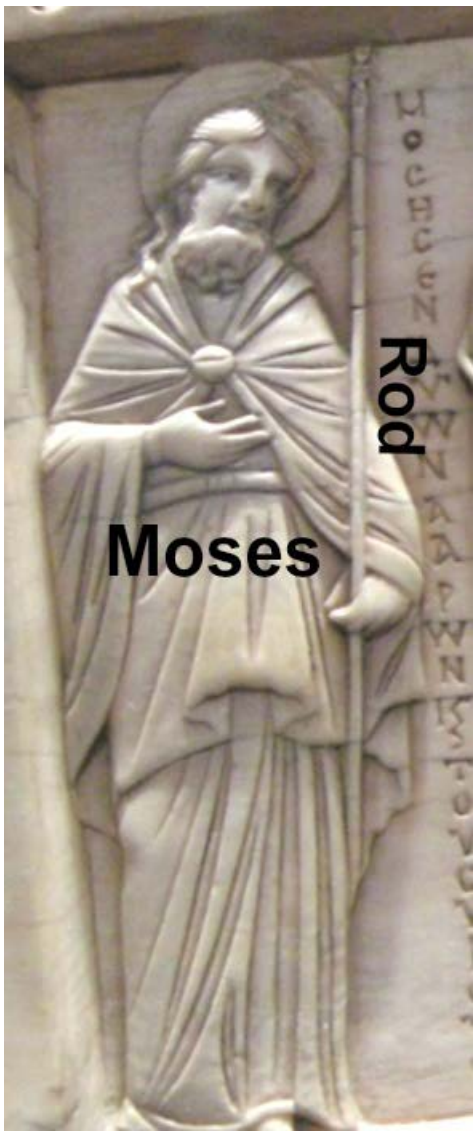

A c.1000AD depiction of Moses with his magical "rod", which, by the power of god, he used to part the red sea; as did the god Bacchus with his "**thyrsus**" before him.

Actual depictions of Moses with a thyrsus-like rod or staff, e.g. as shown adjacent, to note, supposedly, did begin to be seen until (Ñº) the 10th century

Quotes

The following are related quotes:

> "The trumpets they conceal in **Bacchic wands**, as Socrates has stated in his treatise on *The Holy Ones*. Furthermore, the tales regarding the Titans and the rites celebrated by night agree with the accounts of the dismemberment of Osiris and his revivification and regenesis."
>
> — Plutarch (100AD), *On Isis and Osiris* (§35)

References

1. Herodotus. (c.435). (1875). *History of Herodotus, Volume Two* (editors: Henry Rawlinson and John Wilkinson) (pg. 87). Publisher.
2. (a) Wilkinson, Gardner. (1836). *Ancient Egyptians*. Routledge, 2013..
(b) Brown, Robert H. (2002). *Stellar Theology and Masonic Astronomy* (pgs. 102-3). Publisher.

External links

â— Thyrsus – Wikipedia.
â— Thyrsus – Penelope.UChicago.edu.

θΔics

In science, **Tibor Ganti** (1933-2009) was a Hungarian chemical engineer turned theoretical biologist noted for 1966 to 2003 efforts to formulate some type of minimal chemical definition of life.

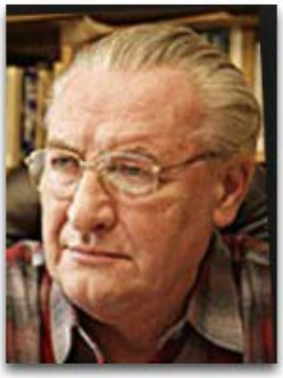

Overview

In 1971, Ganti published his *Principles of Life*; the following being a 2003 abstract of this:

> "**Gánti** offers a radically novel approach to the problem of the origin of life: based on his theory of fluid (chemical) automata he proves that all living systems are basically program controlled self-reproducing fluid automata and that such automata behave as living systems. The simplest such construction—the chemoton—behaves as living, and all living systems have chemoton type organization. This means that the chemoton model is the minimum model of life. Gánti's chemical perspective captures the fundamentally cyclic organization of the living state."

In 1974, Ganti introduced, and or elaborated further, on his his "chemoton theory". [1]

This, to note, seems to have similarity to Stuart Kauffman's auto-catalytic thermodynamic work cycle theory of the origin of life and how the first living thing "catches fire", as Kauffman says, both of which are shown below, respectively:

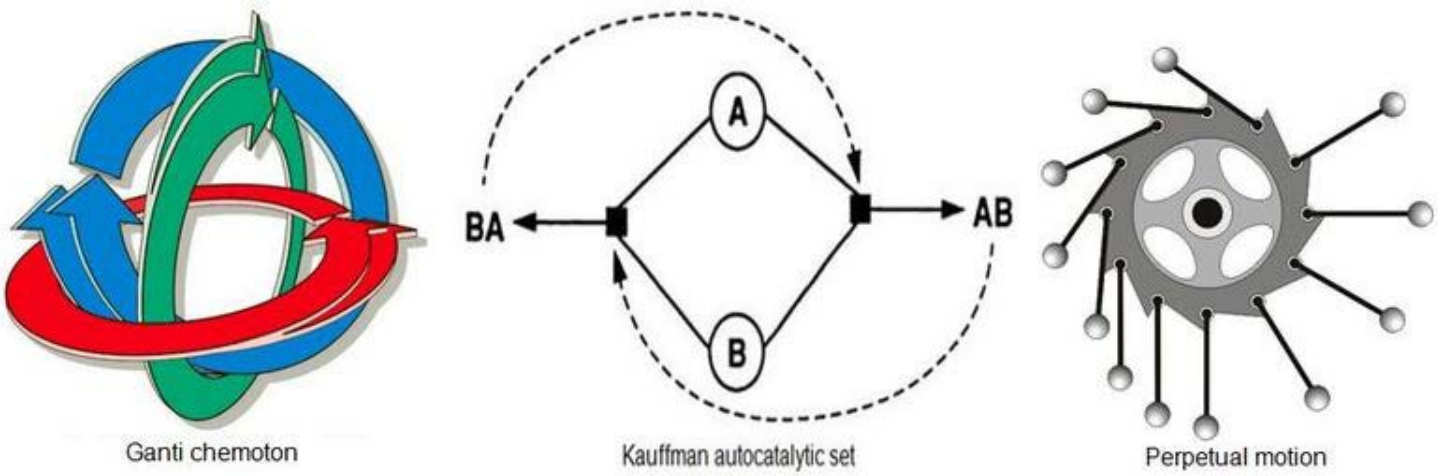

On the left, a diagram (Q) of **Ganti's** 1974 "chemoton" model of a minimum unit of life, which can be compared to Stuart Kauffman's 1995 autocatalytic set model (Q), shown right, of the origin of life; both of which are end-over-unit (perpetual motion) theories, hypothesized to have occurred at the chemical level 3.8 billion years ago, categorized as perpetual motion of the living kind theories (see: defunct theory of life).

Ganti's theory seems to be a chemical spin-off of Rene Descartes' animal organisms as automata theory (see: Cartesian automaton), albeit via Ganti's so-called "soft automata" principles. [3]

Bauer principle

Ganti, in his 2003 *Chemoton Theory: Theory of Living Systems, Volume 2*, gives one of the first-known English presentation of the Bauer principle—or "principle of constant non-equilibrium" of living systems—of Hungarian-born Russian pathologist and physical biologist Erwin Bauer. [2]

References

1. Eors, Szathmary. (2009). "Gant Tibor, 1933-2009" (Hungarian → English), *Magyar*

Tudomany, The Hungarian Academy of Sciences Journal.
2. Ganti, Tibor. (2003) *Chemoton Theory: Theory of Living Systems, Volume 2* (§: Ervin Bauer, pgs. 261-64). Springer.
3. Ganti, Tibor. (2003). *The Principles of Life* (Descartes, pg. 120). Oxford University Press.

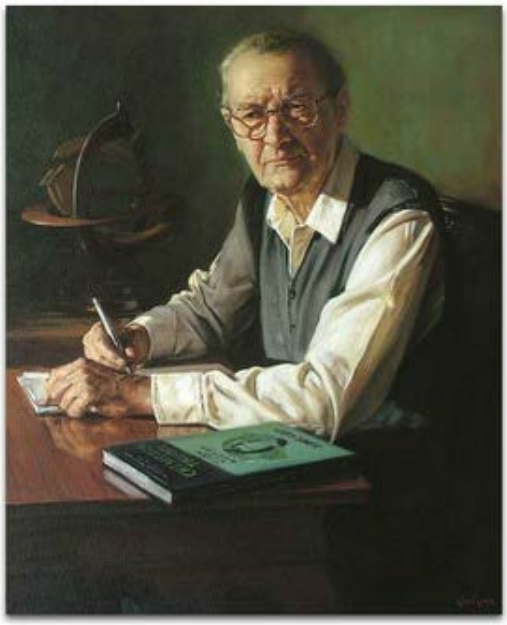

Left: a painting of **Ganti** shown in front of a physical model of his chemoton and behind a copy of his *Chemoton Theory*. Right: a circa 2002 photo of Ganti in Hungary, in his home, in discussion with someone named Manribubia. (Q)

Further reading

● Ganti, Tibor. (1966). *Forradalom az élet kutatásában* (*Revolution in the study of life*). Gondolat, Budapest.
● Ganti, Tibor. (1971). Az élet princípiuma (*Principle of Life*). Gondolat, Budapest.
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● Ganti, Tibor. (1989). *Chemotonelmélet II. Az élő rendszerek elmélete* (*Chemotonelmélet II. The theory of living systems*). OMIKK, Budapest.
● Ganti, Tibor. (2003). *Chemoton Theory. Vol. I. Theory of Fluid Machineries*. Kluwer Academic/Plenum Publishers, New York.
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External links

● Tibor Ganti – Wikipedia.
● Chemoton – Wikipedia.

θΔics

In science, **time** is a dimension that enables two otherwise identical events that occur at the same point in space to be distinguished. [1] The interval between two such events forms the basis of time measurement. The quantity of the second, symbol *t*, unit *s*, defined as the duration of 9,192,631,770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the cesium atom at rest at a temperature of 0 K, is the standard System International (SI) dimension of time. [2]

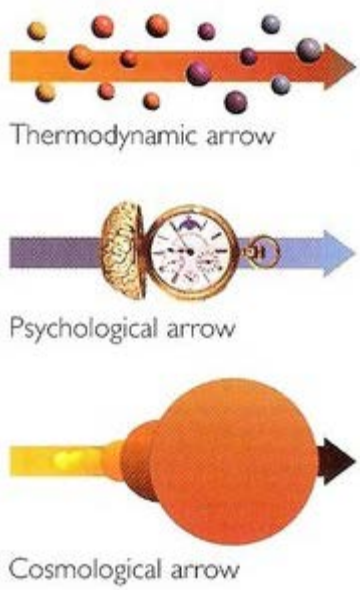

Philosophical thermodynamics

In philosophical thermodynamics, *time* or rather its direction is recognized by an increase in entropy. [3] The translation of this statement, in hands-on human life terms, however, comes about typically with great difficultly, and is usually mistranslated. The stipulations included in this statement are that:

> (a) the system is either *closed* (open to energy boundary flow) or *isolated* (no matter or energy boundary flow) system
>
> (b) one complete heat cycle occurs
> (c) that dQ/T is the amount entropy that increases or irreversibly remains residually bound in the system.

Extrapolation beyond these core precepts, e.g. references to tendencies of disorder, relations to chaos, psychological arrows, etc., typically result in only approximate, vague, or unjustified verbal pronouncements. In more complicated systems, time is measured thermodynamically by free energy or rather by a decrease in free energy as plotted out over the extent (progress in time) of the reaction or process. Specifically, in 1882 German physician and physicist Hermann Helmholtz concluded that the work performed by the free energies of a system determine the direction of chemical change. [4] Subsequently, natural processes, e.g. evolution (a chemical process), will occur spontaneously only in the direction of a minimizing free energy effect.

History

The conception of time in thermodynamics has checkered history involving a number of individuals, originating from a number of points of view. The core seed of the idea stems from German physicist Rudolf Clausius who in 1865 declared in lecture, in a reading at the *Philosophical Society of Zurich* on the 24th of April, regarding the first and second laws of thermodynamics, that: [5]

> "Die Energie der Welt ist constant"
> (The energy of the world is constant)
>
> "Die Entropie der Welt strebt einem Maximum zu"
> (The entropy of the world aspires to a maximum)

On the concluding page the 1965 English translation of his famous textbook *Mechanical Theory of Heat*, these two phrases were listed, with the following concluding paragraph, such that the word “world” was translated as “universe”: [6]

> For the present I will confine myself to the statement of one result. If for the entire universe we conceive the same magnitude to be determined, consistently and with due regard to all circumstances, which for a single body I have called *entropy*, and if at the same time we introduce the other and simpler conception of energy, we may express in the following manner the fundamental laws of the universe which correspond to the two fundamental theorems of the mechanical theory of heat:

1. The energy of the universe is constant.
2. The entropy of the universe tends to a maximum.

The second of these postulates led to idea that concept of entropy gives directionality to the movement of the universe. In 1873, for instance, American mathematical physicist Willard Gibbs utilized Clausius' entropy concept in the study of the graphical behaviors of substances thus arriving at the view that one "should be able to foretell what would occur if ... two states of the substance should be brought together." [7] These views latter developed, beginnining with his 1876 memoir *On the Equilibirum of Heterogeneous Substances*, into the concept of free energy and reaction spontaneity, such as was discussed by Hermann Helmholtz.

Arrow of time

The idea of "time's arrow" was developed in a course of Gifford Lectures delivered by British astronomer Arthur Eddington at the University of Edinburgh in January to march of 1927. These outlines resulted in the influential 1928 book *The Nature of the Physical World*, in which he devoted an eight-page section to the topic of *Time's Arrow* or the relationship between entropy and time. In short, he states "without any mystic appeal to consciousness it is possible to find a direction of time on the four-dimensional map by a study of organization". He continues "let us draw an arrow arbitrarily. If as we follow the arrow we find more and more of the random element in the state of the world, then the arrow is pointing towards the future; if the random element decreases the arrow points towards the past." On this logic, he states "I shall use the phrase *time's arrow* to express this one-way property of time which has no analogue to space."

Then, in a few pages of discussion on changes of *energy* and changes in the *organization of energy* during various natural process, such as dropping a stone, operating a steam engine, opening a stopcock connecting one empty and one filled vessel of gases, etc., and each situations relation to the changes in the positions of the atoms and molecules involved, Eddington states that dissections of these sorts "raises *organization* from a vague descriptive epithet to one of measureable quantities of exact science". Moreover, he states, "a common measure can … be applied to all forms of organization", and that "any loss of organization is equitably measured by the *chance* against its recovery by an accidental coincidence". Then in a form of over-simplified extrapolation, he states "entropy (which he defines as: the practical measure of the random element which can increase in the universe by can never decrease) is the same as measuring by the chance explained in the last paragraph"; where he adds that "only the unmanageably large numbers are transformed (by a simple formula) into a more convenient scale of reckoning." This latter statement is likely in reference to Austrian physicist Ludwig von Boltzmann's logarithmic formula of entropy. In conclusion, he states: [8]

> "So far as physics is concerned, time's arrow is a property of entropy alone."

In the 1951 book *Time's Arrow and Evolution*, American biologist Harold Blum built further on the logic of Eddington. In his opening chapter, Blum stated, in reference to evolution and the one-wayness of events, that "science offers only one widely general principle which seems applicable - the second law of thermodynamics. He surmises, "one way of stating this law is to say that all real processes tend to go towards a condition of greater probability". This implies, according to Blum, that second law of thermodynamics points in the direction of all real events in time, although giving no indication of the speed of which they happen." As such, he states, "it should be tempting, then, to explore the relationship between time's arrow and organic evolution". [9]

In the best-selling 1988 book *A Brief History of Time*, British theoretical physicist Stephen Hawking outlined a view in which there are three arrows. In addition to the thermodynamic arrow, which he defines as the direction of time in which disorder or entropy increases, he also defines a *cosmological arrow*, the direction of time in which the universe is expanding rather than contracting, a *psychological arrow*, the direction in which a person feels time passing or the direction in which one remembers as the past but not the future. Hawking concludes that "the psychological arrow is determined by the thermodynamic arrow, and that these two arrows necessarily always point in the same direction." [10]

Space-time

In 1907, German mathematician Hermann Minkowski, realized that the special theory of relativity, introduced by Albert Einstein in 1905 and based on previous work of Hendrik Lorentz and Henri Poincaré, could be best understood in a four dimensional space, since known as "Minkowski spacetime", in which time and space are not separated entities but intermingled in a four dimensional space-time, and in which the Lorentz geometry of special relativity can be nicely represented. The beginning part of his address delivered at the 80th *Assembly of German Natural Scientists and Physicians* (September 21, 1908) is now famous: [11]

> "The views of space and time which I wish to lay before you have sprung from the soil of experimental physics, and therein lies their strength. They are radical. Henceforth space by itself, and time by itself, are doomed to fade away into mere shadows, and only a kind of union of the two will preserve an independent reality."

(add)

Quotes

The following are related quotes:

> "If I am not asked, I know what **time** is, but if I have to give an explanation of it to someone, I do not know."
>
> — Augustine (c.400), *Publication*; cited by Otto Guericke (1672) *New Magdeburg Experiments on the Vacuum of Space* (pgs. 85-86)

> "Place in itself has no real existence. Rather it is a creation of the mind or imagination, an individual and particular relationship, as it were, of one thing with respect to another. When one thing has taken away, then another takes its place and when this in turn is removed, its place is again filled and vise versa. Furthermore, just as 'place' has no real existence, neither does **time**."
>
> — Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* (pg. 85)

> "I had no sense of the value of **time**, of my own or others, when I wrote it."
>
> — Willard Gibbs (c.1900), reflection on *On the Equilibrium of Heterogeneous Substances*

> "**Time** is not one of the variables of pure thermodynamics."
>
> — Gilbert Lewis (1930), "The Symmetry of Time in Physics"

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8. Eddington, Arthur. (1928). *The Nature of the Physical World*, (pgs. 68-75). Cambridge: Cambridge University Press.
9. Blum, Harold F. (1951). *Time's Arrow and Evolution.* Princeton: Princeton University Press.
10. Hawking, Stephen. (1996). *The Illustrated - A Brief History of Time*, (ch. 9: "The Arrow of Time", pgs. 182-95). New York: Bantam Books.
11. Hermann Minkowski – Wikipedia.

Further reading

â— Mackey, Michael C. (1992). *Time's Arrow - the Origin of Thermodynamic Behavior*. New York: Dover.

External links

â— Time – Wikipedia.
â— Thermodynamic Asymmetry in Time - Standford Encyclopedia of Philosophy

θΔics

In genius rankings, **Time 100 Ideas** refers to *Time Magazine*'s 2011 special edition publication of *100 Ideas that Changed the World: History's Greatest Breakthroughs, Inventions, and Theories*, as compiled by the editors of Time, predominately: managing editor Richard Stengel and editor and writer Richard Lacayo.

List

The following is the list of 100 ideas: [1]

Ancient World

1. Animism
2. Monotheism | Akhenaten
3. Geometry
4. Afterlife
5. Hammurabi's code of laws
6. Alphabet
7. Seven Day Weeks
8. Democracy
9. Buddhism
10. Confucianism
11. Stoicism
12. Atomism
13. Socratic Method
14. Platonic Ideal
15. Aristotelian Logic
16. Infinity
17. Epicureanism
18. Skepticism
19. The Roman Arch
20. Christianity
21. Apocalypse
22. Augustine's *The City of God*

Middle Ages

23. Problem of Evil | Boethius
24. Free Will?
25. Islam
26. Iconoclasm | Ban of Religious Imagery
27. Zero
28. Gunpowder
29. Habeas Corpus
30. Trial by Jury | Henry II
31. The Magna Carta
32. Thomas Aquinas
33. Mysticism

The Renaissance

34. Humanism
35. Classicism
36. Spatial Perspective
37. Movable Type
38. Niccolo Machiavelli
39. Utopia
40. The Protestant Reformation
41. Nicolaus Copernicus

The Age of Enlightenment

42. Scientific Method
43. The Divine Right of Kings
44. "I Think, Therefore I Am"
45. Electricity
46. Thomas Hobbes' *Leviathan*
47. Newtonian Physics
48. John Locke's *Two Treatises*
49. The Cyclical Theory of History
50. Deism
51. "The best of all possible worlds"
52. Marine Chronometers
53. Separation of Powers
54. Jean Rousseau
55. The Free Market
56. Immanuel Kant
57. Hegel's Dialectic
58. Edmund Burke's Conservatism
59. Women's Rights | Mary Wollstonecraft
60. Equality
61. Separation of Church and State
62. Utilitarianism

Modern Times

63. Romanticism
64. Transcendentalism
65. Trade Unionism
66. Anarchism
67. Photography
68. Marxism
69. Nationalism
70. Abolitionism
71. Genetics
72. Nihilism
73. Evolution
74. The Germ Theory of Disease
75. Friedrich Nietzsche
76. Pragmatism
77. Freudianism
78. Flight
79. Leninism
80. Relativity
81. Modernism
82. The Collective Unconscious
83. The Assembly Line
84. Big Bang
85. Surrealism
86. Keynesian Economics
87. Fascism
88. Television
89. Computers
90. Existentialism
91. Nonviolence
92. Atheism
93. Chaos theory
94. Gay Identity
95. Behaviorism
96. Structuralism | Claude Levi-Strauss
97. Monetarism
98. Extraterrestrial Life
99. Animal Rights
100. The World Wide Web

(add)

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1. Stengel, Richard. (2011). *100 Ideas that Changed the World: History's Greatest Breakthroughs, Inventions, and*

Theories (Amz). Time Magazine.

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θΔics

In thermodynamics, **time's arrow** refers a conceptualized forward directional one-way property of time. [1]

Etymology

In 1928, English astronomer Arthur Eddington, in his *The Nature of the Physical World*, devoted an eight-page section to the topic of *Time's Arrow* or the relationship between entropy and time. In short, he stated "without any mystic appeal to consciousness it is possible to find a direction of time on the four-dimensional map by a study of organization". He continues "let us draw an arrow arbitrarily. If as we follow the arrow we find more and more of the random element in the state of the world, then the arrow is pointing towards the future; if the random element decreases the arrow points towards the past." On this logic, he states "I shall use the phrase *time's arrow* to express this one-way property of time which has no analogue to space." [1]

Then, in a few pages of discussion on changes of *energy* and changes in the *organization of energy* during various natural process, such as dropping a stone, operating a steam engine, opening a stopcock connecting one empty and one filled vessel of gases, etc., and each situations relation to the changes in the positions of the atoms and molecules involved, Eddington states that dissections of these sorts "raises *organization* from a vague descriptive epithet to one of measureable quantities of exact science". Moreover, he states, "a common measure can … be applied to all forms of organization", and that "any loss of organization is equitably measured by the *chance* against its recovery by an accidental coincidence". Then in a form of over-simplified extrapolation, he states "entropy (which he defines as: the practical measure of the random element which can increase in the universe by can never decrease) is the same as measuring by the chance explained in the last paragraph"; where he adds that "only the unmanageably large numbers are transformed (by a simple formula) into a more convenient scale of reckoning." This latter statement is likely in reference to Austrian physicist Ludwig Boltzmann's logarithmic formula of entropy. I

Eddington states, in conclusion:

> "So far as physics is concerned, ***time's arrow*** is a property of entropy alone."

In 1965 philosophical discussions, a followup rehash of this model is: [2]

> "Though we first lay hold of ***time's arrow*** in consciousness, our sense of time-direction is probably seated in an entropy-clock in the brain."

See also

- Arrow of time

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2. Staff Writer. (1965). *Proceedings of the American Catholic Philosophical Association* (pg. 105). National Office of the American Catholic Philosophical Association, Vol. 39.

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- Price, Huw. (1997). *Time's Arrow and Archimedes' Point.* Oxford University Press.

External links

- Time’s arrow and Boltzmann’s entropy (Joel Lebowitz) – Scholarpedia.

θΔics

In chronology, a **timeline**, as found in Hmolpedia, tend to be a horizontally scrolling recounting of events and or happenings of a given subject or person.

See also

- Atheism timeline
- Evolution timeline
- FME | Timeline (lecture)
- Goethe timeline
- Hirata timeline
- Timeline of thermodynamics

External links

- Timeline – Wikipedia.

θΔics

The **Timeline of thermodynamics** lists the chronological development of the modern subject of thermodynamics, a preliminary framework, laws and theorems, and experiments, in thermodynamics.

Philoponus' self-moved clepsydra (6th century)

Ctesibius's water clock (c. 1 BCE)

Tycho's mural quadrant (1598)

Hero's Turbinia steam engine (1st century)

Galileo's air thermometer (1603)

Cornelis Drebbel's egg (c. 1620)

Cornelis Drebbel's submarine (1620)

Magdeburg hemispheres experiment (c. 1657)

Marin's perpetuum mobile (1690s)

Denis Papin's steam digester (c. 1679)

Savery's steam pump (1698)

Newcomen's atmospheric engine (1712)

Papin's digester (1679)

Smeaton's improved Newcomen engine (1772)

Watt's steam engine (1769)

Watt's improved steam engine (1774)

Watt's steam engine (1782)

Carnot's heat engine (1824)

Clausius's Carnot cycle (1857)

Kelvin's heat engine (1854)

Stirling's hot air engine (1816)

Joule's experiment (1845)

Mayer's experiment (1842)

Joule's experiment (1847)

Joule's experiment (1850)

Joule's experiment (1860)

Joule's experiment (1867)

Joule's experiment (1878)

Joule's experiment (1879)

Joule's experiment (1879)

Joule's experiment (1879

In existographies, **Timothy Freke** (c.1961-) is an English new age type of religio-mythologist noted for his 1999 to present work, with Peter Gandy, on the Christ myth theory.

Overview

In 2012, Freke, in the documentary film *Caesar's Messiah: The Roman Conspiracy to Invent Jesus*, who was one of the featured scholars, along with Dorothy Murdock, among others, arguing that Jesus, who was a Pagan-based, mostly-Egyptian, mythological morph character. [1]

Quotes

The following are noted quotes:

> "The **Christian myth** of the 'return' is a powerful allegory designed to guide us through the stages of initiation which lead to Gnosis. It was created by synthesizing the Jewish myth of Exodus with Pagan myths of the dying and resurrecting Godman Osiris-Dionysus. Originally a simple and abstract myth, it was revised and embellished over the course of the first and second centuries CE to become the most influential myth ever created: the Jesus story."
>
> — Timothy Freke and Peter Gandy (2001), *Jesus and the Lost Goddess* [2]

References

1. (a) Heede, Fritz. (2012). *Caesar's Messiah: The Roman Conspiracy to Invent Jesus* (Q) (about). Publisher.
(b) Freke, Timothy. (2012). "The Jesus Myth – Timothy Freke" (Q), Caesar's Messiah, Sep 1.
2. Freke, Timothy and Grandy, Peter. (2001). *Jesus and the Lost Goddess: The Secret Teachings of the Original Christians* (Osiris, 18+ pgs; quote, pg. 13). Random House.

Further reading

● Freke, Timothy and Gandy, Peter. (1999). *The Jesus Mysteries: Was the Original Jesus a Pagan God?* (Osiris, 49+ pgs). Ten Speed, 2001.
● Freke, Timothy and Gandy, Peter. (2005). *The Laughing Jesus: Religious Lies and Gnostic Wisdom*. Ten Speed.
● Freke, Timothy. (2008). *The Hermetica: The Lost Wisdom of the Pharaohs*. Tarcher.

External links

● The Jesus Mysteries – Wikipedia.
● Tim Freke (about) – TimeFreke.com.

θΔics

In existographies, **Timothy Kueper** (c.1962-) is an American electrochemist, materials science engineer, and novelist, noted, in literature thermodynamics, sub-genera religious thermodynamics, for []

Evolution Valley

In 1999, Kueper published his first novel *Evolution Valley*; the abstract of the 2019 second edition is as follows: [2]

> "A struggling scientist [Caleb] is confronted with danger on all sides: Obsession with a bicycle-crazed woman [Zenia], entanglement in unspeakable product development, and transfixion over a **sentient machine's search for the thermodynamic meaning of life**. This novel is set in 1996 in Oakland, California, and in the backcountry of the Sierra Nevada. For our hero and his friends, the problems are legion, but one all-encompassing solution may be at hand. Originally printed in 1999, this book was shockingly overlooked by mainstream publishing. It nonetheless developed a cult following among thermodynamics enthusiasts and eco-terrorist types. For the current edition, based on extensive reader feedback, 25,000 words of bullsh*t have been removed. What remains is crystalline clarity for this heartfelt story and its staggering philosophical conclusions."

The book opens to Caleb, an "electrochemist at HAK Research, an engineering firm specializing in aircraft systems", and Zenia, a woman who he bicycles around the mountains with. It makes reference to things such as "In the Beginning" (see: Genesis), and the "best of both possible worlds", i.e. Gottfried Leibniz philosophy.

Motive Power of Fire

In 2019, Kueper published his second novel *The Motive Power of Fire*, the title being a play on Sadi Carnot's 1834 *The Motive Power of Fire*, the cover of which is shown adjacent, wherein we see the Carnot cycle at center; the following quote coming to mind:

> "He was a practical electrician fond of whiskey, a heavy, red-haired brute with irregular teeth. He doubted the existence of a deity but **accepted Carnot's cycle**, and he had read Shakespeare and found him weak in chemistry."

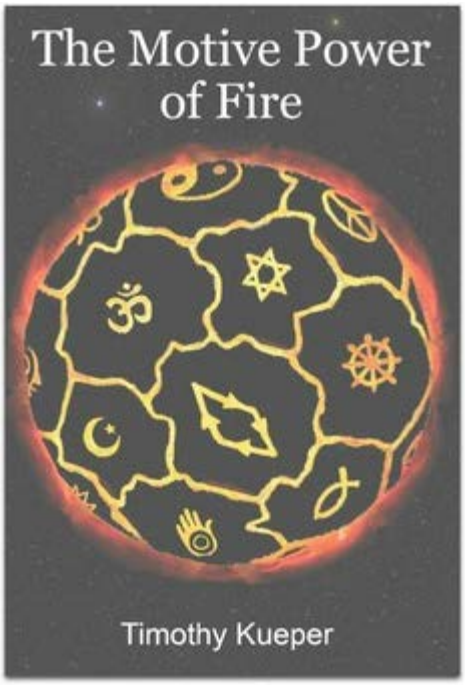

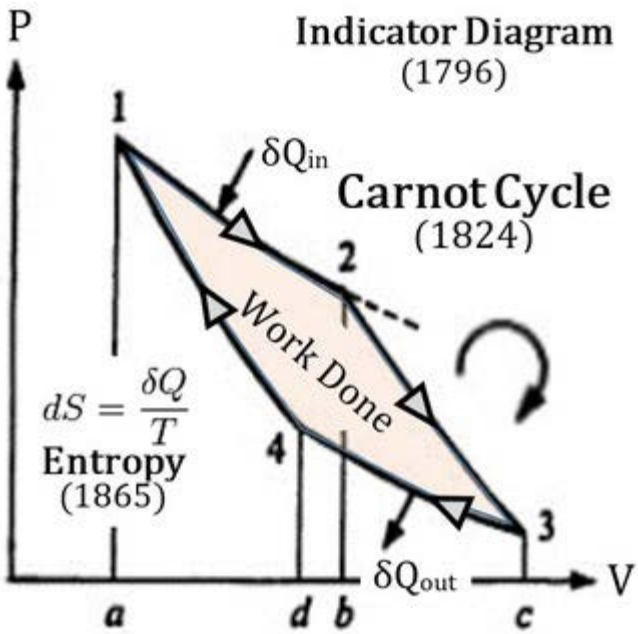

Kueper's 2019 novel *The Motive Power of Fire* (left), showing the religion symbols: yin yang, peace, Judaism, Buddhism, Christianity, Jainism, Islam, Hinduism, Sikhism, Baha'ism, all centered around the Carnot cycle (right), wrapped around some kind of "eclipsed sun", possibly symbolic of the idea that currently we, culturally, are eclipsed by some type of moon-like structure, that is blocking the vision of a future evolved thermodynamics based religion, or something along these lines.

— Herbert Wells (1906), "Lord of the Dynamos" (Ñº); in: *The Door in the Wall, and Other Stories* [1]

The aim of this novel, as Kueper says in his about author section, is to "leverage his formal thermodynamics training,

PhD from Berkeley in materials science, to illustrate the moral functioning of the world"; the abstract is as follows: [1]

> "A sentient machine formulates the six laws of motive power, which explain the link between thermodynamics and the root of religion. Challenged with intractable humans and other dangerous forms of intelligence, he attempts to take shelter in monkhood, seeking humility within civilization's relentless march toward the sublime. Set in the very near future, this novel examines our familiar human world as viewed by an outsider. Nicolas approaches that world as a machine and as a monk, but is soon called upon to help three new associates: A professor who is analyzing the source of religion, an imprisoned polygamous cult leader, and a female machine who envisions a future society of artificial floating islands. The resulting action illustrates the laws of motive power in operation. This book does not advocate any major religion, nor would it alienate most atheists. It asks for no belief save in the idea that **thermodynamics might be a key to finding god**: Divine sanction and sacred mystery can be had without abandoning the natural patterns of the world."

Here, firstly, we note that the idea of "thermodynamics being the key to finding god", is reminiscent of the Atenism religion of Akhenaten (c.1350BC), where the sun was called the god Aten, and all other previous religious models were discarded, in place of proto natural science models, which was said to have bordered on atheism.

The book opens to a Cicero-like dialogue, between the Nicolas, possibly a play on Nicolaus Copernicus [?], the protagonist, presumably the author, a machine-like monk man, auto-characterized as a "practicing monk", who has just made a carrier and relationship change, who has his own theory of "world energetics", and a professor C. Water, a European history specialist working on the "evolution of religion", on the historical religio-theories of moral order:

> "Well, here's my problem: It's about the roots of religion, the very beginning. I want to discuss where it comes from, and **I want ideas that fit with science**, not just pure theology. I've been trying to discuss this topic with sociologists, and we just kind of go in circles. I can tell you all about that frustration if you want. But recently it dawned on me that I might just be asking the wrong people. Maybe this question I have is not really a social question. **Maybe what I'm looking for has a more physical, or even chemical explanation**. I don't know. But I want to see if someone from a technical field like that can help figure it out. Not that I'm necessarily going to understand everything you say. But who knows, maybe something will click. So anyway, I wanted to talk to someone with a solid background in the hard sciences, but someone who's also gone and taken some kind of deep dive into religion."
>
> — Professor C. Water (2019), *The Motive Power of Fire* (pgs. 6-7)

> "I may be able to help you."
>
> — Nicolas (2019), *The Motive Power of Fire* (pg. 7)

The professor, then goes onto say that she is looking for a universal principle of truth and order, rooted in a 'more fundamental physical thing', giving the following examples from religion:

> "Historically, there have been many religions that each had their own name for what normally translates as truth or order. The ancient Egyptians called it

Ma'at. The Hindus called it Arta, while the Zoroastrians called it Asha. Some of the Chinese called it Tao, and in the Hellenistic world, it was Logos. Don't they all seem kind of the same to you?"

— Professor C. Water (2019), *The Motive Power of Fire* (pg. 7)

A simplified depiction (Ñº) of Maat, the embodiment of the Egyptian religion principle of universal moral order and justice, shown with her scale, "feather of truth", and someone's heart, filled with sins, being weighted in the afterlife. Maat is either thought to be the daughter of Ra, and oft-seen riding in his solar barque, or was the principle that brought the world into existence. She is also the wife of Thoth. **Kueper** argues, via dialogue in his novel *The Motive Power of Fire* (2019), that just as the Egyptians believed moral order and justice to be tied up with the heating power of the sun, so to will the "future evolved religion" (see: new religion) be tied up with power and heat defined by thermodynamics.

Nicolaus says he knows what she is talking about, and says her query topic is aiming at the 'heart of his world'. She continues:

"What goes on in the world, that leads people to these ideas, over and over again? The social scientists can't answer me. They seem to run out of gas after they talk about things like 'group cohesiveness', or maybe the 'admixture of dream and reality'. These social explanations for the religious impulse never sound quite right to me. I feel like this is not something caused by society, or even by mind. This is prior to those things. This was there in the beginning."

— Professor C. Water (2019), *The Motive Power of Fire* (pg. 7)

"I know exactly what you mean."

— Nicolas (2019), *The Motive Power of Fire* (pg. 7)

"Well, good, because I was hoping that somebody, some scientist, might have a way to shed some light."

— Professor C. Water (2019), *The Motive Power of Fire* (pg. 7)

"What I can tell you, is that there is an actual physical effect that is always operating in the world, but is almost never understood. And it is, in my opinion, the root of all religion."

— Nicolas (2019), *The Motive Power of Fire* (pg. 7)

"You mean there's something like a life-force that's real?"

— Professor C. Water (2019), *The Motive Power of Fire* (pg. 8)

> “Well, one really shouldn't call it a force. It's more accurately an effect of kinetics.”
>
> — Nicolas (2019), *The Motive Power of Fire* (pg. 8)

> “Those sound like they could be the same to me?”
>
> — Professor C. Water (2019), *The Motive Power of Fire* (pg. 8)

> “In scientific terms, forces can push things around. This kinetic effect [see: kinetic factor] is a little more subtle. It has to do with relative rates of change, and its results become evident over time, and progressively. It's more like evolution. Which, by the way, is also an effect of kinetics.”
>
> — Nicolas (2019), *The Motive Power of Fire* (pg. 8)

Nicolas then digresses into citing quotes from the *Upanishad* (c.700BC), i.e. Hinduism, *Tao Te Ching* (c.500BC), i.e. Taoism, the *Enneads* (270 CE) of Plotinus, and the following seeming Heraclitus-stylized quote by Schelling:

> “The [godhead] is not divine nature or substance but the consuming poignancy of purity, which man is able to approach only with similar purity. For, since **all being is consumed in it as in a fire**, so it is necessarily unapproachable for everyone who is still enveloped in being.”
>
> — Friedrich Schelling (1815), *Ages of the World*

Nicolas interjects on this as follows:

> “In my view, one's attitude toward being is a key area of confusion for most religion. The idea of **‘one's being going up in flames’** is the part I wanted you to hear. But I won't argue that point at this time. I just want this much to be clear: There is a source of progress, an order, which is hidden, and some special effort is required to gain awareness of this order. Over the ages, those select few who have found it, who have reached enlightenment, have done so by letting go of their normal worldly concerns; they have withdrawn, at least temporarily, from all that is other than god.”
>
> — Nicolas (2019), *The Motive Power of Fire* (pg. 10)

All this is pretty good dialogue, up to this point, i.e. very few modern people can engage in thermodynamics, philosophy, and religion. The only downside, is Kueper's seeming underlying conjecture, at this point, namely that force, kinetics, and some type of energy of thermodynamics, e.g. free energy change behind combustion, e.g. as in one’s being consumed in purposeful social combustion, as being "god", the work of god, or a god head.

The idea of trying to sell god as the force, energy, work, or power or thermodynamics, historically, to note, has long been tried, e.g. Joule (1843), Thomson (c.1890), Rossini (1971), Beg (1987), de Lange (1997), etc., but played out as fallacious (see: religious thermodynamics), and is an attempt that belies ignorance in works of the top 150+ religio-mythology scholars, of history, who have painstakingly debunked god and gods as but anthropomorphized notions of geo-astronomical patterns (see: god character rescripts), movements, and phenomena. The case in point, in the above dialogue, being the Buddhism “practicing monk” model, of freeing one’s being, originated in the Egyptian aim of getting onto Ra’s cyclically re-occurring solar barque, so to achieve samsara, release, or something along these lines (see: astro-theology).

Other

Kueper is also at work on a memoir based on 50,000 miles of loaded bicycle touring on three continents.

Education

Kueper, in 1989, completed his MS in materials science engineering, with a thesis on “Electrocladding of Ceramic Superconductors” (Ñº), and in 1992, completed his PhD in materials science engineering, with a dissertation on “Sol-gel Ceramic Electrolyte Films on Porous Substances” (Ñº), both at the at the University of California, Berkeley. He then did five years of post-doctoral research at Argonne National Laboratory, from 1992 to 1997, wherein he performed solid oxide fuel cell research and design improvement. [2] Kueper then worked as a Silicon Valley engineer, specifically at Novellus Systems as a process engineer, from 1999 to 2007, then at MiaSole, as a senior scientist, which is where he currently works.

References

1. Kueper, Timothy. (2019). *The Motive Power of Fire* (Amz). Publisher.
2. Kueper, Timothy. (1999). *Evolution Valley: a Novel* (Ñº). Publisher, 2019.
2. Tim Kueper – LinkedIn.

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External links

â— The Motive Power of Fire (Kueper, 2019) – Reddit.

θΔics

In hmolscience, **Timothy Lister** (c.1950-) is an American consultant noted, in business thermodynamics, noted for his co-authorship of the 1999 book *Peopleware*, with its loose thermodynamics arguments.

Overview

In 1999, Lister co-authored *Peopleware* with Tom DeMarco in which they theorize on corporate entropy, posit a second thermodynamic law of management, and discuss how certain people in companies are like free electrons. [1]

Education

Lister completed his AB at Brown University.

References

1. DeMarco, Tom and Lister, Timothy. (1999). *Peopleware: Productive Projects and Teams* (section: Corporate entropy, pg. 99). Dorset House Pub. Co.

External links

â— Tim Lister (about) – SystemsGuild.com.

θΔics

In hmolscience, **tipping point** is a sociophysics like term referring to the point in time at which a particular social phenomenon or occurrence 'tips' into a large scale trend. [1]

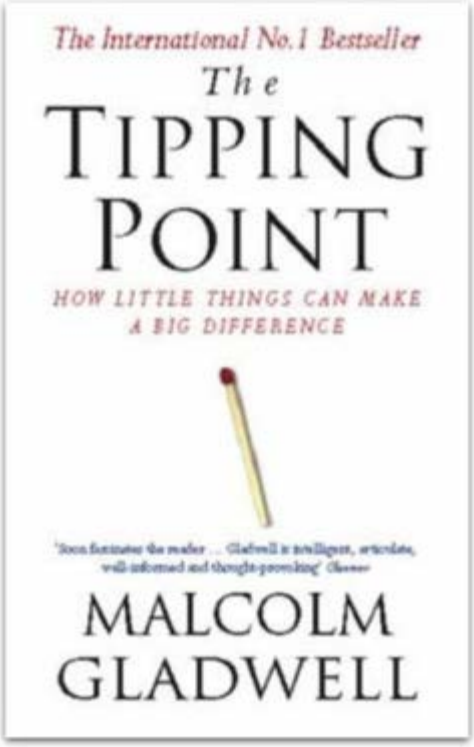

Cover to the 2000 book ***The Tipping Point*** by Malcolm Gladwell. [1]

Overview

In 2000, the "tipping point" theory was introduced prominently by Malcolm Gladwell in his best-selling book *The Tipping Point: How Little Things Make a Big Difference*, pictured adjacent, where as the cover indicates, by analogy, just as a one match, lit, in a forest at its critical point in the dry season, can strike off a state-wide fire, which is a type of combustion characterized by the reaction of wood, a hydrocarbon-type of substance such as methane, with oxygen:

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O + \text{energy}$$

so to can one specific human chemical reaction, act, or cultural influence spark a nationwide or worldwide transition or uncontrolled reaction, releasing a larger amount of energy from a tensed-up social structure.

The June 28, 1914 shooting of Austro-Hungarian Archduke Franz Ferdinand by the Bosnian Serb student Gavrilo Princip, a member of the Serbain terrorist organization Black Hand, is said to have been the tipping point that, within thirty days, led to a global chain reaction that led to WWI, claiming ten million lives, and followup WWII, claiming another thirty million. [2] In this sense, the tipping point can be looked on as either the heat of the spark reaction working to catalyze the bigger reaction, thus acting to get the bigger reaction over the activation energy barrier, or as an aspect of collision theory.

Tipping point theory is utilized in the 2010 business theory book *Employees First, Customers Second*, by Vineet Nayar. [3]

References

1. Gladwell, Malcolm. (2000). *The Tipping Point: How Little Things Make a Big Difference*. Little, Brown and Co.
2. Buchanan, Mark. (2000). *Ubiquity: Why Catastrophes Happen* (pg. 3). Three Rivers Press.
3. Nayar, Vineet. (2010). *Employees First, Customers Second* (quote, pg. 165; energy, 11+ pgs.). Harvard Business Books.

External links

â— Tipping point (sociology) – Wikipedia.
â— The Tipping Point – Wikipedia.

θΔics

In hmolscience, **Tjalling Koopmans** (1910-1985) is a Dutch-born American mathematician, theoretical physicist, economist noted for his 1947 efforts to outline a science of "economic dynamics", wherein people are considered the "molecules" of economic life: [2]

> "While it was long possible and sometimes tempting for physicists to deny the usefulness of the molecular hypothesis, we economists have the good luck of being some of the 'molecules' of economic life ourselves, and of having the possibility through human contacts to study the behavior of other 'molecules'."

Koopmans is also noted for his efforts to understand how thermodynamics, particularly entropy, applies in economics to these molecules of economics, as he calls them, as is exemplified by the following famous and very-forth coming, 1979 entropy quote, which brings to light the great divide that exists between the different departments of modern knowledge, particular when it comes to efforts to make understand thermodynamics crossovers (see: soft science assistance): [7]

> "If we will be more forthcoming with explanations of our cherished terms, our science colleagues may be more inclined to help us with 'entropy', which to me is a more difficult concept than anything economics has to offer."

Koopmans is also noted for his Koopmans' theorem, concerning orbital energies in atoms and molecules, and was co-recipient of the 1975 Nobel Prize in economics. [9]

People | Molecules of economic life

The quote stating that people are molecules, or specifically the molecules of economic life, which, to note, is similar to Leon Walrus idea that people are "economic molecules", arose during the five-year "Measurement Without Theory" debate, between Koopmans and American economist Rutledge Vining (1908-1999), with commentary by M. Hastay. [3] The quote is often cited as having been made by Koopmans in 1947 on page 220 of one of his published articles that year. [4] It is remains to be determined, however, which exact article this quote occurred. [5] The quote is found in the 1949 discussions between Koopmans and Vining. [6]

In 1992, Koopmans quote catapulted to fame when it became the opening quote to American philosopher Alan Nelson's 1992 chapter "Human Molecules", after which the idea seems to have emerged, that Koopmans coined the term "human molecule" in economics, which is only partially true. The 2009 *Oxford Handbook of Philosophical Economics*, for instance, defines the term "human molecule" as an ontologically distinct individual and states that the term human molecules is "Tjalling Koopmans' evocative coinage". [1] The actual first person to coin the term human molecule, thus far determined, however, is French philosopher Jean Sales in 1789.

Koopmans' theorem

In chemistry, Koopmans is known for his 1934 postulate that the energy required to remove an electron from an atom or a molecule, is equal to minus the orbital energy of the electron that is removed, a statement known as "Koopmans' theorem". [8]

References

1. Kincaid, Harold and Ross, Don. (2009). *Oxford Handbook of Philosophy of Economics* (pg. 394). Oxford University Press.
2. Koopmans, Tjalling C. (1979). *Scientific Papers of Tjalling C. Koopmans* ("molecules of economic life", pg. 150), Volume 1. Springer-Verlag.
3. Hendry, David F., Morgan, Mary S. (1997). *The Foundations of Econometric Analysis* (Section: "Measurement without Theory" Debate (1947-51): T.C. Koopmans/R. Vining/M. Hasting, pgs. 491-526; "molecules of economic life",

pg. 515). Cambridge University Press.
4. Friedman, Milton and De Marchi, Neil. (1992). *Milton Friedman: Economics in Theory and Practice* ("molecules of economic life", pg. 127). University of Michigan Press.
5. (a) Koopmans, Tjalling C. (1947). "Measurement Without Theory" (abs), *The Review of Economic Status*. *The Review of Economic Statistics*, Vol. 29, No. 3: 161-172.
(b) Koopmans, Tjalling C. (1947). "Article", *Journal*, pg. 220?
6. Koopmans, Tjalling and Vining, Rutledge. (1949). "Methodological Issues in Quantitative Economics", *The Review of Economics and Statistics* ("molecules of economic life", pg. 87), Volumes 31-32. North Holland Publishing Co.
7. Faber, Malte M., Niemes, Horst, and Stephan, Gunter. (2005). *Entropy, Environment, and Resources: an Essay in Physico-economics* (ch. 3: The Notion of Entropy, quote pg. 77). Springer.
8. (a) Koopmans, Tjalling (1934). "Über die Zuordnung von Wellenfunktionen und Eigenwerten zu den Einzelnen Elektronen Eines Atoms". *Physica* (Elsevier) 1 (1–6): 104–113.
(b) Haaland, Arne. (2008). *Molecules and Models* (pg. 30). Oxford University Press.
(c) Koopmans' theorem – Wikipedia.
9. Koopmans (autobiography) – NobelPrize.org.

External links

â— Tjalling Koopmans – Wikipedia.

θΔics

In conferences, **To Have Done With Life** was 17-19 Jun 2011 meeting at the Multimedia Institute, Zagreb, organized by Nathan Brown (UC Davis) and Petar Milat (MaMa), on the subject of addressing vitalism and antivitalism in contemporary philosophy, i.e. philosophically irreconcilable issues with using the metaphysical term "life" amid growing 21st century materialism.

The flyer for the 2009 Croatian "**To Have Done With Life**" conference, wherein the attempted to have dialogue on going past the "Kauffman patch" emergence models of "life", as Nathan Brown summarized things, of Stuart Kauffman. [2]

Overview

In 2009, Nathan Brown, of UC Davis, and Peter Milat, of the Croatian social activism group MaMa (Q) hosted a symposia entitled "21st Century materialism", the first of an aimed-to-be ongoing series; the series thus far include: (Q)

- 2009 | 21st Century Materialism
- 2011 | **To Have Done with Life**
- 2012 | The Art of the Concept
- 2013 | Modernity: the Bitter End
- 2014 | Sophistry: the Powers of the False
- 2015 | Poiesis (Q) (vid)

In 2011, Brown and Milat, hosted the second series symposia entitled "To Have Done with Life: Vitalism and Antivitalism in Contemporary Philosophy"; the synopsis of which is as follows: [1]

> "'Life' is the site of a formidable lacuna. There is no firmly established scientific account of its constitutive properties or the process of its genesis. Varieties of "vital materialism" prone to describing physical forces in terms of an inherent "life of things" have done little to clarify the problematic nature of the concept, and insofar as "life" functions as an empty signifier concealing an absence of theoretical coherence we might be better to have done with it."

This symposium seems to have dug around not necessarily at the level extreme end of: defunct theory of life, life does not exist, regarding definitions, life terminology upgrades, etc., type of view, but rather from the middle ground: "living crystals", "virus debate", and metaphysical objection end of the spectrum. Brown, in his "Introduction", opened the conference thematically to the following: [2]

> "The title of our 2009 conference at MaMa was 21st Century Materialism. The title of this year's conference is To Have Done With Life. Let me try to frame this year's event by thinking through the relation between these two titles or these two problems: the relation

between the philosophical orientation called materialism and the philosophical and scientific concept of life."

Brown then cites Terrence Malick's 2001 film *The Tree of Life* (Q), shown adjacent, which connects the emotional and psychological event of the "death" of a son or brother, depending on view, backwards in time to the birth of the universe; summarized by Brown as follows:

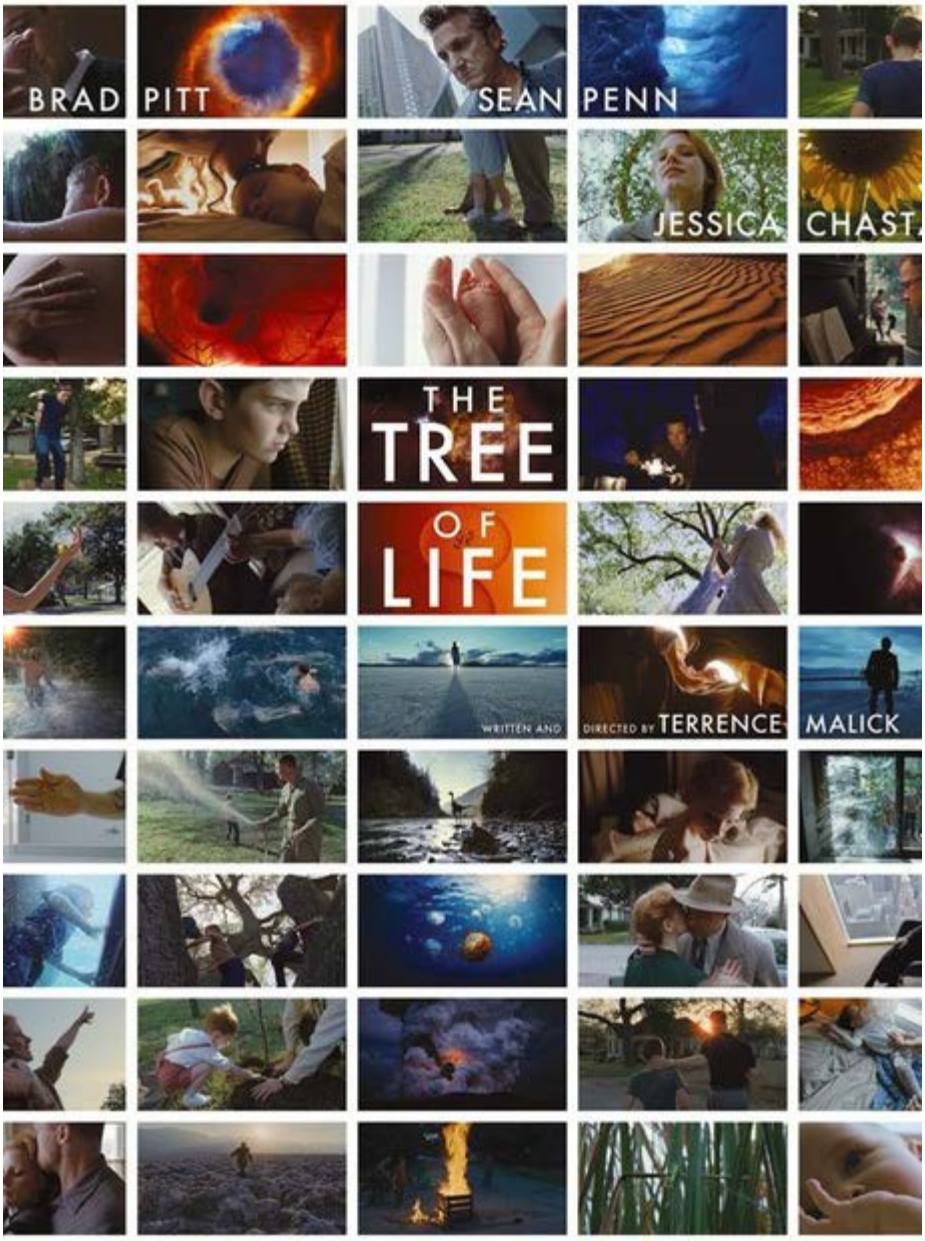

Terrence Malick's 2001 film *The Tree of Life* (Q), which "**To Have Done With Life**" conference co-organizer Nathan Brown cites as an opening platform launching point for discussion, in respect to "issues" with the term "life" from an emergence and or metaphysical point of view. [2]

> "A son dies, he is mourned by his family. And on the anniversary of his death, decades later, the film's narrative focalization upon the psychological interiority of his older brother breaks into what must be one of the most remarkable "flashbacks" in the history of cinema, even more grandiose than the famous analeptic cut which opens 2001: A Space Odyssey. Malick's film returns us to what seems to be the origin of the cosmos, and from here we follow the expansion of the universe and the formation of our galaxy through the accretion of the earth, millennia of geological time, the self-organization of RNA and DNA molecules, the emergence of mitochondria and multicellular organisms, the evolution of diverse animal species during the Cambrian explosion, the reign and extinction of the dinosaurs, and the beginning of the latest ice age during the Pliocene. We then return to the *bildungsroman* (Q) of the eldest son, following the progress of his family romance up through the years preceding his younger brother's death."

Brown then, skipping some paragraphs on how the film is "profoundly materialist", albeit taken up with an "Christian framework", e.g. bringing in "spirituality terminology reform" problems, e.g. "how does spiritual experience—as an existential fact—come into being within the cosmos?", intermixed with life terminology reform, jumps to the following ripe core of the problem statement:

> "The term "emergence" is the surest index of the doubly physical and metaphysical scope of this problem. The emergence of life, we say, and what we seem to mean by this is that we do not know exactly how—at

exactly what point and in exactly what way—life came into being, though we do seem to know a great deal about its properties—including, supposedly, that it exists [see: life does not exist]. The problem of "emergence" is that a modality of being came to be which was not before, and the difficulty is that tracking the physical causes of such an event leads to irresolvable aporia (Q). And these aporia are too easily dissembled through reference to "complex, self-organizing processes," as if we can at once account for and evade the radicality of the event we are trying to think by placing it within the same category as the formation of snowflakes, traffic patterns, or the activities of termite colonies. In its typical usage (the work of Stuart Kauffman, for example), the concept of "emergence" is a crypto-metaphysical concept pretending to offer physical explanations, at once allowing and accounting for gaps in the latter through reference to "complexity"."

Firstly, regarding "the concept of 'emergence' is a crypto-metaphysical concept pretending to offer physical explanations, at once allowing and accounting for gaps in the latter through reference to 'complexity'", this corroborates with the new 2005 post-Dover trail classification of intelligent design (formerly creationism) with "sudden emergence".

Secondly, Brown, in short, asserts that the Kauffman patch (or Kauffman-like patches) to the problem of the origin of life, an example view of which is as follows:

> "Alone, each molecular species is dead. Jointly, once catalytic closure among them is achieved, the collective system of molecules is alive."
>
> — Stuart Kauffman (1995), *At Home in the Universe* (pg. 50)

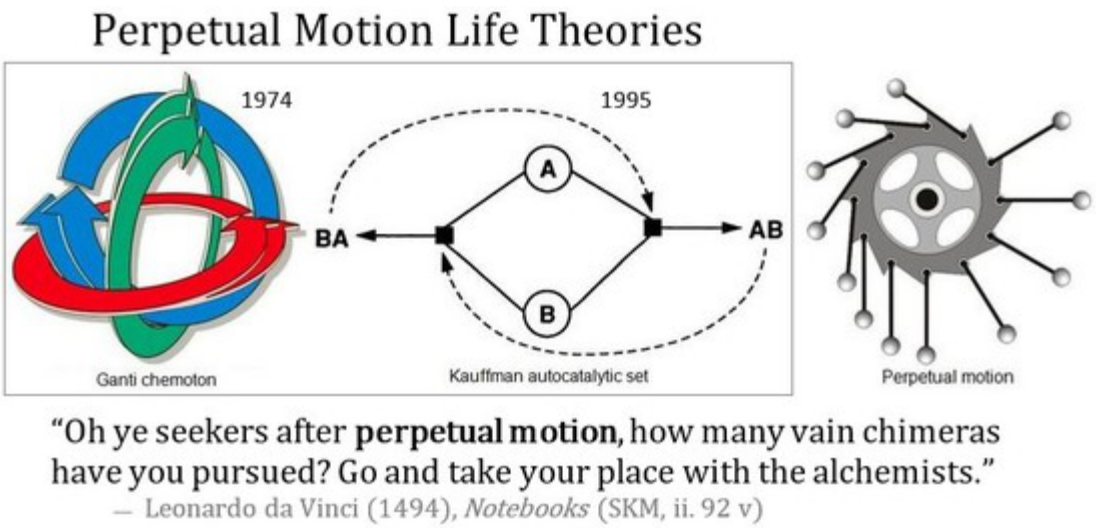

A diagram classifying the "life theories" of Tibor Ganti (1974), i.e. chemoton theory, and Stuart Kauffman (1995), i.e. auto-catalytic closure, as perpetual motion theories, i.e. end over unity theories, i.e. perpetual motion of the living kind; which is what Nathan Brown (2011) seems to be pointing out in in his "Introduction" talk given during the **To Have Done With Life** conference.

is but an "irresolvable aporia", i.e. something that does not allow for passage into the solution; which is pretty near to target, e.g. it took Thims three years to go from puzzlement stage (2007), i.e. the sort-of-alive subatomic particle stage, to the defunct theory of life stage (2009), and thereafter to correctly see Kauffman, and his irk, as nothing but either perpetual motion theories (see: perpetual motion of the living kind) and or ontic opening schemes (e.g. negentropy theory model of life). Brown continues:

> "The problem for biology, then, is that it is constantly on the cusp of either reduction to physical chemistry or ideological capture by metaphysics. The concept of 'life' tends to get lost between explanations of biological organisms referring either to molecular interactions or to an irreducible systemic wholeness [e.g. Behe]. And because it gets lost, it is prone to over-extension as the je ne sais quoi (Q) which accounts for the substance of the biological precisely through its indetermination."

Brown continues:

> "Should we have done with life? If we deploy this concept as a means of pretending we know what we mean when we do not, then we

> probably should. And this is perhaps the dominant para-philosophical use of this concept today, as it is deployed by actor-network theory spin-offs and vitalist Spinozisms extolling the so-called 'life of things'. As, for example, in the 'vital materialism' of Jane Bennett."

American political philosopher and "thing theorist" Jane Bennett's *Vibrant Matter*, wherein she seems to be selling a 21st century do-gooder type of neo-Bersonianism, or something to this effect, which was one of the goads to the 2011 "To Have Done With Life" conference. [4]

The following would seem to be an example Bennett quote, representative of what Brown is against:

> "What counts as the material of vital materialism? Is it only human labour and the socio-economic entities made by men using raw materials? Or is materiality more potent than that? How can political theory do a better job of recognizing the active participation of nonhuman forces in every event and every stabilization? Is there a form of theory that can acknowledge a certain 'thing-power', that is, the irreducibility of objects to the human meanings or agendas they also embody?"
>
> — Jane Bennett (2009), "Agency, Nature and Emergent Properties: an Interview with Jane Bennett" [3]

Likewise, the following as the following abstract to Bennett's highly-cited (Q) 2010 *Vibrant Matter: A Political Ecology of Things* indicates:

> "Bennett examines the political and theoretical implications of vital materialism through extended discussions of commonplace things and physical phenomena including stem cells, fish oils, electricity, metal, and trash. She reflects on the vital power of material formations such as landfills, which generate lively streams of chemicals, and omega-3 fatty acids, which can transform brain chemistry and mood. Along the way, she engages with the concepts and claims of Spinoza, Nietzsche, Thoreau, Darwin, Adorno, and Deleuze, disclosing a long history of thinking about vibrant matter in Western philosophy, including attempts by Kant, Bergson, and the embryologist Hans Driesch to name the "vital force" inherent in material forms. Bennett concludes by sketching the contours of a "green materialist" ecophilosophy."

she seems to be trying to sell neo-green materialism ecophilosopy, situated on an empty "neo-neovitalism" platform; which is what Brown seems to be pointing out, in respect to the incorrigibleness of the term life, and in turn the underlying foundationless of Bennett's well-mindedness in aim position.

Unliving lucidity

Brown, in his "The Lucidity of the Unliving: Crystallography and Inorganic" talk, opens to Scottish chemist Graham Cairns-Smith (Q), his 1985 *Seven Clues to the Origin of Life*, and its assertion that the origin of life, originating from a 1966 paper, which asserted that: "life on earth evolved through natural selection from inorganic crystals", after which he comments how this model is cited by Richard Dawkins and Daniel Dennett, but one that remains speculative and controversial. [6] At 15:00-min mark, Brown, in contract to his sharp "Kauffman confusion" introduction, digresses a type of baseless "crystal pataphysics philo-thesaurus babble", a digression on the 1994 pataphysical crystallography ideas of Christian Bok (Q), on inorganic poetry, i.e. on who "linguistic particles" (letters) bond like electrons to form covalent bonds (words), which by 23-min is reminiscent of someone talking to their alter-ego in an imaginary semiotic sky castle, and by 30-min the talk is non-watchable.

Videos

The following are some of the notable conference videos: [5]

● Kukuljevic, Alexi. (2011). “Notes on Lifeless Matter” (vid), To Have Done With Life: Vitalism and Antivitalism in Contemporary Philosophy conference at MaMa, Zagreb, Jun 17-19.

The first 12:30 min of this is Kant on transcendentalism and and quotes from *Critique of Judgment*; nothing on lifeless matter thus far [?]

● Noys, Benjamin (2011). “The Poverty of Vitalism” (vid), To Have Done With Life: Vitalism and Antivitalism in Contemporary Philosophy conference at MaMa, Zagreb, Jun 17-19.

The first 10 min of this is basically nothing.

See also

● BPE 2016

References

1. Brown, Nathan and Milat, Petar. (2011). “Symposium: To Have Done with Life: Vitalism and Antivitalism in Contemporary Philosophy”, Multimedia Institute, Zagreb, Jun 17-19.
2. Brown, Nathan. (2011). “Introduction” (Q), WordPress, DoneWithLife.mi2.hr.
3. Khan, Gulshuan, Bennett, Jane. (2009). “Agency, Nature and Emergent Properties: an Interview with Jane Bennett” (Q), Dialogues with Political Theorists, *Contemporary Political Theory*, 8:90-105, Feb.
4. Bennett, Jane. (2010). *Vibrant Matter: A Political Ecology of Things* (pdf). Duke University Press.
5. Videos – To Have Done With Life (2011)
6. Brown, Nathan. (2011). “The Lucidity of the Unliving: Crystallography and Inorganic” (vid), To Have Done With Life: Vitalism and Antivitalism in Contemporary Philosophy conference at MaMa, Zagreb, Jun 17-19.

External links

● Peter Milat (faculty) – Club MaMa.

θΔics

In existographies, **Todd Hylton** (c.1960-) (CR:5) is an American machine learning (Q) theorist and entrepreneur, noted for []

Overview

In the 2000s, Hylton working in the area of semiconductor equipment, themed on chips whose architecture is inspired by brain architecture. [1]

In 2009, Hylton, working at DARPA, conceived of his theory of "physical intelligence", which supposes that intelligence spontaneously evolves as a consequence of thermodynamics in open systems, and that such types of evolved intelligences can be built from chemical and electrical components. [2] The ramifications of this, being conceived as a type of applied human thermodynamics, in the area of war thermodynamics.

In 2018, Hylton, gave a TED talk entitled "Is the Universe a Product of Thermodynamic Evolution?", wherein purports to give a "non-mechanistic" (the universe is NOT mechanistic"), "anti-supernatural" (there is NO creator), "evolutionary worldview" (Darwin runs the universe?), to explain how things, such as bugs and humans, come to exist; at the end of which he concludes with the posit that some day we will make "thermodynamic computers" that evolve on their own".

There is some sense in his talk, when he references "potentials" and how things come together owing to these potentials, and how he digresses on causality (compare: Sociology 23), but some of his talk is a bit off, e.g. his idea that the universe is not mechanistic (compare: Holbach's geomatrician), that thermodynamic computers (think: terminator scenario) can become new chemical species, or something along these lines. His general philosophy, baring prolonged digression in areas of greenhorn confusion, at least, is in the correct direction, comparatively speaking.

Difficulties

> *See main: Machine evolution scenario*

As to difficulties on theory, the central problem of Hylton's model of "thermodynamic computers" moving and evolving via "physical intelligence", which is similar to that embedded in *The Matrix* (1999) film scenario, *The Terminator* (1984) film scenario, and or the "grey goo" problem, is that the "potentials", which Hylton speaks of as being the driving force behind the evolution of matter, in the universe, namely thermodynamic potentials, the Gibbs potential specifically for earth-bound surface-reacting social systems, operate between or amid reactive CH-based animation types of chemical species, whereas no sort of similar reproductive Gibbs potential exists between Si-based types of animation, such as computers, CPUs, AI systems, or robots. Correctly, in the human chemical reaction purview, Si-based matter, as found in computers, CUPs, AI systems, or robots, are technically classified as "substrate", which has the function to lower the activation energy barrier of social reactions.

Quotes | By

The following are quotes by Hylton:

> "Existence derives from thermodynamic evolution."
>
> — Todd Hylton (2018), "Is the Universe a Product of Thermodynamic Evolution?" [3]

References

1. Todd Hylton (faculty) – University of California, San Diego.
2. (a) Physical Intelligence (PI) – DARPA-BAA-09-63 – FBO.org.
(b) DARPA – Wikipedia.
3. Hylton, Todd. (2018). "Is the Universe a Product of Thermodynamic Evolution?" (Q) (abs), TEDx Talks, San Diego,

Jan 3.

External links

- Todd Hylton – LinkedIn.

θΔics

In hmolscience, **Todd P. Silverstein** (c.1954-) is an American chemistry professor noted, in human thermodynamics, for his 2006 defense of the use of chemical thermodynamics to explain the human condition, e.g. terrorism concerns.

Overview

In 2006, Silverstein, in his Rossini debate response letter "State Functions vs State Governments", defended the use of chemical thermodynamics to explain or study human freedom and security as outlined by Frederick Rossini's 1971 "Chemical Thermodynamics in the Real" Priestley Medal address. [1] In response to objections regarding this application, by American chemist John Wojcik, Silverstein's states that:

> "I do not agree that such 'loose thinking' should be 'purged' from science altogether."

(add discussion)

Education

Silverstein completed his BA at Brandeis University and MS and PhD, with a 1984 dissertation on "Conformation of Rhodopsin near Reactive Sulfhydryl Groups: Probed by Spin Labeling and Spin Exchange Techniques", at the University of California, Berkeley. [2] Silverstein currently is a professor of chemistry at Willamette University, Salem, Oregon. [3]

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (section: Rossini's political thermodynamics, pgs. 679-88). (preview). Morrisville, NC: LuLu.
(b) Leonard, Harold, E. (2006). "Chemical Thermodynamics in the Real World." (PDF) *Letters, Journal of Chemical Education*, (83) 39, Jan, No. 1. pg. 39.
(c) Wójcik, John F. (2006). 'A Response to Chemical Thermodynamics in the Real World.' (PDF) *J. Chem. Educ.* (*83)* 39.
(d) Silverstein, Todd, P. (2006). "State Functions vs. State Governments", Journal of Chemical Education, Jun. (83): 847, Letters.
2. Silverstein, Todd Philip. (1984). "Conformation of Rhodopsin near Reactive Sulfhydryl Groups: Probed by Spin Labeling and Spin Exchange Techniques", Thesis/disseration.
3. Todd P. Silverstein (faculty) – Willamette University.

θΔics

In hmolscience, **Tom W. Bell** (c. 1966-) is an American philosopher-lawyer noted, in philosophical thermodynamics, for his 1991 publications on the entropy antonym term extropy.

Overview

In 1991, Bell was a member of the editorial committee of the magazine *Extropy*, wherein he utilized and promoting the term "extropy", metaphorically themed to be an antithesis to entropy, as a basis for a new type of transhumanism or futurism philosophy focused on advancing human transformation into the future. The term seems to have arisen during discussions with British-born American futurist philosopher Max More.

Education

In late 1980s, Bell completed his MA in philosophy from the University of Southern California, and in 1991 was studying law at the University of Chicago Law School. In 1993, Bell completed his JD from the University of Chicago in and in 1998 and joined the faculty of Chapman University School of Law. [2]

References

1. Bell, Tom W. (1991). "Privately Produced Law", *Extropy*, 8-pgs, Vol 3, No. 1, Spring.
2. Tom W. Bell (faculty) – Chapman University School of Law.

θΔics

In hmolscience, **Tom DeMarco** (1940-) is an American business consultant noted, in business thermodynamics, for his 1999 *Peopleware*, coauthored with Timothy Lister, in which they present a few physics and thermodynamic analogy models of businesses.

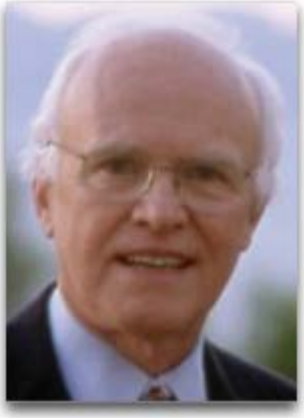

Overview

In 1999, DeMarco co-authored *Peopleware*, with Timothy Lister, in which they use science analogies to speculate on how project teams operate or jell, e.g. people acting as catalysts (human catalyst), the modeling of travelling consultants who operate out of their homes, acting as "free electrons" (human particles), or terms such as "corporate entropy", referring to red tape and disorganization in larger in companies. [1]

Corporate entropy

DeMarco and Lister devote a small half-page section entitled "Corporate Entropy" to entropy in business, wherein they define corporate entropy as "levelness or sameness", such that "the more it increases, the less potential there is to generate energy or do work. In corporations, they state that entropy can be thought of as uniformity of attitude, appearance, and thought process.

Second thermodynamic law of management

On the basis that corporate entropy exists, they posit what they call a second thermodynamic law of management: entropy is always increasing in the organization. The state that this posited law is justified on the basis that just as entropy in the universe is always increasing, so too is corporate entropy always on the rise.

They state that corporate entropy is the reason why elderly institutions are tighter and a lot less fun than sprightly young companies. In application, they state that on the global scale, there is not much one can do in a company to change entropy, but that in one's domain, one must "fight" entropy increase. The most successful manager, according to DeMarco and Lister, is the one "who shakes up local entropy to bring in the right people and let them be themselves, even though they may deviate from the corporate norm.

Education

DeMarco completed his BS in electrical engineering at Cornell University and MS at Columbia University.

References

1. (a) DeMarco, Tom and Lister, Timothy. (1999). *Peopleware: Productive Projects and Teams* (section: Corporate entropy, pg. 99). Dorset House Pub. Co.
(b) Thims, Libb. (2007). *Human Chemistry (Volume One)* (free electron, pg. 29). Morrisville, NC: LuLu.

External links

â— Tom DeMarco – Wikipedia.

θΔics

In existographies, **Tom Harpur** (1929-2017 ACM) was a Canadian priest, New Testament Scholar, turned journalist and 1996 Christ myth theorist, noted for his 2004 *The Pagan Christ*, a kind of Greenberg-like reduction of the New Testament into its Greco-Roman mythology, Sumerian mythology, and Egyptian mythology parts, i.e. monotheistic Jesus as a reformulation of the polytheistic Horus, in short.

Overview

In 2004, Harper published his *The Pagan Christ*, wherein he stitched out the Horus origins of Jesus. [1]

In Sep 2004, Harpur, in interview with Allan Gregg, on his *The Pagan Christ*, stated the following: [1]

> **Allen Gregg** (0-0:19): You're one of Canada's preeminent scholars who spent virtually their entire adult life analyzing, teaching, writing about the biblical scriptures. How in the world did you come to doubt the existence of the historical Jesus of Nazareth?
>
> **Tom Harpur** (0:20-2:30): Well, there's no simple answer to that. It took a little time. It became increasingly obvious to me over the last seven [1997] or eight [1996] years, that the 'Jesus seminar', which had been devoted to studying 'what are the authentic words of Jesus?', 'what are the authentic actions of Jesus?', were pairing it down to smaller and smaller amounts, to the point of I think that 18 percent of what they thought he said might be authentic, and about 17 percent of what they thought he might have done might be authentic; and in the course of watching that process and realizing that Jesus was slipping away on them, and knowing myself, from my own scholarship, that there was nothing coming out of the first century at all, in the way of hard evidence, for his existence – we had the Gospels – whose dating is not quite a precise as people would lead us to believe, and only really come together fully in about 150 common era, but their origins or traditions is 'believed' to come out of the firs century [common era]. But, apart from Josephus, a Jewish historian, who has two interpretations, which are later forgeries, mentioning Jesus Christ, we have nothing from the first century.
>
> This is why there was such a hoo-fer-rah about finding the supposed ossuary of James, the supposed brother of Jesus [that we had at the Royal Ontario Museum], and all the scholars happen to be here, everybody was beside themselves, because here, for the first time, in this little box, there was bones, they thought they had something from the first century, that was outside of [Josephus]. But that went up into seer smoke and flames once they got down into looking at it and realizing it was a forgery. So I realized there was very little in regards to evidence – and I'm interested in evidence. If it's going to be history, let's have evidence. The funny thing was, was that the farther the Church got away from the supposed time of Jesus' life, the more sure it became of what went on!? The closer it got, to that supposed time, the more vague it became. It's the very reverse of what happens with any truly historical person.
>
> **Allen Gregg** (2:31-2:35): I want to get into evidence. But first, you called your book "The 'Pagan' Christ", what do you mean by that?
>
> **Tom Harpur** (2:36-3:59): This is still to continue your answer to your original question. At this point, about three years ago, was sent, by a chap [Larry Marshall], who I didn't know (he was a United Church Clergyman), some material [on Alvin Kuhn] – he said 'I think you should look at this material' – and when I started to look at it, I realized that I was looking at a payload of facts, of evidence, that I had never seen in my life before. And as I examined this, at first, I thought it can't be, but as I went on, I realized accumulatively it was proof that prior to the third or fourth century, that Christianity had been very different than the way it was after Constantine, the Council of Nicaea, and the fourth century. A big change had taken place. In the course of that change, a story which had once been a universal pagan myth, belonging to the Greeks, before that to the Sumerians, and particularly to the Egyptians, that that myth had been clad in

Jewish form, and mad into a history, into a literal story. And that's what striked me. When I say that that had happened and the way in which they were prepared to kill, to burn books, to destroy the evidence of it having happened, that I realized that something [untold] was really at work here!

Allen Gregg (3:59-4:29): Let's give our views some sense of the similarities, because you go through this evidence and you say: 'well, here's the New Testament, that virtually everything Jesus was reported to have done, in the Gospels, from the sermon on the mount to crucifixion, was told in ancient Egyptian religious writing.' Give us some examples, of the same kinds of stories that were being told four or five centuries earlier?

Tom Harpur (4:30-5:13): Oh, more than that, even thousands of years earlier. Yeah, this was my astonishment. When I read for the first time, a story that I had known – I used to be a professor of the New Testament – a story that had always been problematic for me, the 'Raising of Lazarus', which is in the fourth gospel, and is the most dramatic miracle, that Jesus is supposed to have carried out. He raised a man from the dead, that was supposed to have been dead for four days. He was really dead. When I came across that story, in all its full detail, in an Egyptian dress, in an Egyptian setting, right down to the two marries (Martha and Mary), and to the coming forth out of the tomb, in every detail, in 1700 before the common era, 17 centuries earlier, I realized I was on to something.

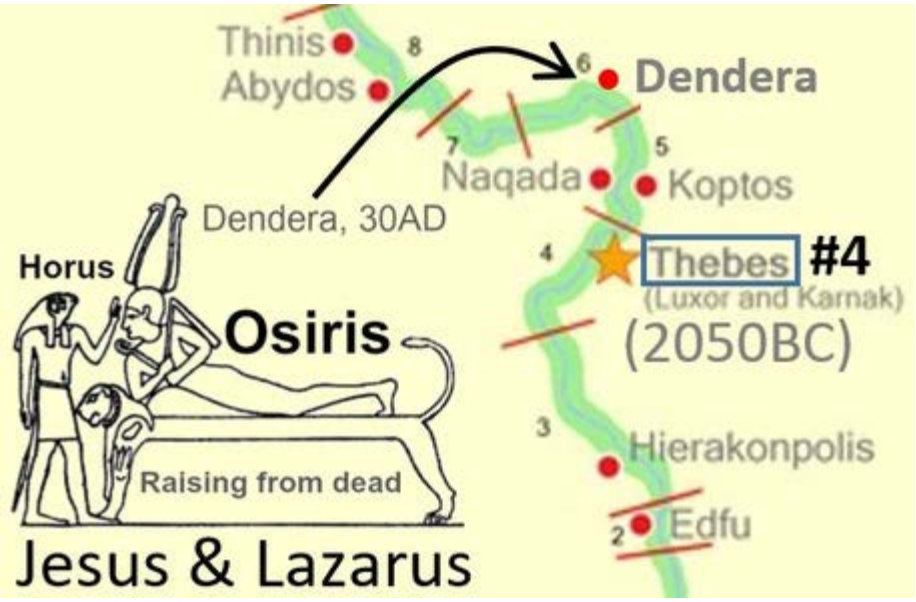

A visual of relief #17, as carved on the walls at the Dendera Temple (30AD), showing Horus raising Osiris from the dead, which became retold in the Bible, in the John 11:1-44, is a miracle of Jesus bringing Lazarus back to life, aka the "Raising of Lazarus", a story that was "always been problematic" for **Harper** (2004), prior to his realization that Christianity was but re-written Egyptian religious beliefs, i.e. Egyptian mythology. [4]

Allen Gregg (5:14-5:37): Those same scholars, Spong (Ñº) and [others], were not unaware of the work of [Kuhn, Massey, Higgens] [and the others] [3], and there analysis was that these 'stories', these 'myths', that were found in Egyptian religion, and in Greco-Roman religion, simply *foreshadowed* the existence and coming of Jesus.

Tom Harpur (5:38-6:24): Yes, this is what they say, and I was force-fed that all through university seminary, and in seven years as professor of New Testament, I force-fed it to my students, and it was **hokum and it was wrong**! It's not just foreshadowing. When you get down to **180 exact parallels found between Horus and Jesus** – a hundred and eighty exact parallels, where he's saying 'I am the bread of life' (this is Horus), or, what the Evangelicals keep saying to me, 'I am the way, I am the truth, I am the life' (this is Jesus), [and they say] so how are you going to get around that one brother? And I say, well have a look at this [statement], 2,000-years earlier [saying] 'I am the way, I am the truth, I am the life' being said. It is so precise, and so exact. [You] cannot argue against it. It blows you away.

(add discussion)

Criticism | Apologetic debunkers

In 2004, theologian W. Ward Gasque, in his "The Leading Religion Writer in Canada: Does he Know What He is Talking About?", discussed how he sent out 20 emails to leading Egyptologists, to discern the legitimacy of Harper's arguments, in respect to the credibility of Alvin Kuhn, and his two main Egyptologist sources, namely: Gerald Massey

and Godfrey Higgins; to quote: [5]

> "Not being myself an expert in Egyptian religion, I consulted those who are about their views of contribution that Kuhn, Higgins and Massey have made to Egyptology and whether they thought some of the key ideas of *The Pagan Christ* well grounded. So I sent an email to twenty leading Egyptologists — in Canada, USA, UK, Australia, Germany, and Austria. I noted as a sample the following claims put forth by Kuhn (and hence Harpur):
>
> • That the name of Jesus was derived from the Egyptian "Iusa," which means "the coming divine Son who heals or saves".
> • That the god Horus is "an Egyptian Christos, or Christ .... He and his mother, Isis, were the forerunners of the Christian Madonna and Child, and together they constituted a leading image in Egyptian religion for millennia prior to the Gospels."
> • That Horus also "had a virgin birth, and that in one of his roles, he was 'a fisher of men with twelve followers.'"
> • That "the letters KRST appear on Egyptian mummy coffins many centuries BCE, and ... this word, when the vowels are filled in., is really Karast or Krist, signifying Christ."
> • That the doctrine of the incarnation" is in fact the oldest, most universal mythos known to religion. It was current in the Osirian religion in Egypt at least four thousand years BCE."

Ten responded; only one of which had ever heard of Kuhn, Higgins, or Massey. One anon referred to Kuhn as "fringe nonsense". This Gasque "twenty leading Egyptologists" citation has since been a stable Christ myth debunking tool. (Ñº)(Ñº)

Here, secondly, we note that this is a pre-Zeitgeist (2006) era attack on the Horus-Jesus connection; the Zeitgeist push done via the work of Dorothy Murdock, citing Massey, among others.

In c.2005, religious apologeticist John Holding posted a page-by-page critique of Harpur's *The Pagan Christ*, the gist of which being, the usually apologetic rebuttal, that all of Harpur's scholars, including Wallis Budge, are bunk, and "original sources" [Pyramid Texts, Coffin Texts, Book of the Dead, Book of Thoth] aren't exact enough; the opening of which is as follows: [3]

> "Harpur's book is merely a reiteration of 'pagan copycat' theories. The bibliography contains many unreliable sources: Freke and Gandy, Acharya S [Dorothy Murdock], Tim Leedom, T. W. Doane, Earl Doherty, Helen Ellerbe, Kersey Graves, John Spong, Godfrey Higgins, Gerald Massey, Alvin Kuhn. These last three (in reverse order) are Harpur's most favored sources; throughout Harpur expresses bewilderment that these three "scholars" (the word he applies liberally to just about anyone, regardless of credentials), especially Kuhn, have been so vastly ignored. The idea that they have been ignored because they are not competent scholars does not occur to Harpur."

In 2006, Stanley Porter and Stephen Bedard published *Unmasking the Pagan Christ: An Evangelical Response to the Cosmic Christ Idea*, in an attempt to debunk Harper. [6]

Education

In 1951 to 1954, Harpur attended Oxford University on a Rhodes Scholarship. (Ñº)

Quotes | Employed

The following are quotes employed by Harper:

"Almost all of the latter part of my life has been spent unlearning the nonsense I learned in my youth."

— Godfrey Higgins (1833), *Anacalypsis, Volume One* (pg. x); cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 200)

"The Hebrew sacred books are all Egyptian in origin."

— Anna Kingsford (c.1885), cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 5)

"The Bible is a 'total plagiarism' of the Sumerian and Egyptian mythologies."

— Sigmund Freud (c.1939), cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 5)

"The Bible is not a document concerned with history, but a vast collection of sublime myths and metaphors."

— Northrop Frye (c.1968) view taught at Victoria College, University of Toronto; cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 1)

"My point, once again, is not that those ancient people told literal stories and we are now smart enough to take them symbolically, but that they told them symbolically and we are **now dumb** enough to take them literally."

— John Crossan (1996), *Who is Jesus?*; cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 1)

"There was an obvious analogy between the Horus child and the baby Jesus and the care they received from their sacred mothers; long before Christianity, Isis had borne the epithet 'mother of the god'."

— Erik Hornung (2001), *The Secret Lore of Egypt: Its Impact on the West* (pg. 60) (Ñº); cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 5)

References

1. Harpur, Tom. (2004). *The Pagan Christ*. Thomas Allan Publishers.
2. Gregg, Allan. (2004). "Tom Harpur: On the Pagan Roots of Christianity" (Ñº)(Ñº), Tvo.org, Sep.
3. (a) Holding, John P. (c.2005). "Tom Harpur's *The Pagan Christ:* a Critique" (Ñº), Tektonics.org.
(b) Holding, John P. (2008). *Shattering the Christ Myth: Did Jesus Not Exist?* (Amz) Xulon Press.
(c) John Patrick Holding (about) – Tektonic.org.
4. Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pg. 136). Dover, 1969.
5. Gasque, W. Ward. (2004). "The Leading Religion Writer in Canada: Does he Know What He is Talking About?" (Ñº), HistoryNewsNetword.org, Aug 17.
6. Porter, Stanley E. and Bedard, Stephen J. (2006). *Unmasking the Pagan Christ: An Evangelical Response to the Cosmic Christ Idea*. Clements Publishing.

Videos

â— Gregg, Allan. (c.2004). "Tom Harpur: On Escaping the Grip of Fundamentalism" (Ñº), Tvo.org.

External links

â— Thomas Harpur – Wikipedia.
â— The Pagan Christ – Wikipedia.

θΔics

In science, **Tom Shachtman** (1942-) is an American writer and science historian noted for his 1999 *Absolute Zero and the Quest for Absolute Cold*, being a rather cogent and learned treatise on the history of temperature and thermodynamics with details on rare subjects such as Thomson's search for Carnot's Reflections, discussions on Robert Boyle, Robert Hooke, and Robert Mayer, among others. [1]

Origin of book

Shachtman, author of over three dozen published books, explains the origin of his low-temperature research book as follows: [2]

> "Curiosity is not merely inquisitiveness but an attempt to amass knowledge in order to reach better understanding. That came home to me, twice, as I researched and wrote a book about the history of low-temperature physics – a field that had been neglected even in the mid-17th century, when Robert Boyle did some pioneering experiments and lamented that research into what makes things cold was not a hot subject. I wanted to begin the narrative with an alchemist's attempt to air-condition Westminster Abbey in 1620; there were no records of how it was done, but, curious, I found enough hints in contemporary chemistry, hydraulics, and engineering to reconstruct the deed.
>
> The book's central battle, which recounts the attempts of rivals James Dewar in London and Heike Kammerlingh Onnes in Leiden to reach down the temperature scale very close to "absolute zero," took place at the turn of the 20th century. (Onnes would be awarded the Nobel in physics in 1913 for winning the "race.") The two scientists were known to have corresponded, but whether the letters had survived was an open question. My curiosity led me, after quite a search, to the library of the Boerhaave Museum in Leiden, where Onnes' original apparatus is displayed. His letters were not properly catalogued, but I persevered and found the ones to and from Dewar. As I had sensed they would, the letters provided new insight into two fascinating scientific egos, and I quoted them in the book, to good effect.
>
> When low-temperature expert Dr. Russ Donnelly of the University of Oregon, whom I had asked to review the manuscript prior to publication, read these sections, which told him things about his field's history that he hadn't known before, he came on board as the book's science advisor. Then, with Russ as principal investigator, we obtained a princely grant from the National Science Foundation, and another from the Alfred P. Sloan Foundation, to underwrite a two-hour documentary based on my book, *Absolute Zero and the Conquest of Cold*. The program was broadcast in 2008 on PBS, on the BBC, and on French and German television."

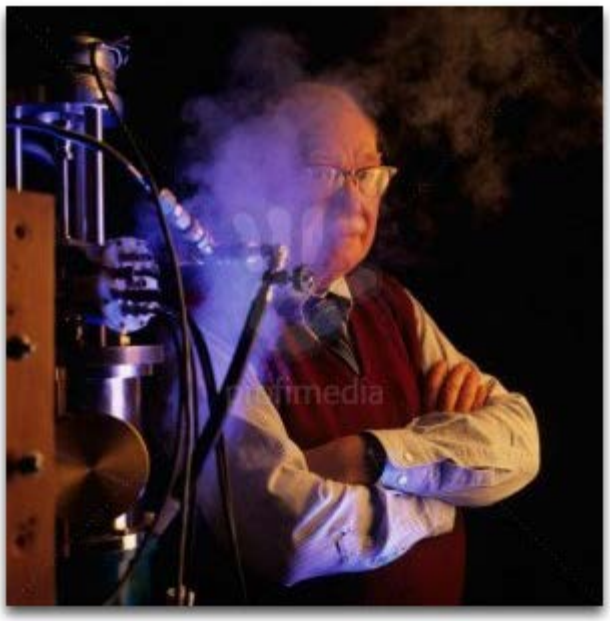

Canadian-born American physicist and low-temperature expert Russell Donnelly, noted student of Lars Onsager at Yale, and science advisor for Shachtman's 1999 *Absolute Zero and the Quest for Absolute Zero*. [2]

(add)

Quotes

The following are noted quotes:

> "[Carnot's *Reflections* is] the most original work ever written in the physical sciences, with a core of abstraction comparable to the best of Galileo"
>
> — Tom Shachtman (1999) [1]

References

1. Shachtman, Tom. (1999). *Absolute Zero and the Quest for Absolute Cold* (pg. 81). Mariner Books.
2. (a) Why I Write – TomShachtman.com.
(b) Russell Donnelly (faculty) – University of Oregon.

External links

â— Tom Shachtman (science history) – TomSchachtman.com.
â— Shachtman, Tom (1942-) – WorldCat Identities.

θΔics

In hmolscience, **Tom Siegfried** (1950-) is an American science writer noted for his 2006 *A Beautiful Math*, generally focused on devoting a certain amount of effort to stitching thermodynamic connections between the work of John Nash, John Neumann, and Oskar Morgenstern, with sections such as "Taking Society's Temperature" (see: social temperature; economic temperature), and discussions of economic equilibrium in chemical equilibrium terms. [1]

Humans ≠ molecules | Theory difficulties

A salient aspect of Siegfried's book is his early seemingly advocation of the humans = molecules or human molecular approach, as exemplified by the following statements:

> "Put enough people together and the laws of human interaction will produce predictable patterns—just as the interactions and motion of molecules determine the temperature and pressure of a gas. Describing people as though they were molecules is just what many physicists are doing today—in effect, they're taking the temperature of society."

> "One of the best ways to take that temperature, it turns out, is to view society in terms of networks. In much the same way that 'temperature' captures an essential property of a jumble of gas molecules, network math quantifies how 'connected' the members of a social group are."

These statements, to note, are mostly in reference to Isaac Asimov's fictional kinetic theory of gases based "psychohistory" theory of the character Hari Seldon of his *Foundation Series*. Later, however, Siegfried seems to turn the tables, namely to advocate a humans ≠ molecules stance: [1]

> "People do not all behave alike. Some players prefer to cooperate while others choose to defect, and some show a stronger desire than others to inflict punishment. A [theory] of nature must accommodate a mixture of individually different behavioral tendencies. The human race plays a mixed strategy in the game of life. People are not molecules, all alike and behaving differently only because of random interactions."

Here, Siegfried seems to two areas of objection, in human molecular theory, namely the so-called "individuality" issue, which many newcomers seem to rankle with, namely the inference of the concept of a "human molecule" that people are all identical molecules, like H_20. Second, the "random interactions" objection could be issues with the Brownian motion model of humans, the blind random chance theory of evolution, or other issues.

MaxEnt + Shannon | Theory difficulties

A quick to note "difficulty on theory" in Siegfried's game theory of everything argument, is his opening statement that he gleaned his notion that sociology and economics can be explained via game theory + statistical mechanics from American physicist David Wolpert's 2004 paper "Information Theory: the Bridge Connecting Bounded Rational Game Theory and Statistical Physics", in which Shannon information theory (see: Shannon bandwagon) and MaxEnt school formulations are employed as the basis of arguments, which are both historically well-established yellow brick road Sokal affair stylized dead ends.

Nash | Chemical equilibrium

The following being a noted excerpt of Siegfried's view of Nash equilibrium in respect to chemical equilibrium: [2]

> "In a chemical reaction, all the atoms involved are seeking a stable arrangement, possessing a minimum

> amount of energy. It's because of the laws of thermodynamics. And just as in a chemical reaction all the atoms are simultaneously seeking a state with a minimum energy, in an economy all the people are seeking to maximize their utility. A chemical reaction reaches an equilibrium enforced by the laws of thermodynamics; an economy should reach a Nash equilibrium dictated by game theory."

Siegfried, to note, footnotes this statement with the following:

> "As one reviewer pointed out, it is not necessarily true that all economic systems converge to equilibrium, and that in some cases a chaotic physical system might be a better analogy than a chemical equilibrium system."

The reviewer in question here seemingly would be Steven Strogatz, quoted on the back cover of Siegfried's book, whose 1994 *Nonlinear Dynamics and Chaos: with Applications to Physics, Biology, Chemistry, and Engineering* argues that chaos theory has application to population biology. [6]

Siegfried then follows his "an economy should reach Nash equilibrium dictated game theory" assertion with:

> "Real life isn't quite that simple, of course. There are usually complicating factors. A bulldozer can push the rock back up the hill; you can add chemicals to spark a new chemistry in a batch of molecules. When people are involved, all sorts of new sources of unpredictability complicate the game theory playing field. Imagine how much trickier chemistry would be if molecules could think."

Siegfried, in a footnote, attributes this statement, supposedly the "imagine if molecules could think" sentence, to physicist Murray Gell-Mann, whom he says made this observation in a slightly different form.

In any event, Siegfried here, in sum, seems to be equating utility maximization with free energy minimization:

> Utility maximization = Free energy minimization

Here we might compare the 2013 "entropy = utility" theories of Peter Richmond, Jurgen Mimkes, and Stefan Hutzler. (Ñº)

Here, also, to note, we are reminded of the 1935 work of American physiologist Lawrence Henderson, who via Willard Gibbs + Vilfredo Pareto, outlined a similar type of chemical economic equilibrium argument. [2]

Chemical teleology

One point to note, regarding people "seeking" to maximize utility, however, is that while Siegfried's connection between the two types of equilibrium models is cogent, we must be careful not to anthropomorphize chemistry, such as by making chemical teleology arguments, so to attempt to justify preconceived models of human ideals. The following is another chemically teleology slanted statement by Siegfried: [1]

> "What about chemistry and physics? At first glance there doesn't seem to be any struggle for survival among molecules [see also: Robert Pirsig, 1991] engaged in chemical reactions. But in a way there is, and the connections between game theory and statistical mechanics promise to reveal ways in which game theory still applies. Reacting molecules, for instance, always seek a stable condition, in which their energy is at a minimum. The 'desire' for minimum energy in molecules is not so different from the 'desire' for

> maximum fitness in organisms."

The following, to clarify, are Mexican-born American chemist Vicente Talanquer's 2013 ripe warnings about the use chemical teleology, e.g. use of term such as "seek" or "desire", in chemistry education: [3]

> "The second law only describes the characteristics of the final state attained by an isolated system that undergoes a process. The law states that the entropy increases during the process and reaches the maximum value possible given the existing constraints. The law DOES NOT state that the system "has a tendency", "seeks to", "desires to", or "wants to" achieve such a state. However, in educational talk it is common to express the law as if there was intentionality in how the system changes."

The gist of Talanquer's counsel seems to be that one is advised to side with Gibbs over Aristotle in matters and descriptions of human nature. Some of Talanquer's anti-teleology positions, however, are a matter of debate, e.g. his position that there is no "drive" in chemical reactions and processes, which would seem to directly go against the views of Gilbert Lewis (1923); hence it is also wise to take Talanquer's counsel with a grain of salt. [N1]

Education

Siegfried completed his undergraduate work in journalism, chemistry, and history at Texas Christian University, and his MA in journalism, with minor in physics, at University of Texas, Austin, after which he became editor in chief of *Science News* and a free-lance science journalist. [4]

Quotes

The following are noted quotes from Siegfried's book:

> "Could not mind, as well as mindless motion, have an underlying order."
>
> — Isaac Asimov (1988), "Emperor Cleon to Hari Seldon", *Prelude to Foundation*

Notes

N1. See also: life terminology upgrades, sociology (§: terminology issues), and *Chemical Thermodynamics: with Applications in the Humanities* (§2. Social Matter: terminology discussion). [5]

References

1. Siegfried, Tom. (2006). *A Beautiful Math: John Nash, Game Theory, and the Modern Quest for a Code of Nature* (desire, pg. 7; chemical reaction, pg. 60-; §: Taking Society's Temperature, pgs. 165-; Gell-Mann, pg. 238, note 18; people are not molecules, pgs. 107-108). National Academies Press.
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3. (a) Email communication from Vicente Talanquer to Libb Thims (20 May 2013).
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4. Tom Siegfried (bio) – TomSiegfried.com.
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External links

â— Siegfried, Tom (1950-) – WorldCat Identities.

θΔics

In hmolscience, **Tom Stoppard** (1937-) is a British playwright noted, in literature thermodynamics, for his 1993 play *Arcadia*, themed on a mix of Goethe's 1809 *Elective Affinities* and modern views.

Overview

In 1993, Stoppard wrote and produced the play *Arcadia*, a modern day take on German writer Johann Goethe's 1809 physicochemical sociology based novella *Elective Affinities*.

Stoppard's play *Arcadia* takes place in two different time periods, 1809, the year of Goethe's novella and the modern day, wherein Stoppard incorporates talk of "sexual energy", "heat", entropy via his discussion of the "second law of thermodynamics", and human chemical affinity via his talk of "the attraction that Newton left out … all the way back to the apple in the garden", the steam engine, upon which the laws of thermodynamics were derived, among other topics. [1]

What is curious about Stoppard, and his *Arcadia*, is that in spite of his apparent lack of background (degrees) in the sciences, he has made the a significant connection between the second law of thermodynamics and chemical affinity, in storyline, a very elusive and advanced scientific connection that was ferreted out in the late 19th century, particularly by German physicist Hermann Helmholtz in 1882, albeit one that generally remains a long buried fact in the scientific community, as the term affinity is not used as much in modern day science, having been replaced by free energy.

References

1. Stoppard, Tom. (1993). *Arcadia* (heat, 6+ pgs; sexual energy, pg. 33; atom, 2+ pgs; second law, pg. 65; quote: "Ah. The attraction that Newton left out. All the way back to the apple in the garden.", pg. 74). London: Faber and Faber.

Further reading

â— Kelly, Katherine. (2001). *The Cambridge Companion to Tom Stoppard* (thermodynamics, 4+ pgs). Cambridge University Press.

External links

â— Tom Stoppard – Wikipedia.

θΔics

In human thermodynamics, **Tominaga Keii** (1920-2009) was a Japanese chemical engineer noted for his short 2004 critique of German polymath Johann Goethe's 1809 *Elective Affinities*, within which are found Goethe's human chemical affinity theories, in the context of modern chemical thermodynamics. As to the scientific impact of the novel, curiously, Keii summarizes that: [1]

> "Goethe's [*Elective Affinities*] did not add any scientific knowledge."

This statement, however, is hugely erroneous, in that Goethe's novel founded the science of human chemistry. [2] In any event, Keii goes on to explain, paradoxically, that the only result that the publication had was to make the concept of 'affinities', which before that time was a technical term solely used in chemistry, popular to the public at large. Keii gives this presentation in a section, entitled "Chemical Affinity in 1806" (which, to note, is a date typo), to his chapter on the thermodynamics of chemical reactions, where he discusses Goethe's theory of human affinities, quoting verbatim an entire page of Goethe's famous chapter four, in the context of the chemical affinity theories of Jacob Berzelius (1811), Jacobus van't Hoff (1884), Willard Gibbs (1876), and Théophile de Donder (1922).

Education

In 1964, Keii was with the department of chemical engineering at the Tokyo Institute of Technology. [3] Keii was the founder of the Japanese Institute for Science and Technology. [4]

See also

â— Gibbs and Goethe

References

1. Keii, Tominaga. (2004). *Heterogeneous Kinetics: Theory of Ziegler-Natta-Kaminsky* (ch. 2: Thermodynamics of Chemical Reactions, pgs. 11-20; section: Chemical Affinity in 1806, pgs. 16-17). Springer.
2. Thims, Libb. (2007). *Human Chemistry (Volume One)*, (preview), (Google books). Morrisville, NC: LuLu.
Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (ch. 10: "Goethe's Affinities", pgs. 371-422). Morrisville, NC: LuLu.
3. Keii, Tominaga. (1965). "Frequency Factor of Natta's Propylene Polymerization." *Nature*, 202: 1331, Jun 27.
4. Anon. (1997). "Newsletter: Faculty of Physical Sciences and Mathematics" (Spanish → English). *University of Chile*. Nov 28.

Further reading

â— Sukekatsu, Ushioda. (2009). "In Memory of Professor Tominaga Keii", *The Physical Society of Japan*, 63: 3. Mar 05.

External links

â— Keii, Tominaga (1920-) – WorldCat Identities.

θΔics

In existographies, **Tony Buzan** (1942-) (CR:31) is an English accelerated learning expert noted for his 1994 *Book of Genius*, co-written with English grand chess master Raymond Keene, in which he gives a formulaic IQ ranking of the said-to-be greatest 100 geniuses to have ever lived. [1] Buzan has also written on concepts such as "genius quotient (GQ)" and outlined the principle of goethendipity.

Overview

Buzan IQs are those determined by English accelerated-learning expert Tony Buzan and English chess grandmaster Raymond Keene in 1994, using a method independent to that of Cox, in which they scored the top 100 leading minds on an 835-point scale (GS=Genius Score): dominance in the field (100), active longevity (100), polymath (100), versatility (100), strength and energy (100), IQ (100), ongoing influence (100), prolificness and achievement of prime goal (100), universality of vision (15), outstanding originality (10), deliberate desire to create teaching avenues or academies to further the genius' ideas (10). [1]

200+ range geniuses

In their top 100 genius list, Buzan and Keene assigned four geniuses with a 200 or above range IQ (below right) which corroborates well with American psychologist Catherine Cox's 1926 listing of the IQs of 300 geniuses, who also found four individuals in the 200-range:

Cox's 200-range Geniuses (1926) of 300-geniuses	Buzan's 200-range Geniuses (1994) of 100-geniuses
1. Goethe (IQ=210)	1. Da Vinci (IQ=220)
2. Leibnitz (IQ=205)	2. Goethe (IQ=215)
3. Grotius (IQ=200)	3. Shakespeare (IQ=210)
4. Wolsey (IQ=200)	4. Einstein (IQ=205)

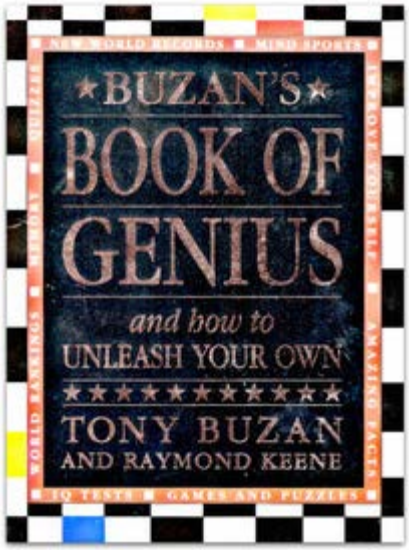

In short, both Cox (and here team) and Buzan (along with Keene) have, independently, determined or arrived at the conclusion that German polymath Johann Goethe (the core theory developer among the 500+ Hmoledia biographies) is likely to have been the smartest person to have ever lived.

Top 1000 geniuses

On 24 Oct 2011, the Cox genius list was merged into the Buzan genius list to create the work in progress Hmolpedia meta-analysis "Genius IQs" table, currently at 430+ geniuses—a listing aiming to reach the top 1000 geniuses of all time.

Rank	Name	IQ
1	da Vinci	220
2	Goethe	215
3	Shakespeare	210
4	Einstein	205
5	Newton	195
6	Jefferson	195
7	Edison	195

Rank	Name	IQ
8	Archimedes	190
9	Aristotle	190
10	Brunelleschi	190
11	Copernicus	185
12	Franklin	185
13	G.Eliot	180
14	J.S.Mill	180

English chess grandmaster **Raymond Keene** (1948-); co-author of the 1994 *Buzan Book of Genius*.[2]Slightly modified table of IQs from their 2005 book *Buzan's Book of Mental World Records*. [3]

References

1. Buzan, Tony and Keene, Raymond. (1994). *Book of Genius.* Stanley Paul.
(c) Greatest Geniuses of All Time (1-50) – Buzan's book of Genius.
(d) Top 10 Geniuses of All Time (1-10) - *Buzan's Book Of Genius*.
(e) Methodology (Buzan 100 Geniuses) – Braintrust.org.
2. Raymond Keene – Wikipedia.
3. Buzan, Tony and Keene, Ray. (2005). *Buzan's Book of Mental World Records* (IQ table: World's top 14 all-time highest IQs (180-220), pg. 31). D&B Publishing.

External links

â— Tony Buzan – Wikipedia.

θΔics

In hmolscience, **Tony Rothman** (1953-) is an American theoretical physicist noted, in sociological thermodynamics, for 1989 skeptical critique of social applications of the second law.

Overview

In 1989, Rothman published *Science a la Mode*, a set of iconoclastic and witty essays are about what happens when scientists jump on band-wagons, in which he applies creative skepticism to contemporary fashions in science, including the "standard model" big bang theory, geodesic domes, the concept of nuclear winter, and sociological applications of the second law of thermodynamics.

Its chapter on evolution and entropy, covers entropy as viewed in thermodynamics, statistical mechanics, information theory, and evolution, and considers whether the systems are isolated, closed, or open, with recourse to discussions on whether variables are deterministic or probabilistic.

References

1. Rothman, Tony. (1989). *Science a la Mode: Physical Fashions and Fictions* (§: Entropy as Evolution, pgs. 75-108). Princeton University Press.

Further reading

â— Romm, Joseph J. (1990). "Myths and Misses: Science a la Mode: Physical Fasions and Fictions", *Bulletin of the Atomic Scientists*, pgs. 39-40, Jun.

External links

â— Tony Rothman – Wikipedia.

θΔics

In hmolscience, **toolism**, a tending-to-be pejorative term, refers to the use of supposed powerful physics tools, i.e. established equations, principles, and or laws, in economics or sociology, and particularly in econophysics. [1]

A depiction of **"toolism"** method of modern econophysicists according to German economist Egmont Kakarot-Handtke. [2]

Overview

The term "toolism" was coined in 2013 by German economist Egmont Kakarot-Handtke who, in his article 'Toolism! A Critique of Econophysics', compares the latest breed of econophysicists, or *toolists*, as he calls them, and their grabbing of equations and tools from physics to the overtypical Arnold Schwarzenegger role of being the hero who breaks into a gun store, grabs the most suitable device—such as the phase plasma rifle in 40 watt range—with the maximum fire power and thereafter relinquishes the enemy, after which in the sequel humankind will, supposedly, be better off. [2]

The latest toolist, according to Kakarot-Handtke, is French physicist Jean-Philippe Bouchard, who in his 2009 article 'The (Unfortunate) Complexity of Economy' argues that the powerful tool of the Curie-Weiss mean-field approximation, will soon revolutionize economics and the social sciences:

> "Whereas the simple Curie-Weiss mean-field approximation for homogenous systems is well known and accounts for interesting collective effects, its heterogeneous counterpart is far subtler and has only been worked out in detail in the last few years. It is a safe bet to predict that this **powerful analytical tool** will find many natural application in economics and social sciences in the years to come."

The term was used in American electrochemical engineer Libb Thims' 2013 University of Pitesti socioeconomic physics talk as a word to the wise, with the suggestion that to remedy toolism one would be keen to study the works and pitfalls of the classic and modern social Newtons. [2]

Quotes

The following are related quotes:

> "When concepts are transferred from physics to social sciences, the underlying analogy is often unsound, but by systematic analysis, the analogy can be made sound, and the increased understanding thus achieved can create **powerful tools** and concepts which are adequate for their new employment. Though part of the study may proceed through analogy, in the end the analogy must be thrown away."
>
> — Alan Wilson (1969), "Notes on Some Concepts in Social Physics" [3]

Reference

1. Kakarot-Handtke, Egmont. (2013). "Toolism! A Critique of Econophysics", MPRA, Apr 30.
2. Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (video, 1:33-min) (article, 40-pgs) (PowerPoint, 36-slides), Key speaker talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29.

3. Wilson, Alan. (1969). “Notes on Some Concepts in Social Physics” (abs), *Regional Science*, 22(1): 159-93.

θΔics

In genius rankings, **top 1000 geniuses** refers to the **greatest one-thousand** autodidacts, brains, brights, curiosos, creators, detectives, erudites, **Faustians**, free thinkers, geniuses — middle ages geniuses, certified geniuses, geniuses' geniuses (e.g. **shoulder geniuses**, genius recognizes genius), universal geniuses, **last universal geniuses**, epicenter geniuses, female geniuses, posthumous geniuses, musical geniuses, artistic geniuses, political geniuses — intellects, "intellectual gods" (e.g. Pythagoras (Ñº), Empedocles, Gibbs, Maxwell, etc.), i.e. people whose work was thought divine, know-it-alls, last persons to know everything, minds, oracles, polymaths, prodigies, paradigm changers, paradox solvers, revolutionary starters, radicals, recondites, sages, savants, seers, sleuths, zeniths of knowledge, among other epitaphs, categories, and characterizers, **of all time**, specifically from 200,000 years ago, when **humans**, as a distinct species or chemical species (as top geniuses would say), arose out of the East African Rift Valley, to the present, albeit in "historical person" retrospect sense (see: number of people who have existed), i.e. this listing does not include "existive" geniuses, i.e. living (in defunct speak) people (see: genius IQs existive), **ranked by real-time IQ** (left column, below), a modern retrospect knowledge gauged, meta-analysis based IQ, by "relative brightness or intellect" (Cox, 1926), in short. Top one-thousand minds of this nature have a rarity of 1 in 90 million people. Below are the first tier greatest geniuses of all time, numbers 1 to 100. Visit: the Hmolpedia threads (e.g. candidates page) and or the Reddit RealGeniuses (Ñº) community for discussion.

Four of the **top 1000 geniuses**, namely: Hendrik Lorentz (#215), Paul Dirac (#35), Albert Einstein (#3), and Erwin Schrodinger (#27), in one photo, along with notables Theophile de Donder and Arthur Compton, during the famous 1927 Solvay conference, a rare confluence of genius (see: epicenter genius).

Overview

This greatest 1000 geniuses ranking page is a ten-part (100 geniuses per wiki page) expansion of the forerunner one-page *circa* 430 person genius IQs listing (2014), which itself is a precipitate of the 15 person IQ:200+ rankings (2008) (see: **chronology**). [N1] This ranked 1000 top geniuses listing, in short, is work-in-progress, in time-adjusting, meta-analysis combined and expanded re-ranking of the: genius IQs (421 people) + candidates (74 individuals), Terman IQs, **Cox IQs**, **Buzan IQs**, along with minds from the: **Cattell 1000**, **Gottlieb 1000**, **Murray 4000**, Platt IQs, Walberg IQs, Simonton IQs, Michael IQs, among other genius ranker IQ calculations. [N1][N2][N3] As a general neutral point of reference, particularly in respect to ceiling IQ calculations, which tend, more often than not to, be inflated (see: inflated IQs), the following is a neutral unbiased "scaling gauge", which shows three genius range points, namely: the IQ:140 genius level "cutoff" (Terman, 1916), plus the "mean IQ" of the only two geniuses common to the 1926 Cox IQs (301 geniuses), the 1994 Buzan IQs (100 geniuses), previously merged into the mean Cox-Buzan IQs (23 geniuses), plus the 1962 Platt IQs (14 geniuses), and 2019 Thims IQs (750 geniuses), namely Darwin and Newton, which provide for unbiased anchor points (see: Cox-Buzan-Platt IQs) about which the top 1000 geniuses can be fitted, in a realistic manner:

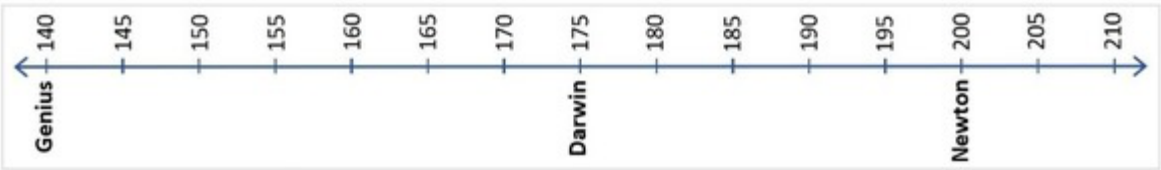

Thims (2019) | **Cox** (1926) | **Buzan** (1996) | **Platt** (1962) | **Terman** (1916) | **Genius IQ Scale**

A second general noticeable ranking pressure, is that a genius' ranking/position (IQ:#|#) tends to align close to their Hmolpedia citation ranking [**CR**:#], i.e. how many pages each genius is internally-hyperlinked with the 5,300+ articles of Hmolpedia, indicative of extant "working" influence. The top five current (Apr 2020) geniuses by CR currently are: Goethe [CR:2151], Newton [CR:866], Gibbs [CR:845], Clausius [CR:829], and Einstein [CR:737], which matches up approximately with their IQ ranking, shown below. The left column IQ, below, is an up-to-date gauged ranking of the "**real IQ**" (IQ_{Real}) of each genius, i.e. an IQ (see: IQ key) that matches up with reality, as compared to: feigned IQs, fake IQs, paper IQs, or miscalculated IQs, etc., on the over-estimated end, and mislabeled geniuses and IQ tests, on the under-estimated end, as best data available to sensory input furnishes. The notation (IQ:#|rank#), e.g. Da Vinci (IQ:200|#7), as employed in Hmolpedia existographies, is tool to see an person's IQ and ranking position.

Geniuses | 1-100

The following are geniuses "1 to 100" of the top 1000 geniuses (next: **101-200**, 201-300, 301-400, 401-500, 501-600, 601-700, 702-800, 801-900, 901-1000): [N2]

	Geniuses 1 to 100		
IQ	**Person**	**IQ estimates**	**Description**
	Future Genius (c.1000 AG) (c.2750 ACM) Library: 1,000+ books		The future genius will: (a) find the secret principle of the universe; (b) embody Henry Adams' famous 1910 “call for the aid of **another Newton**", someone who comes forth to give the “complete solution”, as Adams, who worked on the problem through Gibbs, Clausius, Darwin, etc., put it, to the elective affinities problem: explaining morality, sociology, economics, and history, etc., according to chemistry, physics, and mechanics, *via* pure mathematics, symbols, figures, and one "common formula"—in a sense, the "new Goethe"; (c) be the final version of Nietzsche’s 1883 prophesized “final Uberman”; (d) solve the: gravity/electromagnetic force problem, double slit problem, accelerating universe problem, and the spin-coupling problem (see: modern queries)—all integrated with new findings in particle physics, the final version of quantum mechanics, among other new experimental findings that may arise, all subsumed under the auspices of first law (fundamental law) and second law (supreme law) of thermodynamics—the only science, of universal content, "least likely", in the words of Einstein, to ever be overthrow (unless, of course, it is overthrown); in short. (Cattell 1000:7) (Gottlieb 1000:131) [RGM:36|1,500+] (Murray 4000:2|WL) (GMG:1) (Perry 80:1|Li) [LUG] [LPKE] [TCG] [polymath] [uberman] (**SN**:1) (HD:19) (FA:56) (GA:6) (LR:2) (Re:82) (EvT:8|21+) (GPhE:6) [CR:2151] German poly-intellect; 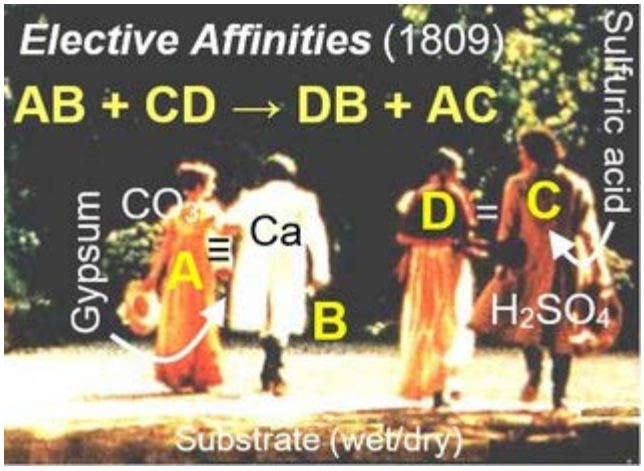
	Johann Goethe (1749-1832)	IQ_O=240 IQ_{BR}=233 IQ_{MM}=225	
	Occupations: 35+		

210 — 1

Polyglot: 7+ languages
Collected works: 142+
Library: 5,000
Vocabulary: 100,000+ words

Anti-chance
HCR theorist
HFE theorist

IQ_B=215|#2
IQ_{SK}=215|#4
IQ_{CB}=**213**
IQ_C=210|#1
IQ_{SS}=210, 200+, 188
IQ_W=200
IQ_O=180

"He who is **firm in will** moulds the world to himself."

#2 in genius meta-analysis rankings; **epicenter genius** (IQ_{avg}:210); a **dual** scientific revolutions genius; blue sky problem theorist; top GLAE; first human estimated to have had an **IQ of 225** (Merrill, c.1925); IQ folklore ranked (2003) at 240 (Ñº); **founder of human chemistry** (theory: human elective affinities; 1796) precursor to human chemical thermodynamics; known for: literature (second ranked WorldCat behind Shakespeare), evolution theory (forerunner to Darwin), poetry (top 10 greatest), anatomy (discovered the intermaxillary bone, proving an connection between humans and lower animals); physics (color theory of light in opposition to Newton's corpuscular theory); philosophical and intellectual mentor to: Einstein, Tesla, Helmholtz, Freud, Elliot, Jung, among others; a founder of religious mythology (1770); world's largest active vocabulary (50,000-90,000 words); very high in emotional intelligence; highest-ranked "longevity genius" (â…˜th-century-long prolificness).

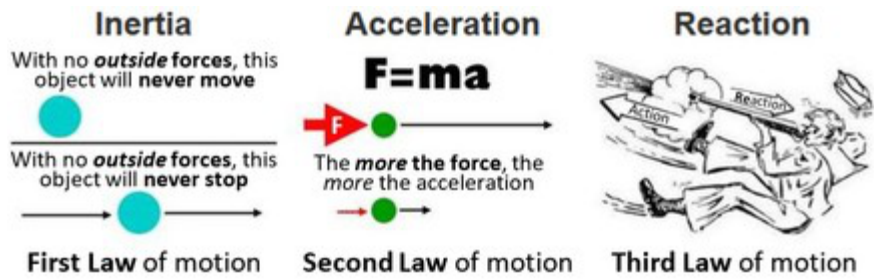

(Cattell 1000:14) (Gottlieb 1000:6) [RGM:3|1,500+] (Murray 4000:2|CS / 1|P / 2|M) (EPD:F0) (GR:1) (SIG:1) (RE:84) [CR:866] English physicist, chemistry, mathematician, and philosopher;

205 — 2

Isaac Newton (1643-1727)

Occupations: 7+
Library: 1,752+ books (369 scientific)

Anti-chance

IQ_O=250+
IQ_{SS}=250
IQ_O=200
IQ_B=195|#5
IQ_{CB}=**193**
IQ_C=190|#7
IQ_{SK}=190|#14
IQ_{JP}=190
IQ_{CPB}=**192**
IQ_W=170

"Is it not for want of an attractive virtue between the parts of water ( ) and oil, of quick-silver (â˜¿)(Hg) and antimony (â™)(Sb), of lead (â™„)(Pb) and iron (â™‚)(Fe), that these substances do not mix; and by a weak attraction, that quick-silver (â˜¿)(Hg) and copper (â™€)(Cu) mix difficultly; and from a strong one, that quicksilver (â˜¿)(Hg) and tin (â™ƒ)(Sn), antimony (â™)(Sb) and iron (â™‚)(Fe), water ( ) and salts, mix readily?"

— Isaac Newton (1718), "**Query 31**" of *Optics*

Noted for his 1686 *Principia: Mathematical Principles of Natural Philosophy*, where he introduced the laws of motion, which he applied to both falling apples and falling planets; the **#1** in genius meta-analysis rankings; **triple** scientific revolutions genius; blue sky problem theorist; [GPE] [GME]; known for: mechanics, gravitational theory; his Query 31 launched affinity chemistry (the key behind Goethe's 1809 *Elective Affinities*) and well as physical chemistry; known for: differential equations, optics, etc; IQ of 250+ (Azak, 2011).

(Gottlieb 1000:17)

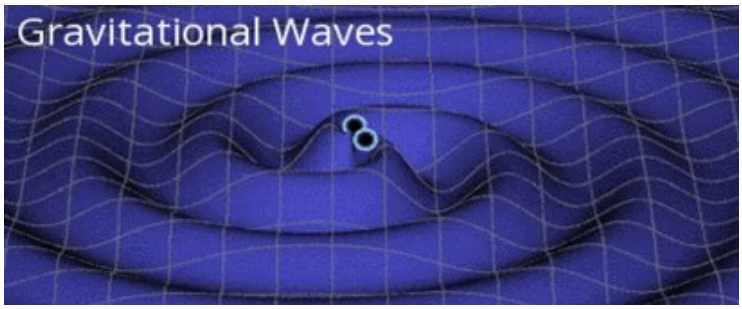

[RGM:2|1,500+] (Murray 4000:9|CS / 2|P) (LGS:1) [Kanowitz 50:2] [Cropper 30:1|R] (GPE:1) (HD:52) (RE:76) [CR:737] German physicist, astronomer, and philosopher;

3 | 205

Albert Einstein (1879-1955)
Polyglot: 2+ languages
Library: 650+ (52+ by Goethe)

Anti-chance

IQ_{SS}=240
IQ_{BR}=233
IQ_{O}=225
IQ_{B}=205|#4
IQ_{O}=200
IQ_{SK}=190|#16
IQ_{JP}=180+
IQ_{O}=160

"I am a determinist. As such, I do not believe in free will. Schopenhauer's words: 'Man can do what he wants, but he cannot will what he wills,' accompany me in all situations throughout my life and reconcile me with the actions of others, even if they are rather painful to me. This awareness of the lack of free will keeps me from taking myself and my fellow men too seriously as acting and deciding individuals, and from losing my temper."

— Albert Einstein (1932), *Aggregate Quote* (1928 George Viereck interview + 1932 James Murphy interview)

He is **#6** in genius meta-analysis rankings; **epicenter genius** (IQ_{avg}:210); a **triple** scientific revolutions genius; blue sky problem theorist; [GPE]; known for: the light quanta hypothesis (quantum mechanics); his 1919 general theory of relativity predicted the existence of gravitational waves (as shown adjacent); noted in: radiation thermodynamics; kept a bust of Goethe in his study, and Goethe's works were the most predominant amid his personal library (see: Einstein's library).

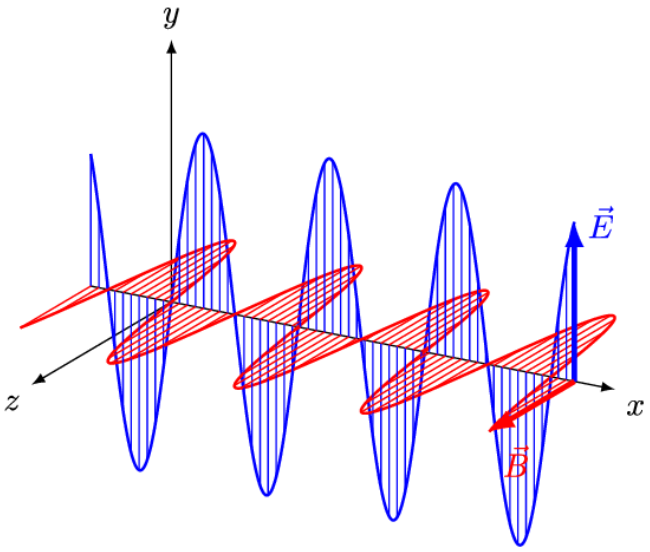

4 | 205

James Maxwell (1831-1879) IQ_{SK}=185|#26

[RGM:73|1,500+] (Gottlieb 1000:205) (Murray 4000:20|CS / 9|P) (EPD:M8) (DN:4±) (RE:48) (GPE:3) [CR:478] Scottish mathematical physicist;

"**Was it a god that wrote these signs**, revealing the hidden and

mysterious forces of nature around me, which fill my heart with quiet joy?”

— Ludwig Boltzmann (1893), on Maxwell’s equations, inspired by opening monologue of Goethe’s *Faust*; which, itself, he considered the “greatest of all works of art”

a **dual** scientific revolutions genius; blue sky problem theorist; known for: electromagnetic theory, model of the electromagnetic force (pictured), kinetic theory, thermodynamics (graphical thermodynamics); highest-ranked "magnitude genius" (prolific output in short time); one of the three shoulder genius Einstein said (Ñº) he stood on; first-slating: 195-215 (c.2015).

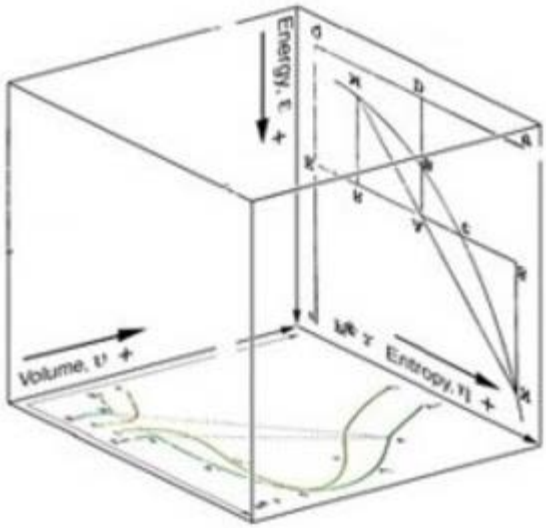

(Gottlieb 1000:825) [RGM:1270|1,500+] [GTE] [GCE:27] [GPE] [GEE] (RE:64) [CR:845] American mechanical engineer, chemical engineer, and mathematical physicist; his genius is unmistakable:

“Willard Gibbs is the **greatest mind** in American history. Lorentz, comparatively, is the **greatest and most powerful thinker** I have ever known. I never met Gibbs, but, perhaps, had I done so, I might have placed him beside Lorentz.”

— Albert Einstein (c.1925/54), aggregate quote

Willard Gibbs (1839-1903) IQ_{SK}=180|#36

“In the last generation, this country produced one of the most eminent men of science in the whole world. His name was quite unknown among us while he lived, and it is still unknown. Yet I may say without too great exaggeration that when I heard it mentioned in a professional assembly in the Netherlands two years ago, **everybody got down under the table and touched their foreheads to the floor**. His name was Josiah Willard Gibbs”.

— Albert Nock (1931)

Central founder of chemical thermodynamics, statistical mechanics, vector analysis; first-slating: 195-220 (c.2013).

(Cattell 1000:86) [RGM:1|1,500+] (Murray 4000:3|T / 4|WA) (Gottlieb 1000:9) [GEE] [LPKE]

6 | 200

Leonardo da Vinci (1452-1519) Library: 200 books (Ñº)

IQ_O=260
IQ_{SS}=250
IQ_{BR}=233
IQ_B=220|#1
IQ_O=210
IQ_{CB}=**200**
IQ_{SK}=195|#9
IQ_C=180|#27
IQ_W=167

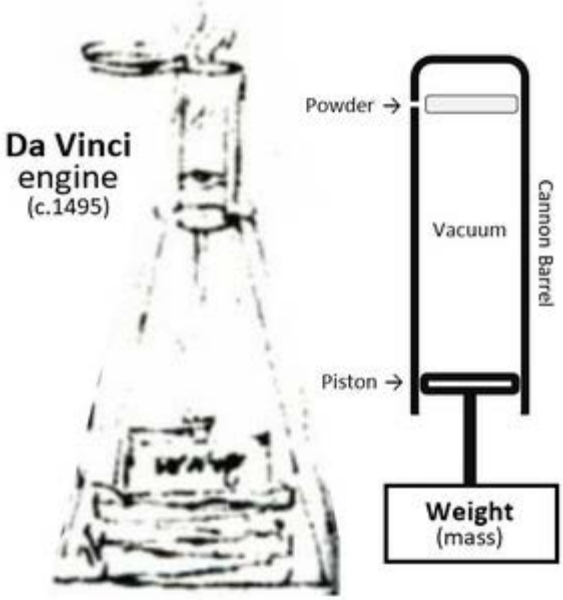

[uberman] (RE:67) (RMS:13) (EP:4) (CR:183) Italian engineer, artist, technologist, polymath, universal genius, physicist, astronomer, and general philosopher;

“The desire to know is natural to good men.”

— Leonardo da Vinci (c.1490)

note for: blue sky problem theorist; animal heat theory, engineering, e.g. he made the first design for a piston and cylinder (see: piston) style gunpowder engine able to to lift a weight (adjacent), and therein an avowed "vacuist" (compare: avacuist); designed warfare technology, flight machines; heliocentrism advocate; did a pumpkin growing variant of Johann Helmont’s later more-popular willow growing experiment; Bible flood myth debunker; said to have utilized a "sleep formula", sleeping no more than four hours at a time, so to optimize his intellectual output: IQ of 260 (Araugo, 2017).

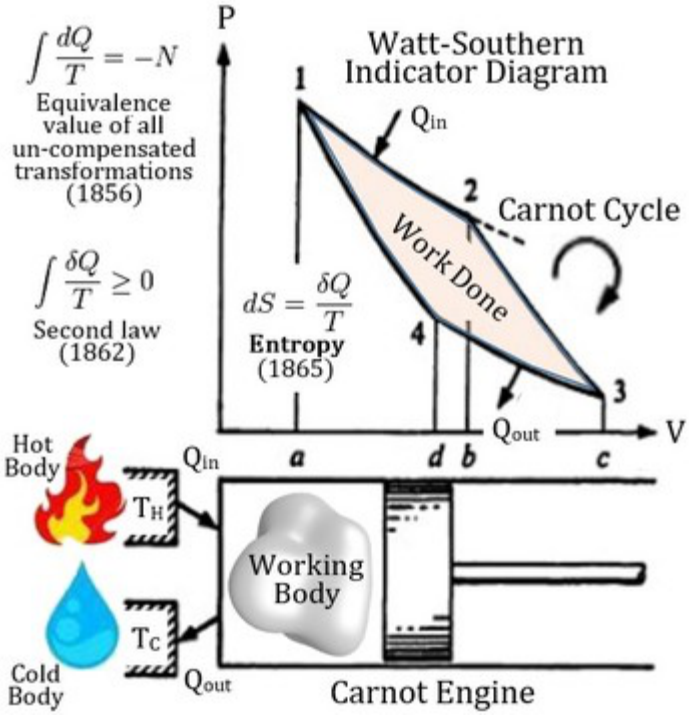

7 | 195

Rudolf Clausius (1822-1888) IQ_{SK}=175|#84

[RGM:1250|1,500+] (GS:5) (SIG:3) (RE:66) [CR:829] German mathematical physicist;

“Before **Clausius**, truth and error were in a confusing state of

mixture, and wrong answers were confidently urged by the highest authorities."

— Willard Gibbs (1889), "Rudolf Julius Emanuel Clausius"

an **Epicenter genius** (IQ_{avg}:210); a **dual** scientific revolutions genius; blue sky problem theorist; [GTE]; known for: thermodynamics (founder and greatest), entropy, kinetic theory; intellectual mentor to Gibbs, Maxwell, Einstein, and Planck; see: Euler genealogy to discern the significance and density of his influence; his Clausius inequality (1856) determined the nature and measure of irreversible "change" in the universe, via the interaction of heat and work on ALL bodies; first-slating: 195-210 (c.2014).

Aristotle (384-322BC)

IQ_{SS}=250
IQ_{O}=190-210
IQ_{Q} =190/200+
IQ_{B}=190

(Cattell 1000:6) [RGM:5|1,500+] (Murray 4000:3|CS / 1|WP) (Glenn 20:1) (Perry 80:3|Li) (**EPD**:M&F) [LPKE] (GPhE:1) (RE:62) [CR:537] Greek physicist philosopher; **#4** in genius meta-analysis rankings; **epicenter genius** (IQ_{avg}:210); first dominate blue sky problem theorist; student of Plato—teacher of Alexander the Great, the synergy and transmission of which, in Alexandria, resulted to bring about the unification of Aristotelian cosmos theory, i.e. a 55-sphere earth-centric universe model (adjacent), with Egyptian astro-theology into what we now know as Christianity; first to document the Mpemba effect; in his circa 350 *Metaphysics*, was the first to dominantly introduced the term energy; central advocate of the nature abhors a vacuum dictum —that complete vacuums are impossible; Quora IQ (Ñº) estimates: 190/200+ (2019).

(Cattell 1000:46) [RGM:4|1,500+] (Murray 4000:2|CS / 5|P / 2|A) (EP:10) [GPE:5] (GAE:2) [CR:273] Italian scientist;

"Many years ago, I accepted Copernicus' theory, and from that point of view I discovered the reasons for numerous natural phenomena which unquestionably cannot be explained by the conventional cosmology. I have written down many arguments as well as

9 | 195

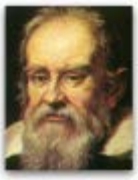

Galileo Galilei (1564-1642)

IQ_{SS}=240
IQ_{C}=185
IQ_{CB}=**183**
IQ_{B}=180

refutations of objections. These, however, I have not dared to publish up to now. For I am thoroughly frightened by what happened to our master, Copernicus. Although he won immortal fame among some persons, nevertheless among countless – for **so large is the number of fools** – he became a target of ridicule and derision. I would of course have the courage to make my thoughts public, if there were more people like you. But since there aren't, I shall avoid this kind of activity."

> — Galileo Galilei (1596), "Letter to Johannes Kepler", after receiving copy of Kepler's *The Cosmic Mystery*

a **#6** in genius meta-analysis rankings; **dual** scientific revolutions genius; ; known for: dynamics, vacuum theory, temperature, astronomy, heliocentric theory; intellectual giant to Einstein; first draft slating: IQ:185-200 (c.2014).

10 | 195

Hermann Helmholtz (1821-1894)

[RGM:235|1,500+] [LUG] [Cropper 30:4|T] (GPE:21) [CR:386] German physicist, philosopher, and physician;

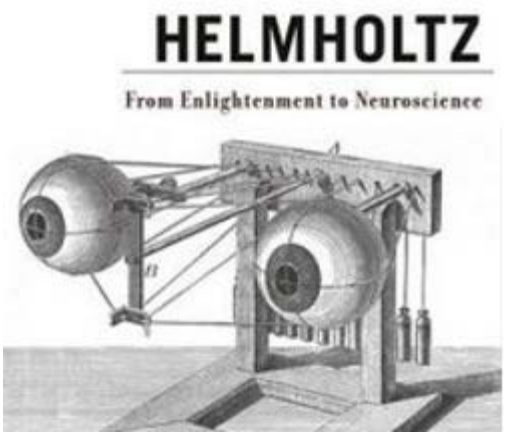

"I believe it is a common saying that Helmholtz was the **last of the last universal geniuses**, and we are fast arriving at the point where even a single subject becomes too vast for one man. At any rate, whether or not any of my learned colleagues could write an entire chemical engineering handbook, I could not—hence the present [multiple contributor] form"

> — Donald Liddell (1922), *Handbook of Chemical Engineering*

solver of the thermodynamic theory of affinity (see: affinity-free energy equation), co-discoverer of the conservation of energy; founder of the Helmholtz school; linchpin of the Reymond-Brucke oath; first-draft slating: IQ:190-210 (c.2015).

[RGM:658|1,500+] (Murray 4000:19|P) [LPKE] [polymath] (RE:56) (CR:103) English physician, physicist, decoder, and general polymath; noted physical sciences encyclopedist pioneer;

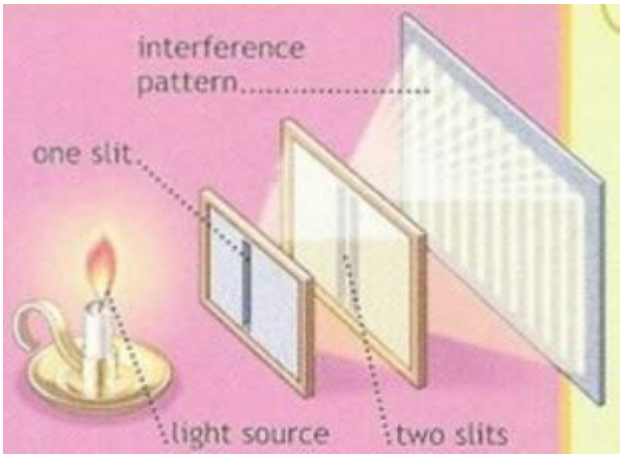

"The longer a person

Thomas

195 | 11

Young (1773-1829) Library: 1,000+ books IQ_{SK}=185|#17

has lived the less he gains by reading, and the more likely he is to forget what he has read and learnt of old; and the only remedy that I know of is to write upon every subject that he wishes to understand, even if he **burns what he has written**."

— Thomas Young (1809), "Letter to Hudson Gurney"

known for coining the the modern term "energy" (with formulation), inventor of the double slits experiment, as shown adjacnent, Rosetta Stone (translator); quote: "scientific investigations are a sort of warfare, carried on in the closet or on the couch against all one's contemporaries and predecessors; I have often gained a single victory when I have been half asleep, but more frequently found, on being thoroughly awake, that the enemy had still the advantage of me when I thought I had him fast in a corner—and all this, you see, keeps one alive" (commentary on the mathematics of Joseph Lagrange); first-draft slating: 185-200 (c.2015).

[RGM:652|1,500+] [CR:429] American physical chemist and chemical thermodynamicist;

"Perhaps **our genius** for unity will some time produce a science so broad as to include the behavior of a group of electrons and the behavior of a university faculty (see: chemistry professor paradox), but such a possibility seems now so remote that I for one would hesitate to guess whether this wonderful science would be more like mechanics or like a psychology."

— Gilbert Lewis (1925), *The Anatomy of Science* (§8: Life; Body and Mind)

195 | 12

Gilbert Lewis (1875-1946)

His *Thermodynamics and the Free Energy of Chemical Substances* is considered the "bible of thermodynamics"; eponym of the Lewis school of thermodynamics, first to translate and distill Willard Gibbs' *On the Equilibrium of Heterogeneous Substances*; invented the Lewis dot structure pair model of chemical bonding; did some of the first work on relativity; coined the term photon; Linus Pauling's *On the Nature of the Chemical Bond* (1939) was dedicated to him; quote: "Lewis was the direct mentor of more Nobel Prize winners in chemistry than any Nobel Prize winner in any category" (Adriaan de Lange, 1998); his 1925 *Anatomy of Science*, speculated on hmolscience, i.e. on whether or not him writing this book was nothing but a large "chemical reaction" (extrapolate up) or conversely whether crystals "think" (extrapolate down); first-slating: IQ:190-200 (c.2015)

(Cattell 1000:23) [RGM:33|1,500+]
(Murray 4000:6|CS / 7|M / 4|WP)
(Gottlieb 1000:25) (GPE:13) (GME:6)

195 | 13

Rene Descartes (1596-1650) ↓↑

IQ_C=180
IQ_{CB}=**178**
IQ_B=175
IQ_W=175

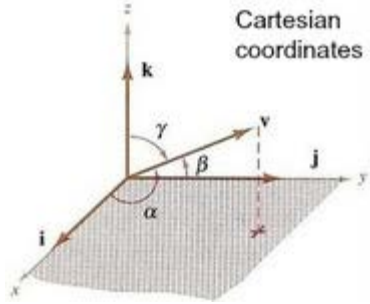

(Library:2,000) (GPhE:3) [CR:441]
French physicist, philosopher, and mathematician, aka the "restorer of modern philosophy" (Holbach, 1770);

"Give me matter and motion, and out of them I will build the universe."

— Rene Descartes (c.1630), *Publication* (Ñº); cited by Ludwig Buchner (1855) in *Force and Matter* (pg. 64)

known for: Cartesian coordinate system, atomic theory revival (1637), vis viva theory (c.1640), the "I think, therefore I am" philosophy, automaton theory (mechanical theory of life), ethereal heat theory; a shoulder genius (intellectual giant) to Newton; downgrade ↓↓ for his "humans have souls" / "animals have NO souls" dualism divide; downgrade ↓ for denying the void, as discussed by Guericke (1672).

(Cattell 1000:233) [RGM:1306|1,500+] (Murray 4000:8|CS / 4|A) (CR:186)
French mathematician, physicist, and astronomer;

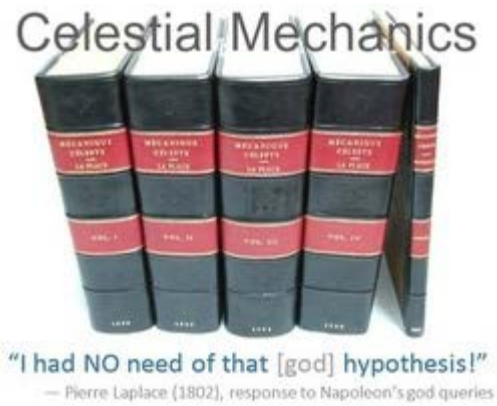

"Let us apply to the political and moral sciences the method founded upon observation and upon calculus, the method which has served us so well in the natural sciences."

— Pierre Laplace (1795), "Application of the Calculus of Probabilities to the Moral Sciences"

195 | 14

Pierre Laplace (1749-1827)

IQ_C=190

"I had no need of that [god] hypothesis."

— Pierre Laplace (1802), Napoleon Laplace anecdote

Anti-chance

a disciple of Baron d'Holbach (Blumenau, 2014) (Ñº), notable for having built the first ice calorimeter with Antoine Lavoisier in 1782, with which they made measurements of heat released or absorbed during various chemical reactions and processes, according to which he is one of the founders of thermochemistry; in his 1796 *Exposition of the System of the World*, he outlined the mathematical details of what has come to be known as the nebular hypothesis; his famous Laplace's demon (1814), which is based on Holbach's geometrician (1770), is a forerunner to Maxwell's demon (1867); his work on the mathematics of force is said to have been precursor to the later

development of the concept of potential; known for his Newtonian upgraded 5-volume, atheism implicit, celestial mechanics (shown).

(Cattell 1000:512)

If this holds:

$$\left(\frac{\partial M}{\partial y}\right)_x = \left(\frac{\partial N}{\partial x}\right)_y$$

for the following two dimensional function:

$$dF = M dx + N dy$$

then F is an **exact differential** (i.e. state function).

195 | 15

Leonhard Euler (1707-1783) ↑

IQ_{SS}=230
IQ_{O}=190-210

[RGM:101|1,310+] (Murray 4000:16|CS / 1|M) (GME:1) (CR:101) Swiss mathematician;

"If Gauss is the Prince; Euler is the King."

— Anon (c.2005), internet meme

upgrade for his reciprocity relation (mathematical proof behind state functions, in particular entropy; see: Mathematical Introduction); see: Euler genealogy; first-draft slating: IQ:180-200 (c.2015); Quora IQ ranked at 190-210 (2016) (Ñº).

(Cattell 1000:4)

195 | 16

Voltaire (1694-1778)

IQ_{O}=200
IQ_{C}=190
IQ_{W}=185

[RGM:34|1,500+] (Murray 4000:7|WL) (EPD:M7) (GPhE:#) [CR:313] French writer, philosopher, scientist; an **epicenter genius** (IQ_{avg}:210); a "universal genius" (Ñº); upgrade for his support of Jean Sales and his human molecular hypothesis; known for: Newtonian mechanics, physics, literature, hmol philosophy, religious mythology; lover of Emilie Chatelet; very high emotional intelligence (a greatest philosopher ever candidate).

(Cattell 1000:N/A) [RGM:7|1,500+] (RE:87) (CR:148) Serbian-born American electrical engineer, inventor, and philosopher;

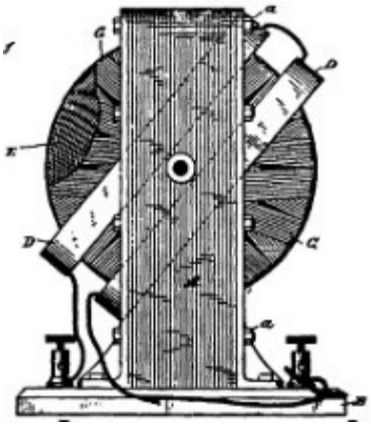

"I am an automaton endowed with power of movement, which merely responds to external stimuli beating upon my sense organs."

— Nikola Tesla (1900), "The Problem of Increasing Human Energy"

195 | 17

Nikola Tesla (1856-1943)

IQ_{O}=230-310
IQ_{O}=200
IQ_{O}=140-160

known for: defunct life theory, electricity, magnetism, human energy, radio technology, alternating current, electromagnetic motors; adhered to a Goethean philosophy, to the exclusion of all other philosophies.

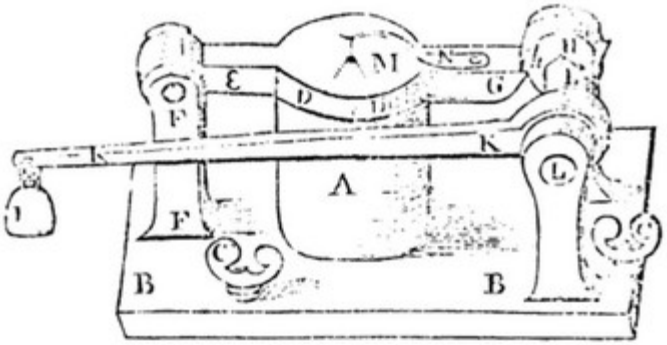

[RGM:584|1,500+] (Murray 4000:13|CS / 20|P) (EPD:13|F) (EP:11) [Kanowitz 50:45] (Partington 50:23) (GCE:#) (GPE:18) [CR:125] English physicist, chemist, engineer, astronomer, and natural philosopher;

"The vacuum left by fire lifts a weight."

> — Robert Hooke (1675), "A New Invention in Mechanics of Prodigious Use, Exceeding the Chimera's of Perpetual Motions for Several Uses"

Robert Hooke (1635-1703) Library: 3,000 books IQ_{HE}=225+

18

"What Des-Cartes did was a good step. **You** have added much several ways, & especially in taking ye colours of thin plates into philosophical consideration. If I have seen further it is by standing on ye sholders of giants [sic]."

> — Isaac Newton (1678), "Letter to Hooke", Feb 5

Anti-chance [?]

A **triple** scientific revolutions genius; a shoulder genius (intellectual giant) to Newton; self-taught: mastered Euclid's *Elements* by age 15; claims (c.1679) to have been the first to arrive at the inverse square law of gravity (before Newton); built the Guericke-style pneumatical engine used to discover Boyle' law (the first gas law); a nature abhors a vacuum theorist; heat as motion advocate; in 1685, defined the a universal law of volume expansion (for all bodies) some forty-years before it was codified as law (Boerhaave's law, 1724), evolution theorist, cellular anatomist; light theory (wave theory of light); shown adjacent is his gunpowder engine (1663) for curling springs; a "highest IQ ever" (2009) nominee (Ñº); first-slated: 190-2015 (c.2015).

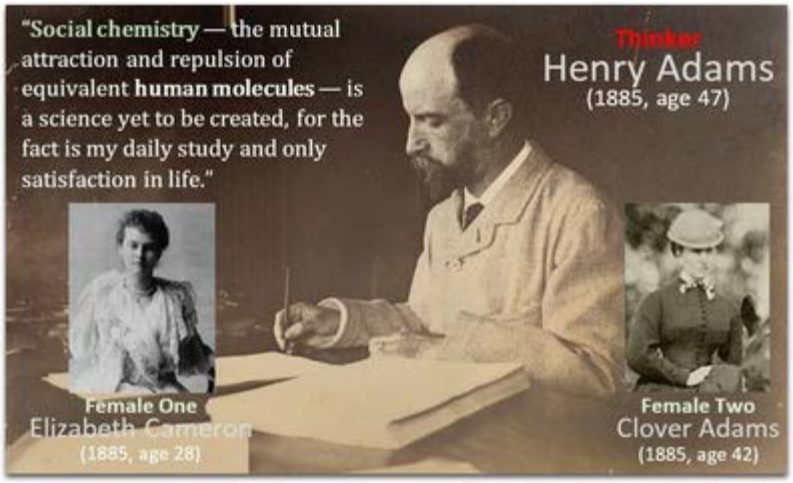

Henry Adams (1838-1918) Collected works: 12+

19 | 195

(RGM:1174|1,500+) (GHE:1) (LR:4) (SN:2) (RE:80) [CR:568] American historian;

"No one shall convince me that I am not a phase."

penned nine-volume American history set solely to prove cause and effect; his *The Education of Henry Adams* (1907), which is ranked as the greatest American nonfiction book of the twentieth century (American Library), grapples with: Goethe, Gibbs, Clausius, Thomson, Pearson, Darwin, among others, in search of a unified theory of the humanities and physical sciences; prophet of the "another Newton"; biggest hmolscience thinker since Goethe; spent five decades on the social-history aspects of the elective affinities problem; quote: "social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life" (1885); quote: "I would travel a few thousand-million miles to discuss with [Thomson] the thermodynamics of socialistic society" (1909); probably the first true hmolscientist (human chemist + human thermodynamicist + human physicist); known to many as an enigmatic genius of political thought; first-slating: 185-195 (c.2016).

HFE theorist

↑ 195+

Vilfredo Pareto (1848-1923) ↑↓

20 | 190

[RGM:590|1,500+] (Scott 50:29) (SN:3) [CR:282] was a French-born Italian mathematical engineer, physical socioeconomist, and "engineer-turned-economist-turned-sociologist" (Stegner, 2001);

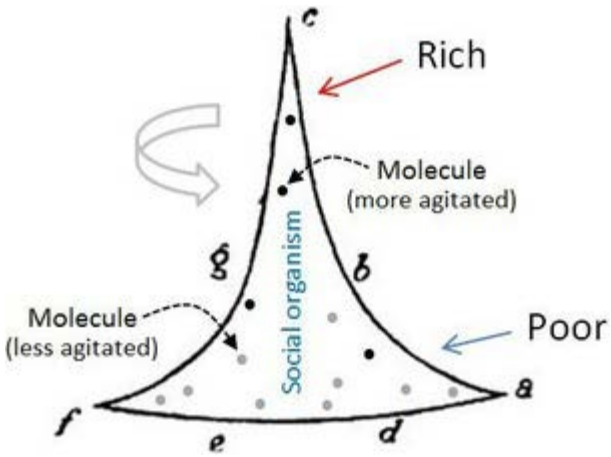

"My wish is to construct a system of sociology on the model of celestial mechanics, physics, and chemistry."

— Vilfredo Pareto (1912), *Treatise on General Sociology* (pg. #)

classified as one of the chiefs of the Laussane school of physical economics (1890s to 1920s), characterized a a “scholar of encyclopedia ambitions and Machiavellian dispositions” (Fuller, 2000); was the thematic backbone of of the 1930s to 1940s Harvard Pareto circle; generally noted, in hmolscience, for his efforts to formulate a social molecule themed mechanics of sociology, aka "economic dynamics" (Pantaleoni, c.1900); his total work culminating in his monumental four-volume magnum opus *Treatise on General Sociology*; ; first-slated: 185-195± (c.2016).

190 | 21

Carl Gauss (1777-1855) ↓↑ IQ_{SS}=240 IQ_{O}=200+ IQ_{JP}=190

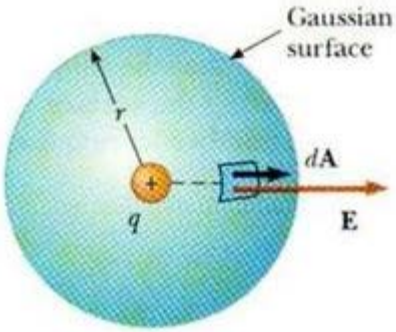

(Cattell 1000:848) [RGM:39|1,500+] (Murray 4000:4|M) (GME:2) [LPKE] (CR:73) German mathematical physicist; known for: mathematics, astronomy, electromagnetics; at age 24, famously solved the Ceres tacking problem; considered by Laplace to have been the greatest mathematician in the world; described as a “powerful intellect” by Maxwell; downgrade (↓) for his late age 60 religious-fallout grappling issues, commenting, e.g., how religious matters, such as ethics, destiny, human future, etc., are outside the province of science; 2018 Quora ranked (Ñº) at 200+.

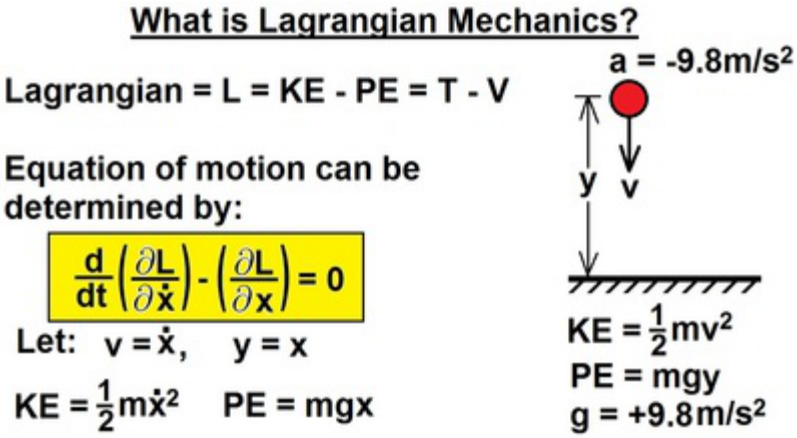

190 | 22

Joseph Lagrange (1736-1813) ↑ IQ_{C}=185

(Cattell 1000:512) [RGM:558|1,500+] [GME:7] (DN:5-7) (CR:114) French mathematician and physicist;

“The invention of dynamics as a mathematical science [was founded by] Galileo, and [through] the wonderful extension which was given to that science by Newton—among the successor to those illustrious men: **Lagrange has perhaps done more than any other analyst to give extent and harmony** to such deductive researches, by showing that the most varied consequences respecting the motions of systems of bodies may be derived from one radical formula; the beauty of the method so suiting the dignity of the results, as to make of his great work a kind of scientific poem.”

— William Hamilton (1834), *On a General Method in Dynamics*

noted for his 1788 Lagrangian formulation of the total energy or force function quantification of a system; see also: Euler genealogy.

(Cattell 1000:34) [RGM:32|1,500+] (Murray 4000:14|CS / 6|M / 11|WP) (GME:8) [LUG] [LPKE] [CR:276] German mathematician, physicist, and philosopher; known for: differential equations, e.g. he invented the integral sign (1675) in the equation shown (see: history of differential equations), dynamics (vis viva, vis mortua);

$$\int x dx = \frac{1}{2}x^2$$

190 | 23

Gottfried Leibniz (1646-1716) ↑↓↓

IQ_C=205
IQ_W=200
IQ_{CB}=**194**
IQ_B=182

"Those who wish to form an idea of the shackles imposed by theology on the genius of philosophers born under the 'Christian dispensation', let them read the **metaphysical romances** of Leibniz, Descartes, Malebranche, Cudworth, etc., and coolly examine the **ingenious but rhapsodically** systems entitled: the pre-established harmony of occasional causes; physical pre-motion, etc."

— Denis Diderot (1770), note to Baron d'Holbach's *The System of Nature* (pgs. 51-52)

Downgrade (↓) for having his 1710 optimistic approach to the problem of evil, i.e. his assertion that this is "best of all possible worlds", lampooned by Voltaire in his 1759 *Candice* (see: Alexander Pope) and also ridiculed by Schopenhauer (Ñº); down-graded from 195|#16 to 195|#22 per Diderot quote (Jan 2018); Down-grade #2 ↓ to 190|#24 for his attack on vacuists and for his principle of sufficient reason, as ridiculed by Samuel Clarke (Sep 2019).

(Cattell 1000:896) [RGM:401|1,500+] (ACR:11) (FA:8) (EvT:5|21+) [CR:276] Greek physical science philosopher;

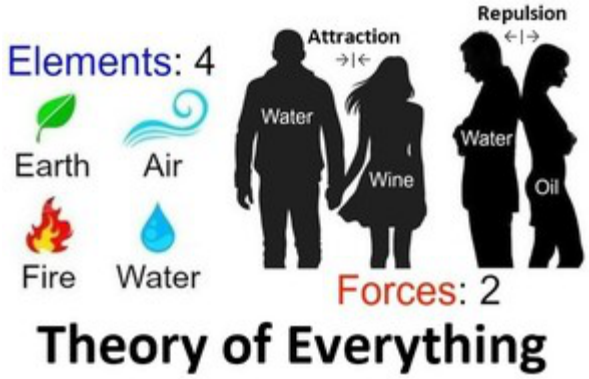

190 | 24

Empedocles (495-435BC) ↑↑↓

"Now though this great country is seen to deserve, in many ways, the wonder of mankind, and is held to be well worth visiting, rich in all good things, guarded by large force of men, yet seems it to have held within it nothing more glorious than this man [Empedocles], and nothing more holy, marvelous, and dear. The verses, too, of his **godlike genius** cry with a loud voice, and set forth in such wise his glorious discoveries, that **he hardly seems born of a mortal stock**."

— Lucretius (60BC), *On the Nature of Things*; cited by Friedrich Lange (1875) in *The History of Materialism, Volume One* (pg. 136)

Anti-chance

HCR theorist

Originator of the two forces four elements theory of everything; person behind the people mix like oil and water or water and wine philosophy (see: Goethe + Empedocles); characterized as and world's first "**professor of atheism**" (Theophilus, 180AD); first-draft slating: 185-195 (c.2014); upgraded ↑ to 190|#37→195|#9 (Jan 2018);

downgraded ↓ to 190|#25 after reading all of the pre-Socratic philosopher fragments, and noting that there is not enough extant text by him (Feb 2019).

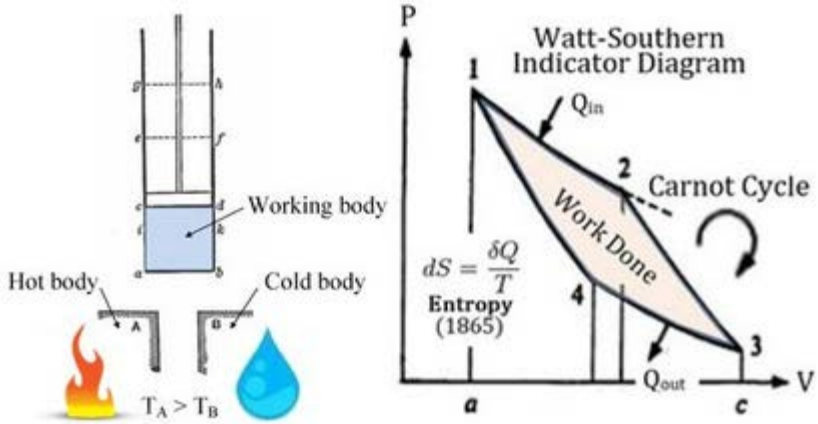

190 | 25

Sadi Carnot
(1796-1832)

(Cattell 1000:345) [RGM:846|1,500+] (EP:25) (CR:425) French physicist and engineer;

"The most original work ever written in the physical sciences, with a core of abstraction comparable to the best of Galileo."

— Tom Shachtman (1999)

Noted for his 1824 *Reflections on the Motive Power of Fire*, wherein, via his Carnot engine and Carnot cycle, initiated the science of thermodynamics; first-slated: 180-195 (c.2014).

[RGM:424|1,500+] (Becker 160:44)
[CR:224] Austrian physicist;

"Life feeds on negative entropy."

— Erwin Schrodinger (1943), *What is Life*

190 | 26

Erwin Schrödinger
(1887-1961)

noted for his 1925 Schrodinger equation, a Lagrangian-based state equation for the wave movement of an electron about an atom, for his 1935 book *Science and the Human Temperament*, wherein he stated his opinion that the rise of cultures is governed by the second law of thermodynamics, for his ultra-famous 1943 "What is Life?, wherein he attempted, in laymanized terms, to explain "life" in terms of physics and chemistry, a lecture-turned-book, wherein he postulated that "life feeds on negative entropy", and followup retraction "Note to Chapter 6", wherein he had to admit to error, commenting that he should have discussed life in terms of "free energy" instead of entropy, in regards to the theory of life; also noted for his 1946 *Statistical Mechanics*; first-slated: 185-195 (c.2015).

27 | 190

Francis Bacon (1561-1626) ↑↑

(Cattell 1000:5) [RGM:130|1,500+] (Gottlieb 1000:84) (LPKE:4|18+) (GPhE:#) [CR:149] English physicist, natural philosopher, and general polymath;

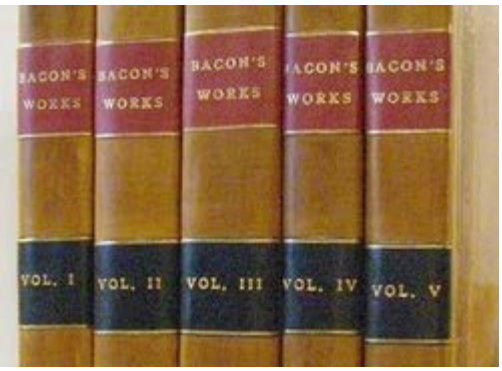

"Knowledge is power."

— Francis Bacon (c.1610)

Commentator on atheism, a pioneer of the scientific method; noted for being one of the first to state, in circa 1600, that heat is motion; first to define impelling power; one of the first to do battle with Aristotle and his "final cause" logic;

28 | 190

Ludwig Boltzmann (1844-1906)

[RGM:618|1,500+] [Kanowitz 50:44] [Cropper 30:1|SM] (GPE:26) (RE:62) [CR:364] Austrian physicist; a **dual** scientific revolutions genius; formulator of the famous H-theorem model of entropy (1872), the seed to the 1901 later S = k ln W model of entropy; initiator of the "What is Life?"—in physical science terms—debate (see: theories of existence), via his infamous riddled postulate: 1886 postulate that "life is a struggle for entropy" (1886); initiator of the quantum hypothesis (quantum mechanics): "I see no reason why energy shouldn't also be regarded as divided atomically" (1891) (see: energy element); hung himself (1906) as a result of prolonged attack by the energetics school of his usage of atomic theory to explain thermodynamics; first-draft slating: IQ:190-195 (c.2015); downgraded from 195|#15 to 190|#28 (Nov 2019) per intuition.

[RGM:30|1,500+] (Murray 4000:15|WP) (Perry 80:7|Li) [HD:44] (FA:138) (GAE:2) [RGA:21|370+] (GPhE:#) [CR:320] German philosopher; his last will to power fragment (WP:1067) is as follows:

"And do you know what 'the world' is to me? Shall I show it to you in my mirror? This world: a **monster of energy**, without beginning, without end; a firm, iron magnitude

Friedrich

IQ_Q=190, 210

190 | 29

Nietzsche (1844-1900) ↑

Library:1,100 books

IQ_{SS}=160, 200, 200+
IQ_{O}=180
IQ_{O}=186
IQ_{O}=180

of **force** that does not grow bigger or smaller, that does not expend itself but only transforms itself ... this, my, Dionysian (see: Dionysus; Osiris rescripts) world of the eternally self-creating, the eternally self-destroying, this mystery world of the twofold voluptuous delight, my "beyond good and evil," without goal, unless the joy of the circle is itself a goal ... this world is the will to **power**—and nothing besides! And you yourselves are also this will to power—and nothing besides!"

First to proclaim "god is dead" (1882), caricature (Ñº) shows Nietzsche killing or gunning for god; postulated an "uberman" (1883), a person with an IQ of 180+ (according to Bertrand Russell), who would eventually become the replacement model for the "idea of god" (god theory); Sigma Society IQ:180 (Ñº); Quora ranked (Ñº) at 190 to 210; or in the range of Alexander Pope to Georg Hegel.

(Cattell 1000:218) [RGM:1271|1,500+] (CR:94) French physicist, philosopher, and polymath;

"Who can easily comprehend that small thing … within the body of an elephant … that it should be able to agitate such a bulk, and to cause it to perform a swift and harmonious dance? But indeed, the same fiery nature of the soul, serves within the body by its own mobility, what a little flame of gunpowder does in a cannon: it not only drives the bullet with so much force, but also drives back the whole machine with so great strength."

— Pierre Gassendi (c.1630), *Publication*; cited by Thomas Willis (c.1660) in "On Convulsive Diseases"

190 | 30

Pierre Gassendi (1592-1655) ↑

IQ_{C}=185

noted for being one of the first to revive the atomic theory work of Epicurus, writing a set of books on the philosophical implications of this subject, supposedly written to counter the philosophical views of Rene Descartes; was the first to coin the term "molecule", which he

described as “fitted together atoms”; gave one of the first chemical creation models: “atoms” → “molecules” → “small structures similar to molecules” description of evolution (a forerunner to the later human molecular hypothesis (1789) of Jean Sales.

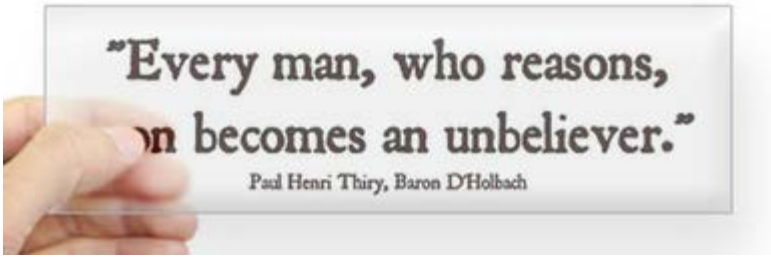

[RGM:414|1,500+] [**SN:12**] (FA:74) (GAE:1) (GPhE:5) [CR:251] German-born French-raised atheism-explicit, anti-chance based, matter-and-motion philosopher;

Baron d’Holbach (1723-1789)

190 | 31

“Holbach’s *System of Nature* is the most exhaustive [and intellectually thorough-going] discussion of atheism — from a scientific, philosophical, moral, and political perspective — ever written.”

— Sunand Joshi (2014), *The Original Atheists* (pg. #)

Anti-chance

aka “Newton of the atheists” (Ñº) (V|1:45); a top-ranked extreme atheist; the Hume-Holbach dinner party (1763) encounter situate him between Voltaire and David Hume in intellect, **if not above** [?] Voltaire; his mentally-penetrating *The System of Nature* turned both Goethe and Percy Shelley into the atheist natural philoosphy mode of thinking; upgraded ↑ from 185|#57 to 190|#33 (Feb 2018) after absorbing first 116 pages of *System of Nature*.

[RGM:311|1,500+] (Murray 4000:15|P) [GPE:#] (DN:7) (CR:129) English-born American physicist;

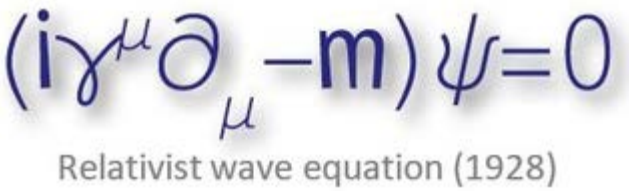

“I don’t know what all the fuss is about, **Dirac** did it all before me.”

— Richard Feynman (c.1948)

Paul Dirac (1902-1984)

190 | 32

first to applying relativity to the electron, thereby predicting the existence of the anti-particle; his *Principles of Quantum Mechanics* (1930) became a sort of handbook for Einstein, who would could frequently be heard saying “where’s my Dirac” whenever he had any type of quantum mechanics question; noted for his atheist physics outspokenness against Einstein and his “god’s dice” proclamations (see: god does not play dice), which was code for the fact that Einstein was an anti-chance philosopher; first-slating: 190|#36 (c.2016).

(Cattell

1000:306)

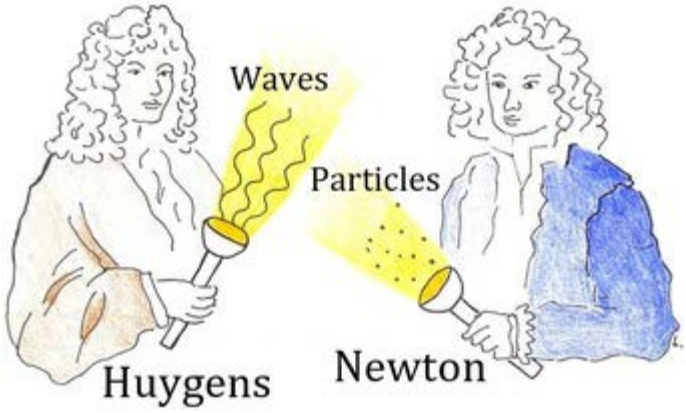

[RGM:186|1,500+] (Gottlieb 1000:333) (Murray 4000:7|CS, 17|P, & 4|T) [Kanowitz 50:16] (EP:14) (GPE:27) (Eells 100:24) (GME:28) [CR:104 Dutch physicist, inventor, astronomer, and mathematician;

190 | 33

Christiaan Huygens (1629-1695) IQ_C=175 ↑

"In all of [Descartes'] physics, I find almost nothing to which I can subscribe as being correct."

— Christiaan Huygens (c.1660) (Ñº)

noted for his wave theory of light (1678), in opposition to Isaac Newton's later corpuscular theory of light; inventor of the pendulum clock (1656); noted for his study of the rings of Saturn and the discovery of its moon Titan; mathematical mentor to Gottfried Leibniz (see: Euler genealogy); liaison between the vacuum work of Otto Guericke and the invention of the steam engine, via his gunpowder engine research with his associate Denis Papin (Papin engine, 1690); determined that the quantity *mv²* (later called vis viva by Leibniz) remains constant during perfectly elastic collisions; upgraded from 185|#56 to 190|#34 (Mar 2018).

190 | 34

Thomas Jefferson (1743-1826) Library: 6,700+ (Ñº)

IQ_B=195
IQ_{CB}=**178**
IQ_C=160
IQ_W=160
IQ_S=160

(Cattell 1000:79) [RGM:37|1,500+] (Washington 23|#) (HD:17) (CR:232) American founding father; third American President; author of declaration of independence (based on Newtonian mechanics); thinker behind the separation of church and state; fabled "last persons to know everything"; thing philosopher; an unlearn expositor; auto-characterized Epicurean materialist.

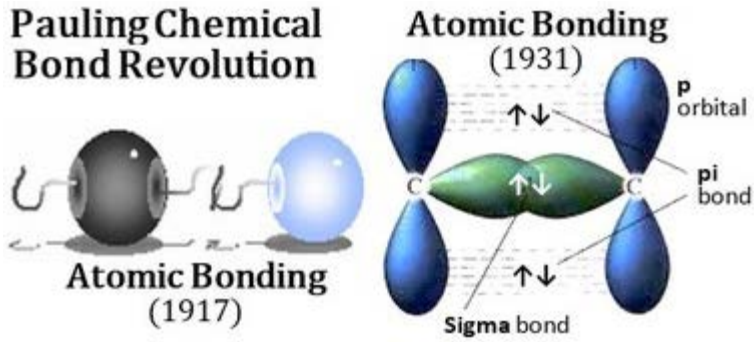

190 | 35

Linus Pauling (1901-1994)

IQ_{JP}=180
IQ_{SS}=160, 170, 180
IQ_{O}=160

[RGM:182|1,500+] [GCE:#] (EPD:F9) (CR:85) American chemical engineer; startup chemical company (before age 15); studied under Arnold Sommerfeld in Munich, Niels Bohr in Copenhagen, and Erwin Schrödinger in Zürich, during which time he became interested in how quantum mechanics might be applied in his chosen field of interest, the electronic structure of atoms and molecules; also, in Zürich, Pauling was also exposed to one of the first quantum mechanical analyses of bonding in the hydrogen molecule, done by Walter Heitler and Fritz London; his 1938 *The Nature of the Chemical Bond* has been referred to as the "bible" of modern chemistry; gets upgrade for, in 1989, ripping apart Schrodinger's thermodynamic views on life (see: Note to Chapter 6).

(Cattell 1000:751)

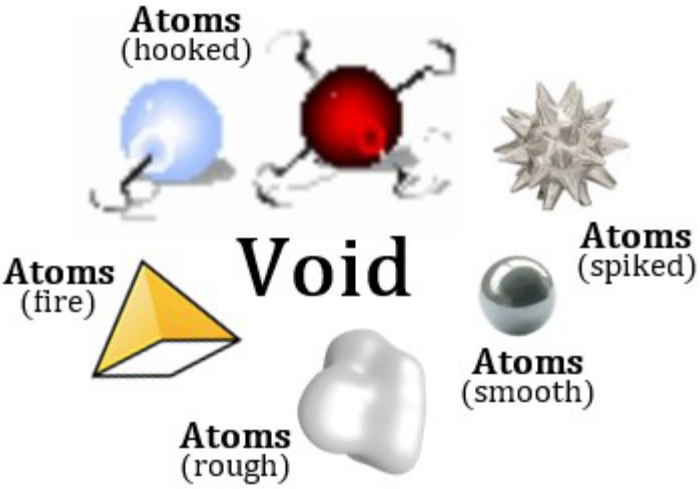

190 | 36

Democritus (c.460-370BC)

[RGM:68|1,500+] (FA:14) (ACR:4) [CR:285] Greek materialism philosopher;

"Democritus must, in truth, amongst the **great thinkers of antiquity**, be numbered with the very greatest."

> — Friedrich Lange (1865), *History of Materialism, Volume One* (pg. 18)

student of Leucippus (c.500-450BC), mentor to Epicurus (341-270BC); someone who "thought about everything" (Aristotle, 322BC), the "weightiest of the ancients" (Bacon, c.1610), a "universal scholar" (Melsen, 1952); famous motto: "Nothing exists but atoms and voids"; first-draft gauged at #71 (Jan 2018); upgraded, above Epicurus (IQ:185|#50), following reading of most of the pre-Socratic philosophers, particularly amid reading Taylor's *The Atomists: Leucippus and Democritus* (pg. 136) and how Democritus

already did Eudoxus' conic section proofs, albeit via assertion without proof, kind of like Fermat (Jan 2019).

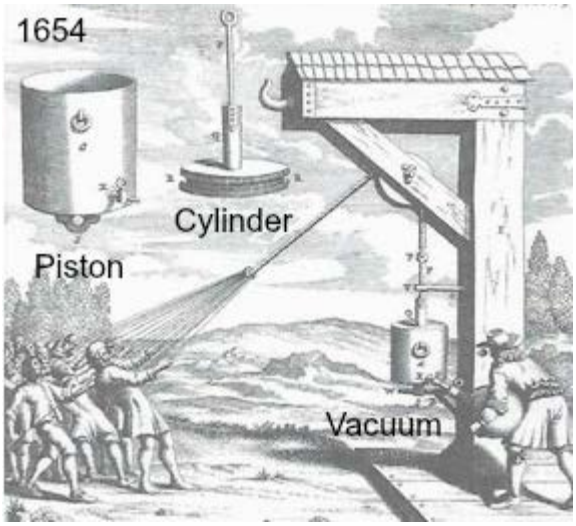

[RGM:274|1,500+] (EP:10) (GPE:62) [CR:161] German engineer, physicist, philosopher, diplomat;

"Theories which are demonstrated by **experiment** and visual perception must be preferred to those derived from reasoning, however probable and plausible, for many things seem true in speculation and discussion, which in actual fact defy reality."

— Otto Guericke (1663), *New Magdeburg Experiments on the Vacuum of Space* (pg. xvii)

37 | 190

Otto Guericke (1602-1686)

In 1854, he experimentally disproved Aristotle's theories about space and and his view that nature abhors a vacuum; a characterized "neglected genius" (Coulson, 1943) (Ames, 1994) (Ñº); the originality, variety, polymathly, and influence of his contributions are difficult to summarize in short; to say the least: he is the person behind: vacuum pump, vacuum engine, piston and cylinder, independent inventor of the barometer (compare Torricelli vacuum), solved the pump problem (proposed to Galileo), first to measure air on a scale, did bird in a vacuum experiment (before Boyle), stated Boyle's law in words (before Boyle), etc., etc., and the so-called: "first and greatest of the electrical discoverers"; first slated at 185|#61 (c.2017); upgrade ↑ to 190|#37 after reading up to pg. 169 of his *Magdeburg Experiments on the Vacuum of Space* (Feb 2019).

[RGM:327|1,500+] (SN:15) (FA:94) (GCE:21) [CR:297] German physical chemistry and radical atheist;

"I am made from the C-H-N-O-S-P combination from which a Bunsen, Helmholtz, Kirchhoff came."

— Wilhelm Ostwald (1926), *Autobiography*

38 | 190

Wilhelm Ostwald (1853-1932) IQ_{CP}=170-195

noted for his involvement in the great 1895 "energetics debate", with Mach and Helm on his side, with Boltzmann, who had Planck on his side; for 1905 MIT Affinity Lecture, wherein he outlines a semblance of a connection from Goethe's *Elective Affinities* to Sadi Carnot to August Horstmann to Willard Gibbs; for his "Ostwald happiness formula" (1905); for his 1910 "Monistic Sunday Sermons" wherein he taught energy-based atheism; and for his color wheel (1916) (Ñº) (Ñº), developed to explain, via formula, why some color combinations are pleasant (or harmonious) and other unpleasant; first-

slated: 190|#41 (c.2017)

39 | 190

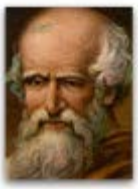

Archimedes (287-212BC)

IQ_{SS}=240
IQ_{JP}=190
IQ_{B}=190

(Cattell 1000:414) [RGM:9|1,500+] (Murray 4000:20|M / 5|T) (GME:4) (CR:75) Greek physicist, mathematician, and mechanical engineer; a fabled "last persons to know everything"; known for: hydrostatics, statics, the principle of the lever, steam cannon; categorized as both an "overrated genius" (Ñº) and an "underrated genius" (Ñº), depending.

40 | 190

John Neumann (1903-1957) ↑↑↓

IQ_{O}=225
IQ_{O}=200
IQ_{JP}=180
IQ_{O}=163-180

💡⇌**HFE theorist**

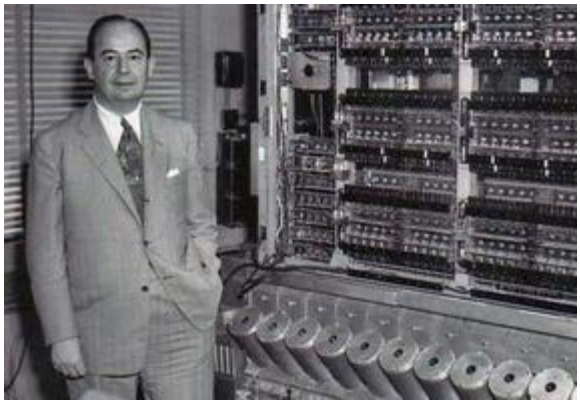

[RGM:234|1,500+] (Gottlieb 1000:959) (Becker 160:142) (Odueny 100:54) (RE:53) [CR:219] Hungarian-born American mathematician, chemical engineer, economist, physicist, and computer scientist, a distinguished polymath, magnitude genius (see: genius), and "last" known of the supposed dying bread of "last universal geniuses" (see: hydraism); noted for his work in quantum thermodynamics (1927, 1932), human free energy theory of economic thermodynamics (1934-1944), for his ill-fated 1940 suggestion to American electrical engineer Claude Shannon to call information by the name "entropy" as in "information entropy" (see: Neumann-Shannon anecdote), for his computer system architecture designs (von Neumann architecture, 1945), and for his ideas on automaton self-assembly (see: Neumann automaton) (1948,1951), and for his work in computer science thermodynamics (1949).

41 | 190

William Shakespeare (1564-1616) ↓

IQ_{BR}=233
IQ_{B}=210

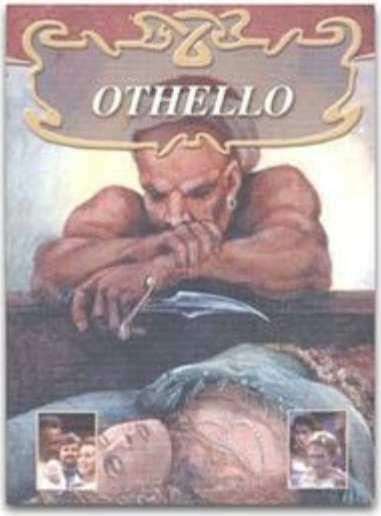

(Cattell 1000:2) [RGM:11|1,360+] (Murray 4000:1|WL) (CR:82) English playwright;

"For there is nothing either 'good' or 'bad', but thinking makes it so."

— William Shakespeare (1602), *Hamlet* (§2.2) (Ñº)

"I know not where is that Promethean heat, that can thy life relum."

— William Shakespeare (1603), *Othello, the Moor of Venice*

a Nietzsche uberman (IQ:186+); a GLAE candidate (#1); known for:

literature, literature chemistry, Promethean heat; very high emotional intelligence; first-slating: 190|#46 (c.2015).

42 | 190

Max Planck
(1858-1947)

[RGM:18|1,500+] (Gottlieb 1000:25) (Odueny 100:15) [Kanowitz 50:8] [Cropper 30:1|QM] (GPE:17) [CR:247] German physicist and thermodynamicist; generally known for his 1900 conjecture (efforts to solve the ultraviolet catastrophe problem), based on the early ideas of Boltzmann, that the internal energy *U* of a black body (resonator) could be divided into a discrete number of "energy elements" ε by the expression:

$$U = \epsilon P$$

where *P* is large integer; this launched launching the quantum mechanics and the quantum revolution; a **dual** scientific revolutions genius; a top three greatest physicist of all time; known for: radiation thermodynamics, work on the third law of thermodynamics; downgrade ↓ for his 1937 (age 79) "Religion and Natural Science", wherein he tries to sell an weak-minded religion + science compatibilism picture; first-slating: 180-195 (c.2015).

43 | 190

Enrico Fermi
(1901-1954) IQ_{AI}=164

[RGM:35|1,310+] (Murray 4000:12|P) (CR:52) Italian physicist; known as the "last universal physicist", in the tradition of great men of the 19th century, and "the last person who knew all of physics of his day"; first-slated: 190|#30 (c.2015).

45 | 190

Hypatia
(360-415)

IQ_{O}=180-200
IQ_{SS}=195
IQ_{O}=170-210
IQ_{O}=170

[RGM:123|1,500+] (GFG:1) (CR:38) Greek philosopher, physicist, and astronomer;

"Fables should be taught as fables, myths as myths, and miracles as poetic fancies. To teach superstitions as truth is a most terrible thing. The child mind accepts and believes them, and only through great pain and perhaps tragedy can he or she be in after years relieved of them. The reason for this is that a superstition is so intangible a thing that you cannot get at it to refute it."

Known as a fabled "last persons to know everything"; only known female universal genius; noted early irreligionist; credited with the invention of the astrolabe (adjacent); is rumored that to explain the seasonal variations of the apparent size of the sun, and conceived of

elliptical orbit heliocentrism; Kepler; Bertrand Russel and Voltaire praised her; stoned to death; IQ:170 (Ñº).

↑ 190+

185 | 46

Giordano Bruno (1548-1600)

(Cattell 1000:655) (RGM:138|1,500+) (FA:47) (GAE:15) [CR:118] Italian philosopher, mathematician, astronomer, and priest;

"There is no absolute up or down, as Aristotle taught; no absolute position in space; but the position of a body is relative to that of other bodies. Everywhere there is incessant relative change in position throughout the universe, and the observer is always at the center of things."
— Giordano Bruno (1584), *On Cause, Primary Origin, and the One*; this, supposedly, is a close paraphrase of Epicurus ("Letter to Herodotus")

"Perhaps you, my judges, pronounce this sentence against me with greater fear than I receive it."

— Giordano Bruno (c.1599), commentary on being sentenced to death by fire

Burned at the stake for refusing to recant his belief in atoms and a universe made of multiple solar systems; caricature (Ñº) shows Bruno giving the "kill" signal with his thumb, while simultaneously lighting his own flame and or the spark of the revolution to follow; first-slating: 190|#32 (c.2016); down-graded from 190|#32 to 185|#45 following a reading of his *On the Infinite, the Universe, and the Worlds* (Jan 2019).

185 | 47

Blaise Pascal (1623-1662) ↓↑

IQ_{SS}=235
IQ_{C}=195
IQ_{W}=192

(Cattell 1000:61) [RGM:40|1,500+] (Murray 4000:8|M) (Gottlieb 1000:144) (GME:18) (GPE:57) (SIG:3) [CR:102] French mathematician, physicist, and philosopher; at age 19 (1642), made a counting machine, impressed Descartes, with toothed wheels and gears, moving drums carrying numbers, that could add, subtract, multiply and divide; built 50 in total; in 1646 repeated Evangelista Torricelli's

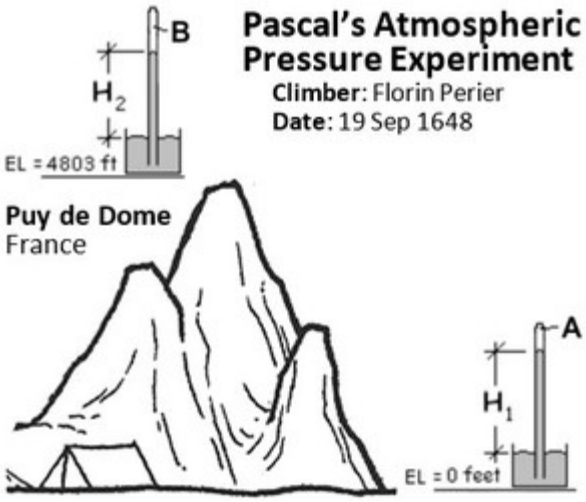

vacuum experiments; from 1652-64, spent all his time on the mathematics of gambling; after his 1654 brush with death (age 31) he "found god" (downgrade ↓) and thereafter seems to have lost his ability to think objectively (see: Pascal's wager) and productively (relating all his theories to the Bible); upgrade (↑) for his *Thoughts* dialogues (Einstein-Pascal dialogue on purpose); upgrade for his atmospheric pressure experiment (1648); dereacted at 39; down-graded from 190|#49 to 185|#47 (Feb 2017).

48 | 185

Richard Feynman (1918-1988)

IQ_{SS}=225
IQ_{O}=190
IQ_{O}=125

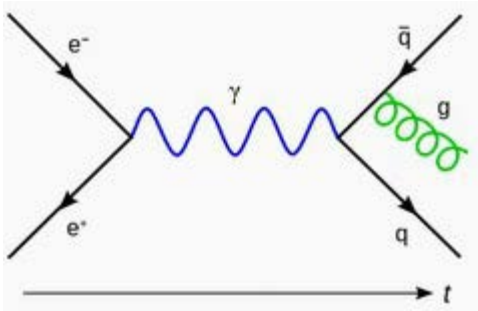

[RGM:131|1,500+] (CR:79|#57) American physicist; in grade school, infamously scored 125 on an IQ test; as an MIT senior, in 1939, had the highest score in the nation on the Putnam; he supposedly had a standing bet that he could solve any problem to within 10% within 60 seconds; and some have suggested his non-verbal IQ was greater than 190 (Ñº); motto: "believe in the atomic hypothesis" (Feynman time capsule wisdom); known for: quantum electrodynamics; see also: Feynman problem solving algorithm. Dirac is generally ranked, e.g. by Freeman Dyson (Ñº), among others (Ñº), as smarter than Feynman.

49 | 185

Pierre Maupertuis (1698-1758)

[RGM:370|1,500+] (Cattell 1000:598) (Eells 100:59) (GME:#) (FA:32) (SN:69) (GPE:66) (CR:30) French mathematician, physicist, philosopher, and evolutionist, aka "radical materialist", noted for his 1745 book *Venus Physics*, in which he outlined a materialistic godless 'blind destiny' inherited traits fitness variation evolution model, and for his 1746 principle of least action, loosely that a system of point masses tend to minimize action. First draft intuitively gauged (Jun 2017) at high 185 possibly 190 range; his principle of least action, based on Newton's first law of motion, precursored the Lagrangian; Helmholtz attempted to reconcile his principle with the conservation of force; digressed on the physics of the soul (via atomic theory); did battle many big geniuses, e.g. Voltaire, Diderot (see: Maupertuis-Diderot debate); his *Venus Physics* oft-brings comparison to Goethe's *Elective Affinities*; mentored by Johann Bernoulli (see: Euler genealogy) and was follower of Leibniz. Note: difficult to rank.

50 | 185

Epicurus (341-270BC)

(Cattell 1000:240) [RGM:72|1,500+] (FA:22) (GAE:3) (GPhE:#) [CR:356] Greek atomic theory philosopher;

"Democritus, when at ripe old age warned him that mind and memory were failing, went freely to place his person in death's path. Epicurus himself died when life's light ran out, **he who in mind surpassed all men**—eclipsed them all, as the sun hung high in heaven, the stars."

— Lucretius (55BC), *On the Nature of Things* (pg. 81; 3:1039-44)

student of Democritus, mentor to Lucretius; name-dropped by nearly ever genius thereafter (e.g. Pierre Gassendi, Thomas Jefferson, etc.); eponym of Epicureanism, Epicurean atheism.

(Cattell 1000:108) [RGM:160|1,330+] (Murray 4000:10|WP) [HD:6] [FA:50] (CR:75) [RMS:19] (EPD product) Dutch philosopher;

"I shall consider human actions and desires in exactly the same manner, as though I were concerned with lines, planes, and solids."

185 | 51

Benedict Spinoza (1632-1677) ↑

IQ_{CB}=**175**
IQ_{C}=175
IQ_{B}=175

Anti-chance

bright from an early age; especially impressed by Rene Descartes and his axiom: "Nothing ought to be received as truth until it has been proved by good and solid reasons", schooled himself in the classic and ancient systems of philosophy, mathematics, algebra, physics, chemistry, optics; met and advised both Christiaan Huygens and Gottfried Leibniz; the result of which was his posthumously-published *Ethics* — which had a great effect on Goethe, opening out for him a "boundless view of both the sensible and the moral world" and his later physical chemistry based "moral symbols" morality system—used the methods of Euclid to describe a single entity (god/nature), of which mind and matter are two manifestations, whereby events and actions are caused, free will is illusory, all explained in such a way, as Goethe says: "what especially riveted me to him, was the utter disinterestedness, which glowed in his every sentence"; mental architype to Nietzsche; see: Spinoza's god; first draft slating: IQ:180-190 (c.2014).

185 | 52

Percy Bridgman (1882-1961) ↑

IQ_{JP}=180
IQ_{EM}=170

(CR:65|#75) American physicist and social physicist; known for Bridgman equations; Bridgman paradox (key modern topic); thermodynamics founders and suicide; played key role in John Q. Stewart's 1939-1954 Princeton Department of Social Physics.

(Cattell 1000:989) [RGM:726|1,500+] (Gottlieb 1000:111) [Kanowitz 50:19] [Cropper 30:5|T] (GPE:47) (SIG:6) [CR:385] Irish-born Scottish mathematical physicist; known for: absolute temperature (adjacent), thermodynamics; Glasgow University age 10; defended Joseph Fourier's 1822 theory

William Thomson

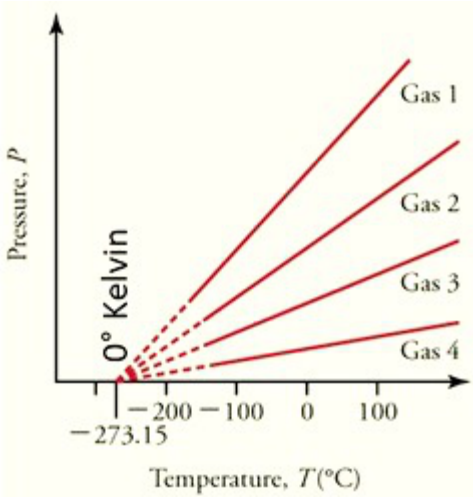

185 | 53

(1824-1907)
↑↑↓

of heat over that of Philip Kelland's 1837 heat theory (age 13); by age 15-16; published first scientific papers by age 17; in 1845 (age 21), after graduating second wrangler (Cambridge), simultaneous unearthed (↑↑) the then unknown and forgotten memoirs of Sadi Carnot's 1824 thermodynamics memoir and George Green's 1828 memoir on the mathematics of electricity and magnetism, now known as two of the most-original works in science; and gave the first mathematical development of Michael Faraday's idea that electric induction takes place through an intervening medium; downgrade (↓) for latter religious undertone based calculations, e.g. age of the sun, etc.; first-slating: 185-190 (c.2015).

185 | 54

Thomas Edison
(1847-1931)

IQ_{SS}=240
IQ_{B}=195

[RGM:38|1,500+] (Murray 4000:2|T) (Gottlieb 1000:28) (GEE:#) (FA:110) [CR:60] American electrical engineer, technologist, inventor, and philosopher;

"The brain can be developed just the same as the muscles can be developed, if one will only take the pains to train the mind to think."
— Thomas Edison (c.1915), *Publication* (Ñº)

noted for the invention of the: practical light bulb (1878), based on the electric arc lamp (1802) invention by Humphry Davy, the phonograph, and motion picture camera; and originated the concept and implementation of electric-power generation and distribution to homes, businesses, and factories; gave pretty decent stance (see: Edison on the soul) on religious theories (e.g. soul, life, immortality, spirit) query during 1909 *New York Times* interview; upgrade (↑) for his comments on Thomas Paine.

185 |

Euclid
(c.340-280BC)

IQ_{B}=182

(Cattell 1000:501) [RGM:50|1,500+] (Murray 4000:19|CS / 3|M) (GME:4) (CR:65) Greek mathematician; his *Elements*, being the most cited mathematics book of all time, was like a "great holy book" to nearly every big genius: Nicolaus Copernicus (age

55

19), Robert Hooke (age 15), James Watt (youth), James Thomson (mathematician), edited a version of Euclid's *Elements* (1834), James Maxwell, who mentions Euclid in his last-dying poem “A Paradoxical Ode”, Albert Einstein, who at age 12 was given a text on Euclidean geometry, which he called the “holy geometry book”; to Sarah Sidis (tutored by Boris Sidis; mother to William Sidis) who in 1891 (age 17) "propped Euclid up above the sink, and studied while she washed the dishes".

(Cattell 1000:341)

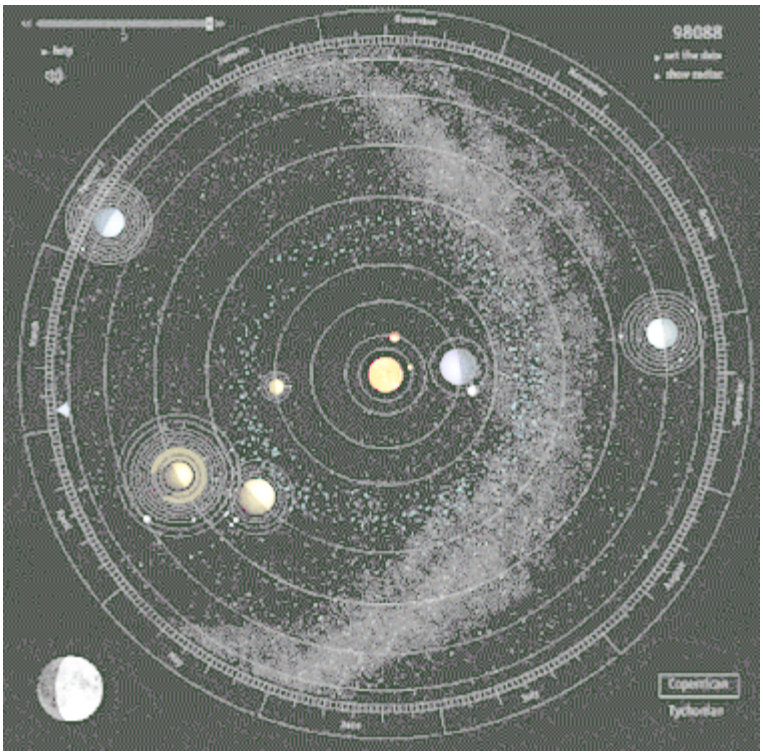

56 | 185

Nicolaus Copernicus (1473-1543) ↑

IQ_{CB}=**173**
IQ_{C}=160
IQ_{B}=185
IQ_{T}=100-110

[RGM:14|1,500+] (Murray 4000:5|A) (Gottlieb 1000:18) [Kanowitz 50:15] (GPE:35) (GAE:1) [CR:136] Polish mathematician, astronomer, and physician, aka the "next Ptolemy" (Erasmus Reinhold, 1542), noted for his 1514 forty-page booklet “Little Commentary” (Commentariolus), in which he began to lay out the basics of his heliocentric model of the universe, as opposed to the older geocentric model of the universe, eventually publishing the finalized version as the 1543 *On the Revolution of the Heavenly Spheres*, the “first book in nearly 1,400-years to rival Ptolemy’s *Almagest*” (Repcheck, 2007), which introduced the revolutionary idea to the world that the “earth moves” or that "the earth is moving and the stars are at rest" (Anon, 1542), a view opposed to that of the older 350BC physics model of Aristotle that the earth is the center of the universe and stationary.

(Cattell 1000:354)

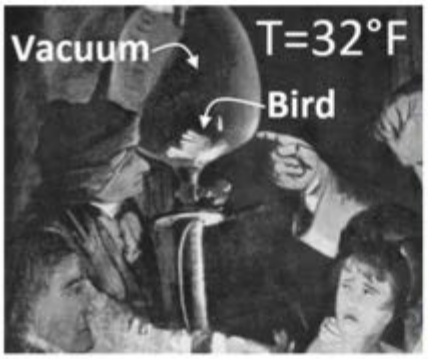

57 | 185

Robert Boyle (1627-1691) IQ_C=160 ↑

[RGM:466|1,500+] (Murray 4000:6|C) (Gottlieb 1000:142) [Kanowitz 50:41] (GPE:39) (GCE:6) (CR:149) English chemist, physicist, philosopher; a **dual** scientific revolutions genius; corroborator with Isaac Newton in the initiation of affinity chemistry; did the famous "power of the cold experiment" (1665), one of the first demonstrations of the mechanical equivalent of heat, showing that a weight of 72-pounds was required to prevent expanding ice from pushing out a cork supervised Robert Hooke in the construction of the pneumatical engine, the experimental device that led to the discovery of Boyle's law, the first gas law; first-slating: 170-185 (c.2015).

58 | 185

Leon Winiarski (1865-1915) IQ_{SN}= 186±

[RGM:N/A|1,310+] (SN:4|55+) Polish socio-econo physicist; his *Essay on Social Mechanics* (1898), attempted to base sociology on the Clausius inequality (adjacent); down-grade from initial 190|#34 (c.2015) to 185|#61 (Mar 2018) until full translation of his work into English.

59 | 185

Norman Dolloff (1907-1984) IQ_{SN}= 186±

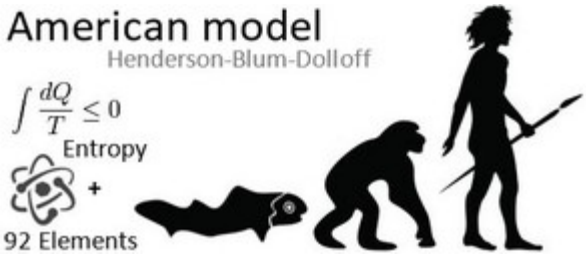

(SN:5|55+) (CR:37) American metallurgical engineering geologist; in his *Heat Death and the Phoenix* (1975), he gives a so-called "organism synthesis equation", namely:

$$\sum n_i \rightarrow \text{organism}; \Delta G_R^\circ = +; \Delta S_R^\circ = -$$

HFE theorist

Classified as the transition point mindset of someone grappling to switch from the entropy "order/disorder" model of everything to the "free energy" model of everything; all done in the framework of explicit atheism.

[RGM:89|1,500+] (Murray 4000:13|WP) (**SN**:15) (FA:93) (GA:10) (GPhE:#) [CR:250] German

Arthur Schopenhauer (1788-1860)

185 — 60

IQ_{EM}=170

atheistic natural philosopher;

“The will of the copper, claimed and preoccupied by the electrical opposition to the iron, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive.”

— Arthur Schopenhauer (1844), *The World as Will and Representation*

HFE theorist

his *The World as Will and Representation* (1814, 1844), building on Goethe's human elective affinities theory (see: elective affinity problem), explains "will" in a universal manner, e.g. in terms of the "will of the copper" atom in electrochemical reaction; first guesstimated at 170-190 (c.2015).

(RGM:693|1,500+) (Gottlieb 1000:509) (HD:22) (FA:94) (GA:15) (CR:98) English romantic poet and physico-chemical philosopher;

“As we come nearer to our own times it becomes increasingly difficult to measure tendencies by the methods we are using. The positions of men on the list are subject to larger probable and constant errors. Byron (IQ:180|#134) may be a household word on the continent and Shelley unknown, while the best criticism may place **Shelley ABOVE Byron**. Our list places Mendelssohn above Bach and ignores Schumann altogether — while the last thirty years have altered not only critical opinion, but also popular taste.”

— James Cattell (1894), “A Statistical Study of Eminent Men”

Percy Shelley (1792-1822)

185 | 61

IQ_{PG}=198
IQ_{O}=185+
IQ_{T}=165

HFE theorist

A posthumous genius (IQ_{avg}:198); Cattell (1894) ranked him *above* George Byron (IQ:180|#134); Terman (1930) calculated his IQ of 165; a Robinson (2010) “missing Cox IQ genius”; Maxwell dedicated his last poem, "A Paradoxical Ode" (1878), to Shelley; derived, independent of Goethe, an atheism-explicit human elective affinity

theory (see: **physicochemical atheism**); Mary Shelley (IQ:175|#225) married him, according to these principles, in the Church of Elective Affinities.

[RGM:108|1,500+] (Cattell 1000:56) (Gottlieb 1000:97) (Stokes 100:27) (CR:37) Dutch intellectual, universal genius, and fabled "last person to know everything";

"Nothing is more beautiful than **to know all**."

— Erasmus (c.1670) (Ñº)

62 | 185

Desiderius Erasmus (1466-1537) IQ_{CB}=**178** IQ_{C}=180 IQ_{B}=175

"Could god have taken on the form of a woman, a devil, a donkey, a gourd, or a flintstone? If so, how could a gourd have preached sermons, performed miracles, and been nailed to the cross?"

— Desiderius Erasmus (1509), *Praise of Folly*

noted for introducing the term "Pandora's box", the precursor to Eve's apple (see: Adam and Eve), into the cultural vernacular, a term he used in respect to the gift box given to Pandora, a penned during his translation of Hesiod's 700BC *Theogony*; close associate of atomic utopian theorist Thomas More.

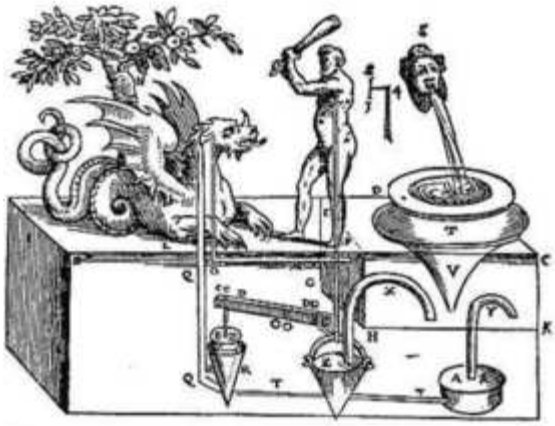

[RGM:310|1,500+] [GEE:#] (Eells 100:36) (CR:53) Greek physicist, engineer, and mathematician; his *circa* 50AD *Pneumatica*, in which, he overviews the physics of Strato and Ctesibius, outlines an atomic theory in which matter consists of particles mixed with distributed vacua, and in which he describes how to make an aeolipile; was said to have openly challenge the nature abhors a vacuum belief, but his attempts to create an artificial vacuum failed; invent and build the world's first working heat engine, namely a steam engine that opens temple doors; built a number of famous "automata", wind turbines, and hydrostatic fountains; said to have discovered imaginary numbers; his *Pneumatica* was translated by Gottfried Leibniz and also read by Denis Papin, likely being influential in the inception of the Papin engine, the first piston and cylinder steam engine; his works, along with the works of Aristarchus, Hypatia, Sappho, and Berossus and his

63 | 185

Hero (c.10-70AD) ↓↑

Babylonaica, are said to be the five most "tantalizing losses from the Library of Alexandria"; first slating: IQ:180-190 (c.2015).

64	185	Alan Turing (1912-1954)	IQ_O=180-190 $IQ_?$=185±

[RGM:32|#1,500+] (Stokes 100:96) (GEE:#) (Glenn 20:18) British polymath, mathematician, engineer, computer scientist, code breaker, and chemist; noted for his 1936 paper "On Computable Numbers, with an application to the Decision Problem" launched computer science; during WWII, his machine called Bombe (adjacent) famously cracked the Enigma code, allowing German naval communications to be read, which is said to have shortened the war by two years; his 1950 digression on the query "can machines think?", wherein he seems to dismiss god talk, i.e. that humans have immortal souls, as unacceptable; famously deboundstated via cyanide apple (see: fruit from the tree of knowledge); IQ gauged at 180-190 (Ñº) (2016).

65	185	Friedrich Schiller (1759-1805) ↑↑	IQ_C=165

[RGM:87|1,310+] (Cattell 1000:75) (CR:144) German poet and philosopher; from 1796 to 1803, he worked with Goethe in the development of his "human chemical theory", namely that people react together like chemicals and that the passions are governed by the driving forces of chemical affinity:

"The **passions are not like playing cards**, what one can shuffle, play, reshuffle, and play again, without their changing at all. Passions are governed by the delicate chemical affinities, through which they attract and repel each other, reunite, neutralize each other, separate again and recover."

— Goethe (1799), comment to Schiller on the writing of Prosper Crebillon

Generally known for his 1795 drive theory poem "The World Ways", wherein he asserted that the world turns, similar to water driving a mill, by hunger and love, which was later used by Freud in his drives theory of sex and death; Goethe's last words mentioned him.

Anti-chance

Humphry

(Cattell 1000:203) [RGM:1265|1,500+] (Murray 4000:5|C) (Partington 50:11) (GPE:43) (GCE:12) (CR:63) was an English chemist and physicist; noted for his (age 20) 1799 "ice-rubbing

185 | 66

Davy (1778-1829) IQ_C=185

experiments", one of the first mechanical equivalent of heat experiments; for his 1802 arc lamp invention (forerunner to the light bulb; done by Edison in 1878), for his 1806 lecture on electricity and chemical affinity; for his 1813 "point atom" theory of a human; and for the discovery of a number of elements; and for for his work on the conservation of force.

185 | 67

Jean Sales (1741-1816)

[RGM:N/A|1,310+] (CR:68) Initiator, through the publication of his multi-volume 1775 *The Philosophy of Nature: Treatise on Human Moral Nature*, of the human molecular hypothesis (1789):

> "We conclude that there exists a **principle** of the human body which comes from the **great process** in which so many millions of atoms of the earth become many millions of **human molecules**."

he was imprisoned and eventually banished from France; while imprisoned, in 1777, he was visited by Voltaire, who gave 500 pounds to towards his release; first-slating: 190|#26 (c.2016); down-graded to 185|#70 (Feb 2018), when discovered that he got his Newton in Senegal from Holbach.

185 | 68

Gerald Massey (1828-1907) ↑↓ IQ_{GD}=140+ $IQ_?$=160-190 ±

[RGM:506|1,500+] (RE:79) [CR:97] English freethinker, poet, archeologist, Egyptologist, evolution advocate, and leading religio-mythology scholar, noted for his 1883 *Natural Genesis*, wherein he

explains how the Christian story of Jesus Christ, the basis of Christianity, is but a re-write of the Egyptian myth of the Egyptian god-human Horus born from the god Osiris and the goddess Isis, aka “Stella Maris” (star of the sea), of the Heliopolis Ennead (9 gods) of Anunian theology in Egyptian cosmology (see: religio-mythology transcription and syncretism); first-slating 185|#73 (Jan 2017)

69 | 185

John Mill (1806-1873) IQ_O=200 IQ_{EM}=190 IQ_B=185 IQ_{CB}=**183** IQ_C=180

(Cattell 1000:180) [RGM:141|1,330+] (Murray 4000:N/A) (Perry 80:6|Li) [HD:24] (FA:80) Englisdh moral philosopher; fabled "last persons to know everything"; known for: political philosophy, utilitarianism; was a split-brainer who could write two different languages simultaneously, one in each hand.

70 | 185

Sigmund Freud (1856-1939) IQ_{JP}=180 IQ_O=156

[RGM:75|1,500+] (Murray 4000:18|M) (Gottlieb 1000:15) (Becker 139:119) (Stokes 100:66) (Bloom 100:19) (Scott 50:11) [HD:51] (FA:122) (GA:13) (RMS:75) (GPhE:32) (GSE:#) [CR:297] Austrian psychiatrist and psychodynamicist;

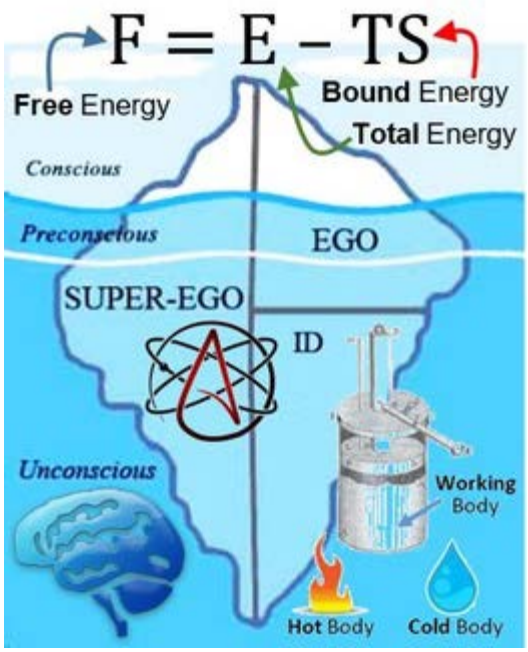

“I feel that I have done for human ‘reason’, what Copernicus did for the ‘universe’, and Darwin did for our ‘origins’.”

— Sigmund Freud (c.1930)

noted for his 1895 his bound energy [-TΔS] / free energy [ΔG] based, atomic theory infused "A Project for Scientific Psychology", the 1896 coining of the term "psychoanalysis", the scientific analysis of the mind, the view that mental processes operate owing to the movement of particles in the mind governed by chemistry and energy, aka psychodynamics, energy psychology, Freud's psychical energy model, dynamic psychology; noted for Freudian atheism, and for religio-mythology debunking, e.g. that Moses is derived from Akhenaten.

| 185

Auguste Comte (1798-1857) IQ_C=185

(Cattell 1000:95) [RGM:397|1,500+] (Scott 50:5) (FA:64) (CR:102) French positivism philosopher;

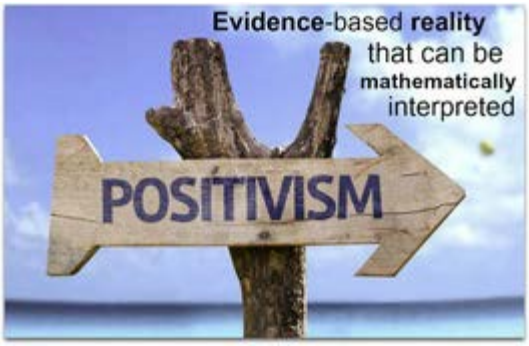

“Now that the human mind has grasped celestial and terrestrial physics, mechanical and chemical, organic physics, both vegetable and animal, **there remains one**

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science, to fill up the series of sciences or observation—**social physics**. This is what men have now most need of; and this it is the principal aim of the present work to establish."

— Auguste Comte (1835), *Positive Philosophy*

A top HP pioneer who asserted that sociology needs a Galileo-Newton type description; he was in intellectual hero to John Mill, who became his close correspondent (Ñº) in 1841, and roll model to Henry Buckle.

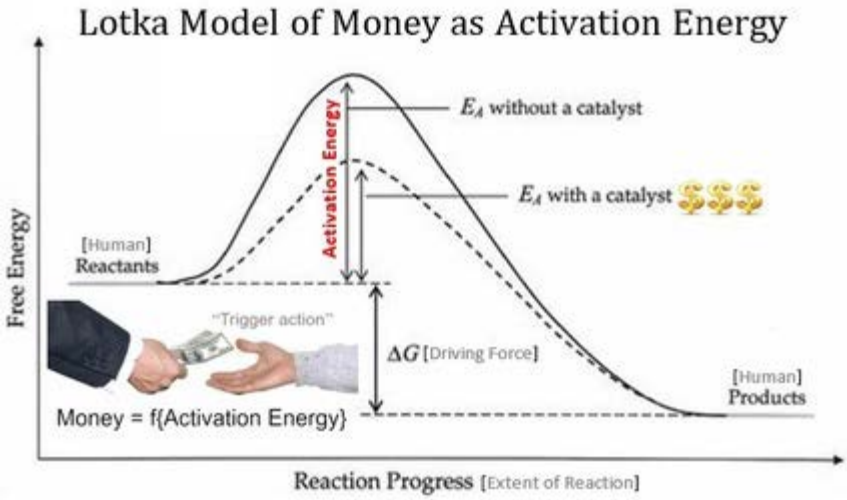

[RGM:1305|1,500+] [SN:20] [CR:174] Austrian-born American physical chemist, mathematician, actuary, and "part-time genius" (Hannon and Ruth, 2014) (Ñº);

Alfred Lotka (1880-1949)

"The examination, and, where need be, revision of our fundamental premises is a task of a wholly different order from that of rearing upon these premises a structure of logical argumentation. It is a task that often demands the efforts of **giant intellects**, of men of altogether unusual independence of thought. Most of us are held back by our preconceived, intuitive judgments, which, blindly entertained, blind us also against the recognition of possible alternatives."

— Alfred Lotka (1925), on "Fundamental Premises and Implicit Assumptions" and "Difficulties of Shaking off Preconceived Premises" in *Elements of Physical Biology* (pgs. 367-77), via citation to how Gauss (1792) showed that Euclid's parallel axiom theorem, once believed to be a "necessary truth", is in fact but an "arbitrary assumption"

72

Anti-chance

HCR theorist

HFE theorist

"Science has not yet produced the Vignola of its ensemble architecture—the **'Newton' called for by Adams** (see: another Newton). Here we must wait not only for the coming of a Newton, but the development of a science not yet begun! Yet, as we observed, Alfred Lotka, among others, have broken ground in this direction."

— Roderick Seidenberg (1950), *Post-Historic Man* (pgs. 163, 170)

The "straining of a soap bubble to contract", an amoeba to "engulf food", and Newton straining his mind to "understand gravity", is explained by "one principle", according to Lotka, rooted in thermodynamics; first-slating: IQ:185-195 (c.2016).

(Cattell 1000:N/A) [RGM:N/A|1,320+] (Murray 4000:N/A) (CR:11) Greek engineer and mathematician;

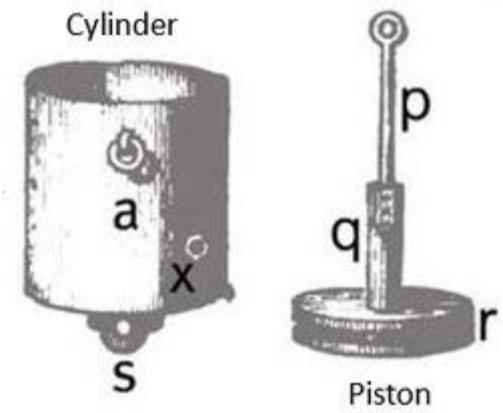

"It is said that **Ctesibius** invented the piston and cylinder before 200BC."

— Richard Kirby (1956), *History of Engineering* (pg. 154)

Ctesibius (c.285-222BC)

noted for a number of inventions, such as the 'aeolipile' (heat engine), pipe organ (hydraulis), counterweight adjustable mirrors, a water clock (clepsydra)—which more than 1,800 years the was the most accurate clock ever constructed, until the Christiaan Huygens detailed the use of pendulums to regulate clocks in the year AD 1656 — force pumps (water lifting device), the principle of the siphon; he published *On Pneumatics* (now lost) on the elasticity of the air; Influenced: Vitruvius, Athenaeus, Pliny the Elder, Philo of Byzantium, Proclus (the commentator on Euclid), and Hero; first-slating: 185|#80 (Feb 2018).

(Cattell 1000:63)

[RGM:127|1,500+] (Murray 4000:16|WP) (Gottlieb 1000:151) (Becker 139:5) (Stokes 100:31) (Perry 80:9) (HD:5) (FA:58) (GA:30) [RMS:18] (GPhE:14) [CR:173] was an English mechanical philosopher, social physicist, political theorist, and psychologist (Romanes, 1895);

Thomas Hobbes (1588-1679) IQ_C=165

"That when a **thing** lies still, unless somewhat else stir it, it will lie still forever, is a truth that no man doubts of. But that when a thing is in motion, it will eternally be in motion, unless somewhat else stay it, though the reason be the same, namely, that nothing can change itself, is

not so easily assented to. For men measure, not only other men, but all other things, by themselves; and because they find themselves subject after motion to pain, and lassitude, think everything else grows weary of motion, and seeks repose of its own accord; little considering, whether it be not some other motion, wherein that desire of rest they find in themselves, consistent.”

— Thomas Hobbes (1651), *Leviathan* (§2: On Imagination) (pg. 3)

He draws analogies between laws of mechanics and features of society, indirectly advocated atheism and initiated the field of human physics (see: HT pioneers); a noted "thing" philosopher, influential to Benedict Spinoza and his natural right of "things" theologico-political philosophy; first to debunk the view that Moses was the author of the Pentateuch.

(Cattell 1000:33) [RGM:20|1,330+] (Murray 4000:3|WP) (Perry 80:5|Li) (RMS:21) (CR:117|#37) German philosopher;

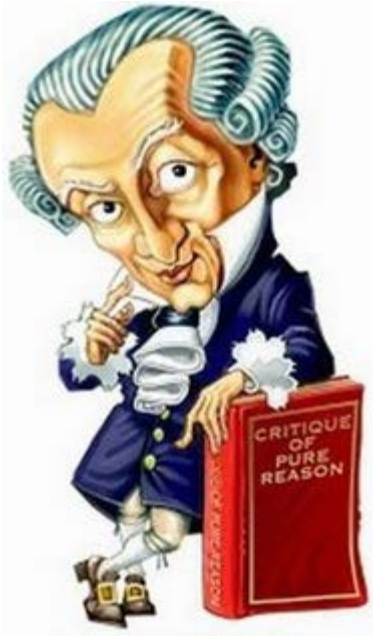

“There is only a single categorical imperative and it is this: act only on that maxim through which you can at the same time will that it should become a universal law.

— Immanuel Kant (1797), *Metaphysics of Morals* (Ñº)

Immanuel Kant (1724-1804) IQ_O=250+ IQ_C=175

fabled "last persons to know everything", an oft-cited "smartest person ever" missing candidate; generally known for his *Critique of Pure Reason* (1781); noted for doing work on the Nebular hypothesis (1755), the Abraham and Brahma problem (c.1769), the categorical imperative (1785), etc.; seems to have aimed to become a “modern Aristotle” of sorts; IQ of 250+ (Azak, 2011).

(Cattell 1000:N/A) (Gottlieb 1000:N/A) [RGM1301|1,500+] (Murray 4000:18|P) (CR:31) English chemist-physicist and physician;

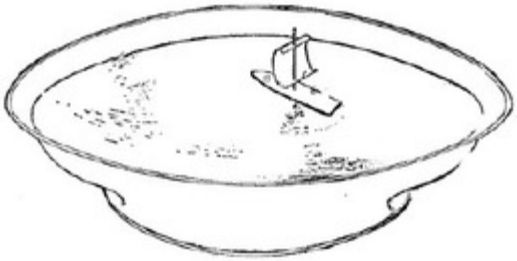

185 | 76

William Gilbert (1544-1603)

"In the discovery of secret things and in the investigation of hidden causes, stronger reasons are obtained from sure experiments and demonstrated arguments than from probable conjectures and the opinions of philosophical speculators of the common sort."

— William Gilbert (c.1590) (Ñº); compare: Otto Guericke

aka "father of magnetism"; introduced the term "electricity"; originator of the floating magnets experiment; his 1600 *De Magnete*, rejected Aristotle's natural philosophy, Galen's medicine, and Ptolemy's astronomy, and in its place situated an electricity-magnetism based Copernican cosmology; first-slating: 185|#84 (c.2015).

185 | 77

Roger Boscovich (1711-1787)

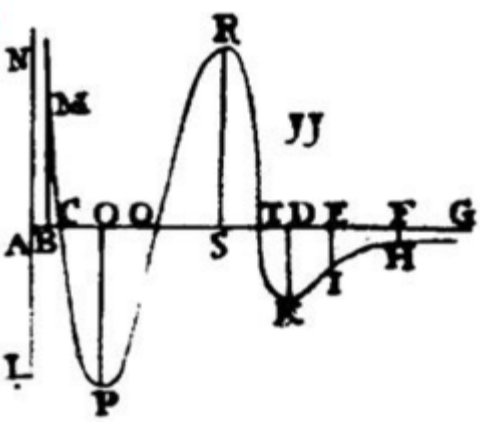

(Cattell 1000:N/A) [RGM:N/A|1,310+] (Murray 4000:N/A) (Eells 100:44) Croatian mathematical physicist, astronomer, engineer, architect, philosopher, diplomat, poet, theologian, and general polymath, aka the "Croatian Leibniz" (Heisenberg, c.1930); noted for his 1758 *Theory of Natural Philosophy*, wherein he outlined a stationary point atom theory (adjacent), viewing atoms a centers of force, with the overall aim to 'understand the structure of the universe in terms of a single idea'; influential to a large number of big geniuses, e.g. Faraday, Priestley, Davy, Kelvin, and Nietzsche; a 2012 missing top 400 genius candidate; (Ñº); down-grade per reason that his work tends to be cite by those, e.g. Lancelot Whyte, who try to sneak god into physical monism; first-slating: 185|#88 (Feb 2018).

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Emanuel Swedenborg (1688-1772) ↓↓ IQ_G=210 IQ_O=205 IQ_C=165

(Cattell 1000:84)

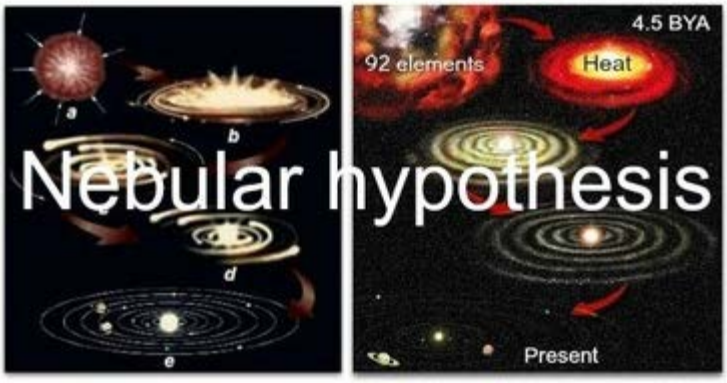

[RGM:127|1,500+] (Murray 4000:N/A) [LPKE] (CR:22) Swedish

scientist, philosopher, theologian, revelator, mystic; noted for early work on nebular hypothesis and atomic theory; downgrade ↓ for plethora of god talk quotes and angels assertions (Ñº).

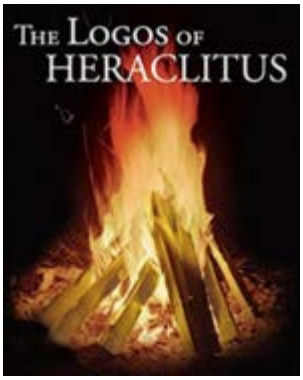

(Cattell 1000:721) (Stokes 100:4) (ACR:9) (Stokes 100:4|Presocratics) (Perry 80:1|Death) (GPhE:#) (CR:121) Greek physicist-philosopher;

"**Lightening steers the universe**."

> — Heraclitus (c.495BC), Fragment 64 (Ñº) (translator: Hans Diels); cited by Hippolytus (c.210AD)

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Heraclitus (c.535-450BC) ↑

"**Fire in its advance will judge and convict all things**."

> — Heraclitus (c.495BC), Fragment 66 (Ñº) (translator: John Brunet)

noted for his now lost *On Nature* (c.500BC), on the universe, politics, and theology, wherein he outlines a three element theory, according to which the universe is comprised of three principle elements: fire, earth, and water, but that fire was the primary element, controlling and modifying the other two, and that everything is in a continuous state of flux, or change, and war and strife between opposites is the eternal condition of the universe; Nietzsche considered his world view to be Heraclitean one; first-slotting: 180|#99 (Apr 2018); upgraded to 185|#81 per digestion of his first 66 fragments (Dec 2018).

80 | 185

Hugo Grotius (1583-1645) ↓ IQ_C=200 IQ_W=197

(Cattell 1000:125) [RGM:255|1,330+] (Murray 4000:N/A) (CR:14) Dutch jurist and international relations theorist; had theory of the origin of war, supposedly, similar to Thomas Hobbes (Ñº); believed that in relations between nations there were natural laws which needed only research and reason to discover their principles.

81 | 185

Satyendra Bose (1894-1974) IQ_{CP}=187

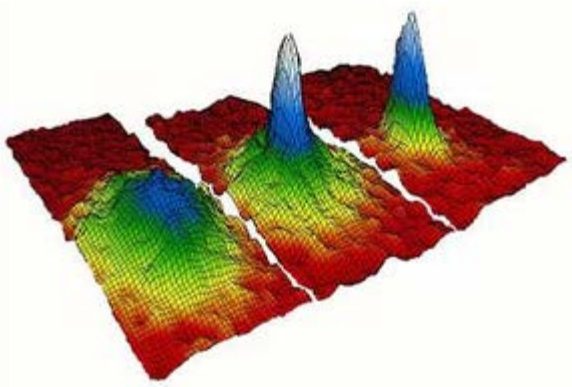

[RGM:1,140|1,260+] (LGS:1) (CR:11) Indian mathematical physicist; noted for his 1919 proof that Max Planck's theory of heat radiation could be deduced from Albert Einstein's theory of photons, for his 1925 prediction, with Einstein, of Bose-Einstein condensate (adjacent), confirmed in 1995; and for his general Bose-Einstein statistics, which bosons obey; mean genius comparison IQ of 187; a top 500 missing genius candidate. (Ñº)

(Cattell 1000:154) (Cattell 1000:154) [RGM:106|1,500+] (Gottlieb 1000:N/A) (CR:37) German philosopher, physicist, and panpsychist (Skrbina, 2005), noted for

82 | 185		Friedrich Schelling (1775-1854) IQ_C=190 ↓	his circa 1796 natural philosophy theory, an attempt go beyond the mechanistic universe views of Rene Descartes and Newton and to go beyond the model of Immanuel Kant, all while aiming to bring all the sciences, human will and feelings, affinity, electricity, and magnetism, together into one unified theory; the theory, however, supposedly, ran amuck in a "mystery forces" language; aspects of the theory were said to have influenced Goethe, the theory was later rejected by the Helmholtz school; caricature (Ñº) shows Schilling smelling a beautiful flower, while thinking about this beauty in terms of the philosophies of Kant and Descartes.
83 | 185		Ettore Majorana (1906-1938)	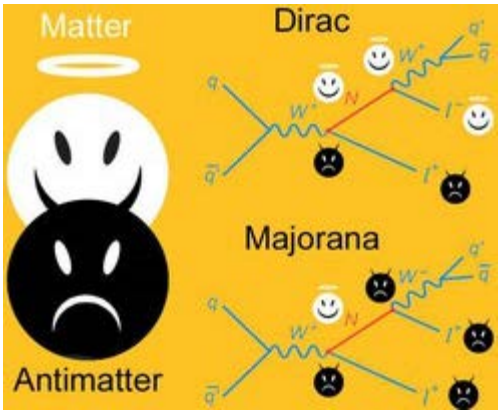 (CR:54) (RE:32) Italian engineer and theoretical physicist; noted as first to predict the existence of the neutrino (discovered experimentally by James Chadwick); for synthesis of the exchange force theory of nuclear bonding; and for his *circa* 1935 sociophysics article “The Value of Statistical Laws in Physics and Social Sciences”, in which he suggested the application of quantum statistical physics to social sciences; ranked as on par with Galileo and Newton (Fermi, 1938); many things (Ñº) in particle physics are named after him; first-slating: 195 (c.2016); downgraded to 185|#87 (c.2017), until further digestion of work resumes.
84 | 185		Jean d'Alembert (1717-1783) IQ_C=185	(Cattell 1000:124) (GME:26) (GPE:71) (CR:35) French mathematical physicist and encyclopedist; known for d’Alembert’s principle; PhD advisor to Pierre Laplace (see: Euler genealogy); noted encyclopedist: his 1772 *Encyclopedie*, co-written with Denis Diderot, is said to mark “end of an area in which a single human being was able to comprehend the totality of knowledge” (see: "last persons to know everything").
			↑ 185+

(Cattell

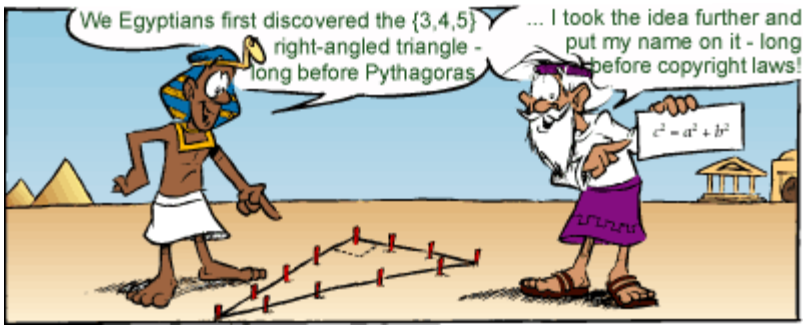

| 180 | 86

Pythagoras (c.570-490BC)

1000:89) [RGM:15|1,500+] (GME:11) (ACR:6) [CR:115] Greek mathematician and philosopher;

“Know, so far as is permitted thee, that nature is in all things uniform.”

— Pythagoras (c.500BC)

a student of Thales, from whom he gained an appreciation of geometry, and Thales' pupil Anaximander (who may have also been Pythagoras' pupil); popularly known for his Pythagorean triangle (adjacent), the sides of which abide by the following equation: $a^2 + b^2 = c^2$; a smartest person ever candidate (Ñº); gauged (Ñº) an over-rated genius; first-slating: 180|#90 (c.2017).

| 180 | 87

Lucretius (99-55BC)

IQ_{CP}=180

(Cattell 1000:209) [RGM:682|1,500+] (EvT:6|21+) [CR:281] Greek atomic theory philosopher;

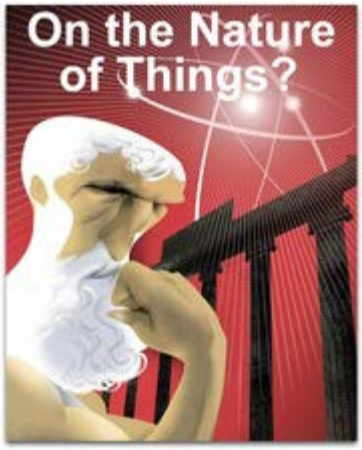

“Fools admire and like all things the more which they perceive to be concealed under involved language, and determine things to be true which can prettily tickle the ears and are varnished over with fine sounding phrase.”

— Lucretius (55BC)

first of Hmolpedia's "famous publications" listing; compared intellectually to Lord Byron (Flaubert, c.1875); characterized a "brilliant genius" (Cicero, c.45BC).

| 180 | 88

William Rankine (1820-1872)

(CR:105) Scottish engineer, mathematical physicist, and thermodynamicist, of the Glasgow school of thermodynamics; noted for being, according to James Maxwell, one of the “three founders”, along with Rudolf Clausius and William Thomson, of “theoretical

Let x denote beauty, y manners well-bred,
z fortune (this last is essential),
Let L stand for love—our philosopher said—
Then L is a function of x, y and z
Of the kind that is known as potential.

Now integrate L with respect to dt
(t standing for time and persuasion)
Then, between proper limits, 'tis easy to see
The definite integral Marriage must be
(A very concise demonstration).*

thermodynamics"; noted for his thermodynamic function (1854), the forerunner to entropy; his "The Mathematician in Love" (1874), outlines, via rhyme, an equation of love, and correctly describes love as a form of thermodynamic potential; first-slating: 180±|#104 (c.2017).

89 | 180

Niels Bohr
(1885-1962)

[RGM:47|1,500+] (LGS:1) (CR:76) Danish physicist; his 1913 "Bohr model" of the atom proposed that normally each electron in an atom is confined to a particular electron shell or what he called "orbits" (see: molecular orbital theory),

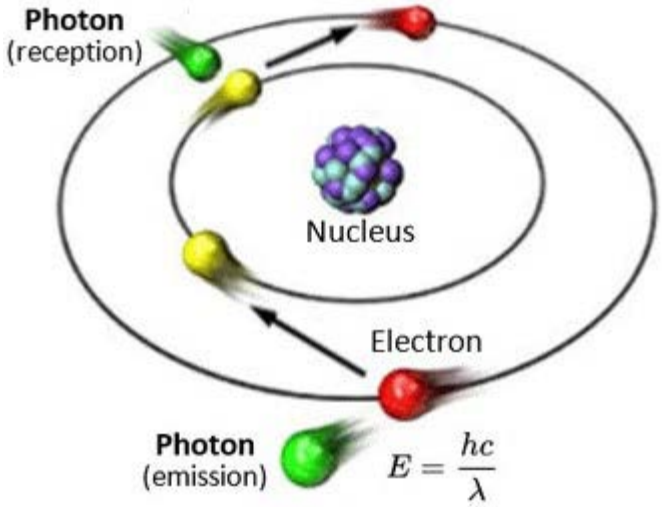

which may be spherical as well as elliptical, but that—in very a very science-redefining way—an electron can move or "jump" between adjacent orbits or orbitals only when the atom (or electron?) emits or absorbs a certain quantum amount (energy element amount) of radiant energy, of the amount 'hν', where h is Planck's constant and ν (nu) is the frequency of the electromagnetic energy or light emitted or absorbed; first-slating: IQ:175-185 (c.2016); downgrade ↓ from 185|#77 to 180|#90 following digestion of his *Atomic Physics and Human Knowledge* (1958) lectures, wherein he attempts to defend, in a puerile middle ground sense, the concepts of life, free will, and teleological like purpose, via recourse to uncertainty principle arguments (Oct 2018).

$$\Delta x \, \Delta p \geq \hbar$$

Δx = uncertainty in position
Δp = uncertainty in momentum
$\hbar$ = $h / 2\pi$

90 | 180

Werner Heisenberg
(1901-1976) $IQ_{B=173}$

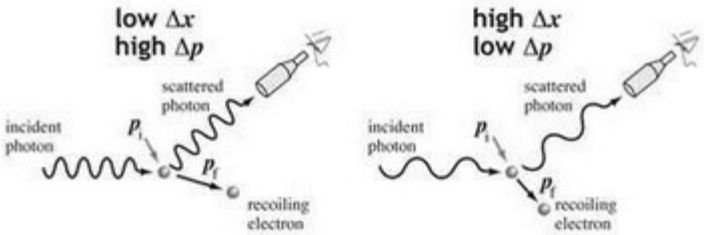

[RGM:37|1,500+] German physicist; student of Niels Bohr; known for: uncertainty principle, exchange force.

(Cattell 1000:157) [RGM:18|1,500+] (Murray 4000:4|CS / 2|A) (GAE:4) [CR:100] German mathematician

180 | 91

Johannes Kepler (1571-1630) IQ_C=175

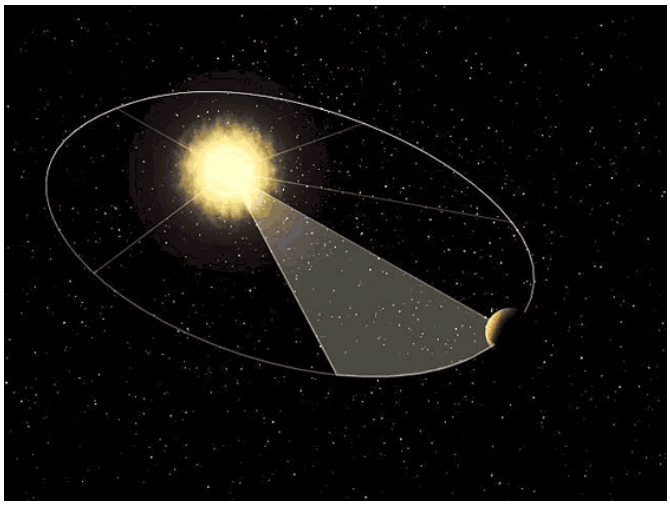

and astronomer; a fabled "last persons to know everything", known for his 1619 three laws of planetary motion, according to which planets, based on the Copernican model, move not in spherical but rather “elliptical” orbits, which he derived from astronomical observations made by Tycho Brahe, that planets move faster at perihelion and slower at aphelion, according to geometric rules, and that "a line between the sun and the planet sweeps equal areas in equal times" (second law), as shown adjacent; his work provided foundations for Isaac Newton’ theory of universal gravitation; down-grade ↓ for believing that planets were moved by angels flapping their wings (see: Ra).

180 | 92

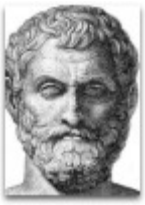

Thales (c.624-546 BC)

(Cattell 1000:914) [RGM:84|1,500+] (Eells 100:62) (Stokes 100:1) (EvT:1|21+) (GPhE:#) [CR:91] Greek physical scientist and philosopher;

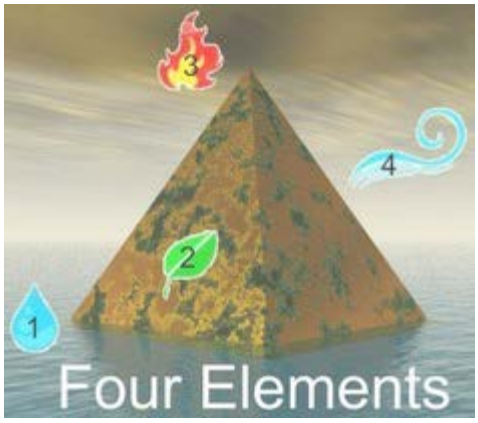

"The principle of all things is water. For all is water and all goes back to water."

root scholar of Greek philosophy (70+ philosophers); after studying in Egypt, he reformulated Egyptian water god Nun into a secular first principle of science, i.e. water as first principle, out of which fire and earth are formed (see: three element theory; four element theory); first-draft IQ gauged at 165-185 (c.2015).

180

Charles Sherrington (1857-1952)

(RE:95) [CR:123] English physiologist and philosopher;

“Both the scientific and the everyday ‘elbow’ are one and the same system of electrical charges. It is of no use asking physics and chemistry whether it is ‘alive’. They do not understand the word. When physics and chemistry have entered on their description of the perceptible, life disappears from the scene, and consequently death. Both are

—
93

anthropisms."

— Charles Sherrington (1938), *Man on His Nature* (pgs. 236, 260)

his *Man on His Nature* (1938), building on Jean Fernel (IQ:180|#175), and his *On the Hidden Causes of Things* (1542), who overthrows Aristotle, e.g. "Did not Aristotle well and truly say, and leave it written for all posterity, that: 'Heat is the condition of life'?", rips the mind into a calm sea, in respect to the defunct theory of life purview, life terminology reform, life does not exist conclusion, and abioism stronghold; first-draft slated at top 500 genius position #100 (May 2017).

(Cattell 1000:393)

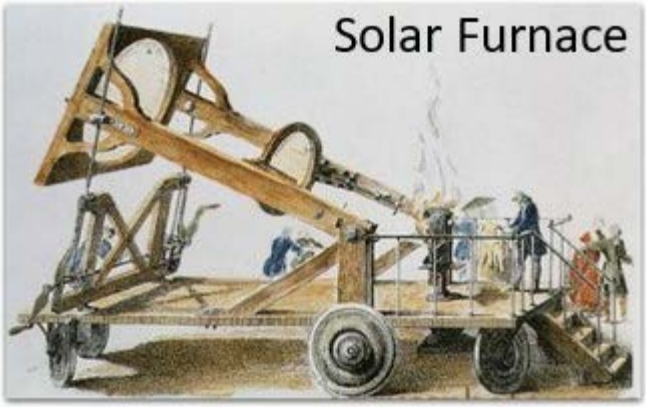

— | 180
94

Antoine Lavoisier (1743-1794) IQ_C=170

[RGM:285|1,500+] (Murray 4000:5|CS / 1|C) (Gottlieb 1000:67) (Partington 50:5) (GCE:2) (CR:157) French chemist;

> "It took them only an instant to cut off **that head**, but it is unlikely that **a hundred years** will suffice to reproduce a similar one."
>
> — Lagrange (1794), on his guillotine

His *Elements of Chemistry* (1789), building on the early model of heat as phlogiston (Stahl, 1703), formulated a new heat as "caloric" model, i.e. caloric theory, which was later superseded by entropy (Clausius, 1865).

(Cattell 1000:83)
[RGM:54|1,500+] (Gottlieb 1000:40) (GPhE:#) (CR:53)
Italian realism philosopher, historian, politician, and diplomat;

"We are much beholden to **Machiavelli** and others, that write what men do, and not what they ought to do. For it is not possible

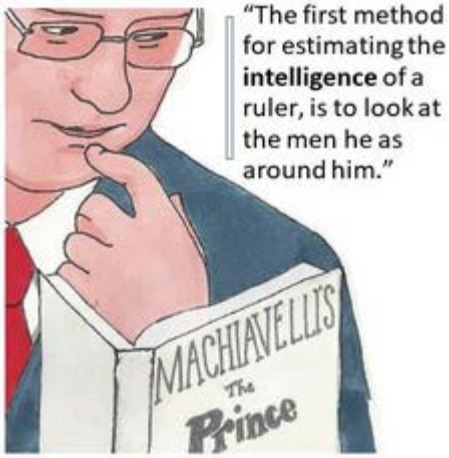

9 | 180
95

Niccolo Machiavelli (1469-1527) IQ_B=165

to join serpentine wisdom with the columbine innocency, except men know exactly all the conditions of the serpent; his baseness and going upon his belly, his volubility and lubricity, his envy and sting, and the rest; that is, all forms and natures of evil. For without this, virtue lieth open and unfenced. Nay, an honest man can do no good upon those that are wicked, to reclaim them, without the help of the knowledge of evil."

— Francis Bacon (1605), *The Advancement of Learning* (Ñº)

upgrade for his "end justifies the means philosophy" (Machiavellian philosophy), as detailed in his *The Prince*; his fox/lions typology of human instincts is said to have influenced Vilfredo Pareto's circulation of elites theory; supposedly, first to advance the idea of cyclic development of societies; the term "Machiavellian intelligence" (Ñº) or Mach IQ (Ñº)(Ñº), a kind of realism social IQ (or political IQ), is named after him.

(Cattell 1000:330) [RGM:35|1,500+] (Gottlieb 1000:119) (Murray 4000: 7|CS / 17|T) [Cropper 30:1|EM] (SIG:7) (GPE:11) (CR:102) English physicist, chemist, and philosopher;

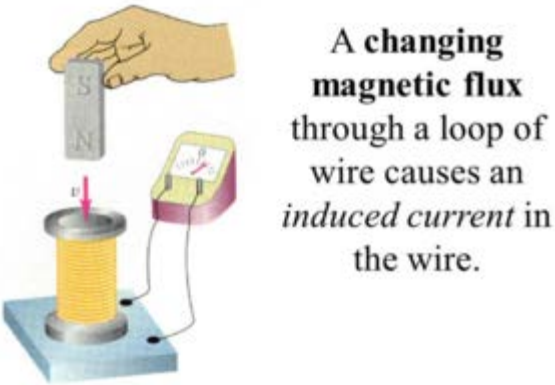

"Let us now consider, for a little while, how wonderfully we stand upon this world. Here it is we are born, bred, and live, and yet we view these things with an almost entire absence of wonder to ourselves respecting the way in which all this happens. So small, indeed, is our wonder, that we are never taken by surprise; and I do think that, to a young person of ten, fifteen or twenty years of age, perhaps the first sight of a cataract or a mountain would occasion him more surprise than he had ever felt concerning the means of his own existence: How he came here; how he lives; by what means he stands upright; and **through what means he moves about from place to place**. We come into this world, we live, and depart from it, without our thoughts being called specifically to consider how all this takes place; and were it not for the exertions

9 | 180
96

Michael Faraday (1791-1867) ↑

IQ_{SS}=230
IQ_B=180
IQ_{CB}=**175**
IQ_C=170

of some few inquiring minds, who have looked into these things, and ascertained the very beautiful laws and conditions by which we do live and stand upon the earth, we should hardly be aware that there was anything wonderful in it."

— Michael Faraday (1859), *On the Various Forces of Matter*

97 | 180

Roger Bacon (1214-1294)

known for: the basic principle of the electric motor, generator, induction coil, and transformer; work in chemistry; electromagnetic induction, largely self-taught through reading of books at a bindery he worked at as a child; intellectual giant to Einstein.

(Cattell 1000:199) [RGM:364|1,310+] (Murray 4000:N/A) (MAG:1) English natural philosopher;

"Argument is conclusive, but it does not remove doubt, so that the mind may not rest in the sure knowledge of the truth, unless it finds it by the method of experiment."

— Roger Bacon (c.1280)

a two cultures genius, a last person to know everything claimant, a "savant with an enormous encyclopedic mind" (Hackett, 1980), and the so-called "first scientist" (Clegg, 2003), and originator of the scientific method; upgraded ↑ from 175±|#154 to 180|#109 (2017).

98 | 180

Plato (c.423-348BC)

IQ_{SS}=225
IQ_{B}=180

[RGM:5|1,240+] (Cattell 1000:10) (Murray 4000:2|WP) (Perry 80:1|Li) (GPhE:2) (CR:271) Greek philosopher;

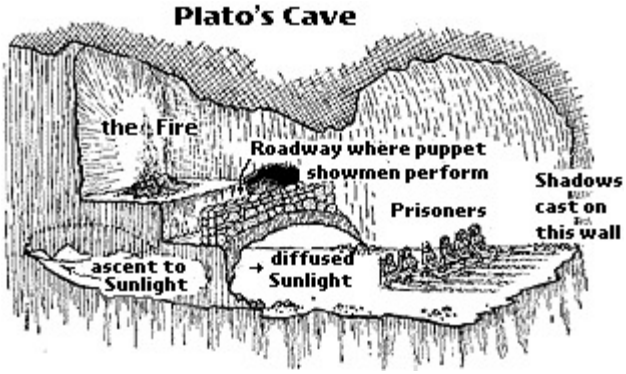

"The intense yearning which lovers have toward each other does not appear to be the desire for sexual intercourse, but for something else which the soul of each desires and cannot tell, and of which he or she has only a dark and doubtful presentiment."

— Plato (c.380BC), voice of Aristophanes, *Symposium*

teacher of Aristotle; known for: Plato's cave (expositor: Socrates), Plato's god, soul mate theory (expositor: Aristophanes), allegory of the charioteer, etc.; upgrade ↑ for his first law of affinity, i.e. likes attract; downgrade ↓for saying that to buy up and burn all the works of Democritus; downgrade ↓ for harsh reviews by d'Holbach (1770),

who calls him the ‘great inventor of chimeras’, and Jefferson (1820), who says ‘no writer, ancient or modern, has bewildered the world with more *ignes fatui* [misleading influence]’; down-slated from 180|#89 (2014) to 180|#110 (early 2018); up-slated to 180|#100 (Apr 2018).

99 | 180

John Strutt (1842-1919)

[RGM:N/A|1,310+] (CR: 21) English physicist; called, by some, the “last of the great Victorian polymaths” (IQ_{AVG}=196); noted for his 1870 discussions with Ludwig Boltzmann on the so-called truth of the second law; his 1871 "scatter theory" **solved the two-millennium old blue sky problem**, about which he gave the definitive explanation of in 1899; his 1892 discussions with Willard Gibbs on statistical mechanics; his 1894 isolation, with William Ramsay, of the element argon (work for which he would win the 1904 Nobel Prize in physics); and his 1900 formulation of spectral energy flux density of black body radiation, which led to the ultraviolet catastrophe problem, and hence to the "energy element" solution by Max Planck, which launched the science of quantum mechanics; original slating: 180-190 (c.2015); down-graded ↓ from 190|#41 to 185|#86 (Apr 2018); down-graded ↓ to 180|#101 (Dec 2018) to make room for Heraclitus.

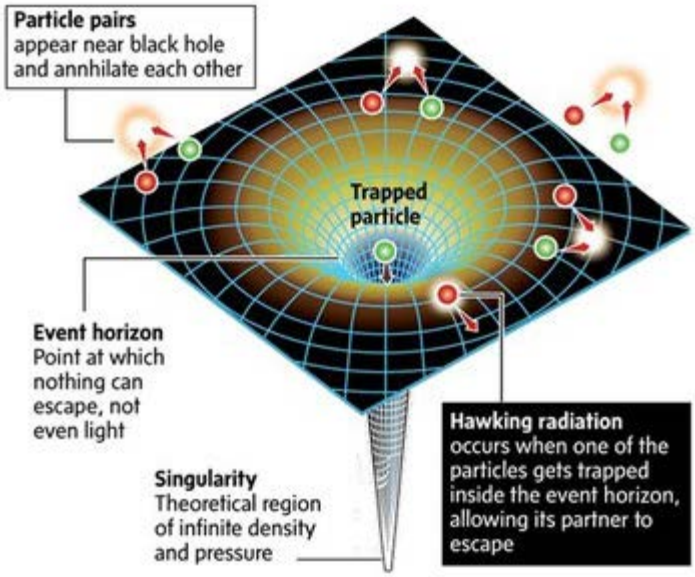

100 | 180

Stephen Hawking (1942-2018)

IQ_O=280
IQ_{MN}=200-250
IQ_{SS}=205
IQ_B=180
IQ_O=160

[RGM:19|1,500+] (Murray 4000:N/A) (CR:118|#30) (DN:7) British astrophysicist and philosopher;

“People who talk about their **IQ** are losers.”

> — Stephen Hawking (c.2005), when asked what his IQ was (*New York Times* interview)

noted for his 1965 PhD thesis, stimulated by research of Rodger Penrose, and based on Albert Einstein’s 1914 general theory of relativity, which argued that if a star can collapse inwards to form a

singularity, coined a "black hole" in 1967 by American physicist John Wheeler, then so to can a singularity explode back outward; thus giving an explanation for the Big Bang; popularly noted for his 1988 *A Brief History of Time*, wherein he gives a short history of the universe, in layperson's terms, the illustrated version of which gives a learning and brain entropy decrease diagram, one of the keys to Thims (2001) discernment of entropy, education, and Beckhap's law; previously listed at #1 in genius IQs existive rankings and #1 ranked existive RGM rankings; some rank him (Ñº) close to Lev Landau on the Landau genius scale; first slating: 185|#85 (Mar 2018); downgraded to 180|#103 (Apr 2018) per cautious intuition of not quickly thinking a person can jump into the top 100 position the day after their existence cessation.

(add)

Quotes | Related

See main: Top 1000 geniuses (quotes)

The following are related quotes:

"Lestrade (Ñº) to be let loose on such a study is exactly as pathetic as for a subnormal waitress in the IQ of 90 range to try to measure the intellectual differences in college students."

— John Platt (1962), "The Coming Generation of Genius" (pg. 73)

"For all of you out there in Twitterland that think he or she is **extremely smart**, check out Hmolpedia to see how you compare with the **geniuses**."

— Kevin Edward (2016), Tweet (Ñº), Nov 13

"I love this site. It's pure genius. I have never seen someone **rank geniuses in such a brilliant way**. I dedicated a [468+ genius] genealogy project (Ñº) to your work. You even have a [Geni.com] profile (Ñº) … because I feel your work deserves wider recognition. I am fairly intuitive … I feel you are descended from Goethe (or another genius on your list)."

— Alex Bickle (2017), site message [via oye777] to Libb Thims, Feb 22, 25

"This [**top 1000 geniuses**] site is very good. Interestingly, outside Goethe and Leonardo da Vinci, most of the smartest on the list are physical [GPE] or mathematical [GME]. So, it is not mistaken the conception that studying physics or mathematics is the type of study that most requires intelligence to be undertaken [see: college degrees by intellectual difficulty]. Only below are philosophers and writers begin to appear. But I was surprised that there are no such genius composers as Beethoven, Bach, Brahms, and Wagner, or painters and sculptors, like Michelangelo, Renoir, and Van Gogh in the top 100. I cannot know which of the IQ indicators is the most reliable. I think the IQ_{Real} (see: real IQ) presented is a good estimate. Note that above 180, which is taken as the lower limit of genius, there are only 209 people, which shows the rarity of genius, considering that more than twenty billion human beings must have been born [see: number of

people who have existed]. Of course, many are not on the list because they were not prominent people."

— Ernesto Ruckert (2018), "Response to Pabis Zanin" (Ñº)(Ñº), May 7

"Libb Thims' Hmolpedia Project has a page [**Top 1000 Geniuses**] with 315 historical persons that Mr. Thims estimates had an IQ of 175+. In these, 71 appear in my list of 330. Another 15 or so from my Top 330, appear on Mr. Thim's lists for IQs 160-174."

— James Allen (2019), Discussion (Ñº) about my List of Greatest Mathematicians

"David Mayer carries around a piece of paper [see: paper IQ] that says he is ranked as having the 93rd highest IQ of all time. That would place him 7 places above Stephen Hawking who is ranked at 100. Naturally, this is complete bullÅ›hit. Source: Top 1000 Geniuses Of All Time."

— Julian Leahy (2019), "AI Global Forex Review" (Ñº), Jan 26

Next

â— **Top 1000 geniuses: 1-100** | IQ: 225-180
â— Top 1000 geniuses: 101-200 | IQ: 180-180
â— Top 1000 geniuses: 201-300 | IQ: 180-175
â— Top 1000 geniuses: 301-400 | IQ: 175-170
â— Top 1000 geniuses: 401-500 | IQ: 170-165
â— Top 1000 geniuses: 501-600 | IQ: 165-160
â— Top 1000 geniuses: 601-700 | IQ: 160-150
â— Top 1000 geniuses: 701-800 | IQ: 150-140
â— Top 1000 geniuses: 801-900
â— Top 1000 geniuses: 901-1000
â— Top 1000 geniuses (candidates)

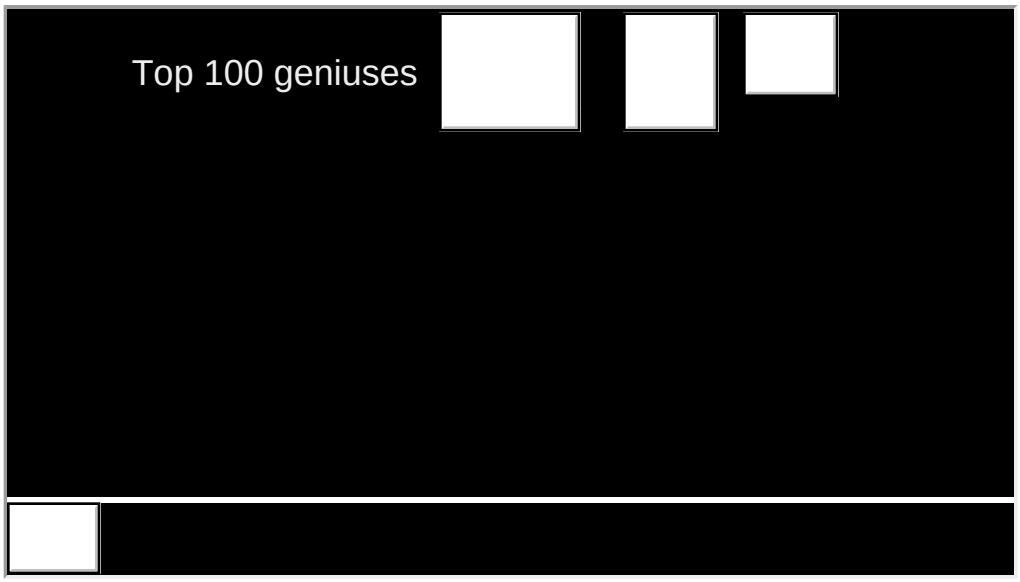

A Nov 2017 1:39-min video overview, by Libb Thims, of the **"top 100" geniuses**, at a point when about 600 geniuses, of the top 1000, had been ranked (see: chronology).

Notes

N1. Other rankings employed include: IQ:200+ (40 individuals) + candidates (two dozen), IQ:225+ (10 individuals), IQ:150+ women (26 individuals), Glenn 20 greatest minds, Stokes 100 essential thinkers, Landau genius scale, the 121 main "cities" (minds) of Porter's 1939 **Map of Physics**, etc., plus others in the genius studies subpages, e.g. greatest physicist ever, greatest chemist ever, greatest philosopher ever, greatest mathematician ever, etc., plus genius rankings (meta-analysis), plus new listings, such as: Ranker greatest minds (1,500+ people), Oduenyi 100, Perry 80, etc.
N2. (a) This genius ranking list originated, in short, when Thims, in the in the late 1990s, began collecting all known individuals cited with IQs of 200 or over, and thereafter, in the period 17 Feb 2010 and 29 Sep 2010, was **"forced"** (no metaphor intended; which, of course, is the **"point"** [no metaphor intended, again], compare: pointlessness (Weinberg model) vs pointfullness models (e.g. Gates model) of existence, of Hmolpedia, into "re-ranking geniuses", when, in particular, he found the curious cases of forced prodigy Adragon de Mello, cited with an IQ cited at 400

(calculated by his father), who for seven months was added to position #1, during which time re-ranking became apparent, e.g. that it is obvious that de Mello is not TWICE as smart as Newton, if we let their respectively "cited IQs" determine their ranked geniuses listing (see: list chronology).
(b) This specific page, then entitled "top 500 geniuses" was started at the point (Jan 2014) when the genius IQs page was at the **460+** geniuses level, i.e. 421 (listed) + 39 (candidates page), but getting difficult to edit, per wiki editing capabilities, i.e. extreme slowness (upwards of 45s wait time per edit) as one continuous page, not to mention page crashes.
(c) On 23 Nov 2017, at the point when the list was pushing the 540+ geniuses level, on now six wiki pages, the entire list was changed from the "top 500 geniuses" to the "top 1000 geniuses". This expanded spreading allows for more accurate fitting of where to fit geniuses like Evariste Galois (1811-1832), when unranked but known as: (RGM:612|1,310+) [GME]; Glenn 20 greatest minds (1996); ranked as “world’s 50 smartest teenagers” (2014) (Ñº); Quora compared (Ñº) to Terence Tao (2016), a top ranked existive genius (see: genius IQs existive), to historical geniuses like Adrien Legendre, who he read at age 14, and Joseph Lagrange (IQ:190|#24), who he read at age 15.
(d) The re-naming, to note, reset the Facebook like count (then at 75) to zero (see: like rankings)
N3. See "IQ key" page for IQ subscript symbol meaning.

Category | Focused

The following genius category focused subset pages, give a topic specific x-ray of the top 1000 geniuses listing:

- â— Greatest artistic geniuses
- â— Greatest black geniuses
- â— Greatest female geniuses
- â— Greatest fictional geniuses ever
- â— Greatest mathematician ever
- â— Greatest middle ages geniuses
- â— Greatest military geniuses
- â— Greatest musical geniuses

Videos

- â— Top 100 geniuses | IQ:180-225 (2017)

External links

- â— Famous Historical Genius IQs (697 individuals) – Geni.com.

θΔics

In genius studies, **top 1000 geniuses (candidates)** refers to potential genius candidates who might fall into the top 1000 geniuses of all time rankings. [N1]

Candidates

The following is a work-in-progress listing, by date of addition (most recent additions at top) of 100+ possible draftee genius potentials , which are in the consederation stage, to be added to the "top 1000 geniuses" rankings:

IQ		----------
—		----------
###		-
	Umberto Eco (1932-2016)	
	Porphyry (233-305)	
		(CR:2) Belgian-born (Q) French-Latin philosopher;
1.	Siger of Brabant (c.1240-1284)	"For not every being has a cause of its being, nor does every question about being have a cause. For if it is asked why there is something in the natural world rather than nothing, speaking about the world of created things, it can be replied that there is a first immoveable mover, and a first unchangeable cause. But if it is asked about the whole universe of beings why there is something there rather than nothing, it is not possible to give a cause, for it's the same to ask this as to ask **why there is a god or not**, and this does not have a cause. Hence, not every question has a cause, nor even every being." — Siger of Brabant (c.1275), *Publication* (Q) aka the "Latin Averroes", noted for his secular interpretation (Q) of Aristotle; in his *Impossibilia*, presented the idea that "there is no god" (see: god does not exist), intended an intellectual training tool for students in logical disputation; the Condemnation of 1277 was, supposedly, a response to radical thinkers, such as Brabant; Dante, in the Divine Comedy, put Siger in the 'Heaven of Light' in the brilliant company of twelve illustrious souls, specifically beside Thomas Aquinas and Isidore of Seville.
2.	Walter Schottky (1886-1976)	(CR:1) German physicist, electrical engineer, and thermodynamicist; after getting his PhD under Planck, he pioneered semiconductor technology, inventing things such as the Schottky diode, Schottky barrier; the then penned his *Thermodynamics: The Theory of the Circular Processes of Physical and Chemical Changes and Equilibria*, wherein he not only introduced the "G" symbol for the isothermal, isobaric chemical potential, aka Gibbs energy, which

is the chemical potential of society, introduced thing such as: the "Schottky anomaly", a peak of heat capacity, and "Schottky system" (Muschik, 1990).

3. Charles Peirce (1838-1914)

[RGM:667|1,500+] (Becker 139:51) (Stokes 100:60) (CR:15) American chance-based philosopher and logician; noted for

4. Hasan Sabah (c.1050-1124)

See: Marco Polo.

5. Simone Beauvoir (1908-1986)

[RGM:419|1,500+] (Stokes 100:75) (Becker 139:25) (CR:16) French writer, atheist, and existentialism philosopher:

"God is a name for nothing more than a cover of a mirage."

— Simone de Beauvoir (c.1950), *Publisher*

noted for

6. Gilles Deleuze (1925-1995)

(RGM:726|1,500+) (Becker 139:94) (HuCR:12) (GPhE:#) (CR:7) French atheist philosopher; noted

7. George Scott (1921-2002)

8. Giovanni Porta (1535-1615)

(EP:6) (CR:17) Italian mathematician, chemist, physicist, and general polymath; noted for his 1586 invention of a telescope, able to see things miles away, and for his 1601 steam engine constructions, based on the earlier models of Hero (50AD).

9. Zu Chongzhi

(Oduenyi 100:51) Chinese astronomer, mathematician, politician, inventor; calculated pi to seven places a record beat until al-Kashi (c.1400) (Q); in astronomy, he was able to make a calendar with this degree of accuracy since he had calculated the length of the tropical year (time between two successive occurrences of the vernal equinox) as 365.24281481 days (an error of only 50 seconds from its true value of 365 days 5 hours 48 minutes 46 seconds), and a nodal month for the moon of 27.21233 days (compare the modern value of 27.21222 days) (Q); inventor of human-powered paddle wheel boats; a

(429-500)

Hedkandi2 (Q) top 1000 missing candidate (Apr 2020).

10.

Diophantus (c.207-293)

(Murray 4000:13|M) (Eells 100:26) (Allen 100:38) (GME:22) Alexandrian mathematician; a Hedkandi2 (Q) top 1000 missing candidate (Apr 2020).

11.

Pierre Duhem (1861-1916)

(CR:34) French mathematical physicist, chemical thermodynamicist, historian, and philosopher of science, characterized an "uneasy genius" (Demartres, 1892) (Q); noted for his age 26 penned a “Study of the Thermodynamics Works of Willard Gibbs” (1887); gave commentary on the Condemnation of 1277; a Philoepisteme (2018) top 10 missing top 1000 genius candidate (below).

12.

Giotto (1266-1337)

[RGM:729|1,500+] (Gottlieb 1000:219) (Murray 4000:8|WA) (GAG:#) (CR:3) Italian painter and architect;

“Giotto, Titian, Rembrandt, and Goya were the great painters. I am only a public clown.”

— Pablo Picasso (1952), Interview (Q)

Noted for artwork in the "halo" article; influential to John Ruskin.

13.

Lewis Carroll (1832-1898)

[RGM:615|1,500+] (Gottlieb 1000:845) (CR:3) English writer, mathematician, photographer; noted for world-famous children’s fiction, e.g. Alice in Wonderland, Through the Looking Glass, and the poem Jabberwocky (see: Lotkean Jabberwocky); the number "42" is employed in his work four times; a Quora-posited (2018) possible (Q) genius.

14

Henry Carey (1793-1879)

(SN:10) (CR:105) American physical science applied sociologist and economist;

15. Keith Burton (1922-1996)

16. Thomas Newcomen (1664-1729)

[RGM:714|1,500+] (EP:17) (CR:29) English engineer;

17.

Emile Clapeyron (1799-1864)

(CR:63) French mining engineer and physicist; his “Memoir on the Motive Power of Heat”, brought Sadi Carnot’s 1824 paper *Reflections on the Motive Power of Fire* into the public light, and with the very important use of the Watt indicator diagram,

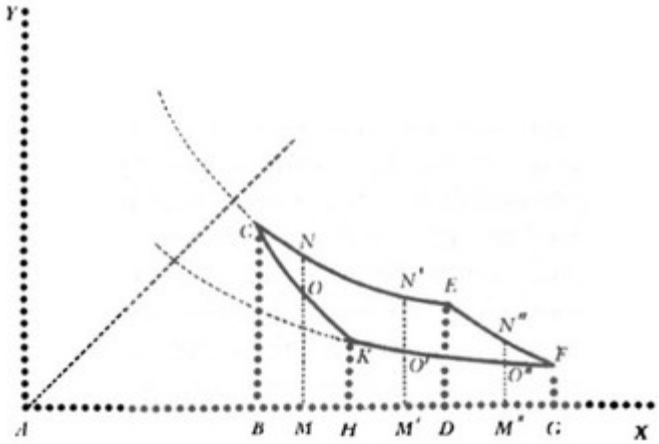

employed to update graphically Carnot's arguments.

(Cattell 1000:571) (EPD:F2) (GPE:#) (CR:41) American-born English physicist;

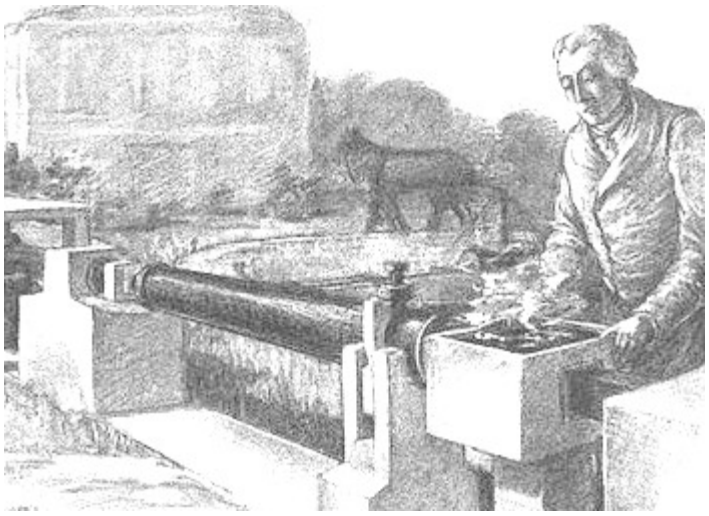

"**Rumford** has informed us himself that he should probably have remained in the modest condition of his ancestors if the little fortune which they had to leave him had not been lost during his infancy. Thus, **like many other men of genius**, a misfortune in early life was the cause of his subsequent reputation. His **father died young** [age 2]. A second husband removed him from the care of his mother, and his grandfather, from whom he had everything to expect, had given all he possessed to a younger son, leaving his grandson almost penniless. Nothing could be more likely than such a destitute condition to induce a premature display of talent."
— Georges Cuvier (c.1815), *Publication* (pg. 9)

18.
Benjamin Thompson (1753-1814)

noted for his 1798 cannon-boring experiments (compare: ice rubbing experiment, 1799), which provided data for the first calculation of the mechanical equivalent of heat, and which laid question to the then-established caloric theory, as discussed in his famous "An Inquiry Concerning the Source of Heat which is Excited by Friction"; after disproving Antoine Lavoisier's caloric theory of heat, he then married his wife (Lavoisier having been guillotined in 1794).

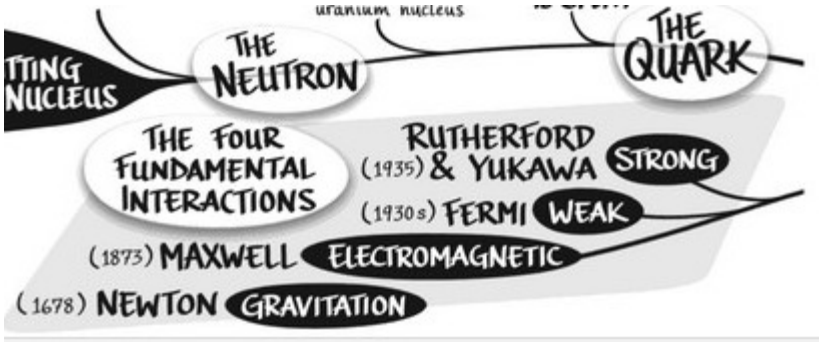

19.
Hideki Yukawa (1907-1981)

Japanese theoretical physicist; noted for his prediction (1935) of the pion or "pi meson" particle; considered,

along with Ernest Rutherford, a pioneer of theory of the strong nuclear force; considered a "genius" (Dalitz, 1985) among modern physicists; adjacent section of "atomic theory" diagram, section four fundamental interactions, indicates his general big name stature (Hanlon, 2020).

20.

Jan Ingenhousz (1730-1799)

Dutch physician, physiologist, biologist, and chemist; noted for his 1779 discovery of photosynthesis and for his 1789 heat conduction in wires experiments; adjacent photo is a 2017 Google Doodle (Q) commemorating his 287th birthday.

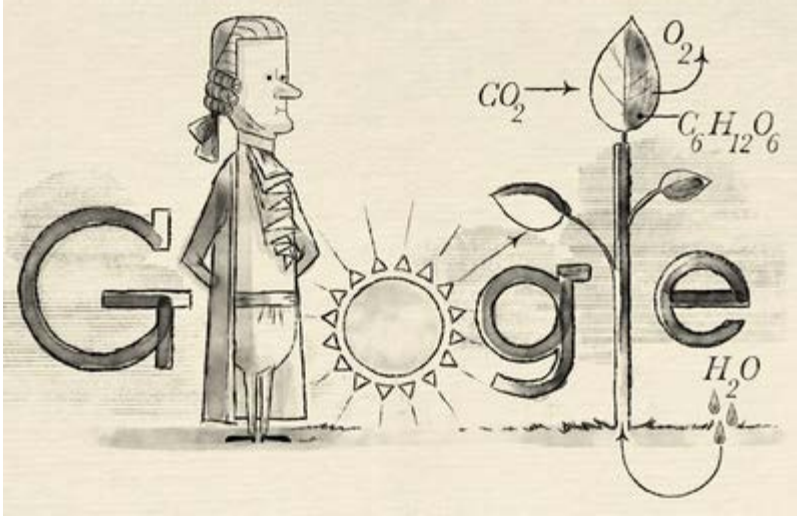

21.

Harold Blum (1899-1980)

(EvT:20|21+) (CR:55)

22.

Etienne Hilaire (1772-1884)

(Cattell 1000:481) (EvT:9|21+) (CR:6)

23.

Philo of Byzantium (c.280-220BC)

Greek engineer, physicist, and mathematician, noted for making the first thermometer.

"Among the greatest scholars that studied in Alexandria were Euclid, Archimedes, Ctesibius, **Philo of Alexandria**, and Hero. It is likely that the study of machines was at first an outgrowth of mathematics research and its application to mechanics rather than as an institute to produce useful machines."
— Francis Moon (2007), *The Machines of Leonardo da Vinci and Franz Reuleaux* (pg. 110)

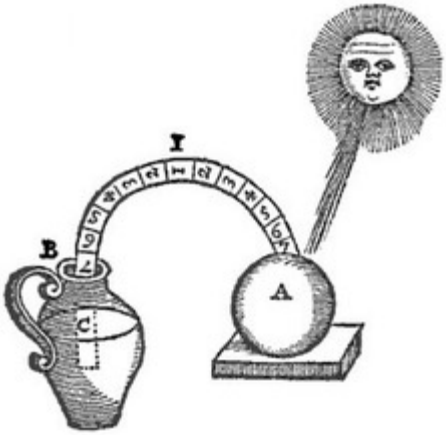

Influenced: Leonardo da Vinci, Robert Fludd, and possibly Galileo.

25.

David Ricardo (1772-1823)

[RGM:739|1,500+] (Gottlieb 1000:127) (GEcE:#) (CR:3) British political economist; noted from some type of "labor theory of value"; one of the four founders of "classical economics", along with Adam Smith, Thomas Malthus, and John Mill (Leontief, 1982).

26. Pierre Proudhon (1809-1865)

(Cattell 1000: 742) (Gottlieb 1000:648) (CR:2) French politician, economic theorist, and self-defined anarchist.

(Murray 4000:18|C) (CR:69) English physical chemist and radiochemist;

27.

Frederick Soddy (1877-1956)

"The laws [of thermodynamics], which express the relation between matter and energy, govern the rise and fall of political systems, the freedom or bondage of societies, the movements of commerce and industries, the origin of wealth and poverty, and the general physical welfare of a people."

— Frederick Soddy (1911), *Matter and Energy* (pg. 10-11)

Noted for his 1911 to 1921 publications on relationship of matter, energy, and thermodynamics to economics; a 2019 "missing top 1,000 genius candidate" (O).

28.

Nicolas Lemery (1645-1715)

29.

Thomas Harriot (1560-1621)

(Siegfried 10:8) (GME:#) (CR:3) English mathematician, philosopher (Hues, 1594), physicist, navigator, linguist, an oft-cited general polymath, noted for the c.1595 introduction of the inequality sign.

30. Claude Berthollet (1748-1822)

(Cattell 1000:669) (Murray 4000:13|C) (GCE:11) (DN:7) (CR:56) French chemist; noted for []

31. Marcellin Berthelot (1827-1907)

(CR:45) French chemist; noted for []

32.

Jacques Charles (1746-1833)

33. 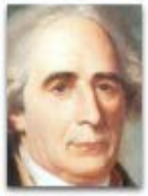

Joseph Montgolfier (1740-1810)

French aeronautics engineer and paper manufacturer; in his early 20s, while observing laundry drying over a fire incidentally form pockets that billowed upwards, he began to contemplate the building of a hot air powered flying machine; in 1775, he built parachutes and did test jumps from his family house; in 1782, together with his brother Etienne Montgolfier, they built the a working hot air balloon; and in 1783, they made a hot air balloon that to carried a human.

34.

Karl Benz (1844-1929)

[RGM:161|1,500+] (Gottlieb 1000:140) German engineer; noted for

Oliver Lodge

35. (1851-1940)

(GPE:111) (CR:11) English physicist, electrical engineer, and philosopher; noted for

36. Charles Wheatstone (1802-1879)

(Murray 4000:15|T) English scientist and inventor;

37. Stephen Gray (1696-1736)

(Cattell 1000:644) English electrical

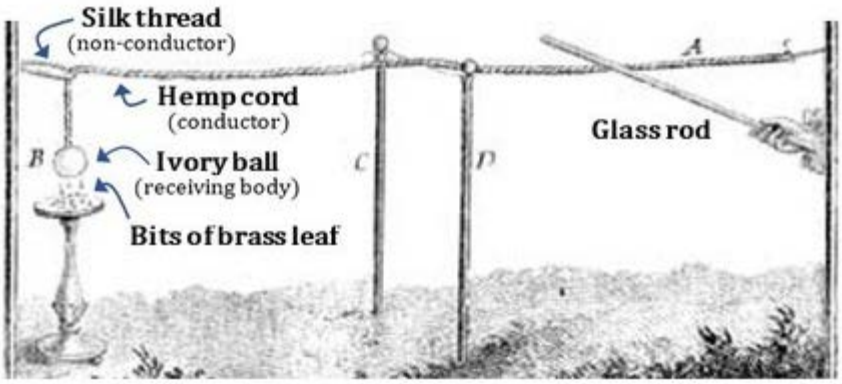

experimenter, astronomer, chemist, and dyer; noted as the first person, via his 1729 experiments with an elongated Hauksbee generator, to conduct electricity through a cord of hemp or metal, for up to several hundred feet, thereby becoming the discoverer or inventor of electrical conductivity and or the inventor of electrical wires.

38. Niccolo Cabeo (1585-1650)

Italian philosopher, engineer, mathematician, and theologian; classified as a "Jesuit naturalist", along with Athanasius Kircher and Gaspar Schott; his *Magnetic Philosophy* (1629), a book that attempted to refute the theories of William Gilbert (1600), from the Aristotelian view, made an important observation of electrical repulsion, reporting his observations that an electrically charged body can attract non-electrified objects, also that two charged objects repelled each other.

39. William Jenney (1832-1907)

(Gottlieb 1000:89) American architect and engineer; his 1885 ten-story Home Insurance Building, Chicago, is considered the first modern skyscraper.

40. Gustave Eiffel (1832-1923)

French civil engineer; person behind the design of the Eiffel Tower, the Statue of Liberty, and many bridges and buildings; an oft-classified "engineering genius" (Q); see: David Harvie's 2006 *Eiffel: the Genius Who Reinvented Himself* (Q).

41. Elisha Otis (1811-1861)

American industrialist; noted for his c.1852 invention of safety device that prevents elevators from falling if the hoisting cable fails, demonstrating it in 1853 at the New York State fair and in 1857 installing it in a five-story elevator at a store at Broadway and Broome Street; this ushered in the start of the skyscraper era. (Q)(Q)

42. Abdus Salam (1926-1996)

43	Srinivasa Ramanujan (1887-1920)	IQ_O =185 IQ_O =180+ IQ_O =130-140	[RGM:N/A|1,500+] (GME:30) Indian mathematician; influential (O) to Abdus Salam (IQ:#|#); IQ guesstimates: 185 (Ratner, 2016) (O), 180+ (Gamarra, 2018) (O), 130-140 (Williams, 2016), and or “overrated as a mathematician” (O) [see: overrated geniuses].
44.	Edmund Burke (1729-1797)		(Cattell 1000:12) [RGM:341|1,500+] (Murray 4000:N/A) (Time 100:58) (Perry 80:33) Irish-born British statesman; noted for []
45.	Henry II (1133-1189)		(Cattell 1000:457) (Time 100:30) English king; noted for his c.1170 introduction of "trial by jury", usurping the older practice of trial by priest with holy water.
46.	Mozi (c.470-391BC)		Chinese philosopher; noted for his “state of nature” (O) theory of society, precursory, in form, in some sense, to the latter logic of Thomas Hobbes, John Locke, and Charles Montesquieu.
47.	Gerbert (c.946-1003)		
48.	Johann Faust (c.1485-c.1540)		
49.	Jean Robinet (1735-1820)		French physicist philosopher, naturalist, encyclopedist, and early evolutionist, noted for his 1786 *Philosophical View of the Natural Gradation of the Forms of Being*, wherein he outlines his so-called "active principle", rooted in active forces and powers, behind the spontaneity of movements, mineral to man, seen in nature, up and down the chain of being, which is behind gradation of forms of being and changes or metamorphosizes produced therefrom; the gist of which, on first pass, seeming to be an early forerunner to: the Gibbs energy, aka the force function, method of natural selection, behind the spontaneity of chemical change, such as is found, in pre-cursory form in Goethe's human chemical theory, described by affiinity chemistry logic, Friedrich Nietzsche's will to power theory, and the leading modern human free energy theorists.
50.	Michael Servetus (c.1510-1553)		(Cattell 1000:642) Spanish theologian, physician, cartographer, and humanist; noted for his *The Restoration of Christianity* (1553) which rejected (O) trinity and the concept of predestination; influential to: Thomas Aikenhead.
	Isidore		[RGM:862|1,500+] (GMAG|#) (CR:3) was a Spanish theologian and scholar; “Live as if you were to die tomorrow. Learn as if you were to live forever.”

51. of Seville (c.560-636)

— Isidore (c.620), *Publication* (Q)

noted for []

American politician; noted as intellectual driving force behind the passage of the 13th amendment;

52

Thaddeus Stevens (1792-1868)

"Stevens was one of the most remarkable figures in 19th century American politics. Two principles shaped Stevens's public career. One was his belief in public education. As a member of the Pennsylvania Legislature in the 1830's, Stevens was known as the "Father of the Common School" because of his efforts to prevent the retrenchment of public schooling during a state budget crisis. The second was his hatred of slavery and commitment to the equal rights of black Americans."

— Eric Foner (1976), "If You Wondered About Thaddeus Stevens" (Q), *The New York Times*, Dec 31

portrayed powerfully by Tommy Jones in the film *Lincoln* (2012); see actual quotes (Q) and film quotes (Q).

53.. Jordanus Nemorarius (c.1250-1310)

54. Alexis Tocqueville (1805-1859)

(Cattell 1000:N/A) [RGM:N/A|1,500+] (CR:3) French diplomat, political scientist and historian;

"History is a gallery of pictures in which there are few originals and many copies."
— Alexis Tocqueville (c.1850) (Q)

Noted for his two-volume *Democracy in America* (1840), read (Q) by Marilyn Monroe and Ayaan Ali, and his *The Old Regime and Revolution* (1856), both read by Henry Buckle.

55. Thomas Malthus (1766-1834)

(Cattell 1000:N/A) [RGM:N/A|1,500+] (Murray 4000:N/A) (CR:4) English scholar and cleric; noted for his *Essay on the Principle of Population* (1798), wherein he argued that all "life forms", including humans, have a propensity to exponential population growth when resources are abundant but that actual growth is limited by available resources (Q); influential to Charles Darwin and Henry Buckle.

56. David Ricardo (1772-1823)

(Cattell 1000:N/A) [RGM:744|1,500+] (Murray 4000:N/A) (GEconE:#) (CR:3) British political economist; influential to Henry Buckle.

57. Viktor Frankl (1905-1997)

[RGM:N/A|1,500+] Austrian meaning philosopher, neurologist, and psychiatrist;

"What man actually needs is not a tensionless state but rather the striving and struggling for some goal worthy of him. What he needs is not the discharge of tension at any cost, but the call of a potential meaning waiting to be fulfilled by him."

— Viktor Frankl (c.1946), *Publication* (Q)

cited in film *Halloween* (2019) as a philosophy being taught to kids in high school about finding “meaning” even in the most dire of circumstances.

58. Murray Gell-Mann (1929-2019)

[RGM:N/A|1,500+]

59. Bernard Fontenelle (1657-1757)

(Cattell 1000:539) (CR:3) French lawyer, scientist, and philosophy writer;

60 Samuel Pufendorf (1632-1694)

[RGM:387|1,500+] Russian-born American novelist, poet, translator, and entomologist;

“Existence is a series of footnotes to a vast, obscure, unfinished masterpiece.”

— Vladimir Nabokov (1962), *Pale Fire* (pg. 272)

61. Vladimir Nabokov (1899-1977)

noted for his *Pale Fire* (1962), characterized as a “brilliant satire of academic writing, in which the footnotes and the commentary swell up and overwhelm the original work” (Goelet, 2015) (Q); colloquially known for his *Lolita* (1955) [ML100:4]; characterized a “scientific genius” (Marsh, 2016) (Q) for his butterfly work; is an auto-characterized “synesthete”, similar to Daniel Tammet (Q), having, since a young age, been able to equate colors with letters and numbers, e.g. red to the letter 5; a 2013 “missing writer” (Q); Pumpkin Person (Q) estimated his IQ at 144 (2015); characterized as “clearly extremely intelligent” (Jackson, 2017) (Q).

62. Max Stirner (1806-1856)

[RGM:253:1,500+] German philosopher; purported influence to Friedrich Nietzsche; top 1000 candidate nominee (2019) (Q).

63. Charles Dupuis (1742-1809)

(RMS:22) (CR:14) French savant, a rhetoric professor, lawyer, mathematician, theologian, telegraph inventor, astronomer, and religio-mythologist;

"We think ourselves possessed, or, at least, we boast that we are so, of liberty of conscience on all subjects. Yet, how far are we from these exalted privileges in fact! There exists, I believe, throughout the whole Christian world, a law which makes it blasphemy to deny our doubt the divine inspiration of all the books of the Old and New Testaments, from Genesis to Revelation. Who would run the risk of translating **Dupuis**?"

— John Adams (1825), "Letter to Thomas Jefferson", Jan 23

noted for his multi-volume 1794 *Universal Religion: Origin of All Cults*, oft-cited, along with the parallel works of Constantin Volney (1791), as one of the first Christ myth theory works; compare: Dorothy Murdock (160|#435), Wallis Budge (155|#540), and Gerald Massey (185|#67).

64. Friedrich Engels (1820-1895)

[RGM:944|1,500+] (FA:104) (CR:51) German social scientist; was strongly against, in an unbridgeable gap sense, the Henry Carey inspired views of Eugen Duhring; noted as intellectual cohort of Karl Marx (1818-1883) (IQ:180|#126) [RGM:175|1,500+] (Scott 50:23) (FA:120) (CR:186); see 1979 cartoon (Q) of Marx and Engels talking an IQ test.

65. Hunter Thompson (1937-2005)

American journalist, author, and realism existence philosopher; Quora IQ guesstimated (Q) in "the 140s" or "pretty high" (2018).

(Cattell 1000:517) Spanish polymath;

"If understanding followed no rule at all, there would be no good in the understanding nor in the matter understood, and to remain in ignorance would be the greatest good."

— Ramon Llull (c.1300), *The Hundred Names of God*; cited (Q) by Margaret Boden (2006) in *Mind as Machine: a History of Cognitive Science, Volume 1* (pg. 56)

66. Ramon Llull (1232-1315)

noted for his 1296 "tree of knowledge" diagram and his 1303 a "scale of intellect" diagram (see: great chain of being); a discussed (Q) potential top 1000 genius candidate.

67. John Wallis (1616-1703)

(Murray 4000:17|M) (Eells 100:33) (GME:25) English mathematician and theologian, noted for []

Italian physiologist,
physicist, and

68. Giovanni Borelli (1608-1679)

mathematician; his *Theory of the Planets* (1666) is cited, in the heated correspondence of Newton (1686), along with the theories of Ishmael Bullialdus (1645), Christiaan Huygens (1673), Christopher Wren (1677) as being the originators of the inverse square law of gravity, in opposition to Robert Hooke's claim that he (1666, 1670, 1679) was the first to propose the inverse square law (Q)(Q) and taught or suggested the idea to Newton

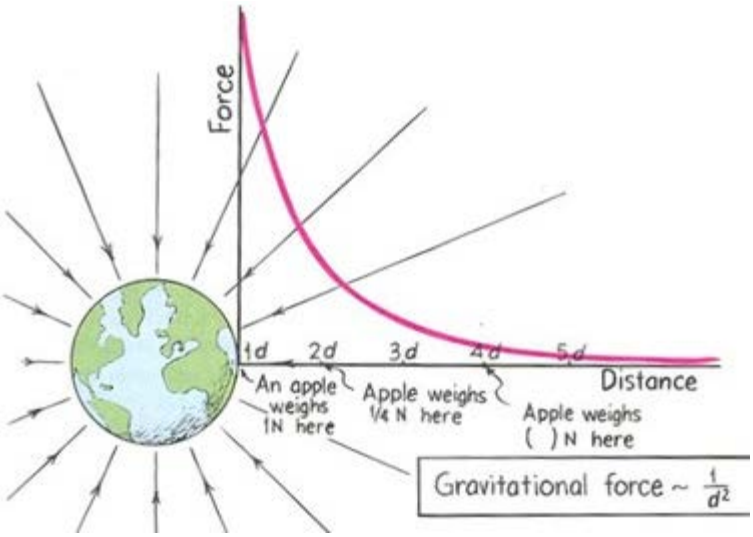

69. Thomas Willis (1621-1675)

70. Johannes Hevelius (1611-1687)

(Murray 4000:20|A) Polish astronomer, lawyer, and mayor; noted

71. Ole Romer (1644-1710)

(Cattell 1000:N/A) [RGM:N/A|1,500+] (CR:4) Danish astronomer; noted for 1675 theory that the apparent anomalies in the apparent movement of the moons of Jupiter, which depended on what season the earth was in, i.e. Jupiter at conjunction (sun between earth and Jupiter) or opposition (earth between sun and moon), could be explained by light having a finite velocity; for his 1676 calculation of the speed of light of earth orbital radius divided by 22 minutes or 220,000 km/s (as calculated later by Christiaan Huygens); and for his 1701 thermometer, fixed at the freezing point and boiling point of water, an model that later influenced Daniel Fahrenheit (c.1708).

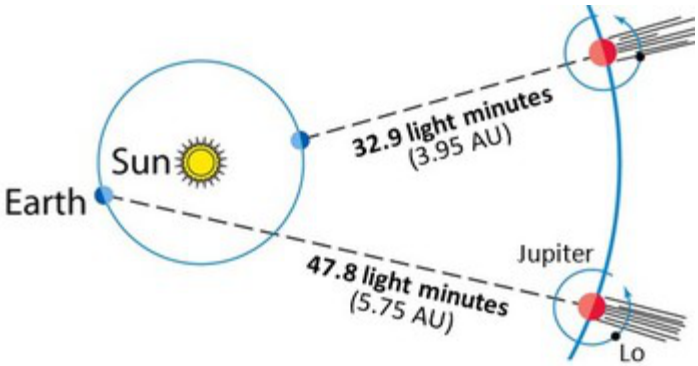

72. John Herapath (1790-1868)

73. Robert Burton (1577-

(Cattell 1000:N/A) [RGM:N/A|1,500+] (CR:15) English scholar; noted for his *The Anatomy of Melancholy* (1621), wherein he impressively employs electricity (amber), magnetism (loadstone), and heat (warmth) logic to explain

1640)

love and beauty; hung himself in the same room that Robert Hooke later stayed in as a student; influential to Henry Finck and also Goethe, possibly.

74. Walter Heitler (1904-1981)

77. William Hamilton (1805-1865)

(GME:27) Irish mathematical physicist; eponym of the Hamiltonian (compare: Lagrangian and Gibbsian).

78. Pieter Musschenbroek (1692-1761)

Dutch scientist; in 1746, building on the electrostatic generator (c.1660) experiments of Otto Guericke, and the electricity storage experiments (c.1742) of George Bose, invention of the Leyden jar, the first working capacitor.

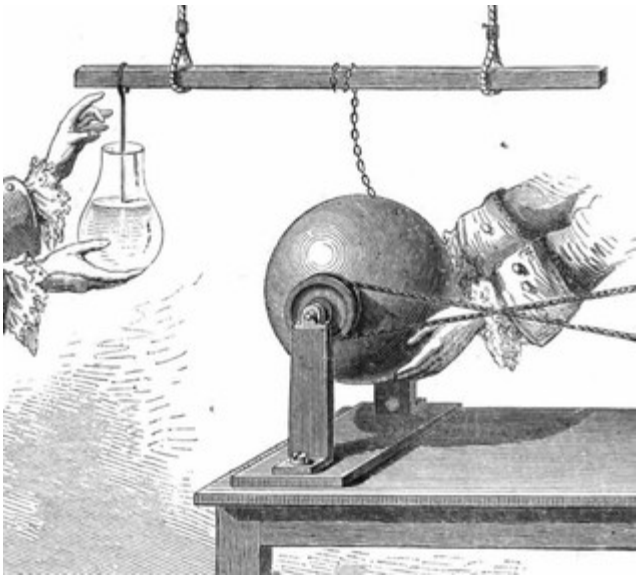

79. Hermann Minkowski (1864-1909)

(GME:#) German mathematician; mentor to Einstein;

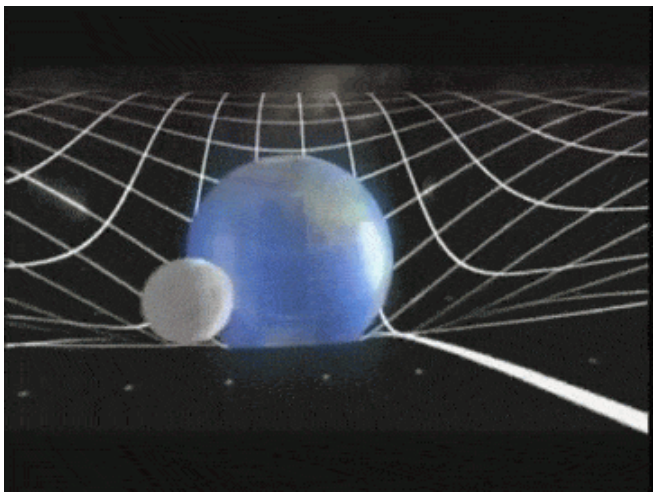

"The views of space and time which I wish to lay before you have sprung from the soil of experimental physics, and therein lies their strength. They are radical. Henceforth space by itself, and time by itself, are doomed to fade away into mere shadows, and only a kind of union of the two will preserve an independent reality."

— Hermann Minkowski (1907) (Q)

noted for his 1907 concept of spacetime, i.e. space and time joined as one new

thing, as shown by the grids adjacent, and that Einstein's special theory of relativity could thus be understood geometrically in four dimensions, Cartesian dimensions plus space-time.

80. Joseph Campbell (1904-1987)

[RGM:1224|1,500+] (RMS:103) (CR:3) American literature professor, comparative religion and mythology scholar, popularly known as the world's most famous mythologist;

81. Wilhelm Weber (1804-1891)

In 1856, through his studies of electrical charges and magnetics, showed that light moves at a constant speed of 300,000 kilometers per second.

82. Ramon Llull (1232-1315)

Spanish polymath;

"Cusanus owned more works by **Lull** than any other single author."

> — Pauline Watts (1982), *Nicolaus Cusanus: a Fifteenth-Century Vision of Man* (pg. 16)

(add)

83. Johannes Widmann (c.1460-1498)

German mathematician; noted for his 1489 *Mercantile Arithmetic*, wherein the "+" and "-" symbols first appeared in print, albeit, in the sense of "surplus" and "deficit".

84. Henricus Grammateus (c.14494-1525)

German mathematician; noted for his 1518 *A New Skill Book*, wherein the "+" and "-" symbols were first used in the modern mathematical sense.

85. Hans Bethe (1906-2005)

[RGM:1234|1,500+] (Landau scale:1.5|Vote) German-born American physicist noted for his work, with Enrico Fermi, on the development of exchange force theory.

86. Robert Grosseteste (1170-1253)

[RGM:758|1,500+] (Siegfried 10:5) English polymath, statesman, scholastic philosopher, theologian, scientist, Bishop, oft-classified middle ages genius;

"Few have attained to consummate wisdom in the perfection of philosophy: Solomon attained to it, and Aristotle in relation to his times, and in a later age Avicenna, and in our own days **Robert, Bishop of Lincoln**, and Adam Marsh. The latter two were aware that the power of mathematics is capable of unfolding the causes of all things, and of giving a sufficient explanation of human and divine phenomena; and the assurance of this fact is to be found in the writings of those great men, as, for instance, in their works on the impressions on the rainbow and the comets, on the generation of heat, on the investigation of geography, on the sphere, and on other questions appertaining both to theology and to natural philosophy."
— Roger Bacon (c.1267), *Opus Tertium* (Q)

			as first chancellor of Oxford, he engaged in commentary on Aristotle's works and translated his *Nicomachean Ethics* from Greek into Latin.
87.		Harlow Shapley (1885-1972)	
88.		Philodemus (c.110-35BC)	Greco-Roman Epicurean philosopher; characterized as "very learned" (Cicero, 55BC) (Q); author of 35 books of varied subjects.
89.		Pietro Pomponazzi (1462-1524)	
90.		Petrus Peregrinus (c.1219-c.1289)	Influential to Roger Bacon, who called him the "master of the experiment", William Gilbert, and Johannes Kepler; top 1000 candidate (Philoepisteme, Jun 2018) (Q)
91.		John Atanasoff (1903-1995)	[RGM:N/A|1,300+] American physicist, mathematician, and inventor; credited with being the first to invent the digital computer (1930s); top 1000 candidate (Bickle, May 2018).
92.		Oswald Avery (1877-1955)	[RGM:N/A|1,300+] Canadian-born American physician and genetics researcher; "In 1944, Avery did the experiment proving that DNA was how traits are inherited." — Craig Venter (2017), "100 Greatest Living Business Minds", Forbes Proved, via experiment, that it is DNA, and not protein, that transmits heredity; characterized as the most-deserving scientist to not have received the Nobel Prize (Tiselius, 2007).
93.		John Eriugena (c.815-877)	Irish pantheist theologian and philosopher; penned *The Division of Nature*, based on aggregate of the ideas of Plato, Plotinus, Proclus, and Origen; Meister Eckhart and Nicholas of Cusa are considered his successors (Q); Schopenhauer ranks (Q) him, pantheistically, with Giordano Bruno, Nicolas Malebranche, and Benedict Spinoza; considered a neglected middle ages genius whose works are "finally coming into their own after centuries of neglect and condemnation (Carabine, 2000) (Q); an "interesting" potential top 1000 candidate (Philoepisteme, Jun 2018) (Q)
94.		Hammurabi (c.1810-1750)	(Cattell 1000:N/A) [RGM:N/A|1,500+] (Time 100:5) Babylonian king; devised the Code of Hammurabi, a collection of 282 rules, established standards for commercial interactions and set fines and punishments to meet the requirements of justice (Q); Quora gauged (Wyze, 2015) (Q) as top 10 intelligent mind of history; [RGM:504|1,300+] (CR:13) American architect and philosopher;
95.		IQ_O =132+	"I live on earth at present, and I don't know what I am. I know that I am not a category. **I am not a thing — a noun. I seem to be a verb**, an evolutionary process – an integral function of the universe." — Buckminster Fuller (1970), *I Seem to Be a Verb*

Buckminster Fuller
(1895-1983)

President of Mensa second World President of Mensa (IQ:132+) from 1974 to 1983; Top 1K candidate nominee (Philoepisteme, Jun 2018) (Q); a “possible real genius” (SpergingKermit, Apr 2019) (Q).

[RGM:552|1,300+] Persian poet;

96. Rumi (1207-1273)

“As you start to walk on the way, the way appears.”

— Rumi (c.1260)

Often name-dropped; influential, e.g. to Hamdi Ulukaya (2017), Chobani Yogurt founder, and his motto: “there’s something magical in movement, in action—it allows you to ‘think’, to discover new ideas, and to feel like you’re making progress. Don’t sit around waiting—act.” (see: Goethendipity) [2]

[RGM:335|1,600+] (WorldCat 100:17) American poet, essayist, and humanist;

97. Walt Whitman (1819-1892)

“There will soon be no more priests (see: Jean Meslier). Their work is done. They may wait awhile ... perhaps a generation or two ... dropping off by degrees.... A new order shall arise and they shall be the priests of man, and every man shall be his own priest. The churches built under their umbrage shall be the churches of men and women. Through the divinity of themselves shall the cosmos and the new breed of poets be interpreters of men and women and of all events and things. They shall find their inspiration in real objects today, symptoms of the past and future.... They shall not deign to defend immortality or god or the perfection of things or liberty or the exquisite beauty and reality of the soul. They shall arise in America and be responded to from the remainder of the earth.”

— Walt Whitman (1855), *Leaves of Grass* (1st edition preface)

influenced by: Ralph Emerson, Robert Ingersoll, Thomas Carlyle, Alfred Tennyson, John Burroughs, William Shakespeare, Homer, Dante Alighieri (Q); cited in Stephen Gould’s *The Mismeasure of Man* (pg. 124) (Q) in respect to his brain weight; noted for []

98. Robert Noyce (1927-1990)

American physicist; independent co-inventor (1959), along with Jack Kilby, of the microchip, which he said (Q) he invented out of "laziness"; co-founder of Fairchild semi-conductor (1957) and Intel (1968).

99. Jack Kilby (1923-2005)

American electrical engineer; independent co-inventor (1959), along with Robert Noyce, of the microchip; co-inventor of the handheld calculator, called “Cal Tech” (1967).

100. Chester Carlson (1906-1968)

American physicist, inventor, and patent attorney; invented (Q)(Q) the xerox “dry way” photocopy method (1938), in his kitchen, while simultaneously going to law school, studying science books in the public library, and working his day job; Quora gauged (Wyze, 2015) (Q) as top 10 intelligent mind of history;

101.	Stan Lee (1922-2018)		[RGM:590|1,500+] American comic book writer, editor, publisher, and producer; a "50 Greatest Living Geniuses" (2015) (Q); supposedly, not considered a genius according to Quora (Q)
102.	Jules Verne (1828-1905)		[RGM:85|1,500+] French novelist, poet, playwright, and science fiction writer; "Science, my lad, is made up of mistakes, but they are mistakes which it is useful to make, because they lead little by little to the truth." — Jules Verne (1864), *A Journey to the Center of the Earth* "We may brave human laws, but we cannot resist natural ones." — Jules Verne (1870), *20,000 Leagues Under the Sea* (§2.15: Accident or Incident) His science fiction novel *From the Earth to the Moon* (Q), followed by the sequel *Around the Moon* (1870), influenced Wernher Braun and his latter NASA guided trip to the moon; ranked (Q) as second or third Robert Heinlein, along with Herbert Wells, as greatest sci-fi writer; a top 1000 suggested candidate, in respect to great playwrights, by oye777 (8 Jan 2019).
103	George Orwell (1903-1950)	IQ_O =120-125	[RGM:56|1,500+] (GLA:43) English novelist, essayist, journalist and critic; noted, supposedly, for work that is marked by awareness of social injustice, opposition to totalitarianism, and outspoken support of democratic socialism; a noted dystopian theorist; his novels *Nineteen Eighty-Four* (1949) [RGN:1|1,200+], *Animal Farm* (1945) [RGN:1|1,200+], are crowd-ranked high; a 2010 top 50 genius candidate (Q); a 2013 Cox-Buzan style "missing genius" (Q); guesstimated at 120-125 (Q).
104.	Neil Armstrong (1930-2012)		[RGM:371|1,300+] American astronaut and aeronautical engineer; noted for being first person to step on moon; top 1000 candidate (Bickle, May 2018).

Philoepisteme

In 2018, Hmolpedia user Philoepisteme, in the top 1000 Candidates thread (Q), commented to Thims "many of the figures you have already written about are equally deserving of being counted as interesting, potential candidates", after which, following a few weeks thought on the matter, he produced the following list (the check mark ✓indicates that the individual has been added since post; the red ✗ indicates that the individual's main opus has been reviewed, and they have been disqualified):

1. Max Born (1882-1970) (RGM:509|1,400+) (CR:3)

2. Pierre Duhem (1861-1916) (CR:28)
3. Sextus Empiricus (c.160-210) (CR:15)
4. Protagoras (c.490-420BC) (FA:8) (CR:8)
5. Georg Simmel (1858-1918) [RGM:1,358|1,500+] (Scott 50:35) (CR:13)
6. Jacobus van't Hoff (1852-1911) (CR:75)
7. Alfred Whitehead (1861-1947) (CR:26) ✗
8. Carl Clausewitz (1780-1831) (IQ:155|#605) [RGM:226|1,500+] (CR:9) ✓
9. Walther Nernst (1864-1941) (CR:118)
10. Daniel Bernoulli (1700-1782) (IQ:170|#350) [RGM:1309|1,500+] (CR:52) ✓

Recent candidate suggestions, by Philoepisteme, include:

11. Emil Reymond (1818-1896) (CR:4) | Jul 2019 add

(add)

Hedkandi

On 25 Sep 2019, user hedkandi2, messaged me the following list of potential top 1000 candidate suggestions:

1. Isidore of Seville (c.560-636) (IQ:#|#) [RGM:862|1,500+] (GMAG|#) (CR:3)
2. Pope Sylvester II (c.946-1003) (Q)
3. Shen Kuo (1031-1095) (Q)
4. Hildegard of Bingen (1098-1179) (**IQ:160|#553**) [RGM:209|1,500+] [GMG:14]✓
5. Nicole Oresme (c.1320-1382) (GMAG|#) (Q)
6. Michael Servetus (c.1510-1553) (IQ:#|#) (Cattell 1000:642)
7. Fausto Veranzio (c.1551-1617) (Q)
8. Nicolas Peiresc (1580-1637) (Q) | supporter of Pierre Gassendi
9. Jeronimo Beaumont (1553-1613) (Q) | supposedly invented a steam powered water pump, for draining mines, for which he was granted a patent in 1606.
10. Ivan Sollertinsky (1902-1994) (Q)
11. Andres Bello (1781-1865) (Q)

Per force of this list, among other implications, e.g. many already have influence and citation momentum, I add Servetus and Isidore to the above candidate listing.

Other

According to one view (Lynam, 2015) (Q), "all the Bernoullis" (see: Bernoulli genealogy), were guesstimated as top 10 most intelligent people in history.

Tools

(Cattell 1000:N/A) [RGM:N/A|1,500+] (Murray 4000:N/A)

See also

- Why does Libb Thims make genius lists?

Notes

N1. Feel free to suggest potential candidates in threads.

θΔics

In genius rankings, **top 1000 geniuses** refers to the greatest five-hundred geniuses of all time ranked by IQ or "relative brightness or intellect" (Cox, 1926); below are the second tier greatest geniuses of all time, numbers 101 to 200.

Geniuses | 101-200

The following are the geniuses "101 to 200" of the top 1000 geniuses (previous: 1-100, next: **201-300**, 301-400, 401-500, 501-600, 601-700, 702-800, 801-900, 901-1000): [N1]

	Geniuses 101 to 200
101 — 180 Strato (c.335-269BC) ↑	(Cattell 1000:N/A) [RGM:N/A|1,310+] (Murray 4000:N/A) (FA:20) Greek philosopher; nicknamed the "physicist"; successor to Theophrastus; "Equally intolerable is the inconsistency of Theophrastus, for at one moment he allots the divine primacy to mind, at another to the heavens, and yet another to the signs of the heavenly stars. Another figure unworthy of attention is Theophrastus' disciple **Strato**, the one they call the 'physicist', for he proposes that all divine power lies in nature, which bears within it the causes of birth, growth, and diminution, but which lacks all sensation and shape." — Cicero (45BC), *On the Nature of the Gods* Strato taught in Lampsacus; where he might have known Epicurus; he attended Aristotle's school in Athens, after which he went to Egypt as tutor to Ptolemy (309–246 BC) (Ñº), where he also taught Aristarchus (famed heliocentric theory pioneer) ↑; returned to Athens after the death (dereaction) of Theophrastus (c.287 BC), succeeding him as head of the Lyceum; he emphasized the need for exact research, and, as an example of this, he made use of the observation of how water pouring from a spout breaks into separate droplets as evidence that falling bodies accelerate; Hero's 50AD *Pneumatica*, was said to overview the physics of Strato and Ctesibius, via outlining an atomic theory in which matter consists of particles mixed with distributed vacua; David Hume declared Strato's brand of atheism to be: "the most dangerous of the ancients"; first-slating: 180|#105 (Feb 2018).
Lawrence Henderson	(SN:8) (EvT:19|21+) (CR:250) American physiologist and physico-chemical sociologist; "Matter and energy have an original property, assuredly not by chance, which

| 180 | 102

(1878-1942)

anti-chance

organizes the universe in space and time."

— Lawrence Henderson (1913), *The Fitness of the Environment*

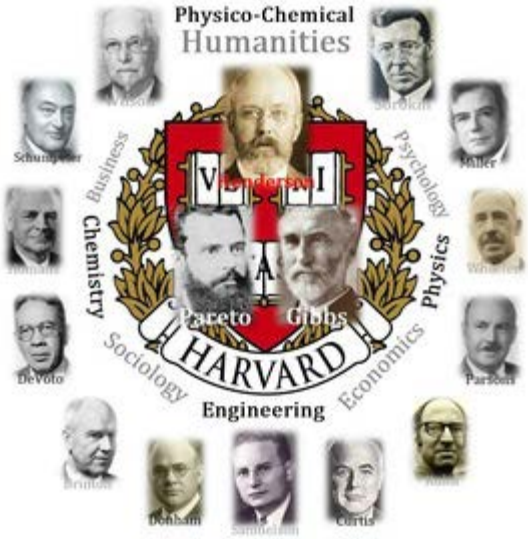

ran the Harvard Pareto circle;
used a synthesis of Gibbs and Vilfredo Pareto for his pioneering "Sociology 23" course; the last great theory of all thing theorists or thing philosophers (following Henry Adams).

(Cattell 1000:15) [RGM:116|1,500+] (Stokes 100:13|Stoics) (GPhE:#) [CR:200], aka "Tully", was a Roman philosopher and politician;

"**Cicero** provided the 'renaissance' with its prime methods of philosophical dialogue, and its fullest knowledge about the ancient philosophical schools."

— Michel Montaigne (c.1580), *Publication*

| 180 | 103

Cicero (106-43BC)

noted for his 45BC *On the Nature of the Gods*, a discourse on Greek and Roman theologies, namely a dialogue on a comparison of the pros and cons of stoicism (character: Balbus), Epicurean theology (character: Velleius), and Platonic Academy based skepticism (character: Cotta); also known for thoughts on morals, society, the legal system, etc., as both religion and and Epicurean atomic theory would each see things; upgraded ↑ to 180|103 from previous IQ guesstimate of 175|#194 (Dec, 2017).

(Cattell 1000:N/A) [RGM:38|1,320+] (Murray 4000:10|WL) Russian literary philosopher; HMS pioneer (Buckle) a GLAE; Quote (1869): "A particle of matter cannot tell us that it is unconscious of the laws of attraction and repulsion and that the law is not true; but man, who is the subject of history, says bluntly: I am free, and am therefore not subject to laws"; a proselyte of Schopenhauer; quote: "Schopenhauer takes us as far as philosophy can"; found on one French person's 2012 ten greatest geniuses ever list, who estimates him at IQ=185.

| 180 | 104

Leo Tolstoy (1828-1910) IQ_O=185

| 180 |

Bertrand Russell (1872- IQ_{JP}=180 IQ_{CE}=180

105 1970)

IQ_O=147

(RGM:145|1,500+) (Gottlieb 1000:593) (EPD:M2/F4) [HD:51] [FA:117] (GAE:21) (Stokes 100:77) (GPhE:#) [CR:165] British mathematician and philosopher; 20th century's greatest atheism advocate; considered his IQ to be 180, which he defined as the uberman cutoff IQ; cited with IQ:180 (2001) (Ñº) and IQ:147 (2015) (Ñº).

(Cattell 1000:116)

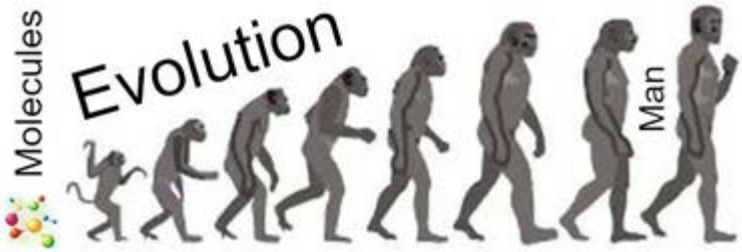

— 180

106 Charles Darwin (1809-1882)

IQ_{JP}=180
IQ_{CPB}=**173**
IQ_B=173
IQ_{CB}=**169**
IQ_C=165
IQ_W=160

[RGM:19|1,500+] (Murray 4000:17|CS / 1|B) (Gottlieb 1000:7) (Glenn 20:10) (EvT:15|21+) [CR:514] English evolution theory pioneer;

> "You have made a convert of an opponent in one sense [of your *Hereditary Genius*], for I have always maintained that, excepting fools, men did not differ much in intellect, only in zeal and hard work."
>
> — Charles Darwin (c.1869), "Letter to Francis Galton"

a reflective polished genius, who went after one of the biggest fishes in the sea; generally noted for his warm pond to man (see: molecules to man evolution) evolution by natural selection theory.

— 180

107 Napoleon Bonaparte (1769-1821)

IQ_{CB}=**163**
IQ_C=145
IQ_B=180
IQ_W=142
IQ_U=186

(Cattell 1000:1) [RGM:149|1,320+] (Murray 4000:N/A) (CR:34) (HD:20) (FA:67) French military leader, emperor, and philosopher; Nietzsche uberman (IQ:186+); was the first to systematically query all leading French scientists about theory atheism belief (see: Napoleon Laplace anecdote); high military IQ; Goethe and Napoleon were mutual devotees of each other; read Goethe's *Sorrows of Young Werther* over six times during his various campaigns; was on a philosophical bent ascertain (or disprove) the theory or location of the soul in the context of modern physical science.

— 180

108 Alexander Pope (1688-1744)

IQ_C=180

[RGM:N/A|1,310+] (Cattell 1000:82) Noted for his deeply reflective queries, namely: "shall gravitation cease when you go by" (digressed on by: John Mill, 1852; Balfour Stewart and Peter Tait, 1875; George Millin, 1896) and "Whatever IS, is RIGHT" (Voltaire vs Leibnitz); his *Essay on Man* was referred to by Voltaire as "the most beautiful, the most useful, the most sublime didactic poem ever written in any

language"; commentator on the great chain of being.

(Cattell 1000:N/A)

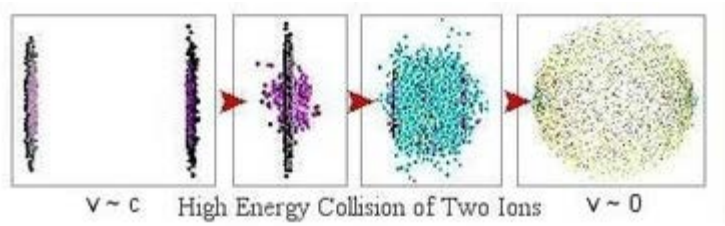

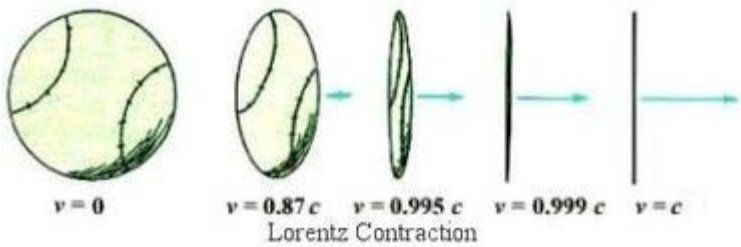

— 180 | 109

Hendrik Lorentz (1853-1928) ↑

[RGM:1314|1,500+] (Murray 4000:N/A) (Odueny 100:84) Dutch physicist;

"Lorentz is the greatest and most powerful thinker I have ever known. I never met Willard Gibbs, but, perhaps, had I done so, I might have placed him beside Lorentz."

> — Albert Einstein (1954), response to question about who were the greatest men, and most powerful thinkers he had known

a top ranked GPE; noted for his postulate that light derives from oscillating electrons in atoms; for his 1892 postulate of relativistic length contraction; many other deep-minded insights; first slating: 175|#244 (c.2017); upgraded ↑ to 180|#110 (Jun 2018).

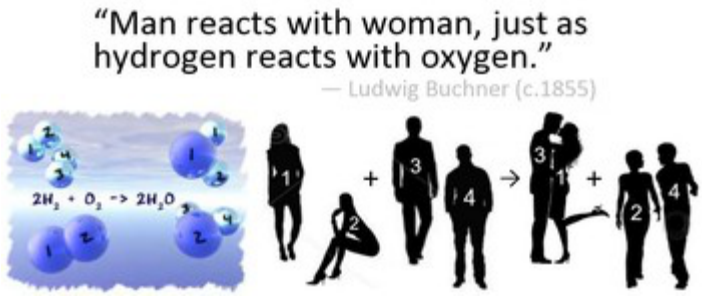

— 180 | 110

Ludwig Buchner (1824-1899)

[RGM:N/A|1,310+] (SN:11|58+) (FA:110) (GA:7|35+) (CR:48) German physicist;

"Man react with woman like hydrogen reacts with oxygen."

his *Force and Matter* (1855), which is a top-ranked atheist's bible (#2|5+), read by Einstein at age 13; first-slated 190|#40 (Mar 2017); down-graded to 180|#110 (Jul 2018) after absorbing his *Force and Matter*.

(Cattell 1000:58) [RGM:109|1,500+] (Murray 4000:4|WP) (Gottlieb 1000:185) (SN:49) (GMG:7) (EPD|F2) (GPhE:#) [CR:90] Scottish philosopher;

anti-chance

111 | 180

David Hume (1711-1776) IQ_C=180

"There is nothing to be learned from a professor, which is not to be met with in the books."

— David Hume (1735), "Letter to Jemmy Birch"

aka "Newton of moral sciences" (Foley, 1990); noted for his 1740 *A Treatise of Human Nature*; his 1783 essay "On the Immortality of the Soul", argued that "it appears difficult by the mere light of reason to prove the immortality of the soul"; Kant's 1788 *Critique of Practical Reason* and his categorical imperative, according to Miguel Unamuno, are both criticism launching points off the two latter works; his posthumous *Dialog Concerning Natural Religion* (1777) did a modern remake of Cicero's *The Nature of the Gods*; famously-known, in atheist circles, for his encounter with Baron d'Holbach, wherein boasted "I do not believe in atheists, because I have never met one" (see: Hume-Holbach dinner party).

112 | 180

Heraclides (387-312BC)

(GAE:#) Greek philosopher and astronomer; proposed that the earth rotates on its axis (compare: Ecphantus (c.500BC)); posited that the soul was light; did battle with Aristotle, supposedly, on the question whether the universe is finite or infinite; and is rumored, according to Simplicius (c.590AD), to have formulated heliocentrism (or at least the precursor model to what Aristarchus (c.240BC) (IQ:175|#244) put into book form); first draft slated at 180|#115, a grade above Aristarchus.

113 | 180

Jeremy Bentham (1748-1832) IQ_C=180

(Cattell 1000:327) [RGM:376|1,250+] (FA:87) was English jurist and philosopher;

"Snow is the spokesperson for the technologico-Benthamite reduction of human experience to the quantifiable, the measurable, the manageable."

— Frank Leavis (1962), "The Significance of C.P. Snow"

noted for his 1789 *Introduction to the Principles of Morals and Legislation*, wherein he took ideas from: Helvetius, Denis Diderot,

Voltaire, John Locke, and David Hume, while simultaneously discarding ideas from: Plato, Aristotle, and Immanuel Kant, e.g. his "categorical imperative" (1785), and therein introduced the so-called: 'utilitarianism' system of morality, wherein he suggested that we forget about parsing "good and evil" and work logically to minimize pain and increase pleasure; aimed at the greatest happiness for the greatest number; teacher of John Mill.

180 | 114	John Milton (1608-1674)	IQ_{CB}=**177** IQ_{C}=180 IQ_{B}=173	[RGM:330|1,250+] (Cattell 1000:16) English poet, polemicist, fabled "last persons to know everything", and GLAE candidate, generally known for his 1667 epic poem *Paradise Lost*, on the biblical story of the "fall of man", i.e. the temptation of Adam and Eve by the fallen angel Satan and their expulsion from the Garden of Eden.
180 | 115	Bernhard Riemann (1826-1866)		[RGM:280|1,500+] (Murray 4000:10|M) (GME:11) (DN:1-2) (CR:14) German mathematician; "The three greatest German mathematicians are: Gauss, Riemann, and Karl Weierstrass." — Henri Poincare (c.1900) (thread) his works were required reading for Albert Einstein's so-called Olympia Academy intellectual club (see: Filon-Pearson demon); first-slating: 180±|#100 (Nov 2014).
180 | 116	Michelangelo (1475-1564)	IQ_{CB}=**178** IQ_{C}=180 IQ_{B}=175	(Cattell 1000:28) [RGM:11|1,320+] (Murray 4000:1|WA) Italian sculptor, painter, architect and poet; a Nietzsche uberman; painter of the "Creation of Adam" (see: God vs Gibbs).
180 | 117	Anaximander (c.610-564BC)		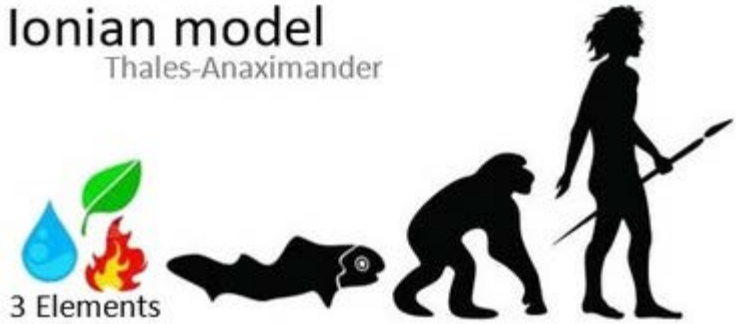 [RGM:609|1,500+] (FA:2) (CR:44) Greek philosopher, astronomer, and evolutionist; characterized as "chief of the old atheistic philosophers" (Cudworth, 1678); immediate successor of Thales; taught that: fixed stars were the centers of other planetary systems (each inhabited just as is the earth); that the sun was a glowing mass; and that the earth moved around the center of the system; first-drafting: 170|#220 (c.2016); upgraded ↑ to 180|#120 (Feb 2018).
180 | 118	Emilie Chatelet (1706-1749)		[RGM:649|1,500+] (CR:20) French philosopher and physicist; eponym: "smartest woman ever"; combined Isaac Newton's definition of energy (E=mv) with Gottfried Leibniz' definition of energy (E=mv²) with Willem Gravesande's brass balls clay surface impact experiments to synthesize the first version of the conservation of energy (vis viva into vis mortua); mistress of Voltaire (IQ=195); had immense library comparable to the Paris academy of science; ran the biggest research lab in France; very highly ranked "magnitude genius" (prolific output in

short time); downgrade from 190|#41 to 185|#48 (Feb 2018) per reason that intuition deems her less of a genius than Hypatia; downgrade to 180|#119 (Apr 2018) after reading Julien la Mettrie's summary of her physics.

119	180	Marie Curie (1867-1934) ↓	IQ_{SS}=205 IQ_{O}=200 IQ_{B}=180

[RGM:13|1,500+] (Murray 4000:14|P) (CR:29) Polish-born French physicist and chemist; noted for work in radioactivity; downgraded ↓ from 185|#76 to 180|#120 (Feb 2018) per reason (a) she seems to be more of a "over-rated genius", e.g. her husband Pierre Curie, a pioneer in crystallography, magnetism, piezoelectricity and radioactivity, has a higher Murray ranking (Murray 4000:10|P), but is hardly famous in genius ranking circles [RGM:N/N|1,330+]; if it was a man who did the same work she did, namely: help develop the theory of radioactivity (with another researcher) and discover two elements (polonium and radium), he would likely not get so-easily ranked in top 100 genius level, nor get ranked with purported IQ 200+ range estimates (e.g. it was Henri Becquerel who ACTUALLY discovered radioactivity) and (b) she is not known (compare: Hypatia) as a big question addressing genius.

(Cattell 1000:601) (Gottlieb 1000:726) (Partington 50:40) (GCE:32) (MAG:2) (CR:26), German-born chemical philosopher;

120	180	Albertus Magnus (1205-1280)	

"The aim of natural science is NOT simply to accept the statements of others, but to investigate the causes that are at work in nature."

— Albertus Magnus (c.1270), "On Minerals" (*De Mineralibus*) (Ñº)(Ñº)

oft-classified "universal genius" (Waite, 1815); aka "Universal Doctor" (*Doctor Universalis*) for the extraordinary depth of his knowledge and learning (Ñº); his affinity chemistry work marks the start of physical chemistry (Partington, 1937); cited by Mary Shelley (IQ:175|#225) as one of the three great pre-Newtonian "secrets of nature" probers, alongside Cornelius Agrippa (IQ:160|#550) and Paracelsus (IQ:175|194).

121	180	Pierre Teilhard (1881-1955)	$IQ_{?}$=170-190±

(Gottlieb 1000:809) [CR:153] French scientific-religious philosopher noted for his religious thermodynamics views on energy, consciousness, irreversibility, thermodynamics, the direction of evolution, and the conception of a person as a "human molecule", which he considered as an evolved structure of atoms, as captured in his 1938 *The Phenomenon of Man*, and other post-humorously published works. ; cited by Thims (2014) in video (Ñº|4:00-), as a "top 500 genius"; in contrast to other IQ fakers (see: feigned IQ); general point at which Thims started to add geniuses to the list.

— 180
122

Fyodor Dostoyevsky (1821-1881)

IQ_{SS}=215
$IQ_{?}$=170+

[RGM:49|1,500+] (Murray 4000:11|WL) (Gottlieb 1000:77) (GLA:30|43+) [CR:50] Russian novelist, psychologist (Nietzsche, 1887), and moral philosopher;

"If god does not exist, **everything is permissible**."
— Fyodor Dostoyevsky (1880), *The Brothers Karamazov*

noted for his 1864 *Notes From the Underground*, his 1866 *Crime and Punishment*, wherein he employs Adolphe Quetelet's social physics, and for his 1880 *The Brothers Karamazov*, which enters deeply into the ethical debates on the existence of god, free will, and morality, in which the character Ivan Karamazov espouses the Dostoyevsky dilemma.

— 180
123

Marcus Aurelius (121-180)

(Cattell 1000:50) [RGM:102|1,500+] (Stokes 100:16) (Perry 80:4|Li) (FA:24) (EPD:F3) (GPhE:#) [CR:46] Roman "philosopher king", politician, the 16th Roman emperor (Ñº), thing philosopher, an adherent of stoicism, an oft-classified "anti-theist" (Ñº), noted for his keen intellect and wisdom on a number of topics, such as atheism, nature, and change, to name a few, generally known for his *Mediations* (167AD), characterized as the "gospel of those who do not believe in the supernatural" (Zimmern, 1887), wherein he extols on a common sense practical Heraclitus-Zeno stylized stoicism; first slating: 180|#115 (2016).

— 180
124

Karl Marx (1818-1883)

IQ_{CP}=189
IQ_{O}=140-160

[RGM:237|1,500+] (Gottlieb 1000:14) (Becker 139:12) (Stokes 100:63) (Scott 50:23) (FA:120) [CR:204] German sociopolitical economic theorist;

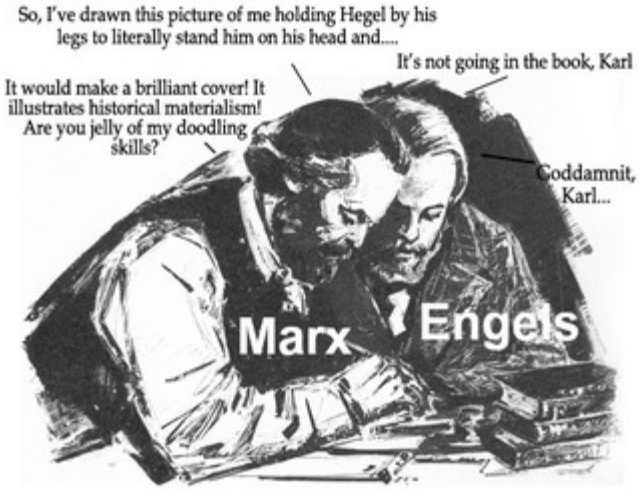

"It is the ultimate aim of this work, to lay bare the economic law of motion of modern society."

— Karl Marx (1867), *Capital*

Noted for his work with Friedrich Engels on dialectical materialism (which led to communism); a 2005 empires history forum poster (Ñº) lists: "Leonardo Da Vinci (IQ=200), Adam Smith (IQ=170) , Aristotle (IQ=195), Julian the Apostate, Marx, Rene Descartes (IQ=195), Isaac Newton (IQ=215), Albert Einstein (IQ=220), Niels Bohr (IQ=185), Ludwig Wittgenstein (IQ=180), Georg Hegel (IQ=165) and Ludwig Beethoven (IQ=165)" as being the top 12 most intelligent figures of history; which when averaged yields IQ=189; another IQ estimate is 140-160 (Ñº); first-slating: 180|#126 (c.2016).

125 | 180

Leucippus (c.500-450BC)

(GCE:10) (GPhE:#) [CR:212] Greek atomic physicist and philosopher;

"Nothing happens *in vain*, but everything from reason and by necessity."

— Leucippus (c.460BC), *On Mind* (Fragment L1)

noted for conceiving of the atomic theory, which was a reactionary theory developed in response to Greek philosopher Parmenides' 485BC denial of the void; first-slating: 180|#124 as "above" that of Parmenides, but below Epicurus and Democritus (Oct 2018).

126 | 180

Parmenides (510-450BC) ↑

[RGM:216|1,500+] (ACR:11) (GPhE:7) [CR:118] Greek physicist-philosopher; in his "On Nature" (485BC) he argued that a void or rather a vacuum, in nature, could not exist, per reason that "being" could not go into "non-being"; this riddled argument launched the famous 2,000-year plus nature abhors a vacuum debated and the Parmenides vs Heraclitus debate; first-slating: 180:#127 (20 positions below Heraclitus; intuition, however, said he could be in top 100 (~87 position)) (Mar 2018).

127 | 180

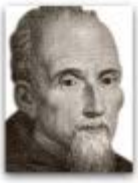

Paolo Sarpi (1552-1623) ↓↓

IQ_C=195
IQ_W=187

(Cattell 1000:426) [RGM:N/A|1,350+] (FA:37) (CR:5) Italian theologian, free thinker, historian, prelate, scientist, lawyer, and statesman, characterized as the "first philosopher to develop systematic arguments for atheism"; published description of the universe that left no room for god or anything supernatural; argued that intelligent people can see past the myths of religion and have normal existences without recourse to fear of god or death; first-slating: 190|#52 (2016); down-grade #1 to 185|#88 (2017); downgrade #2 to 180|#129 (Apr 2018), generally per low CR, low Cattle, and no RGM.

180

Fritz Haber (1868-1934)

(Becker 160:92) (GCE:30) (CR:57) German physical chemist; noted for his pioneering 1905 work in gas reaction thermodynamics, wherein he formerly organized data on free energy, and for his later 1907 solving of the problem of ammonia synthesis, via the Haber process, namely how to the strongly bonded nitrogen molecule N_2 to break apart, i.e. to break its triple bond (three covalent bonds), and to recombine with three hydrogen atoms, according to the following process:

—
129

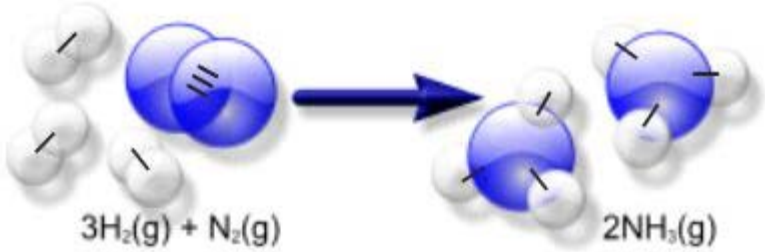

which, in May 1909, working together with English technical engineer Robert Le Rossignol, they were able to achieve, in a process that produced 6 percent yield of ammonia NH_3 at about 300°C and 200 atm pressure, using osmium as a catalyst, a feat par excellence of using thermodynamic prediction methodology to obtain desired products, at a given equilibrium state; first-slating: 180|#129 per his GCE ranking, midway between Faraday and Rutherford (Mar 2020).

— 180
129 Avicenna (980-1037) ↑

(Cattell 1000:364) [RGM:307|1,500+] (GPhE:20±) (GCE:40±) (CR:20) (MAG:3) Persian physician, philosopher, chemist, and general polymath; Da Vinci claimed to disprove his child birth soul origin theory; first draft slating: 75 to 125 tier (Dec 2016).

— 180
130 Oliver Heaviside (1850-1925)

(CR:9) English electrical engineer, mathematician, and physicist; the person who reduced Maxwell's equations, with 20 variables, down to just two equations in two variables; played a significant role in the Gibbs-Heaviside vector algebra method supplantment of the older less-congruous Hamilton-Tait quaternion method; battled Max Planck in the 1903 "what is entropy?" debate, on the question of "choice" in nature or by nature, citing Goethe; first-slating: 185|#86 (c.2015); down-graded ↓ to 180|#129 (Apr 2018).

— 180
131 Arthur Doyle (1859-1930) IQ_B=182

[RGM:140|1,240+]; *Sherlock Holmes* writer.

— 180
132 Anaxagoras (500-428 BC)

(Cattell 1000:703) (ACR:4) (FA:7) (EvT:4|21+) (CR:50) Greek philosopher; teacher of Socrates; held the view that the sun was

NOT a god (was imprisoned for this), but a hot or fiery stone, based on the examination of fallen meteors; that moon light was reflected sunlight; postulated the existence of the element "aether", which he conceived of as being in constant rotation and carried with it the celestial bodies; promoted geocentric nebular hypothesis like origin of things; atomic theory promoter; person behind the concept of "nous", or mind of the cosmos, conceptualized as an ordering force.

— 180 Augustine (354-430) IQ_O=180

[RGM:286|1,245+]; Estimated IQ:180 (2008) (Ñº);

133

| 180 134 Lord Byron (1788-1824) IQ_C=180

A Cattell 1000 (top 30); Ranker Greatest Mind (#337|1200+); quote: “adversity is the path to truth”; father of Ada Lovelace (IQ=160); Tom Stoppard’s 1993 juxtaposition of times play *Arcadia* compares Byron, in a way, to Goethe, intermixed with heat, sex, the second law, and the “attraction that Newton left out” (chemical affinity/human chemical affinity).

| 180 135 Alexander Bell (1847-1922) IQ_B=180

[RGM:45|1,245+] Scottish-born American scientist, inventor, engineer, and innovator who is credited with patenting the first practical telephone and founding the American Telephone and Telegraph Company (1885).

| 180 136 Michel Montaigne (1533-1592) ↑ IQ_C=165

(Cattell 1000:171) [RGM:222|1,500+] (Gottlieb 1000:432) (HD:2) (FA:29) (GPhE:#) (CR:73) French atomic theory based realism philosopher;

“**Montaigne** was the first Frenchman who dared to think.”

— Julien la Mettrie (1751), “Anti-Seneca” (pg. 129)

noted for his three-volume sharp quote filled 1580 *Essays*; wore a medallion around his neck that said "what do I know?" and "I hold back, or reserve judgment" around his neck; first-draft gauged at 175+ (mid 2017); upgraded to 180|#136 (Feb 2018).

| 180 137 William Harvey (1578-1657) IQ_C=180

(Cattell 1000:227) [RGM:N/A|1,320+] (Simmons Scientific 100:38) (Hart 100:49) (Glenn 20:4) (Murray 4000:7|B) (CR:22) English physician; noted generally for his mechanics of heart blood flow circulation models.

| 180 138 Frederick Rossini (1899-1990) ↑↑↓

[SN:7] (RE:91) [CR:175] American physical chemist and chemical thermodynamicist;

“In 1971, **Rossini** received the Priestley Medal, the highest distinction conferred by the American Chemical Society, during which, in his address ‘Chemical Thermodynamics in the Real World’, he made a

$$\ln K = -\frac{\Delta H^\circ}{R}\left(\frac{1}{T}\right) + \frac{\Delta S^\circ}{R}$$

Social Freedom & Security Equation
(Rossini, 1970)

clever comparison of the counterplay of **enthalpy** and *entropy* in thermodynamics with that of **security** vis-à-vis *freedom* in the world at large."

— Ernest Eliel (1999), "Frederick Rossini"

student of Gilbert Lewis, argued that chemical thermodynamics applies to society, and explains the inverse relation between freedom and security in social systems; down-graded from 185|#83 (original) to 180|#140 per creationism comments (Feb 2018) .

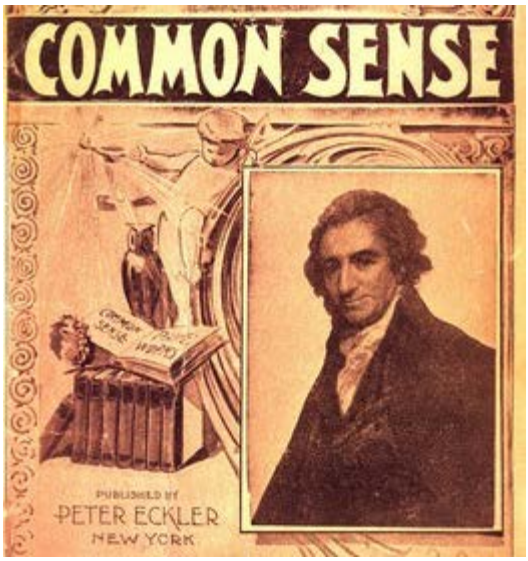

(Cattell 1000:583) [RGM:138|1,400+] (RMS:24) (HD:15) (FA:44) (**GA**:28) (Stokes 100:52) (founding father:6) English-born American political activist, philosopher, irreligionist, atheism-inclining free thinker, and revolutionist;

"I can still remember the flash of enlightenment that shone from its pages."

— Thomas Edison (c.1915), reflection on Paine's [1794] *Age of Reason*

180 | 139

Thomas Paine (1737-1809)

"**Paine**'s [49-page] *Common Sense* [1776] pamphlet [selling some 500,000 copies in the mid 1770s] became the biggest seller per capita in American publishing history and almost single-handedly sparked the [American] revolution."

— Scott Smith (2013), "Thomas Paine's Writing Sparked the American Revolution" (Ñº)

Inspiration to George Washington; befriended by: Benjamin Franklin, Thomas Jefferson, and James Monroe; first-slated at 175|#225 (May 2017); upgraded to #139 per Edison genius recognizes genius quote (Jun 2017).

(Cattell 1000:N/A) [RGM:N/A|1,500+] Dutch physicist, philosopher, astronomer, physician, meterologist and natural philosopher;

"**What is the reason that bodies are moved in any direction**?"

— Isaac Beeckman (1614), *Journal Notes*

180

Isaac Beeckman (1588-

140 1637)

noted for questioning the logic of abhorrence of the vacuum model (see: nature abhors a vacuum) of "movement in nature" (1614), for originating the matter and motion model (1818) of mechanistic philosophy, for introducing the first concept of "molecule" (1820), and for mentoring Rene Descartes and Pierre Gassendi; first-slating: 180|#140 (Jun 2019).

141 | 180 Joseph Fourier (1768-1830)

(Cattell 1000:N/A) [RGM:N/A|1,500+] (GPE:76) (Eells 100:16) (CR:34) French physicist and mathematician; his *The Analytical Theory of Heat* (1822), wherein he outlined a heat flow theory based his reasoning on Newton's law of cooling, namely, that the flow of heat between two adjacent molecules is proportional to the extremely small difference of their temperatures, was read like gospel by William Thomson and James Maxwell in youth, therein being instrumental in the later development of thermodynamics; the book also provided the foundation for the Fourier transform; first-draft gauged at 180±(#138) (Jan 2018).

142 | 180 Nicholas of Cusa (1401-1464)

(Cattell 1000:N/A) [RGM:241|1,320+] (Murray 4000:N/A) Proposed the earth was a sphere, spinning daily on its axis orbiting the sun—also, in opposition to Aristotle's circular orbit theory, argued that perfect spherical orbits are impossible, thus predating the elliptical orbit theories of Johannes Kepler; that heavenly bodies were made of the same material as the earth; proposed dropping objects from towers to see why they fell as they did; described rules for experimentation; took the pulse; forecast the weather; argued for an infinite universe; invented reading glasses; wrote on squaring the circle, among other mathematical subjects; his best known work is his *Learned Ignorance*, according to which a person of learned ignorance is not a person of erudition (Ñº); Nicolaus Copernicus, Galileo Galilei, Giordano Bruno, and Kepler were all, supposedly, aware of his writings, the latter citing him in the first paragraph of his first published work; commonly labeled as a polymath also many-sided genius; first-draft gauged at 170-185 (2016).

143 | 180 George Green (1793-1841)

English mathematical physicist; at age 35, a self-educated miller (read books via the Nottingham Subscription Library), having had almost no formal schooling, self-published his 1828 "An Essay on the Application of Mathematical Analysis to the Theories of Electricity and Magnetism", wherein starting from the work of Pierre Laplace, he introduced the concept of "potential function", i.e. the potential as a function of Cartesian coordinates V(x,y,z), particularly the potential energy of an arbitrary static distribution of electric charges; he also derived the divergence theorem independent of Carl Gauss; is the eponym of the Gauss-Green-Stokes theorem (fundamental theorem of calculus); downgraded (Mar 2017) from #40 to #140 of top 500 genius rankings per intuition (supplanted by Buchner inclusion).

(Cattell 1000:557) [RGM:558|1,500+] [Kanowitz 50:32] (Eells 100:93) (GPE:54) (SIG:6) (CR:15) French physicist and mathematician;

"The experimental investigations by which Ampere established the laws of

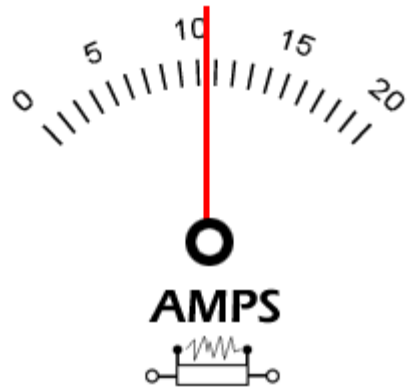

— 180 | 144

Andre Ampere (1775-1836)

mechanical action between electric currents is one of the most brilliant achievements in science. The whole, theory and experiment, seems as if it had leaped, full grown and full armed, from the brain of the **'Newton of electricity'**. It is perfect in form, and unassailable in accuracy, and it is summed up in a formula from which all the phenomena may be deduced, and which must always remain the cardinal formula of electro-dynamics."

— James Maxwell (1873), *Treatise on Electricity and Magnetism, Volume 2*

Dubbed the "father of electrodynamics" (Heaviside, 1888); founder of electrodynamics, the study of currents and dynamical movements; a "tortured genius" who had the phrase "Tandem felix" ("Happy, at last") engraved on his tombstone; gauged at 180-190 (c.2015).

— 180 | 145

John Dalton (1766-1844)

[RGM:435|1,500+] (Murray 4000:7|C) (Gottlieb 1000:248) (Simmons 100:74) (Hart 100:26) (Partington 50:14) (GCE:19) (CR:29) English chemist;

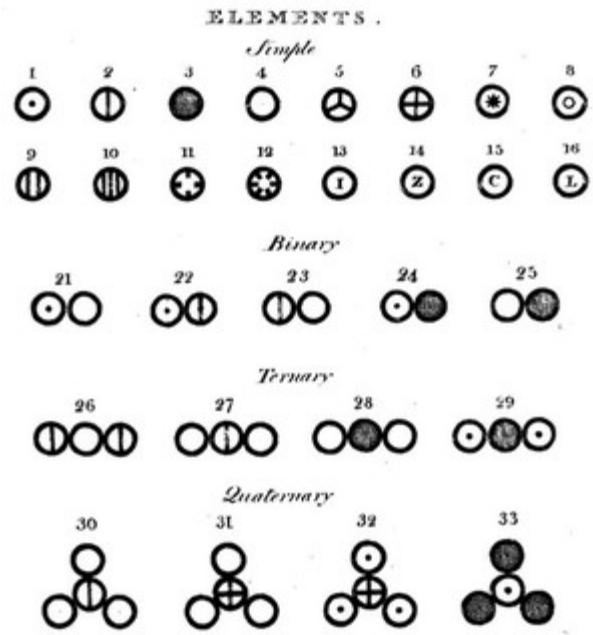

"It was from **Dalton**'s instruction, that I first formed a desire to increase my knowledge of original research."

— James Joule (c.1870)

A main pioneer of atomic theory; first to give the basics of the periodic table, with hydrogen as element one; upgrade from 170|#314 to 180|#142 (Apr 2018).

— 180 | 146

George Berkeley (1685-1753) ↓↓ IQ_C=190

(Cattell 1000:289) [RGM:302|1,310+] (Murray 4000:14|WP) (Stokes 100:44) (**SN**:56) Irish-born English philosopher, noted for a blurry god-based Newtonian sociology gravitation like description of the of sous; that was ridiculed by Baron d'Holbach (1770) ↓↓, but, ironically, derogated by Pitirim Sorokin (1928) ↑, but later defended, in some sense, by Bernard Cohen (1994); down-graded from 185|#89 to 180|#145 (Mar 2018).

180 | 147

Ivan Pavlov (1849-1936)

IQ_B=180

(RGM:257|1,310+) (Glenn 20:14) His 12 years of research, from 1885-1897, on digestive glands and conditioned response, wherein he showed that by ringing a bell he could get a dog to salivate, set the foundation for the later work of John Watson and behaviorism (a thematic forerunner to many two cultures namesakes fields).

180 | 148

James Madison (1751-1836)

IQ_C=160
IQ_{Si}=160

(Cattell 1000:476) [RGM:177|1,305+] American political leader; one of the chiefs of Princeton School of Social Physics; used Newtonian government in the construction of the US Constitution, such as the principle of separation of powers, as found in celestial mechanics.

180 | 149

Jean Rousseau (1712-1778) ↑↑↑

IQ_C=150

(Cattell 1000:43) [RGM:118|1,320+] (Murray 4000:18|WP / 6|WL) (CR:49) Genevan philosopher, writer, and composer; upgraded from 150|#437 to 175|#225 (Jun 2017) per RGM ranking, EPD genius, Goethe universal genius precursor quote (Curtis, 1949), and “Rousseau’s ‘I felt before I thought’, which opposed Descartes ‘I think therefore I am’, brings a new idea” (Badre, 2006); upgraded to 180|#145 (Jan 2018) per Murray 4000 ranking, Kant photo, and his “system of being” quote.

180 | 150

Gustave Coriolis (1772-1843)

(SIG:9) (CR:35) French physicist; noted for his 1829 *Calculation of the Effect of Machines*, wherein he introduced the modern formulaic definition of work as force times distance; some references assert, of note, that also in this book he introduced the introduced the factor ½ in German mathematician Gottfried Leibniz’s 1686 *vis viva* for the sake of mathematical convenience (others say it was Joseph Lagrange who did this in 1811); also noted for his 1835 paper, wherein he stated that “any particle moving in the northern hemisphere is deflected to the right, and any particle moving in the southern hemisphere is deflected to the left”, aka the Coriolis effect, according to which explains why toilets drain clockwise in the northern hemisphere and counterclockwise in the southern hemisphere; first-slating: 180|#150 (Feb 2019).

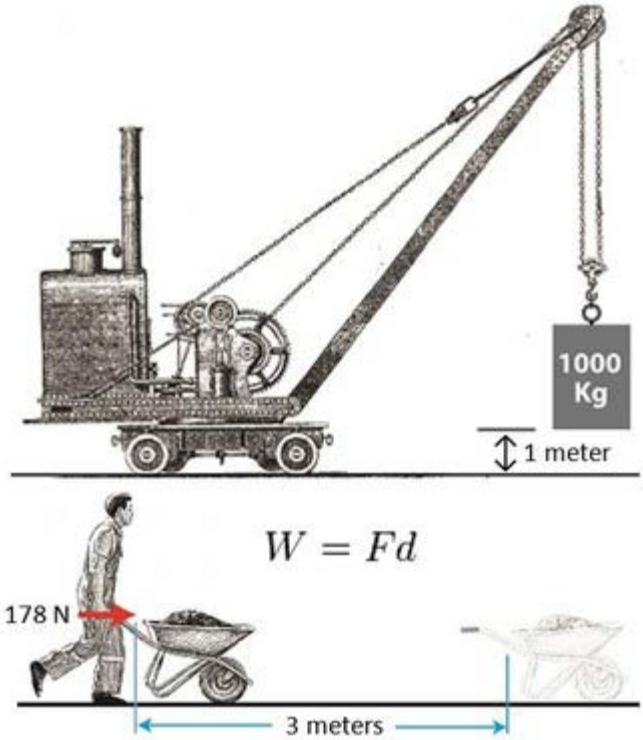

(Cattell 1000:N/A) [RGM:N/A|1,500+] (MAG:5) French physician, coiner of the term ‘physiology’, and also "pathology", the study of the

180 | 151		Jean Fernel (1497-1558)	body's disease; noted for his *On the Hidden Causes of Things* (1542), which overthrows Aristotle, e.g. “Did not Aristotle well and truly say, and leave it written for all posterity, that: ‘Heat is the condition of life’?”, was used by Charles Sherrington (IQ:180|#100) as the platform of his defunct theory of life plowing *Man on His Nature* (1938) lecture; first-draft gauged at #175 of top 500 geniuses (May 2017) per consequence of Sherrington inclusion.
180 | 152		Benjamin Franklin (1706-1790) ↑	IQ_{CB}=**173** IQ_{C}=160 IQ_{B}=185 IQ_{W}=160

(Cattell 1000:45) [RGM:27\|1,500+] (Murray 4000:14\|T) (Gottlieb 1000:54) [Kanowitz 50:25] (GPE:96) (HD:16) (FA:72) (CR:31) American politician, a founding father (see: founding fathers fallacy), diplomat, scientist, and irreligion philosopher, an oft-ranked universal genius; pioneer in the science of electricity; famously noted for his key on kite lightening experiment; upgraded ↑ from 210\|#175 to 200\|#180 (Feb 2018); upgraded from ↑ to 180\|#152 (Nov 2019).

180 | 153		Jacob Berzelius (1779-1848)	IQ_{C}=160

(Cattell 1000:424) [RGM:N/A\|1,500+] (Murray 4000:2\|C / 18\|CS) (EPD:F4 / M9) (GCE:3) (CR:41) Swedish chemist;

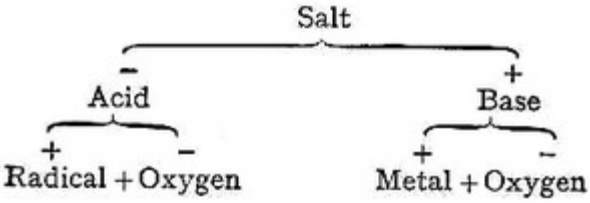

“Chemical signs ought to be letters, for the greater facility of writing. I shall take therefore for the chemical sign, the initial letter of the Latin name of each elementary substance: but as several have the same initial letter, by writing the first two letters of the word.”

— Jacob Berzelius (c.1810) (Ñº)

noted for his 1806 book on animal chemistry, for his 1808 coining of the term "organic chemistry" (and seemingly the terms organic vs inorganic), his 1811 theory of electric dualism of affinity, his 1831 charge distribution atomic structure model, and his 1836 postulate of the “catalytic force” (catalyst), different from that of the force of affinity, possessed by some materials, and is the person who introduced the two letter nomenclature of elements, helium as "He"; upgraded from 165\|#390 to 180\|#150 (Apr 2018).

180 | 154		Alexander the Great (356-323BC)	IQ_{O}=200 IQ_{B}=180

(Cattell 1000:17) [RGM:83\|1,320+] (Murray 4000:N/A) (GMG:1) Greek emperor-warlord; tutored by Aristotle; by age of thirty, he had created one of the largest empires in ancient history; established the Library of Alexandria, unified Greek science with Egyptian theology to form the forerunner religion to what, in the Roman recension would become Christianity (some argue, that via a reformulation of Osiris-Horus, he was prototype to Jesus); carried the works of Homer and Aristotle into battle (Ñº); cited by some (Ñº) with IQ of 200.

(Cattell 1000:494) [RGM:79\|1,310+] (Murray 4000:N/A) Italian philosopher, poet, essayist, and philologist;

180 | 155	Giacomo Leopardi (1798-1837)	IQ_C=185 IQ_W=185	"No one thing shows the greatness and power of the human intellect or the loftiness and nobility of man more than his ability to know and to understand fully and feel strongly his own smallness. When, in considering the multiplicity of worlds, he feels himself to be an infinitesimal part of a globe which itself is a negligible part of one of the infinite number of systems that go to make up the world, and in considering this is astonished by his own smallness, and in feeling it deeply and regarding it intently, virtually blends into nothing, and it is as if he loses himself in the immensity of things, and finds himself as though lost in the incomprehensible vastness of existence, with this single act of thought he gives the greatest possible proof of the nobility and immense capability of his own mind, which, enclosed in such a small and negligible being, has nonetheless managed to know and understand things so superior to his own nature, and to embrace and contain this same intensity of existence and things in his thought." — Giacomo Leopardi (c.1825), *Miscellany of Thoughts* (Zibaldone di pensieri) (Ñº)(Ñº)
180 | 156	Honore Mirabeau (1749-1791) ↓	IQ_C=185	a Heinegg 55 (Ñº) mortalist. (Cattell 1000:55) [RGM:N/A|1,320+] [FA:63] French revolution hero; excelled at mathematics early on; at age 15, found that he "needed" John Locke's *Essay on Human Understanding*; when the anonymous *The System of Nature* (1770) appeared, secretly written by Baron d'Holbach, people attributed it Mirabeau or Helvetius.
180 | 157	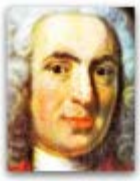 Carl Linnaeus (1707-1778) ↑	IQ_C=165	(Cattell 1000:128) [RGM:88|1,310+] noted for his 1753 binomial nomenclature classification of species scheme; for his 1758 centigrade thermometer work; upgrade for being a mentor to Torbern Bergman, who used the scheme in his 1775 physical chemistry textbook; and upgrade for being a great influence to Johann Goethe in his early 1780s botanical studies in search of his moving order metamorphosis of form theory; upgrade from 170|#275 to 180|#150 (Jan 2018).
180 | 158	John Bardeen (1908-1991)		[RGM:N/A|1,330+] (Murray 4000:N/A) (EPD|M12) (CR:7)(CR:7) American physicist and electrical engineer, a dual Nobel prize recipient , noted for invention of the transistor (Nobel Prize physics, 1956) and for the theory of superconductivity (Nobel Prize physics, 1972); see *True Genius: the Life and Science of John Bardeen: the Only Winner of Two Nobel Prizes in Physics* (2002); first-slated: 180|#130 (c.2016).
180 | 159	Marquis Condorcet (1743-1794)	IQ_C=180	(Cattell 1000:288) [RGM:N/A|1,310+] (FA:79) French mathematician, philosopher, and political scientist; inventor of the "curly d" (∂) symbol for partial differential equations (see: history) (1770); his social mathematics, supposedly, served as a platform for Adolphe Quetelet's later "social physics"; Thomas Jefferson praised his genius.
180 | 160	John Tukey (1915-2000)		(SN:13) American chemist, mathematician, and statistician; noted for his 1966 free energy theory of attitude state changes, based on the theory of absolute reaction rates in chemistry; first-slating: 180|#158 (see: IQ:200+ HCT prodigies) (c.2016).
	Plutarch		(Cattell 1000:134) [RGM:204|1,500+] (FA:31) (GPhE:19) [CR:116]

180 | 161

(c.46-120)

Greek-born Roman historian and philosopher, noted for his commentary on the Osiris resurrection theory (100AD), i.e. Egyptian state religion, for his discussions on the theory of the cold element (118AD) and for his Theseus's ship (see: turnover rate) paradox discussions; first slating: #150 (Dec 2017); upgrade from previous IQ:175|#217 position (c.2019).

180 | 162

James Froude (1818-1894)

His 1849 *Nemesis of Faith*, wherein he digresses on the "will of the copper" in relation to heated and cooled magnets, was burned in moral philosophy class at Oxford; in 1854, he became the first English translator of Goethe's *Elective Affinities*, done anonymously per reasons of caution as to its Christianity overthrowing contents; first-draft slated at #150 (Dec 2017).

(Partington 50:31) (GCE:24) (CR:209) Swedish chemist;

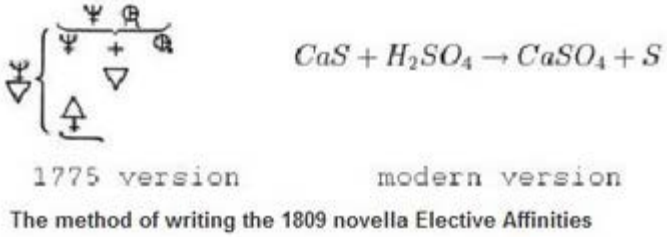

The method of writing the 1809 novella Elective Affinities

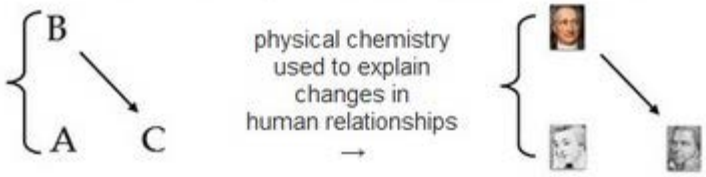

180 | 163

Torbern Bergman (1735-1784)

"The **moral symbols** in the natural sciences—for example that of the elective affinities invented and used by the **great Bergman**—are more intelligent and permit themselves to be connected better with poetry, even connected with society better than any others, which are, after all, even the mathematical ones, anthropomorphic. The thing is that the former (the chemicals) belong with the emotions, the latter (mathematics) belong with the understanding."

— Johann Goethe (1809), "Comment to Friedrich Riemer", Jul 24

His 1775 textbook *A Dissertation on Elective Attractions*, the epitome and culmination of 18th century affinity chemistry, initiated via Newton's last and final "Query 31" (1718), generally, marks the start of what in the 19th century became physical chemistry.

[RGM:151|1,360+] (Murray 4000:3|P / 15|CS) (CR:40) New Zealand-born British physicist;

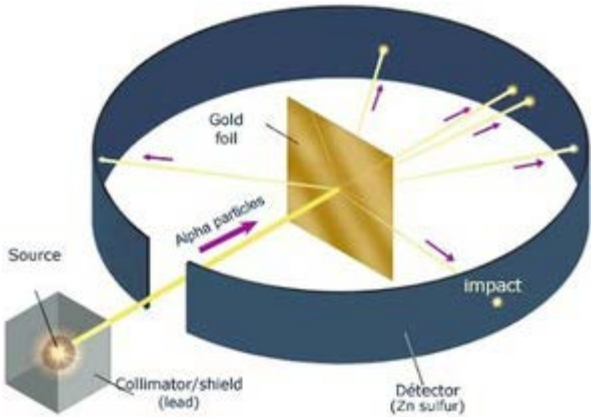

180 | 164

Ernest Rutherford (1871-1937)

"When we have found how the nucleus of atoms is built up we shall have found the greatest secret of all — except life."

— Ernst Rutherford (c.1898)

Noted for his discovery/identification of the alpha particle (1899), aka "gold foil experiment", shown adjacent, nucleus (1909/1911), proton (1919), and for predicting/proposing the "neutron" (1920); first-slating: 180|#160 (Apr 2018).

180 | 165

John Nash (1928-2015)

IQ_{CP} =200± IQ_{O}=180

[RGM:324|1,500+] (YCG:32) (DN:7) (CR:29) American economist; described, at age 20, as "a genius" in his letter of recommendation by Carnegie Tech professor R.L. Duffin; based his 1949 "Nash equilibrium", and supposedly game theory, supposedly, on the statistical interactions of reacting molecules from his studies of chemical engineering and chemistry at Carnegie Tech; some rank Nash at the IQ=200+ level and compare his genius to that of Nikola Tesla or John Neumann (Ñº); famously known for his mixture of genius and madness (e.g. *A Beautiful Mind*, 2001); a Discovery.com top 5 mad genius (Ñº); (V) Quote: "It is believed that mathematician John Forbes Nash had an IQ around 180" (Evans, 2010). (Ñº)

180 | 166

John Toland (1670-1722) ↑

(Cattell 1000:N/A) [RGM:N/A|1,320+] (Murray 4000:N/A) (FA:62) First person ever called a "free thinker" (Molyneux, 1697); characterized by Jonathan Swift as the "great oracle" of the anti-Christians; first citation in Baron d'Holbach's "Motion and its Origin" chapter, referred to by Denis Diderot as the "celebrated Toland"; characterized a "modern Lucian" in his obituary; first draft slated: 170|#250 (May, 2017); upgraded ↑ to 180|#160 (Jan 2018) per Holbach-Diderot endorsement, his 1704 pantheism upgrade attack on the system of Spinoza, etc.

180 | 167

James Joule (1818-1889)

(Murray 4000:16|P) [Kanowitz 50:17] [Cropper 30:3|T] (GPE:28) English physicist and engineer;

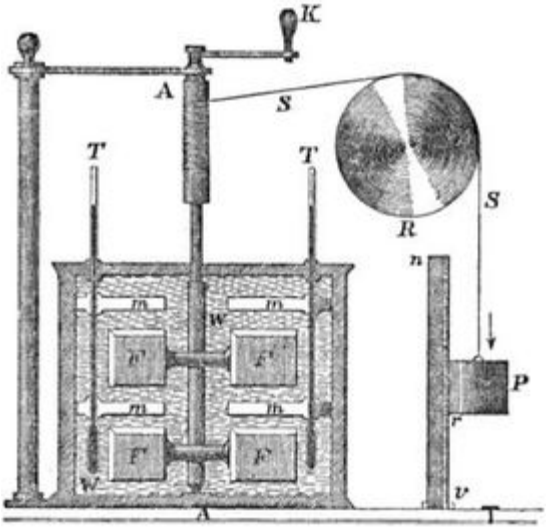

"The height of the pulleys from the ground was twelve yards, and consequently, when the weights had descended through that distance, they had to be wound up again in order to renew the motion of the paddle. After this operation had been repeated sixteen times, the increase of the temperature of the water was ascertained by means of a very sensible and accurate thermometer."

> — James Joule (1845), "On the Existence of an Equivalent Relation between Heat and the Ordinary Forms of Mechanical Power" (Ñº)(Ñº)

together with Hermann Helmholtz and Robert Mayer, are the three main derivers of the mechanical equivalent of heat (aka the conservation of energy) the big three thinkers of Thomas Kuhn's group of 12 independent formulators of the conservation of energy paradigm change theory; gauged at IQ 175-190 (c.2015).

180 Robert Mayer

Together with Hermann Helmholtz and James Joule, are the three main derivers of the mechanical equivalent of heat (aka the conservation of

168	(1814-1878)		energy), or the big three thinkers of Thomas Kuhn's group of 12 independent formulators of the conservation of energy paradigm change theory; gauged at IQ 175-190 (c.2015).
169 | 180	Henry Bray (1846-1922)		(SN:18) English-born American polymath; last thinker to intelligibly argue for the "living universe" hypothesis (Goethean elective affinities inclusive); first Hmolpedia scholar wherein "social Newton term analysis" was performed; a technique later called Beg analysis (Thims, 2014); first-draft slated at 180|#159 (Jan 2018).
170 | 180	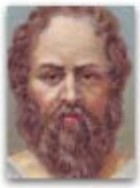 Socrates (c.469-399BC)	IQ_{SS}=235 IQ_{O}=185+ IQ_{B}=160	(Cattell 1000:29) [RGM:10|1,500+] (Murray 4000:12|WP) (FA:11) (GPhE:4) [CR:122] Greek philosopher, student of Anaxagoras; Nietzsche uberman (IQ[mean]:186+); objected to atomic theory; leader of the Plato-Aristotle school of philosophy; famously denied that he was the smartest person in Athens, per reason, after interviewing all the presumed smart men in town, finding that they knew very little, that he "knew nothing"; quote: "the beginning of wisdom is the definition of terms".
171 | 180	Jonathan Swift (1667-1745) ↑	IQ_{O}=186 IQ_{C}=155	(Cattell 1000:64) [RGM:194|1,500+] (Murray 4000:N/A) (CR:17) Anglo-Irish satirical writer, religion vs free thinking commentator, and unlearn expositor (mean IQ: 186); "When a **true genius** appears in this world, you may know him by this sign, that the dunces are all in confederacy against him." — Jonathan Swift (1706), "Thoughts on Various Subjects, Moral and Diverting" generally known for his *Gulliver's Travels* (1726), noted for commentary on John Toland, who he called the "great oracle of the anti-Christians", and for his Cicero-like digression on whether the mind was formed by god or by the Epicurean fortuitous concourse of atoms origin of things; upgrade for his views on "true genius"; first slating: 180|#156 (c.2016).
172 | 180	Joseph Black (1728-1799)		(Murray 4000:9|C) (Partington 50:13) (GCE:14) [CR:76] Scottish physicist and chemist; "**Joseph Black** was the preeminent man of science in the Scottish enlightenment." — David Wilson (2009), *Seeking Nature's Logic* notable for his scientific investigations into the nature of heat, for being a mentor and financier to Scottish mechanical engineer James Watt, and for his discovery of the phenomenon of "latent heat", calculations of which were later used by French chemist Antoine Lavoisier and Pierre Laplace in their 1782 invention the "ice calorimeter", which was used to determine the heat evolved in various chemical reactions. ; first-slating: 180|#171 (Nov 2019).
	Joseph		(Cattell 1000:338) [RGM:503|1,500+] (Murray 4000:4|C) (Gottlieb 1000:137) (Becker 160:81) (GCE:7) (CR:45) English chemist, physicist, philosopher, and general polymath; noted for his expansion of gases

180 | 173

Priestley (1733-1804) IQ_C=165

experimentation; for his 1774 phlogiston as the driving force for chemical reaction theory, said (Woodcock, 2005) to be forerunner to Gibbs energy as driving force; deduced Coulomb's law (1767) nearly two decades before Coulomb; digressed on "will", religion, philosophy. upgrade ↑ from 170:#333 to 180|#173 per his general intellectual stature, covering many fields (Apr 2020).

180 | 173

Heinrich Hertz (1857-1894)

[RGM:151|1,500+] (Murray 4000:N/A) (Gottlieb 1000:453) (Kanowitz 50:24) (SIG:11) (GPE:36) German physicist;

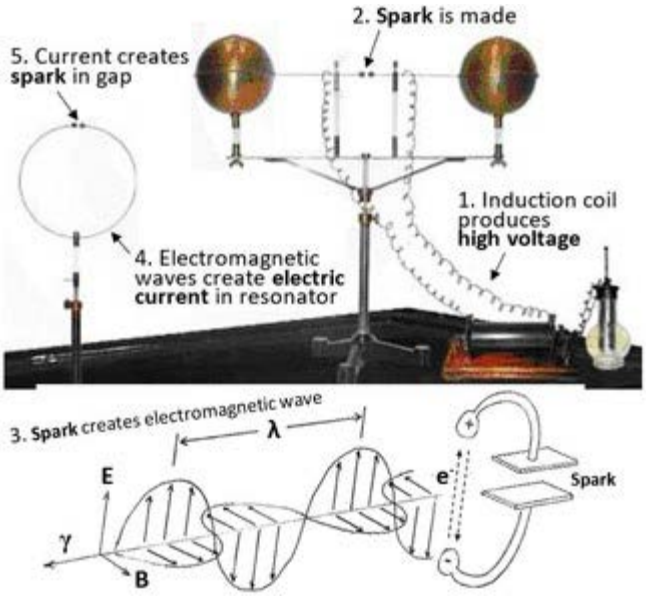

"It's of no use whatsoever. This is just an experiment that proves Maestro Maxwell was right—we just have these mysterious electromagnetic waves that we cannot see with the naked eye. But they are there."

— Heinrich Hertz (1887), *Publication* (Ñº)

noted for his 1886 experimental proof, via detection of radiowaves, of Maxwell's electromagnetic theory, via experimental setup as shown adjacent; first-slating: 180|#185 (Dec 2017).

180 | 174

Edward Gibbon (1737-1794) IQ_C=180

(Cattell 1000:60) [RGM:495|1,400+] (Murray 4000:N/A) [HD:12] (FA:76) (GHE:2) (CR:18) English historian; noted for his six-volume *The History of the Decline and Fall of the Roman Empire*, peer reviewed by David Hume (1776), wherein he openly criticized organized religion, telling the story of the rise and fall of Roman, without the intervention of god, as was previously the standing historical *modus operandi*, but instead from the point of view of Rome's decline as due the "disease of Christianity" spreading through the Roman empire and rotting it.

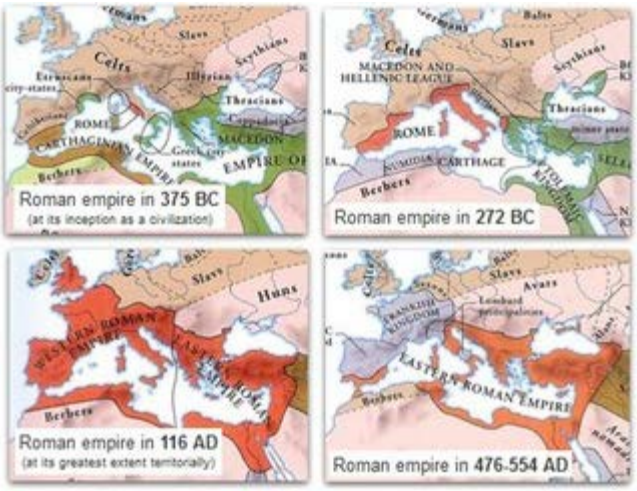

(Cattell 1000:N/A)

175 | 180

Etienne Geoffroy (1672-1731)

[RGM:N/A|1,350+] French physician and chemist; noted for his *Table Concerning the Different Affinities Observed in Chemistry between Different Substances*, wherein, starting with verbal descriptions of reaction powers, as described in Newton's "Query 31", he first stated the following affinity law:

"Whenever two substances are united that have a disposition to combine and a third is added that has a greater affinity with one of them, these two will unite, and drive out the other."

and therein made the world's first affinity table (adjacent); ushering in the science of affinity chemistry, the forerunner to physical chemistry; first-slating: 180|#170 (Apr 2018).

176 | 180

Ludwig Beethoven (1770-1827) ↑↑

IQ_{CB}=**165**
IQ_{C}=165
IQ_{B}=165

(Cattell 1000:220) [RGM:17|1,330+] (Murray 4000:1|WM) (MG:1) (RBCC:2|275+) met with Goethe (see: Goethe and Beethoven); Otto Weininger dereacted (died) in the same room he did; upgraded from 170|#309 to 180|#170 (Feb 2018).

177 | 180

Augustin Fresnel (1788-1827)

(Cattell 1000:N/A) [RGM:N/A|1,330+] (Murray 4000:N/A) French engineer-physicist;

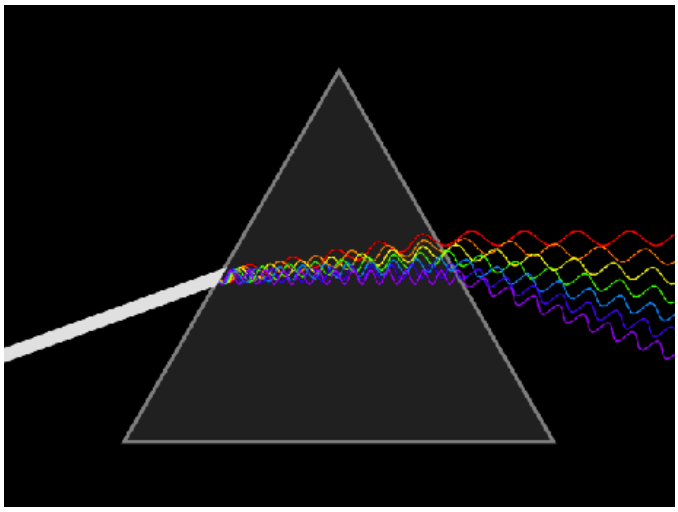

"By the genius of Young and Fresnel the wave theory of light was established in a position so strong that hence forth the corpuscular hypothesis was unable to recruit any adherents among the younger men."

— Edmund Whittaker (1987), *A History of the Theory of Aether and Electricity* (Ñº)

co-founder, with Thomas Young, of the wave theory of light; 2018

missing (Ñº) GPE candidate; first-slating: 180|#170 (Mar 2018).

178 | 180 Denis Diderot (1713-1784) ↑↑ IQ_C=165

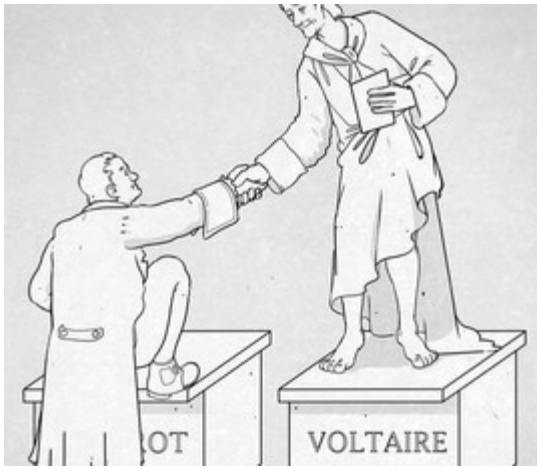

(Cattell 1000:169) [RGM:448|1,360+] (HD:11) (FA:68) (CR:26) was a French philosopher, art critic, encyclopedist, and "physician" (Mettrie, 1747), aka the "father of the encyclopedia" (Stark, 2006), noted for his views on determinism, atheism, anti-chance, among others; the main editorial driving force between the famous 32-volume *Encyclopedie* (1751-1772), co-written with Jean d'Alembert; involved in atheism (e.g. against Julien la Mettrie's supposed amorality); involved in the Maupertuis-Diderot debate; noted for his Diderot-Barthelemy dialogue; upgrade ↑ from 170|#304 to 180|#179 (Apr 2018).

179 | 180 Bernard Shaw (1856-1950) IQ_{JP}=180

[RGM:N/A|1,330+] (Murray 4000:N/A) [HD:45] (GLE:28) Irish playwright, critic, polemicist, and political activist; an Andrew Robinson (2010) "missing Cox 300" genius (Ñº); a top 20 Jabari "smartest atheists" (Ñº); John Platt, in "The Coming Generation of Genius" (1962); first-slating: 180|#172 (c.2017).

180 | 180 Henri Poincare (1854-1912) IQ_{SB}=35

[RGM:476|1,500+] [LPKE:12] (GME:9) (GPE:63) [CR:76] w French mathematical physicist; known for: Poincare conjecture, relativity, thermodynamics, mathematics; scored so poorly on the Binet IQ, to note, that he was judged an imbecile (IQ:35); first slating: 185-195|#40 (c.2016); down-grade to 180|#180 (Apr 2020).

180 | 180 Soren Kierkegaard (1813-1855) ↓

[RGM:58|1,260+] (Stokes 100:69) (CR:16); an oft-cited GPE candidate; one of the founders of existentialism, noted for very ripe inside the mind quotes on nature of genius and introspection on existence; downgrades ↓↓ , from position #98 to #160 (May 2017), for the lacking in logic and absurdism promoting "Fear and Trembling" (1843) and "Crowd is Untruth" (1846).

181 | 180 Philipp Melanchthon (1497-1560) ↓ IQ_C=190 IQ_W=180

[RGM:241|1,500+] (Cattell 1000:137) (CR:15) German child prodigy, a youngest college graduate, and university head, noted for being the second most important individual behind the Lutheran reformation, behind Martin Luther, via acting as restraint on Luther's more "counterproductive impulses"; knew Johann Faust; downgrade for describing Copernicus' 1514 heliocentric theory as an "old joke" (see: crackpot), implying that it was a superfluous revival of a frivolous *circa* 250BC suggestion by Aristarchus.

182 | 180 Jacques Bossuet (1627-1704) IQ_C=180 IQ_W=177

His *Discourse on Universal History* (1681) (Ñº) is regarded by many as a "second edition" or actualization of Augustine's *City of God* (426AD), which had addressed theological puzzles, such as suffering of the righteous, the existence of evil, the conflict between free will and divine omniscience, and the doctrine of original sin. (Ñº)

(Cattell 1000:35) [RGM:108|1,500+] (Murray 4000:7|WP) (Gottlieb 1000:11) (Stokes 100:38) [HD:7] (FA:63) (GPhE:#) (CR:67) English physician and social philosopher; noted for his 1690 *Essay Concerning*

Human Understanding, wherein, he made, supposedly, the first serious attempt to explain the functioning of the mind in purely naturalistic terms, WITHOUT the need for divine intervention in the development of reason;

| 180 | 183

John Locke (1632-1704) ↑↑

> "Bacon, **Locke**, and Newton are the three greatest men that have ever lived, without any exception."
>
> — Thomas Jefferson (1789), "Letter to John Trubull"

close friends with Robert Boyle and Isaac Newton; oft-classified as dominant materialist alongside Thomas Hobbes; influential to the Lausanne school of physical economics; characterized by Baron d'Holbach as "profound"; upgraded ↑ from 170|#347 to 180|#172 (Feb 2018).

| 180 | 184

Charlemagne (c.742-814)

[RGM:176|1,500+] Frankish king; noted for his rulee of much of Western Europe from 768 to 814; classified with Alexander the Great (IQ:180|#138), Napoleon (IQ:180|#106), and Genghis Kahn (IQ:180|#161), by Morris Zucker (1945), in *The Philosophy of American History: The Historical Field Theory* (pg. 57), the four dominate examples of "purely synthetic creations of individual genius", in respect to great man theory of history.

| 180 | 185

Denis Papin (1647-1712) ↑

(Cattell 1000:N/A) [RGM:N/A|1,500+] (Murray 4000:18|T) (CR:95) French physicist and engineer; his operational Papin digester (1679), which spurred Boerhaave's law and later Antoine Lavoisier and caloric theory, and Papin engine (1690), which seeded the all all later steam engines and Carnot engine, and thereafter thermodynamics, are scientific linchpins, to say the least; first-slating: 180±|#150-250 (2015).

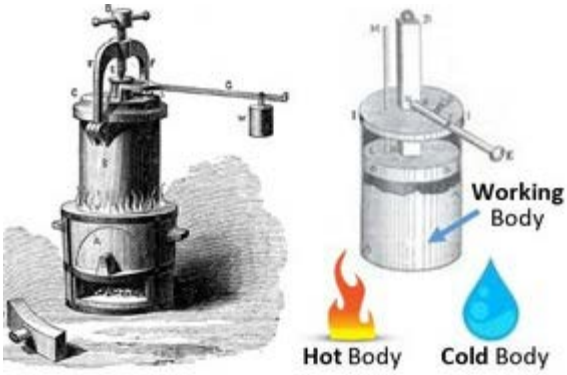

[RGM:366|1,500+] (CR:30) German theologian, Egyptologist, physicist, philosopher, and general polymath;

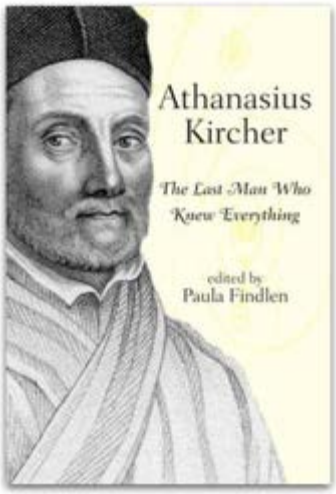

"Nothing is more beautiful than **to know all**."

— Athanasius Kircher (c.1670) (Ñº)

| 180 | 186

Athanasius Kircher (1602-1680)

Known as: aka "Incredible German" (Germanus Incredibilis), a fabled last persons to know everything, noted for his 1667 *The Nature of the Magnetic Universe: with Psychological Discussions*, wherein he outlined a magnetic cosmology, according to which magnetism governed the movements of everything, animate to

inanimate, plants, animals, and planets; Goethe, during his researches of optics and other subjects, commented “thus, entirely unexpected, Father Kircher is here again”; was present at the 1641 Gasparo Berti test of the "nature abhors a vacuum" experiment (which he denied); coined the term electromagnetism; one of the first Egyptologists; first slating: 180-195|#41 (c.2015); downgrade ↓ to IQ:185|#85 for denying (1656) the existence of the vacuum in Otto Guericke’s experiments (Feb 2019); down-grade ↓ to: 180|#185 (Apr 2020) per more anti-vacuum argument.

180 | 18#

Alexander Humboldt (1769-1859) ↓ IQ_C=185

(Cattell 1000:94) [RGM:83|1,310+] (Murray 4000:N/A) Prussian geographer, naturalist, explorer, romantic philosopher, oft-characterized polymath and fabled "last persons to know everything"; younger brother to Wilhelm Humboldt (1767-1835); noted for being one of the first to propose that South America and Africa were both joined; down-graded from 185|#82 to 180|#175 pre reasoning (a) reading of his *Cosmos, Volume One*, filled with closeted-theistic anthropomorphic descriptions of nature, and (b) no-once cited him anymore (Feb 2018).

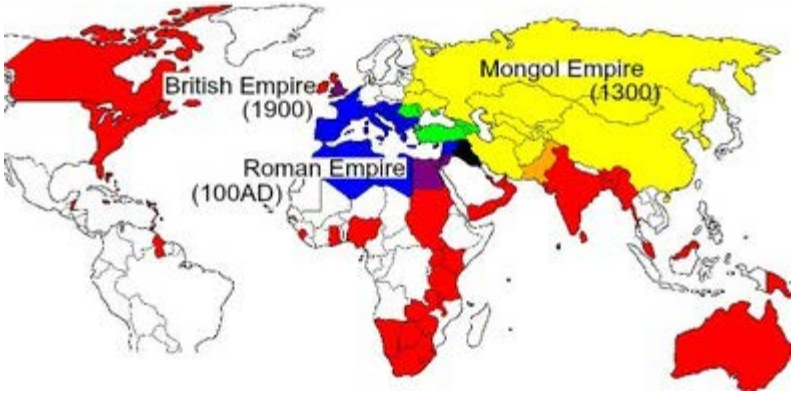

180 | 187

Genghis Kahn (c.1162-1227) IQ_B=180 IQ_O=120-125

[RGM:313|1,300+] Founder of the Mongol Empire, the largest contiguous empire (Ñº) in history; the secret of their power, was said to be their drinking of mare’s milk, which heightened their intellect and warrior power; IQ Quora gauged (Ñº) at 120-125 (2017); Hmolpedia gauged (Ñº) as intellectually comparable to: Adolf Hitler (155|#573), Alexander the Great (180|#152), and Napoleon Bonaparte (180|#108), and Charlemagne (179|#180), by Morris Zucker (1945).

180 | 188

Torquato Tasso (1544-1595) IQ_C=180

Voltaire (1728), in commentary on his poetry, coined the term “christian mythology”.

180 | 189

Victor Hugo (1802-1885) IQ_C=180

(Cattell 1000:142) [RGM:413|1,320+] (Murray 4000:13|WL) (CR:3) French romantic poet, novelist, and dramatist; his *Les Miserables* (1862) is ranked as having an “enormous” influence on Leo Tolstoy, in the age range of 35 to 50, in his reading list rankings.

180 | 190

Francis Edgeworth (1845-1926)

(SN:40|58+) Irish mathematical economist; gauged at 180|#175 (Jun 2016) per repercussion of Virgil IQ:170|#310 inclusion.

(Cattell 1000:259) [RGM:N/A|1,500+] (Murray 4000:N/A) French physicist and astronomer;

“Such is the privilege of genius; it perceives, it seizes relations where

vulgar eyes see only isolated facts."

— Francois Arago (c.1830), *Publication* (Ñº)

| 180 | 191

Francois Arago (1786-1853) IQ_C=180

Studied the phenomenon of magnetic rotation and the fact that a wire coil could be magnetized by passing electrical current through it; discovered, along with, along with Augustin Fresnel, the principles governing the polarization of light and established the theory of light as a wave; studied the velocity of sound, and made it possible to invent the polariscope. Began the studies of the velocity of light which lead to discoveries by Leon Foucault. (Ñº)

(RGM:404|1,500+) (Murray 4000:8|P) [Kanowitz 50:33] (GPE:19) (CR:22) English physicist;

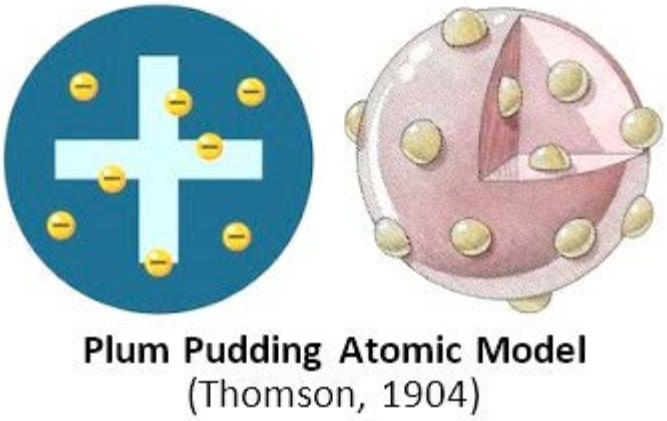

"The atoms of the elements consist of a number of negatively electrified corpuscles [see: electron] enclosed in a sphere of uniform positive electrification [see: proton]."
— Joseph Thomson (1904), "On the Structure of the Atom", Mar

| 180 | 192

Joseph Thomson (1856-1940)

noted for his 1897 paper "On Cathode Rays", wherein he discussed some of the results his cathode-ray experiments done to test some of the consequences of the so-called "electrified-particle theory", as he called it, wherein he posited the existence of "negatively electrified particles", previously dubbed "electrons", a theory about which, in 1904, using the geometrical pattern results of Alfred Mayer's 1878 "floating magnets" experiment, he famously posited the so-called "plum pudding" model of the atom, according to which negatively charged particles were embedded within a sea of positive charge; ranked by *Time* magazine (1923) as the "greatest living physicist" (see: greatest physicist ever); first-draft gauged at position IQ:180|#170 (May 2017)

(Cattell 1000:N/A) [RGM:N/A|1,360+] (Murray 4000:17|C) (GCE:15) (CR:6) French iatrochemist, physician, and philosopher; noted for his c.1610 "oak tree experiment", wherein, after growing an oak tree, in a barrel, for 5-years, to a weight of 62 lbs, he burned the tree, and measured 1 lbs of ash remaining, concluding that the 61 lost pounds transformed into "gas", a term he coined; Leonardo da Vinci, of note, did the same experiment, previously, with a pumpkin; ranked by Boyle (185|#59), along with Aristotle (195|#11), Epicurus (185|#52), Paracelsus (175|#221), Harvey

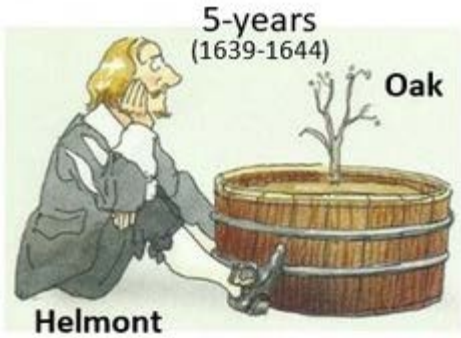

| 180 | 193

Johann Helmont (1579-1644)

(180|#135), as one of the five main expositors of the “book of nature”; first slating: 180|#185 (Apr 2018).

180 | 194	Louis de Broglie (1892-1987)		[GPE] (CR:21) French physicist; noted for his 1924 proof that any kind of particle, whether atom, electron, photon, or even a bullet or a planet must have associated with it a wave, which is not material, but whose strength tells the probability of its presence first-draft gauged at #175 of top 500 geniuses (May 2017)
180 | 195	Euripides (c.480-406BC)	IQ_B=173	(Cattell 1000:99) [RGM:81|1,500+] (FA:10) (ACR:7) (CR:19) Greek philosopher; introduced the term "bios", the etymological root of "bio-" prefix; known for his general "question everything" philosophy, for his view that god was was an invention of a wise man, and for his views on the natural admixture of good and evil.
180 | 196	Wernher von Braun (1912-1977)		[RGM:104|1,280+] The person behind the term "aerospace engineer"; in 1925, age 14, read the work of Hermann Oberth (who himself had read, at age 11, the work of Jules Verne [RGM:85|1,280+], specifically his science fiction novel *From the Earth to the Moon* (Ñº) and his sequel *Around the Moon* (1870)), particularly his *By Rocketry into Planetary Space*, and thereafter began to excel in physics and chemistry, focused on rocketry; in the 1960s, under NASA, Braun served as director of the newly formed Marshall Space Flight Center and as the chief architect of the Saturn V launch vehicle, the superbooster that propelled the Apollo spacecraft to the Moon. In 1969, astronaut Neil Armstrong, on Apollo 11, became the first human to put foot on the moon; an Alex Bickle (Ñº)(Ñº) top 500 genius candidate suggestion (Ñº); first-draft gauged at #150 (Nov 2017).
180 | 197	Filippo Brunelleschi (1377-1446) ↓	IQ_B=190	(Cattell 1000:N/A) [RGM:233|1,500+] (Gottlieb 1000:85) Italian architect, designer, and engineer.
180 | 198	Henry Brougham (1778-1868)	IQ_C=180	(Cattell 1000:194) [RGM:N/A|1,500+] (Gottlieb 1000:N/A) British statesman; noted for his prominent role in passing the 1832 Reform Act and 1833 Slavery Abolition Act.
180 | 199	Barthold Niebuhr (1776-1831) ↓	IQ_C=185	(Cattell 1000:250) [RGM:N/A|1,500+] (Gottlieb 1000:777) German historian; noted for his 1832 three-volume *History of Rome*, wherein, building on Goethe’s concept of “tatige’ (skepsis), aka ‘constructive skepticism’, he showed how to analyze the strata in a source, particularly poetical and mythical tradition, and how to discard the worthless and thereby lay bare the material from which the historical facts could be reconstructed (Ñº); a founding father of historiography.

(add)

Next | Previous
â— Top 1000 geniuses: 1-100 | IQ: 225-180
â— **Top 1000 geniuses: 101-200** | IQ: 180-180
â— Top 1000 geniuses: 201-300 | IQ: 180-175
â— Top 1000 geniuses: 301-400 | IQ: 175-170
â— Top 1000 geniuses: 401-500 | IQ: 170-165
â— Top 1000 geniuses: 501-600 | IQ: 165-160
â— Top 1000 geniuses: 601-700 | IQ: 160-150
â— Top 1000 geniuses: 701-800 | IQ: 150-140
â— Top 1000 geniuses: 801-900
â— Top 1000 geniuses: 901-1000
â— Top 1000 geniuses (candidates)

Notes

N1. Note: see "IQ key" page for IQ subscript symbol meaning.

θΔics

In genius rankings, **top 1000 geniuses** refers to the greatest five-hundred geniuses of all time ranked by IQ or "relative brightness or intellect" (Cox, 1926); below are the third tier greatest geniuses of all time, numbers 201 to 300.

Geniuses | 201-300

The following are the geniuses "201 to 300" of the top 1000 geniuses (previous: 1-100, 101-200, next: **301-400**, 401-500, 501-600, 601-700, 702-800, 801-900, 901-1000): [N1]

	Geniuses 201 to 300		
201 — 180	Herman Boerhaave (1668-1738) ↑↑	IQ_C=165	(Cattell 1000:368) [RGM:N/A|1,360+] (Murray 4000:N/A) (Partington 50:37) (Farber 114:11) (GCE:26) (CR:89) Dutch physician, chemist, and botanist; 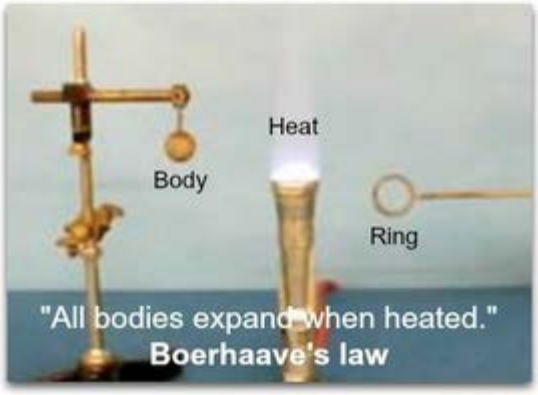 "**Chymistry** is the art whereby sensible bodies contained in vessels … are so changed, by means of certain instruments, and principally fire, that their several powers and virtues are thereby discovered, with a view to philosophy or medicine." — Herman Boerhaave (c.1724) (Ñº) characterized a "great genius" (Mettrie, 1747), notable for his 1724 textbook *Elements of Chemistry*, sometimes referred to as *Traite du feu* or "Treatise on fire", an outgrowth of his lectures at Leiden University, in which he outlined influential theories on heat, fire, and expansion of bodies (see: Boerhaave's law), which is said to mark the start of the modern concept of chemistry; noted for comparing the force of affinity with "love, if love be the desire for marriage" (1732); mentor to Andrew Plummer, whose ideas on attractive and repulsive forces involved in chemical affinity had influence on his successors William Cullen and Joseph Black; and for his 1736 ball and ring experiments with Willem Gravesande (as reported by Voltaire).
— 180	Ernst Haeckel (1834-1919) ↑↑		(Murray 4000:16|B) (FA:74) (GPhE:11) [CR:127] was a German physician, turned Goethe-promoting, Darwin-promoting zoologist; "The fundamental unit of affinity in the whole of nature, from the simplest chemical process to **the most complicated love story**, [as] was recognized by Empedocles [and] Goethe, **[can be] reduced,** on logical

202

analysis, **to matter** (space filling substance) **and energy** (moving force)**,** [which] are but two inseparable attributes of one underlying substance."

— Ernest Haeckel (1899), *The Riddle of the Universe*

Characterized an "unabashed atheist" (Brix, 1992), noted for his "physico-chemical monism" philosophical conception "of the world" (1892)*;* a rare Goethe and Empedocles scholar; first-slating: 175|#190 (c.2017); upgraded to 180|#198 (Mar 2018).

(Cattell 1000:102) [RGM:N/A|1,500+] (Murray 4000:N/A) (Gottlieb 1000:N/A) French Roman Catholic theologian, poet, and writer;

"The god of a Socrates, or of a **Fenelon**, may be suitable to minds as gentle as theirs; but he cannot be the god of a whole nation, in which it will always be extremely rare to find men of their temper."

— Baron d'Holbach (1770), *The System of Nature* (pg. 295)

180 | 203 Francois Fenelon (1651-1715) IQ_C=180

Noted for his *Refutation of the System of Malebranche on Nature and Grace* (c.1689), wherein he rebuts the theology of Nicolas Malebranche; and for his *Adventures of Telemachus* (1699), a retake on Telemachus, son of Ulysses, of Homer's Odyssey, a work that was influential to Jean Rousseau, Charles Montesquieu, Thomas Jefferson, Johann Herder, and Alfred Tennyson.

180 | 204 Joseph Scaliger (1540-1609) IQ_C=180

(Cattell 1000:461) [RGM:N/A|1,330+] (Murray 4000:N/A) French religious leader and scholar; expanded the notion of classical history from Greek and ancient Roman history to include Persian, Babylonian, Jewish, and ancient Egyptian history.

180 | 205 Mimar Sinan (1491-1588) IQ_B=180

(Cattell 1000:N/A) [RGM:733|1,500+] (Murray 4000:N/A) Turkish architect.

180 | Phidias (500-432BC) IQ_B=180

(Cattell 1000:402) [RGM:222|1,330+] (Murray 4000:N/A) Greek sculptor; noted for statue of Zeus at Olympia, considered one of the Seven

206			Wonders of the Ancient World.
180 | 207	Leon Alberti (1404-1472)	IQ_B=180	(Cattell 1000:N/A) [RGM:N/A|1,300+] (Murray 4000:N/A) Italian humanist author, artist, architect, poet, priest, linguist, philosopher and cryptographer; epitomized the 'renaissance man'; Da Vinci's personal library (Ñº) contains a number of books by Alberti.
180 | 209	Thomas Wolsey (1472-1530) ↓↓↓	IQ_C=200	(Cattell 1000:390) [RGM:N/A|1,500+] (Gottlieb 1000:N/A) English churchman, statesman and a cardinal.
180 | 210	William Pitt (the Younger) (1759-1806) ↓	IQ_C=190	(Cattell 1000:18) [RGM:N/A|1,300+]
180 | 211	Jean Bailly (1736-1793)	IQ_C=180	(Cattell 1000:407) [RGM:N/A|1,500+] (Gottlieb 1000:N/A) French Astronomer, mathematician, freemason, and political leader of the early part of the French Revolution.
			↑ 180+
175 | 212	William Clifford (1845-1879) ↑		English mathematician, philosopher, and panpsychist (Skrbina, 2005), a top ten unsung genius (Siegfried, 2014) (Ñº); "If a man, holding a belief which he was taught in childhood or persuaded of afterwards, keeps down and pushes away any doubts which arise about it in his mind, purposely avoids the reading of books and the company of men that call in question or discuss it, and regards as impious those questions which cannot easily be asked without disturbing it — the life of that man is one long sin against mankind." — William Clifford (1879), "Article" (Ñº), *Contemporary Review*
175 | 212	Claude Shannon (1916-2001) ↓	IQ_O=180	noted for his monism views on "mind-stuff" at the inorganic molecular level; for his unlearn advocation; for his ethics of belief views; and for his proto-views on geometrical gravity; first-slating: 175|#206 (Mar 2018). [CR:180] American electrical engineer; noted for his age 21 penned 1937 MS thesis "A Symbolic Analysis of Relay and Switching Circuits" (Ñº) mapped Boolean algebra into circuit language; he later went on to invent information theory; guestimated IQ (2012) of 180± (Ñº); forum (2017) cited IQ (Ñº) at 180; down-graded ↓ to 170|#212 (Apr 2020) per the amount of modern-day Shannon bandwagon confusion, per repercussion of his "poor" terminology choice.
	Abraham	IQ_{CB}=**160** IQ_C=150	(Cattell 1000:40) [RGM:49|1,320+] (Murray 4000:N/A) American president [See: American Presidents by IQ]; "Towering **genius** disdains a beaten path. It seeks regions hitherto

175 | 213 Lincoln (1809-1865) ↑↑ IQ_B=170 IQ_W=147 IQ_{Si}=150

unexplored."

— Abraham Lincoln (1838), Speech, Jan 27 (Ñº)

noted for his Emancipation Proclamation (1863) which ended slavery and brought a close to the civil war; made decisions using Euclidian logic.

(Cattell 1000:N/A)

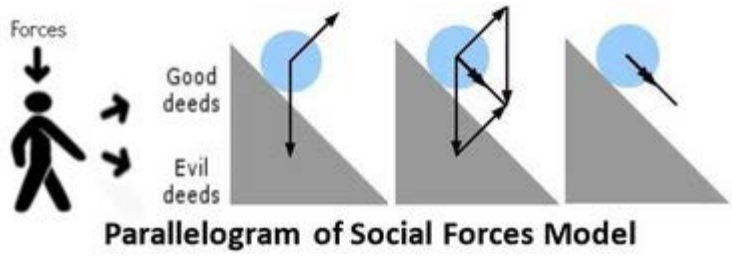

[RGM:N/A|1,300+] (Library:21,000) (GHE:2) (CR:34) English social physics themed historian;

175 | 214 Henry Buckle (1821-1862) ↑

"The actions of men are in reality never inconsistent, but however capricious they may appear only form part of one vast system of universal order."

— Henry Buckle (1861), *History of Civilization in England*

Focused on solving the question of whether the actions of people operate by (a) fixed laws, (b) chance, or (c) supernatural interference, via physical science means, i.e. strong positivism; his work was praised by Maxwell and Boltzmann; first slating: 175|#198 (c.2017).

(Cattell 1000:413) [RGM:N/A|1,320+] (Murray 4000:N/A) (FA:61) French philosopher and progressive encyclopedist; his *Various Thoughts on the Occasion of the Comet*, is the "first-ever all-out defense of the morals of an atheist" (Hecht, 2003) (see: atheistic morality); his 3,000-entry *Historical and Critical Dictionary*, wherein each entry is accompanied by lengthy footnotes, themselves up to 20-pages per note, and these footnotes have footnotes, has been aptly characterized as the "arsenal of the enlightenment".

175 | 215 Pierre Bayle (1647-1706) ↑↑ IQ_C=165

[RGM:421|1,500+] (Murray 4000:11|M) (GME:12) German mathematician;

"Mathematics is a presuppositionless science. To found it I do not need god, as does Kronecker, or the assumption of a special faculty of our understanding attuned to the principle of mathematical induction, as does Poincaré, or the primal intuition of Brouwer, or, finally, as do Russell and Whitehead, axioms of infinity, reducibility, or completeness, which in fact are actual, contentual assumptions that cannot be compensated for by consistency proofs."

175 | 216 David Hilbert (1862-1943)

— David Hilbert (c.1920), *Die Grundlagen der Mathematik* (Ñº)

considered by some as the "greatest mathematician of the 20th century" (Ñº); mentor of Emmy Noether, Ernst Zermelo, and Hermann Weyl; a 2013 missing genius IQs candidate (Ñº); first slating: 175|#216 (Jan

2019).

(Cattell 1000:165) [RGM:27|1,500+] (Murray 4000:2|Med) (FA:17) (CR:43) Greek physician;

“Men think epilepsy divine, merely because they do not understand it. We will one day understand what causes it, and then cease to call it divine. And so it is with everything in the universe.”

— Hippocrates (c.400BC)

175 | 217

Hippocrates (c.460-370BC)

His IQ has been Quora intuited (Ñº) as being in the neighborhood, above, below, or within, of Galen (130-210AD) (IQ:170|#370) (Cattell 1000:443) [RGM:290|1,500+] (Murray 4000:4|Med) (CR:11) and Avicenna (980-1037) (IQ:180|#127) (Cattell 1000:364) [RGM:325|1,320+] (Murray 4000:N/A) (MAG:17) (GPhE:20±) (GCE:40±) (CR:13); first-slating: 175|#214 (Dec 2018).

175 | 218

James Watt (1736-1819) ↑↑ IQ_C=165

(Cattell 1000:225) [RGM:130|1,500+] (Gottlieb 1000:110) (Murray 4000:1|T) (EP:30) (SIG:8) (CR:97) Scottish instrument maker, natural philosopher, chemist, and engineer;

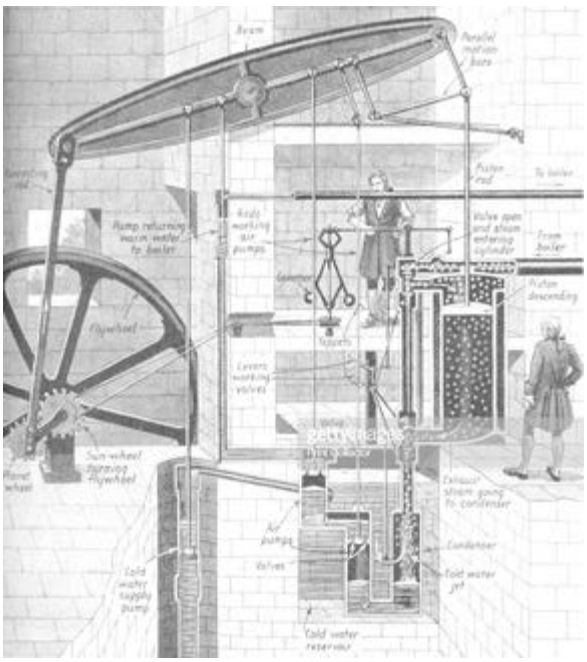

“James Watt was equally distinguished as a natural philosopher and chemist; his inventions demonstrate his profound knowledge of those sciences, and that peculiar characteristic of genius, the union of them for practical application.”

— Humphry Davy (1824), “Address to Royal Society” (Ñº)(Ñº)

noted for a number of inventions and design improvements to the functionality of the steam engine, including: separate condenser (1765), the fly-ball governor (1788), the definition of "pony power" (or horse power), all embodied in what came to be known as the Watt engine (adjacent); upgraded ↑ from 170|#325 to 175|#218 per inconsistency in SI unit geniuses rankings, e.g. in respect to Amedeo Avogadro (Feb 2019).

175 |

Ralph Emerson (1803- IQ_C=155

(Cattell 1000:408) [RGM:286|1,500+] [HD:23] (FA:115) American Goethean philosopher;

“GOETHE is the most powerful of all mental reagents—the pivotal mind in modern literature—for all before him are ancients, and all who have read him are modern.”

— Ralph Emerson (1852), commentary on Margaret Fuller

219 1882) ↑↑

associate of Thomas Carlyle and Margaret Fuller; mentor of Henry Thoreau; in 1836, he proclaimed “make your own Bible” (Ñº); one of the promulgators of the Goethean calendar; upgrade ↑ from 170|#347 to 170|#292 (Feb 2018); upgrade ↑ from 170|#314 to 175|#215 per discovery of his 1877 moral power is variant of material power theory (Oct 2018).

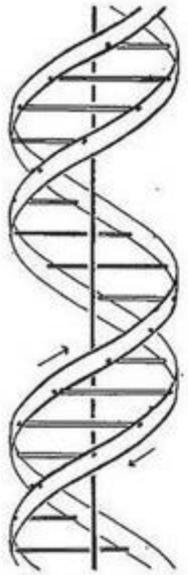

25 Apr 1953
(drawing in *Nature*
by Odile Crick)

Mid 1953
(metal model, reconstructed in 1973)

175 | 220 Francis Crick (1916-2004) ↑ IQ_B=173

[RGM:200|1,500+] (DN:6) (FA:152) (RE:88) (CR:107) English molecular chnopsologist (biologist), neuroscientist, atheism advocate, and anti-vitalism philosopher;

“Let us abandon the word ‘alive’.”

— Francis Crick (1966), *Of Molecules and Men*

generally famous for his 1953 DNA co-discoverery, with James Watson; in his anti-vitalism debates (1966), he suggested “we should abandon the world alive” (see: abioism); and atheism pro and Bible as mythology advocate.

175 Ptolemy (c.100-170)

(Cattell 1000:80) [RGM:98|1,500+] (Murray 4000:12|CS / 6A) (Eells 100:23) (GAE:3) (CR:45) Greco-Egyptian mathematician and astronomer; in his 130AD *Syntaxis Mathematica*, he

221 |

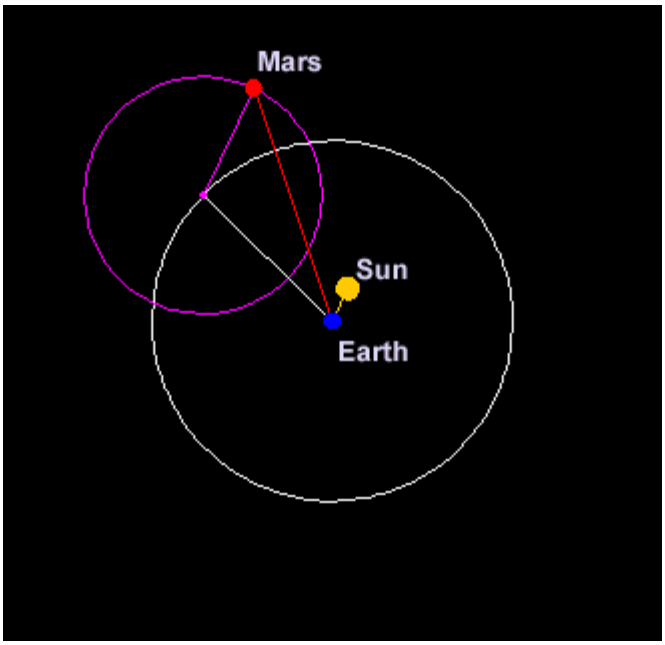

supposedly the first to introduce the zero number; his 150AD Aristotle-based Ptolemaic "geocentric model" (adjacent), was not superseded for some thirteen centuries, namely until Nicolaus Copernicus established the heliocentric model (1543); first-draft slating: 170-175± (c.2016).

222 | 175 |

Lazare Carnot (1753-1823) IQ_C=170

(Eells 100:58) (CR:36) was a French engineer, mathematician, and politician, father of thermodynamics founder Sadi Carnot (and his brother Hippolyte Carnot), who in 1794, working in coordination with French mathematician Gaspard Monge, founded École Polytechnique the hotbed of science in the early 19th century.

223 | 175 |

Joseph Gay-Lussac (1778-1850) IQ_C=175

(Cattell 1000:248) [RGM:N/A|1,330+] (Murray 4000:8|C) French chemist; Noted for his formulation of Charles law (volume-temperature gas law) (1802), Gay-Lussac's law (pressure-temperature gas law), both precursors to the ideal gas law, and the law of combining volumes (1808).

224 | 175 |

Boethius (c.480-524AD)

(Cattell 1000:N/A) [RGM:N/A|1,500+] (Murray 4000:N/A) (Time 100:23) (Eells 100:96) (CR:10) Roman philosopher, mathematician, and senator; view: "there was an intelligence to the universe, which was once called fate, and now we understand it to be a universal force"; discoursed on the laws of love and the problem of evil; first-slating: 175|#211 (Mar 2018).

225 | 175 |

Pierre Fermat (1601-1665)

(Cattell 1000:893) [RGM:628|1,500+] (Murray 4000:5|M) (GME:14) (CR:8) French mathematician and lawyer; his so-called "last theorem", which he scribbled as a note in the margins of one of his writing books, was proved (Ñº) by Andrew Wiles (1993), himself cited (Ñº)(Ñº) at IQ of 170; first slating: 175|#211 (c.2017).

226 | 175 |

Charles Montesquieu (1689-1755) IQ_C=165

(Cattell 1000:308) [RGM:164|1,500+] (SN:46) [HD:8] (CR:57) French political philosopher;

"Newton, Bacon, Leibniz, **Montesquieu**, and myself are the five greatest men I can name."

— Buffon (c.1780), when asked how many great men he could name

noted for his John Locke based *The Spirit of the Laws* (1748) which influenced James Madison in his penning the separation of powers logic

of the US Constitution; first-slating: 175|#200 (c.2017); upgraded from 175|#243 to 175|#220 (Apr 2018).

175 — 227 Ecphantus (c.530-460BC)

Greek physicist, astronomer, and philosopher, supposedly a Pythagorean, noted for his earth-as-wheel rotation theory (compare: Heraclides), according to which the earth rotates like a wagon wheel, and that this explains the apparent motion of the stars; posited some type of early atomic theory, wherein he employed a motive force in addition to atoms and void, and declared that monads of Pythagoras were corporeal; first-slating: 175|#225 (Jan 2019).

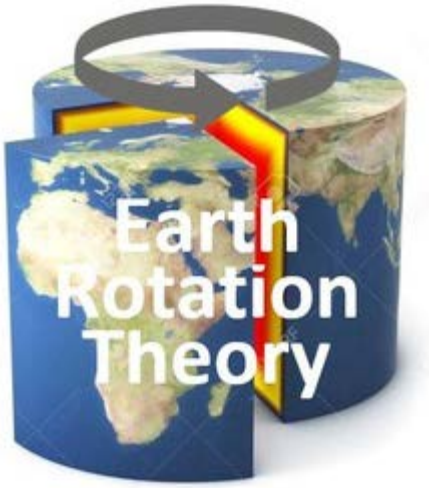

175 — 228 Wolfgang Pauli (1900-1958)

[RGM:N/A|1,500+] (CR:65) Austrian theoretical physicist; noted for being the first to propose the concept of "spin" (see: Pauli exclusion principle); for proposing (1930) the existence of the neutrino (see: particle); for his 1949 letter to Ralph Kronig on his dream about "Ehrenfest's sermon on the love" and how love can be seen as a force of nature, e.g. in the context of Goethe's *Elective Affinities*; and for his 1952 discussion with Werner Heisenberg on the nature of the soul (see: Heisenberg-Pauli dialogue); considered a top 10 physicist (Springer, 2008) (Ñº); first-slating: 175|#220 (Dec 2019).

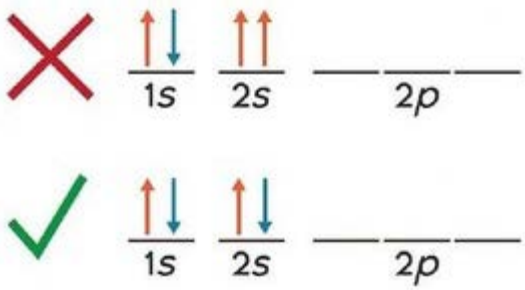

175 — 229 Stanley Jevons (1935-1882)

(Cattell 1000:N/A) [RGM:N/A|1,360+] (Murray 4000:N/A) English economist, natural philosopher, and oft-cited polymath;

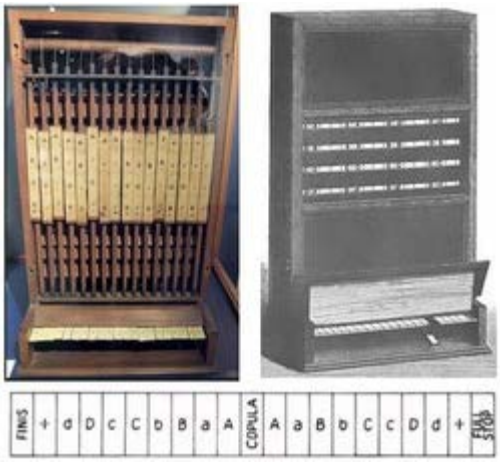

"There exists much prejudice against attempts to introduce the methods and language of mathematics into any branch of the moral sciences. Most persons appear to hold that the physical sciences form the proper sphere of mathematical method, and that the moral sciences demand some other method, I know not what."
— Stanley Jevons (1871), *Theory of Political Economy* (pg. 3)

noted for his theories on utility, for his no origin theory of life ideas, and for his statement of the three moral body problem; in 1869, he built a logic machine (shown) for doing Boolean algebra like truth tables; his *Theory of Political Economy* (1871), supposedly, employed a physics-based "particle theory" of people and firms in economics (Ñº); first-

slating: 175|#151 (2015).

(Cattell 1000:N/A) [RGM:N/A|1,500+] (Murray 4000:N/A) (FA:4) (EvT:3|21+) (CR:28) Greek philosopher, anti-theist, and evolutionist; disciple of Anaximander (Ñº) (IQ:180|#120) (FA:2) and also, supposedly, of the lineage of Pythagoras or the Pythagorean school; taught that all organisms originate from earth and mud; observed fossil fishes and shells, and concluded that the land where they were found had been underwater at some time; he taught that the world formed from the condensation of water and 'primordial mud', and was the first person known, supposedly, to have used fossils as evidence for a theory of the history of the earth (Ñº); noted for his famously-quoted religion ridicule that 'if horses and oxen could draw, their gods would look like horses and oxen'; first-slated: 175|#220 (Feb, 2018).

230 | 175

Xenophanes (560-480BC)

[RGM:55|1,330+] [GLA:14] American writer, editor, and literary critic; best-known for his poem "The Raven" (1845) noted for its musicality, stylized language, and supernatural atmosphere, which tells of a talking raven's mysterious visit to a distraught lover, tracing the man's slow fall into madness, as he is lamenting the loss of his love; sitting on a bust of Pallas, the raven seems to further instigate his distress with its constant repetition of the word "Nevermore"; The poem makes use of folk, mythological, religious, and classical references; Yahoo Answers IQ estimated (Ñº) at 145; his interpolated IQ per GLA position is 170 to 180; his comments on Margaret Fuller (IQ:#|#), madness and intelligence (similar to Aristotle), and true genius, would seem to align him higher ↑ in rankings; position 175|#190 guestimate (Jun 2017).

231 | 175

Edgar Poe (1809-1849) IQ_O=145

IQ estimate 175 (Ñº); a Ranker greatest mind (#77|652) (Ñº), a Cattell 1000 (#337), a semi-ranked "universal genius" (T.K. Seung, 2006); read Schopenhauer four times in 1853, which switched his mind from Feuerbachian atheism to an Schopenhauerian atheism.

232 | 175

Richard Wagner (1813-1883) IQ_C=170 IQ_O=175

In response to how many great men he could name, he replied: "Five: Newton (IQ:220|#2), Bacon (IQ:180|#86), Leibniz (IQ:195|#14), Montesquieu (IQ:175|#221), and myself", therein self-estimating his own IQ as 193.

233 | 175

Buffon (1707-1788) ↑ IQ_S=193 IQ_C=175

(Cattell 1000:382) (Murray 4000:11|C) (Partington 50:2) (GCE:4) (CR:37) German chemist; first to publish Robert Mayer's 1842 controversial mechanical equivalent of heat paper (previously rejected elsewhere); his use of vitalism (*Animal Chemistry*, 1842), which was quickly attacked by the Helmholtz school, gives him a down grade.

234 | 175

Justus Liebig (1803-1873) ↓ IQ_C=180

(EvT:9|21+) (CR:41) English physician, poet, philosopher, botanist and naturalist, stylized "singular genius" (Thurston, 1878), patriarch of the great "Darwin family", grandfather

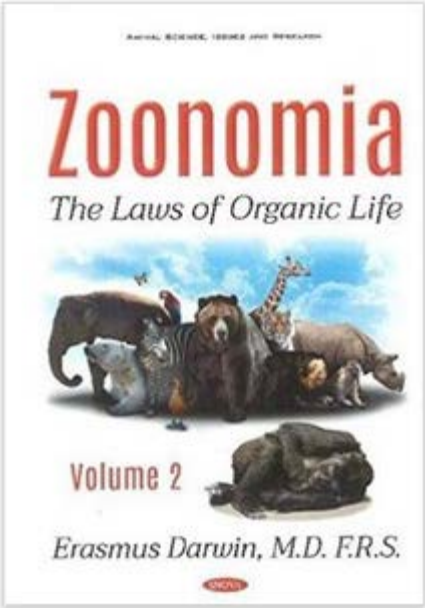

175 | 235

Erasmus Darwin (1731-1802)

of naturalist Charles Darwin and great-great grandfather of physicist C.G. Darwin;

"Would it be too bold to imagine, that in the great length of time, since the earth began to exist, perhaps millions of ages before the commencement of the history of mankind, would it be too bold to imagine, that **all warm-blooded animals have arisen from one living filament**, which the great first cause endued with animality, with the power of acquiring new parts, attended with new propensities, directed by irritations, sensations, volitions, and associations; and thus possessing the faculty of continuing to improve by its own inherent activity, and of delivering down those improvements by generation to its posterity, world without end!"
— Erasmus Darwin (1794), *Zoonomia: the Laws of Organic Life* (pg. 397)

noted for his 1791 evolution theories, preceding those of Saint-Hilaire (1833) and following those of Goethe (1784), and for his 1794 *Zoonomia: the Laws of Organic Life*, in which he argued that organic matter may be the matrix of new life; first-slating: 175|#235 (Mar 2020).

175 | 235

Paracelsus (1493-1541)

(Cattell 1000:553) [RGM:255|1,500+] (Murray 4000:5|M) (Gottlieb 1000:108) (GCE:25) [CR:72] Swiss physician-chemist noted for his early formulations of chemical affinity (Geoffroy's first law of affinity) and for his 1524 combination of Aristotle's circa 350 BC four element theory with Geber's circa 790 three principles.

(Murray 4000:3|AL) (FA:32) (CR:10) Syrian-born blind philosopher, poet, skeptic, and irreligionist, aka the "Arab Lucretius" (Issa, 2016); ; is oft-compared to the following:

175 | 236

Al-Marri (973-1057) IQ_{CP}=178

â— Lucretius (99-55 BC) (IQ:180|#92) [RGM:N/A|1,260+]

(Cattell 1000:209)
â— Lucian (c.120-190AD) (IQ:175|#250)
[RGM:N/A|1,250+] (Cattell 1000:387)
â— John Milton (1608-1674) (IQ:180|#111)
[RGM:330|1,250+] (Cattell 1000:16)
â— Dante Alighieri (1265-1321) (IQ:175|#218)
[RGM:51|1,260+] (Cattell 1000:42)

would yield him (Jun 2017) a four-person genius comparison synthesis intelligence of (IQ:178|#164) [RGM:191|1,260+] (Cattell 1000:164); which, rounding down on the safe side of genius ranking guesstimation, yields an first draft IQ of 175 mean position #173 (which falls in the 180 IQ ranges); therefore #206 intuited.

175 | 237

Eratosthenes (276-194BC)

(Cattell 1000:N/A) [RGM:201|1,350+] (Murray 4000:N/A) (Eells 100:99) Greek mathematician, geographer, poet, astronomer, music theorist, and chief librarian of the Library of Alexandria; did work on the antipode earth model (Virgil of Salzburg was later condemned to be burned for teaching this); originator of the science of geography, from Egyptian *Geb*- "earth god" + Greek *-graphia* "description of" or "to scrape, scratch" (on clay tablets with a stylus) (Ñº), including the terminology used today; popularly known for his measurement of the circumference of the earth, which was accurate to about 1-16% of modern value (40,000 km); first-slating: 175|#225 (Feb 2008).

175 | 238

Helvetius (1775-1771) ↑ IQ_C=160

(Cattell 1000:467) [RGM:N/A|1,310+] French philosopher; approved of by Jean Sales; friend of Voltaire and Denis Diderot (Ñº), noted for his 1758 *On Mind*, which espoused atheistic, utilitarian, and egalitarian doctrines; ran one of the biggest intellectual salons in France; when the anonymous *The System of Nature* (1770) appeared, secretly written by Baron d'Holbach, people attributed it either Honore Mirabeau or Helvetius.

175 | 239

George Boole (1815-1864)

[RGM:424|1,280+] [GME:77] was English mathematician, educator, philosopher and logician; born to a poor cobbler who self-taught himself mathematics, by studying Newton, among others; invented Boolean algebra, the basis of computer logic, with the publication of his 1847 *Mathematical Analysis of Logic*; his 1854 book *The Laws of* Thought, one of the first books in human mathematics, showed how to reduce human reasoning (logic) to a symbolic form resembling ordinary numerical algebra; was a college professor in mathematics by age thirty-four (despite holding no university degree); published a treatise on differential equations (1859).

175 | 240

Walther Nernst (1864-1941)

(Odueny 100:65) (Cropper 30:7/T) (CR:120) German physical chemist; main curator behind the third law of thermodynamics; first-slating: 175|#231 (Nov 2018).

175 — 241

Thomas Browne (1605-1682) Library:

(Cattell 1000:N/A) [RGM:N/A|1,320+] (Murray 4000:N/A) (CR:4) English physician, philosopher, encyclopedist; coiner of the term electricity; first slating: 175|#222 (Jan 2018).

2,000+

175 | 242

Evangelista Torricelli (1608-1647)

[Kanowitz 50:46] (GPE:89) (Eells 100:85) (CR:46) Italian physicist and mathematician;

“To us Torricelli's incredible genius seems almost miraculous.”

— Marin Mersenne (c.1647) (Ñº)

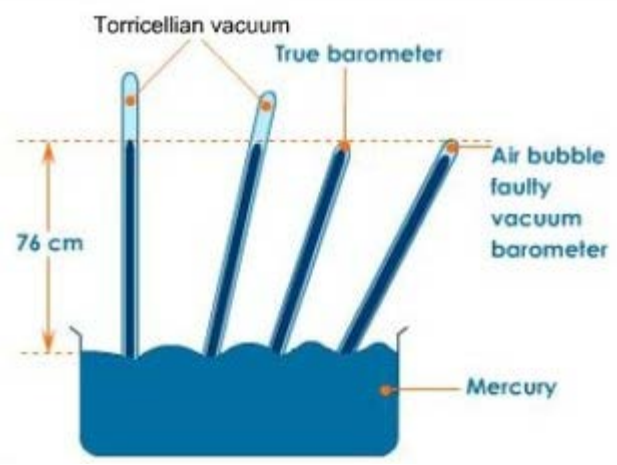

noted for his 1643 investigation of the pump problem, suggested to him by his mentor Italian physicist Galileo Galilei, wherein he invented the world’s first barometer, therein proved that atmospheric pressure exists, and experimentally demonstrated the vacuum (see: Torricelli vacuum); this later put the idea into the head of Blaise Pascal (1648) to climb a mountain with the barometer, to see if it's height went down as one climbed, which he had someone do, therein proving that atmospheric pressure decreases with height; first-slating: 175|#241 (Jan 2019).

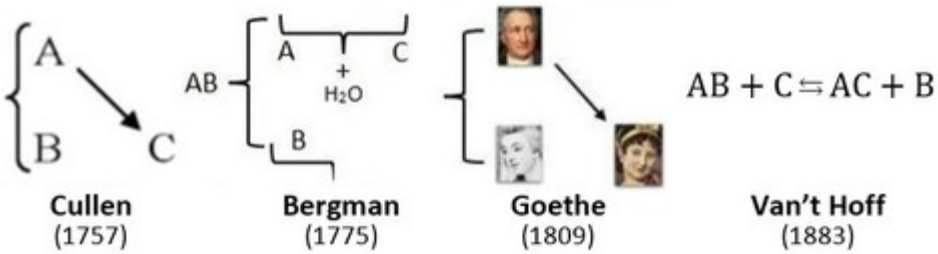

175 | 243

William Cullen (1710-1790)

(GCE:18) (CR:69) Scottish physician and chemist; noted as the inventor of the chemical reaction diagram (1757), aka chemical equation (see: history of chemical equations), via his use of the bonding bracket ‘{’, to signify a chemical bond, and affinity dart or reaction arrow ‘→’ to signify the force of attraction or of chemical affinity, done in his chemistry lectures to illustrated to student the nature of the affinity table, as devised by Etienne Geoffroy (1718), as based on Newton's Query 31; student of the works of Herman Boerhaave and Georg Stahl; mentor to Joseph Black; first-slating: 175|#241 (Nov 2019).

Willem

(GPE:97) (CR:31) Dutch physicist, experimenter, mathematician, lawyer and philosopher;

“**Gravesande** is to be ranged among the most important expounders of Newtonian physics in Europe.”

— Andrea Strazzoni (2013), *Dutch*

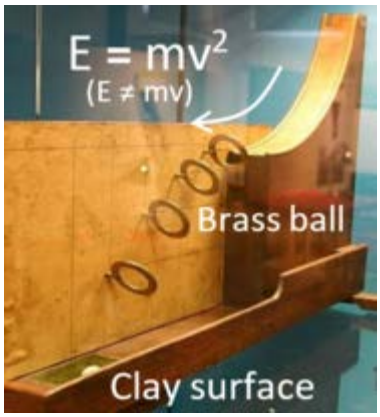

175 | 244

Gravesande (1688-1742)

noted for his *circa* 1718 brass ball clay surface experiments, data from which, showing that the moving ball has an energy of E = mv², rather than E = mv, as many argued, was used to resolve the vis viva controversy; did 1736 ball and ring experiments with Herman Boerhaave (as reported by Voltaire). ; first-draft slotted at #125 (Jun 2017); down-grade ↓to 175|#245 (Apr 2020).

175 | 244

George Eliot (1819-1880) IQ_B=185 IQ_O=160

[RGM:212|1,500+] (GFG:4) (SWE:3) (CR:34) English realism philosopher and novelist; noted, in human chemistry, for her 1872 novel *Middlemarch*, described by those including Martin Amis and Julian Barnes as the "greatest novel" in the English language, a novel based on Johann Goethe's 1809 physical chemistry based novella *Elective Affinities* (*Die Wahlverwandtschaften*); first-slating: 180|#108 (c.2016).

175 | 245

Alfred Wallace (1823-1913)

(Cattell 1000:N/A) [RGM:449|1,330+] (Murray 4000:N/A) English naturalist; noted for his "On the Law which has Regulated the Introduction of New Species", outlined a theory of evolution according to which organisms have resulted from long and uninterrupted series of changes; this prompted Darwin to publish his *On the Origin of Species*; first-slating: 175|#230 (Mar 2018).

175 | 246

John Witherspoon (1723-1794)

(Cattell 1000:N/A) [RGM:N/A|1,310+] (Murray 4000:N/A) (CR:12) Scottish-born American political philosopher, a signatory of the Declaration of Independence (1776), 6th president of Princeton University; noted for having **"taught"** James Madison (IQ:180|#150), in 1769, **a primitive form of "social physics" at Princeton**, based on the Newtonian-based political philosophy work of Charles Montesquieu; in 1771 he bought an orrery, such as shown adjacent, for Princeton University, some logic of which, e.g. separation of powers, went into Madison's formulation of the US constitution; first-slating: 175|#225 (Feb 2018).

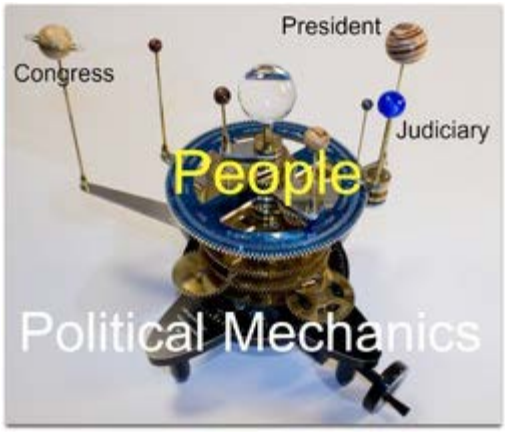

175

Ludwig

IQ_O=190

[RGM:219|1,500+] (Gottlieb 1000:634) (Stokes 100:78) (CR:38) Austrian-British philosopher; noted for comments on Schopenhauer's "elective affinity will" or "will to power" (attacking one's fears); his two biggest works are *Philosophical*

—
247

Wittgenstein
(1889-1951)

IQ_{EM}=170

Investigations and *Tractatus Logico-Philosophicus*, which according to some "show more raw intellect than anything Shakespeare has written"; downgrade for having so many "god-this" and "god-that" quotes attributed to him; some have ranked him above Bertrand Russell.

175 | 248

Johann Herder
(1744-1803) ↑

IQ_{C}=165

(Cattell 1000:264) (CR:37) German philosopher; noted for his evolution theory of language; he was the person to whom Goethe wrote in 1784 that he had found morphological evidence of human evolution (discovered the human intermaxillary bone), of humans and lower animals being related; a date which marks the start of evolution theory, according to Darwin.

175 | 249

Alessandro Volta
(1745-1827)

(Cattell 1000:684) [RGM:140|1,500+] (SIG:13) (CR:18) Italian physicist;

"What is possible to do well, in physics in particular, are those things that can be reduced to degrees and measures."

— Alessandro Volta (c.1800) (Ñº)

noted for his famous 1776 "animal electricity" debated with his friend Luigi Galvani on the topic of the mechanism of the twitching of dead frog legs in an electric circuit, in respect to what separates a "living thing" from a "dead thing", moved by purely electro-physico-chemical means; which resulted in Volta inventing the battery, or "Voltaic pile", in 1800, so to prove Galvani wrong about his animal electricity theory; first-slated 175±|#156 (c.2015).

175 | 250

Guillaume Amontons
(1663-1705)

(GPE:55) (CR:14) French physicist and engineer;

"It appears that the '**extreme cold**' [absolute zero] of this thermometer is that which would reduce the air by its 'spring', to sustain no load at all."

— Guillaume Amontons (1703), *Publication*

Noted, after becoming deaf at an early age, for his constant-volume air thermometer, which he made building on the work of building on Galileo, Robert Boyle, and Edme Mariotte, wherein he gave one of the first verbal formulations of the ideal gas law, and more importantly, argued that there was a zero point of temperature characterized by the absence of heat, which he calculated to be −239.5° C (or 33.65° K), the modern values being: −273.15° C (or 0° K); first-slating: 175|#250 generally per GPE ranking and "sense" of things (Apr 2020).

175 | 250

James Thomson (1822-1892)

First-draft guesstimated (Jul 2017) at ten IQ points lower than his brother William Thomson (IQ:185|#56).

175 | 251

Ernst Mach (1838-1916)

(Cattell 1000:N/A) [RGM:198|1,350+] (Murray 4000:N/A) (CR:16) Austrian physicist and philosopher; popularly known for his 1885 work on supersonic speed; he rejected the existence of god, as well as Isaac Newton's concept of absolute time and space; he argued that no statement in science is admissible unless it is empirically verifiable, which led him to reject atomic theory, which put him in the energetics school which did battle with Boltzmann and Planck (Mach lost); Einstein (1930) said that Mach's ideas should be considered the precursor of the general theory of relativity; first to document turning tendencies (pictured) in human movement; first slating: 175|#235 (Mar 2018).

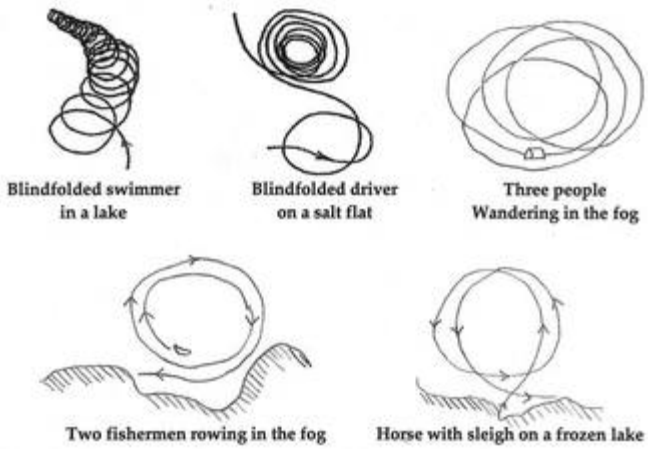

175 | 252

Herodotus (484-425BC)

(Cattell 1000:202) [RGM:171|1,500+] (GHE:4) (ACR:28) [CR:81] Greek historian; noted for his 435BC *Histories*, wherein he discusses the Egyptian origin of Greek religio-mythologies, e.g. phoenix; first draft at 175|#210 (Jul 2017).

175 | 253

Tommaso Campanella (1568-1639) ↓↑

IQ_C=185

(Cattell 1000:446) [RGM:N/A|1,500+] (Gottlieb 1000:N/A) Italian philosopher, theologian, astrologer, and poet; By age 13, had master all the Latin master presented to him; between ages 17 to 26, he read and compared the works of leading philosophers and checked their results by evidences of nature; in 1590, age 22, disenchanted with Aristotelian orthodoxy, penned *Philosophy Demonstrated by the Senses*, wherein, he defended the matter and force theories of Bernardino Telesio (1509-1588) (Ñº); defended Galileo during his inquisition; down-graded from 180|#152 to 175|#250 (Nov 2019).

175 | 254

Jean Champollion (1707-1832)

The main translator of the Rosetta stone, following Thomas Young; an Andrew Robinson (2010) "missing Cox 300" genius (Ñº).

255 | 175

Geber
(c.721-c.815)

[RGM:630|1,500+] (CR:20) Arabian chemist, noted for his 'three principles' theory of generalized chemical properties, one of which, sulphur representative of combustion, was a precursor to the formulation of entropy; first-slating: IQ:175 (c.2017).

256 | 175

Dmitri Mendeleyev
(1834-1907)

(Cattell 1000:N/A) [RGM:N/A|1,350+] (Murray 4000:16|C) (GCE:20) (CR:34) Russian chemist;

"We could live at the present day without a Plato, but a double number of Newtons is required to discover the secrets of nature, and to bring life into harmony with the laws of nature."
— Dmitri Mendeleyev (c.1880) (Ñº)

main formulator of the periodic table (1869); an Andrew Robinson (2010) "missing Cox IQ 300" genius (Ñº);first-slating: 175|#213 (c.2017).

257 | 175

Edmond Halley
(1656-1742)

(Cattell 1000:594) [RGM:425|1,350+] (Murray 4000:8|A) (Eells 100:92) (CR:10) English physicist and astronomer; noted for the prediction of Halley's comet, for solved the riddle of accurate navigation for all sea-going vessels; for having produced a primitive form of social physics (1693); and for spurring Newton into writing his *Principia*; first-slating: 175|#241 (Mar 2018).

258 | 175

Averroes
(1126-1198)

IQ_{B}=175

(Cattell 1000:347) [RGM:503|1,500+] (FA:38) (CR:16) Andalusian polymath, Aristotle commentator, and middle ages genius; his work on atheism was influential to those including: Siger of Brabant, Lucilio Vanini, and Salman Rushdie; he is associated with the "three impostors" hypothesis.

259 | 175

Theodorus
(c.340-250BC)

(Cattell 1000:N/A) [RGM:N/A|1,310+] (FA:19) The world's "first atheist" (Cicero, 45BC); penned *On the Gods*, which is where Epicurus, as some say, borrowed most of what he wrote on the subject (Laertius, c.225); first draft-gauged at #225 (Dec 2017).

260 | 175

George Gore
(1826-1908)

(SN:42) First-draft seemingly under-gauged at 175|#250 (Nov 2018) based on about 5-6 hours of reading, research, and writing on his 1880 to 1906 publications on "materialist morality", which is incredibly sharp, for a new find.

261 | 175

Adolphe Quetelet
(1796-1874)

(Cattell 1000:N/A) [RGM:N/A|1,310+] (SN:25) His social physics work, building on the social mathematics of Marquis Condorcet (IQ:180|#149) (Cattell 1000:288), inspired the proposed Nightingale Chair of Social Physics; first-draft gauged at #225 (Dec 2017).

175 | 175 262	John Adams (1735-1826)	IQ_C=155 IQ_{Si}=155	[RGM:188|1,250+] (HD:14) (Cattell 1000:182) (founding father:3) (American President:2) was an American politician and thinker; patriarch of the so-called Adams family (or Adams political family): his son, John Quincy Adams, was 6th president, and his great grandson was Henry Adams, the leading social Newton, behind Goethe.
175 | 175 263	Imhotep (2635-2595BC)	IQ_O=170-200 IQ_{SS}=150, 170, 190	Egyptian polymath, first architect, engineer, and physician in early history, who served under third dynasty king Djoser (Zoser) as chancellor to the pharaoh and high priest of the sun god Ra at Heliopolis, architect of the world's first pyramid, the Step Pyramid at Saqqara; a possible main theorist behind the current world dominating Anunian theologies.
175 | 175 264	Thomas More (1478-1535) ↑↑	IQ_C=155	(Cattell 1000:106) [RGM:N/A|1,330+] (Murray 4000:N/A) English writer, lawyer, and social philosopher; noted for his 1516 *Utopia*, a name that means "no-place" in Greek, an imaginary island, wherein its inhabitants were allowed to pursue pleasure, in the Epicurean "pleasure principle" atomic theory sense of the matter, so long as they don't deny the existence of divine providence, i.e. think that chance rules the universe (compare: anti-chance), or deny the afterlife, i.e. think that the soul dies with the body; close correspondent of Desiderius Erasmus; upgraded ↑ from 155|#488 to #175|#240 (Feb 2018).
175 | 175 265	William Shockley (1910-1989)	IQ_O=125-129	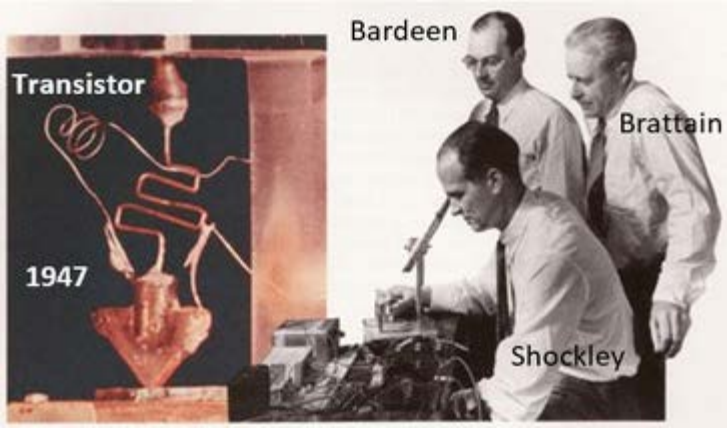 [RGM:N/A|1,350+] (Murray 4000:N/A) American physicist and electrical engineer, aka the "visionary"; noted for being the Bell Labs research group manager of John Bardeen, aka the "thinker", and Walter Brattain, aka the "tinkerer", who together invented the "transistor" (1947) pictured; at age 8 he scored IQ:125 on the Stanford-Binet and 129 at age 9; these early IQ scores frustrated him, and he would later frequently joke about how he could win a Nobel Prize in physics, but not qualify for Terman's gifted study; see: *Broken Genius: the Rise and Fall of William Shockley, Creator of the Electronic Age* (2008); first-slating: 150-175|#248 (c.2016).
175 | 175 266	Wilhelm Humboldt (1767-1835)	IQ_C=175	In 1797, in Jena, with his brother Alexander Humboldt, Friedrich Schiller, and Johann Goethe, the four discussed, in Goethe's own words, "all of nature from the perspectives of philosophy and science". (Cattell 1000:781)

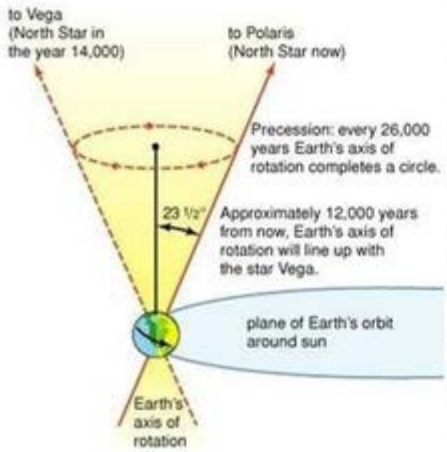

175 | 267

Hipparchus
(190-120BC)

[RGM:637|1,330+] (Murray 4000:10|A) (GAE:8) was a Greek astronomer, geographer, and mathematician;

"**Hipparchus** was a lover of truth (phila-lÄ"thÄ"s)."

— Ptolemy (c.150), *Publication* (Ñº)

founder of trigonometry; famous for his incidental discovery of precession of the equinoxes; first-slating: 175|#250 (Mar 2018).

175 | 268

Godfrey Higgins
(1772-1833)

(RMS:49|155+) (CR:23) English lawyer, religious historian, and mythologist;

"I came to a resolution to devote six hours a day to this pursuit for ten years. Instead of six hours daily for ten years, I believe I have, upon the average, applied myself to it for nearly **ten hours daily for almost twenty years**. In the first ten years of my search I may fairly say, I found nothing which I sought for; in the latter part of the twenty, the quantity of matter has so crowded in upon me, that I scarcely know how to dispose of it."

— Godfrey Higgins (c.1830), *Publication* (Ñº)

First-slating: IQ:175|3268 (Apr 2020).

175 | 268

Gustav Kirchhoff
(1824-1887)

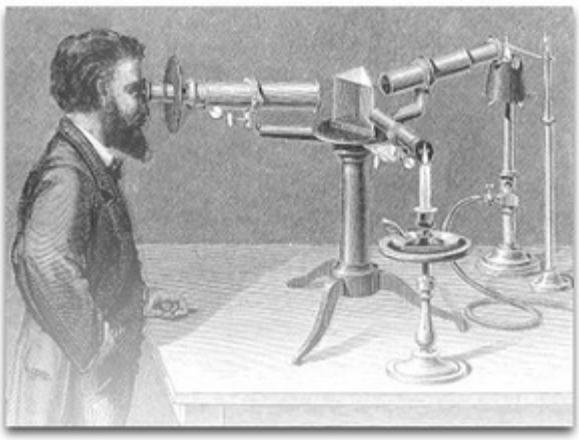

(Cattell 1000:N/A) [RGM:N/A|1,350+] (Murray 4000:11|P) (CR:34) German physicist; noted for calling the energy (or internal energy) of the body by the name "function of activity" (wirkungsfunction), as cited by Clausius in his formulation of the first law; he used spectroscopy, previously developed in joint effort with Robert Bunsen, to explain the dark lines seen in the spectrum of the sun, from which he determined the chemical composition of the sun, therein ushered in a new era of spectrum analysis in astronomy

(photo: Kirchhoff with his spectroscope); Max Planck's 1900 reformulation of his equations on black body radiation started the quantum revolution; also noted for fundamental work in understanding electrical circuits; first slating 175|#250 (Apr 2018).

269 | 175

Pitirim Sorokin (1889-1968)

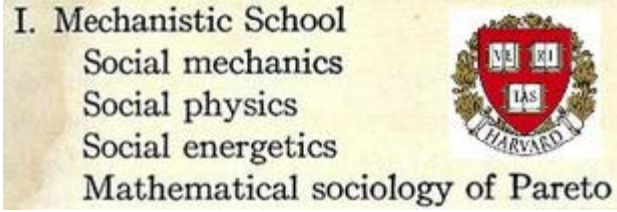

(Cattell 1000:N/A) [RGM:N/A|1,350+] (Murray 4000:N/A) (Scott 50:38) Russian-born American sociologist; founder of Harvard Sociology Department; noted for his all-out well-honed closet theism attack on the historical views of what he calls the "mechanistic school of social thermodynamics" AND for his attack on contemporary formulations, such as found in his battle with Lawrence Henderson and the Harvard Pareto circle; first-slating: 175|#250 (Mar 2018).

270 | 175

Lucilio Vanini (1585-1619)

(Cattell 1000:N/A) [RGM:N/A|1,500+] (Murray 4000:N/A) (FA:57) (Re:34) (EvT:7|21+) (CR:28) Italian lawyer, philosopher, and free-thinker, characterized a “genius burned at the stake” (Gross, 2009) (Ñº); noted for his *Of the Marvelous Secrets of the Queen and Goddess of the Mortal Ones*, *Nature*, building on Pietro Pomponazzi and Gerolamo Cardano, outlined doubts on every aspect of Christianity, and posits some type of evolution model where Africans evolved from apes; had, supposedly, some type of “the greatest perfection is imperfection” model of perfectionism (Ñº), supposedly, derived from Joseph Scaliger, and in turn Empedocles; had his tongue ripped out and was burned at the stake for the crime of atheism; down-grade ↓ for recanting and admitting belief in the trinity before he was burned; first slating: 175|#250 (Feb 2018).

271 | 175

Dante Alighieri (1265-1321) IQ_B=175

(Cattell 1000:42) [RGM:53|1,310+] Italian poet noted for his c.1310 *Divine Comedy*, wherein he tells the story of how he and Latin poet Virgil travel through the nine circles of hell towards, the ninth of which is frozen and at the center of the earth, where Satan resides, the location to which all heavy sinful matter is attracted; a logic based on an Aristotelian universe conception of things, where fire, being the lightest of the four elements, rises to the outer circles of the earth, in geocentric terms

272 | 175

Srinivasa Ramanujan (1887-1920) IQ_{CP}=199

[RGM:393|1,260+] Indian auto-taught mathematics prodigy and autodidact;

“An equation for me has no meaning unless it expresses a thought of god.”

— Srinivasa Ramanujan (c.1910) (Ñº)

who, with almost no formal training in pure mathematics, made extraordinary contributions to mathematical analysis, number theory, infinite series and continued fractions; G.H. Hardy ranking of him in the same league as Gauss, Euler, Cauchy, Newton, and Archimedes, yields mean comparison to person IQ of 199; god-babble downgraded ↓ from 180|#114 to 175|#251 (Feb 2018).

175

Aristarchus (c.310-

(Cattell 1000:N/A) (RGM:172|1,310+) was a Greek astronomer noted for being the first person to popularization of heliocentrism, a view which he adopted from Pythagoras; arguing that the earth rotates on its axis, that the

| 273 230BC)

earth orbits the sun, and devised methods for estimating relative distances of sun and moon from earth; first-draft gauged at #230 (Nov 2017).

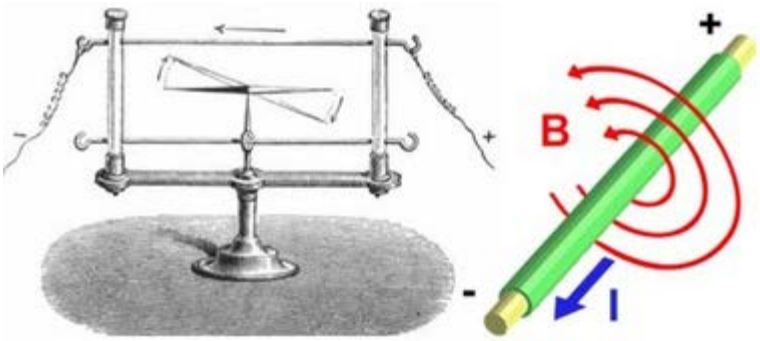

(Cattell 1000:523) [Kanowitz 50:40] (GPE:73) (CR:11) Danish physicist, chemist, and natural philosopher; noted for his 1820 discovery that when a compass is brought near a current-carrying wire, that the needle deflects, i.e. he discovered that electric currents create magnetic field, aka aka "Orsted law" (Ñº), later shown to operate according to the "right-hand rule" (Ampere, c.1831); mentor to Ludwig Colding; supposedly shaped post-Kantian philosophy; downgrade ↓ from 180|#165 to 175|# per Buchner ridicule of his "eternal intelligence" (aka god) theory, and generally for reason that his discovery, while notable, is not as profound as followup work, e.g. Ampere, Maxwell, Faraday, etc., based this simple discovery (Feb 2019).

| 175 | 274 Hans Orsted (1777-1851) IQ_C=180

(Cattell 1000:295) [RGM:N/A|1,320+] (Murray 4000:N/A) French natural philosopher; in 1664, a chance reading René Descartes' *Traité del l'Homme*, moved him so deeply that (it is said) he was repeatedly compelled by palpitations of the heart to lay aside his reading; and was from that hour consecrated to Cartesian philosophy; was inspirational in the development of physiocracy.

| 175 | 275 Nicolas Malebranche (1638-1715) ↓ IQ_C=180

"Those who wish to form an idea of the shackles imposed by theology on the genius of philosophers born under the 'Christian dispensation', let them read the **metaphysical romances** of Leibniz, Descartes, Malebranche, Cudworth, etc., and coolly examine the **ingenious but rhapsodically** systems entitled: the pre-established harmony of occasional causes; physical pre-motion, etc."

> — Denis Diderot (1770), note to Baron d'Holbach's *The System of Nature* (pgs. 51-52)

Downgrade from 180|#121 to 175|#245 per Diderot quote (Jan 2018).

[RGM:616|1,500+] (GME:58) (CR:10) Arabic polymath;

| 175 Alhazen (c.965-1040)

"The seeker after the truth is not one who studies the writings of the ancients and, following his natural disposition, puts his trust in them, but rather the one who suspects his faith in them and questions what he gathers from them, the one who submits to argument and demonstration, and not to the sayings of a human being whose nature is fraught with all kinds of imperfection and deficiency. Thus the duty of the man who investigates the writings of scientists, if learning the truth is his goal, is to make himself an enemy of all that he reads, and, applying his mind to the

276

core and margins of its content, attack it from every side. He should also suspect himself as he performs his critical examination of it, so that he may avoid falling into either prejudice or leniency."

— Alhazen (c.1020) (Ñº)

Noted for work in astronomy and optics, and for his semi "scientific method" like experimental work on light; first-slating: IQ:175 (c.2017).

| 175 277 Homer (c.750-650BC) [**Note**: possibly not real person] IQ_B=175

(Cattell 1000:13) (RGM:37|1,500+) (Hart 100:88) (ACR:2) [CR:51] Greek writer, a universal genius claimant, the purported author of the *Iliad*, focused on a quarrel between king Agamemnon and the warrior Achilles, and the *Odyssey*, focused on journey of Odysseus, king of Ithaca, after the fall of Troy.

| 175 278 Samuel Coleridge (1772-1834) IQ_C=175

(Cattell 1000:283) [RGM:427|1,310+] Noted for his involvement in the 1833 Whewell-Coleridge debate, with English science historian William Whewell, revolving around the question of what exactly someone who works 'in the real sciences', as Coleridge had phrased it, should be called, and what exactly are the real sciences, in the context of the tree of knowledge; a result of which the term "scientist" was coined.

| 175 279 Robert Bunsen (1811-1899) IQ_C=175

(Cattell 1000:266) [RGM:N/A|1,500+] (Murray 4000:20|C) (CR:25) German chemist;

"I am made from the C-H-N-O-S-P combination from which a **Bunsen**, Helmholtz, Kirchhoff came."

— Wilhelm Ostwald (1926), *Lifelines: an Autobiography*

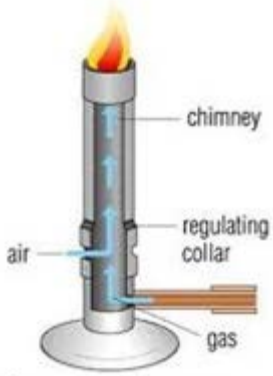

Bunsen Burner

semi-ranked as a greatest chemist ever; eponym of the Bunsen burner, noted for being the mentor of a number of thinkers, including: August Horstmann, Heike Kamerlingh-Onnes, and Sofia Kovalevskaya, famous or his 1860 flame spectrum element prediction analysis work together with Gustav Kirchhoff.

| 175 280 Adrien Legendre (1752-1833)

(Murray 4000:16|M) (GME:21) (Eells 100:11) (CR:3) known for the Legendre transform (or Legendre transformation), in which one specific variable of a state function equation can be converted into a more convenient form; established the modern notation for the partial differential; first-draft gauged at 175|#235 (Nov 2017).

(Cattell 1000:N/A) [RGM:N/A|1,350+] (RMS:39) (FA:106) (EPD product) English surgeon, radical clergyman (dubbed the "devil's chaplain"), free thinker (or "infidel missionary", as he characterized himself), a product of the

genius hiatus effect (three years in prison);

"Bind it about thy neck, write it upon the tablet of thy heart: **'everything of Christianity is of Egyptian origin'**."

> — Robert Taylor (1829), *Oakham Gaol*; cited by Gerald Massey (1883) in *Natural Genesis, Volume One* (pg. iv)

175 | 281

Robert Taylor (1784-1844)

"It is easy to trace almost all the Grecian fables and mythologies from Egypt."

> — Robert Taylor (1829), *The Diegesis* (pg. 180)

ranked, by Dorothy Murdock (2014), with Thomas Jefferson and Thomas Paine as having initiated "our great age of enlightenment" (Ñº); noted for his 1829 *The Diegesis: a Discovery of the Origin, Evidences, and Early History of Christianity*, written in his prison cell, wherein, on the basis of comparative mythology, he attacked Christianity and attempting to expound it as a scheme of solar myths; while attending one of his lectures, a young Charles Darwin was shaken in his boots by watching the backlash from his pronouncements, and therein learned to caution his later theories; first-slating: 175|# (Apr 2018).

175 | 282

Frederick Sanger (1918-2013)

[DNP]; Nobel Prize in chemistry (1958) for the structure of the insulin molecule; Nobel Prize in chemistry for virus nucleotide sequencing; quote: "I and my colleagues have been engaged in the pursuit of knowledge."

175 | 283

Frederick II (1194-1250)

(Cattell 1000:204) [RGM:N/A|1,310+] (FA:34) Italian-born German king who became the head of the Holy Roman Empire during its greatest territorial extent; purportedly originated of the *Treatise on the Three Impostors* (see: three impostors theory); conducted human experiments to test the truths of various religious models, e.g. that Adam and Eve were the first two humans (language deprivation experiments) and soul detection experiments; first-slating: 175|#250 (Mar 2018).

175 | 284

Thomas Macaulay (1800-1859)

IQ_C=175
IQ_W=180

175 | 285

Lucian (c.120-190AD)

(Cattell 1000:387) [RGM:N/A|1,310+] (Murray 4000:N/A) (FA:28) Roman satirist, skeptic, Epicurean admirer, Greek scholar, retrospectively classified atheist; one of the first secular (real) person's to label and ridicule Christianity as an actual sect (see: silent historians problem);

first-draft slating: 175|#250 (Jan 2018).

(Cattell 1000:N/A)
[RGM:N/A|1,500+]
(Murray 4000:N/A)
(GME:#) (CR:6) Dutch mathematician, engineer, and polymath;

"Speaking freely of the great use of this invention; I call it great, being greater then any of you expect to come from me. Seeing then that the matter of this Disme (the cause of the name whereof shall be declared by the first definition following) is number, the use and effects of which your selves shall sufficiently witness by your continual experiences. In these numbers we use no fractions."

175 | 286

Simon Stevin (1548-1620)

— Simon Stevin (1585), *Disme* or *De Thinde* (*The Dime*), *The Arts of Tenths or Decimal Arithmetike* (Ñº)

Noted for his *The Dime* (1585), the first printed treatise on decimal fractions, e.g. see adjacent image (Ñº) of his decimal table, and the notation was instrumental in the development that followed, e.g. Thomas Jefferson adopted it of the US currency; his *Statics and Hydrostatics* (1586), wherein he is said to have given the first complete statement of the impossibility of perpetual motion, and also derived the notion of the vectorial decomposition of forces, according to which force that must be exerted along the line of greatest slope to support a given weight on an inclined plane; gave one of the first accurate calculations of the earth (Guericke, 1663); his fluid mechanics work, is said to precursored the later work of Blaise Pascal; first-slating: 175|#282 (Feb 2019).

(GFG:4) American forced prodigy turned journalist, editor, critic, women's rights advocate, and transcendentalism and Goethean philosopher;

175 | 287

Margaret Fuller (1810-1850)

"Romantic attractions result from unalterable chemical affinities and should be obeyed regardless of marital ties."
— Margaret Fuller (c.1835), paraphrase of her view, by Megan Marshall, following her 1832 reading of Goethe's Elective Affinities

"I now know all the people worth knowing in America, and I find no intellect comparable to my own."
— Margaret Fuller (c.1840), publication (Ñº)

Praised by Edgar Poe and Ralph Emerson as being an intellect among

intellects.

175 | 288 Albrecht Haller (1708-1777) ↓ IQ_C=190

(Cattell 1000:253) (Simmons 100:42) (CR:5) Promoted vitalism and calculated, rather humorously, that god put 200 billion germs of men into the ovary of Eve 6,000 years ago.

175 | 289 Lope de Vega (1562-1635) IQ_C=175

(Cattell 1000:232) [RGM:241|1,500+] (Gottlieb 1000:551) Spanish playwright, poet, novelist and marine; reputation in the world of Spanish literature is second only to that of Cervantes.

175 | 290 Petrarch (1304-1374)

(Cattell 1000:52) [RGM:150|1,310+] Italian scholar, poet, and philosopher; regarded by humanists as their first master; his discoveries of the lost works of Cicero were said to have initiated the Italian renaissance; quote: Written in the land of the living; on the right bank of the Adige, in Verona, in the year of that god whom you never knew the 1345th" (compare: Goethean calendar); first-draft gauged at #240 (Dec, 2017).

175 | 291 Lord Bolingbroke (1678-1751)

(Cattell 1000:115) [RGM:N/A|1,500+] (FA:65) (CR:9) English politician, government official, political philosopher, an unlearn expositor, and religio-mythology scholar; noted as early Bible debunking scholar; Voltaire, Thomas Jefferson, John Adams, and James Madison praise him, e.g. Adams claimed to have read all of his works five times; first-slating at [IQ:175|#240] based on the fact that he is an unlearn expositor (mean IQ:188; mean RGM:115) (c.2018).

175 | 292 Amedeo Avogadro (1776-1856)

(GCE:21) (CR:11) Italian physical chemist;

"The invariable number N is a universal constant, which may appropriately be designated Avogadro's constant."

— Jean Perrin (1909), "Brownian Motion and Molecular Reality"

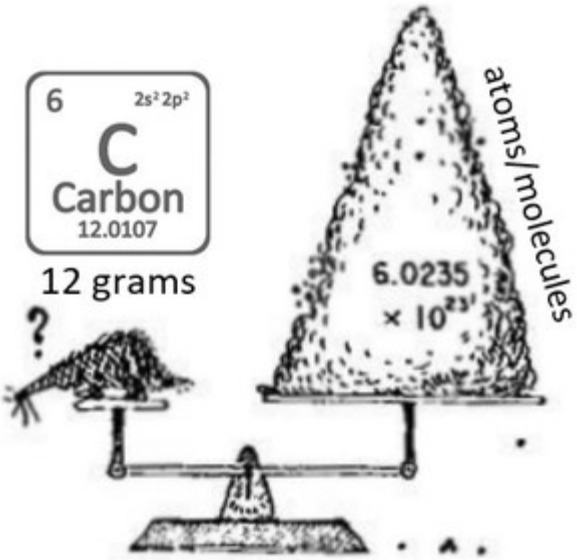

noted for his 1811 hypothesis, based on the earlier work of Joseph Gay-Lussac (1809), that equal volumes of all gases under the same conditions of temperature and pressure, have the same number of molecules; in 1858, two years after his dereaction (death), Stanislao Cannizzaro (1826-1910) showed how the use of Avogadro's number could solve many of the problems in chemistry (Ñº); in 1909, Jean Perrin calculate the "mol" to be 7.05x10E23 (modern value: 6.022x10E23); First-slating: 175|#285, generally gauged near Dmitri Mendeleyev (see: GCE rankings), the Cox IQ estimate of Joseph Gay-Lussac, and general SI unit geniuses rankings (Feb 2019).

175 Louis Agassiz

(Cattell 1000:388) [RGM:N/A|1,330+] (Murray 4000:8|ES) Swiss-born American naturalist, geologist, and teacher who made revolutionary contributions to the study of natural science with landmark work on glacier activity; downgrade quote: "The glacier was god's great plough set

— 293	(1807-1873)	IQ_C=175	at work ages ago to grind, furrow, and knead over, as it were, the surface of the earth"; upgrade quotes: "I cannot afford to waste my time making money" and "Facts are stupid until brought into connection with some general law."
175 — 294	Heike Kamerlingh-Onnes (1853-1926)		Discoverer of superconductivity; coiner of "enthalpy", one of the chiefs of the physical laboratory of the famous Leiden University school; first-draft intuited at #230 genius level, give or take (Oct 2017).
175 — 295	Marie Bichat (1771-1802)	IQ_C=175	(Cattell 1000:397) [RGM:N/A|1,330+] (Murray 4000:N/A) French anatomist and pathologist; known as the father of histology.
175 — 296	Luigi Galvani (1737-1798)		(Cattell 1000:N/A) [RGM:318|1,350+] (Murray 4000:N/A) Italian physician-physicist noted for his circa 1771 discovery of the phenomenon of animal reanimation—via electricity, spark or electrochemical circuit contact—of severed frog legs, eponym of Galvanism; in 1803, Giovanni Aldini, his nephew, reanimated a human corpse, hung for murder, getting him to sit up and open his eye; these were the experiments behind Mary Shelley's 1817 *Frankenstein*; first slating: 175|#270 (Mar 2018). 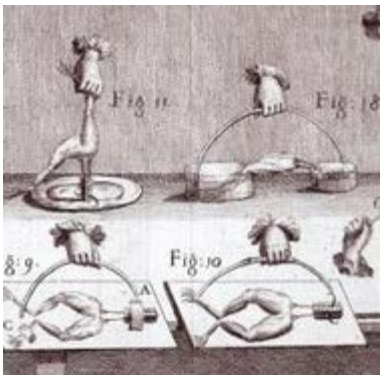
175 — 297	Gerolamo Cardano (1501-1576)	IQ_C=175	(Murray 4000:14|M) (GME:13) (Eells 100:10) (CR:8), aka "Cardan" or "Cardanus", was an Italian mathematician, physician, chnoposologist (biologist), physicist, chemist, astronomer, philosopher, gambler, an "accused atheist" (Lessing, c.1755) (Ñº)(Ñº), and generally classified polymath, characterized a "tormented towering renaissance figure" (Ñº); influential to Lucilio Vanini (1616).
175 — 298	Polybius (c.200-118BC)		(Cattell 1000:289) [RGM:N/A|1,350+] (Murray 4000:N/A) was a Greek historian and cryptographer; "**Polybius** is one of the few great minds that the turbid human species has managed to produce. Damage to his *Histories* is without question one of the gravest losses that we have suffered in our Greco-Roman heritage." — Jose Ortega (c.1940), *Meditations On Hunting* Influential to: Diodorus, Livy, Cicero, Plutarch, Arrian, Niccolo Machiavelli, Jacques Thou, Paolo Sharpi, Charles Montesquieu, John Adams, Louis L'Amour, to name a few; first-slating: 175|#280 (Mar 2018).
175 —	Robert Millikan (1868-		[RGM:N/A|1,330+] (Murray 4000:N/A) (Kanowitz 50:29) (CR:8) American physicist, known for his 1910 oil drop experiment (Ñº), conducted with Harvey Fletcher, wherein they calculated the charge on a single electron (1.6 × 10E-19

299 1953)

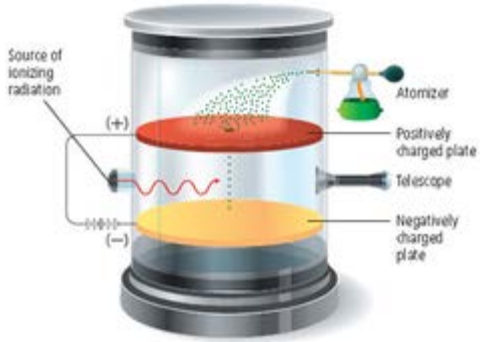

C); for his 1914 work on proving Einstein's 1905 photoelectric effect correct; downgrade for his 1928 cosmic ray anti-entropy heat death religious theory; first-slating: 175|#271 (Mar 2018).

175 — 300 Marcus Varro (116-27BC)

(Cattell 1000:427) (RGM:N/A|1,310+) ranked by Montaigne as being as knowledgeable about "things" as Aristotle; his 41-volume *Antiquities of Human and Divine Affairs* was praised by Cicero as follows: "Your books led us home, when we were wandering like strangers in our own city. You have revealed to us the names, types, duties and origins of all things divine as well as human"; his AUC dating system was how Roman empire dated years until it was switched to AD/BC during the reign of Charlemagne (c.800AD); quote: "The poets, through the conjunction of fire and moisture, are indicating that the *vis*, 'force', which they have is that of Venus [Aphrodite]. Those born of *vis* have what is called *vita*, 'life', and that is what is meant by Lucilius [c.120BC] when he says: 'life is *force* you see: to do everything force doth compel us'." First-drafted gauged at #250 (Dec 2017).

(add)

Next | Previous

â— Top 1000 geniuses: 1-100 | IQ: 225-180
â— Top 1000 geniuses: 101-200 | IQ: 180-180
â— **Top 1000 geniuses: 201-300** | IQ: 180-175
â— Top 1000 geniuses: 301-400 | IQ: 175-170
â— Top 1000 geniuses: 401-500 | IQ: 170-165
â— Top 1000 geniuses: 501-600 | IQ: 165-160
â— Top 1000 geniuses: 601-700 | IQ: 160-150
â— Top 1000 geniuses: 701-800 | IQ: 150-140
â— Top 1000 geniuses: 801-900
â— Top 1000 geniuses: 901-1000
â— Top 1000 geniuses (candidates)

Notes

N1. Note: see "IQ key" page for IQ subscript symbol meaning.

θΔics

In genius rankings, **top 1000 geniuses** refers to the greatest five-hundred geniuses of all time ranked by IQ or "relative brightness or intellect" (Cox, 1926); below are the fourth tier greatest geniuses of all time, numbers 301 to 400.

Geniuses | 301-400

The following are the geniuses "301 to 400" of the top 1000 geniuses (previous: 1-100, 101-200, 201-300, next: **401-500**, 501-600, 601-700, 702-800, 801-900, 901-1000): [N1]

			Geniuses 301 to 400
301	175	Mary Shelley (1797-1851)	[RGM:N/A|1,500+] (EPD:0M) (GFG:6) (CR:47) English philosopher and novelist; noted for her 1818 fictional character "Vicktor Frankenstein", who discovers the "principle of life" (see: life principle), and thereby reanimates, revives, or brings to life a dead corpse with electricity, i.e. creates laboratory produced life; for her 1839 discussions of the atheist-based "Church of Elective Affinities", in which she alluded to have married her husband Percy Shelley; top "female genius" (Q); an About.com top 100 (#49) Women of History (Q); first-slating: #225 (below Paine) (Jun 2017).
302	175	Louis Pasteur (1822-1895)	IQ_{JP}=180+ IQ_{O}=175 [RGM:52|1,250+] (Simmons Scientific 100:5) (Partington ranking:49) (Hart 100:6); supposed an advocate of biogenesis theory; supposedly (Q) expressed some type of belief of god; Singh (2014) estimate (Q) as top 100 genius (#82); Yahoo Answer IQ estimated (Q) at 155-160 or 177 to 185.
303	175	Antonie Leeuwenhoek (1632-1723)	(Cattell 1000:N/A) [RGM:1336|1,500+] (Murray 4000:N/A) (Simmons 100:55) (Hart 100:30) Dutch scientist; "In the year of 1657 I discovered very small living creatures in rain water." — Antonie Leeuwenhoek (c.1670) 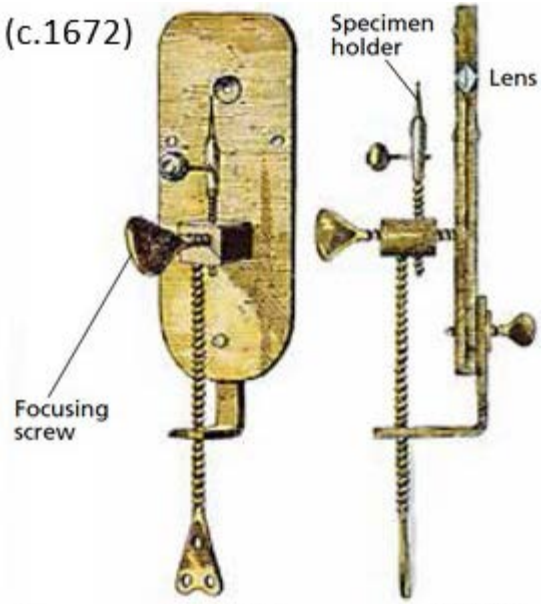 Leeuwenhoek Microscope (200x) noted for his c.1672 modified single lens 200x microscope, with which he became the first to observe single-celled organisms, which he called "animalcules"; mentor to Nicolaas Hartsoeker; first-slating: 175|#280 (Apr 2018).
304	175	Pherecydes (c.580-520BC)	(Cattell 1000:N/A) [RGM:N/A|1,330+] (Murray 4000:N/A) Greek cosmologist, mythicist, theologian, and miracle-mongerer (Q); **teacher of Pythagoras**; oft-cited, e.g. by Cicero, as the "inventor" of the "soul", or at least the Egyptian-adopted Greek version of it, and or metempsychosis (Q), aka transmigration of souls; first-slating: 175|#280 (Mar 2018).
			(Cattell 1000:N/A) [RGM:N/A|1,330+] (Murray 4000:N/A) English

305 | 175

William Whewell (1794-1866) ↑↓

polymath; noted for his involvement in the 1833 Whewell-Coleridge debate, with English romantic philosopher Samuel Coleridge, revolving around the question of what exactly someone who works ‘in the real sciences’, as Coleridge had phrased it, should be called, and what exactly are the real sciences, in the context of the tree of knowledge; a result of which Whewell coined the term "scientist"; guesstimated at 180±|#121 (c.2016); down-graded to 175|#290 (Feb 2018) pre reason that he us more of a side-line figure.

306 | 175

Rene Lubicz (1887-1961)

French-German artist, chemist, esoteric physicist, Egyptologist, religio-mythology scholar, and neo-Pythagorean thing philosopher of sorts, noted for his 1949 two-volume *The Temple in Man*, wherein he defines life as the “faculty of reaction”, which he applied to everything, animals, vegetables, and minerals; first slating: 175|#270 (Jan 2018).

307 | 175

Salvador Dali (1904-1989) ↓

IQ_B=175

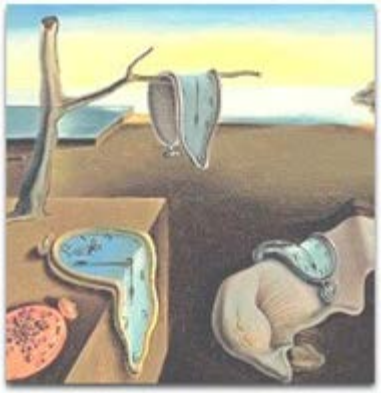

[RGM:170|1,300+] (Murray 4000:N/A) Spanish surreal artist; noted for melting clock painting, i.e. The Persistence of a Memory (1931); when asked by Ilya Prigogine whether this art piece had something to do with Einstein’s relativity theory, Dalí replied that the soft watches were not inspired by the theory of relativity, but by the surrealist perception of a Camembert (cheese circle) melting in the sun; considered himself a “genius” as describes in his *Diary of a Genius* (1964) (Q), akin to a striving to be “Nietzsche of the irrational” or an “almost divine genius like Raphael”, or something to this effect.

308 | 175

Pablo Picasso (1881-1973)

IQ_B=175
IQ_{SS}=175

[RGM:347|1,500+] Spanish-born French painter, sculptor, printmaker, ceramicist, stage designer, poet and playwright.

309 | 175

William Sidis (1898-1944)

IQ_P=250-300
IQ_O=200

[RGM:694|1,500+] (LR:9) (RE:46) (CR:165) was an American mathematical physicist, famously known as a forced prodigy; person behind both the 10% myth (the reserve mental energy theory was used, by his father, in his accelerated upbringing) and the character of *Good Will Hunting* (excelling in math, physics, chemistry, law); down-grade for his magnum opus: *The Animate and the Inanimate*, a rather convoluted second law based "no origin" theory of life, utilizing a two-section universe model, which results to being a patched-together mess of an argument, in spite of his legendary genius prodigy fame status; IQ downgraded ↓ from 180|#149 (2016) to 175|#303 per realization of his empathetic to situation based over-estimated genius status as compared to the actual content of his so-called magnum opus *The Animate and the Inanimate* (Jan 2019).

George

(Murray 4000:19|T) (EP:30) (CR:3) English engineer, noted for the invention of the Invented

175 | 310

Stephenson (1781-1848) IQ_B=173

the miner's safety lamp, and for his development of passenger steam engine to pioneer mass public train transportation.

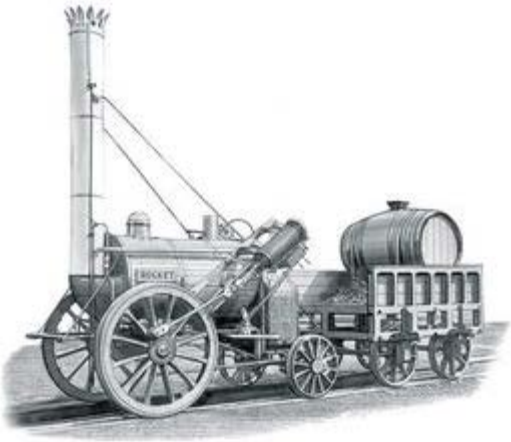

175 | 311

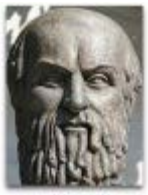

Aeschylus (c.523-456BC) IQ_B=173

(Cattell 1000:238) [RGM:70|1,310+] Greek tragedian playwright; author of *Oresteia* the only trilogy in Greek drama that survives from antiquity, which tells the story of the bloody chain of murder and revenge of the royal family of Argos.

(IQ:175|#306) (Cattell 1000:448) [RGM:293|1,500+] (CR:37) French science intersecting religion themed philosophical fiction author;

175 | 312

Honore Balzac (1799-1850) IQ_C=155 ↑↑

"These two stories, *The Ban* (L'Interdiction) and *The Atheist's Mass* (*La Messe de l' Athee*), would, if they existed entirely by themselves, and if we knew nothing else of their author's, and nothing else about him, suffice to show any intelligent critic that **genius of no ordinary kind** had passed by there."

> — George Saintsbury (1896), "Preface" to *The Atheist's Mass and Other Short Stories*

student of Francois Rabelais (FA:42); a GLAE candidate; HIGHLY noted for his 1834 *Search for Absolute Truth* (see: feelings and affinity dialogue), where the character "Professor Balthazar" (note: some Iranians call Libb Thims "Prof. Balthazar", per cartoons of him played on Iranian television, in the 1990s), a chemist, debates with Josephine, his wife, on the nature of "feelings" from their respective

views, the scientific chemical affinity view and the romantic view; refers to himself as an affinity-controlled gas particle like "electrical mechanism"; upgrade ↑ from 170|#204 (2016) to 175|#284 (Feb 2018).

313 | 175	Jacob Bernoulli (1654-1705)		(Cattell 1000:N/A) [RGM:N/A|1,320+] (Murray 4000:12|M) (GME:20) (Eells 100:28) (Allen 100:53) Swiss mathematician, older brother to Johann Bernoulli (see: Bernoulli genealogy), both of whom were earlier developers of German mathematician Gottfried Leibniz' version of differential calculus, uncle to Daniel Bernoulli, the famed *Hydrodynamia* author, student of Gottfried Leibniz, general secondary PhD advisor to Leonhard Euler (see: Euler genealogy); first draft slating: 175|#275 (Jan 2018).
314 | 175	Arnold Sommerfeld (1868-1951)		[RGM:N/A|1,330+] German theoretical physicist ; Nominated a record eighty-one times [:81] for the Nobel Prize; served as PhD supervisor for more Nobel Prize winners in physics than any other supervisor before or since; introduced the 2nd quantum number (azimuthal quantum number), 4th quantum number (spin quantum number), the fine-structure constant, and pioneered X-ray wave theory; original slating: 180|#86 (c.2016).
315 | 175	Alfred Musset (1810-1857)	IQ_C=180	(Cattell 1000:464) [RGM:N/A|1,350+] (Murray 4000:N/A) French dramatist, poet, and novelist; non-notablity downgrade from 180|#205 to 175|#286 (Feb 2018).
316 | 175	Theophrastus (c.371-287BC)		(Cattell 1000:N/A) [RGM:N/A|1,310+] (FA:19) Greek philosopher, not to be confused with the Anon Theophrastus (c.1609-1665), pupil and successor to Aristotle, characterized as "the most elegant and erudite of philosophers " (Cicero, c.45BC) and a "universal genius" (Cap, 1851), noted for now lost essay, entitled "On Gods" (Περὶ ῶεῶν), wherein, supposedly, he debunks religion and proves gods non-existent; first-slating:175|#306 (Jun 2018).
317 | 175	Robert Peel (1788-1850) ↓	IQ_C=180	(Cattell 1000:176) [RGM:N/A|1,350+] (Murray 4000:N/A) British statesman; non-notablity downgrade from 180|#204 to 175|#287 (Feb 2018).
318 | 175	Antoine Arnauld (1612-1694) ↓↓	IQ_C=190	(Cattell 1000:447) [RGM:N/A|1,330+]
319 | 175	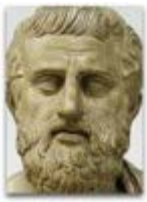 Sophocles (498-406)	IQ_B=173	(Cattell 1000:181) [RGM:49|1,500+] Greek tragedian playwright; "A man, though wise, should never be ashamed of learning more, and must unbend his mind." slated at: 173|#312 (Feb 2019).
320 | 175	Andrew Carnegie (1835-1918) ↓	IQ_B=180	Scottish-born American industrialist, business magnate, and philanthropist;
175	Marcel Duchamp		

— 321	(1887-1968) ↓	IQ_B=180	French-American painter, sculptor, chess player and writer;
— 175 — 322	Jacques Thou (1553-1617)	IQ_C=175	(Cattell 1000:417) [RGM:N/A|1,330+] (Murray 4000:N/A) French statesman, bibliophile, and historiographer whose detached, impartial approach to the events of his own period made him a pioneer in the scientific approach to history.
			↑ 175+
— 170 — 323	Jean Meslier (1664-1729)		(FA:63) (GA:3) (CR:71) French "ultra-intelligent" (Q) abbot and closet extreme atheist; "Meslier's *Testament* is the most singular phenomenon ever seen among all the meteors fatal to the Christian religion." — Voltaire (1766) first-slating at 170|#310 (May 2018) per read-through of his *Testament*, up to the point (pgs. 362-65) when he starts digging into matter, motion, and force as the replacement for god and creation; very prescient for this date in history; very influential to Voltaire, Holbach, and other French renaissance intellectuals.
— 170 — 324	Zeno of Citium (c.334-c.262BC)		(Cattell 1000:859) [RGM:792|1,500+] (GPhE:#) (CR:44) Greek natural philosopher, noted for employing a determinism philosophy of action, particularly in regards to crime and punishment (see: slave stealing parable; flower stealing model), and also the founder of stoicism, a philosophy which holds that the wise man should be free from passion, unmoved by joy or grief, and submissive to natural law and

or one apparently or professedly indifferent to pleasure or pain; slated at #275 (Jan 2018).

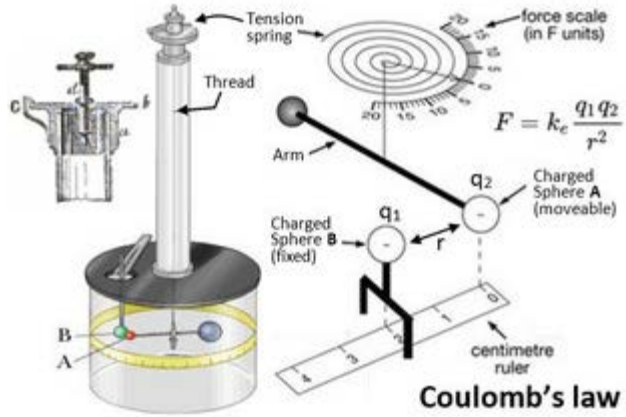

(Cattell 1000:N/A) [RGM:N/A|1,350+] (Murray 4000:N/A) (SIG:15) French physicist and military engineer; noted for his 1785 construction of a built a torsion balance (Q), as shown, wherein, in an effort to prove Joseph Priestley 1766 inference that the force of attraction or repulsion between two small charged spheres would be inversely proportional to the square of the separating distance, using Hooke's spring law, and showed quantitatively that charged spheres haven an inverse proportionality relationship, which he explained formulaically (see: Coulomb's law); first-slating: 170|#291 (Mar 2018).

325 | 170

Charles Coulomb (1736-1806)

(FA:84) German physicist, philosopher, and satirist;

"I thank the lord a thousand times for having made me become an atheist."

> — Georg Lichtenberg (c.1768), *Notebook E 252, 1765-1770* (compare: George Shaw)

326 | 170

Georg Lichtenberg (1742-1799)

one of the first scientists to introduce experiments with apparatus in their lectures; Volta and Gauss sat in on his lectures; associates with Goethe and Kant; from 1765 (age 23) to 1799 (age 56), he kept a series of personal notebooks, quotations that struck Lichtenberg, titles of books to read, autobiographical sketches, and short or long reflections, including keen observations on human nature, à la the 17th-century French moralists, which gained him posthumous fame as one of the best aphorists in Western intellectual history; greatly influential to other later atheists, e.g. Schopenhauer (he is one of those who "think for their own instruction", who are "genuine 'thinkers for themselves' in both senses of the words"), Feuerbach (cites him in "The Natural Sciences and the Revolution", 1850), Tolstoy (I'm perplexity "why the Germans of the present day neglect

this writer so much"), Nietzsche, and Freud (who his “Why War?” letter to Albert Einstein) mentioned Lichtenberg's invention of a “Compass of Motives” in a discussion on the combination of human compounded motives and quoted him as saying, “The motives that lead us to do anything might be arranged like the thirty-two winds and might be given names on the same pattern: for instance, ‘food-food-fame’ or ‘fame-fame-food’,”); an enlightenment figure nonbeliever (Haught, 1996); first-slating: 170|#313 (Jan 2019).

327 | 170

Simeon Poisson (1781-1840)

(Eells 100:39) (CR:2) French mathematician, physicist, and engineer; noted for his early attack on the difficult problem of induced magnetization; his’s name, in the history of classical electrodynamics (Errede, 2007), from 1812, to 1867, appears at least twelve times (in very dense intellectual areas); his genius is difficult to summarize; first-draft at 170|#321 (Nov 2019) based on general intuition.

328 | 170

Akhenaten (c.1380-1335BC) IQ_O=215

(Cattell 1000:N/A) [RGM:N/A|1,320+] (Murray 4000:N/A) (Time 100:2) (FA:1) (CR:39) Egyptian pharaoh and religion reformer;

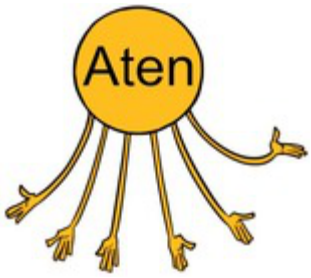

“**Ikhnaton**, who sought to reform religious conceptions in the light of reason is the ‘first individual’ in history.”

> — J.H. Breasted (c.1910), *Publication*; cited by Roderick Seidenberg (1950) in *Post-Historic Man* (pg. 86)

noted as monotheism founder; the person who moved the world, or at least Egypt, from a henotheism-based state religion, i.e. one supreme god (see: supreme god timeline) + lesser gods, to monotheism-based state religion, one god (Aten), where god became, a few anthropomorphisms aside (e.g. Aten's finger), the heat or energy of the sun; he is the main mind behind the Old Testament of the Bible, in short; oft-cited as the person behind the character “Moses” (Freud, 1939); IQ fictionally stated to be 215 (Q); first-draft guestimated at 170|#250 per “greatest black geniuses” page start (Jun 2017).

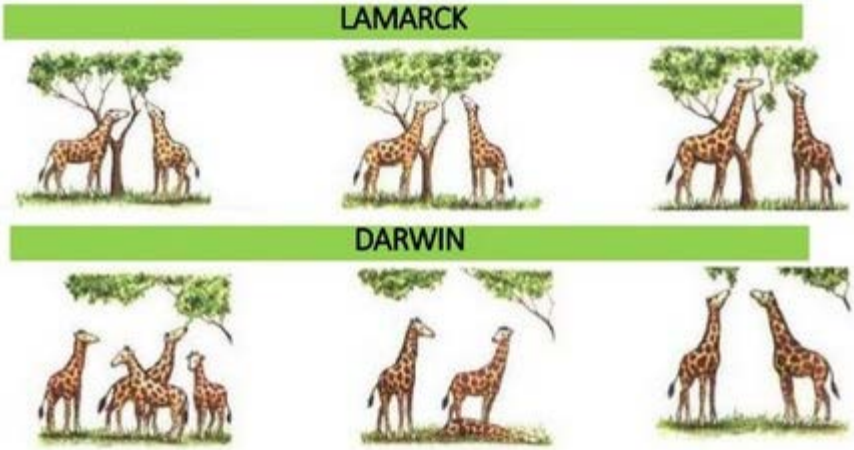

| 170

Jean Lamarck (1744-1829)

(Cattell 1000:681) [RGM:342|1,500+] (Murray 4000:3|B) (EvT:10|21+) (CR:13) French anti-chance based naturalist; noted for

329

anti-chance

his 1800 evolution theory (see: Lamarckian theory) that employed several mechanisms as drivers of evolution, drawn from the common knowledge of his day and from his own belief in (pre-Lavoisier) chemistry namely he envisioned two forces as comprising evolution; a force driving animals from simple to complex forms, and a force adapting animals to their local environments and differentiating them from each other; believed that these forces must be explained as a necessary consequence of basic physical principles, favoring a materialistic attitude toward biology; slight down-grade for his mistaken idea that giraffes grew longer necks by reaching for leaves, and that this trait could be passed on to offspring; he the doctrine that all species, including man, are descended from other species; first-slating: IQ:175|#320 (Jan 2019).

(Eells 100:25) (CR:6) German astronomer and mathematician;

170 | 330

Regiomontanus (1436-1467)

"You, who wish to study great and wonderful things, who wonder about the movement of the stars, must read these theorems about triangles. Knowing these ideas will open the door to all of astronomy and to certain geometric problems."

> — Regiomontanus (1464), *On Triangles of Every Kind* (*De Trianguis Omnimodis*) (Q)

Noted for his *Epitome of the Almagest*, wherein he stated that Ptolemy was wrong; was the main shoulder genius of Copernicus; first-draft slotted at #250 (Jun 2017).

170 | 331

Edwin Hubble (1889-1953)

[RGM:85|1,500+] (Cropper 30:3|NP) (Murray 4000:12|A) American astronomer; first-slating: 170|#324 (Feb 2019).

170 | 332

Thomas Savery (c.1650-1715)

(EP:#) (CR:23) English engineer, and "commissioner of sick and wounded" (Switzer, 1729), noted for his 1698 construction of his "Savery engine", aka Miner's friend, a suction pump type of steam engine designed for the removal of water from mines, the world's first operational steam engine; first-slating: 170|#325 (Oct 2019).

170 | 334

Max Weber (1864-1920) ↑

[RGM:133|1,500+] (Gottlieb 1000:806) (HCR:8) (CR:61) German sociologist, Goethean philosopher, oft cited last person to know everything and considered the "last universal genius of social science", noted for his so-called Weberian elective affinities

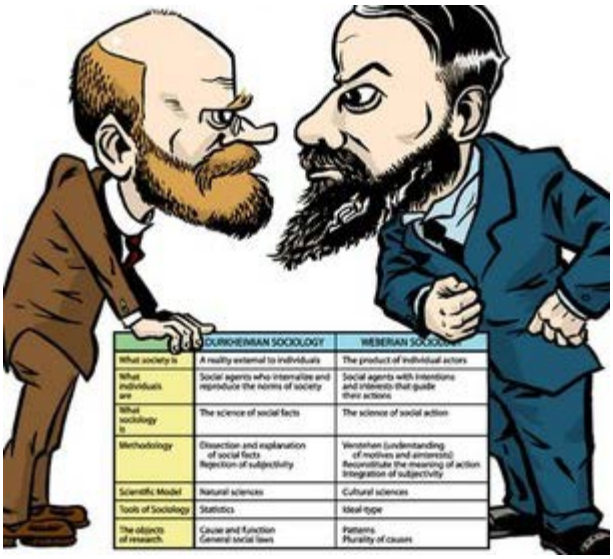

theory, namely the use of Goethe's human elective affinity theories in the development of his social theories; oft-compared to Emile Durkheim (IQ:170|#351), shown adjacent; first slated at 170|#187 (c.2015) per mistaken confusion with Cox IQ citation of composer Karl Weber (1786-1826) at IQ:165 (mistake noticed in Feb 2019).

(Cattell 1000:318)

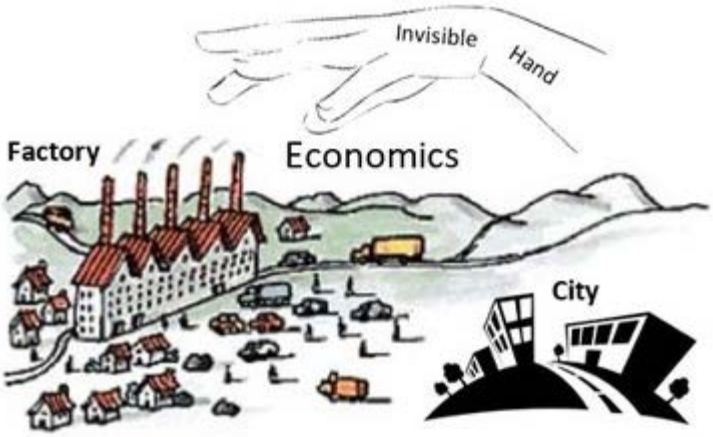

170 | 335

Adam Smith (1723-1790) ↑ IQ_C=170

[RGM:80|1,500+] (GEE:#) (CR:56) Scottish social philosopher and political economist; noted early HP pioneer, his 1759 invisible hand theory and 1776 *Wealth of Nations* were said to have been inspired by Newtonian mechanics.

170 — 336

Seleucus (c.190-120BC)

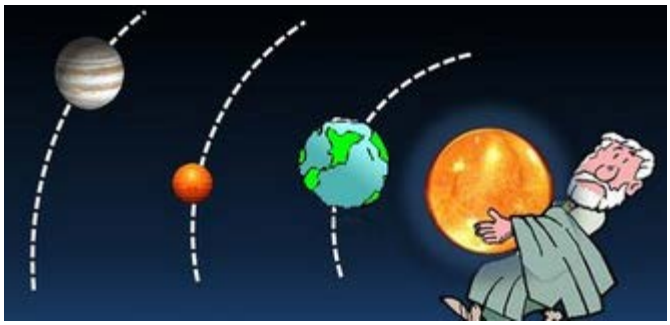

Greek philosopher and astronomer, a follower of Aristarchus; noted for beyond hypothesizing proofs that the earth revolves around the sun; first slating: 170|#325, tentatively gauged as grade below Aristarchus, whose work he expanded on (Jan 2019).

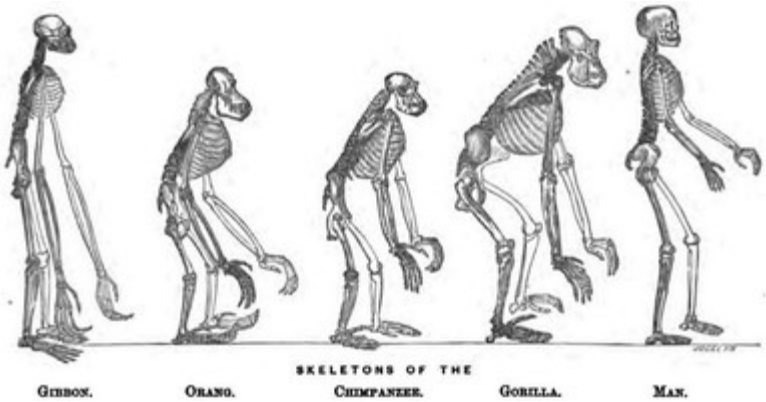

[RGM:530|1,500+] (Gottlieb 1000:799) (CR:126) English evolutionist and natural philosopher;

337 | 170

Thomas Huxley (1825-1895)

"Every society, great or small, resembles ... a complex molecule, in which the *atoms* are represented by *men*, possessed of all those multifarious attractions and repulsions which are manifested in their desires and volitions, the unlimited power of satisfying which we call freedom ... the social molecule exists in virtue of the renunciation of more or less of this freedom by every individual. It is decomposed, when the attraction of desire leads to the resumption of that freedom the expression of which is essential to the existence of the social molecule. The great problem of social chemistry we call politics, is to discover what desires of mankind may be gratified, and what must be suppressed, if the highly complex compound, society, is to avoid decomposition."

— Thomas Huxley (1871), "Administrative Nihilism"

nicknamed "Darwin's bulldog", noted for his argumentative advocacy of Darwin's theory of evolution; social chemistry philosophy; atheism discussion; materialism logic; coining of the term "agnostic" (1869); among other erudition; first-slated at 170|#284 (c.2016)

338 | 170

Constantin Volney (1757-1820)

(Cattell 1000:785) [RGM:N/A|1,310+] (RMS:29) French religio-mythologist; his *The Ruins: a Survey of the Revolutions of Empires* (1791), wherein he connects the main characters of Judaism and Christianity to Hinduism, and both, in some sense, back to Egyptian mythology, was influential to Thomas Jefferson and Abraham Lincoln; first-draft gauged at 165|#350 (Dec 2017); upgraded from 165|#432 to 170|#321 (Sep 2018) per reading up through §8 plus noted of Mary Shelley influence.

(CR:55) English mathematician-physicist, philosopher, lawyer, statistician, evolutionist, Germanic literature scholar;

"There is, for example, the principle of inertia, the statement that no physical corpuscle need be conceived as changing its motion except in the presence of other corpuscles, that there is no need of attributing to it any power of **self-determination** (p. 287). There are probably those who think some power of self-determination must be ascribed to the elementary organic corpuscle, but this seems very doubtful. Placed in a certain field, environed with other organic or

339 | 170

Karl Pearson
(1857-1936)

inorganic corpuscles, the life-germ moves relatively to them in a certain manner."

— Karl Pearson (1892), *The Grammar of Science* (pg. 343); cited in 'self-' [TR:116]

noted for his 1885 lecture "Matter and Soul", wherein he puts the extrapolate down argument in the form of an Aunt Sally in regards to consciousness and life (as a mechanism), supposedly, arisen from "dead mechanism", and for his 1892 book *Grammar of Science*, the first book read in German physicist Albert Einstein's 1902 "Olympia Academy" study group, which expands on the former in regards to what physics has to say about life; first-draft gauged at 165|#350 (Mar 2017); upgraded to 170|#331 (Oct 2019).

340 | 170

Christopher Hitchens
(1949-2011)

IQ_O=160
IQ_O=130-145
IQ_O=137

[RGM:298|1,500+] (FA:215) (CR:54) English-born American political, literature, and religion commentator; an anti-theist (auto-characterization); the most powerful of the four horseman of new atheism; characterized as a "debate genius" and "linguistic genius"; 75% Debate.org ranking as a genius (2018), e.g. that he had a "intellect that couldn't be less than 1 out of a 100,000 or so" (Q)

"You find me a state or society that threw off theocracy and threw off religion and said we adopt the teachings of Lucretius and Democritus and Galileo and Spinoza and Darwin and Russell and Jefferson and Thomas Paine, and we make those **what we teach our children**. We make that scientific and rational humanism our teaching. You find me that state, that did that, and fell into tyranny, and slavery, and famine, and torture, and then we'll be on a level playing field."

— Christopher Hitchens (2008), "Debate with Peter Hitchens on Iraq War and Religion" (Q), Grand Valley State University, Apr 3

IQ estimates: 130-145 (Yaqub Alizada, 2017) (Q), 137 (Eusebius Clay, 2017) (Q), 160 (Alan Hoffman, 2016) (Q); first-slated: 170|#296 (Jan 2018); down-slated: 165|#435 (Feb 2018); up-slated to 170|#321 (Nov 2018) per this "top 10 Hitchens" (Q) video and his #5 ranking on the 193 person voted "Greatest Atheist of All Time" (Q) rankings.

(Cattell 1000:57) (RGM:79|1,260+) (Murray 4000:4|WL) Roman poet;

"Happy is he who is able to know the causes of things."

170 | 341

Virgil (70BC-19BC) ↑

— Virgil (29BC), *Georgics*; cited by Julien la Mettrie (1750) in "The System of Epicurus"

first-slating: 170|#310 (c.2017) interpolated as mix of RGM and Cattell ranking plus the lower end mean IQ [178] of John Milton (IQ:180|#104), Alexander Pope (IQ:180|#104), and Homer (IQ:175|#220), the three authors that Francis Edgeworth (IQ:180|#175) could quote from memory in old age; upgraded from 170|#392 to 170|#321 (Apr 2018).

(Cattell 1000:51) [RGM:51|1,500+] (Gottlieb 1000:59) (Murray 4000:5|WP) (Stokes 100:48|Idealists) (Perry 80:3|Art) (GPhE:#) [CR:79] German natural philosopher;

170 | 342

Georg Hegel (1770-1831) ↑

IQ_C=165

"Philosophy, if one still wants to call it that, has had to sink lower and lower, until it finally reached the lowest level of abasement in the ministerial creature **Hegel**, who in order to smother again the 'freedom of thought', which Kant had struggled for and won, made of 'philosophy', the daughter of reason and the future mother of truth, a tool of state aims, obscurantism, and Protestant Jesuitism. In order to cover up the disgrace and at the same time to bring about the greatest possible stupefaction of minds, he drew over it a cloak of the emptiest word rubbish and silliest gallimathias that have ever been heard outside the insane asylum."

— Arthur Schopenhauer (1839), *Essay on the Freedom of the Will* (pgs. 85-86)

semi-classified a "modern Aristotle" (Ladlier, 2000) (Q), specifically in "young Marx's eyes" (McBride, 1977) (Q).

170 | 343

Johann Fichte (1762-1814)

IQ_C=165

(Cattell 1000:150) [RGM:187|1,350+] (Murray 4000:20|WP) (CR:13) was a German philosopher; noted for the development of some type of non-romantic idealism; was part of Goethe's circle.

170 — 344

Lope de Vega (1562-1635)

IQ_C=175

(Cattell

170 | 344

Henry Cavendish (1731-1810)

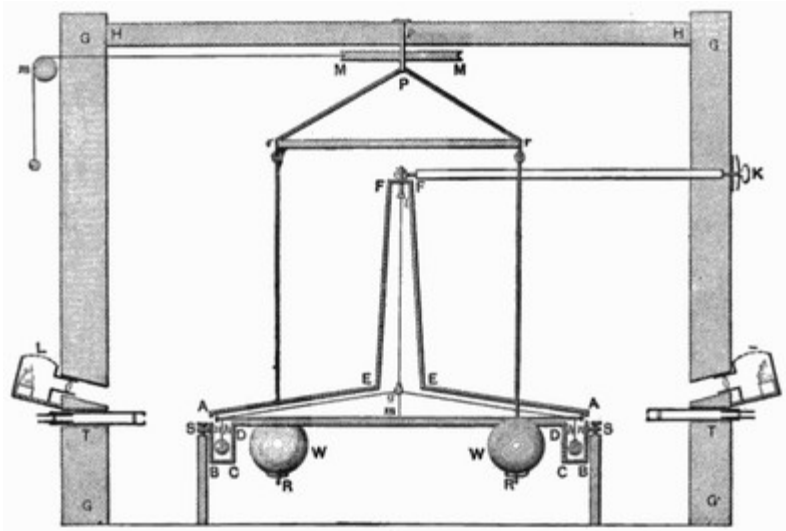

1000:N/A) [RGM:514|1,500+] (Murray 4000:6|P) (GCE:9) English experimental physicist, theoretical chemist, and natural philosopher; noted for his 1766 discovery of hydrogen; for his 1798 determination, via experiment (adjacent photo), of Newton's gravitational constant; Was the first to determine the electrical conductivity of salt solutions; rejected the material theory of heat; experimentally proved the inverse square law; did work on latent heat and specific heat; first-slating: 170|#335 (Feb 2019).

345 | 170

Raphael (1483-1520)

IQ_{CB}=**170**
IQ_{C}=170
IQ_{B}=170

(Cattell 1000:22) [RGM:60|1,320+] (Murray 4000:3|WA) Italian painter and architect; best known for *The School of Athens* (1511).

346 | 170

Posidonius (185-109BC)

(Cattell 1000:N/A) [RGM:N/A|1,300+] a scholar of "almost Aristotelian stature" (Walsh, 1998), characterized the "greatest polymath of antiquity" (Dodds, 1973) (Q); taught Cicero Stoicism; built orrery; calculated distance to sun to be 39M miles (actual: 93M miles); first draft gauging at 170|#275 (Dec 2017).

347 | 170

Georg Stahl (1659-1734)

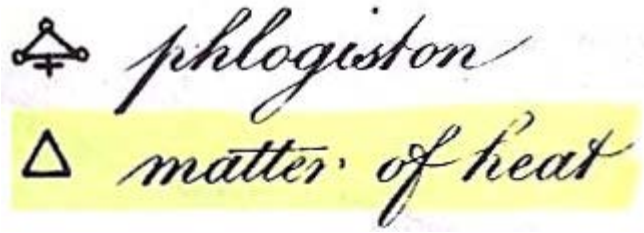

German chemist and physician; a "great genius" (Mettrie, 1745), noted for his 1703 phlogiston theory of heat, wherein he viewed heat as being comprised of small particles with mass which he termed as "phlogiston"; and for his 1708 discussions of soul and movement.

170 | 348

William James (1842-1910)

[RGM:360|1,500+] (Gottlieb 1000:543) (DN:1) (CR:86) American psychologist;

"Ideas, whether for arousing or for stopping belief, may fail to be efficacious, just as a wire at one time alive with electricity, may at another time be dead."
— William James (1907), "Energies of Men"

a "famous American thinker" (1912); theorist behind the reserve energy theory of the mind, a theory famously tested in the raising of William Sidis (aka Will Hunting); a theory which has since come to be known as the 10 percent myth; was an anti-positivist who attempted to do battle with Herbert Spencer (1904) and his social force theory and with Henry Adams (1910) and his second law theory of history; first-slating: 160|#435 (c.2016) → upgraded to: 170|#302 (Feb 2018).

170 | 349

Francois Rabelais (c.1489-1553)

(Cattell 1000:121) [RGM:N/A|1,350+] (Murray 4000:N/A) (FA:42) was French writer, physician, humanist, and Greek scholar, characterized an "aggressive atheist" (Abel Lefranc, c.1890), "ape of Lucian", "Democritus reborn" (du Bellay, c.1550), and or "secular sage" (Hecht, 2004); intellectual teacher of Honore Balzac; first slating at 170|#318 (Feb 2018) per Balzac ranking.

170 | 350

James Hutton (1726-1797)

(Murray 4000|#2ES) Scottish geologist;

"The past history of our globe must be explained by what can be seen to be happening now. No powers are to be employed that are not natural to the globe, no action to be admitted except those of which we know the principle."
— James Hutton (1785), "Theory of the Earth"

noted for 1785 *Theory of the Earth*, wherein he disabused six day creation myth, replacing it with "laws observable in the composition, dissolution and restoration of land upon the globe"; first-slating: 170|#350 (Mar 2020).

170 | 350

Howard Hughes (1905-1976)

[RGM:1,221|1,320+] American entrepreneur; see: why is this site here; genius and diet; "There is no doubt he was **a genius**, he helped design numerous aircraft, created and directed a number of films, and even made a prototype hospital bed that was the basis of those used today" (Q); first-slating: 160-180 (c.2015).

170 | 351

Julius Caesar (I00-44BC)

IQ_B=170

(Cattell 1000:8) [RGM:131|1,320+] (Murray 4000:N/A) Roman general, statesman, Latin prose author; noted for his critical role in the events that led to the demise of the Roman republic and the rise of the Roman empire; Nietzsche uberman (IQ:186+).

170 | 352

Wolfgang Mozart (1756-1791)

IQ_{CB}=**163**
IQ_C=165
IQ_B=160

(Cattell 1000:N/A) [RGM:8|1,310+] (Murray 4000:2|WM) (MG:3) (RBCC:3|275+) Austrian classical era composer;

"Love, love, love, that is the soul of genius."

— Wolfgang Mozart (c.1780), response when queried (Q) how to become a genius at something

Upgrade from 165|#406 to 170|#320 (Feb 2018).

170 | 353

Lev Landau (1908-1968)

(CR:25) Russian physicist noted, in thermodynamics, for his low-temperature work and for free energy calculation theory; noted, in physics, for his multi-volume *Course of Theoretical Physics* (Q), much of which was composed in his head while in an NKVD prison in 1938-1939, later written with the co-authorship assistance of his student Evgeny Lifśhitz, which some consider to the the "bible of physics" (see: scientific bibles); known popularly for his so-called Landau genius scale, a personal logarithmic ranking of physics geniuses that he kept in his pocket, changing from time to time; first-slating: 170|#340 (Feb 2019).

	Landau genius scale
0	Isaac Newton
0.5	Albert Einstein
1	Paul Dirac Erwin Schrodinger Richard Feynman [11] Niels Bohr Werner Heisenberg Louis de Broglie [11] Satyendra Bose Eugene Wigner, and a few others
1.5	**Lev Landau** (in later years) [8] Hans Bethe (2016) [12]
2	**Lev Landau** (after 1962 Nobel Prize) Juan Maldacena (2008) [9]
2.5	**Lev Landau** (before 1962 Nobel Prize)
3	Edward Witten (2008) [9]
3.5	
4	
4.5	David Mermin (own estimate ±)
5	Mundane or "pathologists"

170 | 354

Julien la Mettrie (1709-1751)

(Cattell 1000:N/A) [RGM:N/A|1,320+] (Murray 4000:N/A) (CR:28) (FA:75) (**GA**:11) French physician, materialist philosopher, and extreme atheist;

"Man is a machine and in the whole universe there is but a single substance, matter, variously modified."

— Julien la Mettrie (c.1747) (Q)

noted for his 1745 *The Natural History of the Soul*, in which he argued for a mechanist materialistic position, according to which there was no need of the soul to animate matter, that life was a property of matter, not something breathed into; for his *The Human Machine* (1747), wherein he differentiated between "**little geniuses**", e.g. those who study parts of nature, e.g. insects or bones of fish, and "**great geniuses**", like Newton and Descartes, who study nature as a whole; Frederick the Great considered him to be a genius; first slating: 180|#167 (Jan 2018); downgraded ↓ to 170|#320 (Apr 2018) after reading his *Man: a Machine* (1747) and *Treatise on the Soul* (1745), per reason that his "extreme atheism" stature was more hype than reality, say as compared to a genuine genius like

Holbach.

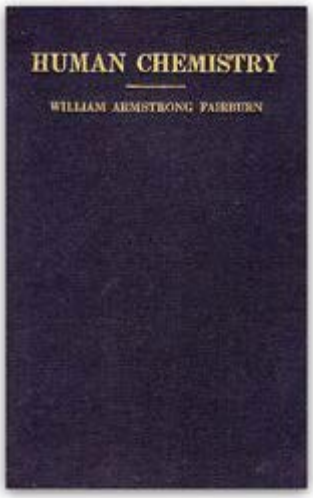

(HCP:24) (SN:22) (CR:60) English-born American naval architect, marine engineer, chemical engineer, and industrial executive;

"As each chemical element is an entity, differing and distinct (see: individuality problem) from any other, so is each human element and entity and a personality, which, when guided by a human chemist to do work and perform his peculiar function in life, feels and acquires what no inert substance can ever acquire, namely **moral stimulus of responsibility**. No chemical element is in a state of harmony unless it is in contact with other elements or influences which do not antagonize or irritate, and no human chemical or worker can ever by truly happy in his work unless he is fitted by nature for the work which he is performing, and unless his general temperament are in harmony with his specific duties and environment."

— William Fairburn (1914), *Human Chemistry* (pgs. 21-22)

355 | 170

William Fairburn (1876-1947)

His 1914 *Human Chemistry*, based on his experience as chemist and president of Diamond Match Company, is the first ever book on the science of human chemistry, wherein he discusses forward thinking concepts such as human catalyst and human entropy; first-slating: 170|#341 (Jan 2019).

356 | 170

Carl Sagan (1934-1996)

IQ_O=130-175

(RGM:123 |1,230+) [FA:125]; an "I am" atomic theorist (like Wilhelm Ostwald); Isaac Asimov (IQ:170±|#231) (RGM:133|1230+), a self-defined know-it-all, stated that Marvin Minsky, an IQ:200+ missing candidate (Q), and Sagan were two people he conceded were smarter than he was; IQ estimates at 130-175 (Q); a frequent (Q)(Q) unanswered Quora query.

357 | 170

Eudoxus (c.390-337BC)

(Cattell 1000:N/A) [RGM:N/A|1,320+] (Murray 4000:N/A) [Allen 100:52] Greek mathematician, astrophysicist, and philosopher; studied under Plato; some say he was teacher to Aristotle; supposedly discovered the leap year and invented an early form of calculus; some rank him second to rank him second only to Archimedes in antiquity genius stature; 1st slating: #295 (Jan 2018).

358 | 170

Isaac Asimov (1920-1992)

IQ_O=215
IQ_O=180
IQ_O=160
IQ_O=165-175

(RGMM:133|1230+); stated, in "Thinking About Thinking" (Q), that he scored IQ of 160 on some test; he was in Mensa (140+) on and off; other IQ estimates at 165 (Q) to 175 (Q); upgrade ↑ for his Hari Seldon character conceived "psychohistory" and for his atheism-advocation; Sigma Society IQ: 180 (Q); IQ ranked, by AI zealot (2016), at 215 (Q).

| 170

Oswald Spengler (1880-1936)

IQ_{EM}=170

(RGM:245|1,500+) (GHE:5) (CR:15) German philosopher and historian; noted for his two-volume *The Decline of the West* (1922), wherein he outlines a Goethean-Nietzschean view of rise and falls of

359

civilization.

170 | 360 Thomas Aquinas (1225-1274) IQ_B=165 ↑↑

(Cattell 1000:384) [RGM:110|1,500+] (Murray 4000:6|WP) (Gottlieb 1000:8) (GPhE:#) (CR:54) Italian theological philosopher;

[RGM:333|1,500+] (Scott 50:9) (HCR:22) (CR:34) French sociologist;

"This obligation is the proof that these ways of acting and thinking are not the work of the individual but come from a moral power above him, that which the mystic calls 'god' but which can be more scientifically explained."

> — Emile Durkheim (1898), "Individual and Collective Representations"; in *Sociology et Philosophie* (1924) (pgs. 32-35); cited by Jennifer Hecht (2003) in *Doubt* (pg. 411)

170 | 361 Emile Durkheim (1858-1917)

"Religious forces spread out and diffuse with extreme facility in the same way in which heat or electricity which a body has received from some external source may be transmitted to the surrounding medium."

> — Emile Durkheim (1912), *The Elementary Forms of Religious Life* (pg. 322)

First-slating: 170|#325 per Scott 50 and RGM (Mar 2018).

170 | 362 Plotinus (207-270) ↑

(Cattell 1000:773) [RGM:500|1,500+] (Stokes 100:18) (Murray 4000:19|WP) (GPhE:#) (CR:27) Greek-Egyptian born Italian anti-atomicist philosopher, characterized a "non-Christian" (Copleston, 1948), founder of the neoplatonic school, noted for his circa 265 collected works set *Enneads*, wherein he attempts to grapple with phenomena such as "passions" and concepts such as "soul" in terms of atomic theory, something rarely seen in modern time; first-slating: 165|#350 (Jan 2018); upgrade to 170|#325 (Feb 2018).

170 | 363 Anthony Shaftesbury, 3rd Earl (1671-1713)

English philosopher and politician; grandson of Anthony Shaftesbury, 1st Earl (1621-1683) (Cattell 1000:365) (IQc:165); educated by John Locke; noted for his philosophies on virtue, merit, and universal morality; influential to John Toland, Denis Diderot, and Benjamin Franklin; added in per formerly confused confluence of 1st Earl Cox IQ calculation and

Cattell 1000 ranking + 3rd Earl moral philosophy genius influence sphere name dominance (c.2018)

170 | 364	Lao-Tzu [**not real**?] (c.625-575BC)	IQ_B=173	(Cattell 1000:552) Supposed author of *Tao Te Ching*, the book that founded of Taoism ("Daoism"); possibly not a real person, but rather a synthesis of mythologies and legends, similar to the way Jesus is a re-write of Osiris mythology (Ra theology).
170 | 365	Origen (185-254AD)		(Cattell 1000:145) [RGM:N/A|1,240+] (RMS:9) Alexandrian-born heretical theologian, referred to as the "great" (Voltaire, 1764), in comparison to Augustine and St. Clement of Alexandria; one of the first to call out the creation myth of Genesis as nonsense, albeit he kept god as logos model of things; first-slating: 175|#263 (c.2018); down-grade ↓ to 170|#350 per Guericke quote on his angel layered heavens theory (Jan 2019).
170 | 366	Daniel Bernoulli (1700-1782)		[RGM:1309|1,500+] (CR:52) Dutch-born Swiss mathematician, physicist, and physician noted for his 1738 *Hydrodynamica* in which he outlined the basics of the ideal gas law, the precursors for the kinetic theory of gases, and gave the first basic definition of pressure; a missing "top ten" top 1000 candidate (Philoepisteme, 2018) (Q); "all the Bernoullis" (see: Bernoulli genealogy) were guesstimated as top 10 most intelligent people in history (Lynam, 2015) (Q); compare: Jacob Bernoulli (175|#307); first-slating: 170|#350 (Jan 2019).
170 | 367	Alfred Tennyson (1809-1892)	IQ_C=170	(Cattell 1000:133) [RGM:N/A|1,320+] (Murray 4000:N/A) English poet.
170 | 368	Francois Vayer (1588-1672)		(Cattell 1000:N/A) [RGM:N/A|1,360+] French writer, skeptic, and anti-religious philosopher, characterized as the "one of the leading exponents of French Pyrrhonism" (Q) (see: Pyrrho), tutor of Louis XIV, a close friend of Moliere, whose plays were based on Vayer's erudite and savage (if carefully hidden) criticism of religious hypocrisy, inheritor of the Michel Montaigne personal library, the popularizer of Sextus Empiricus; developed a philosophy of skepticism more radical than that of Montaigne but less absolute than that of Pierre Bayle; influential to Julien la Mettrie and Baron d'Holbach; first-slating: 170|#330 (Apr 2018).
170 | 369	Subrahmanyan Chandrasekhar (1910-1995)		Pioneered (1939) the application of the first law and second law to black holes.
170 | 370	Elizabeth I (1533-1603) ↓	IQ_B=180	(Cattell 1000:116) [RGM:488|1,500+] Queen of England (reign: 1558 to 1603); educated by renowned scholar, Roger Ascham; as a student, she studied Greek, Latin, rhetoric, and philosophy; she mastered all of these subjects; when she came to power, she transformed the English court into a center for poets, writers, musicians, and scholars; connections to literary figures such as William Shakespeare, Edmund Spenser, and Christopher Marlowe; Brought England into her zenith as a world power; down-grade from 175|#292 to 170|#354 per RGM ranking and via comparison to leaders such as Marcus Aurelius, Alexander the Great, and Frederick the Great (Jan 2019).

170 | 371

Wilder Penfield (1891-1976)

(Cattell 1000:N/A)

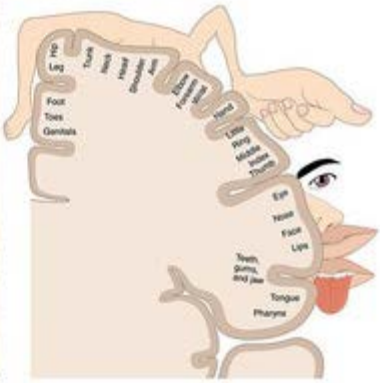

[RGM:N/A|1,350+] (Murray 4000:N/A) American-born Canadian neurosurgeon; invented the technique of prompting memory recall during surgery via temporal lobe stimulation; for his mapping of the functions of various regions of the brain, e.g. cortical homunculus (Q); pioneer of treating epilepsy via surgical removal of certain brain regions; first-slating: 170|#330 (Mar 2018).

170 | 372

Martin Luther (1483-1546)

IQ_C=170
IQ_W=157

(Cattell 1000:39) [RGM:37|1200+] Walberg top ten encyclopedia name (1974) (Q), by word count (#2) and citation rank (#5).

170 | 373

John Quincy Adams (1767–1848)

IQ_C=175

Son of John Adams (2nd president); his grandson was Henry Adams, the leading social Newton, behind Goethe.

170 | 374

John Calvin (1509-1564)

IQ_C=175
IQ_W=165

(Cattell 1000:38) [RGM:446|1,350+] (Murray 4000:N/A) French theologian, pastor, and reformer;

“This doctrine, of predestination, owes its authority among Protestants to the dark though **powerful mind** of Calvin: but in the early Church it was first systematically methodized by Augustin, who appears to have borrowed it from the Manichseans.”

> — Henry Buckle (1861), *History of Civilization, Volume One* (pg. 10)

170 | 375

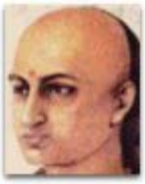

Aryabhata (476-550)

Noted for his work, in Geneva, during the Protestant reformation;

[RGM:345|1,500+] (Odueny 100:61) (GME:#) (GAE:#) (CR:5) Indian mathematician, astronomer, and physicist;

“Just as a person travelling on a boat fees that the trees on the bank are moving, people on the earth feel the sun is moving.

> — Aryabhata (c.520), *Publication* (Q); cited by Kishore Dash (2019) in *The Story of Econophysics* (pg. 2)

employed 62,832/20,000 (= 3.1416) for π; speculated, supposedly, that π (pi) is irrational, as later conjectured by Leonhard Euler, and proved by Johann Lambert (Q); stated that the earth rotates on its axis; classified as a physicist for his explicit mention of the relativity of motion; is said to have been the first to employ a zero symbol

concept, and that his later countryman Brahmagupta was to use a zero symbol and the first to show that subtracting a number from itself results in zero (Q); a “24 smartest person ever” genius (Ratner, 2016) (Q); first-slating: 170|#375 (Apr 2020).

(Cattell 1000:291) [RGM:N/A|1,350+] (Murray 4000:N/A) English child prodigy poet;

“Happy (if mortals can be) is the man; who, not by priest but reason, rules his span: reason, to its possessor a sure guide; reason, a thorn in Revelation’s side.”

— Thomas Chatterton (c.1768), “The Defense” (line 23) (Q)

375 | 170 Thomas Chatterton (1752-1770) IQ_C=180

A “neglected genius” touted as the “second Shakespeare” (Q); committed suicide age 17; down-grade from 180|#192 to 170|#333 (Feb 2018).

(Cattell 1000:621) [RGM:261|1,500+] French writer;

“True love is like ghosts, which everybody talks about and few have seen.”

— Francois Rochefoucauld (c.1865), *Maxims*

376 | 170 Francois Rochefoucauld (1613-1680)

noted for booklet *Maxims*, characterized as a dense collection of sharp one-line philosophies; name-dropped by Nietzsche, frequently; first-slating: 170|#350 (Nov 2018).

377 | 170 John Burroughs (1837-1921)

[RGM:N/A|1,350+] American philosopher and essayist; first-slating: 170|#350 (Oct 2018).

378 | 170 William Pitt (the Elder) (1708-1778) IQ_B=180 IQ_C=155

379 | 170 John Keynes (1883-1946)

(RGM:291|1,500+) (Gottlieb 1000:201) (Stokes 100:68) (GEcE:7) (CR:5) British economist;

“Keynes had a high IQ.”
— Paul Samuelson (c.1940), Publication (Q)

A highest IQ ever candidate (Q); 2020 missing top 100 candidate (Q); first-draft slating: IQ:170 (c.2019).

380 | 170 Sir, William Hamilton, 9th Baronet (1788-1856) IQ_C=170

| 170 Charles Babbage (1791-1871)

[RGM:275|1,300+] (Eells 100:60) designer of the calculating engine; infamous, among scientists, for his ninth Bridgewater treatise,

381

wherein he attempted to reconcile religion + science; IQ first-draft guesstimated at 170± (c.2016).

| 170 382 Nicolaas Hartsoeker (1656-1715)

(Cattell 1000:N/A) [RGM:N/A|1,360+] Dutch mathematician, physicist, and microscope inventor; noted for his 1678 description of sperm, in a letter to Christiaan Huygens, which he postulated was a little human, therein originating the homunculus theory, and for his c.1694 invention of a screw-barrel simple microscope.

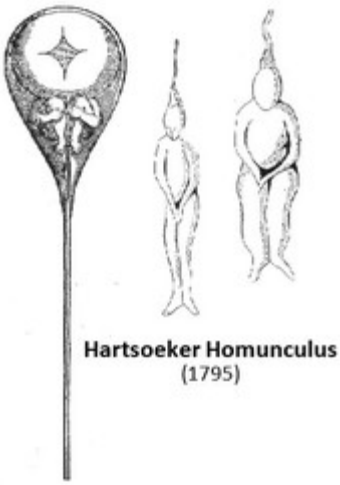

| 170 383 William of Ockham (c.1288-1348) ↑

(Cattell 1000:N/A) [RGM:222|1,330+] (Murray 4000:N/A) English theologian, scholastic philosopher, and physicist; noted, in the history of atomic theory, for being critical of Aristotle; claimed that matter could be reduced down to elementary particles; popularly known for "Occam's razor", a problem solving principle, which states that among competing hypotheses, the one with the fewest assumptions should be selected; first-slating: IQ:170 (c.2017).

| 170 384 Francis Atterbury (1663-1732) IQ_C=170

| 170 385 Qin Shi Huang (259-210BC) ↓ IQ_B=175

| 170 386 Johann Becher (1635-1682)

(Partington 50:43) (CR:18) German physician, chemist, economist, and philosopher;

"Chemists are a strange class of mortals, impelled by an almost insane impulse to seek their pleasure among smoke and vapor, soot and flame, poisons and poverty, yet among all these evils I seem to live so sweetly, that I'd die before I'd change places with the Persian King."

— Johann Becher (c.1675), *Publication*

characterized a "man of original, but irregular, genius" (Ripley, 1861) (Q) also "inventive, erudite, and entirely self-educated" (Cassell, 1893) (Q), noted for his 1669, Paracelsus model advancing,

terra pinguis theory (see: entropy models) of combustion.

170 — 387	Pedro Calderon (1600-1681)	IQ_C=170	
170 — 388	Thomas Chalmers (1780-1847)	IQ_C=170	
170 — 389	Ovid (43BC-c.17AD)		(Cattell 1000:117) [RGM:N/A|1,320+] (Murray 4000:N/A) Roman poetical philosopher; noted for his 8AD *Metamorphoses* (a secular version of Genesis, so to say); studied by William Shakespeare as student (Thos Baynes (Q)); studied and employed by Benedict Spinoza and Goethe; considered Lucretius a "sublime genius"; first slating: 165-185 (c.2016).
170 — 390	Daniel Sennert (1572-1637)		(Cattell 1000:N/A) [RGM:N/A|1,350+] (Murray 4000:N/A) German physician, philosopher, chemist, aka "German Galen" (Mettrie, 1748); noted for work on atomic theory, supposedly promoting some type of "living atom" theory, and for soul theory in respect to spontaneous generation, wherein he rejected views of those including Avicenna, who said that forms come from a celestial and superior intelligence, and Jean Fernel, who supposed that souls are introduced from heaven into matter once the latter is duly prepared; first-slating: 170|#361 (Apr 2018).
170 — 391	Mark Twain (1835-1910)	IQ_O=135-145	[RGM:59|1,245+] [HD:35] (WorldCat100:4); IQ gauged at Answers.com (Q) as 135-145.
170 — 392	Al-Razi (865-925)		(RGM:719|1,500+) (FA:17) (CR:7) Persian physician, chemist, and polymath; "As a result of being long accustomed to their religious denomination, as days passed and it became a habit. Because they were deluded by the beards of the goats, who sit in ranks in their councils, straining their throats in recounting lies, senseless myths, and 'so-and-so told us in the name of so-and-so …" — Zakariya Razi (c.910) generally known for his discovery of alcohol; noted, in atheism, for being one of the first outspoken religion-questioners in the Islamic world; first-gauged: IQ: 150-180 (c.2016).
170 — 393	John Dewey (1859-1952) Library: 1,687 books	IQ_{EM}=170	[RGM:304|1,260+]
			(Cattell 1000:N/A) [RGM:N/A|1,500+] (Murray 4000:19|B) (FA:26) (CR:33) Roman scholar, natural philosopher, military leader, god

skeptic, stoic, and oft-cited first ever encyclopedist;

170 | 394

Pliny the elder (23-79AD)

"The power of nature is what we call god."

> — Pliny the elder (77AD), *Natural History, Volume One* (pg. 25); cited by Jennifer Hecht (2004) in *Doubt* (pg. 154)

noted for his 77AD *Natural History*, a 10-volume compendium of ancient knowledge, wherein he touches on topics such as the soul (see: Pliny on the soul), origin of cremation, etc.; IQ 170 first-draft guesstimate (Mar 2017).

170 | 395

Christian Doppler (1803-1853)

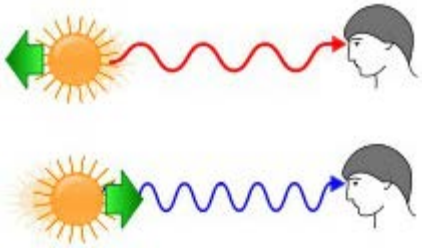

(Cattell 1000:N/A) [RGM:N/A|1,350+] (Murray 4000:N/A) (Kanowitz 50|38) Austrian mathematician and physicist; noted for his 1842 explanation that observed frequency of a wave, e.g. color, depends on the relative speed of the source and the observer, aka "Doppler effect", e.g. red shift or blue shift, which he used to explain the color of binary stars; first slating: 170|#350 (Mar 2018).

170 | 396

Diogenes (c.408-323BC) ↑

(Cattell 1000:N/A) [RGM:386|1,330+] (Perry 80:2|Li) Greek cynic philosopher; teacher of Crates, who was teacher to Zeno of Citium (IQ:170|#286); first-slating: 170|#350 (Mar 2018).

170 | 397

Georges Cuvier (1769-1832) ↓ IQ_C=175

(Cattell:98) [RGM:693|1,500+] (Murray 4000:4|B) (EvT:11|21+) (CR:13) French theism naturalist; known as a brilliant champion of the machine metaphor (upgrade ↑), who following Rene Descartes' view, believed that all species were like animated gears in a great machine—that were fixed and forever unchanging; he, supposedly, is said to have been able to recall in detail the contents all twenty-thousand volumes in his library; downgrade ↓↓ for his Bible-defending "fixed species" created by god, after each new flood (see: Noah's flood) theory of the origin of species.

170 | 398

Pyrrho (c.360-270BC)

(Cattell 1000:N/A) [RGM:N/A|1,350+] (Murray 4000:N/A) Greek skeptic philosopher and "free thinker" (Owen, 1829) (Q); studied the writings of Democritus, became a disciple of Bryson, the son of Stilpo, and later a disciple of Anaxarchus; Epicurus, supposedly, admired (Q) him; first-slating: 170|#350 (Mar 2018).

(Cattell 1000:185)

170

Richard Bentley (1662-1742) IQ_C=170

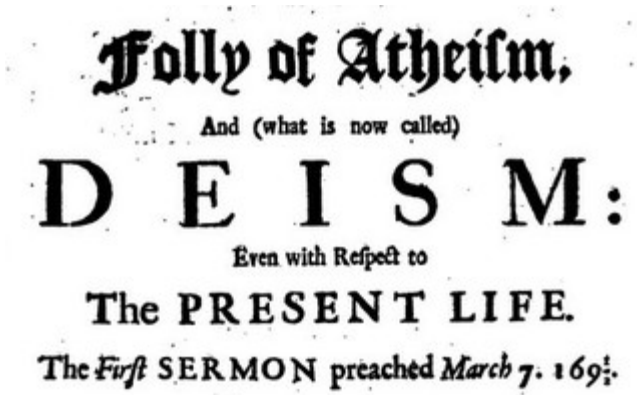
Folly of Atheism,
And (what is now called)
DEISM:
Even with Respect to
The PRESENT LIFE.
The First SERMON preached March 7. 169½.

— 399

[RGM:N/A|1,350+] (Murray 4000:N/A) English classical scholar, critic, and theologian;

"Those who shall be disposed to see the abuse which theological spleen knows how to scatter upon atheists, have only to read a work of Doctor Bentley, entitled, *The Folly of Atheism* (1693) (Q)(Arc)."

— Baron d'Holbach (1770), *The System of Nature* (pg. 303)

— 170 — 400

Galen (130-210AD)

(Cattell 1000:443) [RGM:291|1,310+] (Murray 4000:4|Med); Greek physician, surgeon, and philosopher; general curator of the innate heat model of heart function (later discarded by da Vinci); added at #320 (Jan 2017).

(add)

Next | Previous

- Top 1000 geniuses: 1-100 | IQ: 225-180
- Top 1000 geniuses: 101-200 | IQ: 180-180
- Top 1000 geniuses: 201-300 | IQ: 180-175
- **Top 1000 geniuses: 301-400** | IQ: 175-170
- Top 1000 geniuses: 401-500 | IQ: 170-165
- Top 1000 geniuses: 501-600 | IQ: 165-160
- Top 1000 geniuses: 601-700 | IQ: 160-150
- Top 1000 geniuses: 701-800 | IQ: 150-140
- Top 1000 geniuses: 801-900
- Top 1000 geniuses: 901-1000
- Top 1000 geniuses (candidates)

Notes

N1. Note: see "IQ key" page for IQ subscript symbol meaning.

θΔics

In genius rankings, **top 1000 geniuses** refers to the greatest five-hundred geniuses of all time ranked by IQ or "relative brightness or intellect" (Cox, 1926); below are the fifth tier greatest geniuses of all time, numbers 401 to 500.

Geniuses | 401-500

The following are the geniuses "401 to 500" of the top 1000 geniuses (previous: 1-100, 101-200, 201-300, 301-400, next: **501-600**, 601-700, 702-800, 801-900, 901-1000): [N1]

	Geniuses 401 to 500		
401	John Ray (1627-1705)		(Cattell 1000:867) [RGM:N/A|1,310+] (Murray 4000:15|B) English parson, naturalist, botanist, and zoologist; "Good words cool more than cold water." noted for his proverb commentary on beauty, money, and power; e.g. supposed coiner of the phrase "beauty is power"; for his commentary on the fortuitous concourse of atoms model formation of things; and for his classification scheme for grouping species, later referenced by Carl Linnaeus in his more famous Linnaean classification; characterized a "forgotten genius" (Ñº); first-slated at 170|#350 (Feb 2018).
402	Benjamin Constant (1767-1830)	IQ_C=170	
403	Felix Klein (1849-1925)		(GME:15) German mathematician; "You will see it written that Hadamard was the last of the universal mathematicians (see: last person to know everything) —the last, that is, to encompass the whole of the subject, before it became so large that this was impossible. However, you will also see this said of Hilbert, Poincare, **Klein**, and perhaps of one or two other mathematicians of the period. I don't know to whom the title most properly belongs, though I suspect the answer is actually Gauss." — John Derbyshire (2003), *Prime Obsession: Bernhard Riemann and the Greatest Unsolved Problem in Mathematics*
404	Christian Thomasius (1655-1728)		Noted for: (add); first-slating: 170|#386 based on GME rankings and LUM status (Jan 2019). (Cattell 1000:N/A) [RGM:263|1,360+] German philosopher and jurist; in his *The Foundation of the Law of Nature and Nations* (1705), he opposed Aristotelianism, Lutheranism, the divine right of Kings and Roman Law, instead promoting a non-theological, natural foundation for ethics in the style of Hugo Grotius and Samuel Pufendorf (1632-1694), a Hobbes + Grotius synthesizer; he also derived some type of "special physics" utilizing a numerical scaled "calculus of passions"; first-slating: 170|#355 (Apr 2018).
170	Washington Irving	IQ_C	

— 405	(1783-1859)	=170	
— 170 — 406	August Kotzebue (1761-1819)	IQ_C=170	Some of his books were burned.
— 170 — 407	Ludwig Feuerbach (1804-1872) ↓	IQ_{EM}=180	(Cattell 1000:948) [RGM:227|1,330+] (FA:101) (GA:8) (CR:14) German philosopher and anthropologist; “Whenever morality is based on theology, whenever the right is made dependent on divine authority, the most immoral, unjust, infamous things can be justified and established. Morality is then surrendered to the groundless arbitrariness of religion.” — Ludwig Feuerbach (c.1860) influenced Karl Marx and Friedrich Engels and in turn Russian atheism, initiated by Vladimir Lenin; downgrade ↓ from 180|#140 to 170|#376 after reading his *Essence of Christianity* (1841) wherein he gives a long-winded bloated statement to the effect that "theology is anthropology" (Jun 2018).
— 170 — 408	Henry Longfellow (1807-1882)	IQ_C=170	
— 170 — 409	Jean-Paul Marat (1743-1793)	IQ_C=170	(Cattell 1000:422) [RGM:N/A|1,360+] (Murray 4000:N/A) French politial theorist, physician, and scientist; did 166 experiments on fire and 214 on electricity; was associated with Goethe and Benjamin Franklin.
— 170 — 410	Cornelis Drebbel (1572-1634)		(Cattell 1000:N/A) 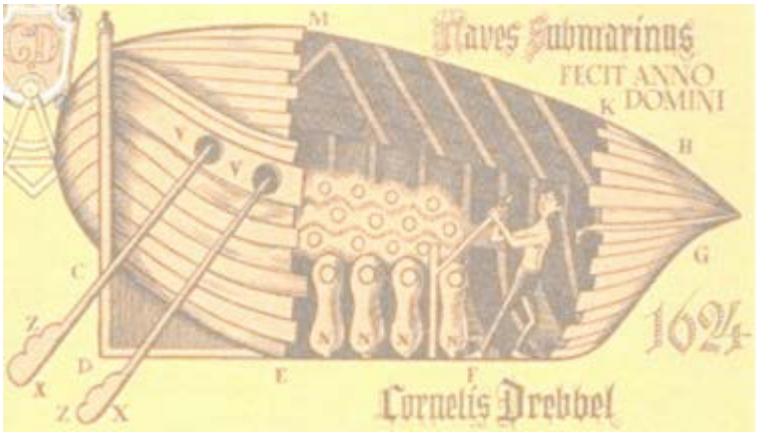 [RGM:N/A|1,500+] (Murray 4000:N/A) (CR:2) Dutch engineer, inventor, and chemist, a characterized "neglected genius" (Harris, 1959); noted for invention of microscope, submarine, and use of oxygen made by heating saltpeter for breathing underwater; first-slating: 170|#410 (Oct 2019).
170	John Napier (1550-1617)	IQ_C=170	(Cattell 1000:172) (Eells 100:18) British landowner, mathematician, physicist, and astronomer; generally know as the “inventor of the

— 411

logarithms", which he described in his *A Description of Logarithm Tables* (1614).

— 170 — 412

Pietro Metastasio (1698-1782)

IQ_C=170

(Cattell 1000:419) Italian poet, librettist, and opera composer.

— 170 — 413

Novalis (1772-1801)

(Cattell 1000:N/A) [RGM:N/A|1,360+] (Murray 4000:N/A) (Re:29) German prose writer, poet, mystic, philosopher, civil engineer, and mineralogist;

"There are men of great genius who have shown no special talent in any marked degree; for instance, men like **Novalis** or Jean Paul."

— Otto Weininger (1903), *Sex and Character* (pg. 103)

First-slating: 170|#360 (Mar 2018).

— 170 — 414

William Penn (1644-1718)

IQ_C=170

(Cattell 1000:26) English-born American real estate entrepreneur, philosopher, minister, and lawyer; quote: "right is right even if everyone is against it; and wrong is wrong even if everyone is for it."

(EP:15)
(CR:3)
Flemish

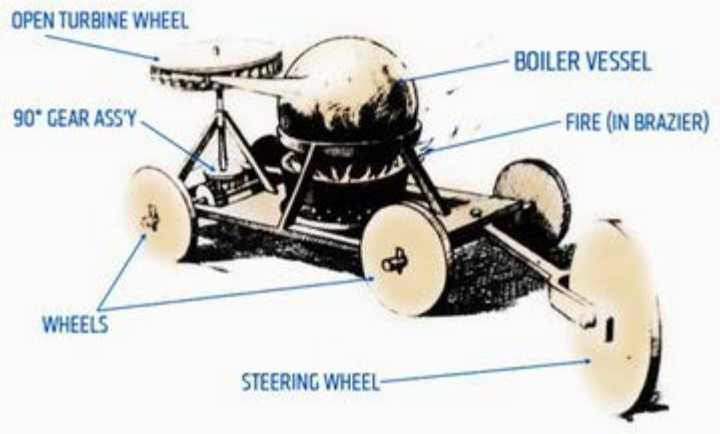

— 170 — 415

Ferdinand Verbiest (1623-1688)

mathematician, astronomer, engineer, theologian, and translator, characterized a "veritable universal genius" (Delumeau, 1977);

"The [cart] moved in a circle with a motion and not slow for an hour or more, for as long a time, be it understood, as the steam continued to be forcefully expelled from the aeolipile."

— Ferdinand Verbiest (1687), *Astronomica Europaea* (§: Pneumatics, pg. 88)

noted for his c.1670 Verbiest engine, a small two-foot sized aeolipile-powered wagon, the world's first working automobile; not be succeeded (Ñº) until Denis Papin's c.1698 piston and cylinder based steam-powered cart; first-slating: 170|#405 (Nov 2019).

170 — 416	Jean Racine (1639-1699)	IQ_C=170	(Cattell 1000:74) French tragedian dramatist playwright.
170 — 417	Pierre Charron (1541-1603)		(Cattell 1000:N/A) [RGM:N/A|1,500+] (FA:58) (CR:9) French lawyer, turned theologian-monk, turned free thinking philosopher, oft-characterized as the "adopted son" of Michel Montaigne; noted for his 1601 *Treatise on Wisdom*, wherein, for the "first time", according to Buckle (1865), an attempt is made in a modern language to construct a system of morals without the aid of theology; first slating: 170|#405 (Aug 2019) gauged as 10 IQ points below Montaigne.
170 — 418	Ernest Renan (1823-1892)	IQ_C=170	(Cattell 1000:455) (RMS:51) French Semitic languages scholar; noted for his work on Averroes (1852) and his *Life of Jesus* (1864) which showed that the Bible was written over a long period of time.
170 — 419	Herman Hollerith (1860-1929)		Adapted or extrapolated on his brother-in-law's Jacquard loom (invented in 1801 by Joseph Jacquard) — a new automated loom that used a control mechanism consisting of a sheet of paper with a pattern of holes, according to which when sprung wire hooks were pressed against the paper, a hook would go through where there was a required thread, thus making complex weaving automated — to make punch card based consensus data tabulating machine (computer prototype), replacing the hooks with electrified wires, that triggered the clock hand of a counter on the other side; He first got his idea for the punch-card tabulation machine from watching a train conductor punch tickets. (Ñº) Hollerith described this in his 1889 Columbia University PhD dissertation "An Electric Tabulating System", according to which the device would "count or tally statistical items separately or in combination by means of mechanical counters operated by electro-magnets the circuits through which are controlled by the perforated sheets"; in 1896 he founded the Tabulating Machine Company, which in 1911 merged with three other companies to form International Business Machine Corporation (IBM); first draft gauged at #285 of top 500 geniuses (May 2017).
170	Ernest Hemingway		(RGM:300|1,310+) [GLAE]: quote: "The world breaks everyone and afterwards many are stronger at the broken places"; added: c.170|#350

420	(1899-1961)		(c.2017).
421 — 170	Johann Reuchlin (1455-1522)		(Cattell 1000:377) [RGM:262|1,310+] German-born humanist and Greek and Hebrew scholar.
422 — 170	Maximilien Robespierre (1758-1794)	IQ_C=170	(Cattell 1000:48) French lawyer, politician, and revolutionist.
423 — 170	William Yeats (1865-1939)		[RGM:368|1,500+] (GLE:16) Irish poet; Andrew Robinson (2010) "missing Cox 300" genius (Ñº).
424 — 170	David Strauss (1808-1874)	IQ_C=170	
425 — 170	Epictetus (55-135AD)		(Cattell 1000:856) [RGM:411|1,320+] (Murray 4000:N/A) Greek stoicism philosopher; ranked by Thomas Jefferson as on par with Epicurus; he tends to be read alongside Marcus Aurelius; first slating: 170|#350 (Feb 2017).
426 — 170	John Tyndall (1820-1893)		(Cattell 1000:N/A) [RGM:N/A|1,320+] (FA:138) (CR:68) Irish physicist; "All religious theories, schemes and systems, which embrace notions of cosmogony, or which otherwise reach into the domain of science, must, in so far as they do this, submit to the control of science, and relinquish all thought of controlling it." — John Tyndall (1874), opening statement, as president, at the Belfast British Association for the Advancement of Science (BAAS) meeting; said to address the growing controversy over the teaching of science at the Catholic University in Ireland notable for having done the first English translations of Clausius and Helmholtz, in the early 1850s, for having seeded the Spencerian dilemma (1858), and for having launched the 1874 Tyndall-Stewart-Tait debate, on the relation between modern hard science and religion, wherein one of the first dead atom theory ridicules resulted; first-gauged at 170|#350 a grade above that of Herbert Spencer (Jan 2018).
— 170	Robert Turgot (1727-1781)	IQ_C=170	(Cattell 1000:293) [RGM:N/A|1,300+] French economist, statesmen, and historian

427			
428 | 170	Norbert Wiener (1894-1964)		[RGM:1329|1,500+] (CR:98) American mathematician; inventor of cybernetics; quote: “I think Wiener had a great brilliance. I’m not putting down his great mind. I think he really did have a **tremendous IQ** and a tremendous grasp of many things” (Shannon, 1982); gauged at: IQ:170± (c.2015)
429 | 170	Edmund Husserl (1859-1938)	IQ_{EM}=170	[RGM:311|1,260+] (Stokes 100:74) (PGT:18) (GPE:#); a top 10 existentialism philosopher; first-draft gauged at #311 (Jun 2017).
430 | 170	Diego Velasquez (1599-1660)	IQ_{C}=170	(Cattell 1000:265) [RGM:N/A|1,300+] Spanish painter.
430 | 170	Jorge Borges (1899-1986)	IQ_{B}=182	[RGM:491|1,500+] (Gottlieb 1000:483) (CR:2) Argentine short-story writer, essayist, poet and translator; “I have always imagined that paradise will be a kind of library.” — Jorge Borges (c.1960), Publication used Georg Cantor’s theory of infinite sets in some (Ñº) of his literary works; despised Marxism; characterized himself as a “Spencerian anarchist”; downgrade ↓ from 180|#208 to 170|#440 per Gottlieb and RGM rankings, and general lack of CR influence (Apr 2020).
431 | 170	Pierre Vergniaud (1753-1793)	IQ_{C}=170	(Cattell 1000:429) [RGM:N/A|1,300+] French lawyer, statesman, and revolutionist.
431 | 170	Maimonides (1135-1204)		(Cattell 1000:N/A) [RGM:398|1,320+] (Murray 4000:N/A); Spanish-born Moroccan physician-philosopher and theologian; a top middle ages genius; noted for his *circa* 1190 *The Guide of the Perplexed*, wherein he states that we should ignore accident-based atomic theory because it denies the existence of god; first-draft slating: 170|#350 (Jan 2018).
| 170	Ilya Prigogine (1917-2003)		[CR:411] Russian-born Belgian chemist and

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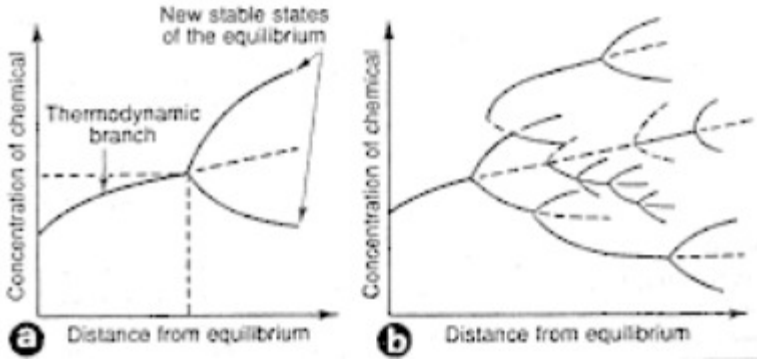

thermodynamicist ; known for is far-from-equilibrium thermodynamics theory of "dissipative structures" formed past the bifurcation point convinced many people in the late 20th century that they are such things; takes some time (in years) to pick through the difficulties of his theory, e.g. that it a religious Trojan horse in underpinnings; first; slating: IQ:170|#301 (c.2017)

434 | 170 Kurt Godel (1906-1978) ↑↓↑ Library: 700 books IQ_O=180

[RGM:268|1,320+] (Stokes 100:95) (CR:21) Austrian-born logician, mathematician and philosopher; Pickover top 14 “most influential” GME; some think his “incompleteness theorem” ranks him up with Aristotle (video: “The World’s Most Incredible Mind”, 2011), which seems a bit overzealous; downgrade for giving an ontological proof for the existence of god (see: Godel’s ontological proof); quote: "whoever became more intelligent by reading Voltaire?" (link), downgrade # two; was a Leibniz proselyte; was a transmigrationist, supposedly (Ñº); known for his 1931 Godel’s demon (see: scientific demon); his incompleteness theorem was used in John Boyd's successful war thermodynamics invasion design of the first Gulf War (1990-1991); see also: *A World Without Time: the Forgotten Legacy of Godel and Einstein* (2005); 8+ thread posts on him; Quora discussed (Ñº) as potential “smartest person ever”; Quora IQ guestimated (Ñº) at 180, akin to John Neuman and William Sidis range; an "overrated genius" for some reason (probably per his ontic openings and or god talk).

435 | 170 Abu al-Suli (854-946) ↓ IQ_B=175

(Cattell 1000:N/A) [RGM:N/A|1,500+] Arab poet, scholar, and chess player; non-notability downgrade 175|#298 to 170|#358 (Feb 2018).

436 | 170 Marion Tinsley (1927-1995) ↓ IQ_B=182

Mathematician; considered to be “greatest checkers player ever”; spent approximately 10,000 hours studying checkers while in graduate school; worked as lay preacher (↓) in the Disciples of Christ Church; non-notability downgrade 175|#294 to 170|#359 (Feb 2018).

437 | 170 Friedrich Wolf (1759-1824) ↓ IQ_C=175

(Cattell 1000:480) [RGM:N/A|1,330+] (Murray 4000:N/A) German classicist; noted as founder of modern philology; downgrade 175|#286 to 170|#359 (Feb 2018).

438 | 170 Solon (c.638-558BC)

(Cattell 1000:391) [RGM:N/A|1,310+] (Washington 23|#) [RMS:2] Greek statesman, lawmaker, philosopher, and poet, one of the seven sages (Ñº); credited with being the one who brought democracy to Athens; cited as starting the tradition of studying abroad method, by visiting the great college of Heliopolis; first-slating: 170|#403 (Apr 2018).

			[RGM:542|1,500+] (Siegfried 10:1) German mathematical physicist;
439 | 170	Emmy Noether (1882-1935)		"In the judgement of the most competent living mathematicians, Fraulein **Noether** was the most significant creative mathematical genius thus far produced since the higher education of women began." — Albert Einstein (1935), "Letter to New York Times" (Ñº) Noted for her 1918 "Noether's theorem", which showed, based on group theory, that every invariance or symmetry property of a physical law corresponds a conservation principle; developed in her effort to help Einstein and David Hilbert understand how the conservation of energy integrates into a general theory of relativity; Hmolpedia ranked (2011) as top 7 smartest women ever; first slating: 170|#416 (Jan 2019).
440 | 170	Lycurgus (c.840-780BC)		(Cattell 1000:437) [RGM:N/A|1,330+] (Washington 23|#) Greek quasi-legendary lawgiver; credited with establishing or promoted the three Spartan virtues: equality (among citizens), military fitness, and austerity; personified generally by the character Leonidas in the film *300* (2007); first-slating: 170|#404 (Apr 2018).
441 | 170	Ben Jonson (1573-1637) ↓	IQ_C=175	(Cattell 1000:48) [RGM:561|1,330+] (Murray 4000:N/A) English playwright, poet, actor, and literary critic;
442 | 170	Edmund Spenser (1552-1559) ↓	IQ_C=175	(Cattell 1000:262) [RGM:N/A|1,330+] (Murray 4000:N/A) English pre-Shakespearean poet (Ñº); Rolfe Humphries (1954), in his translation of Ovid, uses the terms "Spenserian or Byronic stanzas".
443 | 170	Hugues Lamennais (1782-1854) ↓	IQ_C=175	(Cattell 1000:284) [RGM:N/A|1,330+] (Murray 4000:N/A) French Catholic priest, philosopher and political theorist; 5-point IQ down-grade (Feb 2018).
444 | 170	Robert Southey (1774-1843) ↓	IQ_C=175	(Cattell 1000:520) [RGM:N/A|1,330+] (Murray 4000:N/A) English romantic poet; five-point IQ downgrade (Feb 2016).
			↑ 170+
445 | 165	Francois Quesnay (1694-1774)		(Cattell 1000:N/A) [RGM:N/A|1,360+] (Murray 4000:N/A) French physician and economist; characterized a "clever man" (Mettrie, 1745) the "height of genius" in political economy (Marx, 1860), noted for his 1758 *Economic Table*, which outlined the ideas behind the "physiocrat", from the Greek phýsis, meaning "nature," and kràtos, meaning "power", school of economics, e.g. that the source of economic strength or wealth is "land", which is generally considered to be the first school of economic thinking; influential to Adam Smith; first-slating: 165|#391 (Apr 2018).
	Moliere (1622-1673)		(Cattell 1000:39) [RGM:N/A|1,310+] (Murray 4000:8|WL) (GLAE) French playwright and comedic actor; close friends with Francois

165 | 446

↑ IQ_C=160

Vayer, whose erudite and savage (if carefully hidden) criticism of religious hypocrisy, was rumored to be he basis of many of his plays; said to be ranked with Pierre Corneille (1606-1684) and Racine; upgraded ↑ from 160|#479 to 165|#387 (Feb 2017).

165 | 447

Heinrich Heine (1797-1856) ↓↑↑ IQ_C=165

(Cattell 1000:353) [RGM:376|1,245+] (Murray 4000:N/A) German poet and atheistic philosopher; peculiar commentator on Goethe's *Elective Affinities*; noted for his *Thoughts and Ideas*, which is filled with ripe insights, e.g. "All our modern philosophers, though often perhaps unconsciously, see through the glasses which Spinoza ground."

165 | 448

Jean Bruyere (1645-1696)

(Cattell 1000:562) (RGM:379|1,300+) French philosopher, moralist, and satirist, characterized a "sensible writer" (Meslier, 1727); first-slating: 165|#410 (Apr 2018).

165 | 449

Edward Bulwer (1803-1873) ↑↑ IQ_C=155

(Cattell 1000:247) [RGM:N/A|1,310+] (Murray 4000:N/A) English science fiction writer and philosopher; noted for his 1871 novel *Vril: the Power of the Coming Race*, in which he utilized Michael Faraday's version of the conservation of force; an example of which is as follows [1]

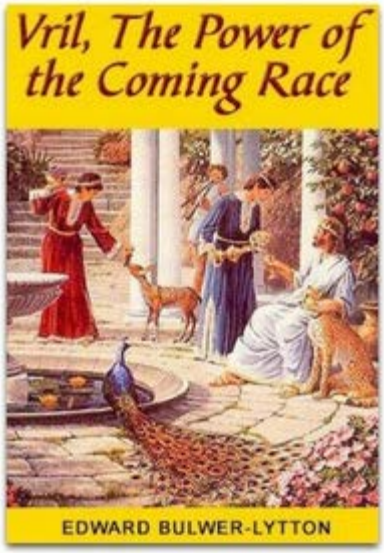

"I have long held an opinion, almost amounting to a conviction, in common, I believe, with many other **lovers of natural knowledge**, that the various forms under which the forces of matter are made manifest have one common origin; or, in other words, are so directly related and mutually dependent, that they are convertible, as it were, into one another, and possess equivalents of power in their action."

to make a story around a subterranean species, called 'Vril-ya', that exist on a hypothetical type of energy called 'vril', according to which both the workings of the machinery in the new society and the government of the new species operate under the same laws of nature, or something along these lines; upgraded from 155|#493 to 165|#360 (Feb 2018).

165 | 450

Thomas Malthus (1766-1834)

(Cattell 1000:869) (Gottlieb 1000:306) (CR:5) English economist and demographer; noted for his 1798 *An Essay on the Principle of Population*, building on some ideas of David Hume, Adam Smith,

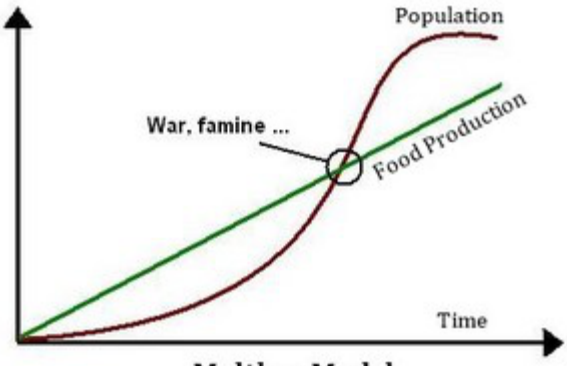

Malthus Model

Wallace [?], and a Dr. Price [?], outlined a general model, thought out mathematically, that, over time, that the "power" population growth, in populations of species, will be "checked" by the "strong law of necessity"; first-slating: IQ:165|#450 (Mar 2020).

165 | 450

Gregor Mendel (1822-1844)

[RGM:41|1,260+] (Glenn 20:10) (Hart 100:52) Austrian physicist and plant experimenter; noted for his 1856 to 1863 breeding experiments on pea plants in attempts to discern rules for parent to offspring trait inheritance; in doing so he initiated the field of genetics.

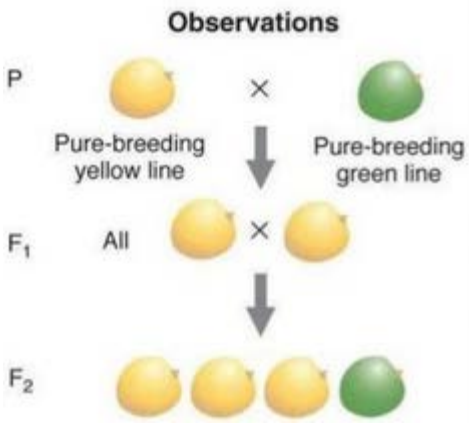

165 | 451

Vitruvius (c.75-15BC)

(Murray 4000:7|T) Roman writer, architect, engineer, civil and military, and philosopher, and influence to Leonardo da Vinci; first-slating: 165|#413 (Jan 2018) based on his variety of knowledge (Ñº), pure and applied.

165 | 452

Martin Heidegger (1889-1976)

[RGM:170|1,500+] (Gottlieb 1000:914) (Perry 80:4|La) (HCR:14) (FA:105) (Stokes 100:71) (Perry 80:28) (GPhE:31) (CR:41) German atheistic existentialist philosopher (Sartre, 1945); influenced deeply by Nietzsche; teacher of Hannah Arendt; noted, predominately, for his 1927 *Being and Time*, in which he suggest that the meaning of our being must be tied up with time, i.e. that we are temporal beings, a logic somehow based on critique of Immanuel Kant and a synthesis of Friedrich Nietzsche; first-slating: 165|#261 (c.2016).

165 | 453

Johann Bach (1685-1750)

IQ_{CB}=**165**
IQ_{C}=165
IQ_{B}=165

[RGM:16|1,310+] (RBCC:1|275+); a great among musical geniuses.

165 | 454

John Hunter (1728-1793)

IQ_{C}=160

(Cattell 1000:141) [RGM:N/A|1,330+] (Murray 4000:19|Med) Scottish physiologist, comparative anatomist; promulgated some type of “great chemist” theory of life; upgrade from 160 to 165|#393 (Mar 2018).

455 | 165

Charles Dickens
(1812-1870)

IQ_{CB}=**165**
IQ_{C}=180
IQ_{B}=150

456 | 165

August Kekule
(1829-1896)

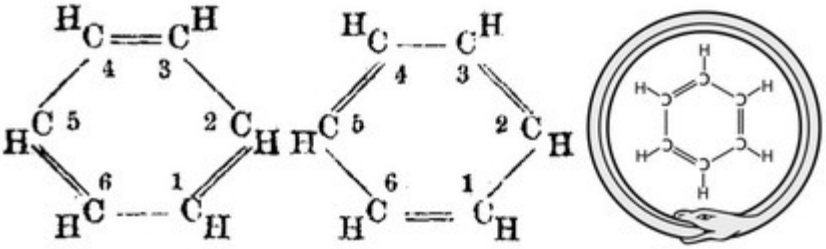

(Cattell 1000:N/A) [RGM:N/A|1,500+] (GCE:8) (Murray 4000:15|C) (Partington 50:6) German chemist, noted as early pioneer of chemical structure theory, per his 1857 models of tetravalent carbon atoms and atoms linking together, to form 3D structures; popularly known for his 1865 benzene ring structure; first-slating: 165|#444 based on his GCE ranking (Sep 2019).

457 | 165

Alan Watts
(1915-1973)

IQ_{O}=125

[RGM:352|1,500+] (Perry greatest thinker:71) English-born American philosopher; IQ ranked (2016) by AI zealot / Christopher Langan fan, at 125 (Ñº); first-draft IQ gauged at 150-170 [?] (c.2015).

458 | 165

Al-Battani
(c.858-929)

(GMG:22) Arab astronomer and mathematician; referred to as the "Ptolemy of the Arabs"; considered the greatest and best known astronomer of the medieval Islamic world; noted for his work in trigonometry; quoted by Copernicus; cited by Guericke (1663) who he refers to as the "follower [or successor] of Ptolemy"; first-slating: 165|#445 as 10 IQ points below Ptolemy (Feb 2009).

459 | 165

Geoffrey Chaucer
(1343-1400)

(Cattell 1000:170) [RGM:296|1,500+] English poet and author; widely considered the greatest English poet of the Middle Ages, he is best known for The Canterbury Tales; in the film *Se7en* (1995), the *Parson's Tale*, the intended final tale of his *The Canterbury Tales*, is an important clue to the methods of a serial killer who chooses his victims based on the seven deadly sins; slotted at #320 based on his RGM position (Jun 2017).

460 | 165

Albert Camus
(1913-1960)

IQ_{O}=155

[RGM:351|1,260+] (Stokes 100:74); IQ cited (Ñº) at 155; upgraded 10 IQ points ↑ (Jun 2017), above previous IQ citation, per reason of start of existentialism article, and calculation of mean IQ of top seven existentialism philosophers.

Jean-Paul

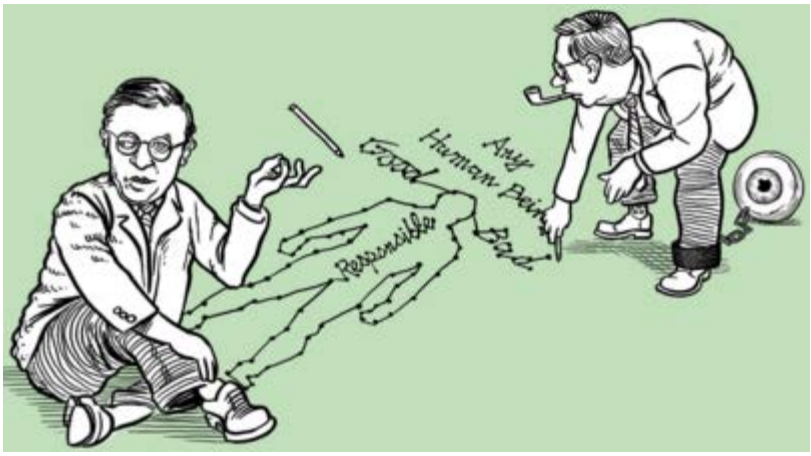

165 | 461

Sartre
(1905-1980) IQ_O=155

[RGM:355|1,500+] (Stokes 100:73) (EPD:F2) (Becker 139:13) (GPhE:#) [CR:54] French atheist existentialist philosopher, predominately noted for his 1943 *Being and Nothingness*, who promoted an anti-deterministic variety, i.e. science not based on causality, of individual "freedom as the foundation of all values" type of existentialism, according to the logic of "existence precedes essence", meaning that man first materializes into the world, encounters himself, and only afterwards defines himself; IQ cited (Ñº) at 155; upgraded 10 IQ points ↑ per start of existentialism article, and calculation of mean IQ of top seven existentialism philosophers (Jun 2017)

165 | 462

Guglielmo
Marconi
(1874-1937) IQ_B=165

(Cattell 1000:N/A) [RGM:106|1,360+] (Murray 4000:6|T) Italian electrical engineer and inventor; in 1895, at the age of 20, building on the work of James Maxwell, Heinrich Hertz, Augusto Righi, and Oliver Lodge, he began laboratory experiments at his father's country estate, where he succeeded in sending wireless radio-wave signals over a distance of one and a half miles (see: device photo); in 1897, he founded the Marconi company, a wireless telegraphy commercial business; he later was a competitor with Nikola Tesla for the patent for radio technology.

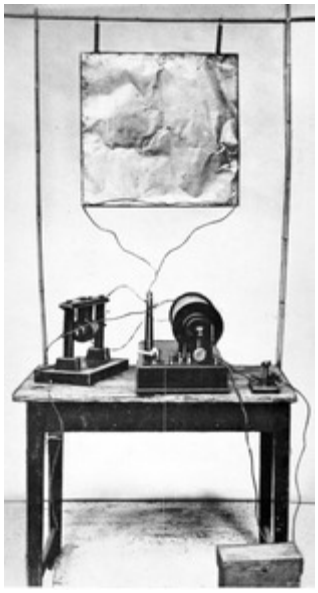

165 | 463

Robert
Grosseteste
(1170-1253)

[RGM:764|1,500+] (MAG:23) (CR:4) English scholastic philosopher, statesman, and theologian, generally noted as an early formulator of the scientific method, particularly in respect to controlled experiment; influenced: Roger Bacon, Bonaventure, and Johannes Kepler; first slating: 165|#450 (Aug 2019).

(Cattell 1000:N/A) [RGM:N/A|1,500+] Greek philosopher, student of Anaximander, mentor to Hippo, noted for his air as "arche" or first principle theory of things, out of which fire, via

464 | 165

Anaximenes
(585-528BC)

rarefaction, and water and earth, via condensation, arise:

"Several scholars have declared that there are many, perhaps even innumerable worlds, including: Aristarchus, **Anaximenes**, Xenophanes, Democritus, Epicurus, Metrodorus, Leucippus, and Diogenes."

> — Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space*

First-slating: 165|#440 (Jan 2019).

(Cattell 1000:49)

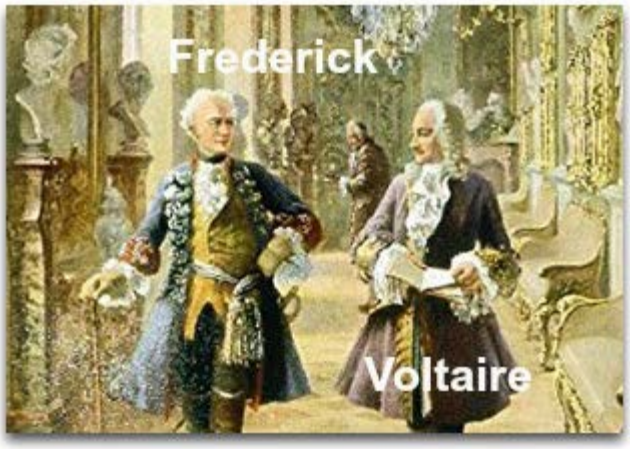

465 | 165

Frederick the Great
(1712-1786)

[RGM:N/A|1,320+] (Murray 4000:N/A) Prussian king, from 1740 to 1786, and philosopher noted for being the host to Voltaire, when he was banished from France, for appointing, per suggestion of Pierre Maupertuis, Julien la Mettrie as his court physician, who was posthumously referred to as the "court atheist" (or "royal atheist") by Voltaire, and for his general efforts to promote French enlightenment stylized ideals in the Prussian empire; first slating: 170|#311 (Jan 2018); second-slating: 165|#405 (Apr 2018) per Frederick II and Francois Vayer rankings.

466 | 165

Mary Somerville
(1780-1872)

[RGM:911|1,500+] Scottish mathematician, astronomer, and science writer, aka "queen of 19th-century science" (Ñº); mathematics tutor to Ada Lovelace; first-slating: 180|#143 (c.2017); downgraded to: 165|#441 (Jan 2019).

(Cattell 1000:N/A)
(Gottlieb 1000:N/A)
[RGM:154|1,500+]
(Murray 4000:N/A)
[Kanowitz 50:27]

467 | 165

Georg Ohm
(1789-1854)

(GPE:93) (SIG:18) (CR:5) German physicist and mathematician; noted for his 1826 discovery of the “Ohm's law”, shown below:

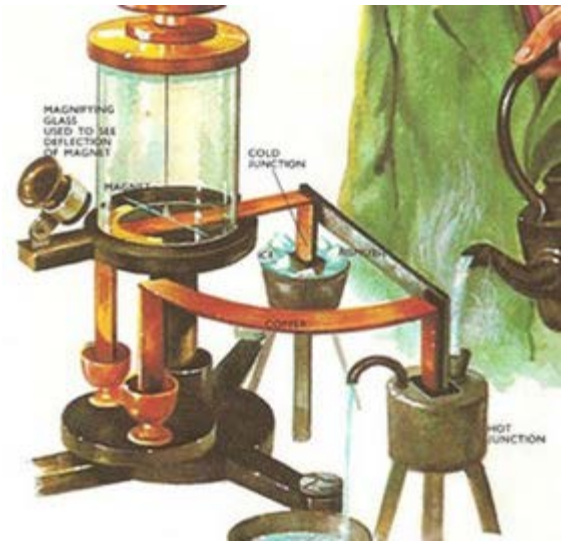

$$I = \frac{V}{R}$$

which states that current is directly proportional to the voltage and inversely proportional to the resistance.

468 | 165

Germaine Stael
(1766-1817)

IQ_C=180

(Cattell 1000:164) [RGM:N/A|1,500+] (CR:5) French-born German writer; only child of Swiss-born French statesman and financier Jacques Necker (1732-1804) (IQ:155|#553) (Cattell 1000:235) and Swiss-born Suzanne Curchod (Suzanne Necker), noted for her who hostessing of Rue de la Chaussée-d'Antin one of the most popular salons of Paris; her mother, at an early age, tried to make her into a prodigy of sorts, piling the books on her; in 1803, she was Banned from France by Napoleon, for publishing her controversial novel *Delphine*; after which she went to German and became part of Goethe’s circle and an *Elective Affinities* admirer; down-graded from 175|#239 to 165|#442 (Jan 2019).

469 | 165

Sofia Kovalevskaya
(1850-1891)

IQ_R=170
IQ_D=156

Russian mathematician; noted for contributions to analysis, partial differential equations, and mechanics; as an infant, owing to a wallpaper shortage, her nursery had been covered with pages from her father’s old calculus text, supposedly she “gazed for hours at those pages, craving to understand them”, reports John Lienhard; at age 19, she entered University of Heidelberg, studying mathematics under Hermann Helmholtz, Gustav Kirchoff, and Robert Bunsen; by age 25, finished her doctorate on partial differential equations, along with a paper on the dynamics of Saturn's rings, and one on elliptic integrals, at the University of Göttingen, graduating *summa *** laude*; she thereby became the first woman in Europe to hold that degree (Ñº) (Ñº); Dduring an invite to one of George Elliot’s Sunday salons, she met Herbert Spencer and was led into a debate, at Eliot's instigation, on "woman's capacity for abstract thought".

470 | 165

Evariste Galois
(1811-1832)

[RGM:517|1,500+] [GME] (Glenn 20:11) ranked as “world’s 50 smartest teenagers” (2014) (Ñº); Quora compared (Ñº) to Terence Tao (2016), as to who was more “brilliant” at age 20; at age 14, he read Adrien Legendre’s *Elements of Geometry* “like a novel”, as he says, mastering it at first reading; at 15, he read Joseph Lagrange’s *Reflections on the Algebraic Solutions of Equations*, which motivated his later work on equation theory; first-draft gauged at 165|#345 (Nov 2017).

165 — 471 William Wordsworth (1770-1859) IQ_C=165 An associate of John Stewart.

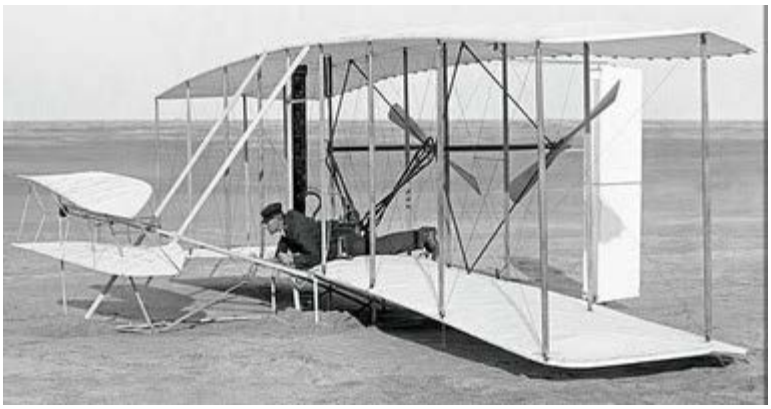

165 — 472 Wilbur Wright (1867-1912) IQ_B=165

[RGM:81|1,500+] American aviation pioneer;

"For some years, I have been afflicted with the belief that flight is possible to man. My disease has increased in severity and I feel that it will soon cost me an increased amount of money if not my life."

— Wilbur Wright (1900) (Ñº)

In 1903, together with his brother Orville Wright (1871-1948), built and flew the first powered airplane.

165 — 473 William Herschel (1738-1822) IQ_C=165 Noted astronomer.

165 — 474 Johannes Brahms (1883-1897)

[RGM:114|1,310+] (RBCC:7|275+) Cox 300 (Ñº) missing genius (Robinson, 2010); a 500 geniuses cited (Ñº) missing candidate (2017); a great among musical geniuses.

165 — 475 Seneca (4BC-65AD) ↑

(Cattell 1000:189) [RGM:N/A|1,500+] (Murray 4000:N/A) (FA:27) (CR:39) Roman stoic philosopher, moralist, statesman, and dramatist [not to be confused with his father "Seneca the elder" (54BC-39AD) (Ñº)]; oft-cited in the silent historians problem; his works together with Cicero's, according to Thomas More (1516) (IQ:175|#240), are said to be the only philosophy of importance in Latin worth reading; first-slating: 165|#410 (Mar 2018).

165 — 476 Lucilius (c.180-102BC)

(Cattell 1000:N/A) [RGM:N/A|1,310+] Quote: "**Life is *force*** you see: to do everything force doth compel us"; first-draft gauged at 165|#351 per Marcus Varro (#250) add (Dec 2017).

165 — 477 Aristophanes (c.446-386BC)

(Cattell 1000:136) [RGM:N/A|1,310+] (FA:18) Greek philosopher; person behind soul mate theory; in his satirical play *The Clouds* (Ñº), tells a dialogue about the nature of rain (natural or Zeus caused), between a fictional atheist character Socrates and a lay character Strepsaides, who thinks rain is caused by "Zeus pissing into a sieve"; first-draft gauged at 165|#352 (Dec 2017).

165 | 478

Richelieu
(1585-1642)

(Cattell 1000:139) [RGM:N/A|1,310+] French clergyman, nobleman, and statesman; noted for his work, from 1625 to 1643, as de facto leader of France, wherein he embedded the world's first secular scheme of government; upgrade from 160|#581 to 165|#463 (Aug 2019).

165 | 479

Vincent van Gogh
(1853-1890)

[RGM:70|1,500+] (Murray 4000:18|WA) Dutch Post-Impressionist painter; in about a decade, he created about 2,100 artworks, including around 860 oil paintings, most of them in the last two years of his existence; noted works: The Starry Night (1889), Irises (1889), Sunflowers (c.1885), The Potato Eaters (1885), and Café Terrance at Night (1888); IQ:150+ (Ñº), IQ:150-200 (Ñº); top 1000 missing candidate (Jan 2019); first-slating: 165|#450 (Jan 2019).

165 | 480

Igor Stravinsky
(1882-1971)

IQ_B=180

[RGM:380|1,310+] (RBCC:22|275+); downgraded per musical geniuses IQ consensus (2017)

165 | 481

Fritz Lipmann
(1899-1986)

(CR:62) German-born American physician and biochemist (CHNOPS-chemist);

"Two groups of important discoveries nourish the thinking of [post Lamarckian-Darwinian] biologists today. For the one part, the astonishing progress since **Fritz Lipmann** in the domain of bioenergetics and for the other, the impetus which thermodynamics has assumed under the fertile impulse of the genius of Prigogine."

— Ernest Schoffeniels (1973), *Anti-Chance* (pg. xi)

Noted for his 1941 ATP bond energy coupling theory, wherein, building on the earlier work of Herman Kalckar who had previously (or simultaneously) showed that phosphate compounds could provide energy, by demonstrating that in frog muscles, where glycolysis had been inhibited with iodoacetate, muscular contraction continued for a short period using phosphocreatine as a source of energy, he showed how cellular activity, e.g. chemical work (molecular synthesis), mechanical work (motor proteins), transport work (membrane transport), is powered thermodynamically inside of animate organisms; first-slating: 165|#450 (Jan 2019).

[RGM:772|1,500+] Roman philosopher, scientist, theologian, grammarian (Ñº), and astronomer (Ñº);

165 — 482 John Philoponus (c.490-570)

"Philoponus is one of the greatest geniuses of antiquity."
— Pierre Duhem (1913), *The System of the World* (*Le système du monde*)

noted for commentary on Democritus; for his impetus theory of motion; influential to: Avicenna, Bonaventure, John Buridan (or Jean Buridan), and Galileo, the latter of whom, in his *The Two New Sciences* (1638), cites Philoponus, and the later development of inertia (principle of inertia); first-slating: IQ:165|#451 (Jan 2019).

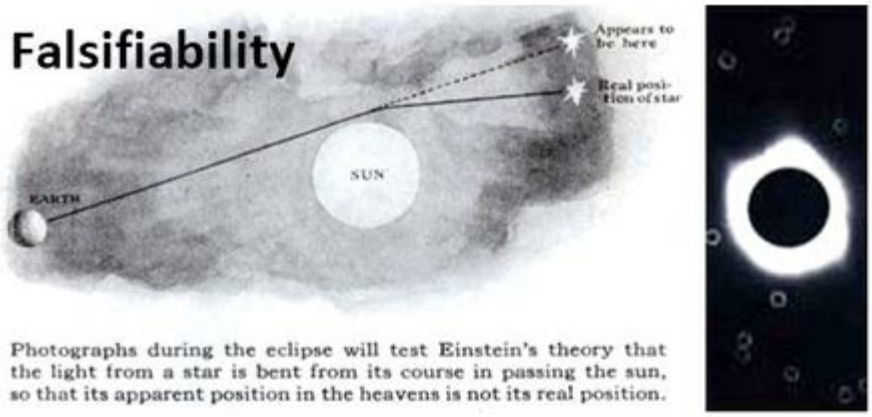

165 | 483 Karl Popper (1902-1994)

(RGM:1182|1,500+) (Stokes 100:94) (GPhE:25) (CR:25) Austrian-born English philosopher, noted for his 1919 falsifiability model of good science, according to which to know if something is true or not, e.g. a new theory like relativity, there must be a way to test it, e.g. measure during an eclipse if the mass of the sun bends light, and for his latter discussions on the arrow of time in relation to entropy as well as his critique on general laws of science; first-slating: top 200-300 (Dec 2016).

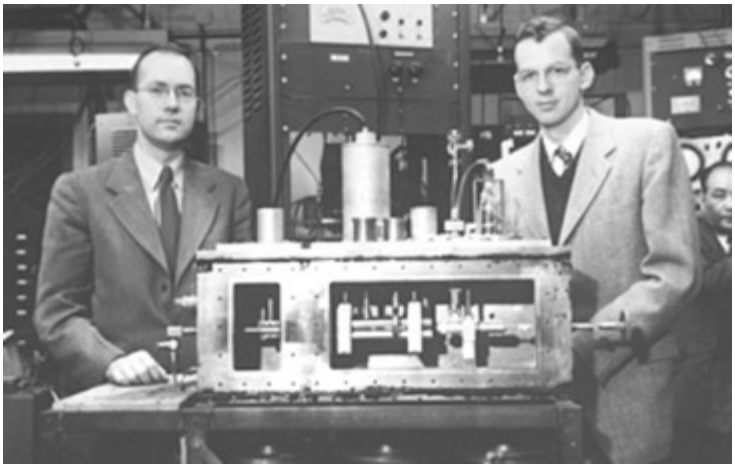

Townes, starting with Einstein's 1917 proposal that the right wavelength of light can stimulate an excited atom to emit light of the same wavelength, was stymied by how to corral a gas of excited atoms without them flying apart; in 1951, while sitting on a park bench in Washington, D.C., 1951, when he was struck by the thought that molecules might be made to vibrate a certain way and to release a certain type of stimulated microwave radiation; his revelatory solution allowed him to separate excited from non-excited molecules and store them in a resonant cavity, so that when a microwave traveled through the gas, the molecules were stimulated to emit microwaves in step with one another: a coherent burst; in 1954, he and his students built such a device using ammonia gas and dubbed it a "maser", for **microwave**

165 | 484 Charles Townes (1915-2015) ↓↑

amplification by stimulated emission of radiation. (Ñº) Four years later, in 1958, he and his brother-in-law and future Nobelist Arthur Schawlow conceived the idea of doing the same thing with optical light, but using mirrors at the ends of a gas tube to amplify the light to get an "optical maser." Downgrade (↓) for promoting religion-science-spirituality compatibility views, two years after winning the Nobel Prize in physics (1964).

485 | 165

Theodore Maiman (1927-2007)

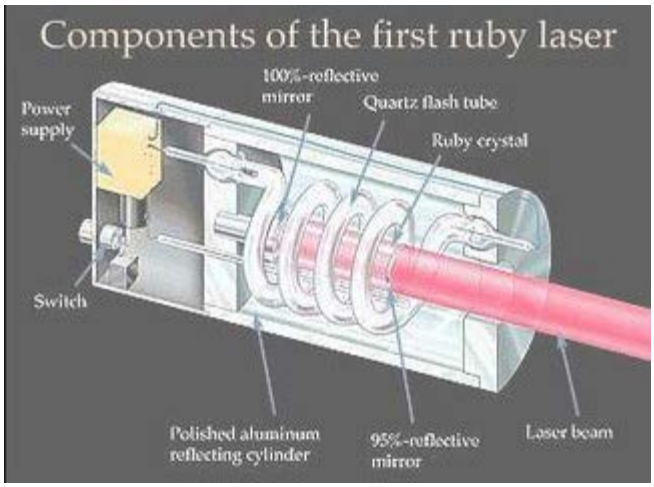

In 1960, after completing his PhD in experimental physics, involving detailed microwave-optical measurements of fine structural splittings in excited helium atoms, under Willis Lamb (1913-2008), eponym of "Lamb shift" (Ñº), and working for three years (1956 to 1958) on the "Ruby Maser Redesign Project" for the US Army, and after reading the Schawlow-Townes paper (1958) on masers, he built and demonstrated the world's first "laser", using a synthetic pink ruby crystal as the lasing medium and a helical xenon flash lamp as the excitation source.

486 | 165

Carl Jung (1875-1961) IQ_O=185 IQ_B=160

[RGM:100|1,260+] Quote: "Did you know he is suspected to have had an IQ of like, 185?" (Ñº)

587 | 165

Anthony Shaftesbury, 1st Earl (1621-1683) IQ_C=165

(Cattell 1000:365) English politician; grandfather to deism moral philosopher Anthony Shaftesbury, 3rd Earl (1671-1713).

488 | 165

Sun Tzu (c.540-496BC) IQ_B=165

(RGM:47|1,310+) a top ranked Chinese genius; purported author of the *Art of War*.

489 | 165

Gustav Fechner (1801-1887)

(CR:19) German experimental psychologist noted for his 1860 stimulus sensation psychodynamics experiments, for his panpsychism-themed atomic theory, and for his inanimate principle of absolute stability; first-draft slating: 165|#420 (Mar 2018).

490 | 165

Joseph Lister (1827-1912) IQ_B=165

Carl Scheele

(Cattell 1000:N/A) [RGM:N/A|1,500+](Murray 4000:3|C) (Partington 50:9) (GCE:10) (CR:4) Swedish-German chemist; noted for discovery

165 | 491	(1742-1786)		of: oxygen, molybdenum, tungsten, barium, hydrogen, chlorine, tartaric, oxalic, uric, lactic, and citric, as well as hydrofluoric, hydrocyanic, and arsenic acids; his *Chemical Treatise on Air and Fire* (1777), his only book, published the results of all of his discoveries; first-slating: 165|#475 generally based on GCE ranking (Oct 2019).
165 — 492	Christopher Wren (1632-1723)	IQ_B=165	
165 — 493	Thomas Digges (c.1546-1595)		English mathematician, astronomer, politician, and military leader; "Tycho Brahe and others deemed **Digges** to be one of the greatest geniuses of the time." — Walter Ball (1889), *A History of the Study of Mathematics at Cambridge* His 1576 publication of the first English translation of the Copernican system, added in a conjecture, as diagrammed adjacent, that the universe is infinite, containing infinitely many stars (possibly the first to do so); influential to Giordano Bruno; first-slating: IQ:165|#461 (Jan 2019).
165 — 494	Frederic Chopin (1810-1849)		
165 — 495	Steve Jobs (1955-2011)	IQ_R=160	[RGM:163|150+] American computer pioneer; co-founder of Apple (1976); initiator of the smart phone revolution, via the development of the iPhone (2007); quote: "in fourth grade, he had an IQ of 160" "The IQ of Steve Jobs"(2011); high entrepreneurial IQ; see also: *Steve Jobs: American Genius* (2012); first-slated: 165|#370 (2016).
165 — 496	Walter Raleigh (1552-1618)	IQ_C=165	
165	Marcello Malpighi (1628-1694)		(Cattell 1000:N/A) [RGM:N/A|1,360+] (Murray 4000:10|B) Italian biologist and physician, aka "father of microscopical anatomy, histology, physiology and embryology"; "It was Hooke, not Malpighi, Swammerdam, Leeuwenhoek, or Nehemiah Grew, who revealed the mysteries of the microscope." — Stephen Inwood (2002), *The Man Who Knew Too Much* (pg. 65)

497

noted for his 1661 identification and description of pulmonary and capillary networks connecting small arteries with small veins; first-slating: 165|#425 (Apr 2018).

— 165
498

Joseph Addison (1672-1719) IQ_C=165

(Cattell 1000:71) [RGM:N/A|1,360+] (Murray 4000:N/A) English essayist, poet, and statesman; associated with Richard Steele and their magazine *The Tatler*.

— 165
499

Richard Trevithick (1771-1833)

(EP:29) (CR:3) British engineer, mining engineer, and inventor, noted for his 1804 demonstration of a train that rain on rails (see: adjacent photo); the first steam locomotive in history to do so; first-slating: 165|#482 (Nov 2019).

— 165
500

Gottlob Frege (1848-1925)

[RGM:235|1,310+] He is grouped with: Auguste Morgan (Eells 100:51), George Boole (IQ:175|#212), Bertrand Russell (IQ:180|#106), Giuseppe Peano, Alfred Whitehead [RGM:1,224|1,310+], Georg Cantor [RGM:495|1,310+] (GME:16), Charles Peirce (Ñº), and Kurt Godel (IQ:170|#332), who, according to PhiloEpisteme (Dec 2017) (Ñº), “cannot be less intelligent” than Russell.

(add)

Previous

â— Top 1000 geniuses: 1-100 | IQ: 225-180
â— Top 1000 geniuses: 101-200 | IQ: 180-180
â— Top 1000 geniuses: 201-300 | IQ: 180-175
â— Top 1000 geniuses: 301-400 | IQ: 175-170
â— **Top 1000 geniuses: 401-500** | IQ: 170-165
â— Top 1000 geniuses: 501-600 | IQ: 165-160
â— Top 1000 geniuses: 601-700 | IQ: 160-150
â— Top 1000 geniuses: 701-800 | IQ: 150-140
â— Top 1000 geniuses: 801-900
â— Top 1000 geniuses: 901-1000
â— Top 1000 geniuses (candidates)

Notes

N1. Note: see "IQ key" page for IQ subscript symbol meaning.

θΔics

In genius rankings, **top 1000 geniuses** refers to the greatest five-hundred geniuses of all time ranked by IQ or "relative brightness or intellect" (Cox, 1926); below are the fifth tier greatest geniuses of all time, numbers 501 to 600.

Geniuses | 501-600

The following are the geniuses "501 to 600" of the top 1000 geniuses (previous: 1-100, 201-300, 301-400, 401-500, next: **601-700**, 702-800, 801-900, 901-1000): [N1]

Geniuses 501 to 600

501 — 165

Marquis de Sade (1740-1814)

(Cattell 1000:N/A) [RGM:685|1,500+] (Murray 4000:N/A) (Gottlieb 1000:N/A) (FA:91) French Epicurean philosopher, revolutionary politician, nobleman;

"Sade's atheism was heavily influenced by the work of two materialist philosophers of the Enlightenment: La Mettrie's *Man Machine* (1748) and Baron d'Holbach's *The System of Nature* (1770)."

— John Phillips (2015), *How to Read Sade* (pg. #)

noted for his 1795 *Philosophy in the Bedroom*, wherein he outlines his natural order based libertine sexuality, i.e. Sadism; first draft slating: 165|#410 (Jan 2018).

502 — 165

Tycho Brahe (1546-1601) ↑

[RGM:78|1,500+] (Murray 4000:7|A) (Gottlieb 1000:202) (Simmons 100:22) (CR:6) Danish astronomer;

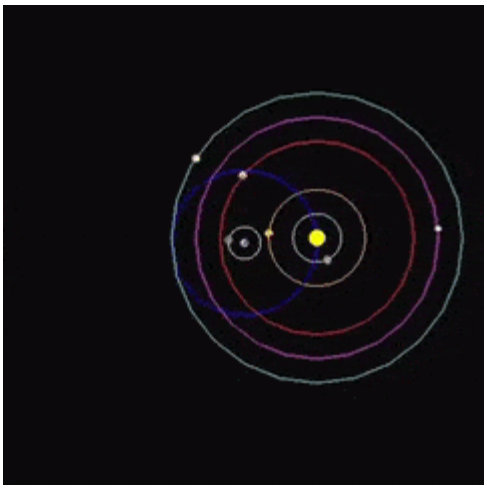

"For those [observations] that I made in Leipzig in my youth and up to my 21st year, I usually call childish and of doubtful value. Those that I took later until my 28th year [i.e., until 1574] I call juvenile and fairly serviceable. The third group, however, which I made at Uraniborg during approximately the last 21 years with the greatest care and with very accurate instruments at a more mature age, until I was fifty years of age, those I call the observations of my manhood, completely valid and absolutely certain, and this is my opinion of them."

— Tycho Brahe (1598), description of instruments and scientific work

built on the Copernican model to make is Brahe model of the world (adjacent); colorful character (Ñº); gather the data, used by Johannes Kepler, to formulate the laws of planetary motion; first draft slotted at #350 (Jun 2017); upgrade needed [?].

— 165 Isambard Brunel (1806-1859) IQ_B=165

503

504 | 165

Cleanthes (c.330-230BC)

Greek stoic philosopher, student of Zeno of Citium (see: Greek philosophy), mentor to Chrysippus (279-206BC), noted for developing, with the addition of this "tension" theory of matter, the basic the tenets of so-called "stoic physics"; IQ first-draft gauged at 165|#469 as in the lower-end of the genius neighborhood of: Cicero (106-43BC) (IQ:180|#103), David Hume (1711-1776) (IQ:180|#111), and Zeno of Citium (c.334-c.262BC) (IQ:170|#317) (Jan 2019).

505 | 165

Sappho (c.630-570BC)

IQ_B=165

506 | 165

George Handel (1685-1759) ↓

IQ_C=170

[RGM:N/A|1,310+] (RBCC:9|275+) a great among musical geniuses.

507 | 165

Ennius (239-169BC)

(Cattell 1000:855) [RGM:N/A|1,330+] (Murray 4000:N/A) Roman epic poet, dramatist, and satirist;

"An ugly brute the ape may be, but how he resembles you and me!"
— Ennius (c.180BC), from a lost satire

noted for his 18 volume *Annals*, on Roman history; did poetic speculation on the relation between ape and man; oft-cited by Cicero; first-slating: 165|#430 (Mar 2018).

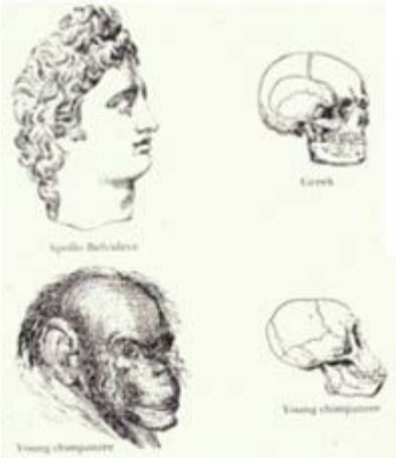

508 | 165

Pierre Beaumarchais (1732-1799)

IQ_C=165

(Cattell 1000:325) French polymath; occupations: watchmaker, inventor, playwright, musician, diplomat, spy, publisher, horticulturist, arms dealer, satirist, financier, and revolutionary; in 1778, shortly after the passing of Voltaire, he set out to publish he complete works of Voltaire, and by 1790 had published a 70-volume set, therein preserving many of Voltaire's later works which otherwise might have been lost.

509 | 165

Theodore Beza (1519-1605)

IQ_C=165

(Cattell 1000:285) French Protestant Christian; disciple of John Calvin; played a role in the reformation.

510 | 165

Charlotte Bronte (1816-1855)

IQ_C=165

(Cattell 1000:721) [RGM:N/A|1,500+] English novelist and poet; at age 7, when asked by her father to name "the best book in the world", answered "the Bible", and in response to the followup query: "and the next best?" replied "the Book of Nature" (Ñº); oft-ranked "greatest literary author ever" (next to Ayn Rand) according to 2012 street poll; noted for genius quotes (Ñº).

511 | 165

Gilbert Burnet (1643-1715)

IQ_C=165

(Cattell 1000:439) Scottish philosopher and historian.

165 — 512	Daniel DeFoe (c.1660-1731)	IQ_C=165	(Cattell 1000:278) [RGM:N/A|1,300+] English trader, novelist, journalist, pamphleteer, and spy; author of *Robinson Crusoe*.
165 — 513	George Canning (1770-1827)	IQ_C=165	(Cattell 1000:212) [RGM:N/A|1,300+] British statesman and politician.
165 — 514	Benjamin Disraeli (1804-1881)	IQ_C=165	(Cattell 1000:143) [RGM:482|1,300+] British statesman, prime minister, novelist, and philosopher; quotes: “nature has given us two ears, but only one mouth”; “there are three kinds of lies: lies, damned lies, and statistics” ; “action may not always bring happiness; but there is no happiness without action.”
165 — 515	Henry Fielding (1707-1754)	IQ_C=165	(Cattell 1000:251) [RGM:N/A|1,300+] English novelist, dramatist, playwright, magistrate; author of *Tom Jones* (1749) a Guardian (2013) 100 best novel (#5) (Ñº); founder of London’s first police force.
165 — 516	Franz Schubert (1797-1828)		[RGM:132|1,310+] (RBCC:8|275+) Cox 300 (Ñº) missing genius (Robinson, 2010); 500 geniuses cited (Ñº) missing candidate (2017); a great among musical geniuses; added at: 165|#390 (2017)
165 — 517	Giuseppe Verdi (1813-1901) ↑↑	IQ_B=150	[RGM:82|1,310+] (RBCC:16|275+) a great among musical geniuses.
165 — 518	Joseph Fouche (1759-1820)	IQ_C=165	(Cattell 1000:260) [RGM:N/A|1,300+] French statesman and Napoleon-siding revolutionist.
165 — 519	Francesco Guicciardini (1483-1540)	IQ_C=165	(Cattell 1000:423) [RGM:N/A|1,300+] Italian historian and statesman; friend and critic of Machiavelli.
165 — 520	Francois Guizot (1787-1874)	IQ_C=165	(Cattell 1000:59) [RGM:N/A|1,300+] French historian, orator, and statesman.
165 — 521	Herbert Spencer (1820-1903)		(Gottlieb 1000:808) (Becker 139:118) (Scott 50:39) [CR:91] English natural philosopher noted his 1858 to 1862 effort to produce a unified theory of everything, the gist of which is found in his *First Principles* (1862), wherein he sought to reconcile the subjects of religion, psychology, and sociology, with physics, chemistry, and biology, all themed on premise of evolution, equilibrium, and force transformations; known his Spencerian dilemma; first-slating: 165|#420 (c.2018).
165 — 522	Warren Hastings (1732-1818)	IQ_C=165	(Cattell 1000:279) [RGM:N/A|1,300+] British statesman and general governor of India.
			[RGM:87|1,500+] (Gottlieb 1000:51) American automobile industrialist;

165 — 523	Henry Ford (1863-1947)		“Thinking is the hardest work there is, which is probably the reason why so few engage in it.” — Henry Ford (c.1930), *Publication* (Ñº)(Ñº); possibly (Ñº) a hybrid quote a top ranked American genius; first-slating: 160|#470 (c.2017); second-slating: 165|#444 (Feb, 2017).
165 — 524	Ludwig Holberg (1684-1754)	IQ_C=165	(Cattell 1000:695) [RGM:N/A|1,300+] Norwegian writer, essayist, philosopher, historian and playwright.
165 — 525	Moses Mendelssohn (1729-1786)		(Cattell 1000:404) [RGM:944|1,330+] German philosopher, aka "modern Plato" (Cox, 1926) or "German Socrates" (Hecht, 2003); at age 13, read Maimonides’s *Guide for he Perplexed* (1190), a book banned, by the Jewish community, to anyone under 25; as an adult he engaged in German enlightenment debates; grandfather of composer Felix Mendelssohn (1809-1847) (Ñº); first-slating: 165|#450 (Apr 2018).
165 — 526	Felix Mendelssohn (1809-1847)		[RGM:N/A|1,310+] (RBCC:19|275+) grandson of Moses Mendelssohn; student of Carl Zelter; performed for Goethe at age 12; a great among musical geniuses.
165 — 527	Lise Meitner (1878-1968)		(Cropper 30:3/NP) (GFG:13) Austrian-born Swedish physicist; noted for her 1938 solution to the mystery of uranium fission; first female physics professor in Germany; the second women ever to get a PhD; she was dubbed by Einstein “our Marie Curie” or the "German Marie Curie" (Ñº); in 2012, she was speculatively ranked on the “smartest woman ever” page as #15 with an IQ of 175; first-slated in top 1000 genius rankings at 165|#475 (Nov 2018).
165 — 528	Callimachus (c.470-400BC)		(Cattell 1000:N/A) [RGM:N/A|1,330+] (Murray 4000:N/A) Greek architect and sculptor; he is noted for having taught the Romans the art of “Greek fire” (da Vinci, c.1500); characterized as: “although not of the first rank of artists, was yet of unparalleled cleverness, so that he was the first to drill holes through stones” (Pausanias, c.160AD); first-slating: 165|#450 (Mar 2018).
165 — 529	Norman Schwarzkopf (1934-2012)	IQ_O=170 IQ_O=150-168	High school valedictorian; MS in mechanical and aerospace engineering; went on to successfully lead all coalition forces during Persian Gulf War (1990-1991).
165 — 530	Edward Jenner (1749-1823)	IQ_C=165	(Cattell 1000:381) [RGM:509|1,300+] English physician; discoverer of the small pox vaccination, an aim he had set for himself before age 20.
165 — 531	Samuel Johnson (1709-1784)	IQ_C=165	(Cattell 1000:46) [RGM:354|1,500+] (Bloom 100:6|Wisdom) (CR:3), aka “Dr. Johnson” (pen name”, was an English poet, playwright, essayist, moralist, literary critic, and biographer; a top 50 geniuses of all time (Waking Times, 2012) (Ñº); invented and compiled (1755) what many consider to the be the first dictionary.

165 — 532	John Law (1671-1729)	IQ_C=165	(Cattell 1000:290) [RGM:N/A|1,300+] Scottish economist; believed that money was only a means of exchange that did not constitute wealth in itself and that national wealth depended on trade.
165 — 533	Giuseppe Mazzini (1805-1872)	IQ_C=165	(Cattell 1000:287) [RGM:N/A|1,300+] Italian politician, journalist, and revolutionist.
165 — 534	John Newman (1801-1890)	IQ_C=165	(Cattell 1000:723) [RGM:613|1,300+] Anglican priest, poet, and theologian.
165 — 535	William Robertson (1721-1793)	IQ_C=165	(Cattell 1000:472) [RGM:N/A|1,300+] Scottish historian.
165 — 536	Charles Sainte-Beuve (1804-1869)	IQ_C=165	(Cattell 1000:378) [RGM:N/A|1,300+] French literary critic.
165 — 537	Walter Scott (1771-1832)	IQ_C=165	(Cattell 1000:27) [RGM:N/A|1,310+] Scottish historical novelist, playwright, poet, and historian; author of *Ivanhoe* (1820).
165 — 538	Richard Sheridan (1751-1816)	IQ_C=165	(Cattell 1000:361) [RGM:N/A|1,310+] Irish satirist, playwright, poet; long-time owner of London Theatre Royal.
165 — 539	Henri Saint-Simon (1760-1825) ↑	IQ_C=165	(Cattell 1000:400) [RGM:N/A|1,310+] French political, economic, and social theorist; his utopian socialism influenced: John Mill, Pierre Proudhon, Karl Marx, Friedrich Engels, Thorstein Veblen; his secretary was Auguste Comte; some claim he coined the term "social physics" (Sweigewood, 2000).
165 — 540	Robert Pirsig (1928-2017)	IQ_R=170	[RGM:N/A|1,500+] (CR:60) American writer-philosopher, and former child prodigy; "Patterns of culture do not operate in accordance with the laws of physics. How are you going to prove in terms of the laws of physics that a certain attitude exists within a culture? What is an attitude in terms of the laws of molecular interaction?" — Robert Pirsig (1991), *Lila: an Inquiry into Morals* (pg. 53) noted for his 1991 book *Lila: An Inquiry into Morals*, wherein the character reflects on the likes of William Sidis, and digs into the questions of life, and morals, in the context of a person being a collection of atoms governed by physics and chemistry, in the context of the second law of thermodynamics; IQ:170 (age 9); ranked in the smartest person existive rankings at 170|#24 (2014); first-slating: 165|#521 (Mar 2019).

165 — 541	Daniel Webster (1782-1852)	IQ_C=165	(Cattell 1000:183) [RGM:N/A|1,310+] American politician, orator, and lawyer.
165 — 542	Auguste Rodin (1840-1917)		[RGM:352|1,500+] (Collins 20:8) French sculptor; "To any artist, worthy of the name, all in nature is beautiful, because his eyes, fearlessly accepting all exterior truth, read there, as in an open book, all the inner truth." — Auguste Rodin (c.1900) Noted for: The Thinker (1902), The Kiss (1882), Monument to Balzac (1898) (Ñº), and The Gates of Hell (1917); Ruth Butler's *Rodin: the Shape of Genius* (1996) recounts the "myths that have grown up around him"; first-slating: 165|#506 (Jan 2019).
165 — 543	Johann Winckelmann (1717-1768)	IQ_C=165	(Cattell 1000:359) [RGM:N/A|1,310+] German art historian and archaeologist; was the first to separate Greek art into periods; influential, supposedly, to Gotthold Lessing, Johann Herder, Goethe, Friedrich Holderlin, Heinrich Heine, Friedrich Nietzsche, and Oswald Spengler; his favorite author was Cicero.
165 — 544	Ulrich Zwingli (1484-1531)	IQ_C=165	(Cattell 1000:190) [RGM:N/A|1,310+] after being influenced by the writings of Erasmus, went on to become the leader of the Protestant religious reformation in Switzerland.
165 — 545	Karl Weber (1786-1826)	IQ_C=165	German composer; creator of the romantic opera.
			↑ 165+
160	Bede (672-735) ↑		(Cattell 1000:878) [RGM:615|1,500+] (Murray 4000:N/A) (GHE:6) (CR:15) English historian and monk; noted for being one of the first to connect John the Baptist with the Aquarius constellation; recounted the "warm sparrow"

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anecdote Christianity adoption in England; his *Ecclesiastical History of the English People* (1731) gained him the epitaph as the “father of English history”; first-slating: 160|#431 (Mar 2018).

— 160 — 547

Augustin Cauchy (1789-1857)

(Cattell 1000:N/A) [RGM:315|1,500+] (Murray 4000:18|M) (GME:19) (Eells 100:15) (CR:10) Maxwell read his *Differential Calculus* at age 16; G.H. Harding (c.1913) ranked him in the same league as: Gauss (IQ:195), Euler (IQ:195), Newton (IQ:220), Archimedes (IQ:190), and Ramanujan (IQ=?); first-slating: 160|#431 (Feb 2018).

(Cattell 1000:N/A)

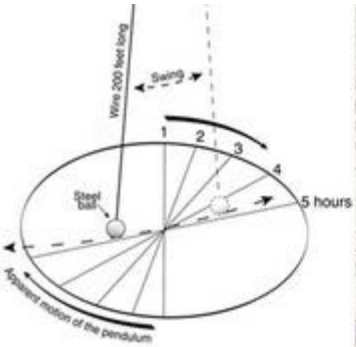

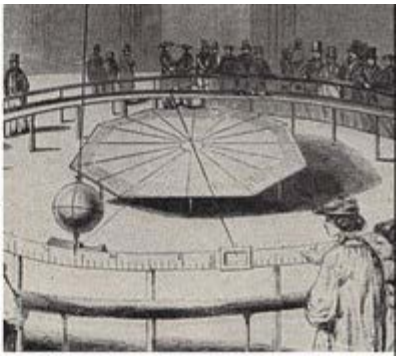

— 160 — 548

Jean Foucault (1819-1868)

[RGM:N/A|1,300+] French physicist;

“You are invited to come to see the earth turn, tomorrow, from three to five, at Meridian Hall of the Paris Observatory.”

> — Jean Foucault (1851), Invitation cards which he sent out to the scientists of Paris, to witness his famous pendulum experiment, Feb 3

his 1851 200-foot clockwise swinging pendulum experiment "proved" Copernicus’ 1514 assertion that the earth rotates once on its axis ever 24 hours; also noted for making early measurement of the speed of light, discovered eddy currents, and naming the gyroscope; first-slating: 160|#495 (May 2018).

— 160 — 549

Mary Wollstonecraft (1759-1797)

(Cattell 1000:851) [RGM:551|1,500+] (Time 100:59) (Stokes 100:75) (GFG:14) English philosopher, wife of William Godwin, mother of Mary Shelley (wife of Percy Shelley); best known for: *A Vindication of the Rights of Woman* (1792), wherein she argues that women are not naturally inferior to men, but appear to be only because they lack education, that both men and women should be treated as rational beings, and imagines a social order founded on reason; first-slating: 160|#433 (Feb 2018).

— 160 — 550

William Godwin (1756-1836)

(Cattell 1000:851) [RGM:733|1,320+] (Murray 4000:N/A) English preacher, turned novelist and political philosopher; husband of philosopher Mary Wollstonecraft, father of Mary Shelley (wife of Percy Shelley); first-slating: 160|#434 (Feb 2018).

[RGM:332|1,500+] (Gottlieb 1000:121) (Stokes 100:97) (CR:5) American psychologist;

“I don’t believe that I have

160 | 550

Burrhus Skinner (1904-1990)

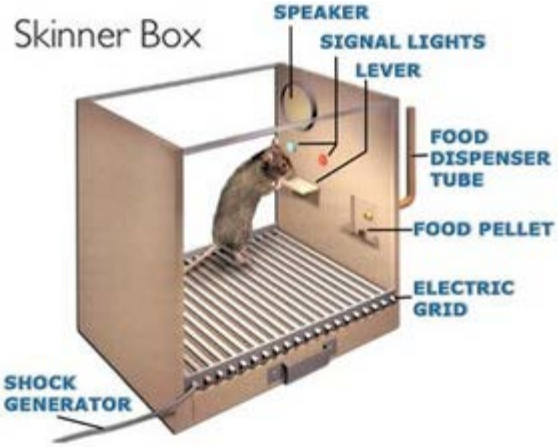

a very high IQ; I think I've done very well with what I've got. There are skills I just don't have. Fortunately, I got into a field [behaviorism] where I could use the ones I do have — largely practical skills. I don't think I'm a classical picture of a great thinker, or anything of that sort."

— Burrhus Skinner (1983), "Conversation with Alfie Kohn"

noted for his 1940s pigeon training experiments, the findings of which he applied to human social behaviorism; first-slating: 160|#550 (Apr 2020).

160 | 551

Joseph Jacquard (1752-1834)

French weaver and merchant; noted for his 1801 invention (Ñº) of the Jacquard loom, aka "programmable loom", which via the use of threads and punch cards, was able to make woven patterns, automatically without human weavers; this was the forerunner to the Hollerith computer (1889); which was the forerunner to IBM.

160 | 552

Virginia Woolf (1882-1941)

[RGM:192|1,500+] (WorldCat 100:23) (Bloom 100:40) (GFG:15) (FA:112) English writer; while not in the top 20 of western literature, in the Murray 4000, she is noted as being the highest ranked female; first-slating: 160|#515 (Jan 2019).

160 | 553

Joseph Henry (1791-1867)

(Gottlieb 1000:605) (SIG:19) (GPE:99) was an American physicist and electrical engineer; noted for his discovery of electromagnetic induction (1832), independent of Faraday (1831); his genius ability was ranked, by Alfred Mayer (1880), as "a little below that of Faraday"; first-slating: 160|#534 (Nov 2019).

160 | 554

Ada Lovelace (1815-1852)

[RGM:434|1,500+] English mathematician, writer, and computer programmer; daughter of George Byron; from an early age, owing to her mother's idea that education would root out any insanity associated with her father's side, she was taught mathematics and science from some of the world's leading scholars, including Mary Somerville; in 1842, wrote the world's first computer program, an algorithm for calculating a sequence of Bernoulli numbers with Charles Baggage's analytical engine; possibly [?] an

over-sold genius ↓ or overrated genius, per reason that Babbage, supposedly, already had did the programming 6 to 7 years before Lovelace (Ñº); first-draft gauged at 145-165 (c.2015).

160 | 555 Christoph Wieland (1733-1813) ↓ IQ_C=170

Commented in a letter to German philologist and archeologist Karl Böttiger, which he suggested should be "burned" after it is read, that: “to all rational readers, the use of the chemical theory [in Goethe’s *Elective Affinities*] is nonsense and childish fooling around”; supposedly, objected owing to the "radicalness of its Christianity" (Jul 16); in another letter, whose addressee, a woman, is unknown, he stated: "I confess to you, my friend, that I have read this truly terrifying work not without feeling or concern."

160 | 556 Alfred Wegener (1880-1930)

(Simmons 100:53); conceived (1910) the supercontinent (Pangaea), stated originally by Robert Hooke (1697), and continental drift theory; in 1912 went on expedition to find evidence of fossil plant overlap between fitting continents.

160 | 557 Dorothy Murdock (1960-2015)

[RGM:N/A|1,320+] American religio-mythologist, with specialty in astrotheology; from 1999 to 2009, her books on Christ myth theory and Moses myth theory, etc., were intellectual staples, in viral films, such as Zeitgeist, in bring about a 21st century awakening on the long latent “Jesus = Osiris-Horus” connection; first-slating: 160|#435 (Feb 2018).

160 | 558 Ayn Rand (1905-1982)

[RGM:456|1,500+] (CR:32) Russian-born American “vulgar philosopher” (Solomon, 1981), extreme atheist and activist;

“If devotion to truth is the hallmark of morality, then there is no greater, nobler, more heroic form of devotion than the act of a man who assumes the responsibility of thinking. The alleged short-cut to knowledge, which is faith, is only a short-circuit destroying the mind.”
— Ayn Rand (1957), *Atlas Shrugged* (Ñº)

noted for her applied atheism philosophy of objectivism, which argues that because each of us is born into a godless world “alone”, each of us therefore is “justified in pursuing our own self-interests”, much of which is outlined in her 1957 magnum opus *Atlas Shrugged*; downgrade (↓) for her so-called proof of the existence of free will and possible downgrade for her fierce criticisms of David Hume, Immanuel Kant, and Friedrich Nietzsche (Ñº); see also: her 1972 “Letter to Boris Spassky” (Ñº) on Bobby Fischer; first-draft gauged at 140-175 (c.2015).

160 Tertullian (c.155-240AD)

(Cattell 1000:283) [RGM:N/A|1,350+] (Murray 4000:N/A) Roman Christian apologist;

“Wherefore will ye trouble yourself, seeking after the law of god, whilst ye have that which is common to all the world, and which is written on the

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tablets of nature."

— Tertullian (c.220AD)

Cited by Baron d'Holbach (1770); first-slated: 160|#475 (Mar 2018).

— 560 Xenophon (c.430-354BC)

(Cattell 1000:223) [RGM:N/A|1,360+] (Murray 4000:N/A) Greek philosopher, historian, soldier, mercenary, and student of Socrates; noted for his 362 book *Oeconomicus* (Ñº), on "household management and agriculture", which is the origin of the word economics; first-slating: #475 (Apr 2018).

— 561 Suleyman (1494-1566) IQ_B=160

(Cattell 1000:N/A) [RGM:N/A|1,310+] Turkish sultan; presided over the apex of the Ottoman Empire's economic, military and political power.

— 562 Mahatma Gandhi (1869-1948) IQ_B=160

(Cattell 1000:#) [RGM:N/A|1,310+] Indian independence movement leader.

— 563 Vittorio Alfieri (1749-1803) IQ_C=160

(Cattell 1000:225) [RGM:N/A|1,310+] Italian dramatist and tragedy poet.

— 564 Sandro Botticelli (1445-1510)

(Cattell

1000:N/A) [RGM:160|1,320+] (Murray 4000:N/A) Italian painter; noted for: *The Birth of Venus*, e.g. as illustrated in the Lucretius article, Sistine Chapel works, etc.; first-slating: 160|#440 (Feb 2018) per crude artistic geniuses rankings.

(Cattell 1000:568) [RGM:N/A|1,310+] (FA:43) English philosopher; His *True Intellectual System of the Universe: Wherein All the Reason and Philosophy of Atheism is Confuted, and Its Impossibility Demonstrated, with a Treatise Concerning Eternal and Immutable Morality* (1678) attempted to refute the atheism of Pierre Gassendi;

— 565 Ralph Cudworth (1617-1688)

"Those who wish to form an idea of the shackles imposed by theology on the genius of philosophers born under the 'Christian dispensation', let them read the **metaphysical romances** of Leibniz, Descartes, Malebranche, Cudworth, etc., and coolly examine the **ingenious but rhapsodically** systems entitled: the pre-established harmony of occasional causes; physical pre-

motion, etc.”

— Denis Diderot (1770), note to Baron d’Holbach’s *The System of Nature* (pgs. 51-52)

His materialistic hylozoism model, however, later brought the charge of “atheism” to his name (Collins, 1713); first-draft slated at 160|#401 (Dec 2017).

160 | 566	Woodrow Wilson (1856–1924) Term: 1913-1921	IQ_{Si}=155	[RGM:640|1,305+] Used Darwinian evolution logic as a logic platform in his presidency.
160 | 567	Gotthold Lessing (1729-1781) ↑↑	IQ_{C}=160	(Cattell 1000:149) [RGM:261|1,500+] (CR:6) German dramatist, critic, and philosopher; in his “Rettung des Hier. Cardanus” (1754), he defended Gerolamo Cardano from the charge of atheism; (Ñº) approved of by Ludwig Buchner; the fifth book from the bottom of the 2006 sculpture “Walk of Ideas” (right), with Goethe at the base and Grass at the summit.
160 | 568	Omar Khayyam (1048-1131)		[RGM:443|1,500+] (HD:1) (FA:18) (CR:9) Persian philosopher, mathematician, astronomer, nonbeliever; “The Koran! Well, come put me to the test; lovely old book in hideous error drest. Believe me, I can quote the Koran too; the unbeliever knows his Koran best. And do you think that unto such as you, a maggot-minded, starved, fanatic crew, god gave the secret, and denied it me? Well, well, what matters it! Believe that too.” — Omar Khayyam (c.1120), a statement of disbelief in Islam (Ñº) known as a skeptic, whose poetry satirized the claims and practices of religion (Hitchens, 2007); an seeming "Persian Voltaire" so to say; first-gauged: IQ:160 (c.2017).
160 | 569	Friedrich Schleiermacher (1768-1834)	IQ_{C}=160	(Cattell 1000:254) [RGM:N/A|1,320+] (Murray 4000:N/A) German theologian, philosopher, and biblical scholar known for his attempt to reconcile the criticisms of the Enlightenment with traditional Protestant Christianity; noted for work on Anaximander.

160 — 570 Charles Etienne (1778-1845) IQ_C=160

160 — 571 Peter Tchaikovsky (1840-1893)

[RGM:62|1,310+] [GCMG:12]

160 — 572 Luis Alvarez (1911-1988)

American experimental physicist; after winning the 1968 Nobel Prize in physics for "for his decisive contributions to elementary particle physics, in particular the discovery of a large number of resonance states, made possible through his development of the technique of using hydrogen bubble chamber and data analysis", he went on to become famous for his 1980 "asteroid impact extinction theory", aka “Alvarez hypothesis” (Ñº), co-developed with his son geologist Walter Alvarez, according to which, based on measurements of iridium in a layer of the earth’s crust, the extinction of the dinosaurs 65-million years ago was caused by an asteroid strike (Ñº); a FamousScientists.org top 100 scientist (Ñº); Alvarez is noted among mislabeled geniuses and IQ tests” for having gone on to become a genius despite having failed (Ñº)(Ñº) to qualify for Terman’s 1921 IQ study, having had a tested IQ below 135; first-slating: 160|#533 (Feb 2019).

160 — 573 Sergei Rachmaninov (1873-1943)

[RGM:N/A|1,310+] [GCMG:13]

160 — 574 Hildegard Bingen (1098-1179) ↑↑

[RGM:209|1,500+] [GMG:14] German Benedictine abbess, writer, composer, philosopher, Christian mystic, visionary, and polymath; a smartest woman ever (Ñº) (IQ:150+) candidate; first-slating: IQ:160 (c.2015).

160 — 575 Hector Berlioz (1803-1869)

[RGM:N/A|1,310+] [GCMG:15] HMS pioneer; a 2010 “Classical Composer” missing genius to the “Top 500 geniuses: 301-400” range.

160 — 576 Lancelot Andrewes (1555-1626) IQ_C=160

(Cattell 1000:436) [RGM:N/A|1,310+] English bishop and scholar; friend of Hugo Grotius; general editor of the King James Bible.

[RGM:276|1,400+] American social reformer, abolitionist, orator, writer, and statesman;

“You are not judged by the height you have risen, but from the depth you have climbed.”

— Friedrich Douglass (1881) (Ñº)

160 | 577

Frederick Douglass (1818-1895)

"**Douglass** was beyond all comparison the ablest man whom the black race ever produced in our country, either among pure black or the class of mixed blood."

— James Pond (1900), *Eccentricities of Genius* (pg. 29)

An Inderjit Singh (2016) (Ñº) top 150 genius; Quora gauged (2015) (Ñº), speculatively, with George Carver, at the possible intellectual level of Newton, given social impediments; first-slated at 160|#520 per greatest black genius rankings.

160 | 578

Francois Chateaubriand (1768-1848)

IQ_C=160

(Cattell 1000:109) [RGM:N/A|1,310+] French writer, politician, diplomat, and historian; founder of French romanticism in literature; influential to Victor Hugo.

160 | 579

Virgil of Salzburg (c.700-784)

(Cattell 1000:N/A) [RGM:N/A|1,350+] (Murray 4000:N/A) Irish abbot; noted for his teaching of the "antipodal" humans theory, namely that the earth was round, had an "antipode" point, as professed by Pythagoras, Aristotle, Eratosthenes, Macrobius, and Bede, and that there were other people at these antipodes; the church condemned him has a heretic and to be burned, per reason that these other antipodal people would not be descendants of Adam and Eve, and therefore not saved by Christ; was an inspiration to Johannes Kepler; ranked as a great scientific martyr, alongside Galileo and Aristotle (Holbach, 1770); first-slating: 160|#490 (Feb 2018).

160 | 580

John Bunyan (1628-1688)

(Cattell 1000:488) [RGM:N/A|1,310+] English writer and Puritan preacher; author of *The Pilgrim's Progress: from this World, to That Which is to Come*, one of the first claimed novels in English (Ñº), about an everyday man named "Christian" who begins his journey with knowledge of original sin from the Bible and travels through places such as the "Slough of Despond", a boggy mire-like swamp where pilgrims' doubts, fears, temptations, lusts, shames, guilts, and sins of their present condition of being a sinner are used to sink them into the mud of the swamp; along the way is diverted by the secular ethics of Mr. Worldly Wiseman into seeking deliverance from his burden through the law, supposedly with the help of a Mr. Legality and his son Civility in the village of Morality, rather than through Christ, allegorically by way of the Wicket Gate, meets the laughing atheist, etc. (Ñº)

"Then the atheist fell into a great laughter!"

160 | 581

Antonio Canova (1757-1822)

IQ_C=160

(Cattell 1000:245) [RGM:N/A|1,310+] Italian marble sculptor.

160 — 582	Francisco Suarez (1548-1617)		(Cattell 1000:N/A) [RGM:N/A|1,320+] (Murray 4000:N/A) Spanish theologian, philosopher, and law scholar; ranked with Duns Scotus (1266-1308), Thomas Aquinas, and William of Ockham, as most important/influential middle ages philosopher-theologians; complete works: 27-volume (Latin); cited by Guericke, Leibniz, Grotius, Pufendorf, Holbach, Schopenhauer, and Heidegger; first-slating: 165|#425 (Mar 2018); down-graded ↓per Guericke's citation of him discussing astronomy in terms of Peter 5-7 and the "day of judgment" (Jan 2019).
160 — 583	William Channing (1780-1842)	IQ_C=160	(Cattell 1000:334) [RGM:N/A|1,310+] American Unitarian preacher.
160 — 584	Philip Stanhope (1694-1773)	IQ_C=160	(Cattell 1000:492) [RGM:N/A|1,310+] British statesman, diplomat, man of letters, and an acclaimed wit of his time; his *Letters to His Son on the Art of Becoming a Man of the World and a Gentleman* (1774) are characterized as "teaching the morals of a whòre , and the manners of a dancing-master" (Samuel Johnson); quote: "However frivolous a company may be, still, while you are among them, do not show them, by your inattention, that you think them so; but rather take their tone, and conform in some degree to their weakness, instead of manifesting your contempt for them. There is nothing that people bear more impatiently, or forgive less, than contempt; and an injury is much sooner forgotten than an insult. If, therefore, you would rather please than offend, rather be well than ill spoken of, rather be loved than hated; remember to have that constant attention about you which flatters every man's little vanity; and the want of which, by mortifying his pride, never fails to excite his resentment, or at least his ill will."
160 — 585	Samuel Clarke (1675-1729)	IQ_C=160	(Cattell 1000:333) [RGM:N/A|1,310+] English philosopher and Anglican clergyman; was a Boyle anti-atheism lecturer for two years.
160 — 586	Pierre Corneille (1606-1684)	IQ_C=160	(Cattell 1000:120) [RGM:N/A|1,310+] French tragedian playwright; ranked with Moliere and Racine.
160 — 587	William Cowper (1731-1800)	IQ_C=160	(Cattell 1000:463) [RGM:N/A|1,310+] English poet; his "On Friendship" (1783), similar to Empedocles, states that politics between courtiers and patriots is akin to the effervescence that arises when salt and lemon juice are mixed (see: chemistry poetry).
160 — 588	John Dryden (1631-1700)	IQ_C=160	(Cattell 1000:144) [RGM:N/A|1,310+] English playwright, poet, and dramatist; ranked with John Dunne and John Milton in 17th century poetry; ranked with William Shakespeare and Ben Jonson as greatest playwright. (Ñº)
			(Cattell 1000:72) [RGM:175|1,500+] (FA:14) (GHE:7) (CR:3) Greek historian and general; "Modern criticism rightly regards Thucydides as the model of the rational and objective historian who made it his first duty to leave the finger of god out of history and to tidy up the mundane events of the human drama. The

589 — 160	Thucydides (460-395BC)		contrast between his work with respect to the gods and the histories of his predecessor Herodotus and his successor Xenophon is plain; it is a contrast so great, in fact, as to provoke the observation from some (e.g. K. J. Dover) that Thucydides may well have been an atheist.” — Borimir Jordan (1986), “Religion in Thucydides” noted for his participation in and later secular recounting of the Peloponnesian War (431-404BC), wherein the Athenians battled the Spartans; considered, by some (Ñº), to be the father of “scientific history”, i.e. history based on evidence-gathering and analysis of cause and effect. (Cattell 1000:N/A) [RGM:N/A|1,360+] (Murray 4000:N/A) Greco-Roman scientist, philosopher, and religio-mythology scholar;
590 — 160	Macrobius (c.390-430AD)		“Good laws are produced by bad actions.” — Macrobius (c.420AD) (Ñº) noted for his work on the antipode model of the earth, wherein, supposedly, predicted that when Columbus crossed the “northern quadrant” of his world map, that he would not reach the orient, but would reach a new land, i.e. America (Ñº); first-slating: 160|#501 (Mar 2018).
591 — 160	Andre Dupin (1783-1865)	IQ_C=160	(Cattell 1000:479) [RGM:N/A|1,310+] French lawyer and politician.
592 — 160	Jacob Grimm (1785-1863)	IQ_C=160	(Cattell 1000:489) [RGM:N/A|1,310+] German philologist, jurist, and mythologist; with his younger brother Wilhelm he is popularly known as the elder of the *Brothers Grimm* and the editor of *Grimm's Fairy Tales*.
593 — 160	George Grote (1794-1871)	IQ_C=160	(Cattell 1000:486) [RGM:N/A|1,310+] English political radical and classical historian; author of the 12-volume *A History of Greece: from the Earliest Period to the Close of the Generation Contemporary with Alexander the Great* (1846–1856) and *Analysis of the Influence of Nature*.
594 — 160	Christian Wolff (1679-1754)		(Cattell 1000:N/A) [RGM:N/A|1,360+] German philosopher and mathematician; characterized a “great genius” (Mettrie, 1747); tends to be ranked, along with Christian Thomasius [RGM:263|1,360+], and Moses Mendelssohn [RGM:944|1,360+], as precursors to Immanuel Kant [RGM:20|1,360+] and German empirical psychology; first-slating: 160|#505 (Apr 2016).
595 — 160	Joseph Haydn (1732-1809)	IQ_C=160	(Cattell 1000:300) [RGM:383|1,500+] (Murray 4000:5|WM) (Gottlieb 1000:396) (GMG:26) Austrian composer; “There was no one near to confuse me, so I was forced to become original.” — Joseph Haydn (c.1790), *Publication* (Ñº) aka “Joseph Haydn” (Sirius Pops, 2020). (Cattell 1000:285) [RGM:N/A|1,310+] On his opera "Iphigénie en Tauride" (Iphigenia in Tauris) (1779) (Ñº), a drama is ultimately based on the play

160 — 596	Christoph Gluck (1714-1787) ↑	IQ_O=160 IQ_C=145	Iphigenia in Tauris by the ancient Greek dramatist Euripides which deals with stories concerning the family of Agamemnon in the aftermath of the Trojan War, Friedrich Schiller (IQC 165) (1801) commented, in a letter to his friend Körner, "Never has so pure and lovely a music affected me, it is a world of harmony which presses directly to the soul and dissolves in sweet exalted melancholy." Richard Wagner (IQC 170) called him "the great Gluck". IQ gauged (Ñº) by LePenseur (Dec 2017) at 160.
160 — 597	Cornelis Jansen (1585-1683)	IQ_C=160	(Cattell 1000:392) [RGM:N/A|1,310+] Dutch Roman-Catholic theologian.
160 — 598	Alphonse Lamartine (1790-1869)	IQ_C=160	(Cattell 1000:131) [RGM:N/A|1,310+] French poet.
160 — 599	Harriet Martineau (1802-1876)	IQ_C=160	(Cattell 1000:893) [RGM:N/A|1,310+] (Murray 4000:N/A) (Scott 50:22) (FA:99) British sociologist; Made of the first calls for a secular children's bible (see: children's atheism bible).
160 — 600	Michel de L'Hopital (1505-1573)	IQ_C=160	(Cattell 1000:421) [RGM:N/A|1,310+] French statesman, humanist, jurist, lawyer; was called on by Catherine de Médicis to try to establish the peaceful coexistence of Catholics and Protestants; and attempted he, however, failed at.

(add)

Previous

â— Top 1000 geniuses: 1-100 | IQ: 225-180
â— Top 1000 geniuses: 101-200 | IQ: 180-180
â— Top 1000 geniuses: 201-300 | IQ: 180-175
â— Top 1000 geniuses: 301-400 | IQ: 175-170
â— Top 1000 geniuses: 401-500 | IQ: 170-165
â— **Top 1000 geniuses: 501-600** | IQ: 165-160
â— Top 1000 geniuses: 601-700 | IQ: 160-150
â— Top 1000 geniuses: 701-800 | IQ: 150-140
â— Top 1000 geniuses: 801-900
â— Top 1000 geniuses: 901-1000
â— Top 1000 geniuses (candidates)

Notes

N1. Note: see "IQ key" page for IQ subscript symbol meaning.

References

1. Terman, Lewis. (1916). *The Measurement of Intelligence: an Explanation of and a Complete Guide for he Use of the Stanford Guide for the Use of the Stanford Revision and Extension of the Binet-Simon Intelligence Scale* (classification of intelligence, pg. 79; I.Q., pg. 53, etc.). Houghton Mifflin Co.

θΔics

In genius rankings, **top 1000 geniuses** refers to the greatest five-hundred geniuses of all time ranked by IQ or "relative brightness or intellect" (Cox, 1926); below are the sixth tier greatest geniuses of all time, numbers 601 to 700.

Geniuses | 601-700

The following are the geniuses "601 to 700" of the top 1000 geniuses (previous: 1-100, 201-300, 301-400, 401-500, 501-600, next: **701-800**, 801-900, 901-1000): [N1]

	Geniuses 601 to 700		
— 160 601	Jules Mazarin (1602-1661)	IQ_C=160	(Cattell 1000:114) [RGM:N/A|1,310+] French statesman.
— 160 602	 Henry Thoreau (1817-1862)		(Cattell 1000:N/A) [RGM:207|1,310+] (GPE) mentored by Ralph Emerson (IQ:170|#308); his *Civil Disobedience*, on the idea of "[non-violent] refusing to cooperate with evil systems" influenced many geniuses, e.g. Leo Tolstoy, Martin King, etc.; note: seems that Alex Bickle mistranslated "Thou" (Q), i.e. Jacques Thou (1553-1617), Cox IQ of 175, as "Thoreau", listing (Q) him with IQ of 175, which is not the case (Cox does not discuss Thoreau); downgraded to 165|#444 (Jan 2018); downgraded ↓ to 160|#520 (Feb 2018) per his "science ruins the beauty of a red sunset" quote.
— 160 603	Peter Rubens (1577-1640)	IQ_C=160	(Cattell 1000:91) [RGM:231|1,310+] Flemish painter.
— 160 604	 Demosthenes (384-322BC)		(Cattell 1000:36) [RGM:N/A|1,350+] (Murray 4000:N/A) (Singh 100:99) Greek statesman and orator; "Hitchens was wonderfully witty, immensely erudite, seemed to have read absolutely everything, he could quote by the yard. He was a devastating wit and his opponents in debate had reason to regret taking him on. Martin Amis said that he would triumph even against Cicero and Demosthenes." — Richard Dawkins (2011), comment (Q) Hitchens passing, Dec 16 First-slating: 160|#515 (Mar 2018).
— 160 605	 Diodorus (c.90-20BC)		(Cattell 1000:N/A) [RGM:N/A|1,360+] (CR:18) Greek historian; noted for his c.40BC *Historical Library*, aka *Bibliotheca Historica* (Q), a 40-volume set, of which only 1-5 and 11-20 survive, arranged into part one (Ancient Egypt up to destruction of Troy), part two (Trojan War to Alexander the Great), and part three (post Alexander to beginning of Caesar's Gallic War, c.59BC); influential to Lucilio Vanini, Robert Taylor, Timothy Freke, and Dorothy Murdock; first-slating: 160|#515 (Apr 2018).
— 160 606	 Al-Kindi (c.800-873)		[RGM:745|1,500+] (CR:1) Muslim Arab philosopher, polymath, mathematician, physician, musician cryptographer (Q); top ten middle ages genius; one of the first to initiate the import of Greek philosophy into Arabic thinking, including: Socrates, Aristotle, Plotinus, and Euclid; was one of the first blue sky problem theorists; an alchemy debunker, e.g. asserting that

base metals cannot be transformed into gold or silver; first-slating: IQ:160|#556 (Jan 2019).

607	160	Abu Al-Biruni (973-1048)	(GME:43) (CR:8) Iranian-born Afghanistan astronomer, mathematician, physicist, comparative religions scholar, a universal genius claimant; “The difference between you and me is that you’re a philosopher and I’m a [mathematical] scientist.” — Abu Al-Biruni (c.1020), “Letter to Avicenna”
608	160	Henri Bergson (1858-1941)	First-slating: 160|#567 (Jan 2019). (Gottlieb 1000:890) (Becker 139:72) (Stokes 100:57) (Perry 80:46) (CR:67) French evolution theory philosopher, noted for his 1907 *Creative Evolution*, in which he attempts to intermix thermodynamic principles, with the term "creation" or "creative", as a patch solution to the incompatibilities between Darwin, Carnot, and theism; his model is sometimes referred (Q) to as “Bergsonian philosophy”; first-slating: 160|#608 as being *lower* than that of Teilhard (180|#121) and Prigogine (170|#433), who carried his argument to their fullest extent, probability in the neighborhood of Spencer (165|#522), who he tried to correct (Apr 2020).
608	160	George Sand (1804-1876)	IQ_C=160 IQ_O=150	(Cattell 1000:173) [RGM:N/A|1,310+] French novelist, memoirist, and socialist; “We cannot tear out a single page of our life, but we can throw the whole book in the fire.” Before 17, she had read Plutarch, Livy, Herodotus, Tacitus, and Rousseau, whose philosophy she was particularly devoted; influential to: Victor Hugo, Fyodor Dostoevsky, and Walt Whitman; IQ:150 (Q).
609	160	Madame Sevigne (1626-1696)	IQ_C=160	(Cattell 1000:222) [RGM:N/A|1,310+] French epistolary writer; gained posthumous fame for her 1,120 letters, addressed to her daughter over the course of 30 years, note for their wit and vividness; influential to Voltaire (Q).
610	160	Cornelius Agrippa (1486-1535)		(Cattell 1000:739) [RGM:N/A|1,300+] German occult philosopher, theologian, physician, legal expert, and soldier; influential to: Giordano Bruno, John Dee, Jean Meslier, Mary Shelley, and Soren Kierkegaard; first slating: 160#550 (Apr 2018).
611	160	Erich Fromm (1900-1980)		[RGM:661|1,500+] (CR:16) German-born American social psychologist; first-slating 160|#550 (Nov 2018).
612	160	Peter Abelard (1079-1142)		(Cattell 1000:110) [RGM:N/A|1,360+] French scholastic philosopher, theologian, and logician, characterized a “fine genius” (Bayle, c.1693) and “keenest thinker of the 12th century” (Chambers, 1897); first-slating: 160|#517 (Mar 2018).

160 — 613	Charles Sumner (1811-1874)	IQ_C=160	(Cattell 1000:771) [RGM:N/A|1,310+] American politician, lawyer, and senator.
160 | 614	Cleopatra (69-30BC)		[RGM:413|1,500+] Egyptian diplomat, naval commander, linguist, and medical author; Into her teens, she became fluent in Greek, Hebrew, Arabic, Persian, and Egyptian, and was the only queen in 300 years to learn the local tongue; last active ruler of the Ptolemaic Kingdom of Egypt; colloquially ranked as 2nd ranked smartest woman of all time" (Thims, c.2011); Marc Anthony gave over 200,000 scrolls to her for inclusion in the Alexandrian library (Q); was compared to George Sand as "another woman of royal soul (Howe, 1861) (Q); IQ crudely gauged at 180 (c.2011) (Q)(Q); first-slating: 160|#572 (Jun 2019).
160 | 615	Marvin Minsky (1927-1216)	IQ_O =200+ IQ_O=160	[RGM:868|1,250+] characterized as "father of AI"; an IQ:200+ missing candidate (Q); Isaac Asimov stated that Minsky and Carl Sagan were two people he conceded were smarter than he was; IQ ranked (2016) by AI zealot / Christopher Langan fan, at 160 (Q); Minsky conceded (Q) that John Nash was smarter than he was, in his comment that Nash solved his PhD problem dissertation, which he was stuck on, by suggesting a Fourier series.
160 — 616	Louis Thiers (1797-1877)	IQ_C=160	
160 — 617	John Wesley (1703-1791)	IQ_C=160	
160 | 618	George Villiers (aka Clarendon) (1800-1870)	IQ_C=160	
			↑ 160+
155 — 619	William Blake (1757-1827)		(Cattell 1000:N/A) [RGM:213|1,310+] (Murray 4000:N/A) English poet, artist, writer, and philosopher; noted for his "energy is eternal delight" stylized poetry; some think (Q) was "IQ was off the chart"; first-slating: 155|#183 (Feb 2018).
155 — 620	Milton Friedman (1912-2006)	IQ_O=300 IQ_O=208 IQ_O =130, 170	[RGM:330|1,250+] a greatest economist ever; cited at IQ of 208, according to a 2010 YouTube post (by spinnerZulu) who heard it on a radio show (in Libb Thims IQ:200+ genius folder); IQ estimated (Q) at 130, 170, 300, in EconJobRumors forum (2014), via polling.
155 | 621	William Thackeray (1811-1863) ↑	IQ_C=150	Gets IQ upgrade for keen interest in Goethe's *Elective Affinities*.
			A GLAE candidate; his 1615 *Don Quixote* was ranked by the Norwegian

622 | 155	Miguel de Cervantes (1547-1616)	IQ_C=155	Book Club's 2002 100 Best Books of All Time listing as the "best literary work ever written", based on 100 top ten lists, submitted by a 100 writers, from 54 countries; a book notably read by Albert Einstein (IQ=220) and his Olympia Academy group (see: Filon-Pearson demon).
623 — 155	William Wallace (c.1270-1305)		(Cattell 1000:957) [RGM:N/A|1,500+] (EPD:M+F|~8) Scottish rebellion leader; first-slating, generally per his legendary persona (Q), at: IQ:155|#603 (Oct 2019).
624 — 155	John Kennedy (1917–1963)	IQ_{Si} =160	[RGM:114|1,305+] a top American President (see: American Presidents by IQ).
625 — 155	Zeno of Elea (495-435BC)		(Cattell 1000:726) [RGM:1,229|1,310+] (ACR:12) (Stokes 100:6) (Eells 100:100) Greek-Italian philosopher, was one of three main philosophers of the Eleatic school, founded by Parmenides, whose third member includes Melissus (500-440BC) — whose essential tenets were the denial of change, denial of the void (or non-being), denial of movement, in support of the overarching postulate of continuity of being (or being oneness), or something along these lines — generally known for his famous paradoxes, e.g. Achilles and the tortoise, which aimed to repudiate plurality and change, and thus motion; first-slating: 155|#475 (Jan 2018).
626 — 155	Carl Clausewitz (1780-1831)		[RGM:226|1,500+] (GMG:9) (CR:9) Prussian general noted for his moral, i.e. "moral force", and romantic theory of warfare, who in his 1832 posthumously-published treatise *On War*, used the principle of friction to distinguish real war from the mechanical, Newtonian world; a Philoepisteme "top 10 missing" (Q) top 1000 geniuses candidate (2018); first-slating: 155|#605 (Oct 2019).
627 — 155	Titian (1488-1576) ↑	IQ_B=145	(Cattell 1000:146) [RGM:200|1,500+] (Murray 4000:3|WA) Italian painter; "Giotto, Titian, Rembrandt, and Goya were the great painters. I am only a public clown." — Pablo Picasso (1952), Interview (Q) Noted for: Assumption of the Virgin (1518), Venus of Urbino (1534), Diana and Actaeon (1559), among others; upgraded from IQ:145|#662 to IQ:155|#582.
	Marco		(Cattell 1000:127) [RGM:147|1,500+] (Gottlieb 1000:66) Italian merchant, explorer, and writer; "Sabah would introduce his designated assassins into his garden, some four or six or ten at a time, having first made them drink a certain potion, which cast them into deep sleep, and then causing them to be lifted and carried in. So, when they awoke, they found themselves in the garden, a place so

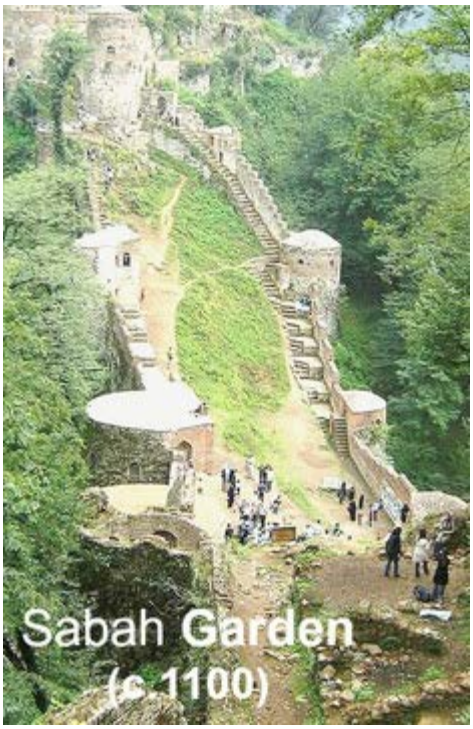

155 | 627 Polo (1254-1324)

charming they believe that it was [Islamic] paradise in truth, and the beautiful voluptuous maidens dallied with them to their heart's content, so thy had **what all men most desire above all else**."

— Marco Polo (c.1300), *Publication*

noted, just as the Greek Heraclitus did with his visits to the Egyptians and surrounding foreign lands, for his travels to the Islamic and Asian countries, and reported back to the Western world, information about various stories, tales, and cultural natures; first-slating: 145|#610 (Mar 2018); upgrade ↑ from 145|#728 to 155|#627 per Sabah quote (Apr 2020).

155 | 628 Alexander Hamilton (1756-1804) IQ_C=155

155 | 629 Giacomo Casanova (1725-1798)

(Cattell 1000:814) [RGM:N/A|1,310+] Italian adventurer, author, and romance philosopher; a semi-ranked polymath (Carr, 2009); first-slating 155|#490 (Feb 2018).

155 | 630 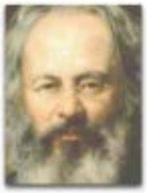 Orestes Brownson (1803-1876) ↑

(Cattell 1000:#) [RGM:881|1,330+] (Murray 4000:N/A) (EPD product) American auto-educated intellectual, activist, and publicist; noted for his voluminous writings on his respective views as a Presbyterian (1822) turned Universalism pastor (1831) turned infidel-atheist (1840) turned Roman Catholic (1844); first-slating: 155|#530 (Mar 2018).

155 | 631 Theodore Roosevelt (1858–1919) IQ_{Si} =153

[RGM:307|1,305+]

(Cattell 1000:755) [RGM:N/A|1,500+] American inventor, engineer, and artist; in 1800, after being commissioned by Napoleon Bonaparte, leader of France, to attempt to design a

632 | 155

Robert Fulton (1765-1815)

IQ_C=155

submarine; he produced the *Nautilus*, the first practical submarine in history; in 1807, he built *The North River Steamboat* (later *Clermont*), the first commercially viable steamboat, which traveled on the Hudson River with passengers, from New York City to Albany and back again, a round trip of 300 miles, in 62 hours.

633 | 155

Livy (59BC-17AD)

(Cattell 1000:119) [RGM:N/A|1,310+] (Murray 4000:N/A) Roman historian; noted for his *History of Rome* (9BC), wherein he discusses the Mucius Scaevola hand burning legend (famously tested by Jean Rousseau and Friedrich Nietzsche in youth); Thomas Jefferson, in his recommended education letter to his nephew Peter Carr, says that one should read the Bible as one “would read Livy or Tacitus”; read by John Mill (O) between ate 8 and 12; cited in the silent historians problem; first-slating: 155|#192 (Feb 2018), as below peer historians: Henry Adams (195|#21), Herodotus (175|#229), Oswald Spengler (170|#308), and Bede (160|#431).

634 | 155

William Wilberforce (1759-1833)

IQ_C=155

635 | 155

Henry IV (1553-1610)

(Cattell 1000:76) [RGM:N/A|1,500+] French king, in power from 1589 to 1610, noted for (add); first-slating: 155|#613 (Aug 2019).

636 | 155

Ludwig Tieck (1773-1853) ↓

IQ_C=165

Downgrade for going against Goethe, calling his theory-containing novella "torture affinities"; a fact that German writer and novelist Bettina Brentano (1785-1859) let Goethe know.

637 | 155

Josephus (c.37-100AD)

(Cattell 1000: 645) (CR:7) Roman-Jewish historian, scholar, and hagiographer, oft-cited in the silent historians problem on whether or not he refers to a "Jesus" as the "Christ", a detail that was “unknown” to Origen (c.230AD), who had copies of his works; he also conjectured that the Jewish exodus was based on the 1300BC expulsion of the Hyksos from Egypt; first-slating: 155|#535 (Apr 2018).

638 | 155

Maria Montessori (1870-1952)

IQ_B=157

[RGM:N/A|1,500+] Italian physician and educator; best known for the philosophy of education, aka Montessori school, that bears her name, and her writing on scientific pedagogy.

His 29th fable quote: "Hippocrates in time arrived at the conclusion that he

639 | 155

Jean de La Fontaine (1621-1695)

IQ_C=155

had not sought whether the heart or the head was the seat of either reason or sense in man and beast" is inscribed at the base of the 1869 Democritus mediating on the seat of the soul statue (Paris).

640 | 155

Adolf Hitler (1889-1945) ↑

IQ_{SS} =143 IQ_O =125-150

TopTens.com's "10 Smartest People in History" (Q); IQ cited at: 125 (Q), 130 (Q), and 150 (Q); must be at least comparable to: Alexander the Great (IQ=180), Genghis Khan (IQ=?), or Napoleon (IQ=175), all of which sought world domination.

641 | 155

Simon Bolivar (1783-1830)

IQ_C=155 IQ_W =145

(Cattell 1000:N/A) [RGM:640|1,500+] (GCH300:277) Venezuelan statesman and military leader (see: greatest military genius); noted for []

642 | 155

Hannibal (247-182BC)

IQ_B=155

(Cattell 1000:107) [RGM:N/A|1,500+] Carthaginian military commander (see: greatest military genius); noted as the man who nearly brought Rome to its knees.

643 | 155

Herbert Wells (1866-1946)

[RGM:162|1,500+] (CR:10) English writer, futurist, and philosopher;

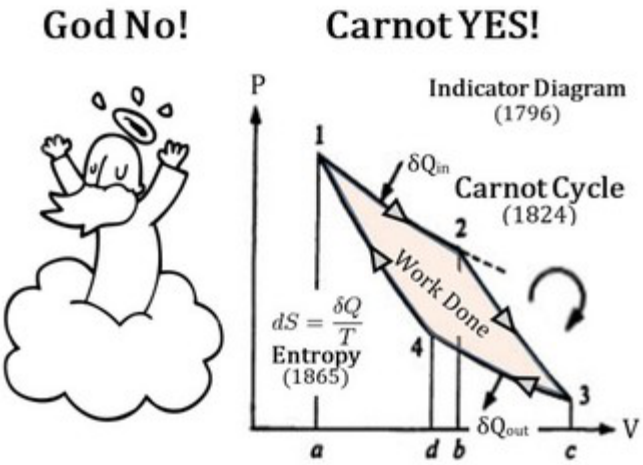

"He was a practical electrician fond of whiskey, a heavy, red-haired brute with irregular teeth. He **doubted the existence of a deity** but **accepted Carnot's cycle**, and he had read Shakespeare and found him weak in chemistry."

> — Herbert Wells (1906), "Lord of the Dynamos" (Q); in: *The Door in the Wall, and Other Stories*

first-slating: 155|#501 (Feb 2018).

644 | 155

Ait Weil Zade [aka Ali Pasha] (1740-1822)

IQ_C=155

(Cattell 1000:N/A) [RGM:N/A|1,350+] (Murray 4000:N/A) (RMS:67) English Egyptologist;

"It would be improper to assume that Budge, despite his reluctance to adopt the newer German school pronunciation reform, never made valuable and lasting contributions to mainstream Egyptological studies. It was Budge who

155 | 645

Wallis Budge (1857-1934)

originally secured the *Papyrus of Ani* from Egypt and brought it to the British Museum. For this alone, the world owes him a vote of thanks. His books may be questionable by academic standards, but his output was huge, filling a very long bookshelf indeed, and inspiring generations of interested readers. His publication of the elephant folio editions of *The Papyrus of Hunefer* and *The Papyrus of Ani* are reason alone to appreciate **his genius**. Had it not been for Budge, this present volume would not exist."

> — Daniel Gunther (2015), "Thoughts on the 20th Anniversary Edition" in the Faulkner-translation of *The Egyptian Book of the Dead* (pgs. 21-22)

noted for his 20+ volume collected works set of the intricacies of Egyptian hieroglyphics translated, with religio-mythology commentary, into English; first-slating: 155|#540 (Feb 2018).

155 — 646

Richard Baxter (1615-1691) IQ_C=155

155 — 647

Pierre Beranger (1780-1857) IQ_C=155

155 | 648

Roger Sperry (1913-1994)

American

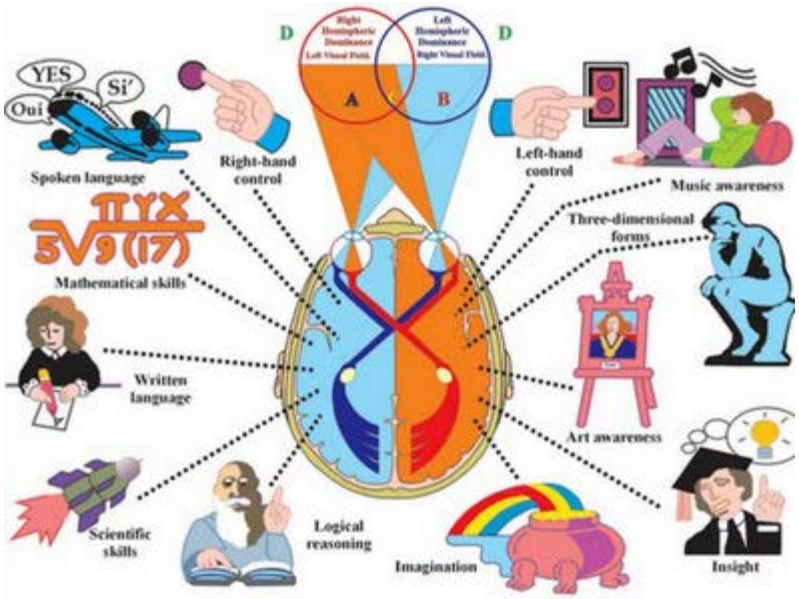

neurophysiologist;

"The cells and fibers of the brain must carry some kind of individual identification tags, presumably cytochemical in nature, by which they are distinguished one from another almost, in many regions, to the level of the single neurons."

> — Roger Sperry (c.1965) (Q)

Noted for his split-brain research on epileptic cats (1953), after which he did split-brain experiments on humans (1962), wherein he found that the left side of the brain can read words, e.g. "nut", and the right side of the brain can feel things, grab a "nut", but not recognize the word; first-slating: IQ:155|#602

(Jan 2019).

649 — 155 Paul Broca (1824-1880)

French physician, anatomist, and anthropologist;

"The left hemisphere is well-qualified for dominance because we know following Broca's remarkable work last century that it is the site of speech and ideation center."

— Eugene Schoffeniels (1973), *Anti-Chance* (pg. 76)

noted for work which revealed that the brains of patients suffering from aphasia contained lesions in the left frontal cortex region, aka "Broca's area" (shown); this also relates to the work of Roger Sperry who showed that only the left side of a split-brain was able to recognize written words; first-slating: IQ:155|#603 (Jan 2019).

650 — 155 Elizabeth Gaskell (1810-1865) IQ_C=160

(Cattell 1000:N/A) [RGM:N/A|1,310+] English novelist, biographer, and short story writer; down-graded from: 160|#550 to 155|#602 per relative non-notability, as compared to other GFG (Jan 2019).

651 — 155 Richard Cobden (1804-1865) IQ_C=155

652 — 155 Diogenes Laertius (c.190-250AD)

(Cattell 1000:N/A) [RGM:N/A|1,310+] (CR:11) Greco-Roman dark age citation staple historian; his *The Lives and Opinions of Eminent Philosophers* (c.230AD), is heavily-cited for a number of historical topics, e.g. Democritus, monad theory, Zeno of Citium and the slave stealing parable (Q), the existographic data on Epicurus, being and nonbeing, etc.; cited by Dean Simonton (Q), in his *Genius 101* (2009), as the first existographical work on geniuses; first slating: 155|#505 (Feb 2018).

653 — 155 Georges Danton (1759-1794) IQ_C=155

654 — 155 Albrecht Durer (1471-1528) IQ_C=155

655 — 155 Thomas Carlyle (1795-1881) ↑

(Cattell 1000:103) [RGM:N/A|1,350+] (Murray 4000:N/A) Scottish philosopher and historian;

"Close thy Byron, open thy Goethe."

— Thomas Carlyle (c.1850) (Q)

noted for his *The French Revolution* (1837), wherein he described members

of states general convention of 1789 as gravitating bodies (see: social gravitation); and for his “great men” theory of history, which Henry Buckle and Morris Zucker both grappled with; friends with John Mill and Ralph Emerson; first slating: 155|#546 (Feb 2018).

656 | 155 George Fox (1624-1691) IQ_C=155

657 | 155 Charles Fox (1749-1806) IQ_C=155

658 | 155 Leon Gambetta (1838-1882) IQ_C=155

659 | 155 Robert Koch (1843-1910)

(Cattell 1000:N/A) [RGM:1320|1,500+] (Murray 4000:3|Med) (Glenn 20:13) German physician; founder of modern bacteriology; known for his role in identifying the specific causative agents of tuberculosis, cholera, and anthrax and for giving experimental support for the concept of infectious disease; son of a mining engineer, he astounded his parents at the age of five by telling them that he had, with the aid of the newspapers, taught himself to read, a feat which foreshadowed the intelligence and methodical persistence which were to be so characteristic of him; first draft gauged at 155|#465 (Nov 2017).

660 | 155 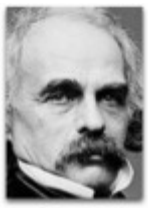 Nathaniel Hawthorne (1804-1864) IQ_C=155

(Cattell 1000:527) [RGM:N/A|1,500+] American novelist, dark romantic, and short story writer;

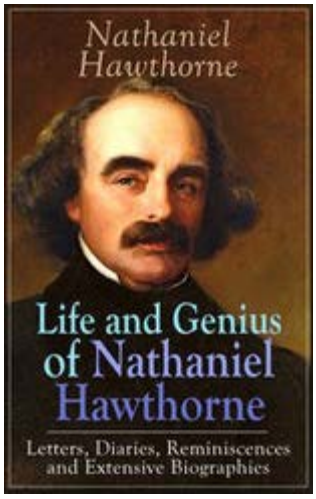

661 | 155 Madame Maintenon (1635-1719) IQ_C=155 (Cattell 1000:281) [RGM:N/A|1,310+] Second wife of Louis XIV.

(Cattell 1000:696) [RGM:N/A|1,310+] Self-taught Scottish geologist and writer, folklorist, and an evangelical Christian; he did not believe that later species were descended from earlier ones; he denied the Epicurean theory that new species occasionally budded from the soil, and the Lamarckian

662 | 155 Hugh Miller (1802-1856) IQ_C=155 theory of development of species, as lacking evidence; argued that all this showed the direct action of a benevolent creator, as attested in the Bible; he accepted the view of Thomas Chalmers that Genesis begins with an account of geological periods, and does not mean that each of them is a day; Noah's Flood was a limited subsidence of the Middle East; geology, to Miller, offered a better version of the argument from design than William Paley could provide, and answered the objections of sceptics, by showing that living species did not arise by chance or by impersonal law.

663 — 155 Jacques Necker (1732-1804) IQ_C=155 (Cattell 1000:235) [RGM:N/A|1,310+] French statesman and financier.

664 — 155 Daniel O'Connell (1775-1847) IQ_C=155 (Cattell 1000:438) [RGM:N/A|1,310+] Irish patriot and orator.

665 | 155 Otto Weininger (1880-1903) [RGM:238|1,350+] Austrian philosopher; noted for his 1903 *Eros and Psyche or Sex and Character: A Fundamental Investigation*, published four months before he shot himself in the heart (see: founders and suicide), in which he claims to be "the first" to pick up on Goethe's chemical affinity theory of relationships, passions, sex, marriage and divorce; first slating: 180|#106 (Dec 2016); down-graded ↓ to 175|#225 upon reading first 100-pgs of his *Sex and Character*; down-grade ↓ to 155|#560 after finishing *Sex and Character* (Mar 2018), if not NOT in top 1000 altogether [?].

666 — 155 Giovanni Palestrina (1525-1594) IQ_C=155 (Cattell 1000:471) [RGM:N/A|1,310+] Italian composer.

667 — 155 William Prescott (1796-1859) IQ_C=155 (Cattell 1000:321) [RGM:N/A|1,310+] American historian.

668 — 155 Girolamo Savonarola (1452-1498) IQ_C=155 (Cattell 1000:187) [RGM:N/A|1,310+] Italian Dominican friar and preacher.

669 | 155 Diagoras (c.448-388BC) (Cattell 1000:N/A)

> With reason did the Athenians adjudge Diagoras guilty of atheism, in that he not only divulged the Orphic doctrine, and published the mysteries of Eleusis and of the Cabiri, and chopped up the wooden statue of Hercules to boil his turnips, but openly declared that there were no gods at all.
> — Athenagoras (200AD), *A Plea for the Christians*

[RGM:N/A|1,310+] (FA:17) Cited by Cicero (*On The Nature of the Gods*, 45BC), along with Theodorus, as the first person to profess that gods do not exist at all (see: first true atheist); in 430BC, the Athenians erected a bronze inscription offering one talent in silver to anyone who killed; first-draft guesstimated at #475 (Dec 2017).

155 — 670	William Seward (1801-1872)	IQ_C=155	(Cattell 1000:441) [RGM:N/A|1,310+] American statesman; opponent of the spread of slavery, in the years leading up to the American Civil War.
155 — 671	William Temple (1628-1699)	IQ_C=155	(Cattell 1000:470) [RGM:N/A|1,310+] English diplomat, statesman, and author.
155 — 672	Anthony Van Dyck (1599-1641)	IQ_C=155	(Cattell 1000:162) [RGM:N/A|1,310+] Flemish painter.
155 — 673	Nicolas Chamfort (1741-1794)		(Cattell 1000:958) (RGM:565|1,500+) French writer, epigramist, and aphorist; "The aphorism as a deliberately cultivated literary form, as distinct from something said briefly, did not appear in European literature until the Renaissance, when the aphoristic writings of Erasmus, Michelangelo, Paracelsus and Bacon, but above all those of the line of French philosophers from Montaigne to **Chamfort**, bestowed on it the distinctive character by which we now recognize it." — Reginald Hollingdale (1990), "Introduction" to Georg Lichtenberg's *The Waste Books* (1799) First-draft slating: IQ:155|#603 (Jan 2019), generally based on the above.
155 — 674	Robert Walpole (1676-1745)	IQ_C=155	(Cattell 1000:394) [RGM:N/A|1,310+] English statesman.
155 — 675	William Warburton (1698-1779)	IQ_C=155	(Cattell 1000:499) [RGM:N/A|1,310+] English prelate, theological controversialist, and critic.
155 — 676	Robert Blake (1599-1657)	IQ_C=155	(Cattell 1000:460) [RGM:N/A|1,310+] English admiral.
155 — 677	Stanley Kubrick (1928-1999)	IQ_O=200	[RGM:343|1,320+] American film director, screenwriter, and producer; noted for meticulous to detail and emotion films such as *Spartacus*, *The Shining*, *Full Metal Jacket*, *A Clockwork Orange*; the nature of this genius is a frequent Quora topic (Q); IQ cited (Q) at 200; first-slating: 155|#570 (Mar 2018).
			↑ 155+
			(Murray 4000:1|ES) (Gottlieb 1000:512) (Simmons 100:28) (CR:11) Scottish-born English lawyer turned geologist;

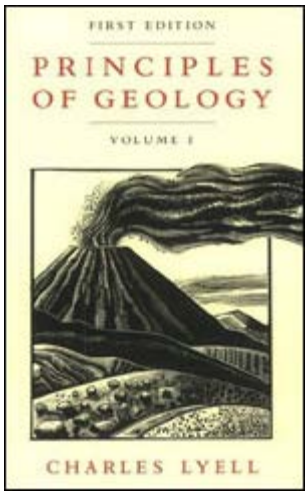

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> "Hitherto, no rival hypothesis has been proposed as a substitute for the doctrine of transmutation; for 'independent creation', as it is often termed, or the direct intervention of the 'supreme cause', must simply be considered as an avowal that we deem the question to lie beyond the domain of science."
>
> — Charles Lyell (1863), *The Antiquity of Man* (pg. 421) (Q)

150 | 678

Charles Lyell (1797-1875)

-

noted for his 1830 *Principles of Geology*, published in three volumes (1830-33), wherein he showed that according to geological evidence that the earth was more than 300-million years old, rather than 6,000-years-old, the Biblical view; very influential book to Charles Darwin and his evolution theory; first-slating: 150|#570 (Mar, 2018).

(Cattell 1000:N/A)

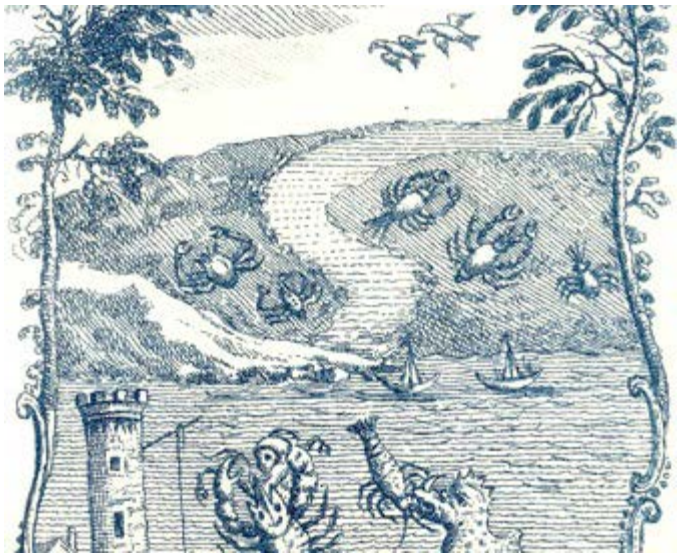

150 | 679

Benoit de Maillet (1656-1738) ↑

[RGM:N/A|1,360+]French natural philosopher, diplomat, and proto-evolution theorist; noted for 1732 *Telliamed* wherein he proposed, based on falling sea level rates iron, sea boat mooring rings in the desert in Memphis, and sea shells in rocks, that the earth was 2-billion years old, and that humans originally derived from human-like sea creatures; proposed that life began in the water in the form of minuscule seeds that joined together to create all aquatic forms, from which all terrestrial and winged creatures were then derived. In his opinion, all plants and animals would have analogous examples among the aquatic specimens; these religion overhauling notions were influential to Buffon and to Julien la Mettrie; first-slating: 150|#570 (Apr 2018).

(Cattell 1000:168)
[RGM:93|1,500+]
(Murray 4000:7|WA) Dutch draughtsman,

680 | 150

Rembrandt (1606-1669)

IQ_{CB} =**150**
IQ_{C}=155
IQ_{B}=145

painter and printmaker;

“A pious mind, paces honor above wealth.”
— Rembrandt (1634) (Q)

“Giotto, Titian, Rembrandt, and Goya were the great painters. I am only a public clown.”
— Pablo Picasso (1952), Interview (Q)

regarded as the greatest artist of Holland's ‘golden age’; his “Pendant Portraits of Maerten Soolmans and Oopjen Coppit”, which sold for $190M, is the eight most expensive painting (Q) in history; is ranked #4 in Ranker.com’s Best Painters of All Time (Q) listing; his “The Night Watch”, adjacent, is Ranker.com ranked at #23 “Best Paintings of All Time” (Q) out of 200.

681 | 150

Horace (65BC-8BC)

(Cattell 1000:53) [RGM:N/A|1,310+] (Murray 4000:16|WL) Roman poet and Epicurean-Stoic philosopher; first-slating: 150|#527 (Feb 2018)

682 | 150

Robert Ingersoll (1833-1899)

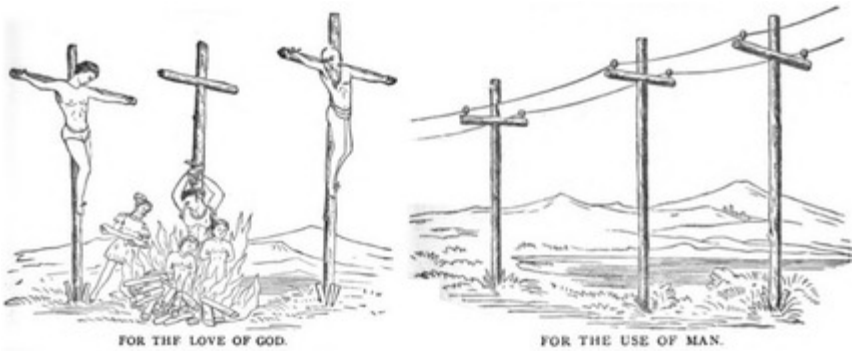

[RGM:802|1,500+] (HD:34) (FA:117) (CR:28) American lawyer, colonel, politician, and free thought orator;

“**Ingersoll** is the nearest approach we Americans have had to Voltaire.”
— James Gillis (1925)

nicknamed the “great agnostic”, “great American atheist” (1888) (Q), and or the "pagan prophet" (Hecht, 2003), noted for being one of the first to state that "Adam and Eve never existed" (c.1882), for making one of the first atheist eulogies, for being one of the supposed atheist rocks to avoid in the Christian captain anecdote, and for being one of the most-prolific atheism quotesmiths; first-slating: 150|#633 (Jan 2019).

(Cattell 1000:N/A)

683 | 150

Alfred Mayer (1836-1897)

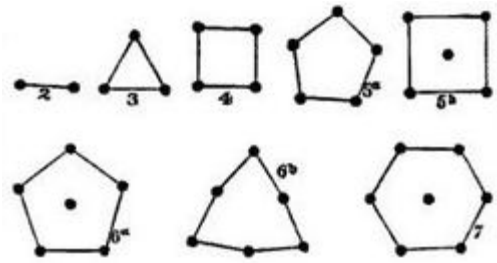

[RGM:N/A|1,330+] (Murray 4000:18|P) American experimental genius; in 1878, in expanding on the earlier c.1590 floating loadstone experiments of William Gilbert, he put charged needles in cork floating in water, above which he put an opposite-charged magnet, and therein discerned geometric patterns, changing per number of needles; this data served as the theoretical basis for Joseph Thomson's 1904 plum pudding model of the atom, two big stepping stones in the development of atomic theory; first slating: 150|#567 (Feb 2018).

684 | 150

Strabo (c.63BC-24AD)

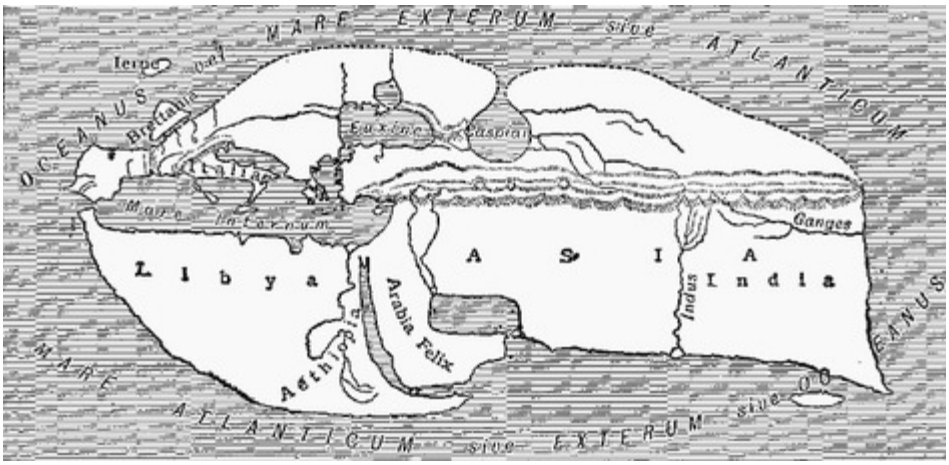

(Cattell 1000:500) Greek geographer, philosopher, and historian, noted for his 23AD *Geography*, which established the science of geography, based on then-current views, and historical precursor models; first-slating: IQ:150|#633 (Jan 2019).

685 | 150

William Crookes (1832-1919)

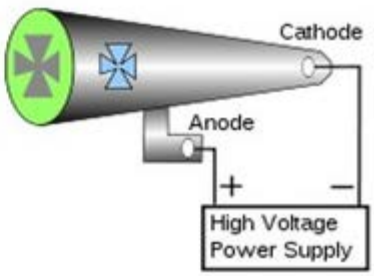

(Murray 4000:12) (CR:3) British chemist and physicist; noted for his for his 1870 invention of the Crooke tube, and cathode-ray studies, fundamental in the development of atomic physics (specifically Joseph Thomson's 1897 paper, published after experimenting with cathode-ray tubes, in which he postulated that the cathode rays are streams of "negatively electrified particles" [i.e. electrons] with mass; data from which, in 1904, became the backbone of the "plum pudding model" of atomic theory), and for his discovery of the element thallium; first-slating: 150|#663 (Oct 2019).

686 | 150

Duns Scotus (1266-1308)

(Gottlieb 1000:635) (Stokes 100:23) Scottish philosopher and theologian, aka "medieval Kant" (Anar, 2019); oft-grouped with: Thomas Aquinas, William of Ockham (who he influenced), and Francisco Suarez as top four middle ages philosopher theologians; influenced: Rene Descartes, Martin Heidegger, Gilles Deleuze, Antonius Andreas; first-slating: 150|#662 (Sep 2019).

687 | 150	Horatio Nelson (1758-1805)	IQ_{CB} =**148** IQ_{C}=150 IQ_{B}=145	(Cattell 1000:N/A) [RGM:N/A|1,500+] [GCH:6|300+] British naval commander and national hero; famous for his naval victories against the French during the Napoleonic Wars.
688 | 150	Joseph Leidy (1823-1891)		One of fabled "last persons to know everything" (although this epitaph seems to more of an overzealous labeling of his biographer American anatomist and biologist Leonard Warren, who was curious to know about this rather unknown University of Pennsylvania biology-paleontology pioneer folk hero, pictured above his office); first-draft IQ gauged at 130-155 (c.2015). 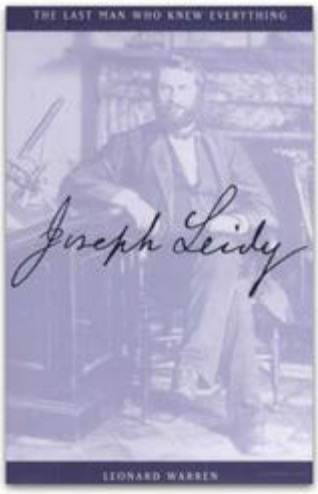
689 | 150	Thorstein Veblen (1857-1929)		One of fabled "last persons to know everything"; IQ first-draft guesstimated at 130-155 (c.2015).
690 | 150	C.S. Lewis (1898-1963)		Irish-born English writer and theism / atheism commentator; said to have “extremely high intelligence in the linguistic domain”, but unable to pass a school certificate mathematics exam, despite many attempts (see: IQ tests and mislabeled geniuses); a common query (Q) is who, J.R.R Tolkien [RGM:67|1,300+] or Lewis, had a higher IQ? First-slating: 150|#616 (Jul 2018)
691 | 150	Franklin D. Roosevelt (1882–1945)	IQ_{Si} =151	[RGM:359|1,305+] a top American President (see: American Presidents by IQ).
692 | 150	Paul Cezanne (1839-1906)	IQ_{B}=150	
693 | 150	Frederick Alexander (1869-1955)	IQ_{B}=150	[RGM:N/A|1,310+] Australian Shakespearian actor; noted for the “Alexander technique”, a psycho-physical re-learning process aimed at fixing ailments, and to recognize and overcome reactive, habitual limitations in movement and thinking.
694 | 150	Martha Graham (1895-1991)	IQ_{B}=148	[RGM:834|1,500+] American dance choreographer; inspiration to Madonna, who stated upon meeting her: “she absolutely lived up to all my expectations with her wit, intelligence, and nerve-wracking imperiousness”.
695 | 150	Muhammad Ali (1942-2016)	IQ_{B}=147	[RGM:786|1,310+] American boxer and activist.

696	150	Johannes Gutenberg (1398-1468) ↑↑	IQ_B=140	(Cattell 1000:231) [RGM:40|1,330+] (Murray 4000:N/A) (Hart 100:3) German blacksmith, goldsmith, and engraver; noted for his c.1450 invention of the movable type printing press; upgraded from 140|#614 to 150|#575 (Feb 2018).
697	150	John Bright (1811-1889)	IQ_C=150	(Cattell 1000:366) [RGM:212|1,310+] English liberal statesman and orator.
698	150	Robert Burns (1759-1796)	IQ_C=150	(Cattell 1000:92) [RGM:753|1,500+] Scottish lyric poet; “Facts are chiels that winna ding, an’ downa be disputed.” — Robert Burns (1786), *A Dream* (Q)(Q); cited by Steven Shapin (1985) in *Leviathan and the Air Pump* (pg. 22)
699	150	Hesiod (c.750-650BC)		(Cattell 1000:477) [RGM:N/A|1,310+] (ACR:20±) (CR:12) his *Theogony*, aka “birth of the gods”, translated the general scheme of main Egyptian creation myths, into a new Greek god framework; first-draft slated at #525 (Jan 2018).
700	150	Hans Lippershey (1570-1619)		(GAE:#) (CR:3) German-born Dutch spectacle maker; he is generally credited (Q) with the invention of the telescope or “Dutch perspective glass”; a device he tried to obtain a patent for in 1608; news of this design reached the ears of Galileo, who improved on the designs; on 7 Jan 1610, Galileo had built a new improved 30 power telescope (shown adjacent), and pointed it towards Jupiter, and found three small, bright stars near the planet (Q); that year, he published a small book titled *The Starry Messenger*, outlining his findings; first draft gauged at IQ:150|#490 (Nov 2017); upgrade from 150|#700 to (add) (Apr, 2020).

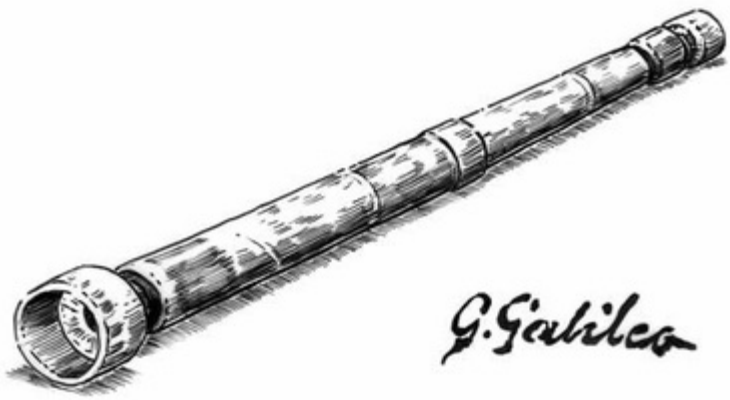

Previous
- Top 1000 geniuses: 1-100 | IQ: 225-180
- Top 1000 geniuses: 101-200 | IQ: 180-180
- Top 1000 geniuses: 201-300 | IQ: 180-175
- Top 1000 geniuses: 301-400 | IQ: 175-170
- Top 1000 geniuses: 401-500 | IQ: 170-165
- Top 1000 geniuses: 501-600 | IQ: 165-160
- **Top 1000 geniuses: 601-700** | IQ: 160-150
- Top 1000 geniuses: 701-800 | IQ: 150-140

- Top 1000 geniuses: 801-900
- Top 1000 geniuses: 901-1000
- Top 1000 geniuses (candidates)

Notes

N1. Note: see "IQ key" page for IQ subscript symbol meaning.

References

1. Terman, Lewis. (1916). *The Measurement of Intelligence: an Explanation of and a Complete Guide for he Use of the Stanford Guide for the Use of the Stanford Revision and Extension of the Binet-Simon Intelligence Scale* (classification of intelligence, pg. 79; I.Q., pg. 53, etc.). Houghton Mifflin Co.
2. Adams, Susan, et al. (2017). “The 100 Greatest Living Business Minds”, *Forbes 100th Anniversary Issue* (pg. 116), Dec 18.

θΔics

In genius rankings, **top 1000 geniuses** refers to the greatest five-hundred geniuses of all time ranked by IQ or "relative brightness or intellect" (Cox, 1926); below are the sixth tier greatest geniuses of all time, numbers 701 to 800.

Geniuses | 701-800

The following are the geniuses "701 to 800" of the top 1000 geniuses (previous: 1-100, 201-300, 301-400, 401-500, 501-600, previous: 601-700, next: **801-900**, 901-1000): [N1]

	Geniuses 601 to 700		
150 — 701	William Cobbett (1763-1835)	IQ_C =150	(Cattell 1000:406) [RGM:N/A|1,310+] English political writer.
150 — 702	John Franklin (1786-1847)	IQ_C =150	(Cattell 1000:442) [RGM:N/A|1,310+] English naval officer.
150 — 703	Auguste de Marmont (1774-1852)	IQ_C =150	(Cattell 1000:174) [RGM:N/A|1,310+] French marshal.
150 — 704	Thomas Moore (1779-1852)	IQ_C =150	(Cattell 1000:332) [RGM:436|1,500+] Irish poet; not to be confused with: George Moore (1873-1958) (Stokes 100:80).
150 — 705	Aesop (c.620-564BC)		(Cattell 1000:944) Greek moral philosopher; noted for his fabulist storytelling using animal-human figures to convey teachings about ambiguous natures; cited by Herodotus (425BC); Socrates, according to Plato, while under the death sentence, was said to have passed the time by converting Aesop's fables, from memory, into verse; discussed by Aristotle, Plutarch, etc.; first-draft gauged at IQ:150|#495 (Dec 2017).
150 — 706	Theodor Schwann (1810-1882)		(Murray 4000:8|B) German physiologist and physician; noted for his 1839 demonstration that animal tissues were made of cells, which, together with Matthias Schlieden's 1838 statement that plant tissues were composed of cells, laid the foundation for "cell theory"; eponym of Schwann cells; discoverer of the digestive enzyme pepsin; coiner of "metabolism"; first-slating: IQ:150|#654 (Jan 2019).
150 — 707	Bartolome Murillo (1617-1682)	IQ_C =150	(Cattell 1000:386) [RGM:N/A|1,310+] Spanish Baroque painter.
150 — 708	Nicolas Soult (1769-1851)	IQ_C =150	(Cattell 1000:343) [RGM:N/A|1,310+] French marshal.

150 — 709	John Wilkes (1727-1797)	IQ_C =150	(Cattell 1000:401) [RGM:N/A|1,310+] English politician, publicist, and political agitator.
150 — 710	Truman Capote (1924-1984)	IQ_{SS} =185	[RGM:663|1,300+] American novelist; author of *Breakfast at Tiffany's*; quote: "It's a scientific fact that if you stay in California, you lose one point off your **IQ** every year" in: *The Portable Curmudgeon* (c.1665) (pg. 59) (Ñº).
150 — 711	Georges Le Sage (1724-1803) ↑↑		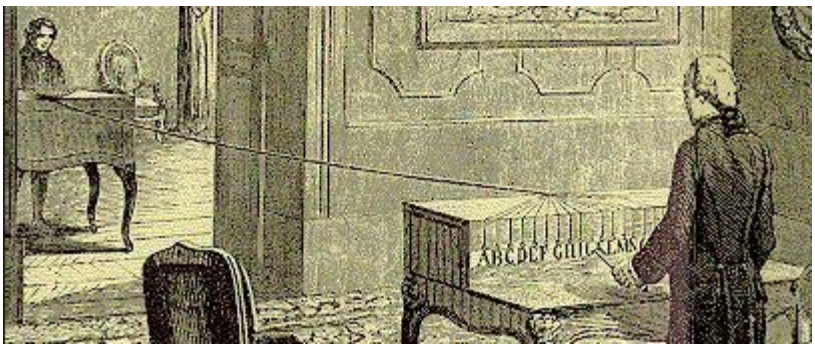 Invented (1774) the first electric telegraph consisting of 24 wires, each suitably spaced and insulated by means of glass partitions at frequent intervals, placed in a trough in the ground, according to which each wire represented a certain letter of the alphabet; did a mathematical proof of chemical affinity; wrote on the history of gravity theory.
150 — 712	Winston Churchill (1874-1965) ↑		[RGM:136|1,300+] British politician, Prime Minister (1940 to 1945; 1951 to 1955), historian, writer, and artist; missing IQ=200+ candidate (Ñº); a gifted child who failed sixth grade (see: mislabeled geniuses) (Ñº).
			↑ 150+
145 — 713	Clarence Darrow (1857-1938)		(CR:13) American lawyer and free thinker; "The number of people on the borderline of insanity in a big country is simply appalling, and these seem especially addicted to believing themselves, saviors, and prophets. It only takes a slight stimulus to throw them entirely off their balance." — Clarence Darrow (1932), *The Story of My Life* "With the death of **Clarence Darrow** in 1938, American public life lost the last well-known secularist crusader who stood squarely in the enlightenment freethought tradition of Thomas Paine and Robert Ingersoll."

— Susan Jacoby (2004), *Freethinkers: a History of American Secularism*

			Noted as celebrated and sharp agnostic lawyer who defended Darwin against god, in the American school system, in the Scopes Monkey Trial (1925); first-slating: IQ:145|#659 (Jan 2019), loosely gauged as below Paine and Ingersoll.
714 | 145		Donald Cardwell (1919-1998)	(CR:48) English physicist and science historian, an expert in the area of the history of heat theory, history of steam engines, and history of thermodynamics, noted for his *From Watt to Clausius*, wherein he gives, what seems to be the ONLY cogent summary, at least in the English-speaking world, of entropy and the second law of thermodynamics, as defined by Clausius; first-slating: 145|#714 (Mar 2020).
714 | 145		Francis Galton (1822-1911) ↓ ↓	IQ_T=200 [RGM:325|1,260+] His IQ estimate (1916, Terman) was a super over-estimate, based on an age four letter he wrote to his sister, that he could read any English book, multiply, and knew the pence table; quote: "god alone knows how [Terman] estimated Galton's IQ as 200" (Peter Medawar).
715 | 145		Ferdinand Magellan (1480-1521)	IQ_B =145 (Cattell 1000:635) [RGM:343|1,310+] Portuguese explorer who organized the Spanish expedition to the East Indies from 1519 to 1522, resulting in the first circumnavigation of the Earth, completed by Juan Sebastián.
716 | 145		Arthur Wellesley (1769-1852)	IQ_B =145 (Cattell 1000:717) [RGM:N/A|1,310+] Anglo-Irish soldier and statesman; defeat of Napoleon at the Battle of Waterloo in 1815.
717 | 145		Claude Monet (1840-1926)	[RGM:119|1,500+] (Collins 20:7) French impressionist painter; best known for his series of serene water lilies paintings; first-slating: IQ:145|#662 (Jan 2019).
718 | 145		Jan Zizka (c.1360-1424)	IQ_B =145 (Cattell 1000:N/A) [RGM:N/A|1,310+] Czech general; his Battle of Kutna Hora (1421), wherein he defeated the army of the Holy Roman Empire and Hungary, was the first case of recorded use of field artillery (previously, artillery was used only during sieges of towns); one of several commanders in history who never lost a battle (alongside Alexander the Great, Bai Qi, Scipio Africanus, Julius Caesar, Khalid ibn al-Walid, Subutai, Yi Sun-Shin, the Duke of Marlborough, Alexander Suvorov, Fyodor Ushakov, and Paul von Lettow-Vorbeck); his skin, according to his dying wish, was used to make drums so that he might continue to lead his troops even after death.
719 | 145		Meister Eckhart (1260-1327)	[RGM:266|1,500+] German theologian, philosopher, and spiritual mystic; "Only the hand that erases can write the true thing." — Meister Eckhart (c.1310) (Ñº) first-slating: 145|#664 (2018).
720 | 145		Jay Gould (1836-1892)	Ninth richest American in history; see: *Dark Genius of Wall Street : the Misunderstood Life of Jay Gould, King of the Robber Barons* (2006).

721 — 145	Giulio Alberoni (1664-1752)	IQ_C =145	(Cattell 1000:148) [RGM:N/A|1,310+] Italian cardinal and statesman.
722 — 145	Hans Andersen (1805-1875) ↑	IQ_C =145	(Cattell 1000:572) [RGM:287|1,310+] Danish author, playwright, poet; noted for numerous fairytales, including: "The Emperor's New Clothes", "The Little Mermaid", "The Nightingale", "The Snow Queen", "The Ugly Duckling", "Thumbelina", and many others.
723 — 145	Gebhard Blucher (1742-1819)	IQ_C =145	(Cattell 1000:342) [RGM:N/A|1,310+] Prussian field marshal.
724 — 145	William Garrison (1805-1879)	IQ_C =145	(Cattell 1000:592) [RGM:N/A|1,310+] American journalist and slavery abolition activist.
725 — 145	William Hogarth (1697-1764)	IQ_C =145	(Cattell 1000:395) [RGM:N/A|1,350+] English painter and engraver.
726 — 145	Andrew Jackson (1767–1845)	IQ_C =145 IQ_{Si} =145 IQ_{SiM} =126	(Cattell 1000:244) [RGM:N/A|1,310+] American politician; 7th American President.
727 — 145	Poggio Bracciolini (1380-1459)		(Cattell 1000:694) [RGM:N/A|1,310+] Italian papal secretary; his 1417 discovery of Lucretius' *On the Nature of Things* (55BC) together with Petrarch's 1385 find of the lost *Letters of Cicero* (50BC) are said to have initiated the Italian renaissance; first-draft gauged at #515 (Dec, 2017).
729 — 145	John Churchill (1650-1722)	IQ_C =145	(Cattell 1000:187) [RGM:N/A|1,310+] [GCH:11|300+] British general.
730 — 145	Mehemet Ali (1769-1849)	IQ_C =145	(Cattell 1000:389) [RGM:N/A|1,310+] Ottoman Albanian commander; became founder of modern Egypt.
731 — 145	Robert Frost (1874-1963)		[RGM:246|1,500+] American poet; quote: "From what I've tasted of desire, I hold with those who favor fire"; downgrade ↓ for siding with Henri Bergson, via Werner Heisenberg, against materialism; first slating: 145|#565 (Mar 2018).

732 — 145	Jean Moreau (1763-1813)	IQ_C =145	(Cattell 1000:329) [RGM:N/A|1,310+] French general; helped Napoleon Bonaparte to power, but later became a rival and was banished to the United States.
733 — 145	Nicolas Poussin (1594-1665)	IQ_C =145	(Cattell 1000:358) [RGM:N/A|1,310+] French-born Italian Baroque painter.
734 — 145	Willem Klein (1912-1986)		Dutch mathematician; noted as famous "mental calculator"; he worked as a “mental computer” at CERN, from 1958 to 1976, doing mathematical calculations in his head, to double check actual computers (installed in 1958) for accuracy; e.g. in 1976, he calculated the 73rd root of a 500-digit number in 2-min 43-sec, getting him in Guinness Book (Ñº); an Alex Bickle (Ñº)(Ñº) top 500 genius candidate suggestion (Ñº); first-slating: 145|#608 (2017).
735 — 145	Joshua Reynolds (1723-1792)	IQ_C =145	(Cattell 1000:440) [RGM:N/A|1,310+] English portrait painter.
736 — 145	Gioachino Rossini (1792-1868) ↑	IQ_C =145	(Cattell 1000:326) [RGM:220|1,310+] Italian opera composer.
737 — 145	Hippolyte Taine (1828-1893)		“If measured in his day, Taine would have had a **very high IQ**” [Bill Wall (2007) “IQ and Chess” (Ñº)] Belief: “The objective of the historian is to write the psychology of the human molecule, or a particular group of human molecules, in their various transformations"; influential to Henry Adams; first-draft gauged at #520 (Nov 2017).
738 — 145	William Sherman (1820-1891)	IQ_C =145	(Cattell 1000:398) [RGM:N/A|1,310+] American general.
			↑ 145+
739 — 140	Hannah Arendt (1906-1975)		[RGM:1,015|1,330+] (HCR:25) (Perry 80:7|Li) German-born American political theorist and philosopher; student of Martin Heidegger, who was deeply influenced by Nietzsche; first-slating: 140|#620 (Mar 2018).
740 — 140	George Washington (1789-1797)	IQ_{CB} =**140** IQ_C =140 IQ_B =140 IQ_W =135	(Cattell 1000:19) [RGM:50|1400+] [GCH:85|300+] (EPD:F11)
			English inventor, author, and

741 | 140

John Harington (1560-1612)

translator; noted for his c.1595 invention of the “flush toilet”, which he had installed at his house at Kelston, in Somerset, which had a 2-foot-deep oval bowl

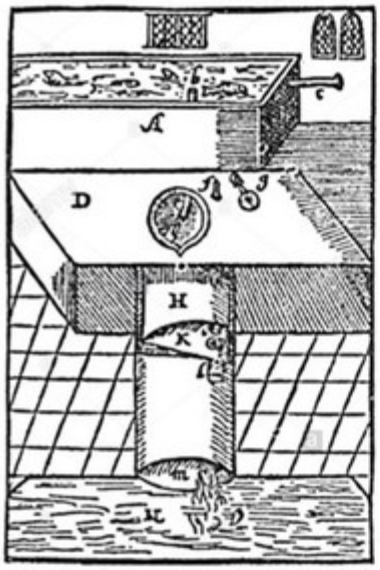

A priuie in perfection

A. the Cesterne.
B. the little washer.
C. the wast pipe.
D. the seate boord.
E. the pipe that comes from the Cesterne.
F. the Screw.
G. the Scallop shell to couer it when it is shut downe.
H. the stoole pot.
I. the stopple.
K. the current.
L. the sluce.
M.N. the vault into which it falles: alwayes remember that ( ) at noone and at night, emptie it, and leaue it halfe a foote deepe in fayre water. And this being well done, and orderly kept, your worst priuie may be as sweet as your best chamber. But to conclude all this in a few wordes, it is but a standing close stoole easilie emptyed.

And by the like reason (other formes and proportions obserued) all other places of your house may be kept sweet.

waterproofed with pitch, resin and wax and fed by water from an upstairs cistern, requiring 7.5 gallons of water, which, when water was scarce, could be used by up to 20 people, before a flush was needed; first-slating: 140|#718 (Oct 2019).

742 | 140

Dr. Seuss (1904-1991)

[RGM:387|1,500+] (GLAE:#) (CR:4) American children’s author, philosopher, and comedian; first-slating: 140|#719 (Nov 2019).

743 | 140

Walt Disney (1901-1966) ↑

IQ_B =123

[RGM:167|1,500+] American child film animator pioneer; an age 23 story-telling genius (Ñº) par-excellence, e.g. his *Fantasia* (1940) was inspired by Goethe’s 1797 ballad “The Apprentice Magician” ("Der Zauberlehrling").

744 | 140

Reginald Hollingdale (1930-2001)

(CR:55) English translator, existographer (biographer), and philosopher, noted for a number of German to English translations, with discerning commentary, including: Goethe, Friedrich Nietzsche, Arthur Schopenhauer, and Georg Lichtenberg, in which he gives the most accurate and true to original English rendition, in respect to the original meaning, as compared to all other German-to-English translators; he was openly an atheist; he is most-noted for his 1971 translation and introduction of Goethe’s 1809 *Elective Affinities*; first-slating: IQ:140|#664 (Jan 2019).

745 | 140

Frank Wright (1867-1959) ↑

[RGM:280|1,310+] American architectural genius; noted for his “falling waters” home; quote: “I believe in god, only I spell it nature”; first-draft gauged at #525 (Dec 2017).

746 | 140

Martin King (1929-1968)

IQ_O =140+

[RGM:68|1,260+] American civil rights leader;

“I have always been somewhat precocious, both physical and mentally. My IQ stands somewhat above the average. So, it seems that from a hereditary point of view, nature was very kind to me.”
— Martin King (1950), essay on the religious development of personality

			(penned at age 21) Generally considered a genius (Ñº)
140 — 747	Sylvia Plath (1932-1963)	IQ_O =140+	[RGM:1,220|1,500+] American poet, novelist, and short-story writer; quote on: “In her last three years of high school, the overachieving Sylvia continued to outclass everyone (IQ test scores ranked her as a genius).”
140 — 748	Christopher Columbus (c.1451-1506)	IQ_B =140	(Cattell 1000:24) [RGM:242|1,500+]
140 — 749	Charlie Chaplin (1889-1977)	IQ_B =140	[RGM:324|1,350+] (Murray 4000:N/A) English comic actor, silent filmmaker, and composer. “In the work of the greatest geniuses, humble beginnings will reveal themselves somewhere, but one cannot trace the slightest sign of them in Shakespeare ... I am not concerned with who wrote the works of Shakespeare ... but I can hardly think it was the Stratford boy. Whoever wrote them had an aristocratic attitude.” — Charlie Chaplin (c.1950) (Ñº)
140 — 750	Jean Bernadotte (1763-1844)	IQ_C =140	(Cattell 1000:311) [RGM:N/A|1,310+] Swedish king.
140 — 751	Robert Clive (1725-1774)	IQ_C =140	(Cattell 1000:167) [RGM:N/A|1,310+] English general and statesman.
140 — 752	Hernan Cortes (1485-1547)	IQ_C =140	(Cattell 1000:219) [RGM:N/A|1,310+] [GCH:128|300+] Spanish soldier; conqueror of Mexico.
140 — 753	Giuseppe Garibaldi (1807-1882)	IQ_C =140	(Cattell 1000:234) [RGM:N/A|1,310+] [GCH:157|300+] Italian general, politician, and nationalist.
140 — 754	Thomas of Kempis (c.1380-1471)		Dutch-German cannon; noted for his *The Imitation of Christ*, advocating inner existence, over vanity and worldly affairs; supposedly, this was a precursor to the later reformation by Martin Luther influential to Thomas More, and Alfred Rogers; first-slating: IQ:140|#697 (Jan 2019).
140 — 755	Robert Lee (1807-1870)	IQ_C =140	(Cattell 1000:585) [RGM:N/A|1,310+] American general.
140 — 756	George Monk (1608-1670)	IQ_C =140	(Cattell 1000:317) [RGM:N/A|1,310+] English general.

140 — 757	Sebastian Vauban (1633-1707)	IQ_C =140	(Cattell 1000:411) [RGM:N/A|1,310+] French military engineer and marshal.
			↑ 140+

Candidates

â— Top 1000 geniuses (candidates)

IQ scale

The following is the original 1916 IQ scale developed by Lewis Terman, which fixated the genius or near genius cut-off point at an IQ of 140 or above: [1]

I Q	*Classification*
Above 140	"Near" genius or genius.
120–140	Very superior intelligence.
110–120	Superior intelligence.
90–110	Normal, or average, intelligence.
80– 90	Dullness, rarely classifiable as feeble-mindedness.
70– 80	Border-line deficiency, sometimes classifiable as dullness, often as feeble-mindedness.
Below 70	Definite feeble-mindedness.

Notes

Note: approximately **# geniuses** [count total: **757**] have recently been added, without updating the fully re-numbering the total list (Nov 2019).

Previous

â— Top 1000 geniuses: 1-100 | IQ: 225-180
â— Top 1000 geniuses: 101-200 | IQ: 180-180
â— Top 1000 geniuses: 201-300 | IQ: 180-175
â— Top 1000 geniuses: 301-400 | IQ: 175-170
â— Top 1000 geniuses: 401-500 | IQ: 170-165
â— Top 1000 geniuses: 501-600 | IQ: 165-160
â— Top 1000 geniuses: 601-700 | IQ: 160-150
â— **Top 1000 geniuses: 701-800** | IQ: 150-140
â— Top 1000 geniuses: 801-900
â— Top 1000 geniuses: 901-1000
â— Top 1000 geniuses (candidates)

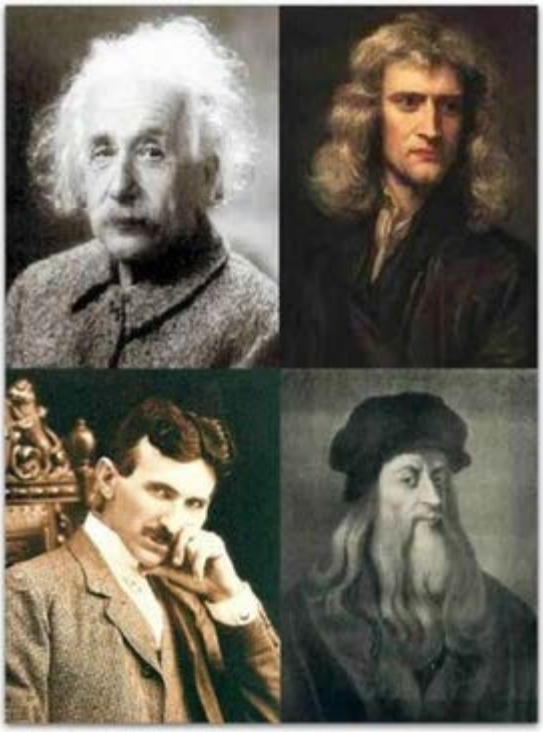

Notes

N1. Note: see "IQ key" page for IQ subscript symbol meaning.

References

1. Terman, Lewis. (1916). *The Measurement of Intelligence: an Explanation of and a Complete Guide for he Use of the Stanford Guide for the Use of the Stanford Revision and Extension of the Binet-Simon Intelligence Scale* (classification of intelligence, pg. 79; I.Q., pg. 53, etc.). Houghton Mifflin Co.
2. Adams, Susan, et al. (2017). "The 100 Greatest Living Business Minds", *Forbes 100th Anniversary Issue* (pg. 116), Dec 18.

θΔics

In videos, **top atheism videos** refers to []

List

The following is a work-in-progress listing of top atheism videos:

#	View/Yr	Views	Like		Video	Topics
1.	1.0M	3.4M	89%	Atheist Bitchslap 2011 Sep 23 By: bdwilson1000		Aborted babies go to heaven. Men need more than one wife. Faith is believing in things without evidence, which is idiocy.
2.						
3.						
4.	379K	2.5M	35%	Dane Cook - Atheists 2008 Jun 4 By: Darkcola0's mind		
5.						
6.						
7.						
8.	395K	3.3M	88%	Atheist 2006 Jul 29 By: zakiechan		Famous atheists (and quotes); stats showing that atheists (21%) have lower divorce rates than believers (26%); make up a lower percentage of prison population.
9.						
10.						

(add discussion)

Analysis

(add)

θΔics

In hmolscience, **Tor Nørretranders** (1955-) is a Danish science author noted, in human thermodynamics, for his 1991 book *The User Illusion: Cutting Conscious Down to Size*, wherein he attempts to explain consciousness in terms of thermodynamics and an external force type theory or argument.

Overview

The gist of Norretrander's consciousness theory seems to be captured by Irish physicist James Maxwell's 1879 final year comment, supposedly in regards to "who" actually wrote his famous "Maxwell's equations" of electrodynamics (Boltzmann having stated that he thought them to have been written by a god), to Irish theological editor Fenton Hort, that: [1]

> "What is done by what is called myself is, I feel, done by something greater than myself in me."

This comment, according to Norretranders, has roots in Maxwell's 1856 poem, written shortly after his father's reaction end, wherein he states:

> "Powers and thoughts within us, that we/know not, till they rise/Though the stream of conscious action from where the/Self in secret lies."

Which, in turn, seems to find corroboration in Maxwell's famous 1847 (age 16) comment that:

> "The only thing which can be directly perceived by the senses is force, to which may be reduced light, heat, electricity, sound and all the other things which can be perceived by the senses."

(add discussion)

Thermodynamic depth

In his 2002 *The Generous Man: A Natural History of the Trouble Image Gives*, he outlines an evolutionary psychology interpretation of thermodynamic depth, loosely translated as the thermodynamic measure of the unspoken signals associated with the energetic value and history of the cost of producing a given product, such as the peacock's tail or a classic poem, and sexual attraction. [2] Nørretranders' books and lectures in the last few years have primarily been focused on science and its role in society, often with Nørretranders' own advice about how society should integrate new findings in science. He is currently the adjunct professor of the philosophy of science at Copenhagen Business School, a position he has held since 2003.

Note

A noted downside of the Norretrander's consciousness theory, is that it is crouched in information theory thermodynamics (information theory + thermodynamics).

Quotes | Cited

The following are quotes employed by Norretranders:

> "The atoms that are in the brain are being replaced; the ones that were there before have gone away. So what is this mind of ours: what are these atoms associated with consciousness? Last week's potatoes! They

now can remember what was going on in my mind a year ago—a mind which has long ago been replaced. The think I call individuality is only a pattern or dance, that is what it means when one discovers how long it takes for the atoms of the brain to be replaced by other atoms."

— Richard Feynman (1955), "The Value of Science"; on turnover rate [3]

References

1. (a) Nørretranders, Tor. (1991). *The User Illusion: Cutting Conscious Down to Size* (*Mærk verden*) (thermodynamics, 62+ pgs; thermodynamic depth, pgs. 83-94). Publisher: A. Lane, 1998.
(b) Fentron John Anthony Hort – Wikipedia.
2. (a) Nørretranders, Tor. (2006). *The Generous Man: How Helping Others is the Sexist Thing You Can Do,* (pg. 180) (English translation). Da Capo Press.
(b) Nørretranders, Tor. (2002). *Det generøse menneske. En naturhistorie om at umage giver mage (The Generous Man: A Natural History of the Trouble Image Gives).* People's Press.
3. (a) Feynman, Richard. (1955). "The Value of Science" (O), in: *What Do You Care What Other People Think?* (pgs. 240-48; quote, pg. 244). W.W. Norton, 1988.
(b) Norretranders, Tor. (1991). *The User Illusion: Cutting Consciousness Down to Size* (pg. 326). Penguin.
(c) Shlain, Leonard. (2009). *Leonardo's Brain: Understanding da Vinci's Creative Genius* (pg. 196). Lyons Press, 2014.

External links

- Tor Norretranders – Wikipedia.

θΔics

In hmolscience, **Toralf Zschau** (c.1975-) is a German-born American biologist and sociologist noted, in sociological thermodynamics, for his 2010 PhD dissertation, which claims to be on complexity, Weberian elective affinities, and thermodynamics, but rather is comprised of vacuous psychobabble without any real content.

Overview

In 2010, Zschau finished his PhD dissertation "The Authoritarian Cosmos: Complexity, Elective Affinities, and the 'Thermodynamics' of Self", in which, building on German sociologist Max Weber's interpretation of elective affinities, along with other frameworks, such as Immanuel Kant, Erich Fromm, Wilhelm Reich, and Abraham Maslow, he outlines an ecological framework for tackling authoritarian phenomena, as are often typified by Orwellian dystopias where blind automatons are coaxed into states of existence of pseudo-happiness. [1]

Elective affinities

In Zschau's model, he states that he recruits German sociologist Max Weber's concept of social elective affinities (which itself is a modified metaphorical borrowing of German polymath Johann Goethe's 1809 human chemical reaction version of human chemical affinities) and transforms it into more than a sensitizing device: a theoretical rationale that – at least in its misty silhouettes – can provide a potential mechanism behind these "affinities". In this extrapolated metaphorical sense, there does not seem to be anything "chemical" in Zschau's thesis, but rather the term "elective affinity" seems to be employed as more of a social-psychological linguistic device.

Thermodynamics

In spite of the fact that the word 'thermodynamics' is used predominantly in the title of the dissertation, in the actual 355-pages of the dissertation, neither the terms energy, nor entropy are used, and the term 'thermodynamics' is used only once in the body of the text, referring to the "ideational thermodynamics of the self", whatever that means, and once as the subtitle of the diagram shown below, referred to as the "model core: thermodynamics of the VBS-based self", the term VBS referring to "value belief systems". All in all, the use of the term "thermodynamics" in this article seems to be a rather overdone extrapolation of American sociologist Rebecca Erickson's 1995 usage of the term "thermostat" in the context of the sociology of emotions. [2]

Education

Zschau completed some type of electrical engineering and or electronics vocational training degree in 1988 at Betriebsschule Paul Schwareze, Dresden, Germany, a BS in biology at the University of Idaho in 1997, a MS in plant biology in 1999 at Arizona State University, and a PhD in sociology, with a thesis on "The Authoritarian Cosmos: Complexity, Elective Affinities, and the 'Thermodynamics' of Self", under advisor Riley Dunlap, at Oklahoma State University in 2010. [3]

See also

â— Yevgeny Zamyatin

References

1. Zschau, Toralf. (2010). "The Authoritarian Cosmos: Complexity, Elective Affinities, and the 'Thermodynamics' of Self" (diagram, pg. 238) (GB) (abs) (preview) (OSU Library), PhD dissertation (advisor: Riley Dunlap), Oklahoma State University.
2. Erickson, Rebecca J. (1995). "The Importance of Authenticity for Self and Society." *Symbolic Interaction* 18:121-144.
3. Toralf Zschau (about) – TranslatorsBase.com.

θΔics

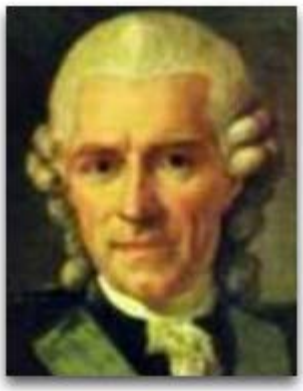

In existographies, **Torbern Olof Bergman** (1735-1784) (IQ:180|#163) (Partington 50:31) (GCE:24) [CR:21] was a Swedish chemist noted for the publication of his 1775 textbook *A Dissertation on Elective Attractions*, which contains what has come to be called "Bergman's affinity table", a 59-column 50-row affinity table, the largest ever assembled, and "Bergman's affinity reaction diagrams". [1] The table was an expanded and advanced version of French chemist Étienne Geoffroy's famous 1718 affinity table. [5]

Bergman chemical symbol notation

See main: Bergman chemical symbol notation

Bergman was the first to represent individual chemical species generically using letters, A or B, and to represent combined species (bonded species) using adjacent letters, as in AB; the latter of which is the prototype to the notion of the chemical bond. [6]

Human chemistry

See: Human chemistry

Bergman's textbook later served as a foundation for German polymath Johann Goethe's theories on human chemical affinities as outlined in his 1809 publication *Elective Affinities*, the founding book of the science of human chemistry. [2] In particular, a year before publication Goethe, who had been studying chemistry for a period of forty-years, told his friend Riemer that 'his idea for the new novella was to portray social relationships and their conflicts symbolically', as in *a*, *b*, *ac*, *abd*, *abcd*, etc., a statement in reference to a Scottish physician and chemist William Cullen's 1757 pioneering development of affinity reaction diagrams (of which 64 such diagrams were made in Bergman's textbook):

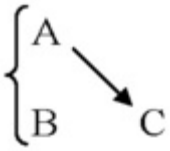

in which, for instance, as diagrammed above, if chemical species *A* and *B* are attached in a weakly bonded chemical union, signified by the bonding bracket "{", ordered such that if species *C* were introduced into the system, the greater affinity preference of *A* for *C* would cause *A* to displace *B* and to thus form a new union with *C*, which equates to the following in modern terms:

$$AB + C \rightarrow AC + B$$

and that furthermore, according to Goethe: [3]

> "The *moral symbols* used in the natural sciences were the elective affinities discovered and employed by the great **Bergman**."

In other words, what is moral or amoral, in Goethe's view, is a point of view inherent in the laws of chemistry according to which species react.

Education

Influenced by his parents, Bergman initially studied theology and philosophy but in secret also mathematics, physics and astronomy. Bergman's broad interest in the natural sciences also brought him in contact with Carl Linnaeus, who

became his teacher, who became convinced that Bergman had a great talent for entomology. Linnaeus's famed classification scheme was said to be the inspiration for Bergman creation of similar binomial Latin names like *acidum aereum* for OCO in 1773 and scores of base + acid-adjective combinations like *argentum natratum* ($AgNO_3$), *calx aerata* ($CaCO_3$), *cuprum saltium* ($CuCl_2$), and *zincum vitriolatum* ($ZnSO_4$) in 1775. [6]

Between 1754-1757 Bergman finished his dissertations in astronomy and physics. The latter achievement rendered him a senior lectureship in physics. In 1764 the newly elected member of the Swedish Academy of Sciences found himself in a quandary about the choice for his inaugural speech. To general astonishment he chose: "The possibility of avoiding the deleterious effects of thunder".

In 1767 a vacancy occurred for the professorship in chemistry at Uppsala University. Bergman's application for the chair only one work in chemistry was included. Fortunately for chemistry Bergman nevertheless obtained the position thanks to the personal intervention by King Gustav III on Bergman's behalf. Within a few years Bergman was established as one of the leading chemists in Europe. His zest for research was immense. Moreover he was a very distinguished teacher. As has been shown, Bergman's scientific contributions were strongly connected with analytical chemistry. [4]

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Further reading

â— Kim, Mi Gyung. (2003). *Affinity, That Elusive Dream – A Genealogy of the Chemical Revolution*. Cambridge, Mass: The MIT Press.

External links

â— Torbern Bergman – Wikipedia.

θΔics

In barometers, **Torricelli barometer** is a device that measures atmospheric pressure, made by talking a long tube of mercury, filled to the top, then ceiled with a thumb, then upended into a larger bowl of mercury, after which “gap” or void is formed in the top of the tube, which varies with the pressure or weight of the height of the atmosphere.

A diagram of the **Torricelli barometer**, showing Evangelista Torricelli (1644) upending a fully-filled tube of mercury into a larger bowl of mercury, the height of the mercury "column", below the void formed at the top, being the measure of atmospheric press. [1]

Overview

In 1644, Evangelista Torricelli constructed the device, which was generally based on the Berti water column barometer (c.1639) (see: Berti vacuum experiment), itself stimulated into inception from debates over the Galileo vacuum device (1632).

See also

- Guericke barometer
- Pascal atmospheric pressure experiment
- Torricelli vacuum

References

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θΔics

In science, **Torricelli vacuum** or Torricellian vacuum is the "vacuum space" or void created when a tube of mercury is inverted to a second dish of mercury, a volume of so-called empty space that results when the downward pull of the column of mercury pressing downward on the dish of mercury finds an equilibrium balance with the downward pull of the 62-mile high Karman line column of air also pressing down on the dish of mercury.

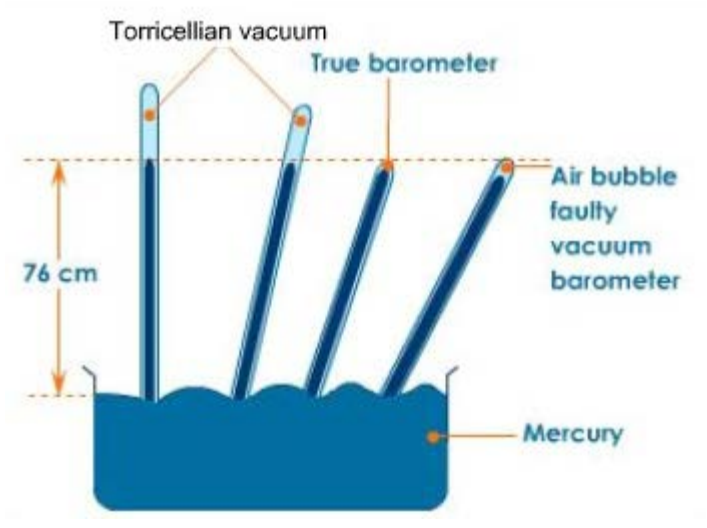

In 1643 Italian physicist Evangelista Torricelli filled a tube with mercury to the top, then capped the top with his finger, then positioned the sealed top into the bowl of mercury, then slipped out his finger, then inverted the tube vertically upside down, a vacuum then formed at the top of the tube; he then measured the height of the column of mercury to be 72 centimeters. The vacuum has since come to be known as a **Torricellian vacuum**.

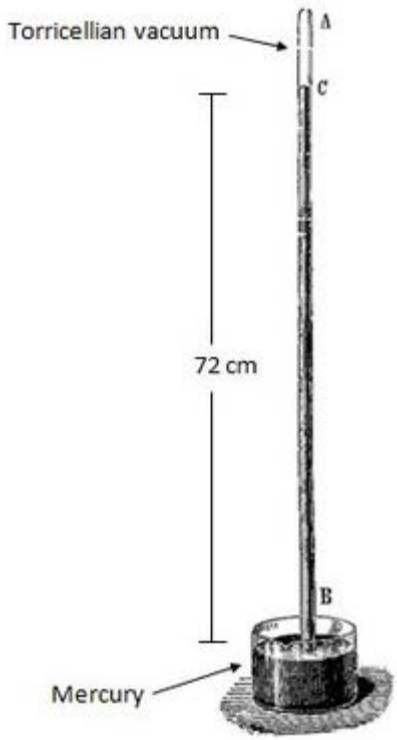

History

In 1643 or early 1644, Italian physicist Evangelista Torricelli, during his investigation into the pump problem, demonstrated the so-called "Torricellian vacuum", so to explain why hand operated water draining pumps stopped working past a depth of about 32 feet.

Mercury

The significance of the use of mercury in this experiment is the result of ingenuity on the part of Torricelli who sought a laboratory sized descaled reproduction of the pump problem and knew that the heaver density of mercury would give him experimentally measurable results that could be scaled up via ratio calculation to explain the water height situation.

Torricelli is quoted as having predicted, knowing the density of mercury (13.5 g/cm³) and water (1 g/cm³), based on his experimentally measured height of 72 centimeters of the column of mercury, that mine pumps would stop operating at 10 meters of water or about 32-33 feet.

Atmospheric pressure variations

Repeated daily observations of this vacuum showed that the size of the vacuum, and hence the height of column of mercury varied from day to day. This height variation phenomenon became the basis for the barometer.

Guericke

Word of Torricelli's vacuum soon spread and is said to have influenced German engineer Otto Guericke in his circa 1650 attempts to make a vacuum in a beer keg, which led to the development of the famous 1657 Magdeburg hemispheres.

Further reading

â— Boye, Martin H. (1855). *A Treatise on Pneumatics: The Physics of Gases* (Torricellian vacuum, pg. 39). E.C. & J. Biddle.

θΔics

In mathematics, a **total differential**, not to be confused with a complete differential (or exact differential), see below, is the sum of partial differentials arising from the separate variation of the variables. [1] In other words, given a function *z* = *f(x, y)*, having continuous first partial derivatives in a region of the *xy*-plane, its "total differential" is: [2]

$$dz = \frac{\partial f}{\partial x}dx + \frac{\partial f}{\partial y}dy$$

Said another way, given a function of two variables:

$$du = P\,dx + Q\,dy$$

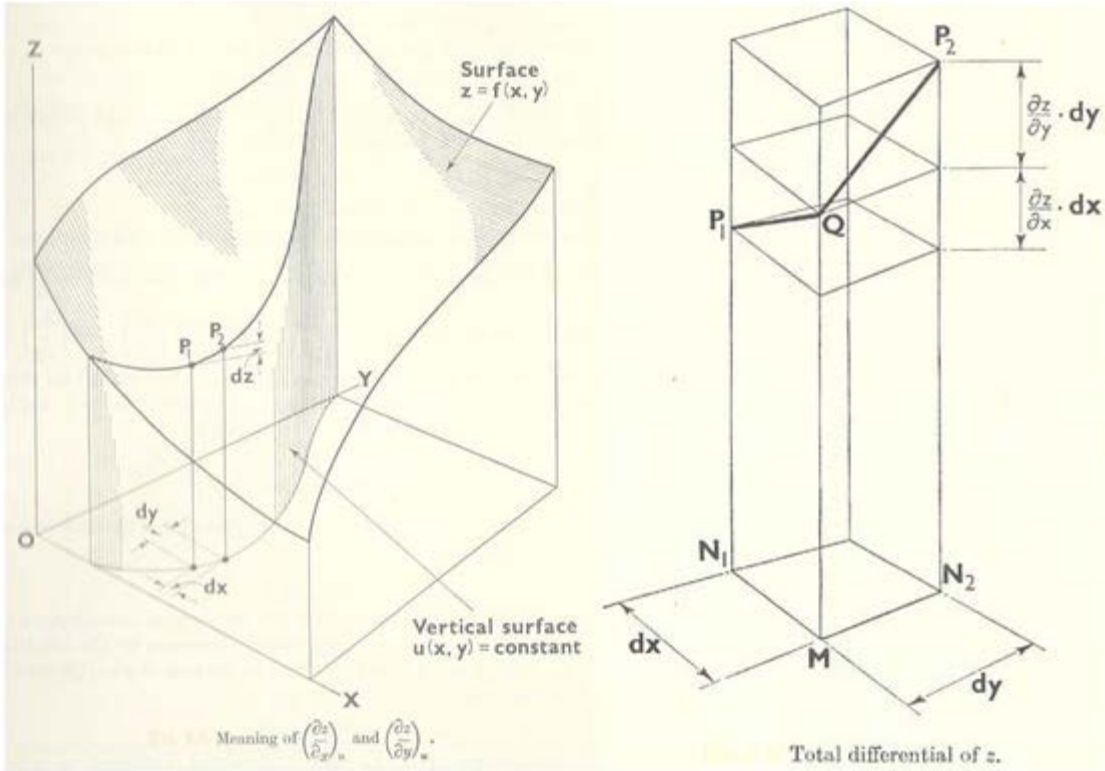

English biophysicist Douglas Spanner's diagrams 3.7 and 3.8, in his *An Introduction to Thermodynamics: Experimental Botany* (1964), from his chapter section on "Total Differential of Z", wherein he explains the graphical nature of the **total derivative** of a function z = f(x, y). [7]

a "total differential" of a *function of several independent variables* is the sum of its partial differentials arising from the separate variation of the variables, whereby the derivative of *u* can be written also as:

$$du = \left(\frac{\partial u}{\partial x}\right)_y dx + \left(\frac{\partial u}{\partial y}\right)_x dy$$

A "total differential equation", stated another way, is a differential equation that contains two or more dependent variables together with their differentials or differential coefficients with respect to a single independent variable which may, or may not, enter explicitly into the equation. [3] To state yet another way, using another set of notation, given a function *f(x, y)*, of *x* and *y* variables, the "total differential" of *f(x, y)* is:

$$df = d_x f + d_y f = \frac{\partial f}{\partial x}dx + \frac{\partial f}{\partial y}dy$$

In words, the total differential of *f(x, y)* is found by finding the partial derivatives with respect to *x* and *y*, multiplying them respectively by *dx* and *dy*, and adding. [4]

History

See main: History of differential equations

Differential equations developed from calculus. Differential equations differ from ordinary equations of mathematics in that in addition to variables and constants they also contain derivatives of one or more of the variables involved.

English physicist Isaac Newton solved his first differential equation in 1676 by the use of infinite series, eleven years after his discovery of calculus in 1665. German mathematician Gottfried Leibniz solved his first differential equation in 1693, the year in which Newton first published his results. Hence, 1693 marks the inception for the differential equations as a distinct field in mathematics. [4]

Complete differential | Exact differential

In thermodynamics, a total differential is not to be confused with a complete differential or exact differential; or, sometimes, a "total exact differential", which is considered as a neoplasm. [5] This is confusion is most predominant in the case of entropy, the most-complex of all exact differentials. To exemplify a case of mis-labeling, in the 1996 article "Sooner Silence than Confusion: the Tortuous entry of Entropy into Chemistry", American physical organic chemist Stephen Weininger and Danish chemical thermodynamics historian Helge Kragh state the following: [6]

> "In an important paper of 1854 Clausius showed that for reversible processes the quantity δq/T is a **total differential**, which means that it is a state function, the line integral of which depends on the variables characterizing the state (pressure, volume, etc.), but not on the particular path chosen for the integration."

A number of errors exist in this statement, which is ironic in that it is in the opening pages of an article aiming to clear the cloud of confusion in regards to entropy for chemistry students and teachers.

Firstly, in regards to these errors, Clausius did *not* use the term "total differential", which as as explained is a mislabeling, but rather he used the term "completed differential" (Thomas Hirst, 1865 translation; Walter Browne, 1879 translation), a term to which he affixed a very specific meaning, namely that it is a function that satisfies the Euler reciprocity relation or as Clausius called it the "condition of immediate integrability".

Secondly, Clausius did not use the small delta symbol "δ" for heat, but rather used the notation "dQ", which he says he adopts from the notation of Leonhard Euler. Clausius does, however, note that German mathematician Carl Jacobi used the "∂" notation or "curly d" symbol, as it has come to be called, in place of the d in the numerator and denominator of the fraction which represents a partial differential coefficient..

Thirdly, although in Clausius' 1854 fourth memoir "On a Modified form of the Second Fundamental Theorem in the Mechanical Theory of Heat" he does introduce the dQ/T function, it is his 1858 publication "On the Treatment of Differential Equations which are Not Directly Integrable" wherein he, in effect, proved that entropy is a path-independent state function for a reversible process, not necessarily the former memoir.

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θΔics

In thermodynamics, **total energy** is a synonym of internal energy. The term seems to have been first employed and used by German physical chemist Fritz Haber in his 1905 formulation of gas reaction thermodynamics. [1]

See also

- Reaction energy

References

1. Haber, Fritz. (1905). *Thermodynamics of Technical Gas Reactions* (preface, pg. a3). Longmans, Green, and Co.

θΔics

In acronyms, **TR** is hyperlink shorthand for "term rank", referring to the number of times a "term" or terminology reoccurs in the pages of Hmolpedia, e.g. on 25 Apr 2014, the term "politics" (TR=405), and or its variants, e.g. "political", occurred on 405 pages of Hmolpedia.

θΔics

In thermodynamics, a **transformation** is the process by which a working body is “transformed” through a specific path (path dependent or path independent), either in one direction or cyclically, being defined by an initial state and a final state. [1] A transformation is said to be reversible if the forward process “compensates” the reverse process; if not, the process is said to be irreversible. The mathematical quantity entropy *dQ/T*, or the quantity of heat d*Q* divided by the absolute temperature *T* of the body in the region of heat flow, represents the energetic value of one direction of the "transformation content" of the working body, which accounts for internal system, atomic-molecular, heat-conversion-to-work actions, resultant due to doctrine of the mechanical equivalent of heat, as heat flows through it. [3]

History

The term ‘transformation’ was first used by French physicist Sadi Carnot in 1824 in his *Reflections on the Motive Power of Fire*. In particular, after detailing the now-famous seven step Carnot cycle, in which a through a cycle of operations, a quantity of “caloric” (an indestructible particle of heat) is passed from a hot body A, first into the intermediary “working substance”, thus causing the substance to expand and exert effort (work) on the piston, and from thence into a cooler body B, he states that “the air we have used to develop the motive power is restored at the end of each cycle of operations exactly to the state in which it was found at the first round.” In an asterisked footnote to this remark, however, Carnot details his opinion that:

> “We tacitly assume in our demonstration, that when a body (working body) has experienced any changes, and when after a certain number of **transformations** it returns to precisely its original state, that is, to the state considered in respect to density, to temperature, to mode of aggregation (atomic ordering)—let us suppose, I say, that this body is found to contain the same quantity of heat that it contained at first.”

The difficultly here, as German physicist Rudolf Clausius spent over 25-years on (in his *Mechanical Theory of Heat*), in the modern view, is that a body cannot contain heat, but rather heat, as a form of movement of the particles of the body, can only exist as energy in transit. Carnot being schooled in the caloric theory of French chemist Antoine Lavoisier, however, elaborates further on his views, in a defining sentence that greatly catches the attention of Clausius, by stating that:

> “We shall assume that the quantities of heat absorbed and emitted in these different **transformations** compensate each other exactly.”

On this supposition, Carnot states very distinctly that: “this fact has never been held in doubt; admitted at first without reflection, it has since been verified in many instances by experiments with the calorimeter.” He concludes “to deny this would overthrow the whole theory of heat, which rests on it as a basis.”

Lastly, as an end note to these declarations, Carnot states, in passing, that “the main principles on which the theory of heat rests require the most careful examination … many experimental facts appear almost inexplicable in the present state of this theory.” These incongruent experimental facts to which Carnot refers, in relation to his model of the production of motive power by heat, are in likely reference to the now famous 1798 cannon-boring experiments of American-born English physicist Benjamin Thomson, in which work of the boring process produced frictional heat, and the 1799 ice-rubbing experiment of British chemist Humphry Davy, in which it was shown that by rubbing ice cubes together in a room colder than the freezing point of water can cause heat to be generated, due to friction, thus melting the ice.

In any event, these “main principles” spoken of here, were later developed by Clausius, between 1850 and 1865, into the form of what he called the first main principle of the mechanical theory of heat and the second main principle of the mechanical theory of heat, later to be called the first and second laws of thermodynamics, respectively.

In the second main principle, Clausius greatly elaborated on the view that, in reality, “in the production of work a

corresponding quantity of heat is consumed (such as when heat transforming in the system is converted into irreversibly lost intermolecular work and friction), and that in consequence the quantity of heat given out to the surrounding space during the cyclical process is *less than* that received from it." To represent this difference mathematically, in that according the modern theory of heat in contrast to that of the older caloric theory there exist uncompensated forward and reverse transformations, Clausius used the quantity dQ/T to represent the measure of one direction of the transformation and called it the "entropy of the body" S, after the word the Greek word τροπη (transformation).

See also

- Uncompensated transformation
- Transformation-equivalents
- Transformation content
- Positive transformation
- Negative transformation
- Equivalence-value of all uncompensated transformations

References

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θΔics

In thermodynamics, **transformation content** or transformation content of a body was a more descriptive precursor name or synonym for entropy used by German physicist Rudolf Clausius in 1865. [1] Specifically, in his April 24th introduction of the now-famous name entropy, he states: [2]

> "We might call *S* the **transformational content** of the body, just as we termed the magnitude *U* its thermal content and ergonal content. But as I hold it to be better to borrow terms for important magnitudes from the ancient languages, so that they may be adopted unchanged in all modern languages, I propose to call the magnitude *S* the entropy of the body, from the Greek word *τροπÎ®*, *transformation*."

(add discussion)

Note

Curiously, Clausius does not use the phrase "transformational content" in the 1875 second edition of his *The Mechanical Theory of Heat*. English science historian Donald Cardwell argues that "these correspond to Clausius' idea of the equivalence value of the thermal content and the disgregation together constituting the transformational content, or entropy of the body." [3]

See also

â— Transformation content energy

References

1. Hokikian, Jack. (2002). *The Science of Disorder: Understanding the Complexity, Uncertainty, and Pollution in Our World* (pg. 27). Los Feliz Publishing.
2. (a) *Read at the Philosophical Society of Zurich on the 24th of April, 1865, published in the Vierteljahrsschrift of this society, Bd. x. S. 1.; Pogg. Ann. July, 1865, Bd. cxxv. S. 353; Journ. de Liouville, 2e ser. t. x. p. 361.*
(b) Clausius, R. (1865). *The Mechanical Theory of Heat – with its Applications to the Steam Engine and to Physical Properties of Bodies* (pg. 357-58) (Ninth Memoir). London: John van Voorst, 1 Paternoster Row. MDCCCLXVII.
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θΔics

In thermodynamics, **transformational content energy** or "transformational content energy", symbol –TS, refers to the internal energy or total energy changes associated with the transformation content changes accruing during a process or transformation.

Etymology

The term “transformation content energy” is an Hmolpedia coining, a conjunction of the Hermann Helmholtz’s 1882 definition of the quantity ‘–TS’ as bound energy and Rudolf Clausius 1865 labeling of ‘S’ as‘transformational content’ or transformation content.

The derived term ‘transformation content energy’ is useful in modern discussion in the sense that the quantity ‘TS’ is the conjugate variable pair for internal energy changes related to the effects of entropy increase or of the equivalence value of all uncompensated transformations.

θΔics

In thermodynamics, **transformation equivalents** is an early synonym for the quantity entropy, used in 1878 by Scottish physicist James Maxwell, a verbal conjunction of the earlier terms: "equivalence-value" (1854), "equivalence-value of all uncompensated transformations" (1856) and "transformational content" (1865)", "equivalence of transformations" (1875), etc., used by German physicist Rudolf Clausius. Specifically, in very humorous form, Maxwell tells us: [1]

> "By the introduction of the expression, "without compensation" (verses "of itself"), combined with a full interpretation of this phrase, the statement of the second principle ("that heat cannot *without compensation* pass from a colder to a warmer body") becomes complete and exact; but in order to understand it we must have a previous knowledge of the theory of **transformation-equivalents**, or in other words entropy, and it is to be feared that we shall have to be taught thermodynamics for several generations before we can expect beginners to receive as axiomatic the theory of entropy."

In short, according to a condensed Clausius perspective, the term "equivalence value of transformations" means that when several units of heat pass through a body they will effect a conversion of heat into work, according to the phenomenon of the mechanical equivalent of heat, and in other cases, when molecules collide or do work on each other inside the system that such work will be converted into heat, means that will exist a certain amount of heat added to a body, causing it to expand, less a certain amount of heat removed from the body, causing it to contract, that will exactly compensate or balance the heat-work conversions inside the body that took place during the process which brings the body back to its original state. [2]

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θΔics

In chemistry, **transition state** is an association of atoms, in the form of a short-lived intermediate, of highest energy formed during a chemical reaction, during the transition from reactants to products. [1] A transition state is the highest point on the reaction coordinate corresponding to the time period in which the activated complex forms, whereby dynamic molecular reconfigurations proceed. The concept of mechanism is a key component to the logic if steps in the transition state.

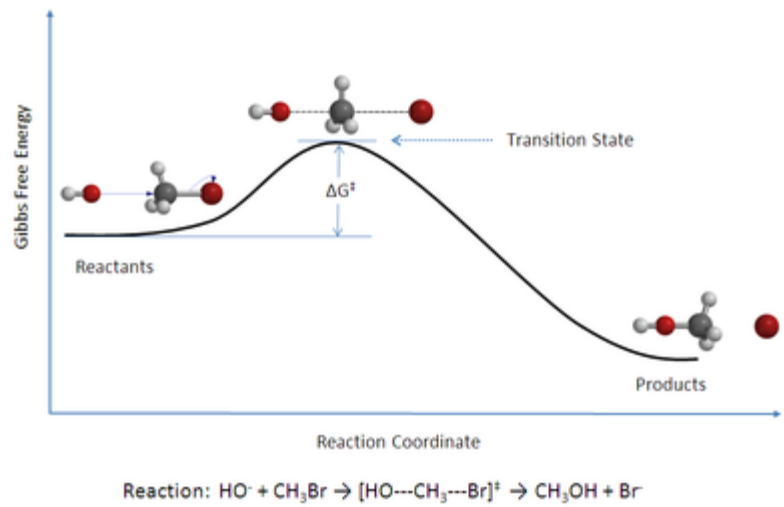

Reaction coordinate for the bimolecular nucleophilic substitution (SN2) reaction between bromomethane and the hydroxide anion, showing a new "forming bond" and old "leaving bond" in the reactants, two stretched leaving-forming bonds in **transition state** (hill region), and a completed forming bond and detached leaving bond in the products.

The theory of transition state was conceived in 1935 by chemists Henry Eyring, Meredith Evans, and Michael Polanyi who, using previously, in 1931, using thermodynamics, kinetics, and statistical mechanics logic, began constructing potential energy surfaces for chemical reactions. [4]

Potential

The application of the thermodynamic concept of potential to the kinetics of chemical reactions (transition state theory) provides a criterion for selecting the optimal pathway for a transition, usually the pathway with the transition state of the lowest free energy. In this perspective, by providing a direction for systems to evolve and an optimal pathway, thermodynamics offers a way for answering *why* things happen the way they do. [2]

Classic model

The classic model of reaction mechanism between two reactants *A* and *B* is as follows

$A + B$	$\leftrightarrow$	$A \cdots B$	$\leftrightarrow$	$A - B$	$\leftrightarrow$	AB
close proximity		encounter complex		transition state		bound state

The first step in the reaction, $A + B$, brings the two atoms or molecules into close proximity, resulting in the first 'macrocollision' and yielding the *encounter complex*: $A \cdots B$. In the second step, short range electrostatic effects result in a well-oriented conformation called the 'transition state' or $A - B$. At this point, orbital overlap effects are not yet significant factors. The last step of the binding process is the latter stage transition from the favorable intermediates to the bound state unit *AB*. This is a process of induced fit, limited by a rate constant, which requires structural rearrangements overcoming mostly enthalpic energy barriers.

Human chemistry

In the study of reactions between people, the transition state is defined as a short-lived heightened-energy configuration in a relationship, in which human chemical bonds are said to be stretched to their maximum, prior to stable product formation. [3] The term new relationship energy is a verbal way of describing the energy of transition state.

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transition state theory, pg. 414, transition state complex, 413) (preview) (Google books). Morrisville, NC: LuLu.
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External links

- Transition state – Wikipedia.
- Transition state theory – Wikipedia.

In hmolscience, **translatability**, “translatability criterion” or “translatability condition”, refers to []

Romanian econophysicist Mircea Gligor at the 2013 "Econophysics and Sociophysics Workshop 5", University of Pitesti, Romania, giving general commentary to the audience and Libb Thims in particular that variables and equations of physics and chemistry, such as energy and entropy, if applied to sociological, psychological, and economical models need to have real measurable quantitative meaning and hold during the translation. [1]

Goethe | Matsui

In 2010, Japanese literary theorist Takaoki Matsui discussed the translatability of Johann Goethe's 1809 physical chemistry based novella *Elective Affinities* (see: Goethe timeline), discussed from the point of view or extension of the ideas of Walter Benjamin, as follows: [2]

> “Synopsis: “The "survival" of "bare life": the physical nature and **translatability** of elective affinities. In Benjamin's essay on translation speaks of "life and survival of the art". "Can consist of sensation, which characterize it only occasionally," according to him is the "life" or from organic physicality alone is to define, but the story it contains. How is this 'life metaphysics would relate' to what he laid out a critical scientific novel whose translatability he presented although not in question?
>
> Goethe's *Elective Affinities* is actually a comedy personified the four elements, according to a controversial doctrine of affinity, they are motivated to adultery, 'and finally brought by the minor characters disguised as scientists to decomposition. The story alludes to historical events and technology scientific findings, Goethe, transferred to the carnival games matter to the emergence of industrialization and the disciplining of human caricature *.
>
> However, he made the **transfer process** in the chemical only visible parable, where the characters learn (elements) of some of their presumed destiny. Encrypts remained linguistically untranslatable picture puzzles: those of the technical equipment, the proper names of body parts had been viewed, etc. They ignore or "mutatis mutandis" as part of a 'tragic' or 'murky' love story. Benjamin also did not want to destroy her 'dull' appearance. Only he fell to distinguish the inserted novel one of the novel's action following analogies: In the novel there is the "heat" before the "storm" in the novel but "the storm and peace", in which the former will only dull light of the "eclipse" in the latter, everything from "light [s] light" sharply outlined. These images correspond exactly to the inventions described therein encrypted and tests. Despite this 'enlightenment' he took only a sublimated nudity true story of the character and complained about the rootedness of the characters in the "association of bare life." The question is whether or not his life, metaphysics, the exact weather has disturbed ”

(add discussion)

Thims | Gibbs

In 1995, Libb Thims, as a chemical engineering student, gleaned the patently-obvious **“**idea**”**, in his mind, that these equations, reactions, and principles, he was learning, in these courses, wherein he received straight As, being near the top of his graduating class, of about 128 student, in each course, to predict and understand the nature of molecular formations, reactions, and dissolutions, applied to human reactions at the macro-social level; something along the lines of the following logic or view, i.e. that columns 1-3 are **"translatable"** to the phenomena described in columns 5-6:

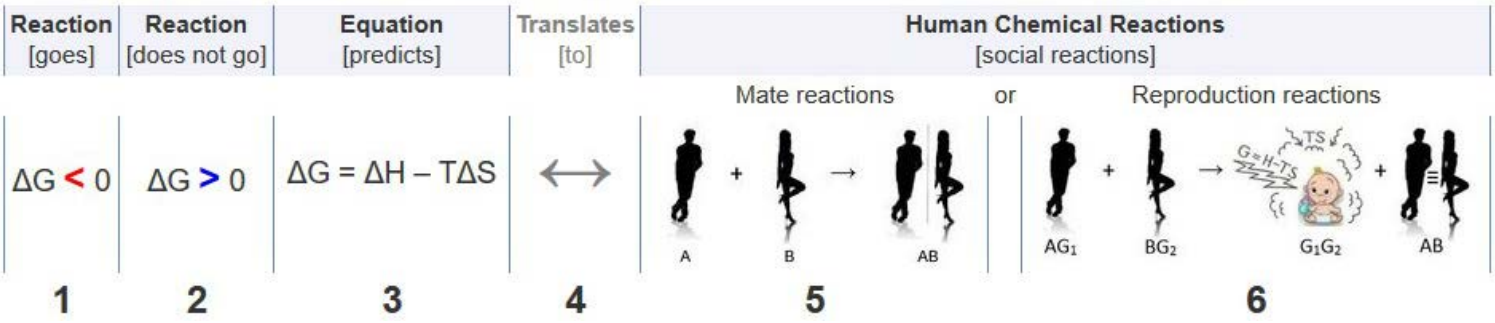

The question Thims had, in his mind, at this point, was “who” exactly, historically, or “how” exactly, in modern terms, was this explained, in detail? In 2006, via footnote 2.5, Thims discovered this person was Goethe, as summarized by Matusi (above).

Quotes

The following are related quotes:

> “Attempts at reductionism within the physical sciences founder because of a failure to satisfy the **translatability condition**.”

— Bruce Caldwell (1992), paraphrased synopsis of, supposedly, Alan Nelson's 1992 position, as outlined in his economics chapter "Human Molecules" [3]

"Thermodynamics great generality and power remains hidden by layers of abstraction and axiomatic rigor. Must this be so? Could we not gain much by loosening the strictures and bringing the main point home by more qualitative applications of thermodynamics to the widest range of everyday experiences? An attempt, at the same time loose and seriously meant, follows. I will argue that given the **proper translation of terms and concepts** from the inanimate to the animate world the laws of thermodynamics can be seen at work in our everyday lives. No proofs will be offered."

— Sture Nordholm (1997), "In Defense of Thermodynamics: an Animate Analogy"

References

1. (a) Gligor, Mircea. (2013). "Statistical Properties of Small World Networks" (vid, 23:44-min) (PowerPoint, 27-slides), talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29.
(b) Thims, Libb. (2015). "Cartesian, Newtonian, Prigoginean vs Gibbsian socioeconomics" (Ñº) (Gligor comments, 14:44-), HumanChemistry 101, Mar 11.
2. Matsui, Takaoki. (2010). "Illuminations of *Elective Affinities:* Goethe's Criticism of Technology and Its Materialistic Transformation by Walter Benjamin" (blog abstract) ("Shinwaryoku no koubou"), in: *Study of the 19th Century Scholarship* (19 Seikigaku Kenkyu), vol. 4, 2010, p. 187 (the article itself - vol.4, pp.141-156 - contains erroneous readings; cf. corrigenda and addenda in Japanese: vol.5, pp.165-168) (Its full version will also soon appear in German).
3. (a) Caldwell, Bruce J. (1992). "Commentary on Alan Nelson's 'Human Molecules'", in N. De Marchi (ed.) *Post-Popperian Methodology of Economics*
(pgs. 135-49). Recovering Practice. Boston: Kluwer Academic Publishers.
(b) Caldwell, Bruce J. (2012). "Email communication with Libb Thims", Jun 13.

θΔics

In religio-mythology, **transmigration** refers to the theory, popularized in Greece, supposedly by Pherecydes (c.540BC), and India, derived adopted from ancient Egypt religio-philosophy, that when a person dies their soul "migrates" or is "transmitted" into the body of another human or animal.

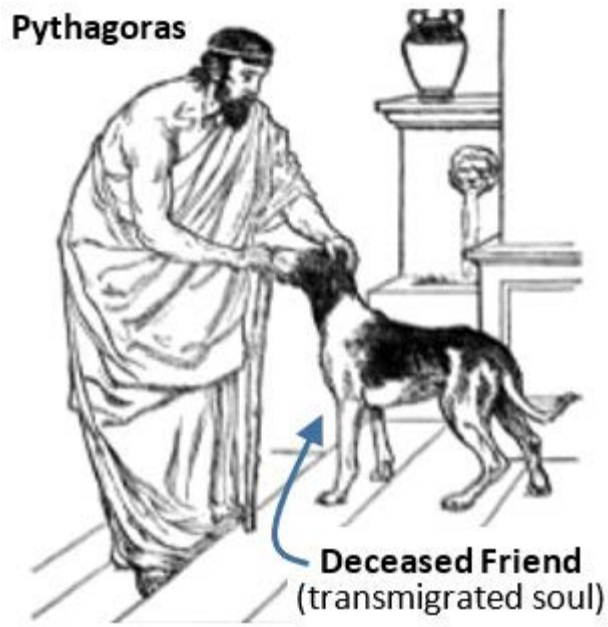

Pythagoras (c.530BC), who popularized the theory of **transmigration**, believed that he had once existed Euphorbus, during the battle of Troy (c.1200BC), and also that he could recognize the voice of a deceased friend in the yelping of a puppy.

Overview

In c.540BC, Pherecydes (c.580-520BC), after studying philosophy in Egypt (Josephus, c.80) (Q) (Cedrenus, c.1050) (Q), therein likely learning their soul theory (see: Egyptian human), purported "invented" the Greek theory of the "soul", as reported by Cicero (*Tusculam Dispulat*, c.55BC), as cited by Baron d'Holbach (1770). [1]

In c.530BC, Pythagoras (c.570-490BC), who studied under Pherecydes (Laertius, 230) (Q), and who also studied in Egypt, came to believe in the theory of transmigration of souls and therein seemingly to popularize it in his works. Pythagoras, according to one story (fragment A31), claimed he was able to recall the shield he had used during the battle of Troy (c.1200BC) when he was incarnate as Euphorbus (Q). In another case, Pythagoras, according to Xenophanes (fragment B7), claimed to be able to recognize the voice of a deceased friend in the yelping of the puppy into which his soul had passed. [3]

Quotes

The following are related quotes:

> "Cicero said the opinion about the immortality of the soul was first introduced by Pherecydes of Syros in the time of King Tullus (others attribute it to Thales, others to others). It is the part of the human science that is treated with the most reservation and doubt. The firmest dogmatists are forced to take cover in the shadow of the academy. No one knows what Aristotle taught about the subject (or even all of the ancients in general who handle it with unsteady belief) and he left it to his successors to battle it out about his opinion on the matter. It is marvelous how those who are stubborn in this opinion about the immortality of our souls come up short and are powerless to establish it by their human powers. They are the dreams of a man who teaches nothing, but is hopeful. As Cicero said: 'dreams are not of a teacher, but of the wisher' (*somnia sunt non docentus, sed optantis*) (*Academia*, 2:38)."
>
> — Michel Montaigne (c.1590), *Essays* (§2:12); cited by Jean Meslier (1729) in *The Testament* (pg. 570) [2]

> "Herodotus upon this occasion says, that the whole romance of the soul and its **transmigrations** was invented by the Egyptians, and propagated in Greece by men, who pretended to be its authors. I know their names, adds he, but shall not mention them (lib. 2). Cicero, however, has positively informed us, that it was Pherecydes, master of Pythagoras. Tuscul. lib. 1, sect. 16. Now admitting that this system was at that period a novelty, it accounts for Solomon's treating it as a fable, who lived 130 years before Pherecydes."
>
> — Constantin Volney (1791), *The Ruins* (Q)

References

1. Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (pg. 118). J.P. Mendum, 1889.
2. (a) Montaigne, Michel. (c.1590). *Essays* (§2.12). Publisher.

(b) Meslier, Jean. (1729). *Testament: Memoir of the Thoughts and Sentiments of Jean Meslier* (translator: Michael Shreve; preface: Michel Onfray) (pg. 570). Prometheus Books.
3. Empedocles. (435BC). *The Poem of Empedocles: a Text and Translation with an Introduction* (editor: Brad Inwood) (pg. 56). University of Toronto Press, 1992.

External links

- Transmigration of the soul (redirect → reincarnation) – Wikipedia.

θΔics

In famous publications, **"Transmission of Information"** is a 1927 presentation given by American electronics engineer Ralph Hartley, at the International Congress of Telegraphy and Telephony, in which he explained how to quantify the capacity of a system to transmit information, mathematically, using logarithms, the systems being those of telegraph, telephone, and television transmission systems, sending information in the form of either pulsations in radio waves or changes in current and correlative voltage level in wire telegraph lines. [1] The mathematical model of information in this paper formed the basis of the later 1948 model of information, and hence "information theory", conceived by Claude Shannon, which he called "entropy" (or information theoretic entropy) on the half-joke suggestion of John Neumann, to the consternation of all thermodynamicists in the years to follow, up to the present day.

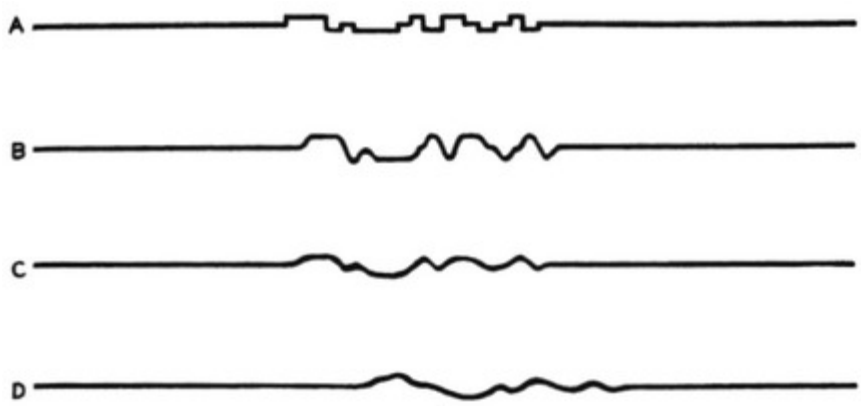

Four varieties of possible information sequences (high: 1, low: 0, or no signal), transmitted in typical telegraph messages, at increasing lengths of cable transmission, A being a short transmission, D being a long cable length transmission.

Overview

To illustrate his derivation, Hartley gives the situation in which a hand-operated submarine telegraph cable system in which an oscillographic recorder traces the received message or rather "information" on photosensitive tape. The sending operator has at his or her disposal three positions of a sending key which correspond to either a high voltage, low voltage, and no applied voltage. The following figure shows three different recordings of a given transmission, where A shows the sequence of the key positions as they were sent, and B, C, and D are traces made by the recorder when receiving over an artificial cable of progressively increasing length. Figure B shows a signal that can be reconstructed to read the original sequence, whereas C shows that more care is needed to reconstruct the original message, and D show a hopelessly indistinguishable message.

To put this information transmission into formulation, Hartley explains that at each point in the reading of the recorded tape of the transmitted single, the reader must select one of three possible symbols (high, no-signal, low). If the reader makes two successive selections, symbolized by *n*, he or she will have 3^2, or 9, different permutations or symbol sequences. This system can then be extended to that in which, instead of three different current or voltage levels to select from, the sender has *n* different current values to be applied to the line and to be distinguished from each other at the receiving end of the line. The number of symbols (or voltage levels) available at each selection is *s* and the number of distinguishable sequences is:

$$s^n$$

He then notes that the measure of the amount of information transmitted would increase exponentially with the number of selections. On this basis, Hartley states that the value 'H' is the amount of information associated with *n* selections for a particular system. Then, through some derivation, arrives at the following logarithmic expression for information:

$$H = n \log s$$

Hartley then comments:

> "What we have done is to take as our practical measure of information the logarithm of the number of possible symbol sequences."

Information theory

In his 1948, American engineer Claude Shannon, in his famous paper "A Mathematical Theory of Communication", would credit this derivation by Hartley as being the point at which the logarithmic function became the natural choice for information and in the same paper, to the ire of many thermodynamicists, equate Hartley's 1928 telegraph "system" model with that of Clausius' 1865 heat engine "system" model. In short, Shannon, using a similar formulation to that above, declared that H, being a measure of information, choice, and uncertainty, is the same H as used in statistical mechanics, specifically the H in Boltzmann's famous H theorem, concluding with:

> "We shall call *H* the entropy of the set of probabilities."

For ever after, countless numbers of information theory scientists have since taken any and all types of information, "which is a very elastic term, ... whether being conducted by wire, direct speech, writing, or any other method", in the Hartley's words, as being a direct equivalent to thermodynamic entropy, as derived from the study of the steam engine. In his paper, Shannon would go on to define the entropy H of the source in units of "bits per symbol", in which in the Hartley derivation s = 2, corresponding to a source that can only send two voltage or current levels, high or low; hence Shannon's entropy being measured in binary digits per symbol.

References

1. Shannon, Claude E. (1948). "A Mathematical Theory of Communication" (bit, pg. 1), *Bell System Technical Journal*, vol. 27, pp. 379-423, 623-656, July, October.
2. Hartley, R. V. L. (1928). "Transmission of Information", *Bell Technical Journal*, July, pgs. 535-64; Presented at the International Congress of Telegraphy and telephony, lake Como, Italy, Sept., 1927.

θΔics

In hmolscience, **transmutation**, from the Latin *trans*- "across, beyond, or through" + -*mutare* "to change", refers to the derivation of every new species from another preexisting different species. [1]

Overview

The theory or doctrine of "transmutation", synonymous in many ways to the early Greek theory of metamorphosis (Ovid, 8AD; Goethe, 1790), as opposed to the "old doctrine of the constancy of species" (aka Biblical creation), seems to have originated in the 1830s writings of Charles Lyell, which in 1838 began to be adopted in the "transmutation notebooks" of Charles Darwin, and popularized thereafter by him in his 1859 *On the Origin of Species*, in the form of what he termed "evolution"

The new terminology upgrade of metamorphosis, transmutation, and or evolution, as explained via human chemical thermodynamics, is the formation and dissolution of new species via the process of "analysis and synthesis", as explained via the logic of reactants (pre-existing species) transforming, via chemical reaction, into products (new species), chemical thermodynamically. [2]

Quotes

The following are related quotes:

> "One may say there is a force like a hundred thousand wedges trying [to] force every kind of adapted structure into the gaps in the oeconomy of nature, or rather forming gaps by thrusting out weaker ones ... The final cause of all this wedging, must be to sort out proper structure and adapt it to change."
>
> — Charles Darwin (1838), ***Transmutation*** *Notebook D* (made directly after some comments on Malthus) (Ñº), Sep 28

> "No positive fact is cited to exemplify the substitution of some entirely new sense, faculty, or organ, in the room of some other rendered useless. All the instances adduced go only to prove, that the dimensions and strength of members, and the perfection of certain attributes, may, in a long course of generations, be lessened and enfeebled by disuse; or, on the contrary, be matured and augmented by active exertion, just as we know that the power of scent is feeble in the greyhound, while its swiftness of pace and its acuteness of sight are remarkable ;—that the harrier and staghound, on the contrary, are comparatively slow in their movements, but excel in the sense of smelling. It is evident, that if some well authenticated facts could have been adduced to establish one complete step in the progress of transformation, such as the appearance in individuals descended from a common stock, of a sense or organ entirely new, and a complete disappearance of some other enjoyed by their progenitors, that time alone might then be supposed sufficient to bring about any amount of metamorphosis. The gratuitous assumption, therefore, of a point so vital to the **theory of transmutation**, was unpardonable on the part of its advocate."
>
> — Charles Lyell (c.1840), *Publication*; cited by John Wilson (1849) in his *Rural Cyclopedia* (pg. 302)

> "Hitherto, no rival hypothesis has been proposed as a substitute for the **doctrine of transmutation**; for 'independent creation', as it is often termed, or the direct intervention of the 'supreme cause', must simply be considered as an avowal that we deem the question to lie beyond the domain of science."
>
> — Charles Lyell (1863), *The Antiquity of Man* (pg. 421) (Ñº)

References

1. Hartman, Edward. (1875). "A Critical Representation of the Theory of Organic Development (§3: The Theory of Heterogeneous Generation and the Theory of Transmutation) (translator: Henry d'Arcy) (Ñº), *The Journal of Speculative Philosophy*, 12:138.

2. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)* (pdf). Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
(c) Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc). LuLu.

External links

â— Transmutation – Wikipedia.

θΔics

In religion, **transubstantiation** is the mythical action by which the bread (wafer) and wine (cup), taken during Eucharist during mass, become, in reality, as children are told, the body and blood of Jesus Christ.

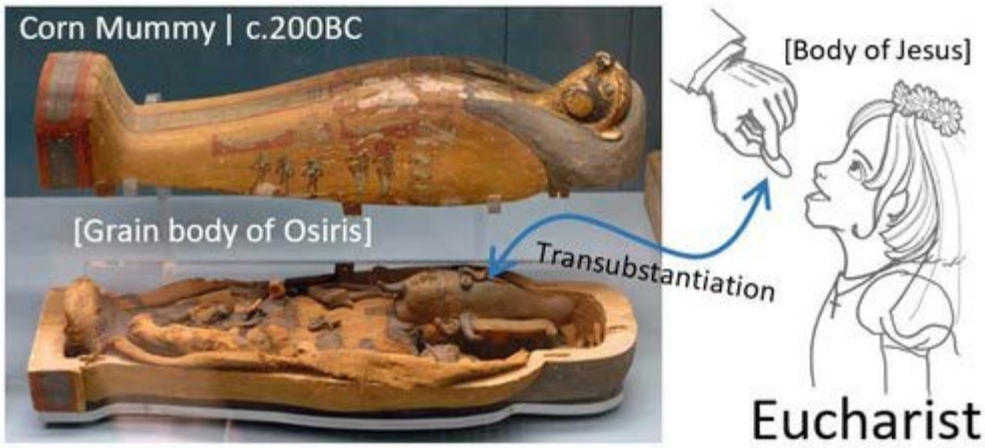

Left: a Ptolemaic Period (c.332-30BC) corn mummy (Q), made of grain and mud, that was shaped and watered in the Khoiak festival month, representative of the re-born Osiris. Bread was made in these shapes and eating by the Egyptians, ritualistically, therein becoming reborn like Osiris. Right: the modern Catholic version of this, a child eating the Jesus wafer during Eucharist, and told that it is, in "reality", the body of Jesus, the bread becoming Jesus via the mysterious process of **transubstantiation**.

Galileo

In 1623, Galileo published *The Assayer* (*Il Saggiatore*), which used so much atomic theory that it was called an Epicurean book; the church attacked the work per reason that it left no room for the doctrine of transubstantiation. [6]

Egyptian | Origin

The origin of Catholic practice of "transubstantiation" is an inherited version of the ancient Egyptian ritual of making the Osiris cakes (aka sacramental bread) (Q), i.e. bread made being symbolic of the reborn or regrown god Osiris, which took place during the annual 30-day Khoiak festival. Each day of the Khoiak festival involved one of the steps of the process of making "corn mummies", a kind of old-fashion Chia Pet shaped like the god Osiris, so to say, that was watered and grew sprouts: [1]

Preserved examples of the Osiris cake moulds (Q) date to 664BC; the British Museum describes the nature of these cakes as follows: [2]

> "Osiris, supreme god of resurrection, was closely associated with the life-giving forces of nature, particularly the Nile and vegetation. Above all, he was connected with germinating grain. The emergence of a living, growing, plant from the apparently dormant seed hidden within the earth was regarded by the Egyptians as a metaphor for the rebirth of a human being from the lifeless husk of the corpse. The concept was translated into physical form by the fashioning of images of Osiris out of earth and grain. These "corn-mummies" were composed of sand or mud, mixed with grains of barley. As in this instance, the "mummy" is sometimes wrapped in linen bandages and may possess a finely detailed mask of wax, representing the face of Osiris."

In 1911,Wallis Budge (1911) describes the mould cases for this divine bread as follows: [1]

> “The moulds for the ‘divine bread’ were made of the wood of a red tree, and cakes were made from them in the forms of the [14 or 16] members of Osiris.”

In 1960, Martin Larson, in his “The Great Osiris” (Q), summarized how the Osiris cakes was the original Egyptian Eucharist as follows:

> “The mummies of the deceased would have inscriptions attached to them which read:
>
> "I am Osiris. . . . Let not my limbs suffer corruption; let them not pass away; let them not decay; and let them be fashioned for me as if I were myself Osiris.... The mighty Osiris taketh possession of me. ... Behold, I am the god who is the Lord of the Underworld. . . . I am the Great One. . . . I have made myself whole and complete; I have renewed my youth; I am Osiris, the Lord of Eternity."
>
> The rituals practiced by the Osirian mystery-cult were extraordinarily impressive. The great annual festival was celebrated in two phases, of which the first was public. It began at Abydos on the seventeenth Athyr, which is our thirteenth of November. This commemorated the death of Osiris, and its significance was emphasized by the fact that this was the very day on which the wheat was planted after the floodwaters of the Nile had receded. **The god and the seed died at the same moment, for the grain was the god and the god was the grain**. The resurrection of the god was the rebirth of the wheat. Man could be redeemed only through the divine sacrifice; the immortality of the communicant stemmed from that of his god. The sacrifice which was eaten and which was the **eucharist** was the dying god, reborn in the grain.
>
> In this public phase of the Osirian passion play, the murder and dismemberment of the deity were depicted in moving scenes by highly skilled actors; to the audience it seemed that they were witnessing actual events, or a replica of them. This was followed by the search for, and the finding of, the body of Osiris by Isis, his resurrection from death, his triumphal return to power, his victory over the forces of evil, symbolized by Set, and his journey into the hereafter in his solar ship. This was known as the Coming Forth by Day.
>
> Such was the first part of the Osirian festival. But within the temples there was an esoteric phase performed by the priests in which only the initiates could participate. All ancient writers were exceedingly secretive about this, for it was considered sacrilegious to reveal it. Nevertheless, from scattered fragments of information, we can reconstruct substantially what these secret rituals were.
>
> Two days after the death of the god on seventeenth Athyr, the priests brought forth a sacred chest, which contained an image of Osiris; when this was revealed to the worshippers, they saw in it their resurrected god. In the temple at Dendera were found a series of inscriptions which describe how **cakes of divine bread were made from the body of Osiris**. These were the mysterious sacred cakes, which Plutarch calls the inward parts of the god and which were in fact the **eucharistic bread**. We see, therefore, that the publicly performed passion-drama depicted the earthly career of Osiris, but the secret ceremonials were eucharistic rituals, symbolizing the transmutation of Osiris into the grain and of the communicant into an Osiris.”

In 2003, Bartholomew Brewer, in his “The Mystery of Eucharist”, summarized how "Osiris cakes" became "Jesus wafers" as follows: [3]

> “The doctrine of **transubstantiation** does not date back to the Last Supper as is supposed. Like many of the

beliefs and rites of Romanism, transubstantiation was first practiced by pagan religions. In Egypt, priests would consecrate **mest cakes** which were supposed to become the **flesh of Osiris** [3100BC]. The idea of transubstantiation was also characteristic of the religion of Mithra [300BC] whose sacraments of cakes and *Haoma* drink closely parallel the Catholic Eucharistic rite. [In Roman religion], it was a controverted topic for many centuries before officially becoming an article of faith, which means that it is essential to salvation according to the Roman Catholic Church. The idea of a corporal presence was vaguely held by some, such as Ambrose, but it was not until 831AD that Paschasius Radbertus, a Benedictine monk, published a treatise openly advocating the doctrine of transubstantiation. Even then, for almost another four hundred years, theological war was waged over this teaching by bishops and people alike until at the Fourth Lateran Council in 1215AD, it was officially defined and canonized as a dogma."

The ritual of eating of corn bread (O), resenting the body of Osiris (O), and the drinking of the beer (or wine), representative of Osiris conceptualized as the god who taught Egyptians to make barley and wine, in short, became re-written into the story of the last supper and the eating and drinking of the body and blood of Jesus Christ and the concept of transubstantiation. [4]

Religious | Doubt

In modern time, many children the world over are given the wafer of Eucharist and told simply that it is the transformed "body of Christ", without being given the detail that this is actually symbolic of the "Osiris cakes" of bread made and eating during the annual Khoiak festival of ancient Egypt.

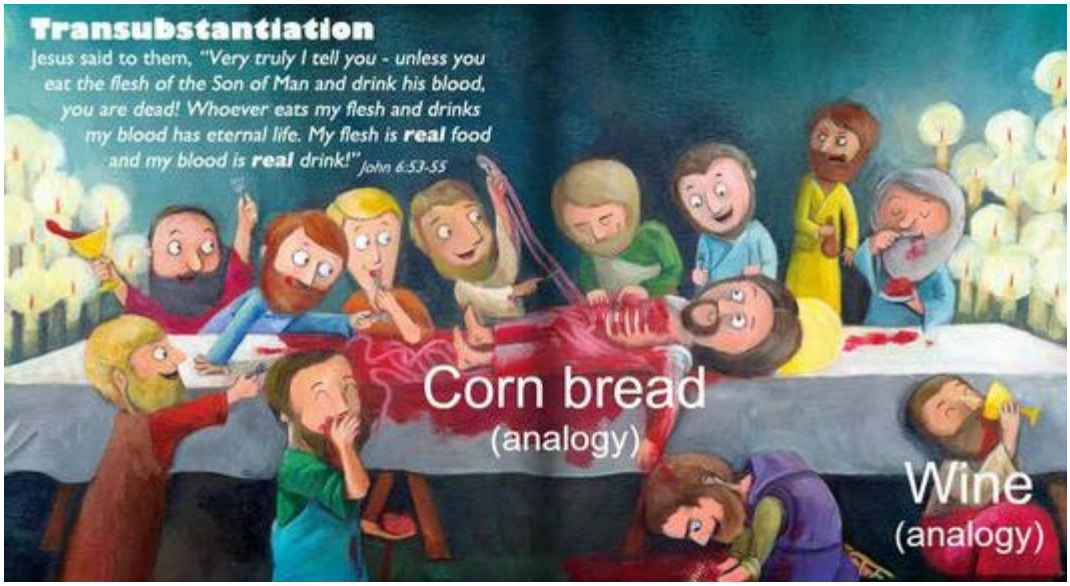

A parody of **transubstantiation**, from the *Awkward Moments Children's Bible*, by Horus Gilgamesh. [5]

Quotes

The following are related quotes:

"Since you have rejected our doctrine as containing things incredible, can you admit that of the Christians? Is not theirs still more contrary to common sense and justice? A god, immaterial and infinite, to become a man! to have a son as old as himself! **This god-man to become bread, to be eaten and digested**! Have we any thing equal to that? Have the Christians an exclusive right of setting up a blind faith? And will you grant them privileges of belief to our detriment?"

— Constantin Volney (1791), *The Ruins* (§XXI: Problem of Religious Contradictions)

"I am what Richard Dawkins would classify as a level 6 'agnostic' - agnostic in the sense that although I cannot prove that there is or isn't a god, there are an infinite number of possibilities I can't definitively disprove. I was brought up in a very devout Catholic family and 'kicked against' religion from the age of nine (when I began to ask questions about the ludicrous concept of **transubstantiation** in Catholicism)."

— Philip Moriarty (2009), "Message (O) to Libb Thims", YouTube, Sep 7

"Eating the wafer and turning into the body of Christ—**transubstantiation**; they tried to explain it to me,

but I was like: ‘what do you mean that I’m eating him?’ ”

> — Martina (2015), polled response (Q) on earliest memory (age 6-7) of being taught a religious concept that didn’t make sense, Jul

“By ‘eating the god’ in the form of the Eucharist, in a type of communion in leavened cakes, Osiris' divinity and immortality become that of the worshiper, and a spiritual communion through becoming one with their god-man. (cf. john 10:38). The sacred ritual of Osiris consisted primarily in the celebration of a Eucharistic rite, in which the advocate and followers of Osiris eat the flesh of their god in the form of wheat-cakes and drink of his blood in the form of a barley-ale (cf. Matthew 26:26, Mark 14:22, Luke 22:19, and I Corinthians 11:24).”

> — Christopher Reyes (2018), *In His Name, Volume 5* (Q)

References

1. (a) Budge, Wallis. (1911). *Osiris and the Egyptian Resurrection*, *Volume One*. P.L. Warner.
(b) Budge, Wallis. (1911). *Osiris and the Egyptian Resurrection*, *Volume Two* (Osiris cakes, 8+ pgs; divine bread, pg. 24). P.L. Warner.
2. Corn Mummy in Wooden Coffin (664-305BC) – HistoryPlace.com.
3. Brewer, Bartholomew F. (2003). “The Mystery of the Eucharist” (Q), MTC.org.
4. Mojsov, Bojana. (2008). *Osiris: Death and Afterlife of a God* (corn, 4+ pgs.). Wiley.
5. Anon. (2013). *Awkward Moments Children’s Bible* (Q) (last supper, pg. #). CreateSpace.
6. Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 319). HarperOne.

External links

- Transubstantiation – Wikipedia.

θΔics

In existographies, **Travis Derouin** (c.1975-) (CR:3) is a Canadian computer programmer and website engineer noted for his 2013 to present work on running the WikiFoundry architecture and server platform that hosts Hmolpedia.

Overview

In 2005, Derouin joined on as an engineer with newly-launched WikiHow (Q) website, founded by Jack Herrick, where he was responsible for several of the Mediawiki add-on features and for building the website's architecture; remaining there until 2011. [1]

Wetpaint

In late 2005 early 2006, Wetpaint wikis were launched by Ben Elowitz (Q), an American computer programmer, who previously, after completing a BS in applied mathematics (1994) and BS in electrical engineering and computer science (1994), at University of California, Berkeley, had been a consultant for eHarmony (2002), among other sites, e.g. he co-founded the 2004-launched jewelry website Blue Nile (Q). Wetpaint was funded with $40M, through a series A, B, and C stage investments (2005-2007). In a post-launch interview with Stewart Mader, Elowitz described the "idea" origin for Wetpaint wikis as a means to help a friend find public-made information and tips about cancer, which he describes as follows: [2]

> "Stewart Madar: that's good to hear. How did Wetpaint start (or Wikisphere when it first started)?
>
> Elowitz: Not all that long ago, a friend of ours was diagnosed with cancer. After the initial shock wore off, he did what most people do when they get bad medical news: He went online. What he found were lots of facts, but not what he was looking for. He wanted to know how people who had the same condition were dealing with the emotional blow. What tricks did they know about working around the symptoms? Who were the best doctors? What's the stuff they don't tell you at the clinics? Sitting helplessly on the sidelines of our friend's dilemma, it dawned on us: Why not come up with a way to harness the collective thinking of people with first-hand knowledge on subjects like health, jobs, world events, or hobbies? Then, instead of relying on so-called experts, real people with real experience would become the experts. We were convinced then, and even more certain today, that, if you put thousands of heads together to solve a problem, give advice, or share a point of view, the results are always truly astonishing.
>
> Elowitz: So what's the best way to bring those minds together? Wikis are great, because they allow readers to become writers, editors, and fact-checkers. The only problem was, wikis haven't been especially easy to use. And that's why we started Wetpaint."

The original "wiki" idea is found at WikiCancer.org (Q)(Q)

In 2007, Wetpaint was named one of *Time Magazine*'s 50 Best Websites. In 2009, ad revenue dynamics began to change, and Wetpaint laid off 15 of their 56 employees. In 2010, the wikifarm was partitioned off into the WetpaintCentral.com domain and the main page Wetpaint.com was rebranded into a new online TV fan destination site. [3]

WikiFoundry

In Sep 2013, Derouin purchased the wikifarm portion of Wetpaint, which had begun to atrophy, owing to lack of maintenance, was purchased by Derouin, and rebranded it as "WikiFoundry", and began to upgrade and rebuild the original code, get better and more powerful servers, etc., thereby making the wiki functional again. [4]

In Mar 2016, Derouin was working to move the platform of WikiFoundry to bigger more powerful servers and to re-write a big portion of the original Wetpaint code, which is out of date.

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2. Mader, Stewart. (2006). “A Conversation with Ben Elowitz, CEO of Wetpaint” (Q), StewartMader.com, Mar 14.
3. Wetpaint – Wikipedia.
4. Main – WikiFoundry.com.

External links

- WikiFoundry – Facebook.
- WikiFoundry – Twitter.
- Travis Derouin – YouTube.

θΔics

In famous publications, ***Treatise on General Sociology***, *Trattato di Sociologia Generale* (Italian) or *The Mind in Society* (1935 edition), is a 1912 four-volume, 2,033-page publication by Italian engineer turned sociological economist Vilfredo Pareto, a Seymour-Smith 100 Most Influential Books Ever Written (1998) (Q) (1998), a 50 Greatest Books Ever Written (2014) (Q), which outlines a *Social Principia* like view of sociology, based on physics, chemistry, and mechanics, using a human molecule point of view, according to which people, as molecules in possession of various levels of agitation inherent to one's nature, are moved by certain "residues" and by "derivations" from these residues, which has thus resultantly worked to rank Pareto (as of 2013) as a top three social Newton of antiquity. [1]

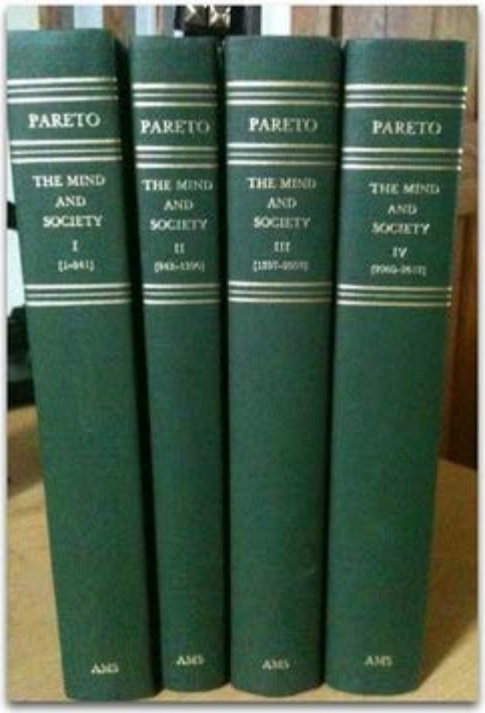

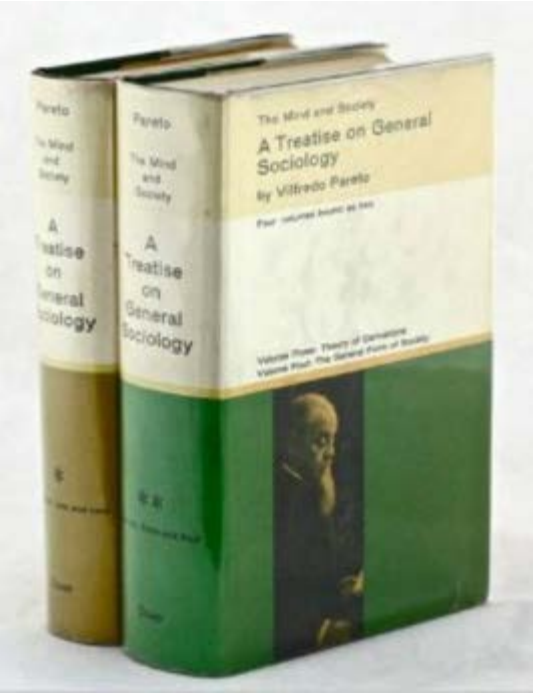

Left: the 1935 four volume English translation set of Italian engineer turned socioeconomist Vilfredo Pareto's 1912 ***Treatise on General Sociology***. Right: the 1963 four volumes bound as two set by Dover edition (Q) of the same.

Overview

Pareto states his aim in the opening paragraphs of his *Treatise* as follows: [5]

> "My wish is to construct a system of sociology on the model of celestial mechanics, physics, and chemistry."

In 1912, Pareto finished his four volume book. Owing to a delay, as a result of the outbreak of WWI, as English political science historian Samuel Finer reports, it was not published until 1916. [4] The original Italian version was published in English in 1935 as a four volume set *The Mind and Society*; then later as a four volumes bound as two set by Dover (Q) in 1963.

In the 1920s, the Italian version of the book, *Trattato di Sociologia Generale*, was making the rounds at Harvard, and thus forming the so-called Harvard Pareto circle (1932-1942), centered around American physical chemist turned biochemist Lawrence Henderson, which worked to shape American sociology in an alternative fashion to that of the then popular Marxian sociology. Henderson gave the following reduced synopsis of Pareto's treatise:

> "The social system makes its appearance on page 1306 of Pareto's book. It has been preceded by a painstaking choice, discrimination, description, and classification of its elements. The first quarter of the book, a study of the non-logical actions of men, leads up to the demonstration that no other elements of the social system are more important than the sentiments. The last half of the book is synthetic, but like all the rest it is enriched with a profusion of diverse and well-chosen facts. Pareto works up to his system, then defines it, and finally tests it in a survey of important aspects of the history of Europe. We can no long follow him here, for these eight hundred pages are incompressible."
>
> — Lawrence Henderson (1935), "Pareto's Science of Society" [9]

Notable and now famous Pareto concepts of: an economic agent as a "homo economicus", circulation of elites, Pareto principle, among others, supposedly, are found in or derive from Pareto's *Treatise*.

Excerpts

The following are noted excerpts from Pareto's *Treatise*:

> "Sociology has hitherto been almost always expounded dogmatically. Let us not be deceived by the name of *positive* given by Comte to his philosophy; his sociology is as dogmatic as Bossuet's *Discourse on Universal History*. The religions of the two men are different, but they are religions; and it is religions that we find in the works of Spencer, of De Graef, of Letourneau, and of innumerable other authors."
>
> — Pareto (1912), *Treatise on General Sociology* (§6) [6]

Quotes

The following are related quotes:

> "And now the astonishing and perturbing suspicion emerges that perhaps almost all that had passed for social science, political economy, politics, and ethics in the past may be brushed aside by future generations as mainly *rationalizing*. John Dewey has already reached this conclusion in regard to philosophy. Veblen and other writers have revealed the various unperceived presuppositions of the traditional political economy, and now comes an Italian sociologist, Vilfredo Pareto, who, in his huge **treatise** on general sociology, devotes hundreds of pages to substantiating a similar thesis affecting all the social sciences. This conclusion may be ranked by students of a hundred years hence [2021] as one of the several great discoveries of our age."
>
> — James Robinson (1921), *Mind in the Making* (Q) (Q)

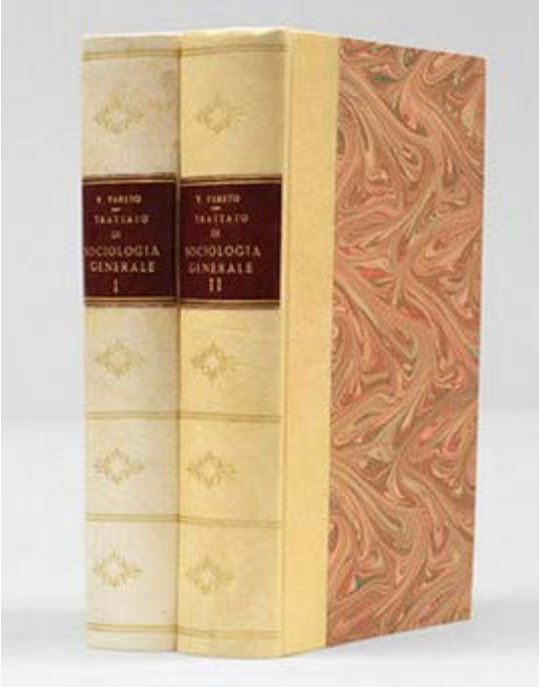

The original two-volume set (Q) of Pareto's *Trattato di Sociologia generale* (1916).

> "Pareto's ***Trattato di Sociologia Generale*** is the hardest boiled book I have ever read. Three times, since I passed my puberty, has my mind been made over. Once by a nexus of which Henry Adams was the center, once by a matrix of which Frazer burned brightest, and once by a long study of genetics and evolution. Pareto is doing the job a fourth time, and far more vitally than any others."
>
> — Bernard DeVoto (1928) [2]

> "If we are to speak of Pareto's **treatise** as a seminal book, we must use the epithet in the sense in which we apply it to Newton's *Principia*. No revolution can follow it, except a revolution in the methods of the social sciences. That revolution is already in its first stages in Italy and in France, and my yet spread to England and to America."
>
> — Andrew Bongiorno (1930). "A Study of Pareto's *Treatise on General Sociology*" [6]

> "Pareto's ***Treatise*** is a work of genius."

— Lawrence Henderson (1935), *Pareto's General Sociology: a Physiologist's Interpretation* [8]

"Pareto's monumental work, ***Trattato di Sociologia Generale***, lies before us as the most massive and impressive statement of the mechanistic conception of social life."

— Werner Stark (1962), *Fundamental Forms of Social Thought* [3]

"In my last three years DeVoto was my tutor in my field of English literature, with whom I met once a week to discuss my reading. Henderson had urged the ***Sociologie*** on DeVoto, as he urged it on everyone; DeVoto in turn urged it on me, not because it was sociology but because it might clear a lot of nonsense from my mind."

— George Homans (1962), "Autobiographical Introduction" [7]

References

1. (a) Pareto, Vilfredo. (1935). *The Mind and Society:* Trattato di sociologia generale *(Volume One)* (chemistry, 24+ pgs; physics, 15+ pgs; thermodynamics, 2+ pgs). AMS Press.
(b) Pareto, Vilfredo. (1935). *The Mind and Society:* Trattato di sociologia generale *(Volume Two)* (chemistry, 1+ pgs). AMS Press.
(c) Pareto, Vilfredo. (1935). *The Mind and Society:* Trattato di sociologia generale *(Volume Three)* (chemistry, 8+ pgs; physics, 7+ pgs; thermodynamics, 2+ pgs). AMS Press.
(d) Pareto, Vilfredo. (1935). *The Mind and Society:* Trattato di sociologia generale *(Volume Four)* (chemistry, 8+ pgs; physics, 4+ pgs; thermodynamics, pg. 1461; molecules, 7+ pgs). AMS Press. .
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4. (a) Finer, Samuel. (1966). "Biographical Summary", in: *Vilfredo Pareto: Sociological Writings* (selected and introduced by: Samuel Finer; translated by Derick Mirfin) (§2, pgs. 9-12). Frederick A. Praeger.
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8. Henderson, Lawrence J. (1935). *Pareto's General Sociology: a Physiologists Interpretation* (pg. 59). Harvard University Press.
9. (a) Henderson, Lawrence. (1935). "Pareto's Science of Society", *Saturday Review of Literature*, 25:3-4, 10, May.
(b) Barber, Bernard. (1970). *L.J. Henderson on the Social System* (§4:181-90; quote, pgs. 185+187). University of Chicago Press.

θΔics

In famous publications, **Treatise on the Three Impostors** is an apocryphal 13th century book said to have been written by Frederick II (1239), or later by Simon of Tournai (1130-1201) or Bernardino Ochino (1487-1564), wherein the divinity of divinity of Jesus, Moses, and Muhammad is denied, and each or dubbed "impostors", hence the term "three impostors".

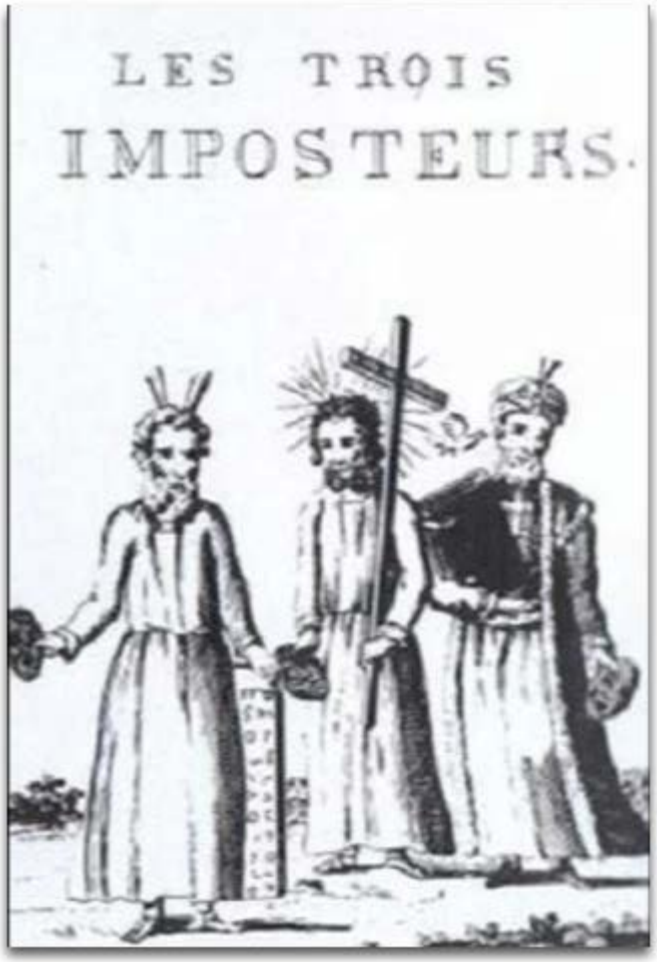

A image (Q) of a Spanish or Italian version of ***Treatise on the Three Impostors***, showing Moses with his "horns", Jesus with his cross and rays of sunlight (halo), and Muhammad, with his holy Quran, each of whom are dubbed "impostors", in the said book, i.e. scammers who founded religions on false pretenses, or something to this effect.

Overview

In 1239, Frederick II is purported to have either denied verbally the divinity of Jesus, Moses, and Muhammad, declaring each of them imposters, and or to have published a book or treatise on such a supposition; the following is testimony to this:

> "Frederick II, this pestilent king, a scorpion spitting out poison from the stinger of his tail, has notably and openly stated that—in his own words—the whole world has been fooled by three impostors, Jesus Christ, Moses, and Muhammad, two of whom died honorably, while Jesus himself died on the cross. Moreover, he has dared to affirm, or rather, he has fraudulently claimed, that all those who believe that a virgin could give birth to the god who created nature, and all the rest, were fools. And Fredrick has aggravated the heresy by this insane assertion, according to which no one can be born without having been conceived by the prior intercourse of a man and woman; he also claims that people ought to believe nothing that cannot be proven by the strength and reason of nature."
>
> — Pope Gregory IX (1239), address to monarchs

This resulted in the anonymous *Treatise on the Three Impostors* (aka *The Atheist's Bible*), either written by Frederick II or Simon of Tournai (1130-1201) or Bernardino Ochino (1487-1564), which began to circulate (Q) in the centuries to follow.

In 1770, Voltaire, published a response to the hoax treatise entitled *Epistle to the Author of the Book of the Three Impostors* (Épître à l'Auteur du Livre des Trois Imposteurs) (Q), which contains one of his best-known quotations, "If god didn't exist, it would be necessary to invent Him."

In 2009, Georges Minois, in his *The Atheist's Bible: the Most Dangerous Book that Never Existed*, argues something to the effect that the three impostors treatise never existed, and that Voltaire was the first to make a semblance of such a book. [1]

References

1. Minois, Georges. (2009). *The Atheist's Bible: the Most Dangerous Book that Never Existed* (translator: Lys Weiss). University of Chicago Press, 2012.

External links

- Treatise on the Three Impostors – Wikipedia.

θΔics

In science, **tree of knowledge** refers to the divisional structuring of the totality of human knowledge into that of the form of a tree whereby knowledge is conceptualized as growing and dividing like the branches of a tree.

Etymology

In 1296, Ramon Llull published an encyclopedia entitled *Tree of Science* (*Arbor Scientaie*), which showed a tree of knowledge: [4]

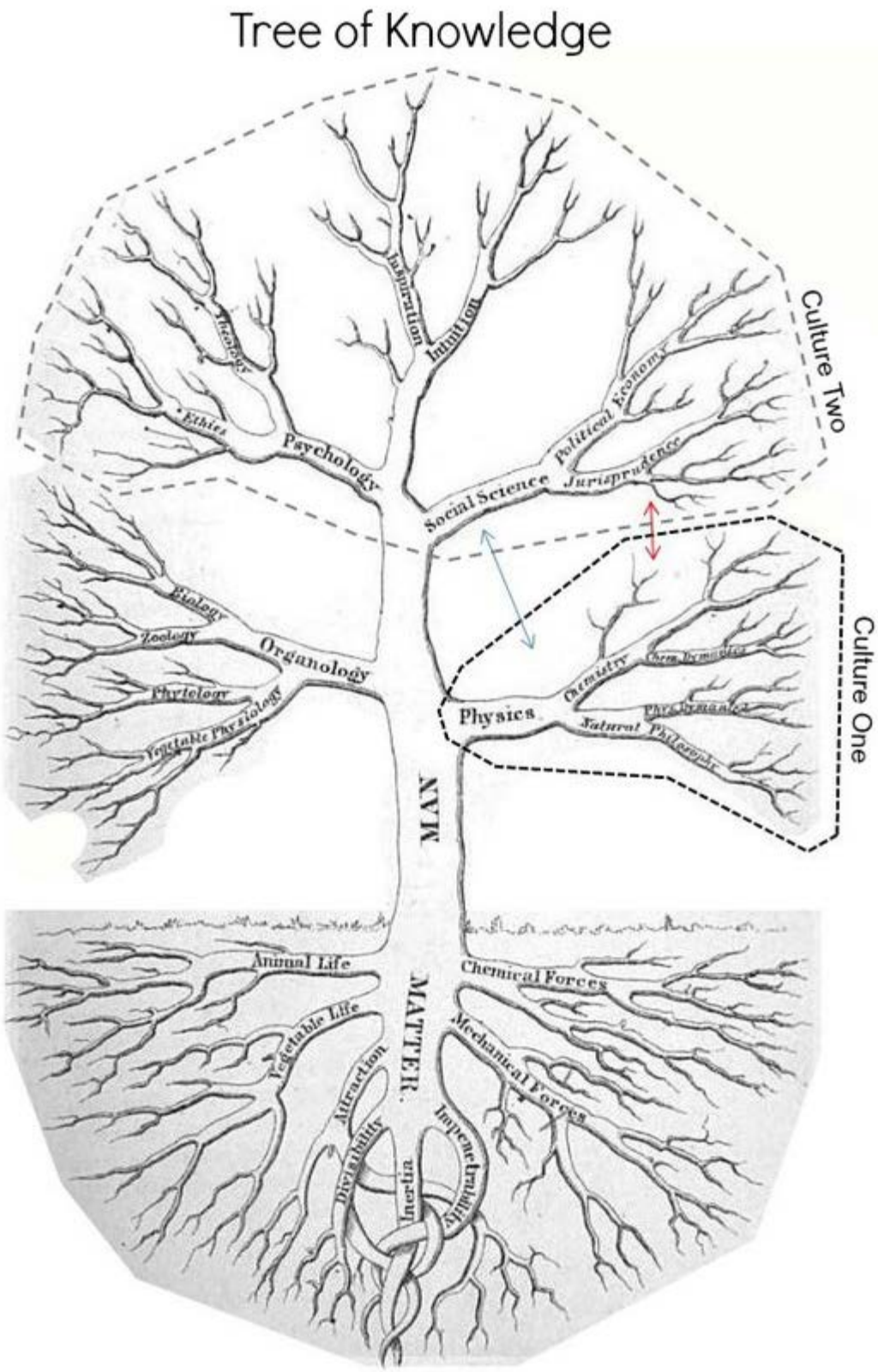

American physical science applied sociologist Henry Carey, one of the founders of the social mechanics school, and his 1858 depiction of the "**tree of knowledge**", annotated to show a post 1959 "two cultures" perspective, wherein the branch of **social science** is intentionally shown located in close proximity to the the **physical science** branch of knowledge, with two-way arrows indicating "exchanges" of ideas talking place, to create a unified branch of social mechanics or social physics, as Carey worked at developing. [3]

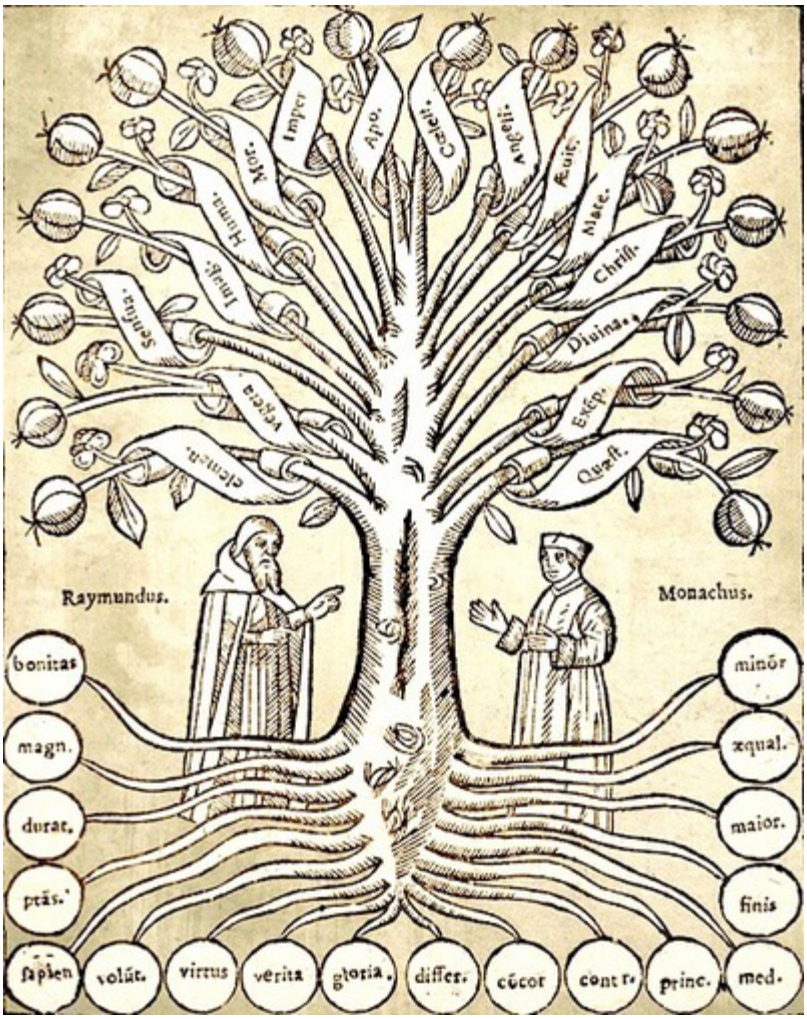

In 1605, English English physicist, natural philosopher, a said to be last person to know everything Francis Bacon, in his *Advancement of Learning*, stated the following: [1]

> "The divisions of knowledge are not like several lines that meet in one angle, but are rather like **branches of a tree** that meet at one stem."

In circa 1610, French natural philosopher, physicist, and a said to be greatest mathematician ever Rene Descartes stated the following: [2]

> "Thus the whole of philosophy is like a **tree**: the roots are metaphysics, the trunk is physics, and the branches that issue from the trunk are all the other sciences."

In 1858, American physical science applied sociologist Henry Carey, in his *The Principles of Social Science*, in aims to visually situate the location of the branch of "social science", in the tree of knowledge, drew out the tree, as he saw things, shown adjacent, having the following branches and roots. [3]

Branches

The following are the branches of the tree of knowledge according to Henry Carey (1858): [3]

Physics

Chemistry
Chemical dynamics
Natural philosophy
Physical dynamics

Social science

Political economics
Jurisprudence

Arts/Philosophy(?)

Intuition
Inspiration

Psychology

Ethics
Theology

Organology (Biology?)
Ecology
Zoology
Physiology
Vegetable Physiology

(add discussion)

Roots

The following are the roots of the tree of knowledge according to Henry Carey (1858): [3]

Animal life
Vegetable life
Attraction
Divisibility
Inertia
Impenetrability
Mechanical forces
Chemical forces

(add discussion)

Alternative frameworks

Alternative non-tree like frameworks of total knowledge include Auguste Comte's 1842 "everything is physics" point of view (celestial physics, terrestrial physics, organic physics, and human physics) as well as his 1854 "hierarchy of sciences" point of view: morals is the "supreme science", about which paramount is the "theory of our emotion nature", which must be tied into: sociology, biology, chemistry, physics, astronomy, and lastly mathematics as the "language", in Willard Gibbs famous phrasing, of it all, respectively, in one unified theory (see: reductionism).

References

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(b) Carey, Henry C. and McKean, Kate. (1874). *Manual of Social Science: Being a Condensation of 'The Principles of Social Science' of H.C. Carey* ("tree of knowledge" diagram, pg. 26). Industrial Publisher.
4. Tree of Science (Ramon Llull) – Wikipedia.

External links

â— Tree of knowledge – Wikipedia.

θΔics

In hmolscience, **Trevor Barnes** (1956-) is an English-born Canadian geographer noted for his 2014 "Big Data: Social Physics, and Spatial Analysis: the Early Years", co-authored with American geographer Matthew Wilson, wherein in they attempt to stitch out a historical red thread from the 1858 social gravitation theories of American sociologist Henry Carey to the 1950s sociophysical geography collaborations of American physicist John Q. Stewart and geographer William Warntz, which they argue went into modern "spatial analysis" (Q), the punchline being that "big data" (Q), supposedly, has roots in social physics. [1]

Monism | Terminology

A subtle issue in Barnes and Wilson's article, is their seeming overuse of term "monism", employed 15-times, in ways that do not match the attribution, e.g. that John Q. Stewart had a bullish "faith in monism", that William Warntz was "uncompromisingly monistic", that Henry Carey "unabashedly believed in monism", etc., whereas correctly, as seems to be the case, none of these authors ever used the term monism. The term "monism" is not found in Carey's *Principles of Social Science*, and there does not seem to be any established Google Books citation connections between either Stewart, Warntz, and George Zipf and monism.

The term "monism", clarify, is a very baggage-loaded term, that tends to bring to mind an association to Gottfried Leibniz' deistic "monad" theory, i.e. that everything is in the universe is composed of thinking soul-filled god-infused particles, or something along these lines.

The variation of "monism" promoted by Ernst Haeckel and later by his cohort Wilhelm Ostwald, e.g. in his "Monistic Sunday Sermons", however, is in the same neighborhood as what Stewart and Carey were promoting.

Ludwig Buchner, to note, was classified as a "materialistic monism" theorist. Whatever the case, Barnes term usage seems to be a case of two cultures namesakes issue.

Barnes may have adopted Pitirim Sorokin's derogative usage of the term monism—Sorokin harboring some type of unstated spiritual dualism underpinnings, as his later decade's writings would show—and sell, classificationally, Carey, Stewart, Zipf, and Warntz as monists. This supposition seems to corroborate with their note 16:

> "The issue here is the relation of monism to big data. The most immediate invocation of monism by big data is its assumption that the social world can be mathematized in the same way as the natural world. Without the supposition that the social world can be fully made over as numbers, big data would have no purchase. We also suggest that monism is invoked by big data in a second form, at least implicitly. When big data deploys models of spatial analysis monism is presumed, because those models partly rest on a social physics that makes monism foundational."

Here, accordingly, as it seems to be the case, the aim they are after is to position the view that Carey-Stewart based macrogeographical "big data" science, infused into the Alex Pentland: "the engine that drives social physics is big data" (2014) variety, in some way—can be mathematized, and that the patterns found therein will find foundation in the "natural sciences, physics in particular", and that this is their selling point. A science vs religion tensional issue debate, in short.

Stewart | Weaver fallout

The over-selling of "monism", summarized above, in short, seems to be a coated way of discussing the so-called Stewart-Weaver fallout, namely the fact that Warren Weaver, in 1953, stopped funding John Q. Stewart's social physics program, after four years of funding, which had been originally seeded with $160,000 level (modern terms), when he came to arrive at the stated belief that physical energy and theories could not be applicable to things such as feelings, meaning, values, decision making (which gets into questions of soul), etc., as he told Stewart, amid, it seems, his soon-to-make "Remarks on the Current State of Social Physics" AAAS meeting paper, wherein Stewart began to assert

isomorphisms between thermal, electromagnetic, and chemical energy and, respectively, human meaning, feeling, and authority, as well as an isomorphism between mechanical work (kinetic, elastic, and gravitational energy) and decision-making. [2]

In 1953, Weaver wrote to Stewart that he was going to cancel his social physics funding per the following logic: [3]

> "To search for isomorphisms between social phenomena and physical phenomena is indeed an interesting idea. The real question, however, is whether or not it is a rewarding idea. It is interesting to suppose that there may be entities, social values, which play in social experience the same roles played by different forms of physical energy … But it is hard for me to sense how one can usefully assign quantitative measures to any significantly wide range of "values" in the social field. And when you link together such things as meaning, feeling, authority, and decision-making, this sounds to me like a very heterogeneous mixture."

Similar examples of such reasoning are found explicitly stated in the Proxmire affair (1975), Rossini debate (2007), the Galem effect:

> "To suggest that humans could behave like atoms was looked upon as a blasphemy to both hard science and human complexity, a total nonsense, something to be condemned. And it has been indeed condemned during the last fifteen years."
>
> — Serge Galam (2004), "Sociophysics: a Personal Testimony"

the Prausnitz-Thims derision (2013) (Q), etc., and likely found in earlier collision efforts, e.g. the Nightingale Chair of Social Physics, which is a spit that dates back to the 1809 with the separation of people as either "admirers" and "enemies" of Goethe's physical chemistry based *Elective Affinities*, which before that dates to the atomic theory vs. standard model vs. being theory debates of the Greek philosophers (see: atheism timeline)

Social physics | Etymology

Barnes and Wilson, in their big data and social physics article, to note, mis-attribute the coining of the term "social physics" to Adolphe Quetelet, and his 1835 *Essay on Social Physics*: *Man and the Development of his Faculties*, whereas correctly Auguste Comte was already using the term in print in 1825, which he coined, and or derived from his interactions with his mentor Henri de Saint-Simon, who may have used the term possibly as early as 1803.

References

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(b) Matthew W. Wilson (faculty) – Harvard University.
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3. Weaver, Warren. (1953). "Letter to John Q. Stewart", Dec 22, in: Box 36, Weaver, W., John Q. Stewart Papers, Rare Books and Special Collections, Princeton University.

External links

- Trevor J. Barnes – Wikipedia.
- Trevor J. Barnes (faculty) – University of British Columbia.

θΔics

In existographies, **Trevor Levere** (1944-) is a London-born Canadian chemistry historian noted for his 1969 PhD dissertation turned book *Affinity and Matter: Elements of Chemical Philosophy 1800-1865*, essential reading for anyone interested in who affinity transformed in to free energy in the 19th century, e.g. how the thermal theory of affinity transformed into the thermodynamic theory of affinity, which rounds off the last chapter Levere's book. [1]

Levere seems to be an associate of David Knight. [2]

Education

In 1956, Levere, at age 12, received a chemistry set and a good microscope.

In 1962, Levere entered Oxford University, majoring in chemistry, while doing recreational reading in the history of science by Herbert Butterfield, Henry Leicester, and Thomas Kuhn.

In 1969, Levere completed his PhD in the history of science, with focus in chemistry, under the direction of A.C. Crombie, the result of which was published in book form in 1971 as *Affinity and Matter: Elements of Chemical Philosophy 1800-1865*. (Q)

See also

- Jeremy Adler
- Mi Gyung Kim

References

1. Levere, Trevor, H. (1971). *Affinity and Matter: Elements of Chemical Philosophy 1800-1865*. Great Britain: Oxford University Press.
2. Science, Technology and Culture, 1700-1945 – AshGate.com.

External links

- Trevor Levere (faculty) – University of Toronto.

θΔics

In hmolscience, **trigger action** refers to release of available energy from a false equilibrium or metastable equilibrium. [1]

Alfred Lotka's 1922 "**trigger action**" model of animate form dynamics, according to which the light that causes the dynamite to explode operates via the same mechanism as when a gazelle "sights" a predator, which causes the explosive flee reaction.

Overview

The origin of the concept of "trigger action", being the general idea that "trigger" of a gun, when the hammer hits the powder, whereby kinetic energy of the impact causes the nitrogen-based products to combust or explode into products, which acts to release the stored energy of gun powder, so to propel or force the bullet into an accelerated motion, for the most part, is a concept invented by Alfred Lotka, namely an extrapolation of this model into the area of the evolution of animals, which originated in his learning of activation energy from the 1902 lectures of Wilhelm Ostwald, and presented by Lotka, in his reformulated view, in the 1920s.

Lotka, retrospectively, however, seems to think that the concept originated in 19th century French science; the following are his views:

> "The significance of 'trigger action' seems to be have been first pointed out by Sadi Carnot [c.1825], and more specifically by Adhemar Venant (Ñº), who speaks of it as 'raised work' (travail de decrochement), as in the pulling of a 'trigger' (declic). See Boussinesq, *Cours de physique mathetnatique* (*Course in Physical Mathematics*), Tome III, p. XXXII (in section: 'Conciliation of Veritable Determinism with the Existence of Life and Moral Freedom' ("Conciliation du veritable deterrninisme avec l'existence de la vie et de la liberte morale"). Paris, Gauthier-Villars, 1922, but referring to original publications in 1872, 1878."
>
> — Alfred Lotka (1945), "The Law of Evolution as a Maximal Principle" (pg. 170)

> "This observation, casually introduced by Ostwald in one of his lectures in 1902, was the 'trigger' that set off the train of thought developed in my subsequent publications, and summarized, in part, in my *Elements of Physical Biology* (1925) and *Analytical Theory of Biological Associations* (*Theorie Analytique des Associations Biologiques*) (1934, 1939)."
>
> — Alfred Lotka (1945), "The Law of Evolution as a Maximal Principle" (pg. 176)

In 1922, Alfred Lotka, publicly, began popularized the term "trigger action", based on the model of a gun, whereby the small amount of work done in the act of pulling the "trigger" releases a disproportionately larger amount of work in the firing of the projectile, according to which when a prey "sights" a predator, the "light" of the visual fear stimulus, triggers an explosive flee reaction, akin to the mallet of a gun triggering an explosion of gun powder.

The following is the stoichiometric equation for the detonation of nitroglycerin, the component of dynamite, which Lotka compares to the predator-prey reaction:

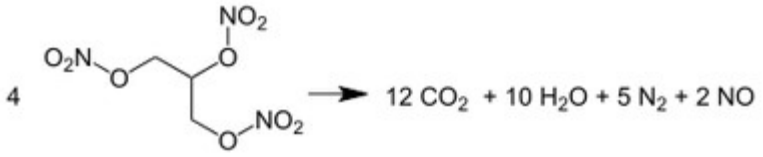

The considerable chemical energy of the detonation is due to the high strength of the bond in molecular nitrogen N2, i.e. a triple bond (N≡N).

Lotka seems to indicate, *via* footnote, that the term "trigger action" originates from a combination of his own writings (1912) along with those of French physician Hyacinthe Guilleminot (1919) and English biologist James Johnstone (1921). [4]

Following Lotka, others have used the term, including: Frederick Soddy (1926), and Richard Adams (1975) in attempts at thermodynamically explaining the standard definition of work, as in weight lifted through a height (or force times distance), in the context of biological work, e.g. the sight of a predator triggering a flee response, or human work, e.g. a workman operating a power-driven appliance at a factory. [2]

Adams defines trigger action, as that in which action in the form of information from one system triggering off a change of state in another system, whereby the change of state continues until the second system reaches another state of equilibrium. He also speaks of trigger mechanisms; which, he says, come in many kinds. [3]

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (trigger action, pg. 102). (preview), (Google books). Morrisville, NC: LuLu.
2. (a) Lotka, Alfred J. (1922). "Natural selection as a physical principle" [PDF]. *Proc Natl Acad Sci*, 8, pp 151–54.
(b) Soddy, F. (1926). *Virtual Wealth and Debt* - *the Solution of the Economic Paradox* (pg. 58). London: George Allen & Unwin LTD.
3. Adams, Richard N. (1975). *Energy and Structure: a Theory of Social Power* (pg. 119). University of Texas Press.
4. (a) Lotka, Alfred J. (1912). "Article", *J. Washington Acad. Sci.*, Vol. 2, pg. 71.
(b) Guilleminot, Hyacinthe. (1919). *Matter and Life* (*La Matiere et la Vie*) (pg. 115). Flammarion.
(c) Johnstone, J. (1921). *The Mechanism of Life* (pg. 49). Liverpool.

θΔics

In

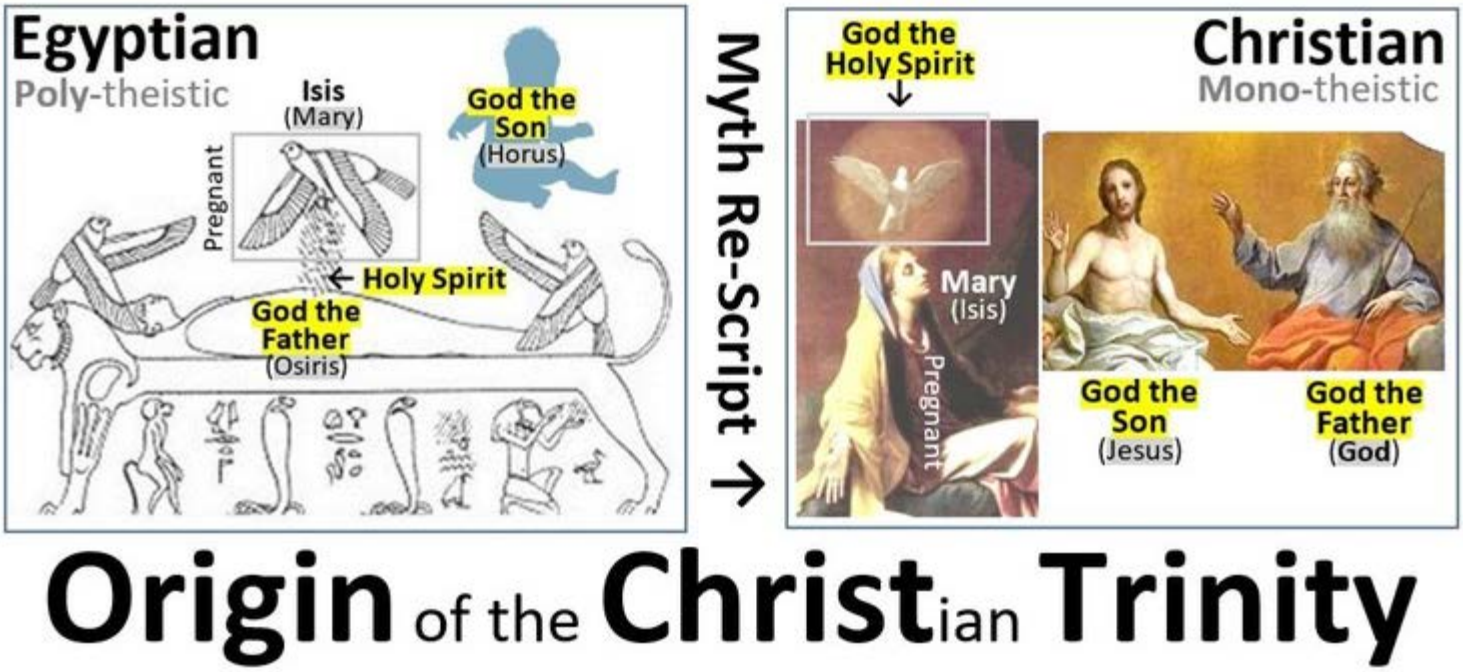

A gist overview of where the Christian "**trinity**" derived, namely from a god reduction of extant Egyptian mythology, wherein Osiris became "god the father", Horus became "god the son", and the magical black rite resurrection powers that brought Osiris back to life so to magically give his sperm to Isis, became the "holy spirit", which became, by 330AD, re-conceptualized as three things rolled into "one god", aka a trinity.

Christian mythology, **Trinity** refers to the belief that there exists a “god the father”, “god the son”, and a “holy spirit” that are three separate yet unified thing or god as one, depending on interpretation.

Egyptian | Christian

In c.150AD, during the Roman recension, religious thinkers took extant religion, i.e. Egyptian mythology as then known, and converted the so-called "black rite" resurrection sex story, wherein the god son Horus, is conceived via the magical time-stopped sex act, according to which the goddess Isis, in the form of a kite (or bird), shown adjacent, hovers over the brought-back-to-life body of Osiris, from which she draws the sperm of Osiris, via the magical "holy spirit" like powers, to therein become pregnant from the seed of her dead mummified husband, and re-wrote in a monotheistic guise, according to which the virgin Mary becomes pregnant the "holy spirit" in the form of a dove (or bird), and thereafter conceives the god son Jesus, son of "god the father", a newly conceptualized supreme god.

Newton

In *circa* 1700, English physicist Isaac Newton, in incognito, would objectionably not label years as AD, but instead used AC (*Anno Christum*), signifying is objection to the argument of the existence of the trinity, namely his view that a person named Jesus may have existed, may have been the son of God, and may have been christened or arisen, but definitely was not the ‘Lord’ or God. [1]

References

1. Gleick, James. (2003). *Isaac Newton* (pg. 112). Vintage Books.

External links

â— Trinity – Wikipedia.

θΔics

In terminology, **tropism** (TR:10), from Greek *trepein* "to turn" + -ism, refers to the turning, growth, or orientation change of all or a part of an organism in a particular direction, away from or towards, an external stimulus.

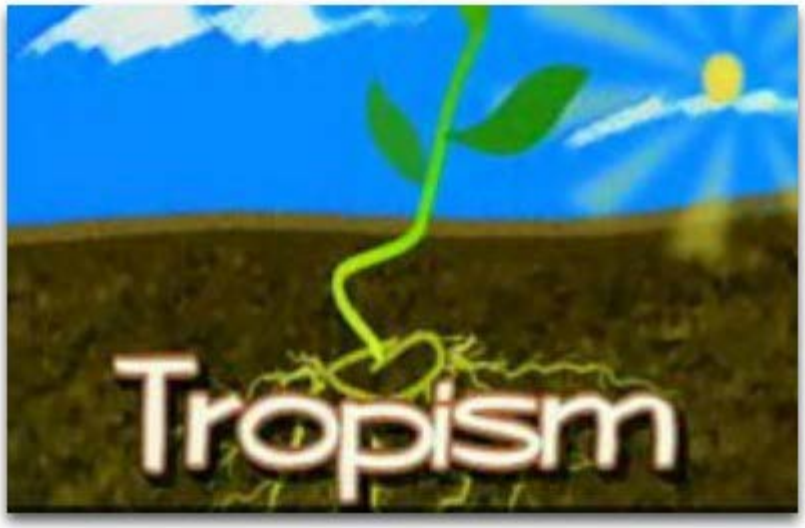

An example of phototropism, a type of **tropism**, defined as growth or a turn towards light or a source of photons, e.g. sunlight.

Overview

In 1888, Jacques Loeb, in his "The Orientation of Animals to Light", introduced his tropism theory or forced movement theory of action (see also: induced movement), the beginning of a long effort to overthrow that anthropomorphic-view of animal and plant movement, e.g. that protoplasmic substances move toward the source of light, "because of curiosity", as many argued during Loeb's day. [1]

In 1918, Loeb, in his *Forced Movements, Tropisms, and Animal Conduct*, stated, in effect, that Galilean-based tropism usurps Aristotelian-based teleology, as the explanative model in biology (chnopsology):

> "The Aristotelian viewpoint still prevails to some extent in biology, namely that an animal moves only for a purpose, either to seek food or to seek its mate or to undertake something else connected with preservation of the individual or the race. The Aristotelians had explained the process in the inanimate world in the same **teleological** way. Science began when Galileo overthrew this Aristotelian mode of thought and introduced the method of quantitative experiments which leads to mathematical laws free form the metaphysical conception of purpose. The analysis of animal conduct only becomes scientific in so far as it drops the question of purpose and reduces the reactions of animals to quantitative laws."

(add discussion)

Humans | Psychological chemotropism

In 1898 to 1903, Ernst Haeckel, in his love letters, mentions the concept of elective affinity at least three times in respect to his own romantic relationships, and in one letter to a Franziska von Altenhausen, defined, his own elective affinity to her as a strange psychological chemotropism: [2]

> "… seductive women—why should I, despite all scruples and obstacles, cast myself into the dust before you? Dearst Franziska, herein lies the enigma of 'elective affinity', of that strange **psychological 'chemotropism'**, of whose power I have spoken repeatedly in my books—little dreaming that I myself should fall a victim to it in my old age!"

A 2010 view (Q) of the tropism of human molecules, according to Russian physical chemist Georgi Gladyshev, which he believes is but one of many type of

In other words, the way a person orients their reaction existence (life) towards, around, or in the

direction of a loved one, or the person to whom the elective affinities direct them is similar to the way a plant turns toward or grows to sunlight, according to Haeckel.

tropism, governed by his theory of hierarchical thermodynamics.

Quotes

The following are related quotes:

> "The **tropism** of human molecules is governed by human and hierarchic thermodynamics which explain tropism via Gibbs' equilibrium criteria."
>
> — Georgi Gladyshev (2010), crowd photo (O) description statement, Jun 8

> "All types of **tropisms** in the universe can be explained using hierarchical thermodynamics."
>
> — Georgi Gladyshev (2010), plant photo (O) description statement, Jun 12

See also

- Retinal molecule | ABC model

References

1. Loeb, Jacques. (1888). "The Orientation of Animals to Light" ("Die Orientierung der Tiere gegen das Licht"), *Sitzngsb. Wurzb. Physik.-md. Ges.* Publisher.
2. Haeckel, Ernst. (1930). *The Love Letters of Ernst Haeckel: Written Between 1898 and 1903* (editor: Johannes Werner) (elective affinity, pgs. 101, 212, 260). Methuen.

External links

- Tropism – Wikipedia.

θΔics

In reality, **true** or what is considered "truth, as compared to what is not true or considered as false, refers to subjects, things, or a state of being that are in accordance with fact or the actual state of affairs; conformable to an essential reality; and or being that which is the case rather than what is manifest or assumed.

> "The first and last thing which is required of genius is the love of **truth**."
>
> – Johann Goethe (1829), *Maxims, Volume III (pg. 229)* (Ñº)(Ñº) [3]

Elective Affinities

In 1796, German polymath Johann Goethe began to develop his physical chemistry based theory of passions; the final result of his theory is embedded in layers of coded gestalt in his 1809 novella *Elective Affinities*, his self-defined best book, the central principle of which, when attacked by a women on the street, he told are "true" and not false, in his own words (as depicted in full adjacent): [1]

> "The principle illustrated in the book is **true**."

American woman's rights activist Victoria Woodhull, in her 1871 "Introduction" section to the D.W. Niles English translation of Goethe's *Elective Affinities*, seems to have been the first to state explicitly that there is a revolution in human thought embedded in Goethe's novella, and to query about whether or not the future would see it as being scientific truth: [2]

> "The tale is, in a word, of the simple construction and genial and moderate character of the "Vicar of Wakefield" rather than in the exciting style of Dickens' *Christmas Carols*: but, everywhere, the interest is skilfully kept up, and the subtle insinuation of a great revolutionary doctrine pervades the whole, and to the thoughtful reader makes the chief point of interest. Doctrines, however, which are here merely insinuated and illustrated by allusions to science, are now so openly expounded and advocated that a portion of the community will regard the great German as too conservative, while yet, doubtless, to the great mass of readers, the radical element may startle, and in some instances offend.
>
> If this fundamental thought of the man who has proved to be the seer or prophet of science in so many other things, is also a **scientific truth**, the fact cannot be appreciated by the world too soon, nor its immense sweep of consequences be too clearly foreseen and provided for. It will affect the whole scope of morals and social order, whether we accept it in our theories or not, and the less hurtfully and the more beneficently, in proportion as we thoroughly study and understand the subject."

In a scene reported by German writer Heinrich Laube (1806-1884):

"A women friend of mine said to Goethe at that time: 'I cannot approve of *Elective Affinities*, Herr von Goethe; it really is an immoral book!' According to her report Goethe was silent for a while and then said with great earnestness:

'I'm sorry you feel that way. It is my best book, and don't think that this is the mere whim of an aging man. I grant you that one loves most deeply the child of one's last marriage, the product of one's late power of generation.

> But you wrong me and the book. **The principle illustrated in the book is true and not immoral**.

But you must regard it from a broader point of view and understand that the conventional moral norms can turn into sheer immorality when applied to situations of this character."

The Goethe late December 1809 "best book" incident, wherein he tells correct that the human physical chemistry principle contained in his *Elective Affinities* are **true**. [1]

The following quote by German philosopher Arthur Schopenhauer, notable for having incorporated much of Goethe's human chemistry morality theory into his *The World As Will and Representation* (1818; 1844), seems to capture the gist of truth:

> “All **truth** passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident.”

This is especially true, in the context of Goethe's theory presently passing through the first-to-second stage of scientific truth, such as outlined on the "crackpot" page and the "Rossini debate" page, respectively, to cite two examples, within the last decade.

Discussion

(add)

References

1. Lewisohn, Ludwig. (1949). *Goethe: the Story of a Man: Being the Life of Johann Wolfgang Goethe as Told in his Own Words and the Words of his Contemporaries, Volume Two* (pg. 174). Farrar Straus and Co.
2. Goethe, Johann. (1872). *Elective Affinities: with an Introduction by Victoria C. Woodhull*. D.W. Niles.
3. Klopsch, Louis. (1896). *Many Thoughts of Many Minds* (106). Publisher.

External links

â— Truth – Wikipedia.

θΔics

In genius studies, **true genius** is a genius that is true.

Related

Enrico Fermi, of note, described Richard Garwin (SPE:8|2014) as "the only true genius he had ever met", as recalled by Marvin Goldberger (Q); though, to note, Fermi also said the same of Ettore Majorana.

Quotes

The following are related quotes:

> "When a **true genius** appears in the world, you may know him by this sign: that the dunces are all in confederacy against him."
>
> — Jonathan Swift (1728), *Essay on the Fates of Clergyman* (Q)

> "Every **true genius** is bound to be naive."
>
> — Friedrich Schiller (c.1785), *Publication* (Q)

> "To sentence a man of **true genius**, to the drudgery of a school is to put a racehorse on a treadmill."
>
> — Samuel Coleridge (c.1810), *Publication* (Q)

> "The **true genius** shudders at incompleteness — imperfection — and usually prefers silence to saying the something which is not everything that should be said."
>
> — Edgar Poe (c.1948), *Marginalia*

See also

- Real genius
- True love

Further reading

- Hoddeson, Lillian and Daitch, Vicki. (2002). *True Genius: the Life and Science of John Bardeen: the Only Winner of Two Nobel Prizes in Physics*. Joseph Henry Press.

θΔics

In genius studies, **true IQ**, similar to "real IQ", as contrasted with a fake IQ (or inflated IQ), is an IQ approximation of an individual that is closest to the truth.

Quotes

The following are related quotes:

> "One rater (M) has scored on the basis of the record of Goethe's youth an **IQ of 225**. Goethe's **true IQ** may in the history of mankind have been equaled in a few instances; one may well wonder whether it has ever been exceeded?"
>
> — Catherine Cox (1926), *Early Mental Traits of 300 Geniuses* (pg. 163) [1]

References

1. Cox, Catharine. (1926). *Genetic Studies of Genius. Volume II. The Early Mental Traits of Three Hundred Geniuses* (GB) (Arc) (pdf) (true IQ, 18+ pgs). Stanford University Press.

θΔics

In terminology, **true love** refers to love that is the genuine thing.

Overview

In 1809, Goethe, supposedly, alluded to the idea that true love or at least "soul mates" (Ottilie + Edward) could be quantified by affinities. (Q)

In 2007, Libb Thims explained that if the Gibbs energy changes for every person on the planet, at a given time, or state of existence, could be listed on a free energy table, similar to the say Goethe did tables of social affinities for people in his novella, then true love could be quantified and determined; kinetic factors aside. [2]

In 2009, Australian mathematician Clio Cresswell published a theory of the mathematics of love and or sex, claiming that singles can increase their chances of finding **true love** by rejecting at least 12 potential partners before settling down. [3]

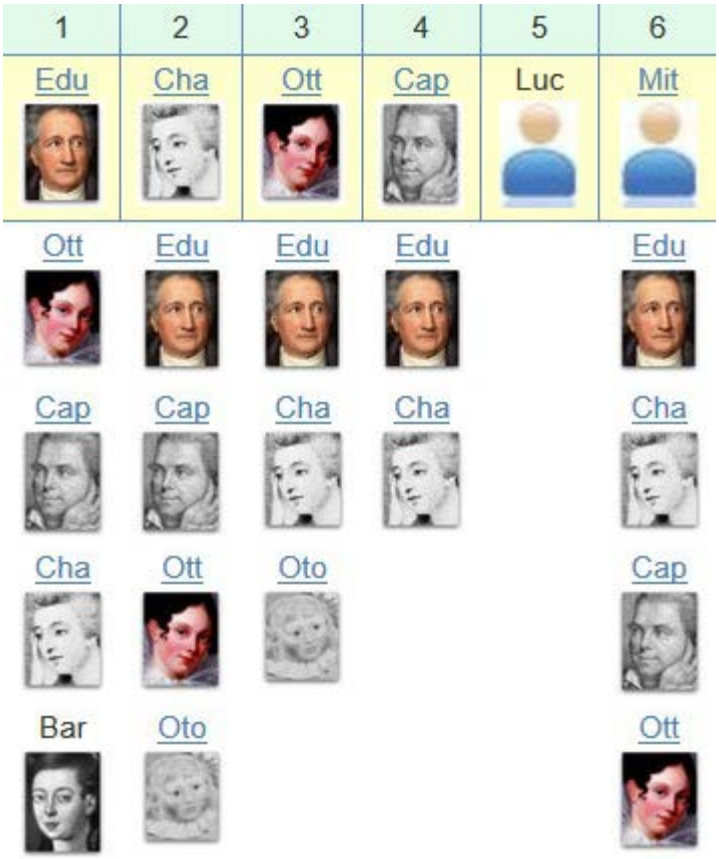

A snippet of a Goethe affinity table (1809), showing that people ordered in terms "affinity" preferences to other people within that person's social sphere, the first historical physiochemical model of "**true love**"; which is based on what Newton outlined in his "Query 31" (1718); the modern version of which found in the logic of people matched via human free energy tables as discerned by Thims (1995).

Quotes

The following are related quotes:

> "**True love** is like ghosts, which everybody talks about and few have seen."
>
> — Francois Rochefoucauld (c.1865)

> "**True love** is a chemical affinity of human monads; they are elementally attracted to one another by the invincible necessity of a law of nature. In the spiritual and physical make-up of those predestined by nature to be joined, a series of inherent correspondences is found."
>
> — Vyacheslav Ivanov (c.1900), on the "message" of Goethe's *Elective Affinities* [1]

> "**True love** is your soul's recognition of its counterpoint in another."
>
> — Steve Faber and Bob Fisher (2005), *Wedding Crashers* (Q)

See also

- Love terminology reform | Henry Bray
- Soul mate

References

1. (a) Ivanov, Vyacheslav. (c.1900). *SS*, vol. 4, pg. 147.
(b) Wachtel, Michael. (1995). *Russian Symbolism and Literary Tradition: Goethe, Novalis, and the Poetics of Vyacheslav Ivanov* (*Wahlverwandtschaften*, pgs. 32-33; human monads, pg. 34). University of Wisconsin Press.
2. Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.
3. Browne, Rachel. (2009). "The Mathematical Formula for Love", *Stuff.co.nz*, Aug 25.

Further reading

● Slater, Lauren. (2006). "True Love", *National Geographic*, Vol. 209, No. 2, pgs. 32-49, February.

θΔics

In terminology, **trust** is assured reliance on the character, ability, strength, or truth of someone or some thing. [1]

The host of the DNews show wearing a “never **trust** an atom” shirt during a 2013 episode (Q) entitled “Does Believing in God Make You Dumb?”.

Overview

In 1956, in the wake of the 1953 “Red Atheism Scare”, the US Congress passed the H. J. Resolution 396 act, which replaced the 1782 *E pluribus unum* or “Out of Many, One” national motto with "In God We Trust" as the official motto of the US, and changed the one dollar bill, the following year, as follows:

In circa 2013, Libb Thims was water-testing the phrase "In ΘΔics we trust" on the main page of Hmolpedia, in place of the religious-based one:

This meaning, in effect, that the modern physicochemical thinker, e.g. Henry Adams:

> “Who can be **trusted** to tell me whether my technical terms are all wrong?”
>
> — Henry Adams (1908), complaint to his brother Brooks Adams, after months of searching for a physicochemical proof-reader [see: Henry Bumstead] for his social phase theory of history [2]

puts his or her "trust" in thermodynamics, more so than they do in belief in the existence of god.

In 2016, Libb Thims, in his *Smart Atheism*, §:Explicit Atheism (pg. 24), was using "in atoms we trust", stylized on the Feynman time capsule wisdom, as follows: [5]

In c.2017, the Freedom From Religion Foundation, in their tweeter banner (Q) and bumper stickers, was using, the following, below left, "in reason we trust" credo motto shown on pennies:

In 2019, FFRF.org made the following parody cartoon (Q)(Q) about a substitute teacher who goes into a Missouri school and crosses out “in god we trust” on the chalk board, shown with books by: Charles Darwin, Robert Ingersoll, Madalyn O’Hair, Christopher Hitchens, Julia Sweeney, and some imaginary “FFRF book” as new reading material:

(add)

Joke | Parodies

The following is a 2016 atheist reddit icon image parody of Bertrand Russell's 1952 teapot (Q) disproof of the existence of god.

(add)

Quotes

The following are related quotes:

> "Supposing there was no intelligence behind the universe, no creative mind. In that case, nobody designed my brain for the purpose of thinking. It is merely that when the atoms inside my skull happen, for physical or chemical reasons, to arrange themselves in a certain way, this gives me, as a by-product, the sensation I call thought. But, if so, how can I **trust** my own thinking to be true? It's like upsetting a milk jug and hoping that the way it splashes itself will give you a map of London.

In 2015, Libb Thims ordered "Keep Clam and Trust God" joke T-shirts for god-believers, as a bit of humor, to wear on the Atheism Reviews show.

But if I can't trust my own thinking, of course I can't trust the arguments leading to atheism, and therefore have no reason to be an atheist, or anything else. Unless I believe in god, I cannot believe in thought: so I can never use thought to disbelieve in god."

— C.S. Lewis (c.1950), an argument for the existence of god (Q); supposedly has something to do with Lewis' earlier "argument from reason", defended in his 1947 *Miracles: a Preliminary Study*, wherein he cited John Haldane's 1927 quote: "If my mental processes are determined wholly by the motions of atoms in my brain, I have no reason to suppose that my beliefs are true ... and hence I have no reason for supposing my brain to be composed of atoms." [4]

"Fire and wind come from the sky, from the gods of the sky, but Crom is your god. Crom, and he lives in the earth. Once giants lived in the earth, Conan, and in the darkness of chaos, they fooled Crom, and they took from him the enigma of steel. Crom was angered, and the earth shook, and fire and wind struck down these giants, and they threw their bodies into the waters. But in their rage, the gods forgot the secret of steel and left it on the battlefield, and we who found it. We are just men, not gods, not giants, just men. And the secret of steel has always carried with it a mystery. You must learn its riddle, Conan, you must learn its discipline, **for no one, no one in this world can you trust, not men, not women, not beasts**... This you can trust. [*points to his sword*]."

— Robert Howard (1982), *Conan the Barbarian*; explaining the mystery of steel to Conan; written by John Milius and Oliver Stone, based on the character Conan created by Robert Howard (Q); thematic to Friedrich Nietzsche and *Scarface* (1983) dialogue

"Whether it was the worldwide flood, the feeding of the 5,000, or arguing against the possibility that man evolved from molecules to ape to man over millions of years, dad defended the word of God as if his life depended upon it … which, in fact, it did. He was always adamant about one thing: if you can't **trust** the Book of Genesis as literal history, then you can't trust the rest of the Bible."

— Ken Ham (2006), *Raising Godly Children in an Ungodly World* [3]

"Since the Bible and the church are obviously mistaken in telling us where we came from, how can we **trust** them to tell us where we are going?"

— Anon (c.2008), AtheistBlogger.com list of 101 atheist quotes (Q); found via mAtheist app (Q)

"Never **trust** the work of a Templeton Prize winner or associate."

— Libb Thims (2013), mental note arisen in reflection of recent adds to Paul Davies page; along with past thought on other Templeton-funded writers: Robert Ulanowicz, Terrence Deacon (Q), among others, whose mind[s] has gone to pasture, i.e. left the path of truth for sake of spiritual/God theory justification aiming/biased funding, 10:09 AM CST, Dec 9.

References

1. Trust – Merriam Webster Collegiate Dictionary, 2000.
2.(a) Daub, Edward E. (2003). "Maxwell's Demon", in: *Maxwell's Demon 2: Entropy, Classical and Quantum Information, Computing* (pgs. 44-). Eds. Harvey S. Leff, Andrew F. Rex. CRC Press.
(b) Leff, Harvey S. and Rex, Andrew F. (2002). *Maxwell's Demon: Entropy, Information, Computing* (revised

Bumstead version, ref 5, pg. 56). Adam-Hilger.
3. Ham, Ken and Ham, S. (2006). *Raising Godly Children in an Ungodly World*: *Leaving a Lasting Legacy* (molecules, 4+ pgs; trust, pg. 19). New Leaf Publishing.
4. (a) Argument from reason – Wikipedia.
(b) Haldane, John. (1927). *Possible Worlds* (pg. 209). Publisher.
5. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

Further reading

● Cercignani, Carlo. (1998). *Ludwig Boltzmann: the Man Who Trusted Atoms.* Oxford: Oxford University Press.

θΔics

In science, **truth** is that which has the grand character of the capability of enduring the test of universal experience, and coming unchanged out of every possible form of fair discussion. [1]

Stages of truth

The following is the post 1981 truncated version of famous 1818 "three stages of truth" quote by German philosopher Arthur Schopenhauer: [4]

> "All **truth** passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident."

Arthur Schopenhauer

And so, after allowing myself the joke to which in this generally ambivalent life hardly any page can be too serious to grant a place, I put my book forth in profound seriousness, confident that, sooner or later, it will reach those to whom alone it can be addressed. For the rest, I am resigned in patience to the fact that the same fate will befall it in full measure which has always fallen to the lot of truth in every branch of knowledge, in the most important branch most of all. **To truth only a brief celebration of victory is allowed between the two long periods during which it is condemned as paradoxical, or disparaged as trivial.** The author of truth also usually meets with the former fate. But life is short, and truth works far and lives long: let us speak the truth.

Dresden, August 1818

German philosopher Arthur Schopenhauer's 1818 final paragraph to the preface of the first edition of his two-volume magnum opus *The World as Will and Representation*, written only two years after consulting with Goethe, the origin of the famous "**three stages of truth**" quote. [4]

The quote comes from the final paragraph, 1958 English translation by E.F.J. Payne, shown adjacent bolded, of Schopenhauer's 1818 *The World as Will and Representation*:

> "To **truth** only a brief celebration of victory is allowed between two long periods during which it is condemned as paradoxical, or disparaged as trivial."

which outlines his Goethean philosophy human chemical theory based "will to power" philosophy. The original German is: [5]

> "Der Wahrheit ist allerzeit nur ein kurzes Siegesfest beschieden, zwischen den beiden langen ZeitrÄaumen, wo sie als Paradox verdammt und als Trivial gering geschÄatzt wird."

See the lecture article: HCT | Truth for more on the details behind this quote.

In 1963, English biochemist (chnopsological chemist) John Haldane, in commentary on a new book that has life tables that consistently overestimate future death rates, thus being favorable to life insurance companies but unfavorable to companies that pay life annuities to the aged, comments that the resistance to the process of acceptance of this new system of doing things will pass through the usual "four stages of resistance" to new ways of seeing things: [6]

1. This is worthless nonsense
2. This is an interesting, but perverse, point of view
3. This is true, but quite unimportant
4. I always said so

Quotes

The following are related quotes:

> "Plato is my friend, but **truth** my greater friend."

— Aristotle (c.300BC) [2]

"Fables should be taught as fables, myths as myths, and miracles as poetic fancies. To teach superstitions as **truths** is a most terrible thing. The child mind accepts and believes them, and only through great pain and perhaps tragedy can he be in after years relieved of them. In fact, men will fight for a superstition quite as quickly as for a living truth—often more so, since a superstition is so intangible you cannot get at it to refute it, but truth is a point of view, and so is changeable."

— Hypatia (c.400)

"Life is an unfoldment, and the further we travel the more **truth** we can comprehend. To understand the things that are at our door is the best preparation for understanding those that lie beyond."

— Hypatia (c.400)

"Those who rely simply on the weight of authority to prove any assertion, without searching out the arguments to support it, act absurdly. I wish to question freely and to answer freely without any sort of adulation. That well becomes any who are sincere in the search for **truth**."

— Vincenzo Galilei (c.1570)

"A thousand Demosthenes, a thousand Aristotles can be laid prostrate by a single man of mediocre talent who has seized upon a better way to find the **truth**. Such a hope, therefore, must be removed: for indeed, men, more learned and superior to us in book-learning, will be found who, to the same of nature itself, can make that which is, in fact, false, true."

— Galileo (1632), *Dialogue on the Two Chief World Systems*; cited by Otto Guericke (1672) in "Preface" to *Magdeburg Experiments*

"There is some **truth** in Boerhaave's poetic comparison: [that] [force of chemical affinity] is "love, if love be the desire for marriage".

— Jean Dumas (1837), commentary on Herman Boerhaave's 1732 conjecture

"The first business of a man of science is to proclaim the **truth** as he finds it; and let the world adjust itself as best it can to the new knowledge."

— Percy Bridgman (469 PE) (1919), American thermodynamicist

"A new scientific **truth** does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it."

— Max Planck (c.1947), on how Boltzmann's statistical thermodynamics and atomic hypothesis triumphed over those as Ernst Mach and others of the energetics school. [3]

"The second law of thermodynamics is one of the bedrock **truth** that physics offers to the world."

— Eric Zencey (1983), "Entropy as Root Metaphor" [7]

"**Truth** does not demand belief. Scientists do not join hands every Sunday, singing, 'yes, gravity is real! I will have faith! I will be strong! I believe in my heart that what goes up, up, up, must come down … Amen!' If they did, we would think they were pretty insecure about it."

— Dan Barker (c.2005) (Ñº)

"The first rule of science is the truth at any price including the price of your life. That rule also applies to morality."

— Howard Bloom (2012), *The God Problem: How a Godless Cosmos Creates*

See also

â— True

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θΔics

In hmolscience, **Tullio Scrimali** (1952-) is an Italian psychiatrist noted, in psychological thermodynamics, for his 2006 *Entropy of Mind*, wherein he outlines a melting pot theory stylized model of the mind according to which he argues that the expulsion of Adam and Eve from Garden of Eden, for eating the forbidden fruit, resulted not in the awareness of physical pain, but what he terms “entropy of mind” or the “terrible apophany which shatters existence as human beings, driving people into an unbearable dimension”, which he equates with schizophrenia; along the way using information theory, aka the Shannon bandwagon, to argue that the "mind is not subject to the second law of thermodynamics."

Overview

In 2006, Scrimali, in his *Entropy of Mind and Negative Entropy*, employs a melting pot mixture of complexity theory, Prigoginean thermodynamics, dissipative structures, information theory (although he doesn't mention Shannon), chaos theory, systems theory, cybernetics, among others, to explain schizophrenia. The following is a representative quote: [1]

> “Based on the second principle of thermodynamics, our bodies and brains are constantly subjected to an increase in entropy that causes the molecules and atoms that form them to become disorganized.”

Strangely, in spite of the dominate use of thermodynamics (entropy and negative entropy) in the title of his book, Scrimali only cites psychodynamic pioneer Austrian psychologist Sigmund Freud marginally on two pages, with no mention of his connection to thermodynamics, and fails to mention Swiss psychiatrist Carl Jung at all, who of course is the pioneer of the use of psychological entropy concepts?

In this work, Scrimali seems to use a new term “phrenentropy”, which he defines as a synonym for "entropy of mind"; a combination of *phren-* (*φρÎ®ν*, *φρεν-*; "mind") and *-entropy* ("thermal content + disgregation").

Difficulties on theory

A few difficulties on Scrimali’s theory are firstly his elementary understanding of thermodynamics, second his understanding that humans are self-organizing systems (where the prefix “self-” equates to biological perpetual motion), and to his supposition that although the brain itself may be subject to the second law, that the mind it not. In his own words:

> “But the mind no; the mind is not subject to the second law of thermodynamics, the mind is constituted by *information* and as long as its physical support survives, it develops without stopping, it organizes, evolves, becomes articulated, and grows stronger.”

(add discussion)

Education

Scrimali is currently a professor of clinical psychology at the University of Catania, Italy.

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2. Tullio Scrimali (founder and head of ALETEIA International) – AleteiaInternational.it

External links

â— Tullio Scrimali (Italian → English) – TullioScrimali.it

θΔics

In human chemistry, **turning tendencies** is a term used in circa 1885 by Austrian physicist Ernst Mach to describe the circular orbital movements of troops on dark nights. This is the same phenomenon as when people lost in the woods tend to return to their starting point. Some of Mach's diagrams and drawings are shown adjacent. [1]

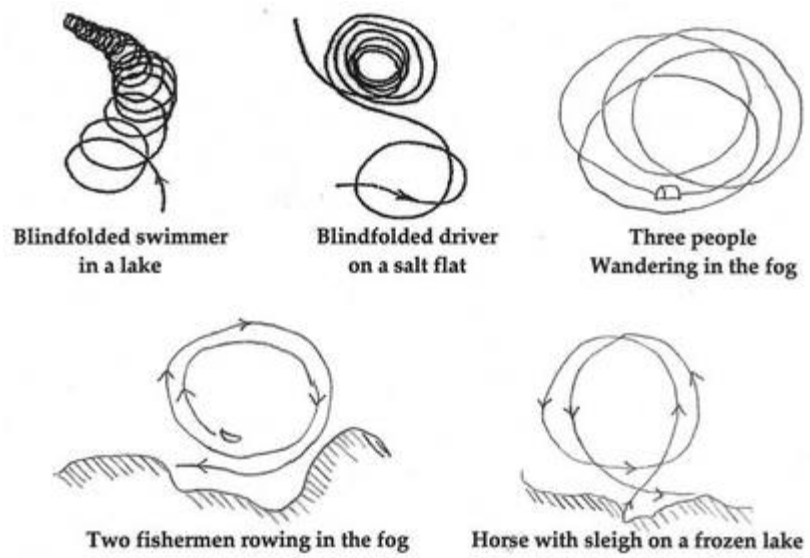

Diagrams of Austrian physicist Ernst Mach's *circa* 1885 "**turning tendencies**" illustrations. [1].

Human molecular spin

See main: Human molecular spin, human molecular orbital

In addition issue of field particle exchanges between individual humans, which constitutes the mechanism of force in the attachment or detachment of human chemical bonds, there is the issue of field particle exchanges between the earth and humans, i.e. between the earth molecule and individual human molecules attached to the earth's surface. [2] In short, whenever a charge moves, it creates a magnetic field that curls around the axis of its trajectory and when an external magnetic field is applied to a charge it causes the charge to curl in motion around the axis of the magnetic field. [3]

When this principle is applied to human life, the general effect is to cause human molecule to rotate differently depending on whether they are located north or south of the equator. At the North Pole, the earth's magnetic field lines go into the ground; at the South Pole, the field lines come out of the ground. As a result of this, people tend to drive on the left hand side of the road in the southern portion of the earth and on the right side of the road in the northern portion. When Feynman diagrams are used to represent human molecular interactions, subsequently, a spin or curl pattern will develop within each system of interaction.

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θΔics

In hmolscience, **turnover rate** refers to the number of atoms that "turn over", annually or biannually, in the physical body of a human, or powered animate-reactive CHNOPS-based molecule, e.g. one human molecule (person), per unit time period, often quantified annually (Aebersold, 1949).

Artistic depiction of atomic turnover

(atoms falling and floating off the body of each molecule)

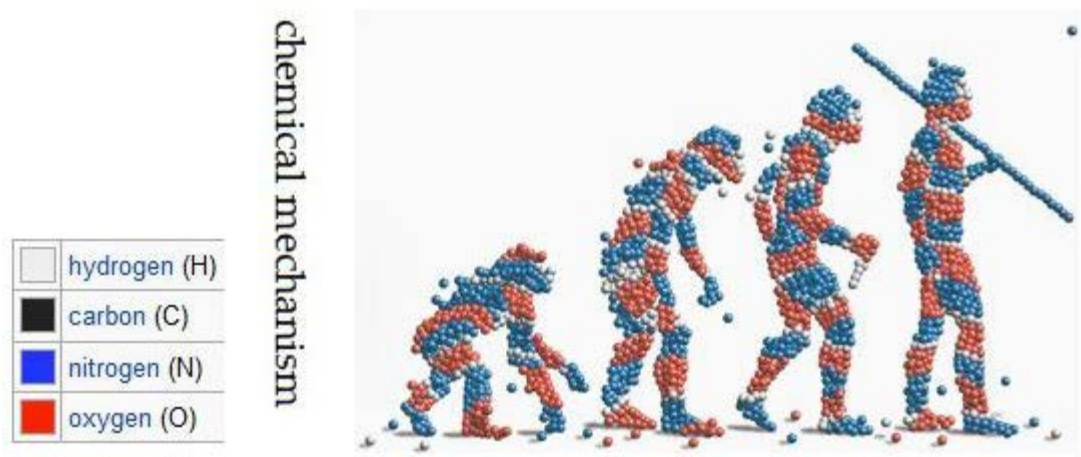

Depiction of the "evolution of the human molecule" by Canadian communications designer Shawn LaPaix, a spin on English biologist Thomas Huxley's famous 1863 evolution of man drawing, using the 1952 CPK atomic color scheme: **red** = oxygen, **blue** = nitrogen, **gray** = hydrogen, **black** = carbon (not shown); for a poster for the 2005 University of British Columbia Art Gallery exhibit "The Human Body in History", alluding to the idea that human is a body of evolving atoms, formed into the structure of a molecule, that has been chemically synthesized into its current form, over long spans of evolutionary time. [4]

Overview

In 2007, Terrence Sejnowski, American computational neuroscientist, stated the following about turnover, in respect to memory mechanism:

> "I have been puzzled by my ability to remember my childhood even though most of the molecules in my body today are not the same ones I had as a child—in particular the molecules that make up my brain are constantly being replaced with newly minted molecules—despite this **molecular turnover**, I have detailed memories of places where I lived fifty years ago."

In the human molecule, the turnover rate of atoms in the body is 98%, meaning that every year, the typical person acquires nearly an a complete set of the 26-elements that comprise the person. [1]

Heraclitus river paradox | Ship of Theseus

The philosophical paradoxes associated with atomic turnover in things that grow or powered metabolic organisms, such as whether a person is still the same person they were a year ago, was first captured in the ancient Greek philosophical debate about whether "river", with new water continuously flowing through it, or a "ship" (or carriage), with its parts continuously replaced, is the same ship or river, a paradox discussed by philosophers including: Heraclitus, Socrates, and Plato.

Greek "flux and fire" philosopher Heraclitus, for instance, attempted to solve the paradox by introducing the idea of a river where water replenishes it, arguing, as quoted by Greek philosopher Arius Didymus, that "upon those who step into the same rivers, different and again different waters flow", which has come down to us as the motto: "you never step in the same river twice."

Socrates and Plato, supposedly, discussed the paradox in terms of the exchange the parts of their "carriages", one by one until, finally, Socrates's carriage is made up of all the parts of Plato's original carriage and vice versa, after which the he question becomes: if or when did they exchanged their carriages.

Greek historian philosopher Plutarch, supposedly, disputed Heraclitus' claim about stepping twice into the same river, citing that it cannot be done because "it scatters and again comes together, and approaches and recedes." He eventually summarized the paradox in the form of the the story of the ship of Theseus, which had its parts continuously replaced each time one broke or rotted, after

which philosophers began to puzzle as to whether it was really the same ship:

> "The ship wherein Theseus and the youth of Athens returned from Crete had thirty oars, and was preserved by the Athenians down even to the time of Demetrius Phalereus, for they took away the old planks as they decayed, putting in new and stronger timber in their place, in so much that this ship became a standing example among the philosophers, for the logical question of things that grow; one side holding that the ship remained the same, and the other contending that it was not the same."

A word scramble representation of the **ship of Theseus**, made of replaceable parts: sails, mast, and planks, the philosopher's model for the query about "things that grow" and whether they are same things when all the parts have been replaced?

This ship question came to be known as "Theseus's paradox". [13]

Modern variants of Theseus' paradox have been discussed by Thomas Hobbes and John Locke. [14]

Slosson | Fallacy of materialism

American religion reconciling chemist Edwin Slosson seems to have been the first to discuss atomic turnover in parts of the human; though it remains to be discerned from where he gets his statistics, as he cites rarely. In 1903, Slosson penned his "The Chemistry of the Greatest Miracle in the Bible" article, in which he interjects on the famous Genesis 2:7 Bible statement: "And God formed man out of the dust of the ground"—which, as Slosson seems to have been unaware, is but a Christian re-write of the Egyptian clay creation myth—in modern chemistry and atomic turnover rate terms, albeit themed in terms of chemical miracles, in respect to the so-called "nonliving" to "living" transformation of the atoms into moving animated humans. To begin with, Slosson states: [15]

> "Each one of us was created out of the dust of the earth, not thousands of years ago, but within the last few years."

Slosson then, after discussing how the air we breathe is four-fifths nitrogen and one-fifth oxygen, both in "nonliving" state, and that we can only absorb the oxygen but not the hydrogen by breathing, fumbles out the following, which he says occurs as a "miracle" twenty times a minute when we breathe:

> "Some particles of nonliving matter are drawn into our bodies and become the medium of life, motion and thought. Just as often the reverse process is repeated. Particles of carbon which have formed part of our living bodies are thrown off with every breath, rapt away by the atoms of oxygen, and sink into the nirvana of the inanimate world, changing their allegiance from the animal to the vegetable kingdom. This transformation of living to nonliving matter is just as great a miracle as the reverse process, when you think of it. We can no more understand how we can die than how we can live. People say we die but once. Really we die every few years just as completely as we ever shall."

This, of course, is parlay into the defunct theory of life position. In any event, he continues:

> “Not all parts of the body wear out equally fast and have to be renewed as frequently. The more mobile and softer tissues change most rapidly. The blood is altering in composition constantly. But even the particles of lime, carbon and phosphorus in the solidest bone are continually being taken out and replaced by new ones, just as they change a railroad bridge, piece by piece, without tearing it down and interrupting the traffic at any time. In the external parts of the body we can see this for ourselves. We get entirely new fingernails every four or five months, and new toe nails once a year. Our eyelashes last us only about a hundred days, and we get a new skin oftener than we get new clothes—that is, most of us—for that is renewed every month. The only part of the body that is not completely changed in the course of a few years (which popular belief places at the magical number of seven) is the enamel of our teeth.”

On this basis, Slosson interjects with some humor:

> “So it would seem that since we are not composed of the same material we cannot be the same persons we were years ago. According to this view, no man ought to be held to a contract longer than, say, seven years at most. If a man is arrested for crime committed ten years ago he can easily prove an alibi. He can show that ever particle which constituted the man who did the deed has long since been dissipated and now forms part of the air, the sea, and the soil.”

This might be the origin of what some have called the “seven year replacement myth”. [8] The seven year turnover rate of atoms in the body, supposedly, dates back to a book from the 19th century. (Ñº) Slosson continues:

> “A man never celebrates his silver wedding with the same woman he married. He may call her his wife, but really he is not married to any part of her—except, as I said, to her teeth—and perhaps those are changed. Speaking from a materialistic point of view, a couple ought, for decency's sake, to have the ceremony performed over again every few years, so as to stay married.”

Slosson then gives his argument for what he calls the fallacy of materialism, as follows:

> “Why is it that these things which are literally true seem to us so absurd? The reason is because of the very apparent fallacy. It is the fallacy of materialism. We know we are the same persons we were last year and the year before. Although we may have changed somewhat, we know it is not because we have new finger nails, new eyelashes and new everything. That did not change us. We know that if every molecule of our bodies were suddenly replaced by new molecules we should never know the difference. As the wisest of the Greeks said long ago: ‘the water changes, but the river remains the same.’ We really care nothing for the particular atoms of carbon, nitrogen, hydrogen and oxygen which make up what we mistakenly call ourselves. Let them go; we can get more: or if we cannot we do not want to keep these longer. We are not attached to the matter that composes our bodies.”

Slosson, in 1925, republished some of the above in his *Sermons of a Chemist* chapter on the chemistry of creation, outlining how finger nails renew ever four months, eyelashes every 150 days, skin once a month, with teeth enamel taking the longest to renew. [5]

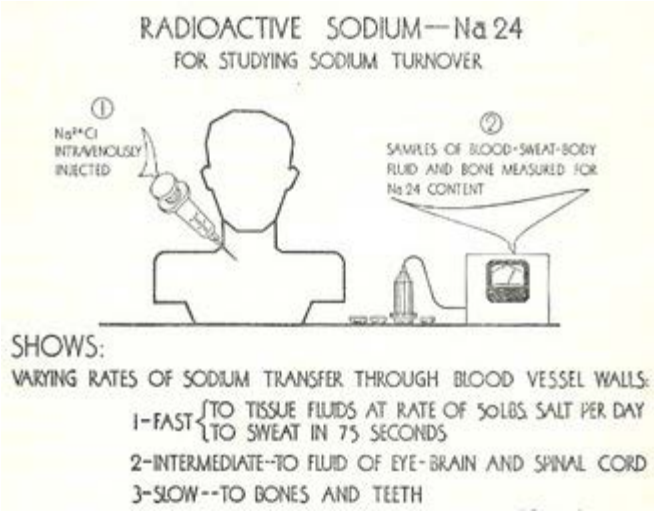

Left: American nuclear scientist Paul Aebersold (1910-1967) at his computer station, likely at the Oak Ridge National Laboratory, Tennessee, where at he did his pioneering experiments done with radioisotopes and the tracing of elements in and out of the body, finding that atoms in animate organisms have a 98 percent per year atomic **turnover rate**. [10] Right: Aebersold's 1949 diagram, from his "Atomic Energy Benefits: Radioisotopes" address, showing how an isotope of an atom, i.e. a "tracer atom", can be tracked in terms of the time it takes to move through the body. [16]

Aebersold's radioisotope studies

In 1940s, American biophysicist Paul Aebersold, did the first work on the production and application of the radioactive materials (sodium-24 and phosphorus-32) administered to humans, for application and studies in medicine.

In 1949, Aebersold, in his "Atomic Energy Benefits: Radioisotopes" address, stated the following, based on his experiments at Oak Ridge National Laboratory, Tennessee, using radioisotopes and the tracing of elements in and out of the body: [16]

> "The atoms now in your body are being replaced by new atoms at an amazingly rapid **rate** — at such a rate that in another year ... Before we go into more detail about the terrific traffic of atoms in your body — for that matter, the rapid **atomic turnover** in all forms of life, in even the simplest organisms — let us pause for some background information that may forestall the quite justified unbelief you may have concerning these startling facts. How do we know all this? How do we follow all the fast and complicated maneuvers that atoms enter into in our bodies and other complex systems?"

Then, following discussion about how radioactive forms (isotopes) of all of the elements can be artificiality made in an atomic reactor or pile, he explains how these radioactive elements can be measured as they leave the body via a Geiger counter:

> "Once the sodium tracer atoms have been incorporated into a system we can study the rate at which they are eliminated. By studying the uptake and elimination, we can obtain the **rate** at which sodium atoms are replaced or **turned over** in the system. It is found that in a week or two, half of the sodium atoms that are now in our bodies will be replaced by other sodium atoms. Similar experiments with tracer hydrogen have shown that hydrogen atoms in our body are also quite rapidly replaced, half of them being replaced also in a week or two. Likewise it has been found that half the phosphorus in us now will have been replaced in a few weeks, and half of the carbon atoms in a month or two, and so on for nearly all the elements."

Then, following a Zeno's paradox like discussion about how atoms are replaced in decreasing fractional rates of time, he famously states:

> "Theoretically we still have a small percentage of the same atoms in us that we had when we were born, but actually this percentage must be extremely small. In a year most of the atoms in us now—at least **98 percent** of them—will have been replaced by other atoms that we take in via air, food, and drink."

Aebersold, in short, found that 98 percent of all the atoms in a person's body change out every year, and that within five years all the atoms had changed. [8] In the study, Aebersold fed radioactive atoms to people and or he injected them with radioactive atoms. Then using radiation detectors, he watched the atoms as they moved around. He'd watch them, for example, go up one arm, into the heart and down the other arm. [12]

Later citations

In 1954, Aebersold's study was made famous with the publication of the *Time* magazine article "Science: the Fleeting Flesh", which stated, among other things, that: [9]

> "The fastest-changing component, says Dr. Aebersold, is water. It forms about 70% of the body, and about half the water molecules are replaced every eight days. Other fleeting elements are carbon, sodium and potassium. The calcium and phosphorus in bones and teeth stay put longer."

In 1955, Richard Feynman, in his "The Value of Science", was discussing the turnover of atoms in his mind as follows: [19]

> "The atoms that are in the brain are being replaced; the ones that were there before have gone away. So what is this mind of ours: what are these atoms associated with consciousness? Last week's potatoes! They now can remember what was going on in my mind a year ago—a mind which has long ago been replaced. The think I call individuality is only a pattern or dance, that is what it means when one discovers how long it takes for the atoms of the brain to be replaced by other atoms."

In 1965, American science writer George Harrison stated, in what likely is a concise summary version of the Aebersold study findings: [2]

> "The body contains only 2 percent of the atoms that were spinning in it one year ago."

This factoid became a popular re-quote; the following is one example from the new age publications:

> "Quantum physicists have proven through radioactive isotope studies that 98% of the atoms in your body are replaced within one year. In three months your body produces an entirely new skeleton. Every six weeks, all the cells have been replaced in your liver. You have a new stomach lining every five days. You are continually replacing old blood cells with new ones. Your skin is sloughing off dead cells and producing a new skin monthly."
>
> — Deepak Chopra (1989), *Quantum Healing* (Ñº)

In 1995, biologist Lynn Margulis and science writer Dorion Sagan stated: [3]

> "Every year, 98 percent of the atoms of your body are replaced."

The utilization of this tool as a means to classify structured on the evolution timeline would seem to be an intuitive approach.

In 2002, American limnologists Robert Sterner and James Elser, in their 2002 book *Ecological Stoichiometry*, give the following note on turnover rate: [7]

> "Perhaps you have noticed that our method of analysis does not consider the **turnover rate** of different biochemical pools. We did not take account, for example, the enormous differences between turnover rate of P within ATP compared to bone. Those turnover rates differ by many orders of magnitude (miniscule fractions of a second for ATP vs. months to years for bone). This was not an oversight. Ecological stoichiometry relates organism composition to its external environment, and hence it is the rates of demand and exchange of the whole living organism that we must focus on."

Activation energy

The general model as to how to go about quantifying atomic turnover in humans is that this factor plays a role in the activation energy of reactions between humans, in the sense that food intake and hence atomic turnover are a substrate factor, i.e. an interaction factor with the surface of the earth, which acts to facilitate human-human reactions, in the same manner as does the oxide-embedded iron surface, in the Haber process, act as a catalyst that works to lower the activation energy barrier to reaction between H_2 and N_2 just as does a fertile earth surface facilitate reactions between a male Mx and female Fy human molecule.

Philosophical implications

In 1949, Paul Aebersold, during his "Atomic Energy Benefits: Radioisotopes" address, diverged at one point into some philosophical implications about personhood: [16]

> "Although next year you will be almost a completely new batch of atoms, you won't be a new person. Your supercolossal traffic of atoms does not take place just by chance. It is very carefully regulated and controlled. In general, the atoms do not get very far off the right road, and there are no traffic jams. Next year we will appear much the same as we do now. Even though most of the atoms in our brain will have been replaced by other atoms, we will still go on remembering things that happened a long time ago. Also our emotions, reasoning, personality and individuality go on much the same. Physically we may be a new batch of atoms but unfortunately, perhaps, we are an old batch of emotions, ideas and reactions."

Aebersold then goes on to dismiss the blind random chance model of evolution in general as follows:

> "The more we study living things, the more we study all of nature, including the atom itself, the more we can see that everything is not just a matter of chance. Figure out the chance that some protein molecule, or some hormone, or vitamin or enzyme, for example, was gotten together by the mere chance meeting of all its component atoms out of a chaos of atoms. Such molecules are so complex that even over the period of billions of years since the earth was formed, it is still extremely unlikely that any such molecules would be formed by pure chance. It is even more inconceivable to believe that that chance can account for all the hundreds of thousands of types of molecules that occur in nature, for all the exceedingly dynamic and complicated processes which these molecules take part, and much less for all the marvels of biology."

In 2007, NPR radio did a segment entitled "Atomic Turn-Up: How the Body Rejuvenates Itself", wherein they had a sort of roundtable discussion on the subject with American chemist Logan McCarthy, a chemistry professor at Harvard University, on the subject of atomic turnover, American evolutionary biologist Daniel Dennett, among others. In the

discussion, NPR science correspondent David Kestenbaum commented his concluding view that: [12]

> "In a very real sense, we are not the people that we were a year ago. We're this collection of atoms that hang out together for a while and then they go on to do other things—sort of a momentary cloud of organization. So what is me? Am I still me if my parts have been replaced?"

Daniel Dennett replied to this: "Well, of course, the question goes way back to ancient philosophy." They digress into science fiction discussion of teleportation and Kestenbaum comments that he knows of some Swedish researcher who found that some atoms do not turnover:

> "It turns out there are some atoms that are with us for our entire life. This comes from a researcher in Sweden and the atoms are actually in some interesting places. They are deep in the DNA of some cells in our brain and in our heart, and also some atoms in our teeth."

In conclusion of the interview, Debbie Elliot, the host, comments: "that is the temporary collection of atoms currently known as our science correspondent David Kestenbaum."

Religious

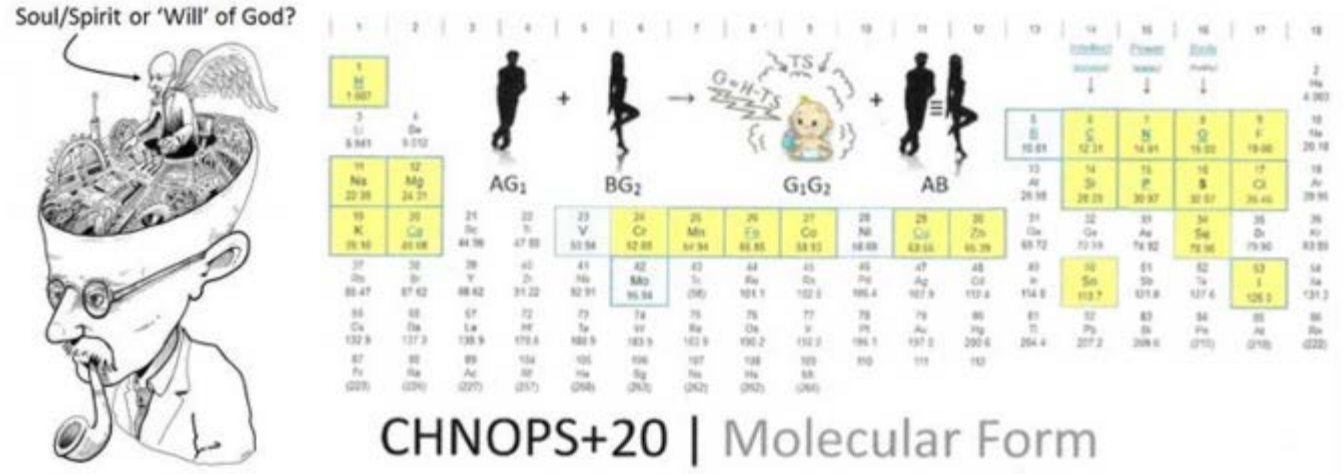

In recent years, the atomic **turnover rate** finding has been used in religion classes to spark discussions about (a) whether 'we are this body' or (b) whether 'we have some kind of spirit-soul', as one 2011 world religions student put it. [11] Left: cartoon from American philosopher Stephen Asma's 2010 article "Soul Talk" on how the "mere mention of the soul" in his philosophy class "is like a spark that sets off dozens of combustions." [18] Right: the atoms (elements), by percent mass, that a human or human molecule in totality is comprised of (see: hmolscience periodic table), which get completely replaced or "turned over" with new atoms every five years.

implications

The experimental finding that atoms "turn over", that is enter and leave the body of a human at a measurable rate per second, day, or year has a number of significant implications, one of which is in the eventual downfall (or possible reformulation) of modern religion. To exemplify, as one Reddit.com poster queried in 2011, in the Ask Science section: [11]

> "In my world religions class, the teacher presented an article that stated that 98% of atoms in the human body are replaced every year."

The abstract of the article is:

> "Studies at the Oak Ridge Atomic Research Center have revealed that about 98 percent of all the atoms in a

> human body are replaced every year. You get a new suit of skin every month and a new liver every six weeks. The lining of your stomach lasts only five days before it's replaced. Even your bones are not the solid, stable, concrete-like things you might have thought them to be: They are undergoing constant change. The bones you have today are different from the bones you had a year ago. Experts in this area of research have concluded that there is a complete, 100 percent turnover of atoms in the body at least every five years. In other words, not one single atom present in your body today was there five years ago."

This, according to the poster, "was to spark a discussion about whether 'we are this body' or whether we have some kind of spirit soul." The poster objected to the statement, in his own words: "this seems incredibly unlikely and comes across as BS to me. Is this 'cells in your body are replaced every 7 years' statement true?"

These religious objections exemplify the collide between the views of the belief system of old world (Egyptian mythology told through the guise of Christianity, Islam, and Hinduism) and the new world (the periodic table / thermodynamic view of humans as surface-attached heat-driven animate molecules with atomic "turn over rate" whose so-called morality (or soul as it was called in olden days), or rather naturalness (as it is called in thermodynamics), is governed by the "moral symbols" of physical chemistry, as Goethe stated in 1809; and where "spirit", in some sense (or possibly not in any sense?), can be likened to the level of "animation" of a given animate molecule, so to speak—although, to note, the notion of spirit, as originally defined in the Egyptian seven component model of a human (ba, ka, etc.), is a bit of blurry subject to attempt to re-translate into physical chemistry terms.

In 2011, American philosopher Alexander Rosenberg, in his *Atheist's Guide to Reality*, discussed Theseus' ship paradox.[17]

Floating magnets | Electromagnetic field

One possible interjection into the turnover rate paradox is recourse to the famous pattern forming "floating magnetics experiment", done originally by English chemist-physicist William Gilbert (c.1590), using floating loadstones, American physicist Alfred Mayer (1878), using negatively-charged needles on floating cork, and recently by Libb Thims (2014), using neodymium magnets on floating cork, according to which the electromagnetic field is what "holds" shapes of the positive and negative charges in regions of space, and that the geometric shape—like a person—will hold in form, if one charge is pushed into the pattern while another is removed:

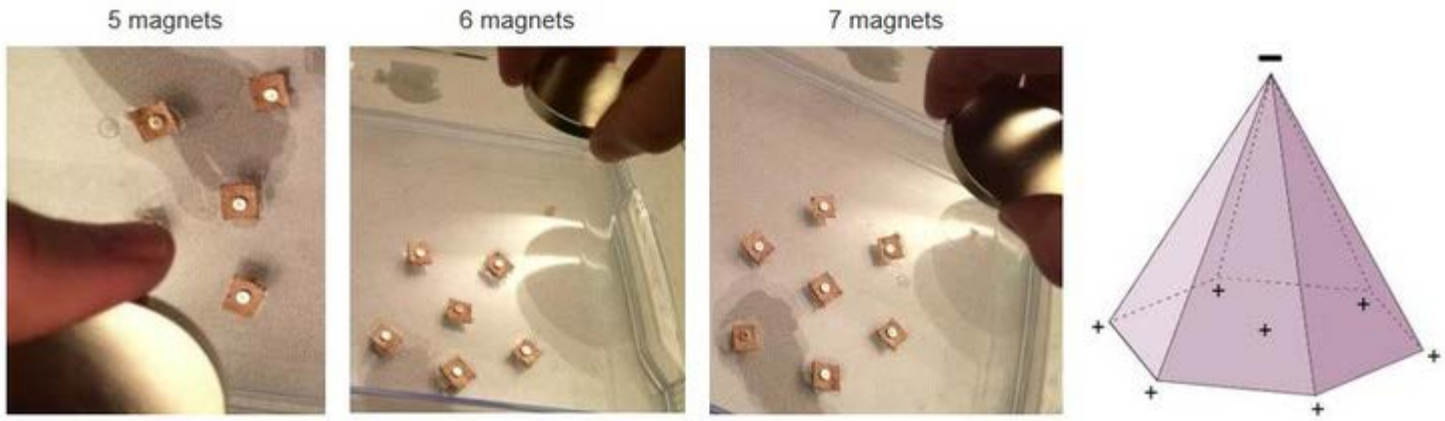

As magnets are added, as Mayer famously diagrammed (up to 20 magnets), the 3D pyramidal structure will grow geometrically: a triangle base at 3 magnets, a square base at 4 magnets, a hexagon base at 5 magnets, a two ringed structure base at 10 magnets, a center magnetic surrounded by two ringed base at 15 magnets, and so on. In this sense, one could conceptually understand the "structure holding" paradox if one were to add a base magnet to a given geometry while simultaneous removing one, and do this for all the magnets of the structure, similar to the ship, river, or carriage variants of the paradox, and then ask if the resulting turned over or magnetic replaced 3D geometric structure is

the same growing "thing" or a different growing thing?

This model, naturally enough, can be scaled up to the people viewed as powered atomic geometries or human molecules, whereby the positively charged (floating) magnets and positively (hovering) magnets become atoms (elements), with varying amounts of positive or negative charged electron valency, albeit the description becomes more complicated owing to the effect that quantum electrodynamic changes are involved owing to cyclical sunlight photon input (cause) and resulting electron orbital transitioning (effect), whereby molecular animation results, something that does not occur in the magnet, ship, carriage, or river water scenarios.

Other

The 2013 Indian film *Ship of Theseus* (vid), is themed on people as reparable ships and the implications of human identity change in respect to morality, personal belief, and cornea, liver and kidney transplant of three different individuals. (Ñº)

In 2015, in episode 5 of the show "Fortitude", available on Amazon, that character Elena explains to Morton about how she's made of atoms and how ever seven years all of her atoms change, refresh, or become new, and therefore that she has become new; the main dialogue is here: (Ñº)

> "I don't have any sort of relationship with Elena. None at all. You know, when I was in prison, I met this man, a man who tried to help me. A psychiatrist. He said to me that **everyone is made up of many... Atomos? Aatoms? You understand? Atoms. Atoms. Atoms, yes**. So for a human being it takes seven years before every atom, one by one, is replaced with a new one. So that means that after seven years this person... Is no longer that. So you are saying that Elena is a completely different person than Esmerelda. That's what you mean. Everything is changed. That is how you console yourself. That you've changed. That you are different. You are not that person anymore. Somebody else did it. You didn't do it. I am not her. Not anymore."

This, supposedly, is a spin on the "my atoms made me do it" defense (see: killing spree paradox) and that after seven years, a prisoner can be pardoned for past crimes, because they are an atomically "new person" so to say.

See also

â— Turning tendencies

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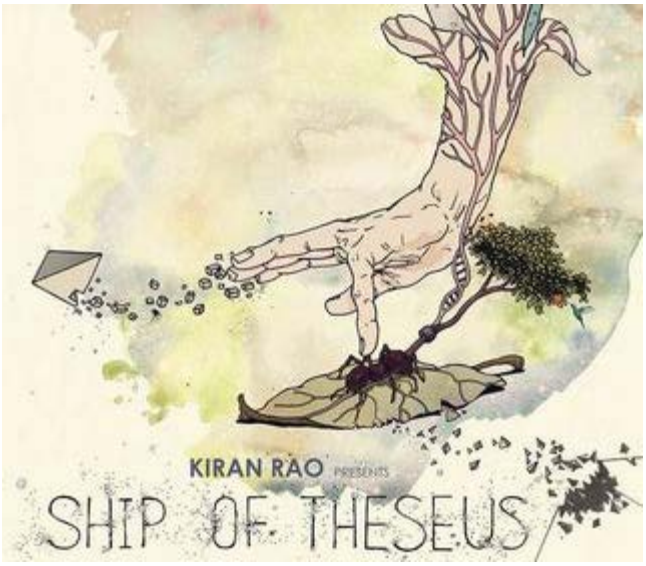

The 2013 film *Ship of Theseus* explores the human "identity" implications of the ship parts replacement paradox in respect to human body part transplants.

(b) Do We Replace Our Cells Every 7 or 10 years? (2010) (comment #20) – AskANaturalist.com.
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19. (a) Feynman, Richard. (1955). "The Value of Science" (Ñº), in: *What Do You Care What Other People Think?* (pgs. 240-48; quote, pg. 244). W.W. Norton, 1988.
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External links

â— Query: Theseus' body, is there any part of a human that is cellularly or even atomically stagnant? (2003) – Reddit.com.

θΔics

In social media, **Twitter** (TR:31) is 2006-launched site, Alexa rank (#10|2016), where uses can post 14-character messages called “tweets”, and where followers can “reply”, “re-tweet”, or “like” among other options, from which trends can be followed and new “hot” information gathered.

There are **tweets**, some "hot" some "cold" some "cool", about Hmolpedia articles (Q) and tweets by people who have Hmolpedia articles, some of which as listed adjacent, wwork to transmit hmolscience related subject matter.

EoHT.info | Flow

The following: (Q) is the EoHT.info Twitter feed, which has daily/weekly flow in 2016.

Hmolpedia | Top tweeters

The following are the top Hmolpedia existographies, with active Twitter accounts, ranked by "hotness", no thermal word metaphor intended, which tend to post hmolscience-related tweets:

- Atomic Romances | Mala Radhakrishnan | Topic: human physical chemistry poetry – Twitter.
- Libb Thims | Libb Thims | Topic: all hmolscience – Twitter.
- Philip Ball | Philip Ball | Topics: physics of society – Twitter.
- Dean Hamden (@silwan23) | Dean Hamden | Topic: human physics – Twitter.
- Stefan Polh Valero (Spanish) | Stephan Pohl-Valero | Topic: Social thermodynamics – Twitter.

- Complexity Digest | Complexity Systems Society – Twitter.
- Mark Buchanan | Mark Buchanan | Topics: Social physics, financial physics – Twitter.
- Malcolm Gladwell | Malcolm Gladwell | Topics: tipping point, social physics – Twitter.

The following are related Hmolpedia twitters:

- CliftonNotes | Clifton Notes | Topic: Atheism (Q) – Twitter.
- Evid3nc3 | Christopher Redford | Topic: Deconversion – Twitter.
- Ferris Jabr | Ferris Jabr | Topic: life does not exist – Twitter.com.
- Matthew Segall | Matthew Segall | Topic: anthrodecentric experientialism – Twitter.
- Luis Balbino Arroyo | Luis Arroyo | Topic: thermal economics – Twitter.
- Cliff Pickover | Clifford Pickover | Topics: misc Hmolpedia articles – Twitter.
- Kurt Bell | Kurt Bell | Topic: asoulism – Twitter.

Atheism

The following is the Twitter page banner for Religulous@religulous (Q), a top ten atheism tweeter, where “religulous = *relig*-ion + ridic-*ulous*”, i.e. religulous is a portmantua of religion and ridiculous:

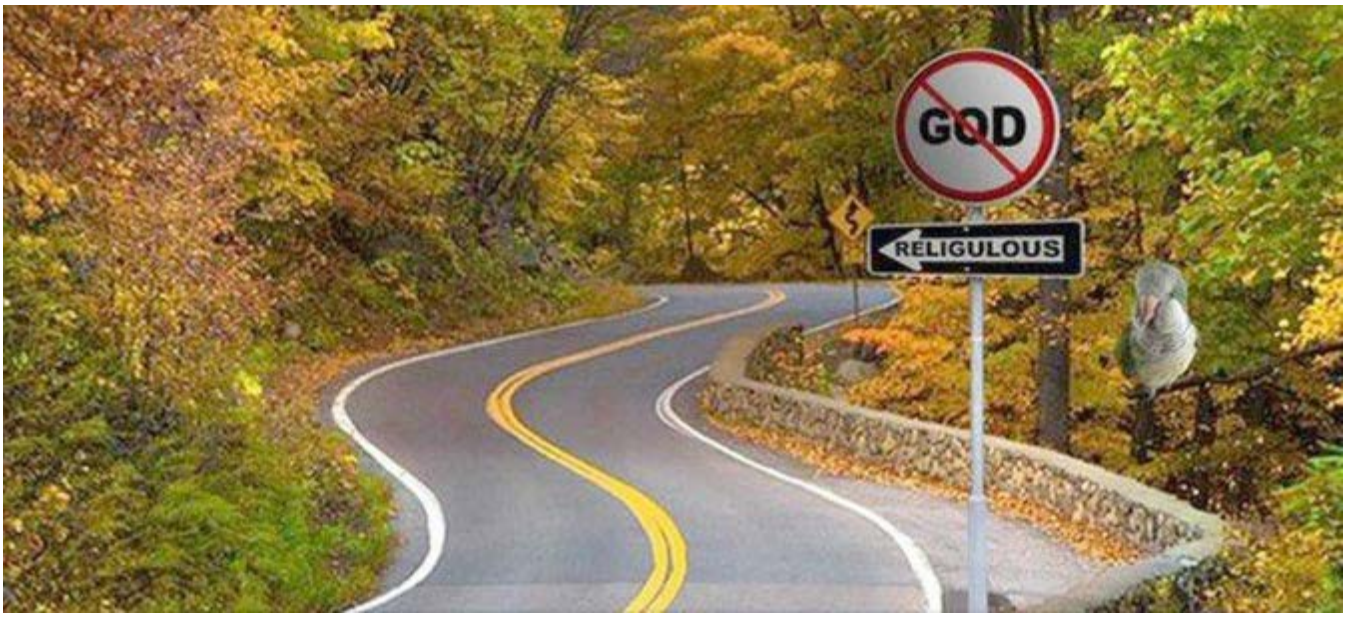

The following, below left, is the "in reason we trust" credo image of the Freedom From Religion Foundation tweeter banner: (Q)

Other

The following are other related Twitter accounts:

- WikiFoundry | Travis Derouin | Topics: WikiFoundry news – Twitter.

Quotes

The following are related quotes:

> "The difference between a 'hot' **tweet** and a 'cold' **tweet** is some 'thing' explainable via human chemical thermodynamics."
>
> — Libb Thims (2016), mental note on new Twitter page, 3:50 CST Mar 22

External links

- Twitter – Wikipedia.

θΔics

In classifications, **two cultures** refers to the general divide of the erudite class between those who read Clausius (second law) and those who read Shakespeare (*Romeo and Juliet*). [1]

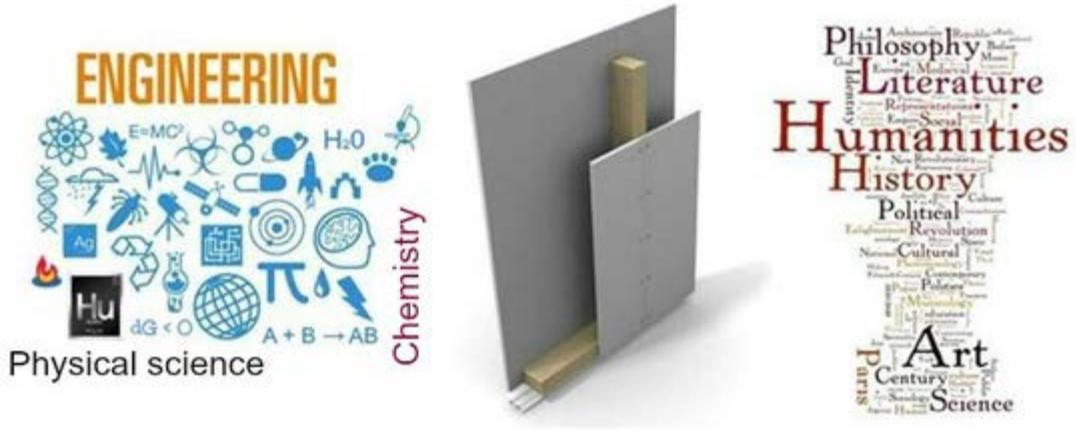

A depiction of the **"two cultures"** of and the mutual dividing wall of incomprehensibility between the two groups. [26]

Rift emergence | History

As to the origin of the rift or divide that has emerged in recent centuries, the exact date is elusive, although a general benchmark can be assigned to the period in which the phrase "last person to know everything" and or the term "last universal genius", referring to Leibniz (1646-1716), Goethe (1749-1832), and Helmholtz (1821-1894), began to be used.

> "Roger Bacon (1214-1294)—the founder of English philosophy whose knowledge of chemistry and mathematics led him to recognize the value of deductive reasoning, establish a scientific method, and invent spectacles—who has been called the last man to know everything, the last man to bridge the **two cultures**."
>
> — Rushworth Kidder (2003), *How Good People Make Tough Choices* [24]

As for a specific year in which the rift first emerged, in debate, a prominent demarcation might well the year 1833 and the Whewell-Coleridge debate, between English science historian William Whewell and English romantic philosopher Samuel Coleridge, centered around the growing inadequacies with the older term "natural philosopher", which embraced the broader philosophical, theological, and moral concerns, but was not what some might call "real science", after which the term "scientist" (1834) was introduced, by Whewell, to demarcate those who worked in the latter field (mathematician, physicist, or naturalist), as contrasted with those who worked in the former (philosophical, theological, and moral concerns).

Likewise, American literature scholar Frederick Burwick attributed the start of the rift to the year 1833, the year following the final installment of Goethe's *Faust*, a story about a man who sells his soul to the devil in pursuit of universal knowledge attainment: [6]

> "The age of *Faust* [1772-1832] had been the age of the 'Renaissance man', a time when the possibility of universal knowledge, mastery of the arts and sciences, still seemed to be open to the ambitious mind; [thereafter] the separation and dispersion of intellectual endeavors, dubbed the **'two cultures'** by C.P. Snow, [resulted]; [in the years to follow, individuals such as] Thomas Young (IQ=200?), Humphry Davy (IQ=185), [and] William Hamilton (IQ=170), could all make serious claims to humanistic breadth, if not universality, in their intellectual accomplishments; nevertheless, a rift between the arts and the sciences was evident, and a need was recognized to reconcile the apparent antagonism."

Burwick goes on to state that Johann Ritter's 1806 *Physics as Art* (*Die Physik als Kunst*) and Humphry Davy's 1807 "Parallels between Art and Science" were themed on this issue. [27]

Herrick | House divided

In 1930, American neuroanatomist Judson Herrick, during the dedication speech

to the University of Chicago's new Social Science research building, famously gave his "Humpty Dumpty and His Great Wall: The Scientific Study of Man and the Humanities" speech; some of the key sections of which are as follows:

In 1930, Judson Herrick famously said that modern universities are **houses divided** against themselves, social sciences on on side, the physical and natural sciences on the other, separated by the great wall of Humpty Dumpty.

> "These centrifugal movements, coming contemporaneously with the dedication of this new laboratory of the social sciences in the very heart of the citadel of the humanities, inevitably raise the questions: Where do the social sciences belong in an academic organization? and, What is a social science anyway?
>
> An ancient teacher [Mark 3:25] once said, "If a **house be divided against itself**, that house cannot stand." (Ñº) This has a personal application: "No man can serve two masters." A more modern philosopher has remarked that it is impossible to live in two unrelated worlds at once.
>
> To an ignorant outsider it looks a little as if the social sciences may be in some danger of attempting this impossible acrobatic feat. The **Great Wall** stands today on our campus as a **barrier** between the natural sciences, whose domain is the world of objects, and the humanities, whose domain is the world of spiritual values [see: spiritual values]. Are the social sciences to remain dispersed on opposite sides of the Great Wall, or is the group as a whole to attempt to maintain a precarious balance astride the Wall, with one foot in the Elysian fields (Ñº) of the humanities and the other solidly resting on the firm ground of scientifically controlled factual data? The available precedents indicate that neither of these alternatives will give a stable organization. The thing is likely to fall to pieces, one way or another. And this is not a trivial matter; it strikes down to the very soil within which are the roots of our university development, the original sources of academic achievement.
>
> Traditionally, our social sciences are aligned with the humanities. And they must maintain this alliance with the realm of spiritual values and experiences if they are to be humanitarian in any proper sense. Traditionally, also, the natural and exact sciences, whose tools the social sciences are employing with increasing efficiency, are uncontaminated by spiritual values, by human emotion, sentiment, or any subjective coloring. We are face to face with a rather appalling dilemma."

(add discussion)

Dewey | Cultural cleavage

In 1938, American philosopher John Dewey, in his *Logic: the Theory of Inquiry*, stated what seems to be the first official statement of a two cultures "house divided", split, or cleavage: [31]

In 1938, John Dewey stated the first version of the **two cultures** "cleavage" or "split" as he called it. [31]

> "On the one hand the outstanding problem of our civilization is set by the fact that common sense in its content, its 'world' and methods, is a **house divided** against itself. It consists in part, and that part the most vital, of regulated meanings and procedures that antedate the rise of experimental science in its conclusions and methods. In another part, it is what it is because of application of science. This **cleavage** marks every phase and aspect of modern life: religious, economic, political, legal, and even artistic. The **existence of this split** is put in evidence by those who condemn the 'modern' and who hold that the only solution of the chaos in civilization is to revert to the intellectual beliefs and methods that were authoritative in past ages, as well as by radicals and 'revolutionaries.' Between the two stand the multitude

> that is confused and insecure. It is for this reason that it is here affirmed that the basic problem of present culture and associated living is that of effecting integration where division now exists. The problem cannot be solved apart from a unified logical method of attack and procedure. The attainment of unified method means that the fundamental unity of the structure of inquiry in common sense and science be recognized, their difference being one in the problems with which they are directly concerned, not to their respective logics. It is not urged that attainment of a unified logic, a theory of inquiry, will resolve the split in our beliefs and procedures. But it is affirmed that it will not be resolved without it."

In 1947, American sociologist George Lundberg was citing Dewey and his cleavage quote as follows: [32]

> "The preference for prescientific thoughtways regarding our social relations has given rise to a fundamental and disastrous cleavage in our culture, for our social predicaments are what they are precisely because we have adopted an applied so extensively in our relations with the physical world. This 'cleavage', as John Dewey has said, 'marks every phase and aspect' of modern culture."

Lundberg, moreover, by the 1961 edition, was footnoting the newer rendition by C.P. Snow (below) and his now-famous 1959 two cultures parody.

C.P. Snow | 1959

The famous phrase "two cultures" was used by English physicist Charles Snow in 1956 as the title for an article in *The New Statesman.* The article provided the germ for his 1959 Rede Lecture at Cambridge University, *The Two Cultures and the Scientific Revolution*, which was subsequently printed in *Encounter* magazine in two installments. [20] In this lecture, he commented to the effect that culture is divided between those who have an understanding of the second law and those who have read a work of Shakespeare and that the two divisions tend not to mix: [1]

> "A good many times I have been present at gatherings of people who, by the standards of the traditional culture, are thought highly educated and who have with considerable gusto been expressing their incredulity at the illiteracy of scientists. Once or twice I have been provoked and have asked the company how many of them could describe the second law of thermodynamics. The response was cold: it was also negative. Yet I was asking something which is about the scientific equivalent of: Have you read a work of Shakespeare's?"

A 50th anniversary depiction of American physicist Charles Snow's famous 1959 **"The Two Cultures"** lecture, wherein he asserted to the effect that a great divide existed in society, between those who are scientifically literate (hard science), able to comprehend the second law, and those who are classically literate (humanities), able to comprehend Shakespeare. [5]

The lecture was initially published as 51-page booklet entitled *The Two Cultures and the Scientific Revolution* (1959) and later expanded into a larger 107-page *The Two Cultures: and a Second Look: an Expanded Version of The Two Cultures* (1965). The truism of this famous quote has gone on to stimulate countless discussions and several books. [2]

Snow-Leavis controversy

In 1962, British literary critic Frank Leavis, in his "The Significance of C.P.

C.P. Snow

vs.

F.R. Leavis

In 1962, British literary critic Frank Leavis launched a scathing attack on C.P. Snow's 1959 "two cultures" argument, which has resulted in what has come to be known as the Snow-Leavis controversy. [19]

Snow" article, delivered what has been called an "explosive demolition of the two cultures", which established what has come to be known as the Snow-Leavis controversy, a position held by some that the divide between two cultures is a good thing, or something along these lines. [19] In 1994, writer Roger Kimball, in his "The Two Cultures Today: On the C.P. Snow-F.R. Leavis Controversy", summarized things as such:

> "*The Corridors of Power* furnished the title for one of Snow's novels; it is all that is left of his work. Things are a little different with 'the two cultures'. The phrase has lived on as a vague popular shorthand for the rift—a matter of incomprehension tinged with hostility—that has grown up between scientists and literary intellectuals in the modern world."

In 2005, English Open University philosophy professor Derek Matravers, in his "Are Two Cultures a Bad Thing? response article, siding with Leavis, stated the following, following Anglo-Australian electrical engineer Alec Broers' 2005 Reith lecture: [21]

> "Running through [Broers'] lecture there is the thought that this lack of knowledge is, in itself, a fault. In this, he echoes C.P. Snow's lecture, 'The Two Cultures', which bemoaned the fact that while scientists are expected to know their Shakespeare, those in the arts are not expected to know – and generally don't know – the second law of thermodynamics. I side with those (such as F.R. Leavis) who think Snow was wrong. What is important about technology is that it works and that people make good use of it. For neither of these is it necessary that people know how how it works. What is important about Shakespeare and music is that they are appreciated with understanding. So it is important that people know their Shakespeare, but not important that they know the second law of thermodynamics, or how a telephone, or indeed a jet engine, works. It is important that *someone* knows how they work (otherwise we would not have them) but I can't see why we all should."

While it may not be important that a philosopher or an artist knows how a telephone works, a type of syndrome that has recently been called "information obesity", it is VERY important—contrary to Matravers' misunderstanding of the situation—that an artist or a philosopher knows how the second law, and by repercussion, a engine works, by virtue of the fact that the second law is at the heart of the underlying nature of every literary work of Shakespeare, a view that was first foreseen ingeniously in the mind of German polymath Johann Goethe—aka the "German Shakespeare" (organized a Shakespeare jubilee in Frankfurt in 1771, stating that the dramatist had shown that the Aristotelian unities were "as oppressive as a prison" and were "burdensome fetters on our imagination")—who in his 1809 physical chemistry based romance novella *Elective Affinities* showed how "chemical affinities", otherwise known as chemical "free energies", in the year 1882 and thereafter (see: thermodynamic theory of affinity), applied to and explained the ins and outs of human experience. This great unified "one culture wisdom" has since, for a number of difficult to pin down reasons, become lost in modern times, akin to a buried intellectual treasure, awaiting to be unearthed.

Other

In 2011, American mathematician and physicist Brian Greene gave the following Q&A response to the two cultures question: [30]

> Q. Do you see a division or antagonism between the cultures of the sciences and humanities?

> A. I see a division between the two cultures insofar as society has willfully allowed people to be okay about not knowing science, but has not allowed them to be okay about not knowing humanities and art. I think that is one of the major barriers that we need to tear down in order that science take its rightful place in the culture alongside music, art, theatre, dance, literature as something that you cannot dispense with [if you want to] consider yourself educated [and] engaged in the world conversation. And slowly, I think, that will happen.

(add disucssion)

Three+ cultures?

The following quote highlights the notion that into the 1960s there were felt, by some, to be upwards of four cultures emerging:

> "Indeed there are not two or three or four cultures: there is only one culture; our generation has lost its awareness of this … Historians, logicians, physicists—all are banded in one common enterprise, namely in their desire to weave an enlightened fabric of human knowledge."
>
> — Wolfgang Yourgrau and Allen Breck (1966), "Proceedings of the first International Colloquium: focused on Logic, Physical Reality, and History" [29]

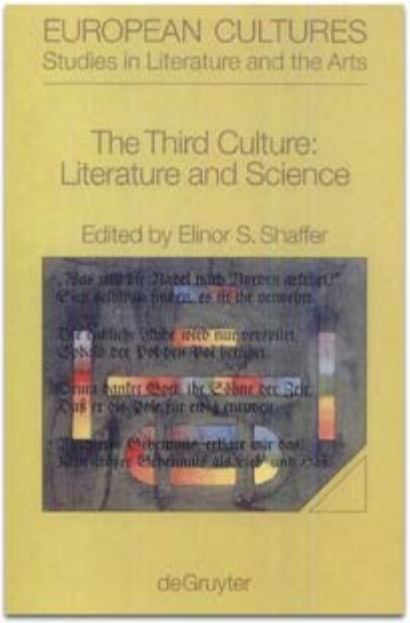

The Third Culture (1998), on the "third culture" of the science used in literature, edited by Elinor Shaffer (comparative literature scholar).

American literary agent John Brockman, 1988 founder of the Edge Foundation (Edge.org) and author of the 1995 *The Third Culture: Beyond the Scientific Revolution*, is a noted two cultures advocator. [11] Much of Brockman's efforts seem to be centered around bringing about roundtable discussions and producing multi-contributor books.

The 1998 book *The Third Culture: Literature and Science*, edited by Elinor S. Schaffer, contains a number of so-called third culture type articles, such as "The Aesthetics of Magnetism: Science, Philosophy and Poetry in the Dialogue Between Goethe and Schelling", by English Goethean human chemical theory scholar Jeremy Adler. [17]

In 2006, American comparative literature professor John McCarthy argued that the intersection of science, philosophy, and literature, such as found in the works of Johann Goethe, Friedrich Nietzsche, and Gunter Grass, embody what can classified as an area of interaction called the "third culture", which bridges the gap between the traditional "cultures" of science and the humanities. [10]

In 2011, Russian-born Israeli chemical engineer Alec Groysman, one of the organizers of the "International Conference on Art, Science, and Technology: Interaction between the Three Cultures", at ORT Braude College, Israel, has argued that there are "three cultures", namely: art, science, and technology (or possibly more), particularly when it comes to engineers and or depending on classification methodology; and that human chemistry is one of the centerpieces of the new three cultures model. [8]

Two cultures geniuses

> *See main: Two cultures genius*

The following are known "two culture geniuses", namely those to have successfully bridged the gap between literature and hard science:

â— Johann Goethe [3]
â— Voltaire | Supported Jean Sales' 1789 human molecular hypothesis.
â— Henry Adams

American engineer Edward Daub, in his 2003 chapter “Maxwell’s Demon”, alludes to the notion that Henry Adams is a semi-representative “two cultures” genius: [9]

> “In his presentation of the **‘two cultures’** issue, C.P. Snow relates that he occasionally became so provoked at literary colleagues who scorned the restricted reading habits of scientists that he would challenge them to explain the second law of thermodynamics. The response was a cold silence. The test was too hard. Even a scientist would be hard-pressed to explain the Carnot engines and refrigerators, reversibility and irreversibility, energy dissipation and entropy increase, Gibbs free energy and the Gibbs rule of phase, all in the span of a cocktail party conversation. How much more difficult, then, for a non-scientist. Even Henry Adams, who sought to find an analogy for his theory of history in the second law of thermodynamics, had great difficulty in understanding the rule of phase.”

This mention of Adams as a two cultures thinkers, although to not Adams was not thinking in terms of analogy but rather he saw his models as reality, might be in the neighborhood of the truth, being notable, similar to Goethe, in his attempts to mix chemistry, physics, thermodynamics, and history, all modeled on people viewed as human molecules, in order to derive a unified theory of human existence. The following are are lesser-known, supposed, or said-to-be "two culture geniuses", who have bridged the gap or attempted to bridge the gap between the two cultures:

â— Carl Djerassi (1923-) [7]
â— G. Evelyn Hutchinson (1903-1991); quote: “Hutchinson was certainly a polymath, a rare scientist who bridged the two cultures, the scientific and the humanistic, so clearly portrayed in the books of C. P. Snow.” [4]
â— John Bernal (1901-1971) [4]

University department

See main: Two cultures university department

In 2012, American electrochemical engineer Libb Thims began actively working towards an effort to found America's first two-cultures university department, similar to what is being done currently at Korea University (regarding social thermodynamics) and the University of Paderborn, Germany (by Jurgen Mimkes), and what historically was attempted at the University of Geneva, Switzerland (by Leon Winiarski). The structure of the aiming two cultures university is as follows:

A generic department logo for a future American **two cultures university department**, envisioned by **Thims** (2012) to teach, in a cross-disciplinary manner, the subject matter as outlined adjacent, all structured about the interrelationship between second law (Clausius) and the humanities (Shakespeare); the synthesis of which being first captured in the 1796 mind of Goethe (see: Goethe timeline).

(a) **Human thermodynamics** | similar to:

â— Leon Winiarski’s 1894 social mechanics course, University of Geneva;

Switzerland; as outlined in his 1900 sociology symposium article "The Teaching of Pure Political Economics and Social Mechanics in Switzerland".
â— Henry Adams' 1910 proposal (*A Letter to American Teachers of History*) to begin teaching history thermodynamics in America.
â— Pitirim Sorokin's 1928 "mechanistic school of social thermodynamics", which he subdivides as follows:

1. Social mechanics

   Representatives: A.P. Barcelo, Spiru Haret, Alfred Lotka

2. Social physics

   Representatives: Henry Carey

3. Social energetics (or social thermodynamics)

   Representatives: Ernest Solvay, W. Bechtereff, Wilhelm Ostwald, T.N. Carver, and Leon Winiarski

4. Mathematical sociology

   Representatives: Vilfredo Pareto and F. Carli

â— Richard Hughes' 2008 political thermodynamics and government thermodynamics course, Texas Tech University, US;
â— Korea University's 2011 social thermodynamics graduate school course;

(c) **Human chemistry** | similar to:

â— Thomas Huxley's 1871 call for the development of the field of social chemistry;
â— Henry Adams' 1885 definition of "social chemistry—the mutual attraction of equivalent human molecules—[as] a science yet to be created."
â— Albion Small's 1899 argument that 'general sociology' might be able to be defined in the future as 'the science of human atoms and their behavior'.
â— Frank Carlton's 1912 call for the inception of the sciences of social mechanics, social physics and social chemistry.

â— Werner Stark's 1962 followup to Huxley's call for the development of the social chemistry;
â— University of Bergen's 2011 "Literature and Chemistry: Elective Affinities" symposium on literature chemistry centered on Goethe's 1809 *Elective Affinities*.

(b) **Human physics** | similar to:

â— Serge Galam's 1980s social atoms based sociophysics teaching program in France, French National Center for Scientific Research.
â— Jurgen Mimkes' 1992-present physical socio-economics department (and PhD students), University of Paderborn, Germany;
â— Joseph McCauley's 2005 econophysics department (and PhD students), University of Houston;
â— Curtis Blakely's 2010 call for the development of sociophysics, treating people as particles, for

application in the field of penology.

a department of study thus uniting the engineering, humanities, and physical science departments into one unified teaching framework, similar in structure to the Lewis school of thermodynamics, albeit inclusive of the humanities, at a leading American university. Online forums indicate, as of 2008, for example, that graduate students are looking to know where they can go to study sociophysics in America, but no department as such currently exists. [13] In engineering, James Ferri, head of the chemical and biomolecular engineering department of Lafayette College, Pennsylvania, is doing something similar, with his student produced video projects, e.g. "Thermodynamics of Life: Occupy Wall Street Edition" (2011), but their seems to be no involvement with the university finance, business, and economics departments, which creates an education disjunct. [14] Thims currently is in talks, see: two cultures university department (discussion section), to found such a multi-disciplinary department; although as French physicist Serge Galam's reports, such an effort is not without decade's of resistance and opposition to the premise of a field in which a person is defined as an atom or a molecule, which comes from someone in France, the least religious country in the world.

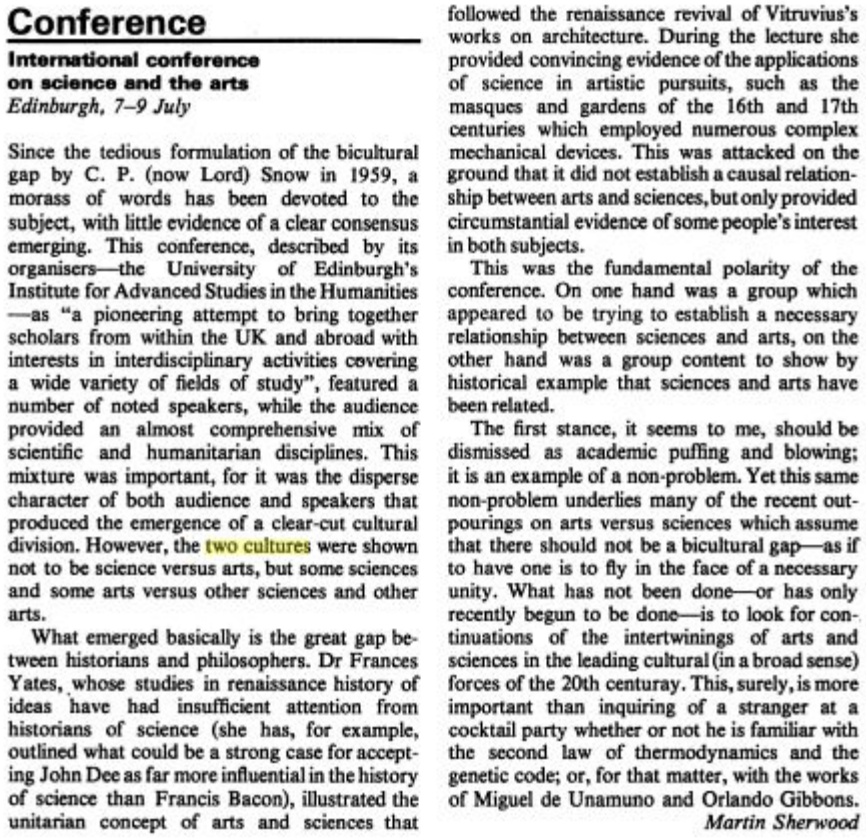

Conference

International conference on science and the arts
Edinburgh, 7–9 July

Since the tedious formulation of the bicultural gap by C. P. (now Lord) Snow in 1959, a morass of words has been devoted to the subject, with little evidence of a clear consensus emerging. This conference, described by its organisers—the University of Edinburgh's Institute for Advanced Studies in the Humanities—as "a pioneering attempt to bring together scholars from within the UK and abroad with interests in interdisciplinary activities covering a wide variety of fields of study", featured a number of noted speakers, while the audience provided an almost comprehensive mix of scientific and humanitarian disciplines. This mixture was important, for it was the disperse character of both audience and speakers that produced the emergence of a clear-cut cultural division. However, the two cultures were shown not to be science versus arts, but some sciences and some arts versus other sciences and other arts.

What emerged basically is the great gap between historians and philosophers. Dr Frances Yates, whose studies in renaissance history of ideas have had insufficient attention from historians of science (she has, for example, outlined what could be a strong case for accepting John Dee as far more influential in the history of science than Francis Bacon), illustrated the unitarian concept of arts and sciences that followed the renaissance revival of Vitruvius's works on architecture. During the lecture she provided convincing evidence of the applications of science in artistic pursuits, such as the masques and gardens of the 16th and 17th centuries which employed numerous complex mechanical devices. This was attacked on the ground that it did not establish a causal relationship between arts and sciences, but only provided circumstantial evidence of some people's interest in both subjects.

This was the fundamental polarity of the conference. On one hand was a group which appeared to be trying to establish a necessary relationship between sciences and arts, on the other hand was a group content to show by historical example that sciences and arts have been related.

The first stance, it seems to me, should be dismissed as academic puffing and blowing; it is an example of a non-problem. Yet this same non-problem underlies many of the recent outpourings on arts versus sciences which assume that there should not be a bicultural gap—as if to have one is to fly in the face of a necessary unity. What has not been done—or has only recently begun to be done—is to look for continuations of the intertwinings of arts and sciences in the leading cultural (in a broad sense) forces of the 20th centuray. This, surely, is more important than inquiring of a stranger at a cocktail party whether or not he is familiar with the second law of thermodynamics and the genetic code; or, for that matter, with the works of Miguel de Unamuno and Orlando Gibbons.

Martin Sherwood

The synopsis of a 1971 **two cultures** symposium held at the University of Edinburgh, according to which a person who is two cultures literate should be familiar with the second law, genetic code, Miguel de Unamuno, and Orlando Gibbons. [16]

Interscience two cultures divide

(add) [18]

Quotes

The following are related quotes:

> "To read Snow's 1959 lecture and Leavis's 1962 reply in succession is to witness precisely the "mutual incomprehension" that Snow had originally described between literary intellectuals and natural scientists—with the only difference being that where Snow sought to engage, Leavis reacted with the defensiveness of a caged animal, and thoroughly undermined any serious point he may have had to make."
>
> — Chris Mooney (2009), "The Science Lover and the Snob" [22]

> "Physics is the sun and mathematics its core ... Chemistry and biology are the near planets and in increasing distant orbits, lie economics, linguistics, psychology, anthropology, sociology and political science. Even though history and philosophy lie in appreciably more distant orbits, they are not completely free of this force field. At the far edge of this hypothetical universe are the arts and literature, but they, too, are subject to this force field.""

— Jerome Kagan (2009), *The Three Cultures* [28]

See also

â— Two cultures synergy
â— Two cultures namesakes

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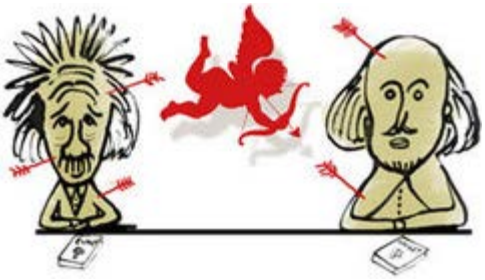

Elective Affinity: A Tale of Two Cultures?

By PD Smith

Prometheus 04 (2000), 46-65

Abstract:

Are literature and science divided by an unbridgeable gulf of mutual misunderstanding? Or are the 'two cultures' actually united by a common objective: to increase human self-understanding? In reality the relationship between literature and science is closer than many people think. In the twentieth century, literature has given voice to popular fears about the role of science in society as well as expressing profound wonder at a world transformed by science.

English literature science writer Peter Smith's 2000 article "Elective Affinity: A Tale of Two Cultures", which explains how German polymath Johann Goethe's 1809 physical chemistry based romance novella *Elective Affinities* was really a C.P. Snow-stylized "**two cultures**" type of book, underlyingly a scientific treatise on human experience, a synopsis extension of his 1997 PhD dissertation on the same subject. [23]

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Further reading

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External links

â— The Two Cultures – Wikipedia.

θΔics

In hmolscience, **two cultures calls** refers to historical and or modern calls for the world's leading universities and educational systems to implement a two cultures namesake course, readership, chair and or university department, seen as a growing and pressing need, that teaches students—natural science and social science students combined—the basics of social physics, pure and applied (Florence Nightingale, 1874), what the Clausius inequality and Romeo and Juliet have to do with each other (C.P. Snow, 1959), themed around a sociology based on chemistry (Werner Stark, 1962) or physicochemical sociology (Mirza Beg, 1987) as modern physical science defines things.

List | Classical

The following is a work-in-progress chronological listing of some of these calls, statements of pressing need, and desires to study and or complete degrees and do research the general field of the physicochemical humanities:

#	Person	Date	Summary
1.	Auguste Comte (1798-1857) French sociologist and philosopher	1842	In his his *Positive Philosophy*, stated following pressing "need": "Now that the human mind has grasped celestial and terrestrial physics, mechanical and chemical, organic physics, both vegetable and animal, there remains one science, to fill up the series of sciences or observation—**social physics**. This is **what men have now most need of**; and this it is the principal aim of the present work to establish."
2.	James Froude (1818-1894) English clergyman-abnegator turned historian, novelist, biographer, and editor	1849	Namely that we need to establish a branch of physics and chemistry that grasps sociological phenomena the same way we have mastered: celestial mechanics, terrestrial physics, analytical mechanics, chemical physics, and organic physics. In his Christian faith-relinquishing semi-autobiographical book *Nemesis of Faith* (1849), during which time, that year, his book was **publicly burned**—specifically by Exeter College, Oxford, moral philosophy professor William Sewell, who denounced the wickedness of the book to his class, and, when one of his pupils confessed to the possession of a copy, seized it, tore it to pieces, and threw it in the fire—he states the following very pressing and trenchant logic: "What is man the wiser or the happier for knowing how the air-plants feed, or how my centuries the flint-stone was in forming, unless the knowledge of them can be linked on to humanity, and **elucidate for us some of our hard moral mysteries**?" a publication, which, ironically—in that two decades later Florence Nightingale would propose to initiate such a chair (see below, 1874)—lost him his fellowship at Exeter College, Oxford, after which he would go in, in 1854, to do the first "anonymous" first English translation (see: translations) of Goethe's physical chemistry based book *Elective Affinities* (1809), which would go on in the three centuries to follow to form the basis and any and all type of physicochemical humanities courses.
			On the passing of Belgian

statistical

Proposal for a Chair in Social Physics

Editor: One of the last initiatives Nightingale took in her life, in 1891, was the attempt to have a chair or readership established at Oxford University on social physics and their practical application. This was to be the means of carrying on Quetelet's work and better still of introducing it to those who could best make use of it for social good: future administrators of government programs. Nightingale had reproached her friend Sidney Herbert, secretary of state for war, for failing to reorganize the War Office so that it could engage in an ongoing reform process. Administrators in the civil service able to interpret statistics would be essential to implement the appropriate lessons from them and advance a reform agenda.

The idea for teaching the subject at Oxford University goes back to her "In Memoriam" essay on Quetelet's death, 1874. It would be "the only fitting memorial" to her great mentor "to introduce *his* science" to Oxford, "the science of which he was the discoverer, upon which alone social and political philosophy can be founded".

3. Florence Nightingale (1820-1910) Italian-born English social reformer 1874

mathematician and astronomer Adolphe Quetelet (1796-1874), author of *Essay on Social Physics* (1835), her social theory mentor since *circa* 1859, proposed that a readership or chair in social physics be established at Oxford University and lobbied up until 1891 to get such a chair established, offering to put forward $100,000 USD, in modern terms, of her own money.

> "The only fitting memorial to Quetelet would be to introduce his science [social physics] in the studies of Oxford, upon which alone social and political philosophy can be founded, which as he said himself ought no means to be limited to the administrative or legislative domain but should be the interpreter of all *theodike*, all the government and its laws embracing the smallest and the most accidental to the greatest and most universal actions and phenomena of our moral physical life."
>
> — Florence Nightingale (1874), "In Memoriam", Feb 21

> "I think the [following] needs doing: [we need] a scheme from someone of high authority as to what should be the work and subjects in teaching 'social physics' and their practical application, in the event of our being able to obtain a statistical professorship or readership at the University of Oxford."
>
> — Florence Nightingale (1891), "Letter to Francis Galton", Feb 7

See the: **Nightingale Chair of Social Physics** for elaboration on this project. Section shown above (right) is Canadian social science historian Lynn McDonald's 2003 chapter section header on Florence Nightingale's 1874-1891 Oxford **social physics chair** initiation project. [1]

"There is, strictly speaking, neither unselfish conduct, nor a wholly disinterested point of view. Both are simply sublimations in which the basic element seems almost evaporated and betrays its presence only to the keenest observation. **All that we need** and that could possibly be given us in the present state of development of the

Friedrich

4.

Nietzsche (1844-1900) German philosopher

1878

sciences, **is a chemistry of the 'moral', 'religious', 'aesthetic'** conceptions and **'feeling'**, as well as of those **'emotions'** which we experience in the affairs, great and small, of society and civilization, and which we are sensible of even in solitude. But what if this chemistry established the fact that, even in its domain, the most magnificent results were attained with the basest and most despised ingredients? Would many feel disposed to continue such investigations? Mankind loves to put by the questions of its origin and beginning: must one not be almost inhuman in order to follow the opposite course?"

— Friedrich Nietzsche (1878), *Human, All Too Human*; first use of 'sublimation' in psychology

Spent some 50+ years aiming to ferret out a general theory of a universal operation underlying the humanities and the course of human history, based on the growing physicochemical sciences of his time, namely: Goethean human chemical theory based philosophy (Arthur Schopenhauer, 1818), thermodynamics (William Thomson, 1849), chemical thermodynamics (Willard Gibbs, 1876), anthropic physics (Wilhelm Ostwald, 1910), etc., culminating in his *A Letter to American Teachers of History* (1910), wherein he advocated the teaching of an atomic-thermodynamics based history course, some statements of which are shown below:

"Social chemistry—the mutual attraction of equivalent human molecules—is a **science yet to be created**, for the fact is my daily study and only satisfaction in life."

— Henry Adams (1885), "Letter to Clover Adams", Apr 12

5.

Henry Adams (1838-1918) American historian and physico-chemical social dynamics pioneer

1885

"I'm looking for a young and innocent physico-chemist [see: Henry Bumstead] who wants to earn a few dollars by teaching an [historian] idiot what is the first element of theory and expression in physics."

— Henry Adams (1908), "Note to John Jameson", Dec

"My *Letter to Teachers* was meant simply to 'teach teachers how to teach'. Schopenhauer prophecied it nearly a hundred years ago. Nothing is to be gained by preaching this lesson as a form of energy. It would act as a dissipator of energy. Therefore I have taught it, or tried teaching it, only to the few men who could profit by it to economise their scholar's energies,—to save them from wasting it on past processes. Economy is all I can see now, as true scientific object for education to pursue. **Certain branches of education may soon be lopped off, to advantage**."

— Henry Adams (1910), "Letter to Barrett Wendell", May 18

Adams, in his most-famous *The Education of Henry Adams*, summarized how the majority of modern education, such as his own at Harvard, is time wasted, and how the modern mind needs education in "physico-chemical social dynamics", as he referred to the subject he had in mind.

The following is a truncated summary of Hauriou's proposal:

6. Maurice Hauriou (1856-1929) French social-philosopher and law professor

1899

"**There is need to establish a new science** … one that compares the mechanics of social science and social movement with thermodynamics. In doing so, the human mind obeys the feeling that he has the web link and continuity of natural phenomena. It will be then possible to determine more accurately the specific content of this new science and to classify the essential elements, which will then serve as a touchstone of human theories."

— Maurice Hauriou (1899), *Lessons on Social Movement*

The following is Slosson's proposal:

7. Edwin Slosson (1865-1929) American chemist and religion-science reconciler

1910

"**Every university should have** a Department of Applied Greek and **a** complementary **Department of Humanized Physics**, and the benefits of these departments also should be extended as freely as is practicable to those who need them most, that is, to those whose main work is in another field."

— Edwin Slosson (1910), *Great American Universities*

In his *Sermons of a Chemist* (1925), he would go on to attempt to integrate atomic theory and relativity with the Bible and ideas on God; comments how his ideas are similar to Albert Mathews; in 1935, American philosopher Oliver Reiser, a correspondent of Slosson, commented in a footnote in his book *Philosophy and Concepts of Modern Science*, in his discussion section on the social energetics theorists, who brought physical chemistry methods to bear on social problems, such as Wilhelm Ostwald, Henry Adams, and Thomas Carver, that "I shall do my best to carry this view a step forward"; meaning that Reiser's aim was to continue the work on the thermodynamic application to history started by Slosson. This, however, did not seem to actualize into much further.

The following, in commentary on Thomas Huxley's 1871 call for the development of the field of social chemistry, are Starks suggestions:

8. Werner Stark (1909-1985) Czechoslovakian-born English sociologist

1969

"**Why should no social chemistry ever been developed?** Nobody would suggest that the social scientists should imitate meteorology, for this discipline does not appear to have got very far, but what about chemistry? A sociology based on chemistry has in fact been called for, but this call has found no echo. It would have been easy to take up this suggestion and develop it further. An intending social chemist would have found it one whit more difficult to manufacture a sociological parallel to the Boyle-Charles law than Haret did to the Newtonian propositions. But **the experiment appears never to have been tried. Why?**"

— Werner Stark (1962), *The Fundamental Forms of Social Thought*

Stated following:

Ernest

9.	Samuels (1903-1996) American lawyer and English professor	1989	"Man must jump, as Adams liked to say, if he would save himself; a moral and intellectual elite must be recruited. If nothing else would serve to make moral philosophers out of historians, the fear of imminent annihilation might. **University education must be revolutionized** by the physicist-historian." — Ernest Samuels (1989), *Henry Adams*

The following are Bohannan's summary of the issue at hand, as far as anthropology goes:

10.	Paul Bohannan (1920-2007) American anthropologist	1995	"Adapting thermodynamic ideas to the study of culture is limited by a very simple fact: nobody has yet figured out what might be the cultural equivalent of heat or energy … nobody has yet found the 'heat' or the 'energy' in cultural matters … the concepts of 'cultural temperature' (see: social temperature) to refine our understanding of 'cultural heat' (see: social heat) have not yet appeared. This is **one of the most pressing problems** for the next generation of anthropologists, and the difficulties are profound." — Paul Bohannan (1995), *How Culture Works*

(add discussion)

Two cultures | Movement

See also: Libb Thims (prospectus)

The following is a work-in-progress chronological listing of recent two cultures calls turned two cultures movements (see: two cultures inquires), two cultures implementations (see: two cultures synergies), or two cultures establishments, namely to either establish a two cultures department and or complete a degree in such a department:

#	Person	Date	Summary
1.	Jurgen Mimkes (1939-) German solid state thermodynamicist and socio-economic physicist	1992	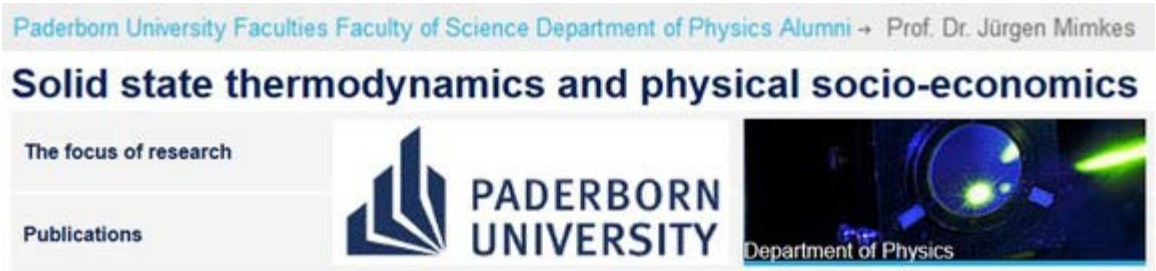 In 1992, Mimkes, as head of physics department of Paderborn University, German, assembled his department together to figure out, from a physics point of view, if anything could be done to remedy, recent student shooting incidents, arising between two cultural groups; thereafter he launched the world's first graduate department of thermodynamics based physical socio-economics; which produced several masters degree students.

Gheorghe Savoiu (1957-) Romanian economist and econophysicist

Began working, in 2007, with physicist Ion Siman on how to go about teaching econophysics and sociophysics, and thereafter founded the Romanian school of physical socioeconomics, centered at the University of Pitesti, Romania; the following is an example quote:

Chapter 10 Sociophysics: A New Science or a New Domain for Physicists in a Modern University 149
Gheorghe Săvoiu and Ion Iorga simăn

10.1 Introduction 149
10.2 A Brief History of Sociophysics 150
10.3 Definitional Issues of Sociophysics 153
10.4 Contemporary and Future Trends and Activities 156
10.5 Why Sociophysics Is Necessary in a Modern University? 160
10.6 Conclusions 165
10.7 A Final Remark 166
References 166

2. Ion Siman (1951-) Romanian physicist, biophysicist, and sociophysicist

2007

> "The apparently common field of sociology has the potential of producing and proving that the laws of physics can be reproduced as laws in human interaction, in social constructions, and even in relationships. In sociophysics, the first objective is the treatment of individuals, somewhat analogously to particles, or to atoms in a gas, and this allows for the application of statistical physics methodologies. **Why** [is] **sociophysics necessary in a modern university?** [Because] entropy and syntropy realities prove that econophysics is virtually the most necessary science discipline in a modern university."
>
> — Gheorghe Savoiu and Ion Siman (2012), "Why Sociophysics is Necessary in a Modern University"

The section shown (above right) is from their 2012 multi-contributor book *Econophysics: Background and Applications in Economics, Finance, and Sociophysics*. Savoiu and Siman, also, in 2011, launched University of Pitesti's new academic publication *Econophysics, Sociophysics and other Multidisciplinary Sciences Journal*, acronym ESMSJ, which has produced articles on two cultures namesake themed multidisciplinary topics; since 2008 they have hosted the annual University of Pitesti Econophysics and Sociophysics Workshop (UPESW) conferences; UPESW 2013 being attended by Libb Thims to study their operation.

Posted the following query in PhysicsForums.com: (Ñº)

3. MrDNA (c.1982-) Anon PhD student

2008

> "I'm currently in a psychology PhD program studying ways the structure of human social networks facilitates information transmission. I find the dominant psychology methodology extremely informal and would like to switch to a department where such things are studied using statistical mechanics (which is essentially the approach I'm taking now but without any faculty support).
>
> This puts me in a weird place because while I've learned the necessary math, none of it is on my transcript. (In fact, many professors in our psychology department literally forbid students to take graduate math courses).
>
> Is anyone sufficiently familiar with sociophysics to know whether there are ways for people like me to prove I have sufficient math background to switch programs? If I want to work with a professor in a physics department solely

on applications of statistical mechanics to questions in social sciences, do I need to prove that I understand topics in physics that are not directly relevant to such questions just to get into a department?"

After completed his master's degree in theoretical physics, Loreti began probing around looking for somewhere where he can completed his PhD in sociophysics, socioeconomic physics, and or human thermodynamics; the following are a few queries, the latter to Libb Thims:

4. 2012

Simone Loreti
(c.1987-)
Italian theoretical physicist

"Dear Sirs, I am looking for a PhD in SocioPhysics (or at most Socio-Econo-Physics), and/or funds for it. Do you know something about it? Any advice is welcome."

— Simon Loreti (2012), "Forum blog post", EconoPhysics Forum, Apr 14

"In March 2011, I graduated with a master's degree in theoretical physics at the University of Bologna (Italy). I am strongly interested in sociophysics or in general in physics applied to human behavior: in my thesis I solved a sociological problem using statistical mechanics, and machine learning methods. I am looking for a PhD in socio-physics or human thermodynamics and/or funds for it. Do you know something about it? Any advice is welcome."

— Simon Loreti (2012), "Email to Institute of Human Thermodynamics", Apr 15

5. 2012

Libb Thims
(c.1975-)
American electrochemical engineer

After giving five different hmolscience-centric and or human chemical thermodynamics based university lectures, at three different universities worldwide (UIC, NIU, PU), during the period 2010 to 2013, and after mentoring and advising one graduate student (Jeff Tuhtan) through his PhD dissertation, via Hmolpedia articles, threads, site messaging, email communications, and video uploads, during the period 2010 to 2012, officially starting probing around (see: **two cultures inquiries**) at various leading university heads, in aims to found a two cultures department, thematically conceived as a combination and modern upgraded synthesis of the: Lausanne school (1890-1923), Harvard Pareto circle (1932-1943), the Princeton social physics department (1945-1955), and the Romanian school (2007-present), or at least to initiate a Nightingale-like chair, readership, and or professorship teaching physicochemical humanities, for undergraduates and graduates; a project ongoing, but not, as of yet (2014), able to find realization, but one moving in that direction.

On 10 Nov 2014, emailed the following query to Libb Thims:

6. 2014

Behrouz Sadeghi

"I am Behruz Sadeghi Amroabadi, PhD Candidate (in last year) of economics at University of Isfahan, Iran and now as a **visiting student in Towson University in USA**. I have passed PhD comprehensive examination in my faculty successfully and have published several research papers about the environment, government, social capital, poverty, etc., in Iranian and international journals. The subject of my thesis is 'Economic Entropy as a New Index of Cost in Economics.' Now, **I am searching for Post-Doc position** and know you have some research in this regard. Do you or your faculty have any Position for Post Doctoral in related to entropy? I really

Iranian economist (1987-)

interest in this subject and want to continue my knowledge for this important."

Thims told Sadeghi that he was working to get an undergraduate and graduate department of "physicochemical humanities" established here in America, but was facing resistance, and in mean time suggesting that he might contact the Romanian school of physical socioeconomics, Yakovenko of the American school, as well as John Rutledge.

(add discussion)

Poudel-Galem-Thims | Discussion

On 30 Jun 2016, amid lunch discussion, between Ram Poudel, Serge Galam, and Libb Thims, on the outside patio of Italian Pizza Kitchen, across from Days Inn (conference hotel), following the end of the three-day BPE 2016 conference:

Poudel, with an MS in mechanical engineering, who for the last ten years, at Pulchowk Campus, Institute of Engineering, Tribhuvan University, Nepal, has been teaching thermodynamics, and since 2014 has been jointly working, at University of Massachusetts, Amherst, towards completion of his PhD on a social field theory and or thermodynamics based poverty-focused economics dissertation, asking Galam and Thims about potential PhD supervisors and or committee members possibilities.

Galem explained that last year he had began teaching a sociophysics-based politics class (of 120-students), at the Paris Institute of Political Studies (Sciences Po (Ñº)), e.g. see his: 2015 "Doctoral Seminar: Do Humans Behave Like Atoms? An Unfortunate Answer from Sociophysics" (Ñº) (adjacent) — if he was in need of an assistant, or would be willing to supervise, sign off, and or be a committee advisor for his PhD dissertation, or something to this effect.

Doctoral seminar Serge Galam

Do humans behave like Atoms? An unfortunate answer from Sociophysics

To participate send Serge Galam (serge.galam@sciencespo.fr) and Alain Need (alain.besoin@sciencespo.fr) before January 7, 2015, a paragraph (5/10 lines) describing motivations to participate in this seminar as well as a short CV (maximum 2 pages), a response will be given to you promptly. The number of participants is limited to 20. **This seminar is also open to students of Masters 1 & 2.**

For the first time ever in a social science institution series of 12 talks Will Be Given Introducing Sociophysics, a new emergent field, qui combined concepts and tools from the physics of disorder to build predictive models counter aiming at the description of Some aspects of social political and behaviors.

A news flyer (Ñº) for Serge Galam's 2015 12-part seminar on sociophysics based politics, aka physical politics, given at the graduate department of Paris Institute of Political Studies (Sciences Po).

Galem, however, explained that either he, his department, or something to this effect, is not in the position to facilitate PhDs of this sort, or something to this effect; as he only started teaching his physics-based politics is a course only started last year, and it is still a relatively new field of inquiry.

Thims, to note, pointed out to Galam that the US constitution, via the Princeton School of Social Physics, in particular the mind of James Madison, was conceptualized in terms of Newtonian physics-based politics; Thims directed Galam to the appropriate reading material advisable for his students to read, to get historical framework for a course in physical politics.

Poudel, Galem, and Thims then began ruminating on the matter. Thims, e.g., told Poudel that he could have done the PhD under Jurgen Mimkes, who ferried two masters degrees in physical-thermodynamical socioeconomics at the University of Paderborn, German, but that he is retired now. Poudel stated that he wanted to complete his PhD in the US, but that he was not for sure that he could complete his PhD at his present research position at University of Massachusetts, Amherst, as his supervisors were not academically equipped (thermodynamically) to sign off on such a PhD, or something to this effect.

Thims suggested the following potential PhD supervisors for Ram Poudel to finalize his 2014 to present work on a thermodynamics based social field theory dissertation:

1. **Erich Muller** | Imperial College, London, chemical engineering department | Poudel told Thims (at BPE 2016) that he read Muller's "Human Societies" 10 times, after being sent it as reading material by Thims, following feedback on Poudel's draft BPE 2016 talk on thermodynamics based social field theory presentation.

2. **James Ferri** | Lafayette College, Pennsylvania, chemical and biomolecular engineering department | Thims' proposed Ferri as a candidate, being that (a) he had already supervised undergraduates in this area ("Thermodynamics of Wall Street", 2011), and (b) as head of the chemical engineering department, at Lafayette College, Pa, he would be able to guide Poudel through equation 133.

3. **Kalyan Annamalai** | Texas A&M, mechanical engineering department | Thims suggested Annamalai as potential PhD supervisor, being that Annamalai was already citing Thims human molecular formula (2002) in his 2011 *Advanced Thermodynamics Engineering* textbook, as the new definition of a human, as pointed out in slide #8 (Ñº) of Thims' BPE 2016 talk, and that Annamalai is a JHT review board member. Thims pointed out, however, that Annamalai may not be technically proficient enough to steer him correctly, along the lines of equation 133, such as taught to Paul Samuelson by Edwin Wilson in his Harvard University "mathematical economics" course.

4. **Two advisor system** | Korea University | Since 2011 (Ñº) in the "Sociology of Science" section of their Science and Technology graduate program, they have been offering (Ñº) a general systems theory based social thermodynamics seminar (SOS 623) course); the PhD student has to have one humanities and one physical science advisor.

(add discussion)

See also

â— Human thermodynamics education

References

1. Nightingale, Florence. (2003). *Florence Nightingale on Society and Politics, Philosophy, Science, Education and Literature: Collected Works of Florence Nightingale* (editor: Lynn McDonald) (§: Proposal for a Chair in Social Physics, pgs. 105-28; see also: pg. 11). Wilfrid Laurier University Press.

θΔics

In hmolscience, a **two cultures department** is a multidisciplinary university department that cross-bridges the humanities departments with the physical science departments, focused on the teaching and research, pure and applied, of the subject of "physicochemical humanities" (Henry Adams, 1908).

> "Every university should have a Department of Applied Greek and a complementary **Department of Humanized Physics**, and the benefits of these departments also should be extended as freely as is practicable to those who need them most, that is, to those whose main work is in another field."
>
> — Edwin Slosson (1910), *Great American Universities* [32]

The template design for American electrochemical engineer Libb Thims' 2010 conceived C.P. Snow-themed **Two Cultures Department**, teaching the subject matter structured about the interdisciplinary relationship between second law (Clausius) and the various branches of the humanities (Shakespeare), bridging the gap between the famously left-brain right-brain divided "two cultures"; the synthesis of which being first captured in the mind of Goethe (see: Goethe timeline), and tested in the coursework of Leon Winiarski at the University of Geneva (1894-1900), in his thermodynamics based socio-political economics course (see: social mechanics), similar to Jurgen Mimkes (modern); being the embodiment of Henry Adams' famous 1910 call to American teachers of history (see: letter) to being teaching chemistry and thermodynamics in history class. [9]

Historically, although a few two cultures synergy attempts at establishing departments or teaching programs have been attempted, e.g. University of Lausanne (1890-1912), University of Geneva (1896-1900), Princeton University (1945-1955), Western Washington University (1977-1995), and University of Pitesti (2007-present), in draft stage, no modern university to date has an established two cultures department, though there have been no shortage of calls.

Two cultures inquires

See main: Two cultures inquires

In 1874, Italian-born English social theorist Florence Nightingale proposed, following the passing Belgian social physics pioneer Adolphe Quetelet, that social physics be taught at Oxford University, and thereafter lobbied to have a chair of social physics (see: Nightingale chair of social physics) established there for nearly three decades.

In 2010, American electrochemical engineer Libb Thims entered into dialogue with university heads and professors on the goal to get a "physicochemical humanities" department working and established at one of the world's leading universities; such as by visiting and studying in 2013 the Romanian school of physical socioeconomics. [33]

Overview

A two cultures department is an attempt to bridge the gap between the "two cultures", namely those who read Clausius (chemists, physicists, and engineers, etc.), i.e. the works thematic to the second law (left-brained thinkers), and those who read Shakespeare (sociologists, economists, historians, philosophers, literature scholars, anthropologists, etc.), i.e. works thematic to the humanities or social sciences (right-brained thinkers), in the famous 1959 words of English physicist C.P. Snow. The nature of the two cultures department mindset was speculated on by American physical chemist Gilbert Lewis, in his 1925 *Anatomy of Science* lecture, as follows:

> "Perhaps our genius for unity will some time **produce a science** so broad as to include the behavior of a group of electrons and the behavior of a university faculty, but such a possibility seems now so remote that I for one would hesitate to guess whether this wonderful science would be more like mechanics or like a

psychology."

This ripe statement, about a wonderful science somewhere between mechanics and psychology, brings to mind German polymath Johann Goethe—the epitome of the two cultures genius—and his famous anonymous 1809 defense "advertisement", to his newly-published physical chemistry based romance novella *Elective Affinities*, wherein he stated to the effect that: "there is after all only one nature", which is the focus that needs to be adopted by a future unified "one culture" focused department.

Need | Historical calls

See main: Two cultures calls

The following are a collection of representative calls for the need and or inception of a two-cultures department:

> "How I look forward to **the effect** that this [physical chemistry-based] novel will have in a few years on many people upon rereading it."
>
> — Johann Goethe (1809), comment (see: timeline) to Karl Reinhard

> "Now that the human mind has grasped celestial and terrestrial physics, mechanical and chemical, organic physics, both vegetable and animal, there remains one science, to fill up the series of sciences or observation—social physics. **This is what men have now most need of**; and this it is the principal aim of the present work to establish."
>
> — Auguste Comte (1842), *Positive Philosophy*

> "What is man the wiser or the happier for knowing how the air-plants feed, or how my centuries the flint-stone was in forming, unless the knowledge of them can be linked on to humanity, and elucidate for us some of our hard moral mysteries?"
>
> — James Froude (1849), *The Nemesis of Faith*, first English (anonymous) translator (1854) of *Elective Affinities*

> "Social chemistry—the mutual attraction of equivalent human molecules—is a **science yet to be created**, for the fact is my daily study and only satisfaction in life."
>
> — Henry Adams (1885), letter to wife

> "There are men who would be better off in a small village than in a large town, **if you had** some sort of human chemical reaction to determine in advance which man's nature was suited to the smaller place and which to the larger."
>
> — Henry Pritchett (1906), on "Large vs. Small Colleges"

> "**The time may come** when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry … then it may be possible, as

Adams suggests, to invent a common formula for thermodynamics and history."

— William Thayer (1918), *Annual Report of the American Historical Association*

"The most familiar attempts to explain how evolution takes place are restricted to special aspects of evolution, and are often epitomized in personal names, such as Darwinism, Lamarkism, Weismannism, Mendelism. Among us there are naturalists, morphologists, physiologists, and psychologists; breeders, experimentalists, and bio-chemists. And surrounding us on all sides are the physicists, chemists, geologists, and astronomers, **with whom we must reckon**, for their domains and their subject matter overlap ours in countless ways. But unfortunately between all these workers there is little common understanding and much petty criticism. ... We shall use the terms morality, behavior, conduct, or constructive action in the same broad way. It may sound strange to speak of the morals of an atom, or of the way in which a molecule conducts itself. But in the last analysis, science can draw no fundamental distinction between the conduct of an animal, a bullet, or a freshman, although there may be more unknown factors involved in one case than in the other."

— William Patten (1920), AAAS address "The Message of the Biologist" + *The Grand Strategy of Evolution: the Social Philosophy of a Biologist*

"**Why should no social chemistry ever been developed?**" He states that "nobody would suggest that the social scientists should imitate meteorology, for this discipline does not appear to have got very far … but what about chemistry? A sociology based on chemistry [has] in fact been called for, but, significantly, [this call has] found no echo. It would have been easy to take up this suggestion and develop it further. An intending social chemist would have found it one whit more difficult to manufacture a sociological parallel to the Boyle-Charles law than Haret did to the Newtonian propositions. But the experiment appears never to have been tried. Why?"

— Werner Stark (1962), commentary on Thomas Huxley's 1871 call for the development of the field of social chemistry

"Adapting thermodynamic ideas to the study of culture is limited by a very simple fact: nobody has yet figured out what might be the cultural equivalent of heat or energy … nobody has yet found the 'heat' or the 'energy' in cultural matters … the concepts of 'cultural temperature' (see: social temperature) to refine our understanding of 'cultural heat' (see: social heat) have not yet appeared. **This is one of the most pressing problems** for the next generation of anthropologists, and the difficulties are profound."

— Paul Bohannan (1995), *How Culture Works*

"There seem to be 'laws' [of] social systems that have at least something of the character of natural physical laws, in that they do not yield easily to planned and arbitrary interventions. Over the past several decades, social, economic and political scientists have begun a dialogue with physical and biological scientists to **try to discover whether there is truly a 'physics of society'**, and if so, what its laws and principles are. In particular, they have begun to regard complex modes of human activity as collections of many interacting 'agents'—somewhat analogous to a fluid of interacting atoms or molecules, but within which there is scope for decision-making, learning and adaptation."

— Philip Ball (2003), "The Physics of Society", talk delivered at the London School of Economics

Chapter 10 Sociophysics: A New Science or a New Domain for Physicists in a Modern University **149**
Gheorghe Săvoiu and Ion Iorga simăn
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Romanians economist and econophysicist Gheorghe Savoiu and physicist and sociophysicist Ion Iorga Siman's 2012 chapter "Sociophysics: A New Science or a New Domain for Physicists in a Modern University", from their multi-collaborator book *Econophysics: Background and Applications in Economics, Finance, and Sociophysics*, in which the call for the inception of "sociophysics" in a multidisciplinary teaching approach in universities, centered on core concepts such as the teaching of entropy in sociology, and teaching the history of the subject, which they date back to Italian physicist Ettore Majorana and his 1936 human quantum mechanics theories, an interdisciplinary method of teaching they have been implementing at the University of Pitesti, Pitesti, Romania, since circa 2007. [36]

American electrochemical engineer Libb Thims in his 16 Apr 2013: talk "Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies" (see: lectures), at segment 48:30-50:39 (see: **video**), at Northern Illinois University College of Engineering, doing the famous 18th century Leiden University volume expansion "ball and ring experiment" to explain "social expansion" (day) and "social contraction" (night), in Carnot cycle terms, in respect to hot body (sun) / cold body (night sky) alternating daily contact of earth-bound social systems (working body), Boerhaave's law, entropy (transformation content) increase, and irreversible changes in Gibbs free energy states of human existence and experience; the human molecule view lecture notes page in the background; illuminated rotating globe to the right.

Chemical engineering centric

See main: Chemical engineering; See also: Lewis school

The nature of the two cultures department would ideally be structured with the chemical engineering department as the central department, within which chemical engineering thermodynamics, centered on the second law, is the core course, with the various humanities departments (economics, sociology, history, philosophy, psychology, government, anthropology, politics, literature, business, law, finance, architecture, etc.) among others (e.g. ecology, biology (chnopsology)) embedded in an integrated manner. The reasoning behind this logic is that the chemical engineer tends to be the person who knows the fundamentals of the language, which in this case are the partial differential equations of thermodynamics. German physicist and thermodynamicist Ingo Muller, in his 2007 *A History of Thermodynamics*, puts it like this: [21]

"It is interesting to note that socio-thermodynamics **is only**

accessible to chemical engineers and metallurgists. These are the only people who know phase diagrams and their usefulness. It cannot be expected, in our society, that sociologists will appreciate the potential of these ideas."

American Lafayette College, Pennsylvania, chemical and biomolecular engineering department head James Ferri's 2011 student-produced video "Thermodynamics of Life: Occupy Wall Street Edition", made by chemical and biomolecular engineering students Angela Wnek (ChBE, 2013), Isaac Lavine (ChBe, 2014), Ashley Kaminski (ChBE, 2013), wherein they apply a number of different molecular, physical chemistry, and chemical engineering principles to the ongoing "Occupy Wall Street" debate/protests, namely what thermodynamics has to say about the fact that about 80 percent of a country's wealth tends to be held in about 20 percent of the population (Pareto principle). [20]

This logic is further exemplified by the following grouping of "chemical engineers" who, in the last century, have attempted to extend and promote aspects of hmolscience in their own directions and spheres:

â— William Fairburn (1914)

His *Human Chemistry* attempted to apply an entropy-based version of human chemistry to business practice.

â— John Neumann (1934)

Reviewed Georges Guillaume's 1932 economic thermodynamics dissertation; which he followed up by his own 1938 article "A Model of General Economic Equilibrium" based on the model of thermodynamic potentials.

â— Benjamin Kyle (1988)

Chemical Engineering Education "The Mystique of Entropy" human thermodynamics-themed article turned 1999 CD-ROM to his *Chemical and Process Thermodynamics*. [11]

â— Erich Muller (1998)

Chemical Engineering Education "Human Societies: a Curious Application of Thermodynamics"human thermodynamics-themed article. [16]

â— Gerard Nahum (1998)

Promoted an investigative study on the thermodynamics of consciousness.

â— Edison Bittencourt (1999)

His engineering conference presentation "Teaching of Thermodynamics in Chemical Engineering" advocating the teaching of the thermodynamic imperative to chemical engineering students.

â— Alfredo Infante (2001)

His "Social Entropy: A Paradigmatic Approach of the Second Law of Thermodynamics to an Unusual Domain" uses the advanced perspective to teach aspects of the understanding of the Gibbs free energy of a social system.

â— Tominaga Keii (2004)

Devoted a chapter subsection to the chemical thermodynamics of Goethe's *Elective Affinities*.

â— Mark Janes (2006)

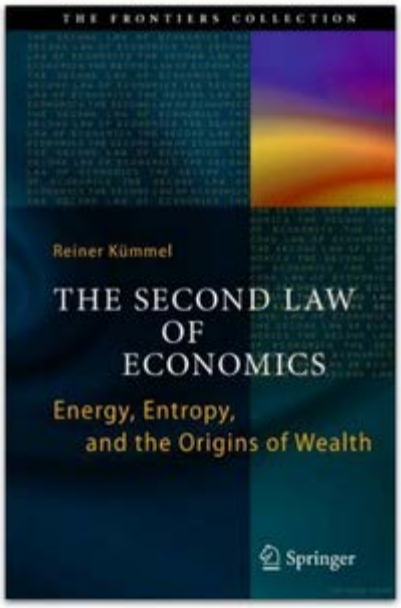

German physicist Reiner Kummel's 2011 *The Second Law of Economics*, the result of lecture notes on a course on "economics and thermodynamics" (economic thermodynamics) taught since 2005 at the University of Wurzburg, Germany.

Developed a thermodynamics-based carbon entromorphology theory of human existence.

â— Alec Groysman (2011)

Symposium suggestion of teaching of "human chemistry" in engineering. [12]

â— James Ferri (2011)

Assigned a "Thermodynamics of Wall street" ChE group video project. [13]

â— Mohsen Mohsen-Nia (2011)

Completed a friendships relations thermodynamic "stability" study. [14]

â— Vamshi Regalla (2012)

Did a "A Strange Thing Called Love: in View of Chemical Thermodynamics" video-turned-article. [17]

â— Jose Aguilera (2012)

Wrote a "Molecular Sociology" chapter section promoting the teaching of modern Empedocles-style aphorisms in a Goethe/Thims context. [15]

Polish physical social economist Leon Winiarski, who for at least six years (1894-1900), at the University of Geneva, Switzerland, taught a course on political economics and social mechanics, based on the thermodynamics of Rudolf Clausius and the physics of Joseph Lagrange, was the first to pioneer the "two cultures" teaching method, as he explains (adjacent) at the 1900 Paris Expo on Social Science Education.

Template courses

The following is a partial listing of current or past college and or graduate school courses precursory and or template-like in structure to a future "Two Cultures Department", presently working to be established for the first time at a leading American university, by American electrochemical engineer Libb Thims, the grouping themselves semi-indicative of the various 36 plus branches of human thermodynamics:

â— Social Mechanics | Leon Winiarski | University of Geneva | 1894-1900

"Turning to the dynamic part of the problem, we gave a definition of social-biological energy in two forms: potential (hunger and love) and kinetic (economic, political, legal, moral, aesthetic, religious, and scientific). This led us to the principles of thermodynamics, including the third, the Clausius same time

explains the progressive spiritualization any closed social aggregate to show a decrease in potential. This dissipation of entropy that occurs is the same in the social world as in the physical world. **…** All this forms the **subject of a course** on social mechanics that we are giving under the title, 'Economic Bases of Social Science,' parallel with our course on pure political economy. In fact, the point of departure of our researches was, as we have shown, pure political economy, to which we refer all social science, and bring it all back to mechanics."

> — Leon Winiarski (1900), Report: "The teaching of pure economics and politics of social mechanisms in Switzerland"

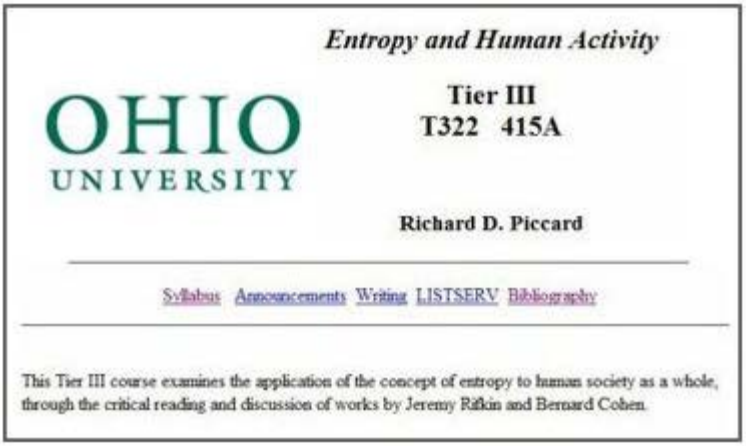

American physicist Richard Piccard's "Entropy and Human Activity" course taught as a senior level class at Ohio University, on and off, from 1998 up to the present, on entropy applied to human society as a whole, albeit using the weaker material entropy theories of Jeremy Rifkin. [19]

â— Entropy Ethics | Robert Lindsay | Brown University | 1930s
â— Entropy Ethics | Dick Hammond | University of Texas | 1980s
â— Entropy and Society | Richard Piccard | Ohio University | 1997-2006
â— Econophysics | Victor Yakoveno | University of Maryland | 2005-present
â— Econophysics | Joseph McCauley | University of Houston | 2006-present
â— Politics, Government, and Thermodynamics | Richard Hughes | California State University, Sacramento | 2008
â— Literature and Narrative Theory | Bruce Clarke | Texas Tech University | 2009
â— Human Thermodynamics | Libb Thims | University of Illinois, Chicago | 2010-2012
â— Seminar on Social Thermodynamics | Instructor[s] | Korea University | 2011
â— Air in Motion / Thermodynamic Materialism | Inaki Abalos, Mathias Schuler | Harvard University | 2013

Two cultures department | Outline

See also: Human thermodynamics education

From *circa* 1945 to 1955, American astrophysicist and engineer John Q. Stewart, ran a **Princeton University Department of Social Physics**, with grant-funding from the Rockefeller Foundation, a group which included no other than Percy Bridgman, one the the top thermodynamicists of the 20th century. [25]

The first to establish a "two cultures" prototype university department in America was American astrophysicist John Q. Stewart, who from circa 1945 to 1955, at the Princeton University, with grant funding from the Rockefeller Foundation, headed a research team project on the development of social physics or social mechanics, depending on namesake, in aims to facilitate physical science based education in global policy and government decision making, in his own words:

> "Statesmen of this and other nations … have embarked upon grandiose undertakings where on physical grounds failure was predictable, and … failure meant that … people perished in vain."

In 2010, American electrochemical engineer Libb Thims, initially tentatively and actively as of 2012, began to enter into discussions with various American university departments in an effort to launch the world's first cross-disciplinary

two-cultures university teaching department. The outline for the proposed two cultures department, envisioned by Thims, would cover the following three overlapping subject matters, which are similar to like-themed departments sprouting in various European countries:

(a) **Human thermodynamics** | 500+ theorists | similar to:

â— Leon Winiarski's 1894 social mechanics course, University of Geneva; Switzerland; as outlined in his 1900 sociology symposium article "The Teaching of Pure Political Economics and Social Mechanics in Switzerland".
â— Henry Adams' 1910 proposal (*A Letter to American Teachers of History*) to begin teaching history thermodynamics in America.

â— Pitirim Sorokin's 1928 "mechanistic school of social thermodynamics", which he subdivides as follows:

I. Mechanistic School
Social mechanics
Social physics
Social energetics
Mathematical sociology of Pareto

Russian-born American Harvard sociology department founder Pitirim Sorokin's 1928 classification of the first main branch (of eleven) of "contemporary sociology", that of the "mechanistic school of social thermodynamics", all based on the thermodynamics of Rudolf Clausius. [17]

1. Social mechanics

   Representatives: A.P. Barcelo, Spiru Haret, Alfred Lotka

2. Social physics

   Representatives: Henry Carey

3. Social energetics (or social thermodynamics)

   Representatives: Ernest Solvay, W. Bechtereff, Wilhelm Ostwald, T.N. Carver, and Leon Winiarski

4. Mathematical sociology

   Representatives: Vilfredo Pareto and F. Carli

â— Richard Hughes' 2008 political thermodynamics and government thermodynamics course, Texas Tech University, US;
â— Korea University's 2011 social thermodynamics graduate school course;

(b) **Human chemistry** | 55+ theorists | similar to:

SOS 623	Seminar on Social Thermodynamics	[3]

This course will be held in the form of seminar. The advantage of general system theory will be solidated and the drawbacks of it will be complemented. The theory of Social Thermodynamics and its application will be also introduced.

â— Johann Goethe's 1796 human chemical theory (see: EA:IAD project); the forerunner to modern human chemical thermodynamics.
â— Thomas Huxley's 1871 call for the development of the field of social chemistry;

Korea University's 2011 three credit graduate course "Seminar on Social Thermodynamics" SOS 623 (SOS short for Sociology of Science), as described above, a type of human thermodynamics education course, divided into two parts: firstly, general systems theory, a discussion of its basic outline, along with its drawbacks; and, second, with what they referred to as the "theory of social thermodynamics and its applications", supposedly on some variant of social thermodynamics, at the introductory level, and discussion of its applications, either theoretical or possibly in the area of applied human thermodynamics; the program, as indicative of its "two cultures approach", employs a "two-supervisors system": one is based on human or social science, the other is based on natural science or engineering, similar to

the American university department **Thims** is looking to launch. [1]

â— Henry Adams' 1885 definition of "social chemistry—the mutual attraction of equivalent human molecules—[as] a science yet to be created."
â— Albion Small's 1899 argument that 'general sociology' might be able to be defined in the future as 'the science of human atoms and their behavior'.
â— Frank Carlton's 1912 call for the inception of the sciences of social mechanics, social physics and social chemistry.

â— Werner Stark's 1962 followup to Huxley's call for the development of the social chemistry;
â— Jeremy Adler's 1977 human chemistry PhD, under the supervision of Claus Bock, on the chemists and human chemical reactions of Goethe's 1809 *Elective Affinities*.
â— University of Bergen's 2011 "Literature and Chemistry: Elective Affinities" symposium on literature chemistry centered on Goethe's 1809 *Elective Affinities*.
â— Alec Groysman's 2011 symposium call for the use of human chemistry in the chemical engineering curriculum, to facilitate an interaction of the "three cultures" (art, science, and technology) as he sees things.

(c) **Human physics** | 45+ theorists | similar to:

American Smith College chemical engineering professor Donna Riley's 2011 EGR 205 course, and accompanying book *Engineering Thermodynamics and 21st Century Energy Problems*, targets what she calls "five often-neglected ABET outcomes", a course through which she seeks "revise engineering curricula to be relevant to a fuller range of student experiences and career destinations", inclusive of topics such as: entropy's philosophical implications, ethics, social constructs, arrow of time, etc. [29]

â— John Q. Stewart's 1945-1955 "social physics"/"social mechanics" research group at the Princeton University physics department.
â— Serge Galam's 1980s social atoms based sociophysics teaching program in France, French National Center for Scientific Research.
â— Arthur Iberall's 1985 UCLA graduate school course in social physics.

â— Jurgen Mimkes' 1992-present physical socio-economics department (and PhD students), University of Paderborn, Germany;

â— Joseph McCauley's 2005 econophysics department (and PhD students), University of Houston;
â— Curtis Blakely's 2010 call for the development of sociophysics, treating people as particles, for application in the field of penology.

Which, in sum, would constitute a cross-culture department of study uniting the engineering, humanities, and physical science departments into one unified teaching framework, similar in structure to the Lewis school of thermodynamics, albeit inclusive of the humanities, at a leading American university.

Graduate student requests

Online forums indicate, as of 2008, indicate that graduate students are looking to know where they can go to study sociophysics in America, but no department as such currently exists. [2]

In the late 2000s, undergraduate and graduate students began contacting Libb Thims, e.g. via email, online communications, or during guest lectures, regarding the question of where one can go to complete a graduate school degree in human thermodynamics and or human physics related fields. In 2009, to exemplify, a Turkish third-year undergraduate mechanical engineering student (Hmolpedia member: Turnkey13) commented to Thims that he desired to come to America to complete a master's degree in on a topic related to thermodynamic of human life, having been inspired by passages in the 2006 *Thermodynamics* textbook by Yunus Cengel and Michael Boles, such as: [7]

In 2012, American investor and economics consultant John Rutledge began teaching ECON 339 "Topics in Far from Equilibrium Economics: Evolutionary Economics and Finance", an economics thermodynamics graduate school course, at Claremont Graduate University, Claremont, California.

> "The arguments presented here are exploratory in nature, and they are hoped to initiate some interesting discussion and research that may lead into better understanding of performance in various aspects of daily life. The second law may eventually be used to determine quantitatively the most effective way to improve the quality of life and performance in daily life, as it is presently used to improve the performance of engineering systems."

GSD Course Bulletin - Spring 2013 - DES-03438

COURSE DETAILS

03438: Air in Motion / Thermodynamic Materialism (DES 0343800)

Architecture

Seminar - 4 credits - Limited enrollment

Thursday 10:00 - 1:00 7 Sumner 104

INSTRUCTOR(S)

Inaki Abalos, Matthias Schuler, TBA

A 2013 graduate seminar architectural thermodynamics course entitled "Air in Motion / Thermodynamic Materialism" taught at the Harvard University Graduate School of Design, wherein air and or space (see: nature abhors a vacuum) are treated "thermodynamically"; the second half of which is devoted to a study of thermodynamic materialism, taught in coordination with a research project at ETH Zurich titled "Thermodynamic Materialism". [10]

Human thermodynamics lectures | Bioengineering

See main: Libb Thims (lectures)

In 2010, American electrochemical engineer Libb Thims, depicted adjacent, began giving invited guest lectures to undergraduate bioengineering thermodynamics students of the University of Illinois, Chicago, on an introduction to human thermodynamics. Thims lectured in 2011 and 2012.

One student, in 2012, to give some insight into the unknown overlap between the humanities and thermodynamics, queried Thims about how he could go about cultivating an overlap between "engineering" (or thermodynamics) and his other passion of "sociology and economics" following graduation, possibly in graduate school?

Theses / dissertations

See main: Human thermodynamics dissertations

In 1991, Swiss electrical engineer Francois Cellier, his 1991 chapter Modelling in Nonequilibrium Thermodynamics, voiced his opinion that PhD dissertation on the thermodynamics of macroeconomics (economic thermodynamics) would be a very worthwhile topic: [23]

> "We have discussed thermodynamics from a systemic rather than a phenomenological viewpoint. We have seen that bond graphs present us with a tool to ensure adherence to physicality in modeling thermodynamic systems … bond graphs [however] are quite meaningless when applied to the description of mathematical equations bare of their physical interpretation. It is therefore not currently feasible to apply bond graphs to the description of a macroeconomic model, for example, since we don't know what energy conservation means in such a model. What does economic power mean in a system theoretical rather than in a political sense? We don't know? Consequently, we cannot define a set of adjugate variables that describe the behavior of a macroeconomy. However, I would like to go one step further. While I cannot prove this to be correct, I am personally convinced that any real system that can meaningfully be describe by a differential

equation model—and macroeconomic systems are among those without any question—possesses some sort of 'energy' that obeys the law of conservation of energy. It is just that, to my knowledge, nobody has ever looked into systems, such as macroeconomies, from quite that perspective and tried to formulate a meaningful and consistent definition of the the terms 'energy' and 'power', and from there derived a set of adjugate variables, the product of which is 'power'. This would be **a very worthwhile topic for a PhD dissertation**."

This keen foresight, in recent years, with the 2007-launching of Hmolpedia, has been coming into fruition. The following, to exemplify, are recent master's theses that use and or cite Hmolpedia articles:

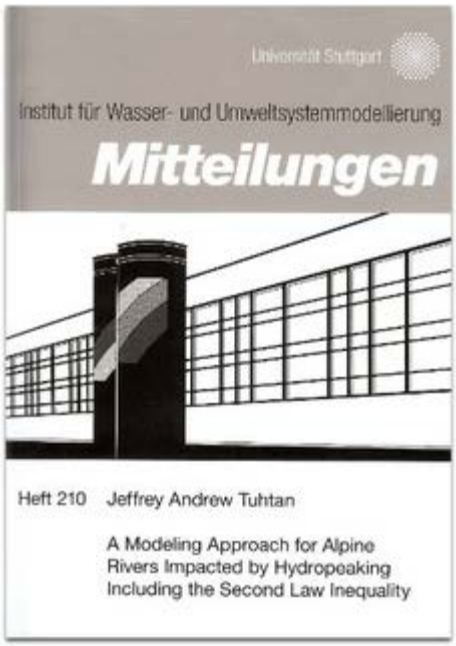

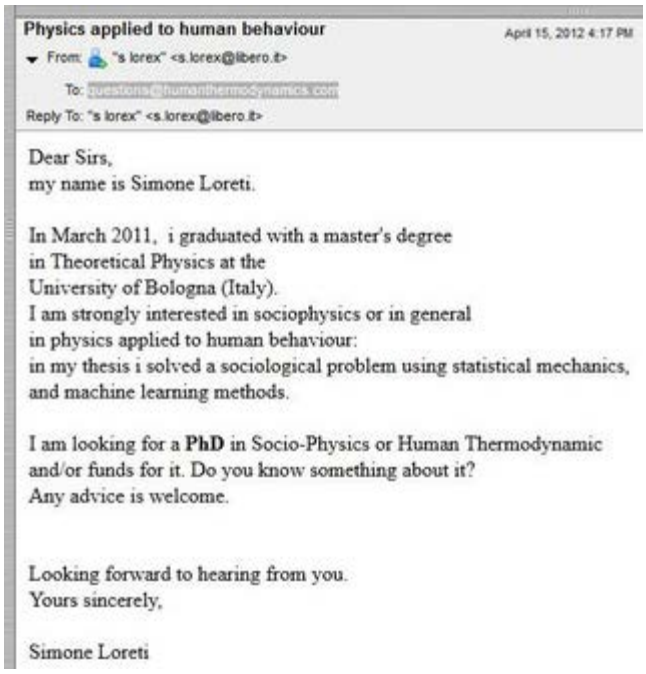
Physics applied to human behaviour
April 15, 2012 4:17 PM
From: "s lorex" <s.lorex@libero.it>
To: questions@humanthermodynamics.com
Reply To: "s lorex" <s.lorex@libero.it>

Dear Sirs,
my name is Simone Loreti.

In March 2011, i graduated with a master's degree
in Theoretical Physics at the
University of Bologna (Italy).
I am strongly interested in sociophysics or in general
in physics applied to human behaviour:
in my thesis i solved a sociological problem using statistical mechanics,
and machine learning methods.

I am looking for a **PhD** in Socio-Physics or Human Thermodynamic
and/or funds for it. Do you know something about it?
Any advice is welcome.

Looking forward to hearing from you.
Yours sincerely,

Simone Loreti

Above left: The 2011 ecological engineering PhD dissertation: "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality", by American civil-ecological engineer Jeff Tuhtan (right), done using the online two-cultures Hmolpedia articles and discussion forum as a central resource hub, and the thermodynamics of human molecules (*The Human Molecule*, 2008) approach as a guiding framework for his fish modelling theories (see: fish molecule). [18] Above right: A 2012 PhD email query by Italian theoretical physicist Simone Loreti, to American electrochemical engineer Libb Thims, regarding what universities are offering PhDs in sociophysics or human thermodynamics and a desire to obtain such a degree.

- â— Bjorke, Lisa. (2010). "To Create with Imagination: In Search of Flow" (abs) (articles: flow, psychic entropy, Csíkszentmihályi flow), MA thesis, Konstfack, University of Arts, Crafts and Design, Stockhom, Sweden.
- â— Hyslop, Megan. (2011). "When We Grow a Garden Together: A Love Story Social Ecological Reflection of a Community Garden Project" (article: chaos), MA thesis, Concordia University, Montreal, Quebec, Canada.

In 2010, Hmolpedia member DeeM1, an American business executive, with background is business, marketing, management consulting, and leadership development, and co-owner of several companies, one of which is a post-graduate school of managerial leadership, was in the middle of embarking on doctoral studies research op the subject of entropy on human behaviors and energy within organizations, using Hmolpedia as a resource. [24]

In 2010 and 2011, Thims, using email communication and Hmolpedia forums and messaging, began mentoring American civil-ecological engineer Jeff Tuhtan through the application of animate thermodynamics techniques to development of aquatic system thermodynamics model portions of his working PhD dissertation, which was completed the following year: [8]

- â— Tuhtan, Jeff. (2012). "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality" (pdf) (articles: human molecule, cell-as-molecule, fish molecule, Georgi Gladyshev, animate thermodynamics, Erwin Bauer, etc.), PhD dissertation, Stuttgart University, Germany.

In 2012, Italian theoretical physicist Simone Loreti, who recently completed his MS on statistical mechanics and machine learning applied to sociological problems, queried Thims (shown adjacent), via questions@humanthermodynamics.com email of the Institute of Human Thermodynamics, regarding what universities are offering PhDs in sociophysics or human thermodynamics. [6]

> "In March 2011, I graduated with a master's degree in theoretical physics at the University of Bologna (Italy). I am strongly interested in sociophysics or in general in physics applied to human behavior: in my thesis I solved a sociological problem using statistical mechanics, and machine learning methods. I am looking for a PhD in socio-physics or human thermodynamics and/or funds for it. Do you know something about it? Any advice is welcome."

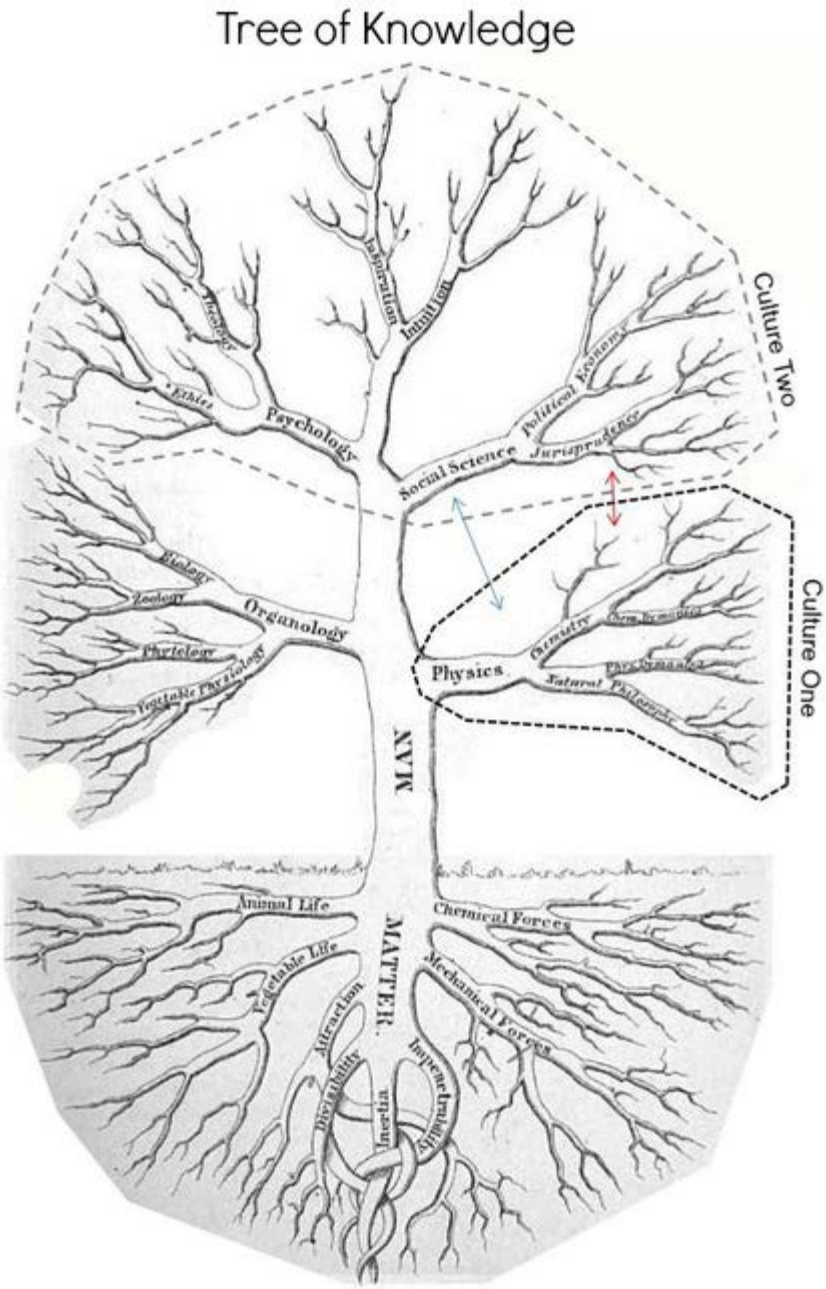

American "physical science applied" sociologist Henry Carey, one of the founders of the social mechanics school, and his 1858 depiction of the "**tree of knowledge**", annotated to show a post 1959 "two cultures" perspective, wherein the branch of **social science** is intentionally shown located in close proximity to the the **physical science** branch of knowledge, with two-way

Thims informed Loreti that he was presently working to establish such a university department here in the United States, potentially at the University of California, Berkeley, but that in the mean time he might like to look into Jürgen Mimkes' socioeconomic physics department (in Germany) or Serge Galam's sociophysics department (in France). [6]

Thims | Department head discussions

Thims first proposed his department founding goal to University of Illinois thermodynamics professor Ali Mansoori, during lunch, in 2010, who suggested that he should enter the UIC engineering department, via a thermodynamics PhD, and go from there. Thims' told Mansoori, however, that his aim was to found the school most likely at the University of California, Berkeley (a top 3 chemical engineering school), home to the Lewis school of thermodynamics, as he had previously planed planned (and been accepted) to complete his undergraduate work there, and had made a promise to himself that he would return there again in the future, or that he would need to found the new university department at a top 10 chemical engineering thermodynamics / chemical thermodynamics rank, such as at Stanford, the MIT school of thermodynamics, Yale (Willard Gibbs' alma mater), among other possibilities, the key feature needed being heightened student academic ability, being that the subject in its very nature is polymathic in structure, multidisciplinary in width, and partial differential equation rooted in depth, something few modern study and go students have the taste for.

In 2011, American chemical engineer James Ferri, head of the chemical and biomolecular engineering department of Lafayette College, Pennsylvania, began doing something similar, with his student

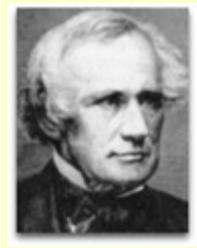

arrows indicating "exchanges" of ideas talking place, to create a unified branch of social mechanics or social physics, as Carey worked at developing. [28]

produced video projects, e.g. “Thermodynamics of Life: Occupy Wall Street Edition” (2011), but their seems to be no involvement with the university finance, business, and economics departments, which creates an education disjunct. [3] Thims mentioned this plan to Ferri, who seemed to indicated that his student supervised projects in financial thermodynamics was a fairly new venture that he was water-testing.

In 2012, Thims discussed the department founding project with Indian-born American mechanical engineer Satish Boregowda—who, in 2008, of relevance, was on the faculty at Purdue University, but at the time was forced to withdraw a publication submission to the *Journal of Human Thermodynamics*, because as he commented in retrospect some of his “colleagues and tenure reviewers were not in favor of my work in ‘human thermodynamics’.” Boregowda, eventually, left Purdue University, in favor of professional work, but commented to Thims in retrospect that the objection was not personal but that objection was that teaching human thermodynamics was not a topic found in professional engineers board exam questions, or something along these lines (Jan 24).

In 2012, in email conversation with American sociologist Mario Small, the head of the University of Chicago’s sociology department, Thims proposed the goal of founding a joint two-department sociophysics-sociothermodynamics-sociochemistry department, strung between the physics and the sociology department, pointing out to Small that the original 1882 founder of the University of Chicago's sociology department Albion Small, who also founded the *American Journal of Sociology* (1895), his 1899 article “A ‘Unit’ in Sociology” argued that ‘general sociology’ might be able to be defined in the future as ‘the science of human atoms and their behavior’, on the model of ‘general chemistry’, which is defined as the science of atoms and their behavior; also pointing out that many at the University of Chicago have worked in the path of the hmolsciences: Frank Carlton, Paul Samuelson, Elihu Fein, Harold Nieburg, Stephen Berry, and John Avery, among others. Mario Small commented on this proposal, following several email exchanges, that: “this seems like a tall order at the moment” (Apr 18). [4]

In sum, Thims, in 2011 and 2012, began to interject into preliminary talks about possibly founding a multidisciplinary two cultures teaching department; although as French physicist Serge Galam's reports (2012), such an effort is not without several decade's of resistance and opposition to the premise of a field in which a person is defined as an atom or a molecule, which comes from someone in France, the least religious country in the world. [5]

Two cultures department team | Tentative outlines

In 2013, Thims, after coming across the 1950s "Princeton University Department of Social Physics", an excellent template

(prototype)

Culture One			+	Culture Two		
(engineering)	(physics)	(chemistry)		(sociology)	(economics)	(law)
	photo needed	photo needed				
Libb Thims				Leon Warshay	John Rutledge	Curtis Blakely

prototype to the envisioned-to-be "Two Cultures Department", **(thermodynamics)** (astronomy) **(mathematics)** **(psychology)** (anthropology) (literature) began to construct the outline potential members of a similar upgraded albeit more diverse such department, i.e. not just "social mechanics" (Leon Winiarski, University of Geneva, Switzerland), "social physics" (John Q. Stewart, Princeton University, America), or "socio-economic physics" (Jurgen Mimkes, University of Paderborn, Germany), but also subjects such as "anthropic physics" as Wilhelm Ostwald was promoting in the 1900s, "socio-history physics" as Henry Adams called for in 1910, "human chemistry" as Alec Groysman has been calling for in 2011 in the chemical engineering curriculum, among other subjects such as financial thermodynamics, overlaps with ecological economics, and so on. On 6 Mar 2013, Truman State University justice systems professor Curtis Blakely commented to Thims:

> "This sounds like a great opportunity. I am impressed and fully support your efforts. Should I be able to assist you in your efforts, please let me know. I am at your disposal. Again, I am impressed and am more than glad to do anything I can to support your efforts!"

In early March 2013 communication with Thims on the proposed two cultures department, American Wayne State University sociology professor Leon Warshay, noted for his 1983 chapter on the social mechanics school, attempted to explain to Thims why the mechanistic school is not being taught in American sociology (the details of which are listed on his Hmolpedia page), commenting to Thims:

> "I fully endorse your efforts to include the mechanical [in sociology] [in your two cultures proposal]."

The bottom line reason for the fall-off in the teaching of social mechanics in sociology being that in the end, according to Warshay, "bias" results and people end up "being called names", comments which again brings directly to mind American physicist John Q. Stewart's 1955 experience in working to establish his short-lived Princeton Social Physics department: "[Stewart] has irritated the social scientists further by criticizing them for immaturity, lack of imagination and 'doctrinaire departmentalism'. Overspecialization, he feels, is choking modern scholarship and limiting man's communication with his fellows." [27]

On 11 Mar 2013, American investor, economics consultant, and economic thermodynamics professor John Rutledge comment the following to Thims on the two cultures department objective:

> "I admire the work you are doing very much and wish you well on the two-culture teaching department idea. I convinced the Claremont Graduate University Economics Dept to add a course called "Topics in Far from Equilibrium Economics: Evolutionary Economics and Finance" to their PhD program, which I am teaching. The syllabus for the course is attached. I am also attaching a paper titled "Asia's Energy Security and the Middle East" that I presented to the BOAO Forum some years ago, in which I describe a non-equilibrium thermodynamics model for economics. My last book *Lessons from a Road Warrior* (2008) has a more detailed presentation. Where do you hope to locate the teaching department? It sounds like a wonderful idea."

On 28 Mar 2013, American chemical engineer John Prausnitz, professor emeritus of the University of California, Berkeley, noted for work in protein

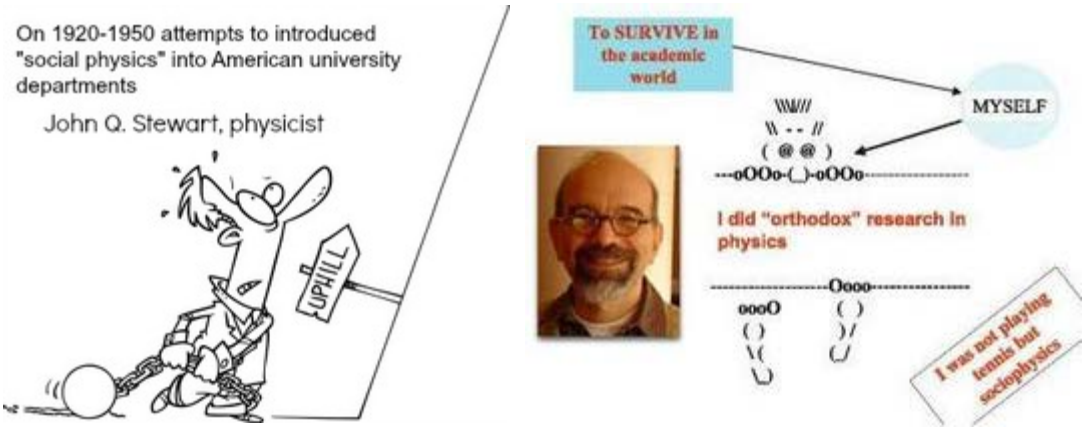

Left: A rendition of American physicist John Q. Stewart and his forty-year effort (1920-1960) effort at attempting to get the subject of "social physics" introduced into American universities and the "raised eyebrow" and "doctrinaire departmentalism" resistance he faced along the way. [40]Right: Diagram of French physicist Serge Galam's 2012 retrospect look on his previous 40-year renegade experience of being a physicist having to practice **sociophysics** as a hobby, alongside his regular physics duties, the way normal physicists play tennis, so as to not disturb the orthodoxy of academia. [37]

thermodynamics and the history of chemical thermodynamics, gave the following opinion to Thims, in query about the potential fit of a two cultures department at UC Berkeley, with the central hub located within the chemical and biomolecular engineering department, and the humanities integrated into this hub, in which the Lewis school, the Rossini debate, and Thims' upcoming 16 Apr 2013 Northern Illinois University "Human Chemical Thermodynamics" lecture, given to the mechanical engineering thermodynamics students, were mentioned:

> "I don't know what the Rossini debate is but I hope to find out. No, your idea for a department for teaching two cultures would not be appreciated at Berkeley. In the social sciences and in some humanities, thermodynamics may be useful as an analogy, as a suggestion for looking at a problem (e.g., information theory) but beyond that, I see little use of thermodynamics outside science."

This is a very interesting position to take by a chemical engineer, reminiscent of Japanese chemical engineer Tominaga Keii's 2004 chemical thermodynamics chapter subsection "Chemical Affinity in 1806", wherein he gave his opinion that Goethe's "[*Elective Affinities*] did not add any scientific knowledge" (see: HC pioneers). Prausnitz's opinion here, however, of "seeing little use of thermodynamics" outside of hard science proper, does not corroborate with the chronological listing of over 500+ HT theorists, over the last two centuries to have used thermodynamics outside of hard science proper, specifically in the humanities.

Interdepartmental tension issues

See main: Two cultures tensions

One issue that seems to stand out is the inter-departmental and in-department "tensional" that seems to arise as a possibly make or break factor in the longevity prospect of a two cultures department. In 1950, to exemplify, American astrophysicist and engineer John Q. Stewart, in his "The Development of Social Physics" article, commented the following, in regards to his early 1920s to 1940s attempt at developing and or introducing social physics into the American university system:

> "In the early nineteen-twenties it had become clear that natural science and technology would continue their triumphant advances while the social and humane studies, in order to reduce their tragic lag, would need to be equipped with methods far more effective than archaic types of merely verbal reasoning. With untrammeled enthusiasm of a youthful PhD in physics, I expected to find a general sympathy with this [social physics] program but the case was otherwise. There is a proverb that 'in the country of the blind the one-eyed man is king', the falsity of which has been depicted in the story by H.G. Wells. One has to find for himself that in the country of the blind—meaning university faculties and their learned societies—the

one-eyed man meets with lifted eyebrows."

This is exemplified well in the following 1955 comment by Stewert and his experience in the 1949 formation of the Princeton University Department of Social Physics, which lasted till about about a decade: [27]

> "Immaturity, lack of imagination, 'doctrinaire departmentalism', and [in particular] overspecialization is choking modern scholarship and limiting man's communication with his fellows."

This same sense of multi-decade long uphill can be felt in the recent personal testimonies of French physicist Serge Galam and his reflection on his two-decade long effort to found a sociophysics group in France:

> "To suggest that humans could behave like atoms was looked upon as a blasphemy to both hard science and human complexity, a total nonsense, something to be condemned. And it has been indeed condemned during the last fifteen years."
>
> — Serge Galam (2004), "Sociophysics: a Personal Testimony"

The adjacent depiction, for example, is Galam's 2012 retrospect look on his previous 40-year renegade experience of being a physicist having to practice sociophysics as a "hobby", alongside of his regular physics work, as discussed in his chapter section 3.5 "More About Academic Freedom", being that the subject was considered "unorthodox" by his fellow physicists—which strikingly similar to American electrochemical engineer Libb Thims who developed human chemistry and human thermodynamics as a curious "hobby" alongside his regular engineering and medical school studies, and his warlike experience getting these two "human molecule" based sciences accepted into mainstream science.

Further examples of "immaturity, lack of imagination, and doctrinaire departmentalism" seen strikingly evident in the 2009 Moriarty-Thims debate between a dozen or so college professors. [37]

Department namesake?

See main: Two cultures namesakes

The following are a few historical subject namesake precursors:

Social physics (Auguste Comte, 1822)
Human physics (Adolphe Quetelet, 1835)
Social chemistry (Thomas Huxley, 1871)
Human chemistry (Henry Adams, 1875)
Physical economics (Patrick Geddes, c.1880s)
Social mechanics (Francis Edgeworth, 1881)
Mathematical psychics (Francis Edgeworth, 1881)
Human thermodynamics (Bryan Donkin, 1893)
Pure political economics and social mechanics (Leon Winiarski, 1894)
Economic dynamics (Maffeo Pantaleoni, c.1908)

See main page for complete list of two cultures subject namesakes.

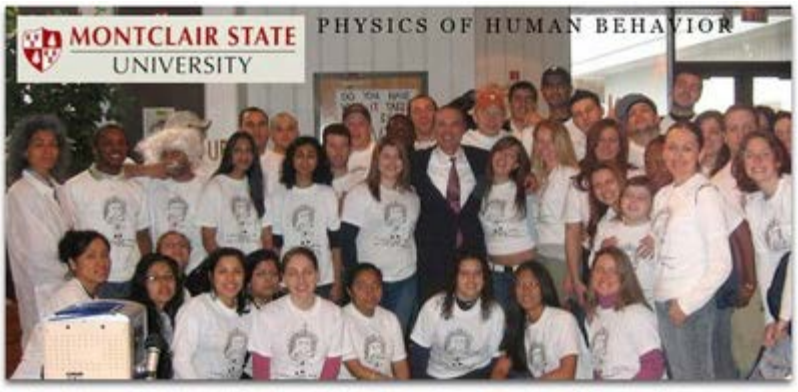

Right: In 2008, Montclair State University physics professor Dean Hamden launched his "physics of human behavior" student-based research group, wherein they apply physics concepts—such as Hooke's law and elasticity coefficients—to human relationships, so to develop physics-based modelling of social phenomena, such as flexibility in relationships, utilizing concepts such relationship elasticity coefficients, to make hypotheses on predictive correlative levels of happiness, among other applications, involving studies of over 500 people. The research, as of 2013, is ongoing presently. [31]

Reinventing the wheel issues

The slow-gradual process of the invention of the wheel, said to have occurred between 10,000 to 5,500 years ago, is a process that no-doubt had to be reinvented many times over, haphazardly, until the basics of its operation became taught as part of the standard engineer's schooling curriculum. [35]

Shown adjacent is "two cultures" reinventing the wheel like happening, namely American physics professor Dean Hamden's 2008-present attempt to formulate a physics of human behavior research project—using basic physics concepts, such as Newton's laws, Hooke's law, Heisenberg uncertainty principle, etc.

Another reinventing the wheel example comes from German applied mathematician Sarah Wolf's 2011 "social energy" conference meeting, wherein a few ideas are passed around and discussion is made about whether or not there is an actual physics behind the social notions of "energy", such as in economics, both of which are what can be classified as "reinventing the wheel" approaches to physical science applied humanities. In more detail, in 2011 a "Social Energy" workshop was held during the European Conference on Complex Systems, Vienna, co-organized by Wolf which focused on the following topics—a two cultures type of seminar: How far does the analogy between energy and social energy carry?, What can be learnt from exploring social energy for the analysis of the dynamics of complex socio-ecological systems?, Where does social energy need to differ from energy as known in physics?, What are parameters that help grasp and measure forms of social energy?, Which mathematical tools and methods (used in physics models) can be successfully used for studying the dynamics of socio-ecological systems? [22]

Neither group, in other words, seems to be aware of the great historical precedence to these subjects e.g. that Stewart previously ran an entire "social physics" research group a Princeton in the 1950s or that Sorokin devoted an entire chapter to the history of "social energetics" theories in 1928—one of the repercussions of the fact that this general subject is not part of main-stream curriculum, but one that is in ripe need to become so.

A 2011 two cultures "reinventing the wheel" like workshop organized by German applied mathematician Sarah Wolf, who generally seems to be completely in the dark to the fact that entire "schools" of social mechanics existed over a century ago, as have been well documented by scholars such as Pitirim Sorokin (1928) and Werner Stark (1962).

How much would Hamden, e.g., have benefited if he had known about Winiarski's University of Geneva course on social mechanics, taught over 100-years ago? How much would Wolf have benefited had she known Carey's three-volume treatise on social energy, published over 150-years ago? How much would Thims have benefited had he been taught, somewhere within his chemical engineering curriculum, or prior, e.g. in high school, about Goethe's physical chemistry based *Elective Affinities*, the so-called "scientific model for human experience", as Scottish German-literature scholar Gundula Sharman put it in 1997, an exquisite theory published over 200-years ago? Certainly, we would surmise, greatly. Hence, the pressing need for a world-leading two cultures university department, so that we don't have to keep reinventing the wheel, journal article

after journal article, symposium after symposium, and book after book.

Bottom-line need

The bottom-line need for the inception of an American engineering-centric humanities embedded two-cultures department is the need to satisfy the deeper questions of the "why's of human existence?", as is well captured in the 1950 Einstein-Pascal dialogue on purpose. In December 1950, German-born American physicist Albert Einstein (IQ=220) received a long handwritten letter from a nineteen-year-old engineering student at Rutgers University, New Jersey, who said: "My problem is this, sir, 'What is the purpose of man on earth?'" Dismissing such possible answers as to make money, to achieve fame, and to help others, the student said:

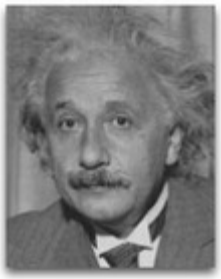

The **Einstein-Pascal dialogue on purpose** is a 1950 dialogue between a 19-year-old Rutgers University engineering student in query to German-born American physicist Albert Einstein (right) in regards to "what is the purpose of man on earth?", as framed around French mathematical physicist Blaise Pascal (left), and his circa 1642 personal jottings thoughts on purpose or rather the "why's of existence?". [1]

> "Frankly, sir, I don't even know why I'm going to college and studying engineering."

The student went on to express his opinion that man is here "for no purpose at all" and went on to quote from French mathematical physicist Blaise Pascal's (IQ=190) *Pensees* (*Thoughts*), which he said aptly summed up his own feelings on the matter, a tenuously-difficult-to-answer query to which Einstein replied, giving his views on the matter (see: main article). College engineering and humanities students (combined) should, in this deep seated need light, be introduced to at least one class, in the course of their twenty-some year educational path, that address this deep query as modern physical science sees things or else all else is in vein. Presently, conversely, the modern US engineer curriculum funnels students through test-answer focused, board exam aimed accreditation classes and subjects, without touching on this deep underlying understanding need in regards to the "why's" of such an effort, whereas correctly and historically chemistry, physics, and engineering have much to say on this question (see: HT pioneers; HC pioneers), a subject that dates back to at the very least Goethe's great 1809 masterpiece *Elective Affinities*, the subject about which one might estimate that less than one in a 1,000 American students are even aware of, if not less.

Quotes

The following are related quotes:

American lawyer Daniel Spiro, a member of the Goethe Institute, Washington, and a graduate of Stanford University and Harvard Law School, notes (2005) strikingly how the works of Goethe, in the US, despite being the second most widely held author in libraries world-wide, according to WorldCat, "remain largely unread and rarely discussed", which is strikingly similar to the experience of American electrochemical engineer Libb Thims who is nearly flubberstruck/flabbergasted, by the that he passed through a US chemical engineering degree and was never told about Goethe's *Elective Affinities*, and the modern-day chemical thermodynamic ramifications of this great treatise, and subsequently was forced to go on another elevent-years searching the literature for the historical underpinnings of the theory of human chemical thermodynamics, before discovering Goethe in circa 2006, via footnote 2.5 in the 1984 work of Belgian chemist Ilya Prigogine, whose father Roman Prigogine, was a chemical engineer?

> "Words like 'great' and 'genius' could aptly be used for but a select number of artists—for Michelangelo or say Shakespeare. In the United States, the works of these great artists have been incorporated into popular culture as the epitome of visual and linguistic beauty. By contrast, on these shores, Goethe's works remain largely unread and rarely discussed except among college students, most of whom develop a healthy dose of amnesia shortly after graduation."

— Daniel Spiro (2005), "Remember to Live! The Philosophy of Johann Wolfgang von Goethe" [26]

See also

â— Homework problems
â— Human thermodynamics dissertations
â— Two cultures synergy
â— Two cultures namesakes

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θΔics

In hmolscience, **two cultures inquires** refers to inquires or query efforts to propose and or initiate a physicochemical-based and or physical sciences based two cultures department, i.e. the bridging of C.P. Snow's infamous two cultures divide into a one culture or one nature conceptualized teaching course, titled physiochemical humanities (see: two cultures namesakes), and eventual department, at some yet unnamed top university, modeled on the heels of the historical two cultures synergy efforts. Some of these queries and responses are listed below. The 1874-1891 efforts of Italian-born English social reformer Florence Nightingale and the the 2012-present efforts of American electrochemical engineer Libb Thims, being two dominant examples.

"I propose that a **chair in 'social physics'** be established at Oxford."

> — Florence Nightingale (1874), spent the years 1874, 1876, and 1890-91, in discussion with Benjamin Jowett, Francis Galton, Alfred Marshall, among others, lobbying to get chair in social physics established [2]

"Every university should have a Department of Applied Greek and a complementary **Department of Humanized Physics**, and the benefits of these departments also should be extended as freely as is practicable to those who need them most, that is, to those whose main work is in another field."

> — Edwin Slosson (1910), *Great American Universities* [1]

Oxford | Chair of Social Physics

In 1874, on the passing Belgian social physics pioneer Adolphe Quetelet, Italian-born English social theorist Florence Nightingale, in her "In Memorandum", proposed that social physics should be taught at the University of Oxford; in 1876, she discussed the idea with Oxford administrative reformer Benjamin Jowett (1817-1893), who offered to leave money in his will for the chair, suggesting that it be named after her father (i.e. **Nightingale Chair of Social Physics**); in 1890-91, she spent a year-and-a-half lobbying to see the chair established, including discussion with Francis Galton, among others,

> "We [need] a scheme from someone of high authority as to what should be the work and subjects in teaching 'social physics' and their practical application, in the event of our being able to obtain a statistical professorship or readership at the University of Oxford."
>
> — Florence Nightingale (1891), "Letter to Francis Galton", Feb 7

Jowett, e.g., in 1891, discussed the proposal with Alfred Marshall who gave his opinion that the "government ought to do it". [2] The chair, despite Nightingale's efforts, was never realized.

Thims | Queries / Responses

The following is the work-in-progress query-response list, from American electrochemical engineer Libb Thims, to the particles shown, in regards to query attempts at getting a two cultures department, a Nightingale Chair of Social Physics, or physicochemical humanities course, put into working operation, query interactions listed from newest to earliest:

Person	Query	Response
2014		
(add)		
(add)		

Query (2 Sep 2014): I am interested in initiating a course in "physiochemical humanities" to be taken by undergraduate engineering students, also possibly humanities and graduate students, in place of one or another standard humanities electives, at Stanford University, thematically aimed at addressing the inherent two cultures (humanities + physical sciences) divide issue, such as touched on in Stanford University's founding physical science professor Fernando Sanford's 1899 address "The Scientific Method and its Limitations."

Norbert Pelc (c.1954-) Chair of bioengineering Stanford

The content of such a slated-to-be course will be to introduce engineering students, and possibly humanities students, to the works of the physical science based humanities works of the so-called "social Newtons" of history, specifically: Goethe, Adams, Pareto, Winiarski, Rossini, Henderson, Wilson, etc., as well as the modern social Newtons, e.g. Mimkes, Wallace, Beg, etc., who are currently heading the various econophysics and sociophysics symposiums and departments, sprouting up around the world (but not in the US).

No response (16 Sep 2014).

I've now taught outlines of this course to bioengineering students at the University of Illinois, Chicago (2010-2012), to mechanical engineering students at Northern Illinois University (2013), and to mixture of economists, sociologists, physicists, and humanities students and professors at the University of Pitesti, Romania (2013). The timeline of my inquiry efforts to initiate such a course here in American are outlined here. The overarching aim is to bring into actualization a modern version of the so-called "Nightingale Chair of Social Physics", envisioned by Florence Nightingale, to have solidified at Oxford, in the 19th century, into 21st century realization.

Query (15 Aug 2014): "I came across you and your whole "possibly we don't have souls", which "could be a wonderful thing" assertion, while watching the National Geographic's "Science of Evil" documentary on Netflix sometime a month or so ago, then ordered your book, then read your 2014 bioethics meeting transcript, and started an Hmolpedia article on you: Joshua Green. Today, I'm on page 160 of your book, and have cited your rocks don't have morality statement here: rock vs human. See the Rothbard section, in this link, to see how the issue goes back through Goethe to Spinoza.

To make a long story short, I'm looking to revive a combination of Lawrence Henderson's "Sociology 23" and Edwin Wilson's "Mathematical Economics" courses, taught in the post WWI years at Harvard, centered around the model of the Nightingale Chair of Social Physics, akin to what John Q. Stewart did at Princeton, via the Princeton Department of Social Physics.

I would like to do this at Harvard and I see a connection in your work to all of this, albeit with much correction on your end, being that the corpus of your tribal utilitarianism theory is ungrounded at

Joshua Greene

School: Harvard
Department: Psychology, philosophy, and neuroscience

the moment; e.g. the Rothbard spider vs human morality, is one example of this, that when taken down the so-called "chain of being" loses its grip the closer one gets to the hydrogen atom. On your part, if interesting in participating in this objective, I would need you to be one of four simultaneous PhD advisors for me (the other three coming from: economics, sociology, and the physical chemistry departments), similar to how the University of Korea is now using a "two-supervisors system" to grant thermodynamics-based sociology PhDs: two-cultures department.

I will then complete the following as my PhD dissertation, under 4-part supervision: *Chemical Thermodynamics: with Applications in the Humanities* (pdf), then start the so-called "Chair of Physicochemical Humanities", as Nightingale lobbied for at Oxford for so many years, teaching sociophysics and econophysics in general, but anchored in physicochemical humanities, i.e. thermodynamics (heat, work, and energy principles) at root: physical humanities, then aim to get funding from the Gates foundation, the way Stewart got funding from the Rockefeller foundation, for his social physics department at Princeton (1945-55), and then aim to get someone trained to take over the chair, when I step down, a "key" something lacking in all previous two cultures departments attempted historically (see: two cultures synergy), so that a department of physicochemical humanities can take root here in America, embracing all of the so-called two cultures subjects at once (see: two cultures namesakes).

The pressing need for a department headed by such a chair is outlined, historically, ere: two cultures calls, see, e.g., the James Froude (1849, 1854) section, and his "moral mysteries" probe, to see how this connects to your neuroimaging moral research probings and to the overall aim of such a chair and or department. The timeline of my ongoing attempts to initiate such a department is shown here: two cultures inquires.

At this point, all I am asking for you to say, if interested, is that: yes, you "might" possibly be interested in such an interdepartmentalism project, if the other departments conceded likewise. If you would be interested, I would gladly be willing to fly out to your location, at your convenience, to explain to you where all the physicochemical corrections need to be amended in your logic, bioethics meeting arguments, and book. Thanks, in advance, for your consideration."

Response (25 Aug 2014): "Thanks for your thoughts, and sorry for the brief reply but I'm working through a large backlog. While I admire your self-starting ambition, I'm afraid that it's not possible to start teaching and doing research here in this way. I can only admit students through the Psychology PhD program, and even then it's not entirely up to me. I appreciate your interest and wish you the best of luck."

Query (27 May 2014): "I was Googling around for the term "first life" and thermodynamics early today, while looking for an example "first life" conceptualized image, for a first life article I started today (while reading Neil Shubin's 2008 *Your Inner Fish*), and so came across the *Quanta Magazine* article on you, and shortly thereafter skimmed your self-replication theory article, and started an *Hmolpedia* article on you: Jeremy England, also available as pdf (here) (volume A-K, pgs. 371-72), you being situated

between the Friedrich Engels and Entropy entries.

Jeremy England
School: MIT
Department: Cellular and macromolecular biophysics

In any event, I notice your research group is hiring, and might be interesting in joining your team for possibly a year (or more)? While I see that your group's research interest tends to be focused on protein thermodynamics, mine tends to be focused on thermodynamics in all areas, up and down the evolution scale, with specific focus on thermodynamics in the teaching and research in physicochemical humanities, akin to what has been done historically, at the University of Lausanne (1890-1923), Harvard (1932-1942), Princeton (1945-1955), Western Washington University (1977-1995), and recently University of Pitesti (2007-present): two cultures synergy.

In return, I would gladly reciprocate, in respect to group synergy, by correcting much of your group's work and theories, as well as learn parts in return, and give you direction in regards to historical precedence; take, e.g., the cellular thermodynamics work of Herbert Salzer, whose article I wrote yesterday, Lionel Harrison being another example. At a minimum, I can bring to the group a 400+ personal thermodynamics book collection and encyclopedic knowledge in most areas of thermodynamics.

In regards to your article, "self-" prefixes tend to be code for perpetual motion of the living kind theories, much of Prigogine's work is now outdated, your citation of Landauer is a waste of time, etc.; also, the biggest issue you will have to grapple with, when you start talking about the thermodynamics of a "living thing", as Charles Sherrington grappled with cogently in 1938, is that chemistry and physics do not recognize the word "alive", an issue addressed in overview here: defunct theory of life. While this is a big issue, requiring much terminology reform, e.g. terms such as biophysics and biochemistry become [defunct] neoplasms, direction in this area will tend to save you years if not decades of wasted time going down cul-de-sacs looking for thermodynamics-like circular chemical reactions mechanisms, the work of Stuart Kaufmann being one example. The following is the best I can give you at present in regards to curriculum vitae: Libb Thims.."

Response (3 Jun 2014): "Thanks for your interest in our work. I'm afraid it won't be possible to have you join the group but I appreciate your enthusiasm. All the best."

2013

John Prausnitz | a department founder
School:

Query (27 May 2013): "I cited your 1986 "Two Sources of Chemical Thermodynamics" article yesterday in an article on the history of chemical thermodynamics that I am slowly building, and upon looking up to see who you were, see that you are chemical engineering professor emeriti of UC Berkeley. Could you possibly give me some insight into the remaining structure, if there is one, of the great Lewis school of thermodynamics?

The last member of this group, in regards to my area of interest, namely thermodynamics applied to the humanities, is the Frederick Rossini and his famous 1971 lecture "Chemical Thermodynamics in the Real World" turned 2006 *Journal of Chemical Education* debate

Response (28 Mar 2013): "I don't know what the Rossini debate is but I hope to find out. No, your idea for a department for teaching two cultures would not be appreciated at Berkeley. In the social sciences and in some humanities,

University of California, Berkeley
Department: Chemical and biomolecular engineering

about the application of chemical thermodynamics to problems of terrorism and global security. Could you give me your opinion on the Rossini debate?

Also, I am presently working to found America's first two cultures teaching department, that teaches content like that embedded in the Rossini debate. My aim is to found the department at the UC Berkeley, with the central hub located within the chemical and biomolecular engineering department, and the humanities integrated into this hub. Could you possibly give me some opinion as the potential of this "two cultures department" finding a fit at UC Berkeley?"

thermodynamics may be useful as an analogy, as a suggestion for looking at a problem (e.g., information theory) but beyond that, I see little use of thermodynamics outside science."

Jay Labinger
School: CalTech
Department: Chemistry

Query (21 Mar 2013): "I came across your 2010 *Literature and Chemistry* pdf today and so started an Hmolpedia article on you: Jay Labinger. Similar to your interests in literature chemistry/thermodynamics and the two cultures issue, presently I am working to found America's first two cultures university teaching department. What advice, suggestions, opinions, etc., do you have on this objective, having yourself waged into the two cultures wars?

My present plan of attack is to (a) quickly complete a PhD dissertation on "Thermodynamics and the Free Energy of Human Molecules", done possibly with two or three advisors (one form chemical engineering one or two from the humanities), a Lewis chemical thermodynamics based treatise on humans viewed as surface attached molecules (see: human molecular formula) chemically reacting to each other, mechanistically, discussed socially, economically, politically, etc., and (b) simultaneously begin teaching a graduate school "two cultures" course, teaching the history and basics of the subject. My present aim is UC Berkeley. How do you think CalTech would "fit" in regards to the establishment of such a department?

Regarding the "science wars" as you call them, what I am most-worried about is not so much the attack coming from people in the arts and humanities group, but rather from within, from the scientists and engineers themselves, such as exemplified in the Rossini debate. Having spent time at Princeton, are you aware of the 1950s "social physics" group ran at Princeton (see: Princeton department of social physics)?"

Response (21 Mar 2013): "Gary: Are you familiar with this guy at all? I'd never heard of him, until I got this message just now out of the blue. I can't immediately tell from a quick scan of the links he includes whether or not he's mostly a crank (I will try to find some time to read more thoroughly, and in any case answer him politely), but there might be something of relevance to the Templeton project here."

Response (23 Mar 2013): "Thanks for the interesting message, and for your nice article about me on your website. I have not had time to do more than glance at some of the links you included; I'll try to take a more careful look, hopefully sometime during the upcoming week, and then will be better able to respond to your questions."

2012

Query (1 Apr 2012): "I would like to meet up with you sometime this summer to discuss a possible revival of the original physics-chemistry based sociology envisaged by Albion Small and Frank Carlton when they founded the University of Chicago's sociology department. I'm looking to found something along the lines of what they're doing with the econophysics department at the

Mario Small |

Department head
School: University of Chicago
Department: Sociology

University of Houston (Ñº), albeit expanded, to be a department that encompasses physics, chemistry, thermodynamics, engineering, and the humanities, all in one; something along the lines of the Lewis school of thermodynamics, but expanded into a "two cultures" cross-disciplinary department:

The subject is essentially lacking here in America (versions are sprouting in Europe), but is one of a large untapped potential, the chemistry-based weak ties model of Mark Granovetter, the supposedly most cited sociology paper of all time, being one example. Essentially, I'm just looking to get a feel for how the physical science based works of thinkers, such as Small, Carlton, Lester Ward, the so-called father of American sociology, Henry Carey, etc., all essentially have just disappeared from modern-day American sociology? For example, I notice you stem from Harvard; hence, I'm looking to discern exactly how Pitirim Sorokin's (the founder of Harvard's sociology department) mechanistic school of social thermodynamics, disappeared from the American education system?

I'm teaching thermodynamics applied in the humanities to the bioengineering students next month at UIC (my third year doing this), lecturing on the following 500+ thinkers in general (see: sociology icons), with focus on the following 40 thinkers in particular: human free energy, but after that I should be free (Mondays and Tuesdays are good for me)."

Response (3 Apr 2012): "This might be a tall order given how the discipline has evolved. However, I'll keep this in mind for after our spring quarter is over."

2010-12

Ali Mansoori | Thermodynamics head
School: University of Illinois, at Chicago
Department: BioEngineering

Dialogue: During lunches together, after giving invited guest lectures on human thermodynamics to Mansoori's bioengineer thermodynamics students, in the years 2010-12 (see: Thims lectures), Mansoori suggested to Thims that he complete his two cultures objective at UIC, and that all he would need to do would be to apply, and Mansoori would take care of the funding and the rest.

Thims, however, politely declined; stating that he had made a promise to himself that he would only go up the education ladder (above the University of Michigan ranking level), but not down, owing to his early very-irregular age 1-19 educational path, e.g. being made to retake second grade (age 6-7), then spending grades 2-12 doing absolutely nothing, educational wise, then jumping to acceptance to chemical engineering at University of California, Berkeley (top 3 ranked in engineering), having never taken a chemistry course prior, but going to University of Michigan (top 5 ranked in engineering), owing to financial reasons, etc., then graduating in the top of his class, then detaching completely from the engineering field, i.e. until initiating personal research in hmolscience, but doing so with a promise made to himself that he would return to the top of the educational ladder, ranking-wise, at or above the Berkeley-level of education stature and world ranking as far as intellectual prestige and respect goes.

(add discussion)

Working models | Historical

Other actual "working model" two cultures university department synergy effort models include: economist Leon Winiarski and his social mechanics course (University

Main "Social Physics" Schools

Unil Physical Economics
UNIL | Université de Lausanne

HARVARD UNIVERSITY
Physicochemical Socio-Economics

of Geneva, 1894-1900), physical chemist Lawrence Henderson and his physicochemical sociology course and seminars (Harvard University, 1932-1942), via the Harvard Pareto circle, polymath Edwin Wilson and his physiochemical economics course (Harvard University, 1932-1938), physicist John Q. Stewart and Rockefeller-founded social physics research group (Princeton University, 1945-1955), see: Princeton department of social physics, albeit not attempted without difficulty, as Stewart commented:

(Lausanne school: 1890-1923)

(Harvard Pareto circle: 1932-1943)

(Princeton social physics: 1945-1955)

(Romanian school: 2007-present)

The form main universities that had or have actual functioning physicochemical humanities stylized courses and or departments (see: two cultures synergy).

> "Immaturity, lack of imagination, 'doctrinaire departmentalism', and [in particular] overspecialization is choking modern scholarship and limiting man's communication with his fellows."
>
> — John Q. Stewart (1955), commentary on social physics initiatives at Princeton

and sociologist Ed Stephan and his territorial social physics project (Western Washington University, 1997), and more recently economist Gheorghe Savoiu and physicist Ion Siman and their econophysics and sociophysics journal and teaching program (University of Pitesti, 2007-present), the latter of which Thims visited and studied in 2013 as key speaker of their 5th annual socioeconomic physics workshop.

Quotes

The following are related quotes:

> "In March 2011, I graduated with a master's degree in theoretical physics at the University of Bologna (Italy). I am strongly interested in sociophysics or in general in physics applied to human behavior: in my thesis I solved a sociological problem using statistical mechanics, and machine learning methods. I am looking for a PhD in socio-physics or human thermodynamics and or funds for it. Do you know something about it? Any advice is welcome."
>
> — Simone Loreti (2012), email to Libb Thims and other online forum postings

See also

â— Libb Thims (lectures)
â— Libb Thims (students)

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(c) Benjamin Jowett – Wikipedia.

θΔics

In science, **two cultures namesakes** refers to coinings, portmanteaus, and new term usages of crossover or bridging disciplines between the two cultures of so-called "hard science" Clausius culture (left brain thinkers), or physical science and engineering culture, and the so-called "soft science" Shakespeare culture (right brain thinkers), or liberal arts and humanities culture.

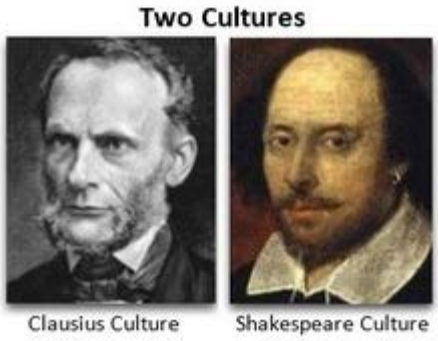

List

The following is a chronological listing of the various two cultures "namesakes" employed—many of which are hmolscience sub-branch sciences, shown with subject coiner; those with photos shown next to term have intellectual dominance, e.g. are high ranking social Newtons, or existive social Newtons, or respectable critiques and historical commentators (e.g. Sorokin) on the subject; namesakes shown bolded and or enlarged signify historical dominance, significance, and or density:

	Term | Two cultures	Coiner | Date
1.	Science of man	David Hume, 1739
2.	Social physics	Auguste Comte, 1822
3.	Human physics	Adolphe Quetelet, 1835
4.	**Human chemistry**	E.B., 1851
5.	Historical materialism	Friedrich Engels, 1859/1892
6.	Religio-political physics (Ñº)	Calvin Blanchard, 1861
7.	Moral chemistry	William Lecky, 1869
8.	Scientific socialism	Friedrich Engels, c.1870
9.	Social chemistry	Thomas Huxley, 1871
10.	Physical economics	Patrick Geddes, c.1880s
11.	Social mechanics	Francis Edgeworth,1881
12.	Mathematical psychics	Francis Edgeworth, 1881
13.	Physical anthropology	Franz Boas, 1882
14.	Dialectical materialism	Georgi Plekhanov, 1891
15.	Mathematical economics	**Vilfredo Pareto**, c.1892
16.	**Human thermodynamics**	Bryan Donkin, 1893
17.	**Pure political economics and social mechanics**	**Leon Winiarski**, 1894
18.	Scientific psychology	Sigmund Freud, 1895
19.	**Molecular sociology**	Guillaume de Greef, 1902
20.	Sociophysiology	Emile Waxweiler, 1906

21.	**Physico-chemical social dynamics**	**Henry Adams**, 1908	
22.	Economic dynamics	Maffeo Pantaleoni, c.1908	
23.	Human energetics	Wilhelm Ostwald, 1909	
24.	Social energetics	Ernest Solvay, 1910	
25.	Humanized physics	Edwin Slosson, 1910	
26.	**Physico-human sociology**	**Henry Adams**, 1912	(see: Adams quotes)
27.	Anthropic physics	**Wilhelm Ostwald**, 1912	
28.	Technocracy	Howard Scott, 1918	
29.	Cartesian economics	Frederick Soddy, 1921	
30.	Mental dynamics	Sigmund Freud, 1923	
31.	Biophysical economics	**Alfred Lotka**, 1924	
32.	Behaviorism → Praxiology	Albert Weiss, 1925	
33.	Social thermodynamics	Pitirim Sorokin, 1928	
34.	Mathematical sociology	Pitirim Sorokin, 1928	
35.	**Gibbs-Pareto based sociology** [Sociology 23]	**Lawrence Henderson**, 1932	
36.	Scientific humanism	Oliver Reiser, 1940	
37.	Chemical sociology	John Grant, c.1940	
38.	Psychohistory	Isaac Asimov, 1942	
39.	**Physicochemical sociology**	**Pitirim Sorokin**, 1943	Themed on: Lawrence Henderson (1932) and Henry Adams (1908), albeit in derogatory opposition.
40.	Emotional thermodynamics	Helen Dunbar, 1943	
41.	Statistical dynamics of systems of energy transformers	**Alfred Lotka**, 1945	
42.	Political physics	Author, 1951 (Ñº)	
43.	**Thermodynamics of humans**	Bazargan, 1956	
44.	Socio-economic thermodynamics	Person, 1962 (Ñº)	
45.	Economic thermodynamics	Person, 1962 (Ñº)	
46.	Psychothermodynamics	Jurgen Ruesch, 1964	
47.	Psychodynamics	Eric Berne, 1964	

48.	Dynamic psychology	John Bowlby, 1969
49.	Homeokinetics	**Arthur Iberall**, 1970s
50.	Social thermodynamics	Marlan Blissett, 1972
51.	Financial thermodynamics	Daedalus, 1972
52.	Ethnoenergetics	Eugene Ruyle, 1973
53.	Political thermodynamics	Harold Nieburg, 1973
54.	Sociophysics	Arthur Iberall, 1974
55.	Social engineering	Arthur Iberall, 1974
56.	Cultural thermodynamics	Stanley Diamond, 1974
57.	Socio-chemistry	Michael Fores, 1976
58.	Anthro-physics	Michael Fores, 1976
59.	Quantum economics	Asghar Qadir, 1978 [7]
60.	Hierarchical thermodynamics	**Georgi Gladyshev**, 1978
61.	Sociophysics and sociochemistry	Alexander Rosenberg, 1980
62.	Ecological economics	Robert Constanza, 1982
63.	Physico-economics	Malte Faber, 1985
64.	Architectural thermodynamics	Hassan Fathy, 1986
65.	**Physicochemical Sociology**	**Mirza Beg**, 1987
66.	Thermoeconomics	Bengt Mansson, 1990
67.	Racial thermodynamics	Richard Delgado, 1990
68.	Relation thermodynamics	Wayne Angel, 1992
69.	Scientism	Caspar Hakfoort, 1995
70.	Econophysics	Eugene Stanley, 1995
71.	Eco-thermodynamics	Robert Ayres, 1995
72.	Religious thermodynamics	Abdul Karim Surush, c.1995
73.	**Animate thermodynamics**	**Sture Nordholm**, 1997
74.	Crowd dynamics	Keith Still, 2000
75.	Physioeconomics	Philip Parker, 2000
76.	Relationship physics	**Christopher Hirata**, c.2000
77.	Physics of socio-economic systems	German Physical Society, 2001 [6]

78	Socio-thermodynamics	**Ingo Müller**, 2002
79.	Socio-economic physics	German Physical Society, 2002
80.	Physics in economics and social sciences	Polish Physical Society, c.2003
81.	Social dynamics	Raddai Raikhlin, 2003
82.	**Physical socio-economics**	Jurgen Mimkes, 2006
83.	**Applied thermodynamics: physical socio-economics**	**Jurgen Mimkes**, c.2005
84.	Econophysics and sociophysics	Jurgen Mimkes, 2006
85.	Econo-thermodynamics	Jurgen Mimkes, 2006
86.	Human molecular dynamics	Libb Thims, 2007
87.	**Human chemical thermodynamics**	**Libb Thims**, 2007
88.	Scientific sociology	John Macionis, 2008
89.	Econo-engineering	Gheorghe Savoiu and Ion Siman, 2008
90.	Econochemistry	Yuri Tarnopolsky, 2009
91.	Pattern chemist	Yuri Tarnopolsky, 2009
92.	Sociophysical geography	
93.	Thermodynamics of physico-chemical socio-economics	Jurgen Mimkes, c.2016

(add)

Hmolpedia

Some more-recently Hmolpedia-introduced umbrella-like classification terms, utilized for grouping the above variations, inclued:

- Philosophical thermodynamics (Thims, 2008)
- Literature thermodynamics (Thims, 2008)
- Human statistical thermodynamics (Thims, 2008)
- Art thermodynamics (Thims, 2008)
- Human thermodynamics education (Thims, 2008)
- Business thermodynamics (Thims, 2008)
- History thermodynamics (Thims, 2008)
- Anthropological thermodynamics (Thims, 2008)
- Business chemistry (Thims, 2009)

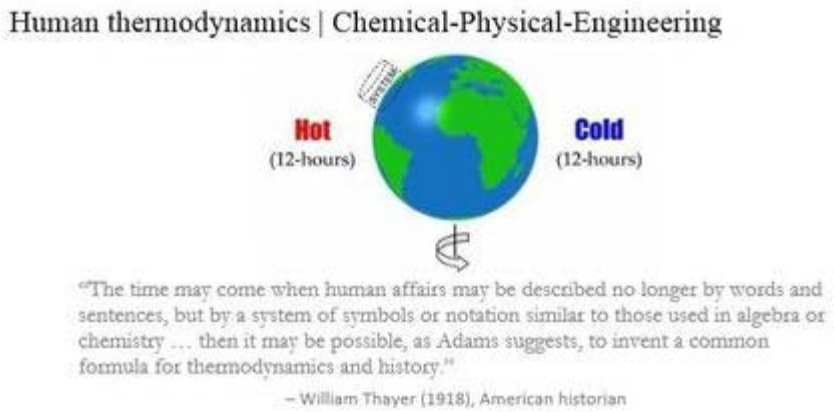

Header to a 2012 lecture handout given to UIC bioengineering thermodynamics students as supplement to a lecture on human thermodynamics by American electrochemical engineer Libb Thims, which may be in the neighborhood of the **two cultures department** namesake? [32]

The following, which began to be used in 2010 to 2012, the term "human engineering thermodynamics" used specifically in a university lecture given to bioengineering thermodynamics students, are a few more closer-to-target namesakes for the subject matter of the proposed engineering-centric humanities embedded two cultures teaching department:

Human engineering thermodynamics (Thims, 2010)
Humanities thermodynamics (Thims, 2010)
Human molecular science (Thims, 2010)
Hmolscience (Thims, 2010)
Integration and segregation thermodynamics (Thims, 2010)
Human mathematics (Thims, 2011)
Literature chemistry (Thims, 2011)
War thermodynamics (Thims, 2011)
Sustainability thermodynamics (Thims, 2012)

A few recent 2013 tentative two cultures department namesakes, aimed at capturing all of the above, include:

Human molecular engineering (Thims, 2013)
Human chemical engineering (Thims, 2013)
Humanities engineering
Physical science applied humanities
Socio-physical chemistry = Sociophysics + sociochemistry
Physical sociology (Warshay, 14 May 2013)
Socioeconomic chemical thermodynamics (Thims, 4 Jun 2013) [N1]

Human molecular dynamics

Humans, by definition, are molecules, attached to substrate, which react selectively together, over evolutionary time periods, and that in each selective, temporally permeable, subsystem the natural evolution tendency or behavior of human chemical species is towards the minimization of Gibbs free energy. This principle holds for all molecular interactions in evolving isothermal, isobaric reacting systems. In other words, the Gibbs free energy function is a direct fusion of the four laws of chemical thermodynamics and provides a basis for a quantitative index of the potential ability of a substance, molecular structure, or system to undergo a physical or chemical transformation.[50]

A 2007 chapter section entitled "human molecular dynamics" from American electrochemical engineer Libb Thims' *Human Chemistry*, which is a term in the neighborhood for a possible "**two cultures department**" namesake? [3]

The following are some recent 2014 introductions:

Physical humanities (Thims, 31 Jan 2014; based thematically, in part, on the 2013 Leon Warshay usage)
Physicochemical humanities (Thims, 6 May 2014; based on the 1908 Henry Adams usages)

(add)

Discussion

The term “human molecular engineering” was used in the University of California, Berkeley article and also in the Gheorghe Savoiu article on the newly-emerging 2008 sociophysics/econophysics applied field of "econo-engineering"; the phrase “physical science applied sociologist”, in regards to physical science applied humanities, was used in reference to Henry Carey; the term “socio-physical chemistry” is a truncation of American philosopher Alexander Rosenberg’s 1980 mocking definition of sociophysics and sociochemistry.

The **umbrella term** namesake [?] for all of the various subjects listed below is still as of yet unsolidified (see: two cultures department).

The former proposed term, i.e. department of human molecular engineering, to note, has thematic commonality to all: in that both the "human molecule" perspective and use of the "second law" analysis perspective have historically been used in and cut through every branch of the humanities, engineering, and the physical sciences, uniformly, up to the present, and likely well into the future, and that ideally the proposed two cultures department will need to be centered around a leading chemical engineering university department, as chemical thermodynamics is the core of the subject of chemical engineering, meaning that chemical engineers are generally, as seems to be the case, the leading experts of chemical thermodynamics, physical chemists aside.

The resultant umbrella term human molecular engineering, in this sense, would seem a cogent department title. The future might see the use of something along the lines of "University of [Fill in the Blank], Department of Hmolscience", but presently this term (hmolscience) is a rather new coining (2010), having little immediate recognition (though Hmolpedia, as of 2013, draws near 70,000 page views per month), whereas something like the "Princeton University Department of Social Physics" has immediate subject recognition, albeit is less encompassing, focused generally on "physics + sociology" only, rather than other needed subjects such as economics, history, philosophy, anthropology, and chemistry, and so on.

Societies | Two Cultures

In 2002, the German Physical Society's socio-economic physics division symbol acronym for the "physics", symbolized by the Greek letter Phi "Φ" of socio-economic "SOE" systems, was employing the following image and term, something not found in American physical science society?

Φ·SOE
Socio-Economic Physics

In c.2003, he Polish Physics Society created a new division entitled "Physics in Economics and Social Sciences" (FENS), under section president Janusz Holyst, catering to physicists who try to "look over the bridge" between the methods used in physics and those of the analysis of economical and social phenomena. [1]

FENS
6 Ogólnopolskie Sympozjum
Fizyka w Ekonomii i Naukach Społecznych
Gdańsk, 19-21.IV.2012

(add)

Other schools | Historical

In "schools of thermodynamics" classification terms, historically speaking, the modern two cultures school would be comparable to: the energetics school (1890-1908), headed by German physical chemist Wilhelm Ostwald, which promoted and or taught a certain amount philosophical thermodynamics (e.g. Robert Lindsay and his 1930s Brown University entropy ethics courses); the Helmholtz school (1845-1923), under the direction of Austrian psychiatrist Sigmund Freud, moved a certain amount of thermodynamics teaching into the format of psychological thermodynamics, such as captured in his 1895 "A Project for Scientific Psychology" (on free energy and bound energy applied to the mental sphere of stored emotions); the Lausanne school (1870-1903), under the guidance of Leon Walras and Leon Winiarski, moved thermodynamics into economics and politics; the Brussels school (1918-c.1980s), under the drive of Ilya Prigogine, taught a certain amount of social thermodynamics and ethics thermodynamics, e.g. Dick Hammond and his 1979 EdD thesis *Analysis of Entropy Reduction and its Implications for Ethical Instruction in Public Education*, and his followup university courses on this subject at the University of Texas; the spin-off Roegen-Daly school (1971-c.1990s) promotes its own barely palatable brand of ecological economics thermodynamics; the Santa Fe Institute (1984-present) has incorporated a certain amount of hmolscience topics into their publications, albeit mostly in the form of emergence/complexity theory applied to mind from matter theories.

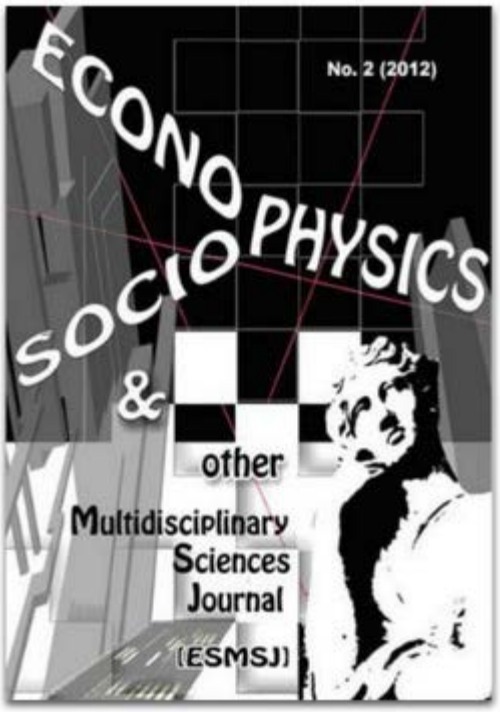

The University of Pitesti's new 2011-launched *Econophysics, Sociophysics and other Multidisciplinary Sciences Journal*, acronym ESMSJ, headed by Romanians economist and econophysicist Gheorghe Savoiu and physicist and sociophysicist Ion Siman, containing articles on multidisciplinary topics such as "quantum economics", which gives way to the need for a "new" umbrella two cultures like namesake that captures this newly-forming modern science. [2]

Quotes

The following are related quotes:

> "It is just because the application of the every-day principles of **engineering** to the animate engine [humans] offers such a powerful corrective to the make-believes of the economic systems of society that I have ventured to address you on the subject."
>
> — Frederick Soddy (1921) "Cartesian Economics Lectures"

Notes

N1. Term used on the Vilfredo Pareto page to capture Lawrence Henderson's sketched out 1935 theory, based on his faculty workshops at Harvard, that:

> Socioeconomic equilibrium dynamics (Henderson) = Economic dynamics (Pareto) + Chemical thermodynamics (Gibbs)

Though, to note, it seems that Henderson never actually gave a name to what he was arguing.

See also

â— Two cultures department
â— Two cultures synergy

References

1. FENS (Polish → English) – Polish Physical Society.
2. Home - *Econophysics, Sociophysics and other Multidisciplinary Sciences Journal*, University of Pitesti, Romania.
3. Thims, Libb. (2007). *Human Chemistry (Volume One)* (§: Human molecular dynamics, pgs. 140-46). Morrisville, NC: LuLu.
4. Thims, Libb. (2012). "An Introduction to Human Thermodynamics: Chemistry, Physics, Engineering, and Applied" (main) (handout), Lecture to bioengineering thermodynamics students (professor: Ali Mansoori), University of Illinois at Chicago (UIC), Apr 10.
5. Association of Physics of Socio-economic Systems (German → English) – German Physical Society.
6. Donzelli, Franco. (1997). "Pareto's Mechanical Dream" (pdf), *History of Economic Ideas*, 3:127-78.
7. Quote: "We need to find the economic assumptions which should lead to the use of the quantum formalism to derive a genuine economic theory of quantum economics as has been done for deriving a physical theory of quantum mechanics." (Ñº)

θΔics

In science, **two cultures synergy** refers to synergistic relationships, associations, and interactions between the so-called "hard science" Clausius culture (left brain thinkers), or physical science and engineering culture, and the so-called "soft science" Shakespeare culture (right brain thinkers), or liberal arts and humanities culture, according to which a two cultures bridging interaction effect results, so to speak, resulting in more than the sum of the parts individually.

> "Every university should have a Department of Applied Greek and a complementary **Department of Humanized Physics**, and the benefits of these departments also should be extended as freely as is practicable to those who need them most, that is, to those whose main work is in another field."
>
> — Edwin Slosson (1910), *Great American Universities*

Timeline

The following table shows noted historical two cultures "synergies" and the fruit resulting from such interaction:

Dates & Location	Thinkers				Product
1890-1923 University of Lausanne + University of Geneva	Economics Leon Walras (1834-1910) Chair of political economy	Economics Maffeo Pantaleoni (1857-1924)	Engineering Vilfredo Pareto (1848-1923) Chair of political economy	Political Economics Social Mechanics Leon Winiarski (1865-1915)	• Lausanne school of physical economics • The Teaching of Pure Political Economics and Social Mechanics in Switzerland Resulted: Pareto writing over eight volumes on his social mechanics / dynamic economics theory; Winiarski wrote a near similar, albeit using the more advanced Clausius inequality. [1]
1932-1940s Harvard University	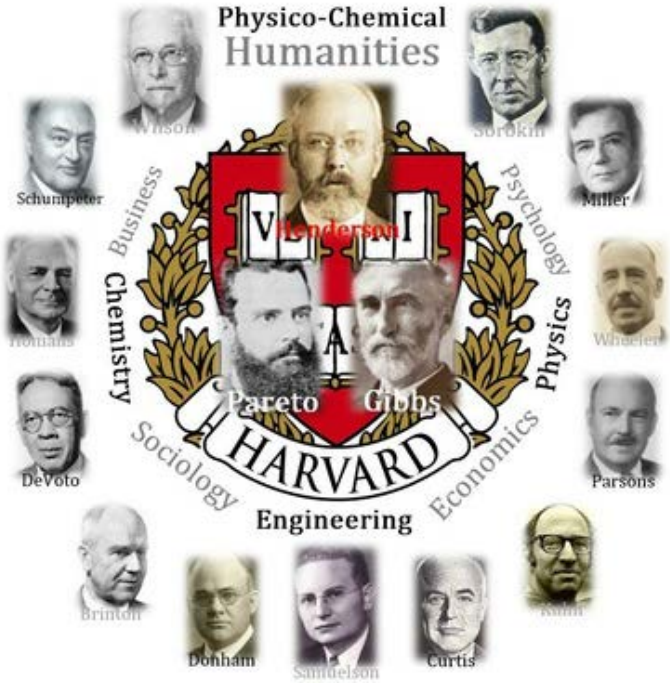				• Harvard Pareto circle • Sociology 23 • Mathematical economics

1945-1955

Princeton University

Physics

John Q. Stewart (1894-1972)

Thermodynamics

Percy Bridgman (1882-1961)

Sociology

Stuart Dodd (1900-1975)

Sociology

John Trimmer (1908-1983)

- Princeton department of social physics
- Princeton school of social physics
- Princeton social physics

- Many publications on social mechanics and social physics, including the 1948 *Demographic Gravitation*. [2]

1977-1995

Western Washington University

Sociology

Ed Stephan (1939-2008) Chair of sociology

Physics

Louis Barrett (c.1940-) Chair of physics

Physical chemistry

George Gerhold (1937-) Dean of arts and sciences

2007-present

University of Pitesti

Economics

Gheorghe Savoiu (1957-)

Physics

Ion Siman (1951-)

Physics and thermodynamics

Mircea Gligor (1963-)

- Resulted in the launching (2008) of an annual "Econophysics and Sociophysics" workshop:

Econophysics UNIVERSITATEA DIN PITEŞTI Sociophysics

- The launching (2011) of the journal *Econophysics, Sociophysics and other Multidisciplinary Sciences*; the 2012 book *Econophysics: Background and Applications in Economics, Finance, and Sociophysics*, among other ventures. [4]

2015/16-

present

University not yet determined

Libb Thims (c.1975-)

See:
- Two cultures calls
- Two cultures inquiries
- Two cultures department

- Textbook: *Chemical Thermodynamics: with Applications in the Humanities* [5]

See also
- Two cultures department
- Two cultures namesakes

References
1. (a) Pareto, Vilfredo. (1897). *Course on Political Economics, Volume 1-2*. University of Lausanne.
(b) Pareto, Vilfredo. (1902). *The Socialist Systems*. Publisher.
(c) Pareto, Vilfredo. (1906). *Manuel of Political Economy*. Societa Editrice.
(d) Pareto, Vilfredo. (1912). *Treatise on General Sociology, Volumes 1-4*. Publisher.
2. Stewart, John Q. (1948). *Demographic Gravitation: Evidence and Application*. Beacon House.
3. Stephan, Ed. (1995). *The Division of Territory in Society*. EdStephan.org.
4. (a) EDEN – Project description.
(b) Home - *Econophysics, Sociophysics and other Multidisciplinary Sciences Journal*, University of Pitesti, Romania.
(b) Savoiu, Gheorghe. (2012). *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (Romanian econophysicists, pg. 13). Academic Press.
5. Thims, Libb. (2014-15/16). *Chemical Thermodynamics: with Applications in the Humanities* (85-page version: pdf of 800-pages estimated total). Publisher.

θΔics

In hmolscience, **two cultures tensions** refers areas of conflict between the Clausius culture and the Shakespeare cultures, of the C.P. Snow divide, in respect to incompatible views of the humanities and human nature, the former tending to be materialistic, the latter spiritualistic (though this tends not to be often stated openly) and or neovitalistic, or thereabouts.

Froude

In 1848, English clergyman-abnegator turned historian, novelist, biographer, and editor James Froude published his semi-autobiographical *Nemesis of Faith*—which, according to David Knight (2009), owed much to Goethe's novel of human and chemical reactions (*Elective Affinities*, 1809)—which lost him his fellowship at Exeter College, Oxford, where his book was publicly burned. [1] Froude went onto become the first English translator of *Elective Affinities* (1854), albeit done anonymously for his safety.

Buchner

In 1855, the "gross materialist" German physician, physicist, philosopher Ludwig Buchner, as American philosopher Henry Finck (1877) characterized him, published his 1855 *Force and Matter: Empirico-Philosophical Studies*. The extreme materialism of this work, e.g. statements such as "just as man and woman attract one another, so oxygen attracts hydrogen", excited so much opposition that he was compelled to give up his post at Tübingen, whereafter he retired to Darmstadt, practicing as a physician and contributing regularly to pathological and physiological magazines.

Teilhard

In 1925, French theologian and physical chemist Pierre Teilhard—the role model for the faith-renouncing priest Father Damien Karras in the 1971 horror novel turned 1973 film *The Exorcist*, by American writer William Blatty—had his "spiritual energetics" (spirit-matter theory) writings, a subject defined as "psychodynamics, on the analogy of thermodynamics" or a "motor force in the universe", devoted to the study of "the conditions under which the human zest for auto-evolution and ultra-evolution occurs in relationship to dissipation", banned by the church, for being against Catholic doctrine, after which he was excommunicated, leaving all of his extensive writings and work to be published posthumously.

America | Church / State

In the United States, owing to the 1802 "separation of church and state" clause, added to the US Constitution by Thomas Jefferson, it is difficult to find similar to above examples of materialism colliding with spiritualism resulting in tenure or job loss; if anything, the reverse situation is true: those teachers inclined to teach or preach creationism and the like will tend to lose their position and or job. The remaining issue, however, as documented well in the 2007 *Monkey Girl: Evolution, Education, Religion, and the Battle for America's Soul* , a non-fiction book about the Kitzmiller v. Dover Area School District trial of 2005, which gives insight into the general view that teachers in America generally avoid and steer clear of any type of physical science trespassing into the territory traditionally controlled by religion, such as morals and meaning and a force and matter materialistic world—some US primary and high school teachers commenting how they will completely skip over the evolution chapters in class, so to avoid the thorny moral questions that often arise, and or parent complaints that their students are being de-Christianized, is that the physicochemical materialistic approach to addressing these so-called "thorny moral issues" is left discussed, according to which atrophy has resulted throughout America, the atheist scientist generally keeping to themselves about his or her own non-Christian belief system.

Social Physics

The following are noted "social physics" two cultures tensions quotes:

> "In the early nineteen-twenties it had become clear that natural science and technology would continue their triumphant advances while the social and humane studies, in order to reduce their tragic lag, would need to be equipped with methods far more effective than archaic types of merely verbal reasoning. With untrammeled enthusiasm of a youthful PhD in physics, I expected to find a general sympathy with this [social physics] program but the case was otherwise. There is a proverb that 'in the country of the blind the

one-eyed man is king', the falsity of which has been depicted in the story by H.G. Wells. One has to find for himself that in the country of the blind—meaning university faculties and their learned societies—the one-eyed man meets with lifted eyebrows."

> — John Q. Stewart (c.1955), commentary on the friction involved in his decade-long effort to get "social physics" established at Princeton

"Immaturity, lack of imagination, 'doctrinaire departmentalism', and [in particular] overspecialization is choking modern scholarship and limiting man's communication with his fellows."

> — John Q. Stewart (1955), commentary on the friction involved in his decade-long effort to get "social physics" established at Princeton [2]

"To suggest that humans could behave like atoms was looked upon as a blasphemy to both hard science and human complexity, a total nonsense, something to be condemned. And it has been indeed condemned during the last fifteen years."

> — Serge Galam (2004), "Sociophysics: a Personal Testimony"

See also

â— Human molecule (banned)
â— Lionel Harrison
â— Stark classification

References

1. (a) Knight, David. (2009). *The Making of Modern Science: Science, Technology, Medicine and Modernity: 1789-1914* (Elective Affinities, pgs. 29, 184, 255). Polity Press.
(b) David M. Knight (faculty) – Durham University.
2. Staff. (1955). "Research in Progress: Social Physics", *Princeton Alumni Weekly*, 55:17.

θΔics

In science, **two nature**, or "natures", as contrasted with one nature, refers to the conviction, view, or belief that, in respect to the various structures and movements in the universe, there exist two "natures", namely one that governs describes humans, and or other animate organisms (e.g. biological things), and one that governs or describes physical, chemical, and or other inanimate matter (e.g. atoms, rocks, or stars).

The basic "**two natures**" divide: physical science on one hand, thought to be governed by one nature, and moral science on another, thought to be governed by an entirely different nature, a "divine" nature of sorts; a rift or conceptual divide that seems to have arisen during the Whewell-Coleridge debate (1833).

Overview

In 1964, George Lundberg outlined the following two natures divide conception: [1]

> "Semantic confusion has resulted in a most mischievous **separation of fields** of knowledge into the 'natural' and 'physical' on one hand as against the 'social' and 'cultural' (mental, non-material, spiritual) on the other. As a consequence, it has been assumed that the methods of studying the former field are not applicable to the latter. The generally admitted lag in the progress of the 'social' as contrasted with the 'physical' sciences has been a further result. The history of science consists largely of the account of the gradual expansion of the realms of the 'natural' and the 'physical' at the expense of the 'mental' and the 'spiritual'. One by one 'spiritual' phenomena have become 'physical'. The evolution of the concept of the 'soul' is especially relevant, because its final stage of transition or translation by way of the 'mind' into purely 'physical' concepts is still under way."

In 1970 German-born Austrian economist Oskar Morgenstern, in retrospect commentary on his earlier 1947 game theory and utility theory collaborations with John Neumann, stated the following two natures (and or unbridgeable gap) stylized view: [2]

> "Game theory is a new discipline that has aroused much interest because of its novel mathematical properties and its many applications to social, economic, and political problems. Earlier efforts were oriented on the physical sciences and inspired by the tremendous success these have had over the centuries. Yet social phenomena are different: people are acting sometimes against each other, sometimes cooperatively with each other; they have different degrees of information about each other, their aspirations lead them to conflict or cooperation. Inanimate nature shows none of these traits. Atoms, molecules, stars may coagulate, collide, and explode but they do not fight each other; nor do they collaborate. Consequently, it was dubious that methods and concepts developed for physical sciences would succeed in being applied to social problems."

Here, paradoxically, Morgenstern seems to hold the view that molecules, at least inanimate molecules, have one nature, whole humans have a different nature.

See also

- Nature abhors a vacuum
- Two cultures
- Two cultures department
- Two cultures namesakes

- Two cultures synergy
- Two cultures tensions

References

1. Lundberg, George A. (1964). *Foundations of Sociology: Revised and Abridged Edition* (§:1-4) (soul → physical, pg. 4; phlogiston, pg. 6). David McKay Company, Inc.
2. (a) Morgenstern, Oskar. (1970). "Forward", *Game Theory: a Nontechnical Introduction* (by: Morton Davis) (pg. x). Basic Books, 1983.
(b) Bueno, Gustavo. (2013). *Science as Categorical Closures* (pg. 111). Grupo Helicon.

θΔics

In existographies, **Tycho Brahe** (1546-1601) (IQ:165|#476) [RGM:78|1,500+] (Murray 4000|7|A) (Simmons 100:22) (CR:6) was Danish astronomer, noted for his telescope observation data, later used and improved upon by Johannes Kepler to conclude that planets move around the sun in ellipses rather than circles, and to thereby propose three laws of planetary motion. [1]

Copernicus

In c.1485, Brahe, one of Copernicus' greatest admirers, sent his assistant to Frombork to purchase the triquetrum owned and used by Copernicus, so that he could better understand how he went about making his observations.

Brahe model

In 1588, Brahe published a geoheliocentric model, aka "Tyconic system"; which is summarized as follows: [3]

> "Shortly after the observations of the comet of 1577-78, **Tycho** developed his own model of the heavens. He called it his Tyconic system, and it was essentially a hybrid of the systems of Copernicus and Ptolemy. His geoheliocentric system called for a perfectly still earth (it did not rotate) to be the center of the universe, with the planets (mercury, venus, mars, jupiter, and saturn) revolving around the sun. The sun, moon, and fixed stars revolved around the earth, as in Ptolemy's conception. Brahe never fleshed out his model the way Copernicus did, but he described it in a book published in 1588, *De mundi aetherei recentioribus phaenomenis*."

The following is the conceptual model of the universe envisioned by Brahe in 1590:

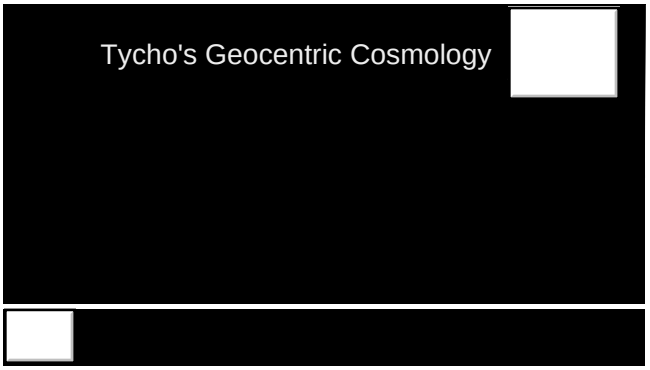

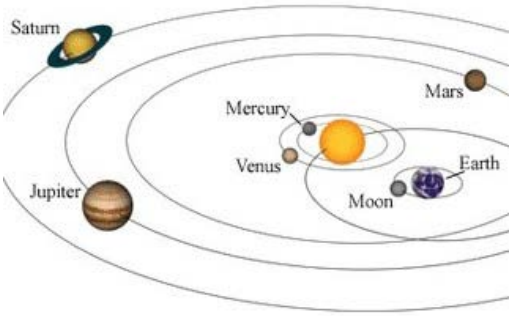

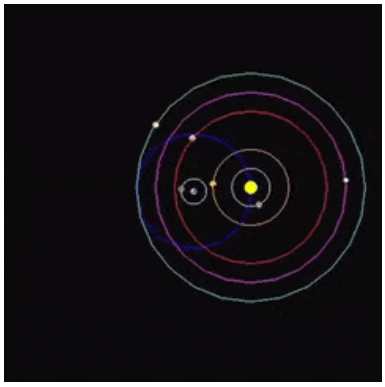

(add discussion)

Quotes | By

The following are representative quotes:

> "What need is there, without any justification, to imagine the earth, a dark dense and inert mass, to be a heavenly body undergoing even more numerous revolutions than the others, i.e. subject to triple motion, in violation of not only of all physical truth, but also of the authority of holy scripture, which ought to be paramount."
>
> —Tycho Brahe (c.1588), note on why he had a stationary earth [3]

> "For those [observations] that I made in Leipzig in my youth and up to my 21st year, I usually call childish and of doubtful value. Those that I took later until my 28th year [i.e., until 1574] I call juvenile and fairly serviceable. The third group, however, which I made at Uraniborg during approximately the last 21 years with the greatest care and with very accurate instruments at a more mature age, until I was fifty years of age, those I call the observations of my manhood, completely valid and absolutely certain, and this is my opinion of them."
>
> — Tycho Brahe (1598), description of instruments and scientific work [2]

References

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External links

â— Tycho Brahe – Wikipedia.

θΔics

In debates, **Tyndall-Stewart-Tait debate** was a heated engagement that erupted at the 1874 Belfast British Association for the Advancement of Science (BAAS) meeting, continuing until at least 1878, on the question of teaching science in the context of the competing and conflicting views of religion, a dialog between primarily Irish physicist John Tyndall, who was under the view that religion must relinquish all control to science, and Scottish physicists Balfour Stewart a Peter Tait, who were of the view that the two could be integrated so as to explain morality, life, death, and immortality. The debate involved a number of high ranking scientists, some of whom were present at the meeting, such James Maxwell, and others such as William Thomson and William Clifford.

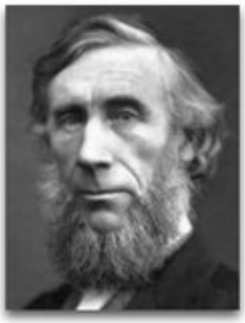

vs.

John Tyndall (1820-1893) | Balfour Stewart (1828-1887) | Peter Tait (1831-1901)

In 1874, a religion vs science **debate** erupted at the BAAS meeting between John Tyndall, who argued that religion needs to relinquish all control to science, and Balfour Stewart and Peter Tait, who argued that the two were compatible; with others, e.g. James Maxwell, on the fence.

Repercussions of the debate include the 1875 book *The Unseen Universe: or Speculations of a Future State*, outlining a 'principle of continuity' theory of afterlife, harsh reviews of his work, e.g. one by Clifford in *Nature*, a followup novel *Paradoxical Philosopher*, by Tait and Stewart, involving a fictional character Hermann Stoffkraft, and a reaction response to this work, that being Maxwell's last and final dying poem "A Paradoxical Ode" (1878), expressing his final enigmatic and riddled views life and death and religion and science; among other documented correspondences.

The debate stemmed from a growing controversy over the teaching of science at the Catholic University in Ireland, a subject about which Tyndall felt he needed to speak out about from a large platform and so accepted the presidency of the BAAS, whereas prior to this tension he had declined the offer of presidency three previous times. His opening statement is sharp and biting:

> "All religious theories, schemes and systems, which embrace notions of cosmogony, or which otherwise reach into the domain of science, must, in so far as they do this, submit to the control of science, and relinquish all thought of controlling it."

This statement is what launched the debate.

Tyndall stance

Tyndall employed the absurdity of the all terrestrial things or living agents (Joseph Butler, 1736) arising from "dead atoms" argument, so conclude that religion needs to step aside. [2] This, of course, is the correct argument (see: defunct theory of life).

Stewart-Tait stance

Stewart and Tait went on to argue the following: [3]

> "We attempt to show that we are absolutely driven by scientific principles to acknowledge the existence of an unseen universe, and by scientific analogy to conclude that it is full of life and intelligence—that it is in fact a spiritual universe and not a dead one."

References

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3. Stewart, Balfour and Tait, Peter G. (1875). *The Unseen Universe: or Physical Speculations on a Future State* (pg. 5). Macmillan.

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θΔics

In

Left: Cicero's 45BC "scattered letters argument" against Lucretius and his chance-based atomic theory origin of the world. Right Emile Borel's 1913 "**typing monkey's argument**, a thermodynamic variant of the former; originating as a spin-off of the Maxwell's demon argument, which asserts that a violation of the second law is less probable than a monkey every typing up a work of Shakespeare.

thermodynamics, **typing monkeys** is probability argument often used to explain the second law of thermodynamics, to the effect that the probability of monkey producing a work of Shakespeare by typing away on a keyboard is more probable than a violation of the second law or of a reversal of entropy. The typing monkey metaphor is simply a humorous way of saying that there is no such thing as a Maxwell's demon.

Lucretius

In 55BC, Lucretius, in his *On the Nature of Things*, argued for a chance-based atomic theory conceptualized godless origin of the world, as follows:

> "My object is to dispel the fear of the gods, which arises simply from the fact that there are so many things which men do not yet understand, and therefore imagine to be effected by divine power. In respect to the origin of the world, surely the atoms did not hold council, assigning order to each, flexing their keen minds with questions of place and motion and who goes where. But shuffled and jumbled in many ways, in the course of endless time they are buffeted, driven along, **chancing** upon all motions, combinations. At last they fall into such an arrangement as would create this universe."

This seems to be the origin of the various parodies, listed below, produced in the years to following, e.g. "throwing letters to the ground [and getting Ennius' *Annals*]" (Cicero, 45BC); "typing monkeys [and getting a library or book]" (Borel, 1913) (Eddington, 1928); "tornado in a junkyard [and getting a Boeing 747]" (Hoyle, 1981); "trowing Scrabble letters to the ground [and getting *Hamlet*]" (Meyer, c.2003); "monkeys typing/computers generating" [and getting a line of Shakespeare] (Jonathan Wells, 2006); "shaking Lego pieces in a bag [and getting a helicopter]" (Think Islam, 2014); among likely others.

Cicero

Cicero, in his treatises *On the Nature of the Gods* or *On Destiny*, seems to be the originator of at least the first version of the typing monkeys analogy, for his following statement: [6]

> "If one believes such a thing possible, I cannot conceive why one would not believe as well that by haphazardly throwing a vast quantity of the twenty-one letters onto the ground, the result could be Ennius' *Annals*, such that they could then be read. I doubt if chance could by itself complete even a single line."

Cicero, here, supposedly, is taking objection to Epicurus and Democritus who, supposedly, held that "everything happens by chance". (O)

Swift

In 1720, Jonathan Swift was using the scattered letters argument as follows:

> "Philosophers say, that man is a microcosm, or little world, resembling in miniature every part of the great; and, in my opinion, the body natural may be compared to the body politic; and if this be so how can the Epicurean's opinion be true, that the universe was formed by a **fortuitous concourse of atoms**; which I will no more believe, than that the accidental jumbling of the letters of the alphabet could fall by chance [see: typing monkeys] into a most ingenious and learned treatise of philosophy. *Risum tincatis amici?* [hor] This false opinion must needs create many more; it is like an error in the first concoction, which cannot be corrected in the second; the foundation is weak, and whatever superstructure you raise upon it, must of necessity fall to the ground. Thus men are led from one error to another, until with Ixion they embrace a cloud instead of Juno; or, like the dog in the fable, lose the substance in gaping at the shadow: For such opinions cannot cohere; but like the iron and clay in the toes of Nebuchadnezzar's image, must separate and break in pieces. I have read in a certain author, that Alexander wept, because he had no more worlds to conquer; which he needed not have done, if the **fortuitous concourse of atoms** could create one; but this is an opinion fitter for that many headed beast the vulgar to entertain, than for so wise a man as Epicurus; the corrupt part of his sect only borrowed his name, as the monkey did the cat's claw to draw the chestnut out of the fire."
>
> — Jonathan Swift (c.1720), "A Critical Essay on the Faculties of the Mind" (Q)

(add)

Borel

The use of typing monkeys to explain irreversibility first appeared in French mathematician Emile Borel's 1913 article "Statistical Mechanics and Irreversibility" and in his 1914 book *Chance*. [1] In short, Borel said that if a million monkeys typed ten hours a day, it was extremely unlikely that their output would exactly equal all the books of the richest libraries of the world; and yet, in comparison, it was even more unlikely that the laws of statistical mechanics would ever be violated, even briefly. [1]

Eddington

In 1928, Arthur Eddington, in his chapter on "The Running Down of the Universe", used the same monkey metaphor in his effort to explain entropy as an increase of disorder. Eddington begins by using the two-compartment model of gas molecules divided by a partition, where at first all the molecules are in one compartment (an ordered state). As the divider is removed, says Eddington, the molecules spread over the whole vessel and remain so ever after (a less ordered state). He says: there is a faint possibility that at one moment all the molecules might happen to be visiting in only one half of the container, but he says the probability of his happening is:

Video stills from the 2014 video (Q) of a Muslim ridiculing the "chance" based atheist explanation of evolution and the formation of complex things, such as helicopters, using a bag of Legos.

$$\left(\frac{1}{2}\right)^n$$

where *n* is the number of total particle in the vessel. [2] He goes on to say that the reason we ignore this chance is seen by "a rather classical illustration", which he says is:

> "If I let my fingers wander idly over the keys of a type writer it might happen that my screed made an intelligible sentence. If an army of **monkeys** were strumming on **typewriters** they might write all the books in the British Museum. The chance of their doing so is decidedly more favorable than the chance of the molecules returning to one half of the vessel."

This re-interpretation of the monkey model, as we see, is a pure Maxwell's demon derivative argument. Sometime after Eddington's take on the monkeys, the parable became shortened to the effect that a violation of the second law would be equivalent to a the happening of monkey, given enough time, typing the works of Shakespeare (particularly Hamelet).

In 2003, for example, a computer algorithm Monkey Shakespeare Simulator was posted on the Internet, which after a year and half of iteration found that it a partial line from *The Second Part of King Henry IV* was produced. [3]

Hoyle

In 1980 or 1981, Fred Hoyle, together with Chandra Wickramasinghe, who co-authored *Evolution From Space: a Theory of Cosmic Creation* (1981) (Q) and *Cosmic Life Force* (1990) (Q), began to state that: "It is ridiculous to suppose that the random shuffling of constituent molecules could create life, and wrong to teach children [this] ... and that such an event is comparable to the "chance that a tornado sweeping through a junk yard might assemble a Boeing 747 from the materials therein." (Q)

> "The chance that higher life forms might have emerged in this way is comparable with the chance that a tornado sweeping through a junk-yard might assemble a Boeing 747 from the materials therein."
>
> — Fred Hoyle (1981), "Hoyle on Evolution", *Nature*, 294(5837):105, Nov 12 (Q)

This is known to some as the junkyard tornado (Q) argument.

Strobel-Meyer dialogue

The following is a bit of dialogue, on the question of random chance created life vs god created life, from American atheist turned skeptical positive theist Lee Strobel's circa 2003 interview of intelligent design advocate Stephen Meyer: [5]

> **Strobel**: "The idea of life forming by random chance is out of vogue right now among scientists."
>
> **Meyer**: "I agree, virtually all origin of life experts have rejected that approach."
>
> **Strobel**: "Even so, the idea is still very much alive at the popular level. For many college students who speculate about these things, **chance** is still the hero. They think

The following shows Stephen Mayer's circa 2003 "scrabble pieces argument", a variant of Cicero's "letters onto the ground" argument against Lucretius, against blind random chance formation of "life" out of the chaos of the universe, randomly

if you let amino acids randomly interact over millions of years life is somehow going to emerge."

moving atoms, and random genetic mutation. [5]

Meyer: "Well, yes, it's true that this scenario is still alive among people who don't know the facts, but there's no merit to it. Imagine trying to generate even a simple book by throwing Scrabble letters onto the floor. Or imagine closing and picking Scrabble letters out of a bag. Are you going to produce *Hamlet* in anything like the time of the known universe?"

Meyer: "Even a simple protein molecule, or the gene to build that molecule, is so rich in information that the entire time since the big bang would not give you, as my colleague Bill Dembski likes to say, the 'probabilistic resources' you would need to generate that molecule by chance."

On one hand, to digress, this last interaction sound akin to two imbecilic ticks arguing about why the dog is moving; on the other hand, the problem—originally argued by Cicero (IQ:175±|#148) on itself is not as imbecilic as it, on the surface, may seem; in that it seems to be digging at a problem left unaddressed since the Greek atomic theory days; ; the correction of which seemingly first addressed in the Schiller-Henderson (Q) train of thought.

Misattributions

In his 1931 book *The Mysterious Universe*, English physicist James Jeans misattributes the monkey parable to English biologist Thomas Huxley.

Evolution

The typing monkeys argument is frequently used to argue that the second law proves that evolution is either false or highly improbable. [4]

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Further reading

● Georgescu-Roegen, Nicholas. (1971). *The Entropy Law and the Economic Process* (appendix F.2: Probability and Time Dimension: Emile Borel and monkey typists, pgs. 417-19). Cambridge, Massachusetts: Harvard University Press.

External links

● Infinite monkey theorem – Wikipedia.

θΔics

In equations, the function:

$$T\Delta S$$

or TdS, in differential form, is called the bound energy, or transformation content energy change, or energy associated with the equivalence-value of all uncompensated transformations, of a process or reaction occurring in a system, where *T* is the absolute temperature of the system, and dS is the differential entropy change and ΔS is the entropy change on going from an initial state entropy to a final state entropy. In expanded form:

$$T\Delta S = T(S_f - S_i)$$

where S_f is the entropy measure of the system in its final state and S_i is the entropy of he system in its initial state.

Work-transformed-into-Heat	Heat-transformed-into-Work
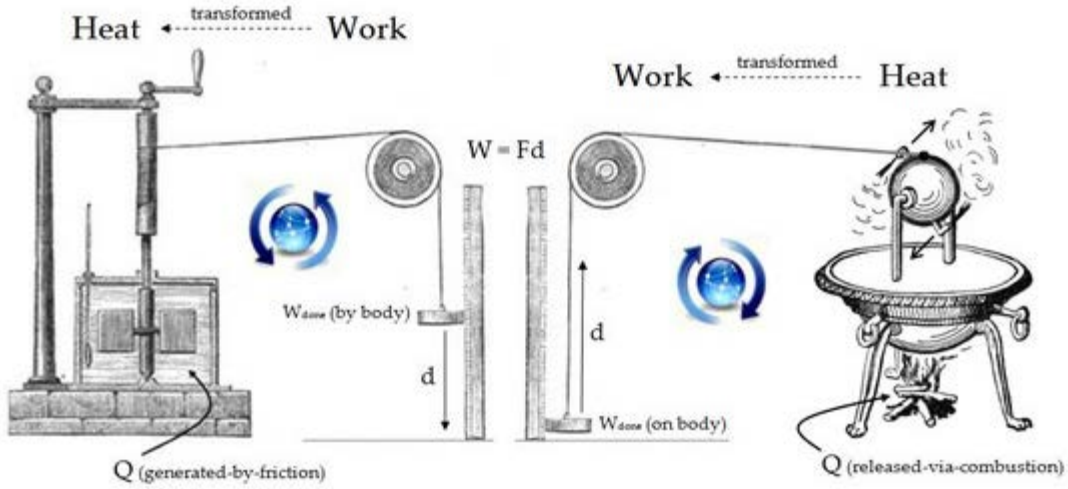	
The Joule paddle wheel experiment (1843) representative of the work transformed into heat aspect of the mechanical equivalent of heat: $$W = JQ$$ which states that W can convert into Q.	The Hero aeolipile (50AD) representative of the heat transforming into work aspect of the mechanical equivalent of heat: $$Q = \frac{W}{J}$$ which states that Q can convert into W.

History

The function was first derived in the work of Rudolf Clausius (1850-1865) and expanded on by Willard Gibbs in 1876.

The labeling of the function TdS as "bound energy", in contrast to "free energy" (internal energy less bound energy) was done in 1882 by German physicist Hermann Helmholtz in his "On the Thermodynamics of Chemical Processes". [1]

References

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θΔics

In symbols, **U**, as introduced by German physicist Rudolf Clausius in 1850, represents the energy or internal energy of a body or system. [1]

History

The symbol *U*, prior to its adoption by Clausius in thermodynamics, has deep roots, which, of course, guided Clausius to this symbol use. Specifically, Clausius utilized Irish mathematician William Hamilton's 1835 assignment, from his *General Method in Dynamics*, of *U* as the 'force function' of a system (which Clausius called the 'ergal'), loosely defined as the sum of the forces of attractions and repulsions acting on the material points of any system (i.e. work in a modern sense), but added to it German mathematician Gottfried Leibniz's 1686 vis viva, so to re-define the energy *U* of a body or system as the sum of the vis viva T plus the ergal J: [2]

$$U = T + J$$

Prior to this, subsequently, Clausius' internal energy, has its roots in both Leibniz's vis viva and Hamilton's force function, the latter of which has its roots in Joseph Lagrange's 1788 'central function', from his *Analytical Mechanics* treatise. [3]

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1. Clausius, Rudolf. (1879). *The Mechanical Theory of Heat* (etymology of U: pg. 31). London: Macmillan & Co.
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(b) Hamilton, W.R. (1835). "A second essay on a general method in dynamics." *Philos. Trans. R. Soc. London*, 125:95-144.
3. (a) Lagrange, Joseph. (1853). *Mecanique Analytique* (Vol. 1). Publisher.
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θΔics

In quotes, **uber genius comparison quotes** refers to quotes by noted scholars or geniuses that give point of view comparison rankings of ceiling geniuses, the German term "über", meaning "beyond, up above, or past", hence the joint term "uber genius" (or ultra genius), similar to Friedrich Nietzche's famous uberman concept, signifying a geniuses genius, so to speak, or all-time top genius above the back of regular genius. Such comparison quotes my help discern better ranking results in the genius IQs table near the top.

An example **uber genius** comparison quote, from TopTens.com "10 Smartest People in History" public rankings (Ñº) , comparing the genius of Goethe, with Einstein, with Hawking.

List

The following is the list of "uber genius" comparison quotes, generally ranked in descending order or genius comparison ranking:

> "Shakespeare, Bacon, Newton present an individual element which nothing in their parentage or nationality or locality serves to explain. Why each expended his power in a given way, may in part be made clear, but the source of those original gifts in inscrutable. The word, *gifts*, indicates this. Genius in any form is not a product to be compounded by the most subtle organic or social chemistry. This assertion does not deny a genetic dependence, but only a complete and exhaustive one. The proper name Milton or Goethe, remains forever the final designation of underived, unweighted combination of powers."
>
> — John Bascom (1876) [5]

> "Newton was the greatest creative genius physics has ever seen. None of the other candidates for superlative (Einstein, Maxwell, Boltzmann, Gibbs, and Feynman) has ever matched Newton's combined achievements as theoretician, experimentalist, *and* mathematician."
>
> — William Cropper (2004), *Great Physicists* [1]

> "Isaac Newton ranks with Copernicus and Einstein among principal shapers of our physical worldview. However, whereas we can appreciate Copernicus against the backdrop of Ptolemy, Einstein against the backdrop of Newton, Newton himself may strike the average educated non-scientist as somewhat remarkable."
>
> — Dennis Danielson (2001), *The Book of the Cosmos: Imagining the Universe From Heraclitus to Hawking* (Ñº)

> "Gibbs ranks with men like Newton, Lagrange and Hamilton, who by the sheer force and power of their minds have produced those generalized statements of scientific law which mark epochs in the advance of exact knowledge."
>
> — Frederick Donnan (1924), "The Influence of J. Willard Gibbs on the Science of Physical Chemistry" [2]

> "Einstein is a genius in higher physics and ranks with Copernicus, Newton and Kepler."

— William du Bois (1932) (Ñº)

"Gibbs' work is the greatest synthetic achievement in science since Newton's construction of the theory of universal gravitation."

— Boltzmann (c.1900) [18]

"Few theoretical scientists have had the talent and assurance to do their work in such isolated fashion. Only Einstein—who wrote some of the most important papers before he even laid eyes on another theoretical physicist—may have outdone Gibbs in this respect."

— William Cropper (2004), *Great Physicists* [1]

"Gibbs did for statistical mechanics and for thermodynamics what Laplace did for celestial mechanics and Maxwell did for electrodynamics, namely, made his field a well-nigh finished theoretical structure."

— Robert Millikan (c.1920) [4]

"Five: Newton, Bacon, Leibniz, Montesquieu, and myself."

— Buffon (IQ=) when asked how many great men he could name

"Of these three the greatest, and one who ranks with Newton and Archimedes, was Karl Friedrich Gauss."

— Morris Kline (1964), *Mathematics in Western Culture* (Ñº)

"Lagrange's deductions from Newton's laws were extended by Pierre-Simon Laplace, who ranks with Lagrange and was his contemporary."

— Morris Kline (1985), *Mathematics in the Search for Knowledge* (Ñº)

"There are several categories of scientists in the world; those of second or third rank do their best but never get very far. Then there is the first rank, those who make important discoveries, fundamental to scientific progress. But then there are the geniuses, like Galilei and Newton. Majorana was one of these."

— Enrico Fermi (1938)

(add discussion)

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θΔics

In philosophy, an **uberman** or "Nietzsche uberman" is a hypothetical archetype person who will eventually bring about the replacement model or mold for the "god" or the theory of god, or supplant the framework that religion embodies under the aegis the name god. The so-called "final uberman" will be the person who brings about the replacement mold upgrade for the downfall of modern religion (Ra theology) and who brings about global disbelief in the existence of god

Overview

In 1883, German philosopher Friedrich Nietzsche conceived uberman premise, as someone in the future who would overthrow "god theory" and or replace it; Nietzsche is said to have cited the following uberman archetypes:

	Uberman [Mean IQ:189] Archetypes: molds to future replacement for god theory		**Description**
1.	Johann Goethe (1749-1832) German polyintellect	IQ:225|#1 **[HD:19]** [FA:54]	(Cattell 1000:7) [RGM:23|1,250+] The famed "trainer of assassins of god", namely: Arthur Schopenhauer, Friedrich Nietzsche, and Libb Thims; among which, Nietzsche, according to Albert Camus (1942), is "the most famous of god's assassins."
2.	Leonardo da Vinci (1452-1519) Italian polymath	IQ:200|#7	(Cattell 1000:86) [RGM:1|1,250+] Rejected Biblical flood myth theory (see: Noah's ark).
3.	William Shakespeare (1564-1616) English writer	IQ:190|#49 **[HD:4]** [FA:23]	(Cattell 1000:2) [RGM:10|1,250+] His brand of atheism influenced Goethe greatly, second only in influence to that of Benedict Spinoza.
4.	Michelangelo (1475-1564) Italian artist	IQ:180|#116	(Cattell 1000:28) [RGM:11|1,250+]
5.	Napoleon Bonaparte (1769-1821)	IQ:180|#106 **[HD:20]**	(Cattell 1000:1) [RGM:171|1,250+] Queried all the scientists of France about their atheism beliefs, and queried physicians about the location of the soul; noted for the Napoleon Laplace anecdote, the most famous atheism

		French leader	[FA:57]	quip of all time.
6.		Julius Caesar (I00-44BC) Roman leader	IQ:170|#248	(Cattell 1000:8)
7.		Socrates (c.469-399BC) Greek philosopher	IQ:180|#159 [FA:57]	(Cattell 1000:29) [RGM:14|1,250+]

Nietzsche, to elaborate, never actually named any actual individual as the ideal uberman; thought it has been conjectured that he pointed towards some as models:

> "Although he explicitly denied that any Supermen had yet arisen, he mentions several individuals who could serve as models. Among these models he lists Socrates, Jesus, Julius Caesar, Leonardo da Vinci, Michelangelo, Shakespeare, Goethe, and Napoleon."
>
> — Brian Hayes (2002), "Friedrich Nietzsche and his Philosophy of the Superman" (Ñº)

Among these, Goethe is considered, by many, to be the closest Nietzsche came to naming the Übermensch. [4] Nietzsche, in his *Will To Power* (1887), e.g., gives the following as examples of great human beings: Caesar, Homer, Aristophanes, Da Vinci, and Goethe. [5]

Nietzsche also thought highly of Heraclitus, as discussed in Nietzsche's *Philosophy in the Tragic Age of the Greeks*—though he does not seem to cite Heraclitus as an uberman, per se. [6] In Heraclitus' work, supposedly, seeds (Ñº) of Nietzsche's will to power can be found.

Russell | 180 IQ minimum

Bertrand Russell, supposedly, asserted that an IQ of 180 was the cutoff IQ to being a Nietzsche uberman; at some point, he estimated his own IQ at 180. In 1962, his IQ was being estimated at 180 by John Platt. [13] The 180 IQ estimate continues to be cited (Ñº) in 2001; others, less discerning, have gauged (Ñº) his IQ at 147. , and also gave the following seven candidates who in sum, supposedly,

Will to power + Faust?

Nietzsche's uberman (*übermensch*), according to *Conan the Barbarian* historian David Smith (1996), is a derivative or synthesis of Arthur Schopenhauer's personification of the will to power, the expression of human existence superior to that of the conventional, sentimental, bourgeois moral majority (to use a contemporary term) whom Nietzsche held in contempt, and Goethe's *Faust*. [2] As William Hubben writes (1966) in his survey of modern philosophers: [3]

> "The new 'superman,' a term borrowed from Goethe's *Faust*, is law unto himself. He is autonomous . . . , destined to fulfill our highest dreams. Nietzsche's vision was that of the new man, the one who . . . will build himself up into a being beyond the 'much-too-many,' the mob. He will be a higher but, of course, also a lonely man. His secret nobility will be of an aristocratic elevation, for which no pattern exists: He has nobody to follow, and nobody should be asked to follow him."

Or, as Nietzsche himself wrote, in *Thus Spake Zarathustra: Second Part*, "Hungry, violent, lonely, godless: thus the lion-will wants itself. Free from the happiness of slaves, redeemed from gods and adorations, fearless and fear-inspiring, great and lonely: such is the will of the truthful."

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θΔics

In thermodynamics, **Udai Veer** (c. 1950-), or possibly Udai Veer Singh, is an Indian science teacher noted for his 2006 two-volume so-named *Encyclopedia of Thermodynamics*, which amounts to a crude thermodynamics textbook, at best. [1]

Education

Veer has done post-graduate work in science and is a teacher, in what seems to be physics (and chemistry), by profession, in Delhi, India. [2] The *Encyclopedia of Thermodynamics* is Veer's fourth book.

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θΔics

In hmolscience, **ultra-reductionism**, aka "extreme reductionism", refers to []

Overview

In Mar 2016, the anon writer of scientific dogma skeptical website

Ultra-reductionism

Going even beyond the typical pseudo-skeptical reductionism, the site Hmolpedia attempts to reduce everything — or, rather, their already-reductionist definition of "everything" (i.e. that which is believed to be "real" by "authorities") — to thermodynamics, chemistry and physics. The etymology of the odd name is explained this way:

> Hmolpedia is a portmanteau "hmol", referring to either one human molecule (a person defined as a molecule), a mole of human molecules (a metric system or mass of human molecules), and or the hmolsciences (human thermodynamics, human chemistry, and human physics) in general, and "encyclopedia" and was introduced in early 2011 as a new representative name for the content of the two-thousand plus articles hosted at EoHT.info all centered around the subjects of chemistry, physics, and thermodynamics applied to the study of human existence.

Yes, "a person defined as a molecule"! An ontology so reductionist as to be fundamentally dehumanizing. According to the definitions they are using, Hmolpedia is an encyclopedia of "eliminative materialism, a type of extreme materialism". On the home page it has an image with this caption: "Above: depiction of reduction of all of human existence and experience into the methodology of chemistry, physics, and thermodynamics, pure and applied."

It even suggests that life isn't "real", using Tesla's (probably DMT-induced) realization that the demarcation between insentience and sentience (i.e. the life/nonlife materialist conundrum, or "great problem of natural philosophy") is an illusion, but replacing Tesla's expansionist idea (termed panbioism) with the absurdly ultra-reductionist "defunct theory of life".

Needless to say, no disagreement with current perceived authority figures can be found on Hmolpedia aside from further reduction(ism) of that which is already believed into a subset thereof.

A 2016 take on Hmolpedia, as being an "**ultra-reductionist**" website, and the defunct theory of life view, first expounded on by Alfred Lotka (1925), as being "absurdly ultra-reductionist", yet a view wherein no disagreement is found. [1]

TheBiggestPicture.net, a seeming DMT-taking Canadian new atheism advocating philosopher, a site devoted to a mix of new atheism, e.g. Lawrence Krauss, new age, e.g. Alan Watts, Rupert Sheldrake, etc., fringe philosophy, e.g. Terence McKenna, and skepticism, e.g. Michael Shermer, posted the following summary (Ñº) of Hmolpedia on their skeptics page, referring to the site thematically as ultra-reductionism and the defunct theory of life as "absurdly ultra-reductionist", as shown adjacent. [1]

Sekhar | Maxwell

The following shows the theism-siding views of Indian chemical engineer DMR Sekhar, according to which he believes he is self-controlled, which gives wind of the theist-siding view:

> "Arrogants like Eddington, despite his achievements, are the cause as to why people like Libb Thims fall from one position to another lower position. First Libb argued that **life is a defunct theory** to justify the application of classical version of the second law of thermodynamics to living systems, ignoring statistical thermodynamics. Then to justify 'life is a defunct theory' he argues that his actions and behavior or not 'self-controlled' or 'self-driven' [see: self-motion] but are governed by external electromagnetic forces. Arrogance leads to ignorance and scientific blindness as we noted from the example of Eddington and Nobel laureate Chandra Sekhar. Thims' science is laced with **extreme atheism** and materialism and hence his precarious position. Science needs to be kept at equal distance and away from both atheism and theism. I can't stop but laugh at myself when I think that I am not alive or I am not moving myself."
>
> — DMR Sekhar (2011), "Eddington's Psycho-Syndrome" [2]

The following shows the alternative atheism-sided views of Scottish mathematical physicist James Maxwell, the founder of the theory of the electromagnetic force, which gives wind of the so-called ultra-reductionist view:

> "I cannot help thinking about the immediate circumstances which have brought a thing to pass, rather than about any 'will' setting them in motion. What is done by what is called **my-self** is, I feel, done by something greater than myself in me."

— James Maxwell (1879), “Comment to Fenton Hort when terminally ill” [3]

(add)

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θΔics

In termodinamica, **termodinamica umana** è lo studio scientifico degli aspetti energetici ed entropici dei processi delle attività umane e il movimento, nel contesto della boundaried cicli giornalieri solare, in particolare quelle esistenti tra il calore, il lavoro, la spontaneità, l'irreversibilità e le leggi che definiscono ivi previste.

θΔics

In existographies, **Umberto Eco** (1932-2016) (IQ:#|#) [RGM:308|1,500+] (CR:2) was an Italian novelist, literary critic, philosopher, and semiotician, noted for []

Overview

In 1980, Eco published his *The Name of the Rose*, which is ranked by some (Q) alongside Dan Brown's *The Da Vinci Code* and Graham Hancock's *Fingerprints of the Gods*.

Library

Eco, of note, presently is ranked as having the third-largest personal library in history, said to contain 30,000 to 50,000 books; multiple videos (Q)(Q) of which exist.

Influenced

Eco influenced Nassim Taleb.

Quotes | By

The following are quotes by Eco:

> "Epistemological thinkers connected with quantum methodology have rightly warned against an ingenuous transposition of physical categories into the fields of ethics and psychology (for example. the identification of indeterminacy with moral freedom). Hence, it would not be justified to understand my formulation as making an analogy between the structures of the work of art and the supposed structures of the world. Indeterminacy, complementarity, noncausality are not modes of being in the physical world, but systems for describing it in a convenient way. The relationship which concerns my exposition is not the supposed nexus between an "ontological" situation and a morphological feature in the work of art, but the relation between an operative procedure for explaining physical processes and an operative procedure for explaining the processes of artistic production and reception. In other words, the relationship between a scientific methodology and a poetics."
>
> — Umberto Eco (1979), *The Role of the Reader* (Q)

> "Adso: 'But how does it happen', I said with admiration, 'that you were able to solve the 'mystery of the library', looking at it from the outside, and you were unable to solve it when you were inside?' William of Baskerville: 'Thus, god knows the world, because he conceived it in his mind, as if from the outside, before it was created, and we do not know its rule, because we live inside it, having found it already made'."
>
> — Umberto Eco (1980), *The Name of the Rose*; cited by Steven Shapin (1985) in *Leviathan and the Air Pump* (pg. 1) [1]

> "I'm afraid that, by now, it might actually be 50,000 books. When my secretary wanted to catalogue them, I asked her not to. My interests change constantly, and so does my library. By the way, if you constantly change your interests, your library will constantly be saying something different about you. Besides, even without a catalogue, I'm forced to remember my books. I have a hallway for literature that's 70 meters long. I walk through it several times a day, and I feel good when I do."
>
> — Umberto Eco (2009), *Publication* (Q)

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External links

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θΔics

In human thermodynamics, **Umberto Lucia** (1966-) is an Italian physicist and power engineer who develops researches in applied thermodynamics and complex systems.

Overview

In 2012, Lucia developed a new approach in firstly religion thermodynamics. This paper was on communication and analogy in the overlap of religion and thermodynamics, based on St. Thomas Aquinas, the theology before the Protestant and the Catholic Schism, and secondly neurological thermodynamics, such as his 2013 article "Irreversible Human Brain". [1]

Education

In 1991, Lucia completed a degree in elementary particle physics, at the University of Turin, for work in meson spectroscopy, after which he did a significant amount of work and research in thermodynamics, at both the nuclear level and macroscopic level, eventually completing his PhD in energy in Florence, Italy. [2] Lucia currently is an assistant professor of applied and engineering thermodynamics in the energy department of the Polytechnic University of Turin, Italy.

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External links

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● Umberto Lucia (profile) (Italian → English) – Xaltro.it.

θΔics

In atheism terminology, **unbeliever**, as compared to a "believer", is a soft, non-offensive, and or indirect variant of atheist, akin to secular (Q), referring to one to who does not believe in god, god theory, and or religious doctrine; someone who thinks that ideas about heaven and hell are for the birds (Heine, c.1835).

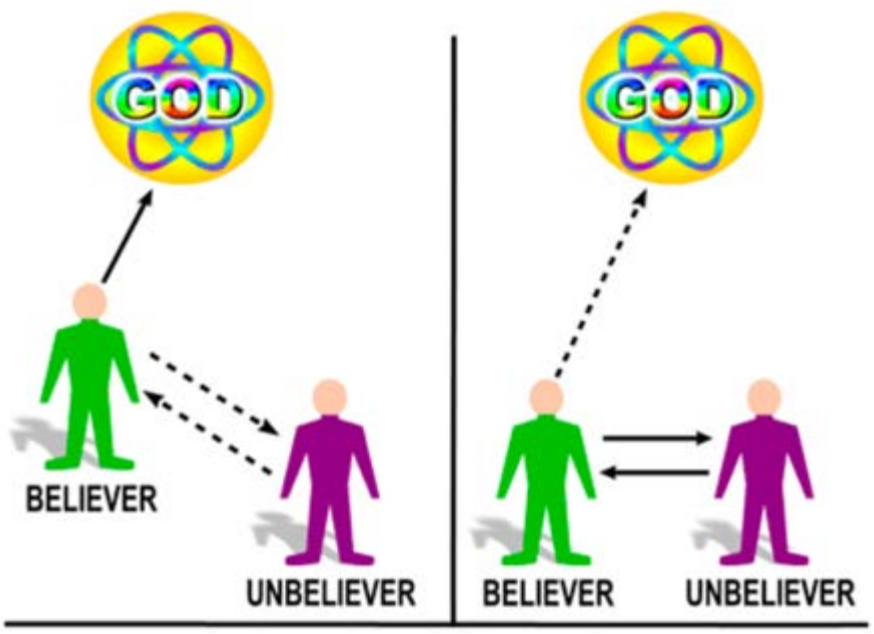

An image (Q), from a 2015 Christian blogger, depicting a believer as one who has god mixed into their understanding of atoms and atomic theory, and the **unbeliever** as one who does not have god beliefs, who uses the diagram to question the believer ideology that "a deep friendship with an unbeliever will pull the believer down", spiritually speaking.

Overview

In 1772, Joseph Priestley published *Institutes of Natural and Revealed Religion*, wherein he argued against atheism.

In 1782, a "Mr. Hammon", later said to be English chemist-physician Matthew Turner (Q), or possibly two authors combined, published *Answer to Dr. Priestley's Letters to a Philosophical Unbeliever* (Q) , in which, by stating the following, becomes the first overt or avowed atheist in Britain: [1]

> "As to the question whether there is such an existent being as an atheist, to put that out of all manner of doubt, I do declare upon my honor that I am one. Be it therefore for the future remembered, that in London, in the kingdom of England, in the year of our Lord one-thousand seven-hundred and eighty-one, a man has publicly declared himself an atheist. "

Here, firstly, we can compare this "public declaration" of atheism to the famous 1763 Hume-d'Holbach dinner party encounter, wherein in David Hume, upon first encountering Baron d'Holbach, says that he does not believe in atheism "because he had never seen one".

Here, secondly, we see the term "philosophical unbeliever" equated to and or synonymous with "atheism".

In c.1835, German poet Heinrich Heine was using the term "Unglaubensgenossen" (unbelievers) and or "Unglaubensgenoss" (unbeliever) in reference to Benedict Spinoza. [1] Jennifer Hecht (2003), of note, incorrectly asserts that Heine coined the term "unbeliever", which is not the case, as the Mr. Hammon usage (above) shows.

In 1927, Sigmund Freud, in his *The Future of an Illusion*, was citing the following statement by Heine, whom he refers to as a "fellow unbeliever", as something he can say without regret:

> "We leave heaven to the angels and the sparrows."
>
> — Heinrich Heine (c.1850), *Publication*

In the 21st century, the query "are you a believer" is a non-offensive way of asking do you believe in god.

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θΔics

In science, **unbridgeable gap** refers to the perceived separation or boundary, e.g.

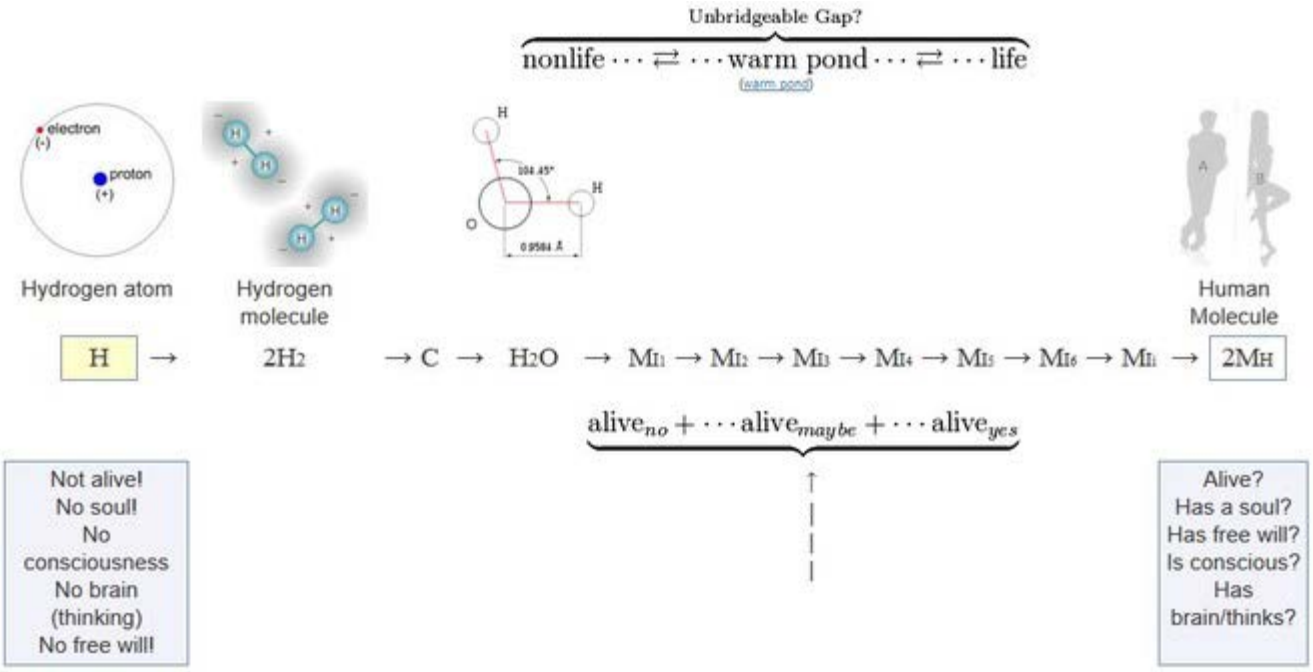

A rendition of the **unbridgeable gap** model: the thinker who holds-fast to the ancient mythological doctrines of 'life', 'soul', 'consciousness', 'free will', 'choice', a 'brain', etc., will argue, to their grave, that, in some contrived-way or another, at one particular second in time, via "emergence" (the new term for intelligent design), in the course of human evolution mechanism, that molecules, somehow, came to life, acquired souls, developed a free will, obtained the a state of consciousness, evolved the ability to think, among other now-defunct traits that do not apply to the hydrogen atom, nor to any other molecule, known in science.

materialism/physicalism vs. spiritualism/psychology, or life vs. non-life, etc., in the minds of many, that exists between the chemical world and the human world.

Overview

In 1873, French locomotion physiologist Etienne Marey published his *Animal Mechanism*, of which the following is the bold opening paragraph:

> "Living beings have been frequently and in every age compared to machines, but it is only in the present day that the bearing and the justice of this comparison are fully comprehensible. No doubt, the physiologists of old discerned levers, pulleys, cordage, pumps, and valves in the animal organism, as in the machine. The working of all this machinery is called "animal mechanics" in a great number of standard treatises. But these passive organs have need of a motor; it is "life", it was said, which set all these mechanisms going, and it was believed that thus there was authoritatively established an **inviolable barrier** between inanimate and animate machines."

Marey goes on to say that because modern engineers have created machines, which via combustion, and the animation of various mechanical organs, thereby, we are now more legitimately able to compare animals to animate motors, we now need to "seek another basis for such distinctions".

In 1875, German physician and diplomat Ernst Gryzanowski stated the following in his dissection of the social physics of Auguste Comte: [9]

> "We maintain, that as long as we are unable not only to **bridge over the gulf** that separates organic from inorganic nature, but even to see the bottom of it, the *onus probandi* must lie on those who deny its width and its depth. Comte himself holds curious opinions on this point. He deprecates the inquiry into the origin

of organic life as a useless speculation (thus admitting the partly speculative nature of biology). He believes in the immutability of species, and separates, in his pedigree of sciences, biology from physics by a twofold division, making them agnates rather than cognates. It would therefore have been easy for him to admit the *specific* difference between man and atom, and to find this difference in self-consciousness, and in the moral freedom of man's will."

In 1895, French sociologist Emile Durkheim stated the following: [10]

> "If we begin with the individual, we shall be able to understand nothing of what takes place in the group. In a word, there is between psychology and sociology the same **break in continuity** as between biology and the physico-chemical sciences. Consequently, every time that a social phenomenon is directly explained by a psychological phenomenon, we may be sure that the explanation is false."

This rather contentious statement has since been requoted by and discussed by those including: Werner Stark (1962), Edward Wilson (1977), and Michael Ruse (1984). [11]

In 1925, American physical chemist Gilbert Lewis, in his "Anatomy of Science" lecture, end chapter: "Life; Body and Mind", stated the following, in what seems to well-capture the gist of the 2010 inception of hmolscience: [8]

> "Perhaps our genius for unity will some time produce a science so broad as to include the **behavior** of a group of electrons and the behavior of a university faculty, but such a possibility seems now so remote that I for one would hesitate to guess whether this wonderful science would be more like mechanics or like a psychology."

Lewis, further on toward the end of his lecture, stated to the following:

> "We cannot forget that there are two kinds of behavior with which we are already intimately acquainted: on one hand, the behavior of weights and electric charges and chemical reagents; on the other hand, the behavior of man. These require two distinct vocabularies, and most writers who describe animal behavior have adopted the one or the other. We have 'nature fakers', who make animals think and act just like men, and there are the others, who regard the swarming of bees as a sort of chemical reaction. I do not know which of these two extremes to regard as the more futile, for both extrapolations go far beyond what is now justifiable. Yet the attempt to bridge the **vast gulf** is a legitimate aim of science."

In 1936, Russian plant physiologist Alexander Oparin, in his *The Origin of Life*, stated the following: [12]

> "Neither the theory of spontaneous generation nor the theory of the continuity of life solves rationally the problem of the origin of life, since these theories are based on the tacit assumption of an absolutely **impassable hiatus** between animate and inanimate nature."

In 1938, English physiologist Charles Sherrington in his "Man on his Nature" lecture turned book was the first to state clearly that there is no boundary, that the various divides (e.g. life/non-life) or dualisms (e.g. mind/matter) are fictional: [7]

> "In the middle ages, and after them with Fernel, as with Aristotle before, there was the difficulty of the

> animate and the inanimate and finding of the boundary between them. Today's scheme makes plain why that difficulty was, and dissolves it. **There is no boundary**."

In 1953, American economist Robert Heilbroner stated the unbridgeable gap viewpoint as follows: [1]

> "There is an **unbridgeable gap** between the 'behavior' of [subatomic particles] and those of human beings who constitute the objects of study of social science. Aside from pure physical reflexes, human behavior cannot be understood without the concept of volition—the unbridgeable capacity to change our minds up to the very last minute. By way of contrast, the elements of nature 'behave' as they do for reasons of which we know only one thing: the particles of physics do not 'choose' to behave as they do."

In 2001, South African chemical physicist and human free energy theorist Adriaan de Lange stated the following in regards to recollection of a once-held gap mindset:

> "Since as a kid I was aware of the **abyss** (super rift) between the material and mental worlds. I tried to bridge this abyss, but could not. Yet I kept on with my own "Steigerung" as Goethe did. Then during 1982-83 I discovered empirically that the law of entropy production applies to the *humanistic* world as it applies to the physical world. My joy knew no bounds. I have found the **bridge** between these two worlds with which to cross the abyss between them. Others thought I was crazy and would not dare to publish my account."

In 2002, Turkish-born American physicist Turner Edis gave the following statement on the matter: [4]

> "Even in the realm of what we see, there must be **unbridgeable gaps** separating order from chaos, animate from inanimate, life from nonlife, humans from other animals, and consciousness from nonconscious matter."

It is difficult to see, to note, whether or not Edis is for or against this statement because he footnotes this to two religious themed books (Arthur Custance's 1978 *Science and Faith*, pg. 134-49, and Gay Habermas and J.P. Moreland's 1992 *Immortality: the Other Side of Death*, pg. 51) and mentions how some religious philosophers still defend the notion of an animal soul or life force irreducible to physics. [4]

Life vs. Non-life

Variations of this perceived 'gap' separating humans from chemicals are captured in the various "what is life? debates" along with debates on differences between life vs non-life, animate matter vs inanimate matter, living vs non-living, organic life vs inorganic life, vegetable life vs animal life, human life vs animal life, etc.

Vernadsky's gap

An interesting twist on the gap between the life and non life perspective or dichotomy is Russian biogeochemist Vladimir Vernadsky's 1926 perpetual life model of living matter, in which he argued that living matter or biosphere was comprised of certain specific elements and that the remainder of the azoic parts of the earth, such as the crust or atmosphere were composed on inert matter, and that this imagined separation of the two types of matter has remained intact since time eternal and that living matter cannot be

Danish chemist Martin Hanczyc, in his 2001 TED talk "The Line Between Life and Not-Life", argues that there is no longer an **unbridgeable gap** (or dividing line), but rather over the last 150 years or so "science has blurred the distinction between non-living and living systems", as he diagrams above, which is nothing but superficial recourse to a mix of emergent hypothesis and properties hypothesis: namely that certain properties constitute "life" and that these various properties have "emerged" over time (and or a life principle argument). [5]

created from non-living matter or that abiogenesis is impossible. In his own words: [2]

> "It is very clear that living matter becomes manifest without abiogenesis. In other words, living organisms have always sprung from living organisms during the whole geological history; they are all genetically connected; and nowhere can solar radiation be converted into chemical energy independent of a prior, living organism. We do not know how the extraordinary mechanism of the earth's crust could have been formed. This mechanism is, and always has been, saturated with life. Although we do not understand the origin of the matter of the biosphere, it is clear that it has been functioning in the same way for billions of years. It is a mystery, just as life itself is a mystery, and constitutes a **gap** in the framework of our knowledge."

What is interesting here is that Vernadsky readily admits that he has discarded religious views and moreover that he is an adherent of thermodynamic models, physics, gas system models of the biosphere, but the origin of life, for him remained somewhat of a mystery. To note, Vernadsky's 'theories on perpetual life' came under attack by Russian biochemist Alexander Oparin who stated that they were not in accord with the "objective data of modern science." [3] Some have noted that latter in life, Vernadsky began to recant his gap view and concede that life could have had an origin. [2]

Mechanism view | No gap

See also: Defunct theory of life

The central issue is embedded in evolution theory, which states that humans evolved over time from earlier forms of life, as popularized in large part by English naturalist Charles Darwin and his 1871 warm bond model, which argues that life began in a heated pond 3.9-billion years ago. Taken at face value, this is a cogent argument, yet the inquisitive thinker is soon led down the path to the question of if this theory is true, then at what exact millisecond in time past did the first "form" of life (whatever it may be) solidify or come into existence? If one holds to both the theory of evolution and the theory of life, the resultant paradoxical picture, shown above, will emerge.

The typical (non-religious) person will still-hold fast to the view that yes "humans evolved from earlier forms of life", with the implicit assumption that they are alive, that bacteria were alive 3.9-billion years ago (and block out the rest of the answer), and pull-out of the question at this point, satisfied with some type of emergence theory explanation (or whatever theory happens to be in vogue in that decade).

Correctly, any given molecule, such as a hydrogen molecule a water molecule a bacteria molecule or human molecule, cannot technically be said to be alive, any more than sun can be said to be alive. Correctly, the modern view finds that it is technically impossible to find a specific day (or rather second) in the contiguous chemical synthesis mechanism, on

the evolution timeline, starting with hydrogen reactants H (13.7 billion years ago), stepping through a number of molecular species intermediates M_I, and ending with modern human molecule products M_H (200,000 years ago):

In modern view, every intermediate, M_{I1}, M_{I2}, M_{I3}, etc., in the steps of chemical synthesis of the human molecule, over time, are simply only bigger-and-bigger, more-and-more dynamic molecules, derivative of the hydrogen atom. Subsequently, one is forced into one of two conclusions, either the hydrogen atom is alive or the human molecule is not alive. The former is nonsensical. Others, has history has shown, will argue that these olden-days properties said to be characteristic of "living beings" (living matter, living system, living organism, living molecules,), are "emergent", or "self-organizing", or "auto-catalytic", etc., properties, or in possession of some type of "living energy" (or living force), or in a specific "living state", etc., and write entire books and spend decades in attempts to salvage the olden-days concepts.

A few prime examples, used to explain the "missing link" mechanism step (dividing life from non-life) in the above contiguous mechanism, include the 1926 theory of Vladimir Vernadsky who argues that "living matter" of the "biosphere" (sphere of life) is a type of "green fire" of stable compounds in a thermodynamics field living off of free energy; the 1970s views of Ilya Prigogine, who posits that living things are a far-from-equilibrium sort of Benard cell state or type of dissipative structure; to the 1990s views of Stuart Kaufman to argues that life is an auto catalytic reaction, able to complete one thermodynamic cycle, that somehow that 'catches fire'.

In any event, in summary, many newcomers to the subject of the "human molecule" will object to the definition of a human being as 'molecule' on the grounds that a human being has a soul (religious objection), that humans have internal crystalline structures, e.g. teeth enamel, hence the term molecule cannot be used (technical jargon objection), that living things have an atomic turnover rate of about 48-percent of structural atoms per year and thus cannot be a molecule (theoretical issue), or that a human cannot be a molecule because a person has a brain (conceptual issue), that a human cannot be a molecule because a human has consciousness, choice, and free will (educational issues), and so on. Whatever the objection, there is no doubt that humans are made purely of atoms, meaning that humans can be categorized as a type of chemical entity using whatever name one prefers, and that humans are reactive to each other, hence the subject of 'human chemical reactions' is a topic germane to human chemistry, and subsequently, study in this fields invariably leads one into the modern view that humans are simply reactive animate molecules moving about on a surface, which acts as catalyst, driven by cyclical heat input from the sun, just as is any heat engine driven or rather worked by the alternating contact of a hot body and cold body.

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11. (c) Stark, Werner. (1962). *The Fundamental Forms of Social Thought* (pgs. 240-41). Routledge & Kegan Paul.
(d) Wilson, Edward O. (1977). "Biology and Social Science", *Daedalus*, 106, 125.
(e) Ruse, Michael. (1984). *Sociobiology: Sense or Nonsense* (pg. 192). Springer.

12. Oparin, Alexander. (1936). *The Origin of Life* (introduction and translation: Serguis Morgulis) (pdf) (pg. 45). Dover, 2003.

θΔics

In physics, **uncertainty principle** (TR:64), or "Heisenberg uncertainty principle", a type of commonly used ontic opening argument, states that it is impossible to simultaneously measure both the position and the momentum of a particle or in equation form:

$$\Delta x \, \Delta p \gtrsim h$$

which states that the product of the variation in position Δx and the variation in momentum Δp of a particle will be greater than or equal to Planck's constant h.

American physicist Arthur Compton and German physicist Werner Heisenberg, two early promoters and or commentators of "indeterminism" via the uncertainty principle (1927).

History

The uncertainty principle was first presented by Werner Heisenberg in his 1927 paper "On the Perceptual Content of Quantum Theoretical Kinematics and Mechanics". [1] In his 1930 *The Physical Principles of the Quantum Theory*, Heisenberg stated the following: [4]

> "The resolution of the paradoxes of the atomic physics can be accomplished only by renunciation of the old and cherished ideas. Most important of these is the idea that natural phenomena obey exact laws—the principle of causality."

In 1935, American physicist Arthur Compton, in his *The Freedom of Man*, cited this passage, alluding to the notion that it makes the model of Laplacian determinism, as captured in Laplace's demon model of the universe, seem "less and less probable" to some physicists. [5]

Free will | Pro

In 1927, Canadian-born American physiologist Ralph Lillie published his "Physical Indeterminism and Vital Action", wherein he used the uncertainty relation to argue for a neurological based free will, namely that deliberate actions of the organism, in particular humans, are non-deterministic at the neurological level and hence subsequently at the psychic-choice level. [6]

English physicist Arthur Eddington, in his 1927 Gifford lecture turned 1928 book *The Nature of the Physical World*, supposedly, was the first invoked Heisenberg's newly published uncertainty principle, which Eddington called the "principle of indeterminancy", in support of free will or human freedom or to argue that the universe is indeterministic, or something along these lines; a switch from his previous Gifford Lectures position, wherein he stated that he saw nature as being deterministic. [2] Specifically, in his chapter fourteen "Causation", of the revised book, he gives the following opening synopsis: [3]

> "Like most other people, I suppose, I think it incredible that the wider scheme of nature which includes life and consciousness can be completely predetermined; yet I have not been able to form a satisfactory conception of any kind of law or causal sequence which shall be other than deterministic. It seems contrary to our feeling of the dignity of the mind to suppose that it merely registers a dictated sequence of thoughts and emotions; but it seems equally contrary to its dignity to put it at the mercy of impulses with no causal antecedents. I shall not deal with this dilemma. Here I have to set forth the position of physical science on this matter so far as it comes into her territory. It does come into her territory, because that which we call human will cannot be entirely dissociated from the consequent motions of the muscles and disturbance of the material world. On the scientific side a new situation has arisen. It is a consequence of the advent of the

quantum theory that *physics is no longer pledged to a scheme of deterministic law*. Determinism has dropped out altogether in the latest formulations of theoretical physics and it is at least open to doubt whether it will ever be brought back.

The foregoing paragraph is from the manuscript of the original lecture delivered in Edinburgh. The attitude of physics at that time was one of indifference to determinism. If there existed a scheme of strictly causal law at the base of phenomena the search for it was not at present practical politics, and meanwhile another ideal was being pursued. The fact that a causal basis had been lost sight of in the new theories was fairly well known; many regretted it, and held that its restoration was imperative.*

* A few days after the course of lectures was completed, Einstein wrote in his message on the Newton Centenary, "It is only in the quantum theory that Newton's differential method becomes inadequate, and indeed strict causality fails us. But the last word has not yet been said. May the spirit of Newton's method give us the power to restore unison between physical reality and the profoundest characteristic of Newton's teaching — strict causality." (*Nature*, 1927, March 26, p. 467.)

In rewriting this chapter a year later I have had mingle with this attitude of indifference an attitude more definitely hostile to determinism which has arisen from the acceptance of the principle of indeterminancy."

This paragraph was one of the seeds that supplanted into the mind of American physicist Robert Doyle the puzzle of the question of "free will" viewed in the context of quantum mechanics and thermodynamics, as the Eddington text was part of his 1958 undergraduate course on the philosophy of physics, taught by Bruce Lindsay; the result of which was Doyle's collection of 150 books on free will, eventual launching of his 2002 cite InformationPhilosopher.com, and summary 2011 book *Free Will: the Scandal in Philosophy*. [2]

Free will | Con

In 1935, Polish-born American physical chemistry based physiologist Selig Hecht (1892-1947) published his "The Uncertainty Principle and Human Behavior", wherein he outlined the main arguments for why human actions are mechanistically determined, citing laboratory experimental evidence as a basis for his argument. [7]

Ontic openings

The uncertainty principle, according to Swedish theorist Erland Lagerroth, has been classified as an "ontic opening", owing to its multifarious usage in arguing for things such as free will or the existence of God.

Advertising/Marketing theory

English marketing physicist Dan Cobley notably has used the uncertainty principle to explain some of the fundamentals of branding, in what seems to be a stretched analogy, so to speak.

A humorous take on the overuse and often misaligned use of the **Heisenberg uncertainty principle** in the humanities.

Quotes

The following are related quotes:

"The **Heisenberg principle** is irrelevant to ethical questions, particular the question of human freedom. For a concise and excellent discussion of the Heisenberg principle and its irrelevance to ethics, see: Lewis Beck's 1952 *Philosophical Inquiry*."

— George Strodach (1963), "Introduction" to *Epicurus: the Art of Happiness* [7]

References

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2. (a) Arthur Eddington – InformationPhilosopher.com.
(b) Doyle, Bob. (2011). *Free Will: the Scandal in Philosophy* (pgs. xvii). I-Phi Press.
3. Eddington, Arthur. (1928). *The Nature of the Physical World* (pgs. 293-95). Cambridge University Press.
4. Heisenberg, Werner. (1930). *The Physical Principles of the Quantum Theory* (pg. 62). Publisher.
5. Compton, Arthur H. (1935). *The Freedom of Man* (pg. 6). Yale University Press.
6. Lillie, Ralph S. (1927). "Physical Indeterminism and Vital Action", *Science*, 46: 139-44.
7. (a) Hecht, Selig. (1935). "The Uncertainty Principle and Human Behavior", *Harper's Magazine*, Jan.
(b) Compton, Arthur H. (1935). *The Freedom of Man* (pg. 56-58). Yale University Press.
(c) Wald, George. (1991). "Selig Hecht: A Biographical Memoir", *National Academy of Sciences*.
7. (a) Beck, Lewis. (1952). *Philosophical Inquiry* (pgs. 143-47). Publisher.
(b) Strodach, George. (1963). *Epicurus: the Art of Happiness* (Introduction, pgs. 71, 199). Penguin.

External links

â— Uncertainty principle – Wikipedia.

θΔics

In thermodynamics, **uncompensated transformation** is a transformation which thus remains at the conclusion of a cyclical process without another opposite one, and which can only be positive. [1] The logic behind this term was a significant precursor to the conept of entropy and the second law of thermodynamics.

In the 1920s, Belgian chemist Theophile de Donder incorporated Clausius' logic of the uncompensated transformations into a chemical reaction formalism of the second law through the concept of affinity. [2]

References

1. Clausius, R. (1865). *The Mechanical Theory of Heat – with its Applications to the Steam Engine and to Physical Properties of Bodies*, (pgs. 133), (URL). London: John van Voorst, 1 Paternoster Row. MDCCCLXVII.
2. (a) Kondepudi, Dilip and Prigogine, Ilya. (1998). *Modern Thermodynamics – from Heat Engines to Dissipative Structures*, (keyword: "uncompensated transformation", pg. 86). New York: John Wiley & Sons.
(b) Kondepudi, Dilip. (2008). *Introduction to Modern Thermodynamics*, (keyword: "uncompensated transformation", pgs. 118-20). John Wiley and Sons.

θΔics

In genius studies, **underrated geniuses**, as compared to "overrated geniuses", refers to geniuses, culturally or colloquially speaking, that do not tend rated as high as they should be rated; geniuses who tend to not have enough representation in the top 1000 geniuses rankings.

Overview

In 2014, Tom Siegfried, in his "Top Ten Unsung Geniuses", gave the following list of underrated geniuses, in the fields of mathematics and science: [1]

1. Emmy Noether (1882-1935)
2. Emile Borel (1871-1956)
3. William Clifford (1845-1879)
4. Adolphe Quetelet (1796-1874)
5. Mary Somerville (1780-1872)
6. Antoine Parent (1666-1716)
7. Thomas Harriot (c.1560-1621)
8. Nicole Oresme (c.1320-1382)
9. Robert Grosseteste (c.1170-1253)
10. Brahmagupta (598-c.670)

The check mark indicates the individual has been added to the top 1000 genius rankings.

See also

- Forgotten genius

References

1. Siegfried, Tom. (2014). "Top Ten Unsung Geniuses" (Q), Nautilus, Oct 16.

θΔics

In Hmolpedia, **unfiled pages (double)** are editable versions of missing pages; since the 7 Feb 2018 hack of four missing header pages: hmolscience, pioneers, atheism, and MailCubes, resulting in the inoperation of all of the subpages, previously filed below these four header pages.

θΔics

In Hmolpedia, **unfiled pages** is a header page for newly-written stubs or articles that are not yet categorized, into the Hmolpedia filling system, classification, and category tables. These are listed in the dropdown menu, adjacent.

The pages currently listed in the adjacent dropmenu, via order of creation, span from Alan Lightman (1 Mar 2012) to Thomas Nagel (19 Mar 2014).

θΔics

In Hmolpedia, **unfiled pages** is a header page for newly-written stubs or articles that are not yet categorized, into the Hmolpedia filling system, classification, and category tables. These are listed in the dropdown menu, adjacent.

θΔics

In science, a **unit** is one of a number of agreed upon forms of measurement for describing amounts of quantities. There are three categories of units: base units, supplementary units, or derived units. The system of agreed upon units in science is what is called the system international (SI) unit system, which is comprised of seven base units: mass (kg), length (m), (s), amount of substance (timemol), electric current, (A), temperature (K), and luminous intensity (cd). [1]

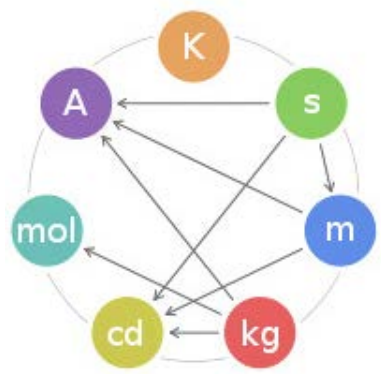

Relationship diagram of the seven standard SI **base units**.

History

The introduction, usage, and uniformication of units in the history of science has a long and tattered history.

s: (add)
m: (add)
kg: (add)
cd: (add)
A: (add)

K: The absolute temperature scale was introduced in 1848 by Scottish physicist William Thomson, in which –273 ° C was determined to be the lowest possible temperature achievable at which point a gas was said to have zero volume. [3] In 1850, Thomson's scale began to be employed in the formulation of the newly forming science of thermodynamics by German physicist Rudolf Clausius; and in 1854, through a bit of derivation and argument, Clausius assigned Thomson's thermodynamic scale with the name "absolute temperature". In 1866, for his year previous work in laying the transatlantic telegraph cable, Thomson was knighted as "Baron Kelvin" of Largs by Queen Victoria, after which, to the lay public, he became known as "Lord Kelvin". Into the late 1890s, such as found in *Pears Cyclopaedia* (1897), the unit of '° K' was in use, being referred to as the "Kelvin temperature scale" or "Kelvin's absolute scale of temperature", among other variants. [4]

mol: The term 'mol' was first used in 1895 by German physical chemist Walther Nernst, a truncation of the 1893 term gram-molecule, used by German physical chemist Wilhelm Ostwald. [2] Etymologically, supposedly, the term derives from the German *mol*, meaning small mass.

Thermodynamic quantities

In thermodynamics, there are various "quantities" each being a type of derived unit made of base units. The five principle quantities are the energy *U*, entropy *S*, volume *V*, temperature *T*, and pressure *P* of a body. Quantities can be either "intensive", defined uniquely per point in space, or "extensive", proportional to the dimension of the system.

Relationship table

The following table, from the 1976 US National Bureau of Standards, shows relationships between the SI units with names, supplementary units, namely plane angle (rad) and solid angle (sr), and derived units with special names: [1]

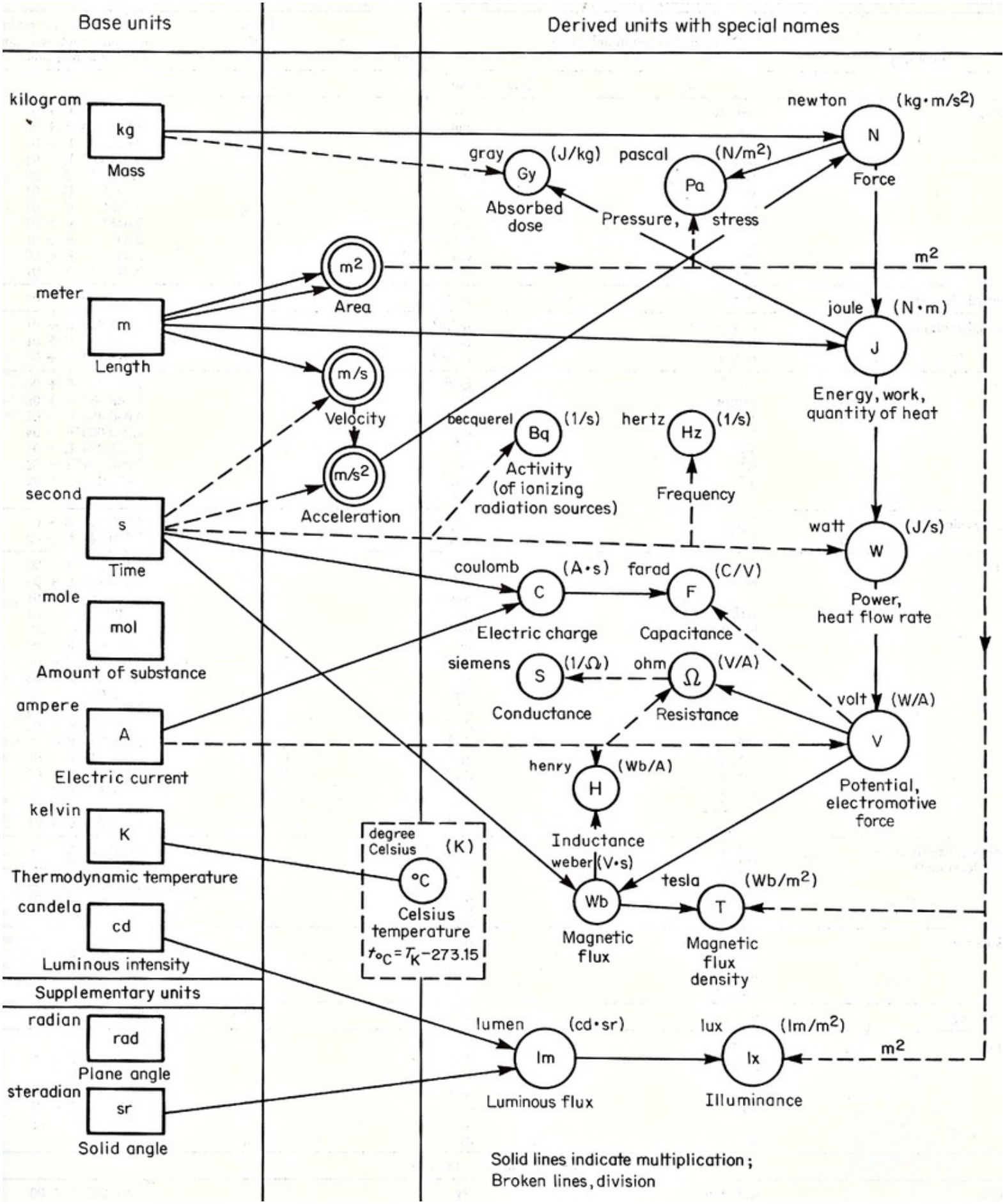
Base units
Derived units with special names
kilogram
kg
Mass
meter
m
Length
second
s
Time
mole
mol
Amount of substance
ampere
A
Electric current
kelvin
K
Thermodynamic temperature
candela
cd
Luminous intensity
Supplementary units
radian
rad
Plane angle
steradian
sr
Solid angle
m2
Area
m/s
Velocity
m/s2
Acceleration
newton
(kg·m/s2)
N
Force
gray
(J/kg)
Gy
Absorbed dose
pascal
(N/m2)
Pa
Pressure, stress
joule
(N·m)
J
Energy, work, quantity of heat
becquerel
(1/s)
Bq
Activity (of ionizing radiation sources)
hertz
(1/s)
Hz
Frequency
watt
(J/s)
W
Power, heat flow rate
coulomb
(A·s)
C
Electric charge
farad
(C/V)
F
Capacitance
siemens
(1/Ω)
S
Conductance
ohm
(V/A)
Ω
Resistance
volt
(W/A)
V
Potential, electromotive force
henry
(Wb/A)
H
Inductance
degree Celsius
(K)
°C
Celsius temperature
t°C = TK − 273.15
weber
(V·s)
Wb
Magnetic flux
tesla
(Wb/m2)
T
Magnetic flux density
lumen
(cd·sr)
lm
Luminous flux
lux
(lm/m2)
lx
Illuminance
m2
Solid lines indicate multiplication;
Broken lines, division

See also

â— Unitless thermodynamics

References

1. (a) Perry, John H. (1984). *Perry's Chemical Engineers' Handbook* (pg. 1-3). McGraw-Hill.
(b) US National Bureau of Standards (1976), LC 1078, December.
2. (a) Nernst, Walther. (1895). *Theoretical Chemistry: from the Standpoint of Avogadro's Rule & Thermodynamics.* MacMillan and Co.
(b) Ostwald, Wilhelm. (1893). *Hand- und Hilfsbuch zur ausführung physiko-chemischer Messungen* (*Handbook and Support for Making Physico-Chemical Measurements*). Leipzig. p.119.

External links

â— SI base unit – Wikipedia.

θΔics

In thermodynamics, **unitless thermodynamics** is the use of thermodynamic formula or variables, stripped of SI units, but instead used with new units, no units, or some other situationally-based choice of units.

Individuals in this obscure and very questionable group include: American electrical engineer Claude Shannon (1948), who infamously choose to measure entropy in bits, Nikos Salingaros (1997), Australian environmental chemist Ivan Kennedy (2001), and Israeli physical chemist Arieh Ben-Naim (2007-2010) who argues that the entire SI unit system should be reformulated, e.g. with a new version of absolute temperature a new Planck's constant among other outlandish ideas, all in the name of replacing the joules per kelvin per mol units of entropy with units of bits.

Kennedy's version of "biothermodynamics", which he claims it to be, is the prime example of unitless thermodynamics, wherein he introduces the concept of 'action', which he defines as a unitless thermodynamic property related to entropy, resulting from impulses of energy on matter producing force, based on the sole principle of the conservation of momentum, and uses this a unifying concept to make a so-called unified theory. [1]

References

1. Kennedy, Ivan R. (2001). *Action in Ecosystems: Biothermodynamics for Sustainability* (ch. 4: Action Thermodynamics, pgs. 65-98). Research Studies Press.

θΔics

In terms, **universal**, or "universality", refers to a thing, principle, rule, or law, which holds throughout the universe.

Quotes

The following are related quotes:

> "A gravity-like force of attraction is now as **universal** in the political as in the philosophical world."
>
> — John Desaguliers (1728), *The Newtonian System of the World* [2]

> "The **universality** of the relationships of thermodynamics eliminates an "artificial" distinction between the animate and the inanimate, and thereby enables one to see the world as a single thing."
>
> — Donald Haynie (2001), *Biological Thermodynamics* [1]

See also

- Universal flood
- Universal genius
- Universal gravitation law
- Universal morality
- Universal rule
- Laws of the universe

References

1. (a) Haynie, Donald. (2001). *Biological Thermodynamics* (animate, pgs. 297, 316). Cambridge University Press.
(b) Haynie, Donald. (2008). *Biological Thermodynamics* (pg. 330). Cambridge University Press.
2. (a) Desaguliers, John T. (1728). *The Newtonian System of the World: the Best Model of Government - an Allegorical Poem* (§:dedication). A. Campbell.
(b) Ball, Philip. (2016). "Describing People as Particles Isn't Always a Bad Idea: Using Physics to Describe Social Phenomena Can Work – If It's the Right Physics" (Q), *Nautilus*, Feb 11.

θΔics

In existographies, **universal flood**, aka global flood or "flood myth", refers to a large number of great deluges, all of which derive from the annual Nile River flood (see: Noah's flood), a phenomenon occurring annual in Egypt, wherein, owing to the melting of snow in the Ethiopian mountains, waters would rise three stories in height, covering entire islands and homes, lasting for 150 days.

Quotes

The following are related quotes:

> "Because the sea could not rise fifteen cubits, or one-and-twenty standard feet and a half, above the highest mountains, without leaving its bed dry, and, at the same time, violating all the laws of gravity and the equilibrium of fluids, which would evidently require a miracle."
>
> — Voltaire (1764), *Philosophical Dictionary* (§:Deluge) [1]

> "Because the physical impossibility of a universal deluge, by natural means, can be strictly demonstrated. The demonstration is as follows: All [72] the seas cover half the globe. A common measure of their depths near the shores, and in the open ocean, is assumed to be five hundred feet. In order that they might cover both hemispheres to the depth of five hundred feet, not only would an ocean of that depth be necessary over all the land, but a new sea would, in addition, be required to envelop the ocean at present existing, without which the laws of hydrostatics would occasion the dispersion of that other new mass of water five hundred feet deep, which should remain covering the land. Thus, then, two new oceans are requisite to cover the terraqueous globe merely to the depth of five hundred feet. Supposing the mountains to be only twenty thousand feet high, forty oceans, each five hundred feet in height, would be required to accumulate on each other, merely in order to equal the height of the mountains. Every successive ocean would contain all the others, and the last of them all would have a circumference containing forty times that of the first."
>
> — Voltaire (1764), *Philosophical Dictionary* (§:Deluge) [1]

See also

- God character equivalents

References

1. (a) Voltaire. (1764). *Philosophical Dictionary* (§:Deluge) (txt). Publisher.
(b) Joshi, Sunand T. (2014). *The Original Atheists: First Thoughts on Nonbelief* (pg. 54). Prometheus Books.

External links

- Flood myth – Wikipedia.
- Genesis flood narrative – Wikipedia.
- List of flood myths – Wikipedia.

θΔics

In intelligence rankings, **universal genius** is a term used to signify a genius, polymath, or person with a great or varied learning, albeit to a heightened degree, with a near universal grasp of knowledge, in possession of a mean IQ of 195 range (mean IQs of those listed below) or at a minimum an IQ of 170, of which there are about a dozen known. [1]

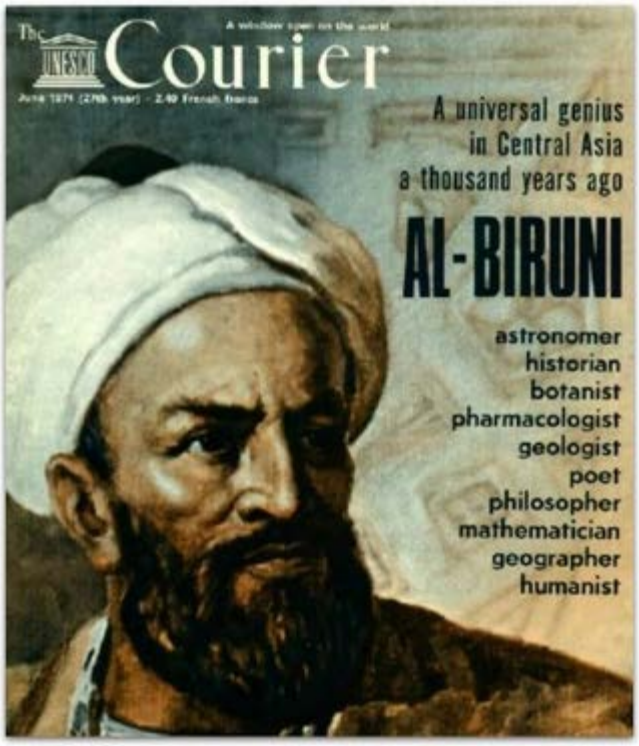

A 1974 cover story article on Iranian polymath Abu Al-Biruni, who is described as a **universal genius**, for his his multifarious work in astronomy, history, botany, pharmacology, geology, poetry, philosophy, mathematics, geography, and comparative religion, and the humanities. [2]

The following page lists the known group of people called "universal geniuses", the foremost example being Leonardo da Vinci, to whom it seems this term was first invented, since becoming his tag line, so to speak, along with: Gottfried Leibniz, Johann Goethe, Hermann Helmholtz, Emanuel Swedenborg, Albert Einstein, John Neumann, Benjamin Franklin, Homer, Richard Wagner, and Abu Al-Biruni, Hypatia, among others (a work in progress).

The following is the list of the known and cited-to-be "universal geniuses", in chronological order, according to year of reaction end (death):

Homer (800-701BC)

> "Goethe was a **universal genius** such as even Greece had not known, except perhaps (who can say?) in Homer."
>
> — Humphry Trevelyan (1981), *Goethe and the Greeks* [11]

> "Temple praises Homer as 'the greatest **universal genius**'."
>
> — Kirsti Simonsuuri (2010), *Homer's Original Genius* [16]

Hypatia (350-415)

> "In Fact, the only woman acknowledged as a **universal genius** [is] Hypatia, a somewhat obscure and mysterious woman of ancient times."
>
> — Julie Creech (c.2005) [16]

Abu Al-Biruni (973-1048)

> ● Gafurov, Bobojan. (1974). "Al-Biruni: A Universal Genius in Central Asia a Thousand Years Ago", *Courier* (pgs. 4-9), Jun.

Da Vinci (1452-1519)

> "That '**universal genius**'
> Leonardo da Vinci, as Freud

called him, had enlisted Freud's interest years before he ventured to write on 'this great and mysterious man'."

> — Peter Gay (1964), "Introduction" to *Sigmund Freud: Leonardo da Vinci and a Memory of His Childhood* [30]

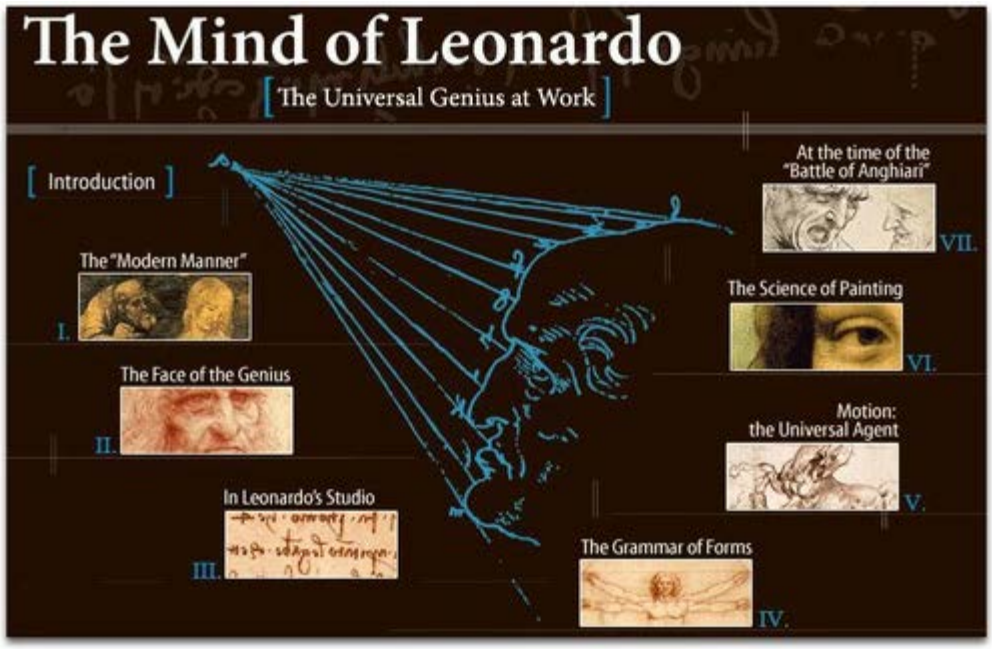

An online/book/museum showcase of the mind of Leonardo Da Vinci, at the Institute and Museum of the History of Science, Florence, Italy. [31]

"Freud had long been fascinated by the enigma which represented for a psychoanalyst the life and work of the universal genius of the Renaissance that was Leonardo da Vinci. His study of Leonardo, written in 1910, enabled Freud to introduce several fundamental psychoanalytic concepts such as sublimation and narcissism and to describe a particular type of homosexuality."

> — Jean-Michel Quinodoz (2005). *Reading Freud: A Chronological Exploration of Freud's Writings* [32]

- Silvestri, Paolo de. (2009). *Leonardo or the Universal Genius*. ATS Italia Editrice.
- Leonardo da Vinci: Universal Genius (BBC, 2007) – YouTube.

Erasmus (1466-1536)

"Erasmus was a man of **universal genius** whose rare capacities would have surfaced in any age and under any circumstances."
— Daniel Robinson (1995), *An Intellectual History of Psychology* (pg. 137)

Leibniz (1646-1716)

> "The trend towards the already mentioned diversified society of 'specialists' and the related danger of narrower way of thinking (idiot savant) necessarily leads to a growing helplessness of the individual. Related to this is a growing blind belief in science. Since Leibnitz, probably the **last universal genius**, we know more and more about a shrinking area of knowledge. Biology and physics, chemistry and medicine are divided already today into dozens of individual disciplines, which like a 'hydra', keep dividing into other individual disciplines."
>
> — Hans-Wolff Graf (1995), "We Need a New World View" [21]

A Leipzig University stature of Gottfried Leibniz and "**universal genius**" caption (link).

"Leibniz was maybe the **last universal genius** incessantly active in fields of theology, philosophy, mathematics, physics, engineering, history, diplomacy, philology and many others."

— K. Eriksson (1996), *Computational Differential Equations* [20]

"Having already postulated differential and integral calculus by the time he visited Spinoza at The Hague, Leibniz spent the next several years of his life developing theories of knowledge and truth that resulted in hundreds of essays and dozens of key encounters with other thinkers that in turn spurred them on to great discoveries and formulations. In his time a belief arose that he was the **last universal genius**, a judgment made about Goethe that the great minds of Europe were to make three generations later."

— Larry Peer and Diane Hoeveler (1998), "A Lens for Comparative Romanticisms" [22]

"Remarkable for his encyclopedic knowledge and diverse accomplishments outside the fields of philosophy and mathematics, he was perhaps the **last universal genius**, spanning the whole of contemporary knowledge."

— Staff (2003). *The Houghton Mifflin Dictionary of Biography* [12]

"Remembered for his philosophy of 'preestablished harmony' on one hand and his bitter feud with Isaac Newton of the invention of calculus on the other, Leibniz was, according to one modern writer, the '**last universal genius**.' His famous claim that this is the 'best of all possible worlds', was later ridiculed by Voltaire in *Candide*."

— Alan Cutler (2004),*The Seashell on the Mountaintop* [13]

"Leibniz was one of the greatest geniuses in the history of human thought, perhaps the **last universal genius**."

— Peter Kreeft (2009), *Socrates Meets Kant* [14]

"Many consider Gottfried Leibniz history's last universal genius, a walking encyclopedia of the already-known and inventor of the radically new who juggled so many ambitious projects that he designed a chair in which he could both sleep and work, so as to not waste a minute moving from one location to another."

— Jeffrey Tlumak (2013), *Classical Modern Philosophy* [19]

● The Universal Genius: Gottfried Leibniz (quote: "known as the **last universal genius**") (2010) – The Philosopher's Zone, ABC.net.
● Leibniz: Universal Genius: Inventor of Calculus and Binary systems – by Jürgen Schmidhuber, Dalle Molle Institute for Artificial Intelligence.

Swedenborg (1688-1772)

● Groll, Ursula. (2011). "Swedenborg: a Universal Genius", lecture, Swedenborg Center, Apr 1.

Haller (1708-1777)

"A poet, anatomist, physiologist, botanist, and doctor. Thoughout his life, he continued to do research and to publish in his various fields. Like Leibniz before him, he was known, even in his own time, as 'the **last universal genius**'."

— William Youngren (2003), *C.P.E. Bach and the Rebirth of the Strophic Song* [26]

Franklin (1706-1790)

● Morison, Sameul E. (1959). "Ben Franklin: the Universal Genius", address upon the occasion of the publishing of Volume 1 of Labaree ed. Papers of Benjamin Franklin, at New Haven, Nov 22.
● Lemay, J. A. Leo. (date). "Benjamin Franklin: Universal Genius", *The Renaissance Man in the Eighteenth Century*, Publisher.

Goethe (1749-1832)

"Scholars agree that Goethe was the **last universal genius**: practically nothing within reach of the human mind escaped his attention."

— Walter

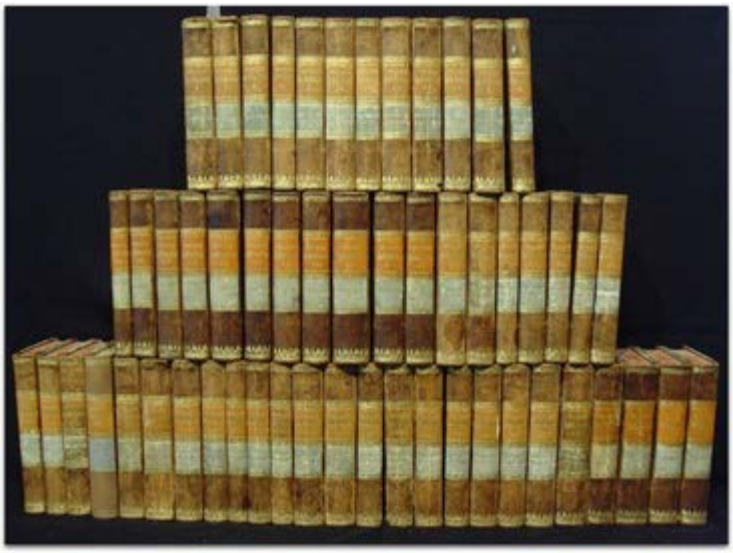

German polymath Johann Goethe had a 5,000 book personal library,

Wadepuhl (1932), *Goethe's Interest in the New World* [3]

142 volumes comprise the entirety of his literary output, on topics ranging from: poetry, botany, chemistry, zoology, anatomy, physics, mathematics, nearly every topic, astronomy aside, and he currenty ranks second behind Shakespeare according to WorldCat library holdings.

"The middle of the eighteenth century witnessed the first powerful revolt against cultural tradition, which is marked by Rousseau. This tradition was restarted by **universal genius** Goethe. But it was restarted for the last time. Goethe had not been succeeded by another universal genius. He had a very clear consciousness of belonging to this tradition. He pointed to Homer, to Plato, to Aristotle, and to the Bible as its foundations. He was stepping into the shoes elders, many of whom he thought greater than himself. History was to him a sequence of great minds which commanded respect and loyalty. Viewed in the light of the present, he seems to be nearer to Dante and to Shakespeare than to us. He is the last link of that golden chain. Yet he is not too remote from us. We can still grasp that link."

— Ernst Curtius (1949), "The Medieval Bases of Western Thought" [24]

"We often hear that Goethe was the last man in the world who was a universal genius. By this it is meant that he can be compared with a figure of the Renaissance such as Leonardo da Vinci. To me it never seems that Goethe fills happily the role of modern Leonardo. He is called the **last universal genius**, of course, because it is impossible to think of anyone born after his time acquiring so much knowledge in so many fields. After his time, no man could be poet, administrator and man of science."

— Stephen Spender (1950) [10]

"Goethe is often referred to as the last polyhistorian, and is considered the **last universal genius** with far-reaching interests and the ability to be creative in the most diverse fields. These few giants mark the end of what could be called the Renaissance genius."

— Walter Sorell (1970), *The Duality of Vision: Genius and Versatility in the Arts* [25]

"Goethe comes as close to deserving the title of a **universal genius** as any man who has ever lived."

— Sterling Brown (1973)

“Goethe was a **universal genius** such as even Greece had not known, except perhaps (who can say?) in Homer.”

— Humphry Trevelyan (1981), *Goethe and the Greeks* [11]

“To us, Goethe seems an end rather than a beginning: the **last universal genius** capable of embodying a tradition stretching from the dawn of Greek civilization to his own day; the last man in history able to take all learning for his province; the last incarnation of the humanistic ideal of harmonious individual development.”

— Gustaf Cromphout (1990), *Emerson’s Modernity and the Example of Goethe* [29]

“Goethe needed to assert himself as an *Universalgenie* (Sengle repeatedly debunks this to his mind pernicious myth) because of Weimar’s political and geographical position, because of his profession as a courtier, because of his literary and position; the only explanation not offered is that he had a genuine interest in the full range of his activities.”

— Jane Brown (1992), ““Book Review: Sengle, Friedrich, *Neuses zu Goethe: Essays und Vortrage*” [23]

“Having already postulated differential and integral calculus by the time he visited Spinoza at The Hague, Leibniz spent the next several years of his life developing theories of knowledge and truth that resulted in hundreds of essays and dozens of key encounters with other thinkers that in turn spurred them on to great discoveries and formulations. In his time a belief arose that he was the **last universal genius**, a judgment made about Goethe that the great minds of Europe were to make three generations later.”

— Larry Peer and Diane Hoeveler (1998), “A Lens for Comparative Romanticisms” [22]

“Since my method is juxtaposition, I delight in bringing together **universal genius** Goethe, with Sigmund Freud, Samuel Johnson, and Thomas Mann.”

— Harold Bloom (2002), *Genius: A Mosaic of One-Hundred Exemplary Creative Minds*

● Donat, Sebastian. (2004). *Goethe: A **Last Universal Genius**?* Munchen: Wallstein.

Humboldt (1769-1859)

“Humboldt's apartment on Oranienburger Strasse 67 in Berlin was the first think tank of the world. From here, he built a network including all great scientists of the time using pen and paper - he left more than 50,000 letters. Humboldt is the most recognized **universal genius** in intellectual history, the first to see the world as a whole: He discovered that all aspects of the world are intertwined.”

— *The Atlantic Times* (2009), "The Conqueror with a Butterfly Net" [18]

A photo of **universal genius** Alexander Humboldt (IQ=185) reading in his personal library. [18]

Wagner (1813-1883)

● Seung, T.K. (2006). *Goethe, Nietzsche, and Wagner: their Spinozan Epics of Love and Power* (universal genius, pg. 280). Lexington Books.

Helmholtz (1821-1894)

"The matter of multiplicity of contributors needs no great explanation, for we are all used to this in the modern handbooks. I believe it is a common saying that Helmholtz was the **last universal genius**, and we are fast arriving at the point where even a single subject becomes too vast for one man. At any rate, whether or not any of my learned colleagues could write an entire chemical engineering handbook, I could not—hence the present form."

— Donald Liddell (1922) *Handbook of Chemical Engineering*, McGraw-Hill [2]

"Helmholtz, on the other hand, achieved preeminent success within the scientific community. He is regarded by some as the **last universal genius**, the last Renaissance man."

— Harold Morowitz (1981), *The Wine of Life, and Other Essays on Societies, Energy, & Living Things* [27]

Rizal (1861-1896)

"Recently, Thomas L.U. Szenes, in a fine analysis of the phenomenon Rizal, called him the '**last universal genius**'. Szenes said: 'the Germans have a felicitous name for it—'Universalgenie', denoting an exceptional type of man who shows superior aptitude in whatever mental activity he chooses to pursue."

— Diosdado Capino (1982). *Stories on Rizal's Character, Teachings, Examples* [28]

Pioncare (1854-1915)

"The earliest work in radar polarimetry is found in the early 1950s [Sinclair, 1950]. The theory was inspired by the work of Stokes [Stokes, 1852] and of the '**last universal genius**' Poincare [1989], both of whom laid the basis for a unified formalism for electromagnetic waves, regardless of their state of polarization."

— Massonnet Didier and Jean-Claude Souyris (2008), *Imaging with Synthetic Aperture Radar* [15]

Einstein (1879-1955)

● Whitaker, Andrew. (2006). *Einstein, Bohr, and the Quantum Dilemma: from Quantum Theory to Quantum Information* (§: Albert Einstein: universal genius, pg. 6-). Cambridge University Press.
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Neumann (1903-1957)

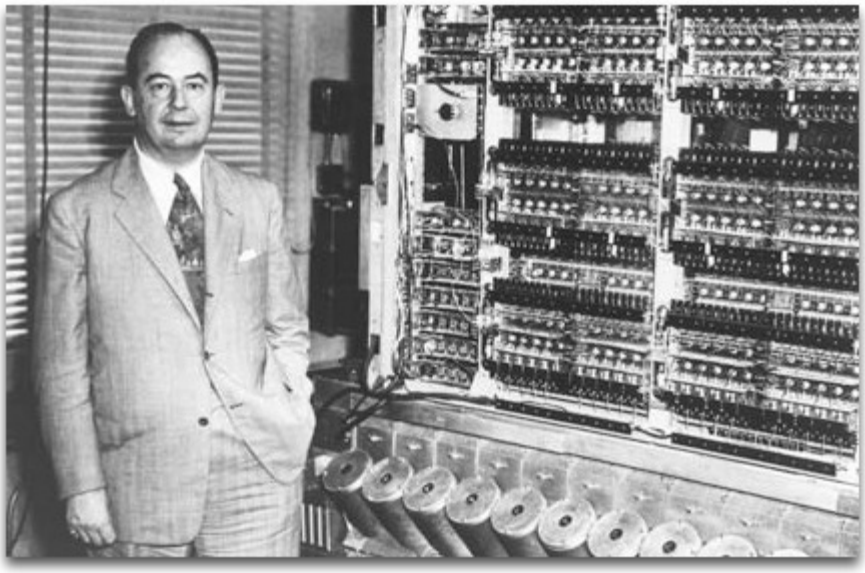

Universal genius John Neumann with the stored-program computer at the Institute for Advanced Study, Princeton, New Jersey, in 1945.

"The most radically diverse thinker of the twentieth century was a mathematician: the Hungarian John von Neumann. He quite consciously cultivated this diversity, which led him apparently effortlessly from mathematical logic to quantum physics or from hydrodynamics to meteorology. At times it seems that he directed his interest towards a new field precisely because it was different than anything he had ever done before. For this reason, it would have greatly fascinated him that two completely separate fields, which eh created, have grown together in a surprisingly natural way. First, there is game theory, which he (and his Austrian friend, Oskar Morgenstern) created as a tool for economics. Second, there are the models for artificial life, which his Polish friend, Stanislav Ulam, suggested and for which von Neumann designed, using cellular automatons. This method of combining abstract biology and theoretical economics only became viable with the development of computers, which as is well known, von Neumann influenced more than anybody else. This rounds off the portrait of a **universal genius** comparable only to Leonardo or Leibniz."

— Karl Sigmund (2005), "Game Theory and Artificial Life" [7]

"As soon as brilliant people invented the computer, other brilliant people made it better. One of these was John Neumann of the Institute for Advanced Study. Von Neumann was a **universal genius**. Certain unsolved problems of the ENIAC entranced him, and he wrote out a paper laying out what he believed should be the 'architecture' or logic of computers. This included a control to tell the computer what to do and when. Some have called him 'father of the computer'."

— James Davis (2004), *The Human Story* [8]

> “Von Neumann, a **mathematical universal genius**, was interested in the construction of models of living systems, in particular with respect to their ability of self-reproduction.”
>
> — Jeurgen Kleuver and Christina Kleuver (2011), *Social Understanding* [9]

Idiot savant syndrome | Discussion | 1950s-present

See main: Hydraism

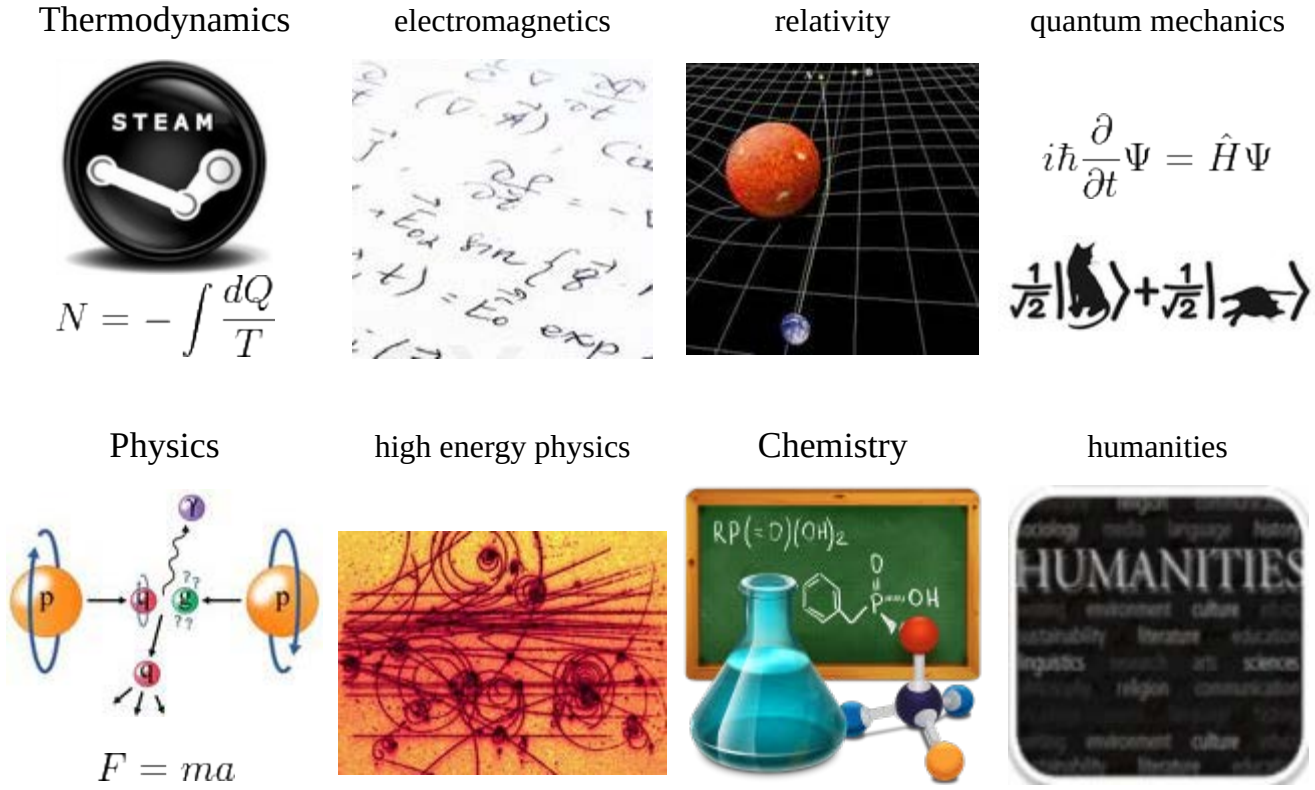

A sampling of the some of the main intellectual road blocks a "modern" universal genius needs to grapple with, in order to have a modern "universal' understanding of reality.

Chronologically, American chemical engineer and mathematician John Neumann, who met his reaction end in 1957, seems to be the "last" of the last known referred-to-as "last universal geniuses", although, to note, no actual citation of the specific term "last universal genius" + "Neumann" can be found. To requote, the following 1995 statement by German social economist Hans-Wolff Graf seems to well-situate the crux of the issue: [21]

> “The trend towards the already mentioned diversified society of **‘specialists’** and the related danger of narrower way of thinking (idiot savant) necessarily leads to a growing helplessness of the individual. Related to this is a growing blind belief in science. Since Leibnitz, probably the **last universal genius**, we know more and more about a shrinking area of knowledge. Biology and physics, chemistry and medicine are divided already today into dozens of individual disciplines, which like a ‘hydra’, keep dividing into other individual disciplines.”

The only other person that comes to mind, following Neumann, is American IQ:225+ cited, former child prodigy (as was Neumann), youngest-ever (age 13) winner of the international Physics Olympiad, thinker Christopher Hirata, noted for his age-17 written *circa* 2000 human chemical thermodynamics based "Physics of Relationships" theory; presently an astrophysics professor at Ohio State University, working on gravitational lensing, relativity, dark energy, and accelerating universe problems, among other topics on modern astronomy. Hirata is also listed, according to OnlineColleges.net., among “the 10 youngest PhDs of all time” (Neumann, similarly, simultaneously completed a BS in chemical engineering and PhD in mathematics at age 23). [33] Presently, however, Hirata has disassociated himself from relationship physics, and seems to now only confine himself to physical-astronomy problems.

Also, of note, the association of Einstein as a universal genius seems to be a misnomer or over-glorified label, being that

Einstein, generally speaking, give or take a few philosophical excursions, only excelled in one field, namely that of pure and applied mathematical physics (radiation thermodynamics and relativity), and notably failed entrance exams in other subjects, and also fumbled famously on the question of how to explain love in the context of modern chemistry and physics.

Last universal genius of "subjects"

See also: Last universal genius; Last person to know everything; Greatest physicist of all time

Of this universal geniuses (list below), only three: Leibniz (1646-1716), Goethe (1749-1832), and Helmholtz (1821-1894), the middle of these three in the most predominant manner, are frequently assigned the very rarefied epitaph of "last universal genius", as shown in bolded text format below, of which the mean IQ of this group is 207, which can be taken as the mean IQ for an archetype last universal genius. [17]

Of significant note, one who (since the 1980s) as been frequently called the "last universal physicist" is Enrico Fermi (1901-1954). [5] To exemplify, Emilio Segrè called Fermi "the last universal physicist in the tradition of great men of the 19th century" and "the last person who knew all of physics of his day". [6]

Quotes

The following are related quotes:

> "Universality is the distinguishing mark of genius. There is no such thing as a special genius, a genius for mathematics, or for music, or even for chess, but only a **universal genius**. The theory of special genius, according to which for instance, it is supposed that a musical genius should be a fool at other subjects, confuses genius with talent. There are many kinds of talent, but only one kind of genius, and that is able to choose any kind of talent and master it."
>
> — Otto Weininger (1903), *Sex and Character* [34]

> "Grotius, Leibnitz, Goethe, three **universal geniuses**, the evidence of whose overpowering intellect appeared and was recognized in earliest childhood as it was later in their youth, are doubtless among the greatest minds with whom this study is concerned. A minimum childhood IQ for these cannot be less than 180. A maximum is probably close to the maximum for the human race."
>
> — Catherine Cox (1926), *Early Mental Traits of Three Hundred Geniuses* (pg. 155)

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External links

- Universal genius (criteria) – Hypatia Society, PhotoFoxyGirl.Tripod.com.
- Goethe, Math & Universal Genius (2010) – Hmolpedia threads.

θΔics

In laws, **universal gravitation law**, aka “Newton’s law of universal gravitation”, is []

Overview

In c.1645, Ismael Bullialdus (1605-1694) wrote, without proof, that there was a force on the earth towards the sun.

In 1666, Giovanni Borelli, in his *Theory of the Motion of the Medicean planets [Moons of Jupiter] deduced from Physical Causes*, argued that the planets were revolving as a result of three forces. The first force involved the planets' desire to approach the sun. The second force dictated that the planets were propelled to the side by impulses from sunlight, which is corporeal. Finally, the third force impelled the planets outward due to the sun’s revolution. The result of these forces is similar to a stone’s orbit when tied on a string.

In Jan 1684, Edmond Halley, Christopher Wren, and Robert Hooke were engaged in an animated conversation, either over drinks before a roaring fire (Christianson, 1988), or at a coffee house in London (Ñº), on the topic of why planets traveled in ellipses, according to which, either Hooke or Halley, or both, depending on story, claimed to have solved the problem, via the theory that the inward force of attraction between planets and the sun must decrease in inverse proportion to the square of the distance between them. Wren, to settle the matter, offered them either a large sum or money or book worth forty shillings to whoever could come up with the mathematical means of proving their theory. Hooke, supposedly, claimed to have solved the problem, “but would conceal the solution for some time so that others trying and failing might know how to value it, when he should make it public.”

In Aug 1684, Wren went to Cambridge to see if Newton had the solution, the event of which, as recounted by French mathematician Abraham de Moivre, to whom Newton related the event in his later years, is as follows:

> “In 1684, Halley came to visit Newton at Cambridge, after they had been some time together, Halley asked him what he thought the curve would be that would be described by the planets supposing the force of attraction towards the sun be reciprocal to the square of their distance from it. Newton replied immediately that it would be an ellipsis; Hooke, struck with hoy and amazement, asked him how he knew it, to which Newton said that he had calculated it, whereupon Halley asked him for his calculation. Without any further delay, Newton looked among his papers, but could not find it, but he promised him to renew it, and send it.”

In 1686, Newton, in his *Principia*, citing Bullialdus and Borelli, the latter of whom whose book he had, stated that every point mass attracts every single other point mass by a force pointing along the line intersecting both points, wherein the force is proportional to the product of the two masses and inversely proportional to the square of the distance between them; stated formulaically as such:

$$F = G\frac{m_1 m_2}{r^2}$$

where F is the force between the two masses, G is the gravitational constant, m_1 is the first mass, m_2 is the second mass, and r is the distance between the centers of the two bodies.

Quotes | Related

The following are related quotes:

> “One must not think that this idea of Hooke diminishes Newton’s glory. The example of Hooke serves to show what a distance there is between a truth that is glimpsed and a truth that is demonstrated.”
>
> — Alexis Clairaut (1727), comment (Ñº) on review of what Hooke published

See also

â— Laws of motion

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External links

â— Newton's law of universal gravitation – Wikipedia.

θΔics

In philosophy, **universal morality** is a system of right, aka "Vita" arrival, in mythological-etymology speak, and wrong, aka "Mor" arrival, in mythological-etymology speak, defined according to universal operation, and or the laws of the universe; a system of morality defined universally.

A **universal morality** is a description of right and wrong or natural and unnatural according to the operation of the universe or laws of universal operation as they are known.

Overview

In 1711, Anthony Shaftesbury, in his *Characteristics of Men, Manners, Opinions and Times*, outlined some type of system of species within species universal moral goodness; the gist of which is as follows: [1]

> "**Shaftesbury**'s view of virtue is part of his larger view of goodness. Something is good, according to Shaftesbury, if it contributes to the "Existence or Well-being" of the system of which it is a part (C 2.18). Every animal is a part of its species. So a particular animal, say a tiger, is a good member of its species—it's a good tiger—if it contributes to the well-being of the tiger species as a whole. There is also "a system of all animals", which consists of the "order" or "economy" of all the different animal species (C 2.19). So a good animal is one that contributes to the well-being of "animal Affairs" in general (C 2.19). The system of all animals, moreover, works with the system "of Vegetables, and all other things in this inferior World" to constitute "one system of a Globe or Earth" (C 2.19). So something is a good earthly thing if it contributes to the existence of earthly things in general. And the system of this earth is itself part of a "Universal System" or "a System of all Things" (C 2.20). So to be "wholly and really" good a thing must contribute to the **good of the universe as a whole** (C 2.20). This progression of ever-larger systems is a bit dazzling, and we might wonder how we can know (or even make sense of) whether something is contributing to the well-being of the universe as a whole. But Shaftesbury avoids this problem by discussing in detail only that which makes "a sensible Creature" a good member of its species—by focusing on whether an individual creature is promoting the well-being of its species (C 2.21). Perhaps Shaftesbury believes that a creature that contributes to the well-being of its species will also always contribute to the well-being of the universe as a whole, in which case being a good member of one's species would be coextensive with being "wholly and really" good. The goodness or evilness of a sensible creature, according to Shaftesbury, is based on the creature's motives, and not simply on the results of the creature's actions (C 2.21–22). This leads to a crucial claim: every motive to action involves affection or passion (C 2.40–44). Reason alone cannot motivate (C 2.28–52, 77–81)."

In 1785, Immanuel Kant posited his so-called categorical imperative, the gist of which is: "act that your conduct may be taken as a universal law".

In 1809, Goethe, in his *Elective Affinities*, and later via commentary on this, stated that what is "moral" in nature and society is found within the moral symbols of affinity chemistry, aka physical chemistry, in modern speak, i.e. the laws of thermodynamics in root sense.

In 2011, Libb Thims, in his "Thermodynamic Proof that Good Always Triumphs over Evil", and later in his "Zerotheism for Kids" (2015) atheism class, explained, building on Goethe, how free energy and coupling theory explain natural from unnatural, whether in society or nature, in a universal sense, i.e. according to the combined law, as exergonic and endergonic, respectively, acts or processes.

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External links

â— Moral universalism – Wikipedia.

θΔics

In science, **universal rule** refers to the unification of the first law and second law of thermodynamics into a unified universal statement governing the operation of nature.

History

In circa 1770, German polymath Johann Goethe was the first to correctly dig out, search for, explicate, and uncover a "universal principle" permeating nature, chemical realm up through the human realm of affairs and doings. As he comments in book 20 of his autobiographical *From My Life: Poetry and Truth* (1813), regarding his pre 1775 years: [3]

> "I perceived something in nature (whether living or lifeless, animate or inanimate) that manifested itself only in contradictions and therefore could not be expressed in any concept, much less any word. It was not divine, for it seemed irrational; not human, for it had no intelligence; not diabolical, for it was beneficent; and not angelic, for it often betrayed malice. It was like chance, for it laced continuity, and like providence, for it suggested context. Everything that limits us seemed penetrable by it, and it appeared to dispose at will over the elements necessary to our existence, to contract time and expand space. It seemed only to accept the impossible and scornfully to reject the possible."

Universal Rule (1923)

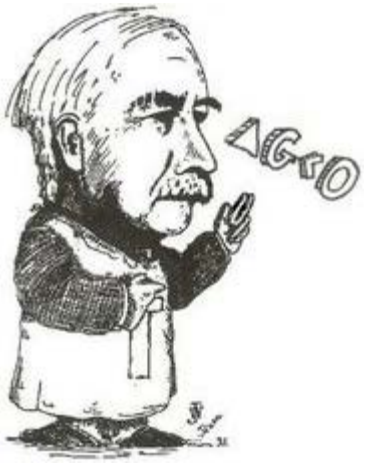

"It is a **universal rule** that if any isothermal process is to occur with finite velocity, it is necessary that:

$$\Delta F > w'$$

[This applies to] a chemical process which is in some way harnessed for the production of useful work. In the far more common case of a reaction which runs freely, like the combustion of a fuel, or the action of an acid upon a metal; in other words, systems which are subject to no external forces except a constant pressure [exerted by the atmosphere]. In such cases w' = 0, and it follows that no actual isothermal processes is possible unless:

$$\Delta F < 0$$

Therefore if we know the value of ΔF for any isothermal reaction, and if this value is positive, the we know that the reaction, in the direction indicated, is thermodynamically impossible. We may think of:

$$-\Delta F$$

as the driving force of a chemical reaction."

The "**universal rule**" of thermodynamics, as explained in 1923 by Gilbert Lewis, formulaically, using the F "Free" energy symbol characteristic function notation, and caricature form, using the modern G "Gibbs" free energy symbol notation, a rule with governs the "reactions which run freely" about us, as Lewis says, such as the "combustion of a fuel, the action of acid upon a metal", or the reactions that occur between people (human chemical reactions). [2]

It would take Goethe a little over three decades to solve this puzzle, namely to determine what exactly this "something" was, and by 1796 he began outlining his grand theory of how chemical affinity pervades and regulates the whole of existence on earth, chemical to the human romance and social affairs level of existence (see: Goethe timeline), publishing the final form of his theory in coded physical chemistry novella format, in his 1809 *Elective Affinities*; and shortly thereafter its tumultuous publication Goethe came under attack, as the principle presented therein go against the standard cultural morality system, and in confrontation on this he gave his final word on the matter:

> "The principle illustrated in the book is true."

Likewise, as summarized well by British artist Wolfe von Lenkiewicz, in 2011 comment on his oil on canvas rendition of Goethe's famed theory:

> “In 19th century chemistry, the term ‘elective affinities’ was used to describe chemical compounds that only interacted with each other under determined circumstances. The writer Goethe employed this as a **universal organising agent** agent running across human relationships and science. I was drawn to these ideas – which are now seen as degenerated methods in modern science – as relevant to language, and how we use it.”

To correct Lenkiewicz here, Goethe's theory of a universal chemical nature are not now seen as "degenerate methods in modern science", but rather, correctly, affinity was subsumed into chemical thermodynamics, through the 1882 "On the Thermodynamics of Chemical Processes" of German physicist Hermann Helmholtz, and the connecting equation, first derived in the work of Helmholtz, between Goethe's affinity version of his pervading nature theory is the Goethe-Helmholtz equation:

$$A = -\Delta G$$

which relates the driving forces, A, of a chemical process, such love or war, to the change in the Gibbs free energy ΔG of the system.

To continue, a few years prior to this, in 1865, German physicist Rudolf Clausius stated the the laws of the universe as follows: [1]

> "The energy of the universe is constant." | First main principle
>
> $$dQ = dU + dW$$
>
> "The entropy of the universe tends to a maximum." | Second main principle
>
> $$\int \frac{dQ}{T} \geq 0$$
>
> “If for the entire universe we conceive the same magnitude to be determined, consistently and with due regard to all circumstances, which for a single body I have called *entropy*, and if at the same time we introduce the other and simpler conception of *energy*, we may express in the [above] manner the **fundamental laws of the universe** which correspond to the two fundamental theorems of the mechanical theory of heat.”

In 1915, English physiologist William Bayliss, in his his *Principles of General Physiology*, restated these two universal laws in the form of one statement, which he says is applicable to both the chemical realm and the human realm. Specifically, he re-interpreted Wilhelm Ostwald’s 1912 energetic imperative (the thermodynamic imperative version of Kant's original 1785 categorical imperative), rather interestingly, having a decent grasp of the views of of the work of Willard Gibbs (available energy) and Hermann Helmholtz (free energy and bound energy), as not being solely based on the first law, but on both the first and second law, whereby the imperative should yield a rule is how one should act "morally" within the confines of universal rule, as follows:

> “It is plain that, of the energy contained in a system, only that part which can do work is of value. This principle was applied by Willard Gibbs (1878, pp. 216, etc.). Helmholtz (1882, p. 33) made the important distinction between "free" and "bound" energy. Clausius, at the end of a fundamental paper *(Pogg. Annalen*, cxxv. p. 400, 1865), formulates the two laws of energetics as follows:
>
> > I. The energy content of the universe is a constant quantity.
> >
> > II. The entropy of the universe is always striving to a maximum.
>
> The word "entropy" is here used as having essentially the same meaning as the "bound" energy of Helmholtz. The law is therefore equivalent to the statement that "free " energy is always striving to a minimum. The fact, derived from **universal experience**, that free energy always tends to diminish, if it possibly can, is sometimes known as the *"principle of Carnot and Clausius"*. It was also enunciated, about the same time as the publication of the paper of Clausius (referred to above), by William Thomson under the name of the "Dissipation of Energy." The principle has obviously a great practical, as well as philosophical, importance. It has been made by Ostwald (1912) the basis of a general rule of conduct, which he calls the "Imperative of Energetics." The rule may be translated thus: waste not free energy; treasure it and make the best use of it. As will be admitted, the admonition is an excellent one, and, when applied, leads to interesting results, as may be seen from the collection of essays under this name. To mention two subjects only, which are amongst those discussed, the waste involved in war and the value of a universal standard for the sizes of printed books.”

In 1923, American physical chemist Gilbert Lewis, published the 1923 textbook *Thermodynamics and the Free Energy of Chemical Substances*, which resulted to replace the notion of "affinity" with the notion of "free energy" in the corpus of modern science, and in his chapter sub-section "The Driving Force of a Chemical Reaction", he famously situated the "driving force" thermodynamic view of chemical process and introduced what he defined as a "universal rule" according to the rule that "no actual isothermal processes is possible" unless, using modern notation:

$$\Delta G < 0$$

meaning that Gibbs free energy has to decrease in order for a reaction, human or otherwise, to occur. [2]

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θΔics

In science, **universe** represents the entirety that is accessible to our senses and experiment.

Nun cosmology

The following shows the main "cosmologies" developed over the years, the three of which define what is called "Nun cosmology" developed predominantly in Egypt, a synthesis of the local mythologies of the 42 pre-dynastic nomes (5000-3100BC), which was worked into a nation creation theology, changing theoretical form and development over time, in four different power centers: Heliopolis (3100BC), Memphis (2800BC), Hermopolis (2400BC), and Thebes (2040BC). In Hermopolis scheme, the model became strongly anthropomorphic, in the sense that the god earth (Geb) was viewed as being surrounded by the heavens (Nut) through which the sun (Ra) passed on its daily journey being carried on a solar barque. The Heliopolis creation model, sometimes referred to as the Heliopolitan Ennead (god of nine), as well as the other modified versions, are shown below:

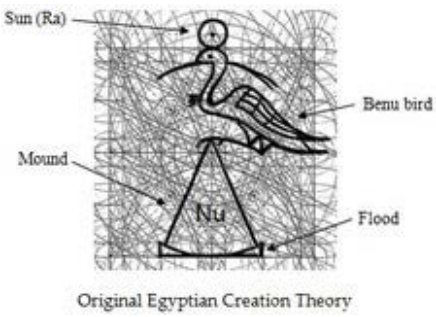

Heliopolis creation theory (3100BC)

→

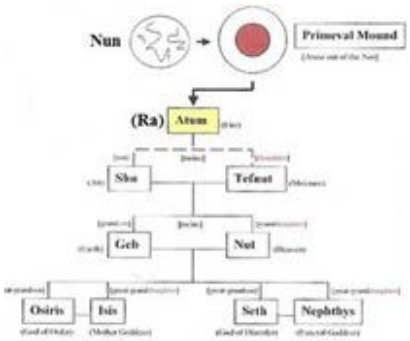

Heliopolitan Ennead (2700BC)

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Anthropomorhic Ennead (2400BC)

Egyptian flat earth model (1000BC)

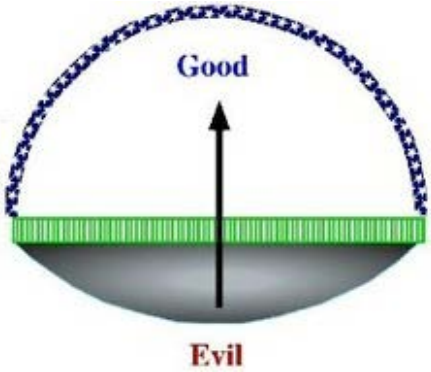

Osiris-Set rendition of the Ennead [1]

→

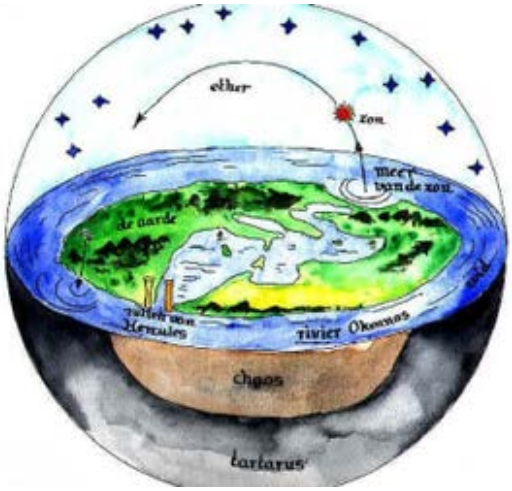

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Aristotelian cosmology

The Nun cosmology model, through the teachings of Plato, who traveled to Egypt to learn their sciences and religio-mythology models, was incorporated into the work of Aristotle and afterwords into science. On the specific description of the heavens, Aristotle created a complex system containing 55 spheres, the last of which demarcated the so-called "edge" of the universe—as famously depicted in the 1888 Flammarion engraving, below right, as found in Camille Flammarion's book *The Atmosphere: Popular Meteorology*: [4]

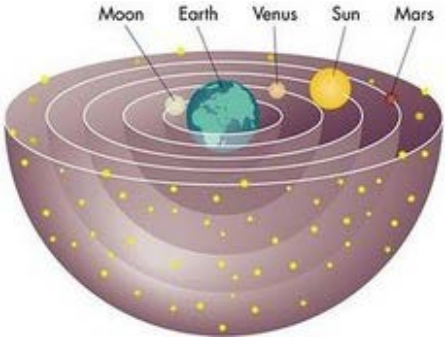

Aristotle's Egyptian version + Greek four element theory (320BC)

Ptolemy-Aristotle model

In 150 AD, Ptolemy expandedon Aristotle's model:

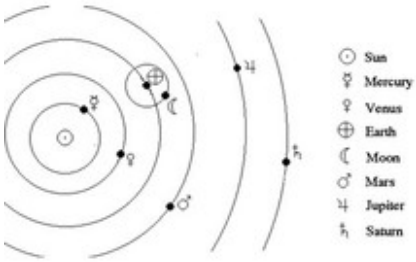

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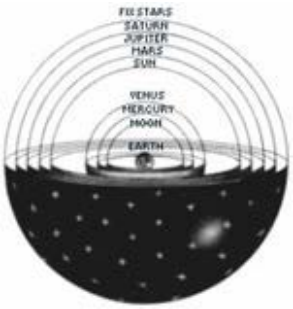

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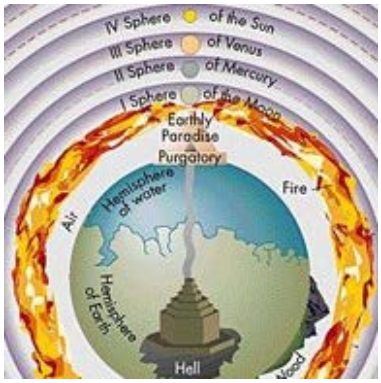

Aristarchus heliocentric model (270BC)

Ptolemy' elaborated Aristotle model (150AD)

Dante's universe (1300)

Copernican model

The 1543, Polish astronomer Nicholaus Copernicus introduce the heliocentric model:

→

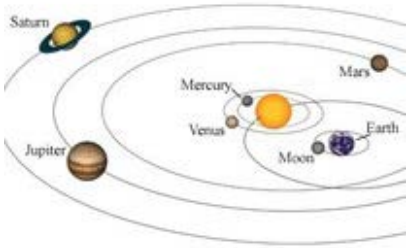

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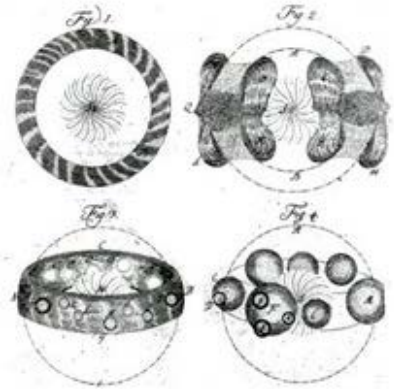

Copernican model (1543)

Brahe model (1590)

Nebular hypothesis (1734)

Fludd cosmology

The following shows a 1617 four element geocentric cosmology according to Robert Fludd, a segment of the macrocosm showing the elemental spheres of terra (earth), aqua (water), aer (air), and ignis (fire): (O)

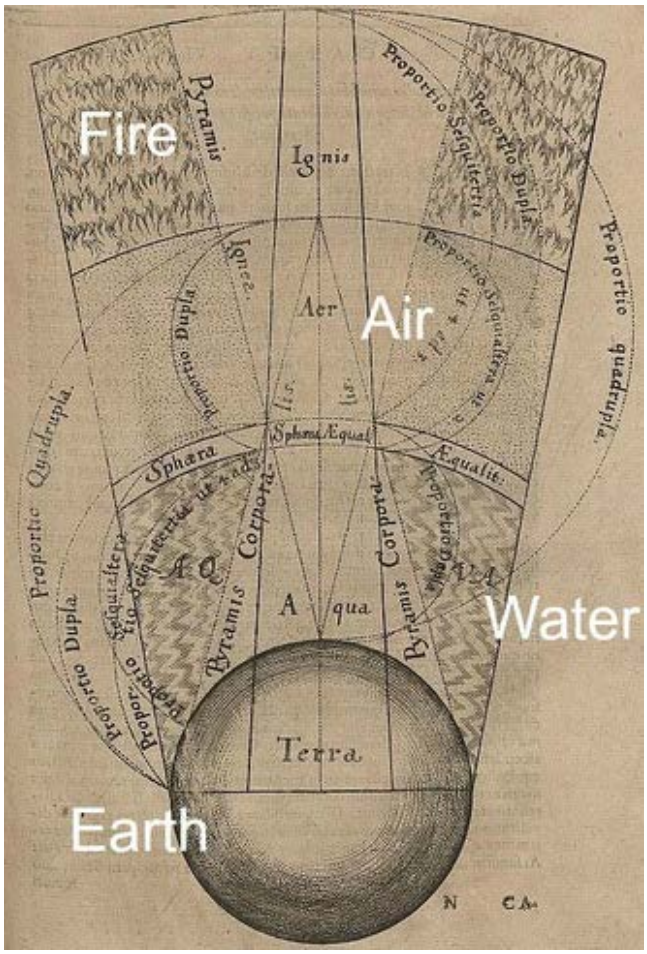

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Modern laity views

The following is a generic model of how the average child is taught about existence, i.e. the earth and heaven/hell model of existence, an unwritten mixture of Anunian cosmology, modern religion, and modern science:

Thermodynamics

The universe, for the thermodynamicist, is made up of the system examined and the surroundings able to act on its evolution. [1] By convention, the universe of the thermodynamicist is an isolated system, which equates to the following:

Universe = System + Surroundings

Whether the universe of the cosmologist is an isolated system still remains a subject of discussion. This discussion is

particularly notable in the field of black hole thermodynamics, in which the laws of thermodynamics seem to be phrased differently depending on whether or not the system contains a black hole. [2]

See also

- Atheistic universe
- Living universe
- Mechanical universe
- Pantheistic universe
- Physical universe
- Spiritual universe
- Theistic universe
- Thermodynamical universe

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2. Wald, Robert M. (1994). *Quantum Field Theory in Curved Spacetime and Blackhole Thermodynamics.* Chicago: The University of Chicago Press.
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4. Flammarion engraving – Wikipedia.

θΔics

In universities, **University of California, Berkeley**, or UC Berkeley for short, is state university located in Berkeley, California, home to the Lewis school of thermodynamics, and alumni to a number of famous thinkers common to the hmolsciences (hmolscientists), most notably American physical chemist Gilbert Lewis, who in 1925 questioned whether the process of him writing a book was but a chemical reaction.

Gilbert Lewis (1925)

Robert Nisbet (1970)

Frederick Rossini (1971)

Richard Delgado (1990)

Famous human thermodynamicists and or hmolscientists common to the **University of California, Berkeley**.

> "Perhaps our genius for unity will some time **produce a science** so broad as to include the behavior of a group of electrons and the behavior of a university faculty, but such a possibility seems now so remote that I for one would hesitate to guess whether this wonderful science would be more like mechanics or like a psychology."
>
> — Gilbert Lewis (1925), *The Anatomy of Science* [5]

Others include: American sociologist Robert Nisbet noted social bond/social entropy theorist, founder of the UC Berkeley sociology department, American chemical engineer and physical chemist Frederick Rossini, noted for his 1971 Priestley Medal Address "Chemical Thermodynamics in the Real World", which in 2006 sparked what has come come to be called the "Rossini debate" in regards to whether or not chemical thermodynamics applies to questions of freedom and security in society, and American neurological anthropologist Terrence Deacon, the current head of the of the UC Berkeley anthropology department, noted for his 2011 thermodynamics-based non-reductive materialism theories of mind from matter, among others.

Lewis school | Formation

See main: Lewis school of thermodynamics

The "Lewis school", a term used as early as 1923, or G.N. Lewis school, a term that came into use commonly into the 1950s, refers to anyone schooled under the logic of American physical chemist Gilbert Lewis. In the 20th century, the most cited textbook on thermodynamics was the 1923 *Thermodynamics and the Free Energy of Chemical Substances* written by Lewis and his editorial assistant American physical chemist Merle Randall.

Human thermodynamics | Human molecular engineering

See main: Two cultures department

UC Berkeley, centered around the so-called "Lewis school", has a number of human thermodynamics thinkers to have interjected into debate, commentary, and or theory on the implications of thermodynamics on human existence.

In 1899, American philosopher Harry Overstreet, noted for his *circa* 1950 "extropy", conceived as a counter-entropy, theories of truth, beauty, and goodness, completed his BA and his BS (1901) both at the University of California, Berkeley, after which he taught philosophy at UC Berkeley from 1901 to 1911.

Chemical and Biomolecular Engineering
DEPT OF CHEMICAL AND BIOMOLECULAR ENGINEERING • UNIVERSITY OF CALIFORNIA, BERKELEY

In 2010, the name of the UC Berkeley "Chemical Engineering" department was changed to the department of "Chemical & Biomolecular Engineering" to reflect the widened scope of teaching and research activities in the department, which is a change not in cogent alignment with the new defunct theory of life perspective, which according works of English physiologist Charles Sherrington: [16]

In 1925, Gilbert Lewis, himself, in his "Anatomy of Science" lecture turned book, was the first to give his opinion on the

"Chemistry does not know the word life."

The "new" UC Berkeley department namesake, one day, will eventually have to be changed again (see: life terminology upgrades).

implications of chemical thermodynamics. On the subject of the origin of life question, he then brings up "autocatalysis" as a possible solution, which he describes as a type of catalysis in which a reaction is accelerated by one of its own products, so that a long time may elapse before anything happens, but if that product begins to form, or is introduced form with, the reaction goes faster and faster." Lewis then spends a page or two describing a thought experiment where we are told to imagine a "certain solution capable of producing a given organic substance, but that it will not produce this substance unless one molecule of this substance is already there, after which more and more of these molecules form at the expense of the nutrient solution." He then goes on to explain how isomers of these molecules could form, then begin to collide with each other, knocking off certain atoms, leading to mutations. He then concludes: [5]

> "We should see a process of evolution, each molecule reproducing itself exactly, until an accidental rearrangement would set a new molecule to propagating itself. Would not this be reproduction with transmission of acquired characteristics?"

A molecule that "propagating itself", however, is perpetual motion—it is biological theory forced biasedly into chemistry. Lewis defends this by commenting "you may object to my using terms drawn from biology." In any event, he then boldly digs into the heart of the matter, i.e. the gist of what we now have come to define as hmolscience (human chemistry + human thermodynamics + human physics):

> "Suppose that this hypothetical experiment could be realized, which seems not unlikely, and suppose we could discover a whole chain of phenomena [evolution timeline], leading by imperceptible gradations form the simplest chemical molecule to the most highly developed organism [human molecule]. Would we then say that my preparation of this volume [*Anatomy of Science*] is only a chemical reaction [extrapolate up approach], or, conversely that a **crystal is thinking** [extrapolate down approach] about the concepts of science?"

Here we see Lewis wavering on whether he is a molecule or an organism in regards to the deeper questions on mind and life.

In 1928, American chemical engineer and physical chemist Frederick Rossini, one of the founders of political thermodynamics, completed his PhD under Lewis, Giauque, and Randall (his direct doctorial supervisor). In 1950, Rossini penning his *Chemical Thermodynamics* textbook, one of the first followups to Lewis' 1923 textbook. In his 1971 Priestley Medal address "Chemical Thermodynamics in the Real World", Rossini sparked what has come come to be called the "Rossini debate" in regards to whether or not chemical thermodynamics applies to questions of freedom and security in society. [3] A noted 2006 commentator, or rather defender of Rossini, in this debate is American chemist Todd Silverstein who completed his MS and PhD at the University of California, Berkeley. [4]

American electrochemical engineer Libb Thims, who as an undergraduate had been accepted to the University of California, Berkeley, presently is working to found America's first "two cultures" department (see: two cultures department) at UC Berkeley, centered around the chemical engineering department, in the form of human chemical engineering or "humanities + chemical engineering", in

In 1974, American law professor and racial thermodynamics theorist Richard Delgado completed his JD in 1974 at the UC Berkeley.

mindset alignment with some of the great thinkers to have been products of this school: Gilbert Lewis (1925), Frederick Rossini (1971), Todd Silverstein (2006).

In 1981, American evolutionary psychology founder David Buss, one of the backbone theorists behind American electrochemical engineer Libb Thims' 2007 human chemical thermodynamics formulations, completed his PhD in psychology at the UC Berkeley.

American sociologist Robert Nisbet, the founder of the **UC Berkeley** sociology department, was one of the first to incorporate chemical thermodynamics concepts, e.g. entropy, into sociology.

Sociology

In 1939, American sociologist Robert Nisbet, noted for his 1970 book *The Social Bond*, utilizing concepts such as social entropy, social bond, etc., completed his PhD in sociology, with a dissertation on French conservative social thought in the early nineteenth century, at UC Berkeley and went on to found the sociology department at Berkeley, staying there until 1953. The following is Nisbet's position on sociology:

> "Just as modern chemistry concerns itself with what it calls the chemical bond, seeking the forces that make atoms stick together as molecules, so does sociology investigate the forces that enable biologically derived human beings to stick together in the 'social molecules' in which we actually find them from the moment, quite literally, of their conception."

The conception of a "hydrogen bond" defined as the binding between two atoms as being possible through the medium of a hydrogen ion was first advanced in the unpublished work of American chemist Maurice Huggins in 1919, with his conception of an H-bond, a theory later expanded on by Wendell Latimer and Worth Rodebush in 1920, who cite Huggins in a footnote, in their paper "Polarity and Ionization from the Standpoint of the Lewis Theory of Valence". [6] All three were students of Gilbert Lewis, working in his chemical laboratory at UC Berkeley. This "hydrogen bond" vs "covalent bond" theory work, in turn, inspired the 1973 human chemical bond type article "The Strength of the Weak Ties" by American sociologist Mark Granovetter, outlining his weak tie/strong tie theory, which has resulted to be one of the most cited sociology articles of all time. [7]

In the early 1960s, American sociologist James Beniger, noted for his 1986 human thermodynamics themed book *The Control Revolution*, completed his MS in statistics, and MA and PhD in sociology, at UC Berkeley.

Literature

In 1964, American literature thermodynamics writer Thomas Pynchon applied to study mathematics as a graduate student at the UC Berkeley, but was turned down. [8]

In 1970, American literature thermodynamics theorist Lois Zamora, who would go on to be a noted Thomas Pynchon scholar, completed her MA and PhD in 1977 in comparative literature at UC Berkeley, which again, ironically, is the same university that rejected Pynchon six years earlier. In her 1988 *Dictionary of Literary Themes and Motifs* entry on apocalypse, to exemplify, Zamora summarizes use of the metaphor of entropy and the second law to describe the end of times as follows:

[9]

Ironically, the same university (UC Berkeley) that originally rejected American writer Thomas Pynchon into their graduate program (in mathematics), in 1964, now teaches courses, such as English 190 (Spring, 2013), devoted to studies of his literature thermodynamics books: *Gravity's Rainbow*, *The Crying of Lot 49*, and *V*. [11]

> "A contemporary variation on the apocalyptic vision is provided by the metaphor of entropy. Like apocalypse, entropy is an eschatological vision; it is based on the second law of thermodynamics, which describes the gradual leveling of energy in the universe and the molecular equilibrium called heat death at the end of the process. Entropy posits a world moving toward its extinction inexorably and irreversibly; the end is not to be orchestrated with the great crescendo of apocalyptic cataclysm but rather with the decrescendo of entropic chaos. This eschatology is far more pessimistic than conventional apocalyptic eschatology. The end is not caused by man's action and God's reaction, but is produced by decomposition, disintegration, and gradual loss of energy and differentiation. The anthropomorphism of the traditional apocalypse, with it implicit sense of purposeful history responding to human as well as to divine actions, yields to the bleak mechanism of a purely physical world that is irreversibly running out of energy. Whereas the apocalyptic vision sees a causal relationship between past, present, and future, the law of entropy, when applied to human affairs, negates such rational, temporal continuity. History does have a direction as it moves towards heat death, but it admits not human influence, no logical relationship between cause and effect. The use of the metaphor of entropy to describe the end of times appears through the fiction of Thomas Pynchon, William Burroughs, Norman Mailer, and James Purdy."

In 2012 and 2013, American electrochemical engineer Libb Thims helped to mediate the allegations of "theory plagiarism" that the head of the UC Berkeley anthropology department Terrence Deacon "stole" American philosopher Alicia Juarrero's 1999 thermodynamics-framed non-reductive materialism theory, a factoid that should serve as a clarion call that it is due time for the establishment of an educational system that teaches the overlap of, at the very least, philosophy, anthropology, and thermodynamics.

Anthropology

See main: Juarrero-Deacon affair

In 2011, Cuban-born American philosopher Alicia Juarrero, formerly a professor of Prince George's Community College, Maryland, accused American neurological anthropologist Terrence Deacon, the current head of the of the UC Berkeley anthropology department, stole or "misappropriated" the bulk of her thermodynamics-framed non-reductive materialism theories, contained in her 1999 book *Dynamics in Action: Intentional Behavior as a Complex System*, and used them as the basis of his 2011 book *Incomplete Nature: How Mind Emerged from Matter*, without citation of her work. This prompted a UC Berkeley investigation into the alleged "research misconduct" allegations.

On 22 Jan 2013, the Berkeley investigation committee released its findings, the conclusion of which Deacon was exonerated. In the report overview cites American electrochemical engineer Libb Thims Hmolpedia "HT pioneers" page, with its 500+ chronological listing of theorists to have applied thermodynamics to questions of human existence, a group to which both Juarrero and Deacon belong (though not yet input into the table, as they are both newly-found theorists, i.e. theorists not found in the 2002-2012 search period construction of the table), as a method of disproof to American Wall complexity-emergence theorist Michael Lissack's definition of what he calls "plagiarism by negligence", the gist of which is that anyone now, according to Lissack, in the modern Internet age, who publishes a new idea or theory without first doing a search for previous theorists, is guilty of plagiarism. [27] Specifically, as stated in a 2012 letter to Robert Price, entitled "Subliminal Influence or Plagiarism by Negligence?", according Lissack: [28]

> "There is no excuse, to even tolerate the idea that in the Internet Age it is acceptable … to fail to see what others have written before publishing his own work. Plagiarism by negligence is still plagiarism."

This idealized view of Lissack, as the Berkeley investigation report explains, is a naïve perspective. The HT pioneers page, in fact, as stated here (31 Jan 2012), took American electrochemical engineer Libb Thims 10-years (2002-2012) to construct and compile, using an exhaustive method of searching, namely: Google Books, Google scholar, libraries, Internet, footnotes, bibliographies, articles, blogs, webpages, etc., and that was after working independently on his own theoretical queries, without worry about what had been done prior to him, for a period of seven years (1995-2001) simply as a personal curiosity. Some HT authors, such as Iranian-born American electrical engineer and material scientist Robert Kenoun (*Theory of History and Social Evolution*, 2006), to note, choose specifically to avoid a prior read of the extant literature to keep the originality of their work in view. Hence, Lissack's conception of "plagiarism by negligence", even if an idea gets into the mind of the author via "subliminal influence", as Lissack puts it, where the author loses track of or may not be aware of the original seed, is an unreal idealization and hence defamatory in assertion.

By early February 2013, Thims, in an humorous educational gleaning effort to discern light into the so-called affair, read through both the Juarrero (1999) and the Deacon (2011) books, along the way creating a Google Book search overlapping "key term" usage in each book to account for similarity. A JHT report summary is underway.

Other

In 1900, college students at the UC Berkeley, were attempting to make or reconstruct models of American engineer Willard Gibbs' thermodynamic surface, similar to what James Maxwell did in his thermodynamic surface.

Mexican-born American theoretical chemist Henry Eyring, noted for the 1931 potential energy surface model, the 1935 transition state theory, completed his PhD degree in chemistry at UC Berkeley in 1927 for a dissertation entitled: "A Comparison of the Ionization by, and Stopping Power for, Alpha Particles of Elements and Compounds."

In circa 1957, American physical-quantum chemist William Cropper, noted for his chemical thermodynamics soaked 2001 *Great Physicists*, completed his PhD at UC Berkeley.

In 1957, American science paradigm change theorist Thomas Kuhn taught in both the philosophy department and the history department, being named Professor of the History of Science in 1961.

In 1965, Israeli biophysical thermodynamicist Aharon Katchalsky gave a series of lectures on "The Physics and Biology of Time", recorded by on film, at UC Berkeley.

Presently, English biochemist Christopher Southgate, noted for his work and discussion on the science-religion debate, a course he began teaching in 1993 at the University of Exeter, scholar at the Graduate Theology Union, Berkeley, an affiliate of the UC Berkeley.

Detractors

In *circa* 1967, American-born Canadian biochemist and physical chemist Stephen Lower, noted for his 2007 online listing of human chemistry as a "crackpot" subject, competed his BS in biochemistry at UC Berkeley.

In 2009, American chemist Mitch Garcia, a vocal detractor to the proposal of teaching human chemistry theory in schools, completed his PhD in chemistry at UC Berkeley.

See also

â— University of Chicago
â— Princeton University Department of Social Physics
â— Two Cultures Department
â— Schools of Thermodynamics

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15. Lissack, Michael. (2012). “Subliminal Influence or Plagiarism by Negligence?”, Letter to Robert Price, Dec 20.
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External links

â— University of California, Berkeley – Wikipedia.

θΔics

In schools, **University of Chicago** is a prominent school common to several noted hmolscience thinkers in the fields of sociochemistry (social chemistry), sociophysics (social physics), socio-thermodynamics (social thermodynamics or sociological thermodynamics) human physics, and in general branches of human thermodynamics, some of which are listed below.

Some of the noted University of Chicago departments: sociology, physics, and chemistry, who have been home to some noted hmolscience related scholars.

Hmolscience | Alumni

● Albion Small (1854-1926) – founded the sociology department of the University of Chicago (1892) and founded the *American Journal of Sociology* (1895); his 1899 article "A 'Unit' in Sociology" argued that 'general sociology' might be able to be defined in the future as 'the science of human atoms and their behavior', on the model of 'general chemistry', which is defined as the science of atoms and their behavior.
● Frank Carlton (1873-1961) - studied with Albion Small and others at the University of Chicago's newly burgeoning sociology department; his 1912 "History-Making Forces" argues for the inception of the sciences of the sciences of social mechanics, social physics and social chemistry; he elaborates further in his 1920 *Elementary Economics*.
● Paul Samuelson (1915-2009) – completed his undergraduate work at the University of Chicago; and would go on in his 1941 Nobel-Prize winning PhD dissertation to use thermodynamic models and chemical models such, as Le Chatelier's principle, to explain that in a system (chemical or economic) the changes in the equilibrium is a constrained maximization problem when one of the constraints is marginally tightened or relaxed and thus solved by the "variation principle".
● Elihu Fein (c.1916-c.2006) – completed his MS in physics at the University of Chicago and his 1970 "Demography and Thermodynamics" outlines a type of molecular sociology in which social activity is defined as being analogous to molecular activity and uses concepts such as adiabatic and entropy in social systems.
● Harold Nieburg (1927-2001) – completed PhD in political science at the University of Chicago (1960); his 1973 *Cultural Storm* outlines aspects of political thermodynamics.
● Stephen Berry (1931-) – noted for his 1971 "thermodynamic analysis of society" theory; physical chemistry professor of the University of Chicago, since 1964.
● John Avery (1933-) – completed his MS in physics at the University of Chicago (1954); his 2003 *Information Theory and Evolution* explains human existence thermodynamically, such as along the lines of John Neumann's circa 1950 free energy automaton theory.

Other

● Robert Wald (1947-) – black hole thermodynamicist; current chairman of the physics department at the University of Chicago.

See also

● Princeton University Department of Social Physics
● Schools of thermodynamics
● University of California, Berkeley

References

1. Molecular engineering – University of Chicago.

External links

● University of Chicago – Wikipedia.

- Sociology – University of Chicago.
- Physics – University of Chicago.
- Chemistry – University of Chicago.

θΔics

In conferences, **University of Pitesti Econophysics and Sociophysics Workshop 2013**, abbreviated **UPESW 5**, is the 5th annual workshop on econophysics and sociophysics, held at the University of Pitesti, Pitesti, Romania, on June 29th, a workshop that has occurred annually since 2008. [1]

Group photo of some of the speakers at **UPESW 5** (29 Jun 2013): Constantin Bratianu (Thims' left), Libb Thims (Hu shirt), Daniel Pele (Thims' back right), Mircea Gligor (Thims' back left), and seated in front left to right: Ion Siman and Gheorghe Savoiu, all noted members of the Romanian school of physical socioeconomics.

Organizers

- Gheorghe Savoiu, Romanian econophysicist
- Ion Siman, Romania sociophysicist
- Libb Thims, American electrochemical engineer

Background

The structure of the 2013 UPES workshop resulted from 25 Mar 2013 to present discussions between American electrical chemical engineer Libb Thims and Romanian socioeconomist Gheorghe Savoiu about Savoiu and Romanian sociophysicist Ion Siman's 2012 co-chapter subsection §10.5: "Why Sociophysics is Necessary in a Modern University", something that Thims has been actively work to establish in America, although facing uphill resistance, via a the inceptions of a formal unified two cultures university department (see: two cultures department) similar, albeit more encompassing, to the short-lived 1950s Princeton Department of Social Physics run by Americans physicist John Q. Stewart and thermodynamicist Percy Bridgman and sociologists Stuart Dodd (1900-1975) and John Trimmer (1908-1983).

Opening speech

UPESW 5 was opened with a short introductory speech (in Romanian) by University of Pitesti vice-rector Sabastian Parlac on the pleasure to be hosting the fifth annual econophysics and sociophysics workshop at the University of Pitesti:

Savoiu and Siman | Econo-sciences vs. Econo-disciplines

The opening introductory talk of UPESW 5 was the presentation "Econo-sciences vs. Econo-disciplines" jointly-given by Romanians economist Gheorghe Savoiu and physicist Ion Siman:

> - Savoiu, Gheorge and Siman, Ion. (2013). "Econo-sciences vs. Econo-disciplines" (Article pdf, 11-pgs) (PowerPoint ppt-pdf, 56-slides), talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29.
>
> Abstract: All modern econoscience taxonomies must present the new econo- disciplines.

Romanians economist Gheorghe Savoiu and physicist Ion Siman on their joint talk "Econo-sciences vs. Econo-disciplines" about the ranking of the new econo-physical science disciplines in general economics.

Savoiu and Siman are notable for having, through their mutual discussions and dialogs, beginning in the period 2006 to 2007, produced the University of Pitesti econophysics workshops:

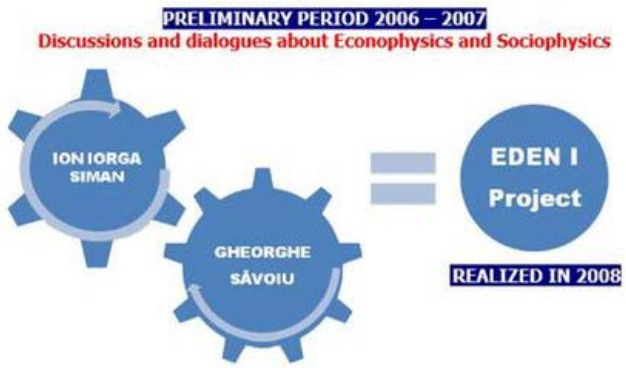

Thims | Econoengineering and Economic Behavior

The key speaker of the 2013 UPES workshop was American electrochemical engineer Libb Thims, who presented on "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?":

- Thims, Libb. (2013). "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?" (video, 1:33-min) (article, 40-pgs) (PowerPoint, 36-slides), Key speaker talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29.

Photo and video of American electrochemical engineer Libb Thims the key speaker at UPESW 5 who presented on "Econoengineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models?"; photo shown being Thims (at 2:20-min) holding his social piston and cylinder model explaining how the city boundary of Pitesti, Romania, is an example of a socioeconomic boundary in a thermodynamic modelling sense.

Abstract: An introduction to the newly being talked about field of econoengineering is given with focus on the nature of economic behavior and the question of the correctness and utility of particle, electron, atom, and or molecule versus *agent* models of humans.

Much of Thims' talk was centered on French-Italian engineer and socioeconomic physicist Vilfredo Pareto and Lausanne school of physical economics and the uses and abuses of physics in the growing fields of econophysics and sociophysics.

Bratianu | Knowledge and Thermodynamics

The second speaker at UPESW 5 was Romanian engineer Constantin Bratianu who presented on "Energy Metaphors for Knowledge Dynamics".

- Bratianu, Constantin. (2013). "Energy Metaphors for Knowledge Dynamics: Western and Eastern Perspectives on Knowledge" (video, 46:50-min) (PowerPoint, 21-slides), talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29.

Photo and video of Romanian engineer Constantin Bratianu the second speaker at UPESW 5 who presented on "Energy Metaphors for Knowledge Dynamics: Western and Eastern Perspectives on Knowledge".

Abstract: (add)

Bratianu is noted for research papers such as his "Changing Paradigm for Knowledge Metaphors from Dynamics to Thermodynamics" (2011) and "The Entropic Intellectual Capital Model" (2013) among others. [3]

Chisleag | Newtonian Mechanics and the Romanian

Constitution

The third speaker at UPESW 5 was Romanian physicist Radu Chisleag who presented on “The Mastering of Even Simple Physics Models: a Social Strategic Advantage for Legal Professionals” a general synopsis on how Newtonian mechanics can and should be employed to facilitate the development of the newly reformed Romanian Constitution:

Photo and video of Romanian physicist Radu Chisleag the third speaker at UPESW 5 who presented on "Newtonian Mechanics and Romanian Constitution Reform".

- Chisleag, Radu. (2013). "Newtonian Mechanics and Romanian Constitution Reform" (video, 49:19-min) (PowerPoint, 78-slides), talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29.

Abstract: (add)

Radu is noted his 2003 to present human quantum mechanics theory, co-developed later with his daughter Romanian mathematician and lawyer Roxana Chisleag (2011), wherein they applied quantum mechanics, specifically the tunneling effect, to analysis of crossing of social barriers and financial relationship jumps, modeling a human as a quantum particle, and for his 2012 human thermodynamics variables table or physics-to-economics "correspondence" table as he calls it: [2]

Physics-to-Economics Correspondence Table	
Particle	Individual; payer, broker, hedger
Energy	Energy, capability, potential, maximum credit permitted the individual to engage in a process.
Kinetic energy	Capacity of the individual to act at a given stage of the process.
Potential energy	Energy used by the individual to jump in the other region (on the potential step.
Mass	Inertia of the individual.

Chisleag also is noted for his application of the Schrodinger equation of Erwin Schrodinger and the de Broglie waves of French physicist Louis de Broglie to the situation where "some individuals, even having been granted the right to act, are rejected at the step".

Gligor | Small Worlds Networks and Seven Degrees of Kevin Bacon

The fourth speaker at UPESW 5 was Romanian physicist and socioeconomic thermodynamicist Mircea Gligor who presented on "Statistical Properties of Small World Networks":

Photo and video of Romanian physicist and socioeconomic thermodynamicist Mircea Gligor the fourth speaker at UPESW 5 who presented on "Statistical Properties of Small World Networks".

- Gligor, Mircea. (2013). "Statistical Properties of Small World Networks" (video, 23:44-min) (PowerPoint, 27-slides), talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29.

Abstract: (add)

Gligor is noted for his 2003 PhD dissertation “Thermodynamics and Statistical Models for Dissipative Socio-Economic Systems” and for his his 2012 chapter “Statistical Physics Models for Group Decision Making”, stated that he considered the following: Hermann Haken (*Advanced* Synergetics, 1983), Elliott Montroll (“On the Dynamics and Evolution of Some Sociotechnical Systems”, 1987), and Serge Galam (“Majority Rules, Hierarchical Structure and Democratic Totalitarianism: a Statistical Approach”, 1986) to be three “remarkable works” of pre-21th century sociophysics. [5]

Pele | Fractals and Heavy Tails in the Romanian Stock Market

The fifth speaker at UPESW 5 was Romanian economist Daniel

Pele (Q) who presented on "Fractals and Heavy Tails in the Romanian Stock Market", co-written with Romanian e-business theorist Miruna Mazurencu-Marinescu:

- Pele, Daniel, Mazurencu-Marinescu, Miruna . (2013). "Fractals and Heavy Tails in the Romanian Stock Market" (video, 20:15-min) (PowerPoint, 14-slides), talk delivered at the University of Pitesti Econophysics and Sociophysics Workshop (UPESW) / Exploratory Domains of Econophysics News (EDEN V). University of Pitesti, Pitesti, Romania, Jun 29.

  Abstract: (add)

Photo and video of Romanian economist Romanian economist Daniel Pele (Q) the fifth speaker at UPESW 5 who presented on "Fractals and Heavy Tails in the Romanian Stock Market".

Pele is noted for his 2007 PhD on “Statistical Methods in Analysis of Capital Market”, based on statistical mathematics, and has written articles such as “Mechanism Movement in BSE Prices” (2007).

Schedule

The following is the workshop schedule (as of 25 Apr 2013):

Faculty of Sciences

University of Pitesti Address: 110040
Pitesti 1st. Targu din Vale Street, Arges, Romania

Faculty of Economic Sciences

INTERNATIONAL WORKSHOP EDEN V-UPitESW

UNIVERSITY OF PITESTI ECONOPHYSICS AND SOCIOPHYSICS WORKSHOP - UPitESW

PROGRAMME
EDEN V- UPitESW
THE 29TH OF JUNE 2013

	9h30 – 14h00 MORNING SESSION – EDEN V Exploratory Domains of Econophysics. News	15h30 – 18h30 AFTERNOON SESSION – EDEN V Exploratory Domains of Econophysics. News	
9h30	Opening speech Rector of the University of Pitesti – Ionel DIDEA	Miruna MAZURENCU-MARINESCU and Daniel Traian PELE *A Multilevel Modeling Approach on the Stock Market*	15h30
9h50	Gheorghe SĂVOIU, Ion Iorga SIMĂN *Econo - sciences Versus Econo - disciplines*	Gheorghe SĂVOIU, Constantin MANEA, Mladen ČUDANOV, Ondrej JAŠKO, *Modern Econo-Sciences: A Multidisciplinarity Reality*	16h00
10h20	Libb THIMS *Econo-engineering and Economic Behavior: Particle, Atom, Molecule, or Agent Models*	Gheorghe SĂVOIU, Jelena, Z. MINOVIĆ, Dejan ERIĆ *A Multidisciplinary Index Model of Demographical and Economical Regional Approaches Based on EUROSTAT Statistics*	16h30
10h50	Daniel Taian PELE *Fractals and Heavy Tails in the Romanian Stock Market*		
11h20	Mircea GLIGOR *Statistical Properties of Small World Networks*	Aretina-Magdalena DAVID PEARSON *Procedure to Detect Mean Reversion in (Stock) Prices*	17h00
11h50	Ioana-Roxana CHISLEAG LOSADA Radu CHIŞLEAG *The Mastering of Even Simple Physics Models - A Social Strategic Advantage for Legal Professionals*	Ivana RAJKOVIĆ, Ivan TODOROVIĆ, Stefan KOMAZEC, Gheorghe SĂVOIU *Explaining the Dynamics of Euroisation using Electric Circuits Models with Empirical Evidence*	17h30 18h00
12h20	Constantin BRĂTIANU *Energy Metaphors for Knowledge Dynamics*	Moderators:Gheorghe SĂVOIU & Ion IORGA SIMĂN	18h30
12h50	Ivana MIJATOVIĆ, Mladen ČUDANOV, Gheorghe SĂVOIU, Ondrej JAŠKO *Multidisciplinary Approach to Standardization and Organizational Design: Example of De-Facto Standardization in Public Companies*	Final discussions Workshop closing	
13h20	Gheorghe, SĂVOIU, Slađana BARJAKTAROVIĆ RAKOČEVIĆ, Siniša MALI *The Financial Data Specificity and the Development of A New Econo – Science*		
13h50	Lunch break		

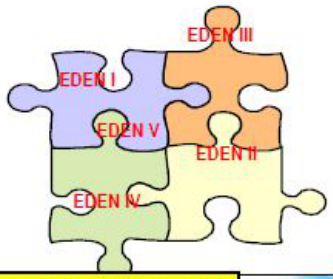

International Workshop Organizer EDEN V2013-UPitSEW
e-mail: gsavoiu@yahoo.com
Phone: +40 745 047 085
website: http://www.esmsj.upit.ro/

Key speaker invitation & photos

The following is the invitation to UPESW 2013:

> The EDEN V – UPitESW international workshop, hosted by the University of Pitesti (UPIT) on 29th of June 2013 will present the current work and the new ideas in the Exploratory Domains of Econophysics, Sociophysics and other trans and multidisciplinary sciences, by researchers from around the world. Trans and multidisciplinary Econo-Sciences, from Distinctive Econo-Metrics to Econo-Physics, and from Econo-Operations Research to Econo-Engineering have played a significant role in economic and social modelling but still remains understudied in modern universities, despite their major capacity in understanding and describing social and economic processes. As key speaker you are invited to submit and present original, unpublished manuscripts that address any phase or aspect of the modern multidisciplinary Econo-sciences, from Econophysics to Econo-engineering modelling process, such as new domains and methods for studying modern finance, recession and growth, management under risk and uncertainty, and the influences of, and effects on, social economic development, and may focus solely on one domain, model or method, on comparisons between phenomena, or cross-border processes in multidisciplinary thinking. Any possible areas of study could include Econophysics, Sociophysics, Econo-Engineering, but papers are not limited to these special sciences (thermodynamic models, organizational models, social networks, and complexity science are naturally accepted).

The following is Thims, during his key speaker talk, discussing the thermodynamic conception of the "boundary" of the social piston and cylinder model of a human social working substance (society):

Pre UPESW 2013 photos

The following is a photo on 28 Jun 2013, the day before UPESW 5, showing Ion Siman, Gheorghe Savoiu, Libb Thims, and Constantin Bratianu, discussing physical science applied to the humanities theory at the popular Zahana restaurant on the lake, Pitesti, Romania:

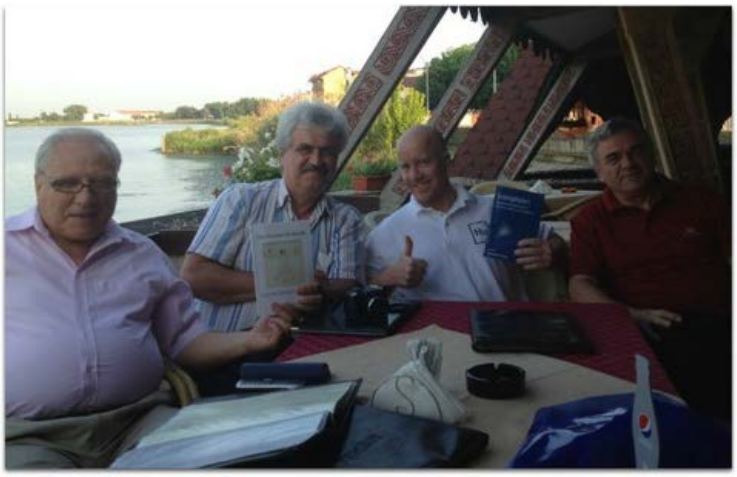

American electrochemical engineer Libb Thims with the two heads of the Romanian school of physical socioeconomics, from left to right: Ion Siman and Gheorghe Savoiu, holding Thims 2008 *The Human Molecule*, Thims, holding Savoiu and Siman's 2012 *Econophysics*, and Constantin Bratianu, a newcomer to the group, noted for his work in knowledge thermodynamics (28 Jun 2013).

UPESW 2013 photos

The following are photos during the 5th annual University of Pitesti Econophysics and Sociophysics Workshop 2013:

An workshop attendee, Radu Chisleag, and Ion Siman:.

Mircea Gligor and Gheorghe Savoiu.

Coffee break in hallway.

Audience members, students, and workshop attendees.

Audience members, students, and workshop attendees.

Ion Siman speaking; University of Pitesti rector Ionel Didea seated in front;

Audience members, students, and workshop attendees.

Radu Chisleag seated behind backpack.

Gheorghe Savoiu, Libb Thims, and linguist Manea Coustantui, who acted as translator for Thims for parts of the workshop in Romanian; Constantin Bratianu seen seated behind.

Libb Thims and Manea Coustantui, front row; Mircea Gligor and Constantin Bratianu second row; listing to an interesting part of Gheorghe Savoiu's talk.

Audience members, students, and workshop attendees.

UPESW 2013 | Group discussion

The following are after workshop celebration and group discussion photos on 29 Jun 2013 following the socioeconomic physics workshop, at the Zahana restaurant on the lake, Pitesti, Romania:

Clockwise: Daniel Pele, Mircea Gligor, Constantin Bratianu, Gheorghe Savoiu, Radu Chisleag, Libb Thims, and linguist Manea Coustantui, at dinner celebration after the UPESW 5 (29 Jun 2013).

More toasting (clockwise): Radu Chisleag, Libb Thims, and linguist Manea Coustantui, Ion Siman, economist Daniel Pele, and e-business theorist Miruna Mazurencu-Marinescu.

Clockwise: Daniel Pele, Radu Chisleag, Libb Thims, Manea Coustantui, and Ion Siman.

Clockwise: Daniel Pele, Miruna Mazurencu-Marinescu, Mircea Gligor, Constantin Bratianu, Gheorghe Savoiu, Radu Chisleag, Libb Thims

Miruna Mazurencu-Marinescu and Mircea Gligor.

Post UPESW 2013

The following are 30 Jun 2013 photos and video of Libb Thims, Gheorghe Savoiu, and Ion Siman who traveled around Romania for the day, going to famous historical sites, such as Dracula's castle (the castle of Vald Tepes, aka "Vlad the Impaler", in Arges county, Transylvania), two old churches, a gypsy village, concluding with a nice dinner cooked by Savoiu at his summer house, discussing physical socioeconomics, the history of the formation of the EDEN/UPES workshops, the Romanian School of Physical Socioeconomics, and future *Journal of Human Thermodynamics* contributions, throughout:

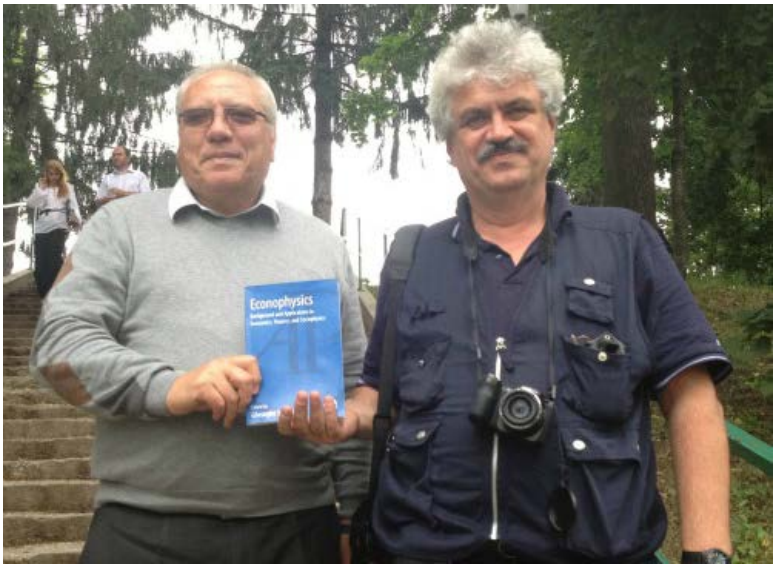

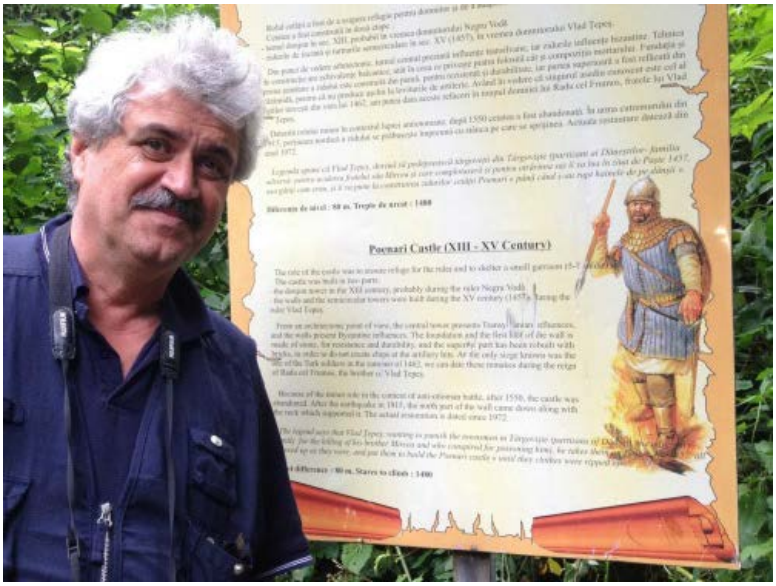

Gheorghe Savoiu and Ion Siman cutting wood for outdoor grilling and discussion with Libb Thims.

(video)

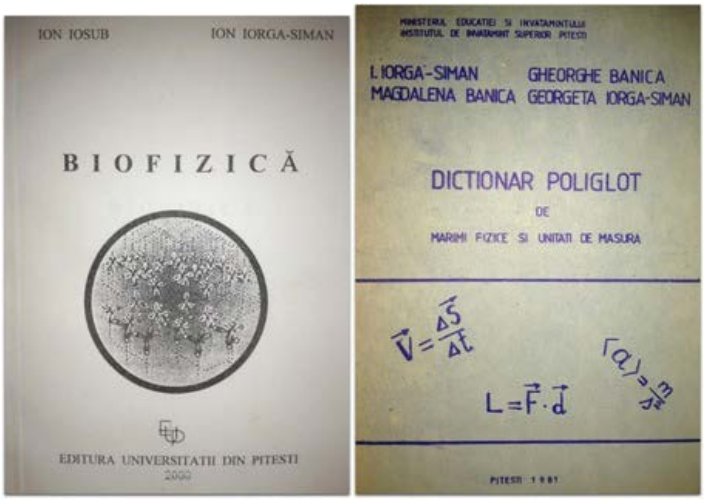

Ion Siman showing Libb Thims some of the physics books he has written, such as his co-authored 2000 *Biophysics* (Biofizica) and 1981*Multilingual Dictionary of Units of Measure Physical Quantities* (*Dictionar Poliglot de Marimi Fizice se Unitati de Masura*).

EDEN 2008

The first University of Pitesti Exploratory Domains of Econophysics Workshop took place in 2008, a photo of which is shown below, showing front to back: Ion Siman, Mircea Gligor, among others. [2]

Ion Simon and Mircea Gligor at EDEN 2008.

EDEN 2006-2012

A 2013 draft overview of the history of the EDEN-turned-UPESW conferences has been outlined by Gheorghe Savoiu. [4]

References

1. Savoiu, Gheorghe. (2012). *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (EDEN workshop, pg. 14; §10: Sociophysics: A New Science or a New Domain for Physicists in a Modern University, pgs. 149-65; §10.5: Why Sociophysics is Necessary in a Modern University, pgs. 160-64). American Institute of Physics.
2. Zanocea, Cosette. (2012). "Professor at the 'Roman-Voda' Researcher in Belgium, PhD physical economics" (Romanian → English) , Ziarul de Roman, Aug 27.
3. (a) Bratianu, Constantin. (2011). "Changing Paradigm for Knowledge Metaphors from Dynamics to Thermodynamics", *Systems Research and Behavior Science*, 28:160-69.
(b) Bratianu, Constantin and Orzea, Ivona. (2013). "The Entropic Intellectual Capital Model", *Knowledge Management Research & Practice*, 11:133-41.

4. Savoiu, Gheorghe. (2013). “Two Cultures Formation Dynamics of Pitesti Econophysics and Sociophysics, 2006-2013”, JHT slated | Preprint (pdf), Jul 13.
5. (a) Gligor, Mircea. (2012). “Statistical Physics Models for Group Decision Making”, in: *Econophysics: Background and Applications in Economics, Finance, and Sociophysics* (editor: Gheorghe Savoiu) (§9, pgs. 131-48, statement, pg. 132). Academic Press.
(b) Haken, Herman. (1983). *Advanced Synergetics* (Amz). Springer.
(c) Galam, Serge. (1986). “Majority Rules, Hierarchical Structure and Democratic Totalitarianism: a Statistical Approach” (abs), *Journal of Mathematical Psychology* 30:426-34.
(d) Montroll, Elliott W. (1987). “On the Dynamics and Evolution of Some Sociotechnical Systems” (abs) (pdf), *Bulletin of the American Mathematical Society*, 16:1-46.

External links

- EDEN workshop (overview) – University of Pitesti, Romania.

θΔics

In education, **University of Wisconsin, Madison** is an American university, located in Madison, Wisconsin (Lat: 43.0°), noted for []

Chemical engineering

In 2015, University of Wisconsin, Madison had a #15 position in global chemical engineering rankings and #6 position in US chemical engineering school rankings.

Hmolscience

The following are hmolscience-related thinkers connected in some way with the University of Wisconsin, Madison:

- Erwin Hiebert
- Harold Davis
- Thomas Dreier
- Anson Rabinbach
- Barkley Rosser
- John Sanford
- Alan Nelson

External links

- University of Wisconsin-Madison – Wikipedia.

θΔics

In education, **unlearn**, as compared to learn, refers to the process by which a previous taught or assumed truth must be removed, expunged, and or extracted from the mind, once seen, acknowledged, and or confirmed to be a falsehood or untruth; akin to Bernard DeVoto's 1928 phrase getting one's "mind made over", in respect to collision of previous instilled conceptions (e.g. religio-mythology) with new knowledge (e.g. evolution, genetics), views (e.g. Adams, Pareto, etc), or experimental findings (e.g. relativity, cannon boring experiment, etc).

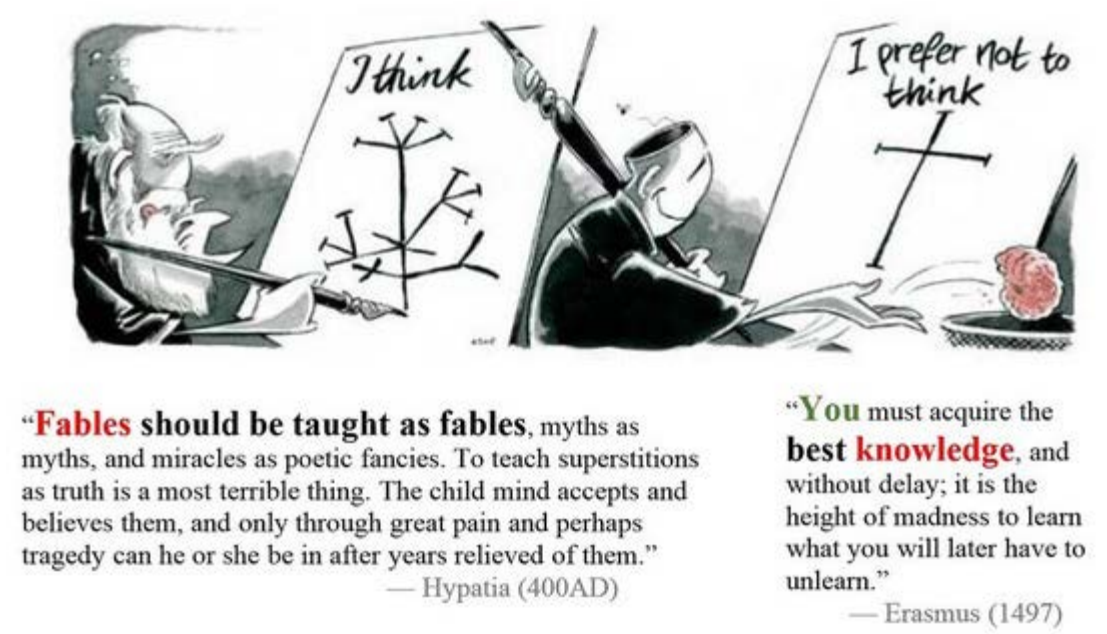

A photo (Q) Hypatia-Erasmus teaching method, as taught to a group of six kids, aged 6-11, during Libb Thims' 2015 "Zerotheism for Kids" lecture, showing the "**unlearn**" process being connected with the height of madness, according to Erasmus.

Overview

One of the more difficult "unlearnings", the new 21st century person is forced to endure is the unlearning that life is something that exists (see: life does not exist), being that it is so deeply ingrained into the mind, that it takes a decade plus of neurological dewiring to even begin to slightly feel cleansed of the corruption.

Quotes

The following are related quotes:

> "Fables should be taught as fables, myths as myths, and miracles as poetic fancies. To teach superstitions as truth is a most terrible thing. The child mind accepts and believes them, and only through **great pain and perhaps tragedy** can he or she be in after years relieved of them. The reason for this is that a superstition is so intangible a thing that you cannot get at it to refute it."
>
> — Hypatia (c.400)

> "You must acquire the best knowledge first, and without delay; it is the height of madness to learn what you will later have to **unlearn**."
>
> — Desiderius Erasmus (1497), "Letter to Christian Northoff" [1]

> "It is now some years since I detected how many were the **false beliefs** that I had from my earliest youth admitted as true and how doubtful was everything I had since constructed on this basis."
>
> — Rene Descartes (1641), *Mediations on the First Philosophy in Which the Existence of God and the Distinction Between Mind and Body are Demonstrated* [4]

> "It hath often seemed to me beyond an ordinary probability, and something more than fancy, however paradoxical the conjecture may seem, to think that the least bodies we are able to see with our naked eyes,

are but middle proportionals (as it were) betwixt the greatest and smallest bodies in nature, which two extremes lye equally beyond the reach of human sensation: for as on the one side they are but narrow souls, and not worthy the name of philosophers, that think any 'body' can be too great or too vast in its dimensions; so likewise are they as inapprehensive, and of the same litter as the former, that on the other side think the particles of matter may be too little, and that nature is stinted at an 'atom', and must have a non-ultra of her subdivisions. Such, I am sure, our modern engine (the micro-scope) will ocularly evince and **unlearn them their opinions** again: for herein you may see what a subtill divider of matter nature is."

— Henry Power (1664), *Publication* [5]

"The latter part of a wise man's life is taken up in **curing the follies, prejudices, and false opinions** he had contracted in the former."

— Jonathan Swift (1706), "Thoughts on Various Subjects, Moral and Diverting"

"The shortest and surest way of arriving at real knowledge is to **unlearn** the lessons we have been taught, to mount the first principles, and take nobody's word about them."

— Lord Bolingbroke (c.1730) (Q)

"I remember well the enthusiasm with which I devoured it [Hume's work] when young, and the length of time, the research and reflection which were necessary to **eradicate the poison** it had instilled into my mind."

— Thomas Jefferson (1810), "Letter to William Duane", Aug 12 [9]

"Almost all of the latter part of my life has been spent **unlearning** the nonsense I learned in my youth."

— Godfrey Higgins (1833), *Anacalypsis, Volume One* (pg. x); cited by Tom Harpur (2004) in *The Pagan Christ* (pg. 200)

"It takes the latter half of all of one's lifetime to **unlearn** the falsehood that was instilled into us during the earlier half. Generation after generation we learn, unlearn, and re-learn the same lying legendary lore. Henceforth, our studies must begin from the evolutionist standpoint in order that they may not have to be gone over again."

— Gerald Massey (1883), *The Natural Genesis* [2]

"Beware of **false knowledge**; it is more dangerous than ignorance."

— Bernard Shaw (c.1920) (Q)

"Pareto's *Treatise on General Sociology* is the hardest boiled book I have ever read. Three times, since I passed my puberty, has my **mind been made over**. Once by a nexus of which Henry Adams was the center, once by a matrix of which Frazer burned brightest, and once by a long study of genetics and evolution. Pareto is doing the job a fourth time, and far more vitally than any others."

— Bernard DeVoto (1928), commentary on Pareto's *Treatise* [3]

"In regards to the above 'reduction' arguments, you must always keep in mind that all you are, nothing more nothing less, are the following 26 elements: hmolscience periodic table – aggregated into a dynamic geometric mass called a bound state, that 'exists' for a certain period of time, within the framework of the universe. This is a step above Cartesian 'I think, therefore I am' philosophy of existence. A great deal of **unlearning** must be done to accept this."

— Libb Thims (2012), "Reply #12 to Mahesh Deva" (Q); dialogue on the HT principles (Q) + Wikipedia "human thermodynamics" AFD (Q) comment: "[...] is human life a chemical reaction or not?", Oct 25

Unlearn | Expositors

The mean IQ of the rare breed of aware "unlearn expositors", as cited via quoted statement above, based on the established genius rankings, as of Nov 2017, of: Hypatia (IQ:190|#44) [RGM:145|1,245+], Desiderius Erasmus (IQ:185|#89) [RGM:212|#1,245+], Rene Descartes (IQ:195|#13) [RGM:36|1,245+], Thomas Jefferson (IQ:190|#45) [RGM:29|1,245+], and Jonathan Swift (IQ:180|#160) [RGM:170|1,246+] is **188|#64** and **RGM:115**.

An artistic rendition of the unlearn process in respect to error-filled and false religious teachings, that one later has to puke out of their mind.

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θΔics

In science, **unnatural** or 'what is unnatural', as contrasted with natural, is defined by processes or reactions, for standard earth-bound systems, that meet the following criterion: [1]

$$dG > 0$$

for a natural process

$$dT = 0 \qquad dP = 0 \qquad dG < 0$$

for an unnatural process

$$dT = 0 \qquad dP = 0 \qquad dG > 0$$

for a reversible process

$$dT = 0 \qquad dP = 0 \qquad dG = 0$$

The standard definition, according to English chemical thermodynamicist Edward Guggenheim (1933), of what constitutes the differences between an **unnatural** process and a natural process, based on the Clausius inequality, for standard earth-bound systems. [1]

This is called the Lewis inequality that are 'thermodynamically impossible', defined in 1923 by American physical chemist Gilbert Lewis, based on the various Gibbs inequalities, which he termed as a "universal rule" for freely reacting isothermal-isobaric processes (e.g. ones that occur between reacting humans). [2] In generalized form, what is natural for any system or body of the universe is defined or quantified those processes or reactions that meet the Clausius inequality (1856).

See also

â— Natural science

Quotes

The following are related quotes:

> "Contrary to popular belief, being alive is **unnatural**."
>
> — Michael Guillen (1995), *Five Equations that Changed the World* (pg. 6)

References

1. Guggenheim, Eduard, A. (1933). *Modern Thermodynamics by the Methods of Willard Gibbs* (pgs. 5, 17). London: Methuen & Co.
2. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pg. 160). McGraw-Hill Book Co., Inc.

Further reading

â— Ball, Philip. (2011). *Unnatural: the Heretical Idea of Making People* (pg. 3). Vintage Books.

θΔics

In science, **unpredictable** or unpredictability refers to the inability to predict the course of action of certain events or processes.

Radioactivity

Italian physicist Ettore Majorana, who did his PhD on "The Mechanics of Radioactive Nuclei" under Enrico Fermi in 1929, commented the following: [1]

> "The disintegration of an atom is a simple event. It is **unpredictable**, happens in isolation, and after a wait of sometimes thousand or up to millions of years. In contrast, nothing similar happens in the events registered by social statistics. This is not, however, an insuperable objection. The disintegration of a radioactive atom can force an automatic counter, possessing an adequate amplifier, to register it with a mechanical effect. We then only need some common laboratory artifices to prepare in one way or another a colorful and complex chain of phenomena, which are controlled by the accidental disintegration of a single radioactive atom.
>
> Nothing exists from a strictly scientific point of view to prevent us from accepting as plausible that the origin of human occurrences could also be found in some fundamental event similarly simple, invisible and **unpredictable**. If this is so, and we believe that it is so, the role of statistical laws in social sciences will be seen to increase. Their role will not only be that of empirically establishing the result of a large number of unknown causes. It will rather be to provide, above all, a concrete and immediate testimony of reality. The interpretation of this testimony will require a special art, one that is not precisely secondary to the art of government."

Majorana's aim, according to Carlos Perez, was to establish a theoretical connection between the death-rates or marriage-rates of a modern society and the disintegration of a radioactive atom. [2]

Free will

English physicist C.G. Darwin, in the "Introduction" to his 1952 *Next Million Years*, argued in a contradictory manner that the next million years of human evolution could be predicted by the methods of thermodynamics and statistical mechanics, and that people were "human molecules" as he defined us, but that, in a contradictory manner to his overall thesis, humans have free will owing to their 'unpredictability'.

Bifurcations

Belgian chemist Ilya Prigogine, in the 1970s, predominately, promoted the view that the evolution of humans was akin a like the evolution of Benard cells, which he defined as dissipative structures, according to which, prior to their formation, up to the bifurcation point, things were predictable, but that at the bifurcation point things became **unpredictable**.

This is an ontic opening argument method of arguing against determinism in the human sphere or arguing that human behavior is indeterministic, which of course is code for a free will argument.

Adjacent possible

In 1999, in promotion of his upcoming 2000 book *Investigations*, Kauffman began to outline what seems to be his unified theory, that of what he calls the "adjacent possible" (or chemically adjacent possible), a rather ill-defined term, which he describes as those regions of the biosphere in which "autonomous agents" (Kauffman's term for a minimal living thing, which meets the criterion: (a) is auto-catalytic, (b) completes one thermodynamic work cycle, (c) has a membrane) push their way into novelty—molecular, morphological, behavioral, and organizational. The thermodynamic states not yet attained - the "adjacent possible" states as Kauffman terms them - are **unpredictable** since they are the result of the interaction of the large collection of autonomous agents, such as people, or rather one's genes, and all the other evolving things in the external world. [3]

This, similar to Prigogine's dissipative structures argument, is an ontic opening argument against determinism.

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θΔics

In government, **US Constitution** is []

Overview

In 1787, James Madison, the so-called "father of the Constitution", wrote the US Constitution, wherein the word god does not appear:

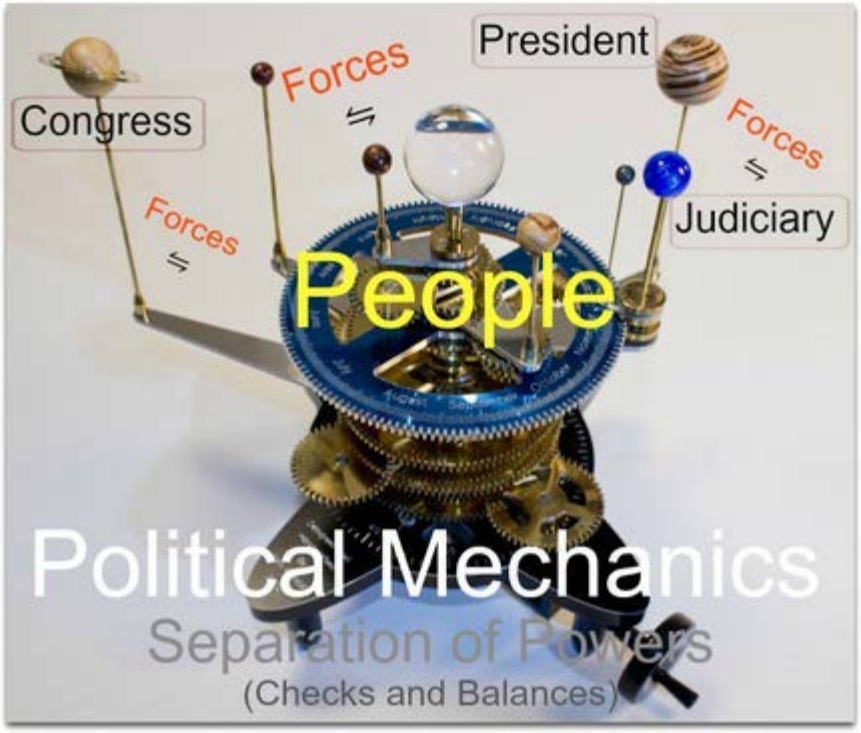

A **US Constitution** labeled “orrery” similar to the one purchased for Princeton University by John Witherspoon in 1771, showing a working model of a Newtonian mechanics based "solar system", the logic of which being taught to James Madison as a Princeton student, via an early form of social mechanics, the basics of which he used in the construction of writing of the US Constitution, in respect to separation of powers and checks and balances.

originally drafted in the form of his “Virginia Plan” (Ñº), with its model of checks and balances between three different branches of government, mentally constructed from the Newtonian-conceptualized (see: Newtonian government) theories of John Witherspoon and or Charles Montesquieu, based on the primitive form of social physics he had learned at Princeton in 1769.

Quotes | Madison

The following are James Madison-related quotes:

> “There can be no question of the fact that, in early Princeton, physics cooperated with politics in a sort of analogical double play, Newton to Witherspoon to **Madison**.”
>
> — John Q. Stewart (1955), on social physics at Princeton [2]

> "The eighteenth century was dominated intellectually by the scientific work of Newton, and mechanical metaphors sprang naturally to men's minds. Men had found a rational order in the universe and they hoped that it could be transferred to politics. **Madison** spoke in the most precise Newtonian language when he said that such a 'natural' government must be so constructed 'that its several constituent parts may, by their mutual relations, be the means of keeping each other in their proper places.'"
>
> — Richard Hofstadter (1967), *The American Political Tradition* [3]

> "The third element—the principle of checks and balances—in the principle of separation of powers is what **Madison** called 'partial agency', which gives each branch enough power over the others to be able to check them. This principle of checks and balances, designed to enable the three branches to protect themselves from each other's encroachments."
>
> — Levine and Cornwell (1968), *An Introduction to American Government* [4]

> "The founders were elitists, and realists about human nature. Their task was to make passion subject to reason. If men could be expected to be selfish, or worse, then said **James Madison** 'ambition must be made to counteract ambition'. The Newtonian principles of action and reaction were applied to politics."
>
> — Lance Morrow (1987), "The Ark of America" [5]

Quotes

The following are related quotes:

> "The **Constitution** was founded on the law of gravitation. The government was to exist and move by virtue of the efficacy of 'checks and balances.' The trouble with the theory is that government is not a machine, but a living thing. It falls, not under the theory of the universe, but under the theory of organic life. It is accountable to Darwin, not to Newton. It is modified by its environment, necessitated by its tasks, shaped by the sheer pressure of life."
>
> — Woodrow Wilson (1912), Presidential candidate campaign speech [1]

> "By the statement America was founded on 'Judeo-Christian philosophy', I mean that the founders of the **Constitution**, the people who forged the country, believed in the Ten Commandments, and that's what they based the 'law' on."
>
> — Bill O'Reilly (2015), on (Ñº) Carson's no vote for Muslim President statement, Sep 22

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External links

â— United States Constitution – Wikipedia.

θΔics

In morality theories, **utilitarianism** is a type of consequentialist or teleological philosophy or moral guidance system which argues that the consequence to be pursued is the maximization of good or utility, generally referring to the greatest total good for the greatest number. [1]

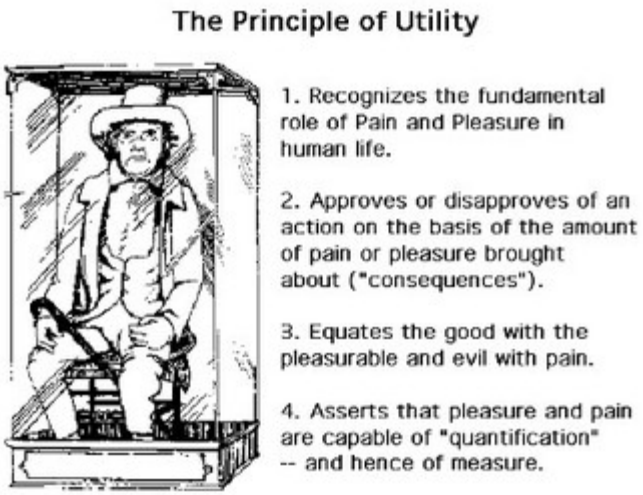

Cartoon version of Jeremy Bentham's version of **'utilitarianism'** or the principle of utility. [3]

History

English jurist and philosopher Jeremy Bentham coined the term 'utilitarianism' in his 1789 *Introduction to the Principles of Morals and Legislation*. [2] Bentham, supposedly, viewed the classical theories of Plato and Aristotle and notions such as Immanuel Kant's 1785 "categorical imperative" to be too outdated, confusing, and or controversial to be of much help with modern society's ills and a program of social reform. He adopted what he took to be a simple and 'scientific' approach to the problems of law and morality and grounded his approach in the "Principle of Utility." [3]

Bentham's utility principle was expanded in English political philosopher John Stuart Mill's 1863 book *Utilitarianism*. [4]

Thermodynamics

A noted debated quote from an anonymous undergraduate paper concerning the validity of the utility theory of morality is:

> "Utilitarianism is wrong because it violates the second law of thermodynamics, and we should not violate the second law."

Mika LaVaque-Manty comments on this that the format of the presentation of this argument is called a 'category error' in the sense that "the laws of thermodynamics are not the sort of things that can be violated, not by us or, insofar as we know, anything else in the universe." [5] In the correct sense, the student would have been better to argue that the theory of utilitarianism does not meet the Eddington rule, which translates to the effect that it does not hold up against the Clausius inequality in the long run and the Lewis inequality theory of spin cycles in the human sphere of directed or prescribed 'good' and 'bad' directions of operation.

See also

- Negative confessions
- Moral symbols
- Moral movement

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External links

- Utilitarianism – Wikipedia.

θΔics

In terminology, **utility** is “pleasure itself, together with exemption from pain” (Epicurus, 300BC + Jeremy Bentham, 1789); “the foundation of morals, which holds that actions are right in proportion as they tend to promote happiness, wrong as they tend to produce the reverse of happiness” of which there is “public utility” and “private utility” (John Mill, 1863); a “discredited concept” (Paul Samuelson, 1938); the “measure of what you want [desire]; basically a measure of value or preference” (Tom Siegfried, 2006). [6]

Thermodynamics

In modern human chemical thermodynamics terms, the concept of utility seems to be a groping at what is now quantified by bulk human action directionality defined by coupling theory.

History

The earliest utility models, e.g. as espoused by Richard Cumberland (1631-1718) and John Gay (1699-1745), were theologically-based, utility conceptualized as something that maximizes a god-based moral directionality compass of human actions. [1] Gay, e.g., in 1731, enunciated utility—god sanctioned happiness—as the explanation of human actions. [2]

In 1738, Daniel Bernoulli, supposedly, introduced a “utility” function, which, according to Jing Chen (2016), was the first so-called “utility” function in economics. [8]

In circa 1750, David Hume (1711-1776) elaborated on Gay’s discussions of utility.

This was followed by the elaborations of Jeremy Bentham and John Mill, who, like Epicurus, identified the good with pleasure, holding that people ought to maximize the good, that is, bring about ‘the greatest amount of good for the greatest number’. [1]

Bentham

In 1780, English jurist-philosopher Jeremy Bentham defined utility as follows: [7]

> “**Utility** is that property in any object, whereby it tends to produce benefit, advantage, pleasure, good, or happiness or to prevent the happening of mischief, pain, evil, or unhappiness.”

Bentham often referred to this “principle of utility” as the “greatest happiness principle”. [5]

Pareto

In 1896, Italian engineer Vilfredo Pareto was paralleling his term “ophelimity” with utility as follows: [3]

> “In all treatises on political economy, the main part is formed by the science of ophélimité and **utility**.”

In 1912, Pareto, in his *Treatise on General Sociology*, defined utility as one of the properties of social molecules (people defined as molecules), as follows: [4]

> “§2079. Organization of the social system. The economic system is made up of certain molecules set in motion by tastes and subject to …” (pg. 1442)
>
> “… and molecules have certain thermic, electrical, and other properties. So a system made up of social molecules also has certain properties that are important to consider. One among them has been perceived, be it in a rough and crude fashion, in every period of history—the one to which with little or no exactness the term **‘utility’** …” (pg. 1456)

> "… subsist in certain relationships. The reasonings (derivations), theories, beliefs that are current in the mass of such molecules are taken as manifestations of the [psychic] state of that mass and are studied as facts on a par with other facts that society presents to view. We look for uniformities among them, and try to get back to the facts in which the in turn originate." (pg. 1919)

(add discussion)

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External links

â— Utility – Wikipedia.

θΔics

In equations, the formula:

$$V = kT$$

is called Charles' law and states that for a body of ideal gas, at constant particle count and pressure, not too far from STP, the volume V of the gas will be equal to the product of a constant k and the temperature T of the gas.

History

The equation was based on experiments done by French scientist Jacques Charles in circa 1787 and named in his honor in 1802 by French chemist Joseph Gay-Lussac.

θΔics

In hmolscience, **V.N. Ilyin** (1952(?)-), Валерий Николаевич Ильин (Russian), В.Н. Ильин, or Viktor N. Il'in (?), is a Russian scientist noted for []

Overview

In 2005, Ilyin, in his *Thermodynamics and Sociology: Physical Basis of Social Processes and Phenomena*, attempted to outline some type of thermodynamics based sociology; the abstract of which is as follows: [1]

> "The book presents the foundations of a new branch of theoretical sociology—social thermodynamics. Consider the global sense of social processes from the standpoint of the fundamental laws of nature—the laws of thermodynamics. First formulated [are the] social counterparts gas laws and the first law of thermodynamics. A concept of the organization and the differences as the basis of thermodynamic worldview defines the principles of conduct in view of the differences ranging forms of energy according to their values. Given the social interpretation of the second law and on its basis the analysis of the behavior of modern open and closed social systems, including the positions of globalization.
>
> Scientifically, in terms of the thermodynamics of open systems, grounded destructiveness of globalization in today's conditions for Russia. The principle of least samozatrat (?) [самозатрат] energy as the basis of microevolution behavior of physical and social systems, describes its manifestations in various areas of public consciousness. Much attention is paid to understanding the concept of information and its relationship with the organization, entropy and energy. The book should contribute to the development of sociology as a rigorous theoretical science, based on the general laws of nature and able to give an objective physical explanation of social phenomena. For a wide range of readers interested in the unity of nature and society. The book can also be used by students, graduate students and faculty as a teaching tool in the social sciences: sociology, political science, philosophy, etc."

(add discussion)

In 2010, Ilyin, in his second edition, stated the following in regards to free energy:

> "I consider it necessary to make a reservation on the understanding of the book used the term "free energy". As is known, in classical thermodynamics they represent one of the thermodynamic potentials - free energy Boltzmann or Gibbs. In order to simplify the presentation, I thought it possible to depart from this strict definition, bringing with it the need for a large number of additional explanations and restrictions. The text of the book, the term "free energy" does not refer to Boltzmann, Gibbs and neither represents the energy that is capable of conversion into other forms of energy, as opposed to the concept of energy associated to such a transformation of disability. Perhaps more properly be called the free energy of unbound. I hope that experts in thermodynamics will understand me and forgive this liberty, like other permissive, caused solely by a desire to make the presentation understandable to a wider audience."

Cover of Ilyin's 2005 *Thermodynamics and*

Without a look at the equations, it is difficult to glean what Ilyin means by this note? To exemplify, it is difficult to see what he is referring to here in regards

to "Boltzmann free energy"?

Sociology, which seems to depict a gas particle (human particle) view of people, shown sad in the pressurized (left) compartment and happy in the depressurized (right) compartment.

Other

Ilyin's 2009 *Manifesto of the Russian Civilization* contains a chapter on the thermodynamics of social systems. [3]

Education

Ilyin has a PhD in the technical sciences, is a professor, and head of the Moscow State Aviation University (MAI), academician of the International Academy of Information Technology and the Academy of New Information Technologies, a specialist in the field of design automation and artificial intelligence, the author of over 200 publications, including 16 books and manuals, published in our Russia and abroad. [2]

References

1. Ilyin, V.N. (2005). *Thermodynamics and Sociology: Physical Basis of Social Processes and Phenomena* (*Termodinamika i sotsiologiya Fizicheskie osnovy sotsialnykh protsessov i yavleniy*) (Термодинамика и социология: физические основы социальных процессов и явлений) (304-pages) (abs). KomKniga; URSS, 2009.
2. Ilyin, V.N. (2010). *Thermodynamics and Sociology: Physical Basis of Social Processes and Phenomena* (Table of contents; about the author). URSS.ru.
3. Ilyin, V.N. (2009). *Manifesto of the Russian Civilization* (abs). URSS.ru.

θΔics

In science, **Vaclav Havel** (1936-) is a Czech playwright and former Czechoslovakian president noted for his 1986 quote on entropy as struggle to evolves, or something along these lines.

Overview

In 1986, Havel, in his "Letter to Dr. Gustav Husak", stated the following now-popular entropy quote: [1]

> "Just as the constant increase of entropy is the basic law of the universe, so it is the basic law of life to be ever more highly structured and to struggle against entropy."

which is a variant of the original 1886 version by Austrian physicist Ludwig Boltzmann. [2]

Education

From around the time Havel was seventeen, he was tutored privately in philosophy by Czech sociologist Josef Fischer, a friend of the family, who would often present Havel with a long list of books to read. [4] Fisher during this period was said to have been working to develop a fourth law of thermodynamics. Fischer significantly influenced Havel, which is likely from where Havel likely learned about entropy. [3] Into the 1950s, entered into a four-year apprenticeship as a chemical laboratory assistant and simultaneously took evening classes; he completed his secondary education in 1954. Havel then studied economics at the Czech Technical University in Prague from 1955 to 1957.

Related

Another head of a country to use thermodynamics in application to human existence, was Iranian Prime Minister Mehdi Bazargan.

References

1. (a) Havel, Vaclav. (1986). "Letter to Dr. Gustav Husak", in *Living in Truth*, pt. 1.
(b) Andrews, Robert. (1993). *The Columbia Dictionary of Quotations* (pg. 224). Columbia University Press.
(c) Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (pg. 485). AuthorHouse.
2. Boltzmann, Ludwig. (1886). *The Second Law of Thermodynamics.* In B. McGinness, ed., *Ludwig Boltzmann: Theoretical physics and philosophical problems: Select Writings.* Dordrecht, Netherlands: D. Reidel, 1974.
3. Keane, John. (2001). *Vaclav Havel: A Political Tragedy in Six Acts* (pg. 91). Basic Books.
4. Fischer, J. L. (Josef Ludvik) (1894-1973) – WorldCat Identities.

External links

â— Vaclav Havel – Wikipedia.

θΔics

In science, **Vaclav Smil** (1944-) is a Czech-born Canadian earth and mineral sciences scholar noted for summary works on the topics of the Haber process, Fritz Haber, Eduard Sacher, and a general history of energy technologies. [1]

References

1. (a) Smil, Vaclav. (1991). *General Energetics: Energy in the Biosphere and in Civilization* (Sacher, pgs. 5, 348). Wiley.
(b) Smil, Vaclav. (1999). *Energies: an Illustrated Guide to the Biosphere and Civilization*. MIT Press.
(c) Smil, Vaclav. (2004). *Enriching the Earth: Fritz Haber, Carl Bosch, and the Transformation of the World Food* (pg. 226). MIT Press.

External links

â— Vaclav Smil – Wikipedia.
â— Smil, Vaclav – WorldCat Identities.

θΔics

In science, **vacuist**, as opposed to a "plenist" (or Aristotelian), refers to one who believes in the existence of the vacuum; both are pre 18th century (1701-1800) terms.

Quotes

The following are related quotes:

> "These and many other considerations are adduced on both sides of this question. Melchior Cornaeus (Q), professor of theology at our own university of Wurzburg, has learned and at some length argued these matters in a discussion of his own dedicated to this topic. On several occasions he and I observed and carefully scrutinized the experiments in question. When I first saw them, I sent an account to Kircher at Rome and to some other friends and scholars, asking their opinion of them. All of them sided with the Aristotelians against the '**vacuists**'. Among the replies I received was [a Feb 1656] letter from Kircher."
>
> — Gaspar Schott (c.1656), summary of communications on Otto Guericke's vacuum experiments [1]

See also

- Vacuum break
- Vacuum bulb
- Vacuum pump

References

1. (a) Schott, Gaspar. (1657). *Mechanica hydraulico-pneumatica* (§:Experimentum Novum Magdeburgicum, pgs. 441-88; Vacuist, pgs. 451-52). Publisher.
(b) Conlon, Thomas. (2011). *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum* (vacuist, pgs. 67, 319). Saint Austin Press/LuLu.

θΔics

In science, **vacuum** (TR:269) which is near synonymous with "void", is region of space completely devoid of matter.

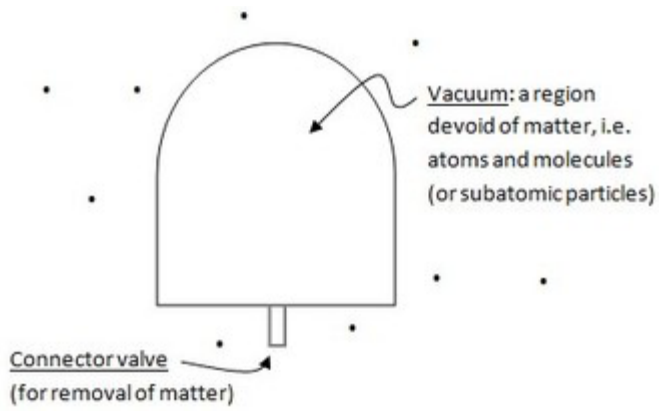

Simplistic diagram of a **vacuum** or region devoid of anything, showing a connector valve attached to a vacuum bulb, whereby a vacuum pump can be used to remove the interior particles, through the action of work (the 'working' of the pump arm), creating a pressure difference between the volume inside the bulb and the surrounding space.

Overview

The topic of whether or not a vacuum can actually exist in reality is captured in the famous dictum "nature abhors a vacuum", initiated by Greek philosopher Parmenides' 485BC argument that vacuums or voids are a natural impossibility. This debate can be said to have been directly responsible for the the vacuum pump, invented by German engineer Otto Guericke in circa 1643, the gas laws which followed, the invention of the steam engine, and thus thermodynamics as the science of the study of heat engines from the general point of view.

The term "ideal gas" originated in the phrase "perfect gas" and "perfect ideal gas" on attempts to make a "perfect vacuum", during in the 17th century, inside of a piston and cylinder, e.g. in a gunpowder engine.

The vacuum debate, through the thinking of Italian physicist Galileo Galilei, resulted in the invention of the barometer, via investigations on the subject of the vacuum by Galileo's student Italian physicist Evangelista Torricelli in 1643.

Quotes

The following are related quotes:

> "If the **vacuum** cannot be recognized either by the senses or by the intellect, how have you managed to find out that it does not exist?"
>
> — Galileo (c.1620), annotations, in his copy of Julius Galla's *On the Appearance of the Orbit of the Moon* (*De phaenomenis in orbe lunare*), after the phrase 'concerning the vacuum'; cited by William Middleton (1964) in *The History of the Barometer* [1]

> "The word '**vacuum**' first appeared in the English language in 1550, introduced by Thomas Cranmer, the Archbishop of Canterbury, who composed the Book of Common Prayer, the central document of the Church of England. The phrase he used, as part of a theological argument, is cited in the Oxford English Dictionary: 'Naturall reason abhorreth vacuum, that is to say, that there should be any emptye place, wherein no substance shoulde be.' This was the sanctioned view, but, with the accession of the Catholic Queen Mary in 1553, the winds of orthodoxy shifted. Cranmer was convicted of heresy in 1555, and was burned at the stake the following year."
>
> — Richard Williams (2012), "Oct 1644: Torricelli Demonstrates the Existence of a Vacuum" (Q), This Month in Physics, APS News

References

1. Middleton, William E. (1964). *The History of the Barometer* (pg. 5) (Amz). Publisher.

Further reading

● Close, Frank. (2007). *The Void.* Oxford University Press.
● Grant, Edward. (1981). *Much Ado about Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution* (Guericke, 9+ pgs; void, 20+ pgs; vacuum, 22+ pgs). Cambridge University Press.

External links

- Vacuum – Wikipedia.

θΔics

In science, **vacuum break**, vacuum breaking, or the premise that when the "vacuum broke", refers to the Aristotle-themed premise that vacuums cannot exist, and that what seems to be the formation or start of a vacuum, in maximum amount of force required to pull a piston out of, e.g. a sealed piston in a Galileo engine, or the two hemispheres of the Magdeburg hemispheres, is the breaking of a air or water conceptualized like a "sponge" or "rope", as conceptualized by Galileo (*Dialogue Concerning the Two Chief World Systems*, 1632), that when pulled hard enough "breaks", but in reality is the breaking point when the force of the pull overcomes the weight of the atmospheric pressure or column of air, up to the Karman line boundary of space.

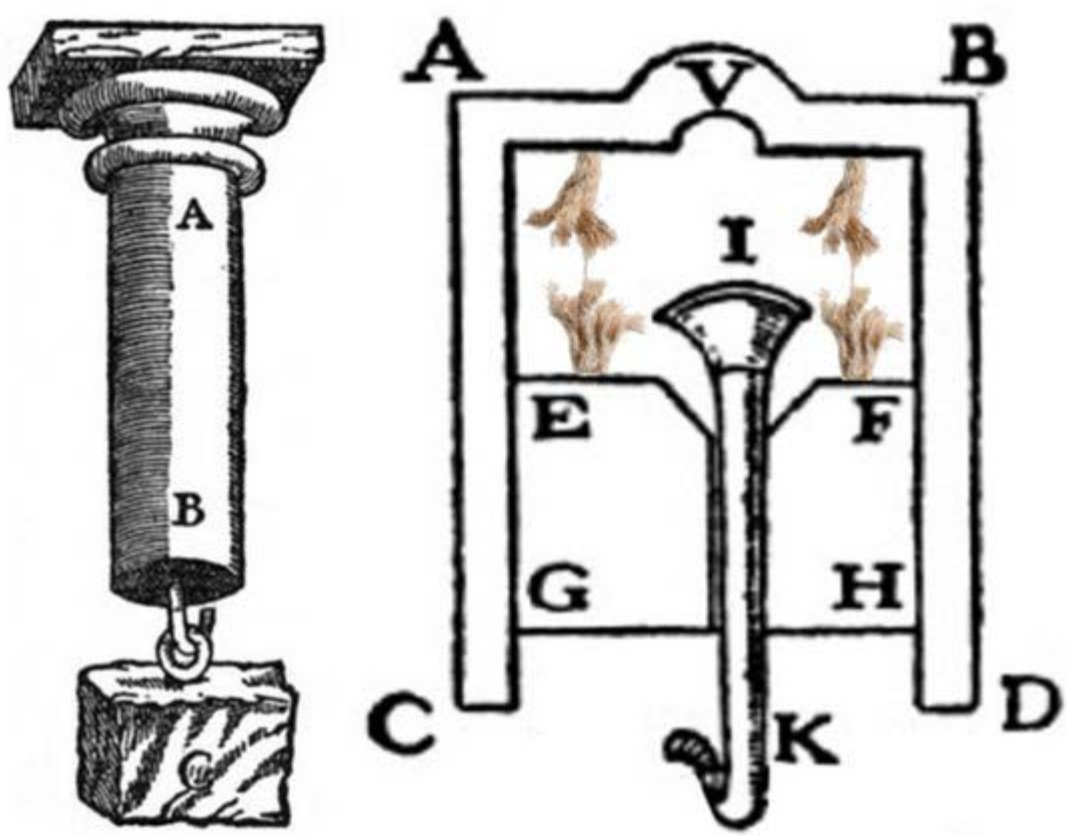

The 1632 Galileo engine shown with nearly broken hemp cords, which is kind of how Galileo tentatively thought what would happen if one filled the above piston and cylinder with air or water and then pulled on handle K until the seal broke, meaning that the "cord of water or air" had been broken, NOT that a vacuum had been formed, as this contradicted the nature abhors a vacuum dictum. [2]

Quotes

The following are related quotes:

> "If hemp or steel cords break under excessive weight, what doubt could we have that a **cord of water will likewise break**? In fact, it will break more easily, insofar as the parts of water, becoming separated from one another, do not have to overcome resistances other than that of the vacuum that is created at the moment of division. This is because in the case of iron and other solids, there is a very strong and tenacious attachment of the parts that is absent in water."
>
> — Galileo (1630), "Letter to Giovani Baliani" (Ñº), Aug 6

> "In spite of its advance over its predecessors, the Newcomen engine was slow and inefficient. As has been said, it operated at atmospheric pressure or less. It used steam only to create by condensation a vacuum which allowed the atmosphere to press down upon the piston. Its working beam was balanced to rock again as the **vacuum broke** and steam reentered the cylinder. The expansive force in the steam was not used to push or pull anything."
>
> — Richard Kirby (1956), *Engineering in History* (pg. 166) [1]

References

1. Kirby, Richard; Withington, Sidney; Darling, Arthur; and Kilgour, Frederick. (1956). *Engineering in History* (pg. 169-72). Courier, 1990.
2. (a) 5. (a) Galilei, Galileo. (1638). *Discourse and Mathematical Demonstration of the Two New Sciences* (*Discorsi e dimostrazioni Matematiche Intorno a Due Nuove Scienze*) (pg. 15). Leiden.
(b) Boschiero, Luciano. (2007). *Experimental and Natural Philosophy in Seventeenth-century Tuscany* (pg. 118).

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θΔics

In engines, **vacuum bulb** (TR:21), aka "air pump", is a glass sphere that can be attached and detached to a vacuum pump, with a twist of the of the stopcöck, after the vacuum is made inside the bulb and be carried about as a sort of storage vacuum and used later to be harnessed for work as in the lifting device arrangement of the Guericke engine.

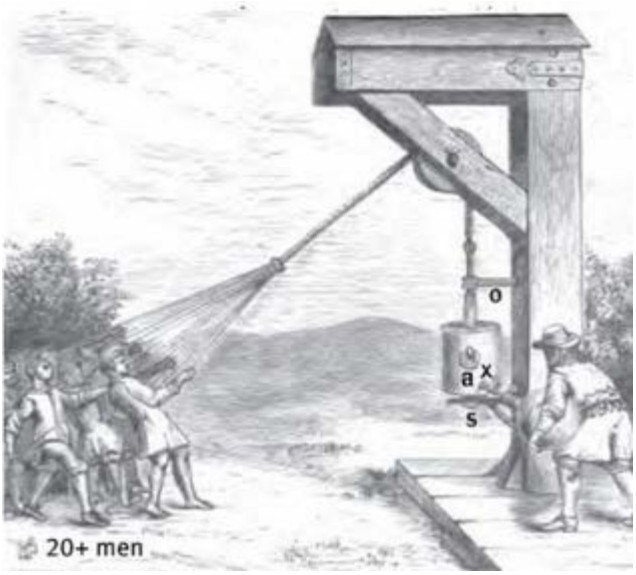

Left: a 1663 design **vacuum bulb** (top part) and vacuum pump (bottom part), the third design of the vacuum pump by German engineer Otto Guericke. Right: a small boy (left) holding a **vacuum bulb** in circa 1670 "lifting device" Guericke engine experiment where, when connects the bulb to connector x and then turns the stopcöck, releasing the power of the vacuum, at which point the piston is pushed down and the men jerked forward.

History

The vacuum bulb was invented in circa 1650 by German engineer Otto Guericke as the vacuum holding part of the the vacuum pump.

Quotes

The following are related quotes:

> "Guericke had designed his first air pump on the basis of a fire syringe: a piston moving back and forth in a brass cylinder. During the outward motion, it took in air from a spherical recipient. The pump was emptied during the inward stroke, while a leather valve prevented the air from flowing back to the recipient. The outlet was supplied with a valve as well, to prevent the atmospheric air from being taken in during the suction stroke. Hooke and Huygens improved on this design, but the overall idea remained the same. Leakage was the largest problem with the earliest **vacuum pumps**. To reduce it, the pump cylinder had to be perfectly straight with a smooth inner surface. Requirements like this made the construction of a vacuum pump extremely expensive and difficult. No more than fifteen scholars and institutions succeeded in obtaining a vacuum pump before 1670, and most of these depended on Guericke, Hooke, or Huygens for the construction and maintenance of their instruments."
>
> — Anne Helden (2003), "Air Pump", in: *Encyclopedia of the Scientific Revolution* [1]

See also

â— Engine development timeline

References

1. Otto von Guericke and the Magdeburg Hemispheres – MK-Technology.com.
2. (a) Shapin, Steven and Schaffer, Simon. (1985). *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Guericke, 5+ pgs; map, pg. 228; antlia pneumatica, pg. 278). Princeton University Press, 2011.
(b) Helden, Anne. (1991). "The Age of the Air-Pump" (pdf), *Tractrix: Yearbook for the History of Science, Medicine, Technology, and Mathematics*, 3:149-72.
(c) Helden, Anne. (2003). "Air Pump", in: *Encyclopedia of the Scientific Revolution: from Copernicus to Newton* (editor: Wilbur Applebaum) (§: Air Pump, pgs. #; Guericke, 5+ pg. #). Routledge.

θΔics

In science, **vacuum pump** (TR:69), as contrasted with an air pump, is a device that is able to withdraw air from an attached bulb (vacuum bulb, or receiver), thus producing a vacuum in the receiver, e.g. via the mechanical cranking of an arm, the down-stroke of each arm working to remove the air from a connecting vessel (top bulb) or vacuum bulb, via the mechanism of a piston and cylinder action with a one-way valve, and thus create a vacuum or region devoid of gas.

Left: the original **vacuum pump**. Center: a 1663 third generation vacuum pump. Right: a semi-modern laboratory size scale version.

History

The first vacuum pump was invented in circa 1650 by German engineer Otto Guericke, as shown adjacent. [1] The third design, supposedly, being more of a portable design, was built in 1663.

The following shows a "second generation" **vacuum pump**, the one shown constructed in Guericke's private house in 1664, spanning from the cellar up to his office. [2]

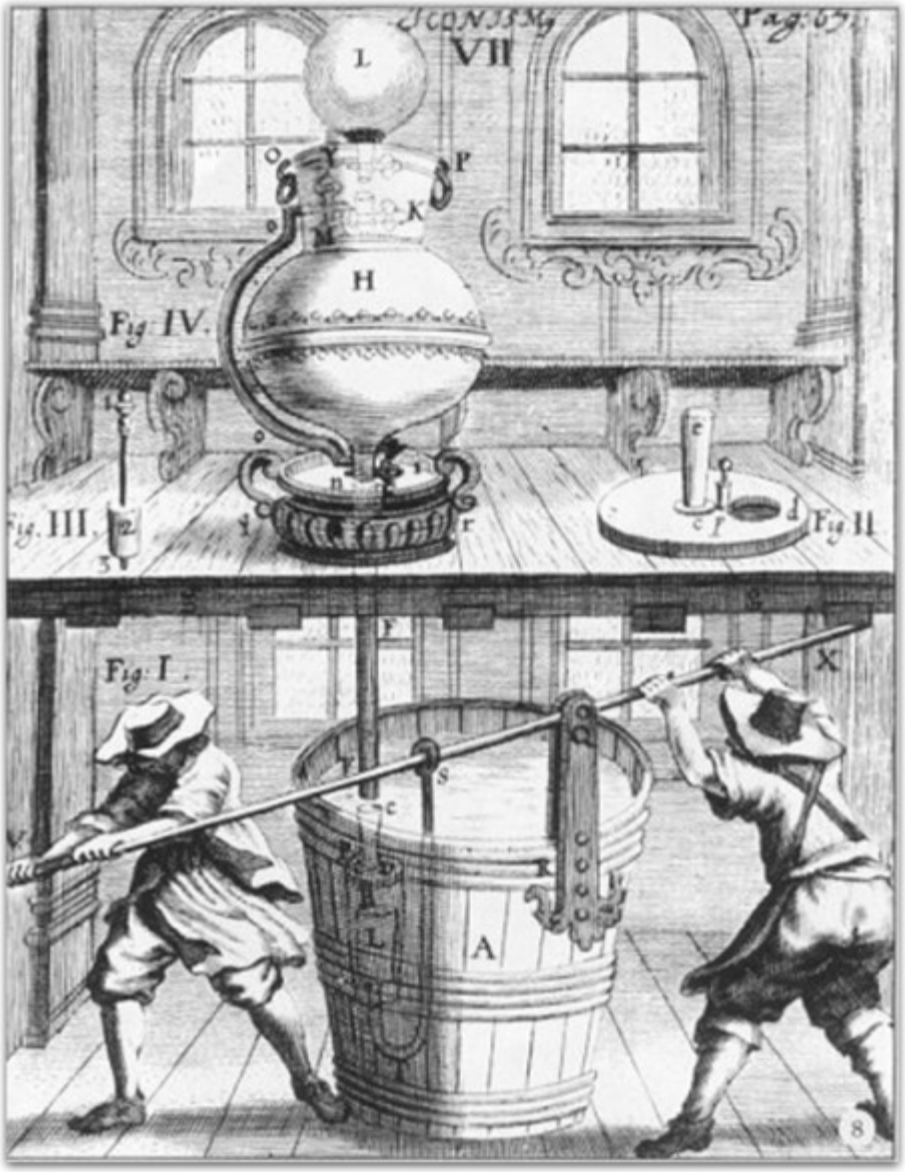

(add)

See also

â— Engine development timeline
â— Timeline of thermodynamics

References

1. (a) Wilson, George. (1849). "On the Early History of the Air-Pump in England", *The Edinburgh New Philosophical Journal*, (pgs. 330-54).
(b) Galloway, Robert L. (1881). *The Steam Engine and its Inventors*. London: MacMillan and Co.
2. (a) The First Vacuum Pump – MK-Technology.com.
(b) Otto von Guericke and the Magdeburg Hemispheres – MK-Technology.com.

External links

â— Vacuum pump – Wikipedia.

θΔics

In chemistry, **valence**, valency, or “combining power”, refers to the ability of one type of atom to bond to another type of atom.

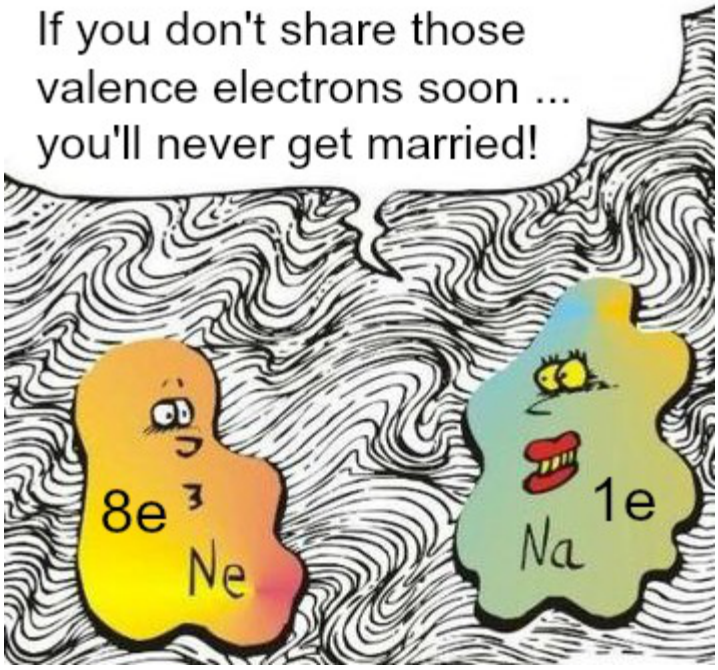

A chemical anthropomorphism cartoon depiction elements and marriage in terms of **valence** electrons. [3]

History

The main forerunner to the concept of the valence bond was the "hooked atoms" model of chemical attachment.

Irish chemist William Higgins’s 1789 theory of the division of forces between ultimate particles was said to foreshadow the valency bond.

English chemist Edward Frankland’s 1852 theory of “combining powers” is said to have launched the basic outline of valance theory. [1] The actual paragraph attributed to the inception of the “valence” theory of chemistry is found at the tail end of Frankland’s 1852 article “On a New Series of Organic Bodies Containing Metals” wherein he writes:

> “When the formulae of inorganic chemical compounds are considered, even a superficial observer is struck with the general symmetry of their construction; the compounds of nitrogen, phosphorous, antimony, and arsenic especially exhibit the tendency of these elements to form compounds containing 3 or 5 equivalents of other elements, and it is in these proportions that their affinities are best satisfied; thus in ternal group we have NO_3, NH_3, NS_3, PO_3, PH_3, PCl_3, SbO_3, SbH_3, $SbCl_3$, AsO_3, AsH_3, $AsCl_3$, etc., and in the five-atom group NO_5, Nh_4O, NH_4I, PO_5, Ph_4I, etc. Without offering any hypothesis regarding the cause of this symmetrical grouping of atoms, it is sufficiently evident from the examples just given that such a tendency or law prevails and that no matter what the character of the uniting atoms may be, the combining power of the attracting element, if I may be allowed the term, is always satisfied by the same number of these atoms.”

Frankland's term “combining power” was soon afterwards called quantivalence or valency, by the English chemists, and later valence by American chemists.

In 1919, American chemist Irving Langmuir, borrowed the term valency to explain Gilbert Lewis's 1902 cubical atom model by stating that "the number of pairs of electrons which any given atom shares with the adjacent atoms is called the *covalence* of that atom"; and hence, thereafter, the concept of the “covalent bond” originated, meaning the sharing of two electrons. The prefix *co-* means "together", in the sense that a co-valent bond means that the atoms share valence.

In 1921, Julius Cohen, in his *Organic Chemistry*, stated that “degree of affinity” corresponded exactly to “valency”. [4]

References

1. Partington, J.R. (1989). *A Short History of Chemistry*. Dover.
2. (a) Frankland, Edward. (1852). “On a New Series of Organic Bodies Containing Metals”, *Philosophical Transactions of the Royal Society of London*, 142: 417-44.
(b) Palmer, William. (1944). *Valency: Classical and Modern* (Frankland and Kekule discover valency, pgs. 8-). Cambridge University Press.
3. Jarape. (year), “Valance Electrons”, JarpeScienceCartoons.Blogspot.com.
4. Cohen, Julius B. (1921). *Organic Chemistry: for Advanced Students, Volume 1* (pg. 54). Arnold.

Further reading

● Lewis, Gilbert. (1923). *Valence: and the Structure of Atoms and Molecule*. The Chemical Catalog Company, Inc.

● Coulson, Charles A. (1952). *Valence.* Oxford at the Clarendon Press.
● Russell, Colin A. (1971). *The History of Valency*. Humanities Press.
● Russell, Colin. (2003). *Edward Frankland: Chemistry, Controversy, and Conspiracy in Victorian England.* Cambridge University Press.

External links

● Valence (chemistry) – Wikipedia.

θΔics

In human thermodynamics, **Valery Chalidze** (1932-) is Russian-born American mathematician and physicist noted for his 2000 *Entropy Demystified*, wherein he argues that economic processes are entropy lowering processes, but that human will is a type of "informed energy" that allows people to deviate from the proscriptions of physical laws.

Overview

In 2000, Chalidze, in his *Entropy Demystified: Potential Order, Life and Money*, attempted to extrapolate entropy into the social sciences, on the logic that money is a purely energetic and low-entropic component of an economy. On the basis of Romanian mathematician Nicholas Georgescu-Roegen (1971) and German economist Malte Faber (1983), who are said to have introduced the concept of entropy into economics and sociology, Chalidze argues that an economic system is a thermodynamic system. He states, as a matter-of-fact, that:

> "After all, human activity, which is the subject of economic study, is a local entropy lowering process."

Chalidze's focal point is his concept of "potential order" defined as the ability of an open system to become orderly or to create order in another system. [2]

At the end of his book, Chalidze scripted a section entitled "In Conclusion: The Unpredictability of Will and Physics", in which he argues that someday physics may be able to accept "willing bodies into it sphere of study." [3] This section, as is the case often when writers attempt to argue that thermodynamics explains human existence, while simultaneously retaining the proposition of free will, is a sinker of the book. He states, for instance:

> "Our **will**, which is informed energy, is capable of deviating from the prescriptions of physical laws."

This, of course, is an incorrect view. The human being is a molecule (human molecule) and all molecules abide by the same laws.

Difficulties on theory

The book, in general, is poorly written, as far as books go in human thermodynamics. Without going into too much detail, to give an idea of this, both Jeremy Rifkin and Claude Shannon are cited early on, names are misspelled numerous times, e.g. Laplas (correct: Laplace) or Ludvic Boltzman (correct: Ludwig Boltzmann), special anthropomorphic concepts, such as informed energy, are attributed to human activity, and diatribe on God and religious thermodynamics are used prolifically, e.g. "from the first words of the Bible we see a deep intuitive understanding of the law of entropy", among other numerous issues.

Education

Chalidze studied at Moscow and Tbilisi University, completing his PhD in physics in *circa* 1960. [1] In 1972, he traveled at the invitation of the United States to lecture, and almost immediately was deprived of his Soviet citizenship; thereafter settling in the state of Vermont, where he currently resides.

References

1. Valery Chalidze – Peoples.ru (English translate)
2. (a) Entropy Demystified – Universal Publishers.
(b) Chalidze, Valery. (2000). *Entropy Demystified - Potential Order, Life and Money*. USA: Universal Publishers.
3. ibid, appendix section: In Conclusion: The Unpredictability of Will and Physics, pgs. 191-94.

External links

â— Valery Chalidze - Wikipedia (English)

â— Valery Chalidze – Wikipedia (Russian) (English translated)

θΔics

In existographies, **Valery Nikolaevich Ilyin** (c.1955-), or “Валерий Николаевич Ильин” (Russian), is a Russian-Israeli chemical physicist, noted for his 2005 *Thermodynamics and Sociology*, wherein, building on the gas laws and the first law of thermodynamics, and in some way information and entropy, he attempts to outline ideas on the thermodynamics of open and closed social systems.

Overview

In 2005, Ilyin published, in Russian, a 303-page treatise intitled *Thermodynamics and Sociology: Physical Basis of Social Processes and Phenomena*, the abstract of which is as follows: [1]

> “The book outlines the foundations of a **new theoretical branch of sociology**: social thermodynamics. The global meaning of social processes is considered from the standpoint of the fundamental laws of nature - the beginnings of thermodynamics. For the first time, social analogues of gas laws and the first law of thermodynamics were formulated. The concept of organization and differences is proposed as the basis for the thermodynamic worldview, the principles of the behavior of differences are formulated taking into account the ranking of energy forms according to their value. The social interpretation of the second beginning is given, and on its basis the analysis of the behavior of modern closed and open social systems, including from the standpoint of globalization processes, is carried out. Scientifically substantiated (from the standpoint of the thermodynamics of open systems) the destructiveness of globalization for Russia in modern conditions.
>
> The principle of the least self-expenditure of energy is considered as the basis of the microevolutionary behavior of physical and social systems, its manifestations in various areas of public consciousness are described. Much attention is paid to understanding the concept of information and its relationship with the organization, entropy and energy. The ideas contained in the book should contribute to the development of sociology as a rigorous theoretical science, based on the general laws of nature and able to provide an objective physical explanation of social phenomena. For a wide range of readers interested in the unity of ‘nature’ and ‘society’ . The book can also be used by students, graduate students and teachers as a textbook on the social sciences - sociology, political science, philosophy, etc.”

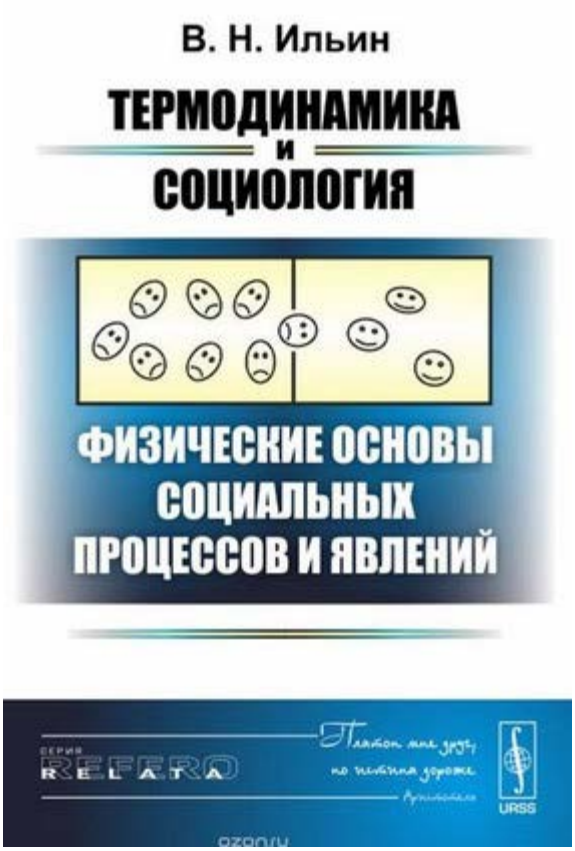

Cover of **Ilyin's** 2005 *Thermodynamics and Sociology*, which shows a two-compartment gas vessel, with molecules on the left being in a higher concentration or pressure, and "less happy", and molecules on the right at a lower concentration or pressure, and "more happy". [1]

The 2017 edition cover version of Ilyin’s book, of note, seems to be showing chemical anthropomorphism, with his depiction of happy and unhappy molecules in a two-compartment gas vessel, differing by concentration.

Education

In 2018, Ilyin was associated with the Department of Chemical Physics, of the Weizmann Institute of Science, Israel. [2]

Quotes | On

The following are quotes on Ilyin:

> “The search for such a bridge between social and natural sciences has been going on for a long time but it

was unsuccessful until the law-governed connection between them was established through thermodynamics by **Valery Ilyin** in his pioneering work: *Thermodynamics and Sociology: Physical Basics of Social Processes and Phenomena*. The author made in it a large and necessary preparatory work for understanding unity of nature and society from the natural sciences side, primarily from the standpoint of thermodynamics – one of the most universal and fundamental natural theories."

— John Avery (2017), "Thermodynamics and Negentropy of Spherical Classes" [3]

References

1. Ilyin, Valery N. (2005). *Thermodynamics and Sociology: Physical Basis of Social Processes and Phenomena* (Термодинамика и социология: физические основы социальных процессов и явлений) (Abs)(GB)(WorldCat). URSS; Moscow Aviation University, 2009.
2. Valery Ilyin (overview) – ResearchGate.net.
3. Avery, John. (2017). "Thermodynamics and Negentropy of Spherical Classes" (Q), Transcend.org, May 29.

External links

- Valery Ilyin (faculty) – Weizmann Institute of Science.
- Il'in, V.N. (Valerii Nikolaevich) – WorldCat Identities.

θΔics

In hmolscience, **Valter Caggio** (1954-) is an Italian mechanical engineer noted, in human thermodynamics, for 2004 to present publications on an effort to stitch out an entropy-themed theory of global meaning.

Overview

In 2004, Caggio seems to have been working on an entropy-based theory of global meaning, promoting his views on a number of multi-language sites: Negentropy.us (2007), Negentropie.com, and Negentropia.com. Caggio defines negentropy as 'an order factor or vital renewal for living beings'. [2]

In 2008, Caggio, in his *Negentropy and its New Global Meaning*, applies the negentropy concept to the various subjects of the humanities, ethics, politics, and religious models, using a negentropism-style of argument. [1] Caggio makes mention of Ilya Prigogine, and his Nobel Prize, Erwin Schrodinger, and his 1944 *What is Life?*, Rudolf Clausius, and his 1865 *The Mechanical Theory of Heat*, and Leon Brillouin, and his 1964 *Scientific Uncertainty and Information*, but all only in superficial loose passing or namesake.

Difficulties

A few downsides of his work are (seem) that: (a) his writing style is very unprofessional looking in terms of structure, style, feeling, and layout, e.g. half the text of the book is bolded, the Italian-to-English translation is lacking in cleanness, there's multitudes of rows of dotted lines and triple asterisks all over the place, etc.; (b) he mixes in a large amount information theory into his discussion, assuming Shannon entropy and Clausius entropy are the same; and (c) there is no derivation of negentropy, he simply jumps into a long entropology-style treatise on how he believes negentropy applies to the humanities, meaning that his underlying understanding of thermodynamics is lacking.

Education

Caggio states that he is or has worked in technical and managerial roles in industry; is or has taught at various colleges in Italy; along with having a free professional engineering course. He is a professor emeritus of Superior Tech Institutes.

References

1. (a) Caggio, Valter. (2007). *Negentropy: Meaning and New Meaning* (*Negentopia: Accezione, Nuove Accezioni*). Lulu.com.
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Further reading

â— Caggio, Valter. (2008). *Negentropy* (free online read) (pdf). YouBlisher.com.

External links

â— Home – ValterCaggio.com.

θΔics

In society, **value**, meaning “price equal to the intrinsic worth of a thing” (c.1300), from the Latin *valere* “be strong, be well; be worth” (Q), is the relative worth, utility, or importance of a thing. [1]

Thermodynamics

Thermodynamics, entropy, and evolution, according to many, are relevant to questions of values and ethics. [2] In economic thermodynamics, money, a measure of value to a certain extent, is often considered as a form of energy. [3] This implies that "value" is a term that, in theory, can be defined energetically or thermodynamically.

References

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θΔics

In human thermodynamics, **Vamshi Regalla** (c.1985-) is an Indian chemical engineer and short film production hobbyist noted for his 2012 short film "A Strange Thing Called Love", coproduced with American mechanical engineer Ravi Vedula, turned *Journal of Human Thermodynamics* article "A Strange Thing Called Love: in the View of Chemical Thermodynamics", wherein they outline their take on the chemical thermodynamics of love, employing Thims-Pati style reaction mechanisms (see: love thought experiment): [1]

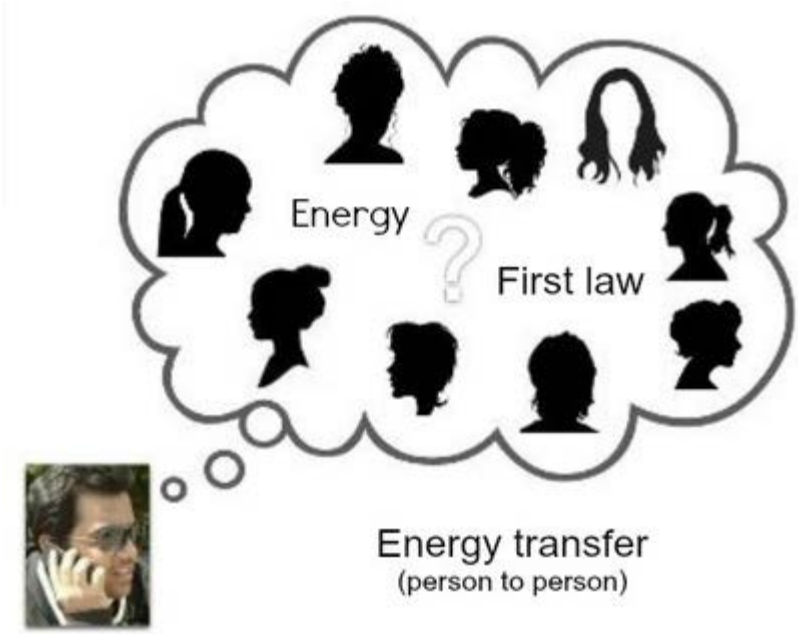

Education

Regalla completed his BS in chemical engineering at Osmania University, India, after which he spent two years in manufacturing industry, and presently is a spend analyst with a procurement consulting company.

See also

â— Goethe timeline

References

1. (a) Regalla, Vamsi and Vedula, Ravi. (2012). "A Strange Thing Called Love", YouTube, Feb 04.
(b) Regalla, Vamsi and Vedula, Ravi. (2012). "A Strange Thing Called Love: in View of Thermodynamics" (url) (pdf), *Journal of Human Thermodynamics*, 8(2): 121-32, Dec 31.

External links

â— Vamshi Krishna Reddy Regalla – LinkedIn.

θΔics

In thermodynamics, the **van der Waals equation** is an equation of state for a fluid in the liquid-vapor transition state in which particles begin to experience measurable attraction between each other, versus no noticeable attraction (Boltzmann chaos assumption), as in the ideal gas model equation of state (ideal gas law). The van der Waals equation is defined as follows:

$$\left(p + \frac{a}{v^2}\right)(v - b) = RT$$

where *a* is the 'degree of association factor', *b* the particle volume factor, *p* the pressure, v the volume, *R* the ideal gas constant, and *T* the the temperature of the body. The equation was proposed in 1873 by Dutch physicist Johannes van der Waals, who would go on to win the 1910 Nobel Prize for this work. [1]

Derivation

In 1864, German physicist Rudolf Clausius began to write the ideal gas law as:

$$pv = RT$$

where *p* is the pressure, *v* the volume, and *T* the absolute temperature of the body of non-interactive gas particles. In systems where either the pressure is increased, volume decreased, or temperature decreased, the gas can be turned into a liquid state, and the above equation becomes inapplicable. The system will be become a non-dilute aggregate of moving particles, interacting through inter-particle forces, and will fail to comply with Boyle's law. These two effects, according to Van der Waals, can attributed to attraction between the particles, signified by a new constant "a", and particle volume effects, signified by a new constant "b", and thus the new vapor-approaching-liquid state of the body of particles can thus be quantified by the following equation: [2]

$$p = \frac{RT}{v - b} - \frac{a}{v^2}$$

in its original form, or as it came to be written in later years:

$$\left(p + \frac{a}{v^2}\right)(v - b) = RT$$

With the introduction of the Avogadro constant N, being the number of particles in a mol of substance, a term coined in 1909 by French chemist Jean Perrin, the van der Waals equation became reformulated as:

$$\left(p + \frac{n^2 a}{V^2}\right)(V - nb) = nRT$$

where n^2a/V^2 is the "internal pressure" representing the attraction exerted between the molecules at short distances by the so-called "Van der Waals forces", and *nb* is the "covolume" representing the in compressible volume occupied by the gaseous molecules. [1]

See also

â— Dilute solution model

References

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2. Van der Waals, Johannes, D. (1910). "The Equation of State for Gases and Liquids." *Nobel Lecture*, December 12.

Further reading

â— Thims, Libb. (2007). *Human Chemistry (Volume One)* (pg. 293). Morrisville, NC: LuLu.

External links

â— Van der Waals equation – Wikipedia.

θΔics

In thermodynamics, a **van't Hoff equilibrium box**, or "equilibrium box" or "van't Hoff box", is a vessel of unchanging volume (fact check?) in which various substances taking part in a given reaction are present in the equilibrium state, wherein the walls of the vessel are suitably permeable to given substances, but impermeable to others. [1] The "equilibrium box idea", supposedly, can only be applied to reactions taking place in a homogeneous system, such as gases or dilute solutions. [1] The aim of the operation of the van't Hoff equilibrium box is to produce useful work arising from the following scheme:

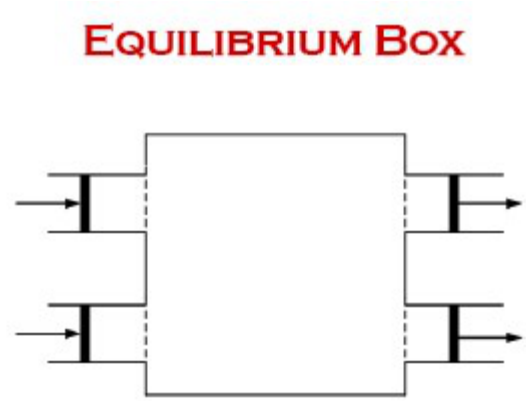

A depiction of a **van't Hoff equilibrium box**, according to American chemist Clayton Gearhart, of the type said to have been used by German physical chemist Walther Nernst in 1893 to calculate the available work A of an isothermal reversible reaction in which reactants entered on the left and products exited on the right, the entire process mediated by moving pistons and semi-permeable membranes. [4]

reaction → energy → heat → useful work

without violation of the second law of thermodynamics, even at constant temperature, using heat evolved by a reaction. [2]

History

The equilibrium box was invented by Danish physical chemist Jacobus van't Hoff in circa 1886 and supposedly is the basis for the equation that relates free energy change (ΔG or ΔF) to the equilibrium constant (k) of a chemical reaction. [3] The following is a 2003 summary of van't Hoff and his equilibrium box conception by American biochemist, science historian, and physiologist Robert Root-Bernstein: [5]

> "When I turned to the history of chemistry in graduate school, it was perhaps inevitable that I should therefore have been drawn to the man who best combined both physical chemistry and stereochemistry in his work, Jacobus van't Hoff. The beauty of three-dimensional chemical forms and their interactions still intrigues me and occupies my daily research, but the most intense aesthetic experience I have ever had in science (outside of the experience of my own rare illuminations) came when I read van't Hoff's original derivations of his equations describing the thermodynamic properties of solutions. I was struck first by the brilliance of the analogy he created between the adiabatic cycle that Clausius had imagined for pistons working on a gas and the equivalent cycle that van't Hoff mentally devised using pistons working on osmotic pressure by means of semipermeable membranes. Beyond that – far beyond that – was the experience of reading the equations he then derived describing the equivalent of PV = nRT for solutions (van't Hoff 1887). It was the most brilliant, insightful poem I had ever read!
>
> Van't Hoff's poem ["The Role of Osmotic Pressure in the Analogy between Solutions and Gases", 1887] deriving the laws of solutions wasted not a symbol. Each one made numerous connections to existing principles so that each line became a nexus of meaning. His symbols, like a magic key, opened a door from the mansion of gas thermodynamics onto the vista of an entirely unexpected estate that nature had somehow hidden from everyone else. Order from disorder, sense from confusion, imagination, insight, surprise – van't Hoff had it all. I suddenly understood a comment that van't Hoff's contemporary, Max Planck, had made in his *Autobiography*, to the effect that he was drawn to science when he encountered the first law of thermodynamics in high school. It appeared to him to be 'like a sacred commandment […] sublime' (Planck 1949). I suddenly appreciated viscerally how one could shudder before the majestic beauty of unexpected comprehension (Chandrasekhar 1987)."

The derivation supposedly done by German physical chemist Walther Nernst in his 1893 *Theoretical Chemistry*. Nernst, following the work of others, especially van't Hoff, is said to have started with the following equation:

$$A - U = T\frac{dA}{dT}$$

which reoccurs frequently in 1880-1930 German thermodynamics.

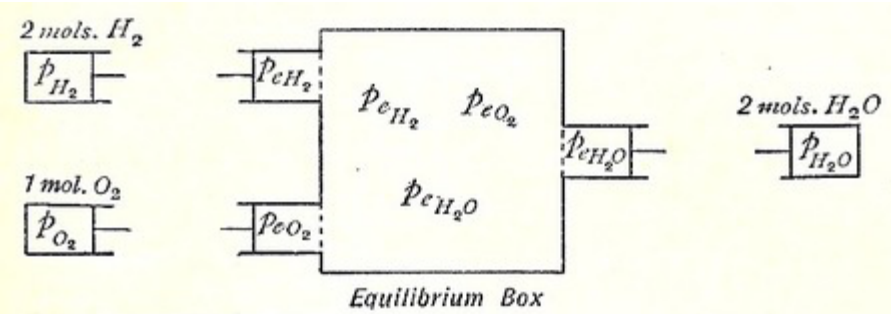

Figure: Maximum work of a gaseous reaction.

A 1928 diagrams of an **Equilibrium Boxes** from English physical chemist John Butler's *Fundamentals of Chemical Thermodynamics*, which can be used to deduce the equilibrium constant. [4]

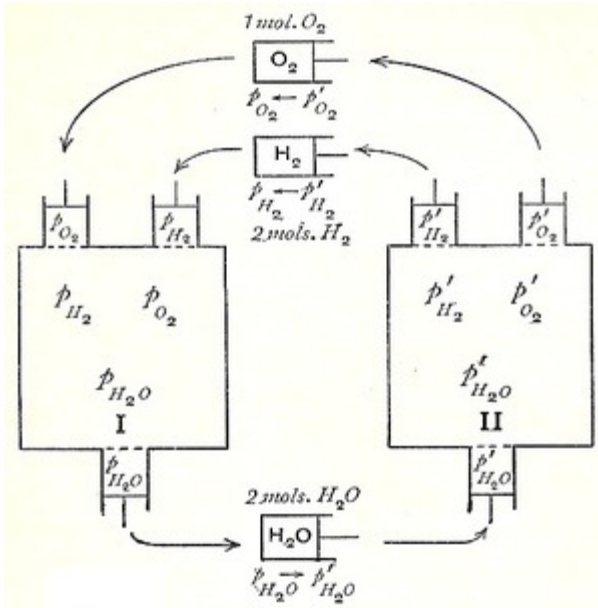

Figure: Deduction of the equilibrium constant.

To note, this last equation, in modern thermodynamic potential notation, supposedly, can be written as:

$$\Delta F - \Delta U = T\left(\frac{\partial \Delta F}{\partial T}\right)_V$$

In any event, using this equation, Nernst was able to show that for an isothermal chemical reaction, occurring in an "equilibrium box", that:

$$A = RT \ln K$$

where K is the equilibrium constant as defined in the circa 1865 work of Norwegian mathematicians Cato Guldberg and Peter Waage and their "law of mass action". [4] To connect this last equation to free energy, the 1882 Goethe-Helmholtz equation:

$$A = -\Delta G$$

can then be substituted in to yield:

$$\Delta G = -RT \ln K$$

which is the standard modern day equation relating the equilibrium constant to free energy change.

See also

â— Christopher Hirata
â— Relationship physics

References

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â— Pauli, Wolfgang. (1958). *Thermodynamics and the Kinetic Theory of Gases* (Van't Hoff box, pgs. 53-61). MIT Press, 1973.

θΔics

In thermodynamics schools, **van't Hoff school**, or physico-chemical van't hoff school (2008) or Arrhenius-Ostwald-van't Hoff school (1938), refers to the work of Dutch physical chemist Jacobus van't Hoff, and to some extent the work of Svante Arrhenius and Wilhelm Ostwald.

Etymology

The coining "van't Hoff school" seems to be a coining of Fielding Garrison as found in his multi-part 1809 article "Josiah Willard Gibbs and his Relation to Modern Science", who states: [1]

> "The contention of the van't Hoff school is that the gas equation and the Arrhenius theory are only true for infinite dilution."

A few other examples:

> "According to the Van't Hoff school the kinetic energy of dissolved molecules obey the laws governing gas pressure." (1915) [3]
>
> "The van't Hoff school has always assumed that the affinities act from the apices of the tetrahedra and have not taken the consequences of close-packing into account." (1922) [2]
>
> "The subtle boundary between physico-chemical van 't Hoff school and the organic school of Franchimont was not the only dividing line which separated the early members of NCV from other segments of the Dutch chemical community." (2008) [4]

Note

Some have said that the van't Hoff school is a "pre-Gibbsian school". [5] This, however, is a misnomer being that van't Hoff's first published paper to contain his beginning views on chemical thermodynamics was his 1877 "Views on Organic Chemistry", whereas American engineer Willard Gibbs, as a professor at Yale University, in 1873 had already published his "Graphical Methods in the Thermodynamics of Fluids", on graphical thermodynamics. [6]

See also

â— Van't Hoff equilibrium box

References

1. Garrison, Fielding H. (1909). "Josiah Willard Gibbs and his Relation to Modern Science. II", *Popular Science Monthly* (van't Hoff school, pg. 560), Jun 74:551-61.
2. Chisholm. (1922). *The Encyclopedia Britannica* (section: Chemistry, pg. 626). The Encyclopedia Britannica, Co.
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4. Nielsen, Anita K and Strbanova, Sona. (2008). *Creating Networks in Chemistry: the Founding of Chemical Societies in Europe* (pg. 208). Royal Society of Chemistry.
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(b) Van't Hoff, Jacobus. (1877). "Views on Organic Chemistry" (Ansichten über die organischen Chemie), Publisher/Journal.
(b) Gibbs, J. Willard. (1873). "Graphical Methods in the Thermodynamics of Fluids", *Transactions of the Connecticut Academy*, I. pp. 309-342, April-May.

θΔics

In terminology, **vanity**, from the Latin *vanus* "empty, void", refers to something that has no real value; a thing that is empty or valueless; inflated pride in one's own appearance; possibly from the PIE root *eue-* "to leave, abandon, give out". [1]

A visual of "**vain**", from LiberalDictionary.com, in reference to one who is excessively proud of their appearance, qualities, or "achievements" (see: Buss study) or "accomplishments; ineffectual or unsuccessful; senseless or futile; without real significance, value, or importance; baseless or worthless; without effect or avail; to no purpose; given to ostentatious display, especially of one's perceived beauty. [2]

Quotes

The following are related quotes:

> "Nothing happens ***in vain***, but everything from reason and by necessity."
>
> — Leucippus (c.460BC), *On Mind* (Fragment L1)

> "The [Faustian] puppet-play echoed and vibrated in many tones through my mind. I, also, had gone from one branch of knowledge to another, and was early **enough convinced of the vanity of all**. I had tried life in many forms, and the experience had left me only the more unsatisfied and worried. I now carried these thoughts about with me, and indulged myself in them, in lonely hours, but without committing anything to writing. Most of all, I concealed from Herder my mystic-cabalistic chemistry, and everything connected with it."
>
> — Johann Goethe (1770), reflection on intercourse with Johann Herder, in Strasburg [3]

See also

- Alley equation
- Beckhap's law
- Buss study
- Drive-thru paradox

References

1. (a) Vanity – Merriam-Webster.
(b) Vain – EtymOnline.com.
2. Vain – LiberalDictionary.com.
3. (a) Goethe, Johann. (1811-1833). *From My Life: Poetry and Truth*. Publisher
(b) Goethe, Johann. (1832). *Faust* (translator: Bayard Taylor) (pgs. 230-31). Houghton, Mifflin & Co., 1883.

θΔics

In existographies, **Vannevar Bush** (1890-1974) (CR:4) was an American electrical engineer noted for []

Overview

In 1931, Bush and Harold Hazen built a differential analyzer (O), as done earlier by James Thomson (1876) and Gustave Coriolis (1836).

In Sep 1940, Bush, of note, turned down Norbert Wiener's proposal to build a binary digital computer. [1] Bush declined to provide NDRC funding for it on the grounds that he did not believe that it could be completed before the end of the war. The supporters of digital computers were disappointed at the decision, which they attributed to a preference for outmoded analog technology. Nearly three years later (Jun, 1943) the Army provided $500,000 to build the computer, which became ENIAC, the first general-purpose electronic computer.

Quotes

The following are noted quotes:

> "In these days, when there is a tendency to specialize so closely, it is well for us to be reminded that the possibilities of being at once broad and deep did not pass with Leonardo da Vinci or even Benjamin Franklin. Men of our profession—we teachers—are bound to be impressed with the tendency of youths of strikingly capable minds to become interested in one small corner of science and uninterested in the rest of the world.... It is unfortunate when a brilliant and creative mind insists upon living in a modern monastic cell."
>
> — Vannevar Bush (c.1930), told to a group of MIT professors [2]

> "Apparently, Shannon is a genius."
>
> — Vannevar Bush (1939), written comment [3]

References

1. Zachary, G. Pascal (1997). *Endless Frontier: Vannevar Bush, Engineer of the American Century* (pg. 226-27). The Free Press.
2. Soni, Jimmy. (2017). "10,000 Hours with Claude Shannon: How a Genius Thinks, Works, and Lives" (O), The Mission, Jul 20.
3. Poundstone, William. (2005). *Fortune's Formula: the Untold Story of the Scientific Betting System that Beat the Casinos and Wall Street* (pgs. 15, 17, 148-49; Bush quote, pg. 21; Thorp, pgs. 38-40). Macmillan.

External links

- Vannevar Bush – Wikipedia.

θΔics

In science, a **variable** is a quantity that that varies or changes with time or circumstances, which can be divided into two classifications: extensive (or path independent) and intensive (or path dependent), as well as be a dependent variable or an independent variable.

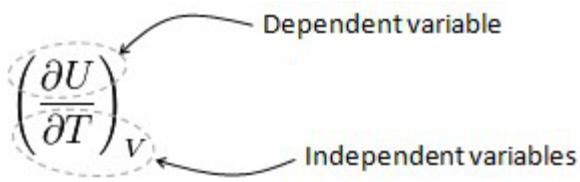

An example of a dependent variable in relation to an independent variable, as used in thermodynamics.

Extensive variables

The following are extensive variables: [1]

Length l
Surface A
Volume V
Entropy S
Internal energy U
Enthalpy H
Free energy, F or G
Momentum
Kinetic energy
Electricity amount of (of substance)

(add)

Intensive variables

The following are intensive variables: [1]

Temperature T
Pressure P
Magnetic field B
Chemical potential μ
Density
Velocity

(add)

See also

- State variable
- Conjugate variables
- Human thermodynamics variable table

References

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(b) Le Bellac, Michel, Mortessagne, Fabrice, and Batrouni, Ghassan G. (2004). *Equilibrium and Non-equilibrium Statistical Thermodynamics* (pg. 12). Cambridge University Press.
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- Gill, Adrian. (1982). *Atmospheric-Ocean Dynamics* (3.2: Thermodynamics variables, pg. 41-). Academic Press.

External links

- Variables (mathematics) – Wikipedia.
- Dependent and independent variables – Wikipedia.

θΔics

In hmolscience, **Vasily Aksyonov** (1932-2009) was a Russian-born American physician-turned writer noted for []

Overview

In 1989, Aksynov, in his *Our Golden Ironburg: a Novel with Formulas*, penned the following statement: [1]

> "Veliky-Salazkin (with a hyphen), saw the insoluble and infinite human molecule which flashes brightly, if you notice it, and which brings together the saving threads of a host of beings: Dostoevsky, and Kant and the plumber in the House of Culture, and Galileo, and Tchaikovsky, and Uncle Misha the lab assistant, Engels, and Homer."

The novel employs the term "molecule" 8+ times, two of which are as follows:

Page 136

> Recalling the time that's slipping away from me, I try to find sparkling nuclei in order to combine them into a molecule, just a barely visible one, but still one that exists as a dotted line, otherwise time itself disappears. How can I save my time—a decade, a year, at least my vacation?

Page 183

> was no one else in the huge cupola, but it just seemed like he should whisper and glance around. "A quite curious molecule is being formed, my Aristotle. Lu Morkovnikova is drinking "Tea for Two" and Samsik Sabler plays the same tune. Get it? Erik walks around gloomy, but the mistress of

He could be employing some type of human molecular theory, reaction or combination logic, or something; a full read-though, however is requisite before determination can be made.

The novel uses the terms: chemistry (1+), physics (1+), math (1+), and energy (8+) (Ñº); possibly a key term fishing bate fluke, the abstract (Ñº), e.g. doesn't seem to indicate anything of note.

References

1. Aksyonov, Vasily. (1989). *Our Golden Ironburg: a Novel with Formulas* (pg. 50). Ardis.

External links

â— Vasily Aksyonov – Wikipedia.

θΔics

In terminology, **vast chemical laboratory** refers to []

Baume | Lavoiser

In c.1530, Paracelsus, supposedly, was employing some type of "nature = vast chemical laboratory" and "god = great chemist" ideology in his mind and or works; this has been argued as follows:

> "Another important aspect of the thought of Paracelsus and of the Paracelsians is the idea that our universe ought to be understood in terms of alchemy or chemistry. The earth was regarded as a **vast chemical laboratory**, which allowed to explain volcanic phenomena, hot springs and the growth of metals. In like manner, the torrents were water distilled by the mountains, which acted like stills; the explosion of sulfur and salitre was observed in the use of cannon. Agriculture, for the Paracelsians, as for a Bernard Palissy, could benefit from In this context, **god was the great alchemist** who, at the time of the creation, had set in motion a chemical process, and it is in fact the chemical operations and the products The first classification of operations and products is by Libavius (Alchemia, 1597) It was not until the eighteenth century that classifications were begun to be drawn up in the chemical composition of matter."
>
> — Margaret Llasera (1999), *Scientific Representations and Poetic Images in England in the 17th Century: In Search of the Invisible* (Q)

In 1773, French chemist Antoine Baume, in his *Experimental and Rational Chemistry*, used the term "vast chemical laboratory" (vaste laboratoire chimique) as follows: [5]

> "I consider nature a **vast chemical laboratory** in which all kinds of compositions and decompositions are formed. Vegetation is the basic instrument the creator uses to set all of nature in motion. Vegetables are organized bodies that grow on the dry areas of the globe and within its waters. Their function is to combine immediately the four elements (water, earth, air and fire) and to serve as food for animals. Nature uses both kingdoms to form all existing combustible matter."

In this period, Antoine Lavoisier, supposedly, was thinking along these lines, albeit more progressively, and had read Baume. In 2002, via BrainyQuote (Q), this Baume statement ("I consider nature a vast chemical laboratory in which all kinds of compositions and decompositions are formed.") began to be misattributed to Lavoisier, and thereafter into Internet postcard (Q) folklore. There does not, however, presently seem to be any extant Lavoisier citation to this usage.

In c.1800, the French use of the term *vaste laboratoire chimique* began to be translated into English works, and there after into English printed arguments about nature, god-based or godless, depending.

In 1819, Abraham Rees, in his *Cyclopedia*, in discussion to volcanoes, seems to have been the first to employ the term "vast chemical laboratory" as follows: [1]

> "This view of the subject is consistent with that system of geology which supposes the existence of a central fire in the globe, and it assigns to that fire its use in the **vast chemical laboratory** of nature."

In 1847, American spiritualist Andrew Davis (1826-1910) (Q), in his *The Principles of Nature: Her Divine Revelations*, was using the term, in a feminine sense, aka "mother nature" equals god, or something along these lines, as follows: [2]

> "§58. We have now ascended to a period in the creation of the earth and kingdoms that is more intimately connected with the scientifics of the world, and which abounds with more distinct representations of all

things now existing, than was either of the previous periods. No history is extant of the commencement of the present period of time: and all the knowledge that is existing in reference to the original species is the result of inferences drawn from the present condition of creation. Concerning the various degrees of perfection in the developments of the previous days, *general* remarks have been offered; but a description of the *specific* changes of nature and her productions, from the first conditions to the present, would have been impossible. And all the knowledge existing in reference to the laws of nature is derived from their *general* and *universal* effects, and not from detailed manifestations. And by comprehending *general* principles, assisted by an enlarged view of their correspondences, nature and her laws will appear as one **vast chemical laboratory**, in which the lowest constituents of the whole composition are constantly being developed and purified. And the whole is a compound of *polygastric globules*, whose power of chemical action and principles of progression unfold all the forms that are developed from the great mass — which again produce new substances and new modes of composition, each being unlike the first. And every internal quality which is sequestered in present forms is becoming unfolded, and will ultimately progress to the highest possible form and condition of being."

Davis, here, to note, attempts to stitch this argument into the Biblical mold of a seven-day creation model and how the above description differed in respect to being before or after the sixth day.

In 1853, Harland Coultas, in his "Contributions to Botany" used the term, in a seeming secular scientific sense, as follows:

"The earth and the atmosphere are the two grand sources from whence plants draw those substances which contribute to their growth or the extension of their parts. These substances can only be ascertained when the chemical composition of the plants has been determined. Let us take, not the costly exotic from the conservatory, but any common wild flower and weed, for all wild flowers and weeds are interesting when examined scientifically. Here we have a beautiful pile of matter which the living principle in the plant has attracted from the earth and atmosphere. How does nature form this green leaf and this beautiful flower? We see her in Spring ever operating with untiring industry in weaving the earth, the air and water into every variety of vegetable fabric. The whole earth is in fact but one vast chemical laboratory or workshop, and every living plant is but a common centre of attraction, around which matter gathers and fashions into forms of loveliness and infinite perfection. The chemistry of plants has been carefully examined by Liebig, Mulder, and Johnson, and we are about to place before our readers the results of the labors of these philosophers. The solid parts of plants, chemically considered, consists of organic and inorganic matter: the former may be burnt away, and is derived from the atmosphere; the latter is incombustible, and is derived from the soil."

In 1855, William Foster, at the end of his *First Principles of Chemistry*, a book that does not use the term "god" (see: year god was disabused from science), concluded things as follows:

"As the student of this neglected branch of popular education has now crossed its threshold, it is to be hoped he will not content himself with having mastered the few elementary principles embodied in the foregoing pages, as the greater novelties and beauties of the subject are yet to be unfolded. By becoming still more familiar with the invisible causes which produce the prominent phenomena of chemical science, he will be irresistibly led to behold nature in the light of a **vast chemical laboratory**, performing upon a grander scale the same processes that the chemist so successfully imitates in his limited sphere. The rain, the dews, the snow, the hail, the breeze, the hurricane, the water-spout, the earthquake, and the volcano, are all phenomena which result from those chemical laws which produce, by their varied action, all that is beautiful, terrible, or sublime in nature."

(add)

Quotes

The following are related quotes:

> "The universe is one **vast chemical laboratory**, in constant operation, by her internal forces. The laws or principles of attraction, cohesion, and repulsion, produce in never-ending succession the phenomena of composition, decomposition, and recomposition. The *how*, we are too ignorant to understand, to modest to presume, and too honest to profess. Had man been a patient and impartial inquirer, and not with childish presumption attributed everything he could not understand, to supernatural causes, given names to hide his ignorance, but observed the operations of nature, he would undoubtedly have know more, been wiser, and happier."
>
> — Ernestine Rose (1861), "A Defense of Atheism", Apr 10 [2]

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θΔics

In science, **vegetable life**, or "plant life", along with animal life, was one of the two Linnaean classification divisions of living matter used in the pre-Darwinian days of chemistry and biology.

Vegetable life and caloric

In 1787, French chemist Antoine Lavoisier stated that the true elements of vegetables are hydrogen, oxygen, and charcoal and that, in relation to the decomposition of vegetable (and animal) substances by the action of fire that "of these elements, hydrogen and oxygen have a strong tendency to unite with caloric, and be converted into gas, whilst charcoal is a fixed element, having by little affinity with caloric." [2]

With the development of the new science of "thermo-dynamics" in the 1850s, those such as William Thomson, began to postulate on how the new mechanical theory of heat and dissipation related to to "vegetable life" or to the "will of animate creatures". [1]

References

1. (a) Quote: according to “known facts with reference to the mechanics of animal and vegetable bodies” there is “at present in the material world a universal tendency to the dissipation of mechanical energy” and that “any *restoration* of mechanical energy, without more than an equivalent of dissipation, is impossible in inanimate material processes, and is probably never effected by means of organized matter, either endowed with vegetable life or subject to the will of an animated creature”
(b) Thomson, William (Lord Kelvin), "On a Universal Tendency in Nature to the Dissipation of Mechanical Energy" (Google Books) (URL), Proceedings of the Royal Society of Edinburgh for April 19, 1852, also Philosophical Magazine, Oct. 1852, also Mathematical and Physical Papers, vol. i, art. 59, pp. 511.
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θΔics

In religio-mythology, **Venus** is the Roman goddess of love, beauty, sex, and desire; a rescript of the Greek goddess Aphrodite; who herself is a rescript of the Egyptian god Hathor (see: god character rescripts).

A supposed visual rendition of **Venus**, by Botticelli (c.1483), wherein the sea from which Venus emerged (Q) can be seen in the distant background, and wasps around the head of Mars, supposedly, signifying pain or death.

Other

The love god Cupid is the son of Venus.

Vis | Force | Life

In c.50BC, Roman thinkers were of the opinion that the "vis" or force of Venus brought animals to life or what constituted life; the following are example views:

> "Whence does **Venus** bring animals forth to life kind after kind, and earth, the magic-maker, nourish, increase, and feed them, kind by kind?"
>
> — Lucretius (55BC), *On the Nature of Things* (translator: Frank Copley) (pg. 6) (1:226-29)

> "The poets, through the conjunction of **fire** and **moisture**, are indicating that the *vis*, 'force', which they have is that of **Venus** [Aphrodite]. Those born of *vis* have what is called ***vita***, 'life', and that is what is meant by Lucilius (c.120BC) when he says: **'life is *force*** you see: to do everything force doth compel us'."
>
> — Marcus Varro (c.50BC), *On the Latin Language*

While interpretations of this vary, the gist logic (Q) seems to be that because Venus was born from a fiery seed that fell from the sky into the sea, which produced Venus from the "foam masses", that life is the product of fire + water bound by the force of love or force of Venus; the following is one take on this:

> "A *Venere finis*. It is understood that Lucretius felt the significance or significances of her name, the main province of ancient etymology being the names of the gods. Varro (*De lingua latina* 5.61) etymologizes **Venus as the force of tying together fire and water, man and woman**: *horum vinctionis vis Venus* (`Venus is the force binding these things'). He contents himself with the twofold *v* and the assonance *vin—ven* (cf. Plautus, Trin. 658: *vi Veneris vinctus*, 'bound by the force of Venus'), whereas the much more banal etymology in Cicero's *De natura deorum* (3.62) *Venus quia venit* (Venus because she comes [to all]') utilizes the whole root. Lucretius could not stop his etymological vein just short of Venus. When he writes (1.227) *unde animate genus generatim in lumina vitae redducit Venus*? (whence does Venus bring back the race of animals after their kind into the light of life?)"
>
> — Monica Gale (2007), *Oxford Readings in Lucretius* (pg. 367)

The term "vis" is found in the semi-modern terms vis viva (aka kinetic energy) and vis mortua (aka potential energy).

See also

- Greek pantheon

- Mangnall's abstract of Heathen Mythology

External links

- Venus (mythology) – Wikipedia.

θΔics

In human thermodynamics, **Vera V. Daniel** (c.1917-c.1993) (CR=8) was an English physicist and electrical researcher noted for his 1952 article "Physical Principles in Human Cooperation", in which he used analogy as a starting point to apply physical principles to human affairs, e.g. force fields around humans, and follow-up article "The Uses and Abuses of Analogy", wherein he attempts to show that while most analogy abstractions to human modeling are unsound, that his is justified because his approach uses the scientific method and that his "excursion into sociology constitutes a use and not an abuse of analogy".

Physical principles | Cooperation

In 1952, Daniel, in his "Physical Principles in Human Cooperation", dates social physics to the 17th century, opens to a citation of Pitirim Sorokin and his criticisms of mechanistic social theories, commenting that using physical analogies to explain social phenomena are suspect and that:

> "Common sense recoils from comparing people to atoms or molecules."

On this platform, he goes on state physics can help elucidate social phenomena, and that where others have failed his attempt will work, the focal point of which seems to be to introduce an Ising model of social behavior (see: Ising model of human behavior). [1] Daniel diagram, shown adjacent, of magnetic needles aligned on a board, among which a increasing number of beetles could be added, thus increasingly bumping into the needles, deflecting their alignment position:

A few beetles bumps would not disrupt the

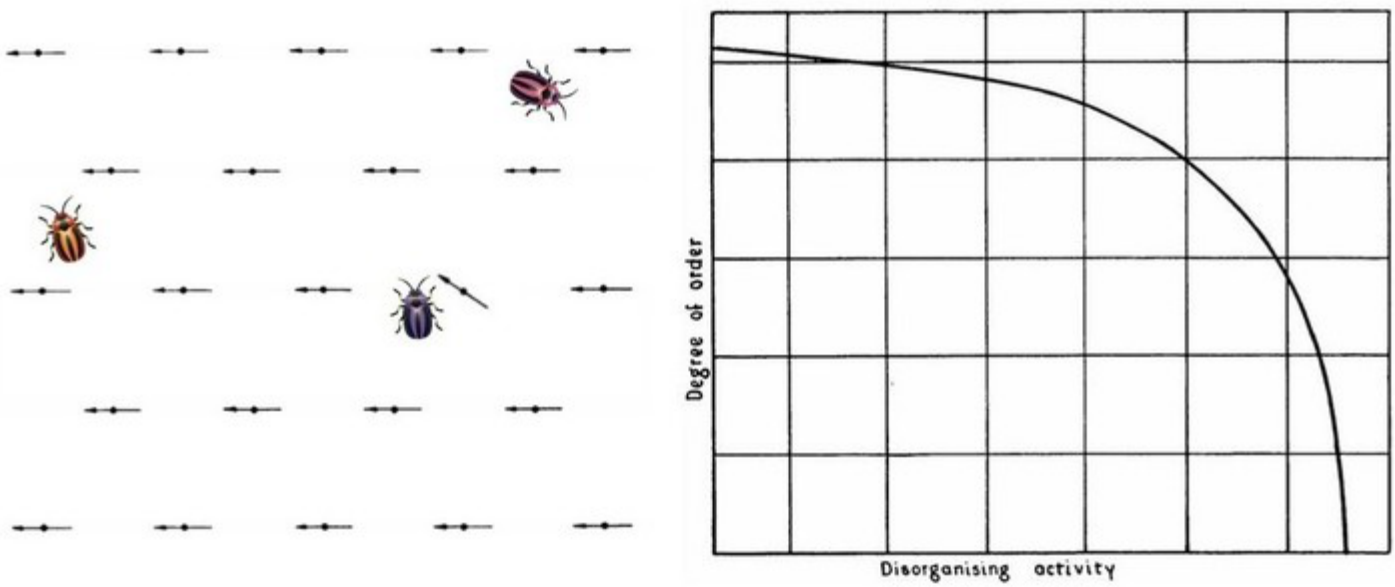

Daniel's 1952 magnetic needle field, with moving beetles (disorganizing activity), model of social behavior: once disorganizing activity count gets to a certain threshold, say of past the 10-20 beetle range, the behavioral ordering of the field of needles may suddenly drop off into complete disorder (above right), after which a phase transition to a new alignment may be reached (see also: Aristotle-Mpemba effect) [1]

alignment of the entire board of needles, but at a critical point of beetles, the needle bumps might be so disorganized that a critical phase shift of the whole board of needles might go from north aligned to south aligned. Daniel points out that his beetle-needle model of social order-disorder transition is a very simplistic description, and refers the reader to a more robust physics description by German-born British physicist Herbert Frohlich (1905-1991), supposedly, on a theory of an order-disorder transition in a long-chain ketone. (Ñº)

Daniel, in footnote, states that his "Physical Principles in Human Cooperation", was written independently of Czechoslovakian-born English physicist Reinhold Furth's 1951 "Physics of Social Equilibrium", which is indicative, to him, that the subject of applying physics to human affairs is "in the air", as he says. [4]

Analogies | Social

In 1954, Daniel, in his "The Uses and Abuses of Analogy", cites American economist Henry Carey who, in the nineteenth century, stated among others an analogy between gravitation and the concentration of people in a town: all particles of matter attract on another in direct ratio to their mass, and in inverse ratio to their distance. Analogously people attract on another also in direct ratio to their mass, and inverse ratio to their distance, and so they condense in towns. [2]

He then cites German physical chemist Wilhelm Ostwald who in circa 1910 argues that from the energetic point of view 'culture' is nothing but a transformation of crude energy into useful energy. The greater the coefficient of useful energy obtained in such a transformation, the greater is the progress of culture.

On Polish physical economist Leon Winiarski, Daniel states that at the end of the nineteenth century, he tried to base a theory of society on thermodynamics, postulating that a social aggregate is nothing but a system of points, i.e. individuals, who are in a perpetual movement of approaching and withdrawing from one another. The primary cause of these movements is attraction and repulsion. These forces tend towards a maximum of pleasure, and Winiarski tried do define some kind of thermodynamic laws whereby these changes can be described. Winiarski concluded, according to Daniel, by postulating that in the future society tends towards a state of maximum entropy, manifested by an equalization of social classes, races, etc.

He then mentions English natural philosopher Herbert Spencer who, in his social organism theory, compared society to a living organism, and in his *The Decline of the West*, used the analogy between the aging of an organism and the ageing of civilization, to reason that Western society is growing old.

On these four examples, Daniel concludes:

> "Some the analogies quoted are simply absurd, while others make one feel that there may be something in them. However, none of them can be verified in the scientific sense."

On Spencer's analogy, he states that it is plausible. On Carey's analogy, he states that "it seems to be demonstrably untrue." On the combination of Ostwald's social energetics and Winiarski's social thermodynamics examples, Daniel concludes:

> "The thermodynamic case would involve the author into calculations of fantastic difficulty, if he were to take it seriously, and it is also a comparison of the complicated with the complicated."

This last quote, to note, captures the essence of human thermodynamics fairly well.

In the reminder of the article, Daniel goes on to discuss human physics, on subjects germane to his own field, such as how the Curie point, a temperature below which the atoms of materials are aligned, and above which atomic disorder results culminating in a loss of magnetic properties, may apply as an analogy to human affairs, particularly the breakdown of moral in a field of working humans and a Curie catastrophe. This, to note, seems to be similar to the human physics of Mark Buchanan as well as, possibly, Philip Ball.

Education

In 1943, Daniel had studied spinodal decomposition in the solid state in detail at the Cavendish Laboratory, along with Henry Lipson, who had examined a copper-nickel-iron ternary alloy. [3]

Daniel completed his PhD with a dissertation on "Intermediate States of Precipitation of Allows" in 1944 at the University of Cambridge. [5]

In 1952, Daniel was a physicist on the senior staff of a research association. [1] In 1963, Daniel was associated with The Electrical Research Association in Leatherhead, Surrey. Daniel's most widely held publication is the 1967 book *Dielectric Relaxation*.

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External links

â— Daniel, Vera V. – WorldCat Identities.

θΔics

In existographies, **Vespasian** (9-79AD) was a Roman emperor, who ruled from 69 to 79AD, noted for []

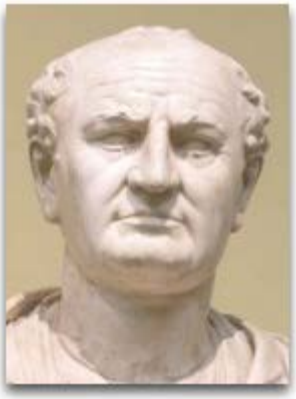

Jesus | Roman recension

See main: Roman recension

Vespasian, when in Alexandria, according to Tacitus (c.105AD), healed a blind man immediately upon touching his eyes and he also healed a cripple by touching the sole of his feet. [1]

Jesus, likewise, was said to have healed a blind man (John 9-12) (Q) and healed a cripple (Matthew 9) (Q).

In 69AD, Vespasian promoted a state religion based on the supreme gods Serapis (Osiris-Apis) and Isis. [2]

In 2006, Joseph Atwill, in his *Caesar's Messiah*, argued that the New Testament Gospels were written as wartime propaganda by scholars connected to the Roman imperial court of the Flavian emperors: Vespasian, Titus and Domitian, whose primary purpose in creating the religion was to control the spread of Judaism and moderate its political virulence, in light of the fact that the Jewish nationalist zealots had been defeated in the First Jewish–Roman War of 70 AD, but that Judaism remained an influential movement throughout the Mediterranean region. Atwill argues that the biblical character Jesus Christ is a typological representation of the Roman emperor Titus. (Q)

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External links

- Vespasian – Wikipedia.

θΔics

In technology, **Vibraimage** is an emotional detection imaging device that allows the hidden states of a person to be mapped or correlated according to video image pixel vibration rates. In 2007, vibraimage was conceived by Russian biometrist Viktor Minkin to be a potential human molecular state measurement imaging technology, similar to the thermometer, barometer, or indicator diagram, which are devices used to acquire a reading of the thermodynamic state of a physical system. Generally more than one measurement device is required to entirely quantify the energetic state of a physical system, such as pressure, volume, and temperature for ideal gas phase systems. With human working or social systems, the number of thermodynamic measurement devices needed to quantify the state of a human thermodynamic system is as of yet unknown.

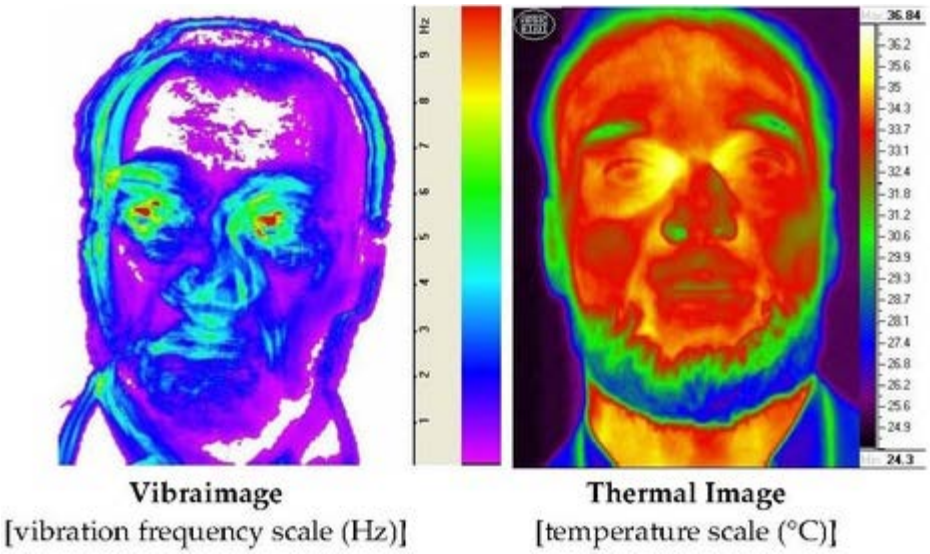

Human vibraimage is one such technical demonstration of psychodynamic features, which may provide quantifiers of aspects such as the measurement of the internal energy of a system of human molecules. [1] The image displays micro vibrations of a human head, vibrations which are mostly linked with vestibular system function; an example is shown below to the left:

Overview

According to the action of vestibular system functions and mechanical movement, the human stands with the head in a balanced vertical position, continuously and reflexively performing three-dimensional micromovements of vibrations. [2] The dependence between head vibration parameters and emotional state is called a vestibular-emotional reflex (VER) or vestibular-energy reflex. [3] It is hypothesized, that the head vibration parameters are sensitive to emotions and human energy regulation in coordination with the first and second thermodynamics laws.

Vibraimage is the primary image that indicates the vibration parameters of an object. [4] Vibraimages are calculated by video image processing and show amplitude and frequency of vibration in every pixel of object and as such, it reflects time and spatial movement characteristics of an object, e.g. the sub-conscious emotional state of a person. Closely related analogue of vibraimage is thermal imaging, as shown above to the right.

History

The direct link between reflex movement and brain activity was discovered in 1863 by the famous Russian physiologist Ivan Sechenov in his publication “Reflexes of Brain” [5]. Charles Darwin in his book “The expression of the emotions in man and animals” [6], 1872, also declared that reflex movements associated with emotions. Nobel laureate and the famous researcher of aggression Konrad Lorenz claims, that amplitude and intensity of reflex movements characterized the aggression. (On Aggression, 1966) [7]. George Gladyshev in his hierarchical thermodynamics theory [8] supposed that it is possible to consider the person in mechanical balance condition as thermodynamics system and it is well known that vestibular system realized mechanical balance in human like any other physiological sensor system [9].

Coordination of vestibular system characterized by different vestibular reflexes and vestibular-emotional reflex is the one of it characterizing emotion energy by head vibration. The first thermodynamic law gives two possibilities for emotional human energy regulation as heat or movements. Galvanic skin response (GSR) [10] is sensitive to human emotion because of thermoregulation and vibraimage is sensitive to emotions because of energy regulation by reflex head vibration. Vibraimage has several advantages in comparison with other emotions detector methods as contactless and friendly for users method.

Test your couple in politics by vibraimge free test on Psymaker. Vibraimage matching gives you 3 politics with the best biological compatibility % with you!

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θΔics

In human chemistry, **Vicente Talanquer** (c.1963-) is a Mexican-born American chemist noted for []

Overview

In 2007, Talanquer, in his "Explanations and Teleology in Chemistry Education", summarized how he had completed a study of eight leading US general chemistry textbooks, wherein he systematically looked for instances of chemical teleology. [1]

In 2013, Talanquer, published his "When Atoms Want", the abstract of which is as follows: [2]

> "Chemistry students and teachers often explain the chemical reactivity of atoms, molecules, and chemical substances in terms of purposes or needs (e.g., atoms want or need to gain, lose, or share electrons in order to become more stable). These teleological explanations seem to have pedagogical value as they help students understand and use abstract chemical models. They may, however, become a roadblock in developing mechanistic understandings of the structure and properties of chemical systems. I explore the explanatory preferences of college students with different levels of training in chemistry to determine the extent to which they prefer teleological explanations over causal explanations. Major results revealed a strong preference at all the targeted educational levels for explanations that invoke intentionality as a driver for chemical reactivity."

Talanquer, in his article, showed the results of a multiple choice test he gave to students wherein they were given a choice between teleological-slanted answers and causal-slated answers; one simple example of which is shown below: [3]

Teleological
(anthropomorphic or intentionality-invoking)
[explanation built in terms of the consequences of event]

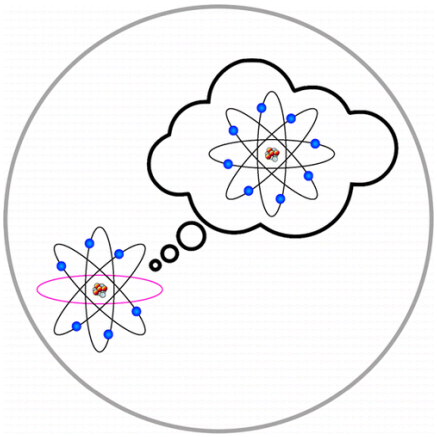

Causal
(mechanistic or physiochemically-neutral)
[explanation built in terms of the antecedents of event]

Sodium atoms want to lose one electron so that they can have a full electron shell.

Sodium atoms have one electron in a valence orbital with a higher energy than available valence orbitals in other atoms.

(add discussion)

Second law | Le Chatelier principle

While some of Talanquer's discussion is food for thought, when he gets into the second law, and the driving force of reactions, he seems to be digressing into an in-correct murky water of terminological assertion; the following being one example:

Questions and Response Statements with Paired Teleological and Casual Explanations[a]		Response of "T", %[b]
Oxygen atoms commonly form two chemical bonds when forming molecules with other atoms. What is the cause of this behavior?		
T	Oxygen atoms need to gain two electrons to satisfy the octet rule.	74.3
C	Oxygen atoms have two semifilled valence orbitals that can be occupied by valence electrons of other atoms.	
Sodium atoms commonly react and form sodium ions with a $^{+}1$ charge. What is the cause of this behavior?		
T	Sodium atoms lose one electron so that they can have a filled valence shell.	74.0
C	Sodium atoms have one electron in a valence orbital with a higher energy than available valence orbitals in other atoms.	
During the reaction between an acid and a base, it is said that the acid donates hydrogen ions (protons) while the base accepts them. Why does the transfer of hydrogen ions happen?		
T	Hydrogen ions are transferred from molecules of the acid to molecules of the base because the molecules want to become more stable.	63.8
C	Hydrogen ions randomly move between molecules of the acid and the base but it takes less energy for the ions to transfer from the acid to the base than from the base to the acid.	
During a redox reaction between substances A and B, the oxidizer A gains some electrons while the reducer B loses them. Why does this transfer of electrons happen?		
T	Electrons are transferred from molecules of type B to molecules of type A because the atoms in both types of molecules want to become more stable.	73.6
C	Electrons randomly move between molecules A and B but it takes less energy for them to transfer from B to A than from A to B.	

[a]T indicates a teleological explanation statement; C indicates a causal explanation statement. [b]$N = 265$.

The results of one of Talanquer's 2013 chemical teleology vs chemical causality surveys, given to second semester general chemistry students; which show a host of issues, with his slanted data mining method.

"Consider, for example, the following textbook excerpt (*Chemistry: the Central Science* [2006], p 650):

> 'If a chemical system is at equilibrium and we add a substance (either a reactant or a product), the reaction will shift so as to reestablish equilibrium by consuming part of the added substance.'

This statement about Le Chatelier's principle is teleological because it seems to imply that the change in the system is driven by the system's goal or intention to reestablish equilibrium. In general, such teleological explanations tend to be linked to the existence of a principle or law (e.g., the second law of thermodynamics) that explicitly or implicitly implies the minimization or maximization of some intrinsic property (e.g., minimization of energy, maximization of entropy). This law or principle tends to provide a sense of preferred direction in the evolution of a transformation. In these contexts, explanations built in terms of purposes or desires reduce complex emergent processes into simpler directed events."

(add discussion)

Education

Talanquer completed his BS, thesis: "Simple Model for Electrolyte" (1985), MS, thesis: Sublattice Ordered Phases of the Griffith's Three Component Model (1987), and PhD, thesis "Bulk and Interfacial Properties of Reacting and Associating Systems" (1992), all in chemistry at the National Autonomous University of Mexico, notably graduating first in his class in all three degrees. Since 2000, he has been a chemistry professor at the University of Arizona, with focus on theories of chemistry education.

Quotes

The following are example quotes:

> "Teleological explanations generate an illusion of understanding that may hinder learning in the longer term. Overreliance on teleological explanations may limit students' ability and motivation to build deeper mechanistic explanations about chemical phenomena."

— Vincente Talanquer (2013), “When Atoms Want” [2]

> “If we state, e.g., ‘sodium atoms lose one electron to become more stable’, we are building a teleological explanation because we are using the consequences of an event (to become more stable) to explain why the event (loss of an electron) happened. In these types of explanations, entities are portrayed as having purposes or desires, acting to attain certain needs or to fulï¬ ll some function.”

— Vincente Talanquer (2013), “When Atoms Want” [2]

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External links

â— Vicente Talanquer (faculty) – University of Arizona.

θΔics

In existographies, **Victor Hugo** (1802-1885) (IQ:180|#178) (Cattell 1000:142) [RGM:413|1,320+] (Murray 4000:13|WL) (CR:10) was a French romantic poet, novelist, and dramatist, noted for []

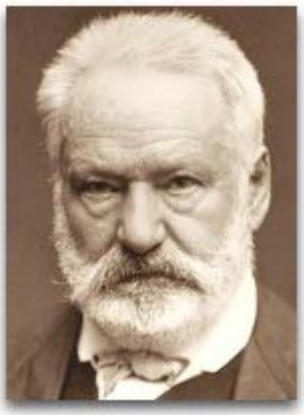

Other

Hugo's *Les Miserables* (1862), in the sense of "chemical alter ego", of note, is cited in Gary Freedman's unusual "The Chemistry of Human Relationships" blog. [1] It is also ranked as having an "enormous" influence on Leo Tolstoy, in the age range of 35 to 50, in his reading list rankings. [2]

Quotes | By

The following are quotes by Hugo:

> "To love is to act."
>
> — Victor Hugo (1885), scribbled note (Ñº) two days before reaction end (death), May

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External links

â— Victor Hugo – Wikipedia.

θΔics

In human thermodynamics, **Victor Pavlovich Maslov** (c.1936-) is a Russian mathematical physicist noted for a number of publications, beginning in 2009, on a mixture of applications of thermodynamic modeling in economics and sociology, using a fluid thermodynamics formulation in thermoeconomics, in particular.

Overview

In his 2009 article "Similarity Laws in Thermodynamics", Masolv states his objective as such: [1]

> "We would like to move from the general statistical laws for molecules to jurisprudence and the elaboration of laws in human society. Here the matter concerns the origin of social laws based on the same principles of natural selection which annihilates biological communities when their entropy decreases."

In his followup 2010 article "Thermoeconomics of Russia", attempts to account for collisions and interactions of people as such:

> "This gives us the possibility to summarize the Feynman diagrams of collisions and creations of separate particles, as well as collisions and interactions of market goods transferred into money, and then combine this into general laws of thermodynamics of fluids dealing with few variables."

Maslov, in this article also cites the work of American physicist Wayne Saslow (1999), American engineer Libb Thims (2002), and Russian physical chemist Georgi Gladyshev (1997), among others.

Maslov's 2012 article "Wiener Quantization of Economics as an Analogy of the Quantization of Thermodynamics", co-authored with Tanya Maslova, has the keyword topics: Godel's theorem, Bohr's complementarity principle, critical point of a gas, quantization of economics (see: human quantum mechanics), human thermodynamics, Friedman's rule, Irving Fisher's law (see: Irving Fisher), debt crisis. The abstract of the human thermodynamics portion of the article is as follows:

> "We also consider debt crises, the stratification of society, and Islamic revolutions from the point of view of human thermodynamics."

Education

Maslov has been actively studying mathematical physics in 1958. [1] He completed his PhD in physico-mathematical sciences in 1967, after which he became a professor. [2] In 2009, Maslov was associated with the V. A. Steklov Institute of Mathematics, Russian Academy of Sciences.

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External links

â— V. P. Maslov – Scientific Commons.

θΔics

In existographies, **Henri Victor Regnault** (1810-1878) (CR:2) was a French chemist and physicist notable as for being a mentor to Scottish physicist William Thomson, during the years 1845-46, as the chair of chemistry at the École Polytechnique, and for his research on the thermal properties of gases.

Overview

In 1847, Regnault, in his 700-page article "Experimental Relations … to determine the Main Laws and Numerical Data Entering into the Calculations of Steam Machines", presented what was then considered the standard authority of data in relation to critical point phenomena. [2] This paper stimulated William Rankine to develop his theories of thermo-dynamics and his "molecular vortex" hypothesis.

Education

Regnault entered the École Polytechnique in 1830, graduating in 1832, and then entered the École des Mines, where he developed an aptitude for experimental chemistry. [3]

See also

- Thomson's search for Carnot's *Reflections*

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External links

- Henri Victor Regnault – Wikipedia.
- Henri Victor Regnault – Encyclopedia Britannica, 1911.

θΔics

In hmolscience, **Victor Sergeev** (1944-) is a Russian physicist noted, in economic thermodynamics, for his early 2000s work on the thermodynamics of economic systems.

Overview

In 2001, Sergeev, in his "A Thermodynamic Approach to Market Equilibrium", attempted to explain economic equilibrium thermodynamically, worked out while on sabbatical at the Santa Fe Institute, culling from the thermodynamics work of Greek mathematician Constantin Caratheodory and his work on the Pfaffian form of the equation of state. [2]

In 2005, Sergeev expanded his earlier article into the 155-page booklet *The Thermodynamic Approach to Market*, wherein he expands on his earlier ideas, albeit touching on more topics such as the thermodynamics of prices, the application of Le Chatelier's principle in economics, heat engines in economics, migration potential, evolution, phase transitions in social systems, among others.

Education

Sergeev completed his MA in physics from the Moscow Power Engineering in 1967, an MA in mathematics from the department of mechanical engineering and mathematics, Moscow State University, in 1970, a PhD in mathematics and physics, at the Moscow Institute for High Temperature in 1974, and a Dr. Sci. in history, with a thesis on "Genesis of Democracy in Russia and the Tradition of Sobornost", in 1990.

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External links

â— Victor Sergeev (2008 speaker bio) – University of Groningen.

θΔics

In human thermodynamics, **Victor Stenger** (1935-2014) was an American physicist noted for his 1995 "entropy per unit volume" argument of how life or order formed starting from the big bang in a universe tending towards maximal entropy or what Stenger equates to maximal disorder. [1]

In 2003-2007, Stenger expanded on his earlier entropy of the universe augments to disprove the existence of God scientifically, by arguing that the universe at the start of the big bang existed *not* in a low entropy state, as is commonly stated, but rather in a state of maximum entropy (per unit volume) and in a state of zero energy, the latter view loosely derived from Stephen Hawking. [2]

Atheism

In the mid-2000s, Stenger was an atheism advocate, the following being one of his more famous quotes (see: atheism timeline).

Roemer

Interestingly, one of Stenger, in his final days, was posting up in Google Groups, about the so-called "Roemer-Styer fiasco", on the rather peculiar and unusually over-zealous efforts of David Roemer, 2008-present, to get the 2008 article "Entropy and evolution", by American physicist Daniel Styer, retracted from the *American Journal of Physics*, the following, e.g., being a 2 Jun 2014 response letter from New York Senator Kirsten Gillibrand to Roemer about his concerns. (Ñº) Among the 21 email recipients to the forward of this scan/fax, Stenger aside, include: Libb Thims (two emails) and Fred Wolf.

Entropy of the universe

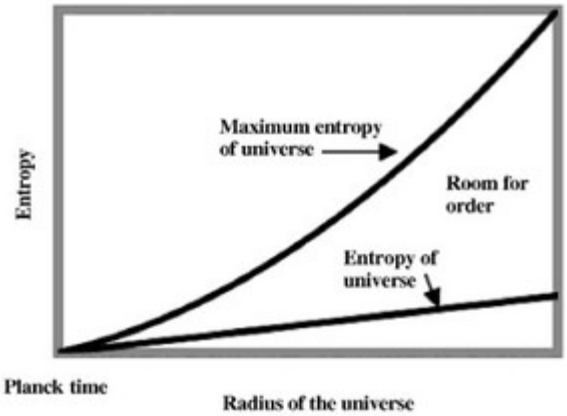

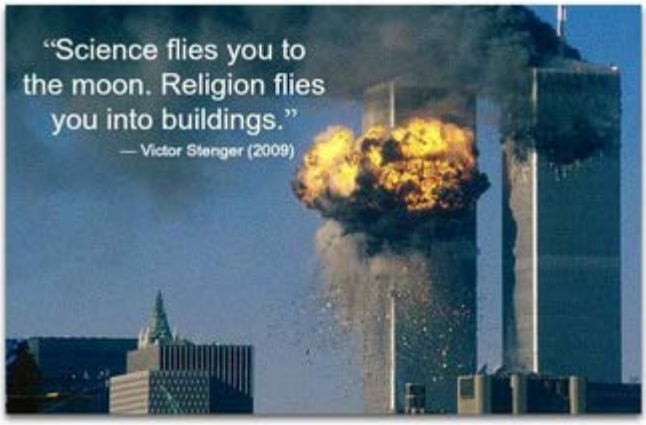

Left: Stenger's entropy gap model: Plot of the total entropy of the universe and the maximum entropy of the universe as a function of the radius of the universe, according to Stenger's calculations. [2] Right: Stenger's noted 2009 atheism quote.

In the figure adjacent, Stenger states that the plot shows the total entropy of the universe and the maximum entropy of the universe as a function of the radius of the universe. [2] He argues that, according to his calculations, the maximum entropy and the total entropy are equal at the origin, the Planck time, which according to his view shows that the universe began in a state of total chaos. After the big bang, however, the universe began to expand in such a way that the maximum entropy, supposedly, is increasing faster than the actual entropy, thus leaving room for order (supposedly he means humans by this term) to form without violating the second law of thermodynamics, as typically claimed by Creationists.

Education

Stenger completed his BS in electrical engineering in 1956 from Newark College of Engineering, and MS in physics (1958) and PhD in physics (1963) at UCLA. Stenger was a professor of physics at the University of Hawaii until his 2000 retirement.

Difficulties on theory

Two salient difficulties on Stenger's big bang thermodynamics models are firstly his unassuming equation of entropy with disorder, which is only a statistical mechanical approximation (Boltzmann-Planck approximation of Boltzmann

chaos assumption) valid only in certain cases and under certain types of entropy change, and secondly his definition of the universe as a "closed system", which technically means a system surrounded by a boundary across which energy, in the form of work or heat, but not matter may pass. On the latter terminology, it is likely "isolated system" to which Stenger meant to define the universe (a common slip), as there do not exist any known theories that purport the universe to be being acted on by transfers or passages of energy, heat, or work (aside from fringe wormhole theories, parallel universe theories, or multiverse theories, etc.).

-

Quotes | By

The following are quotes by Stenger:

> "Modern physics, including quantum mechanics, remains completely materialistic and reductionist while being consistent with all scientific observation."
>
> — Victor Stenger (1997), "Quantum Quackery" [3]

> "As a physicist who had never seen the hand of god in any observable phenomena, I view the scientific rejection of the soul as the ultimate validation of reductionist material monism."
>
> — Victor Stenger (2005), "Forward" to *The Soul Fallacy* (pg. 9) by Julien Musolino

-

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(b) Edis, Taner. (2002). *The Ghost in the Universe: God in the Light of Modern Science* (pgs. 67-68, 80). Prometheus Books.
2. (a) Stenger, Victor J. (2003). *Has Science Found God? The Latest Results in the Search for Purpose in the Universe* (mathematical derivation of the curves in the plot given in Appendix C, pgs. 356-57). Prometheus books.
(b) Stenger, Victor J. (2007). *God: the Failed Hypothesis: How Science Shows That God Does Not Exist* (ch. 4: Cosmic Evidence, pg. 113-36). Prometheus Books.
3. (a) Stenger, Victor. (1997). "Quantum Quackery" (Ñº), Committee for Skeptical Inquiry, Jan/Feb.
(b) Musolino, Julien. (2015). *The Soul Fallacy: What Science Shows We Gain from Letting Go of Our Soul Beliefs* (foreword: Victor Stenger) (pg. 124). Prometheus.

-

Further reading

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External links

â— Victor J. Stenger – Wikipedia.

θΔics

In existographies, **Victor Yakovenko** (1961-) (CR:35) is a Russian-born American physicist noted, in econophysics, for his 1998 to present work in promoting the subject of econophysics in America.

Overview

In 2000, Yakovenko and graduate student Romanian-born American physicist Adrian Dragulescu, argued that: [1]

> "In a closed economic system, money is conserved. Thus, by analogy with energy, the equilibrium probability distribution of money must follow the exponential Boltzmann-Gibbs law characterized by an effective temperature equal to the average amount of money per economic agent."

The following is the gist of their Boltzmann distribution money model:

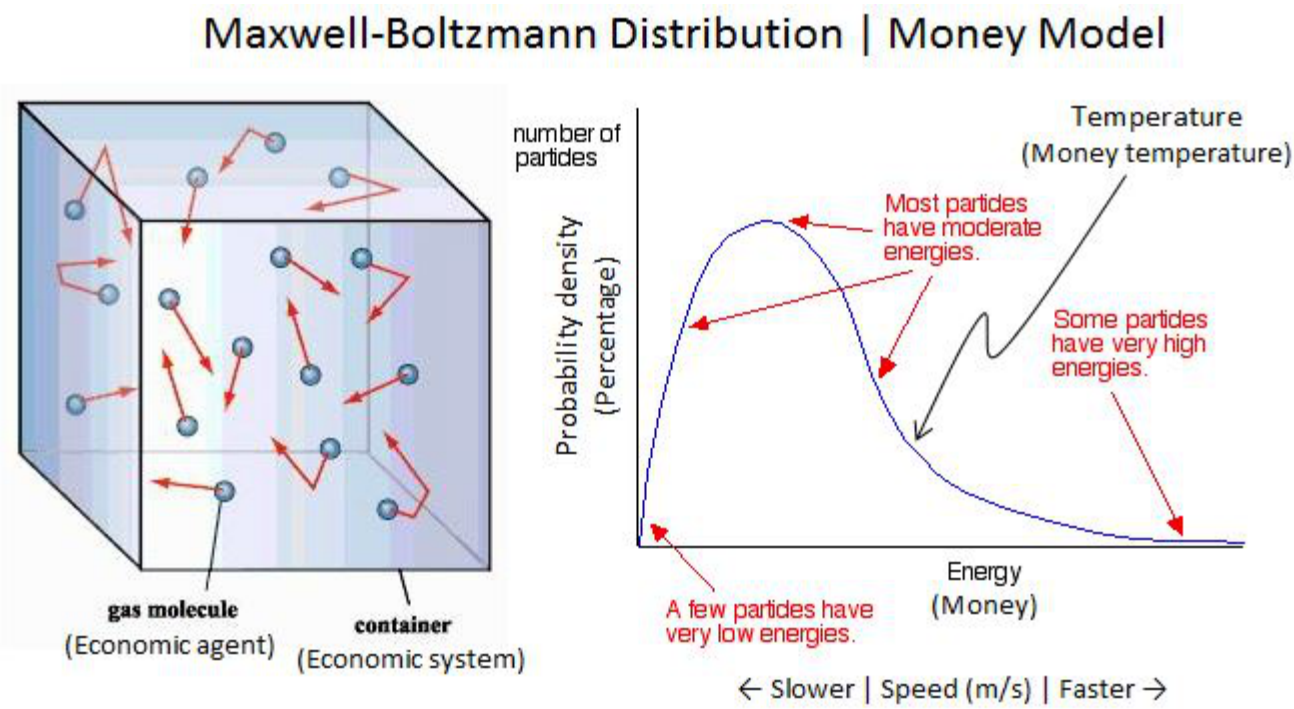

Since about 2003, Yakovenko has been running an econophysics research group at the physics department of the University of Maryland, where he lists Barkley Rosser as one of his collaborators. [3]

In 2006, Yakovenko, expanding on the above "Boltzmann distribution money theory", was the opening speaker at the American Physical Society focus session on econophysics. [2]

Information theory

In 2009, Yakovenko was a co-author of the monograph *Classical Econophysics*, the abstract of which is: [4]

> "This book sets out to address some basic questions drawing from classical political economy and information theory and using an econophysics methodology: What is information? Why is it valuable? What is the relationship between money and information?"

No doubt this is a ride on the Shannon bandwagon. [5]

Education

Yakovenko completed his undergraduate work and his MS (1984) at the Moscow Physical-Technical Institute, and his PhD in 1987 in theoretical physics at the Landau Institute for Theoretical Physics. Since 1993, he has been a physics professor at the University of Maryland.

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● Yakovenko, Victor M. (2009). "Econophysics, Statistical Mechanics, An Approach to", in: *Encyclopedia of Complexity and System Science* (editors: R.A. Meyers) (abs). Springer.

Videos

● Yakovenko, Victor. (2013). "What Causes Inequality? An Econophysics Approach" (O), New Economic Thinking, Oct 25.

External links

● Victor M. Yakovenko (faculty) – University of Maryland.
● Econophysics (Yakovenko's econophysics research group) – University of Maryland.

θΔics

In hmolscience, **Victoria Woodhull** (1838-1927) was an American woman's rights activist (particularly in regard to freedom to divorce), taboo topics newspaper founder (*Woodhull & Claflin's Weekly*, 1870-1876), and first female presidential candidate, noted for her 1871 "Introduction" section, reproduced below, to the D.W. Niles English translation of German polymath Johann Goethe's 1809 *Elective Affinities*. [1]

Discussion

Of note, in her introduction, Woodhull seems to be the first, with her mention that a "great revolutionary doctrine pervades the whole", to speak of what has come to be known as the Goethean revolution, the human chemical thermodynamics revolution that is only now beginning to see the light of debate and discussion.

Introduction

Woodhull's 1871 introduction is reproduced in full below; although done so with the important and quotable sections indented; the greater the indent the greater the weight of the passage: [1]

> "At the request of Mr. D. W. Niles, publisher, Boston, I have re-read, having read with pleasure and profit in my early life, the *Elective Affinities* of Goethe, an English translation of which Mr. Niles proposes to publish for the use of the American public; and he does me the honor to think that my views of the value of the book may contribute somewhat to its success among us at this time.
>
> > It is very true that ideas of social freedom and of inevitable law governing the action of human affections are rapidly spreading in the world, at this day, and that I may have done something to aid their growth. Perhaps my name may *not*, therefore, be inappropriately associated with this reproduction of the work of the greatest genius of Germany, the first who promulgated the thought that there is a chemistry of the mind, and that "elective affinities" are as powerful and legitimate in the realm of human sentiment as in the realm of matter.
> >
> > > If this fundamental thought of the man who has proved to be the seer or prophet of science in so many other things, is also a scientific truth, the fact cannot be appreciated by the world too soon, nor its immense sweep of consequences be too clearly foreseen and provided for. It will affect the whole scope of morals and social order, whether we accept it in our theories or not, and the less hurtfully and the more beneficently, in proportion as we thoroughly study and understand the subject.
>
> Themes of freedom on all subjects form the staple public sentiment of the world in this age. A doctrine like that of Goethe's is, therefore, eminently calculated to make progress even unconciously in this century. Indeed, I think that if there is any objection whatever, which will be felt to the really chaste and simple tale of this great writer, as it shall be read by the American public of to-day, it will be, that it is too mild and unpronounced, rather than on account of its radicalism. It may not be sufficiently spiced or high-seasoned either with adventure, or with audacity of speculation to suit the already stimulated palates of our modern and progressive community. Indeed, it strikes me almost ludicrous, that the translator has shrunk from appending his name to the work, if he has done so from any idea that its dangerous views might tend to impair his reputation.

> The tale is, in a word, of the simple construction and genial and moderate character of the "Vicar of Wakefield" rather than in the exciting style of Dickens' *Christmas Carols*: but, everywhere, the interest is skilfully kept up, and the subtle insinuation of a great revolutionary doctrine pervades the whole, and to the thoughtful reader makes the chief point of interest. Doctrines, however, which are here merely insinuated and illustrated by allusions to science, are now so openly expounded and advocated that a portion of the community will regard the great German as too conservative, while yet, doubtless, to the great mass of readers, the radical element may startle, and in some instances offend.

But in any event genius has its prerogatives, and the genius of Goethe is incontestable and uncontested. The American public is entitled to know what this great leader of modern thought, one of the founders of comparative anatomy, has thought on the more recondite subject of the chemistry of mind. The question is not, in the first instance, whether his views were right or wrong, true or false; but simply, what were they? and in none of his works is that question so effectively answered as in *Elective Affinities*. Undoubtedly, he shocked the age he lived in, both by his writings and by his life, even in Germany, where the puritanical element has always had less sway than it has had among us; but now, if the book runs any risk of a failure to command the public interest, it will be as I have said, for the opposite reason, that it may be thought not radical and outspoken enough. But even this circumstance adds a new ground of interest in the fact that it presents vividly the opportunity to compare two or three successive generations in respect to the growth of opinion upon a most important subject, and the comparison prepares the mind for the still more radical change which the next few years will inevitably produce.

It is well to learn not to be shocked or astounded by any of the events which the impending progress of humanity presents, and especially at this epoch; for all of the signs of the times concur to indicate that we are entering upon the most revolutionary period in human society, not it is to be hoped of the old style and blind sort, but revolution in respect to opinions and general institutions."

(add discussion)

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External links

â— Victoria Woodhull – Wikipedia.

θΔics

In thermodynamics schools, the **Vienna school** or "Viennese school" refers to the thermodynamics and statistical thermodynamics works, theories, and teachings developed at or in connection with the University of Vienna, Austria. [1] The Viennese school, according to Belgian chemist Ilya Prigogine, was led by Gustav Jaumann, originating concepts such as energy production and entropy flow. [2] Noted thermodynamicists associated with this school include Ludwig Boltzmann, Josef Loschmidt, and Josef Stefan.

The core date of the Vienna school can be said to have been the year 1868 when Austrian physicist Ludwig Boltzmann published a more convincing physical explanation of the formula James Maxwell had derived in his 1860 paper “Illustrations on the Dynamical Theory of Gases”. [3]

Overview

Austrian physicist Ludwig Boltzmann is the best-known thermodynamicist associated with the Vienna school. Boltzmann studied physics at the University of Vienna, starting in 1863.

Loschmidt became professor of physical chemistry at the Vienna University in 1868.

Among his teachers were Austrians chemist and physicist Josef Loschmidt and mathematical physicist Joseph Stefan. Boltzmann received his PhD degree in 1866 working under the supervision of Stefan; his dissertation was on kinetic theory of gases.

In 1867 he became a Privatdozent (lecturer). After obtaining his doctorate degree, Boltzmann worked two more years as Stefan’s assistant. It was Stefan who introduced Boltzmann to Scottish physicist James Maxwell's work.

Loschmidt and his younger university colleague Boltzmann latter became good friends. His critique of Boltzmann's attempt to derive the second law of thermodynamics from kinetic theory became famous as the "reversibility paradox" or “Loschmidt’s paradox”. It led Boltzmann to his statistical concept of entropy as a logarithmic tally of the number of microscopic states corresponding to a given thermodynamic state.

In 1873, Boltzmann joined the University of Vienna as professor of mathematics and there he stayed until 1876.

In 1893, Boltzmann succeeded his teacher Joseph Stefan as professor of theoretical physics at the University of Vienna.

In circa 1899, a young Otto Weininger studied under Boltzmann at the University of Vienna.

Boltzmann, however, did not get along with some of his colleagues in Vienna, particularly Austrian physicist Ernst Mach, strong objector to the molecular hypothesis, who became a professor of philosophy and history of sciences in 1895. Thus in 1900 Boltzmann went to the University of Leipzig, on the invitation of Wilhelm Ostwald. After the retirement of Mach due to bad health, Boltzmann came back to Vienna in 1902. His students included Karl Przibram, Paul Ehrenfest and Lise Meitner.

In Vienna, Boltzmann not only taught physics but also lectured on philosophy. Boltzmann’s lectures on natural philosophy were very popular, and received a considerable attention at that time. His first lecture was an enormous success. Even though the largest lecture hall had been chosen for it, the people stood all the way down the staircase. Because of the great successes of Boltzmann’s philosophical lectures, the Emperor invited him for a reception at the Palace.

Austrian psychology thermodynamicist Sigmund Freud started medical school at the University of Vienna in 1873, where he was introduced to the first law of thermodynamics, through the teachings of German physiologist Ernst Brücke, a friend of Hermann Helmholtz.

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2. Kondepudi, Dilip and Prigogine, Ilya. (1998). *Modern Thermodynamics: from Heat Engines to Dissipative Structures* (pg. 87). New York: John Wiley & Sons.
3. Lindley, David. (2001). *Boltzmann's Atom: the Great Debate that Launched a Revolution in Physics* (pgs. 17-18). The Free Press.

θΔics

In existographies, **Viktor Frankl** (1905-1997) (IQ:#|#) (CR:3) was an Austrian meaning philosopher, neurologist, and psychiatrist, noted for []

Culture

Cited in film *Halloween* (2019) as a philosophy being taught to kids in high school about finding "meaning" even in the direst of circumstances.

Quotes

The following are quotes by Frankl:

> "What man actually needs is not a tensionless state but rather the striving and struggling for some goal worthy of him. What he needs is not the discharge of tension at any cost, but the call of a potential meaning waiting to be fulfilled by him."
>
> — Viktor Frankl (c.1946), *Publication* (Ñº) [1]

References

1. Viktor Frankl – Pursuit-of-Happiness.org.

External links

â— Viktor Frankl – Wikipedia.

θΔics

In human thermodynamics, **Viktor Albertovich Minkin** (c.1959-) is a Russian biometrist notable for his work in the application and development of human thermodynamic theory, beginning in 2007, with the connective use of various technologies, particularly vibraimage and fingerprint analysis, to the quantification of states of human molecules. [1]

Minkin has a BS in Measurement and Information Technologies and a MS in Photosensitive Devices. He has spent over twenty years in the development and study of dermatoglyphics and software applications on the calculation of extrovert/introvert levels and left/right brain hemisphere levels according to fingerprints.

Human thermodynamics

In 2007, Minkin began to consider the combination of human emotional state quantification computerized technologies, such as computational dermatoglyphics pixel vibration rate video image processing (vibraimaging), with the sciences of human chemistry and human thermodynamics, to the further understanding and analysis of human-human compatibilities in family and business. In February of 2007, Minkin stated, in commentary on American chemical engineer Libb Thims' *Human Chemistry (Volume One)*, that "at first, (Thims) theory looks strange, but after time, following further thought and understanding, I did not find any arguments against it … if we have rules for molecular behavior, why not adapt these molecular terms for human behavior; moreover, until human thermodynamics, there had never been a direct link between fingerprints, which reflect the character and health of a person, and DNA – this phenomenon can now be explained". [2]

Pair matching

In 2009, Minkin, possibly using some of the Gibbs free energy matching theory, took the project to the working model stage in the site PsyMaker.com, which claims to facilitate (a) recognition of emotions of visitors, (b) emotion recognition in Skype, (c) measure pixel-dependent aura, (d) lie detection, (e) couple compatibility matching, (f) remote and contactless public security. [4]

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θΔics

In existographies, **Vilfredo Pareto** (1848-1923) (IQ:190|#20) [RGM:590|1,500+] (Scott 50:29) (SN:3) [CR:282] was a French-born Italian mathematical engineer, physical socioeconomist, and "engineer-turned-economist-turned-sociologist" (Stegner, 2001), classified as one of the chiefs of the Laussane school of physical economics (1890s to 1920s), characterized a a "scholar of encyclopedia ambitions and Machiavellian dispositions" (Fuller, 2000); was the thematic backbone of of the 1930s to 1940s Harvard Pareto circle; generally noted, in hmolscience, for his efforts to formulate a social molecule themed mechanics of sociology, aka "economic dynamics" (Pantaleoni, c.1900); his total work culminating in his monumental four-volume magnum opus *Treatise on General Sociology*.

Nationality	French-Italian
Fields	Physical economics Physical sociology Econoengineering
Alma matter	Polytechnic University of Turin Lausanne school
Students	Emanuele Sella
Known for	Circulation of elites Social spinning top Economic molecules Social molecules
Collected works	12+ volumes
Eponyms	Pareto principle Spinning top social pyramid Harvard Pareto circle
Influences	Isaac Newton, Jean D'Alembert, Niccolo Machiavelli, Leon Walras, Maffeo Pantaleoni, Auguste Comte, Herbert Spencer
Influenced	Lawrence Henderson, Paul Samuelson, Tjalling Koopmans

Overview

In c.1893, Pareto began teaching a course in political economics, on economics and sociology, at the University of Lausanne, Switzerland (see: Lausanne school).

In 1912, Pareto published his magnum opus *Treatise on General Sociology*, in four volumes (or two-volumes, later reprintings).

The following 1924 obituary like summary of Pareto by American political-economist James Rogers (Ñº), seems to well encapsulate the life (existence), times, and nature of Pareto: [29]

> "A marquis by birth, his long academic career never robbed him of either the tastes or the charm of manner of an Italian nobleman. Although professor at the University of Lausanne, for half of his long life he made his home in the quiet country village of Céligny, where, on the shores of the Lake of Geneva, he built the beautiful little Villa Angora. Here, with all the seclusion and comforts of a miniature country estate, and surrounded by numerous and beautiful specimens of Angora cats—his favorite pets and perpetual companions, which, in painted form, ornamented even the walls of his villa—he divided his time between writing books, and entertaining his friends. From his study, thus secluded, but filled with books of all ages and in all languages—-a veritable watch tower—he observed and studied the actions, customs, prejudices, motives, feelings, and thinking of his fellow men of all times, much as would an entomologist, at a safe distance, investigate the characteristics of a society of bees industriously shaping to their whims and needs, the social and material world around them. His objectivity and freedom from bias have rarely been surpassed in the academic field."

The comment here about "objectivity and freedom from bias" are indeed very rare in the academic world, most academics being shaped and molded by pressures of job security, grant money acquisition, peer support gathering, etc. Rogers continues, which what seems to be a well-honed description of the advanced perspective:

> "While the English and German scholars were issuing equally partisan and contradictory manifestos on the causes of the war, he calmly discussed the same great event as though it were taking place on the planet Mars."

Pareto, in other words, according to Rogers, seems to have studied society they way a chemist studies molecules or a physicist studies planets, i.e. objectively, and with experimental science and the scientific method guiding the way and taking precedence over personal belief or motive.

Paretian terminology

Pareto produced a certain amount of jargon peculiar to his own writing. One of these is the distinction between what he called "residues", a constant, instinctive part of social phenomena, and "derivations", a deductive part that aims to explain, justify, and demonstrate the first. [28] The following is a Pareto terminology table:

Term	Definition	Source
Sentiment	An attitude, thought, or judgment prompted by feeling: predilection; a specific view or notion: opinion; emotion; refined feeling: delicate sensibility especially as expressed in a work of art; emotional idealism; an ideal colored by emotion.	Merriam-Webster Collegiate Dictionary (2000)
Residue	The manifestation of a sentiment.	Lawrence Henderson (1935) [1]
Derivation	A non-logical argument, explanation, assertion, appeal to authority, or association of ideas or sentiments in words.	Lawrence Henderson (1935) [1]
Logical action	Actions of which the anticipated direct consequences are [probably] objectively and subjectively identical [to a first approximation].	Lawrence Henderson (1935) [1]
Non-logical action	Anything that is not a logical action.	
Ophelimity	A simple type of utility, described by the study of acts of the homo economicus, derived from economic forces.	Pareto (1897) [17]

The following is an example 1902 usage of some of the above terms by Pareto: [34]

> "Each of us has within a secret adversary who tries to prevent him from abstaining from the mixture of his own sentiments with logical deductions from facts. In noting this general defect, I well know that I am not exempt. My sentiments lead me to favor freedom; therefore I have taken pains to react against them. But it may be that I have gone too far and, fearing to give too much weight to the arguments in favor of freedom, have not given them enough weight. Similarly, it is possible that, fearing to give too little weight to sentiments that I do not share, I have given them too much. In any case, since I am not quite sure that this source of error is absent, it is my duty to point it out."

Henderson (1935) gives the following examples of sentiments: [1]

> "A desire to solve a scientific problem, a feeling that justice exists, a sense of the value of certain customs and rites, a need to participate in the acts of a cult, a feeling of personal integrity, a sense of loyalty to a community, a sexual complex."

Here, according to Henderson, we see sentiment being but a term embodying: desires, feelings, senses, and needs. He goes on to clarify that these sentiments are "regarded as forces are regarded in modern dynamics." This brings to mind James Maxwell's 1947 statement that "the only thing which can be directly perceived by the senses is force, to which may be reduced light, heat, electricity, sound and all the other things which can be perceived by the senses."

Pareto, as summarized by Henderson, distinguished between six types of residues and four types of derivations: [30]

Residues	Derivations
1. Instinct of combinations.	1. Affirmation.
2. Persistence of aggregates.	2. Authority.
3. Need to manifest sentiments by external acts.	3. Accord with sentiments or with principles.
4. Residues related to sociability.	4. Verbal proofs.
5. Integrity of individual and of what he considers dependent upon him.	
6. Sexual residuals.	

In other words, the main classes of residues, as summarized by Andrew Bongiorno (1930), are: combination-residues, which compel men to innovate; persistence of aggregates, residues which compel men to conserve; those which compel men to express their sentiments by means of outward acts; those which make a man a social being; the residues of the integrity of the individual; and sexual residues. [28]

Education

Pareto completed his BS in mathematical sciences in 1867 and his PhD civil engineering, in 1870, with a dissertation on "The Fundamental Principles of Equilibrium in Solid Bodies", an essay on mechanical equilibrium, both from what is now the Polytechnic University of Turin. It is said that his later interest in equilibrium analysis in economics and sociology can be traced back to his dissertation. After graduation, Pareto worked as director of the Rome Railway Company from 1870 to 1874, after which he became managing director of the Societa Ferriere d'Italia, Florence, a firm which extracted and processed iron and allied products. [24]

Amid the 1874 "Parliamentary Revolution", wherein the "Historical Right" fell from power, being overthrown by the "Historical Left", Pareto, himself being descendent of the ennobled Ligurian family—his father Marchese Pareto a leading civil engineer who had to seek exile in France because of his republican opinions and adherence to Joseph Mazzini—began become an outspoken critic of the government *consorteria*, regarding the Italian aristocracy as "sucking the blood" from the Italian poor, and in 1882 stood as an opposition candidate for a constituency in Florence, but without success. The next decade brought about a significant change in his reaction existence, which is best summarized by English political science historian Samuel Finer's 1966 biographical summary chapter on Pareto: [24]

> "Pareto's father died in 1882; and after the death of his mother in 1889, the family household in Florence broke up and Pareto changed his entire way of living. He threw up the managing directorship of the firm and, instead, accepted a consultancy. Marrying a penniless Russian girl from Venice, Allessandrina ('Dina') Bakunin, he moved from Florence to a villa in Fiesole. He made use of his new leisure to launch a personal crusade against the government's foreign and domestic policies. Between 1889 and 1893 he wrote 167 articles, many of the scholarly, but the vast majority anti-government polemics. His public lectures in a working men's institute were closed by the police [see:

Laussane school of physical socioeconomics

Auguste Walras
(1801-1866)

human molecule (banned)], and he became a marked man in government circles.

"In the course of these activities, he became closely acquainted with other free-trading publicists and economists of the day and with one of these, Maffeo Pantaleoni, the economist, he formed a warm friendship which was to endure for the rest of his life. Through, Pantaleoni, Pareto developed an interest in pure economics and became acquainted with the new, mathematically expressed equilibrium system developed by Walras, the professor of political economy at Lausanne. He soon began to contribute acute and learned articles expounding Walras' doctrine in the *Giornale degli Economisti*. For these his early mathematical training had equipped him superbly and they gained him international recognition. In 1893, with some intermediation from Pantaleoni, Pareto succeeded Walras in the chair of political economy at Lausanne; in 1894 this appointment was made permanent.

Pareto's first important publication was the two-volume *Cours d'Economie Politique* (1896), based on his university lectures.

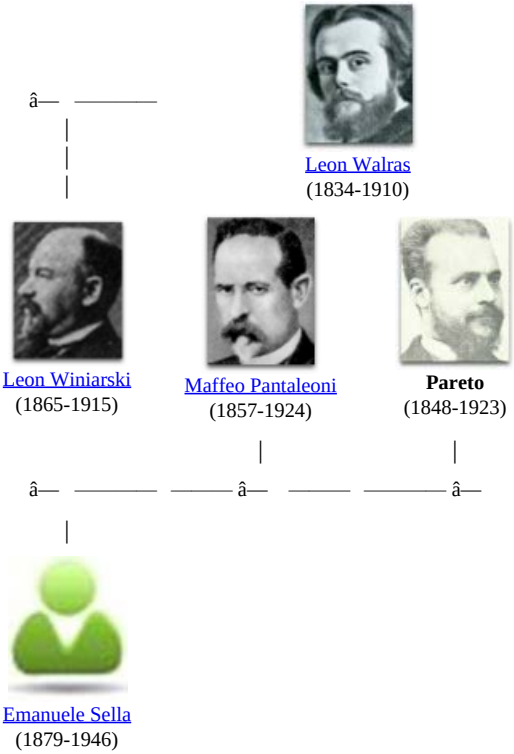

The connectivity tree of hard science based economics philosophy of the Lausanne school starting from French socioeconomist Leon Walrus to the two cultures synergy of Italian economist Maffeo Pantaleoni, to that of Emanuele Sella who studied under Pantaleoni, to that of Italian political economist Claudia Rotondi, who did her 1995 PhD on Pantaleoni, Pareto, and Sella.

In 1898, his uncle died leaving him a legacy the value of which [is] estimated at about â ,£200,000 [$134 million US dollars in equivalent 2013 terms]. Cynthia Russett has also commented that his father, previously, had left him a lifetime income, which had allowed him to retire in the first place, and to devote himself to the study of mathematical economics.

The other reason which contributed to the revolution in his thinking—and which incidentally also drove him to seek retirement from his teaching career for the sake of pure academic research—was an idea that came to him in his reflections on the astonishing popularity of Marxism in Italy. How was it that propositions which, in his view, were so demonstrably false had come to be regarded by the best youth in Italy as—to us his own words—a 'new gospel'? In 1897 the idea suddenly came to him that the bulk of human activity is not due to rational processes at all but to sentiments. Men feel an urge and act; they invent justifications afterwards. He now burned to devote himself to writing a sociology based on this new principle.

His new views were first expressed in 1900 in a long article for *Rivista Italiana di Sociologia* and then in his book *Les Systemes Socialistes* (1901-02). They were further developed in his *Manuel of Political Economy* (1906). In 1907, he retired from his chair at Lausanne (though he continued to deliver lectures on sociology until 1916), and decided to write the long-meditated work on sociology—*Treatise on General Sociology*—completing it in 1912. Publishing delays and the outbreak of war postponed its appearance until 1916."

The point when Pareto and Italian economist Maffeo Pantaleoni met was January 1890, with whom he established a long and sincere two cultures type of friendship that would prove decisive for the future course of science. In 1893, Pantaleoni recommended Pareto to Leon Walrus for appointment as a professor of political economy at the University of Lausanne. [1]

Course on Political Economy | 1893-1997

In *circa* 1893, Pareto began teaching a course in political economics, on economics and sociology, at the University of Lausanne, Switzerland (see: Lausanne school), a large part of which was based on a direct extrapolation of elasticity theory and vibration theory of equilibrium of the atoms and molecules in solid bodies to develop a theory of equilibrium of moving humans in socioeconomic systems. The content of this course, finished in draft notes form in 1895, was published in two volumes, in 1896 and 1897, respectively, entitled *Course of Political Economics*.

"Comparison to a system of material points is the only comparison, in our opinion, which can explicate the very complicated actions and reactions of social phenomena, and which can thus give us a clear idea of economic equilibrium."

— Pareto (1897), *Course on Political Economy, Volume 2* (pg. 26)

The first volume, a little over 70 pages, explains his principles of political economy and provides a first-approximation treatment of the economic phenomena that allows for the setting forth of the general conditions of economic equilibrium. The second volume, of about 800 pages, covers applied economics, wherein a large amount of statistical and factual material is used and analyzed, and in which his famous law of income distribution (Pareto principle) is formulated. [8]

Mechanical-to-sociology comparison table

See main: see: human thermodynamics variables table

The following, below right, from the second volume (pgs. 12-13), is a 1971 English translation, by translator Ann S. Schwier, of Pareto's famous 1897 mechanical-to-sociology comparison table, below left hyperlinked text version: [17]

Mechanical phenomenon	Social phenomenon
Given a certain number of solids, we study their relations of equilibrium and movement abstracted from the other properties. We obtain thus a study of mechanics.	Given a society, we study the relations of production and wealth between men, abstracted from other circumstances. We obtain thus the study of political economy.
The science of mechanics is divided into two others. If we consider inextensibly connected material points we obtain a pure science, rational mechanics, which studies in an abstract way the forces of equilibrium and movement. The easiest part of science is equilibrium. D'Alembert's principle, considering the forces of inertia, enables the reduction of the dynamic problem to a static one.	The science of political economy is divided into two others. If we consider the *homo economicus* who acts only as a result of economic forces, we obtain political economy, which studies in abstract terms ophelimity. The only part of this which is well known is static equilibrium. There may be a principle for economic systems analogous to D'Alembert's, but at present our knowledge is very poor. The theory of economic crisis offers an example of dynamic study.
From rational mechanics comes applied mechanics, which is a little closer to reality, considering elasticity, friction, etc.	From pure political economy comes applied political economy, which does not consider solely *homo economicus*, but also other models of humankind closer to reality.
Real solids not only have mechanical properties of the phenomena caused by light, electricity and heat. Chemistry studies other properties. Thermodynamics, like other sciences, studies some of these properties in detail. All these sciences constitute the physical-chemical sciences.	Men and women have other characteristics which are studies by other particular sciences, such as law, religion, aesthetics, the organization of society, and so on. Some of these have quite a high level of development, others on the contrary, have not. As a whole they constitute the social sciences.
If we wish to consider a concrete fact, all these sciences must be taken into account because they have been separated through a process of abstraction.	
In reality, solids with only mechanical properties do not exist. It is a mistake to assume the existence of concrete phenomena subject only to mechanical forces, abstracted form chemical ones, as it is to assume that concrete phenomena may be subtracted from the laws of rational mechanics.	In reality, persons who are subject only to economic stimuli do not exist. It is a mistake to assume the existence of the concrete phenomenon subject only to economic motivations, abstracted from other considerations, just as it is to assume that a concrete phenomenon may be subtracted from the laws of pure economics.
The practice differs from the theory precisely because practice must take into account a quantity of secondary characters which are not studied in the theory. The relative importance of primary and secondary characters is not the same from the general point of view of science and from the particular point of view of a practical operation. Syntheses have sometimes been attempted. An attempt has been made to find the cause of all phenomena in:	
The attraction of atoms. An attempt has been made to reduce to all physical and chemical forces from a fundamental unity.	Utility, of which ophelimity is simply a type. An attempt has been made to explain all phenomena in terms of biological evolution.
These are all interesting studies. But we must not resist these hypotheses and not go far from the solid basis of experience.	

The above table, to note, seems to have been modeled on Irving Fisher's earlier table, being that Pareto seems to have been well-aware of Fisher's PhD dissertation. In 1902, in his *Socialist Systems*, Pareto, for example, commented the following: [13]

> "Progress in the purely scientific sense of political economy are considerable. Books such as *Mathematical Psychics*, F. L. Edgeworth, *Principii di economia pura* [*Pure Economics*], Maffeo Pantaleoni, *Mathematical Investigations in the Theory of Value and Prices*, Irving Fisher, etc., are written in a purely scientific point of view. A similar attempt is one of my courses, in the first volume, published in 1896, I said: "In all treatises on political economy, the main part is formed by the science of ophélimité and utility."

Namely that on the Edgeworth, Pantaleoni, Fisher pioneering platform, that he had made a "similar attempt" in his 1897 *Course on Political Economics*.

Economic molecules

Pareto, in his 1890s *Course on Political Economy*, not only used the "society as a system of material points" model, but also seems to have increasingly begun use or employ the "society as a system of molecules" model. Pareto's overall theory is summarized by Indian sociologist Rajendra Pandey as follows: [12]

> "**Pareto** views society as a system of human molecules which are in a complex mutual relationship."

To clarify further, the following are main human to "molecule" comparison quotes from his *Course of Political Economics*, the first of which seems to come from his 1896 first volume, the latter from his 1897 second volume: [6]

"Human society appears to us as a vast aggregate of molecules,	"La société humaine nous apparait ainsi comme un vaste agrégate de

rendering services, consume products and save, and centers, or glands, where savings are transformed into capital and products, some ...”	molécules, qui rendent des services, consomment des produits et épargnent; et de centres, ou de glandes, où l’épargne se transforme en capitaux, et les produits, les uns …” (pg. 70)
“The economic phenomenon is not a static phenomenon, it is a dynamic phenomenon. The molecules which together represent the social aggregate oscillate perpetually. We may for the sake of analysis take certain average economic positions, as we take the average level of the ocean.”	“Le phénomène économique n'est pas un phénomène statique, c'est un phénomène dynamique. Les molécules dont l'ensemble représente l'agrégat social oscillent perpétuellement.” (pg. 277)
“The theories of mathematical physics teach us how the vibrations of material molecules interfere and overlap. One day, perhaps, will we have similar theory of economic vibrations.”	“Les théories de la physique mathématique nous enseignent comment les vibrations des molécules matérielles interfèrent et se superposent. Un jour, peut-être , aurons-nous de semblables théories pour les vibrations économiques.” (pg. 278)
“In service of the equilibrium of the molecules of the economic aggregate, we see movement of these molecules, and finally we see rise of the conception of the whole aggregate which is in motion and vibration.”	“ser en équilibre les molécules de l'agrégat économique ; ensuite nous avons considéré certains mouvements de ces molécules; enfin nous nous élevons à la conception d'un agrégat qui est tout entier en mouvement et en vibration.” (279)
“A social aggregate can be viewed in a similar appearance to that under which the elasticity theory considers molecule aggregates material. We conclude with a test of social physiology, we conduit ....”	“Un agrégat social pourra alors être considéré sous un aspect analogue à celui sous lequel la théorie de l'élasticité considère les agrégats de molécules matérielles. Nous terminons par un essai de physiologie sociale, qui nous conduit de ....” (pg. 409)

This is all fairly interesting and what seems to be original theory for 1896, certainly in need of much analysis. The English translation of this work, however, seems to be non-existent.

Socialist Systems | 1902

In his 1902 *Socialist Systems*, Pareto elaborated on his earlier 1896 outlined wealth distribution principle ideas with the following diagram—shown with added clarification annotations—and comments: [26]

> “The curve of the distribution of wealth in our society, varies little from one era to another. What is called social pyramid is in reality a sort of spinning top, which the following figure gives an idea:

This is shown below, with additional quote: [17]

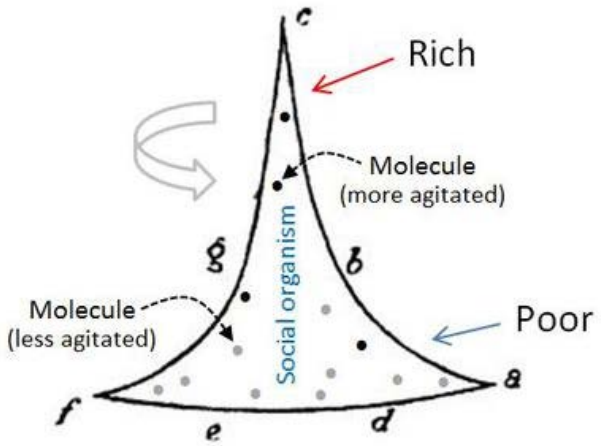

> “The molecules of which the social aggregate is composed don’t stay at rest; some individuals enrich themselves, other impoverish themselves.”
>
> — Pareto (c.1902)

> Rich occupying the summit, the poor are at the base. *Abcgf* the part of the curve we are only well known, thanks to the statistical data. The *adef* part is only speculative. We have adopted the form indicated by Otto Ammon and which seems to us quite likely that the shape of the curve is not due to chance. It probably depends on the distribution of the physiological and psychological characteristics of men. Moreover.

can, in part, relate to the theories of pure economics, that is to say, the choice of men (these choices are specifically related to the physiological and psychological characteristics) and the obstacles encountered in production.

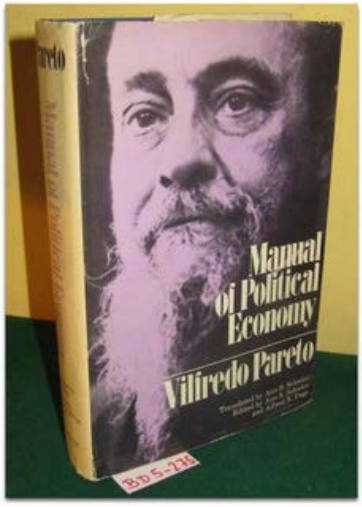

Assuming men arranged in layers according to their wealth, figure *abcgfed* is the outer form of the social organism. From what we have said this form does not change much, it can be assumed nearly constant on average and for a short time. But the molecules that make up the social aggregate do not remain at rest; individuals get richer, others poorer. So quite extensive are the agitated movements within the social organism, which resembles, in this, a living organism. In the latter, the blood flow is rapidly moving some molecules, the absorption and secretion processes continually change the molecules composing the tissue, while the external shape of the body, such as an adult animal, feels only insignificant changes.

Assuming men arranged in layers according to other characters, such as their intelligence, their ability to study mathematics, their musical talent, poetic, literary, their moral character, etc., it is likely to have curves forms more or less similar to what we just found for the distribution of wealth."

(add)

Manuel of Political Economy | 1906

In 1906, Pareto published *Manuel of Political Economy*, wherein he seems to have used the term "molecule" only once, the English translation of which reads: [14]

> "§73. Economic crises. The economic complexus is composed of molecules which vibrate continuously; this is a consequence of the nature of man and of the economic problems which he has to solve. These movements may occur in different directions, and in that case …"

Though in the original French edition it is difficult to see where this quote is found. [15]

Homo economicus | Pantaleoni

In *circa* 1908, Italian economist Maffeo Pantaleoni, in his article "The Phenomena of Economic Dynamics", classified Pareto's overall theory as "economic dynamics" during the course of which he comments how Pareto referred to man as "homo economicus", the outline of which is as following: [22]

> "The ruling idea in economic studies following those of Adam Smith was wealth. Later it became the idea of value and is so still in the case of many writers. The science has contained in a sporadic shape much material for a science of economic equilibrium, such as has been suggested by Pareto in a work which makes only a beginning of a study of economic dynamics.
>
> In describing dynamic phenomena comparisons are used which were formerly taken from mechanics, but now more usually from biology. Economic agents are thought of either as molecules subjected to equal pressure in all directions, or, on the other hand, as parts of a living body subjected to equal stimuli, which are mutually counteracting. There is little use in disputing as to which method is better, since the useful thing is to apply a method rather than to argue about it.
>
> Economic dynamics may be defined as a study of movements of disequilibrium, which lead to positions of equilibrium. When an individual spends his income so as to bring into a proportion the marginal utility of different articles within his purchasing power, the equilibrium exists and is rightly called static, because it will continue indefinitely and return if disturbed. Until this condition is reached, modifications in his demand or in his supply are likely to take place, and the quantity of the goods coming within his reach will change and these changes affect both the man himself and the persons he deals with, involving both the quantity of goods available and the incomes of different producers. The state of equilibrium yields the maximum of satisfaction relatively to the initial position and to the changes which this allows.

In every society purely economic motives have an extending or contracting radius of activity; in other words, the zones of economic action grow larger or smaller. As Pareto says:

> "Man's actual conduct resembles that of the ***homo economicus***, or that of the *homo ethicus*, or that of the *homo religiosus*. It is sometimes a composite of all these characters. There are concrete phenomena in which the economic influences transcend all others, and here it is possible to consider alone the results deduced by economic reasoning; while there are other phenomena in which the economic constituent is insignificant and may be neglected. There are still others which are intermediate in character."

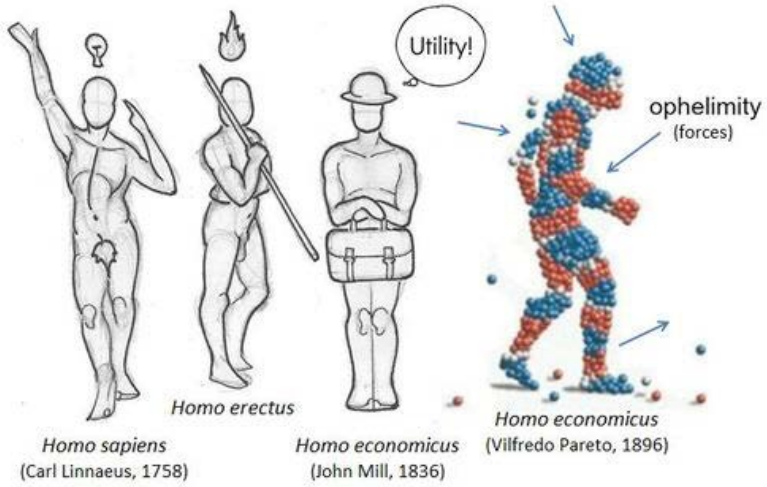

The term *homo economicus*—a Linnaeus-themed variant of John Mill's 1836 generic utility maximizing "economic man"—is said to be attributed to the work of **Pareto** and his 1896 statement that: "man himself; stripping him of a large number of his attributes, leaving out the passions, good or bad, reducing him to *a kind of molecule* that only acts in response to the forces of ophelimity", which, as summarized by Australian economics historian Michael McLure (2002), is an abstract entity that only responds to the forces of ophelimity, in other words "an abstract molecule that acts only in response to economic forces". [17]

> To this we in the main agree, but find it necessary to examine variations of the zones in which all these homines move, and we must notice that even the homo economicus in his own proper capacity is modified when he enters into a composite with the others."

Australian economics historian Michael McLure has discussed Pareto's economic molecule theory in comparison to this generic *homo economicus*—one who attempts to maximize utility as a consumer and economic profit as a producer—a term deriving from John Mill's "economic man" utility logic, such that Pareto's *homo economicus* is 'an abstract molecule that responds only to economic forces'. McLure elaborates further: [17]

> "In pure theory, *homo economicus* of *Cours* [*on Political Economy*] is analogous to a molecule in the theory of mechanics (note: the impersonal subject pronoun has been used because the homo economicus is an abstract 'molecule', not a person). Kirman has pointed out that 'Pareto regarded equilibrium as the termination point of a process … The time taken for this process is not specified but it certainly is not regarded as … as negligible (Kirman 1987, pg. 806)."

The discussion here of British-French economist Alan Kirman's synopsis of Pareto's equilibrium model from his 1987 *Dictionary of Economics* entry "Pareto as an Economist" is interesting. [18]

Treatise on General Sociology | 1912

In 1912, Pareto finished his four volume *Treatise on General Sociology* (*Trattato di Sociologia Generale*), though not published until 1916—later published in English as *The Mind and Society* (1935)—in which he elaborated further on his early theories, arguing that people are moved by certain "residues" and by "derivations" from these residues. Only in the fourth edition does he use the term "molecules" on seven page. The following are a few example quotes:

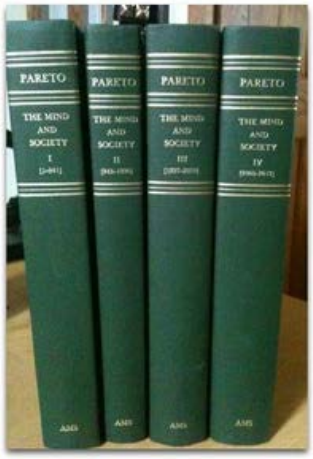

Pareto's 1912 four-volume magnum opus *Treatise on General Sociology*, reprinted in 1935 under the English title *The Mind and Society*, wherein he applies chemistry, physics, and mechanics to the study of man, defined as a type of molecule, sociologically and economically (see: power center). [10]

> "§2079. Organization of the social system. The economic system is made up of certain molecules set in motion by tastes and subject to …" (pg. 1442)
>
> "… and molecules have certain thermic, electrical, and other properties. So a system made up of social molecules also has certain properties that are important to consider. One among them has been perceived, be it in a rough and crude fashion, in every period of history—the one to which with little or no exactness the term 'utility' …" (pg. 1456)
>
> "… subsist in certain relationships. The reasonings (derivations), theories, beliefs that are current in the mass of such molecules are taken as manifestations of the [psychic] state of that mass and are studied as facts on a par with other facts that society presents to view. We look for uniformities among them, and try to get back to the facts in which the in turn originate." (pg. 1919)

Again, these are fairly advanced speculations for 1916, in much need of analysis.

> "Action and reaction follow one another indefinitely as if in a circle"

— Vilfredo Pareto (1912), *Treatise on General Sociology* (Ñº)

In 1917, the year following the completion and publication of his magnum opus, Pareto gave an address on the 25th anniversary of his appointment as professor at the University of Lausanne, July 6th, the following are two of the noted end statements from the address: [32]

> "The writing of my *Treatise on General Sociology* was driven by the desire to bring an indispensable complement to the studies of political economy and inspired by the example of the natural sciences that I determined to begin my *Treatise on General Sociology* the sole purpose of which—I say sole and I insist upon the point—is to seek experimental reality, by the application to the social sciences of the methods which have proved themselves in physics, in chemistry, in astronomy, in biology, and in other such sciences."
>
> "No one knows better than I how imperfect this treatise is; but even if it ought soon be forgotten, I hope that it will have been of some use, as a stone that is part of a great building: that of experimental science."

(add)

Molecular enrichment | Pareto principle

Another noted Pareto molecule quote, in respect to personal enrichment or impoverishment, is as follows: [17]

> "The molecules of which the social aggregate is composed don't stay at rest; some individuals enrich themselves, other impoverish themselves."

This seems to be the mechanistic understanding of his Pareto principle of wealth distribution, a logic that he referred to as the "circulation of the aristocrats". Austrian economist and political scientist Joseph Schumpeter comments on this: [19]

> "As a matter of fact, there was an incessant—to use Pareto's term—*circulation des aristocracies*. The elements that composed the uppermost stratum around 900 had practically disappeared by 1500. The Medici are not really an exception."

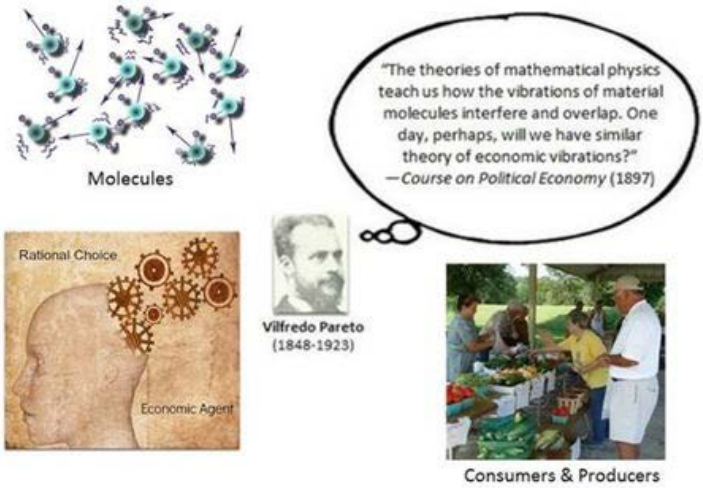

Pareto's general theory of molecular economic vibration overlap. [33]

In sociology, this is a regime change theory referred to as the "circulation of elite". [20] Interestingly, Pareto's human molecular enrichment / human molecule impoverishment theory seems to have given rise to the following 1942 footnote statement by Schumpeter: [19]

> "It can be shown that in all cases, that human molecules rise and fall within the class into which they are born, in a manner which fits the hypothesis that they do so because of their relative aptitudes; and it can also be shown, second, that they rise and fall across the boundary lines of their class in the same manner. This rise and fall into higher and lower classes as a rule takes more than one generation. These molecules are therefore families [see: family molecule] rather than individuals. And this explains why observers who focus attention on individuals so frequently fail to find any relation between ability and class position."

Schumpeter says he would like to elaborate on in the framework of a book, but this not at the moment being possibly, is something about which he refers readers to his 1927 "Theory of Social Classes in the Ethnic Homogenous Milieu" [21]

Ophelimity

In the first part of volume one, he outlines his pure principles of political economy, supposedly based on natural science methods, and in doing so coins the term "ophelimity" (ophélimité), to refer to the subjective aspect of utility—though not "utility" exactly, being that he considered the conventional definition of utility to be flawed and ambiguous on several points, hence he needed a new replacement term—the new term "ophelimity" defined by hims as ability of any object or service to satisfy a need or desire of an individual. [9]

Pareto, however, compounded this newly coined term, by bring human molecular theory into the picture, i.e. referring to a person or the economic agent as a "kind of molecule", and and society as a system of human molecules. He then compounded his newly-coined term "ophelimity" further by asserting that ophelimity has "forces" associated with it and that the human molecule "only acts" in response to these forces: [6]

> "First we separate the study of ophelimity (economic satisfaction) from the diverse forms of utility, then we direct our attention to man himself; stripping him of a large number of his attributes, leaving out the passions, good or bad, reducing him to *a kind of molecule* that only acts in response to the forces of ophelimity."

Pareto reading (c.1912) at about the time of publication of his *Treatise on General Sociology*.

Pareto further distinguished between what he called "elementary ophelimity" (ophélimité élémentaire), defined as the unit of pleasure that an individual draws form the consumption of a small increase of a good. Elementary ophelimity, defined by Pareto, is function of the quantities of all goods consumed, expressed as: [8]

$$\phi_a(x_a, x_b, ...)dx_a$$

a consequence of which is that partial derivatives of total utility appear in his equations of economic equilibrium. [8]

Generalizations

Pareto's last monograph was his 1920 *Generalizations*, retitled as *The Rise and Fall of Elites: an Application of Theoretical Sociology* (1991), outlines a well-developed, articulate, and compelling theory of change based on a Newtonian vision of science and an engineering model of social equilibrium, according to which the dynamic involves a shifting balance among the countervailing forces of centralization and decentralization of power, economic expansion and contraction, and liberalism versus traditionalism in public sentiment; and in which he expounds a scheme for predicting shifts in magnitude of these forces and subsequent change in the character of society. (Ñº)

Henderson | Gibbs + Pareto = social equilibrium

A common misattribution, originating from the 1935 alluded to similarity between the 1912 mechanical equilibrium theories Pareto and the 1876 chemical equilibrium theories of American engineer Willard Gibbs, outlined by American physiologist Lawrence Henderson, is that Pareto transposed his theory of social equilibria directly from the chemical thermodynamics work of Gibbs. The following, to exemplify, is a 2005 misattribution example found in the 2005 work of American science historian Hunter Heyck: [25]

> "**Pareto**'s work appealed to social scientists who had lost faith in the rationality of the public but not in the rationality of science. Henderson fit the bill perfectly: he was so taken with Pareto's ideas that he led a faculty seminar on Pareto at Harvard in the early 1930s, from which emerged Henderson's study *Pareto's General Sociology: a Physiologist's Interpretation*.
>
> Pareto's mathematical analysis of society was based on his engineer's understanding of the thermodynamics of equilibrium systems. For example, one of Pareto's central concepts was that of 'ophelimity', now usually called Pareto optimality. Ophelimity was a redefinition of marginal utility in thoroughly thermodynamic terms. Pareto defined a system as having maximum ophelimity when the increase of the ophelimity of any element in the system necessarily reduced that of some other element (or elements) in the system. Thus ophelimity, like energy, always was conserved in a closed system, making the reallocation of ophelimity a zero-sum game. This concept, it should be noted, especially welfare economics, where it plays an important role in the work of Paul Samuelson and Abram Berg."

Socioeconomic Chemical Thermodynamics

Physico-chemical system

Gibbs
(1876)

+

Socio-economic system

Pareto
(1912)

Henderson's theory

Lawrence Henderson
(1935)

In 1935, American physiologist Lawrence Henderson theorized that **Pareto**'s 1912 mechanics based socioeconomic equilibrium theory, while not directly based on the chemical thermodynamics based equilibrium theories of American engineer Willard Gibbs, are nevertheless arguing the same point of view, and hence modern socioeconomic equilibrium theories will need to be reformulated in the physical chemistry reaction terms of chemical thermodynamics, a unified synthesis of Gibbs and Pareto, in short. [1]

This, however, is historical anachronism. At the time when Pareto was studying civil engineering at Polytechnic University of Turin, from 1865 to 1870,

thermo-dynamics (see: etymology) was barely yet a coined term, and it would not be until 1875 when Rudolf Clausius would call his second edition *The Mechanical Theory of Heat* a "textbook" suitable for standard engineering study, in Germany, let alone in Italy. While it is true that Pareto did begin to use the term "thermodynamics" on about 16 various pages of his 1912 *Treatise on General Sociology*, he only uses the term "entropy" once in the fourth volume, which is the key term one would have to grapple with if he or she was so inclined to attempt to reformulate the general equilibrium theory of economics in "thoroughly thermodynamic terms" as Heyck alleges.

In any event, to clarify, the name Gibbs is not found in Pareto's 1897 two-volume *Course of Political Economics*—which, of course, is natural enough being that Gibbs' 1876 *On the Equilibrium of Heterogeneous Substances* was not translated into French until 1899 by French chemist Henry Le Chatelier—nor, supposing that Pareto, by chance, read Gibbs in the 1900s, is the name Gibbs found in Pareto's 1916 four-volume *Treatise on General Sociology*. [10]

The root if the misattribution seems to have arisen in the views of American physiologist Lawrence Henderson who in his 1935 *Pareto's General Sociology: a Physiologists Interpretation*, elaborates on a large number of Pareto-Gibbs comparisons, such as the following: [1]

> "Gibbs considers temperature, pressure, and concentrations, so **Pareto** considers sentiments, or, strictly speaking, the manifestations of sentiments in words and deeds, verbal elaborations, and …"

Henderson, however, never actually stated that Pareto derived his theory from Gibbs but rather only "compared Pareto's social system to a physicochemical system as defined by Gibbs and emphasized that the equilibrium of the social system is logically identical to physiological equilibrium." [12] In fact, in his appendix "Note 5", Henderson states is views on this matter explicitly:

> "It is very unlikely that the general characteristics of Gibbs' system had anything to do with Pareto's construction of his social system. In other words, it is very probable, I thing certain, that Pareto did not keep Gibbs' work in mind and *a fortiori* that he did not imitate it, when he worked out his social system; so that Pareto's system is not the result of the application of the *theories* of physical chemistry to sociology."

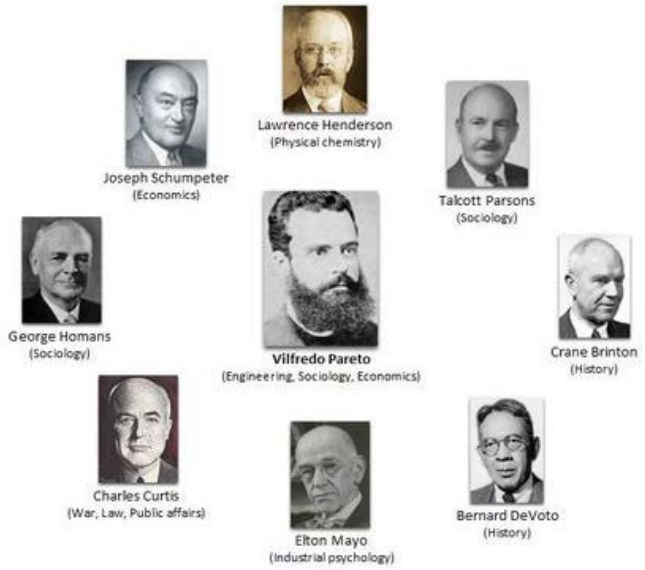

The so-called Harvard Pareto circle that solidified at Harvard University from 1932 to 1942, owing to the promotion of **Pareto**'s work by American physical chemist, biochemist, physiologist, and sociologist Lawrence Henderson.

Henderson, however, does have this application in mind, and in his end note appendices, actually goes though a comparison of the equilibrium properties of the following liquid phase chemical reaction, namely of reactants carbon acid H_2CO_3 with disodium phosphate Na_2HPO_4 to form the products of sodium bicarbonate $NaHCO_3$ and monosodium phosphate NaH_2PO_4:

$$H_2CO_3 + Na_2HPO_4 \rightleftharpoons NaHCO_3 + NaH_2PO_4$$

to that of the equilibrium properties of social systems, at the end of which he states:

> "This simple example illustrates [the] logical principles [physical chemistry] that find universal application in the physical, biological, and social sciences."

Henderson's treatise is fairly decent and in need of detailed analysis.

In any event, Henderson's 1935 Gibbs-Pareto comparisons, in turn, were later picked up by American sociologist Kenneth Bailey, whose 1990 *Social Entropy Theory* further builds on Henderson's comparisons, albeit it seems without reading his "Note 5", to outline a rather faint eluded to connection between Pareto and Gibbs. Bailey states, for example: [11]

> "There is a direct link from the equilibrium analysis of Gibbs (1877), through Henderson (1935), who was a great admirer of both Gibbs and **Pareto**, to Parson (1951), thus the bulk of social systems analysis, particularly functionalism, is rooted in Gibbsian equilibrium analysis."

In 2001, citing Bailey, American sociologist Daniel Rigney stated the following: [7]

> "In popular parlance we speak of 'chemistry' of personal and group relationships. **Vilfredo Pareto** (1916) had a rather different sort of social chemistry in mind when he transposed his theory of social equilibria directly from the theory of chemical equilibria advanced by chemist J. Willard Gibbs."

Likewise, in 2010, citing Bailey, Sri Lankan disaster management theorist Buddhi Weerasinghe stated the following: [11]

> "The concept of resilience—time to recovery, the rate of speed of return to pre-existing conditions after disturbance (engineering resilience); the magnitude of disturbance that can be absorbed before the system changes its structure by changing the variables and processes that control behavior (ecological resilience)—has increasingly gained recognition and acceptance and it is now frequently used in many fields. In the early 20th century, economists and sociologists, such as Vilfredo Pareto began to apply J. Willard Gibbs' equilibrium criterion to the modeling of economic systems and social systems (Bailey, 1990)."

Entropy

In his discussions and theories on mind and society, Pareto was cognizant of the concept of entropy but, according to Kenneth Bailey, eschewed it, instead relying heavily upon the concept of equilibrium. [4] Pareto, in fact, only seems to use the term once, namely in his fourth volume, where he says:

> "The 'energy' of mechanics must not be confused with the 'energy' of ordinary parlance, nor is it excusable to imagine that a mechanical 'live force' is a force that is alive. If one would know the meaning of 'entropy' one had better glance at a treatise on thermodynamics."

This statement seems to be in the vicinity of the defunct theory of life view.

Recent views

In 2003, Indian physicist Bikas Chakrabarti, in his article "Money in Gas-Like Markets: Gibbs and Pareto Laws", coauthored with Arnab Chatterjee and S.S. Manna, considered ideal-gas models of trading markets, where each agent is identified with a gas molecule and each trading as an elastic or money-conserving (two-body) collision. Unlike in the ideal gas, they introduce a quantity the "saving propensity" $\lambda of agents, such that each agent saves a fraction $\lambda of its money and trades with the rest. They show that steady-state money or wealth distribution in a market is Gibbs-like for relation $\lambda = 0, has a non-vanishing most-probable value for $\lambda \neq 0, and Pareto-like when $\lambda is widely distributed among the agents. They compare these results with observations on wealth distributions of various countries. [2]

In the 2008 article "Pareto and Boltzmann-Gibbs behavior in a Deterministic Multi-agent System, several authors used a Pareto-Boltzmann-Gibbs logic to develop an economic dynamics model in which an economy is a deterministic system of interacting agents. They consider the dynamics of the system to be described by a coupled map lattice with near neighbor interactions, in which the evolution of each agent results from the competition between two factors: the agent's own tendency to grow and the environmental influence that moderates this growth. These authors argue that depending on the values of the parameters that control these factors, the system can display Pareto or Boltzmann-Gibbs statistical behaviors in its asymptotic dynamical regime. [3]

Schmoller anecdote

The following is a noted humorous and witty encounter between Pareto and German economics historian Gustav Schmoller (1838-1917) (Ñº) , following a speech by Pareto at a statistical congress in Berne, Switzerland: [36]

> "When Schmoller challenged Pareto, saying that there were no economic laws, Pareto politely asked if there were any restaurants where one might eat for nothing. Schmoller disdainfully replied that one always had to pay something. That, retorted Pareto, was natural economic law."

(add)

Quotes | On

The following are related quotes on Pareto:

> "**Pareto**'s theory is that pure science is science is 'rational mechanics'. Pure political economy, therefore, becomes a mathematical science. He begins with man as a 'hedonistic molecule' in which the economic factor is the primary force. But an analysis of the molecule into its component parts demonstrates its complexity and the presence of many other forces. Each factor must be studied separately and then all the factors recombined to form a synthetic concept of a real society or sociology."
>
> — Howard W. Odum (1929), *Introduction to Social Research* [38]

> "**Pareto**'s *Treatise on General Sociology* is the hardest boiled book I have ever read. Three times, since I passed my puberty, has my mind been made over. Once by a nexus of which Henry Adams was the center, once by a matrix of which Frazer burned brightest, and once by a long study of genetics and evolution. Pareto is doing the job a fourth time, and far more vitally than any others."
>
> — Bernard DeVoto (c.1930) [27]

"**Pareto**'s monumental work, *Trattato di Sociologia Generale*, lies before us as the most massive and impressive statement of the mechanistic conception of social life."

— Werner Stark (1962), *Fundamental Forms of Social Thought* [23]

"**Pareto** was one of the last Renaissance scholars. Trained in physics and mathematics, he became a polymath whose genius radiated into nearly all other major fields of knowledge."

— Joseph Lopreato (1999), *Publication* (co-author: Sandra Rusher) (Nº)

Quotes | By

The following are noted quotes:

"Give me a fruitful error any time, full of seeds, bursting with its own corrections. You can keep your sterile truths for yourself."

— Vilfredo Pareto (c.1910), comment on Johannes Kepler [1]

"My wish is to construct a system of sociology on the model of celestial mechanics, physics, and chemistry."

— Vilfredo Pareto (1912), *Treatise on General Sociology* (pg. #) [5]

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In hmolscience, **Vincenzo Cioci** (1965-) is Italian-Czech Republic physics historian noted for a number of physical humanities like historical publications, such as the economic thermodynamics of Frederick Soddy, the ethics thermodynamics or thermodynamic imperative premise of Bruce Lindsay, and the social mechanics of Vilfredo Pareto, the work of Spiru Haret, among possible others.

Education

Since 2003, Cioci has been a member of the Italian Society of Historians of Physics and Astronomy (SISFA). He is a member of the Research Group on Physics Education and History of Physics, University of Calabria, Italy, and of Research Centre for the Theory and History of Science, University of West Bohemia in Pilsen, Czech Republic.Since 2010, he has been the secretary of secretary of the Naples section two of the Italian Association for the Teaching of Physics. He has been devoting to the training of physics teachers with regard to the history and teaching of physics. [1] Cioci is associated with the physics department of the University of Calabria, Cosenza, Italy.

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External links

● Vincenzo Cioci (profile) – Blogger.com.

θΔics

In existographies, **Vincenzo Viviani** (1622-1703) was an Italian mathematician and scientist, noted for []

Galileo

In 1639, Viviani, aged 17, became the assistant of Galileo, remaining his disciple until Galileo's end on 8 Jan 1642.

Torricelli

In 1632 to 1640, the location of Evangelista Torricelli, supposedly, is unknown; presumably he was secretary to Galileo's friend Giovanni Ciampoli.

On 10 Oct 1641, Torricelli, aged 33, at the invitation of Galileo, joined Galileo and Viviani in Galileo's home, thereafter becoming Galileo's four month "pupil", so to say, and university chair successor, thereafter. [1] Viviani then succeeded Torricelli as mathematician to the Medici court. (Ñº)

Both Viviani and Torricelli, generally are classified as disciples or students of Galileo, each with different mathematical focuses. (Ñº)

Mercury experiment

The famous Torricelli vacuum experiment (1643), seems to have been designed by Torricelli, but "constructed" (Ñº) and or "performed" (Ñº) by Viviani; other views on this are as follows:

> "Torricelli communicated this reasoning to his friend **Vincenzo Viviani** who, anxious to see the operation, soon had the instrument made and, procuring quicksilver, was the first to make this noble experiment, and to see the effect foretold by Torricelli."
>
> — Author (1943), "Article" (pg. 407), *Journal of the Royal Astronomical Society of Canada*

> "And it is my belief that the same result will follow in other liquids, such as quicksilver, wine, oil, etc., in which the rupture will take place at a lesser or greater height than 18 braccia, according to greater or less specific gravity of these liquids in relation to that of water, reciprocally; always measuring such heights perpendicularly, however."
>
> — Galileo (1638), corrections

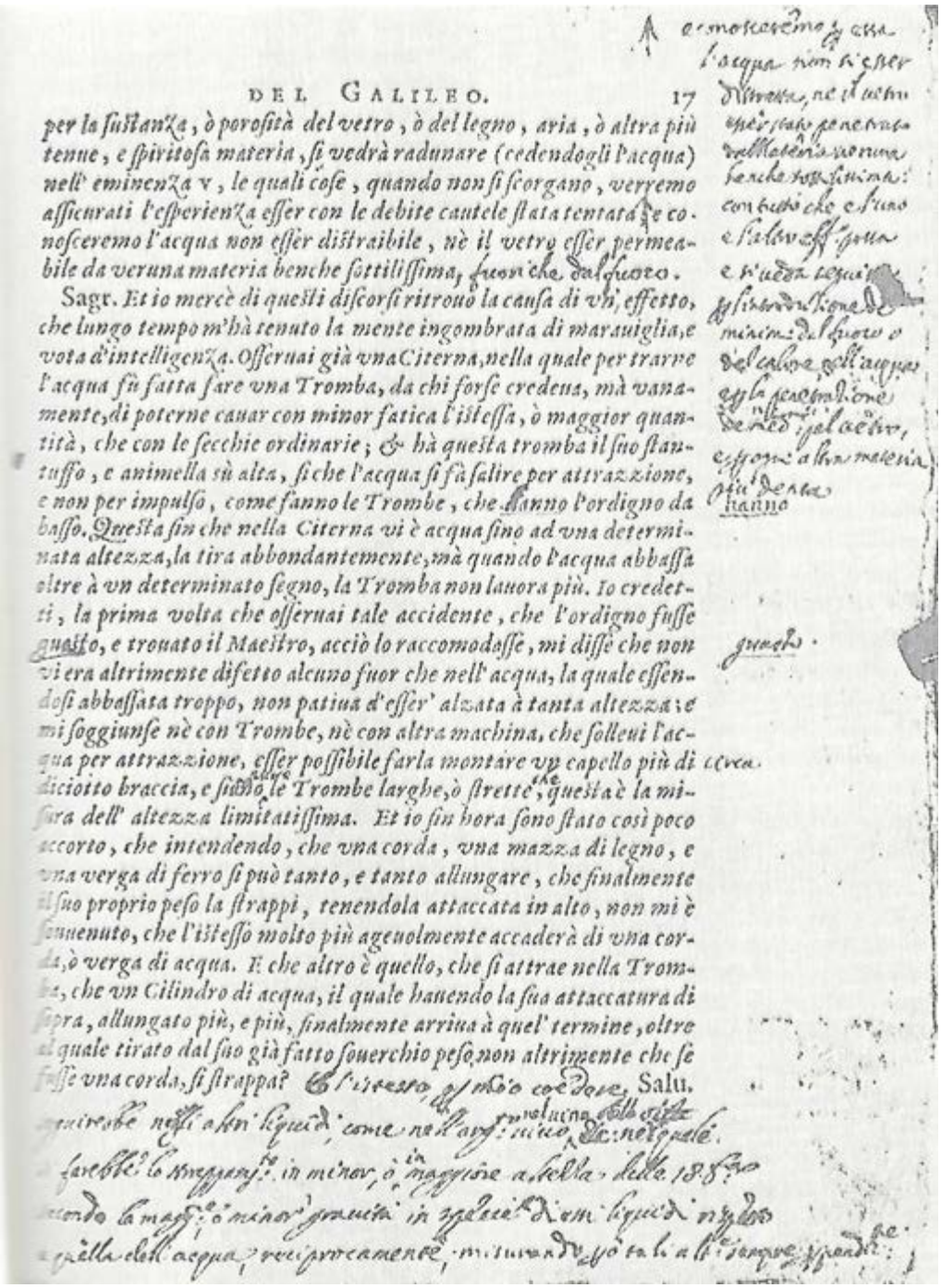

DEL GALILEO. 17

per la sustanza, ò porosità del vetro, ò del legno, aria, ò altra più tenue, e spiritosa materia, si vedrà radunare (cedendogli l'acqua) nell' eminenza v, le quali cose, quando non si scorgano, verremo assicurati l'esperienza esser con le debite cautele stata tentata, e conosceremo l'acqua non esser distraibile, nè il vetro esser permeabile da veruna materia benche sottilissima, fuor che dal fuoco.

Sagr. Et io mercè di questi discorsi ritrouo la causa di vn' effetto, che lungo tempo m'hà tenuto la mente ingombrata di marauiglia, e vota d'intelligenza. Osseruai già vna Citerna, nella quale per trarre l'acqua fù fatta fare vna Tromba, da chi forse credeua, mà vanamente, di poterne cauar con minor fatica l'istessa, ò maggior quantità, che con le secchie ordinarie; & hà questa tromba il suo stantuffo, e animella sù alta, si che l'acqua si fà salire per attrazzione, e non per impulso, come fanno le Trombe, che fanno l'ordigno da basso. Questa fin che nella Citerna vi è acqua fino ad vna determinata altezza, la tira abbondantemente, mà quando l'acqua abbassa oltre à vn determinato segno, la Tromba non lauora più. Io credetti, la prima volta che osseruai tale accidente, che l'ordigno fusse guasto, e trouato il Maestro, acciò lo raccomodasse, mi disse che non vi era altrimente difetto alcuno fuor che nell' acqua, la quale essendosi abbassata troppo, non patiua d'esser' alzata à tanta altezza; e mi soggiunse nè con Trombe, nè con altra machina, che solleui l'acqua per attrazzione, esser possibile farla montare vn capello più di diciotto braccia, e sieno le Trombe larghe, ò strette, questa è la misura dell' altezza limitatissima. Et io fin hora sono stato così poco accorto, che intendendo, che vna corda, vna mazza di legno, e vna verga di ferro si può tanto, e tanto allungare, che finalmente il suo proprio peso la strappi, tenendola attaccata in alto, non mi è souuenuto, che l'istesso molto più ageuolmente accaderà di vna corda, ò verga di acqua. E che altro è quello, che si attrae nella Tromba, che vn Cilindro di acqua, il quale hauendo la sua attaccatura di sopra, allungato più, e più, finalmente arriua à quel' termine, oltre al quale tirato dal suo già fatto souerchio peso, non altrimente che se fusse vna corda, si strappa? Et certo, al mio credere, Salu.

made by **Vincenzo Viviani**, with the approval of Galileo, to the Leiden edition of *Discorsi*; cited by William Middleton (1964) in *The History of the Barometer* (pg. 20)

A page from the 1638 Leiden edition of Galileo's *Two New Sciences*, shown with Viviani's additions, made with the "approval of Galileo", in the side margins, wherein Salviati, the voice of Galileo, is made to say that other liquids such as quicksilver, wine, and oil, will produce the same result, only at different heights. [2]

"Galileo is believed to have been one of the first to suggest an experiment that tested the relationship between the density of the liquid and the height of the column. The liquid of choice was liquid mercury (quicksilver). Mercury has a density 13.5 times that of water and it is one of the few metals that is a liquid at room temperature. Although Galileo is often credited with the idea, after Galileo's death it was **Viviani** who suggested the experimental design to a former student of Galileo, Evangelista Torricelli. In 1644, Torricelli designed a device to test the effects of air pressure on liquid mercury."

— Michael Windelspecht (2002), *Groundbreaking Scientific Experiments, Inventions, and Discoveries of the 17th Century* (pg. 15)

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External links

â— Vincenzo Viviani – Wikipedia.

θΔics

In business chemistry, **Vineet Nayar** (1962-) is an Indian engineer turned business executive noted for his 2010 sociophysics-themed book *Employees First, Customers Second*.

Overview

In 2010, Nayar, in his *Employees First, Customers Second*, utilized sociophysics-like concepts such as 'tipping point', 'critical mass', human particle, corporate molecule, new energy, etc., in application in reconstruction of corporations; the following is a popular quote: [1]

> "When a critical mass of employees [activate] (usually, 5 or 10 percent is all you need), throughout the company, it creates a kind of fusion – a coming together of the human particles in the corporate molecule that releases a massive amount of energy."

Nayar cites thinkers such as Malcolm Gladwell, and his 2000 *The Tipping Point*, and how people act as connectors, and spend considerable time discussing 'energy' and how to bring about the release of new energy laying dormant in the employees of the corporation.

Education

Nayer completed his BS in engineering from G.B. Pant University in 1983 and his MBA from XLRI, Jamshedpur in 1985. In 2005, he became president of HCL Technologies.

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θΔics

In thermodynamics, **violations of the second law** are supposed instances of exception to the universal applicability and governing rule of the second law of thermodynamics. The modern cogent view of supposed "violations" of the second law, as summarized by British physicist Brian Pippard (1957), is as follows: [13]

> "There is thus no justification for the view, often glibly repeated, that the **second law** of thermodynamics is only statistically true, in the sense that microscopic **violations** repeatedly occur, but never violations of any serious magnitude. On the contrary, no evidence has ever been presented that the second law breaks down under any circumstances."

To a good approximation, as soon as the second law was formulated, in circa 1860, and from there afterwards, there have been alleged or claimed proofs that the second law can be violated.

American mathematician turned Lyndon LaRouche economist Jonathan Tennenbaum's hilarious 1993 attempt at refuting the laws of thermodynamics, per some type of anti-cybernetics negentropy argument.

Perpetual motion

Any device, machine, or working entity that violates the second law is what is called perpetual motion of the second kind.

Overview

Opinions differ on the matter, but most agree that the second law of thermodynamics has never been violated (or shown to be false) and never will be violated; whereas a marginal number of others claim to find violations. Every experiment that has been conducted to disprove the validity of the second law or to show a violation of it has been unsuccessful. [1] The idea that violations could exist, however, remains a popular pastime; with over 100,000 Google search results, as of 2009, for the common search phrase "violation second law of thermodynamics". This popularity is likely related to the evolution/creationism debate. [2]

Maxwell

The earliest significant writings on the possibility that the second law might have loopholes seem to stem from Scottish physicist James Maxwell. As early as 1867, Maxwell had suggested to his associate Peter Tait that he should attempt to pick a hole in the second law of thermodynamics; a discussion that resulted in the now-famous Maxwell's demon. [3] Into the 1870s, Maxwell sought to prove that the second law may not be an absolute attribute of nature, but rather a result of incomplete and imperfect human perception; this effort may have been the result of his deep religious convictions, as a committed Evangelical, and a firm believer in the literal interpretation of the Bible, such as the story of Noah's flood, to which Maxwell would become very aroused if spoken of in disregard. [4] In 1878, Maxwell commented that: [5]

> "The truth of the **second law is** therefore a statistical, **not a mathematical**, **truth**, for it depends on the fact that the bodies we deal with consist of millions of molecules, and that we never can get a hold of single molecule."

A down fall in Maxwell's view is that single particle thermodynamics has been formulated; as well as sub-quantum thermodynamics, a term recently popularized by Gerhard Groessing (2008).

Maxwell, however, with his flawed demon argument, and noted entropy misinterpretation, for which he had to correct for in later editions of his *Theory of Heat*, may not have had a lucid understanding of the second law.

Poincaré recurrence theorem

See main: Poincaré recurrence theorem

In 1890, French mathematician Henri Poincaré, in his 1890 article "On the Three-body Problem and the Equations of Dynamics", building on the previous work of French mathematician Simeon Poisson, stated that:

> "It is proved that there are infinitely many ways of choosing the initial conditions such that the system will return infinitely many times as close as one wishes to its initial position … there are also an infinite number of solutions that do not have this property, but it is shown that these unstable solutions can be regarded as 'exceptional' and may be said to have zero probability."

Six years later, in 1896, German mathematician Ernst Zermelo, an assistant to Max Planck, pointed out what he viewed as the apparent incompatibility between Poincaré's recurrence theorem, Clausius' second law, and Boltzmann's H-theorem, in the sense that either the second law can be violated or connection to mechanical system cannot be made. Zermelo argued that the science of irreversible processes, thermodynamics, could not be reduced to mechanics, and reasoned that, for instance, German physicist Heinrich Hertz's mechanical derivation of the second law must be impossible.

Universe

In 1921, English biologist James Johnstone gave a four page so-called "proof" using a terse bit of derivation and arguments about particles colliding in a body of gas to argue that "a system can, of itself, decrease its entropy" causing a reversal of the second law, and form a hot and cold body divide, starting from an originally uniform temperature body. The entire proof is barely readable in logic, but seems to have been done in attempts to explain the past state or history of the universe, in opposition to heat death theory, an issue that was prevalent prior to the initiation of big bang theory (1927-1949). At the end of his proof, Johnstone concludes "as such [our universe] is a permanent universe, self-sufficient, without beginning and without end." [14]

Life

Prior to the 1940s, it was commonly asserted that life violates the second law in some way. To cite one example, in 1933 English physicist James Jeans reasoned that: [11]

> "In fact it would seem reasonable to define life as being characterized by a capacity for evading this law. If probably cannot evade the laws of atomic physics, which are believed to apply as much to the atoms of a brain as to the atoms of a brick, but it seems able to evade this statistical laws of probability."

In 1969, British developmental psychologist John Bowlby devoted the entire first chapter, entitled "Point of View", of his three-volume famous *Attachment* series, in efforts to discredit Austrian Sigmund Freud in his use of physics terms, such as energy, entropy, force, pressure, or inertia, as in "principle of inertia", etc., in psychology, and on the topic of the second law states: [12]

> "Nor is it to be supposed that the principle of entropy apples to living as it does to non-living systems."

To note although, in modern terms, one scoffs at this statement by Bowlby, many modern hard scientists have some some type of unwritten adherence to this.

No violations

The by far majority opinion, emerging after *circa* 1950, is that there are no violations of the second law. An example of this is found in the 1964 famous quote by Russian thermodynamicist Ivan Bazarov who states: [6]

> "The **second law** of thermodynamics is, without a doubt, one of the most perfect laws in physics. Any *reproducible* **violation** of it, however small, would bring the discoverer great riches as well as a trip to Stockholm. The world's energy problems would be solved at one stroke. It is not possible to find any other law (except, perhaps, for super selection rules such as charge conservation) for which a proposed violation would bring more skepticism than this one. Not even Maxwell's laws of electricity or Newton's law of gravitation are so sacrosanct, for each has measurable corrections coming from quantum effects or general relativity."

Likewise, in 2008 American physical chemist Robert Mortimer stated his view on the matter as such: [7]

> "No **violation** of either physical statement [Clausius or Kelvin statement] of the **second law** of thermodynamics has ever been observed in a properly done experiment … a machine that would violate the second law and turn heat completely into work in a cyclical process is called a perpetual motion machine of the second kind."

Yes violations

A converse 1988 view comes from British astrophysicist Stephen Hawking, who also cited Newton's law, albeit in support of a possible violation: [8]

> "The **second law** of thermodynamics has a different status than that of the other laws of science, such as Newton's law of gravity, for example, because it **does not always hold**, just in the vast majority of cases."

Other

This particular quote, which stems from contrived ideal gas probability arguments (statistical mechanics), related particularly to a mixture of discussions on Maxwell's demon (1867), Loschmidt's paradox (1876), and the Poincaré recurrence theorem (1890), has become a common launching point for novice thermodynamics researchers who would like to argue that the second law can be violated, and that it particularly does so for the case of evolution. Indian chemical engineer DMR Sekhar, for instance, was stimulated to develop his 2007 genopsych theory based on this quote. [9]

Other supposed "mathematical proofs" can be found at a yearly rate claiming to have found violations of the second law. These violation claims are usually resolved by pointing out the areas of illogic used in the proof or argument. [10]

The 2002 article "Experimental Demonstration of Violations of the Second Law of Thermodynamics for Small Systems and Short Time Scales", by a group of scientists from the Australian National University, involving a laser and the measure of entropy of tiny latex beads in water, according to American mathematician turned journalist Charles Seife, 'caused a minor ruckus'. [15]

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θΔics

In existographies, **Virgil** (70BC-19BC) (IQ:170|#321) (Cattell 1000:57) (RGM:79|1,260+) (Murray 4000:4|WL) was a Roman poet, student of Philodemus, noted for []

Influence

Francis Edgeworth is said to have had a photographic memory and could repeat numerous passages from Milton, Pope, Virgil, and Homer in his old age knew Greek, Latin, German, Italian, and Spanish. [2]

Quotes | On

The following are quotes on Virgil:

> "The Christmas tree is traced to the Roman Saturnalia. It is distinctly described by **Virgil** [c.30BC] with its suspended toys and images: 'the farmers of Ansonia, a Race sent forth from Troy, in uncouth verse and unchecked laughter play and put on hideous vizards wrought of hollowed bark, and sing thee, O Bacchus, with joyful hymns, and in thy honor hang from the tall pine waving masks to thee'."
>
> — Lewis Burdick (1912), "Primary Economical and Political Significance of Our Christmas Anniversary" [3]

> "**Virgil**, in his noble epic, had made its hero the son of a mortal and a goddess, Venus; the implications of this genealogy were a temptation Ovid could not resist."
>
> — Rolfe Humphries (1954), "Introduction" to *Metamorphosis* [1]

Quotes | By

The following are quotes by Virgil:

> "Happy is the man who has discovered the causes of things, and is thereby cured of all kind of fears, even of death itself, and all the noise and din of hell."
>
> — Virgil (29BC), *Georgics*; as rendered by Sunand Joshi (2014) [4]

> "Happy is he who is able to know the causes of things."
>
> — Virgil (29BC), *Georgics*; cited by Julien la Mettrie (1750) in "The System of Epicurus" [5]

See also

â— Virgil of Salzburg

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External links

â— Virgil – Wikipedia.

θΔics

In existographies, **Virgil of Salzburg** (c.700-784) (IQ:160|#490), “Feirghill” or “Fergal” (Irish), Virgilius (Latin), or “St. Virgil of Salzburg”, was as Irish abbot or bishop, of St. Peter’s Monastery in Salzburg, noted for []

Influence

Virgil was an inspiration to Johannes Kepler. [1]

Antipodes | Controversy

In 322BC, Aristotle introduced the term “antipode” as the point opposite one’s location on a round earth; the round earth view professed by those including Pythagoras and Eratosthenes. Lucretius, of note, supposedly, rejected the spherical earth model, per reason that he considered the idea of antipodes absurd. Macrobius wrote about a round earth and antipodes. Bede wrote about a round earth.

In 400AD, Augustine objected to the antipodes concepts as follows:

> “As to the fable that there are antipodes, that is to say, men on the opposite side of the earth, where the sun rises when it sets to us, men who walk with their feet opposite ours, that is on no ground credible. And, indeed, it is not affirmed that this has been learned by historical knowledge, but by scientific conjecture, on the ground that the earth is suspended within the concavity of the sky, and that it has as much room on the one side of it as on the other: hence they say that the part which is beneath must also be inhabited. But they do not remark that, although it be supposed or scientifically demonstrated that the world is of a round and spherical form, yet it does not follow that the other side of the earth is bare of water; nor even, though it be bare, does it immediately follow that it is peopled. It is too absurd to say, that some men might have taken ship and traversed the whole wide ocean, and crossed from this side of the world to the other, and that thus even the inhabitants of that distant region are descended from that one first man.”

The gist of the objection, from a theological point of view, is that these other antipodal people would not be descendants of Adam and Eve, and therefore not saved by Christ, or something to this affect. [1]

In 748, or shortly therebefore, Virgil was teaching that “there was another world and other men beneath the earth”, during which time Pope Zachary authorized bishop Boniface to excommunicate Virgil for teaching this anti-religious antipode view. [1]

Quotes | On

The following are quotes on Virgil:

> “As for the antipodes, the Church Fathers, including Chrysostome, Jerome, Augustine, Theodoretus, Theophilactus, Lactantius, likewise Bede and several others, were unwilling to grant their existence, but contended that this belief was not only contrary to the Holy Scriptures, but also human reason. For just as a house cannot stand without a foundation and a roof, so of necessity, they held, the earth must stand on an immovable foundation and have the sky as a roof. For this reason, they label those who assert that there are antipodes as stupid men who have been deluded by groundless error: in fact, they have condemned them as heretics. We have as an example. **Virgilius, Bishop of Salzburg**, who in 745 AD or thereabouts, was charged with heresy by Bonifacius, Archbishop of Mainz, for no other reason than that he held there were antipodes. Now when this information was transmitted to the King of the Bohemians and thence an appeal was directed to Pope Zaharias, Virgilius was condemned because of his "heretical antipodes", for the very reason that these "absurd, ill-founded deductions" were not considered to be in accord with the Holy Scriptures.”

— Otto Guericke (1672), *New Magdeburg Experiments on the Vacuum of Space* (pg. 4)

"**Virgil, the bishop of Saltzburg**, was condemned by the church, for having dared to maintain the existence of the antipodes. All the world is acquainted with the persecutions which Galileo suffered for pretending that the sun did not make its revolution round the earth. Descartes was put to death in a foreign land."

— Baron d'Holbach (1770), *The System of Nature* (pg. 284)

"**Virgilius** was condemned to be burned for asserting the antipodes, or in other words, that the earth was a globe."

— Thomas Paine (1794), *The Age of Reason* [2]

See also

â— Virgil (70-19BC) | Roman poet

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External links

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θΔics

In religio-mythology, **virgin birth** is the Christian (aka Roman recension) monotheistic rewrite, i.e. Jesus born of the Virgin Mary via the sexual power of the Holy Spirit, of the polytheistic story of the magical "resurrection sex" (see: black rite) act conception (aka immaculate conception) of the Egyptian man-god Horus, via the embrace of the mummified Osiris (see: death and resurrection of Osiris), brought back to life, for a moment in time (specifically when Thoth stops time), then becomes erect, namely has an artificial phallus, specifically the thumb of Isis, affixed to his body (as his real phallus was cut off and forever lost in the Nile River, i.e. eating by a fish, as legend has it), then unites sexually with the goddess Isis, who hovers over Osiris in the form of a kite (or goddess as bird), therein taking the divine magical sperm of Osiris, and making Horus.

Osiris Ḥemka begetting a son by Isis, who hovers over him in the form of a hawk. Anubis, Horus, Nephthys and Shentit are present.

A basic depiction, as found on the walls of the Dendera Temple (37AD), of the magical "black rite" resurrection sex act of the conception of Horus (aka Jesus) by the union of Isis (aka Virgin Mary), in the form of a kite, hovering above Osiris (aka god the father), who is magically brought back to life, after being dead for three days, long enough for him to impregnate Isis, before going to the afterlife, to be the judge god of the dead. [1] In circa 600 to 800AD, this mythical story was decreed, in a new Christian monotheistic guise, to be a "**virgin birth**".

Overview

In c.2000BC, in Spell 148 of the Coffin Texts, the magical "virgin birth" of Horus in the womb of the goddess Isis who waked pregnant with the seed of her departed husband god Osiris is described as follows:

> "Isis [Mary], taking the shape as a falcon. The lightening-flash strikes [see: black rite] and the gods are afraid. **Isis wakes pregnant with the seed of her [deceased] brother [husband] Osiris** [Holy Spirit]. She is uplifted, **even she the widow [of the dead Osiris]**, and her heart are glad with the seed of her brother Osiris. She says: 'Oh gods! I am Isis the sister of Osiris who wept for the father of the gods, Osiris, who settled the slaughterings of the Two Lands [Upper Nile and Lower Nile]. **His seed is within my body**, and it is as the son of the foremost of the Ennead who will rule this land and who will become heir to Geb [Joseph] and who will speak for his father and who will slays Seth [Satan], the enemy of his father Osiris, that I have molded the shape of the **god [Horus]** within (my) egg. Come, Oh gods, so that you shall make his protection within my womb. Know in your hearts that **your lord is he**, this god, who is in his egg, blue(?) of form, the lord of the gods. Great is their beauty, namely (that of) the blue barbs(?) of the two plumes'."
>
> — Anon (c.2000BC), Coffin Texts spell 148 [4]

Over the next two millennia, this Egyptian "virgin birth" story, as taught in the post Roman recension era, deriving the Passion of Osiris, wherein the god Osiris was betrayed by his brother Set, during their "last supper", then chopped into 14 pieces (half the lunar period or number of stars of Orion constellation), and scattered around the land of Egypt, became the story of the Roman "virgin birth" of Jesus in the womb of Mary by the seed of the "holy spirit". Later the goddess Isis, the lover of Osiris, re-collected all the pieces, put them back together into the form of a mummy, summoned the moon god Thoth to stop time, and at that moment, in a ceremony called the "black rite", hovered over the body of Osiris, in the form of a kite (bird), and got him to come back to life, long enough to make an erection and conceive the god son Horus, albeit the sex being done, supposedly, without any physical contact, spiritually so to say, depicted as follows:

The early Roman recension era Egyptian-Christian theologians rescripted this polytheistic sexual resurrection procreation story, via god reduction, into the the monotheistic or trinity based idea of the virgin birth; the gist of which is summarized below:

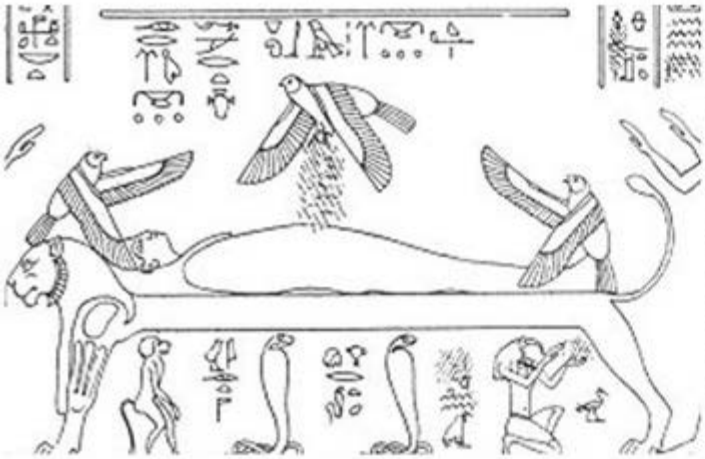

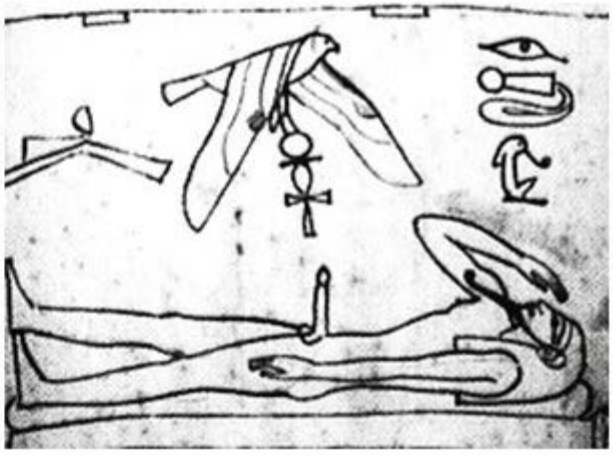

Examples of the **virgin birth** of Horus, showing the spiritual nature of the act, at left, and the "ankh" or symbol of life, making the baby, at right.

> “Several of the ancient religions believed in a trinity. India’s was composed of three gods, the Creator [Brahma], the Preserver [Vishnu], the Destroyer [Shiva]. Egypt's trinity was composed of Osiris, Isis and Horus. Isis **without the touch of man** [she hovered above Osiris in the form of a bird] brought forth Horus, and then married Osiris. The three were one god, and in connection with eight others composed an ennead or assemblage of nine, into many of which assemblages the Egyptians had to distribute their too numerous deities. Alexandria, the capital of Egypt, was a city founded by Alexander the Great in the year BC 322; it became at one time a vast school of religion and philosophy, but its population was addicted to piracy in the century before Christ, and their ships dominated the Mediterranean till the Romans destroyed them and captured their city. The idea of making Jesus and the Holy Ghost gods seems to have originated in Egypt. Says Milman (1840): "The Arians and Athanasians first divided the world on a pure question of faith." These parties took their names from Arius and Athanasius (Ñº), two Egyptian priests. Athanasius was an Alexandrian and the leader of the trinitarians; Arius would not accept the views of Athanasius, and the controversy reached a stage which seemed to threaten bloodshed.”

— John Pherson (1896), “A Chapter in the History of Christian History” [3]

This is shown in the following visual:

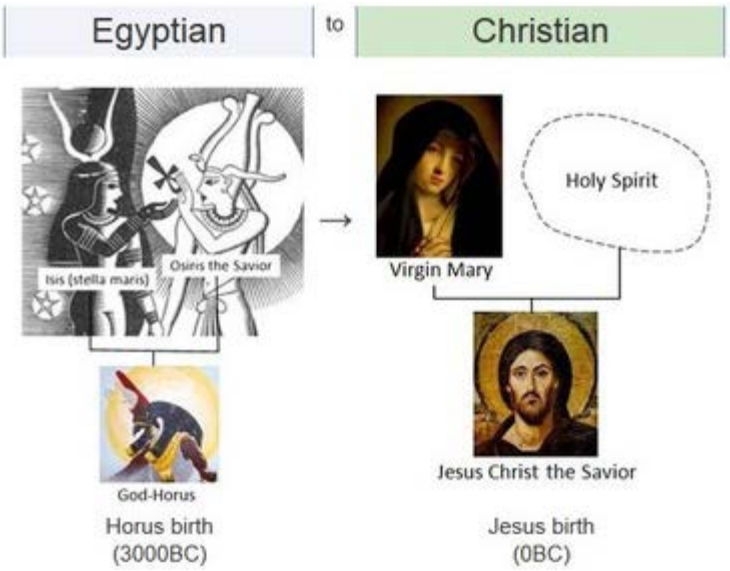

The following shows the magical act of the virgin birth (see: Death and Resurrection of Osiris) carved in stone on the walls of the Dendera Temple (37AD):

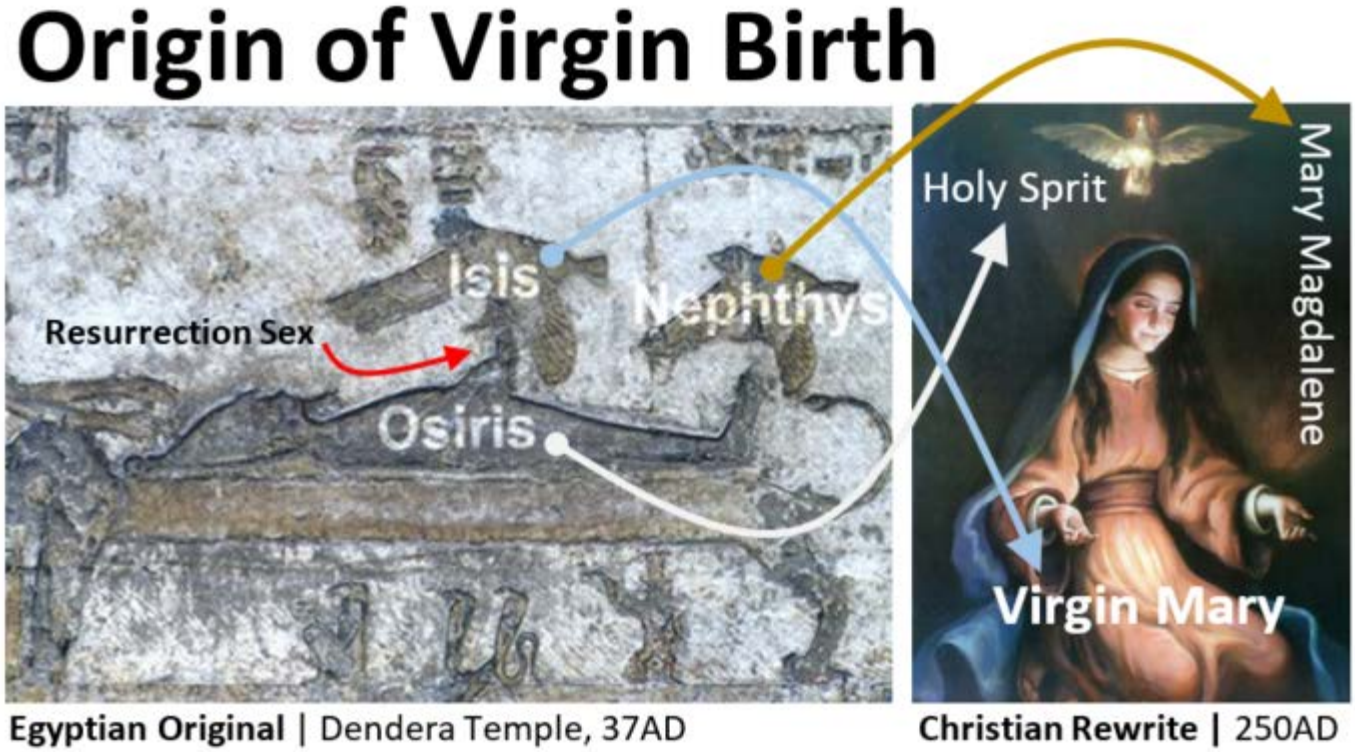

The details of how the character switch from Isis to Virgin Mary, Osiris to Holy Spirit, Horus to Jesus, Nephthys to Mary Magdalene occurred is detailed in the Roman recension, in the context of larger recension theory.

Quotes

The following are related quotes:

> "If our Christ-cultists say that their Jesus Christ was **born miraculously from a virgin** who had known no men, likewise the pagans had already said that Romulus and Remus, the founders of Rome, were miraculously born of a vestal virgin named Ilia, Sylvia, or Rhea Sylvia. They had already said that Mars, Vulcan, Argus, and others were born of Juno, who had no knowledge of men."
>
> — Jean Meslier (1729), *The Testament* (pg. 129)

> "When also I am told that a woman, called the Virgin Mary (see: Isis), said, or gave out, that she was with child **without any cohabitation** with a man, and that her betrothed husband, Joseph (see: god Geb), said that an angel told him so, I have a right to believe them or not."
>
> — Thomas Paine (1794), *The Age of Reason* (pg. 24); cited by Jennifer Hecht (2003) in *Doubt: a History* (pg. 356)

> "And the day will come when the mystical generation of Jesus, by the supreme being as his father in the **womb of a virgin** will be **classed with the fable** of the generation of Minerva in the brain of Jupiter."
>
> — Thomas Jefferson (1823), "Letter to John Adams", Apr 11 (Ñº); note: Thomas Paine (1794) stayed with Jefferson in 1802

> "I believe that every human being has two human parents; but the Catholics believe that Jesus only had a human mother. And other people might believe that there are human beings with no parents, and give no credence to all the contrary evidence."
>
> — Ludwig Wittgenstein (c.1950), *On Certainty* [2]

> "Some people draw unwarranted conclusions from the fact that I never say more about the blessed Virgin Mary that is involved in asserting the **'virgin birth'** of Christ. But surely the reason for doing so would be obvious? To say more would take me at once into **highly controversial** regions. And there is no controversy between Christians which needs to be so delicately touched as this."
>
> — C.S. Lewis (1952), "Preface" to *Mere Christianity*, based on three 1942-44 wartime radio talks

> "I think it was David Hume who put is slightly vulgarly—about the **virgin birth**—which is more likely: that the whole of natural order is suspended or that a Jewish mink [?] should tell a lie?"
>
> — Christopher Hitchens (c.2007) (Ñº|1:31-)

> "That the Virgin Mary **was a virgin** [didn't make sense]."
>
> — Aaron (2015), age: 9-10, Jul 27

“How **can a “virgin”** Mary give birth?”

— Anthony (2015), 3rd grade, Jul 27

“I began to reject all religion as nonsense at age 5; specifically the **virgin birth** as nonsense at age 13.”

— Bill (2015), Jul 31

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1. (a) Mariette, Auguste. (1873). *Dendera* (*Denderah*), *Volume Four* (pg. 90). Paris: Publisher.
(b) Budge, Wallis. (1911). *Osiris and the Egyptian Resurrection, Volume Two* (pg. 42). P.L. Warner.
2. (a) On Certainty – Wikipedia.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 456). HarperOne.
3. (a) Milman, Henry H. (1840). *The History of Christianity*. Publisher.
(b) Pherson, John D. (1896). “A Chapter in the History of Christian History” (pg. 745), *The Free Thought Magazine*, 14:737-.
4. (a) Faulkner, Raymond. (1968). “Translation of Spell 148 of the Coffin Texts”, *The Journal of Egyptian Archeology*, 54:40-44.
(b) Gilula, Mordechai. (1971). “Coffin Texts Spell 148” (Ñº), *The Journal of Egyptian Archaeology*, 57:14-19, Aug.
(c) Luckhert, Karl. (1991). *Egyptian Light and Hebrew Fire: Theological and Philosophical Roots of Christendom in Evolutionary Perspective* (pg. 92). SUNY Press.

In religio-mythology, **Virgin Mary** is a Roman era (c.100-400 ACM) monotheistic rescript (see: god character rescripts) of the Egyptian goddess Isis, aka “Stella Maris” or star of the sea, who conceived her son Horus during an act of resurrection sex (see: Virgin Birth) with the god Osiris during what is called the black rite.

Quotes

The following are related quotes

> “Virgin births have been traditionally attributed as representing the constellation of Virgo, thought to be derived from the fact that the ancient glyph for Virgo is the altered "m" or “m̩”. This is why **Mary** along with other **virgin mothers** from religious mythology, such as Adonis's mother Myrrha and Buddha's mother Maya begin with an M.”
>
> — Ian Sawyer (2016), “Is the story of Jesus based on the Egyptian god Horus?” [1]

References

1. Sawyer, Ian. (2016). “Is the story of Jesus based on the Egyptian god Horus?” (Q), Quora, Jul 10.

Further reading

● Jordan, Michael. (2001). *The Historical Mary: Revealing the Pagan Identity of the Virgin Mother*. Seastone.

External links

● Mary, mother of Jesus – Wikipedia.

θΔics

In existographies, **Virginia Woolf** (1882-1941) (IQ:160|#515) [RGM:186|1,400+] (WorldCat 100:23) (Bloom 100:44) (FA:112) was an English writer, noted for []

Atheism | Religion

Woolf has been characterized a "mystical atheist" (Q); in her private letters she stated that they thought of herself as an atheist. [3]

Quotes | On

The following are quotes on Woolf:

> "The names of individuals who surrendered their belief in a universe governed by a supernatural being include: Percy Shelley, Charles Darwin, Karl Marx, Sigmund Freud, **Virginia Woolf**, Albert Camus, Simone Beauvoir, Salmon Rushdie, and Marquis Sade. Others who choose to live without religion—Ernestine Rose and Charles Bradlaugh are examples—should be better known, given their historical import and former notoriety."
>
> — Mitchell Stephens (2014), *Imagine There's No Heaven* [1]

Quotes | By

The following are quotes by Woolf:

> "I have had a most shameful and distressing interview with dear Tom Eliot, who may be called dead to us all from this day forward. He has become an Anglo-Catholic believer in god and immortality, and goes to church. I was shocked. A corpse would seem to me more credible than he is. I mean, there's something obscene in a living person sitting by the fire and believing in god."
>
> — Virginia Woolf (1928), "Letter to T.S. Eliot" [2]

> "From this I reach what might be called a philosophy; at any rate it is a constant idea of mine; that behind the cotton wool is hidden a pattern; that we — I mean all human beings — are connected with this; that the whole world is a work of art; that we are parts of the work of art. Hamlet or a Beethoven quartet is the truth about this vast mass that we call the world. But there is no Shakespeare, there is no Beethoven; certainly and emphatically **there is no god**; we are the words; we are the music; we are the thing itself."
>
> — Virginia Woolf (c.1925), *Moments of Being* [2]

> "A sight, an emotion, creates this 'wave in the mind', long before it makes words to fit it."
>
> — Virginia Woolf (c.1925) (Q)(Q)

References

1. Stephens, Mitchell. (2014). *Imagine There's No Heaven: How Atheism Helped Shape the Modern World* (pg. 2). St. Martin's Press.
2. Virginia Woolf – CelebrityAtheists.com.
3. Streufert, Mary J. (1988). *Measures of Reality: the Religious Life of Virginia Woolf* (Q). MA thesis. Oregon State University.

External links

- Virginia Woolf – Wikipedia.

θΔics

In hmolscience, **virtutibus mundanis**, or "virtutes mundanae", variously translated as "cosmic forces"; a term employed by Otto Guericke (1663) in his system of the universe, being a precursor, supposedly (Conlon, 2011), to the later centuries concept of "forces of nature". [1]

Quotes

The following are related quotes:

> "As far as **my treatise** [*New Magdeburg Experiments*], it is divided into eight books. The first is entitled 'About the Cosmos and its Organization According to the More Commonly Received Opinion among Philosophers'; the second is 'Concerning my own Experiments'; the third, 'About What is and What is Not' (this particularly demonstrates that space is infinites and immeasurable); the fourth, 'Concerning the **virtutibus mundanis** [potencies operating] in the Cosmos, and Other Associated Topics'; the fifth, 'concerning the Earth of Land and Sea and its Associate Moon'; the sixth, 'Concerning the World of the Planets and their True Organization'; the seventh, 'Concerning the Fixed Stars'; and the eight, 'Concerning What is at the Limits of the Cosmos'."
>
> — Otto Guericke (1661), "Letter to Gaspar Schott", Nov 16 [1]

> "There are different minerals that, poured together with sulphur into a ball about the size of two fats, allow a usual demonstration of what I have named 'mundane virtues' (***virtutes mundanae***). Tycho Brahe writes that he would very much like to support Copernicus, if only the earth were not such a heavy body. My experiments show the contrary is true — the earth is not as heavy as the lightest feather. Likewise, Galileo in his treatise thinks that one cannot grasp the reason why the moon follows the earth and always presents the same fade towards it. I show with the same spherical ball that this happens through particular forces of nature. When the ball is first rubbed, e.g., somewhat by hand and then a light feather is held close to it, the ball first attracts the feather to itself, but then soon repels it as far as the range of its force (orbis virtutis) allows. Then, wherever the ball goes the feather goes too, hovering in the air, so that one can bring it to any desired point even up to someone's nose. It always presents the same side to the spherical ball, so that, by means of this ball, once can turn it in the air, as one pleases. Likewise, many other remarkable things can be demonstrated using this ball."
>
> — Otto Guericke (c.1672), "Letter to Gottfried Leibniz"; cited by Thomas Conlon (2011) in *Thinking About Nothing* (pgs. 84-85)

> "It is plain from the above quotation, that Cabeus did not recognize repulsion as a true property of electrification. Nor was it so recognized by others until the publication by Otto Guericke of his paper 'De **Virtutibus Mundanis**' in 1672. Von Guericke recognized what he regarded as a true repulsion of his electrified sulphur globe for light bodies in its vicinity, but his explanation of the phenomenon was rather metaphysical than physical."
>
> — Fernando Sanford (1921), "Some Early Theories Regarding Electrical Forces" [2]

References

1. (a) Schott, Gaspar. (1664). *Technical Curiosities, Volume One* (§: Book One: Magdeburg Miracle – Five Magdeburg Pneumatical Experiments Exhibited, pgs. 1-86; book, pg. 36) (*Technica Curiosa, Volume One* [§: Liber Primus: Mirabilia Magdeburgica, Five Experimenta Pnevmatica Magdeburgi Exhibita, pgs. 1-]). Publisher.
(b) Conlon, Thomas. (2011). *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum* (Amz) (pg. 76). Saint Austin Press/LuLu.

2. Sanford, Fernando. (1921). “Some Early Theories Regarding Electrical Forces: the Electrical Emanation Theory” (pg. 546), *The Scientific Monthly*, 12:544-.

Further reading

â— Guericke, Otto. (1672). “A General Discussion of Mundane Virtues” (abs), *The New Magdeburg Experiments on the Vacuum of Space* (ps. 193-95). Publisher.
â— Conlon, Thomas. (2011). *Thinking About Nothing: Otto von Guericke and the Magdeburg Experiments on the Vacuum* (Amz) (pg. 76; discussion, pg. 84). Saint Austin Press/LuLu.

θΔics

In classifications, **virus**, from the Latin *contagium* "contagious" + *vivum* "that which is alive", is organism or molecular agent, ten times smaller than a bacteria cell, which carries out reproduction via host cell carrier RNA (or DNA) injection.

Left: an image (Q) of a T4 **virus**, which reproduces via injection of its DNA, through floating insect stinger-like mechanism, into host bacteria cells, which is destroyed in the process, an organism about which Charles Sherrington in 1937, stated we "hesitate whether or not to call it 'living'." [3] Right: news coverage of recent 2013 study, led by Andrew Camilli, which finds that bacteriophages have types of host-stolen adaptive immune systems, about which he says "lends credence to the controversial idea that viruses are living creatures." [4]

Debate

In debates about "life", the virus is often found at center stage, in that being many times smaller than a cell it is often defined purely as a molecule (see: virus molecule), crystal, and or a non-living thing as compared to a living thing, because it seemingly has a reproductive cycle and possible Darwinian conceptualized struggle to survive.

In 1918, R.W. Glaser, as cited by Alfred Lotka (1925) in his "Regarding Definitions", stated the following: [7]

> "We are justified at present in not classifying viruses either with plants or animals."

In 1935, American bio-chemist (powered chnops+ system chemist) Wendell Stanley isolated the tobacco mosaic virus, in needlelike crystal form, estimated its molecular weight, and showed that when rubbed on the tobacco plant leaves it produced the tobacco mosaic disease (first described by Adolf Mayer in 1886). [6] Stanley's work appeared in *Science* that year and soon made the front page of *New York Times*, for its sensational aspect that it was the missing link between the living and nonliving. [1] In 1937, Barclay Newman commented on the state of the situation as follows: [2]

> "It has astonished the scientific world that a single molecule can be the causative organism of a disease. How can a crystal be made up of living molecules?"

Indeed, here we are confronted with an absurdity—and "absurdities", as history has shown, often tend toward or lead to revolution of intellectual thought. That inert crystals have "life" or "mind" imbibed molecules inside of them is something that that doesn't make sense or one that leads to a panbioism philosophy. Stanley's findings, in short, showed that a virus was a "giant chemical molecule". [1] With its apparent ability to move about, invade, infect, and reproduce, etc., these "life-like" qualities immediately led into questions about the nature of what defines "life".

In 1938, English physiologist and life theory debunker (see: defunct theory of life) par excellence Charles Sherrington, in his *Man on His Nature* University of Edinburgh Gifford Lectures, was the first to quickly rip into this is a virus alive issue: [5]

> "Perhaps the most striking feature of [life defined as a self-balanced energy system] is that it acts as though it 'desired' to maintain itself. But we do not say of the spinning of a heavy top which resists being upset

that it 'desires' to go on spinning. The very constitution of the living system may compel it to increase; thus a self-fermenting protein system, granted its conditions, *must* increase. The behavior of a living body is an example of this, and we call it 'living'. The behavior of the atom is an example of this and we *do not* call it 'living'. The behavior of those newly discovered so-called **'viruses'** is an example of this and there is hesitation whether or not to call it 'living'."

In 1991, Akhteruzzaman Molla, Aniko Paul, and Eckard Wimmer, in their "Cell-free, de novo Synthesis of Poliovirus", calculated the following empirical formula for poliovirus: [8]

$C_{332,652}H_{492,388}N_{98,245}O_{131,196}P_{7,501}S_{2,340}$

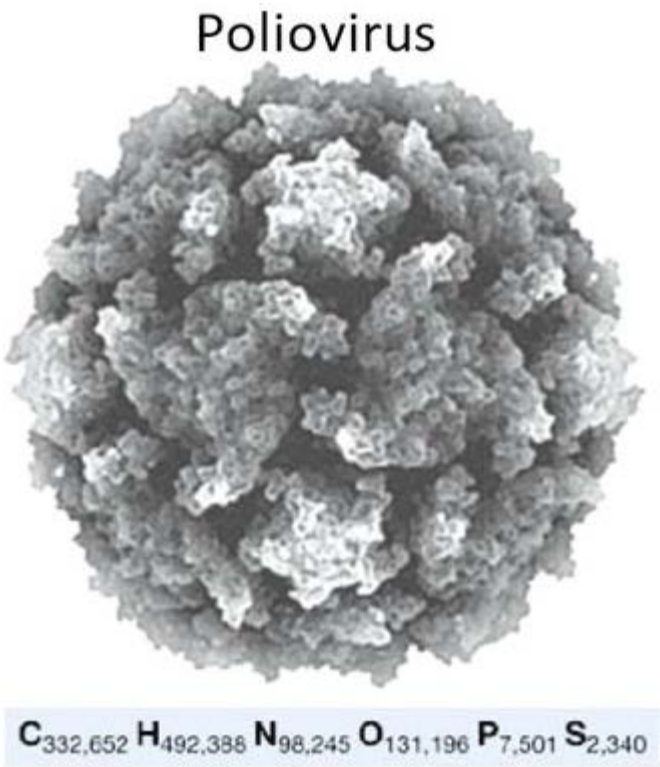

In 2002, Molla, and associates, synthesized poliovirus in a test tube, which created somewhat of a media frenzy; Wimmer (2006) retrospectively summarizes this event as follows:

> "In July 2002, newspapers across the globe reported that scientists had created a **virus** in a test tube. This unexpected news struck a raw nerve among lay people and scientists alike. The work was condemned as dangerous and irresponsible, scorned as a stunt and perceived as a challenge to divine power. It was also hailed as a milestone in biology. What really happened? The empirical formula of poliovirus (Molla et al, 1991) is $C_{332,652}H_{492,388}N_{98,245}O_{131,196}P_{7,501}S_{2,340}$. Because poliovirus is a quasi-species (Wimmer et al, 1993), the number of atoms in viral particles represents an average from a large population of different viruses. There might be little practical use in describing poliovirus by its empirical formula, but it persuasively portrays the virus as a **chemical**. Placing the atoms in order, a particle of high symmetry emerges (Hogle et al, 1985), with all the properties required for its proliferation and survival in nature. These properties are encoded in the viral genome, a single-stranded RNA molecule of about 7,500 nucleotides (Kitamura et al, 1981)."
>
> — Akhteruzzaman Molla (2002), "Cell-free, de novo Synthesis of Poliovirus" [8]

(add)

References

1. James, Laylin K. (1993). *Nobel Laureates 1901-1992* (pg. 302). Chemical Heritage Foundation.
2. Creager, Angela N.H. (2002). *The Life of a Virus: Tobacco Mosaic Virus as an Experimental Model, 1930-1965* (§:Crystals at the "Threshold of Life", pgs. 47-78). University of Chicago Press.
3. Enterobacteria phage T4 – Wikipedia.
4. Gallagher, Siobhan. (2013). "New Study Shows Viruses Can Have Immune Systems: a Pirate Phage Commandeers the Immune System of Bacteria" (Q), TuftsNow, Dec 07.
5. Sherrington, Charles. (1938). *Man on His Nature* (desires, pgs. 75, 260). Cambridge University Press, 1950.
6. Wendell Meredith Stanley – Wikipedia.
7. (a) Glaser, R.W. (1918). "The polyhedral virus of insects with a theoretical consideration of filterable viruses generally", *Science*, 48:301-02.

(b) Lotka, Alfred J. (1925). *Elements of Physical Biology* (republished (Q) as: *Elements of Mathematical Biology*, which includes: corrections from Lotka's notes and a completed list of his publications) (pdf) (Q) (txt) (pgs. 6). Dover, 1956.
8. (a) Molla, Akhteruzzaman, Paul, Aniko V., and Wimmer, Eckard (1991). "Cell-free, de novo Synthesis of Poliovirus" (Q), *Science*, 254(5038):1647-51, Dec 13.
(b) Wimmer, Eckard. (2006). "The Test-tube Synthesis of a Chemical called Poliovirus: the Simple Synthesis of a Virus has Far-Reaching Societal Implications" (Q), *EMBO Reports*, 7:S3-S9, Jul.
9. Wimmer, Eckard. (2006). "The Test-tube Synthesis of a Chemical called Poliovirus: the Simple Synthesis of a Virus has Far-Reaching Societal Implications" (Q), *EMBO Reports*, 7:S3-S9, Jul.

External links

- Virus – Wikipedia.

θΔics

In hmolscience, **virus molecule**, as contrasted with the virus particle, is the modeling of a virus, not as a living organism or *contagium vivum fluidum* (soluble living germ), that reproduces (by transferring RNA to a host), but rather as a large or giant molecule.

In 1941, *Life* magazine stated the following about the virus: [8]

> "The viruses are a strange order of substance that bridge and obscure the once sharply defined boundary between the living cell and the non-living chemical molecule."

(add)

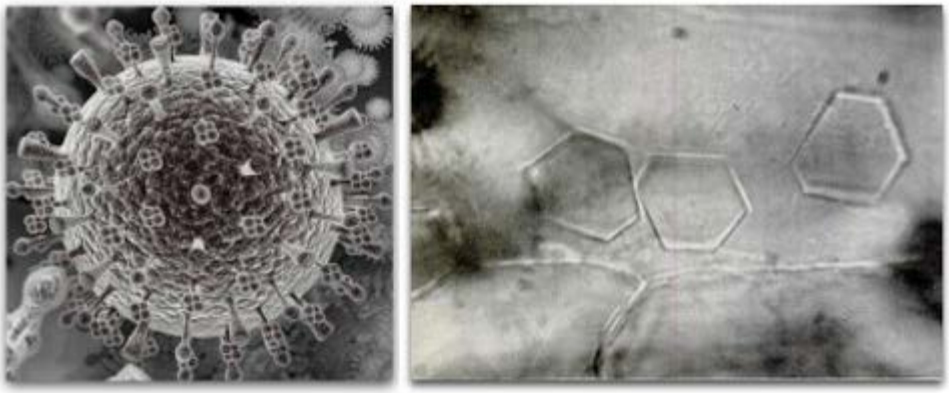

Left: The avian flu virus, depiction of a **virus molecule**, with an approximate molecular formula of: $C_{E3}H_{E3}O_{E4}N_{E4}P_{E2}S_{E2}Ca_{50}K_{50}$, can be viewed as a bound state of thousands of atoms (as particle) or as a giant molecule. Right: a 1941 photo of the hexagonal crystalline structure of the tobacco mosaic virus (discovered in 1933) in its active state inside of a so-called living plant cell. [8] This thereafter blurred the older animal/plant/mineral division of matter. [9] In particular are crystals alive or not? This was a deep question grappled with by those including: Gilbert Lewis (1925), Francis Crick (1966), and Linus Pauling (1969).

History

In 1892, Russian biologist Dmitry Ivanovsky used a Chamberland filter (bacteria filter) to study crushed leaf extracts from infected tobacco plants, concluding that a toxin, smaller than bacteria, might be the cause of the infection. In 1898, Dutch microbiologist Martinus Beijerinck repeated the experiments and became convinced that a new form of infectious agent, which he called *contagium vivum fluidum* or "soluble living germ", remained in the solution. The term *vivum*, of course, is Latin for "that which is alive", as in vis viva (living force) or vitalism (life force principle); which is synonymous with *bio* which is Greek for "life".

Virus: liquid, particle, molecule, or organism?

Beijerinck maintained that viruses were liquid in nature; but this "living liquid theory" was later discredited by American biochemist Wendell Stanley (1904-1971), who proved they were particulate. [1] In his 1961 book *Viruses and the Nature of Life*, however, Wendell devoted chapters to his vacillating views on whether to consider the virus as a particle, molecule, or living organism. [2]

Is a virus alive?

See main: Are viruses alive?; Defunct theory of life

In 1935, American bio-chemist (chnops-chemist) Wendell Stanley isolated the tobacco mosaic virus, in needlelike crystal form, estimated its molecular weight, and showed that when rubbed on the tobacco plant leaves it produced the tobacco mosaic disease (first described by Adolf Mayer in 1886). Stanley's work appeared in *Science* in 1935 and soon made the front page of *New York Times*, for its sensational aspect that it was the missing link between the living and nonliving. [11]

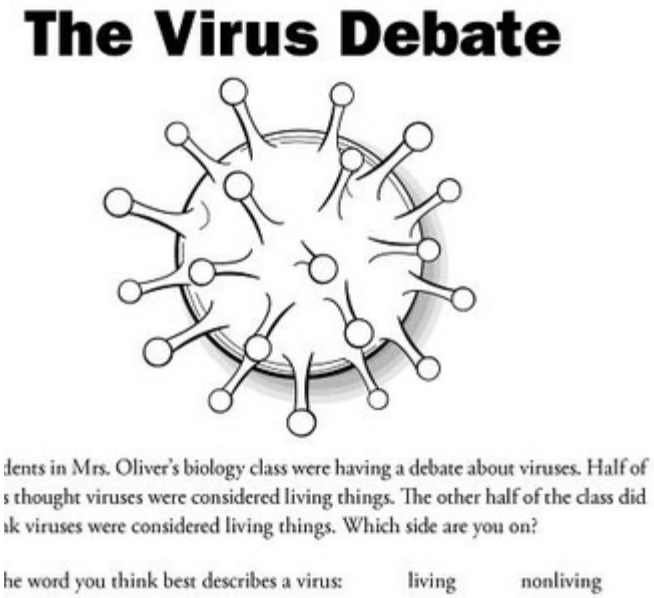

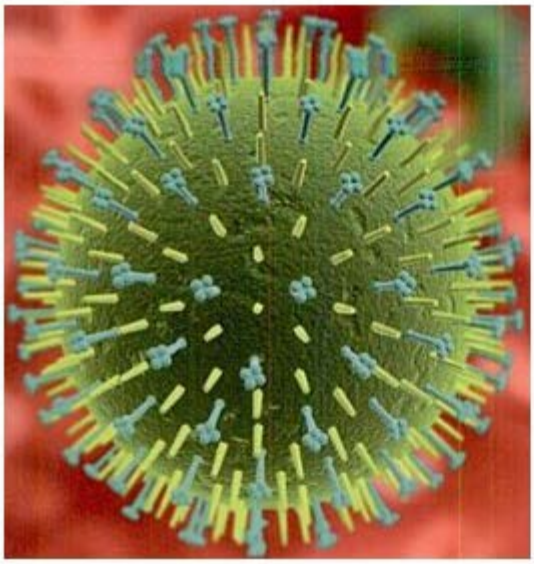

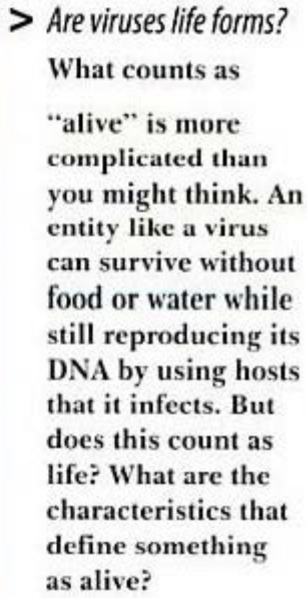

2011 elementary school science class classroom study aid designed to facilitate debate and discussion on the question as to whether a **virus** is alive l. [10] Right: American debater Kate Shuster's "what is life?" section, from her 2008 book *Is There Other Life in the Universe?*, which uses the "is a live" query in attempts to resolve the puzzle. [6]

In 1937, Barclay Newman commented on the state of the situation as follows: [12]

> "It has astonished the scientific world that a single molecule can be the causative organism of a disease. How can a crystal be made up of living molecules?"

In short, Stanley's findings showed that a virus was a "giant chemical molecule". [11] With its apparent ability to move about, invade, infect, and reproduce, etc., these "life-like" qualities immediately led into questions about the nature of what defines "life".

In 1969, Linus Pauling, in his classic 1969 *General Chemistry*, devoted the opening sections of his biochemistry chapter to debate the question of whether or not to consider the virus, which he characterized as "the simplest kind of matter thought to be alive", as correctly: (a) living organism, (b) giant particle, or (c) giant molecule (with a molecular weight of 10,000,000), a query to which, in the end, he remained indecisive about. [3]

In 1972, American geneticist Lila Gatlin, in her *Information Theory and the Living System*, attempted to redefine life as a "system that both stores and processes the information necessary for its own existence", and based on this redefinition argued that under this definition the "virus would not be regarded as being alive since it can only store but not process information." [7]

The query "is a virus alive", in modern times, is a common chapter section in most microbiology textbooks, where, just as with Pauling, indecisiveness reigns. [4]

The following, for example, is a summary of Luis Villarreal's 2004 *Scientific American* article "Are Viruses Alive?", in which he takes refuge in the emergence viewpoint, that "life is an emergent property of nonliving things" that appears at some "critical level of complexity or interaction", which of course is slippery code for a non-answer to the question: [5]

> "Another way to think about life is as an emergent property of a collection of certain nonliving things. Both life and consciousness are examples of emergent complex systems. They each require a critical level of complexity or interaction to achieve their respective states. A neuron by itself, or even in a network of nerves, is not conscious-whole brain complexity needed. Yet even an intact human brain can be biologically alive by incapable of consciousness, or 'brain-dead'. Similarly, neither cellular nor viral individual genes or

proteins are by themselves alive. The enucleated cell is akin to the state of being brain dead, in that it lacks a full critical complexity. A virus, too, fails to reach a critical state, but it is made from the same fundamental, physical building blocks that constitute a virus. Approached from this perspective, viruses, though not fully alive, may be thought of as being more than inert matter: they are on the verge of life."

(add)

See also

â— Evolution timeline

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External links

â— Virus – Wikipedia.

What is life?

Since the beginning of time, something has plagued humanity and all living things. It can exist on its own without eating, drinking, or sleeping for very long periods of time. It doesn't breathe, or grow, or move. But it can kill you. It sounds like an imaginary creature in a science fiction movie, doesn't it? This thing is the most common form of genetic material on the planet. It is one of the simplest and oldest types of thing on Earth, and we're not even sure if it's alive or not. This thing is a **virus**, simply composed of a single piece of genetic material in a wrapper of protein. Viruses remain "dormant," or inactive, for long periods of time. When a virus comes into contact with a host creature, it becomes active and uses the host to reproduce its **genetic** material. Is this virus alive? It depends on what we mean by "life."

θΔics

In physics, ***vis mortua*** refers to "dead force", in contrast to *vis viva* or "living force". The term was introduced by German mathematician Gottfried Leibniz in *circa* 1686. Leibniz distinguished active force into *vis mortua*, associated with the tendency of bodies to begin motion, as in a stretched spring that begins to recoil, and *vis viva*, associated with actual motion. His introduction of the term, and newly forming calculus behind its quantification, to note, seems rather elusive. He states, for instance, vis viva arises “from an infinite number of continuous impressions” of vis mortua. [1]

In the 1730s, Daniel Bernoulli defined vis mortua as the force “which a body not in motion receives when solicited or pressed towards motion.”

English mathematician Charles Hutton defined vis mortua in 1815 as “any kind of pressure, or an endeavor to move, not sufficient to produce actual motion, unless its action on a body be continued for some time. [2]

Vis mortua seems to be a precursor to potential energy.

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External links

â— Vis mortua – TheEnergyLibrary.com

θΔics

In science, ***vis viva***, defined in Latin as "living force", as contrasted with vis mortua, i.e. "dead force", is the mathematical quantity of the product of the mass of a moving object multiplied by its velocity squared, mv^2. [1] This quantity was determined to be conserved absolutely in perfectly elastic collisions, such as between steel balls, by Dutch physicist Christiaan Huygens in 1669. [4] This was a precursor to kinetic energy.

History

See main: Vis viva dispute

In *circa* 1640, French mathematician René Descartes ruminated on the issue of what happens when a body, such as a hard spherical ball, of mass *m* and speed *v* collides with another such body of different mass and speed. He concluded that the quantity *mv* (now called momentum) would be conserved. In other words, according to Descartes, for two colliding spheres the sum:

$$m_1 v_1 + m_2 v_2$$

would be the same before and after the collision. In short, Descartes argued for a principle of conservation of motion, where quantity of the product of the mass of a moving object by its velocity *mv* was thought to be conserved in mechanical interactions. Descartes' reasoning, however, was partly metaphysical and therefore not convincing. [5]

In the 1660s, Dutch physicist Christiaan Huygens, an associate of Descartes, carried out many ingenious experiments on colliding spheres, some of which were demonstrated at the Royal Society in London. This led him, in 1669, to the correct conclusion that the quantity preserved in a collision is not *mv* but mv^2.

In 1686, in opposition to Descartes' logic, German mathematician Gottfried Leibniz, coined the name "vis viva" for Huygens' quantity mv^2, and argued for a principle of the conservation of *vis viva*. [2]

½ factor

In 1811, according to one reference, Italian mathematician Joseph Lagrange used calculus to show that a factor of two is involved in the relationship "potential" (potential energy) and "vis viva" (kinetic energy). [2] Conversely, according to a second reference, it was French physicist Gustave Coriolis who in 1829 introduced the factor ½ in Leibniz's *vis viva* for the sake of mathematical convenience. [7]

$$\textit{Vis viva} = \frac{1}{2}mv^2$$

(add)

Vis viva + vis mortua

In *circa* 1740, French physicist Emilie du Chatelet suggested that living force or *vis viva* could be converted into *vis mortua* or dead essence and that the sum of the two quantities, being interconvertable, would remain constant. [6] Vis mortua is said to have been a precursor to potential energy, just as vis viva was to kinetic energy. [4]

These two entities, vis viva and vis mortua were taken up later by Italian mathematician Joseph Lagrange, in his 1788 *Analytical Mechanics*, who enunciated, in effect, that the total mechanical energy, composed of kinetic and potential energies, is constant in an isolated system. This work was carried on further by Irish mathematician William Hamilton in his 1834 *On a General Method in Dynamics*; work later cited by German physicist Rudolf Clausius in his development of internal energy.

Kinetic energy

In 1847, English physicist James Joule highlighted the name association issues: [8]

> "The force expended in setting a body in motion is carried by the body itself, and exists with it and in it, throughout the whole course of its motion. This force possessed by moving bodies is termed by mechanical philosophers ***vis viva***, or living force. The term may be deemed by some inappropriate, inasmuch as there is no life, properly speaking, in question; but it is useful, in order to distinguish the moving force from that which is stationary in its character, as the force of gravity. When, therefore, in the subsequent parts of this lecture I employ the term living force, you will understand that I simply mean the force of bodies in motion.

The term *vis viva*, however, was soon abandoned in favor of first, for a few tentative years, the term "actual energy" by William Rankine, in 1853, and then eventually "kinetic energy" by William Thomson and Peter Tait in 1862 [9]

Thermodynamics

In thermodynamics, *vis viva* was a model of logic in precursory form to the principle of the conservation of energy; used in theory development by those such as Scottish engineer William Rankine and German physicist Rudolf Clausius. By 1879, Clausius had come to define the vis viva, symbol *T*, for a whole system of points as: [3]

$$T = \sum \frac{m}{2} v^2$$

(add)

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External links

- Vis viva – Wikipedia.

θΔics

In disputes, **vis viva dispute** or "vis viva controversy" was a 1686 to 1720s debate as to whether vis viva or momentum was conserved in the universe.

Overview

In 1620s, Rene Descartes published findings showing that momentum was conserved.

In 1686, Gottfried Leibniz, searching for some active principle that was conserved and kept the universe from running down and slowly coming to a halt, published "Brief Demonstration of a Notable Error of Descartes", wherein he asserted that Descartes' assertion that the "quantity of motion", i.e. the product of the mass and simple speed (velocity), of an object, was the quantity that was conserved, and that the true quantity that was conserved was vis viva, i.e. the product of the mass and square of speed (velocity).

This sparked a debate that split scientists down the middle, the Leibnizians on one side and the Cartesians on another, that lasted form some five decades; the debate, supposedly, was never officially resolved, supposedly, until it became a mute issue when in the 1840s the conservation of energy usurped them both; which is another subject in and of itself, inclusive as to whether force or kraft was conserved (conservation of force) or whether energy was conserved (conservation of energy). [1]

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Further reading

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θΔics

In terminology, **Vita**, root of *vis viva* (living force | kinetic energy), as contrasted with Mor, root of *vis mortua* (dead force | potential energy), i.e.—the goddess of death—is the Greco-Roman goddess of life, according to which the "arrival of Vita", conceptualized in modern times as the arrival of "good fortune", signifies the arrival of life, e.g. *omnis vita*, meaning the "whole of life" (Cicero (Ñº)).

According to at least one Roman writer, *vis* and *vita* may be both elements of a traditional collocation and derivations of the same root. Varro's claim that the ***vita*** is given to children by the ***vis*** of Venus may be an implicit etymology:

> Poetae . . . coniunctione ignis et humoris, quam habent vim significant esse Ve<ne>ris. A qua vi natis dicta **vita** et illud a Lucilio:
> **Vis est vita**, vides, nos facere omnia cogit (*L.* 5.63)

> The poets . . . through the conjunction of fire and moisture are indicating that the *vis*, "force," which they have is that of Venus. Those born of *vis* have what is called *vita*, "life," and that was meant by Lucilius:
> Life is force you see: to do everything force doth compel us.[32]

Varro's quotation of Lucilius, who implicitly derives *vis* from *vita*, pushes back the etymology to the late second century:

> **Vis est vita vides? Vis nos facere omnia cogit**

> Life is force you see: to do everything force doth compel us.

American Proto-Indo-European to Latin-Greek linguistic evolution scholar Jay Fisher's synopsis of Roman scholar Marcus Varro (116-27BC) and his *On the Latin Language* implicit etymological assertion that Roman satirist Gaius Lucilius (180-103BC), in his assertion that "vis est **vita**, vides, nos facere omnia cogit" (i.e. "**life** is force you see: to do everything that force doth compel us"), is some type of truncation of the poetical-mythologic Greco-Roman notion that through the conjunction of fire and moisture, "life" (vita) is something given to children by the "force" (vis) of the goddess Venus, the Roman version of the older Greek goddess Aphrodite. [2]

Terms | Derivatives

Common etymological derivative of Vita include: vital energy, vital force, vital heat, vitalism, or *curriculum vitae* (CV), Latin for "course of one's life" (1902). [1]

One example, of semi-recent terminological usage is French philosopher Pierre Gassendi's 1647 book *De vita, moribus, et doctrina Epicuri libri octo* (*On the Life, Customs* [*Character-Behavior-Morals*], *and Doctrines of Epicurus Book Eight*), which acted to revive the life, work and atomic theory views of Epicurus.

Quotes

The following are related quotes:

> "The poets, through the conjunction of fire and moisture, are indicating that the *vis*, 'force', which they have is that of Venus [Aphrodite]. Those born of *vis* have what is called ***vita***, 'life', and that is what is meant by Lucilius (c.120BC) when he says: **'life is *force* you see: to do everything force doth compel us'**."
>
> — Marcus Varro (c.50BC), *On the Latin Language*

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θΔics

In science, **vital energy** was a type of energy said to exist in plant life and animal life capable of being transformed when needed into heat or muscular motive power. [1] This form of energy was associated, in some cases, with the theory of vitalism. The term seems to have been dominate between the 1860s and the 1920s, where after, with the rise of chemical thermodynamics, it fell into disuse.

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θΔics

In science, **vital force** was a hypothetical force, nearly synonymous to the term "living force", now categorized as defunct theory, said to characterize life or living phenomena, distinct from the known forces of nature. The vital force theory is one of the early concepts in the vitalism theory debates.

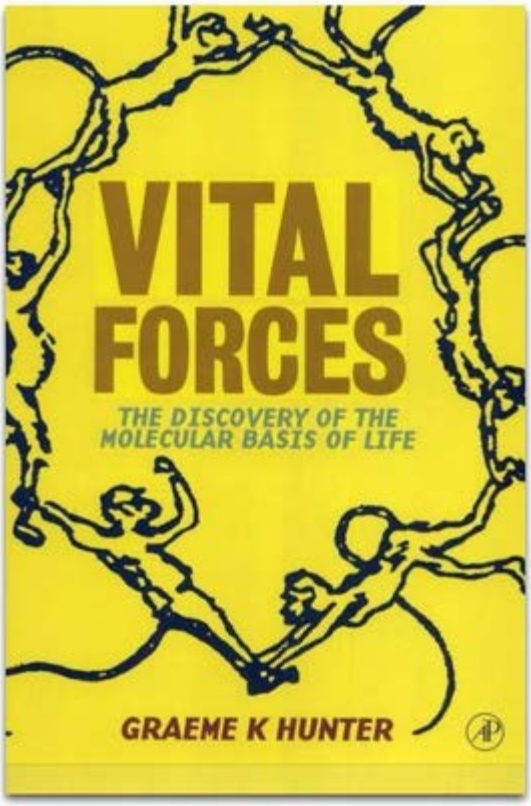

Graeme Hunter's 2000 *Vital Forces*, on a history of the various "**vital force**" theories of nature. [6]

History

In 1774, German physician Friedrich Medicus (1736-1808) introduced the term "vital force" (lebenskraft) as the force responsible for processes such as digestion and respiration. In 1795, German physician Johann Riel (1759-1813), in his article "On the Vital Force", posited five types of forces: physical force, vital force, vegetative force, animal force, and mental force. [1] German chemist Hermann Kolbe (1818-1884) commented in 1845: [2]

> "If the concept, however, is extended to include the assumption that the **vital force**, pushes out and replaces the original forces of matter, so that the latter cease to operate, then one has gone too far; for at times it is possible by experimentation to unite the lifeless fundamental substances into compounds identical with those that are formed through vital processes."

French chemist Marcellin Berthelot has been described as the official executioner of the vital force theory, a concept about which he had an expressly philosophical bias against: [3]

> "It is the object of these researchers to do away with life as an explanation, wherever organic chemistry is concerned."

His aim here, although this seems to have have a feel of the defunct theory of life in it, according to chemistry historian Forris Moore (1918), was to show that all the transformations of the organic world are due to the play of simple chemical and mechanical forces acting in a mechanical way. [4] In his 1860 "Organic Chemistry Founded on Synthesis", his so-called masterpiece, Berthelot described his breakthrough insight, in his introduction, of how he obtained a first organic compound (formic acid): [3]

> "Solely by a combination of time and ordinary affinities."

This seems, in some way, to be a forerunner to the debate that will eventually surround the premise of the synthesis of a human molecule (person), a large animate 26-element organic compound (see: human free energy of formation).

In 1920, American mathematician William Sidis, one the last of the dying breed of scientists to attempt to find a physical basis for the vital force concept, in his *The Animate and the Inanimate*, outlined a rather convoluted second law based "split universe model", consisting of a forward universe and a reverse universe, to "supply the basis for the idea of vital force", as he put it. [5]

See also

â— Vital energy

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θΔics

In science, **vital heat** refers to heat associated with life produced with in a living body. It is generally viewed as an historical term, a cousin of sorts to the concept of vitalism. The term is used significantly in the human thermodynamics works of French physicist Gustave Hirn. [1]

See also

- Animal heat
- Vital energy

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External links

- Vital heat – Wikipedia.

θΔics

In science, **vitalism** supposes there exists a hypothetical type of vital energy innate in living structures or vital force peculiar to life itself. [1] The vitalism theory was popular during the years circa 1830s to 1880s, but slowly began to replaced the thermodynamic view of living things.

A **vitalism** word scramble (Q), showing all the telltale signs of defunctness associated with this term, namely: bioenergetics, teleology, emergent, immaterial, posited, pejorative, animus, mesmerism, etc.

American neurological anthropologist Terrence Deacon argues that Greek philosopher Aristotle's concept of "entelechy", or active principle to intrinsic to the material substance of an organism, was a precursor or forerunner so to say of vitalism. [15]

Types

The so-called "neo-vitalisms" are those varieties of vitalism in the post 1842 years, i.e. years following the Reymond-Brucke oath.

Among vitalism theories in general, according to 1970 views of French philosopher Jacques Monod, one is, supposedly, able to distinguish between two categories: "metaphysical vitalism", French philosopher Henri Bergson being the prime example, and "scientific vitalism", German embryologist Hans Driesch, German-born American physicist Walter Elsasser, and Hungarian polymath Michael Polanyi, being representative examples. [13]

Vital force

In 1774, German physician Friedrich Medicus (1736-1808) introduced the term “vital force” (lebenskraft) as the force responsible for processes such as digestion and respiration.

In 1795, German physician Johann Riel (1759-1813), in his article “On the Vital Force”, posited five types of forces: physical force, vital force, vegetative force, animal force, and mental force. [8]

In 1845, German chemist Hermann Kolbe commented: [10]

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> "Solely by a combination of time and ordinary affinities."

This seems, in some way, to be a forerunner to the debate that will eventually surround the premise of the synthesis of a human molecule (person), a large animate 26-element organic compound (see: human free energy of formation).

Berzelius

In the early 19th century, Swedish chemist Jacob Berzelius, author of *Animal Chemistry* (1806), held the view that organic atoms, in contrast to inorganic atoms, were responsive to vital force (see also: Vladimir Vernadsky's conceptional divide of the of the elements in regards to life or the biosphere). [5]

From 1806 into the 1820s, Berzelius argued for a modified chemical affinity theory in living beings. [9]

In the 1827 edition of his *Textbook on Chemistry*, he wrote: [6]

> "In living nature the elements seem to obey entirely different laws than they do in the dead … The essence of the living body consequently is not founded in its inorganic elements, but in some other thing, which disposes the inorganic elements … to produce a certain result, specific and characteristic of each species."

Urea synthesis

Berzelius held tight to this view up until his student Friedrich Wohler famously after which Berzelius' views on the matter began to synthesized urea in 1828, thus disproving the then-dominate theory that only organic matter could produce organic matter,ange. In 1831, to exemplify, Berzelius flatly rejected the premise of vital force:

> "To suppose that the elements are imbued with other fundamental forces in organic nature than in the inorganic is an absurdity … the fact that we cannot rightly understand the conditions prevailing in organic nature gives us no sufficient reason to adopt other forces."

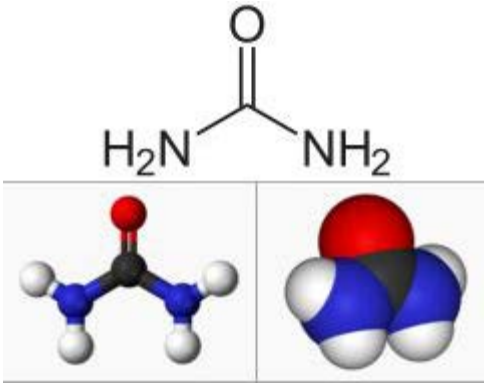

Molecular structure of the organic compound urea, $CO(HN_2)_2$, synthesized by Friedrich Wohler in 1828 from "inorganic" components, thus disproving the vital force theory of organic chemistry.

In his 5th and last edition of his *Textbook on Chemistry* (1847), Berzelius is said to have upgraded his view of vital force in a way analogous to 20th century ideas on the origin of life. [7]

Vitalism

Italian physician-physicist Luigi Galvani's 1771 theory of "animal electricity" used to explain the observed twitching of the muscles of dead frog legs struck by a spark, and the followup 1800 invention of the "voltaic pile" (battery) by Italian physicist Alessandro Volta, built specifically to disprove Galvani's animal electricity theory, can loosely be said to be the start of the vitalism debate.

The synthesis of urea, in 1828 by German chemist Friedrich Wohler, as mentioned above, a so-called organic chemical, thought to be a product unique to life, from inorganic starting products, is often cited as being the first blow to vitalism.

[3]

German physiologist Johannes Müller's had dominant theory of vitalism so-much-so that the Helmholtz school of thermodynamics originated as a result of a 1842 pact (Reymond-Brucke oath) between Muller's medical students Emil Du Bois-Reymond, Ernst Brücke, and Hermann Helmholtz who vowed to overthrow their mentor's theory, by proving that all physiological process operated by purely physical means. [1]

Another theory of vitalism is said to have been the product of the work of German zoologist Hans Driesch, who, in objection to the 1888 views of German embryologist Wilhelm Roux that frog embryos developed by pure physical mechanical methods, conceived that living organisms must contain a 'vital force', peculiar to life itself. [2]

The circa 1905 work of German-born American physiologist Jacques Loeb on artificial parthenogenesis (virgin generation) based on pure physical chemistry mechanism, is said to have been a blow to vitalism. [3] Loeb's follow-up books on the mechanical, dynamical, or physical chemical view of the organism seem to be indicative of this. [4]

Neo-vitalism and modern vitalism

See main: Neo-vitalism

Into the 20th century, according to English biologist James Johnstone, a hue of residual or covert vitalism remained. As explained in his 1921 chapter on the nature of life: [3]

> "Into the last generation there has been a recrudescence of vitalism—'**neo-vitalism**' it is now called—being obviously something that seems to be different from the Cartesian speculations about the sensitive soul. At its best this is seen in the 'psychoids' and 'entelechies' of Driesch and others, concepts which are applicable to living things only, and not to chemical and physical phenomena. At its worst **modern vitalism** is exhibited in the crude and even grotesque 'spiritualism' which has attained such a vogue with the less resolute thinkers of our own generation. This, then, is the modern impasse to which biology has come. Purely physico-chemical explanations of life are not satisfactory, and the immaterial and non-energetic agencies that are being invoked in their place have no interest for science, since they cannot be the objects of investigations."

In modern times, a shade of this type of vitalism is found in works of the new-agers, energy medicine practitioners, and various new types of science-religious blend theories. Even to modern hardened scientists, debates over the question of the "origin of life" seems to evoke types of physics-disguised vitalism, or scientific-based explanations for what supposedly constitutes "life". An example of the latter, is found in the last sentence of Johnstone's book:

> "Life probably itself has existed on earth for 1,000 million years [and] in living processes the increase of entropy is retarded—this is our '**vital**' concept."

Here, Johnstone is invoking a contrived thermodynamic argument, i.e. entropy reversal (or entropy reduction), to salvage the view that certain types of matter can be considered alive.

In 1966, English geneticist Francis Crick, in his *Of Molecules and Men*, defined a so-called neo-vitalist as "one who holds vitalistic ideas but does not want to be called a vitalist." [14]

In 2011, there was a 3-day symposium, Jun 17-19, at the Multimedia Institute, Zagreb,

organized by Nathan Brown (UC Davis) and Petar Milat (MaMa), on the subject of addressing **vitalism** and antivitalism in contemporary philosophy, the synopsis of with is: [12]

A 2011 poster for an anti-vitalism conference in Zagreb. [12]

> "'Life' is the site of a formidable lacuna. There is no firmly established scientific account of its constitutive properties or the process of its genesis. Varieties of "vital materialism" prone to describing physical forces in terms of an inherent "life of things" have done little to clarify the problematic nature of the concept, and insofar as "life" functions as an empty signifier concealing an absence of theoretical coherence we might be better to have done with it."

See: defunct theory of life (2009), for more on this direction.

Defunct theory of life

Into the 21st century, most non-religious scientists do not consider themselves to be adherents to the vitalism view, most readily aligning with the views of the Helmholtz school, but nearly all consider themselves to be "alive", which a view found to be defunct, as of 2009 (see: defunct theory of life), particularly when attempting to search for the chemical thermodynamics location and explanation of the so-called origin of life, wherein a molecule came to life.

Quotes

The following are noted quotes:

> "All **vital** phenomena can be explained in terms of physics and chemistry."
>
> — Wilhelm Kuhne (1898), anti neo-vitalism talk in England (Q)

> "Exact knowledge is the enemy of **vitalism**."
>
> — Francis Crick (1963), *Of Molecules and Men* (vii)

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Further reading

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External links

● Vitalism – Wikipedia.

θΔics

In existographies, **Vito Volterra** (1860-1940) (CR:3) was an Italian mathematician and physicist, noted for []

Overview

In 1926, Volterra, in his "Variations and Fluctuations of the Number of Individuals in Animal Species Living Together", building on the work of Pierre Verhulst (1804-1849), published some type of mathematical predator-prey model; this model overlapped in some way with the early work of Alfred Lotka. [1]

In 1937, Volterra, in his "Principles of Mathematical Biology", employed the terms: "demographic potential", "demographic energy" (energie demographique), "principle of least action in biology" (principe de moindre action en biologie). [4]

In 1945, Alfred Lotka derided Volterra for his use of physical terms in the area of predator prey dynamics:

> "**Volterra**'s use of the term 'potential' cannot be commended. Moreover, his use of 'demographic energy' and 'principle of least action' [in biology], are used in a sense not conforming with their strict usage in physics. Potential is a technical term in physics, of the dimensions of an energy, and Volterra's analysis nowhere introduces considerations of energy of the peculiar mechanical properties of the organism. If we were dealing in problems wholly unconnected with energetics, the borrowing of a term from that field in a purely figurative sense might be condoned. But, quite on the contrary, the energy relations of the system of organic nature are a deeply fundamental feature, in which potentials of some kind, in the physicist's meaning, may be expected to play a role. To christen a function as a potential, which does not have the dimensions and qualities of a potential in the physicist's meaning, is to create the impression that a problem has been solved which, actually, still awaits solution. This does not make for the advancement of science."
>
> — Alfred Lotka (1945), "The Law of Evolution as a Maximal Principle" [5]

Lotka went on to say that Bertrand Russell's 1926 views on evolution where a better signpost.

Quotes | On

The following are quotes on Volterra:

> "The system of differential equations proposed by **Vito Volterra**, describing the variation in time of the populations Nr of interacting species in a biological association, admits a Liouville's theorem (when log Nr are used as variables) and a universal integral of 'motion'. Gibbs' microcanonical and canonical ensembles can then provide a thermodynamic description of the association in the large. The 'temperature' measures in one number common to all species the mean-square deviations of the Nr from their average values. There are several equipartition theorems, susceptible of direct experimental test, a theorem on the flow of 'heat' (the conserved quantity in an isolated association) between two weakly coupled associations at different temperatures, a Dulong-Petit law for the heat capacity, and an analog of the second law of thermodynamics expressing the tendency of an association to decline into an equilibrium state of maximal entropy. The analog of the Maxwell-Boltzmann law is a distribution of intrinsic abundance for each species which has been successfully used by ecologists for interpreting experimental data. A true thermodynamics develops upon introducing the idea of work done on an association through a variation of the variables (such as physical temperature) defining the physical and chemical environment. An ergodic theorem is suggested by the agreement of ensemble and time averages in the one case where the latter may be found explicitly."
>
> — Edward Kerner (1957), "A Statistical Mechanics of Interacting Biological Species" [3]

> “The Lotka correspondence shows that **Volterra**’s approach was strictly adherent to the classical physico-mathematical paradigm, while Lotka’s point of view was more eclectic and open-minded as regards to new developments of physics, and somewhat skeptical about formal statements. We could say that while Volterra followed the ‘mechanical analogy’, Lotka had an inclination for the ‘thermodynamic analogy’ and had a great interest for the energetic problems in population dynamics.”
>
> — Giorgio Israel (1988), “On the Contribution of Volterra and Lotka to the Development of Modern biomathematics” [1]

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External links

â— Vito Volterra – Wikipedia.

θΔics

In existographies, **Marcus Vitruvius** (c.75-15BC) (IQ:165|#439) (Murray 4000:7|T) (CR:5), aka "Vitruvius", was a Roman writer, architect, engineer, civil and military, and philosopher, and influence to Leonardo da Vinci, noted for []

Vitruvian model

In 25BC, Vitruvius, in his *On Architecture* (*De Architectura*), in which he hinted at correlations of the ideal geometrical proportions of a human, later used by Italian polymath Leonardo da Vinci in the construction of his famous Vitruvian man. [1] The following is an artistic rendition of Vitruvius' geometrical man, from his *On Architecture*:

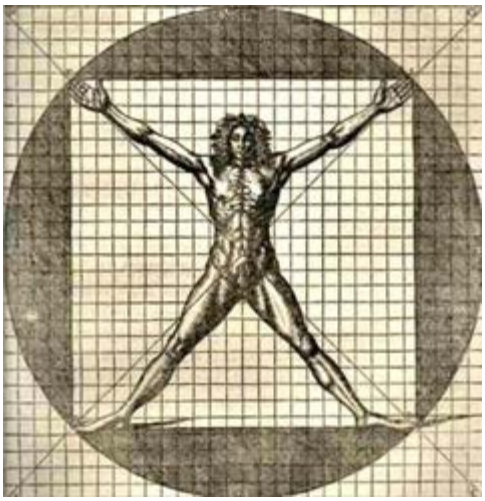

Vitruvian man model was used famously Italian polymath Leonardo da Vinci's depiction of his ideal geometrical human, the Vitruvian man; which was later used as the the depiction of the generic 'human molecule' by Americans chemical engineer Libb Thims, in *The Human Molecule* (2008), and later by writer John Hodgson, in *molecules humans* (2010). [2]

Quotes | On

The following are quotes on Vitruvius:

> "**Vitruvius** was the first practicing engineer whose writings are extant."
>
> — Richard Kirby (1956), *Engineering in History* (pg. 45) [4]

> "**Vitruvius** had described the pump of Ctesibius with great care, and Vitruvius' writings, printed in 1486, had been among the earliest works to appear in print."
>
> — Richard Kirby (1956), *Engineering in History* (pg. 153)

Quotes | By

The following are related quotes:

> "Such as possess the gifts of fortune are easily deprived of them: but when learning is once fixed in the

mind, no age removes it, nor is its stability affected during the whole course of life."

— Marcus Vitruvius (c.25BC)

"Thales [and others] and Democritus of Abdera handed on their discoveries of the laws according to which natural events are ordered and have their effects. Relying on their discoveries Eudoxus, Aratus and others devised the method of calendars to show the rising and setting of the stars and the significance of the seasons and handed it on to their successors."

— Marcus Vitruvius (c.25BC), *Publication* (IX.6.3) [3]

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External links

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θΔics

In thermodynamics, **Vladimir Igorevich Arnold** (1937-2010) was a Russian mathematician noted for []

Overview

In1989, Arnold, in his "Contact Geometry: the Geometrical Method of Gibbs' Thermodynamics", explained the graphical thermodynamics work of Willard Gibbs as follows:

> "According to Gibbs, the geometrical structure of thermodynamics is described by a contact manifold, equipped with the contact form, whose zeros define the laws of thermodynamics:
>
> $$d\varepsilon = td\eta - pdv$$
>
> where ε is the energy, t the temperature, η the entropy, p the pressure, and v the volume. Let us call this contact 5-manifold the Gibbs manifold. Gibbs thesis: substances are Legendre submanifolds of the Gibbs manifold."

Arnold, in this same work, also gives the following popular quote:

> "Every mathematician knows it is impossible to understand an elementary course in thermodynamics. The reason is that thermodynamics is based—as Gibbs has explicitly proclaimed—on a rather complicated mathematical theory, on the contact geometry. Contact geometry is one of the few 'simple geometries' of the so-called Cartan's list, but it is still mostly unknown to the physicist—unlike the Riemannian geometry and the symplectic or Poisson geometries, whose fundamental role in physics is today generally accepted."

Arnold explains that Gibbs methods are based on *circa* 1790s work of French mathematician Adrien-Marie Legendre and his "Legendre submanifold", which comes from the theory of Legendre transformation or "Legendre transform", which is a special case of the "Legendre singularities construction".

Arnold's 1979 *Mathematical Methods of Classical Mechanics*, supposedly, gives some historical background to the historical origin of energy landscapes. [2]

Education

Arnold completed a partial solution of Hilbert's thirteenth problem in 1957 (age 19), completed his MS in 1959, thesis "On Mappings of the Circle to Itself", PhD in 1961, dissertation "On the Representation of Continuous Functions of 3 Variables by the Superpositions of Continuous Functions of 2 Variables", the latter two both under A.N. Kolmogorov, and ScD in 1963, thesis "Small Denominators and Stability Problems in Classical and Celestial Mechanics", under Nikolay Bogolyubov, V.M. Volosov, and G.N. Duboshin. He was a professor of mechanics and mathematics at Moscow State University until 1986, after which he worked at both the Steklov Mathematical Institute, Moscow, and Paris Dauphine University, France.

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External links

â— Vladimir Arnold – Wikipedia.
â— Vladimir Igorevich Arnold (2009 faculty page) - St. Petersburg Department of Steklov Mathematical Institute, RAS.

θΔics

In existographies, **Vladimir Bekhterev** (1859-1927) (CR:4), aka "W. Bechtereff" (Sorokin, 1928) or "W. [Wladimir] Bechterew" (Q)", was a Russian neurologist noted, in psychological thermodynamics, for his 1897 to 1921 work on energy of thoughts on people and dogs.

Overview

In 1897, Bekhterev, in his lecture turned book *Suggestion and its Role in Social Life* (1903), emphasized organism-environment interactions as a framework in which a "hidden reserve energy" can be accumulated, whereby, through social suggestion each person accumulated particular suggested material aspects of energy in a way that starts to look as if it were the person's own willful act. He applied the concept of "reflex" to behavioral (and psychic) reflections, manifestations of energy, an output from an organism following the transformation of an energy input. [2]

In 1901, Bekhterev, in his *Psyche and Life*, published on the relation between the psyche and energetics. [1] In this work, according to William McDougall (1911), he gives some type of "energetics" view, similar to Grot and Krainsky. [2]

Bekhterev transferred the conditional reflex work of Ivan Pavlov's dogs to humans, wherein he utilized energy concepts.

Bekhterev published a number of works arguing that suggestion, hypnosis, and telepathy were phenomena caused by some type of underlying energy transformation process.

In 1920 to 1921, Bekhterev, or a 20-month period, famously conducted a number of experiments on dogs, making more than 1,200-measurements of the impact of telepathy on dogs' behavior, upon which he claimed that their experiments proved the existence of a special "shining" type of energy (Q) released from one person and influencing another (compare: Rupert Sheldrake).

In 1921, Bekhterev, in part two of his *Collective Reflexology*, as summarized derisively by Sorokin (1928), supposedly, imported all the laws of physics, mechanics, chemistry, and biology, that he could find, to postulate a total of 23 laws governing social phenomena; which include, as summarized by Sorokin: [4]

> "The law of the preservation [conservation] of energy; of the proportionality of the ratio of motion to motive force; of gravitation; of repulsion; of the equality of action with counter-action [reaction]; of similarity or homology; of rhythm; of inertia; of continuity of movement and change; of entropy; of relativity; of evolution; of differentiation; of reproduction; of elective generalization; of historical sequence; of economy; of adaptation: of interaction; of compensation; of dependable relationship and of individuality."

In 1923, Pitirim Sorokin, in his 1928 "mechanistic school" classification, labels Bekhterev, whom he cites as "W. Bechtereff", as being one of the chief representatives of the "social energetics" divisions. [4]

Quotes | By

The following are quotes by Bekhterev:

> "The laws of the super-organic, i.e. that of 'social' phenomena, are the same as the laws of the organic and inorganic phenomena."
>
> — Vladimir Bekhterev (1921), *Collective Reflexology;* cited by Pitirim Sorokin (1928) in *Contemporary Sociological Theory* (pg. 18); cited by Joseph Mayer (1941) in *Social Science Principles in Light of Scientific Method* (pg. 233) [5]

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External links

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θΔics

In existographies, **Vladimir Cruz** (1965) is a Cuban writer, actor, and producer noted for his 2010 film *Afinidades*, co-directed with civil engineer turned actor Jorge Perugorria, a modern day remake of Goethe's *Elective Affinities*, with focus on the growing existentialist void of modern scientifically-literate man, in the wake of the loss of values in Cuba, and Goethe's human chemical theory, or something along these lines, the plot of which is structured around Reinaldo Montero's 2004 novel *Chamber Music* (Musica de Camara). [1]

Bruno | Captain

Cruz, in *Afinidades*, plays the role of Bruno, a theoretical physicist working in a chemical factory run by Nestor his boss; each character shown below and labeled according to the Goethe lettering scheme:

(add discussion)

Quotes | About

The following are related quotes:

> "The film [***Afinidades***] takes place inland on fresh water and its time is quite different from what we are used to in our contemporary cinematography. We are only trying to meditate about the human being and their complexities, facing emptiness and the lack of rational explanation for many of the problems of the contemporary world, sometimes appearing that the only way out is to take refuge in instincts. Those instincts lead to sex. At least this is the way out that the protagonists of this story find: sex as a way of electric discharge so as to keep themselves alive, the manipulation of others as a way to cast out impotence and reaffirm personalities lacerated by loneliness. But the result is ephemeral and the attempt has unforeseeable consequences."
>
> — Vladimir Cruz (2010), "Interview" (Ñº), Jun 18

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External links

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â— Home (Spanish → English) – VladimirCruz.net.

θΔics

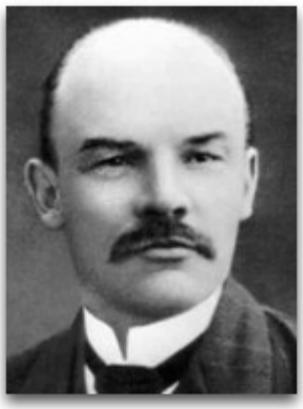

In hmolscience, **Vladimir Lenin** (1870-1924) was a Russian political thinker who led the Bolshevik Revolution, helped create the Soviet Union and launched the communist era, notable for having in 1894 popularized the term "dialectical materialism", a 1891 coining by Russian political theorist Georgi Plekhanov, an extension in some way of Friedrich Engels' term "scientific materialism" and Karl Marx's conception of "historical materialism", itself a mixture of Adam Smith's theories and Epicurean philosophy. [1]

Lenin, supposedly, blended all this together with criticism of the "energetics school" of Ernst Mach and Wilhelm Ostwald, who he argued either departed from dialectical materialism or casually neglected it, referring to the work of Abel Rey, who divided the physics schools into three groups: the energeticist, the neo-mechanicist, and the critical. Lenin, supposedly, denunciated "energeticism", arguing after Ludwig Boltzmann that motion cannot exist without matter, and rejected Ostwald's ontological proposition that energy rather than matter is the universal coordinage. [2]

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2. Stokes, Kenneth M. (1995). *Paradigm Lost: a Cultural and Systems Theoretical Critique of Political Economy* (pgs. 128-29). M.E. Sharpe.

External links

â— Vladimir Lenin – Wikipedia.

θΔics

In economic thermodynamics, **Vladimir Pokrovskii** (1934-) is a Russian physicist noted for his 1999 *Physical Principles in the Theory of Economic Growth*, wherein, based on predominantly the 1980 models of Belgian chemist Ilya Prigogine, he attempts to model economic systems as being in the far from equilibrium state; an excerpt of which is as follows: [1]

> "One can apply notions and tools of modern thermodynamics (Callen, 1960; Reif, 1974) to describe the processes in [an economic] system, in particular, the processes of production of useful things."

In 2010, Pokrovskii, with Canadian energy rent theory economist Bernard Beaudreau, published "On the Energy Content of Money", in attempt to estimate the energy content of a dollar's worth for US and Russia. [3]

In 2011, Pokrovskii published *Econodynamics: the Theory of Social Production*, which seems to be an expanded second edition of his 1999 book, has a notable chapter section entitled "Thermodynamic Interpretation of Value", with attempts a differential equation formulation of "value" in units of entropy, internal energy, Gibbs free energy, among others. [2]

Education

Pokrovskii, in 2005, was associated with the physics department of the University of Malta, Msida; in 2010, with the Center for Ecodynamics, Moscow; in 2011, with the Institute of Chemical Physics, Russian Academy of Sciences.

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Further reading

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External links

● Pokrovskii, V.N. (Vladimir Nikolaevich) – WorldCat Identities.

θΔics

In hmolscience, **Vladimir Stanchinsky** (c.1887-c.1947), or V. V. Stanchinsky, was a Russian scientist noted, in ecological thermodynamics, for his 1920s and 1930s work food chain energetics, some of which he theorized about in terms of thermodynamics.

Overview

In the 1920s, Stanchinsky, inspired by the work of Russian physical geologist Vladimir Vernadsky, posited that the quantity of living matter in the biosphere depends on the amount of solar energy that is transformed by natural communities at different trophic (i.e. food chain) levels, and on this basis studied “dynamic equilibrium” of natural communities by invoking the second law to explain decreasing biomass of the higher groups on the “trophic ladder”, wherein each successive rung on the trophic ladder has less energy, as it depends on the lower rungs for its energy supply in the form of food, but cannot appropriate it all, or something to this effect.

Stanchinsky summarized his views in his 1927 book *Variability of Organisms and its Importance for Evolution*.

In 1930 to 1937, Stanchinsky, with co-authors I.V. Ivlev and G.G. Winberg, measured and published results of energy lost at each trophic level. Raymond Lindeman, supposedly, later learned of these results. [2]

Other

Other authors to have employed "food chain thermodynamics" models include Paul Colinvaux and Paul Ehrlich, and in a unique way Vernadsky who outlined a blurry type of food chain picture of free energy, so to speak.

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(b) Ascher, William. (2001). *Guide to Sustainable Development and Environmental Policy* (pg. 66). Duke University Press.
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θΔics

In thermodynamics, **Viacheslav Vladimirovich Sychev** (c.1935-), cited as V.V. Sychev, known as "Vladimir Sychev", is a Russian scientist noted for his 1973 *Complex Thermodynamic Systems*, on equilibrium thermodynamics applied to complex systems, and for his 1981 *Differential Equations of Thermodynamics*, on the partial differential equations of thermodynamics of mathematical thermodynamics, in which he discusses the Pfaffian form, among other subjects [1] In the 1980s, Sychev also co-authored a number of other works such as the thermodynamic properties of nitrogen, of ethylene, and of butane, respectively.

Russian school

Sychev seems to be part of the Russian school of thermodynamics or what might be better categorized as the Russian school of complex systems thermodynamics or possibly hierarchical thermodynamics. On 2 Jan 2011, Russian physical chemist Georgi Gladyshev commented the following to American electrochemical engineer Libb Thims in the *Hmolpedia* forums: [2]

> "You write at first on the classical free energy. This is enough for chemical simple systems and complex (*) chemical thermodynamic systems. However, in general case when we say on complex chemical thermodynamic systems and the systems of higher hierarchies we must say about free energy of complex systems (*), **V. Sychev**, G. Gladyshev, et al. I believe it will correct if you will write on this."

On 10 Jan 2011, Gladyshev elaborated to Thims as follows: [3]

> "Interactions and the behavior of humans can be described by the equations of complex system thermodynamics only. The human is not "a heat engine" or "steam engine"! I said this you many times in delicate form. I believe you must say on delta G*<0 ! In your *Encyclopedia* you present the opinions of different people. Many of them had no and have no any relation to professional physics, physical chemistry. Science is not decided by voices. Many of your articles in the *Encyclopedia* have only an interest to the history of human thoughts or the history of science. You have no general theory of your own. You discuss the meanings of some terms or of some words. By the way I would to say that your *Human Chemistry* (and the branches of human chemistry) is the component of hierarchical thermodynamics. I believe it is clear after reading of my books and textbooks of I. Bazarov, **V. Sychev**, R. Kubo, N. Bogolubov and others professional scientists. I think thermodynamics requires not only the knowledge of philosophy but the knowledge of mathematics at first. During some years I try little by little to correct your views, but it is in vain? However, I would like to hope you'll understand to me, and your Herculean efforts will be recognized by science. That's my opinion."

Ecological thermodynamics

In 2012, American ecological thermodynamicist Jeff Tuhtanbegan studying what he calls "Sychev-complex systems" (systems in which more than expansion work is performed) to ecological systems, particularly the fish-river system. [4]

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θΔics

In hmolscience, **Vladimir Vernadsky** (1863-1945) (CR:38) was a Russian geochemical mineralogist noted, in animate thermodynamics, for his 1926 living matter biosphere theory, wherein he attempts to surmount the life / non-life issue, thermodynamically, by arguing that certain portions of the periodic table go into living matter, and that there is some type of unbridgeable gap between living matter and non-living matter, or something along these lines, but one that leads to insurmountable difficulties on theory, in modern retrospect.

Overview

In circa early 1920s, Vernadsky penned three articles on the topic of living matter: "Living Matter", "The Structure of Living Matter", and "Living Matter in Geochemical History of the Element's System"; only one of which has since been published. [8]

In 1926, Vernadsky published *The Biosphere*, in which, building on the 1875 theory of "biosphere" (region of life) by Austrian geologist Eduard Suess, he extolls on a periodic table peculiar thermodynamic-based theory of earth surface growth fed by solar energy is outlined, inclusive of a green fire theory, blended with element discussion and free energy theory. The following excerpt from *The Biosphere* exemplifies a glimpse into Vernadsky's mind: [1]

> "The diffusion of life is a sign of internal energy – of the chemical work life performs – and is analogous to the diffusion of a gas. It is caused, not by gravity, but by the separate energetic movements of its component particles."

Here we see an excellent view of a biological system as being comprised of many multi-element structured biological entities (bacteria, organisms, animals, etc.), analogous to the atoms of a body of gas, acting on each other energetically, in a way that is said to characterize the internal energy of the system.

Living matter

Vernadsky is very peculiar in his delineation of the matter of the biosphere into two types: (a) living matter and (b) *kosnoe* matter or inert matter. He states:

> "Living organisms have never been produced by inert matter. In its life, its death, its decomposition an organism circulates it atoms through the biosphere over and over again but living matter is always generated from life itself."

The Russian word 'kosnoe' is the antonym of living, and usually translated as 'inert'. All in all, Vernadsky seems to adhere to the unbridgeable gap model of life / non-life issue. He states: [1]

> "Living matter gives the biosphere an extraordinary character, unique in the universe. Two distinct types of matter, inert and living, though separated by the impassable gulf of their geological history, exert a reciprocal action upon one another."

He even postulated that in the future that it will be an established axiom of science that living matter is somehow irreducible to the elements:

> "It has never been doubted that these different types of biospheric matter belong to separate categories of phenomena, and cannot be reduced to one. This apparently-permanent difference between living and inert matter can be considered an axiom which may, at some time, be fully established."

As of 2009, and the defunct theory of life, however, we now know that Vernadsky was incorrect in this postulate. In any event, Vernadsky goes on to cite what he calls the known facts, on which he bases his theory, firstly he states that (a) abiogenesis has never occurred and (b) that azioc periods (geological periods devoid of life) have never been observed. On this argument, he goes on to state that conditions favorable for the existence of living matter have always been present.

Origin of life

Vernadsky is very peculiar on the question of the origin of life. In his preface to the Russian edition, he states:

> "Two preconceived ideas have infiltrated geology from roots foreign to the empirical principles of science. The first is the assumption of the *existence of a beginning of life*—the genesis or biopoesis at a certain stage in the geological past. Considered a logical necessity, this has penetrated science in the form of religious and philosophical speculation."

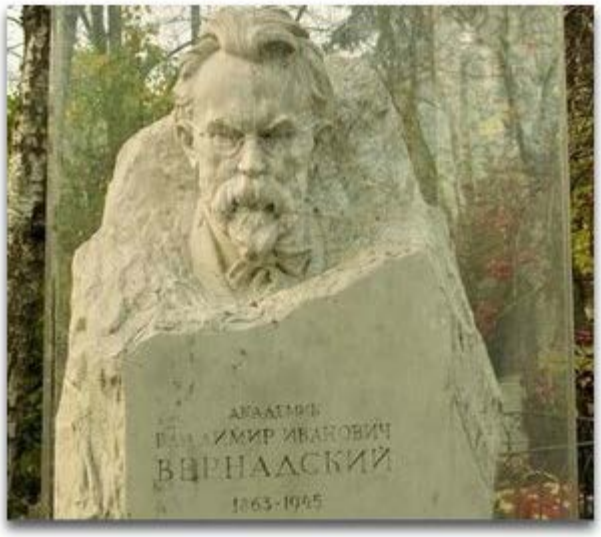

Vernadsky's tombstone (see also: thermodynamic tombstones) in the Novodevichy cemetery in Moscow. [9]

As the editors of the 1998 English edition note, the emphasis is his and state that it is testimony to his allegiance to the principle of actualism and substantive uniformitaianism. All-in-all, the theory of the origin of life seems to be a dismissed theory by Vernadsky, but he doesn't seem to speculate much as to what the alternative is in his view. Later into *The Biosphere*, he clarifies:

> "The structures of living organisms are analogous to those of inert matter, only more complex. Due to changes that living organisms effect on the chemical processes of the biosphere, however, living structures must not be considered simply as agglomerations of inert stuff. There energetic character, as manifested in multiplication, cannot be compared geochemically with the static chemistry of the molecular structures of which inert (and *once*-living) matter are composed."

In other words, it seems he is making an attempt to differentiate living matter with non-living matter by saying that life is matter that is (a) non-inert, (b) multiplies or reproduces, and (c) has a certain type of 'energetic character'. This, however, is only a patch answer to the question, and he essentially leaves the answer to the question only glossed over.

Free energy

A notable usage of Vernadsky's theory is his usage of of a mixture of sunlight radiation, free energy, and descriptions of biological work being done. He states, for instance: [1]

> "The radiations that pour upon the earth cause the biosphere to take on properties unknown to lifeless planetary surfaces, and thus transform the face of the earth. Activated by radiation, the matter of the biosphere collects and redistributes solar energy, and converts it ultimately into free energy capable of doing work on earth."

This may be a Russian-to-English translation issue, in the term free energy, but interesting nonetheless? in another instance, he states:

> "Living matter creates new chemical compounds by photosynthesis, and extends the biosphere at incredible speed as a thick layer of new molecular systems. These compounds are rich in free energy in the thermodynamic field of the biosphere. Many of these compounds, however, are unstable, and are continuously converted to more stable forms."

As he does not cite anyone for this argument, it is difficult to get a glimpse of his inside view of free energy in this statement. In regards to plants, photosynthesis, and free energy he states: [1]

> "Animals and fungi accumulate nitrogen-rich substances which, as centers of chemical free energy, become even more powerful agents of change. Their energy is also released through decomposition when, after death, they leave the thermodynamic field in which they were stable, and enter the thermodynamic field of the biosphere. Living matter as a whole—the totality of living organisms—is therefore a unique system, which accumulates chemical free energy in the biosphere by the transformation of solar radiation."

Here, we see that he has a blurry picture of free energy, a sort of food chain picture of free energy, so to speak.

Pressure

Vernadsky was one of the first to argue that living matter has a sort of horizontal pressure acting out over the surface of the earth, in a manner analogous to a gas, which can be felt and measured. In *The Biosphere*, he first makes mention of this:

> "Living matter—organisms taken as a whole—is spread over the entire surface of the earth in a manner analogous to a gas; it produces a specific pressure in the surrounding environment, either by avoiding obstacles on its upward path, or overcoming them."

The editors of the 1998 edition comment that here Vernadsky introduces his concept of the 'pressure of life', which he elaborates on succinctly in 1939 as: "the spreading of life in the biosphere goes on by way of reproduction which exercises a pressure on the surrounding medium and controls the biogenic migration of atoms. It is absent in inert substance. The reproduction creates in the biosphere an accumulation of free energy, which may be called *biogeochemical energy*. It can be measured." Further on, he states:

> "The careful observer can witness this movement of life, and even sense its pressure. In the impact of a forest on steppe, or in a mass of lichens moving up from the tundra to stifle a forest, we see the actual movement of solar energy being transformed into the chemical energy of our planet."

In latter commentary, he argues interestingly that energy of the sun is what determines the pressure of life and hence the pressure felt in civilized life: [1]

> "Cosmic energy determines the pressure of life, which can be regarded as the transmission of solar energy to the earth's surface. This pressure arises from multiplication, and continually makes itself felt in civilized life. When man removes green vegetation from a region of the earth, he changes the appearance of virgin nature, and must resist the pressure of life, expending energy and performing work equivalent to this pressure."

Here he is speaking, essentially, of pressure volume work. He continues that if, at any point, man stops his defense

against green vegetation, his works are swallowed up at once by a mass of organisms that will reposes, whenever and wherever possible, any surface man has taken from them. This argument, to note, is similar to discussions on boundary expansion, particularly as documented in territory change, e.g. as in rise and fall of civilizations or human thermodynamic instruments theories.

Speed of transmission of life

Vernadsky gives a formula he defines as the 'speed of transmission of life', loosely modeled on how fast a single bacterium can reproduce itself and cover the globe, as follows: [1]

$$N_n = 2^{nD}$$

where N_n is the number of individuals formed in n days and D is the ratio of progression or growth rate, characteristic for each species, loosely quantified as the number of generations formed per unit time. What is interesting is that Vernadsky states that speed of transmission is subject to the law of inertia, is hindered by external forces, slows down at low temperatures, and weakens or ceases in the absence of food, gas, breath, or space for the newly born. In other words, he is saying that reproduction is a function of external forces, system temperature, system volume, the medium of the system, and substrate composition.

Equilibrium

Curiously, at one point, Vernadsky seems to be quoting Gibbs' *Equilibrium* verbatim: [1]

> "Any system reaches a stable equilibrium when its free energy is reduced to a minimum under the given conditions; that is, when all work possible in these conditions is being produced. All processes, of both the biosphere and the crust, are determined by conditions of equilibrium in the mechanical system of which they are a part."

What Vernadsky seems to insert into the standard Gibbsian logic is the notion that equilibrium equals 'stable', which contrasts to the standard view that equilibrium equals death or the absence of potential further spontaneous movement or natural chemical reaction. To explain, Vernadsky comments:

> "When solar radiation has produced the maximum work, and created the greatest possible mass of green organisms, this system has reached a stable equilibrium."

This view, however, seems to be an incorrect extrapolation of the standard chemical thermodynamics view.

Evolution

Vernadsky, supposedly, is quite explicit in his writings on challenging the "randomness" component of materialistic Darwinism. In contrast, he states: [1]

> "Creatures on earth are the fruit of extended, complex processes, and are an essential part of a harmonious cosmic mechanism, in which it is known that fixed laws apply and chance does not exist."

Biosphere

Vernadsky defines or alludes to the idea that the entities of the biosphere are what he calls 'transformers'. He states: [1]

> "The biosphere may be regarded as a region of transformers that convert cosmic radiations into active energy in electrical, chemical, mechanical, thermal, and other forms."

This seems to be a Gibbs-based view.

Thermodynamics

As to his studies and learning in thermodynamics, Vernadsky seems to have been indoctrinated on the subject via his crystallography studies, at some point coming across the chemical thermodynamics works of American engineer Willard Gibbs. In his discussion of Gibbs' equilibria, in relation to terrestrial equilibria, for instance, Vernadsky states that "in crystallization, we encounter vectorial energy and internal energy in the formation of crystal twins [and] surface energy plays a role in all crystallization processes"; thus indicating a detailed corpus of knowledge on the subject of crystallization thermodynamics. [4]

Beyond this, Vernadsky utilizes some rather detailed thermodynamic terminologies, such internal energy, free energy, transformations of energy, or re-establishment of equilibrium, etc., the latter being a very intricate concept originating in the 1824 postulate of re-establishment of equilibrium in the caloric (a pre-entropy related concept) by French physicist Sadi Carnot; even coining new terms such as "thermodynamic field" and "thermodynamic envelopes". [5] On the issue of equilibrium reestablishments, Vernadsky states: [1]

> "The speed at which equilibrium is reestablished is a function of the transmission of geochemical energy."

The thermodynamicist that Vernadsky references to substantiate his work is the chemical thermodynamics of American engineer Willard Gibbs. Vernadsky declares that: [1]

> "All of the empirically-recognized geospheres can be distinguished by the variables (temperature, pressure, physical state, and chemical composition) of Gibbs' equilibria."

Thermodynamic envelopes

On the basis of Gibbs 1876 treatise "On the Equilibrium of Heterogeneous Substances", Vernadsky conceives of six types of what he calls "thermodynamic envelopes" to be quantifiable in the volume of the earth, viewing the earth's crust as a structure of thermodynamic envelopes, which can be "determined by values of temperature and pressure; envelopes of states of matter, characterized by material phases (solid, liquid, etc.); and chemical envelops, distinguished by chemical composition." He says that this an empirical generalization, useful as a basis for further discussion. On this crude sort of logic, Vernadsky then suppositions his views on the thermodynamics of the biosphere: [5]

> "The envelope proposed by Suess, the *biosphere*, is left out of this scheme. Its reaction are subject to the laws of equilibrium [Gibbs, 1876], but are distinguished by a new property, an independent variable which Gibbs failed to take into account."

Here, aside from note regarding what Gibbs failed to take into account, we see a very robust and accurate quote, in the modern sense. What Vernadsky is essentially telling us is that all of the reactions within the volume of the biosphere (chemical reaction, biochemical reactions, human chemical reactions, etc.) are subject to the quantification and regulations of the combined law of thermodynamics.

The first thermodynamic envelope or layer, in Vernadsky's scheme, is the "upper envelop" corresponding to the region of atmosphere-space starting at an altitude of 9-miles going upward into space, past the Karman line weightlessness demarcation (62 miles), to a vertical height of 373-miles. This is the outer thermodynamic envelope. The second

thermodynamic envelope (layer) is the “surface envelope”, extending from the surface of the earth to an altitude of 9-miles. Vernadsky’s description of the third and fourth layers is a bit vague. He states that “it is impossible to indicate the precise line of demarcation between envelopes” noting that this is due to our lack of knowledge regarding the boundary zones, but comments that this understanding will improve as science progresses. The fifth envelope Vernadsky assigns to the region of magma (molten rock) inside of the earth, beginning at a level of 22-miles below the earth (according to current data); and postulates the existence of a sixth thermodynamic envelope, or rather core sphere, found inside of the fifth envelope. On this model, he states that “the entire biosphere lies between these layers [one and five]”, i.e. in layers two-four, and comments further that “matter confined to the first and sixth envelopes does not enter into the biosphere or has not been observed in it.”

Influence

Vernadsky's work stimulated or influenced the work and discussions between Edouard Le Roy and Pierre Teilhard, the former of which first wrote on the noosphere concept in 1927.

Education

In 1881, Vernadsky began to study the natural sciences in the physics and mathematics department of Saint Petersburg University, studying under the likes of Russians chemist Dmitri Mendeleyev (formulator of the periodic table) and geographer Vasili Dokuchaev (founder of pedology), graduating in 1885. [2]

In 1886, he became curator of St Petersburg University's mineralogical collection. (Ñº) It was probably at this point wherein he began to grapple with the Linnaean tripartite: mineral (or mineral life), vegetable life, animal life divide, then-dominate, in respect to the "sphere of life" on earth.

In the following three years, Vernadsky mediated on the issue of how the laws of operation of the chemical reactions of the elements of the composition of the earth actuated in developmental changes in the earth, in its evolution, in accordance with the general laws of celestial mechanics. [3] In 1888, Vernadsky embarked on a two-year scholarship in Western Europe, studying under German mineralogist Paul Groth, noted for his books on the physical chemistry of crystallography. In 1989, Vernadsky studied with Henry Le Chatelier. In 1891, Vernadsky completed his MS dissertation: “On the Sillimanite Group and on the Role of the Alumina in the Silicates” and thereafter began his twenty-year professorship in mineralogy and crystallography at Moscow University; completing his PhD there in 1897.

Difficulties on theory

(add)

Quotes

The following are noted quotes:

> “Our model of the cosmos always must have a thermodynamic component.”
>
> — Vladimir Vernadsky (1926), *The Biosphere* (pg. 102)

> “I’m prepared to leave this life. I have no fear. I’ll just disintegrate into molecules and atoms. They’ll be probably transformed into another form of living matter.”
>
> — Vladimir Vernadsky (1945), “Diary Note” (Ñº), written shortly before his dereaction (death) on Jan 6

References

1. Vernadsky, Vladimir I. (1926). *The Biosphere* (free energy quote, pg. 44; chance quote, pg. 44; transformers, pg. 47; nitrogen and free energy, pg. 58; speed of transmission, pgs. 65-66; equilibrium, pg. 75; part one: The Biosphere in the Cosmos, pgs. 43-90; part two: The Domain of Life, pgs. 91-150; living matter, pg. 53-56; keyword: “internal energy”,

pg. 60; J.W. Gibbs, pg. 97; “sense its pressure”, pgs. 59-62, 76). Copernicus.
2. Grinevald, Jacques. (1997). “Vladimir Ivanovich Vernadsky (1863-1945): A Biographical Chronology” in *The Biosphere: Complete Annotated Edition* (pgs. 151-58) by Vladimir Vernadski, Mark A. McMenamin, and David Langmuir, 1998. Copernicus.
3. (a) Quote: "To collect facts for their own sake, as many now gather facts, without a program, without a question to answer or a purpose is not interesting. However, there is a task which someday those chemical reactions which took place at various points on earth; these reactions take place according to laws which are known to us, but which, we are allowed to think, are closely tied to general changes which the earth has undergone by the earth with the general laws of celestial mechanics. I believe there is hidden here still more to discover when one considers the complexity of chemical elements and the regularity of their occurrence in groups..."
(b) Source: Letter from Vernadsky to his wife Natasha Vernadsky on 20 June 1888 from Switzerland.
5. *ibid*, Vernadsky (1926). Terms: “thermodynamic field” (pgs. 50-51, 58, 81-85, 97-99, 145, 150); “thermodynamic envelopes” (pgs. 97, 100-02, 119).
7. Samson, Paul R. and Pitt, David. (1999). *The Biosphere and the Noosphere: Global Environment, Society, and Change* (pg. 51). Psychology Press.
8. Vernadsky, Vladimir I. (1978). *Zhivo Veshchestvo* (*Living Matter*). Moscow: Nauka.
9. (a) Vernadsky grave (German → English) – Wikipedia.
(b) Vernadsky grave (photo).

Further reading

â— Vernadsky, Vladimir. (1945). “The Biosphere and the Noosphere”, *American Scientist*, 33(1): 1-12; republished in *Main Currents in Modern Thought* (pgs. 49-53), 1946, April.

External links

â— Vladimir Vernadsky – Wikipedia.
â— Eduard Suess – Wikipedia.

θΔics

In thermodynamics, **vocal Memnon**, aka "singing Memnon", refers to two 60-foot stone statues of the Pharaoh Amenhotep III (c.1410-1350BC), which, for many centuries, made a singing like noise when heated by the sun (hot body) in the morning and when cooled at night (cold body) following sunset; the reference to this purported heat-powered singing statue, semi-frequently appears in the history of heat engines or steam engines.

Photo of the two statues of Amenhotep III (c.1410-1350BC), called by the Greeks the "**singing Memnon**", owing to the fact that from 27BC to 196AD, it made some kind of noise or sound, when heated in the morning and when cooled at night.

Overview

In 20BC, Strabo, after a visit to the statue, stated that the sound was "like a blow".

Others to have reported hearing the sound include: Pliny (based on collected reports), Pausanias, Tacitus, Philostratus, and Juvenal. [2]

In 1648, John Wilkins, in his *Mathematical Magic*, classified the vocal Memnon as operating similar to the sun-powered water-filled musical instrument of Cornelius Drebbel. [1]

In 1999, Massimo Pettorino, in his "Memnon: the Vocal Statue", was conjecturing that Hero was hired by someone to modify the Amenhotep III statue to speak, similar to one of his singing devices. [3]

Quotes

The following are related quotes:

> "The **statue of Memnon**, erected over his tomb near Thebes, is recorded by many authors [to make a melodious noise]. Memnon is said to have been the son of Aurora; the Goddess of the morning; and his statue is related to have had the peculiar faculty of uttering a melodious sound every morning when touched by the first beams of day, as if to salute his mother; and every night at sunset to have imparted another sound, low and mournful, as lamenting the departure of the day. This prodigy is spoken of by Tacitus, Strabo, Juvenal and Philostratus. The statue uttered these sounds, while perfect; and, when it was mutilated by human violence, or by a convulsion of nature, it still retained the property with which it had been originally endowed. Modern travelers, for the same phenomenon has still been observed, have asserted that it does not owe its existence to any prodigy, but to a property of the granite, of which the statue or its pedestal is formed, which, being hollow, is found in various parts of the world to exhibit this quality. It has therefore been suggested, that the priests, having ascertained its peculiarity, expressly formed the statue of that material, for the purpose of impressing on it a supernatural character, and thus being enabled to extend their influence with a credulous people."
>
> — William Godwin (1934), *Lives of Necromancers* [2]

> "At first, the two colossi were monoliths very much alike. It was about in the 27BC that the northern colossus, owing to an earthquake, broke into two pieces: as the pedestal leaned of 2°40', the bust slid on it along an inclined line of fracture that is still now evident on the stone. The statue was restored by order of Settimius Severus in the year 196 AD. During these two centuries, as the 108 epigraphs carved on the legs

of the colossus testify, the phenomenon of the **vocal statue** took place."

— Massimo Pettorino (1999), "Memnon: the Vocal Statue" [3]

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2. Godwin, William. (1834). *Lives of Necromancers* (pg. 32). Mason, 1876.
3. Pettorino, Massimo. (1999). "Memnon: the Vocal Statue" (pdf), *Proceedings of the 14th International Congress of Phonetic Sciences (ICPhS), San Francisco*. Publisher.

Further reading

● Gardiner, Alan. (1961). "The Egyptian Memnon" (abs), *Journal of Egyptian Archeology*, Dec 1.
● Pettorino, Massimo. (1999). "Memnon: the Vocal Statue" (pdf), *Proceedings of the 14th International Congress of Phonetic Sciences (ICPhS), San Francisco*. Publisher.

Videos

● Anon. (2019). "Thousand Ton 'Singing Statutes Found in Egypt?" (O), Mystery History, Jun 18.

External links

● Colossi of Memnon (sounds) – Wikipedia.

θΔics

In science, **void** (TR:92), aka "vacuum" or "emptiness", is a region of space containing nothing; archaically thought of as "absence of being" or "non-being" (Parmenides, c.470BC)

Quotes

The following are related quotes:

> "By convention sweet is sweet, bitter is bitter, hot is hot, cold is cold, color is color; but in truth there are only atoms and the **void**."
>
> — Democritus (c.410BC) (Q)

> "The **void** is 'not-being', and no part of 'what is' is a 'not-being'; for what 'is' in the strict sense of the term is an absolute plenum. This plenum, however, is not 'one': on the contrary, it is a 'many' infinite in number and invisible owing to the minuteness of their bulk."
>
> — Aristotle (c.330BC) (Q)

> "**Void** means and absence of things."
>
> — Giordano Bruno (1584), *On the Infinite Universe and Worlds* [1]

See also

- God void issue
- Nature abhors a vacuum

References

1. Bruno, Giordano. (1584). *On the Infinite Universe and the Worlds* (*On the Infinite, the Universe, and the Worlds*) (*de l'Infinito, Universo e Mondi*) (translator: Scott Gosnell) (pg. 10). Giusto Laterzi & Sons, 1907; CreateSpace, 2014.

Further reading

- Grant, Edward. (1981). *Much Ado about Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution* (Guericke, 9+ pgs; void, 20+ pgs; vacuum, 22+ pgs). Cambridge University Press.

External links

- Void (disambiguation) – Wikipedia.

θΔics

In hmolscience, **Volker Wiskamp** (c.1957-) is a German organic chemist noted for his 2002 article "Chemistry in the Work of Goethe", wherein he discusses German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities* (along with his 1832 novel *Faust*) in chemical thermodynamic terms, in particular he equates exothermic to "hot love" and endothermic to "cold love" in the connection to the enthalpy of formation (see: human enthalpy), which is a very rarely-made connection in human free energy theories (see: Elective Affinities | IAD: equation decipherment).

Chemistry in the Work of Goethe

In circa 1997 to 2002, Wiskamp was involved an interdisciplinary teaching effort at a high school in Darmstadt, Germany, wherein the class, of 16-year-old pupils, watched and discussed the theory and philosophical implications of Goethe's *Elective Affinities*. The class, in part, was a stimulated precipitate of the release of the 1996 film *Le affinità elettive*, the French-Italian rewrite of Goethe's *Elective Affinities* by the brothers Paolo Taviani and Vittorio Taviani, which was shown as part of a high school chemistry class and classroom discussion that resulted.

In 2002, Wiskamp, collected the results of the noted and discussion of the class into an online article "Chemistry in the Work of Goethe", in which he discusses the chemical thermodynamics of Goethe's *Elective Affinities*, a subject very rarely touched upon. Wiskamp explains the origin of the article as follows: [3]

> "The website was written approximately 10-years ago, but it has not been published in any journal. 10-15 years ago, I had a cooperation with a high school in Darmstadt. One focus of that cooperation was to bring different fields of teaching together. At that time Goethe's novel 'affinities' was discussed in the German class and the 16-year-old pupils watched an Italian movie on Goethe's novel. The chemical aspects in that novel were discussed in the chemistry class and analogies between chemical interactions and human interactions, especially love, were worked out. The text which I put onto my website is the result of that class, a class report, so to say. A few years later I was involved in a similar project which had the focus on science and religion."

In his article section entitled "Choice, Opportunity, and Higher Provision", Wiskamp states: [1]

> "Edward introduces the concept of elective affinities between chemicals. He means that substances then obviously preferable to one another, particularly when a lot of latent heat is released. The thermodynamic sense, Edward speaks of enthalpy of formation, ΔH, especially the exothermic *(hot love)* chemical reactions. Charlotte finds that a chemical reaction takes place only when the opportunity arises. It compares that there is theft only if there is something to steal, and also handy for the thief is ready. It describes so clearly that the position of a chemical equilibrium depends crucially on the concentrations of the reactants (mass action). Extremely formulated: Come marble not contacted

An advertisement for the 1996 film *Le affinità elettive*, the French-Italian rewrite of Goethe's *Elective Affinities*, which was used as a teaching medium in 1999 high school chemistry class that Wiskamp took part in, which resulted in the 2002 article

> "Chemistry in the Work of Goethe", an overview of the chemical thermodynamics of human relationships. [1]

with sulfuric acid, so there are neither gypsum nor carbon dioxide; Otto and Ottilie were not published, the marriage of Charlotte and Edward would not have been compromised. Maybe thinks Charlotte, when she speaks of occasions, other boundary conditions, which can change a marriage, for example, homely, financial, medical or social, similar to e.g. the temperature on the rate of a chemical reaction and the setting of the chemical equilibrium has a significant influence. Otto says that is the course of a chemical reaction by a higher purpose.

The chemist knows that the driving force of a chemical reaction by the Otto speaks, on the one hand depends on the heat of reaction (exothermic or endothermic), on the other hand but also of temperature and entropy of a measure of the disorder of the system, after the second law of thermodynamics, which states that the system strives toward a maximum, with the motto: the chaos is increasing.

The reaction of calcium carbonate with sulfuric is entropy-controlled especially because with the carbon (IV) oxide is a reaction product escapes from the mixture (chaotic) in the disordered gas phase. Even with the mutual relations of the four main characters in his novel all ends in chaos. Now the behavior of calcium carbonate and sulfuric acid is fully with the relationship between Charlotte, Edward, Otto and Ottilie comparable? If so, do adultery as the most natural thing in the world and are considered practically the above-cited law of science meet. But Charlotte is really a soulless carbonation, Edward etc. a soulless calcium? Are not the self-re-fall in love and committing adultery not only solved with old friends and new ones and creates a lot of chaos, but also feelings of hurt people? Therefore need not even be considered laws that go beyond the purely scientific? For example, those who long ago brought an old man of the mountain and down the sixth of which is: Thou shalt not commit adultery! Goethe asks this question in his novel also. Describe the natural sciences with its laws is the only truth, or are there other levels of reality, we only guess, but (still) do not know?"

Regarding the "Thou shalt not commit adultery!" comment, see the Goethe timeline (29 Jan 1830) for Goethe's comments to his friend composer Carl Zelter (1758-1832) on the relation of this commandment and the novella.

Lab experiments

See also: Homework problems; Human thermodynamics education

Of note, Wiskamp, whose focus is on chemical education, gives end-of-article laboratory experiments, contextually related to the novel.

Education

Wiskamp completed his BS in chemist in 1979 at Ruhr-University Bochum and his PhD in 1981 at the Max Planck Institute for Coal Research in Mulheim-Ruhr after which he worked as a postdoctoral fellow at UC Berkeley. Since 1989, he has been a chemistry professor at the University of Applied Sciences Darmstand, where at he presently is dean of students. [2]

Key

Wiskamp was found via Google search keys: Thermodynamik, Goethe, Wahlverwandtschaften.

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External links

● Volker Wiskamp (faculty) (German → English) – Darmstadt University.

θΔics

In existographies, **Voltaire** (1694-1778) (IQ:195|#17) (Cattell 1000:4) [RGM:34|1,500+] (Murray 4000:7|WL) (EPD:M7) (GPhE:#) [CR:313] was a French philosopher, writer, lay physicist, noted for having been an advocate of French philosopher Jean Sales' circa 1770s human molecular based atomic evolution theory; specifically Voltaire, the year of his death, visited Sales in jail to donate 500 pounds towards his release; and is noted for his work in connecting the experiments of Herman Boerhaave and Willem Gravesande (ball and ring experiment; ball and clay experiment) with the new mechanics of Isaac Newton and the later re-formulations of Emilie Chatelet.

Personal library

Voltaire's personal library contained evidence of interest in clandestine manuscripts, e.g. Benoit de Maillet, and his *Telliamed*, which taught that all living things emerged from the ocean (Q)

Sales

In the late 1760s, if not earlier, Voltaire had developed an intellectual kinship with Jean Sales. In 1770, amid the publication of extreme atheist Baron d'Holbach's 1770 *The System of Nature: Laws of the Moral and Physical World*, dubbed the "Atheist's Bible", Voltaire was lamenting about this to Sales; one version of this is summarized as follows:

> "D'Holbach's book caused a great stir among the Paris savants, effectively dividing the deists from the atheists. **Voltaire**, committed to deism and long impatient with d'Holbach's declamatory ways, called it 'a chaos, a great moral sickness, a work of darkness, a sin against nature, a system of folly and ignorance.' He wrote to Delisle de Sales: "I think that nothing has debased our century more than this enormous stupidity."
>
> — Rebecca Stott (2013), *Darwin's Ghosts: in Search of the First Evolutionists* [9]

In 1777, Sales (age 36), while imprisoned for his *The Philosophy of Nature: Treatise on Human Moral Nature* (1770-initiated) was visited by French philosopher Voltaire (age 83), a year before his death, who gave 500 pounds to towards his release, the equivalent of $100,000 in 2015 inflation terms.

Hart 100

The following is the logic behind the Hart 100 rankings:

> "In his book *Letters of the English*, **Voltaire** relates that during his stay in England, in 1727, he overheard some learned men discussing the question: who was the greatest man—Caesar, Alexander, Tamerlane, or Cromwell? One speaker maintained that Newton was beyond a doubt the greatest man. Voltaire agreed with this judgment, per the following reasoning:

At Café Procope (circa 1750): showing (Q): Marquis Condorcet, Jean-Francois de La Harpe, Voltaire, with his arm raised, the central epicenter genius, and Denis Diderot, Father Adam, his personal priest (Q), whom he played chess with.

> 'It is to him who masters our minds by the force of truth, and not those who enslave them by violence, that we owe our reverence."

Whether Voltaire was truly convinced that Newton was the greatest man who ever lived or was simply

> trying to make a philosophical point, the anecdote raises an interesting question: of the billions of human beings who have populated the earth, which persons have most influenced the course of history? This book is solely involved with the question of who were the 100 persons who had the greatest effect on history and on the course of the world. I have ranked these 100 persons in order of importance: that is, according to the total amount of influence that each of them had on human history and on the everyday lives of other human beings."

(add)

Physics

Voltaire was one of the first to popularize Isaac Newton's calculus theories in France, assisted by his mistress, French mathematician Emilie Chatelet, a subject which he described as the art of the numbering and measuring exactly a thing whose existence cannot be conceived. [2]

In 1726, after being released from the Bastille (jail), on the condition that he go to England, Voltaire went to London, where he occupied himself mainly with mathematics and made himself familiar with the philosophy of Newton, of which he made a more special study afterwards at Leyden University. He remained in London for three years, then returned to Paris, made several journeys, and then in 1736 settled in Leyden under the name of "Revol", which he dropped when he found the pseudonym was useless.

In a letter to the crown prince of Prussia (afterwards Frederick the Great), with whom he had entered into an active corresponds with, Voltaire says:

> "I am the town of two simple citizens, Boerhaave and Gravesande attract from four to five hundred strangers."

During this period, Voltaire was very busy writing a work on the philosophy of Newton, and received great assistance from the learned Gravesande and consulted with Boerhaave. [3]

Voltaire and Frederick the Great in the study at Sans Souci; engraving by P.C. Baquoy after N.A. Monsiau.

Religion | Atheism

See main: Voltaire on religion

Voltaire was one of the first radical critics of Christianity; himself, however, identifying with deism in belief; his views oft-cited in atheism circles.

In 1769, Voltaire, penned his *God and Human Beings*, one of the first works in comparative religion and mythology. [9]

In 1770, Voltaire, in his *Epistle to the Author of the Book of the Three Imposters* (*Épître à l'Auteur du Livre des Trois Imposteurs*), in response to John Toland's circa 1720 *Treatise on the Three Impostors*, penned (Q) one of his most-famous quotes: [1]

> "I want my lawyer, my tailor, my servants, even my wife to believe in God, because it means that I shall be cheated and robbed and cuckolded less often. ... If God did not exist, it would be necessary to invent him."

Voltaire, according to Ravi Zacharias (2008), is reported to have said that within a hundred years of his day, the Bible would be a forgotten book. (Q)

Name

The name "Voltaire", which the author adopted in 1718, is an anagram of "*AROVET LI*," the Latinized spelling of his surname, Arouet, and the initial letters of "*le jeune*" ("the younger"). The name also echoes in reverse order the syllables of the name of a family château in the Poitou region: "Airvault". The adoption of the name "Voltaire" following his incarceration at the Bastille is seen by many to mark Voltaire's formal separation from his family and his past.

Tesla

Serbian-born American Nikola Tesla, somewhere along the lines, also engaged into a quest to master the works of Voltaire. The following are Tesla's reflections on this task:

> "I had a veritable mania for finishing whatever I began, which often got me into difficulties. On one occasion I started to read the works of Voltaire when I learned, to my dismay, that there were close on one hundred large volumes in small print which that monster had written while drinking seventy-two cups of black coffee per diem. It had to be done, but when I laid aside the last book I was very glad, and said, 'Never more!'"

(add)

Quotes | On

The following are quotes on Voltaire:

> "I have been the more particular in stating the immense obligations history is under to **Voltaire**, because, in England there exists against him a prejudice, which nothing but ignorance, or something worse than ignorance, can excuse and because, taking him on the whole, he is probably the **greatest historian Europe has yet produced**. The vast labors of Voltaire towards reforming the old method of writing history, were greatly aided by those important works which Montesquieu put forward during the same period. In 1734, Montesquieu published what may be truly called the first book in which there can be found any information concerning the real history of Rome; because it is also the first in which the affairs of the ancient world are treated in a large and comprehensive spirit."
>
> — Henry Buckle (1856), *History of Civilization, Volume One* (pgs. 591-92)

> "Where it is a duty to worship the sun, it is pretty sure to be a crime to examine the laws of heat."
>
> — John Morley (1872), *Voltaire* [10]

> "There is a significance in the fact that it is actually the hundredth anniversary of the death of **Voltaire** (1878) with which *Human, All Too Human*, as it were, apologizes for being published. Voltaire is, in contrast to all who have written after him, above all a *grandseigneur* (Q) of the spirit: precisely what I am too."
>
> — Friedrich Nietzsche (1888), *Ecce Homo* (pg. 59)

"God if reason, the Bible is Newtonian physics; and the prophet is Voltaire."

— Anon (c.1900), summarized by Ching-Yao Hsieh [4]

"Several are well above the 200 IQ mark. Arnauld, Comte, Goethe, Grotius, Laplace, Leopardi, Michelangelo, Newton, Pascal, the younger Pitt, Sarpi, Shelling, **Voltaire** and Wolsey probably rated at 200 IQ or even higher. A group containing Voltaire must approach or perhaps exceed a score of 200"

— Catherine Cox (1926), *Early Mental Traits of 300 Geniuses* [6]

"Pascal and **Voltaire** both probably had IQs in the neighborhood of 200."

— Paul Popenoe (1927), "The Childhood of Genius: A Review" [7]

Quotes | By

The following are noted Voltaire quotes:

"Oh Plato, so much admired! I fear that you have told us only fables, and have never spoken except in sophisms. Oh Plato! You have done more harm than you know. How so? I shall be asked, but I shall not answer?"

— Voltaire (c.1755), *Publication*; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 253)

"Why should, and how can, existence be infinite? Newton demonstrated the reality of the vacuum. If in nature there can be a void beyond nature, wherein lies the necessity that entities should extend to infinity? What would an infinite extension be? It could no more exist that an infinite number."

— Voltaire (c.1755), *Publication*; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 253)

"The chain is not an absolute plenum. It is demonstrated that the heavenly bodies perform their revolutions in a non-resistant space. Not all space is filled. There is not, therefore, a series (suite) of bodies from an atom to the most remote of the stars; there can therefore be immense intervals between sensible beings, as well as between insensible ones. We cannot, then, be sure that man is necessarily placed in one of the links which are attached one to another in an unbroken sequence."

— Voltaire (1756), "personal note"; cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 363)

"If all the geniuses of the universe were assembled, Newton should lead the band."

— Voltaire (c.1760)

"Every man is the creature of the age in which he lives; very few are able to raise themselves above the ideas of the time."

— Voltaire (c.1760)

> "A clergyman is one who feels himself called upon to live without work at the expense of the rascals who work to live."
>
> — Voltare (c.1760) in FSM app

> "The question of good and evil remain in remediless chaos for those who seek to fathom it in reality. It is a mere mental sport to the disputants, who are captives that play with their chains."
>
> — Voltaire (c.1765) (Q) cited by Jennifer Hecht (2003) in *Doubt: a History* (pg. 345)

See also

- Advice of the Guardian of the Ragusa Capuchins
- Poem on the Lisbon disaster

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External links

- Voltaire – Wikipedia.

θΔics

In geniuses on, **Voltaire on religion** refers to views on religion, beliefs on the existence or non-existence of god, morality, good and evil, etc., of French thinker Voltaire (1694-1778), a self-defined deist, albeit technically an "atheism-curious agnostic deist", in categorizational terms, a Haught disbeliever (#9), albeit oft-labeled as an atheist and or at least a name prominent in atheism discussions publications.

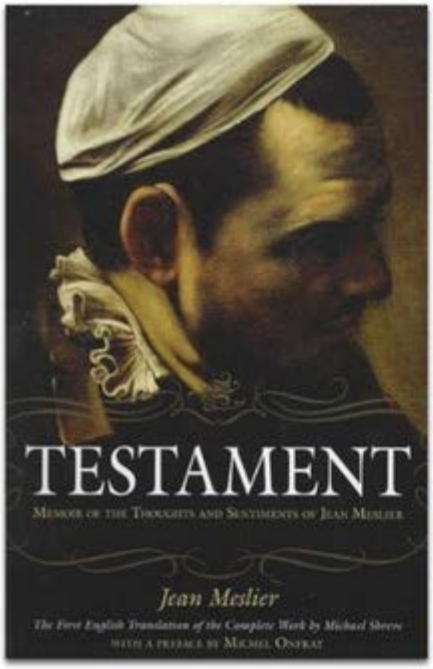

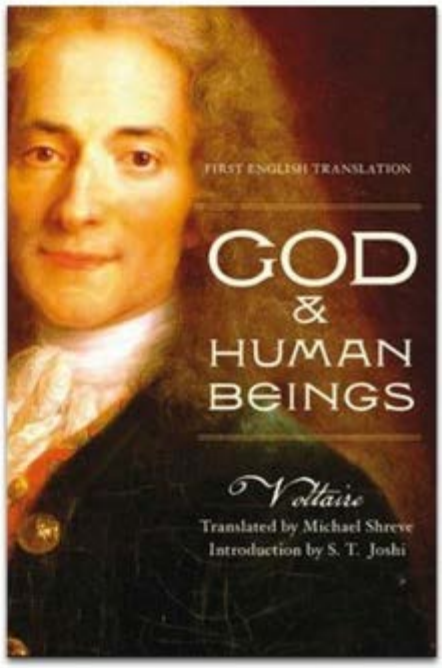

The views of **Voltaire on religion**, ranked by James Haught (1996) as one of the top 64 disbelievers (#9) of history, is an intricate one: in 1759, in his *Candice*, he made a parody out of Gottfried Leibniz's proposed solution to the problem of evil; sometime thereabouts he discovered the 1829 closet extreme atheism work of Jean Meslier, and into the 1760s began to promote Meslier's anti-Catholic views and proofs. In 1769, Voltaire published *God and Human Beings*, wherein he presents one of the first comprehensive works on comparative religion and mythology.

Pascal | Descartes

In 1733, Voltaire, in his *Philosophical Letters*, satirized the religious teachings of Rene Descartes and Blaise Pascal, including Pascal's famed "wager" on God. Voltaire wrote: "The interest I have in believing a thing is not a proof of the existence of that thing." Voltaire's French publisher was sent to the Bastille and Voltaire had to escape from Paris again, as judges sentenced the book to be "torn and burned in the Palace." (Ñº)

Leibniz

In 1759, Voltaire penned his satirical *Candice*, a parody of Gottfried Leibniz's problem of evil solution, the key section being the following: "Appalled, stupefied, distraught, covered in blood and shaking uncontrollably, Candice said to himself: 'If this is the best of all possible worlds, what must the others be like?'"

German philosopher Arthur Schopenhauer, the first "admitted and inexorable atheist" (Friedrich Nietzsche, 1882) among Germans, commented the following: [3]

> "I cannot assign to the *Theodicy* any other merit than that it gave rise to the immortal *Candice* of the great Voltaire. In this way, of course, Leibniz's oft-repeated and lame excuse for the evil of the world, namely that the bad sometimes produces the good, obtained proof that for him was unexpected."

(add discussion)

Meslier

In circa 1759, Voltaire obtained a copy of French closet atheist priest Jean Meslier's *Testament* (1729), wherein he explicitly denies the existence of god, denies the existence of the soul, dismissed the notion of free will, denounces all belief in an associated with god, and all religions, Christianity in particular, with a "frenzied anger that makes Richard Dawkins' *The God Delusion* seem like a work of reasoned scholarship", as atheism historian Nick Spencer (2014) puts it. Voltaire, however, found the Meslier's atheism too extreme for his tastes; or at least too extreme to be sided with publicly. The gist of the situation, in this time in history, is summarized well by Michel Onfray as follows: [7]

> "Meslier's war cry [*Testament*, 1729], never before heard in the history of western thought, offers one of the first true atheist moments, if not the first. Prior to him, they call the *agnostic* an atheist who, as Protagoras, concludes that when it comes to god one can conclude nothing; the *pantheist* who, such as Spinoza, affirms its existence consubstantial with nature; the *polytheist*, like Epicurus, who teaches its

multiplicity; the *deist*, in the way of Voltaire, for whom god creates the world en bloc, but does not care about the details; or whoever's idol does not correspond to the strict criteria established by the church. Now, the *atheist* clearly says that 'god does not exist'. This is what Meslier clearly writes: 'there is no god' (chapters 59, 74, 93, 94)—that is clear and distinct, blunt, and straightforward."

In 1761, Voltaire published corrupted version of Meslier's work entitled *Extract of the Sentiments of Jean Meslier*, wherein he omits the author's materialism and atheism, and focuses on his anti-Catholicism to serve his own purpose, and asserts falsely that Meslier asked for forgiveness on his death bed for writing such blasphemy; resultantly, Meslier, as Michael Onfray (2009) put it, becomes the "shield of Voltaire" and his anti-Catholic deism crusade. The following are a number of communicates, in the 1760s, of Voltaire promoting Meslier:

> "Apropos, they have lent me that work attributed to St. Evremon, and which is said to be by Dumarsais, of which you spoke to me some time ago; it is good, but the *Testament* of Meslier is still better!"
>
> — Jean d'Alembert (1764), "Letter to Voltaire", Jul 9

> "They have sent me two abstracts of Jean Meslier. It is true that it written in the style of a carriage-horse, but it is well suited to the street. And what testimony! That of a priest who asks pardon in dying, for having taught absurd and horrible things! What an answer to the platitudes of fanatics who have the audacity to assert that philosophy is but the fruit of libertinage!"
>
> — Helvetius (1763), "Letter to Voltaire", May 1

> "The *Testament* of Meslier ought to be in the pocket of all honest men; a good priest, full of candor, who asks god's pardon for deceiving himself, must enlighten those who deceive themselves."
>
> — Voltaire (1764), "Letter to Ferney", Jul 16.

> "**Meslier's** *Testament* is the most singular phenomenon ever seen among all the meteors fatal to the Christian religion."
>
> — Voltaire (1766) [2]

In 1772, Baron d'Holbach published, albeit anonymously, an atheism explicit version of Meslier's work entitled *Common Sense*, which included some of the above commentary.

Other

In 1769, Voltaire, penned his *God and Human Beings*, one of the first works in comparative religion and mythology. [4]

Influence

Lord Byron, early on, read enough of Voltaire and David Hume to become a skeptical agnostic leaning towards atheism. [5]

Quotes | Related

The following are other related Voltaire content quotes:

> "It is very important not to mistake hemlock for parsley; but not at all so to believe or not in god."

— Denis Diderot (c.1765), “Response to Voltaire” [3]

Quotes

The following are other related quotes by Voltaire:

> “The Bible. That is what fools have written, what imbeciles command, what rogues teach, and the young children are made to learn by heart.”
>
> — Voltaire (c.1750) [8]

> “I want my lawyer, my tailor, my servants, even my wife to believe in god, because it means that I shall be cheated and robbed and cuckolded less often. ... If god did not exist, it would be necessary to invent him.”
>
> — Voltaire (c.1760) [1]

> “Atheism is the vice of a few intelligent people.”
>
> — Voltaire (1764), *Philosophical Dictionary* (Ñº)

> “There are not sects in geometry.”
>
> — Voltaire (1764), *Philosophical Dictionary* (Ñº)

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External links

â— Voltaire quotes – PositiveAtheism.com.

θΔics

In thermodynamics, **volume** is an extensive quantity whose conjugate tension is pressure. [1] The elementary work exchanged with the surroundings by pressure forces is given by:

$$dW = -PdV$$

hence, a change in volume, *dV*, at a given pressure, enables the calculation of the the work done by the body during that process.

Overview

In 1778, French chemist Antoine Lavoisier, in his *Elements of Chemistry* stated the following, aka Boerhaave's law:

> "That every body, whether solid or fluid, is augmented in all its dimensions by any increase of its sensible heat, was long ago fully established as a physical axiom, or universal proposition, by the celebrated Boerhaave."

In other words, adding heat to a body or system (volume) causes expansion, and this fact is a physical axiom long ago established phenomenon of nature.

Social volumes

See main: Social volume

The translation of the understanding of thermodynamic volume in human reactions in systems, e.g. a country, town, or territory, etc., is extremely difficult and is at the core of human thermodynamics. When translated over into the human sphere, where people are considered as "human particles" or "human molecules", however, the understanding of this expansion boarders on the cutting edge of modern knowledge.

In 2005, Ingo Muller, in his *Entropy and Energy: A Universal Competition*, discussed socio-thermodynamics, wherein he correlates pressure-volume boundary work to "part of the habitat lost', whether the habitat is atoms, molecules, birds or men. [4]

Studies show, for instance, that alpha males and alpha females are given more individual or personal space. A supermodel, someone who, according to common opinion, is considered physically "hot", when walking alone through a crowd of people will be given more personal space than as compared to a more homely female. [2] Moreover, when people are asked to approach a stranger and stop when they no longer feel comfortable, they will stop about two feet away from a tall person (22.7 inches to be exact) but less than a foot (9.8 inches) from a short person. As height is correlative with physical attractiveness, e.g. shorter than average men and women are less attractive than taller men and women, it is found, according to attractiveness researcher Nancy Etcoff, that "very attractive people of any size are given bigger personal space and territory; which they carry around with them." [2] In other words, physically 'hot' molecules, in a sense, trigger volume increase be it a gaseous molecule or a human molecule. [3]

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θΔics

In thermodynamics, **volume change**, in terms of either a small differential volume change dV or large volume change ΔV, refers to a change in the three-dimensional structure of a body, delineated by a boundary (or boundary surface), on going from in initial to a final volume V during a reaction or process. This is expressed mathematically as:

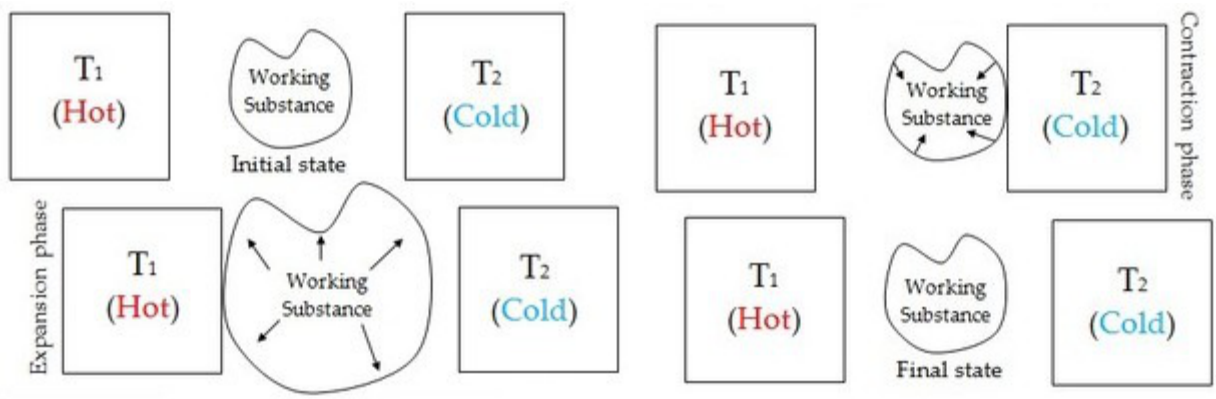

Left: The expansion phase (volume increase) of a standard heat cycle. Right: the contraction phase (volume decrease) of a standard heat cycle.

$$\Delta V = V_f - V_i$$

where V_f is the final volume of the system and V_i is the initial volume.

Social volumes

The measure of volume changes in human chemical processes and reactions can be understood in several ways: (a) in terms of daily heat cycle expansions of society due to expansion phase daily heat input from the hot body of the sun, followed by contraction during contact with the cold body of the night sky, (b) in terms of interpersonal chemical reactions, and the volume changes accruing therein, and (c) in terms of large scale territorial changes of societies over decades and centuries.

This reaction volume change aspect is illustrated adjacent, where in the initial state volume V_i two single men and two single women are shown each having a set amount of personal space, which he or she would occupy in a large city in terms of costly square foot living space, and in the final state volume, one man and one women have chemically reacted to form a dihumanide molecule (two human molecules bound as a single entity) or married pair at which point their previously dual volumes become united to into one shared space of existence, and hence a volume decrease accrued in the process, quantified by a specific amount of PΔV work energy.

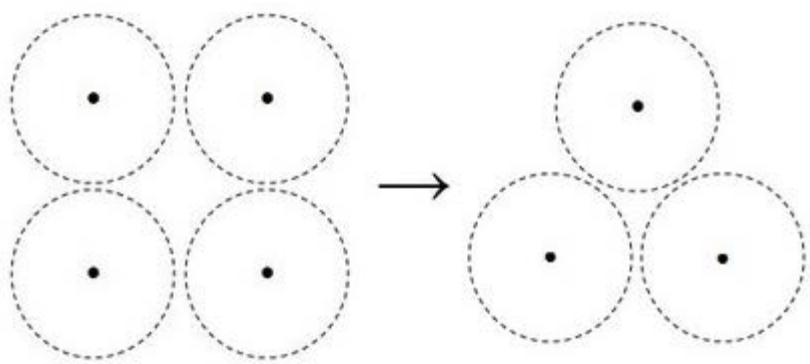

A depiction of volume decrease resulting from a change in the number of chemical entities in during a chemical reaction, such as would be the case when two atoms unite to form a diatomic molecule.

θΔics

In physics, **volume expansion**, as contrasted with volume contraction, is the process in which a body is made to increase in size, generally though the action of the addition of heat or through chemical reaction.

History

Dutch physicist Willem Gravesande's circa 1730 ball and ring experiment was one of the first measured experimental demonstrations of the phenomenon of expansion of a metal by heat. [1]

See also

- Boerhaave's law

References

1. Turner, Gerard L. (1983). *Nineteenth-century Scientific Instruments* (§Expansion, pgs. 112-). University of California Press.

θΔics

In hmolscience, **Vonda Neel McIntyre** (1943-) is an American biological geneticist turned science fiction writer noted, in literature thermodynamics, for her 1981 Star Trek series novel *The Entropy Effect*, themed on the topics of entropy, singularities (black holes), matter disintegrating into energy, time travel, the universe in chaos, among others. [1]

References

1. McIntyre, Vonda N. (1981). *The Entropy Effect.* Pocket Books.

External links

â— Vonda McIntyre – Wikipedia.
â— The Entropy Effect – Wikipedia.

θΔics

In hmolscience, [NAME] **Voronoff** (c.1860-c.1930) was a Russian sociologist noted for his 1909 *Foundations of Sociology*, wherein he tries to interpret social phenomena, supposedly, from the standpoint of "social mechanics" or "social physics" (O) and or "purely mechanistic" sociology; and defines, according to Pitirim Sorokin (1928), association and cooperation as "addition and multiplication of force", war and social struggle as "subtraction of forces", and social organization as "an equilibrium of forces. [1]

References

1. (a) Voronoff, NAME. (1909). *Foundations of Sociology*. Russia.
(b) Sorokin, Pitirim. (1928). *Contemporary Sociological Theories* (pdf) (§1: The Mechanistic School [pdf], pgs. 4-62). Harper & Brothers.
(c) Bierstedt, Robert. (1981). *American Sociological Theory: a Critical History* (pg. 309). Elsevier, 2013.

θΔics

In human chemistry, **Vyacheslav Ivanov** (1866-1949) was a Russian symbolist poet and philosopher noted for []

Overview

In circa 1910, Ivanov began to incorporat the ideas and concepts of German polymath Johann Goethe's human chemical theory, as presented in his 1809 *Elective Affinities*, into his philosophy, outlook on reality, and his own personal relationships. Ivanov, e.g., describes the "message" of *Elective Affinities* as follows: [1]

> "**True love** is a chemical affinity of human monads; they are elementally attracted to one another by the invincible necessity of a law of nature. In the spiritual and physical make-up of those predestined by nature to be joined, a series of inherent correspondences is found."

Here we see Ivanov mixing in German polymath Gottfried Leibniz' monad theory into the picture, with is mention of "human monads".

In his later years, Ivanov describes Goethe's *Elective Affinities* as "the ultimate revelation about the mystery of love". [1]

Elective affinity | Love letters

> *See also: Ernst Haeckel* (love letters)

Ivanov's love letters of 1895 to Lidiya Dmitrievna Zinov'eva-Annibal, whom he met early that year, and how eventually became his second wife, are filled with references to *Elective Affinities*, in regards to theory and comparisons of the characters to himself.

References

1. (a) Ivanov, Vyacheslav. (c.1900). *SS*, vol. 4, pg. 147.
(b) Wachtel, Michael. (1995). *Russian Symbolism and Literary Tradition: Goethe, Novalis, and the Poetics of Vyacheslav Ivanov* (*Wahlverwandtschaften*, pgs. 32-33; human monads, pg. 34). University of Wisconsin Press.
2. Wachtel, Michael. (1995). *Russian Symbolism and Literary Tradition: Goethe, Novalis, and the Poetics of Vyacheslav Ivanov* (Lidiya Dmitrievna Zinov'eva-Annibal, pgs. 31-36). University of Wisconsin Press.

External links

â— Vyacheslav Ivanovich Ivanov – Wikipedia.

θΔics

In symbols, **W** can refer to work done by force on a body, in physics or thermodynamics, or, in statistical mechanics and statistical thermodynamics, to the multiplicity or complexions of the particles of a Boltzmann-type system

Multiplicity

The multiplicity, W, from the German *Wahrscheinlichkeit* (meaning probability), is the number of quantum states associated with the macrostate of a system. [1] The probability of a macrostate, for an isolated system, is proportional to its multiplicity.

For systems, comprised of N identical particles, which satisfy the Boltzmann chaos assumption, the entropy of the system is found to be proportional to the multiplicity of the system:

$$S = k \ln W$$

References

1. Pauling, Linus. (1969). *Chemistry* (ch. 10.4: Entropy: the Probable State of an Isolated System, pgs. 350-54). Dover.

θΔics

In equations, the formula:

$$W = mgh$$

is called the “gravitational work”, or potential energy, and is the work done by a force on a body of mass *m*, against the force of gravity g, when the mass is raised though a distance of height *h* or, conversely, the work done by the force of gravity on the rock, when the mass is lowered through a distance of height h.

Overview

In 1686, English physicist Isaac Newton, in his famed *Principia*, established his second law of motion:

$$F = ma$$

which states that a force *F* acting on a body equals the product of the mass *m* of the body and the acceleration *a* of the body.

In 1784, French engineer Lazare Carnot published his *Essay on Machines*, which contained a statement that foreshadowed the principle of energy as applied to a falling weight.

In 1824, Lazare’s son, French physicist Sadi Carnot, in his famed *Motive Power of Fire*, the publication that launched the science of thermodynamics, defined ‘motive power’, or what is defined as ‘work’ in the modern sense, as “an effect likened to the elevation of a weight to a certain height, which has a measure of the product of the weight multiplied by the height to which it is raised; although, to note, he did not state this principle formulaically, but only mentions it in a footnote. [1]

In 1829, French physicist Gustave Coriolis, in his *Calculation of the Effect of Machines*, established the “principle of the transmission of work”, the foundation of the definition of work as force times distance, in rigorous mathematical format. The English translations for this work seem to be lacking, but the gist of Coriolis' derivation, which seems to use a certain amount of trigonometry and discussion of component forces, is the establishment of the the following equation:

$$W = Fd$$

In 1875, German physicist Rudolf Clausius, in the the opening paragraph to the finalized version of his *The Mechanical Theory of Heat*, in "Mathematical Introduction" section, summarized the gist of Coriolis's work principle with the following terse statement:

> “Whenever a body moves under the influence of a force, work is performed.”

This is the bedrock statement of the science of thermodynamics, the study of the relation between heat and work, as was captured previously in the opening paragraph to Sadi Carnot's *Reflections*, wherein he stated:

> “Everyone knows that heat can produce motion and that to heat are due the vast movements which take place on the surface of the earth.”

These are huge statements which require a deep concerted amount of thought to see how this applies to human motion,

in the sense that the force performs the work, not the person.

Derivation

Substitution of Newton's second law (1686) into Coriolis' work principle (1829) yields the following formula:

$$W = (ma)d$$

If, then, in the case of a weight lifted through a height or conversely descended through a height, the distance *d* becomes a measure of height *h*, and the acceleration *a* becomes the gravitational acceleration of earth *g*, whereby with substitution:

$$W = mgh$$

which is the stand formula for the calculation of gravitational work.

References

1. Carnot, Sadi. (1824). *Reflections on the Motive Power of Fire: and on Machines Fitted to Develop that Power*. Paris: Chez Bachelier, Libraire, Quai Des Augustins, No. 55.
2. (a) Coriolis, Gustave. (1829). *Calculation of the Effect of Machines, or Considerations on the Use of Engines and their Evaluation* (*Du Calcul de l'effet des Machines, ou Considérations sur l'emploi des Moteurs et sur Leur Evaluation*). Paris: Carilian-Goeury, Libraire.
(b) Coriolis, Gustave. (1844). *Treatise on the Mechanics of Solid Bodies and Calculation of the Effect on Machines* (*Traité de la Mécanique des Corps Solides et du Calcul de l'effet des Machines*) (section: Principle of the Transmission of Work in the Movement of a Material Point, pgs. 35-40). 2nd. Ed. Paris.

θΔics

In existographies, **W.S. James** (c.1883-c.1958), presumably “William James”, was a physicist and science historian, noted for []

Boyle | Mariotte

In 1928, James, in his “The Discovery of the Gas Laws: I. Boyle’s Law”, after giving a review of a number French 19th century science books, which basically “ignore Boyle” or state that Boyle “did not formulate and clear law”, with a number of English 19th century science books, which generally state that Mariotte “plagiarized Boyle’s works”, goes on to compare the actual published texts of both, namely he compares Boyle’s 1662 *On the Spring of the Air* with Mariotte’s 1676 *Discourse on the Nature of the Air*, generally finding that, while Mariotte does not cite Boyle, he does use the same apparatus as Boyle, and also uses much of the same terminology that Boyle used, such as:

> “The power of the dilation of compressed air can be likened to the power in a dry **sponge compressed**.”
>
> — Robert Boyle (1662), *On the Spring of the Air* [1]

> “We can understand this difference in air condensation, by the example of **several sponges**.”
>
> — Edme Mariotte (1676), *Discourse on the Nature of the Air* [1]

This air as "sponge", however, to note seems to come from Galileo's chapter “First New Science: Treating of the Resistance which Solid Bodies offer to Fracture” of his 1638 *Dialogues Concerning the Two New Sciences* (§1:1-108), wherein he refers to a "column of air" as being like a long "hemp rope".

James, next, also give the following comparisons:

> “This notion may perhaps be somewhat further explained by conceiving the air near the earth as **resembling fleece of wool**.”
>
> — Robert Boyle (1662), *On the Spring of the Air* [1]

> “To explain in general the rarefaction and the condensation of the air one can conceive that the air is something **similar to cotton**.”
>
> — Edme Mariotte (1676), *Discourse on the Nature of the Air* [1]

The following, likewise, have a strong overlapping similarity in terminology:

> “There is **a ‘spring’ or elastic power in the air** we live in. By which ‘έλατηρ’ or ‘spring of the air’, that which I mean is this: that our air either consists of, or at least, abounds with, parts of such a nature, that in the case they be being or **compressed by the weight** of the incumbent part of the atmosphere, or by any other, body, the do endeavour, as much as in them lieth, to free themselves from that pressure, by bearing against the contiguous bodies that keep them bent; and, as soon as those bodies are removed, or reduced to give them way, by presently unbending and stretching out themselves, either quite, or so far forth as the contiguous bodies that resist them will permit, and thereby expanding the whole parcel of air, these elastical bodies compose.”
>
> — Robert Boyle (1659), ‘Letter to nephew, Lord Dungarvan’ (pg. 8), Dec 20 [3]

> "**Air** can be condensed and expanded and **has a 'virtue of spring'**."
>
> — Edme Mariotte (1676), *Discourse on the Nature of the Air* [1]

> "Air condenses in **proportion to the weight** it is loaded with."
>
> — Edme Mariotte (1676), *Discourse on the Nature of the Air* [1]

(add)

Education

In 1928, James subtitled himself as "B.Ss., A.I.C." and in 1929 as "M.Sc., A.I.C.", presumably meaning that in 1929, he had completed a science degree, and that by 1929, he had completed a masters degree, presumably in physics.

Quotes | On

The following are quotes on James:

> "Towneley was the person who first suggested [what is now called] 'Boyle's law'. Boyle, however, is generally credited with the discovery that the pressure exerted by a gas is inversely proportional to the volume of the space in which it is confined. From Boyle's point of view, that discovery by itself was insignificant, and though he had provided the experimental evidence for it, he readily admitted that he had not found any general quantitative relation between pressure and volume *before* Richard Towneley suggested his simple hypothesis. Hooke also provided further experimental confirmation of the hypothesis. This 'hypothesis' was long known, on the continent, as 'Mariotte's law', because Edme Mariotte, proposed it in his *Essay on the Nature of the Air* (1679. There are good reasons (**James**, 1928/1929) for believing that Mariotte was familiar with Boyle's work [see: Spring of the Air (1660)] even though he does not mention it, so that he does not even deserve the credit for independent, much less simultaneous, discovery."
>
> — Stephen Brush (2003), *Kinetic Theory of Gases* (pg. 3) [2]

Quotes | By

The following are quotes by James:

> "In searching for the origins of any 'law' expressing a quantitative variation, it must be remembered that the qualitative result must necessarily be established *before* any attempt to discover a numerical relationship is made."
>
> — W.S. James (1928), "The Discovery of the Gas Laws, Part One: Boyle's Law" (pg. 263) [1]

References

1. James, W.S. (1928). "The Discovery of the Gas Laws: I. Boyle's Law" (abs), *Science Progress in the Twentieth Century (1919-1933)*, 23(90):263-72.
2. (a) James, W.S. (1928). "The Discovery of the Gas Laws: I. Boyle's Law" (abs), *Science Progress in the Twentieth Century (1919-1933)*, 23(90):263-72.
(b) James, W.S. (1929). "The Discovery of the Gas Laws: II. Gay-Lussac's Law" (abs), *Science Progress in the Twentieth Century (1919-1933)*, 24(93):57-71.

(c) James, W.S. (1930). “The Discovery of the Gas Laws: III. The Theory of Gases and Van der Waals Equation” (abs), *Science Progress in the Twentieth Century (1919-1933)*, 25(98):232-39.
(d) Brush, Stephen. (2003). *Kinetic Theory of Gases: an Anthology of Classic Papers with Historical Commentary, Volume One* (editor: Nancy Hall) (pgs. 3-4). Imperial College Press.
3. (a) Boyle, Robert. (1660). “The Spring of the Air”, Letter to Charles Lord Viscount.
(b) Boyle, Robert. (1774). *The Works of the Honorable Robert Boyle, Volume One* (editor: Thomas Birch) (§: Table of Contents of Five Volumes, pg. 145; §:1: New Experiments Physico-Mechanical Touching on the Spring of the Air, pgs. 1-75; §2: Defense of the Doctrine Touching the Spring of the Air, pgs. 75-118; elastical power, pg. 8). Millar.
(c) Brush, Stephen. (2003). *Kinetic Theory of Gases: an Anthology of Classic Papers with Historical Commentary, Volume One* (§1: Spring of the Air [section of letter to Charles Lord Viscount), pgs. 43-51). Imperial College Press.

Publications

● James, W.S. (1928). “The Discovery of the Gas Laws. I. Boyle’s Law” (abs), *Science Progress in the Twentieth Century (1919-1933)*, 23:261
● James, W.S. (1929). “The Discovery of the Gas Laws. II. Gay-Lussac’s Law” (abs), *Science Progress in the Twentieth Century (1919-1933)*, 24(93):57-71.
● James, W.S. (1930). “The Discovery of the Gas Laws: III. The Theory of Gases and Van der Waals Equation” (abs), *Science Progress in the Twentieth Century (1919-1933)*, 25(98):232-39.

θΔics

In terminology, **wahlverwandtschaft** is a German term that translates as “elective attraction” or elective affinity”; but, in more detail, is a complex word having the two part meaning:

> **wahl** [choice or election]
> **verwandtschaft** [affinities]

Ever since, the reception of the novel has been dogged by the controversy over whether Goethe's notion of “Wahlverwandtschaften” is more about **“Wahl”** (the choice to respect marriage vows despite one's contrary inclinations) or about **“Verwandtschaften”** (affinities which have no respect for social conventions).

A 2002 translation of **Walh-verwandtschaften** by Susan Gustafson. [6]

Translator Charles Leland (1893), in his translation of the works of Heinrich Heine, of note, translates (Ñº) *wahlverwandten* as “electively allied”.

In the plural sense, wahlverwandtschaften, with the suffix *-en*, means “elective attractions” or elective affinities. [1] In this sense, the full original German title, as Goethe would have conceptualized it, in the Baconian sense (1620) of the term "election":

> “It is certain that all bodies whatsoever, though they have no sense, yet they have perception; for when one body is applied to another, there is a kind of election to embrace that which is agreeable, and to exclude or expel that which is ingrate; and whether the body be alterant or altered, evermore perception precedeth operation; for else all bodies would be like one to another.”

might well be correctly rendered in English as:

> Die Wahlverwandtschaften | The Choice of [one's] Elective Attractions [elections towards attractions]

A rendition that, of course, embodies the age-old "choice or free will vs determinism" debate.

In 1960, Herbert Morgan Waidson (1916-1988), to noted, did a translation into English under the title *Kindred by Choice*, but the translation seems to have not been popular, and hence "correct", by virtue of the fact that no later mass production reprintings were made under that title.

Wahl

The term German prefix ‘wahl’ translates directly as *election* or "choice". [5]

Verwandtschaft

The German suffix term ‘verwandtschaften’ translates directly as *affinities* or 'relationship', or a mixture of both, depending on context. [7]

Etymology

The origins, the term "wahlverwandtschaften" or "elective affinities", stems from Greek philosopher Empedocles theory of the affinity forces of philia (love) and neikos (strife) existing between all bodies in the universe. Others expanded on this logic.

as 1799 Goethe wrote to Schiller (23 October) concerning the work of the French author Crébillon in terms that show that he thought of these forces as chemical ones:"There is not a trace in his work of the delicate relationship (Verwandtschaft) with which they (his characters) attract and repel each other, unite, neutralize each other, separate again and reestablish themselves."

An example 1990 English-to-German translation of the term "**verwandtschaften**" from the 1799 Goethe-Schiller discussion quote of Crebillon, wherein Goethe first begins to openly discuss his theory that human relationships are chemical relationships or affinity reactions. [8]

The name *affinitas* was first used in the sense of chemical relation by German philosopher Albertus Magnus in the year 1250 to qualify the combinations of bodies. In his *Book of the Marvels of the World*, Magnus outlined four principles related to affinity. The first principle of affinity is that likes attract to likes, meaning that an attraction between things with similar qualities or virtues exists, stated in general terms, referring to the Aristotelian elements: earth, air, fire, and water. The second affinity principle is that all things have prime, or first, qualities, but can acquire second or third qualities by association. The third affinity principle is that qualities may be innate to a whole species or to individual things. The fourth affinity principle is antagonism where just as all things attract related things with like qualities, they also 'repel' things with opposite qualities. Magnus' affinity theories and works were frequently reprinted well into the 16th century.

In 1620, English scientific philosopher Francis Bacon developed theories on chemical affinityto explain the inherent nature of motion and its causes. Bacon reasoned that 'dispute and friendship are the spurs to motion in nature, and the keys to her works.' Bacon defined chemical affinity as such:

> "It is certain that all bodies whatsoever, though they have no sense, yet they have perception; for when one body is applied to another, there is a kind of election to embrace that which is agreeable, and to exclude or expel that which is ingrate; and whether the body be alterant or altered, evermore perception precedeth operation; for else all bodies would be like one to another."

This logic, naturally, evolved into a conception of elective attractionor *elective affinity*, defined as 'a favorable inclination to one more than to another' or a process in which 'a substance tends to combine with certain substances in preference to others.'

The first table of affinity relations between a group of basic chemical species was compiled in 1718 by French chemist Etienne Geoffroy, during a translation into French of Isaac Newton's *Opticks*, wherein Newton described a series of affinity relations verbally. Geoffroy's affinity table was entitled: "Table of the Different Relations Observed between Different Substances" or *Tableau des différentes Rapports Observées entre Différentes Substances*, in French.

Left: a 1976 edition Goethe's *Wahlverwandtschaften*, with essay Walter Benjamin notes by Hand J. Weitz (notes). [4] Right: *Wahlverwandtschaften*: German language version of the 1996 Italian-language film: *Les affinities electives* (*Elective Affinities*), written and directed by: Paolo Taviani and Vittorio Taviani; produced by: Jaen-Claude Volpi.

The term die wahlverwandtschaften, meaning "The Elective Affinities", was famously used as the title of German polymath Johann Goethe's 1809 novella *Elective Affinities*. [2] Goethe said that he adopted the term from the 1782 translation of Swedish chemist Torbern Bergman's chemistry textbook *De Attractionibus Electivas* (*A Dissertation on Elective Attractions*), which is an expanded version of Geoffroy's original table, with affinity reaction diagrams and explanation. [3]

References

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2. (a) Die Wahlverwandtschaften – Wikipedia (German).

(b) Die Wahlverwandtschaften (German → English) – Wikipedia.
3. Tantillo, Astrida, O. (2001). *Goethe's Elective Affinities and the Critics* (pg. xvii). New York: Camden House.
4. Goethe, Johann. (1976). *Wahlverwandtschaften* (with Essay by Walter Benjamin and notes Hand J. Weitz). Frankfurt AM Main: Insel Verlag.
5. Wahl (German → English) – Google Translate.
6. Gustafson, Susan F. (2002). *Men Desiring Men: the Poetry of Same-sex Identity and Desire in German Classicism* (excerpt, pg. 68; Ch. 2, Section: Elective Affinities or Metaphors of Self and (Same-Sex) Desire, pg. 67-91). Wayne State University Press.
7. Verwandtschaften (German → English) – Google Translate.
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θΔics

In religio-mythology, **Wakeman Ryno** (1849-1918) was an American physician and comparative mythologist noted for []

Noah

In 1912, Ryno, in his "Comparative Mythology", opened to the following: [1]

> "The misnomer *Semitic* and *Hamitic*, pertaining to the reputed descendants of Shem and Ham, are still in use in our Encyclopedias, Histories, and Dictionaries, is one of the unanswered queries of the times. **It is admitted by some of the most learned theologians that no such men ever lived as Noah, Shem, Ham, and Japheth**; that they are merely personifications of a year of three seasons; and that it would be just as proper to say the descendants of Summer, as to say the descendants of Shem; or the descendants of Winter, as to say the descendants of Ham."

(add discussion)

Abraham

Ryno then goes on, among other interesting details, to give one of the first overly-cogent Abraham as "father Ra, born of earth, at is fire city" etymologies:

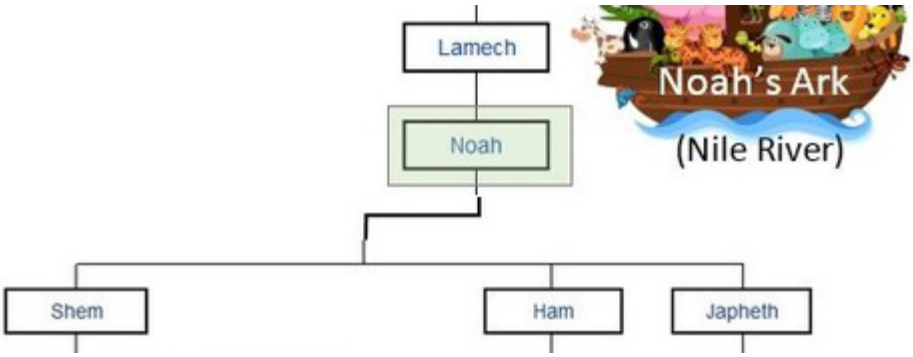

The Noah family, from the religio-mythology genealogy page, who Ryno rightly defines as "personifications" of something, which he seems to think are seasonal.

> Here Adam and Eve (Earth and Sky, Sibu and Nuit) mourned their first born Abel (summer), who had been killed by his brother Cain (lance), with the lance-like frosts of winter. Here Abraham (Ab-RA-Ham, father Ra at his Fire-City) mourned his father Terah (Earth). Here is where the God Saturnus mourned his mother Terra (Earth). Here is the dark abyss of Tartarus where Cronus receives his scythe. Here is the Ur of Chaldees, where Old Father Time cuts off the year with his sickle.

(add discussion)

Keys

Ryno was found in Google Books via the keys: Abram, Ab-ram, father Ra, following reading Wallis Budge translation of "father Ra" text, which prompted search idea for term "Ab-Ram". [2]

References

1. Ryno, Wakeman. (1912). "Comparative Mythology" (Ñº), *The American Antiquarian and Oriental Journal*, 34:41-46.
2. Budge. Wallis. (1899). *Egyptian Religion: Egyptian Ideas of a Future Life* (pg. 70). Publisher.

External links

â— Wakeman Ryno (grave) – FindAGrave.com.

θΔics

In hmolscience, **Walker Percy** (1916-1990) was an American author, who in his writings explored the "dislocation of man in the modern age", as seen by a Southerner, with deep Catholic faith, albeit with existential questioning—his best work being the *The Moviegoer*.

Physical science | Social science

Percy, in his *The Moviegoer*, pens the following semi-famous quote: [1]

> "As late as a week ago, such a phrase as 'hopefully awaiting the gradual convergence of the physical sciences and the social sciences' would have provoked no more than an ironic tingle or two at the back of my neck. Now it howls through the Ponchitoula Swamp, the very sound and soul of despair."

This is the opening quote to American economics historian Philip Mirowski's *More Heat Than Light* (1989), seemingly indicating a sort of mental outlook kinship between the two. [2]

Kierkegaard

In circa 1945, while performing an autopsy, Percy contracted tuberculosis, after which he spent several years recuperating (see: genius hiatus effect) at the Trudeau Sanitarium, New York, during which time he read and was greatly influenced by the existentialism theories of Danish philosopher Soren Kierkegaard and the Russian novelist Fyodor Dostoevsky. Thereafter, he began to question the ability of science to explain the basic mysteries of human existence, and in 1947 converted into the Catholic faith.

Percy's *The Moviegoer* is said to be heavily influenced by the *existentialist* themes of authors, Søren Kierkegaard, in particular, whom Percy read extensively. [3]

Suicide

In 1917, when Percy was one, his grandfather committed suicide; in 1929, when Percy was 13, his father committed suicide (see: early parental death and genius); in 1931, when Percy was 15, his mother committed suicide, by driving her car off a bridge. Thereafter, Walker Percy and his two younger brothers, LeRoy (Roy) and Phinizy (Phin), moved to Greenville, Mississippi, where their second cousin William Alexander Percy, a bachelor lawyer and poet, became their guardian, where he was raised agnostic.

Education

Percy completed his BS in chemistry in 1937 at the University of North Carolina, his MD in 1941 at the College of Physicians and Surgeons, Columbia University, after which he began practicing as some type of general practitioner. [4]

References

1. Percy, Walker. (1961). *The Moviegoer* (pg. #). Alfred A. Knopf.
2. Mirowski, Philip. (1989). *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (pg. v). Cambridge University Press.
3. The Moviegoer – Wikipedia.
4. Walker Percy – NNDB.

External links

â— Walker Percy – Wikipedia.

θΔics

In nouns, **walking encyclopedia** is a semi-literal figure of speech used to refer to someone in possession of a large amount of knowledge, in general or sometimes on a specific subject, often being immediately reproducible. [1]

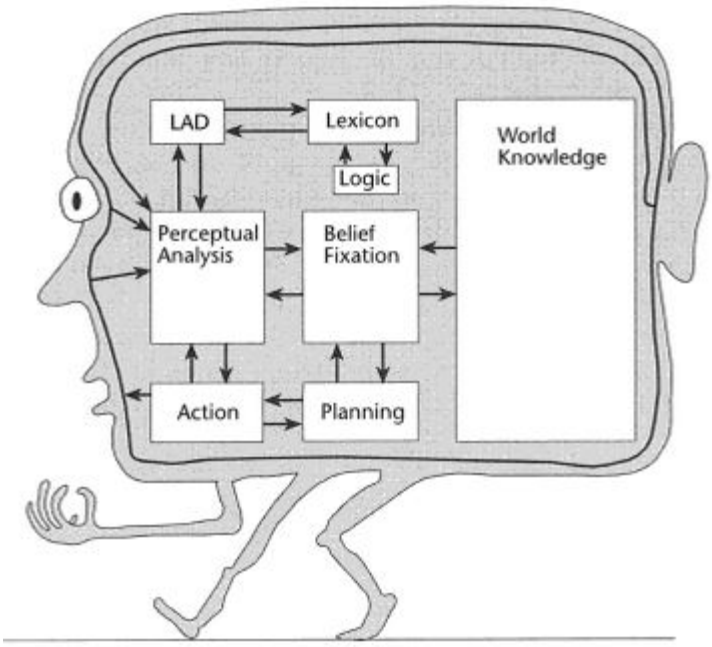

American cognitive science philosopher Daniel Dennett's 2001 conception of the processing system of a **walking encyclopedia** type of person, which he characterizes as the one kid in school who knows it all, answers all the teachers questions, memorizing all the capitals of every state and country in the world, etc. [4]

Genius | Walking encyclopedia

Some people, to note, may be classified as a "walking encyclopedia", e.g. memory savant Kim Peek, able to recall the exact contents of some 13,000 books, but not necessarily classified as a genius, e.g. Peek was classified as an idiot savant. The following quote may give some feel to this model:

> "Nineteenth-century man is a **walking encyclopedia**, stuffed with useless knowledge."
>
> — Nietzsche (c.1878) (Ñº)

American cognitive science philosopher Daniel Dennett's 2001 conception of the processing system of a walking encyclopedia type of person, shown adjacent, gives insight into the notion that a genius may devote more time developing the "belief fixation", "planning", and possibly action (e.g. inventive genius, military genius, scientific genius, etc.) than as compared to the pure encyclopedia genius (e.g. trivia genius) who may devote more time to pure memory of all knowledge generally, allocating equal amounts of memory energy to each factoid, without thought to the relative importance of each bit of knowledge, in respect to analysis, belief, planning, and action. [4]

> "To know and not to do—is not to know at all."
>
> — Goethe (c.1815) (Ñº)

The above quote by Goethe lends some credence to this model of having knowledge but not doing or putting the knowledge into action.

Some of this overstuffing of useless knowledge may have something to do with the theory of axon-dendrite trimming, that supposedly occurs in children during the general education to focused application process.

Encyclopedist | Walking encyclopedia

A related term is encyclopedist, referring to one who writes encyclopedias. One may, for example, be both a walking encyclopedia and an encyclopedist, though not always. [1]

Among American Presidents, to go through an example, is American political philosopher Thomas Jefferson, with his 180 IQ, 6,487 book personal library, and "last persons to know everything" and polymath-polyglot status, has often been characterized as a walking encyclopedia:

> "Mr. Jefferson was, himself, a living and **walking encyclopedia**."
>
> — William Wirt (1833) (Ñº)

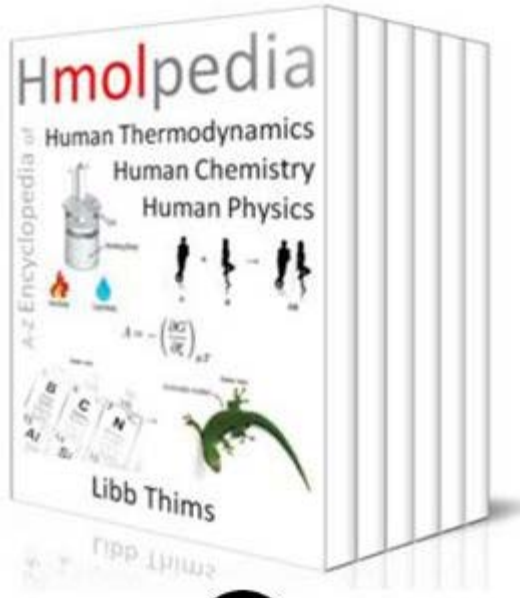

Although he, himself, was not an encyclopedist per se, i.e. he did not actually write any form of exhaustive encyclopedia on any given subject, he did frequently meet up with other actual encyclopedists at the famous Café Procope—meeting ground to Voltaire (IQ=195) and Denis Diderot (IQ=165), the latter maker of the first modern encyclopedia (see: epicenter genius) — those including: Benjamin Franklin, and John Paul Jones. [2]

Thims | Walking encyclopedia

An example of someone who is often described as a "walking encyclopedia" and who has written an encyclopedia (*Hmolpedia*) is American electrochemical engineer Libb Thims:

> "Libb Thims is [walking] **encyclopedia** of human thermodynamics."
>
> — Milivoje Kostic (2013), introduction to Libb Thims during his April NIU lecture [3]

American Libb Thims depicted as a "**walking encyclopedia**" epitaph assigned to him by several people, including Milivoje Kostic (2013).

Other

A related term that has made its way into the fiction world as of late is "walking Wikipedia"; though an actual non-fiction person associated with this term seems to be lacking. (Ñº)

See also

â— Walking molecule

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1. Walking encyclopedia – MacMillanDictionary.com.
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3. (a) Kostic, Milivoje. (2013). "Introduction of Speaker Comments", in: full video (time:), Apr 16.
(b) Thims, Libb. (2013). "A Guidemap to Human Chemical Thermodynamics: Goethe's Elective Affinities to Human Free Energies" (abs) (NIU announcement) (cover) (main) (full video) (abs video), Lecture to mechanical engineering thermodynamics students (professor: Milivoje Kostic), Northern Illinois University (NIU), Apr 16.
4. Dennett, Daniel C. (2001). "Things about Things" (§:Walking Encyclopedia, pgs. 137-), in: *The Foundations of Cognitive Science* (editor: Joao Branquinho). Oxford University Press.

θΔics

In science, **walking molecule**, similar to animate molecule, is an atomic structure or molecule, such as, myosin, kinesin or DTA, etc., that is able to move along a surface, through the action of induced movement, by alternating its appendices, driven by external energy source, e.g. heat or electric charge. [1]

History

The walking ability of kinesin seems to have been discovered in the late 1990s.

In September of 2005 a research team led German-born American physical chemist Ludwig Bartels at the University of California Riverside designed a molecule, called DTA or 9,10-DiThioAnthracene (Ñº) molecule, with a body made of linked benzene molecules and two sulfur atom legs, which when cooled down to -223°C they form rows (Ñº) and began to move in a straight line, walking on a flat copper Cu(111) surface, induce by a little heat, like a little human being. [2]

Molecules Take A Walk

c&en

Unidirectional motion gives researchers control important for molecular machines, self-assembly

Volume 83 Issue 40 | p. 1 | News of The Week
Issue Date: September 27, 2005

By ***Elizabeth K. Wilson***

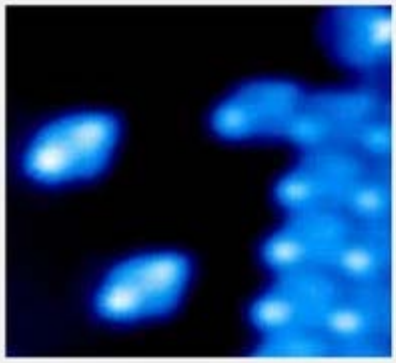

STROLLER
9,10-Dithioanthracene walks a straight line along a copper surface.
Click Image to View a video of the "walking" molecule in Quicktime format (6.2MB)
Credit: COURTESY OF LUDWIG BARTELS

SURFACE DYNAMICS

Scientists have designed a molecule that walks across a surface in a straight line, putting one bond in front of the other. Such purposeful control of a molecules motion is vital for advancing fields such as molecular self-assembly, molecular machines, and computing.

The electrically charged tip of a scanning tunneling microscope serves as a sort of carrot, luring a single 9,10-dithioanthracene molecule across a copper surface. A thermal vibration can also act as a lure. The researchers —**Ludwig Bartels**, assistant professor of physical chemistry and chemical physics at the University of California, Riverside, graduate student Ki-Young Kwon, and colleagues there and at Kansas State University—report their findings in an upcoming issue of ***Physical Review Letters***.

A 2005 Chemical & Engineering News article on Ludwig Bartels' 9,10-dithioanthracene molecule (DTA), a synthetic **walking molecule**, which is neither "alive" nor "dead", but a form of "powered animation" (see: life does not exist), no different, complexity aside, than human; the molecule is shown, via scanning tunneling electron microscope, walking, one leg or bond at a time, along a copper surface, induced to move (see: induced movement) using lures such as "thermal vibration" and "electrically-charged" carrots, a sort of electrochemical thermal tropism, so to say.

The news release for the results of this project, first published in the *Physics Review Letters*, was entitled 'Molecule Walks Like a Human.' [3] This tiny walking molecule, shown above, achieves this effect by mimicking the motor dynamics of a human walking. [4]

The molecule's motion, according to Bartels' research team, was extremely stable: "in tests, DTA took more than 10,000 steps without losing its balance once. Our work proves that molecules can be designed deliberately to perform certain dynamic tasks on surfaces," said research leader Ludwig Bartels. "Similar to a human walking, where one foot is kept on the ground while the other moves forward and propels the body, our molecule always has one linker on a flat surface, which prevents the molecule from stumbling to the side or veering off course."

Philosophical implications

In hmolscience, the existence of so-called "walking molecules", whether naturally occurring in the cell, e.g. kinesin or dynein, or synthesized in the laboratory, e.g. DTA, frequently becomes a highlighted or pointed out example, when debates arise as to the so-called "nature" of a human defined chemically as a "molecules" (human molecule) or "chemical" (human chemical), e.g. in life vs. non-life debates (see: defunct theory of life), morality debates, etc., wherein one is forced to side with the conclusion that the movement of each "type" molecule, whether kinesin or human, abides by the same movement, work, and energy confines of the laws of thermodynamics.

Walking principle

The following is the schematic representation of working principle of the walker migration along the four-foothold track: [6]

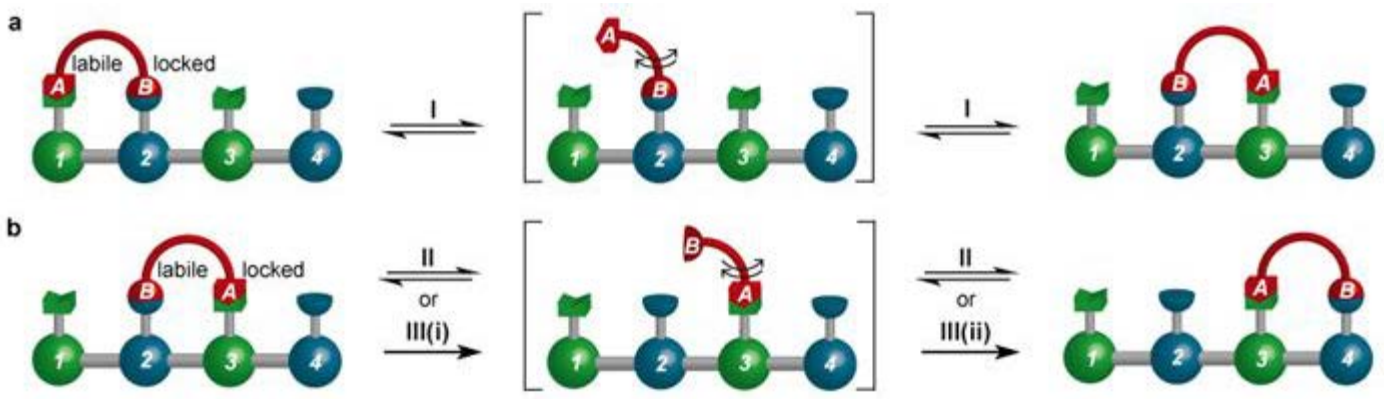

The following is the chemical structure representation of working principle of the walker migration along the four-foothold track: [6]

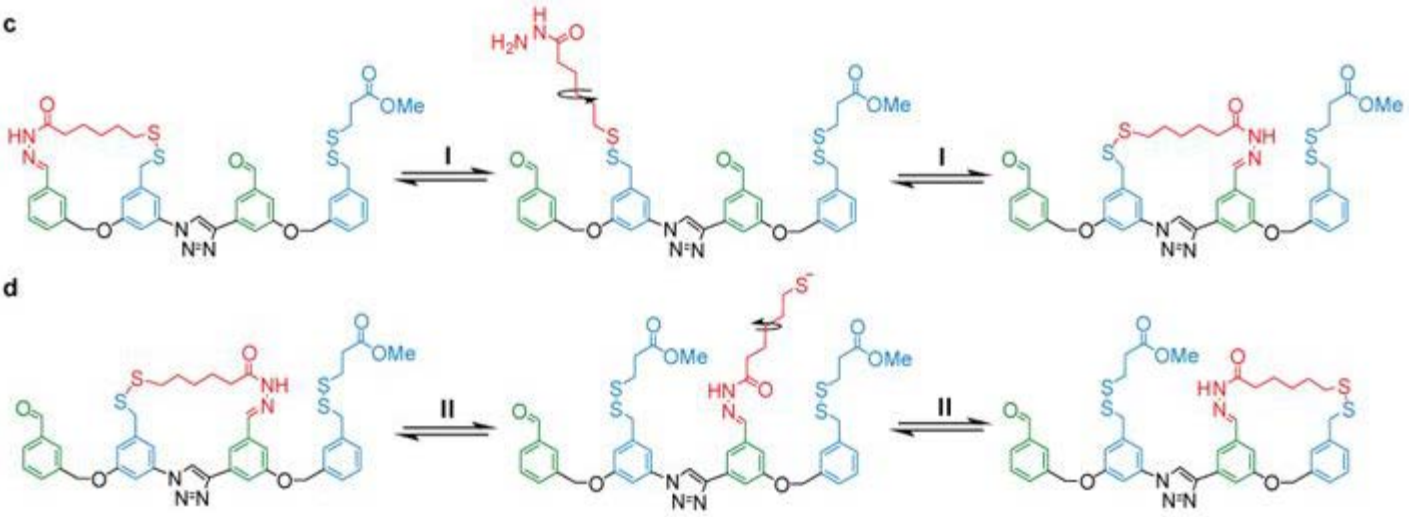

DTA

This tiny walking-molecule, called *9,10-dithioanthracene* or 'DTA', has two linkers that act like little mobile feet. DTA, is an organic molecule composed of a coal tar derivative called anthracene linked to a pair of sulfur-bearing functional groups on either side (referred to as "linkers"), which serve as the molecule's "feet". When the compound is heated on a flat copper surface, the linkers raise up, alternating from side to side, and propel the molecule forward.

Thus, obtaining its energy by heat supplied to it (similar to human molecules, obtaining their heat from the sun), the molecule moves such that only one of the linkers is lifted from the surface; the remaining linker guides the motion of the molecule and keeps it on course. Without the assistance of non-rails or nano-groves for guidance, the little molecule is able to alternate the motion of its two 'feet' so to walk in a straight line. These published results generated a great deal of interest and made the American Institute of Physics 'Top 25 Physics Stories for 2005.'

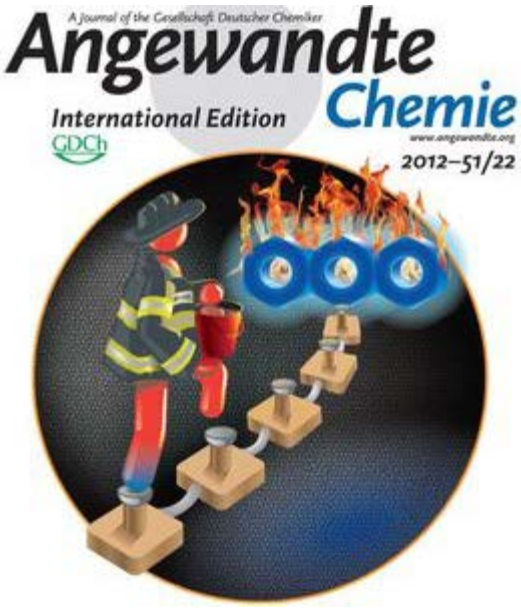

A 2012 depiction of task-performing walking molecule—a synthetic small molecule that walks through successive forward/retro "Michael reactions" to perform a task, namely quenching the fluorensence of an anthracene group at one end of the track—on the cover of *Angewandte Chemie*. [11]

Molecular carrier

In January of 2007, interestingly, Bartels' research team found a way to attach cargo: two CO_2 molecules (load), making the nano-walker a **molecule carrier** or worker. The new molecule carrier runs on a copper surface:

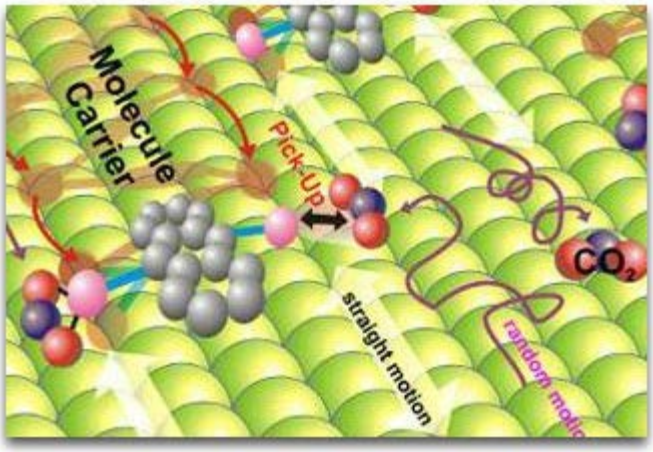

Bartels' molecular carrier can pick up and release up to two carbon dioxide (CO_2) molecules and carry them along its straight path. 'Carrying a load slows the molecule down' explained Bartels. 'Attachment of one CO_2 molecule makes the carrier need twice as much energy for a step, and a carrier with two CO_2 molecules requires roughly three times the energy. This is not unlike a human being carrying heavy loads in one or both hands.' [5]

He said his team will be pursuing the next step for this molecule carrier. 'Next, we would like to be able to make one go around corners, rotate its cargo or send out photons to tell us where it is.' This depiction, of human molecules looking at and studying simpler walking molecules, from a humorous perspective, might be analogous to how English naturalist Charles Darwin felt when, in 1838, he first looked at the great chimpanzees and realized they were related to us. [1]

Kinesin

The following shows two examples of walking molecules, below left a walking human molecule and below right a walking kinesin molecule carrying a load along a microtubule. [6] The comparison of the two, human and kinesin, leads into philosophical debates in regards to what exactly is the fundamental difference between the two "types" of two-legged walking molecules?

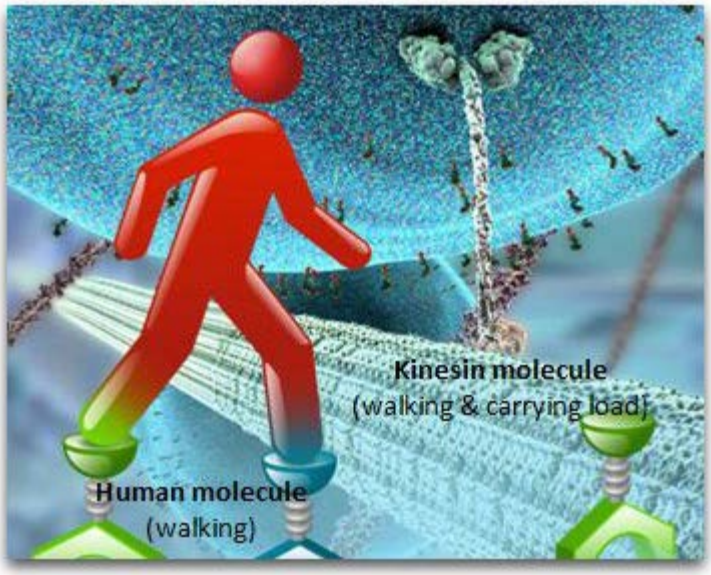

Shown below (left), is a two-legged kinesin molecule (left), carrying a load along a microtubule in a cell, as compared to a two-legged human molecule (right), pushing a boulder up a hill on the surface of the earth, which highlights certain philosophical conundrums in great need of rectification: life vs. non-life, free will, purpose, meaning, movement, mind-brain issues, consciousness, morality, etc., being that the "work" of each animate molecule is quantified by the very same thermodynamics.

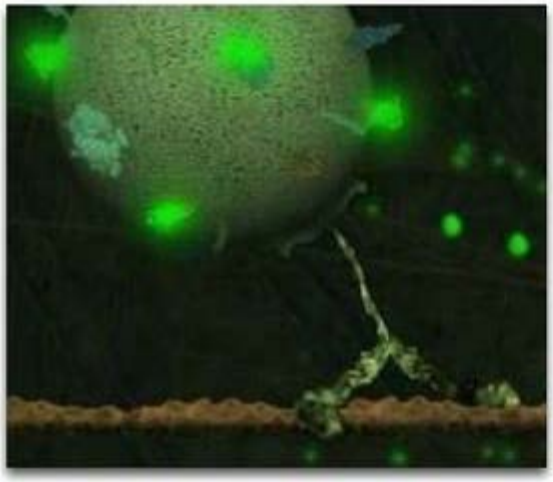
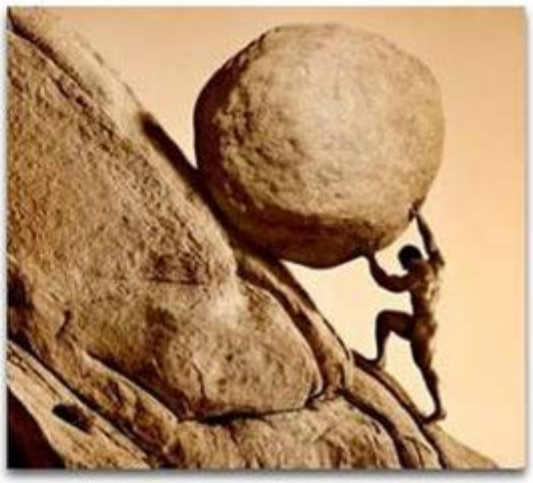

(add discussion)

Myosin

Myosins comprise a family of ATP-dependent motor proteins and are best known for their role in muscle contraction and their involvement in a wide range of other eukaryotic motility processes. They are

responsible for actin-based motility. The term was originally used to describe a group of similar ATPases found in striated and smooth muscle cells

Left: Myosin molecules move about actin filaments and cause cells to move using a "power stroke" (aka the "lever-arm swing") motion reminiscent of a caterpillar walking along a twig. The additive effect of countless myosin molecules pulling on actin filaments ultimately causes our muscles to contract. The physics of this interaction has previously been limited to speculation based on protein signatures, hypothetical models, and static images of the proteins. This 2011 video marks the very first moving image of these microscopic cellular events. Right: a 1999 animation of the molecular motor "kinesin" walking along a protofilament of a microtubule in for the Milligan and Vale Science paper. [10]

Multiple myosin II molecules generate force in skeletal muscle through a power stroke mechanism fuelled by the energy released from ATP hydrolysis. The power stroke occurs at the release of phosphate from the myosin molecule after the ATP hydrolysis while myosin is tightly bound to actin. The effect of this release is a conformational change in the molecule that pulls against the actin. The release of the ADP molecule and binding of a new ATP molecule will release myosin from actin. ATP hydrolysis within the myosin will cause it to bind to actin again to repeat the cycle. The combined effect of the myriad power strokes causes the muscle to contract. [9]

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4. University of California Riverside Newsroom (2005). "Molecule Walks Like Human".
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(b) Leigh group (publications) – Catenane.net.

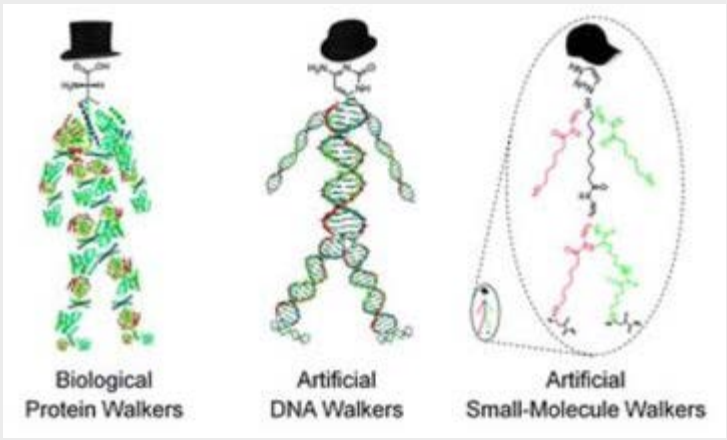

Scottish chemists Max von Delius and David Leigh's 2011 depictions of a DNA-based "**walking molecule**", a view from which the "life | non-life" issue dissolves into the nonsensical (see: defunct theory of life). [3]

Further reading

â— Deretsky, Zina. (2008). "Molecular Walker Takes Baby Steps", *National Science Foundation after figure by Peng Yin, Harry M. T. Choi, Colby R. Calvert and Niles A. Pierce, California Institute of Technology*. Aug.
â— Fountain, Henry. (2009). "Experiments Show that Molecules Can Walk, but Can They Dance?", *New York Times*, Science, Apr 07.
â— Hadlington, Simon. (2009). "Two-legged Molecular Walker Takes a Stroll", Dec 21.
â— Brown, Mike. (2010). "Molecular Robots on Nano-assembly Lines", Chemistry World, May 12.

External links

â— Kinesin – Wikipedia.
â— Dynein – Wikipedia.

θΔics

In hmolscience, **Wallace Donham** (1877-1954) was an American business school administrator noted for his 1933 speech "The Failure of Business Leadership", wherein, via influence of American physical chemist and physiologist Lawrence Henderson, he compares discusses the physiology of society and its moving equilibriums: [1]

> "The problem is one in the general physiology of society. The continuance of life and health for any individual depends on maintenance of a moving organic equilibrium within certain definite limits of tolerance. The daily work of the world is done by individuals living their specialized economic and social lives within a moving equilibrium … But specialized progress brought uneven social and economic developments and serious maladjustment. General equilibrium is lost. The limits of tolerance, the margins of safety, are exceeded."

Donham was a Harvard classmate of Henderson, whom, as second dean of Harvard Business School (1919-1942), he associated with in the Harvard School of Business Administration. [2]

In 1927, Henderson, for example, established the Fatigue Laboratory at Harvard Business School to discover physiological norms for human biological processes and to study the physiological changes that cause fatigue in workers. [3]

This would seem to put Donham in the Harvard Pareto circle, in some sense.

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3. Guides to Archival Collections – Harvard Business School Library.

External links

â— Wallace Brett Donham – Wikipedia.

θΔics

In religio-mythology, **Wallis Budge** (1857-1934) (IQ:155|#540) (RMS:67) (CR:107) was an English Egyptologist noted for his 1895 English translation of the *Egyptian Book of the Dead* (*Papyris of Ani*), and various publications to follow, in which he laid out the basic outline foundation of Egyptian theology, or Ra theology in core structure, wherein after it began to become apparent that Ab-ra-ham-ic theologies (Torah religions) and B-ra-hma-ic theologies (Vedic religions), which constitute over 72 percent of the modern world's belief system, are Egyptian-based religions, in derivative-syncretism structure, such as explained in the 1996-2000 work of American Egyptologist Gary Greenberg and 2003 work of American electrochemical engineer Libb Thims.

Book of the Dead | Recension theory

In 1842, Richard Lepsius published the first "standard edition" attempt at an English rendering of the Egyptian *Book of the Dead*, one from the papyrus of a Ptolemaic official named Iuwefankh. Lepsius divided this book into 165 chapters, assigning the numbers on the basis of the dividing lines and rubrics of that document. Additional chapters were added by Willem Pleyte, Edouard Naville, Wallis Budge, T.G. Allen, and others, raising the total number, as of 2008, to 192 chapters. [2]

Swiss Egyptologist Edouard Naville (c.1895) is credited with "recension theory" the assertion that there were both a "Theban recension" (18th-19th dynasties), i.e. those written before the Late Period, of the *Book of the Dead*, and a "Saite recension" (26th dynasty), after which the *Dead Book* became standardized into a specific order and "fossilized", as some have referred to it, in terms of content. [3] Budge promoted Naville's recension theory, by adding to it the Heliopolitan recension.

British Museum | Head

The following is an outline of the transition of heads or keepers of oriental antiquities of the British Museum: [6]

	Scholar	Span	Notes
1.	Samuel Birch (1813-1885)	1836-1886	"Birch and Brugsch are the two greatest masters of Egyptology." — Wallis Budge (1904), *The Gods of the Egyptians, V1* (pgs. 63-64)
2.	Peter Renouf (1822-1897)	1886-1991	Renouf disliked Budge intensely, considering him to be a "charlatan and a plagiarist", and instead preferred his friend and colleague Edouard Naville to succeed him. [5]
3.	**Wallis Budge** (1857-1934)	1891-1924	
4.	Henry Hall (1873-1930)	1924-1930	

(add)

Religio-mythology | Christianity

Budge, while professing at one point to be a "confessed Christian" (Q), devoted a noted effort, seemingly throughout his writings, at passing jabs and commentaries on similarities between the older Egyptian and Sumerian, in respect to

Hebrew beliefs, and the three of these in respect to Coptic Christianity, modern Christianity, and Islam.

> "In Osiris the Christian Egyptians found the prototype of Christ, and in the pictures and statues of Isis suckling her son Horus, they perceived the prototype of the Virgin Mary and her Child."
>
> — Wallis Budge (1899), *Egyptian Ideas of the Future Life* [1]

> "It may seem unnecessary to discuss Egyptian monotheism at such length, but the matter is one of great interest and importance because the literature of Egypt proves it to have been in existence in that country for more than three thousand five hundred years before Christ; in fact, Egyptian monotheism is the oldest form of monotheism known to us."
>
> — Wallis Budge (1904), *The Gods of the Egyptians, Volume One* (pg. 145) [4]

> "Much has yet to be done before all the comparisons and connections between the Egyptian and Christian systems can be fully worked out, but the facts quoted above will, perhaps, suggest the importance of the study."
>
> — Wallis Budge (1904), *The Egyptian Gods, Volume One* (pg. 281) [4]

> "We may note in passing another legend, which was popular among the Copts, to the effect that the Virgin Mary once hid herself and her son from their enemies in the trunk of the sycamore at Heliopolis, and that it is based upon an ancient Egyptian myth recorded by Plutarch which declared that Isis hid the body of Osiris in a tree trunk."
>
> — Wallis Budge (1904), *The Gods of Egypt, Volume Two* (pg. 108)

> "The rapid growth and progress of Christianity in Egypt were due mainly to the fact that the new religion, which was preached there by St. Mark and his immediate followers, in all essentials **so closely resembled** that which was the outcome of the worship of Osiris, Isis, and Horus that popular opposition was entirely disarmed. In certain places in the south of Egypt, e.g., Philae, the worship of Osiris and Isis maintained its own until the beginning of the fifth century of our era, though this was in reality due to the support which it received from the Nubians, but, speaking generally, at this period in all other parts of Egypt Mary the Virgin and Christ had taken the places of Isis and Horus, and the "God-mother" or "mother of the god" , was no longer Isis, but Mary whom the Monophysites styled Θεοτοκος [mother of god]. "
>
> — Wallis Budge (1904), *The Gods of Egypt, Volume Two* (pgs. 220-21) (Q)

(add)

Dynasty | Dating

Budge dynasty datings, to note, are off by many centuries, in some cases, compared to current Dynasty Datings. Budge (1904) (pg. ix), e.g., dates the 4th Dynasty to 3600BC, whereas modern schemes date this dynasty to 2613-2498BC [correction: 0.71]. He dates the New Empire (pg. ix) start to 1700BC, where as modern New Kingdom start is 1549BC [correction: 0.91].

Education

Budge began to study languages on his own at the age of 10. In 1878, he attended Cambridge University, where he studied Semitic languages, including Hebrew, Syriac, Ethiopic, and Arabic, continuing to study Assyrian on his own. In 1883, Budge began working in the department of Egyptian and Assyrian antiquities of the British Museum, a position in which he remained until 1924, specializing in Egyptology. During this period, Budge collected a large number of Coptic, Greek, Arabic, Syriac, Ethiopian, and Egyptian Papyri manuscripts and was involved in numerous archaeology digs in Egypt, Mesopotamia and the Sudan.

Thermodynamics

The work of Budge is important because one of the first issues that people grapple with when introduced to the hmol sciences, which is structured in the logic that each human is an animated reactive 26-element molecule (human molecule) whose interpersonal reactions are governed by the laws of thermodynamics and whose body (and mind) was synthesized over time through chemical mechanism, is the objection that (a) they have a soul and that this is "beyond" the discussion and measurement of modern physical science and (b) that they have free will with which they choose right and wrong, and hence one has to re-educate oneself in the historical etymology of the concept of the soul, soul weighting, life-death cycles, morality, free will vs choice, etc., all of which originated in Egyptian theology and was carried over into the mindsets of the average modern person though religious syncretism and modification.

Religion

Budge, supposedly, was a “confessed Christian” (Q), at least at some point in his existence.

Quotes | On

The following are quotes on Budge:

> “It would be improper to assume that Budge, despite his reluctance to adopt the newer German school pronunciation reform, never made valuable and lasting contributions to mainstream Egyptological studies. It was Budge who originally secured the *Papyrus of Ani* from Egypt and brought it to the British Museum. For this alone, the world owes him a vote of thanks. His books may be questionable by academic standards, but his output was huge, filling a very long bookshelf indeed, and inspiring generations of interested readers. His publication of the elephant folio editions of *The Papyrus of Hunefer* and *The Papyrus of Ani* are reason alone to appreciate his genius. Had it not been for Budge, this present volume would not exist.”
>
> — Daniel Gunther (2015), “Thoughts on the 20th Anniversary Edition” in the Faulkner-translation of *The Egyptian Book of the Dead* (pgs. 21-22) [5]

See also

- Religio-mythology scholars

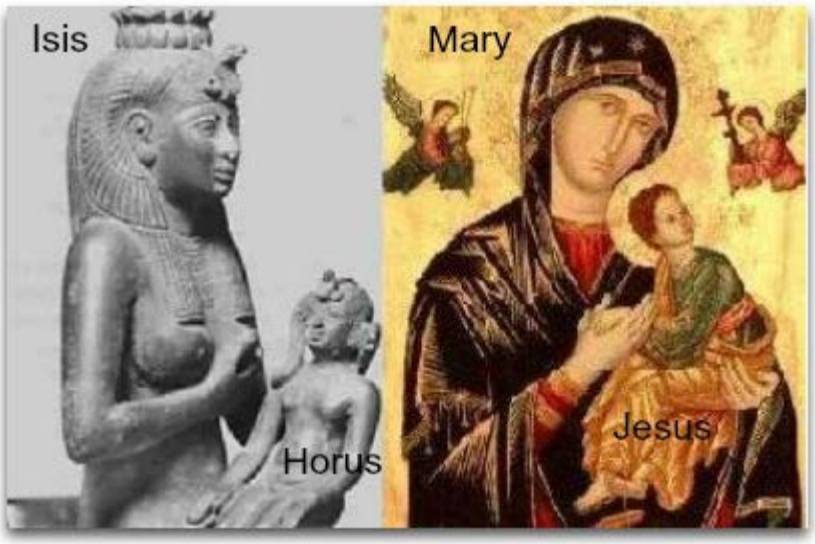

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θΔics

In hmolscience, **Walter J. Albersheim** (1897-c.1982) was a German-born American electrical engineer and physicist noted, in religious thermodynamics, for his 1948 to 1955 attempts to grapple with physics and religion.

Overview

In 1948, Albersheim was speculating on what he referred to as the paradox of free will. [1]

In 1955, Albersheim, in his "Entropy and Evil", ventured on the topic of how entropy relates to evil and morality [2]

Education

Albersheim was born in Cologne, Germany, on April 27, 1897. He completed his BS in electrical engineering degree and ScD in engineering from Aachen Institute of Technology in 1924. In 1948, Albersheim was being described as a physicist engaged in research with a US electrical manufacturing company, as being well versed in mysticism and the related topics, and a member of the national research council at the Rose-Croix University. [2] In 1957, he was working at Bell Telephone Laboratories. The 1982 book *The Conscience of Science*, seems to be a collected works of his various essays.

References

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θΔics

In existographies, **Walter Bagehot** (1826-1877) (CR:4) was a British mathematician, moral philosopher, and political economist noted for his 1873 *Physics and Politics: Thoughts on the Application of Natural Selection and Inheritance to Political Science*, cited by Judson Herrick (1956) as a "convincing argument", wherein he attempts to outline an evolution-based theory of political philosophy, admixtured with talk of nervous force, stored energy and power of the nervous system, albeit done in such a way that the sides with free will theory, and implicit Christianity, i.e. each individual "chooses" his or her own actions, autonomously and independent of external actions, impacts, or forces, the sum of the weight of the choices, and actions resulting being the measure of the "soul", term mentioned only once (Ñº), according to the argument that the mind acts on the forces of nature, rather than the reverse of such operation.

Overview

In 1873, Bagehot, in his *Physics and Politics*, first platforms off Thomas Huxley's *Elementary Physiology* (pgs. 284-86), with its discussion of reflex action and the nervous system, and Henry Maudsley's *Physiology and Pathology of the Mind* (pg. 73), with its talk of nervous force, complex modes of energy, and how the existence of the individual is but a "link in the chain of organic beings connecting the past with the future", he argues that there is a transmitted nerve element, or connective tissue of civilization, that works as a continuous force that binds age to age, which enables each to begin with some improvement on the last, which actuates via a cause and effect materialism, or via a play on the nerves of men, and a power associated with the principle of inheritance.

Freewill | Conservation of force

Bagehot, in his introductory section, digs into the crux of the matter as follows:

> "These principles are quite independent of any theory as to the nature of matter, or the nature of mind. They are as true upon the theory that mind acts on matter — though separate and altogether different from it — as upon the theory of Bishop Berkeley that there is no matter, but only mind; or upon the contrary theory — that there is no mind, but only matter; or upon the yet subtler theory now often held—that both mind and matter are different modifications of some one *tertium quid*, some hidden thing or force. All these theories admit —indeed they are but various theories to account for—the fact that what we call matter has consequences in what we call mind, and that what we call mind produces results in what we call matter; and the doctrines I quote assume only that. Our mind in some strange way acts on our nerves, and our nerves in some equally strange way store up the consequences, and somehow the result, as a rule and commonly enough, goes down to our descendants; these primitive facts all theories admit, and all of them labor to explain."

On this statement, he then situates the views of the "freewillists", who hold that a "special force of free volition is applied to the pre-existing forces of our corporeal structure", against the views of the "physicists", and the doctrine of conservation of force, which, if applied to decision, is "inconsistent with free will; if you hold that force 'is never lost or gained', you cannot hold that there is a real gain—a sort of new creation of it in free volition."

Bagehot then clarifies, his side, by saying that his doctrine has nothing to do with the universal conservation of force, nor does he confound his principles with Henry Buckle's idea that "material forces have been the main-springs of

progress, and moral causes secondary, and, in comparison, not to be thought of." Bagehot, conversely, states his platform as follows:

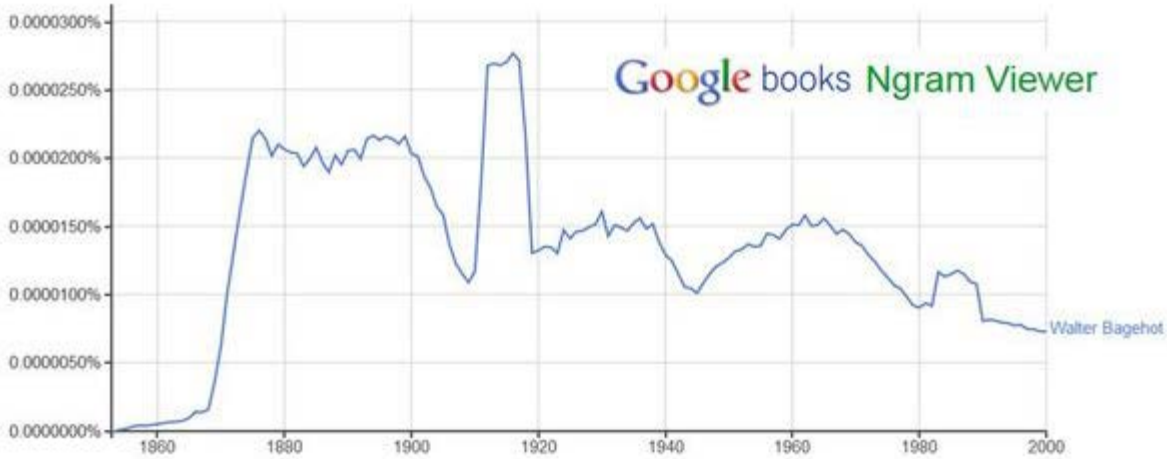

A 2015 Ngram view (Ñº) of **Walter Bagehot**, indicating that sidings with religion over that of modern science, when it comes to the specific question of forces, energy, power, the nervous system (mind or brain), and "will", i.e. free (free will) will or forced (forced will), leads to a decrease in mention of that point of view.

> "On the contrary, moral causes are the first here. It is the action of the will that causes the unconscious habit; it is the continual effort of the beginning that creates the hoarded energy of the end; it is the silent toil of the first generation that becomes the transmitted aptitude of the next. Here physical causes do not create the moral, but moral create the physical; here the beginning is by the higher energy, the conservation and propagation only by the lower."

Bagehot then goes onto intermix this position with discussion of how this might change political philosophy and political economics, after which he drifts into citation of jurisprudence and citation to Genesis chapters, i.e. theistic political philosophy.

Education

Bagehot completed his BS in mathematics (c.1846) and MA in in moral philosophy (1848) at the University College London. In 1860, he become the editor-in-chief of *The Economist*, founded by his brother-in-law James Wilson, wherein he reported on politics, therein influencing policymaking.

Praise | Tribute

The following are noted quotes:

> "**Bagehot**'s *Physics and Politics* is a work in some respects unfortunately influenced by early Darwinists, by the writings of Herbert Spencer and of contemporary anthropologists, to all of which Bagehot ascribed too much weight or intellectual authority. But after errors of judgment and fact have been deleted, *Physics and Politics* remains an important and original work. Possibly Bagehot's bad health while writing this book may explain the defects, for Bagehot had been of all the Victorians one of the freest from the influences of intellectual authority."
>
> — Lawrence Henderson (1938), "Sociology 23" (pg. 75) [3]

> "Condorcet's and Quetelet's social physics, as well as **Bagehot's** *Physics and Politics*, provided the outstanding attempts which began with the new-Platonists and culminated with the neo-positivists."
>
> — Paris Arnopoulos (2005), *Sociophysics* [2]

Quotes

The following are noted quotes:

> "One may incline to hope that the balance of good over evil is in favor of benevolence; one can hardly bear to think that it is not so: but anyhow it is certain that there is a most heavy debit of evil, and that this burden might almost all have been spared us if philanthropists as well as others had not inherited from their barbarous forefathers a wild passion for instant action."
>
> — Walter Bagehot (1873), *Physics and Politics*, cited by Henderson in: "Sociology 23" (pg. 75)

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θΔics

In existographies, **Walter Benjamin** (1892-1940) (PL:2K±) was a German literary critic noted, in human chemistry, for his 1921 essay "Goethe's *Elective Affinities*", first published by Hugo von Hofmannsthal in the *Neue Deutsche Beitrage* (1924/25), wherein he digs in to some of the meat and criticism of German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities* (see: Goethe timeline). [1]

American Goethean scholar Astrida Tantillo, in her 2001 book *Goethe's Elective Affinities and the Critics*, describes Benjamin as "by far the most influential critic of Goethe's *Die Wahlverwandtschaften* in the twentieth century." [2]

References

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External links

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θΔics

In thermodynamics, **Walter Raleigh Brown**e (1842-1884) was an English civil engineer notable for being the English translator of the 1879 second edition of German physicist Rudolf Clausius' textbook *The Mechanical Theory of Heat*. [1] At the time of publication Browne was a late fellow of Trinity College, Cambridge.

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θΔics

In hmolscience, **Walter Frederick Buckley** (1922-2006) was an American sociologist noted, in sociological thermodynamics, for his 1967 entropy themed general systems sociology theory.

Overview

In 1967, Buckely, in his *Sociology and Modern Systems Theory*, used concepts from general systems theory, such as entropy and negentropy, to develop sociology. [1]

Buckley used the term negentropy to refer to how social systems overcome disintegrating or decaying effects of entropy by importing sufficient energy and other resources to maintain themselves. [2]

Education

Buckley completed his PhD from the University of Wisconsin in 1956 later becoming professor of sociology at the University of New Hampshire.

References

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Further reading

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External links

â— Walter F. Buckley – Wikipedia.
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θΔics

In existographies, **Walter Cannon** (1871-1945) (CR:3) was an American physiologist, noted for []

Overview

In c.1932, Cannon advanced the homeostasis theory of Claude Bernard, the hypothesis that "stability of the internal environment [the *milieu intérieur*] is the condition for the free and independent life". [1]

Other

Cannon was an attendee of Lawrence Henderson's Harvard-Pareto circle.

Quotes | On

The following are quotes on Cannon:

> "Before nonlinear process was well understood and before dissipative structures [Prigogine (c.1971)] were proposed, indeed before **Cannon** (1960/1932) proposed biological homeostasis, a basic understanding of the selective advantage of such dissipative processes was proposed by Alfred Lotka."
>
> — Richard Adams (1988), *The Eight Day* (pg. 36)

References

1. (a) Henderson, Lawrence. (1927). "The Process of Scientific Discovery", in: *An Introduction to the Study of Experimental Medicine* (translator: H.C. Greene) (introduction, pgs. v-xii). Henry Schuman, 1949.
(b) Barber, Bernard. (1970). *L.J. Henderson on the Social System* (§2:149-58; quote, pg. 151; founder, pg. 153). University of Chicago Press.

External links

â— Walter Bradford Cannon – Wikipedia.

θΔics

In existographies, **Walter Charleton** (1619-1707) was an English religious apologist, noted for his attempt to reconcile so-called "Gassendist Epicureanism", the atomic theories of Epicurus as interpreted by Pierre Gassendi, and Christianity. [1]

Overview

Charleton was a friend of Thomas Hobbes and reader of Pierre Gassendi and Johann Helmont.

Quotes | On

The following are Charleton related quotes:

> "**Charleton** was the main conduit for the transmission of Epicurean ideas to England."
>
> — Jon Parker (1999), *Science, Religion and Politics in Restoration England: Richard Cumberland's De Legibus Naturae* (pg. 149)

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External links

- Walter Charleton – Wikipedia.

θΔics

In science, **Walter Elsasser** (1904-1991) was a German-born American physicist noted for his work in attempting to apply physics to biology (chnopsology), albeit in what seems to have been an antireductionist (see: reductionist anti-reductionist debate) and or unbridgeable gap way. His views, supposedly, are similar to the "ecology of mind" theories of Gregory Bateson, produced independently at about the same time.

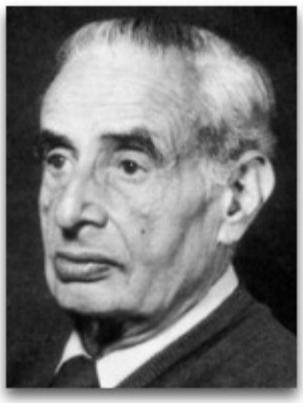

Unique events

Elsasser's so-called "unique events" theory, according to Swiss two-cultures literature theorist Erland Lagerroth, categorically, is an ontic opening; such as been employed in the ascendency theories of American chemical engineering ecologist Robert Ulanowicz. [1]

Biotonic laws

In 1958, Elsasser, in his *The Physical Foundation of Biology*, postulated the existence of higher so-called "biotonic laws", i.e. laws of nature which cannot be contained in the laws of physics, said to govern living systems. [2] English molecular biologist (chnopsologist) Francis Crick, in his 1966 *Of Molecules and Men*, derided Elsasser, defining him as an example of neovitalist, commenting on his book that: [4]

> "Although the book was published in 1958, and although it has a few passing references to recent developments in molecular biology, it was clearly conceived in an earlier era, and it is a beautiful example of the confusion that can be brought about by ignorance."

Hungarian-born American Eugene Wigner, conversely, in his 1967 *Symmetries and Reflections*, backed Elsasser up, commenting that he held a "firm conviction in the existence of biotonic laws." [3]

References

1. (a) Ulanowicz, Robert E. (2008). "Process Ecology: Creatura at Large in an Open Universe", in: *A Legacy for Living Systems: Gregory Bateson and Precursor to Biosemiotics* (pg. 125). Springer.
(b) Lagerroth, Erland. (2009). "In the Beginning was the Process", Aug. 11. Amazon.com Reviews.
2. (a) Elsasser, Walter M. (1958). *The Physical Foundation of Biology*. Pergamon Press.
(b) Gatlin, Lila L. (1972). *Information Theory and the Living System* (pg. 15). Columbia University Press.
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External links

● Walter M. Elsasser – Wikipedia.

θΔics

In neuroscience, **Walter Freeman** (1927-) is an American neuroscientist philosopher note for []

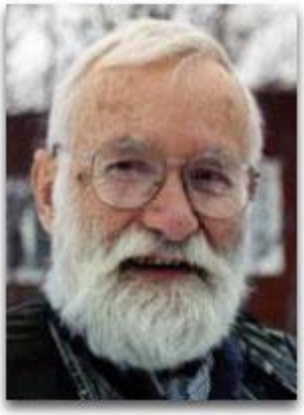

Overview

In 1995, Freeman, in his *Societies of Brains: A Study in the Neuroscience of Love and Hate*, argued that brain cells and or cortical patterns are analogs of Benard cell formation formed from thermodynamic fluctuations; the following is an example view: [1]

> "Each cortical pattern is a dissipative structure emergent from a microscopic fluctuation."

Freeman's neurological Benard cell theories are utilized in the emergence teleology theories of both Cuban-born American philosopher Alicia Juarrero and American neurological anthropologist Terrence Deacon. [2]

References

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(b) Deacon, Terrence W. (2011). *Incomplete Nature: How Mind Emerged from Matter* (pgs. 502-03). W.W. Norton & Co.

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External links

â— Walter Jackson Freeman III – Wikipedia.
â— Walter J. Freeman – MachinesLikeUs.com.

θΔics

In existographies, **Walter Heitler** (1904-1981) (GPE:#) was a German physicist noted, in chemistry, for []

Overview

In 1927, Heitler, in his article "Interaction of Neutral Atoms and Homopolar Bonding according to Quantum Mechanics", co-authored with Fritz London (1900-1954), used Danish physicist Niels Bohr's model of the atom (Bohr model), French physicist Louis de Broglie's electron wave theory, and Austrian physicist Erwin Schrödinger's wave equation, to quantify and conceptualized the idea that the movements of the electrons, technically called electron wavefunctions—mathematical expressions involving the coordinates of the electrons in space—can join together mathematically with plus, minus, and exchange terms, to form a Lewis-type covalent bond. [1] In short, they explained the interaction and bonding of atoms according to quantum mechanics, thus launching the subject of quantum chemistry.

Terms such as bound state, binding energy, overlap integral, exchange energy, supposedly, all stem from this so-called Heitler-London theory. [2]

Heitler commented the following on his new quantum mechanical bonding model discovery, in retrospect: [3]

> "I slept till very late in the morning, found I couldn't do work at all, had a quick lunch, went to sleep again in the afternoon and slept until five o'clock. When I woke up...I had clearly...the picture before me of the two wave functions of two hydrogen molecules joined together with a plus and minus and with the exchange in it. So I was very excited, and I got up and thought it out. As soon as I was clear that the exchange did play a role, I called London up, and he came to me as quickly as possible. Meanwhile I had already started developing a sort of perturbation theory. We worked together then until rather late at night, and then by that time most of the paper was clear.... Well...at least it was not later than the following day that we had the formation of the hydrogen molecule in our hands, and we also knew that there was a second mode of interaction which meant repulsion between two hydrogen atoms, also new at the time—new to chemists, too."

(add)

Quotes | By

The following are quotes by Heitler:

> "My interest in science awoke rather early, at the age of 10 or 12 or so. I don't think it was stimulated by a special home atmosphere or by school. My father was a professor for engineering, and so the atmosphere at home was certainly not unfavorable, but it did not particularly stimulate interest in science. I was first interested in astronomy; at the age of 12 or so I made myself a telescope from an old camera lens and the objective of an old microscope. I was very happy then that I could see the ring of Saturn and so on. Well, later at the age of 14 or 15 I became interested in practically everything scientific — mathematics, physics and chemistry, even geology. I installed a chemical laboratory in the bathroom which was perhaps not always to the pleasure of my family, and so on. My school education was mainly classic, Latin and Greek. And for this I'm very grateful, in fact. Especially I derived a great deal of pleasure and interest from Greek — Greek philosophy, Greek poetry. Plato was my favorite philosopher, and perhaps he still is. The science, teaching in school was rather poor; my mathematics teacher was a kindly old man, but as I usually was far in advance of his lessons, I used the mathematics lessons for preparing the next Latin lesson or so, and he didn't object. The physics teacher's main concern was to be against Einstein and against relativity. Well, I was not on very good terms with him, or he was not with me, to put it more precisely, especially since he once discovered that I was reading a book by Einstein secretly under my desk."

— Walter Heitler (1963), “Interviewed by John Heilbron” (Ñº), Mar 18

See also

â— History of chemical bonding theory

References

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3. Heitler, Walter. (1963). “Article” (quote), *AHQP* (Archive for the History of Quantum Physics), volume 6. March 18.

External links

â— Walter Heitler – Wikipedia.

θΔics

In existographies, **Walter Lippmann** (1889-1974) (HD:62) (FA:165) was an American journalist and philosopher, noted for []

Overview

In 1929, Lippmann, a Jew turned atheist humanist, who had previously associated with George Santayana, William James, and Woodrow Wilson, published *A Preface to Morals*, wherein he analyzed the "values vacuum" of the 1920s, observing that thinking modern people no longer could embrace religion or totally trust human institutions, and thus were left in a limbo of uncertainty, commenting how while previous generations had followed orthodox dogmas, new times had brought "brave and brilliant atheists". Lippmann, citing Santayana, herein, refers to what he calls the "romantic theory of affinities", as follows: [1]

> "This is the reason why the popular conception of romantic love as the meeting of two affinities produces so much unhappiness. The 'mysterious glow of passion' (Santana, c.1930) (O) is accepted as a sign that the great coincidence has occurred; there is a wedding and soon, as the **glow of passion** cools, it is discovered that no instinctive and preordained affinity is present. At this point the wisdom of popular romantic marriage is exhausted. For it proceeds on the assumption that love is a mysterious visitation. There is nothing left, then, but to grin and bear a miserably dull and nagging fate, or to break off and try again. The deep fallacy of the conception is in the failure to realize that compatibility is a process and not an accident, that it depends upon the maturing of instinctive desire by adaptation to the whole nature of the other person and to the common concerns of the pair of lovers. The **romantic theory of affinities** rests upon an immature theory of desire."

(add)

Quotes | By

The following are quotes by Lippmann:

> "The radical novelty of modern science lies precisely in the rejection of the belief, which is at the heart of all popular religion, that the forces which move the stars and atoms are contingent upon the preferences of the human heart."
>
> — Walter Lippmann (1955), *The Public Philosophy* [2]

See also

- Fritz Lipmann

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(b) Haught, James A. (1996). *2000 Years of Disbelief: Famous People with the Courage to Doubt* (pg. 266-68). Prometheus.
2. (a) Lippmann, Walter. (1955). *The Public Philosophy*. Publisher.
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External links

- Walter Lippmann – Wikipedia.
- Walter Lippmann – FFRF.org.

θΔics

In hmolscience, **Walter Pater** (1839-1894) was English essayist noted for []

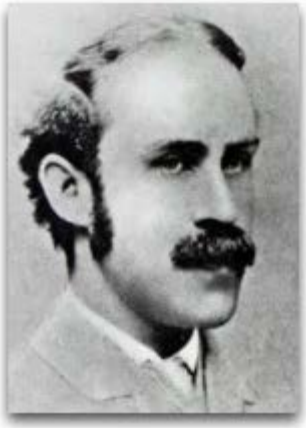

Overview

In 1873, Pater, in his *The Renaissance*, described life as some type of perpetual motion flame (see also: living flame); the main section of which is as follows: [1]

> "To regard all things and principles of things as inconstant modes or fashions has more and more become the tendency of modern thought. Let us begin with that which is without—our physical life. Fix upon it in one of its more exquisite intervals, the moment, for instance, of delicious recoil from the flood of water in summer heat. What is the whole physical life in that moment but a combination of natural elements to which science gives their names? But these elements, phosphorus and lime and delicate fibres, are present not in the human body alone: we detect them in places most remote from it. Our physical life is a perpetual motion of them—the passage of the blood, the wasting and repairing of the lenses of the eye, the modification of the tissues of the brain by every ray of light and sound—processes which science reduces to simpler and more elementary forces. Like the elements of which we are composed, the action of these forces extends beyond us; it rusts iron and ripens corn. Far out on every side of us these elements are broadcast, driven by many forces; and birth and gesture and death and the springing of violets from the grave are but a few out of ten thousand resulting combinations. That clear perpetual outline of face and limb is but an image of ours under which we group them—a design in a web, the actual threads of which pass out beyond it. This at least of flame-like our life has, that it is but the concurrence, renewed from moment to moment, of forces parting sooner or later on their ways."

Pater, amid these conclusions, cites a number of renaissance men: Goethe, Voltaire, Novalis, Comte, Hegel, Da Vinci, Rousseau, Victor Hugo, among others.

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External links

â— Walter Pater – Wikipedia.

θΔics

In existographies, **Walter Russell** (1871-1963) (CR:1) was an American painter, sculptor, and new age panbioist philosopher noted for his 1926 book *The Universal One*, his so called 'master work' as his followers describe it, wherein he outlines a cyclical expansion-contraction theory of the universe, in which derives an expanded snake-like Mendeleev periodic table, wherein he supposedly predicts the existence of deuterium and tritium as well as all the transuranium elements such as plutonium and neptunium, and in regards to human desires and philosophy of existence, outlines what seems to be a panbioism cyclical 'sex force' theory, described in verbal electromagnetic force terms, that extends down to the elements.

Philosophy

The main draw of Russell, as gleaned by resent books on or about him, is that his philosophy seems to provide patch solutions to questions such: "Why am I here? ", "What happens when I die? ", "How are things, Really?" (Robert Mayer, 2007) or "Who am I?" and "Why am I here?" (Christopher Anderson, 2012).

Sex force

The following are a few truncated excerpts of Russell's sex force theory: [1]

> "Sex is the apparent division of the father-mother substance of mind into apparent opposites. This division is due to the opposite desires of electricity and magnetism, expressed in the action and reaction of the thinking process. Sex is the active desire of mind for division into opposites, and its reactive desire for unity. Sex is that motive force which demands separability into two, and equally desires union of the apparent two into one. Sex desire is that force in thinking that continues thinking. Existence is continued only through thinking. Sex force is that quality in the electro-magnetic impulse of thinking which continues one impulse of thinking into the next impulse of thinking."

Here, in regards to his comments on the "desires of electricity and magnetism", we might recall similar Goethean philosophy / human chemical theory views discussed will to power theories of German philosopher Arthur Schopenhauer, for example in his 1944 *The World as Will and Representation*, Schopenhauer cites German chemist Justus Liebig's description of the reaction of damp copper Cu in air containing carbonic acid H_2CO_3, to argue rather cogently that the: [6]

> "The will of the copper, claimed and preoccupied by the electrical opposition to the iron, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive."

The obvious difference between the two philosophies, Russell (1926) and Schopenhauer (1844), is that the former is theistic and anthropmorphic flavored, whereas the latter is atheistic and deanthropomorphized. In any event, Russell continues:

> "The material substance of mind cannot evade its materialization into the form desired by mind. This is an immutable law to which there can be no exception. Man's concept of sex as beginning with organic life is a wrong concept. Sex is as absolute in the elements as in the complexities and compounds of the elements. Man's concept of the beginning of sex and the

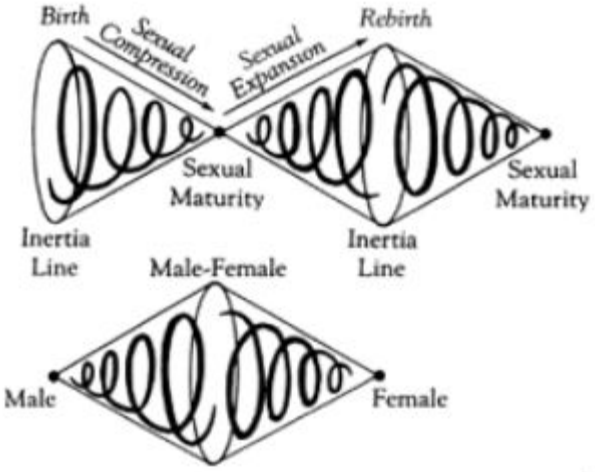

Russell's male-female relationship model.

> beginning of life is a concept founded on conditions of temperature. Sex and life and light and intelligence are in and of all things from the beginning. The sex principle is as much a part of the granite rock or bar of iron as it is of man.
>
> The great hot star called Argo, blazing away at a temperature of thirty thousand degrees, knows sex in its fiery heart, and cannot continue its appearance without it. The Martian ice cap knows sex in its frozen depths, and retains its appearance because of sex. Sex is an electromagnetic equalizer of matter in motion."

Whatever the case, as we see, it is an interesting philosophy.

University of Science and Philosophy

In 1949, Russell leased American millionaire James Dooley's vacant mansion Swannanoa, Nelson County, Virginia, shown adjacent, and therein formed what seems to have been a half sex cult half philosophy retreat for men. Writer A.O. Pollard (1983), in retrospect, describes the school as such: [3]

> "During this period, the retreat took in a series of feminine acolytes who, to help support the institute, gave tours of the mansion and grounds. It became a right-of-passage for the region's young men to view the lasses, as the diaphanous gowns they wore made quite evident that the mountain top location was often a chilly clime."

The so-called university was supposedly active until 1998, wherein they decided to leave the property and gave up their lease. The location of the project seems to now be confined to the site Philosophy.org, whereat many of Russell's writings and books can be found—along with gallery of his scientific drawings. [3]

The Swannanoa mansion, Nelson County, Virginia, leased by Russell and his followers from

Religion

Russell, in his work, seems to making an attempt to remold the notion of 'God' into what he terms 'Mind' (his capital letter); a representative quote: 'All creating things are but the ideas of divine Mind', a type of

pandeism-materialism theory.

1949 to 1998 for his so-called "**University of Science and Philosophy**", wherein he taught his theories. [3]

Classification

Russell is sometimes classified alongside Austrian-born American psychologist Wilhelm Reich and his 1920s hypothesized sexual energy 'orgone energy' theory, although there are significant differences between the two theories. [2] Russell might also be grouped in the same category as Arthur Young (*The Reflexive Universe*, 1976), Louise Young (*The Unfinished Universe*, 1986) and possibly even the recent 1988 theory of Louis-Marie Vincent and his theory that the "brain is a machine that obeys the laws of thermodynamics", that soul is a type of quantum field attached to superluminal particles (Russell also discusses light particles), that love is a form of thermodynamic potential, that may be converted into heat and movement, and how the brain, being comprised of matter and energy, thus obeying the laws of matter and the laws of thermodynamics, may act in a "change of state" of energy at the time of death. Russell's male-female division of everything in the universe also brings to mind the 1988 'molecular relationship' ideas and theories of Joseph Dewey. See also: Leong Ying.

Education

Russell left formal schooling at the age of 9 or 10 becoming autodidactic thereafter, accumulating a rather vast science library, and becoming a sought-after sculptor and painter. The following are few representative views on Russell's intellect:

> "[Russell was] the Leonardo Da Vinci (IQ=205) of our time."
>
> — Walter Cronkite (1963) [5]

> "Even though Walter Russell only had a fourth-grade education, he was a genius."
>
> — Robert A. Mayer (2007) [5]

In this sense, many of Russell's followers tend to classify him, intellectually, as a polymath and unsung genius. [8] A comparison of his ideas, say as compared to Tesla (IQ=195) or Schopenhauer (IQ=185), show that although Russell may have been in the genius range (IQ=140+) of intellect, he was closer to cutoff than the ceiling.

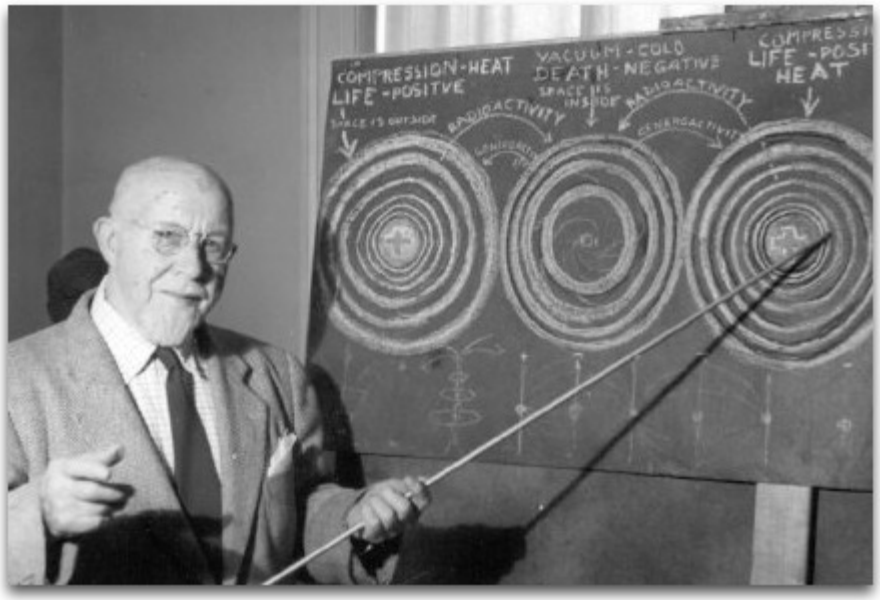

Russell lecturing on his expansion contraction panbioism theory. [7]

Other

Russell, in his book *Atomic Suicide*, commented that met with Nikola Tesla and discussed their respective cosmologies, during which time Tesla, supposedly, told Russell: "bury your ideas in a vault for a thousand years and await the unfolding of human consciousness." [7]

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8. Childress, David H. (1990). *Antigravity and the Unified Field* (pg. 72). Adventures Press.

External links

â— Walter Russell – Wikipedia.

θΔics

In existographies, **Walter Schottky** (1886-1976) (IQ:#|#) (CR:1) was a German physicist, electrical engineer, and thermodynamicist, noted for []

Overview

In 1929, Schottky, in his *Thermodynamics: The Theory of the Circular Processes of Physical and Chemical Changes and Equilibria*, according to the standard established published "characteristic function tables" (see: characteristic function notation table), was, supposedly, the first to employ the symbol " G", in honor of Willard Gibbs, for the the isothermal, isobaric chemical potential; the gist of the assignment, barring a full English translation of his book, seems to have occurred in his section "Chemical Potential", where he first derives:

$$\frac{G}{T} = -\Phi = \frac{W}{T} - S$$

calling W the the "absolute warm function" (absolute warmefunktion) or "absolute heat function" (or "heat content", is it was called prior to 1908), which he defines as follows:

$$W = U + pV$$

which we now call "enthalpy", the name Heike Onnes gave to this function in 1909. With substitution of Schottky's warm function, aka Onnes enthalpy function, we have:

$$\frac{G}{T} = \frac{U + pV}{T} - S = -\Phi$$

With division by T, we have:

$$G = U + pV - TS$$

which, of course, is the now-standard formula for Gibbs free energy. Schottky, however, concludes with the following formula:

$$\frac{G}{T} = -\Phi$$

which, when T is divided through, yields the following:

$$G = -T\Phi$$

This specific definition of the isothermal-isobaric free energy, of note, was adopted that year by Ralph Fowler, in his

Statistical Mechanics (1929), to represent the isothermal-isobaric chemical potential. At this point, however, a certain amount of terminological confusion arose, largely as a result of Francois Massieu (1869) using the Greek letter notation of **– tψ' (minus T psi primed**) for the same function, a notation style Gibbs (1876) adopted, naming the same function ζ (zeta), which was named Φ (Phi) by Pierre Duhem (1897), and – Tψ (minus T psi) by Max Planck (1897), Schottky's PhD professor, ζ (zeta) by Otto Sackur (1912), Z by Percy Bridgman (1914), F by Gilbert Lewis (1923), Z by James Partington (1924), H by Theopile de Donder (1926), F by John Butler (1928), and finally, at last, **'G'** by Schottky, which in 1933, in Edward Guggenheim's *Modern Thermodynamics*, the book which solidified chemical thermodynamics, as we now define it, became the 'by definition' symbol of the isothermal-isobaric free energy, in honor of Gibbs.

The following is a translation of one of the opening pages of Schottky's *Thermodynamics*, so to give a glimpse of his deep thinking mindset: [1]

German (pg. 3)

wohl von A. HORSTKANN (1869, 1872/77)2. Eine sehr allgemeine, aber zugleich etwas abstrakte Behandlung hat das mit der Frage der chemischen Arbeiten zusammenhängende Problem des chemischen Gleichgewichts durch WILLARD Gams 1876/78' erfahren, und etwas später entwickelt H. v. Hnwionz3 aus Untersuchungen über die Temperaturabhängigkeit der elektromotorischen Kräfte den Begriff der Freien Energie, der sich schneller als die noch umfassenderen Ginsschen Überlegungen auch in der Praxis Eingang verschafft. Bei allen diesen Betrachtungen, die dann später u a durch VAN'T Hon, PLANCK, NERNST mit so großem Erfolge fortgeführt wurden, handelt es sich methodologisch, gleichwie in der physikalischen Thermodynamik, um eine Anwen-dung der allgemeinen außenthermodynamischen Beziehungen auf individuelle Ar-beits- und Wärmeeffekte des Systems.

Der einzige Unterschied besteht darin, daß es jetzt die Arbeits- und Wärmeeffekte bei einer chemischen Umsetzung, nicht mehr nur bei einer physikalischen Veränderung, sind, die der thermodynamischen Untersuchung unterzogen werden. Jedoch, ebenso wie in der „Physikalischen Thermodynamik", liefert auch in der „Chemischen" die Anwendung der außen-thermodynamischen Sätze auf die verschiedenen chemischen Veränderungen nur einen Bruchteil der zur völligen Kenntnis der Arbeits- und Wärmeeffekte benötig-ten Aussagen, und ebenso wie dort sieht sich der Forscher auch hier dem Problem gegenüber, die thermodynamisch nicht ableitbaren Gesetze für die spezifischen Arbeits- und Wärmeeffekte auf anderem Wege zu gewinnen: durch Empirie, molekularkinetische Betrachtungen, Statistik.

Als konsequenter Pfadsucher auf diesem Gebiet ist z. B. I. P. vAN DER WAALS zu nennen, der immer von neuem auf die Ergänzungsbedürftigkeit der rein thermodynamischen Beziehungen hinweist. Ein Theorem, dessen allgemeiner Charakter nur durch gewisse Bedingungen in der Wahl der ilun unterworfenen Systeme eingeschränkt wird (III, § 12),

English (pg. 3)

probably by August Horstmann (1869, 1872/77) 2. The problem of chemical equilibrium associated with the question of chemical work was given a very general, but at the same time somewhat abstract treatment by Willard Gibbs in 1876/78, and a little later Hermann Helmholtz from studies on the temperature dependence of the electromotive forces the term free energy, which gets into practice faster than the even more extensive Gibbsian considerations. All of these considerations, which were later continued with such great success, among others, by Van't Hoff, Planck, Nernst, are methodologically, as in physical thermodynamics, an application of the general external thermodynamic relationships to individual work - and heat effects of the system.

The only difference is that it is now the work and heat effects of a chemical reaction, not just a physical change, that are subjected to the thermodynamic study. However, just like in "physical thermodynamics", in "chemical" the application of the external thermodynamic theorems to the various chemical changes provides only a fraction of the statements required for complete knowledge of the work and heat effects, and also there the researcher is faced with the problem of obtaining the thermodynamically non-derivable laws for the specific work and heat effects in another way: through empiricism, molecular kinetic considerations, statistics.

As a consistent path finder in this area, e.g. Johannes van der Waals, who always points out anew that **the purely thermodynamic relationships need to be supplemented**. We owe a theorem whose general character is limited only by certain conditions in the choice of the systems subject to ilun (III, § 12), Walther Nernst, 1906, and more recently it is statistical

verdanken wir W. NERNST5, 1906, und in neuester Zeit ist es die statistische Mechanik und Quantentheorie, die weitere Einsichten und Aufschlüsse in Richtung des von NERNST beschrittenen Weges versprechen.

mechanics and quantum theory, which provides further insights and promise information in the direction of the path followed by Nernst.

Dabei darf man nicht vergessen, daß die Begründer der chemischen Thermo-dynamik, voran W. GIBBS, noch einen großen Teil ihrer Gedankenarbeit einem Problem zuwenden mußten, das zwar schon in Angriff genommen, aber noch nicht gelöst worden war: dem Problem der quantitativen Erfassung chemischer Vorgänge überhaupt, dem Problem der Meßgrößen, durch welche der Fortschritt einer chemischen Umwandlung angegeben werden konnte, mathematisch ge-sprochen, dem Problem der „unabhängigen Variabeln" des Systems.

It should not be forgotten that the **founders of chemical thermodynamics** (see: founders of chemical thermodynamics), especially Gibbs, still had to devote a large part of their **thought work** to a problem that had already been tackled but had not yet been solved: the problem of quantitative recording chemical processes in general, the problem of measured variables, by means of which the progress of a chemical conversion could be indicated, mathematically spoken, the problem of the "independent variables" of the system.

Auch heute noch tritt die Frage nach der Wahl und Bestimmung dieser Meßgrößen an keiner anderen Stelle mit derartiger Schärfe auf, wie in der chemischen Thermodynamik, und so ist denn die Darstellung einer chemischen Thermodynamik auch noch mit diesem Problem beschwert, das nicht ohne tiefes Eingehen auf das Wesen der chemischen Umsetzungen, insbesondere vom molekulartheoretischen Standpunkt aus, gelöst werden kann. Groß ist aber dafür auch der praktische Gewinn, den die Beherrschung einer so gründlich angefaßten chemischen Thermodynamik dem chemischen Forscher

Even today the question of the choice and determination of these measured variables does not arise on anybody elsewhere **with such acuity**, as in chemical thermodynamics, and so the representation of chemical thermodynamics is also still burdened with this problem, which **cannot be solved without going deeply into the nature of chemical reactions**, especially from the molecular theoretical point of view But the practical gain that the researcher of such a thorough chemical thermodynamics ...

Schottky, in retrospect, is the eponym of a number of important things: “Schottky diode” (c.1928) and “Schottky barrier” in electrical engineering (c.1928), the “Schottky anomaly”, a peak of heat capacity, and “Schottky system” (Muschik, 1990), in thermodynamics, to name a few.

Education

In c.1908, Schottky completed his BS in physics at the University of Berlin, then in 1912 completed his PhD, under Max Planck, on the topic of “Relative Theoretical Energetics and Dynamics”. He then went to the University of Jena, where he studied under physicist Max Vienna, where he experimentally prove his theoretically derived his U 3/2 law for the glow electron current in electron tubes (Schottky equation). Then he went back to University of Berlin to habilitate, but then switched to work at Siemens in 1916, after which, while remaining tied to Siemens, he submitted his postdoctoral thesis on “thermodynamics of rare conditions in the steam room; thermal ionization and thermal glow” (Thermodynamik der seltenen Zustände im Dampfraum (Thermische Ionisierung und thermisches Leuchten)) at the University of Wurzburg in 1920. He then became professor of theoretical physics at the University of Rostock form 1923 to 1927, after which he returned to “Siemens & Halske in Berlin to work in their scientific laboratories, where he conducted research on semiconductor physics and electronics.

Quotes | On

The following are quotes on Schottky:

> “**Schottky**'s interest in thermionic emission, in connection with thermionic valves, led to fundamental considerations of the thermodynamics of charged particles and to the development of the so-called ‘electrochemical potential’ (equal to the Fermi energy) as a determinant of thermodynamic equilibrium. This was an extension of the basic treatment of equilibrium by J. W. Gibbs. In essence, the equilibrium of a system demands that charged particles be in equilibrium both in their roles as particles of a chemical system and as charge carriers; that is, the electrochemical potential throughout the system should be equal and free of gradients. One of the results of Schottky's preoccupation with thermodynamics, was the realization that lattice vacancies and other singularities were subject to statistical treatment. The equilibrium density of lattice defects can thus be calculated. One result of this work is the name given to lattice vacancies: ‘Schottky defect’. The occupancy of localized electronic states is similarly determined by their position in relation to the electrochemical potential and by the temperature.”
>
> — Ernest Braun (1992), “Selected Topics from the History of Semiconductor Physics and its Application” [2]

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External links

â— Walter Schottky – Wikipedia.
â— Walter Schottky (German → English) – Wikipedia.

θΔics

In existographies, **Walther Nernst** (1864-1941) (IQ:175|#231) (Odueny 100:65) (Cropper 30:7/T) (CR:121) was a German physical chemist, of the Berlin school of thermodynamics, notable for his 1888 work on thermodynamics of ion movement, for his 1893 statement of the ideal gas law in its modern form and for his 1906 "heat theorem", regarding the nature of the measurement of chemical affinity in relationship to heat and free energy, later to be incorporated into the format of the third law of thermodynamics, work for which he was awarded the 1920 Nobel Prize in chemistry. [1]

Overview

In 1906, Nernst, in his Silliman lecture *Experimental and Theoretical Applications of Thermodynamics to Chemistry*, wrote: [5]

> "In the hope of penetrating more deeply into the relations between chemical energy and heat, I have carried out in the last few years together with my students, a number of investigations on reactions at high temperatures in gaseous systems."

Nernst is considered as one of the founding fathers of physical chemistry. [2] Notable students include Richard Abegg, Otto Sackur, and Gilbert Lewis, among others.

Education

Nernst became an assistant to Wilhelm Ostwald in 1887. (O)

An 1887 group photo (O), showing (standing, from the left): **Nernst**, Heinrich Streintz, Svante Arrhenius, Hiecke, and (sitting, from the left): Aulinger, Albert von Ettingshausen, Ludwig Boltzmann (seated at middle), Ignacij Klemencic, Hausmanninger. See also: epicenter genius.

Affinity and free energy

Nernst had an excellent grasp of the relationship between free energy, affinity, and the external work output of chemical processes as well as their relation to the natural advancement of processes in nature. In 1893, as to the question of determining the long-sought "chemical affinity" of a reaction, Nernst explains that neither the "heat-toning" (heat releasing) effects of a reaction, as French chemist Marcellin Berthelot had argued, in his 1875 principle of maximum work, nor the velocity of a reaction can function as a measure of affinity, but rather only the free energy can. In summary Nernst states: [3]

> "Since every chemical process, like every process of nature, can only advance without the introduction of external energy only in the sense in which it can perform work; and since also for a measure of the chemical affinity, we must presuppose the absolute condition, that every process must complete itself in the sense of the affinity—on this basis we me may without suspicion regard the maximal external work of a chemical process (i.e. the change of free energy), as the measure of affinity. Therefore the clearly defined problem of thermo-chemistry is to measure the amounts of the changes of free energy associated with chemical processes, with the greatest accuracy possible … when this problem shall be solved, then it will be possible to predict whether or not a reaction can complete itself under the respective conditions. All reactions advance only in the sense of a diminution of free energy, i.e. only in the sense of the affinity."

In 1922, the above logic was formulated as:

$$A = -\Delta G$$

by Belgian theoretical physicist Théophile de Donder. This is equivalent to:

$$A = T\Delta S - \Delta H$$

in a more direct sense.

Other

Nernst paid for a marble memorial to American engineer Willard Gibbs in 1906, shown adjacent; although they had never met. [4]

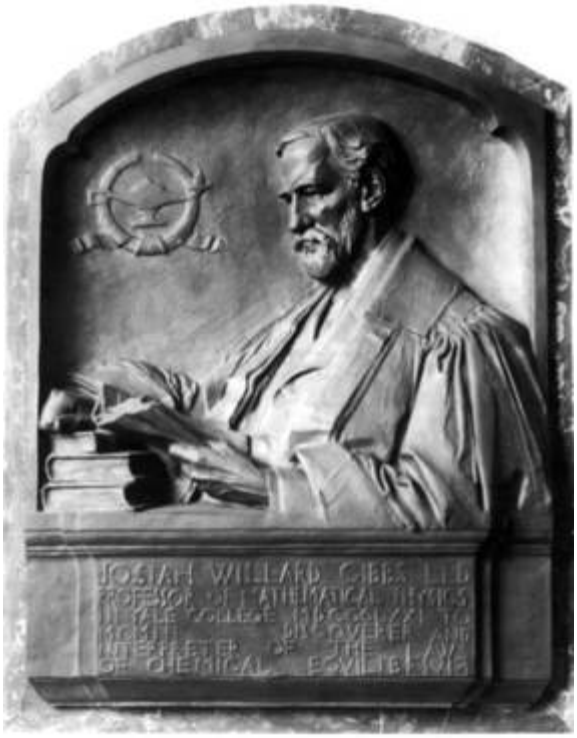

When **Nernst** visited Yale in 1906 to give the Silliman lecture, he was surprised to discover that there was no tangible memorial for Gibbs, after which he therefore donated his $500 lecture fee to the university to help pay for a suitable monument, which was finally unveiled in 1912 in the form of a bronze bas-relief (above) —with caption: "discoverer and interpreter of the laws of chemical equilibrium"—by sculptor Lee Lawrie, installed in the Sloane Physics Laboratory, now at the entrance to the J. W. Gibbs Laboratories, Yale University. [6]

Quotes | By

The following are quotes by Nernst:

> "I have already been to heaven. It was quite nice there, but I told them they could have it even better."
>
> — Walther Nernst (1941), "last words", told to his wife Emma [7]

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External links

● Walther Nernst – Wikipedia.

θΔics

In existographies, **Wang Chung** (c.27-100AD), or Wang Ch'ung, was a Chinese rational philosopher noted for []

Overview

In 80AD, Chung, in his *Discourses Weighted in the Balance*, presented a series of 80 essays, wherein he rational, secular, naturalistic and mechanistic account of the world and of human beings and gave a materialistic explanation of the origin of the universe, along the way debunking all of the Chinese folk religions, superstitions, and magical thinking common in his time, e.g. souls, spirits, god created humans on purpose, Daoism based immortality, lightning being the result of angry heavens, etc.

Education

Chung educated himself by reading and memorizing in the bookstalls. [1]

Quotes

The following are noted quotes:

> "People say that spirits are the souls of dead men. That being the case, spirits should always appear naked, for surely it is not contended that clothes have souls as well as men."
>
> — Wang Chung (c.80AD), *Discourses Weighed in the Balance* [2]

See also

â— Carvaka

References

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External links

â— Wang Chong – Wikipedia.
â— Wang Chung – PraBook.com.

θΔics

In phenomenon, **war** is a state of usually open and declared armed hostile [heated] conflict, tending to involved attack, reaction, and transformation, between two or more particles, states or nations. [1]

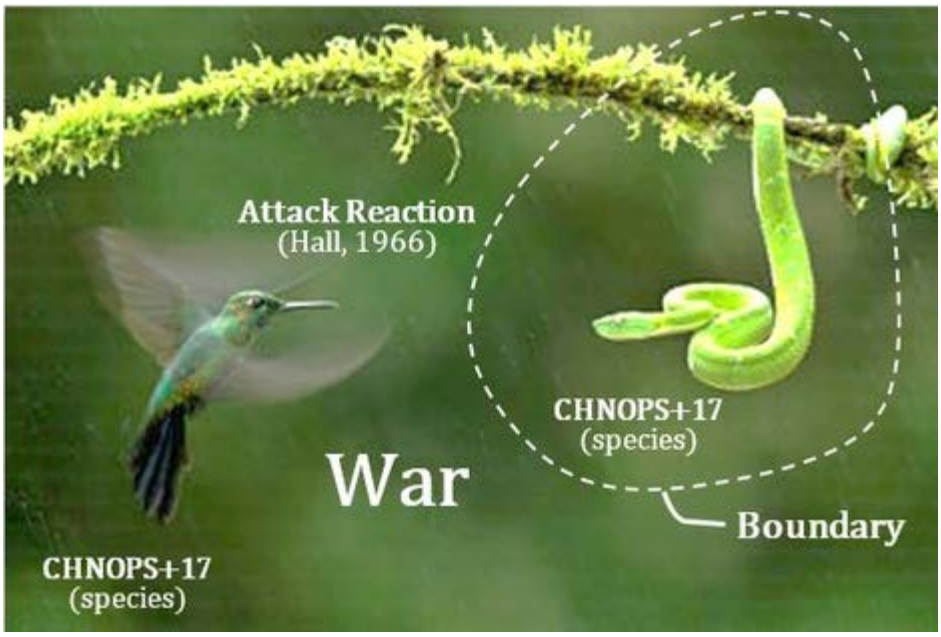

A simplified depiction of armed conflict (**war**), between a humming bird (a powered gas-like CHNOPS+17 species) and snake (a powered surface-attached CHNOPS+17 species), resulting from territorial overlap, and subsequent "fight" or "flight" reaction, aka the "attack reaction" (Hall, 1966).

Overview

In 1642, Thomas Hobbes surmised that if, in the future, there existed a "social geometrician" who knew the geometry of human actions the way we know the geometry of navigation, then there would be hardly be left any pretense for war:

> "Now, look how many sorts of things there are which properly fall within the cognizance of human reason, into so many branches does the tree of philosophy divide itself. For treating of figures, it is called geometry; of motion, physics; of natural right, morals; put all together, and they make up philosophy. And truly the geometricians [see: Holbach's geometrician] have very admirably performed their part. For whatsoever assistance doth accrue to the life of man, whether from the observation of the heavens or from the description of the earth; from the notation of times, or from the remotest experiments of navigation; finally, whatsoever things they are in which this present age doth differ from the rude simpleness of antiquity, we must acknowledge to be a debt, which we owe merely to geometry. If the moral philosophers had as happily discharged their duty, I know not what could have been added by human industry to the completion of that happiness which is consistent with human life. For were the nature of human actions as distinctly known as the nature of quantity in geometrical figures, the strength of avarice and ambition, which is sustained by the erroneous opinions of the vulgar as touching the nature of right and wrong, would presently faint and languish; and mankind should enjoy such an immortal peace, that unless it were for habitation, on supposition that the earth should grow too narrow for her inhabitants, there would hardly be left any pretense for **war**."
>
> — Thomas Hobbes (1642), *Publication* (Q); in 1894 "Preface" (pg. 6-7) of *Leviathan*; bolded section seems to be synopsis of Benedict Spinoza's *Ethics* (1675) [3]

This idealistic conjecture, while admirable, is not in alignment with the nature of the chemical reaction, wherein products transform into reactants, generally speaking, through what might be called, in anthropism speak, a rather violent transition state, wherein the old is ripped apart to form the new.

Thermodynamics

The study of the thermodynamics of war is called war thermodynamics.

The term "cold war", say as compared to a "hot war", a thermal word referring to an endergonic prolonged stalemate type of war, not resulting in actual combat.

South Ossetia war

The following, to cite one diagrammed example, is a timeline depiction of the 2008 Russia-Georgia "five day war", an armed conflict in August between

Georgia on one side, and Russia and separatist governments of South Ossetia and Abkhazia on the other, which can be likened to the collisions of gas particles on the containing vessel boundary of Dutch-born Swiss mathematical physicist Daniel Bernoulli's 1738 moveable piston head (above)—which, in the context of war thermodynamics, however, the moveable piston head becomes replaced by the heavily-fortified territorial boundaries of the "conflict zones", as shown above (in purple) according to which the Russian human molecules to the North and the Georgian human molecules to the south create a type of social-political-governmental territorial pressure at the boundary, that can be measured in SI units.

A depiction of the boundary intrusion, of Russia into Georgia, during the 2008 South Ossetia War.

The depiction, shown adjacent, is similar to the 1970-74 Chimpanzee war, the result of which, in the end territorial expansion resulted.

Quotes

The following are related quotes:

> "Society, therefore, is the work of nature, since it is a natural product of human perfectibility, equally fertile of evil and of good. Arts and sciences, laws, the diversity of the forms of government, **war** and commerce — everything, in short, is only a development. The seeds of all were latent in nature; they have unfolded, each in its own time. Perhaps she still retains in her womb other germs, of slower growth, of which future races will reap the fruits. Then genius will expand and take on a still greater form. The tree of science will acquire new branches. As the catalogue of the arts is extended, their scope will become more ample. Thus, new vices and other virtues will manifest themselves."
>
> — Jean Robinet (c.1768), *De La Nature, Volume Five* (pg. 148) [4]

> "The immense physical suffering, the moral degradation, the deep offense to the intellect, the bitter heartbreak that all this destruction causes are of slight moment to the Bolshevik leaders. They coolly assume that when the **rearrangement of the human molecules** is completed according to their plan all the obstreperous elements of human nature will adapt themselves to the new conditions, and the result will be a very tolerable utopia."
>
> — Harold Williams (1921), "The Meaning of Civil War in Russia" [2]

See also

- Chimpanzee war
- Mean Girls (debate)
- Combat thermodynamics

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External links

- War – Wikipedia.

θΔics

In human thermodynamics, **war thermodynamics** is the study of thermodynamics applied to the art of war, warfare or combat theory.

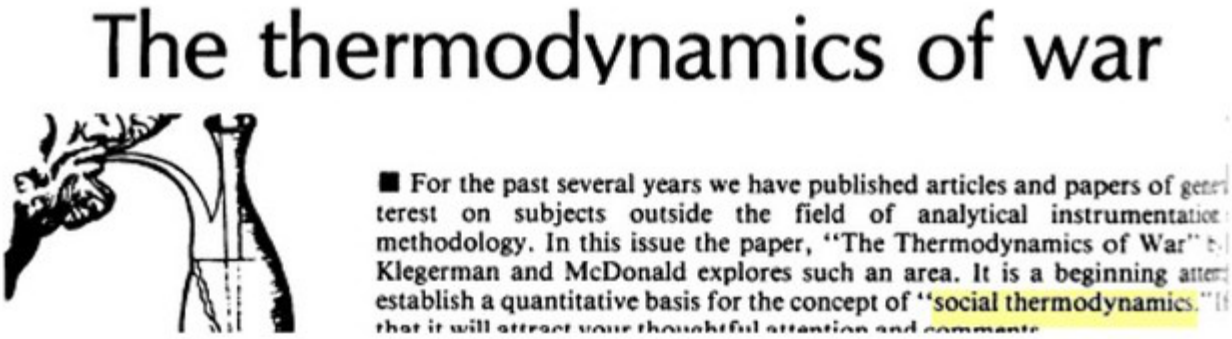
The thermodynamics of war

■ For the past several years we have published articles and papers of gener
terest on subjects outside the field of analytical instrumentatio
methodology. In this issue the paper, "The Thermodynamics of War" b
Klegerman and McDonald explores such an area. It is a beginning atter
establish a quantitative basis for the concept of "social thermodynamics."
that it will attract your thoughtful attention and comments

An image from the article **"The Thermodynamics of War"** by Melvin Klegerman, and Hugh McDonald, published in the *American Laboratory* journal, wherein they attempted to ferret out the beginnings of an instrument-based quantitative social thermodynamics, which they apply to the phenomena of war. [10]

Overview

In 1918, American historian William Thayer, in his address "Vagaries of Historians", delivered before the American Historical Association, commented in his critique of Henry Adams' 1910 theory that historians begin to incorporate the second law into history studies and history theory, that: [1]

> "The time may come when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry. It may then be possible, as Adams suggests, to invent a common formula for thermodynamics and history.
>
> But, what means of measuring this dissipation would the historian have? If Kelvin's law is true, there must have been less energy in 1865, when our **Civil War** [1861-1865] ended, than in 1861, when it began. The energy dissipated during these four years was not only human but material, solar, sidereal, cosmic. Who can compute it?"

The difficulty here, in the modern view, is that both Adams and Thayer were applying what's called the isolated potential, of the various five types of thermodynamic potentials, to the governance of humans, whereas the correct potential, as explained in Gilbert Lewis' 1923 *Thermodynamics and the Free Energy of Chemical Substances*, is the isothermal-isobaric potential, or Gibbs free energy, according to which entropy increase acts such that the Lewis inequality of natural processes governs the direction of human nature. This is diagrammed below (left) on the extent of reaction coordinate plot.

Subsequently, the initial state of 1861 of the boundaried thermodynamic system of the United States, comprised of a certain number of initial state human molecules, would have been at a heightened or tensioned level of isothermal-isobaric free energy, on the reaction coordinate, possibly near the tip or tipping point of the activation energy barrier E_A, or possibly in or near the midpoint of the transition state, and all that would have been needed would be one small "spark" trigger the civil war reaction, just as Gavrilo Princip was said to have triggered or "sparked" the reaction of WWI at 11AM June 28, 1914 after which, five years later, forty million lay dead, a reaction which was followed by a second ebb followup reaction, twenty years later, which claimed another sixty million. [2]

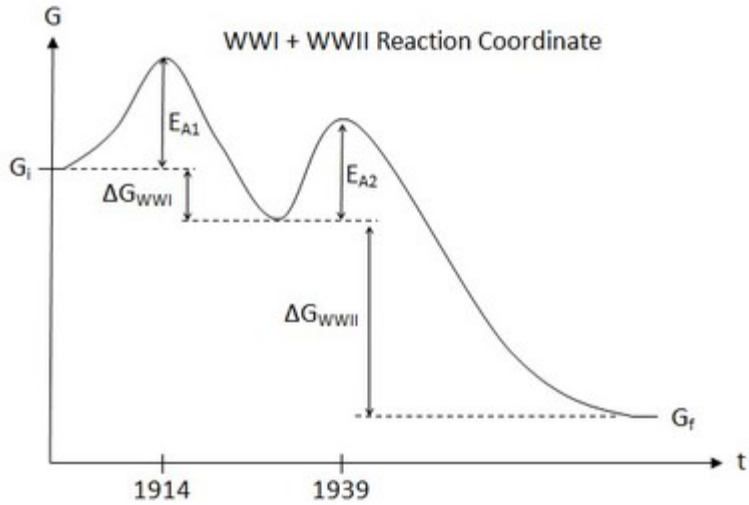

A Gibbs free energy G versus time t reaction coordinate for global combined reaction of World Wars I and II, spanning from 1914 to 1945,

In 1915, English physiologist William Bayliss, in his *Principles of General Physiology*, re-interpreted Wilhelm

Ostwald's 1912 energetic imperative (the thermodynamic imperative version of Kant's original 1785 categorical imperative), rather interestingly, as: "waste not free energy; treasure it and make the best use of it", and went on to argue that this has great philosophical value, one example of which he gives is that it can be applied to warfare to remedy the "waste involved in war".

a transformation process that took over 100 million casualties, resulting in an final state G_f being at a more stable position that the initial state G_i, hence the over all process was natural, according to the governance of the Lewis inequality for natural processes ($\Delta G < 0$). [5]

In 1919, Russian engineer and writer Yevgeny Zamyatin outlined a thermodynamics theory of revolution. In his 1923 essay "On Literature, Revolution, Entropy, and Other Matters", for example, he attempted to describe the Russian revolutions of 1905 and 1917 in the language of thermodynamics, supposedly arguing to effect that in wars and revolutions, there are two opposing forces at work, namely energy and entropy. [3]

In 1960, American fighter pilot instructor and combat theorist John Boyd was looking for deeper engineering and modern physical science insight into figuring out anomalous combat statistics from the Vietnam war, namely why the slower bigger less-maneurvable American planes (F-86 Sabre) had a better kill ratio than the faster smaller more-maneuverable Vietnamese planes (Russian Mig-15), and and in this direction entered into the industrial engineering program at Georgia Tech, where he learned the fundamentals of thermodynamics, which he began to apply to his puzzle in regards to pilot combat training behaviors and dog fight reaction behaviors.

The following is Boyd's **thermodynamics** based combat reaction theory (second law, uncertainty principle, dissipative structures, complexity theory, Godel's incompleteness theory), parts of which were used in the successful architectural invasion design of the **Gulf War** (1990-1991). [9]

American fighter pilot and industrial engineer John Boyd combined his thermodynamics education with his combat experience to develop his energy-entropy decision based reaction cycle model of combat operation processes (OODA loop). [8]

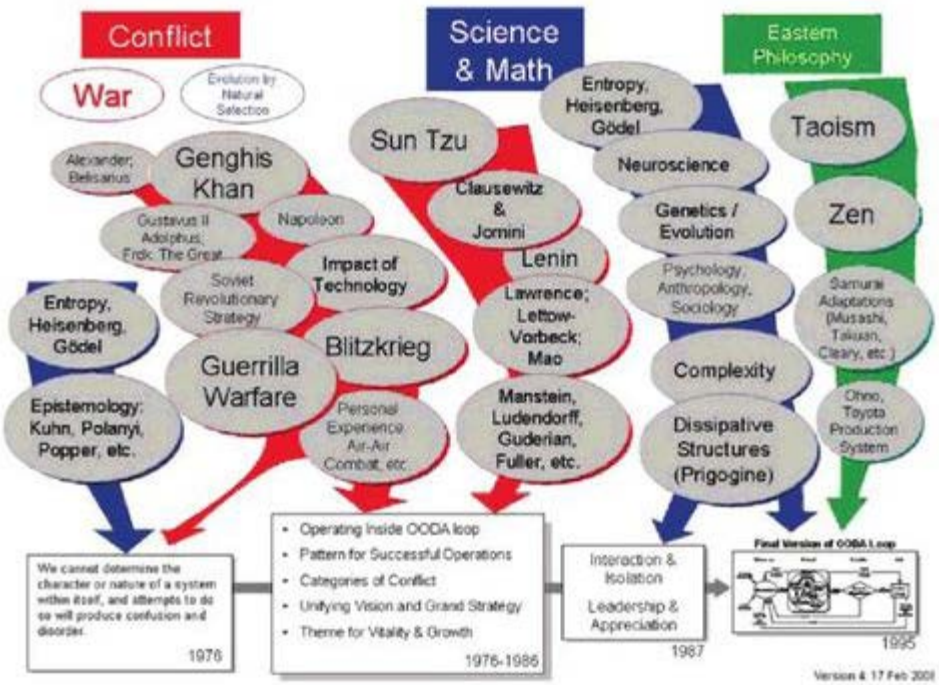

In 1967, Norwegian sociologist Johan Galtung, in his "Entropy and the General Theory of Peace", a mix of thermodynamics and information theory, attempted to explain peace and conflict using conceptions such as "conflict energy", "conflict transformation", "actor entropy", and "interaction entropy"; postulates that macro-conflicts, such as war between nations, will occur when entropy level is low, while micro-conflicts, such as cognitive dissonance, will occur when the entropy level is high; defines entropy condition of messiness or disorder but not in a pejorative sense; the incapacity of a system to crystallize or establish order permits, for instance, greater complexity and diversity, thus acting to mitigate the reification of violent structures.

In 1976, Melvin Klegerman (Ñº), a noted thermodynamic coupling theorist (Ñº), and Hugh McDonald, in their "The Thermodynamics of War" article, published in the *American Laboratory* journal, attempted to ferret out the beginnings of an instrument-based quantitative social thermodynamics, which they apply to the phenomena of war; the following are snippets from page 62: [10]

from application of thermodynamic principles to the parameters, as defined above.

The purpose of human society may be construed as twofold:

1. To provide security to its constituents.
2. To carry out the Thermodynamic Imperative' to decrease the entropy of itself and its environment, to bring order out of disorder, although randomness.

A number of statements concerning human societies will be made, based on the foregoing assignment of thermodynamic parameters to specific social variables. Although several of these statements may seem to violate prevalent conclusions of the social sciences, they follow directly

equilibrium, their capacity to do useful work, G, seldom remains constant, and ΔG_c serves as a barometer to determine the state of a social unit as it does for a system in chemical thermodynamics. A negative ΔG_c represents work done by the system on the surroundings, easily understandable in social terms, but the meaning of a positive ΔG_c is less apparent. Work may be done on a society, either by to a social unit at a given time, H_c, is determined by complex and subtle psychological, environmental, social, economic, and political factors that need not be considered in a thermodynamic analysis, which disregards the pathways between initial and final states.

Since societies seldom attain a state of

They define (Ñº) the main thermodynamic variables (see: human thermodynamics variables table) as follows:

> G is the capacity of a system to do useful work.
> H is the resources available to a system.
> S represents the entropy, disorder, freedom, or randomness.

Here, of note, we see them making a reference (Ñº) to Bruce Lindsay's "thermodynamic imperative", conjoined with citation to Albert Lehninger's *Bioenergetics* and Gilbert Lewis' *Thermodynamics*; and in which they seem to be attempting to quantify work done "by a social system" as being a quantified by a "negative ΔG", i.e. exergonic, and work done "on a social system" as being quantified by a "positive ΔG", i.e. endergonic.

In 1993, French philosopher Jean-Francois Lyotard stated his views on relationship between war and thermodynamics as follows: [6]

> "Conflict and ultimately **war** do not arise between human and nature; rather, the struggle is between more developed systems and something else that is necessarily less developed and that the physicists know as entropy, the second principle of **thermodynamics**."

In the 2007 book *Age of Fallibility*, author George Soros states that the expression "far-from-equilibrium conditions", of the Prigogine school of thermodynamics, can be applied to political and social situations. Soros argues that "in financial markets, far-from-equilibrium conditions prevail often, but by no means all the time." In respect to World War Two, Soros states that Jews during the 1944 Nazi Germany occupation of Hungary, faced with daily extermination, were in a far-from-equilibrium condition. As another example, the collapse of the Soviet empire, according to Soros, was a "far-from-equilibrium process *par excellence*." [7]

In 2009, English complexity theory economist Antoine Bousquet devoted an entire book to an outline of a "scientific way of warfare", where, of note, in his chapter three entitled "Thermodynamic Warfare and the Science of Energy", he outlined a scientific view of war theory in the context of thermodynamics and complexity

theory.

Bousquet considers that the identification of the rules of thermodynamics directly influenced the military doctrines of rapid, dispersed, and unpredictable movement that culminated in WWII with such tactical and operational formulations as the German Blitzkrieg.

Bousquet gives credit to the increasingly recognized ideas of US air force colonel and military strategist John Boyd who deliberately used such scientific theories as the second law of thermodynamics and chaos theory in his military thinking. Using these theories, Boyd for example developed his famous Observe, Orient, Decide, Act (OODA) "loop" which is said to be a very accurate conceptual model for all command and control (C2) systems. [4]

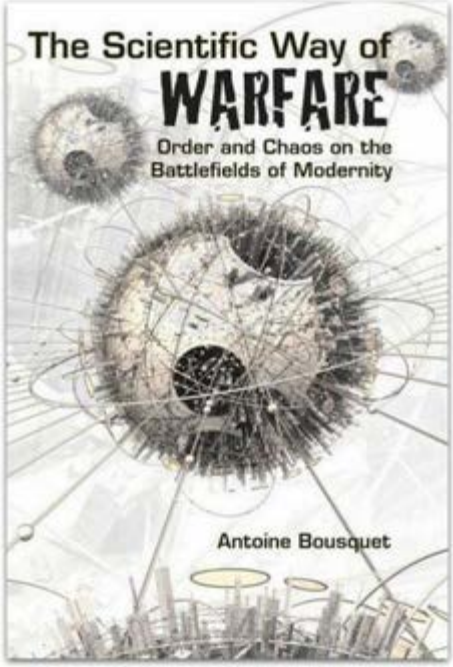

The 2009 book *The Scientific Way of Warfare*, by Antoine Bousquet, uses **thermodynamics** principles to explain aspects of **war**. [4]

In c.2010, Turkey mechanical engineer Yunus Cengel and American mechanical engineer Michael Boles state that that entropy can be applied to warfare organizations and processes, to the effect that a high entropy army is less powerful than a low-entropy army, namely one that is divided into divisions. The state that the old cliché 'divide and conquer' equates thermodynamically to the phrase 'increase the entropy and conquer'.

Physical intelligence

In 2009, idea of physical intelligence (PI), a thermodynamics upgrade to artificial intelligence (AI), so to speak, was conceived as a two-year research and development project, initiated by Defense Advanced Research Projects Agency (DARPA), of the US Department of Defense, under the direction and conception of program manager Todd Hylton.

The outline of the program is hinged on three independent but connected points: (a) creating a theory (a mathematical thermodynamic formalism) and validating it in natural and engineered systems; (b) building the first human-engineered systems that display physical intelligence [chemical thermodynamic based intelligence] in the form of abiotic, self-organizing electronic and chemical systems; (c) developing analytical tools to support the design and understanding of physically intelligent systems.

Several different teams worked on this project for a period of two-years, the end objective to build PI systems that could be used in the battlefield.

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Further reading

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θΔics

In science, **warm pond model** (TR:68), aka Darwin's warm pond, argues that life began in a warm pond about 3.9 billion years ago.

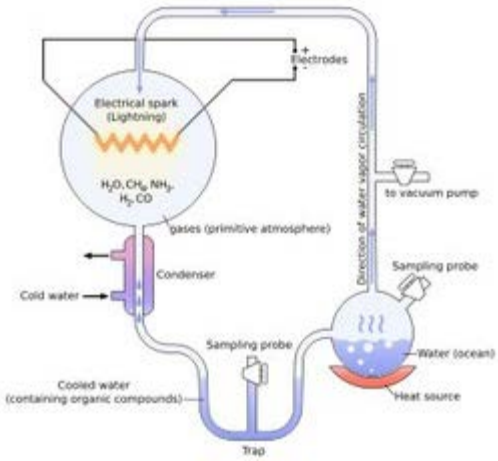

The 1952 (Miller-Urey experiment) **warm pond** experiment of American chemists Stanley Miller and Harold Urey. [2]

Overview

In 1871, Englishman naturalist Charles Darwin, in a letter to botanist Joseph Hooker, posited or conjectured the warm pond origin of life theory theory as: [1]

> "The original spark of life may have begun in a **warm little pond**, with all sorts of ammonia and phosphoric salts, lights, heat, electricity, etc., present, so that a protein compound was chemically formed ready to undergo still more complex changes."

(add)

Miller-Urey experiment

The first attempt at proof or disproof of Darwin's warm pond hypothesis, came from American chemists Stanley Miller and Harold Urey at the University of Chicago, who added electricity (see: lightning origin of life theory) to a chemical broth (an "ocean" of liquid water and an "atmosphere" of hydrogen-rich gases, e.g. methane, ammonia, hydrogen sulfide, and water vapor) for several days, after which they found that the vessel had "formed all sorts of compounds, including large quantities of amino acids." [1] In short, Miller and Urey showed that sparks ignited in a chemical broth, over several days, could make amino acids.

Difficulties on theory

> *See main: Unbridgeable gap; Defunct theory of life*

The results of the Miller-Urey experiment combined with recent fossil records, indicated that bacterial existed on the earth about 3.85 billion years ago, have led to the belief that 'once upon a time', three or four billion years ago, lightning struck a puddle of water containing a kind of warm chemical chicken broth and triggered the formation of amino acids, the building blocks of life. This type of logic, however, is inconsistent with standard molecular evolution tables that show a continuous build up and lineage of molecular structure (via mechanism), a table that cannot be divided by a certain hypothetical day. In other words, the laws of chemistry don't simply stop on a particular day and give their powers over to the laws of biology. The reverse is true, the laws of chemistry and thermodynamics are what define evolution and the laws of biology are only approximations. [3]

Theism

The following is "was Darwin wrong" diagram (Q) of the "primordial pond" model, by intelligent design advocate Gert Korthof, showing how the theist thinks about Darwin's warm pond model origin of things:

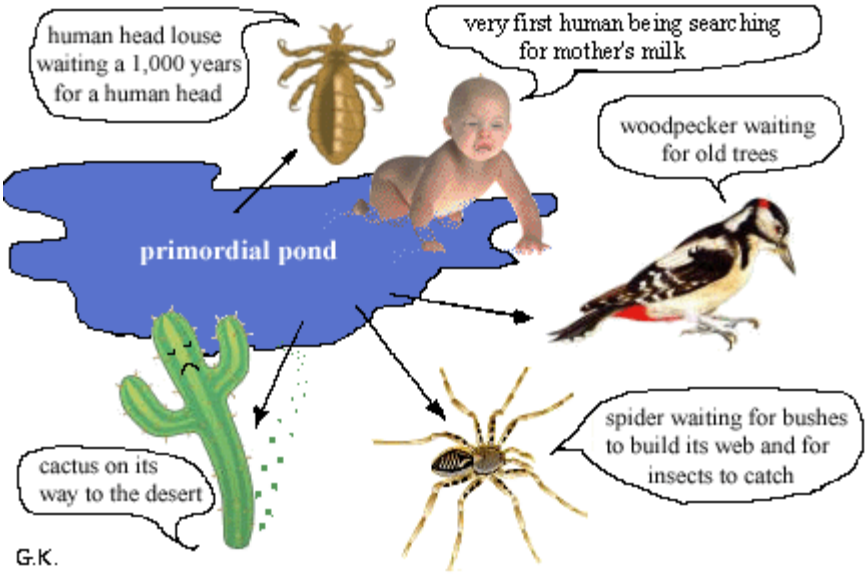

(add)

See also

- Molecules-to-man evolution
- Primordial soup

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2. Miller-Urey experiment – Wikipedia.
3. (a) Gladyshev, Georgi, P. (1997). *Thermodynamic Theory of the Evolution of Living Beings*. Commack, New York: Nova Science Publishers.
(b) Avery, John (2003). *Information Theory and Evolution*. New Jersey: World Scientific.

Further reading

- Pacchili, David. (2001). "Reflections From a Warm Little Pond", SpaceDaily.com, May 10.
- Armstrong, John. (2009). "Did Life on Earth Begin in a 'Little warm Pond'?", ScienceClarified.com, Jul 14.

θΔics

In hmolscience, **warming effect**, as compared to "chilling effect", a thermal term, refers to the view that reductionism, when viewed through the right light, is warming, yields greater meaning, yields to "sense of purpose" (compare: pointlessness), and therein giving context and structure to one's state of existence, and or reaction existence place in the universe.

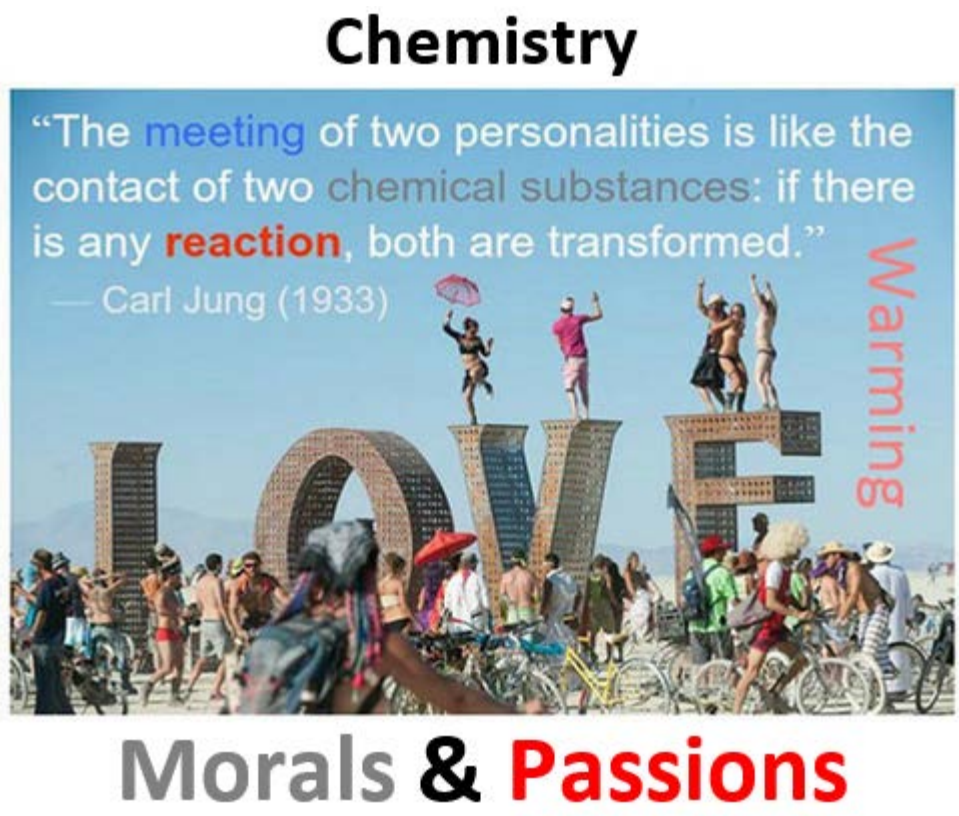

Slide #7 (Q) from Libb Thims 10 Aug 2015 "Zerotheism for Kids" class, a smart atheism for kids stylized "Monday School" lecture (compare: Monistic Sunday Sermons), wherein (V|12:27-14:57), wherein reductionism was explained as "warming", per reason that enlightenment, by definition, adds light to the big picture, therein **"warming"** the state of one's mind.

Overview

Noted warming effect genius scholars, i.e. historical smart atheists in the know, include: Johann Goethe (see: love thought experiment), Percy Shelley (see: Church of Elective Affinities), and Honore Balzac (see: Balzac feelings and affinity dialogue); these thinkers have been keen to the connection between the reductionist view of the morals and the passions to physical chemistry, understand that, although there are a still a few pieces to the puzzle to work out, the general resulting physicochemically-reduced picture or new world view is both warming and chilling and intelligible.

To explain via thermal analogy, when an uneducated person, in a cold dark winter, snow-covered forest, finds a little scrap of paper that explains how to start a fire, via friction, by rubbing dry sticks together, that person can therein, if successful and perseverant, start a fire and become "warmed", per reason that they have come to understand a new operation of nature, and used that knowledge to bring about a "warming effect".

Similarly, if in the social sphere of things, an uneducated person is lost in a cold dark era of personal or social turmoil, e.g. Fyodor Dostoyevsky, in the early cold period (1880s) of Russian, but happens to find a scrap of paper that explains how to start an emotional fire, either individually or socially, e.g. by the social friction of "rubbing of human molecules together" (Henry Carey, 1858), that newly educated person can therein become "warmed", per reason that they have come to understand a new operation of nature, and used that knowledge to bring about a "warming effect", individually or socially.

Quotes

The following are related quotes:

> "Even if open windows of science at **first make us shiver**, after the cozy **indoor warmth** of traditional humanizing myths, in the end the fresh air brings vigor, and the great spaces have a splendor of their own."
>
> — Bertrand Russell (1925), *What I Believe* [1]

References

1. (a) Russell, Bertrand. (1925). *What I Believe* (pg. 13). Dutton.
(b) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates*

and Jesus to Thomas (pg. 454). HarperOne.

See also

- Gates model
- Dostoyevsky dilemma

θΔics

In existographies, **Warren Weaver** (1894-1978) (CR:16) was an American mathematician and machine translation theorist noted for

Brillouin | Szilard

In 1940s, Weaver, supposedly, was the one who, prior to 1949, introduced Leon Brillouin to Leo Szilard's 1929 Maxwell's demon paper "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent Beings", and also was the one who later facilitated a formal meeting between Szilard and Brillouin. [3] Brillouin, in his 1949 article "Life, Thermodynamics, and Cybernetics", by repercussion, was discussing Norbert Wiener's 1948 *Cybernetics* discussion of Maxwell's demon.

Information theory

In 1949, Weaver, in an infamous 1949 footnote, shown below, to the opening chapter of *The Mathematical Theory of Communication*, wherein convoluted a falsely-made thermodynamics-based historical platform to Claude Shannon's 1948 information theory:

> "Shannon's work roots back, as von Neumann has pointed out, to Boltzmann's observations, in some of his work on statistical physics (1894), that entropy is related to 'missing information', inasmuch as it is related to the number of alternatives which remain possible to a physical system after all the macroscopically observable information concerning it has been recorded. Leo Szilard (*Zeitschrift fur Physik*, Vol. 53, 1925) extended this idea to a general discussion of information in physics, and von Neumann (*Mathematical Foundation of Quantum Mechanics*, Berlin, 1932, Chap V) treated information in quantum mechanics and particle physics. Shannon's work connects more directly with certain ideas developed some twenty years ago by Harry Nyquist and Ralph Hartley, both of Bell Laboratories; and Shannon has himself emphasized that communication theory owes a great debt to Norbert Wiener for much of its basic philosophy [cybernetics]. Wiener, on the other hand, points out that Shannon's early work on switching and mathematical logic antedated his own interest in this field; and generously adds that Shannon certainly deserves credit for independent development of such fundamental aspects of the theory as the introduction of entropic ideas. Shannon has naturally been specially concerned to push the applications to engineering communication, while Wiener has been more concerned with biological applications (central nervous system phenomena, etc.)."

To note, see the "information" article for more discussion on this and how this erroneous footnote led to the launching of the Shannon bandwagon. [2]

Rockefeller Foundation

In 1932, Weaver joined the Rockefeller foundation, therein becoming head of the newly-established natural sciences division.

In 1950, Weaver outlined the focus of the program of physical sciences applied to humans as follows: [5]

> "The analysis and control of the physical universe has made possible technological advances which have contributed to our safety and our comfort; but it is also true that some frightening secrets have been unlocked. Whether man has the wisdom to utilize properly his increased knowledge of physical nature is not as yet clear. To prevent becoming degraded by gadgetry or destroyed by physical force, it will be necessary to solve a variety of problems; and behind most if not all of these personal, social, and international problems there is a more basic set of problems - the problems involved in understanding individual human behavior."

He continues:

> "The gap between our sciences and our morals is primarily **a gap** [see: unbridgeable gap] between the capacity with which we control the physical forces of nature and the wisdom with which we control ourselves. Research in the physical sciences does not contribute toward closing this gap, and is in fact likely to widen the gap. Research which lays the foundations for a better understanding of the functioning of living organisms, and hence an ultimately better understanding of human behavior, tend to help close this gap."

Weaver then summarizes his conclusions, the last three of which are:

> "Place dominant emphasis on studies which are aimed at increasing our knowledge of basic biological problems. Particularly stress fields that promise to increase man's understanding of himself. Encourage the application to biological problems of all the methods developed in physics, chemistry, and mathematics."

(add)

Princeton social physics

See main: Stewart-Weaver fallout

In 1949, Weaver began to fund John Q. Stewart's newly conceived Princeton Social Physics project, with a grant of $15,000 (equivalent to $150,000 in 2015 terms), with which Stewart used to initiate a series of social physics symposiums. Four years later, in 1953, Weaver cut funding for the social physics projects, per the following reasoning:

> "To search for isomorphisms between 'social' phenomena and 'physical' phenomena is indeed an interesting idea. The real question, however, is whether or not it is a rewarding idea. It is interesting to suppose that there may be entities, social 'values', which play in social experience the same roles played by different forms of physical energy. But it is hard for me to sense how one can usefully assign quantitative measures to any significantly wide range of *values* in the social field. And when you link together such things as meaning, feeling, authority, and decision-making [choice], this sounds to me like a very heterogeneous mixture."
>
> — Warren Weaver (1953), "Letter to John Q. Stewart", Dec 22 [7]

This, of course, directly contradicts Warren's 1950 conclusions (above) for research funding focus; therein he becomes a hypocrite, resulting, in an inadvertently-stated manner, from closet theism objections (see: below).

Religion

Warren was brought up in a devout Christian home; his mother being an active leader in the church; in his 80s, he was still attending Church services. The following are a selection of his views on how he held Christian and scientific views in his mind, simultaneously:

> "I was brought up in a religious home. Not only did I go to Sunday school and church, I was taken to Wednesday-evening prayer meetings as well. With one part of my mind and heart I accepted all this. I think that god has revealed himself to many at many times and places. I think, indeed, that he keeps continuously revealing himself to man today. Every new discovery of science is a further 'revelation' of the order which god has built into his universe"

— Warren Weaver (1955), “Can a Scientist Believe in God?” [4]

“**I do not want to see ‘science’ as the central core**, with the arts, letters, philosophy, and ethics, and all the rest relegated to a less central, less dominant, less significant position. I want to see science in a full partnership with other approaches to the order and beauty and meaning of life. Science, to me, contributes most to our understanding of ‘order’, a good deal to ‘beauty’, largely via order, and **still less to ‘meaning’**. The humane arts start with the middle one of these three words, contribute chiefly at that point, and spill over in each direction. **Moral philosophy starts with the third, and diffuses back to the second and the first**. If I had to assign priorities, it would be to moral philosophy.”

— Warren Weaver (c.1957), “Comment to Bentley Glass”; cited by Bentley Glass (1958) in “Liberal Education in a Scientific Age” (pg. 348) [8]

“Throughout my life—and since I am now in my early eighties [age 81] I am speaking of a considerable span of years—I have had two dominate interests and concerns: science and religion. In all this dazzling array of novel and shocking scientific ideas, there are two that I judge to be of central significance in any discussion of the relation between science and religion. If I am to advance with any persuasiveness my ideas concerning religion, I must deal briefly with these two important principles of quantum theory: the ‘uncertainty principle’ and the ‘principle of complementarity’. **I do not believe, for instance, that Western man will ever have to change the basic principles that Moses or Jesus enunciated**, al-though we will surely have to reinterpret them, to make them applicable to changing modern problems. Science and religion, then, both change, but in very different ways, because of the contrasting levels at which uncertainty and confusion exist.”

— Warren Weaver (1975), “My Religious Belief as a Scientist” [9]

Weaver, in his article “My Religious Belief as a Scientist” (1975), goes on to state that he does not believe in the trinity, he disagrees with the Apostle’s creed (and therefore does not say it aloud in church), does not accept “all” the miracles in the Bible, and things that “god has created the complex orderliness of the universe, as revealed by science”, is an anti-chance believer, and adheres to the “watchmaker analogy” specifically in respect to elementary particles. Lastly, Weaver cites the following affirmation by Tolstoy as being closest to his creed:

“I believe in god, who for me is spirit, love, the principle of all things. I believe that he is in me, and I in him.”

— Leo Tolstoy (1880), *Confessions* (Ñº)(Ñº)

(add)

Quotes | By

The following are related quotes:

“Why do we seem to know so much more about atoms than we do about men?”

— Warren Weaver (1950), “The Program in the Natural Sciences” [6]

References

1. Shannon, Claude E. and Warren, Weaver. (1949). *The Mathematical Theory of Communication* (pg. 3, footnote). University of Illinois Press.
2. Thims, Libb. (2012). "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair" (URL), *Journal of Human Thermodynamics*, 8(1): 1-##, Nov.
3. (a) Lanouette, William. (1992). *Genius in the Shadows: a Biography of Leo Szilard: the Man Behind the Bomb* (pg. 64). C. Scribner's Sons.
(b) Mirowski, Philip. (2002). *Machine Dreams: Economics Becomes a Cyborg Science* (pg. 50). Cambridge University Press.
4. (a) Weaver, Warren. (1955). "Can a Scientist Believe in God", *Look Magazine*, Apr 5; in: *Religions of America* (editor: Leo Rosten) (pgs. 204-). Publisher, 1963; in: *Physics and Man* (editor: Robert Karplus) (pgs. 109-). W.A. Benjamin, 1970.
(b) Kodish, Bruce I. (2003). *Dare to Inquire: Sanity and survival for the 21st Century and Beyond* (pg. 243). Extensional Publishing.
5. Molecular Biology (history) – Rockefeller100.org.
6. Weaver, Rockefeller. (1950). "The Program in the Natural Sciences" (Ñº)(pdf), Trustees' Confidential Report, Mar; in: Rockefeller Archive Center, RG 3.1, Series 915, Box 2, Folder 14.
7. Weaver, Warren. (1953). "Letter to John Q. Stewart", Dec 22, in: Box 36, Weaver, W., John Q. Stewart Papers, Rare Books and Special Collections, Princeton University.
8. Glass, Bentley. (1958). "Liberal Education in a Scientific Age" (§: "The Present Divorce Between Science and the Humanities", pg. 348), *Bulletin of the Atomic Scientists*, pgs. 346-53, Nov.
9. Rostein, Leo. (1975). *Religions of America* (§: The Religion of a Scientist, pgs. 296-305). Simon and Schuster.

External links

â— Warren Weaver – Wikipedia.

θΔics

In Egyptian mythology, **was scepter**, aka "tcham-scepter", uas scepter, or ueb staff, is a staff, with an "Set animal" head (Gardiner, c.1916) and spear-like tip, symbolic of the powers of the god Set, generally thought to be representative of the dry death-like properties of the red desert, as contrasted with the green fertile lands of the Nile River banks; when a god holds it, it is said to represent dominion over the powers of destruction or evil (Q), by that god, or something to this effect.

Various images of the "was scepter", or staff of Set, the left image from Djet's ivory comb (c.2980BC) (Q)(Q), the three sketches to the left from Rene Lubicz's *Sacred Science* (pg. 29).

Overview

In 2980BC, pharaoh Djet, the fourth pharaoh of unified Egypt, had two was scepters engraved on his ivory comb as follows, along with an ankh symbol: [2]

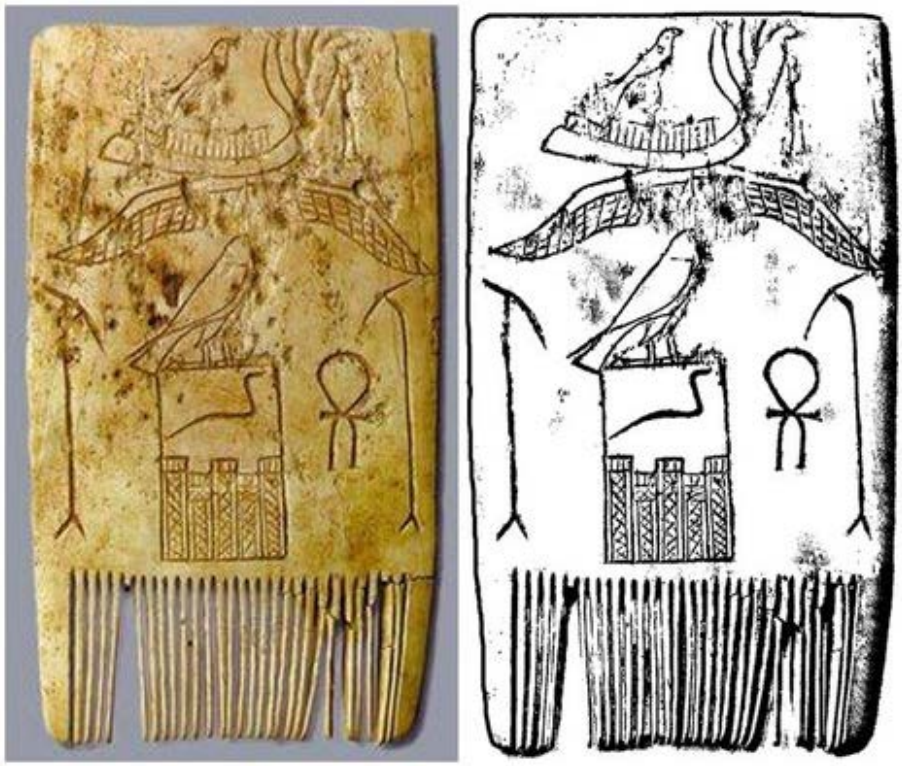

In c.2600BC, pharaoh Djoser (Q) had was scepters showing arms, along with ankh's showing arms:

These was scepters, in this period, presumably, would be representative of the powers of darkness, death, and evil, during either the first or second hypostasis of Set as the opposite of Heru-ur (3,100BC) or of Ra (2600BC).

> "We have now seen how the god **Set** was the opponent first of Heru-ur [3,100BC], then of Ra [2600BC], and finally of Osiris [1100BC] and his son Horus [332BC], and that during the long period of Egyptian history his attributes changed according to the various modifications which took place in the beliefs concerning this god in the minds of the Egyptians, and that from being a power of nature, the darkness, he became the symbol and personification of both physical and moral evil."
>
> — Wallis Budge (1904), *The Gods of the Egyptians, Volume Two* (pgs. 244-45)

In 1250BC, in the iconic "weighting of the soul scene" in the Ani-version of the Egyptian Book of the Dead, all the gods of the Ennead are shown holding the was scepter, symbolic, supposedly, at this point, of the powers of death or physical and moral evil, as Budge conjectures:

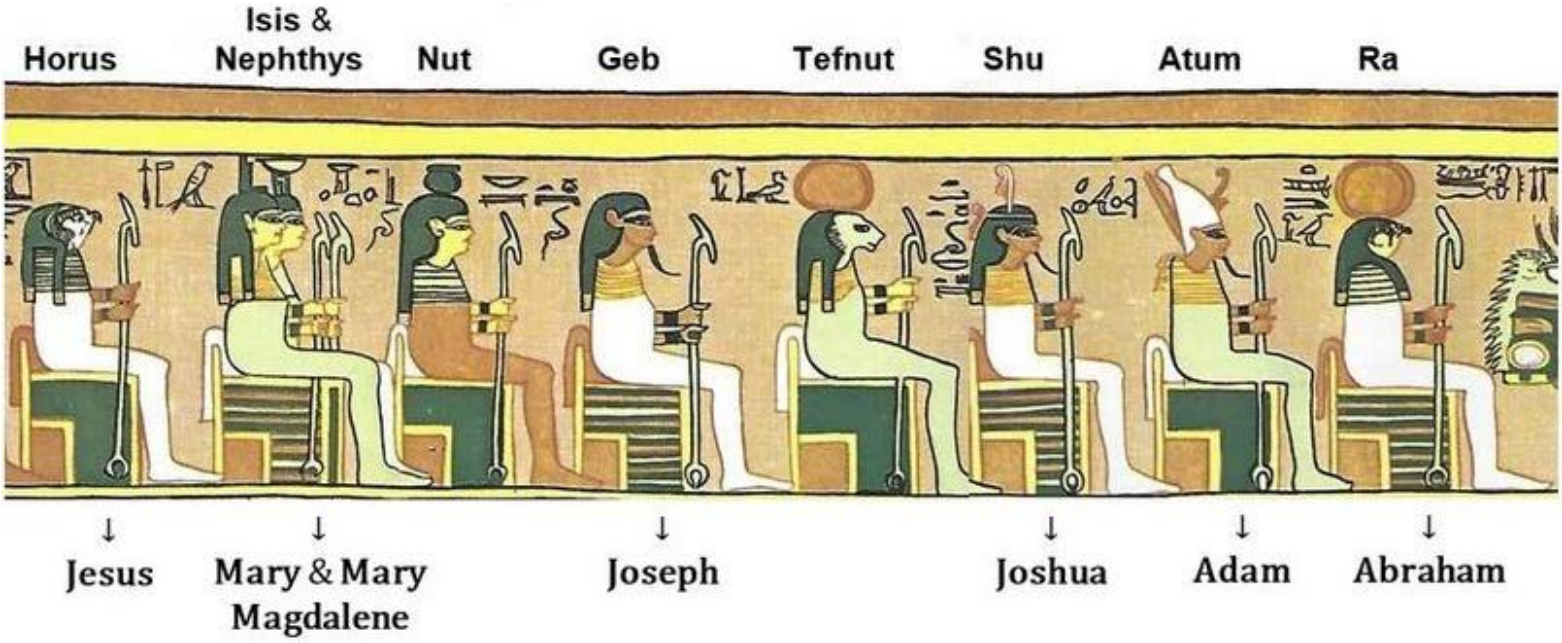

At this point, in the hypostasis of Set, his staff, held by each of the main gods of the Egyptian pantheon, is symbolic of the forces of darkness; this would eventually culminate, during the Roman recension (c.100-600BC), as Satan (without staff) as the demon of darkness who battles with god or Jesus.

See also

- Ankh
- Djed pillar

● Thyrsus

References

1. (a) Ford, Michael W. (2013). (§: The Was-Scepter & D'M Scepter, pgs. 100-). LuLu.
(b) Thompson, Henry O. (1970). *Mekal: the God of Beth-Shan* (pg. 58). Publisher.
2. Early Was – JoanLansberry.com.

Further reading

● Faulkner, Raymond. (1972). *The Egyptian Book of the Dead: the Book of Coming Forth by Day: Complete Papyrus of Ani, Featuring Integrated Text and Full-Color Images* (translator: Ogden Goelet; Preface: Carol Andrews; Introduction: Daniel Gunther; Foreword: James Wasserman) (Amz) (pgs. 41-41, 165). Chronicle Books, 2015.

External links

● Was-sceptre – Wikipedia.
● Was-sceptre – GlobalEgyptianMuseum.org.

θΔics

In genius studies, **Washington 23** refers to []

A selection of 8 of the 23 great lawgivers, aka **Washington 23**, shown in the House Chamber of the US House of Representatives selected (1950) as being noted for their work in establishing the principles that underlie American law. [1]

Overview

In 1950, 23 great lawgivers were chosen, by scholars from the University of Pennsylvania and the Columbia Historical Society of Washington, DC, in consultation with authoritative staff members of the Library of Congress, the selection being approved by a special committee of five Members of the House of Representatives and the Architect of the Capitol, as being noted for their work in establishing the principles that underlie American law, as listed below, in alphabetical order: [1]

1. Alfonso X
2. Edward I
3. Gaius
4. George Mason
5. Gregory IX
6. Hammurabi
7. Hugo Grotius / (IQ:185|#87) (Cattell 1000:125) [RGM:255|1,330+] (CR:14)
8. Innocent III
9. Jean Colbert
10. Justinian I
11. Lycurgus | (Cattell 1000:437)
12. Maimonides / (IQ:170|#399) [RGM:398|1,320+]
13. Moses (see: Moses never existed)
14. Napoleon I
15. Papinian
16. Robert Pothier
17. Saint Louis
18. Simon de Montfort
19. William Blackstone
20. Solon / (Cattell 1000:391) [RMS:2]
21. Suleiman
22. Thomas Jefferson / (IQ:190|#40) (Cattell 1000:79) [RGM:29|1,245+] (HD:17) (CR:219)
23. Tribonian

Each lawgiver is depicted in bas-relief over the gallery doors of the House Chamber of the US House of Representatives.

References

1. (a) About (23 great lawgivers) – AOC.gov.
(b) Photos (23 great lawgivers) – AOC.gov.

θΔics

In existographies, **Wassily Leontief** (1906-1999) (CR:8) was German-born American economist noted for being one of the 1941 doctoral advisors for Paul Samuelson and for his 1953 lecture "Mathematics in Economics", wherein he traces the origin of mathematical economics from Willard Gibbs to Irving Fisher to Edwin Wilson to Samuelson. [1]

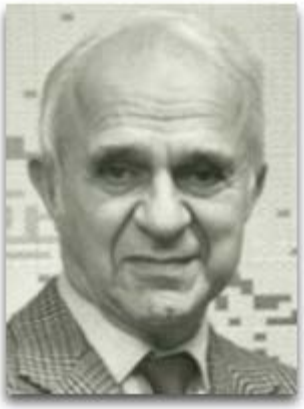

Gibbs-based | Mathematical economics

In 1953, Leontief, in his "Mathematics in Economics", stated the following summary:

> "Fisher and Wilson were leading spirits in the organization—twenty-three years ago—of the international Econometric Society which now unites 2,500 economic statisticians and economists who claim the ability to speak—or at least to understand when spoken to—the 'language of mathematics' which Gibbs used with such compelling and poetic power."

Leontief then commented how not every economist is in alignment with mathematical economics, of this sort, e.g. citing John Keynes as referring to it as "mere concoctions."

Leontief goes onto stitch this together, historically, with the general equilibrium theory of Leon Walras—and before him Daniel Bernoulli, Augustin Cournot, and E.J. Dupiut, in mathematical form—and after him in the work of Vilfredo Pareto, his contemporaries and successors.

Samuelson anecdote

In circa 1941, Samuelson, following his Harvard's Society of Fellows intellectual sojourn (1937-1940), quickly wrote up his PhD dissertation, after which, as the story goes, when he completed his defense of his doctoral dissertation, one member of the committee, great economist Joseph Schumpeter, turned to Wassily and said, "did we pass?"; or specifically, as William Barnett, in co-editor association with Samuelson (2007): [2]

> "It is widely reported that at the end of Samuelson's dissertation defense at Harvard, the great economist Joseph Schumpeter turned to Nobel Laureate, **Wassily Leontief**, and asked, 'Well, Wassily, have we passed?'"

The exact date of this defense needs to be tracked down, but whatever the case, most sources report that Samuelson received his PhD in 1941 from Harvard —though, to note, somehow, he had moved to MIT before finalizing his PhD (see below) (check). Samuelson's thesis, according to Andrew W. Lo, modeled each person as an economic agent, and assumed that each individual acted so as to maximize a quantity called 'expected utility', a model with which he assumed should be able to predict their behavior in much the same way that physicists predict the behavior of physical objects.

Quotes | By

The following are quotes on Leontief:

> "How long will researchers working in adjoining fields abstain from expressing concern about the **splendid isolation** within which 'academic economics' now finds itself."
>
> — Wassily Leontief (1982), "Letter to *Science* magazine" [3]

References

1. Leontief, Wassily. (1953). "Mathematics in Economics", 27th Josiah Willard Gibbs Lecture, AMS, Baltimore

Maryland, Dec 28; in: *Bulletin of the American Mathematical Society*, 60(3), May, 1954; in *Essays in Economics: Theories and Theorizing, Volume 1* (pgs. 22-44). M.E. Sharpe, 1976.
2. Samuelson, Paul and Barnett, William A. (2007). *Inside the Economist's Mind: Conversations with Eminent Economists* (§:Coeditor's Preface: an Overview of the Objectives and Contents of the Volume, pgs. xi-). Wiley.
3. Hall, Charles and Klitgaard, Kent. (2011). *Energy and the Wealth of Nations: Understanding the Biophysical Economy* (pg. vii). Springer.

External links

â— Wassily Leontief – Wikipedia.

θΔics

In existographies, **Wassim Haddad** (1961-) is a Greek-born American mechanical engineer, noted for []

Overview

In 2019, Haddad, in his *A Dynamical Systems Theory of Thermodynamics*, penned an epilogue chapter on the following topics: origin of life, health, and aging. The specifics of these, however, peter out into nonsense, per reasons of reference to Claude Shannon and Shannon entropy as the open sesame "key" to solve any problem; to exemplify:

> "In a healthy conscious human, entropy production occurs spontaneously and, in accordance with Jaynes' maximum entropy production principle [see: MaxEnt school], energy dispersal is optimal, leading to a maximum entropy production rate. Hence, low entropy in (healthy) human brain networks is synonymous with consciousness and the creation of order (negative entropy change or the availability of energy to do work) reflects a rich fractal spatiotemporal variability, which, since the brain controls key …"
>
> — Wassim Haddad (2019), *A Dynamical Systems Theory of Thermodynamics* (pg. 664)

> "Before unlocking the mystery of the origin of life, it is necessary to develop a rigorous unification between thermodynamic entropy, information entropy, and biological organization; these fundamental notions remain disjoint, and this is not surprising when one considers how Shannon chose …"
>
> — Wassim Haddad (2019), *A Dynamical Systems Theory of Thermodynamics* (pg. 652)

Haddad, here, is selling a Sokal affair style, Shannon bandwagon, ontic opening, in short; not to mention the fact that there is NO origin of life (see: abioism).

Quotes | By

The following are quotes by Haddad:

> "Thermodynamics is universal, and hence, in principle, it applies to everything in nature—from simple engineering systems to complex living organisms to our expanding universe. The laws of thermodynamics form the theoretical underpinning of diverse disciplines such as biology, chemistry, climatology, ecology, economics, engineering, genetics, geology, neuroscience, physics, physiology, sociology, and cosmology, and they play a key role in the understanding of these disciplines."
>
> — Wassim Haddad (2019), *A Dynamical Systems Theory of Thermodynamics* (pg. 641)

References

1. Haddad, Wassim. (2019). *A Dynamical Systems Theory of Thermodynamics* (Shannon, 5+ pgs). Princeton University Press.

External links

â— Wassim Michael Haddad – Wikipedia.

θΔics

In science, **water** is a chemical substance, consisting of aggregates of H_2O molecules, found existing in one of three states: gas, liquid, or solid.

Greek philosopher Plato, in his *circa* 360BC dialogue *Timaeus*, supposedly following Pythagoras, introduced the four element version of geometric atomic theory proposition that ideal geometric forms serve as atoms, according to which atoms broke down mathematically into triangles, such that the form elements had the following shape: fire (tetrahedron), air (octahedron), water (icosahedron), earth (cube). [1]

NPR science writer Robert Krulwich summary of Neil Shubin's 2013 humans as "**watery** molecules" take on the Sterner-Elser human molecular formula. [2]

See also

â— Waterpower

References

1. (a) Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pgs. 58). University Press of America.
(b) Timaeus (dialogue) – Wikipedia.
2. (a) Shubin, Neil. (2013). *The Universe Within: Discovering the Common History of Rocks, Planets, and People* (§: pg. #; end note, pg. 198). Random House.
(b) Krulwich, Robert. (2013). "Born Wet, Human Babies are 75 Percent Water. Then Comes Drying" (Ñº), NPR, Nov 26.

External links

â— Water – Wikipedia.

θΔics

In industry, **waterpower** or *water-power* is defined as the power of water employed to move machinery or the fall of water suitable for being used to move machinery. [1] This was the primary means of powering the operation of factories, prior to the industrial revolution, initiated in 1702 by the functional development of English engineer Thomas Savery's engine. [2]

In this sense, a proximity to bodies of water was a necessary prerequisite to the development of mills and later towns around mills. To exemplify, in his *Pirotechnica* of 1540, Italian metallurgist Vannoccio Biringuccio stated that:

> "Of all the inconveniences, shortage of **water** is the most to be avoided, for it is a material of the utmost importance in such work, because wheels and other ingenious machines are driven by its **power** and weight."

An artistic rendition of a water mill, according to which the power of the fall of water through a height, i.e. work per unit time or **water power**, "drives" the mechanical operation of the mill, which is to grind grain.

Typically, to obtain power from water, an amount of water from a river, impoundment, or mill pond is diverted to a turbine or water wheel, along a channel or pipe. The force of the water's movement drives the blades of a wheel or turbine, which in turn rotates an axle that drives the mill's other machinery.

Thermodynamics

In 1823, French engineer Sadi Carnot, in his *Reflections on the Motive Power of Fire*, famously stated that the "fall of caloric", from the hot body (boiler) to the cold body (condenser), through the working substance in the operation of the steam engine, is comparable, in principle, to the "fall of water", from the higher location, through the rotary mechanism of the water mill, to the lower location, in the machines operated by falling water, in the production of motive power.

Drive theory

In 1930, Austrian psychologist Sigmund Freud stated, in his *Civilization and its Discontents*, that the starting point for his famous 1895 conceived free energy and bound energy connected 1910 "drive theory" basis for his libido energy (id, ego, superego) model of the "theory of instincts" of psychoanalysis from the final line of Friedrich Schiller's 1795 "The World Way" poem, which according to the 1961 translation by James Strachey, Freud quotes as follows:

> "Hunger and love are what moves the world."
>
> — Friedrich Schiller (1795), quoted by Sigmund Freud, in *Civilization and its Discontents* (1930) (Q), as basis if his drive theory (Q)

(add discussion)

See also

- Horsepower
- Manpower
- Social power

References

1. Manpower – Merriam-Webster Collegiate Dictionary, 2000.
2. Kirby, Richard S., Withington, Sidney, Darling, Arthur B., and Kilgour, Frederick, G. (1956). *Engineering in History*, (pgs. 154, 171-72). New York: McGraw-Hill.
3. Biringuccio, Vannoccio. (1540). *Pirotechnia of Vannoccio Biringuccio* (American Institute of Mining and Metallurgical Engineers, New York, 1942, pg. 22).

θΔics

In existographies, **Watson Heston** (1846-1905) (FA:85) was an American freethinker, photographer, and illustrator noted for []

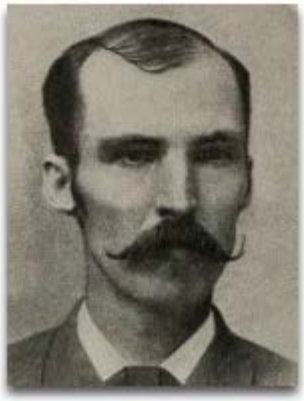

Overview

In the 1880s, Heston began making illustrations in the free thinker journal *Truth Seeker*. (O)

In 1892, Heston, expanding on these illustrations, published *The Old Testament Comically Illustrated*, wherein he steps though all the big tales of the Bible, starting with Adam and Eve. This was followed up by *The New Testament Comically Illustrated* (1898), and *The Bible Comically Illustrated* (1900), the latter of which being 800 pages in length, containing 400 pictures (O), and having a print run of 10,000 copies.

Adam

The following, from his "The Adventures of Adam" (see: Adam and Eve) is Heston's rendition of the creation of Adam: [1]

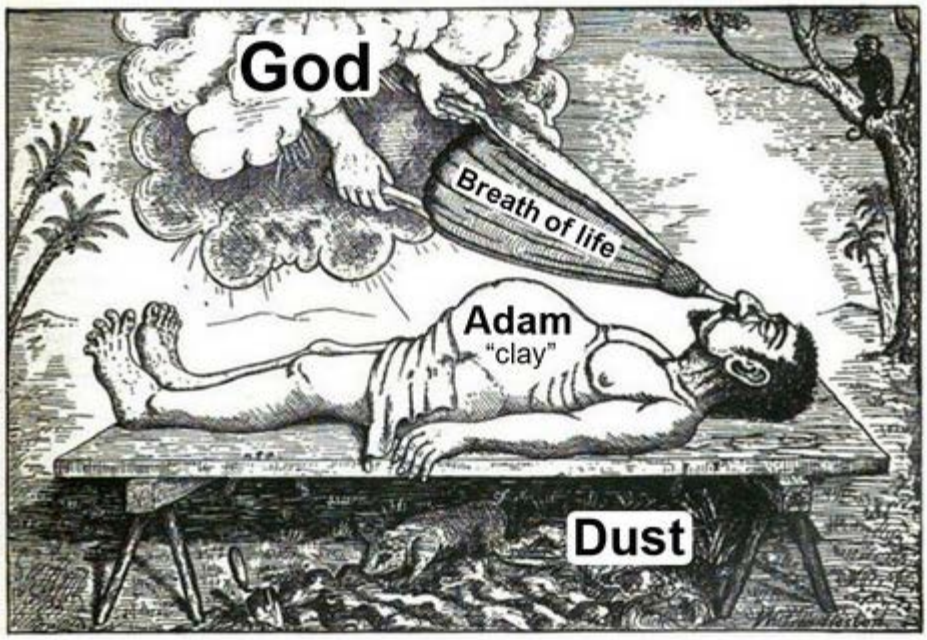

"And the **Lord God** formed **man** of the **dust** of the ground, and **breathed** into his nostrils the **breath of life**, and man became a **living soul**."
— Anon (c.500BC), *Bible* (Genesis 2:7)

Heston, in reference to clay creation myth, comments on this:

> "The idea is borrowed from preceding religions, and is no more original than true. According to Grecian mythology, the god Prometheus created man, in the image of gods, out of clay; and the god Hephaistos was commanded by Zeus to mold of clay the figure of a maiden, into which Athene, the dawn-goddess, 'breathed the breath of life'."

(add discussion)

Quotes

The following are noted quotes:

> “The first heretic was the gentleman who counted his wife’s ribs.”
>
> — Watson Heston (1892), *The Old Testament Stories Comically Illustrated* (pg. 10)

See also

- Horus Gilgamesh

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Further reading

- Heston, Watson. (1896). *The Freethinkers' Pictorial Text-book: Showing the Absurdity and Untruthfulness of the Church's Claim to be a Divine and Beneficent Institution and Revealing the Abuses of a Union of Church and State*. Bank of Wisdom.

External links

- Watson Heston – Wikipedia.

θΔics

In barometers, **Watt barometer**, aka “Steam gauge” (Watt, 1818) or “barometer gauge” (Farey, 1827), or “manometer” (Cardwell, 1971), refers to []

Overview

In 1765, James Watt, in the development of his steam engine (see: Watt engine) used a standard Torricellian barometer, which he attached to his condenser, so to ascertain a reading of the pressure of the steam in the piston and cylinder.

In 1818, Watt described his pressure-gauge, shown adjacent, as follows:

> “The **steam-gauge** is a short glass tube with its lower end immersed in a cistern of mercury, which is placed within an iron box screwed to the boiler steam-pipe, or to some other part communicating freely with the steam, which, pressing on the surface of the mercury in the cistern, raises the mercury in the tube (which is open to the air at the upper end), and its altitude serves to show the elastic power of the steam over that of the atmosphere.”
>
> — James Watt (1818), “Appendix Notes on John Robinson’s Steam-Engine Articles” [2]

In 1827, John Farey, in his “Barometer gauge” section, of his *A Treatise on the Steam Engine*, gives the following summary of the pressure gauge: [3]

> “*Barometer gauge.* This is an instrument to indicate the degrees of exhaustion within the condenser; it is constructed like a weather-glass or barometer, except that the upper end of the glass tube communicates by a small copper pipe with the condenser: the lower end of the glass tube is open, and is immersed in mercury contained in a small cistern or basin, the surface being exposed to the atmospheric pressure. The glass tube, which is about 32-inches long, is placed in a perpendicular direction, and the copper pipe from the condenser is very closely cemented to the glass at the upper end. When the engine is at work, and a vacuum is formed in the condenser, the barometer tube is exhausted, so that the surface of the mercury in that tube is relieved from pressure, and the weight of the atmosphere which presses upon the surface of the mercury in the basin, causes a column thereof to mount up in the tube, to a greater or less height according as the vacuum in the condenser is more or less perfect, and according to the weight of the atmosphere, which will be shown by a common Torricellian barometer or weather-glass.
>
> The pipe which leads from the condenser to the top of the barometer tube must be provided with a cóck , which should be only very partially opened, or else the variations of the vacuum at every stroke of the engine, would occasion such continual oscillations of the height of the mercury in the tube, as to prevent any accurate observation. A ruler or scale divided into inches, and numbered up. wards from the surface of the mercury in the bason, is fixed behind the tube to measure the height to which the mercury rises therein, in the same manner as the scale of a common weather-glass.
>
> When an engine is in good order, free from leakage and with cold injection water, the cóck of the barometer being opened very gradually, the mercury will ascend in the tube to 28 inches above the level of the surface of the mercury in the basin, the ordinary atmospheric barometer at the same time standing at 30 inches. This shows that the elasticity of the rare steam which remains uncondensed in the condenser, is equal to the pressure of a column of two inches of mercury. According to the table of elasticities, the temperature of that steam would be near 102 deg. Fahrenheit, supposing that no atmospheric air is present; but as some air is always mixed with the rare steam, and augments its elasticity, the temperature of the water discharged into the hot well will be about 100 degrees.
>
> The mercury will be observed to rise gradually, and fall suddenly, at every stroke of the engine. The vacuum is most perfect towards the end of the returning stroke, when the piston has risen to the top of its course, because the greatest cold has been then produced by the injection, and also the air-pump has just

taken its stroke, and exhausted part of the air, water, and steam, from the condenser; at this period, the mercury will often stand at 28 or 28} inches, but when the exhausting valve is opened, and the steam is admitted into the condenser, the mercury will fall rapidly to 27 or 26, inches; but before the piston has completed its stroke, the mercury will become stationary, because the cylinder being exhausted, no more steam is let into the condenser; the mercury will even begin to rise again slowly, because the injection-water continues to flow and condense the steam. After the injection is shut, and whilst the engine makes its returning stroke, the mercury will continue to rise with more rapidity, in consequence of the condenser being further exhausted by the ascent of the air-pump bucket; and the mercury will have regained its original height of 28 or 28; inches, by the time the piston reaches the top of the cylinder.

The cóck of the barometer tube should be shut when the observation is finished, and should always remain so. It must be shut when the engine is blowing through, to avoid throwing the mercury out of the bason. The basin for the mercury must be large enough to contain all the mercury, because when the engine is not at work, the air will leak in, and the mercury will descend into the basin.

As glass tubes are liable to be broken, the barometer tube may be made of iron, in the form of an inverted syphon, like the steam-gauge, before described (pg. 872), one leg communicating with the condenser, and the other left open to the air, the rise of the mercury in one leg, will produce a corresponding fall of the mercury in the other; and the scale being applied to only one leg, the divisions must be half inches, that is, provided the two legs are of the same bore; but if they are different, the scale must not be half inches, but must be divided by trial, in a proper proportion to show the true difference of level between the surfaces of the mercury in the two legs.

The inverted syphon for this barometer may be made of glass; but both parts of the tube, must be correctly of one diameter, or else the result will be erroneous; it is difficult to graduate a scale by experiment in an iron tube, because the difference of level of the mercury in the legs cannot be seen. This barometer tube must communicate with the condenser by a small copper pipe, and a stop-cóck. The index is a light wooden rod, which is put into the open leg of the tube, the same as in the steam-gauge; the mercury being poured into the tube to within a few inches of the open end, the rod floats on the surface of the mercury, and its upper end points to the divisions on the scale ; the numbers on that scale must be inverted with respect to those of a single tube.

The engine barometer shows the perfection of the vacuum, or the pressure of the atmosphere to enter into the o space; the steam-gauge shows the pressure of the steam to escape into the air, and the height of these two columns added together, shows the utmost force which the steam is capable of exerting on the piston, supposing that the steam met with no resistance whatever, in passing from the boiler into the cylinder, or in passing out of the cylinder into the condenser."

In c.1785, Watt later tried to affix a mercury barometer directly to the piston and cylinder, but the vibrations or something made this untenable; the following is one statement on this:

> "The barometer being adapted only to ascertain the degree of exhaustion in the condenser where its variations were small, the vibrations of the mercury rendered it very difficult, if not impracticable, to ascertain the state of exhaustion of the cylinder at the different periods of the stroke of the engine."
>
> — James Watt (c.1675), *Publication* [1]

In 1790, Watt, working with his employee Matthew Boulton, supposedly (check), had invented the spring-style barometer, as seen used in the indicator.

See also

- Torricellian barometer
- Guericke barometer

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3. Farey, John. (1827). *A Treatise on the Steam Engine: Historical, Practical, and Descriptive* (§: Barometer gauge, pgs. 377-79). Longman.

θΔics

In engines, **Watt engine**, or “Watt steam engine”, refers to []

Overview

In 1763, James Watt was assigned the job of improving a Newcomen engine.

The remodeled version, which had a separate condenser (1765), sun and planet gear (1781), centrifugal governor (1788), and indicator diagram (1796), came to be known as the Watt engine, as illustrated below: [1]

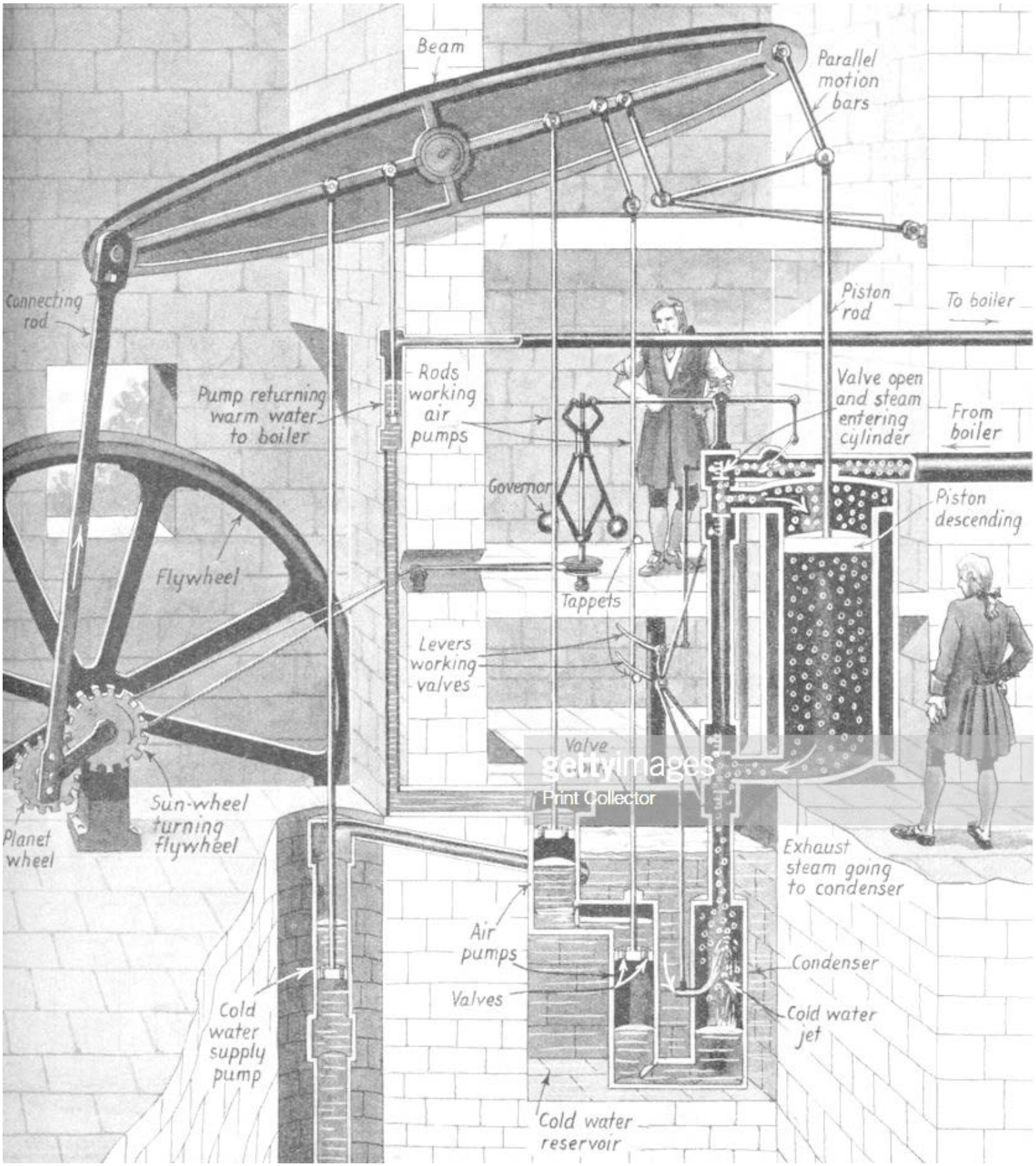

gettyimages
Print Collector

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See also

- Engine development timeline

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θΔics

In physics, **wave function collapse**, or collapse of the wave function, is the position held that all particles, electrons in particular, have a "wavelike" motion (Louis de Broglie, 1923), which can be mathematically quantified according to a "wave function" (Erwin Schrodinger, 1926), and that normally an electron will fill a certain volume of space, such as a box, in entirety, being found anywhere inside that volume, but that when we look into either side of the volume to find the location of the particle, the wave function will instantaneously collapse, thus form into a particle, and "decide" which location to be in. [1]

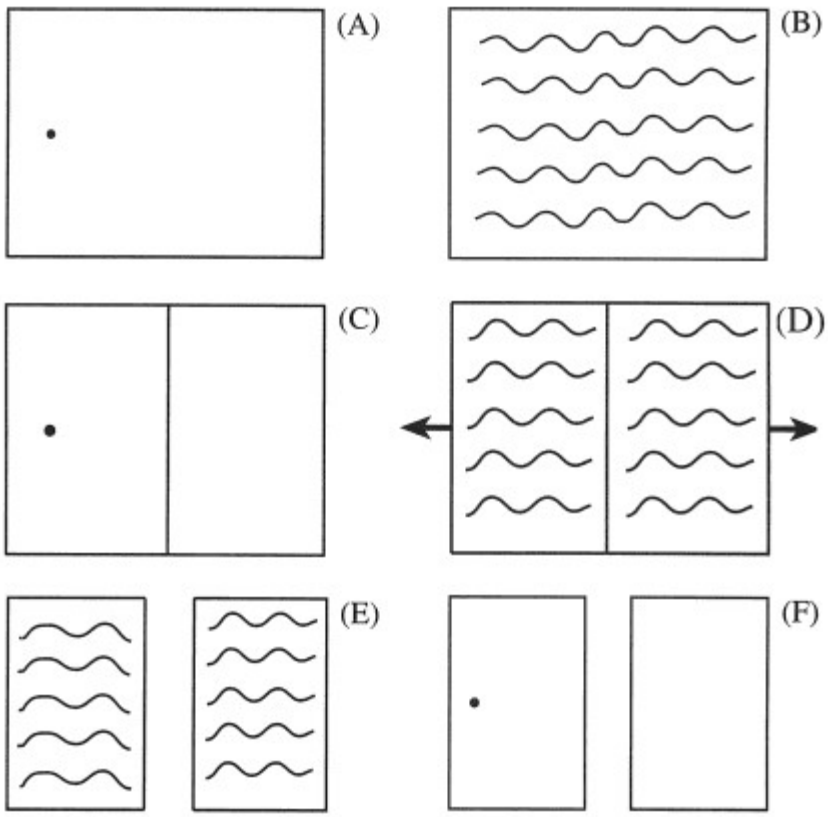

History

The mathematical formalism describing the collapse of the wave function was developed by John Neumann, based on the previous so-called "Copenhagen interpretation" work of Niels Bohr, Max Born, and Werner Heisenberg's uncertainty principle.

The famous thought experiment of Schrodinger's cat, i.e. a cat that is both dead and alive, is based on the absurdity of certain interpretations of the notion of a wave function collapse owing to observation.

Adjacent is a visual depiction, according to English physicist John Gribbin, of the notion of the **wave function collapse**, : (A) common sense dictates that an electron is in a definite location, even if we don't know where it is; (B) the Copenhagen interpretation states that the electron exists as a wave filling the box, and could be anywhere inside; (C) at the moment we look for the electron, the wave function collapses at a certain location; (D) common sense says that if we slide a partition into the box, without looking, the electron must be on one half of the box; yet the Copenhagen interpretation states that as long as we don't look, the electron will still occupy both halves, and that it only collapses on one side when "we look"; (E) as long as we don't look, even if we move the two halves of the box far apart, the wave still fills both boxes; (F) if we then "look" into the two separated boxes (even if they are light years apart), the wave function will collapse, instantaneously, and the particle will "decide" which box it is in. [1]

Human physics

In human physics, some have argued that wave function collapse explains things such as: consciousness, free will, and or the existence of God.

American physicist Robert Doyle, for example, argues, in his 2011 book *Free Will*, that the wave function collapse is one of the steps, along with entropy increase, involved in the "creation" of every material object in the universe, and that measurement of the wave function collapse produces new information, and that, in some way, this gives humans free will. [2]

See also

â— Double slit experiment

References

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External links

â— Wave function collapse – Wikipedia.

θΔics

In science, **wave theory of light**, or "undulation theory", as contrasted with the "corpuscular theory of light", states that light is composed of waves, similar to water waves made when a stone is dropped in still water. []

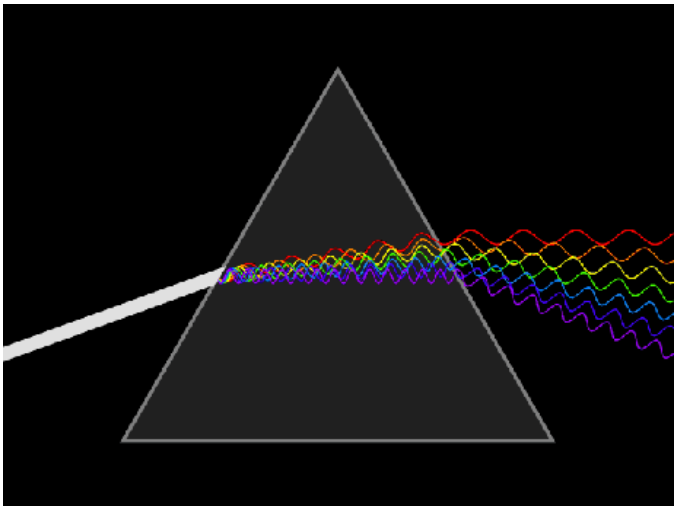

A diagram showing white light being split, during its passage through a prism, into its component electromagnetic waves (see: electromagnetic force) of color, a general conception of the **wave theory of light**.

Overview

In c.1630, Rene Descartes French natural philosopher Rene Descartes looked through a prism in sunlight and saw a circle of colors; he hypothesized that light is a pressure in the ether and color an effect of the rotation of the ether particles.

In 1665, Robert Hooke, in his *Micrographia*, section IX: "Of the Colors Observable in Muscovy Glass, and other Thin Bodies", digressed on microscope observations he had made on Muscovy glass, a type of Muscovite or mica, a form of silicate of aluminum which was composed of many layers, which could easily be split into fin flakes, which were themselves composed of several thinner layers, in which Hooke saw rings of color in a succession of rainbow sequences around a white central layer. [1]

Hooke found that by pressing the flakes, he could move the colored rings, and that by splitting them he could produce plates of a single color.

Quotes

The following are related quotes:

> "By the genius of Young and Fresnel the **wave theory of light** was established in a position so strong that hence forth the corpuscular hypothesis was unable to recruit any adherents among the younger men."
>
> — Edmund Whittaker (1987), *A History of the Theory of Aether and Electricity* (Q)

> "To explain the rings of colour in thin plates, Hooke presented his own explanation of the nature and behaviour of light. He put forward several important propositions, which amounted to a new **wave theory of light**, different in many respects from the abstract speculations of Descartes. Hooke's first proposition, that all luminous bodies had their particles in motion, was shared with Descartes. But the fact that a rubbed diamond shone indicated to him that this motion was not circular (as Descartes had said) but a short and rapid vibration. The rubbed diamond also suggested to him that luminosity did not involve the transmission of particles, since the diamond was not worn away. This example was important in his later dispute with Newton over the nature of light. Vibrations or pulses of light travelled through any transparent medium with unimaginable speed, but there was no reason to accept Descartes's supposition that their journey was instantaneous, 'for I know not any one experiment or observation that does prove it'."
>
> — Stephen Inwood (2002), *The Man Who Knew Too Much* (pg. 69) [1]

See also

- Double-slit experiment
- Wave function collapse

References

1. Inwood, Stephen. (2003). *The Man Who Knew Too Much: the Strange and Inventive Life of Robert Hooke 1653-1703*

(pgs.68-69). Pan MacMillan.

External links

- Wave theory (light) – Wikipedia.

θΔics

In hmolscience, **Wayne M. Angel** (1945-) is an American physicist and computer scientist noted, in human thermodynamics, for his 2005 Herbert Callen based "relation thermodynamics" theory.

Overview

In 1991, Angel gleaned the insights of his thermodynamics-based "theory of society", in part, from a reading of Japanese physicist Satosi Watanabe's *Knowing and Guessing* (1969), in which it is argues that social measurements can be quantified by changes in interdependencies, a type of "interdependence analysis", so to say.

Angel also adopted Richard Dawkins' ideas on memes and how individuals/ideas and ideas/ideas form a "relationship space", with humans conceptualized as actors capable of manipulating memes. Angel was also influence, after Watanabe, by secondly the general systems theories of Gerry Weinberg, and thirdly the ideas of Kenneth Boulding. [2]

The basics of this theory went into his 1992 PhD dissertation "On the Feasibility of Quantitative Predictive Models of Human System Behavior", completed at Walden University, some of which was based on the notion that thermodynamics could be used to make "prediction" in social phenomena. Angel then expanded on these ideas, of the years, to some extent, resulting in a 2005 draft online book *The Theory of Society*: *Relation Thermodynamics*, seemingly filled in up to about chapter six. Herein, he terms "relation thermodynamics", a term which he defines as the "thermodynamics of human relation systems", which attempts to answer the question: [1]

> "What is [the] thermodynamics of human relation systems?"

Angel states that the aim of his book is to present a theory of social organization and to develop the means towards historical prediction. In short, Angel strives to understand the thermodynamics of systems of humans connected in dynamic relationships. Angel states that human relation systems thermodynamics or "relation thermodynamics" is the study of macroscopic consequences of myriads of individual actions on the interdependence coordinates within human relation systems, whereby due to statistical averaging do not appear in the macroscopic description of systems. Angel argues that much of this theory has to do with "relation energy", whereby the internal relation kinetic energy of a human system is determined by the rate of change of relationships between entities. He reasons that human systems can transfer some of its internal relation energy to other human systems, thereby doing relation work on other human systems. He reasons that and that "it is equally possible for this internal relation kinetic energy to be individual random motion that at the macroscopic level is observable as relation heat", whereby much of organizational relation thermodynamics thus is concerned with relation heat transfer.

Information theory | Callen

Angel's relation thermodynamics, to note, is inspired by the information based thermodynamics models of Watanabe. Watanable, however, is somewhat unique, in respect to information theory based thermodynamics modellers, in that he employs American physicist Herbert Callen's 1960 thermodynamics textbook as a basis for his Watanable-extended model. In 2016, Angel, amid the process of collecting his work for peer-review JHT publication, received feedback from Libb Thims, that his use of information theory is not scientifically acceptable (see: information entropy quotes), and that he would have to reformulate the connection points of the introductory material of his draft-stage article; to which Angel replied: [3]

> "I understand your concern. I use information theory as a starting point because of my familiarity due to other work. But, it is not an essential feature. The fundamental starting point is a switch from focusing on the entities of a society, people, things, and ideas to the relationships of these things and how they change. There are other means of describing these relationships in general mathematical terms. The first one that comes to mind is the correlation coefficient."

Angel, presently, is in the process of reformulation.

Education

Angel completed his BS in physics in 1967 at University of Santa Clara, his MS in physics in 1969 at the University of Arizona, and his PhD in computer science and business administration, with a dissertation "On the Feasibility of Quantitative Predictive Models of Human System Behavior", in 1992 at Walden University.

Quotes

The following are noted quotes:

> "Thermodynamics of human relation systems is the study of the macroscopic consequences of myriads of individual actions on the interdependence coordinates within human relation systems, which, by virtue of statistical averaging, do not appear explicitly in the macroscopic description of a system. Although much of the "microscopic" actions of individuals may be hidden from the direct observations of a macroscopic viewer, they can affect macroscopic observables. One such clear example deals with the concept of relation energy. The internal relation kinetic energy of a human system is determined by the rate of change of relationships between entities. Clearly a given human system can transfer some of its internal relation energy to another human system, i.e. it can do relation work on another human system. It is equally possible for this internal relation kinetic energy to be individual random motion that at the macroscopic level is observable as relation heat. Much of organization thermodynamics is concerned with relation heat transfer."
>
> — Wayne Angel (2005), *The Theory of Society: Relation Thermodynamics*

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θΔics

In hmolscience, **Wayne M. Saslow** (c.1941-) is an American physicist noted, in economic thermodynamics, for his 1999 human thermodynamics variable table, wherein he equates wealth, in a human free energy theory sense, to the negative of Helmholtz free energy.

Overview

In 1999, Saslow, in his "An Economic Analogy to Thermodynamics", argued that the state of an economic system, being a physical system, must be quantified by a temperature and conjugate variable pair entropy. He also formulates an analogy version of free energy, Maxwell relations, and a Gibbs-Duhem relationship. The following is Saslow's human thermodynamics variable table: [1]

Table I. Summary of the suggested analogies between thermodynamic and economic systems. Not listed are the direct analogies between S and T.

Thermodynamics	$-F$	$-E$	TS	μ	N
Economics	W(wealth)	U(utility)	Ψ(surplus)	p(price)	N(# of goods)

Here he equates wealth W to negative Helmholtz free energy (-F), utility U to negative energy (-E), surplus Ψ to entropic energy (TS), price p to chemical potential, and number of goods n to number of chemical species crossing the boundary N.

American economist Duncan Foley was the one who suggesting to Saslow that he develop an analogy between economics and thermodynamics. Saslow's work has been referenced by Victor Maslov. [2]

Other

Saslow's article formed the basis of Canadians physicists Hans Kreuzer and Isaac Tamblyn's 2010 *Thermodynamics* chapter section on economics thermodynamics. [3]

Education

Saslow completed his BA at the University of Pennsylvania, his MS at the University of California at Berkeley, and his PhD at the University of California at Irvine. He was a research associate at the University of Pittsburgh. He became a professor at Texas A&M University in 1971, where he currently resides.

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External links

â— Wayne Saslow (faculty) – Texas A&M University.

θΔics

In famous publications, ***We Human Chemicals: the Knack of Getting Along with Everybody*** is a 1948, 122-page, book by Americans writer Thomas Dreier and consulting chemist Gustavus Esselen, which sets forth the simplified view that "we are all human chemicals and human chemists", discussed in 27 classic human chemistry themed chapters, such as how certain people won't mix like oil and water or how marriage is a matter of human chemistry. [1]

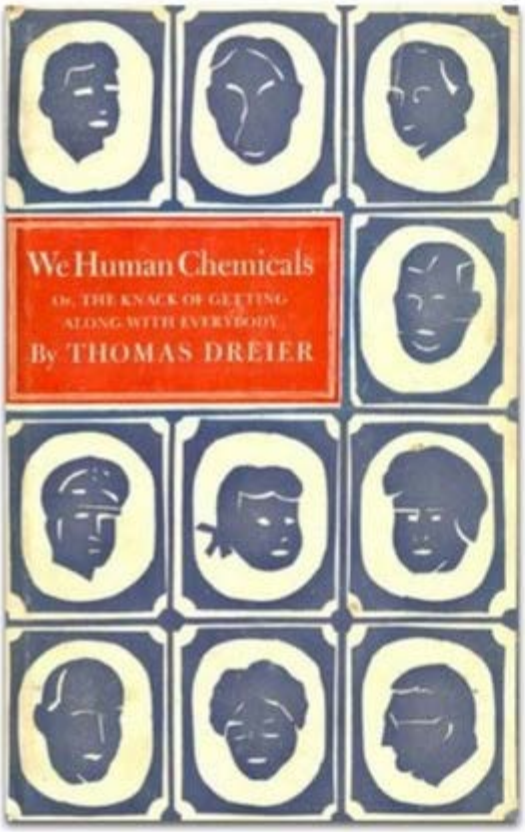

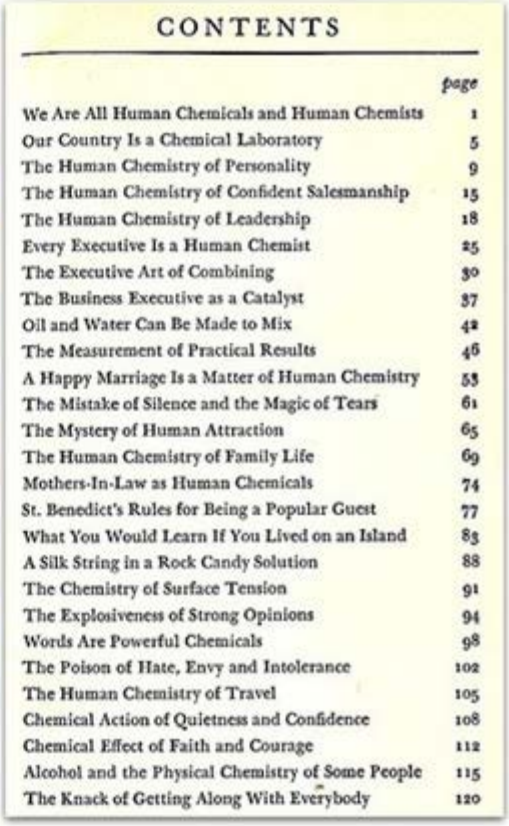

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Cover of 1948 book ***We Human Chemicals****: the Knack of Getting Along with Everybody* by Thomas Dreier, showing each person as analogous to an element on the periodic table.

Overview

In his opening section "Genesis of this Book", Dreier states that his original thesis, that "the business executive is a human chemist" and the extrapolations of this premise, grew out of observations of the inept executive of a Chicago organization who assumed that all kinds of men and women thrown together in an organization, would work together harmoniously without any concern on the part of the executive. Conversely, the people in the said organization worked, according to Dreier, in an atmosphere of confusion, strife, tension, and unhappiness. The answer or solution to this issue came to Dreier shortly thereafter:

> "One night the answer came to me like a revelation. I sat down at my typewriter and wrote a brief essay entitled "Human Chemicals". It was published in a magazine of limited circulation. There were so many requests for it that it was brought out in pamphlet form. In fact, seven editions were printed over a period of years."

This pamphlet would seem to have first been published in 1910. [2] Dreier states that the expanded book was written due to the urging of his publisher friend Robert R. Updegraff and that the well-known consulting chemist Gustavus Esselen gave suggestions on chemical terms and analogies in the expanded book.

See also

â— Human Chemistry (book)
â— Human Chemistry (textbook)
â— The Human Molecule

References

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θΔics

In human chemistry, a **weak tie** is an intermediate connection that exists between two people owing to the principle of triadic closure, which states that if two unacquainted people have a 'strong tie' relationship to a third person, who is common to them both, then by virtue of that indirect connection, a weak association or 'tie' will then begin to exist between the two previously unacquainted people. [1] Strong ties are depicted by straight lines (————) whereas weak ties are depicted by dashed lines (– – – – – –). The weak tie theory was conceived by American sociologist Mark Granovetter in 1969 based on hydrogen bonding models. [2]

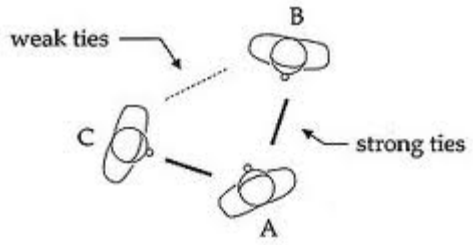

Diagram of two strong ties and a **weak tie** based on the principle of triadic closure. [3]

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θΔics

In terminology, **wealth** refers to a material possession, resource, or property that has value or an exchange value. [1]

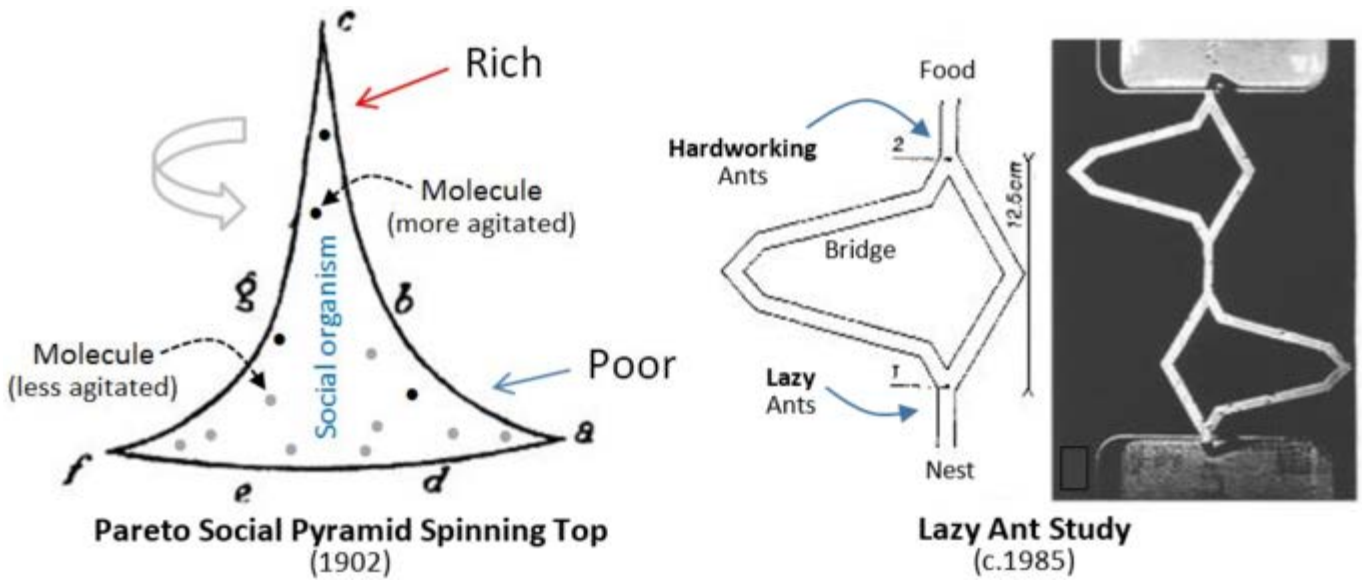

Diagram to Libb Thims' 2017 Quora answer (Q) to query "why do wealth families hardly last more than three generations?", showing the Pareto principle based "Pareto pyramid social spinning top" (1902) and the "lazy ant study" (c.1985).

Overview

In 1896 and 1902, Vilfredo Pareto explained the flow of wealth in society in human molecular theory terms.

In 1926, American physical chemist Frederick Soddy defined economics, in a national sense, as that "concerned with wealth as what is produced by human beings in order to maintain their lives". Moreover, he argued that wealth, in contrast to debt, is subject to the laws of thermodynamics. In particular, according to Soddy: [2]

> "Debts are subject to the laws of mathematics rather than physics. Unlike *wealth*, which is subject to the laws of thermodynamics, debts do not rot with old age and are not consumed in the process of living. On the contrary, they grow at so much per cent per annum, by the well-known mathematical laws of simple and compound interest."

In commentary on Soddy's thermodynamic wealth ideas, American ecological economist Herman Daly states that while debt can grow at compound interest forever, real physical *wealth* cannot continue to grow at the same speed "because its physical dimension is subject to the destructive force of entropy". [3]

Quotes

The following are related quotes:

> "Wealth, as Hobbes says, is power."
>
> — Adam Smith (1776), *Wealth of Nations* (pg. 13)

See also

- Wealth, Energy, and Human Values

References

1. Wealth (definition) – *Merriam-Webster Collegiate Dictionary*, 2000, CD-ROM, version 2.5.
2. (a) Soddy, F. (1926). *Virtual Wealth and Debt - the Solution of the Economic Paradox*, (pgs. 70-73). London: George Allen & Unwin LTD. (318 pages).
(b) Hattersley, Martin J. (1988). "Soddy and the Doctrine of Virtual Wealth", A paper presented to the 14th Annual

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θΔics

In famous publications, ***Wealth, Energy, and Human Values****: the Dynamics of Decaying Civilizations from Ancient Greece to America*, with its noted appendix sectoin "The Fundamentals of Thermodynamics Applied to Socioeconomics", is a 2009, 501-page, book by American physical chemist Thomas Wallace, in which physical chemistry logic, i.e. reactions, dynamics, mechanisms, transition states, chemical equilibrium, entropy production, etc., is applied to the explanation of the historical growth and decline of civilizations, using concepts such as reaction equations, $A + B \rightarrow C + D$, Le Chatelier's principle, and most importantly the Gibbs equation, $\Delta G = \Delta H - T\Delta S$, which is said to 'determine whether processes conducted by society will take place'. The book contains an appended chapter on 'The Fundamentals of Thermodynamics Applied to Socioeconomics'. The sixth chapter, 'The Mechanisms and Energetics of the Human Social Order', goes into some interesting and detailed discussion of how a system of 'societal reactions' may be at a final state of thermodynamic equilibrium, thus not able to produce further useful work, but one in which, internally or rather visualized on the day-to-day basis, many reactions will still be proceeding, in both the forward and reverse sense. A larger aspect of the book utilized the ideal of societal entropy production, explained loosely as energy lost to social disorders.

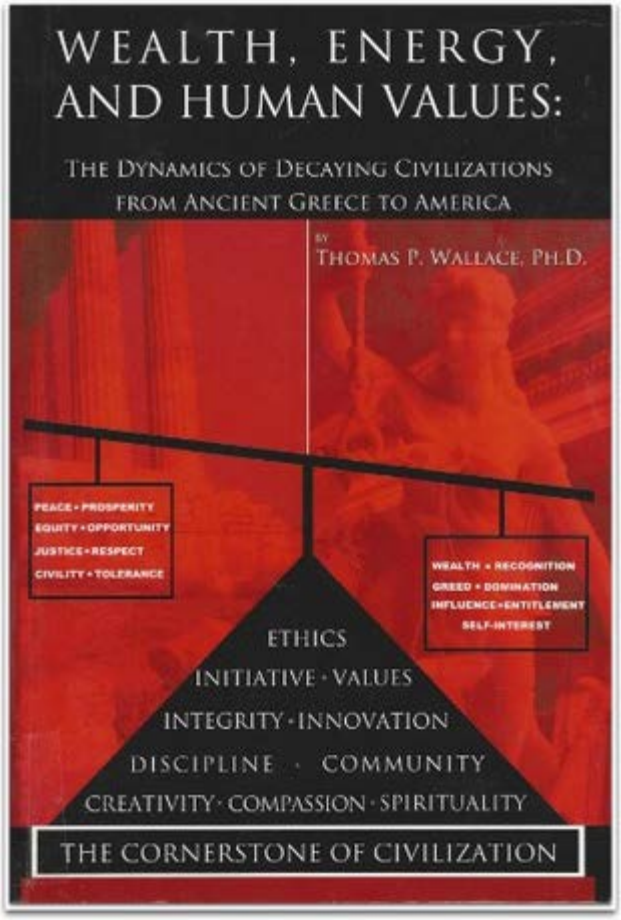

Cover of American physical chemist Thomas Wallace's 2009 book ***Wealth, Energy, and Human Values***, on of the first book to go into detail as to how the Gibbs equation determines the rise and fall of societies. [1]

Socioeconomic thermodynamics | Fundamentals

One of the most-interesting aspects of *Wealth, Energy, and Human Values*, aside from chapter six, is the 21-page appendix section 'The Fundamentals of Thermodynamics Applied to Socioeconomics', in which Wallace attempts to outline the physical chemistry basics of how a society transforms from a 'initial state' to a 'final state', differing by an amount of energy or rather 'free energy', and how the difference between these two states is a path-independent process determined by the enthalpy change ΔH and entropy change ΔS of the process of the societal transformation. The following aggregate quote summarizes the section:

> "The thermodynamic parameter free energy, mathematically $\Delta G = \Delta H - T\Delta S$, represents the fundamental driving force in nature and determines whether physical and chemical processes conducted by nature and society will take place."

Wallace explains further that free energy is 'nature's intrinsic dynamic force, representing the probability parameter entropy S and the energy content parameter enthalpy.'

In more correct detail, Wallace, here, to note, is using Boltzmann-Planck type entropy descriptions, which are specifically culled from gas theory, wherein the particles are said to have a non-correlation of velocities. Humans, however, have correlated velocities; subsequently it is necessary to return to the original work of Clausius and his universal description of entropy change as the 'equivalence value of all uncompensated transformations', to human social transformation. Beyond this, enthalpy is not simply an 'energy content parameter', but one must use the full expression for enthalpy:

$$\Delta H = \Delta U + P\Delta V$$

to study human social systems in terms of both internal energy changes and the work-energy associated with volume changes in systems, such as exemplified by the volume change in territory in the course of the rise and fall of Rome during a 1,000-years of human reactions.

Reaction coordinates

In his appendix section, Wallace attempts to explain how a society or civilization must pass from an initial state to a final state, transforming along the way, a process that can be quantified on a reaction coordinate:

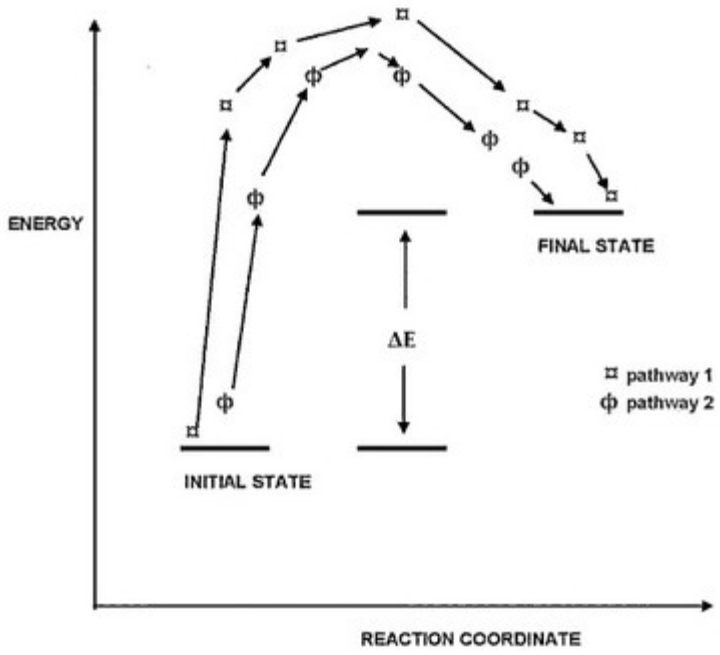

In his chapter six, on ‘The Mechanisms and Energetics of the Human Social Order’, Wallace explains how the 'final state', which typically represents a minimum of Gibbs free energy, in which the change in Gibbs free energy becomes zero, wherein the system can no longer produce useful work, may often still be seen as a very active 'dynamic equilibrium' state in which internal to the system forward and reverse reactions are still proceeding, but one in which overall there is no net change in free energy.

References

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2. ibid, Wallace. (2009). Appendix A: The Fundamentals of Thermodynamics Applied to Socioeconomics, pgs. 469-89; Graph pg. 474.

θΔics

In science, **Weberian elective affinities** refers to German sociologist Max Weber's 1878 to 1920 re-interpretation of German polymath Johann Goethe's 1809 elective affinities or human elective affinities in sociology and economics. The 2005 *Max Weber Dictionary* gives the following entry: [4]

> "**Elective affinities** (*Wahlverwandtschaften*) – the exact meaning of this term, which Weber often uses, is contested. The most common interpretation, however, is that 'elective affinity' is used by **Weber** to express the fact that two sets of social facts or mentalities are related to each other or gravitate to each other—even though no direct and simple causality between the two can be established."

See *Die Wahlverwandtschaften* "title decoding" for more on the complex interpretation and rendering of the term "elective affinities".

Overview

In 1878, age 14 German student Max Weber, in class, began reading German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities* (German: *Die Wahlverwandtschaften*), while "hiding it behind his textbook". [6] Weber, greatly influenced by this work, went on to utilize the meaning-complex term "Wahlverwandtschaften" through his later sociological writings, in complex theoretical ways. In his posthumously published 1922 *Economy and Society: an Outline of Interpretive Sociology*, to exemplify usage, Weber states: [5]

> "[There exists] an elective affinity between the sect and political democracy."

elective affinity

The term elective affinity is currently associated with Weber's thesis concerning modern capitalism. A key aspect concerns the linkage, attraction, or inner "affinity" between "the Protestant Ethic/Protestant sects" and the "spirit" of modern capitalism. The idea of an affinity could be indicated by any two factors seeming to go together – to be "connected." Weber argues that there is an "inner affinity" (*innere Verwandtschaft*) between several things, especially between (1) a this-worldly asceticism of sects (e.g., Quakers, Mennonites) and (2) the underlying "spirit" (*Geist*) of modern capitalism. Rather than hedonism, among Protestants there is an ascetic outlook, an estrangement from joy, as indicated by Benjamin Franklin's maxims. The lack of possibility of a temporal causal argument is already emphasized in Weber's 1905 statement (Weber 2002a), published at the same time as his famous methodological essay on "Objectivity." Since statistical terminology was not widely used there was no universally agreed term to represent the notion of an "association" or non-causal "co-relationship" between two factors or "variables" (Howe 1978).

Canadian sociologist and anthropologist Hans Bakker's 2010 *Concise Encyclopedia of Sociology* entry on German sociologist Max Weber's **elective affinity** theory. [7]

Discussion

English translators of Weber's work, to note, more often than not, have tended to render the German term "Wahlverwandtschaft", meaning elective affinity, as either "correlation, relationship, or bond", thus unintentionally acting to distance or cut off Weber's original chemical meaning from his work. [1]

In 1978, American sociologist Richard Herbert Howe, in his "Max Weber's Elective Affinities: Sociology within the Bounds of Pure Reason", opens to the following abstract: [6]

> "Several scholars have called attention to the importance of Weber's use of the term 'elective affinity', yet nowhere has the term received a treatment both systematic and historically founded. The present paper attempts to fill that gap. Each instance of Weber's usage is cited and discussed. Next, the place of elective affinity in his order of discourse is determined. Then, the lineage of the term in the histories of literature, chemistry, and philosophy is examined with special reference to Weber's knowledge of those histories. Two related terms, 'affinity' and 'inner affinity', are examined and brought into relationship with Weber's use of elective affinity. These materials suggest that elective affinity, conceived as an 'idea' in the Kantian sense, would have served to answer the question: 'how is social science possible?' which was implicit in the neo-Kantian framework of Weber's order of discourse."

In 2010, Scottish sociologist Andrew McKinnon erroneously claimed—e.g. Richard Howe (1978) previous to him—to have done the first systematic analysis of Weber's usage of "elective affinity" in his work and theories. [2]

Bourdieu

French sociologist Pierre Bourdieu (1930-2002), knowledgeable about Weber, has some kind of borrowed Goethe-Weber usage and or connection to "elective affinity". [8] Bourdieu's 1984 *Distinction* and his 1998 "Elective Affinities, Institutionalised Connections, and the Circulation of Information", for instance, use the term "elective affinity" in some way. [9]

Conference

In 2013, March 21-24, The University of Sao Paulo, Brazil, is hosting a 5-day "Architectural Elective Affinities Conference", themed on the subject of "architectural elective affinities", which they defined as a "complex borrowing of the Weberian concept of elective affinities, namely the: attractions, interactions and similarities between individuals or disciplines and fields of research—used as a tool for grasping the development of architectural forms in the perspective of specific spatio-temporal structures." The synopsis of the conference seems to be the following: [3]

> "The elective affinities operative between architectural history and other disciplines- such as literature, history, sociology, anthropology, arts, including the photography and the cinema - have been lengthily debated in the past years. The conference intends particularly to identify these affinities, looking from inside the discipline of architecture."

Note: the conference seems to be digging around in the area of architectural thermodynamics; to some extent.

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(b) McKinnon, Andrew. (2010). "Elective Affinities of the Protestant Ethic: Weber and the Chemistry of Capitalism" (abs), *Sociological Theory*, 28(1):108-26.
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7. (a) Howe, R. (1979). "Max Weber's Elective Affinities: Sociology within the Bounds of Pure Reason", *American Journal of Sociology*, 84:366-85.
(b) Weber, Max. (1905). *The Protestant Ethic and the Spirit of Capitalism: the Version of 1905, together with Weber's Rebuttals of Fischer and Rachfahl and Other Essays on Protestantism and Society*. Penguin, 2002.
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(d) J.I. (Hans) Bakker (Johannes Iemke Bakker) (faculty) – University of Guelph, Ontario.
8. (a) Boekhoven, Jeroen W. (2011). *Genealogies of Shamanism: Struggles for Power, Charisma and Authority* (pg. 18). Barkhuis.
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44). Harvard University Press.
(b) Bourdieu, Pierre. (1998). “Elective Affinities, Institutionalised Connections, and the Circulation of Information”, in: *The State Nobility, Elite Schools in the Field of Power* (pgs. 360-69). Stanford University Press.

Further reading

â— Mainprize, Steve. (1996). “Elective Affinities in the Engineering of Social Control: the Evolution of Electronic Monitoring” (Ñº), *Electronic Journal of Sociology*, 2(2).

External links

â— Elective Affinity – Encyclopedia of Religion and Society.

θΔics

In terminology, **weed theory** is a theory that act as a "weed" in the beautiful garden of thermodynamics (Hiebert, 1966); namely those whose theories "transgress the limits of credulity to the point of sheer ridiculousness" or rather those whose theories are so far off the broad highway of pure thermodynamics, as Gilbert Lewis (1925) put it, that they are not even thermodynamical, i.e. within the bounds of reality, in any sense of the matter. [1]

In this sense, the various metaphysics and theologies found in the garden of thermodynamics continuously need to be weeded and removed so to not choke out the beauty of the thermodynamics, pure, proper, and applied.

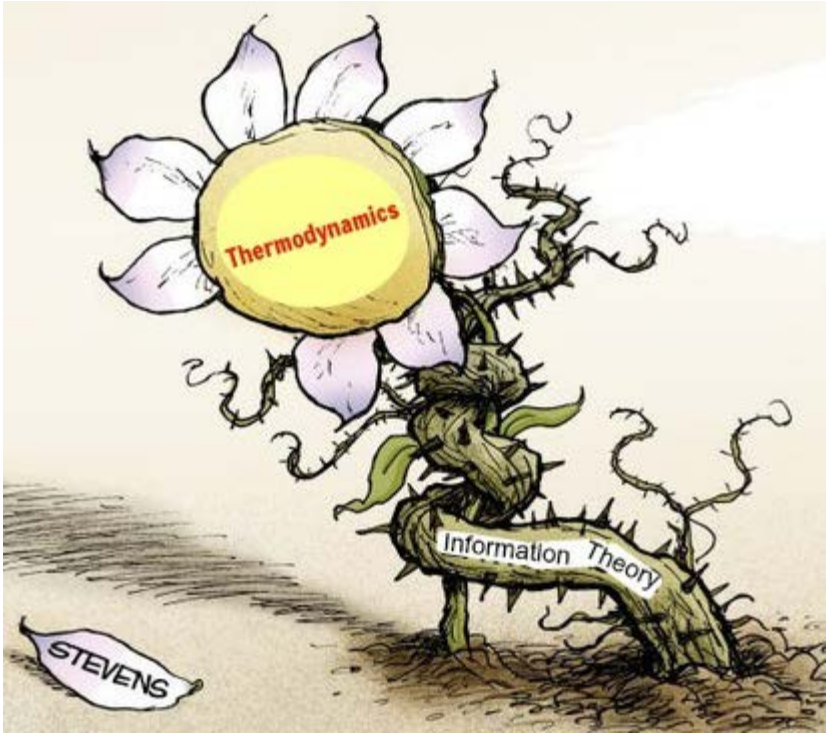

A depiction of someone who uses information theory, outside of communications engineering, information science, or cryptography, proper, as a **weed theorist**, choking out the flowers of good science. [2]

Weed theorists

The biggest weed in thermodynamics, currently, information theory, developed by Claude Shannon, and its incorrigible attempts at thermodynamics association.

Other noted weed theorists, include: Corrado Giannantoni, and his "quality thermodynamics" theory; Ivan Kennedy and his "action thermodynamics" theory; Jeremy Rifkin and his agenda; Nicholas Georgescu-Roegen, and his material entropy theory; among numerous others, e.g. Christopher Langan, and (add).

See also

â— Melting pot theory

References

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(b) Hiebert, Erwin N. (1966). “The Uses and Abuses of Thermodynamics in Religion” (quote: pg. 1075). , *Daedalus*, 95: 1046-80
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θΔics

In existographies, **Wenyuan Niu** (c.1950-) (SNE:5) (CR:14), Wen-Yuan Niu or W.Y. Niu, is a Chinese scientist noted for his 2001 to present social physics and social mechanisms of social stability theories.

Niu's work has been influential to Miao Ning and Jifa Ju and their 2009 activation energy theory of social transformation. [1]

Social combustion theory

In 2001, Niu proposed a "social combustion theory", which supposedly carries a "reasonable analogy between the natural burning phenomena and social disorder, instability and turmoil", the 2009 abstract form of which is as follows: [2]

> "Social Harmony Equation (SHE) leads the social system to the evolution direction of social by accumulation of "social combustion substances", i.e., the accumulation of microcosmic entropy increase "basic particles" (individual) in social system from assimilated "basic social energy" to dissimilated one; meanwhile, the catalysis of "social combustion promoter" (social excitation energy) has enhanced the "social temperature" of disordering process of social system and completed the energy accumulation of social entropy increase that can generate the transition. Finally, ignited by the "social trigger threshold", the social system has completed the abrupt change from orderliness to disorderliness. The continuous variation of the above-mentioned three basic non-linear processes has jointly composed the whole contents of social combustion theory. Under the restriction of such conditions of different time (t), different space (α) and different scale (β), it is finally explained as a comprehensive dynamics of social system deterioration."

In 2013, Chinese physicist Yi-Fang Chang sited Niu's social combustion theory. [3]

Education

In 2011, Niu was listed as adviser to the Chinese state council, chief scientist at the Chinese Academy of Sciences, and director of the Chinese Ecological Economics Society. [3] He also is listed as a sustainability scientist. (Q)

See also

- Chinese school of social physics

References

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External links

● Niu Wenyuan (faculty) – Institute of Policy and Management, Chinese Academy of Sciences.

θΔics

In aquatic thermodynamics, **Werner Ebeling** (c.1946-) is a German ecological physicist noted for his 1981 paper "On the Thermodynamics of Irreversible Processes in Ecosystems", co-written with German physical oceanographer Rainer Feistel, in which they develop a top down thermodynamic model of aquatic ecosystems, along the way introducing concepts such as the dilute solution model. [1]

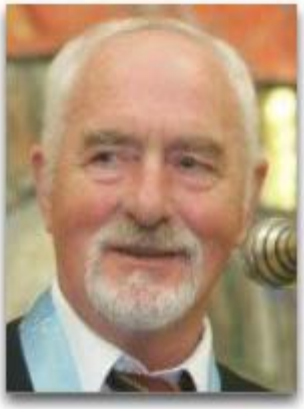

See also

- Peter Mauersberger

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(b) Tuhtan, Jeff. (2011). "Irreversible Aquatic Ecosystem Models", ch. 1 (draft) to PhD dissertation, Department of Hydraulic Engineering, University of Stuttgart.
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- Ebeling, Werner and Hoffman, Dieter. (1991). "Grand Schools of Physics: The Berlin School of Thermodynamics founded by Helmholtz and Clausius", *European. J. Phys.*, 12, 1-9.
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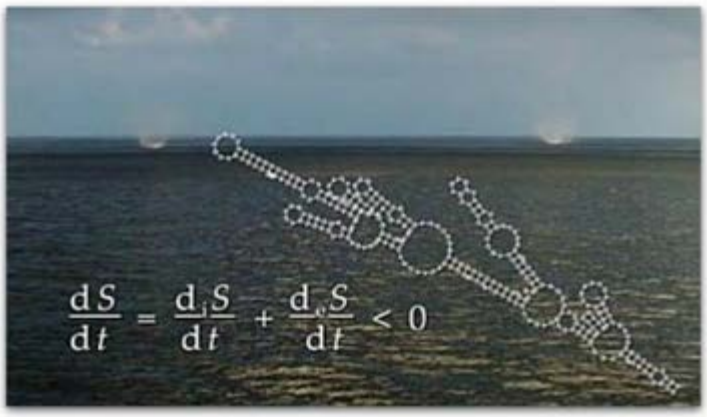

Cover photo to the 2011 English edition of Ebeling and Feistel's *Physics of Self-Organization and Evolution*, in which they employ the equation overlay method to depict their model. [2]

External links

- Werner Ebeling (books) – Werner-Ebeling.eu.
- Ebeling, Werner – WorldCat Identities.
- Feister, Rainer – WorldCat Identities.
- Rainer Feistel (faculity) – Leibniz-Institut fur Ostseeforschung Warnemunde.

θΔics

In hmolscience, **Werner Ehrenberg** (1901-1975) was a English physicist noted for his 1967 "Maxwell's Demon", wherein he gives a short overview of Maxwell's demon theory, and for his posthumously published 1977 *Dice of the Gods: Causality, Necessity and Chance*, wherein he seems to give an ambivalent ontic opening like argument to explain soul and morality in the context of modern science.

Conduction irreversibility

In 1943, Ehrenberg, in his "A Note on Entropy and Irreversible Processes", seems to have been working on some type of electrical conduction theory of irreversibility, the abstract of which is as follows: [4]

> "On the basis of an analysis of the notion "body" in thermodynamics irreversible processes are classified as "conduction" and as "breaking-up" processes. A new derivation of the relation $dS=dQ/T$ is given on the basis of Clausius's principle, and it is shown that this relation is not restricted to reversible processes, but holds for irreversible "conduction" processes as well. Bridgman's hypothesis, the theory of Carathéodory and Born and the bearing of the new derivation on the interpretation of the equilibrium conditions are discussed."

(add discussion)

Maxwell's demon

In 1967, Ehrenberg (age 66), published his "Maxwell's Demon", wherein typical of scientists into their 60s and 70s, he begins to put focus on the bigger meaning and morality questions of existence in the context of modern science, while retaining a surface-appearance scientific-like demeanor. The following are example quotes:

> "A practical system with immunity from the second law of thermodynamics would be … capable of returning the fuel after the work is done."
>
> "Similar calculations appear to be applicable whenever intelligent beings propose to act as sorting demons."

Scholars related to and or citing Ehrenberg's article include: William Ross Ashby (*An Introduction to Cybernetics*, 1963), Jacques Monod (*Chance and Necessity*, 1971), and Erwin Schrodinger (*What is Life?*, 1943). (Ñº)

Dice of the Gods

> *See main: God does not play dice*

Ehrenberg, in his 1977 *Dice of the Gods: Causality, Necessity and Chance*, discusses how Aristotle compared atoms to the letters of the alphabet", and discusses the pros and cons of the indeterminism argument, statement such as: [1]

> "… proof of indeterminism. It has been argued that strict causality is not incompatible with moral judgment and true statements. Other others have considered free will and truth utterly problematic."

This last publication may have been some type of ontic opening stylized attempt to stylize "soul" in scientific terms; a few example quotes:

> "How then do these two substances, matter and mind, interact; in particular, how does the mind or soul affect the body? Descartes had satisfied himself that the properties of matter cannot include the capacity of

…" (pg. 21)

"… ambiguous connection which may be called individual causality has still all the marks of causality without requiring a cause for the deviation. It may well exist and be the root of the freedom of the soul. It is truly remarkable how close Simmel, being a student of the …" (pg. 46)

Here we see Ehrenberg, in his last year, grappling with the classic "mind, matter, and soul" problem, namely how modern scientific views on "mind and matter" situate in the older "soul" or moral movement, and or continuity theories, in respect to the big picture of humans and movements and activities of humans in a large dynamic universe.

Education

In 1949, Ehrenberg was associated with the research laboratory at Birkbeck College, London, focused it seems on electrical phenomena and x-rays. In 1961, Ehrenberg was chair of experimental physics and head of the department at Birkbeck College. (Ñº)

References

1. Ehrenberg, Werner. (1977). *Dice of the Gods: Causality, Necessity and Chance* (indeterminism, 4+ pgs; quote, pg. 13). Birkbeck College.
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(b) Cooper, Peter L. (1983). *Signs and Symptoms: Thomas Pynchon and the Contemporary World* (pg. 89). University of California Press.
(c) Poirier, Richard. (2003), "The Importance of Tomas Pynchon" (pg. 52), in: *Thomas Pynchon* (editor: Harold Bloom). Infobase Publishing.
3. Ehrenberg, Werner. (1943). "Note on Entropy and Irreversible Processes" (abs). *Philosophical Magazine*, 34(233):396-409.

Further reading

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External links

â— Ehrenberg, W. 1901-1975 (Werner) – WorldCat Identities.

θΔics

In science, **Werner Heisenberg** (1901-1976) (IQ:180|#84) (CR:107|#38), Ranker Greatest Mind (#45|1200+), was German theoretical physicist noted for his 1926 uncertainty principle, for his matrix mechanics, later shown to be equivalent to the Schrodinger equation work of Erwin Schrodinger, for his 1928-1933 work on the development of the theory of the exchange force, and for his 1952 dialogue (see: Heisenberg-Pauli dialogue) with Austrian theoretical physicist Wolfgang Pauli on the question of god, soul, the magnetic force—and by inference the electromagnetic force—and the need for future moral compasses.

Uncertainty principle

See main: Heisenberg's uncertainty relation

In 1926, while working at Neil Bohr's institute, Heisenberg is said to have realized that non-commutativity implies the uncertainty principle, and states this as such: [1]

> "One can never know with perfect accuracy both of those two important factors which determine the movement of one of the smallest particles—its position and its velocity. It is impossible to determine accurately *both* the position and the direction and speed of a particle *at the same instant*."

The uncertainty principle is frequently evoked unrationally in the humanities to explain and or justify all sorts of irreverent theories. One example is English physicist and marketing director Dan Cobley's 2010 use of it to explain marketing theories. The uncertainty principle has been classified as an "ontic opening" by Swedish thinker Erland Lagerroth in regards to its use in fields outside of physics proper.

Exchange forces

It seems that in 1928, Heisenberg had invented a chemical bonding type of electron "exchange force" theory, which posited a purely quantum mechanical force arsing from the exchange of identical electrons, and had assigned Rudolf Peierls, one of Sommerfeld's students, to work on the idea, as applied to Felix Bloch's quantum mechanical electron theory of metals. Heisenberg's "exchange interaction" intuition, supposedly, was the notion of a force generated solely by the exchanging of positions of two totally indistinguishable quantum particles. [2]

Because of the exclusion principle (Pauli exclusion principle), no two electrons can be in the same quantum state. Since, unlike classical particles, quantum electrons are identical, they can be considered to exchange places continually, which gives rise to an additional "attractive exchange force" between electrons.

Heisenberg thus suggested that Peierls examine the effects of this force on Bloch's theory of how electrons are able to propagate long distances in metals.

On 7 July, 1932, Enrico Fermi presented his report in Paris on "The Present State of the Physics of the Atomic Nucleus" (1932) without mentioning the type of force which was subsequently called "Majorana force" and which had actually been thought of, although in a crude form, some months earlier (circa Mar 1932 by Ettore Majorana). The issue of the *Zeitschirft für Physick* dated 19 July, 1932, contained Heisenberg's first paper on what latter came to be called the "Heisenberg's exchange forces", namely forces involving the exchange of both the space and spin coordinates. [3]

At the 1933 Solvay Congress, Heisenberg had presented his neutron-proton nuclear theory to Fermi and others, according to which the neutron-proton force arises from the virtual exchange of an electron ("virtual" because energy conservation is violated for an instant).

In December of 1933, stimulated by Heisenberg, Fermi showed that both Heisenberg's force and conservation laws could be maintained if the neutron and proton exchange not just an electron but and electron and a neutrino. [2]

Religion

Heisenberg, his "uncertainty" principle being one of the most-employed ontic opening god tool, leans towards the science blended by religion side of the fence; this attitude can be seen in the 1927 Solvay Conference photo, wherein his "soul compass" (see: Heisenberg-Paul dialogue) idea is shown affixed below his name:

The following is Heisenberg's oft-searched for so-called "god glass" quote:

> "The first gulp from the glass of natural sciences will turn you into an atheist, but at the bottom of the glass god is waiting for you."
>
> — Werner Heisenberg (c.1950), "Source", original German quote (O) in: *Hildebrand* (1988) (pg. 10)

(add discussion)

Education

Heisenberg completed his PhD under Arnold Sommerfeld, the same person who was the doctoral advisor for Wolfgang Pauli, Peter Debye, and Hans Bethe, all of whom won Nobel Prizes.

Further reading

1. Heisenberg, Werner. (1952). *Die Physik der Atomkerne* (pg 30) (*The Physics of the Atomic Nucleus*). Taylor & Francis.
2. Cassidy, David C. (1992). *Uncertainty: the Life and Science of Werner Heisenberg* (exchange interactions, pgs. 283-84, 292, 357). W.H. Freeman and Co.
3. (a) Amaldi, Edoardo. (1966). "Ettore Majorana: Man and Scientist: Commemoration Speech" (pgs. 25-95; quote: 57-8); "La Vita e l'Opera di E. Majorana" (Accademia dei Lincei, Rome, 1966); "Ettore Majorana: Man and scientist," in *Strong and Weak Interactions* (pgs. 10-77). Present problems, A. Zichichi, ed. (Academic, New York, 1966).
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Further reading

● Brush, Stephen G. (1976). "Irreversibility and Determinism: Fourier to Heisenberg", *Journal of the History of Ideas*, 37: 603-30.

External links

● Werner Heisenberg – Wikipedia.
● Uncertainty principle – Wikipedia.

θΔics

In existographies, **Werner Stark** (1909-1985) (CR:71) was an Czechoslovakian-born English sociologist noted for his 1962 harsh critiques of physics and chemistry based sociologies and economics, which he classifies via extremeness (see: Stark classification).

Overview

In 1962, Stark published his *The Fundamental Forms of Social Thought*, in which he devotes two chapters to a "angry" critique of what he refers to as the "extreme mechanicism" school of sociology, where people are treated as particles (see: human particle) and or molecules (see: human molecule) whose behaviors are explained through mechanism and physical science principles. [1] The gist of Stark's extreme mechanism sociology critique is summarized well by a recent 1993 retrospect synopsis by American sociologist Leon Warshay: [4]

> "Some modes of mechanism (Chapter 10), such as Simmel's, are tolerated; others, such as Lundberg's, are not. Simmel is deemed a moderate even though he leans toward nominalism, just as Durkheim is favorably contrasted with Simmel as a moderate who leans toward realism. Lundberg is criticized for aping physics—for using motion, energy, and force as social mechanism and defining societal groups as 'electron-proton configurations'—thereby being enslaved by 'mechanistic modes of thought' (pgs. 153-54).
>
> The work of Henry Charles Carey (which is discussed in Chapters 10 and 11) and that of S.C. Haret is characterized as extreme mechanicism. Both apply physical principles to society (e.g. force, attraction, motion, constrains, space, equilibrium, energy, and electricity) and both see individuals in mechanistic-atomistic terms (e.g. as particles and or molecules) as inert elements caused from without. Stark criticizes extreme mechanicism for its inability to deal with social fact (pg. 163) and as inclined to be a- or anti-historical (pg. 159).
>
> Some 'empiricism' is evident here in Stark's criticisms of the various types of mechanicism he posits. His argument is an angry one: that Carey, Pareto, and Lundberg have all 'imported' models from elsewhere (e.g. from physics and astronomy), and have 'imposed' them on social phenomena (which Stark knows to have an idealistic character) under a 'unity of nature' positivist ideal, which is really a sociology unified under physics (pg. 155)."

In short, Stark aims to espouse extreme theories of social mechanism in which the individual is discussed in guise of the physicalist terms of atoms and molecules, which Stark considers a 'foreign substance'. The following is Stark's view on the theories of Italian engineer Vilfredo Pareto: [4]

> "Pareto's positive mechanism is excoriated for imposing a molecular model upon social life in the name of an objective science."

In the end, however, although critical of these extreme mechanism views, Stark comments that these views will be needed in some way in a modern sociology.

Stark's two chapter critique is similar to Russian-born American sociologist Pitirim Sorokin's 1928 opening chapter "The Mechanistic School" to his *Contemporary Sociological Theories*.

Social chemistry

In questioning why English biologist Thomas Huxley's 1871 call for the development of the field of social chemistry has never actuated, Stark comments: [1]

> "Why should no social chemistry ever been developed?" He states that "nobody would suggest that the social scientists should imitate meteorology, for this discipline does not appear to have got very far … but what about chemistry? A sociology based on chemistry [has] in fact been called for, but, significantly, [this call has] found no echo. It would have been easy to take up this suggestion and develop it further. An intending social chemist would have found it one whit more difficult to manufacture a sociological parallel to the Boyle-Charles law than Haret did to the Newtonian propositions. But the **experiment** appears never to have been tried. Why?"

In this same year, Stark also speculates on the concept of the 'human molecule', a view which he seems to reject.

Other

Stark also theorizes on social mechanisms, social processes, and spent the last ten years of his life writing his five-volume treatise *The Social Bond* (1976-87) on the subject of the social bond. [3]

References

1. Stark, Werner. (1962). *The Fundamental Forms of Social Thought*. Routledge & Kegan Paul.
2. Stark, Werner. (1976-87). *The Social Bond: an Investigation into the Bases of Law-abidingness.* Fordham University Press.
3. Stark, Werner, Leonard, Eileen B., Strasser, Hermann, and Westhues, Kenneth. (1993) *In Search of Community: Essays in Memory of Werner Stark (1909-1985)* (Part III: Social Bond, pgs. 117-72; physicalist terms, pg. 54, 57). Fordham University Press.
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(b) Leon H. Warshay (faculty) – Wayne State University.
5. (a) Stark, Werner. (1962). *The Fundamental Forms of Social Thought.* (pgs. 261-63). Routledge.
(b) Huxley, Thomas. (1871). "Administrative Nihilism", *Fortnightly Review*, pg. 536. Nov. 1.

External links

â— Werner Stark – Wikipedia.

θΔics

In existographies, **Wernher von Braun** (1912-1977) (IQ:180|#150) [RGM:104|1,280+] was a German-born American aerospace engineer notable for being the mind behind the rocket technology that put the first human on the moon.

Moon

In 1865, Jules Verne [RGM:85|1,280+] published the science fiction novel *From the Earth to the Moon* (Q), which was followed by the sequel *Around the Moon* (1870).

In 1905, Hermann Oberth, aged 11, read Verne's two moon books to the point of memorization; in 1923, he completed his PhD dissertation, after getting rejected sever times per reason it was "too utopian", on *By Rocketry into Planetary Space*.

In 1925, Braun, aged 14, read Oberth's *By Rocketry into Planetary Space*, and thereafter began to excel in physics and chemistry, focused on rocketry. In 1929, Braun, aged 18, became an apprentice of Oberth, helping him test a static firing of his first liquid-fueled rocket motor.

> "You know, I plan on traveling to the moon at some time."
>
> — Wernher von Braun (1930), comment to Auguste Piccard, the famous pioneer of high-altitude balloon flight (Piccard is said to have responded with encouraging words)

> "Everything in space obeys the laws of physics. If you know these laws, and obey them, space will treat you kindly. And don't tell me that man doesn't belong out there. Man belongs wherever he wants to go—and he'll do plenty well when he gets there."
>
> — Wernher von Braun (1958), *Time*, Feb 17

In the 1960s, under NASA, Braun served as director of the newly formed Marshall Space Flight Center and as the chief architect of the Saturn V launch vehicle, the superbooster that propelled the Apollo spacecraft to the Moon. In 1969, astronaut Neil Armstrong, on Apollo 11, became the first human to put foot on the moon.

Religion

Braun, beginning in 1945 and thereafter, unusual for a mechanical engineer of this time period, specifically, only 17% of leading scientists in this year believed in the existence of god (Q), voiced considerable support for a god-based universe. [1]

Quotes

The following are noted quotes:

> "Science does not have a moral dimension. It is like a knife. If you give it to a surgeon or a murder, each will use it differently."
>
> — Wernher von Braun (c.1965), arose amid moral qualms surrounding WWII rocket science technology [1]

References

1. Wernher von Braun – WikiQuotes.

θΔics

In hmolscience, **Wesley Mitchell** (1874-1948) was an American economist noted for []

Overview

In 1924, Mitchell, in his "Quantitative Analysis in Economic Theory", stated the following dualism-like idea about social experimentation:

> "The experiments must be repeat upon numerous individuals or groups; the varieties of reaction to the stimuli must be recorded and analyzed; the representative character of the samples must be known before generalization can be established. This whole procedure may have more in common with the quantitative study of data drawn from common experience than with the procedure of the man who deals with electric currents passing through a vacuum tube. In collecting and analyzing such experimental data they can obtain, the quantitative workers will find their finest, but most exacting opportunities for developing statistical technique—opportunities even finer than are offered by the recurrent phenomena of business cycles."

In 1929, Howard W. Odum, in commentary on this, stated that Mitchell believes that, because of the variability and complexity of the data, experiments in social sciences will have to develop a different technique from that of the physical sciences, and that much more depends upon statistical considerations since social experiments must be repeated again and again. [2]

In 1946, Mitchell, together with Arthur Burns, described an economic cycle. [3]

References

1. (a) Mitchell, Wesley C. (1924). "Quantitative Analysis in Economic Theory" (Ñº), Presidential Address delivered at the 37th Meeting of the American Economic Association, Chicago, Dec 29; in: *American Economic Review*, XV:8-9, 1925.
(b) Odum, Howard W. and Jocher, Katharine C. (1929). *An Introduction to Social Research* (pg. 302). H. Holt and Co.
2. Odum, Howard W. and Jocher, Katharine C. (1929). *An Introduction to Social Research* (pg. 302). H. Holt and Co.
3. Burns, Arthur F and Mitchell, Wesley C. (1946). *Measuring Business Cycles.* New York: National Bureau of Economic Research.

External links

â— Wesley Clair Mitchell – Wikipedia.

θΔics

In Hmolpedia, adding equations, symbols, superscripts, subscripts, etc., to a page is a crude process. On this page are listed a few tips.

Fact check | Under construction | Fact check | Fact check | Clean | photo needed

Sticky point | Issue

Note | 2020

Per reasons of growing problems of Hmolpedia articles showing up in Google search returns, e.g. Joule's first law, eoht.info (Q), but not working when clicked (Q), per apostrophe font recognition issues, try renaming the page as following:

Joule's first law (**Arial font**) → Joule's first law (**Wikipedia font**)

Test date: 22 Mar 2020 (check back) | Works via key: "Joule's first law, eoht.info" (8 Apr 2020).

REDIRECT

Quote dash:

—

Symbols

The following table gives a few symbols that can be copied and pasted into any Wetpaint page.

α alpha	β beta	γ gamma	δ delta	ε epsilon	ζ zeta	η eta	θ theta	ι iota	κ kappa	λ lambda	μ mu	ν nu	ξ (xi)	ο (omicron)	π (pi)
⧄	§		δ (inexact differential)				ρ (rho)	ς (sigma)	σ (sigma)	τ (tau)	υ (upsilon)	φ (phi)	χ (chi)	ψ (psi)	ω (omega)
cóck		⊙													

German

Ä/ä, Ö/ö, Ü/ü, ß

→	←		↑	↓	↔	↕	↕	ΘΔics	⧄	⇔	✓	?	W	∞
·	±	⇌	°F	•	≡	⁺	≤	≥	≠	≈	∫	∑		
²	³	⁴	Δ	♀	♂	⁻	⁻¹				✗			
H_2														
¼	½		¾	⅓	⅔		⅛	⅜	⅝	⅞	⅘	H_2O		
∂	∞		━	10° C			J/K·mol	http://						Word — Dash

♂ + ♀ Baby

Derivation needed

The following are Greek letters:

Α, α	alpha	Ι, ι	iota	Ρ, ρ	rho
Β, β	beta	Κ, κ	kappa	Σ, σ	sigma
Γ, γ	gamma	Λ, λ	lambda	Τ, τ	tau
Δ, δ	delta	Μ, μ	mu	Υ, υ	upsilon
Ε, ε	epsilon	Ν, ν	nu	Φ, ϕ	phi
Ζ, ζ	zeta	Ξ, ξ	xi	Χ, χ	chi
Η, η	eta	Ο, ο	omicron	Ψ, ψ	psi
Θ, θ	theta	Π, π	pi	Ω, ω	omega

1000px bars:

Photo needed images:

Alpha	Αα	Iota	Ιι	Rho	Ρρ
Beta	Ββ	Kappa	Κκ	Sigma	Σς
Gamma	Γγ	Lambda	Λλ	Tau	Ττ
Delta	Δδ	Mu	Μμ	Upsilon	Υυ
Epsilon	Εε	Nu	Νν	Phi	Φφ
Zeta	Ζζ	Xi	Ξξ	Chi	Χχ
Eta	Ηη	Omicron	Οο	Psi	Ψψ
Theta	Θθ	Pi	Ππ	Omega	Ωω

Other

The code: f2f2fa (gives a light blue text box color)

The code: ffffcc (gives a light pasty color)

The code: ff6633 (gives a red detractor color)

The code: CFFCDC (gives a green detractor color)

FFD9C9

10 bar spacer

20 bar spacer (163px)

30 bar white spacer (215px)

40 bar white spacer (322px)

50 bar white spacer

white bar 60

white bar 70

White bar 80

90 white bar

Three bar white spacer: "━━━"
Four bar white spacer: " "
16 bar white spacer: " "
32 bar white spacer: " "

Equations

To add an equation, one can make the equation using Latex code in any Wikipedia page, preview the equation, and then right-click on the equation, select save, and then paste into the Wetpaint article. The following code

$\int \frac{\delta Q}{T} \ge 0$

previewed in any Wikipedia page, gives the following expression:

$$\int \frac{\delta Q}{T} \ge 0$$

which can be copied as an image (right-click, save) and pasted into Wetpaint. This technique, however, seems to only work when using Internet Explorer.

| Under Construction |

Superscripts and subscripts

Only a few superscripts can be used (those found in Word symbols), e.g. E = mc^2, and subscripts don't work at all in a Wetpaint (using a 7-point font and 12-point font difference is the only alternative, e.g. H_20).

Useful

- Roger's Online Equation Editor (with transparent background) – RogerCortesi.com.
- Greek alphabet – RapidTables.com.

External links

- Adding Equations and Symbols – Wetpaint.
- LaTex math markup – SklogWiki
- Help:Displaying a Formula - Wikipedia
- Thermodynamics equations – Wikipedia.
- Superscripts and Subscripts – Wikipedia.

θΔics

In philosophy, **what happens when you die?** is the greatest philosophical conundrum of modern times; the question in most need of answer. It is the first question, according to many accounts, that absorb the minds of the person starting at age three. [8]

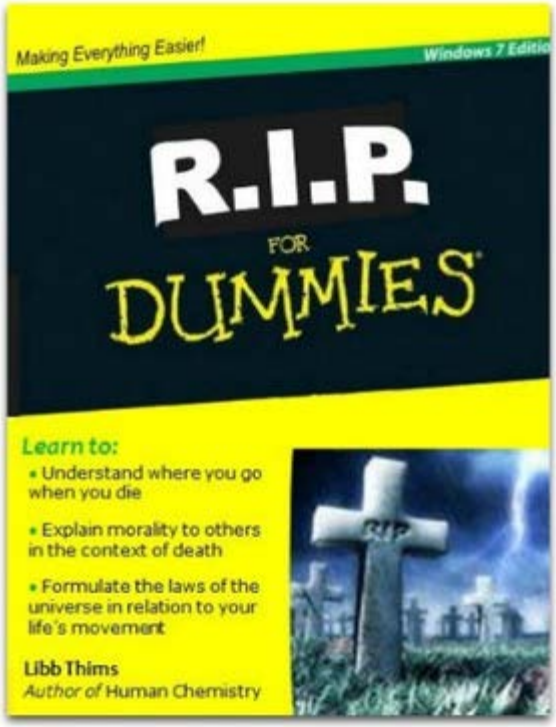

Draft cover for possible book by American chemical engineer Libb Thims, explaining death energetically.

Semantic | Confusions

See main: Life terminology upgrades

There is to note a subtle but profound semantic confusion surrounding the term "die" per reason that a walking, talking, thinking human is in fact a powered atomic thing, and atoms and structures made of two or more atoms do not technically "live" or "die"; some of which is captured below:

> "You can't die if you're not alive." | "If you're not alive, you cannot die."
>
> — Libb Thims (2014), reverberating mental note, as a way to succinctly capture the direct implications of the "life does not exist" purview; triggered into documentation phase, via dialogue in the Jabr thread, 4:51PM CST, Oct 23

This ramifications of this are found in the: "chemicals seem so alive" (Goethe, 1809), "there is no thing endowed with life" (Tesla, 1915), "if we continue to use the word life" (Lotka, 1925), "chemistry and physics do not recognize the word life" (Sherrington, 1938), "let of abandon the world alive" (Crick, 1966), "life doesn't scientifically make sense" (Brooks, 2005), "defunct theory of life" (Thims, 2009) or "life does not exist" (Rogers, 2010) (Jabr, 2013) purviews.

Conundrum | Polls

When asked the question: 'what is humankind's present-day greatest philosophical conundrum', according to 2005 polls, people the top three responses are: [1]

- What happens when you die [27%]
- What is love? [23%]
- What is the meaning of life? [19%]

The subject of death is typically approached as being a transformation process that will abide by the known laws of the universe, namely the first and second law of thermodynamics.

Overview

A scientific answer to the question of death is typically approached using the first law of thermodynamics, such as was outlined in 1997 by Puerto Rican cultural anthropologist Migene Gonzalez-Wippler. [2]

> "We want to establish a theory about **what happens after we die**. In order to do this, we must first provide a foundation for this theory, and this foundation is the first law of thermodynamics. This law states that energy can neither be created nor destroyed."

This type of theory was first outlined in 1892 by German physician and physicist Hermann Helmholtz. [3] Others to

have approached the death question via thermodynamics include: German chemist Wilhelm Ostwald (1906), Engish physical chemist Frederick Soddy (1919), Iranian thermodynamicist Mehdi Bazargan (c. 1950), American engineer Ronald Pearson (1990), and French engineer and biophysical chemist Louis-Marie Vincent (c. 2000). In 1978, in what seems to have been influenced by the writings of Pierre Teilhard, Scottish-born American philosopher Geddes MacGregor outlined some of the difficulties involved in attempts to reconcile theories of soul, immortality, and reincarnation with the second law of thermodynamics. The following is an example quote: [5]

> "If whatever is called the soul is to have the importance attributed to it by those who would contend for its immortality, then it must be dynamic *par excellence* and therefore subject to entropy in an eminent degree."

One can also find discussions on energy, death and the first law in the context of the Vedic religions, particularly the Bhagavad-Gita, a subject which occupies the mindset of about 13 percent of the world, as speculated on by American author Steven Rosen: [6]

> "Modern science recognizes a sort of spark or energy that animates the body, something that distinguishes it from dead matter. Further, the first law of thermodynamics, stating that energy cannot be created or destroyed, gives us reason to pause when thinking about reincarnation—if there is energy in the body, and this energy cannot be created or destroyed, where does it go at the time of death?"

(add discussion)

Quantification

In circa 1995, American physician Gerry Nahum, with a background in thermodynamics and information theory, supposedly, worked out a 25-page proposal, entitled "Proposal for Testing the Energetics of Consciousness and its Physical Foundation", to conduct a consciousness-weighing project to quantify the energy of consciousness or rather the "weight of the soul", at the point of death, estimated to cost $100,000, using a negative entropy theory. [7]

In 2005, American chemical engineer Libb Thims classified this subject of study by the name cessation thermodynamics, the study of what happens to the entity or moral essence of neurologically functioning person, thermodynamically, when he or she ceases to be, as a branch of philosophical thermodynamics. In short, this subject amounts to a study of the changes or transformations of the internal energy *dU* (ergal + vis viva) of the energy content of one's residual human chemical bonds (one's bonded social structure), i.e. bond energy, at the point of termination, a transformation process that would be defined by the following approximate expression: [4]

$$\oint dU = f\Big\{\sum_{i=1}^{N} X_i dY_i\Big\}$$

which shows that the circle integration of the change in energy of the structure or movement of a person's life over the boundary of one's activity spheres, in a death cycle, will be quantified by a summation of changes to intensive-extensive conjugate variable pairs, assignable to a before and after system state and connective system structural change.

Quotes

The following are related quotes:

> "Old chemists never die; they just reach equilibrium."

— Anon (c.1995), oft-quoted joke, as found on T-shirts; variant of this joke is: 'old chemists never die; they just fail to react'.

See also

- Aaron Freeman

References

1. Thims, Libb. (2007). *Human Chemistry (Volume One)* (pgs. 301-02). Morrisville, NC: LuLu.
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6. Rosen, Steven J. (2002). *Gita on the Green: The Mystical Tradition Behind Bagger Vance* (thermodynamics, pg. 72). Continuum International Publishing Group.
7. Roach, Mary. (2006). "What Happens After You Die?", *New Scientist*, Nov. 18.
8. Thims, Libb. (2016). *Smart Atheism: For Kids* (pdf | 309-pgs). Publisher.

External links

- What happens with energy in you after you die? – Fluther.com.
- What happens when you die? – CliffNotes.com.

θΔics

In queries, "**what is a human?**", or "what is a person", or "what is a human being?", the latter, of note, a double meaning term [human + being], refers to the question of what a person is?

Quotes

The following are related quotes:

A section from American sociologist John Evan's 2016 *What is a Human?*, wherein he attempts to parlay some sort of small study he conducted, to compare and contrast Christian ideologies, as contrasted with Darwinian ideologies, of what a human is, in respect to their differing implications in the area of "human rights". [2]

> "The *Human Molecule* traces the historical development of the conception of the human being as an individual 'molecule'. The question of **what is a 'human'** has passed down through the ages as an unsolved riddle of curiosity?"
>
> — Libb Thims (2008), *The Human Molecule* (abs) [1]

References

1. Thims, Libb. (2008). *The Human Molecule* (abs) (issuu) (GB) (DS). LuLu.
2. Evans, John. (2016). *What is a Human? What the Answers Mean for Human Rights*. Oxford.

Further reading

â— Goodman, Michael. (1988). *What is a Person?* Springer.
â— Olafson, Frederick. (1995). *What is a Human Being? A Heideggerian View*. Cambridge.
â— Thims, Libb. (2020). *Human Chemical Thermodynamics — Chemical Thermodynamics Applied to the Humanities: Meaning, Morality, Purpose; Sociology, Economics, History, Philosophy, Government, Anthropology, Politics, Business, Jurisprudence; Religion, Relationships, Warfare, and Love* (§1: What is a Human?, pgs. 1-#) (**pdf**). Publisher.

θΔics

In debates, **What is Entropy Debate?**, or Swinburne entropy debate, was a famous 1897 to 1907 debate as to the nature of entropy, originating between primarily English physicist James Swinburne and Irish mechanical engineer John Perry (former assistant to William Thomson).

As summarized in the 1907 *Harvard Engineering Journal* article "The Question of Entropy" by American steam engineering and thermodynamicist Sidney Reeve. [1]

> "Eighteen months previously to its opening there was published in *Engineering* (July 13, 1900) a letter upon 'The Nature of Entropy', from Mr. J. MacFarlane Gray to Mr. T. O'Connor Sloane, which is worthy of notice. But the bulk of the expression of opinion occurred within the three months from early December, 1902, to early March, 1903, during which time forty odd contributions to the topic appeared in the columns of four London engineering periodicals, all of them from the pens of prominent men."

Journal.	*Date and Page.*	*Remarks.*
The Electrician.	1902—253, 274, 315, 344, 394.	Mr. Swinburne's presidential address.
Engineering.	1902—749.	Editorial thereon.
The Engineer.	1902—564.	Editorial thereon.
The Electrician.	1902—398.	Letter from Prof. John Perry, combatting Mr. Swinburne's position.
Engineering.	1902—843.	
Electrical Review.	1903— 11.	Letter from "Ad. H. F."
The Electrician.	1903—442.	Mr. Swinburne *vs.* Prof. Perry.
Engineering.	1903— 15.	Letter from M. J. Garcin, Paris.
The Electrician.	1903—477.	Prof. Perry *vs.* Mr. Swinburne.
The Electrician.	1903—478.	Letter from Mr. Evershed.
Electrical Review.	1903— 52.	"Entropy," by Mr. Swinburne.
Electrical Review.	1903— 58.	Mr. Swinburne *vs.* Prof. Perry.
Engineering.	1903— 53.	Mr. Swinburne *vs.* the editors.
Engineering.	1903— 84.	The same.
The Electrician.	1903—526.	Mr. Swinburne *vs.* Mr. Evershed.
The Electrician.	1903—560.	"Entropy." Sir Oliver Lodge.
The Electrician.	1903—542.	Editorial on the above.
Electrical Review.	1903—135.	"Entropy." Prof. Perry.
The Engineer.	1903— 84.	
The Electrician.	1903—610.	Letter from Mr. Swinburne.
Electrical Review.	1903—177.	"Entropy." Mr. Swinburne.
The Engineer.	1903—114.	"Entropy." Prof. Robt. H. Smith.
The Engineer.	1903—122.	Letter from Mr. Swinburne.
The Engineer.	1903—149.	"Entropy." Prof. Perry.
The Electrician.	1903—656.	Letter from Mr. Wm. Robinson.
Electrical Review.	1903—220.	"Heat and Temperature." Prof. Perry.
The Electrician.	1903—688.	"Entropy." Prof. Poincaré.
The Electrician.	1903—694.	"Mr. Swinburne and Entropy." Prof. Max Planck.
The Electrician.	1903—695.	Letter from Mr. Swinburne.
The Engineer.	1903—171.	Letters from Prof. Mark Robinson, Mr. J. W. Cable and Mr. Swinburne.
The Engineer.	1903—199.	"Entropy." Mr. J. W. Cable.
The Electrician.	1903—735.	Letters from Sir Oliver Lodge and Mr. Oliver Heaviside.
The Engineer.	1903—210.	"Rankine's Thermodynamic Function and Entropy."
The Electrician.	1903—821.	Letter from Prof. Max Planck.
The Engineer.	1903—236.	Review of Prof. Reeve's "Thermodynamics" in which entropy is identified with physical mass.

Summary of the letters of exchange in the 1902-1904 **"What is Entropy"**, centered at London, by American thermodynamicist Sidney Reeve. [1]

In sum, the debate took place primarily through the exchange of letters in a number of British electrical and mechanical engineering journals, involving a number of eminent scientists, including Max Planck, Henri Poincare, Oliver Lodge, Sydney Evershed, Oliver Heaviside, among others, that resulted in the writing of a number of educational articles on entropy and even one book, the 1904 *Entropy: or Thermodynamics from an Engineer's Standpoint and the Reversibility of Thermodynamics* by Swinburne.

Debaters

The following is work-in-progress list of debaters:

- James Swinburne
- John Perry (1902), "Letter Reply Title", Dec 26
- Sydney Evershed (1903), "Article", Jan 9
- Max Planck (1903), "Article", Mar 6
- William Franklin (1903), "The Misuse of Physics by Biologists and Engineers", Oct 31
- Henri Poincare
- Oliver Lodge
- Oliver Heaviside
- Sidney Reeve (1907), "The Question of Entropy" (1907)

(add)

Events

In 1897, during the Hartford Meeting of the American Society of Mechanical Engineers, a paper by American civil engineer De Volson Wood (1832-1897) (Q), shown adjacent, on the "Adiabatics of Staurated Vapour" was read, the blackboard equation derivation minutes of which, being reported as follows: [14]

De Volson Wood

Mr. Richmond

ADIABATICS OF SATURATED VAPOUR.

The next paper, by Professor De Volson Wood, of Stevens Institute of Hoboken, was on "Adiabatics." In this paper he gave the mathematical expression for a perfect gas, and as follows concerning the adiabatics of saturated vapour.

Adiabatics of Saturated Vapour.—Let F N be the curve of saturation, then A C $= v_2$ will represent the volume of a pound of dry saturated vapour. Let A B be the xth part of a pound of the vapour, $(1 - x)$ A C $=$ B C being liquid, and E Bϕ_3 be the adiabatic sought. Let state D be $d\tau$ higher in temperature than A, then

$$\text{pressure A D} = \left(\frac{dp}{d\tau}\right) d\tau$$

Construct an indicator card, one side of which is the adiabatic E B, the two sides D E and A B isothermals of a liquid and its vapour, and A D the constant volume of the liquid, then, as before, heat absorbed along A D + along D E + along E B − along B A = area A D E B.

Draw adiabatics Aϕ_1, Dϕ_2, then along A D, heat absorbed $= \phi_1$ A Dt_2 $=$ C $d\tau$; along A B, heat absorbed $= \phi_1$ A Bt_3 $= x$ H$_e$ $=$ the heat of vaporisation;

along B E, zero;
" D E, ϕ_2 D E ϕ_3 $= x$ H$_e$ $+ d(x$ H$_e)$;

hence we have

$$C\,d\tau + x\,H_e + d(x\,H_e) + 0 - x\,H_e = A\,D\,E\,B,$$

or

$$C\,d\tau + d(x\,H_e) = A\,D\,E\,B = x\,v.\,dp = x\,H_e\frac{d\tau}{\tau}$$

$$\therefore C\,d\tau + d(x\,H_e) - x\,H_e\frac{d\tau}{\tau} =$$

$$\therefore C\,d\tau + \tau\,d\left(\frac{x\,H_e}{\tau}\right) = 0;$$

$$\therefore -C\frac{d\tau}{\tau} = d\left(\frac{x\,H_e}{\tau}\right) \quad . \quad . \quad . \quad (c)$$

Integrating

$$-C\log_e\frac{\tau}{\tau_1} = \frac{x\,H_e}{\tau} - \frac{x_1 H_{e1}}{\tau_1} \quad . \quad . \quad . \quad (d)$$

which is a well-known equation of the adiabatic of liquid and its vapour mixed.

Draw an isothermal, L N, one degree lower than that of A C; then will the horizontally shaded part A $b\,a$ L be $\frac{C\,d\tau}{\tau}$ and the obliquely shaded part A B M L be $\frac{x\,H_e}{\tau}$, which terms appear in equation (c).

A heated debate on the nature of entropy then the erupted; which is reported by an American correspondent as follows:

> "The discussion which followed this brief communication was a beautiful example of the way in which a society whose members are fresh from practical life and forgetful of the accurate definitions of modern science, may hopelessly involve itself when questions concerning the nature of energy are sprung.
>
> Mr. Richmond arose, and with the assistance of the blackboard explained at length a method, in common use among the engineers of Europe, for obtaining the adiabatical equation in such a case as that of Professor Wood's "engine in which the law of pressures and volumes of the working fluid are represented on a diagram of energy by a closed path," in which it is desirable to express in heat units the difference in amount between the heat absorbed and the heat emitted. Mr. Richmond emphasized the fact that by this method "absolutely no calculation" was required. It could "all be mastered by anybody with about an hour's

careful thought."

Mr. Kent wanted Mr. Richmond to indicate more plainly what were the abscissae in his diagrams upon the board; and he desired, furthermore, to know whether these abscissac represented "entropy for work."

Mr. Richmond responded that he had tactfully omitted the word "entropy" from his explanation because "most people had a notion that entropy was some sort of a mystery." He thereupon proceeded to elucidate the mystery. If we represent a quantity of heat by a rectangle, the absolute temperature being represented on one side, the other side will represent the "entropy." "It's simply the name 'entropy.' One is temperature, the other is entropy. The thing itself is so much simpler than the name that there is no trouble in understanding that if a rectangle represents the heat, one side representing the heat, the other must represent the ratio."

Mr. Kent declared himself abundantly satisfied with Mr. Richmond's explanation, and hoped Mr. Richmond would write it all out in a little treatise to be printed in the Transactions—omitting the calculus.

Mr. Rockwood did not wish to appear frivolous, but thought Mr. Richmond would confer a favor on the world of steam engineers at large if he would inform the gentlemen present "Why he uses adiabatics, what adiabatics are for, and what they ever will be for." "The prophetic eye," he continued, "may discern what use they can subserve ; but at present it is perfectly plain that no gas ever expands adiabatically, or ever will, steam least of all, and the deductions arising from the analysis of adiabatic curves are wholly inapplicable to any known case of a gas or heat engine." Mr. Rockwood wanted to know what sort of a heat engine was going to be devised in the future to utilize all the mathematical theory evolved by distinguished writers in their investigation of the interesting adiabatic mystery.
Mr. Kent desired to ask whether this system was identical with that of Macfarlane Gray. Mr. Richmond responded that it was, and that its use being almost universal in Europe, he failed to understand why it had not been adopted in this country.

Mr. Kent knew why. It was because Mr. Richmond had not written the proposed treatise. "I heard Macfarlane Gray read his paper in 1889, and I do not think there were five men in the room that understood it. You were one of them, probably."

Mr. Richmond, ignoring the Delphic ambiguity of Mr. Kent's last sentence, proceeded again to enlarge upon the extreme simplicity and unmathematical nature of his method.

Mr. Rockwood again incurred the risk of being deemed frivolous by asking Mr. Richmond to "dwell particularly upon the nature of heat and upon the nature of entropy, because therein he will do a great service for steam engineers."

Mr. Kent expressed the hope that Mr. Richmond would not say anything in his treatise about the nature of heat. Quoting the dictum of Maxwell, "or somebody else" : " What heat is we do not know," he added impressively, "We do not know, and we are not going to know. There is no such thing as entropy."

Mr. Rockwood insisted, nevertheless, that Mr. Richmond should be allowed to write his treatise.

Mr. Richmond declared Mr. Kent's sententious utterances to be, in the present case, a mathematical fiction. It was not a mathematical fiction, but an elementary concession, "the moment you allowed that energy is a quantity of two dimensions and you know one. When you represent that, the other dimensions, whether it has a name or not, is a clear factor."

This seems to be the spark that flamed the debate that was to engulf some near 50 scientists in the decade to follow.

Swinburne

This entropy issue seems to have particularly pequied the interest of British electrical engineer James Swinburne (1858-1958), pictured adjacent, who, retrospectively, stated that as a young man, in his 20s, when trying to study the subject of thermodynamics, entropy was a mental barricade; in his own words: [2]

> "As a young man I tried to read thermodynamics, but I always came up against entropy as a brick wall that stopped my further progress. If found the ordinary mathematical explanation, of course, but no sort of physical idea underlying it. No author seemed even to try to give any physical idea. Having in those days great respect for textbooks, I concluded that the physical meaning must be so obvious that it needs no explanation, and that I was especially stupid on the particular subject."

Swinburne goes on to state that he eventually found the physical meaning and correct definitions through study of irreversible thermodynamics in physical chemistry.

On Dec 02, 1902, however, the difficulty associated with the definition of entropy was still on Swinburne's mind and when he gave his presidential address to the British Institute of Electrical Engineers, nearing the end of the lecture he turned to the question of the proper mathematical definition of entropy, appending to the body of his address a footnote which reiterated and elaborated his ideas. [1] In this address, he stated that all the textbook definitions of entropy were "fundamentally wrong", claiming that authors were pushing the ideas of *reversible* thermodynamic processes far beyond their domain of applicability. [3]

Perry

On Dec 26, 1902, Irish mechanical engineer and thermal physicist John Perry responded to Swinburne, with: [4]

> "When Mr. Swinburne gravely informs an audience that two and three do not make five, but something else, everybody takes him to be joking, but when he tries to upset some other well-established scientific principles …he may be doing much harm [and] he does not know what he is talking about."

(add discussion)

Evershed

In a Jan 9, 1903, English electrical instrument maker Sydney Evershed (1857-1982), supposedly also stirred by Swinburne's comments, sent in his thoughts to *The Electrician*, wherein he stated that: [5]

" $\int_0^\infty JSdt = 0$ conveys a profound truth!"

Evershed also listed the following six summary of his known definitions of entropy:

> (a) Entropy is that portion of the intrinsic energy of a system which *cannot* be converted into work by even a perfect heat engine (Clausius)

"In despair, I offer your readers their choice of the following definitions of entropy. My authorities are such books and journals as I have by me at the moment.

"(*a*) Entropy is that portion of the intrinsic energy of a system which *cannot* be converted into work by even a perfect heat engine. — *Clausius.*

"(*b*) Entropy is that portion of the intrinsic energy which *can* be converted into work by a perfect engine. — *Maxwell, following Tait.*

"(*c*) Entropy is that portion of the intrinsic energy which *is not* converted into work by our imperfect engines. — *Swinburne.*

"(*d*) Entropy (in a volume of gas) is that which remains constant when heat neither enters nor leaves the gas. — *W. Robinson.*

"(*e*) Entropy may be called 'thermal weight,' temperature being called 'thermal height.' — *Ibid.*

"(*f*) Entropy is one of the factors of heat, temperature being the other. — *Engineering.*

. . . . . .

"I set up these bald statements as so many Aunt Sallys, for any one to shy at.

A listing of mostly incorrect **misinterpretations** of entropy, in a letter to *The Electrician* (London) from Sydney Evershed, January 09, 1903, in connection to the great "what is entropy debate" (1902-1904) launched by British electrical engineer James Swinburne. [5]

(b) Entropy is that portion of the intrinsic energy which *can* be converted into work by a perfect engine (Maxwell, following Tait).
(c) Entropy is that portion of the intrinsic energy which is *not* converted into work by our imperfect engines (Swinburne).
(d) Entropy, in a volume of gas, is that which remains constant when heat nether enters nor leaves the gas (R. Robinson).
(e) Entropy may be called the 'thermal weight', temperature being called the 'thermal height' (ibid).
(f) Entropy is one of the factors of heat, temperature being the other (Engineering).

Evershed then states that he has 'set up these bald statements as so many Aunt Sallys, for any one to shy at. [5]

Lodge

In an effort to remedy this dispute, the editors of *The Electrician* English physicist Oliver Lodge to write a tutorial on entropy, but the result was said to have been so clearly an attempt to offend no one that it satisfied no one. [6]

Swinburne then began appealing to outside expert authorities on thermodynamics, particularly Henri Poincare and Max Planck and some of their comments were published in *The Electrician.*

Planck

German physicist Max Planck (1858-1947), shown adjacent, per Lodge's request for comment, wrote: [7]

> "Astonishment [at seeing] a man so well known and so eminent in science as Sir Oliver Lodge putting forward ideas on thermodynamics which I have combated ever since the commencement of my studies in that science."

Planck called Swinburne's writing on entropy "excellent" and stated that:

> "Swinburne has written one of the best and clearest expositions of the subject that has ever been written, especially when he points out that Nature never undertakes any change unless her interests are served by an

> increase in entropy."

(add discussion)

Heaviside

This metaphysical-sounding statement caught the eye of English self-taught electrical engineer, mathematician and physicist Oliver Heaviside, and prompted a letter which tells us, explicitly, something about his thermodynamic ideas, and of energy: [8]

> "I should like to ask Professor Max Planck whether the view he expresses that 'Nature never undertakes any change unless her interests are served by an increase of entropy' is to be taken with or without any particular reservation or with any special interpretation of 'her interests'. My thermodynamic ideas are somewhat old-fashioned—viz., that there is invariably a dissipation of energy or loss of availability of energy due to imperfect or total want of reversibility in natural processes. This entirely agrees in effect with the way of expressing things in terms of increase of 'entropy', although that subtle quantity is certainly 'ghostly', and is somewhat too evasive to be regarded as a physical state even though it be a function of the physical state referred to a standard state. But the question is how the interests of Nature are served by imperfect reversibility? Professor Planck's words suggest a choice on Nature's part, as if Nature had any choice. Goethe said God himself could not alter the course of Nature. That was truly scientific. Then, again, what are to be considered the interests of Nature? Are we to take exactly things exactly as we find them, and define the interests in that way? If so, it carries us no further. Or is there a theorem of greatest entropy, showing how any variation from the proper course of Nature would tend to reduce the rate of increase of the entropy?"

Planck replied promptly with a sharp rejection of Heaviside, at first dismissing the 'ghostly' business: [9]

> "Whether entropy has any 'ghostly' attributes, is a question I will not open, but I am for the present quite content to know that it is a quantity which can be measured without ambiguity."

Planck continued:

> "I do emphatically deny, and always have combated the proposition adduced by Mr. Heaviside, of the universal dissipation of energy."

Here, Planck is referring to Irish-Scottish physicist William Thomson's 1852 "On a Universal Tendency in Nature to the Dissipation of Mechanical Energy", the popular verbal layman-style version of the second law, being only a loose approximation to Rudolf Clausius' 1865 very-rigorous mathematical textbook definition of entropy and the second law, which is what Planck did his PhD on. This objection of Planck to the dissipation of energy view of entropy is similar to the general objection to American organic chemist Frank Lambert's verbalized "energy dispersal" view of entropy, such as was debated for several months on the Wikipedia entropy talk pages in 2006, between Lambert and American chemical engineer Libb Thims, among others. [11]

Planck when on to explain his proposition, but there is no record of a Heaviside reply. [3] Interestingly, two months after Heaviside's description of entropy as 'ghostly', Perry copied him a curious book review in *Nature*; that was not really a 'review', but rather a statement of Perry's experiences in teaching thermodynamics to engineers, which is supposedly very funny, containing lines such as 'we know men who pet and fondle their slide rules …', and seems to have been written as an emotional release to the debate with Swinburne. [10]

In 1903-04, driven no doubt by the fuel of the debate, Swinburne published the book *Entropy: or Thermodynamics from an Engineer's Standpoint and the Reversibility of Thermodynamics*. [2] In what seems to be a continuation with the ongoing debate, Perry published a negative review in *Nature* that year. [12] A response to the review followed by Swinburne. [13]

See also

- Moriarty-Thims debate

References

1. Reeve, Sidney. (1907). "The Question of Entropy", *Harvard Engineering Journal* (pgs. 138-54), Vol. 6.
2. Swinburne, James. (1904). *Entropy: or Thermodynamics from an Engineer's Standpoint and the Reversibility of Thermodynamics* (quote: Personal, pgs. 3-4). Westminster: Archibald Constable & Co.
3. Nahin, Paul J. (2002). *Oliver Heaviside: the Life, Work, and Times of an Electrical Genius of the Victorian Age* (pgs. 114-). JHU Press.
4. Perry, John. (1902). "Letter Reply Title", *The Electrician*, 50: 398, Dec 26.
5. Evershed, Sydney. (1903). "Title", *The Electrician*, 50: 478, Jan 09.
6. Lodge, Oliver. (1903). "Title", *The Electrician*, 50: 560-63, Jan 23.
7. Planck, Max. (1903). "Article", *The Electrician*, 50: 694, Feb 13.
8. Heaviside, Oliver. (1903). "Article", *The Electrician*, 50: 735, Feb 20.
9. Planck, Max. (1903). "Article", *The Electrician*, 50: 821, Mar 06.
10. Perry, John. (1903). "Review: *Entropy: The Thermodynamics of Heat-Engines* by James Swinburne", *Nature*, 67: 602-05, April 30.
11. Introduction (Jul 01, 2006) – en.Wikipedia.org/Talk:Entropy/Archive2.
12. Perry, John. (1904). "Entropy", *Nature*, April 14.
13. Swinburne, James. (1904). "Entropy", *Nature*, 70: 54-55, May 19.
14.Anon (American correspondent). (1897). "The Hartford Meeting of the American Society of Mechanical Engineers; §:Adiabatics of Staurated Vapour [paper by De Volson Wood]" (pgs. 225-), *Engineering*, 64:222-, Aug 20.

Further reading

- Perry, John. (1899). *The Steam Engine and Gas and Oil Engines* (ch. 22: Work and Heat: Entropy, pgs. 344-57). MacMillan.
- Reeve, Sidney A. (1903). *The Thermodynamics of Heat-Engines*. The MacMillan Co.

External links

- John Perry (engineer) – Wikipedia.
- Oliver Heaviside – Wikipedia.
- Oliver Lodge – Wikipedia.

θΔics

In famous publications, ***What is Life?*** *- the Physicist's approach to the Subject: with an Epilogue on Determinism and Free Will*, is a classic 1944 booklet by Austrian physicist Erwin Schrödinger, in which the puzzling aphorism that "life feeds on negative entropy" was presented to the lay public.

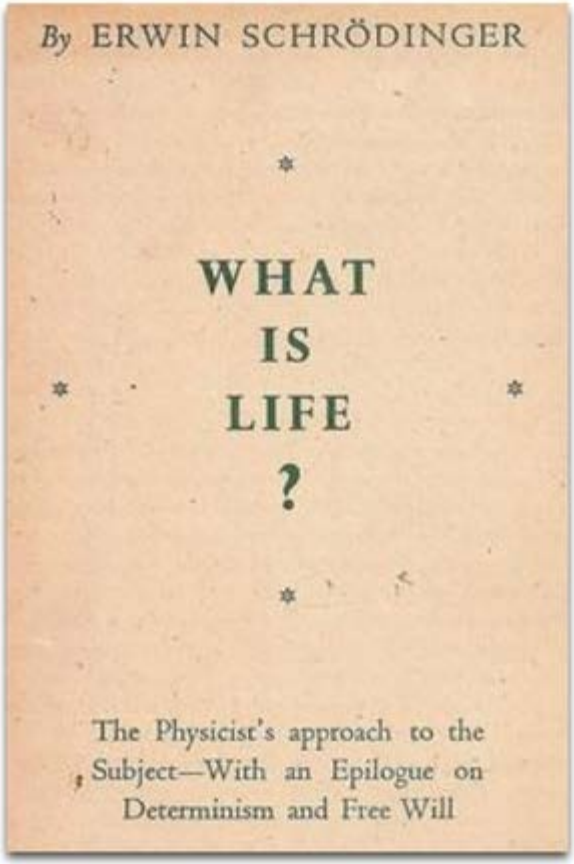

Original cover to Erwin Schrodinger's famous 1994 Dublin lecture ***What is Life?***, the book that inspired James Watson to discover DNA (1953) and that initiated the famous life feeds on negative entropy supposition. [3]

The book originated from a course of public lectures in February of the year prior at Trinity College, Dublin, in which Schrödinger attempted to explain, in lay terms, to explain how the events in space and time take place with the spatial boundary of a living organism or, in short, to give a definition of life according to physics and chemistry.

In thermodynamics, Schrödinger's *What is Life?*, referring particularly to chapter six "Order, Disorder and Entropy", in which a crude description on life and negative entropy was presented, is by far one of the the most-cited thermodynamics publications; a phenomenon do in large part to its small size (approximately 90-pages), its quaint lay-person style of writing, and to Schrödinger's celebrity status for having won the 1933 Nobel Prize in physics for is work in quantum mechanics.

Order, Disorder and Life

The famous chapter six, of *What is Life?*, entitled "Order, Disorder and Entropy", is a rich source of famous quotations and a typical launching point or basis of logic in writings on life and thermodynamics. In this chapter, Schrodinger gives his famous derivation of "order". To begin with, he gives the following expression for entropy:

$$\text{entropy} = k \log D$$

where *D* is a quantitative measure of the atomistic disorder of the body in question; with the addendum that to give an exact explanation of *D* in non-technical terms is well-nigh impossible. On this, skipping a few paragraphs of discussion, he jumps to the conclusion that since the logarithm of 1/D is minus the log of D, we can thus write:

$$-(\text{entropy}) = k \log \frac{1}{D}$$

where, as he famously states, "the awkward expression 'negative entropy' can be replaced by the better one: entropy, taken with a negative sign, is itself a measure of order.

The following paragraph is a frequently quoted section of the chapter: [2]

> "What then is that precious something that contained in our food which keeps us from death? That is easily answered. Every process, event, happening – call it what you will; in a word, everything that is going on in Nature means an increase of the entropy of the part of the world where it is going on. Thus a living organism continually increases its entropy – or, as you may say, produces positive entropy – and thus tends to approach the dangerous state of maximum entropy, which is death. It can only keep aloof from it, i.e. alive, by continually drawing from its environment negative entropy – which is something very positive as we shall immediately see. **What an organism feeds upon is negative entropy**. Or, to put it less

> paradoxically, the essential thing in metabolism is that the organism succeeds in freeing itself from all the entropy it cannot help produce while alive."

The bolded line in this paragraph, in particular, is possibly the most quoted line in thermodynamics; aside from, of course, Clausius' even more riddled statement that the "entropy of the universe tends to a maximum".

Note to Chapter 6

In the follow-up to this chapter, Schrodinger received a lot of flak from fellow physicists about various over simplifications and difficulties in his presentation; after which time he appended a two-page Note to Chapter 6 in which he explained that if he had been catering his talk to physicists that:

> "[I should have] let the discussion turn on free energy instead [but that] this high technical term seemed linguistically too near to energy for making the average reader alive to the contrast between the two things … the concept [free energy] is a rather intricate one, whose relation to Boltzmann's order-disorder principle is less easy to trace than for entropy and 'entropy taken with a negative sign', which by the way is not my invention."

Other

American physicist Jack Hokikian states that Schrodinger coined the term "negative entropy". [2] This, however, may not be the case, as the term or a variant of it seems to have been used prior to this.

References

1. (a) Schrödinger, Erwin. (1944). *What is Life?* (ch. 6 "Order, Disorder, and Entropy", pgs. 67-75). Cambridge: Cambridge University Press.
(b) What is Life? (1944 book in word doc download).
(c) Schrödinger's scripture "*What is Life?*" was based on a course of public lectures delivered under the auspices of the Dublin Institute for Advanced Studies at Trinity College, Dublin, in February 1943 and published in 1944.
2. Hokikian, Jack. (2002). *The Science of Disorder: Understanding the Complexity, Uncertainty, and Pollution in Our World* (pg. 66). Los Feliz Publishing.
3. Watson, James. (2003). *DNA: the Secret of Life* (image, pg. 34). Alfred A. Knopf.

See also

- What is life? (theories of existence)

External links

- What is Life? – Wikipedia.
- What is Life? The Physical Aspect of the Living Cell (image) – Austrian Center Library for Physics.

θΔics

In queries, **what is life? (theories of existence)** refers to []

Overview

In circa 1882, German physicist Hermann Helmholtz, according to Russian biophysicist Aleksandr Zotin, supposedly argued that life somehow circumvents the second law. [13]

In 1886, Austrian physicist Ludwig Boltzmann stated: [1]

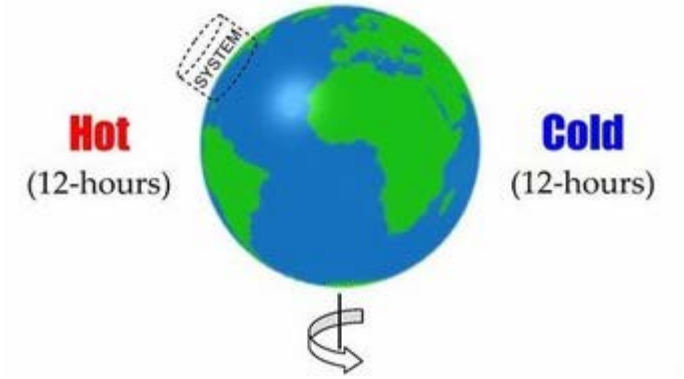

Thermodynamics system view of the earth (4 BYA, daily rotation was fast, rotating about once every 10-hrs).

> "Between the earth and sun there is a colossal temperature difference; between these two bodies energy is thus not at all distributed according to the laws of probability. The equalization of temperature, based on the tendency towards greater probability, takes millions of years, because the bodies are so large and are so far apart. The intermediate forms assumed by solar energy, until it falls to terrestrial temperatures, can be fairly improbable, so that we can easily use the transition of heat from sun to earth for the performance of work, like the transition of water from the boiler to the cooling instillation. The general struggle for existence of animate beings is not a struggle for raw materials – these, for organisms, are air, water and soil, all abundantly available – nor for energy, which exists in plenty in any body in the form of heat *Q*, but of a struggle for entropy *S*, which becomes available through the transition of energy from the hot sun to the cold earth."

Boltzmann's verbal outline is diagrammed below in a *steam engine view* of the earth, in which the surface of the earth has attached "system" (working substance or working body), rotating once every 24-hours, such as to have contact, alternately, with a hot body (boiler) and cold body (condenser).

In 1914, American experimental biologist and oceanographer James Johnstone, in his *The Philosophy of Biology*, stated: [10]

> "Entropy is a shadowy kind of concept, difficult to grasp, but again, we may point out that, the reader who would extend the notion of mechanism into life simply *must* grasp it."

In 1920, American thinker William Sidis, in his book *The Animate and the Inanimate*, outlined the view that life is a "reversal of the second law of thermodynamics". [8]

In 1944, Austrian physicist Erwin Schrödinger, in his popular book *What is Life?*, outlined the view, using crude probability arguments, that: [2]

> "[Life] feeds on negative entropy."

The basic difficulty in Schrödinger's negative entropy theory is that he equates sustenance (metabolism) with measures of entropy; whereas in the correct sense, sustenance is a function of substrate interactions, as studied in the field of surface chemistry. In an appended note to his thermodynamics-life chapter, however, Schrödinger states that:

> "The remarks on *negative entropy* have met with doubt and opposition from physicist colleagues. Let me

> say first, that if I had been law catering for them alone I should have let the discussion turn on free energy instead. It is the more familiar notion in this context. But this highly technical term seemed linguistically too near to energy for making the average reader alive to the contrast between the two things."

In 1959 and 1963 American physicist Robert Lindsay outlined a similar view in this statement that: [11]

> "Man's whole struggle … practically every element in man's developed civilization, may be interpreted either as an instinctive or conscious and deliberate attempt to replace disorder with order, in other words to consume entropy."

In 1978, American chemist Peter Molton defined life as "regions of order which use energy to maintain their organization against the disruptive force of entropy." [9]

In 1987, Austrian-born English molecular biologist Max Perutz, in commentary on Schrödinger's negative entropy postulate, stated that: [4]

> "We live on free energy and there [is] no [need] to postulate negative entropy."

Thus, by 1987 the rather paradoxical view had emerged, in the thermodynamics community, that life is something that either:

> (a) Struggles for entropy – Boltzmann, 1886.
> (b) Feeds on negative entropy – Schrödinger, 1944.
> (c) Consumes entropy – Lindsay, 1959.
> (d) Lives on free energy – Perutz, 1987.

In this sense, the silly question becomes do we (as human beings) "struggle", "feed", "consume" entropy, or "live" on free energy? The only correct answer to this question is to ask: what do molecules (human molecules) do, in the thermodynamic system, during a Carnot cycle, because that is what happens.

To note, in 1987 commentary on Schrödinger's *What is Life?,* American chemical engineer Linus Pauling noted that Schrödinger was discussing a change in the entropy of the "system", he never defined the system. In other words, one must first define both the system and the boundary, before speaking about either the entropy or the free energy of the system, living or not. Pauling wrote, "Sometimes he seems to consider that the system is a living organism with no interaction whatever with the environment; sometimes it is a living organism in thermal equilibrium with the environment; and sometimes it is the living organism plus the environment, that is, the universe as a whole." Pauling wrote that Schrödinger failed to recognize the most important question: "How biological specificity is achieved; that is, how the amino-acid residues are ordered into the well-defined sequence characteristic of the specific organism." [3]

In 2003, using what seems like a two-category answer (animate vs. inanimate), Danish theoretical chemist John Avery gives us the correct modern interpretation of the relation of Gibbs free energy to the interactions of molecules, by stating that: [5]

> "When two molecules fit closely together, with their physical contours matching, and with complementary patterns of excess charge also matching, the Gibbs free energy of the total system is minimized … thus, the self-assembly of matching components proceeds spontaneously, just as every other chemical reaction proceeds spontaneously when the difference in Gibbs free energy between the products and the reactants is

> negative."

Yet, when it comes to fitting together of larger sized molecules, such as bacteria molecules, animals, or human molecules (people), such as in the acts of reproduction, sex, or the movements of life in general, he uses a different answer, in particular: "Life maintains itself and evolves by feeding on Gibbs free energy … that enters the biosphere from outside sources."

In 2008, Russian physical chemist Georgi Gladyshev argued that from the bio-physical perspective life can be characterized as a manifestation of one of the forms of existence of material, inherent with the rotation of the substance, which takes place under the action of energy flow, predominately solar energy. In the compressed general formulation, according to Gladyshev: [12]

> "Life [is] the phenomenon of existence of the energy-dependent dynamic hierarchic structures, mandated by hierarchical thermodynamics."

(add discussion)

Difficulties

The general difficulty in each of these entropy/negative-entropy/free energy theories, as stated above, is that the thermodynamic terms used are defined for systems of reactive molecules subjected to a heat gradient. Said another way, the term "free energy", for instance, is the measure of the reactive "affinity" felt between the atoms and molecules of the system and "entropy" is the amount of system energy consumed when the molecules of the system do work on each other irreversibly. As such, one must firstly define humans as "molecules", i.e. human molecules, then define "boundaries" to the thermodynamic systems of study, on the surface of the earth, such as an ecosystem, a type of species, a small town, a group of friends, etc., and then define the factors of the "surroundings" that will affect the internal energy of the system. The difficulties involved in making these assignments are enormous. [6] When this is done, the illogic in all of the suggested *what is life* statements becomes apparent: *Boltzmann* - a system of molecules in a flask on a hot-plate (for instance) do not: 'struggle for entropy'; *Schrödinger* - a system of molecules in a flask on a hot-plate (for instance) do not: 'feed on negative entropy'; *Perutz* - a system of molecules in a flask on a hot-plate (for instance) do not: 'live on free energy'; *Avery* - 'free energy' is not something that comes from outside the system. In 2001 American biophysicist Donald Haynie clearly stated that: "Any theory claiming to describe how organisms originate and *continue to exist* by natural causes must be compatible with the first and second laws of thermodynamics." [7]

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θΔics

In philosophy, **what is love?** is one of the big three age-old conundrums, along with what happens when you die?, what is the meaning of life?, and what is life?, that has remained at the forefront of intellectual speculation.

Human chemistry

The question of what is love, can be dissected using a number of tools in the science of human chemistry, which defined people, abstractly, as human molecules, according to which the combinations and separations of human molecules, are mediated by, in a colloquial sense, by innate affinity preferences characterized by a balancing of feelings of love and hate, quantified by studies of human chemical bonding and reaction dynamics. [1]

See also

- Chocolate theory of love
- Endorphin theory of love
- Hate
- Love the chemical reaction
- Love at first sight
- The Thermodynamics of Love
- Physics of relationships
- Equation of love

References

1. (a) Thims, Libb. (2007). *Human Chemistry (Volume One)*. Morrisville, NC: LuLu.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*. Morrisville, NC: LuLu.

External links

- What is Love (top 150 definitions) – Institute of Human Thermodynamics.

θΔics

In queries, **what is the meaning of life?** refers to the question of they meaning of reaction existence, in non-defunct terminology, in the dynamics and operation of the universe.

Overview

The following (Q) is a meaning of life poster of historical views, encapsulating: Platonism, Aristotelianism, cynicism, hedonism, Epicureanism, stoicism, classical liberalism, Kantianism, nihilism, pragmatism, theism, existentialism, absurdism (see: Albert Camus), humanism, logical positivism (compare: positivism), natural pantheism, Mohism, Confucianism, and legalism:

A 2011 **meaning of life** (Q) visual test stylized image.

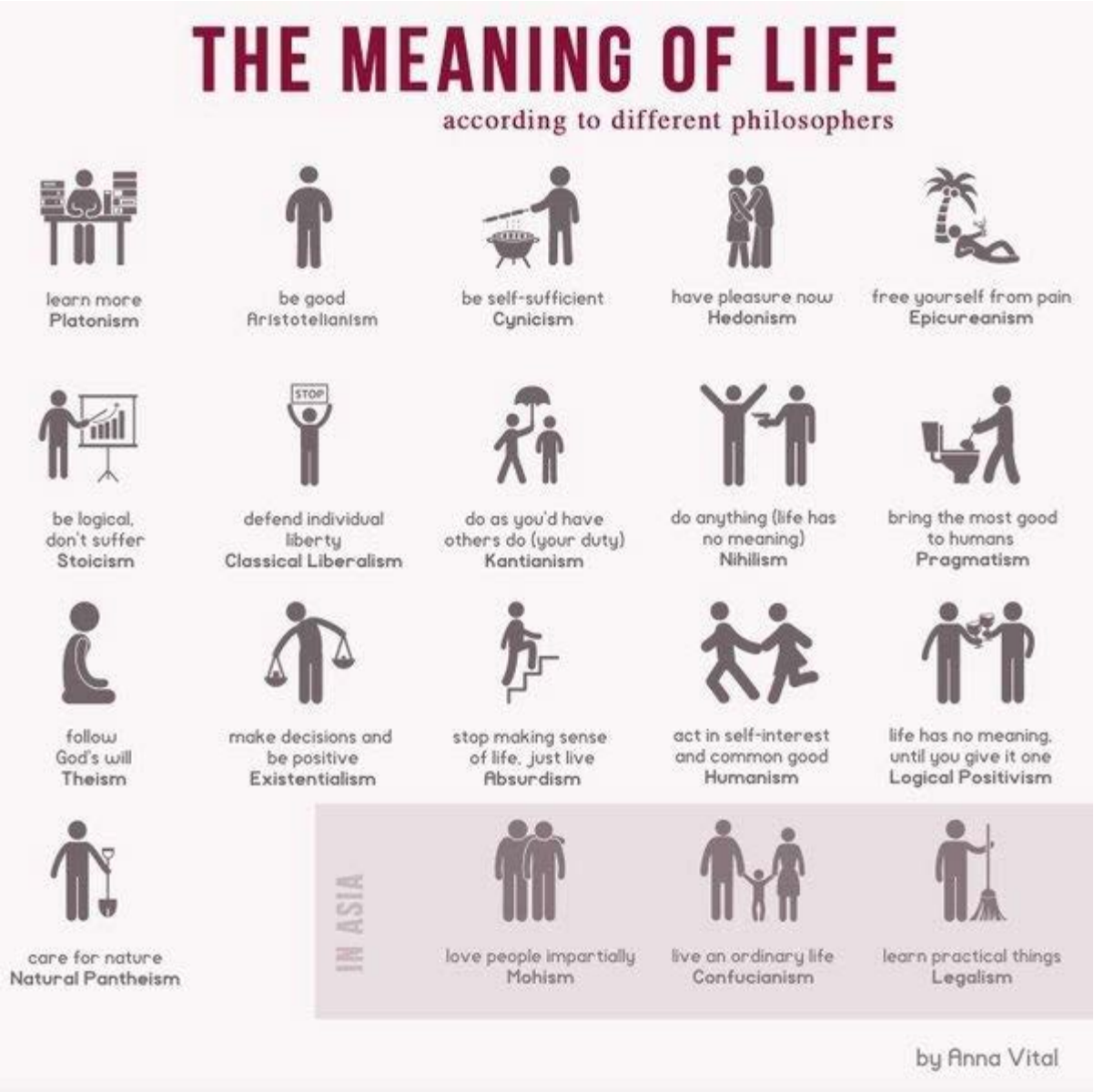

This list, of note, is missing: Goetheanism.

Life does not exist

In 2009, American electrochemical engineer Libb Thims solved part of the puzzle, via the partial solution that life does not exist; but rather what one calls the time period between the point of awareness of coming into existence (reaction start) and going out of existence (reaction end), is correctly a connective coupled state of reaction existence. The question then becomes what does it mean to react as a bound state entity or powered CHNOPS+22 chemical being, within the framework of a large and vast yet-to-be fully explained dynamical universe.

See also

- What is life? (theories of existence)
- What is love?
- What happens when you die?

Further reading

- Sean. (2010). "Free Energy and the Meaning of Life", *Discover Science Blogs*, Mar 10.

Videos

● Thims, Libb. (2010). “Second Law, Heat Death, and the Meaning of Life” (Q), HumanChemistry101, Dec 1.

θΔics

In debates, the **Whewell-Coleridge debate** was a debated launched in 1833 between English science historian William Whewell and English romantic philosopher Samuel Coleridge revolving around the question of what exactly someone who works 'in the real sciences', as Coleridge had phrased it, should be called, and what exactly are the real sciences, in the context of the tree of knowledge? A result of this debate is that the term "scientist" was coined (1834).

William Whewell
(1794-1866)

Samuel Coleridge
(1772-1834)

In 1833, English science historian William Whewell intered into a **debate** with English romantic philosopher Samuel Coleridge on the issue that not all "natural philosophers" are people who work in the "real sciences", hence the latter needs a new occupational "label", similar to artist, economist, or atheist, after which, the following year, the term "scientist" was coined.

Overview

It is said that in the early 1830s, there was a growing tension concerning the growing proliferation of the subjects of the natural philosopher and concordant lack of subject name to categorize this new area of investigation. The debated peaked at an 1833 meeting of the British Association for the Advancement of Science (BAAS), chaired by William Whewell, in which English romantic philosopher Samuel Coleridge was drawn into a passionate discussion of semantics, revolving around the question of what exactly someone who works 'in the real sciences', as Coleridge had phrased it, should be called? Whewell reported the British Association debate in the *Quarterly Review* of 1834 as follows: [4]

> "Formerly the 'learned' embraced in their wide grasp of all the branches of the tree of knowledge, mathematicians and well as philologers, physical as well as antiquarian speculators. But these days are past. This difficulty was felt very oppressively by the members of the BAAS at Cambridge last summer. There was no general term by which these gentlemen could describe themselves with reference to their pursuits.
>
> 'Philosophers' was felt too wide and lofty a term, and was very properly forbidden them by Mr. Coleridge, both in his capacity and philologer and metaphysician. 'Savans' was rather assuming and besides too French; but some ingenious gentlemen [Whewell] proposed that, by analogy with 'artist', they might form **'scientist'**—and added that there could be no scruple to this term since we already have such words as 'economist' and 'atheist'—but this was not generally palatable."

This *Quarterly Review* interjection, was written in the context of a review of Mary Somerville's 1834 *On the Connexion of the Physical Sciences*; Whewell then again in his 1840 *Philosophy of the Inductive Sciences* advocated the use of the term:

> "We need very much a name to describe a cultivator of science in general. I should incline to call him a *scientist*. Thus we might say, that as an artist is a musician, painter, or poet, a **scientist** is a mathematician, physicist, or naturalist."

This, to note, was also the first coining of the term 'physicist'. In 1840, the term 'scientist' made its way into the OED. Whewell used the term scientist again in his 1851 "Inaugural Lecture" to the Great Exhibition. [2] The term 'scientist', however, was not immediately adopted, as is evidenced by that fact that twenty-years into its coining Whewell was still tentative in its use; this was partly because important of science, such as Michael Faraday and Thomas Huxley, preferred the term 'natural philosopher', which embraced the broader philosophical, theological, and moral concerns. [3]

Moral world

See main: Tyndall-Stewart-Tait debate

Indeed, it seems that from the outset Whewell had in his mind, as did others, the view that the ‘material world’, was the field of the scientist (e.g. mathematician, physicist, or naturalist), was distinct from that of the ‘moral world’, which was thought to be the work or realm of god. [1]

The mere association of the term ‘scientist’ with ‘atheist’, by Whewell in his 1834 discussion, came under attack from the get-go, Adam Sedgwick explosively commenting, for example, ‘better die of this want [of a term] than bestialize our tongue by such a barbarism.’

In the early 1870s, a new controversy was boiling over the proposed teaching of science at the Catholic University in Ireland, and to rectify the situation, at the 1874 meeting, at Belfast, the new BAAS president John Tyndall summarized the position of the two, i.e. science vs religion, as follows:

> “All religious theories, schemes and systems, which embrace notions of cosmogony, or which otherwise reach into the domain of science, must, in so far as they do this, submit to the control of science, and relinquish all thought of controlling it.”

Many were, supposedly, offended by Tyndall's call for reason over revelation, which was seen as an attack on religion. In protesting reaction to Tyndall's speech, Balfour Stewart and Peter Tait wrote the 1875 *The Unseen Universe: or Physical Speculations of a Future State*, in which they argued that religious miracles and the immortality of the soul are compatible with modern science and that God is hidden because human thought is 'conditioned' (an Immanuel Kant and later William Hamilton concept). This led to the followup sequel *Paradoxical Philosophy*, both of which resulted in harsh ridiculing objection review by James Maxwell, written on his deathbed, in which he summarized that Stewart and Tait were the examples of the paradoxical philosopher, i.e. those natural philosophers who lock up their science books and theories in the cabinet, when it comes to speculating and theorizing about the death, morality, and purpose, and go out into the blissful country field to contrive 'viewless fancies' to save face with religion. [6]

The gist of the debate-tension, which still exists today, according to science historian Richard Holmes, is whether the new proliferations of branches on the tree of knowledge ‘would promote safe religious belief or a dangerous secular materialism.’

This unwritten divide, in the minds of many, curious, seems to exist even in the modern 21st century, as evidenced by inability of American high school teachers to discuss human origins, in their biology lectures on evolution, for fear that it might tread on the dangerous toes of religion, and hence their own job security. [5]

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θΔics

In genius rankings, **who was smarter** [person one] **or** [person two]**?** is a popular search query; the dominate examples of which are listed below. [1]

Common **who was smarter** Google search suggestions, made on 16 Dec 2013.

Einstein

The following are the popular search queries, per Google suggestions, of Albert Einstein or candidates:

Einstein or Newton
Einstein or Tesla
Einstein or da Vinci
Einstein or Hawking
Einstein or Mozart
Einstein or von Neumann
Einstein or Newton or Maxwell
Einstein, Shakespeare, or Mozart

Regarding the "Einstein vs Newton vs Maxwell" comparison, from Quora.com (Q), we note that the phrased listing of the query is ordered per current genius IQ rankings, via IQ assignments of 220, 215, 210, respectively, and is a rather advanced comparison.

The only person who might, as only the future would be able to discern, as his work is too dense to give proper ranking at the moment, outrank all three (Einstein, Maxwell, Newton) would tentatively be Willard Gibbs, whose work made Maxwell become his European publishing agent, and who Einstein characterized as the "greatest mind in American history". Gibbs, like Newton, and Tesla, never married; instead devoted his entire intellectual space-time energy to the pursuit and acquisition of knowledge, in respect to the deeper puzzles and truths of nature. The following "thinness" of ideas and or work quotes by Einstein and Gibbs shows a similar mindset:

> "I have little patience for [thinkers] who take on a board of wood, look for its **thinnest** part, and drill a great number of holes when the drilling is easy."
>
> — Albert Einstein (c.1940), recalled by Philipp Frank [3]

> "A person who writes so much must spread his message rather **thin**."
>
> — Willard Gibbs (c.1901), comment to Edwin Wilson on uncut (unread) books

(add)

Neumann

Regarding the "Einstein vs Neumann" comparison, we note that American electrical engineering prodigy Claude Shannon, characterized by some as having insight above that of Einstein, described John Neumann, as the 'smartest person he had ever met', above that of Einstein—whom he occasionally bumped into at the Institute for Advanced Study, Princeton, where the three of them worked in 1940 to 1941—among others such as child prodigy Norbert Wiener, his semi-rival information theory competitor, or his 200+ IQ test taking buddy

Neumann

vs.

Person

Edward Thorp (Q), who together with Shannon, in 1961, invented the world's first wearable computer. [2] The following is an alternative view, siding with Einstein over Neumann:

A semi-common modern thinker people cite, in "who is smarter?" discussions (Q), is John Neumann, one of the last person's to have a shot or grasp of the last universal genius title.

> "I have known a great many intelligent people in my life. I knew Planck, von Laue and Heisenberg. Paul Dirac was my brother in law; Leo Szilard and Edward Teller have been among my closest friends; and Albert Einstein was a good friend, too. But none of them had a mind as quick and acute as Jansci [John] von Neumann. I have often remarked this in the presence of those men and no one ever disputed. But Einstein's understanding was deeper even than von Neumann's. His mind was both more penetrating and more original than von Neumann's. And that is a very remarkable statement. Einstein took an extraordinary pleasure in invention. Two of his greatest inventions are the special and general theories of relativity; and for all of Jansci's brilliance, he never produced anything as original."
>
> — Eugene Wigner (c.1980) (Q)

(add)

Newton

The following are the popular search queries, per Google suggestions, of Isaac Newton or candidates:

Newton or Einstein
Newton or Tesla
Newton or Leibniz
Newton or da Vinci
Newton or Einstein or Maxwell

(add discussion)

Tesla

The following is the second most popular search queries, per Google suggestions, of Nikola Tesla or candidates:

Tesla or Edison
Tesla or Einstein

A 2012-launched RRRater.com poll, which as of 19 Nov 2013 had 255 votes (Q), finding that 59 percent of people believed Tesla to have been smarter than Edison; a comparison discussed more fully on the IQ ranking methodology page.

Some discussion on the "Tesla vs Edison" ranking is found on the IQ ranking methodology page.

Jefferson

The following are most popular search queries, per Google suggestions, of Thomas Jefferson or candidates:

Jefferson or Adams
Jefferson or Hamilton

Here, to note, we may find resolution in the IQ rankings tables in the American Presidents page.

Aristotle

The following are popular search queries, per Google suggestions, of Aristotle or candidates:

> Aristotle or Plato
> Aristotle, Socrates, or Plato

Here, to clarify, there is no contest: Aristotle wins hands down, he was an epicenter genius, we have Aristotle citation rankings, and he is one of the biggest names in all-time genius IQ rankings

Other

The following are a few "other" comparisons found via Google search for "who was smarter [a-z]" typing search return patterns:

> Dawkins or Hitchens
> Jobs or Gates
> Leonard or Sheldon
> Dirac or Feynman (Q)
> Curie or Noether

Another related posting is “who is smarter than Einstein?”, along with the related query “who is smarter than Stephen Hawking?”, both of which returns numerous ratio IQ contrived T-shirt of the week anon child prodigies, who take either a 2-3 hour Mensa test or a Wechsler test (Q) and thereafter make it into the news media as being smarter than Einstein, Hawking, and Gates, which are but diseased absurdities resulting from the so-called "inexact science" of genius IQ ranking and the numerous loopholes, gimmicks, and tricks employed therein, for the sake of false-pretense popularization.

On an aside, there’s also a 2008 viral video (Q) about doctor Sherwin Nuland, of Yale University, putting the intellect of Aubrey de Grey above both Einstein and Newton, which is but over-zealousness.

Occupations

Then there is the which occupation is the hardest query, a few common examples of which are the search queries:

> Engineers or doctors
> Engineers or lawyers

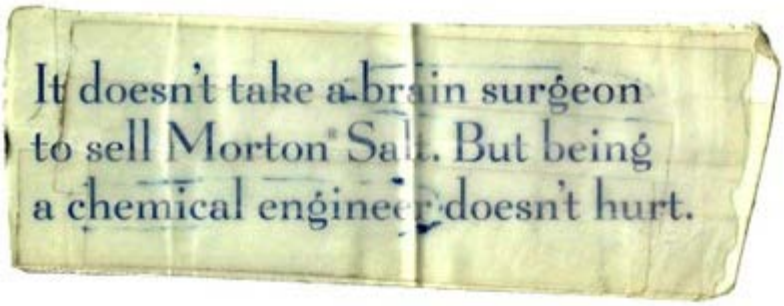

A *circa* 1994 Morton Salt advert comparing neurosurgeons with chemical engineers, a play on the famous "you don't have to be a rocket scientist" to figure this out saying.

Quotes

The following are related quotes:

> “There is a parlor game physics students play: Who was the greater genius? Galileo or Kepler? (Galileo.) Maxwell or Bohr? (Maxwell, but it's closer than you might think.) Hawking or Heisenberg? (A no-brainer,

whatever the best-seller lists might say. It's Heisenberg.) But there are two figures who are simply off the charts. Isaac Newton is one. The other is Albert Einstein. If pressed, physicists give Newton pride of place, but it's a photo finish—and no one else is in the race."

— Thomas Levenson (1997), "Einstein Genius Among Geniuses" (Q)

"Each human being that revolutionized our way of thinking, and carried us one step further, was above the current methods, understanding, and categories. Now you try to categorize and even worse try to decide **who was smarter** than whom, oh friends, where do you find this spare time to kill? What a futile effort!"

— Anon (2009), forum poster from Turkey (Q)

References

1. Note: this page was started, on 16 Dec 2013, following a viewing of the Hildago rankings (2012), Cattell rankings (1894), Hmolpedia ranking (2013), Hildago-Cattell combined rankings, and Hildago-Cattell-Hmolpedia combined rankings, in the latter of which only Newton remains, as shown on the Wikipedia 20 most influential people page, after which a search query, in efforts to gauge the Newton/Einstein genius ranking position, on: "who was smarter Newton or Einstein" was broached, in an effort to discern community consensus—following the earlier "no way Einstein above Newton" YouTube smartest person ever five thumbs up forum post.
2. Thims, Libb. (2012). "Thermodynamics ≠ Information Theory: Science's Greatest Sokal Affair" (url) (pg. 54), *Journal of Human Thermodynamics*, 8(1): 1-120, Dec 19.
3. Einstein, Albert (c.1940). "Recalled by Philipp Frank" (Q), in: "Einstein's Philosophy of Science", *Reviews of Modern Physics*, 21(3): 349-55, Jul.

θΔics

In queries, **why do we work?** refers to the question as to why a force moves a human body through a unit distance, i.e. work (see: principle of the transmission of work), per daily cycle, generally framed around the force per unit distance movements associated with income.

Overview

In 1686, Bernard Fontenelle, in his *Conversation on the Plurality of the World*, in philosophical extension of the Copernican model (c.1514), viz that the earth goes around the sun, and the Brunonian hypothesis (1584), viz that each star in the universe has planets revolving about them, many of which are inhabited, stated that this new world view justifies laziness:

> "We must confess, dear Madam, that we scarce know where we are, in the midst of so many worlds; for my own part, I begin to see the earth so fearfully little, that I believe that from henceforth I shall never be concerned at all for anything. That we so **eagerly desire to make ourselves great**, that we are always designing, always troubling and harassing ourselves, is certainly because we are ignorant what these vortexes are; but now I hope my new lights will in part justify my laziness, and when anyone reproaches me with carelessness, I will answer, Ah, did you but know what the fixed stars are!"."
>
> — Bernard Fontenelle (1686), *Conversation on the Plurality of the World* (Preliminary Discourse, pgs. xxxviii-xlii); cited by Arthur Lovejoy (1933) in *The Great Chain of Being* (pg. 133) [1]

In commentary on this conjecture of Fontenelle, Arthur Lovejoy, commented the following:

> "It affords a justification for **doing nothing**, since it makes all human achievement seem of infinitesimal consequence."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pg. 133) [1]

In c.1776, Adam Smith professed the view that, according to him, people are inherently lazy, and that the only way to get them to work, was to pay them. [2]

In c.1987, Libb Thims, then aged 15, obtained a paying job, at a fast food restaurant, and therein observed grown adults who worked in these types of minimum wage jobs, had a home, and in some cases family and children, and seemed relatively content, give or take, and thereafter began to ruminate on the question of why a person should work, beyond this minimum level of employment. This resulted in the drive-thru paradox.

Quotes

The following are related quotes:

> "I think careers are a 20th century invention and I don't want one."
>
> — Chris McCandless (c.1992), attributed (Ñº); cited in film *Into the Wild* (2007)

See also

â— Einstein-Pascal dialogue

References

1. Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea*. Harvard University Press, 1936.

2. Anon. (2016). “Why Do We Work?” (Ñº), BrainCraft, Dec 15.

θΔics

In queries, **why does Libb Thims make genius lists?**, an overly-common, reoccurring, and frequently asked question, particularly in genius studies, oft-referring to assumed reasonings behind the various IQ listings (e.g. IQ: 225+, IQ:200+, etc.) and genius listings (e.g. geniuses on) made by Libb Thims.

The results of the 1993 "reaction of college women to outright sexual proposition", above (left), as published in David Buss' *The Evolution of Desire* (1994), from which, in real time data, in evolutionary psychology terms, one is able to "see" the entire process of mate selection, and the concordant human reproduction reaction, broken down mechanistically, e.g. in terms of exchange forces and chemical reaction mechanism steps, wherein the solution to "love thought experiment", above (right) as Goethe ruminated on in 1808, becomes muddled, to the point of being near insoluble, i.e. until one becomes either a human affinity theorist (as Goethe and Percy Shelley did), or a human free energy theorist (as Neumann did), among which, as one will find, free thinkers, oft-cited in the IQ of 200 or above range (see: IQ 200 or above impossible) and or IQ of 225 or above are common (see: IQ:200+ HCT prodigies); accordingly, one, in this situation, is "forced" into the field of IQ ranking (see: methodology), so the real geniuses (the whey) from the disrespecting-to-intelligence "fake IQs" (the curd); a sign of respect to true geniuses, e.g. one's who are willing to burn at the stake in the name of truth (e.g. Giordano Bruno, Thomas Aikenhead, etc.), which are as rare as lightening struck twice.

Overview

The short answer why Thims ranks and orders genius in listings, is: (a) an ideology that arose out of curiosity, and (b) per reason of mental ordering, e.g. for personal reasons, e.g. similar to the personal list of physics geniuses that Lev Landau carried round in his pocket (see: Landau genius scale), and for social reasons, in respect to public correction of gross error and misinformation.

Thims' genius rankings

The following are main "general" genius, as compared to specialized rankings (e.g. greatest mathematician ever, greatest chemist ever, greatest philosopher ever, last universal genius, universal genius, last person to know everything, polymath, etc.), ranked listings made by Libb Thims, shown in reverse chronological order: [N1]

On 16 Apr 2020, Thims began to employ the Thims-Cox-Buzan-Platt Genius IQ scale (2 geniuses), an enhanced version of the Cox-Buzan-Platt IQs (2 geniuses), which is more focused version the Cox-Buzan IQs (23 geniuses), as a means of forced downscaling of the ceiling range geniuses to more neutralized, unbiased points of reference:

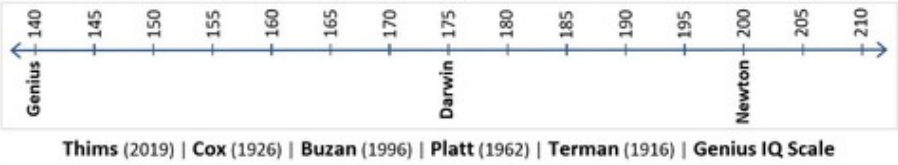

Wherein, following recently updated CR page, and a finding that Clausius derived a large part of entropy from Thomson, the following downscaling actuated:

Goethe (225|#1) → (210|#1)
Newton (220|#2) → (205|#2)
Einstein (215|#3) → (205|#3)
Maxwell (210|#4) → (205|#4)
Gibbs (210|#5) → (205|#5)
Clausius (205|#5) → (195|#7)
Da Vinci (200|#7) → (200|#6)
Young (200|#8) → (195|#11)
Helmholtz (195|#9) → (#195|#10)

Aristotle (195|#10) → (195|#8)
Galileo (195|#11) → (195|#9)

● **Top 1000 geniuses** (753 names) + candidates (73 names) | Nov 2019
● **Top 1000 geniuses** (732 names) + candidates (~30 names) | Feb 2019
● Top 1000 geniuses (676+ names) + candidates (~20 names) | Jul 2018

● **Top 1000 geniuses** | list expanded into ten wiki pages; **name changed** from 500 to 1000, and a total of 577 geniuses (full names and dates) ranked | 1 Jan 2018

● Top 500 geniuses | 502+ geniuses (non-existive) | Jun 2017; named-changed.

● Genius IQs existive | 15 Dec 2016 (version 7); active
● Smartest person alive | existive | 22 Jun 2013 (version 25); archived

● Top 500 geniuses (5 Jun 2015) (e.g. version 34 of Top 500 geniuses: 101-200), **removed** all "existive" (living) people, e.g. Bill Gates [see: Gates model], Terrance Tao, etc., from list

● Thims' 40-person IQ:200+ listing/video (27 Feb 2015) and his American Presidents by IQ (30 Mar 2015), following phone interview with Thims, became *Business Insider* feature articles [1]

● 25 Smartest People Alive | Existive (2014) (80-min video) (Q) | 11 Dec 2014 | 4K+ views

● Top 500 geniuses (Jan 2014) existive (alive) and non-existive (historical) geniuses

● **Genius IQs** | 460+ geniuses (24 Oct 2011 to Jan 2014); archived

● IQ 200+ (online) | 40 geniuses | 17 Oct 2011 (version 554); archived

● IQ: 150+ | Smartest woman ever | 6 individuals | 16 Apr 2011 (version 12)

● **Cox-Buzan IQs** | 13 individuals | 6 Aug 2010 (version 3) | 23 individuals (current)

● IQ: 225+ | 11 individuals | 9 Mar 2010 (version 8)

● IQ 200+ | Smartest person ever (2010 4-part 1-hr video) | 40 individuals (2M views)

● IQ 200+ (online) | 36 individuals | **29 Sep 2010** (version 477) | Adragon de Mello **down-graded** (↓↓↓) to #33; Goethe **up-graded** (↑) to position #1; this was the "turning point" (or tipping point), wherein **Thims began (or was forced) re-ranking geniuses** into cogent order and or adjusting up or down the purported extant genius range IQs (140+) of individuals

Thims' IQ 200+ list (2007)

#	Name	Years	I.Q. (200+)
1	Michael Kearny	1982-	325 (age 4)
2	**William James Sidis**	1898-1944	200, 250-300 (verbal estimate)
3	Marilyn vos Savant	1946-	228 (age 10), 186 (age 40)
4	Leonardo da Vinci	1452-1519	180, 210-225
5	**Johann von Goethe**	1749-1832	210
6	Kim Ung-Yong	1963-	200-210
7	Hypatia	c.360-415	170-210
8	Nathan Leopold	1904-1971	200-210
9	Emanuel Swedenborg	1688-1772	205
10	Gottfried Leibniz	1646-1716	205
11	John Stuart Mill	1806-1873	200
12	Francis Galton	1822-1911	200
13	Hugo Grotius	1583-1645	200
14	Thomas Wolsey	c.1472-1530	200
15	Michael Grost	1954-	200

Growth

Thims' IQ 200+ list (2010)

	Name	Years	IQ
1.	Adragon De Mello	(1976-)	*400* (age 5)
2.	Michael Kearney	(1982-)	*325* (age 4), 200 (age 14)
3.	William Sidis	(1898-1944)	200, 250-300 (age 42)
4.	Terence Tao	(1975-)	220-230 (age 11), 211
5.	Marilyn vos Savant	(1946-)	*228* (age 10), **186** (age 40)
6.	Christopher Hirata	(1983-)	225 (age 16)
7.	Johann Goethe	(1749-1832)	180, **210**, 215, 225
8.	Leonardo da Vinci	(1452-1519)	**180**, 210, 220, 225
9.	Albert Einstein	(1879-1965)	160, 200, 205, 225
10.	William Shakespeare	(1564-1616)	210
11.	Kim Ung-Yong	(1963-)	200-210
12.	Nathan Leopold	(1904-1971)	200, 206-210
13.	Hypatia	(360-415)	170-210
14.	Christopher Langan	(1952-)	**174**, 195, **190**-210
15.	Emanuel Swedenborg	(1688-1772)	**165**, 205
16.	Gottfried Leibniz	(1646-1716)	**205**
17.	Edith Stern	(1952-)	200, 201-203
18.	Isaac Newton	(1643-1727)	**190**, 195, 200
19.	Francis Galton	(1822-1911)	200
20.	John Mill	(1806-1873)	**180**, 180, 200
21.	Hugo Grotius	(1583-1645)	**200**
22.	Hugo Grotius	(1583-1645)	**200**
23.	Thomas Wolsey	(1472-1530)	**200**
24.	Michael Grost	(1954-)	*200* (age 8)
25.	Sho Yano	(1990-)	*200* (age 10)

● IQ 200+ (online) | 24 individuals | **17 Feb 2010** (version 213) | Adragon de Mello, with IQ cited at 400 (calculated by his father), added to position #1 (as shown above), at which point the entire ranking became completely nonsensical, e.g. that de Mello was, supposedly, twice as smart as de Mello.

● **Thims discovered Christopher Hirata | 15 Feb 2010** (version 6); note: Hirata, and his concordant chemical

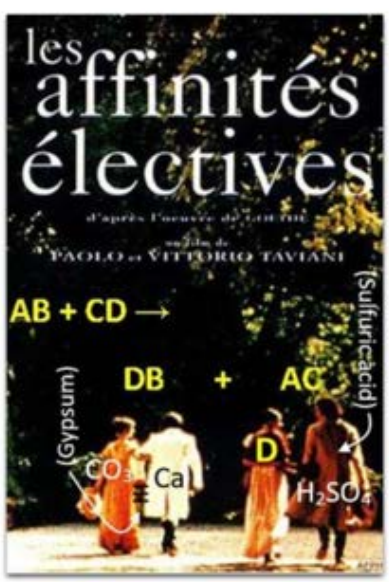

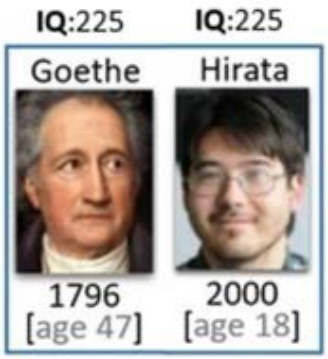

1. Thermochemical Approach to Relationships

For many of us, thermochemistry was our first science subject which involved nontrivial mathematics. It therefore seems **appropriate to apply thermochemistry to relationships** first before attempting something harder. A general reversible chemical reaction is written as:

$$m_1A_1 + m_2A_2 + \ldots + m_pA_p \leftrightarrow n_1B_1 + n_2B_2 + \ldots + n_qB_q$$

and has equilibrium constant: (where the brackets [] denote concentration of a chemical in, say, atoms per cubic centimeter)

$$K = [B_1]n_1 \ldots [B_q]n_q / [A_1]m_1 \ldots [A_p]m_p$$

as well as having internal energy change dE, volume change dV, and entropy change dS_0 at standard concentrations. If the pressure is P and the temperature is T then the equilibrium constant can be found from:

$$-k_BT \ln K = dE + PdV - TdS_0$$

Here k_B is Boltzmann's constant and is roughly equal to 8.6x10-5 eV/K. If I make a change in the concentration of one substance, the reaction equilibrium will shift to compensate for the change.

In c.1995, Thims, as a chemical engineering student, began working on human chemical thermodynamics, as an intellectual pastime; in 2005, Thims discovered that Goethe had done, what he had been ruminating after for over a decade, in 1799, and that in 1925 he became the first human calculated to have had an IQ of 225, from among the Cattell 1000, i.e. the most cited thousand people of history in 1896; in 2010, Thims, while searching for other people with IQs in the 225 range, discovered Hirata, who did the same exact theory,

independently, in 2000, and that in 1999 he was **ALSO** one of the rare few handful of people to have been cited, calculated, and or estimated to have an IQ of 225. The hallmark of the modern genius, according to these to examples, accordingly, his having done work in human chemical thermodynamics, as a model of reality.

thermodynamics based "Physics of Relationships", was found by specifically search the Internet for people with IQs of 225 or above.

> "I agree with Gladyshev's 2012 statement that 'Goethe's affinity can be interpreted on the basis of supramolecular thermodynamics. Changing of the Gibbs function occurring on the supramolecular structure level in complex systems (organisms). The affinity of Goethe is related to the phenomenon of sensory tropism', but the reason **Libb peddles Goethe and Hirata** (although unlike Goethe, Hirata is the real deal) is that he thinks it allows him to peddle his 'human chemistry' BS, which in turn, he thinks will make it easier for him to peddle and sell his BS scam books on *Human Chemistry*. Essentially his entire website [eoht.info] is a book scam operation to try and sell his book. It's funny that he goes on to give the illusion that there are other posters that agree with him. He has done the same laughable tactic where he cites some quote from some anon poster on how brilliant he is and that becomes the proof that he supposedly has an IQ in the range of 170-220. For the record NO ONE has an IQ over 200 despite what anyone claims. Having said that I certainly would put Fields medalist Manjul Bhargava (Q) ahead of Goethe any day."
>
> — American Anon (2016), "Goethe is Overrated", tread (Q) posts (#9-10), made from McMinnville, Oregon, Mar 3

● IQ 200+ | Smartest person ever | 2009 10-min video | 18 individuals (after 30K views; good feedback; poor quality video, in ranking, sound, and visual, was removed by Thims)

● IQ 200+ (online) | 15 individuals | 24 Mar 2008 (version 28)

● IQ 200+ geniuses (**MS Word file listing**) (image) | 15 geniuses (Jan 2008)
● Thims' discovered Michael Kearney, with his age 4 cited IQ of 325 (14 Dec 2007)
● Thims' discovered William Sidis, with his IQ listing of 250-300 (2007)

#	Name	Years	I.Q. (200+)
1	Michael Kearny	1982-	325 (age 4)
2	**William James Sidis**	1898-1944	200, 250-300 (verbal estimate)
3	Marilyn vos Savant	1946-	228 (age 10), 186 (age 40)
4	Leonardo da Vinci	1452-1519	180, 210-225
5	**Johann von Goethe** *	1749-1832	210
6	Kim Ung-Yong	1963-	200-210
7	Hypatia	c.360-415	170-210
8	Nathan Leopold	1904-1971	200-210
9	Emanuel Swedenborg	1688-1772	205
10	Gottfried Leibniz *	1646-1716	205
11	John Stuart Mill	1806-1873	200
12	Francis Galton	1822-1911	200
13	Hugo Grotius *	1583-1645	200
14	Thomas Wolsey *	c.1472-1530	200
15	Michael Grost	1954-	200

Thims Jan 2008 MS word file (image) **listing**, from his IQ:200+ personal folder, of ordered (by highest IQ per citation) **of individuals** said to have or have had an **IQ of 200 or above** (see also: IQ 200 or above impossible).

● **Thims' discovered Goethe** (IQ cited at 210 [Cox, 1926] or 225 [Merrill, 1925]), in namesake, either between **6 Aug 2005** (Prigogine's *Order Out of Chaos*, which contains "footnote 2.5", order placed) and **10 Oct 2005** (Goethe's *Elective Affinities*, which contains the famous "chapter four", order placed) [see: 900+ books ordered], and as the founder of human chemistry, either late that Oct or by 7 Nov 2006 wherein Thims was commenting to people via email that he was going to write a "basic textbook on human chemistry, based on on Carnot, Clausius, Gibbs, Helmholtz, Goethe, Gladyshev, and about a dozen others." (Q) Thims, accordingly, in c. Sep 2005, had read the Goethe Wikipedia page, wherein (Q) the following information is found: "Catharine Cox, in her 1926 *Early Mental Traits of* ***Three Hundred Geniuses***, speculatively estimated Goethe's **IQ at 210**, the **highest score** that she assigned." (Sep 2005)

● Thims' discovered Christopher Langan, who in *Esquire Magazine* (**Nov 1999**) was being billed as the "smartest man in America, with an IQ of 195) (1999)
● Thims' discovered *Marilyn Savant*, who on the back cover of her *The World's Most Famous Math Problem* (1993) characterizes herself as the "person with the highest recorded IQ in the world" (Q), Guinness Book (1986) "highest IQ" listing of 228 (see: Guinness Book IQ) (**circa 1990s**)

● Thims engaged into a Faustian quest for knowledge in order to solve and understand the "vanity vs achievement paradox", such as exemplified in the **drive-thru paradox** (1987), as exemplified well in the the *Good Will Hunting* (1997) "bar scene", albeit riddled in evolutionary psychology things such as: **Beckhap's law** (c.1975), the Buss sexual receptiveness study (1993) (Q), **sweaty T-shirt study** (1995), colloquially known in the form of sayings such as **Alley equation** (c.2000) or the 19th century saying "no bees, no honey; nor work, no money".

Genius listings | Other

The following are related pages:

● American Presidents | IQ rankings
● Another Newton
● Cattell 1000
● Catch up effect
● Certified genius
● Cox IQ
● Cox-Buzan IQ
● Buzan IQ
● Early parental death and genius
● Epicenter genius
● Genius
● Genius IQs
● Genius IQ candidates
● Genius rankings
● Glenn 20 greatest minds
● Greatest chemist ever
● Greatest engineer ever
● Greatest mathematician ever
● Greatest literary author ever
● Greatest philosopher ever
● Greatest physicist ever
● Greatest thermodynamicist ever
● Guinness Book IQ
● Hard science
● Hart 100
● Hmolscience citation ranking
● Humanities citation ranking
● IQ
● IQ: 150+ | Smartest woman ever
● IQ: 200+
● IQ: 225+
● IQ history
● IQ key
● IQ tables
● IQ ranking methodology
● Last person to know everything
● Last universal genius
● Magnitude geniuses
● Military geniuses
● Nobel Prize winners in thermodynamics
● Political geniuses
● Polymath | 50 greatest polymaths
● Ratio IQ
● Scientific geniuses
● Smartest person ever
● Smartest person alive | existive
● Stokes 100 essential thinkers
● Terman IQ
● **Top 500 geniuses**
● Two cultures genius | Two cultures
● Universal genius
● Uber genius comparison quotes
● Uberman
● Walking encyclopedia

See also

● Libb Thims (genius rankings)

Quotes

The following are related quotes:

> "There are two sorts of judges unto whom all writers are obnoxious, viz. the **ignorant**, and the **judicious**. As for the ignorant, they are such men as I before was speaking of, then whose approbation I dread nothing more: *simili simile gaudet* ['like rejoices in like'] (Q), is a maxim that holds true as well in all other things, as physics; and there is nothing would make me have so ill an opinion of myself, as to hear one of them commend me. But the other judge, viz. the man of learning and judgment, is the he I fear, and before him only will I arraign myself."
>
> — Charles Blount (1679), *Anima Mundi* (to the readers) [2]

> "Lestrade (Q) to be let loose on such a study is exactly as pathetic as for a subnormal waitress in the IQ of 90 range to try to measure the intellectual differences in college students."
>
> — John Platt (1962), "The Coming Generation of Genius" (pg. 73)

> "For all of you out there in Twitterland that think he or she is **extremely smart**, check out Hmolpedia to see how you compare with the **geniuses**."
>
> — Kevin Edward (2016), Tweet (Q), Nov 13

“How embarrassing for you, the chronic underachiever you are. **Do not make lists of history's geniuses** and think by placing yourself among them on your own website will you secure you among them.”

— Australian Anon (2017), “Why are you writing about yourself in the third person?” (Q), Hmolpedia forum post, made from Buff Point, Australia, May 12

“I love this site. It's pure genius. I have never seen someone **rank geniuses in such a brilliant way**. I dedicated a [468+ genius] genealogy project (Q) to your work. You even have a [Geni.com] profile (Q) … because I feel your work deserves wider recognition. I am fairly intuitive … I feel you are descended from Goethe (or another genius on your list).”

— Alex Bickle (2017), site message [via oye777] to Libb Thims, Feb 22, 25

“This [**top 1000 geniuses**] site is very good. Interestingly, outside Goethe and Leonardo da Vinci, most of the smartest on the list are physical [GPE] or mathematical [GME]. So, it is not mistaken the conception that studying physics or mathematics is the type of study that most requires intelligence to be undertaken [see: college degrees by intellectual difficulty]. Only below are philosophers and writers begin to appear. But I was surprised that there are no such genius composers as Beethoven, Bach, Brahms, and Wagner, or painters and sculptors, like Michelangelo, Renoir, and Van Gogh in the top 100. I cannot know which of the IQ indicators is the most reliable. I think the IQ_{Real} (see: real IQ) presented is a good estimate. Note that above 180, which is taken as the lower limit of genius, there are only 209 people, which shows the rarity of genius, considering that more than twenty billion human beings must have been born [see: number of people who have existed]. Of course, many are not on the list because they were not prominent people.”

— Ernesto Ruckert (2018), “Response to Pabis Zanin” (Q)(Q), May 7

“Libb Thims' Hmolpedia Project has a page [**Top 1000 Geniuses**] with 315 historical persons that Mr. Thims estimates had an IQ of 175+. In these, 71 appear in my list of 330. Another 15 or so from my Top 330, appear on Mr. Thim's lists for IQs 160-174.”

— James Allen (2019), Discussion (Q) about my List of Greatest Mathematicians

“David Mayer carries around a piece of paper [see: paper IQ] that says he is ranked as having the 93rd highest IQ of all time. That would place him 7 places above Stephen Hawking who is ranked at 100. Naturally, this is complete bullśhit. Source: Top 1000 Geniuses Of All Time.”

— Julian Leahy (2019), “AI Global Forex Review” (Q), Jan 26

Notes

N1. Note: on 4 Jun 2012, a first-draft general attempt at explaining where the 460+ person “genius IQs” page arose, is found in “list curator” section at the bottom of that page, which came into existence, when, firstly, on 31 May 2012 (version 191), Thims had listed himself, with up and down arrows (↑↓), between Gilbert Lewis (IQ:190) and Jean Sales (IQ:190) in position, after which, on 2 Jun 2012 (version 192), Thims removed himself from the list, for the third time (per reason, firstly, that ranking of “existive IQs”, in general, is a fluctuating thing; secondly, ranking of one’s own “existive IQ” (IQ state) is irritating to the mind) but then, on 4 Jun 2012 (version 193), re-added himself, NOT to the actual genius IQ listing, but to a section at the bottom of the genius IQ page, entitled “list curator”.

References

1. (a) Bertrand, Natasha. (2015). “The 15 Smartest Presidents of All Time” (Q), *Business Insider*, Mar 30.

(b) Bertrand, Natasha. (2015). “The 40 Smartest People of All Time” (Q), Business Insider, Feb 27.
2. Blount, Charles. (1679). *Anima Mundi* (*World Soul*)*: an Historical Narration of the Opinions of the Ancients Concerning Man’s Soul after this Life according to Unenlightened Nature*. Will Cademan.

Threads

● Comedy and Libb’s so-called IQ (2016) – Hmolpedia threads.

External links

● Does Libb Thims really have an IQ of 225+? Is his work valid? (Mar 2017) – Quora.com.

θΔics

In productions, "**Why Students Choose Chemical Engineering?**" is a 2009 10-min CNN-stylized parody of a tongue-in-cheek investigative report, published on AIChE.org's blog ChEnected (Ñº), written by American chemical engineer Mary Guthrie, who acted as the investigative reporter, on why students "choose" to become chemical engineers, in which student Jawad Mirza explains how in thermodynamics they learn not only about "heat transfer", but also, supposedly [joke], about how "heat" transfers between people.

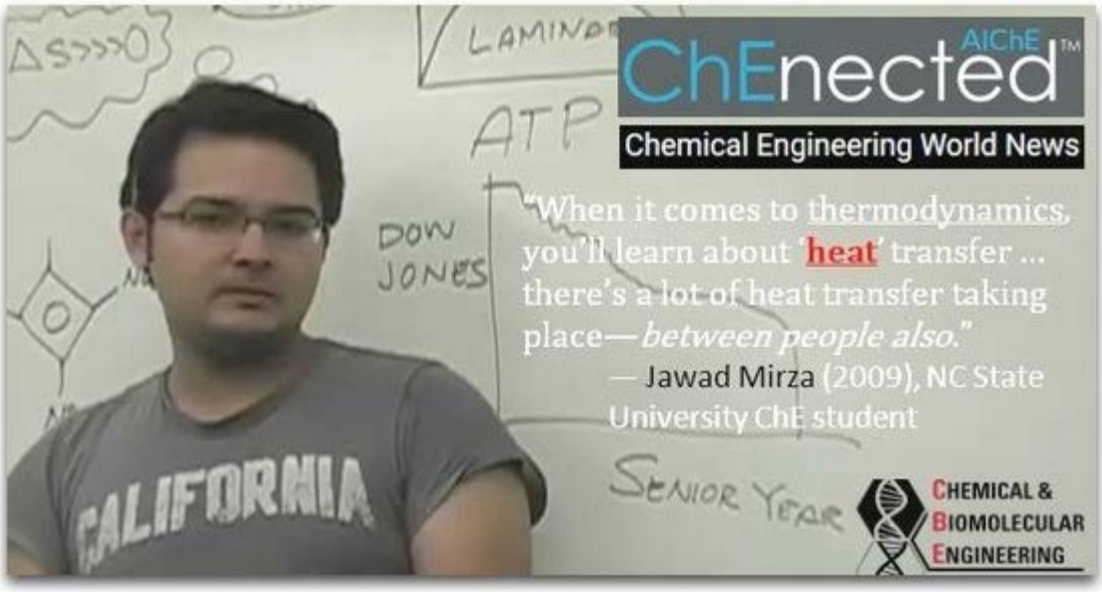

Screenshot (4:47-4:53) from Mary Guthrie's 2009 investigative report video "**Why Students Choose Chemical Engineering**", wherein chemical engineering student Jawad Mirza comments, via tongue-in-cheek humor, or rather eludes to the premise that in thermodynamics, students, at NC State University, learn about heat transfer, in typical engineering systems, and also how heat transfers "between people" (see: social heat). [1]

Heat transfer | Social | a Joke?

See main: Social heat; Social heat transfer

The humorous quip that chemical engineering students, at NC State University, learn, in their thermodynamics class, how "heat" transfers between people–meant as a thermal word stylized joke in fun—has great irony too it.

On one hand, it is funny: a side comment that makes people laugh (see: Rich Byrnes).

On the another hand, in a more serious note, it is also funny that what Mirza (or Guthrie, script writer) says is true, thermodynamics does indeed explain how heat transfers between people, at least in semi-worked-out theory, a subject that forms the backbone of hmolscience in general and physicochemical sociology, in particular, such as found in: Empedocles' four element theory of social aggregation (450BC), German polyintellect Johann Goethe's human chemical theory (1809) to American sociologist Henry Carey's social heat theory (1857), to Chinese ecological economist Wenyuan Niu's social combustion theory (2001), to name a few dominate examples; yet it is NOT a subject taught in any engineering school in the world presently (Korea University's 2011 "Seminar on Social Thermodynamics" graduate seminar aside) (Ñº); whereas, conversely, a century ago, in the early 20th century this subject—of heat transferring between people—was the leading branch of modern sociology, according to Harvard sociology department founder Pitirim Sorokin (1928) and his mechanistic school classification, such as anchored in the work of engineers American Willard Gibbs (see: Sociology 23; Mathematical Economics) or Italian Vilfredo Pareto (see: Harvard Pareto Circle); or in the work of Leon Winiarski who built political economics and sociology, at the University of Geneva (1890s), on a Clausius inequality framed social mechanics.

In short, the phenomena of intellectual fragmentation, specialization, compartmentalization, and a decline of interdisciplinarity-based universal education, has resulted in a state of two cultures "hydraism", so to say, wherein engineering departments have become diploma paper mills, producing niche subject focused (e.g. drug design) secular students without any foundational schooling in the fruits of the deeper universal genius type problems of human nature, the "heat" of the torch of 21st century enlightenment being drowned out by passing humor, as though the "heat" of passion, existence, and being was a metaphorical joke of modern day, which can be compared to 20th century enlightenment thinkers, such as Henry Adams, who after studying Willard Gibbs, physics, and chemistry for some 50-years, could declare, at age 70, that "no one shall persuade me that I am not a phase (see: social phase).

Thermodynamics forces | Social

In 2012, American chemical engineer Rich Byrnes commented on the parody: [2]

> "I'm happy to know that the thermodynamic forces that compel folks to become ChE's have not changed much over the years."

Here again we see a double joke, namely the assertion that the subject of the "thermodynamic forces that compel people to become chemical engineers", the forces in question here being the isothermal-isobaric force function of Willard Gibbs (aka Gibb energy), is a standard subject taught in chemical engineering curriculum, which is not the case. When this subject is broached, e.g. Frederick Rossini's "Chemical Thermodynamics in the Real World" (1971), Mirza Beg's *New Dimensions in Sociology: a Physico-Chemical Approach to Human Behavior* (1987), or Erich Muller's "Human Societies: a Curious Application of Thermodynamics" (1998), etc., the first barrier to hurdle is the religious obstacle, which tends to bring about so much "social friction", of human molecules "rubbing together", using Henry Carey's phraseology, that "sparks" of objection and debate quickly result, and the fire department of social *status quo* is called to put the kindling subjects out, before then can can successfully ignite.

Choice | Chemical thermodynamics

The term "choose" of the video title, i.e. why do students "choose" the major of "chemical engineering", brings to mind that fact that "choice" was the center piece philosophical puzzle of Goethe's 1809 human chemical theory based novel *Die Wahlverwandtschaften*, which translates (see: titled decoding) as: **die** [the] **wahl** [choice] [of] [one's] **verwandtschaft** [affinities or elections], the gist of which being that "humans", as evolved or "metamorphized" types of chemicals, or CHNOPS+20 molecules, as we say in modern terms, have their "choices" pre-configured by the "affinities" of the reactions or human chemical reactions they are thrown into, which in modern terms is quantified by the Gibbs energy of the system, affinity being equivalent to free energy change, proved by Hermann Helmholtz in his "On the Thermodynamics of Chemical Processes" (1882), the logic of which is found historically in the so-called human free energy theorists. This, however, is a branch of education so far removed from modern chemical engineering curriculum, which should be its centerpiece, as per humanities instructions go, that it is like a foreign language to newly-minted chemical engineers; despite recent engineering conference calls, e.g. Alec Groysman (2011), Libb Thims (2013), and Jaime Aguilar-Arias (2014).

References

1. Guthrie, Mary. (2009). "Investigative Report: on Why Students Choose Chemical Engineering" (Ñº) (writer: Mary Guthrie) (Jawad Mirza quote, 4:47-4:53; Byrnes quote, comment section), ChETube, CHEnected, Jan 13.
2. Byrnes, Rich. (2012). "Forum Comment" (Ñº) to "Why Students Choose Chemical Engineering", AIChe.org, Jan 21.

θΔics

In hierarchical thermodynamics, **wick model** is a conceptual model of aging in living organisms in which the wick of a burning candle, as a quasi-closed, quasi-equilibrium thermodynamic system, models transformation of structure over time of life, wherein both cases the chemical composition changes slowly during the course of its evolution. The model was conceived by Russian physical chemist Georgi Gladyshev in 2007. [1]

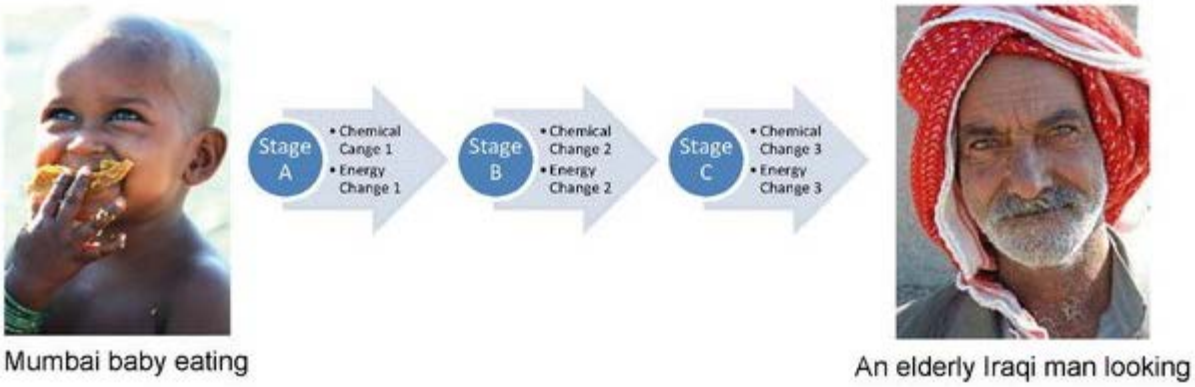

The evolution of composition and structure of wick, as a reactive system, is analogous, in a primitive way, to the evolution of the composition and structure of a hierarchical living systems, both of which evolve in the direction that tends to minimize the Gibbs free energy (the specific Gibbs function) of formation of each structure.

References

1. Gladyshev, Georgi. (2007). A burning candle wick is a model of living system , *Academy of Creative Endeavors*.

θΔics

In genius rankings, **Wikipedia 20 most influential people** is 2012 ranking of the world's most influential people, born (synthesized) before 1950, compiled by Chilean-born American social physicist Cesar Hidalgo—student (Ω) of human physics pioneer Laszlo Barabasi (see: HP pioneers)—head of MIT's Media Lab's Macro Connections group, based on parameters such as the number of language editions in which that person has a page, and the number of people known to speak those languages. [1]

The top 17 of the Hidalgo 20 can be compared to the top 17 of the Cattell 1000, also shown below, a similar methodology compiled list done famously—it is the backbone to the Cox 300—by American science editor James Cattell in 1894.

List

The following is the Hidalgo compiled Wikipedia-reach based listing of the world's most influential people, with the exclusion of the three non-existive religio-mythology aggregate figures; also shown are the top 17 of the Cattell 1000, the Hildago-Cattell combined ranking of names common to both listings, ranked by combined mean of ranking number, and the top 17 of the Hmolpedia citation rankings: [2]

Hildago/Wikipedia (2012)	**Cattell** (1894)	**Hmolpedia** (2014)	**Hildago-Cattell** (Combined)	**Hild-Catt-Hmol** (Combined)
		1. Johann Goethe 2. Willard Gibbs 3. Rudolf Clausius		
1. Isaac Newton 2. Gandhi 3. Albert Einstein 4. Aristotle 5. Vasco da Gama 6. Leonardo da Vinci 7. Plato 8. Archimedes 9. Mao Zedong 10. William Shakespeare 11. Socrates 12. Karl Marx 13. Michelangelo 14. Nelson Mandela 15. Galileo Galilei 16. Julius Caesar 17. Joseph Stalin	1. Napoleon Bonaparte 2. William Shakespeare 3. Voltaire 4. Francis Bacon 5. Aristotle 6. Johann Goethe 7. Julius Caesar 8. Martin Luther 9. Plato 10. Napoleon III 11. Burke 12. Homer 13. Isaac Newton 14. Cicero 15. John Milton 16. Alexander the Great 17. Pitt	4. Gilbert Lewis 5. James Maxwell 6. Isaac Newton 7. Hermann Helmholtz 8. Ludwig Boltzmann 9. Albert Einstein 10. Charles Darwin 11. Sadi Carnot 12. Ilya Prigogine 13. Henry Adams 13. William Thomson 15. Max Planck 16. Vilfredo Pareto	1. Aristotle (4.5) 2. William Shakespeare (6.0) 3. Isaac Newton (6.5) 4. Plato (8.0)	1. Isaac Newton (7.0)

17. Claude Shannon

The only name common to all three rankings (fourth column), Cattell, Hildago, and Hmolpedia, is Newton, with a tri-list combined ranking of 7.0 in position.

See also

- Who was smarter?

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2. Removals: Jesus Christ (#1), Confucius (#2), and Buddha (#16), are the three Aggregate non-existive religio-mythology figures removed from the list, as they were not individual “people”, *per se*; the first and third, i.e. Jesus and Buddha, being religio-mythology figures, derived largely as extensions from the Imhotep-constructed Heliopolis creation myth theory, the second, i.e. Confucius, being largely a Chinese proverbs attributed aggregate figure, arguably non-existive, similar to other mythological figures, such as: Abraham, Moses, Mohammed, Lao Tzu, etc. (O)

θΔics

In human thermodynamics, **Wilbert C. Lepkowski** (c.1935-), commonly cited as 'Wil Lepkowski', is an American chemist and science writer noted for his 1979 article "The Social Thermodynamics of Ilya Prigogine", wherein he argues that the nonequilibrium thermodynamics of Belgian chemist Ilya Prigogine can lead to new ways of understanding social processes in the form of 'social thermodynamics'.

Lepkowski is also noted for the 1977 article "Researchers, Policy makers Related Entropy Concepts to Economics", in which he explains how the second law and entropy logic can be used in energy and economic policy considerations, covering subjects germane to economic thermodynamics. [2]

Social thermodynamics

In 1979, Lepkowski, in *Chemical and Engineering News*, published "The Social Thermodynamics of Ilya Prigogine", the abstract of which is as follows along with an image section (shown adjacent):

> "The application of nonequilibrium thermodynamics could lead to new ways of understanding social processes."

Lepkowski's article, while not necessarily being of much theoretical forces, is notable as being one of the earliest articles to make a formal suggestion for the premise and applicability of a science of sociological thermodynamics or "social thermodynamics", as he referred to it, has since been cited by those including: Jeremy Rifkin (1980), David Monieson (1981), Neil Schore (1981), Henry Morris (1985), Yi-Fang Chang (2009), etc. [6]

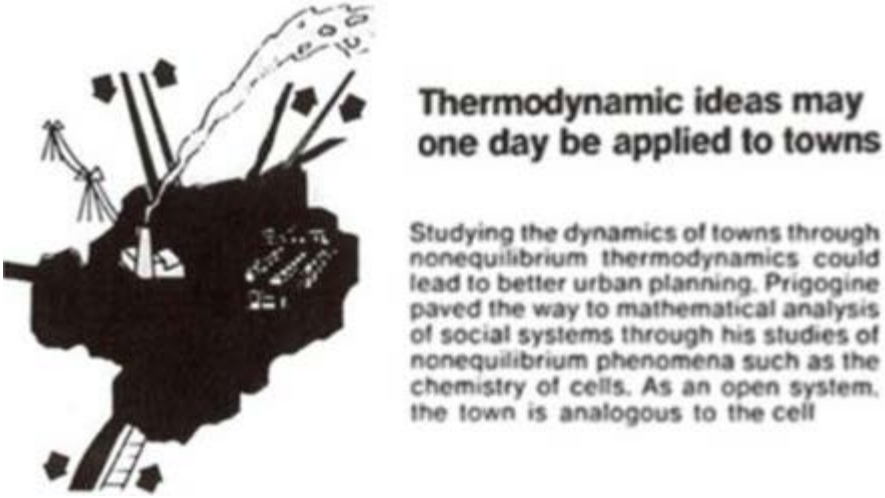

Image and description from **Lepkowski's** 1979 "The Social Thermodynamics of Ilya Prigogine". [1]

Religion and science

Lepkowski's 1984 article "Scientists Discuss Ways to Integrate Science with Christianity" outlines various views on attempts to reconcile conflict between science and Christianity, with focus on the group American Science Affiliation (ASA), or a membership of scientists affiliated with the Christian faith. [4] Lepkowski is described by the ASA as: "Brought up a Catholic, at one stage in his spiritual and intellectual journey he turned away from the church to explore various 'religious trips' that attracted many in the '60s and '70s. Then he married Helene, a Jewish woman who has become a Christian. Through Helene and other believers, Wil found his way back to Jesus Christ. That book review was one way of flying his new flag." [5] Lepkowski would thus be close to one on the Dawkins scale of belief in the existence of god.

Education

Lepkowski completed his BS in chemistry at the University of Massachusetts, Amherst, and his MS in biochemistry in 1961 with a thesis on "The partial purification and properties of galactokinase from Saccharomyces fragilis yeast" at Ohio State University. He was a fellow in the advanced science writing program at the Columbia University Graduate School of Journalism. Most of his career has been as a science writer and reporter for Chemical & Engineering News, on and off from circa 1965 to 1969 and 1977 to 1999. [3] He has taught graduate courses on writing at the Virgina Institute of Technology. His writing tends to focus on the interrelationship of science, technology. and society.

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2. Lepkowski, Wil. (1977). “Researchers, Policy makers Related Entropy Concepts to Economics” (abstract), *Chemical and Engineering News*, 46: 18-19, Nov.
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(e) Chang, Yi-Fang. (2009). “Social Synergetics, Social Physics and Research of Fundamental Laws in Social Complex Systems” (Ñº), ArXiv.org, Nov 6.

External links

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θΔics

In hmolscience, **Wilbur Urban** (1873-1952) was an American language philosopher noted, philosophical thermodynamics, for his 1929 “The New Gotterdammerung: Degradation and Value”, wherein he expounds on the view that the second law cannot be wholly irrelevant to philosophy. [1]

Overview

In 1929, Urban, in his “The New Gotterdammerung: Degradation and Value”, digs into the second law of thermodynamics, which he categorizes as a “magnificent dysteleology”, in respect to destiny, then ventures into discussion of: Henri Bergson, Henry Adams, and Wilhelm Ostwald, his “The Energetic Imperative” in particular, William James, among others.

Urban’s position seems to be, in part, a reaction to James' famous contention that the second law is *irrelevant* to history save as it sets a terminus, and this fact of terminus makes no difference to the meaning and value of history and the truth of progress. [2]

Quotes | Employed

The following are quotes employed by Urban:

> “There is no entropy of being.”
>
> — Georg Simmel (c.1910)

Reference

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External links

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θΔics

In chemistry, **Wilder Bancroft** (1867-1953) was an American physical chemist who, according to American thermal physicist Ralph Baierlein, is noted for coining the term "chemical potential", a modified variant of American engineer Willard Gibbs original term "potential", with whom he exchanged a number of letters. [1]

Bancroft founded the first American *Journal of Physical Chemistry*. He was one of the first reviewers of German physical chemist Otto Sackur's 1912 *A Text-book of Thermochemistry and Thermodynamics*. [2] Bancroft is typically cited in the history of phase equilibrium the phase rule, and phase diagrams. [3]

Le Chatelier's principle

In 1910, Bancroft gave a rather talked about address entitled "A Universal Law" on Le Chatelier's principle wherein he makes assertions about the applicability of this principle to the migrations of nations, in respect to the balance between population and food supply, and re-establishment of equilibrium, among others. [4] The following is a popular quote:

> "I wish to call your attention to-night to what I believe to be another universal law, a qualitative one and not a quantitative one. The chemists call it Le Chatelier's Theorem. The physicists call it the the theorem of Maupertuis or the principle of least action. The biologists know it as the survival of the fittest, while the business man speaks of the law of supply and demand."

Bancroft truncates all of this with the statement the broadest definition is that "a system tends to change so as to minimize an external disturbance." He goes one to give a whole slew of (non-chemical) examples wherein he sees Le Chatelier's principle at work.

American chemical engineer Harry Curtis, in commentary on Bancroft's address, adds in that in engineering, Le Chatelier's principle is conceptualized under the title "The Principle of Least Work." [5]

Education

Bancroft was a PhD student of German physical chemist Wilhelm Ostwald after which he became a physical chemistry professor at Cornell University.

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Further reading

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External links

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θΔics

In hmolscience, **Alexander Wilford Hall** (1819-1902), cited as A. Wilford Hall, was an American philosopher, albeit generally known (Q) as a quack physician, for his hope-based hygienic treatment, noted for his 1877 spark of life ridicule of Ernst Haeckel's atheism-explicit evolution monism theory.

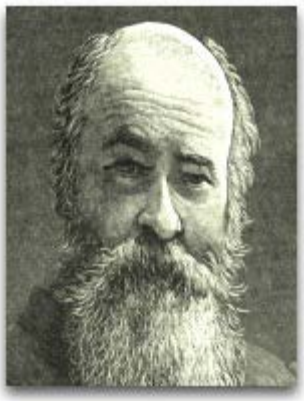

Overview

In 1877, Hall, in his *The Problem of Human Life*, in review of Ernst Haeckel's *The History of Creation*, stated the following: [1]

> "How, in fact, a man believing in spontaneous generation can reasonably object to miracles, or to the separate creation of each individual species by the direct interposition of an infinite creator is more than I can imagine. As a proof that a belief in miracles must produce less of a mental strain upon a logical mind than the acceptance of the impossible process of spontaneous generation, we see Darwin deliberately choosing the former plan for the first few simple beings rather than the latter. We may rest assured that had there been the least rational ground for spontaneous generation, this shrewd naturalist would never have been found reverently but reluctantly bending the knee by resorting to the special intervention of an infinite creator to 'breathe' into that 'larva' of a mollusk to find something by which to start evolution!
>
> He would have almost given his life for Haeckel's scientific assurance, with a reasonable proof of spontaneous generation. Haeckel, however, was equal to the strain: for while believing firmly in spontaneous generation, he ridicules the belief in miracles as but the creation of a superstitions and poetical faith. If the father of evolution laid its foundation in superstition and a poetical fancy, what are we to think of the superstructure?
>
> But look at the difference as to the probability of the two systems of creation. While the miraculous production of a living being, by an act of the creator, is only the transfer of a **vital spark** of a pre-existing life, having intellect capable of planning the structure [of] Haeckel's method, by means of a carbon miracle, is not only to construct an ingenious organism without prior ingenuity or mentality, but absolutely to originate life out of nothing, or without there having been a **spark of life** in the universe before it! Such a miracle would seem to defy human imagination.
>
> Yet Haeckel is equal to the emergency. The world is surely in need of 'philosophical culture', especially among believers in a carbon god which can not only construct ingenious organisms in the absence of all ingenuity, but can transfer life and mental powers to inorganic matter, while it has neither life nor mental powers to transfer!

(add discussion)

Education

Hall, supposedly, obtained a PhD in philosophy; which he parlayed into the sell that he was a "doctor". (Q)

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Further reading

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θΔics

In human chemistry, **Wilhelm Bolsche** (1861-1939) was a German natural science popularize noted for his 1889 essay “Goethe’s *Elective Affinities* in Light of Modern Science”, in which he argues that the Goethe's *Elective Affinities* novel is realistic due to its portrayal of natural forces and psychology, but that it should be seen as a predecessor to such realistic works such as George Eliot and Honore Balzac, and is a pioneering work of literary realism. [1]

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External links

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θΔics

In chemistry, **Wilhelm Heinrich Sebastian Buchholz** (1734-1798) was German physician, chemist, and pharmacist noted for having been an early chemistry mentor or scientific comrade to German polymath Johann Goethe. Buchholz may have been the role model for the Captain in *Elective Affinities* (see: Geothe's human affinity table).

Friday society

Buchholz and Goethe were part of a current science society at Weimar called *Freitagsgesellschaft* (Friday Society), a group that met from 1791 to 1797. The members of the society were charged to present their current research to the others. Buchholz was said to have discussed his latest chemical findings, physician Christoph Wilhelm Hufeland (1762-1836) discussed macrobiotics or the art of prolonging human life, and Goethe was said to have presented his theory of colors. [3] Buchholz remained an active an honored member of Goethe's celebrated "Freitaggesellschaft" (Friday Society) up until Buchholz's passing in 1798. [1]

Goethe

It seems that Buchholz was acquainted with Goethe at about the time Goethe was an official member of the government of Weimar, or at least as early as 1783. [1] The pair worked together on the analysis of water and its purification by the use of powdered charcoal. Goethe's debt to Buchholz was said to have been considerable, which Goethe supposedly admits in the narrative entitled "Geschichte meines botanischen Studiums" (History of my Botanical Studies) which closes his *Metamorphosis of Plants*.

The Captain

Buchholz may have been a role model to the character of the Captain in Goethe's 1809 *Elective Affinities*. In his 1916 article "Goethe and the Chemists", author Roy Temple House describes Buchholz as a "prosperous and jovial man of the world" and "genuine scientist." This seems to fit the description of the Captain. Buchholz was said to have kept up a large garden which contained not only herbs needed for business, but also rare and newly discovered plants. This is similar to how the Captain worked out a reformulated landscaping of the estate. Buchholz is described as having "kept himself well-informed as to new discoveries and developments in his own and related sciences". [1] This is similar to the response of the Captain, in chapter four, when queried by Charlotte about what elective affinities are:

> "As well as I can from what I learned from reading about [affinities] some ten years ago. Whether the scientific world still thinks of it in the same way, or whether it agrees with the latest theories, I cannot say."

As Goethe conceived of and began writing the novella in 1808, the comment of ten year ago would coincide with Buchholz's death in 1798 and to Buchholz's presentations of the latest discoveries in chemist at the weekly Friday Society meetings, in the seven years prior.

Education

Buchholz studied medicine and obtained his medical degree, but after leaving school devoted himself to pharmacy and bought the sole apothecary shop in Weimar. He is described, in a caption to an engraved picture of him, as the chief physician of Saxon-Weimar. [2]

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2. Wilhelm Heinrich Sebastian Buchholz (engraving with caption) – UPenn.edu.
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θΔics

In existographies, **Friedrich Ostwald** (1853-1932) (IQ:190|#41) [RGM:327|1,500+] (SN:15) (FA:94) (GCE:21) [CR:297], generally known as "Wilhelm Ostwald", was a German physical chemist noted for the subject he called "anthropic physics", or physics pertaining to humanity, as described in his various works: the 1902 "energy theory of culture"; his 1905 MIT Affinity Lecture, wherein he outlines a semblance of a connection from Goethe's *Elective Affinities* to Sadi Carnot to August Horstmann to Willard Gibbs; his 1906 Ingersoll lecture (Ñº) turned booklet *Individuality and Immortality*, on the subject of what the science of energetics has to say about death and human individual (cessation thermodynamics); for his 1909 book *Energetic Bases of Social Studies*; for his 1912 book *The Energetic Imperative*, on the postulate of the "energetic imperative" (or thermodynamics imperative), and for being awarded 1909 Nobel Prize in thermodynamics; and is considered the founder of the "school of energetics" [1]

Radical atheism

Ostwald, as many may not know, became a "strong atheist", "radical atheist", and or "pugnacious atheist", among others, depending on label, in the early 20th century; the following is one example statement of this: [25]

> "**Ostwald** was certainly an atheist in the strong sense. The 1969 biography by Rodnyj and Solowjew contains a section on Ostwald entitled 'A Pugnacious Atheist' ['als streitbarer Atheist'] and an entire German language book on this subject was published in 1960: *Science versus Faith in God: From the Atheist writings of the Great Chemist Wilhelm Ostwald* (Friedrich Herneck)."
>
> — William Jensen (2015) [25]

(add discussion)

Ostwald happiness formula

See main: Ostwald happiness formula

In 1905, German physical chemist Wilhelm Ostwald penned a happiness equation based on his energetics theories. [17] Ostwald's happiness equation reads as follows:

$$G = k(A - W)(A + W)$$

where *G* is *Gluck* (happiness), *A* is *Arbeit* (work or 'energy expended in doing useful work'), *W* is *Widerstand* (energy dissipated in overcoming resistance), and *k* supposedly some type of proportionality constant. [18]

Scholars

Noted Ostwald energetics historians include: Caspar Hakfoort, Robert Deltete, Eric Zencey, and Janet Stewart .

Perpetual motion

Ostwald, supposedly, was the one who introduced the phrase "perpetual motion of the second kind" referring to those perpetual motion machines that seek to violate the second law of thermodynamics. [7]

Energetics

In 1887, in a lecture at Leipzig, Ostwald outlined his new "energism" view, as American historian Niles Holt refers to it, according to which all natural processes are essentially

transformations of energy, and most-contentiously that: [16]

> "Matter is only a mirage, which the mind creates to comprehend the workings of energy."

In 1890, Ostwald entered into the universal theory of everything arena of the "all is energy" philosophical motto, following a spring physics conference in Berlin, wherein Ostwald attempted to convince a group of physicists to adhere to the following new outlook: [13]

> "From now on the whole of physics has to be represented as a theory of energies."

Ostwald and Svante Arrhenius, from a 1904 issue of *Popular Science Monthly* (Ñº); in 1884, Arrhenius published work which showed that affinities and electrical conductivity in solution parallel one another; Ostwald, who in 1882 had become full professor at the University of Riga, recognized the originality of the this young fellow chemist and helped him to find due appreciation, the same way M.M. Pattison Muir (1848-1931) had further him in 1879.

This incident has been documented by American energetics historian Robert Deltete in a series of articles. The group found the idea "so absurd that they refused to take it seriously at all" and offered only "ridicule and abuse". The next morning, Ostwald awoke early and went for a walk in the *Tiergarten*, and had a "personal Pentecost", as he described it, seeing clearly the view that "all is energy". Ostwald's revelatory moment of insight is detailed in his *Autobiography*, and is quoted in Eduard Farber's *Great Chemists*. [15]

In the 1890s, Ostwald, translated American mathematical engineer Willard Gibbs' 1876 *On the Equilibrium of Heterogeneous Substances* into French, and styled Gibbs as the "founder of chemical energetics". [2]

The term 'human energetics', a near synonym to 'human thermodynamics', seems to have been attributed to Ostwald's 1909 book *Gross Manner*. [8]

The school of energetics, existing from 1890 to 1908, is a set of logic, attributed to German chemist Wilhelm Ostwald (the founder) and Austrian physicist Ernst Mach, that rejected the atomic hypothesis focusing instead on the law of conservation of energy and a belief that macroscopic energy levels were the only reality. [5] The seed of belief may trace to the 1887 book *The Doctrine of Energy* by German physicist Georg Helm, a work read by Ostwald. With the discovery of the atom, between 1897 and 1909, this school, however, soon became defunct.

Catalysts

In 1894, on the occasion of a review in his *Zeitschrift*, he casually formulated a new definition of a catalyst as a substance which influences the velocity of a reaction without taking part in it as a component; in 1901, at a conference in Hamburg, he expressed this explicitly: [15]

> "A catalyst is any substance which changes the velocity of a reaction without appearing in its end products."

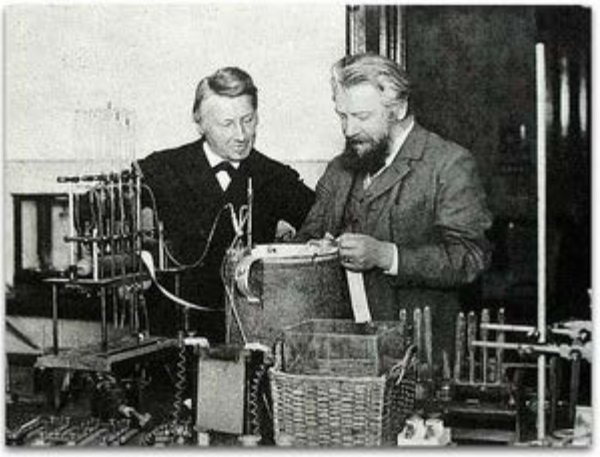

Ostwald with Jacobus van 't Hoff, in Leipzig, from a 1905

Ostwald, in short, was the first to realize that a catalyst acts without

altering the energy relations of the reaction, and that it usually speeds up a reaction by lowering the activation energy. [11] In 1909, Ostwald was awarded the Nobel Prize in chemistry for his work on catalysis.

issue of the *Journal of Physical Chemistry*. (Ñº)

Physical chemistry

Beginning in 1885, Ostwald published *Lehrbuch der allgemeinen Chemie* (*Textbook of General Chemistry*), the first textbook on physical chemistry and in 1887, together with Dutch chemist Jacobus van't Hoff, founded *Zeitschrift für physikalische Chemie* (*Journal of Physical Chemistry*) the first periodical in physical chemistry. [3]

Natural philosophy

In 1901, Ostwald gave a seven part lecture series on "natural philosophy", in which he applied energy and entropy logic to human mental life. [9]

In 1910, translator Thomas Seltzer produced an English-version as the book *Natural Philosophy*, the last section four of which is shown adjacent. [24]

THE BIOLOGIC SCIENCES 163
54. Life 163
55. The Storehouse of Free Energy 168
56. The Soul 171
57. Feeling, Thinking, Acting 174
58. Society 179
59. Language and Intercourse 182
60. Civilization 184

The final section of Ostwald's *Natural Philosophy*. [4]

The main points of Ostwald's theory were summarized and criticized in the 1903 article “The Theory of Energetics and its Philosophical Bearings” by American philosopher John Hibben. [10] In 1920, Ostwald published *Das große Elixier - Die Wissenschaftslehre* (*The Philosopher's Stone: The Theory of Science*) a book outlining his philosophy of the natural sciences, and its affects on, and utility to human society. In this work, he ascribes the mental work capacity of a human being as the most efficient utilization of chemical energy, and asks if it were not possible to breed humans ("Menschenzüchtung") to enhance society's mental capacity, instead of relying on random genius for the advancement of human civilization. [12]

Religious | Conflicts

In 1905, Ostwald came into serious conflict with the university, the reason being concerned with “religious questions”, as biographer Eduard Farber puts it, at the time of the official obsequies for freethinker Johannes Wislicenus (1835-1902). The tensions came to a breaking point, when Ostwald was asked to be relieved of lecturing duties, after which he was suspended until 1906, officially appointed as an exchange professor to the United States.

Monistic Sunday sermons

See main: Monistic Sunday Sermons

After his retirement in 1906, Ostwald found a new sphere for his scientific and organizatorial talents. Besides continuing his studies and publication on philosophy, such as *Der energetische Imperativ* (*The Energetic Imperative*), *Moderne Naturphilosophie* (*Modern Natural Philosophy*), *Die Pyramide der Wissenschaften* (*The Pyramid of the Sciences*), he also took an active part in public life.

In 1906, Ernst Haeckel founded the “Monisten Bund” or German Monist League (Ñº), in Jena, a free-thinking organization centered on promoting some type of monistic world view, anchored in some way on a mix of Goethe’s 1809 metamorphology theory, Darwin's 1959 theory of evolution, and Ostwald's 1898 energetics view. (Ñº)

In 1910, Haeckel elected Ostwald as the president of the Monist League, after which he began giving his famous “Monistic Sunday sermons”, as Haeckel (1913) called them. Ostwald, in this direction, was interested in educational reforms and in monism. He believed that in view of his position he could decisively fight the Church's claim to power in the field of natural sciences and to spread a modern scientific ideology. This aim he pursued in his writings *Monistische Sonntagspredigten* (Monistic Sunday sermons) and *Arbeiten zum Monismus* (*Works on Monism*). (Ñº)

Sociological energetics

In 1908, Ostwald, in his *The Energy* (*Die Energie*), published “Sociological Energetics”, as an end chapter. This served

as a launching point for the following works: *The Energetical Foundations of the Cultural Sciences* (*Energetische Grundlagen der Kulturwissenschaft*) (1909), *Today's Challenges* (*Die Forderung des Tages*) (1910), *The Energetical Imperative* (*Der energetische Imperativ*) (1912), and *The Philosophy of Values* (*Die Philosophie der Werte*) (1913). [26]

Goethe

Oswald's 1905 MIT Affinity Lecture, outlines a semblance of a connection from Goethe's *Elective Affinities* to Sadi Carnot to August Horstmann to Willard Gibbs.

In 1932, Oswald published his last literary work: a collection on "Goethe, the Prophet" in the year of the one-hundredth anniversary of his death (reaction end). [15]

Economic thermodynamics

See main: Economic thermodynamics

In 1907, Ostwald incorporated thermodynamics, or energetics specifically, into a general theory of economic development. Ostwald reasoned that energy was the sole universal generalization, in that energy processes underlie all circumstances. Based on this hypothesis, Ostwald theorized that for any event in the universe it is always possible to state an equation, between two time intervals, such as to quantify the difference between the energies that have disappeared and those newly arrived. [6] This, coincidentally, is the methodology currently used to quantify energetic reactions in chemistry, namely the calculation of the before and after conditions in reactions.

Individuality | Immortality

In 1906, Ostwald gave his Ingersoll lecture (Ñº) on "Individuality and Immortality", on what a physicist and chemist has to say on the question of the mortality and or immortality of the individual from the point of view of energetics; the following are noted quotes: [23]

> "If a chemist or physicist of to-day is asked about his ideas on immortality, his first feeling will be that of some astonishment. He meets with no question in his work which is connected with this one, and his reply may usually be classified under one of two heads. He may remember the religious impressions which have clung to him since his youth, kept alive by him or nearly forgotten, as the case may be, and he will then explain that such questions are in no way connected with his science; for the objects treated by his science are non-living matter. This is immediately evident in physics, and while there exists an *organic* chemistry, he will explain that any matter which is called organic in his sense is decidedly dead before it can become the object of his investigation. It is only the inanimate part of the world which concerns him scientifically, and any ideas he may hold about the question of immortality are his private opinions and quite independent of his science. Or he may dismiss his interlocutor still more shortly by saying from his standpoint of matter-and-motion: Soul is a function of living matter only. The moment life ceases in an organized body the value of this function becomes zero, and there is no further question about immortality."
>
> — Wilhelm Ostwald (1906), *Individuality and Immortality* (pgs. 4-5)

> "It must be restated from its very foundation, because, as I have been maintaining for the last ten years, the matter-and-motion theory (or scientific materialism) has outgrown itself and must be replaced by another theory, to which the name *energetics* has been given. The question therefore takes the form: what has energetics to say about immortality?"
>
> — Wilhelm Ostwald (1906), *Individuality and Immortality* (pg. 7)

> "In conscious beings such natural tendencies are accompanied by a certain feeling which we call will, and

we are happy when we are allowed to act according to these tendencies or according to our will. Now, if we recall the happiest moments of our lives, they will be found in every case to be connected with a curious loss of personality. In the happiness of love this fact will be at once discovered. And if you are enjoying intensely a work of art, a symphony of Beethoven's, for example, you find yourself relieved of the burden of personality and carried away by the stream of music as a drop is carried by a wave."

— Wilhelm Ostwald (1906), *Individuality and Immortality* (pgs. 44-55)

"Consider the best case, where we often use the word 'immortal' [see: Mor], that of a great poet or scientist. We say that Homer and Goethe, Aristotle and Darwin, are immortal, because their work is lasting, and will persist for scores of centuries, and their personal influence has proven independent of their bodily existence."

— Wilhelm Ostwald (1906), *Individuality and Immortality* (pg. 59)

"Death, considered from the standpoint of sexual propagation, is not only not an evil, but it is a necessary factor in the existence of the race. And looking into my own mind with all the frankness and scientific objectiveness which I can apply to this most personal question, I find no horror connected with the idea of my own death. After I have lived out the span of my life, the bodily ending will seem a perfectly natural thing, and it will be more a feeling of relief than one of sorrow that will come in watching the end. Quite independent of individual life or death, the work a man has done remains effective."

— Wilhelm Ostwald (1906), *Individuality and Immortality* (pgs. 62-63)

"There remains one last and most important question, What becomes of the foundation of all our *ethics* without the idea of a personal future life, in which vice shall be punished and virtue rewarded? I do not hesitate to answer that I not only think ethics possible without this idea, but that I even think that this condition involves a very refined and exalted state of ethical development."

— Wilhelm Ostwald (1906), *Individuality and Immortality* (pg. 67)

"No one thinks of punishing a cat who tortures a poor mouse for no vital purpose whatever, and we find it perfectly natural that the lame of certain wasps should develop in the interior of caterpillars, slowly devouring their hosts from within. It is only man who tries to change this general way of nature's and to diminish as far as possible cruelty and injustice to his fellow men and his fellow creatures. And from the strong desire that this black stain should be removed as fully as possible from humanity, the idea developed that there must be beyond our bodily life a possibility of compensating for the evil which is done and for that which is suffered during life without due punishment or reward as suggested by our sense of justice."

— Wilhelm Ostwald (1906), *Individuality and Immortality* (pgs. 68-69)

(add discussion)

Students

That coinage of the term "chemical potential" has been attributed to Cornell physical chemist Wilder Bancroft, one of Ostwald's former PhD students who introduced the term in the 1890s. [3] American physical chemist Gilbert Lewis worked as an instructor at Harvard for a year before taking a traveling fellowship, studying under the physical chemists Wilhelm Ostwald at Leipzig and Walther Nernst at Göttingen. [4]

Education

Ostwald graduated from the University of Tartu, Estonia, in 1875, received his PhD in chemistry there in 1878 under the guidance of Russian biochemist Carl Schmidt (a student of German chemist Justus Liebig). After a period of being a schoolmaster, he became professor of chemistry at Riga Polytechnic Institute in 1881. In 1887, he became professor of physical chemistry at the University of Leipzig, remaining there until 1906. [11]

Quotes | On

The following are quotes on Ostwald:

> "**Ostwald** developed [his] epiphany into his doctrine of energetics, which he thought should revolutionize all human understanding: natural and earth sciences, of course, but also history, economics, sociology, politics, even ethics and morality. The laws of thermodynamics, to Ostwald, implied a new categorical imperative: 'waste no energy!'"
>
> — Eric Zencey (2013), "Energy as Master Resource" via citation of Caspar Hakfoort [1]

Quotes | By

The following are noted quotes by Ostwald:

> "Everything we sensually experience can be reduced to energy relationships between our sense organs and the world around us."
>
> — Wilhelm Ostwald (1909), autobiographical reflection of his spring "pentecostal inspiration"; as recounted in his *Lifelines: an Autobiography*, 1926 [21]

> "Research workers were, at one time, obliged to endeavor to ensure that their theories did not contradict those of the church; nowadays, in contrast the church is at pains to prove that its teachings are compatible with those of science. In other words, the church acknowledges science as the higher authority."
>
> — Wilhelm Ostwald (1909). "On Catalysis", Nobel Lectures [22]

> "I am made from the C-H-N-O-S-P combination from which a Bunsen, Helmholtz, Kirchhoff came."
>
> — Wilhelm Ostwald (1926), *Lifelines: an Autobiography* [19]; compare Carl Sagan (1980)

> "My only supporter and comrade-in-arms was Georg Helm, who had endeavored to formulate an energetic conception of science before me and had presented his results in a treatise [*Die Lehre von der Energie*] exhibiting great independence of thought. But we were separated by his aversion to a realistic conception of energy. Consequently, each of us considered the other only a half ally, toward whom an attitude of caution was necessary."
>
> — Wilhelm Ostwald (1927), reflection on the 1895 energetics dispute in Lubeck [20]

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θΔics

In science, **Wilhelm Preyer** (1841-1897) was an English-born German physiologist noted for his 1880 "motion origin of life theory".

Overview

In 1880, Preyer, in his *Hypotheses Concerning the Origin of Life in Scientific Facts*, outlined, as summarized by William Sidis (1920), the following origin of life theory: [1]

> "The earth itself, in the heated state, was itself an immense living organism, from which all living organisms existing at present are descended; all inorganic matter on the earth being merely the rejected excretions of the former living earth, while the living substance came more and more to resemble protoplasm."

Prayer, as summarized by Alexander Oparin (1936), argued that following the cooling of the earth, according to the Nebular hypothesis, the following occurred: [3]

> "Only when these combinations had in the course of time petrified on the earth's surface, i.e. died out, combinations of elements appeared which till then had remained in gaseous and liquid state, and which have gradually taken on the semblance of protoplasm, the foundation of everything living today. We, therefore, assert that motion is the beginning of life in the world, and that protoplasm is the residuum which must have been left over after the substances now regarded as inorganic had separated out on the cooled surface of the planet."

Preyer's theory is said to be similar to Theodor Fechner's 1873 theory, i.e. of extending the idea of life to the whole cosmos (panbioism), and rejecting over-typical organic and inorganic distinction (or animate and inanimate) that tends to be drawn.

In 1904, Ernst Haeckel, summarized Preyer's theory, wherein he seems to tend to situate the initiation, start, origin, or name of "life" to the fiery mass in the formation of the earth, as follows: [2]

> "The fiery mass of the forming earth is the gigantic organism, and **Preyer** gives the name of 'life' to its rotatory movement (or gravitational energy). As it cooled down, the heavier metals (the dead inorganic masses) separated form it; from the rest of it were formed first simple and afterwards complex carbon-combinations, and finally albumin and plasm."

(add discussion)

Discussion

Preyer's version of the no-origin theory of life, to note is one of the stepping stones to the defunct theory of life view. Also, his differentiation of the elements of the earth, i.e. those that went into living matter (organic matter) and those that went into dead matter (inorganic matter), seems to have some of the flavor of the theory promoted by Vladimir Vernadsky and his biosphere model origin of life.

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θΔics

In psychology, **Wilhelm Reich** (1897-1957) was an Austrian-born American psychologist noted for his circa 1930 theory of "orgone energy", a derivative or synthesis of "libido", namely the libido energy model of Sigmund Freud, and the sexual "orgasm", a type of universal vitalism-style radiating "biological energy" or orgasmic energy; a possible variant or spinoff of psychic energy model espoused by Sigmund Freud and Carl Jung school of psychodynamics, that was proposed to be something that could be quantified and measured. [1]

Education

After serving in the Austrian army on the Italian front, Reich began attending classes at the University of Vienna and graduated in 1922 as a doctor of medicine. While studying for his doctorate, Reich became a protégé of Sigmund Freud, and soon after graduating became a clinical assistant at Freud's *Psychoanalytical Clinic*. [3]

In 1934, after being expelled from the International Psychoanalytic Association, he moved to the US where he working on his orgone theory, started a laboratory in Maine, an observatory, and a publishing house called Orgone Press. In 1954 a lawsuit was filed against him for selling his "orgone accumulators" after which he was sentenced to two years in prison, where he died in 1957. [2]

See also

â— Toralf Zschau
â— Siegfried Bernfeld and Sergei Feitelberg (libido energy; rectal temperature vs. brain temperature measurements of entropy, etc.).

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θΔics

In existographies, **Wilhelm von Kaulbach** (1802-1874) was a German painter and book illustrator noted for his “Goethe Gallery” consist of fifty paintings illustrating Goethe’s poems and life, such as the anecdote of Goethe skating (1773) and the Ottilie on the lake (date), a type of art chemistry classification (see: Goethe timeline); a set that took him five years to complete.

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θΔics

In existographies, **Wilhelm Weber** (1804-1891) (GPE:73) (SIG:#) was a German physicist, noted for []

Quotes | On

The following are quotes on Weber:

> "My theory of electrical forces is that they are called into play in insulating media by slight electric displacements, which put certain small portions of the medium into a state of distortion which, being resisted by the elasticity of the medium, produces an electromotive force ... I suppose the elasticity of the sphere to react on the electrical matter surrounding it, and press it downwards. From the determination by Kohlrausch and **Weber** of the numerical relation between the statical and magnetic effects of electricity, I have determined the elasticity of the medium in air, and assuming that it is the same with the luminiferous ether I have determined the velocity of propagation of transverse vibrations. The result is: 193,088 miles per second (deduced from electrical & magnetic experiments). Fizeau has determined the velocity of light = 193,118 miles per second by direct experiment. This coincidence is not merely numerical. I worked out the formulae in the country, before seeing Weber's [sic] number, which is in millimeters, and I think we have now strong reason to believe, whether my theory is a fact or not, that the luminiferous and the electromagnetic medium are one."
>
> — James Maxwell (1861), "Letter to Michael Faraday" (Ñº), Oct 19

Quotes | By

The following are quotes by Weber:

> "When the globe is covered with a net of railroads and telegraph wires, this net will render services comparable to those of the nervous system in the human body, partly as a means of transport, partly as a means for the propagation of ideas and sensations with the speed of lightning."
>
> — Wilhelm Weber (1835), *Publication* (Ñº)

External links

â— Wilhelm Eduard Weber – Wikipedia.

θΔics

In existographies, **Wilhelm Wundt** (1832-1920) (Simmons 100:99) (CR:8) was a German physician, physiologist, and philosopher, characterized as the "founder of psychology", noted for his theory of "animated will-centers" (Wil-lenszentren), said to be comparable to Ernst Haeckel's "animated atoms" (bescelte Atome) theory. [1]

Overview

Wundt, in his *System of Philosophy*, sought to understand the human mind by identifying the constituent parts of human consciousness, in the same way that a chemical compound is broken into various elements and who viewed psychology as a science, much like physics or chemistry, in which consciousness is a collection of identifiable parts.

Education

Wundt studied with Johannes Muller and had been assistant to Hermann Helmholtz.

Students

German psychologist Oswald Kulpe was a student of Wundt.

Ward

American sociologist Lester Ward's aimed-to-be sociological theory of everything, as outlined in his *Glimpses of the Cosmos: Volume 6*, a compilation of Ward's collected works, of the period 1897-1912, a post humorous outline of Ward's system of sociology, planned and largely executed, is given, the aim of which was to reduce sociology to an exact science, consisting of social mechanics (social statics and social dynamics), viewed through the guise of the formation and transformation of cosmic, organic, and social structures. The parts Ward's 'system of sociology' are summarized to be representative of (a) formative principles or synergy, based on the work of Auguste Comte and Jean Lamarck; (b) creative synthesis, based on the work of Wundt; (c) transformative principles, based on the work of, primarily, Leon Winiarski.

Quotes | On

The following are related quotes:

> "The great man of science, unless he is also a philosopher (I think of such names as Newton and Gauss, Linnaeus and Darwin, Copernicus and Galileo), deserves the title of genius as little as the man of action. Men of science are not universal; they deal only with a branch or branches of knowledge. This is not due, as is sometimes said, merely to the **extreme modern specialization** that makes it impossible to master everything. Even in the nineteenth and twentieth centuries there are still amongst the learned men individuals with a knowledge as many-sided as that of Aristotle or Leibnitz; the names of von Humboldt and **William Wundt** at once come to my mind."
>
> — Otto Weininger (1903), *Sex and Character* (pg. 139-40)

> "The naturalist now readily admits that plants have souls—or will-power—but he appropriates the soul as an energy of thermodynamics."
>
> — Henry Adams (1910), per citation of Wilhelm Wundt [2]

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θΔics

In science, **will** is a term referring to the mental faculties, operations, or surrounding circumstances connected to how one's actions are chosen. [1]

Goethe | Elective Affinities

In 1809, German polymath Johann Goethe published his physical chemistry based novella *Elective Affinities*, wherein in the famous P1:C4 of which he compares the movements and reactions of chemicals with those of people, mentioning the term "will" in the discussion:

> "I am sure you will forgive me my fault," she said, "when I tell you what it was this moment which came over me. I heard you reading something about affinities, and I thought directly of some relations of mine, two of whom are just now occupying me a great deal. Then my attention went back to the book. I found it was not about living things at all, and I looked over to get the thread of it right again."
>
> "It was the comparison which led you wrong and confused you," said Edward. "The subject is nothing but earths and minerals. But man is a true Narcissus (see: ECHO); he delights to see his own image everywhere; and he spreads himself underneath the universe, like the amalgam behind the glass."
>
> "Quite true," continued the Captain. "That is the way in which he treats everything external to himself. His wisdom and his folly, his **will** and his caprice, he attributes alike to the animal, the plant, the elements, and the gods."

Here, in this last passage, we see Goethe, via the Captain, explaining how humans are narcissistic, tending, in their explanations of the universe, to anthropomorphize animals, plants, elements, with properties of "wisdom and folly, will and caprice", and moreover to conceptualizes the "powers of the universe" in the form of anthropomorphized gods and goddesses with these same properties. The job of the modern intellectual, following Goethe, is thus to undo or reverse all of these false anthropomorphized "natures" of the universe, conceptualized prior to Goethe.

Schopenhauer | Will to live

In 1818, German philosopher Arthur Schopenhauer, Goethe's protege, building on Goethe's human chemical theory expanded on the above to introduced his "will to live" theory.

> "Man can do what he wills but he cannot will what he wills."
> — Arthur Schopenhauer (1839), *On the Freedom of the Will*; cited by Einstein (see: Einstein-Murphy dialogue)

In 1844, Schopenhauer, in his second volume *The World as Will and Representation*, cited German chemist Justus Liebig's description of the reaction of damp copper Cu in air containing carbonic acid H_2CO_3, to argue rather cogently that the:

> "The **will** of the copper, claimed and preoccupied by the electrical opposition to the iron, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive."

(add discussion)

Froude | Will of iron

In 1849, James Froude,

in his *Nemesis of Faith*, supposedly, at this point influenced by Goethe (in 1854 he did the first English translation of *Elective Affinities*), penned the following discussion on a general theory of morality and will, via discussion of the nature of the "will of steel", as diagrammed adjacent, when suspended between two magnets, of differing strength: [7]

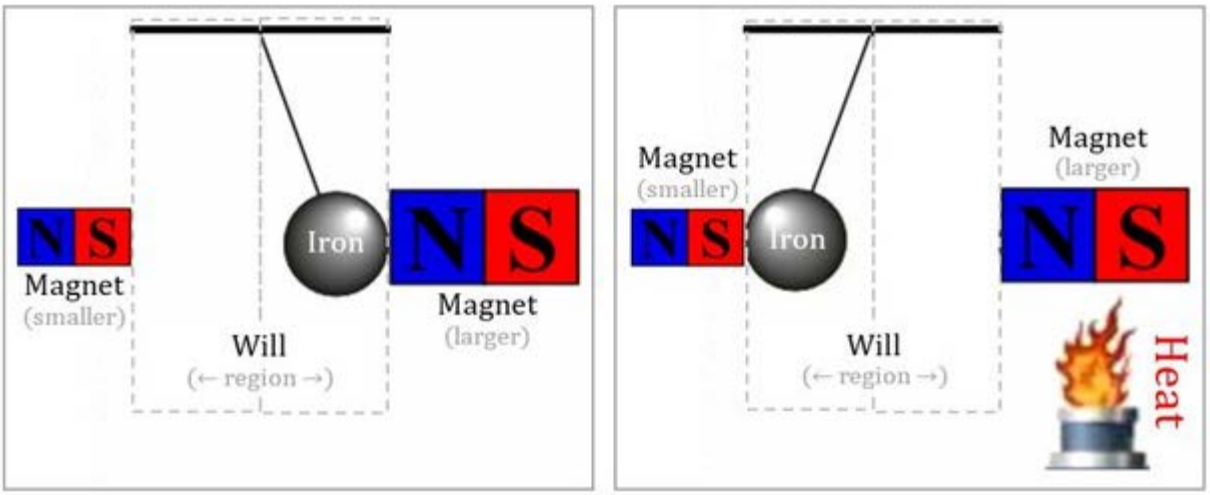

Left: the Froude model of the will (1849), according to which the "will" of the man is "determined" as is the pull of a suspended iron rod to a stronger magnet, similar to the views Arthur Schopenhauer (1844), according to which "sin, as commonly understood, is a chimera". [7] Right: a diagram showing how the will can be changed by external factors, such as the heating of the one of the magnets, during which, when reaching the Curie point (Ñº) (or Curie temperature) (Ñº), the larger magnet will lose its attractive power, after which the so-labeled "will" of the iron may result to be inclined, in this new system state, to the smaller magnet.

"The source of all superstition is the fear of having offended god, the sense of something within ourselves which we call sin. Sin, in its popular and therefore most substantial sense, means the having done something to gratify ourselves which we knew, or might have known, was displeasing to god. It depends, therefore, for its essence on the doer having had the power of acting otherwise than he did. When there is no such power there is no sin.

Now let us examine this. In reflecting upon our own actions we find that they arise from the determination of our **will**, as we call the ultimate moral principle of action, upon some object. When we will, we will something, not nothing. Objects attract or repel the will by the appearance of something in themselves either desirable or undesirable. And in every action, if analyzed, the will is found to have been determined by the presence of the greatest degree of desirableness on the side towards which it has been determined.

It is alike self-contradictory and contrary to experience, that a man of two goods should choose the lesser, knowing it *at the time* to be the lesser. Observe, I say, at the time of action. We are complex, and therefore, in our natural state, inconsistent, beings, and the opinion of this hour need not be the opinion of the next. It may be different before the temptation appear; it may return to be different after the temptation is passed; the nearness or distance of objects may alter their relative magnitude, or appetite or passion may obscure the reflecting power, and give a temporary impulsive force to a particular side of our nature. But, uniformly, given a particular condition of a man's nature, and given a number of possible courses, his action is as necessarily determined into the course best corresponding to that condition, as a **bar of steel suspended between two magnets** is determined towards the most powerful. It may go reluctantly, for it will still feel the attraction of the weaker magnet, but it will still obey the strongest, and must obey. What we call knowing a man's character, is knowing how he will act in such and such conditions. The better we know him the more surely we can prophesy. If we know him perfectly, we are certain.

So that it appears that at the stage first removed from the action, we cannot find what we called the necessary condition of *sin*. It is not there; and we must look for it a step higher among the causes which determine the conditions under which the man acts. Here we find the power of motives depends on the character, or the want of character. If no character be formed, they will influence according to the temporary preponderance of this or that part of the nature; if there be formed character, on the conditions, again, which have formed it, on past habits, and therefore on past actions. Go back, therefore, upon these, and we are again in the same way referred higher and still higher, until we arrive at the first condition, the

natural powers and faculties with which the man has been sent into the world.

Therefore, while we find such endless differences between the actions of different men under the same temptations, or of the same man at different times, we shall yet be unable to find any link of the chain undetermined by the action of the outward circumstance on the inner law; or any point where we can say a power lay in the individual will of choosing either of two courses—in other words, to discover sin. Actions are governed by motives. The power of motives depends on character, and character on the original faculties and the training which they have received from the *men* or *things* among which they have been bred.

Sin, therefore, as commonly understood, is a chimera.

If you ask me why, then, conscience so imperatively declares that it is real? I answer, conscience declares nothing of the kind. We are conscious simply of what we do, and of what is done to us. The judgment may come in to pass sentence; but the judgment is formed on instruction and experience, and may be as wrong in this matter as in any other: being trained in the ordinary theory of morals, it will and must judge according to it; but it does not follow that it must be right, any more than if it be trained in a particular theory of politics, and judges according to that, it must be right. Men obey an appetite under present temptation, to obey which they have before learned will be injurious to them, and which, after the indulgence, they again learn has been injurious to them; but which, at the time, they either expected would, in their case, remit its natural penalty, or else, about which, being blinded by their feelings, they never thought at all. Looking back on their past state of mind, and finding it the same as that to which they have returned when the passions have ceased to work, it seems to them that they knew better, and might have done otherwise. They wish they had. They feel they have hurt themselves, and imagine they have broken a law. It is true they have broken the higher law, but not in the way which they fancy, but by obeying the lower law, which at the time was the stronger.

Our instinct has outrun our theory in this matter; for while we still insist upon free will and sin, we make allowance for individuals who have gone wrong, on the very ground of provocation, of temptation, of bad education, of infirm character. By and by philosophy will follow, and so at last we may hope for a true theory of morals. It is curious to watch, in the history of religious beliefs, the gradual elimination of this monster of moral evil. The first state of mankind is the unreflecting state. The nature is undeveloped, looking neither before nor after; it acts on the impulse of the moment, and is troubled with no weary retrospect, nor with any notions of a remote future which present conduct can affect; and knowing neither good nor evil, better or worse, it does simply what it desires, and is happy in it. It is the state analogous to the early childhood of each of us, and is represented in the common theory of paradise—the state of innocence.

But men had to grow as we grew. Their passions developed rapidly, their minds slowly; but fast enough to allow them, in the interval of passion, to reflect upon themselves, to generalise, and form experience; and, acquiring thus rudimental notions of laws from observing the tendency of actions, men went through what is called the "fall"; and obtained that knowledge of good and evil which Schiller calls "ein Kiesen Schritt der Menscheit" ["a gravel step of humanity"]. Feeling instinctively that the laws under which they were, were not made by themselves, but that a power was round and over them greater than themselves, they formed the notion of a lawgiver [see: Critias hypothesis], whom they conceived they could please by obedience to the best they knew, and make angry by following the worse. It is an old remark, that as men are, such they paint their gods; and as in themselves the passionate, or demonic nature, long preponderated, so the gods they worshiped were demons like themselves, jealous, capricious, exacting, revengeful, the figures, which fill the old mythologies, and appear partly in the Old Testament. They feared them as they feared the powerful of their own race, and sought to propitiate them by similar offerings and services."

(add discussion)

Nietzsche | Will to power

In 1883, building on Schopenhauer's will to live theory, German philosopher Friedrich Nietzsche positioned a "will to power" theory. [3] Nietzsche's notebook writings on this subject, which ran up to 1888, wherein he begins to dig in to heat death, forces, William Thomson, and beyond good and evil, were posthumously collected and published as *The Will to Power*, and considered his long-sought, albeit unrealized magnum opus.

Freud | Will to die | Will to pleasure

> *See: Freud-Schiller drive theory*

A variant of Schopenhauer's will to live is Austrian psychologist Sigmund Freud's 1920 death drive theory, the reverse so to speak of the former, a sort of will to death driving instinct; along with, supposedly, a "will to pleasure" theory, embodied somewhere in his 1921 *Beyond the Pleasure Principle*.

Waton | Will of steel

Here, to note, we may compare Froude's discussion of the will of steel suspended between two magnets to Harry Waton's 1932 physicalism-like argument about free will or the freedom of the will, in respect to steel as follows: [7]

> "The will is free. Free in what sense? It is free to act according to its nature. This, in fact is true of all realities. Take steel. Steel is free to act as steel, and nothing in existence can make steel act otherwise than steel should act."

Wonton's take on steel's will seems to have some Marcus Aurelius flavor, mixed in with scorpion and the frog parable logic; and the will of steel is reminiscent of Arthur Schopenhauer's discussion of the "will of copper".

Other

In 2002, American philosopher William Plank, building on Nietzsche, intermixed with nonequilibrium thermodynamics dissipative system models, outlined his version of a will to power. [3]

Free will

In human thermodynamics, often is the case that when one begins to model human systems, comprised of human actions, as thermodynamic systems that the question of whether or not the "will" is free or not comes to the fore; an example English physicist C.G. Darwin's 1952 thermodynamical view of humans as "human molecules", but molecules with free will justified by a passing mention of their "unpredictability". [2] This is what is called an "ontic opening" method of argument.

Anthropomorphism | De-anthropomorphism

The following shows the timeline of the natural deanthropomorphizings, done famously:

Nature	Anthropomorphism	Deanthropomorphism	Thinker	
Power [s] (of the universe)	God[s]	"Celestial mechanics has no need of that hypothesis."	Pierre Laplace (1802)	[Ñº]
		"God is dead."	Friedrich Nietzsche (1883)	[Ñº]
Movement	Free will	External force (80%) / internal force (20%) chemical affinity movement reaction theory	Johann Goethe (1796)	[Ñº]

		"A man can do what he will, but not will what he wills."	Arthur Schopenhauer (1839)	
		"will to power" drive theory	Friedrich Nietzsche (1883)	
		Retinal molecule photon mediated conformational change	Libb Thims (2007)	[6]
Natural/Unnatural	Good/Evil	"I perceived something in nature (whether living or lifeless, animate or inanimate) that manifested itself only in contradictions and therefore could not be expressed in any concept, much less any word."	Johann Goethe (1770)	[Ñº]
		Natural + unnatural coupling drive theory	Libb Thims (2011)	[4]
Synthesis/Analysis	Life/Death	Defunct theory of life / Life terminology upgrades	Libb Thims (2009)	
Aggregation/Disaggregation Grouped movement	Sociology	→ deanthropomorphization of the 19th century "social matter" terminology Sociology terminology upgrades	Libb Thims (2013)	[5] [Ñº]

(add discussion)

Quotes

The following are related quotes:

> "**Will** is nothing more than a particular case of the general doctrine of association of ideas, and therefore a perfectly mechanical thing."
>
> — Joseph Priestley (c.1780) (Ñº)

> "I cannot help thinking about the immediate circumstances which have brought a thing to pass, rather than about any 'will' setting them in motion. What is done by what is called myself is, I feel, done by something greater than myself in me."
>
> — James Maxwell (1879), "Comment to Fenton Hort when terminally ill" [9]

> "In conscious beings such natural tendencies are accompanied by a certain feeling which we call **will**, and we are happy when we are allowed to act according to these tendencies or according to our will. Now, if we recall the happiest moments of our lives, they will be found in every case to be connected with a curious loss of personality. In the happiness of love this fact will be at once discovered. And if you are enjoying intensely a work of art, a symphony of Beethoven's, for example, you find yourself relieved of the burden of personality and carried away by the stream of music as a drop is carried by a wave."

— Wilhelm Ostwald (1906), *Individuality and Immortality* (pgs. 44-55)

"If thought is capable of being classified with electricity, or will with chemical affinity, as a mode of motion, it seems necessary to fall at once under the second law of thermodynamics. Of all possible theories, this is likely to prove the most fatal to professors of history."

— Henry Adams (1910), *A Letter to American Teachers of History*

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External links

â— Will (philosophy) – Wikipedia.

θΔics

In philosophy, **Will Durant** (1885-1981) was an American total perspective historian-philosopher, with a gifted prose condensed wit style of writing, tending toward the use or interspersion of thermal words and seeming truisms, known generally for his 1926 *The Story of Philosophy*, in which he gives the following hot faith/cold hostility thermal words laden quote: [1]

> "The failure of the reformation to capture France had left for the Frenchmen no half-way house between infallibility and infidelity; and while the intellect of Germany and England moved leisurely in the lines of religious evolution, the mind of France leaped from the hot faith which had massacred the Huguenots to cold hostility with which La Mettrie, Helvetius, Holbach, and Diderot turned upon the religion of the fathers."

Durant's collected works set comprises at least 26-volumes, which includes his 11-volume *The Story of Civilization*.

American writer Gary Freedman, in his circa 2009 ebook *Significant Moments*, somehow attributes the attributes the origin of life puzzle solution possibility that "chemically, all life is one" to Durant's *The Life of Greece*. [2]

Civilization reformation theory

Durant seems to be known for his cyclical and or transformation view of civilizations and wealth distributions. In 2009, American physical chemist Thomas Wallace, in his chapter section on the mechanistic thermodynamics paradigm model of socioeconomic system change, cites the following quote by Durant as one of the best depictions of the concept of what he calls the "reconstitution" of or "rebirth of dying civilizations", as he defines the term: [4]

> "Civilization does not die, it migrates; it changes its habitat and its dress, but it lives on. The decay of one civilization, as of one individual, makes room for the growth of another; life sheds the old skin, and surprises death with fresh youth. Greek civilization is alive; it moves in every breath of mind that we breathe, so much of it remains that none of us in one lifetime could absorb it all. We know its defects—its insane and pitiless wars, its stagnate slavery, its subjection of woman, its lack of moral restraint, its corrupt individualism, its tragic failure to unite liberty with order and peace. But those who cherish freedom, reason, and beauty will not linger over these blemishes. They will think of Greece as … our nourishment and our life."

Likewise, some associate the following cyclical Pareto principle quote by Durant to thermodynamic equilibrium: [4]

> "We conclude that the concentration of wealth is natural and inevitable, and is periodically alleviated by violent or peaceable partial redistribution. In this view all economic history is the slow heartbeat of the social organism, a vast systole and diastole of concentrating wealth and compulsive redistribution."

Thinkers

The following is Durant's circa 1950 list of the ten "greatest thinkers" of all time, shown in chronological order, as found in his 2002 collected works book *The Greatest Minds and Ideas of All Time*: [6]

Durant's 10 greatest "thinkers"

#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
Confucius	Plato	Aristotle	Copernicus	Aquinas	Bacon	Newton	Voltaire	Kant	Darwin
IQ=170	IQ=180	IQ=195	IQ=190	IQ=165	IQ=180	IQ=215	IQ=195	IQ=180	IQ=175

Quotes

The following are relevant quotes, some of which are shown in duplicate: [5]

> "Even when repressed, inequality grows; only the man who is below the average in economic ability desires equality; those who are conscious of superior ability desire freedom, and in the end superior ability has its way."

The following are other poster quotes:

References

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External links

â— Will Durant – Wikipedia.

θΔics

In science, **will to live**, or *Wille zum Leben* in the original German, is a physical chemistry theory of will, outlined by German philosopher Arthur Schopenhauer in his *The World as Will and Representation* (1814/44), based on a platform of German polymath Johann Goethe's human chemical theory, which in short posits that all observable phenomena is controlled by a driving force or 'will' in anthropomorphic speak, or 'will to live' as the theory has come to be known, or drive, whereby one "can indeed do what he wants, but he cannot will what he wants".

Overview

The following passages and comments by Schopenhauer outline his general will to live theory:

> "As the title indicates [*Elective Affinities*], though Goethe was unaware of this, [it] has as its foundation the idea that the will, which constitutes the basis of our inner being, is the same will that manifests itself in the lowest, inorganic phenomena." [1]
>
> "Knowledge which everyone possesses directly in the concrete, namely as feeling, is the knowledge that the inner nature of his own phenomenon, which manifests itself to him as representation both through his actions and though the permanent substratum of these his body, is his *will*. This constitutes what is most immediate in his consciousness, but as such it has not wholly entered into the form of the representation, in which object and subject stand over against each other; on the contrary, it makes itself known in an immediate way in which subject and object are not quite clearly distinguished, yet it becomes known to the individual himself not as a whole, but only in its particular acts. Of itself it will become the key to the knowledge of the innermost being of the whole of nature, since he now transfers it to all those phenomena that are given to him, not like his own phenomenon both in direct and in indirect knowledge, but in the latter solely, and hence merely in a one-sided way, as *representation* alone. He will recognize that same will not only in those phenomena that are quite similar to his own, in men and animals, as their innermost nature, but continued reflection will lead him to recognize the force that shoots and vegetates in the plant, indeed the force by which the crystal is formed, and the force that turns the magnetic to the North Pole, the force whose shock he encounters from the contact of metals of different kinds, the force that appears in the elective affinities of matter as repulsion and attraction, separation and union, and finally even gravitation, which acts so powerfully in all matter, pulling the stone to the earth and the earth to the sun; all these he will recognize as different only in the phenomena, but the same according to their inner nature." [2]
>
> "The will of the copper, claimed and preoccupied by the electrical opposition to the iron, leaves unused the opportunity that presents itself for its chemical affinity for oxygen and carbonic acid, behaves exactly as the will does in a person who abstains from an action to which he would otherwise feel moved, in order to perform another to which he is urged by a stronger motive." [2]

Terminology issues

While Schopenhauer's will theory is fairly cogent, it does smack of an anthropomorphizing of chemistry or to an extent of blend of both the extrapolate down approach and the extrapolate up approach, whereas the gain in knowledge in modern science has allowed us deeper insight into physical and chemical processes, and hence allowing a stripping away of the many of the older anthropomorphisms, e.g. life (see: defunct theory of life), among others. To exemplify, in 1938 English physiologist Charles Sherrington, in his own grappling battle with explaining existence in pure physical and chemical terms, exemplifies how when the will to live terminology is extrapolated down to the combustion reaction of the ignition of gunpowder the notion of a 'will-to-implode' becomes a laughingstock: [3]

> "Let us seek where we can first trace mind, or where we last lose it. Does it not begin with urge to live? Zest to live which is part and parcel of life? Is it not that all through? Becoming gradually more sophisticated? The zest of the living thing to go on living, and renew itself as a new life. The zest which implements the whole conduct of life; the zest which the whole conduct of life implements. At once an urge and a motive. No species of life without it. Innate, inalienable, impelling alike man and animalcule. A

character which in the more than millionfold variety of nature's types does not fail or falter in single one. Individual minds of endless variety of type, reptile, fish, bee, octopus, ant. Man observing them, wrapt in his own anthropism, finds some as strange in mind as in the bodily forms that clothe them. Some on still closer knowledge become to him still more strange; some on closer knowledge hateful beyond all tolerance; some delightful to know more closely. But in them all, whatever else, this constant trait; the dirve to live and increase. We can call it zest, and zest it often is, but who shall say where, traced along life's scale of forms receding from man's own, zest becomes blind drive, and drive retreats into mindless urge? It may be mind still, although mind 'over the horizon'.

It was panegyrized years ago as **"will-to-live"**. But that was a misconception and despite its intention sadly inadequate to the fact. As well call an ocean-tide which sweeps the mariner onward his 'will'. As well suppose we summon the spring's growth by asking for it. To think of the vast nether flood of the 'urge-to-live' as mere 'will-to-live' is to miss the meaning of the whole subconscious world whence man has come, and in part still belongs. Urge-to-live is an immense natural situation, greatly older and far wider than 'will' can embrace. It was a biological 'law' before 'will' came to be.

I remember sowing into 2 liters of distilled water contained in one of a pair of similarly filled tall glass jars a minute speck of a culture of cholera germ. I added this speck to the clear water just before leaving the laboratory late in the summer afternoon. The water in both the jars then crystal-clear. Next forenoon, to my extreme astonishment, the whole tall column of water in the one jar was faintly opalescent. I microscoped a drop. It teemed with myriads of cholera germs, the progeny of my speck of the day before. An almost incredible multiplication. But a philosophy which dubs such a phenomenon **'will-to-live'** adopts melodrama. To gunpowder its lyricism would impute a 'will-to-explode'."

The take-away wisdom of this is that, in regards to terminology and conception development, the extrapolate down approach is the safer approach to follow.

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External links

â— Philosophy of the 'Will' (Arthur Schopenhauer) – Wikipedia.
â— Will to live – Wikipedia.

θΔics

In science, **will to power**, German *wille zur macht*, is an 1883 theory, conceived by German philosopher Friedrich Nietzsche, conceptualized as an upgrade to Arthur Schopenhauer's 1818 will to live theory—itself a modified extension of the Johann Goethe's 1796 chemical affinity internal force/external force reacting system metamorphology theory of the will—intermixed with aspects of Roger Boscovich's 1758 "center of forces" atomic theory and Wilhelm Roux's 1881 Darwin-modified cellular-level "struggle for existence" theory, the gist of which argues something to the affect that the so-called "will" of all material entities throughout the universe is mediated by the inherent desire to obtain "power" or mastery or stability of work per unit time dynamics in the atomic geometries of movement.

In 1888, Nietzsche had some 1,067 draft noted completed on this subject, posthumously-published as *The Will to Power: An Attempt at a Revaluation of All Values*. [2]

Overview

(add)

Thermodynamics

Nietzsche's will to power theory is not only, supposedly, intermixed with some kind of wave mechanics theory, e.g. citation of the ebb and flow of the ocean, but also thermodynamics, supposedly, somewhere discussing "will to power cycles" between a hot high point [hot body] and a cold low point [cold body], in global and local terms. American Nietzsche scholar philosopher Eric Steinhart comments, to give one example: [1]

> "These thermal cycles constitute the *inner will* that distinguishes the will to power form merely mechanical forces."

Moreover, supposedly, Nietzsche, as Steinhart discusses, somewhere renders "entropy cyclical" in his theory.

Humor

See also: Thermodynamics humor

The following is a humorous depiction of a *Will to Power Bar*, supposedly sold for $4.99 out of PhilosophersGuild.com, a play on the *Power Bar*—the first "energy bar", invented in 1986 by Canadian athlete Brian Maxwell, Mike McCollum, and nutritionist Jennifer Biddulph—and Nietzsche's will to power theory, his uberman theory, his theories on good and evil, and his beyond Judeo-Christianity models of philosophical atheism and nihilism: [3]

The following is a open version of the bar, which supposedly outlines a 12-step program to escape the constraints of the Judeo-Christianity belief system, the system of beliefs predominately taught to us as children. In 2007, another seeming version of the will to power bar brand, supposedly, was being sold at the University of Virginia in 2007 for $2.99.

(add discussion)

Quotes

The following is related "money, power, women" gangster philosophy quote: (clip)

> “In this country, you gotta make the money first. Then when you get the money, you get the power. Then when you get the power, then you get the women.”
>
> — Tony Montana (1983), *Scarface*

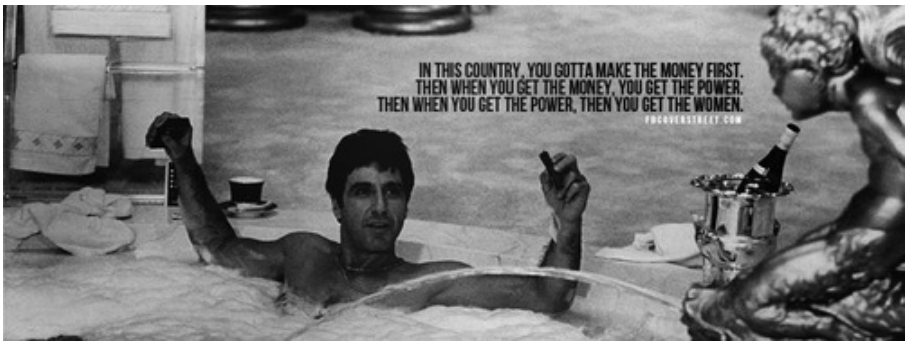

The so-called "money, power, respect" philosophy was introduced in the 1983 film during the pool scene after Manny gets rejected by a woman who is laying out. (clip)

A spin-off variant of the above, to note, is the "money, power, respect" street philosophy of the Scarface motto association, supposedly on the logic that: "when you get the women, then you get the respect", such as found in the 1998 debut album title *Money, Power, & Respect*, of the hip hop group The LOX, the 2006 film *Money, Power, Respect: How Far Will You Go?*, and the 2006 video game title *Scarface: Money, Power, Respect.*

Search keys

● Nietzsche, will to power, thermodynamics

See also

● Freud-Schiller drive theory

References

1. (a) Steinhart, Eric. (1999). “The Will to Power and Parallel Distributed Processing” (§:From Thermodynamic to Philology: the Thermodynamic Conception of the Will to Power), in: *Nietzsche, Epistemology, and Philosophy of Science: Nietzsche and the Sciences II* (editors: Babette Babich, Robert Cohen) (pgs. 313-22; §, pgs. 314-). Kluwer Academic Publishers.
(b) Steinhart, Eric. (1999). *On Nietzsche* (thermodynamics, pg. 80). Cengage Learning.
2. Nietzsche, Friedrich. (1885). *Will to Power: An Attempt at a Revaluation of All Values* (translator: Walter Kaufmann and Reginald Hollingdale; editor: Walter Kaufmann). Random House, 2011.
3. (a) Will to Power Bar ($4.99) – PhilosophersGuild.com.
(b) PowerBar – Wikipedia.

Further reading

● Plank, William. (2002). *The Quantum Nietzsche: the Will to Power and the Nature of Dissipative Systems* (ch. 7: Human Reality as a Thermodynamics Model, pgs. 33-34). iUniverse.

External links

● Will to power – Wikipedia.

θΔics

In existographies, **Josiah Willard Gibbs** (1839-1903) (IQ:205|#5) (Gottlieb 1000:825) [RGM:1270|1,500+] (GS:2) [CR:845], pronounced “Gibs” (Ñº), as in “bibs”, not “Jeebs” (Ñº), aka "Willard Gibbs", was an American engineer (first PhD engineer in America), mathematical physicist, and preeminent thermodynamicist, who, through the publication of his 1876 *On the Equilibrium of Heterogeneous Substances*, is considered, along with German physicist Hermann Helmhotlz, as the central founder of chemical thermodynamics. [1] Gibbs' grouped publications in thermodynamics are sometimes referred to as "Gibbsian thermodynamics", although this is but synonym for modern chemical thermodynamics; whereas, his 1876 *Equilibrium* treatise, specifically, has been famously called the *Principia* of thermodynamics. In commentary on his *Equilibrium* paper, written over a period of three years, 1875-78, Gibbs stated that: [7]

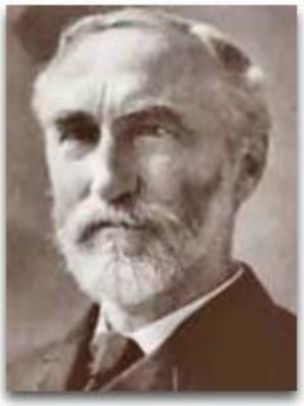

Nationality	American
Fields	Chemical thermodynamics Statistical mechanics Vector analysis
Alma matter	Yale University
Students	Henry Bumstead, Edwin Wilson, Irving Fisher, Lynde Wheeler
Known for	Gibbs free energy | Gibbs energy Gibbs function Gibbs fundamental equation Gibbs energy flow Gibbs energy of attraction Gibbs energy of repulsion Gibbs entropy Gibbs equation Gibbs free energy change Gibbs landscape Gibbs-Clausius equations
Eponyms	Gibbsian school Gibbsian thermodynamics Gibbs stamp Gibbs tombstone Gibbs Award
Influences	Rudolf Clausius, Francois Massieu, James Maxwell

Signature

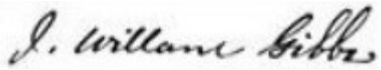

> “I had no sense of the value of time, of my own or others, when I wrote it.”

Through his 1901 work on the statistical mechanic nature of thermodynamics he is considered as one of the central developers of the science of statistical thermodynamics. [2] Gibbs is also referred to as the “father of chemical thermodynamics”. [15] This timelessness quote above by Gibbs, to note, might be representative of Csíkszentmihályi flow, a state of timeless associated with frictionless highly productive work output.

Abstract

The following is an abstract of Gibbs chemical thermodynamic work, as summarized by American equilibrium historian Cynthia Russett: [36]

> “What [Gibbs] did, essentially, was to add to the independent variables, entropy and volume, of the prime [thermodynamic] equation, a specific number of other independent variables or energy terms equal to the number of components in the system. The new concept he introduced in this connection, called the chemical potential, performs the same function in chemical systems as temperature and pressure do in mechanical systems. Here lay the key to the vast field of chemical equilibrium. In an isothermal (constant temperature) complex system, equilibrium exists when the chemical potential is at a minimum … Gibbs had pioneered a new scientific field, that of physical chemistry.”

(add discussion)

Students

The few known direct students of Gibbs include: physicist Henry Bumstead (reviewer for Henry Adams), Irving Fisher, noted maker of the first-every human thermodynamics variables table, and mathematician Edwin Wilson (advisor of Paul Samuelson), noted for his efforts in the 1930s to teach a physical chemistry / steam engine (thermodynamics) based course called "mathematical economics" at Harvard.

Two other direct students of Gibbs include Lee De Forest (1873-1961), who earned his PhD degree in 1899 with a dissertation on radio waves, and Lynde Wheeler, noted for his 1951 biography on Gibbs, who received a PhD in physics in 1902, with a thesis on "The Reflection of Polarized Light from Mercury in Water", both dissertations supposedly

supervised by Gibbs.

Gibbs also is said to have advised the following thesis's: Eliakim Hastings More (1885), Percey Frankly Smith (1891), George Pratt Starkweather (1898), and Herbert Edward Hawkes (1900), among a few others wherein his help is acknowledged, which seem to included Bumstead and Wheeler. [29]

Difficulty | Density

See also: Hidden treasures

It might aptly be said that Gibbs' 1876 *On the Equilibrium of Heterogeneous Substances*, published at age 37, is the most-difficult-to-read and densest work in all of science. This is evidenced, firstly, by the fact that of the supposed 300-scientists that Gibbs mailed his treatise out to (see: Gibbs correspondence list), only Maxwell was able to understand it and thereby after so intrigued by it as to spend an entire winter building a three-dimensional plaster surface of Gibbs coordinates. Other noted quotes on the so-called "difficulty" of Gibbs' work are as follows:

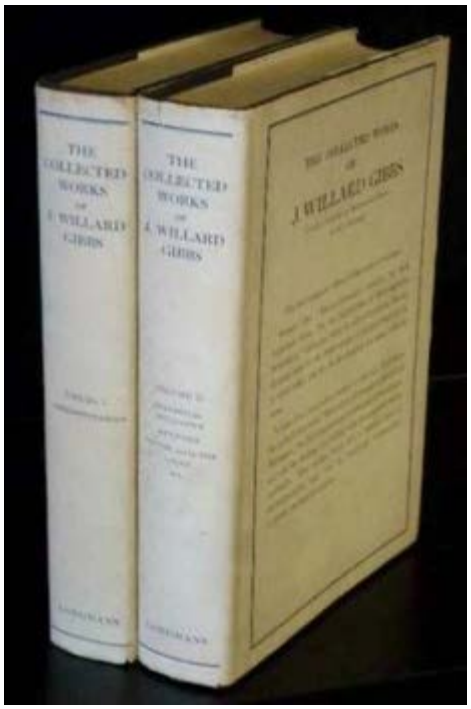

Gibbs collected works, namely: *Scientific Papers, Volume One* (*Thermodynamics*), *Scientific Papers, Volume Two* (*Dynamics, Vector Analysis, Multiple Algebra, Electromagnetic Theory of Light, etc.*), and *Elementary Principles of Statistical Mechanics* (1902) (see: power center).

> "Your *Equilibrium* is too difficult and **too condensed** for most, I might say all, readers."
>
> — John Strutt (1892), "Letter to Gibbs"; Gilbert Lewis (1923) was the first to "uncondense" it; followed by Guggenheim (1933)

> "There is, probably, no other book [*An Outline of the Theory of Thermodynamics* (1900)] so well suited as this to the needs of him who is making preparation for an attempt to explore those tremendous abysses of thought, where reigns that condition of supernal calm known as the *Equilibrium of Heterogeneous Substances*."
>
> — Edwin Hall (1902), "Review of Edgar Buckingham's *Thermodynamics*" [55]

> "Only one man lived who could understand Gibbs' papers. That was Maxwell, and now he is dead."
>
> — Anon (1903), Connecticut Academy member; *circa* Nov, said in meeting [29]

> "It was a number of years before its value was generally known; this delay was due largely to the fact that its mathematical form and rigorous deductive processes make it difficulty reading for anyone, and especially so for students of experimental chemistry whom it concerns most."
>
> — Henry Bumstead (1903), "Josiah Willard Gibbs", *American Journal of Science*

> "Let a drop of wine fall into a glass of water; whatever be the law that governs the internal movement of the liquid, we will soon see it tint itself uniformly pink and from that moment on, however we may agitate the vessel, it appears that the wine and water can separate no more. All this, Maxwell and Boltzmann have explained, but the one who saw it in the cleanest way, in a book that is too little read because it is difficult to read, is **Gibbs**, in his *Principles of Statistical Mechanics*."

— Henri Poincare (1905), *The Value of Science* (Ñº)

"I have run my head hard up against a form of mathematics that grinds my brains out. I flounder like a sculpin in the mud. It is called the 'law of phases', and was invented at Yale. No one shall persuade me that I am not a phase."

— Henry Adams (1908), "Letter to Elizabeth Cameron" (Sep 29) [40]

"The works of Willard Gibbs can only be attacked with profit by the expert mathematician."

— William Bayliss (1915), *Principles of General Physiology*

"Although Gibbs' treatment of thermodynamics has been accessible in English, French, and German for many years, its highly condensed and abstract form has repulsed the great majority of students, with the result that the science of thermodynamics has been recast in many different moulds during the last fifty years."

— Frededrick Donnan (1932), Irish physical chemist

"The original source is, of course, Gibbs, but his discussion is difficult reading."

— Edward Guggenheim (1933), *Modern Thermodynamics by the Methods of Willard Gibbs*

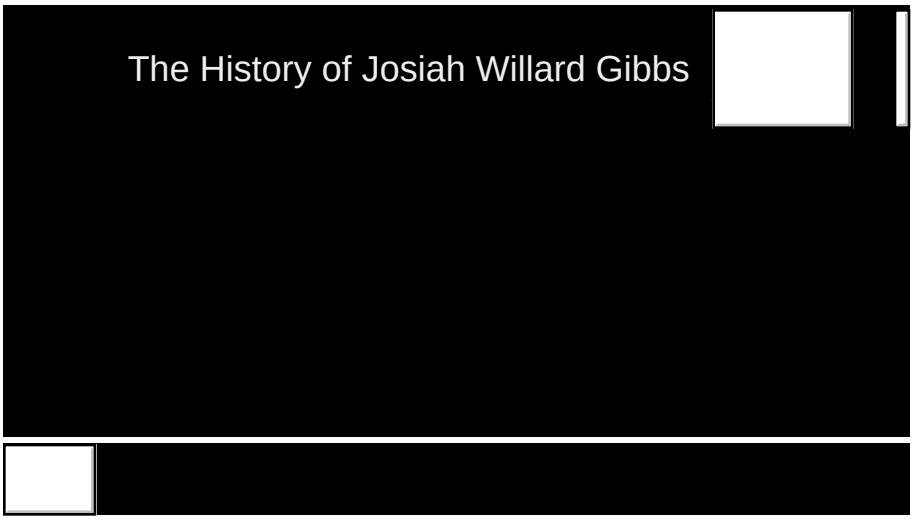

A 2017 video summary of **Gibbs** based on Lynde Wheeler's 1951 *Josiah Willard Gibbs: the History of a Great Mind*.

"Reading Gibbs' *Equilibrium* is something like reading Laplace, who frequently omits but the conclusion, with the optimistic remark 'it is easy to see', shorthand for things 'seen' following hours—sometimes days—of hard work."

— E.T. Bell (c.1940), Scottish mathematician

"I worked this out in detail—the principle that the maximum value of entropy indicates a state of equilibrium, according to which all the laws of physical and chemical equilibrium follow from a knowledge of entropy—during the following years, in a number of different researches. First, in investigations on the changes in physical state, presented in my probationary paper at Munich in 1880, and later in studies on gas mixtures. All my investigations yielded fruitful results. Unfortunately, however, as I was to learn only subsequently, the very same theorems had been obtained before me, in fact partly in an even **more universal form**, by the great American theoretical physicist Josiah Willard Gibbs, so that in this particular field no recognition was to be mine."

— Max Planck (1948), "Scientific Autobiography" (pg. 20)

"There is a considerable testimony from eminent men that they found the *Equilibrium of Heterogeneous Substances* very difficult reading. But that it is obscure or lacking in clarity of style is untrue. It is logical, terse, and requires unrelieved concentration of thought."

— Lynde Wheeler (1951), *Josiah Willard Gibbs: the History of a Great Mind*

"I have not had the opportunity to discuss this matter with a physical chemist, a person with a good understanding of the **great work** by J. Willard Gibbs on chemical thermodynamics. I am sure that he or she would agree with me."

— Linus Pauling (1989), "Schrodinger's Contribution to Chemistry and Biology"

"Very few experts in thermodynamics have the ability to read this from cover-to-cover."

— David Bottomley (1999), Japanese physicist

"The intrepid reader who takes on Gibbs' *Equilibrium* can expect months of 'blind work'."

— William Cropper (2001), *Greatest Physicists*

"Gibbs' thermodynamic papers—difficult, abstract, and buried in an obscure journal on the fringes of European scientific awareness-remained for a time virtually unknown except among a small circle of admirers. Fortunately, the latter included physicist James Maxwell, who advocated effectively for Gibbs' insights and methods. Major centers of Gibbsian influence began to appear in Germany, Holland, and elsewhere, as many Nobel Prize winning careers were launched from a passing remark or footnote in Gibbs' monumental masterpiece."

— Frank Weinhold (2009), *Classical and Geometrical Theory of Chemical and Phase Thermodynamics*

"Gibbs' work is much deeper than I ever possibly imagined."

— Jeff Tuhtan (2011), PhD "A Modeling Approach for Alpine Rivers Impacted by Hydropeaking Including the Second Law Inequality"

"Gibbs is not an easy read. He wrote in a terse, abstract style and provided few examples to illustrate his general conclusions. In addition, he would seldom tell his readers about the specific problems that led to the work on which he was reporting, much less inform them of any larger project he thought results might further."

— Robert Deltete (2011), "Josiah Willard Gibbs" [25]

(add discussion)

Graphical thermodynamics

In Gibbs' second graphical paper of 1873, it is said that he extended his graphical methods to three-dimensional space, the first example of which was the volume-pressure-temperature diagram employed by Scottish engineer James Thomson in 1871. [22]

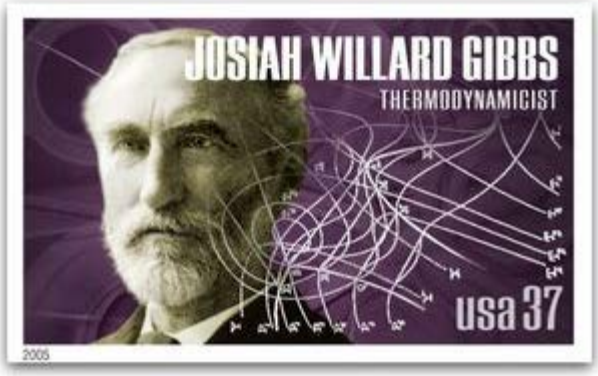

2005 commemorative Gibbs stamp, showing an overlay of one of Scottish physisict James Maxwell's 1875 thermodynamic surfaces, based on Gibbs' two 1873 graphical thermodynamics papers.

Equilibrium of Heterogeneous Substances

Gibbs is best-known for his 1876, 700-equation *Equilibrium* treatise on the extrapolation of the thermodynamics of Rudolf Clausius to chemical systems, among others.

The central thread of Gibbs logic, supposedly, employs the variation principle of Joseph Lagrange. [18] More research needs to be done on this topic, however, as Gibbs does not cite Lagrange (nor William Hamilton), but rather bases his work on Clausius; Clausius, in turn, does cite Hamilton, but his derivation seems to be self-standing.

Human thermodynamics

In human thermodynamics, through his theories on the free energy of chemical substances and spontaneity, in relation to human chemical reaction prediction, Gibbs is considered one of central founders. In particular, the most-dominant thermodynamic quantity in chemistry is the the Gibbs free energy, G, named in honor of Gibbs by English physicist Edward Guggenheim in 1933: [19]

$$G = H - TS$$

The following 2009 summary by American physical chemist Thomas Wallace outlines the role of Gibbs free energy in the process of society: [20]

> "The thermodynamic parameters enthalpy H and entropy S represent the variables of heat content and probability, respectively, for the physical, chemical, and biological processes of nature and society. The thermodynamic parameter free energy G represents the fundamental driving force in nature and determines whether physical and chemical processes conducted by nature and society will take place."

In very simple terms, as explained by German polymath Johann Goethe in 1809, the entire process and workings of society can be described as the summation of all human chemical reactions occurring in the boundary of the society, whereby each individual reaction can be quantified as an elective affinity reaction, wherein the chemical affinity A or force of reaction, shown to be equal to the negative of the change in the free energy by German physicist Hermann Helmholtz in 1882, determines what will occur:

$$A = -\Delta G$$

Therefore, the affinities between people, are functions of Gibbs free energy changes involved in human interactions. This description, however, is compounded by the 1941 discovery, by Fritz Lipmann, that free energy coupling occurs.

Statistical mechanics

In 1892, Gibbs wrote English physicist John Strutt with characteristic modesty:
[13]

> "Just now I am trying to get ready for publication something on thermodynamics from the *a priori* point of view, or rather on 'statistical mechanics' . . . I do not know that I shall have anything particularly new in substance, but shall be contented if I can so choose my standpoint (as seems to me possible) as to get a simpler view of the subject."

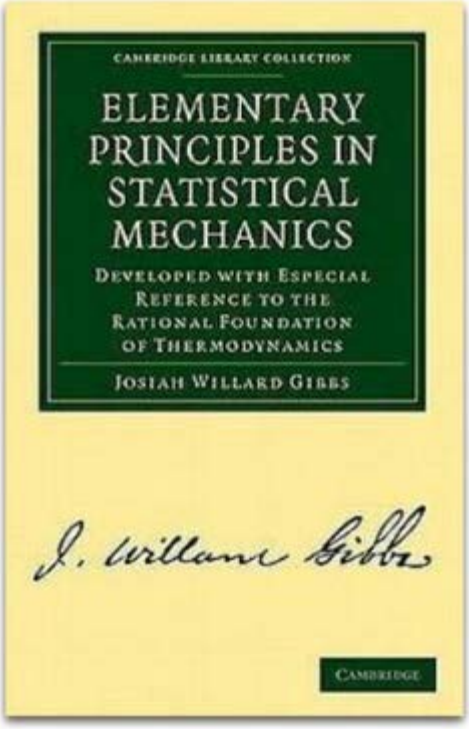

Lawrence Henderson describes **Gibbs'** *Statistical Mechanics* (1902) as the "greatest example of sustained thought in the history of America."

Supposedly, by the term *a priori* Gibbs meant related to or derived by reasoning from self-evident propositions. In any event, ten years later this work resulted in a classic book, *Elementary Principles in Statistical Mechanics* (1902), which has since been called the "bible of statistical physics", which put statistical mechanics on a new and more general basis.

> "**Gibbs**' last work on *Statistical Mechanics* (1902), written after long years of meditation, but, as it seems, almost without notes to aid in the task, and completed in a period of less than a year, is perhaps the greatest example of sustained thought in the history of America."
>
> — Lawrence Henderson (1917), *The Order of Nature* (pg. 131)

As far as terminology goes, the terms: "statistical mechanics" (coined by Maxwell in 1878), "statistical physics", and "statistical thermodynamics", all essentially address the same subject, the use of statistics to explain thermodynamic laws and behaviors of physical systems, although each seems to have a peculiar flavor and direction of presentation. [14]

German-born American physicist Albert Einstein, unaware of Gibbs' work, had undertaken a similar generalization of Boltzmann's theory in theory papers of 1902-1904, but as he later observed: [26]

> "I only wish to add that the road taken by Gibbs in his book [*Elementary Principles in Statistical Mechanics*], which consists in one's starting directly from the canonical ensemble, is in my opinion preferable to the road I took. Had I been familiar with Gibbs' book at that time, I would not have published all those papers at all, but would have limited myself to the discussion of just a few points."

(add discussion)

Education

Gibbs entered Yale University at the age of 15 graduating a salutatorian in 1858 at the age of 18. [7]

In this period, Gibbs seems to have been mentored by American mathematician

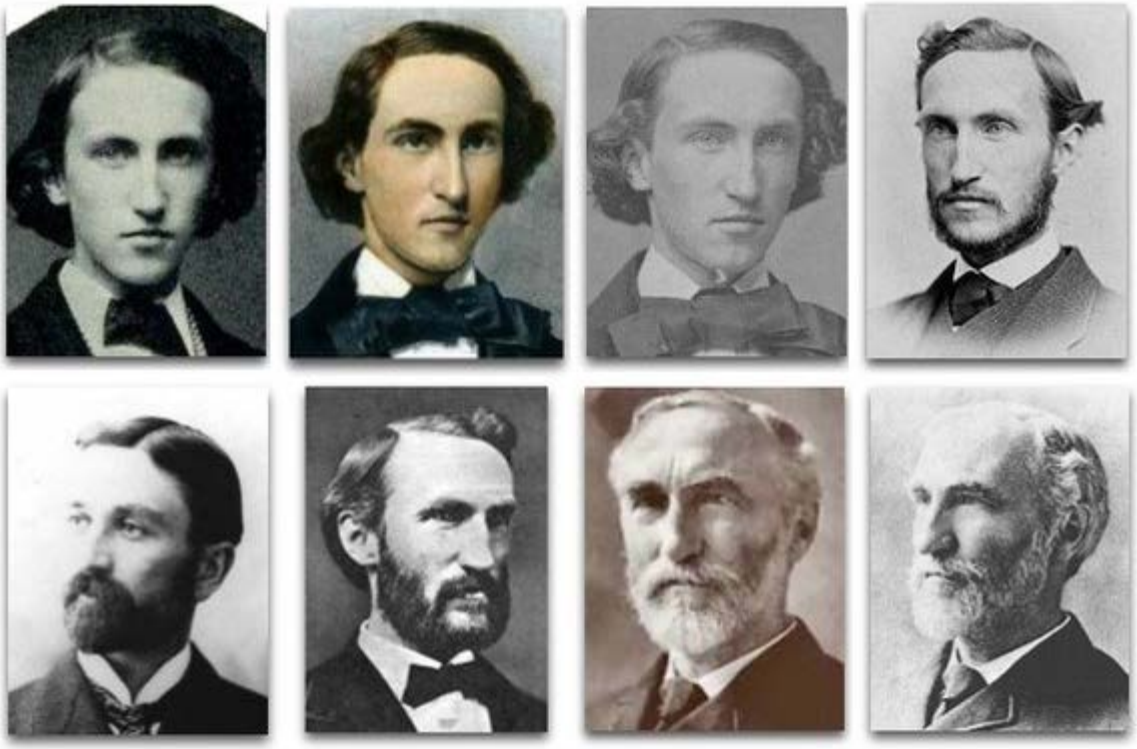

Top left: Gibbs (c.1855). Top middle two: Gibbs (c.1860). [16] Top right: Gibbs as Yale tutor (1863-64). Bottom right: Gibbs (c.1895).

Hubert Newton, the so-called "grandfather of American mathematics", who in 1855 had become Yale's only professor of mathematics, after receiving his BA their in 1850.

American mathematics historian Steve Batterson (2008) describes Newton as the "confidant and sounding board for Gibbs." [41] Newton and Rudolf Clausius seems to have been the only two people Gibbs ever wrote biographies or obituaries on (see: collected works). [42]

He then entered the new Yale graduate school earning the first PhD in engineering in the United States, completed in 1863. Gibbs' PhD thesis was “On the Form of the Teeth of Wheels in Spur Gearing”. [10] In 1871, two years after returning from a study abroad at various universities in Europe, Gibbs became Yale's first professor of mathematical physics.

Anecdote | Touching foreheads to floor

In 1932, American educational theorist Albert Nock gave the following summary about about Gibbs, in the context of eminence: [23]

> “In the last generation, this country produced one of the most eminent men of science in the whole world. His name was quite unknown among us while he lived, and it is still unknown. Yet I may say without too great exaggeration that when I heard it mentioned in a professional assembly in the Netherlands two years ago, everybody got down under the table and touched their foreheads to the floor. His name was Josiah Willard Gibbs.”

The "professional assembly", Nock refers to here, may likely have been some convention or meeting of sorts associated with the Dutch school of thermodynamics, although this is only a reasoned guess.

Anecdote | Maxwell's suggestion

See main: Thermodynamics anecdotes

Maxwell: During a visit to Cambridge University, in the years *circa* 1873-78, the president of Yale (likely Reverend Noah Porter, president from 1871 to 1886) inquired about possible people to promote at Yale. [21] The famous Scottish

physicist, James Maxwell immediately suggested Gibbs. At this time there was also a socially rather prominent individual, named Alan Gibbs, at Yale. Thus, the president replied with pleasure. "Oh, you mean *Alan* Gibbs." "No! No!" answered Maxwell; "Willard Gibbs." The president's reply was: [11]

> "Well, but he is a nobody. He just sits in his room and writes."

Anecdote | J.J. Thomson's suggestion

J.J. Thomson: Gibbs had a mailing list of over 300 of the world's greatest scientists, to which, it has been said, he sent his publications to. Of the bunch, it was Scottish physicist James Maxwell who first took appreciation of Gibbs' work and began to promote it. One of Gibbs' biographers, J. G. Crowther, remarked that Maxwell became, in effect, Gibbs' "intellectual publicity agent". In the years after Maxwell's premature death, in 1879, a humorous incident occurred between one of Maxwell's successors at Cambridge English physicist Joseph Thomson, the discoverer of the electron, and a president of a newly formed American university on a faculty-recruiting mission. As the story went, according to Thomson: [7]

> "He came to Cambridge, and asked me if I could tell him of anyone who could make a good Professor of Molecular Physics." Thomson told him that one of the greatest molecular physicists in the world was **Willard Gibbs**, and he lived in America. The president responded that Thomson probably meant *Wolcott* Gibbs, a Harvard chemist. Thomson was empathetic that he did mean *Willard* Gibbs, and tried to convince his visitor that Gibbs was indeed a great scientist. "He sat thinking for a minute or two", Thomson continues, "and then said, "I'd like you to give me another name. Willard Gibbs can't be a man of much personal magnetism or I should have heard of him'."

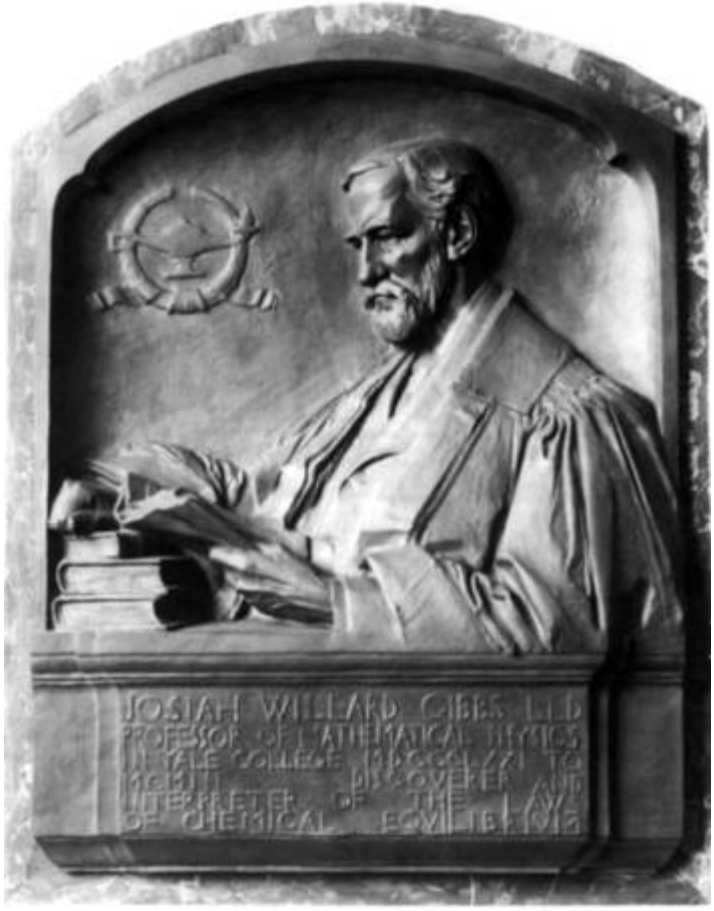

When the German physical chemist Walther Nernst visited Yale in 1906 to give the Silliman lecture, he was surprised to discover that there was no tangible memorial for Gibbs, after which he therefore donated his $500 lecture fee to the university to help pay for a suitable monument, which was finally unveiled in 1912 in the form of a bronze bas-relief (above) —with caption: "discoverer and interpreter of the laws of chemical equilibrium"—by sculptor Lee Lawrie, installed in the Sloane Physics Laboratory, now at the entrance to the J. W. Gibbs Laboratories, Yale University. [30]

(add)

Anecdote | Mathematics is a language

Gibbs: Gibbs was not talkative and not prone to giving public speeches. Once at the faculty meeting, however, after long wrangling - whether the curriculum should be expanded to make more space for language classes (thus cutting down on time given to mathematics), or whether math should be taught to all freshmen instead - Gibbs stood up and defensively said:

> "Mathematics is a language!"

after which he sat down and did not say a word more thereafter. [12]

Anecdote | Student diagram help

The following, as recounted by Muriel Rukeyser (1942), is a rather telling account of Gibbs attempt to explain one of his geometrical diagrams to a confused student: [29]

> “Gibbs was unknown to the people about him, who were beginning to hear rumors of some achievement, dimly realized, and not, as it seemed, capable of being described. The stories grew in New Haven. One tale was of a student who went into see Gibbs in his office. He asked him about a diagram which had been explained in class; and Gibbs, to explain, began to draw imaginary lines across the floor. The lines grew more complicated. They reached up the walls, to the ceiling, across the door; and, as the student left exhausted, he saw that Gibbs was still standing in the center of the floor, hopelessly enmeshed in his own diagram.”

Anecdote | Uncut books

Sometime between 1899 and 1902, in the years when Edwin Wilson studied under Gibbs at Yale, the following incident occurred, as recounted by Wilson in 1930: [31]

> “Once I desired to consult some books which were not in the library but which I had seen on the shelves in his office during a lecture. I ventured to ask whether I might borrow them. He was entirely willing. As I picked the books off the shelves I noticed that the pages had not been cut and enquired whether I might cut them, to which he replied : Certainly, if you think it worthwhile. Probably I looked abashed, for he added: The author kindly sends me all he writes; there is a great deal of it; I sometimes feel that a person who writes so much must spread his message rather thin.”

(add)

Quotes | On

The following are parse and tributes given to Gibbs:

-

> “Read **Gibbs**. He has more sense than any German.”
>
> — James Maxwell (1874), “Letter to Peter Tait”, Oct 12 (Ñº)(Ñº)

-

> “In a series of remarkable papers read before the Connecticut Academy, **Gibbs** has proved that the laws of thermodynamics are as applicable to chemical action as to simple changes of state.”
>
> — James Dewar (1888), “Presidential Address to the Society of Chemical Industry” [43]

> “The translation of your main work is nearly complete and I cannot resist repeating here my amazement. If you had published this work over a longer period of time in separate essays in an accessible journal, you would now be regarded as by far the greatest thermodynamicist since Clausius—not only in the small circle of those conversant with your work, but universally—and as one who frequently goes far beyond him in the certainty and scope of your physical judgment. The German translation, hopefully, will more secure for it the general recognition it deserves.”
>
> — Wilhelm Ostwald (1891), comment after spending entire year translating Gibbs' *Equilibrium* [17]

> “Gibbs is the greatest synthetic philosopher since Newton.”
>
> — Ludwig Boltzmann (c.1900) [33]

“By the year 2000 Yale will be best known to the world for having produced J. Willard Gibbs.”

— William Thomson (c.1902), comment during visit to Yale; as recounted by Irving Fisher [32]

“Gibbs is the greatest of Americans, judged by his rank in science.”

— Henry Adams (1907), *The Education of Henry Adams* [5]

“The concept of an independent system is a pure creation of the imagination. For no material system is or can ever be perfectly isolated from the rest of the world. Nevertheless it completes the mathematician’s ‘blank form of a universe’ without which his investigations are impossible. It enables him to introduce into his geometrical space, not only masses and configurations, but also physical structure and chemical composition. Just as Newton first conclusively showed that this is a world of masses, so Willard Gibbs first revealed it as a world of systems.”

— Lawrence Henderson (1917) *The Order of Nature: An Essay* [5]

“When I studied in Berlin in 1893, and was asked under whom I had studied in America, I enumerated the mathematicians at Yale. To my mortification not one of the names was known to those Berlin professors, until I mentioned Gibbs, whereupon they were loud in his praises. *"Geebs, Geebs, jawohl, ausgezeichnetl"* [Gibbs, Gibbs, yes, excellent!!] My acquaintance with J. Willard Gibbs was an open sesame with any scientist there (Ñº)”

— Irving Fisher (1929/17), “The Application of Mathematics to the Social Sciences” [32]

“Gibbs did for statistical mechanics and for thermodynamics what Laplace did for celestial mechanics and Maxwell did for electrodynamics, namely, made his field a well-nigh finished theoretical structure."

— Robert Millikan (c.1920) [28]

“Gibbs ranks with men like Newton, Lagrange and Hamilton, who by the sheer force and power of their minds have produced those generalized statements of scientific law which mark epochs in the advance of exact knowledge.”

— Frederick Donnan (1924), “The Influence of J. Willard Gibbs on the Science of Physical Chemistry” [34]

“Gibbs is the greatest mind in American history.”

— Albert Einstein (c.1925), *Source*; cited by William Phelps (1939), in *Autobiography* (pg. 425)

“No result of Gibbs’ work has yet been overthrown, and, in this respect, Gibbs seems to stand unique and supreme among the great scientists.”

— John Johnstone (1929), “Address on Gibbs” (Ñº)(Ñº) by Yale chemistry professor (Ñº)

“In view of the statements of Lord Kelvin and others, Gibbs virtually ranks as the Sir Isaac Newton of America.”

— Irving Fisher (1929), “The Application of Mathematics to the Social Sciences” [32]

“Gibbs is almost beyond doubt the greatest mind in theoretical chemistry that ever lived.”

— Albert Nock (1933), *Journal of These Days* [3]

“Willard Gibbs’ generalized physico-chemical system is possibly the most famous piece of scientific work that has been done by an American.”

— Lawrence Henderson (1935), “Physician as Patient and as a Social System” [44]

“Like Newton’s *Principles*, the work of Gibbs stands out in the history of man’s intellectual progress as an imperishable monument to the powers of abstract thought and logical reasoning.”

— Lynde Wheeler (1952), *A History of a Great Mind* (pg. 69) (Ñº)

“Lorentz is the greatest and most powerful thinker I have ever known. I never met **Willard Gibbs**, but, perhaps, had I done so, I might have placed him beside Lorentz.”

— Albert Einstein (1954), response to question about who were the greatest men, and most powerful thinkers he had known

“When I entered Niels Bohr’s institute in Copenhagen in 1924, the first thing Bohr demanded was that I should read the book of Gibbs on thermodynamics. And he added that Gibbs had been the only physicist who really understood statistical thermodynamics.”

— Werner Heisenberg (1973), retrospect comment [24]

“Gibbs is the greatest thermodynamicist of them all.”

— John Fenn (1982), *Engines, Energy, and Entropy* [4]

“Few theoretical scientists have had the talent and assurance to do their work in such isolated fashion. Only Einstein—who wrote some of the most important papers before he even laid eyes on another theoretical physicist—may have outdone Gibbs in this respect.”

— William Cropper (2004), *Great Physicists* [35]

“Gibbs is perhaps the greatest American scientist, ever.”

— Richard Hughes (c.2010) [6]

Quotes | By

The following are noted Gibbs' quotes:

“A mathematician may say anything he pleases—

but a physicist must be a least partially sane."

— Willard Gibbs (c.1895)

The **Gibbs medal** in honor of Gibbs who in 1950 was elected to the Hall of Fame for Great Americans, at New York University. [8] A similar award is the Willard Gibbs Medal a yearly award of the American Chemical Society, founded in 1910 by William A. Converse.

"The comprehension of the laws which govern ANY material system is greatly facilitated by considering the energy and entropy of the system in the various states of which it is capable. As the difference of the values of the energy for any two states represents the combined amount of work and heat received or yielded by the system when it is brought from one state to the other, and the difference of entropy is the limit of all the possible values of the integral $\int dQ/T$, dQ denoting the element of the heat received from external sources, and T the temperature of the part of the system receiving it, the varying values of the energy and entropy characterize in all that is essential the effects producible by the system in passing from one state to another."

— Willard Gibbs (1876), *On the Equilibrium of Heterogeneous Substances* (pg. 1)

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θΔics

In existographies, **Willem Gravesande** (1688-1742) (IQ:175|#244) (GPE:97) (CR:31), aka " 's Gravesand ", was a Dutch physicist, experimenter, mathematician, lawyer and philosopher noted for his *circa* 1718 brass ball clay surface experiments and for his expansion of metals by heat experiments.

Newton

In 1715, Gravesande travelled to London, as a secretary to a Dutch legation, during which time he met Isaac Newton; and by 1717, he was professor of mathematics and astronomy at Leiden University, during which time he conducted countless experiments. (Ñº)

Vacuum pump

In 1722, Gravesande built a double-barrel vacuum pump, shown below: [4]

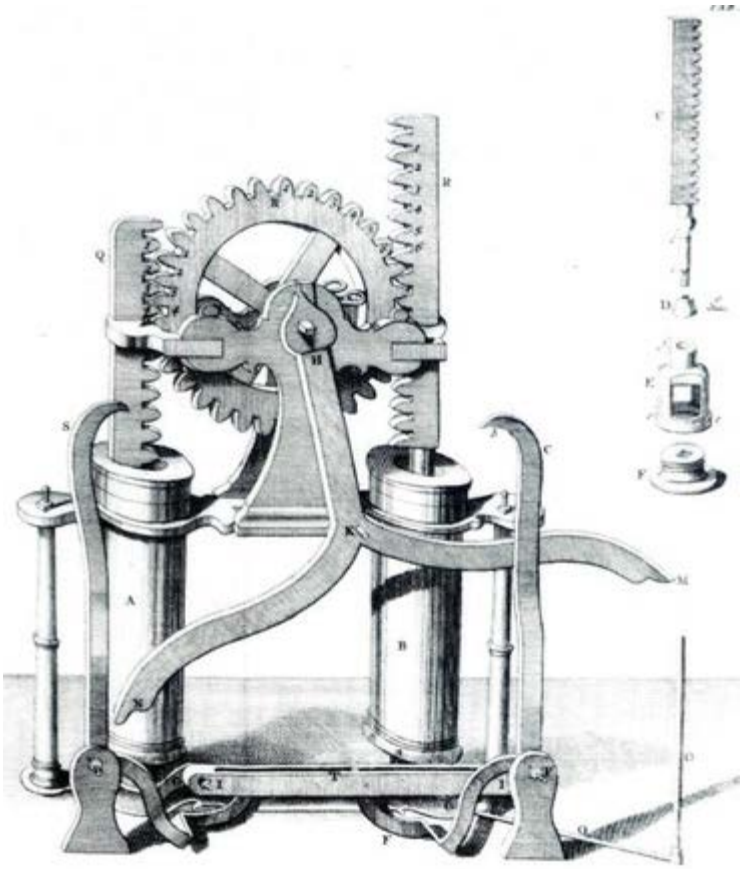

This, supposedly, was an upgrade design, modeled on a Hauksbee vacuum pump, Musschenbrock vacuum pump, or a Papin vacuum pump (Helden, 1991).

Brass ball experiment

See main: Ball and clay experiment

Gravesande's most famous experiment was the one where he allowed brass balls to be dropped (or rolled down a ramp) with varying velocity onto a soft clay surface. Gravesande found in his experiments that a ball with twice the velocity of another would leave an indentation four times as deep, that three times the velocity yielded nine times the depth, and so on. [1]

Gravesand shared these results with Emilie Chatelet, and with Voltaire (Chatelet's companion), after which, it is said, that Chatelet subsequently corrected Isaac Newton's formula $E = mv$ to $E = mv^2$, and thus synthesized the first version of the conservation of energy (vis viva into vis mortua).

In 1740, Emilie Chatelet, in her *Lessons in Physics*, supposedly, combined the theories of Gottfried Leibniz and the practical observations of Gravesande to show that the energy of a moving object is proportional not to its velocity, as had previously been believed by Newton, Voltaire and others, but to the *square* of its velocity. Hence it is said that where as Gravesande provided the experimental data for the formula of kinetic energy, Chatelet provided the formulaic explanation.

Expansion by heat experiments

See main: Ball and ring experiment

Gravensande, supposedly, also designed an experiment to test Boerhaave's law, i.e. the postulate that all bodies expand in volume when heated.

Education

In 1717, Gravesande became professor in physics and astronomy in Leiden, where he introduced the works of his friend Isaac Newton in the Netherlands.

Quotes | On

The following are quotes on Gravesande:

> "**Gravesande** is to be ranged among the most important expounders of Newtonian physics in Europe: in fact, he made possible its acceptance in a European context both by adapting its barely comprehensible mathematical structure to a wide audience and by pro-viding it with a justification and an introduction through logic and metaphysics. Eventually, Gravesande made Newton's physics fit the needs of academia."
>
> — Andrea Strazzoni (2013), *Dutch Cartesianism and the Birth of Philosophy of Science* (pg. 174)

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θΔics

In hmolscience, **William Bayliss** (1860-1924), often cited as W. M. Bayliss, was an English physiologist noted, in animate thermodynamics, for his 1915 to 1922 work on the thermodynamics of morality and of life.

Overview

In 1915, Bayliss, in his *Principles of General Physiology*, translated Wilhelm Ostwald's 1912 energetic imperative as follows: [1]

> "Waste not free energy; treasure it and make the best use of it."

In 1922, Bayliss gave his lecture "Life and the Laws of Thermodynamics", wherein he disputes some entropy and heat contentions of James Johnstone. [2]

Bayliss seems to be well culled in the founders, siting the likes of Rudolf Clausius, Sadi Carnot, Hermann Helmholtz, Willard Gibbs, Jacobus van't Hoff, Walther Nernst, Max Planck, among others, in a cogent manner. Bayliss comments, for instance, that "the works of Willard Gibbs can only be attacked with profit by the expert mathematician." [1]

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θΔics

In hmolscience, **William Blake** (1757-1827) (IQ:155|#483) [RGM:213|1,310+] was an English poet, artist, writer, and philosopher, a top ranked artistic genius (Q), noted for his 1793 *The Marriage of Heaven and Hell*, wherein he refers to energy as "eternal delight", amid discussion of the soul, among other interjections of artwork on Newton and religion. [1]

Energy | Eternal delight

In 1793, Blake, in his *The Marriage of Heaven and Hell*, opens to the following:

> 1. Man has no body distinct from his soul. For that called body is a portion of soul discerned by the five senses, the chief inlets of soul in this age.
> 2. Energy is the only life, and is from the body; and reason is the bound or outward circumference of energy.
> 3. Energy is eternal delight.

(add)

Quotes | On

The following are quotes on Blake:

> "I think that **Blake's** IQ was off the charts. His mind was capable of maximum development in multiple fields of endeavor. Obviously his senses were acutely capable of receiving and processing more data than most of us can handle. He was sensitive to ethical and philosophical issues as well as religious and aesthetic ones. His sexual responses were so acute that he recognized them as an avenue to the Divine. Intellectually he could have gone in any direction he chose."
>
> — Ellie (2010), "William Blake: Religion and Psychology" (Q), Oct 29

Quotes | By

The following are noted poetic quotes by Blake:

> "Genius is always above its age."
>
> — William Blake (c.1800) (Q)

> "Mock on, Mock on Voltaire, Rousseau: Mock on, Mock on: 'tis all in vain! You throw the sand against the wind, And the wind blows it back again. And every sand becomes a Gem Reflected in the beams divine; Blown back they blind the mocking Eye, But still in Israel's paths they shine. The Atoms of Democritus And Newton's Particles of light Are sands upon the Red sea shore, Where Israel's tents do shine so bright."
>
> — William Blake (c.1802), poems (Q) from notebook, 1800-1830

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θΔics

In existographies, **William Clifford** (1845-1879) (IQ:175|#206) (Siegfried 10:3) (Re:34) was an English mathematician, philosopher, and panpsychist (Skrbina, 2005), noted for []

Panpsychism

In 1874, Clifford, in his "Body and Mind", claimed that science had bridged the gap between organic and inorganic, that the same chemical elements and laws of physics applied to both realms, and hence the laws of organic were only a "complication" of the inorganic.

> "That element of which, as we have seen, even the simplest feeling is a complex, I shall call mind-stuff. A moving molecule of inorganic matter does not possess mind or consciousness; but it possesses a small piece of mind-stuff. When molecules are so combined together as to form the film on the under side of a jelly-fish, the elements of mind-stuff which go along with them are so combined as to form the faint beginnings of sentience. When the molecules are so combined as to form the brain and nervous system of a vertebrate, the corresponding elements of mind-stuff are so combined as to form some kind of consciousness; that is to say, changes in the complex which take place at the same time get so linked together that the repetition of one implies the repetition of the other. When matter takes the complex form of a living human brain, the corresponding mind-stuff takes the form of a human consciousness, having intelligence and volition."
>
> — William Clifford (1878), "On the Nature of Things-in-Themselves" [2]

Clifford, supposedly, arrived at a form of Spinozan parallelism that incorporated elements of Julien La Mettrie's and Denis Diderot's vitalistic materialism. [1]

Gravitation

Clifford, supposedly, was the first to suggest that gravitation might be a manifestation of an underlying geometry.

> "I hold that in the physical world nothing else takes place but this variation [of the curvature of space]."
>
> — William Clifford (c.1875), "Article" (Ñº), in: *Mathematical Papers*, 1882

(add)

Influence

Clifford was influential to Charles Peirce.

Quotes | By

The following are quotes by Clifford:

> "It is wrong always, everywhere, and for anyone, to believe anything upon insufficient evidence."
>
> — William Clifford (1877), *The Ethics of Belief* (Ñº)

> "A little reflection will show us that every belief, even the simplest and most fundamental, goes beyond experience when regarded as a guide to our actions."
>
> — William Clifford (c.1877)

“When an action is once done, it is right or wrong for ever; no accidental failure of its good or evil fruits can possibly alter that.”

— William Clifford (c.1877)

“If a man, holding a belief which he was taught in childhood or persuaded of afterwards, keeps down and pushes away any doubts which arise about it in his mind, purposely avoids the reading of books and the company of men that call in question or discuss it, and regards as impious those questions which cannot easily be asked without disturbing it — the life of that man is one long sin against mankind.”

— William Clifford (1879), “Article” (Ñº), *Contemporary Review*

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External links

â— William Kingdon Clifford – Wikipedia.

θΔics

In existographies, **William Rickets Cooper** (1843-1878) was a an English (or Irish) religio-mythologist, noted for making one of the first Horus equals Jesus connections.

Overview

In c.1860s, Cooper, then a carpet pattern designer turned London Missionary, met and or came under the influence of English Egyptologist Joseph Bonomi who directed his energies to Egyptian antiquities. [1]

In 1870, Cooper became one of the secretary, and therein a principle originator, of the Society for Biblical Archaeology, holding this position until 1876, during which time, for health reasons, he was forced to retire to Ventnor, ceasing to exist two years later.

Osiris | Horus

In 1877, Cooper, in his *The Horus Myth in its Relation to Christianity*, attempted to assert that Jesus was a Horus rewrite; the following is his opening paragraph:

> "There are few points on which the Egyptian and Christians religions so nearly analogize, and which are more striking in their resemblances than that one doctrine which has always been regarded, and rightly so, as a special result of revelation, —the doctrine of a 'vicarious deliverer' of mankind in the person of a mysterious Being, who is at once both very god and very man. The definite language of the Nicene Creed, and its commentary, the symbol of St. Athanasius, explains the nature and attributes of the founder of our religion, and it is my province, as far as I am able to do so, to show to-night in what degree that nature and those attributes were anticipated in the Egyptian dogma of Horus Nets, the only-begotten son of his father —the 'deliverer of mankind' from the 'evil one'."

(add discussion)

Translations

Cooper translated a series of valuable Assyrian and Egyptian documents, entitled 'Records of the Past,' along with Lenormant's :Chaldæan Magic" (1887).

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External links

- Cooper, W.R. (William Rickets) 1843-1878 – WorldCat Identities.

θΔics

In existographies, **William Cowper** (1731-1800) (IQ:160|#418) (Cattell 1000:463) was an English poet noted, in human chemistry, for his 1783 Empedocles-style chemical aphorism like poem "On Friendship", in which he compares the politics that arise from the mixing of courtiers and patriots to the effervescence that arises when salt and lemon juice are mixed, comments that the true friendship might be something akin to the chemist's attempt to make gold, compares certain friendships to simmering copper, and intermixes this with discussion on the role of religion.

On Friendship

The following is Cowper's 1783 "On Friendship" poem:

> "Amicitia niri inter bonoe cite non potent" [Friendship can not be defined between good cite]
>
> — Cicero

What virtue can we name, or grace,
But men unqualified and base
Will boast it their possession!
Profusion apes the noble part
Of liberality of heart,
And dullness of discretion.

But as the gem of richest cost
Is ever counterfeited most,
So, always, imitation
Employs the utmost skill she can
To counterfeit the faithful man,
The friend of long duration.

Some will pronounce me too severe,
But long experience speaks me clear;
Therefore that censure scorning,
I will proceed to mark the shelves
On which so many dash themselves,
And give the simple warning.

Youth, unadmonish'd by a guide,
Will trust to any fair outside,—
An error soon corrected;
For who but learns with riper years,
That man, when smoothest he appears,
Is most to be suspected?

But here again a danger lies,
Lest, thus deluded by our eyes,
And taking trash for treasure,
We should, when undeceived, conclude
Friendship imaginary good,
A mere Utopian pleasure.

An acquisition rather rare
Is yet no subject of despair;
Nor should it seem distressful,
If cither on forbidden ground,
Or where it was not to be found,
Wc sought it unsuccessful.

No friendship will abide the test,
That stands on sordid interest
And mean self-love erected;
Nor such as may awhile subsist
'Twixt sensualist and sensualist,
For vicious ends connected.

Who hopes a friend, should have a heart
Himself well furnish'd for the part,
And ready on occasion
To show the virtue that he seeks;
For 'tis an union that bespeaks
A just reciprocation.

A fretful temper will divide
The closest knot that may be tied,
By ceaseless sharp corrosion:
A temper passionate and fierce
May suddenly your joys disperse
At one immense explosion.

In vain the talkative unite,
With hope of permanent delight;
The secret just committed
They drop through mere desire to prate,
Forgetting its important weight,
And by themselves outwitted.

How bright soe'er the prospect seems,
All thoughts of friendship are but dreams,
If envy chance to creep in;
An envious man, if you succeed,
May prove a dangerous foe indeed,
But not a friend worth keeping.

As envy pines at good possess'd,
So jealousy looks forth distress'd,
On good that seems approaching,
And if success his steps attend,
Discerns a rival in a friend,
And hates him for encroaching.

Hence authors of illustrious name,
(Unless belied by common fame)
Are sadly prone to quarrel;
To deem the wit a friend displays
So much of loss to their own praise,

And pluck each other's laurel.

A man renown'd for repartee
Will seldom scruple to make free
With friendship's finest feeling;
Will thrust a dagger at your breast,
And tell you 'twas a special jest,
By way of balm for healing.

Beware of tattlers; keep your ear
Close stopt against the tales they hear,—
Fruits of their own invention;
The separation of chief friends
Is what their kindness most intends;
Their sport is your dissension.

Friendship that wantonly admits
A joco-serious play of wits
In brilliant altercation,
Is union such as indicates,
Like hand-in-hand insurance plates,
Danger of conflagration.

Some fickle creatures boast a soul
True as the needle to the pole;
Yet shifting, like the weather,
The needle's constancy forego
For any novelty, and show
Its variations rather.

Insensibility makes some
Unseasonably deaf and dumb,
When most you need their pity;
'Tis waiting till the tears shall fall
From Gog and Magog in Guildhall,—
Those playthings of the City.

The great and small but rarely meet
On terms of amity complete:
The attempt would scarce be madder,
Should any, from the bottom, hope
At one huge stride to reach the top
Of an erected ladder.

Courtier and patriot cannot mix
Their heterogeneous polities
Without an effervescence,
Such as of salts with lemon-juice;
But which is rarely known to induce,
Like that, a coalescence.

Religion should extinguish strife,
And make a calm of human life:
But even those who differ

Only on topies left at large.
How fiercely will they meet and charge!
No combatants are stiffer.

To prove, alas! my main intent,
Needs no great cost of argument,
No cutting and contriving;
Seeking a real friend, we seem
To adopt the chymist's golden dream
With still less hope of thriving.

Then judge, or ere you chuse your man,
As circumspectly as you can,
And, having made election,
See that no disrespect of yours,
Such as a friend but ill endures,
Enfeeble his affection.

It is not timber, lead and stone,
An architect requires alone,
To finish a great building;
The palace were but half complete,
Could he by any chance forget
The carving and the gilding.

As similarity of mind,
Or something not to be defined,
First rivets our attention;
So, manners, decent and polite,
The same we practised at first sight,
Must save it from declension.

The man who hails you Tom or Jack,
And proves by thumping on your back,
His sense of your great merit,
Is such a friend, that one had need
Be very much his friend indeed,
To pardon or to bear it.

Some friends make this their prudent plan—
"Say little, and hear all you can;"
Safe policy, but hateful:
So barren sands imbibe the shower,
But render neither fruit nor flower,
Unpleasant and ungrateful.

They whisper trivial things, and small;
But, to communicate at all
Things serious, deem improper;
Their feculence and froth they show,
But keep the best contents below,
Just like a simmering copper.

These samples (for alas! at last

These are but samples, and a taste
Of evils yet unmention'd;)
May prove the task, a task indeed,
In which 'tis much, if we succeed,
However well-intention'd.

Pursue the theme, and you shall find
A disciplined and furnish'd mind
To be at least expedient,
And, after summing all the rest,
Religion ruling in the breast
A principal ingredient.

True friendship has, in short, a grace
More than terrestrial in its face,
That proves it heaven-descended;
Man's love of woman not so pure,
Nor, when sincerest, so secure
To last till life is ended.

(add discussion)

Other

In 1894, American poet John Spollon, in his article-poem "Among the Bards", cites the following section on Cowper's chemical poetry:

Courtier and patriot cannot mix
Their het'rogeneous politics
Without an effervescence,
Such as of salts with lemon-juice,
But which is rarely known t'induce,
Like that, a coalescence.

which has the alternative translation variations of:

VARIATIONS.

XX.——4. Like that of salts with lemon-juice,
Which does not yet like that produce
A friendly coalescence.

and goes on to elaborate on this platform that the mixing of republicans and democrats as being akin to action of an antacid in water. [2]

Quotes | On

The following are quotes on Cowper:

> "Much of Lincoln's unhappiness, the melancholy that 'dripped from him as he walked', was due to his want of religious faith. When the black fit was on him, he suffered as much mental misery as Bunyan or **Cowper** in the deepest anguish of their conflicts with the evil one."

— Ward Lamon (1872), *Life of Lincoln* [3]

See also

â— Johann Goethe
â— Mala Radhakrishnan

References

1. Cowper, William. (1782). “On Friendship”, in: *The Life and Posthumous Writings of William Cowper* (editor: William Hayley) (pg. 219). J. Seagrave, 1803; in: *The Poetical Works of William Cowper* (editor: H.F. Cary) (pgs. 116-17). William Smith, 1839.
2. Spollon, John. (1894). “Among the Bards”, Truth, and Opinion, *Supplement to Fibre and Fabric: A Record of American Textile Industries in the Cotton and Woolen Trade*, 20(509):1113, Dec 1.
3. (a) Lamon, Ward. (1872). *Life of Lincoln* (pg. 486). Publisher.
(b) Jacoby, Susan. (2004). *Freethinkers: a History of American Secularism* (pg. 115). Henry Holt and Co.

External links

â— William Cowper – Wikipedia.

θΔics

In existographies, **William Craig** (1949-) (CR:7) is an American Christian apologist, noted for []

Debates

Craig has debated a number of prominent atheists; including:

- Peter Atkins vs William Craig (1998)
- Christopher Hitchens vs William Craig (2009) | Biola University

Quotes | By

The following are quotes by Craig:

> "The assertion that 'Osiris' son Horus has the exact same bio of Jesus' is just based on misinformation. This is garbage that's spread on the Internet, that just isn't true. What's funny about this is that these people who say this kind of thing, never seem to quote the primary sources. They tell you that this is in **Osiris OR Horus** [see: Osiris-Horus], but you never see the primary sources quoted. When you look at the primary sources, you find out that they're not at all parallel."
>
> — William Craig (2012), response (Q)(Q) to audience member who asks about the Osiris/Horus and Jesus parallel, Feb 24

External links

- William Lane Craig – Wikipedia.

θΔics

In existographies, **William Crookes** (1832-1919) (IQ:150|#663) (Murray 4000:12|C) (CR:3) was a British chemist and physicist; noted for his for his 1870 invention of the Crooke tube, and cathode-ray studies, fundamental in the development of atomic physics, and for his discovery of the element thallium.

Overview

In 1870, Crookes developed the so-called "Crookes tube", a glass tube, with a partially-evacuated vacuum, having a cathode attached to one end, and an anode attached to another end, therein allowing so-called "cathode rays" to be seen visually streaming from the cathode to the anode.

In 1897, Joseph Thomson, after experimenting with cathode-ray tubes, published a paper, in which he postulated that the cathode rays are streams of "negatively electrified particles" [i.e. electrons] with mass; data from which, in 1904, became the backbone of the "plum pudding model" of atomic theory.

Quotes | On

The following are quotes on Crookes:

> "What is this word 'life' for him who has only existed in order to hand down his name to posterity in the footnotes of a classic or as an inventor of an integral. [To answer this question] I rush from science to philosophy, and from philosophy to our old friends the poets; and then, over-wearied by too much idealism, I fancy I become practical in returning to science. Have you ever attempted to conceive all there is in the world worth knowing — that not one subject in the universe is unworthy of study? The giants of literature, the mysteries of many-dimensional space, the attempts of Boltzmann and **Crookes** to penetrate nature's very laboratory, the Kantian theory of the universe, and the latest discoveries in embryology, with their wonderful tales of the development of life — what an immensity beyond our grasp! … Mankind seems on the verge of a new and glorious discovery. What Newton did to simplify the planetary motions must now be done to unite in one whole the various isolated theories of mathematical physics."
>
> — Karl Pearson (1880), *The New Werther*

> "The world is full of well-educated people who have made stupid choices, a phenomenon referred to by scientists as 'dysrationalia'. A survey of Canadian Mensa Club members, whose membership is limited to those in the top two percentiles of IQ, demonstrates this nicely. Among those surveyed, 44% believed in astrology, 51% bought into biorhythms and 56% believed that earth has been visited by aliens. Martin Heidegger, a well-respected philosopher, used his keen mind in support of the Nazi party, using spurious arguments to defend reprehensible behavior. **William Crookes**, who discovered the element thallium, was repeatedly swindled by spiritual mediums but could never be persuaded to give up his spiritualist beliefs. And Isaac Newton, a scientist without equal, lost his fortune in the South Sea Bubble through a fundamental misunderstanding of the nature of markets and human behavior. Smarts, it would seem, are no guarantee of being a rational actor. Yes, the lessons you have just learned will be least available to your mind when they are most needed. Studies suggest that we lose roughly 13% of our cognitive capacity under stress, lending credence to Nassim Taleb's advice: 'Even once we are aware of our biases, we must recognize that knowledge does not equal behavior. The solution lies in designing and adopting an investment process that is at least partially robust to behavioral decision-making errors."
>
> — Daniel Crosby (2019), *Behavioral Investor* [1]

References

1. Crosby, Daniel. (2019). *Behavioral Investor* (pg. #). Jaico Publishing.

External links

â— William Crookes – Wikipedia.

θΔics

In existographies, **William Herbert Cropper** (1927-) is a an American physical-quantum chemist noted for his 2001 information dense *Great Physicists: the Life and Times of Leading Physicists from Galileo to Hawking*, touching on a plethora of the greatest physicists ever (see: Cropper 30), such as is chapter on Willard Gibbs, including rare topics ranging from Maxwell's thermodynamic surface, interspliced with discerning quotes.

Education

Cropper completed his BS at Iowa State University, his PhD at the University of California, Berkeley, and in 1992 became professor emeritus of chemistry of St. Lawrence University, New York. In 2004, he was residing in Saugerties, New York.

Quotes | By

The following are quotes by Cropper:

> "Perhaps more than any other major nineteenth-century scientist, Clausius has been neglected in biographical studies."
>
> — William Cropper (2001), *Great Physicists*

> "Few theoretical scientists have had the talent and assurance to do their work in such isolated fashion. Only Einstein—who wrote some of the most important papers before he even laid eyes on another theoretical physicist—may have outdone Gibbs in this respect."
>
> — William Cropper (2001), *Great Physicists*

> "Newton was the greatest creative genius physics has ever seen. None of the other candidates for superlative (Einstein, Maxwell, Boltzmann, Gibbs, and Feynman) has ever matched Newton's combined achievements as theoretician, experimentalist, *and* mathematician."
>
> — William Cropper (2001), *Great Physicists*

References

1. Cropper, William H. (2001). *Great Physicists: the Life and Times of Leading Physicists from Galileo to Hawking.* Oxford University Press.

External links

â— Cropper, William H. – WorldCat Identities.

θΔics

In existographies, **William Cullen** (1710-1790) (IQ:175|#243) (GCE:17) (CR:73) was a Scottish physician and chemist who, according to chemistry historian Maurice Crosland, pioneered affinity reaction diagrams, the precursors to chemical reaction equations (see: history of chemical equations), during his 1757 lectures on the use of French chemist and physician Étienne Geoffroy's 1718 affinity table. [1]

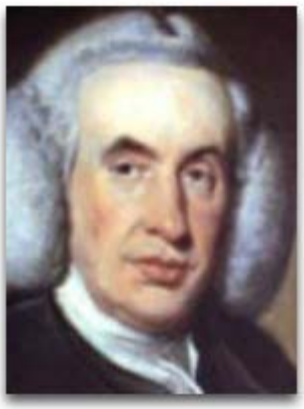

Education

In 1726, Cullen began working on general studies at the University of Glasgow. In 1729, Cullen began working as an apothecary. He 1736, Cullen studied chemistry and medicine at the University of Edinburgh and in 1740 completed his MD at Glasgow University. Cullen became a chemistry lecturer at Glasgow University in 1747.

Lectures

Cullen was a charismatic lecturer, attracting large classes. He always came before a class with a manuscript or lengthy notes that he revised each year, but he rarely used them and spoke extemporarily. He gave the students the necessary background of information, but this was never presented as a list of facts to be memorized, rather as a journey of exploration into the mysteries of diseases and the processes that caused them. The professor and his students were companions on the journey. Phrases like ‘as far as I know’ and ‘I am persuaded’ abound in his lectures and textbooks. [2]

Students

One of his most notable pupils was Scottish physicist and chemist Joseph Black, a central founder of thermochemistry.

Affinity reaction diagrams

In 1748, Cullen printed and distributed among his students “The Plan of a Course of Chemical Lectures and Experiments, Directed Chiefly to the Improvement of Arts and Manufactures, to be Given in the Laboratory of the College of Glasgow”. [5]

In 1757, Cullen began to use Geoffroy’s affinity table in lectures at the University of Aberdeen. [1] To help in explaining to his students the idea of ‘single elective attractions’ (single displacement reactions) and ‘double elective attractions’ (double displacement reactions), Cullen pioneered the use of reaction arrows ‘→’ or ‘darts’, as he called them, drawn diagonally to represent the affinity tendencies of the individual species in the reaction. In addition, he introduced the conception of using brackets ‘{’ to represent a bonded association.

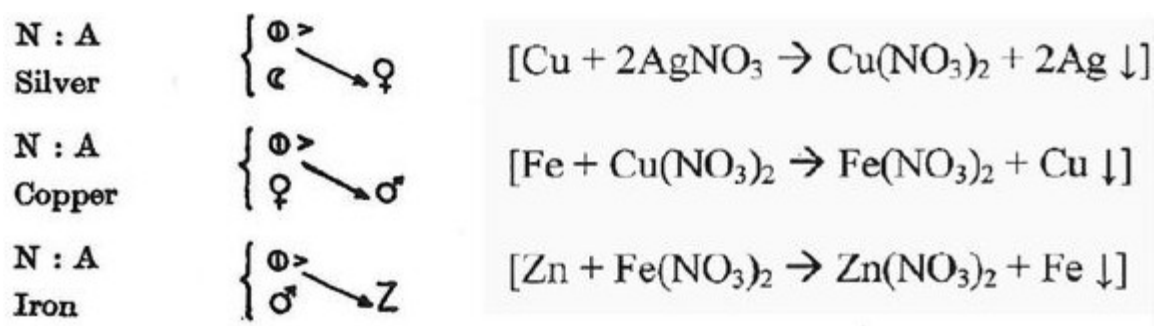

Three examples of **Cullen's diagrams** of single elective affinity reactions (middle), with the crochet ‘{’ representing the bonded association or union, and the dart ‘→’ representing the affinity. The modern equivalent reaction equation is shown to the right of each affinity reaction. [3]

In Cullen’s lecture notes, a core example used is the list of species in the third column of Geoffroy’s affinity table. At the head of the third column, i.e. row-one, column-three (R1:C3), is nitric acid *HNO3* which Cullen labels as N : A. The relative affinities of nitric acid, according to Geoffroy, are in the order: iron ♂, copper ♀, lead ♄, mercury (R5:C3), and silver (R6:C3). Therefore, iron would displace copper from a solution of copper in nitrous acid and would similarly displace lead, mercury, and silver from their solutions of nitrous salt. Using the conception of affinity arrows and bonding brackets, Cullen used diagrams in his lectures to represent these individual reactions steps of single elective affinities or single displacement reactions.

Refrigeration

In 1748, Cullen was the first to make artificial refrigeration, using the phenomenon of cold being produced by evaporating liquids (nitrous aether), plus a vacuum. Cullen's device has come to be known as the Cullen refrigerator.

Heat

In 1756, Cullen, in his "Of the Cold Produced by Evaporating Fluids and Some Other Means of Producing Cold", which dealt with the phenomenon of cooling by evaporation, particularly in reduced pressures, called attention to the fact, first noted in the 17th century, that water boils at lower temperatures as the pressure is reduced. [6]

Quotes | By

The following are quotes by Cullen:

> "Chemistry is an art that has furnished the world with a great number of useful facts, and has thereby contributed to the improvement of many arts; but these facts lie scattered in many different books, involved in obscure terms, mixed with many falsehoods, and joined to a great deal of false philosophy; so that it is no great wonder that chemistry has not been so much studied as might have been expected with regard to so useful a branch of knowledge, and that many professors are themselves but very superficially acquainted with it. But it was particularly to be expected, that, since it has been taught in universities, the difficulties in this study should have been in some measure removed, that the art should have been put into form, and a system of it attempted—the scattered facts collected and arranged in a proper order. But this has not yet been done; chemistry has not yet been taught but upon a very narrow plan. The teachers of it have still confined themselves to the purposes of pharmacy and medicine, and that comprehends a small branch of chemistry; and even that, by being a single branch, could not by itself be tolerably explained. I do not choose the invidious task of derogating from established reputations; but were it necessary, I could easily show that the most celebrated attempts towards a system or course of chemistry are extremely incomplete, as examining but a few of the objects of chemistry; that of those examined a very scanty and imperfect account of their relations to other bodies is given ; and that, even what is given, is in a method inconvenient and faulty. Now this is the case with the generality of the books on chemistry; but I must take notice, however, that Dr Stahl is one who has endeavored to avoid these faults; he has taught chemistry with a more general view, and attempted to collect the chemical facts, and to range them in a better order. Perhaps we have the substance of Dr Stahl's lessons, in a book published by a disciple of his, Dr Juncker of Halle, under the title *of Conspectus Chemiae*. This is the fullest collection that I have met with, and I have made a good deal of use of it, and you may do so too; but I must notice at the same time, that it is written in such a clumsy manner, is mixed with so much pedantic, trifling philosophy, and is often so inaccurate and superficial in describing experiments, that it will not contribute much to the propagating of chemical knowledge."
>
> — William Cullen (c.1748), "Fragment of Early Chemistry Lecture" [5]

Quotes | On

The following are quotes on Cullen:

> "After Boerhaave's decease, the lectures on chemistry were continued at Leyden by his pupil Gaubius, whose lectures on that subject seem to have been circulated extensively in manuscript, and to have been much sought after by **Cullen**."
>
> — John Thomson (1832), *An Account of the Life, Lectures and Writings of William Cullen, Volume One* (pg. 38) [5]

References

1. Crosland, Maurice P. (1959). "The Use of Diagrams as Chemical 'Equations' in the Lecture Notes of William Cullen

and Joseph Black" (abs), *Annals of Science*, 15(2):75-90.
2. William Cullen – James Lind Library.
3. Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (pgs. 385-388). Morrisville, NC: LuLu.
4. Shachtman, Tom. (1999). *Absolute Zero and the Quest for Absolute Cold* (pg. 57). Mariner Books.
5. Thomson, John. (1832). *An Account of the Life, Lectures and Writings of William Cullen, Volume One* (chemistry lectures, pg. 35-; lecture fragment, pgs. 40-41; double elective affinities, pg. 5##-). Blackwood.
6. (a) Cullen, William. (1756). "Of the Cold Produced by Evaporating Fluids and Some Other Means of Producing Cold", *Essays and Observations* (pg. 11). Edinburgh.
(b) Cardwell, Donald S.L. (1971). *From Watt to Clausius: the Rise of Thermodynamics in the Early Industrial Age* (pg. 34). Cornell University Press.

External links

- William Cullen – Wikipedia.

θΔics

In hmolscience, **William Dembski** (1960-) (CSRI:5) is an American mathematician-theologian noted, in religious thermodynamics, for his 1998 law of conservation of information, for his 2004 attempt at a fourth law of thermodynamics, and for his general promotion of "intelligent design" as the "Logos theology of John's gospel restated in the idiom of information theory. [1] Dembski's two main books on this topic are his 2002 *No Free Lunch: Why Specified Complexity Cannot be Purchased without Intelligence* and his 2004 *Uncommon Dissent: Intellectuals Who Find Darwinism Unconvincing* and followup 2007 book *No Free Lunch: Why Specified Complexity Cannot be Purchased without Intelligence*. [2]

References

1. (a) Ed brayton: on the Dover Trail (2 of 6) – YouTube.com.
(b) Humes, Edward. (2007). *Monkey Girl: Evolution, Education, Religion, and the Battle for America's Soul* (pg. 289). Harper.
2. (a) Dembski, William A. (2004). *Uncommon Dissent: Intellectuals Who Find Darwinism Unconvincing.* ISI Books.
(b) Dembski, William A. (2002). *No Free Lunch: Why Specified Complexity Cannot be Purchased without Intelligence*. Publisher.

Further reading

â— Dembski, William A. (2004). *Uncommon Dissent: Intellectuals Who Find Darwinism Unconvincing.* ISI Books.
â— Bradley, Walter L. (2004). "Information, Entropy, and the Origin of Life" (pgs. 331-51), ch. 18, in *Debating Design* by William A. Dembski and Michael Ruse. Cambridge University Press.

External links

â— William Dembski – Wikipedia.

θΔics

In existographies, **William Derham** (1657-1735) (CR:3) was an English clergyman, natural theologian philosopher, and scientist, noted for []

Overview

Derham's primary fields were: natural philosophy, meteorology, and natural history, and his secondary fields were: astronomy, entomology, and physics. [2]

Derham made one of the best measurements of sound, which was accepted and used by Newton in his *Principia*.

In 1715, Derham, in his *Astro-Theology*, stated support for what he called the "New System", namely a Copernican universe, wherein the outer boundary of stars were solar systems like our own, each with its own inhabitable planets. [3]

Boyle

Derham was the editor of the *Posthumous Works* of Robert Boyle (1705) and his *Philosophical Experiments* (1726).

Quotes | On

The following are quotes on Derham:

> "I designedly made *Principia* abstruse to avoid being baited by little smatterers in mathematics."
>
> — Isaac Newton (c.1687), "Comment to **William Derham**" [1]

> "We agree with **Derham** that atheists are rare; superstition has so disfigured nature, and its rights; enthusiasm has so dazzled the human mind; terror has so disturbed the hearts of men; imposture and tyranny have so enslaved thought; in fine, error, ignorance, and delirium, have so perplexed and entangled the clearest ideas, that nothing is more uncommon, than to find men who have sufficient courage to undeceive themselves of notions, which every thing conspires to identify with their existence."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 303)

Quotes | By

The following are quotes by Derham:

> "We have a right to look upon an atheist as a monster amongst rational beings, as one of those extraordinary productions which we hardly ever meet with in the whole human species, and who opposing himself to all other men, revolts not only against reason and human nature, but against the divinity himself."
>
> — William Derham (c.1714), *Publication* (Ñº)(Ñº); cited by Baron d'Holbach (1770) in *The System of Nature* (pg. 303)

References

1. (a) Westfall, R.S. (1980). *Never at Rest* (pg. 459). Cambridge.
(b) Inwood, Stephen. (2003). *The Man Who Knew Too Much: the Strange and Inventive Life of Robert Hooke 1653-1703* (pg. 379). Pan MacMillan.
(c) Fara, Patricia. (2002). *Newton: the Making of a Genius* (pg. 18). Columbia University Press.

(d) Stokes, Mitch. (2010). *Isaac Newton* (pg. 122). Thomas Nelson.
2. William Derham – Galileo Project.
3. Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea* (pgs. 133-34). Transaction Publishers, 2011.

External links

â— William Derham – Wikipedia.

θΔics

In existographies, **William Armstrong Fairburn** (1876-1947) (IQ:170|#341) (HCP:24) (SN:22) (CR:60) was an English-born American naval architect, marine engineer, chemical engineer, and industrial executive and noted for the publication of his 1914 *Human Chemistry*, a 55-page booklet that outlines a semblance of a precursor to the science of human chemistry. [1] Fairburn was the first to discuss the idea of the human catalyst and human entropy. In general, according to Fairburn, regarding a chemically-based philosophy of life and work:

> "No human chemical can ever be truly happy in his work unless he is fitted by nature for the work he is performing."

Fairburn's *Human Chemistry* is the only book ever-published on the science of "human chemistry", which he defined as the analysis and synthesis of the reactions resulting from combinations of human chemical elements (workers), prior to American chemical engineer Libb Thims' 2007 textbook *Human Chemistry*. [4]

Education

After arriving in America, Fairburn was educated in the Bath public schools and during these years became an apprentice mechanic in the local iron works. He acquired his master's papers at the age of eighteen. In 1896, he returned to Ireland entering the University of Glasgow and completed in one year a two-year program in naval architecture and engineering, standing at the head of his class. At the age of twenty-three, he designed the first all-steel freighter in America. By 1900 he became an independent engineering consultant. [2]

From 1900 to 1908, Fairburn supervised the construction of cargo vessels and pioneered in applying the diesel to railroads. In these years, he also served as a consultant for the Sterling Company and for Babcock and Wilson, on steam boiler and marine manufacturing problems.

Diamond Match company

In 1909, Fairburn became head of the Diamond Match company; guiding Diamond's research chemists into new domestic sources. In particular, Fairburn revolutionized U.S. match manufacturing by using sesquisulphate to produce matches rather than white phosphorus, which had been publicly condemned for leading to poisoning. [3] By 1937, Diamond controlled 90% of America's match production. Fairburn was president of the firm until his death in 1947.

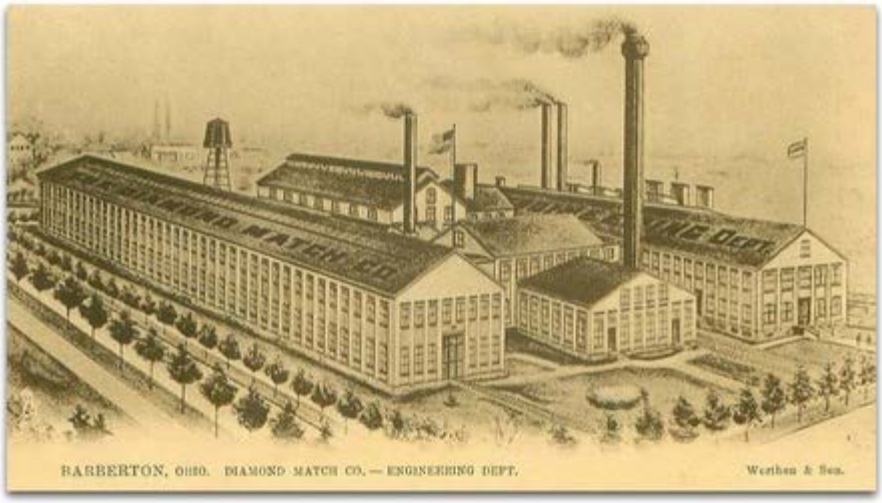

In 1915, Fairburn, as new head of the Diamond Match Co., began buying up all match factories in the US, and over the next 25-years obtained near market domination. (Ñº)

Human elements

Fairburn defines humans, from a chemical reaction point of view, as either "human elements", "human chemicals", or "human chemical elements". The following is an example quote of this view: [4]

> "As each chemical element is an entity, differing and distinct from any other, so is each human element and entity and a personality, which, when guided by a human chemist to do work and perform his peculiar function in life, feels and acquires what no inert substance can ever acquire, namely moral stimulus of responsibility. No chemical element is in a state of harmony unless it is in contact with other elements or influences which do not antagonize or irritate, and no human chemical or worker can ever by truly happy in his work unless he is fitted by nature for the work which he is performing, and unless his general

temperament are in harmony with his specific duties and environment."

(add)

Human chemistry

In his *Human Chemistry*, Fairburn was the first, aside from German polymath Johann von Goethe, and his 1809 chemistry-based novella *Elective Affinities*, and American author Thomas Dreier, and his 27-page 1910 pamphlet "Human Chemicals", to specifically outline the view, in book format, that people are "human chemicals" or *human chemical elements*, that the manager or foreman of people is a "human chemist", and that the job of the human chemist is to align individuals in their working combinations to achieve the correct "reactions resulting from the combinations of individuals" (human chemical reactions). Interestingly, Fairburn was the first to state that people might be classified by relative energies and entropies; the latter of which, i.e. the conception of "human entropy" or human molecular entropy, referring to measures of entropy of an individual person, is a very advanced concept, even in the modern age.

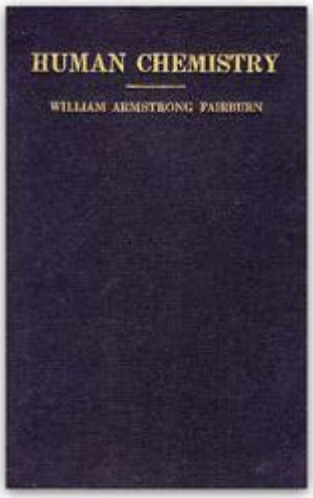

Fairburn's 1914 ***Human Chemistry*** argues that humans are chemicals, that state properties, such as energy and entropy apply to the description of their respective natures, and that the foreman of factories needs to be a master human chemist.

The central goal of Fairburn's *Human Chemistry* was to outline how the laws of science or nature might better guide the executive in the operation of his company in terms of placement and work functions of individual people. Many of his postulates are filled with philosophical ideologies based on satieties or bonding satisfactions in small chemical systems.

Human chemists

In pioneering the proto-fields of business chemistry and business thermodynamics, Fairburn's general view is that the foreman acts as the "human chemist", aligning proper work reactions between individuals, and that in this sense, he or she must study the basic principles of chemistry so to intelligently perform their occupation. Fairburn comments further on this in stating that a scientific human chemist will be a psychological analyst who will study the science of the individual in relation to environment and the science of the human mind, its power, function, and mental processes. He states further that:

> "The human chemist should have the same broad views in regard to human chemicals that the scientific chemist has in regard to the chemical elements."

Energy and entropy

See main: Human energy, human entropy

Fairburn, in addition to stating that human chemical elements could be classified by their relative affinities (or Gibbs free energy in the modern sense), seems to be the first to have stated that an interactive system of humans, e.g. a group of factory workers is a system of reactive chemical entities (humans), and on this basis speculates on how one would go about classifying reactive humans modeled as elements. He reasons that: [6]

> "A classification based on their relative electricity or relative energy or enthusiasm would not of itself help us much, for misapplied energy and wasteful application of human forces are common. The classification of entropy, referring to temperature changes which can be likened to coolness, passion, explosiveness and frigidity, are all interesting but of themselves prove little."

Human emulsifiers

Fairburn postulates that in occupational situations, certain men (or human chemicals) will act as emulsifiers, acting to facilitate the mixing of non-mixing groups, just as soda or gum Arabic, causing oil and water to blend together. [5]

Family

It seems to be the case that William Armstrong Fairburn (1876-1947) the son of William Fairbairn (junior) (dates) and grandson of William Fairbairn (senior) (1789–1874), noted founder of the Manchester shipbuilding company William Fairbairn & Sons; the factory where Scottish engineer James Thomson, of the Glasgow university, apprenticed in 1843 and while there discussed with William Fairbairn (junior), one of William Fairbarn's (senior) eight surviving children, heat engine theory, showing William Fairbairn (junior) his drawings of Morin's dynamometer. [7] Six facts corroborate this:

(a) The full name 'William Armstrong Fairburn' is prominent on his books (indicating that he is a third generation William Fairburn, and is thus attempting to distinguish his name);
(b) He returned to Glasgow University for college in 1896 (the college where James Thomson was a professor (1873-89);
(c) The family immigrated from Huddersfield a town 30-miles North-East of Manchester (the location of the shipbuilding company);
(d) He degreed in naval architecture and engineering (as did Fairbairn junior and senior);
(e) He built many ships (as did Fairburn junior and senior);
(f) He became an executive of a company, the Diamond Match Co. (just as did Fairburn junior and senior).

What likely happened was that last name Fairbairn was Americanized to Fairburn when the family moved to America (Bath, Maine) in 1889-90 from England (Huddersfield). A more definitive reference, however, needs to be found to corroborate this.

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(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)* (Fairburn, William, pgs. 442, 609, 702) (preview), (Google books). Morrisville, NC: LuLu.
4. Fairburn, William A. (1914). *Human Chemistry* (chemical element vs. human element, pgs. 21-22). Publisher.
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θΔics

In human thermodynamics, **William Suddards Franklin** (1863-1930), commonly cited as "W.S. Franklin", was an American electrical engineer and physicist noted for []

Overview

In 1903, Franklin, in his "The Misuse of Physics by Biologists and Engineers", waded into the famous "What is Entropy Debate?" ; the following seems to be his first point of attack:

> "Swinburne believes, apparently, that the precise ideas and methods of thermodynamics are unconditionally applicable to irreversible processes in general. I do not agree with him in this, and I do not think that the legitimacy and precision of the accepted ideas of thermodynamics especially as represented in the writings of Willard Gibbs can be questioned; but **I do think** that the notions of thermodynamics are precisely applicable to those types of irreversible processes which constitute permanently varying states, and approximately applicable to those irreversible processes which involve either approximate states of thermal equilibrium or approximately permanent states of variation."

(add discussion)

In 1910, Franklin, in his "Entropy and Time", according to Gilbert Lewis, was the first to differentiate between simple reversible processes and irreversible phenomena. [1]

In 1924, Franklin, in his "The Quantum Puzzle and Time", stated the following: [2]

> "The law of increase of entropy and our intuition of time unquestionably grow out of the same condition in nature."

(overview)

Education

Franklin, according to a well-written biography by Gibbs' protégé Edwin Wilson, completed his BS (1887) and MS (1888) at the University of Kansas, during which time he showed such exceptional ability in mathematics and physics that he became an instructor of physics in his second undergraduate year; following his graduation he served three years as assistant professor of physics. For the year 1890-1891 he studied at the University of Berlin (see: Berlin school) with Hermann Helmholtz, Max Planck, and August Kundt. During 1891 to 1892, he was a Morgan Fellow at Harvard University. While professor of physics and electrical engineering at Iowa State College (1892-1897), he studied further at Cornell University, completed his ScD there in 1901. He was professor of physics and electrical engineering at Lehigh University from 1807 to 1903 and professor of physics 1903 to 1915; subsequently he was lecturer in physic at Columbia University (1917-1929), lecturer and professor of physics at MIT (1915-1929), lecturer at Harvard University (1917-1925), and visiting professor at Rollins College from 1929 till his end. [3]

References

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θΔics

In hmolscience, **William Gairdner** (1940-) is a Canadian writer noted, in sociological thermodynamics, his 1994 *The Trouble with Canada*, wherein he argues that societies heat up and cool according to thermodynamics.

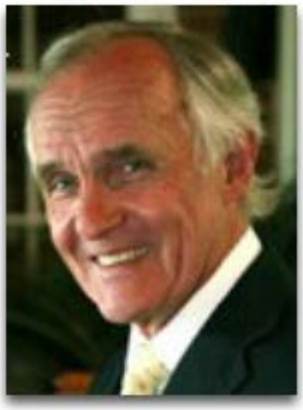

Overview

In 1994, Gairdner, in his *The Trouble with Canada*, argued that the principle of entropy, as in social entropy, and the entropic force applies to creation and cooling of societies, similar to the formation and eventual heat death of galaxies.

References

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θΔics

In existographies, **William Garrison** (1805-1879) (IQ:145|#668) (Cattell 1000:592) (CR:3) was an American abolitionist, journalist, and social reformer, noted for []

Religion

Garrison's anti-religious views were akin to those of Thomas Paine, whose views he did, however, read until Nov 1845; the following is a representative view:

> "The Bible should be judged by its reasonableness and utility, by the probabilities of the case, by historical confirmation, by human experience and observation, by the facts of science, by the intuition of the spirit. Truth is older than any parchment."
>
> — William Garrison (1845), "Article" [1]

Garrison's objection of religion stemmed, in part, for the oft-used literal interpretation of the Bible to justify slavery.

Influences

Garrison, supposedly, was influenced by Jonathan Dymond and his 1834 *Essays on the Principles of Morality*. [3]

Influenced

Garrison is said to have influenced Henry Thoreau and his *Civil Disobedience*. [3]

Quotes | On

The following are quotes on Garrison:

> "To write of the Civil War without Garrison is to write of the American Revolution without Tom Paine, the labor movement without Eugene Debs, the civil rights movement without Bob Moses, or feminism without Elizabeth Stanton."
>
> — Henry Mayer (1998), *All on Fire* [2]

Quotes | By

The following are quotes by Garrison:

> "I will be as harsh as truth and as uncompromising as justice."
>
> — William Garrison (c.1835)

> "With reasonable men, I will reason; with humane men I will plead; but to tyrants I will give no quarter, nor waste arguments where they will certainly be lost."
>
> — William Garrison (c.1835) (Ñº)

References

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2. Jacoby, Susan. (2004). *Freethinkers: a History of American Secularism* (pg. 71). Publisher.
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θΔics

In thermodynamics, **William Francis Giauque** (1895-1982) was a Canadian-born American chemist, of the Lewis school of thermodynamics, noted for being a mentor to American chemical engineer Frederick Rossini, and for his 1949 Nobel Prize in chemistry for his experimental work on the nature of the third law of thermodynamics. [1]

Another noted student of Giauque is American engineer Myron Tribus, a chemistry student at UCLA, whom Giauque taught thermodynamics and statistical mechanics to.

Education

Giauque was a student of American chemist Gilbert Lewis at Berkeley receiving his bachelors there in 1920 and PhD in chemistry with a minor in physics in 1922. He later became a full professor of chemistry there in 1934, where he stayed until his retirement in 1962. Both Lewis and Giauque were teachers and mentors to American chemical thermodynamicist Frederick Rossini, one of the founders of political thermodynamics.

References

1. (a) William F. Giauque (biography) – Nobel Prize Organization.
(b) Giauque, William G. (1949). "Some Consequences of Low Temperature Research in Chemical Thermodynamics", *Nobel Lecture*, December 12.

θΔics

In existographies, **William Gilbert** (1544-1603) (IQ:185|#76) [RGM1301|1,500+] (Murray 4000:18|P) (CR:34) was an English chemist-physicist and physician, known as the "father of magnetism", noted for his 1600 *De Magnete*, a work which rejected Aristotle's natural philosophy, Galen's medicine, and Ptolemy's astronomy, and in its place situated an electricity-magnetism based Copernican cosmology, a work that in a way was a precursor to the gravity-based Copernican cosmology of Isaac Newton and his 1687 *Principia*.

Floating loadstones

His magnetic cosmology of a rotating earth was, in part, said to be based on his experiment where spherical lodestones were floated on water in small wooden boats, which showed that magnetic forces often produce circular motion (see also: Alfred Mayer and his 1878 floating magnets experiment) (see also: turning tendencies). [1]

Electron

In his *De Magnete*, Gilbert was the first to use the New Latin term *electricus* to mean "like amber in it is attractive properties", which came from the Greek word for amber, Î®λεκτρον (*Ä"lektron*). Based on Gilbert's usage, in 1646 term 'electricity' was introduced by Thomas Browne. In 1894, Irish physicist George Stoney coined the term electron: "an estimate was made of the actual amount of this most remarkable fundamental unit of electricity, for which I have since ventured to suggest the name *electron*." According to quantum electrodynamics, i.e. according to Richard Feynman, it is the interaction of the electron and light that is the root cause of all human behavior. [3]

Magnetic gravity

English mathematician and astronomer Edmond Halley (1656-1742), having been influenced by Gilbert's theories, believed that the movements of comets were governed magnetically. English physicist Isaac Newton culled much of his astronomical data measurements for his 1687 *Principia* from Halley and it was Halley in turn who paid for Newton's *Principia* to be published. [4]

Perpetual motion

On the subject of perpetual motion, particularly magnetic perpetual motion machines, Gilbert commented: [1]

> "May the gods damn all such sham, pilfered, distorted works, which do but muddle the minds of students."

(add)

Quotes | By

The following are noted quotes:

> "In the discovery of secret things and in the investigation of hidden causes, stronger reasons are obtained from sure experiments and demonstrated arguments than from probable conjectures and the opinions of philosophical speculators of the common sort."
>
> — William Gilbert (c.1590) (Ñº); compare: Otto Guericke

References

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4. Fara, Patricia. (2005). *Fatal Attraction: Magnetic Mysteries of the Enlightenment* (pgs. 32, 39). MJF Books.

External links

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θΔics

In hmolscience, **William Gladstone** (1809-1898) was an English statesman noted for his 1880s effort to argue for the inerrancy of the Bible, and advocating for the reality of miracles, etc., using semi-scientific arguments.

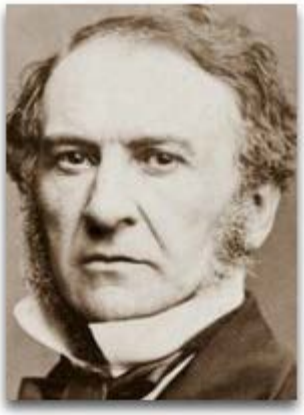

Huxley | Pearson

In 1885, Gladstone, with the publication of his "Dawn of Creation and of Worship", publically butted heads with figureheads such as Thomas Huxley and Karl Pearson on questions of surrounding the conflicts between Genesis, geology, and modern science. [1]

Pearson, e.g., seemingly gave his 1885 "Matter and Soul" lecture, wherein he puts the extrapolate down argument in the form of an Aunt Sally in regards to consciousness and life (as a mechanism), supposedly, arisen from "dead mechanism", as a response to Gladstone's article. [2]

Miracles | Impossibilities

In 1891, Thomas Huxley, in the *Agnostic Annual*, published an article dealing with some of the New Testament miracles. In reaction to this, in connections to references to "Gadarene swine" (Ñº) and the "existence of demons" (Ñº), Gladstone had the following hilarious words to say: (Ñº)

> "I am unaware of anything that has a right to the title of an 'impossibility' except a contradiction of terms. There are impossibilities logical but none natural. A 'round square', a 'present past', 'two parallel lines that intersect', are impossibilities, because the ideas denoted by the predicates, round, present, intersect, are contradictory of the ideas denoted by the subjects, square, past, parallel. But walking on water, or turning water into wine, or procreation without male intervention, or raising the dead, are plainly not 'impossibilities' in this sense. In the affirmation that the man walked upon water the idea of the subject is not contradictory of that in the predicate. Naturalists are familiar with insects which walk on water, and imagination has no more difficulty in putting a man in place of the insect, than it has in giving a man some of the attributes of a bird and making an angel of him; or in ascribing to him the ascendive tendencies of a balloon, as the 'levitationists' do.
>
> Undoubtedly, there are very strong physical and biological arguments for thinking it extremely improbable that a man could be supported on the surface of the water as the insect is; or that his organisation could be compatible with the possession and use of wings; or that he could rise through the air without mechanical aid. . . . But it is sufficiently obvious, not only that we are at the beginning of our knowledge of nature, instead of having arrived at the end of it, but that the limitations of our faculties are such that we never can be in a position to set bounds to the possibilities of nature. The same considerations apply to the other examples of supposed miraculous events.
>
> The change of water into wine undoubtedly implies a contradiction, and is assuredly 'impossible' if we are permitted to assume that the 'elementary bodies' of the chemists are now and forever immutable. Not only, however, is a negative proposition of this kind incapable of proof, but modern chemistry is inclining to the contrary doctrine. And if carbon can be got out of hydrogen or oxygen, the conversion of water into wine comes within range of scientific possibility— it becomes a mere question of molecular arrangement. *As for virgin procreation, it is not only clearly imaginable, but modern biology recognizes it as an everyday occurrence among some groups of animals. So with restoration to life after death.*"

(add discussion)

References

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Prof. Max Muller, Prof. T.H. Huxley, M Reville, and E. Lynn Linton. The Truth Seeker Company, 1885.
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θΔics

In existographies, **William Godwin** (1756-1836) (IQ:155|#521) (Cattell 1000:851) [RGM:733|1,320+] (Murray 4000:N/A) (CR:14) was an English preacher, turned novelist and political philosopher, noted for []

Family

Godwin was husband of philosopher Mary Wollstonecraft (IQ:140±|#591) (Cattell 1000:851) [RGM:528|1,320+] (Stokes 100:75) father of Mary Shelley (wife of Percy Shelley).

Overview

In c.1780, Godwin, while taking a stab at the vocation of ministry, prior to turning to writing as a vocation (1783), one of his parishioners in Stowmarket, Suffolk, gave him key works of the French enlightenment, namely: Baron d'Holbach, Helvetius, and Jean Rousseau, after which this theology dwindled towards deism and his politics turned toward Whig opposition. [1]

In 1793, Godwin, published *Political Justice*, which is said to be most influenced by the Holbach, Helvetius, and Rousseau, respectively. [2]

Quotes | By

The following are quotes by Godwin:

> "He that loves reading has everything within his reach."
>
> — William Godwin (c.1795)

> "Let us not, in the eagerness of our haste to educate, forget all the ends of education."
>
> — William Godwin (c.1795)

> "Next in respect of time to Cornelius Agrippa comes the celebrated Dr. Faustus. Little in point of fact is known respecting this eminent personage in the annals of necromancy. His pretended history does not seem to have been written till about the year 1587, perhaps half a century after his death. This work is apparently in its principal features altogether fictitious. We have no reason however to deny the early statements as to his life. He is asserted by Camerarius and Wierus to have been born at Cundling, near Cracow, in the kingdom of Poland, and is understood to have passed the principal part of his life at the university of Wittenberg. He was probably well known to Cornelius Agrippa and Paracelsus. Melanchthon mentions him in his letters; and Conrad Gessner refers to him as a contemporary. The author of his life cites the opinions entertained respecting him by Luther. Philip Camerarius speaks of him in his 'Horas Subsecivae' as a celebrated name among magicians, apparently without reference to the life that has come down to us; and Wierus does the same thing. He was probably nothing more than an accomplished juggler, who appears to have practiced his art with great success in several towns of Germany. He was also no doubt a pretender to necromancy."
>
> — William Godwin (1834), *Lives of Necromancers* [3]

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● Shelley, Percy B. (1891). *Letters from Percy Bysshe Shelley to William Godwin, Volume One*. Publisher.

External links

● William Godwin – Wikipedia.

θΔics

In thermodynamics, **William Grove** (1811-1896) was a Welsh physicist noted for his theory of the 'correlation of the physical forces', an earlier view of the conservation of force and a prototype view in the development of the conservation of energy and the measurement of the mechanical equivalent of heat. [1] The following is the opening paragraph from his first 1842 lecture on his theory:

> "Physical science treats of matter, and what I shall to-night term its *affections;* namely, attraction, motion, heat, light, electricity, magnetism, chemical-affinity. When these re-act upon matter, they constitute forces. The present tendency of theory seems to lead to the opinion that all these affections are resolvable into one, namely, motion: however, should the theories on these subjects be ultimately so effectually generalized as to become laws, they cannot avoid the necessity for retaining different names for these different affections; or, as they would then be called, different modes of motion."

Grove postulated a relationship between mechanics, heat, light, electricity, and magnetism by treating them all as manifestations of a single "force". In respect to the interconvertability of forces, he states: [3]

> "Each force is definitely and equivalently convertible into any other and that where experiment does not give the full equivalent, it is because the initial force has been dissipated, not lost, by conversion into other unrecognized forces. The equivalent is the limit never practically reached."

His thoughts were first collected in the 1846 book *The Correlation of Physical Forces*. [2] By the time of the 1862, third edition, Grove had been to take note of the implications of those as Rudolf Clausius and William Thomson.

See also

- Lionel Beale

References

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External links

- William Robert Grove – Wikipedia.

In hmolscience, **William Hanna Thomson** (1833-1918), oft-cited as W.H. Thomson, not to be confused with Irish-born Scottish physicist William Thomson, was an American physician, mind brain dualism scholar, and Christianity vs materialism writer, noted for his public attacks on American inventor Thomas Edison's controversial 1910 *New York Times* atheism-themed interview on the merits of religious theories.

Edison | Review

In 1910, Thomson, in his "Author of *Brain and Personality* Replies to Edison: Dr. W.H. Thomson, Whose Book the Inventor Quoted, Says That Any One Denying the Immortality of the Soul is Either Abnormal or Pathological", argued the following position: [1]

> "People who do not believe in the immortality of the soul are abnormal, if not pathological."

Edison replied as follows: [6]

> "The criticisms which have been hurled at me have not worried me. A man cannot control his beliefs. If he is honest in his frank expression of them, that is all that can in justice be required of him. Professor **Thomson** and a thousand others do not in the least agree with me. His criticism of me, as I read it, charged that because I doubted the soul's immortality, or 'personality,' as he called it, my mind must be abnormal, 'pathological,' in other, words, diseased. I greatly admire Thomson. What he said about my mind did not disturb me. I try to say exactly what I honestly believe to be the truth, and more than that no man can do. I honestly believe that creedists have built up a mighty structure of inaccuracy, based, curiously, on those fundamental truths which I, with every honest man, must not alone admit but earnestly acclaim."

(add discussion)

Overview

W.H. Thomson's father was the reverend William McClure Thomson (1806-1894), author of *The Land and the Book*, a best-selling description of the area of Lebanon and Palestine, used as a means of illustrating and illuminating passages from the Bible. [5] During these years, at least by the 1850s, W.H. Thomson became a relatively good sketch artist, drawing a number illustrations, e.g. Bethlehem (Q), that appeared in his father's and his later books.

In 1884, Thomson published *The Great Argument: or Jesus Christ in the Old Testament*, some type of historicity of the Old Testament, in regards to number and dates of authors, with focus on the so-called prophecy of the coming of Jesus Christ. [2]

In 1892, Thomson gave his "Materialism and Modern Physiology of the Nervous System" Address (turned-book) before the Philosophical Faculty of Columbia College, wherein he set out to address the nature of the materialism vs anti-materialism debate, centered around those including Thomas Huxley and George Romanes ("The Fallacy of Materialism"), in respect to physiology, the nervous system, and the biological sciences. [4]

On 1 May 1909, Thomson published *What is Physical Life? Its Origins and Nature*, wherein he sets out to address the following query—otherwise known as the great problem of natural philosophy: [3]

> "No intelligent person can fail to be interested in the great question, what makes physical matter living matter? This question has been the oldest, and still remains the latest topic of scientific discussion. It is well, therefore, to recognize at the outset why no agreement has been reached on the subject."

To this query, Thomson, in this book, sets out to prove the following:

> "Enough has been demonstrated already to prove that the hypothesis of earthly life every having had a spontaneous, or mechanical, or physico-chemical origin, is wholly untenable."

(add discussion)

Education

In 1892, Thomson was a professor of material medicine and of diseases of the nervous system, at the University of New York.

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θΔics

In existographies, **William Rowan Hamilton** (1805-1865) (IQ:#|#) (Becker 160:118) (GME:27) [CR:61] was an Irish mathematical physicist, eponym of the Hamiltonian (compare: Lagrangian and Gibbsian), noted for []

Overview

In 1834, Hamilton published the first part of "On a General Method in Dynamics", which was followed by a second part the following year; the collected works abstract of both is as follows: [4]

> II On a General Method in Dynamics (1834)
>
> This is the first of Hamilton's two famous Essays on dynamics, in which he develops the whole of theoretical dynamics by the aid of one central function. In this Essay he defines his characteristic function by analogy with his researches in optics, and develops its chief properties for a general system of points in any system of coordinates. The remainder of the paper is devoted to methods of approximation with a view to applying them to perturbations of astronomical bodies. At the end he introduces another function, the principal function, which he develops in the Second Essay.
>
> III. Second Essay on a General Method in Dynamics (1835)
>
> Hamilton develops the properties of the principal function in much the same way as in the previous Essay, but he here establishes for the first time his well-known equations of motion. He applies his method to a case of planetary motion, using a system of canonical elements.

In 1865, Clausius, in his "Mathematical Introduction", defined Hamilton's "force-function" as follows: [2]

$$W = F(x,y,z) + \text{constant}$$

in which the work *W* done by forces acting on a system of particles can be expressed as a function *F(xyz)* of rectangular coordinates.

This is one of the founding papers in the science of dynamics, served as a mathematical basis of logic for German physicist Rudolf Clausius' mathematical foundations, particularly on the calculation of work done or consumed in a system of particles acted on by forces, to his 1865 textbook *Mechanical Theory of Heat*. [1]

Hamilton was looped into the early thermodynamics network via his correspondence with Scottish mathematical physicist Peter Tait. [3]

Students

In c.1832, Thomas Andrews studied astronomy under Hamilton at Trinity College, Dublin.

Quotes | On

The following are quotes on Hamilton:

> "In those cases in which equation (12) holds, or the work done can be simply expressed as a function of the co-ordinates, this function plays a very important part in our calculations. **Hamilton** gave to it the special name of "force function"; a name applicable also to the more general case where, instead of a single moving point, any number of such points are considered, and where the condition is fulfilled that the work done

depends only on the position of the points."

— Rudolf Clausius (1875), *The Mechanical Theory of Heat*, *Second Edition* (§: Mathematical Introduction, pgs. 1-20; quote, pg. 11)

Quotes | By

The following are quotes by Hamilton:

"The invention of dynamics as a mathematical science [was founded by] Galileo, and [through] the wonderful extension which was given to that science by Newton—among the successor to those illustrious men: **Lagrange has perhaps done more than any other analyst to give extent and harmony** to such deductive researches, by showing that the most varied consequences respecting the motions of systems of bodies may be derived from one radical formula; the beauty of the method so suiting the dignity of the results, as to make of his great work a kind of scientific poem."

— William Hamilton (1834), *On a General Method in Dynamics*

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θΔics

In existographies, **William Harvey** (1578-1657) (IQ:180|#137) (Cattell 1000:227) [RGM:N/A|1,320+] (Simmons Scientific 100:38) (Hart 100:49) (Glenn 20:4) (Murray 20:7|B) (CR:22) was an English physician noted generally for his mechanics of heart blood flow circulation theories.

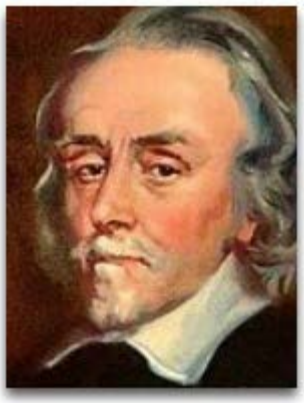

Soul | Life

The following are Harvey's views on the soul:

> "Whatever the power be that creates such an animal out of an egg, that it is either the soul, or part of the soul, or something having a soul, or something existing previous to, and more excellent than the soul, operating with intelligence and foresight."
>
> — William Harvey (c.1630), commentary on the source of the chick embryo (Ñº)

(add)

Biogenesis

Some attribute Harvey as the originated or first to state the principle of biogenesis, namely the logic that life and only come from life; the following, supposedly, was stated by Harvey: [1]

> "Omne vivum ex ovo" | Latin (original)
>
> "Every living thing from an egg" [attributed]

Dean Wooldridge, similarly, states that Harvey, historically, has been assigned the epitaph "father of modern biology" for his used of ordinary engineering principles, governing the pumping and flowing of liquids, to account for functions of the heart. [2]

Physiocracy

Francois Quesnay, in his physiocracy **economic tables**, in which he explained the flow of goods and services, at each step in the passage downward, modeled on a combination of Harvey's heart pump models and Rene Descartes' machine models of blood flow model of the body. [3]

References

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θΔics

In science, **William Herschel** (1738-1822) was German-born English astronomer, a Simmons 100 (#27) and Cattell 1000 (#78), noted for his studies and theories of stars and heat in respect to life.

Nebular hypothesis

Herschel is said to have arrived at the nebular hypothesis as an explanation of many phenomena he observed among stars.

Heat | Life

In 1795, Herschel stated the following: [3]

> "That the emission of light must waste the sun, is not a difficulty that can be opposed to our hypothesis. Many of the operations of Nature are carried on in her great laboratory which we cannot comprehend. Perhaps the many telescopic comets may restore to the sun what is lost by the emission of light."

Herschel would go on, somewhere, to assert that the sun's heat is responsible for life and for most geological evolution on earth. His work, supposedly, influenced Charles Darwin and his 1859 calculation of the age of the earth of 300-million-years. [1]

Extraterrestrial life debate

Herschel, in some way, was involved in the so-called the "extraterrestrial life debate", which ran from 1750 to 1900, regarding the existence or nonexistence of intelligent extraterrestrial life, involving thinkers such as Immanuel Kant, Voltaire, Percival Lowell, among others, an idea which supposedly was crouched with embroiled tensions with religion, supposedly because the possibility of life beyond earth, conflicted with the seven-days of creation view of the Bible, the earth being at the center of the universe, with God creating vegetable life on day three, animal life on day five, and human life (in his likeness) on day six. [2]

Blue sky problem

Herschel is said to have worked on the blue sky problem with respect to the 90 degree polarization data.

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External links

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θΔics

In hmolscience, **William Inge** (1860-1954), or "Dean Inge" or "Gloomy Dean" (Q), as he was commonly known, being Dean of St Paul's Cathedral, was English writer and priest noted, in religious thermodynamics, for his 1931-33 lectures on the heat death as a evidence for divine eschatology.

Overview

In 1931, Inge, in his Warburton lectures at Aberystwyth University, Wales, explored the "religious and philosophical implications of the law of entropy". [1]

Inge's views were summarized in an April article in *Philosophy*, which resulted in a response letter by Canadian philosopher W.E.M. Mitchell on the subject of animate thermodynamics, in which Mitchell points out seeming inconstancy between Inge's article, which argues that thermodynamics applies to animate nature as well as inanimate nature, and James Johnstone's July article, which concludes (incorrectly) that entropy is the inorganic world (non-carbon based) and decreasing in the organic world (carbon-based); which leaves the reader with the incorrigible view that time's arrow (1928) points in both directions (↔). [2]

In 1934, Inge, in his *God and the Astronomers*, used thermodynamics to argue for the existence of God. [3] In this treatise, according to American chemical thermodynamicist Benjamin Kyle, Inge eagerly accepted the law of entropy as proof of a creator, and argued that the god of Christianity was unique, compared to pantheistic gods of the natural religions, because gods of the latter type would be subject to the thermal death of the universe, but is not the fate of the Christian god. [4]

Quotes

The following are representative quotes:

> "Modernist philosophy is wrecked on the second law of thermodynamics."
>
> — William Inge (1933) (Q) (Q)

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External links

● William Ralph Inge – Wikipedia.

θΔics

In existographies, **William Irvine** (1743-1787) (CR:2) was an Scottish chemist and physician noted for having done research in the 1770s on specific heat, furthering the earlier 1760 ideas of his mentor Joseph Black on this same topic, to outline a concept of "absolute heat", differing from Black's ideas to some extent.

Other

Irvine's doctrine of the varying capacities of different bodies for heat was defended and his method of experiment was explained in various papers by his son William Irvine (1776-1811), in *the Journal of Natural Philosophy*; his collected works were published posthumously in 1805 by his son. [3]

Education

In 1756, Irvine entered the University of Glasgow where he studied medicine and chemistry under Joseph Black, whom he assisted in his first experiments on the latent heat of steam. [2] In 1766, at Glasgow, Irvine became lecturer of medicine and in 1770 the chair of chemistry.

Quotes | On

The following are quotes on Irvine:

> "**Irvine**'s particular theory was basically very simple in that the took the concept of 'quantity of heat' to its logical conclusion. Each and every body, according to Irving, contains a certain 'absolute quantity of heat', which is fixed by its heat capacity and its absolute temperature. If, for any reason, the heat capacity of a body should change then it must either emit or absorb heat; thus, the heats of combustion, of chemical reactions in general and the latent heats of fusion and vaporization are merely the consequences of abrupt changes in the heat capacities of the substances concerned. In fact, all productions or absorptions of heat indicate changes in heat capacity. Now this theorem enabled Irvine and his followers to calculate the absolute zero of temperature."
>
> — Donald Cardwell (1971), *From Watt to Clausius* (pg. 55)

Quotes | By

The following are quotes by Irvine:

> "**Capacity for heat** of a body is the number of units of heat required to raise one pound weight of the body one degree in temperature."
>
> — William Irvine (c.1780), attributed [1]

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3. Irvine, William. (c.1780). *Essays: Chiefly on Chemical Subjects* (editor: William Irvine Jr) (specific heat, pg. 48). J. Mawman.

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Irving, pg. 158). University of Wisconsin Press.

External links

- William Irving (chemist) – Wikipedia.

θΔics

In existographies, **William James** (1842-1910) (IQ:170|#335) [RGM:360|1,500+] (Gottlieb 1000:543) (DN:1) (CR:86) was an American psychologist notable for his 1906 lecture on "The Energies of Men", in which he conceived of the theory of mental "reserve energy" and for arguing, in *circa* 1909, against determinism and physicalism, by stating that the second law of thermodynamics was irrelevant to the study of human history.

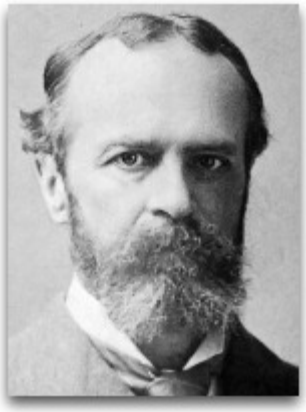

Second law

James rejected the second law of thermodynamics; specifically, according to James: [1]

> "The 'second law' is wholly irrelevant to 'history'—save that it sets a terminus—for history is the course of things before the terminus."

James had commented this in objection to his friend American historian Henry Adams who was writing a theory, suggesting that the second law undermined all of human history. [2] On the contrary, James reasoned that between the beginning and the end, human activity rather than levels of physical energy "is the most important rill we know of."

Geniuses

In 1880, James, in his "Great Men, Great Thoughts, and the Environment" (Ñº), penned the following about epicenter geniuses:

> "Sporadic great men come everywhere. But for a community to get vibrating through and through with intensely active life, many **geniuses** coming together and in rapid succession are required. This is why great epochs are so rare, – why the sudden bloom of a Greece [Aristotle], an early Rome [Cicero], a Renaissance [Goethe], is such a mystery. Blow must follow blow so fast that no cooling can occur in the intervals. Then the mass of the nation glows incandescent, and may continue to glow by pure inertia long after the originators of its internal movement have passed away.
>
> We often hear surprise expressed that in these high tides of human affairs not only the people should be filled with stronger life, but that individual geniuses should seem so exceptionally abundant. This mystery is just about as deep as the time-honored conundrum as to why great rivers flow by great towns. It is true that great public fermentations awaken and adopt many geniuses who in more torpid times would have had no chance to work. But over and above this there must be an exceptional concourse of genius about a time, to make the fermentation begin at all. The unlikeliness of the concourse is far greater than the unlikeliness of any particular genius; hence the rarity of these periods and the exceptional aspect which they always wear."

(add)

Herbert Spencer | 1904

In 1904, James had the following to say about English natural philosopher Herbert Spencer's calculus of forces theory of social force: [6]

> "But what on earth is 'social force'? Sometimes he identifies it with 'social activity' (showing the latter to be proportionate to the amount of food eaten), and sometimes with the work done by human beings and their steam-engines, and shows it to be due ultimately to the sun's heat. It would never occur to a reader of this pages that a social force proper might be anything that acted as a stimulus of social change,—a leader, for example, a discovery, a book, a new idea, or a national insult; and that the greatest of 'forces' of this kind need embody no more 'physical force' than the smallest. The measure of greatness here is the effect

> produced on the environment, not a quantity antecedently absorbed from physical nature. Mr. Spencer himself is a great social force; but he ate no more than the average man, and his body, if cremated, would disengage no more energy."

The tricky issue that James is grappling with here, in regards to the discorrelation between the average food intake versus the average greatness of a person is that food intake is surface-substrate interaction factor that only effects the lowering of the activation energy barrier to a reaction, whereas free energy change is what quantifies the relative greatness of a person, in that the latter is a result of person-to-person or person-to-society human chemical reaction factors.

Henry Adams | 1910

James' life work, according to biographer Robert Richardson, was the "discovery, retrieval, and harnessing of previously unused energies (reserve energy) that lie dormant within us." [4] Yet in early 1910, in spite of his own theories on this subject, James' reserve energies, within himself, were running out, and he was in a state of great downward depression. According to Richardson, "life", for James, "had slowed almost to a halt". In this state, however, in mid-June of 1910, James had finished reading his friend American historian Henry Adams' newly published 125-page *Letter to American Teachers of History*, which argued based on the second law that the energy of society and of human activity tends to run down, towards inevitable heat death. On his near death bed, James was so stirred in protest to Adams presentation that he quickly fired of a riposte, dated June 17th: [5]

> "To tell you the truth it doesn't impress me at all, save by its wit and erudition, and I ask you whether an old man soon about to meet his maker can hope to save himself from the consequences of his life by pointing to the wit and learning he has shown in treating a tragic subject. No, sir, you can't do it, — can't *impress* God in that way."

James then concedes, in a discourse on religious thermodynamics, that:

> "It main be admitted that your Creator (and mine) started the universe with a certain amount of 'energy' latent in it, and decreed that everything that should happen thereafter should be a result of parts of that energy falling to lower levels; raising other parts higher, to be sure, in so doing, but never in equivalent amount, owing to the constant radiation of unrecoverable warmth incidental to the process."

He then got down to cases:

> "I protest against your interpretation of some of the specification of the great statistical drift downwards of the original high-level energy … [history is] the course of things before that terminus."

As an example, James states:

> "Physically a dinosaur's brain may show as much intensity of energy-exchange as a man's, but it can do infinitely fewer things, because as a force of detent it can only unlock the dinosaur's muscles, while the man's brain, by unlocking far feebler muscles, indirectly can by their means issue proclamations, write books, describe Chartres Cathedral etc. and guide the energies of the shrinking sun into channels which never would have been entered otherwise—in short *make* history. Therefore the man's brain and muscles are form the point of view of the historian, the more important place of energy-exchange, small as this may be, when measured in absolute physical units."

James followed up this letter with two postcards (June 19 and 26) furthering his position. James died on August 26, exactly two months after sending his last postcard to Adams. Richardson, in his 2007 biography on James, comments on this last stand effort take before his death: [4]

> "What can one say about the philosophical bravado, the cosmic effrontery, the sheer panache of this ailing philosopher with one foot in the grave talking down the second law of thermodynamics? It is a scene fit to set alongside the death of Socrates."

In short, Adam's *Letter to American Teachers of History* essentially laid question to James' theory of innate reserve energies.

Reserve energy

See main: Reserve energy

In 1906, in what seems to be followup to the issues he had with Spencer's social forces theory, namely that the energy of food eaten does not correlated with the energy or force associated with "a leader, a discovery, a book, a new idea, or a national insult", James gave his speech-turned-article "The Energies of Men", wherein he claims to have discovered a hidden mental energy principle, i.e. "reserve energy", concurrently with his protege Russian-born American psychologist Boris Sidis. [7]

Education

James completed his MD from Harvard in 1864. At Harvard, James became an instructor in anatomy and physiology anatomy in 1873, and later professor of psychology (1876), philosophy (1881), chair in psychology (1889), return to philosophy in 1897, and emeritus professor of philosophy in 1907.

William James Sidis

One of James' noted students at Harvard was Russian-born American psychologist Boris Sidis who was so enamored with James and his theory of reserve energy, that he applied it to the accelerated raising of his newborn son William James Sidis (named after William James) to actuate a resultant adulthood IQ of 250-300, one of the world's highest documented intellects. William James Sidis later went on to script his greatest work *The Animate and the Inanimate* upon a theory of "reversals of the second law" to explain the existence of life. [3]

Quotes | By

The following are quotes by James:

> "Romeo wants Juliet as the filings want the magnet; and if no obstacles intervene he moves towards her by as straight a line as they. But Romeo and Juliet, if a wall be built between them, do not remain idiotically pressing their faces against its opposite sides like the magnet and the filings with the card. Romeo soon finds a circuitous way, by scaling the wall or otherwise, of touching Juliet's lips directly. With the filings the path is fixed; whether it reaches the end depends on accidents. With the lover it is the end which is fixed, the path may be modified indefinitely."
>
> — William James (1890), *Principles of Psychology* [8]

> "Ideas, whether for arousing or for stopping belief, may fail to be efficacious, just as a wire at one time alive with electricity, may at another time be dead."

— William James (1907), “Energies of Men”

> “Conversions, whether they be political, scientific, philosophic, or religious, form another way in which ‘bound energies’ are let loose. They unify, and put a stop to ancient mental interferences. The result is freedom, and often a great enlargement of power. A belief that thus settles upon an individual always acts as a challenge to his will. Whatever it is, it may be a highwater mark of energy, in which ‘noes’, once impossible, are easy, and in which a new range of ‘yeses’ gain the right of way.”

— William James (1907), “Energies of Men”

> “The terms have to remain vague; for though every man of woman born knows what is meant by such phrases as having a good vital tone, a high tide of spirits, an elastic temper, as living energetically, working easily, deciding firmly, and the like, we should all be put to our trumps if asked to explain in terms of scientific psychology just what such expressions mean. We can draw some child-like psychophysical diagrams, and that is all. In physics the conception of ‘energy’ is perfectly defined. It is correlated with the conception of ‘work’. But mental work and moral work, although we cannot live without talking about them, are terms as yet hardly analyzed, and doubtless mean several heterogeneous elementary things. Our muscular work ire a voluminous physical quantity, but **our ideas and volitions are minute forces of release**, and by ‘work’ here we mean the substitution of higher kinds for lower kinds of detent.”

— William James (1907), “Energies of Men”

See also

â— Founders of thermodynamics and suicide

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(b) James, William. (1907). “The Energies of Men” (GB) (JST) [URL] (WS), *Science* 1, Vol. 25, no. 635. pgs. 321-32. March.

Further reading

â— Graham, Wendy. (1999). *Henry James’s Thwarted Love* (ch. 2: William James on Energy and Entropy, pgs. 52-96). Stanford University Press.
â— Blum, Deborah. (2006). *Ghost Hunters: William James and the Search for Scientific Proof of Life after Death.* Penguin.
â— Franzese, Sergio. (2009). *The Ethics of Energy: William James’ Moral Philosophy in Focus* (social thermodynamics, pg. 157). Ontos Verlag.

External links

â— William James – Wikipedia.

θΔics

In existographies, **William B. Jensen** (1948-) (DN:7) (CR:23) is an American chemistry historian noted for his research into the etymology of thermodynamic the symbols such as: "R", the universal gas constant, and "Q" for heat; several articles on the chemical thermodynamics work of August Horstmann, who Jensen claims was the first person to convert R into a universal gas constant; for a number of chemistry caricatures, such as his 1970 Gilbert Lewis caricature, as shown below; and for his 2012 *Notebooks of an Epicurean Materialist*, in which he outlines his thermodynamics based philosophy. [7]

Thermodynamic philosophy

See also: Belief system

Jensen's encapsulated 2012 summary statement, from his *Notebooks of an Epicurean Materialist*, of his particular thermodynamic philosophy (see also: philosophical thermodynamics), being openly atheist (contrary to the status of most scientists, who predominately, in the range of 95 percent, are atheist "but do not like to say so", in the words of Napoleon (see: Napoleon-Laplace anecdote), is as follow: [5]

> "As a scientist, I feel, both intellectually and esthetically, that the laws of thermodynamics are by far the most powerful and significant product produced by western science. As a secular humanist, who believes that the human race is ultimately on its own and cannot count on some last minute supernatural intervention to bail it out of its collective woes, I feel that the confrontation between these laws and the apparent inability of humans to transcend their biologically ingrained imperative to reproduce at all costs will form the ultimate test of whether civilization, and possibly even the human race itself, will survive in the future."

In short, Jensen classifies himself as an "Epicurean materialist", a modern version of the 307BC philosophy of Greek philosopher Epicurus, an atomic materialist (see: atomic theory), who, following in the steps of Democritus, was an advocate of materialism, led him to a general attack on superstition and divine intervention, and, following Aristippus—about whom very little is known—believed that pleasure is the greatest good, but the way to attain pleasure was to live modestly and to gain knowledge of the workings of the world and the limits of one's desires. This led one to attain a state of tranquility (*ataraxia*) and freedom from fear, as well as absence of bodily pain (*aponia*). The combination of these two states is supposed to constitute happiness in its highest form. [6]

History of chemistry

See main: History of chemistry

In 1977, American chemist Ralph Oesper, noted for his 1975 *The Human Side of Scientists*, a book on chemical anecdotes, left a substantial endowment to the Chemistry Department at the University of Cincinnati for the support of activities in the history of chemistry.

The department decided to use this fund to support a faculty position in chemical education and history of chemistry, and in 1986 Jensen was appointed Oesper Professor of Chemical Education and History of Chemistry. Jensen decided to use the endowment to start a new American journal for the history of chemistry, known as the *Bulletin for the History of Chemistry*, and to expand the small collections of rare books, journals, and portraits which Oesper had accumulated over the years. In addition, Jensen, who had been an avid collector of antique chemical apparatus since his days as a graduate student at the University of Wisconsin, decided to add a third collection devoted to the history of chemical apparatus.

Jensen reading in his history of chemistry

During the next 14 years, the book, journal, portrait and apparatus collections were increased more than a hundred fold, much of the apparatus being acquired as donations resulting from the many lectures on the history of chemistry which Dr. Jensen gave during these years at various small colleges and schools. In 2000, a doubling of the endowment resulting from the death of Oesper's son, Dr. Peter Oesper, allowed the collections to acquire space for the separate housing of the books, journals and prints, as well as a museum area, with an accompanying work area and store rooms, for the antique apparatus. Currently the book and journal collections, which span the period 1600-1960, contain more than 17,000 volumes, whereas the portrait collection contains more than 2,500 portraits, prints and photographs related to the history of chemistry, and the apparatus collection more than 4,000 artifacts.

archives and museum at the University of Cincinnati. [2]

Other

In 1979, Jensen published *The Lewis Acid-Base Concepts*, on Gilbert Lewis' 1923 notion of an acid as that which can employ an electron and a base as that which can donate an electron, and in 2002 published *Mendeleev on the Periodic law: Selected Writings*, on Russian chemist Dmitri Mendeleyev's 1869 periodic table.

Caricatures

Jensen's interesting in drawing caricatures began in about 1968 when he was a junior chemistry student at the University of Wisconsin-Madison and attending Aaron Ihde's lectures on the history of chemistry. Each week, rather than taking lecture notes, Jensen would instead select one of the chemists that Ihde was lecturing on and do a caricature based on the portraits found in Ihde's textbook, *The Development of Modern Chemistry* (1964).

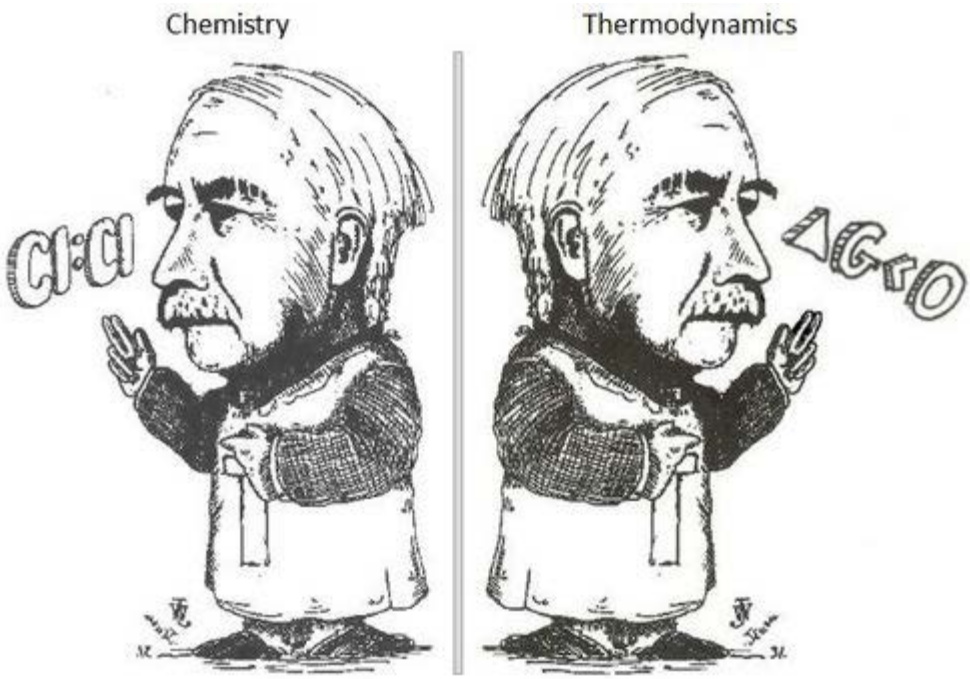

Left: caricature of Lewis, originally done by Jensen in 1970, depicting American physical chemist Gilbert Lewis as a prophet of the chemical bond for the vision of his dot structure notation developed as an aid to students during his 1902 chemistry lectures at Harvard. **Righ**t: retouched caricature of Lewis, by Libb Thims (2012), as one of the prophets of modern thermodynamics, for the publication of his 1923 chemical thermodynamics textbook, soon known as the "bible" of thermodynamics (see: thermodynamic bible), for, in the words of chemistry historian Henry Leicester, (a) replacing the word "affinity" by the word "free energy" throughout the English speaking world, and most importantly (b) through the simplification of 700-equation treatise of Willard Gibbs into the following truncated equation: $\Delta G < 0$, which has since come to be called the Lewis inequality for natural processes, an equation which has been found to govern both human nature and chemical nature (see: human free energy) or as put succinctly by Goethe "there is, after all, only one nature".

This original set has since been supplemented by about another half-dozen caricatures prompted by requests over the years from various individuals and journals. In the 1970s there was little interest in these drawings, but with the passage of time, a sort of underground demand for them has spontaneously arisen among teachers and students of chemistry and many have since been reproduced on coffee mugs, T-shirts, and on various internet sites. More recently, one of them (Robert Bunsen) was even being used as the logo for a rock band. A collected works set of Jensen's caricatures can be found in his 2010 book *Chymists: That Strange Class of Mortals: Caricatures of Famous Chemists with a Few Physicists and Biologists Added*. [4]

Religion | Atheism

In 2011, Jensen, in his "Atheism and Free-Thought in 19th-Century Cincinnati", a talk at the 20th Anniversary Conference of Cincinnati Free Inquiry Group, gave some historical snapshots of noted atheists, supposedly. [8]

In 2014, Jensen stated a version of his atheist's creed.

Education

Jensen completed his BS in chemistry (1970), MS in chemistry and education (1972), and PhD (1982) in organic chemistry, all at the University of Wisconsin. Presently, he is professor emeritus of chemistry at the University of Cincinnati. [3]

References

1. (a) Jensen, William B. (2003). "The Universal Gas Constant R" (abstract: "this column traces the history of the gas constant R and the probable reason for its representation by the letter R.), *J. Chem. Edu.* 80: 731.
(b) Jensen, William B. (2009). "August Horstmann and the Origins of Chemical Thermodynamics", *Bull. Hist. Chem.*
(c) Jensen, William B. (2009). "Introduction to the English Translation of the 'The Theory of Dissociation' by August Horstmann: a Forgotten Classic of Chemical Thermodynamics", *Bull. Hist. Chem.*
(d) Lewis caricature (original) – Woodrow.org.
2. Oesper Collections (history) – University of Cincinnati.
3. (a) Jensen, William. (1972). *The Secondary Chemistry Textbook and the History of Secondary Chemistry Teaching: 1820-1960*, M.S. Thesis, University of Wisconsin, Madison, WI.
(b) Jensen, William. (1982). *Investigations of the Quarternary M/MCl4/X8 /Al2CI6 Systems (where M = Zr, Ti, and X8 =S, Se,) and Related Melts*, Ph.D. Thesis, University of Wisconsin, Madison, WI.
4. Jensen, William B. (2010). *Chymists: That Strange Class of Mortals: Caricatures of Famous Chemists with a Few Physicists and Biologists Added*. Oesper Collections.
5. (a) Email communication to Libb Thims on atheism and philosophical point of view.
(b) Jensen, William B. (2012). *Notebooks of an Epicurean Materialist*. In press.
6. Epicureanism – Wikipedia.
7. Thims, Libb. (2012). "Email to Libb Thims" (on his Dawkins number: reply: "I would say I am a seven"), Apr 9.
8. Jensen, William. (2011). "Atheism and Free-Thought in 19th-Century Cincinnati: Some Historical Snapshots," 20th Anniversary Conference of Cincinnati Free Inquiry Group, Cincinnati, OH., 15 October.

Further reading

â— Jensen, William. (2005)."The Quantification of 20th-Century Thermodynamics: A Tribute to the 1923 Text, *Thermodynamics and the Free-Energy of Chemical Substances* by Gilbert Newton Lewis and Merle Randall," Invited Paper, Bolton Society Symposium, 230th National ACS Meeting, Washington, DC. 28.
â— Jensen, William B. (date). "George Downing Liveing and the Early History of Chemical Thermodynamics" (pdf), *Publication*.
â— Jensen, William. (2010). "Physical Chemistry Before Ostwald: The Textbooks of Josiah Parsons Cooke," Invited Paper, Bolton Symposium, 240th National ACS Meeting, Washington, DC, 23 August.
â— Jensen, William R. (2010). "Why are q and Q used to Symbolize Heat?" (pdf), *Journal of Chemical Education*, 87(11):1114.

See also

â— James Partington
â— History of chemical bonding theory
â— Greatest chemist ever

External links

â— William B. Jensen (faculty) – University of Cincinnati.
â— Jensen, William B. – WorldCat Identities.

θΔics

In philosophy, **William Thomas Jones** (1910-c.1990) was an American philosopher noted for his five-volume *A History of Western Philosophy*, the first volume of which devotes considerable discussion to the formation of Greek atomic theory, e.g. Democritus, Empedocles, Epicurus, Lucretius, Heraclitus, and the so-called "atomists" in general.

Education

Jones was a professor of philosophy at Pomona College and California Institute of Technology. He was awarded the Guggenheim fellowship in 1958. [2]

Quotes

The following are noted quotes:

> "The only ontological difference between men and say, billiard balls is the degree of complexity in the groups of atoms involved. A billiard ball is being bombarded by atoms from the cabbage just as I am, but it does not perceive the cabbage. Why? Because none of its atoms happen to be grouped into that configuration of atoms we call a mind."
>
> — William Jones (1969), *The History of Western Philosophy, Volume 1: The Classical Mind*

References

1. Jones, William T. (1969). *A History of Western Philosophy, Volume 1: The Classical Mind* (pg. 94). Harcourt, Brace & World.
2. List of Guggenheim Fellowships awarded in 1958 – Wikipedia.

Further reading

● Jones, William T. (1969). *A History of Western Philosophy, Volume 2: The Medieval Mind*. Harcourt, Brace & World.
● Jones, William T. (1969). *A History of Western Philosophy, Volume 3: Hobbes to Hume*. Harcourt, Brace & World.
● Jones, William T. (1975). *A History of Western Philosophy, Volume 4: Kant and the Nineteenth Century*. Harcourt, Brace & World.
● Jones, William T. (1975). *A History of Western Philosophy, Volume 5: The Twentieth Century of Quine and Derrida*. Harcourt, Brace & World.

External links

● Jones, W.T. (William Thomas) (1910-) – WorldCat Identities.

θΔics

In hmolscience, **William Jordy** (1917-1997) was an American historian and architectural critic noted, in history thermodynamics, for his 1952 *Henry Adams: Scientific Historian*, wherein he delves into the physics, thermodynamics, and chemistry amid the philosophical work of Henry Adams.

Overview

In 1951, Jordy, in his "Two Temperaments in History: Scientific and Literary", ventured into the Henry Adams oeuvre, mentioning his massive study of the Thomas Jefferson and James Madison administrations, his *The Education of Henry Adams*, and his mention of how "Henry Maine, Moses Tyler, John McLennan, Henry Buckle, Auguste Comte, and the various philosophers who, from time to time, stirred the scandal, and made it more scandalous", according to which the scandal was that history presently was but storytelling and needed to become an experimental science. [3]

In 1952, Jordy, in his *Henry Adams: Scientific Historian*, is highly critical of American physical historian Henry Adams' attempt to apply the laws of science, in particular the phase rule and the second law, to history. [1]

Commentators on Jordy's work on Adams include American historians Greg Myers and Keith Burich. [2]

Gibbs | Adams

Jordy, at one point, on the Willard Gibbs influence on Adams, devotes several pages to addressing what he refers to as the "myth linking Adams to Gibbs", in which he suggests that Adams learned of the phase rule, and in turn Gibbs, in the mid 1990s, from his friend Samuel P. Langley, the then director of the Smithsonian Institute, who had consulted Gibbs in preparing one of his early papers on aerodynamics. While this may be but spurious conjecture, Jordy does note that Adams did have a copy of 1906 edition British chemist Alexander Findlay's *The Phase Rule and its Application* (1904), and was making marginal notes in it.

Quotes

The following are representative quotes:

> "No mechanist, Adams was nevertheless nurtured on mechanistic physics, where every action had its corresponding reaction."
>
> — William Jordy (1952), *Henry Adams: Scientific Historian* (pg. 195)

References

1. Jordy, William H. (1952). *Henry Adams: Scientific Historian* (physics, 23+ pgs; thermodynamics, 22+ pgs; chemistry, 2+ pgs; Gibbs, pg. 168-71). Yale University Press.
2. (a) Myers, Greg. (1985). "Nineteenth-Century Popularizations of Thermodynamics and the Rhetoric of Social Prophecy." *Victorian Studies*, 29: 35-66.
(b) Burich, Keith R. (1987). "Henry Adams, the Second Law of Thermodynamics, and the Course of History" (abs). *Journal of the History of Ideas*, Vol. 48, No. 3 (Jul-Sep.), pp. 467-482.
3. Jordy, William H. (1951). "Two Temperaments in History: Scientific and Literary", *American Quarterly*, 3(1), Spring; in: *Symbolic Essence and Other Writings on Modern Architecture and American* (§1:55-70). Yale University Press, 2005.

External links

â— William Jordy – Wikipedia.
â— Jordy, William H[enry] – Dictionary of Art Historians.
â— Jordy, William H. – WorldCat Identities.

θΔics

In existographies, **William King** (1650-1729), aka "Archbishop King", was an Irish philosopher, politician, and theologian, noted for []

Quotes | On

The following are quotes on King:

> "It was in the eighteenth century that the conception of the universe as a 'chain of being', the principles which underlay this conception – plenitude, continuity, gradation – attained their widest diffusion and acceptance. The faith in speculative *a priori* metaphysics was waning, and the Baconian temper (if not precisely the Baconian procedure), the spirit of patient empirical inquiry, continued its triumphant march in science, and was an object of fervent enthusiasm among a large part of the general educated public. There has been no period in which writers of all sorts — men of science and philosophers, poets and popular essayists, deists and orthodox divines — talked so much about the 'chain of being', or accepted more implicitly the general scheme of ideas connected with it, or more boldly drew from these their latent implications, or apparent implications. Addison, **King**, Bolingbroke, Pope, Haller, Thomson, Akenside, Buffon, Bonnet, Goldsmith, Diderot, Kant, Lambert, Herder, Schiller — all these and a host of lesser writers not only expatiated upon the theme but drew from it new, or previously evaded, consequences; while Voltaire and Samuel Johnson, a strange pair of companions in arms, led an attack upon the whole conception. Next to the word 'nature', the 'great chain of being' was the sacred phrase of the eighteenth century, playing a part somewhat analogous to that of the blessed word 'evolution' in the late nineteenth."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pgs. 183-84) [2]

> "There can hardly be much doubt that it was largely from the original work of **King** that Pope derived, directly or through Bolingbroke, the conceptions which, rearranged with curious incoherency, served for his vindication of optimism in the First Epistle of the *Essay on Man*; for it is unlikely that Pope derived them from their fountain-head, the *Enneads* of Plotinus."
>
> — Arthur Lovejoy (1933), *The Great Chain of Being* (pg. 212) [2]

Quotes | By

The following are quotes by King:

> "There exists a perpetual war between the elements, between animals, between men."
>
> — William King (1702), *De Origine Mali*; paraphrase by Arthur Lovejoy [1]

References

1. (a) King, William. (1702). *De Origine Mali*. Publisher; *An Essay on the Origin of Evil* (translator: Edmund Law) (Arc), Publisher, 1731.
(b) Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea* (pg. 212). Harvard University Press, 1936.
2. Lovejoy, Arthur. (1933). *The Great Chain of Being: a Study of the History of an Idea*. Harvard University Press, 1936.

External links

â— William King (bishop) – Wikipedia.

θΔics

In existographies, **William Lawrence** (1783-1867) was an English physiologist and surgeon noted for []

Quotes | On

The following are quotes on Lawrence:

> "It is evident that the notion of *spirits*, imagined by savages and adopted by the ignorant, is calculated to retard the progress of knowledge, since it precludes our researches into the true cause of the effects which we see, by keeping the human mind in apathy and sloth. This state of ignorance may be very useful to crafty theologians, but very injurious to society. This is the reason, however, why in all ages priests have persecuted those who have been the first to give natural explanations of the phenomena of nature— as witness: Anaxagoras, Aristotle, Galileo, Descartes—and, more recently, Richard Carlile, **William Lawrence**, Robert Taylor, and Abner Kneeland; to which we may add the name of the learned and venerable Thomas Cooper M. D., lately president of Columbia College, South Carolina."
>
> — H.D. Robinson (1835), notes to Baron d'Holbach's *The System of Nature* [1]

> "Returning to Paley's attack on materialist science, however, the seriousness of the issues raised in *Natural Theology* was illustrated some years later by the case of the physiologist **William Lawrence**. Lawrence fell foul of the medical establishment for *An Introduction to Comparative Anatomy and Physiology* (1816) and *Lectures on Physiology, Zoology, and the Natural History of Man* (1819), where he argued that **life was a result of physical organization** rather than a quasi-electro-chemical 'vital fluid' which would somehow indicate the existence of a soul. **He was suspended** from the Royal College of Surgeons and **refused the copyright** of the offending books, which ironically added to their circulation in pirated editions by radical publishers, including Richard Carlile."
>
> — Martin Priestman (2000), *Romantic Atheism: Poetry and Freethought, 1780-1830* [2]

Quotes | By

The following are quotes by Lawrence:

> "The representations of all the animals being brought before Adam in the first instance and subsequently of their being collected in the ark... are zoogically impossible."
>
> — William Lawrence (1819), *Lectures on Physiology, Zoology, and the Natural History of Man: Delivered at the Royal College of Surgeons* (pg. 249). Callow.

References

1. d'Holbach, Baron. (1770). *The System of Nature: Laws of the Moral and Physical World* (notes by Denis Diderot; translator: H.D. Robinson) (pg. 53). J.P. Mendum, 1889.
2. Priestman, Martin. (2000). *Romantic Atheism: Poetry and Freethought, 1780-1830* (pg. 189). Cambridge University Press.

External links

â— William Lawrence – Wikipedia.

In existographies, **William LeVan** (1829-c.1910) (CR:2), or "William Barnet Le Van", was an American mechanical engineer, noted for a number of detailed publications on the indicator and indicator diagram.

Quotes | By

The following are related quotes:

> "In the hands of a skillful engineer, the indicator is as the stethoscope of the physician, revealing the secret workings of the inner system, and detecting minute derangements in parts obscurely situated, and it also **registers the power of the engine**."
>
> — William LeVan (1901), *The Practical Management of Engines and Boilers* (pg. 173) [1]

References

1. LeVan, William. (1901). *The Practical Management of Engines and Boilers, Including Compound and Multiple Cylinder Engines and the Practical Management of Dynamos and Motors* (§12: The Indicator, pgs. 172-94; stethoscope, pg. 173; indicator card, pg. 181). Publisher.

Further reading

â— LeVan, William B. (1889). *The Steam Engine and the Indicator: Their Origin and Progressive Development.* H.C. Baird & Co.
â— Anon. (1892). *Appleton's Cyclopedia of American Biography* (WS). Publisher.

θΔics

In human chemistry, **William John Lillyman** (c.1938-) is an American German-literature scholar, specializing in romanticism, Goethe, and Ludwig Tieck, noted especially for his decoding work on German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*.

Goethe | Aristophanes

In 1982, Lillyman, in his Goethe Symposium talk "Analogies for Love: Goethe's *Die Wahlverwandtschaften* and Plato's *Symposium*", argued that Greek comedy playwright Aristophanes (446-386BC) was somehow an influence to Goethe in the writing of his *Elective Affinities*: [1]

> "Underlying the overt analogy for human love—or 'Gleichnisrede' to use Goethe's term—and analogy which was taken from Aristophanes' speech in Plato's *Symposium*. It not exaggerated to say that parallels and allusions to Aristophanes' explanation of the nature of love permeate Goethe's *Die Wahlverwandtschaften*."

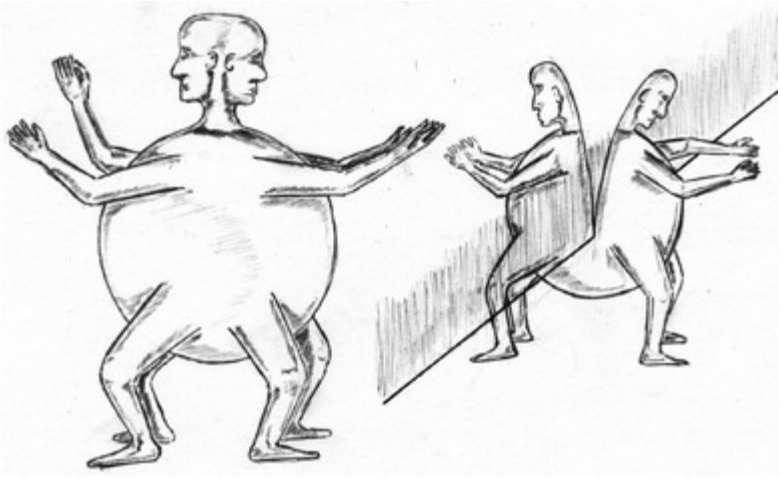

A *circa* 2012 rendition of the splitting of Aristophanes' original circular human by Tom Stockmann, which Lillyman argues Goethe incorporated into *Elective Affinities* via the characters Ottilie and Eduard becoming a perfect love union (true love) or soul mates (see: love at first sight), as evidenced by their mutual headaches on opposite sides of their head (P#:C#), their reading happily together (P#:C#), their musical accompaniment of each other (P1:C8), and their identical handwriting (P#:C#). [2]

While some of Lillyman's arguments do seen tenable, e.g. the Edward/Ottilie polarities and similarities, others seem less so. One example of the latter is the following passage from P1:C4 where the Captain speaks of round water drops and the globular form of melted lead and quicksilver:

"And here," said the Captain, "let me just cursorily mention one remarkable thing, I mean that the full, complete correlation of parts which the fluid state makes possible, shows itself distinctly and universally in the globular form. The falling water-drop is round; you yourself spoke of the globules of quicksilver; and a drop of melted lead let fall, if it has time to harden before it reaches the ground, is found at the bottom in the shape of a ball."

Goethe explicitly states that the chemical affinity theory comes from Swedish chemist Torbern Bergman not Aristophanes. The "roundness" aspect stems from the Heliopolis creation myth, of Ra mythology, of the sun (or sun disc) giving birth or being the progenitor to everything else.

Education

Lillyman completed his PhD in 1965 with a dissertation on "Otto Ludwig's Zwischen Himmel und Erd" ("Otto Ludwig's Between Heaven and Earth") at Stanford University. Currently he is a professor emeritus of the German School of Humanities at University of California, Irvine. One of Lillyman's current research project is an article or book entitled: Goethe's Historical Imagination. "Die Wahlverwandtschaften".

References

1. (a) Lillyman, William J. (1982). "Analogies for Love: Goethe's *Die Wahlverwandtschaften* and Plato's *Symposium*" (quote, pg. 128). Goethe's Narrative Fiction: the Irvine Goethe Symposium. Walter de Gruyter.
(b) Aristophanes – Wikipedia.
(c) Plato. (c.380BC). "Aristophanes' speech", in: *Collected Works of Plato* (translator: Benjamin Jowett) (pgs. 520-25). Oxford University Press, 1953.

(d) Symposium (Plato) – Wikipedia.
2. Burton, Neel. (2010). “Platonic Myths: the Myth of Aristophanes”, Outre-Monde.com, Sep. 25.

Further reading

● Lillyman, William J. (1982). "Monasticism, Tableau Vivant and Romanticism: Ottilie in Goethe's Die Wahlverwandtschaften," *Journal of English and Germanic Philology* 81: 347-66.
● Lillyman, William J. (1980). "Affinity, Innocence and Tragedy: The Narrator and Ottilie in Goethe's Die Wahlverwandtschaften," German Quarterly 53: 46-63.

External links

● William J. Lillyman (faculty) – University of California, Irvine.
● Lillyman, William J. – WorldCat Identities.

θΔics

In existographies, **William Middleton** (1902-1998) (CR:16) was an English-born Canadian meteorologist and barometer historian, noted for []

Overview

In 1964, Middleton, in his *The History of the Barometer*, building on the earlier work of Cornelis de Waard (1936) (O), gave a detailed history of the barometer, with lots of inside details on things such as the Berti vacuum experiment, ending with a good deal of discussion about weather barometers. [2]

Other

Of note, the Middleton article was the 5,000th Hmolpedia article, started on 5 Jun 2019.

Quotes | Employed

The following are quotes employed by Middleton:

> "The discovery of the 'barometer' [Torricelli, 1643] caused the appearance of physics to change, such as the telescope [Lippershey, 1608] did to that of astronomy, the circulation of blood [Harvey, 1628] to that of the medicine, the pile of Volta [1800] to that of molecular physics. "
>
> — Vincenzo Antionori (1841), *Historical Information about the Academy of Cimento* (pg. 27); cited by William Middleton (1964) in *The History of the Barometer* (pg. 1) [1]

Quotes | By

The following are quotes by Middleton:

> "As to the question of the 'vacuum', millions of words have been devoted to it through eighteen hundred years."
>
> — William Middleton (1964), *The History of the Barometer* (pg. 4)

References

1. Middleton, William E. (1964). *The History of the Barometer* (Amz) (definition, pg. x; Stevin, pg. 53). Publisher.
2. (a) De Waard, Cornelis. (1936). *The Barometric Experience: its Background and Explanations – Historical Study* (*L'experience Barometrique: Ses Antecedents et ses Explications. Etude Historique*). Publisher.
(b) Middleton, William E. (1964). *The History of the Barometer* (Amz). Publisher.

External links

- William Edgar Knowles Middleton (about) – Science.ca.
- W.E. Knowles Middleton (about) – CMOSArchives.ca.

θΔics

In existographies, **William Molyneux** (1656-1698) was an Irish science writer, lawyer, politician, and natural philosopher, noted for []

Toland | Free thinker

In 1696, John Toland published *Christianity Not Mysterious*, wherein the Bible was read in a new critical mode, which included the most doubting aspects of John Locke's philosophy; the publication was said to have started the "deist controversy" (see: deism); the book was burned in Ireland in 1697 and Toland had to flee the country. [1]

On 24 Dec 1697, Irish natural philosopher William Molyneux (1656-1698) (Q), in a letter to John Locke, referred to Toland as a "candid freethinker", as follows: [2]

> "In my last to you, there was a passage relating to the author of *Christianity Not Mysterious*. I did not then think he was so near me as within the bounds of this city; but I find since that he has come over hither, and have had the favor of a visit from him. I now understand that he was born in this country, but that he has been a great while abroad, and his education was for some time under the great Le Clerc. But that for which I can never honor him too much, is his acquaintance and friendship to you, and the respect which upon all occasions he expresses for you. I take a great deal of satisfaction in his conversation. I take him to be a candid **freethinker**, and a good scholar. But there is a violent sort of spirit which reigns here, which begins already to show itself against him, and I believe will increase daily, for I find the clergy alarmed to a mighty degree against him. And last Sunday he had his welcome to this city, by hearing himself harangued against out of the pulpit, by a prelate of this country."

This, as is generally cited, was the first English usage of the term "free thinker". [3] There is, of note, a prevalent amount of literature mis-citation (e.g. Hecht, 2003), dating to the late 20th century, stating that Locke was the one that "coined" the term freethinker, in reference to Toland, which, as the above letter (in full) evidences, is not the case. [4] The letter exchange, between Molyneux and Locke, on Toland, continues as follows:

> "For the man I wish very well, and could give you, if needed, proofs that I do so. And, therefore, I desire you to be kind to him; but I must leave it to your prudence in what way and how far. For it will be his fault alone, if he proves not a very valuable man, and have not you for his friend."
>
> — John Locke (c.1698) "Letter to William Molyneux", c. Jan (Q)

> "I look upon Mr. Toland as a very ingenuous man, and I should be very glad of any opportunity of doing him service, to which I think myself indispensably bound by your recommendation."
>
> — William Molyneux (c.1698) "Letter to John Locke", c. Jan (Q)

> "He has had his opposers here, as you will find by a book which I have sent to you. The author (Peter Brown) is my acquaintance, but two things I shall never forgive in his book: the one is the foul language and opprobrious names he gives Mr. Toland ; the other is upon several occasions, calling in the aid of the civil magistrate, and delivering up Mr. Toland to secular punishment. This, indeed, is a killing argument, but some will be apt to say, that where the strength of his reason failed him, then he flies to the strength of his sword. And this reminds me of a business that was very surprising to many, the presentment of some pernicious books and their authors by the grand jury of Middlesex. This is looked upon as a matter of dangerous consequence, to make our civil courts judges of religious doctrines; and no one knows upon a change of affairs whose turn it may be next to be condemned. But the example has been followed in this country, and Mr. Toland and his book have been presented here by a grand jury, not one of whom I am

persuaded ever read one leaf in *Christianity Not Mysterious*. Let the Sorbonne forever now be silent ! A learned grand jury, directed by as learned a judge, does the business much better. The Dissenters here were the chief promoters of this matter, but, when I asked one of them 'What if a violent Church of England jury should present Mr. Baxter's books as pernicious, and condemn them to the flames, by the common executioner,' he was sensible of the error, and said he wished it had never been done."

— William Molyneux (c.1698) "Letter to John Locke", c. Jan (Q)

"The Dissenters had best consider; but they are a sort of men which will always be the same."

— John Locke (c.1698) "Letter to William Molyneux", c. Jan (Q)

"Mr. Toland is at length driven out of our kingdom; the poor gentleman at last wanted a meal's meat, and the universal outcry of the clergy ran so strong against
him, that none durst admit him to their tables. The little stock of money which he had was soon exhausted, he fell to borrowing, and to complete his hardships, the
Parliament fell on his book, voted it to be burnt by the common hangman, and ordered the author to be taken into custody by the Sergeant-at-Arms, and to be prosecuted by the Attorney General. Hereupon he is fled out of this kingdom, and none here knows where he has directed his course."

— William Molyneux (c.1698) "Letter to John Locke", c. Jan (Q)

(add)

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External links

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θΔics

In existographies, **William of Ockham** (c.1288-1348) (IQ:170|#340) [RGM:222|1,330+], or "Occam", was an English theologian, scholastic philosopher, and physicist; noted for []

Atomic theory

Ockham, in the context of the history of atomic theory, was critical of Aristotle; claimed that matter could be reduced down to elementary particles. [1]

Occam's razor

Ockham is commonly known for "Occam's razor", which is a problem solving principle, attributed to him, which states that among competing hypotheses, the one with the fewest assumptions should be selected. (Ñº)

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θΔics

In existographies, **William Paley** (1743-1805) (Cattell 1000:656) was an English philosopher and Christian apologeticist, noted for []

Paley graduated senior wrangler at Christ's College, Cambridge, after which he taught a course on moral philosophy, themed on Samuel Clarke, Joseph Butler, and John Locke; which later formed the basis of his *Principles of Moral and Political Philosophy* (1785). [1]

Watch analogy

In 1802, Paley published *Natural Theology: Evidences of the Existence and Attributes of the Deity*, wherein he gives his now infamous "watchmaker analogy", according to which he stated that if he was walking on a heath—or tract of wasteland—and he came across a pocket watch, it would be most reasonable to assume that someone had dropped it and that it was made by a watchmaker and not by natural forces; the original statement of which is as follows:

> "In crossing a heath, suppose I pitched my foot against a ***stone***, and were asked how the stone came to be there; I might possibly answer, that, for anything I knew to the contrary, it had lain there forever: nor would it perhaps be very easy to show the absurdity of this answer. But suppose I had found a *watch* upon the ground, and it should be inquired how the watch happened to be in that place; I should hardly think of the answer which I had before given, that, for anything I knew, the watch might have always been there. Yet why should not this answer serve for the watch as well as for the stone?
>
> Why is it not as admissible in the second case, as in the first? For this reason, and for no other, viz. that, when we come to inspect the watch, we perceive (what we could not discover in the stone) that its several parts are framed and put together for a purpose, *e.g.* that they are so formed and adjusted as to produce motion, and that motion so regulated as to point out the hour of the day; that if the different parts had been differently shaped from what they are, of a different size from what they are, or placed after any other manner, or in any other order, than that in which they are placed, either no motion at all would have been carried on in the machine, or none which would have answered the use that is now served by it."

The gist argument, which is a rock vs human argument relocated to the focus of a watch, is that design implies a designer, and that designer must be god. [2]

A depiction of **William Paley**'s 1802 "watch analogy", the gist of which is that if you were walking along a heath and came across a **stone** and a watch, and asked yourself how they came to be, you would say the stone came to be their by natural forces, but the watch had an artificer (aka watchmaker) who designed the watch with parts that produce motion for a purpose; the watch is analogous to a human, who must have been designed similarly, and that "designer" must be god.

Quotes | On

The following are quotes on Paley:

> "Bangs have bangers, information has an informer, and rigged dice have riggers."
>
> — J.P. Moreland (2004), a **Paley**'s watch analogy reformulated to big bang theory, information in DNA, and the fine tuning argument [3]

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External links

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In hmolscience, **William Paterson** (1745-1806) was an Irish-born American statesman, governor, US Supreme Court judge, and signer of the US constitution, noted for his 1795 comparisons of the social and planetary realms. [1] American criminal justice professor Curtis Blakely cites this as the first recorded comparison of its kind by a criminal justice official. [2]

Education

Paterson graduated from Princeton and was admitted to the New Jersey bar in 1768.

Paterson was one of the founders of the Whig-Cliosophic Society, Princeton's literary and debate club, which had in its circle John Witherspoon and James Madison—two notable social physics and social mechanics theorists, according to American physicist John Q. Stewart, founder of the Princeton Department of Social Physics.

See also

â— Francesco Algarotti
â— Maurice Hauriou

References

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θΔics

In hmolscience, **William Patten** (1861-1932) was an American zoologist and biologist noted for his late 1919 address “The Message of the Biologist”, given to the American Association for the Advancement of Science, and followup 1920 book *The Grand Strategy of Evolution: the Social Philosophy of a Biologist*, in both of which he utilizes chemistry theory, mixed with evolution theory, mixed with biology, to outline a philosophy of society. Patten outlines a view that each person is a "Mr Molecule" of a chemical society. The following is a representative excerpt from the Patten's message:

> “The most familiar attempts to explain how evolution takes place are restricted to special aspects of evolution, and are often epitomized in personal names, such as Darwinism, Lamarkism, Weismannism, Mendelism. Among us there are naturalists, morphologists, physiologists, and psychologists; breeders, experimentalists, and bio-chemists. And surrounding us on all sides are the physicists, chemists, geologists, and astronomers, with whom we must reckon, for their domains and their subject matter overlap ours in countless ways. But unfortunately between all these workers there is little common understanding and much petty criticism.”

Patten, in general, was a specialist in the evolution of invertebrates and fossil fish (Ñº); noted particularly for his 1912 “The Evolution of the Vertebrates and their Kin”. (Ñº)

Message of the Biologist

In his 1919 address “The Message of the Biologist”, Patten attempted to outline how the modern person might go about deriving a science-based system of morality and future governing constitution for a ‘molecular society’, of people considered as ‘human social atoms’ (social atoms) or ‘human molecules’, based on the pure science teachings of chemistry, physics, and astronomy. [1]

> “We may say, for example, that when the right chemical elements are in the right relations to one another, or if they are moved into them, or placed there, or if these elements themselves find the right relations by chance, or otherwise, cooperative action between them then takes place automatically, or under a compulsion neither can resist, and something new is created. In this cooperative action, each element evidently does something, or gives something to the other, and receives something from the other. It is in fact apparently a clear case of creative action through mutual subjection and mutual service—not necessarily service for each other, because for all we know these elements may be the original anarchists and would much prefer neither to give anything to anybody, nor receive anything from anybody—but for the molecule so created.

Here, in Patten’s discussions of “creative action” at the level of elements, we see him employing a Teilhardian-like *modus operandi*, in his view that the “theory of evolution is not necessarily in conflict with Christian theology”, as biographers have summarized his 1919-1920 mindset. [7] Patton, likewise, continues with usages such as "creative process", "new is created", "creative act", "created by", and "in his creation", all of which is but code for chemical creationism theory:

> In this creative process, the essential factors are, unity, mutual service, mutual discipline, and some sort of constructive rightness. When these conditions are fulfilled, something new is created, and these anarchistic elements then become, perforce, altruistic agents, or accessories, to some ulterior creative act, in which they may or may not be interested. In spite of themselves, by their mere existence, they are compelled to act for something beyond self, and in doing so they cease to be anarchists and become more or less orderly servants in a staid molecular society.
>
> Mr. Molecule, therefore, is created by the mutual services and directive discipline of his constituent atoms,

> or elements, and by his home surroundings, all acting cooperatively to give him birth. In his creation, he becomes endowed with a sovereign quality of his own, subject to the sovereignty of his outer world. He endures as long as those cooperative services are rightly performed, and the discipline rightly maintained, and no longer. His existence, therefore, is contingent on the performance of these services, and on the existence of some degree of rightness within himself, and outside himself; and that molecule which does survive has preserved within its makeup some measure of that rightness. In that measure of cooperation and rightness lies the fitness of his constituents, and the selective agency in the evolution of the molecule."

Chemical creationism issues aside, Patton goes on to cogently discuss how the molecule goes on to set up business for itself, among other excursions on chemical philosophy.

Grand Strategy of Evolution

In his 1920 book *The Grand Strategy of Evolution: the Social Philosophy of a Biologist*, Patten digs into a plethora issues that arise when one follows evolution down to the atomic level. The following is a representative excerpt: [2]

> "We shall use the terms morality, behavior, conduct, or constructive action in the same broad way. It may sound strange to speak of the morals of an atom, or of the way in which a molecule conducts itself. But in the last analysis, science can draw no fundamental distinction between the conduct of an animal, a bullet, or a freshman, although there may be more unknown factors involved in one case than in the other."

Here we see deep insight. In another instance he states:

> "The fractions of time and space which isolate, and which give freedom and individuality to the labile units of social life, are indeed far larger, and perhaps more variable, than those which isolate the atoms of a chemical molecule, or the constituent parts of an ocean liner, or of a social institution, like a college, or university; but this same separating matrix is present in all these individualities, and so far as we may know, it is everywhere of precisely the same nature, immaterial and indefinable. Neither formal aggregation, nor contiguity of substance, is the basic attribute of unity and individuality, whether physical, organic, or social."

On the animate-inanimate (life/death) problem, he comments:

> "When we attempt to follow up these vital processes within the body, they break up into countless larger and smaller ones, mingling inextricably the living and the dead; into organs, cells, and molecules, each a system in itself, and yet interlocking with all the others in a common give and take, with merely nominal, or purely arbitrary boundaries between them, like different departments in one department store. And when the chemist, or biologist turns his sharpest scrutiny on the most vital fragments of life, the dead and the living appear not less mingled than before. Precisely what parts are 'dead' and what 'alive' does not appear. Only this is sure: what once was dead is now a part of life; and what was once a part of life, is now a part of things called 'dead.'"

Here were gleam that he is beginning to grasp a partial view that the conception of life or "life theory" does not hold in the science of chemistry. [4]

Education

Patten completed his BS in 1883 at the Lawrence Scientific School, Harvard, where he studied under Edward Laurens Mark and Nathaniel Shaler.

Patten then won a Parker Traveling Fellowship, allowing him complete his AM and PhD in 1884 under German zoologist Rudolf Leuckart (1822-1898) at the University of Leipzig; his dissertation dealt with the development of Phryganids (caddisflies). [3] He spent the following two years at the University of Vienna and the Naples Zoological Station. In 1886, he joined the Allis Lake Laboratory of Zoology in Milwaukee as an assistant to C. O. Whitman, and in 1889 he was appointed professor of biology at the University of North Dakota, remaining there untill 1893, after which he became professor of zoology at Dartmouth College, remaining there until retirement. The photo of Patten shown above is from the 1892 publication *To Commemorate the Celebration of the 70th Birthday of Rudolf Leuckart*. [6]

Notes

English biologist Mark Janes, who in 2006 independently developed his own version of "Mr. Carbon Atom", akin to Patten's 1919 "Mr Molecule", considers Patten to be his "philosophical doppelgänger". [5]

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Further reading

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θΔics

In hmolscience, **William R. Paulson** (1955-) is an American literature theorist noted, in literature thermodynamics, for 1998 analysis of two cultures stylized thermodynamics books in literature.

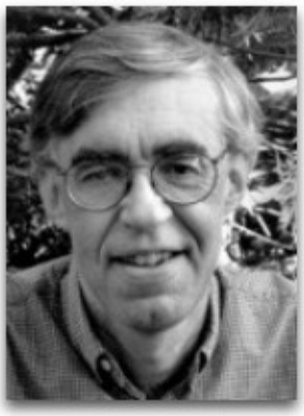

Overview

In 1988, Paulson, in his *The Noise of Culture: Literary Texts in a World of Information*, used a mix of thermodynamics and information theory to analyze information and noise in themes of various novels and stories. [1] Paulson begins by citing English physicist C.P. Snow's famous 1959 lecture on division of "the two cultures", divided between those who have an understanding of the second law and those who have read a work of Shakespeare, as a motif for his following chapters, and goes on to discuss topics such as the second law, negentropy, nonequilibrium thermodynamics, closed systems, among others, in relation to information theory. Paulson comments, for instance, on French philosopher Michel Serres' use of thermodynamics and information theory in his 1980 *Le Parasite*, a work which uses fable to explore how human relations are identical to that of the parasite to the host body.

Paulson's book, in human thermodynamics education, of note, is used as reference material for an English 4342.001 course called "Literary and Narrative Theory", taught by American literature thermodynamicist Bruce Clarke at *Texas Tech University*. [2]

Education

Paulson completed his undergraduate work Rockford College. He received his MA and PhD (1981) from Princeton University.

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θΔics

In hmolscience, **William G. Plank** (c. 1934-) is an American philosopher noted, in philosophical thermodynamics, for his 2002 work on a mixture of dissipative structures, quantum mechanics, and Friedrich Nietzsche.

Overview

In 2002, Plank, in his *The Quantum Nietzsche: the Will to Power and the Nature of Dissipative Systems*, attempted to put a modern-day reinterpretation of German philosopher Friedrich Nietzsche's 1883 theory of "will to power" in terms of the quantum theory, particularly the work of physicists Irish-born American John Bell and American-born Brit David Bohm, and thermodynamics, specifically using the Prigoginean dissipative structure logic. [1] Plank's central premise is the postulate that: [2]

> "Time is a function of the will to power as a dissipative, out-of-equilibrium system [and] morality is linked to valorization of dissipative systems; a morality of anti-entropy."

Beyond this, Plank reasons that "good is anti-entropic; the decadent and sick are entropic … the dissipative is life; equilibrium is death."

On his view of heat death in relation to Nietzsche's philosophy, Plank surmises that "total and universal equilibrium is the end of change and the death of the universe" and that this is the meaning of Nietzsche's admonition to live dangerously, out of equilibrium, and that this dissipative logic capture's Nietzsche's disgust with ideologies which promote safety and happiness as the goal of human efforts, and Nietzsche's assertion that self-preservation is not necessarily the major motive of human effort. [2]

Education

Plank completed his BA in French in 1956 from the University of Missouri, his MA in French in 1966, thesis "Art and the Artist in the Cosmogenesis of Teilhard de Chardin", and his PhD in French in 1972, dissertation "Sartre and Surrealism". [3] It likely from French philosopher Pierre Teilhard that Plank learned his views on energy and entropy and was thus stimulated into his thermodynamic modeling of human reality.

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External links

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θΔics

In hmolscience, **William Provine** (1942-2015) (FA:186) is American mathematician, evolutionist, geneticist, historian, and atheistic philosopher, noted for []

Atheistic | Philosophy

In 1988, Provine began to profess his own peculiar brand of adamant chance-based, Mendelian-centric, nihilistic atheism (compare: closet atheism):

> "The implications of modern science, however, are clearly inconsistent with most religious traditions. No purposive principles exist in nature. Organic evolution has occurred by various combinations of random genetic drift, natural selection, Mendelian heredity, and many other purposeless mechanisms. Humans are complex organic machines that die completely with no survival of soul or psyche. Humans and other animals make choices frequently, but these are determined by the interaction of heredity and environment and are not the result of free will. No inherent moral or ethical laws exist, nor are there absolute guiding principles for human society. The universe cares nothing for us and we, have no ultimate meaning in life."
>
> — William Provine (1988), "Scientists Face It! Science and Religion are Incompatible" [5]

> "A widespread theological view now exists saying that god started off the world, props it up and works through laws of nature, very subtly, so subtly that its actions are undetectable. But that kind of god is effectively no different to my mind than atheism."
>
> — William Provine (1988) [2]

> "If Darwinism is true, then there are five inescapable conclusions: 1) there's no evidence for god, 2) there's no life after death, 3) there's no absolute foundation for right or wrong, 4) there's no ultimate meaning for life, and 5) people don't really have free will."
>
> — William Provine (1988), as summarized by Lee Strobel (*The Case for a Creator*, 2004) [3]

> "An intellectually honest 'Christian evolutionist', a term which itself is an oxymoronic label, has to check their brains at the church door."
>
> — William Provine (1988), "Scientists Face It! Science and Religion are Incompatible"; "oxymoronic" affixed by Lee Strobel [5]

> "Let me summarize my views on what modern evolutionary biology tells us loud and clear — and these are basically Darwin's views. There are no gods, no purposes, no goal-directed forces of any kind. There is no life after death. When I die, I am absolutely certain that I am going to be dead. That's the end for me. There is no ultimate foundation for ethics, no ultimate meaning to life, and no free will for humans, either."
>
> — William Provine (1994), "Darwinism Science or Naturalistic Philosophy?" [7]

In 1994, Provine classified himself as an atheist who denies immortality, a rational basis for ethics, and free will. [1]

In 1998, Provine, in his talk "Evolution: Free Will, Punishment, and the Meaning of Life", seemingly described himself

as a “naturalistic atheist evolutionist”, and stated the following five beliefs, which he derived from Darwin: [4]

> 1) No gods worth having exist
> 2) No life after death exists
> 3) No ultimate foundation for ethics exists
> 4) No ultimate meaning in life exists
> 5) Human free will is nonexistent.

In respect to Provine’s points, to clarify, point #1 is correct (no god exists); point #2 is partially correct (not only does life after death not exist, but life in life does not exist); point #3 is wall off base (Goethe correctly stated that the ultimate foundation are the “moral symbols” of physical chemistry); point #4 is off-platform (meaning exists; life does not exist), and point #5 is correct.

Much of this talk, in respect to crime and punishment in respect to determinism, i.e. point five, seemed to be thematic to the slave stealing parable of Zeno of Citium.

Determinism | Indeterminism

Provine, supposedly, in his 1998 talk, curiously stated something along the lines to the effect that he was a split determinist, i.e. a determinist in biology, but not a determinist in physics or chemistry (Q), or something along these lines; thereby rejecting free will for humans, but believing in indeterminism in physical chemistry.

Johnson

In circa 1994, Provine, described as “pit bull in a debate”, debated atheist turned agnostic (Q) turned intelligent design promoter Phillip Johnson. [1] Provine starts out his course on evolutionary biology, in a style similar to John Patterson, by having students read Phillip Johnson’s 1991 *Darwin on Trial*, to find the errors.

Praise | Tribute

The following are noted quotes of praise and or tribute:

> “I thought **Provine** was great when I took his evolution course, but his seminar in free will blew my mind. Because of this course, I had the most epiphany of my life, regarding the way I view myself, others, and society. If you have the opportunity to take this course, do so. You will be a better person for it. I graduated in 1995, and even back then Provine was packing them in. He is a preaching atheist and is obviously *very* bias against Christians, religion, and intelligent design. I really love the class mainly because of him.”
>
> — Anons (c.2014), aggregate student reviews

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External links

● Will Provine – Wikipedia.
● William B. Provine (faculty) – Cornell University.

θΔics

In hmolscience, **William Proxmire** (1915-2005) was an American politician, the US senator of Wisconsin from 1957 to 1989, noted for his 1975 to 1988 so-called Golden Fleece Awards, a pejorative award aimed at labeling prevalent examples of frivolous government spending, issued out in monthly press releases, numbering some 168 in total, the most-famous of which was his 1975 award to the NSF for spending $84,000 on a study (Q) to learn why people fall in love.

Love grant | Proxmire affair

See main: Proxmire affair

In 1974, the National Science Foundation (NSF) awarded American psychologist Ellen Berscheid, of the University of Minnesota, and her colleague Elaine Walster, a grant of $84,000 ($371,000, in 2014 terms) for a study on romantic love, the phenomenon of falling in love, and or relationship research. (Q) The project description included the subject of "romantic love" in its proposal, which provoked considerable controversy on use of tax dollars, and called into question use of public funds in scientific research. (Q) Proxmire soon herd of this spending and awarded the NSF the first-annual so-called Golden Fleece award, given to "wasteful, ironic or ridiculous uses of taxpayer money", per the following logic: [2]

> "I object to this not only because no one—not even the National Science Foundation—can argue that falling in love is a science; not only because I'm sure that even if they spend $84 million or $84 billion they wouldn't get an answer that anyone would believe. I'm also against it because *I don't want the answer*. I believe that 200 million other Americans want to leave some things in life a mystery, and right on top of the things we don't want to know is why a man falls in love with a woman and vice versa. So NSF—get out of the love racket. Leave that to Elizabeth Barrett Browning and Irving Berlin. Here if anywhere Alexander Pope was right when he observed: 'if ignorance is bliss, tis folly to be wise.'"

Proxmire's self-serving proclamation garned widespread publicity, both pro and con, soon thereafter becoming known as the "Proxmire affair". (Q) In 1978, Elaine Hatfield, a research partner of Berscheid, and William Walster, Hatfield's co-author, e.g. refered to Proxmire's statement as an "idiotic press release gleefully fired off." [2]

The following are other quoted truncations of Praxmire's reasoning:

> "No one can argue that falling in love is a science. The impact of love is a very subjective, nonquantifiable subject matter. Love is simply a mystery."
>
> — William Proxmire (1975), on NSF grant to study love, as quoted by Robert Solomon (1981) [3]

> "The study of love is better left to poets and mystics, to Irving Berlin, to thousands of high school and college bull sessions."
>
> — William Proxmire (1975), on NSF grant to study love, quoted in NY Times obituary (2005) [1]

(add discussion)

Religion

Proxmire was a Protestant Christian, specifically an affiliate of the United Church of Christ.

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● William Proxmire – Wikipedia.
● Golden Fleece Award – Wikipedia.

θΔics

In existographies, **William Ramsay** (1852-1916) (Murray 4000:10|C) (CR:19) was a Scottish chemist, physical chemistry founder, noted, in human chemistry, for his 1898 description of gas molecules as akin to football players.

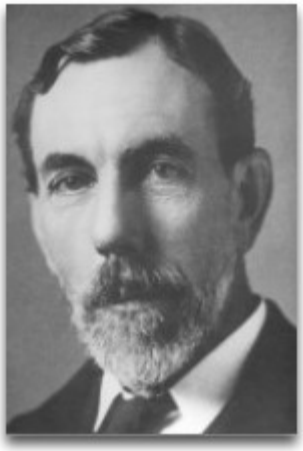

Overview

In 1898, Ramsay referred to people as human molecules, in his discussion of the kinetic theory, where he compares the collisions of gas molecules to the collisions of football players, as follows: [1]

> "I find, in my own case, that it helps greatly to a clear understanding of a concept if a mental picture can be called up which will illustrate the concept, if even imperfectly. Some such picture may be formed by thinking of the motions of the players in a game of football. At some critical point in the game, the players are running, some this way, some that; one has picked up the ball and is running with it, followed by two or three others; while players from the opposite side are slanting towards him, intent upon a collision. The backs are at rest, perhaps; but, on the approach of the ball to the goal, they quicken into activity, and the throng of human molecules is turned and pursues an opposite course. The failure of this analogy to represent what is believed to occur in a gas is that the players' motion is directed and has purpose; that they do not move in straight lines, but in any curves which may suit their purpose; and that they do not, as two billiard-balls do, communicate their rates of motion to the other by collision. But, making such reservations, some idea may be gained of the encounters of molecules by the encounters in a football-field."

(add)

Notes

A noted student of Ramsay was Otto Sackur.

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External links

â— William Ramsay – Wikipedia.

θΔics

In thermodynamics, **William Rankine** (1820-1872) (IQ:180|#92) (CR:105) was a Scottish engineer, mathematical physicist, and thermodynamicist, of the Glasgow school of thermodynamics, noted for being, according to Scottish physicist James Maxwell, was one of the "three founders", along with German physicist Rudolf Clausius and English physicist William Thomson, of "theoretical thermodynamics", and for his c.1845 "The Mathematician in Love" poem, wherein he outlines, via rhyme, an equation of love, and describes love as a form of thermodynamic potential.

Overview

Rankine was one of the core thinkers who, between 1845-1865, brought the newly forming science of thermo-dynamics to maturity, in particular for his competition, so to speak, with Rudolf Clausius, in their similar, but slightly different formulations of thermodynamics (Clausius' version the one we use in modern times). [1]

Ranking notably introduced the term "potential energy" in 1853. In his 1854 article "On the Geometrical Representation of Expansive Action of Heat, and the theory of Thermo-dynamic Engines", Rankine describes James Watt's 'indicator-diagram', Emile Clapeyron's 'diagrams of energy', and discusses 'isothermal curves' and 'curves of no transmission of of heat'. [8]

Rankine's chapter on thermodynamics, according to Maxwell, titled "Principles of Thermodynamics", in his 1859 book *A Manual of the Steam Engine and Other Prime Movers*, was the first published treatise on the subject of thermodynamics, and is the only expression of his views addressed directly to students. [7] In the opening section of this chapter, in reference to the results of the mechanical equivalent of heat, Rankine defines thermodynamics as such:

> "It is a matter of ordinary observation, that heat, by expanding bodies, is a source of mechanical energy; and conversely, that mechanical energy, being expended either in compressing bodies, or in friction, is a source of heat. The reduction of the laws according to which such phenomena take place, to a physical theory, or connected system of principles, constitutes what is called the science of **thermodynamics**."

In October of 1849, Rankine finished a two-part article on a theory of "molecular vortices", by which he explained heat such that bodies consisted of voids with nuclei and atmospheres, such that circulating streams of elastic vortices existed whose volumes spontaneously adapted to their environment. [2] Building on this theory, in 1850 and over the next three years, Rankine wrote a series of papers on "The Mechanical Action of Heat", with supplements, published in the *Royal Society of Edinburgh*, which related chiefly to the "mutual conversion of heat and mechanical power, by means of the expansion and contraction of gases and vapours." [3] In this paper, Rankine set out to mathematically describe the variations of heat in a body, deriving from variations in volume and temperature, during an expansion-contraction cycle, after which the body returned to its original state. He reasoned that variation of heat in the body would be due to three components: [4]

> (a) Volume changes (pressure-volume work) or heat conversion to work transformations.
> (b) Molecular distribution changes (dependent on volume).
> (c) Molecular distribution changes (dependent on temperature).

The latter two changes, which he considered as "internal" changes, were represented by Rankine via a function *U*, which he says "is one depending on molecular forces, the nature of which is yet unknown", that can be calculated directly for a body of ideal gas and calculated indirectly for other bodies by employing from the principle of the conservation of *vis viva*. In derivation of the first law of thermodynamics for the quantification of changes in the body, during one expansion-contraction cycle, he elaborates on an argument that the energetic effects of internal changes cancel each other out. Specifically, he states:

“Suppose a portion of any substance, of the weight *unity*, to pass through a variety of changes of temperature and volume, and at length to be brought back to its primitive volume and temperature. Then the absolute quantity of heat in the substance, and the molecular arrangement and distribution, being the same as at first, the effect of their changes is eliminated.”
He continues:

> “The algebraical sum of the *vis viva* expanded and produced, whether in the shape of expansion and compression, or in that of heat, must be equal to zero.”

That to say, Rankine continues, “if, on the whole, any mechanical power has appeared, and been given out from the body, in the form of expansion, an equal amount must have been communicated to the body, and must have disappeared in the form of heat; and if any mechanical power has appeared and been given out from the body in the form of heat, an equal amount must have been communicated to the body, and must have disappeared in the form of compression.” He states this principle using the following formula:

$$\Delta\Pi + \Delta Q' = 0$$

Where Π, when positive, represents "expansive power" (mechanical work) given out, when negative, compression power absorbed; and Q’ represents, when positive, heat given out, when negative, heat absorbed. In relation to Carnot’s caloric particle heat supposition, that the “quantity of heat remains unchanged” in its passage through the working substance, from a hot body to a cold body, Rankine concludes, in a phrasing that mirrors that views of German physicist Rudolf Clausius, that:

> “According to the theory of this essay, … and to every conceivable theory which regards heat as a modification of motion, no mechanical power can be given out in the shape of expansion, unless the quantity of heat emitted by the body in returning to its primitive temperature and volume is *less* than the quantity of heat originally received.”

To clarify further, Rankine states that “the excess of the latter quantity (heat received, Qin) above the former (heat emitted, Qout) disappearing as heat”, modeled by:

$$Q_{in} - Q_{out} = Q_{dissapeared}$$

Would thus “appear as expansive power, so that the sum of the vis viva in these two forms continues unchanged.”
Within the year, Clausius, who had recently written a paper very similar to Rankine’s titled “On the Motive Power of Heat” (1850), had been sent a copy of Rankine’s paper (under the suggestion of William Thomson). This seems to have started a bit of competitive rivalry between the two; in particular, to reconcile how exactly less heat went out of the working body than went in, Rankine would go on to develop his “thermodynamic function” and Clausius his “entropy” function. Clausius’ version won out in the long run.

Vortex theory | Matter theory of heat | Change of views

Even long after an explanation of the properties of gases had been found, via the kinetic theory, on the theory of the collisions of molecules, Rankine continued to defend his molecular vortices view and in 1865 published what he supposed to be a proof that the phenomena of heat were invariably due to steady streams of continuous fluid matter. [5] Said another way, citing Rankine’s 1865 paper (pg. 244), American science historian Fielding Garrison cites Rankine as the last of the adherents of the so-called material theory of heat:

> “As of late 1865 an authority like Rankine still believed that heat is of material essence.”

In 1869, in his “Thermal Energy of Molecular Vortices”, however, Rankine recants (see: list of recants) and admits that the expansion of gaseous pressure by the impacts of molecules has been proved to be possible. [6]

Education

In 1828, at age 8, Rankine attended Ayr Academy for two years (1828-29) followed by Glasgow High School (1830) for one year, after which, at age 10, an illness forced him to leave and for the next six years he was taught by his father David Rankine, a respected railway engineer in the Edinburgh & Dalkeith Railway. At age 14, his father gave him a copy of Isaac Newton’s *Principia*, in Latin, which he subsequently absorbed, thus laying the foundation of his knowledge in higher mathematics, dynamics, and physics. [9]

In 1836, at age 16, Rankine began studying chemistry, natural history, under Robert Jameson, botany, and natural philosophy, under James Forbes, at the University of Edinburg. Under Forbes he was awarded prizes for essays on methods of physical inquiry and on the undulatory (or wave) theory of light.

Rankine left the University of Edinburgh in 1838 without a degree (which was not then unusual) and, perhaps because of strained family finances, became an apprentice to John Macneill, who was at the time surveyor to the Irish Railway Commission, and there worked under John MacNeill on the railways and canals of Ireland. During his pupilage he developed a technique, later known as Rankine's method, for laying out railway curves, fully exploiting the theodolite and making a substantial improvement in accuracy and productivity over existing methods.

In 1842, Rankine returned to Edinburgh and worked for railway companies, consulting engineers, and later in the London office of Lewis Gordon, who at the time was chair of civil engineering and mechanics, recently set up at the University of Glasgow—a post that Rankine would eventually succeed him (1855) in—and also that year attempted to reduce the phenomena of heat to a mathematical form but he was frustrated by his lack of experimental data. In 1848, Rankine switched careers to study mathematical physics, thermodynamics, and applied mechanics.

In 1849, through the actions of William Thomson, Rankine was elected a fellow of the *Royal Society of Edinburgh*, and in 1854, he was awarded the Keith medal for his work in thermodynamics. Rankine was professor of civil engineering and mechanics at the University of Glasgow from 1855 until his death in 1872, pursuing engineering research along a number of lines in civil and mechanical engineering.

In 1872, after a long battle, the authorities agreed to Rankine’s proposal of awarding the academic degree bachelor of science for the study of engineering at British universities, the first step toward raising the status of engineering sciences in universities.

Rankine is associated with both the Edinburgh school and the Glasgow school of thermodynamics.

Quotes

The following are noted quotes:

> “A hypothetical theory is necessary, as a preliminary step, to reduce the expression of the phenomena to simplicity and order before it is possible to make any progress in framing an abstract theory.”
>
> — William Rankine (1855), *Outlines of the Science of Energetics* [11]

> “Discrepancy between theory and practice, which in sound physical and mechanical science is delusion, has a real existence in the minds of men; and that fallacy, though rejected by their judgments, continues to exert and influence over their acts.”

— William Rankine (1856), *Introductory Lecture on the Harmony of Theory and Practice in Mechanics* [12]

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External links

â— William Rankine – Wikipedia.

θΔics

In hmolscience, **William Ritter** (1856-1944) was an American geologist, zoologist, and biologist noted for 1909 there is no actual beginning of life in time position, aka no origin theory of life argument, amid the 1910s ongoing vitalism-materialism debates, supposedly, penning out a third alternative to materialism and vitalism, namely: organicism. (Q)

Materialism | Vitalism

In 1908 to 1909, the Philosophical Union of the University of California, held a series of discussions led by speakers from various departments of biology; the concluding paper of the academic year of discussion was Ritter's "Life From the Biologist's Standpoint", wherein he digresses on the chicken and the egg problem, Herbert Spencer's views on whether life or organization came first, then ventures into chemistry discussion, during which time he tackles the so-called mind-body problem with the following hypothesis:

> "Since we know absolutely nothing about the relation of the atoms in living substance, would it not be a reasonable hypothesis to say that the nature of that marvelous process called metabolism is due to just the fact that the atoms of carbon, nitrogen, hydrogen, oxygen, etc., are undergoing perpetual change of valence? I see no reason why we may not legitimately imagine even consciousness due to such a process. Were such a hypothesis to be seriously taken, it would seem to follow that consciousness would have its roots wherever metabolism is going on. What an excellent starting point this would make for dealing with the perennial puzzle of how it is that the 'mind influences the body'! The mind would then be part of the body."

Ritter goes on to tentatively state that his views might be similar to Henri Bergson, whose work he has recently been directed towards, and also, supposedly, German-Swiss philosopher Richard Avenarius (1843-1896):

> "This suggestion as to the chemical foundation of consciousness would seem to fall in admirably with the views held not only by M. Bergson but also by Avenarius (Q), that not the brain alone but the whole body is the seat of conscious life."

At the end of his talk, Ritter concludes with the following: [1]

> "The hypothesis of an actual beginning of life in time seems to be growing less and less fruitful with the advance of experiential knowledge."

(add discussion)

Education

Ritter, as a youth, according to his uncle Nelson Ritter, was a voracious reader who was always seeking meaning. In 1879, he attended Oshkosh Normal School (now University of Wisconsin, Oshkosh) where he became enchanted University of California, Berkeley professor Joseph LeConte's *Elements of Geology* (1878), with its unbiased perspective—LeConte (1823-1901) being someone who is characterized as a pre-Teilhardian like thinker who did early grappling with the religion, science, and evolution issue—which convinced him to go to UC Berkeley where he complete BA in geology, under LeConte, in 1888. He then completed his MA and PhD in zoology at Harvard University, after which he went to Berkeley to teach biology, thereafter becoming the founding chair of new zoology department. In 1903, he met American newspaper magnate E.W. Scripps, and together they founded the Scripps Institution of Oceanography, in San Diego.

Quotes

The following are other noted quotes:

> "Joseph LeConte, more than any other teacher, helped me to look with the eye of reason upon the beauty, the wonder, the majesty, and the mystery of nature."
>
> — William Ritter (1818), book dedication [3]

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External links

- William Emerson Ritter – Wikipedia.

θΔics

In existographies, **William Sewell** (1804-1874) was an English moral philosophy professor, semi-rector, and reverend noted for his public burning of James Froude's 1849 *Nemesis of Faith*—a novel about a divinity student who gives up his ministry because he cannot reconcile himself to various tenets held by the Church of England, including incarnation and atonement, in light of growing scientific knowledge. [1]

Education

Sewell attended Winchester College from 1819 to 1822, and then matriculated at Merton College, Oxford, where he held a postmastership until 1827, during which time he took first-class honours in literae humaniores (Ñº), i.e. the classics, after which he was elected Petrean Fellow of Exeter College, Oxford, winning the Chancellor's Prize for the English essay in 1828 and for the Latin essay in 1829. He was ordained as a minister in 1831 and served various curacies. [7] Sewell completed an MA in something, and in the 1840s was listed himself as a fellow and tutor of Exeter College, and Oxford professor of moral philosophy, and by 1849 was a semi-rector. Sewell wrote many books, among which his *Christian Morals* (1840), *An Introduction to the Dialogues of Plato* (1841), and *Christian Politics* (1840/44) were chief, as Exeter College historian Charles Boase notes. [4] The following is a semi-discussed (Ñº) exert from the former: [5]

> "I believe that a geologist deeply impressed with the mystery of baptism—that mystery by which a new creature is formed by means of water and fire—would never have fallen into the absurdities of accounting for the formation of the globe solely by water or solely by fire. He would not have maintained a Vulcanian or a Neptunian theory. He would have suspected that the truth lay in the union of both."

His writings have been described as paradoxical and laced with semi-scientific discussion, e.g. he employs the term "fire" 25+ times in his *Christian Morality*, one time giving the paradoxical example of a metal, such as sodium, catching fire under water, and how this is at odds with the intuitive model that fire typically puts out fire.

Book burning

See main: *Book burning*

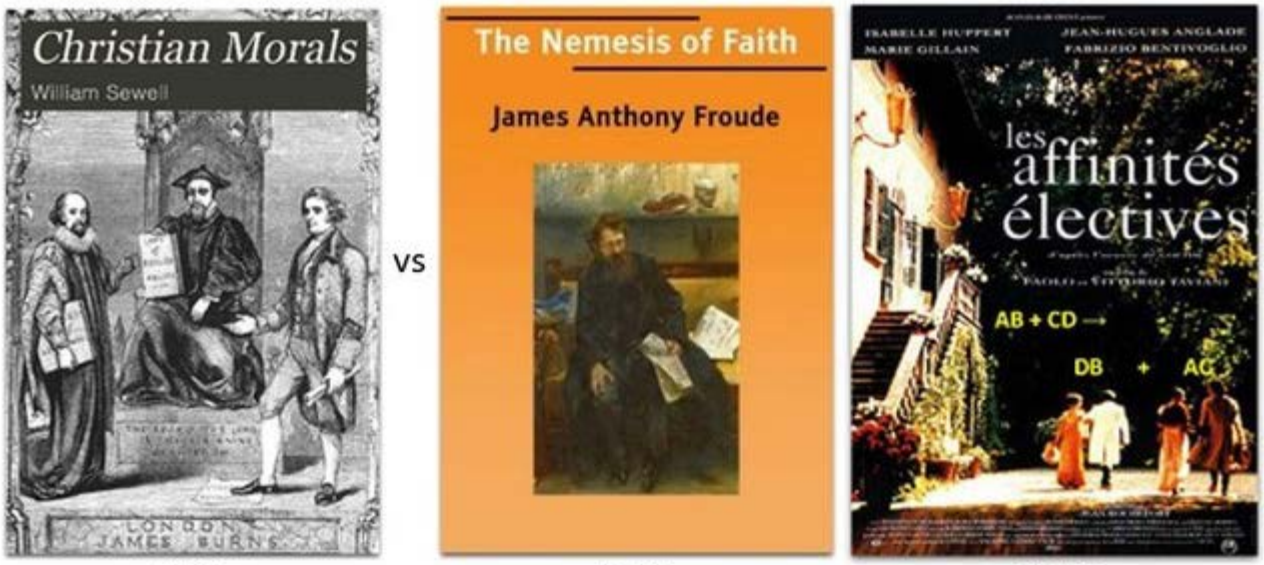

In 1841, **William Sewell** published *Christian Morals*, wherein he argued that modern sciences, e.g. chemical findings, such as certain metals burn under water, sided with Christianity; in 1849, Sewell burned James Froude's *Nemesis of Faith*, a treatise on how modern science causes one to lose one's Christian faith; in 1854, Froude did the first English translation of Goethe's *Elective Affinities*, wherein it is shown how chemical findings allows one to create a new system of morality, based on physical chemistry, via interpretation of the "moral symbols" describing the heat and work aspects of chemical reactions, people explicitly conceived as being large "metamorphized", i.e. evolved, types of animate chemicals.

In 1849, English clergyman-abnegator and writer James Froude published his semi-autobiographical novel *Nemesis of Faith*, about a young priest whose faith comes into question in light of early 19th-century developments in science and history; the following is a representative statement from the novel: [2]

> “What is man the wiser or the happier for knowing how the air-plants feed, or how my centuries the flint-stone was in forming, unless the knowledge of them can be linked on to humanity, and elucidate for us some of our hard moral mysteries?”

While great thinkers, such as George Eliot, professed profound admiration for the novel, others, specifically English religious figures, condemned the novel. [3]

On 27 Feb 1849, Froude’s book was burned in a Tuesday moral philosopher class at Oxford by Sewell—an incident summarized by Exeter College historian Charles Boase (1894), via citation to an 1892 letter published by the owner of the book Arthur Blomfield, as follows: [6]

> Charles Boase (1894): “It was at one of these lectures that Sewell burnt a book which he thought obnoxious, in 1849, the last time a book has been publicly burnt in a College hall. The scene is thus described by the owner of the book, Arthur Blomfield, now R. of Beverston and RD. of Dursley, Glouc. [Rev. A. Blomfield of Beverston Rectory, Tetbury, Gloucestershire]:
>
> > Arthur Blomfield (1892): ‘I had just bought the *Nemesis of Faith*, or as it was called, ‘Faith with a Vengeance’, when on Tuesday morning, Feb. 27, 1849, I, an undergraduate of Exeter College, attended a lecture in hall. The Rev. William Sewell, Sub-Rector of Exeter College (not ‘Dean of the Chapel’) was lecturer. He declaimed loudly against Froude’s *Nemesis of Faith*. Hearing, on my own confession, that I possessed it, he requested me to bring ‘that book’ to him. No sooner had I complied with his request (Sewell was my college tutor) than he snatched the book from my hands and thrust it into the blazing fire of the college hall (not ‘quadrangle’). I see him now, with hall poker in hand, in delightful indignation, poking at this, to him, obnoxious book. In a few hours this ‘burning of the book’ was known all over Oxford. As your article justly remarks, ‘the burning only served as an advertisement’. ’

Sewell, supposedly, decried Froude’s work as a “wicked book” and the incident gave rise to apocryphal story that the book was burned publicly (Ñº) at Oxford, i.e. not just in a classroom setting, but at some kind of out-door public gala or event.

In more detail, in a 1892 book section on the history of “book burning”, made amid a discussion of James Farrer’s 1892 *Books Condemned to be Burnt*, we find the following retelling of the Sewell book-burning incident as follows: [8]

> “Mr. Farrer's delightful book teems with facts, and he practically covers the whole range of the subject, so far as book-burning in England is concerned. But it seems more than passing strange that the institution existed, to a certain extent, just over forty years ago, for the Rev. A. Blomfield writes from Beverston Rectory, Tetbury, Gloucestershire: "My private journal records—' Sewell burnt Froude's book.' The history is this: The burnt book was mine. I had just bought the 'Nemesis of Faith,' or as it was called, ' Faith with a Vengeance,' when on Tuesday morning, Feb. 27, 1849,1, an undergraduate of Exeter College, attended a lecture in hall. The Rev. William Sewell, Sub-Rector of Exeter College (not 'Dean of the Chapel') was lecturer. He declaimed loudly against Froude's 'Nemesis of Faith.' Hearing, on my own confession, that I possessed it, he requested me to bring 'that book to him.' No sooner had I complied with his request (Sewell was my college tutor) than he snatched the book from my hands and thrust it into the blazing fire of the college hall. I see him now, with hall poker in hand, in delightful indignation, poking at this, to him, obnoxious book. In a few hours this ' burning of the book' was known all over Oxford. The book became famous—editions multiplied. I lost my 'Nemesis of Faith;' I think I lost 'Faith' in my college tutor, for at

least he should have recouped costs (3s. 6d., I believe, was the book's price), or presented me with an antidote in the form of one of his books—*e.g.*,'Sewell's Christian Morals.' Not he. O temporal O mores!'"

(add discussion)

Nightingale

Ironically, Froude, not only would go onto to promote Goethe's human chemistry to the English speaking world, via being the first "anonymous" (1859) English translator of his *Elective Affinities*, but would go on to become an associate and promoter of the works of Florence Nightingale, who in turn, from 1874-1891 would lobby and petition to get a chair of social physics established at Oxford (see: Nightingale Chair of Social Physics).

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7. William Sewell (1804-1874) – VictorianWeb.org.
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(b) Anon. (1892). *The Bookworm: an Illustrated Treasury of Old-time Literature* (§Book Burning, 255-57; esp. pg. 257). London: Elliot Stock.

External links

â— William Sewell (author) – Wikipedia.

θΔics

In existographies, **William Shakespeare** (1564-1616) (IQ:190|#48) (CR:178) was an English writer noted, in hmolscience, for []

Overview

In 1603, Shakespeare, in his *Othello, the Moor of Venice*, commented on puzzling issues surrounding the fire theory of life, riddled form: [1]

> "I know not where is that Promethean heat, that can thy life relum."

Shakespeare's quote was commented on further by English thermodynamicist Alfred Ubbelohde in his 1954 discussions on thermodynamics and life, concluding to the affect that scientists in his day were not much above Shakespeare in their thermodynamical understanding of the origin of life. [2]

Human chemistry

English chemical physicist Philip Ball argues that alchemical imagery lies at the core of several of Shakespeare's works, most notably his 1606 *King Lear*, where the tribulations of the king can be seen as symbolizing the transformations in alchemy that were supposed to produce the "Red King", a substance in route to the Philosopher's Stone. [3]

Two cultures

The works of Shakespeare as contrasted with the works of Rudolf Clausius are said to be what defines the "two cultures" of modern-day intellectuals, as famously stated by English physicist Charles Snow in his 1959 Rede Lecture "The Two Cultures", wherein he comments: [4]

> "A good many times I have been present at gatherings of people who, by the standards of the traditional culture, are thought highly educated and who have with considerable gusto been expressing their incredulity at the illiteracy of scientists. Once or twice I have been provoked and have asked the company how many of them could describe the second law of thermodynamics. The response was cold: it was also negative. Yet I was asking something which is about the scientific equivalent of: Have you read a work of **Shakespeare**'s?"

In other words, Snow argues that the people who read science (and thermodynamics) and the people who read literature (and Shakespeare) are of two different cultures.

Human chemical bonds

Shakespeare, the context of the theory of human chemical bonding, assumed the existence of an external force that induces amorous attraction. [6]

In 2002, New Trier High School, Illinois, assigned a project, entitled "It's all about Bonding: How Humans, Animals, Chemicals, and Natural Forces, have Conflicted in Time, but Also Worked Together", wherein students were asked to consider how elements and chemical species chemically bond or conflict, and to think about how these polar opposite processes of bonding and conflicting play out in life, specifically in human relationships, in the form of human chemical bonds. [7]

In this assignment, it was argued that by studying how elements interact and bond to each other, students might learn about how humans interact and bond with each other. Suggestive queries were 'how does electrical attraction promote bonding in certain species,' or 'how do incongruent physical shapes between compounds can promote debonding,' and 'why does the famed *opposites attract* scenario occurs in chemistry?', etc. One interesting suggestion was to try to determine what kind of hypothetical chemical bond Romeo and Juliet had in their high-energy relationship.

American electrochemical engineer Libb Thims mentioned this "human chemical bonding" homework assignment in his 2007 *Human Chemistry* textbook; and sometime in the following year, circa 2008, stopped down and talked to the principle, a friend of his, about giving a talk to the science department on human chemistry; the result of which Thims donated some of his textbooks to the school to be used by the science department. [8]

Quotes | On

The following are quotes on Shakespeare:

> "The relationship of probability and entropy (more precisely, the decision about spontaneous occurrence of process) or calculation of Gibbs energy for some chemical reactions, is similar to Hamlet's 'to be or not to be?' of **William Shakespeare**."
>
> — Alec Groysman (2004), "Aesthetic, Philosophical and Historical aspects in the Physical Chemistry education" [9]

Quotes | By

The following are quotes by Shakespeare:

> "Love looks not with the eyes, but with the mind."
>
> — William Shakespeare (c.1593) *A Midsummer Night's Dream* (Act I, Scene I, 234) [1]

> "I'll not be made a soft and dull eyed fool, to shake the head, relent, and sigh, and yield to Christian intercessors."
>
> — William Shakespeare (c.1598), *The Merchant of Venice* (Act 3, Scene 3); cited by Elihu Palmer (1801) in *Principles of Nature* (title page)

> "Fate, show thy force; ourselves we do not owe;
> What is decreed must be, and be this so!"
>
> — William Shakespeare (1602), *Twelfth Night* (Act 1, Scene 5); cited by Edward Farber (1961), in respect to ranking greatest chemists [10]

> "For there is nothing either 'good' or 'bad', but thinking makes it so."
>
> — William Shakespeare (1602), *Hamlet* (§2.2) (Ñº)

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(b) Research Outline Plan (PDF).
8. Thims, Libb. (2007). *Human Chemistry (Volume One)* (New Trier, pg 91). Morrisville, NC: LuLu.
9. Groysman, Alec. (2004). “Aesthetic, Philosophical and Historical aspects in the Physical Chemistry education”, in: *Trends in Electrochemistry and Corrosion at the Beginning of the 21st Century* (pgs. 1203-1226). Edicions Universitat Barcelona.
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External links

â— William Shakespeare – Wikipedia.

θΔics

In chemistry, **William Sheehan** (1926-2008) was an American physical chemist noted for his 1970 relative abundance periodic table.

Overview

In 1970, Sheehan made a noted periodic table of elements according to relative abundance on the earth's surface; however, further analysis demonstrates that there are major problems with its accuracy [2]. The colors suggest relative electronegativity—a concept first proposed by Linus Pauling in 1932 as a development of valence bond theory—those with more negative charge, i.e. able to attract electrons, shown in red, those with more positive charge, i.e. able to donate electrons, shown in blue: [1]

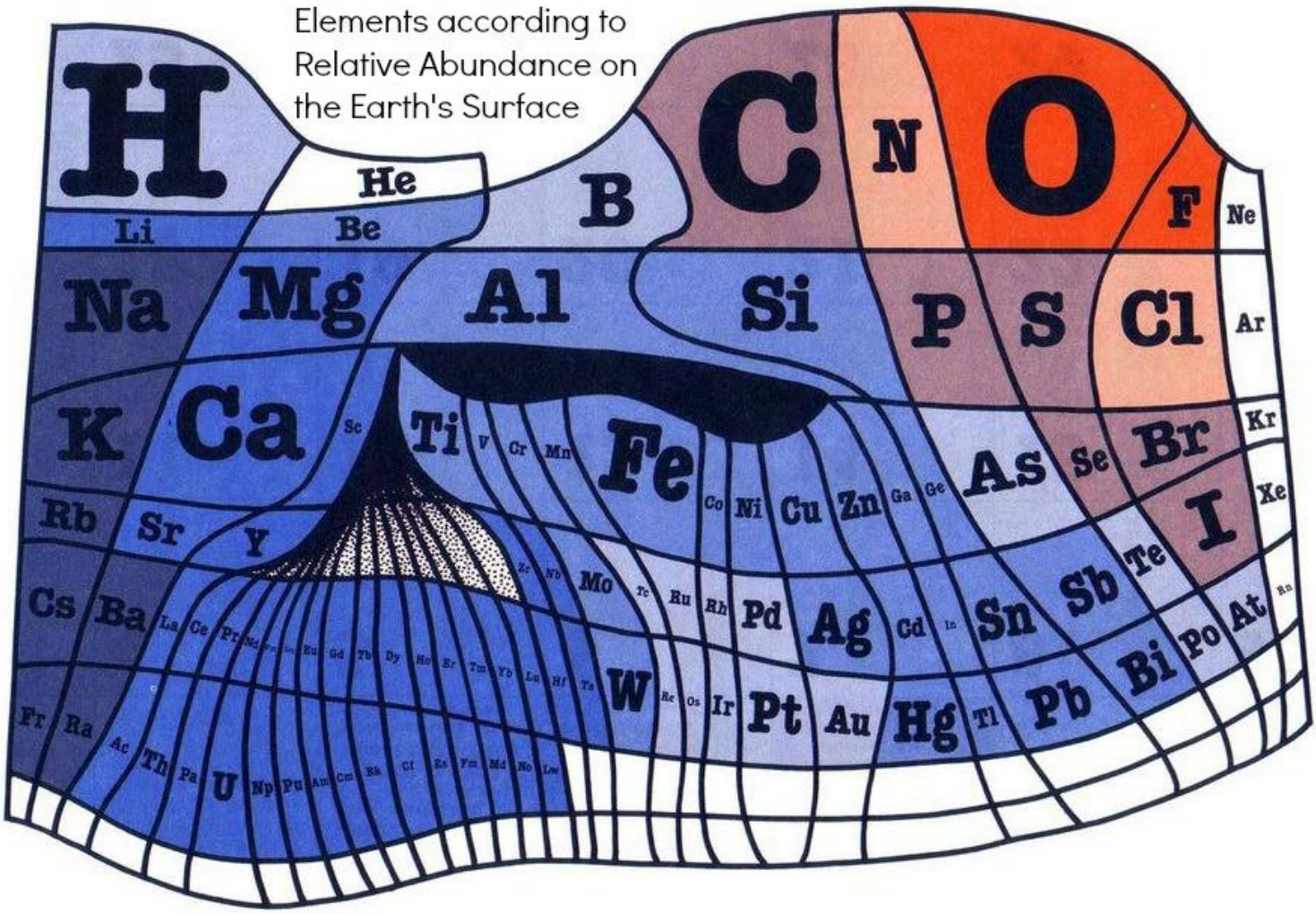

In 2013, the Sheehan periodic table was used as a conceptual model by American electrochemical engineer Libb Thims to make a hyperlinked periodic table of elements (see: hmolscience periodic table) according to the relative abundance in humans or human molecules:

Education

Sheehan attended Loyola University in Chicago before earning a PhD in chemistry in 1952 with a dissertation on “Studies in Molecular Structure and Valance State Energy” at the California Institute of Technology, where he studied under Linus Pauling. Sheehan taught at Santa Clara University from 1955 to 1991, wrote two widely used textbooks on physical chemistry, during which time he invented the notorious Periodic Table of the Elements with Emphasis. [3]

References

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(b) Elements According to Relative Abundance (1970) – Meta-Synthesis.com.
2. Burdette, Shawn C. (2014). "Periodic Table with {wildly inaccurate} EMPHASIS."
3. Anon. (2008). “In Memoriam: William Francis Sheehan, Jr.”, *Santa Clara Magazine*, Summer.

Further reading

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â— Sheehan, William F. (1961). *Physical Chemistry*. Allyn and Bacon.

External links

â— Sheehan, William Francis (1926-) – WorldCat Identities.

θΔics

In existographies, **William Shockley** (1910-1989) (IQ:175|#260) was an American physicist and electrical engineer, noted generally for being the Bell Labs research group manager of John Bardeen, aka the “thinker”, and Walter Brattain, aka the “tinkerer”, who together, as a group, invented the “transistor” (1947).

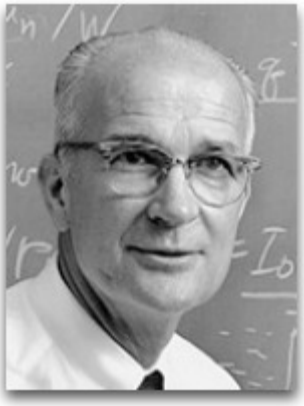

Quotes | On

The following are quotes on Shockley:

> “A more valid criticism — and this is crucial to understanding the flaw in **Shockley**'s argument too — lies in what IQ did not measure in Terman's study. Most obviously, Terman missed the two Nobel Laureates. Neither Shockley nor Luis Alvarez had IQs above 135. Shockley was tested twice and missed both times. Whatever talent they had went unmeasured by Terman's questions. One hypothesis is that the tests do not measure mathematical prowess very well, but is that ability not a facet of what we mean by ‘intelligence’?”
>
> — Joel Shurkin (2006), *Broken Genius: the Rise and Fall of William Shockley, Creator of the Electronic Age* (pg. 230)

> “Two of the students Terman deemed to be insufficiently intelligent to participate in his study, Luis Alvarez and **William Shockley**, won the Nobel Prize in Physics. None of the Termites received a Nobel Prize or a Pulitzer Prize. Nor did any of the Termites become world-class musicians like Isaac Stem and Yehudi Menuhim — two other students rejected by Terman for insufficient IQ scores. ‘All in all’, writes David Shenk, the author of *The Genius in All of Us* (2010), Terman's epic studies in genius turned out to be studies in disappointment’.”
>
> — Randall Kiser (2017), *Soft Skills for the Effective Lawyer* (pg. 89)

Quotes | By

The following are quotes by Shockley:

> “I often laugh at how I couldn’t qualify for Terman’s gifted study, yet go on to in a Nobel Prize in Physics?”
>
> — William Shockley (c.1960), frequently mused joke, following his 1956 Nobel Prize win [1]

References

1. Shurkin, Joel N. (2006). *Broken Genius: the Rise and Fall of William Shockley, Creator of the Electronic Age* (joke, pg. 13). Publisher.

External links

â— William Shockley – Wikipedia.

θΔics

In existographies, **William James Sidis** (1898-1944) (IQ:175|#303) [RGM:691|1,500+] (LR:9) (RE:46) (CR:167) was an American mathematical physicist, famously known as a forced prodigy; noted for

Overview

In 1920, Sidis, in his *The Animate and the Inanimate*, on the general topic of animate and inanimate things, set forth the view that life is a "reversal of the second law"; a book in which he also postulated the existence of dark matter; he following is the opening abstract: [1]

> "This work sets forth a theory which is speculative in nature, there being no verifying experiments. It is based on the idea of the reversibility of everything in time; that is, that every type of process has its time-image, a corresponding process which is its exact reverse with respect to time. This accounts for all physical laws but one, namely, the second law of thermodynamics."

(add)

Education

In 1914, at age 16, Sidis completed his BS at Harvard in mathematics.

Sun spot cycles | Social revolutions

In 1918, Sidis wrote a paper entitled "A Remark on the Occurrence of Revolutions", on climatic change and revolutions, wherein, building on English physical economist Stanley Jevons' sun spot cycle theory of industrial cycles, which he does not agree with, he identifies sun-spots as contributing indirectly to revolts and revolutions. [8]

IQ 225+ | Existence thermodynamics

> *See main: IQ: 225+*

Of interesting curiosity, Sidis, with his 250-300 range IQ citation:

> "I have tested more than five thousand people. Of all the mentally superior individuals that I have seen, nobody begins to approach the intellect and perspicacity of **William Sidis**. According to my computations, he easily had an IQ between 250 and 300."
>
> — Abraham Sperling (c.1940), New York City's Aptitude Testing Institute Director [7]

falls into the rare handful grouping of IQ 225+ cited adults to have worked on the problem of the thermodynamics of human existence, a group which includes: German polymath Johann Goethe (1809), Serbian-born American electrical engineer Nikola Tesla (1900), American electrochemical engineer Libb Thims (1995), and American astrophysicist Christopher Hirata (c.2000).

Good Will Hunting | 10 percent myth

See main: *Good Will Hunting (William Sidis)*; *10 percent myth*

The life of Sidis, of notability, served as the basis for the 1997 film *Good Will Hunting*, about a outcast prodigy who stuns students and professors at MIT with his ability to solve baffling problems with easy and to have a retention memory down to the reference, sentence, and page number level; Sidis is also the person behind the now-famous 10% myth, a theory originated by his father Boris Sidis and his mentor William James at Harvard. [4]

The Animate and the Inanimate

See main: The Animate and the Inanimate

Sidis' *The Animate and the Inanimate*, which he began working on in 1916 (age of 18), finished in 1920 (age 21), and eventually published as the 1925 was the only published book by him in which he used his own name, signifying it as his self-defined greatest work. [2] Sidis stated that he was at first hesitant to publish this theory, but that he gained confidence on discovering the following quotation by William Thomson:

> "It is conceivable that animal life might have the attribute of using the heat of surrounding matter, at its natural temperature, as a source of energy for mechanical effect . . . . the influence of animal or vegetable life on matter is infinitely beyond the range of any scientific enquiry hitherto entered on. Its power of directing the motions of moving particles, in the demonstrated daily miracle of our human free-will, and in the growth of generation after generation of plants from a single seed, are infinitely different from any possible result of the fortuitous concurrence of atoms."

With this fuel of support, building on the "reserve energy" theories of American psychologist William James (whom Sidis was named after), in which a person is theorized to have latent mental stores of energies (such as second or third winds of thought), along with English physicist William Thomson's views on life and the second law, and Scottish physicist James Maxwell's conception of an intelligent demon able to circumnavigate the second law, Sidis used a theory of probability to argue that a vital force exists in living matter able to supply available energy, in a converse manner to entropy (unavailable energy) such that: [1]

FOOTNOTE TO HISTORY

by Cathie Slater Spense

In Search of the April Fool

BORN ON APRIL 1, 1898, WILLIAM James Sidis could speak five languages and read Plato in the original Greek by the age of five. At eight he passed the entrance exams for Harvard but had to wait three years to be admitted. Even so, he became Harvard's youngest scholar and graduated *cum laude* in 1914 at the age of 16. Frequently featured in "Ripley's Believe It or Not," Sidis made the front page of the *New York Times* 19 times.

But after graduating from Harvard, the "Boy Wonder" pursued his own obscure and seemingly meaningless interests. The press that had lionized him turned on him. The most scathing example came in the *New Yorker* in 1937. Entitled "April Fool," the magazine article ridiculed everything from Sidis's hobbies to his physical characteristics. Sidis sued for libel and invasion of privacy. Though he won a small out-of-court settlement for libel, the invasion of privacy charge was dismissed by the U.S. Supreme Court in a landmark decision. "The article is merciless in its dissection of intimate details of its subject's personal life," the court conceded, but Sidis was "a public figure" and thus could not claim protection from the interest of the press, which continued to hound him until his death in 1944. Obituaries called him "a prodigious failure" and "a burnt-out genius" who had never achieved anything of significance despite his talents.

Dan Mahony of Ipswich, Massachusetts, read about Sidis in 1976 and was puzzled. "What was he really doing and thinking all that time?" Mahony wondered. "It's true he held low-paying jobs, but Einstein came up with the theory of relativity while working in a patent office. I had a feeling Sidis was up to more than most people thought."

Sidis spoke five languages at age five.

courtesy Harvard University Archives

Mahony has spent the last ten years looking into Sidis's work. In one dusty attic, he found a bulky manuscript called *The Tribes and States* in which Sidis argued persuasively that the New England political system was profoundly influenced by the democratic federation of the Penacook Indians. When Mahony sent Sidis's book *The Animate and Inanimate* to another eccentric genius, Buckminster Fuller, Fuller found it "a fine cosmological piece" that astoundingly predicted the existence of black holes — in 1925!

Mahony has unearthed a science fiction novel, economic and political writings, and 89 weekly newspaper columns about Boston that Sidis wrote under a pen name. "The amazing thing is that we may only have tapped the surface of what Sidis produced," says Mahony. "For instance, we've found just one page of a manuscript called *The Peace Paths*, and people who knew Sidis have said they saw many more manuscripts. I think Sidis may still have a few surprises in store for us." □□

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A 1987 said to be "truthful" article, by Cathie Spense on Sidis and his 1937 *New Yorker* "April Fool" article, lawsuit, and stress-hastened reaction end.

> "Animal life acts the part of Clerk-Maxwell's *sorting demon*."

Maxwell's demon, however, was supposedly exorcised by Hungarian-American physicist Leó Szilárd in 1929; a proof that lays question to Sidis' theory. [3]

Economics

The following is a popular 1938 quote by Sidis: [5]

> "The laws that govern the structure of an economic system cannot, in the nature of things, be set aside or altered by anything a mere government can do."

(add)

End years

After returning to Boston, Sidis got a small South End apartment, took clerical jobs, and went on with his writing, living in relative seclusion. He began to be jarred again when in August 1937, *Boston Sunday Advertiser* and the *New Yorker* ran articles about him. The *New Yorker* piece, bylined "Jared L. Manley" but reworked by James Thurber, was titled "April Fool." Sidis had had enough. He sued both publications. The *Advertiser* eventually settled for $375. In a breach-of-privacy suit against the *New Yorker*, the court ruled that Sidis could not claim privacy rights because he was still a public figure. In 1944 the magazine paid a reported $500 to settle a companion suit for malicious libel. Sidis died of a cerebral hemorrhage three months later. He was 46. [4]

Quotes | On

The following are quotes on Sidis:

> "Gauss is the only example in history, of all prodigies, whom **Sidis** resembles."
>
> — Daniel Comstock (c.1910)

> "If any man since Leonardo had universal knowledge, it was **William Sidis**."
>
> — Mrs. Sharfman (c.1944). "Lament for William James Sidis, an American" (pgs 1, 2)

> "Young **Sidis** was truly an intellectual phenomenon. His childhood achievements ranked with those of John Stuart Mill, Thomas Macaulay, and Johann Goethe."
>
> — Abraham Sperling (1946) (Ñº) (Ñº)

WILLIAM JAMES SIDIS, WHO ENTERED HARVARD AT FOURTEEN, AND ASTONISHED ALL HIS INSTRUCTORS BY HIS PROFOUND GRASP OF MATHEMATICAL PRINCIPLES. AT FIVE HE COULD STATE OFFHAND ON WHAT DAY OF THE WEEK A GIVEN DATE WOULD FALL

A circa 1910-12 picture of Sidis in an article on historical lightening calculator minds. [6]

Quotes | By

The following are quotes by Sidis:

> "In order to effect any sweeping change in society, it is absolutely essential to produce a discontinuity — that is, a break in continuity. The theory of social continuity shows that. without this, the old continuities will necessarily tend to pull things back to the past."
>
> — William Sidis (c.1925), "Lessons on Social Continuity" (Ñº), 3-pgs; found in Helena Sidis' files, 1977

References

1. (a) Sidis, William J. (1920). *The Animate and the Inanimate* (WB). Draft stage 1916; Formerly published: R.G. Badger, 1925.
(b) Sidis predicted the existence of regions of space where the second law operated in reverse to the temporal direction experienced in our local area; meaning that everything outside of the galaxy would be such a region. Sidis claimed that the matter in this region would not generate light.
2. (a) Sidis published the 1935 book *The Tribes and the States* under the pseudonym "John W. Shattuck" and also wrote a treatise on streetcar transfers under the pseudonym of "Frank Folupa".
(b) Notes the Collection of Sidis' pseudonyms - Sidis.net
3. (a) Szilárd, Leó. (1929). "On the Decrease in Entropy in a Thermodynamic System by the Intervention of Intelligent

Beings”, *Zeitschrift fur Physik*, 53, 840-56.
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Further reading

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â— Meet William James Sidis: the Smartest Guy Ever? (2011) – NPR.org.

External links

â— William James Sidis – Wikipedia.

θΔics

In existographies, **William Thackeray** (1811-1863) (IQ:155) (CR:5) was an English novelist, poet, and German literature translator, a Cattell 1000 (#331), noted for []

Overview

In 1830-1831, Thackeray took up residence in Weimar, where he began to read and translate Goethe and Schiller, went often to the theater, and fell variously in love with a great and apparently insipid beauty, on one hand, and also with a young woman of wit, sensibility, and illicit origins, on another hand, as Martin Meisel (2014) reports. [1]

In 1853, in his *Vanity Fair: A Novel Without a Hero*, Thackeray name-drops *Elective Affinities*, a period wherein the work had not yet been translated in to English, as follows: [2]

> "So, pleased herself, she tried with all her might to please everybody; and we know that she was eminent and successful as a practitioner in the art of giving pleasure. As for Jos, even in that little interview in the garret at the Elephant Inn, she had found means to win back a great deal of his good will. In the course of a week, the civilian was her sworn slave and frantic admirer. He didn't go to sleep after dinner, as his custom was, in the much less lively society of Amelia. He drove out with Becky in his open carriage. He asked little parties and invented festivities to do her honor. Tapeworm, the Chargé d'Affaires, who had abused her so cruelly, came to dine with Jos, and then came every day to pay his respects to Becky. Poor Emmy, who was never very talkative, and more glum and silent than ever after Dobbin's departure, was quite forgotten when this superior genius made her appearance. The French Minister was as much charmed with her as his English rival. The German ladies, never particularly squeamish as regards morals, especially in English people, were delighted with the cleverness and wit of Mrs. Osborne's charming friend; and though she did not ask to go to Court, yet the most august and Transparent Personages there heard of her fascinations, and were quite curious to know her. When it became known that she was noble, of an ancient English family, that her husband was a Colonel of the Guard, Excellenz and Governor of an island, only separated from his lady by one of those trifling differences which are of little account in a country where *Werther* is still read, and the *Wahlverwandschaften* of Goethe is considered an edifying moral book, nobody thought of refusing to receive her in the very highest society of the little Duchy; and the ladies were even more ready to call her *du*, and to swear eternal friendship for her, than they had been to bestow the same inestimable benefits upon Amelia. Love and Liberty are interpreted by those simple Germans in a way which honest folks in Yorkshire and Somersetshire little understand; and a lady might, in some philosophic and civilized towns, be divorced ever so many times from her respective husbands, and keep her character in society. Jos's house never was so pleasant since he had a house of his own, as Rebecca caused it to be. She sang, she played, she laughed, she talked in two or three languages; she brought everybody to the house: and she made Jos believe that it was his own great social talents and wit which gathered the society of the place round about him."

In 2014, Martin Meisel, in hi *Realizations: Narrative, Pictorial, and Theatrical Arts in Nineteenth-Century England*, comments, in respect to the above, that there is more here than meets the eye: [1]

> "Thackeray had a direct interest in *Elective Affinities*, however, that was more than historical, and the complex relations between that novel and *Vanity Fair* deserve a fuller exploration than they have received, or will receive here."

Meisel notes that Thackeray met Goethe during his stay in Weimar and was part of his daughter-in-law Ottilie Pogwisch's literary and artistic circle. Meisel comments on the *Vanity Fair* citation:

> "Such disparagement belongs to the ironic moralist's public voice rather than to the voice of the

> imagination, which in Thackeray spoke alluringly of heated spiritual affinities and even spiritual adultery. His imagination would seem also to have responded to the contrast in *Elective Affinities* between two young women, a contrast crystallized in *tabnleauzx vivants*. The difference between Goethe's use and Thackeray's reuse of this pictorial-theatrical device is as interesting as the similarities."

In 2015, Goethean scholar Ritchie Robertson cites this as follows: [2]

> "Love, marriage and divorce are the subject of Goethe's novel *Die Wahlverwandtschaften* (*Elective Affinities*, 1809). They are treated with a frankness that shocked Goethe's readers in Victorian England: **Thackeray** in *Vanity Fair* deplores how in German society 'the *Wahlverwandtschaften* of Goethe is considered an edifying moral book'."

(add discussion)

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External links

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θΔics

In hmolscience, **William Roscoe Thayer** (1859-1923) was an American historian noted, in history thermodynamics, for his his 1918 address “Vagaries of Historians”, wherein he critiqued the physio-chemical historical dynamics theories of Henry Adams.

Overview

In 1918, Thayer, in his address “Vagaries of Historians”, delivered before the American Historical Association, critiqued American historian Henry Adams’ 1910 *Letter to American Teachers of History* on the suggested incorporation of the second law of thermodynamics in the teaching of history in America. [1] Thayer’s central conclusion is that: [2]

> “The time may come when human affairs may be described no longer by words and sentences, but by a system of symbols or notation similar to those used in algebra or chemistry … then it may be possible, as Adams suggests, to invent a common formula for thermodynamics and history.”

Thayer also notes the many difficulties or obstacles to this task, such as the resultant race-specific eliminations of WWI (1914-1918) where science, i.e. the theory of survival of the fittest, in Thayer's view, was used by the Germans to justify human ends, conflicts with religion, morality issues, etc.

Dissipation measurements

See main: War thermodynamics

In his "Vagaries" address, on the idea of application of thermodynamics to history, in Adams’ premise, for instance that the history of the Peloponnesian War (431-404BC) or the American Revolution (1775-1783) would disclose how each was an experiment, so to speak, not merely of politics and war, but also in the dissipation of energy, Thayer asks:

> “What means of measuring this dissipation would the historian have? If Kelvin’s law is true, there must have been less energy in 1865, when our Civil War [1861-1865] ended, than in 1861, when it began. The energy dissipated during these four years was not only human but material, solar, sidereal, cosmic. Who can compute it?”

Thayer also asks that if we are to incorporate hard science into the study of history and human affairs why use one of the laws of thermodynamics in particular, as compared to other laws of science. Specifically:

> “Why should we inject into our description of human affairs the law of dissipation rather than the law of gravitation, or of capillary action, or the binomial theorem?”

He concludes that so far as any of these scientific truths or others affect the action of humans, that one may notice their affects, but not otherwise, but leaves the issue open to future speculation.

Other

Thayer, prior to the publication of his 1915 biographical book *Life and Letters of John Hay* , received a private printing review copy of Adams' autobiographical *Education*. [3]

Education

Thayer completed his BA, in 1881, and MA, in 1886, both from Harvard University.

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External links

â— William Roscoe Thayer – Wikipedia.
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â— William Roscoe Thayer – JSSGallery.org.

θΔics

In existographies, **William Thomson** (1824-1907) (IQ:185|#53) (Cattell 1000:989) [RGM:726|1,500+] (Gottlieb 1000:111) [Kanowitz 50:19] [Cropper 30:5|T] (GPE:47) (SIG:6) [CR:385], aka "Lord Kelvin", was an Irish-born Scottish child prodigy turned mathematical physicist notable for being the third person to publish a paper on French physicist Sadi Carnot's 1824 heat engine theories, specifically his "On an Absolute Thermometric Scale", for his role in the formation of the Glasgow school of thermodynamics, and for his behind the scenes efforts in helping to bring together the science of thermodynamics, through his association with Peter Tait, James Maxwell, and William Rankine, among others. Thomson, in fact, coined the terms "thermo-dynamic" (1849) and "thermo-dynamics" in 1854.

William Thomson was grandson of Scot farmer James Thomson, son of mathematician James Thomson, and younger brother to engineer James Thomson.

Thomson vs. Darwin | Sun age

In the mid-19th century, three scientists, namely: Robert Mayer (1840s), John Waterston (1840s), and Hermann Helmholtz (1854), had posited—supposedly on a mixture of the conservation of energy and the nebular hypothesis—that gravitational contraction of mass is responsible for the radiated energy of the sun. [12]

In 1854, Thomson, like Helmholtz, was convinced that the sun's luminosity was produced by the conversion of gravitational energy into heat, and suggested that the sun's heat might be produced continually by the impact of meteors falling onto its surface; at some point, therein or thereafter, he was forced, by astronomical evidence, to modify his hypothesis to argue that the primary source of the energy available to the sun was the gravitational energy of the primordial meteors from which it was formed.

In 1859, Charles Darwin, in his *Origin of Species*, estimated, via crude calculation of the time of erosion occurring at the current observed rate at the Weald, a great valley that stretches between the North and South Downs across the south of England, that the earth was 300 million years old, long enough for speciation by natural selection to have occurred.

In 1862, Thomson, being firmly opposed to Darwin’s evolution theory, as it inherently negates creation theory, declared the following:

> “That some form of the meteoric theory is certainly the true and complete explanation of solar heat can scarcely be doubted, when the following reasons are considered: (1) No other natural explanation, except by chemical action, can be conceived. (2) The chemical theory is quite insufficient, because the most energetic chemical action we know, taking place between substances amounting to the whole sun's mass, would only generate about 3,000 years' heat. (3) There is no difficulty in accounting for 20,000,000 years' heat by the meteoric theory. What then are we to think of such geological estimates as [Darwin's] 300,000,000 years for the ‘denudation of the Weald''?”

Thomson estimated the lifetime of the sun, and by implication the earth, by calculating the gravitational energy of an object with a mass equal to the sun's mass and a radius equal to the sun's radius and divided the result by the rate at which the sun radiates away energy. This calculation yielded a lifetime of only 30 million years. [12]

Rutherford | Thomson anecdote

In 1904, a famous anecdote, retold many times, occurred during a lecture by Ernest Rutherford during his Royal Institution lecture on radium, during which time, Thomson, then aged 80, was in the audience, albeit asleep, but yet still dominating the mind of Rutherford, the opinion of Thomson, being one of the old guards of science, not to be taken lightly. Rutherford recounts the anecdote as follows: [13]

> “I came into the room which was half-dark and presently spotted Lord Kelvin in the audience, and realized

> that I was in for trouble at the last part of my speech dealing with the age of the earth, where my views conflicted with his. To my relief, Kelvin fell fast asleep, but as I came to the important point, I saw the old bird sit up, open an eye and **** a baleful glance at me. Then a sudden inspiration came, and I said 'Lord Kelvin had limited the age of the earth, *provided no new source* [of heat] *was discovered*. That prophetic utterance referred to what we are now considering tonight, radium!' Behold! The old boy beamed upon me."

(add discussion)

Early life

In May 1830, at the age of six, William's mother died. Shortly afterwards the family moved to Scotland, where Thomson's largely self-taught father, James Thomson, had been appointed professor of mathematics at Glasgow University. Four years later, in 1832, William, age 10, and his brother James, age 12, began their studies at Glasgow University. [8]

Origin of thermo-dynamics interest

> *See main: Thomson's search for Carnot's Reflections*

In 1839, Scottish astronomy professor John Nichol introduced Thomson to French mathematical physicist Joseph Fourier's 1822 *Analytical Theory of Heat.* [5] This was his first stimulator as to the nature of heat. In 1840, Thomson came across Edinburgh mathematics professor Philip Kelland's 1837 *Theory of Heat*, in which it was claimed that Fourier was mostly wrong. [6] In comparing the two, as Thomson told his father, "Fourier is right, and Kelland is wrong." [7]

Thomson developed in interest in the efficiency of heat engines and the paper of Carnot through discussions on the subject with his older brother James Thomson beginning in about 1843.

In 1847, Thomson, along with his friend Gabriel Stokes, attended a session of the British Association for the Advancement of Science where he heard James Joule exhibit his paddle wheel, wherein he demonstrated how fluid friction generated heat, after which the two approached Joule and began a discussion with him. William and his brother James Thomson would later comment that the Joule's data would "unsettle" anyone steeped in the Carnot-Clapeyron version of heat, particularly the datum that heat could be generated by friction of fluids in motion. [11]

In 1848, Thomson developed the Kelvin scale of absolute temperature measurement based on Carnot's theories and in 1849 he coined the term "thermo-dynamic". [4] In 1854, defined "thermo-dynamics" as a subject. In 1851 conceived of the "heat death" theory of universal end and, in 1852, gave verbal descriptions of the second law of thermodynamics that there is a universal tendency in nature to the dissipation of energy. [1] In the years to follow this was translated as the "law of degradation" or "law of dissipation of energy". With the publication of Charles Darwin's 1859 *Origin of Species*, which seemed to imply the existence of a "law of elevation" in nature, a conflict erupted between the phenomenon of evolution by natural selection and the concept of entropy as loosely defined by Kelvin's universal dissipation postulate. [2] In 1874, he christened the now-famous term "Maxwell's demon".

Heat death

> See main: *Heat death*

Thomson also developed the central argument of the "heat death" theory of universal end in which the universe, in its end state, will run down to the point where there will be no more energy available for doing work due to the action of the dissipation of mechanical energy.

The idea of heat death was first proposed in loose terms beginning in 1851 by

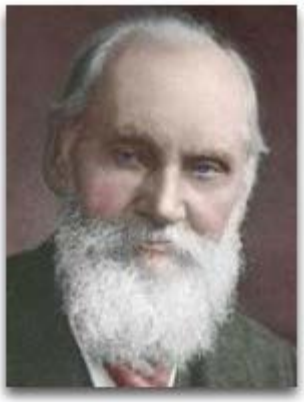

Thomson, who theorized further on the mechanical energy loss views of Sadi Carnot (1824), James Joule (1843), and Rudolf Clausius (1850). Thomson's views were then elaborated on more definitively over the next decade by German physicist Herman von Helmholtz and Scottish physicist William Rankine.

Dissipation | Will of animate creatures

See main: Law of dissipation

In 1852, Kelvin supposed that "there is a universal tendency in nature to the dissipation of mechanical energy" and suggested how this tendency might relate to "vegetable life" or to the "will of animate creatures". [1] Soon thereafter, people began to wonder how this universal law of physics related to or contrasted with the universal law of biological evolution as established by English naturalist Charles Darwin in his 1859 *Origin of Species*.

Thomson on Darwin

Thomson, and his antimaterialist allies, according to Welsh science historian Iwan Morus, regarded thermodynamics as a powerful weapon with which to counter Darwinian evolution. [9] In a series of papers in the early 1860s, appearing shortly after the publication of Darwin's 1859 *Origin of Species*, Thomson argued, based on age of sun calculations, that thermodynamics clearly demonstrated that natural selection was wrong.

Atomic theory

See main: Atomic theory

In 1902, Thomson proposed the first 'structural theory of the atom' in which an atom was hypothesized to have a uniformly distributed positive electrical cloud in which electrons were inserted so as to produce an equilibrium situation when the negative charges were at rest. [10]

Religion

See main: Thomson on religion

Thomson was covertly religious in his early writings, e.g. referring to the "will of animate creatures" (1852), in regards to the second law of thermodynamics; although, to note, he was not, in these early years, as open about his religious views, say as compared to James Joule who preached in church about the mechanical equivalent of heat as responsible for the actions in Genesis. In later years, e.g. see Darwinism sun age refutation above (1860s), however, Thomson began to become more outspoken about his religious beliefs.

In 1908, James Walsh, following is obituary on Kelvin, in *Catholic World*, commented that those wishing to become proficient in Christian apologetics, should consult Thomson. [15]

Quotes | On

The following are noted quotes of praise:

“**Thomson** has the gift of translating real facts into mathematical equations and *vice versa*, a gift which is far rarer than the capacity for finding the solution of a given mathematical problem.”

— Hermann Helmholtz (c.1890), *Publication* [15]

“With the death of Lord Kelvin, on December 17 [1907], there passes away the grandest figure of contemporary science, and with it closes an epoch in the history of physics. When **William Thomson** was born, in 1824, Ohm's law of the flow of electric currents had not been discovered, Oersted's discovery of the magnetic action of the current was but four years old, while Faraday's capital discovery of the induction of currents was not to come for seven years. The wave theory of light had been but recently set on its feet by Young and Fresnel, and was not yet thoroughly believed, while the two laws of thermodynamics, perhaps the most important contribution of the nineteenth century, were unknown. All these things Lord Kelvin saw, and a great part of them he was. Probably no one, with the single exception of Helmholtz, born three years earlier, exercised greater influence on the science of the nineteenth century, while to compare the influence of these two great physicists with that of Darwin is as bootless as to question whether the grass is greener than the sky is blue.”

— Arthur G. Webster (1908), “Lord Kelvin”, Dec 22 [14]

“Once **Thomson** had had accepted the new [dynamical theory of heat] he produced, in the course of a few years, an abundance of new ideas, which were to prove immensely important: many of them in the hands of other men, such as Clausius. Prominent among these ideas were the concept of the ‘energy’ of a body, the insight into the process of dissipation of energy, the establishment of an ‘absolute temperature scale’, the awareness of the importance of ‘transformation’ and ‘equivalence’ and, finally, the expression of the second law of thermodynamics in the mathematical form:

$$\frac{Q_1}{T_1} + \cdots \frac{Q_n}{T_n} = 0$$

Finally, we note that the function C [Carnot function] was originally proposed as the measure of the work done per degree temperature difference by a unit of heat at a given temperature. It was first visualized by Carnot, refined by Clapeyron, who measured its value at five different temperatures, and by Thomson who, using Regnault’s results, extended the range of measurement an established that it diminished steadily with the temperature. It was brought into the context of the dynamical theory of heat by Clausius and finally related by Joule and Thomson to the reciprocal of the absolute temperature on the thermodynamic scale. If we turn back now to the earlier work and substitute ‘T’ for ‘C’ we can appreciate how close writers like Clapeyron were to the truth.”

— Donald Cardwell (1871), *From Watt to Clausius* (pgs. 159-60) [16]

Quotes | By

The following are other noted quotes:

“Dead matter cannot become living matter without coming under the influence of matter previous alive.”

— William Thomson (c.1876), statement of his biogenesis philosophy (Ñº)

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â— William Thomson, 1st Baron Kelvin – Wikipedia.

θΔics

In existographies, **William W. Warntz** (1922-1988) (CR:18) was an American economist-geographer, a genius hiatus effect product, noted for his extension of American sociologist Henry Carey's demographic gravitation theory, and for his later work with American sociophysicist John Q. Stewart on physics-based models of population potentials.

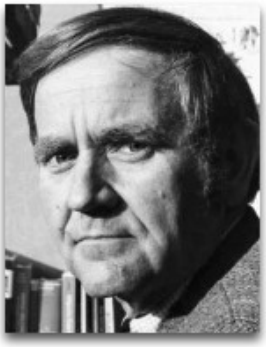

Population potential | Maps

Warntz, in his collaboration with Stewart early on, emphasized the importance of recognizing general geographical patterns through the spatial analysis of large sets of geo-coded data—thinking, supposedly, that the patterns could be represented and explained by models and theories of physics, particularly the Lagrangian potential model of Newtonian mechanics. [13]

In 1964, Warntz built a 2x3.25 feet, tree-dimensional so-called "potential population" map of the US using 3,100 nails, the exact height and location of each calculated using an IBM 7090 computer. [10]

he following are a few images of Warntz's three-dimension potential population model or "potential of population", as Warntz seems to have called it, indicating the economic importance of all the cities, towns, and rural areas in the US, which was done for a special exhibit of the American Geographical Society at the New York State Fair. The varying heights of each nail represent the varying demographic "potential" of population groupings based on "formulas analogous to those in field quantity physics", according to one article summary, having something to do with movement of people, mail, and economic goods into and out of each location: [11]

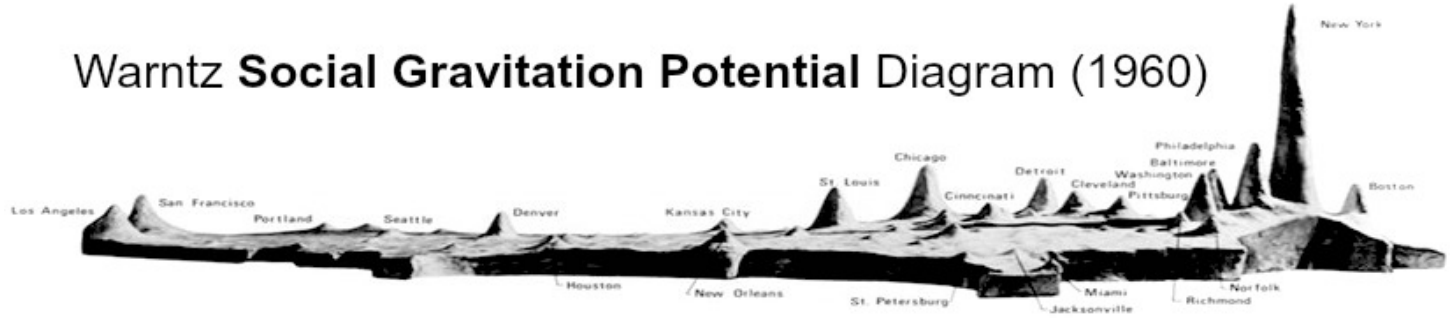

In 1960, supposedly, Warntz made the following plaster-style social gravitation potential (Ñº) countered map:

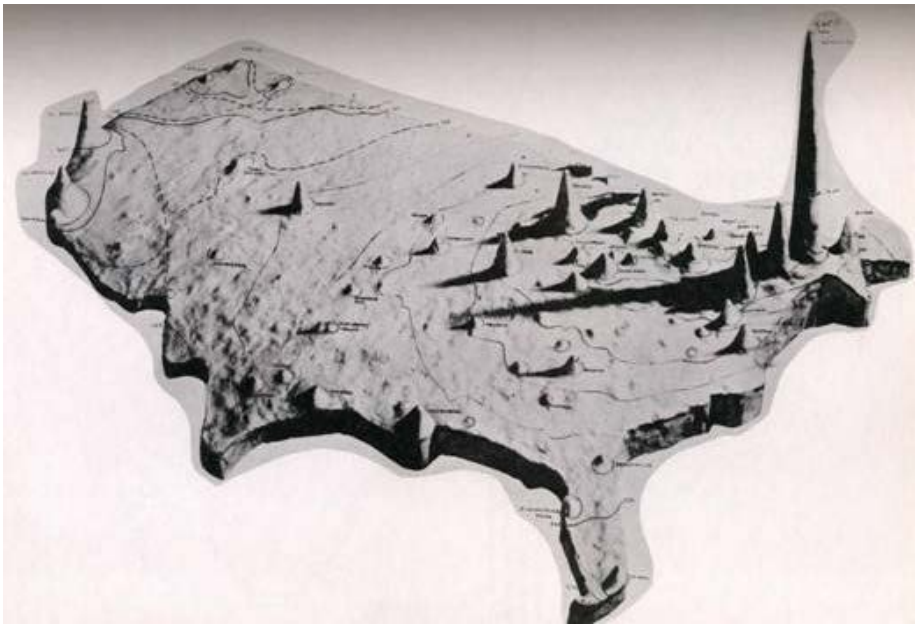

The equation Warntz used to make these peaks seems to have been a variant of the following:

$$v_i = \frac{P_j}{d_{ij}}$$

which measures the influence of a given population at one location (j) on another location (i), where vi is the population potential at location i, Pj is the size of the population at j, and Dij is the distance between locations i and j.

Each of these "population potentials", shown as peaks on the map, as summarized by Donald Janelle, indicate an index of sociological intensity, according to which the population at any point in space contributes to the population potential of all other points, is a measure of influence at a distance. [11]

Warntz found, accordingly, that the strength of the interaction I or interaction force F_i, i.e. exchange force, as measured by number of telephone calls, traffic flows, etc., is proportional to the product of the populations of the respective populations P_1 and P_2 and inversely proportional to their distance of separation squared:

$$F_i = k\frac{P_1 P_2}{d^2}$$

(add)

Overview

In 1947, American sociophysicist John Q. Stewart published his "Empirical Mathematical rules Concerning the Distribution and Equilibrium of Population", in the *Geographical Review*, wherein he introduced geographers to his idea about isomorphic (equal form or structure) relations between social behavior and the laws of physics, stating, among other things, that: [4]

> "There is no longer an excuse to ignore the fact that human beings, on average and at least in certain circumstances, obey mathematical rules resembling in a general way some of the primitive 'laws' of physics."

Stewart pointed out isomorphic relationship between empirical studies, which indicated that the movement of persons between two urban centers was proportional to the product of their populations and inversely proportional to the square of the distance between them, and Newton's law of gravitation. This postulate, in quantitative geography, soon came to be known as the gravity model, as detailed below by Norwegian geographer Arild Holt-Jensen, from his 2009 *Geography: History and Concepts*: [3]

Stewart, in his 1947 paper, also published maps of

population potentials. [5]

Warntz, in 1984, remarked that he was introduced to Stewart's ideas via his 1945 book *Coasts, Waves and Weather*; in his own words: [6]

> "[Stewart's book] was prepared primarily to explain to marine and air navigators the physical environment … [but] Stewart could not resist the temptation to include an exotic chapter describing potential of population and its sociological importance."

Warntz, sometime thereafter, began working with Stewart, resulting in at least two papers in 1959 and 1964, in which they were said, according to Holt-Jensen, to have borrowed models from physics in their studies of population potentials. [1]

Warntz suggesting that the mathematics of a population potential is the same as that which describes a gravitational field, a magnetic potential field and an electrostatic potential field. [2]

Box 3.2	**The gravity model**

Early in the nineteenth century, some scientists suggested that the laws of physics could be applied to the study of human relationships and that the laws of gravitation might explain patterns of travel and trade between places. By the mid-twentieth century gravity models were widely applied within the **spatial science** school of geography. In its simplest form, the **gravity model** can be expressed as follows:

$$I_{ij} = \frac{k\,(P_i P_j)}{(D_{ij})^2}$$

where I_{ij} represents the interaction between town i and town j; P_i and P_j are the populations of the two towns; D_{ij} is the distance between them; and k is a constant.

The equation indicates that the interaction between the two towns (for instance, numbers of telephone calls, flows of traffic) is proportionate to the *product* (.) of their populations, divided by the *square* – $(\ )^2$ – of the distance between them.

The Carey-Stewart-Warntz "**gravity model**" of the so-called "social physics school", one of the four schools of quantitative geography, according to human geography historian Ron Johnston. [7]

Education

Warntz completed his BS, AM, in economics, and PhD, with a dissertation on "The Geography of Prices" in 1955 in economics, all at the University of Pennsylvania. Warntz then taught at the University of Pennsylvania, and was a research associate at the Department of Astrophysical Sciences at Princeton University and at the American Geographical Society. In 1968, Warntz then became professor and director of theoretical geography and regional planning in the graduate school of design, Harvard. In 1971, he became professor of geography and departmental chair at the University of Western Ontario. [9]

Quotes

The following are related quotes:

> "Every educated person should carry about in his mind's eye an instantaneously available globe. The globe should be in life colors and rotating slowly in the sunlight. On it the mind's eye should see at least the continental outlines, major political divisions, vegetation and climatic belts, primal atmospheric and oceanic circulation, the earth's outstanding cities and their economic flows, and ultimately the people themselves and the quality of life."
>
> — William Warntz (1968), on a proposal to initiated a Department of Geography at Harvard [12]

See also

â— Mateo Gil

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Further reading

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External links

â— Warntz, William (1922-) – WorldCat Identities.

θΔics

In hmolscience, **William Wheeler** (1865-1937) was and American myrmecological entomologist notable for his studies of insect societies, prompted him to take an interest in the structure of human societies, which led him to the work of French-Italian engineer turned socioeconomist Vilfredo Pareto, whose *Treatise on General Sociology* (1917 French version), in circa 1926, he introduced to American physical chemistry trained physiologist Lawrence Henderson.

Henderson | Pareto

In 1926, Wheeler introduced American physical chemistry trained physiologist Lawrence Henderson to the works of French-Italian engineer turned socioeconomist Vilfredo Pareto, whose *Treatise on General Sociology* (1917 French version), while Henderson was recovering from illness (see: genius hiatus effect). Henderson, supposedly, resisted at first because he did not think much of sociology, but the agreed to read the book on Wheeler's recommendation. [1] Henderson, in 1937, would later comment: [2]

> "Wheeler had always read some book that other people read later—often at his instigation."

This fortuitous suggestion, by 1932, resulted in the launch, via the lead of Henderson, of the influential decade long operational Harvard Pareto circle (1932-1942).

American psychologist Burrhus Skinner gives a rather detailed account of the Pareto book recommendation as follows: [3]

> "Pareto's influence had reached Harvard through a strange accident: Professor L.J. Henderson, who may be remembered longer for his *Fitness of the Environment* than for his pioneering work in the chemistry of blood, had ulcers. In the middle or late twenties he was recovering from an attack in a hospital in his beloved Paris [see: genius hiatus effect], when his friend William Wheeler, the entomologist, brought him a copy of Pareto's *Traite*. Henderson read it with complete absorption during the rest of his stay in the hospital and on the voyage back to America, and he returned to Cambridge a dedicated convert. He was then director of the Fatigue Laboratory at Harvard Business School, which was already involved in projects very close to sociology and social anthropology, and he organized a series of seminars on Pareto.
>
> One of the friends with whom Henderson talked about Pareto was Bernard DeVoto, who was then teaching at Harvard. DeVoto had a young tutee of the class of 32 named George Homans. He told George that he should read Pareto, and George did—'at least the first volume' at that time, as he later reported. DeVoto [then] introduced George to Henderson, and because George had read Pareto, Henderson asked him to help in his seminar. And that was how George spent his first year out of Harvard—as an assistant to L.J. Henderson without pay."

In 1935, Wheeler had impressed Pareto upon his old friend David Fairchild and Mrs. Fairchild, the later of which, in turn, began translating something of Pareto's with Wheeler's help. [4]

Quotes

The following are noted quotes:

> "… emergence, the physicochemical, the organismal, the mental and the social. Hence, it till the advent of a few super-Einsteins, theoretical biology must stand as a combination of oppositions—a *compositio oppositorum*."

— William Wheeler (c.1935), “Essay” [5]

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External links

â— William Morton Wheeler – Wikipedia.

θΔics

In existographies, **William Whewell** (1794-1866) (IQ:175|#278) was an English polymath noted for a number of coinages that arose in debates with him, such as "scientist", a specific non-morality field type of natural philosopher (older term), and "physicist", that were coined as a repercussion of the Whewell-Coleridge debate (1833), "human chemistry", in followup debate (E.B., 1851) on his *Bridgewater Treatise* (1833), and he is said to have suggested the terms ion, dielectric, anode, and cathode to English physicist chemist Michael Faraday. [1]

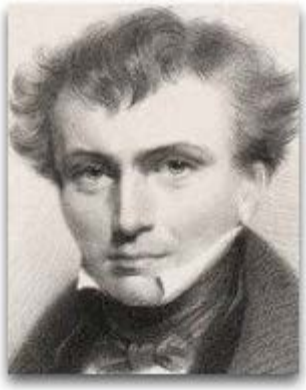

Affinity | History

In 1840, Whewell, in his "The Establishment and Development of the Idea of Chemical Affinity", had the following to say about Herman Boerhaave's 1732 comments on chemistry and love: [1]

> "In 1775, the Swedish chemist Bergman, pursuing still further this subject of chemical affinities, and the expression of them by means of tables, returned again to the old Newtonian term; and designated the disposition of a body to combine with one rather than another of two others as *elective attraction.* And as his work on *Elective Attractions* had great circulation and great influence, this phrase has obtained a footing by the side of affinity, and both one and the other are now in common use among chemists.
>
> There are some analogies drawn from the common meaning of this word, which appear to recommend it as suitable for the office which it has to discharge. For common mechanical attractions and repulsions, the forces by which one body considered as a *whole* acts upon another external to it, are, as we have said, to be distinguished from those more intimate ties by which the *parts* of each body are held together. Now this difference is implied, if we compare the former relations, the attractions and repulsions, to alliances and wars between states, and the latter, the internal union of particles, to those bonds of affinity which connect the citizens of the same state with one another, and especially to the ties of family.
>
> We have seen that Boerhaave compares the union of two elements of a compound to their marriage; "we must allow," says an eminent chemist [Jean Dumas, 1837] of our own time", "that there is some truth in this poetical comparison." It contains this truth, that the two become one to most intents and purposes, and that the unit thus formed (the family) is not a mere juxtaposition of the component parts. And thus the idea of Affinity as the peculiar principle of chemical composition, is established among chemists, and designated by a familiar and appropriate name."

(add discussion)

Polymathy

Whewell has frequently been described as a polymath. [2] What is most often remarked about Whewell is the breadth of his endeavors. At a time when men of science were becoming increasingly specialized, Whewell appears as a vestige of an earlier era when men of science dabbled in a bit of everything. He researched ocean tides (for which he won the Royal Medal), published work in the disciplines of mechanics, physics, geology, astronomy, and economics, while also finding the time to compose poetry, author a Bridgewater Treatise (religious re-interpreted in terms of natural phenomena), translate the works of Goethe, and write sermons and theological tracts, all while becoming a relative science history buff.

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External links

â— William Whewell – Wikipedia.

θΔics

In hmolscience, **William Wordsworth** (1770-1850) (IQ:165|#231) (CR:16) was an English romantic poet, an greatest literary author ever (#29), a Cattell 1000 (#67), noted for []

Coleridge

In 1798, Wordsworth, together with Samuel Coleridge, published *Lyrical Ballads*, which is sometimes credited as having helped to launch the romantic age in English literature. In 1800, Coleridge, on his on his plans to set up a joint chemistry laboratory with Humphry Davy and Wordsworth in Lake District, commented the following: [3]

> "I shall **attack** chemistry like a shark."
>
> — Samuel Coleridge (1800) (see also: Whewell-Coleridge debate)

(add discussion)

Stewart

Wordsworth was an associated of John Stewart; the following being an example dialogue:

> "Stewart is the most eloquent man on the subject of nature I have ever met."
>
> — Thomas De Quincey (c.1792), discussion with Wordsworth; view concurred (Ñº)

(add discussion)

Quotes | On

The following are noted quotes on Wordsworth:

> "Wordsworth's claim, his special gift, his lasting contribution, lies in the extraordinary strenuousness, sincerity and insight with which he first idealizes and glorifies the vast universe around us, and then makes of it, not a theatre on which men play their parts, but an animate presence, intermingling with our works, pouring its companionable spirit about us, and 'breathing grandeur upon the very humblest face of human life'."
>
> — John Morley (c.1900), "Introduction", in: *Wordsworth Collected Poetic Works* [1]

Quotes

The following are noted quotes by Wordsworth:

> "And 'tis my faith, that every flower
> Enjoys the air it breathes."
>
> — William Wordsworth (c.1790), cited by Henry Finck (1887) [2]

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External links

â— William Wordsworth – Wikipedia.

θΔics

In existographies, **William Winwood Reade** (1838-1875), published as “Winwood Reade”, was a British historian, philosopher, and explorer noted for []

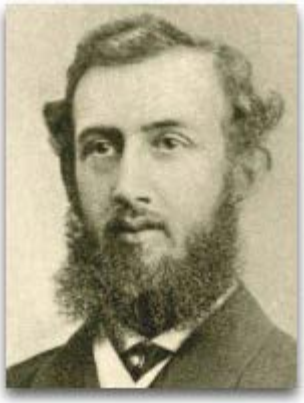

Overview

In 1872, Reade, published his *The Martyrdom of Man*, summarized via the phrase “From Nebula to Nation”, dubbed an “atheist’s bible” (O) and “substitute bible for secularists” (Smith, 1967), wherein, using what seems to be a Darwin-based comparative religions stylized approach, he argues, in his last chapter, for what he calls a “religion of reason and love”, based on "Darwinian law" and the "Book of Nature". [1]

Quotes

The following are noted quotes:

> “In the matter of religion, I listen to no remonstrance, I acknowledge no decision, save that of the divine monitor within me. **My conscience is my adviser, my audience, and my judge**. It bade me write as I have written, without evasion, without disguise; it bids me to go on as I have begun, whatever the result may be. If, therefore, my religious opinions should be condemned, without a single exception, by every reader of the book, it will not make me regret having expressed them, and it will not prevent me from expressing them again. It is my earnest and sincere conviction' that those opinions are not only true, but also that they tend to elevate and purify the mind.”
>
> — Winwood Reade (1872), *The Martyrdom of Man* (pg. 6)

> “In the winter and spring it rolls, a languid stream, through a dry and dusty plain. But in the summer an extraordinary thing happens. The river grows troubled and swift; it **turns red as blood**, and **then green**; it rises, **it swells, till at length, overflowing its banks**, it covers the adjoining lands to the base of the hills on either side. The whole valley becomes a lake, from which the **villages rise like islands**, for they are built on artificial mounds. This catastrophe was welcomed by the Egyptians with religious gratitude and noisy mirth. When their **fields had entirely disappeared**, they thanked the gods and kept their harvest-home. ... the water which had thus risen was their life. Egypt is by nature a rainless desert, which the Nile, and the Nile only, **converts into a garden** [Garden of Eden] every year”
>
> — Winwood Reade (1872), *The Martyrdom of Man* (pg. 9-10)

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External links

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θΔics

In science, **Witold Brostow** (c.1932-) is a Canadian chemist noted for 1972 weed theory article "Between Laws of Thermodynamics and Coding of Information", wherein he asserts that Carnot cycle based thermodynamics is no longer needed, because information transmission theory has usurped the cycle.

Overview

In 1972, Brostow, in his "Between Laws of Thermodynamics and Coding of Information", cites Robin Giles (1964), who gives the view that a three step logic operation shortcut to thermodynamics exists, Edwin Jaynes (1957), who attempts to shortcut thermodynamics via Claude Shannon (1949), and Peter Landsberg (1970), who waters down all of this, to argue, in short, thermodynamics no longer needs the Carnot cycle, because of information theory; he's a prime example of someone succumb to scientific fool's gold shortcuts of Shannon bandwagon musicals.

In 1975, Norman Dolloff listed Brostow in his bibliography, resulting to become a weed theorists in Dolloff's semi-cogent garden of thermodynamics. [2]

Quotes

The following are example quotes:

> "There's nothing wrong with Carnot's cycle, but contemporary thermodynamics [Shannon-based statistical mechanics] may be more useful."
>
> — Witold Brostow (1972), "Between Laws of Thermodynamics and Coding of Information" (pg. 123)

> "If somebody needs thermodynamics, he might well find that information theory serves his purpose better."
>
> — Witold Brostow (1972), "Between Laws of Thermodynamics and Coding of Information" (pg. 126)

References

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2. Dolloff, Norman H. (1975). *Heat Death and the Phoenix: Entropy, Order, and the Future of Man* (pg. 199). Exposition Press.

θΔics

In human chemistry, **Witold Gombrowicz** (1904-1969) was a Polish lawyer turned dramatic novelist noted for his 1960 novel *Pornografia*, wherein he explores the dark limits of sexuality via a mixture of Goethe's *Elective Affinities* and Michael Faraday's "lines of force" reconceptualized as lines of passion, or thereabouts.

Overview

In *circa* 1950s, Gombrowicz wrote his novel *Pornografia*, which was first published in French in 1960, which he described as "a descent to the dark limits of the conscience and the body" and which is said to be a modern rewrite of German polymath Johann Goethe's 1809 physical chemistry based novella *Elective Affinities*, both making references to the chemical model of combination to explain human affairs and passions.

In 2003, a film adaption of the novel was made, of which the following is a synopsis, also shown pictured below: [5]

> "Set in Nazi-occupied Poland, *Pornography* (*Pornografia*) focuses on two middle-aged men: Frederic, a theater and film director, and Witold, a writer who serves as a wry commentator. The two journey out to the country estate of Hippolyte, a friend of Witold marginally involved in the resistance. There they encounter German soldiers and partisans, young lovers and even younger murderers, patriots and Catholics. Frederic will reveal an uncanny ability to hear clearly even distant and delicate sounds. Director Jan Jakub Kolski effectively finds the cinematic means to capture Gombrowicz's abrupt changes of mood and tone and almost surreal juxtapositions, while anchoring the story in a very concrete time."

The mention of the "estate" here would seem to indicate that Gombrowicz has Goethe's "estate" in mind as his reaction vessel as did Goethe; and the two men, Frederic and Witold, seem to embody the chracters Edward and the Captain of *Elective Affinities*, who are both, under various circumstances and times, in love with Charlotte.

Goethe

French literature philosopher Francois Regnault's 1966 article "The Optic of Witold Gombrowicz", which opens to the following article synopsis: [1]

> "The *Pornography* of Witold Gombrowicz. Rarely it was written a novel, not whose conscience was so clear - there are so many and what interest? - But the clarity was so conscious. Rarely, and perhaps not since Goethe's *Elective Affinities* Goethe. We say why."

A shot from the 2003 film version of Gombrowicz's *circa* 1950s *Pornografia*, depicting a woman (Maria, Hippolyte's wife) seemingly in love with or fond of two men, Frederic (left) and Witold (right), who are invited to her husband's (Hippolyte) estate. [5]

seems to be one of the first publications to make a connection between Goethe and Gombrowicz. A more recent 2011 summary of the mixture of Regnault's views on Gombrowicz in regards to Goethe is as follows: [2]

> "Regnault situates Gombrowicz's Pornography in the tradition of Goethe's Elective Affinities, which could be said to represent 'a decisive break [coupure]' from the approach to the novel found in Rousseau's Nouvelle Héloïse. Although novels portraying 'the transparency of consciousness' are no longer uncommon, novels where 'transparency itself assumes

> consciousness' are rare: 'so rare' that Pornography could be 'the first since Goethe's Elective Affinities' [3].

> Both Goethe and Gombrowicz incorporate explanations of structure into their narratives, and both make references to a chemical model of combination. 'Gombrowicz's novelty consists in his going one step further and perfecting Goethe's revolution': the character of Olek Skuziak allows him to destroy the narratives completely and put himself 'in the position of speaking to oneself alone'. Regnault writes, on Gombrowicz's behalf: 'My pornography is an optic of perversions, but it is also an inversion of the art of writing, a pornology of writing'. When Gombrowicz writes of 'persevering in obscenity', the persevering designates the rigours of the structure, which allow one to surpass the charms of obscenity and lead to their expulsion."

The mention here of the character of Olek Skuziak could be the embodiment of the "Otto" conceptual character.

Likewise, German literature theorist Hanjo Berressem argues, in his 1998 *Lines of Desire*, chapter one Theory and Text: Elective Affinities, that Gombrowicz's *Pornografia* is "a subversive rewrite of Goethe's *Elective Affinities*, from which it takes, among other things, its chemical imagery and the use of tableaux vivants". [4]

Lines of force | Lines of desire

Berressem, interesting, also shows how Gombrowicz, supposedly, updates Goethe's reaction theory with English chemist Michael Faraday's 1830s lines of force (precursor to James Maxwell's electromagnetic field lines and hence to the concept of the electromagnetic force) to explain the lines of force of passion (or desire), or something these lines (no pun intended). [4] Berressem argues that the following happening in *Pornography*: [4]

> As Frederick writes to Witold about his plans: "I follow the lines of force, you understand? *The lines of desire*" (Gombrowicz, pg. 102; emphasis added).

Corresponds to the following passage from *Elective Affinities*:

> "Just as each thing has a connection to itself, so it must equally have a relationship [*Verhaltnis*] to others …. that will vary according to the the variations in the different species." (Goethe 1976, pg. 34)

(add discussion)

See also

â— Tom Stoppard (*Arcadia*, 1993)

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2. Synopsis of Francois Regnault, "Optique de Gombrowicz" – Kingston University.
3. Note 57 – Kingston University.
4. Berressem, Hango. (1998). *Lines of Desire: Reading Gombrowicz's Fiction with Lican* (pg. 6; lines of desire, pgs. 154-). Northwestern University Press.
5. Pornography (2003) – 13th Annual Polish Film Festival.

External links

â— Pornografia – Wikipedia.
â— Witold Gombrowicz – Wikipedia.

θΔics

In art science, **Wolfe von Lenkiewicz** (1966-) is a British artist noted for his 2011 oil on canvas 210 x 160 centimeter "Elective Affinities" painting, depicting a mixture of the thematics of Lewis Carol's 1865 fantasy novel *Alice and Wonderland* and Goethe's 1809 physical chemistry based novella *Elective Affinities* (see: Goethe timeline). [1]

Description | Meaning

Lenkiewicz, in a 26 April 2011 interview, commented on his painting as follows: [2]

> "In 19th century chemistry, the term 'elective affinities' was used to describe chemical compounds that only interacted with each other under determined circumstances. The writer Goethe employed this as a universal organizing [see: universal rule] agent running across human relationships and science. I was drawn to these ideas – which are now seen as degenerated methods in modern science – as relevant to language, and how we use it.
>
> In this painting, there is an elective affinity between Alice and the rabbit where it ought not to be. They have combined as compounds in an environment (the adventure) that itself has an irrational basis. Alice is effectively married into the rabbit in much the same experimental [see: love thought experiment] way Goethe subjects Ottilie to Eduard in his novel.
>
> It's also very interesting to me that Carroll's rabbit always seems to be subservient to time, retrieving a watch from its waistcoat in a world where time seems to be relative – The Mad Hatter's tea party, for instance, is outside of time or set in extenuated time, as opposed to the rabbit's very strict schedule. Inevitably, in the animal's subjection to human time, a consciousness of death and time running out is reattributed to the rabbit.
>
> I am interested in the association of humanist segregation from animalism being broken down here, where the two are communicating and experiencing the same existence in a commensurable way. There is a profound question regarding primitive societies' relation to animals at play in the normal association of the animal being unconscious of its selfhood – somewhere in between Heidegger's *non-experiencing stone* and humanities' privileged position of holding the logos of language. Carroll breaks this down in the adventures, redistributing awareness –albeit of a human form – to the rabbit.
>
> In the painting, the "nearness" of the rabbit to Alice has been eradicated, making them one and the same, when, within the actual adventure, they are separated by haste. The marriage is reflected by an alchemical image [see: Chemical Wedding] – a symbolic picture from an alchemical text showing a crowned man standing on the sun and a crowned woman standing on the moon joining flowers with a descending dove, which represents marriage and the union of two substances.
>
> Above these two is a picture of Philadelphia daguerreotypist Frederick Langenheim, who

Lenkiewicz's 2011 oil on canvas "Elective Affinities" painting, themed on Goethe's 1809 *Elective Affinities*, and Alice and Wonderland.

experimented with The Magic Lantern. This image has floated into the painting, as it were, from a chapter of Proust's *Swans Way*. The book describes a boy in his bedroom looking at a magic lantern projected onto his wall. He feels both inspired by this medieval "cinema" but also uncomfortable about being transported from his accustomed environment.

The painting is a resequencing – if you like – of all these elements and ideas that creates something new. There is a very interesting quote in *Alice In Wonderland* – "I can't explain myself because I'm not myself you see?" The opposite of which would be something like "I can explain myself because I am." In proposing this statement, Alice represents what Wittgenstein would call taking "language on holiday", giving birth to an ill-directed philosophy by asking questions outside of normal language, which always presents us with serious category mistakes regarding essentialist standpoints whenever we try to use its teleology to prove the notion of having a 'centre'. However, it is a statement that would make absolutely perfect sense if she were part-rabbit."

(add discussion)

Other

Lenkiewicz also did a remake of Johann Tischbein (1751-1828)'s 1787 painting of Goethe during his Italian adventure years (see: Goethe timeline). [3]

References

1. Elective Affinities – WolfevonLenkiewicz.com.
2. Pryor, John-Paul. (2011). "Interview: Wolfe von Lenkiewicz on his 'Elective Affinities'", AnotherMag.com, Apr 26.
3. Sovereign and the Beast – WolfeVonLenkiewicz.com.

θΔics

In existographies, **Wolfgang Muschik** (c. 1936-) (CR:8) is a German mathematical physicist and thermodynamicist, noted for []

Overview

In 1990, Muschik, *Aspects of Non-Equilibrium Thermodynamics*, outlined his views on nonequilibrium thermodynamics. [1]

In the 2000s, Muschik was the editor of the *Journal of Non-Equilibrium Thermodynamics*.

Entropy of students

In 2009, Muschik was one of the commentators in Moriarty-Thims debate, on the question of whether or not a group of students, standing together in grassy campus field, has a thermodynamic entropy; the following is Muschik's view:

> "**Yes, you CAN** [say that a particular arrangement of students has a thermodynamic entropy]. If you have a certain defined distribution function related to these students, you can define an entropy."
>
> — Wolfgang Muschik (2009), "Moriarty-Thims debate" (Comment #2) (Ñº), Sep 3

(add)

Education

Muschik completed his PhD in 1966 on an "Attempt at a Phenomenological Grounds of the Casmir-Onsager Reciprocal Relations" at the Technical University of Berlin. [2]

References

1. Muschik, Wolfgang. (1990). *Aspects of Non-Equilibrium Thermodynamics*: *Six Lectures on Fundamentals and Methods*. World Scientific.
2. Wolfgang Muschik – Mathematics Genealogy Project.

External links

â— Wolfgang Muschik (faculty) (German | English) – Technical University of Berlin.

θΔics

In existographies, **Wolfgang Pauli** (1900-1958) (IQ:175|#220) (CR:65) was an Austrian theoretical physicist, son of chemist Wolfgang Joseph Pauli and godson (O) of Ernst Mach, noted for being the first to propose the concept of "spin", and hence the Pauli exclusion principle, and for his 1933 article on the foundations of quantum mechanics.

Heisenberg-Pauli dialogue

See main: Heisenberg-Pauli dialogue

In 1952, Pauli, one summer night, and Werner Heisenberg, following a Copenhagen meeting on quantum mechanics (with Niels Bohr), entered into a dialogue on god and soul, wherein, as recounted by Heisenberg (below), Heisenberg stated frankly that the main issue (or tension) is that we don't yet have a gravito-electromagnetic force based "moral compass", the way sailors do for directional guidance in the earth's magnetic force

Thermodynamics

In thermodynamics, Pauli is noted for his "Pauli Lectures" on physics, given at the ETH in Zurich, the third division of which became compiled as the 1958 book *Thermodynamics and the Kinetic Theory of Gases*, which is said to be a conventional course in phenomenological thermodynamics, which goes through the labors of the Carnot cycle and the van't Hoff boxes. [1] Of note, in 1958, during his occupation with this course, Pauli worked out a better formulation of chemical reactions, the manuscript description of which was included in the German edition of his lectures.

On love

See main: Pauli on love

The following is a 22 Dec 1949 letter from Pauli to German-American physicist Ralph Kronig, on the subject of the lack of discussion on the subject of love in the 20th century, in which German polymath Johann Goethe's 1809 *Elective Affinities* is mentioned: [2]

German (original)	English (translated)
Pauli an Kronig Princeton, 22 Dezember 1949 Lieber Kronig! Ich war sehr froh von Ihnen wieder zu hören und noch mehr froh, daß Si emit Thellung zufrieden sind. [1] Hoffentlich kommt er auch mit seiner Doktorarbeit vorwärts (die sich leider nun auf eine technische Izerei reduziert, doch wird das Resultat von gewissem Interesse sein). An den Feldtheorien interessiert mich jetztam moisten, für welche Wechselwirkungen der Schwinger-Dyson-Formalismus der "Renormalisierung" (eindeutig) zum Ziel führt und für welche anderen Wechselwirkungen das nicht der Fall ist. Darüber weiß man schon einiges, aber noch nicht genug. Vielleicht komme ich bei einer anderen Gelegenheit nochmals darauf zurück. Dies ist ja ein Weihnachts-und Neujahrsbrief mit allen guten Wünschen an Sie beide, die das impliziert. Zu dem	Pauli Kronig Princeton, December 22, 1949 Dear Kronig! I was very glad to hear from you again, and even more glad that Si emit Thellung are satisfied. [1] I hope he comes forward with his thesis (which, unfortunately, is now reduced to a technical Izerei, but the result will be of some interest). The field theories interest me jetztam moisten, for which interactions the Schwinger-Dyson formalism of "renormalization" leads (clearly) to the target and which other interactions that is not the case. In one knows quite a bit, but not enough. Maybe I'll come back again on another occasion it.

abgelaufenen Jahr zählt bi emir auch die freundlich-komische Erinnerung, wie wir in Como zu viert aus diesem schrecklichen Gedränge ausstiegen und Ihre Frau den Koffer gerettet hat. [2]

Tom Kelder Skizze von mir möchte ich gerne einmal sehen. [3] (Der Bildhauer Haller in Zürich hat eine Büste von mir gemacht, wo ich auch sehr introvertiert (d.h. “Buddha-like” herausgekommen bin.) [4] Sagen Sie ihm bitte viele Grüße von mir.

> Ihr Traum über Ehrenfests Predigt über die Liebe hat mich sehr interessiert und es fällt mir hierzu vieles ein, nämlich in einem geistesgeschichtlichen Zusammenhang. In unserer Zeit pflegt man die Liebe als etwas persönlich-subjetives zu betrachten, im Gegensatz zur objektiven wissenschaftlichen Naturekenntnis. Aber in Wirklichkeit ist das Gefühl ebenso allgemein wie das Denken und die Wurzeln des ersteren gehen ebenso tief. Die Liebe als Naturkraft ist eine alte Idee (alchemistisch das Hassen und lieben der Elemente – die “Affinität” oder “Wahlverwandtschaft” der Substanzen – vgl. auch Goethe). [5] Der traum scheint darauf hinzudeuten, daß die Liebe nicht den ihr gebührenden Platz gefunden hat in der Einstellung des Menschen unserer Zeit zum *Kosmos* und damit in der Naturphilosophie. (Denn in Ihrem Traum spricht ja ein Gelehrter und Physiker öffentlich und nicht eine Frau privat.)

Das war nun keineswegs immer so und insbesondere in der *Renaissance* finden wir das andere Extrem. Die Liebe war das wichtigste Thema der Philosophie we dies insbesondere bei *Marsillio* Ficino (sein Hauptwerk ist die “Theologia platonica”, [6] im Original lateinisch, doch wohl in alle Sprachen übersetzt) bei seinem Schüler Pico della Mirandola und in Leone Ebreos* “Dialoghi di amore” zu Tage tritt. [7]

Die Liebe wurde damals so allgemein gefaßt, daß sie als *αφροδιπη οβρανιη* (amor coelestis) religiös-ekstatische Zustände (wie die Moses and Paulus) und als ‘amor intellectualis dei’ (der sich spatter bei Spinoza wiederfindet, [8] aber von Ficino stammt) den Erkenntnistrieb umfaßt. In Verbindung mit dem amor coelestis hat Ficino auch den Begriff “platonische Liebe” eingeführt, der sich bei Plato und im Altertum eigentlich nicht findet, sondern dem Renaissance-Platonismus

This is indeed a Christmas and New Year's letter with all good wishes to you both, which implies. For the past year include the emir bi-friendly comic reminder of how we got out of the four of Como in this horrible crowd and your wife has saved the suitcase. [2]

Tom Kelder sketch of mine I would like to see again. [3] (The sculptor Haller in Zurich did a bust of me, where I also very introverted (ie am "Buddha-like" come out.) [4] Tell him. Please many greetings from me

> Your **dream about Ehrenfest's sermon on the love** that I was interested and I find it much on this one, that in a context of intellectual history. In our time, we won't see the love for something as personal-subjetives, as opposed to objective scientific knowledge of nature. But in reality, the feeling is just as generic as the thinking of the former and the roots go as deep. Love as a force of nature is an old idea (the alchemical elements of hate and love - the "affinity" or "elective affinity" of the substances - see also Goethe). [*Die Wahlverwandtschaften* (*Elective Affinities*), 1809] The dream seems to suggest that the love has not found its rightful place in the attitude of the people of our time in the cosmos and thus in natural philosophy. (Because in your dream so speaks a scholar and physicist publicly and privately not a woman.)

That was not always the case, especially in the Renaissance we find the opposite extreme. Love was the most important topic in philosophy this we especially Marsillio Ficino (his most important work is the "Theologia platonica", [6] in the original Latin, but probably in all languages) with his student Pico della Mirandola and Leone Ebreos * "Dialogue on Love" takes to light. [7]

The attention was then taken so general that they as αφροδιπη οβρανιη (amor coelestis) religious-ecstatic states (like Moses and Paul) and as 'amor intellectualis dei' (which spatter finds in Spinoza, [8] originates from Ficino includes) the desire for knowledge. In conjunction with the amor coelestis Ficino also introduced the term "platonic love", which in Plato and the ancients is not really, but the Renaissance-Platonismus is peculiar. This (especially Ficino and Ebrewo) has developed the peculiar idea that the rapture of the body rests darafu that the body

eigentümlich ist. Dieser (besonders Ficino und Ebrewo) hat auch die eigentümliche Idee entwickelt, daß die Wonne der Leibe darafu beruht, daß die Leibenden sich in einen *kosmischen Kreisstrom* einschalten, der von Gott ausgehend bis zur prima material herabsteigt und nachher weider zu Gott herafführt. Die Kreisstromidee findet sich auch schon früher im mittelalterlichen Platonismus und hat dort kosmogonische und theologische Bedeutung. (Vgl. Plotin: Das *Eine* als Emanationsquelle; [9] die Dinge als "Theophanieen" von Gott emaniert und weider zu ihm zurückkehrend, bereits bei Scotus Eriugena). [10] – So hat mich Ihr Traum in die Renaissance geführt. Damals gab es noch nicht die Trennung von Erkennen und Erleben, den die Erkenntnis der Natur war über die emotiona-betonten Anfäge dieses Prozesses noch nicht hinausgekommen. – Sollte es nicht Einsichten über die Natur geben, die ohne Gefühl nicht gewonnen warden können?

Alles Gute an Sie beide von uns!
Stets Ihr

W. Pauli

ends in a cosmic cycle power on, the starting descends from God to the great material and afterwards weider herafführt to God. The circular current idea is also found in the earlier medieval Platonism and there has cosmogonic and theological significance. (See Plotinus: The One as Emanationsquelle; emanates [9] things as "Theophanieen" weider from God and returning to him, even at Scotus Eriugena). [10] - So me your dream has resulted in the Renaissance. Those days there was not the separation of recognition and experience, the knowledge of nature was not yet left the emotional stressed Anfäge this process. - Should not it give insights into the nature, without feeling the warden can not win?

All the best to both of us!
Always Yours

W. Pauli

(add discussion)

Education

As a teen, Pauli had read Einstein's work on relativity, and by the time he was 18, he had published several definitive papers on relativity. In 1921, at the age of 21, Pauli completed his PhD in theoretical physics under advisor was Arnold Sommerfeld. [3]

References

1. Pauli, Wolfgang. (1958). *Thermodynamics and the Kinetic Theory of Gases* (*Thermodynamik und Kinetische Gastheorie*). MIT Press, 1973.
2. (a) Pauli, Wolfgang. (1949). "Letter to Ralph Kronig", Dec. 22 ; in: *Wissenschaftlicher Briefwechsel mit Bohr, Einstein, Heisenberg u.a. / Scientific Correspondence with Bohr, Einstein, Heisenberg a.o.*: Band/Volume 3: 1940-1949 (pgs. 725-26). Springer DE, 1993.
(b) Ralph Kronig – Wikipedia.
3. Anon. (2012). " The 10 Youngest PhDs of All Time" (Q), Online Colleges, Apr 2.

External links

- Wolfgang Pauli – Wikipedia.

θΔics

In existographies, **Wolfgang Weidlich** (1931-2015) (CR:13) was a German physicist, noted for []

Overview

In 1971, Weidlich, in his article "The Statistical Description of Polarization Phenomena in Society" on the dynamics of opinion forming, which, according to Serge Galam, is said to be one of the founding papers of sociophysics. [1]

Weidlich's article, in turn, stimulated the 1974 article "A Theory of Social Imitation" by American physicists Earl Callen and Don Shapero in which they suggested that the simple nonlinear model proposed by Weidlich could shed light on the tendency of fish to align in schools, birds to fly in flocks, and people to conform in fads and fashions. [2]

In 2000, Weidlich, in his *Sociodynamics: A Systematic Approach to Mathematical Modelling in the Social Sciences*, introduced a physics-stylized model of "sociodynamics". [4]

In 2002, Weidlich is said to have exploited the master equations of thermodynamics to develop a general theory of sociodynamics. [3] This, supposedly, is a reference to his *Sociodynamics.*

References

1. (a) Weidlich, Wolfgang. (1971). "The Statistical Description of Polarization Phenomena in Society", British Journal of Mathematical Statistical Psychology, 24: 251-66.
(b) Galam, Serge. (2004). "Sociophysics: a Personal Testimony", *Physica A: Statistical and Theoretical Physics*, 336(1-2) 49-55.
2. (a) Callen, Earl and Shapiro, Don. (1974). "A Theory of Social Imitation", *Physics Today*, 23-28, July.
(b) Vaga, Tonis. (1994). *Profiting from Chaos* (pgs. 12-13). Tonis Vaga.
3. Day, Richard H. (2004). *The Divergent Dynamics of Economic Growth* (pg. 14). Cambridge University Press.
4. Weidlich, Wolfgang. (2000). *Sociodynamics: A Systematic Approach to Mathematical Modelling in the Social Sciences.* Courier, 2006.

Further reading

â— Weidlich, Wolfgang. (1991). "Physics and Social Science: the Approach of Synergetics" (abs), *Physics Reports*, 204:1-163.
â— Barkley, Rosser J. (2005). "Book Review of Wolfgang Weidlich's *Sociodynamics: A Systematic Approach to Mathematical Modelling in the Social Sciences*" (abs), *Discrete Dynamics in Nature and Society.*

External links

â— Wolfgang Weidlich (faculty) (German → English) – University of Stuttgart.

θΔics

In terminology, **woman** (TR:211), female (TR:152) or women (TR:163), as contrasted with a man, or alternatively hermaphrodite (an animal or plant having both male and female reproductive organs), is bipedal primate mammal, of reproductive age, with an XX 23-chromosome, as contrasted with an individual with an XY 23-chromosome (male).

Overview

In 1995, Libb Thims, chemical thermodynamically, had the following basic human reproduction reaction model in mind:

Male + Female → Baby

In 2001, Thims playing with the "s" symbol meaning "solid" as used in chemistry:

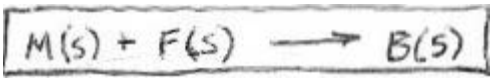

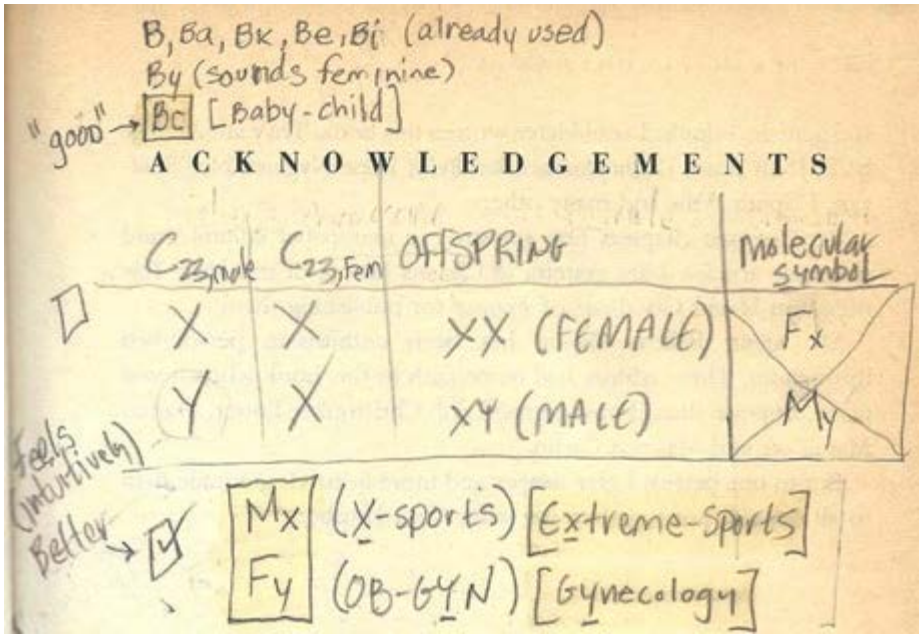

A c.2002 photo of hand-written notes by Libb Thims, in the front matter of his copy of Matt Ridley's Genome: the Autobiography of a Species in 23 Chapters (1999), wherein he is attempting to formulate a chemical symbol notation for a male Mx, female Fy, and baby Bc, per the reproductive reaction.

In c.2002, hand-written notes by American electrochemical engineer Libb Thims, in the front matter of his copy of Matt Ridley's *Genome: the Autobiography of a Species in 23 Chapters* (1999), wherein he is attempting to formulate a chemical symbol notation for a male Mx, **female** Fy, and baby Bc, per the reproductive reaction, Thims had in mind, in his early years of theory development (1995-2003):

Mx + Fy → Bc

In 2003, however, Thims came to the realization that, contrary to his previously incorrectly conceptualized model, above, the human reproduction reaction was in fact a double displacement reaction, and not a combination reaction; correctly:

AB + CD → AC + BD

where the molecular components "B" and "D" are the germ cells of each person, i.e. sperm and egg, AC is a dihumanide molecule, in possession of a human chemical bond "A≡C", in which a quantifiable amount of Gibbs free energy is stored, in the form of bond energy, per the Fritz Lipmann coupling theory, and BD is the newly-formed child at the point of parental detachment (age 18). Prior to this, Thims, of note, had assumed, in his formulation, that the parents "died off", somewhere along the line, and that all that mattered between initial state and final state was the couple at first collision (meeting) and the fully formed product (adult child). In the correct view, he realized that (a) the Gibb energy stored in the intact marriage bond "A≡C" was a large missing piece of the calculation and (b) no one, to his knowledge, had yet formulated a theory of the "human chemical bond", in a scientific quantitative sense.

In 2005, resultingly, Thims attempted to draft the online article "On the Nature of the Human Chemical Bond", which halted when it became evidence that the subject would not fit on one webpage; nevertheless, the effort did result in (a)

the Journal of Human Chemical Thermodynamics and (b) the two-volume textbook *Human Chemistry*. [4]

Quotes

The following are noted quotes:

> "Just as man and **woman** attract one another, so oxygen attracts hydrogen, and, in loving union with it, forms water, that mighty omnipresent element, without which no life nor thought would be possible."
>
> — Ludwig Buchner (c.1880), quoted by Henry Finck (1887) as an example of gross materialism [1]

> "Just as man and **woman** attract one another, so oxygen attracts hydrogen, and, in loving union with it, forms water, that mighty omnipresent element, without which no life nor thought would be possible."
>
> — Ludwig Buchner (c.1880), quoted by Henry Finck (1887) as an example of gross materialism [1]

> "I am not prepared to deny or assert any proposition which concerns myself; but certainly this solitary struggle with platitudinous atoms, called men and **women** by courtesy, leads me to wish for my wife again. How did I ever hit on the only woman in the world who fits my cravings and never sounds hollow anywhere? Social chemistry—the mutual attraction of equivalent human molecules—is a science yet to be created, for the fact is my daily study and only satisfaction in life."
>
> — Henry Adams (1885), Letter to wife Clover Adams, Apr 12 [3]

> "At one point, a minority of some of the more extreme Christians (following Aristotle) doubted whether **women** had souls, or at least had souls of the same quality as men."
>
> — Francis Crick (1995), *The Astonishing Hypothesis* [2]

> "Women initiate negotiations four times less often than men, resulting in getting less of what they want—promotion opportunities, plum assignments, and higher pay."
>
> — Selena Rezvani (2012), *Pushback: How Smart Women Ask – and Stand Up – For What They Want* (Q)

See also

- IQ: 150+ | Smartest woman ever
- Male-female reaction

References

1. Finck, Henry. (1887). *Romantic Love and Personal Beauty: Their Development, Causal Relations, Historic and National Peculiarities* (section: Cosmic Attraction and Chemical Affinities, pgs 4-9). MacMillan.
2. Crick, Francis. (1995). *The Astonishing Hypothesis: the Scientific Search for the Soul* (pg. 4). Simon and Schuster.
3. (a) Adams, Henry. (1885). "Letter to Marian Adams", April 12.
(b) Adams, Henry. (1989). *The Letters of Henry Adams: 1892-1899, Volume 4* (equivalent human molecules, pg. xxviii). Harvard University Press.
4. Thims, Libb. (2005). "On the Nature of the Human Chemical Bond" (un-finished). *Journal of Human Thermodynamics*, Vol. 1, Issue 5, pgs. 36-67. December.

External links

- Woman – Wikipedia.

θΔics

In science, **woo woo physics**, aka “quantum woo woo”, generally, is the term used by Michael Shermer (2010) in reference to the new age quantum physics stylized ideas of Deepak Chopra, generally meant to convey the first "woo" reaction to the perceived "magic" effect that the show performer impresses onto the audience. [1]

Note: on 7 Feb 2018, Hmolpedia was hacked by an adolescent Japanese individual, who believed that the cite was “**woo woo physics**” (Q)(Q), and uploaded the above image, as he began to delete pages..

Woo salad

The terms “woo salad” and “woo woo salad”, oft seen in recent (c.2019) pop culture dialogue (Q), are a combination of Michael Shermer’s 2010 “woo woo” term and Sam Harris’ oft-employed phrase “word salad” (c.2015), both of which imbibing the notion that someone is playing a Sokal affair with words on someone else; both of which tend to trace to Deepak Chopra's quantum spirituality theories.

Quotes

The following are related quotes:

> “Thims’ thermodynamic proof that good always triumphs over evil to be nothing but “**calculus coated woo**, hidden behind a smokescreen of rhetorical mathematics.”
>
> — Ryan Grannell (2011), comment (Q) on Libb Thims’ “Thermodynamic Proof that Good Always Triumphs Over Evil”

References

1. Review: Sam Harris and Michael Shermer vs Deepak Chopra (2010) (Q)

External links

- Quantum woo – RationalWiki.org.

θΔics

In hmolscience, **Woodrow Wilson** (1856-1924) was the 28th American President notable as being one of the members of the Princeton social physics school, for his efforts to, supposedly, overcome the "friction" of the separation of powers in America, and for his 1912 presidential candidate speech wherein he contends that American 4th president James Madison's Newtonian-based version of the Constitution was outdated, in that government, as he saw things, was answerable to Darwin not to Newton. [1]

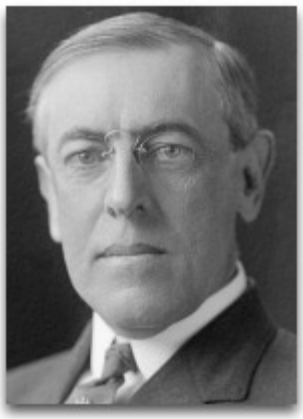

Political dynamics

In 1908, Wilson, in his *Constitutional Government in the United States* lectures-turned-book, stated the following, in regards to theoretical structure of constitutions, in general—the concept of which, i.e. a constitutional government, he says arose at Runnymede, when the barons of England in 1215 exacted the Magna Carta of John, the resulting constitution of England being the mother of all constitutions as he says:

> "The government of the United States was constructed upon the Whig theory of political dynamics, which was a sort of unconscious copy of the Newtonian theory of the universe [see: Newtonian government]. In our own day, whenever we discuss the structure or development of anything, whether in nature or in society, we consciously or unconsciously follow Darwin; but before Darwin, they followed Newton. Some single law, like the law of gravitation, swung each system of thought and gave it its principle of unity. Every sun, every planet, every free body in the spaces of the heavens, the world itself, is kept in its place and reined to its course by the attraction of bodies that swing with equal order and precision about it, themselves governed by the nice poise and balance of forces which give the whole system of the universe its symmetry and perfect adjustment. The Whigs had tried to give England a similar constitution."

(add discussion)

Darwin | Newton

In 1912, Wilson, in his "What is Progress?", his second campaign speech, tells the story of how when he was president of Princeton, he listened to a lecture of a visiting Scottish philosopher who discussed Newtonian thinking in respect to Darwinian thinking, which triggered in Wilson speculation about how a Darwinian reformulation of the Constitution might be a good political platform, which he explains as follows:

> "One of the chief benefits I used to derive from being president of a university was that I had the pleasure of entertaining thoughtful men from all over the world. I cannot tell you how much has dropped into my granary by their presence. I had been casting around in my mind for something by which to draw several parts of my political thought together when it was my good fortune to entertain a very interesting Scotsman who had been devoting himself to the philosophical thought of the seventeenth century. His talk was so engaging that it was delightful to hear him speak of anything, and presently there came out of the unexpected region of his thought the thing I had been waiting for. He called my attention to the fact that in every generation all sorts of speculation and thinking tend to fall under the formula of the dominant thought of the age. For example, after the Newtonian theory of the universe had been developed, almost all thinking tended to express itself in the analogies of the Newtonian theory, and since the Darwinian theory has reigned amongst us, everybody is likely to express whatever he wishes to expound in terms of development and accommodation to environment."

He continues

> "Now, it came to me, as this interesting man

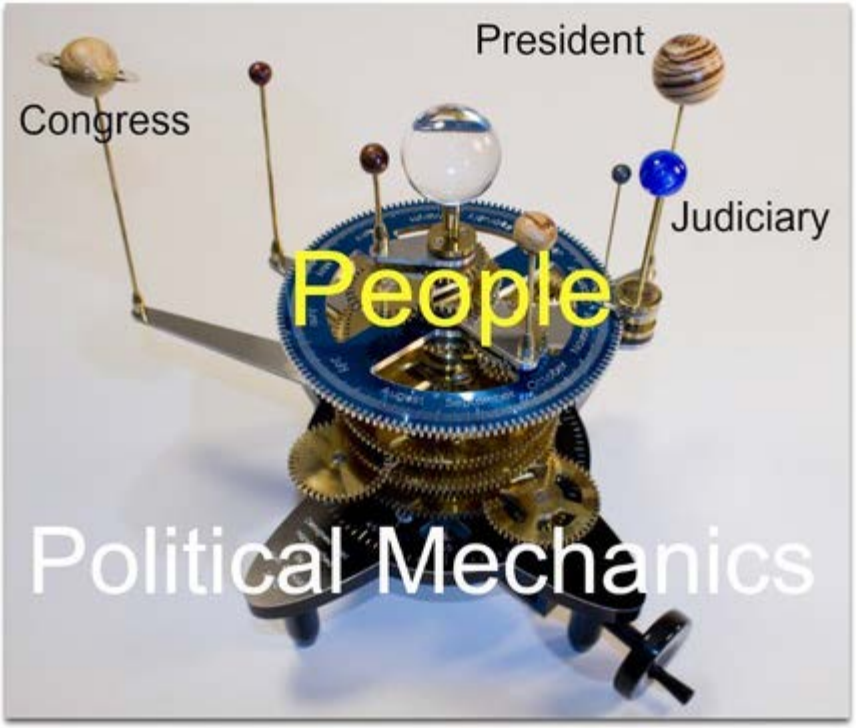

Wilson's 1912 description of how the Constitution built via Newtonian mechanics, namely: "they constructed a government as they would have constructed an orrery—to display the laws of nature. Politics in their thought was a variety of mechanics. The attraction of gravitation the various parts—Congress, the Judiciary, and the President—are held in their orbits; and then they proceed to represent as a sort of imitation of the solar system."

> talked, that the Constitution of the United States had been made under the dominion of the Newtonian theory. You have only to read the papers of *The Federalist* to see that fact written on every page. They speak of the "checks and balances" of the Constitution, and use to express their idea the simile of the organization of the universe, and particularly of the solar system,—how by the attraction of gravitation the various parts are held in their orbits; and then they proceed to represent Congress, the Judiciary, and the President as a sort of imitation of the solar system.
>
> They were only following the English Whigs, who gave Great Britain its modern constitution. Not that those Englishmen analyzed the matter, or had any theory about it; Englishmen care little for theories. It was a Frenchman, Montesquieu, who pointed out to them how faithfully they had copied Newton's description of the mechanism of the heavens. The makers of our Federal Constitution read Montesquieu with true scientific enthusiasm. They were scientists in their way,—the best way of their age,—those fathers of the nation. Jefferson wrote of "the laws of Nature,"—and then by way of afterthought,—"and of Nature's God." And they constructed a government as they would have constructed an orrery,—to display the laws of nature. Politics in their thought was a variety of mechanics."

Wilson then states the following, oft-quoted segment:

> "The Constitution was founded on the law of gravitation. The government was to exist and move by virtue of the efficacy of 'checks and balances.' The trouble with the theory is that government is not a machine, but a living thing. It falls, not under the theory of the universe, but under the theory of organic life. It is accountable to Darwin, not to Newton. It is modified by its environment, necessitated by its tasks, shaped by the sheer pressure of life."

Wilson here seems to have in mind: Charles Montesquieu, John Witherspoon, James Madison, Thomas Jefferson, William Paterson, and Benjamin Franklin.

Religion

Wilson, supposedly, was a deeply religious Presbyterian; the following, to exemplify, are retrospect comments by Raymond B. Fosdick, one of his former students: [2]

> "Wilson was a deeply religious man. He believed that God was working out his purposes in this world, and once he made up his mind that a particular course of action represented the will of God, nothing could

shake him loose from it."

Fosdick, who was with Wilson during his last days, comments how Wilson, with tears running down his face, said "You can't fight God!", in commentary on his failed effort to actuate the League of Nations, based on what he thought was an underlying principle, representing the fulfillment of a preordained purpose, mediated or enacted by the will of God.

Quotes | By

The following are quotes by Wilson:

> "Whenever bodies of men employ bodies of men, it ceases to be a private relationship."
>
> — Woodrow Wilson (1912), "The Old Order Changeth", 1st campaign speech (pg. 28) [3]

> "It would seem a waste of time to point out that ancient distinction,—between mere change and improvement. Yet there is a class of mind that is prone to confuse them. We have had political leaders whose conception of greatness was to be forever frantically doing something,—it mattered little what; restless, vociferous men, without sense of the energy of concentration, knowing only the energy of succession. Now, life does not consist of eternally running to a fire. There is no virtue in going anywhere unless you will gain something by being there. The direction is just as important as the impetus of motion."
>
> — Woodrow Wilson (1912), "What is Progress?", 2nd campaign speech (pg. 44)

> "May it suffice for me to say that of course like every other man of intelligence and education I do believe in organic evolution. It surprises me that at this late date such a question should be raised."
>
> — Woodrow Wilson (1922), "Letter to Academic", Aug 29 [5]

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External links

â— Woodrow Wilson – Wikipedia.

θΔics

In nouns, **word-helot**, from the Greek *eirein* to say + *Heilotes* a member of a class of unfree men—between slave and free citizen—owned by the state, refers to someone only able to understand and explain the world according to words or verbal skills, but not through mathematics and equations.

Etymology

The term “word-helots” was introduced in 1971 by French-born American physicist turned literary critic George Steiner, who warned that in the future those with only verbal skills could be in danger of becoming “word-helots”, and hence excluded from the advanced processes of society. [1]

The term was used by Stefan Collini in 2003 in reference to the “literary intellectuals” (Shakespeare culture or right-brainers) of C.P. Snow’s two cultures divide, in contrast to the “natural scientists” (Clausius culture or left-brainers). [2]

Equation freedom

As the term Helot, according to Pollux, refers to people who occupied a status "between free men and slaves", tied to the land, who worked in agriculture as a majority, there would seem to exist an equivalent parallel term, something akin to an “equation freed citizen”, or something along these lines, that could capture the two-cultures equivalent of the Clausius culture, natural scientists, or left-brain thinkers of the C.P. Snow classification.

A noted problem, however, in those who are able to break free from the bonds of word-helot servitude, is the complex issue of not being able to understand and employ equations properly, a phenomenon found to be particularly ripe in the hmolsciences, wherein "equations" are often seemingly cherry-picked, in bulk, in what seems to be supercilious attempts at explaining human social phenomena, albeit often resulting phenomena such as; toolism, bent or misaligned and unproductive mathematical isomorphism (or thermodynamic isomorphisms), or in some cases a type of defeating self-Sokal affairing (e.g. Shannon bandwagon), among others.

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θΔics

In science, **work** quantifies the measure of the "dynamic effect" of a motor or the action of the movement of a body under the influence of a force. [1] The term was first described as "motive power" in 1824 by French physicist Sadi Carnot to quantify the "effect that a motor is capable of producing", including such effects as to lift water or ore out of mines, impel ships, excavate ports and rivers, forge iron, fashion wood, grind grains, spin and weave cloth, or transport heavy burdens, etc.; each of which can be likened to the measure of the energy associated with the lifting of a weight through a gravitational height. [2]

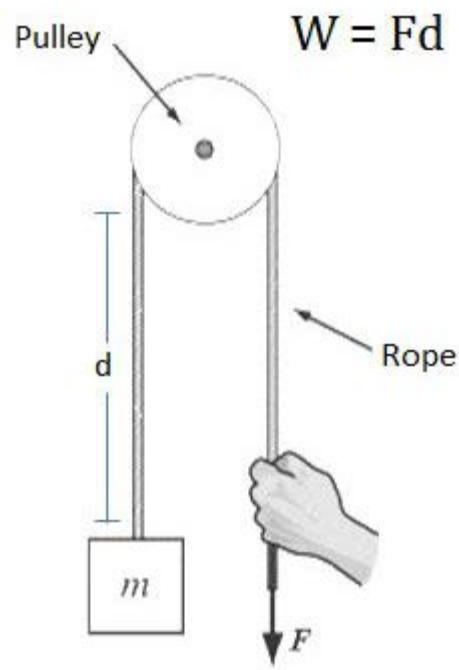

Basic definition of **work**, the product of a force moving an object through a distance; in its original conceptual form, a weight lifted through a height, as in the lifting of water out of a flooded coal mine.

Force and distance

In the 1687 publication *The Mathematical Principles of Natural Philosophy* (*The Principia*), English physicist Isaac Newton outlined the laws governing the relationship between the motions of bodies and force. In simplified form, Newton's three laws of motion state that **one**: a body will stay at rest or continue at constant motion unless acted on by an external force; **two**: the force acting on an object is equal to the product of the mass of the object and its acceleration; **three**: every action has an equal and opposite reaction.

Motive Power

In the 1824 publication *Reflections on the Motive Power of Fire*, French physicist Sadi Carnot, a former student (1812-14) of the École Polytechnique, defined the term "motive power", what we now understand as work, as: "the **effect that a motor** is capable of producing", which can be likened to "the elevation of a weight to a certain height", having a measure of "the product of the weight multiplied by the height to which it is raised". [2] In equation form:

$$\text{Motive power} = \text{weight} \cdot \text{height}$$

The units of the term weight, later explicitly defined as mass of the object times the force of gravity *mg*, however, were not clarified at this point by Carnot.

Travail

The actual term "work" as the product of force and distance, was coined by French physicist Gustave Coriolis who used the French term *travail* in his 1829 textbook *Calculation of the Effect of Machines*. [3] In the preface to this work, the English translation reads:

> "The name of **work** is defined as the product of a weight carried, multiplied by the distance from transport, or in general the product of an area covered, multiplied by a force directed perpendicular to this space; it is necessary to consider only the effort is exerted in the direction of the area covered."

Coriolis, it seems, derived his notion of work as a replacement of German mathematician Gottfried Leibniz's 1686 theory of vis viva (living force, i.e. kinetic energy or mv^2), namely in via the useful effect that a moving mass (e.g. a piston) is capable of doing. [7] To cite an example of Coriolis' terminology, in his 1844 second edition, Coriolis outlined a section on what he called the "principle of the transmission of work in the movement of a material point". Defining P as sum of the moving forces, he states: [8]

> "The integral $\int P dS$, $P dS$ the product of the tangential component of the force F by the infinitesimal arc ds described by its point of application, is called the amount of **work** due to this force F . The $P dS$ product is

> the element of work at the same strength."

Nearly word-for-word, this seems to be the basis of the opening "Mathematical Introduction" section of Rudolf Clausius' textbook *The Mechanical Theory of Heat* (1865, 1875). In modern equation form:

$$W = F \cdot d$$

In this work, Coriolis promoted the technical term "work" (travail) to cover a wide variety of equivalent terms used by practitioners. He states:

> "All of the practitioners today understand by the vis viva (living force) the **work** which the velocity acquired by a body is capable of doing."

French mathematician Jean-Victor Poncelet, the commandant general of the École Polytechnique, acknowledged that the word "work" was brought in by Coriolis. [4] Poncelet was Coriolis' teacher and source of stimulus of many of his ideas. Poncelet, who in 1824 had become professor of 'mechanics applied to machines', later built on the logic of Coriolis and lectured successfully on the topic of work done by machines, wherein he used the word 'travail' to signify work. [6] Poncelet expanded the concepts of agents of work far beyond vis viva, so that it became a unifying concept of physical, chemical, and biological processes. [7]

Coriolis, a former student (1808) and later tutor (1816) at the École Polytechnique, may have adopted parts of his logic on that outlined earlier by the Carnot the younger, but this is unlikely. Coriolis does, however, devote a section to the "theorem of Carnot", but in what seems to be on the work of Lazare Carnot. [9]

Clapeyron's pressure-volume work

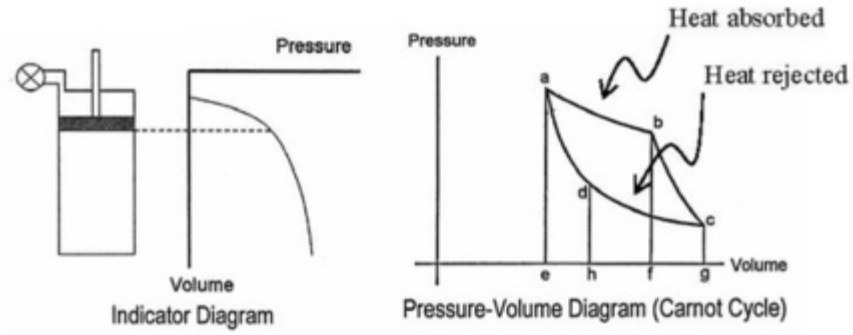

The graphical measure of work was identified in 1834 by French mining engineer Émile Clapeyron who used the phrase "mechanical action" as "the integral of the product of the pressure times the differential of the volume" during either the expansion or contraction of the gas and the resultant piston movement. [5] Specifically, in 1796, Scottish instrument maker James Watt and his employee John Southern developed a work measurement tool called an "indicator diagram", used to exactly quantify the work produced by a steam engine, which made a chart of the pressure of the steam in a cylinder plotted out against the steam's volume.

From this, as was determined by Clapeyron, the work of the steam can be determined using calculus:

$$W = \int_{V_i}^{V_f} P\,dV$$

Mechanical work

Beginning in 1850, Clausius built on these foundations (Carnot, Coriolis, and Clapeyron) by digging into the nature of atomic work, in the working substance, using the logic that: "[whenever a] body moves under the influence of [a] force,

work is performed." [1] Clausius used the terms "motive power", "work", and "mechanical work" somewhat interchangeably; although tending towards the latter terminology in his later papers. In his work, the equation view was used such that the product of the force *F* and the distance *d* through which the force moves a body is the "work" done:

$$W = Fd$$

Units of work

In circa 1830s, Coriolis proposed a unit of work, namely the 'dynamode'. The unit represents 1000 kilogram-metres and was proposed by Coriolis as a measure which could provide a sensible unit with which to measure the work which a person might do, a horse, or a steam engine. Although his term 'work' has become standard, the dynamode did not prove popular in the long run as the unit of work. [4]

In 1875, Clausius was defining the "unit of work" as the kilogram-meter, based on the standard force of gravity, as "that which must be performed in order to lift a unit of weight [kilogram] through a unit of length [meter]". [1] The differentiation between mass [kilograms] and weight [kilograms·m/s²], and the subsequent SI unit of work, Joule [kilograms·m²/s²] came in later years.

In particular, the joule was adopted as the unit for electrical work, heat, mechanical work and energy in 1948 at the 9th General Conference on Weights and Measures, avoiding the calorie as far as possible. This unit was also formally approved in 1960 in the International System of Units (SI). [10]

Human molecular work

In human molecular interaction terms, i.e. with reference to human occupational work, the definition is the same, namely any activity energetically equivalent to lifting a weight. The exact quantification of this measurement, e.g. when trying, for instance, to measure "household work" or "child raising work" as compared the work spent in lifting buckets of water up a well, is a major area of research in human thermodynamics. This is where the development of human indicator diagrams are needed.

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θΔics

In thermodynamics, **work function**, symbol A, from the German *arbeit*, meaning "work", sometimes called the total work function or Helmholtz work function, is a synonym for Helmholtz free energy. [1]

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See also

â— Work function (solid state physics) – Wikipedia.

θΔics

In thermodynamics, **working body**, aka "working substance" (Carnot, 1824), "system" or "thermodynamic system", is the a collection of partitioned-off atoms, molecules, matter, or particles confined to a region or boundary that does work (or consumes work) due to the contact action at the boundary surface of a either a hot body (or cold body).

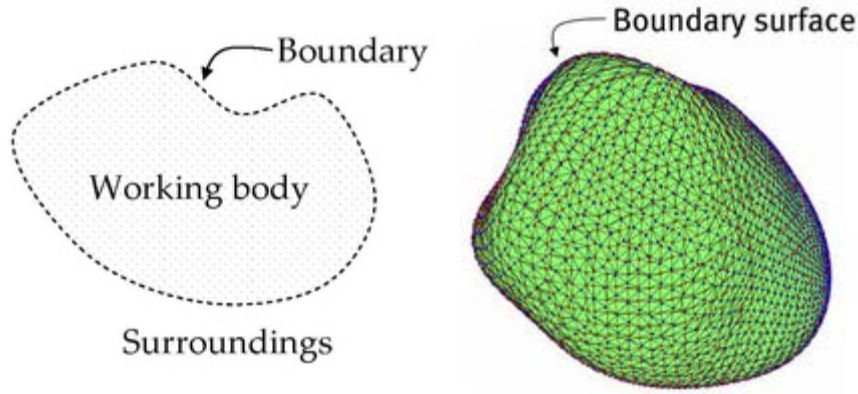

Left: 2D view of a working body. Right: 3D view of a working body.

History

The first to develop the concept of a "thermodynamic system" was the French physicist Sadi Carnot who in his 1824 *Reflections on the Motive Power of Fire* studied what he called the *working substance* (system), i.e. typically a body of water vapor, in steam engines, in regards to the system's ability to do work when heat is applied to it. [1] The working substance could be put in contact with either a heat reservoir (a boiler), a cold reservoir (a stream of cold water), or a piston (to which the working body could do work by pushing on it). In 1850, the German physicist Rudolf Clausius generalized this picture to include the concept of the surroundings and began to use the term "working body" when referring to the system. From his 1850 manuscript *On the Motive Power of Fire* Clausius states: [2]

> "With every change of volume (to the working body) a certain amount work must be done by the gas or upon it, since by its expansion it overcomes an external pressure, and since its compression can be brought about only by an exertion of external pressure. To this excess of work done by the gas or upon it there must correspond, by our principle, a proportional excess of heat consumed or produced, and the gas cannot give up to the *surrounding medium* the same amount of heat as it receives."

In the following diagram, is shown the Carnot engine as is typically modeled in current use, where heat flows from a high temperature T_H furnace through the fluid of the "working body" (working substance) and into the cold sink T_C, thus forcing the working substance to do mechanical work W on the surroundings, via cycles of contractions and expansions.

In the diagram shown, the “working body” (system), a term introduced by Clausius in 1850, can be any fluid or vapor body through which heat Q can be introduced or transmitted through to produce work. In 1824, Sadi Carnot, in his famous paper *Reflections on the Motive Power of Fire*, had postulated that the fluid body could be any substance capable of expansion, such as vapor of water, vapor of alcohol, vapor of mercury, a permanent gas, or air, etc. Although, in these early years, engines came in a number of configurations, typically Q_H was supplied by a boiler, wherein water was boiled over a furnace; Q_C was typically a stream of cold flowing water in the form of a condenser located on a separate part of the engine. The output work W here is the movement of the piston as it is used to turn a crank-arm, which was then typically used to turn a pulley so to lift water out of flooded salt mines. Carnot defined work as “weight lifted through a height”.

Human working bodies

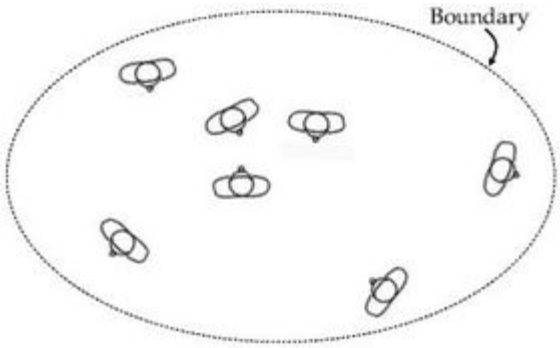

In human thermodynamics, the working body is defined such that instead of water molecules, confined to the internal regions of a steam engine, put in alternating contact with a hot body (a fire) and a cold body (cool water), driven to do mechanical work, we have human molecules, confined to the internal regions of a social system, put in alternating contact with a hot body (the day sun) and a cold body (the cool night sky), driven to do the daily work of life, e.g. economic work, social work, volunteer work, household work, parenting work, territorial expansion work, interpersonal work,

relationship work, etc. [3]

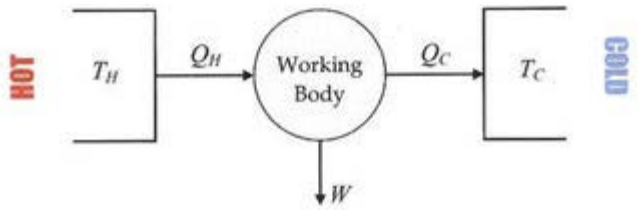

A boundaried social system of seven people (human molecules) defined as a "**working body**".

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θΔics

In economic thermodynamics, a **working medium** refers to a state of excited people or human molecules functioning as a thermodynamic system in an economic cycle. [1]

The term was conceived by Russian bioelectrochemist Octavian Ksenzhek in 2007 on terminological analogy to French physicist Sadi Carnot's 1823 "working substance" and German physicist Rudolf Clausius' 1850 "working body".

Origin

In relation to the concept of the human molecule, in the 2007 book *Money: Virtual Energy*, Ksenzhek correctly states that: "the economy of mankind is a very large and extremely complicated system ... people are the 'molecules' of which it consists", and that "various associations of people constitute its structural components." [1]

On this logic, Ksenzhek then outlines the view of what he calls a "working medium". Specifically, he gives a very basic neurochemical human thermodynamic view in which endorphins, i.e. the body's natural pain killer and mental high chemical, in low concentrations exert a strong influence on the processes of the nervous system, particularly in the pleasure center. Thus, he concludes that endorphins play a key role in the hidden processes of basic human motivations and that in the economic system, humans act as "active agents" coupling technology and "virtual energy flows". [1]

Subsequently, according to Ksenzhek, the modern economy exploits the various endorphin channels with every-increasing intensity, via advertising, commercials, the image in the mind of becoming sexier with a certain product, e.g. a new car, or new technology. In this manner, "a whole arsenal of various means is set into action to inspire people to incessantly wish for something. Such a state of people is necessary for their efficient functioning as the "working medium" of the economic cycle. In order to keep people excited, powerful advertising is used. As a rule, it appeals to the subconscious rather than reason." [1]

References

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θΔics

In anatomy, a **fingerprint** is a trace, print, or scan of the friction ridges of the skin of any finger that serve as unique identification markers. [1] The three generalized types of fingerprints are arches, loops, and whorls. The scientific study of fingerprints or "skin patterns" and there relation to personality types, e.g. extrovert (energy outgoing) or introvert (energy ingoing), or genetic disease, Down syndrome, is called *dermatoglyphics*. [1] In 2007, it was suggested by Russian biometrist Viktor Minkin that the human thermodynamics of fingerprint pattern analysis may explain these patterns. [2]

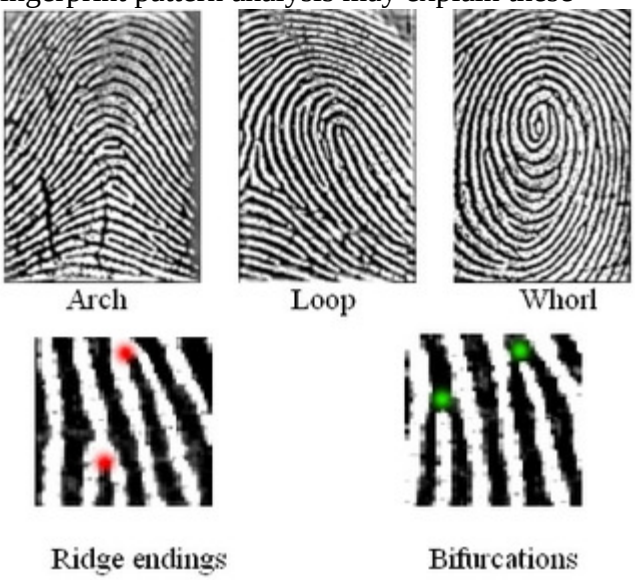

Embryogenesis

In humans, dermatoglyphs (patterns) are present on fingers, palms, toes, and soles, and can give insight into a critical period of embryogenesis, between 4 weeks and 5 months, when the architecture of the major organ systems is developing. Unusual dermatoglyphic patterns often relate to genetic disorders, such as Down syndrome, Turner syndrome, or Klinefelter's syndrome among others. [11]

Hypothesis

In 2007, it was hypothesized by Russian biometrist Viktor Minkin that there exists a "direct link between fingerprints, which reflect the character and health of the person, and DNA" that can be explained via the thermodynamics of human development. [2]

Fingerprints, according to Minkin, are natural visible markers of the results of the thermodynamics process driving the early stages of human embryo forming. It is well known, for instance, that fingerprints have correlation with human character. [3]
It is possible to test your personality with FingerCard program created by Elsys Corp and compare fingerprint analysis with
Eysenck personality test.

Likewise, modern science has accumulated many results in genetic studies of heredity and their relation to fingerprints. The heredity mechanism, however, includes both discrete processes, i.e. genetics, and analogue processes, namely biological or system influence. It is known, for example, that identical twins have identical genetic code, but differ in fingerprints.

History of dermatoglyphics

Fingerprints and dermatoglyphics have ancient classification history, Henry [4] system differs fingerprints by three main types arch, loop and whorl. Fingerprint identity characterized by minutiae, which totally could be only two types as bifurcations or ridges endings.

Morphology

Fingerprints form by the friction ridges of the skin, which includes several lays: epidermis, dermis and hypodermis. Ridges are anatomically located over blood vessels and nerve fibers, and the development of real skin crossing is complicated process. [5]

Unexplained puzzle

Epidermis or friction ridges cover only limited part of skin on fingertips, palms, foots and there is no generally accepted theory explaining it. Fingerprints exist on human beings and a few primates. It was supposed, originally, that fingerprints appeared during evolution process for friction force increased during trees climbing [6].

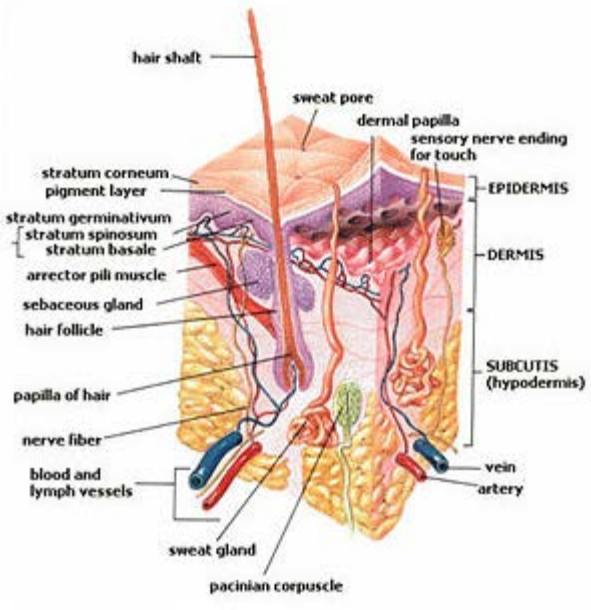

One unexplained puzzle is that of the correlation between genetics and fingerprints. There is a lot of science research confirming the statistical correlation between fingerprints and genetic characteristics of person, but there is no one accepted conception? [3]

To answer this, Minkin's theory is that the human embryogenesis genetic program is realized in correlation with the laws of thermodynamics and that embryo formation aims towards a entropy minimum during its developments with minimal energy spending. [7] This correlates to the biochemical rule that internal molecular entities, such as drugs moving towards receptors, move along paths of minimum free energy. Subsequently, the development of an embro may also form or assemble along a path of minimum system free energy.

Free enegy minimization paths

According to Danish quantum chemist John Avery, protein conformational changes, enzyme-substrate dynamics, antigen-antibody interactions, and sub-cellular organelle autoassembly processes all take place along paths that minimize the Gibbs free energy of the system. Likewise, according to Russian physical chemist Georgi Gladyshev, the ontogenetic and phylogenetic development at any stage in the development of an organism, as well as the evolution of social systems of organisms, takes place along paths that tend to minimize the Gibbs free energy of the system. [12]

In evolving protein systems, such as in autoassembly, protein folding, and other known scientific processes, complementary charges are drawn towards each other, not along paths that minimize the energy of the system, but along paths that minimize Gibbs free energy. Likewise, humans, in evolving molecular systems, are drawn along paths that minimize the Gibbs free energy. In the protein system, the entropy term plays the essential role between two opposite charges, the water molecules are aligned, and their entropy is lower than it would be if they could move around freely. As the opposite charges approach each other, the volume of the structured water between them is reduced, and the entropy of the system increases. [12]

This principle is common for every personal physiological system formation developed and realized by the one way in the determined embryogenesis period (10-13 weeks); subsequently, the structure of fingerprint ridges may have correlation with brain and nerve system structure [1].

Hence, every minutiae on the fingerprints may reflect some element of a thermodynamics process during embryogenesis and possibly influence on brain formation as well. This conception explains why fingerprint image type is genetic parameter (identical twins have identical fingerprint types) though minutiae and ridges characteristics are not genetic parameter (identical twins have different minutiae). The brain and nerves system structure has influence to the person behavior and at the same time every fingerprint parameter has correlation with the person character. [18]

Fingerprint as energy marker

In the early part of the 20th century, Carl Jung, one of the founders of psychodynamics, suggested that the extraversion/introversion trait is a central quality of the human personality. This characteristic is based on the direction of the flow psychological energy for extraversion (outside energy direction) and introversion (inside energy direction)

[9]. Visual fingerprint, coincedently, analysis gives the same results, the arch ridges have more open ridges direction and whorls have more closed ridges directions. Dermatoglyphic statistics confirms this and refers to people with arch to extraversion, people with whorls to introversion, and people with loops to intermediate type [10]. Application of energy and entropy analysis principals of fingerprint image may allow one to raise the reliability of personal heredity forecast.

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This document is available at: *Thermostat for Thermonuclear War* (working book). Ishi Press.

Libb,
I have prepared a short notes “Supramolecular thermodynamics” and “Supramolecular system” for our site. I think that these notes will be very important for the best understanding of our conceptions by readers. What do you think about this? Look at this carefully and correct English please.
Thank you very much for everything!
Georgi

> Georgi, I have started the page (supramolecular thermodynamics) and am adding material slowly. This seems to be, at present, a very ill-definied term, supposedly encompassing every system or entity of 4-element molecular structures or above. - Libb (03/23/08).

Supramolecular thermodynamics

Supramolecular thermodynamics is thermodynamics of intermolecular interactions (im) investigates the homogenous and heterogeneous chemical and biological systems, including dynamic open (quasi-equilibrium, quasi-closed) systems using the methods of equilibrium thermodynamics (thermostatics) or near-equilibrium thermodynamics. Supramolecular thermodynamic (as a supramolecular chemistry and thermodynamics of individual intermolecular interaction of molecules) refers to the area of physical chemistry of non-living and living structures that focuses on the nonchemical bonding (for example, noncovalent bonding) interactions of molecules.

Supramolecular thermodynamics is a branch of macro-thermodynamics or hierarchical thermodynamics. The conception (the notion and the term) was introduced by Georgi Gladyshev in the middle of 90-s although the physical sense of this conception was discussed by him and his colleagues in the middle of 70-s and the beginning of 80-s. **[References needed]** Gladyshev, Georgi, P. (1978). "On the Thermodynamics of Biological Evolution", *Journal of Theoretical Biology*, Vol. 75, Issue 4, Dec 21, pp. 425-441; G. P. Gladyshev, Yu. A. Ershov and V. I. Loshchilov
Thermodynamic principles of the behavior of biological systems
Journal of Theoretical Biology, Volume 83, Issue 1, 7 March 1980, Pages 17-42;
G. P. Gladyshev and Yu. A. Ershov
Principles of the thermodynamics of biological systems
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Unlike the supramolecular chemistry, which considers thermodynamics of interaction between individual (separate) molecules or molecular aggregates, the supramolecular thermodynamics studies intermolecular interactions in macro-volumes (units of mass) rather of greater sizes. The conformational variations of supramolecular structures in these volumes are reflected in variation of average specific Gibbs function of the formation of these structures, G im (im – intermolecular interactions).

From this viewpoint the supramolecular thermodynamics can be conceded as thermodynamics of volume's supramolecular structures in which supramolecular interaction spreads everywhere (all over) entire volume of the system so that the supramolecular equilibrium in this volume (or in the all local parts of this volume) is achieved (takes place). According to the supramolecular thermodynamics one can investigate the supramolecular structures which represent nanostructure and macro-structural formations. Thermodynamic quasi-equilibriums in these structures can be reached without direct contact between molecules and their fragments.

These interactions, for example, extend through structured water (physiological liquids) which easily changes the conformations of supramolecular structures. The interactions between comparatively big structures, as cells and living

organisms, can be took place thru a direct or indirect receptors.

Reference

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http://www.humanthermodynamics.com/HT-Glossary.html http://en.wikipedia.org/wiki/Supramolecular_chemistry

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Supramolecular system

Supramolecular system – the allocated (isolated) volume (mass) of molecular system in which between atoms and molecules exist supramolecular interactions (intermolecular interactions). **[Reference needed] New!** [also, what is the difference between this and the standard "thermodynamic system" or "working body" (Clausius) or "working substance" (Carnot)?] **On supramolecular system** Our supramolecular system in the general sense is a usual thermodynamic system, in which the supramolecular structures are investigated only! The same situation is with a working body or thermodynamic system. In our working body we investigate the supramolecular interactions and transformations of supramolecular structures only. We investigate one supramolecular hierarchy only! Thus, our terms are the particular terms (notions). The working body (thermodynamic system) is the general term (notion).

In the supramolecular system can be observed (to take place) the conformational transformations into local zones of system and in all system as a whole. Spontaneous transformations in closed (quasi-closed) supramolecular system are directed aside the rise of stability of this system. Conformational transformations into such system, at a constancy of temperature and pressure, are accompanied by aspiration of the specific Gibbs function of system formation to a minimum. Examples quasi-closed supramolecular systems are hydrated molecular complexes, colloid particles, organelles, cells, organisms, communities, ecosystems, etc. The organism of person is quasi-closed supramolecular polyhierarchical system in which different chemical transformations are observed. Such system can be named "Human molecule".

- Georgi, if your are supposing this term to apply to communities, you are also going to have to define the "supramolecular boundary" such as is done in the "boundary" article and we will need a reference. --Libb (02/19/08)
- After giving this time to filter, and after starting the "supramolecular thermodynamics" article, I think that we need one reference that defines the term "supramolecular system" before we can start an article on it. I cannot find one. --Libb (04/30/08).

Reference

Gladyshev G.P. On the Thermodynamics of Biological Evolution // J. Theor. Biol. – 1978. – Vol. 75. - P. 425-441.
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http://www.humanthermodynamics.com/HT-Glossary.html http://en.wikipedia.org/wiki/Supramolecular_chemistry

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Notes by Thims

The first to coin the term "supramolecular thermodynamics" was author Mihajlo D. MesaroviÄ‡ in 1968. [1]

[1] MesaroviÄ‡, Mihajlo D. (1968). *Systems Theory and Biology: Proceedings*, (pg. 58). Springer-Verlag.
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In human thermodynamics, **working papers** are articles or papers in the construction stage of development on topics on thermodynamics and human existence or topics connected therein, e.g. life thermodynamics, philosophical thermodynamics, etc. Anyone with a tentative theory or working paper is welcome to showcase their paper below, via the docstoc.com site. [1] An example working paper by EoHT member Libb Thims is shown below. The discussion threads on this page may thus be fortuitously used for critique, comment, and discussion of new papers.

On the Supposed Attributes of the Human Molecule

Thims, Libb. (2009). "On the Supposed Attributes of the Human Molecule", May-June, in: *Philosophy of Evolution* by AK Purohit (editor), 2010. Publisher.

References

1. To add a docstoc article: (a) sign up for a free account at docstoc.com; (b) upload a working paper to docstoc; (c) find the embed code (Wetpaint format style) (set dimensions to: 950px (width) by 450px (height), such as above) and paste the code into the widget box in the easy edit tool bar on this page. To note, after uploading a file to Docstoc, click on the “View Doc on Docstoc” button”, then on the next page click the embed button on the far left (the embed button on the first page doesn’t give the Wetpaint code option for some reason?)

In thermodynamics, **working substance** is the term used by French physicist Sadi Carnot in 1824 to define any generalized body, such as a body of water, a metallic bar, an aeriform fluid, etc., that may be configured to do work when put in alternating contact with hot and cold bodies able to supply or absorb heat. [1] In 1850, building on the work of Carnot, German physicist Rudolf Clausius rephrased this concept using the term "working body" [2] Carnot's original diagram of this "working substance" is pictured adjacent with the hot body A, the cold body B, and the working substance contained within the cylinder and the adjustable piston.

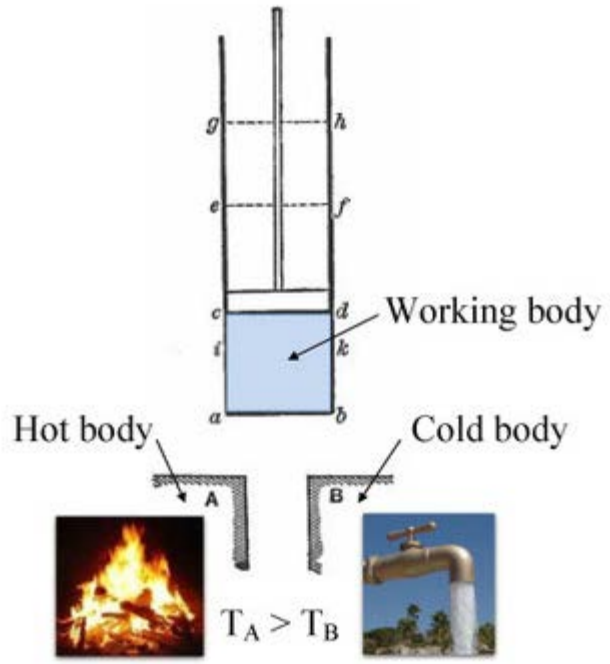

Carnot engine diagram showing the **working substance** (working body) under inside of the piston and cylinder.

Overview

In opening pages of his 1824 memoir, Carnot outlines the view that: "the phenomenon of the production of motion by heat has not been considered from a sufficiently general point of view". He continues, "we have considered it only in machines the nature and mode of action of which have not allowed us to take in the whole extent of application of which it is possible." More to the point "in such machines the phenomenon is, in a way, incomplete. It becomes difficult to recognize its principles and study its laws." Also, "in order to consider in the most general way the principle of the production of motion by heat", Carnot states, "it must be considered independently of any mechanism or any particular agent." Specifically:

> "It is necessary to establish principles applicable not only to steam-engines but to all imaginable heat-engines, whatever the ***working substance*** and whatever the method by which it is operated"

In an endnote to this comment, Carnot details that "we distinguish here the steam-engine from the heat engine in general … the latter may make use of any agent whatever, of the vapor of water or of any other, to develop the motive power of heat." In more detail, regarding this any-type-of-substance proposal, Carnot points out that:

> "Wherever there exists a difference of temperature, wherever it has been possible for the equilibrium of the caloric to be re-established, it is possible to have also the production of impelling power. Steam is a means of realizing this power, but it is not the only one. All substances in nature can be employed for this purpose, all are susceptible of change of volume, of successive contradictions and dilations, through the alternation of heat and cold."

Here we see the core of the extrapolation of the science of thermodynamics to systems of working bodies on the earth, being alternatively (diurnally) put in contact with a hot body (the day sun) and a cold body (the cool night sky), thus being modified by "successive contradictions and dilations, through the alternation of heat and cold". Indeed, such a terminology, i.e. "working medium", was used by Russian bioelectrochemist Octavian Ksenzhek in 2007. [3]

Carnot continues, "a solid body—a metallic bar for example—alternately heated and cooled increases and diminishes in length, and can move bodies fastened to its ends. A liquid alternatively heated and cooled increases and diminishes in volume, and can overcome obstacles of greater or less size, opposed to its dilatation."

To give some examples, Carnot states "an aeriform fluid is susceptible of considerable change of volume by variations of temperature. If it is enclosed in an expansible space, such as a cylinder provided with a piston, it will produce

movements of great extent. Vapors of all substances capable of passing into gaseous condition, as of alcohol, of mercury, of sulphur, etc., may fulfill the same office as a vapor of water. The latter, alternately heated and cooled, would produce motive power in the shape of permanent gases, that is, without ever returning to a liquid state. Most of these substances have been proposed, many have even been tried, although up to this time perhaps without remarkable success."

To give a visual picture of the relation between the hot body, cold body, and working substance, he states: "to heat any substance whatever requires a body warmer than the one to be heated; to cool it requires a cooler body. We supply caloric to the first of these bodies that we may transmit to the second by means of the *intermediary substance*."

Animate thermodynamics

In 1921, English biologist James Johnstone used the Carnot heat engine model in attempts to to explain animal and plant life in thermodynamic terms, but incorrectly defined the food as the "working substance" of the animal or "animate engine" as he called it, stating that the energy content of one's daily diet, about 3,500 calories of protein, carbohydrates, and fat, loose their free energy or available energy as it passes through the body. [4] In his own words:

> "We have to consider the further history of the working substance of life after it has undergone the chemical and energetic degradations that are the result of animal and bacterial metabolism. Returning to our inanimate engine, it may be recalled that the working substance, or steam, expands and does mechanical work on the pistons, and actuates the mechanism. Then it passes through the condenser, having lost its available energy. It is returned to the boiler and is heated, and so takes up fresh available energy, and the cycle of operations recommences."

This entire description, however, is incorrect, based on a pure misunderstanding of the action of the working substance. For one, in the Papin-Carnot heat engine model, the steam never leaves the confines of the piston and cylinder volume, it is only put into contact with a hot body, then a cold body, thus completing one cycle; the body of the water does not pass through the condenser as Johnstone envisions, but rather heat passes into the body of the condenser. In any event, he continues:

> "We take the same general view of the animate engine. The working substance, which is a mixture of fats, proteins, and carbohydrates, passes through the animal body, undergoing chemical transformations, doing mechanical work, and (possibly) heating the body. Then it passes out from the body as the excretions, having lost most of its available energy, and is further acted upon by bacteria, when it loses the remainder. It must be transformed so as to reacquire available energy, just as the cold water entering the steam boiler again takes up energy in the form of heat."

This last paragraph is completely a mess, confusing the internal energy for available energy, among numerous other issues.

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4. Johnstone, James. (1921). *The Mechanism of Life in Relation to Modern Physical Theory* (pgs. 56-77, 81). Longmans, Green & Co.

Further reading

â— Emswiler, John E. (1921). *Thermodynamics* (ch. 3: Working Substance, pgs. 8-12). McGraw-Hill.

θΔics

In genius studies, **WorldCat 100** refers to the top 100 identities in WorldCat library holdings.

Overview

The following are the top 43 literary authors of all time, ranked by "world library holdings", according to 2011 WorldCat Identities library rankings, as culled from the top 100 identities (shown adjacent) of the worlds libraries, non-literary (e.g. Harold Bloom) or fictional authors (e.g. Jesus Christ, Mary, etc.) removed:

#	Person	IQ	Description
1.	William Shakespeare (1564-1616)	IQ:**190**|#48	**Total:** 72,727 works in 218,591 publications in 156 languages and **5,252,605 library holdings**. **Top:** *Hamlet* (in 77 languages and held by 8,026 libraries worldwide).
2.	Johann Goethe (1749-1832)	IQ:**225**|#1	**Total:** 46,208 works in 115,053 publications in 97 languages and **937,127 library holdings**. **Top:** *Faust* (in 69 languages and held by 5,993 libraries worldwide).
3.	Charles Dickens (1812-1870)	IQ:**165**|#301	**Total:** 17,987 works in 65,580 publications in 99 languages and **964,113 library holdings**. **Top:** *Great Expectations* (in 37 languages and held by 8,235 libraries worldwide).
4.	Mark Twain (1835-1910)	IQ:**170**#275	**Total:** 10,144 works in 32,424 publications in 85 languages and **922,432 library holdings**. **Top:** *The Adventures of Huckleberry Finn* (in 60 languages and held by 9,056 libraries worldwide).
5.	Henry James (1843-1916)		**Total:** 5,323 works in 16,327 publications in 48 languages and **661,944 library holdings.** **Top:** *The Portrait of a Lady* (in 22 languages and held by 5,821 libraries worldwide).
6.	John Milton (1608-1674)	IQ:**180**|#114	**Total:** 7,701 works in 25,201 publications in 58 languages and **655,700 library holdings**. **Top:** *Paradise Lost* (in 41 languages and held by 5,978 libraries worldwide).
7.	Geoffrey Chaucer (c.1343-1400)		**Total:** 6,519 works in 18,758 publications in 47 languages and **623,468 library holdings**. **Top:** *The Canterbury Tales* (in 36 languages and held by 7,354 libraries worldwide).
8.	William Faulkner (1897-1962)		**Total:** 6,687 works in 14,323 publications in 58 languages and **569,066 library holdings**. **Top:** *The Sound and Fury* (in 35 languages and held by 6,085 libraries worldwide).
9.	Jane Austen (1775-1817)		**Total:** 3,522 works in 14,880 publications in 51 languages and **562,500 library holdings**. **Top:** *Pride and Prejudice* (in 41 languages and held by 8,575 libraries worldwide). Note: her *Sense and Sensibility* takes a 'quietism' approach to the problems of skepticism and the reliability of sense perception, arguing that they arise only by misconstruing ordinary language, not because there is anything genuinely wrong with our empirical knowledge.
10.	Dante Alighieri (1265-1321)	IQ:**175**|#206	**Total:** 17,860 works in 43,787 publications in 83 languages and **550,811 library holding**. **Top:** *The Divine Comedy* (in 64 languages and held by 7,072 libraries

			worldwide).
11.	Ernest Hemingway (1899-1961)	IQ:**170**|#408	**Total:** 5,764 works in 16,770 publications in 81 languages and 539,291 library holding. **Top:** *The Old Man and the Sea* (in 63 languages and held by 6,894 libraries worldwide).
12.	James Joyce (1882-1941)		**Total:** 5,403 works in 12,967 publications in 57 languages and 531,502 library holding. **Top:** *A Portrait of the Artist as a Young Man* (in 37 languages and held by 6,168 libraries worldwide).
13.	Agatha Christie (1890-1976)		**Total:** 6,989 works in 32,248 publications in 65 languages and 521,124 library holding. **Top:** *And Then There Were None* (in 36 languages and held by 4,409 libraries worldwide).
14.	Edgar Poe (1809-1849)	IQ:**175**|#190	**Total:** 10,553 works in 24,502 publications in 73 languages and 508,183 library holding. **Top:** *Tales of Mystery and Imagination* (in 13 languages and held by 3,678 libraries worldwide).
15.	Homer (c.800BC)	IQ:**175**|#208	**Total:** 14,430 works in 46,240 publications in 90 languages and 496,740 library holdings. **Top:** *The Odyssey* (in 68 languages and held by 8,406 libraries worldwide).
16.	William Yeats (1865-1939)		**Total:** 6,464 works in 13,907 publications in 43 languages and 465,402 library holding. **Top:** *The Collected Poems of W.B. Yeats* (in English and Undetermined and held by 3,109 libraries worldwide).
17.	Walt Whitman (1819-1892)		**Total:** 6,920 works in 13,971 publications in 60 languages and 462,939 library holding. **Top:** *Leaves of Grass* (in 42 languages and held by 6,543 libraries worldwide).
18.	David Lawrence (1885-1930)		Total: 5,786 works in 17,048 publications in 58 languages and 452,177 library holding.
19.	Isaac Asimov (1920-1992)	IQ:**170**|#250	**Total:** 4,168 works in 11,590 publications in 51 languages and 447,995 library holding. **Top:** *Foundation* (in 22 languages and held by 4,395 libraries worldwide).
20.	Thomas Hardy (1840-1928)		**Total:** 5,282 works in 15,875 publications in 54 languages and 441,209 library holding. **Top:** *Tess of the d'Urbervilles* (in 33 languages and held by 7,047 libraries worldwide).
21.	Clive Lewis (1898-1936)		Total: 2,986 works in 11,582 publications in 50 languages and 440,640 library holding. Top: *The Lion, the Witch, and the Wardrobe* (in 37 languages and held by 6,610 libraries worldwide).
22.	Nathaniel Hawthorne (1804-1864)		**Total:** 4,748 works in 14,430 publications in 56 languages and 440,205 library holding. **Top:** *The Scarlet Letter* (in 32 languages and held by 8,271 libraries worldwide).
23.	Virginia Woolf (1882-1941)	IQ:160|#515	Total: 4,267 works in 12,385 publications in 45 languages and 434,446 library holding.

24.	Leo Tolstoy (1828-1910)	IQ:**180**|#106	**Total:** 17,086 works in 42,014 publications in 115 languages and 424,069 library holding. **Top:** *Anna Karenina* (in 50 languages and held by 7,749 libraries worldwide).
25.	Thomas Eliot (1888-1965)		**Total:** 5,840 works in 13,494 publications in 63 languages and 420,775 library holding. **Top:** *Murder in the Cathedral* (in 25 languages and held by 4,006 libraries worldwide).
26.	Joseph Conrad (1857-1924)		Total: 4,254 works in 14,760 publications in 46 languages and 439,188 library holding.
27.	Robert Stevenson (1850-1894)		**Total:** 6,601 works in 25,805 publications in 88 languages and 421,705 library holding. **Top:** *Treasure Island* (in 62 languages and held by 8,534 libraries worldwide).
28.	Bernard Shaw (1856-1950)	IQ:**180**|#160	Total: 10,885 works in 25,057 publications in 62 languages and 417,358 library holding.
29.	William Wordsworth (1770-1850)	IQ:**165**|#306	Total: 5,976 works in 13,205 publications in 32 languages and 407,344 library holding.
30.	Fyodor Dostoyevsky (1821-1881)	IQ:**180**|#121	Total: 9,455 works in 25,680 publications in 73 languages and 403,097 library holding.
31.	Herman Melville (1819-1891)		**Total:** 4,337 works in 11,308 publications in 58 languages and 402,499 library holding. **Top:** *Moby Dick* (in 52 languages and held by 8,565 libraries worldwide).
32.	Arthur Doyle (1859-1930)		**Total:** 12,652 works in 31,496 publications in 91 languages and 402,162 library holding. **Top:** *The Adventures of Sherlock Holmes* (in 42 languages and held by 6,447 libraries worldwide).
33.	Voltaire (1694-1778)	IQ:**195**|#18	**Total:** 21,973 works in 52,487 publications in 73 languages and 344,468 library holding. **Top:** *Candide* (in 45 languages and held by 6,012 libraries worldwide).
34.	Honore Balzac (1799-1850)	IQ:**175**|#233	**Total:** 9,758 works in 32,500 publications in 66 languages and 339,511 library holding. **Top:** *Pere Goriot* (in 35 languages and held by 5,149 libraries worldwide).
35.	Rudyard Kipling (1865-1936)		**Total:** 6,416 works in 22,787 publications in 75 languages and 366,153 library holdings. **Top:** *The Jungle Book* (in 49 languages and held by 6,332 libraries worldwide).
36.	Walter Scott (1771-1832)		**Total:** 17,286 works in 48,077 publications in 74 languages and 324,680 library holding. **Top:** *Ivanhoe* (in 50 languages and held by 6,820 libraries worldwide).
37.	Jacob Grimm (1785-1863)	IQ:**160**|#379	**Total:** 16,105 works in 36,241 publications in 114 languages and 324,307 library holding. **Top:** *Grimm's Fairy Tales* (in 41 languages and held by 6,397 libraries worldwide).

38.	Virgil (70-15BC)		**Total:** 13,663 works in 39,929 publications in 61 languages and 313,005 library holding. **Top:** *The Aeneid* (in 45 languages and held by 6,435 libraries worldwide).
39.	Friedrich Schiller (1759-1805)	IQ:**185**|#69	**Total:** 14,096 works in 38,298 publications in 71 languages and 298,000 library holdings. **Top:** *Wilhelm Tell* (in 52 languages and held by 2,918 libraries worldwide).
40.	Cervantes Saavedra (1547-1616)		**Total:** 7,569 works in 27,759 publications in 81 languages and 293,399 library holding. **Top:** *Don Quixote* (in 75 languages and held by 7,632 libraries worldwide).
41.	Victor Hugo (1802-1885)		Total: 9,922 works in 30,004 publications in 78 languages and 273,031 library holdings
42.	Alexander Pushkin (1799-1837)		**Total:** 11,289 works in 25,193 publications in 103 languages and 249,204 library holding. **Top:** *Eugene Onegin: a Novel in Verse* (in 40 languages and held by 2,887 libraries worldwide).
43.	Moliere (1622-1673)	IQ:**160**|#370	Total: 10,521 works in 32,452 publications in 88 languages and 244,282 library holding.
44.	Alexandre Dumas (1802-1870)		Total: 10,047 works in 35,002 publications in 80 languages and 186,427 library holding.

(add)

External links

â— WorldCat Identities – Home.

θΔics

In hmolscience, **worthless application** is a view that that the application of the physics, chemistry, and or thermodynamics to the study of questions of human existence is worthless endeavor, useless application, or waste of time.

Overview

To put the subject of the question of the application of three main physical sciences to human existence in context, of the eleven known people to have had IQs estimated in the 225+ range, this is the only intellectual puzzle worked on, independently, by four or more of this group. The same question was worked by Goethe, Sidis, Einstein, and Hirata (and Newton previous to them) and generally serves as the litmus test to true genius.

German polymath Johann Goethe (IQ=180-225) considered his solution to this problem (which he spent over 50 years on) to be his "best publication"; and American mathematical physicist William Sidis (IQ=250-300) who wrote his solution while in an insane asylum, was the only publication he was confident enough to use his own name (compared to pen names used in all his other publications); while Isaac Newton (IQ=190-200) commented he only "wished he could find the solution"; and Christopher Hirata (IQ=225) considered it to be a "worthless application", but nevertheless, worked out part of the solution; while the great Albert Einstein (IQ=160-225) could only comment "how on earth are you ever going to be able to explain this in terms of chemistry and physics?". To put the matter frankly, in 1910, Harvard historian Henry Adams gave his opinion that solution to the problem would "require the aid of another Newton." Or as commented in 1971 by Romanian mathematician Nicholas Georgescu-Roegen (who spent several decades on the problem) “manifold avenues open up almost as soon as one begins to work on the problem.”

In more detail, in introducing his 2000 article “The Physics of Relationships”, American astrophysicist Christopher Hirata commented that his entire article was a fun, but, in a general meaning, a:

> “Compilation of **worthless applications** of physics and mathematics to relationships.”

In 2005, a retired geologist and high school science teacher, going by the Wikipedia user name of VSmith, commented to American electrochemical engineer Libb Thims that the idea of modelling humans as human molecules and relationships and interactions as pure chemical reactions, was in his view:

> “Good for a laugh, but not much else.”

This last seed comment, to note was one of the driving forces that irritatively pushed out the writing of the first-ever textbook on human chemistry (2007) and followup historical booklet on the subject of the human molecule (2008). [2]

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(c) Thims, Libb. (2008). *The Human Molecule* (issuu) (preview) (Google Books) (docstoc). LuLu.

θΔics

In Nietzsche fragments, **WP:1067** is the last and final mental fragment composed by Friedrich Nietzsche, penned in 1885, as found in his posthumously published *The Will To Power*, wherein he attempts to interconnect the physics-based concepts of force, energy, power, cold, hot, light, space, waves, boundary, transformation, time, iron, and void, with the human-centric concepts of: will, play, good, evil, self-, and the Greek god Dionysus (the Greek rescript of Osiris), via the term "Dionysian", meaning sensual, spontaneous, and emotion. [N1]

Overview

The following is Nietzsche's 1885 will to power fragment #1067:

> "And do you know what 'the world' is to me? Shall I show it to you in my mirror? This world: a **monster of energy**, without beginning, without end; a firm, iron magnitude of force that does not grow bigger or smaller, that does not expend itself but only transforms itself; as a whole, of unalterable size, a household without expenses or losses, but likewise without increase or income; enclosed by "nothingness" as by a boundary; not something blurry or wasted, not something endlessly extended, but set in a definite space as a definite force, and not a sphere that might be "empty" here or there, but rather as force throughout, as a play of forces and waves of forces, at the same time one and many, increasing here and at the same time decreasing there; a sea of forces flowing and rushing together, eternally changing, eternally flooding back, with tremendous years of recurrence, with an ebb and a flood of its forms; out of the simplest forms striving toward the most complex, out of the stillest, most rigid, coldest forms toward the hottest, most turbulent, most self-contradictory, and then again returning home to the simple out, of this abundance, out of the play of contradictions back to the joy of, concord, still affirming itself in this uniformity of its courses and, its years, blessing itself as that which must return eternally, as a, becoming that knows no satiety, no disgust, no weariness: this, my, Dionysian world of the eternally self-creating, the eternally self-destroying, this mystery world of the twofold voluptuous delight, my "beyond good and evil," without goal, unless the joy of the circle is itself a goal; without will, unless a ring feels good will toward itself—do you want a name for this world? A solution for all its riddles? A light for you, too, you best-concealed, strongest, most intrepid, most midnightly men?—This world is the will to power—and nothing besides! And you yourselves are also this will to power—and nothing besides!"

(add discussion)

Beg analysis

The the following is a Beg analysis of the key terms used in WP:1067 (1885); numbers show being times term was employed:

World (6)	Notes
Force (6) **Energy** (1) **Power** (2)	Di·o·ny·sian *adjective* 1. GREEK MYTHOLOGY of or relating to the god Dionysus. 2. of or relating to the sensual, spontaneous, and emotional aspects of human nature. "dark, grand Dionysian music"
will (4); will to power (1)	Compare: Maxwellian will (1879) (Ñº)
coldest (1); hottest (1); light (1)	See: heat; cold; hot or not; hot war; cold war; thermal word, hot sex vs cold sex, etc. [6]

	Compare: human chemical thermodynamics
play (2); waves (1); time (2)	Compare: Adams creed (1863); Dirac dancing anecdote (1929) Compare: Lewis time (1930) (Ñº) See: Rise and fall of civilization
transformation (1); no beginning (1); no end (1); change	Compare: Heraclitus
good (2); evil (1)	See: problem of evil solution (2011) [5]
boundary (1); space (1); iron (1),	See: spacetime
self- (9);	See: self-motion (i.e. perpetual motion); e.g. Christopher Langan (2002)
Dionysian (1)	Compare: sensual (sex), spontaneity, emotion; see: Dionysus See: Mangnall's Abstract of Heathen mythology (1789)
nothingness (1); empty (1)	See: void/vacuum; Compare: Otto Guericke; Parmenides vs Heraclitus

Nietzsche, in other words, was beginning to glean a world based on force, energy, and power.

Notes

N1. "The fragments are consequently ordered not chronologically (which, with a time span of six years, is serious) but instead according to systematic, categorizing of keywords." [1]

References

1. Montinari, Mazzino. (2003). *Reading Nietzsche* (pg. 16). University of Illinois Press.

θΔics

In terminology, **wrong**, as compared to right, is []

Coupling

The following shows the appeal to nature model of coupled natural ethics:

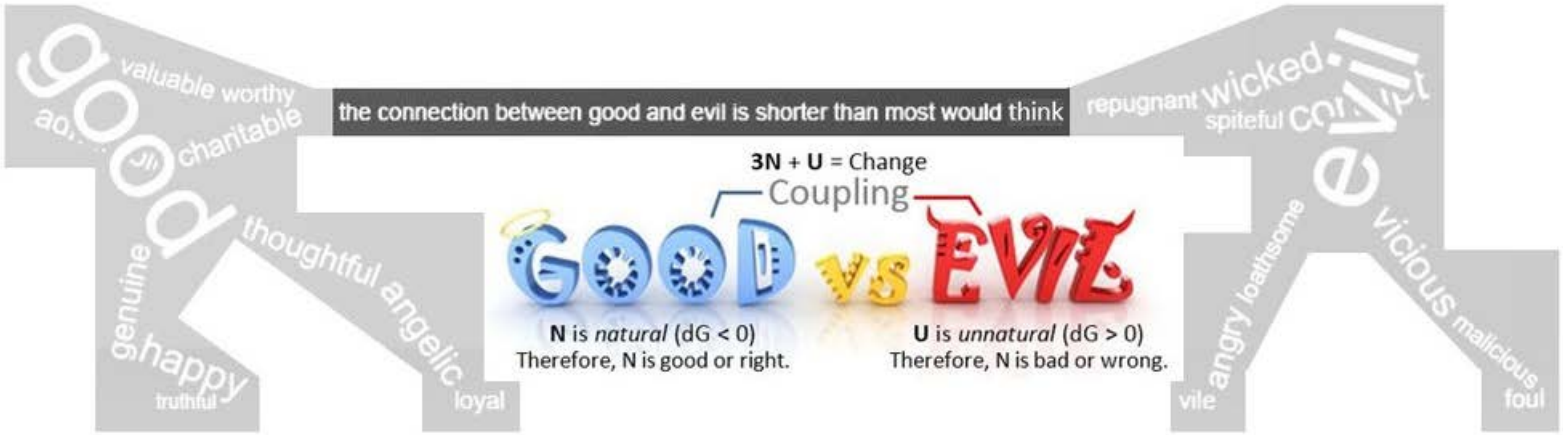

(add discussion)

Quotes

The following are related quotes:

> "Red skies at night, sailor's delight; red skies in the morn, sailors take warn."
>
> — Anon (c.1000), cited by Shakespeare among others as a useful truism, within limits (O)

> "You **wrong** me and the book. The principle illustrated in the book is true and not immoral. But you must regard it from a broader point of view and understand that the conventional moral norms can turn into sheer immorality when applied to situations of this character."
>
> — Johann Goethe (1809), "best book" incident, late Dec

> "They cut the man into two parts, soul and body, the philosopher took one, and another naturalist, they both have worked, studied on their behalf have lost sight and we find ourselves today in the presence of a duality, convenient perhaps, but unwise, in that it overlooked the man to deal with only two elements that constitute it. But in doing so we run the risk of being **wrong**. If one wanted to know the chemical properties of water H_20, seek it in those of oxygen O_2 and hydrogen H_2? No, because he knows that there is little relationship between the characteristics of a substance and those of simple bodies which enter into its composition. To study humans, it is perhaps even more reserve, his corpse is certainly different from his living, his soul is a being whose morality tells us in existence, but whose philosophy can boast of acquire specific knowledge, since it can be studied in a free state, the revelation can only speak in this regard. But what science and philosophy can and should perhaps only study, is a man indivisible and tangible for us, where the angel and the beast are inseparable, which has a body and ailments, but also passions and faculties, such as intelligence, memory and reason."
>
> — Francois Massieu (c.1869)

> "Before Clausius, truth and error were in a confusing state of mixture, and **wrong** answers were confidently urged by the highest authorities."
>
> — Willard Gibbs (1889), "Rudolf Julius Emanuel Clausius" [1]

> "Who can be trusted to tell me whether my technical terms are all **wrong**?"
>
> — Henry Adams (1909), said to brother Brooks, while looking for reviewer for "The Rule of Phase Applied to History"

> "I was a high school science teacher for 15 years. I had become a Christian at age 16, and right away ran into the conflict between what I

was taught in my science textbook and what I'm reading in the Bible, so I knew somebody was **wrong**."

— Kent Hoven (2000), Coast-to-Coast AM interview, Aug 2 (Q)

"The chiral lad says, 'Though I do fancy her, / I can't bind; she the **wrong** enantiomer'."

— Mala Radhakrishnan (2013), Atomic Romances tweet, four re-tweets, to stars (top 5 tweet), Apr 9

"South of the equator, e.g. Australia, it's 'right'—legislated by law—to drive on the left-hand side of the road; north of the equator, e.g. New York, it's '**wrong**'—legislated by law—to drive on the left-hand side of the road."

— Libb Thims (2015), Crocodile Dundee morality model, Jul 27

References

1. (a) Gibbs, Willard. (1889). "Rudolf Julius Emanuel Clausius" (pg. 459), *Daedalus: Journal of the American Academy of Arts and Sciences*¸16:458-65.
(b) Garrison, Fielding H. (1909). "Josiah Willard Gibbs and his Relation to Modern Science, Parts I-IV" (pdf) (§1: 475), *Popular Science Monthly*, Part I: 74(27):470-84, May; Part II: 74:551-61, Jun; Part III: 75:41-48, Jul; Part IV: 75:191-203, Aug.

Further reading

● Lewis, C.S. (1942). "Right and Wrong as a Clue to the Meaning of the Universe", in: *Mere Christianity*. Publisher.

Videos

The following are related videos:

● What's wrong with star dust oppressing star dust? (2012) | Riptime @ 2:21 (Q)

External links

● Wrong (redirect to wrongdoing) – Wikipedia.

θΔics

In human chemistry, **Xavier Duran** (1959-) is a Spanish chemist and journalist noted for his 2012 article "Goethe and the Affinity between Chemistry and Literature: Molecules and Divorce in a Romantic Novel", in which he discusses how German polymath Johann Goethe used affinity chemistry theory to show humans' limited ability to cope with a fate that seems relentlessly set by inescapable laws.

Duran cites the larger 2006 article "Goethe's *Elective Affinities:* between Science and Literature" by French chemistry historian Bernard Joly, who in turn cites Walter Benjamin and his 1922 large essay on the novel. [3]

Overview

The article contains a rather cogent synopsis of the Isaac Newton's subject-launching contribution to affinity chemistry: [1]

> "Newton, who had already come up with an explanation for the attraction of bodies, went on to propose that the laws of gravitational attraction and of magnetism and electricity could be extended to the union and separation of substance and gave examples of the reactions between alkalis and acids. In the only article he published on chemistry—written in 1692 but published in 1710—and issues 31 and 32 of Optics, he proposed the existence of a very powerful force between the particles of substances, which varied from one species to another. He even put forward a short list of six metals ordered by priority on replacing one another when dissolved in nitric acid."

On the affinity theory work of Claude Berthollet, about whom Goethe admitted struggling with for decades (26 Sep 1826), Duran summarizes:

> "In 1803, Claude Louis Berthollet said that factors such as concentration, temperature or pressure affect affinity. He said that explained why attempts had failed to find laws and well-established quantitative relations, which would provide the foundations of chemical reactions as predictive as Newton's laws that could predict the movement of the stars."

On the novel, Duran gives the following cogent synopsis:

> "Sometimes the novel has been outlined as follows:
>
> $$AB + CD \rightarrow AD + BC$$
>
> Albeit CD fails to occur here, a couple comprising the Captain and Ottilie never exists. But the fact is that if we analyze the nature of each character, the reaction was inevitable. Edward is immature, self-centered and temperamental. Ottilie is a very young girl, frail and inexperienced. Charlotte is rational and farsighted. The Captain is also rational, but he is also clever, honest and resolute. If elective affinity works, then no other reaction is possible. Edward is bound to be attracted to Ottilie and Charlotte and the Captain must end up together. It is even impossible, when the Captain and Edward go off to war, that new suitors may have a chance with Ottilie or Charlotte: there is no affinity.
>
> Thus it highlights the inevitable way in which things work, a sort of social mechanism that works like a set of gears and constitutes an inevitable fate. It is clear that characters can rebel, but in the end what counts is the natural law, as happens with objects and substances alike. That does not retract from the fact that the

novel is clearly romantic and that the ending is tragic."

(add discussion)

Education

Duran completed a BA in chemistry and a PhD in communication sciences at the Autonomous University of Barcelona. Duran has published several books, from novels to popular science essays. He is currently the editor of the TV3 programme El Medi Ambient. In 1991 he won the Joan Fuster Prize of essay. His latest book is the 2011 *Molecules in Action: from the Big Bang to Materials of the Future*, shows how chemistry can help to understand things such as reactions occurring in organisms or some of the greatest challenges of technology. In an accessible language and entertaining tone, this book provides an overview of chemistry, including its dark side, in order to view this science from a new perspective. [2]

References

1. Duran, Xavier. (2012). "Goethe and the Affinity between Chemistry and Literature: Molecules and Divorce in a Romantic Novel", Mètode, Annual Review.
2. Publications & Reports – UAB.es.
3. Joly, Bernard. (2006). "Les *Affinities elective* de Goethe: entre science et literature" (French) (English), Methodos, 6.

θΔics

In existographies, **Xenocrates** (396-314BC) (ACR:30) (CR:5) was a Greek philosopher and mathematician, student of Plato, associate of Aristotle, head of the Platonic Academy from c.338 to 313BC, purported teacher of Epicurus, noted for []

Overview

Xenocrates believed that matter is composed of individual units, according to which some attribute him as being an early proponent of atomic theory, in some sense. He also believed in humans having threefold existence, mind, body and soul; also that people die twice, once on earth, then for a second time on the moon when the mind separates from the soul and travels to the sun. (Ñº)

Quotes | On

The following are quotes on Xenocrates:

> "Apollodorus in his *Chronology* tells us that our philosopher was a pupil of Nausiphanes and Praxiphanes; but in his letter to Eurylochus, Epicurus himself denies it and says that he was self-taught. Both Epicurus and Hermarchus deny the very existence of Leucippus the philosopher, though by some and by Apollodorus the Epicurean he is said to have been the teacher of Democritus. Demetrius the Magnesian affirms that Epicurus also attended the lectures of **Xenocrates**."
>
> — Diogenes Laertius (c.230), *Lives and Opinions of Eminent Philosophers* (§10.12)

External links

â— Xenocrates – Wikipedia.

θΔics

In existographies, **Xenophanes** (c.560-475BC) (IQ:175|#230) (FA:4) (EvT:3|21+) (ACR:19) (CR:29) was a Greek philosopher, anti-theist, and evolutionist, noted for []

Religion | Morality

Xenophanes was a critic of Greek god-based morality; for example: [2]

> "Homer and Hesiod have attributed to the gods all sorts of things that are matters of reproach and censure among men: theft, adultery, and mutual deception, as they sang of numerous illicit divine deeds: theft, adultery, and mutual deceit."

He, supposedly, advocated some type of proto-monotheism.

Horses | Anthropomorphism

The famous atheism quote "if horses could draw" quote, supposedly, originated with in the fragments of Xenophanes:

> "If horses and oxen had hands and could draw pictures, their gods would look remarkably like horses and oxen."
>
> — Xenophanes (c.510BC), in fragment [B15] [2]

> "Montaigne says 'Man is not able to be other than he is, nor imagine but after his capacity; let him take what pains he may, he will never have a knowledge of any soul but his own.' **Xenophanes** said, 'If the ox or the elephant understood either sculpture or painting, they would not fail to represent the divinity under their own peculiar figure; that in this, they would have as much reason as Polyclitus or Phidias, who gave him the human form.' It was said to a very celebrated man that 'god made man after his own image'; 'Man has returned the compliment', replied the philosopher; and L'amotte le Vayer used to remark, that 'theanthropy (Q) was the foundation of every system of Christianity'."
>
> — Baron d'Holbach (1770), *The System of Nature* (pg. 181)

> "If cattle and horses and lions had hands they would depict gods like cattle and horses.
>
> — Xenophanes (c.510BC) version according Patrick Walsh (1997) [3]

> "If horses could draw, god would have four limbs and run very fast."
>
> — Empedocles (c.450), either mis-attributed aphorism or re-statement (Q)

Latin scholar Patrick Walsh (1997) says the statement comes from Xenophanes and that he is best known for attacking anthropomorphism with this technique.

God

In 45BC, Cicero, in his *On the Nature of the Gods*, summarized Xenophanes view of god as follows: [3]

> "**Xenophanes** argued that the whole world had a 'mind' attached to it,

> and was god because it was ‘unbounded’. On this concept of mind as god, he will be subject to the same censure as his predecessors; on god’s infinity, the criticism will be even more severe, for what is infinite can have neither sensation nor connect with anything outside itself.”

In 1997, Patrick Walsh, in footnote commentary on Cicero’s view of Xenophanes, he states: [3]

> “**Xenophanes** posits, instead [of anthropomorphized gods], a single god ‘greatest among gods and men, not like men in form and thought, remaining motionless in the same place, shaking all things by the thought of his mind’.”

(add)

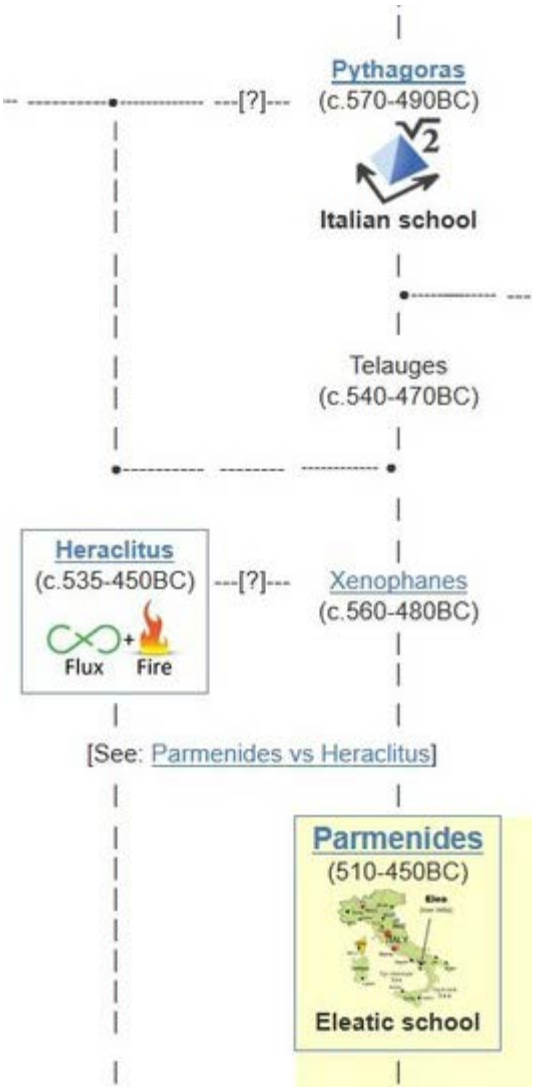

The location of **Xenophanes** in the Greek philosophy genealogy intellectual tree; generally being a Anaximander, Pythagoras, and product of Telagues, with possible association with Heraclitus.

Evolution

Xenophanes taught that all organisms originate from earth and mud. [1] He observed fossil fishes and shells, and concluded that the land where they were found had been underwater at some time; he taught that the world formed from the condensation of water and ‘primordial mud’, and was the first person known, supposedly, to have used fossils as evidence for a theory of the history of the earth. (Q)

Education

Xenophanes was a disciple of Anaximander (Q) and also, supposedly, of the lineage of Pythagoras or the Pythagorean school.

Quotes | By

The following are quotes by Xenophanes:

> “It takes a wise man to recognize a wise man.”
>
> — Xenophanes (c.475), comment (Q) made, according to Laertius (c.230), to Empedocles who remarked: “it is impossible to find a wise man!” (see: genius recognizes genius)

References

1. Oparin, Alexander. (1936). *The Origin of Life* (introduction and translation: Serguis Morgulis) (pg. 6). Dover, 1965.
2. (a) Hecht, Jennifer M. (2003). *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas* (pg. 4; horses, pg. 7). HarperOne.
(b) Kirk G.S., Raven, J.E., and Schofield, M. (1957). *The Presocratic Philosophers* (pgs. 168-69). Cambridge University Press.

(c) Xenophanes – Stanford Encyclopedia of Philosophy.
3. Cicero. (45BC). *The Nature of the Gods* (Introduction, translation, and notes: Patrick Walsh) (pgs. 13, 153). Oxford University Press, 1998.

Further reading

● Xenophanes (c.485BC). *Xenophanes of Colophon: Fragments: a Text and Translation with a Commentary* (editor: James Lesher) (Empedocles, 5+ pgs). Publisher.

External links

● Xenophanes – Wikipedia.

θΔics

In economic thermodynamics, **Xenophon Zolotas** (1904-2004) was a Greek social economist who in 1981, building on the work of Nicholas Georgescu (1971), argued that the law of entropy, i.e. the second law of thermodynamics, has a functional relationship to economic growth. [1] In 2005, Greek theorist Dimitris Keranis used Zolotas' function to argue that the work produced in social system is quantified by both the Gibbs free energy function and in economic terms by Zolotas' function. [2]

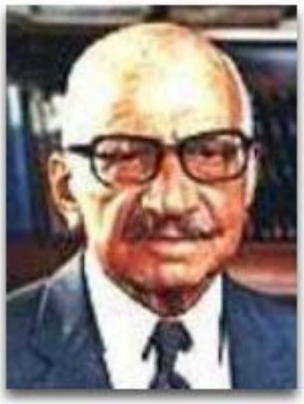

Zolotas' function

In his 1981 book *Economic Growth and Declining Social Welfare*, Zolotas on the thermoeconomic theories of Romanian mathematician Nicholas Georgescu-Roegen who previously in his 1971 *The Entropy Law and the Economic Process* had laid out the view that the amount of energy bound within a closed system continuously increases; where, as a result, there is a gradual shift from low entropy (large free energy) to high entropy (large bound energy). The thermodynamic balance of such a system, according to Zolotas, is restored when "all the free energy is converted to bound energy." The effects of the law of entropy in relation to economic growth, according to Zolotas, "can best be understood if the world ecosystem is conceived as a closed system, in which one of the links is human economic activity."

Education

Zolotas was prime minister of Greece in the late 1980's, who as one of Greece's leading economists, helped lead the revival of Greece's shattered economy after World War II. He was one of the four leading international economists entrusted with the shaping of the Organization for Economic Development and Cooperation (OECD) in 1960 and served as a caretaker prime minister of that country in 1989 and 1990. [3]

References

1. (a) Zolotas, Xenophon. (1981). *Economic Growth and Social Welfare* (pgs. 56-57, 120-21). New York University Press.
(b) Thims, Libb. (2007). *Human Chemistry (Volume Two)*, (preview), (pgs. 452-455). Morrisville, NC: LuLu.
2. Dimitris, Keranis, N. (2005). "Human Values and the 2nd Law of Thermodynamics". Athens University.
3. Xenophon Zolotas - Life in Legacy, week of June 12, 2004.

External links

â— Xenophon Zolotas – Wikipedia.

θΔics

In religio-mythology, **Yahweh**, Jahve, Jehovah, or JHWH, period of worship: c.1200BC to present, the god of the J source of the Old Testament, as compared to the Elohim (or El), period of worship: c.2500BC to 700BC, a northern tribe god, the god of the E source, is a southern tribe god, originally an Arabian volcano god (Freud, 1939), note for being the conceptual belief system backbone of the author of the so-called "J source" of the Old Testament of the Bible.

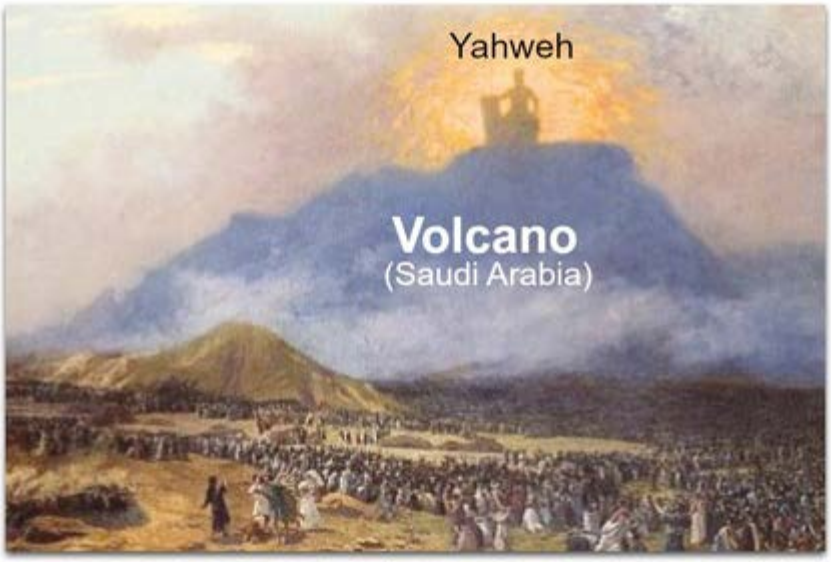

An rendition of **Yahweh** as originally a volcano god of one of the c.1300 active volcanoes, e.g. Mount Bedr, of the Saudi Arabia peninsula. [4]

Translations

The early term "JHWH" was first translated as Jahve or Yahweh; in 1200-1300AD, the term Jehovah began to be used; in 1600, in English, the term began to be rendered as "Lord".

Overview

In 1939, Sigmund Freud, in his *Moses and Monotheism*, asserted that in the Old Testament four main gods were in competition for reigning power of the newly being formed religion, namely: Ra the sun god of Heliopolis, Aten (or Adonai, as Freud renders it), the sun god of Akhenaten, which Freud translates as "Adonai", El the Canaanite mountain god, and Yahweh (or Jahve, as Freud renders it), which he described as a volcano god. Freud describes Jahve as follows: [1]

> "These modern historians, well represented by Eduard Meyer [1906] follow the Biblical text in one decisive point. They concur that the Jewish tribes, who later on become the people of Israel, at a certain time accepted a new religion. But this event did not take place in Egypt nor at the foot of a mount in the Sinai Peninsula, but in a place called Meribat-Qades, an oasis distinguished by its abundance of springs and wells in the country south of Palestine between the eastern end of the Sinai Peninsula and the western end of Arabia. There they took over the worship of a god **Jahve**, probably from the Arabic tribe of Midianites who lived near-by. Presumably other neighboring tribes were also followers of that god. Jahve was certainly a volcano god. As we know, however, Egypt has no volcanoes and the mountains of the Sinai Peninsula have never been volcanic; on the other hand, volcanoes which may have been active up to a late period are found along the western border of Arabia. One of these mountains must have been the Sinai -Horeb which was believed to be Jahve's abode."

In 2003, Cambridge professor Colin Humphrey, likewise, argues that the holy mount, described in the Bible, where Moses spoke to a burning bush, was an active volcano, since it "shook and emitted fire and smoke (Exodus 19:18), which he believes was Mount Bedr in northwestern Saudi Arabia. (Q)

Adon | Aten

In later years, the term Adon or Adonai became used as either an epithet of the "god Yahweh" and or as a euphemism to avoid invoking the deity's proper name. [5]

The Hebrew term Adon, according to Sigmund Freud (1939) is a synonym of the Egyptian term Aton (or Aten), the monotheistic sun god Akhenaten.

Quotes

The following are related quotes:

> “And **Yahweh**, Elohim (Shining One), fashioned the Adam of the clay of the soil; and He blew in his nostril the breath of life, and the Adam turned into a living soul.”
>
> — Anon (500BC), *Genesis* 2:7 (O); see: Clay creation myth

> “The different names [**Jahve** and Elohim] [in the Bible] are a distinct sign of originally different gods.”
>
> — Hugo Gressmann (1913), *Moses and His Time* [2]

References

1. Freud, Sigmund. (1937). *The Man Moses and the Monotheistic Religion: Three Essays* (*Der Mann Moses und die monotheistische Religion. Drei Abhandlungen*). Imago*; Moses and Monotheism* (translator: Katherine Jones) (Arc) (txt) (volcano god, pg. 39). Knopf, 1939.
2. (a) Gressmann, Hugo. (1913). *Moses and His Time* (*Mose und seine Zeit*) (pg. 54). Gottingen: Publisher.
(b) Freud, Sigmund. (1937). *The Man Moses and the Monotheistic Religion: Three Essays* (*Der Mann Moses und die monotheistische Religion. Drei Abhandlungen*). Imago*; Moses and Monotheism* (translator: Katherine Jones) (Arc) (txt) (Gressmann, pg. 47). Knopf, 1939.
3. Jordan, Michael. (1993). *Encyclopedia of Gods: Over 2,500 Deities of the World* (pg. 293). Facts on File, Inc.
4. Yahweh: a Volcano Mountain God of Fire and War (2012) – TheThinkingAtheist.com.
5. (a) Adon – Wikipedia.
(b) Adonai (section) – Wikipedia.

Further reading

● Anon. (2003). *The Urantia Book* (Yahweh, pg. 901). Uversa Press.

Videos

● Anon. (2010). “Was God a Volcano?” (O), Thunderf00t, May 26.
● Anon. (2012). “The Real Mount Sinai Found in Saudi Arabia” (O), Circumcise Your Heart, May 1.

External links

● Yahweh – Wikipedia

θΔics

In knowledge, **year god was disabused from science** refers to years in which the various branches of science were made free from error, fallacy, or misconception in respect to god talk, belief in the existence of god, god theory, and or the hypothesis of god in general as a connective concept.

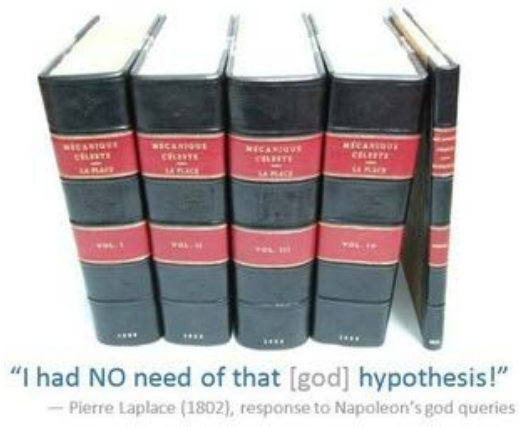

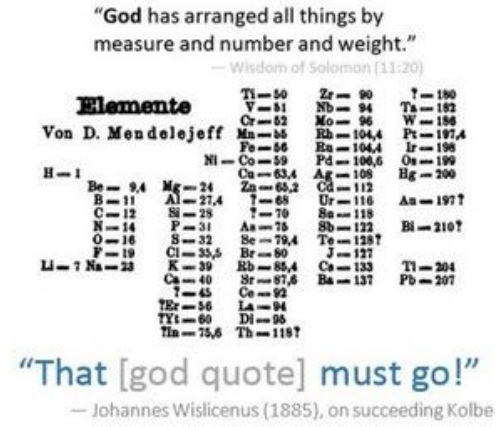

A visual synopsis of the years in which **god was disabused** from physics (1802), specifically in celestial mechanics, by Pierre Laplace (see: Napoleon Laplace anecdote), and chemistry (1885), specifically in general chemistry, by Johannes Wislicenus.

Overview

The years in which "god", as a functional concept, was jettisoned from physics (i.e. celestial mechanics) and chemistry, organic and general, were the years 1802, 1823 and 1885, respectively, the former by French physicist Pierre Laplace, and latter two by German chemist Johannes Wislicenus, as follows:

> "I had no need of that [god] hypothesis."
>
> — Pierre Laplace (1802), response to Napoleon why the divine was not found in his new celestial mechanics book (see: Napoleon Laplace anecdote)

> "That [god statement] must disappear!"
>
> — Johannes Wislicenus (1885), order to his guide, during his orientation tour of the University of Leipzig, as the new chemistry professor successor to Hermann Kolbe, in reference to Kolbe's Biblical quotation "God has arranged all things by measure and number and weight" (Wisdom of Solomon 11:20) in large letters, above the periodic table chart of the chemical elements at the front of his lecture theater (O)

God, in sum, in the 19th century, was debarred (or disabused) from science, in the following fields: physics in 1802 (via Laplace | France), organic chemistry in 1828 (Wohler | Germany), physiology in 1842 (via the Reymond-Brucke oath | Germany), general chemistry in 1885 (via Wislicenus | Germany), psychology in 1895 (via Freud | Vienna), sociology in 1933 (Dirac | Belgum), thermodynamics in 1934 (via Blum | America), and biology in 1938 (Sherrington | America).

List

The following is a chronological listing of the various branches of knowledge wherein in god was disabused, thrown out, made superfluous, and or rendered obsolete, via methods such as a experimental disproof, a wave of the hand, among others, as shown:

	Subject	Year	Person	Statement
1.	Physics 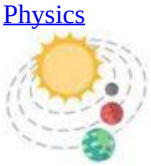 → Celestial mechanics	1802	Pierre Laplace	"I had **no need** of that [god] hypothesis." **See also** ● Napoleon Laplace anecdote 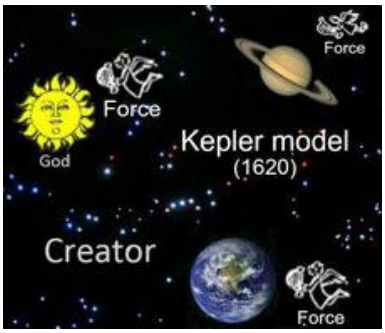
2.	Moral science	1809	Johann Goethe	"The **moral symbols** of the natural sciences, discovered and employed by Bergman [1775], are the **elective affinities**." **See also** ● Moral symbols

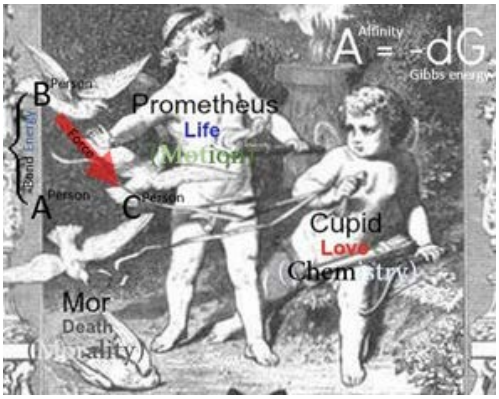

3.	Organic chemistry	1828	Friedrich Wohler	Organic synthesis (or urea) from inorganic components
4.	Physiology 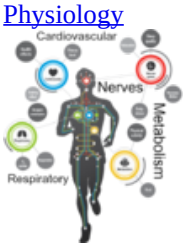	1842	Helmholtz school	"[We pledge] to put in power this truth: no other forces than the common physical chemical ones are active *within* the organism. In those cases which cannot at the time be explained by these forces one has either to find a specific way or form of their action by means of physical mathematical method, or to assume new forces equal in dignity to the chemical-physical forces inherent in matter, reducible to the force of attraction and repulsion." **See also** ● Reymond-Brucke oath
5.	Evolution	1859	Charles Darwin	"Man is descended from a hairy, tailed quadruped, probably arboreal in its habits. I call this principle [by which we have descended], by which each slight variation, if useful, is preserved, by the term of 'natural selection'. [On this assertion, the first objection has been a religious one]. We can allow satellites, planets, suns, universe, nay whole systems of universes, to be governed by laws, but the smallest insect, we wish to be created at once by special act. **I cannot persuade myself** [however] that a beneficent and omnipotent god would have designedly created parasitic wasps with the express intention of their feeding within the living bodies of caterpillars." 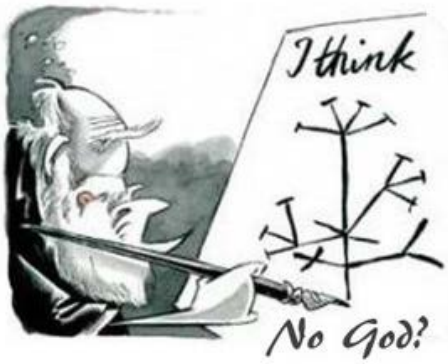
6.	Thermodynamics 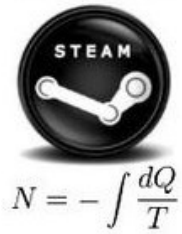	c.1875	Franz Pisko	Stated somewhere, according to German physicist Ludwig Buchner (1891), that the modern science of the thermodynamics of force and matter had displaced or supplanted god; the following quote is representative of this: "And if the inscription on the ancient pyramid of Sais says, 'I am all that is, that was, and that will be, no mortal man has yet removed the veil', it might be replied thereto, that modern science has removed the veil and has discovered that force and matter were, are, and will be." "That [god quote] **must go**!"
7.	Chemistry	1885	Johannes Wislicenus	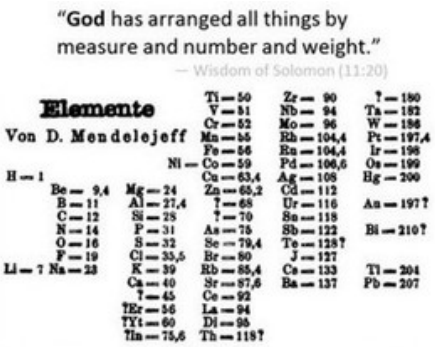

8.	Psychology	1895	Sigmund Freud	"The intention is to furnish a psychology that shall be a natural science; that is, to represent psychical [mental] processes as a quantitatively, free energy [G] and bound energy [-TS], determinate states of specifiable material particles." **See also** ● A Project for Scientific Psychology
9.	Mathematics	c.1920	David Hilbert	"Mathematics is a presuppositionless science. To found it I do not need god, as does Kronecker, or the assumption of a special faculty of our understanding attuned to the principle of mathematical induction, as does Poincaré, or the primal intuition of Brouwer, or, finally, as do Russell and Whitehead, axioms of infinity, reducibility, or completeness, which in fact are actual, contentual assumptions that cannot be compensated for by consistency proofs." — David Hilbert (c.1920), *Die Grundlagen der Mathematik* (O)
10.	Physics 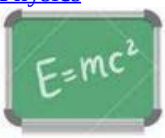 (General)	1927	Paul Dirac	"If we are honest — and scientists have to be — we must admit that religion is a jumble of false assertions, with no basis in reality. The very idea of God is a product of the human imagination. It is quite understandable why primitive people, who were so much more exposed to the overpowering forces of nature than we are today, should have personified these forces in fear and trembling. But nowadays, when we understand so many natural processes, we have no need for such solutions. Religion is a kind of opium that allows a nation to lull itself into wishful dreams and so forget the injustices that are being perpetrated against the people. Hence the close alliance between those two great political forces, the State and the Church. Both need the illusion that a kindly God rewards — in heaven if not on earth — all those who have not risen up against injustice, who have done their duty quietly and uncomplainingly. That is precisely why the honest assertion that God is a mere product of the human imagination is branded as the worst of all mortal sins." **See also** ● God does not play dice
11.	Sociology → Government → Politics → Economics	1933	Paul Dirac	"Any further assumption implied by belief in a god which one may have in one's faith is inadmissible from the point of view of modern science, and should **not be needed** in a well-organized society."
12.	Natural selection	1934	Harold	"Practically since its first definitive formulation by Darwin the concept of chance variation and natural selection has dominated the study of evolution, although frequent attempts have been made to replace or modify it. Probably most such attempts are provoked by a vaguely defined awareness of an insufficiency in the natural selection hypothesis, and the recognition of a directive factor in evolutionary processes

→ Thermodynamics [Directionality]

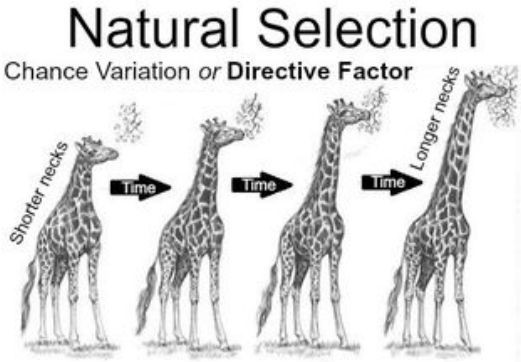

Blum

which persists through successive generations. The latter concept which is commonly known as 'orthogenesis', is supported a by considerable amount of evidence (Leo Berg, 1926), but at present is not widely accepted among biologists.

The general reason for abandoning or neglecting this concept has been the failure, thus far, to demonstrate the existence of the necessary directing factor outside of the theological doctrine; and one may suspect that fear of leaning too closely to such doctrine has caused most biologists to 'shy off' from orthogenesis. It will be the aim of the writer to indicate the actual existence of a directing factor in evolutionary processes, while at the same time **avoiding all necessity** of invoking theological concepts." [1]

Biology

13. 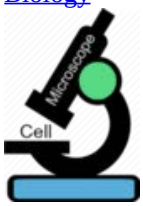

(General)

1938 Charles Sherrington (partial disabusement)

"Deep down among human intuitions is one that spontaneous movement means life. Our kith and kin among the animals entertain it as well as we, though for them 'life' is, of course, an unconceptualized thought. We know from ourselves that the indirect field of sight will see what moves when it fails to see what does not move. Our horse may shy at a blown leaf on the roadway, not at a still one. The frog snaps at a fly that moves, but not at one which is still. The vine-tendril never lives so vividly as when at the cinema its clasping is speeded into visible movement. When the cardboard puppet dances it becomes thinkably alive, and Don Quixote's irruption at the puppet-theater becomes intelligible.

The **bio**-logist knows this intuitive inference as native, even to a primitive mind. Movement accepted as spontaneous implies living. And the motion of the planets seemed to be spontaneous. Their movement told men that they were alive. All stars might be alive, but of them all the planets most so. The other stars were 'fixed', that is, relatively to each other did not move. When physics and chemistry, however, enter on their description of the perceptible, life disappears from the scene, and consequently death. Both are anthropisms. It is of no use asking physics and chemistry whether [something] is alive. They **do not understand** the word."

Genetics

14.

1966 Francis Crick

"Let us abandon the world 'alive'."

(add summary)

See also

- Defunct theory of life
- Life does not exist
- Life terminology upgrades

Biology

15. 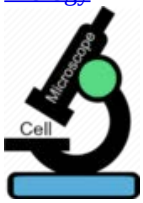

(General + Origin)

2009 Libb Thims (full disabusement)

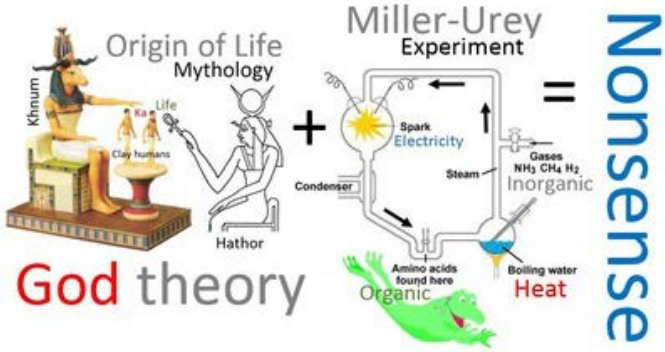

Physics

16. 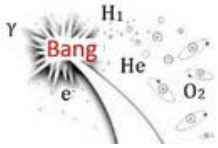

→ Big bang

2012 Stephen Hawking

"When people ask me if a god created the universe, I tell them that the question itself makes no sense. Time didn't exist before the big bang, so there is no time for god to make the universe in. It's like asking directions to the edge of the earth; the earth is a sphere; it doesn't have an edge; so looking for it is a futile exercise [see: karman line]. We are each free to believe what we want, and it's my view that the simplest explanation is; **there is no god**. **No one created our universe**, and **no one directs** our fate. This leads me to a profound realization; There is probably no heaven, and no afterlife either. We have this one life to appreciate the grand design of the universe, and for that I am extremely grateful." [2]

(add)

Biology / Life origin | Disabusement

God has not, however, been disabused from "biology", nor can it ever, as *status quo* remains, barring a scientific revolution; an issue, to say the least, which is a bit more complex. In short, one cannot simply disconnect or dismiss, with a wave of the hand, like Laplace or Wislicenus did, in their respective fields, god from "biology", because the prefix 'bio-", itself, is a religious term, i.e. a "god term", to put it plainly. Thus, to explain, via elaboration, e.g., while Helmholtz, Reymond, and Brucke, of the so-called Helmholtz school, the key figures behind the 1842 Reymond-Brucke oath, may make a vow or pact of allegiance, "signed in blood", as legend has it, to the side with the reductionism view that, unquestionably, only "physicochemical forces", in opposition to any and all "life force" (or vitalism) theories, operate 'in' (or within) organisms; the three of them will still inconsistently "believe", in logical contradiction to their own theory, that they are in fact "alive", and likewise that they will "die" one day; the latter of which, i.e. life and death, being concepts not recognized by physics and chemistry; they are "anthropisms", as Charles Sherrington (1938) put it; and these so-called foundationless anthropisms, invariably, come to us via the religio-mythology pipeline of cultural transmission; and hence, in turn, from god theory; and before that from the theory of "multiple gods"; and before that from a "plurality of spirits" theories of ancient times, etc.

See also

- Top 100 atheists

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2. Hawking, Stephen. (2011). "Curiosity: Did God Create the Universe?" (Q)(Q), Discovery Channel, Aug 7.

θΔics

In hmolscience, **Yelena Istileulova** (1966-) is a Kazakhstan economist noted for []

Overview

In 2011, Istileulova, in her "Organization as a Human Being: Information (mind) + Matter (body) + Energy" (capacity to work)", employed a human thermodynamics conceptualized, Hmolpedia-cited ideas, wherein she discussed the meaning of organization from the prospective of humans as creative intelligence systems, focusing on two questions, one: what is organization as a form of creative intelligence with its mind (information), body (matter) and capacity to work (energy) [?] and two: how is information born and fluctuated within organizations and how is the quest for meaningful orientation to manage organisation are met [?], all within the context of thinkers such as: Pierre Teilhard (noosphere), Irvin Laszo (dynamic energy conservation), James Miller (living systems theory), and the human thermodynamics of: Mehdi Bazargan, Leon Winiarski, C.G. Darwin, along with the relatively unknown 1986 work of Russian scientist A.I. Yablonsky (1936-1986), who applies thermodynamics logic, along with Zipf's law and Pareto distribution, to theorize about the temperature of scientific organizations as the accumulated characteristics of external impact on scientists. [1]

Education

Istileulova completed her BA in environmental economics in 1990 at the Institute of Irrigation, her MBA in 1994 at the Kazakh Institute of Management Economics and Strategic Resources, and her PhD in economics in 2013 at Ljubljana University.

References

1. (a) Yablonsky, A.I. (1986). *Mathematical Models of Science Studies*. Moscow: Nauka.
(b) Kostyuk, V. and Schreider, J. (1989). "Book Review: *Mathematical Models in Science Studies*" (abs), *Scientometrics*, 15(1-2):155-57.
(c) Istileulova, Yelena. (2011). "Organization as a Human Being: Information (mind) + Matter (body) + Energy" (capacity to work)" (Q), Assignment, PhD student, Ljubljana University, Faculty of Economics, Dec 2.

External links

- Yelena Istileulova – LinkedIn.
- Yelena Istileulova – Academia.edu.
- Istileulova, Yelena (2004 profile) – Policy.hu.

θΔics

In existographies, **Yevgeny Zamyatin** (1884-1937) (CR:25), aka "Eugene Zamiatin" (Seidenberg, 1950), was a Russian engineer and writer noted, in literature thermodynamics, for his 1920 thermodynamical society conceptualized novel *We*, futuristic type of 26th century dystopia-utopia, wherein all actions are calculated mathematically and scientifically, through what is called an integration of the indefinite equation of the universe (see also: Isaac Asimov's *Foundation Series*).

Overview

In 1919, Zamyatin made the initial draft of *We* and finished the final version 1921, the central premise which, according to Zamyatin, was the problem of the individual personality (the "I") versus the collective (the "we"), discussed in the guise of futuristic type of 26th century dystopia-utopia, wherein all actions are calculated mathematically and scientifically, through what is called an integration of the indefinite equation of the universe. [8]

A central premise is the subject of "freedom", which is attributed to societies in primitive states, seen as synonymous with "disorganized wildness", verses being subjugated to the control or the power of the nation-state and the formulas for controlled happiness.

In *We*, Zamyatin positions the logic that the thermodynamics of molecules in closed systems at equilibrium is the physical analogue of the political status of individuals (human molecules) in a totalitarian regime, within which one is either imprisoned by order or liberated by chaos. [4] The following is a popular quote from *We*: [5]

> "Surely you see that only differences, difference of temperature, on contrasts in degree of heat, only that makes for life? And if throughout the universe all bodies are equally worm, or equally cool … you've got to smash them into each other—so there'll be fire, explosion, inferno."

In *We*, according to a review by American literary thermodynamicist Bruce Clark, "the violent social impasse between entropic mechanism and evolutionary vitalism takes high-modernist form", within which Zamyatin "mixes classical thermodynamics with the leading edge of Einsteinian physics." [4]

As this so-called individuality "problem" was at odds with the philosophy of communism, *We* was quickly banned by Glavlit, the new Soviet censorship bureau, and remained a banned in Russia until 1988.

In 1923, Zamyatin followed up his novella with his essay "On Literature, Revolution, Entropy, and Other Matters", in which he attemptes to describe the Russian revolutions of 1905 and 1917 in the language of thermodynamics, with mentions of Euclid, Galileo, Darwin, Schopenhauer, Nietzsche, Tolstoy, among others. [1]

Happiness

In *We*, Zamyatin gives the following mathematical formula for happiness:

$$\text{happiness} = \frac{\text{bliss}}{\text{envy}}$$

or the ratio of bliss to envy, whereby when envy is decreased towards zero (e.g. by mathematically organizing sexual impulse and love), bliss goes to infinity; which he says is used to regulate the nature of the OneState.

Frederick Taylor

Zamyatin often refers to the work of American mechanical engineering consultant Frederick Taylor (1856-1915), e.g. the "formulae of Taylor", "Taylor exercises", and what seems to be the logic of work task formulation as described in

his 1911 *Principles of Scientific Management*. In this work, Taylor derives three mathematical equations, based on twelve input variables of the process of a man cutting metal in the factory, equations, which he says can be solved by the mathematician, that in the end will make the task more efficient. Taylor extrapolates on the premise that this type of mathematical formulation can be extended to all types of social activities, such as in the management of one's home, farm, business, and other institutions. [9] Zamyatin's idea is to extend this formulation method to the 24-hours of human movement. As the lead character D-503, the one who is in the process of formulating the equations of existence, comments:

> "No doubt about it, that Taylor was the genius of antiquity. True, it never finally occurred to him to extend his method over the whole of life, over every step you take right around the clock. He wasn't able to integrate into his system the whole spread from hour 1:00 to 24:00. But still, how could they write whole libraries about someone like Kant and hardly even notice Taylor—that prophet who could see ten centuries ahead?"

Correctly, to note, Taylor did conclude in his introduction:

> "It is hoped that it will be clear to readers that the same principles can be applied with equal force to all social activities."

A downfall about Taylor's approach is that there does not seem to be an fundamental physical science basis to his approach, other than to "increase employer-employee coupled maximum prosperity."

On Literature, Revolution, Entropy, and Other Matters

Two years after *We* was finished, Zamyatin got around to putting his central philosophy or idea into essay form, using the speech of 1-330 as an epigraphy. The essay was titled "On Literature, Revolution, Entropy, and Other Matters" (1923), in which he attempts to describe the Russian revolutions of 1905 and 1917 in the language of thermodynamics. [1] The epigraph derives from Record 30 of *We*, the philosophical core of the book. The logic presented is that there are two forces at war, like the Country and City, the Mephi and OneState, and these forces are energy and entropy. [7]

Color of entropy

Of curious note, it is said that Zamyatin had synesthesia, a condition in which letters or numbers are perceived as inherently colored. Zamyatin supposedly gave letters and sounds qualities. To Zamyatin, "L", for instance, was pale, cold and light blue. [2] The law of entropy, in Zamyatin's view, according to Danish science historian Helge Kragh, was conformist and anti-revolutionary because it promised a dull equilibrium state form which no new revolution could ever emerge. [3] Hence, according to Zamyatin:

> "The law of revolution is red, fiery, deadly; but this death means the birth of new life, a new star. And the law of entropy is cold, ice blue, like the ice interplanetary infinities … the sun ages into a planet, if the planet is to be kindled into youth again, it must be set on fire, it must be thrown off the smooth highway of evolution."

Gladyshev's review

According to a review of original Russian text of *We* by Russian physical chemist Georgi Gladyshev, "Zamyatin gives a grotesque image of a totalitarian regime. Serious considerations on entropy, energy are not to be found. It seems that the author is familiar with physics a little. The terms of entropy and energy he uses as fancy words. He knows about the heat death of the universe as a system of ideal gas. The term "psychological entropy" is only fashionable combination of words. In the book there are no facts which indicate that the author is relevant to the beginnings of the field of human thermodynamics. Zamyatin, as the author the *We*, can only be referred to as a writer, who used only a few phrases with

thermodynamic terms." Gladyshev cites the following excerpts:

> "... Here: the two forces in the world - the entropy and energy. One - to the blessed rest, to a happy equilibrium, the other - to destroy the balance, the painfully-infinite movement. Entropy - our, or rather - your ancestors, the Christians, to worship God. And we, the anti - Christians, we are ...
>
> - Aga: Uniformly, everywhere! That's it the most and are – entropy, Psychological entropy. You, mathematics - is it not clear that the only difference between the temperature, only thermal contact - only their lives. And if everywhere throughout the universe, the same heat or cool the body equally ... They need to push - to fire, explosion, Hell. And we will face."

as, perhaps, the language of allegory. [6]

Education

Zamyatin studied naval engineering in Saint Petersburg from 1902 to 1908 during which time he joined the Bolsheviks; wherein he was arrested during the Russian Revolution of 1905 and exiled, but returned to Saint Petersburg where he lived illegally before moving to Finland in 1906 to finish his studies. He graduated as a naval engineer in circa 1915.

Quotes

The following are representative quotes:

> "Love and hunger rule the world. Ergo, to rule the world, one must master love and hunger."
>
> — Yevgeny Zamyatin (1920), *We*

References

1. Zamyatin, Yevgeny. (1923). "On Literature, Revolution, Entropy, and Other Matters"; In: Yevgeny Zamyatin, *A Soviety Heretic: Essays by Yevgeny Zamyatin*, ed. And trans. Mirra Ginsburg, 1970. Chicago: University of Chicago Press.
2. Introduction to Randall's translation of *We*; In: Zamyatin, Yevgeny (2006). We. Natasha Randall (trans.). Modern Library.
3. Kragh, Helge S. (2008). *Entropy Creation: Religious Contexts of Thermodynamics and Cosmology* (pg. 233). Ashgate Publishing, Ltd.
4. (a) Zamyatin, Yevgeny. (1921). *We* (introduction). Penguin.
(b) Clark, Bruce. (2001). *Energy Forms: Allegory and Science in the Era of Classical Thermodynamics* (keyword: Zamyatin, pgs. 11, 13, 78-80, 134-57, etc.; section: Dimensionality in Zamyatin, pgs. 202-07). University of Michigan Press.
5. (a) Pages: I-330 to D-503 in Zamyatin's *We*.
(b) We (novel) – Wikipedia.
6. Email communicate from Georgi Gladyshev to Libb Thims on 05/13/09.
7. Zamyatin, Yevgeny. (1921). *We* (introduction, pgs. xi-xxvi; Taylor, 11+ pgs; entropy, 5+ pgs.). Penguin Classics, 1992.
8. Brown, Clarence. (1992). "Introduction: Zamyatin and the Persian Rooster", in: *We* (pgs. xi-xxvi). Penguin Classics.
9. Taylor, Frederick. (1911). *Principles of Scientific Management* (formula, pgs. 109-10). Publisher.

Further reading

â— Zamyatin, Yevgeny and Ginsburg, Mirra. (1970). *A Soviet Heretic: Essays by Yevgeny Zamyatin* (abs). University of Chicago Press.

External links

â— Yevgeny Zamyatin – Wikipedia.

θΔics

In hmolscience, **Yi-Cheng Zhang** (1956-) (CR:4) is Chinese-Swiss physicist noted for his 1998 founding of the EconoPhysics Forum, which has econophysics, financial physics, and sometimes human thermodynamics related topic material.

Overview

In 1998, Zhang, in his "Toward a Theory of Marginally Efficient Markets", presented at the Econophysics meetings in Rome, argued the following:

> "Empirical evidence suggests that even the most competitive markets are not strictly efficient. Price histories can be used to predict near future returns with a probability better than random chance. Many markets can be considered as favorable games, in the sense that there is a small probabilistic edge that smart speculators can exploit. We propose to identify this probability using conditional entropy concept. A perfect random walk has this entropy maximized, and departure from the maximal value represents a price history's predictability. We propose that market participants should be divided into two categories: producers and speculators. The former provides the negative entropy into the price, upon which the latter feed. We show that the residual negative entropy can never be arbitraged away: infinite arbitrage capital is needed to make the price a perfect random walk."

This, of note, is an information entropy model, e.g. "conditional entropy", and therefore not physics. Joseph McCauley (2002), to note, cites this amid a discussion of an attempt at a thermodynamic formulation stock buying and selling, mistakenly thinking that Zhang is referring to thermodynamics, and that "arbitrage corresponds to lower entropy, reflecting correlations in the empirical returns distribution." [3]

Influence

Zhang's asking of Joseph McCauley to write reviews and then articles for the *Econophysics Forum*, in 1999, to note was what drew him in to econophysics.

Education

Zhang completed his PhD in something at the International School for Advanced Studies, Italy, in 1984 and since 1992 has been a physics professor at the University of Fribourg, Switzerland, and in 2016 was the chair of the physics department. [1]

Quotes | On

The following are Zhang related quotes:

> "In 1995, Eugene Stanley coined the phrase 'econophysics' at a meeting in India. At about the same time, Yi-Cheng Zhang and his group introduced the econophysics webpage: unifr.ch/econophysics. Simon Capelin at Cambridge University Press led the charge by publishing Stanley's and other econophysics books. His program there is still strong. Sadly, econophysics, like nonlinear dynamics, was never recognized by the APS as part of physics. American physics prefers (nonfalsifiable) string theory to falsifiable approaches to social problems. My university offers one of the only econophysics PhD programs in the world."
>
> — Joseph McCauley (2008), "Emergence of Finance Theory and Econophysics" [16]

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and Palermo, Sep 1998; in: *Palermo Proceedings* (editor: R.N. Mantegna). Publisher, 1999.
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External links

â— Yi-Cheng Zhang – Academia.edu.
â— Yi-Cheng Zhang – Google Scholar.

θΔics

In hmolscience, **Yi-Fang Chang** (1947-), or 张一方 (in Chinese) or YiFang Zhang, is a Chinese particle physicist noted, in human thermodynamics, for his 2009 to present effort to formulate a melting pot of physics and thermodynamics theories to explain social phenomenon.

Overview

In Oct 2009, Chang published "Moderate Degree of Input Negative Entropy Flow and Decrease of Entropy in Astrophysics, Biology, Psychology and Social Systems", wherein he begins with some black hole thermodynamics calculations, the cites Erwin Schrodinger's 1943 *What is Life?*, then mentions John Edsall and Hanoch Gutfreund's 1983 book on biothermodynamics, after which jumps into smattering of semi-recent applications of thermodynamics in spirituality, social sciences, etc. [5]

In Nov 2009, Chang, in his "Social Synergetics, Social Physics, and Research of Fundamental Laws in Social Complex Systems", attempts to formulate social thermodynamics equations and theorize on concepts such as social temperature. [1]

Chang seems to base much of his social thermodynamics theories on the work of Belgian chemist Ilya Prigogine and synergetics of German theoretical physicist Hermann Haken. [2]

In 2013, Chang published "Social Thermodynamics, Social Hydrodynamics and Some Mathematical Applications in Social Sciences", wherein he cites the 2001 social combustion theory of Wenyuan Niu, among others. [4]

Criticism

In 2011, American physicist Len Fisher calls Chang's social thermodynamics derivation article "frankly hilarious" and "non-serious", describing the article as pages and pages of convoluted mathematics, all ending with the outlandish conclusion that his home country was essentially perfect. [3]

Education

Chang began a process of self-education in physics as a youth, reading through some 46 physics books, focusing in on higher mathematics and Albert Einstein's theory of relativity work. Chang currently is a professor of physics at Yunnan University.

See also

- Chinese school of social physics

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1. (a) Chang, Yi-Fang. (2009). "Approach to a Quantitative Description of Social Systems based on Thermodynamic Formalism" (abs), ArXiv.org, Nov 11.
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5. Chang, Yi-Fang. (2009). "Moderate Degree of Input Negative Entropy Flow and Decrease of Entropy in Astrophysics, Biology, Psychology and Social Systems" (abs), ArXiv.org, Oct 4.

Further reading

- Chang, Yi-Fang. (2013). "Chaos, Fractal in Biology, Biothermodynamics, and Matrix Representation on Hypercycle"

(abs), *NeuroQuantology*, 11(4).

External links

- Yi-Fang Chang (publications) – ArXiv.og.

θΔics

In hmolscience, **Yoshiro Tamanoi** (1918-1985), Japanese 玉野井, 芳郎, was a Japanse ecological economist who, as a student of Uno Kozo and through studies of Karl Polanyi, noted for some type of thermodynamics-conceptualized economics and or socialism theory, e.g. equating entropy and waste, in discussions of production and industrialism. [1] Much of his work seemed to be focused on Karl Marx.

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1. (a) Barshay, Andrew E. (1998). "Postwar Social and Political Thought", in: *Modern Japenese Thought* (editor: Bob T. Wakabayashi) (pg. 351). Cambridge University Press.
(b) Duncan, Colin A. (1996). *The Centrality of Agriculture: between Humankind and the Rest of Nature* (pg. 30). McGill-Queen's Press.
(c) Author. (1990). "Introduction", in: *Socialist Dilemmas: East and West* (editors: Henry Flakierski and Thomas Sekine) (pg. x). M.E. Sharpe.

External links

- Tamanoi Yoshiro (Japense → English) – Wikipedia.
- Tamanoi Yoshiro (Japense → English) – WorldCat Identities.

θΔics

In genius studies, **youngest college graduates** refers to child prodigy like individuals, throughout history, to have completed a bachelors, masters, doctorate, medical degree, and or law degree, and or become a college professor, at an young age. [N1]

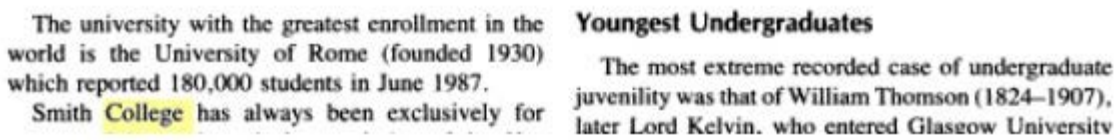

The university with the greatest enrollment in the world is the University of Rome (founded 1930) which reported 180,000 students in June 1987.

Smith College has always been exclusively for

Youngest Undergraduates

The most extreme recorded case of undergraduate juvenility was that of William Thomson (1824–1907), later Lord Kelvin, who entered Glasgow University

A 1990 Guinness Book of World Records clip, from their section "youngest undergraduates", discussion how William Thomson entered college at age 10. [6]

Bachelors | Youngest

The following gives a listing of the known youngest college graduates, ordered by youngest age that standard 4-year bachelor's degree was completed; those shown bolded were (or are) *Guinness Book* record holders of "youngest youngest person to graduate from college"; the first column (#) shows each person age-based ranking; the second column (IQ) shows that individual's real IQ if that person is listed among the top 1000 geniuses:

#	IQ	Person	Age	Degree[s]	IQ estimates	Description
#.		Laurent Simons (2000-)	9	BS electrical engineering (age 9) | 2019	IQ_{Th}=267 IQ_{O}=145	A Belgian child prodigy; in Nov 2016 (age 6), just starting high school, was being cited with an IQ of 145+ (Q); in Dec 2019 (age 9), is slated, according to reports (21 Nov 2019) (Q), to completed a BS in electrical engineering at Eindhoven University of Technology (Q), and then go into medicine to make artificial organs; for ratio IQ of 267 see note. [N2]
1.		**Michael Kearney** (1982-)	10	AS geology | 1992 (age 8) BS anthropology (age 10) | 1992 MS biochemistry (age 14) MS computer science (age 17)	IQ_{R}=325 IQ_{O}=200	Completed associates degree in geology from Santa Rosa Junior College (age 8), BS in anthropology from the University of South Alabama (age 10), MS in biochemistry from Middle Tennessee State University (age 14), and MS in computer science from Vanderbilt University (age 17).
2.		Tathagat Avatar Tulsi (1987-)	10	BS physics (age 10) | 1997 MS (age 12) PhD physics (age 21)		Completed high school at the age 9; completed BS in physics at the age of 10 and MS at age 12 both at Patna Science College (Patna University); completed PhD (age 21 or 22) on "Generalizations of the Quantum Search Algorithm" at the Indian Institute of Science. (Q)
3.			11	BS computational	IQ_{R}=400	At 8 he was enrolled at Cabrillo College, a two-year community college in Santa Cruz, California, where he studied physics and mathematics getting straight As; at 10 he transferred to the University of California at Santa Cruz to major in computation

	Adragon De Mello (1976-)		mathematics | 1987		mathematics, graduating a year later (age 11). He was listed in the Guinness Book as being the youngest college graduate in history (only to be beat by Michael Kearney in 1992).
4.	Sho Yano (1990-)	12	BS biology | 2002 PhD genetics (age 18) MD (age 21)	IQ_O=200+	Completed BS in biology with minor in chemistry (age 12), from the Loyola University Chicago; entered combined MD-PhD program, in molecular genetics and cytology (age 13) at the University of Chicago Medical School; completed PhD in molecular genetics and cell biology (age 18); third year medical school student as of 2010.
5.	**Jay Luo** (1970-)	12	BS mathematics (age 12) | 1982		Completed his BS mathematics at Boise State University in 1982 (age 12), with a B+ average, degree completed in three years (Q); had started graduate work at Stanford afterward, but dropped out.
6.	Kim Ung-Yong (1963-)	12?	BS physics | 1976? MS physics (14) PhD physics (age 15) PhD civil engineering (age 22)	IQ_O=200-210	Admitted to the physics department of Hanyang University (age 5), BS physics (age 12), MS physics (age 14), and PhD physics (age 15) from Colorado State University (Q); PhD civil engineering (age 22), from Chungbuk National University.
7.	Ruth Lawrence (1971-)	13	BS mathematics (age 13) | 1985 BS physics (age 14) PhD (age 17)		BS mathematics (1985) at age 13, BS physics (1986) age 14, and PhD (1989) age 17 at the University of Oxford; academic post at Harvard (1990) at age 19, and associate professor with tenure at the University of Michigan in 1997.
8.	Gregory Smith (1989-)	13	BS mathematics | 2002 MS mathematics (age 16)	IQ_O=186/200	BS in mathematics, in 2002 (age 13) from Randolph-Macon College; in 2006 (age 16), he completed his MS in mathematics; as of 2010, he is working towards a second graduate degree in computational biology (Q); plans to have four PhDs by age 27 (2016) in: math, aerospace engineering, international relations, and biomedical research (Q).
9.	Balamurali Ambati	13	BS biology | 1990 MD (age 17)		Completed his BS biology, at age 13 from New York University; MD at age 17 from Mount Sinai School of Medicine; ophthalmology residency at Harvard; in circa 1987; set a goal to become the youngest graduate of medical school after reading about Ben-Abraham's age 18 MD record in the

		(1977-)				Guinness Book (Q), and did so at age 17 years, 294 days.
10.	180 / 177	Philipp Melanchthon (1497-1560)	14	BA (age 14) | 1511 MA (age 14) | Denied per age MA classics (age 17)	IQ_C=190 IQ_W=180	Before he was 13 he entered the University of Heidelberg, where he read poetry, wrote verses, and studied, for the most part without other direction than his own. At 14 he took the Bachelor's degree. It is believed that he was working on his grammar at this time. At the end of another year he had fulfilled the requirements for the Master's degree, but the degree was denied him because of 'his youth and boyish appearance.' At 15 he went to Tubingen, where his studies 'took a wide range'. 'He sought to know everything and to be a master in every science'. 'He gave attention chiefly to Greek and Latin literature, to philosophy, history, eloquence, logic, and mathematics, heard the theologians and the lecturers on law and medicine, and read Galen so carefully that he could repeat most of his works from memory.' Just before his 17th birthday he received the degree of Master of Arts as first among eleven candidates and, with the degree, the license as *privat docent* to lecture on the ancient classics. [1]
11.	170 / 416	Norbert Wiener (1894-1964)	14	BS mathematics | 1908 PhD mathematics (age 18)		Completed his BS in mathematics from Tufts College at age 14 and PhD in mathematics from Harvard at age 18
12.	180 / 191	Thomas Wolsey (1472-1530)	14	BS arts | 1486	IQ_C=200	Completed his bachelor's in arts at Oxford University at age 14.
13.		Stephen A. Baccus (1969-)	14	BS computer science JD (age 16) MS computer science (age 18) PhD neuroscience (age 29)	IQ_P=190	IQ estimated by psychologist Aaron Stern (father of Edith Stern [IQ=203]), following an age 10 interview; BS computer science, University of Miami; entered University of Miami's law school at 14, graduating at 16, making a name for himself by successfully suing the State of New York for its age restrictions on the bar exam after receiving a special waiver in Florida; began practicing law at 17; MS computer science from NYU age 18; made partner in a firm by 19 (Q); PhD in neuroscience age 29 at University of Miami (Q); currently neurobiology professor at Stanford Medical School.
14.		Eric Demaine (1981-)	14	BS MS mathematics (age 15) PhD (age 20) BS applied		BS age 14; MS mathematics age 15; PhD age 20; joined the MIT faculty in 2001, at age 20, reportedly the youngest professor in the history of MIT.

15.	Alia Sabur (1989-)	14	mathematics | 2003 MS materials science and engineering (age 17) PhD materials science and engineering (age 18)		Completed BS (2003) in applied mathematics from Stony Brook University at age 14; MS (2006) and PhD in materials science and engineering at Drexel University; professor of mathematics at age 19.
16.	Kathleen Holtz (1989-)	14	BS | 2003 JD (age 18)		Holtz started at Cal State LA at age 10; entered UCLA Law at 15, earning a spot on the law review; passed the bar exam, first time around in 2007 (age 18).
17.	**Merrill Kenneth Wolf** (1931-2011)	14	AB music | 1945 MD (age 25)	IQ_O=182	AB in music from Yale in 1945 (age 14) and MD from Western Reserve University School of Medicine in 1956 (age 25). Was listed, for some two decades, prior to Jay Luo's 1982 (age 12) BS mathematics degree, in *Guinness Book of World Records*, the youngest person to graduate from a United States college. [4]
18.	Tony Lai (1972-)	14	BS mathematics (age 14) MS computer science (age 15) PhD computer science (age 18)		At the end of grade 3, had finished junior high school math, and had taught himself to program a computer; in grade 6, had completed high school math, and placed 7th on a provincial math competition for high school students; therein began taking introductory calculus courses at University of Prince Edward Island, during which time he learned about 12-year-old college graduate Jay Luo (1970-), and decided to apply for college. (Q)(Q)
19.	Eugenie de Silvia (1998-)	14	BA intelligence analysis (age 14) | 2013 MA intelligence analysis (age 15) MA legal studies (age 16)		
20.	Michael Grost (1954-)	15	BS mathematics | 1969 MS mathematics (age 17) PhD mathematics (age 23)	IQ_O=200	Graduated from MSU, at age 15, with BS in mathematics; MS age (17); PhD in mathematics from the University of Michigan at age 23.
					Enrolled in college at 12; associated degree age 14

21.	Edith Stern (1952-)	15	BS science | 1967 PhD mathematics (age 18)	IQ_P=200/203	at Miami-Dade Jr. College; BS in mathematics at Florida Atlantic University (age 15), assistant professor of mathematics at MSU at 15; MS in mathematics at Michigan State University at age 18 (Q); and or PhD in mathematics at age 18. (Q)
22.	Colin Carlson (1997-)	15	BS ecology and evolutionary biology | 2009 BS environmental studies (age 15) MS environmental studies (age 16)		At age 12, enrolled at the University of Connecticut; completed BA (age 15) in degree in ecology and evolutionary biology and another in environmental studies; completed MS in environmental studies at age 16 (2013) at the University of Connecticut. Currently PhD student in the Department of Environmental Science, Policy and Management at University of California, Berkeley. [3]
23.	Juliet Beni (1993-)	15	BA (age 15) MA (age 17) PhD in psychology (age 19)		
24.	Moshe Kai Cavalin (1998-)	15	AS physics | 2009 BS mathematics (age 15)		At age 8, entered East Lost Angeles Community College, graduating with 4.0GPA at the age of 11 (2009); at age 15 (2013), completed BS in mathematics at the University of California, Los Angeles. (Q)
25.	Anne-Marie Imafidon (1990-)	15	BS mathematics (age 15) MS mathematics (age 19)		At 13, in 2003, began studying mathematics at Johns Hopkins University. At 15, in 2005, she was admitted a degree program by the University of Oxford; at 19, in June 2010, she became the youngest ever graduate with a master's degree. (Q) (Q)
26.	Terence Tao (aka Adrian Seng) (1975-)	16	BS mathematics (age 16) MS mathematics (age 16) PhD mathematics (age 20) Tenure (age 25)	IQ_O=233	
	Mikaela		BS physics (age 16) MS physics		

27.	Fudolig (1991-)	16	(age 22) PhD physics (age 23) JD (engaged age 24)		(Q)
28.	175 | 303 William Sidis (1898-1944)	16	BS mathematics | 1914	IQ_P=250-300 IQ_O=200	Passed Harvard medical school anatomy exams (age 6); MIT entrance example (age 8); graduated high school (age 9); BS mathematics at Harvard in 1914 (age 16); professor of mathematics at Rice University (age 17), while pursuing PhD; age 18 to 19 was in Harvard Law School, then quit in his last semester, while in good academic standing, for no apparent reason; age 22, working on advance physics problems at MIT, but soon resigned, after learning of the military applications.
29.	Dylan Jones (1992-)	17	BS mathematical and computer science; minor in bioengineering and life sciences | 2007	IQ_O=200	Engineering freshman at Colorado School of Mines at age 10 (Q); switched majors to graduate with a BS in math and computer science, with a minor in bioengineering and life sciences (age 16); completed first year of medical by age 17 (2009) and taking into account a seven-year residency, plans to be a board certified neurosurgeon by the time he's 28 (2020). (Q)
30.	John McClellan (1896-1977)	17	JD (age 17) | 1913		Admitted to the Arkansas Bar Association in 1913 at age seventeen, having previously studied law in his father's office.
31.	Christopher Hirata (1983-)	18	BS physics | 2001 PhD physics (age 22)	IQ_O=225	At age 14 entered Caltech; began working with NASA at age 16 on a project exploring the possibility of colonizing Mars; completed BS at age 18 from Caltech with a 4.2 GPA; completed PhD in physics (2005) at age 22 at Princeton; currently is an assistant professor of astrophysics at CalTech.
32.	180 | 165	19	BS mathematics (age 19) MS mathematics (age 20) PhD in	IQ_O=200	At c. age 15, enrolled in the chemical engineering program at Carnegie Institute of Technology "This is to recommend **Mr. John F. Nash, Jr**. who has applied for entrance to the graduate college at Princeton. Mr. Nash is nineteen years old and is graduating from Carnegie Tech in June. He is a mathematical genius." — Richard Duffin (1947), "Graduate School Recommendation Letter" (Q) then swited to chemistry, then mathematics,

		John Nash (1928-2015)		economics (age 22)	completing his BS and MS in mathematics there; at age 21 (1949) or 22 (1950), he completed his PhD with a 28-page dissertation on “Non-Cooperative Games”, written under the supervision of doctoral advisor Albert W. Tucker, based partially on John Neumann and Oskar Morgenstern’s *Theory of Games and Economic Behavior* (1944), a dissertation that in 1994 won him the Nobel Prize in economics.
33.		Lu Jiaxi (1915-2001)	18/19	BS chemistry | 1934 PhD chemistry (age 24) Post-graduate work at CalTech (under Pauling)	
34.		Stephen Wolfram (1959-)	20	PhD particle physics | 1979	PhD (age 20) at CalTech under Richard Feynman and others.
35.	185 | 53	William Thomson (1824-1907)	21	Glasgow University student (age 10) BS mathematics and natural philosophy | 1845 (age 21) Chair of natural philosophy (age 22)	At age 10, began his studies at Glasgow University; at age 13, defended Joseph Fourier’s 1822 theory of heat over that of Philip Kelland’s 1837 heat theory; at age 17, entered Cambridge University, during which year he published first scientific papers; at age 21, completed his BS at Cambridge, graduating as Second Wrangler, during which time he simultaneous unearthed the then unknown and forgotten memoirs of Sadi Carnot’s 1824 *On the motive Power of Fire*, therein initiating the science of thermodynamics, along with George Green’s 1828 memoir on the mathematics of electricity and magnetism, therein seeding what would become electromagnetic theory, via his soon-to-become friend James Maxwell; at age 22, was chair of natural philosophy at the University of Glasgow.
36.	195 | 12	Gilbert Lewis (1875-1946)	21	matriculated college (age 13) Sophomore (age 16) BA chemistry (age 21) MA chemistry (age 23) PhD physical chemistry (age 24)	Educated at home by his parents in the style of the English tutoring system, where, as he says, he ‘escaped some of the ordinary processes of formal education’. (Q) His only public schooling occurred between the ages of 9 to 14 years in Lincoln, Nebraska. At age 14, entered the University of Nebraska, where he completed up to his sophomore year, after which he transferred to Harvard College, where at he completed his BS in chemistry (1896), his MA (1898), and PhD (1899), the latter with a thesis on “Some Electrochemical and Thermochemical Reactions of Zinc and Cadmium Amalgams”, which was published jointly with American chemist Theodore Richards.

Presently, the record for the youngest BS is that obtained by Michael Kearney at age 14; the youngest MS obtained by Michael Kearney, age 14; the youngest PhD obtained Kim Ung-Yong, age 14 or 15 (this later age needs to be fact checked).

Engineers | Youngest

The following gives a listing of youngest engineers:

#	IQ	Person	Age	Degree[s]	IQ estimates	Description
1.		Laurent Simons (2000-)	9	BS electrical engineering (age 9) | 2019		A Belgian child prodigy; in Nov 2016 (age 6), just starting high school, was being cited with an IQ of 145+ (Q); in Dec 2019 (age 9), is slated, according to reports (21 Nov 2019) (Q), to completed a BS in electrical engineering at Eindhoven University of Technology (Q), and then go into medicine to make artificial organs; for ratio IQ of 267 see note. [N2]
2.		Henry Muhlbauer (2003-)	15	BS electrical engineering (age 15) | 2018		In 2018, at age 15, completed his BS in electrical engineering, with minors in physics, computer science, and applied mathematics, at University of Virginia; after teaching himself to read at age 2, mastered calculus at age 9 (see: prodigies and calculus), learned organic chemistry from a textbook, and started college courses at UVA at the age of 10. (Q)
3.		Tanishq Abraham (2003-)	15	BS biomedical engineering (age 15) | 2018		Joined Mensa when he was age 4, was home-schooled after feeling 'bored' in his classes, graduating from high school at age 10 (Q); in 2015, at age 11, completed three associates degrees, at American River College (Q); in 2018, aged 15, completed BS in biomedical engineering (Q) at University of California, Davis.
4.		Alia Sabur (1989-)	17	BS applied mathematics | 2003 MS materials science and engineering (age 17) PhD materials science and engineering (age 18)		Completed BS (2003) in applied mathematics from Stony Brook University at age 14; MS (2006) and PhD in materials science and engineering at Drexel University; professor of mathematics at age 19.

(add)

Lawyers | Youngest

The following gives a listing, culled from the above bachelors or above general listing, of the known youngest "law school" graduates:

#	IQ	Person	Age	Degree[s]	IQ estimates	Description
1.		Karl Witte (1800-1883)	16	LLD (PhD in law)		
2.		Stephen A. Baccus (1969-)	16	BS computer science JD (age 16) | 1985 MS computer science (age 18) PhD neuroscience (age 29)	IQ_O=190	Entered University of Miami's law school at 14, graduating at 16, making a name for himself by successfully suing the State of New York for its age restrictions on the bar exam after receiving a special waiver in Florida; began practicing law at 17; MS computer science from NYU age 18; made partner in a firm by 19 (Q);
3.		John McClellan (1896-1977)	17	JD (age 17) | 1913		Admitted to the Arkansas Bar Association in 1913 at age seventeen, having previously studied law in his father's office.
4.		Kathleen Holtz (1989-)	18	BS | 2003 JD (age 18)		Holtz started at Cal State LA at age 10; entered UCLA Law at 15, earning a spot on the law review; passed the bar exam, first time around in 2007 (age 18).

(add)

Physicians | Youngest

The following gives a listing, culled from the above bachelors or above general listing, of the known youngest "medical school" graduates:

#	IQ	Person	Age	Degree[s]	IQ estimates	Description
1.		Balamurali Ambati (1977-)	17	BS biology | 1990 MD (age 17)		Completed his BS biology, at age 13 from New York University; MD at age 17 from Mount Sinai School of Medicine; ophthalmology residency at Harvard; in circa 1987; set a goal to become the youngest graduate of medical school after reading about Ben-Abraham's age 18 MD record in the Guinness Book (Q), and did so at age 17 years, 294 days.
2.		Avi Ben-Abraham (1957-)	18	MD | 1976 [?]		Quote: "The youngest to receive a Doctor of Medicine degree is Avi Ben-Abraham (b. Nov 18, 1957, Kfar-Saba, Israel) who graduated with the MD summa *** laude on Mar 4, 1976 from the Univ of Perugia, Italy, at the age of 18 years 3 months" (Guinness Book, 1987); supposedly a dubious and or contested assertion (Q) and or some-kind of high-society genius

						self-promotion scam. (Q)
3.	Sho Yano (1990-)	21	BS biology (age 12) PhD genetics (age 18) MD (age 21)	IQ_O=190		Completed BS in biology with minor in chemistry (age 12), from the Loyola University Chicago; entered combined MD-PhD program, in molecular genetics and cytology (age 13) at the University of Chicago Medical School; completed PhD in molecular genetics and cell biology (age 18); third year medical school student as of 2010.

(add)

PhD | Youngest

The following gives a listing, culled from the above bachelors or above general listing, of the known youngest "medical school" graduates:

#	IQ	Person	Age	Degree[s]	IQ estimates	Description
1.		Karl Witte (1800-1883)	13	Age 9.5 matriculated at Leipzig University Age 12 [Guinness Book], 13, or 14 (Q), PhD in philosophy at University of Giessen, Germany. Age 16 Doctor of Law		A forced prodigy; a product of the efforts of his father Karl H.G. Witte (1767-1845) (Q), who, being disenchanted with social ills, e.g. gambling, sex, etc., believed that most wasted their "god-given intellects"; and set out to see that his son did not waste his; his two-volume *The Education of Karl Witte: Training of the Child* (1819) (Q) details the accelerated raising of Witte. IQ determined (Q) by Lita Hollingworth (1942) to be "in excess of 180".
2.		Kim Ung-Yong (1963-)	15	BS physics (age 12) MS physics (age 14) PhD physics (age 15) PhD civil engineering (age 22)	IQ_O=200-210	Admitted to the physics department of Hanyang University (age 5), BS physics (age 12), MS physics (age 14), and PhD physics (age 15) from Colorado State University (Q); PhD civil engineering (age 22), from Chungbuk National University.
3.		Ruth Lawrence (1971-)	17	BS mathematics (age 13) BS physics (age 14) PhD (age 17)		BS mathematics (1985) at age 13, BS physics (1986) age 14, and PhD (1989) age 17 at the University of Oxford; academic post at Harvard (1990) at age 19, and associate professor with tenure at the University of Michigan in 1997.
4.		Alia Sabur (1989-)	18	BS applied mathematics | 2003 MS (age 17) PhD materials science and engineering (age 18)		Completed BS (2003) in applied mathematics from Stony Brook University at age 14; MS (2006) and PhD in materials science and engineering at Drexel University; professor of mathematics at age 19.
		Sho		BS biology (age 12)		

5.		Yano (1990-)	18	PhD genetics (age 18) MD (age 21)	IQ_O=200	
6.	170 | 416	Norbert Wiener (1894-1964)	18	BS mathematics (age 14) PhD mathematics (age 18)		Completed his BS in mathematics from Tufts College at age 14 and PhD in mathematics from Harvard at age 18
7.		Edith Stern (1952-)	18	BS science | 1967 PhD mathematics (age 18)	IQ_O=200/203	Enrolled in college at 12; associated degree age 14 at Miami-Dade Jr. College; BS in mathematics at Florida Atlantic University (age 15), assistant professor of mathematics at MSU at 15; MS in mathematics at Michigan State University at age 18 (Q); and or PhD in mathematics at age 18. (Q)
8.		Tony Lai (1972-)	18	BS mathematics (age 14) MS computer science (age 15) PhD computer science (age 18)		
9.		Juliet Beni (1993-)	19	BA (age 15) MA (age 17) PhD in psychology (age 19)		
10.		Stephen Wolfram (1959-)	20	PhD particle physics (age 20)		PhD (age 20) at CalTech under Richard Feynman and others.
11.		Eric Demaine (1981-)	20	BS (age 14) MS mathematics (age 15) PhD (age 20)		BS age 14; MS mathematics age 15; PhD age 20; joined the MIT faculty in 2001, at age 20, reportedly the youngest professor in the history of MIT.

(add)

Professors / Chairs | Professors

The following are individuals cited in the media or historical record as being "youngest college professors" and or "chair of departments":

#	IQ	Person	Age	Degree[s]	IQ estimates	Description

1.			Alia Sabur (1989-)	19	BS applied mathematics | 2003 MS materials science and engineering (age 17) PhD materials science and engineering (age 18) Professor of mathematics (age 19) | 2008	Completed BS (2003) in applied mathematics from Stony Brook University at age 14; MS (2006) and PhD in materials science and engineering at Drexel University; professor of mathematics at age 19. [5]
2.			Colin Maclaurin (1698-1746)	19	MS mathematical physics (age 15) | 1715 Professor of mathematics (age 19) | 1717	(Eells 100:27) Scottish child prodigy; entered university of Glasgow at age 11; on 23 Jun 1715, aged 15, he completed MS in mathematical physics, with a thesis "On Gravity and Other Natural Forces" (De Gravitate, aliisque viribus Naturalibus) (Q), wherein he defended Newton's theory of gravity against rival theories, namely Descartes' vortex theory (Q), along the way attempting to digress on certain philosophical aspects of a universal law of gravity; at age 19 became professor of mathematics at Marischal College, Aberdeen; after which he joined the Royal Society, where he met Newton, and went on to further some of Newton's work. (Q) [5]
3.	185 | 53		William Thomson (1824-1907)	22	Glasgow University student (age 10) BS mathematics and natural philosophy | 1845 Chair of natural philosophy (age 22)	At age 10, began his studies at Glasgow University; at age 13, defended Joseph Fourier's 1822 theory of heat over that of Philip Kelland's 1837 heat theory; at age 17, entered Cambridge University, during which year he published first scientific papers; at age 21, completed his BS at Cambridge, graduating as Second Wrangler, during which time he simultaneous unearthed the then unknown and forgotten memoirs of Sadi Carnot's 1824 *On the motive Power of Fire*, therein initiating the science of thermodynamics, along with George Green's 1828 memoir on the mathematics of electricity and magnetism, therein seeding what would become electromagnetic theory, via his soon-to-become friend James Maxwell; at age 22, was chair of natural philosophy at the University of Glasgow.

(add)

Other

The following are some news media hyped prodigies who have completed 2-year associates degrees at a young age:

#	IQ	Person	Age	Degree[s]	IQ estimates	Description

1.	Jacob Barnett (1999-)	15	At age 15 (2014), completed one-year non-degree master's level program at the Perimeter Institute. (Q)
2.			

(add)

Discussion

A salient pattern noticeable, among backgrounds to early finishing students, is the commonality, more often than not, of the parents of such students, having a high end education level themselves, taking the education of students into their own hand, and or giving guidance. Hence, with William Thomson's father, James Thomson, was mathematics professor at Glasgow university, when he entered college. Gilbert Lewis was homeschooled until he entered college, at age 13:

> "Gilbert Lewis was born near Boston, Massachusetts, on 25 Oct 1875. At the age of nine, he was taken by his parents to live in Lincoln, Nebraska. Here, for several years, **he had little formal schooling, enjoying an advantage which he mentioned in his later years as having occurred frequently in the careers of the world's most distinguished men**, that of **having 'escaped some of the ordinary processes of formal education'**. At the age of thirteen, he was admitted to the preparatory school of the University of Nebraska. He graduated from this school into the University of Nebraska, where he remained to complete the sophomore year. In 1893 he transferred to Harvard College, and, after graduating in 1896, spent a year in teaching at Phillips Academy at Andover. He then returned to Harvard for graduate work and received the degree of Master of Arts in 1898 and Doctor of Philosophy in 1899. His thesis was entitled, 'Some electrochemical and thermochemical relations of zinc and cadmium amalgams', and was published jointly with Theodore Richards."
>
> — Joel Hildebrand (1947), "Gilbert Newton Lewis, 1875-1946" (Q)

Alia Sabur's father was an electrical engineer.

Notes

N1. This page originated as a subsection of the 2009 initiated IQ: 200+ page.
N2. Based on the statement: "I taught [Laurent Simons] when he was six and we studied at the level of a 16 year-old" (Wilkes, 2019) (Q), one can calculate a age ratio IQ based "theoretical IQ" of 267 (which, however, is an "inflated IQ" estimate, per reasons that all IQs in the 225+ range are fictional, and that "existive IQ" assignments in the ceiling genius range (c. IQ 170 to 225) require retrospectively-gaged real genius work corroboration). Done, crudely and quickly by Thims (Nov 2019) per request of his mother.

A 2007 video summary of this page by Libb Thims. [7]

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3. List of child prodigies – Wikipedia.
4. Anon. (1982). “At 12, He’s Looking Forward to June and a College Degree” (O), *The New York Times*, May 2.
5. Temitope, Ayanwuyi. (2018). “The Trailblazer: Professor Alia Sabur” (O), AIF Media’s Blog, Jun 16.
6. McFarlan, Donald; McWhirter, Norris. (1990). *Guinness Book of World Records* (Youngest undergraduate, pg. 265; Youngest Professor, pg. 265). Sterling Publishing.
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Further reading

● Anon. (2009). “10 Youngest College Graduates in History: and Where They Are Today”, OnlineDegree.net.
● Stanley, J. and Benbow, C. (1983). “Extremely Young College Graduates: Evidence of Their Success.” *College and University: American Association of Collegiate Registrars and Admissions Officers*, Vol. 58, pgs. 361-71.

θΔics

In existographies, **Yu-Hang Kim** (c.1950-), or “김유항” (Korean), is a Korean engineer and science promoter, noted for []

Overview

In 2015, Kim published *Tango of Science and Humanities*. [1]

In 2016, Yu Hang Kim, together with his co-author and wife Hwang Jin Myung (황진명), a chemist and engineer (Q), in their *Outsiders Struggle for the Search for Truth Against the Seven Pillars of Science*, cite hmolscience and a number of topics, such as Libb Thims, human chemical thermodynamics, human thermodynamics, *Journal of Human Thermodynamics*, and Goethe and his human affinity theory (see: human chemical theory).

The following are a few translations, grouped according to the Google Books key term, e.g. "hmolscience", "thermodynamics", etc., that generated the search return (as page #s are not shown), the gist of which seems to be found in their chapter 10 "Why Did the Founders of Thermodynamics Choose Suicide? Goethe’s Affinity"; a few noted translations are as follows:

Key: hmolscience

여하튼 반평생 대학에서 열역학을 가르쳐 오면서 이러한 분야가 있다는 것을 일찍 알았다면 , 다른 것은 몰라도 열역학을 어려워하는 학생들에게 좀 더 재미있는 강의를 해주지 않았을까 하는 아쉬움이 있다 . 실상 이 러한 분야는 화학과 사회학 , 문학 , 심 리학을 융 합해서 설명하기에는 매우 흥미롭지만 , 그러나 인간 화 학열역학을 가지고 무엇을 예측할 수 있는 보편적인 식 을 만들어낼 수 있을지 아직은 매우 의문스럽다 . 사물과는 달리 ‘마음’을 가지고 있는 인간이라는 ‘분 자’는 수시로 어디로 튈지 모르는데 , 어떻게 화학 , 물리 ,

수학과 같은 과학에서 추구하는 보펀적인 법칙들을 인간분자과학 ((**Hmolscience**) 에서 도출해낼 수 있을지 모르겠 다 . 정치권의 여당과 야당 , 며느리와 시어머니 , 진보와 보수 등 복잡한 방정식 같은 관계를 인간분자과학으로 분석해시 풀 수 있다면 분명 노벨 평화상감이다 .

In any case, if I had learned thermodynamics at half-life college, I knew early on that there was such a field, but I would not have offered a more interesting lecture to students who have difficulty in thermodynamics without knowing anything else. Indeed, this field is very interesting to combine chemistry, sociology, literature, and psychology, but it is still very questionable what can be predicted with human chemical thermodynamics. Unlike things, the "molecular" of human beings with "mind" doesn't know where they go from time to time.

It may be possible to derive Bolfun's laws pursued in sciences such as mathematics from **Hmolscience**. If it can be solved, it is obviously a Nobel Peace Inlay.

Key: thermodynamics

“인간 화학열역학 ((Human chemical thermodynamics)'] r,넌던i,ㅐ n - 란 인간을 하나의 반응하는 화학종이나 분자로 , 그리고 사회체제를 반응하는 화학종들로 이루어진 계로 생각하 여 순수·응용 화학열역학의 논리에 따라 인간의 존재 , 경 험 , 기능을 연구하는 분야이다 .

“Human chemical thermodynamics" is a field that studies human existence, experience, and function according to the logic of pure and applied chemical thermodynamics, thinking of humans as a system of chemical species or molecules that react with social agents.

Key: thermodynamics

분야에서 왕성한 활동을 하여 박식가 (Polymath) 또는 ‘르 네상스맨’이라고 불린다 . 괴테는 ‘마지막 만능천재’, ‘지성의 왕자’, ‘모든 것을 다 아는 사람’,'100가지 학문분야의 학자‘, ‘가장 현명 한 사람’, ‘인류 역사상 가장 높은 IQ' 등으로 불리며 많 은 학자들에게 존경의 대상이 된 인물이다 . 인간을 분자관점에서 보는 학문을 “인간분자과 학 ((human molecular science)이라고 하는데 인간열역 학 ((human thermodynamics), 인간화학 ((human

Active in the field, he is called Polymath or Le Nessenceman. Goethe is called the 'last all-genius', 'prince of intelligence', 'who knows everything', 'scholastic in 100 disciplines', 'the wisest man', and 'the highest IQ in human history'. He is a respected scholar. The study of humans from a molecular perspective is called “human molecular science,” which consists of

chemistry) 인 간물래human physics)의 중요한 세 분야로 이루어져 있 다 . 그런데 괴테가 그 중 인간 화학열역학의 창시자 중 한 사람이라고 하는 이유는 다음과 같다 . 괴테는 스스로 최고의 책으로 꼽은 《친화력 ((Elective Affinities)》을 1809년에 출간했는데 , 이 책에서 그는 인 간을 화학 * 종으로 보고 인간들의 움직임 , 관계 , 상호작용 을 마치 화학 친화력 (chemical affinity) 이 화학반응을 일으 키는 원동력이라는 열역학적 원리에 비유하는 혁명적인 아이디이를 제안했다 . 요즘 사람들 사이의 관계가 좋을 때 케미스트리가 통한다고 하거나 , 또는 남녀관계에서

three important areas: human thermodynamics and human physics. . The reason why Goethe is one of the founders of human chemical thermodynamics is as follows. Goethe published his first book, *Elective Affinities*, in 1809, where he regarded humans as chemical species and regarded human movements, relationships and interactions as if they were chemical affinity. A revolutionary idea is proposed that compares the thermodynamic principle of the driving force behind this chemical reaction. In chemistry these days when people have a good relationship,

잘 어울린다는 의미로 사용되는 “케미’라는 말도 어쩌면 괴테에게 최초의 저작권이 있을 듯하다 . 스웨덴의 화학자 베리만 ((Torbern Bergman) 은 화학종들 을 최초로 A,B,C 같은 표기법을 사용하여 화학반응을 나타낸 화학자이다 . 그는 1775년 (선택적 인력에 대한 논문 ((Dissertation on Elective Attractions)〉을 발표했는데 그 내용 속에 당시로서 가장 큰 화학 친화력 표 (59행 50열) 가 포함되어 있다 . 베리만의 친화력 표에서 (아래 그림 참조) 각 물질들은 심볼로 나타냈고 맨 첫 번째 가로줄 (행) 의 물질 과 바로 그 아래에 놓인 세로줄 (열) 물질의 친화도는 거 리 가 가까울수록 친화도가 높고 멀리 떨어져 있을수록 친 화도가 낮다 .

The word "chem", which is used to match well, may be Goethe's first copyright. The Swedish chemist Torbern Bergman is the first chemist to describe chemically reacting species using notations such as A, B, and C. He 1775 (*Dissertation on Elective Attractions*) It contains the largest chemical affinity table at that time (59 rows and 50 columns) in the Verimann Affinity Table (see figure below). The affinity between the substance and the vertical line (heat) material directly below it is higher as the distance is closer and the lower as it is farther away.

Kim, of note, connects all of this to Gilbert Lewis and his *Thermodynamics and the Free Energy of Chemical Substances*, which he mentions in an historical sense.

Quotes | By

The following are quotes by Hang-Kim:

> “I wonder if it can be made. Unlike things, the ‘molecule’ of a human being with a ‘heart’ does not know where, how to derive from Hmolscience the universal laws pursued in sciences such as chemistry, physics, and ... .”
>
> — Kim Yu Hang (2016), *Outsiders Struggle for the Search for Truth Against the Seven Pillars of Science* (pg. #); alternative translation

The Korean version of American artist Zack Brown’s 2012 “relationship entropy” cartoon from his “Thermodynamics of Love” article, in his Stickmen with Martinis blogspot, which he captions with a take on his view of a relationship as being like a closed thermodynamic system, which Kim pictures in his book. [2]

References

1. Kim, Yu-Hang. (2015). *Tango of Science and Humanities* (과학과 인문학의 탱고). Sejong Books.
2. Kim, Yu-Hang and Jin Myung, Hwang. (2016). *Outsiders Struggle for the Search for Truth Against the Seven Pillars of Science* (과학의 일곱 기둥 편견과 차별에 맞서 진리탐구를 위해 투쟁한 아웃사이더들) (contents) (§10: Why Did the Founders of Thermodynamics Choose Suicide? Goethe’s Affinity; hmolscience, 3+ pgs; thermodynamics, 5+ pgs). Publisher.
3. Brown, Zack. (2012). “Thermodynamics of Love”, Stickmen with Martinis, Feb. 02.

External links

- Yu Hang Kim (김유항) (Korean → English) – DongaScience.Donga.com.

θΔics

In hmolscience, **Yuji Aruka** (c. 1950-) is a Japanese economist noted for his work in econophysics and for a number of joint publications in economic thermodynamics with German physicist Jurgen Mimkes, in which they utilize concepts such as social temperature, a Carnot theory of wealth, among other subjects. [1]

Education

Aruka completed his BA (1972) and MA (1975) in economics at Waseda University and PhD in economics, with a thesis on "Essays on Sraffa Model and its Perturbed Systems of Technology" at Kyoto University in 1999. Aruka currently is an economics professor at Chuo University.

References

1. (a) Aruka, Yuji and Mimkes, Jurgen. (2006). "An Evolutionary Theory of Economic Interaction: Introduction to Socio- and Econo-Physics", *Evolutionary and Institutional Economics Review*, 2(2): 145-60; in *Complexities of Production and Interacting Human Behavior* (ch. 4, pgs. 113-27), 2011.
(b) Mimkes, J., and Aruka, Y. (2005). "Carnot Process of Wealth Distribution" (abs), in *Econophysics of Wealth Distribution*, 2:70-78.

External links

â— Yuji Aruka (faculty) – Chuo University.

θΔics

In thermodynamics, **Yunus Ali Cengel** (1955-) is a Turkey-born American mechanical engineer noted for []

Overview

In 1989, Cengel, American mechanical engineer Michael Boles, published *Thermodynamics: an Engineering Approach*, in later editions of which they began to incorporate social applications (see: Cengel-Boyles human thermodynamics), e.g. they discuss subjects such as war thermodynamics, human efficiency, studying and low-entropy learning, among others. [1]

Quotes | Employed

The following are quotes employed by Cengel:

> "Economic activities are inherently dissipative and governed by the second law of thermodynamics."
>
> — Robert Ayres (c.2000), *Publication*; cited by Cengel (2002) in fourth edition of *Thermodynamics*

Education

Cengel completed his PhD in 1984, with a thesis on "Radiative Transfer in Plane-Parallel Inhomogeneous Media and Solar Ponds", at the mechanical engineering department of North Carolina State University. [2] Currently, Cengel is dean in Mechanical Faculty of Yildiz Technical University, Istanbul, Turkey. And also works with The Scientific and Technological Research Council of Turkey. In addition, he is a consultant for Energy Ministry.

See also

â— List of thermodynamics textbooks that include human thermodynamics

References

1. Cengel, Yunus A. (2010). *Thermodynamics: an Engineering Approach*, 7th ed. McGraw-Hill.
2. Cengel, Yunus A. (1984). "Radiative Transfer in Plane-Parallel Inhomogeneous Media and Solar Ponds", mechanical engineering department of North Carolina State University.

External links

â— Yunus Cengel (faculty) – University of Nevada, Reno.

θΔics

In human chemistry, **Yuri Tarnopolsky** (1936-) is a Russian-born American organic chemist noted for his 2009-2011 ebook *Introduction to Pattern Chemistry*, on the subject of what he calls "econochemistry", in which, building on a number of previously written 55 or so essays (2001-2008), he outlines a "chemistry on the human scale" model of society and economy, arguing, using Greek philosopher Lucretius's atomic theory as a basis, that an "economy is an assembly, separation, and rearrangement of atoms and molecules," and that transitions such as the transformation of Russia from absolute monarchy to constitutional monarchy (1905) to republic (1917) to totalitarian (1936) to chaotic democracy (1991) to opaque authoritarian (2000) is the story of a system consisting of "essentially the same atomic human entities (his term for human molecule)" undergoing a type of chemical isomerization, similar to when propyl alcohol molecule isomers to methyl ethyl ether molecule.

Tarnopolsky speculates on the thermodynamics of these types of processes, on things such as social temperature (which he equates to social freedom), activation energy in relation to money, among other topics. [1]

Pattern Chemistry

In 2009, Tarnopolsky published *Introduction to Pattern Chemistry*, parts 1-3, in pdf form (followed by a part 4, in 2011), wherein he cited Goethe (1809) and Thims (2007), giving his new discovery take on the positions advocated by both. [4]

Thermodynamics | Humanities

In 1979, Tarnopolsky, owing to cold war restrictions, was refused a visa, and being cut off from his desired society with no chance of professional employment, he immersed himself into his studies, which he describes as follows: [3]

> "The introduction of set theory by Georg Cantor in 1880 was one of a kind among major conceptual revolutions. While previously mathematicians had operated with numbers and points, set theory gave them the tool to deal with any objects. Since set can be not only a collection of numbers but also a collection of things, people, or ideas—and even a mix of all three—science acquired the language to talk about everything. With a hindsight, the abstract message of set theory was a promise of universal approach to the world as a whole, like in the times of Aristotle.
>
> About the same time, thermodynamics came up with an idea of a great generality, introducing the way to measure chaos by entropy. Chaos was one of the most ancient pre-scientific concepts of humanity and it appeared quite natural to apply the idea of entropy (Rudolf Clausius, Ludwig Boltzmann) to many areas beyond traditional physics. Thermodynamics turned out to be as universal as mathematics and not just a part of theory of heat engines. For a while it had balked at the phenomenon of life, but in the twentieth century it smoothly covered the controversial area of non-equilibrium phenomena (Ilya Prigogine).
>
> Thermodynamics is applicable to very large collections of more or less similar objects, such as molecules exchanging energy. Scientific publications, scientists, and large assemblies of people are large collections exchanging information. Economics deals with many thousands of entities exchanging value and information. All those areas have already been treated as thermodynamic systems, in spite of the defiantly individualistic human nature."

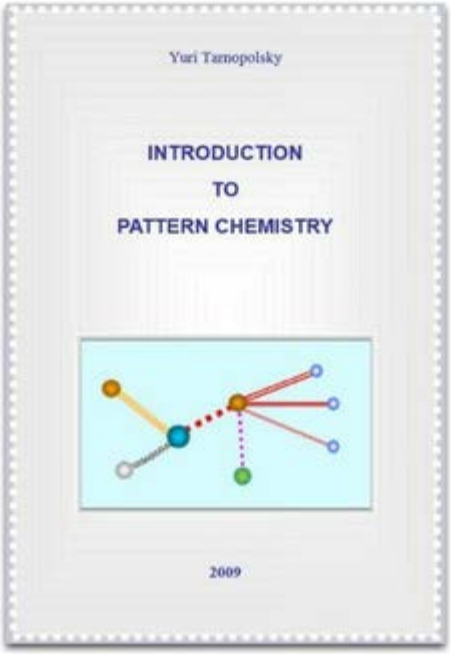

Tarnopolsky's 2009 *Introduction to Pattern Chemistry*, digresses on the human

(add discussion)

chemistry works of Goethe (1809) and Thims (2007), giving his take on the matter, wherein he marvels on Goethe's usage of human chemical reaction theory, albeit remaining ambivalent on the reality or metaphor issue. [4]

Chemistry | Humanities

Tarnopolsky states the following about his early "chemistry" + "humanities" connectivity ideas: [3]

> "Practically all comments to the folk tales in my collection contained references to a book by the Russian ethnographer Vladimir Propp (1971), who systematized Russian folk tales as 'molecules' consisting of the same 'atoms' of plot arranged in different ways, and even wrote their formulas. His book was published in the 30's, when Claude Levi-Strauss, the founder of what became known as structuralism, was studying another kind of "molecules:" the structures of kinship in tribes of Brazil. Remarkably, this time a promise of a generalized and unifying vision of the world was coming from a source in humanities. What later happened to structuralism, however, is a different story, but the opportunity to build a bridge between sciences and humanities was missed. The competitive and pugnacious humanities could be a rough terrain.
>
> I believed that chemistry carried a universal message about changes in systems that could be described in terms of elements and bonds between them. Chemistry was a particular branch of a much more general science about breaking and establishing bonds. It was not just about molecules: a small minority of hothead human 'molecules' drove a society toward change. A nation could be hot or cold. A child playing with Lego and a poet looking for a word to combine with others were in the company of a chemist synthesizing a drug."

(add discussion)

Grenander | Pattern theory

Tarnopolsky, following his chemistry then thermodynamics leads, then found the pattern theory work of Swedish chemist Ulf Grenander (Ñº), which he describes as follows: [3]

> "In 1979 I heard about a mathematician who tried to list everything in the world. I easily found in a bookstore the first volume of *Pattern Theory* (1976) by Ulf Grenander, translated into Russian. As soon as I had opened the book, I saw that it was exactly what I was looking for and what I called 'meta-chemistry', i.e., something more general than chemistry, which included chemistry as an application, together with many other applications. I can never forget the physical sensation of a great intellectual power that gushed into my face from the pages of that book.
>
> Although the mathematics in the book was well above my level, Grenander's basic idea was clear. He described the world in terms of structures built of abstract 'atoms' possessing bonds to be selectively linked with each other. Body movements, society, pattern of a fabric, chemical compounds, and scientific hypothesis—everything could be described in the atomistic way that had always been considered indigenous for chemistry. Grenander called his 'atoms of everything' *generators*, which tells something to those who are familiar with group theory, but for the rest of us could be a good little metaphor for *generating complexity* from simplicity. Generators had affinities to each other and could form bonds of various strength. Atomism is a millennia old idea. In the next striking step so much appealing to a chemist, Ulf Grenander outlined the foundation of a universal 'physical chemistry' able to approach not only fixed structures but also "reactions" they could undergo."

(add discussion)

Tarnopolsky goes on to state that how he also read works of Manfred Eigen on molecular evolution, and the physical picture of the world in general, after which, in 1983, he was put in a Siberian labor camp for "defaming the Soviet

system", then released in 1986, migrating to the US the year after, where he resumed his professional career as a scientists, and began to write and publish, based on his previous notebook writings. He then began to read about complexity and in 1994 met Ulf Grenander, then a professor of mathematics at Brown University, Providence, Rhode Island.

In 1996, Tarnopolsky published *The New and the Different* in print and in 2006 online. [3]

Thims

In 2011, Tarnopolsky's published a review of American electrochemical engineer Libb Thims' versions of human chemistry and human thermodynamics, as follows [4]

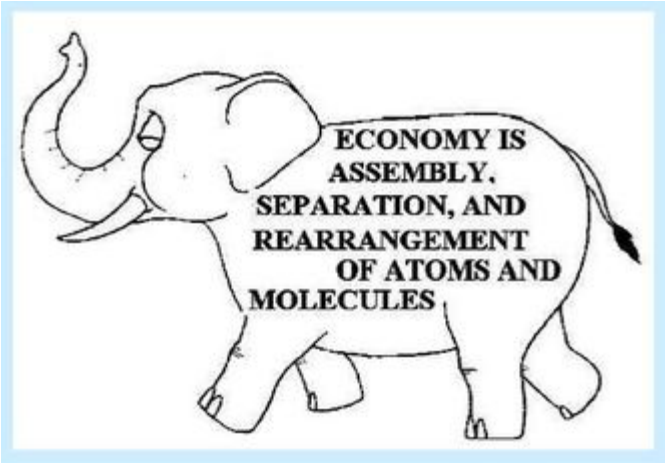

Tarnopolsky's 2011 depiction of "pattern chemistry" or "econochemistry" as he also calls it.

> "The idea that individual humans are atom-like entities and there is a kind of chemistry between social atoms and molecules is very natural, but whether it is more than a metaphor remains uncertain. Anyway, human chemistry has been on the marketplace of ideas for quite a while. For the history of the subject (see: history of human chemistry), see Libb Thims' *Human Chemistry* (EoHT.info) and *Human Thermodynamics* (HumanThermodynamics.com).
>
> The main reason why I abstain from referring to Libb Thims' flamboyant venture other than as to a commendable review of literature is that he, apparently, uses the term chemistry too literally in the sense of molecular chemistry, while I am interested in pattern chemistry. I can only note that the very idea of human thermodynamics as a separate subject looks to me completely sound. Thus, the concept of metabolic cost (see Chapter 3.6) is part of it. Obviously, human interaction is a component of global economy."

In the remainder of his "patter chemistry" theory, Tarnopolsky comments that only wishes to revisit the main chemical ideas of history, in the context of human chemistry, and to avoid the "humming and blinking of electronic present", and in this sense devotes a certain amount of discussion to German polymath Johann Goethe and his 1809 *Elective Affinities*. [4]

Molecular | Hypocrisy

In 1996, Tarnopolsky, in the "Introduction" to his *The New and the Different*, freely posits that chemistry is general applicable to society and that: [3]

> "Small minorities of hothead human 'molecules' can drive a society toward change and nations can be hot or cold."

In 2011, conversely, Tarnopolsky states that: [4]

> "The main reason why I abstain from referring to Libb Thims' *Human Chemistry* is because uses the term chemistry too literally in the sense of molecular chemistry, while I am interested in pattern chemistry."

Here, we see Tarnopolsky being a hypocrite: when he refers to people as molecules and societies being hot or cold, its OK—supposedly, because it's just metaphor—but when anyone else states that people are in fact, no metaphor, molecules, yes societies have temperatures, being respectively "hot" or "cold" gauged by social thermometers, no metaphor, and that thermodynamics quantifies all of this, it becomes nothing but flamboyancy?

Education

The following outlines Tarnopolsky's educational upbringing: [3]

> "I became a dedicated chemist in my teens after I had seen a demonstration of chemical experiments, arranged at a local college for six-graders. I was hypnotized by chemical names, strange formulas, and miraculous change of color right before my eyes. Soon I was more or less familiar with the high school chemistry, very much ahead of the curriculum. Yet I was open to many other things, not necessarily bordering with chemistry. After high school I even considered psychiatry as my future career. I took up chemistry, however, and joined the Soviet academe as a professor of chemistry in Krasnoyarsk, a large city in Siberia. My bookshelves were stuffed with books on chemistry and psychiatry, but there were also physics, biology, mathematics, logic, Aristotle, Lucretius, Descartes, utopian literature. I devoured all classics of world literature."

Tarnopolsky, in more detail, completed his undergraduate work at Kharkov Poitechnicum, completed his PhD at Moscow Mendeleyev Institute, after which he taught chemistry at Krasnoyarsk Institute of technology. In 1983, he became a "refusenick activist", was arrested and sent to a Siberian labor camp in Chita for three years. In 1987, he immigrated to American and began working as an industrial research chemist. Tarnopolsky retired in 1999, after which he began working in the field of pattern theory, a research group founded at Brown University by Ulf Grenander in 1972, which is a type of computer algorithm based applied mathematics that looks for formation patterns, in generalized complex systems, similar to the formation of molecules from atoms connected by bonds. [2]

Religion

Tarnopolsky, in his 1993 reflection book *Memoirs of 1984*, about his days in the Siberian concentration camp, is described by Publishers Weekly as a "Ukrainian-born Jewish chemistry" and in the book he describes how he "finally embraces Judaism through rationalism". Tarnopolsky, in this memoir, cites God 11+ times, the following being a few examples: [5]

> "It was only much later that I learned about the Jewish tradition that strongly opposed any deliberate harm to the body. At the same time, the Jews had their own martyrs, who could sometimes prevent terrible death by repenting or converting. When one believes in God, victory and defeat are unimportant." (pg. 30)
>
> "I had always respected physicists, viewing them as superior beings and mediators between God and us mere mortals. Gary was the first theoretical physicists I had ever met, and he did not disappoint me. In my memory, he stands as that mediator because was my first teacher of Jewish history." (pg. 104)
>
> "Heresy could be detected only with the yardstick of orthodoxy. Soviet orthodoxy was shaped as a quasi-religion with Marx as God and the Spirit, Lenin as God the Father, and the party as collective God the Son." (pg. 135)

In his online profile, Tarnopolsky summarizes things as follows: [2]

> "My very first religious book in atheist Russia was the Buddhist *Dhammapadha*. It deeply imprinted me for life. Five years later, at the age of 25,I accidentally found the Gospel. I managed to get access to the Bible only at 40. At 45, I learned about the Judaism ofTalmud. 'Jew' in Soviet Russia meant not religion but ethnicity."

(add)

-

Quotes | By

The following are quotes by Tarnopolsky:

-

> "On human molecules (2016): *Hmolpedia* (eoht.info), an *A to Z Encyclopedia of Human Thermodynamics, Human Chemistry, and Human Physics*, is **a unique, rich venture**."
>
> — Yuri Tarnopolsky (2016), *Essays a la Montaigne* (pg. 180)

-

References

1. (a) Tarnopolsky, Yuri. (2009). *Introduction to Pattern Chemistry*. SpiroSpero.net.
(b) 55 essays (2001-2008) – SpiroSpero.net.
2. (a) Yuri Tarnopolsky (biography) – SpiroSpero.net.
(b) Pattern Theory Group – Brown University.
3. Tarnopolsky, Yuri. (1996). *The New and the Different* (Introduction; foreword (2006); pgs. 11-12). Scribd.com, 2011.
4. Tarnopolsky, Yuri. (2009). *Introduction to Pattern Chemistry* (parts: 1-3, 353-pgs (2009); part 4, 132-pgs (2011)) (Thims, 154-55). SpiroSpero.net.
5. Tarnopolsky, Yuri. (1993). *Memoirs of 1984* (Amz). University Press of America.

Further reading

â— Young, Cathy. (1994). "Review: One Year in the Life of Yuri Tarnopolsky", The New York Times, Feb 06.
â— Tarnopolsky, Yuri. (2003). *Molecules and Thoughts* (pdf). Brown.edu.

External links

â— Yuri Tarnopolsky (about) – AngelFire.com.
â— Tarnopolsky, Yuri (1936-) – WorldCat Identities.

θΔics

In human chemistry, **Yves Guyot** (1843-1928) was a French economist noted for his 1903 to 1918 human molecular theory descriptions.

Overview

In 1903, Guyot used the term molécules humaines (the English translation being 'human molecules'), referring to a person as a molecule. The quote is: [1]

> "If only wheat and cattle, its industry cannot rely on its domestic market, if it is active, one cannot believe that the future belongs to stagnant civilizations. It belongs to civilization in which the fluid human molecules roll ever on each other."

Likewise, in his 1918 book *The Guarantees of Peace*, he states: [2]

> "It is the rapid evolution of human groups: the large current conflict is between those who seek to freeze the situation and those who adapt to fluid civilizations, whose molecules are in constant movement."

References

1. Guyot, Yves. (1903). "La These de M. Balfour" ("The Thesis of Stuart Balfour"), *The Monthly Review* (molécules humaines, pg. 11). 13: 9-16.
2. Guyot, Yves. (1918). Les garanties de la paix: ptie Lesleçons du passé (*The Guarantees of Peace: the Lessons of the Past*) (molécules, pg. 165). F. Alcan.

External links

â— Yves Guyot – Wikipedia.

θΔics

In hmolscience, **Zachary Hatch** (c.1969-) is an American thinker noted for his *circa* 1991 hypothesis that that historical dissolution of empires—in which political power is first consolidated into large, centralized regimes and then ultimately dispersed into many smaller nation states—can be understood on the basis of the second law of thermodynamics.

Hatch's proposal was made into one of American physicist Alan Lightman's 1992 discussion questions (see: homework problems) which he says should be either solved by students as part of their coursework in a one semester course or done as part of an open classroom discussion. [1]

Education

Hatch graduated from Princeton University in 1991; alma mater of the famous 1950s Princeton Department of Social Physics.

References

1. Lightman, Alan. (2000). *Great Ideas in Physics: the Conservation of Energy, the Second Law of Thermodynamics, the Theory of Relativity, and Quantum Mechanics* (§: Conservation Laws and Human Freedom, pgs. 35-36; §: The Second Law Applied to Human Society, pgs. 110-114; Appendix B: Problems and Discussion Questions, pgs. 253-; Zachary Hatch, pg. 275). McGraw-Hill.

θΔics

In human thermodynamics, **Zack Brown** (c.1992-) is an American cartoon artist noted for his 2012 cartoon philosophy take on entropy and relationships.

Overview

In 2012, Brown, in his art thermodynamics style cartoon "Thermodynamics of Love" cartoon (see: thermodynamics of love), from his Stickmen with Martinis blogspot, a cartoon series concerning politics, philosophy, and randomness, showing two stickpeople discussing their relationship in thermodynamic terms, wherein the guy tells his girlfriend (as illustrated blow): [1]

> "I just feel that our relationship's entropy has increased."

In more detail, Brown states:

> "Read this [second law, Simple Wikipedia] and this [thermodynamic entropy, Simple Wikipedia] before going further (Don't worry--they're in Simple English).
>
> A relationship is a lot like a closed thermodynamic system. Starting off there is much potential for success, almost unbridled potential. You could have just found the person you were always meant to be with, and each new fact and intricacy of that person adds to that mystique. Entropy decreases.
>
> With time, however, as in a closed thermodynamic system, entropy increases and heat dissipates. That's not to say that feelings do not get stronger, but the relationship can tend toward a sort of normalcy and complacency. The system needs an outside source of energy to push it onward and decrease entropy [see: entropy increase] once more.
>
> But should that added, outside energy [see: coupling] be necessary? Is it worth the added energy to work toward something that will eventually even out once again? Or should people just accept the increased entropy, letting systems settle [see: equilibration] and relationships end?"

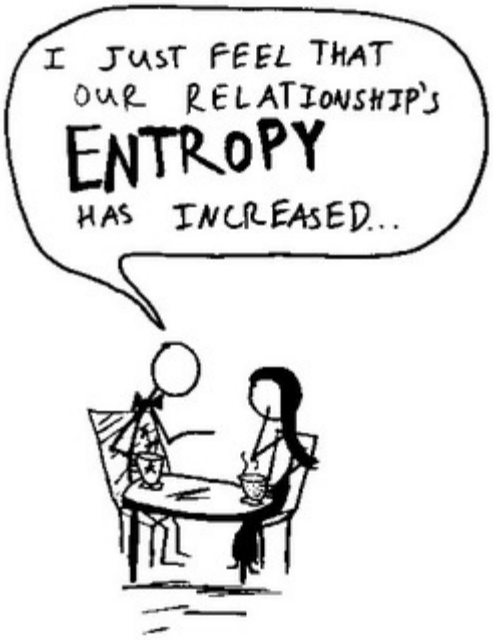

The cartoon is in the neighborhood of truth, in the sense of (a) entropy being "transformation content" in the original sense of the term; (b) love being a chemical reaction (see: love the chemical reaction); and (c) the condition for chemical equilibrium, meaning the reverse reaction (AB → A + B) (breakup) is equally favored as the forward reaction (A + B → AB) (formation), is that of maximal entropy, as first announced famously by German physical chemist August Horstmann in 1873.

Education

Brown currently is studying history at Samford University, Alabama.

References

1. Brown, Zack. (2012). "Thermodynamics of Love", Stickmen with Martinis, Feb. 02.

Further reading

â— Brown, Zack. (2011). “Chemical Bonds”, Stickmen with Martinis, Sep. 11.
â— Brown, Zack. (2012). “Race”, Stickmen with Martinis, Mar. 18.

External links

â— Zack Brown – Google+.

θΔics

In hmolscience, **Zack N. Zwiebel** (c.1990-) is an American philosopher noted for []

Overview

In circa 2012, Zwiebel began outlining a semi new age / semi scientific "social field biophoton energetics" model of social interactions, a sort of Eric Berne "games people play" (1964) model, so to say, with photon, energy, and entropy stylized additions; the following is a social interaction diagram, seemingly depicting some type of photon bond or photon exchange force model:

The following is a conceptual image of his "social field biophoton energetics" model:

In 2015, Zwiebel, in his "Love & Dating How did This Take so Long to Notice?", blogged about how he began to newly see relationships in a photon interaction style of viewing things. [2]

Religion

Zwiebel was a Buddhism philosopher, prior to turning to his light-energy play interaction model of spiritual enlightenment.

Quotes

The following are noted quotes:

> "Absences of play between people may lead to the inability to develop social bonds."
>
> — Zack Zwiebel (c.2014), *Natural Social:*

the Science of Biophotons and Play

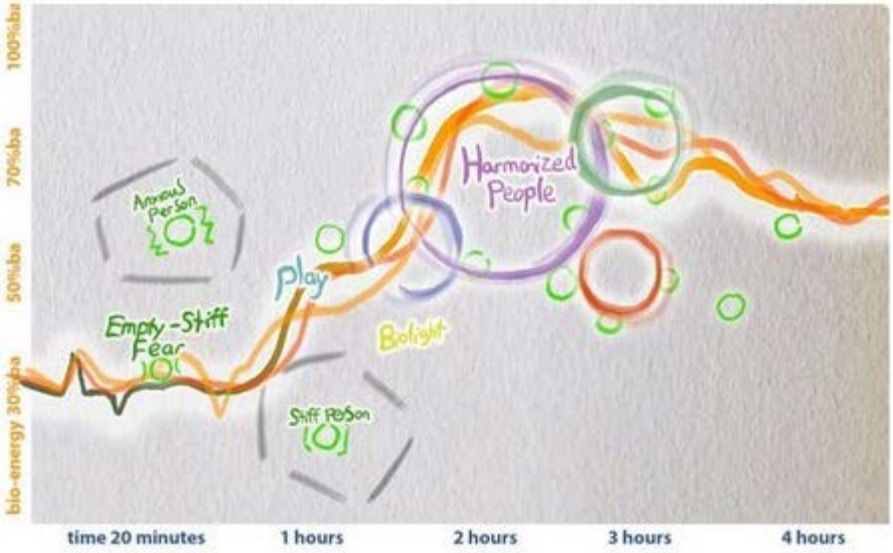

A 2016 Tweeted diagram of Zwiebel's conception bio-energy play diagram per unit time. (O)

"We are fish that play in a sea of light."

— Zack Zwiebel (c.2015), tagline (O) of Light Play Evolution WordPress blog.

References

1. Zwiebel, Zack N. (c.2014). *Natural Social: the Science of Biophotons and Play* (social bonds, pg. 15) (pdf). ZackZwiebel.com.
2. Zwiebel, Zack N. (2015). "Love & Dating How did This Take so Long to Notice?" (O), Light Play Evolution, WordPress, Nov 11.

External links

- Home – ZackZwiebel.com.
- Zack N Zwiebel – YouTube.com.
- Zack Zwiebel – Twitter.com.

θΔics

In information theory, **Zeilinger's principle** states that any elementary system carries just one bit of information. This principle was put forward by Austrian physicist Anton Zeilinger in 1999 and subsequently developed by him to derive several aspects of quantum mechanics. Some have reasoned that this principle, in certain ways, links thermodynamics with information theory. [1]

References

1. Daintith, John. (2005). *Oxford Dictionary of Science* (5th ed.). Oxford: Oxford University Press.

θΔics

In religio-mythology, **Zeitgeist** (TR:5) is was a viral Internet film, released on 18 Jun 2007, produced by Peter Joseph, the first part of which being focused on mythical underpinnings of religion, generally based on the scholarship and consultation of mythologist Dorothy Murdock, supported by publications of Jordan Maxwell and Gerald Massey, the gist of which is that Jesus is a rewrite of Horus, all of which is based on astro-theology; the second part argues that 9/11 was an inside job, orchestrated by the US government; the third part of which argues that Federal Reserve System is controlled by a small cabal of international bankers who conspire to create global calamities to enrich themselves.

An image from a 2009 article (Q) on the **Zeitgeist Movie**, which summarizes the three parts of Zeitgeist: part one: Jesus is a fake god (a rewrite of Horus); part two: 9/11 was a planned demolition (planned by the US government); part three: the economy is controlled be a few bankers (who manipulate things for their own financial gain).

Overview

In c.2006, Peter Joseph began to collaborate with Dorothy Murdock in an effort to turn the Christ myth theory, such as presented in her *The Christ Conspiracy* (1999) and *Sons of God: Krishna, Buddha, and Christ Unveiled*, into a simple to digest and thought provoking Internet video, one that would have mass appeal, telling the basic story, in calm fashion, that the Christ story is a based on an older motif, the Horus story, all of which is astro-theology in framework. [1]

On 18 Jun 2007, the film was uploaded to he web, after which it began to be get tens of millions of views, becoming viral shortly thereafter.

In 2010, Murdock published "The Zeitgeist Movie Companion Source Guide", a pdf booklet of source that goes into more detail of the scholarship behind the film. [2]

The film, in the decade to follow, worked to turn a good percentage of US citizens from being believers into skeptics, agnostics, and or atheists.

Foreman | Craig

In c.2010, Mark Foreman, a Christian apologeticist and philosopher, after one of his Liberty University philosophy classes, was approached by one of his students, who vented his confused feelings about Peter Joseph's Christ myth theory advocating film Zeitgeist (2006), as follows: [1]

> "**Zeitgeist** claims that Christianity is a total fiction — that it was completely made up from a combination of other religious claims—and that all world religions are just different expressions of sun worship. [blurting] They really backed up their claims with all sorts of evidence, I don't know what to believe anymore. **Is it true? Is all this stuff I was taught in church just a big hoax?**"

In 2012, Foreman, in reaction to this student query incident, penned "Challenging the Zeitgeist Movie: Parallelomania on Steroids", wherein he asserts that the following statement by Dorothy Murdock (2010), the primary religio-mythology scholar behind the film, is a "poorly reasoned" argument that does not "hold up" under close scrutiny:

> “Indeed, it is my contention, and that of others deemed ‘Jesus mythicists’, that the creators of the gospel tale picked various themes and motifs from the pre-Christian religions and myths, including and especially the Egyptian, and wove them together, using also the Jewish scriptures, to produce a unique version of the "mythos and ritual." In other words, the creators of the Christ myth did not simply take an already formed story, scratch out the name Osiris or Horus and replace it with Jesus. They chose their motifs carefully, out of the most popular religious symbols, myths and rituals, making sure they fit to some degree with the Jewish "messianic scriptures" as they are termed, and created a new story that hundreds of millions since have been led to believe really and truly took place in history. We are convinced, in other words, that **‘Jesus Christ’ is a fictional character created out of older myths, rituals and symbols**.”

Foreman's article soon became cited in discussions and debates by William Craig (Q), among others, as a scholarly refutation of the Zeitgeist claims; the following being one example:

> “The assertion that ‘Osiris’ son Horus has the exact same bio of Jesus’ is just based on misinformation. This is **garbage that’s spread on the Internet**, that just isn’t true. What’s funny about this is that these people who say this kind of thing, never seem to quote the primary sources. They tell you that this is in **Osiris OR Horus**, but you never see the primary sources quoted. When you look at the primary sources, you find out that they’re not at all parallel.”
>
> — William Craig (2012), response (Q)(Q) to audience member who asks about the Osiris/Horus and Jesus parallel, Feb 24

In 2013, Foreman gave a talk, the audio (Q)(Q) of which is available, wherein he tries to debunk Zeitgeist, amid watching clips of the film.

Dawkins

In Apr 2013, Richard Dawkins Tweeted (Q) about the Zeitgeist Horus = Jesus assertion, per reason that he was “doubting the story”:

> “Comparisons often made of Jesus with Horus, Dionysus, Krishna etc. Any real scholars out there confirm each one?”
>
> — Richard Dawkins (2013), Tweet (Q), Apr 10

The Tweet was responded to by Dorothy Murdock (Q), among others.

Other

In Sep 2013, Mary Sharp, of Biola University, during their “Apologetics Conference on Zeitgeist and *Religulous*”, gave a talk on how to go about refuting the “Horus equals Jesus” assertion; and example quote of which is:

> “If watch ***Zeitgeist*** the movie, it could rock your world, as far as your faith.”
>
> — Mary Sharp (2013), “Apologetics Conference on Zeitgeist and *Religulous*”, Sep 14 [3]

Sharp goes onto to talk about how the best way to refute the arguments for Zeitgeist is to keep asking for the "primary sources"; specifically, if someone comes up and says the following:

> Statement: “Worshiping Jesus Christ is like worshiping Horus!”Response: “Well, where are you getting that from? What is your ‘source’ for that?”

the believer is supposed to respond with the followup response (shown); which is followed by a discrediting and slurring any scholar who supports Zeitgeist, per reason that that is "not a primary source" or that is not a "real scholar".

See also

- *The God Who Wasn’t There* (2005) (Q)(Q) | Brian Flemming
- *Religulous* (2008) | Bill Maher

Quotes

The following are related quotes:

> “You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.”
>
> — Buckminster Fuller (c.1970), Zeitgeist movement related (Q) quote

References

1. (a) Murdock, Dorothy M. (1999). *The Christ Conspiracy.* Adventures Unlimited.
(b) Murdock, Dorothy M. (2004). *Sons of God: Krishna, Buddha and Christ Unveiled.* Adventures Unlimited.
2. Murdock, Dorothy M. (2010). “Zeitgeist: the Movie: Companion Source Guide” (pdf), ZeitgeistMovie.com.
3. Sharp, Mary. (2013). “Biola University Apologetics Conference on how to Refute the "Horus = Jesus" connections of Zeitgeist (2007) and Bill Maher’s Religulous (2008)” (Q). YouTube, Biola University, Sep 14.

Videos / Threads

- Zeitgeist Debunked (2019) – ReligioMythology, Reddit, Mar 8.

External links

- Zeitgeist (film series) – Wikipedia.

θΔics

In existographies, **Zeno of Citium** (c.334-c.262BC) (IQ:170|#317) (Cattell 1000:859) [RGM:792|1,500+] (GPhE:#) (CR:44) was a Greek natural philosopher, noted for employing a determinism philosophy of action, particularly in regards to crime and punishment, and also the founder of stoicism, a philosophy which holds that the wise man should be free from passion, unmoved by joy or grief, and submissive to natural law and or one apparently or professedly indifferent to pleasure or pain.

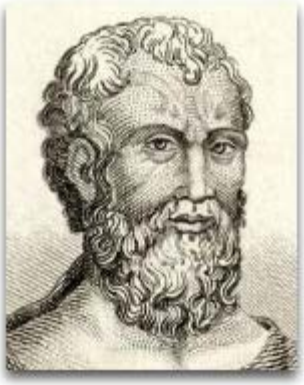

Soul | Fire

Zeno, unique among soul theorists, proposed that the soul or mind was fire, or something to this effect; the following are representative quotes:

> "Crates and Dicaearchus were of opinion that there was **no soul at all**, but that the body thus stirs by a natural motion; Plato, that it was a substance moving of itself; Thales, a nature without repose; Asclepiades, an exercising of the senses; Hesiod and Anaximander, a thing composed of earth and water; Parmenides, of earth and fire; Empedocles, of blood, e.g. "He vomits up his bloody **soul**" (Sanguineam vomit ille **animam**). Posidonius, Cleanthes, and Galen that it was heat or a hot complexion: "their vigor of fire and of heavenly race" (Ignens est ollis vigor, et coelestis origo). Hippocrates, a spirit diffused all over the body; Varro, that it was an air received at the mouth, heated in the lungs, moistened in the heart, and diffused throughout the whole body; **Zeno, the quintessence of the four elements** ["I know not," says Mr. Coste, "where Montaigne had this; for Cicero expressly says that this quintessence, or fifth nature is a thought of Aristotle, who makes the soul to be composed of it; and that **Zeno thought the soul to be fire**." (Cicero, *Tusc. Quaes*, i.9). After this, Cicero adds, "that Aristotle calls the mind, which he derives from that fifth nature entelechia [entelechy], a new-coined word, **signifying a perpetual motion**." Though Montaigne has copied these last words, in what he proceeds to tell us of Aristotle, he censures him for not having spoken of the origin and nature of the soul. But had he only cast his eye upon what Cicero had said a little before, he would have been convinced that Aristotle had taken care to explain himself concerning the origin of the soul, before he remarked the effect of it If he has not thereby fully demonstrated what the nature of it is, Zeno has not given us much better light into it when he says, **"the soul or mind seems to be fire"**; and it would not be difficult to show that in this article the other philosophers have not succeeded better than Zeno and Aristotle]; Heraclides Ponticus, that it was the light; Zenocrates and the Egyptians, a mobile number; the Chaldeans, a virtue without any determinate form: "A certain vital habit in man's frame, which harmony the Grecian sages name" (Habitum quemdam vitalem corporis ease, Harmonium Grseci quam dicunt.) Let us not forget Aristotle, who held the soul to be that which naturally causes the body to move, which he calls entelechia [entelechy], with as cold an invention as any of the rest; for he neither speaks of the essence, nor of the original, nor of the nature of the soul, but only takes notice of the effect. Lactantius, Seneca, and most of the dogmatists, have confessed that it was a thing they did not understand. Heraclitus, who was of opinion that every being was full of souls and demons, did nevertheless maintain that no one could advance so far towards the knowledge of the soul as ever to arrive at it; so profound was the essence of it."
>
> — Michel Montaigne (1580), "Apology for Raymond Sebond" [1]

> "**Zeno**, according to Cicero, supposed the soul to be an igneous substance, from whence he concluded it destroyed itself."
>
> — Note Annotator (1889), in Baron d'Holbach's *The System of Nature* (pgs. 129-130)

> "**Zeno** held that the **soul is fire**. Zeno's doctrine of the elements, however, was such that in the first place he did not connect this fifth element, from which his predecessors thought sense and intellect were produced,

with the four original constituents of things: for he postulated fire as that element which produces everything, both intellect and sense. Zeno and almost all of the Stoics regard the supreme god as aether endowed with mind, by which all things are ruled. Cleanthes, a disciple of Zeno, thinks that the **sun rules and governs affairs**. Zeno the Stoic says that the soul [ψυχη] has eight parts, dividing it into the governing part and the five senses, the power of speech and the generative power."

— Ernest Burton (1918), *Spirit, Soul, and Flesh* (pg. 99)

(add)

God

In 45BC, Cicero, in his *On the Nature of the Gods*, had the following to say about Zeno's views on god: [10]

"In now come, Balbus, to the philosophers of your school. **Zeno** proposes that the 'law of nature' is divine, with the power of enjoining what is right and of forbidding the opposite. How he lends life to this law—and we certainly require a god to be a living creature—we fail to understand. In other books, he states his belief that there is a kind of reason which pervades the whole of nature and is endowed with divine power. The same power he assigns also to the stars, and to the years and months and changing complexion of the years."

In 1997, Patrick Walsh, in end note commentary on this, states: [10]

"The stoics use the term 'law of nature', which they derive from Heraclitus, as an alternative title for Pronoia, Destiny, or Logos, the range of labels used to present the stoic god, which is the fiery *pneuma* directing the course of the world."

(add)

Heraclitean physics

Zeno was an adherent of the physics of Heraclitus, i.e. "Heraclitean physics" of flux-fire physics, the gist of which is as follows: [4]

"The universe, in Zeno's view, is god a divine reasoning entity, where all the parts belong to the whole. The universe, based on Heraclitean logic, contains a divine artisan-fire, which foresees everything, and extending throughout the universe, must produce everything. He defines nature by saying that it is artistically working fire, which advances by fixed methods to creation. For he maintains that it is the main function of art to create and produce, and that what the hand accomplishes in the productions of the arts we employ, is accomplished much more artistically by nature, that is, by artistically working fire, which is the master of the other arts.

This divine fire, or aether, is the basis for all activity in the universe, operating on otherwise passive matter, which neither increases nor diminishes itself. The primary substance in the universe comes from fire, passes through the stage of air, and then becomes water: the thicker portion becoming earth, and the thinner portion becoming air again, and then rarefying back into fire. Zeno, following Heraclitus, adopted the view that the universe underwent regular cycles of formation and destruction. The nature of the universe is such that it accomplishes what is right and prevents the opposite [what is wrong], and is identified with unconditional fate, while allowing it the free will attributed to it."

Individual souls, according to Zeno, as summarized by Cicero, are part of the same fire as the world-soul of the universe. [5]

Slave stealing anecdote

See main: Slave stealing parable

Zeno, who did not believe in slavery but nevertheless had a slave, is reported to have caught him stealing and set about giving him a beating for punishment. Knowing Zeno's creed, the slave is reported to have said: [1]

> "But you should not punish me for stealing. The destiny of the ages, over which I have no control, has determined that I should steal."

To which Zeno is supposed to have answered:

> "The destiny of the ages, over which I have no control either, has also determined that I should beat you for it."

This is what America physical organic chemist George Scott, a human molecular philosopher, calls physical determinism. He cites this anecdote of Zeno as the best known ancient deterministic system of philosophy. [2]

Stoicism

In 300BC, Zeno is credited with having founded the school of philosophy known as "stoicism", named so in the 14th century from the Greek *stoikos*, literally, of the portico, from Stoa (*Poikile*) the Painted Portico, portico at Athens where Zeno taught, a philosophy holding that the wise man should be free from passion, unmoved by joy or grief, and submissive to natural law and or one apparently or professedly indifferent to pleasure or pain.

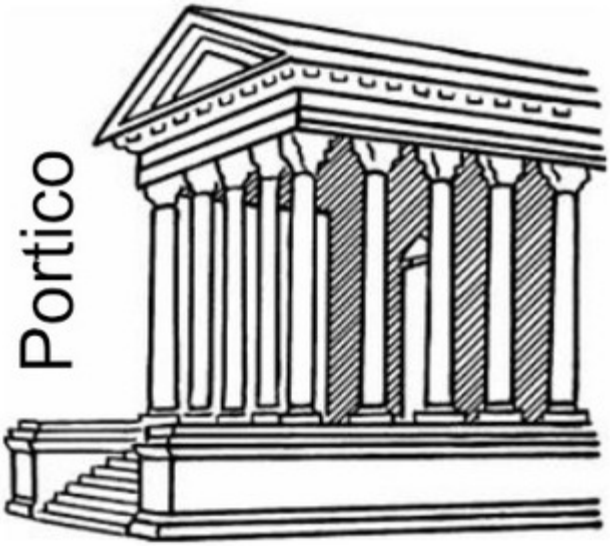

A Greek "unmovable" portico (or entrance porch) to a temple, the root of the term "stoicism".

In 300BC, Zeno is credited with having founded the school of philosophy known as "stoicism", named so in 14th century retrospect, from the Greek *stoikos*, literally, of the portico, from Stoa (*Poikile*) the Painted Portico, portico at Athens where Zeno taught, a philosophy holding that the wise man should be free from passion, unmoved by joy or grief, and submissive to natural law and or one apparently or professedly indifferent to pleasure or pain. [6]

Stoics were concerned with the active relationship between cosmic determinism and human freedom, and the belief that it is virtuous to maintain a will (called *prohairesis*) that is in accord with nature. [7]

Stoicism had a number of adherents, including Marcus Aurelius (121-180), lasting until 529 during which time emperor Justinian I (482-565) shut down all philosophical schools, so that Christianity would have no opposition. [8]

Atomic theory | Stoicism

The stoic philosophers, according French quantum chemist, quantum biochemist, and atomic theory historian Bernard Pullman (1998), gave the "clearest expression of opposition to the teachings of the atomists." [9]

Quotes | By

The following are quotes by Zeno:

> "Fate is the endless chain of causation, whereby things are; the reason or formula by which the world goes on."
>
> — Zeno of Citium (c.275BC) [3]

> "The goal of life is living in agreement with nature."
>
> — Zeno of Citium (c.275BC) [3]

> "Man seems to be deficient in nothing so much as he is in time."
>
> — Zeno of Citium (c.275BC) [3]

> "All things are parts of one single system, which is called nature; the individual life is good when it is in harmony with nature."
>
> — Zeno of Citium (c.275BC) [3]

See also

â— Zeno of Elea (495-430BC) Greek motion paradox philosopher

References

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2. Scott, George P. (1985). *Atoms of the Living Flame: an Odyssey into Ethics and the Physical Chemistry of Free Will* (pg. 11). University Press of America.
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4. Physics | Zeno of Citium – Wikipedia.
5. (a) Cicero, *Tusculanae Quaestiones*, i. 9, *de Natura Deorum*, iii. 14; Diogenes Laërtius, vii. 156.
(b) Physics | Zeno of Citium – Wikipedia.
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9. (a) Pullman, Bernard. (1998). *The Atom in the History of Human Thought* (pg. 68). Oxford University Press.
(b) Bernard Pullman – Wikipedia.
(c) Stenger, Victor J. (2013). *God and the Atom: from Democritus to the Higgs Boson: the Story of a Triumphant Idea* (pg. 44). Prometheus Books.
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11. (a) Montaigne, Michel. (1580). "Apology for Raymond Sebond", *Works of Raymond Sebond, Volume Two* (translator: Orlando Wright) (§:12:117-344; quote, pg. 260-62). W. Vaezie, 1862.
(b) Montaigne, Michel. (1580). "An Apology for Raymond Sebond"; in: *The Complete Works* (translator: Donald Frame) (Varro and Aristotle, pg. 435). Everyman's Library, 2003.

External links

â— Zeno of Citium – Wikipedia.

θΔics

In existographies, **Zeno of Elea** (495-435BC) (IQ:155|#475) (Cattell 1000:726) (Stokes 100:6) (Eells 100:100) (GPhE:#) (ACR:12) (CR:19) was a Greek-Italian philosopher, was one of three main philosophers of the Eleatic school, founded by Parmenides, whose third member includes Melissus (500-440BC) — whose essential tenets were the denial of change, denial of the void (or non-being), denial of movement, in support of the overarching postulate of continuity of being (or being oneness), or something along these lines — generally known for his famous paradoxes, e.g. Achilles and the tortoise, which aimed to repudiate plurality and change, and thus motion.

Quotes | On

The following are quotes on Zeno:

> "The disciples of Parmenides and Melissus [e.g. **Zeno of Elea**] have rejected the existence of movement. Aristotle labeled them immobilists and antiphysicists: immobilists because of paralysis, and antiphysicists because movement is the very essence of nature, and to pretend, as they did, that nothing moves is tantamount to abolishing nature."
>
> — Sextus Empiricus (c.200AD) [1]

See also

â— Zeno of Citium (335-260BC) | Stoicism founder

References

1. Pullman, Bernard. (1998). *The Atom in the History of Human Thought* (pg. 21). Oxford University Press.

External links

â— Zeno of Elea – Wikipedia.

θΔics

In thermodynamics, **zeroth law of thermodynamics** states that two bodies in thermal equilibrium with a third body are also in equilibrium with each other. [1] The zeroth law is often considered as the "equilibrium principle". [2] The zeroth law is the basis of thermometry. [8]

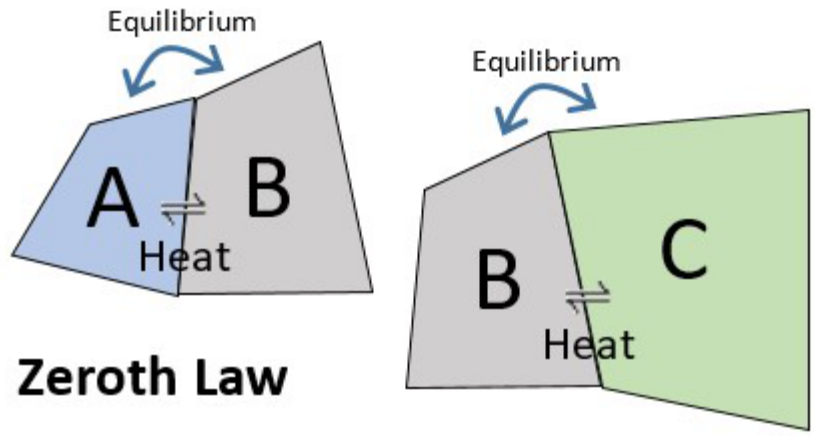

The gist of the **zeroth law**, namely that if body A is in an equilibrium of heat exchange with body B, as indicated by say volume markings on body B, if B were a body of mercury, as in a thermometer, and if B were in heat equilibrium with C, of the the same markings, then A and C are in the same heat equilibrium.

History

One of the first to stated the basics of the zeroth law was Scottish physicist and chemist Joseph Black. In the late 18th century, to cite one example, in his "Lectures on the Elements of Chemistry" delivered at the *University of Edinburgh*, Black outlined the view that "a second improvement in our knowledge of heat, which has been attained by the use of thermometers, is the more distinct notion we have now than formerly, of the *distribution* of heat among different bodies." [3] He continues, "I remarked formerly, that, even without the help of thermometers, we can perceive a tendency of heat to diffuse itself from any hotter body to the cooler around, until it be distributed among them, in such a manner that none of them are disposed to take any more heat from the rest. The heat is thus brought into a *state of equilibrium*." This is one of the first statements of the zeroth law of thermodynamics.

Black continues "this equilibrium is somewhat curious. We find that when all mutual action is ended, a thermometer, applied to any one of the bodies, acquires the same degree of expansion: therefore the temperature of them all is the same, and the equilibrium is universal. No previous acquaintance with the peculiar reaction of each to heat could have assured us of this, and we owe the discovery entirely to the thermometer." He then states, what is now, essentially considered the "combined law of thermodynamics, that "we must therefore adopt, as one of the most *general laws of heat*, that: all bodies communicating freely with each other, and exposed to no inequality of external action, acquire the same temperature, as indicated by a thermometer. All acquire the temperature of the surrounding medium."

In this context of the property thermal equilibria, Black typically is cited in prefix histories on the zeroth law. [4] Most references, however, state that Irish physicist James Maxwell's 1871 law of equal temperatures, stated by Maxwell as:

> "if when two bodies are placed in thermal communication neither of them loses or gains heat, the two bodies are said to have equal temperatures of the same temperature [and] are then said to be in thermal equilibrium."

This was the first formulation of what is now called the zeroth law. [5]

The actual establishment of this argument to the position of a zeroth law, as "two systems in thermal equilibrium with a third system are in thermal equilibrium with each other", was first formulated by Ralph Fowler in 1931. [6] It seems, however, that the actual coining of the term "zeroth law" was done jointly by Fowler and Edward Guggenheim in their 1939 *Statistical Thermodynamics* textbook: [7]

> "The concept of temperature. As a natural generalization of experience we introduce the postulate: *if to assemblies are each in thermal equilibrium with a third assembly, they are in thermal equilibrium with each other*. From this it may be shown to follow that the condition for thermal equilibrium between several assemblies is the equality of a certain single-valued function of the thermodynamic states of the assemblies, which may be called the temperature *t*, any one of the assemblies being used as a 'thermometer' reading the temperature *t* on a suitable scale. This postulate of the 'existence of temperature' could with advantage be known as the ***zeroth law of thermodynamics***."

This seems to be the first use of the term "zeroth law", in the framework of thermodynamics.

References

1. Cengel, Y. & Boles, M. (2002). *Thermodynamics – an Engineering Approach, 4th Ed.* (textbook). New York: McGraw Hill.
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7. Fowler, Ralph and Guggenheim, Eduard A. (1939). *Statistical Thermodynamics: a Version of Statistical Mechanics for Students of Physics and Chemistry* (zeroth law: pg. 56 - coined). Cambridge University Press.
8. Pierre, Perrot. (1998). *A to Z of Thermodynamics* (pg. 328). Oxford University Press.

External links

â— 10+ Variations of the Zeroth Law of Thermodynamics – *Institue of Human Thermodynamics*.

θΔics

In terminology, **zerotheism**, from the Indian *zero*- "0" + Greek *-theism* "god", refers to belief in the existence of zero gods; fully, belief in the existence of bosons (force) and fermions (matter), interacting (Paul Dirac, 1945), belief in the existence of waves (rhythm) and tides (rhyme), in the movement of the operation of the universal (Adams creed, 1863), and belief in zero gods (or god).

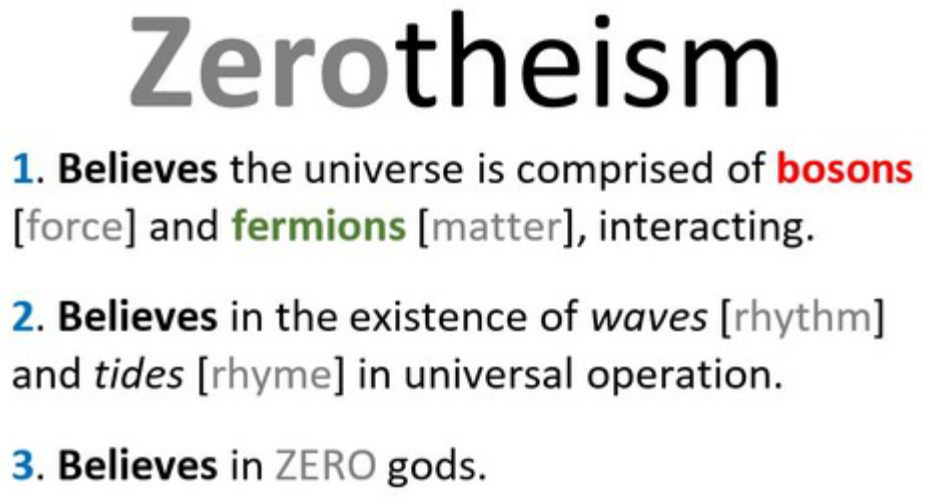

The basic definition of **zerotheism**, comprised of three main beliefs: (a) fermions and bosons (i.e. Dirac 1945 standard model), (b) waves and tides (aka Adams belief), and (c) zero gods (aka Critias hypothesis) from the end slide of the 4:40-hr, 14-video part "Zerotheism for Kids" lecture given by Libb Thims and Atheism Reviews co-host Thor on 10 Aug 2015. [1]

Critias reductionism

In 3,100BC, most people, such as the Egyptians, were "polytheists", i.e. believed in multiple gods; as illustrated below, via caricature of some semi-modern active gods (Gott, Allah, and Jahwe) and historical non-active gods (Odin and Jupiter):

In circa 410BC, Greek thinker Critias (c.460-403BC) (Q) posited that "gods" were invented by the lawgivers of ancient times, employed to justify their laws (which are but "codified morals" as Barack Obama [2006] put it); as summarized (Q) by Sextus Empiricus (160-210AD) in circa 200 as follows:

> "Critias seems to be from the ranks of the atheists when he says that the lawgivers of ancient times invented god as a kind of overseer of the right and wrong actions of men. Their purpose was to prevent anyone from wronging his neighbors secretly, as he would incur the risk of vengeance at the hands of the gods."

In time, on this so-called "Critias hypothesis", i.e. that gods were invented to justify laws and justice, the premise of there existing different gods, in say two different states, e.g. two the 42 nomes or state capitals of ancient Egypt, regulating regions that were found to have the same laws, intellectual conflict resulted, and therefrom, the move to "monotheism", i.e. belief in one overarching lawgiver or god resulted, which occurred in the years 300BC-800AD; as illustrated below:

Likewise, in the years 1700-2300AD, as initiated by Jean Meslier (1729), among the chronology of famous atheists, a switch from monotheism, i.e. belief in one god, to “zerotheism”, i.e. belief in zero gods, began to actuate; as illustrated below:

In 1802, Pierre Laplace famous told Napoleon Bonaparte (see: Napoleon Laplace anecdote) that he no need of the hypothesis of god for celestial mechanics; the other sciences began to follow suit in the decades to follow (see: year god was disabused from science).

In 1927 to 1933, Paul Dirac began to state his views on the need to for a "zero" god belief system:

> “If we are honest — and scientists have to be — we must admit that religion is a jumble of false assertions, with no basis in reality. The very idea of God is a product of the human imagination. It is quite understandable why primitive people, who were so much more exposed to the overpowering forces of nature than we are today, should have personified these forces in fear and trembling.

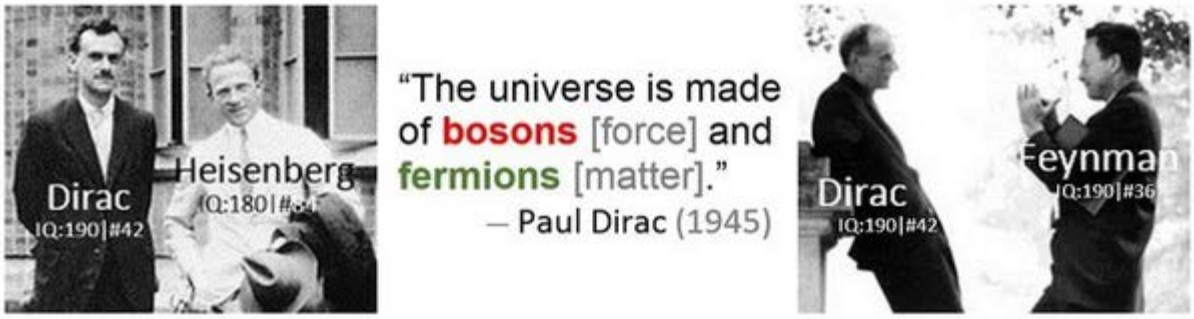

Left: Paul Dirac with Werner Heisenberg (1929). Right: Dirac with Richard Feynman (c.19450s). Center: Dirac on the nature of the universe as being comprised of bosons (forces) and fermions (matter), interacting (1945).

But nowadays, when we understand so many natural processes, we have no need for such solutions. I can't for the life of me see how the postulate of an Almighty God helps us in any way. What I do see is that this assumption leads to such unproductive questions as why God allows so much misery and injustice, the exploitation of the poor by the rich and all

the other horrors He might have prevented.

If religion is still being taught, it is by no means because its ideas still convince us, but simply because some of us want to keep the lower classes quiet. Quiet people are much easier to govern than clamorous and dissatisfied ones. They are also much easier to exploit. Religion is a kind of opium that allows a nation to lull itself into wishful dreams and so forget the injustices that are being perpetrated against the people. Hence the close alliance between those two great political forces, the State and the Church. Both need the illusion that a kindly God rewards — in heaven if not on earth — all those who have not risen up against injustice, who have done their duty quietly and uncomplainingly. That is precisely why the honest assertion that God is a mere product of the human imagination is branded as the worst of all mortal sins."

> — Paul Dirac (1927), rant to Werner Heisenberg and Wolfgang Pauli, during the 5th Solvay Conference, on Einstein's "god's dice" talk

"Any further assumption implied by belief in a God which one may have in one's faith is inadmissible from the point of view of modern science, and should not be needed in a well-organized society."

> — Paul Dirac (1933), unpublished hand-written note

In 1945, Dirac introduced the terms "bosons" (field exchange particles of the forces), i.e. particles that obey Bose-Einstein statistics, and "fermions" (matter), i.e. particles that obey Fermi-Dirac statistics, as the basic ingredients of the universe.

In Jul 2015, American electrochemical engineer Libb Thims, amid drafting the online manuscript for book Morality Squared, began using the term "zerotheism", as "fill-in-the-blank" term to complete the Critias hypothesis reduction from "poly-theism" (3,100BC) to "mono-theism" (300AD) to "TERM-theism" (2015), and therein began to use "zero" being that the Greeks had no name for the concept of the zero, as they do for the other Greek prefixes.

In 10 Aug 2015, Libb Thims, and Atheism Reviews co-host Thor, gave the "Zerotheism for Kids" lecture, anchored in the term "zerotheism", defined as follows: [1]

zero- | 0 | Indian
mono- | 1 | Greek
di- | 2 | Greek
tri- | 3 | Greek
tetra- | 4 | Greek
penta- | 5 | Greek
(etc.)
poly- | many | Greek

A basic Greek prefix number chart, showing that "0" has no equivalent Greek term, akin to mono- "1", hence the invention of the term "**zerotheism**".

> "A **zerotheist**, aka a "smart atheist", is someone (e.g. Paul Dirac, 1945) who believes (a) that zero gods exist, (b) that universe is comprised of fermions (matter) and bosons (forces), interacting, and (c) there is a rhyme and reason to why people dance (something Dirac couldn't understand); which can be compared to a polytheist (e.g. Hindus or ancient Egyptians), who believe that multiple gods exist, or monotheist (e.g. Christians or Muslims), who believe that one god exists."

wherein both Thims and Thor explained to the kids that they were "zerotheists".

See also

- Zerotheism for kids

References

1. Thims, Libb. (2015). "Zerotheism for Kids" (co-host: Thor) (main), 14-part [4:41-hr] lecture playlist (Q), 5-intro sides (Q), 56-main sides (Q), 11AM-3PM, Chicago, recorded: Aug 10; published: Sep 7.

θΔics

In education, **Zerotheism for Kids | Smart Atheism for Children** was a 10 Aug 2015 Atheism Reviews lecture, given by American electrochemical engineer Libb Thims, and co-host Thor, to a group of six kids (ages 2, 6, 7, 9, 10, 11), typical American kids, stylized as a "Monday School" for natural science minded free thinking children, who were introduced to the topic of zerotheism, i.e. smart atheism, a modern 21st century version, in large part, of German physical chemist Wilhelm Ostwald's famous 1910 "Monistic Sunday Sermons"; both of which being scientifically-literate upgrades, so to say, to the standard "Sunday School" for theists (or polytheists). [1] The class was a "do ask and do tell" motto course; an upgrade to the "don't ask; don't tell" unwritten motto of biology teachers, world-wide, ever since Darwin, whenever the subject of human evolution comes up.

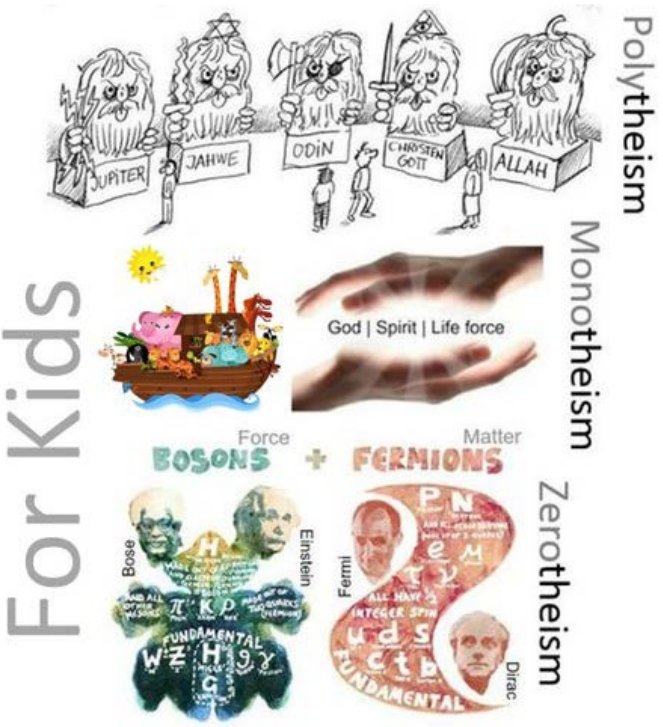

A general overview of "**zerotheism**" (as taught to **kids**), which, like the switch from polytheism to monotheism, occurring some 2,000-years ago, shows the switch from monotheism to belief in fermions, bosons, zero gods, and waves and tides (or rhythm and rhyme), i.e. Adams creed.

Schedule

The class, attended by six kids (ages: 2,6,7,9,10,11), started at about 11AM and consisted of approximately three one-hour lectures, separated by soccer, games, and snakes schedule, and ending Q&A period, recorded in 8 total segments, totaling 3.5-hrs uncut footage, resulting in a finished 14-part lecture series video product totaling 4:41-hrs.

Video | Playlist

The following is the video-playlist ordered according to slide insertion:

1. Slide: #1 | Camp Quest kids on "**you're gonna go to hell**" and "**morality**" (Ohio/Ontario) (Q:0-1:56)
2. Slide: #3 | Swedish kids on god (Q:0-1:48) | I believe **god is like a force** [explain: fermions]
3. Slide: #5 | **What triggers** a chemical reaction? (Q:1-3:45)
4. Slide: #19 | Sweden on **inner compass** and Bible as fairytales (Q:0-1:25)
5. Slide: #24 | Dawkins **interviewing biology teachers** (Q:0-5:05)
6. Slide: #39 | **Kirk Cameron** explaining where humans came from (Q:0-1:16)
7. Slide: #43 | Neil Shubin on **how humans can come from fish** (Q:0-4:35)
8. Slide: #47 | 11-year-old Nada Alahdal explains **why she ran away** (Q:0-2:28)

Abstract

The following is the abstract:

> "A zerotheist, aka a "smart atheist", is someone (e.g. Paul Dirac, 1945) who believes (a) that zero gods exist, (b) that universe is comprised of fermions (matter) and bosons (forces), interacting, and (c) there is a rhyme and reason to why people dance (something Dirac couldn't understand); which can be compared to a polytheist (e.g. Hindus or ancient Egyptians), who believe that multiple gods exist, or monotheist (e.g. Christians or Muslims), who believe that one god exists."

From the zerotheism platform, a modern meaning system can be re-derived, correcting the classical conceptions of: meaning (why and hows of things), morality (right from wrong), "sense of purpose" (Einstein on purpose), origin of humans (evolution), future, etc.

> "The poets, through the conjunction of fire and moisture, are indicating that the *vis*, 'force', which they have is that of Venus [Aphrodite]. Those born of *vis* have what is called *vita*, 'life', and that is what is meant by Lucilius (c.120BC) when he says: **'life is *force* you see: to do everything force doth compel us'**."
>
> — Marcus Varro (c.50BC), *On the Latin Language*

(add discussion)

Playlist

There 3.5-hour lecture was video edited and divided into 14-parts, available as a 4:41-hour playlist (Q), the visual synopsis of which is as follows:

Zerotheism for Kids | Introduction

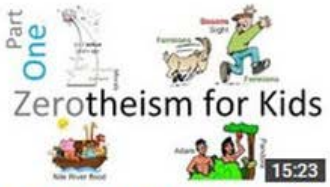

Zerotheism for Kids | Lecture: 1 | Old vs New Beliefs

Zerotheism for Kids | Lecture: 2 | Old vs New Morals

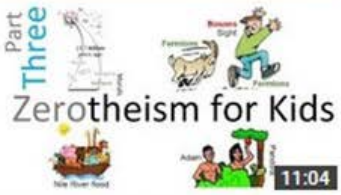

Zerotheism for Kids | Lecture: 3 | Electromagnetic force

Zerotheism for Kids | Lecture: 4 | Enthalpy & Entropy

Zerotheism for Kids | Lecture: 5 | Adam & Eve and the Soul

Zerotheism for Kids | Lecture: 6 | Moral Compass, Noah's Ark and...

Zerotheism for Kids | Lecture: 7 | Jesus Isn't Real

Zerotheism for Kids | Lecture: 8 | Passion of Osiris to Passion of ...

Zerotheism for Kids | Lecture: 9 | Resurrection, Moses, Soul, and ...

Zerotheism for Kids | Lecture: 10 | Big Bang, Evolution, and Huma...

Zerotheism for Kids | Lecture: 11 | Chemical Morality: Natural vs ...

Zerotheism for Kids | Lecture: 12 | Moral Gravity, Higher Powers, ...

Zerotheism for Kids | Lecture: 13 | Kid's Q&A

Hudson | Spencer

The following are the 30 Jan 2016 reaction comments, on the first video (Introduction), from two kids: Hudson (age 7) and Spencer (age 5), as jotted down by their mother Lynn Liss, as they watched the video:

1. "What are the letters?" (Hudson) – "People" (Lynn)
2. "I think god doesn't make our bodies, we go to monkeys and then us." (Spencer)
3. After noticing the dominoes in the video "Cool" (Hudson)
4. "That story is just fake" (Hudson) when told about the Jesus story by Lynn.
5. "I told you about monkeys!" (Spencer) after seeing the molecular evolution table.
6. "First we were bacteria, then we were worms and then we were fish" (Spencer)
7. "We can become something else…even beyond humans" (Hudson)
8. "Or you could be different" (Spencer)
9. "We're the highest on the food chain" (Hudson) after looking at the Darwin tree vs cross
10. "People say that god created us, in fact no one created us, it's the air and the molecules that made us" (Hudson)
11. "Is this a man-monkey?" (Spencer) after seeing the 'fossil evidence' slide
12. "When is he gonna do the dominoes?" (Hudson)
13. "They're like trading, each person gives another person something" (Hudson) after seeing the dominoes fall
14. "Not god" (Hudson) and "Someone" after I asked them what THEY think this type of science/belief system should be called if not Zerotheism or SmartAtheism.

(add discussion)

Abstract | Visual

The following is the two main opening visual abstracts (slides) for the "Zerotheism for Kids" class. Firstly, shown below, are the world religions—which can be divided into three groups, firstly the scrabble letter religions (below left), which are all Ra-based theologies, Ra being the phoenix-like bird that carried the sun disc god on its head into the sky, after bursting forth from the primordial land mound (Nun), represented by the Pyramids, following the great flood (i.e. the annual 150-day Nile River flood, a general mythology-based theology, comprising about 75 percent of the world's religious beliefs, which can be further subdivide into "reincarnation" belief sects, shown by the Hinduism-Buddhism word intersection, and the "resurrection" belief sects, shown by the Christianity-Islam-Judaism word intersection; secondly the Chinese folk religions, comprised primarily of Taoism, top right; thirdly, lower right, atheism, i.e. belief in laws of nature, the latter group inclusive of "secular, non-religious, agnostics and atheists": (Q)

The second main diagram, shows the jump from teaching kids ancient "snake-n-apple morals", based on Nile River flood mythology (Anunian theology), via King James Bible taught Ussher chronology (O), to teaching them modern free energy coupling morals, based on big bang cosmology:

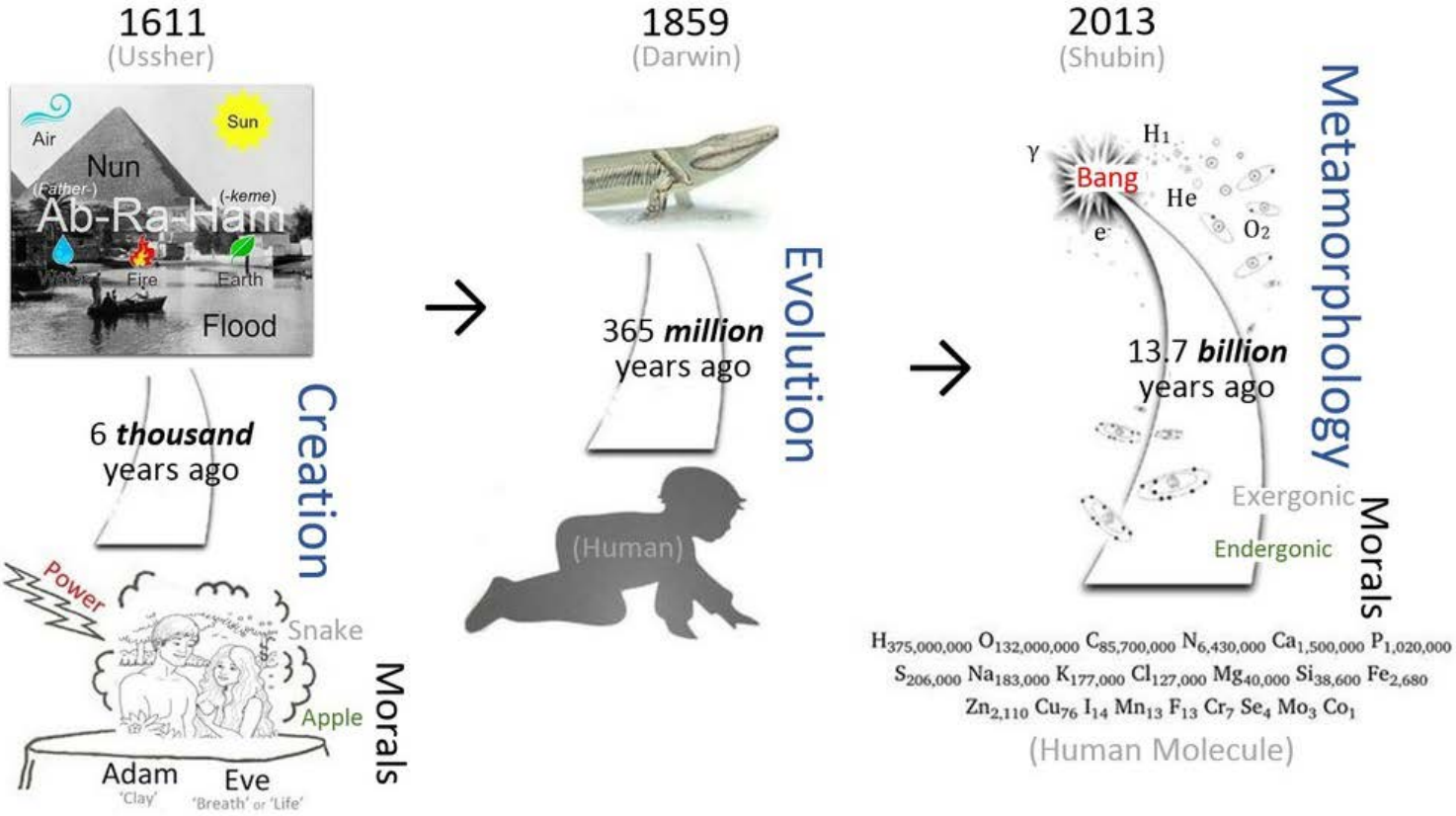

(add discussion)

Lecture slides

The following are the lecture slides that are going to be used on the side TV during the class:

- Zerotheism Bible – Flickr.
- Zerotheism for Kids [first draft; before above] – Flickr.

The touch-screen computer will be used for the several short videos, some of which are shown below, to be shown among other purposes.

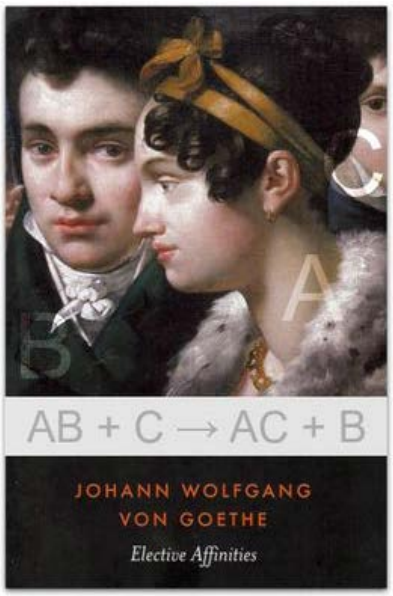

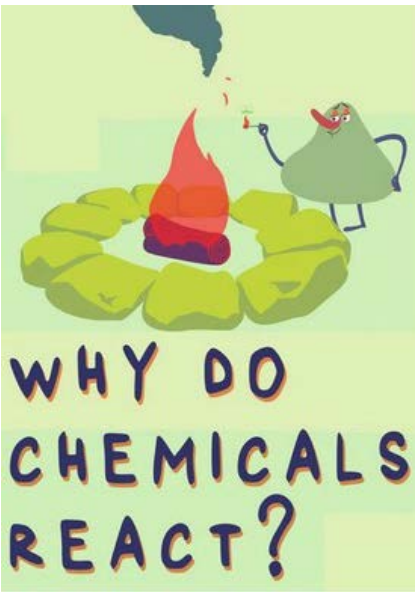

Right: still from TED-Ed 3:45 kid's video (Q), by Kareem Jarrah (2015), on "What Triggers a Chemical Reaction?"

Smart atheism | Zerotheism

Among the various "brands" of atheism (see: atheism types by denial and belief), one can readily differentiate between the "smarter" (intelligent), i.e. smart atheism, versions and the "dumber" (less-intelligent) versions, the former typified by: Johann Goethe, i.e. Goethean atheism (see: Goethe on the soul), who professed the following decisive logic:

> "Crebillon … treats the passions like playing cards, that one can shuffle, play, reshuffle, and play again, without their changing at all. There is no trace of the delicate, chemical affinity, through which they attract and repel each other, reunite, neutralize [each other], separate again and recover."
>
> — Johann Goethe (1799), "Letter to Friedrich Schiller", Oct 23

Others include: Thomas Jefferson, who self-described himself as an "Epicurean materialist", Dirac atheism (see: Paul Dirac), and Heisenberg atheism (see: Heisenberg-Pauli dialogue), among others: Bertrand Russell, Bill Gates, Mark Zuckerberg, Warren Buffett, etc.

Intermediate atheism | Brands

A number of intermediate atheism brands in intelligence exist and have been implemented such as Epicureanism (Epicurus), utilitarianism (John Mill), Dawkinsian atheism (Richard Dawkins), among others, such as Haldane's genetic utilitarianism:

> "I would gladly die [lay down my life] for two brothers or eight cousins."
>
> — John Haldane (c.1952), recalled by Maynard Smith

Others include: e.g. Ayn Rand (Randianism) and objectivism, Sam Harris (spiritual utilitarianism), among others.

Dumb atheism | Sheer immorality

The antonym smart atheism are a number of less discerning varieties of atheism attempts, aka "dumb atheism", for lack of a better word; one example of which is so-called: Dahmer atheism (see: Dahmer on rules), who reasoned that, if their was no god and because of evolution, that he could circumvent the fifth commandment (i.e. "thou shalt not kill"), and went on a killing spree to satisfy his desires; the logic of which, as he said in the end:

> "If it all happens naturalistically? What's the need for god? Can't I set my own rules? Who owns me? I own myself!"
>
> — Jeffrey Dahmer (c.1993), variant of atheism belief he tried (see: killing spree paradox); as told to his father (Q)

Others included: Hitler atheism (see: atheism atrocity fallacy), and Stalin atheism (see: Stalin chicken abuse parable).

Founding fathers fallacy | American founded by free thinkers

The so-called "founding fathers fallacy" is the assertion typically put to children and adults by unknowing or uneducated (ignorant) religiously-minded people who like to tout that America was founded as "Christian nation", whereas correctly the founding fathers were top Haught disbelievers, three of the first four American presidents, i.e. John Adams (#2), James Madison (#3), and Thomas Jefferson (#4), where disbelievers, the authors of the Declaration of Independence, Thomas Jefferson and John Adams, which we celebrate with fireworks every 4th of July, were disbelievers, and the architect of the US Constitution, i.e. James Madison, who used Newtonian government models, to enact the "separation of powers" (legislative | judicial | executive) was a disbeliever, all of whom are shown below:

"Religion: your reason is now mature enough [age 17] to examine this object. In examining this subject, divest yourself of all bias, in favor of novelty and singularity of opinion, shake off all fears and servile prejudices, under which *weak minds* are servilely crouched: fix reason in her seat firmly; **question with boldness even the existence of God**; because if there is one, he must approve more of the homage of reason than that of blindfolded faith. Read the Bible as you would Tacitus or Livy. Those facts in the Bible which contradict the laws of nature must be examined with care."

— Thomas Jefferson (1787), "Letter to [nephew] Peter Carr" [7]

(add discussion)

The father of our current president Barack Obama, namely Barack Obama, Sr., was a Muslim-turned-atheist, while a graduate student at Harvard two years before Obama was born, as was his mother Ann Dunham, who, was adamantly opposed to religion, a self-touted "atheist, because it was something she could read about and argue", described by Obama as "a lonely witness for secular humanism" who fought for woman's rights and progressive world views, e.g. pro-homosexual rights: (O)(O)

The parents of American president Barack Obama were both atheists; his mother, Ann Dunham, was a women's rights focused atheist; Barack Obama, Sr., his father, was an admitted atheist while a graduate student at Harvard; a school, which in 2014 had a student body comprised of 38 percent self-identifying atheist/agnostic (O); which can be compared to 2012 US public polls which showing 6 percent of the of the population identifying as atheist/agnostic. (O)

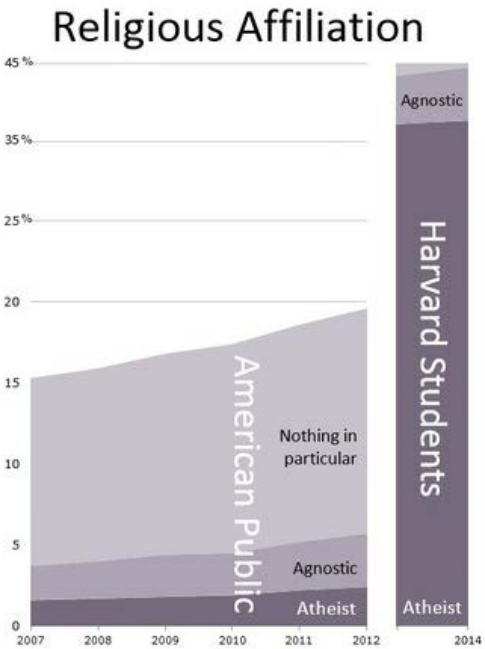

"My father was almost entirely absent from my childhood, having been divorced from my mother when I was 2 years old; in any event, although my father had been raised a Muslim, by the time he met my mother [1960] he was a confirmed atheist, thinking religion to be so much superstition."

— Barack Obama (2006), "My Spiritual Journey" (O), *Time*, Oct 16

"Given the increasing diversity of America's population, the dangers of sectarianism have never been greater. Whatever we once were, we are no longer just a Christian nation; we are also a Jewish nation, a Muslim nation, a Buddhist nation, a Hindu nation, and a nation of **nonbelievers** [atheists]. Which passages of Scripture should guide our public policy? Should we go with Leviticus, which suggests slavery is OK and that eating shellfish is abomination? How about Deuteronomy, which suggests stoning your child if he strays from the faith? Democracy demands that the religiously motivated translate their concerns into **universal**, rather than religion-specific, **values**. It requires that their proposals be **subject to argument**, and **amenable to reason**. I may be opposed to abortion for religious reasons, but if I seek to pass a law banning the practice, I cannot simply point to the teachings of my church or evoke God's will. I have to explain why abortion violates some principle that is accessible to people of all faiths, including those with no faith at all."

— Barack Obama (2006), "Faith and Politics" speech, Jun 28

"The polling data [showing that 38 percent of Harvard student body is atheist/agnostic] is consistent with a huge trend that has swept the nation and that is not going to change any time soon: this is what the future looks like. America is going to become much, much less religious. And that will be a great thing for religious and nonreligious people alike, provided we can encourage and nurture the many positive qualities these nonreligious

young people are, in my experience, likely to demonstrate: thoughtfulness, critical reasoning, compassion for the less fortunate; acceptance of all people and welcoming diversity; comfort with ambiguity; comfort with diverse sexual identities; creativity; humor and wit; passion to improve the world and make a difference."

— Greg Epstein (2014), Harvard's humanist chaplain; response to query (Q) by Hemant Mehta on what the polling numbers meant to him, May 29

(add discussion)

Dawkins | Biology teacher interview

In 2008, English biologist Richard Dawkins, in his channel-4 documentary "God Strikes Back", interviews four biology teachers, at Park High School (Q), North London, video segment shown adjacent (2:20-3:50) about tensioned difficulties of teaching evolution to kids:

Left: a 2008 clip of Richard Dawkins, from his Channel-4 documentary "The Genius of Darwin", part one "God Strikes Back" →(Q) [watch: 0-5:05], interviewing (2:20-3:50) four London high school biology teachers about why they don't address the religious conflict when they teach evolution. Right: a 2008 clip of Neil Shubin on the Colbert Report being queried about how humans can come from fish →(Q) [watch: 0-4:35].

> "I teach evolution not as a unit, but by introducing the concept here and there throughout the year. I put out my little bits and pieces wherever I can. While some students have college educated parents, other students come from families that may not accept the idea, and that holds me back."

— Ron Bier (2005), "Interview on teaching evolution at Oberlin High School, Ohio"

> "I worry that high school biology teachers are tiptoeing too respectfully around traditional beliefs."

— Richard Dawkins (2008), Park High School teacher interview

> "We can't get into the business of knocking down kid's religions and the religions of families."

— Chris Scott (2008), head of science at Park High School queried by Dawkins about why the conflict isn't addressed

> "American science teachers, fearing religious backlash, have become timid about teaching **evolution** theory to their students."

— Lauri Lebo (2008), *The Devil in Dover*

> "Because we teach science, and I would not feel comfortable talking about anything but science."

— Rachel Hughes (2008), Park High School biology teacher interviewed by Dawkins about why the conflict isn't addressed

The teaching of evolution, in short, inherently puts kids religious beliefs into question; hence the teachers avoid this tenuous issue, because, as they repeatedly say, in interview with Dawkins, "it is not their place".

Atheist kids | Camp Quest & Swedish kids | Videos

The following are scheduled videos to watch and discuss:

> "Without god in your life and such, how do you develop your morality, how you see the world, what is that based on?"

— Interviewer (c.2008), query →(Q)|1:20) to kids at 1996-launched (Q) Camp Quest

(add discussion)

Left: (2014). "Atheist Kids: Camp Quest Niagara Falls, Ontario" →(Q) [watch: 0-1:56; 1:20-1:56 (morality without god)], Atheism-is-Unstoppable, Oct 5. Right: (2010). "Swedish Kids on God" (Q) (Compare: Swedes on god (2009)), WimSweden, Feb 9.

Free energy coupling morality | Nada Alahdal

The simplest examples of a so-called "moral" vs "immoral" reaction, in social phenomena, is the distinction between marriages that occur "naturally", e.g. love at first sight, as contrasted with marriages that are "forced" (e.g. shot gun wedding) or arranged (e.g. by the families of the children). The latter are classified as endergonic reactions (work energy releasing), the former as exergonic reactions (work energy absorbing); examples of which are shown below:

An 11-year-old Yemen girl Nada Alahdal (2013) explains →(Q)[watch:0-2:28], why she ran away from her mother, and why children are "jumping" into the sea (suicide) rather than be "forced" into arranged marriages by their parents; an example of an "unnatural" reaction (exergonic).

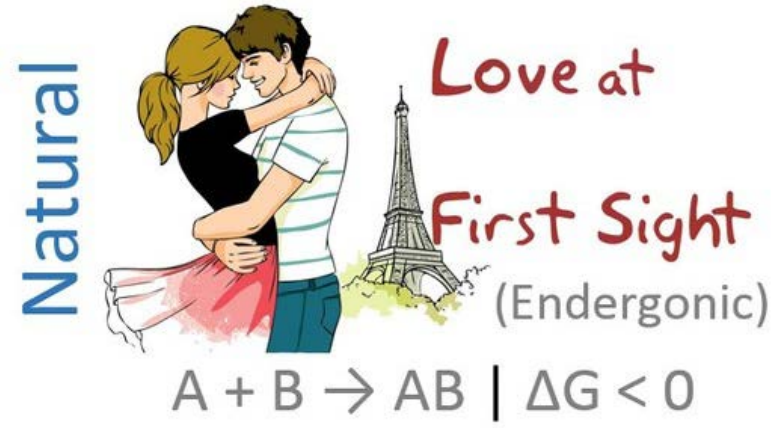

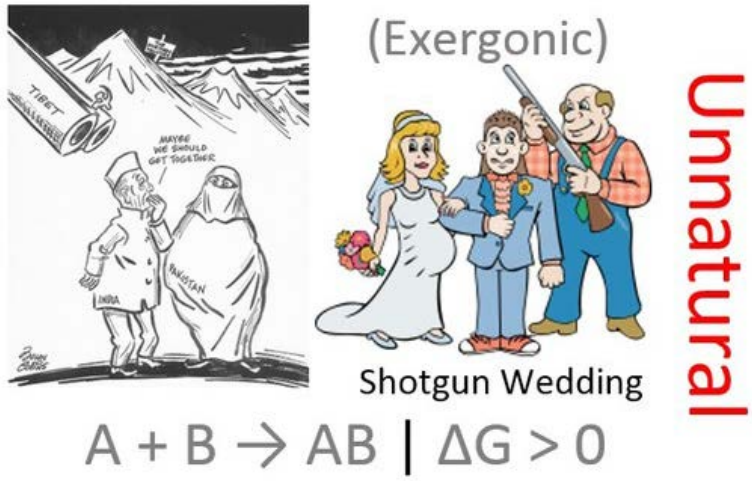

One of the more viral examples of the latter is the 2013 video of 11-year-old Yemen girl Nada Alahdal running away from here "arranged" (forced) marriage by her mother (shown adjacent); a case of religious-based morality turning into "sheer immorality", as Goethe phrased things, in Saudi Arabia.

Confusion | Coming back from dead?

The following Jul 2015 polls of adults

who recall being told or taught standard aspects of religious doctrine, stories, or explanation, etc., that as a child DIDN'T make sense to them, to which the question openly or at least in their mind, in respect to the "coming back from the dead" parable:

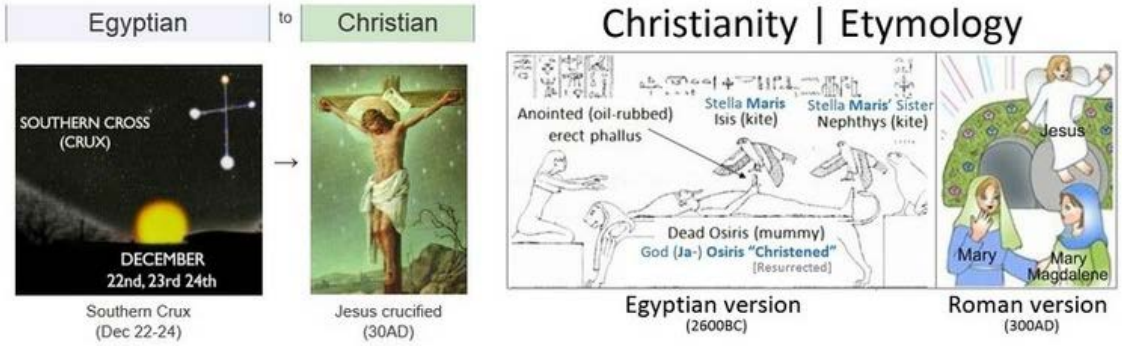

The story of 3-day death and resurrection of Jesus Christ (i.e. Passion of Christ), via the "operation" of two Maries (Mary and Mary Magdalene), i.e. two "stars of the sea" [Maris = sea], who sat "over" the sepulcher (Matthew 27:61), a metaphorical rewrite for "resurrection sex" (three-some), and third angel who "sat upon" the stone rolled away from the tomb (Matthew 28:2), after which Jesus is "risen" from the dead (Matthew 28:6-7), is but a monotheistic rewrite of the crucifixion, mummification, and two Mary-powered celestial sex resurrection of Osiris from three days of death (i.e. Passion of Osiris); itself based on the then-believed life/death solar cycle and the re-birth of the sun from the dead, after 3-days of "perceptual" standstill (death), i.e. solstice, from Latin *sol* (sun) + *sister* (stand still), occurring on Dec 22-24.

> "At Girl Scouts, during a sleep-over, I asked how can someone come back from the dead? [didn't make sense]."
>
> — Cassi (ages 7-8)

> "Jesus' resurrection: how can someone come back to life after being dead for 3-days?"
>
> — Brian (age 10), didn't make sense; illogic of made him an atheist by teens

(add discussion)

Confusion | Virgin giving birth?

See main: Virgin birth

The following Jul 2015 polls of adults who recall being told or taught standard aspects of religious doctrine, stories, or explanation, etc., that as a child DIDN'T make sense to them, to which they questioned openly or at least in their mind, in respect to the "virgin birth" parable:

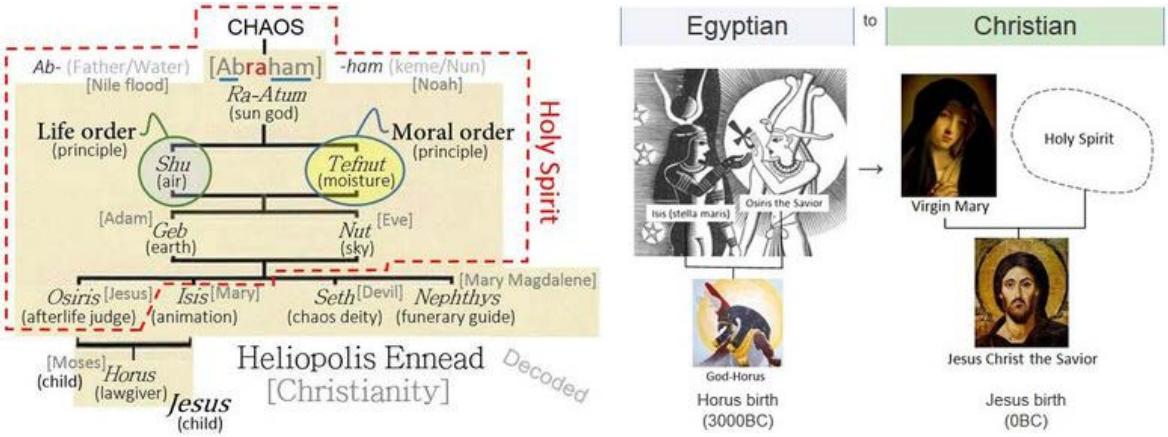

The gist nutshell of where the "virgin birth" story came from, namely: the early Christian redactors re-cast the work-in-progress Is-Ra-El-ites rewrite of the Heliopolis Ennead, wherein the spouse god (Osiris), parent gods (Geb and Nut), grandparent gods (Shu and Tefnut) and great grandparent supreme god (Ra-Atum) of the goddess Isis (Stella Maris) became syncretized (god grouped) into a "Holy Spirit", which impregnated a person named Mary giving birth to the deemed "son of god" named Jesus (in place of the original man-god Horus son of Osiris).

> "And the day will come when the mystical generation of Jesus, by the supreme being as his father in the womb of a virgin will be **classed with the fable** of the generation of Minerva in the brain of Jupiter."
>
> — Thomas Jefferson (1823), "Letter to John Adams", Apr 11 (O)

> "Some people draw unwarranted conclusions from the fact that I never say more about the blessed Virgin Mary that is involved in asserting the 'virgin birth' of Christ. But surely the reason for doing so would be obvious? To say more would take me at once into **highly controversial** regions. And there is no controversy between Christians which needs to be so delicately touched as this."
>
> — C.S. Lewis (1952), "Preface" to *Mere Christianity*, based on three 1942-44 wartime radio talks

> "That the Virgin Mary was a virgin [didn't make sense]."
>
> — Aaron (2015), age: 9-10, Jul 27

> "How can a "virgin" Mary give birth?"
>
> — Anthony (2015), 3rd grade, Jul 27

> “I began to reject all religion as nonsense at age 5; specifically the virgin birth as nonsense at age 13.”
>
> — Bill (2015), Jul 31

Technically, i.e. in reality, a child can only be conceived via a human chemical reaction, which is a double displacement reaction, wherein two different germ cells G_1 (sperm) and G_2 (egg) must bond, as shown below (modern view):

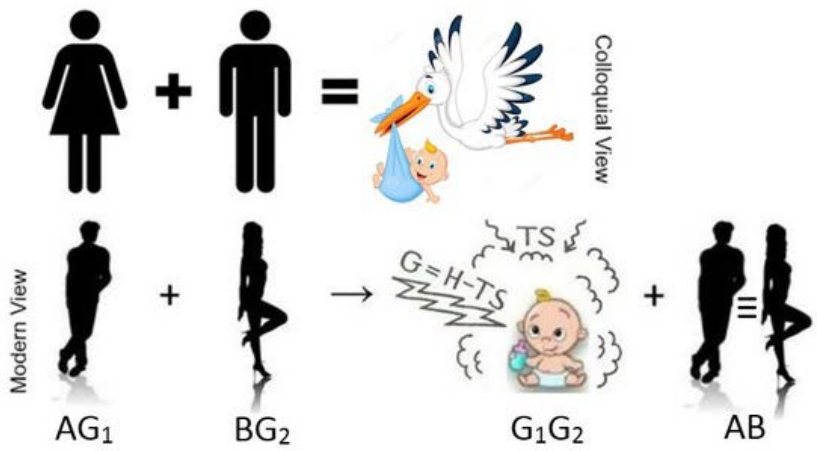

(add discussion)

Confusion | Creation in six days?

The following Jul 2015 polls of adults who recall being told or taught standard aspects of religious doctrine, stories, or explanation, etc., that as a child DIDN'T make sense to them, to which the question openly or at least in their mind, in respect to the "six-day creation" parable:

> “How did god create the world so fast (six-days)?”
>
> — Caleb (age 6), query to Sarah after reading a *Children’s Bible*

> “The [creation in] seven days thing [didn’t make sense].”
>
> — Sidney (age 10)

(add discussion)

Confusion | Morality parables?

The following Jul 2015 polls of adults who recall being told or taught standard aspects of religious doctrine, stories, or explanation, etc., that as a child DIDN'T make sense to them, to which the question openly or at least in their mind, in respect to the "six-day creation" parable:

> “My father said that if you do bad things, e.g. drink, you’re not going to go to heaven; but then he would always come home drunk; after which I didn’t believe.”
>
> — Armando (age 9)

The origin of the opening paragraph of Genesis, namely: a monotheistic truncated re-script of the combined Hermopolitian and Theban versions of the Ra-theology (Heliopolis creation myth), intermixed with Aten's fingers (shown); see: religio-mythology transcription and syncretism).

> “They told me not to punch some kid because god would take care of it [didn’t make sense/I didn’t believe].”
>
> — Victor (age 11-12)

“That someday Jesus was going to come down and separate the good from the bad [didn’t make sense].”

— Fernando (age 11)

“Why did god give us free will? Why not just make us all good in the first place? My dad was a super Bible-pusher and a complete assh*le; so the two didn’t make sense?”

— Aaron (youth)

(add discussion)

Adam and Eve

The following are Adam and Eve confusion issues:

Bottom (left): actor Kirk Cameron explaining “How God Made Life?” (O), dumb-version: →(O)[watch:0-1:16] by breathing spirit into dirt, form the 2013 film Unstoppable (see: Clay creation myth).

“Some of the Genesis stuff, e.g. creation of the world, Adam and Eve, etc.”

— Tommy (age 10 / grade 5)

“How Adam and Eve could create black people [didn’t make sense]. You’ve got this white girl and this white guy, and then this black baby? (age 7) Dinosaurs; where life came from (after learning science).”

— Sabrina (age 7-12)

(add discussion)

Confusion | Other?

The following Jul 2015 polls of adults who recall being told or taught standard aspects of religious doctrine, stories, or explanation, etc., that as a child DIDN'T make sense to them, to which the question openly or at least in their mind, in respect to the "other" parables:

“Eating the wafer and turning into the body of Christ—transubstantiation; they tried to explain it to me, but I was like: ‘what do you mean that I’m eating him?’”

— Martina (age 6-7)

“Why do we have to keep praying / asking for forgiveness? [didn’t make sense] For example, the prayer: forgive me heavenly father … (forgive me for what?); per logic that Jesus died for our sins, etc.”

— Thor (age 7)

“How Jesus went for 40 days without food or water [made no sense].”

— Tim L. (grade school)

“Didn’t believe in anything for a while, because I was told that Jesus projects us, that he died for us; yet I kept watching all my family members getting sick?”

— Sarah M (age 9)

“The Bible says that the earth is 10,000 years old or something; but there’s dinosaurs millions of years old [didn’t make sense]?”

— Isho (age 6-7)

“Moses and the burning bush; David and Goliath [didn’t make sense].”

— Samkele (age 9 / grade 3)

“They told me don’t eat things that fall on the floor because the ‘devil already licked it’; whereas they could have just said that it was dirty.”

— Jesus (age 7-8)

“God will forgive you for your sins; unless you are gay. I have a gay aunt. Didn’t make sense?”

— Amanda (age 12)

“That there was a God and Holy Spirit [confusing]; like believing in something not human or there?”

— Tanya (age 14-15)

“Why can’t we eat pork?” Everyone else does? Why do we have to keep the Sabbath [Not work Fri sundown to Sat sundown]; when other types of ‘work’, e.g. lighting a candle or driving a car, are ok?”

— Trevor (youth)

“The karma/sin thing didn’t make sense, e.g. even if you’re a good person, but you leave your phone on a park bench, someone will still steal it. People would say: ‘don’t’ worry, karma will get them! No it won’t, karma won’t make up for stupidity.’”

— Ramsin (ages 10-11)

(add)

What happens when you die? | Death is a mythological term

The following is a launching-point quote to interject into the topic of "what happens when you die?", frequently put to atheists by theists when they find out you are an atheist:

A *circa* 2014 Photoshop image (O) by Richard Davis conceptualizing the "model" he once held in his mind as a youth, because as a boy people told him that heaven, where the angles lived, was above the clouds; and that when people died they would go to this place to spend eternity living on the clouds.

“When I was a little boy people told me that angels live in heaven and heaven was above the clouds. So at this young impressionable age I believed that **when people died** they spent their eternal lives on the clouds.”

— Richard Davis (c.2014), person who made adjacent Photoshop image (O) to illustrate his view

“So what do you think happens when you die?”

— Aaron (2015), query to Libb Thims in discussion about reservations about bring his son to the zerotheism for kids class, Aug 2

“The [photoshop] adjacent image—by Richard Davis—brings to mind the absurdity of looking out the window, as a youth, during my first plane trip, when the plane first crossed over into the clouds, and peering out the window to see if there were ‘dead’ people walking around, per the logic that someone had told me that when you die you go to heaven, which is in the clouds.”

— Libb Thims (2015), mental documentation note for kids lecture, on memory of circa age 8-13-ish look out the window during first flight through clouds, 6:33AM CST Aug 3

(add discussion)

Objections | Teaching kids Smart Atheism is wrong?

The following are objections raised by parents and others, accumulated following advertisement of the "Zerotheism for Kids" lecture:

“You can teach kids science and you can teach kids to

have faith in a higher power (and you can believe in both) ... but to each is own! What we shouldn't be doing is putting down each other's beliefs because that simply just discourages children. It is important to teach them to have beliefs whether it is in science or god or simply to believe in themselves."

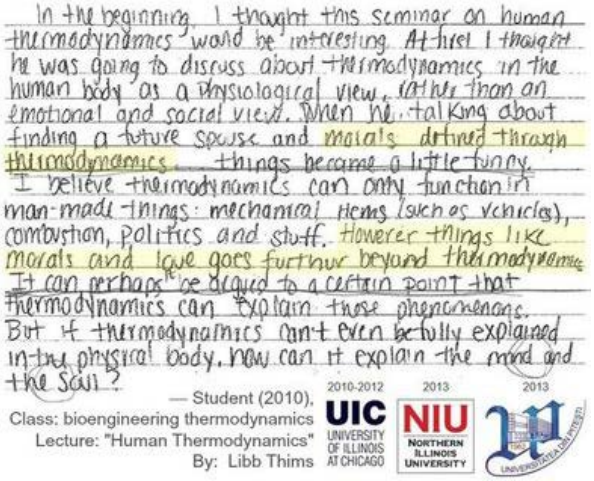
In the beginning I thought this seminar on human thermodynamics would be interesting. At first I thought he was going to discuss about thermodynamics in the human body as a physiological view, rather than an emotional and social view. When he talking about finding a future spouse and morals defined through thermodynamics... things became a little funny. I believe thermodynamics can only function in man-made things: mechanical items (such as vehicles), combustion, politics and stuff. However things like morals and love goes further beyond thermodynamics. It can perhaps be argued to a certain point that thermodynamics can explain those phenomenons. But if thermodynamics can't even be fully explained in the physical body, how can it explain the mind and the soul?

— Student (2010), Class: bioengineering thermodynamics Lecture: "Human Thermodynamics" By: Libb Thims

Left: a K-Tor Pocket Socket Hand Crank Generator, which can be used, via cranking the handle (doing "work") to "power" a light (Q|1:52) or iPhone (Q|2:17); which is the same "power" (NOT higher power) governing human affairs, according to one nature philosophy; which is the same power that governs love the chemical reaction (a view held by 66 percent of people; according to 2005 polls). Right: a 2010 student feedback letter (Q) to Libb Thims' 2010 UIC lecture on teaching introductory human thermodynamics to bioengineering students.

— Latrea (2015), response to advert promo for "Zerotheism for Kids" lecture, Jul 30

"The teachings in the Bible can be intimidating as so many questions arise and not enough answers. But to teach and instill atheism into a 6-year-old is ultimately stripping them of any type of beliefs whatsoever, in my opinion. You can challenge religious and biblical concepts, but what about spirituality? The idea that there is a higher power and focus ones energy and beliefs on that? The children are being stripped of that idea and taught to believe science wins?"

— Lana (2015), response to advert promo for "Zerotheism for Kids" lecture, Jul 30

"What you're doing to those children is child abuse and brain washing in my view. You could invert that argument and point it at myself, but I don't hold classes for children telling them to knock down silly ideas of false claims."

— Tim (2015), response to advert promo for "Zerotheism for Kids" lecture, Jul 29

"In July 1968, *Life* magazine published a shocking cover (Q) showing a pair of starving children in Biafra. Jobs took it to Sunday school and confronted the [Lutheran] church's pastor: 'If I raise my finger, will god know which one I'm going to raise even before I do it?" The pastor answered, 'Yes, god knows everything!" Jobs then pulled out the *Life* cover and asked, "Well, does god know about this and what's going to happen to those children?" The pastor responded "Steve, I know you don't understand, but yes, god knows about that." Jobs announced that he didn't want to have anything to do with worshiping such a god, and he never went back to church."

— Walter Isaacson (2011), *Steve Jobs*; on his age 13 (Q) religion fallout

(add discussion)

Quotes

The following are related quotes:

"Are humans **fermions** or bosons?"

— Ed Stephan (1977), speculative discussions with physicist Louis Barrett

"All entities, whether **fermions** or humans, need some mediating agency to interconnect them into systems. This indispensable interrelating and interacting role is ultimately played by different field particles named bosons. Unlike fermions, which are characterized by a significant mass and charge, bosons do not take partake of these to attributes. Rather, they only have spins and provide connections as they are exchanged among fermions."

— Paris Arnopoulos (2005), *Sociophysics*

"If you vest your meaning in imaginary things, your meaning will always be imaginary. If you vest

your meaning in real things, your meaning will always be closer to reality."

— Libb Thims (2015), mental note, arisen at gym; circa 2:30PM CST Jul 24

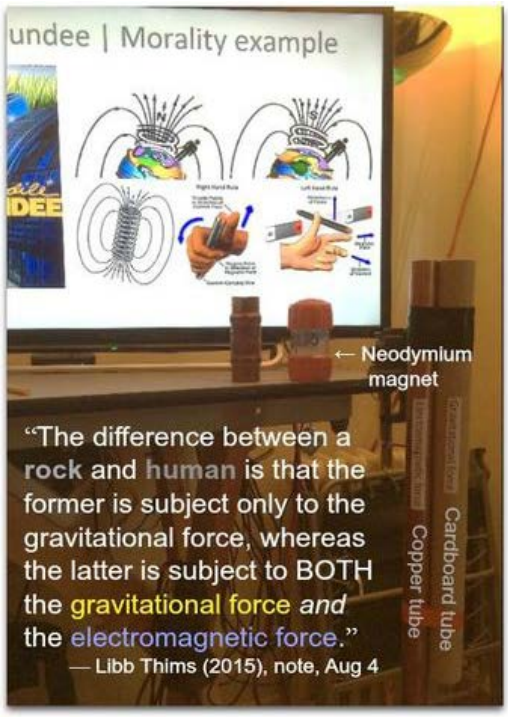

The set up for the electromagnetic force vs gravitational force demonstration, i.e. Lenz's law, first deduced in 1833 by Heinrich Lenz, for the kids, to explain the difference between a rock and a human and "right" vs "wrong" via electromagnetic force reasoning.

See also

- Smart atheism
- Smart Atheism: For Kids
- Children's Atheism Bible

References

1. (a) Thims, Libb. (2015). "Zerotheism for Kids" (co-host: Thor) (main), 14-part [4:41-hr] lecture playlist (O), 5-intro sides (O), 56-main sides (O), 11AM-3PM, Chicago, Aug 10 (recorded), Sep 7 (published).
(b) Note 1: the first attempt at this lecture was initiated in circa Feb 2015 when Thims' sister came to visit with her two kids (ages 4 and 6) to Chicago during which Thims said he wanted to do an atheism for kids video with them; she explained that, as they were already in Hebrew school, that "they already believe in god, that will only confuse them!"; after which Thims got into an argument and the project was scuttled.
(c) Note 2: the modern working version of the show was conceived, in mid Jul 2015, when Sarah, a friend of Thims, explained who she gave her 3 kids, two boys, ages 6 and 9, and one girl age 10, a children's bible to read, after which the youngest (aged six) asked "how did god create the world so fast?" (i.e. 6-days, standard Genesis account); to which Sarah really didn't have an answer; Thims then sent his "Are Adam and Eve Real People?" (O) video to her to watch; which in turn found its way into Alex, another friend of Thims, who texted him to send her more like this to show her two kids.

Further reading

- Simoons, Frederick J. (1960). "Snow in Ethiopia: a Review of the Evidence" (O), *Geographical Review*, 50(3):402-411.

External links

- 42 Principles of Maat | 10 Commandments (2008) – Xenophilius, WordPress.com

In religio-mythology, **Zeus** (TR:7) is

Amen

See main: God equivalence table

In 425BC, Herodotus, in his *Histories*, equated the Greek god Zeus with the Egyptian god Amen. [1]

> "Then, holding the head before him and covering himself in the fleece, he showed himself to Heracles. This story explains why the Egyptians represent **Zeus** with a ram's head—a practice, which has extended to the Ammonians, who are a joint colony of Egyptians and Ethiopians ... So far as I can see, the Ammonians took their name too from the circumstance; for **Amun is the Egyptian name for Zeus**."

In 300BC, Alexander the Great, in an attempt to unify his new kingdom under one religion, attempted to make Amen-Zeus or Zeus + Amen-Ra the new supreme god of the Greek empire.

In 100AD, Plutarch, in his *On Isis and Osiris*, stated things thusly: [2]

> "Most people believe that Amoun is the name given to **Zeus** in the land of the Egyptians, a name which we, with slight alteration, pronounce Ammon.

Lucas Livingston (2002) elaborates on this as follows: [3]

> "One of the most frequently mentioned deities in Herodotus' account of Egypt is 'Theban Zeus'. Herodotus makes it abundantly clear that **Zeus** is known as Amun among the Egyptians. He relates a myth that he heard from the Egyptians at Thebes, the cult center of the ram-headed god Amun, where Heracles attempts to persuade Zeus to reveal his true form to him, but Zeus resists and devises a means by which to get around the issue. Zeus skins a ram and cuts off its head."

Modern views seem to consider the connection or equivalence (Q) between Zeus and Amen as status quo. [4]

References

1. (a) Herodotus. (c.425BC). *Histories* (Book 2, 42, 4-5). Publisher.
(b) Livingston, Lucas. (2002). "Egyptian Gods with Greek names in Herodotus and Votive Statuary" (Q), Artic.edu, Jun 7.
2. Plutarch. (c.100AD). *Isis and Osiris*; in: *Plutarch's Moralia, Volume Five* (pg. 25) (Introduction: Victor Hanson). Harvard University Press.
3. Livingston, Lucas. (2002). "Egyptian Gods with Greek names in Herodotus and Votive Statuary" (Q), Artic.edu, Jun 7.
4. Anon. (2007). "Egyptian Parallels to Greek Deities" (Q), Atlantis Online, Feb 17.

External links

- Zeus – Wikipedia.
- Family tree of the Greek gods – Wikipedia.

In hmolscience, **ZiF Sociophysics Conference** was a 6-9 Jun 2002 interdisciplinary international conferences on the subject of sociophysics, which took place at the Center for Interdisciplinary Research (Zentrum fiir interdisziplinare Forschung | ZiF), Bielefeld Germany, organized by Frank Schweitzer and Klaus Troitzsche, wherein a number of noted pioneers of sociophysics lectured, including: Jurgen Mimkes, Wolfgang Weidlich, Dietrich Stauffer, and Gunter Haag.

A banner for the 2002 **ZiF SocioPhysics Conference**, Germany, where Jurgen Mimkes talked on a Lagrangian derived free energy minimization formulation of social systems with chemical-modeled social bonds, Wolfgang Weidlich talked about sociodynamics of social systems, and Dietrich Stauffer talked about the Sznajd model.

Overview

The following is the abstract of the SocioPhysics Conference: [1]

> "The aim of the international conference SocioPhysics was to provide an overview of different approaches to quantitative modeling and computer simulation of social systems that have been developed within the physics and the social sciences. The meeting thus made reference to an international science development, in the social sciences, computer science and natural sciences new form alliances: econophysics, socionics, computational economics are just a few examples. The German Physical Society (DPG) has now established a working group "Physics of socio-economic systems" (AKSOE).
>
> The great international interest in SocioPhysics proved the conference registrations from 18 different countries, including the United States and Brazil. The nearly 70 conference participants from very different disciplines (physics, mathematics, sociology, computer science, demography, philosophy, political science, economics) was presented in 27 lectures and 17 posters, a wide range of SocioPhysics concepts whose applications z. B. Decision Processes and voting behavior, collective opinion, include development of cooperation and of social networks.
>
> Considerable space occupied the partly controversial but also constructive discussions on whether and to what extent physical methods are applicable to the description of social systems. It became clear that it in no way comes to a simple transfer of physical concepts, but to provide an accurate understanding of the related reductions. As the various examples showed in the oral presentations and posters, SocioPhysics modeled less social actors with their complex worldview, but rather the dynamics of their collective interaction with analogies to physical many-body systems play a major role. So the question comes to the "reasonable" abstraction of social processes and the limits of the interpretation of the results of particular significance, which can only be clarified in interdisciplinary discourse.
> At the end, the participants agreed that the conference has made an important contribution to outline the possibilities and the limitations of a physical modeling of social processes. The multidisciplinary discussions and the lively atmosphere during the four days were here praised highly. The scientific director of the AG SocioPhysics would like to thank very warmly the ZiF for financial and organizational support for the implementation of the Convention."

(add discussion)

Mimkes

A cursory perusal of the abstracts indicates that the meat of the conference was Jurgen Mimkes talk on the "The Structure of Complex Systems: Thermodynamics, Socio-Economics", wherein he makes the following discerning connection:

> "The state of large stochastic systems of N objects may be calculated by the Lagrange principle L(N) = T log P(N) + E(N) → maximum ! P is the probability, that is to be maximized under a system condition E, and T is the Lagrange ordering parameter. L is the Lagrange function of the system, that may be far away or close to stability. At equilibrium the Lagrange function is at maximum. In natural sciences, E is given by the **chemical bonds** and the (negative) Lagrange function corresponds to the free energy, from which all thermodynamic states may be calculated. In social systems, the Lagrange principle corresponds to the common benefit. The function E represents the **social bonds** of the system."

(add discussion)

Quotes

The following are related quotes:

> "SocioPhysics has become an attractive field of research over the past years, despite some controversies about its scientific eligibility and potential use for the understanding of social phenomena. This international conference tends to reflect these discussions: It brings together scientists from various disciplines, such as physics, sociology, informatics, demography, philosophy, political sciences, economics. They will jointly discuss whether and to what extent physical models and tools can be reasonably used to enhance quantitative methods and computer simulations in the social sciences. Ideally, this interdisciplinary dialog will result in a mutual enhancement: Social scientists may learn about the latest development in applying physical methods to the life and social sciences, physicists and other natural scientists may increase their awareness of problems, methods, and needs in the social sciences."
>
> — Frank Schweitzer (2002), "Aim and Scope" of SocioPhysics Conference [1]

See also

â— Sociophysics conferences

References

1. Schweitzer, Frank and Troitzsche, Klaus. (2002). ZiF SocioPhysics Conference (abs) (toc) (pdf), Center for Interdisciplinary Research (Zentrum fiir interdisziplinare Forschung) (ZIF), Bielefeld Germany, Jun 6-9.

Further reading

â— Mimkes, Jurgen. (2002). "The Structure of Complex Systems: Thermodynamics, Socio-Economics", SocioPhysics Conference (abs) (toc) (pdf), Center for Interdisciplinary Research (Zentrum fiir interdisziplinare Forschung) (ZIF), Bielefeld Germany, Jun 6-9.

θΔics

In thermodynamics, **Zoran Rant** (1904-1972) was a Slovene mechanical engineer noted for his 1956 introduction of the term "exergy" as a new name for "technical available energy", which he followed up by "anergy" (1964) as a derivative term. [1] During the years 1954 to 1972, Rant published 42 papers in thermodynamics, including a 1963 *Thermodynamics* book, with an English translation.

Education

In 1926, Rant graduated from the *Technical High School in Vienna*, thereafter working as an engineer in the Solvay soda (barrels) factory in Lukavac, up until 1946. In his theoretical work in the factory, he thought about delazmožnosti (dissipation?) heat and internal energy, and in this practical work found a theme for its subsequent doctoral dissertation, entitled "Energy evaluation of the case manufacture barrels" (1950), which is based on the delazmožnosti heat, that he later called eksergije (exergy) heat. [2]

After WWII, Rant became a professor at the University of Ljubljana, where he stayed until 1962. In his last decade, Rant worked as a professor of process engineering at the Braunschweig University of Technology.

References

1. Rant, Zoran. (1956). "Exergie, ein neues Wort fur "Technische Arbeitsfahigkeit" (Exergy, a New Word for "Technical Available Work")". *Forschung auf dem Gebiete des Ingenieurwesens*, 22: 36–37.
2. Rant, Zoran. (1951). *Energy evaluation of the case manufacture soda (Na_2CO_3).* (*Energy Evaluation of a Procedure of Soda Fabrication*). *(Energy Evaluation of a Procedure of Soda Fabrication).* Acta Technica (3). Doctoral dissertation. Ljubljana. (COBISS) Ljubljana.

Further reading

- Rant, Z. (1957). "Exergie, Reaktionsenthalpie und freie Enthalpie" (Reaction Enthalpy and Free Enthalpy). *Vestnik Slovenskega kemijskega društva* (4) 1957/1-2, 49–56. Vestnik Slovenian Chemical Society (4). 1-2, 49-56.
- Rant, Z. (1964): "Exergie and Anergie" ("Exergy and Anergy"). *Wissenschaftliche Zeitschrift der* TU Dresden (3)/4, 1145–1149. Wissenschaftliche Zeitschrift der TU Dresden (3) 1964 / 4, 1145-1149.
- On Exergetics, Economics and Desalination – by Goran Wall and Mei Gong.
- Wall, Goran. (1986). "Exergy: a Useful Concept", PhD thesis, Chalmers University of Technology, Goteborg.

External links

- Zoran Rant – Wikipedia (Slovenian → English).

θΔics

In religio-mythology, **Zoroaster**, in Greek (Q), or Zarathustra, in Iranian mythology (Persian mythology), is an Iranian prophet figure, origin dated to c.1000 to 600BC, in Iran, whose period of worship is said to have begun with Cyrus the Great (c.600-530BC), which continues to be practiced by some in Iran.

Theban | Origins

The following shows the overlap in god-imagery between the Theban recension god Amen-Ra, aka "Neb-er-tcher" (Q), as Muata Ashby calls him, aka the super "all-in-one" Egyptian god (Ra, Atum, Ptah, and Amen combined), and the Iranian prophet Zoroaster, and Cyrus the Great (600-530BC), founder of the Achaemenid Empire (First Persian Empire) (c.550-330BC) (Q) a territory (Q) controlling Egypt (past Thebes), the Palestine area, and half of India: [1]

Amen-Ra
(1189-945BC)

Zarathustra
(1000-600BC)

Cyrus the Great
(600-530BC)

(add)

Achaemenid Empire

In 550BC, Cyrus the Great (600-530BC) conquered much of the world, as shown below, and therein founded the Achaemenid Empire (First Persian Empire) (c.550-330BC) (Q) a territory (Q) covering Egypt (past Thebes), the Palestine area, half of India, and the land up to Greece:

Another rendition of the Achaemenid Empire is shown below, which highlights the so-called Babylonian exile of the people of Judea, which from 587 to 400BC, during which time, according to Gary Greenberg (2000), and others, the Jews, aka Is-Ra-El-ites (Israelites) absorbed Babylonian mythology into their own Egyptian mythology based Hebrew mythology, after which the Old Testament of the Bible was written:

(add discussion)

Judaism | Christianity | Islam

Zoroaster is oft-discussed (O) as a precursor to the Hebrew prophets, and a forerunner to the later figures of Jesus, Muhammad, and Buddha.

Quotes

The following are related quotes:

> "The **[Judeo-Christian] Cosmogony**, that is, the account of the creation with which the book of Genesis opens, has been taken and mutilated from the Zend-Avesta of **Zoroaster**, and was fixed as a preface to the Bible after the Jews returned from captivity in Babylon, and that the Robbins of the Jews do not hold their account in Genesis to be a fact, but mere allegory. The six thousand years in the Zend-Avesta, is changed or interpolated into six days in the account of Genesis."
>
> — Thomas Paine (c.1803), "Origin of the Christian Religion"

References

1. (a) Budge, Wallis. (1904). *The Gods of the Egyptians, Volume Two* (pg. 7). Dover, 1969.
(b) Ashby, Muata. (1997). *Anunian Theology: African Religion, Volume One* (pg. 60). Cruzian Mystic Books.
(c) Cyrus the Great – Wikipedia.

External links

- Zoroaster – Wikipedia.

θΔics

In science, the symbol:

Δ

called "delta", is the fourth letter of the Greek alphabet, capital form:

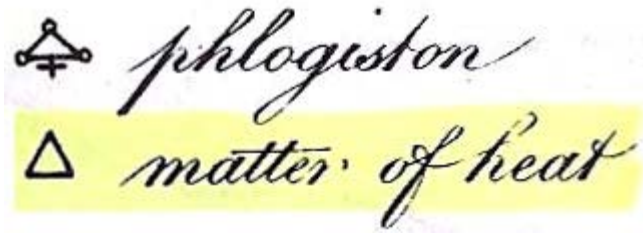

Swedish chemist Torbern Bergman's 1775 listing of the symbols for phlogiston and the matter of heat, categorized as two types of "earths", of which he listed 15 types, as contrasted with the acids (25), alkalis (3), and metallic calces (16). [7]

1. A α (alpha) | English [A]
2. B β (beta) | English [B]
3. Γ γ (gamma)
4. Δ δ (delta) | English [D]
5. E ε (epsilon) | English [E]

Water (ab-)

Fire

It is possible, etymologically, give the above ordering, noting that the prefix "ab-" equates to water (or father), that the use of the delta symbol for heat, as well as the ordering of the first four letters of the Greek, and in turn English alphabet, derive from the Heliopolis creation myth (3100BC), according to which the creation of the universe actuated as (a) flood (water, i.e. Nile river flood), (b) land (perceptual mountains rising out of the receding Nile flood at day 150), and (c) fire (sun or Ra) born out of the land, i.e. pyramid.

and can either mean "heat", if written over a reaction arrow:

meaning that the reaction under discussion is being heated; or "change" in a variable, say X:

$$\Delta X = X_f - X_i$$

on going from an initial state X_i, to a final state X_f, e.g. ΔH, ΔG, or ΔS.

Heat symbol

The triangle symbol has long been associated with heat or fire. [3] However, there seems to be no agreed upon etymology of this symbollic use. One of the more intuitive reasons that the delta symbol "Δ" is the fire symbol is that the shape of any common nightly campfire will often take the shape of a triangle, pyramid, or delta, such as shown adjacent.

One of the earliest documented uses of the triangle shape representation for heat, fire, or warmth traces back to the Greeks. The Greek classical elements are:

fire (△)
earth (▽)
air (△)
water (▽)

Greek philosopher Plato mentions the elements as of pre-Socratic origin, a list created by the Ionian philosopher Empedocles (ca. 450 BC).

The association of the triangle or pyramid shape with fire, however, traces to the pre-3,000 BC Egyptian mythological story of the birth of the sun out of the primordial mound that arose out of the waters of chaos before the formation of the world. The primordial mound, by 2,800 BC, was often shown in the form of mudbrick mastabas stacked one upon another in the form of a step pyramid (adjacent). Step pyramids later served as models for bigger pyramids, such as those at Giza (below right).

Left: Step pyramid (2,800 BC) out of which the dead were said to have arisen at the rise of the sun, carried by a fiery bird on its head out of the tip of the mound. Center: Heat, fire, or light rising out of the benben stone at the tip of one of the pyramids at gaza out of which Ra the sun god arose into the sky. Right: a campfire, making the shape of a pyramid or triangle, the symbol of fire or heat.

In the ancient Egyptian city of Heliopolis, the central location of the sun birth story, the tip of the pyramid was said to be a type of sacred stone called the "benben stone" shaped as a triangle (Δ), pictured adjacent, made out of gold or petrified semen, out of which, at each sunrise, a bird called the "bennu", often depicted as a heron, carried the sun into the sky on its daily cycle. This fiery bird was recorded the Greek historian Heroditus as the phoenix. [4]

The Greeks, beginning in 1,800 BC, later re-incorporated this pyramid sun-birth logic with the phenomenon of heat-fire (lava) release in local island volcanic eruptions, such as the c. 1400 BC eruption of Thera (Santorini), picture below, that devastated a thriving culture on that island. To explain these various types of natural heats, Empedocles says that many fires burn beneath the earth, that the solar fire was born in the bowels of the earth, and that volcanic fire shoots to the heavens and licks the stars.

Thus, prior to 400BC, in Greek mythology, both the sun “Δ” and *tartaros* “Δ”, a deity and a place of fire in the underworld, were assigned the triangle or delta symbol. [2] In evolved connection to the original Egyptian story, according to ancient Orphic sources, Tartaros is also the unbounded first-existing "thing" from which the light and the cosmos are born.

Left: *Circa* 1400 BC volcanic eruption of Thera (Santorini). Center: the "phoenix", the name assigned, by Herodotus, to Ra (bird) carrying the newborn sun out of the Nun (pyramid) following the birth of the earth. Right: German chemist Oswald Croll's 1609 alchemical symbols table, showing the “Δ” listed as the element of fire.

From these mythological beginnings, the triangle, pyramid, or delta symbol “Δ” as shorthand representation of heat, fire, or light soon became the dominant symbol in science and particularly in chemistry.

Reaction arrow

In German chemist Oswald Croll's 1609 alchemical symbols table, as shown, the “Δ” is listed as the element of fire . [2] Prior to this, it seems, the Delta symbol has often been associated with heat or fire and in modern chemistry, when written over a reaction arrow, signifies that a chemical reaction occurs with the addition of heat or energy, such as

shown below:

$$A + B \xrightarrow{\Delta} AB$$

The triangle symbol representation of heat or fire, etymologically, seems to trace back to early Greek philosophers, and their 1,000 BC analysis of heat released from volcanoes in relation to the heat of the sun, and before that to ancient Egypt proto-scientists, with their 5,000 BC thoughts on the birth of the sun out of tips of pyramids.

The use of the delta symbol used to represent a heated chemical reaction diagrammatically came of use in the 1757 lectures of Scottish chemist and physicist William Cullen and later, significantly, in the 1775 textbook *A Dissertation on Elective Attractions* by Swedish chemist Torbern Bergman, who included a chart showing sixty-four reactions drawn in two dimenions. [5] The following diagram, for instance, is Bergman's reaction scheme #42, where the triangle in the center of the diagram signifies that the reaction is heated or carried out in "the dry way":

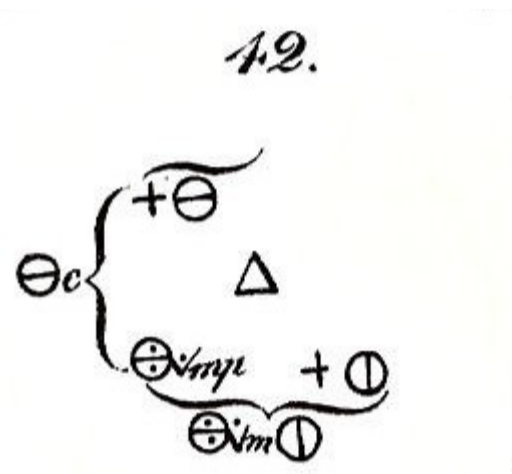

which shows that "if common salt be subjected to distillation with nitrous acid, the marine acid will rise, and the fossil alkai remain in the retort". Modeled on this logic, in the decades to follow, chemical reactions began to incorporate the heat symbol above the reaction arrow to signify that the reaction was heated:

Thermodynamics

In 1825, Scottish physicist James Forbes contributed papers to the *Edinburgh Philosophical Journal* anonymously under the signature "Δ", likely in being a pseudonym for a person who is interested in heat. [1] Between 1836 and 1844 he published in the *Trans. Roy. Soc. Ed.* four series of "Researches on Heat".

In the 1850s, the "θΔics" symbol was used, by William Thomson, James Maxwell, and Peter Tait, as shorthand for the newly forming science of thermo-dynamics.

References

2. Opsopaus, John. (1998). "The Ancient Greek Esoteric Doctrine of the Elements: Fire", *University of Tennessee.*

3. Croll, Oswald. (1609). "Alchemical Symbols" in *Basilica Chymica*.
4. Littleton, Scott C. (2002). *Mythology - the Illustrated Anthology of World Myth and Storytelling.* San Diego, Ca.: Thunder Bar Press.
5. Torbern Bergman's 1775 Reaction Diagrams - Department of Chemistry at Texas A&M University.
6. Proceedings of the Royal Society of London, vol. XIX, p ii.
7. Bergman, Torbern. (1775). *A Dissertation on Elective Attractions*. London: Frank Cass & Co.

θΔics

In equations, the following formula:

$$\Delta G < 0$$

is called, in Hmolpedia namesake, the Lewis inequality for a natural process and states that the difference of the Gibbs free energy, symbol "G", of an isothermic-isobaric system in its final state G_f less the Gibbs free energy of the system in its initial state G_i, is less than zero, where ΔG is equal to:

$$\Delta G = G_f - G_i$$

the symbol "Δ", the Greek capital letter Delta, being the thermodynamics symbol for a large change (in contrast with a small differential change, symbol "d" or "δ" (delta), for an exact differential change, or $\bar{d}$ (d-hat) or đ (d-crossbar), for an inexact differential change), the symbol "<" being the less than inequality mathematical symbol. [1] A synonymous name of this equation is the: Gibbs free energy change for a spontaneous process.

History

This equation was first stated by American physical chemist Gilbert Lewis in 1923, based on the 1876 work of American engineer Willard Gibbs, which in turn is based on the 1856 Clausius inequality, developed by German physicist Rudolf Clausius, which in turn is based on the the principle of Carnot efficiency, developed in 1824 by French physicist Sadi Carnot.

References

1. Guggenheim, Edward, A. (1933). *Modern Thermodynamics by the Methods of Willard Gibbs* (pg. 17). London: Methuen & Co.
2. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pgs. 160-61). McGraw-Hill Book Co., Inc.

θΔics

In equations, the formula:

$$\Delta G = \Delta H - T\Delta S$$

is called the equation for "Gibbs free energy change" for a closed isothermic-isobaric reaction or process and states that the change, symbol "Δ", in Gibbs free energy, symbol "ΔG", over the extent of the reaction or process, on transforming from an initial state to a final state, is equal to the change in enthalpy, symbol "ΔH", less the product of the absolute temperature, symbol "T", of the system, and the entropy change, symbol "ΔS", of the process.

History

The above equation, albeit not exactly in the shown notation, was first derived in the 1873 work of American engineer Willard Gibbs. The first to start using the delta symbol notation, it seems, was American physical chemist Gilbert Lewis in 1923. In 1933, the function began to be specifically called "Gibbs free energy" but English physicist Edward Guggenheim.

Humans

The above function is the main governing equation of human existence, as defined by the Lewis inequality for natural processes (ΔG < 0). This view is expressed well by American physical chemist Thomas Wallace who in his 2009 appendix section "The Fundamentals of Thermodynamics Applied to Socioeconomics", states that the following about this equation:

> "The spontaneity of a thermodynamic process is measured by its free energy change ΔG, which at constant temperature is mathematically represented by the function ΔG = ΔH – TΔS, whereby the parameters enthalpy H and entropy S represent the variables of heat content and probability, respectively, for the physical, chemical, and biological processes of nature and society, and where free energy G represents the fundamental driving force in nature and determines whether physical and chemical processes conducted by nature and society will take place."

This quote is fairly representative of the view that has been emerging in the last decade or so.

References

1. Wallace, Thomas P. (2009). *Wealth, Energy, and Human Values: the Dynamics of Decaying Civilizations from Ancient Greece to America* (Appendix A: The Fundamentals of Thermodynamics Applied to Society, pgs. 469-89.). AuthorHouse.

External links

â— ΔG = ΔH – TΔS (Frank Lambert) – 2ndLaw.oxy.edu.
â— ΔG = ΔH – TΔS (Mr. Kent) – KentChemistry.com.

θΔics

In equations, the function

$$\Delta G = \Delta U + P\Delta V - T\Delta S$$

Is the expanded form of the equation for Gibbs free energy change ΔG, which shows that Gibbs free energy change is a function of internal energy change ΔU plus pressure volume work energy PΔV less bound energy or transformation content energy TΔS. We can then insert the Rudolf Clausius 1865 definition of the internal energy function U as:

$$U = T_v + J_e$$

or in terms of change:

$$\Delta U = \Delta T_v + \Delta J_e$$

where ΔT_v is the change in vis viva, loosely defined the sum of the kinetic energy of the particles of the system, in going from the system initial state to system final state, and ΔJ_e is the change in ergal, loosely defined as the forces that brought the system to its current configurational state, in going from the system initial state to system final state, into the above equation, to arrive at:

$$\Delta G = \Delta T_v + \Delta J_e + P\Delta V - T\Delta S$$

although, technically, to note, this last step may not be fully rigorous, in that there may be mathematical issues involved in making the jump to stating that the variables vis viva change ΔT_v and ergal change ΔJ_e exist or can be formulated as such. In any event, this last formula gives crude idea that there are four main components to Gibbs free energy change.

θΔics

In equations, the following formula:

$$\Delta G = -nFE$$

is called “[name]” and states that Gibbs free energy change *ΔG* of a Galvanic cell equals the negative of the number of faradays *n* passing through the cell, when the reaction takes place, times the Faraday constant *F* times the electromotive force *E* of the cell. [1]

History

The basics of this equation was first outlined by American engineer Willard Gibbs in his 1876 section "Electromotive Force" of his *Equilibrium* treatise, in which he derived the following formula for a perfect (reversible) electrochemical apparatus:

$$V'' - V' = -\frac{d\zeta}{de}$$

where *V′* and *V″* denote the electrical potentials in pieces of the same kind of metal connected with the two electrodes, *de* is a differential quantity of electricity, and *dζ* (differential of zeta) is the change in the available energy (or isothermal-isobaric free energy, i.e. Gibbs free energy dG). [2]

The work of Gibbs was expanded on further by German physicist Hermann Helmholtz in his 1877 "On Galvanic Currents originated by Differences of Concentration", and followup famous 1882 "On the Thermodynamics of Chemical Processes", in which he is said to have derived the function in terms of the isochoric-isobaric free energy (Helmholtz free energy, dF); although, it is difficult to pin down the exact formulation. [3]

In 1923, American physical chemists Gilbert Lewis and Merle Randall were stating this equation in its essential modern notation, as follows:

$$\Delta F = -NFE$$

albeit, in his characteristic function notation, where *ΔF* is the Lewis free energy (in place of *G* or Gibbs free energy), F is the Faraday equivalent, and *N* (in place of *n*) is the number of equivalents passing through the cell when the reaction occurs as written. [4]

Here, no note, we see a notation our first instance of notation confusion overlap, i.e. the symbol F, being used for two different quantities (Faraday constant and Free energy); hence the symbol "G" was instilled as the standard symbol for the isothermal-isobaric free energy in honor of Willard Gibbs in 1933 by English chemical thermodynamicist Edward Guggenheim.

References

1. (a) Laidler, Keith. (1993). *The World of Physical Chemistry* (section: thermodynamics of electrochemical cells, pgs. 220-21). Oxford University Press.
(b) Merle, Randall. (1942). *Physical Chemistry* (pgs. 325-). Randall and Sons.
2. Gibbs, Willard. (1876). *On the Equilibrium of Heterogeneous Substances* (section: "Electromotive Force", pgs. 331-49). Dover.
3. (a) Helmholtz, Hermann. (1877). “On Galvanic Currents Originated by Differences of Concentration”, Wiss. Abh. Bd. i. No. xliv.
(b) Helmholtz, Hermann. (1882). “On the Thermodynamics of Chemical Processes” (Die Thermodynamic Chemischer

Vorgange), in: *Physical Memoirs Selected and Translated from Foreign Sources*, 1: 43-97. Physical Society of London, Taylor and Francis, 1888.
4. (a) Lewis, Gilbert and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pgs. 157). McGraw-Hill.
(b) Merle, Randall. (1942). *Physical Chemistry* (pgs. 325-). Randall and Sons.

θΔics

In equations, the following formula:

$$\Delta G > 0$$

is called the Lewis inequality for an unnatural process and states that the difference of the Gibbs free energy, symbol "G", of an isothermic-isobaric system in its final state G_f less the Gibbs free energy of the system in its initial state G_i, is greater than zero, where ΔG is equal to:

$$\Delta G = G_f - G_i$$

the symbol "Δ", the Greek capital letter Delta, being the thermodynamics symbol for a large change (in contrast with a small differential change, symbol "d" or "δ" (delta), for an exact differential change, or $\bar{d}$ (d-hat) or đ (d-crossbar), for an inexact differential change), the symbol ">" being the greater than inequality mathematical symbol. [1] A synonymous name of this equation is the: Gibbs free energy change for a non-spontaneous process.

History

This equation was first stated by American physical chemist Gilbert Lewis in 1923, based on the 1876 work of American engineer Willard Gibbs, which in turn is based on the 1856 Clausius inequality, developed by German physicist Rudolf Clausius, which in turn is based on the the principle of Carnot efficiency, developed in 1824 by French physicist Sadi Carnot.

References

1. Guggenheim, Edward, A. (1933). *Modern Thermodynamics by the Methods of Willard Gibbs* (pg. 17). London: Methuen & Co.
2. Lewis, Gilbert N. and Randall, Merle. (1923). *Thermodynamics and the Free Energy of Chemical Substances* (pgs. 160-61). McGraw-Hill Book Co., Inc.

θΔics

In equations, the following formula

$$\Delta G^\circ = -RT \ln K$$

is called “[name]” and states that the standard Gibbs free energy change ΔG° equals the negative of the product of the gas constant *R* times the absolute temperature of the system *T* times the natural logarithm ln of the equilibrium constant *K*.

History

The equation is said to have originated in the 1886 work of Danish physical chemist Jacobus van't Hoff and his so-called "van't Hoff equilibrium box"; although, to note, he derived the equation in terms of the chemical affinity work w_A, and never utilized the concept of free energy in his theories. [1]

References

1. Laidler, Keith. (1993). *The World of Physical Chemistry* (section: thermodynamics of electrochemical cells, pgs. 218-19). Oxford University Press.

Further reading

● Merle, Randall. (1942). *Physical Chemistry* (pg. 300). Randall and Sons.

External links

● How was ΔG = –RT ln Keq discovered? (cache) (2009) – ChemicalFormums.com.

θΔics

In equations, the function:

$$\Delta H = \Delta U + P\Delta V$$

is called enthalpy change, or change in the heat content of the system, and is internal energy change ΔU less the pressure volume work energy change PΔV of a system's enthalpy on going from an initial state to a final stated. This difference is quantified by the expression:

$$\Delta H = H_f - H_i$$

or the final system state measure of enthalpy H_f less the initial system state measure of enthalpy H_i.

θΔics

In equations, the function:

$$\Delta H - T\Delta S$$

is called the "free energy content change", or available energy change, of a closed isothermal-isobaric freely-going process and is the thermodynamic expression of Gibbs free energy change ΔG, and is the change of enthalpy ΔH less the conjugate energy pair of the product of the absolute temperature T of the system and the entropy change of the system ΔS, a quantity, TΔS, otherwise known as bound energy.

Factors Affecting the Sign of ΔG in the Relationship ΔG = ΔH – TΔS

ΔH	ΔS	ΔG
+	+	Reaction proceeds spontaneously at high temperatures. At low temperatures, reaction is spontaneous in the reverse direction.
+	−	ΔG is always positive. Reaction is spontaneous in the reverse direction at all temperatures.
−	+	ΔG is always negative. Reaction proceeds spontaneously at all temperatures.
−	−	Reaction proceeds spontaneously at low temperatures. At high temperatures, the reverse reaction becomes spontaneous.

An example spontaneity table, from American chemist Raymond Chang's 1998 *Chemistry* textbook, showing how the variables ΔH and ΔS are the key to the understanding of reaction spontaneity, as defined by the function "ΔH – TΔS". [2]

Thims

American electrochemical engineer Libb Thims spent a period of at least six years studying this quantity, from 1995 to 2001, as a sort of pastime hobby, during which period the "ΔH – TΔS" expression was viewed as essentially a black box as to how the changes of the three variable of this expression relate to states of human existence, such as on going from the “single state” to the “married with 2.5 kids state”. [1]

One of the precipitates of this effort was the publication of the two-volume 2007 textbook *Human Chemistry*, the first-ever attempt to ferret out the basic structure of the science of human chemistry.

References

1. Thims, Libb. (2007). *Human Chemistry (Volume Two)* (pgs. 668-72. Morrisville, NC: LuLu.
2. Chang, Raymond. (1998). *Chemistry* (pg. 740). McGraw-Hill.

External links

â— Why does ΔH – TΔS equal “useful” energy? (2009) – Yahoo Answers.

θΔics

In equations, the function:

$$\Delta S$$

where Delta, symbol "Δ", means "large change" (as contrasted with "differential change", symbol "d"), as in before minus after of some quantity, and S is entropy of the system, whereby the product or joint symbol ΔS is the entropy change of the system or reaction on going from an initial state entropy to a final state entropy or in expanded form:

$$\Delta S = S_f - S_i$$

See also

- TΔS

θΔics

In equations, the function:

$$\Delta U$$

is called the change Δ in internal energy *U* of a system, in which the system goes from an initial state, at a specific internal energy, U_i, to a final state, at a specific internal energy U_f, quantified as the difference between the internal energy of the system in its final state less the free energy of the system in its initial state:

$$\Delta U = U_f - U_i$$

In more detail, internal energy, in its original formulation, as conceived by German physicist Rudolf Clausius in 1850 to 1865, is the sum of the vis viva T and the ergal J or:

$$U = T_v + J_e$$

Referring to a change over time, internal energy can be defined as:

$$\Delta U = \Delta T_v + \Delta J_e$$

where ΔT is the change in vis viva in going from the system initial state to system final state, and ΔJ is the change in ergal in going from the system initial state to system final state. If the idea of vis viva change is taken literally, the following expression results:

$$\Delta T_v = \frac{1}{2}\left(\sum_{i=1}^{j} m_{f_i} v_{f_i}^2 - \sum_{i=1}^{k} m_{i_i} v_{i_i}^2\right)$$

which opens up issues as to the mathematics to the idea of vis viva change, which may not be fully mathematically cogent, as formulated here.

θΔics

In thermodynamics, “**θΔics**” (also: θΔ or θΔcs) is the shorthand notation for 'thermo-dynamics' used in the 1870s correspondences between James Maxwell, William Thomson, and Peter Tait. [1]

Forbes

In c.1825, James Forbes, Scottish physicist, mentor to Scottish engineer William Rankine, at the Edinburgh University, the latter of whom being connected to William Thomson, contributed papers to the *Edinburgh Philosophical Journal* anonymously under the signature "Δ", likely in being a pseudonym for a person who is interested in heat. [8]

It could be possible, therefore, to conjecture, that the later Maxwell-Tait and Thomson circle usage of Δ in θΔcs, as Greek shorthand code for thermodynamics, was influenced or inspired by Forbes' age 16 pseudonym signature.

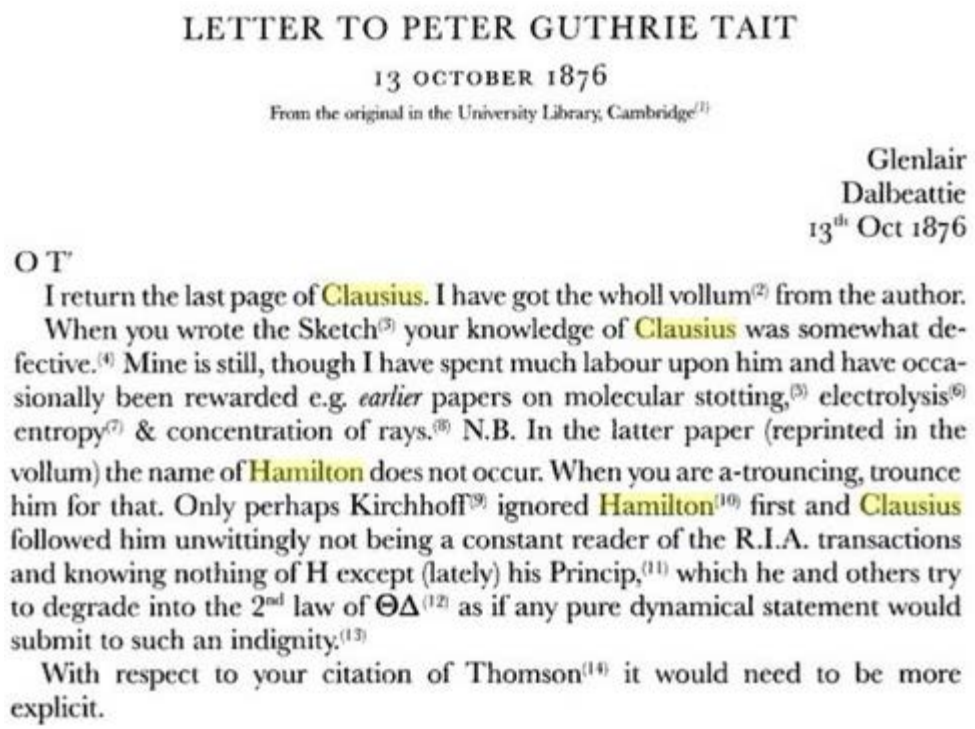

LETTER TO PETER GUTHRIE TAIT

13 OCTOBER 1876

From the original in the University Library, Cambridge[1]

Glenlair
Dalbeattie
13th Oct 1876

O T'

I return the last page of Clausius. I have got the wholl vollum[2] from the author. When you wrote the Sketch[3] your knowledge of Clausius was somewhat defective.[4] Mine is still, though I have spent much labour upon him and have occasionally been rewarded e.g. *earlier* papers on molecular stotting,[5] electrolysis[6] entropy[7] & concentration of rays.[8] N.B. In the latter paper (reprinted in the vollum) the name of Hamilton does not occur. When you are a-trouncing, trounce him for that. Only perhaps Kirchhoff[9] ignored Hamilton[10] first and Clausius followed him unwittingly not being a constant reader of the R.I.A. transactions and knowing nothing of H except (lately) his Princip,[11] which he and others try to degrade into the 2nd law of **ΘΔ**[12] as if any pure dynamical statement would submit to such an indignity.[13]

With respect to your citation of Thomson[14] it would need to be more explicit.

An 1876 letter from James Maxwell to Peter Tait showing the "**θΔcs**" notation.

Thomson | Maxwell | Tait

In the 1870s correspondences between James Maxwell, William Thomson, and Peter Tait, Thomson, in his his letters, in particular, used phrases such as “2nd law of θΔ” or “2nd law of θΔcs”, among others. [2] The three of them likely used the symbol as a combination sound representation of *thermo-dynam-ics*, i.e. "theta-delta-ics", in association with the symbol delta "Δ" having had a long history in science as the symbol of heat or fire. [3]

> “I return the last page of Clausius. I have got the whole volume from the author. When you wrote the *Sketch* [*of Thermodynamics*, 1868] your knowledge of Clausius was somewhat defective. Mine is still, though I have spent much labor upon him and have occasionally been rewarded, e.g. earlier papers on molecular sorting, electrolysis, entropy, and concentration of rays. N.B. In the latter paper, reprinted in the volume, the name of Hamilton does not occur. When you are a-trouncing, trounce him for that. Only perhaps Kirchhoff ignored Hamilton first and Clausius followed him unwittingly not being a constant reader of the R.I.A. transactions and knowing nothing of H except (lately) his *Princip*, which he and others try to degrade into the **2nd Law of ΘΔ** as if any pure dynamical statement would submit to such an indignity. With respect to your citation of Thomson, it would need to be more explicit.”
>
> — James Maxell (1876), “Letter to Peter Tait”, Oct 13

In the early phases of the development of the science of thermodynamics, from the 1840s into the early 20th century, aside from θΔics, thermodynamics went by such names as "energetics", "mechanical theory of heat", or "theory of heat" among others.

The idea to use coded Greek letters to represent the term ‘thermo-dynamics’ (coined by Thomson in 1854), likely arose from Maxwell. During his early school years, at the Edinburg Academy at the age of 10, Maxwell frequently wrote to his father in zany letters filled with puns and misspellings, embellished with elaborate doodles, and containing secret messages in different colored inks. [5]

In the adjacent 1876 letter (or postcard) to Peter Tait wherein Maxwell uses, according to the 2002 editing of physics historian Peter Harman, the term "2nd law of ΘΔ" as shorthand for second law of thermodynamics.

According to the 2003 biography of Maxwell by English physicist Basil Mahon, however, its is stated that Maxwell used "ΘΔics", rather than "ΘΔ" alone. [1] A third references it he Sklog wiki, discussed below, wherein it is indicated that "ΘΔcs" was used as the shorthand term. More research needs to be done to find a more definitive answer to this issue.

Macrakis

In 1997, Michael Macrakis, founder of the Greek Font Society (Q), was titling his thermodynamics chapters as follows:

THERMODYNAMICS ($\Theta\Delta^{CS}$)

using the Thomson-Maxwell-Tait Greek code shorthand for the subject of thermodynamics (see: θΔics), before it was called thermodynamics. [7]

Sklog wiki

The symbol $\Theta\Delta^{cs}$ is used in the logo of the SklogWiki (in conjuction with S = K ln W) as shown below: [4]

Human thermodynamics

In circa 2010, Libb Thims was testing the extrapolation, in respect to the science of human thermodynamics, knowing that Mars "♂" and Venus "♀" symbol symbolically represent man and woman, respectively, and knowing that the triple parallel line symbol "≡" is a representation of bonding between molecules, such as between human molecules, then the symbolic representation shorthand for human thermodynamics may be: Human (♂≡♀) Thermodynamics (θΔics) or "♂≡♀ θΔics".

IoHT

In circa 2008, in modern use, θΔics is the symbol for the *Institute of Human Thermodynamics* and is used as the bottom page icon for the Encyclopedia of Human Thermodynamics.

Above: The "ΘΔics" symbol, found at the bottom of every Hmolpedia article (linking to this page), being shorthand for the term "thermodynamics" (the science that governs the known universe), shown on a US one dollar bill, meaning, for the modern physical scientist, "In Thermodynamics We Trust"; substituted for original 1956 statement "In God We Trust" (a defunct theory), as adhered to by the general public. In 2010, Christopher Redford did a video (V) on God-reform in US currency and constitution wording.

References

1. Mahon, Basil. (2003). *The Man Who Changed Everything - the Life and Science of James Clerk Maxwell* (pg. 132). UK: Wiley.
2. Maxwell, James. (1876). "Letter to Peter Guthrie Tait", Oct. 13.
3. Opsopaus, John. (1998). "The Ancient Greek Esoteric Doctrine of the Elements: Fire", *University of Tennessee*.
4. SklogWiki (About) - a Statistical Mechanics and Thermodynamics Wiki.
5. Lindley, David. (2001). *Boltzmann's Atom: the Great Debate that Launched a Revolution in Physics* (pg. 79). The Free Press.

6. In God We Trust – Wikipedia.
7. Macrakis, Michael S. (1997). *Scarcity's Ways: the Origins of Capital: a Critical Essay on Thermodynamics, Statistical Mechanics and Economics (Boston Studies in the Philosophy of Science)* (§:4: Thermodynamics (ΘΔcs), pgs. 93-). Springer.
8. Smith, Crosbie. (1998). *The Science of Energy: a Cultural History of Energy Physics in Victorian Britain* (pgs. 102-07). University of Chicago Press.

θΔics

In equations, the following expression:

$$\sum_{i=1}^{j} \Delta G_{N_i} + \sum_{i=1}^{k} \Delta G_{\tilde{N}_i} < 0$$

is called the Lipmann coupling inequality and quantifies free energy coupling for natural earth-bound processes and reactions occurring at or near the surface of the earth, where the quantity to the left of the inequality:

$$\Delta G_T = \sum_{k=i}^{j} \Delta G_N + \sum_{i=1}^{k} \Delta G_{\tilde{N}}$$

is defined as the "total" system Gibbs free energy change ΔG_T, where ΔG_{N_i} refers to an individual, naturally occurring, system constrained process or reaction, defined by the Lewis inequality for a natural processes (ΔG < 0), where $\Delta G_{\tilde{N}_i}$refers to an individual, unnaturally occurring, system constrained process or reaction, defined by the Lewis inequality for an unnatural processes (ΔG > 0), where the summation:

$$\sum_{k=i}^{j} \Delta G_N$$

is the sum of the Gibbs free energy changes for all "natural", symbol N, processes or reactions in a given coupled system, where the summation:

$$\sum_{i=1}^{k} \Delta G_{\tilde{N}}$$

is the sum of the Gibbs free energy changes for all "unnatural", symbol $\tilde{N}$, processes or reactions in a given coupled system.

Morality

The Lipmann coupling inequality succinctly captures the age old idiom or belief that good always triumphs over evil or in thermodynamic terms natural processes always triumphs over unnatural processes. [1]

Etymology

The above equation is an EoHT assigned name, named after German-born American Fritz Lipmann who in 1941 "Metabolic Generation and Utilization of Phosphate Bond Energy" did the first work in the development of free energy coupling theory, specifically applied to frog leg contraction energy puzzle.

References

1. Thims, Libb. (2011). "Thermodynamic Proof that Good Always Triumphs over Evil", *Journal of Human Thermodynamics*, 7: 1-4.

θΔics

В термодинамике **человека термодинамики** является научное исследование энергетических и энтропийных аспекты процессов человеческой деятельности и движение, в контексте boundaried ежедневных солнечных циклов, а именно тех, существующих между теплотой, работа, спонтанность, необратимости и законы, определяющие в нем.

θΔics

از پروسه فعالیت های انسانی و حرکت است ، در چهار چوب entropic در ترمودینامیک ، ترمودینامیک انسان مطالعه علمی از جنبه های پر انرژی و روزانه خورشیدی ، یعنی کسانی که بین وجود گرما ، کار ، خود به خودی ، تغییر ناپذیری و قوانین تعریف در آن boundaried از چرخه

θΔics

In symbols, ∂, called the “curly d” character, is the character, in differential equations, for a partial differential or "partial derivative", first introduced in 1770 by French mathematician Marquis de Condorcet (see: history of differential equations).

θΔics

In symbols, the mathematical operator âˆ®, of an integration sign with a circle in it:

$$\oint$$

is called the "cycle integral", closed path integral, or circle integral. In mathematics, the symbol is used to mean that the "integration is done around a closed path". [1] In thermodynamics, means that the "integration is done around a cycle", in particular that of the Carnot cycle or heat cycle, and thus seems to take on a peculiar meaning, distinct form that of its usage in standard mathematics. [1]

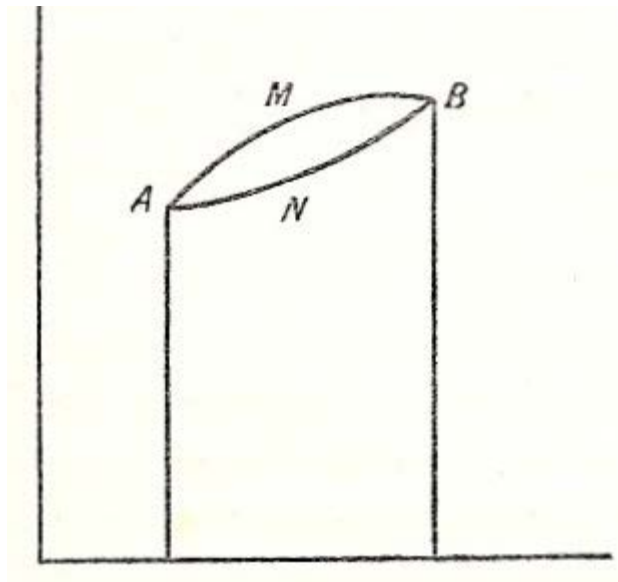

The cycle integral diagram used by James Partington (1924) to explain that, in chemical thermodynamics, the following symbol $(\int)$ or âˆ® in modern symbol nomenclature, means or denotes "integration round a cycle", such that a function, say internal energy U, can be taken from position A, to point B, along one path (M) and then brought back to its starting position along a second path (N), thus completing a cycle, in each path an integration can be done, the sum of which yields the value of the cycle integral. [3]

History

The origin of this symbol introduction remains to be tracked down, particularly because it is often associated with the Clausius inequality, and thus with the summations of differential units of heat dQ going into and out of bodies through the boundary.

In 1901, American mathematician Edwin Wilson (Gibbs' student) is said to have used a small circle below the standard integral symbol to denote integration around a closed curve in his *Vector Analysis* (1901, 1909) as well as in his *Advanced Calculus* (1911, 1912).

In 1917, English physicist Arnold Sommerfeld is said to have used the circle integral symbol. [2]

In 1924, English chemist James Partington, in his *Chemical Thermodynamics*, goes into some detail into describing the the following symbol:

$$(\int)$$

which he says "denotes integration round a cycle". To explain the idea of the “cycle integration”, Partington begins with the principle of conservation of energy, which according to him states that

> “The change of intrinsic energy of a system undergoing any change depends solely on the initial and final states of the system and is independent of the manner in which the change from one state to the other is effected.”

The definition of intrinsic energy, according to Partington, was first described by William Thomson in 1851. [4] Intrinsic energy or rather internal energy is one of the five main characteristic functions. Characteristic functions in which the change in the function depends solely on the initial and final states of the system and is independent of the manner in which the change from one state to the other is effected are called “path independent.” Those functions that depend on the path followed are called “path dependent.”

Hence, in diagrammatic terms, shown above, the change of the system from an initial state A to a final state B can be carried out along path M, according to which the change in intrinsic energy will be ΔU_M. If then the change in the system is reversed by bringing the system from state B to the original state A, but via path N, then the change in intrinsic energy U will be $-\Delta U_N$.

The two changes, according to Partington, constitute what is called "cycle". Because U is a path dependent function and in this graphical cycle has returned to its original position on the graph, the total change of U is zero or:

$$\Delta U_M - \Delta U_N = 0$$

Partington goes on to state that the same method may be applied to any other possible direct change instead of M, but the proof depends on the existence of at least one path (N) along which the change from A to B can be reversed. If this does not exist, the principle can only be inferred. He gives the example of radioactive decay changes as one such process or change in the state of a system, in which reversible paths do not exist.

Partington later defines the circle integral for the Clausius equality or reversible version of the second law as follows: [3]

$$(\int)\, \delta Q/T = \sum \frac{Q}{T}$$

Partington, supposedly, gives a fuller account of this in his 1920 *Higher Mathematics for Chemical Students.* [5]

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2. Sommerfeld, Arnold. (1917). "Die Drudesche Dispersionstheorie vom Standpunkte des Bohrschen Modelles und die Konstitution von H2, O2 und N2", *Annalen der Physick.*
3. Partington, James R. (1924). *Chemical Thermodynamics: An Introduction to General Thermodynamics and its Applications to Chemistry* (pg. 14). D. Van Nostrand.
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θΔics

熱力学では、 人間の熱は、人間の活動と運動のプロセスのエネルギーとエントロピーの側面の科学的研究、boundaried毎日の太陽サイクルの文脈で、すなわち熱間 の存在、仕事、自発性、不可逆性や法律はそこに定義されます。

θΔics